REPORT NUMBER: TO2-MGA-2004-011

VEHICLE TO VEHICLE CRASH TESTS IN SUPPORT OF COMPATIBILITY RESEARCH

FULL FRONTAL COLLINEAR
Test Date: June 29, 2004
Task Order #T0002 / RFP #0003

1999 DODGE GRAND CARAVAN SE (RX0322)
TO 2004 HONDA ACCORD EX (R45344)

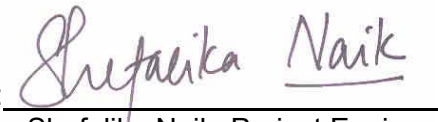
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This final test report was prepared for the U.S. Department of Transportation, Volpe National Transportation System Center, in response to Contract Number DTRS57-04-D-30001.

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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This vehicle to vehicle crash test was conducted as part of Contract No.: DTRS57-04-D-30001, RFP 3, task order 2, sponsored by the U.S. Department of Transportation, Volpe National Transportation System Center. The purpose of this testing is to evaluate and compare vehicle and occupant responses in vehicle to vehicle crash tests against full frontal rigid barrier crash tests conducted using a high resolution load cell barrier. This task order plans for eighteen vehicle to vehicle crash tests in support of the vehicle compatibility research plan. There will be six tests each in three test configurations; full frontal collinear, fifty percent offset collinear, and FMVSS 214 configuration side impact. For all tests the target vehicle will be stationary.

SUMMARY

A 1999 Dodge Grand Caravan SE impacted a 2004 Honda Accord EX in the full frontal collinear configuration. The test was performed at MGA Research Corporation on June 29, 2004.

The bullet vehicle (1999 Dodge Grand Caravan SE) contained one Part 572E, 50th percentile male anthropomorphic test device (ATD) placed in the driver seating position and one Part 572O, 5th percentile female ATD placed in the right front seating position. These dummies were positioned according to dummy placement instructions specified in the FMVSS 208 TP-12 Laboratory Indicant Test Procedure.

The target vehicle (2004 Honda Accord EX) contained one Part 572E, 50th percentile male anthropomorphic test device (ATD) with THOR Lx lower leg instrumentation placed in the driver seating position and one Part 572O 5th percentile female ATD placed in the right front seating position. These dummies were positioned according to dummy placement instructions specified in the FMVSS 208 TP-12 Laboratory Indicant Test Procedure.

Appendix A contains the test photos. Appendices B and C contain the data plots for the bullet and target vehicles respectively. The dummy calibration data is located in Appendix D and the dummy instrumentation is summarized in Appendix E.

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

TEST NOTES

The driver airbag deployed but had a large tear in the fabric.

No valid data was collected for the following channels:

Bullet: Driver Left Knee Shear
Right Brake Caliper X after 40 msec.
Bottom of Engine X after 40 msec.

Target: Driver Left Upper Tibia Moment X
Bottom of Engine X
Driver Left Mid-Foot Z after 55 msec.
Right Rear Seat Crossmember X after 30 msec

SECTION 2

BULLET VEHICLE INFORMATION / DATA SHEETS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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

BULLET VEHICLE TEST SUMMARY

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Door was unlocked	Door was unlocked
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Track Shift	0	0

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50^{th}/ 110	HIII 5^{th}/ 324
Head Contact	Airbag, Head Rest	Airbag, Head Rest
Chest Contact	Airbag	Airbag
Abdomen Contact	Airbag	Airbag
Left Knee Contact	Knee Bolster, Steering Column	Glovebox
Right Knee Contact	Knee Bolster, Steering Column	Glovebox

INSTRUMENTATION

Driver ATD Sensors	57
Passenger ATD Sensors	36
Belt Assessment Sensors	4
Vehicle Structure Accelerometers	13
Timing Channels	1
Total	111

TEST SPEED

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	101.7	101.2

$$\textbf{Speed}_{\textbf{Bullet}} = \frac{(\textbf{Weight}_{\textbf{Bullet}} + \textbf{Weight}_{\textbf{Target}})}{\textbf{Weight}_{\textbf{Bullet}}} * 56 \text{ kph} = \frac{(1992.6 + 1626.7)}{1992.6} * 56 \text{ kph}$$

DATA SHEET NO. 2

BULLET VEHICLE DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

VEHICLE INFORMATION

Make	Chrysler
Model	Dodge Grand Caravan SE
Body Style	Van
NHTSA No.	RX0322
VIN	1B4GP44G2XB574877
Color	Maroon
Odometer Reading (mile)	76,002
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.3
Engine Placement	Lateral

VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	Yes
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	No
Anti-lock Brakes	Yes
AM/FM/CD	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	DaimlerChrysler Corporation
Date of Manufacture	09/98

GVWR (kg)	2432
GAWR Front (kg)	1246
GAWR Rear (kg)	1246

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Cold Pressure (kPa)	241	241
Recommended Tire Size	P215/65R15	P215/65R15
Tire Size on Vehicle	P215/65R15	P215/65R15
Tire Manufacturer	GoodYear	GoodYear

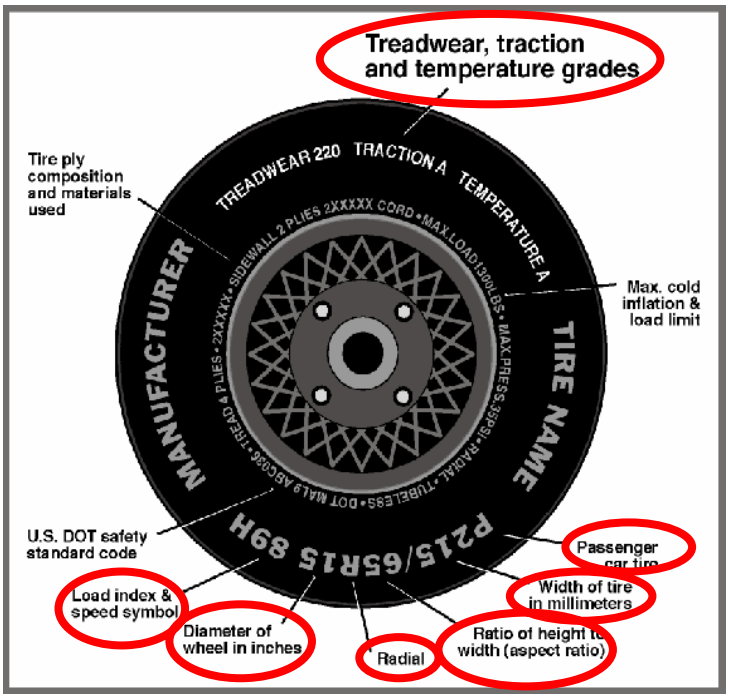
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Bench	
Number Of Occupants	2	2	3	7

DATA SHEET NO. 3

BULLET VEHICLE TIRE INFORMATION

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Vehicle Year	1999	Vehicle Make	Chrysler
VIN	1B4GP44G2XB574877	Vehicle Model	Dodge Grand Caravan SE



	Front	Rear
Tire Manufacturer	GoodYear	GoodYear
Tire Name	Weather Handler CS	Weather Handler CS
Tire Type	P	P
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	65	65
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	95T	95T
Treadwear	560	560
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 4

BULLET VEHICLE SETUP INFORMATION

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	545.2	392.8		593.8	431.8	
Right	kg	505.8	384.2		545.2	421.8	
Ratio	%	57.5	42.5		57.2	42.8	
Totals	kg	1051.0	777.0	1828.0	1139.0	853.6	1992.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1828.0
Weight of 1 P572E & 1 P572O ATDs	kg	127.0
Rated Cargo/Luggage Weight (RCLW)	kg	45.4
Calculated Vehicle Target Weight (TVTW)	kg	2004.4

VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	748	751	768	770	1291
As Tested	mm	737	742	756	758	1301
Post Test	mm	800	865	835	818	

Vehicle Wheelbase (mm): 3036

Weight of Ballast secured in cargo area (kg): 0

Vehicle Components Removed: Third Seat, Rear Carpeting, Hub Covers, jack

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

DATA SHEET NO. 4... (Continued)

BULLET VEHICLE SETUP INFORMATION

SEAT BACK POSITION

Driver seat back angle: 24.9° on seat back

Passenger seat back angle: 21.2° on seat back

SEAT FORE/AFT POSITIONS

The driver and passenger seat travel are manually adjustable.

Driver seat fore/aft total travel: 23 positions

Passenger seat fore/aft total travel: 23 positions

Driver seat fore/aft position: 12th position of 23 total

Passenger seat fore/aft position: full forward

SEAT BELT UPPER ANCHORAGE

The driver anchorage was placed in the middle position. The passenger anchorage was placed full down.

FUEL TANK CAPACITY DATA

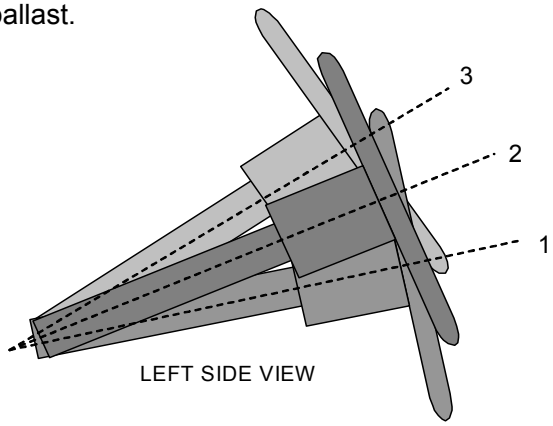
The fuel tank was filled with 26.5 liters of water for ballast.

STEERING COLUMN ADJUSTMENT

Lowermost. Position 1: 18.7°

Geometric Center, Position 2: 27.1°

Uppermost, Position 3: 36.7°



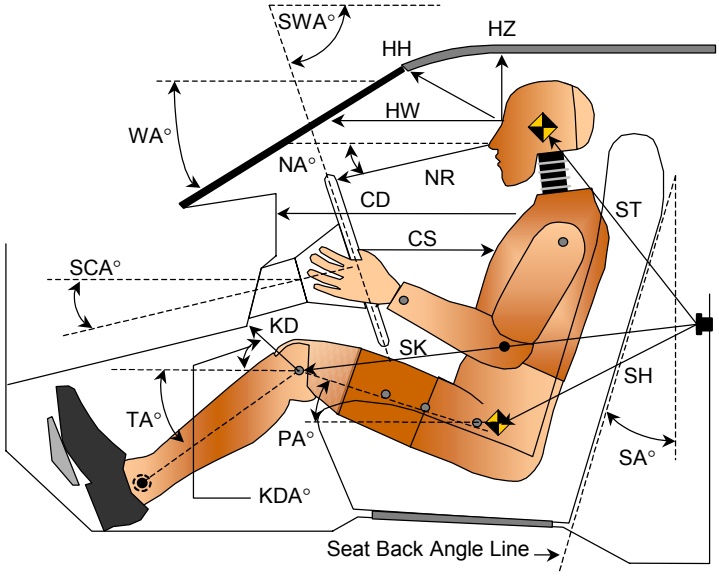
STEERING COLUMN ASSEMBLY

DATA SHEET NO. 5

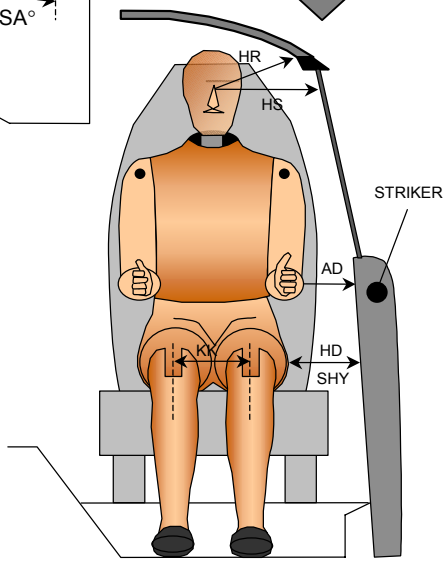
DUMMY POSITIONING IN BULLET VEHICLE

Bullet Vehicle:	1999 Dodge Grand Caravan SE	NHTSA No.:	RX0322
Target Vehicle:	2004 Honda Accord EX	NHTSA No.:	R45344

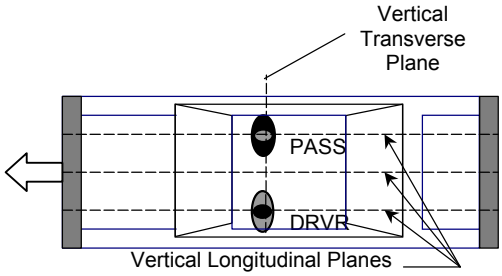
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



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. 5... (continued)

DUMMY POSITIONING IN BULLET VEHICLE

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

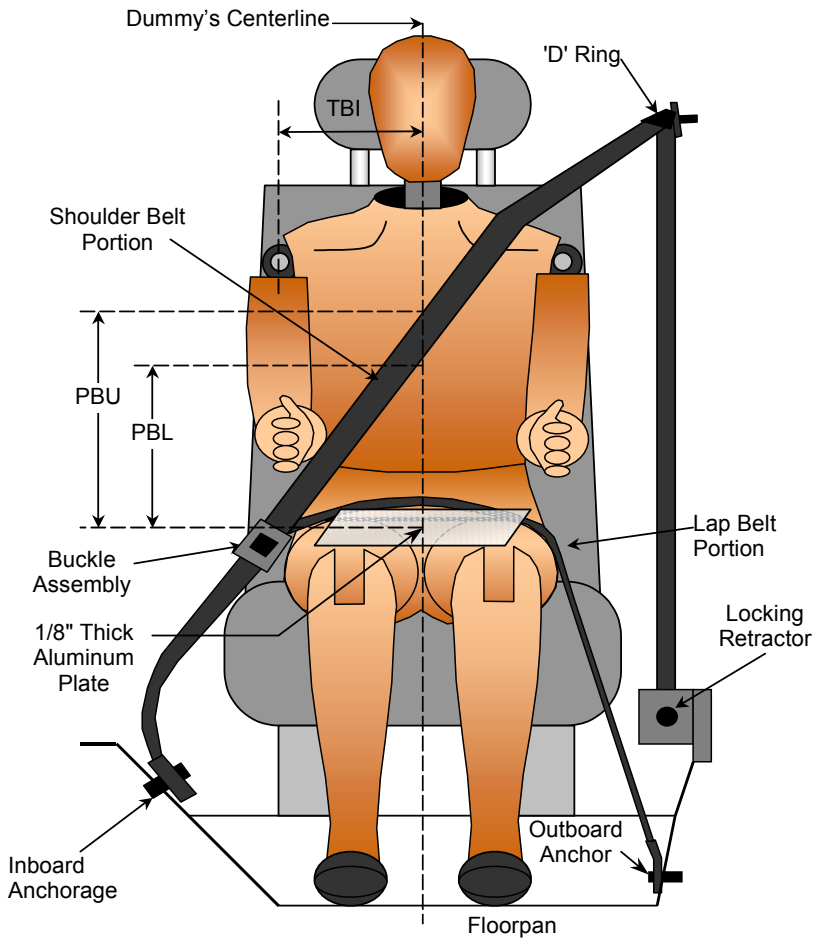
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		28.6		
SWA	Steering Wheel Angle		62.5		
SCA	Steering Column Angle		27.1		
SA	Seat Back Angle		24.9		21.2
HZ	Head to Roof (Z)	206	90.0	240	90.0
HH	Head to Header	349	23.6	316	46.8
HW	Head to Windshield	634	0.0	680	0.0
HR	Head to Side Header (Y)	232		257	
NR	Nose to Rim	399	12.8		
CD	Chest to Dash	558		452	
CS	Chest to Steering Hub	301	13.3		
RA	Rim to Abdomen	153	0.0		
KDL	Left Knee to Dash	172	35.3	133	
KDR	Right Knee to Dash	193		119	17.4
PA	Pelvic Angle		22.5		27.8
TA	Tibia Angle		59.1		62.1
KK	Knee to Knee (Y)	306		223	
SK	Striker to Knee	635	80.2	701	84.2
ST	Striker to Head	648	9.6	602	23.4
SH	Striker to H-Point	239	91.9	356	90.4
SHY	Striker to H-Point (Y)	271		314	
HS	Head to Side Window	341		319	
HD	H-Point to Door (Y)	146		171	
AD	Arm to Door (Y)	138		81	
AA	Ankle to Ankle	306		142	

DATA SHEET NO. 6

BULLET VEHICLE SEAT BELT POSITIONING DATA

Bullet Vehicle:	1999 Dodge Grand Caravan SE	NHTSA No.:	RX0322
Target Vehicle:	2004 Honda Accord EX	NHTSA No.:	R45344



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	329	275
PBL - To surface of reference to belt lower edge	mm	260	198

DATA SHEET NO. 7

BULLET VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

ACCELEROMETER PEAK DATA (CFC 60)

Accelerometer Location	Peak Values				
	Units	Max	Time	Min	Time
Left Rear Seat Crossmember X	G's	3.3	129	-34.2	39
Right Rear Seat Crossmember X	G's	3.0	129	-32.4	37
Front Brake Caliper Left X	G's	44.0	55	-105.6	40
Front Brake Caliper Right X	G's	*	*	*	*
Dash Panel Center X	G's	16.3	63	-64.8	50
Top Engine X	G's	48.3	46	-138.8	34
Bottom Engine X	G's	*	*	*	*
Toe Pan (Accelerator) X	G's	12.0	64	-65.8	42
Toe Pan (Accelerator) Z	G's	28.4	58	-20.7	47
Toe Pan (Footrest) X	G's	19.8	48	-99.2	41
Toe Pan (Footrest) Z	G's	27.1	52	-48.6	47
Rear Deck Z	G's	20.1	62	-17.1	51
Rear Compartment Center X	G's	3.2	130	-32.4	38

* No Valid Data Collected after 40 msec

DATA SHEET NO. 7… (Continued)

BULLET VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

ACCELEROMETER LOCATIONS

Accelerometer Location	Pre Test Measurements (mm)			Post Test Measurements (mm)		
	X	Y	Z	X	Y	Z
Left Rear Seat Crossmember	2322	-305	465	2322	-305	510
Right Rear Seat Crossmember	2322	305	464	2322	305	527
Front Brake Caliper Left	4196	-680	256	4098	-663	277
Front Brake Caliper Right	4196	680	256	4122	700	264
Dash Panel Center	3758	0	1150	3754	0	1244
Top Engine	4292	80	882	4170	106	925
Bottom Engine	4283	0	214	4054	15	183
Toe Pan (Accelerator)	3778	-212	472	3667	-283	538
Toe Pan (Footrest)	3898	-480	592	3786	-513	647
Rear Deck	385	-70	560	385	-70	628
Rear Compartment Center	2790	0	432	2792	0	493

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

DATA SHEET NO. 8

BULLET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	28.2	195	-63.7	85	34.6	165	-74.8	79
Head CG	Y	G's	6.3	197	-5.6	96	31.1	162	-28.5	89
Head CG	Z	G's	15.5	75	-8.0	86	24.2	78	-4.8	91
Head CG Resultant	N/A	G's	64.0	85			78.5	79		

HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg. G's	T^1	T^2	HIC	Avg. G's	T^1	T^2
HIC 36	513.3	50.7	70.6	98.6	777.7	59.7	72.0	100.3
HIC 15	381.2	57.8	76.0	91.0	577.6	68.3	74.4	89.4

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head Front	X	G's	27.8	195	-63.4	84	33.4	166	-77.0	79
Head Front	Y	G's	2.5	253	-6.7	68	22.5	45	-36.6	88
Head Front	Z	G's	22.1	62	-4.4	86	38.2	78	-16.0	48
Head Front Res	N/A	G's	63.6	85			84.9	78		

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head Left	X	G's	24.2	195	-63.8	84	19.4	169	-78.4	81
Head Left	Y	G's	5.2	198	-5.5	89	31.4	162	-23.7	88
Head Left	Z	G's	16.3	65	-13.4	87	24.2	72	-7.0	91
Head Left Res	N/A	G's	64.8	85			80.6	81		

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head Upper	X	G's	42.9	195	-63.2	81	51.0	162	-84.0	83
Head Upper	Y	G's	8.3	198	-9.4	100	52.8	162	-35.4	84
Head Upper	Z	G's	16.3	65	-7.8	87	27.5	78	-4.7	91
Head Upper Res	N/A	G's	63.4	76			91.1	85		

DATA SHEET NO. 8... (Continued)

BULLET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	442	70	-108	59	1102	84	-203	183
Neck Force	Y	Newtons	127	78	-72	133	338	105	-218	181
Neck Force	Z	Newtons	2013	81	-58	265	1158	73	-580	95
Neck Moment	X	N•m	4.4	199	-12.9	100	9.6	89	-19.8	71
Neck Moment	Y	N•m	39.9	70	-13.1	225	83.3	86	-18.0	184
Neck Moment	Z	N•m	9.6	111	-5.1	160	27.0	108	-4.8	300

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	592	71	-94	131	661	86	-269	185
Neck Force	Y	Newtons	274	75	-118	114	92	126	-344	90
Neck Force	Z	Newtons	2365	78	-72	264	1623	73	-575	185
Neck Moment	X	N•m	22.7	77	17.5	114	20.2	120	-19.3	60
Neck Moment	Y	N•m	19.1	136	-147.7	78	42.9	184	-91.3	72
Neck Moment	Z	N•m	20.9	92	-4.0	159	31.0	112	-15.7	60

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	5.6	197	-46.5	80	5.5	176	-48.9	61
Chest CG	Y	G's	1.4	108	-5.0	86	4.9	51	-7.4	73
Chest CG	Z	G's	8.2	58	-4.2	84	5.7	78	-4.6	116
Chest CG Resultant	N/A	G's	46.7	75			49.0	61		

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	mm			-35.4	92			-12.7	74

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	46.4	77.1	80.4	43.1	59.3	62.3

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	5334	67			2670	58		
Shoulder Belt Force	N/A	Newtons	2968	77			3034	59		

DATA SHEET NO. 8... (Continued)

BULLET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	814	49	-5397	62	348	46	-5976	54
Right Femur	Z	Newtons	251	49	-5290	65	530	47	-4401	61

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	15.0	48	-77.7	57				
Left Lower Moment	Y	N•m	152.6	65	-48.9	48				
Left Lower Force	X	Newtons	1079	55	-82	147				
Left Lower Force	Y	Newtons	61	128	-414	63				
Left Lower Force	Z	Newtons	260	48	-1877	58				
Left Upper Moment	X	N•m	49.5	49	-16.5	59				
Left Upper Moment	Y	N•m	24.8	145	-107.3	69				
Left Upper Force	X	Newtons	171	48	-716	65				
Left Upper Force	Y	Newtons	470	57	-71	102				
Left Upper Force	Z	Newtons	204	46	-1615	59				
Right Lower Moment	X	N•m	82.4	68	-17.3	50				
Right Lower Moment	Y	N•m	101.0	47	-482.3	65				
Right Lower Force	X	Newtons	1933	69	-75	163				
Right Lower Force	Y	Newtons	192	67	-148	56				
Right Lower Force	Z	Newtons	132	153	-2860	68				
Right Upper Moment	X	N•m	36.6	90	-22.1	51				
Right Upper Moment	Y	N•m	66.1	62	-168.2	49				
Right Upper Force	X	Newtons	1841	66	-509	50				
Right Upper Force	Y	Newtons	133	47	-456	55				
Right Upper Force	Z	Newtons	65	174	-3327	72				

KNEE SHEAR DISPLACEMENT

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left	Z	mm								
Right	Z	mm			-8.3	63				

DATA SHEET NO. 8... (Continued)

BULLET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	28.4	195	-63.3	85	34.9	165	-73.6	79
Head CG	Y	G's	7.1	230	-11.7	84	31.3	162	-27.9	89
Head CG	Z	G's	15.9	75	-7.4	87	25.4	78	-4.0	48
Head CG Resultant	N/A	G's	64.2	84			77.7	79		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	5.7	197	-46.8	79	6.7	176	-48.0	61
Chest CG	Y	G's	1.8	101	-3.7	87	4.7	51	-7.3	73
Chest CG	Z	G's	7.2	57	-6.7	84	5.6	78	-4.6	116
Chest CG Resultant	N/A	G's	46.9	80			48.2	61		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg.	T^1	T^2	HIC	Avg.	T^1	T^2
HIC 36	506.5	50.7	70.6	98.3	726.2	58.5	72.0	99.7
HIC 15	375.0	57.4	76.1	91.1	555.3	67.2	74.2	89.2

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Redundant	46.4	77.5	80.5	41.9	59.3	62.3

NECK INJURY CRITERIA

Location	Driver	Passenger
N_{te} (Tension – Extension)	0.4	0.1
N_{tf} (Tension – Flexion)	0.3	0.3
N_{ce} (Compression – Extension)	0.1	0.4
N_{cf} (Compression – Flexion)	0.0	0.5

DATA SHEET NO. 9

BULLET VEHICLE SEAT BELT ASSESSMENT AND POST TEST AIRBAG DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	862	885
Lap belt length as measured on ATD	mm	890	925
Remainder of belt	mm	3955	3875
Total belt length for continuous webbing systems	mm	5707	5685

BELT SPOOL-OUT DATA

Measurement Description	Units	Driver	Passenger
Pretensioner	mm		
At the Retractor	mm	169	315
At the Shoulder	mm	197	320

POST TEST AIRBAG DATA

Number of Vent Holes			
Driver	0	Passenger	0
Size of Vent Holes (Note whether round or square)			
Driver	N/A	Passenger	N/A
Total Vent Area			
Driver	N/A	Passenger	N/A
Deflated Airbag Length and Width Dimensions or, if Round, Diameter			
Driver	Length:	Width:	Diameter: 665 mm
Passenger	Length: 625 mm	Width: 463 mm	Diameter:
Is the Airbag Tethered?			
Driver	Yes		Length: 275 mm
Passenger		No	Length:

DATA SHEET NO. 10

BULLET VEHICLE FMVSS 212 DATA

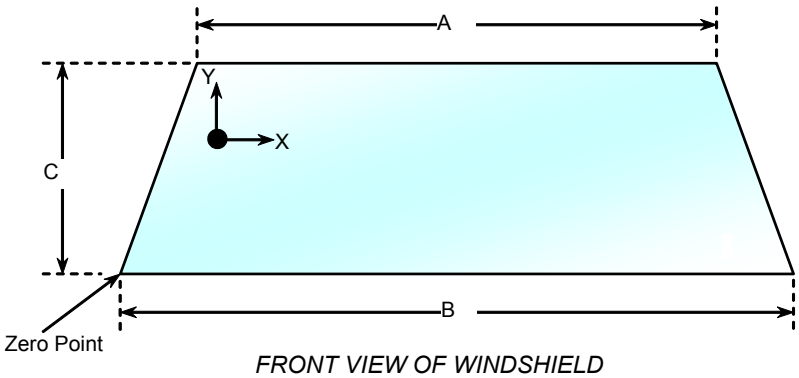
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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

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

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2331	2331	100
Right Side	2331	2331	100
Total	4662	4662	100



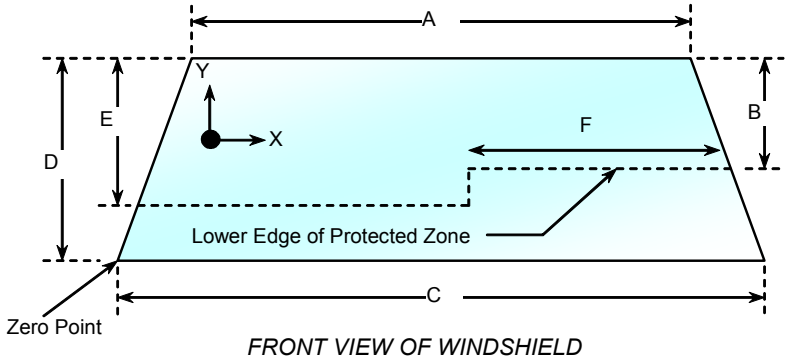
FRONT VIEW OF WINDSHIELD

Item	Units	Segment Length	Molding Width
A	mm	1240	11
B	mm	1648	11
C	mm	887	12

DATA SHEET NO. 11

BULLET VEHICLE FMVSS 219 (Partial) DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1240
B	mm	521
C	mm	1648
D	mm	887
E	mm	601
F	mm	675

AREA OF PROTECTED ZONE FAILURES - NONE

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

X	Y

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

X	Y

DATA SHEET NO. 12

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

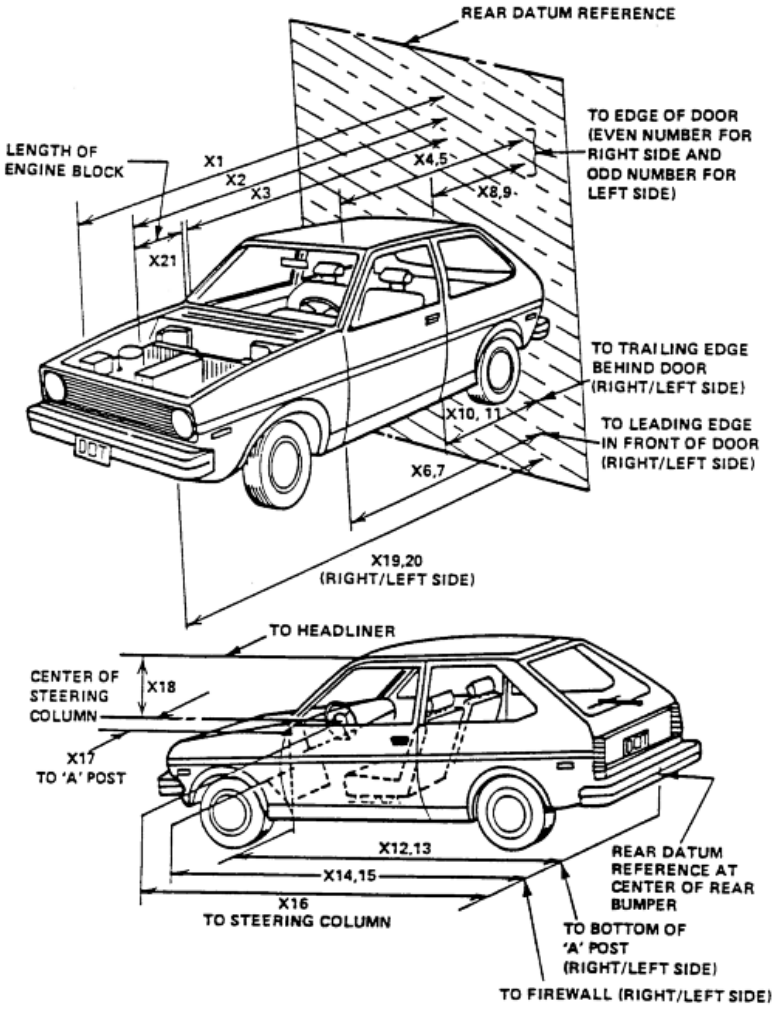
Note: The body shifted forward on the frame during impact.

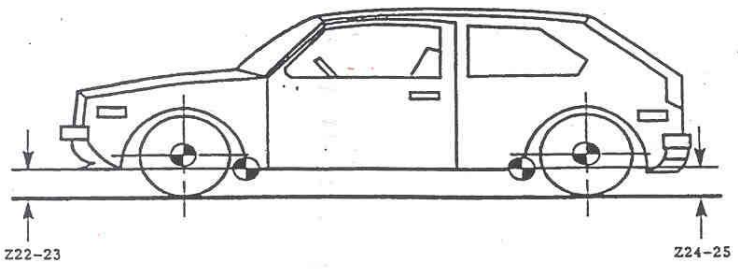
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
X1	Total length of vehicle at centerline	mm	5024	4594	430
X2	RSOV to front of engine	mm	4502	4449	53
X3	RSOV to firewall centerline	mm	4291	4283	8
X4	RSOV to leading edge of right door	mm	3644	3653	-9
X5	RSOV to leading edge of left door	mm	3645	3656	-11
X6	RSOV to lower leading edge of right door	mm	3608	3615	-7
X7	RSOV to lower leading edge of left door	mm	3602	3612	-10
X8	RSOV to upper leading edge of right door	mm	2622	2630	-8
X9	RSOV to upper leading edge of left door	mm	2620	2633	-13
X10	RSOV to lower trailing edge of right door	mm	2612	2620	-8
X11	RSOV to lower trailing edge of left door	mm	2613	2616	-3
X12	RSOV to bottom of right 'A' pillar	mm	3601	3611	-10
X13	RSOV to bottom of left 'A' pillar	mm	3596	3603	-7
X14	RSOV to firewall on right side	mm	4129	4121	8
X15	RSOV to firewall on left side	mm	4138	4246	-108
X16	RSOV to steering column	mm	3196	3179	17
X17	Center of steering column to left 'A' pillar	mm	401	357	44
X18	Center of steering column to headlining	mm	450	397	53
X19	RSOV to right side of front bumper	mm	4856	4460	396
X20	RSOV to left side of front bumper	mm	4851	4517	334
X21	Width of engine block	mm	408	408	0
Z22	Right Front Sill to Ground Plane	mm	260	301	-41
Z23	Left Front Sill to Ground Plane	mm	251	335	-84
Z24	Right Rear Sill to Ground Plane	mm	290	330	-40
Z25	Left Rear Sill to Ground Plane	mm	290	370	-80
X26	Firewall to Engine or Transaxle	mm	173	166	7
Z27	Vertical Dim. From Door Sill to Centerline of St. Col.	mm	754	814	-60
X28	Wheelbase of Vehicle (left side)	mm	3036	2948	88
Y29	Width of Vehicle at Maximum Width Point	mm	1930	1930	0
X30	RSOV to Engine Target	mm	4301	4068	233
X31	RSOV to Compartment Target	mm	3025	3039	-14
X32	RSOV to Bumper Target	mm	4983	4481	502
X33	RSOV to Frame Crossmember	mm	3817	3670	147

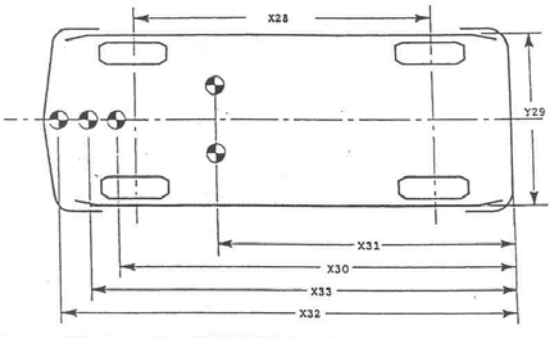
DATA SHEET NO. 12... (continued)

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344







DATA SHEET NO. 12... (continued)

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

TOP OF BUMPER

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	249	583	334
C2	Crush Zone 2 on left side	mm	132	663	531
C3	Crush Zone 3 on left side	mm	85	595	510
C4	Crush Zone 4 on right side	mm	85	574	489
C5	Crush Zone 5 on right side	mm	130	595	465
C6	Crush Zone 6 on right side	mm	247	640	393

BOTTOM OF BUMPER

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	270	575	305
C2	Crush Zone 2 on left side	mm	160	620	460
C3	Crush Zone 3 on left side	mm	112	590	478
C4	Crush Zone 4 on right side	mm	112	572	460
C5	Crush Zone 5 on right side	mm	160	610	450
C6	Crush Zone 6 on right side	mm	272	654	382

CENTER GRILL

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	177	573	396
C2	Crush Zone 2 on left side	mm	161	616	455
C3	Crush Zone 3 on left side	mm	149	628	479
C4	Crush Zone 4 on right side	mm	150	633	483
C5	Crush Zone 5 on right side	mm	162	680	518
C6	Crush Zone 6 on right side	mm	180	680	500

FRONT HOOD

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	368	583	215
C2	Crush Zone 2 on left side	mm	232	540	308
C3	Crush Zone 3 on left side	mm	196	583	387
C4	Crush Zone 4 on right side	mm	197	608	411
C5	Crush Zone 5 on right side	mm	234	621	387
C6	Crush Zone 6 on right side	mm	373	673	300

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
L	Length of Region	mm	1525	1168	-357

Note: Crush is positive. Measurements are taken from a reference plane in front of the vehicle. The body shifted forward on the frame.

DATA SHEET NO. 12... (continued)
BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

BULLET VEHICLE STRUCTURAL MEASUREMENT

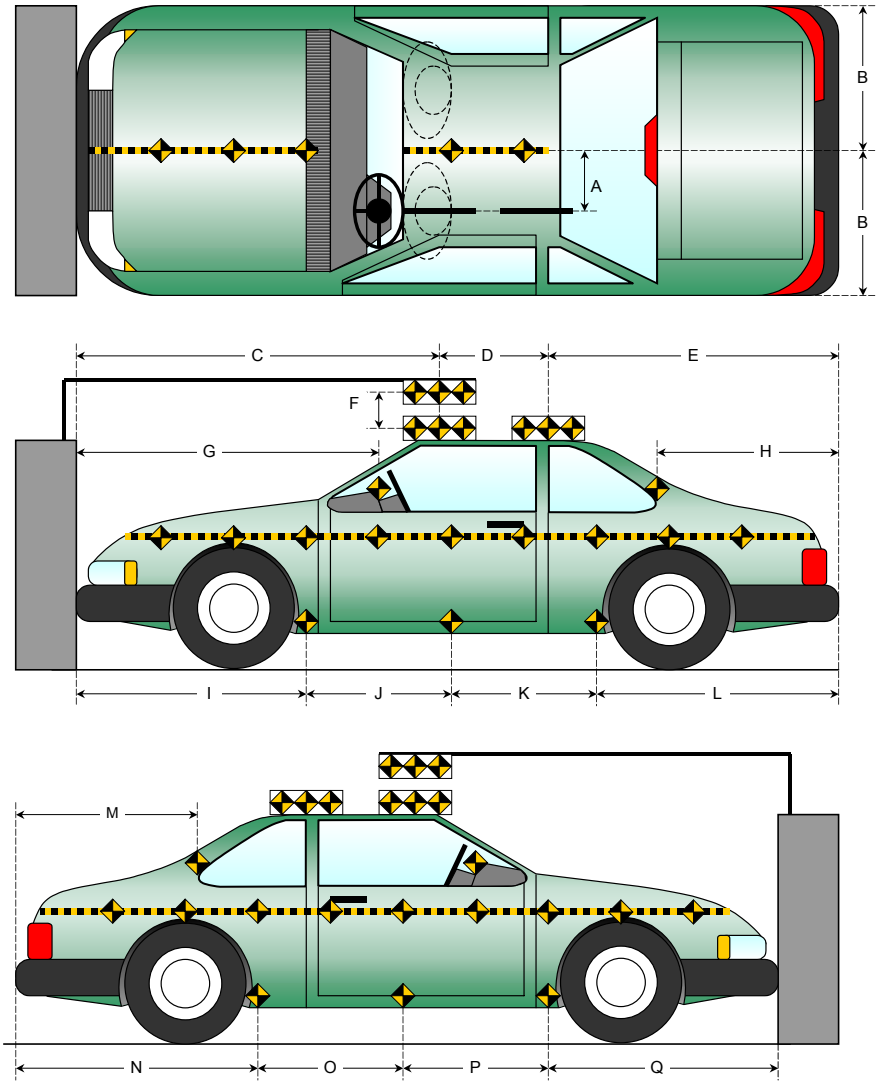
	Elements	Pre-Test (mm)
1	Total Length	5024
2	Total Width	1930
3	Bumper Top Height	500
4	Bumper Bottom Height	390
5	Longitudinal Member Top Height	570
6	Distance between Longitudinal Members	1055
7	Longitudinal Member Width	80
8	Engine Top Height	882
9	Engine Bottom Height	170
10	Engine and gearbox width	408
11	Front bumper-engine distance	300
12	Front shock absorber fixing height	955
13	Bonnet leading edge height	740
14	Front shock absorber fixing width	1190
15	Front bumper – front axle distance	917
16	Front axle – a pillar distance	485
17	A-pillar – B-pillar distance	1010
18	B-Pillar – rear axle distance	1530
19	B-pillar – C-pillar distance	860
20	Roof sill bottom height	1558
21	Roof sill top height	1616
22	Floor sill bottom height	268
23	Floor sill top height	368

DATA SHEET NO. 13

BULLET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Item	Value
A	392
B	965
C	2264
D	611
E	2149
F	
G	1613
H	1558
I	1448
J	1020
K	1024
L	1532
M	1555
N	1529
O	1026
P	1018
Q	1451



DATA SHEET NO. 14

BULLET VEHICLE INTRUSION MEASUREMENTS

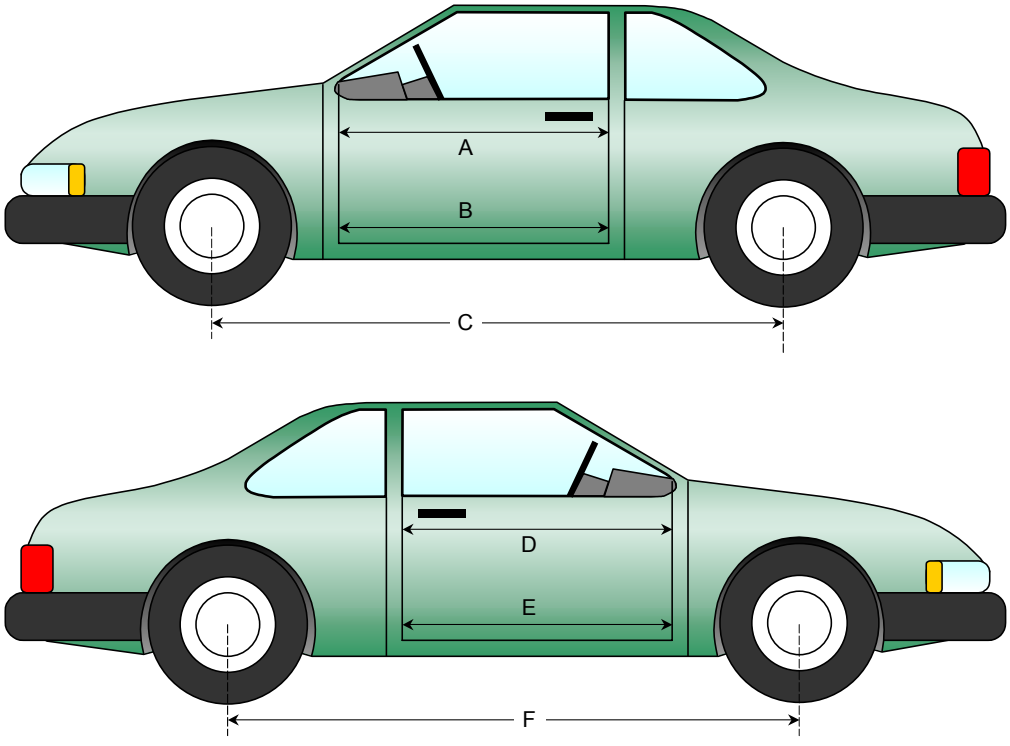
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1000	995	5
B	Left Side Lower	mm	980	978	2
D	Right Side Upper	mm	1000	995	5
E	Right Side Lower	mm	980	976	4

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3036	2948	88
F	Right Side Wheelbase	mm	3036	2975	61



DATA SHEET NO. 14... (Continued)

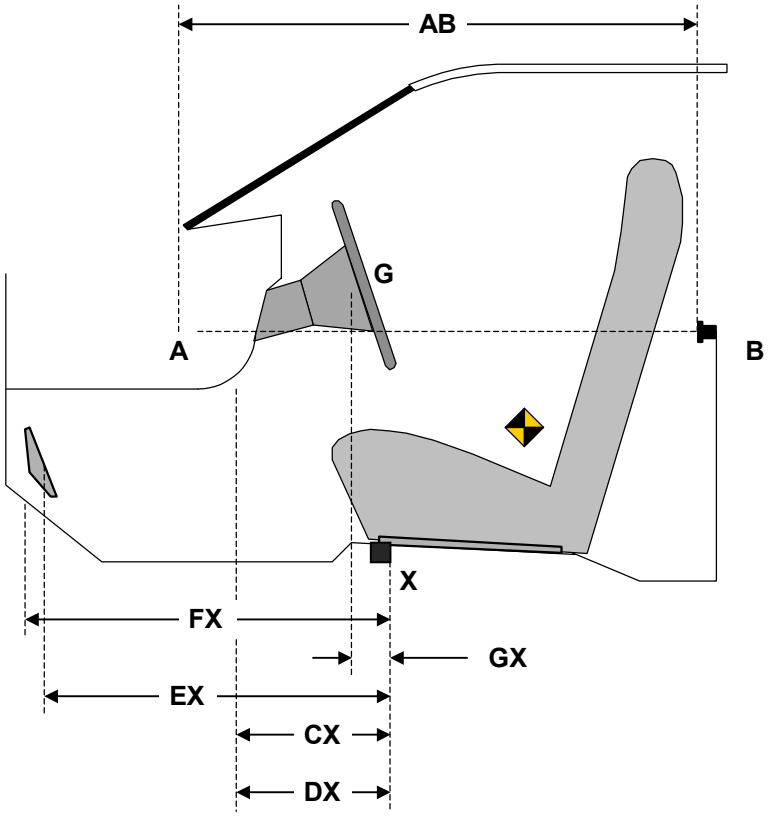
BULLET VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	947	942	5
CX	Left Knee Bolster to X	mm	366	369	-3
DX	Right Knee Bolster to X	mm	370	392	-22
EX	Brake Pedal to X	mm	520	438	82
FX	Foot Rest to X	mm	582	557	25
GX	Center of Steering Column Wheel Hub to X	mm	52	80	-28

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 14... (Continued)

BULLET VEHICLE INTRUSION MEASUREMENTS

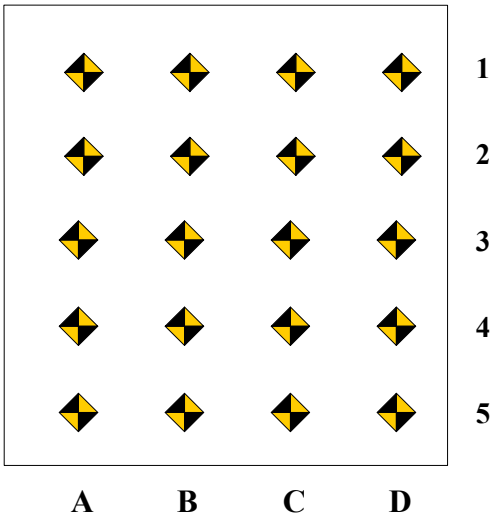
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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		654	654	647		547	528	512		107	126	135
2		603	603	601		497	492	464		106	111	137
3	545	545	545	545	468	467	458	454	77	78	87	91
4	375	375	375	375	354	354	351	336	21	21	24	39
5	205	205	205	205	186	185	185	186	19	20	20	19

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-2	-8	-15		63	75	86		-65	-83	-101
2		-62	-70	-62		0	2	25		-62	-72	-87
3	-117	-114	-125	-123	-90	-84	-71	-43	-27	-30	-54	-80
4	-116	-107	-126	-112	-122	-111	-118	-119	6	4	-8	7
5	-100	-102	-108	-112	-107	-112	-117	-114	7	10	9	2

DATA SHEET NO. 14... (Continued)

BULLET VEHICLE INTRUSION MEASUREMENTS

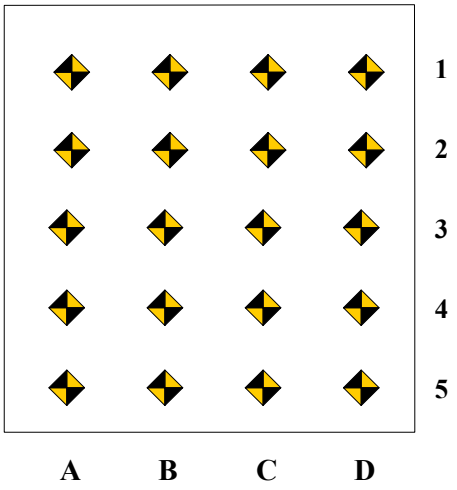
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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		661	658			523	520			138	138	
2		605	605			480	501			125	104	
3		542	545			485	486			57	59	
4	372	372	375	375	356	360	368	368	16	12	7	7
5	205	205	205	205	201	201	203	203	4	4	2	2

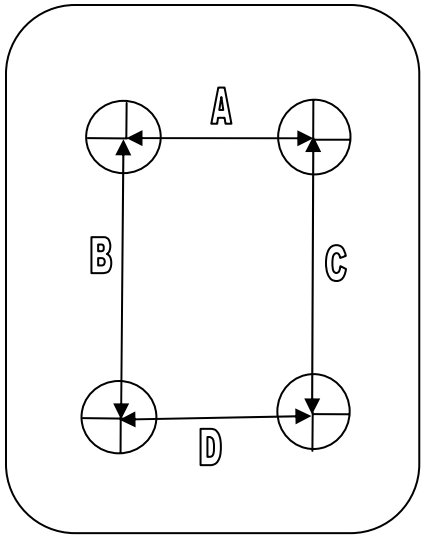
PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		0	0			90	104			-90	-104	
2		-54	-56			25	27			-79	-83	
3		-104	-104			-48	-52			-56	-52	
4	-104	-104	-104	-118	-103	-95	-92	-113	-1	-9	-12	-5
5	-100	-97	-97	-109	-111	-105	-99	-114	11	8	2	5

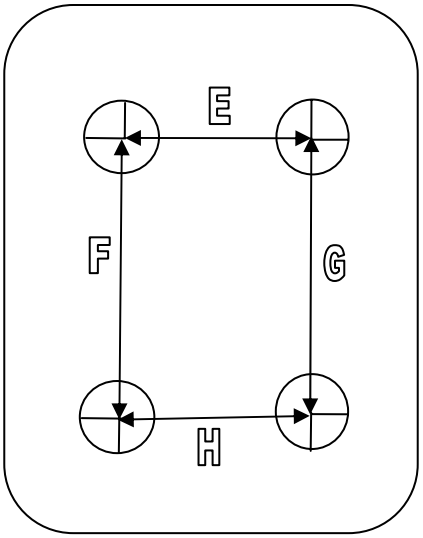
DATA SHEET NO. 14... (Continued)

BULLET VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344



Driver



Passenger

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	280	282	-2
B	234	232	2
C	239	239	0
D	265	265	0
E	280	280	0
F	230	231	-1
G	232	232	0
H	270	269	1

DATA SHEET NO. 15

BULLET VEHICLE IIHS MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Location		Difference
A Pillar	X	-2
	Y	13
	Z	4
B Pillar	X	-2
	Y	4
	Z	3
Brake Pedal	X	-83
	Y	34
	Z	66
Footrest	X	-29
	Y	17
	Z	26
Knee Bolster Left	X	-1
	Y	9
	Z	21
Knee Bolster Right	X	4
	Y	8
	Z	16
Toepan Left	X	-51
	Y	20
	Z	19
Toepan Center	X	-103
	Y	9
	Z	48
Toepan Right	X	-108
	Y	12
	Z	25
Outboard Front Seat Bolt	X	1
	Y	9
	Z	-1
Inboard Front Seat Bolt	X	2
	Y	6
	Z	-17
Inboard Aft Seat Bolt	X	2
	Y	8
	Z	-8
Outboard Aft Seat Bolt	X	1
	Y	6
	Z	0

DATA SHEET NO. 15… (Continued)

BULLET VEHICLE IIHS MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Location		Difference
Bumper 1 (Extreme LH)	X	-326
	Y	-70
	Z	-170
Bumper 2	X	-457
	Y	-76
	Z	-205
Bumper 3	X	-535
	Y	-84
	Z	-221
Bumper 4	X	-519
	Y	-76
	Z	-193
Bumper 5	X	-499
	Y	-70
	Z	-167
Bumper 6 (Mid)	X	-499
	Y	-67
	Z	-157
Bumper 7	X	-479
	Y	-69
	Z	-149
Bumper 8	X	-482
	Y	-65
	Z	-145
Bumper 9	X	-480
	Y	-60
	Z	-146
Bumper 10	X	-488
	Y	-61
	Z	-143
Bumper 11 (Extreme RH)	X	-467
	Y	-34
	Z	-159

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

SECTION 3

TARGET VEHICLE INFORMATION / DATA SHEETS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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. 16

TARGET VEHICLE TEST SUMMARY

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Door was unlocked	Door was unlocked
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Track Shift	0 mm	0 mm

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50th/ 90	HIII 5th/ 547
Head Contact	Front Airbag, Side Airbag, Curtain Airbag, Head Rest	Front Airbag, Side Airbag, Curtain Airbag, Head Rest
Chest Contact	Airbag	Airbag
Abdomen Contact	Airbag	Airbag
Left Knee Contact	Knee Bolster, Steering Column	Glovebox
Right Knee Contact	Knee Bolster, Steering Column	Glovebox

INSTRUMENTATION

Driver ATD Sensors	72
Passenger ATD Sensors	37
Belt Assessment Sensors	4
Vehicle Structure Accelerometers	13
Total	126

DATA SHEET NO. 17

TARGET VEHICLE DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

VEHICLE INFORMATION

Make	Honda
Model	Accord EX
Body Style	Sedan
NHTSA No.	R45344
VIN	1HGCM56754A108943
Color	Silver
Odometer Reading (mile)	42
Transmission	Automatic
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.4
Engine Placement	Lateral

VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	Yes
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	Yes
Anti-lock Brakes	Yes
AM/FM/CD	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of America Mfg., Inc.
Date of Manufacture	04/04

GVWR (kg)	1871
GAWR Front (kg)	1009
GAWR Rear (kg)	900

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Cold Pressure (kPa)	220	210
Recommended Tire Size	P205/60R16	P205/60R16
Tire Size on Vehicle	P205/60R16	P205/60R16
Tire Manufacturer	Michelin	Michelin

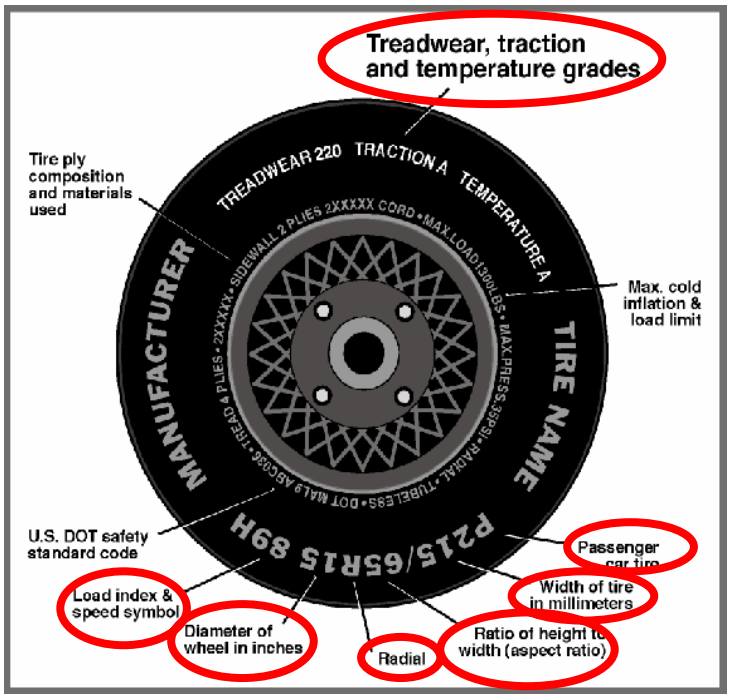
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5
Vehicle Capacity Weight (kg)				385.6
Rated Cargo Weight (kg)				45.4

DATA SHEET NO. 18

TARGET VEHICLE TIRE INFORMATION

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Vehicle Year	2004	Vehicle Make	Honda
VIN	1HGCM56754A108943	Vehicle Model	Accord EX



	Front	Rear
Tire Manufacturer	Michelin	Michelin
Tire Name	Energy MXV4	Energy MXV4
Tire Type	P	P
Tire Width (mm)	205	205
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	91V	91V
Treadwear	440	440
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET NO. 19

TARGET VEHICLE SETUP INFORMATION

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	445.9	291.2		484.0	345.2	
Right	kg	446.3	279.0		475.4	322.1	
Ratio	%	61.0	39.0		59.0	41.0	
Totals	kg	892.2	570.2	1464.4	959.4	667.3	1626.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1464.4
Weight of 1 P572E & 1 P572O ATDs	kg	127.0
Rated Cargo/Luggage Weight (RCLW)	kg	45.4
Calculated Vehicle Target Weight (TVTW)	kg	1636.8

VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	704	709	687	694	1067
As Tested	mm	691	698	672	679	1124
Post Test	mm	765	651	798	702	

Vehicle Wheelbase (mm): 2740

Weight of Ballast secured in cargo area (kg): 4.5

Vehicle Components Removed: Rear Seat, Trunk Interior, Spare and Jack.

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

DATA SHEET NO. 19… (Continued)

TARGET VEHICLE SETUP INFORMATION

SEAT BACK POSITION

Driver seat back angle: 5th notch, 1st as 0 (14.3 deg. on headrest post)

Passenger seat back angle: 6.6 deg. on headrest post

SEAT FORE/AFT POSITIONS

The driver and passenger seat were manually operated.

Driver seat fore/aft total travel: 25 positions

Passenger seat fore/aft total travel: 25 positions

Driver seat fore/aft position: 13th position of 25

Passenger seat fore/aft position: Full forward

SEAT BELT UPPER ANCHORAGE

There were four adjustment positions. The driver side was placed in the second position with the top as one and the passenger side was placed in the lowest position.

FUEL TANK CAPACITY DATA

The fuel tank was filled with 60.6 liters of water for ballast.

STEERING COLUMN ADJUSTMENT

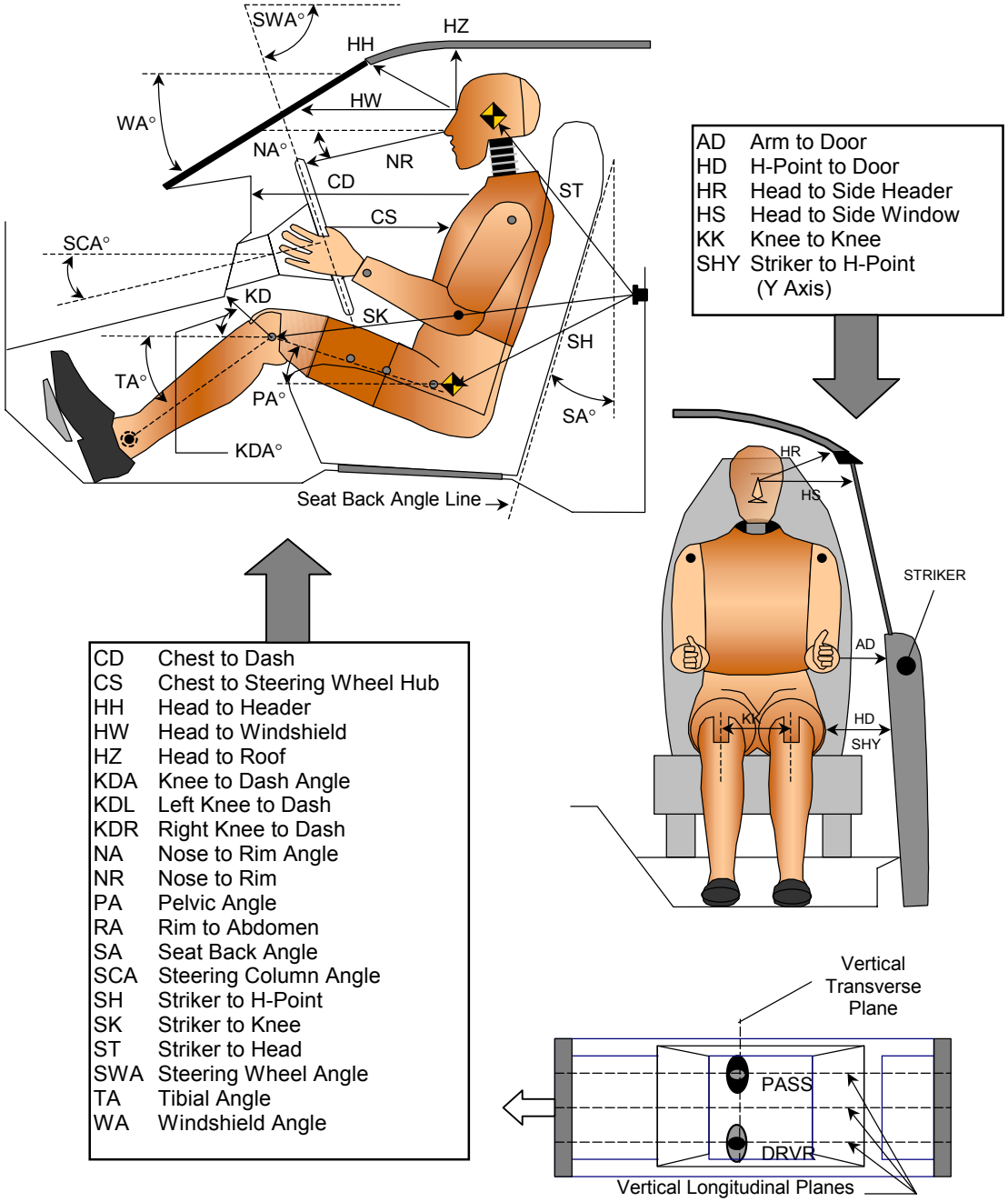
The steering column was placed in the mid position of travel.

DATA SHEET NO. 20

DUMMY POSITIONING IN TARGET VEHICLE

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



DATA SHEET NO. 20... (Continued)

DUMMY POSITIONING IN TARGET VEHICLE

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

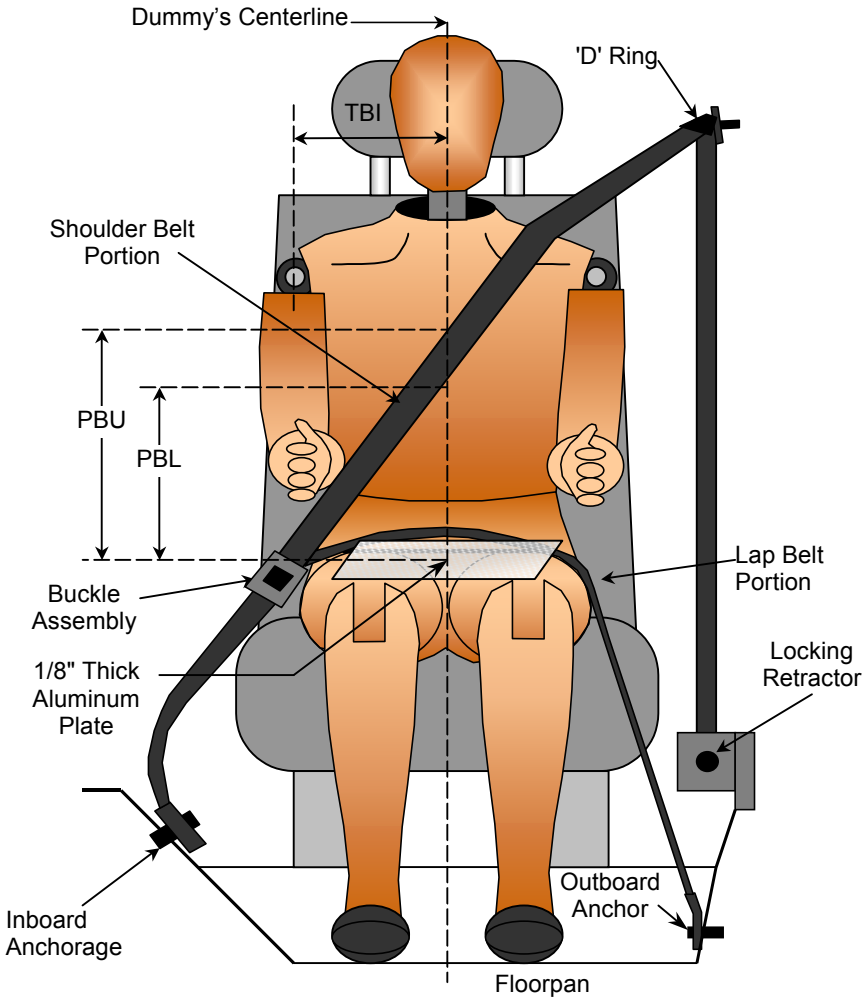
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		27.0		
SWA	Steering Wheel Angle		67.3		
SCA	Steering Column Angle		22.6		
SA	Seat Back Angle (on headrest post)		14.3		6.6
HZ	Head to Roof (Z)	174	90.0	184	90.0
HH	Head to Header	368	18.0	262	50.2
HW	Head to Windshield	341	0.0	595	0.0
HR	Head to Side Header (Y)	203		240	
NR	Nose to Rim	400	8.0		
CD	Chest to Dash	532		401	
CS	Chest to Steering Hub	326	9.2		
RA	Rim to Abdomen	201	0.0		
KDL	Left Knee to Dash	195	30.7	101	
KDR	Right Knee to Dash	169		115	28.8
PA	Pelvic Angle		23.0		26.6
TA	Tibia Angle		43.3		49.4
KK	Knee to Knee (Y)	320		214	
SK	Striker to Knee	588	87.1	704	86.3
ST	Striker to Head	510	8.7	514	28.1
SH	Striker to H-Point	252	124.4	391	105.2
SHY	Striker to H-Point (Y)	262		292	
HS	Head to Side Window	312		346	
HD	H-Point to Door (Y)	147		182	
AD	Arm to Door (Y)	141		201	
AA	Ankle to Ankle	310		164	

DATA SHEET NO. 21

TARGET VEHICLE SEAT BELT POSITIONING DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	330	267
PBL - To surface of reference to belt lower edge	mm	245	182

DATA SHEET NO. 22

TARGET VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

ACCELEROMETER PEAK DATA (CFC 60)

Accelerometer Location	Peak Values				
	Units	Max	Time	Min	Time
Left Rear Seat Crossmember X	G's	1.6	132	-33.1	53
Right Rear Seat Crossmember X	G's	*	*	*	*
Front Brake Caliper Left X	G's	13.7	71	-64.3	53
Front Brake Caliper Right X	G's	37.9	69	-76.0	32
Dash Panel Center X	G's	19.1	63	-70.5	49
Top Engine X	G's	32.6	70	-134.0	39
Bottom Engine X	G's	**	**	**	**
Toe Pan (Accelerator) X	G's	29.5	65	-62.9	50
Toe Pan (Accelerator) Z	G's	33.7	71	-20.8	49
Toe Pan (Footrest) X	G's	11.0	20	-54.7	38
Toe Pan (Footrest) Z	G's	15.0	73	-7.8	40
Rear Deck Z	G's	19.1	91	-24.5	57
Rear Compartment Center X	G's	2.9	118	-33.5	51

* No Valid Data collected after 30 msec

** No Valid Data collected

DATA SHEET NO. 22… (Continued)

TARGET VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

ACCELELEROMETER LOCATIONS

Accelerometer Location	Pre Test Measurements (mm)			Post Test Measurements (mm)		
	X	Y	Z	X	Y	Z
Left Rear Seat Crossmember	1812	-325	470	1812	-325	527
Right Rear Seat Crossmember	1816	325	470	1816	325	499
Front Brake Caliper Left	3870	-695	312	3889	-702	329
Front Brake Caliper Right	3935	695	312	3895	709	309
Dash Panel Center	3431	-5	1024	3210	-5	1010
Top Engine	3997	13	837	3796	2	757
Bottom Engine	4062	-20	225	3921	-14	134
Toe Pan (Accelerator)	3495	-345	395	3425	-291	426
Toe Pan (Footrest)	3510	-550	505	3447	-518	553
Rear Deck	842	0	1082	842	0	1143
Rear Compartment Center	1981	0	370	1981	0	390

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

DATA SHEET NO. 23

TARGET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	15.4	231	-192.3	84	18.8	191	-50.1	67
Head CG	Y	G's	7.5	82	-14.6	84	5.9	39	-12.8	38
Head CG	Z	G's	45.8	84	-6.2	18.9	22.2	50	-7.8	34
Head CG Resultant	N/A	G's	197.5	84			50.5	67		

HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg. G's	T^1	T^2	HIC	Avg. G's	T^1	T^2
HIC 36	899.9	144.3	82.1	85.7	358.1	39.7	51.5	87.5
HIC 15	899.9	144.3	82.1	85.7	224.9	46.8	61.8	76.8

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head Front	X	G's	15.9	231	-190.4	84	17.6	192	-49.9	66
Head Front	Y	G's	9.0	90.4	-26.3	84	10.2	60	-16.0	50
Head Front	Z	G's	93.6	84	-28.6	88	36.4	50	-8.2	33
Head Front Res	N/A	G's	213.4	84			50.1	72		

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head Left	X	G's	18.1	232	-198.4	84	16.5	193	-49.2	70
Head Left	Y	G's	4.2	82	-23.3	84	6.1	57	-8.2	50
Head Left	Z	G's	44.2	80	-2.2	18	22.4	55	-8.0	70
Head Left Res	N/A	G's	203.1	84			49.8	70		

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head Upper	X	G's	27.6	233	-136.6	87	27.5	190	-56.6	66
Head Upper	Y	G's	4.8	81	-16.0	87	12.1	71	-11.0	57
Head Upper	Z	G's	52.0	84	-3.1	18	20.4	50	-6.0	37
Head Upper Res	N/A	G's	144.5	87			57.0	66		

DATA SHEET NO. 23... (Continued)

TARGET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	1588	85	-401	77	601	64	-209	27
Neck Force	Y	Newtons	102	100	-136	83	71	74	-172	88
Neck Force	Z	Newtons	1545	84	-874	90	584	39	-419	225
Neck Moment	X	N•m	10.5	103	-4.7	83	8.3	89	-8.8	116
Neck Moment	Y	N•m	28.4	282	-87.2	87	40.8	64	-19.3	230
Neck Moment	Z	N•m	3.3	98	-2.5	154	4.9	99	-4.7	163

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	516	89	-906	84	276	61	-207	105
Neck Force	Y	Newtons	205	92	-53	282	71	80	-204	92
Neck Force	Z	Newtons	2103	84	-451	90	920	39	-419	225
Neck Moment	X	N•m	9.0	95	-8.4	85	9.1	201	-26.0	106
Neck Moment	Y	N•m	48.4	82	-88.4	87	42.9	138	-42.6	39
Neck Moment	Z	N•m	12.6	93	-3.3	286				

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.9	290	-42.8	87	4.2	227	-51.2	54
Chest CG	Y	G's	1.3	65	-3.0	90	5.7	40	-13.5	84
Chest CG	Z	G's	7.9	74	-18.0	90	4.1	224	-10.2	75
Chest CG Resultant	N/A	G's	42.9	87			51.5	54		

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	mm			-27.3	87			-18.2	57

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	42.1	85.7	88.7	48.3	52.1	55.1

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	6874	60			2378	50		
Shoulder Belt Force	N/A	Newtons	4884	64			4016	55		

DATA SHEET NO. 23... (Continued)

TARGET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	942	53	-874	66	443	25	-2884	54
Right Femur	Z	Newtons	1388	57	-537	43	424	32	-2337	54

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Lower Moment	X	N•m	77.1	73	-23.4	31				
Left Lower Moment	Y	N•m	17.0	106	-57.1	60				
Left Lower Force	X	Newtons	129	105	-301	59				
Left Lower Force	Y	Newtons	400	63	-99	156				
Left Lower Force	Z	Newtons	208	183	-2135	33				
Left Upper Moment	X	N•m	*	*	*	*				
Left Upper Moment	Y	N•m	53.4	66	-44.0	45				
Left Upper Force	X	Newtons	410	77	-79	36				
Left Upper Force	Z	Newtons	33	182	-1568	34				
Right Lower Moment	X	N•m	22.5	42	-52.4	89				
Right Lower Moment	Y	N•m	19.4	106	-44.1	54				
Right Lower Force	X	Newtons	83	255	-621	76				
Right Lower Force	Y	Newtons	72	125	-285	43				
Right Lower Force	Z	Newtons	232	166	-3177	43				
Right Upper Moment	X	N•m	38.4	44	-31.9	116				
Right Upper Moment	Y	N•m	38.9	108	-66.4	55				
Right Upper Force	X	Newtons	361	55	-193	107				
Right Upper Force	Z	Newtons	187	170	-2480	43				

* No valid data collected

DATA SHEET NO. 23... (Continued)

TARGET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

KNEE SHEAR DISPLACEMENT

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left	Z	mm			-5.4	66			-0.6	89
Right	Z	mm			-1.4	57			-0.4	65

TIBIA MID SHAFT ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left	X	G's	6.3	282	-89	59				
Left	Y	G's	21.5	30	-24.5	71				
Right	X	G's	8.2	107	-47.7	76				
Right	Y	G's	12.0	88	-17.5	43				

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Mid Foot	X	G's	32.6	44	-65.2	64				
Left Mid Foot	Y	G's	25.0	33	-77.8	58				
Left Mid Foot	Z	G's	*	*	*	*				
Right Mid Foot	X	G's	14.5	100	-51.9	51				
Right Mid Foot	Y	G's	50.2	52	-17.8	33				
Right Mid Foot	Z	G's	24.3	67	-59.8	40				

* No Valid Data Collected after 55 msec

FOOT ROTATIONS

Location	Units	Driver				Passenger			
		Max	Time	Min	Time	Max	Time	Min	Time
Left Dorsiflexion / Plantar Flexion	Degrees	21.2	77	-9.2	222				
Left Inversion / Eversion	Degrees	46.2	88	10.6	235				
Left Internal / External	Degrees	17.7	19	-2.4	81				
Right Dorsiflexion / Plantar Flexion	Degrees	24.0	88	-19.7	194				
Right Inversion / Eversion	Degrees	18.0	0	-13.0	97				
Right Internal / External	Degrees	11.6	131	2.3	228				

DATA SHEET NO. 23... (Continued)

TARGET VEHICLE HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	14.9	231	-192.5	84	18.4	192	-49.1	69
Head CG	Y	G's	6.2	82	-16.3	84	4.9	39	-11.9	38
Head CG	Z	G's	48.6	84	-6.4	19	20.6	50	-7.1	34
Head CG Resultant	N/A	G's	198.6	84			49.3	66		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	4.1	290	-42.1	86	4.2	228	-50.5	54
Chest CG	Y	G's	2.6	65	-2.8	95	4.8	46	-11.1	84
Chest CG	Z	G's	7.4	73	-19.3	90	3.8	224	-10.0	75
Chest CG Resultant	N/A	G's	42.2	86			50.7	54		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg.	T^1	T^2	HIC	Avg.	T^1	T^2
HIC 36	925.9	142.8	82.0	85.8	345.5	39.2	51.3	87.3
HIC 15	925.9	142.8	82.0	85.8	216.1	46.1	61.4	76.4

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Redundant	41.7	85.8	88.8	47.6	52.1	55.1

NECK INJURY CRITERIA

Location	Driver	Passenger
N_{te} (Tension – Extension)	0.9	0.1
N_{tf} (Tension – Flexion)	0.3	0.3
N_{ce} (Compression – Extension)	0.8	0.3
N_{cf} (Compression – Flexion)	0.2	0.2

DATA SHEET NO. 24

TARGET VEHICLE SEAT BELT ASSESSMENT AND POST TEST AIRBAG DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to "D" ring	mm	140	80
Shoulder belt length as measured on ATD	mm	855	937
Lap belt length as measured on ATD	mm	765	620
Remainder of belt on reel	mm	1462	1587
Total belt length for continuous webbing systems	mm	3222	3224

BELT SPOOL-OUT DATA

Measurement Description	Units	Driver	Passenger
Pretensioner	mm		
At the Shoulder	mm	217	12
At Retractor	mm	192	35

* No Valid Data

POST TEST AIRBAG DATA

Number of Vent Holes			
Driver	2	Passenger	2
Size of Vent Holes (Note whether round or square)			
Driver	round	Passenger	round
Total Vent Area			
Driver	21.2 cm^2	Passenger	30.2 cm^2
Deflated Airbag Length and Width Dimensions or, if Round, Diameter			
Driver **	Length:	Width:	Diameter: 562mm
Passenger	Length: 830 mm	Width: 720 mm	Diameter:
Is the Airbag Tethered?			
Driver	Yes		Length: 266mm
Passenger		No	Length:

** The driver airbag had a big tear during impact which was 394mm long.

DATA SHEET NO. 25

TARGET VEHICLE FMVSS 212 DATA

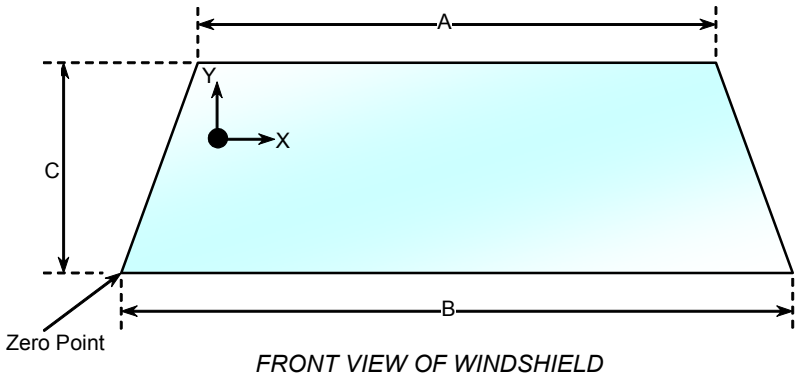
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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

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

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2133	2133	100
Right Side	2138	2138	100
Total	4271	4271	100



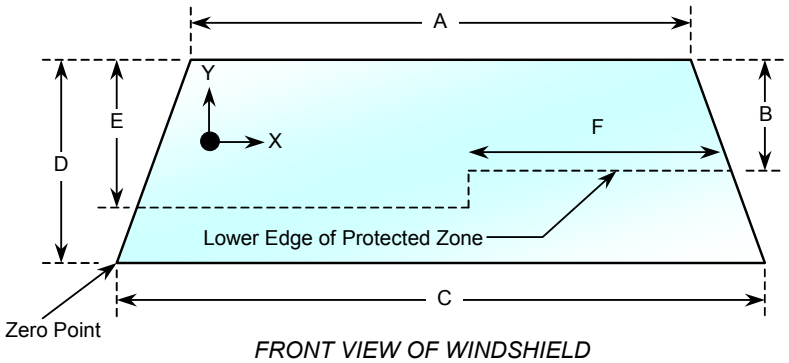
FRONT VIEW OF WINDSHIELD

Item	Units	Segment Length	Molding Width
A	mm	1148	17
B	mm	1486	11
C	mm	825	22

DATA SHEET NO. 26

TARGET VEHICLE FMVSS 219 (Partial) DATA

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1148
B	mm	443
C	mm	1486
D	mm	825
E	mm	541
F	mm	500

AREA OF PROTECTED ZONE FAILURES - NONE

B. 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. 27

TARGET VEHICLE MEASUREMENTS

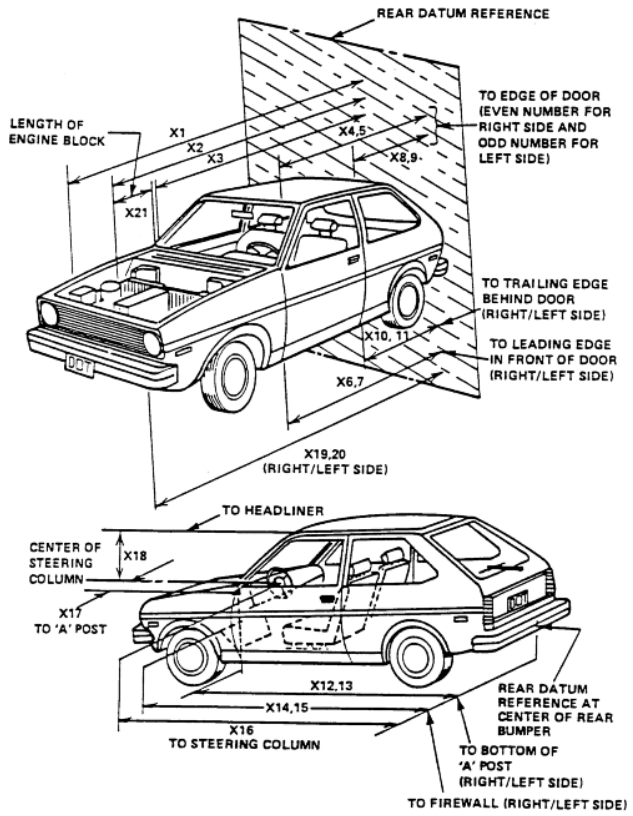
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

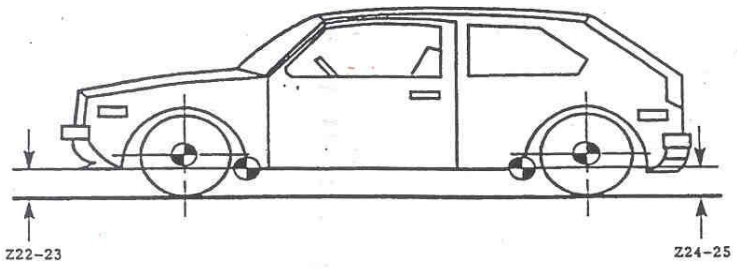
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
X1	Total length of vehicle at centerline	mm	4800	4289	511
X2	RSOV to front of engine	mm	3969	3771	198
X3	RSOV to firewall centerline	mm	3714	3725	-11
X4	RSOV to leading edge of right door	mm	3325	3332	-7
X5	RSOV to leading edge of left door	mm	3324	3344	-20
X6	RSOV to lower leading edge of right door	mm	3320	3315	5
X7	RSOV to lower leading edge of left door	mm	3320	3319	1
X8	RSOV to upper leading edge of right door	mm	2183	2196	-13
X9	RSOV to upper leading edge of left door	mm	2180	2208	-28
X10	RSOV to lower trailing edge of right door	mm	2190	2186	4
X11	RSOV to lower trailing edge of left door	mm	2189	2194	-5
X12	RSOV to bottom of right 'A' pillar	mm	3290	3299	-9
X13	RSOV to bottom of left 'A' pillar	mm	3287	3306	-19
X14	RSOV to firewall on right side	mm	3668	3491	177
X15	RSOV to firewall on left side	mm	3668	3477	191
X16	RSOV to steering column	mm	2810	2882	-72
X17	Center of steering column to left 'A' pillar	mm	380	376	4
X18	Center of steering column to headlining	mm	400	398	2
X19	RSOV to right side of front bumper	mm	4577	4316	261
X20	RSOV to left side of front bumper	mm	4574	4441	133
X21	Width of engine block	mm	450	450	0
Z22	Right Front Sill to Ground Plane	mm	207	159	48
Z23	Left Front Sill to Ground Plane	mm	200	232	-32
Z24	Right Rear Sill to Ground Plane	mm	220	208	12
Z25	Left Rear Sill to Ground Plane	mm	212	293	-81
X26	Firewall to Engine or Transaxle	mm	255	46	209
Z27	Vertical Dim. From Door Sill to Centerline of St. Col.	mm	650	627	23
X28	Wheelbase of Vehicle (left side)	mm	2740	2701	39
Y29	Width of Vehicle at Maximum Width Point	mm	1822	1828	-6
X30	RSOV to Engine Target	mm	4093	2909	184
X31	RSOV to Compartment Target	mm	2728	2718	10
X32	RSOV to Bumper Target	mm	4620	4348	272
X33	RSOV to Frame Cross member	mm	3976	3884	92

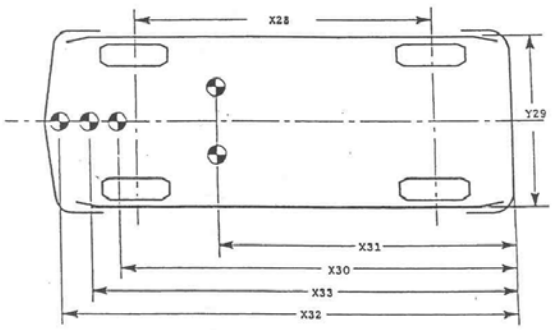
DATA SHEET NO. 27... (Continued)

TARGET VEHICLE MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344







DATA SHEET NO. 27... (Continued)

TARGET VEHICLE MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

TOP OF BUMPER

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	426	570	144
C2	Crush Zone 2 on left side	mm	266	630	364
C3	Crush Zone 3 on left side	mm	206	697	491
C4	Crush Zone 4 on right side	mm	206	656	450
C5	Crush Zone 5 on right side	mm	267	534	267
C6	Crush Zone 6 on right side	mm	423	687	264

BOTTOM OF BUMPER

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	427	582	155
C2	Crush Zone 2 on left side	mm	263	648	385
C3	Crush Zone 3 on left side	mm	204	707	503
C4	Crush Zone 4 on right side	mm	204	676	472
C5	Crush Zone 5 on right side	mm	261	541	280
C6	Crush Zone 6 on right side	mm	424	690	266

CENTER GRILL

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	325	775	450
C2	Crush Zone 2 on left side	mm	292	759	467
C3	Crush Zone 3 on left side	mm	268	745	477
C4	Crush Zone 4 on right side	mm	269	742	473
C5	Crush Zone 5 on right side	mm	291	753	462
C6	Crush Zone 6 on right side	mm	322	760	438

FRONT HOOD

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 on left side	mm	344	726	382
C2	Crush Zone 2 on left side	mm	310	790	480
C3	Crush Zone 3 on left side	mm	296	783	487
C4	Crush Zone 4 on right side	mm	295	787	492
C5	Crush Zone 5 on right side	mm	309	782	473
C6	Crush Zone 6 on right side	mm	344	752	408

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
L	Length of Region	mm	1532	1424	108

Note: Crush is positive. Measurements are taken from a reference plane in front of the vehicle.

DATA SHEET NO. 27... (Continued)
TARGET VEHICLE MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

TARGET VEHCLE STRUCTURAL MEASUREMENT

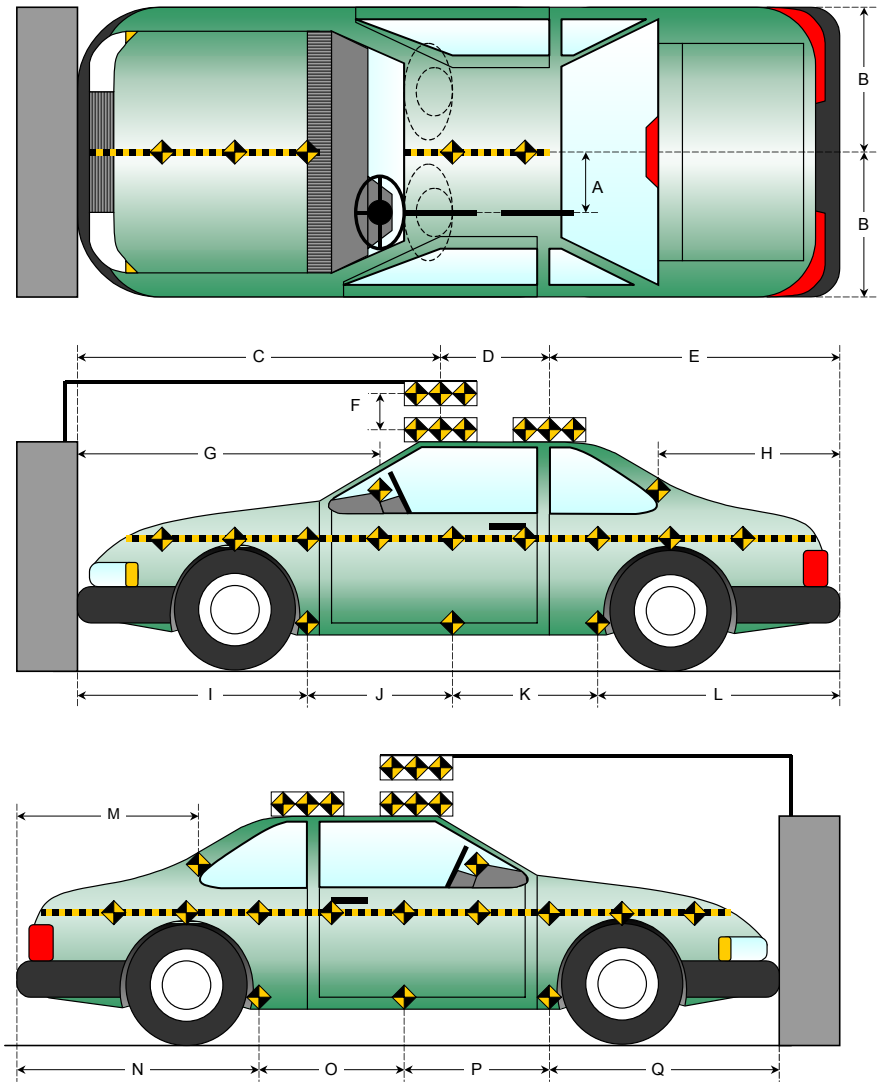
	Elements	Pre-Test (mm)
1	Total Length	4800
2	Total Width	1822
3	Bumper Top Height	540
4	Bumper Bottom Height	430
5	Longitudinal Member Top Height	529
6	Distance between Longitudinal Members	858
7	Longitudinal Member Width	85
8	Engine Top Height	837
9	Engine Bottom Height	189
10	Engine and gearbox width	895
11	Front bumper-engine distance	580
12	Front shock absorber fixing height	833
13	Bonnet leading edge height	651
14	Front shock absorber fixing width	964
15	Front bumper – front axle distance	1017
16	Front axle – a pillar distance	443
17	A-pillar – B-pillar distance	1090
18	B-Pillar – rear axle distance	1089
19	B-pillar – C-pillar distance	988
20	Roof sill bottom height	1311
21	Roof sill top height	1427
22	Floor sill bottom height	203
23	Floor sill top height	333

DATA SHEET NO. 28

TARGET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Item	Value
A	354
B	911
C	2418
D	610
E	1772
F	
G	1788
H	1037
I	1437
J	935
K	933
L	1495
M	1059
N	1490
O	936
P	942
Q	1432



DATA SHEET NO. 29

TARGET VEHICLE INTRUSION MEASUREMENTS

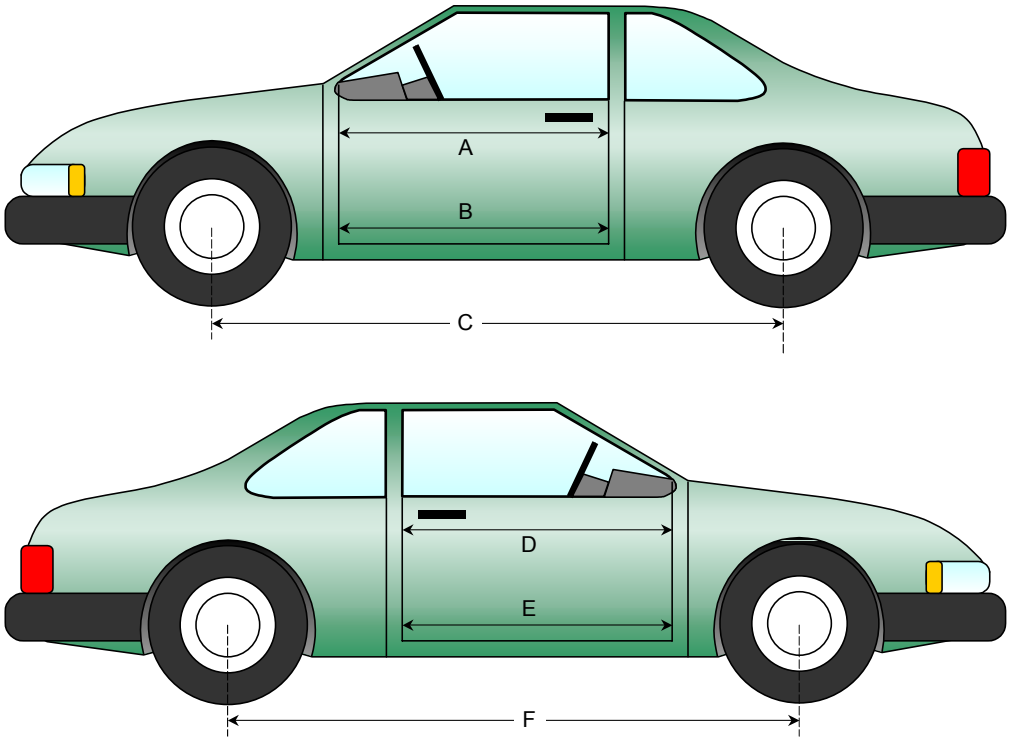
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1044	1041	3
B	Left Side Lower	mm	1030	1023	7
D	Right Side Upper	mm	1042	1035	7
E	Right Side Lower	mm	1024	1021	3

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2740	2701	39
F	Right Side Wheelbase	mm	2740	2597	143



DATA SHEET NO. 29... (Continued)

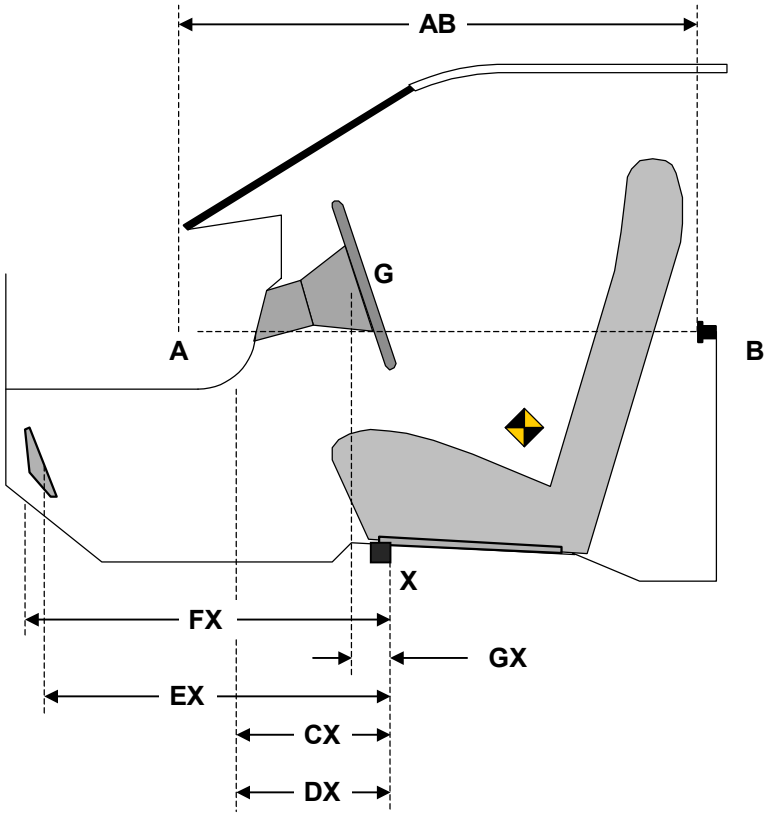
TARGET VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1044	1041	3
CX	Left Knee Bolster to X	mm	354	346	8
DX	Right Knee Bolster to X	mm	330	342	-12
EX	Brake Pedal to X	mm	600	586	14
FX	Foot Rest to X	mm	638	619	19
GX	Center of Steering Column Wheel Hub to X	mm	95	121	-26

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 29... (Continued)

TARGET VEHICLE INTRUSION MEASUREMENTS

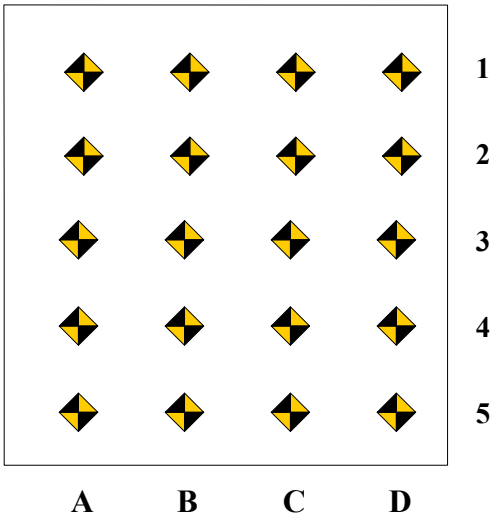
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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		710	702	707		687	671	692		23	31	15
2		675	668	666		657	639	652		18	29	14
3	595	592	589	587	592	591	581	577	3	1	8	10
4	396	393	388	390	394	387	380	383	2	6	8	7
5	195	193	188	190	189	187	182	186	6	6	6	4

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		13	18	18		23	29	25		-10	-11	-7
2		-21	-17	-19		-14	-11	-13		-7	-6	-6
3	-62	-66	-65	-66	-69	-78	-80	-81	7	12	15	15
4	-62	-60	-62	-63	-67	-63	-67	-66	5	3	5	3
5	-61	-59	-62	-49	-53	-56	-56	-43	-8	-3	-6	-6

DATA SHEET NO. 29... (Continued)

TARGET VEHICLE INTRUSION MEASUREMENTS

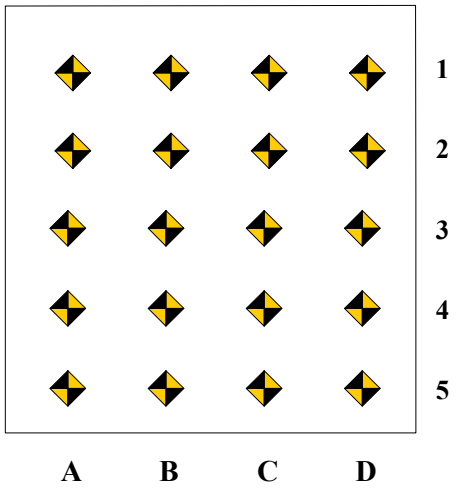
Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

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	715	714	722		691	684	692		24	30	30	
2	693	692	689		676	665	670		17	27	19	
3	609	609	609	613	602	600	608	609	7	9	1	4
4	412	409	413	411	412	409	413	411	0	0	0	0
5	208	208	211	212	202	208	211	212	6	0	0	0

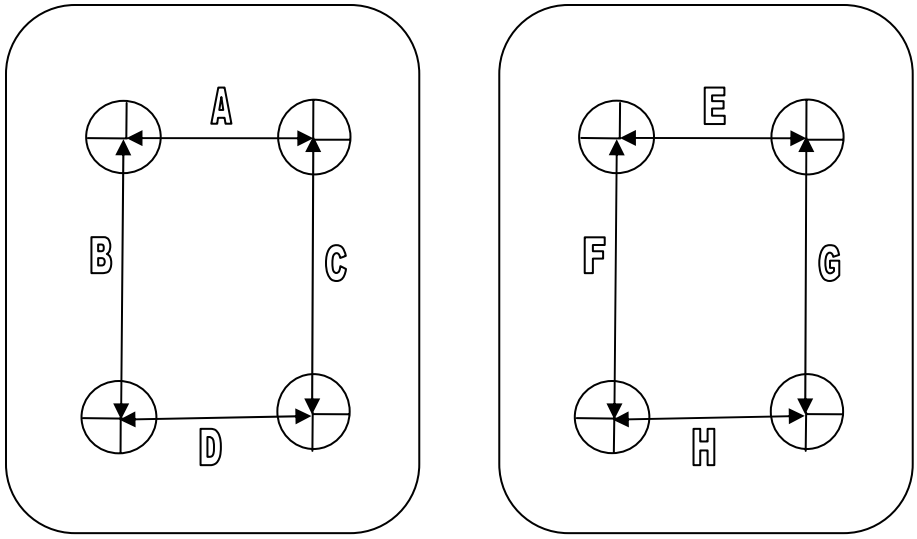
PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	31	35	29		49	50	49		-18	-15	-20	
2	7	13	-3		16	19	11		-9	-6	-14	
3	-64	-61	-61	-59	-68	-54	-58	-55	4	-7	-3	-4
4	-71	-60	-60	-57	-78	-65	-59	-57	7	5	-1	0
5	-54	-59	-62	-56	-61	-59	-57	-44	7	0	-5	-12

DATA SHEET NO. 29... (Continued)

TARGET VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344



Driver Passenger

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	273	269	4
B	416	416	0
C	433	433	0
D	270	269	1
E	305	300	5
F	422	422	0
G	420	420	0
H	305	296	9

DATA SHEET NO. 30

TARGET VEHICLE IIHS MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Location		Difference
A Pillar	X	-2
	Y	10
	Z	2
B Pillar	X	-1
	Y	5
	Z	2
Brake Pedal	X	2
	Y	7
	Z	8
Footrest	X	-18
	Y	12
	Z	8
Knee Bolster Left	X	5
	Y	5
	Z	-1
Knee Bolster Right	X	7
	Y	7
	Z	-1
Toepan Left	X	-32
	Y	5
	Z	18
Toepan Center	X	-35
	Y	4
	Z	18
Toepan Right	X	-57
	Y	8
	Z	19
Outboard Front Seat Bolt	X	-1
	Y	4
	Z	0
Inboard Front Seat Bolt	X	1
	Y	6
	Z	-6
Inboard Aft Seat Bolt	X	-1
	Y	1
	Z	2
Outboard Aft Seat Bolt	X	-1
	Y	4
	Z	2

DATA SHEET NO. 30… (Continued)

TARGET VEHICLE IIHS MEASUREMENTS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

Location		Difference
Bumper 1 (Extreme LH)	X	-183
	Y	-64
	Z	-3
Bumper 2	X	-218
	Y	-81
	Z	-8
Bumper 3	X	-368
	Y	-77
	Z	-17
Bumper 4	X	-443
	Y	-31
	Z	-88
Bumper 5	X	-481
	Y	-29
	Z	-112
Bumper 6 (Mid)	X	-507
	Y	-22
	Z	-137
Bumper 7	X	-433
	Y	-9
	Z	-116
Bumper 8	X	-357
	Y	7
	Z	-93
Bumper 9	X	-271
	Y	11
	Z	-69
Bumper 10	X	-238
	Y	11
	Z	-51
Bumper 11 (Extreme RH)	X	-284
	Y	42
	Z	-57

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

DATA SHEET NO. 31

CAMERA LOCATIONS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	West Wide	829	15319	1670	13	**
2	West Bullet Rear Close-Up	889	9123	1580	25	1000
3	West Bullet Front Close-Up	1719	8972	1497	25	1000
4	West Target Front Close-Up	-5702	9833	1580	25	1005
5	West Target Rear Close-Up	-3299	9368	1603	25	948
6	East Bullet Rear Close-Up	5941	-36256	1779	13	***
7	East Bullet Front Close-Up	-1601	-18043	1547	13	833
8	East Target Front Close-Up	-425	-14376	1627	50	***
9	East Target Rear Close-Up	-1065	-14145	1759	50	***
10	East Wide	-6319	-12890	1701	35	1000
11	East Overall	3380	-12624	1727	35	833
12	Overhead	532	0	4831	8	***
13	Bullet Driver Onboard				8	**
14	Bullet Passenger Onboard				8	**
15	Target Driver Onboard				8	**
16	Target Passenger Onboard				8	**

*COORDINATES:

+X = film plane forward of impact plane

+Y = film plane to right of monorail centerline

+Z = film plane above ground level

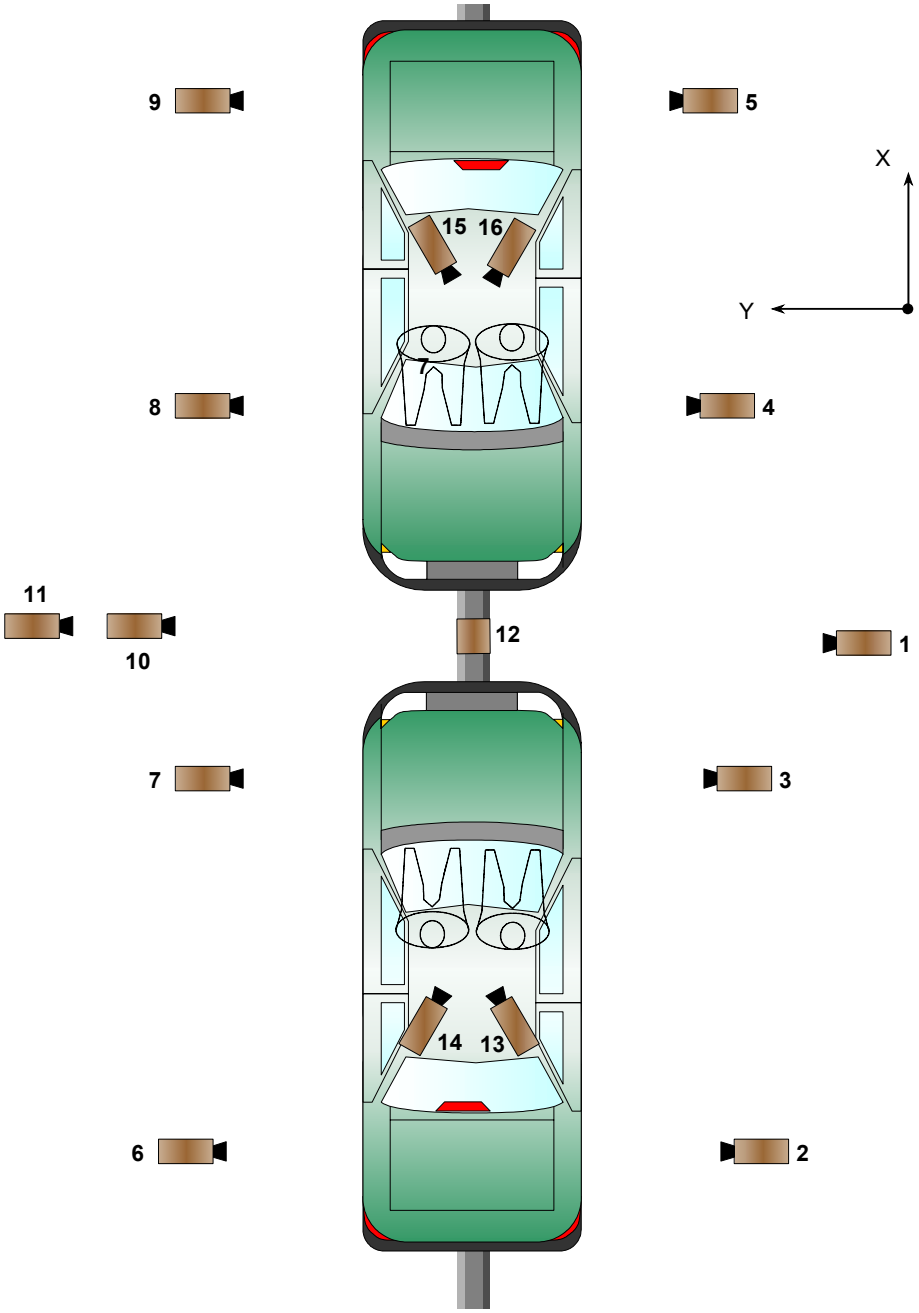
**No Timing

***Camera did not run

DATA SHEET NO. 31... (Continued)

CAMERA LOCATIONS

Bullet Vehicle: 1999 Dodge Grand Caravan SE NHTSA No.: RX0322
Target Vehicle: 2004 Honda Accord EX NHTSA No.: R45344



APPENDIX A

PHOTOGRAPHS

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Bullet Vehicle Certification Label/Tire Placard



Pre-Test Front View of Bullet Vehicle



Post-Test Front View of Bullet Vehicle



Pre-Test Left Side View of Bullet Vehicle



Post-Test Left Side View of Bullet Vehicle



Pre-Test Left Front ¾ View of Bullet Vehicle



Post-Test Left Front ¾ View of Bullet Vehicle



Pre-Test Right Front ¾ View of Bullet Vehicle



Post-Test Right Front ¾ View of Bullet Vehicle



Pre-Test Left Rear ¾ View of Bullet Vehicle



Post-Test Left Rear ¾ View of Bullet Vehicle



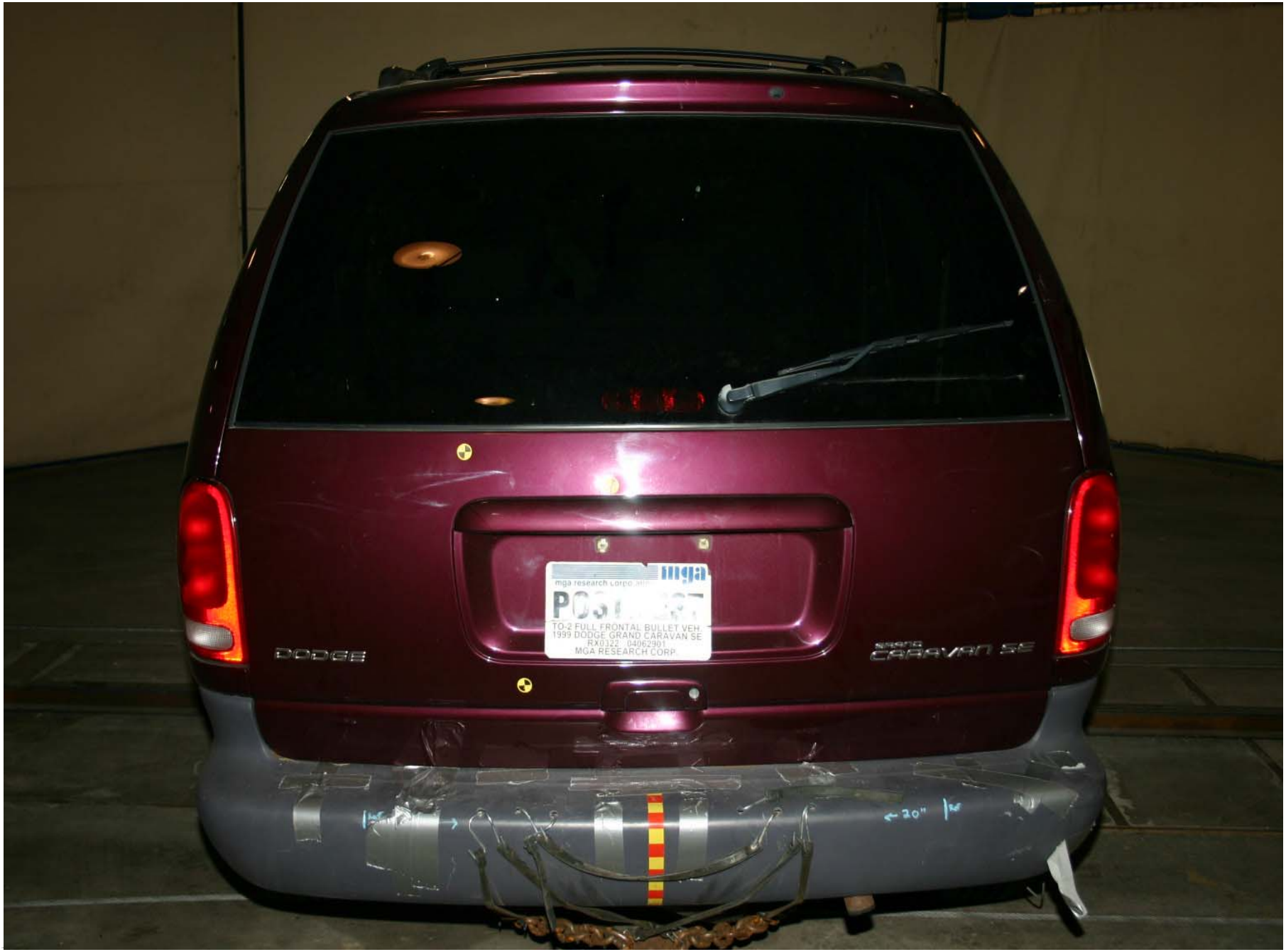
Pre-Test Right Rear ¾ View of Bullet Vehicle



Post-Test Right Rear ¾ View of Bullet Vehicle



Pre-Test Rear View of Bullet Vehicle



Post-Test Rear View of Bullet Vehicle



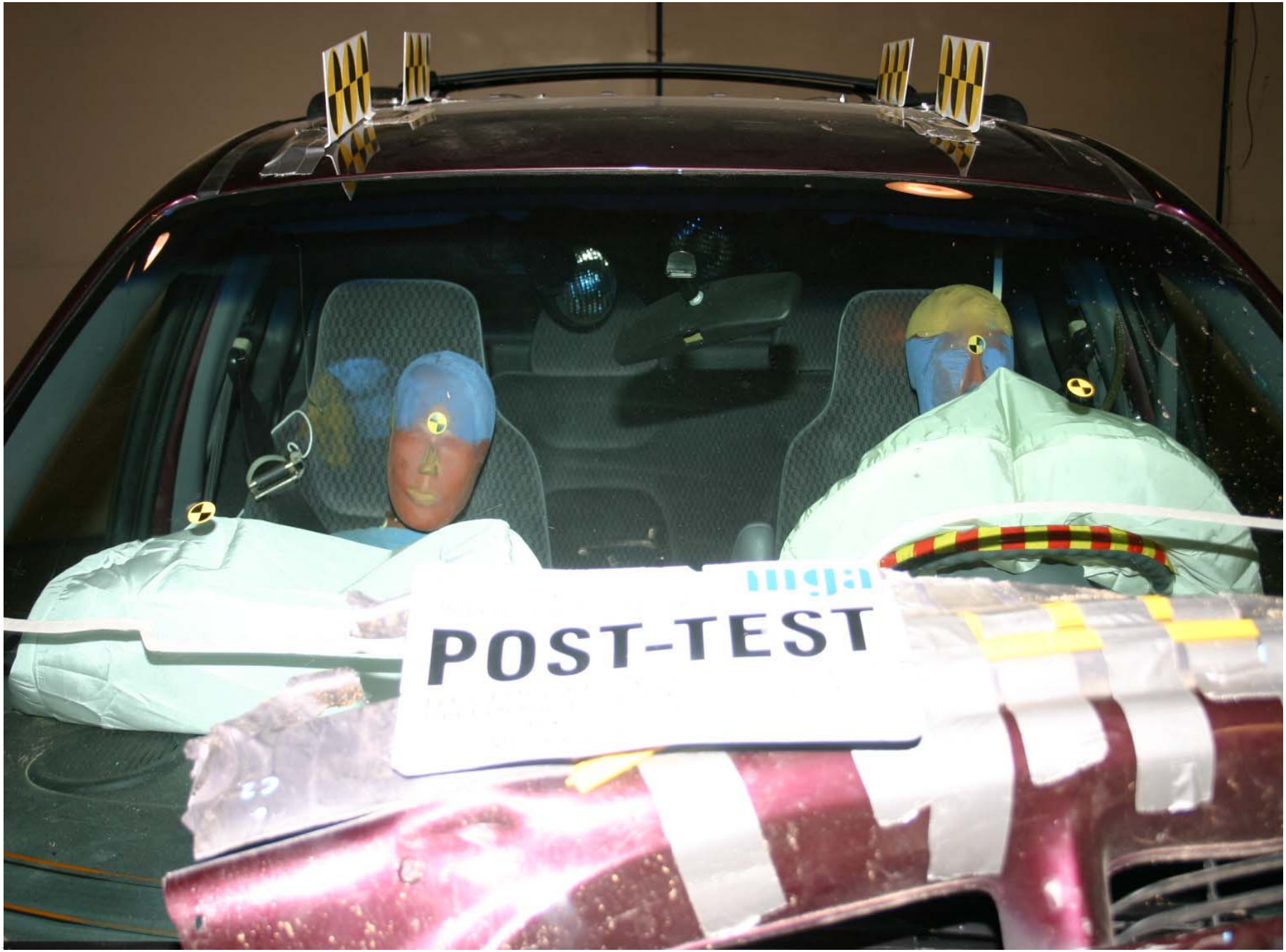
Pre-Test Right Side View of Bullet Vehicle



Post-Test Right Side View of Bullet Vehicle



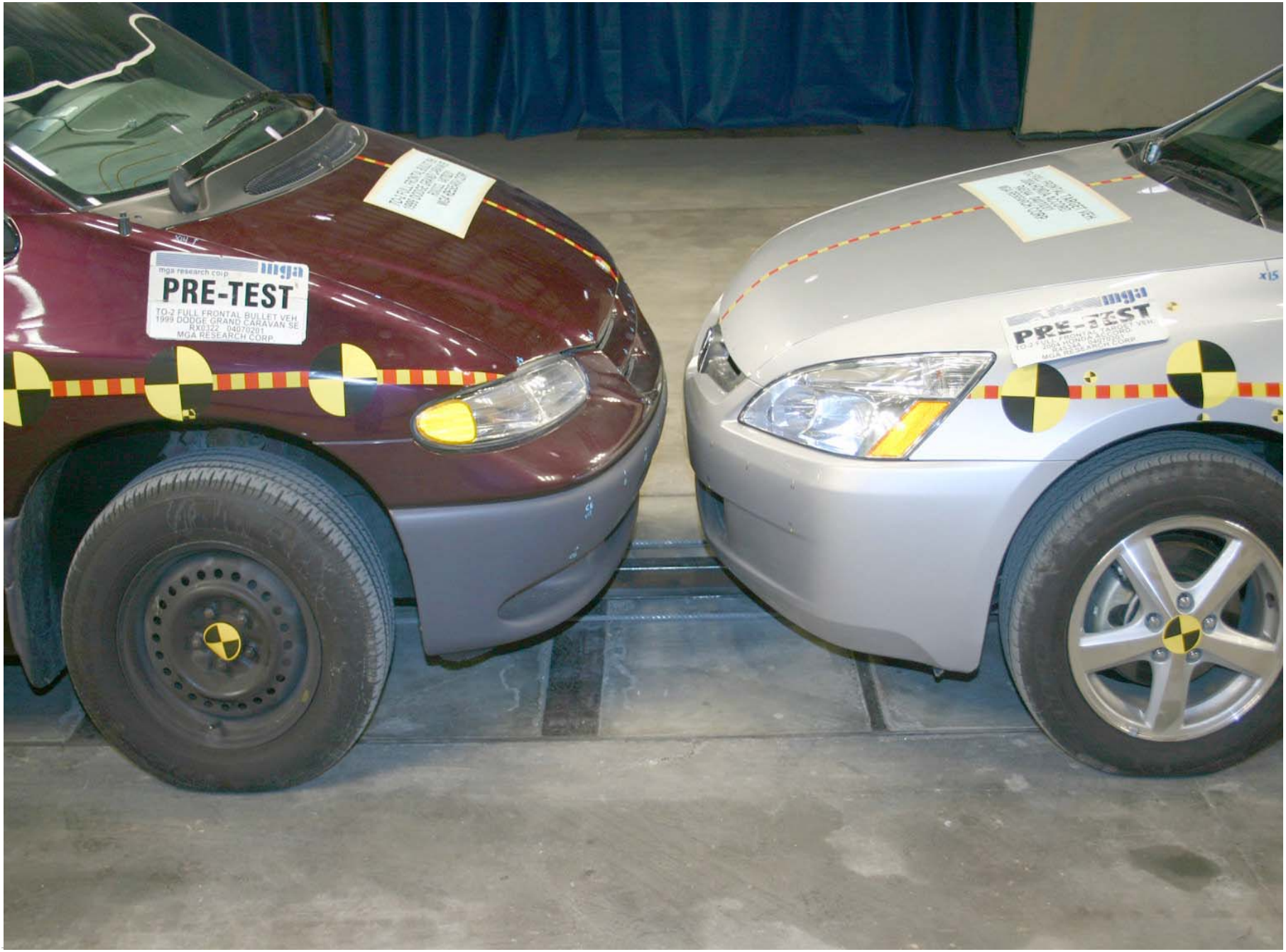
Pre-Test Windshield View of Bullet Vehicle



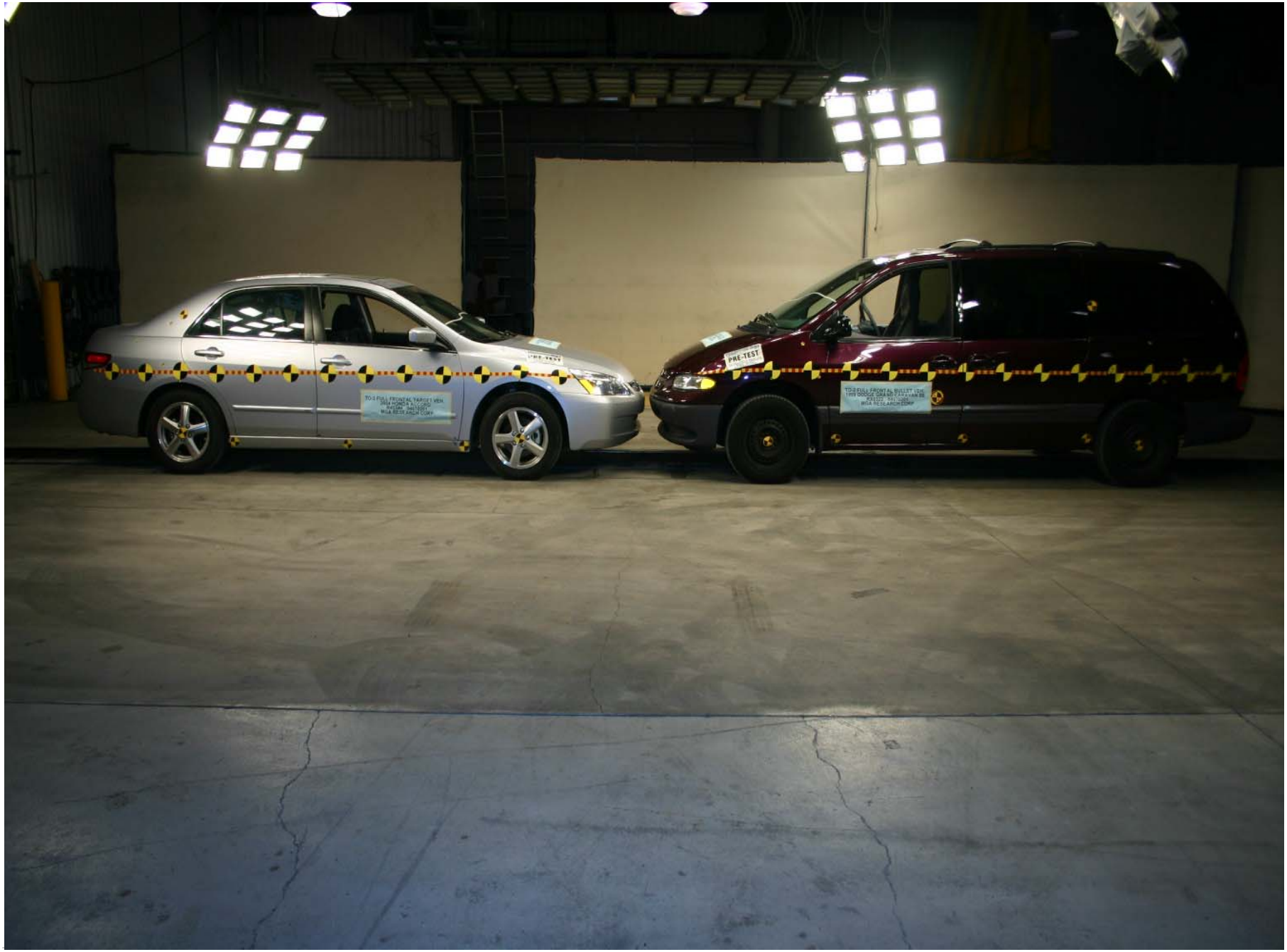
Post-Test Windshield View of Bullet Vehicle



Pre-Test Left View of Bullet and Target Vehicles (Close-Up)



Pre-Test Right View of Bullet and Target Vehicles (Close-Up)



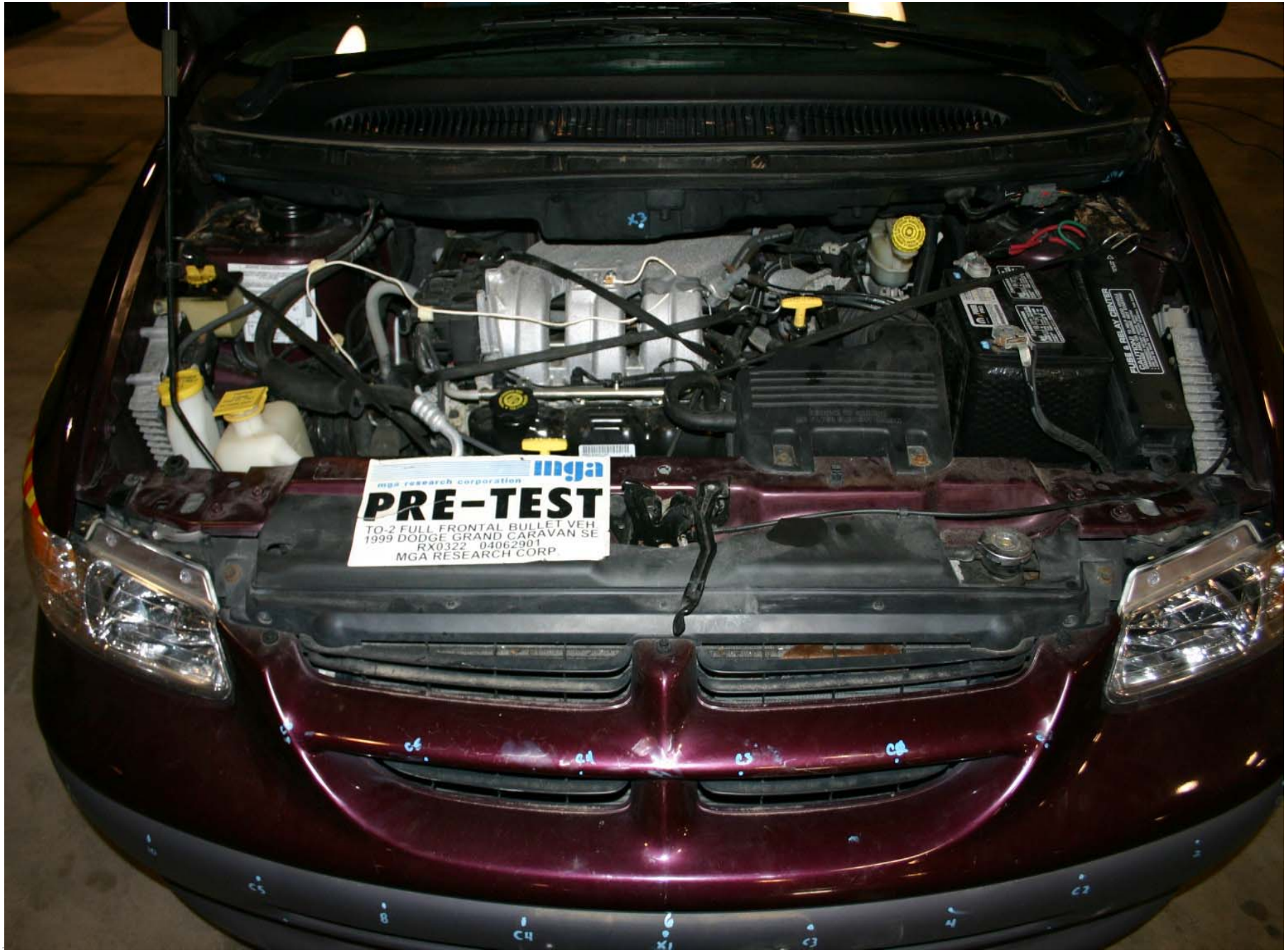
Pre-Test Left Overall View of Bullet and Target Vehicles



Pre-Test Right Overall View of Bullet and Target Vehicles



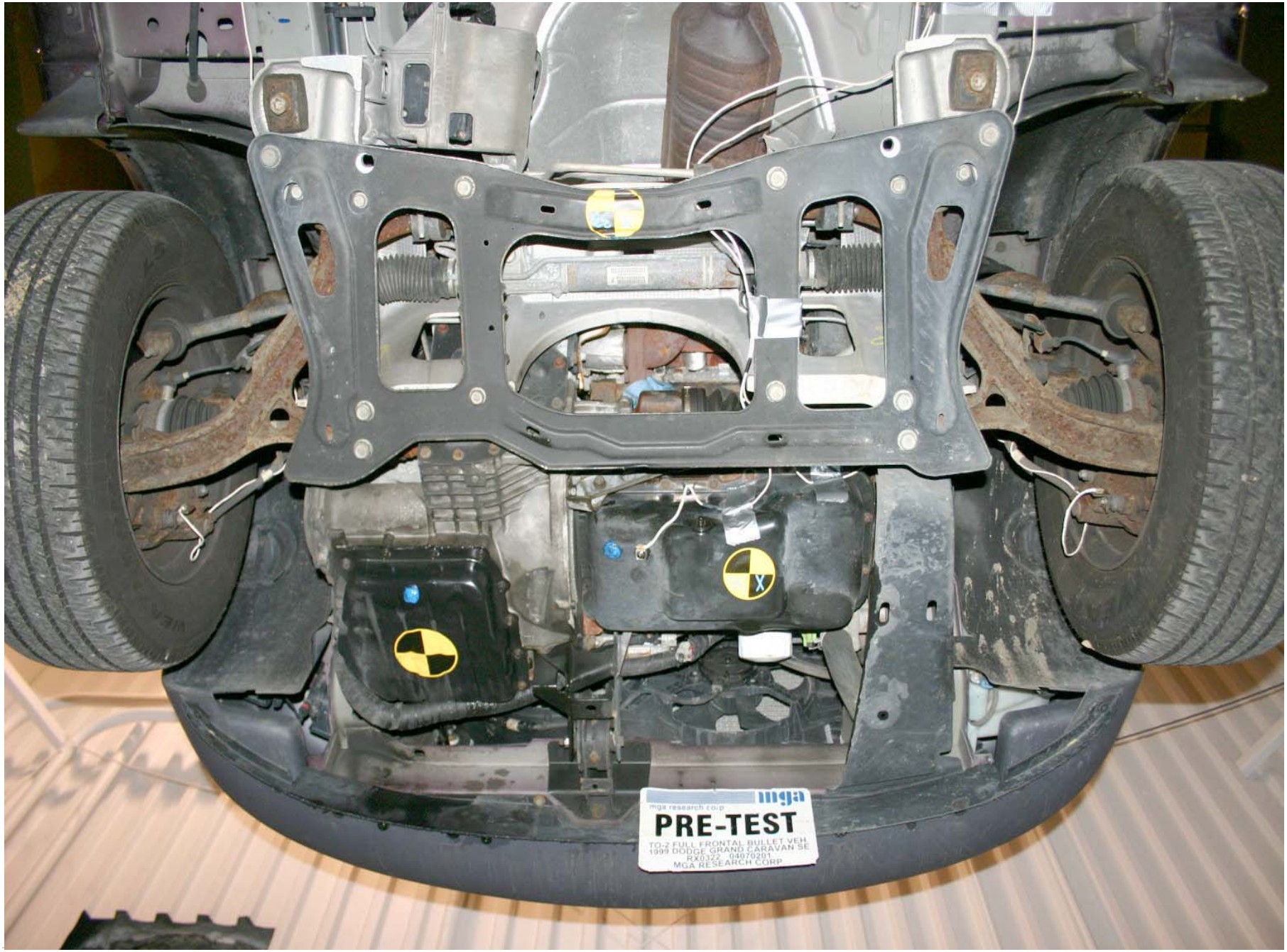
Pre-Test Overhead View of Bullet and Target Vehicles



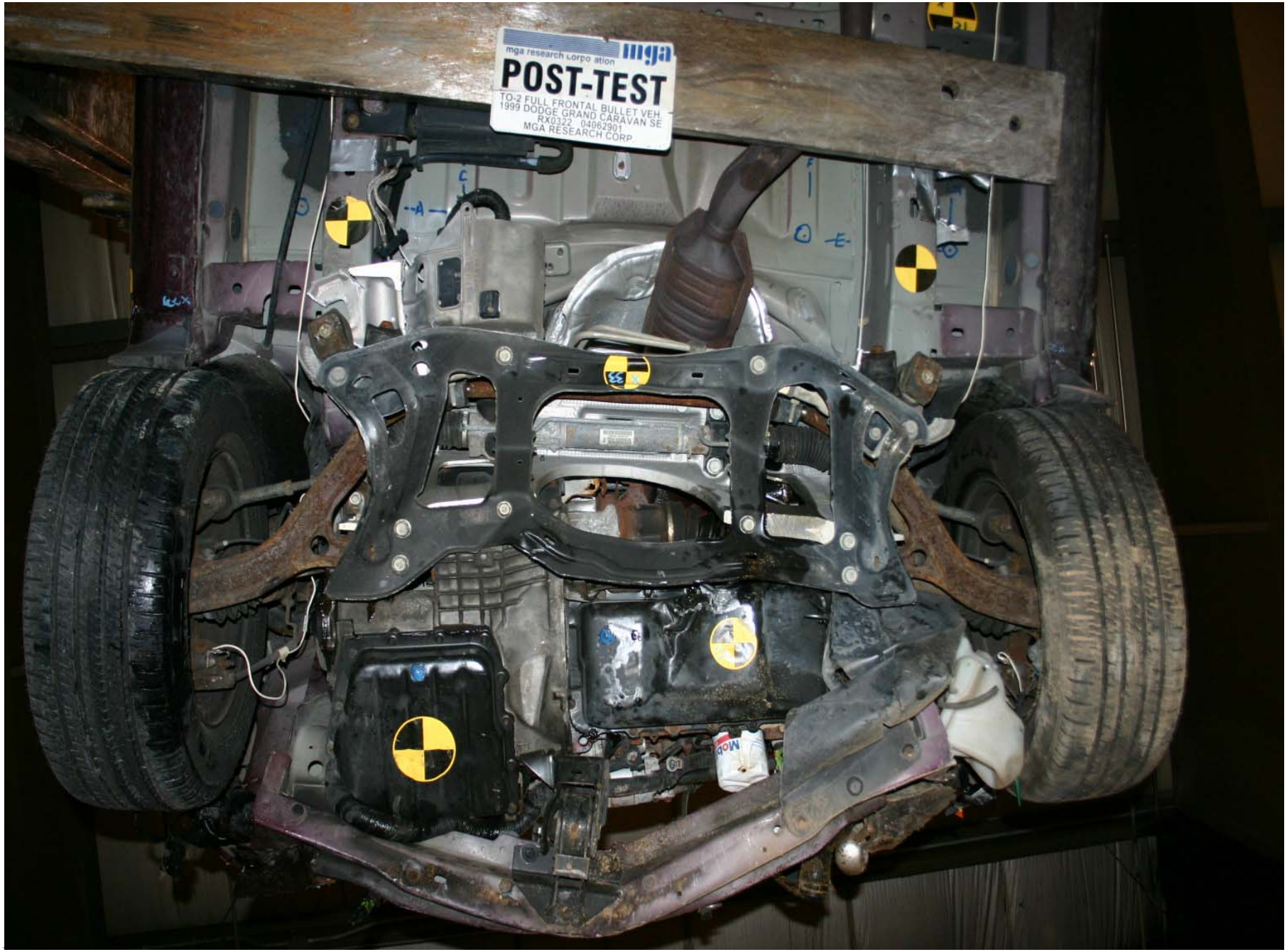
Pre-Test Engine Compartment View of Bullet Vehicle



Post-Test Engine Compartment View of Bullet Vehicle



Pre-Test Front Underbody View of Bullet Vehicle



Post-Test Front Underbody View of Bullet Vehicle



Pre-Test Mid Underbody of Bullet Vehicle



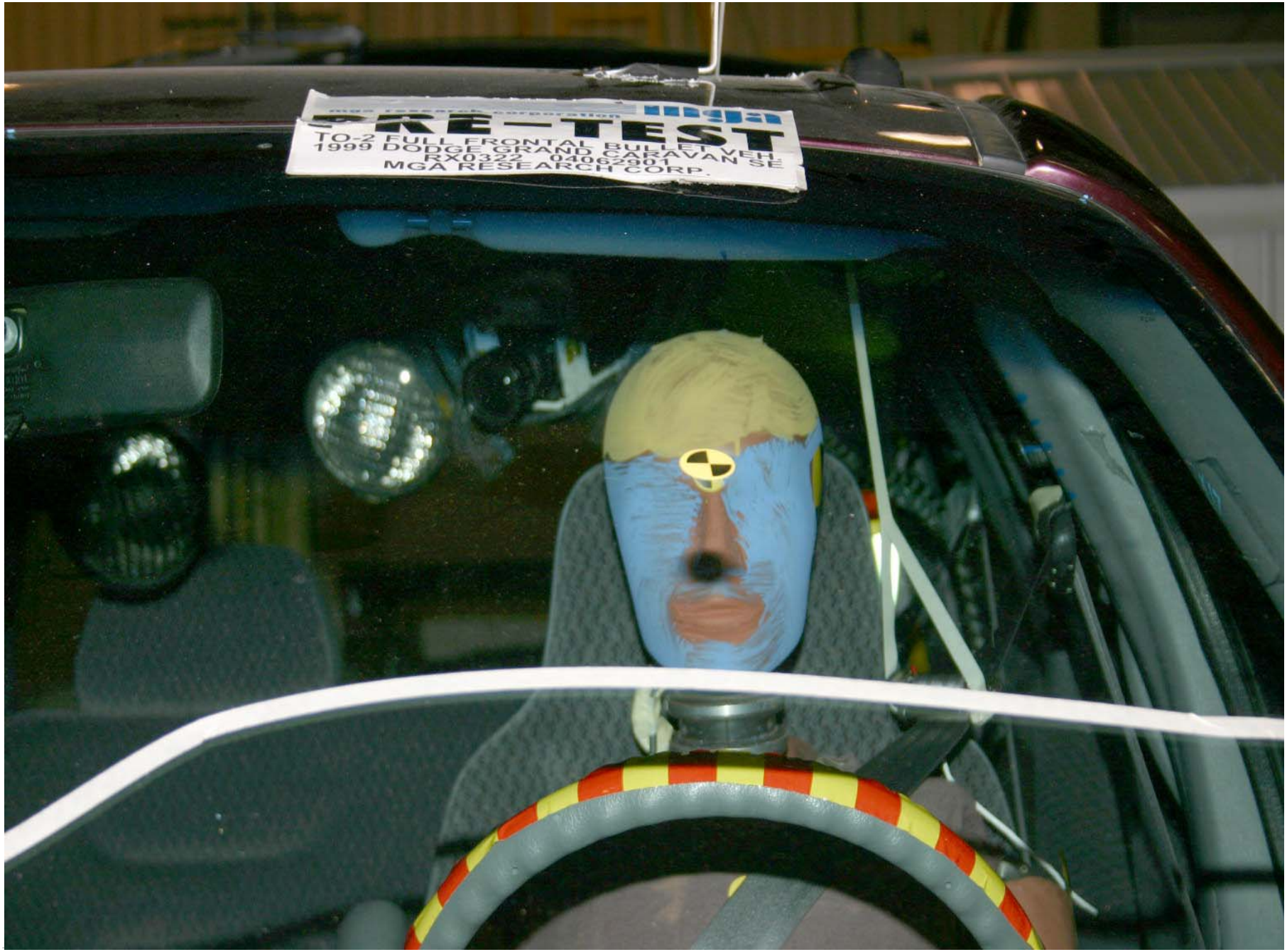
Post-Test Mid Underbody of Bullet Vehicle



Pre-Test Rear Underbody View of Bullet Vehicle



Post-Test Rear Underbody View of Bullet Vehicle



Pre-Test Driver Dummy Front View Head Position in Bullet Vehicle



Post-Test Driver Dummy Front View Head Position in Bullet Vehicle



Pre-Test Driver Dummy Position Left Side View in Bullet Vehicle



Post-Test Driver Dummy Position Left Side View in Bullet Vehicle



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



Post-Test DR Dummy Position Left Side View in Bullet (Door Open)



Pre-Test Driver Dummy Seat Position of Bullet Vehicle



Post-Test Driver Dummy Seat Position of Bullet Vehicle



Pre-Test Driver Dummy Feet Position in Bullet Vehicle



Post-Test Driver Dummy Feet Position in Bullet Vehicle



Pre-Test Driver Side Knee Bolster View in Bullet Vehicle



Post-Test Driver Side Knee Bolster View in Bullet Vehicle



Post-Test Driver Dummy Head Contact in Bullet Vehicle



Post-Test Driver Dummy Knee Contact in Bullet Vehicle



Post-Test Driver Dummy Airbag Contact in Bullet Vehicle



Pre-Test Driver Side Floor Pan View of Bullet Vehicle



Post-Test Driver Side Floor Pan View of Bullet Vehicle



Pre-Test Pass Dummy Front View Head Position in Bullet Vehicle



Post-Test Pass Dummy Front View Head Position in Bullet Vehicle



Pre-Test Pass Dummy Position Right Side View in Bullet Vehicle



Post-Test Pass Dummy Position Right Side View in Bullet Vehicle



Pre-Test Pass Dummy Position Right Side View in Bullet Vehicle (Door Open)



Post-Test Pass Dummy Position Right Side View in Bullet Vehicle (Door Open)



Pre-Test Passenger Dummy Seat Position of Bullet Vehicle



Post-Test Passenger Dummy Seat Position of Bullet Vehicle



Pre-Test Passenger Dummy Feet Position in Bullet Vehicle



Post-Test Passenger Dummy Feet Position in Bullet Vehicle



Pre-Test Passenger Side Knee Bolster View in Bullet Vehicle



Post-Test Passenger Side Knee Bolster View in Bullet Vehicle



Post-Test Passenger Dummy Head Contact in Bullet Vehicle



Post-Test Passenger Dummy Knee Contact in Bullet Vehicle



Post-Test Passenger Dummy Airbag Contact in Bullet Vehicle



Pre-Test Passenger Side Floor Pan View of Bullet Vehicle



Post-Test Passenger Side Floor Pan View of Bullet Vehicle



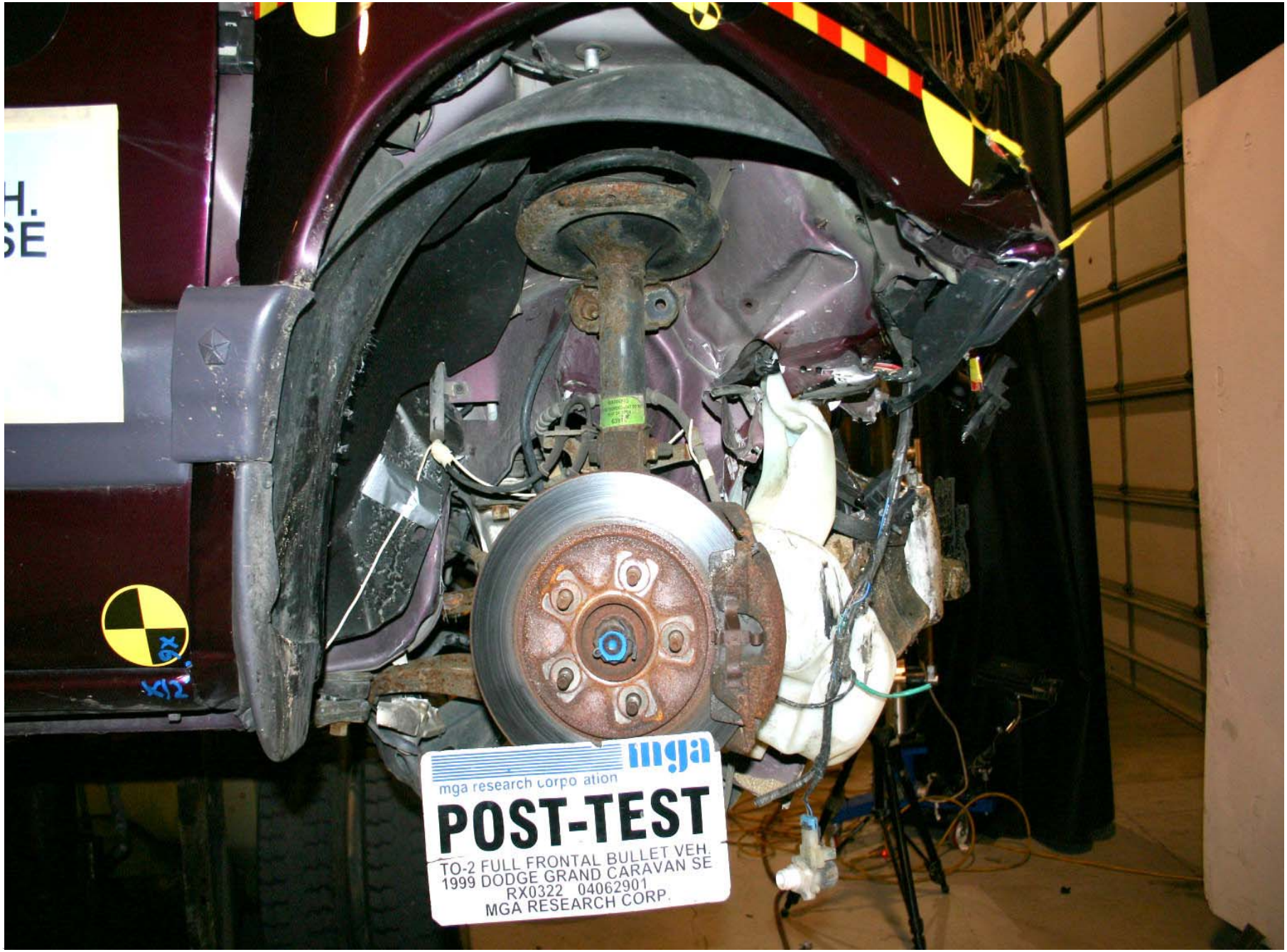
Pre-Test Left Front Wheel Well of Bullet Vehicle



Post-Test Left Front Wheel Well of Bullet Vehicle



Pre-Test Right Front Wheel Well of Bullet Vehicle



Post-Test Right Front Wheel Well of Bullet Vehicle



Pre-Test Left Front Side Close-Up View of Bullet Vehicle



Post-Test Left Front Side Close-Up View of Bullet Vehicle



Pre-Test Right Front Side Close-Up View of Bullet Vehicle



Post-Test Right Front Side Close-Up View of Bullet Vehicle



Post-Test Front Sub-Frame View #1 of Bullet Vehicle



Post-Test Front Sub-Frame View #2 of Bullet Vehicle



Post-Test Front Sub-Frame View #3 of Bullet Vehicle



Post-Test Front Sub-Frame View #4 of Bullet Vehicle



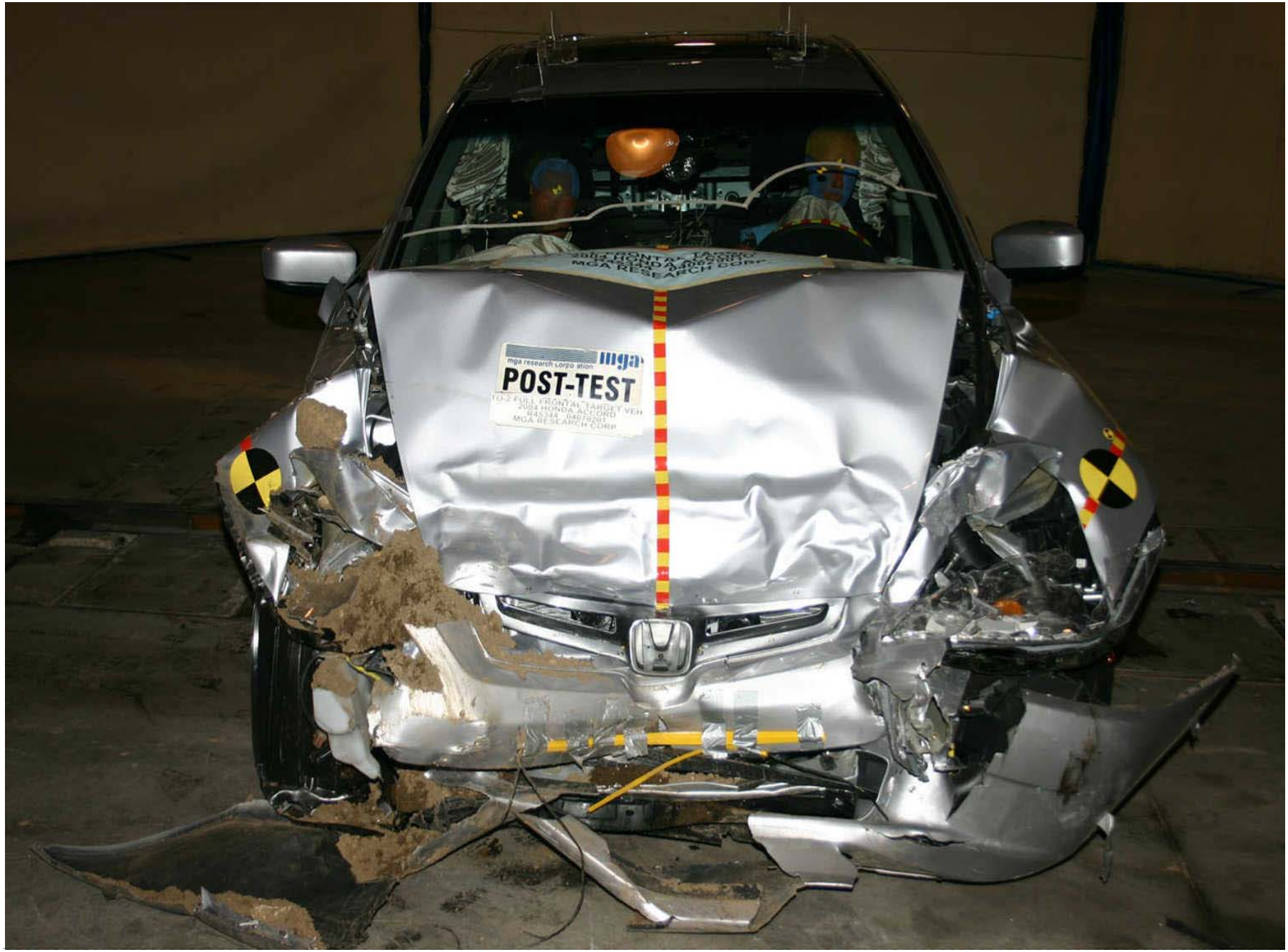
Target Vehicle Certification Label



Target Tire Placard



Pre-Test Front View of Target Vehicle



Post-Test Front View of Target Vehicle



Pre-Test Left Front ¾ View of Target Vehicle



Post-Test Left Front ¾ View of Target Vehicle



Pre-Test Left Side View of Target Vehicle



Post-Test Left Side View of Target Vehicle



Pre-Test Right Front ¾ View of Target Vehicle



Post-Test Right Front ¾ View of Target Vehicle



Pre-Test Left Rear ¾ View of Target Vehicle



Post-Test Left Rear ¾ View of Target Vehicle



Pre-Test Right Rear ¾ View of Target Vehicle



Post-Test Right Rear ¾ View of Target Vehicle



Pre-Test Rear View of Target Vehicle



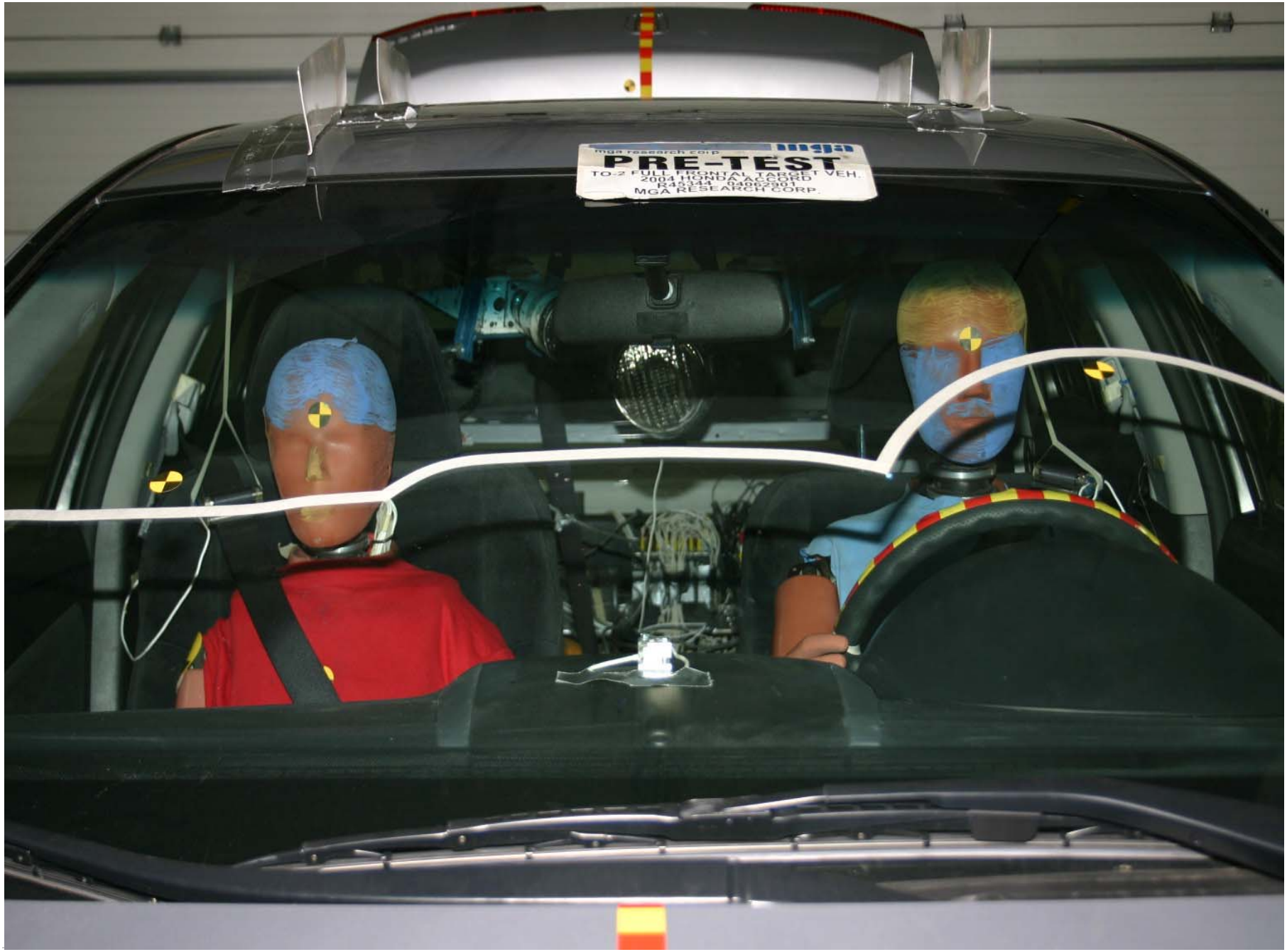
Post-Test Rear View of Target Vehicle



Pre-Test Right Side View of Target Vehicle



Post-Test Right Side View of Target Vehicle



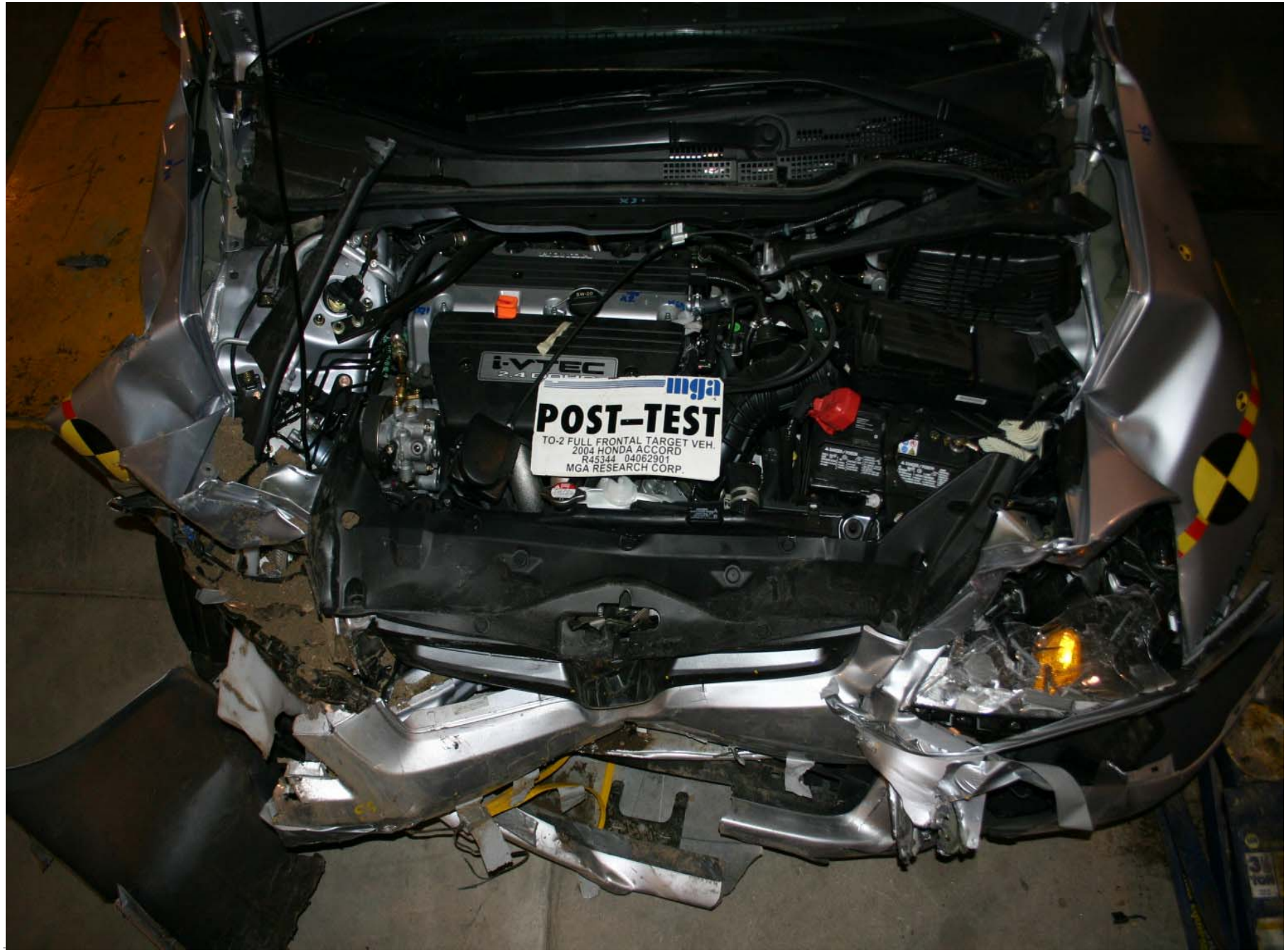
Pre-Test Windshield View of Target Vehicle



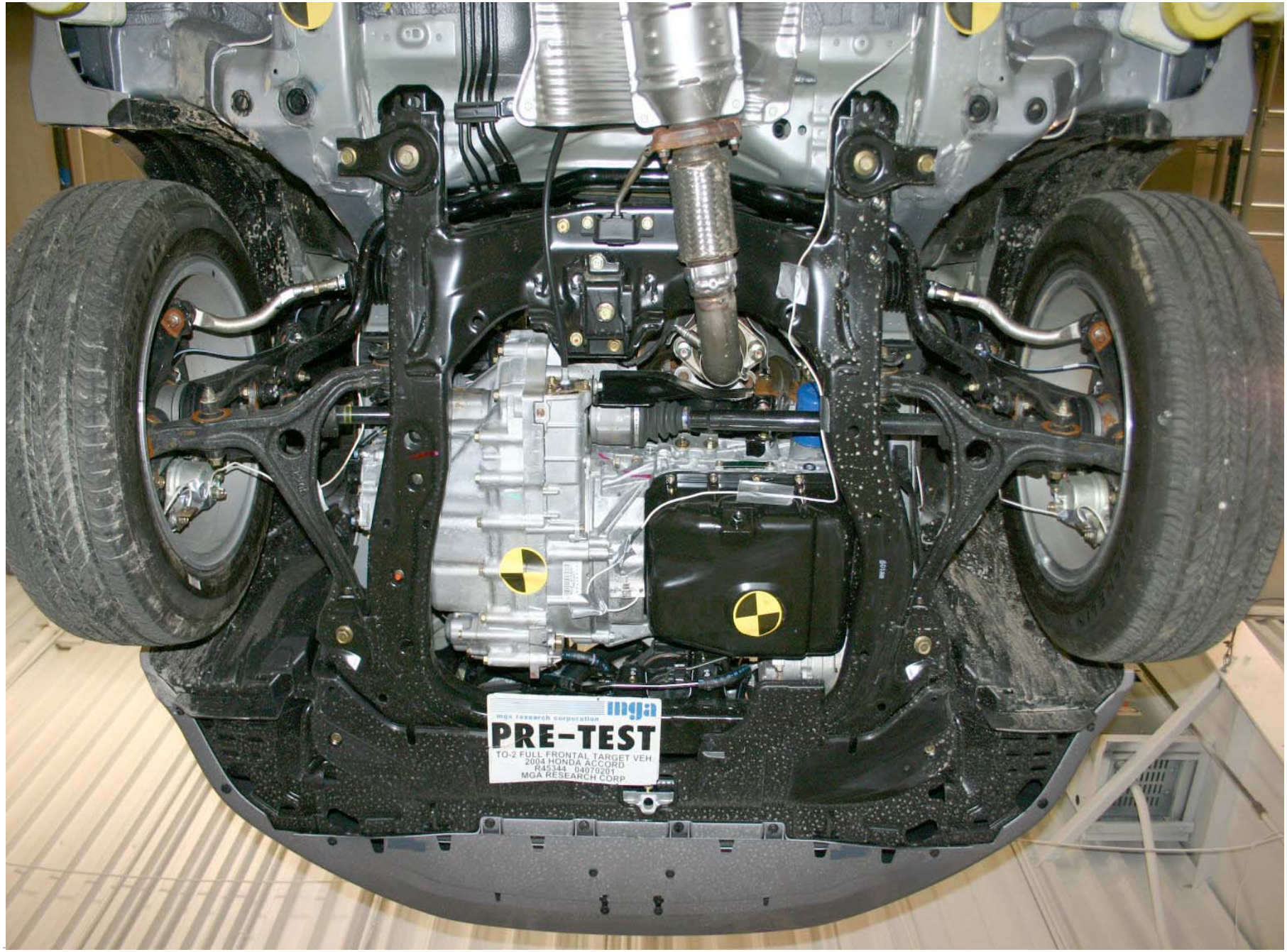
Post-Test Windshield View of Target Vehicle



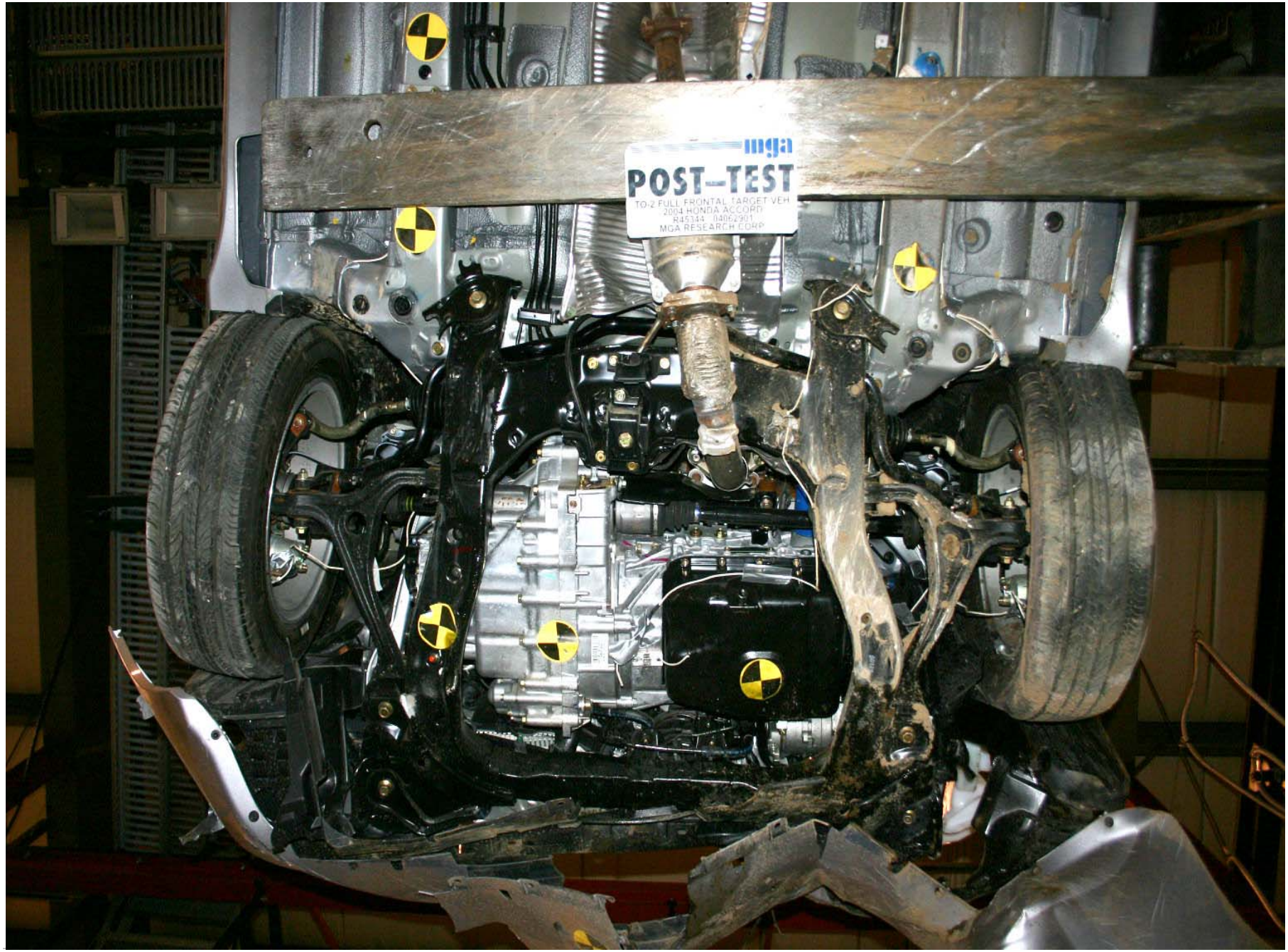
Pre-Test Engine Compartment View of Target Vehicle



Post-Test Engine Compartment View of Target Vehicle



Pre-Test Front Underbody View of Target Vehicle



Post-Test Front Underbody View of Target Vehicle



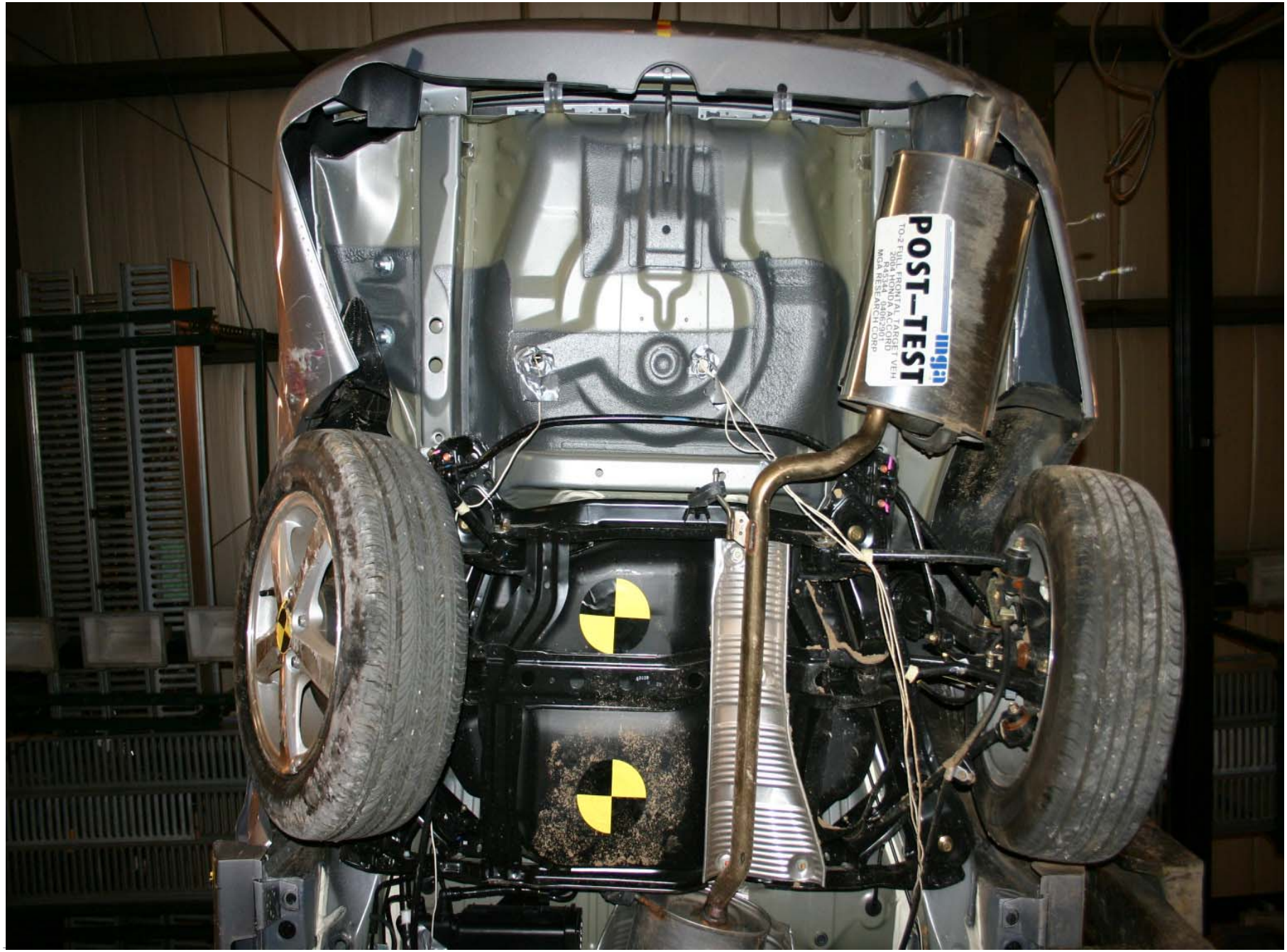
Pre-Test Mid Underbody of Target Vehicle



Post-Test Mid Underbody of Target Vehicle



Pre-Test Rear Underbody View of Target Vehicle



Post-Test Rear Underbody View of Target Vehicle



Pre-Test Fuel Tank View of Target Vehicle



Post-Test Fuel Tank View of Target Vehicle



Pre-Test Driver Dummy Front View Head Position in Target Vehicle



Post-Test Driver Dummy Front View Head Position in Target Vehicle



Pre-Test Driver Dummy Position Left Side View in Target Vehicle



Post-Test Driver Dummy Position Left Side View in Target Vehicle



Pre-Test DR Dummy Position Left Side View in Target (Door Open)



Post-Test DR Dummy Position Left Side View in Target (Door Open)



Pre-Test Driver Dummy Seat Position of Target Vehicle



Post-Test Driver Dummy Seat Position of Target Vehicle



Pre-Test Driver Dummy Feet Position in Target Vehicle



Post-Test Driver Dummy Feet Position in Target Vehicle



Pre-Test Driver Side Knee Bolster View in Target Vehicle



Post-Test Driver Side Knee Bolster View in Target Vehicle



Post-Test Driver Dummy Head Contact in Target Vehicle



Post-Test Driver Dummy Knee Contact in Target Vehicle



Post-Test Driver Dummy Airbag Contact in Target Vehicle



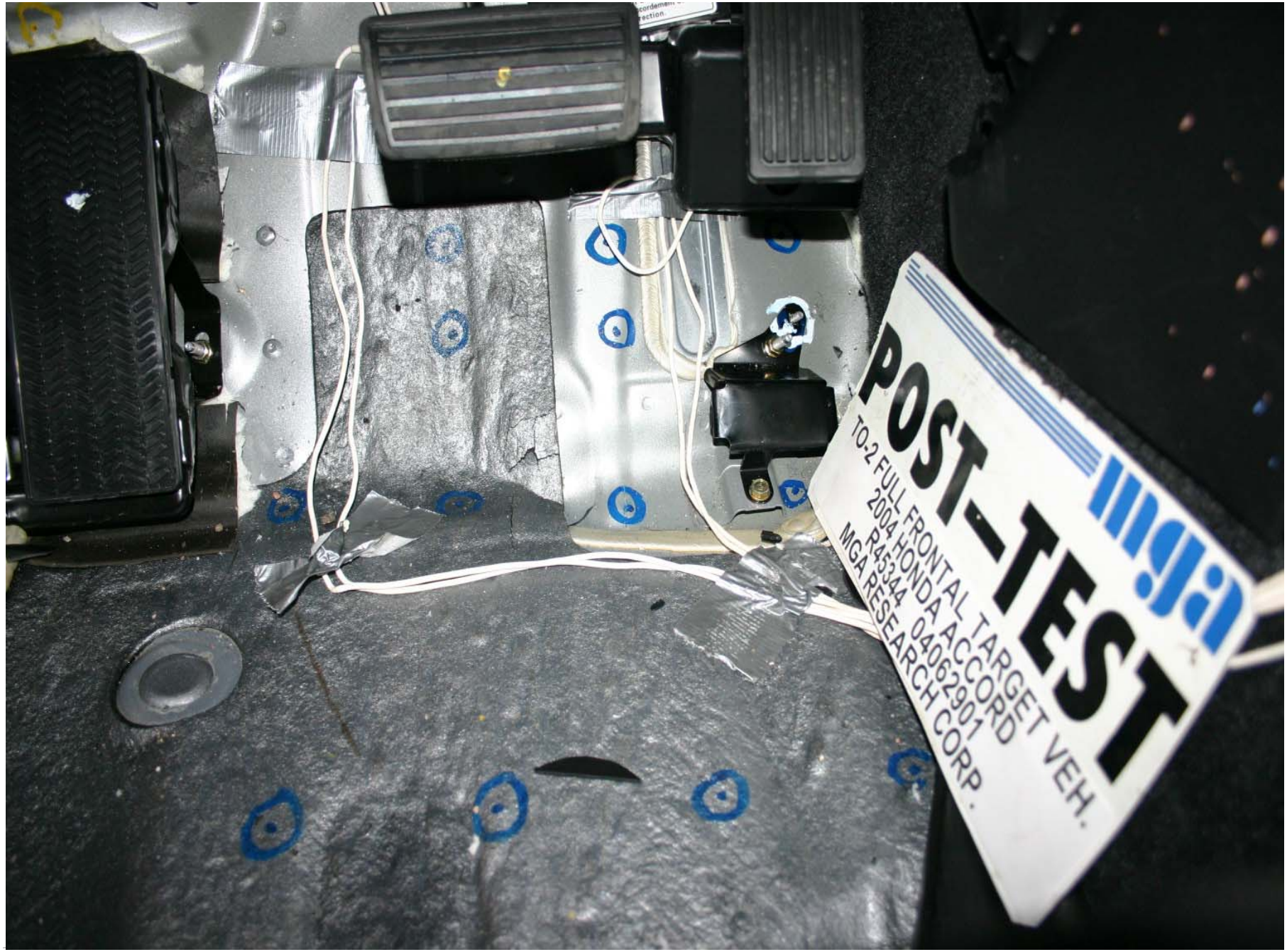
Post-Test Airbag Tear in Target Vehicle View #1



Post-Test Airbag Tear in Target Vehicle View #2



Pre-Test Driver Side Floor Pan View of Target Vehicle



Post-Test Driver Side Floor Pan View of Target Vehicle



Pre-Test Pass Dummy Front View Head Position in Target Vehicle



Post-Test Pass Dummy Front View Head Position in Target Vehicle



Pre-Test Pass Dummy Position Right Side View in Target Vehicle



Post-Test Pass Dummy Position Right Side View in Target Vehicle



Pre-Test Pass Dummy Position Right Side View in Target Vehicle (Door Open)



Post-Test Pass Dummy Position Right Side View in Target Vehicle (Door Open)



Pre-Test Passenger Dummy Seat Position of Target Vehicle



Post-Test Passenger Dummy Seat Position of Target Vehicle



Pre-Test Passenger Dummy Feet Position in Target Vehicle



Post-Test Passenger Dummy Feet Position in Target Vehicle



Pre-Test Passenger Side Knee Bolster View in Target Vehicle



Post-Test Passenger Side Knee Bolster View in Target Vehicle



Post-Test Passenger Dummy Head Contact in Target Vehicle



Post-Test Passenger Dummy Knee Contact in Target Vehicle



Post-Test Passenger Dummy Airbag Contact in Target Vehicle



Pre-Test Passenger Side Floor Pan View of Target Vehicle



Post-Test Passenger Side Floor Pan View of Target Vehicle



Pre-Test Left Front Wheel Well of Target Vehicle



Post-Test Left Front Wheel Well of Target Vehicle



Pre-Test Left Front Close-Up View of Target Vehicle



Post-Test Left Front Close-Up View of Target Vehicle



Pre-Test Right Front Close-Up View of Target Vehicle



Post-Test Right Front Close-Up View of Target Vehicle



Post-Test Front Sub-Frame View #1 of Target Vehicle



Post-Test Front Sub-Frame View #2 of Target Vehicle



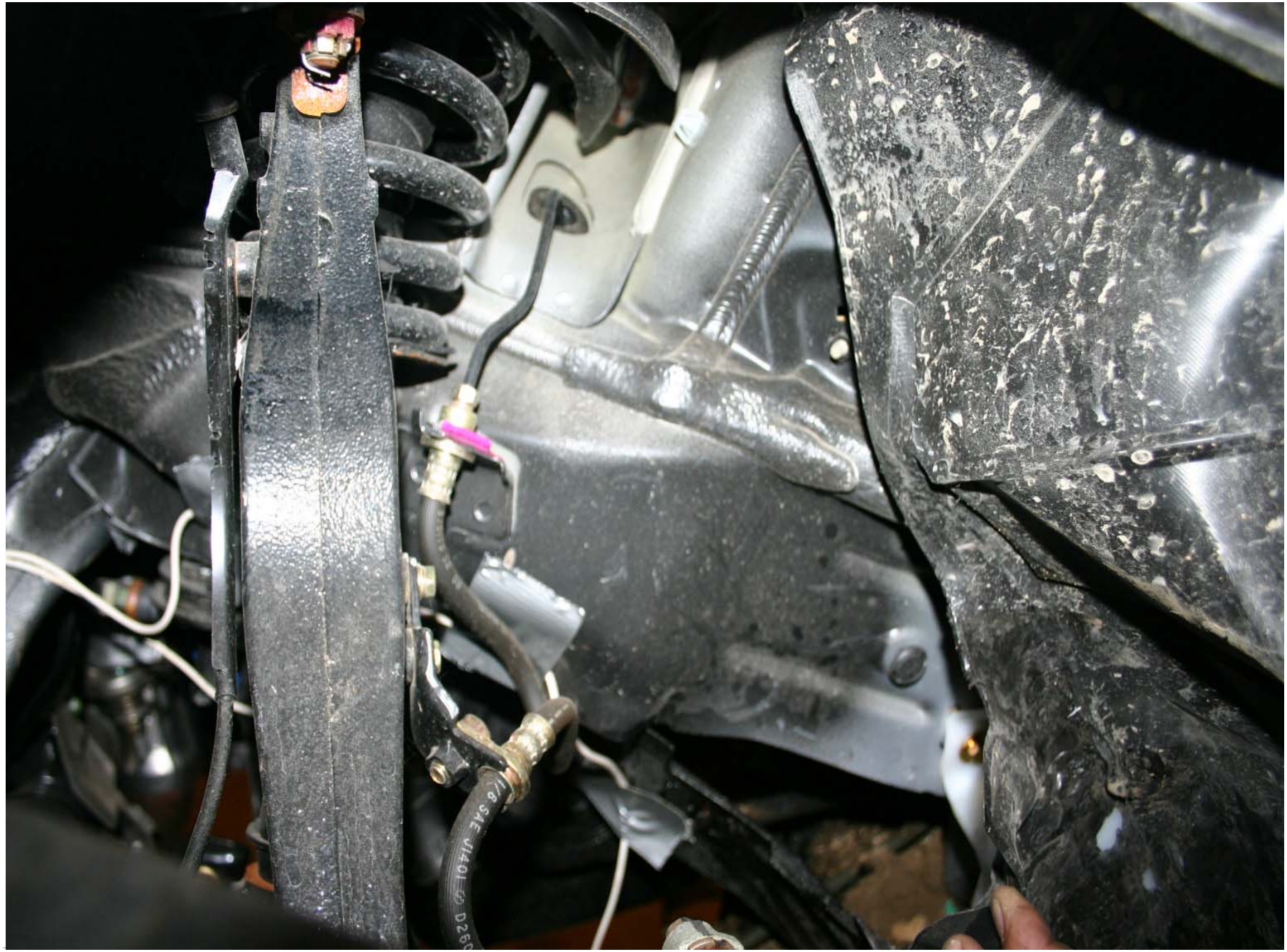
Post-Test Front Sub-Frame View #3 of Target Vehicle



Post-Test Front Sub-Frame View #4 of Target Vehicle



Post-Test Front Sub-Frame View #5 of Target Vehicle



Post-Test Front Sub-Frame View #6 of Target Vehicle



Vehicle Impact View #1



Vehicle Impact View #2



Vehicle Impact View #3

APPENDIX B

BULLET VEHICLE DATA TRACES

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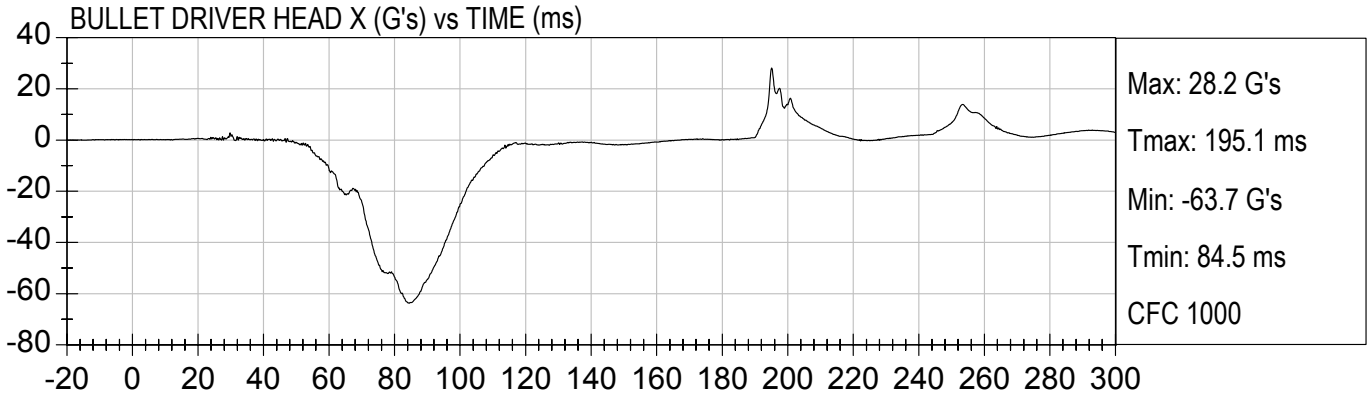
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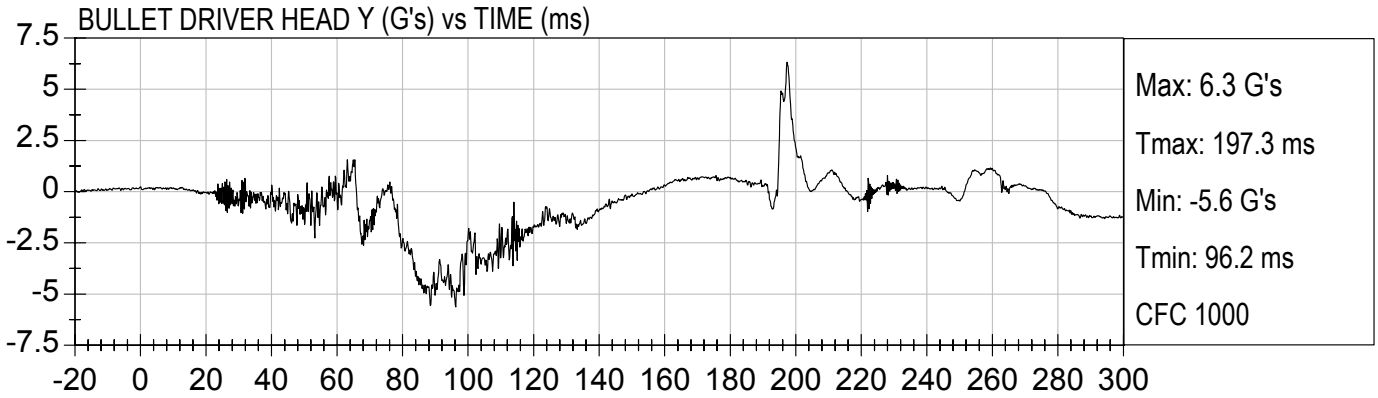
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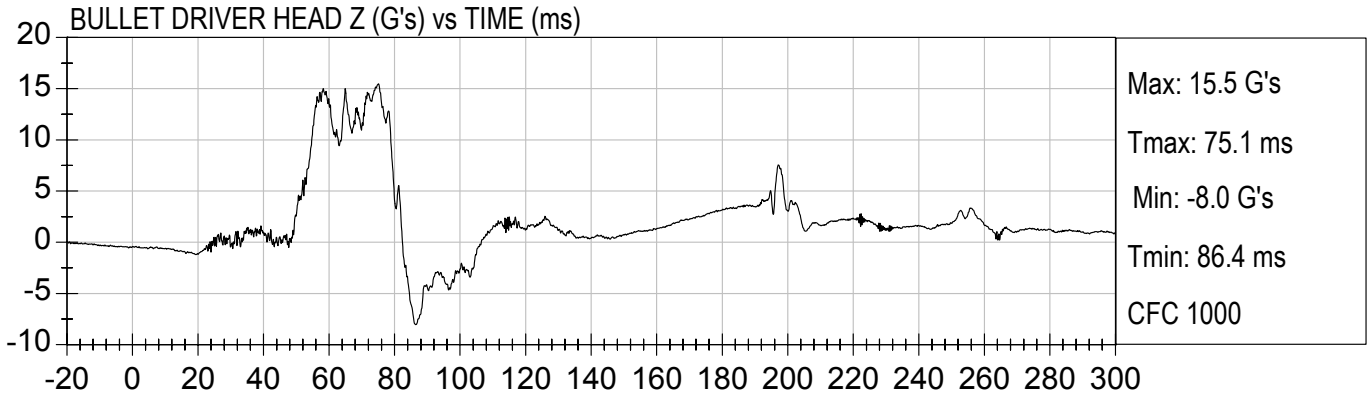
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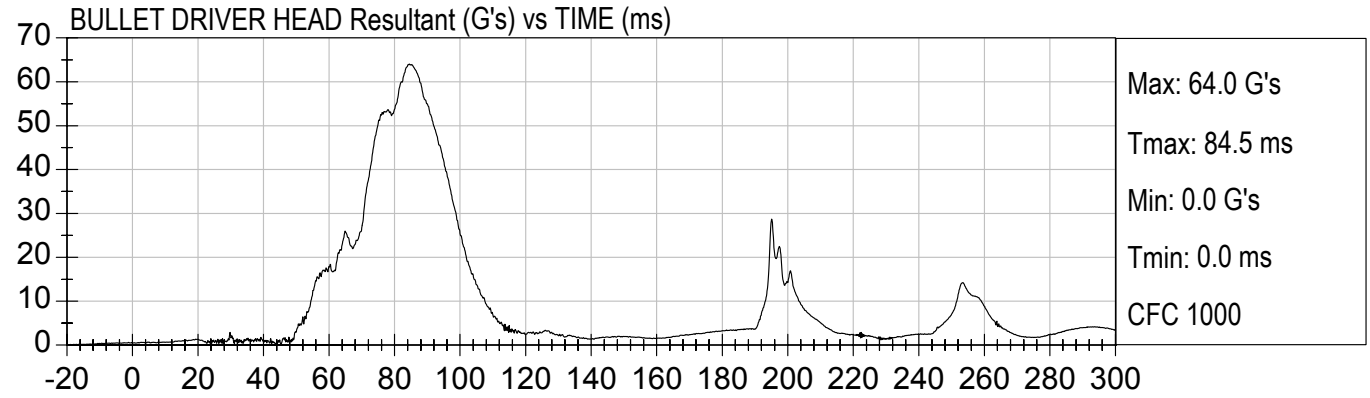
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



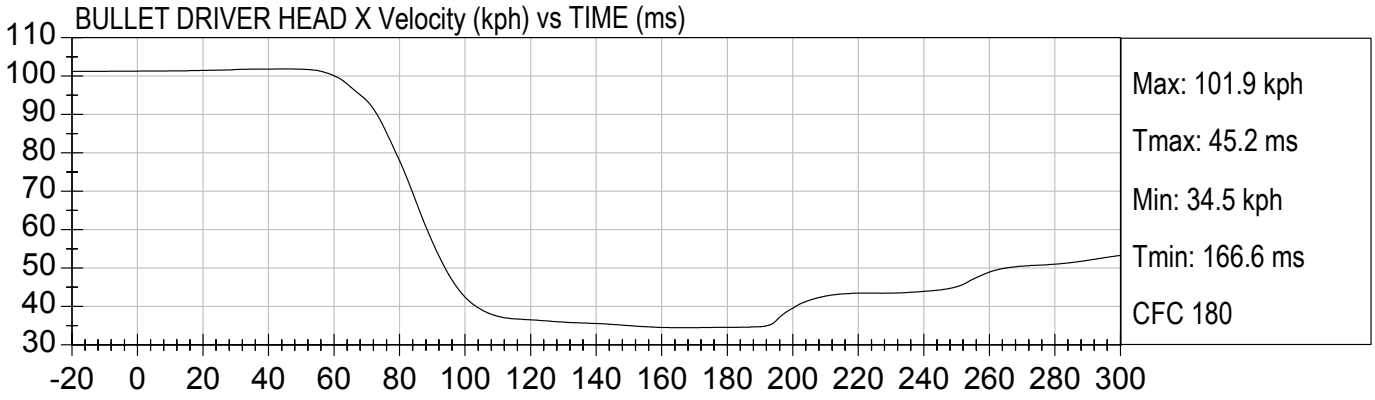


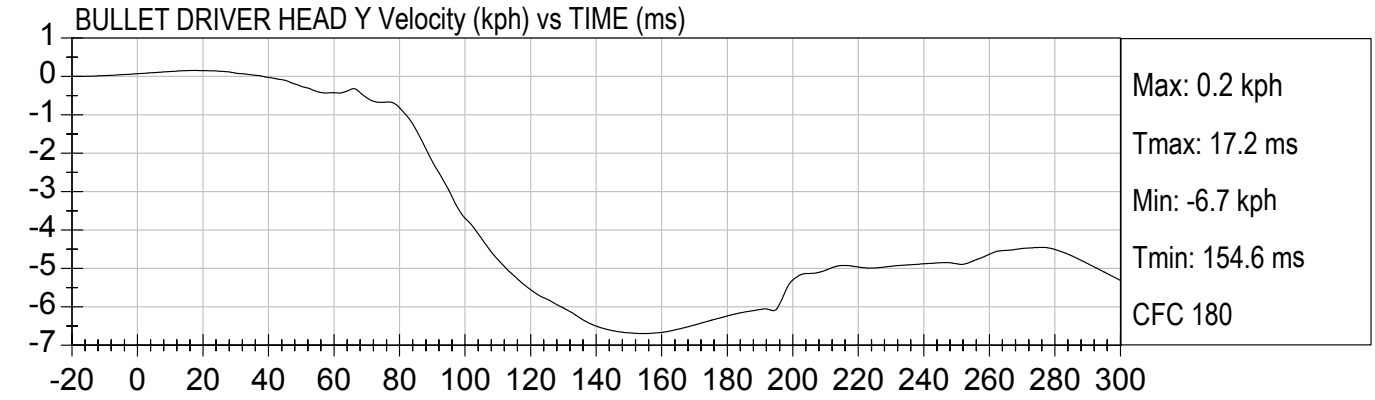


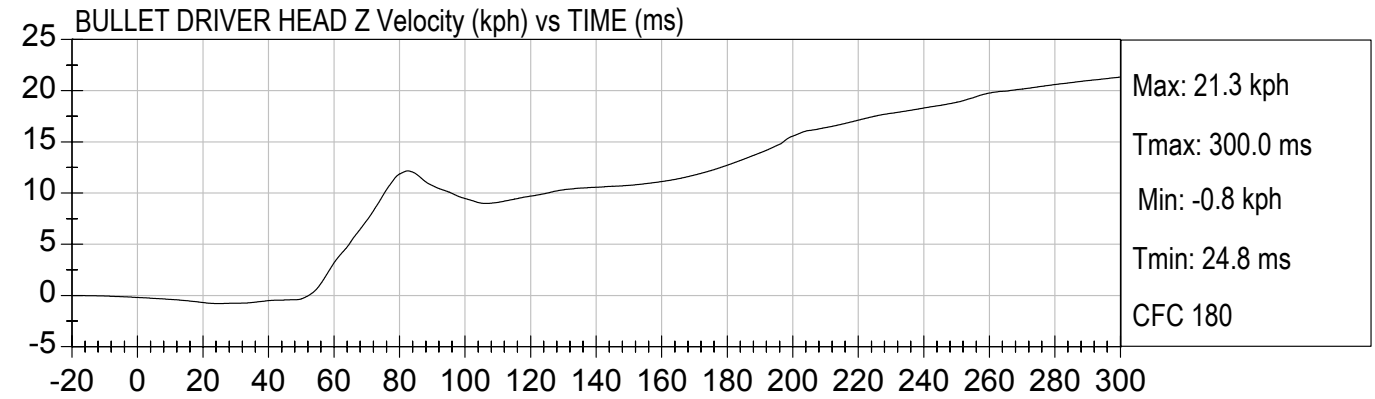


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1999 DODGE CARAVAN SE (RX0332)

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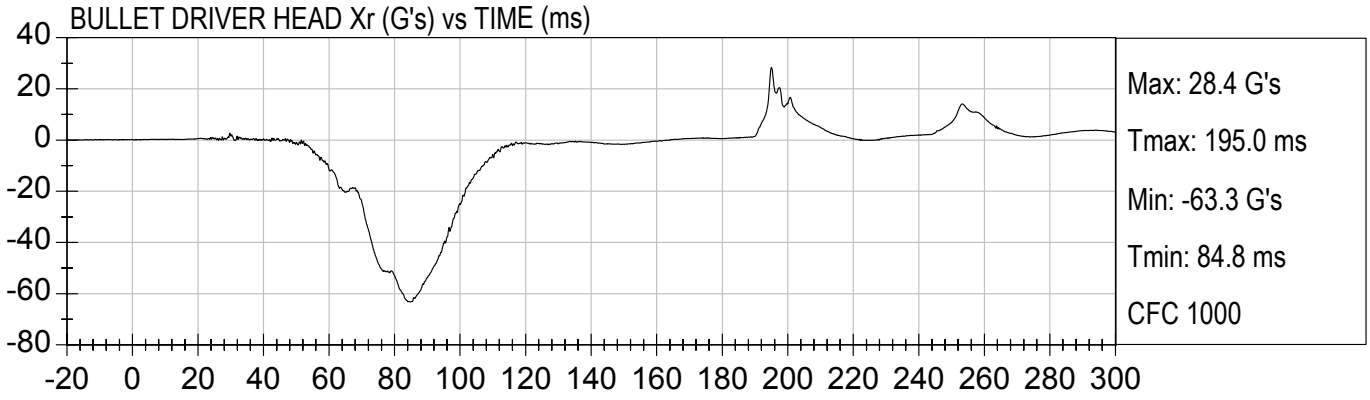


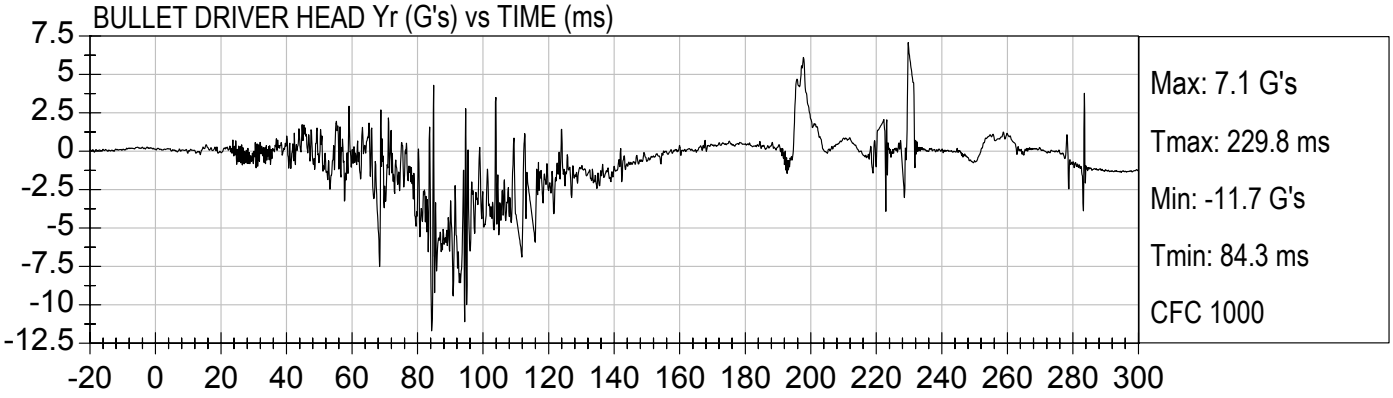


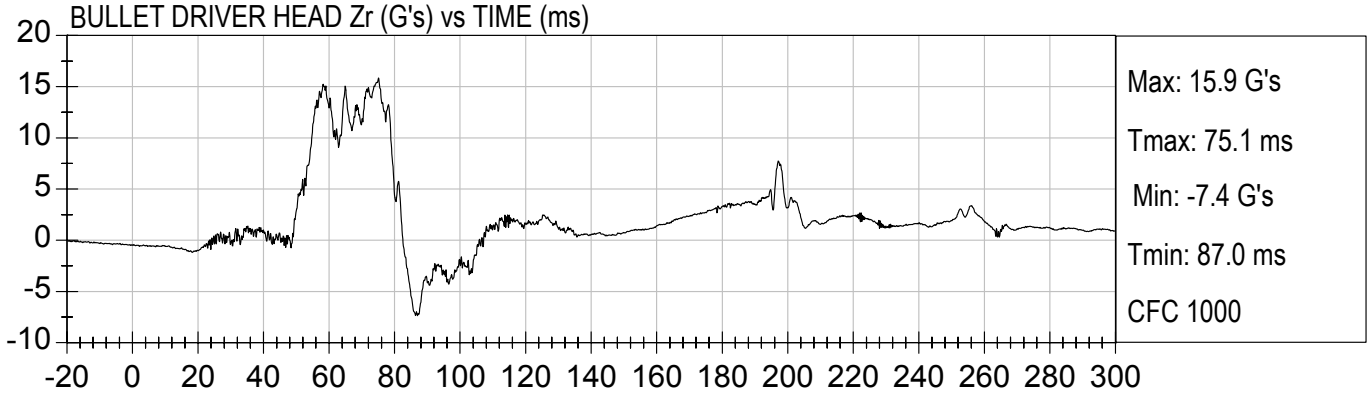


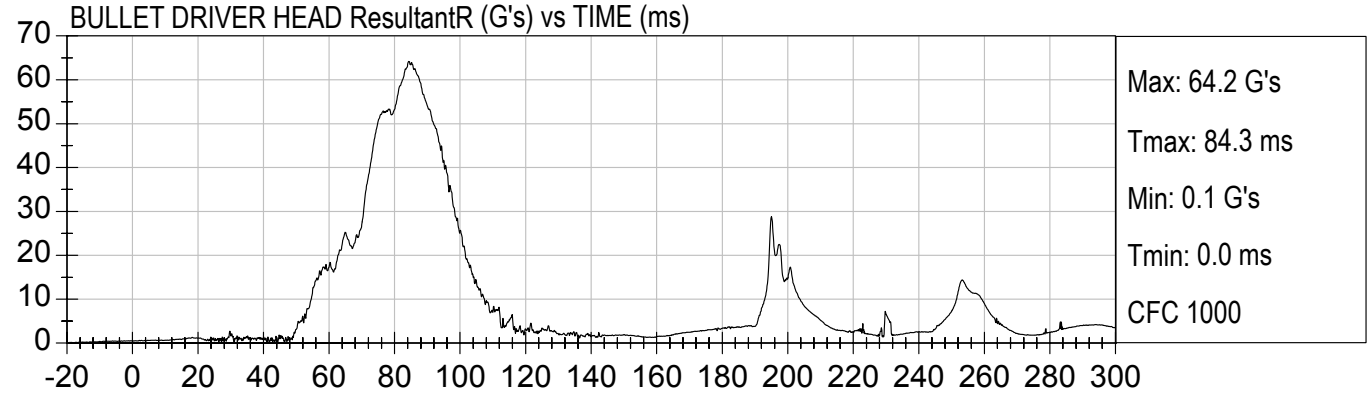
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1999 DODGE CARAVAN SE (RX0332)

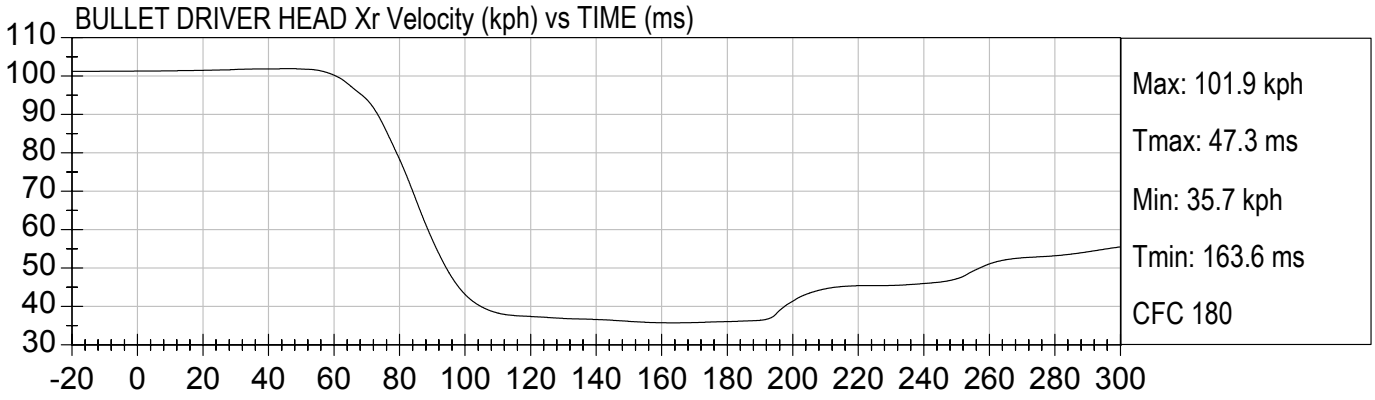
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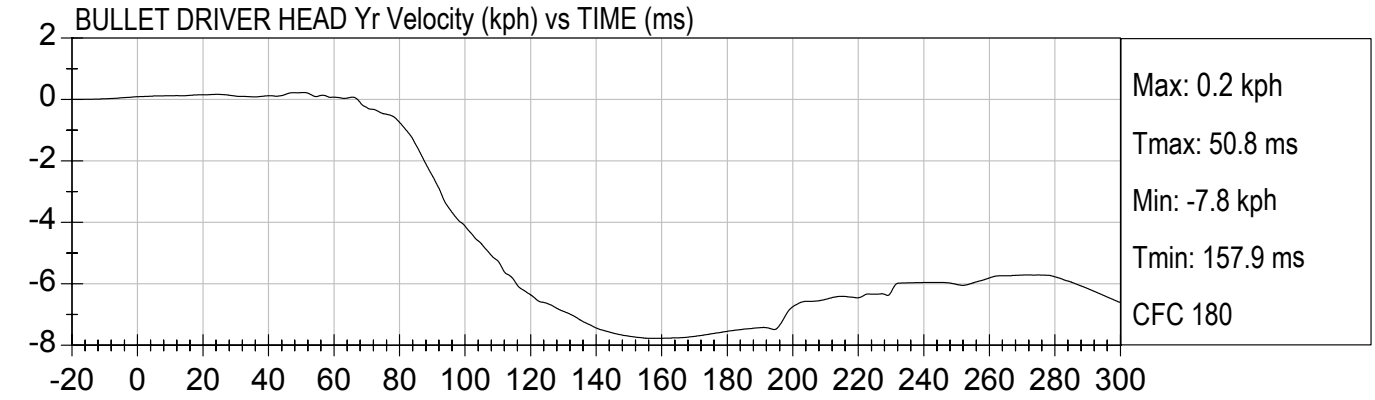


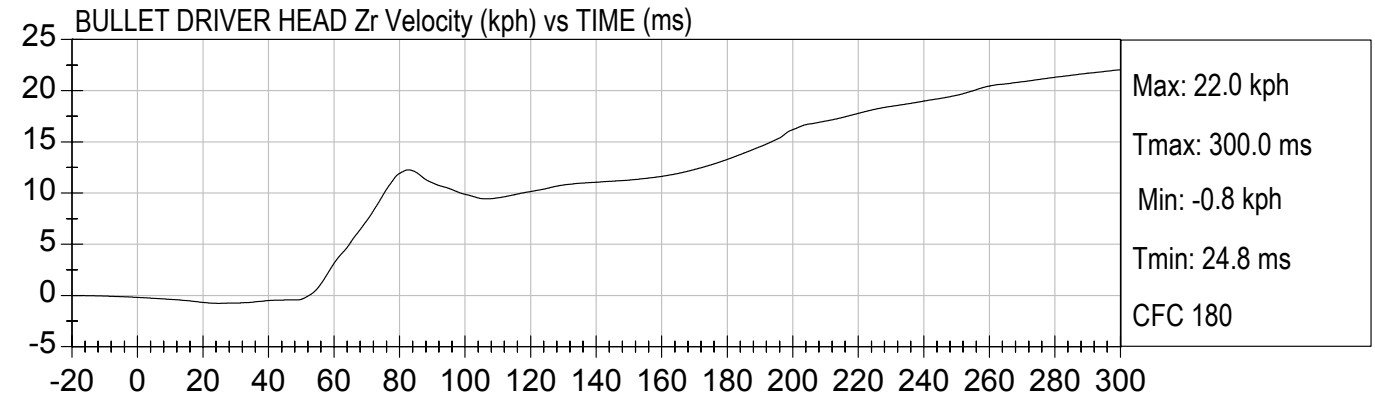






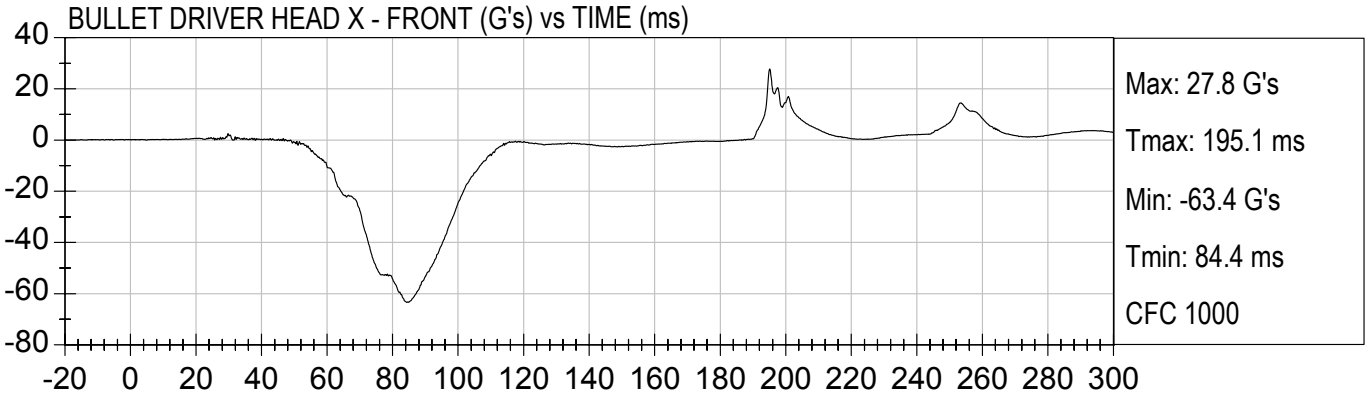

BULLET DRIVER HEAD Xr Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 101.9 kph
Tmax: 47.3 ms
Min: 35.7 kph
Tmin: 163.6 ms
CFC 180

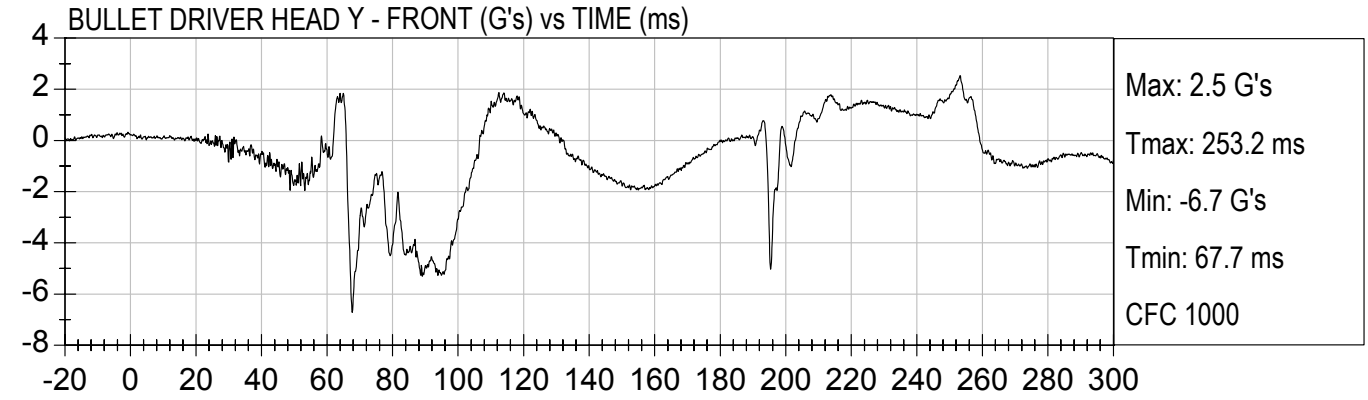

BULLET DRIVER HEAD Yr Velocity (kph) vs TIME (ms)
2
0
-2
-4
-6
-8
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 50.8 ms
Min: -7.8 kph
Tmin: 157.9 ms
CFC 180

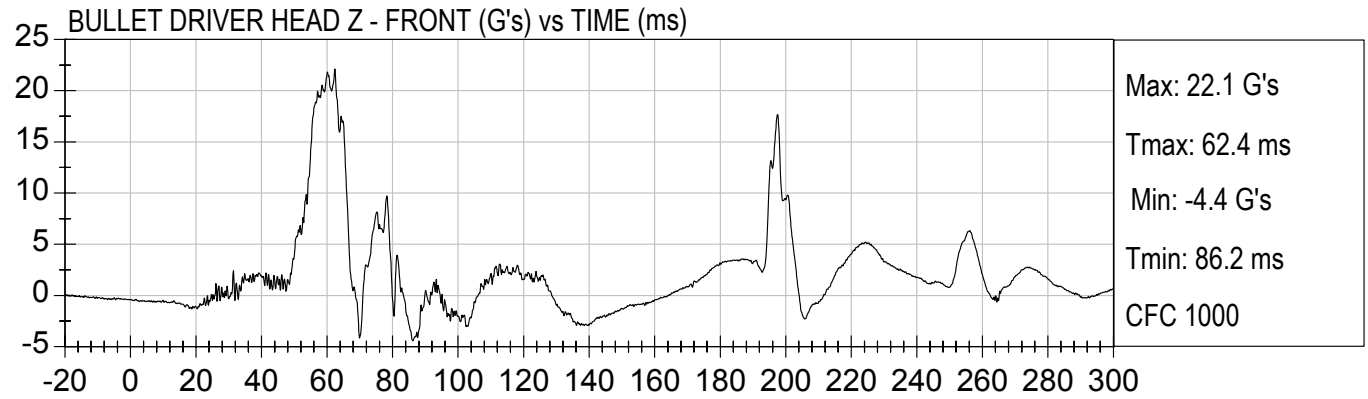

BULLET DRIVER HEAD Zr Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 22.0 kph
Tmax: 300.0 ms
Min: -0.8 kph
Tmin: 24.8 ms
CFC 180

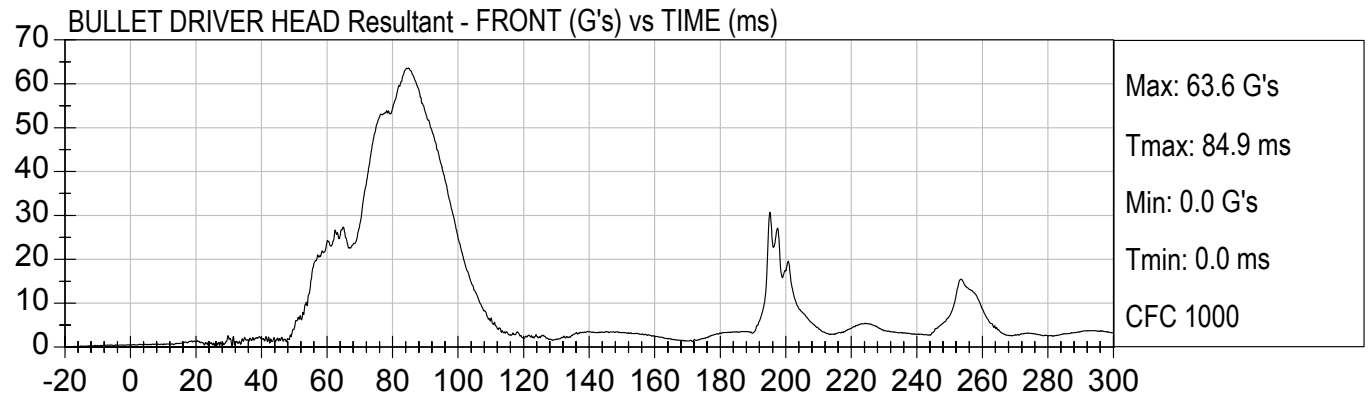
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

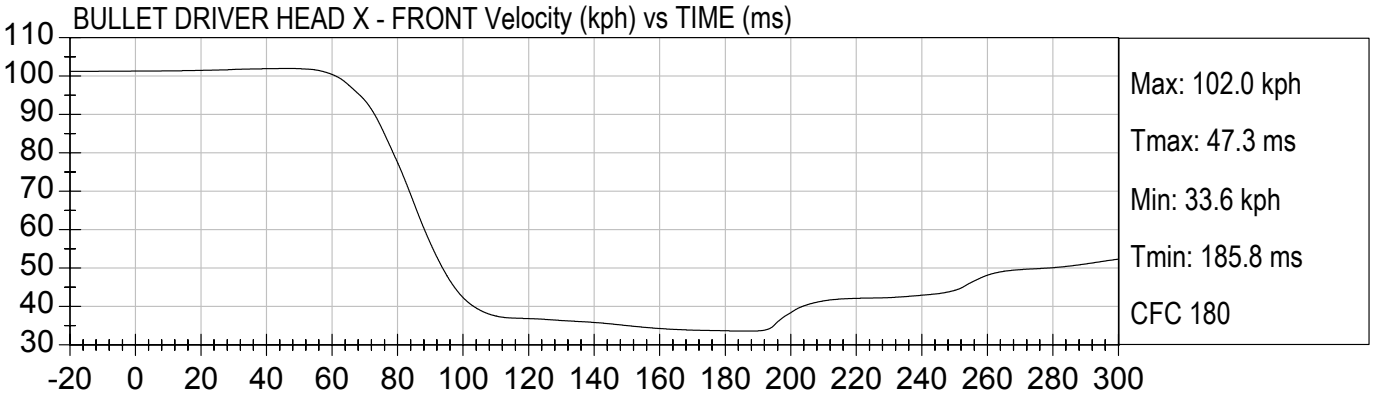
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

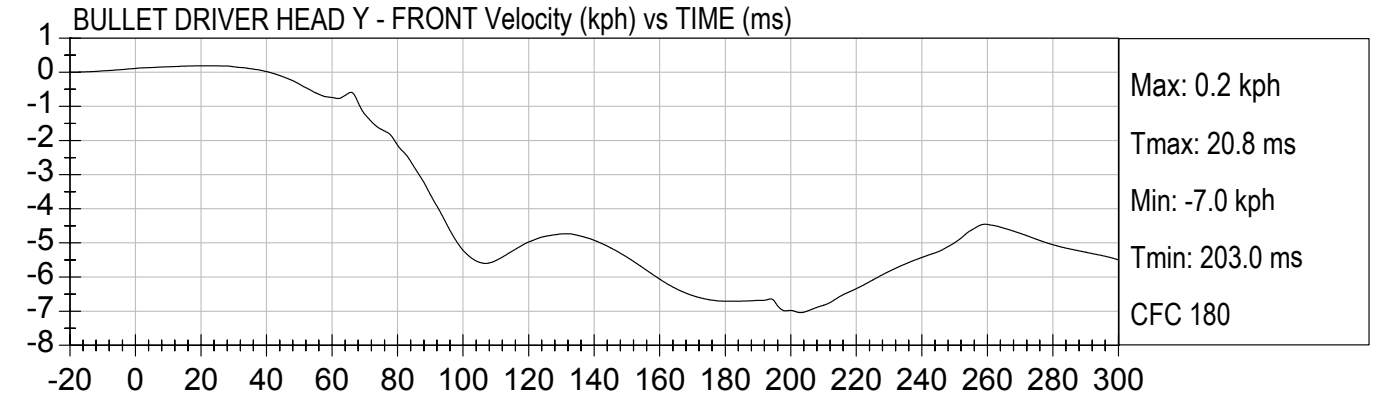


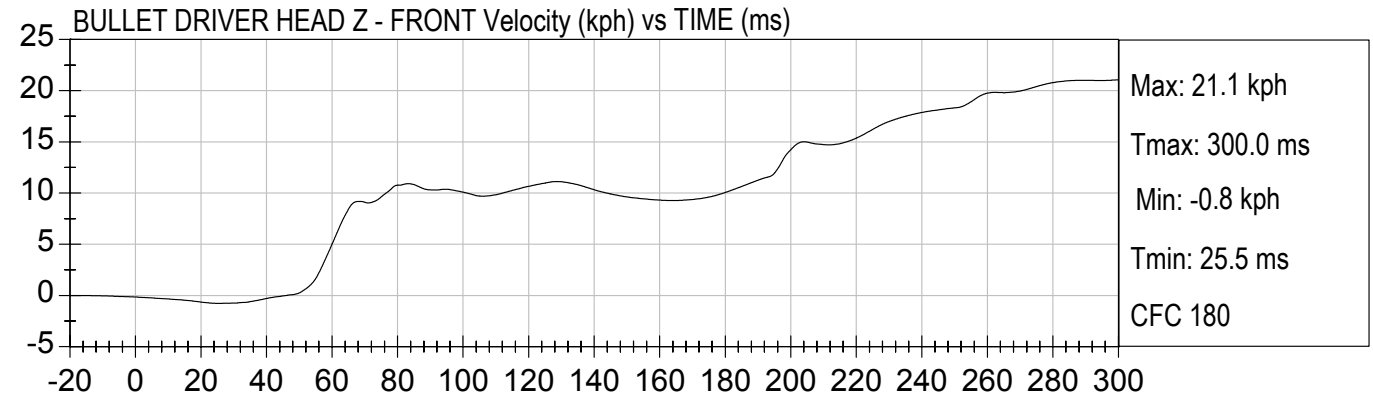






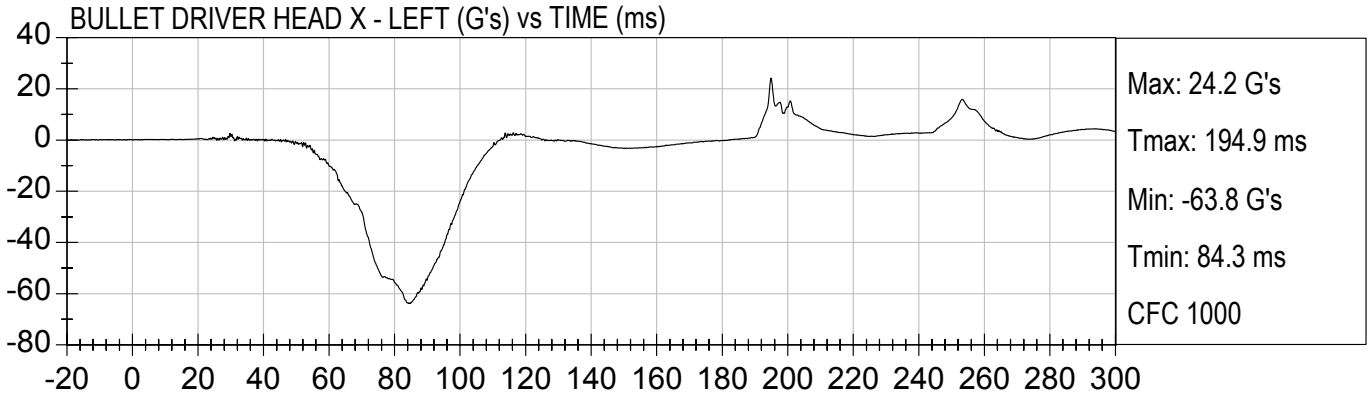

BULLET DRIVER HEAD X - FRONT Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 102.0 kph
Tmax: 47.3 ms
Min: 33.6 kph
Tmin: 185.8 ms
CFC 180

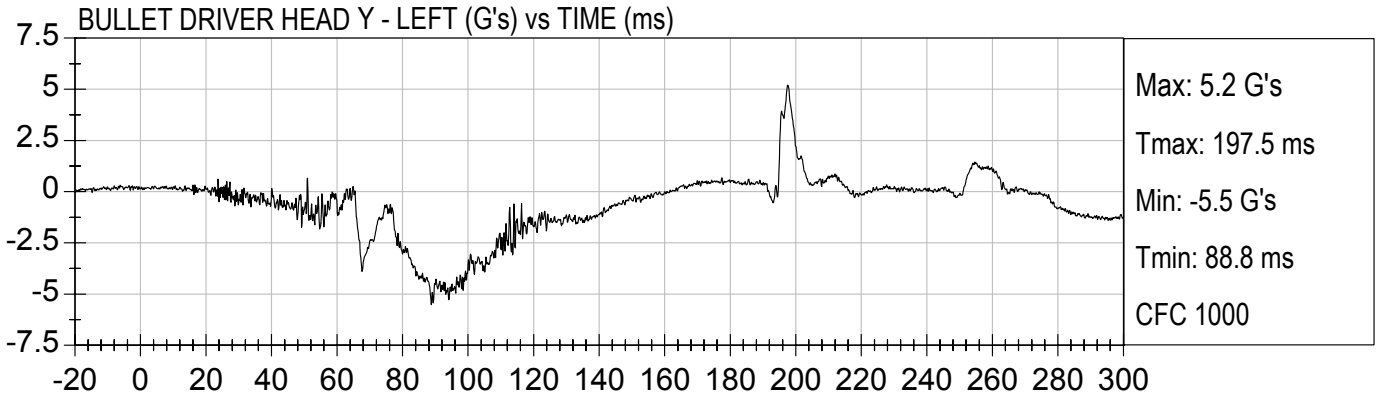

BULLET DRIVER HEAD Y - FRONT Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 20.8 ms
Min: -7.0 kph
Tmin: 203.0 ms
CFC 180

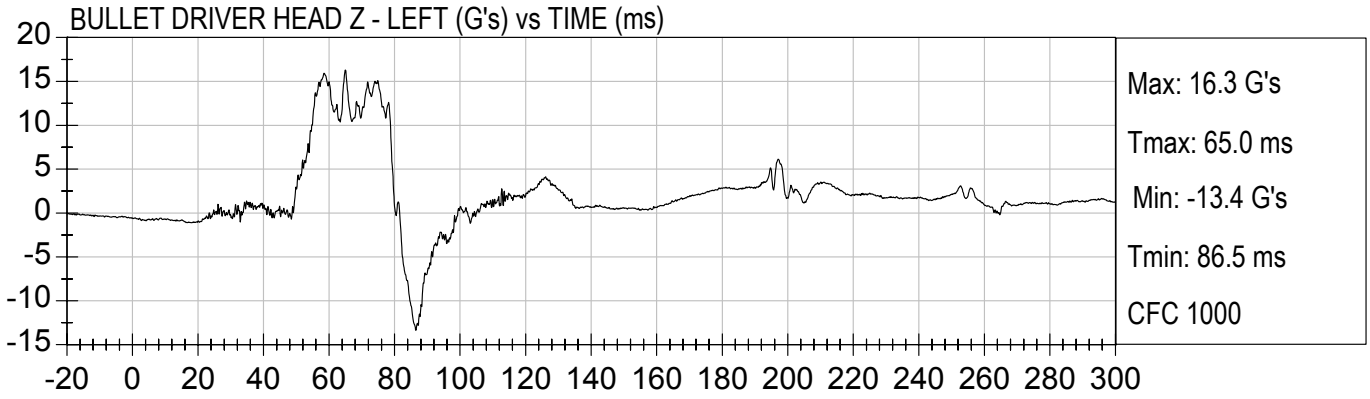

BULLET DRIVER HEAD Z - FRONT Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 21.1 kph
Tmax: 300.0 ms
Min: -0.8 kph
Tmin: 25.5 ms
CFC 180

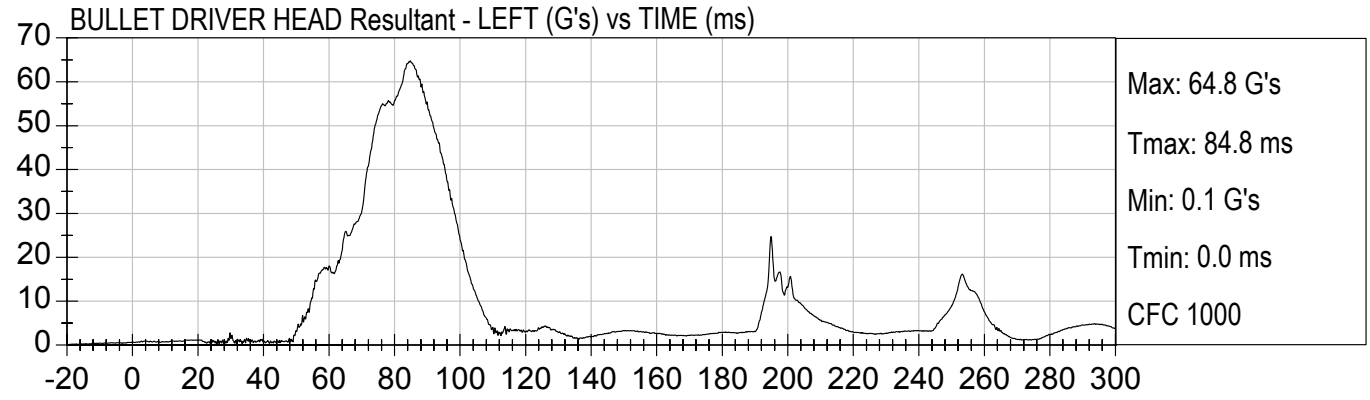
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

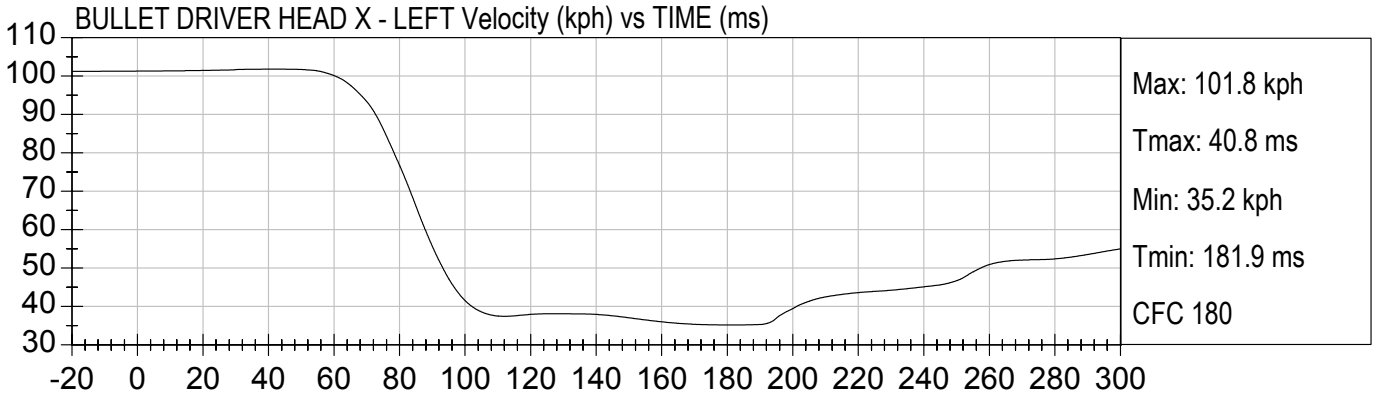
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

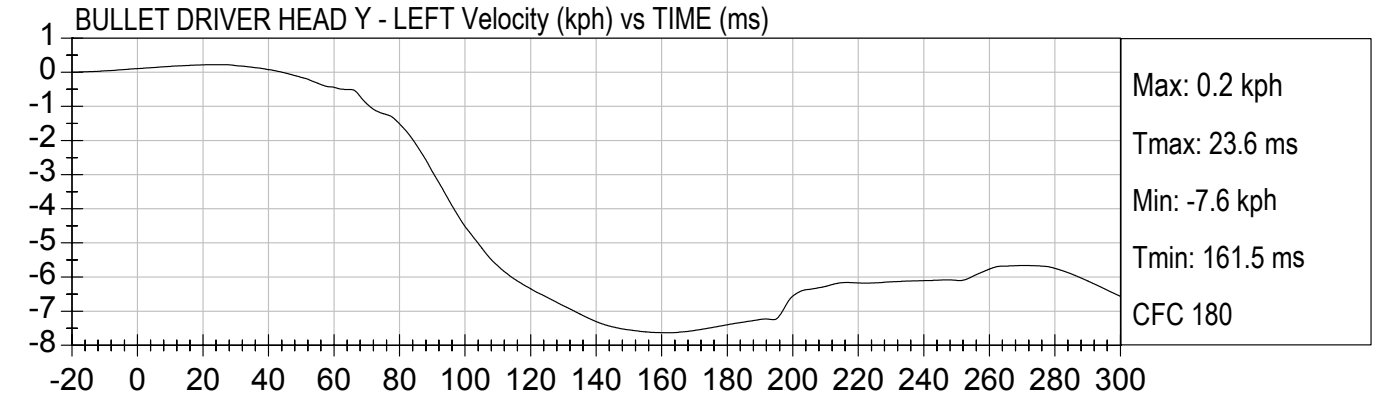


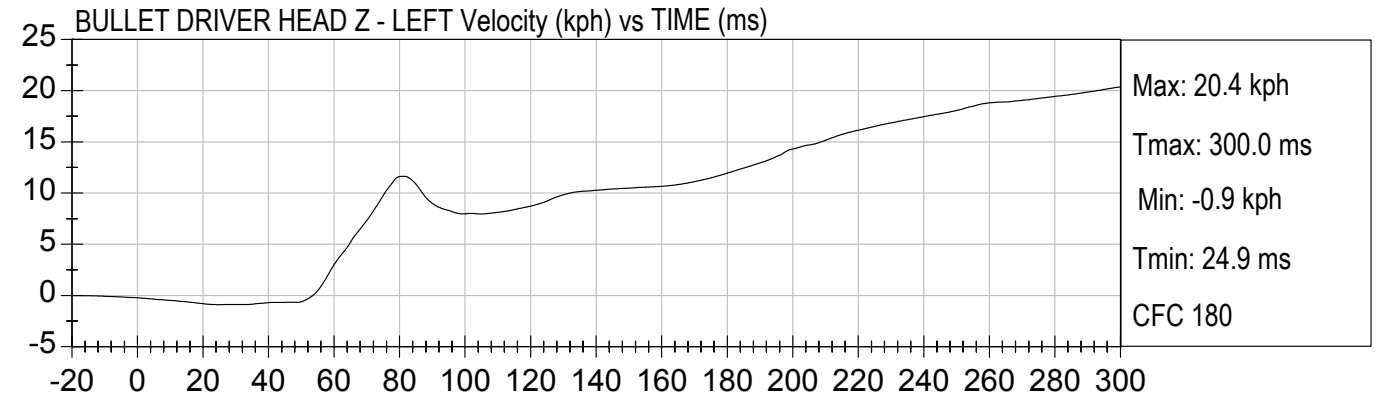






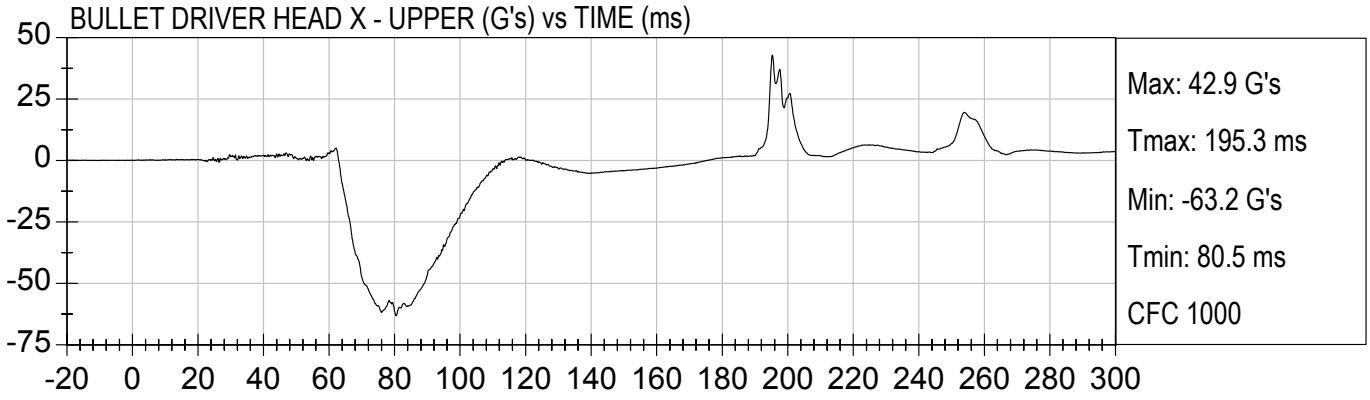

BULLET DRIVER HEAD X - LEFT Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 101.8 kph
Tmax: 40.8 ms
Min: 35.2 kph
Tmin: 181.9 ms
CFC 180

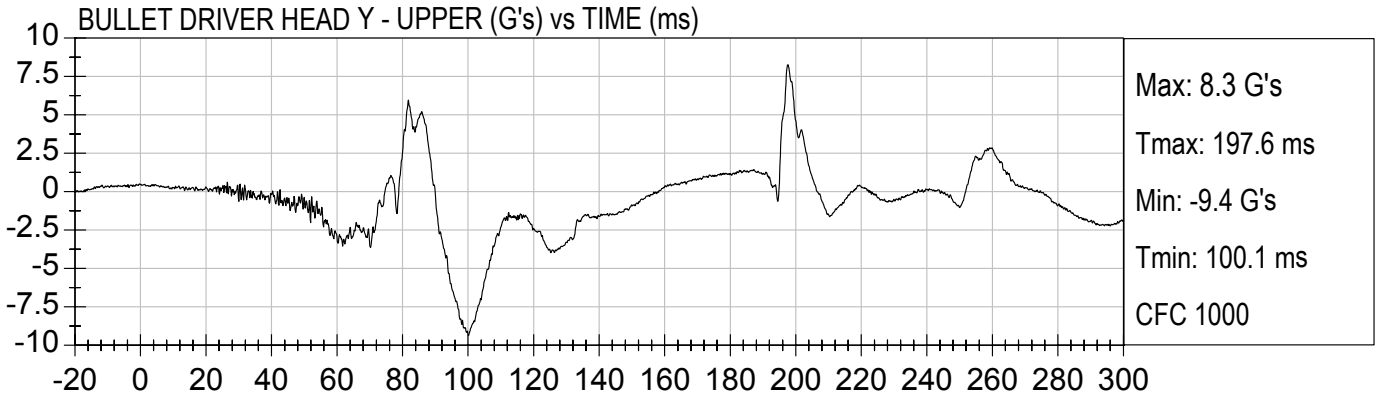

BULLET DRIVER HEAD Y - LEFT Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 23.6 ms
Min: -7.6 kph
Tmin: 161.5 ms
CFC 180

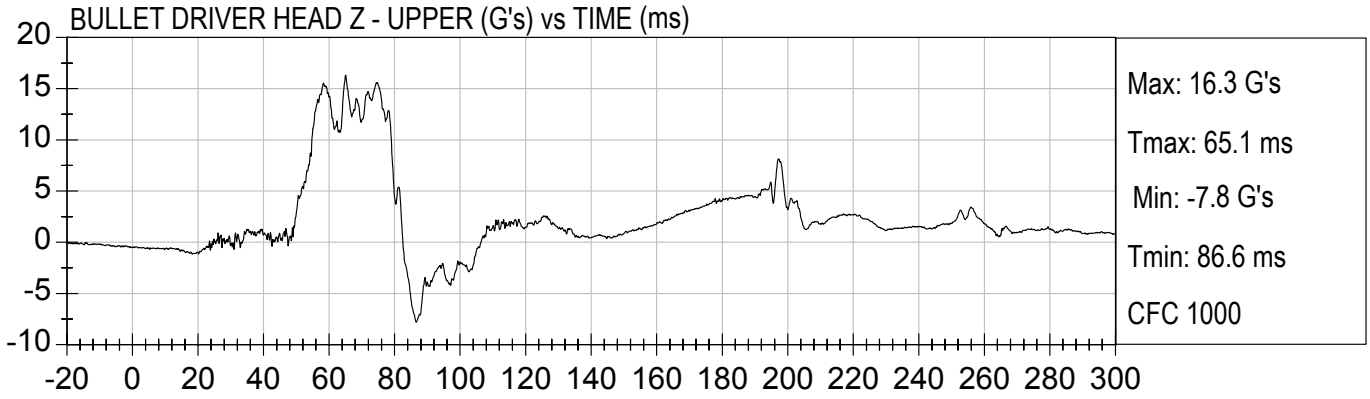

BULLET DRIVER HEAD Z - LEFT Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 20.4 kph
Tmax: 300.0 ms
Min: -0.9 kph
Tmin: 24.9 ms
CFC 180

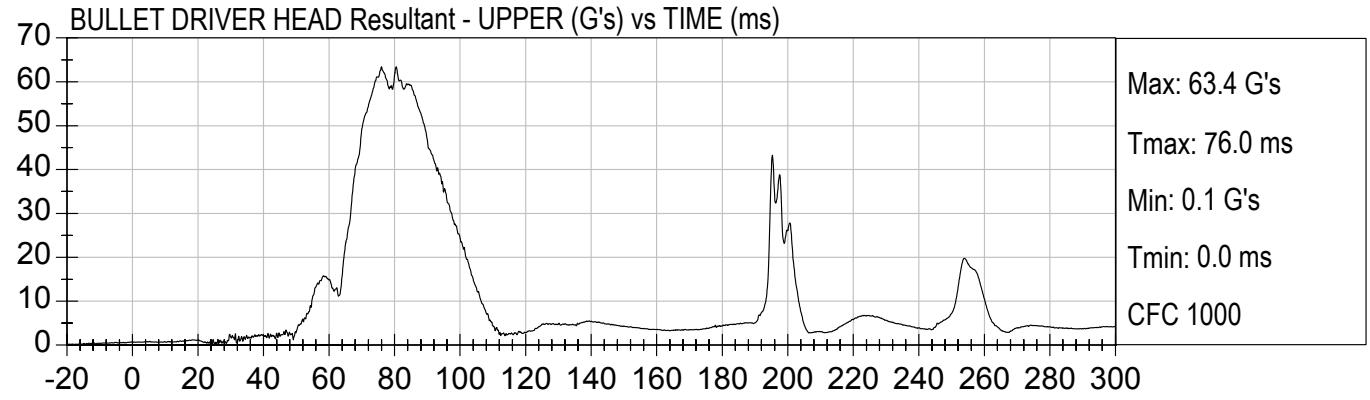
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

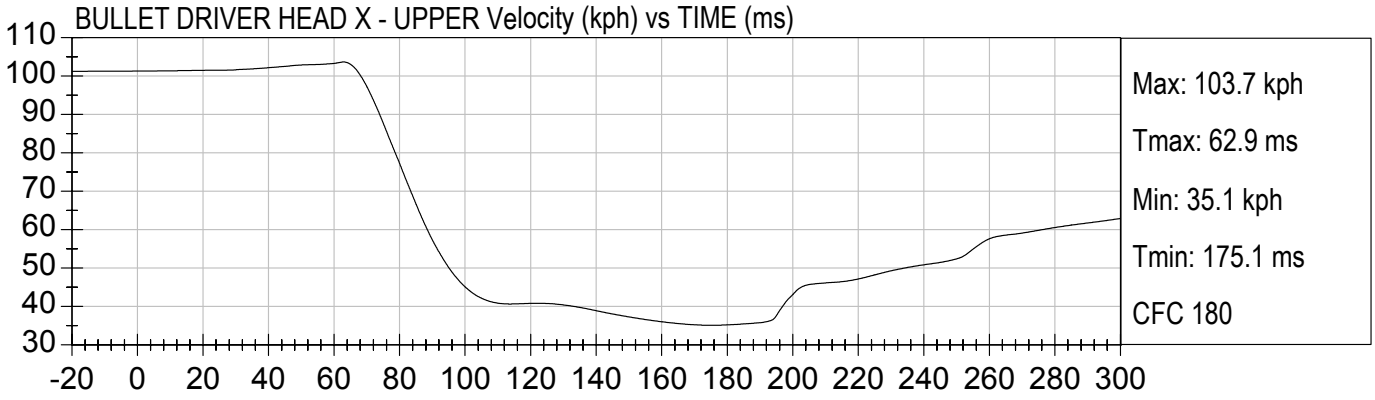
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

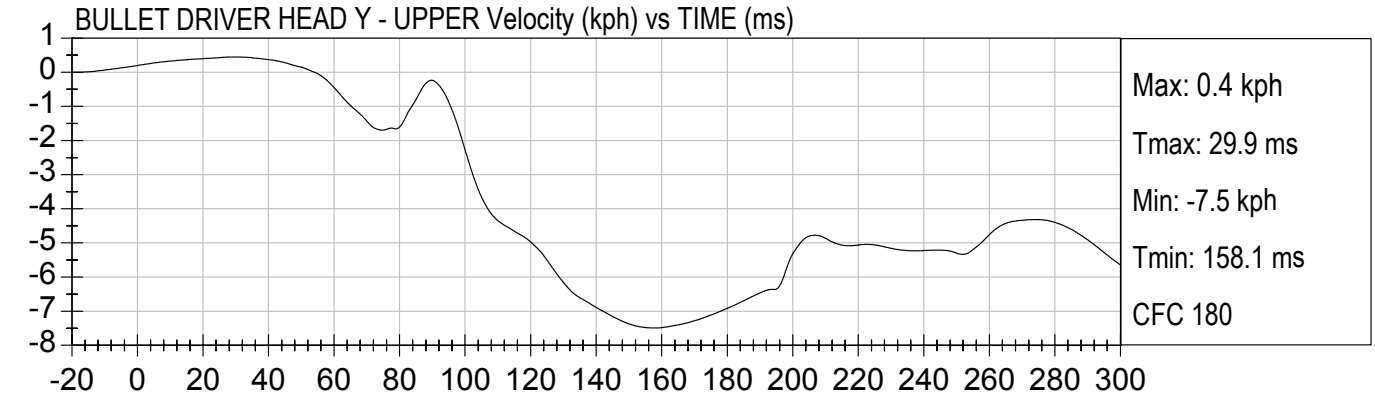


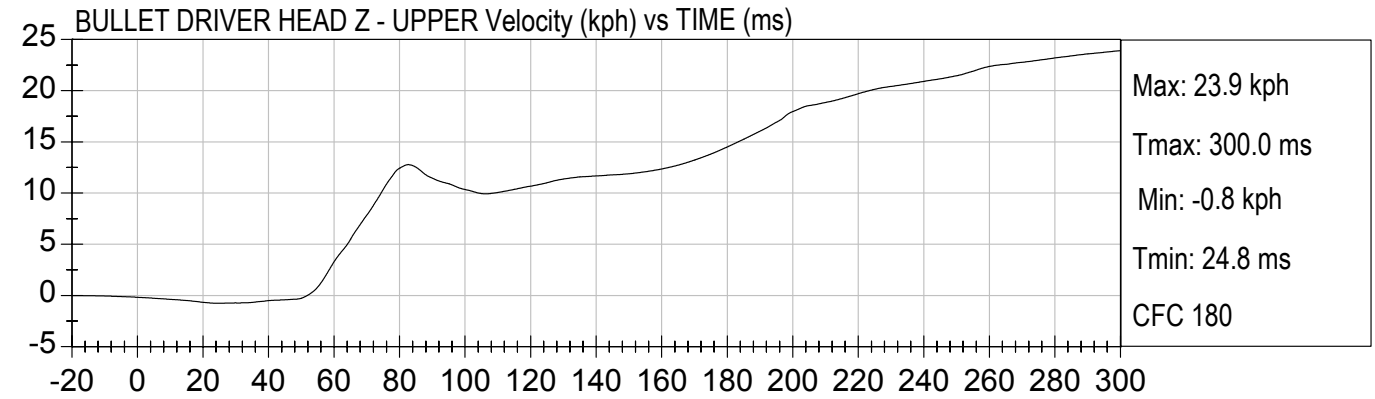






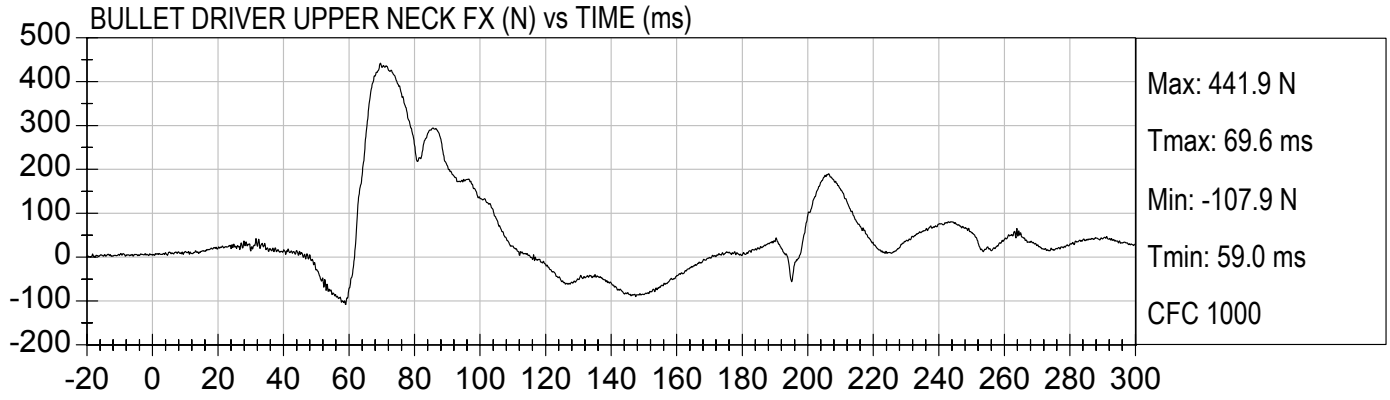

BULLET DRIVER HEAD X - UPPER Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 103.7 kph
Tmax: 62.9 ms
Min: 35.1 kph
Tmin: 175.1 ms
CFC 180

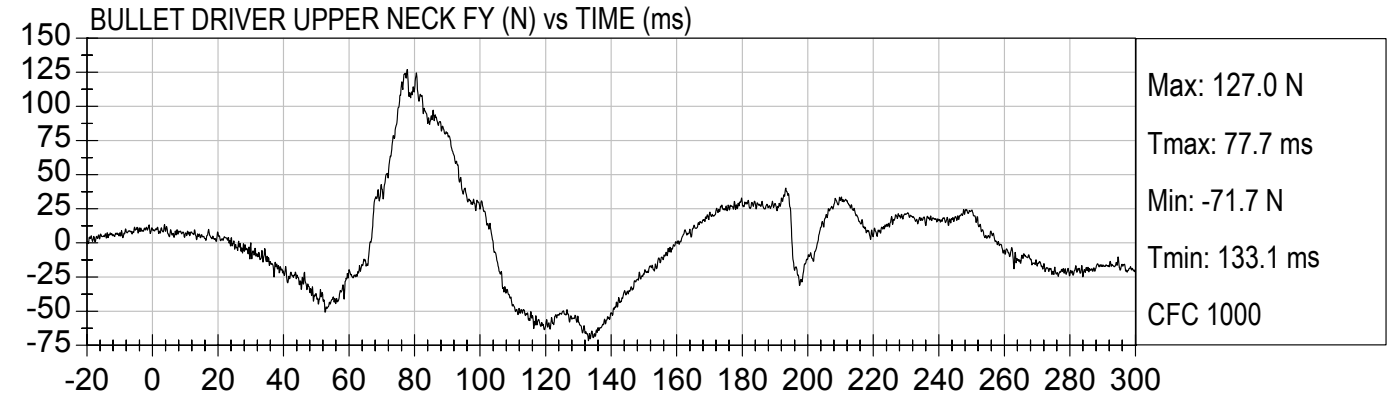

BULLET DRIVER HEAD Y - UPPER Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.4 kph
Tmax: 29.9 ms
Min: -7.5 kph
Tmin: 158.1 ms
CFC 180

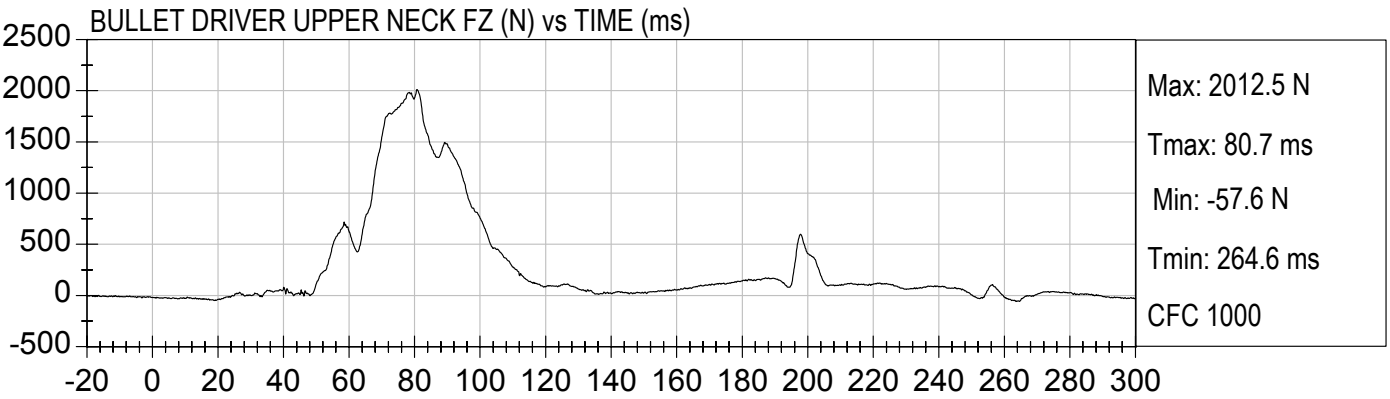

BULLET DRIVER HEAD Z - UPPER Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 23.9 kph
Tmax: 300.0 ms
Min: -0.8 kph
Tmin: 24.8 ms
CFC 180

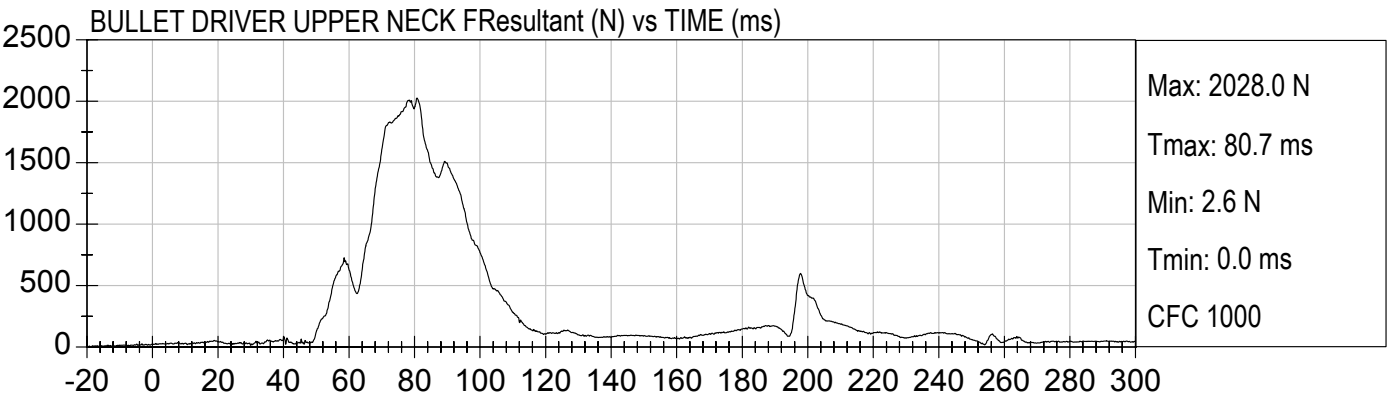
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



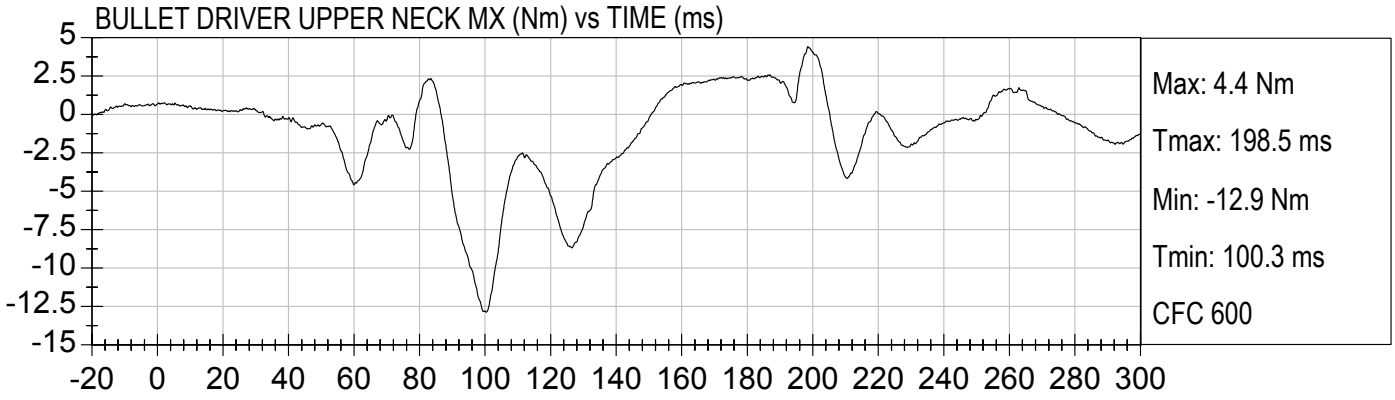


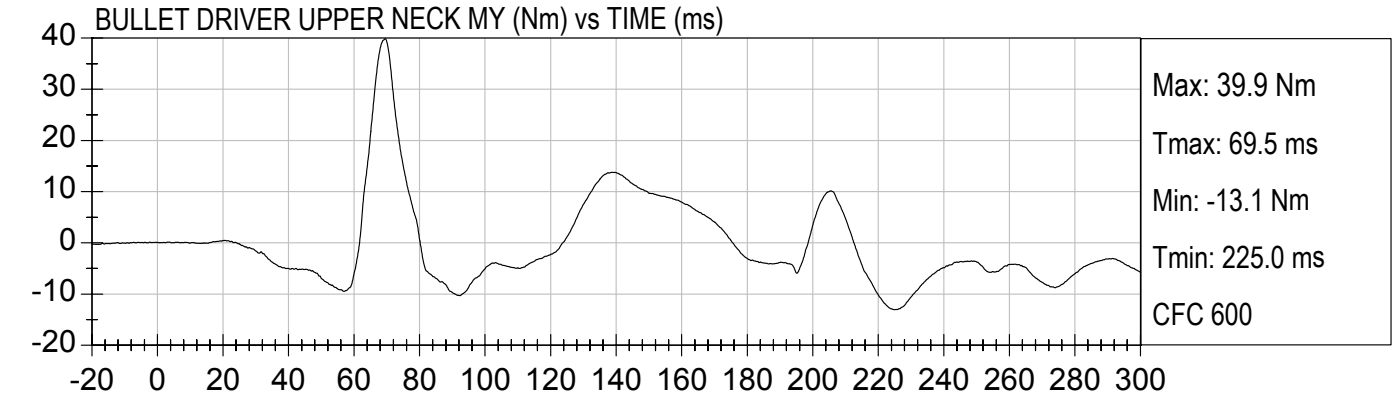


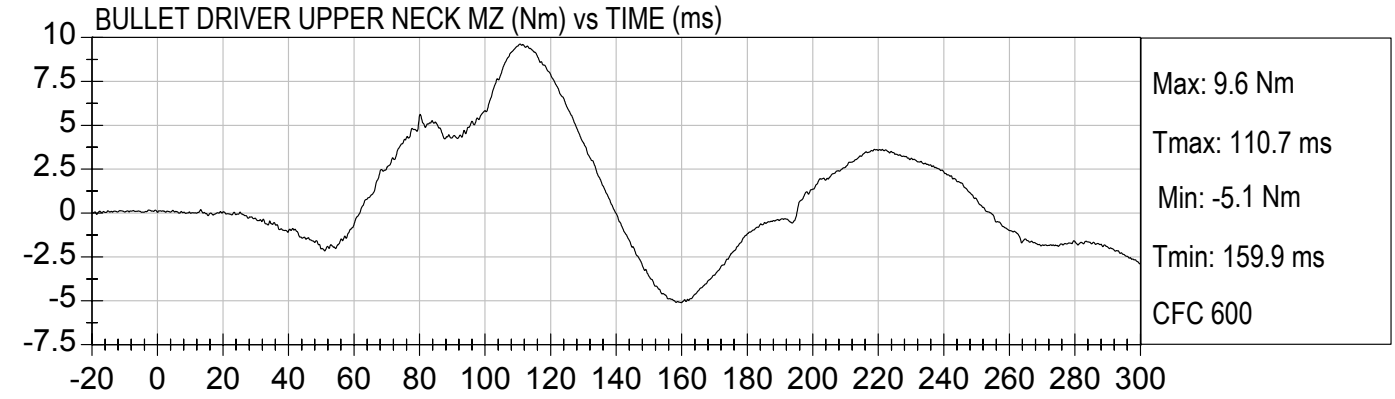


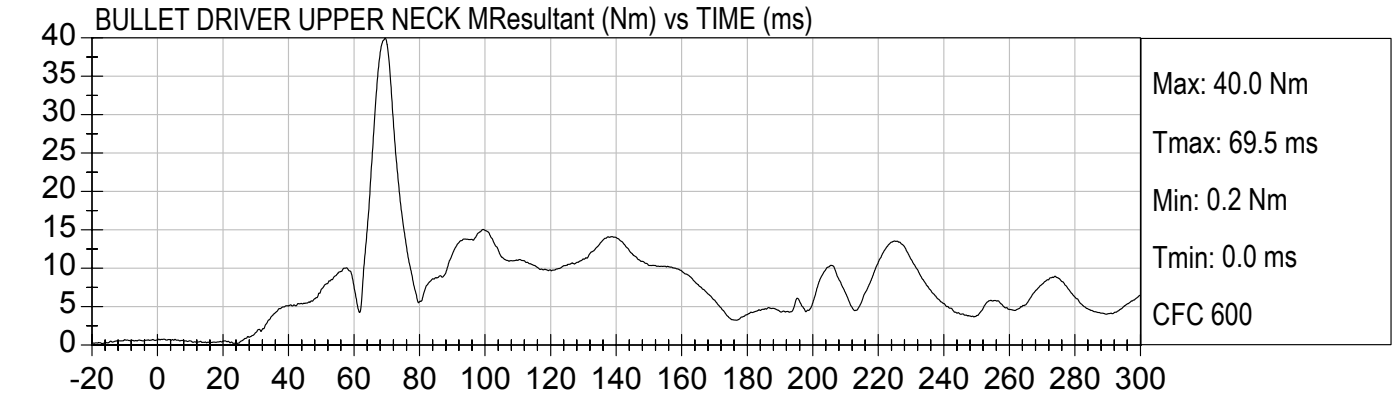
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



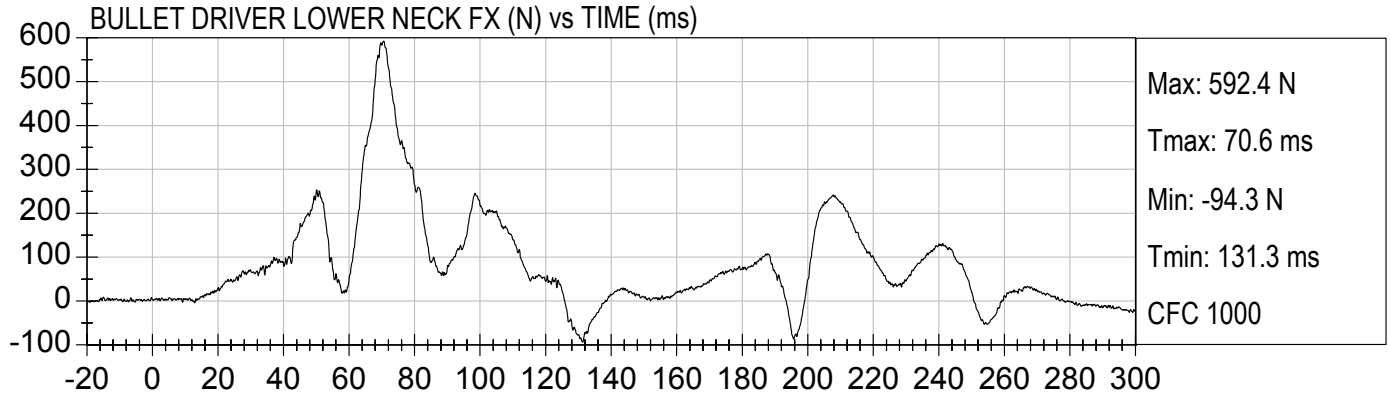


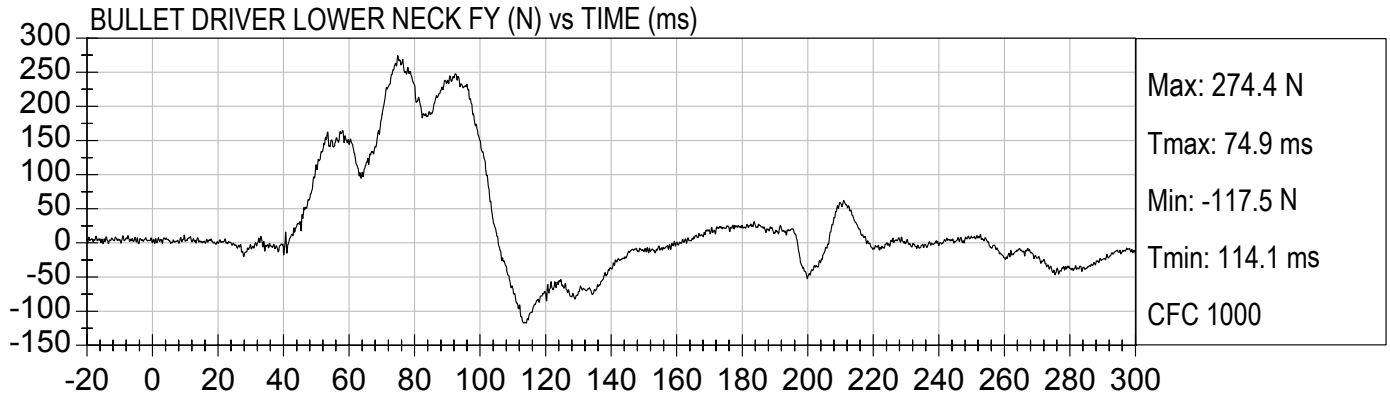


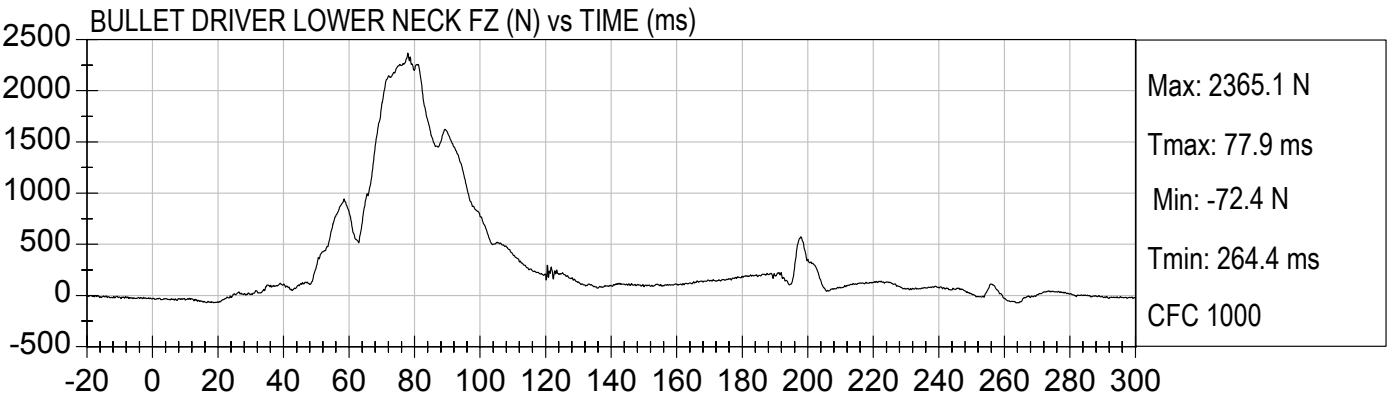


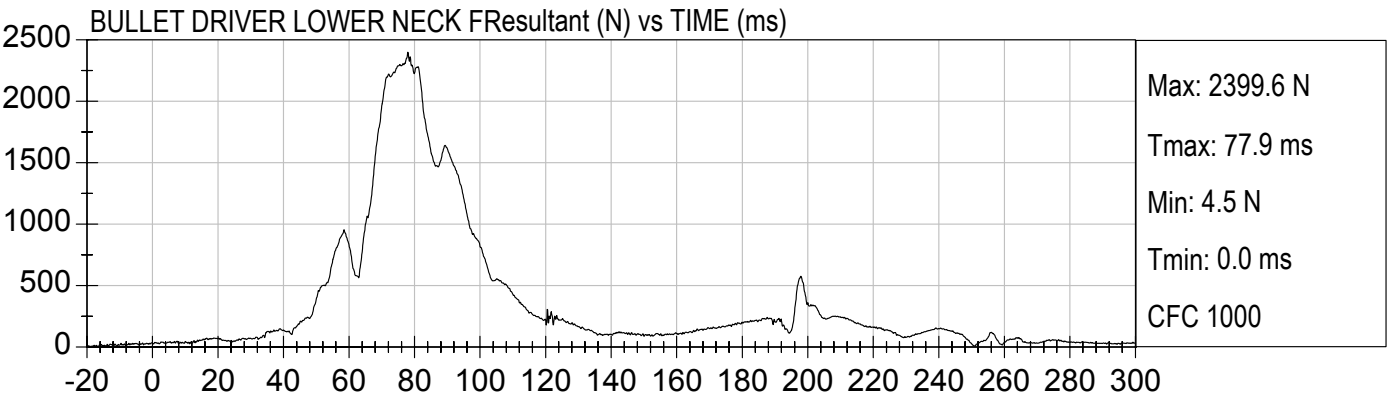
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



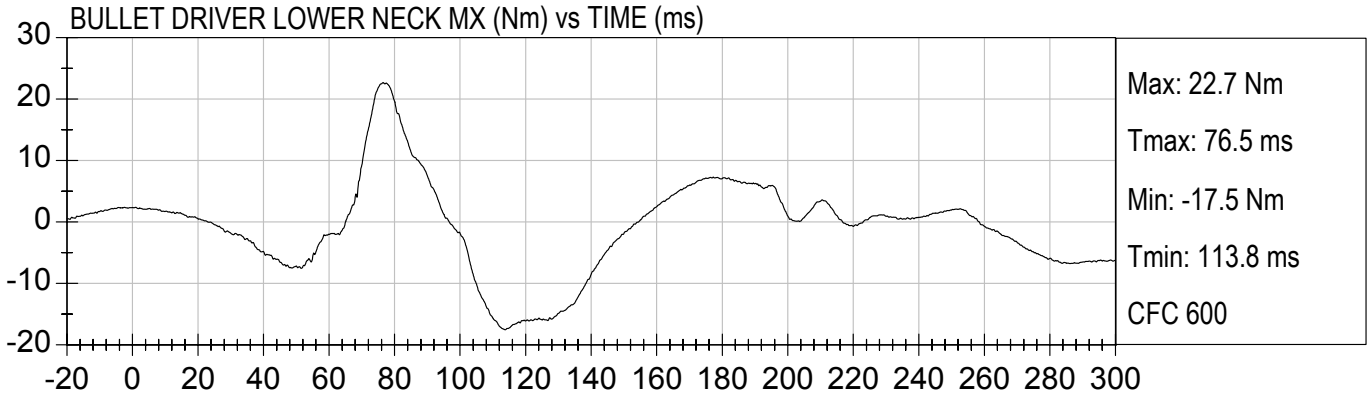


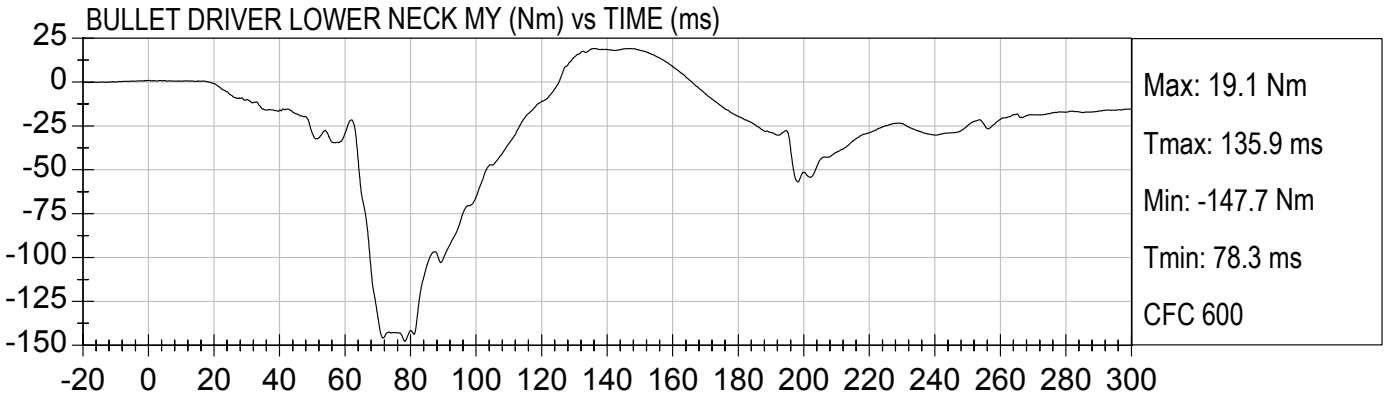


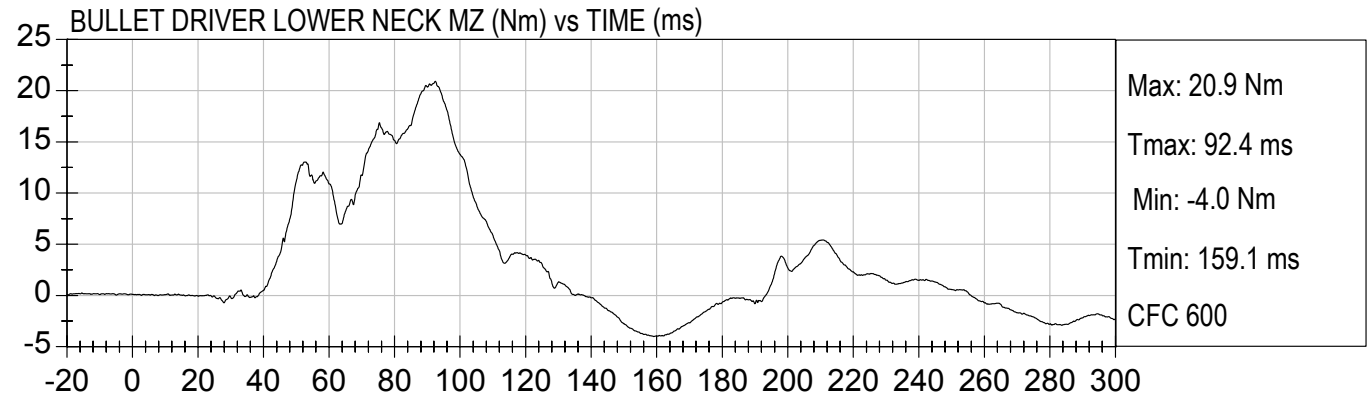


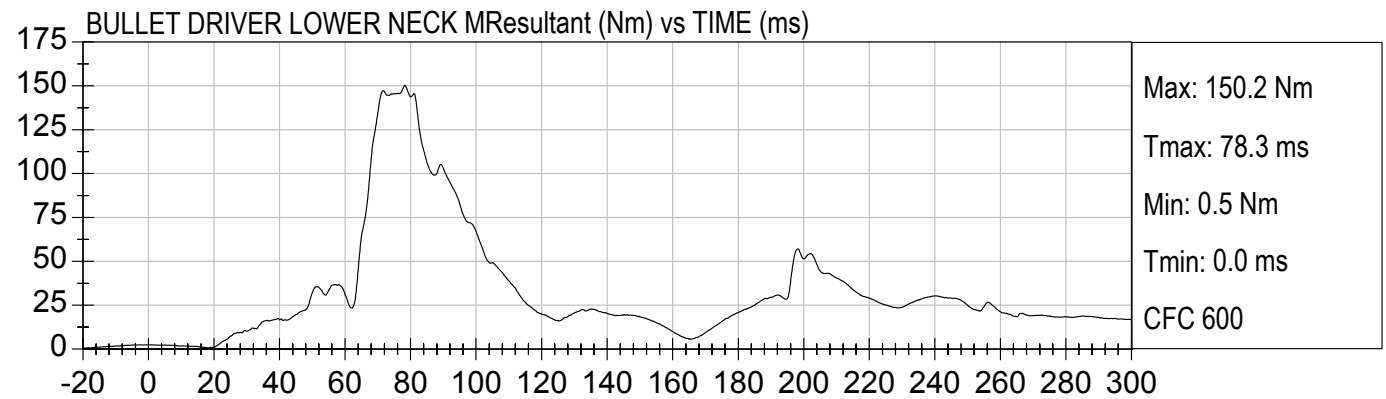
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



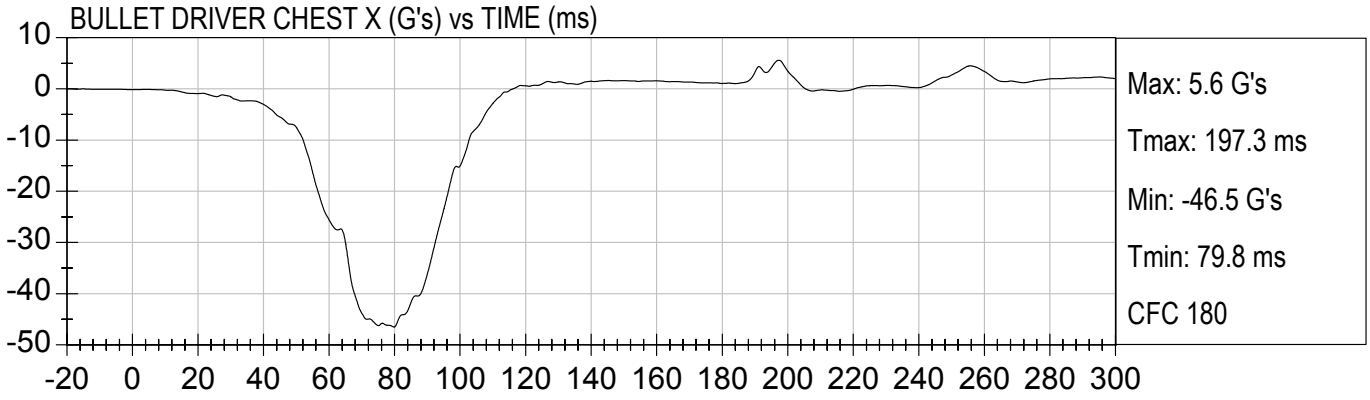


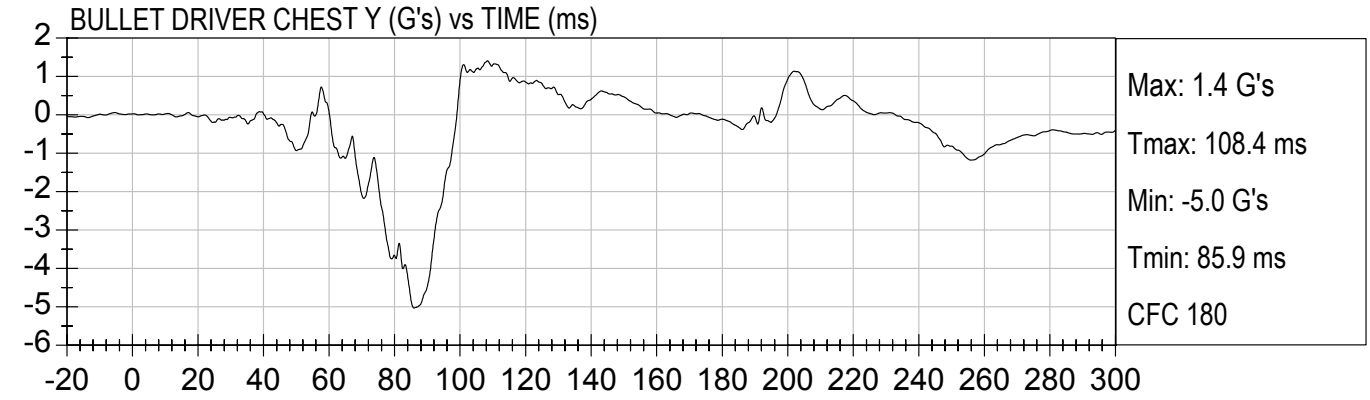


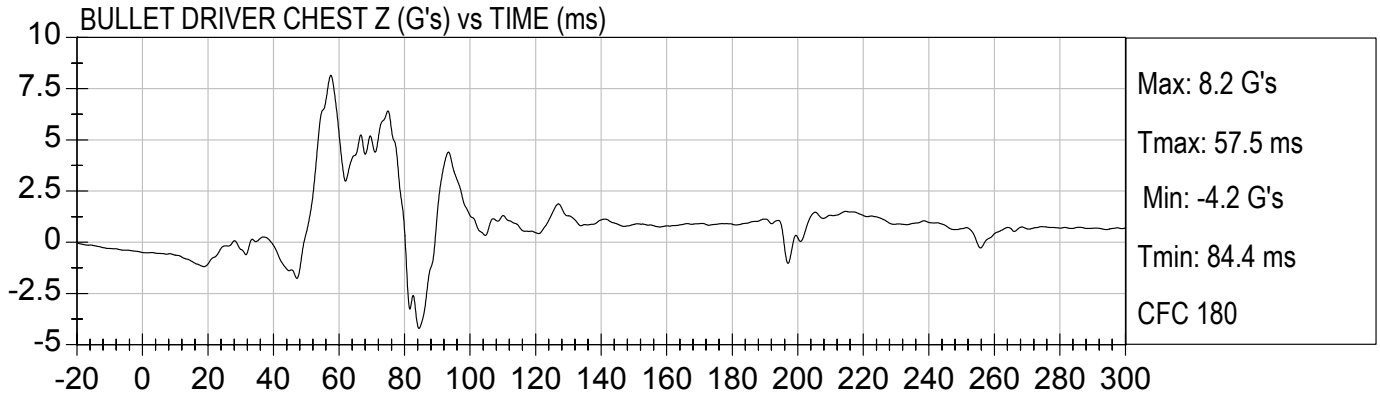


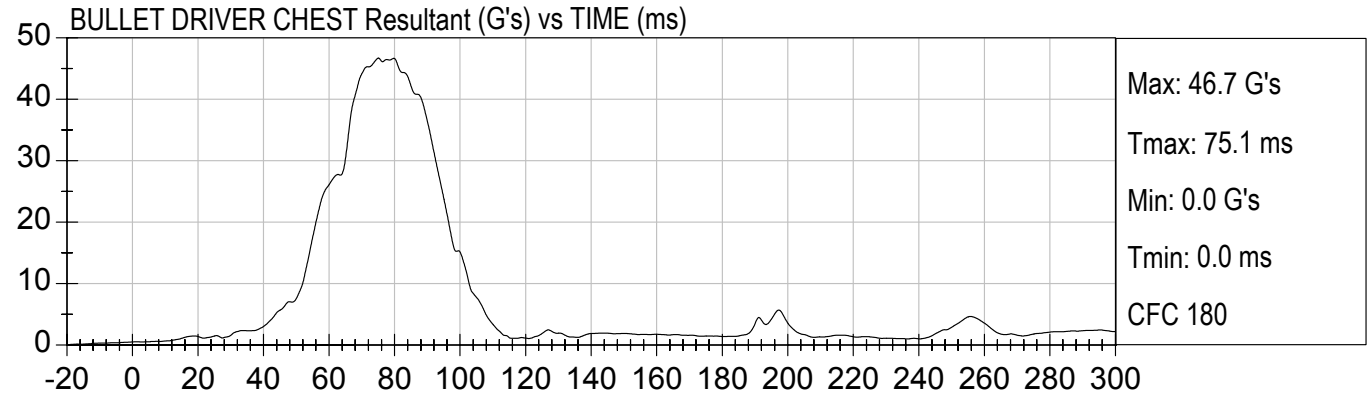
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



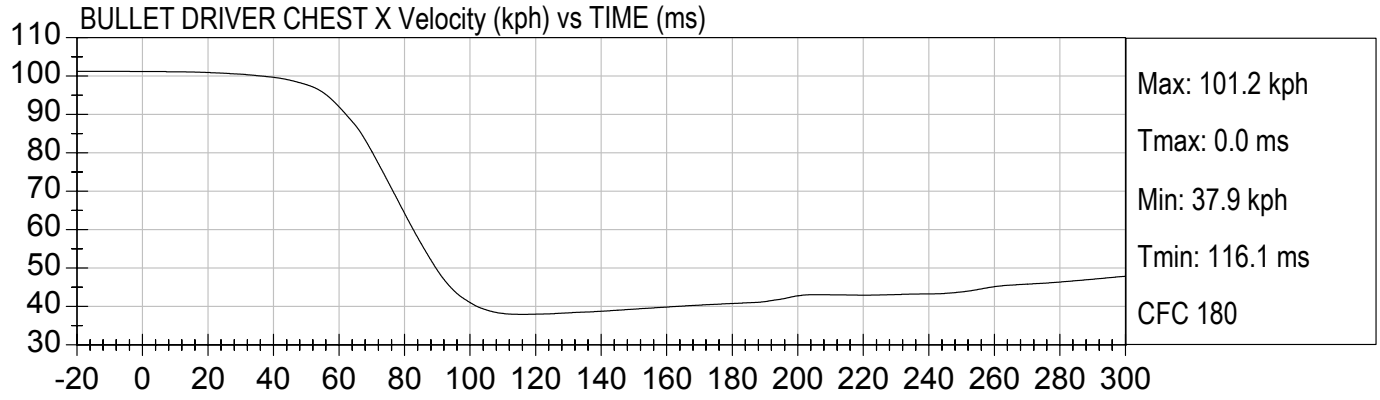


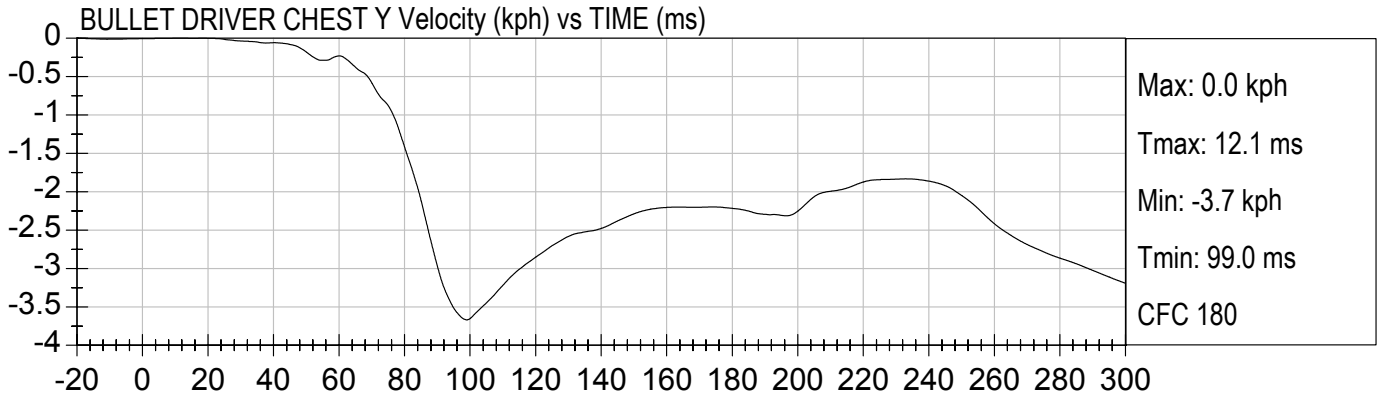


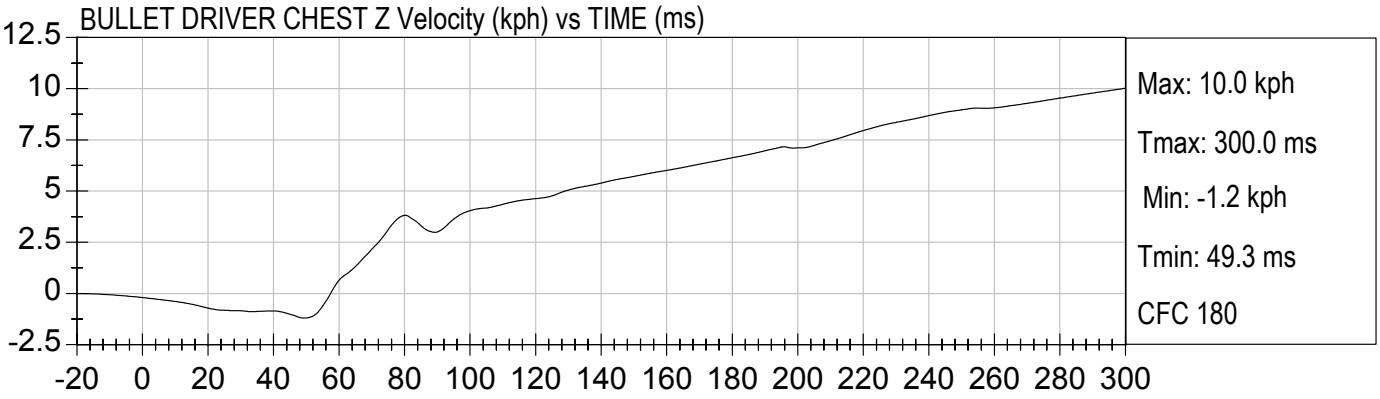


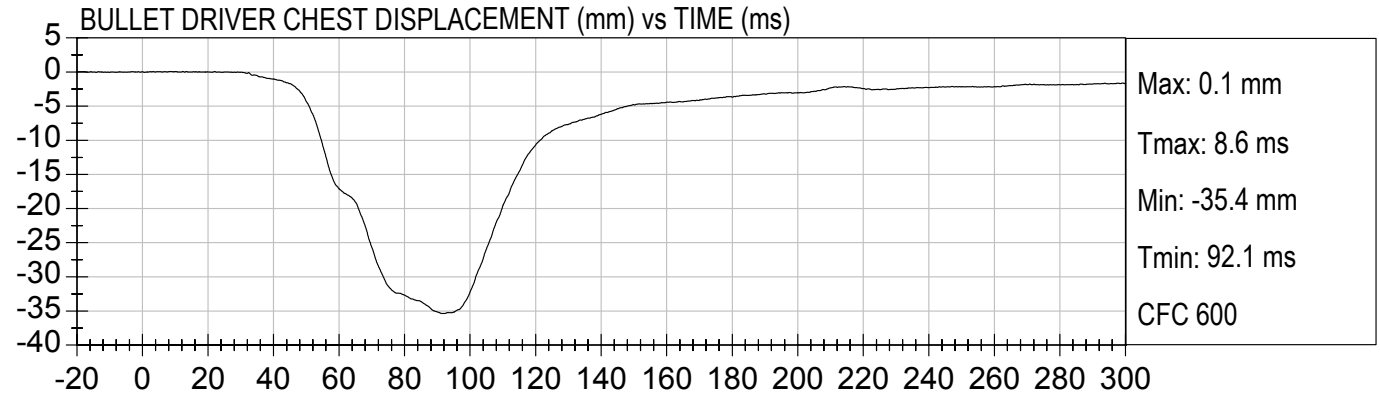
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



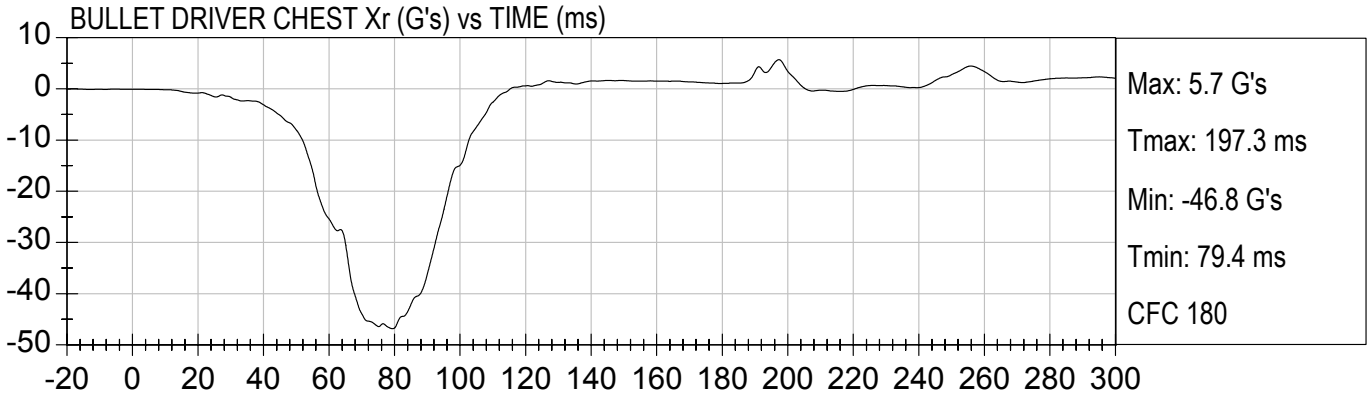


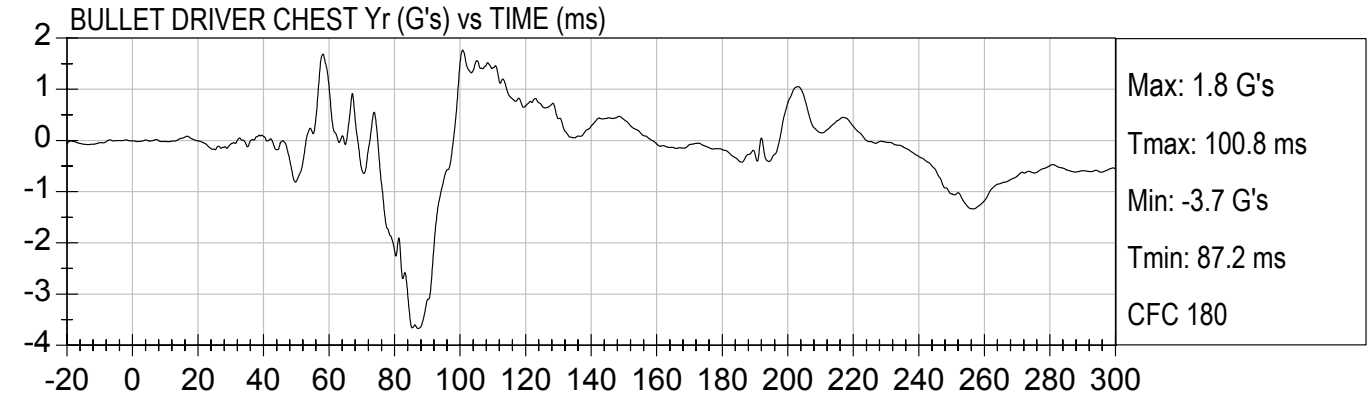


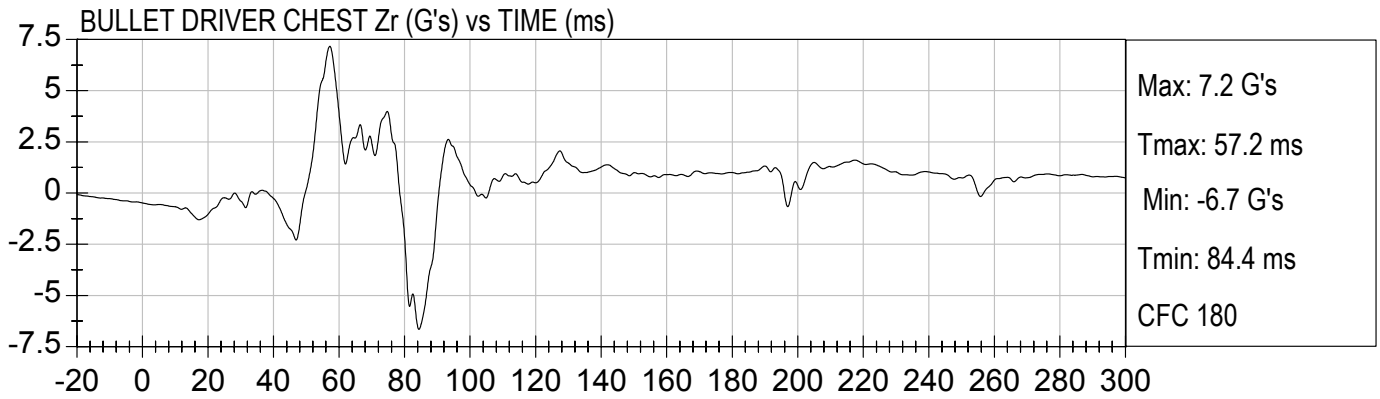


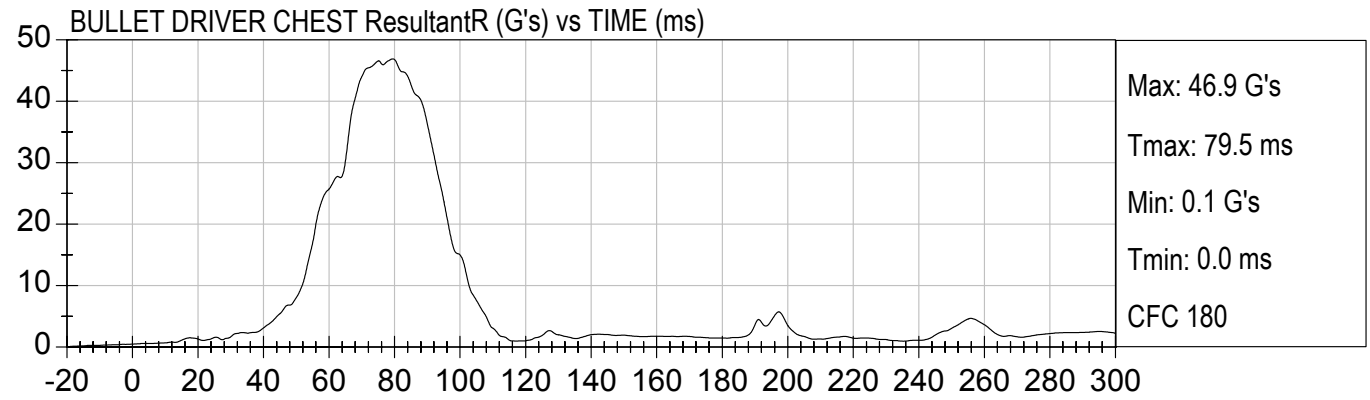
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



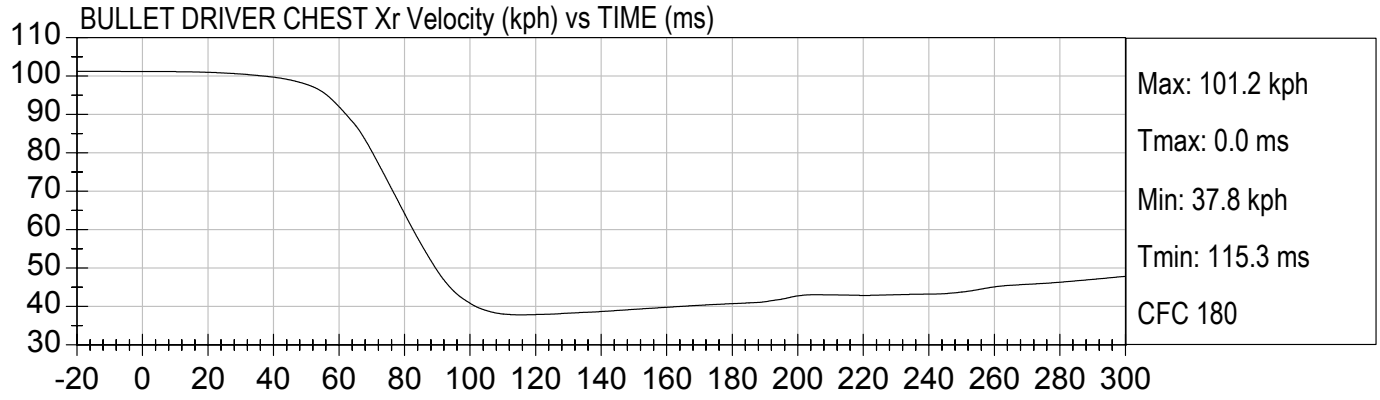


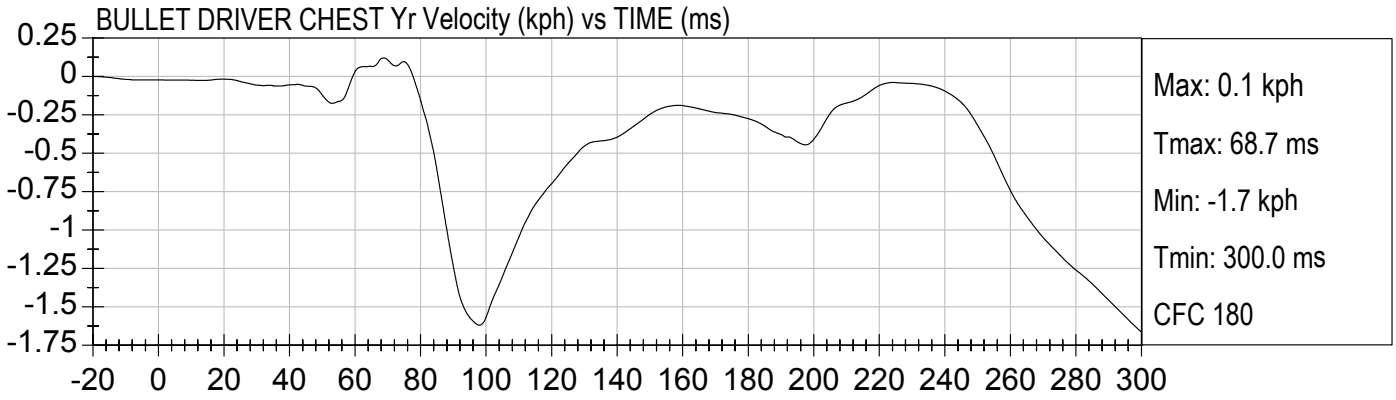


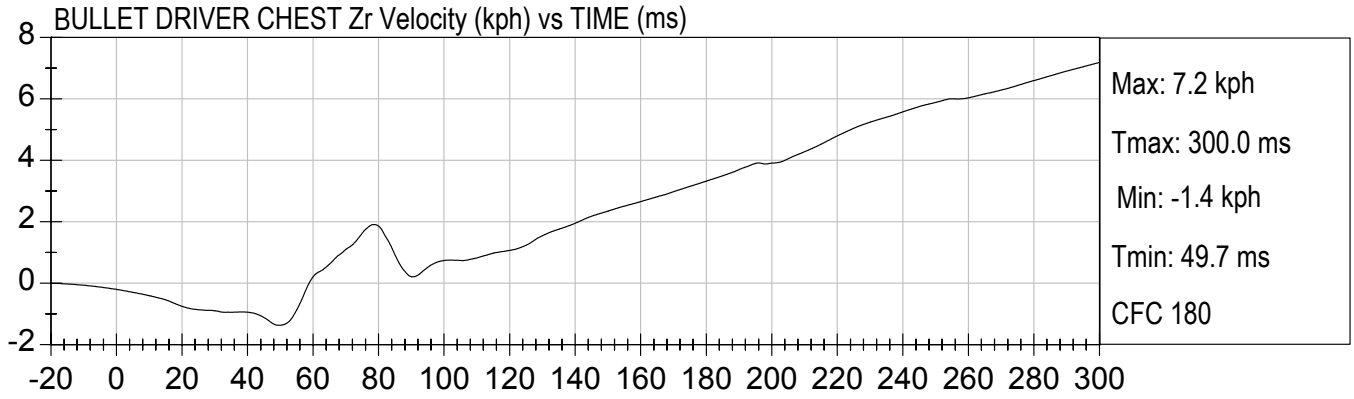


TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

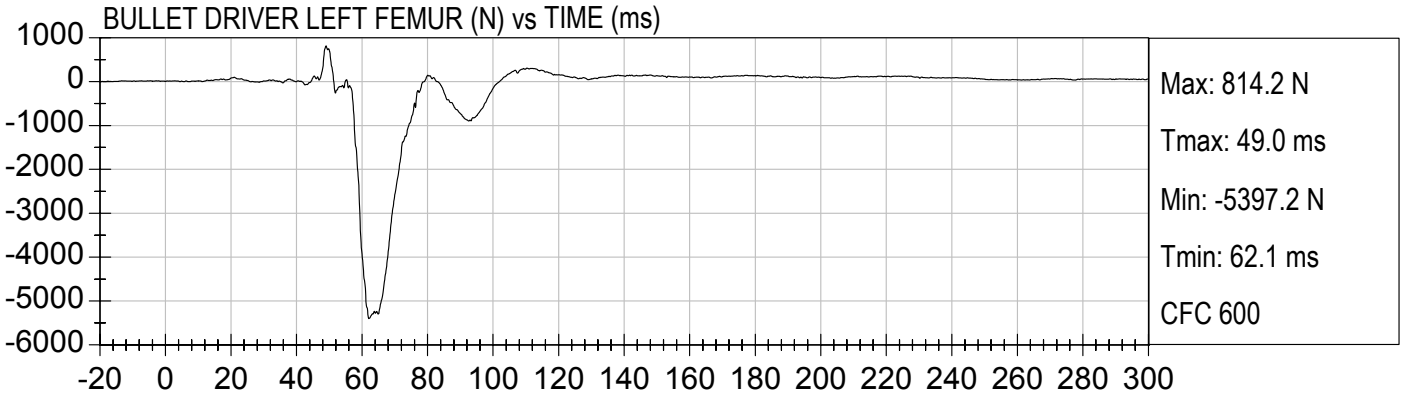


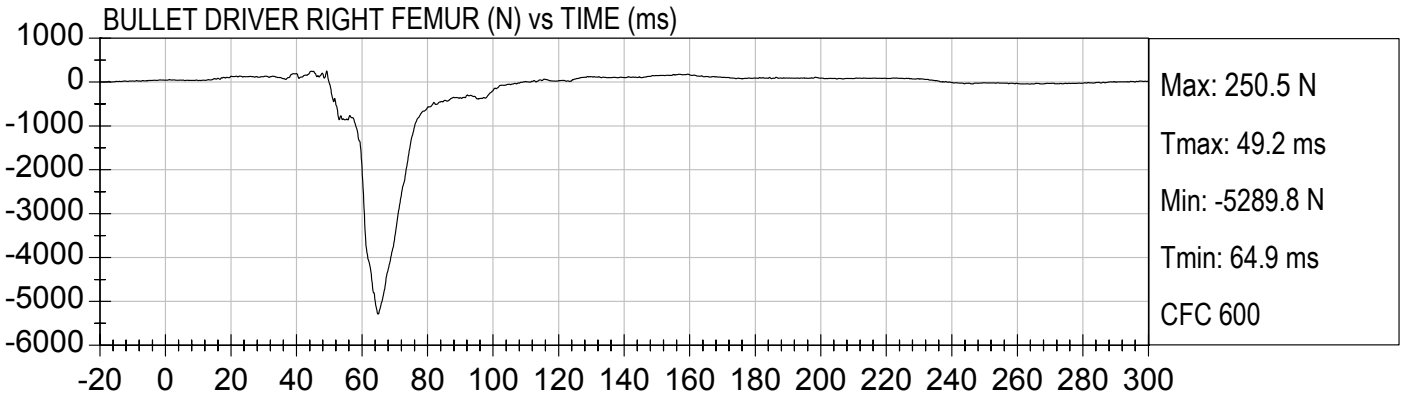


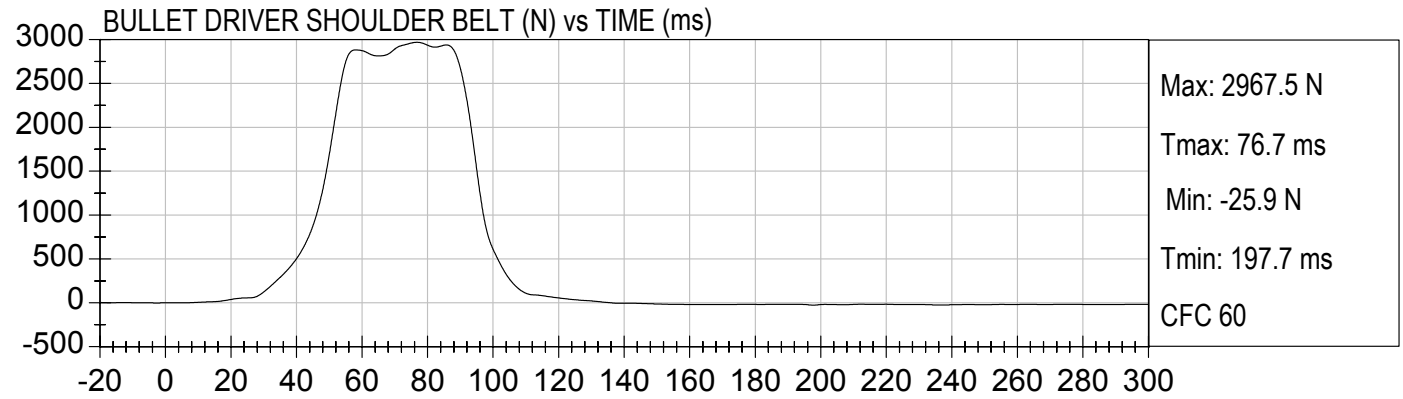


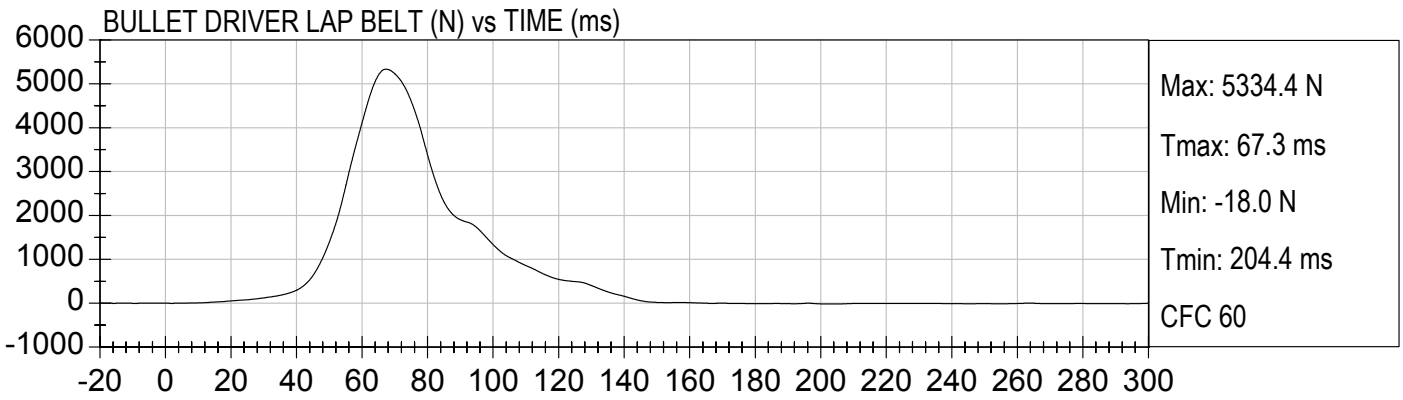
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

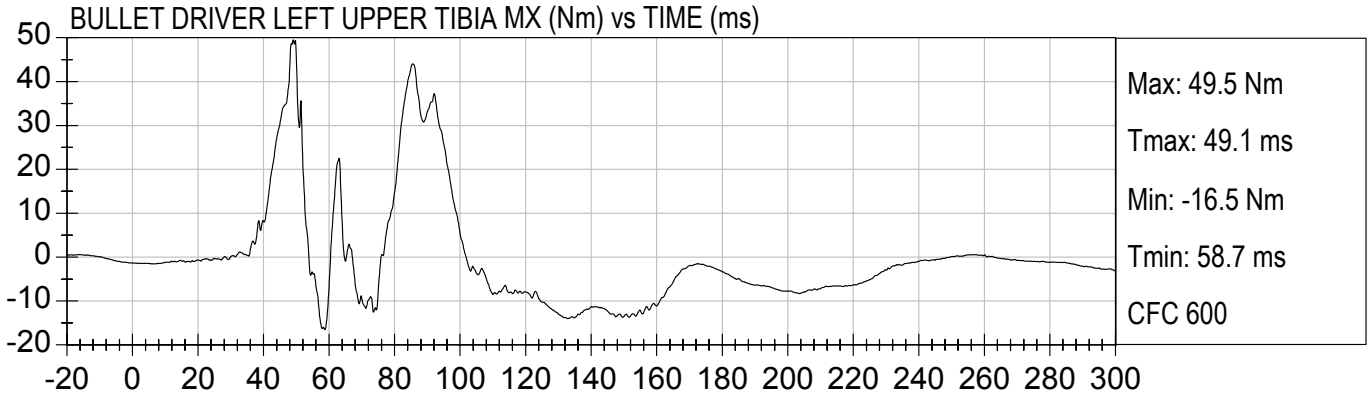
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

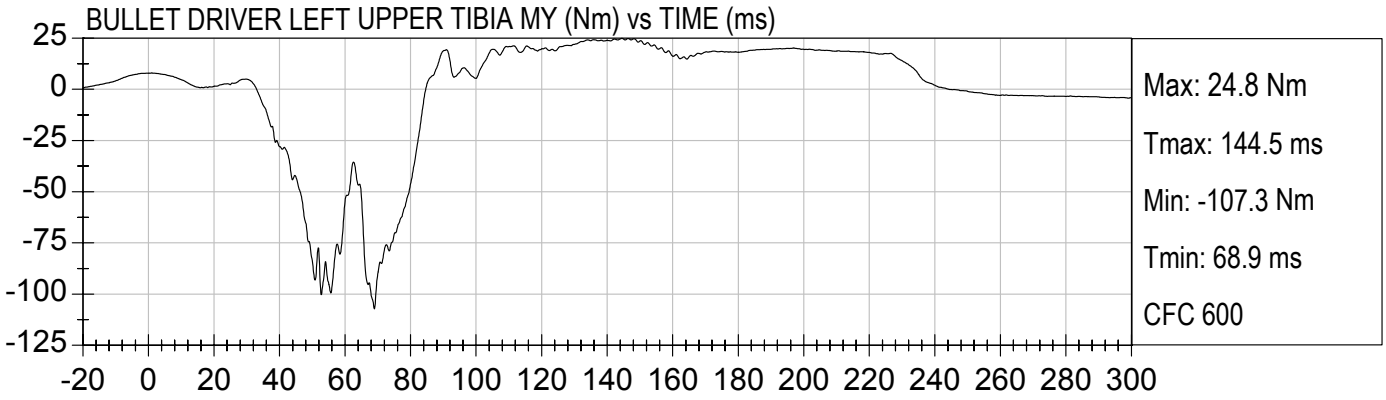






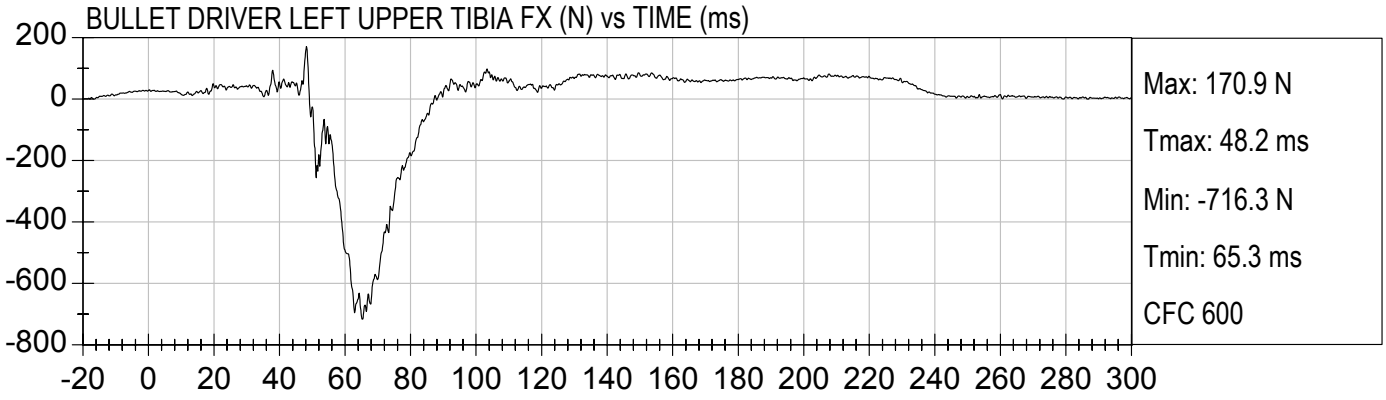


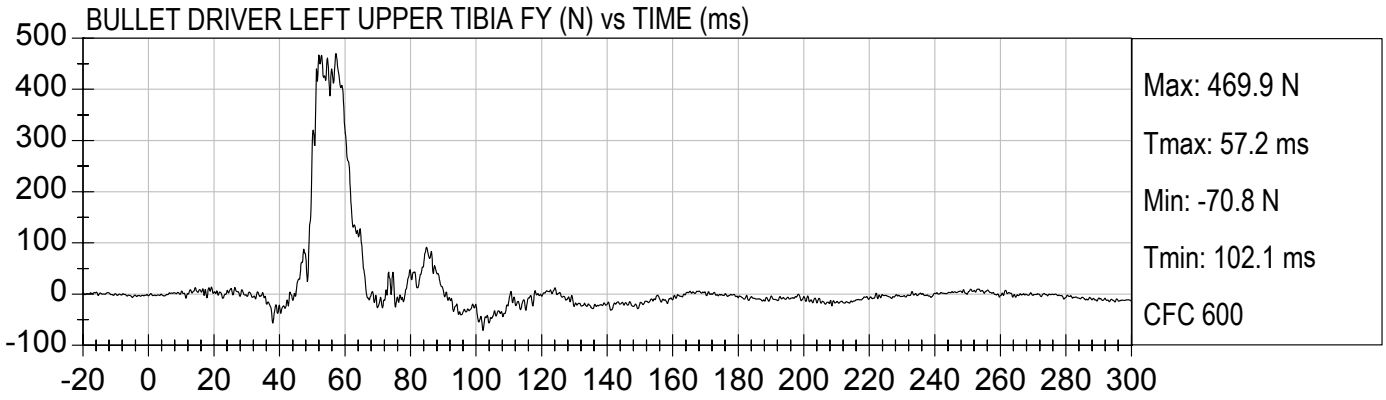

BULLET DRIVER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 49.5 Nm
Tmax: 49.1 ms
Min: -16.5 Nm
Tmin: 58.7 ms
CFC 600

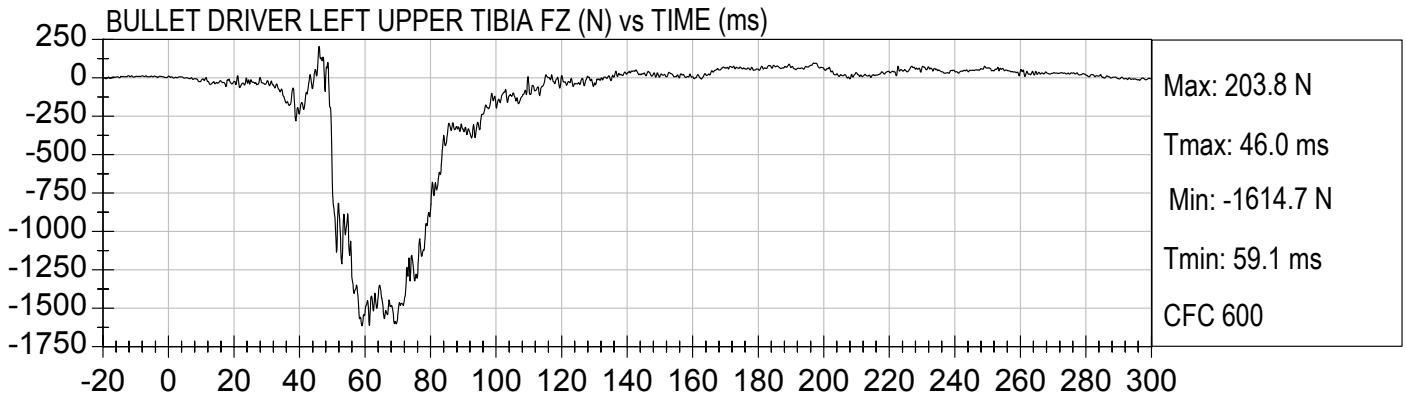

BULLET DRIVER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)
25
0
-25
-50
-75
-100
-125
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 24.8 Nm
Tmax: 144.5 ms
Min: -107.3 Nm
Tmin: 68.9 ms
CFC 600

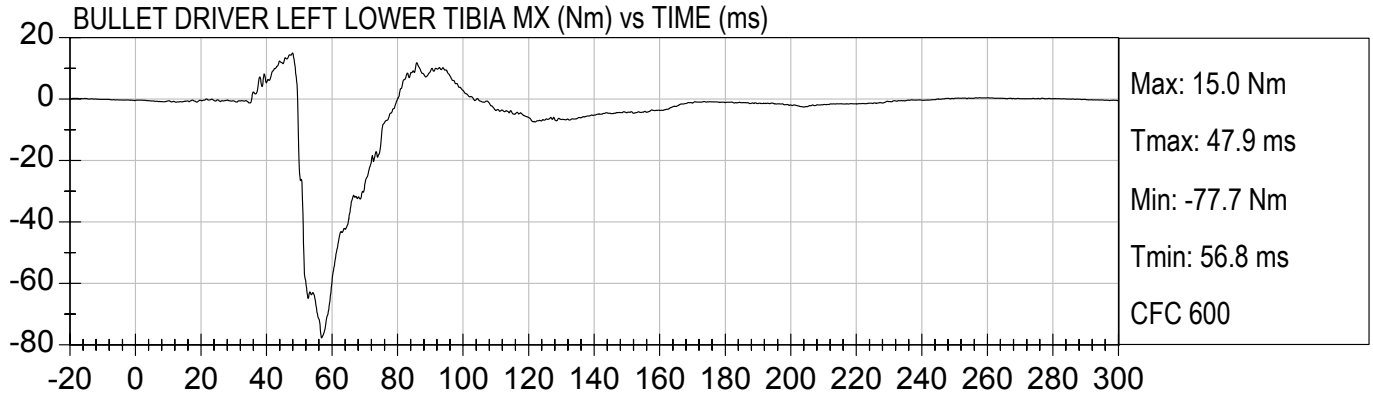
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

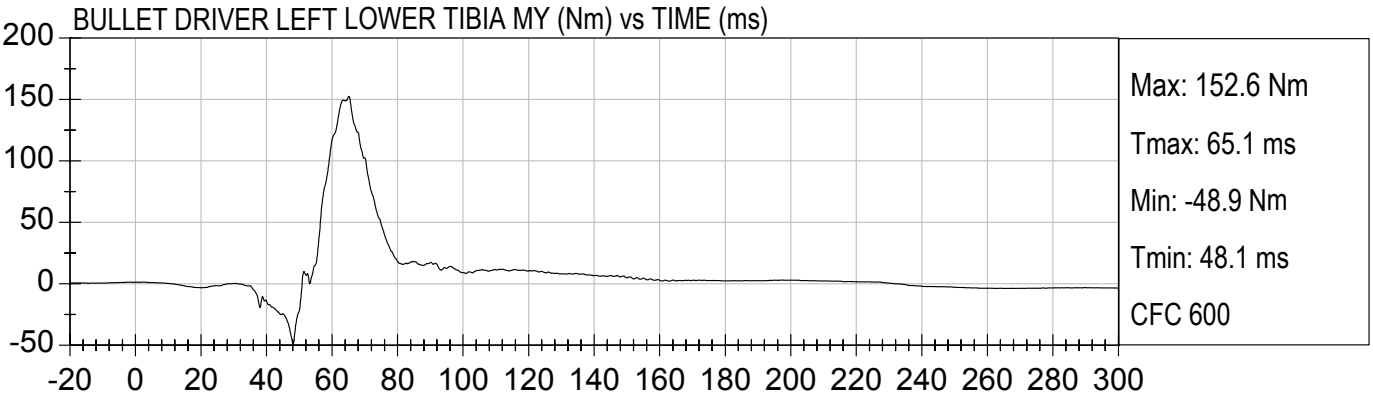
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

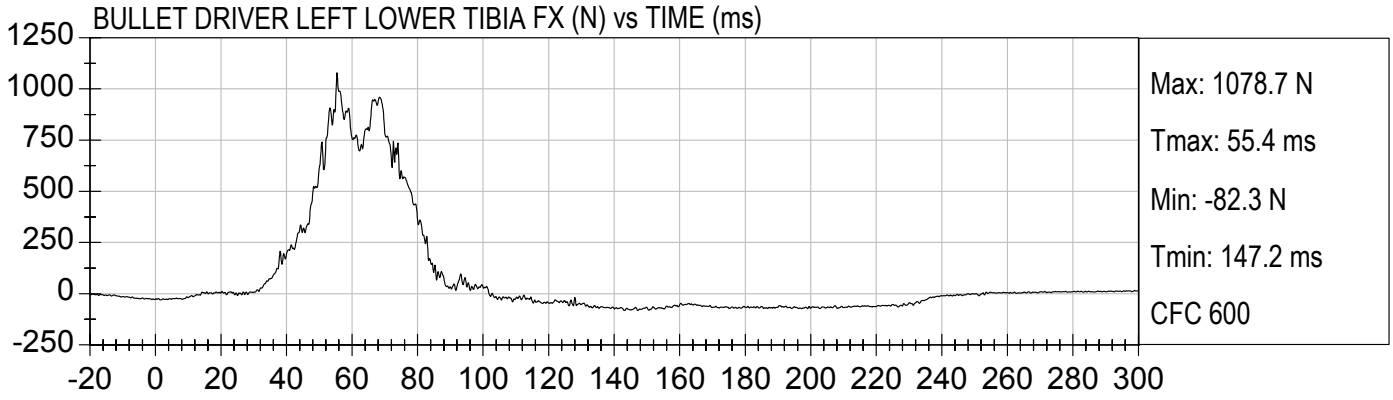


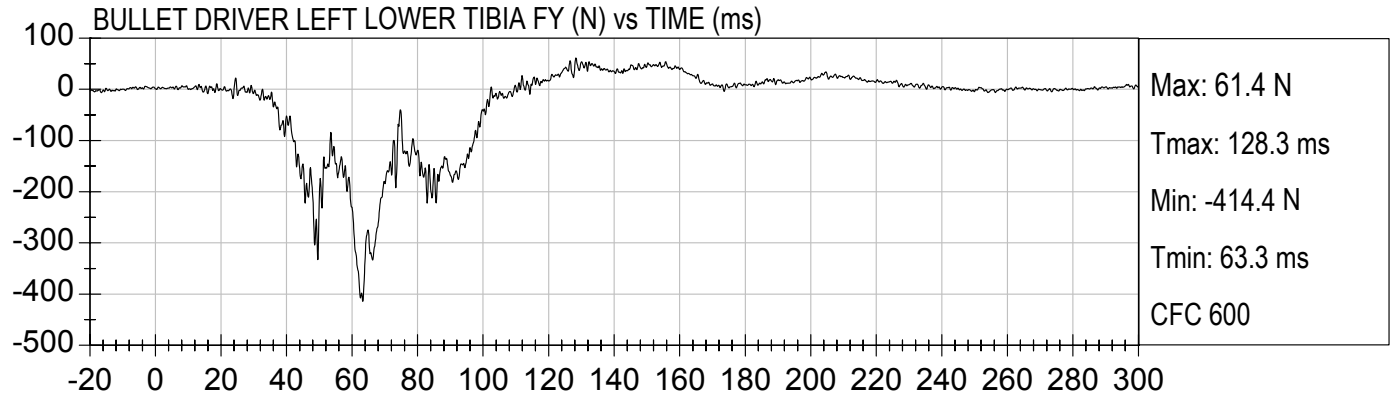


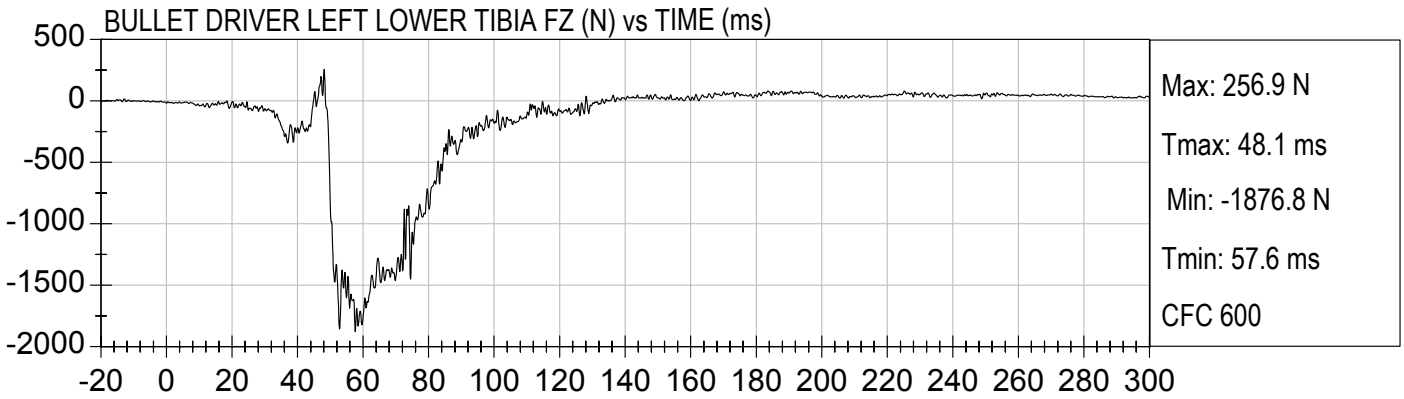


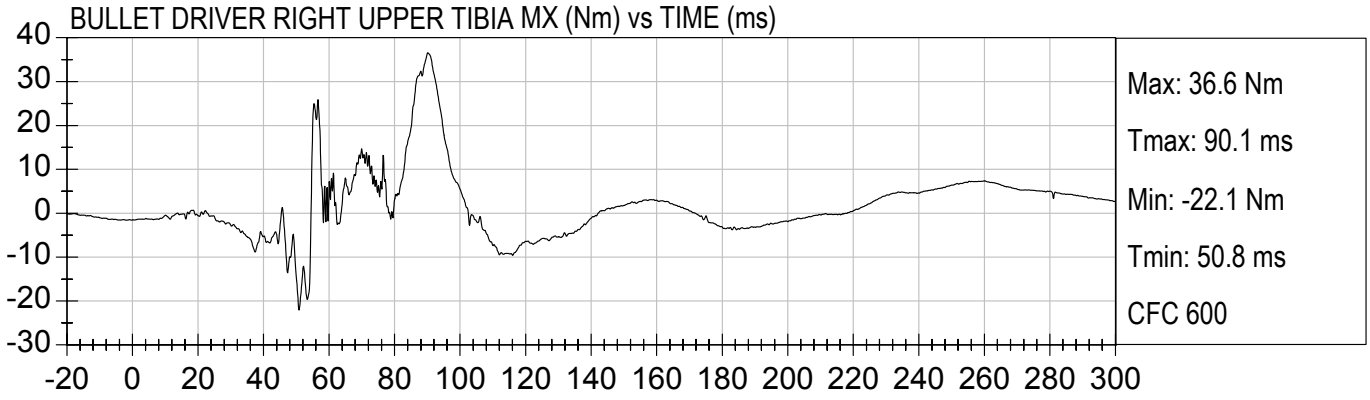

BULLET DRIVER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)
20
0
-20
-40
-60
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 15.0 Nm
Tmax: 47.9 ms
Min: -77.7 Nm
Tmin: 56.8 ms
CFC 600

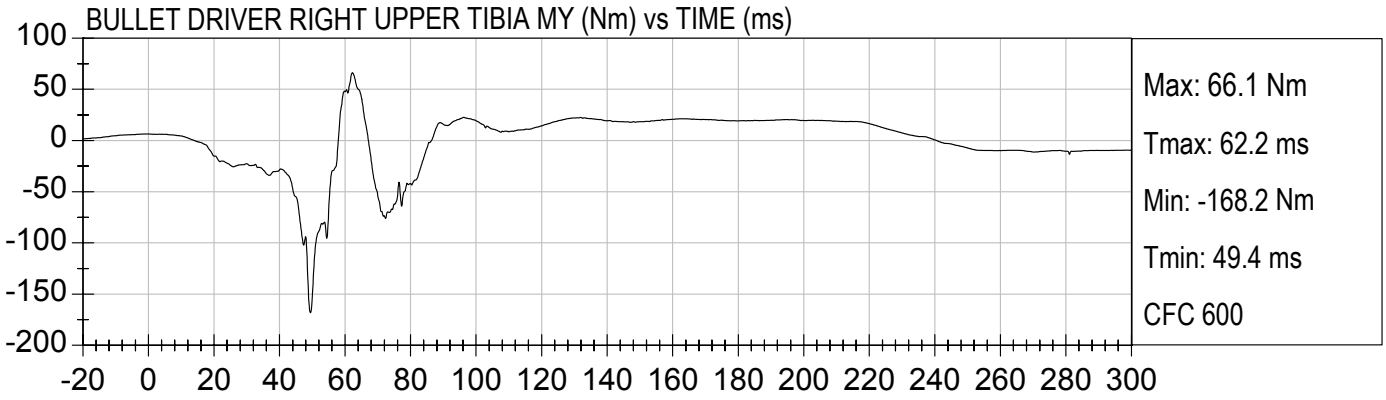

BULLET DRIVER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)
200
150
100
50
0
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 152.6 Nm
Tmax: 65.1 ms
Min: -48.9 Nm
Tmin: 48.1 ms
CFC 600

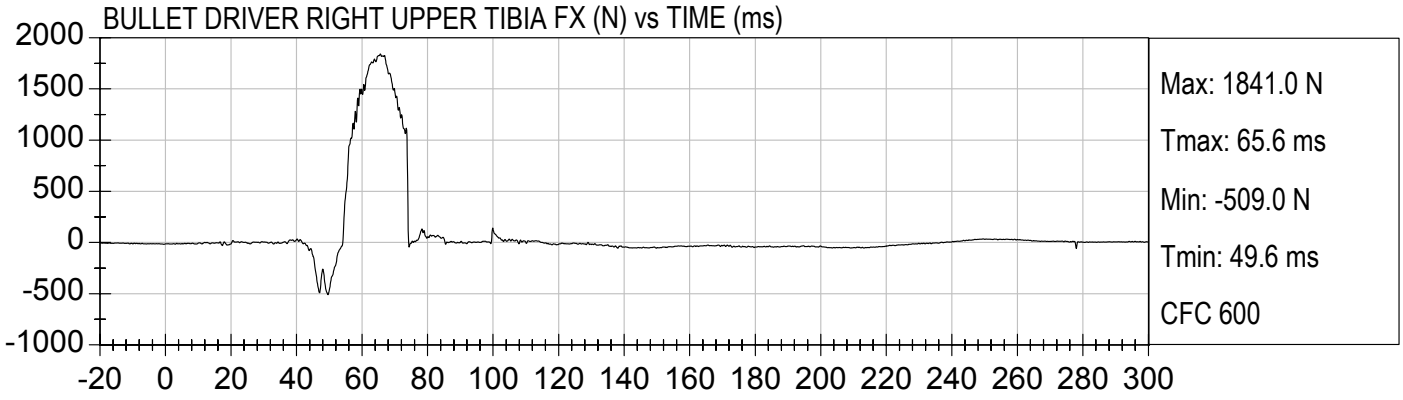

BULLET DRIVER LEFT LOWER TIBIA FX (N) vs TIME (ms)
1250
1000
750
500
250
0
-250
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1078.7 N
Tmax: 55.4 ms
Min: -82.3 N
Tmin: 147.2 ms
CFC 600

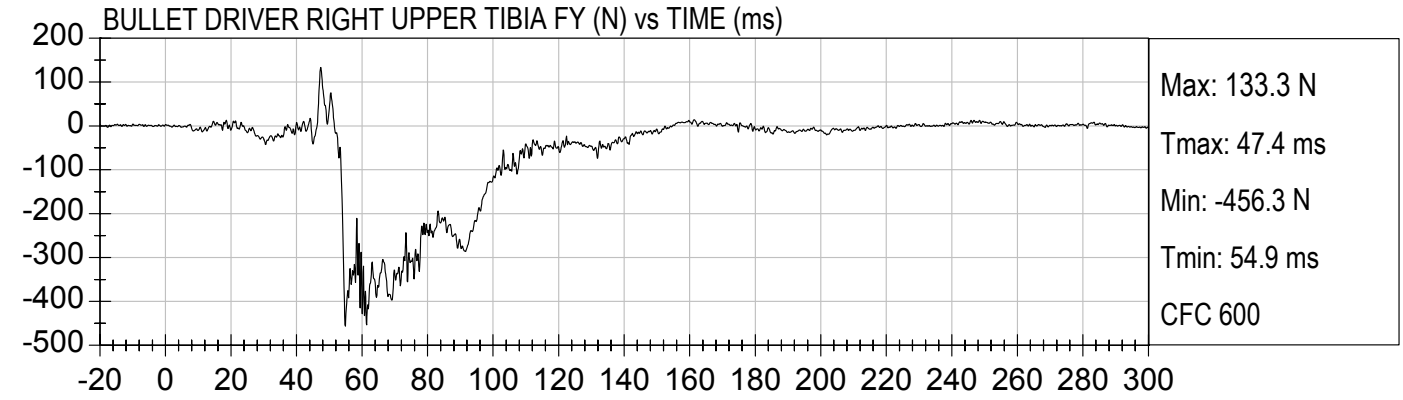

BULLET DRIVER LEFT LOWER TIBIA FY (N) vs TIME (ms)
100
0
-100
-200
-300
-400
-500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 61.4 N
Tmax: 128.3 ms
Min: -414.4 N
Tmin: 63.3 ms
CFC 600

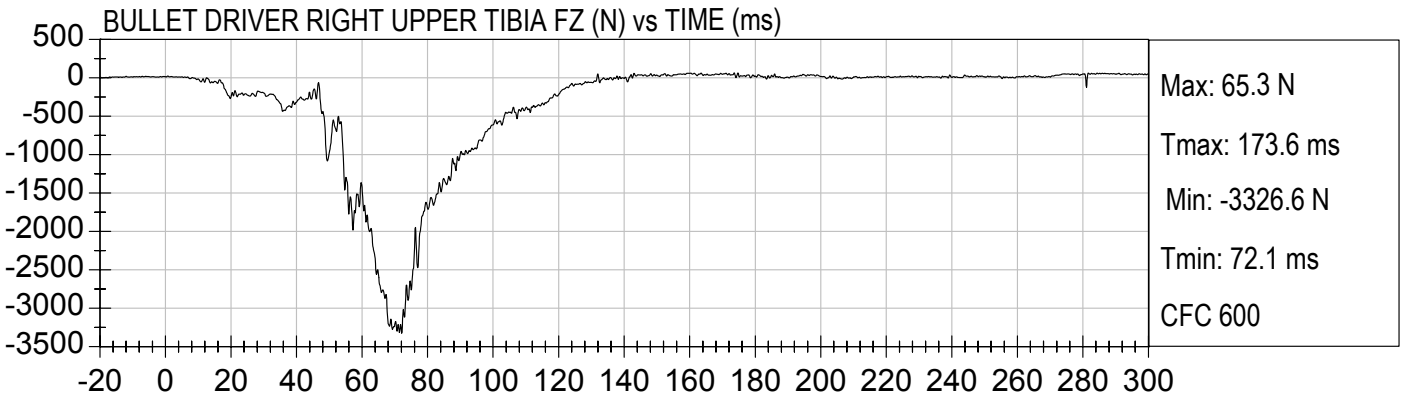

BULLET DRIVER LEFT LOWER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 256.9 N
Tmax: 48.1 ms
Min: -1876.8 N
Tmin: 57.6 ms
CFC 600

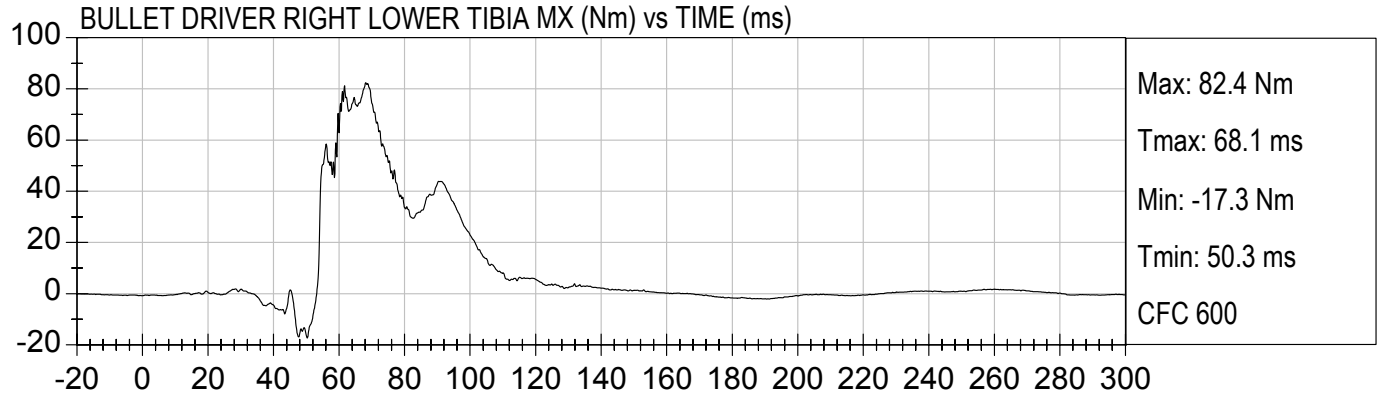

BULLET DRIVER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)
40
30
20
10
0
-10
-20
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 36.6 Nm
Tmax: 90.1 ms
Min: -22.1 Nm
Tmin: 50.8 ms
CFC 600

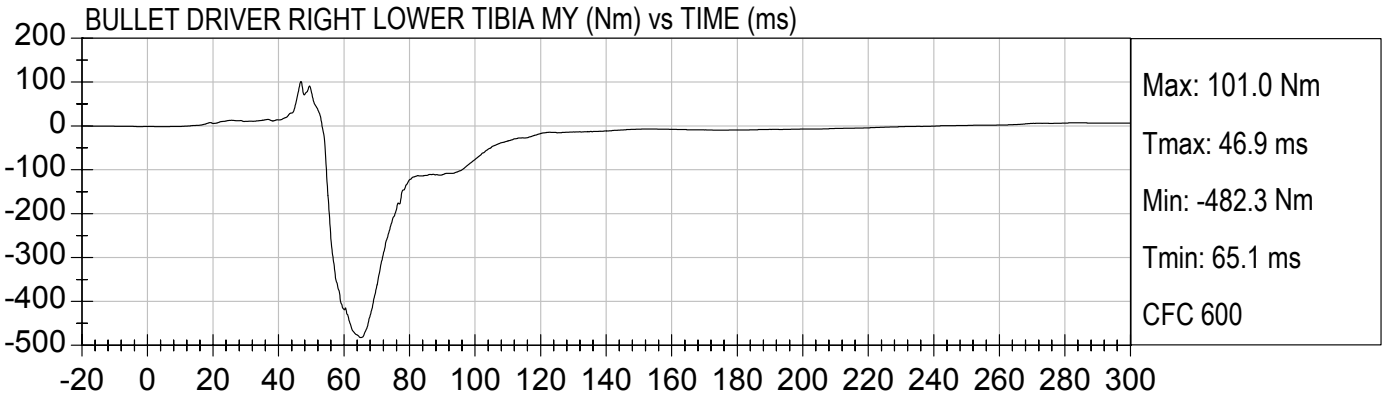

BULLET DRIVER RIGHT UPPER TIBIA MY (Nm) vs TIME (ms)
100
50
0
-50
-100
-150
-200
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 66.1 Nm
Tmax: 62.2 ms
Min: -168.2 Nm
Tmin: 49.4 ms
CFC 600

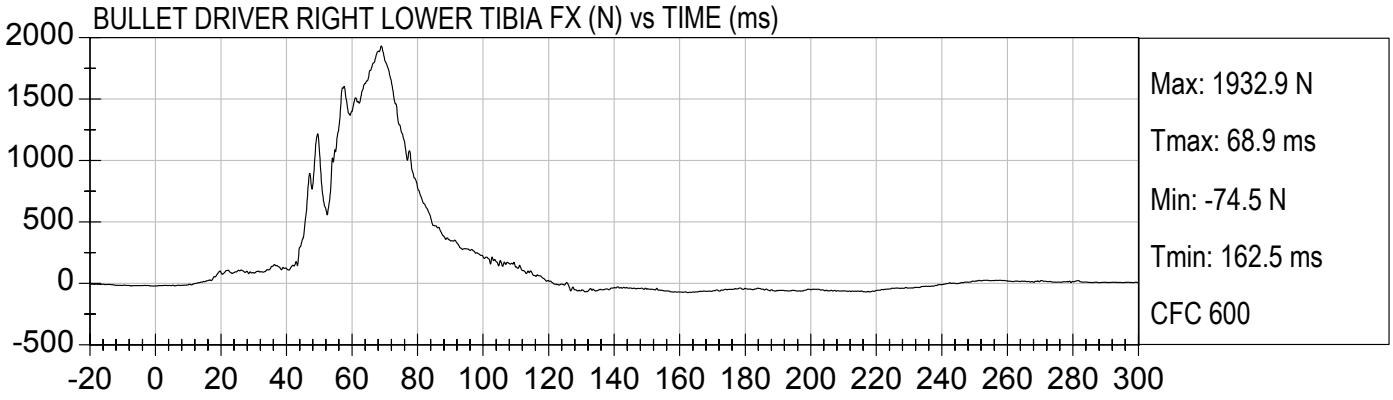

BULLET DRIVER RIGHT UPPER TIBIA FX (N) vs TIME (ms)
2000
1500
1000
500
0
-500
-1000
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1841.0 N
Tmax: 65.6 ms
Min: -509.0 N
Tmin: 49.6 ms
CFC 600

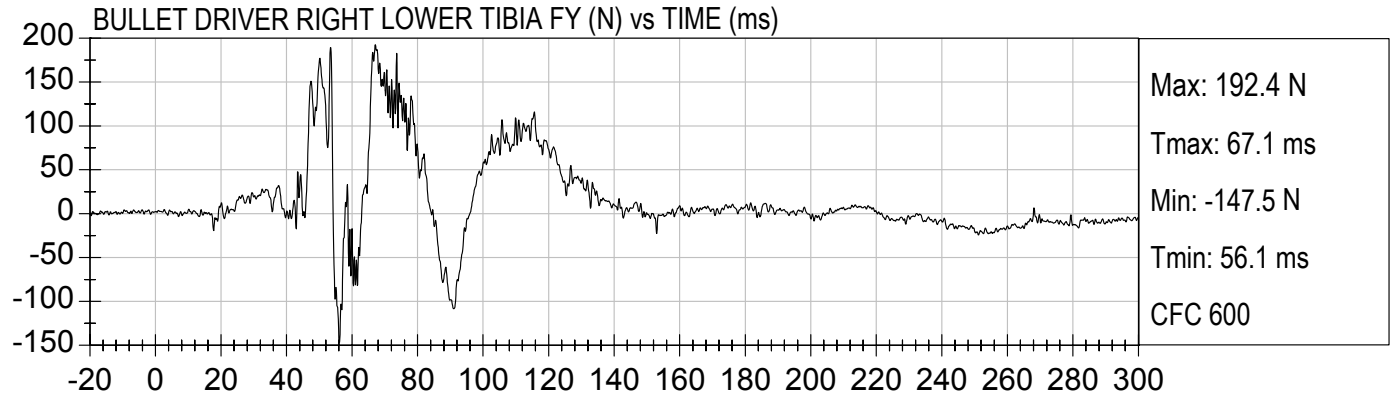

BULLET DRIVER RIGHT UPPER TIBIA FY (N) vs TIME (ms)
200
100
0
-100
-200
-300
-400
-500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 133.3 N
Tmax: 47.4 ms
Min: -456.3 N
Tmin: 54.9 ms
CFC 600

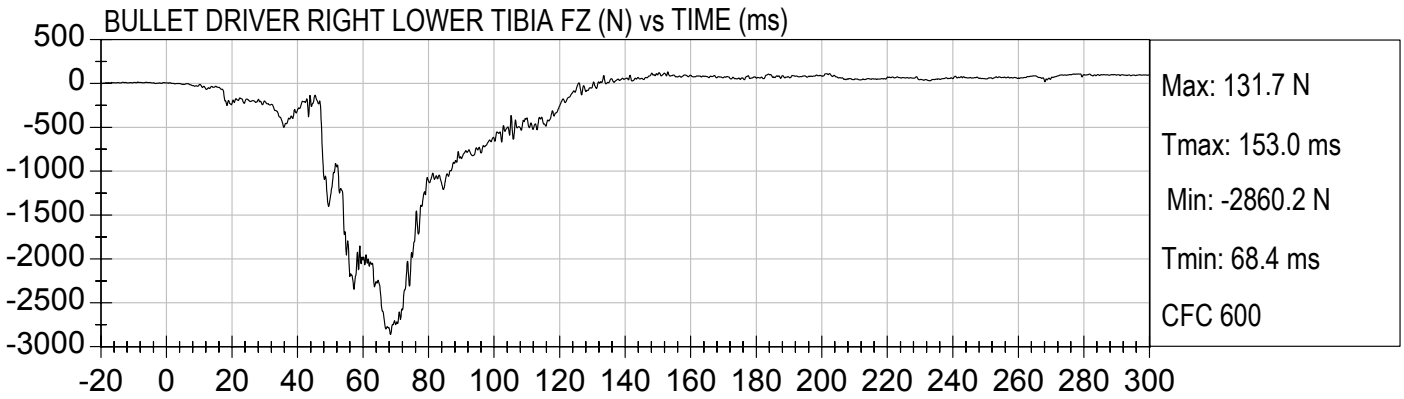

BULLET DRIVER RIGHT UPPER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 65.3 N
Tmax: 173.6 ms
Min: -3326.6 N
Tmin: 72.1 ms
CFC 600

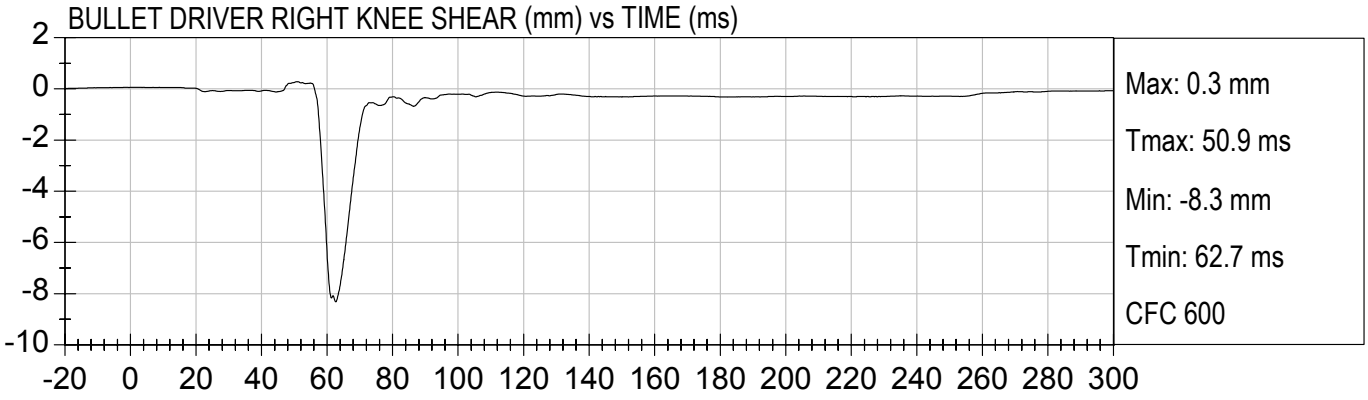

BULLET DRIVER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)
100
80
60
40
20
0
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 82.4 Nm
Tmax: 68.1 ms
Min: -17.3 Nm
Tmin: 50.3 ms
CFC 600


BULLET DRIVER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)
200
100
0
-100
-200
-300
-400
-500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 101.0 Nm
Tmax: 46.9 ms
Min: -482.3 Nm
Tmin: 65.1 ms
CFC 600


BULLET DRIVER RIGHT LOWER TIBIA FX (N) vs TIME (ms)
2000
1500
1000
500
0
-500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1932.9 N
Tmax: 68.9 ms
Min: -74.5 N
Tmin: 162.5 ms
CFC 600

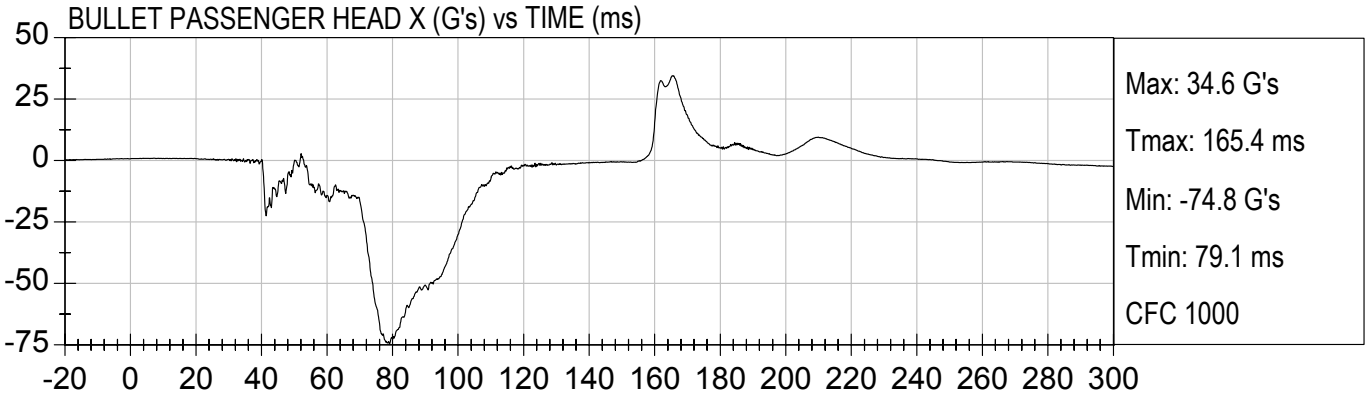

BULLET DRIVER RIGHT LOWER TIBIA FY (N) vs TIME (ms)
200
150
100
50
0
-50
-100
-150
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 192.4 N
Tmax: 67.1 ms
Min: -147.5 N
Tmin: 56.1 ms
CFC 600

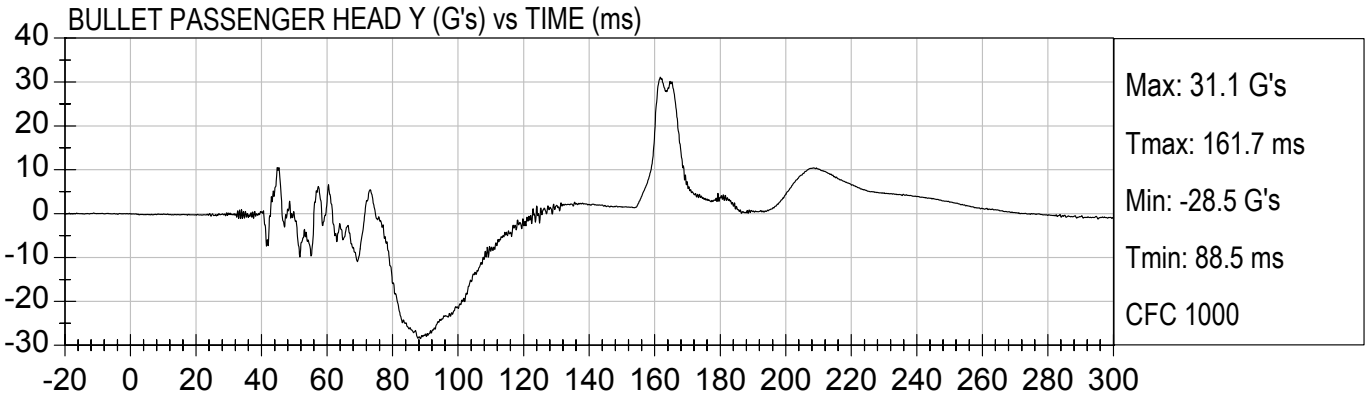

BULLET DRIVER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 131.7 N
Tmax: 153.0 ms
Min: -2860.2 N
Tmin: 68.4 ms
CFC 600

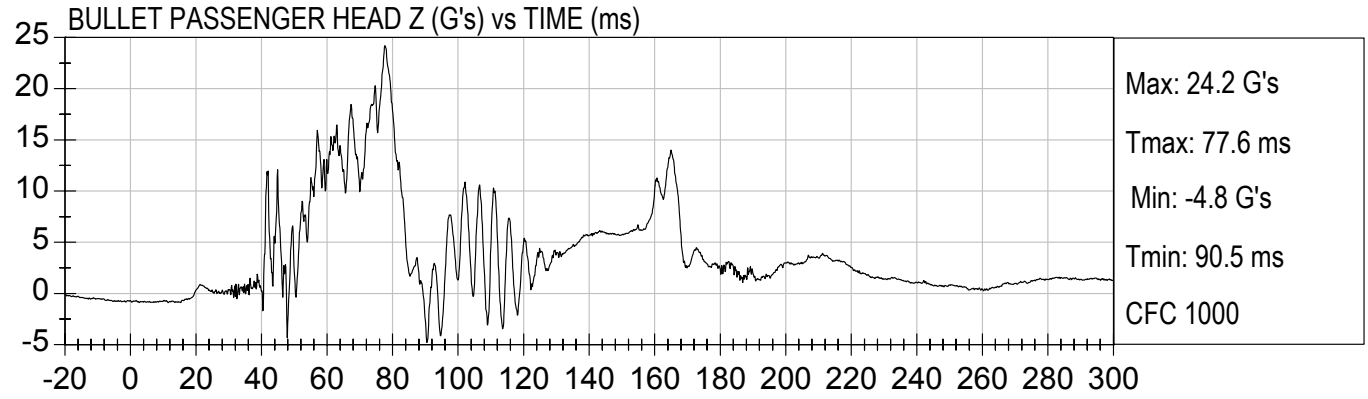

BULLET DRIVER RIGHT KNEE SHEAR (mm) vs TIME (ms)
2
0
-2
-4
-6
-8
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.3 mm
Tmax: 50.9 ms
Min: -8.3 mm
Tmin: 62.7 ms
CFC 600

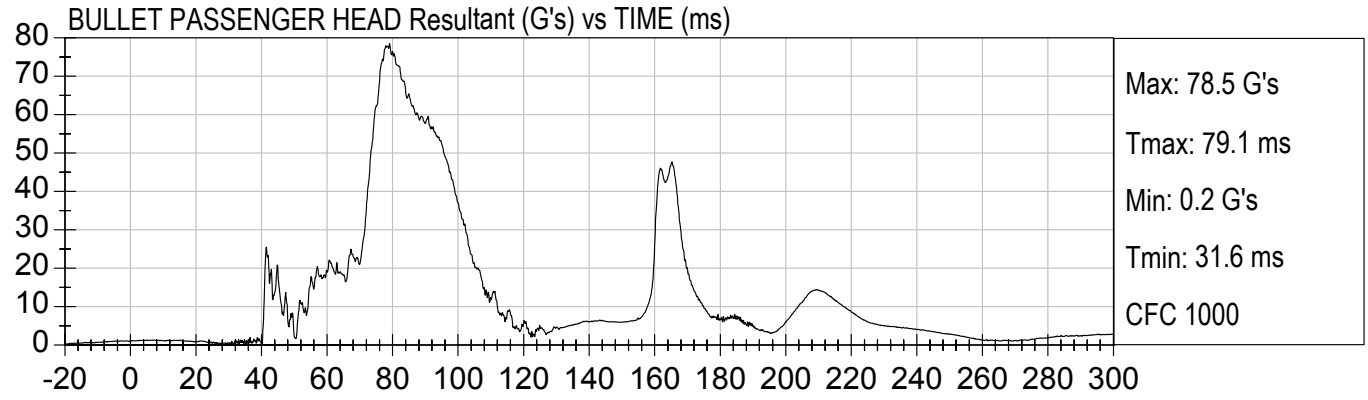
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

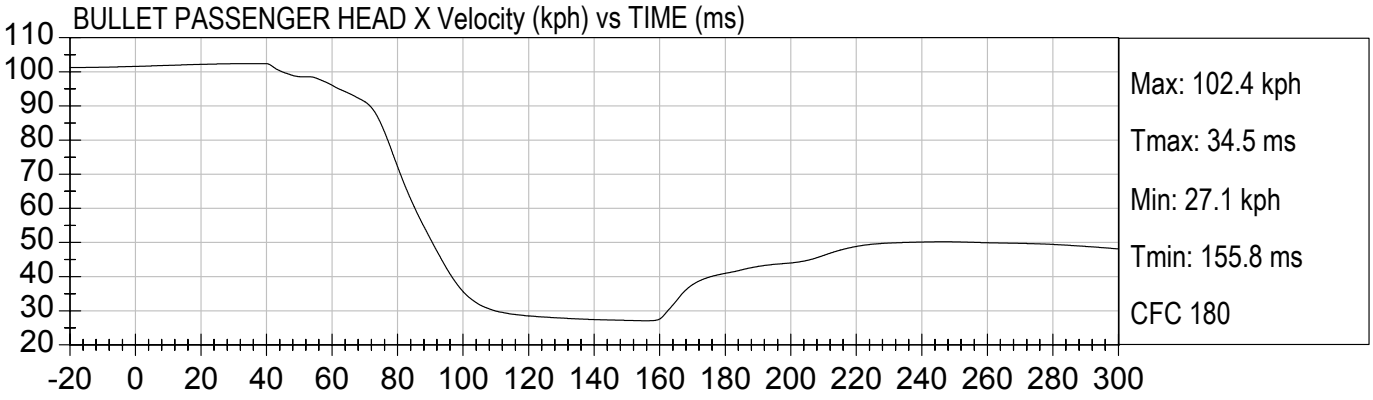
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

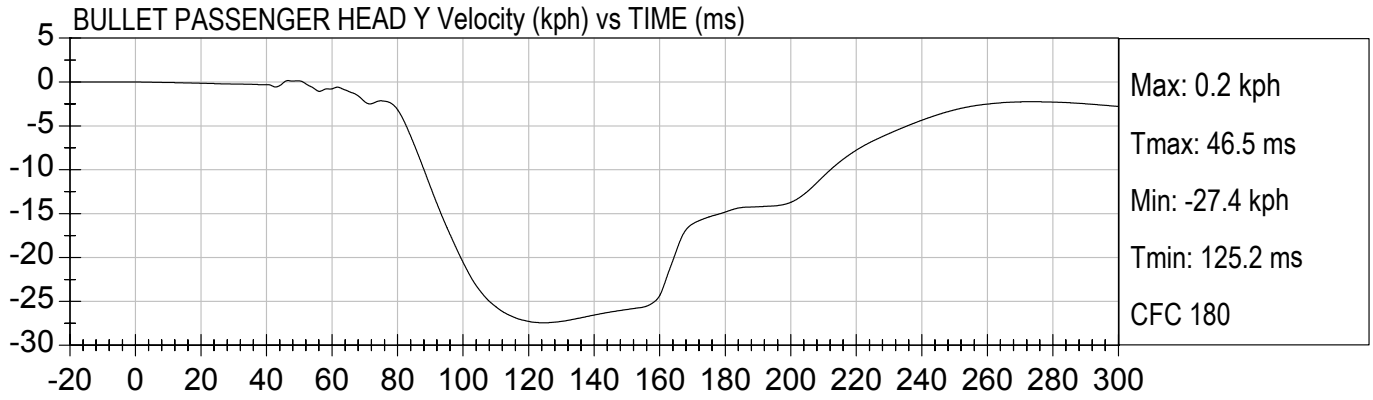


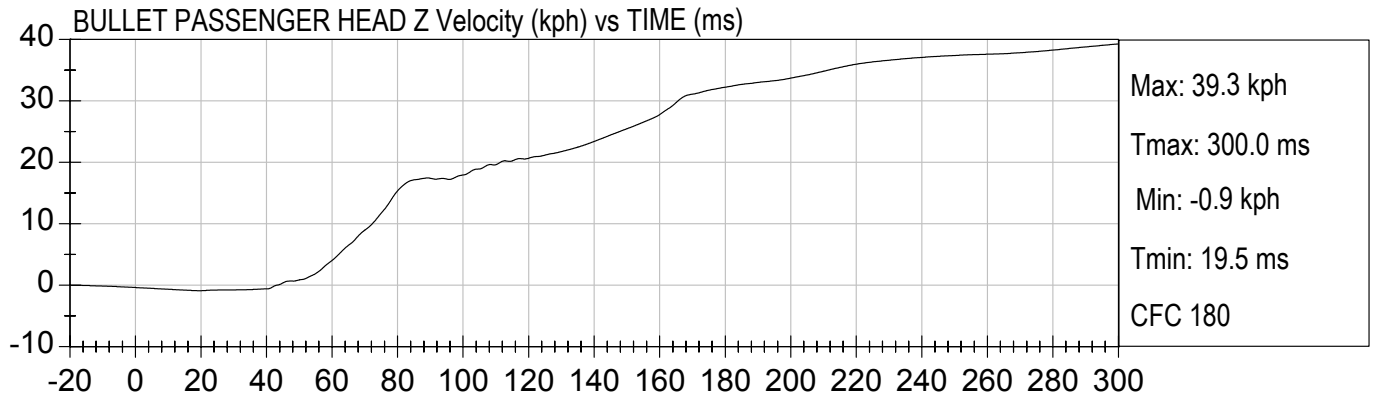






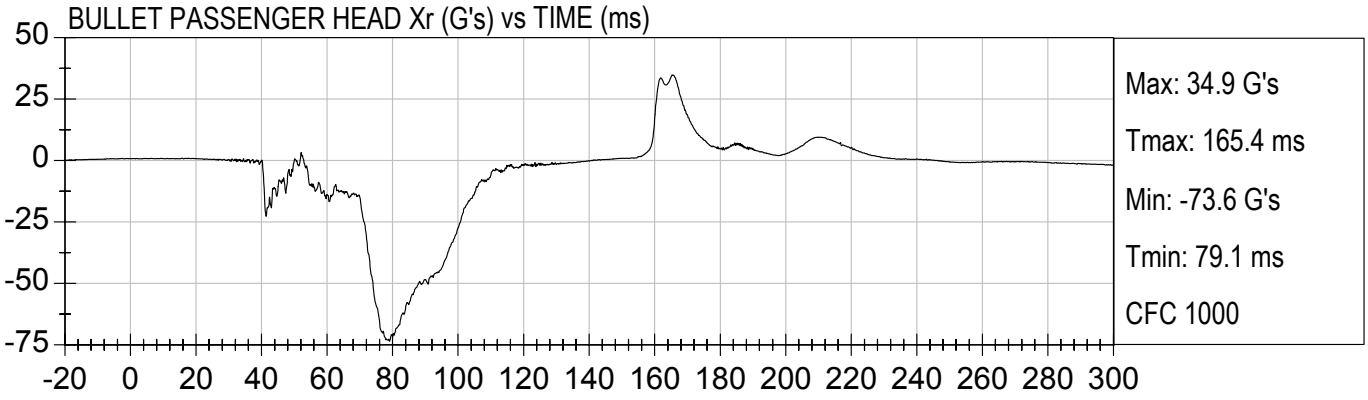

BULLET PASSENGER HEAD X Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 102.4 kph
Tmax: 34.5 ms
Min: 27.1 kph
Tmin: 155.8 ms
CFC 180

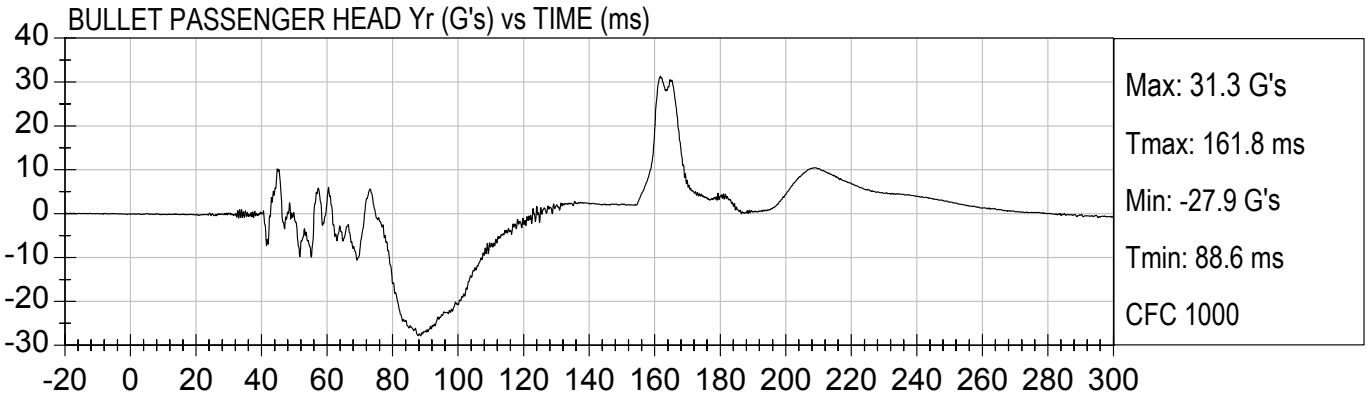

BULLET PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 46.5 ms
Min: -27.4 kph
Tmin: 125.2 ms
CFC 180

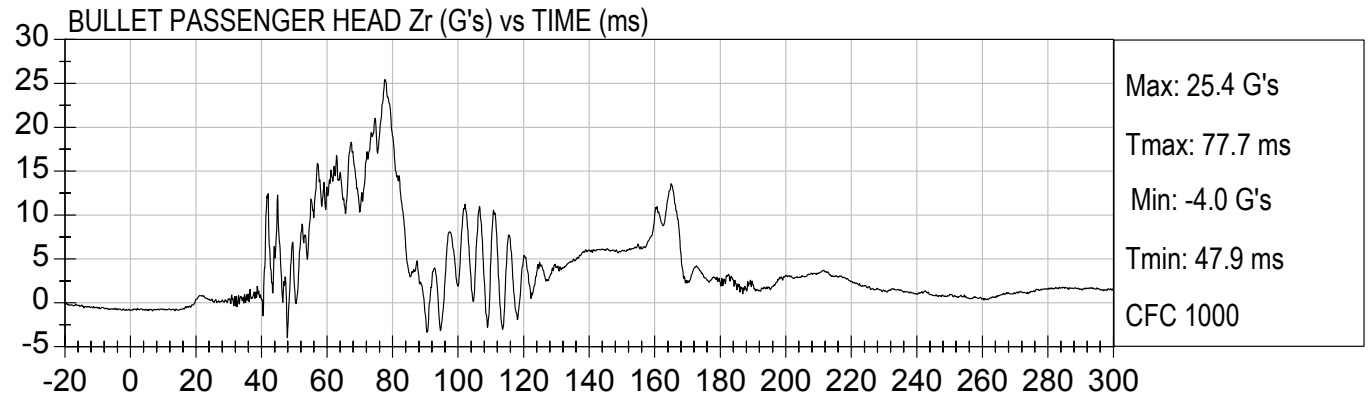

BULLET PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 39.3 kph
Tmax: 300.0 ms
Min: -0.9 kph
Tmin: 19.5 ms
CFC 180

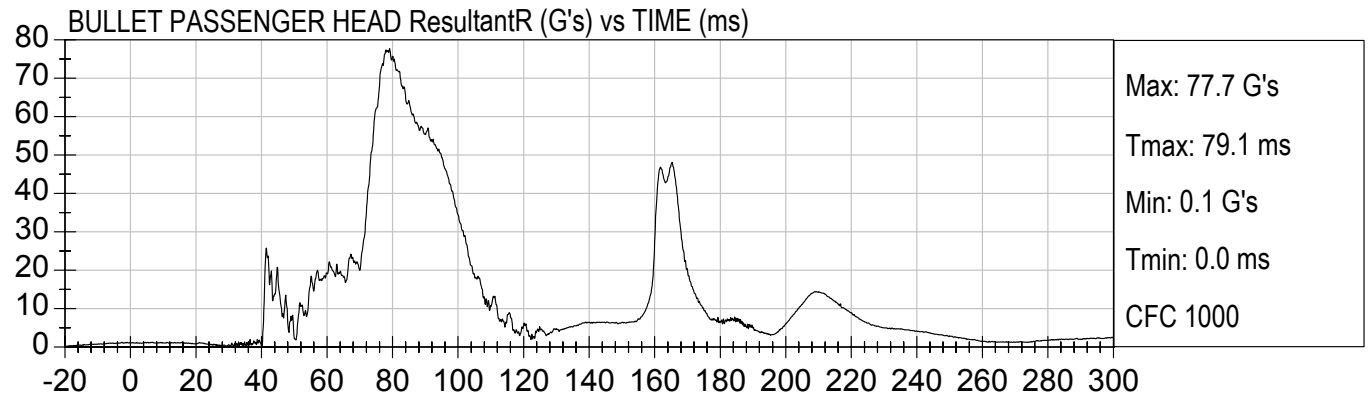
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

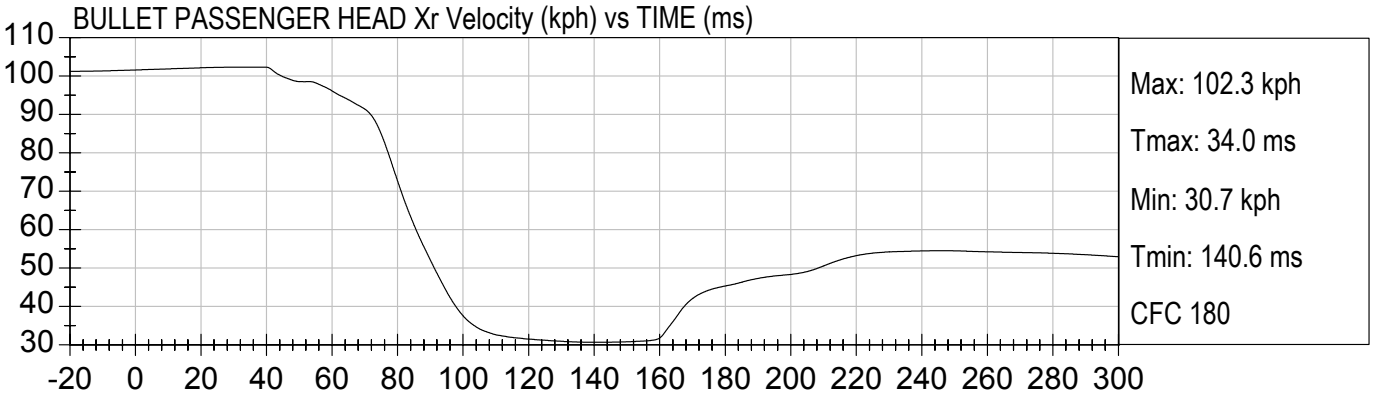
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

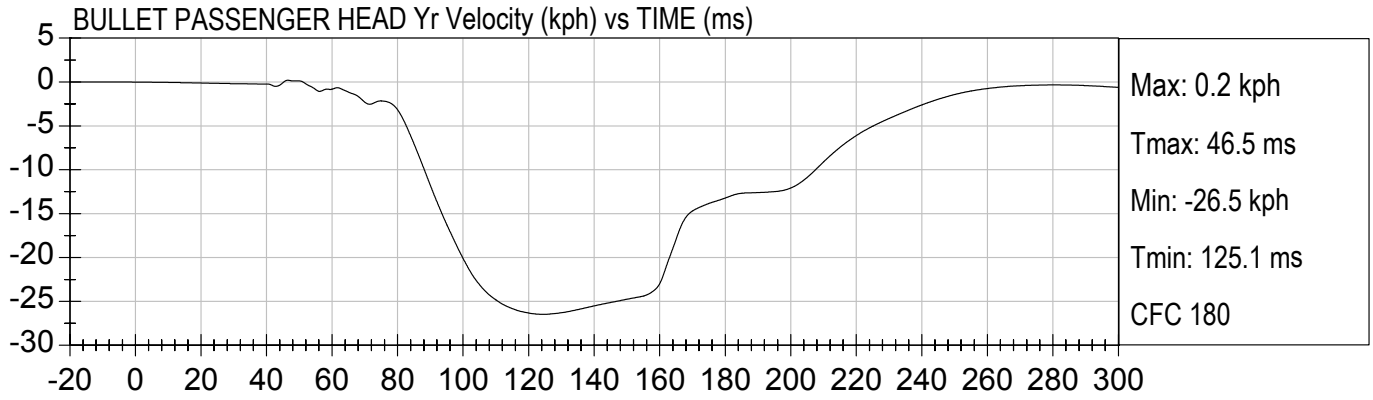


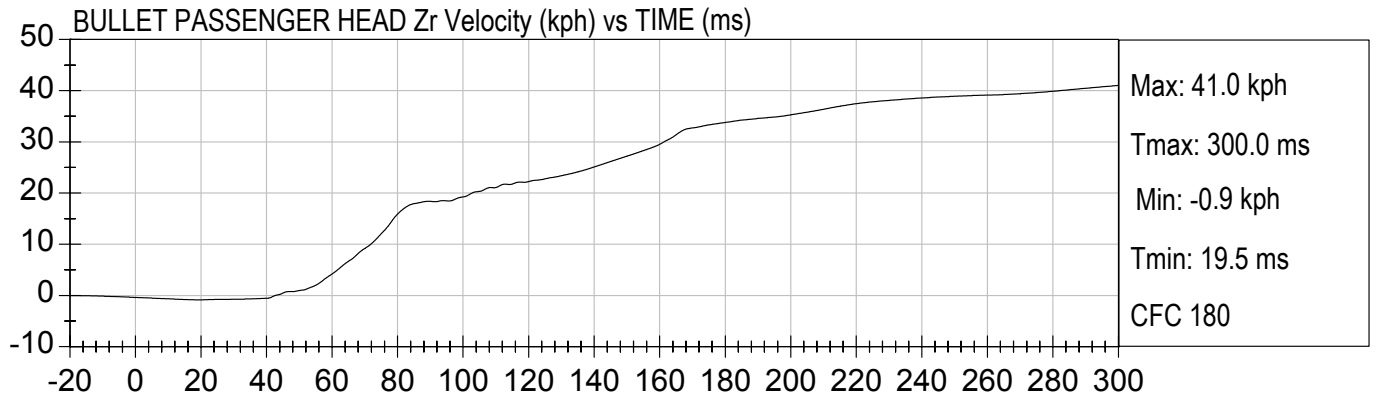






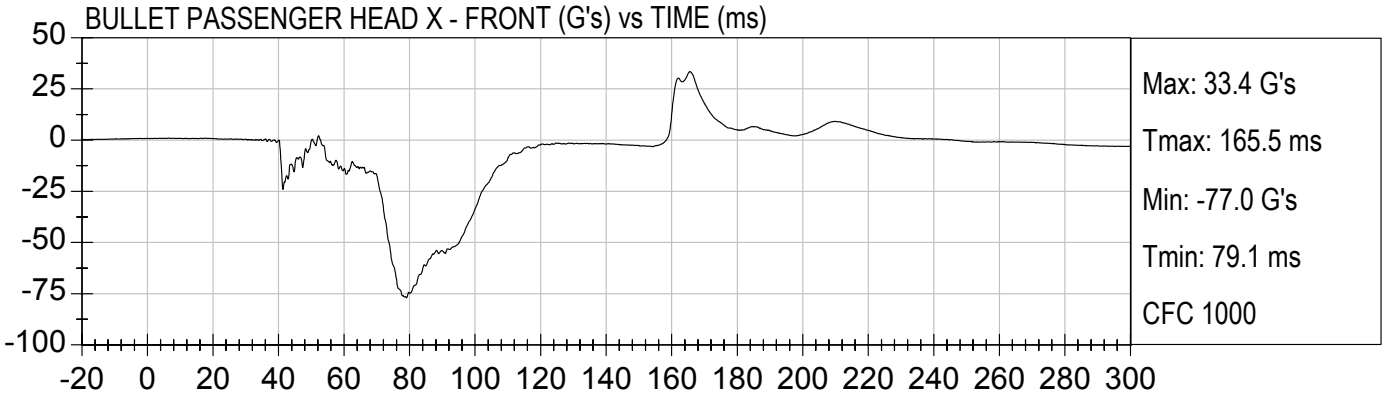

BULLET PASSENGER HEAD Xr Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 102.3 kph
Tmax: 34.0 ms
Min: 30.7 kph
Tmin: 140.6 ms
CFC 180

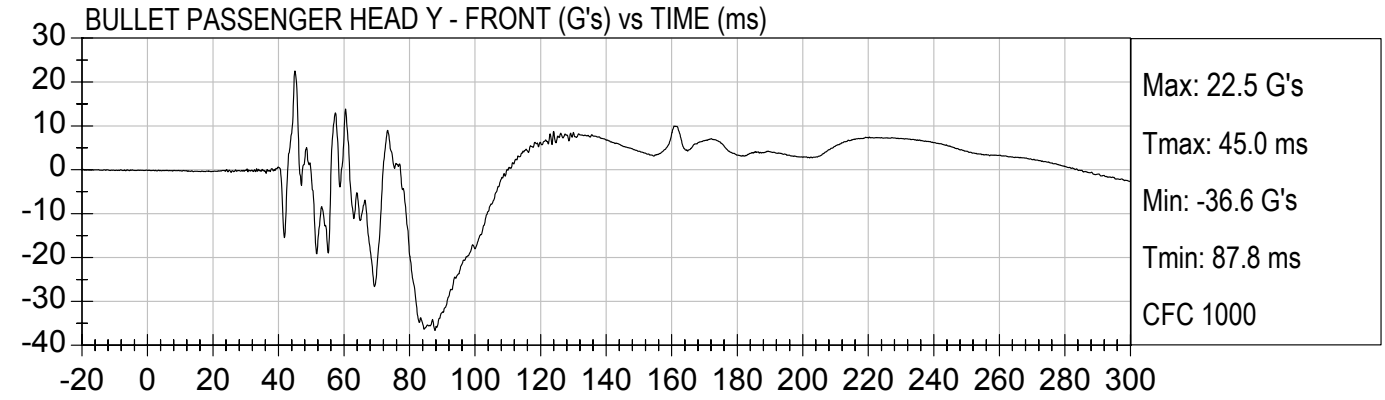

BULLET PASSENGER HEAD Yr Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 46.5 ms
Min: -26.5 kph
Tmin: 125.1 ms
CFC 180

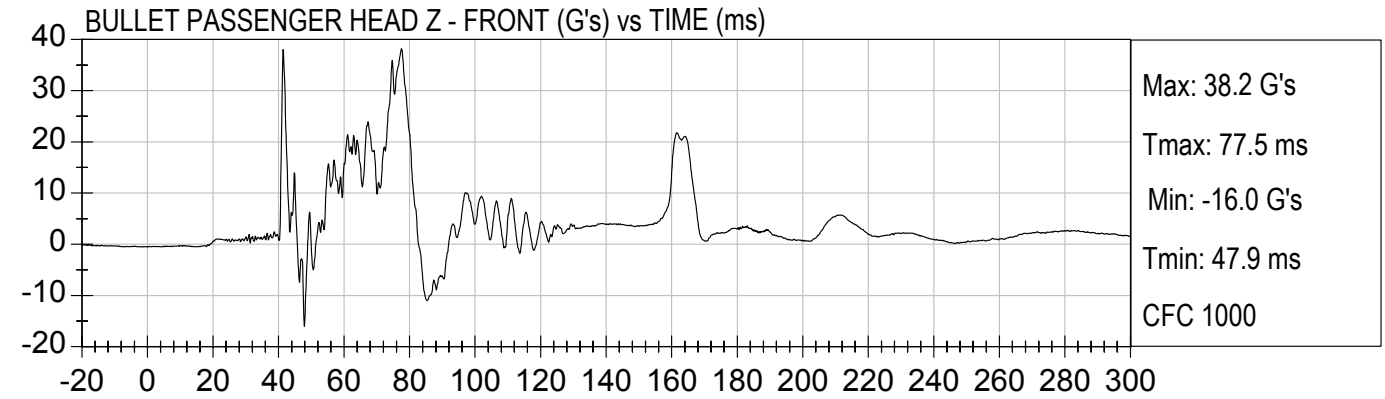

BULLET PASSENGER HEAD Zr Velocity (kph) vs TIME (ms)
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 41.0 kph
Tmax: 300.0 ms
Min: -0.9 kph
Tmin: 19.5 ms
CFC 180

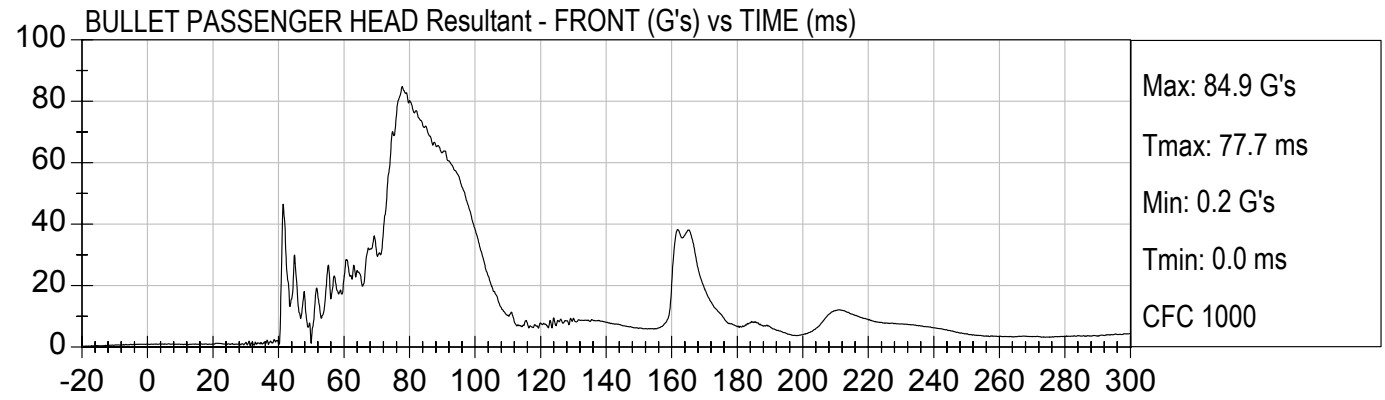
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

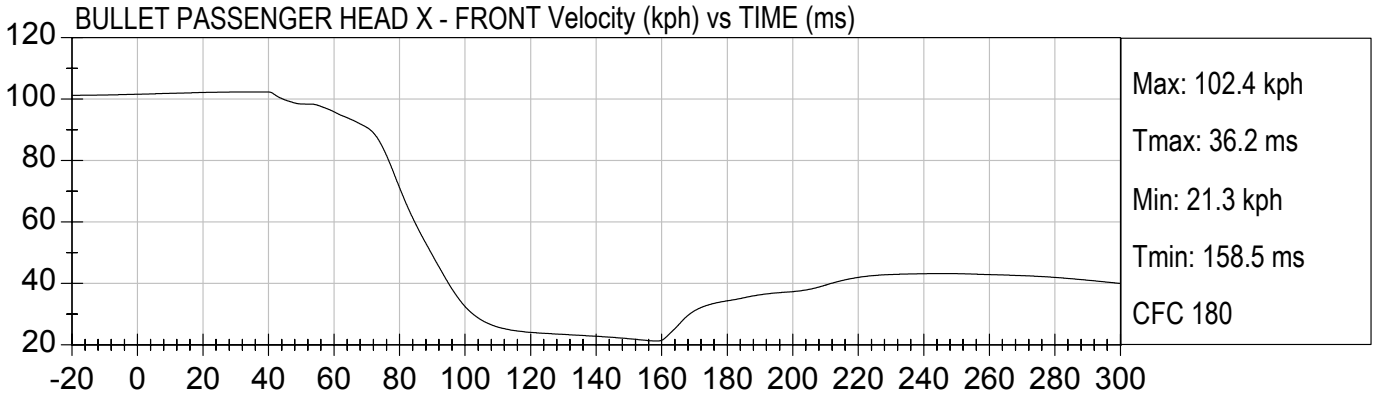
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

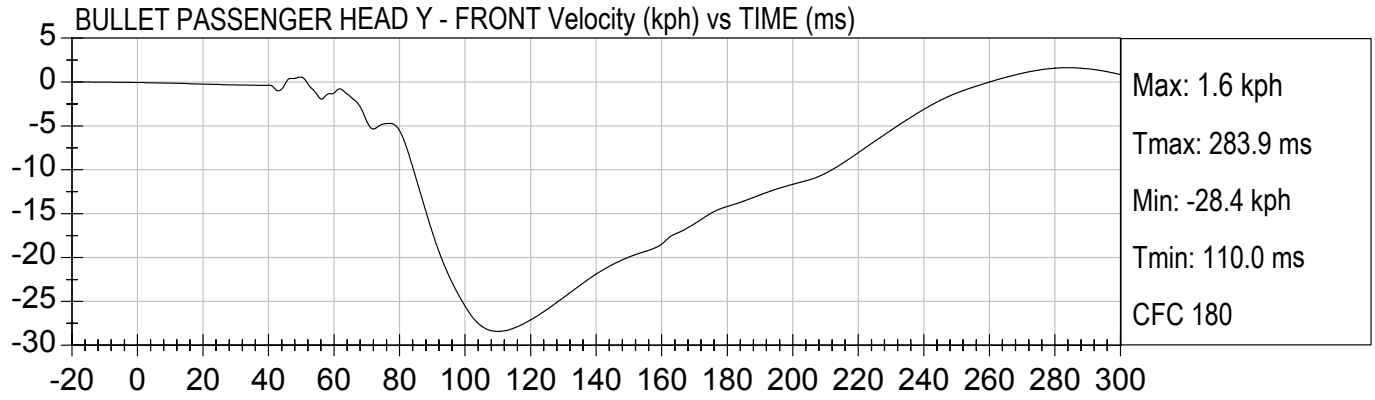


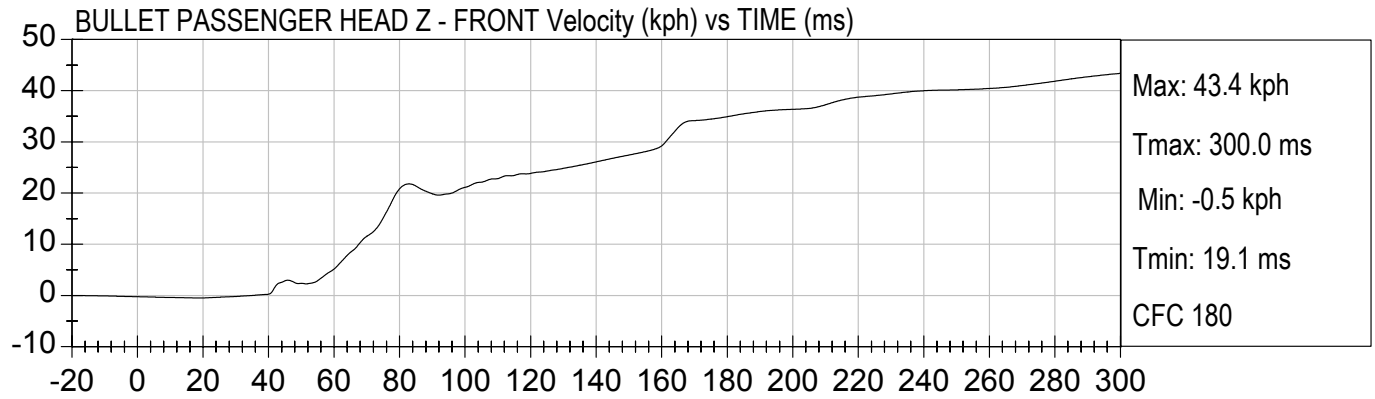






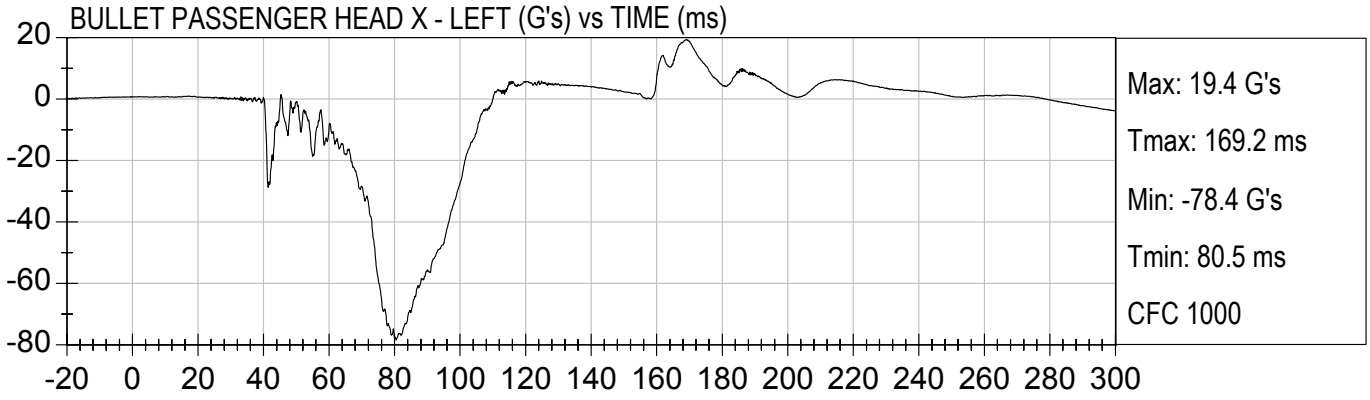

BULLET PASSENGER HEAD X - FRONT Velocity (kph) vs TIME (ms)
120
100
80
60
40
20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 102.4 kph
Tmax: 36.2 ms
Min: 21.3 kph
Tmin: 158.5 ms
CFC 180

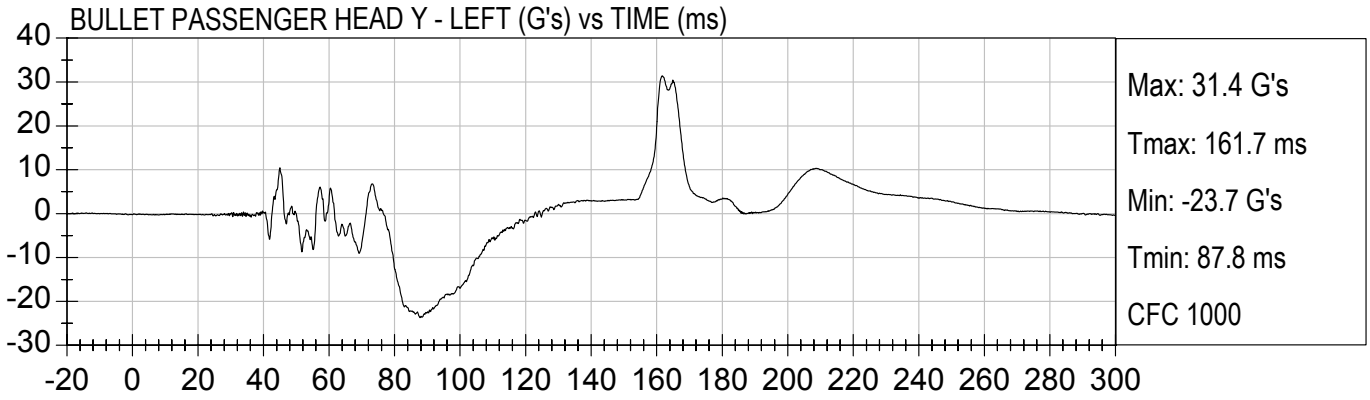

BULLET PASSENGER HEAD Y - FRONT Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.6 kph
Tmax: 283.9 ms
Min: -28.4 kph
Tmin: 110.0 ms
CFC 180

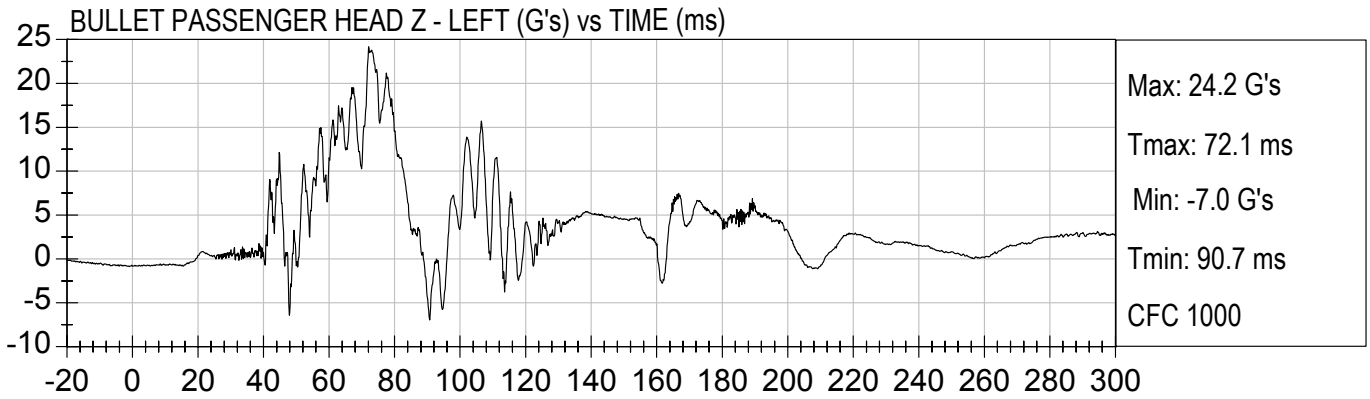

BULLET PASSENGER HEAD Z - FRONT Velocity (kph) vs TIME (ms)
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 43.4 kph
Tmax: 300.0 ms
Min: -0.5 kph
Tmin: 19.1 ms
CFC 180

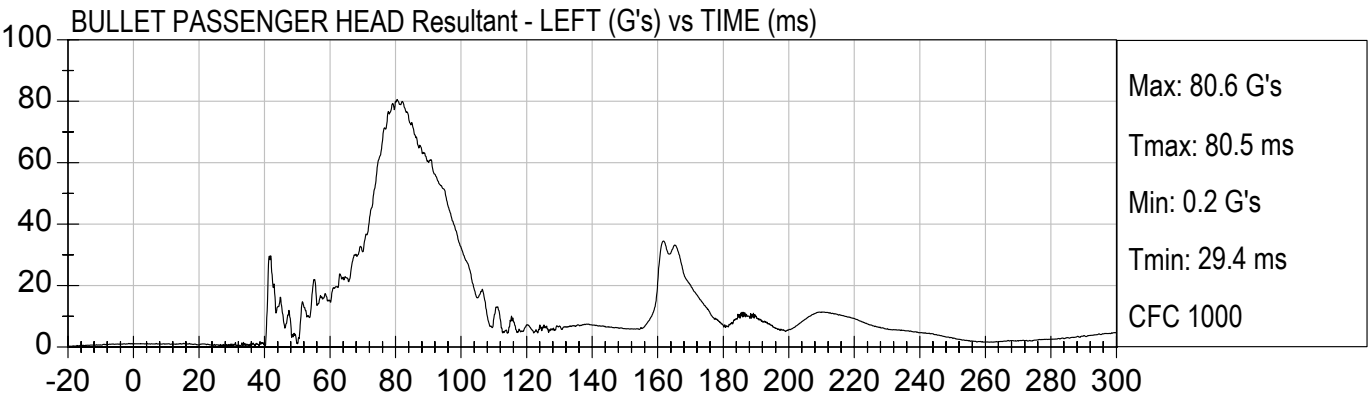
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

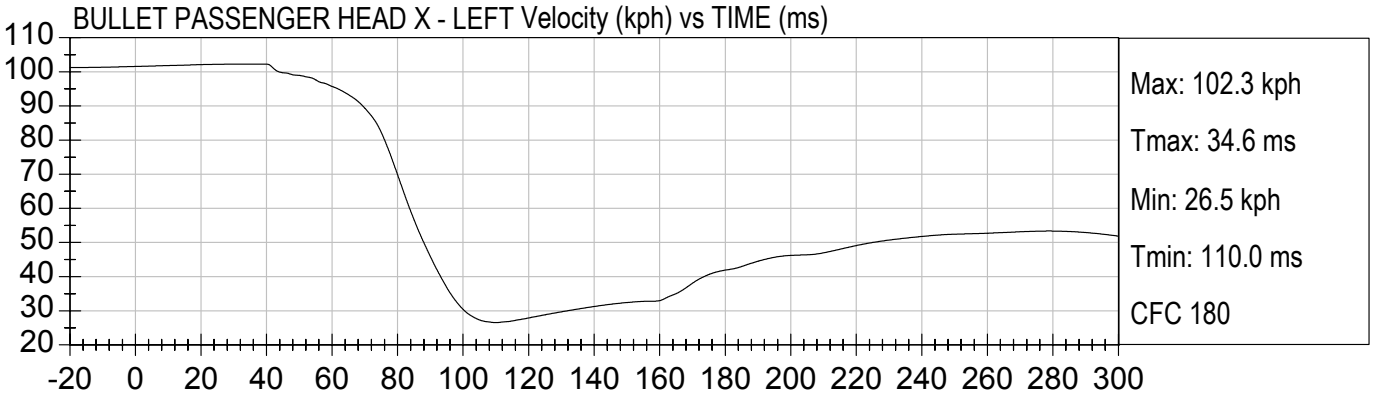
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

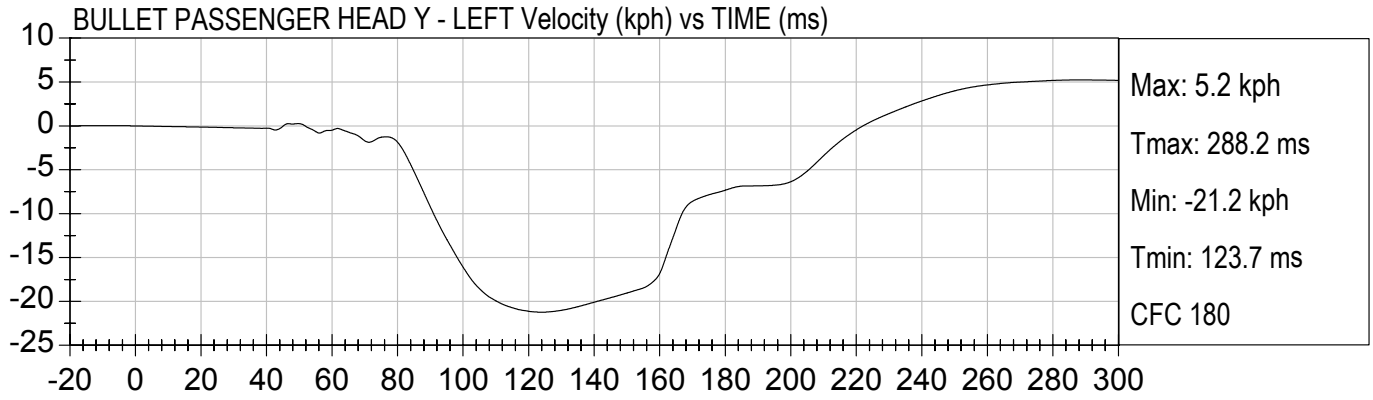


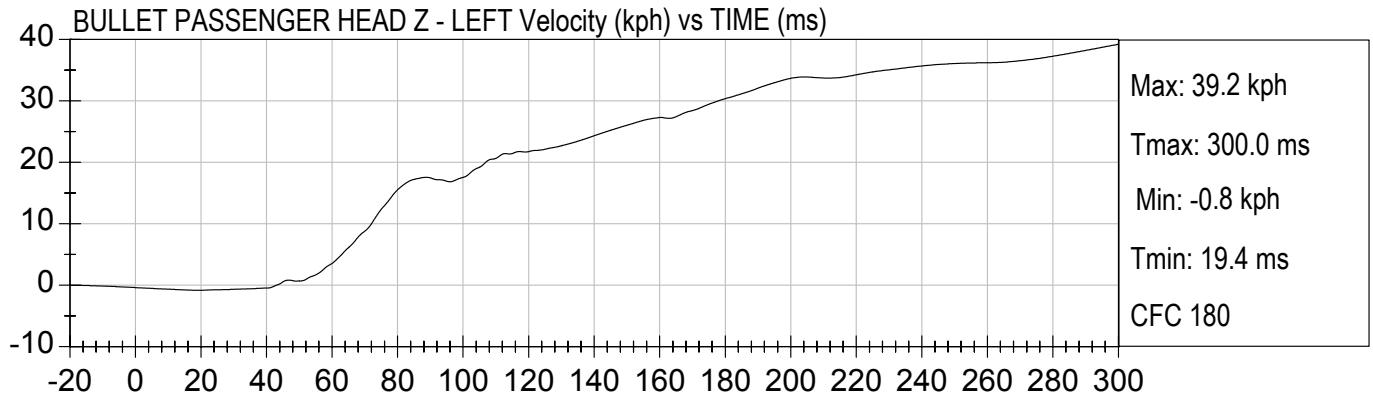






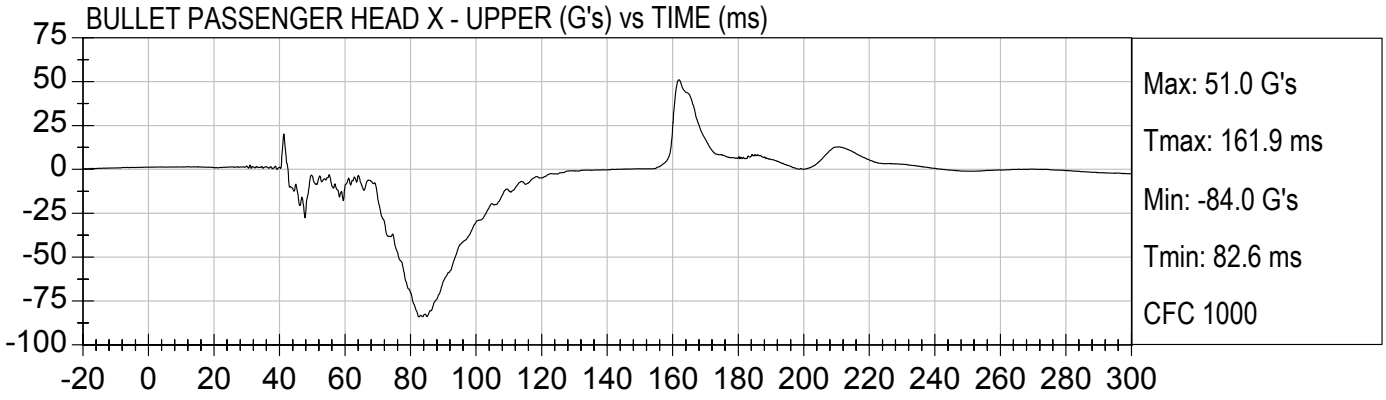

BULLET PASSENGER HEAD X - LEFT Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 102.3 kph
Tmax: 34.6 ms
Min: 26.5 kph
Tmin: 110.0 ms
CFC 180

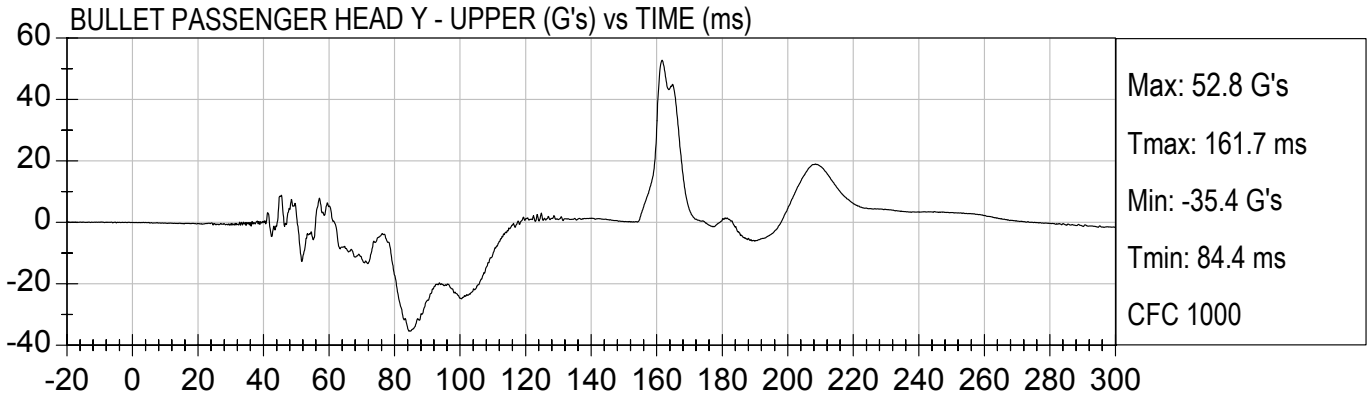

BULLET PASSENGER HEAD Y - LEFT Velocity (kph) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-25
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 5.2 kph
Tmax: 288.2 ms
Min: -21.2 kph
Tmin: 123.7 ms
CFC 180

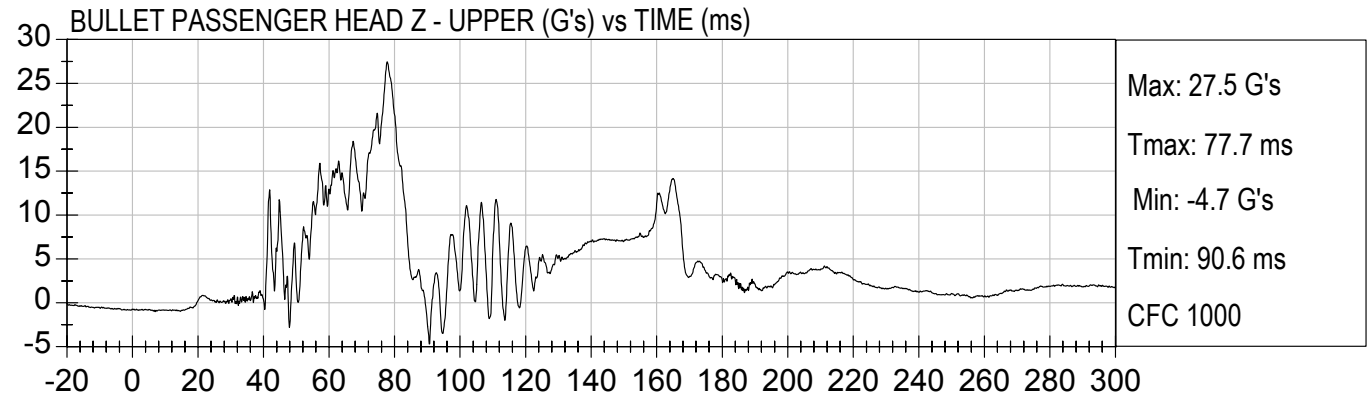

BULLET PASSENGER HEAD Z - LEFT Velocity (kph) vs TIME (ms)
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 39.2 kph
Tmax: 300.0 ms
Min: -0.8 kph
Tmin: 19.4 ms
CFC 180

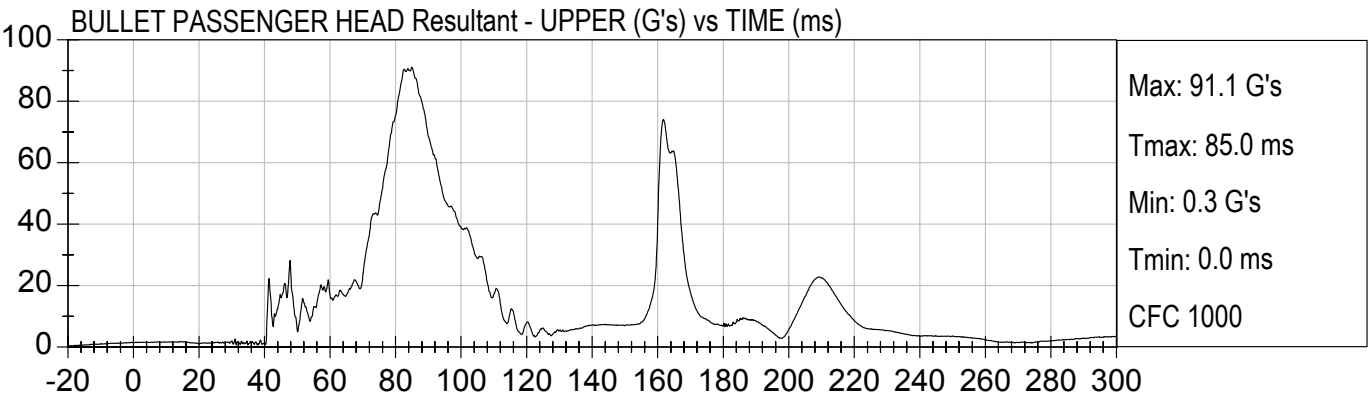
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

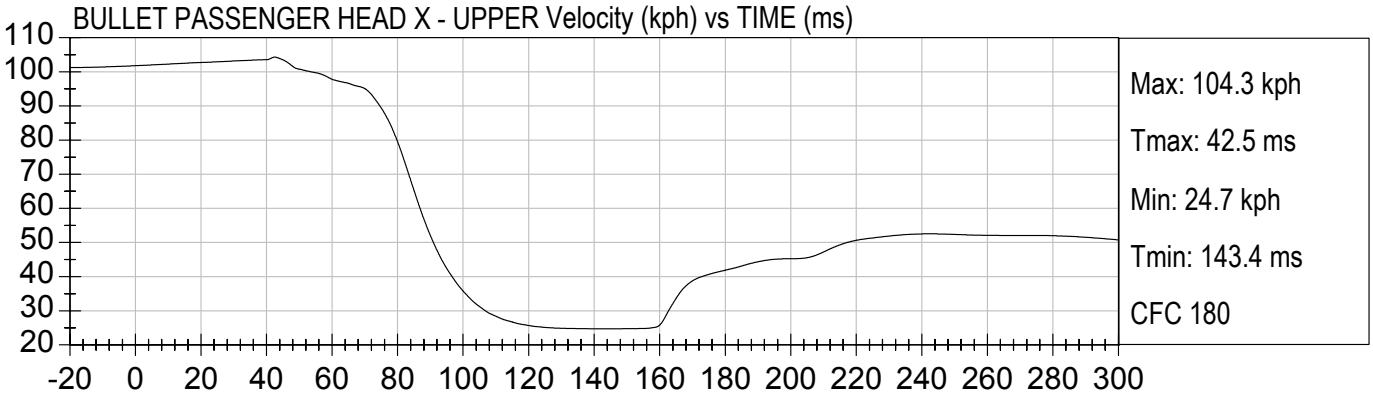
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

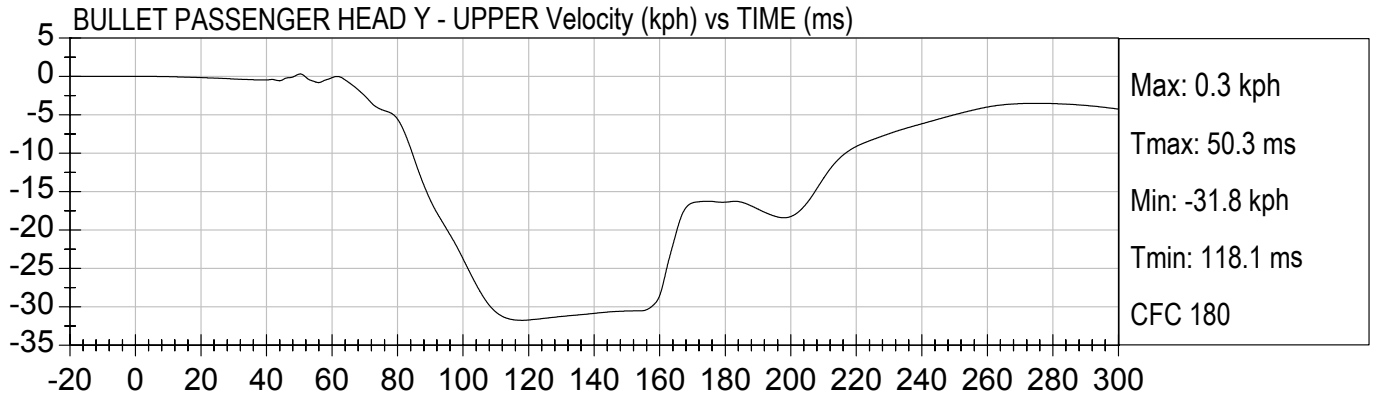


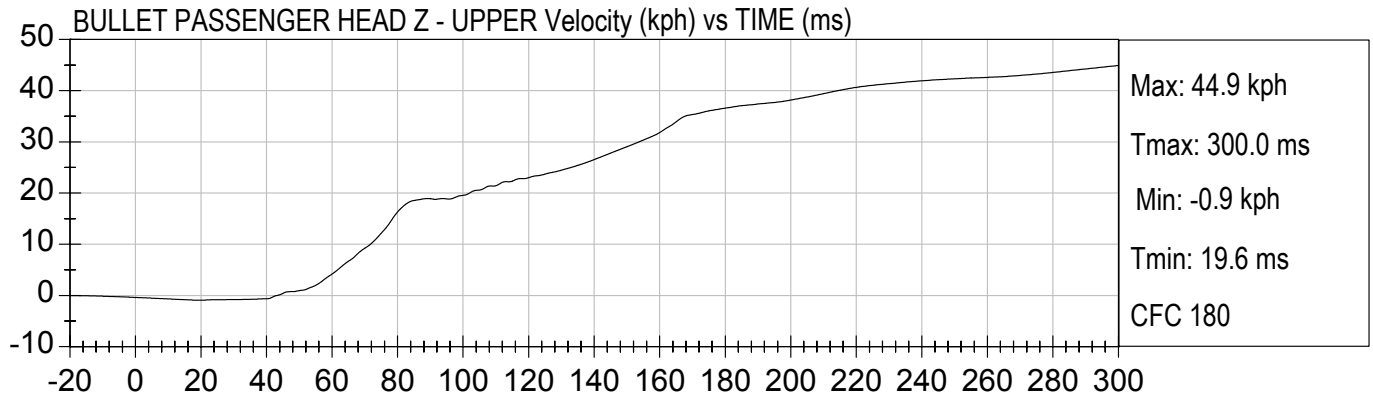






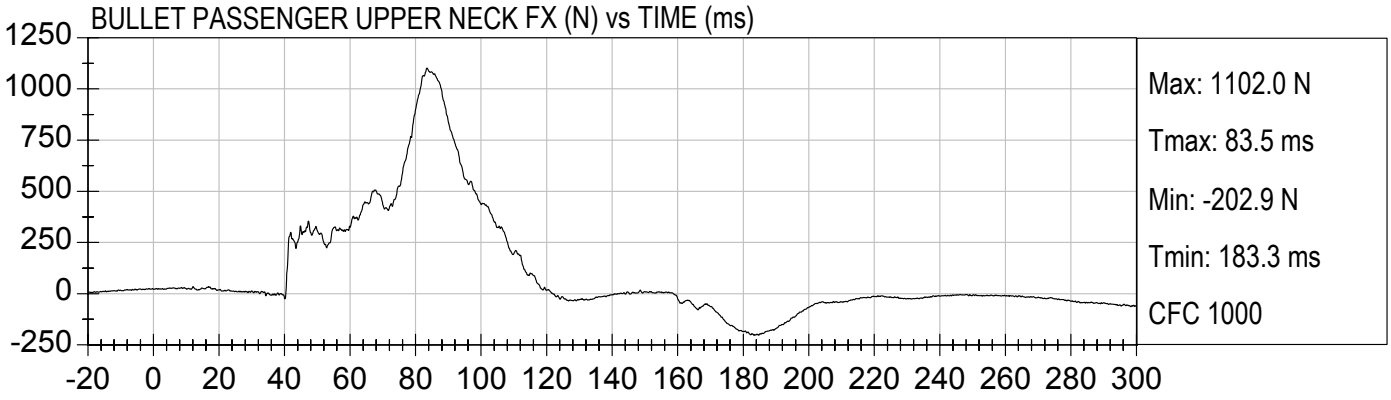

BULLET PASSENGER HEAD X - UPPER Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
30
20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 104.3 kph
Tmax: 42.5 ms
Min: 24.7 kph
Tmin: 143.4 ms
CFC 180

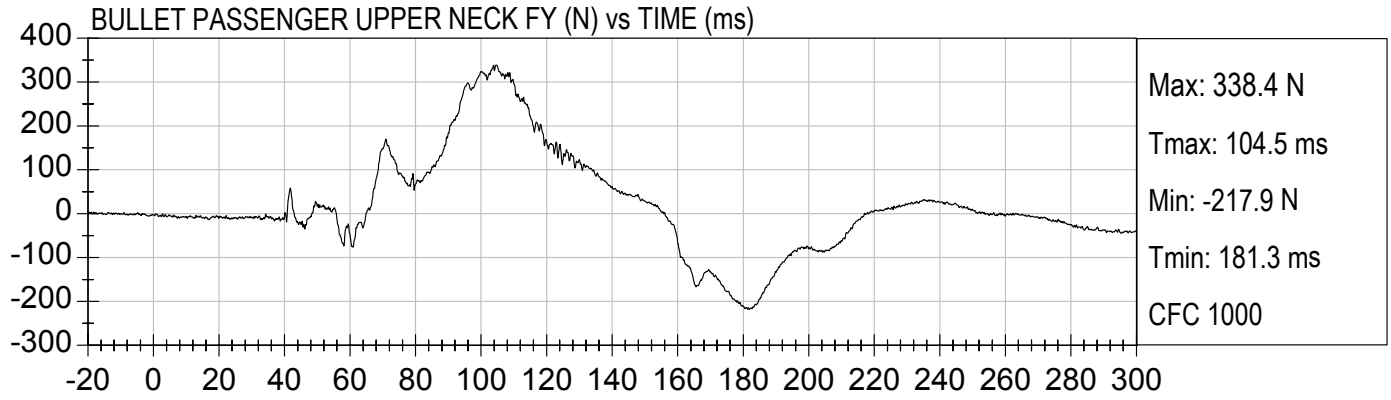

BULLET PASSENGER HEAD Y - UPPER Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.3 kph
Tmax: 50.3 ms
Min: -31.8 kph
Tmin: 118.1 ms
CFC 180

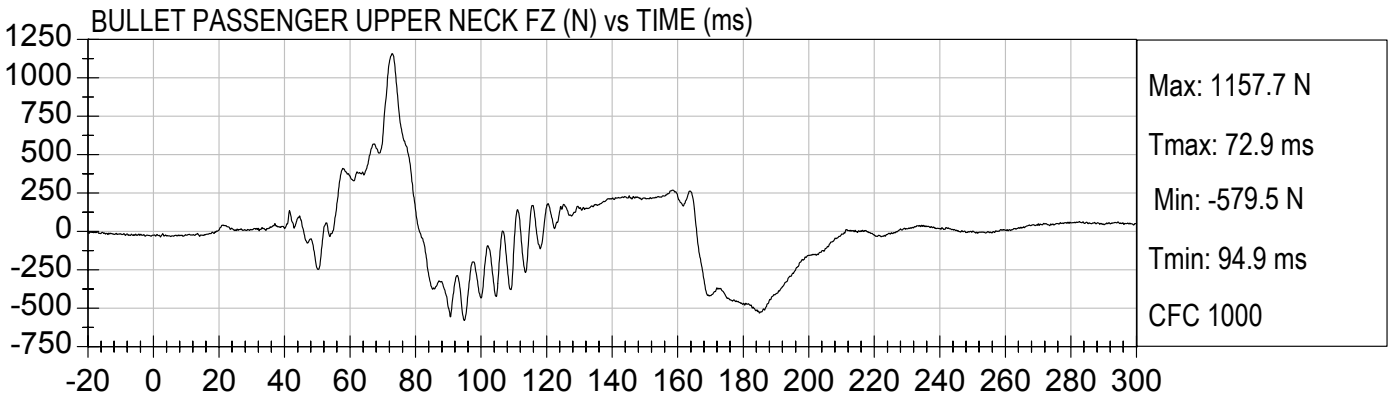

BULLET PASSENGER HEAD Z - UPPER Velocity (kph) vs TIME (ms)
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 44.9 kph
Tmax: 300.0 ms
Min: -0.9 kph
Tmin: 19.6 ms
CFC 180

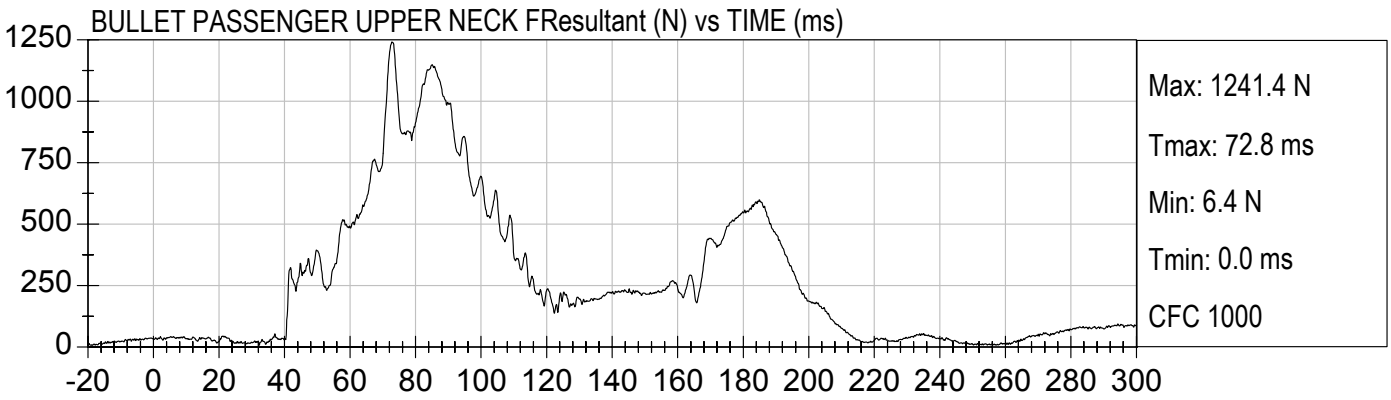
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



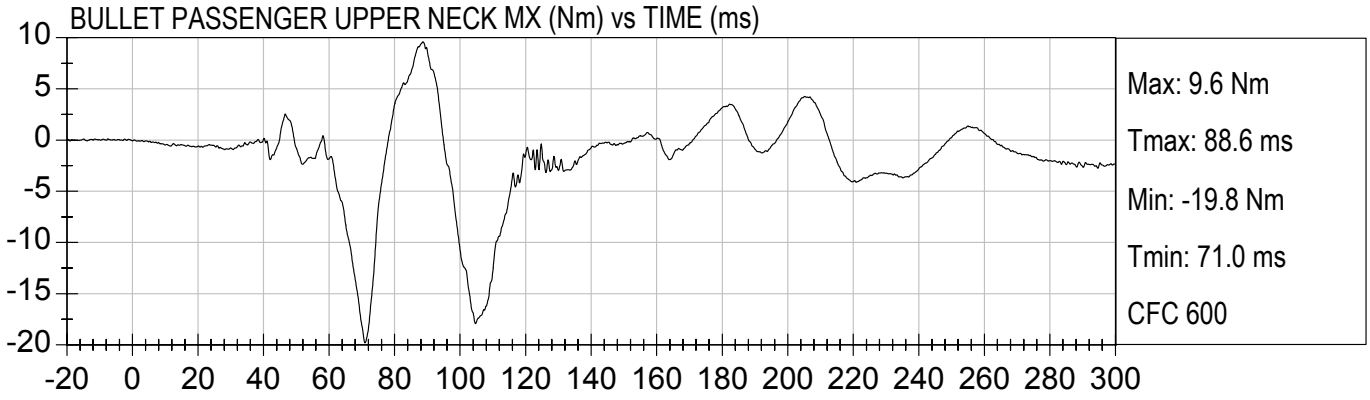


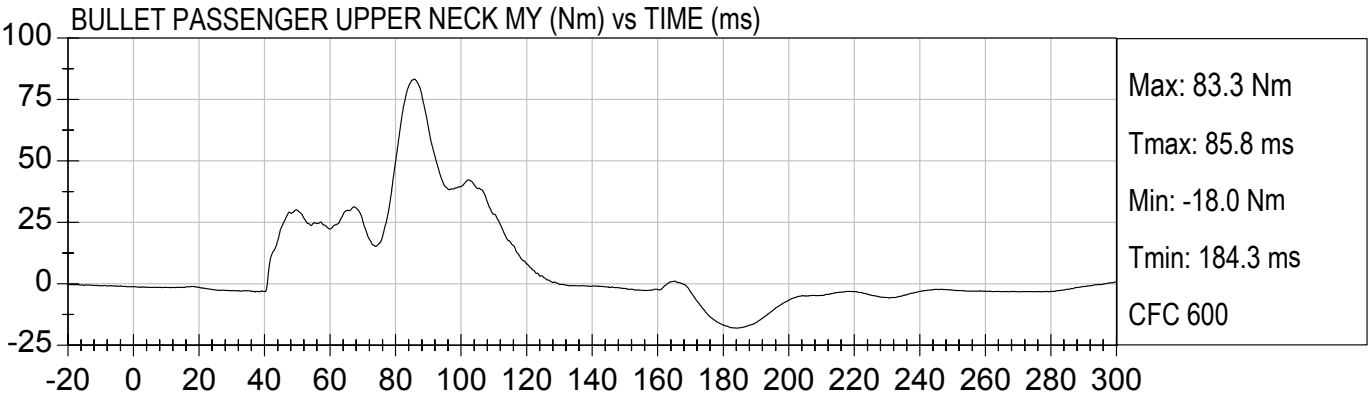


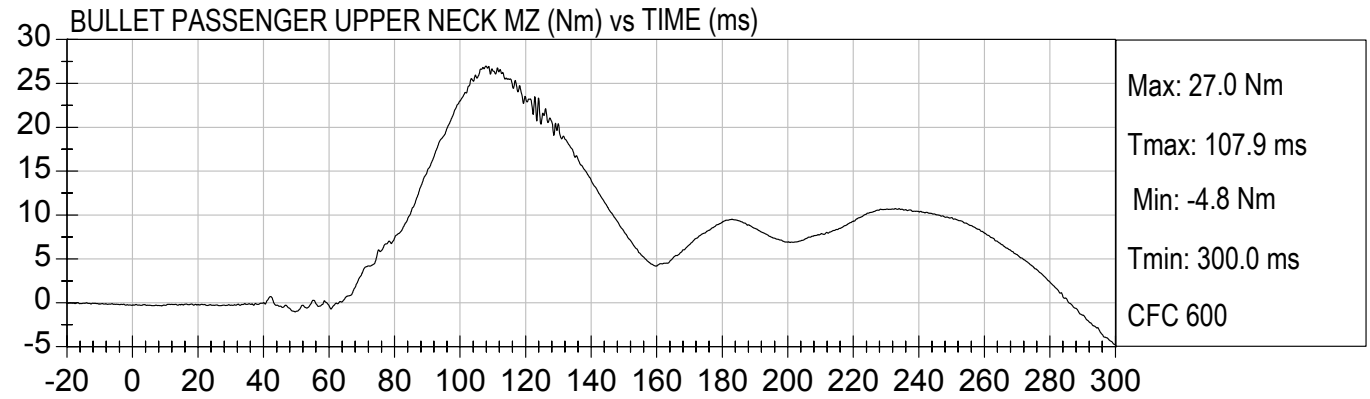


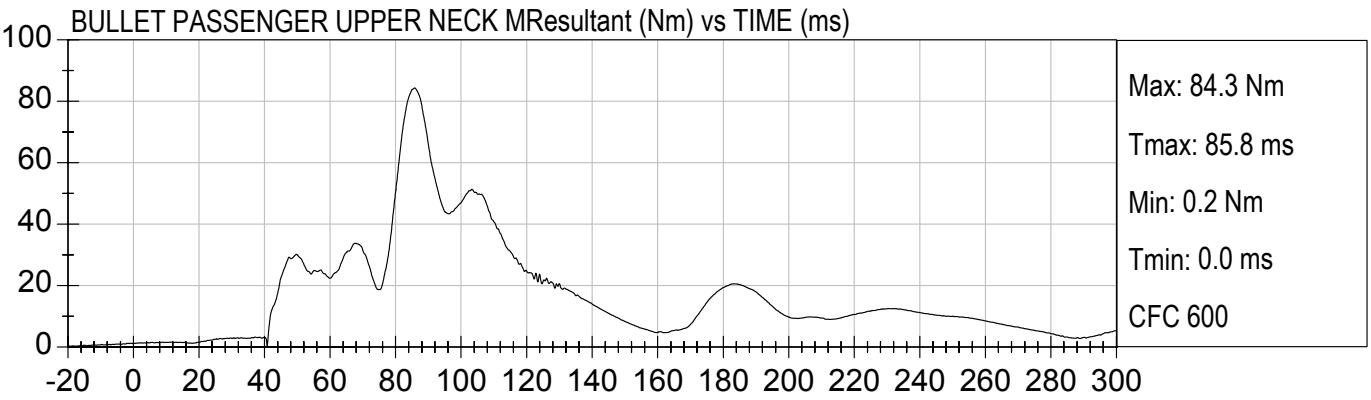
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



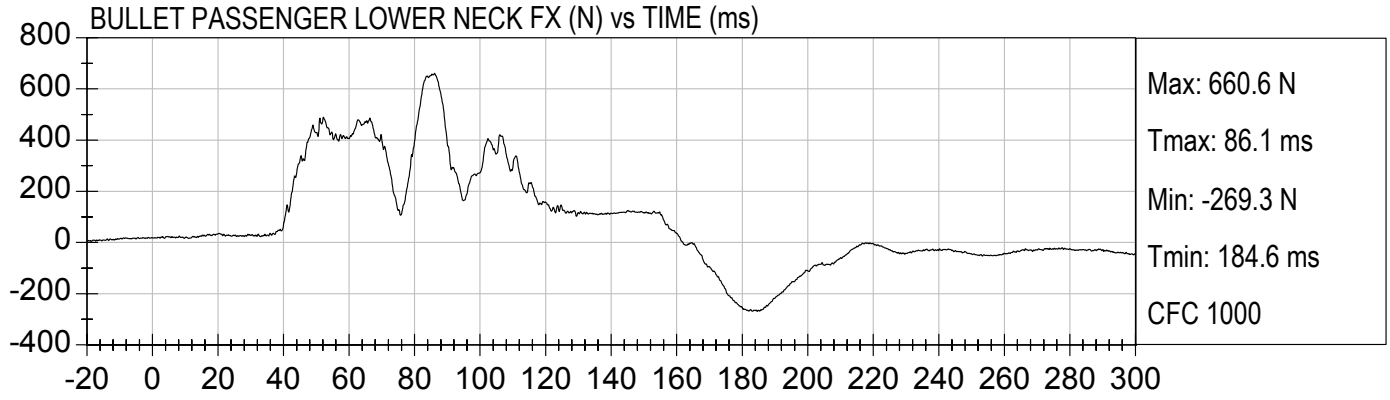


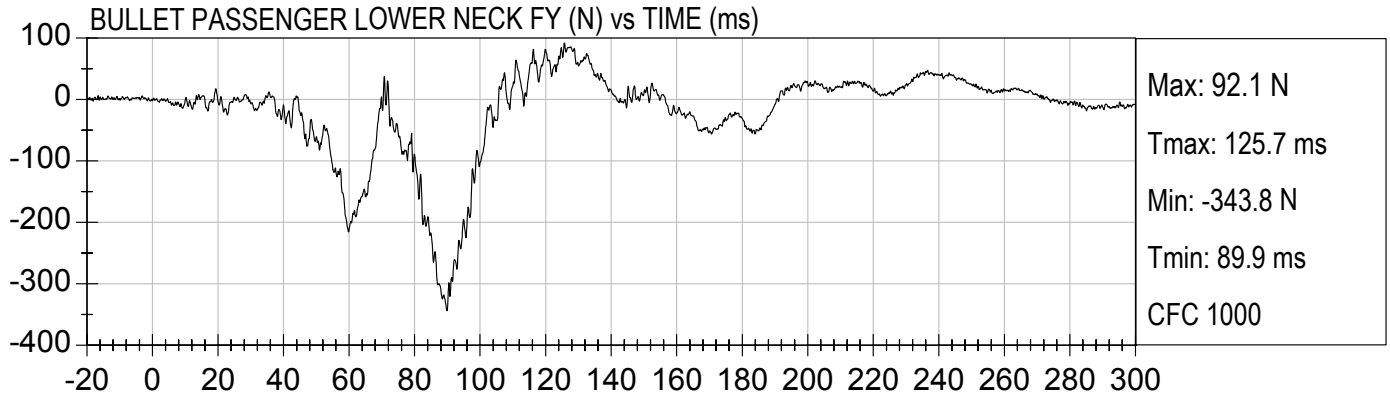


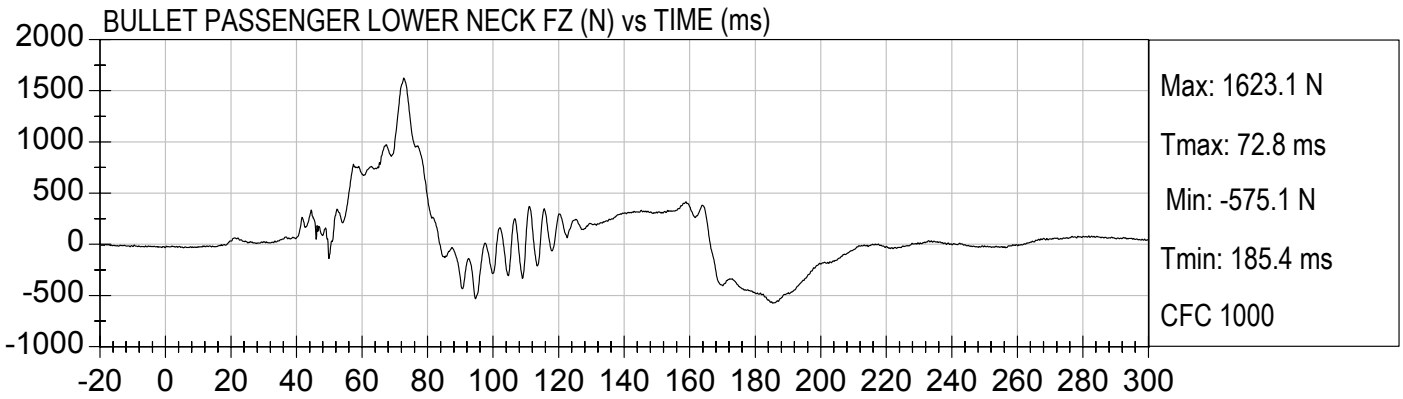


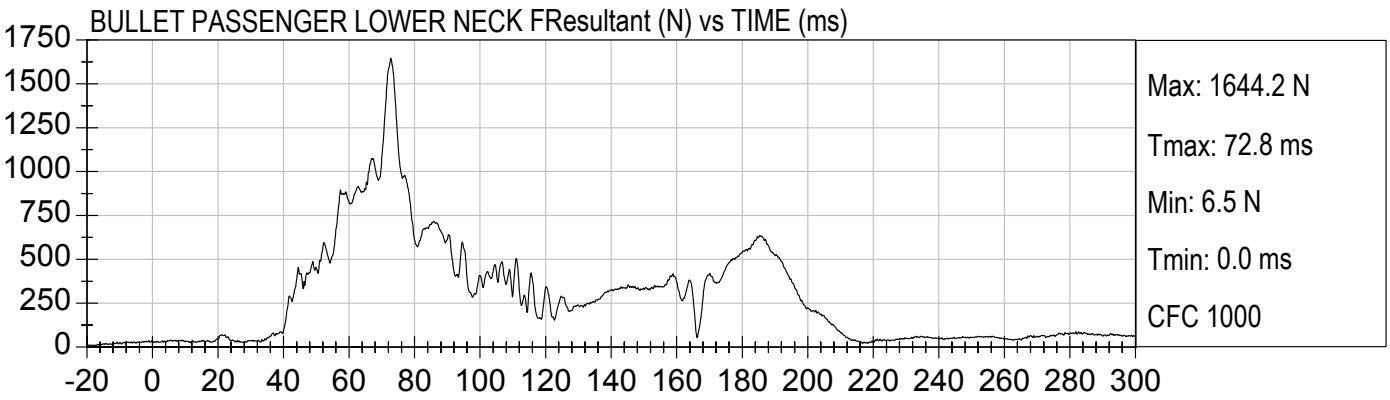
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



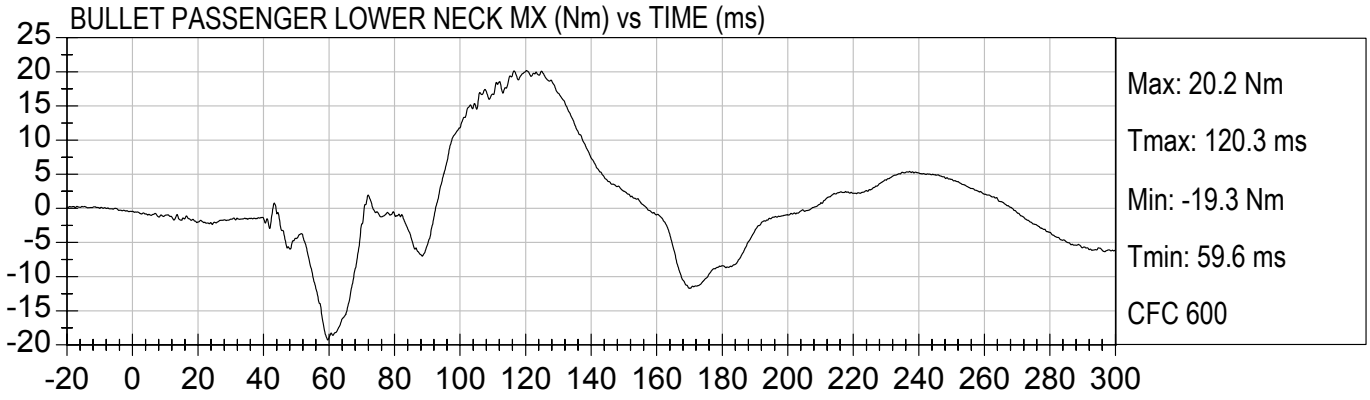


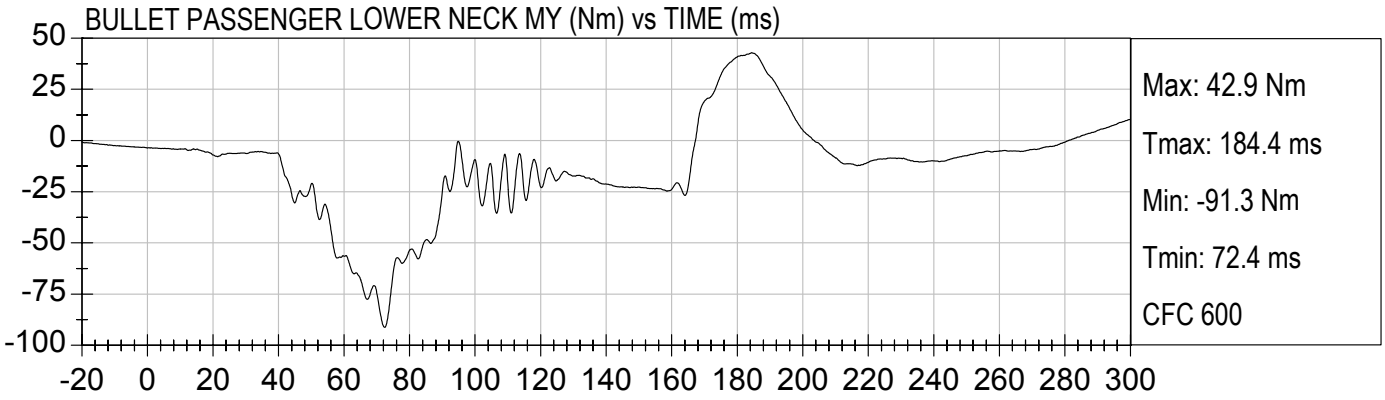


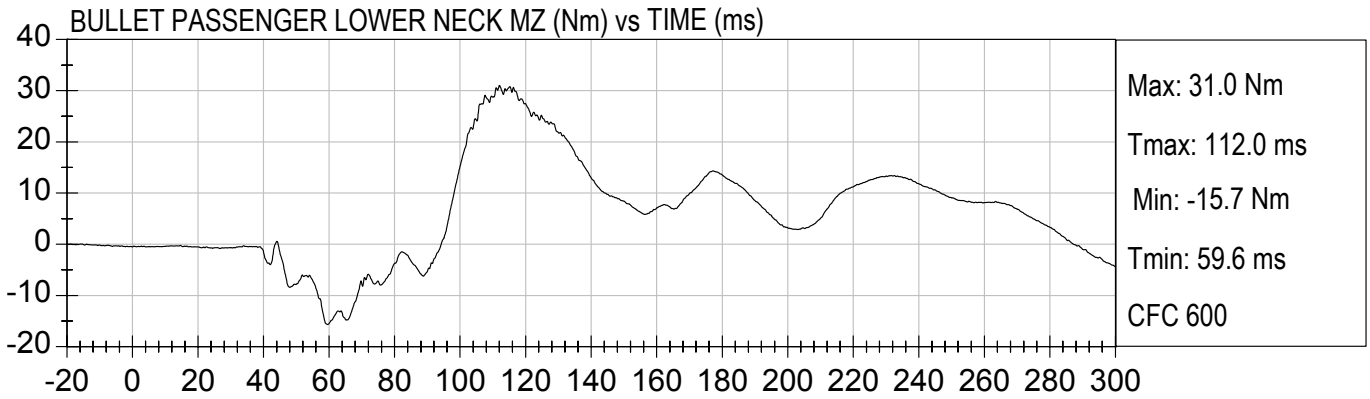


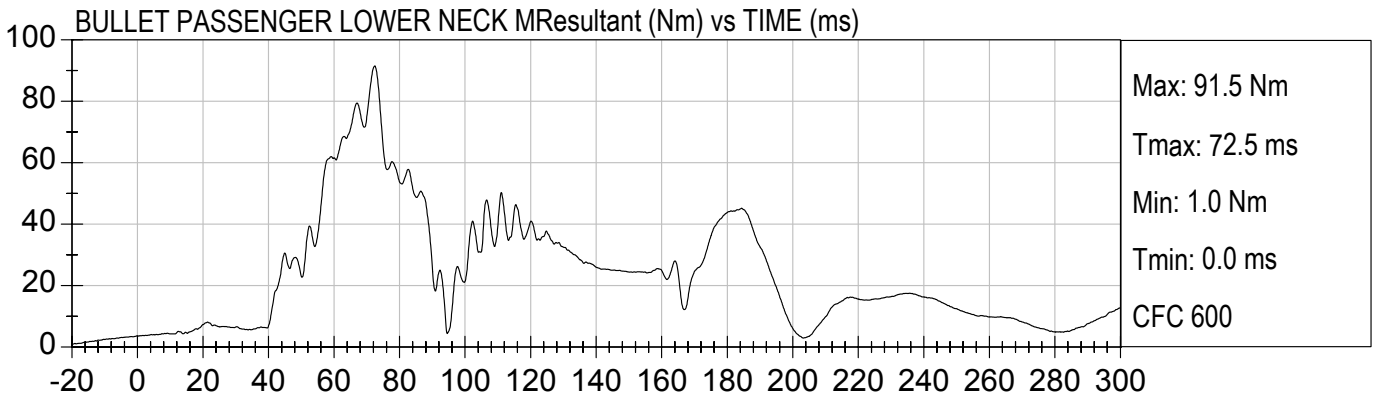
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



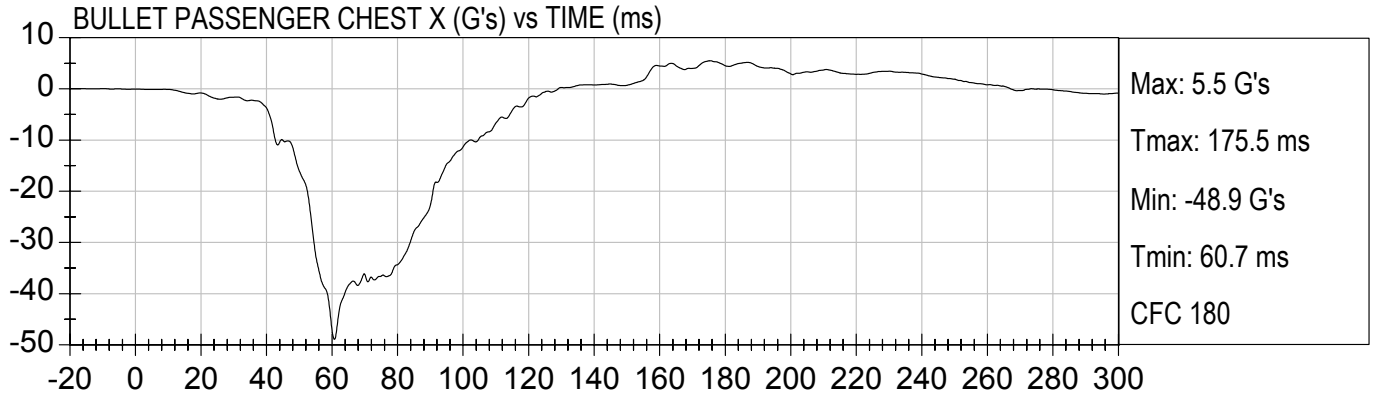


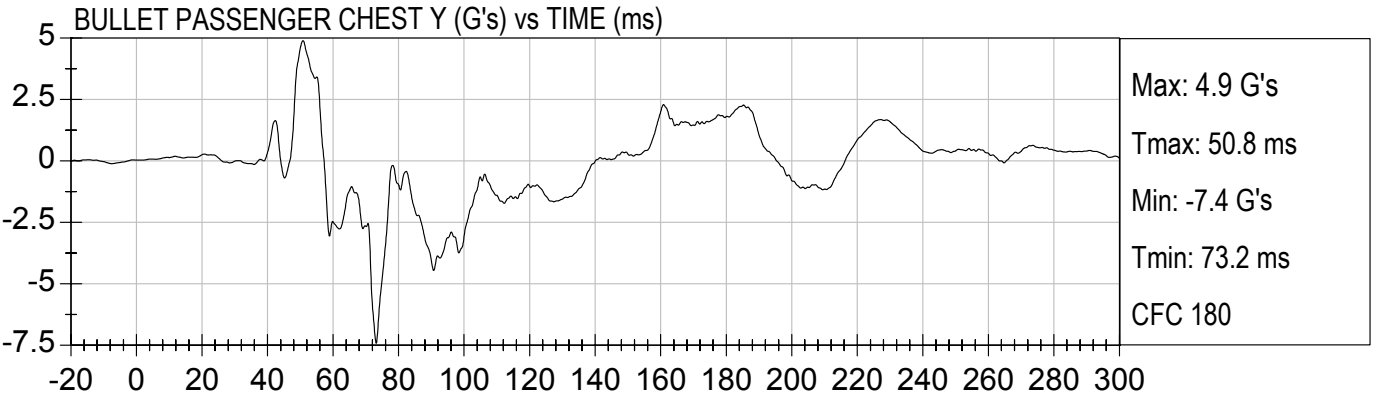


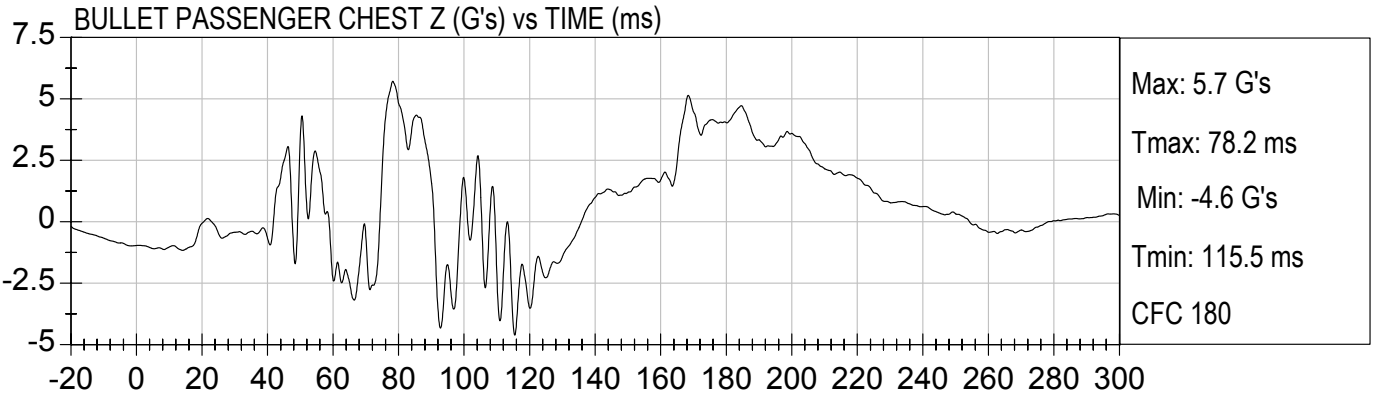


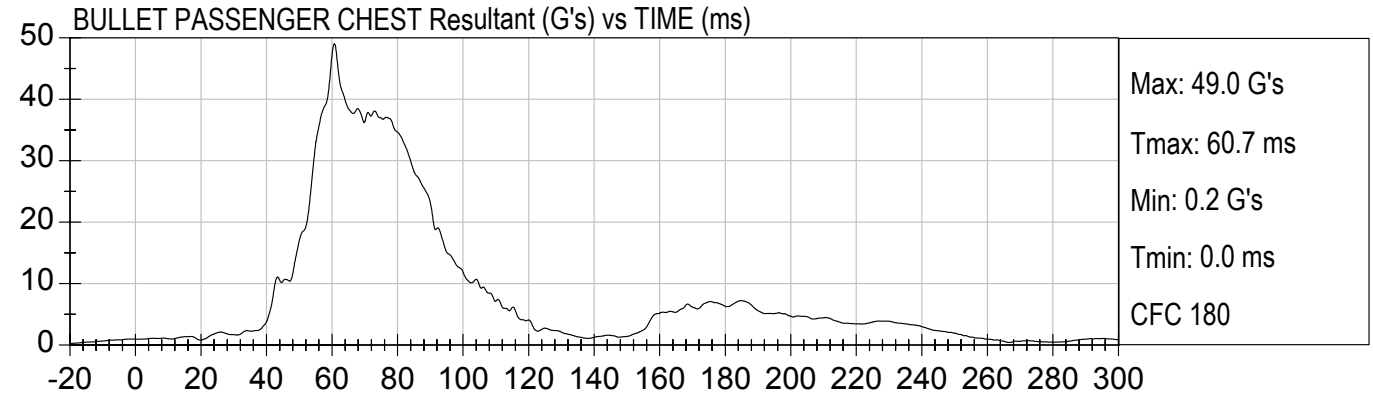
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



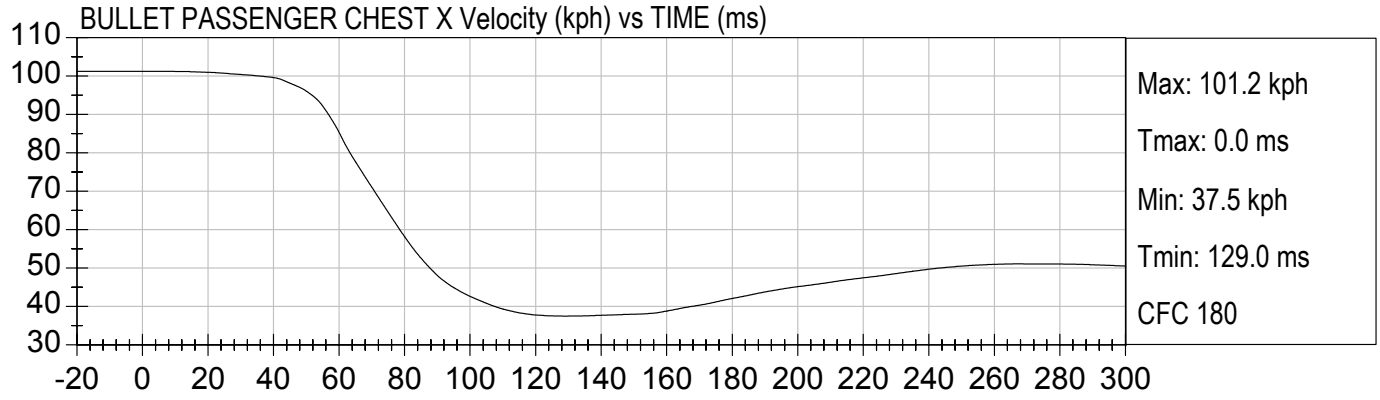


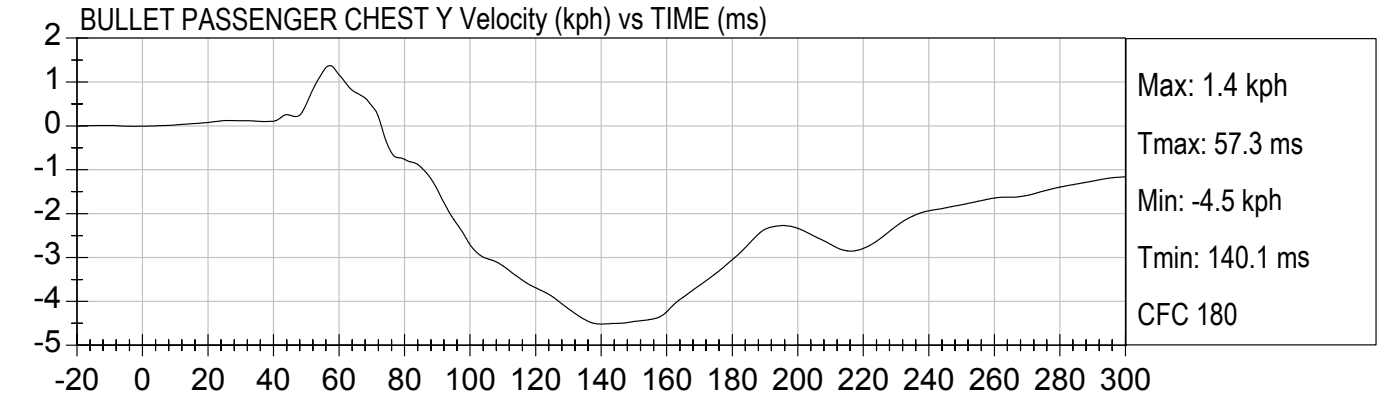


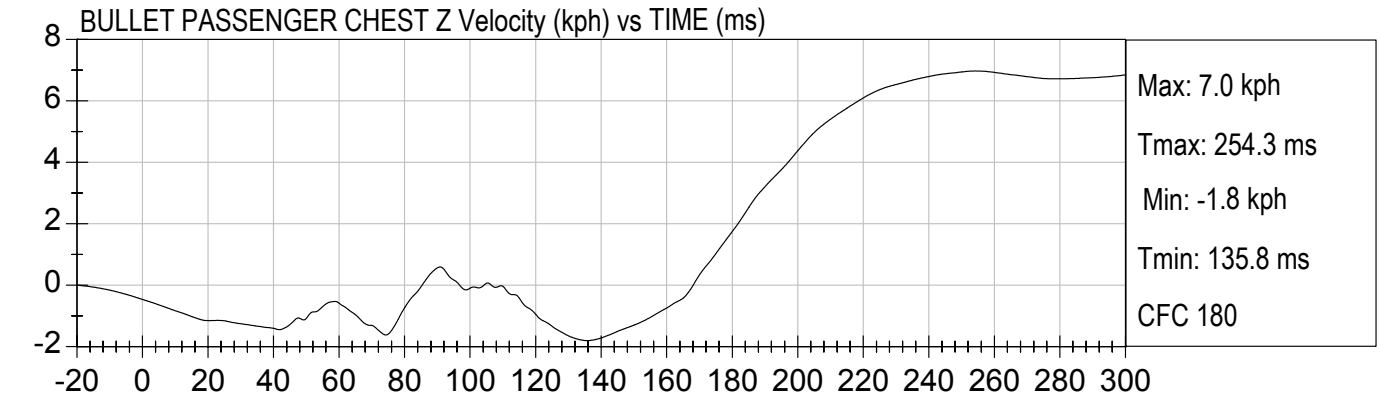


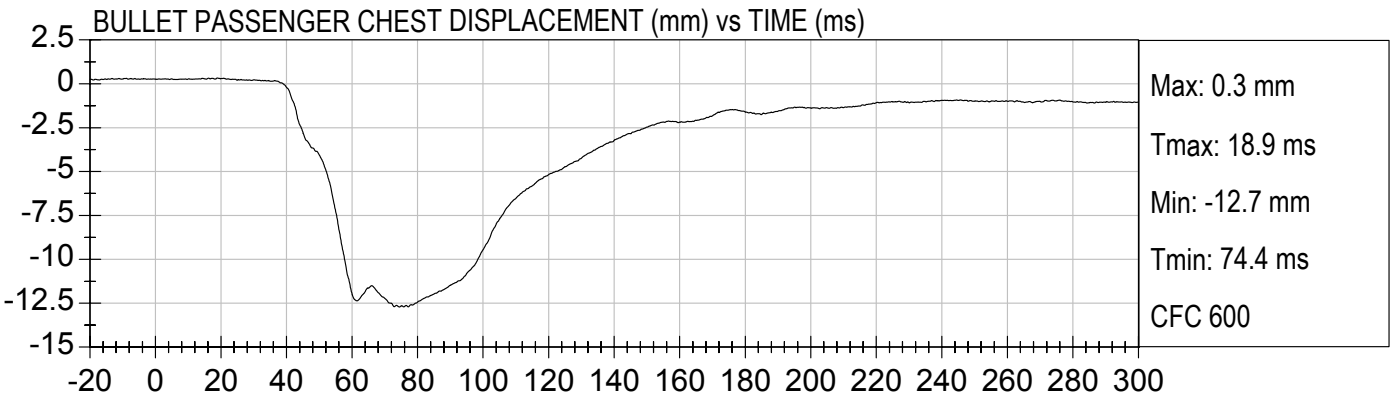
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



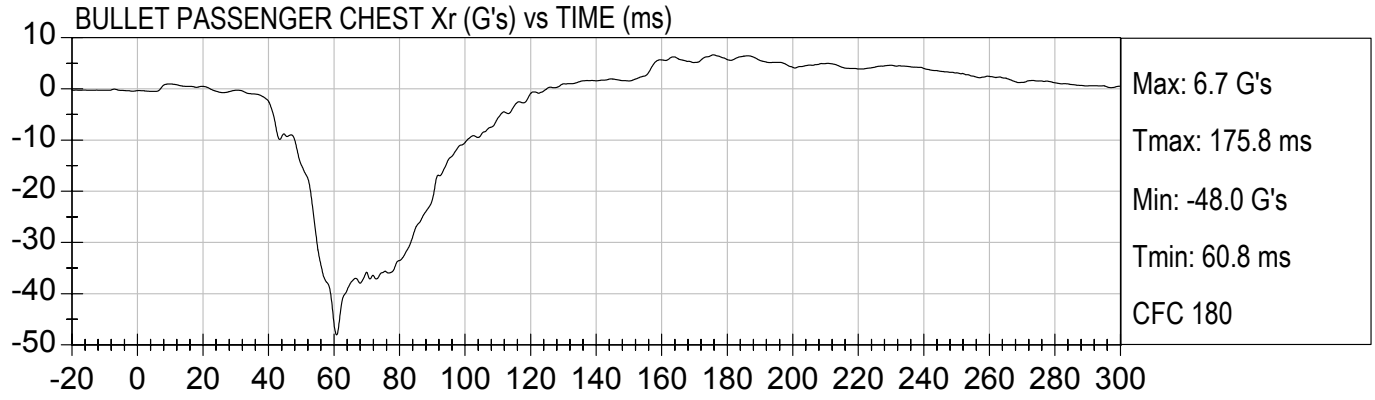


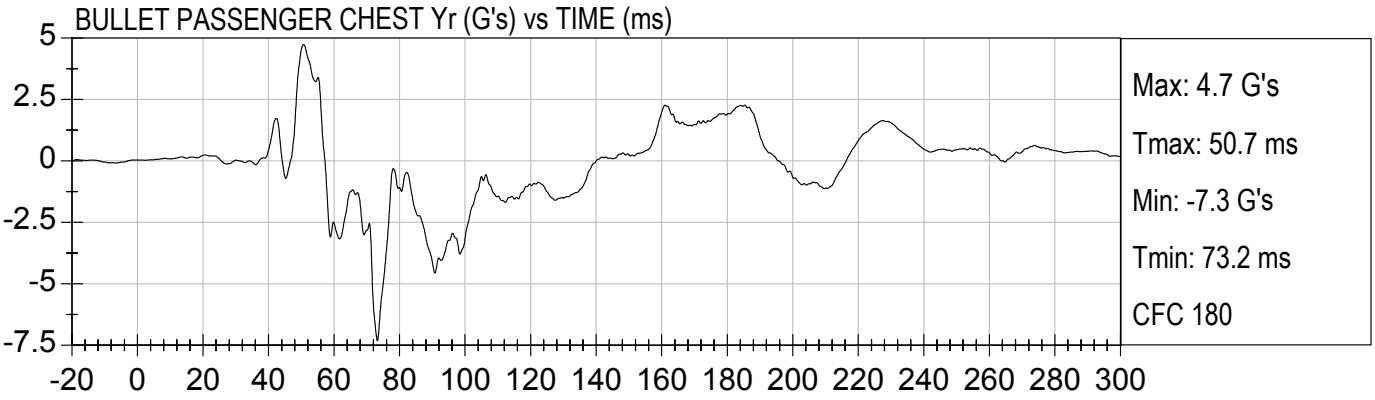


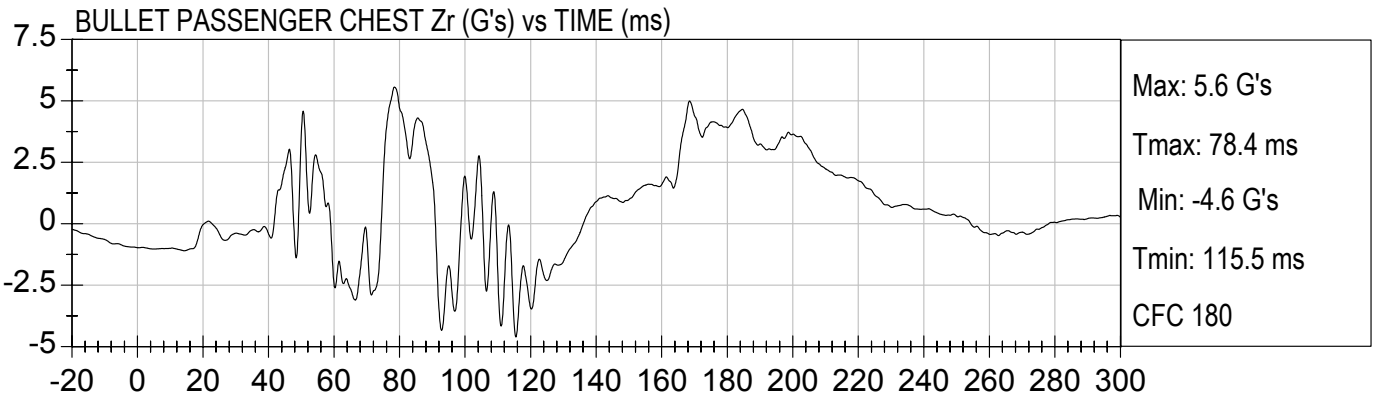


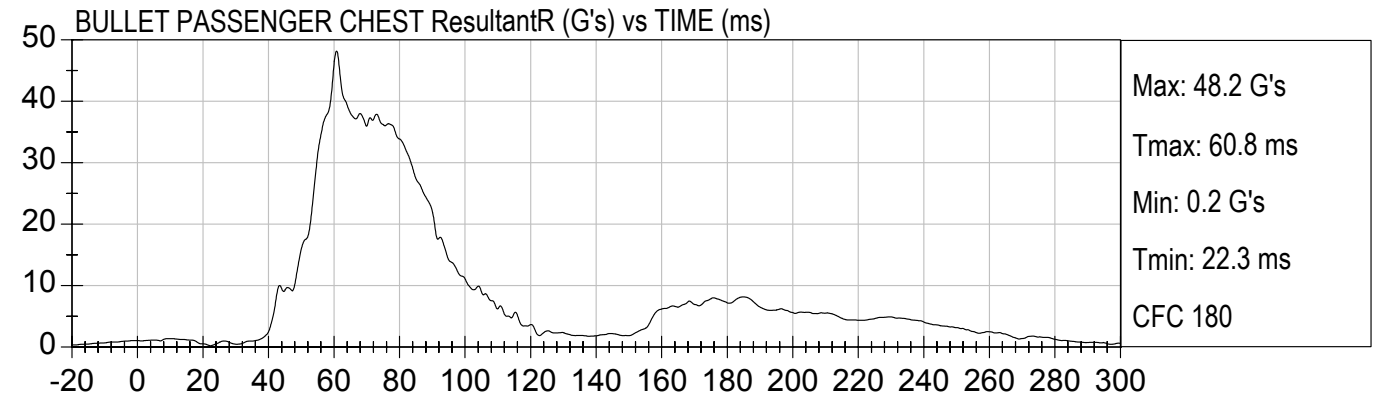
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

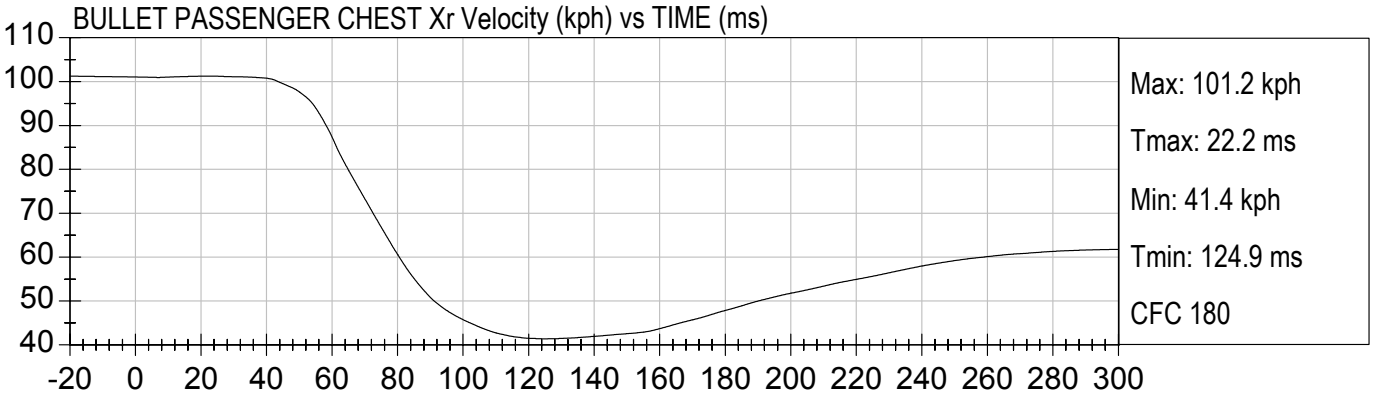
Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)

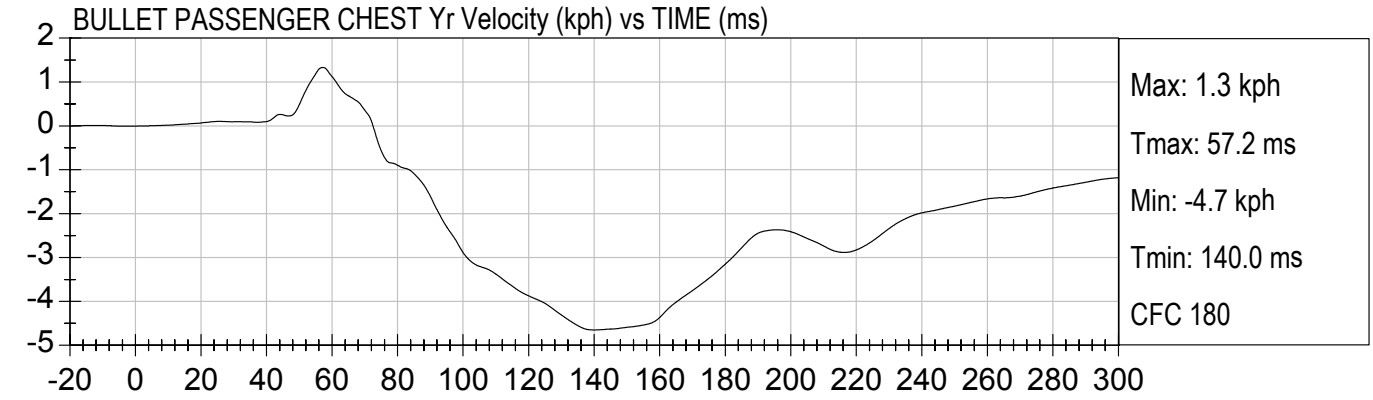


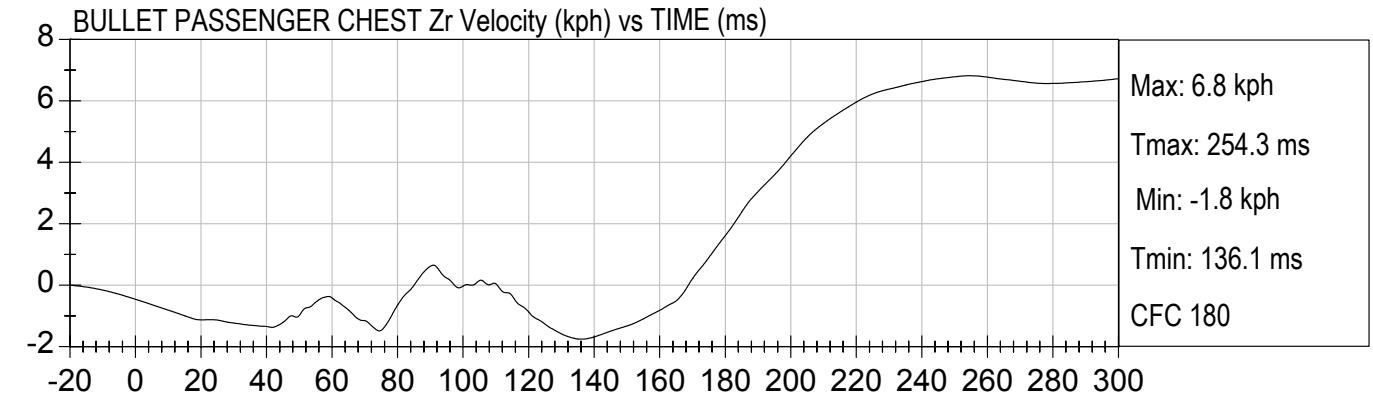






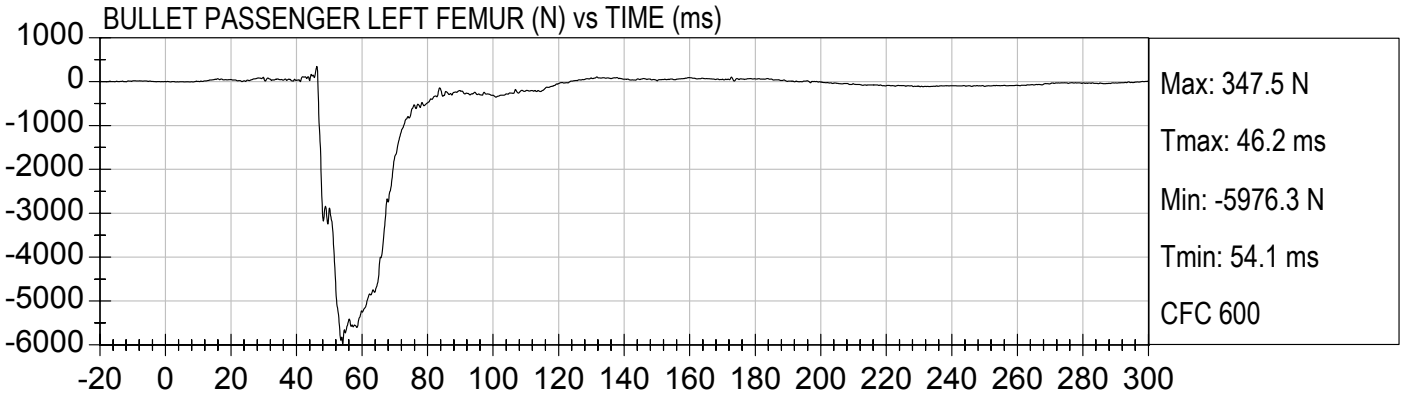

BULLET PASSENGER CHEST Xr Velocity (kph) vs TIME (ms)
110
100
90
80
70
60
50
40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 101.2 kph
Tmax: 22.2 ms
Min: 41.4 kph
Tmin: 124.9 ms
CFC 180

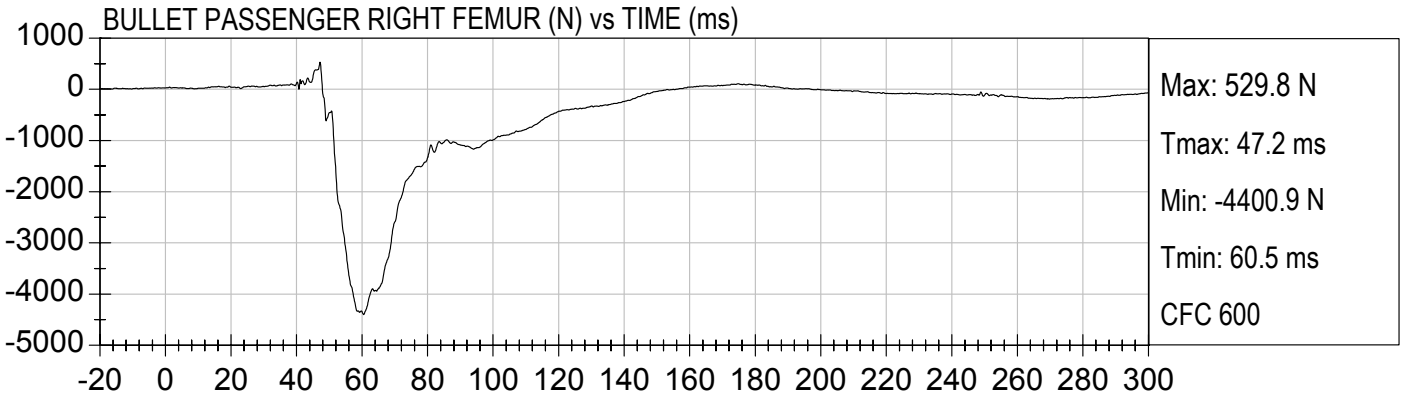

BULLET PASSENGER CHEST Yr Velocity (kph) vs TIME (ms)
2
1
0
-1
-2
-3
-4
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.3 kph
Tmax: 57.2 ms
Min: -4.7 kph
Tmin: 140.0 ms
CFC 180

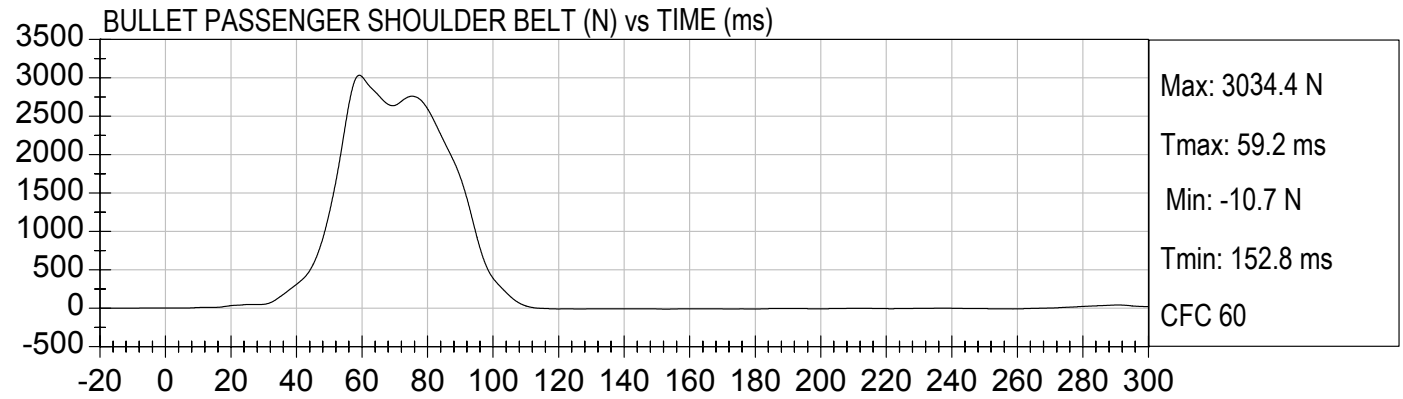

BULLET PASSENGER CHEST Zr Velocity (kph) vs TIME (ms)
8
6
4
2
0
-2
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 6.8 kph
Tmax: 254.3 ms
Min: -1.8 kph
Tmin: 136.1 ms
CFC 180

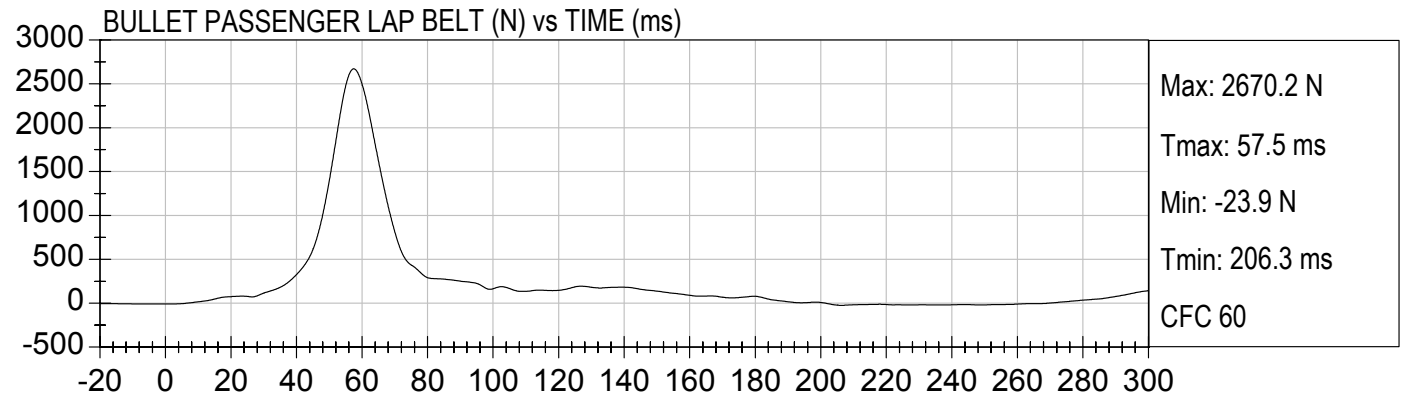
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



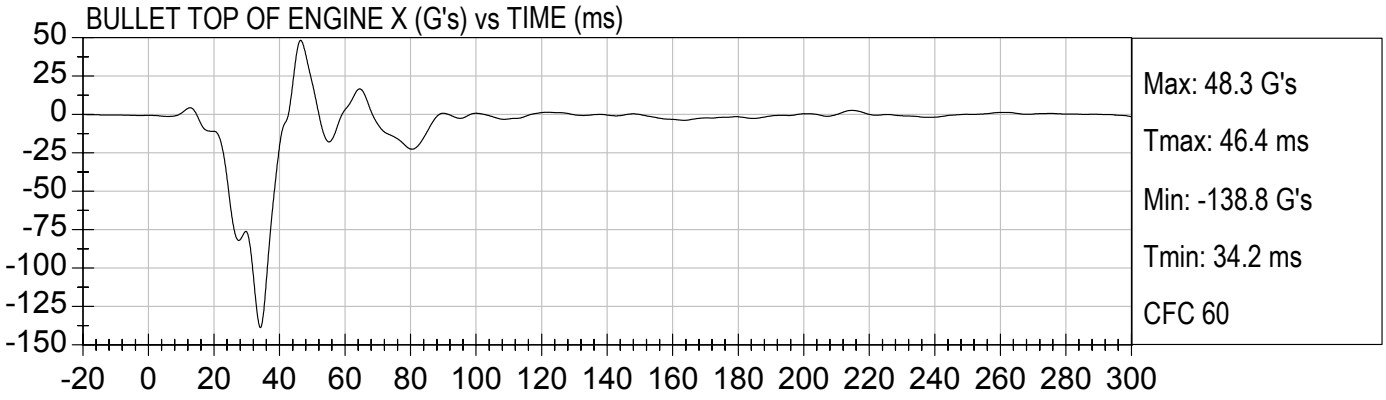


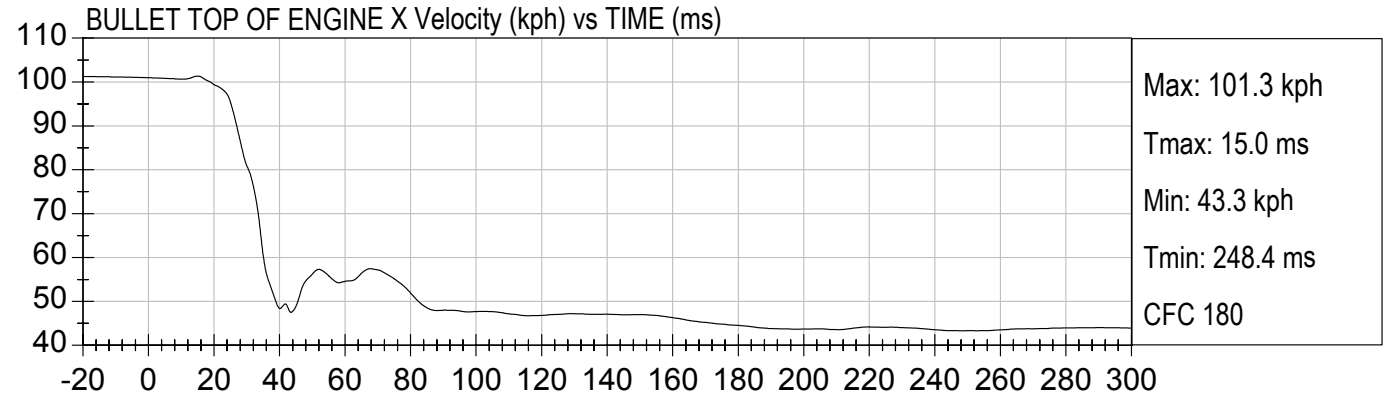


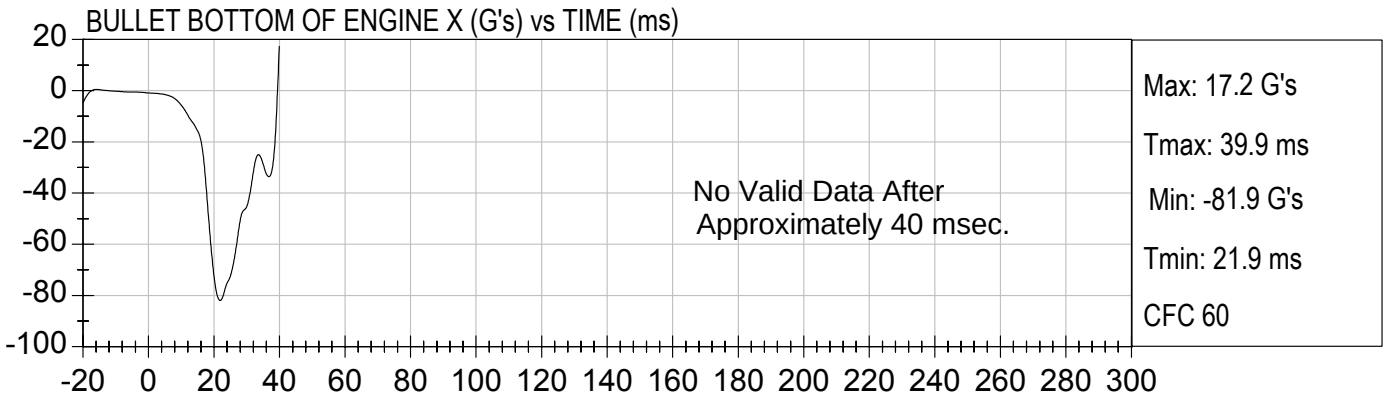


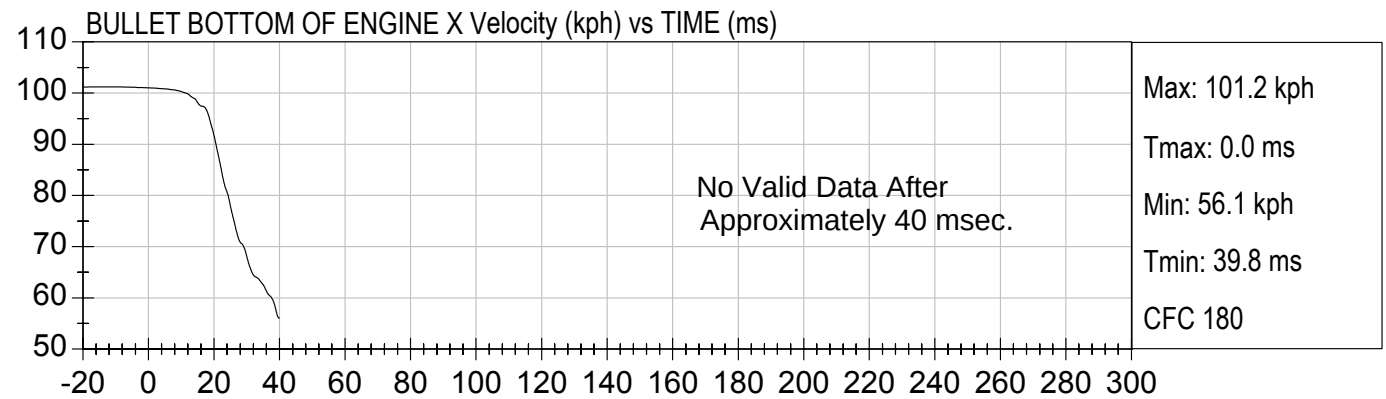
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Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



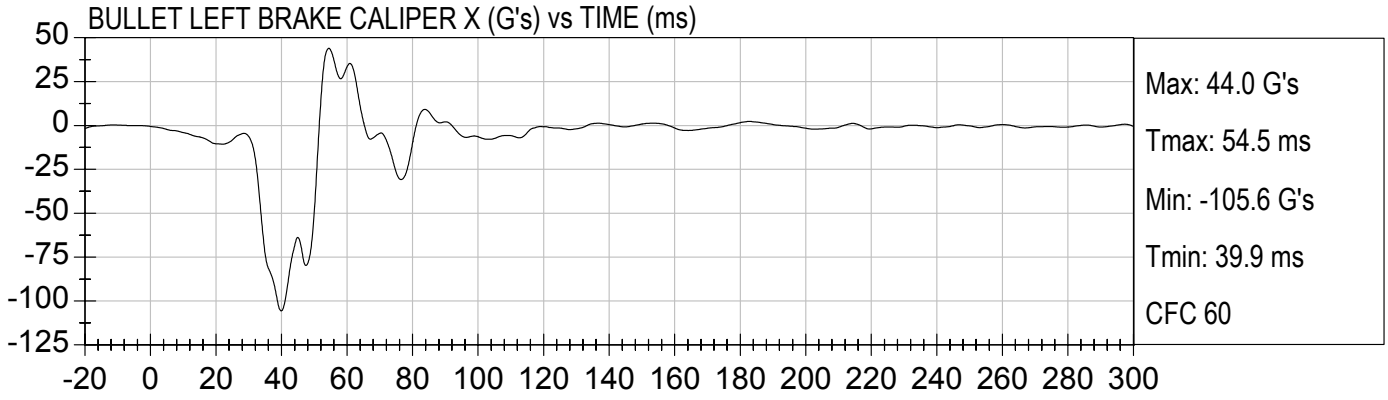


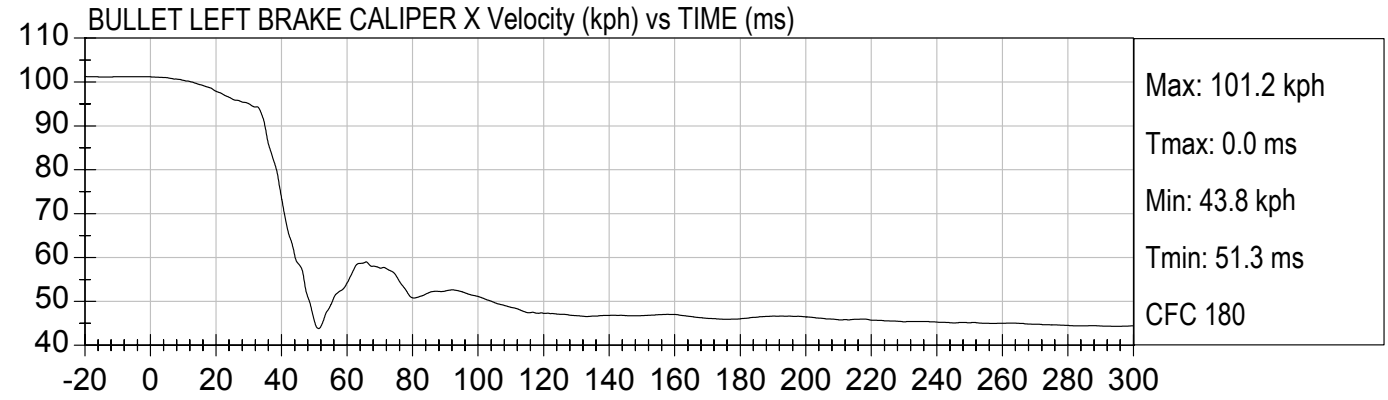


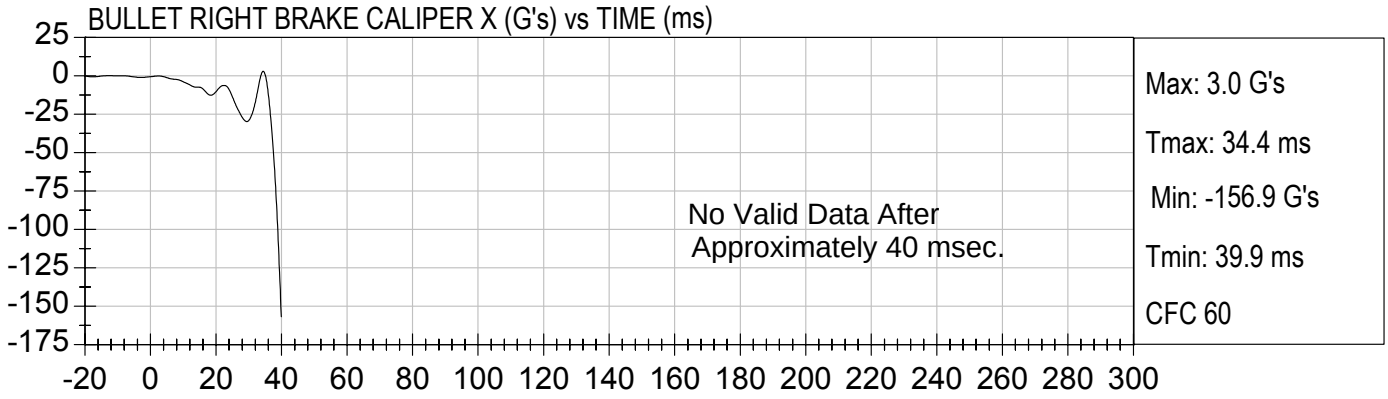


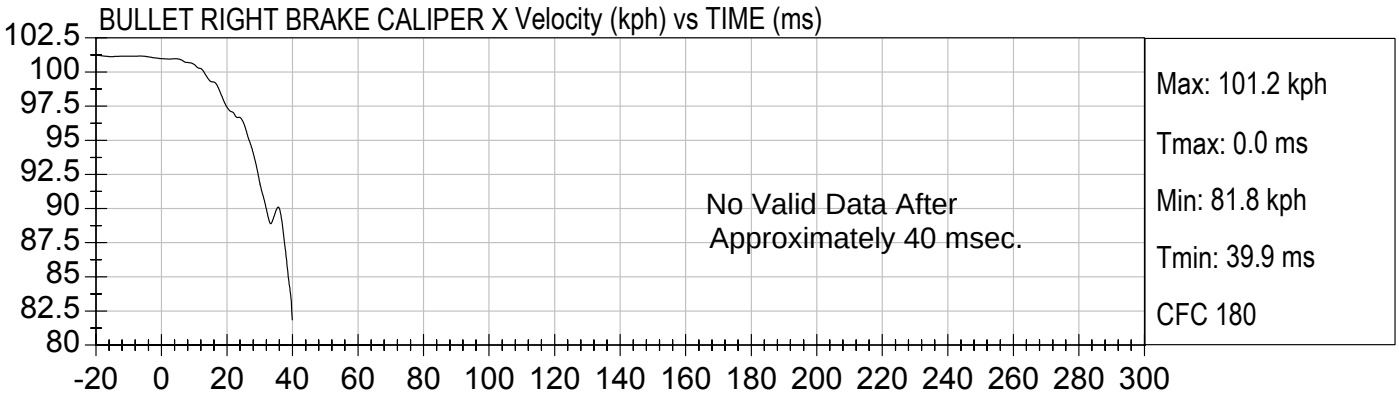
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1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)



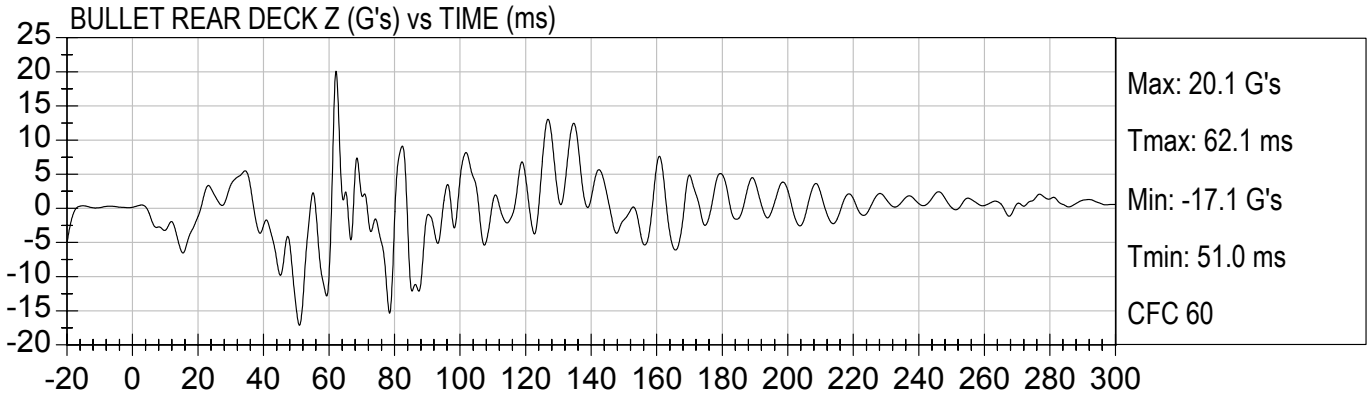


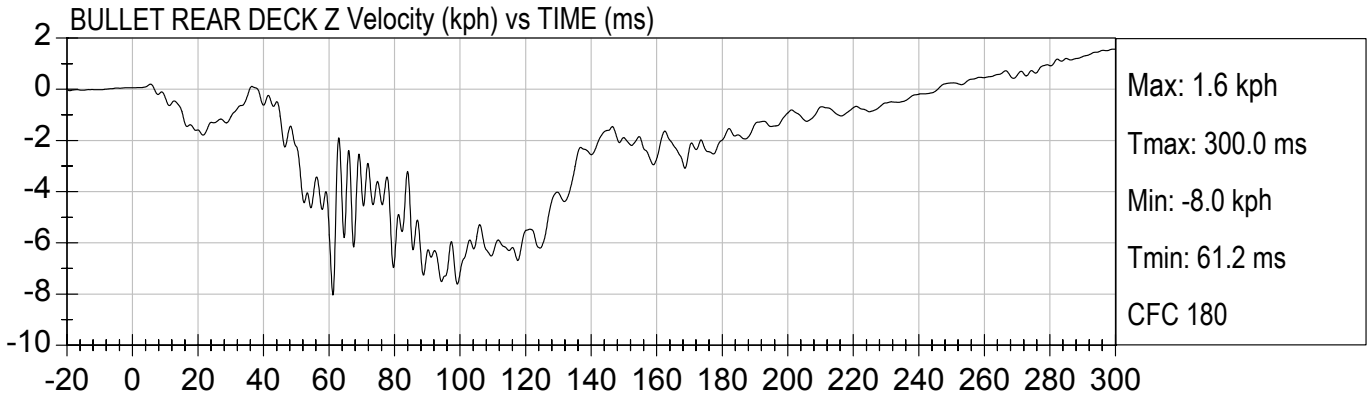


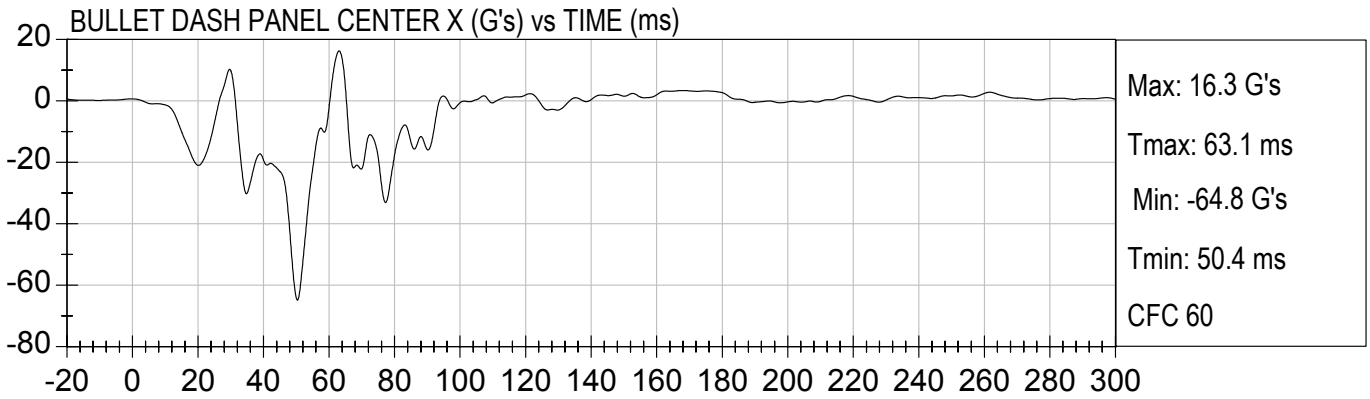


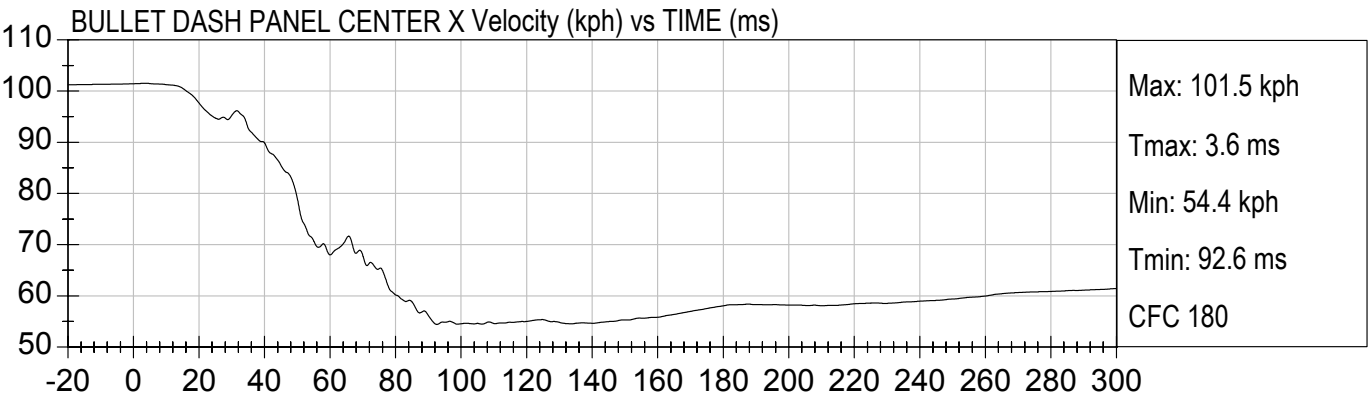
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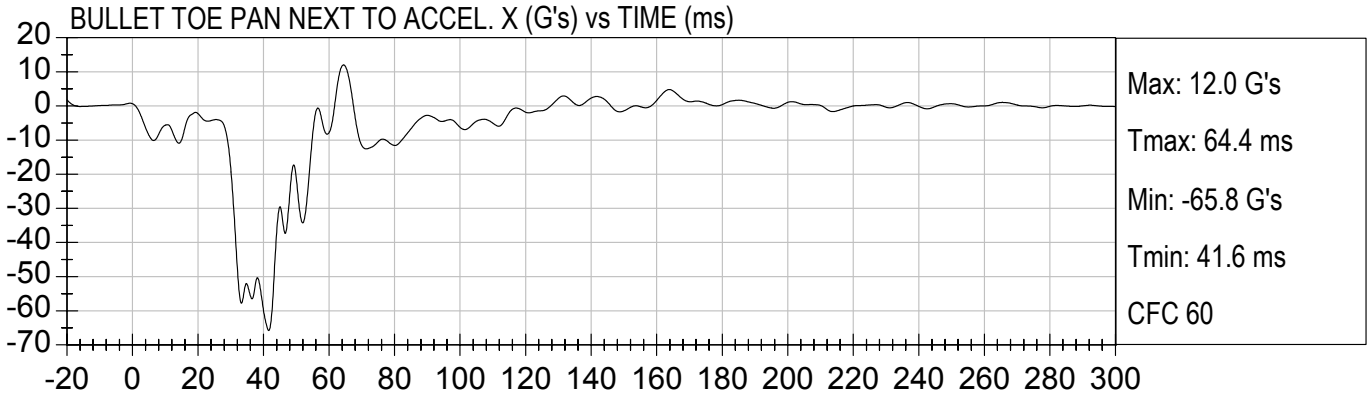


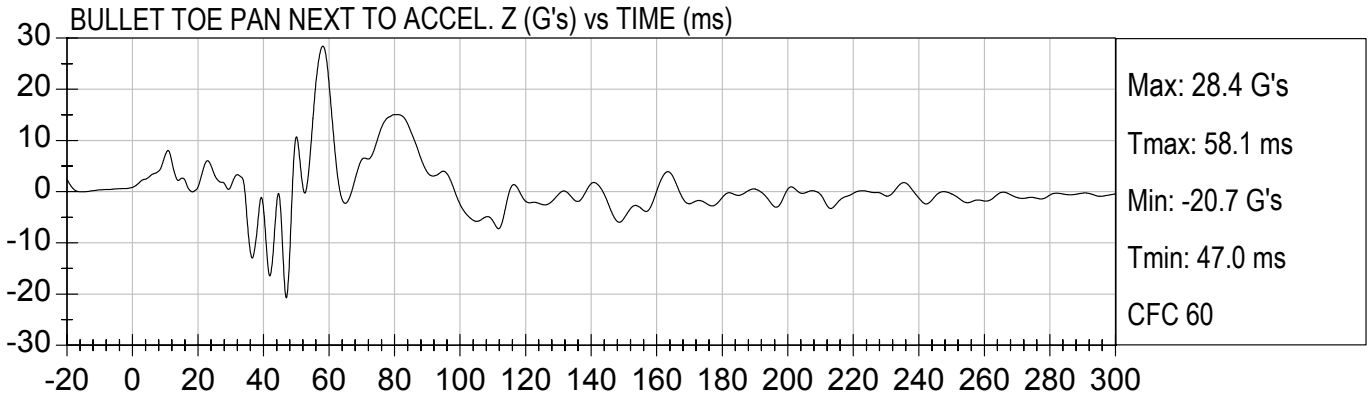


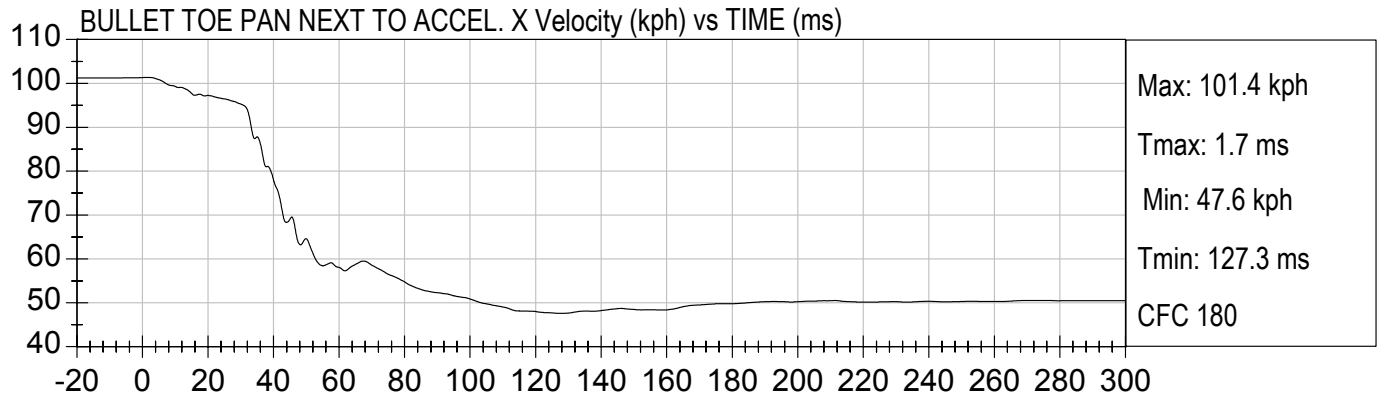


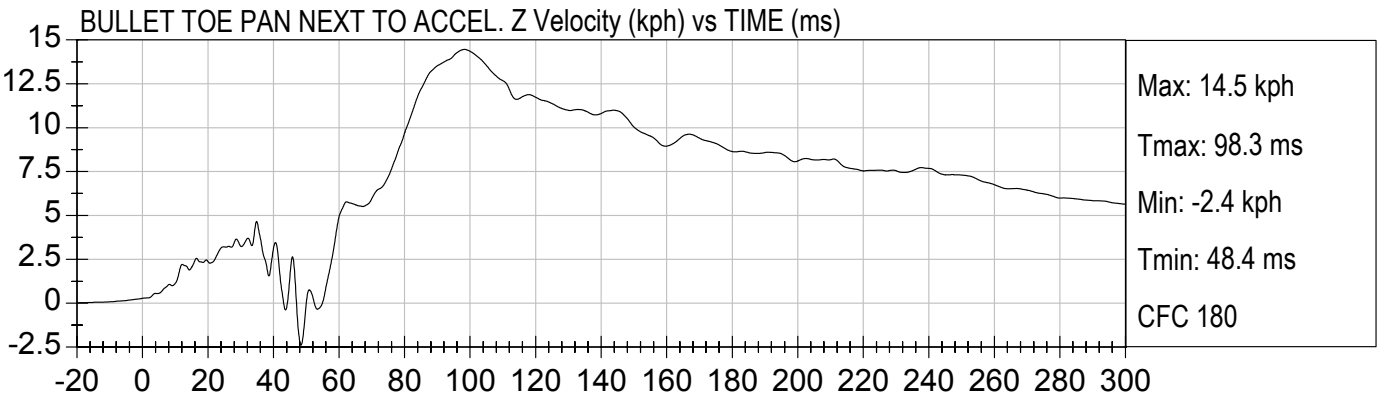
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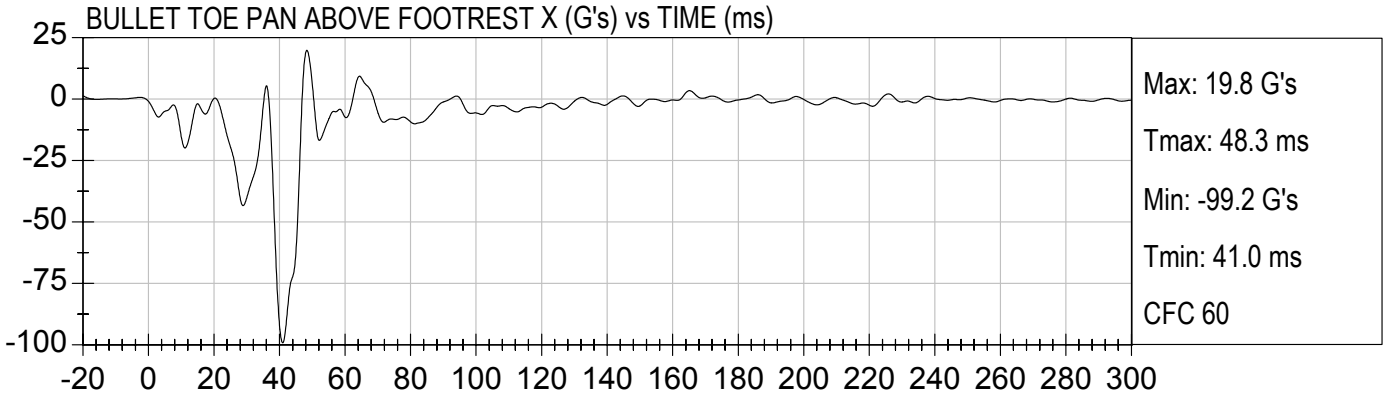


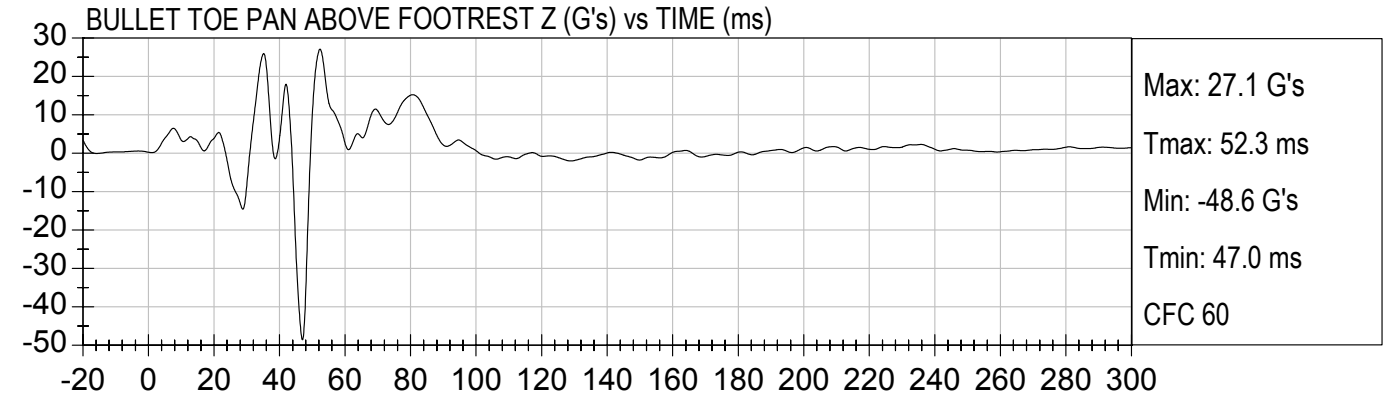


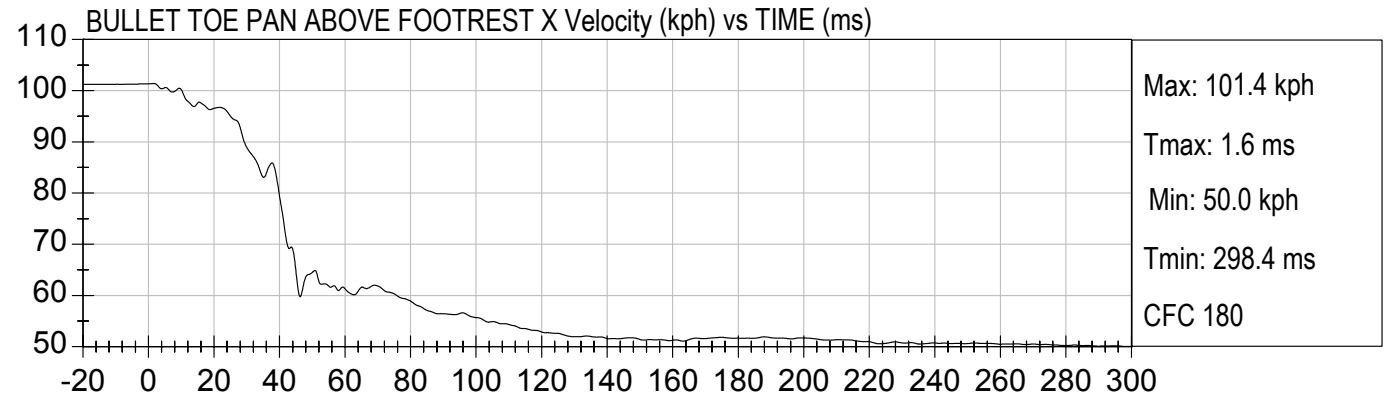


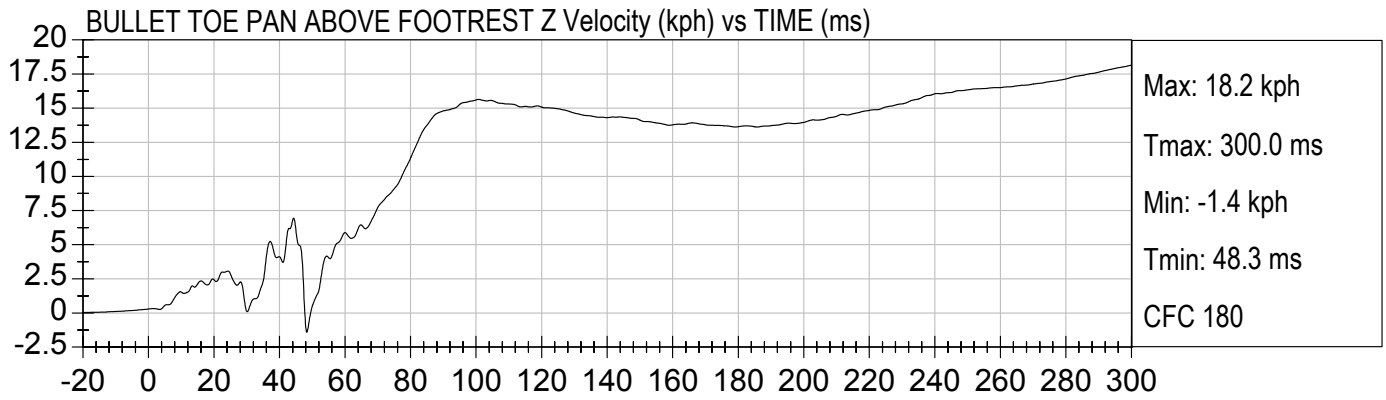
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1999 DODGE CARAVAN SE (RX0332)

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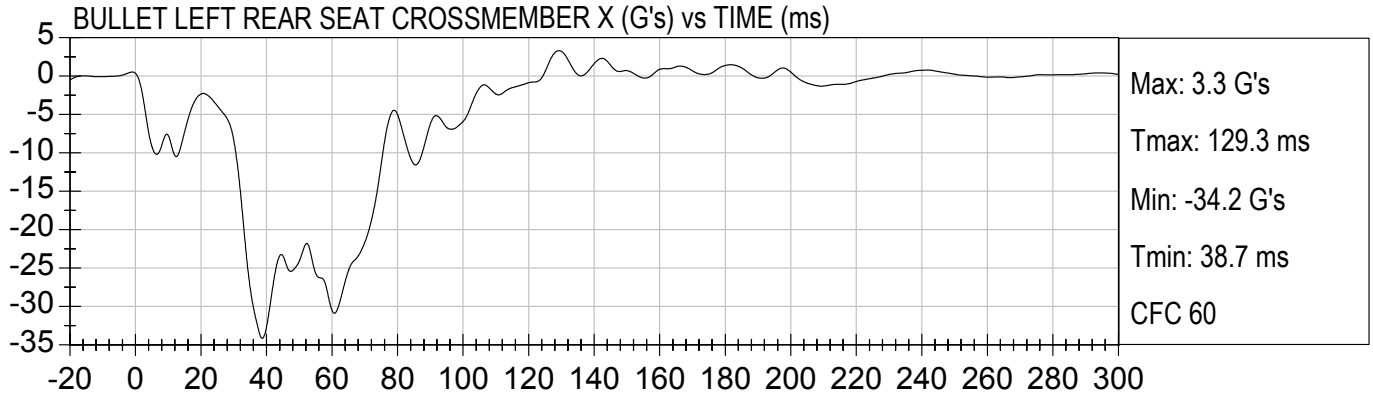


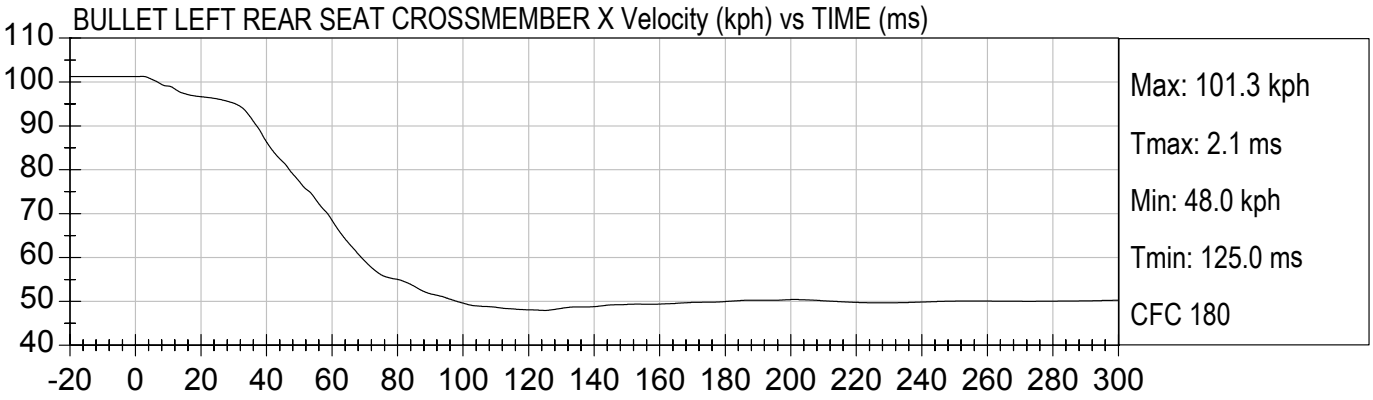


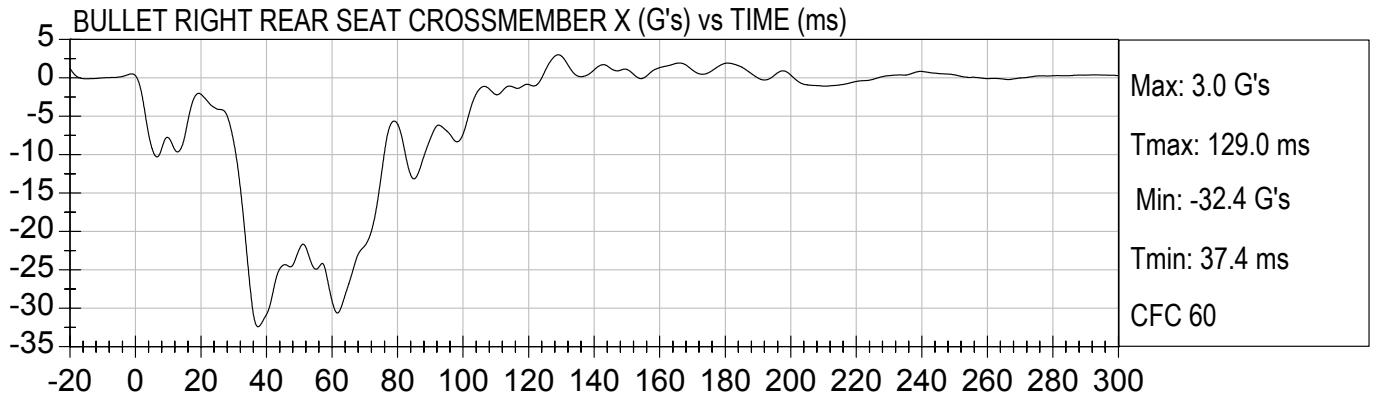


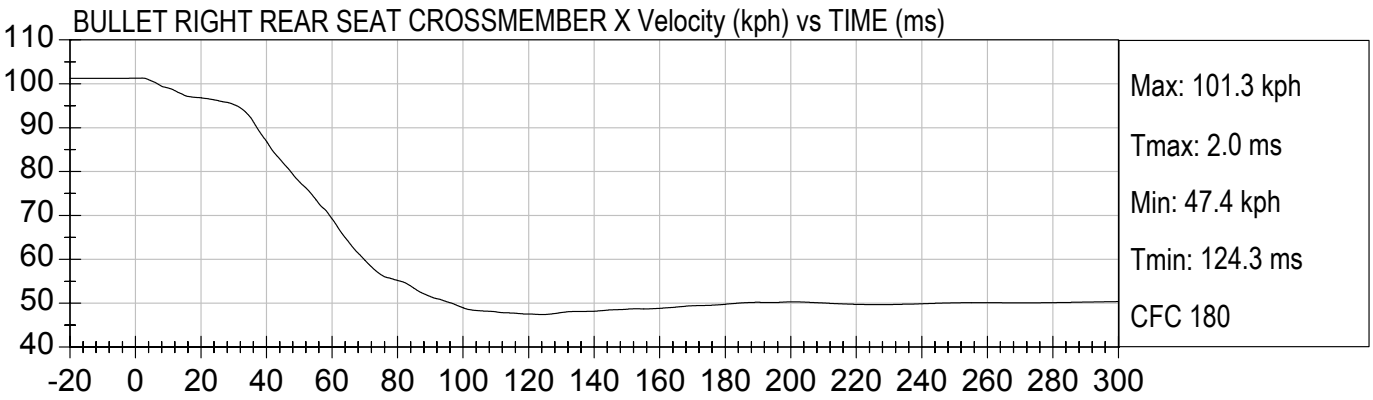
TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
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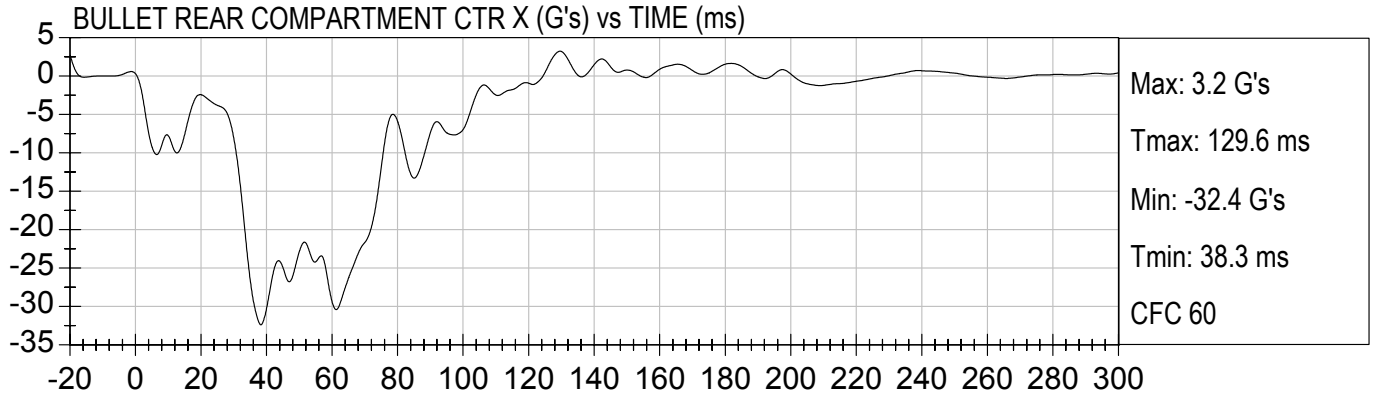


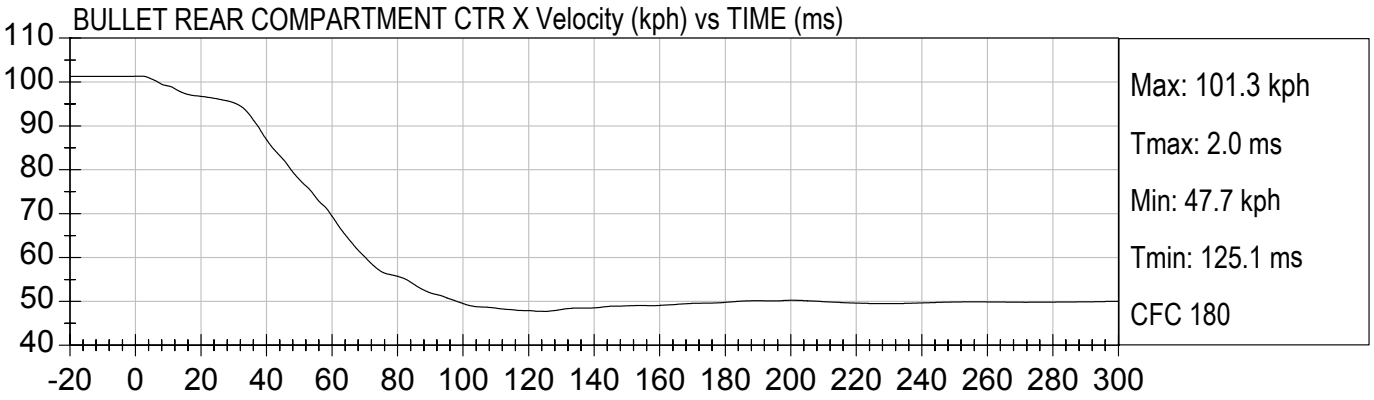


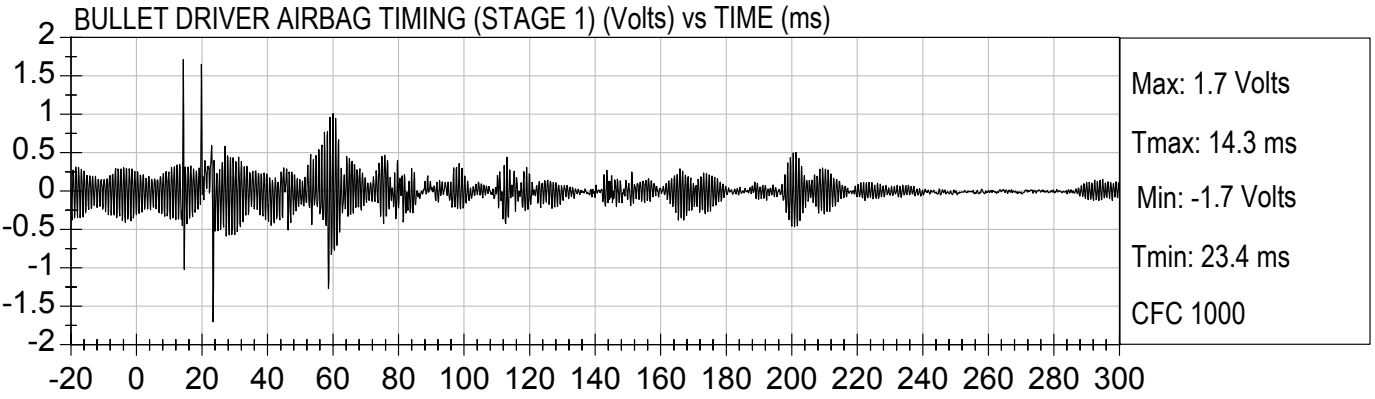


TO#2 FULL FRONTAL IMPACT
1999 DODGE CARAVAN SE (RX0332)

Test Date: 06/29/04
Speed: 62.9 mph (101.2 km/h)







APPENDIX C

TARGET VEHICLE DATA TRACES

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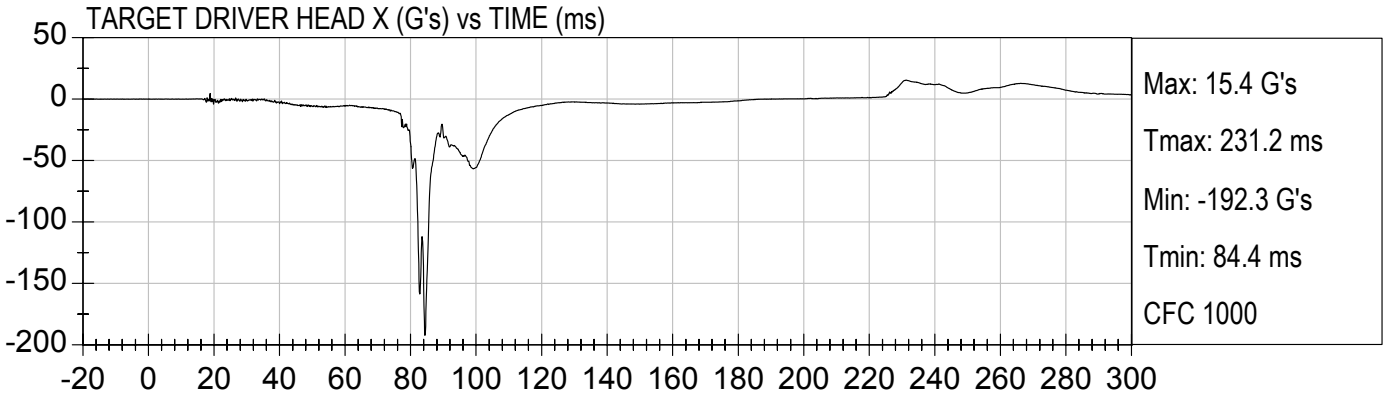
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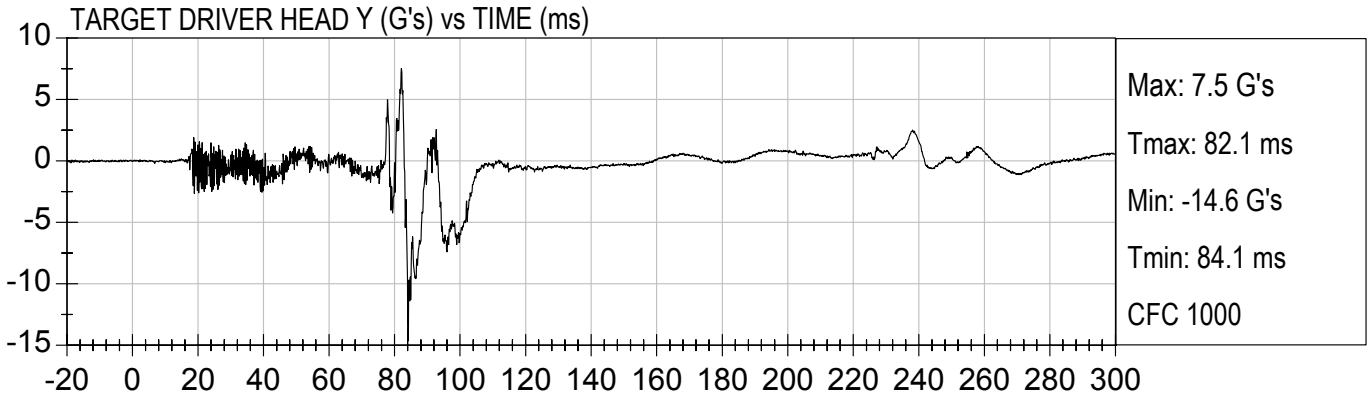
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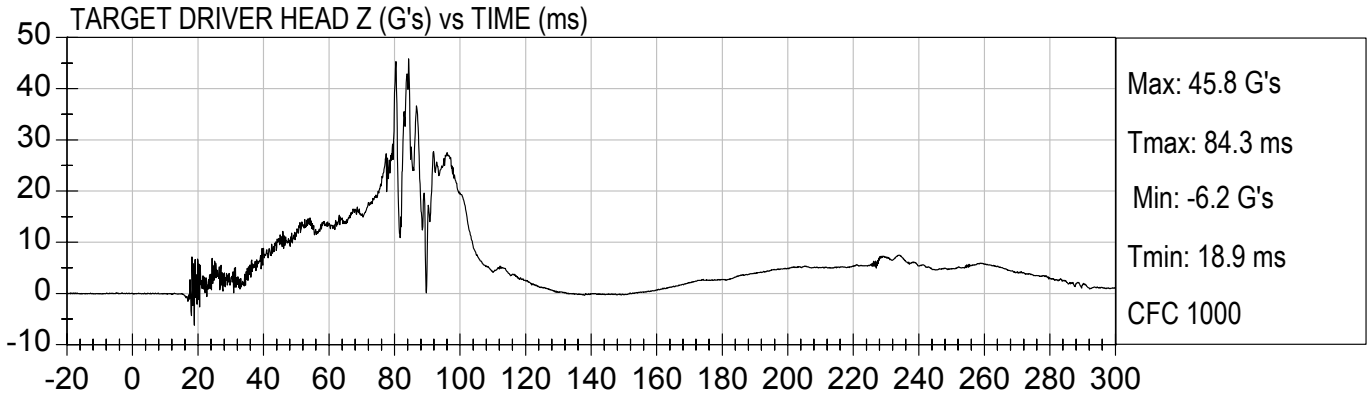
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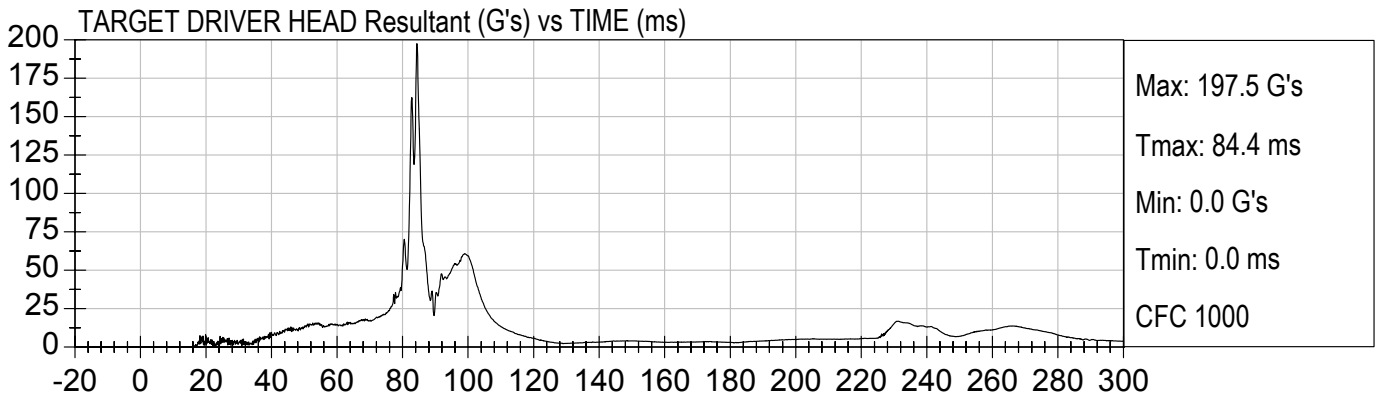
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



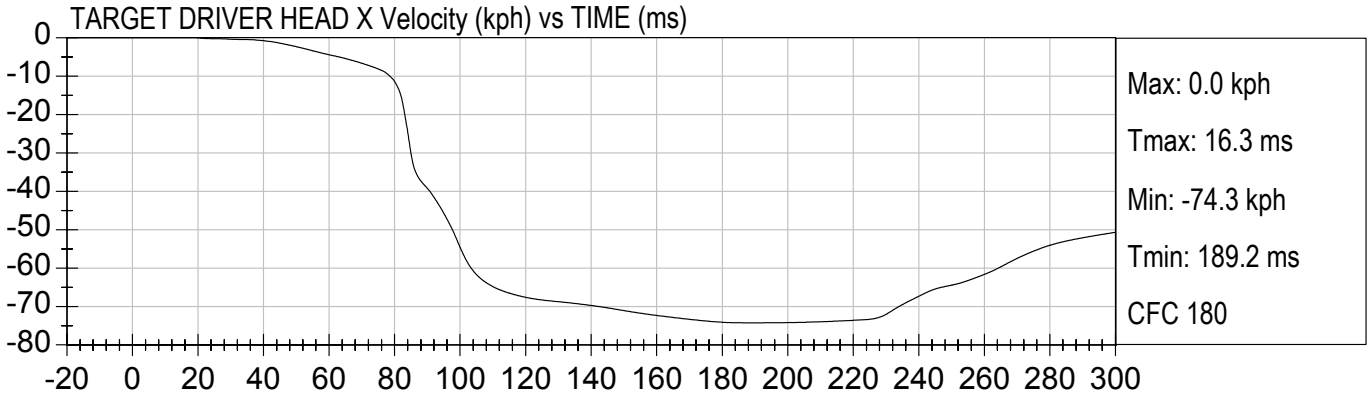


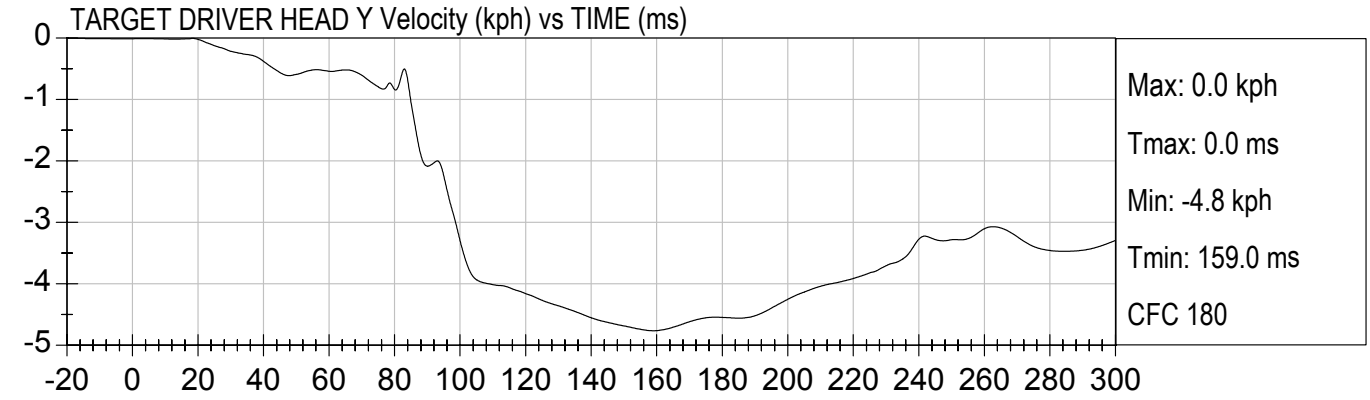


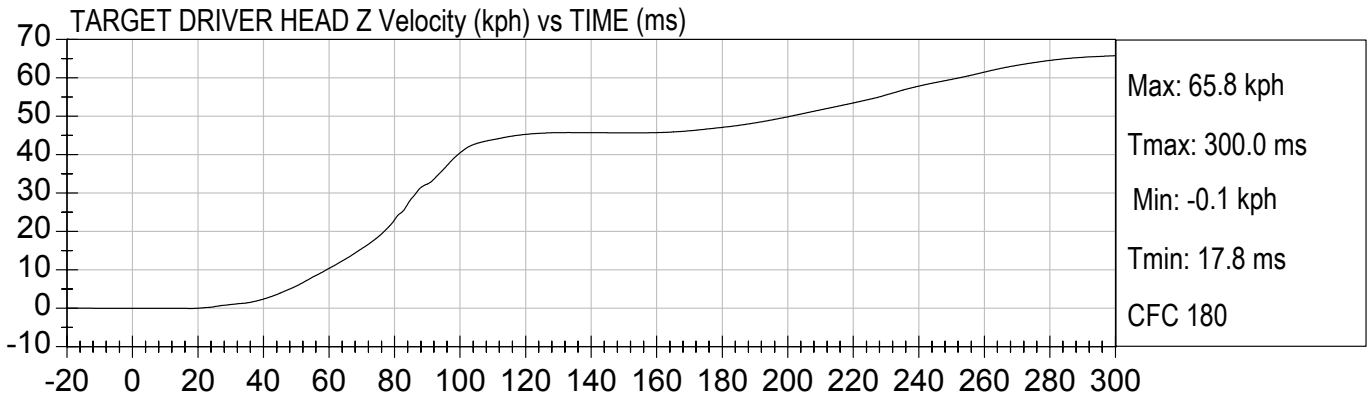


TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

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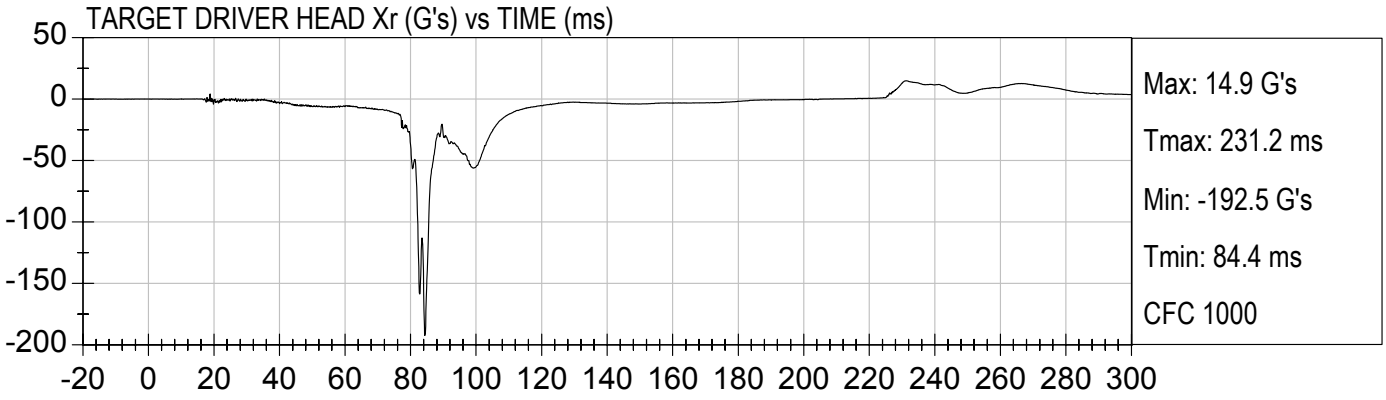


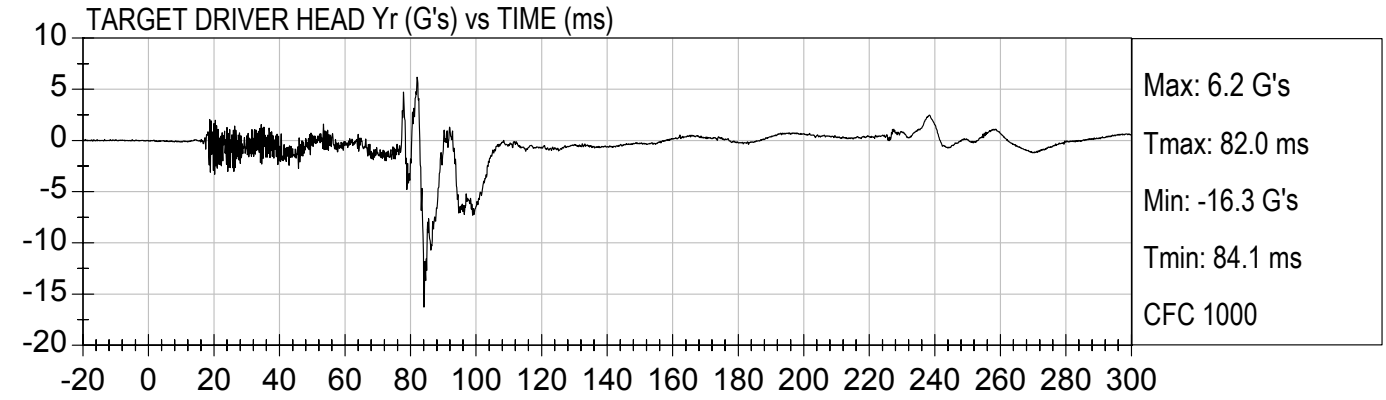


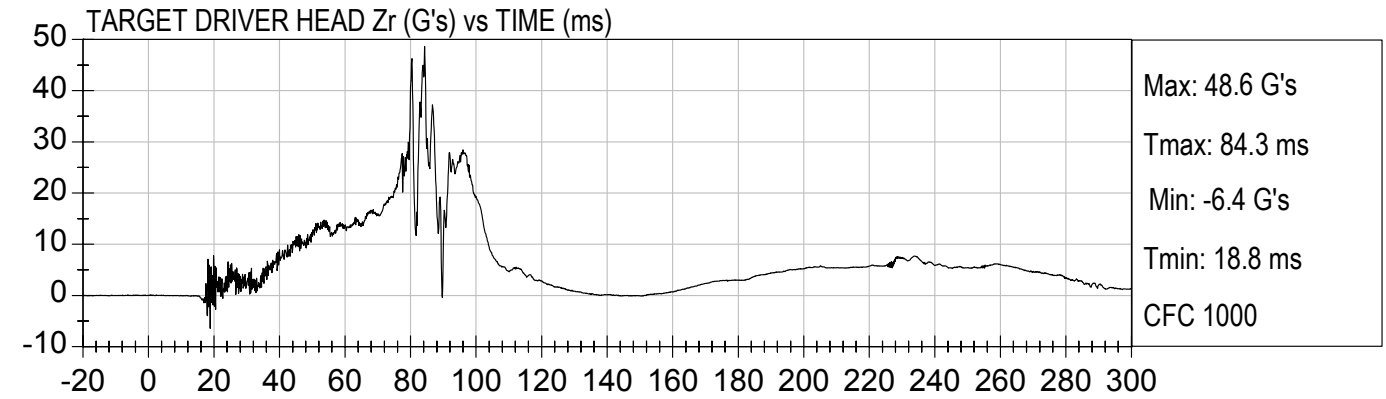


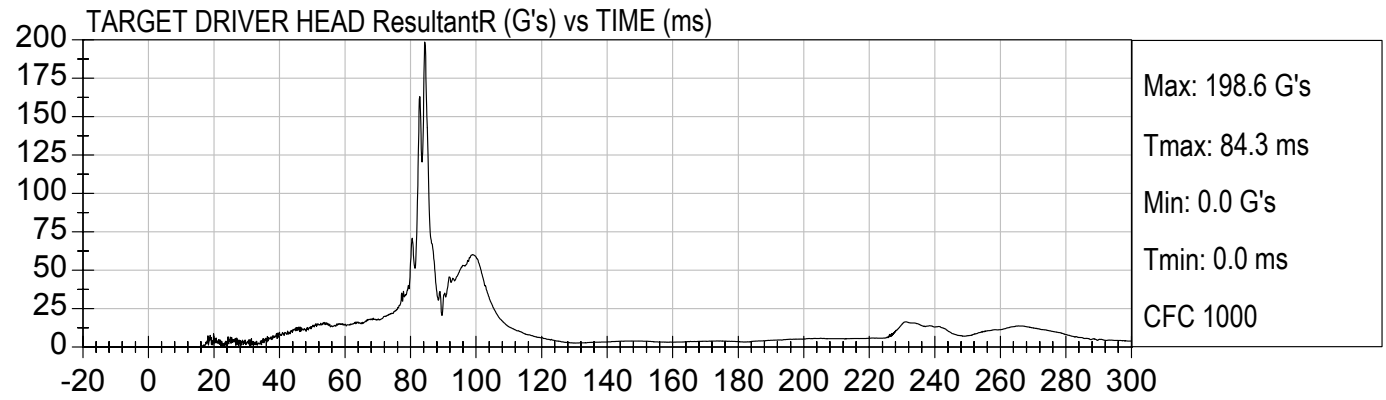
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

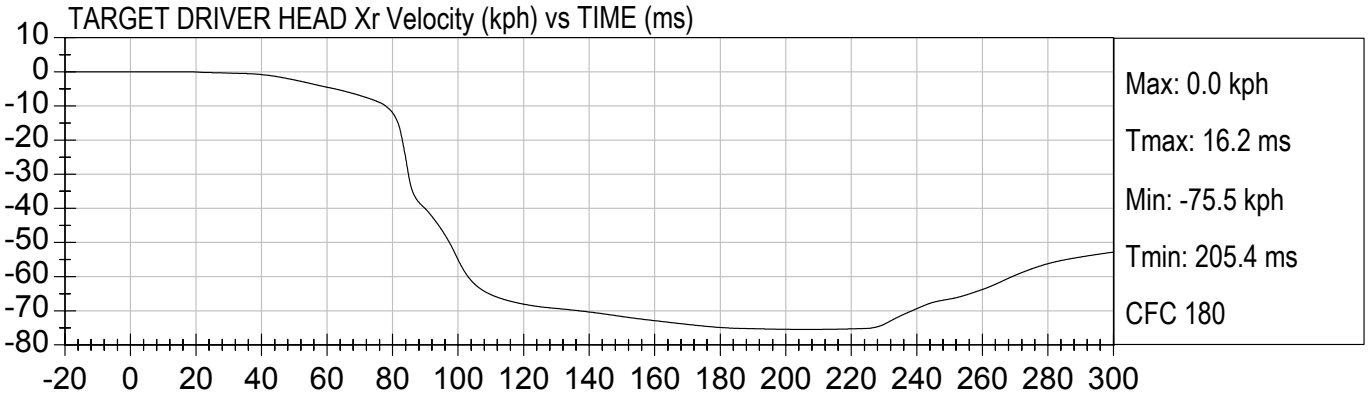
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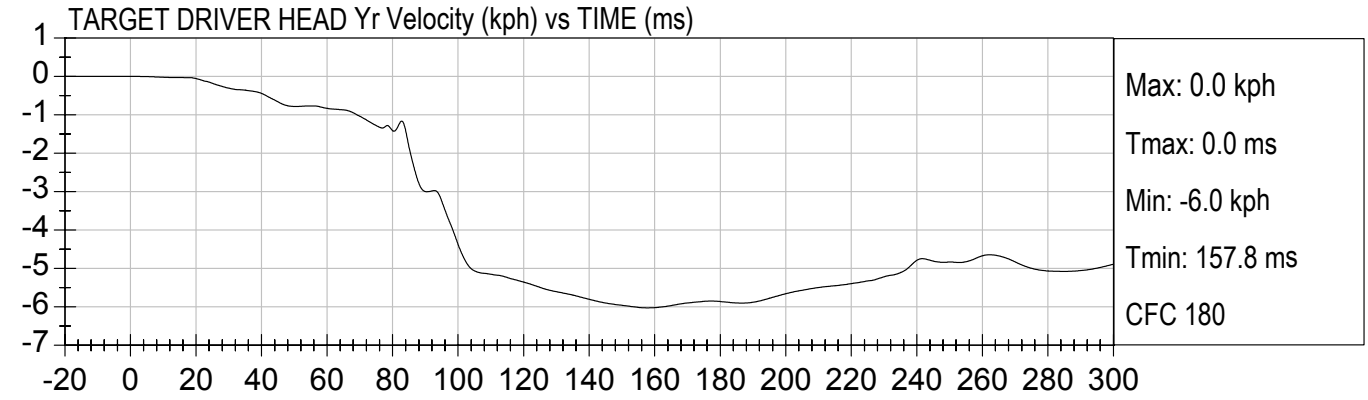


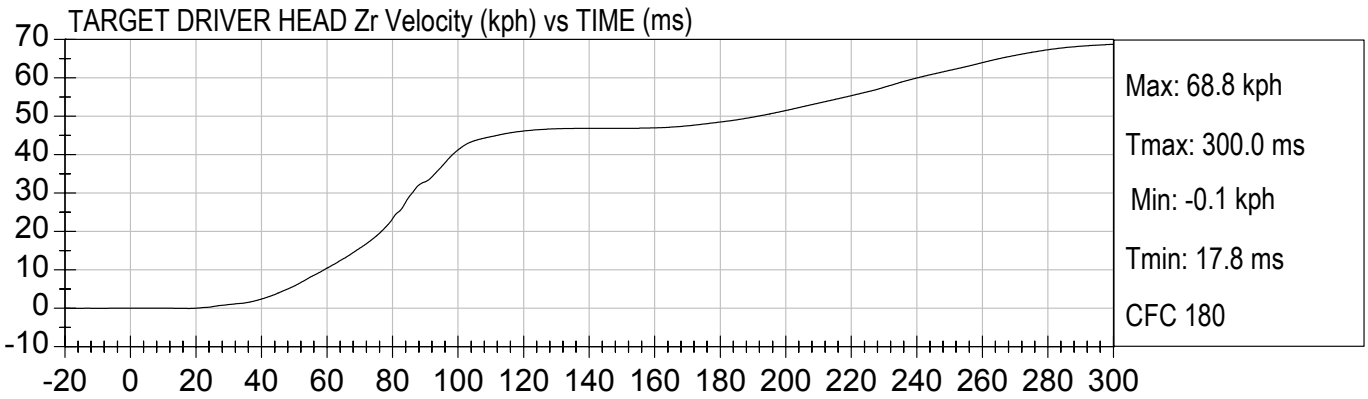






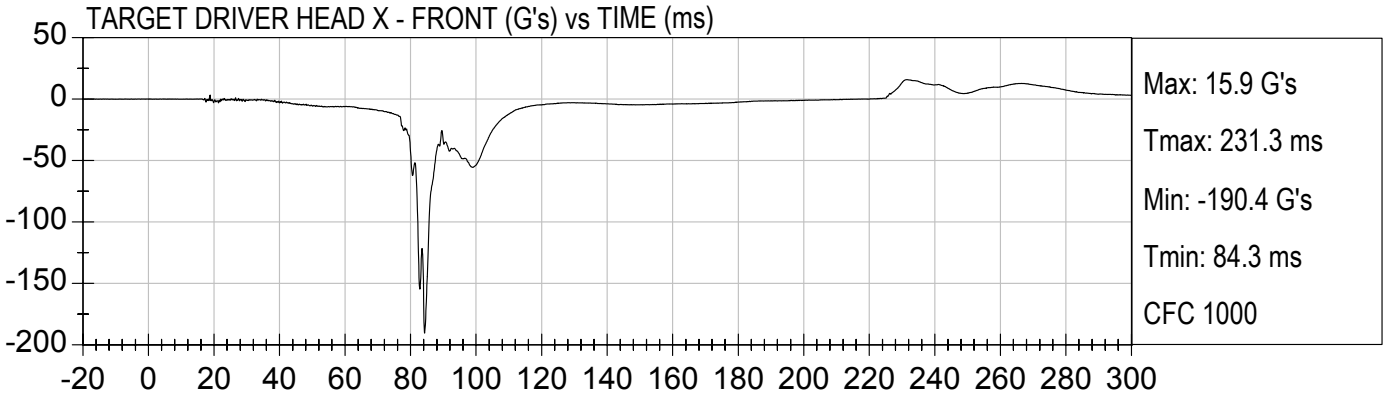

TARGET DRIVER HEAD Xr Velocity (kph) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 16.2 ms
Min: -75.5 kph
Tmin: 205.4 ms
CFC 180

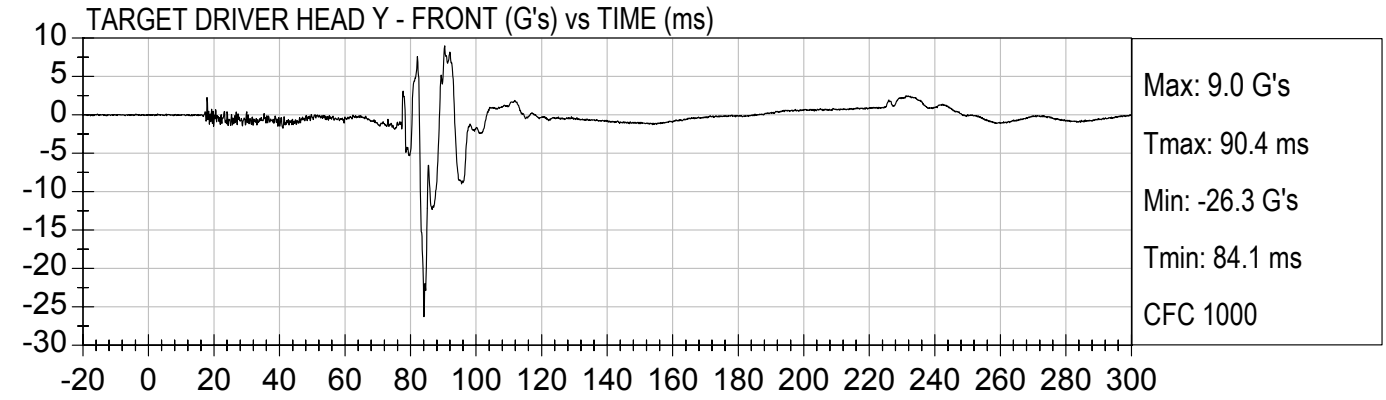

TARGET DRIVER HEAD Yr Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -6.0 kph
Tmin: 157.8 ms
CFC 180

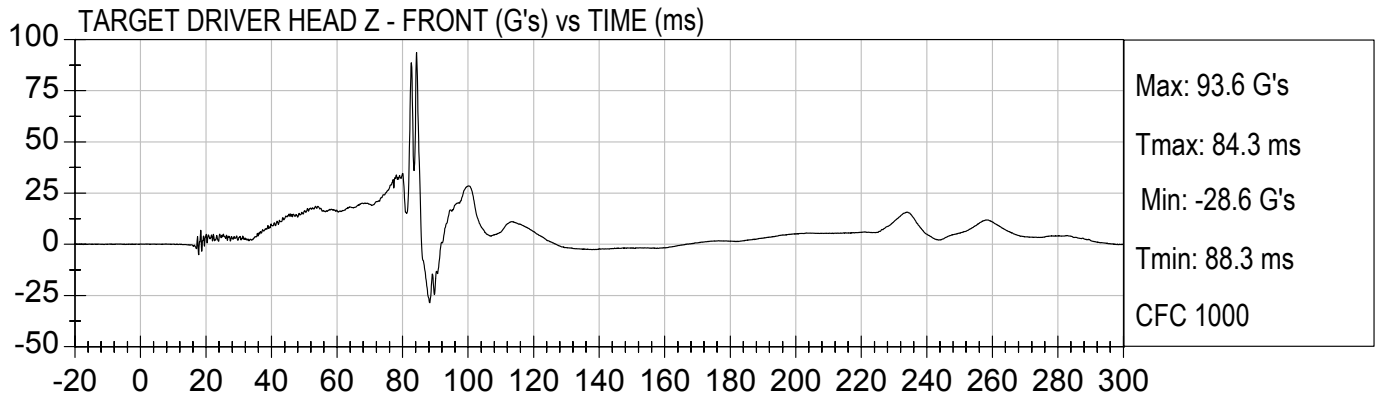

TARGET DRIVER HEAD Zr Velocity (kph) vs TIME (ms)
70
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 68.8 kph
Tmax: 300.0 ms
Min: -0.1 kph
Tmin: 17.8 ms
CFC 180

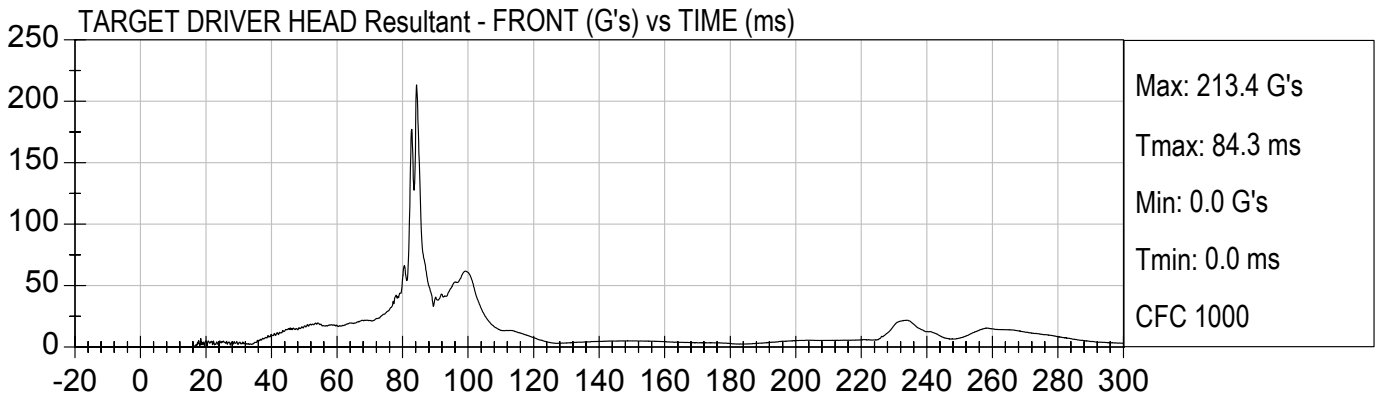
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



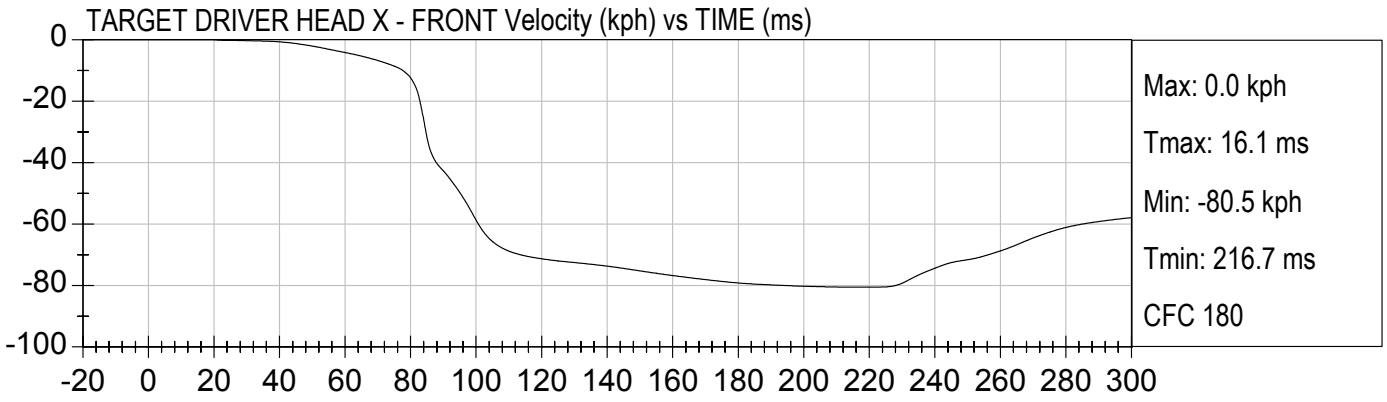


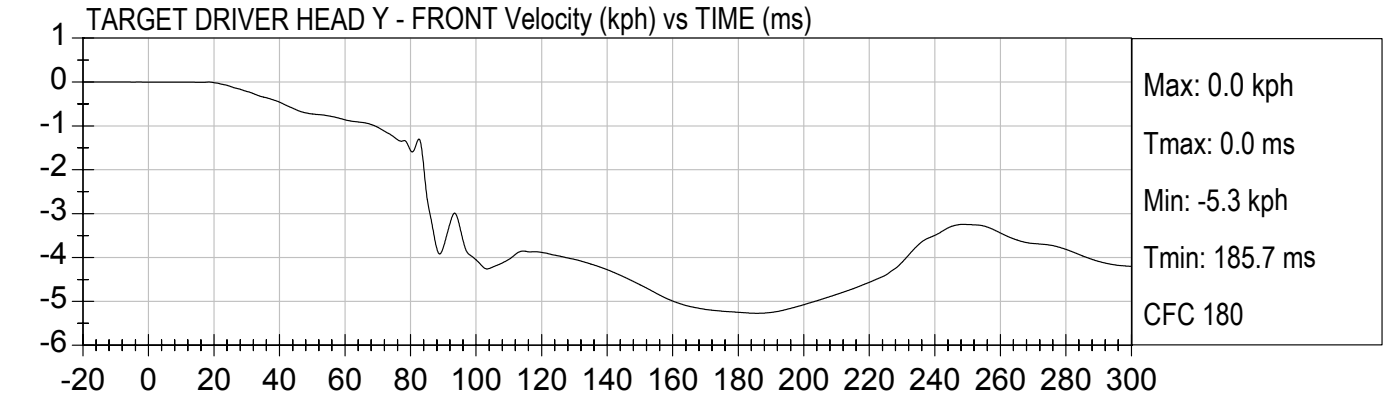


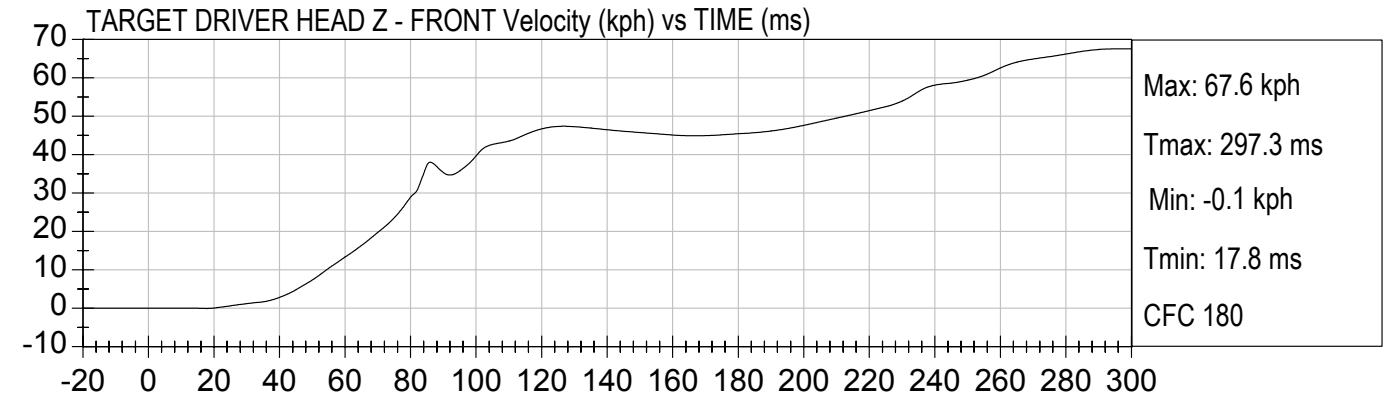


TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
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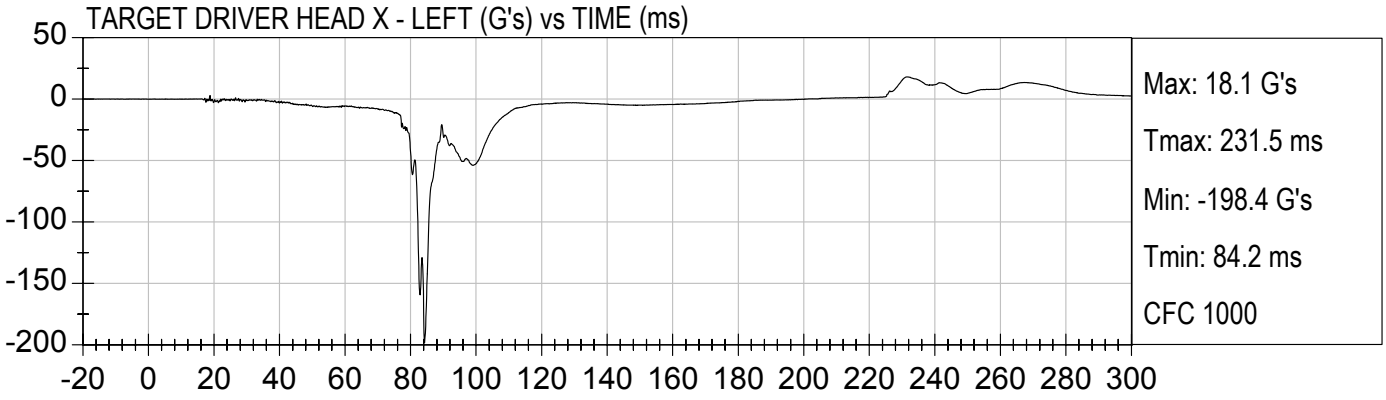


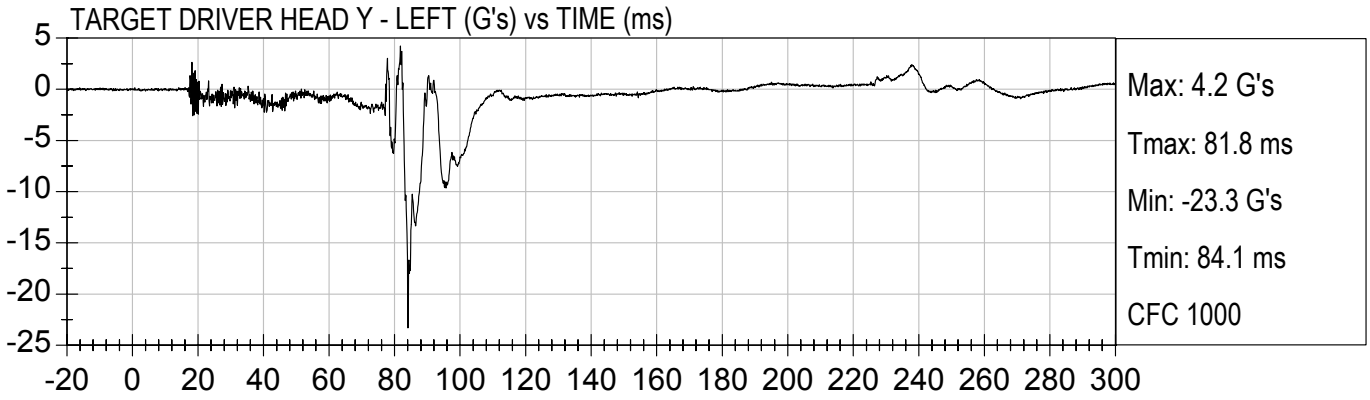


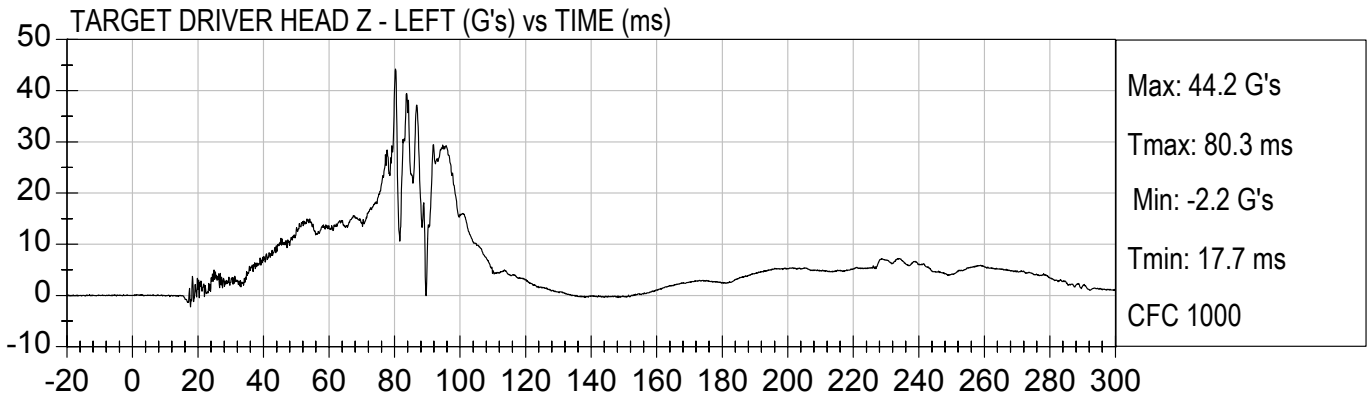


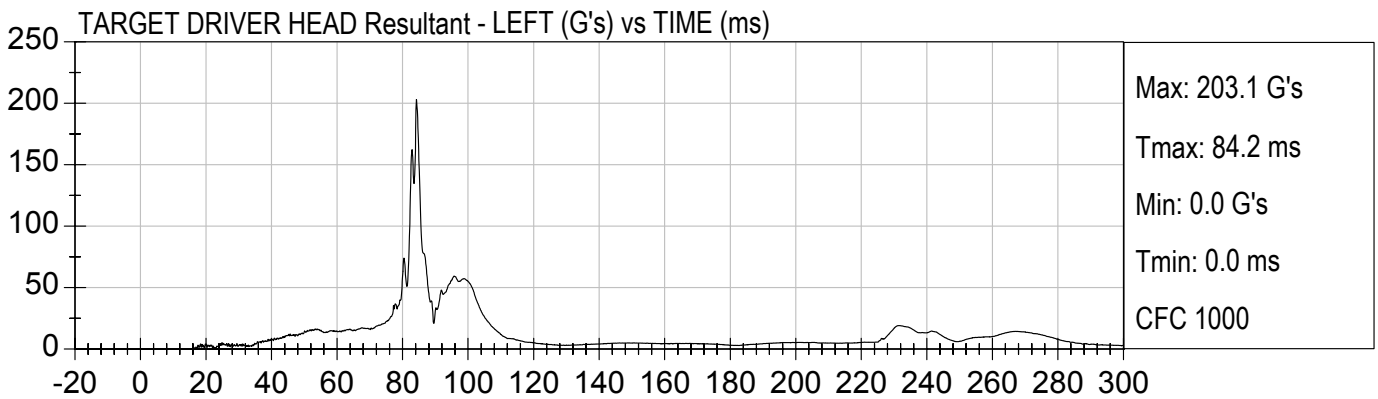
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

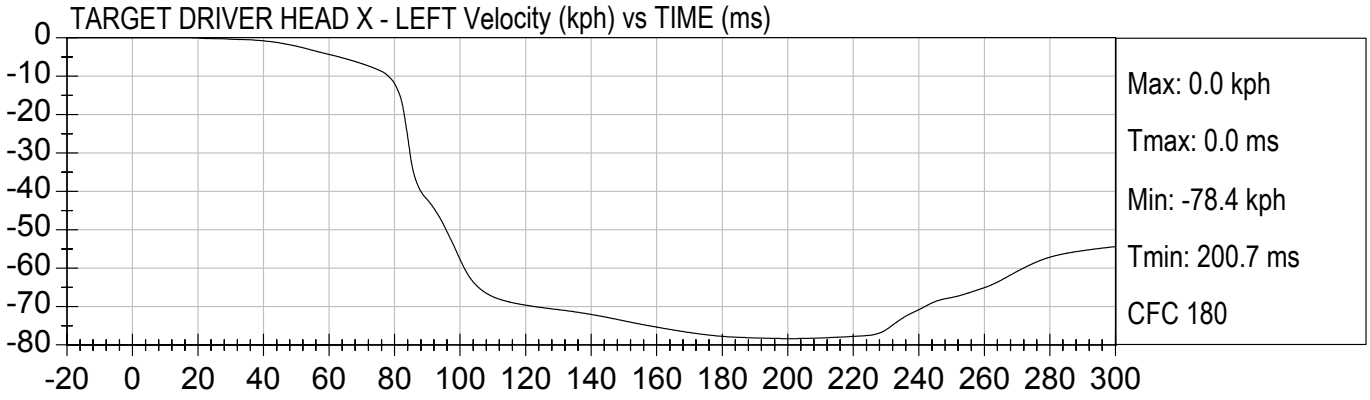
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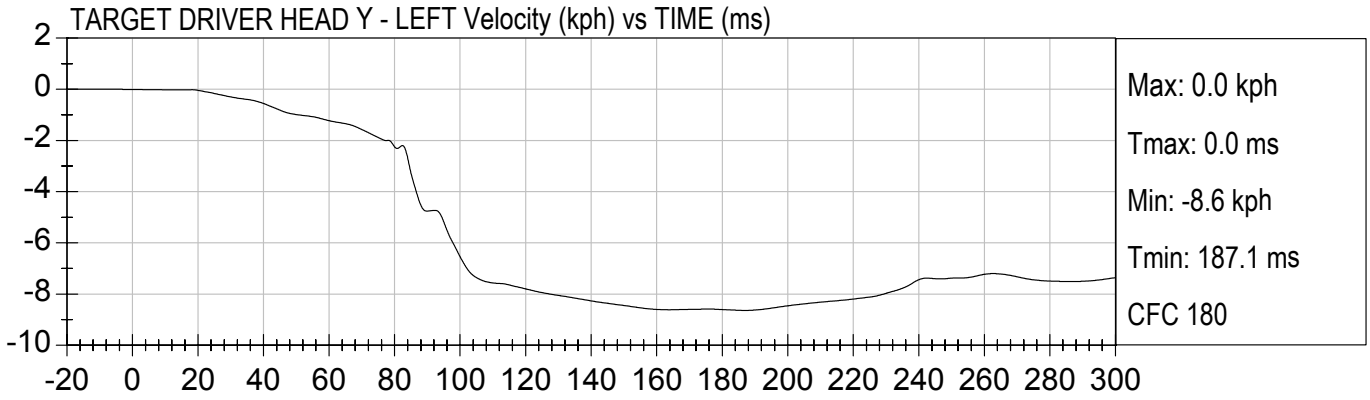


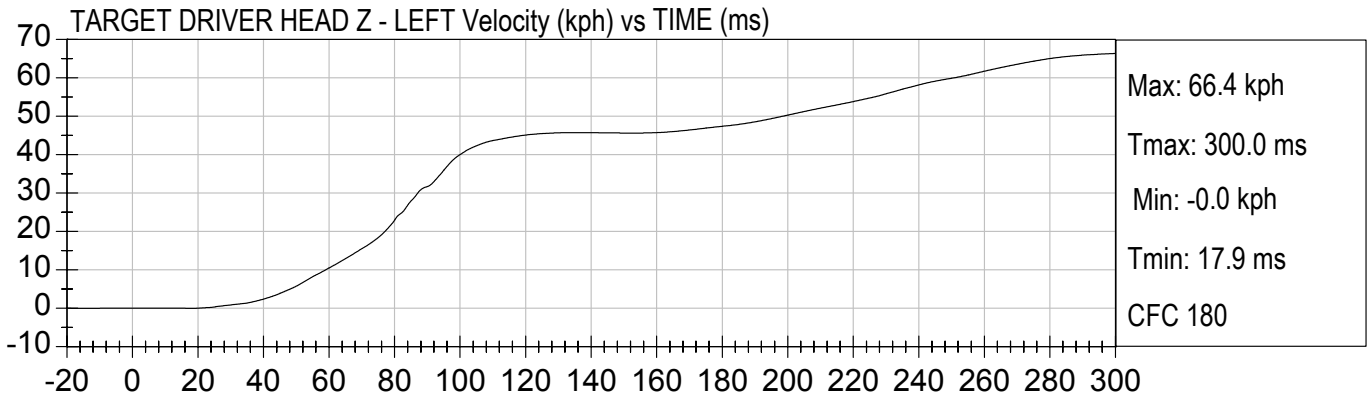






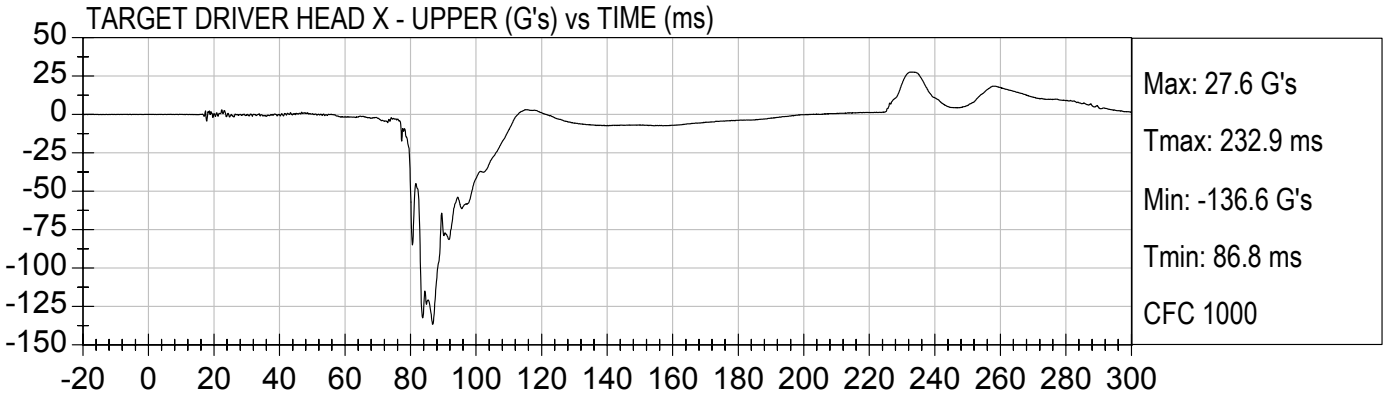

TARGET DRIVER HEAD X - LEFT Velocity (kph) vs TIME (ms)
0
-10
-20
-30
-40
-50
-60
-70
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -78.4 kph
Tmin: 200.7 ms
CFC 180

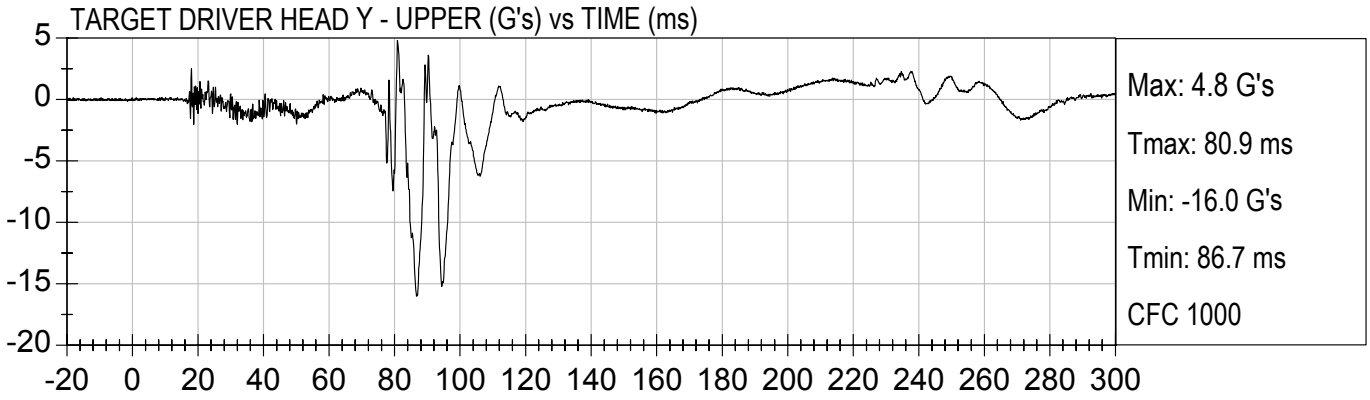

TARGET DRIVER HEAD Y - LEFT Velocity (kph) vs TIME (ms)
2
0
-2
-4
-6
-8
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -8.6 kph
Tmin: 187.1 ms
CFC 180

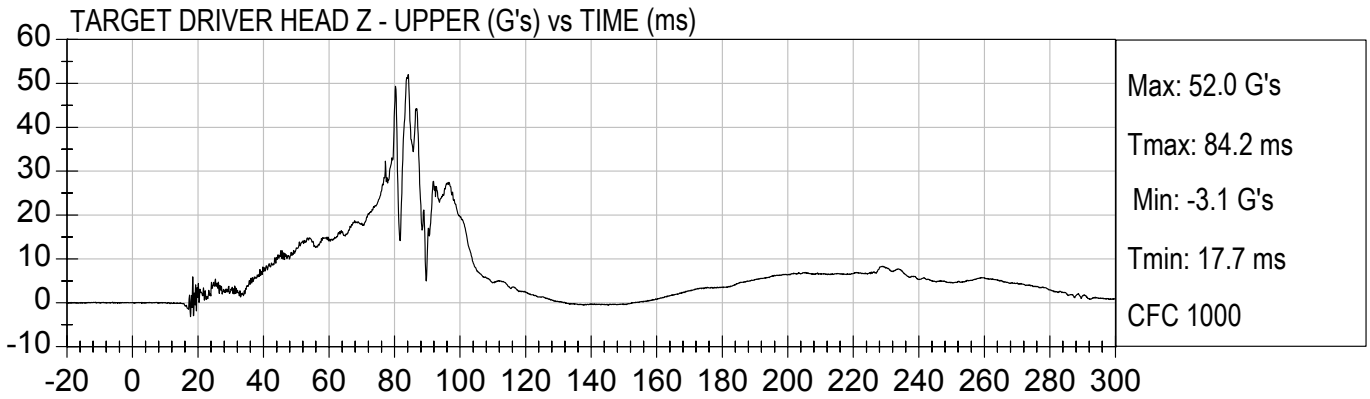

TARGET DRIVER HEAD Z - LEFT Velocity (kph) vs TIME (ms)
70
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 66.4 kph
Tmax: 300.0 ms
Min: -0.0 kph
Tmin: 17.9 ms
CFC 180

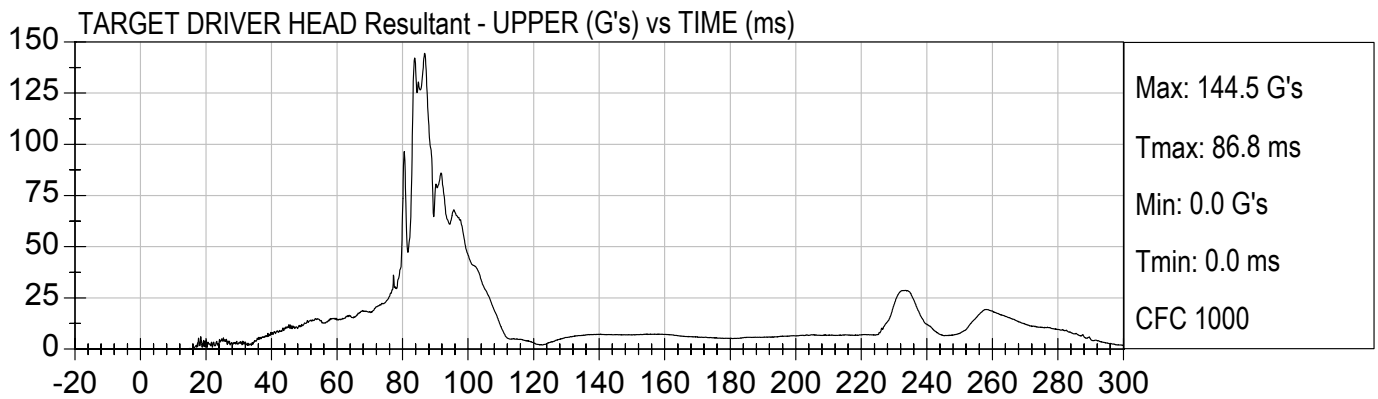
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

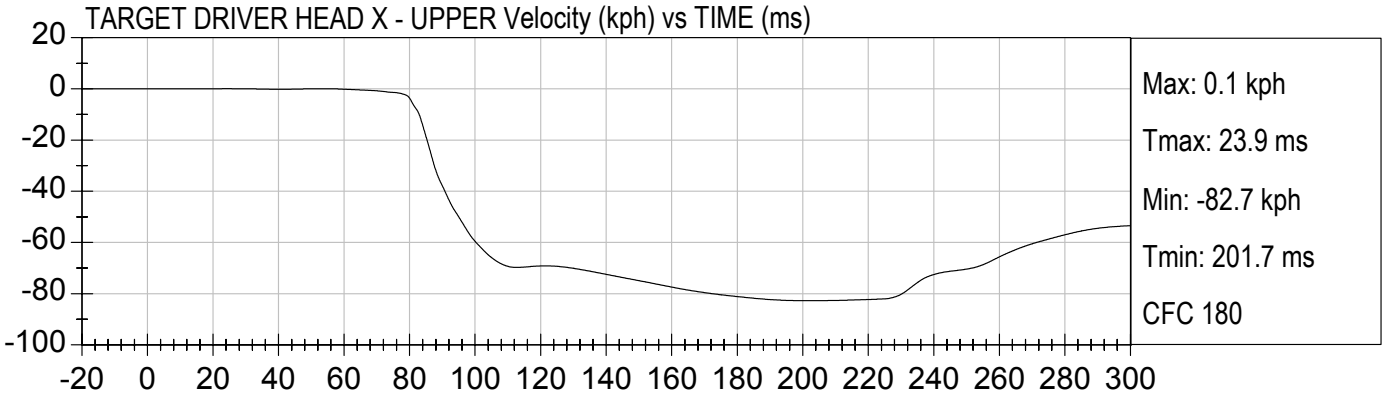
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

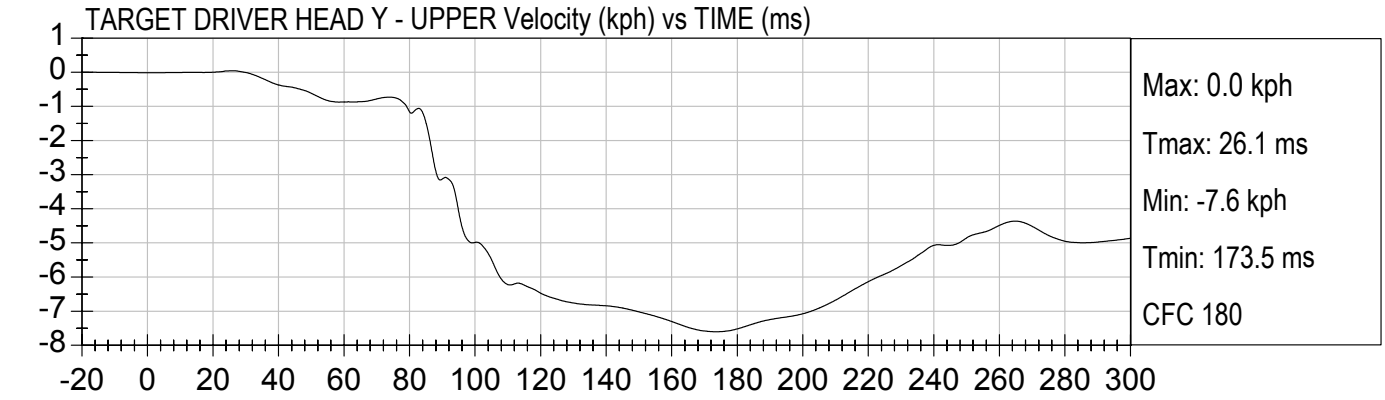


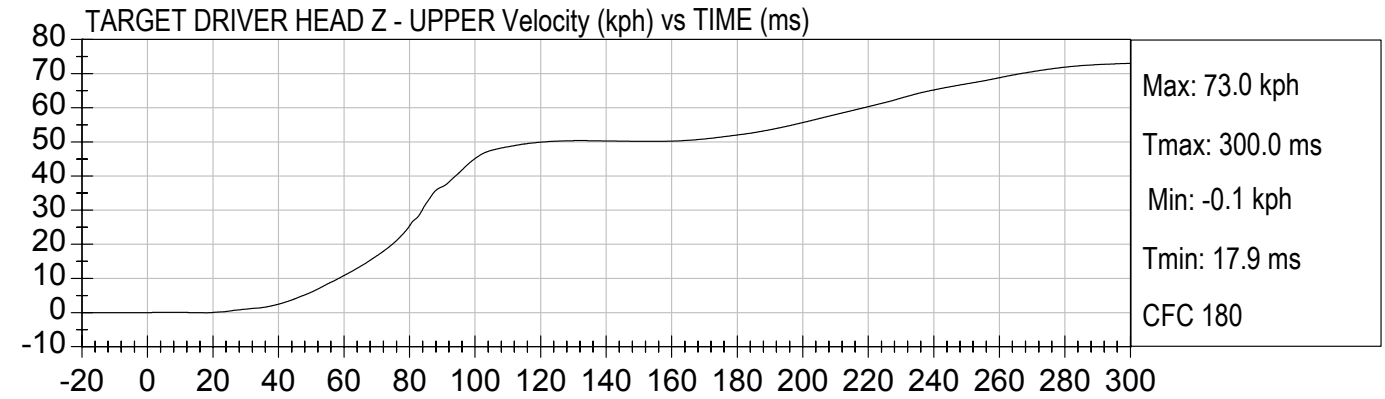







TARGET DRIVER HEAD X - UPPER Velocity (kph) vs TIME (ms)
20
0
-20
-40
-60
-80
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.1 kph
Tmax: 23.9 ms
Min: -82.7 kph
Tmin: 201.7 ms
CFC 180

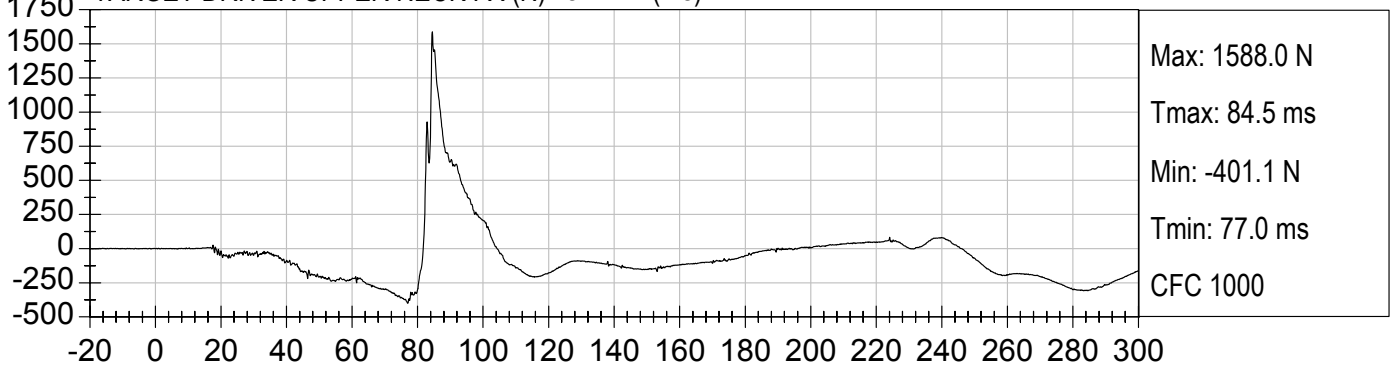

TARGET DRIVER HEAD Y - UPPER Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 26.1 ms
Min: -7.6 kph
Tmin: 173.5 ms
CFC 180


TARGET DRIVER HEAD Z - UPPER Velocity (kph) vs TIME (ms)
80
70
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 73.0 kph
Tmax: 300.0 ms
Min: -0.1 kph
Tmin: 17.9 ms
CFC 180

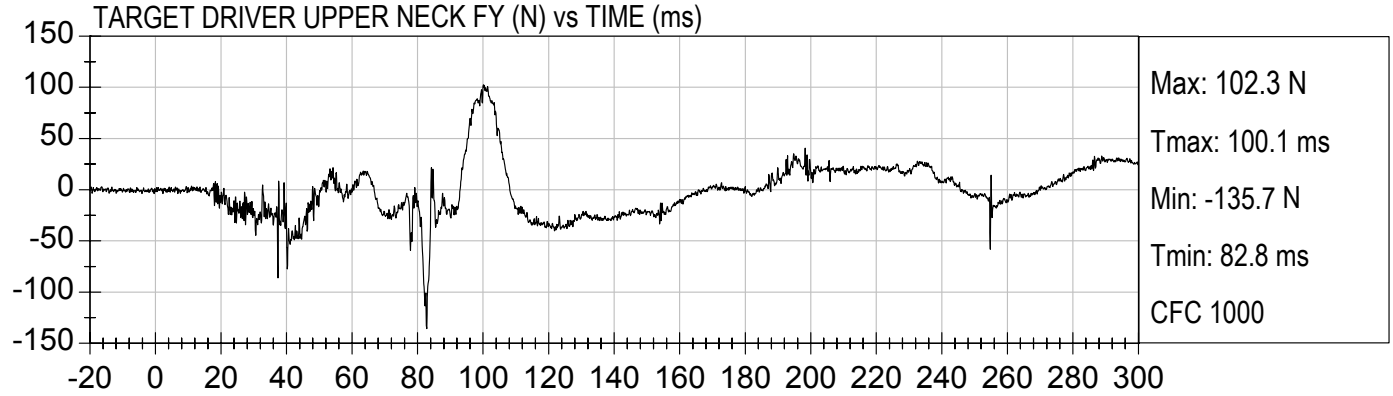
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

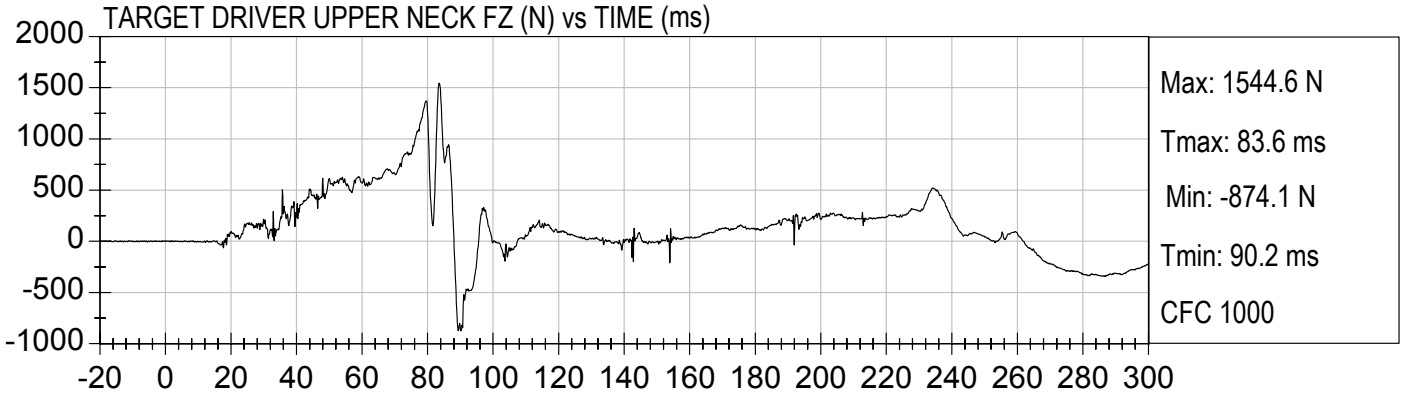
TARGET DRIVER UPPER NECK FX (N) vs TIME (ms)



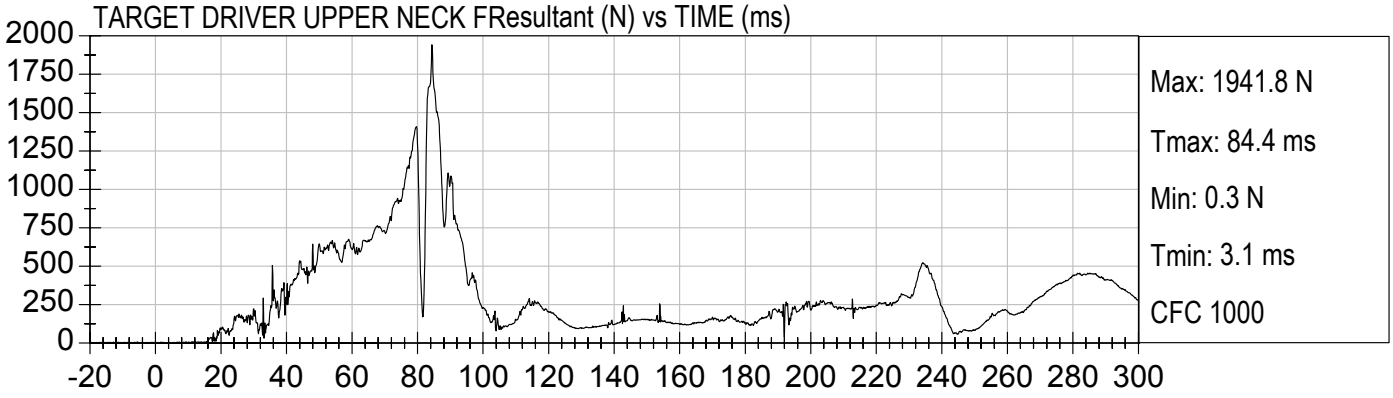
TARGET DRIVER UPPER NECK FY (N) vs TIME (ms)



TARGET DRIVER UPPER NECK FZ (N) vs TIME (ms)

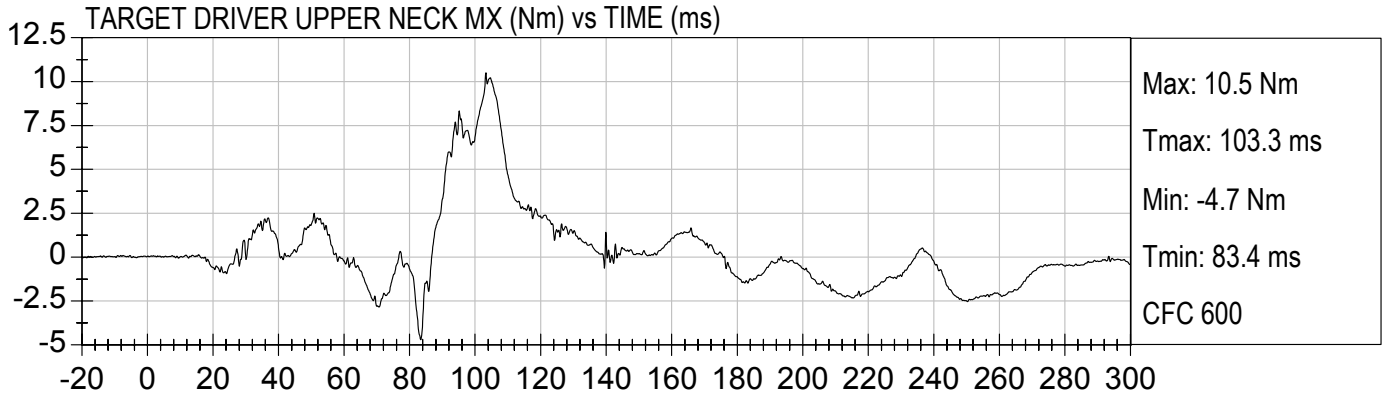


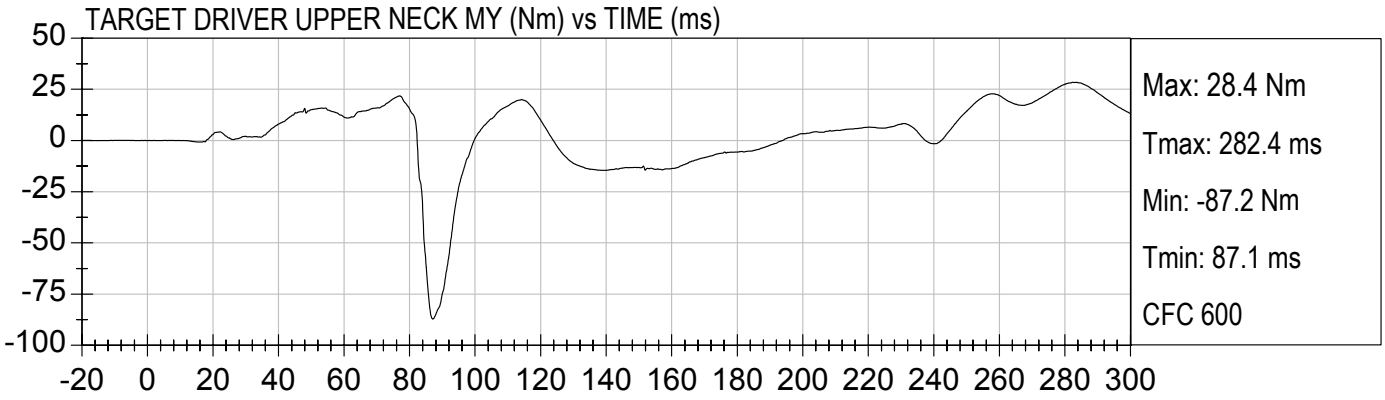
TARGET DRIVER UPPER NECK FResultant (N) vs TIME (ms)

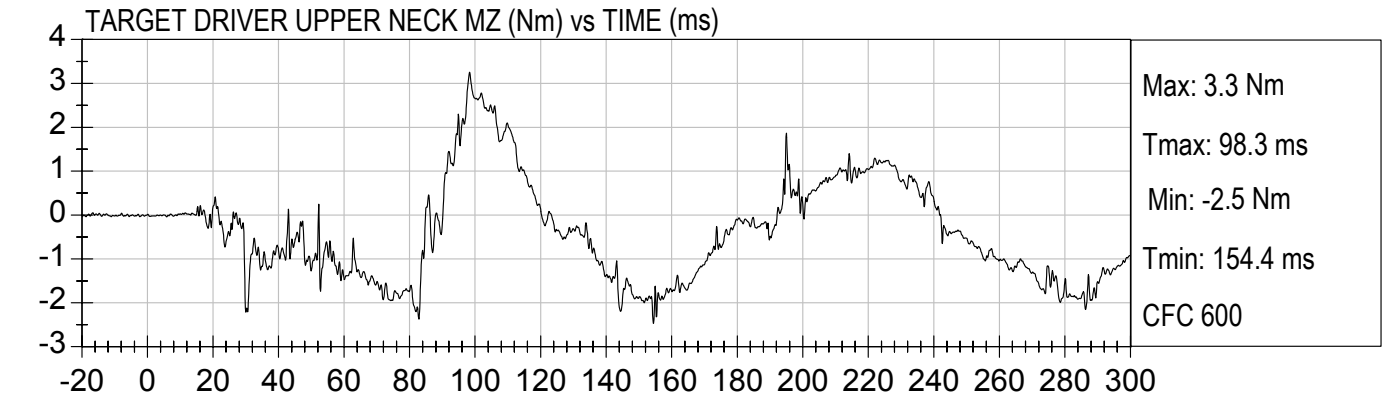


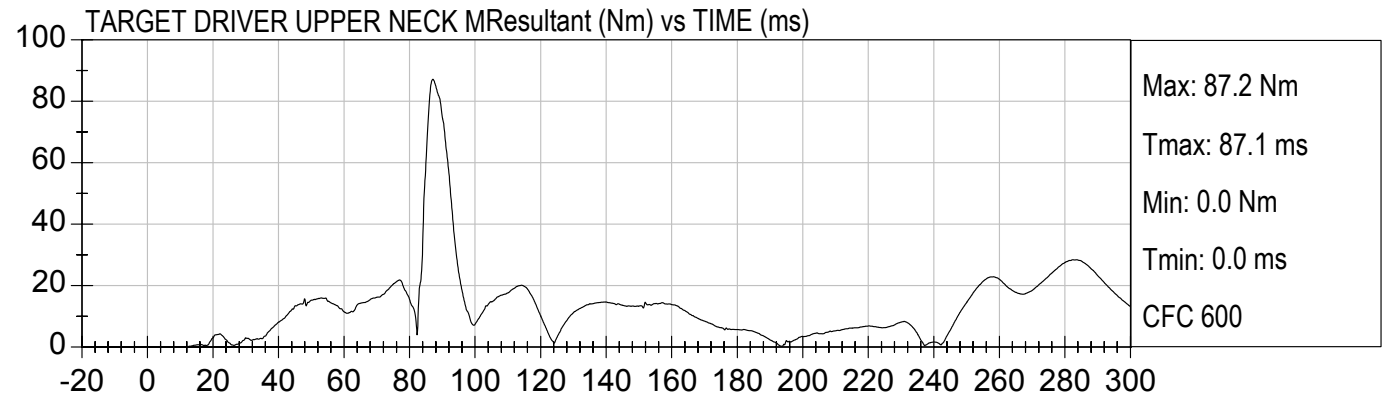
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



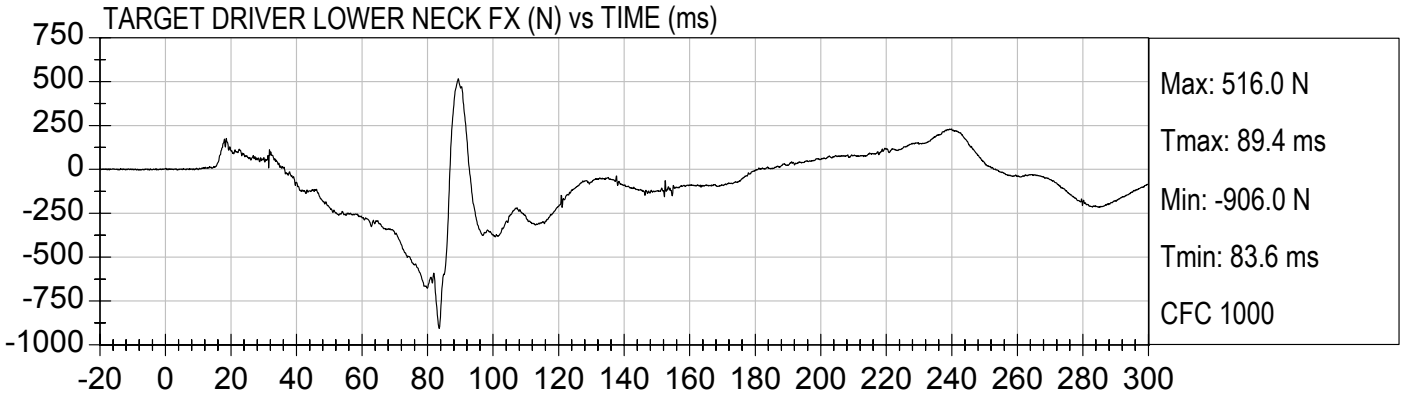


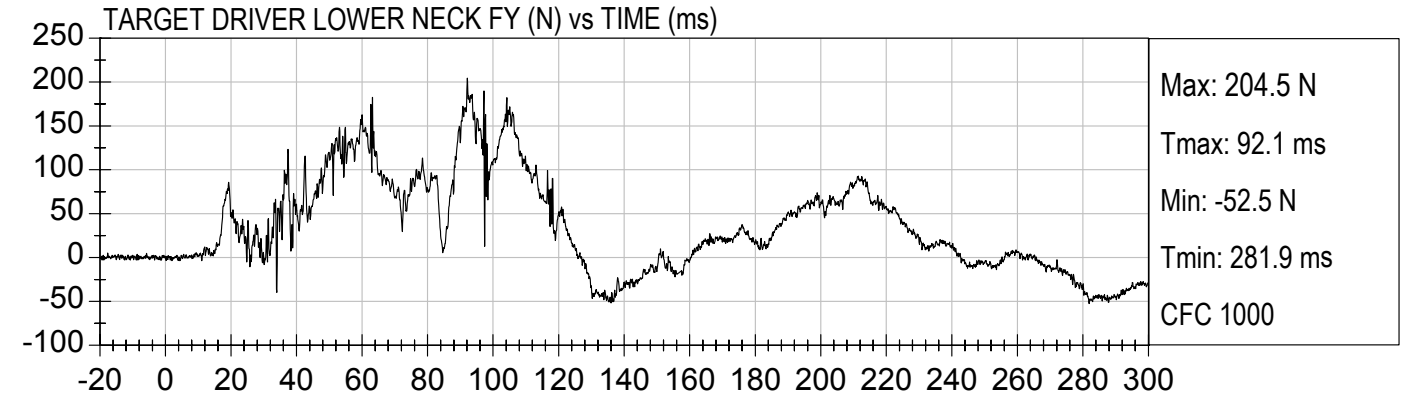


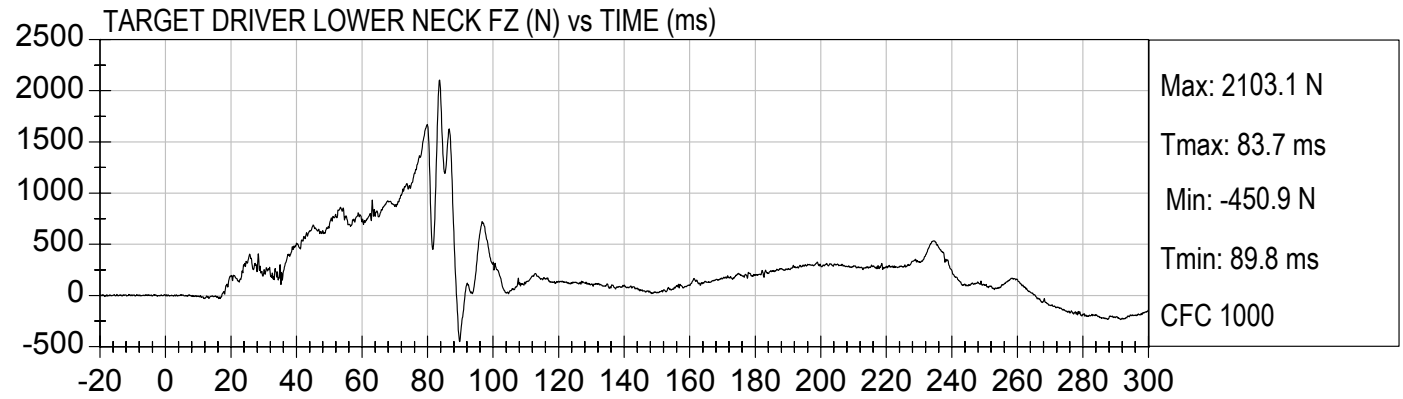


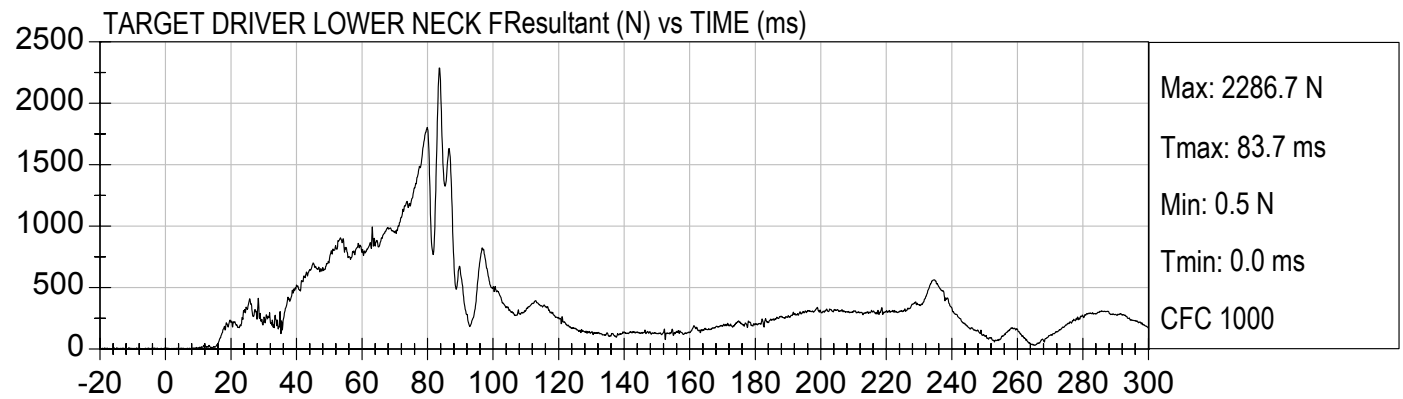
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



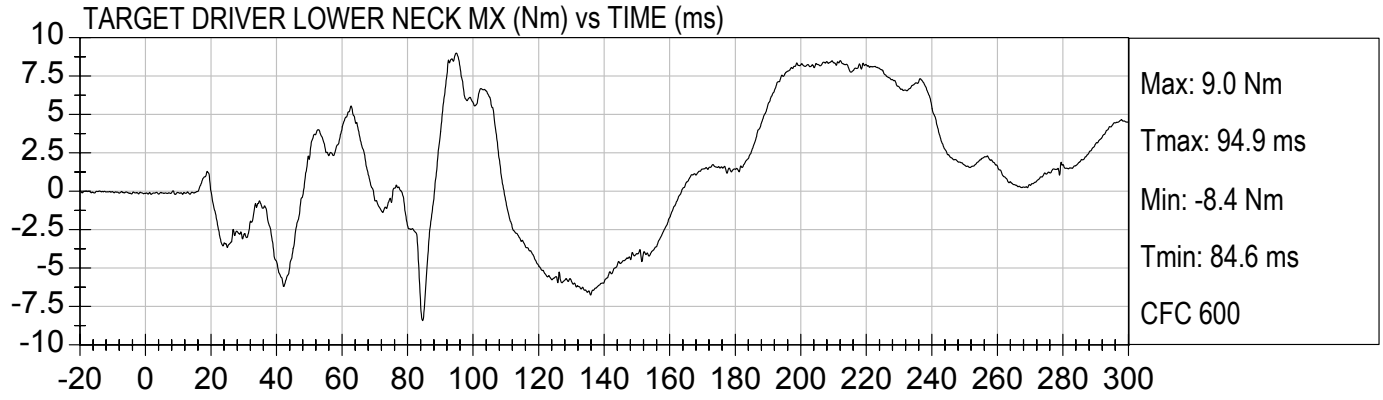


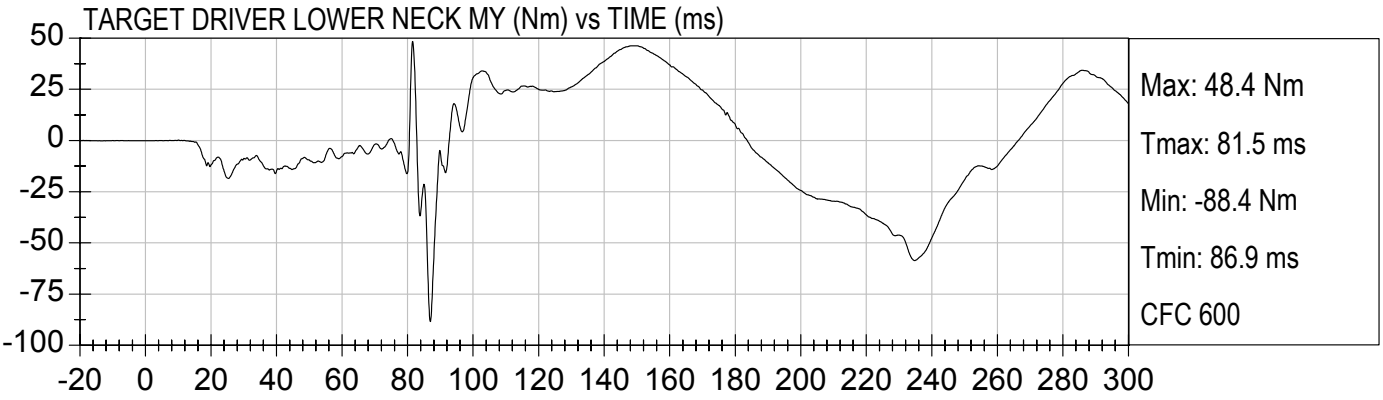


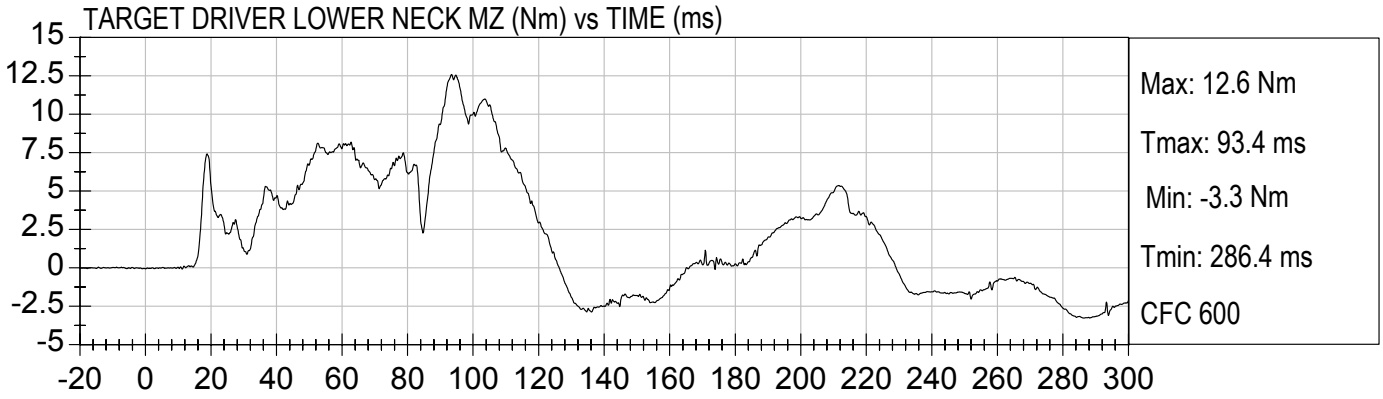


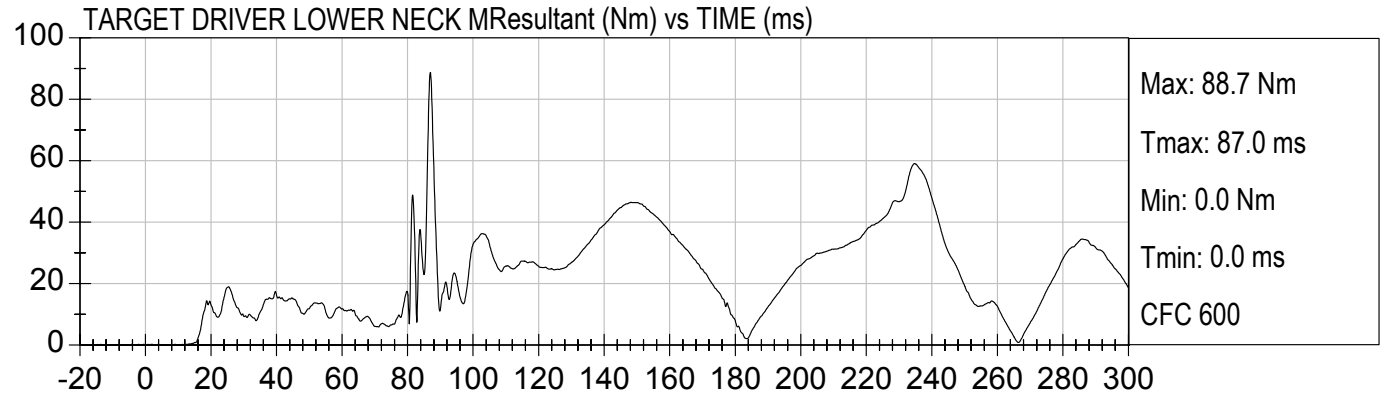
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



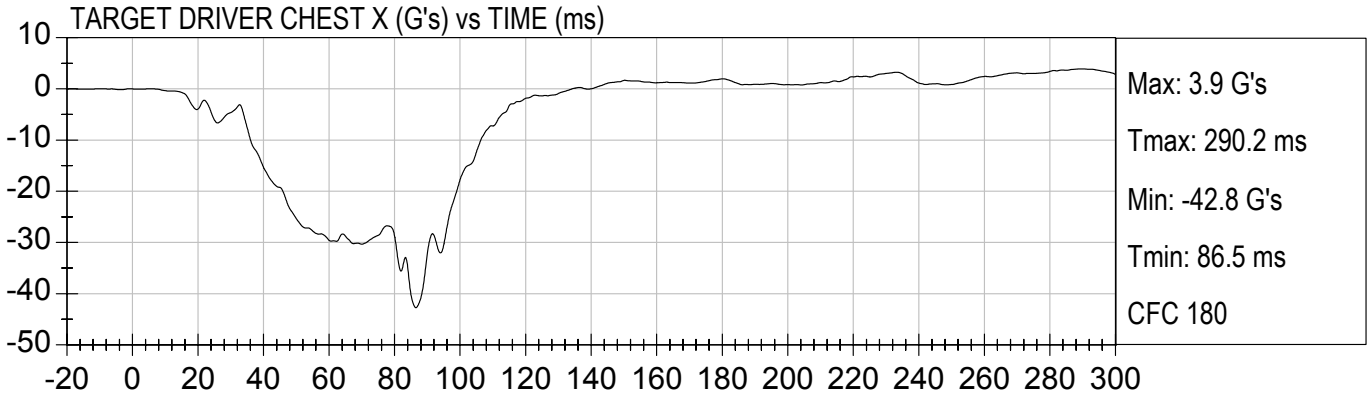


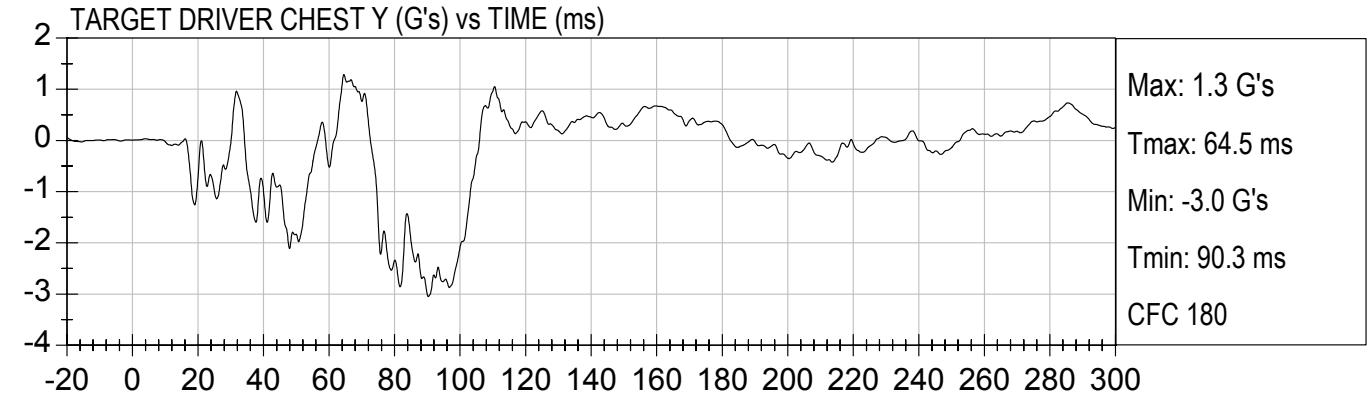


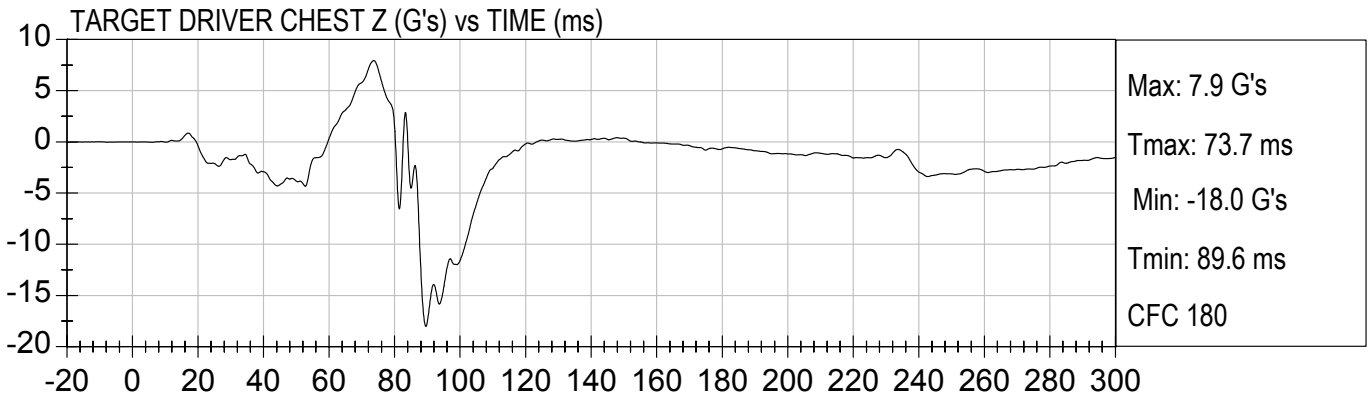


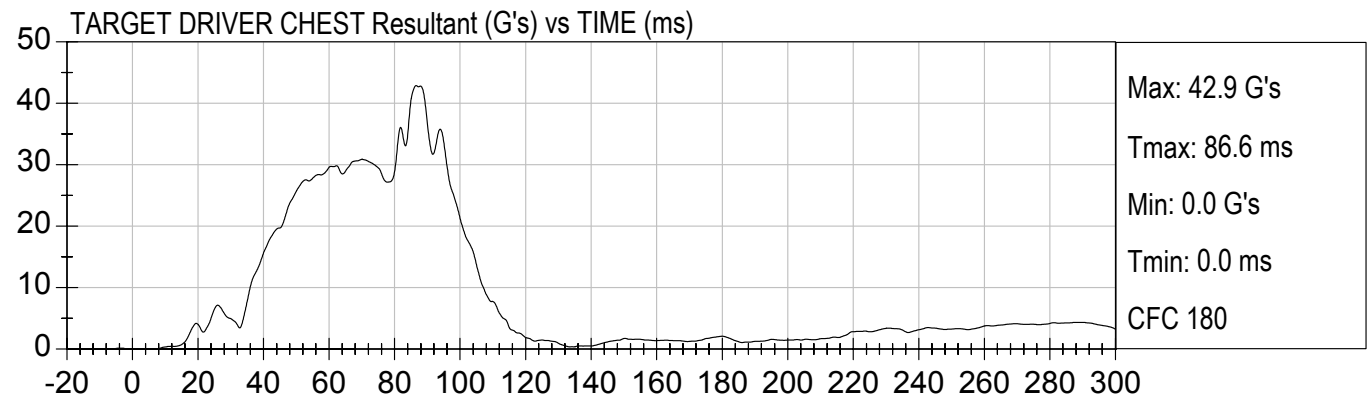
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



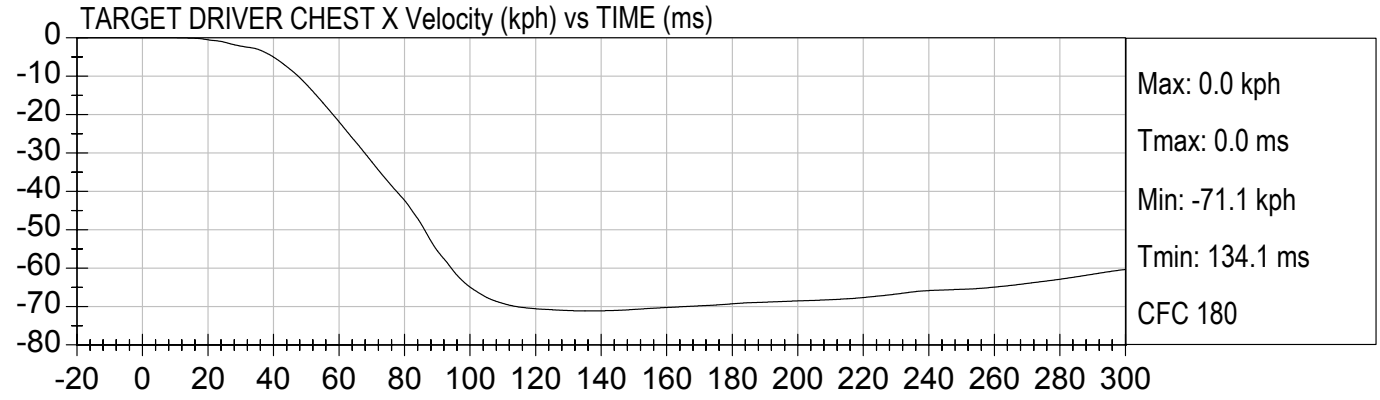


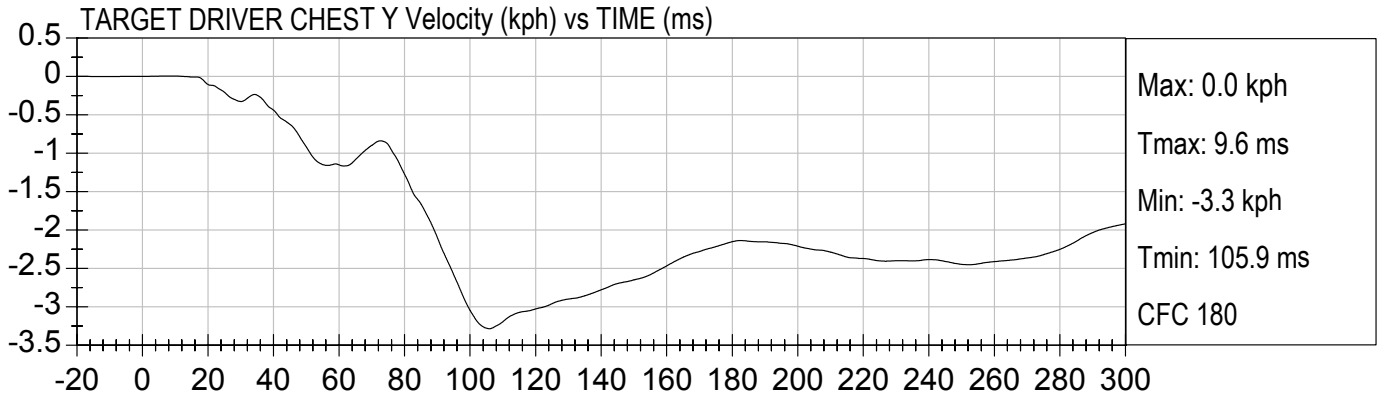


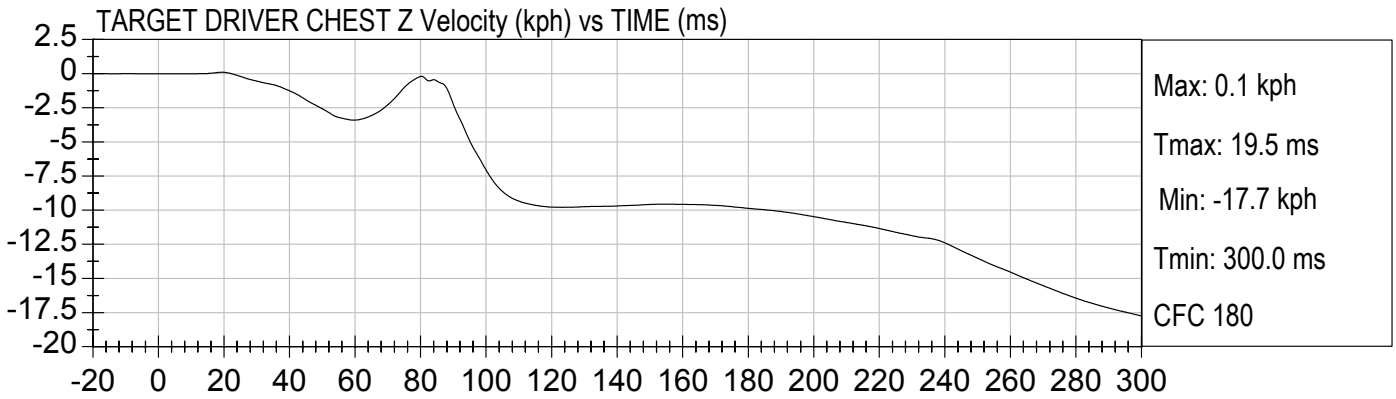


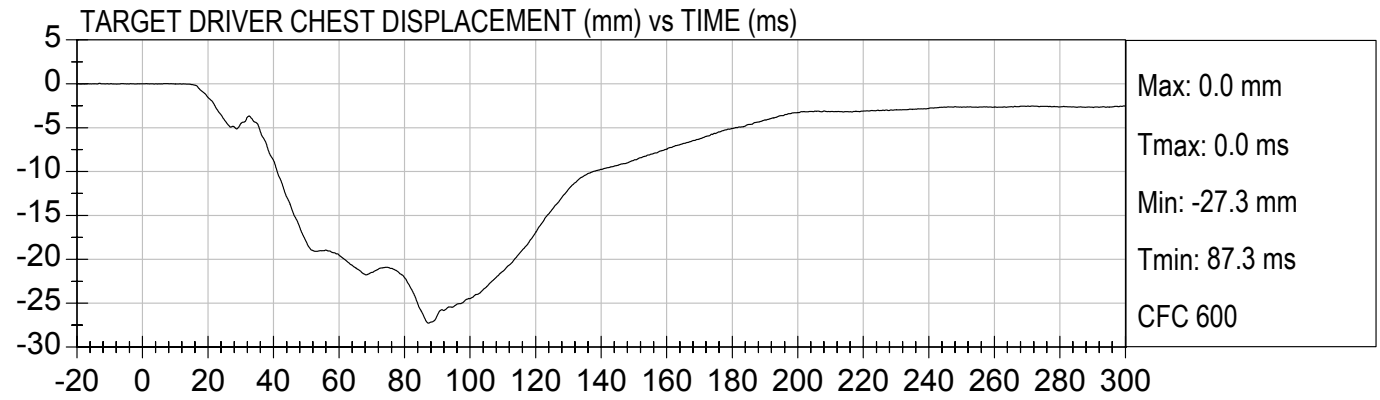
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



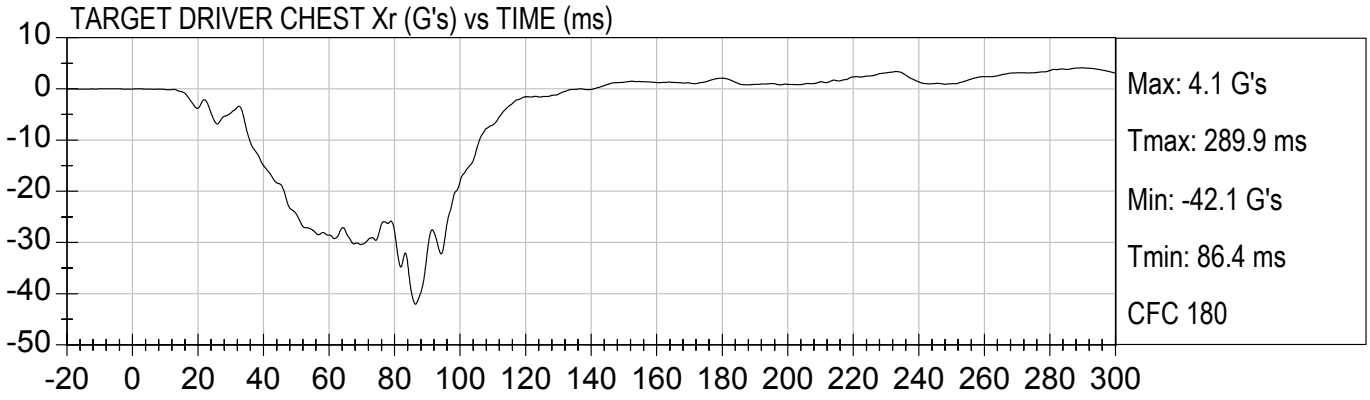


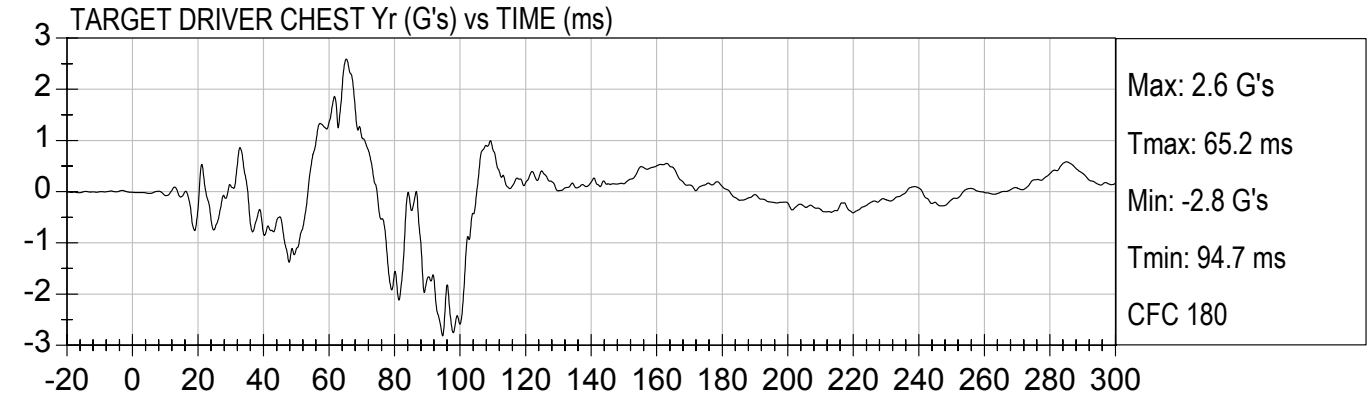


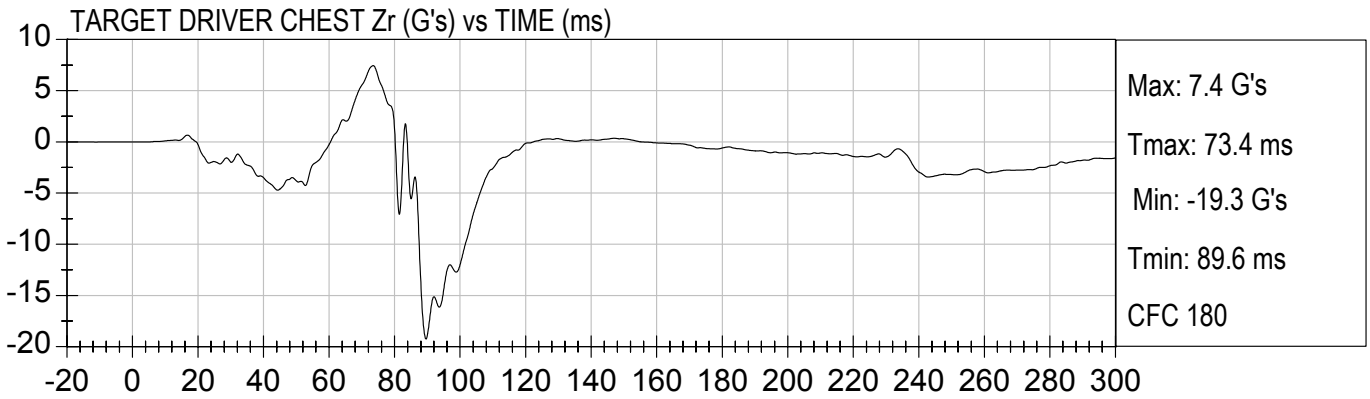


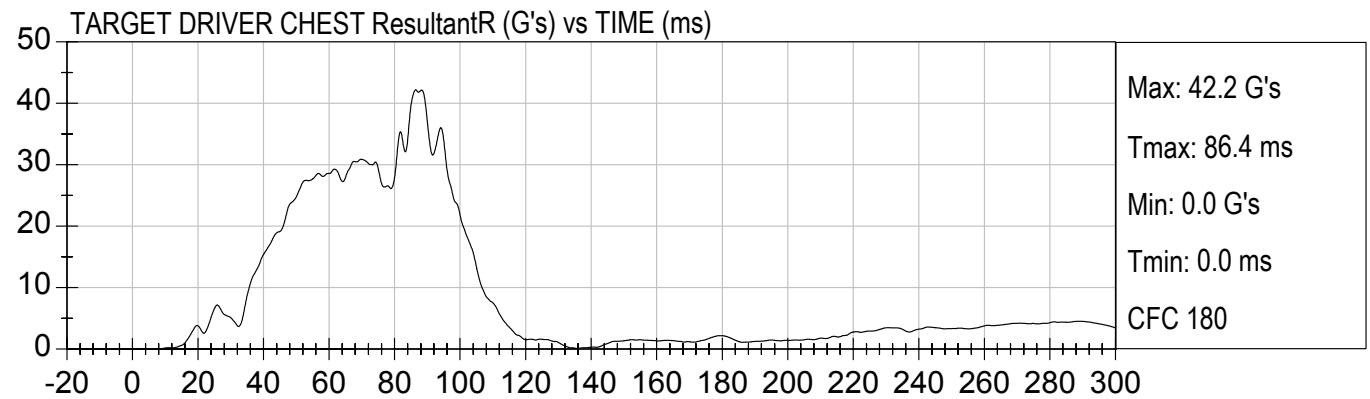
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



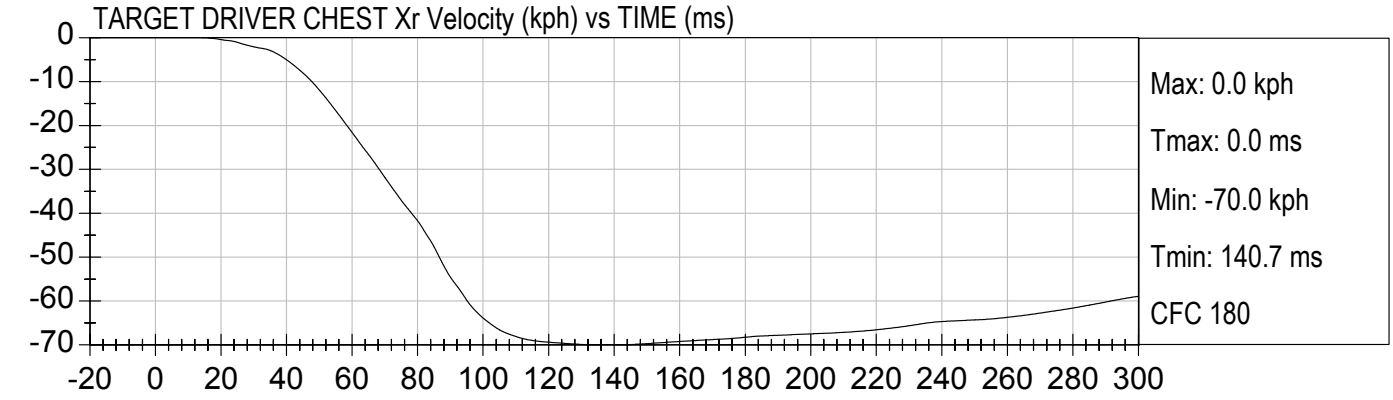


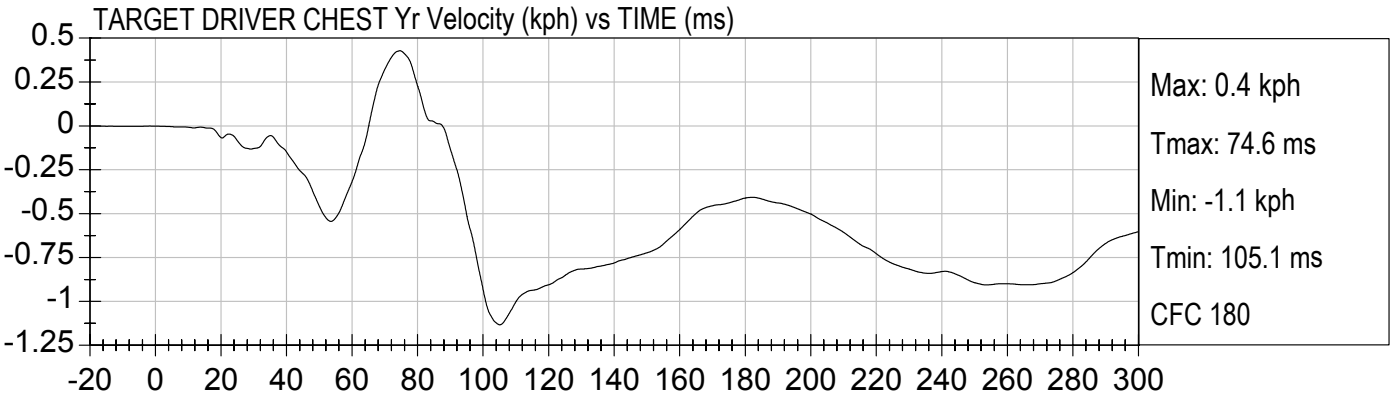


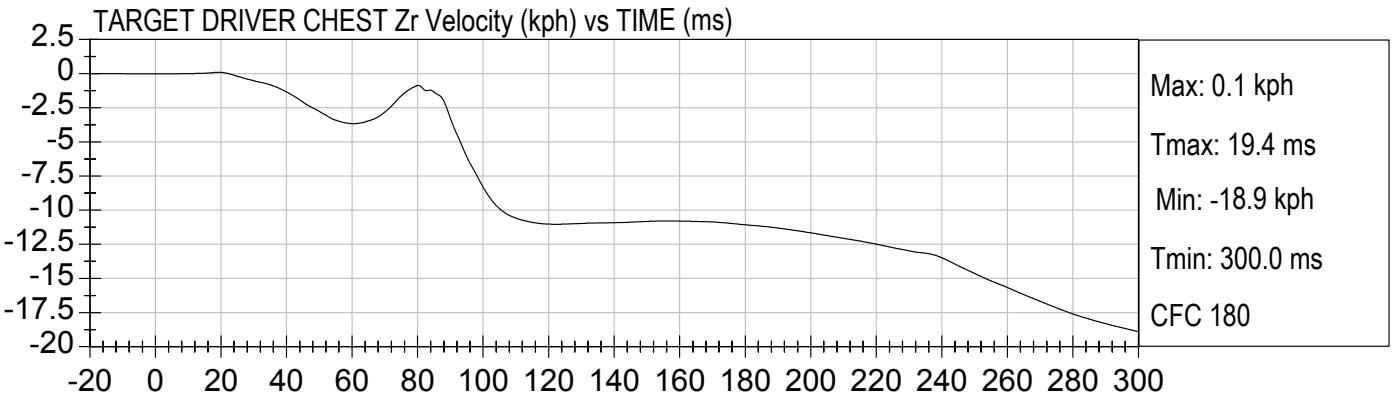


TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

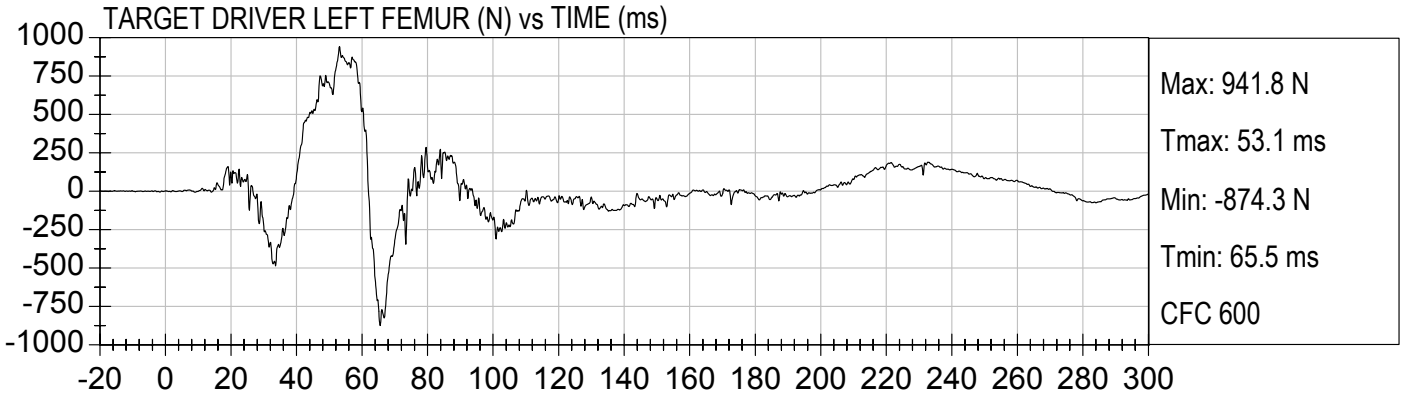


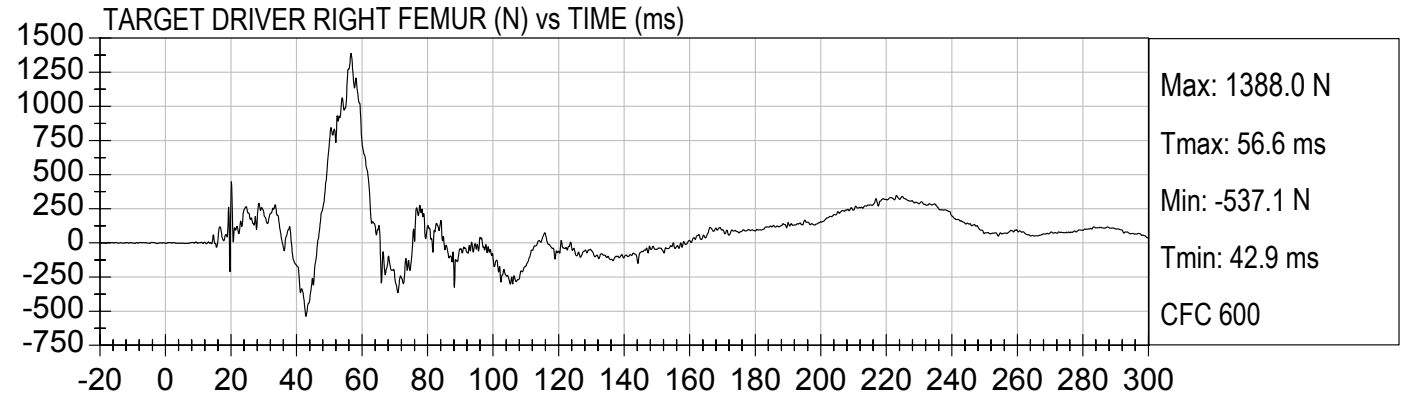


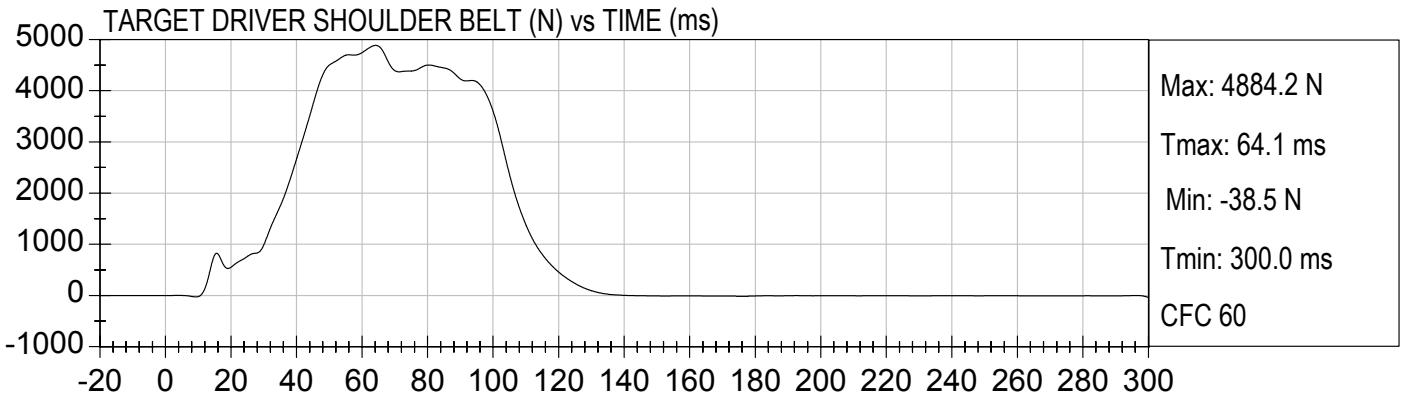


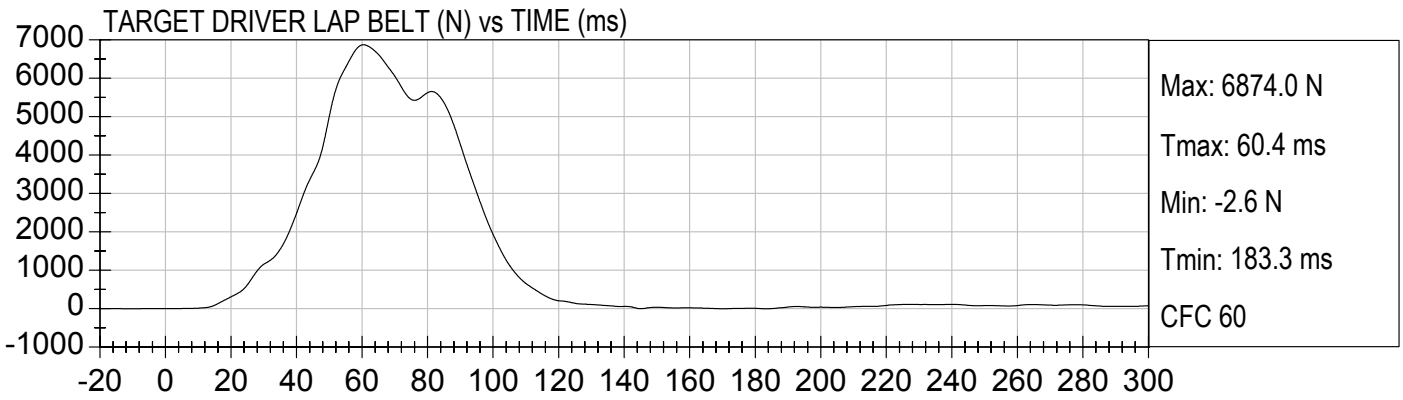
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

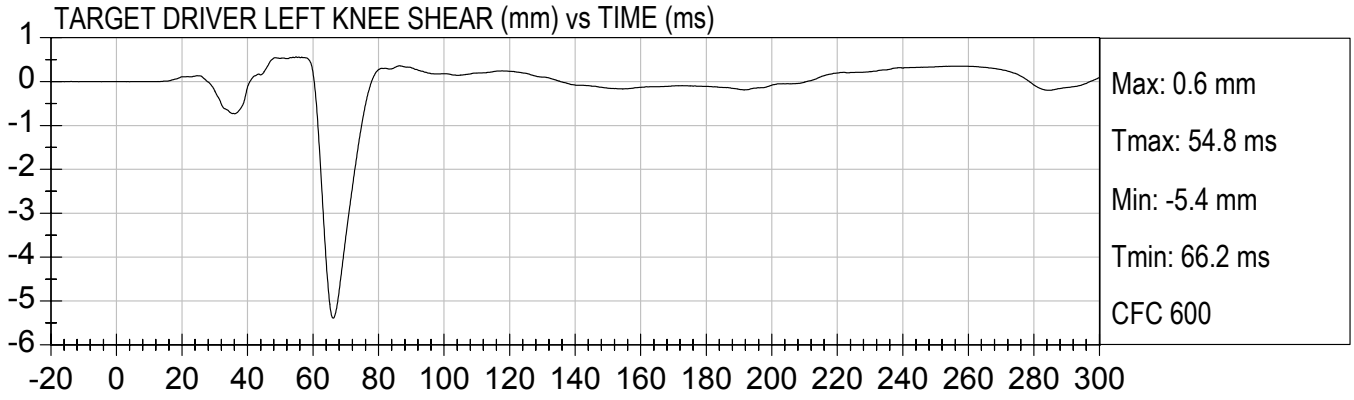
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

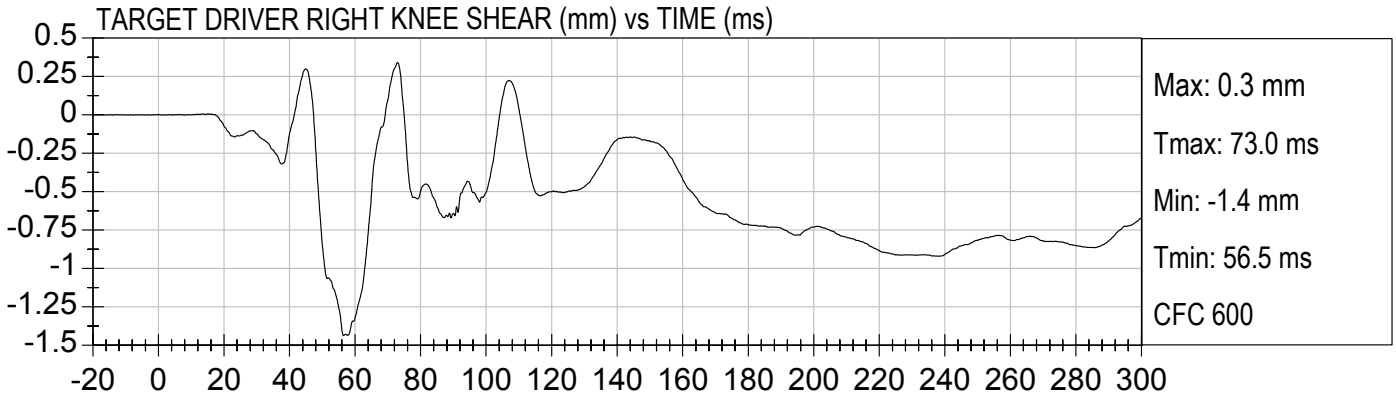






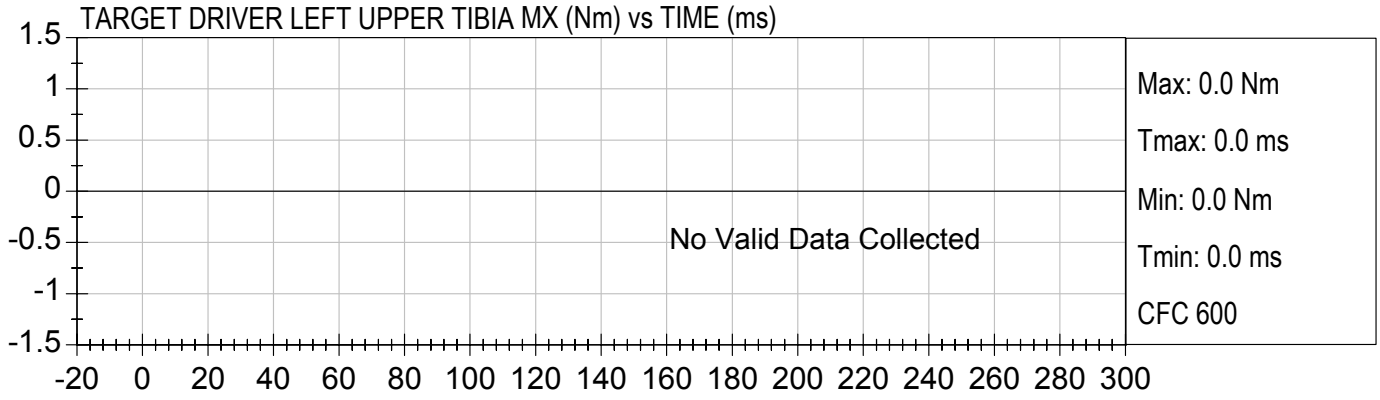


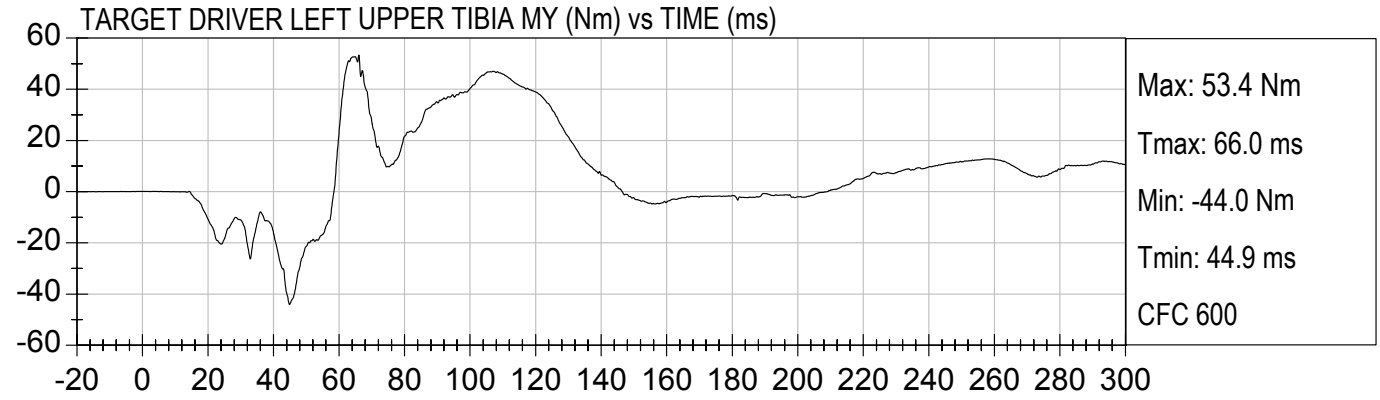

TARGET DRIVER LEFT KNEE SHEAR (mm) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.6 mm
Tmax: 54.8 ms
Min: -5.4 mm
Tmin: 66.2 ms
CFC 600

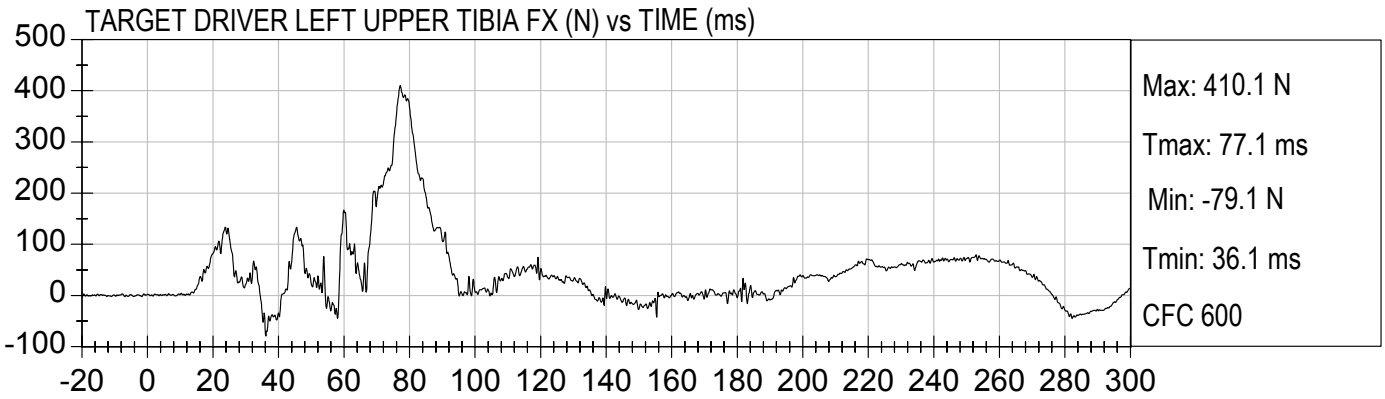

TARGET DRIVER RIGHT KNEE SHEAR (mm) vs TIME (ms)
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1.25
-1.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.3 mm
Tmax: 73.0 ms
Min: -1.4 mm
Tmin: 56.5 ms
CFC 600

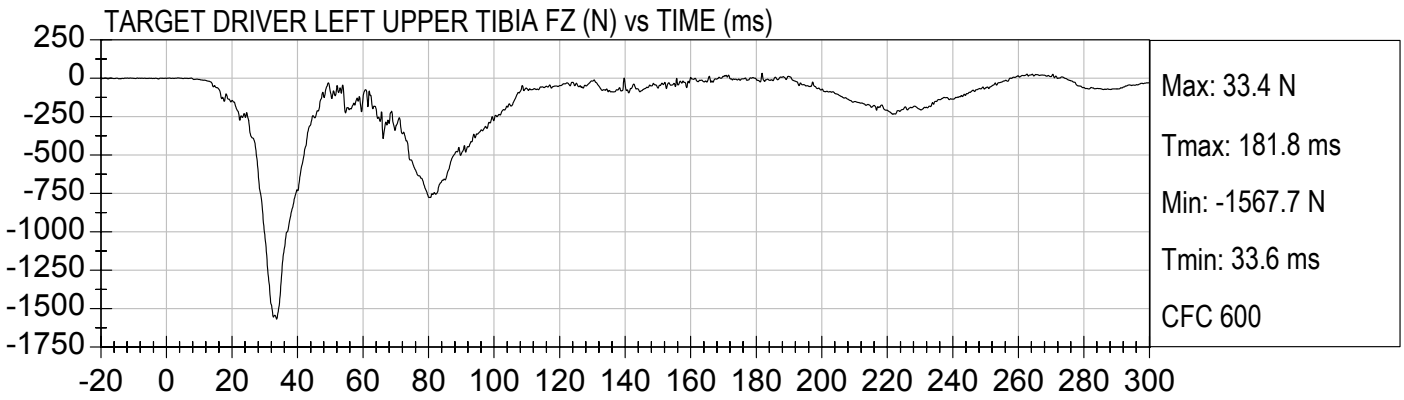
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

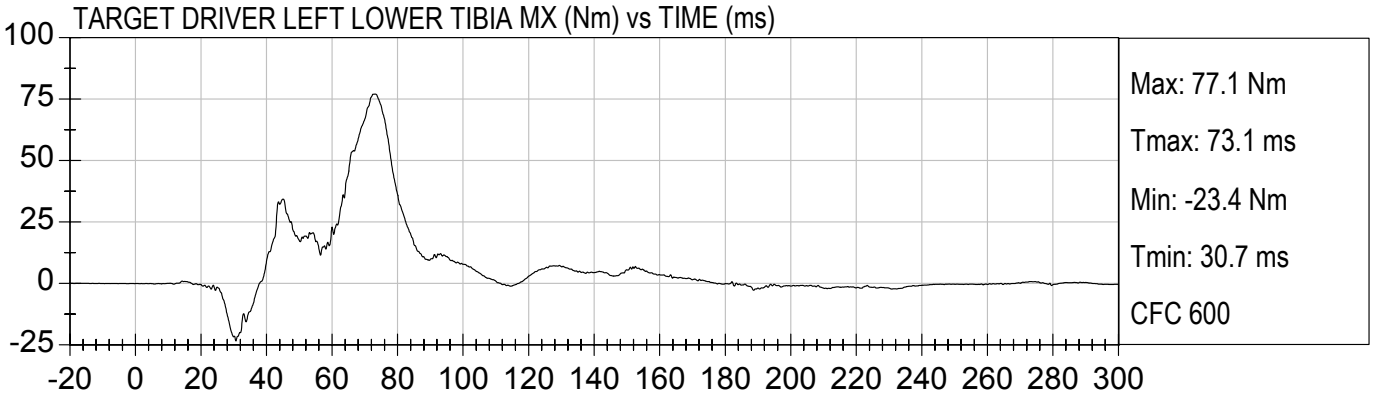
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

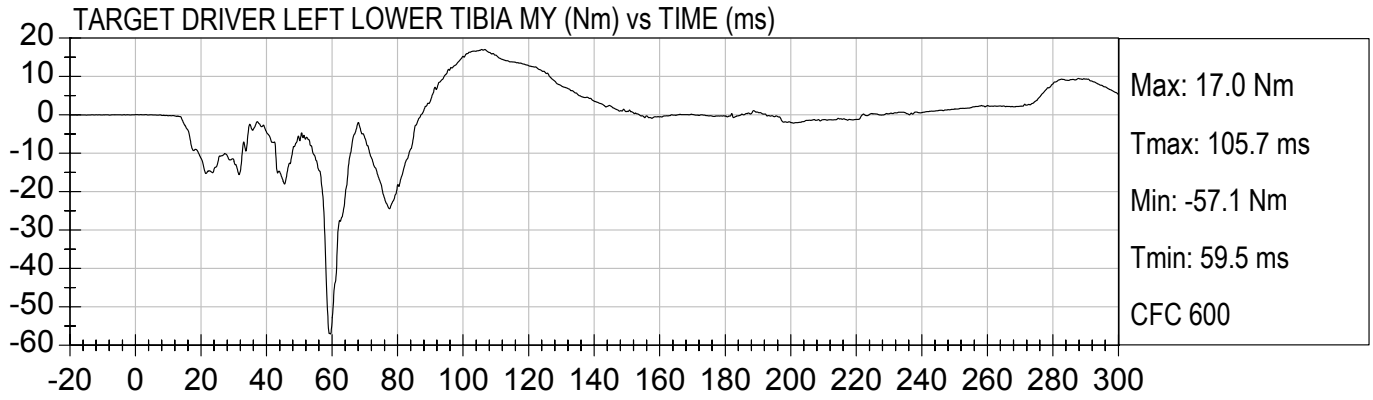






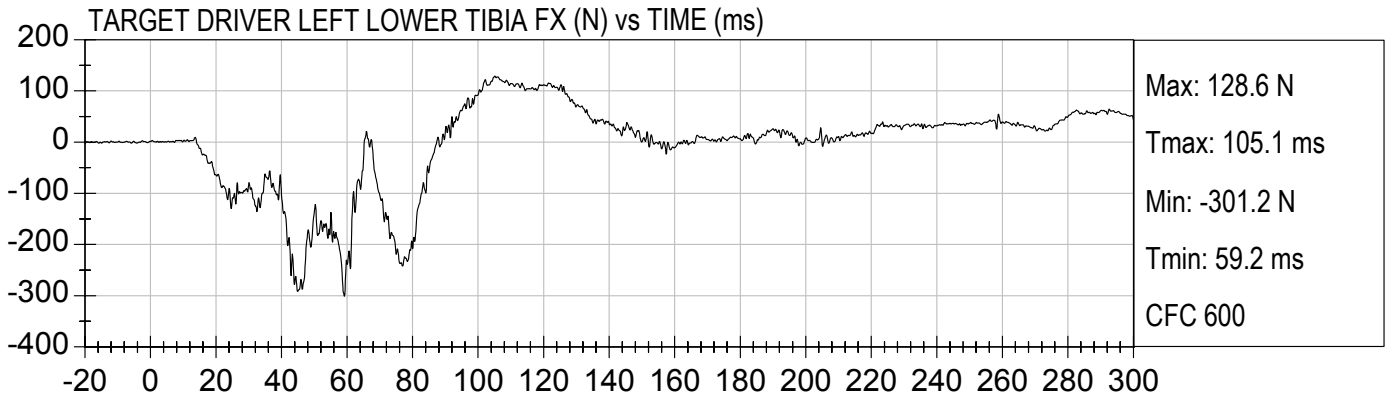


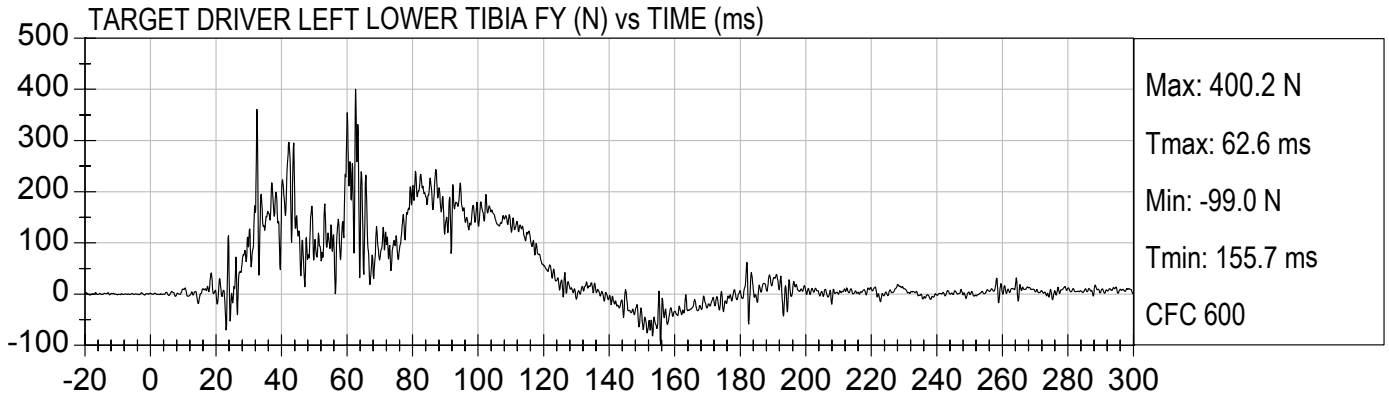

TARGET DRIVER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)
100
75
50
25
0
-25
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 77.1 Nm
Tmax: 73.1 ms
Min: -23.4 Nm
Tmin: 30.7 ms
CFC 600

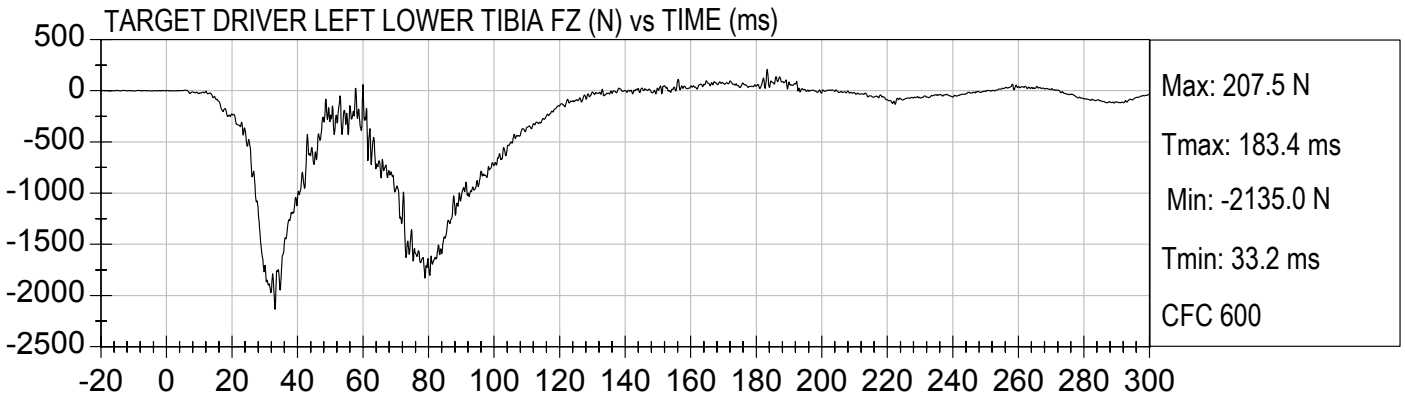

TARGET DRIVER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-50
-60
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 17.0 Nm
Tmax: 105.7 ms
Min: -57.1 Nm
Tmin: 59.5 ms
CFC 600

TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

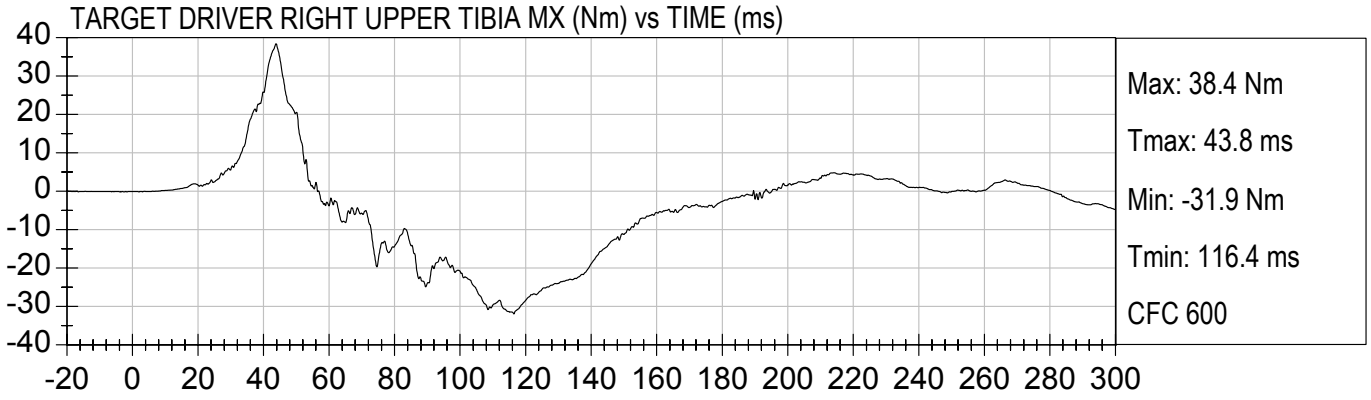


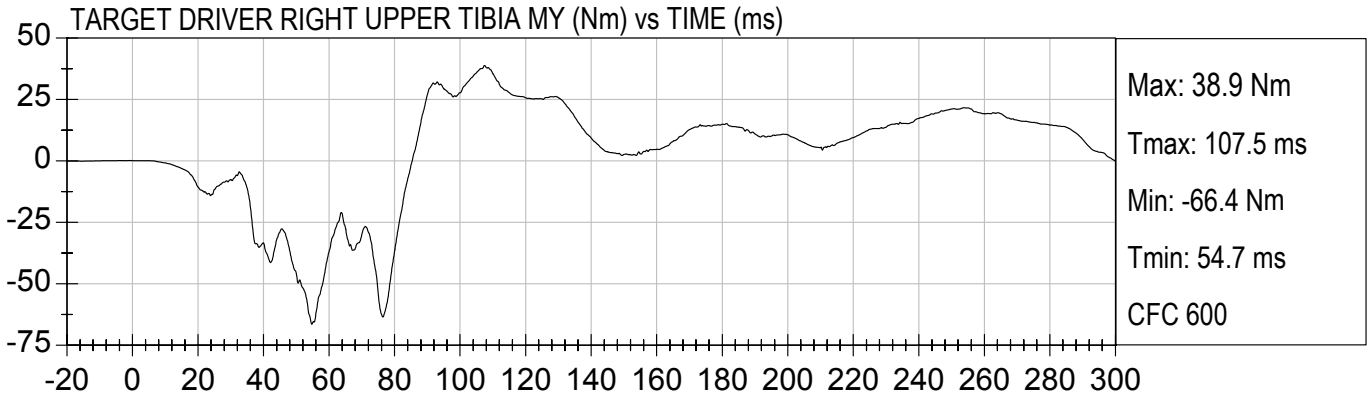


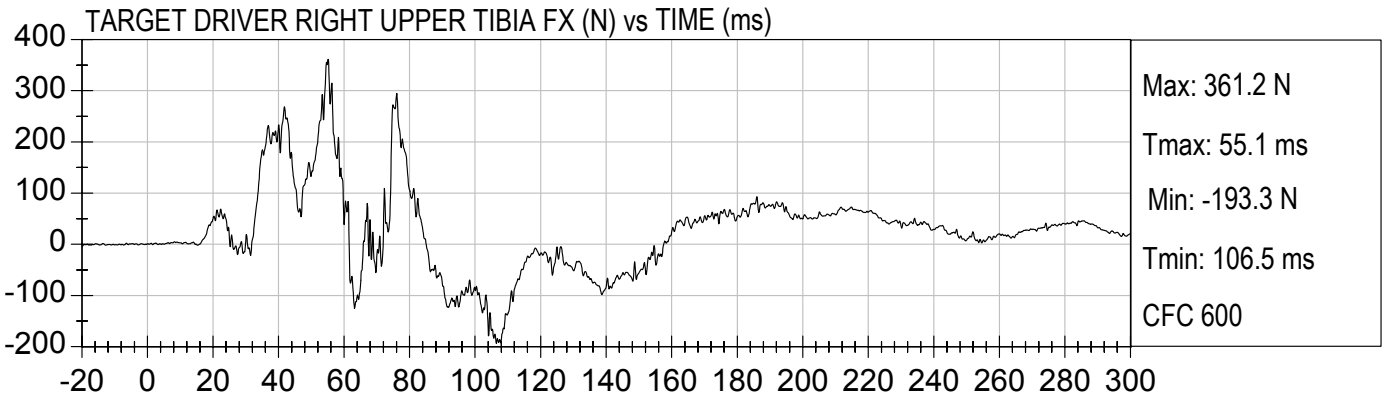


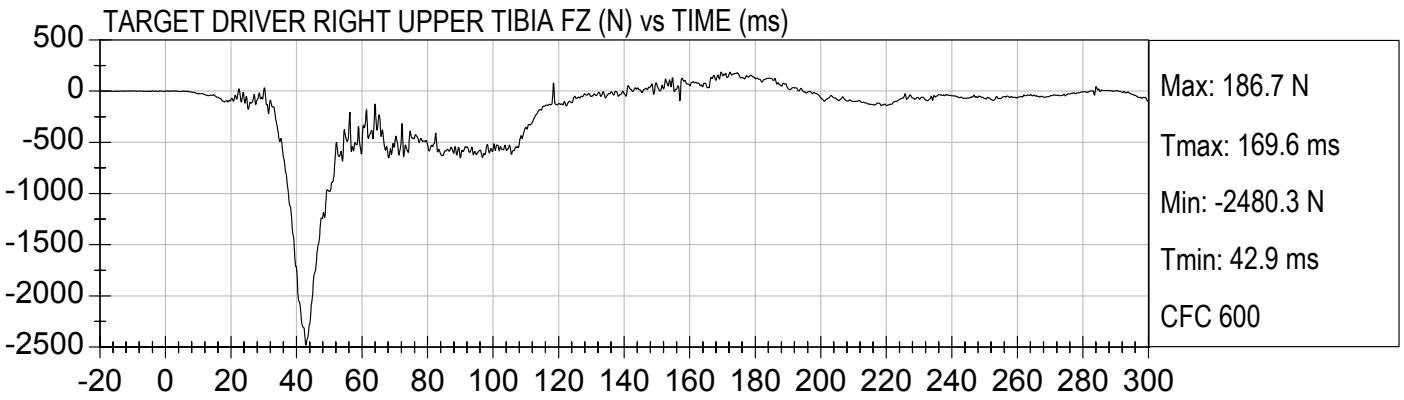
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

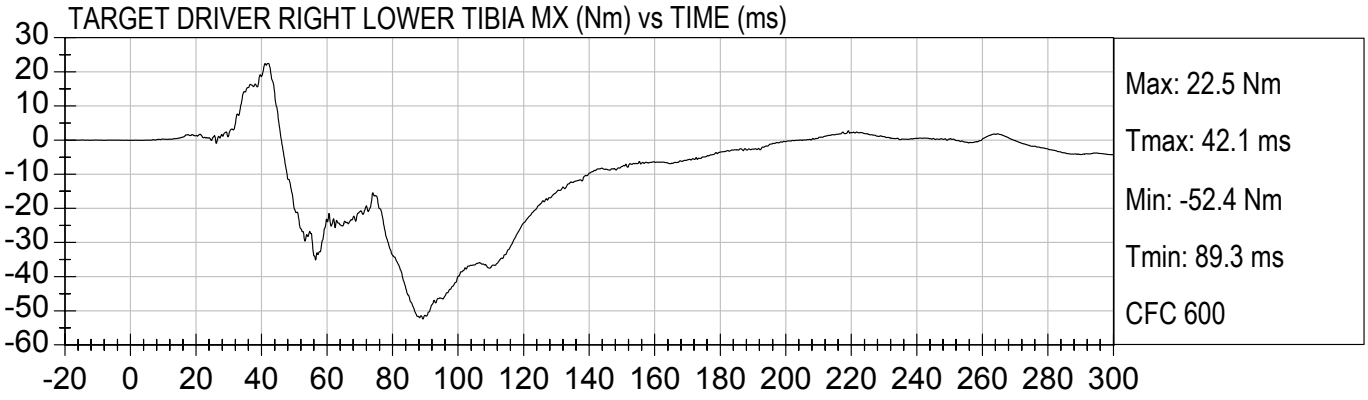
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

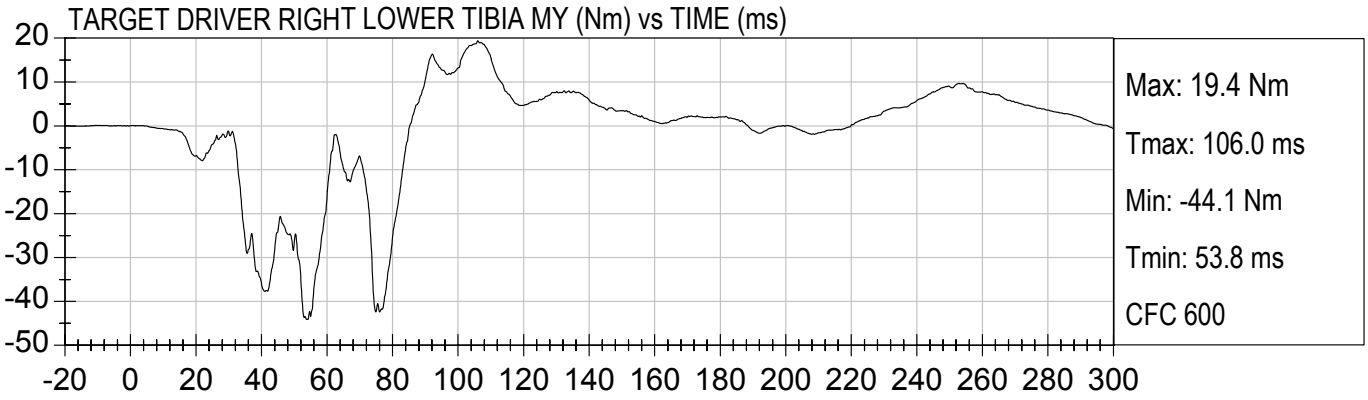






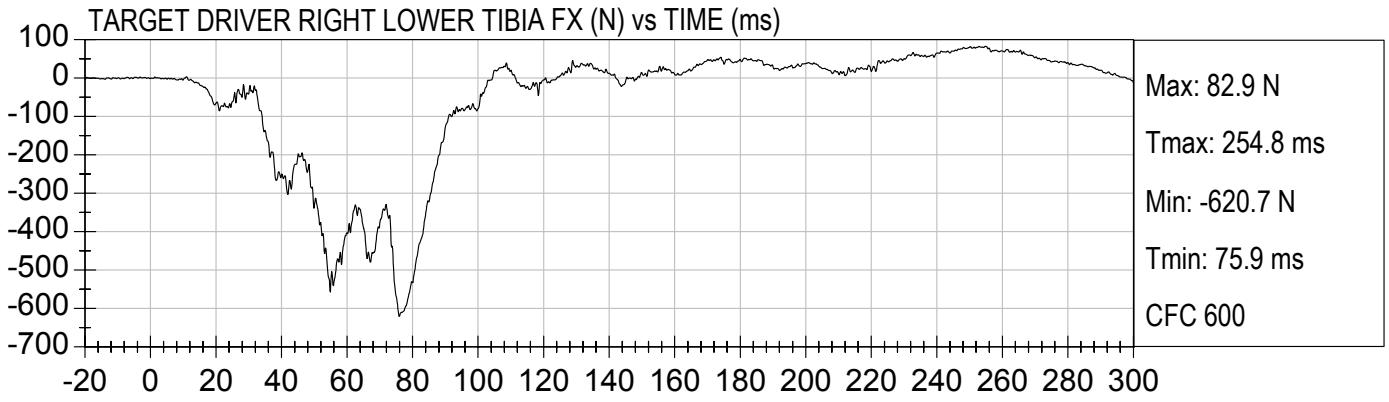


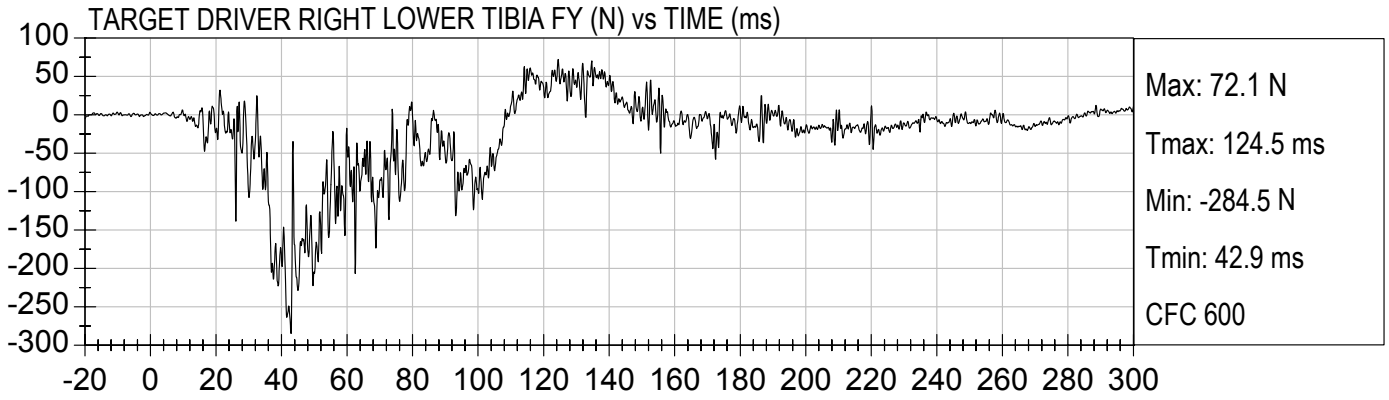

TARGET DRIVER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)
30
20
10
0
-10
-20
-30
-40
-50
-60
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 22.5 Nm
Tmax: 42.1 ms
Min: -52.4 Nm
Tmin: 89.3 ms
CFC 600

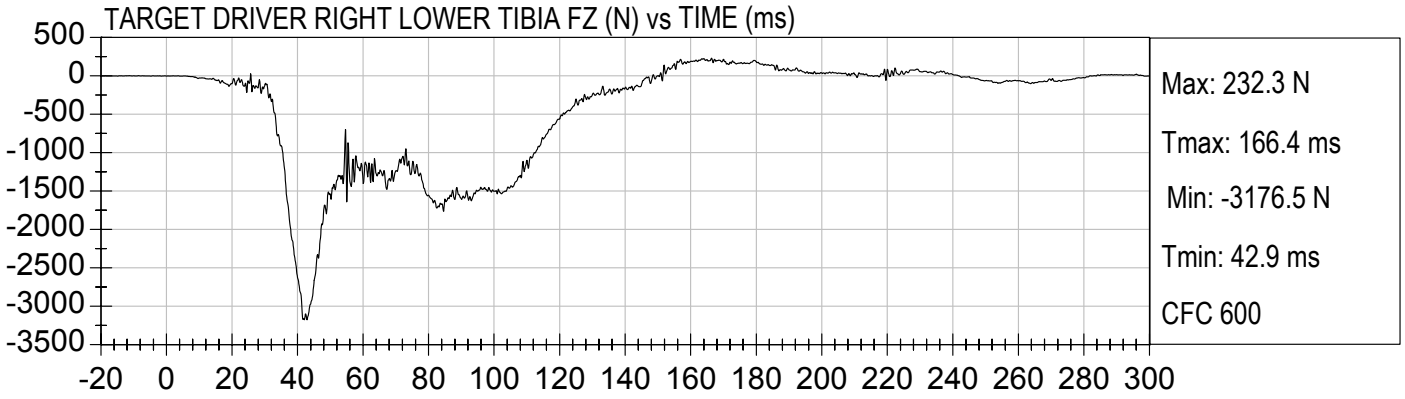

TARGET DRIVER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 19.4 Nm
Tmax: 106.0 ms
Min: -44.1 Nm
Tmin: 53.8 ms
CFC 600

TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



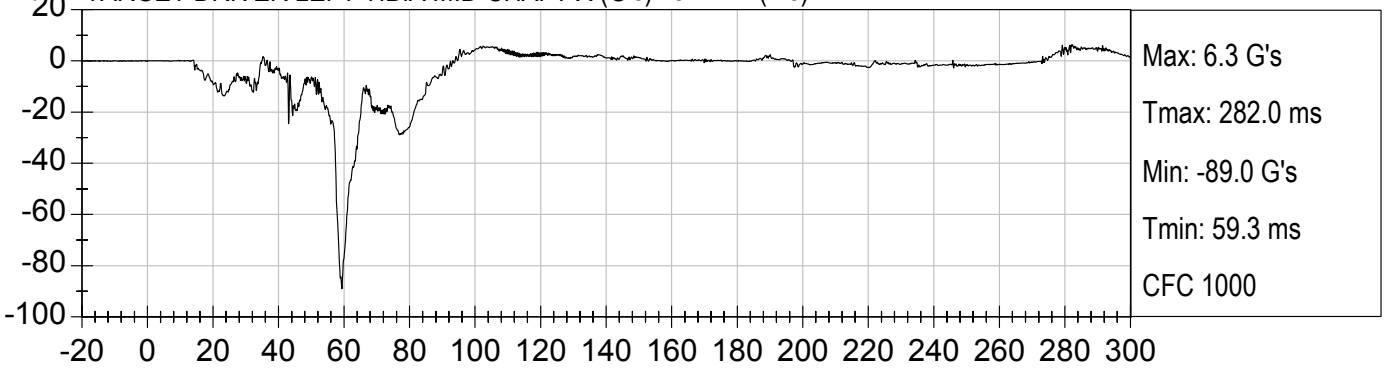




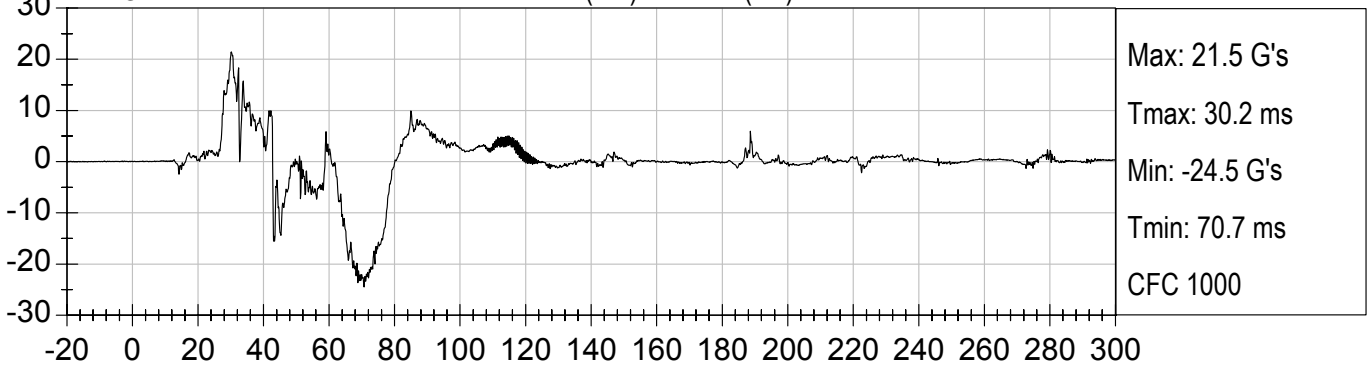
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

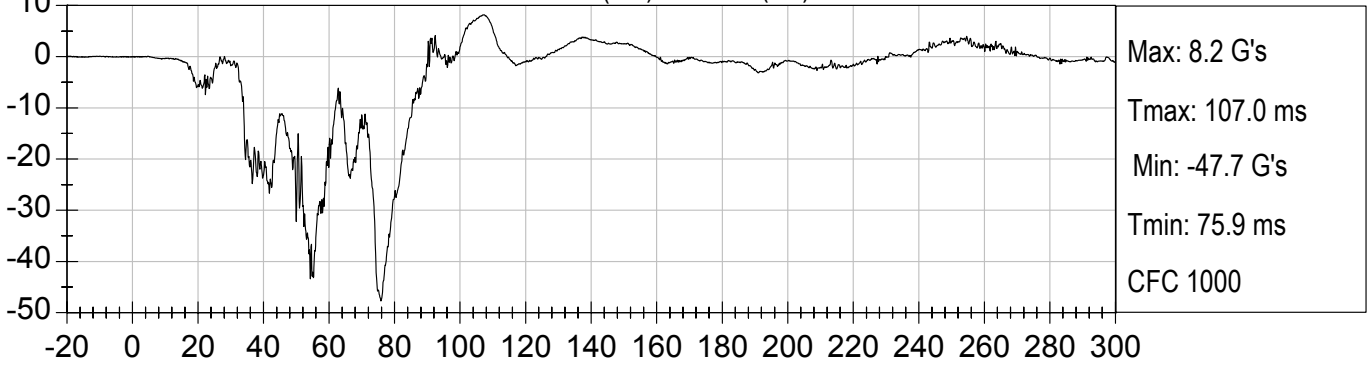
TARGET DRIVER LEFT TIBIA MID-SHAFT X (G's) vs TIME (ms)



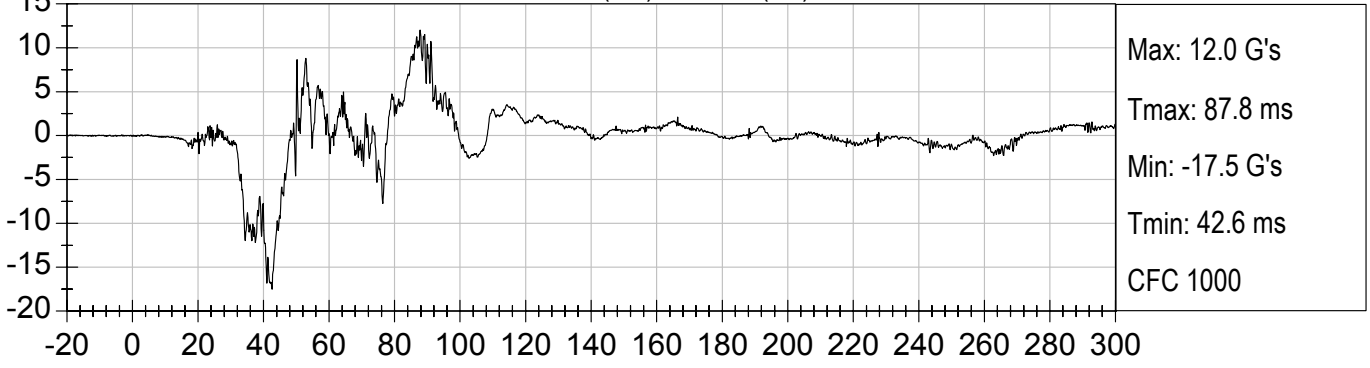
TARGET DRIVER LEFT TIBIA MID-SHAFT Y (G's) vs TIME (ms)



TARGET DRIVER RIGHT TIBIA MID-SHAFT X (G's) vs TIME (ms)

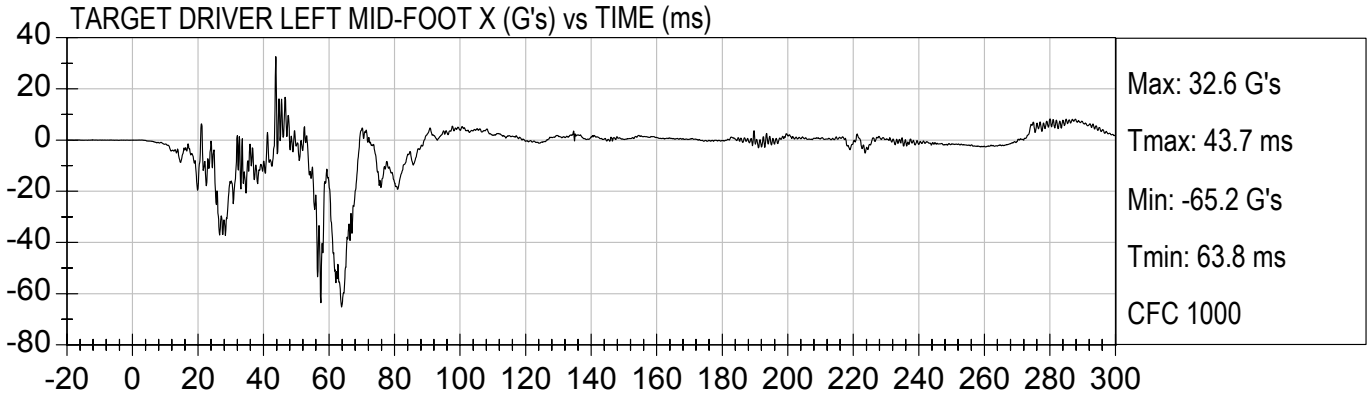


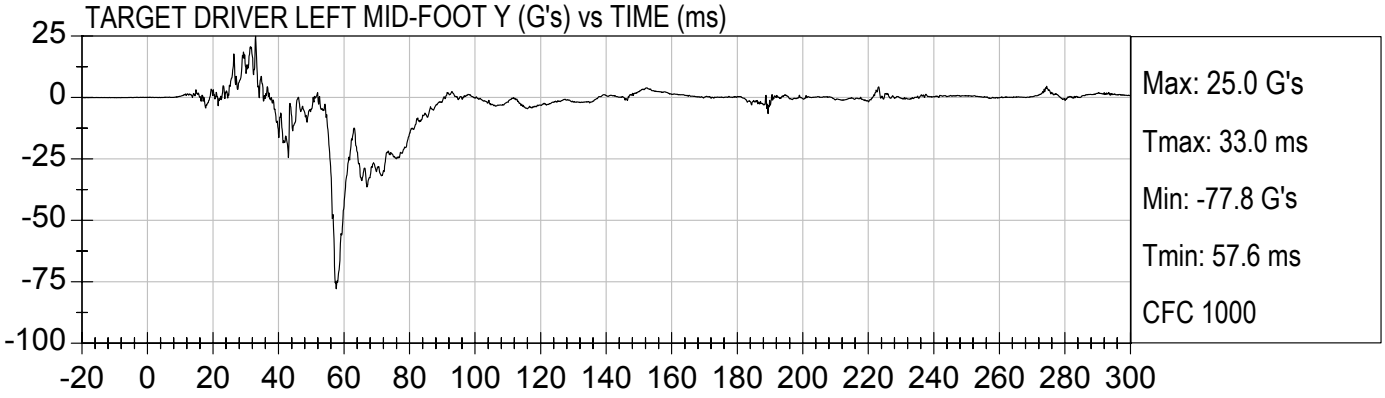
TARGET DRIVER RIGHT TIBIA MID-SHAFT Y (G's) vs TIME (ms)

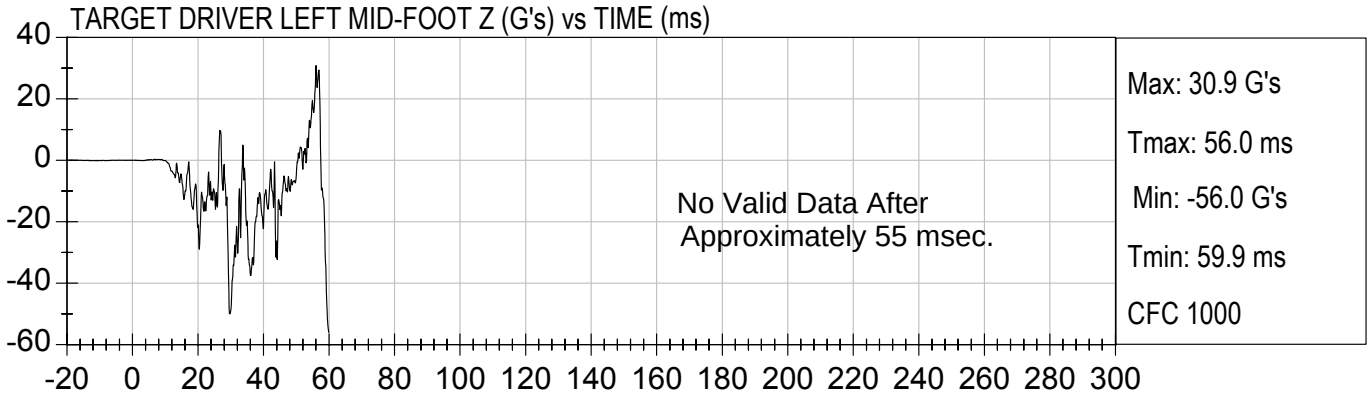


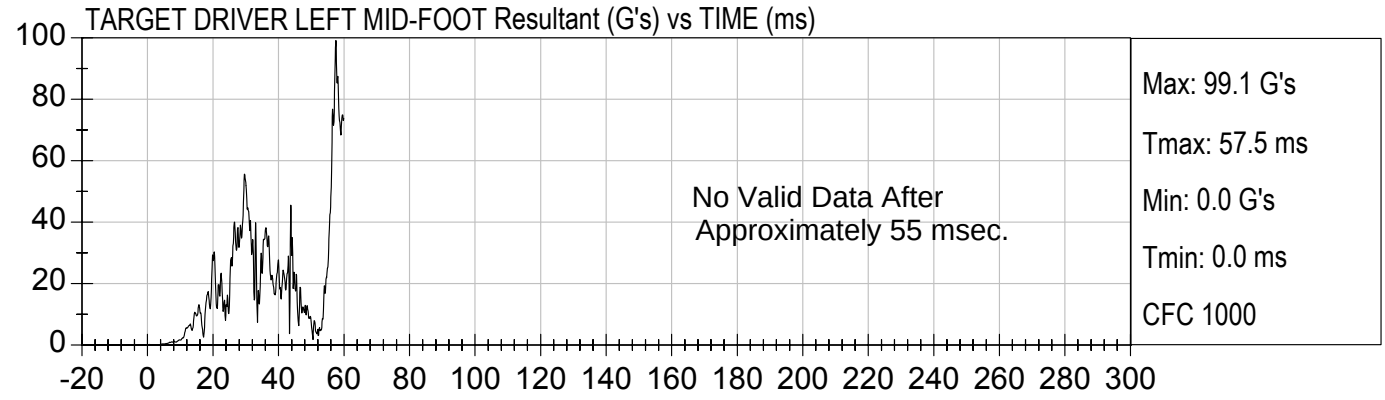
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)





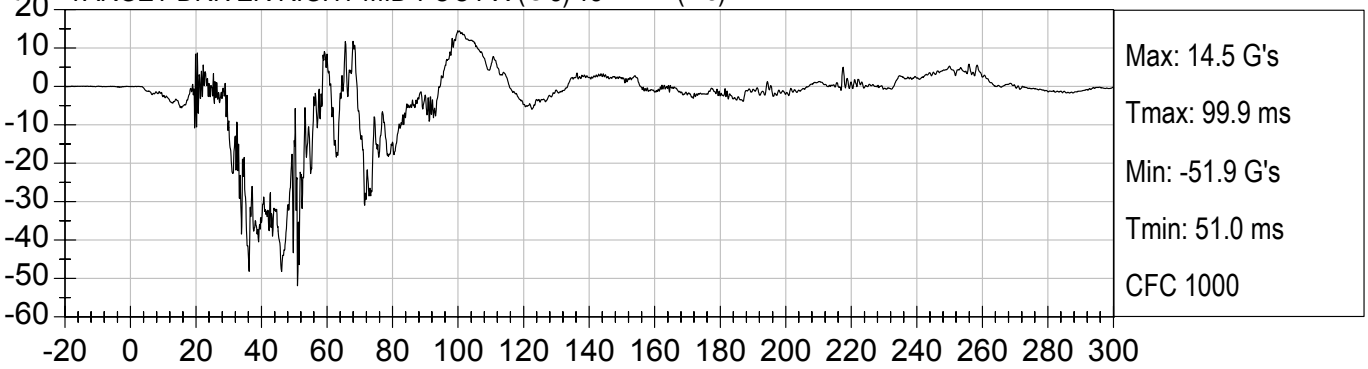




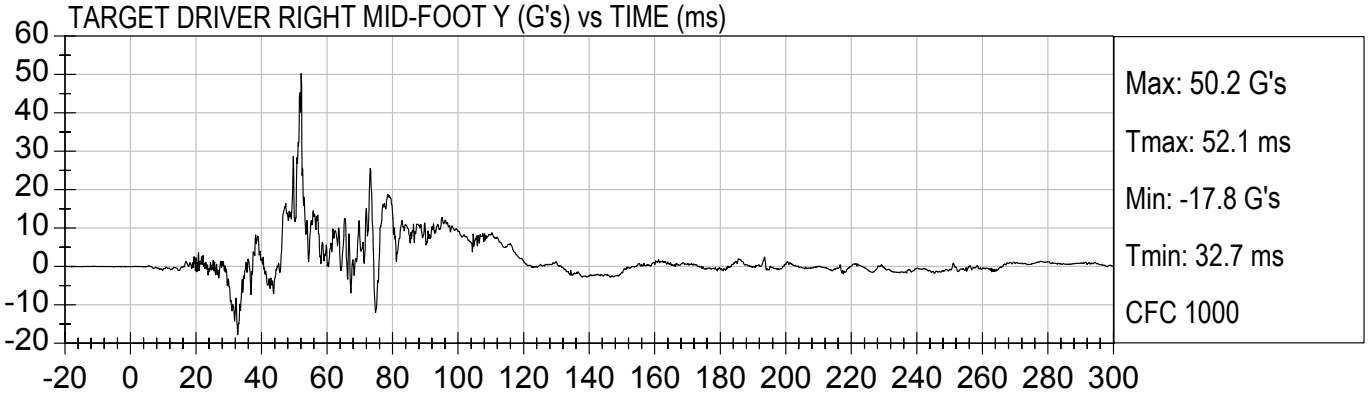
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

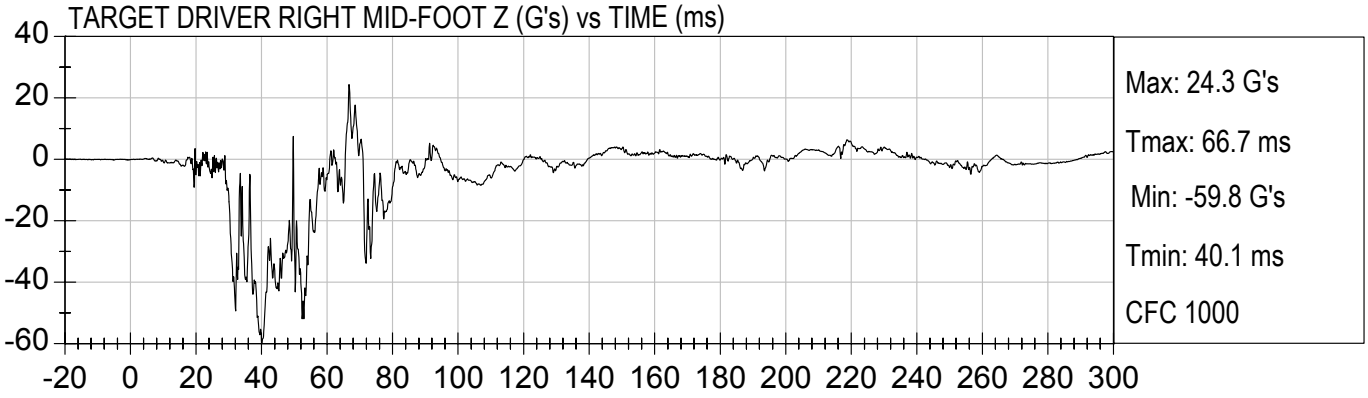
TARGET DRIVER RIGHT MID-FOOT X (G's) vs TIME (ms)



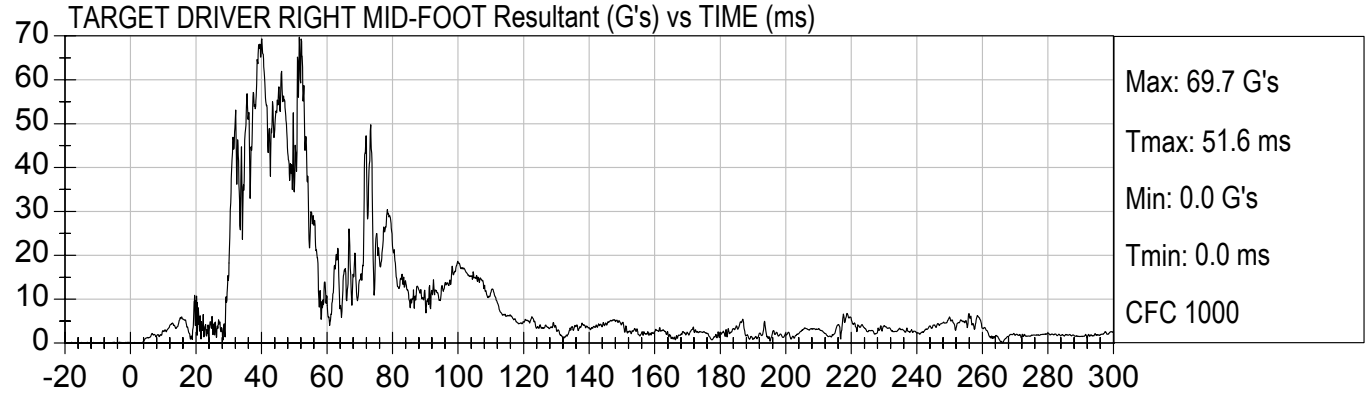
TARGET DRIVER RIGHT MID-FOOT Y (G's) vs TIME (ms)

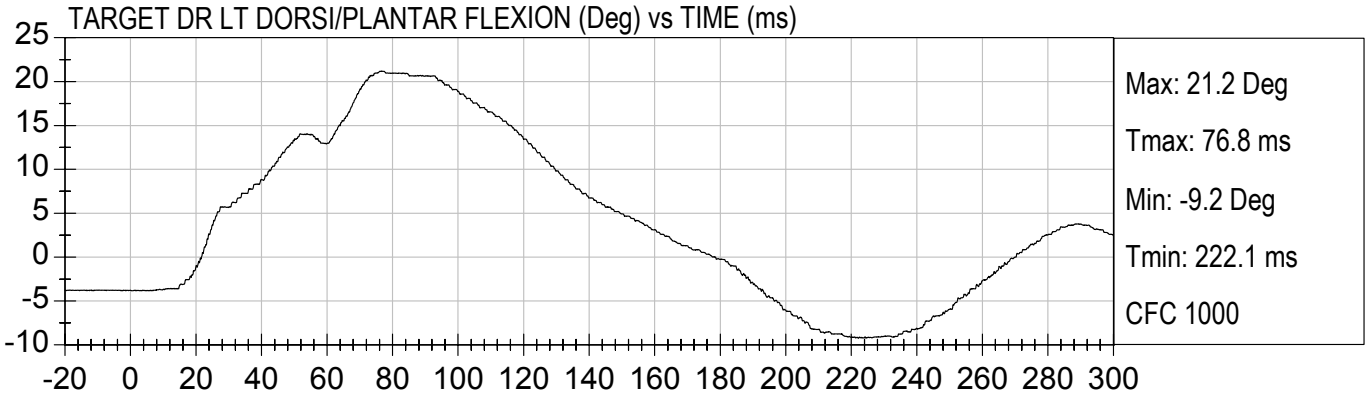


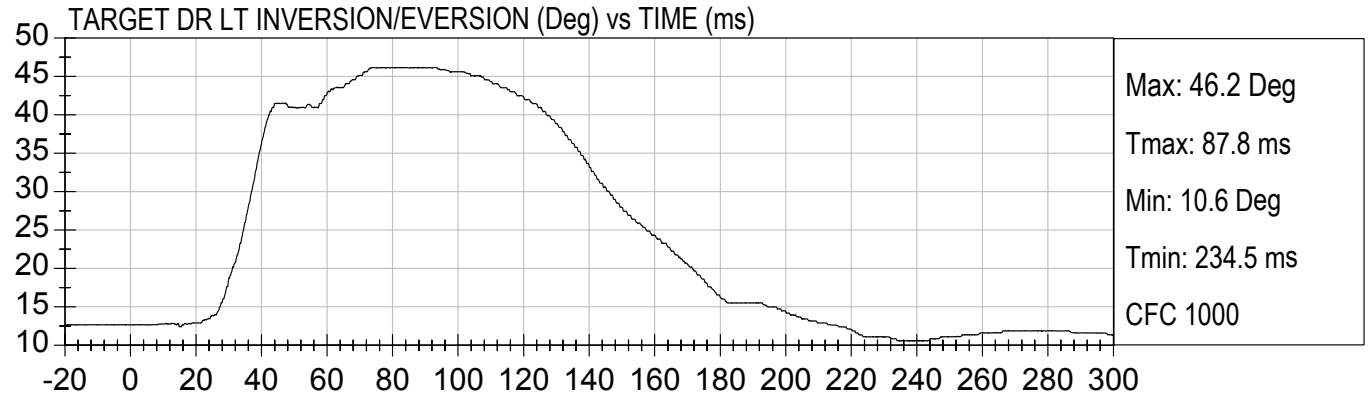
TARGET DRIVER RIGHT MID-FOOT Z (G's) vs TIME (ms)

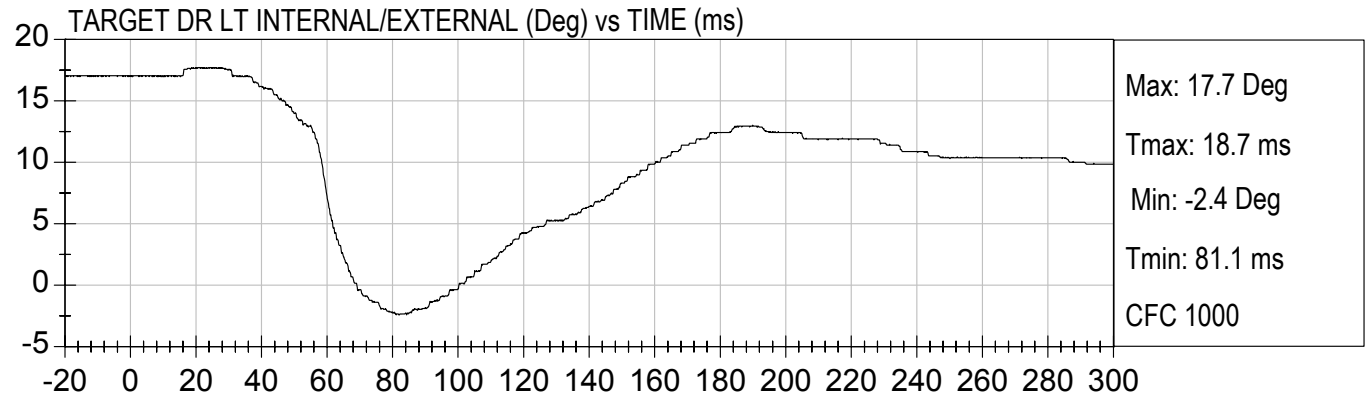


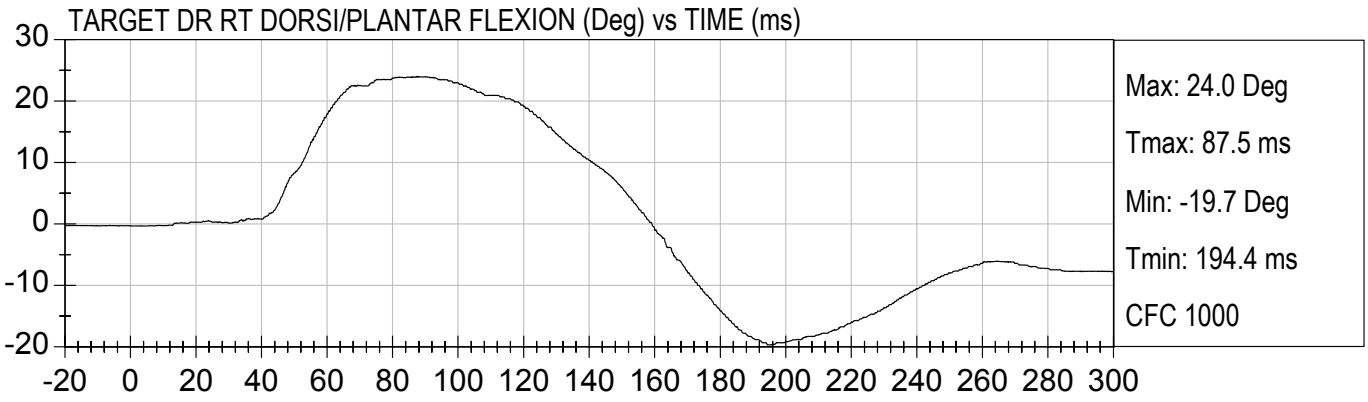
TARGET DRIVER RIGHT MID-FOOT Resultant (G's) vs TIME (ms)

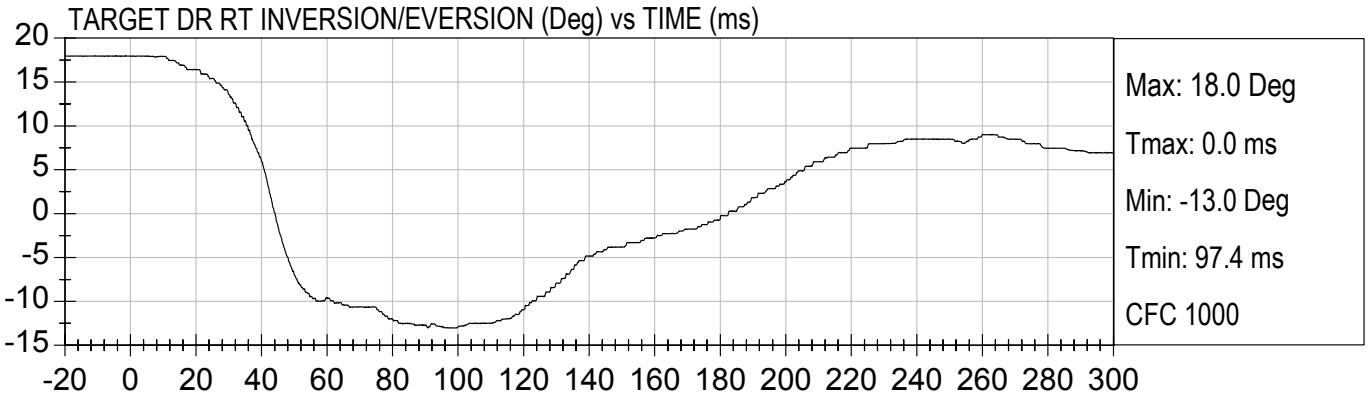


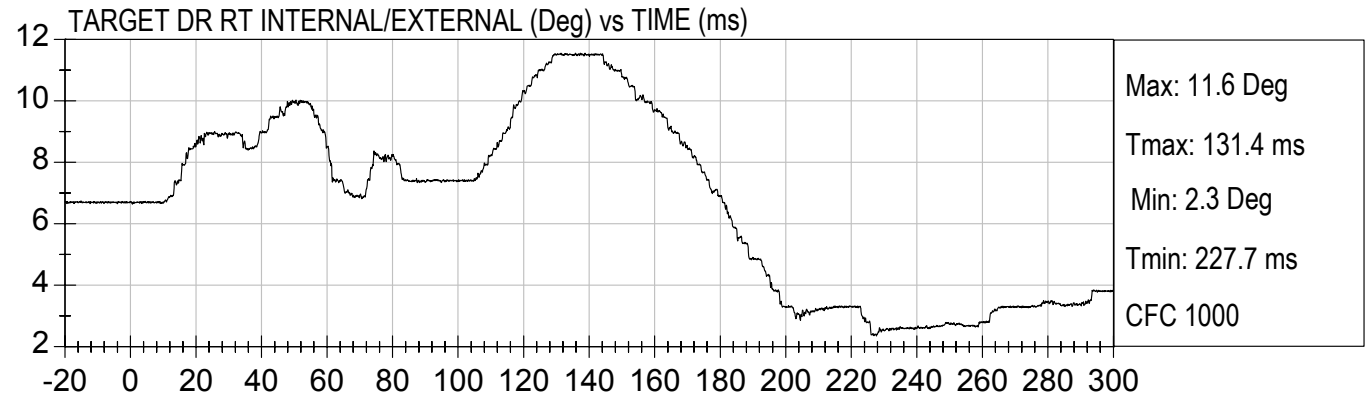

TARGET DR LT DORSI/PLANTAR FLEXION (Deg) vs TIME (ms)
25
20
15
10
5
0
-5
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 21.2 Deg
Tmax: 76.8 ms
Min: -9.2 Deg
Tmin: 222.1 ms
CFC 1000


TARGET DR LT INVERSION/EVERSION (Deg) vs TIME (ms)
50
45
40
35
30
25
20
15
10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 46.2 Deg
Tmax: 87.8 ms
Min: 10.6 Deg
Tmin: 234.5 ms
CFC 1000


TARGET DR LT INTERNAL/EXTERNAL (Deg) vs TIME (ms)
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 17.7 Deg
Tmax: 18.7 ms
Min: -2.4 Deg
Tmin: 81.1 ms
CFC 1000


TARGET DR RT DORSI/PLANTAR FLEXION (Deg) vs TIME (ms)
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 24.0 Deg
Tmax: 87.5 ms
Min: -19.7 Deg
Tmin: 194.4 ms
CFC 1000

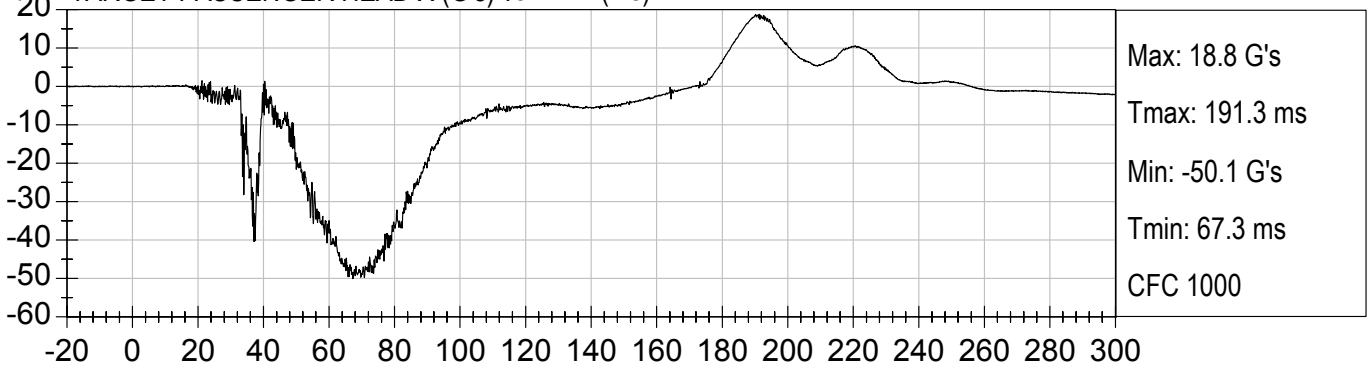

TARGET DR RT INVERSION/EVERSION (Deg) vs TIME (ms)
20
15
10
5
0
-5
-10
-15
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 18.0 Deg
Tmax: 0.0 ms
Min: -13.0 Deg
Tmin: 97.4 ms
CFC 1000


TARGET DR RT INTERNAL/EXTERNAL (Deg) vs TIME (ms)
12
10
8
6
4
2
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 11.6 Deg
Tmax: 131.4 ms
Min: 2.3 Deg
Tmin: 227.7 ms
CFC 1000

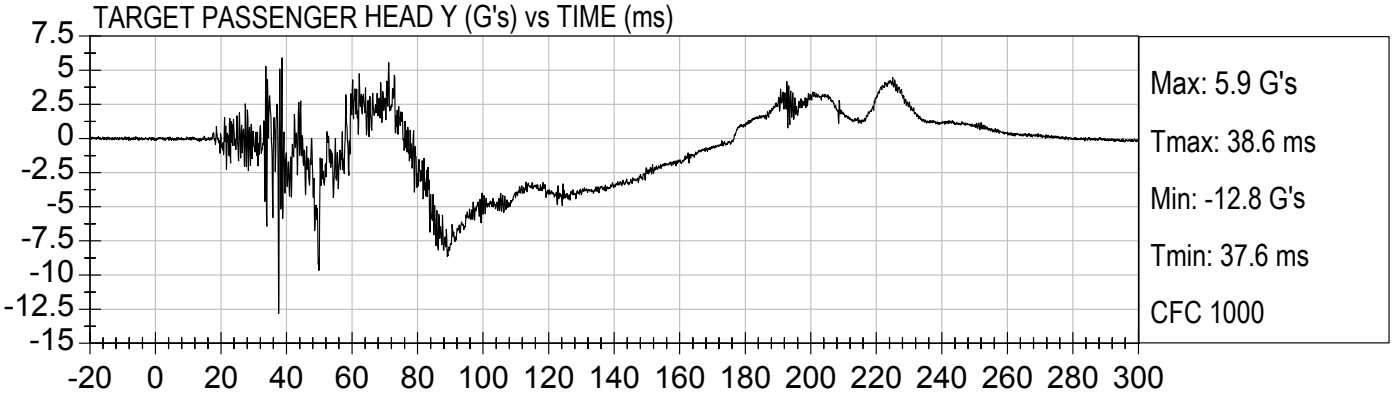
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

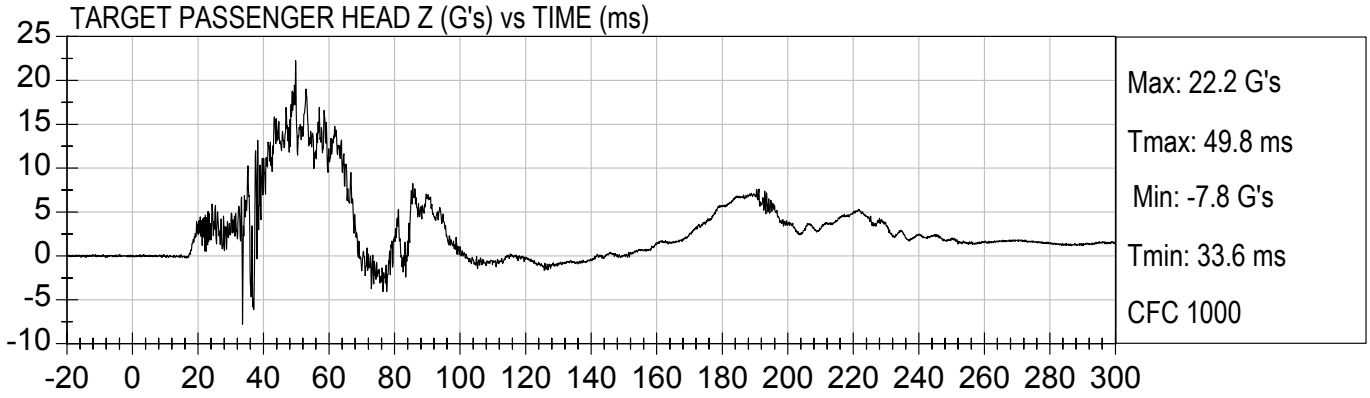
TARGET PASSENGER HEAD X (G's) vs TIME (ms)



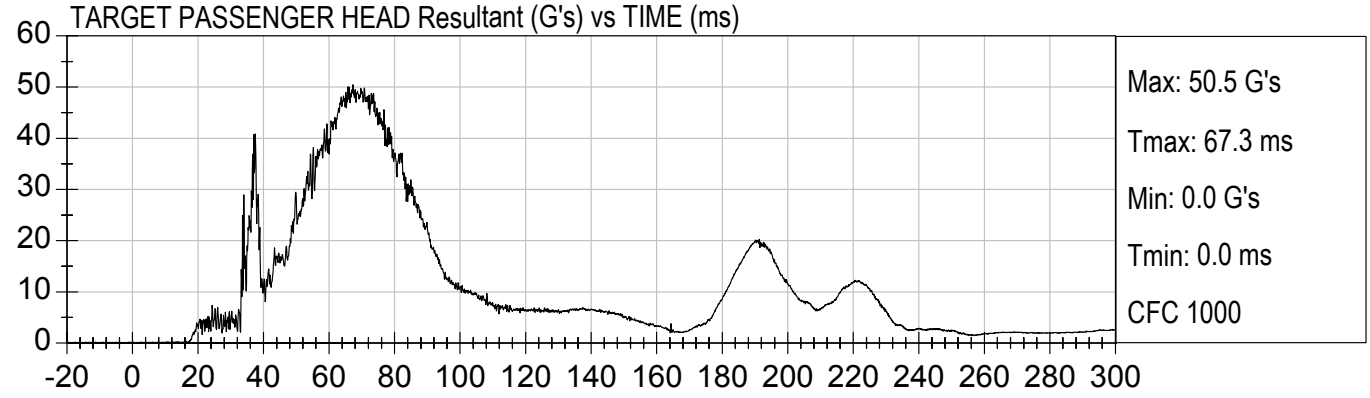
TARGET PASSENGER HEAD Y (G's) vs TIME (ms)

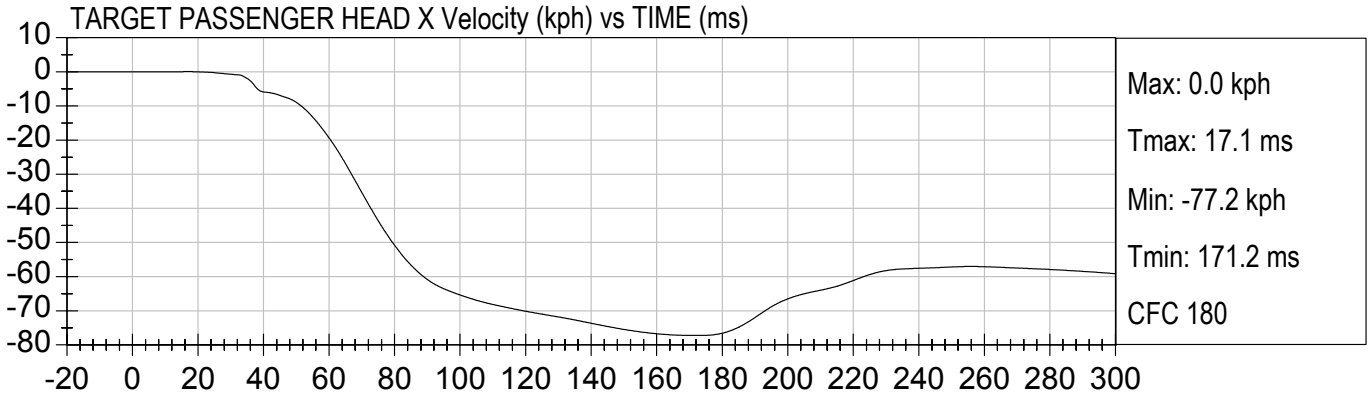


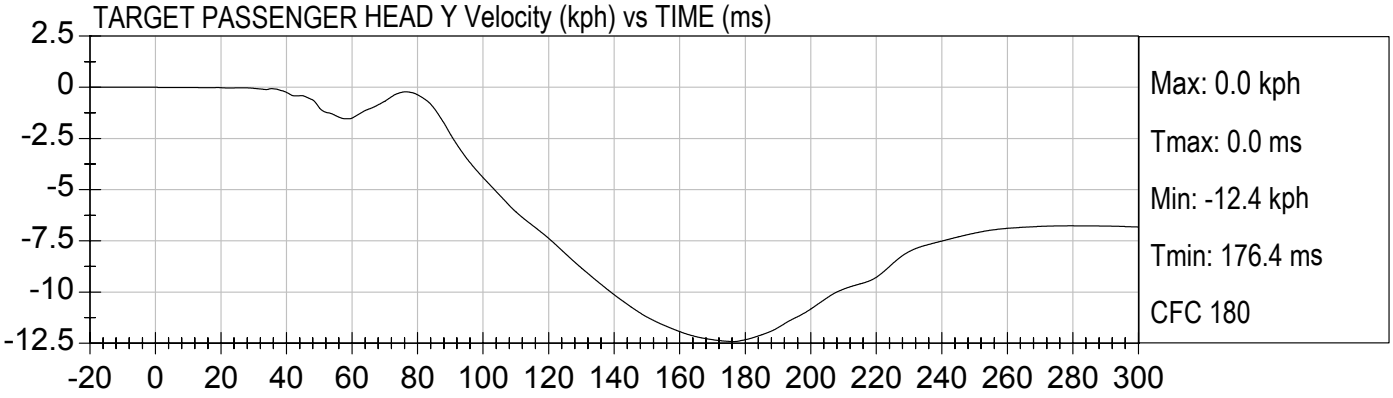
TARGET PASSENGER HEAD Z (G's) vs TIME (ms)

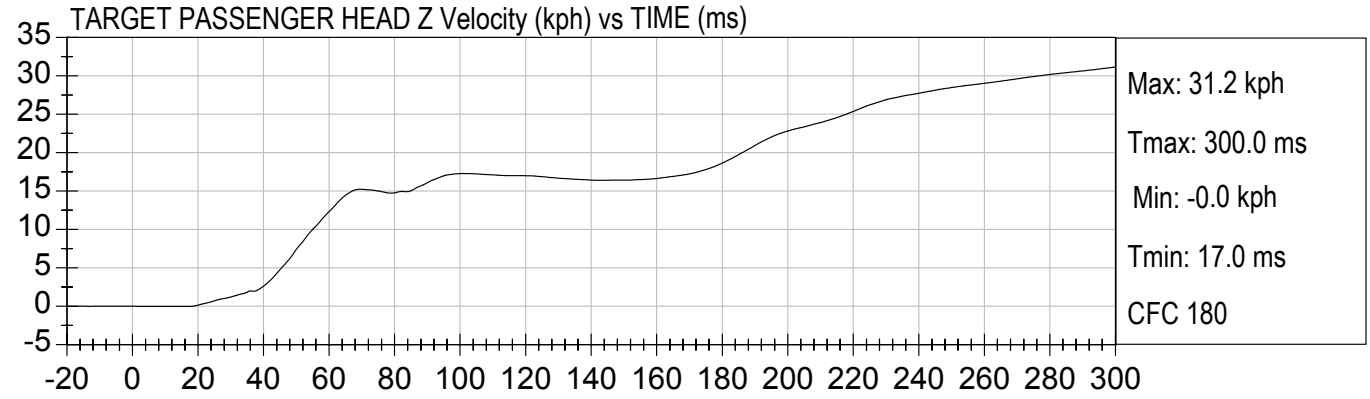


TARGET PASSENGER HEAD Resultant (G's) vs TIME (ms)



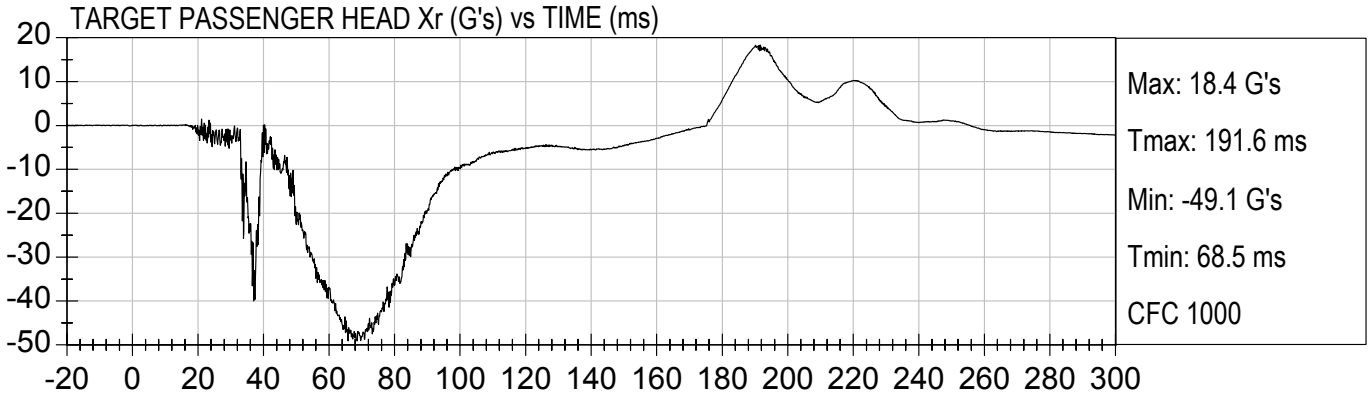

TARGET PASSENGER HEAD X Velocity (kph) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 17.1 ms
Min: -77.2 kph
Tmin: 171.2 ms
CFC 180

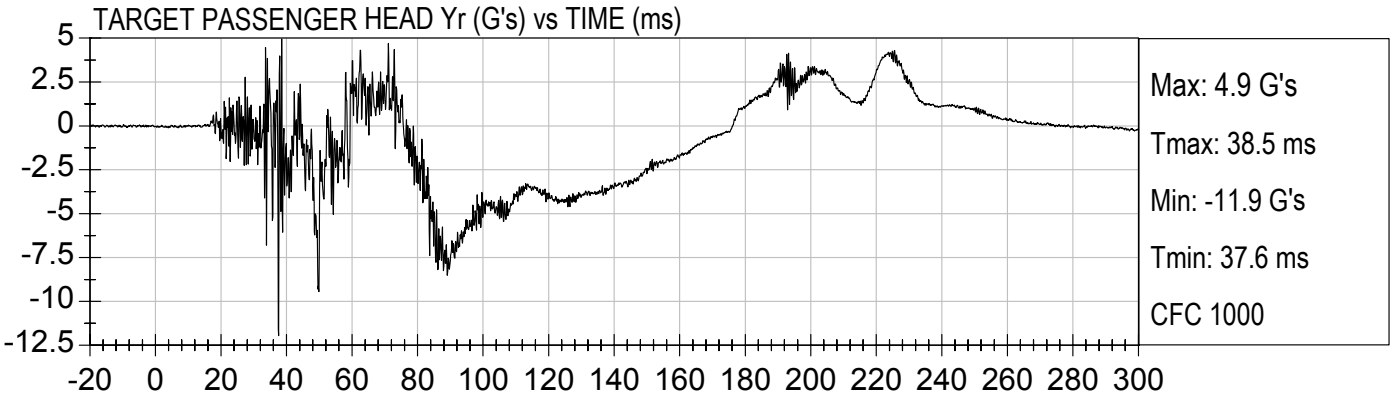

TARGET PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -12.4 kph
Tmin: 176.4 ms
CFC 180

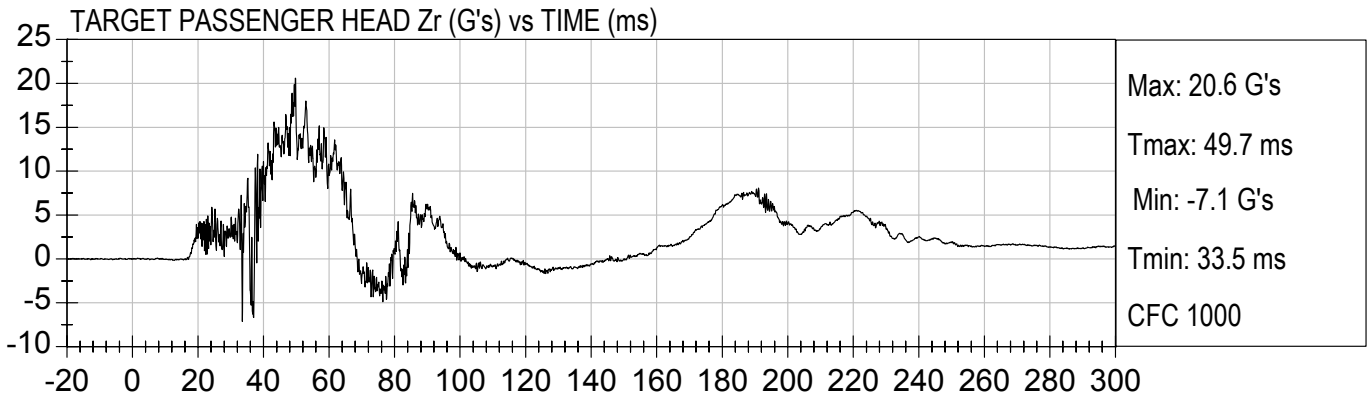

TARGET PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 31.2 kph
Tmax: 300.0 ms
Min: -0.0 kph
Tmin: 17.0 ms
CFC 180

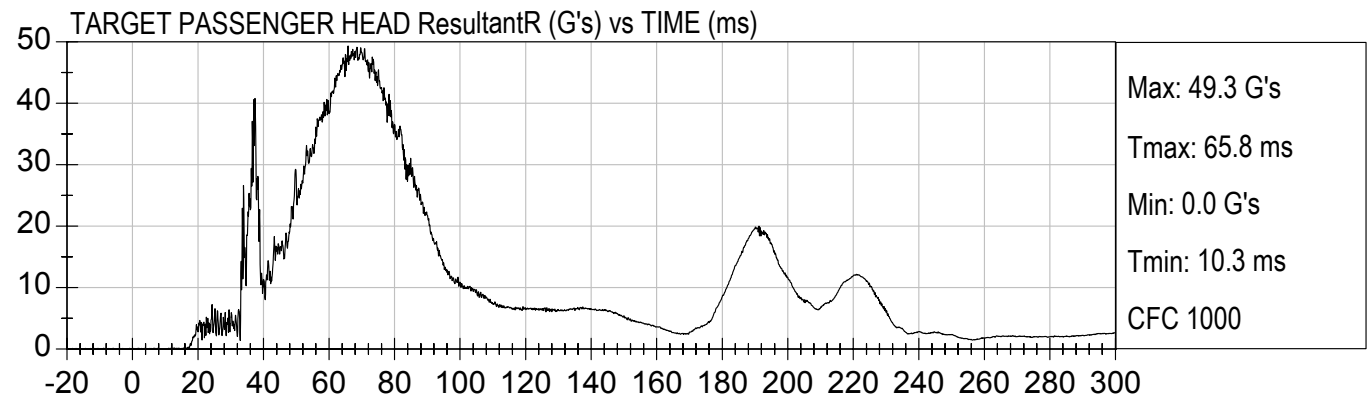
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

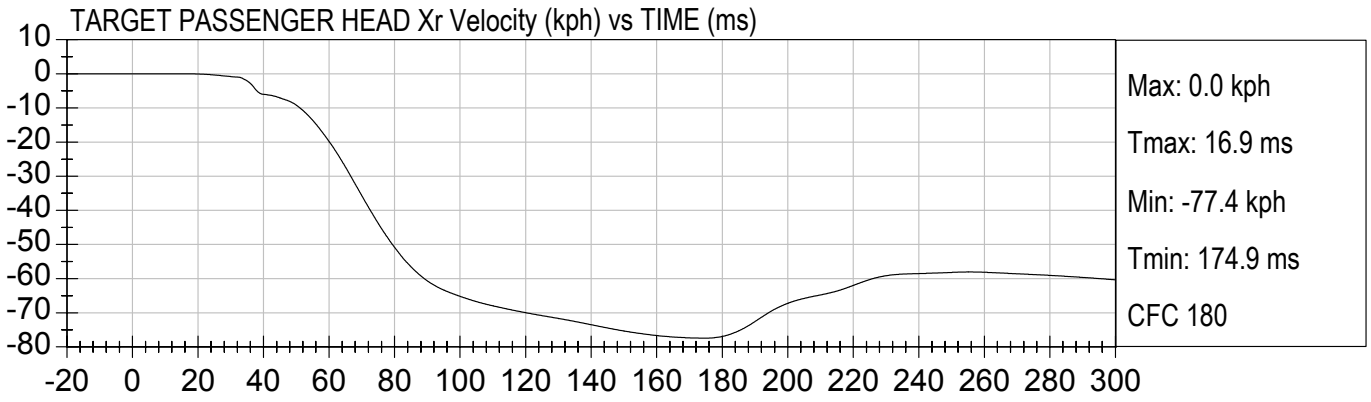
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

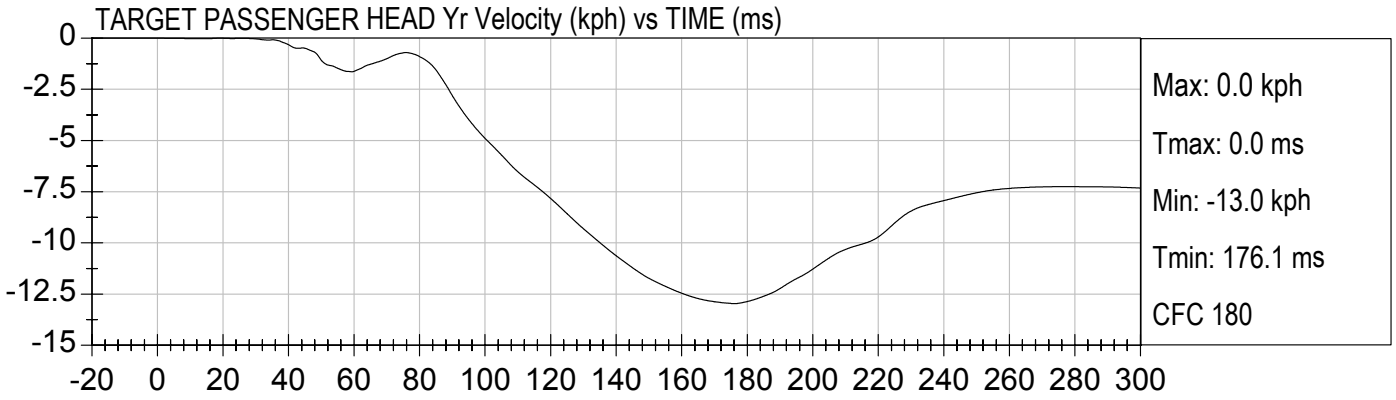


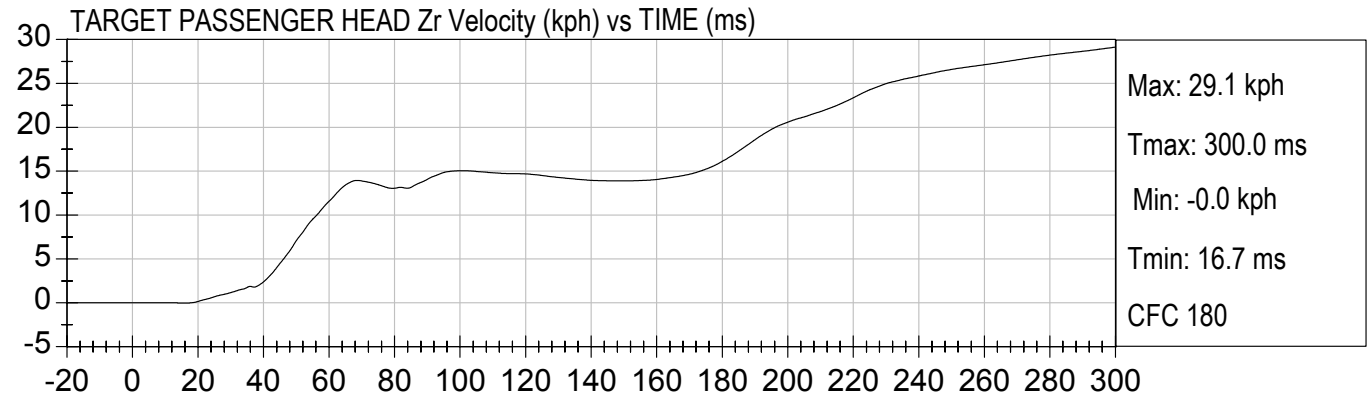






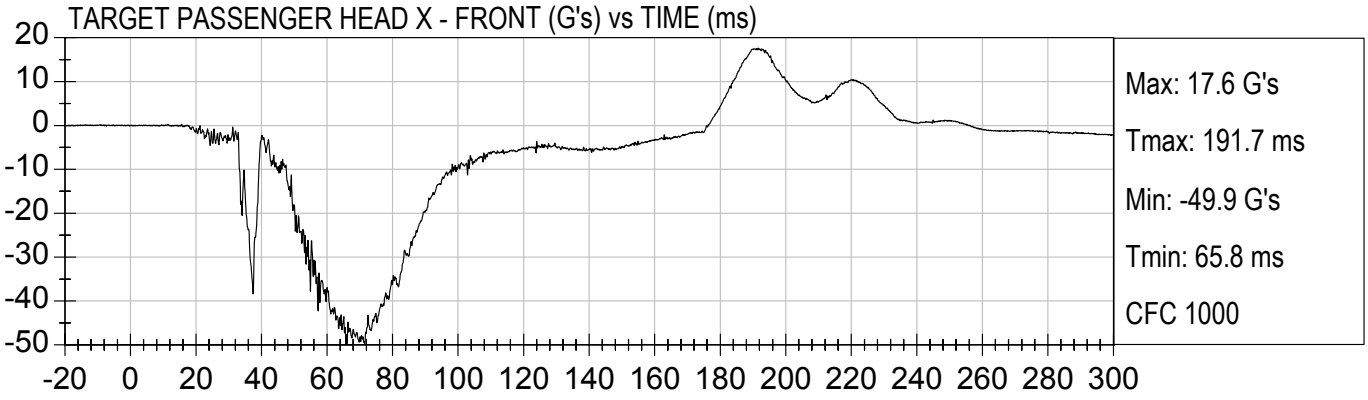

TARGET PASSENGER HEAD Xr Velocity (kph) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 16.9 ms
Min: -77.4 kph
Tmin: 174.9 ms
CFC 180

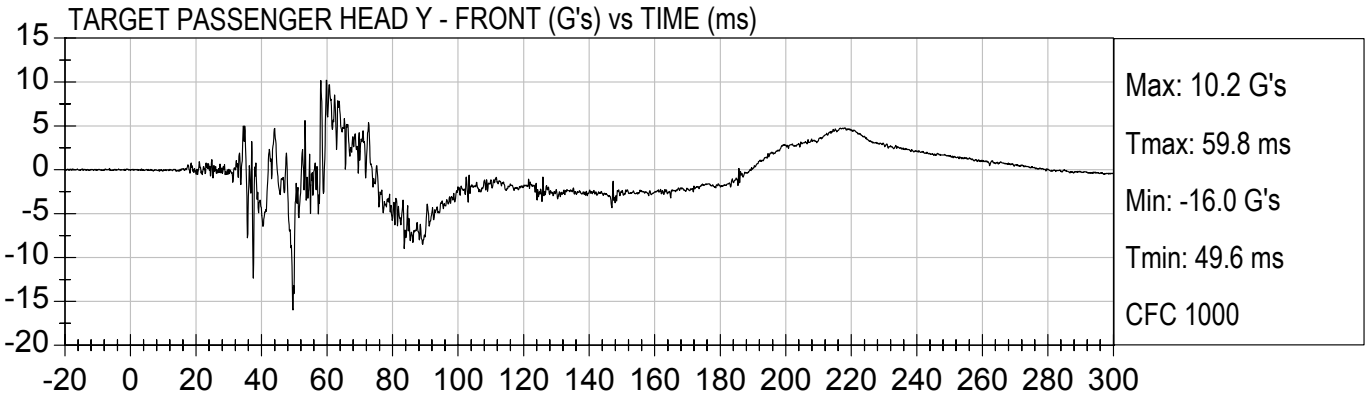

TARGET PASSENGER HEAD Yr Velocity (kph) vs TIME (ms)
0
-2.5
-5
-7.5
-10
-12.5
-15
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -13.0 kph
Tmin: 176.1 ms
CFC 180

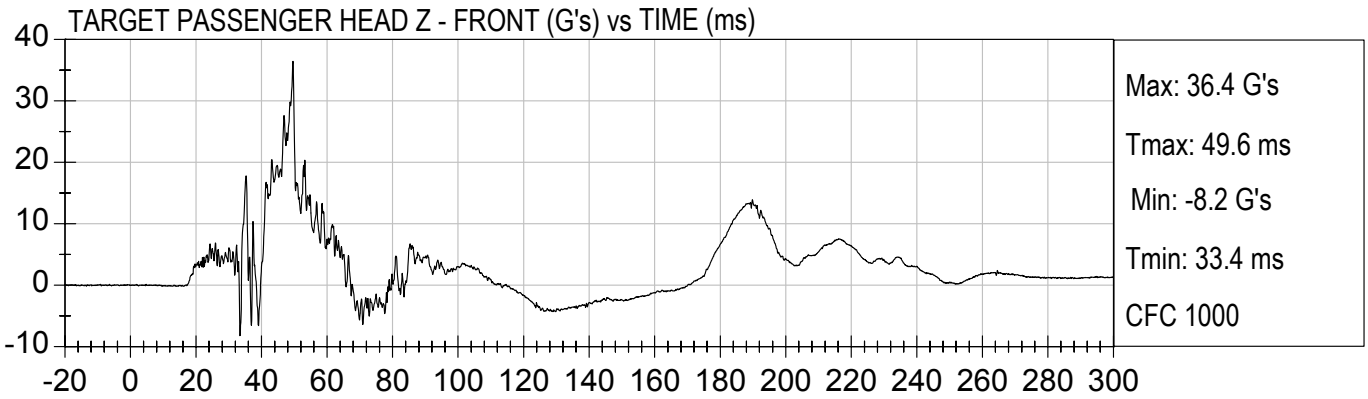

TARGET PASSENGER HEAD Zr Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 29.1 kph
Tmax: 300.0 ms
Min: -0.0 kph
Tmin: 16.7 ms
CFC 180

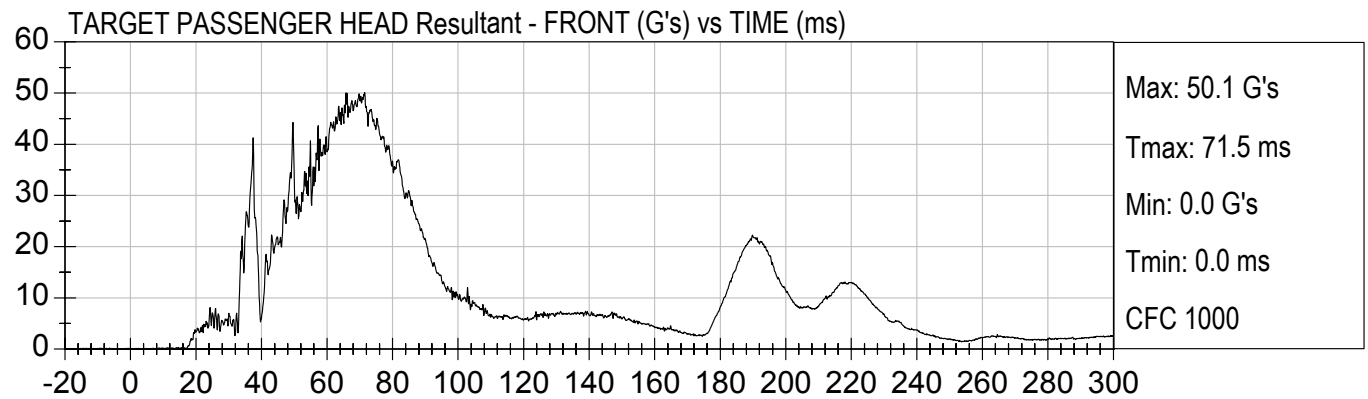
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

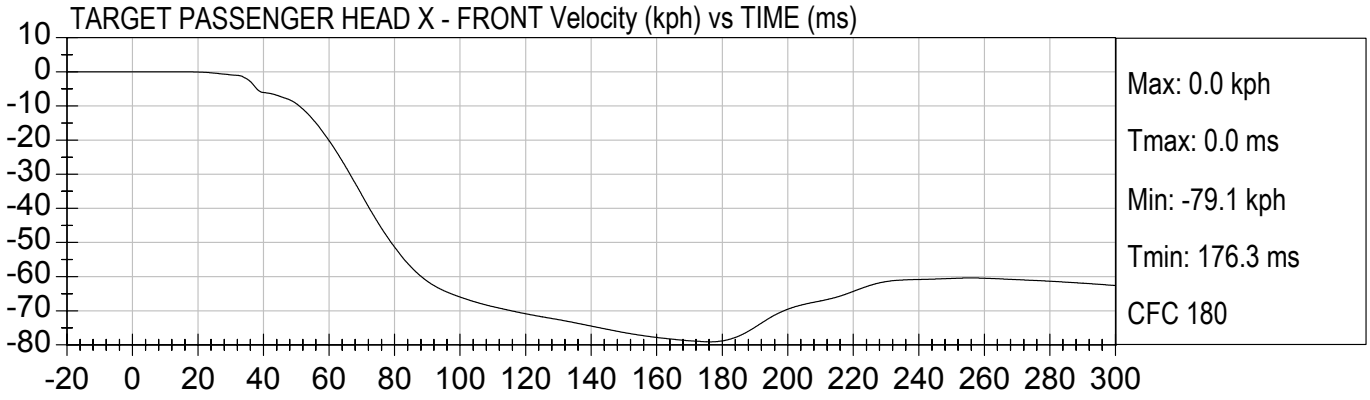
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

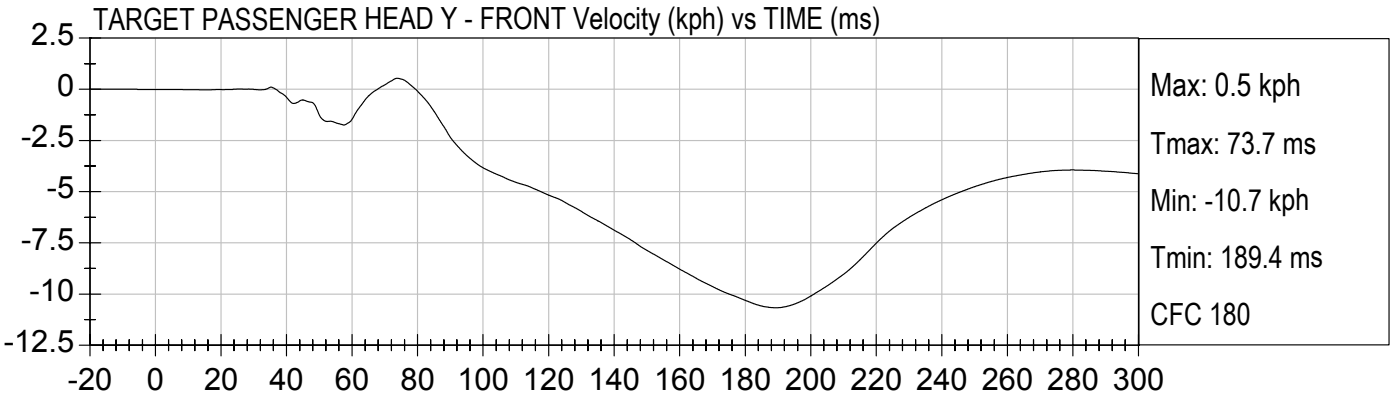


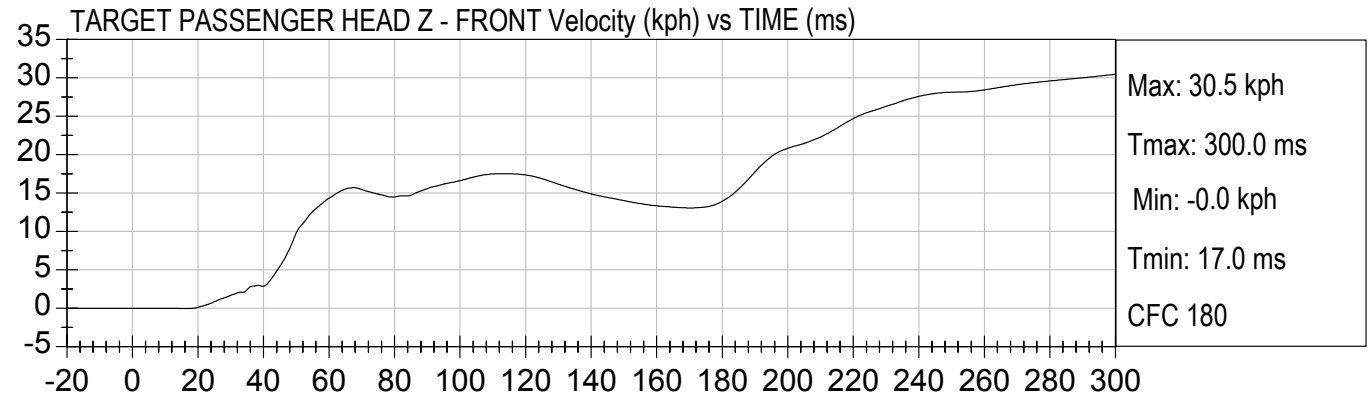






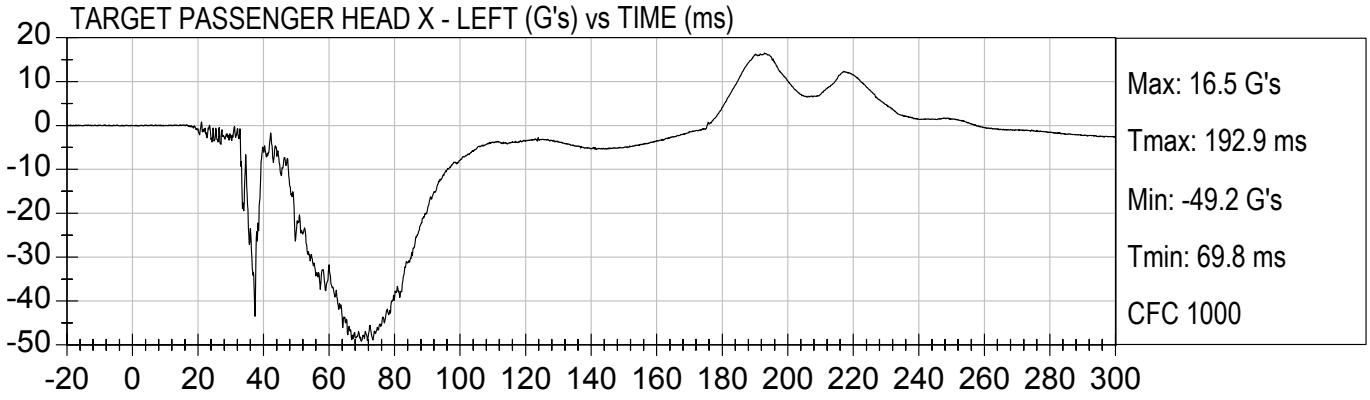

TARGET PASSENGER HEAD X - FRONT Velocity (kph) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -79.1 kph
Tmin: 176.3 ms
CFC 180

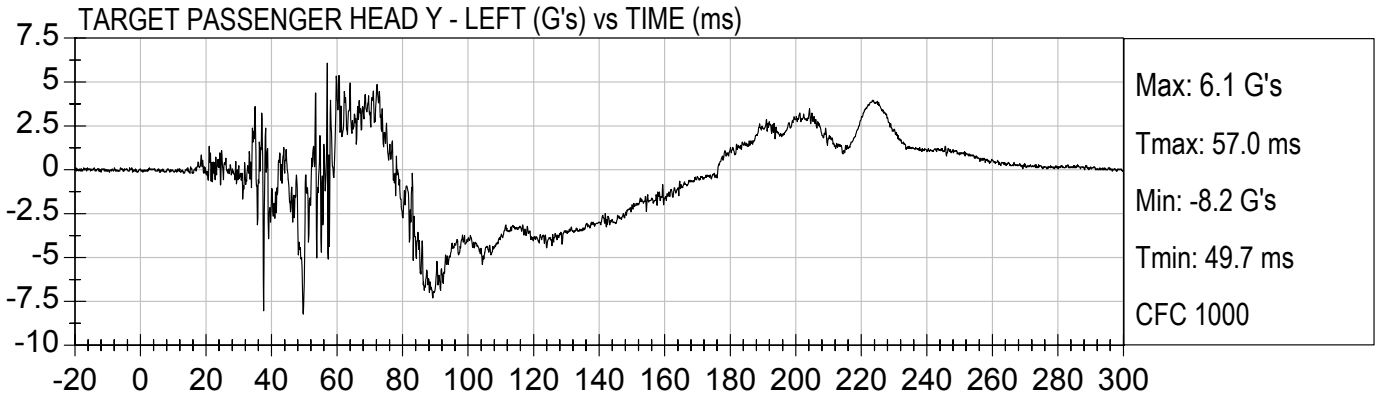

TARGET PASSENGER HEAD Y - FRONT Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.5 kph
Tmax: 73.7 ms
Min: -10.7 kph
Tmin: 189.4 ms
CFC 180

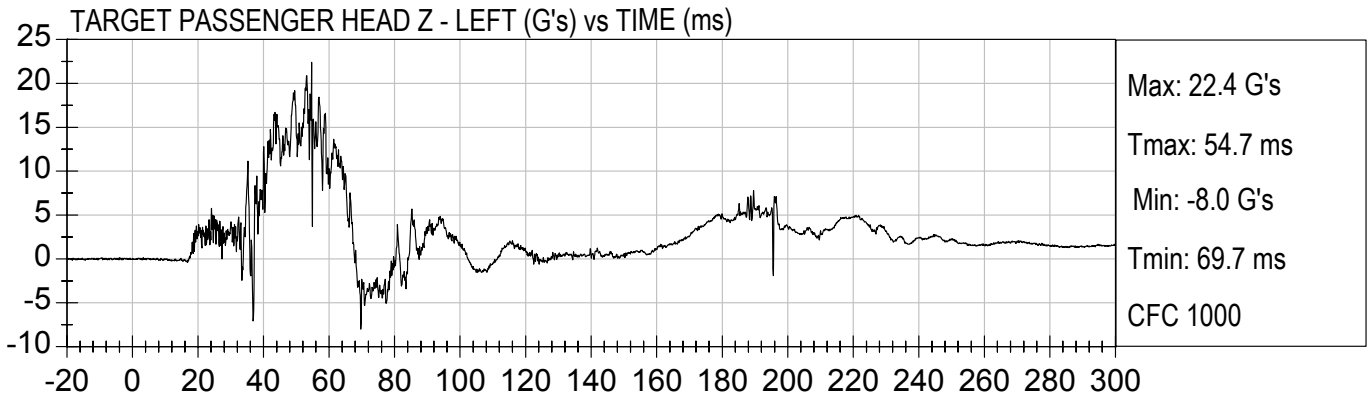

TARGET PASSENGER HEAD Z - FRONT Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 30.5 kph
Tmax: 300.0 ms
Min: -0.0 kph
Tmin: 17.0 ms
CFC 180

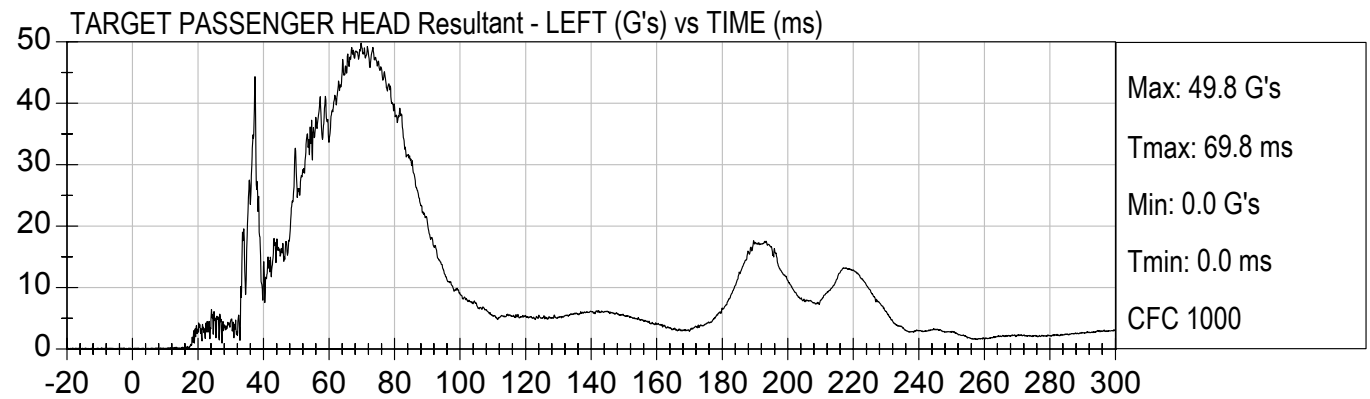
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

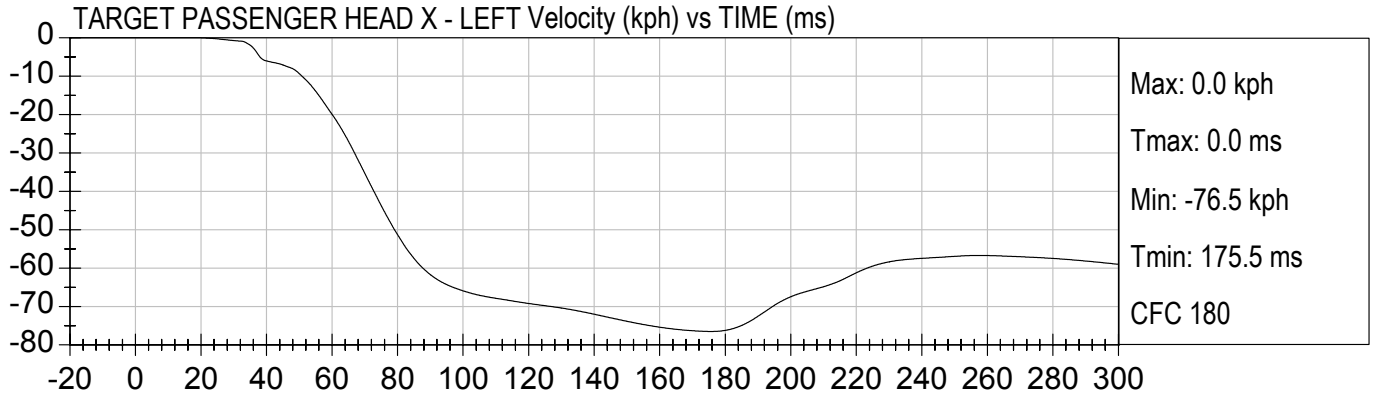
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

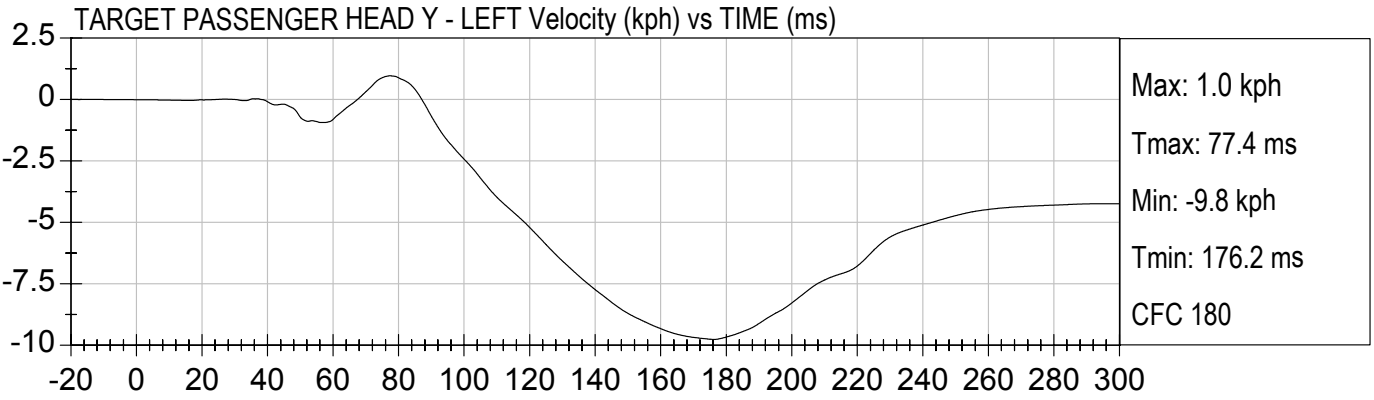


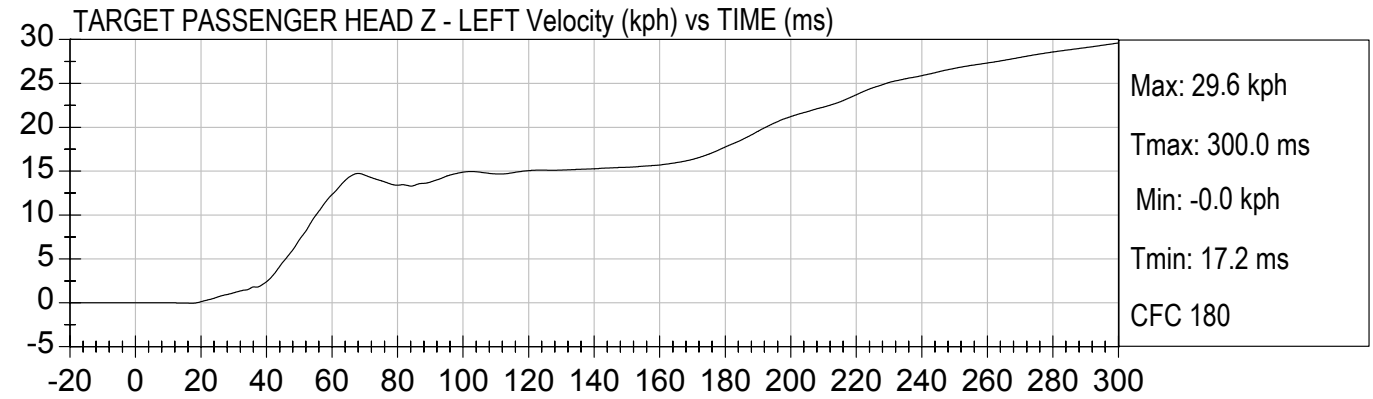






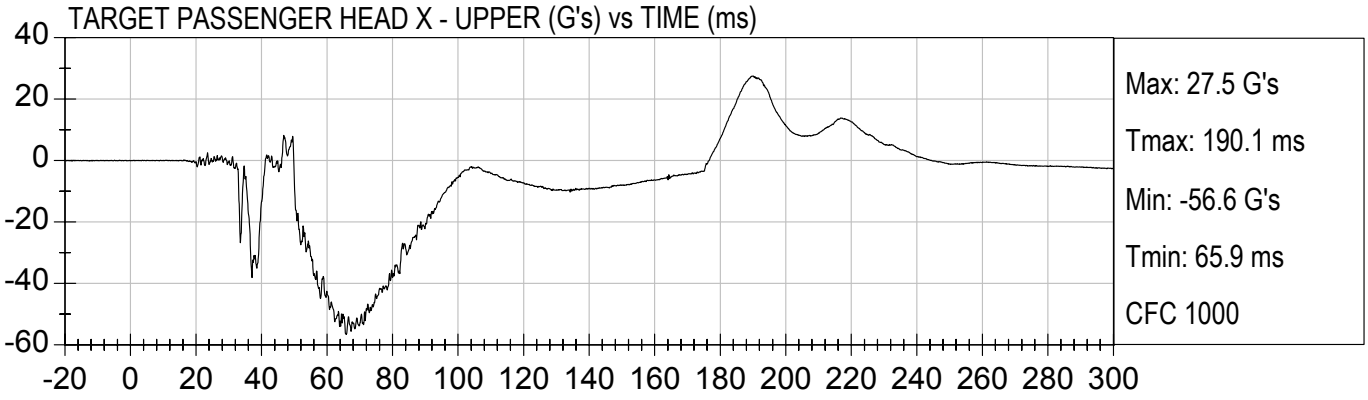

TARGET PASSENGER HEAD X - LEFT Velocity (kph) vs TIME (ms)
0
-10
-20
-30
-40
-50
-60
-70
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -76.5 kph
Tmin: 175.5 ms
CFC 180

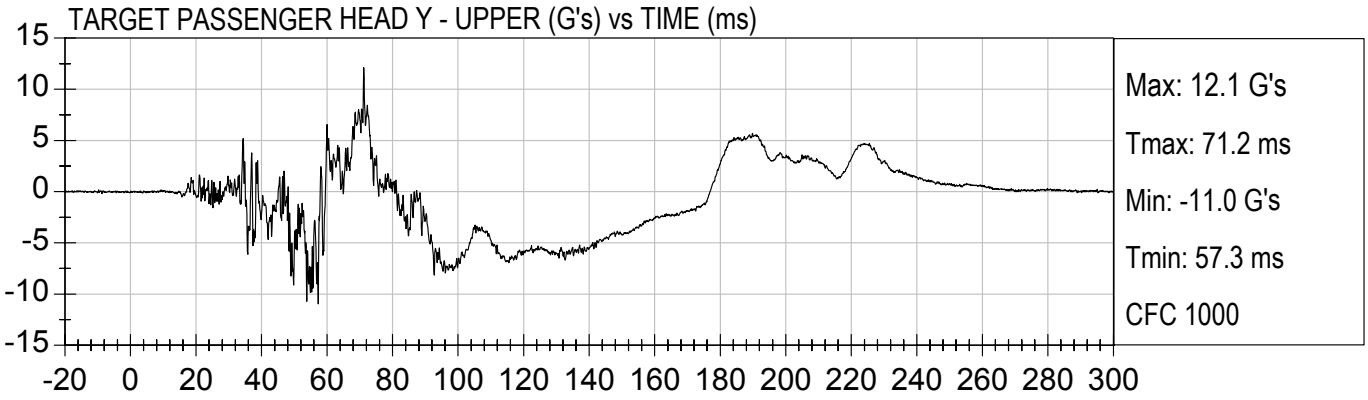

TARGET PASSENGER HEAD Y - LEFT Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.0 kph
Tmax: 77.4 ms
Min: -9.8 kph
Tmin: 176.2 ms
CFC 180

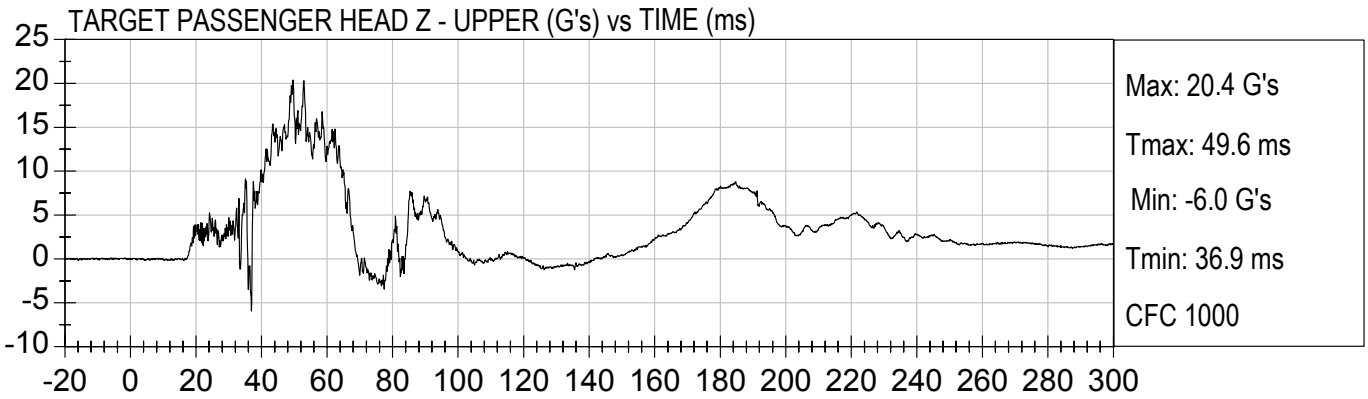

TARGET PASSENGER HEAD Z - LEFT Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 29.6 kph
Tmax: 300.0 ms
Min: -0.0 kph
Tmin: 17.2 ms
CFC 180

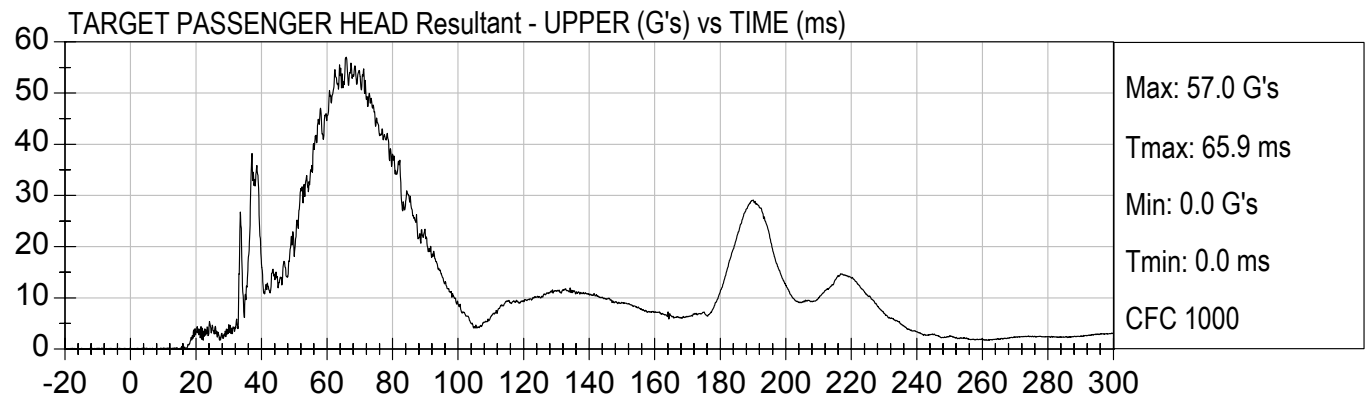
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

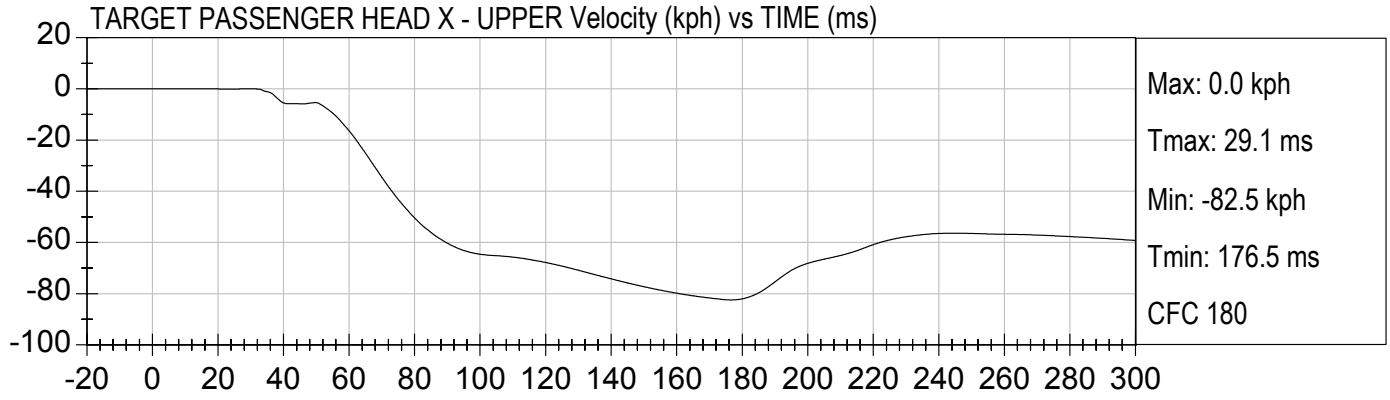
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

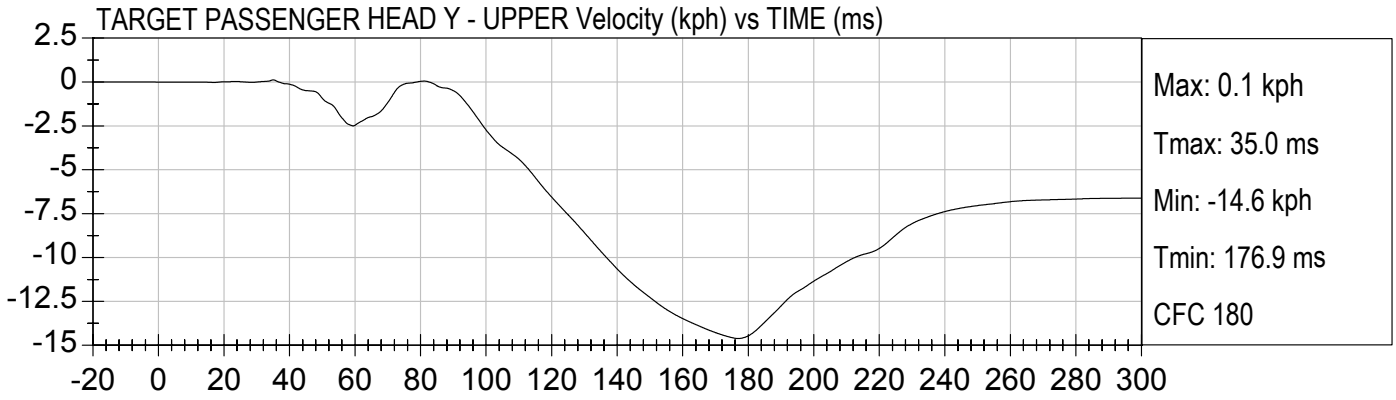


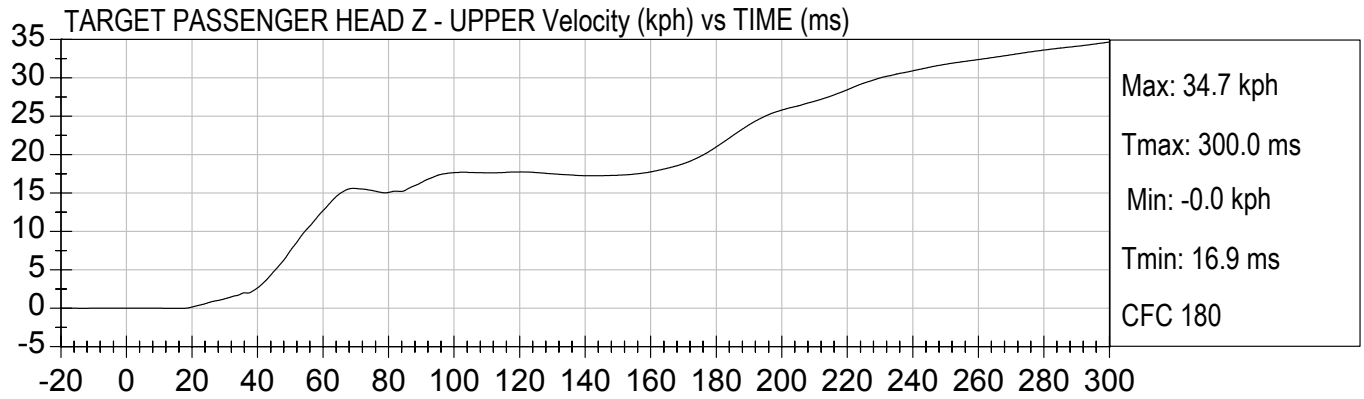






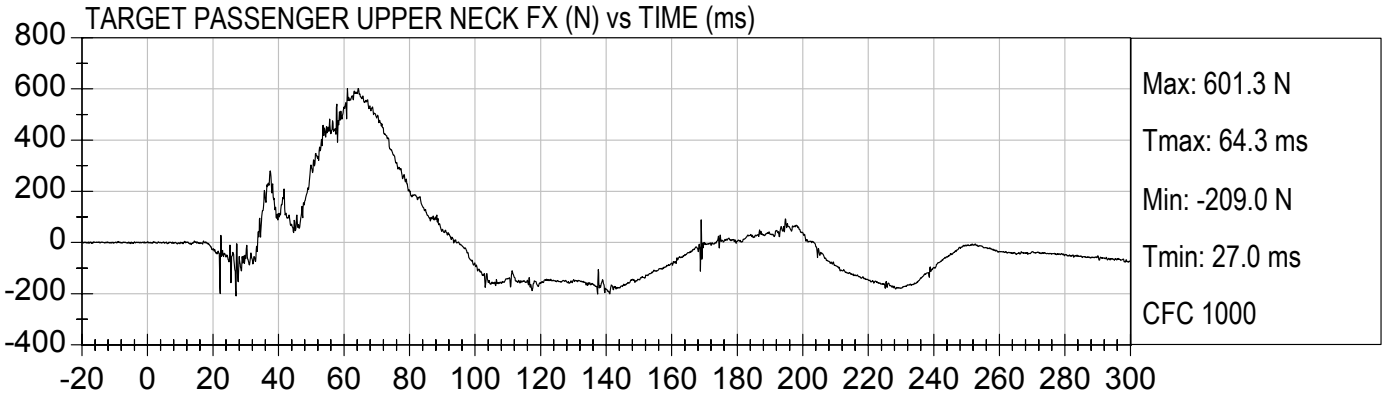

TARGET PASSENGER HEAD X - UPPER Velocity (kph) vs TIME (ms)
20
0
-20
-40
-60
-80
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 29.1 ms
Min: -82.5 kph
Tmin: 176.5 ms
CFC 180

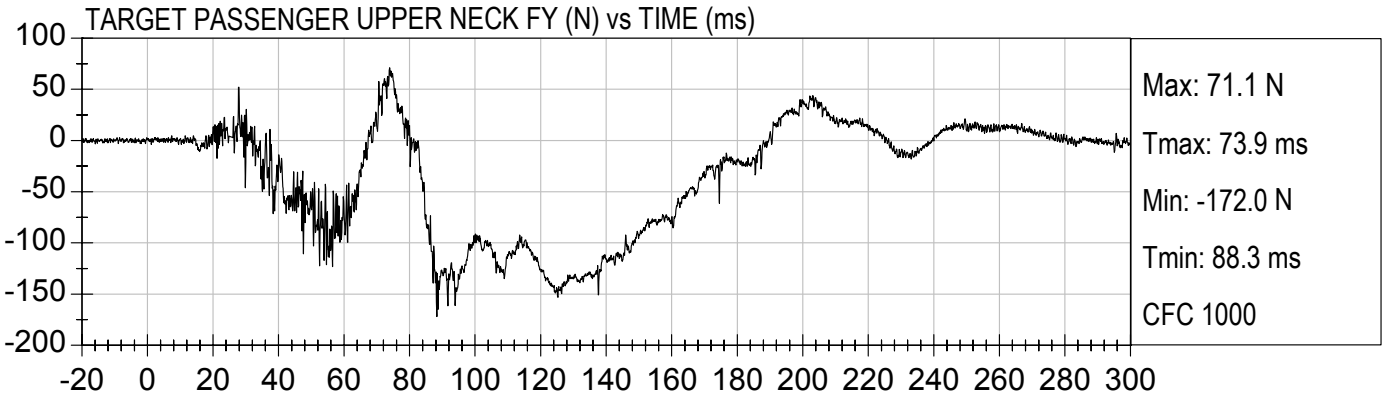

TARGET PASSENGER HEAD Y - UPPER Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-15
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.1 kph
Tmax: 35.0 ms
Min: -14.6 kph
Tmin: 176.9 ms
CFC 180

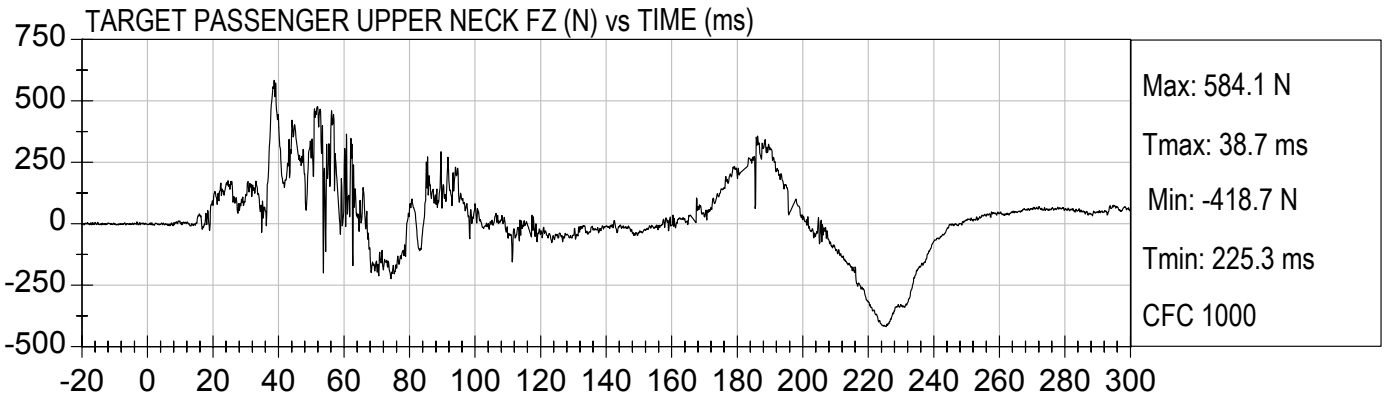

TARGET PASSENGER HEAD Z - UPPER Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 34.7 kph
Tmax: 300.0 ms
Min: -0.0 kph
Tmin: 16.9 ms
CFC 180

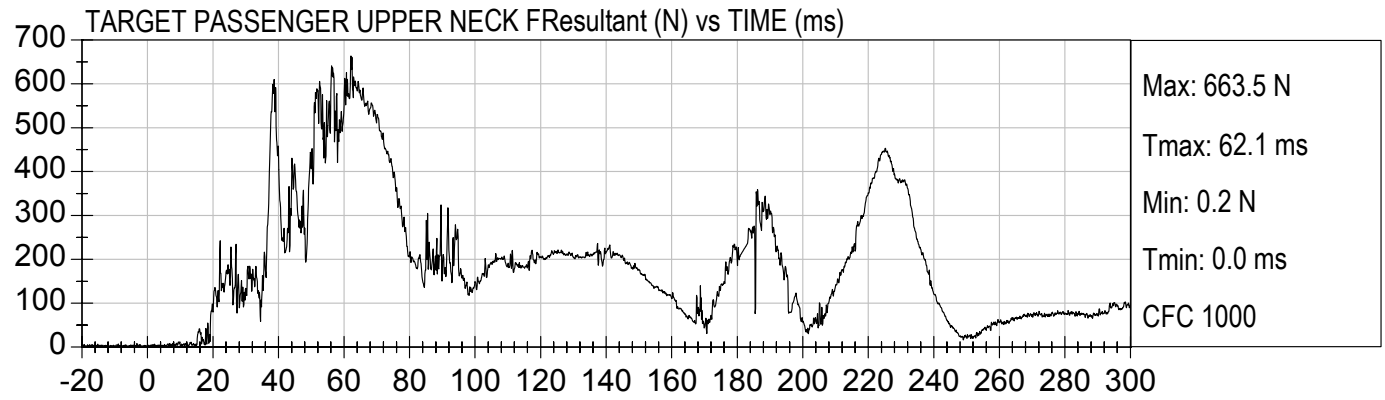
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



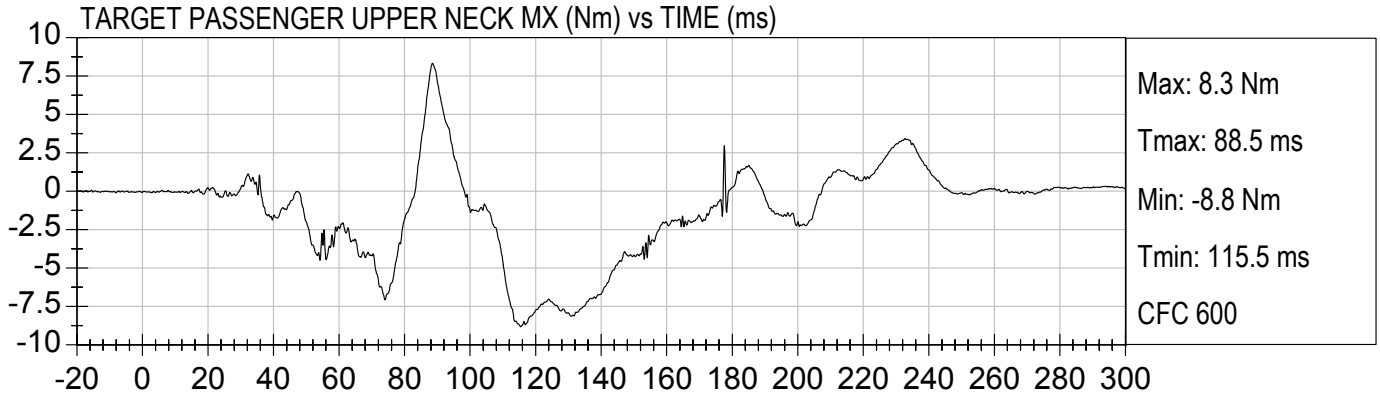


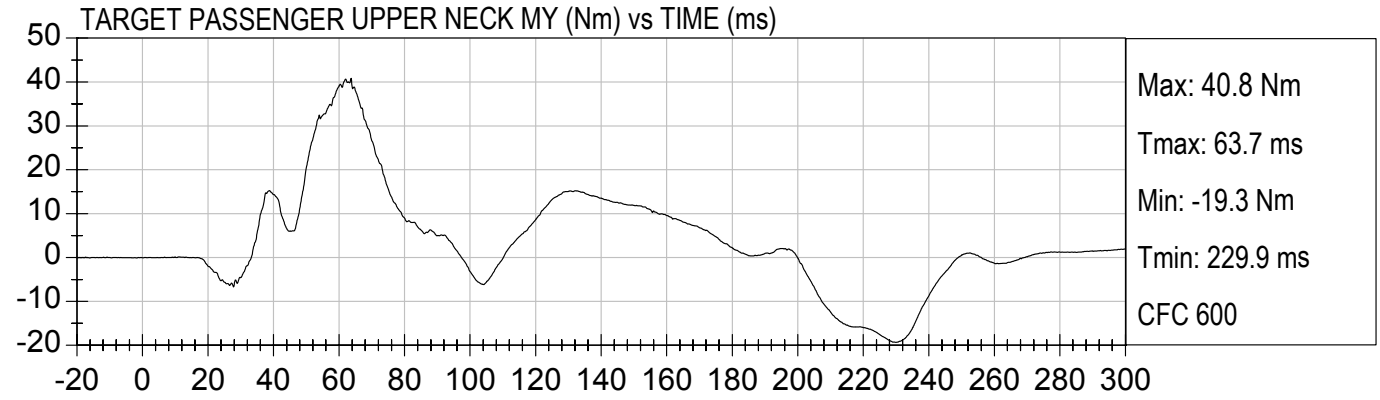


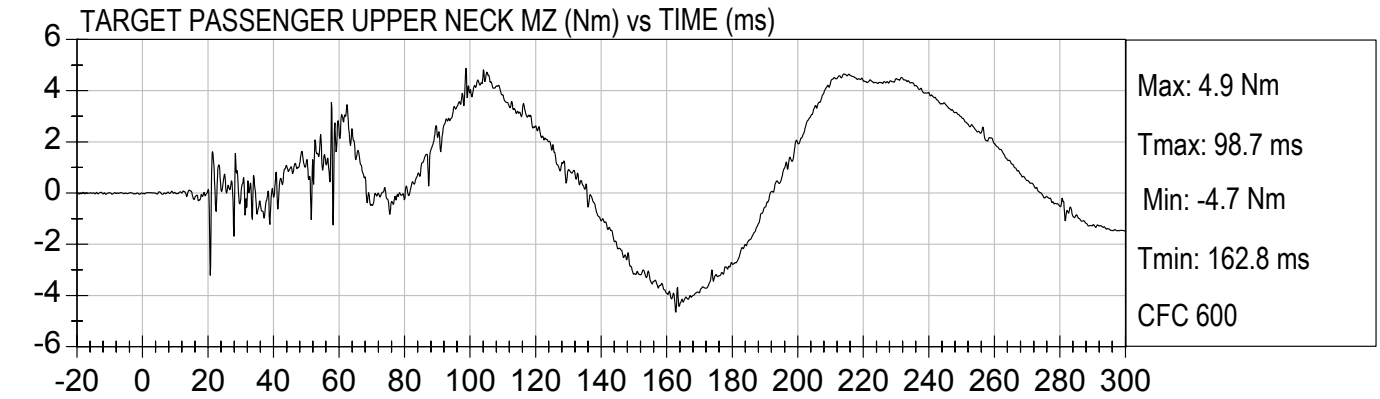


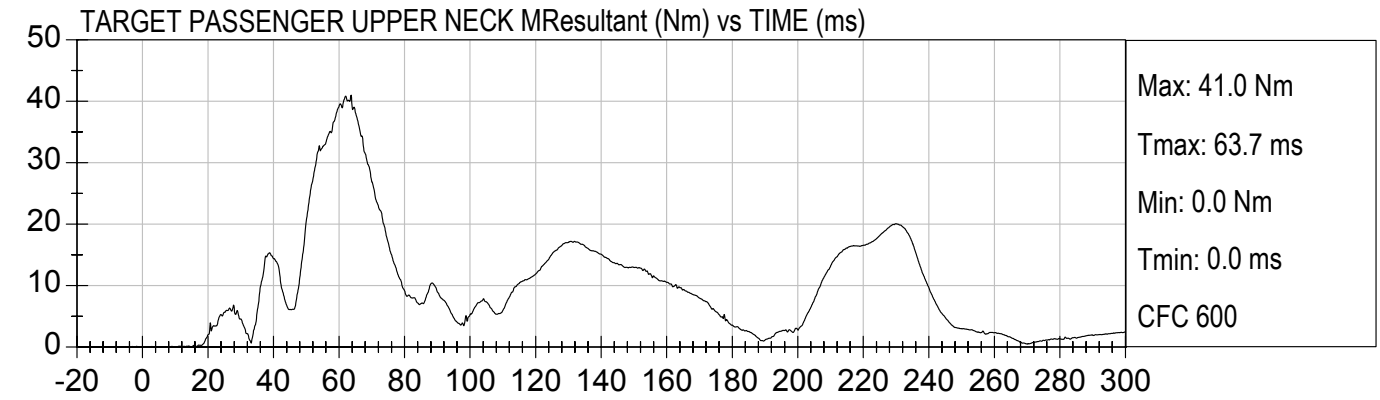
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



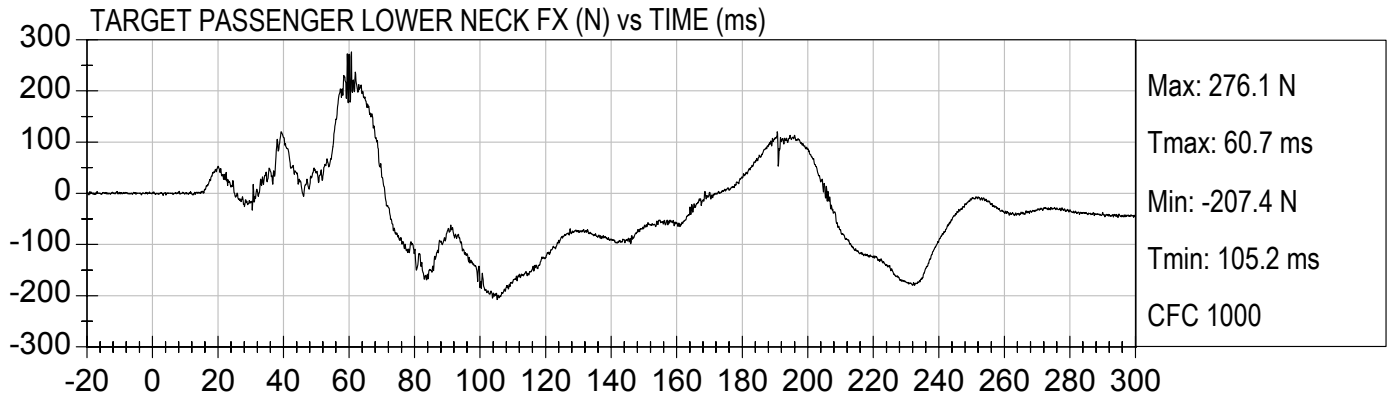


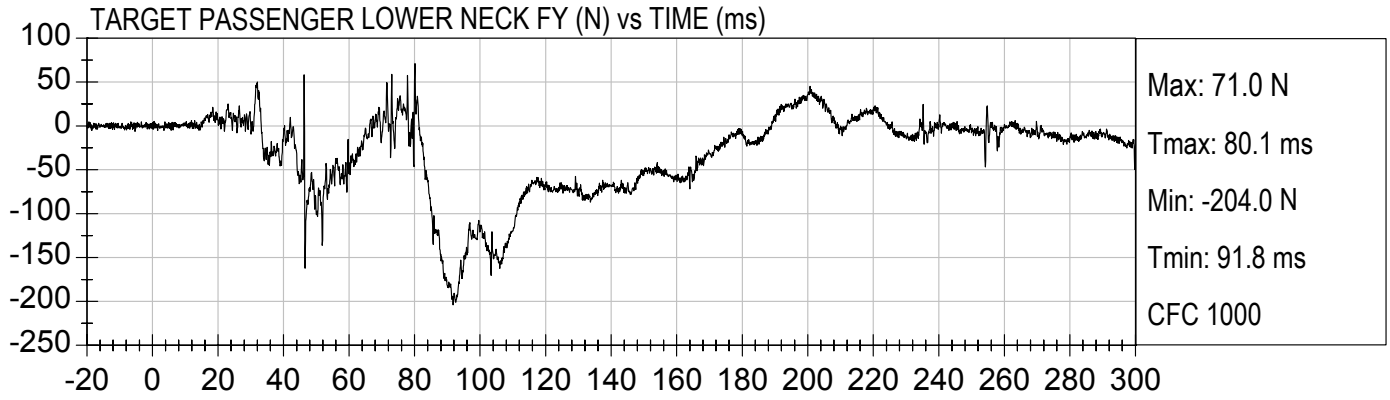


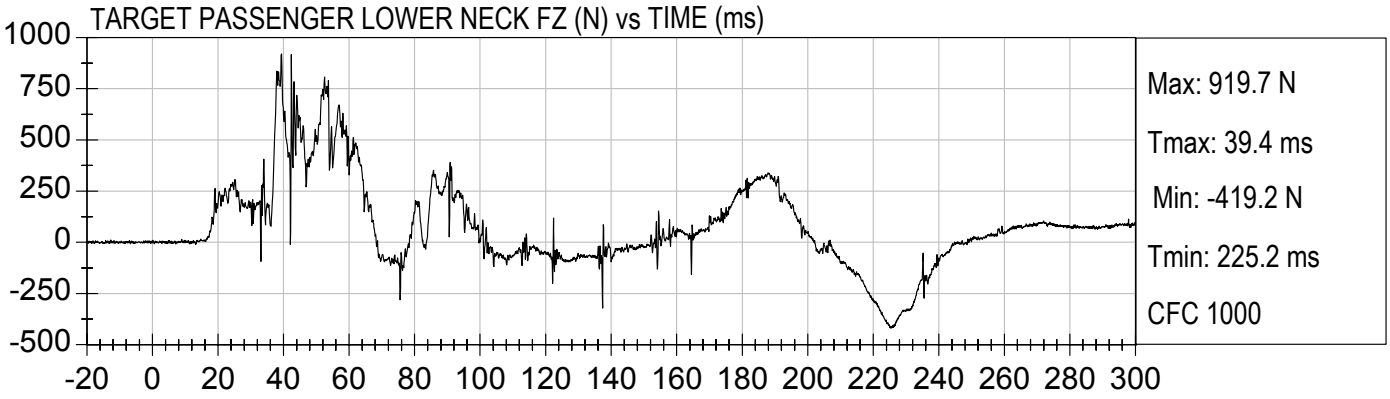


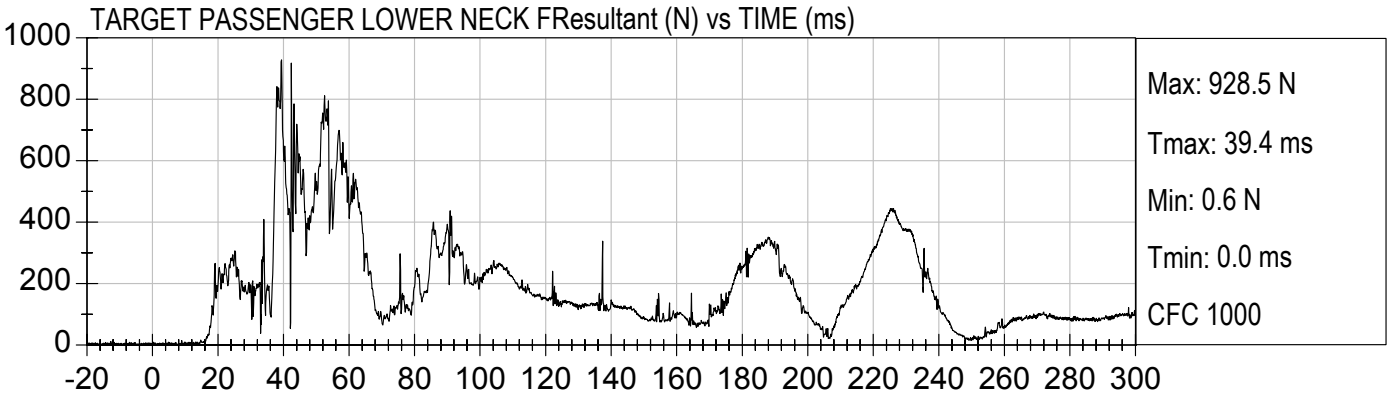
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

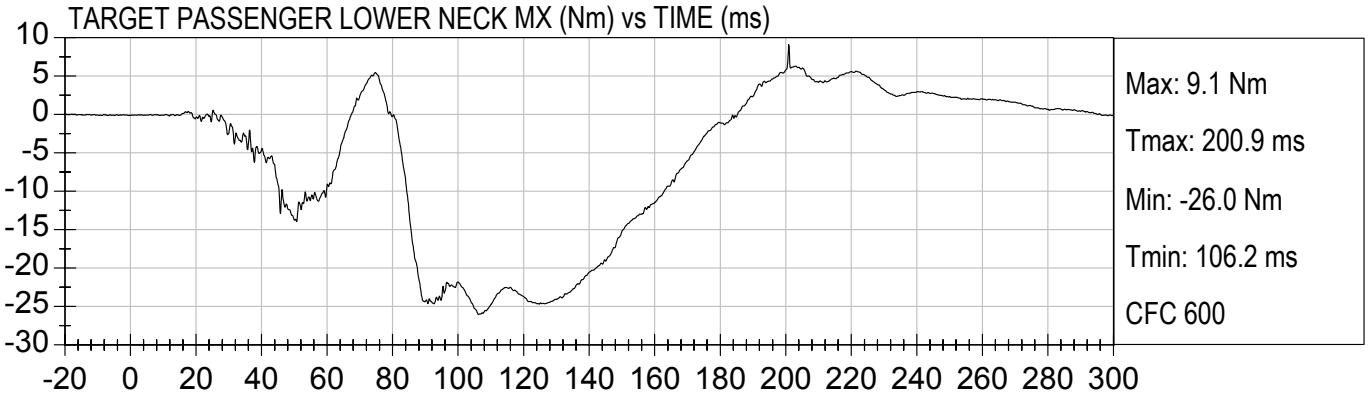
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

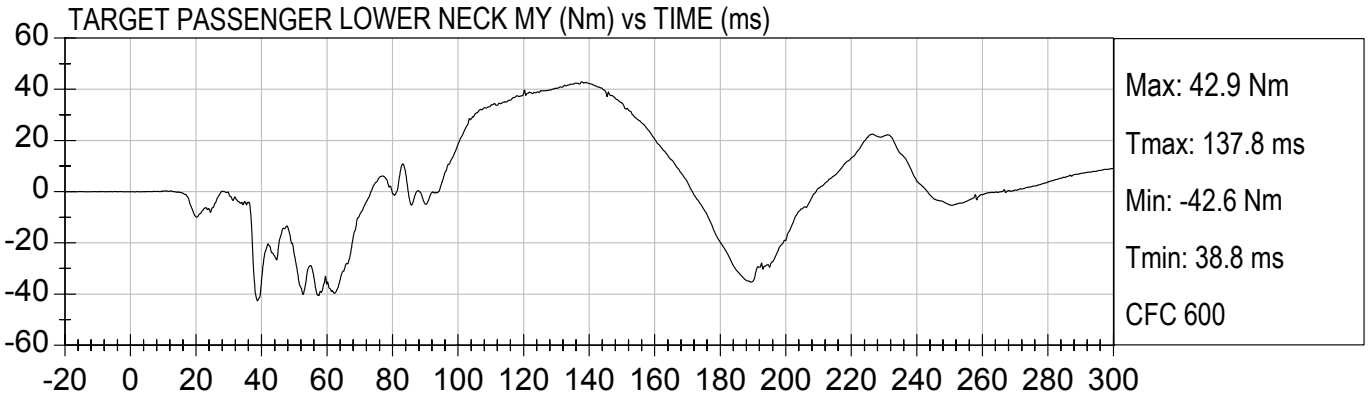






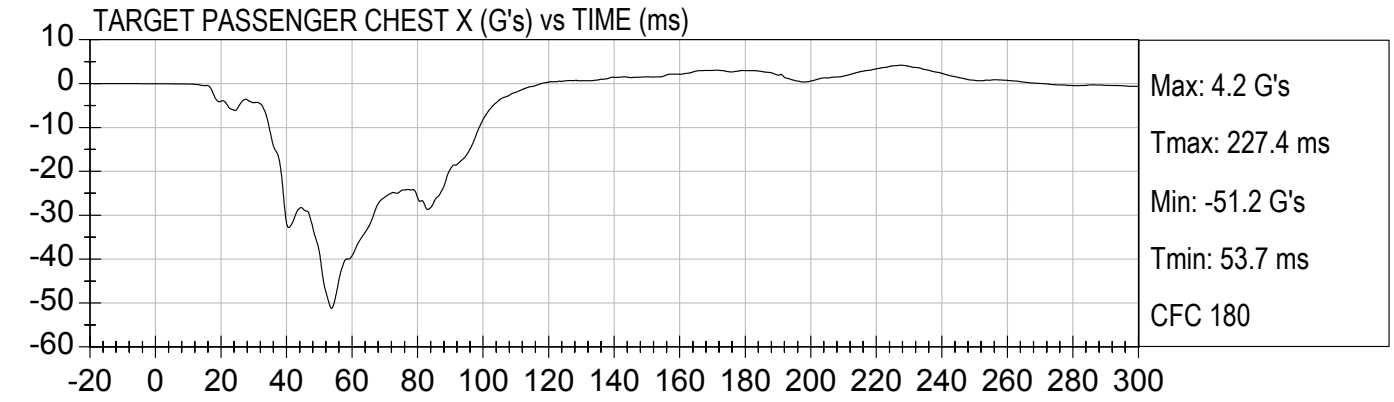


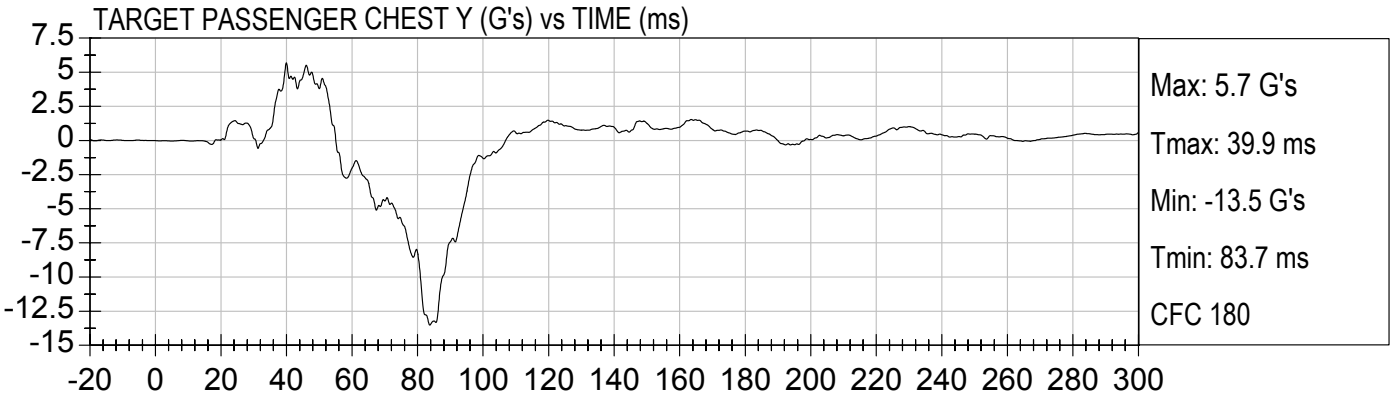

TARGET PASSENGER LOWER NECK MX (Nm) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 9.1 Nm
Tmax: 200.9 ms
Min: -26.0 Nm
Tmin: 106.2 ms
CFC 600

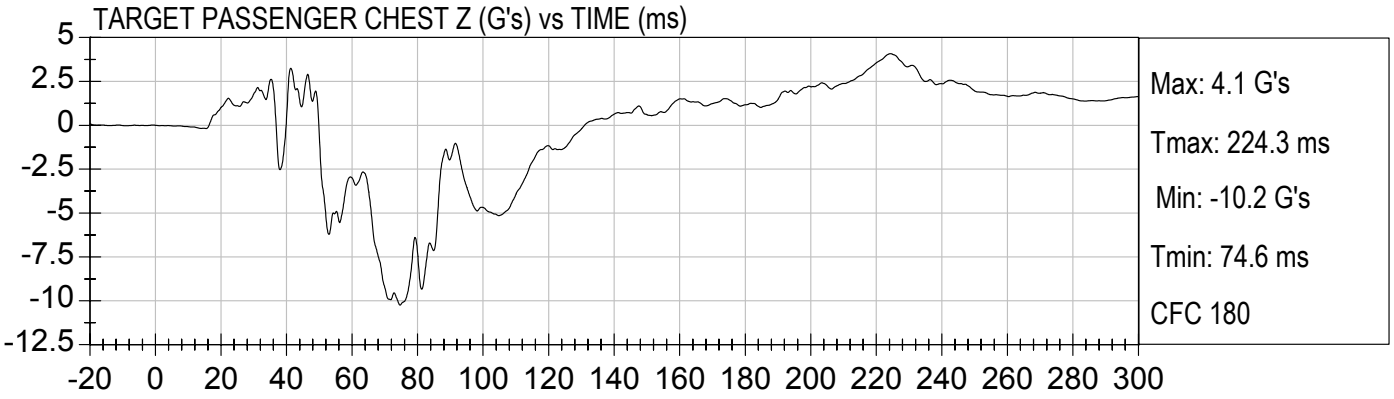

TARGET PASSENGER LOWER NECK MY (Nm) vs TIME (ms)
60
40
20
0
-20
-40
-60
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 42.9 Nm
Tmax: 137.8 ms
Min: -42.6 Nm
Tmin: 38.8 ms
CFC 600

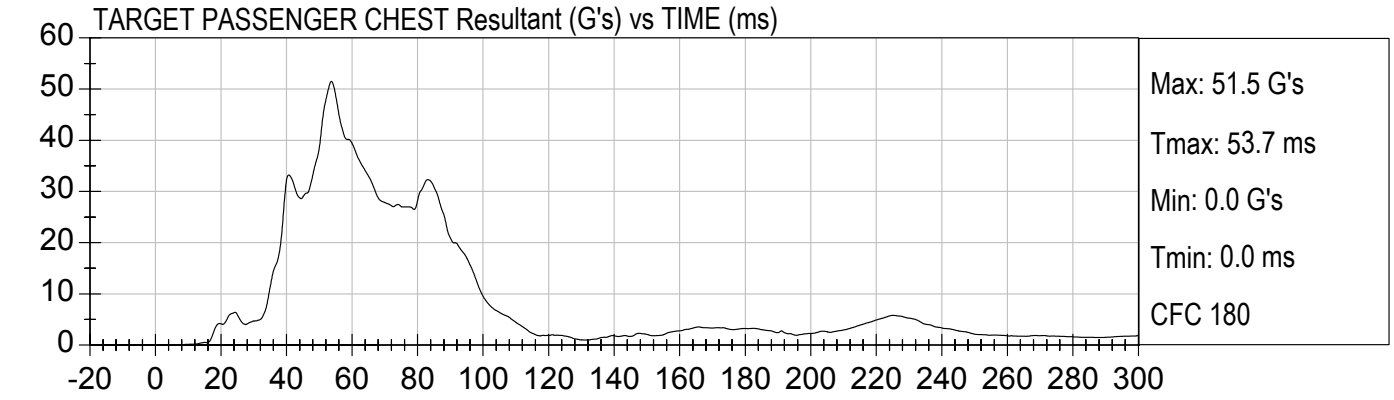
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



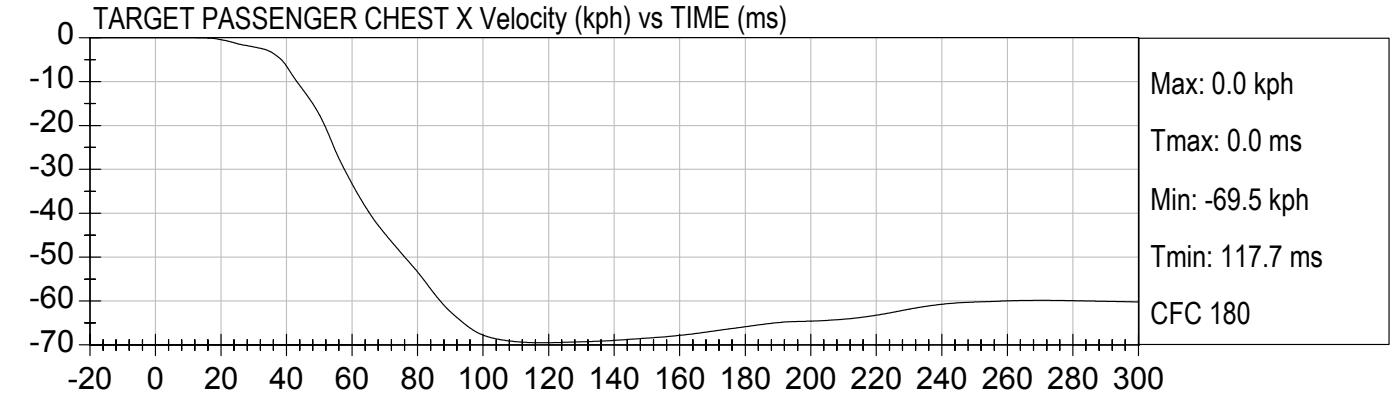


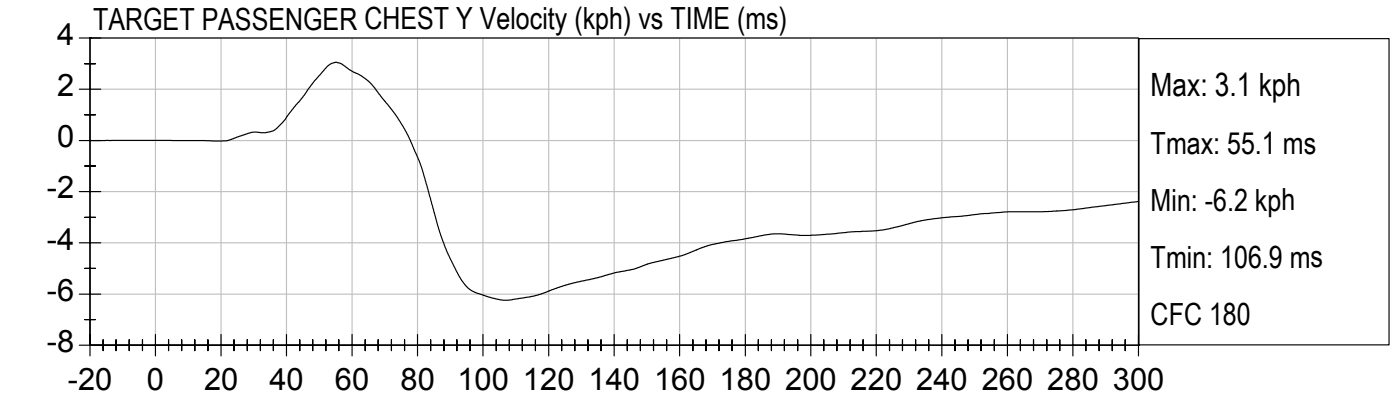


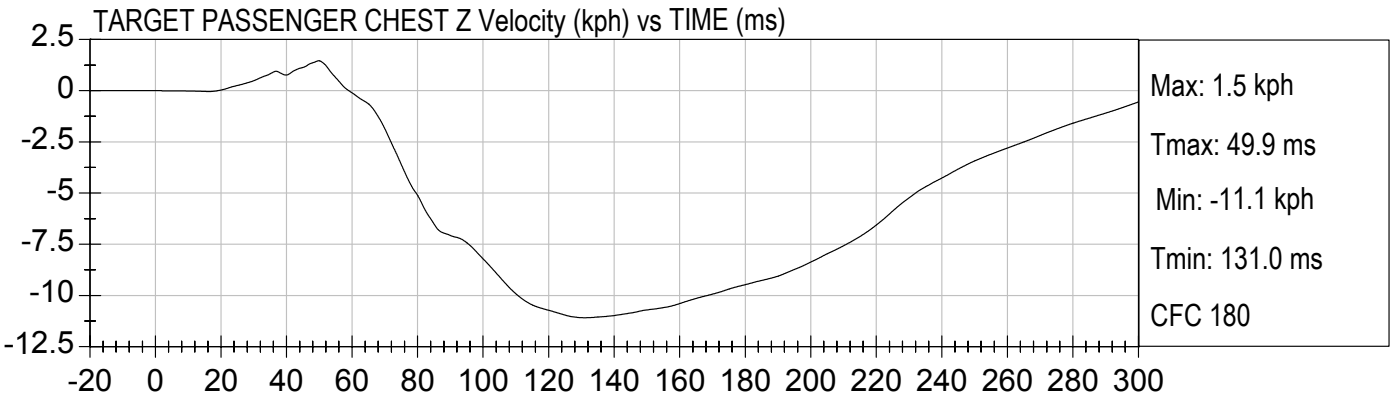


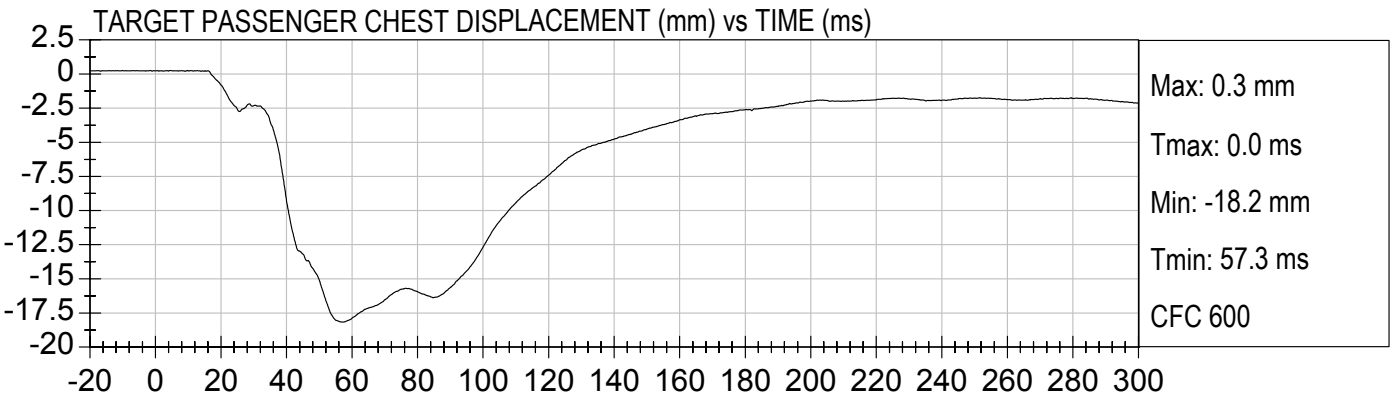
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



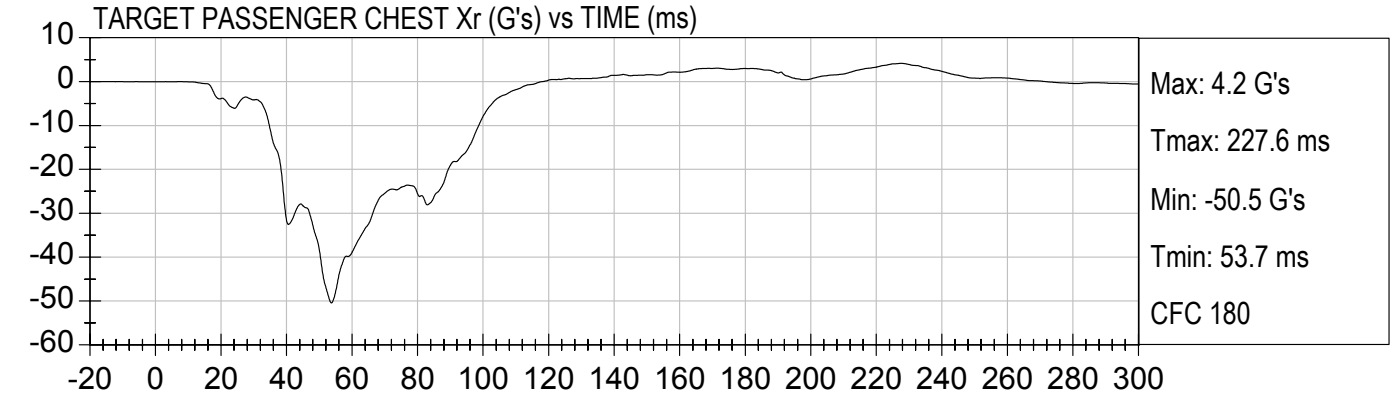


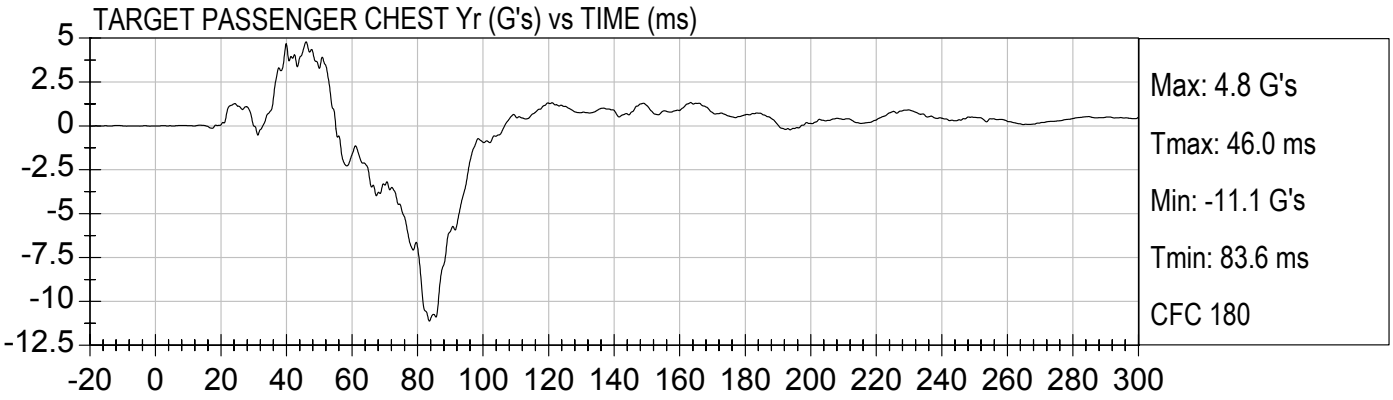


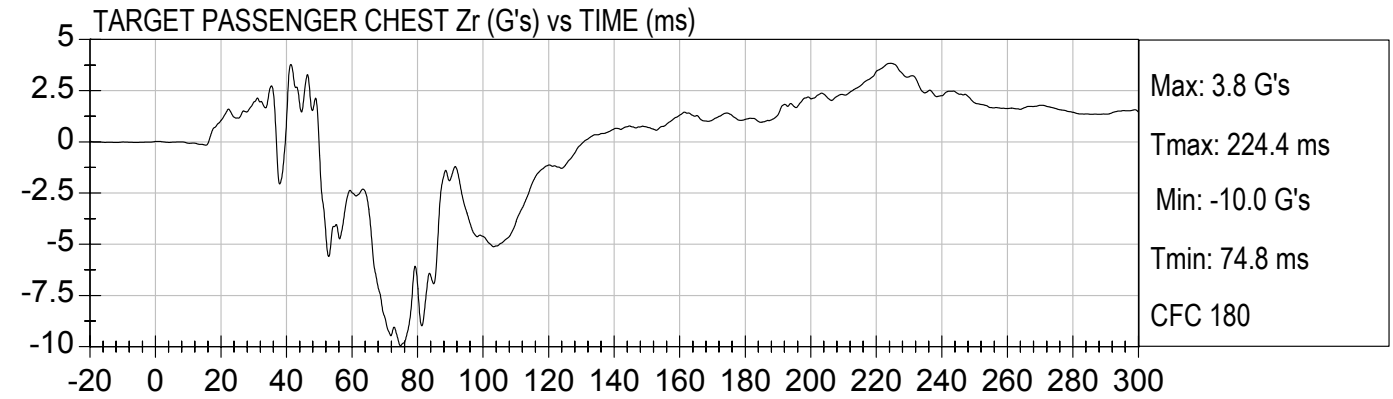


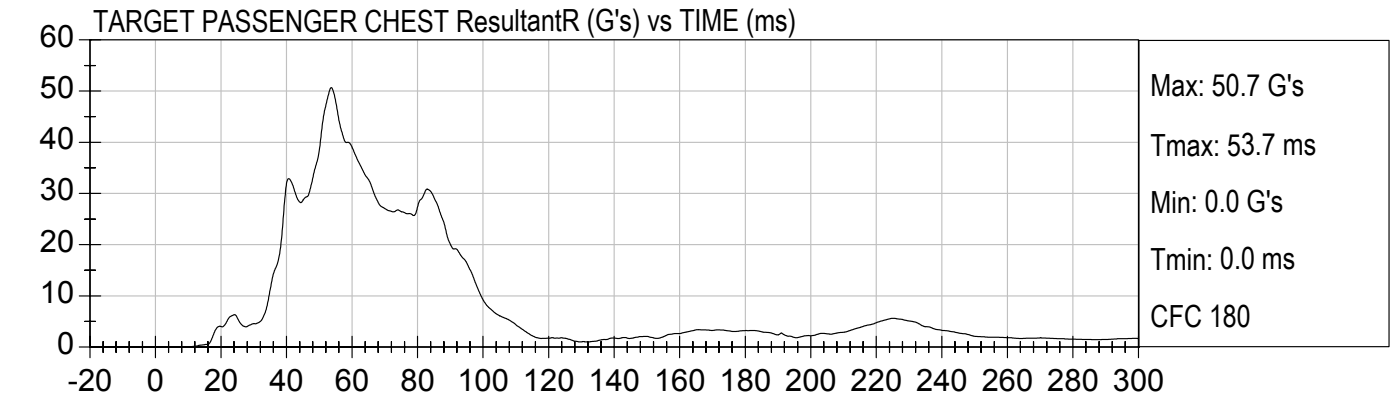
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

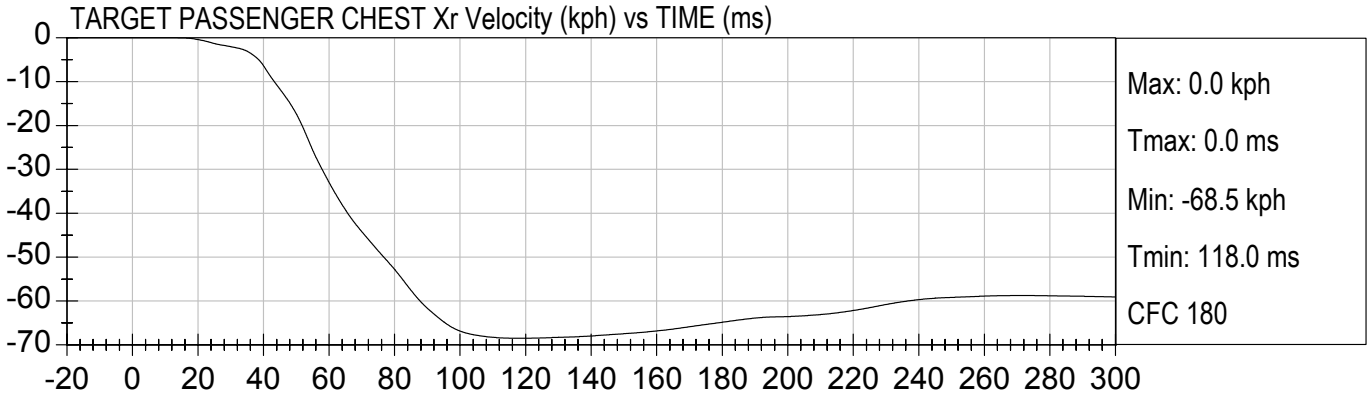
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

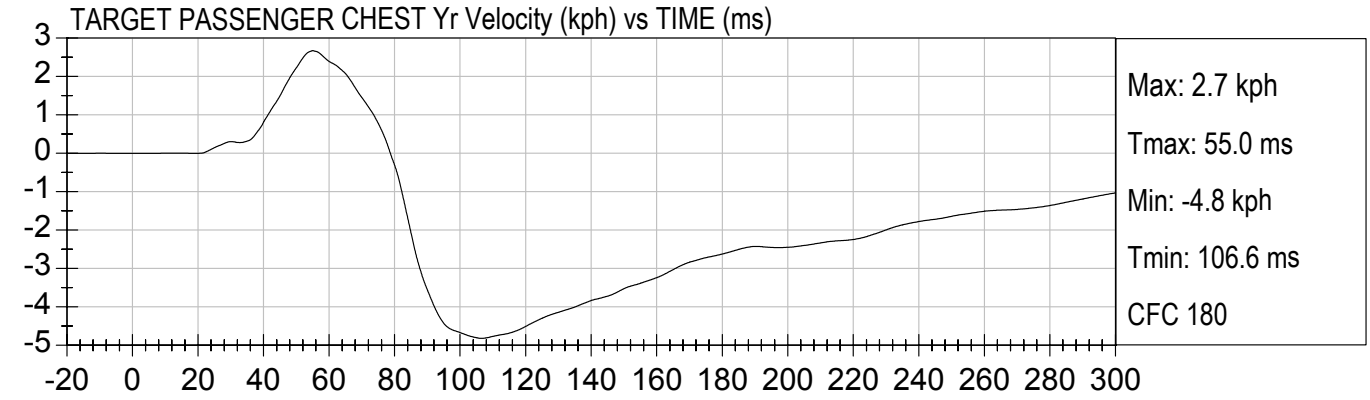


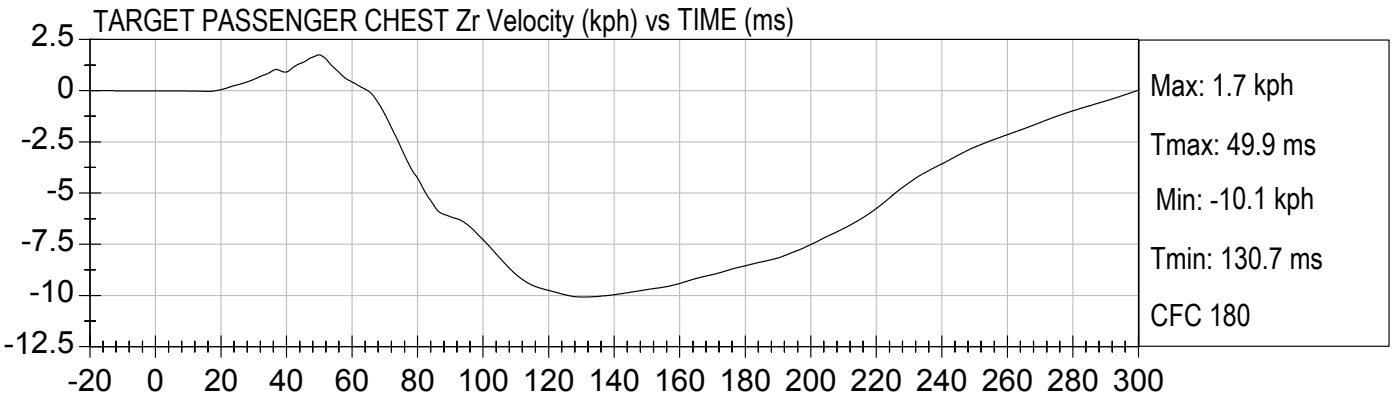






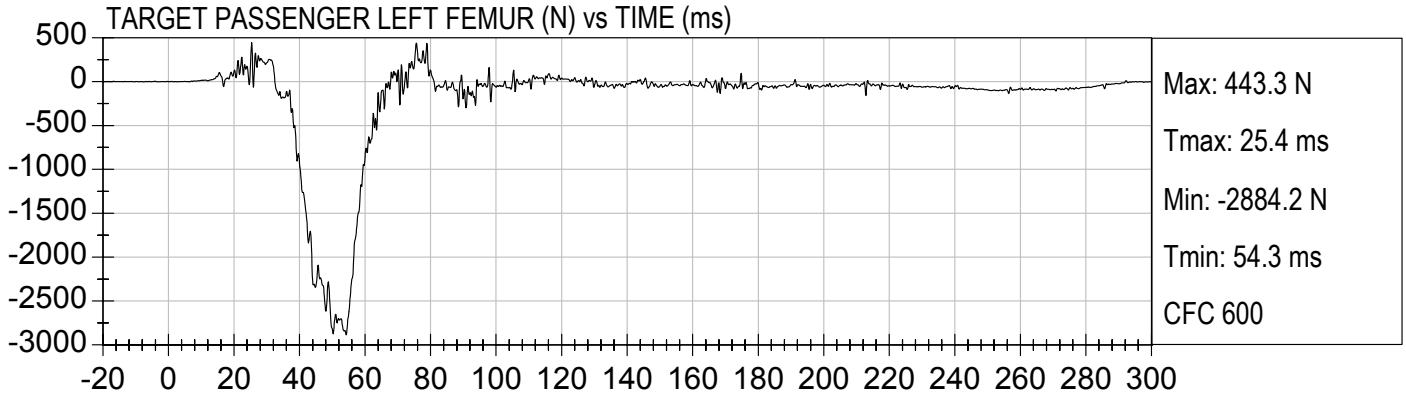

TARGET PASSENGER CHEST Xr Velocity (kph) vs TIME (ms)
0
-10
-20
-30
-40
-50
-60
-70
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -68.5 kph
Tmin: 118.0 ms
CFC 180

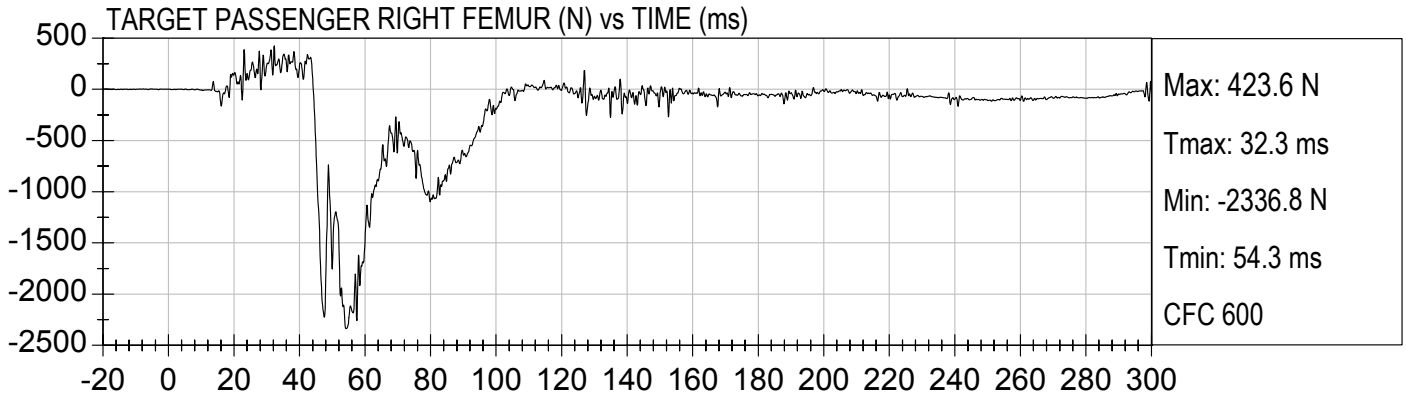

TARGET PASSENGER CHEST Yr Velocity (kph) vs TIME (ms)
3
2
1
0
-1
-2
-3
-4
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 2.7 kph
Tmax: 55.0 ms
Min: -4.8 kph
Tmin: 106.6 ms
CFC 180

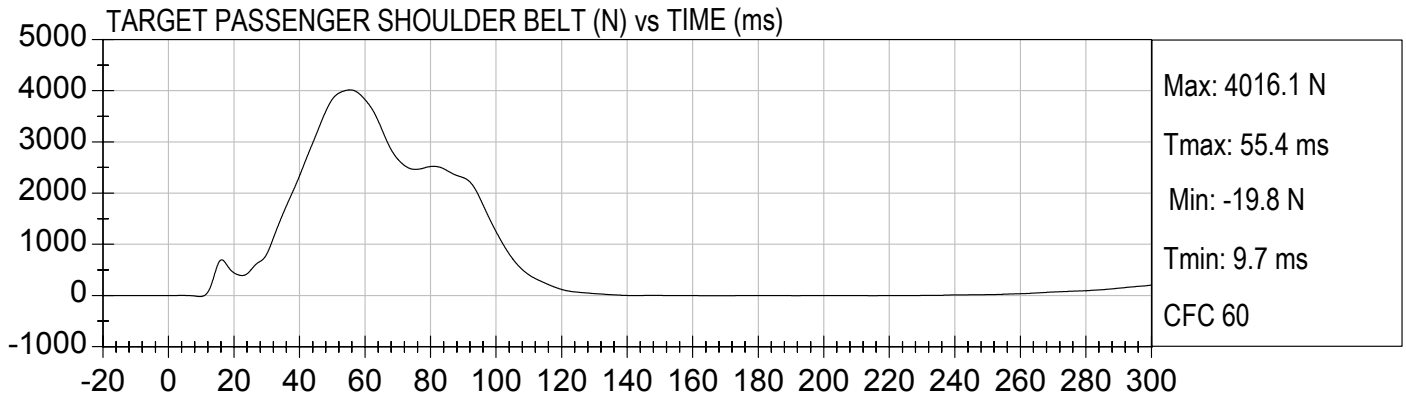

TARGET PASSENGER CHEST Zr Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.7 kph
Tmax: 49.9 ms
Min: -10.1 kph
Tmin: 130.7 ms
CFC 180

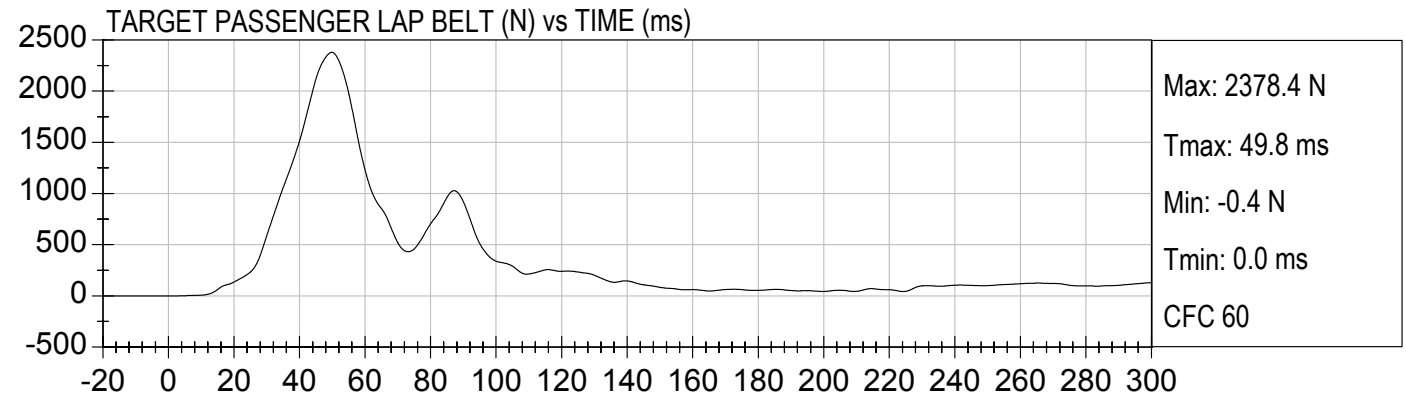
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

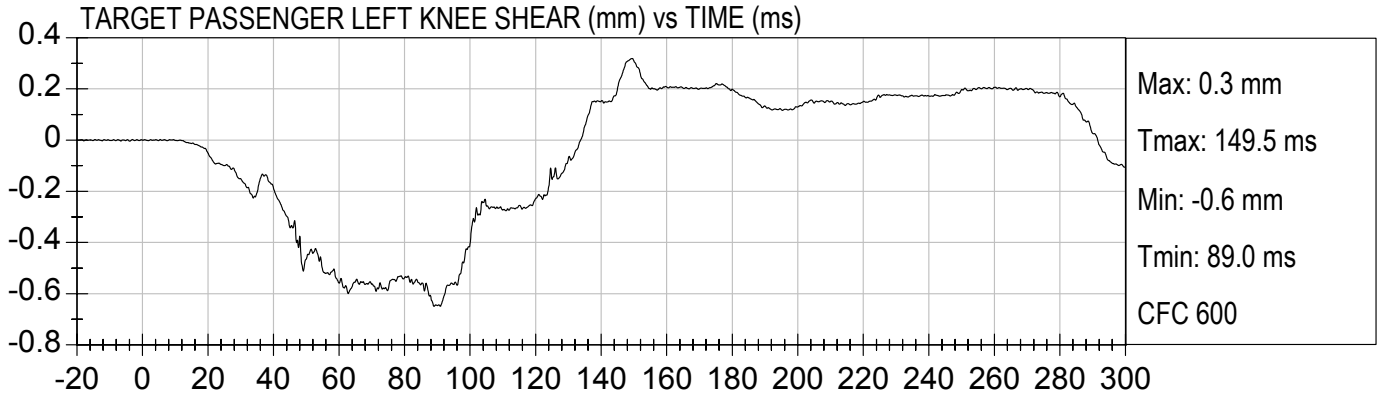
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

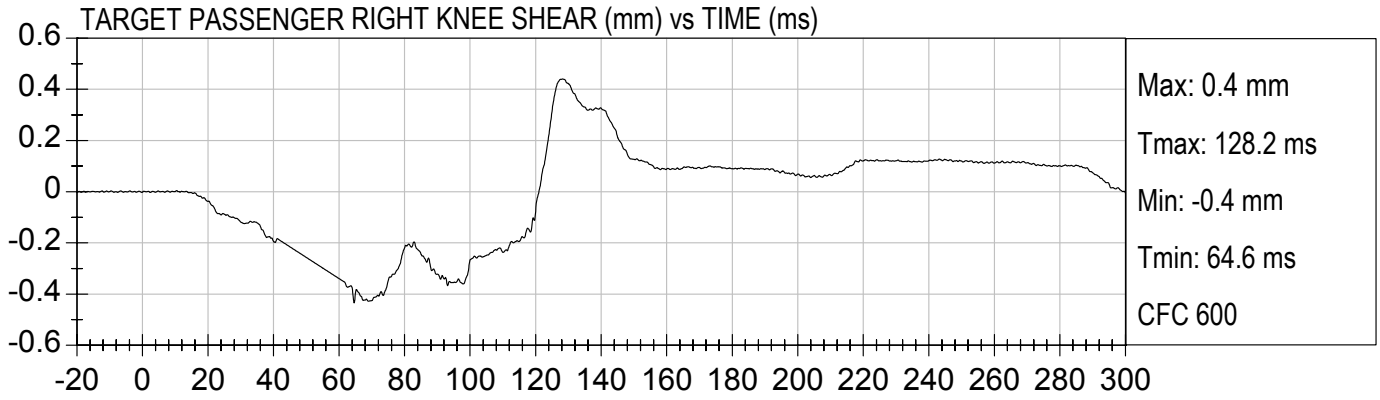






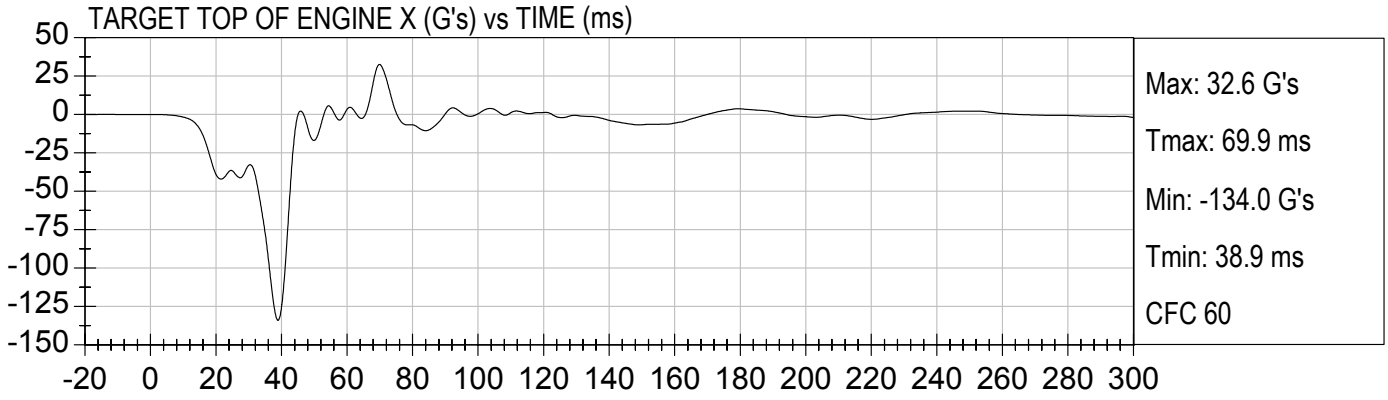


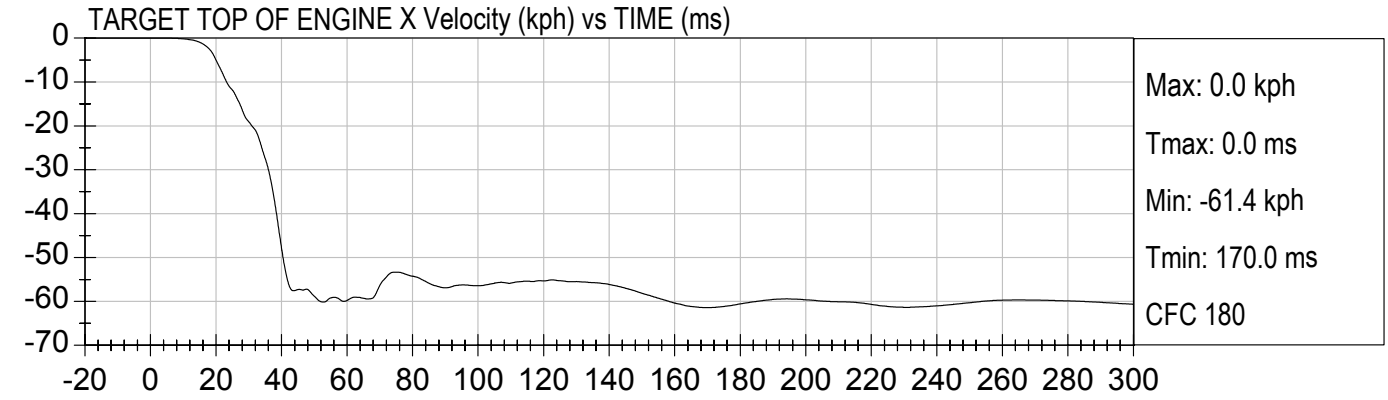

TARGET PASSENGER LEFT KNEE SHEAR (mm) vs TIME (ms)
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.3 mm
Tmax: 149.5 ms
Min: -0.6 mm
Tmin: 89.0 ms
CFC 600

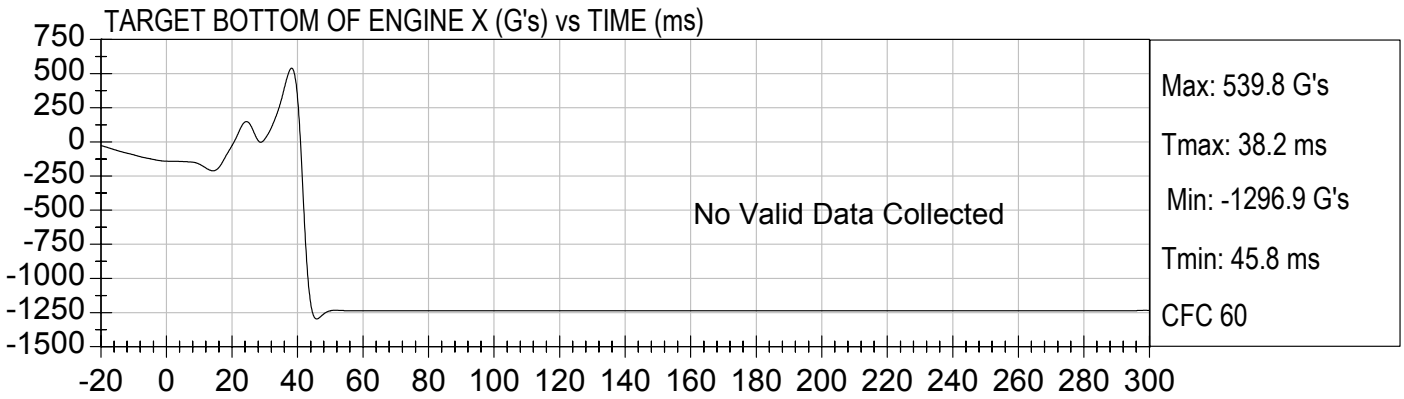

TARGET PASSENGER RIGHT KNEE SHEAR (mm) vs TIME (ms)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.4 mm
Tmax: 128.2 ms
Min: -0.4 mm
Tmin: 64.6 ms
CFC 600

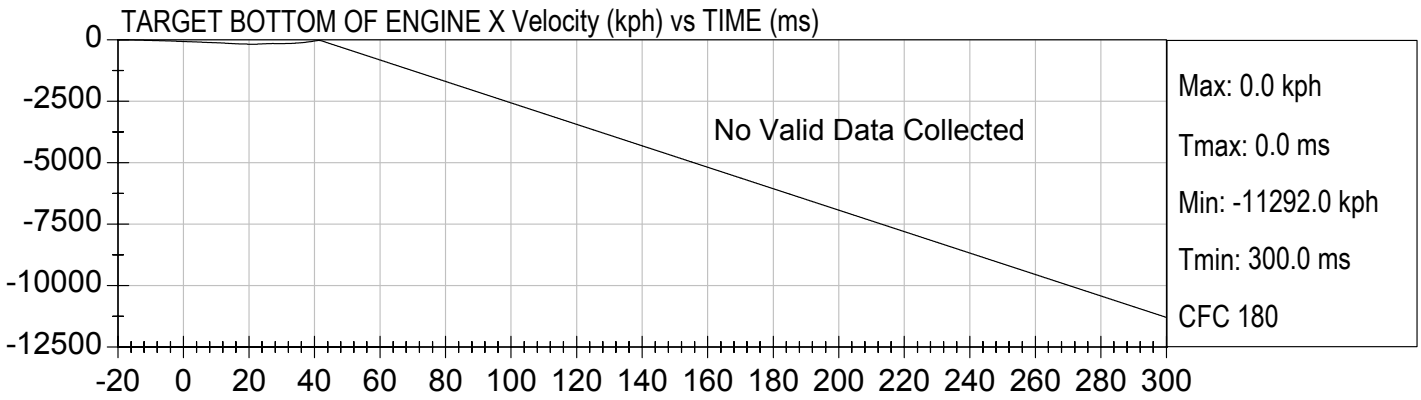
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



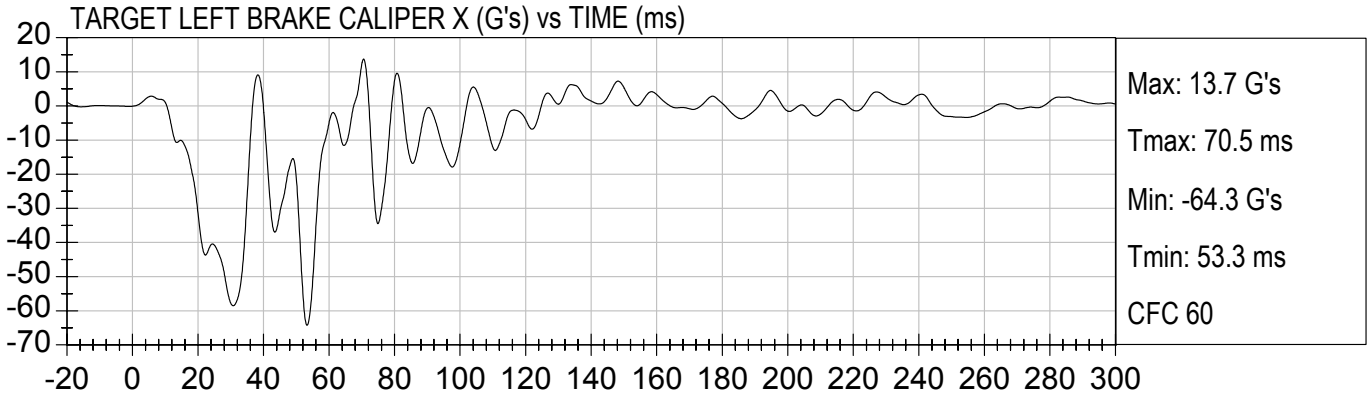


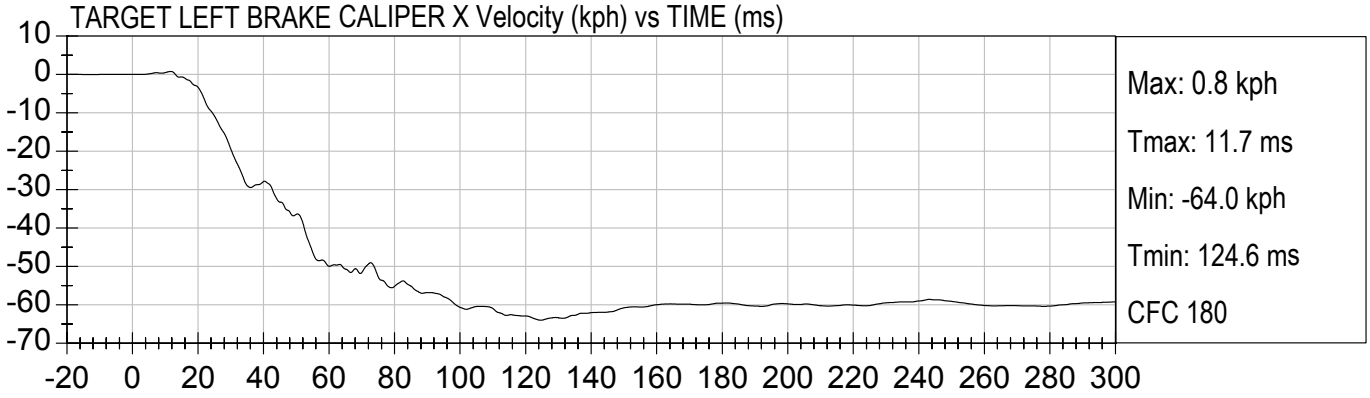


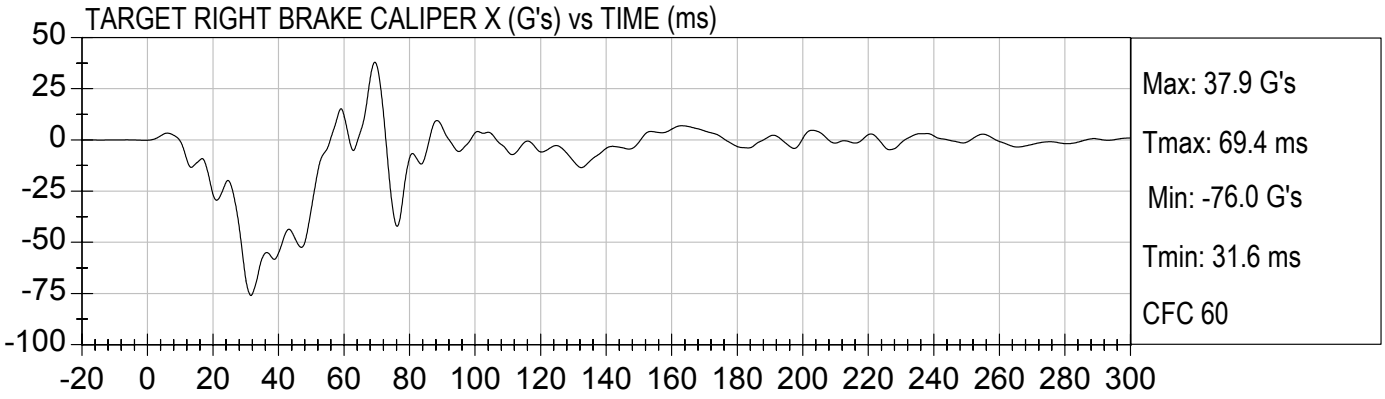


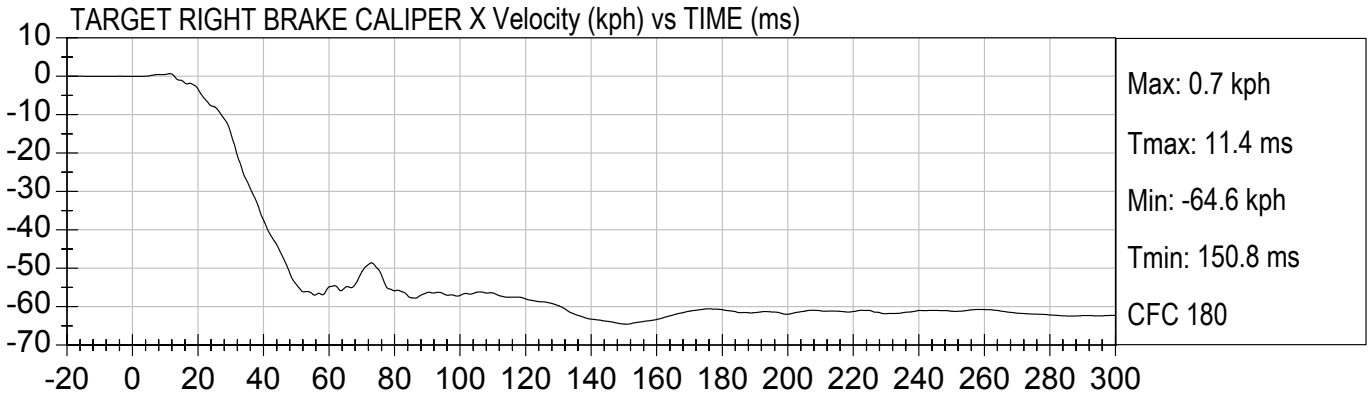
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

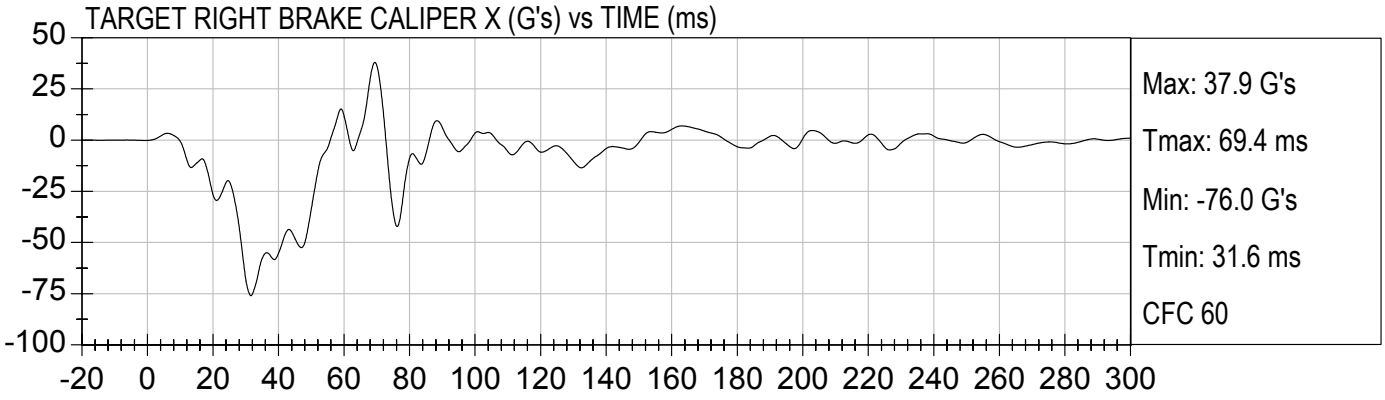
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

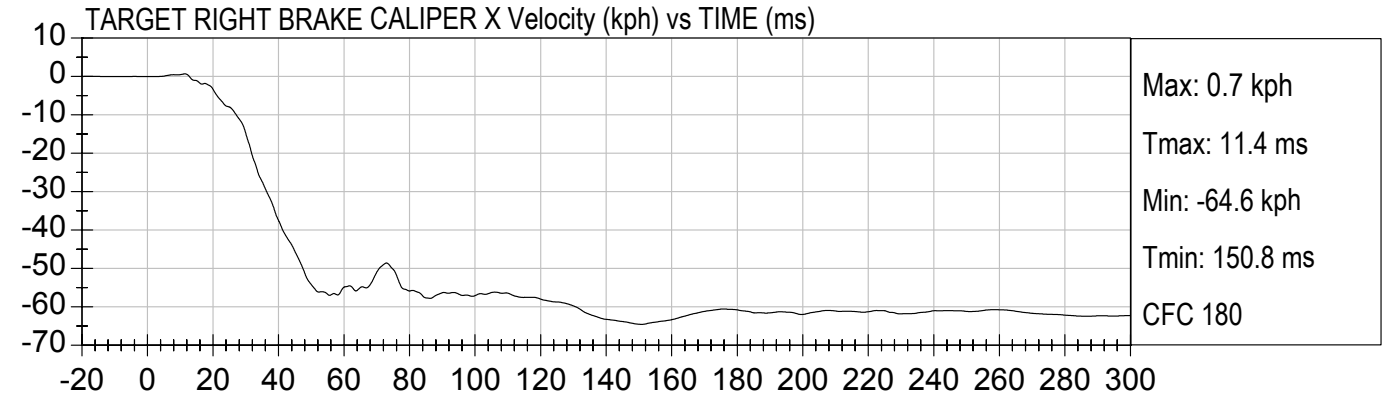






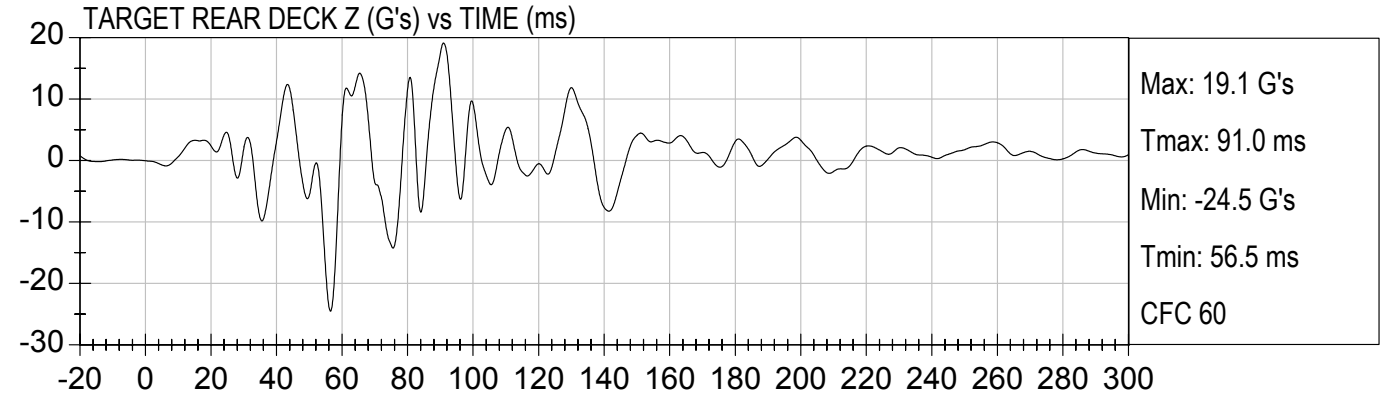


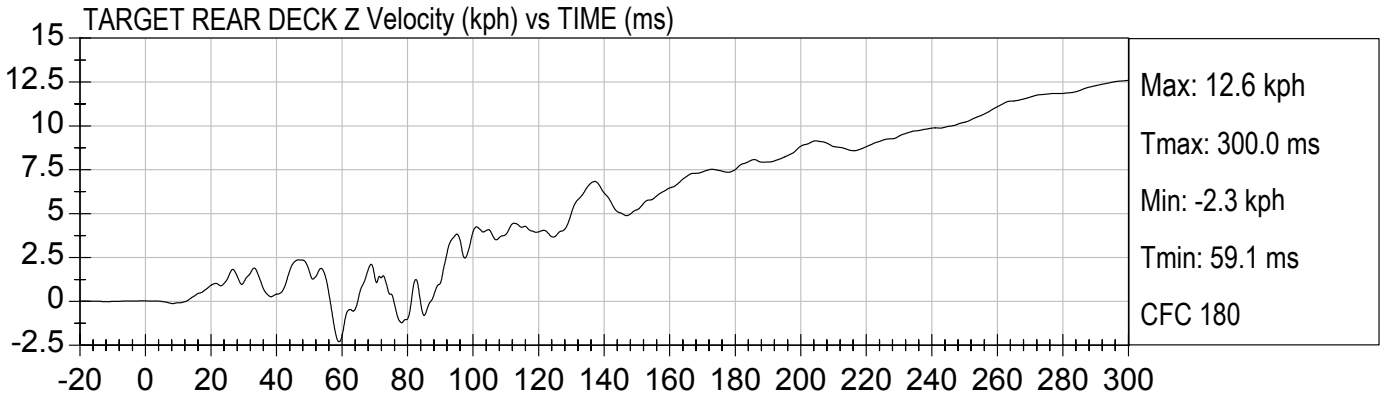

TARGET RIGHT BRAKE CALIPER X (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 37.9 G's
Tmax: 69.4 ms
Min: -76.0 G's
Tmin: 31.6 ms
CFC 60

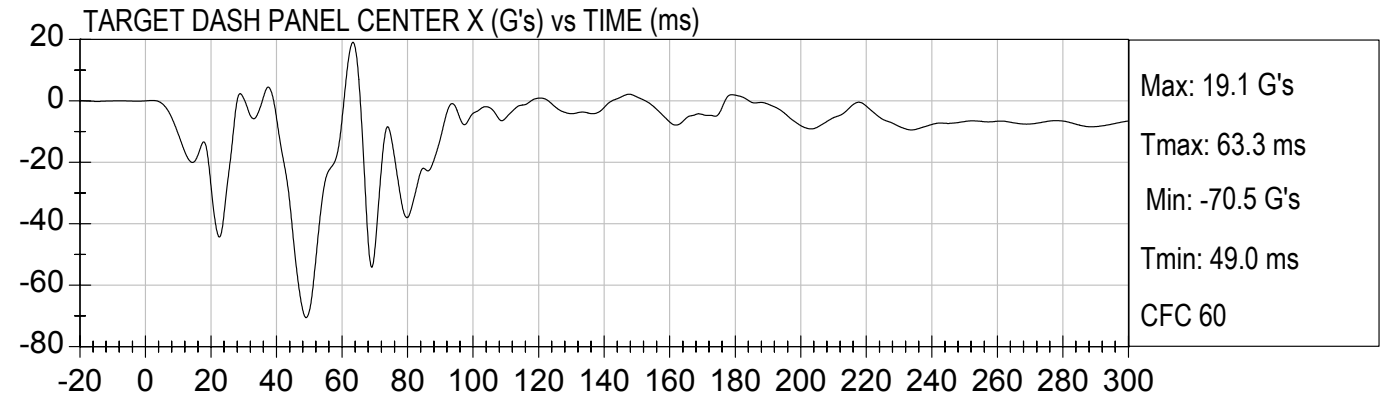

TARGET RIGHT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.7 kph
Tmax: 11.4 ms
Min: -64.6 kph
Tmin: 150.8 ms
CFC 180

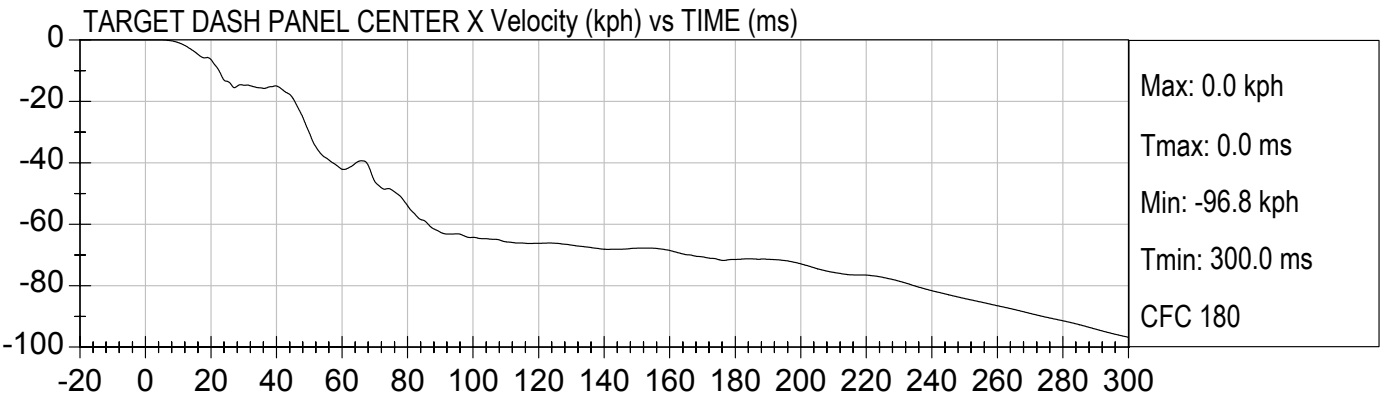
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



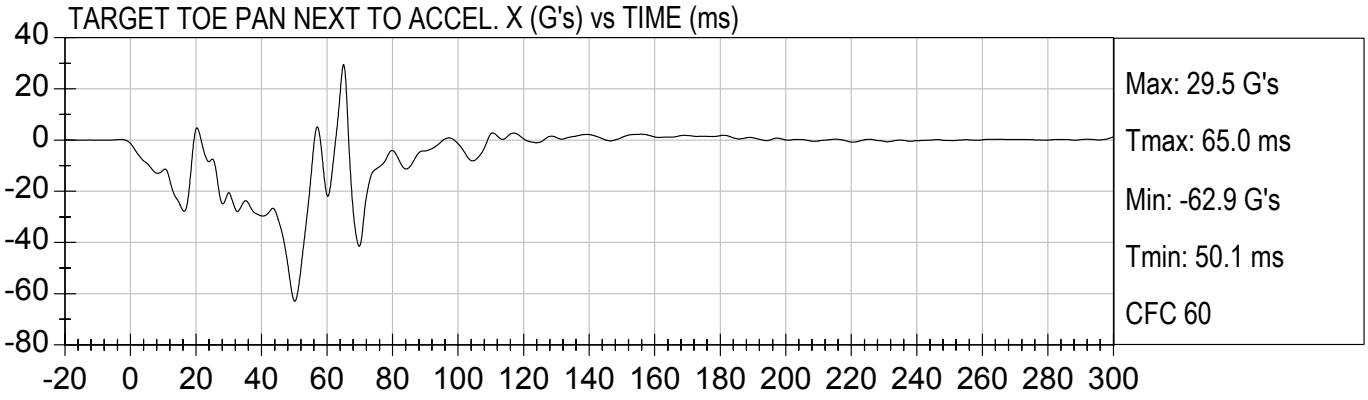


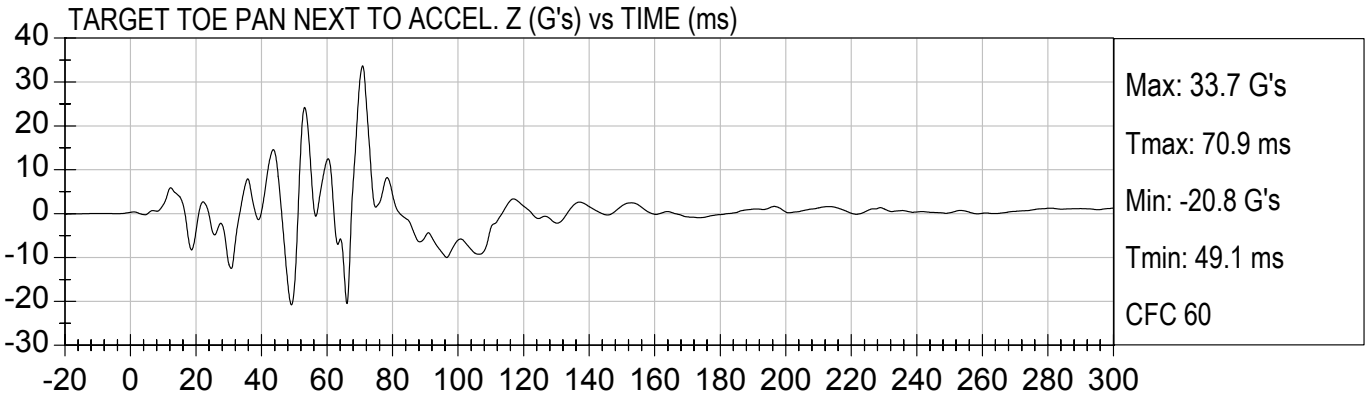


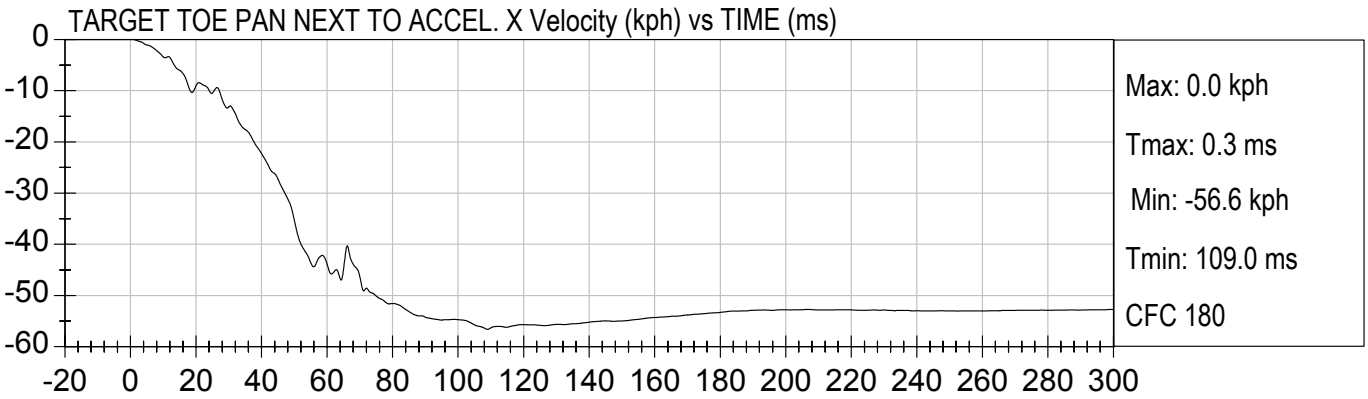


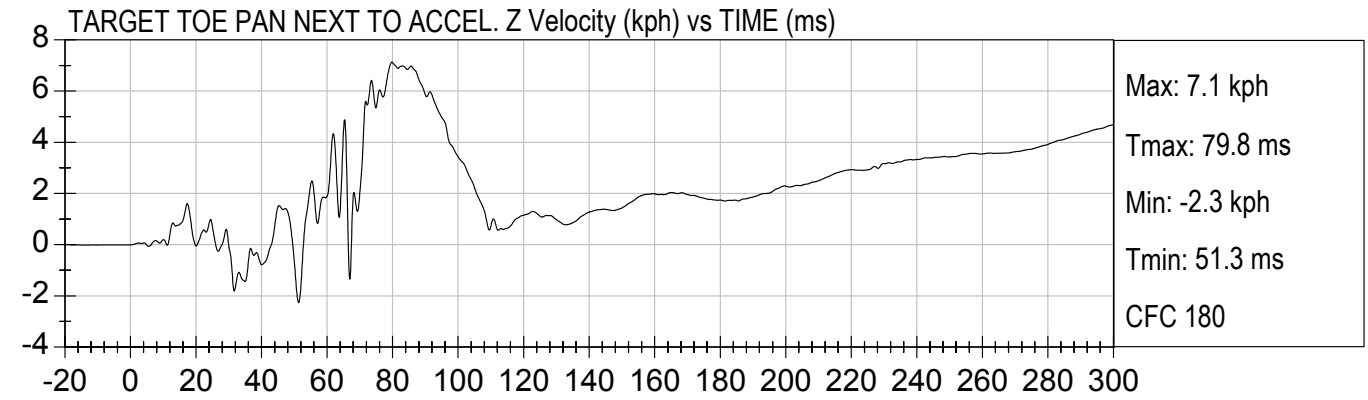
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



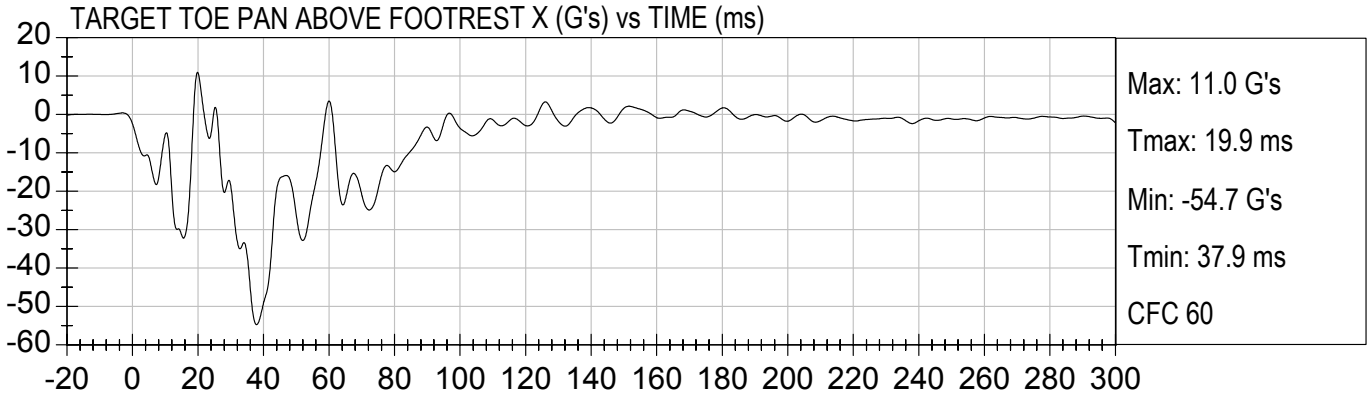


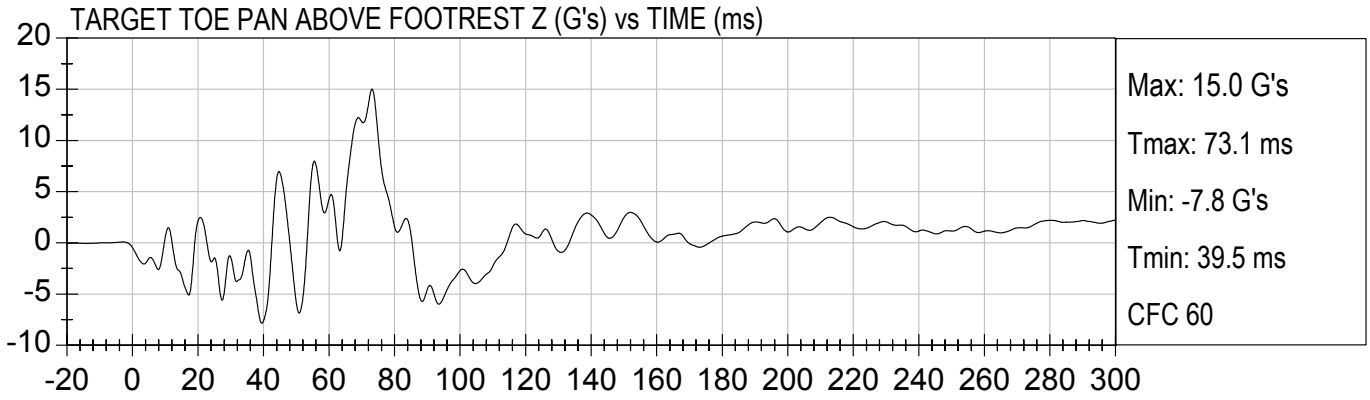


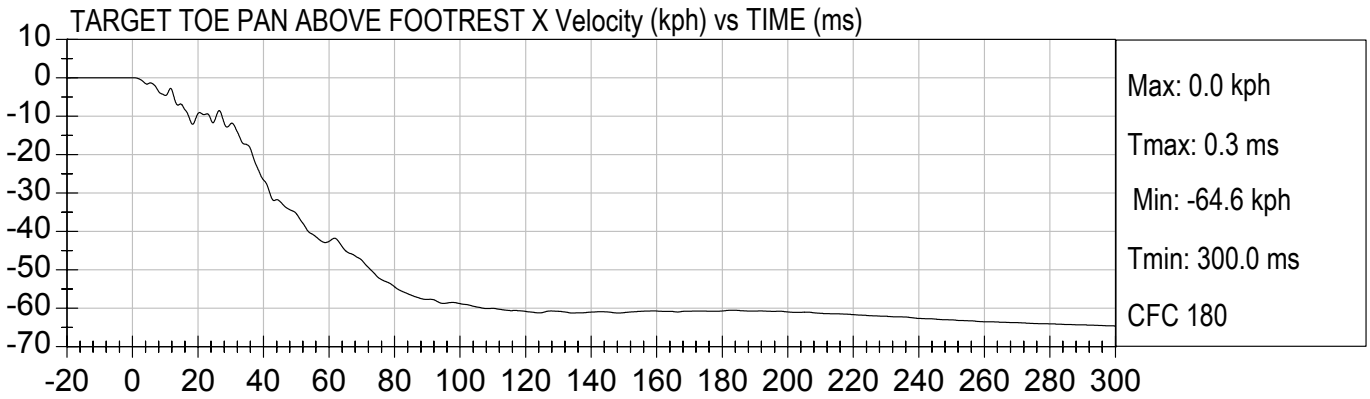


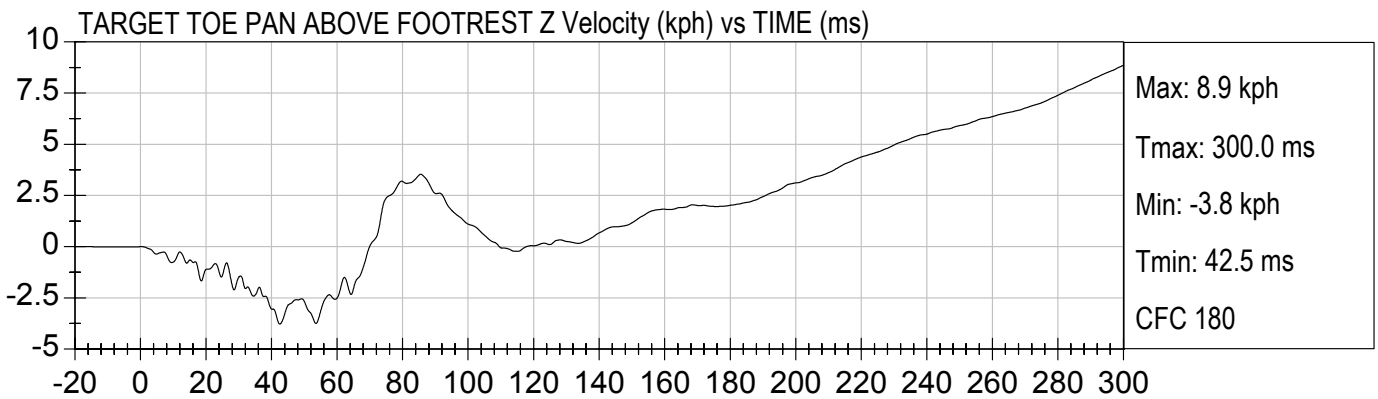
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)



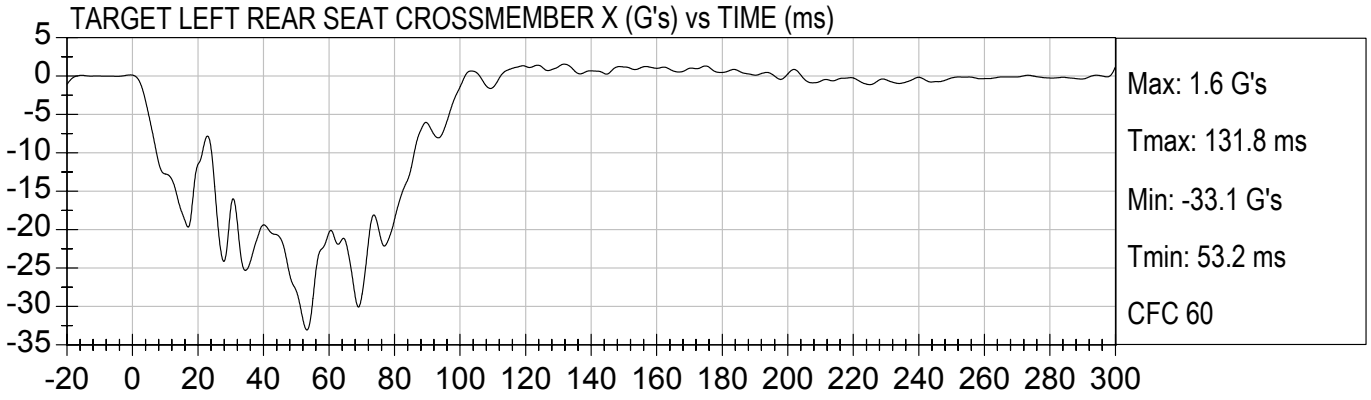


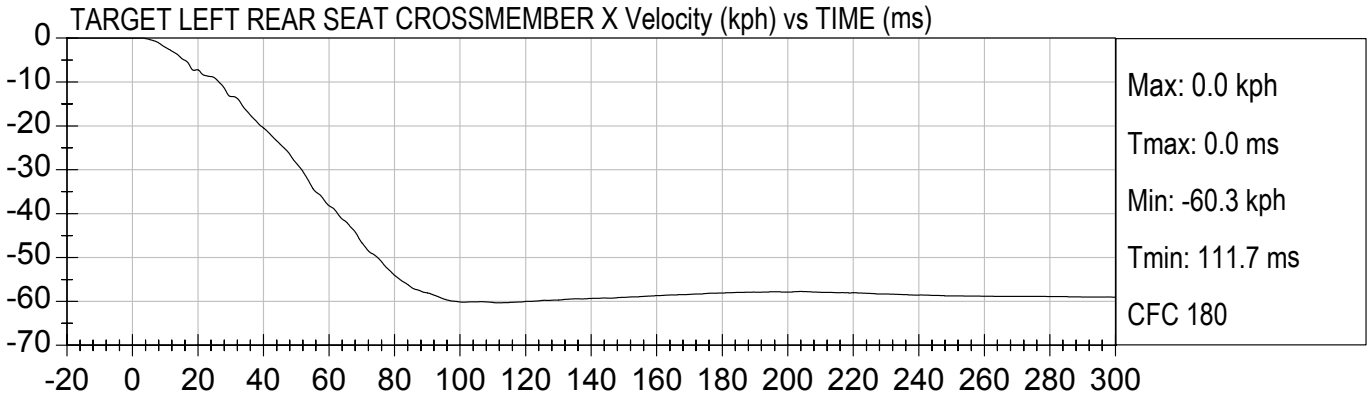


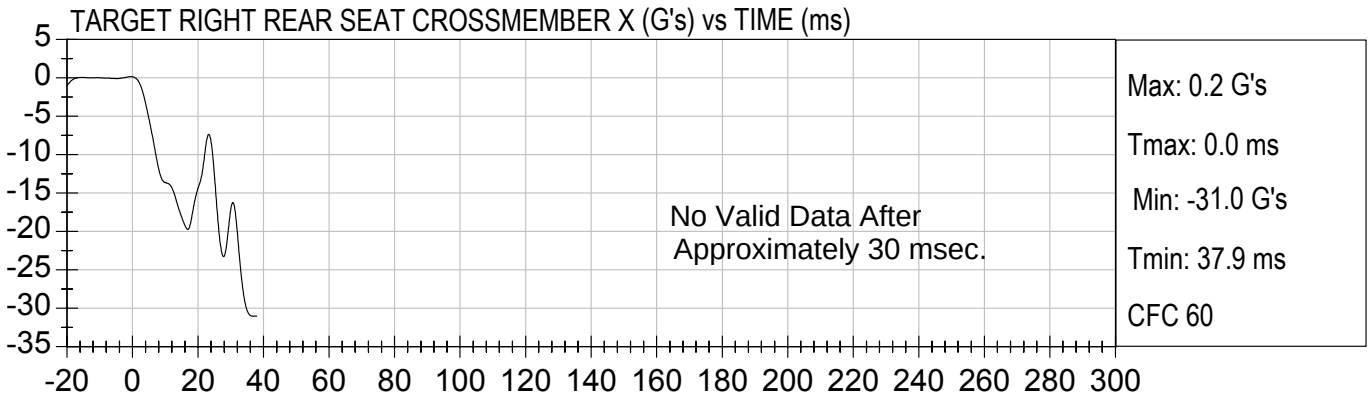


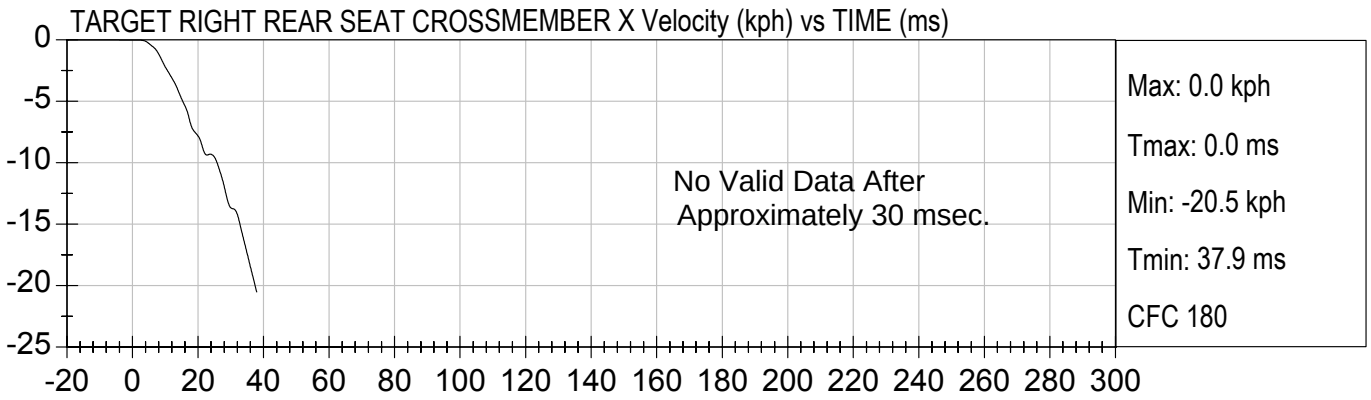
TO#2 FULL FRONTAL IMPACT
2004 HONDA ACCORD (R45344)

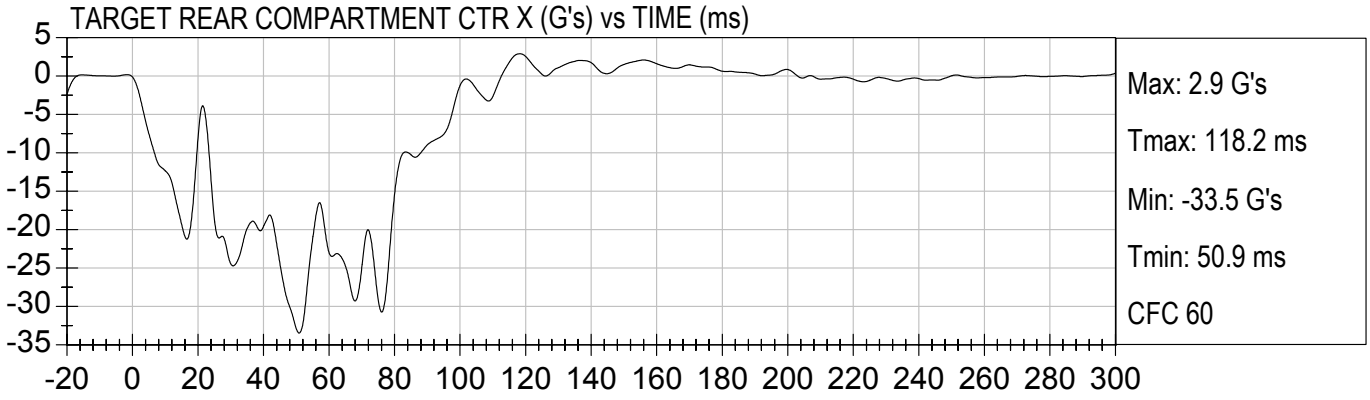
Test Date: 06/29/04
Speed: 0.0 mph (0.0 km/h)

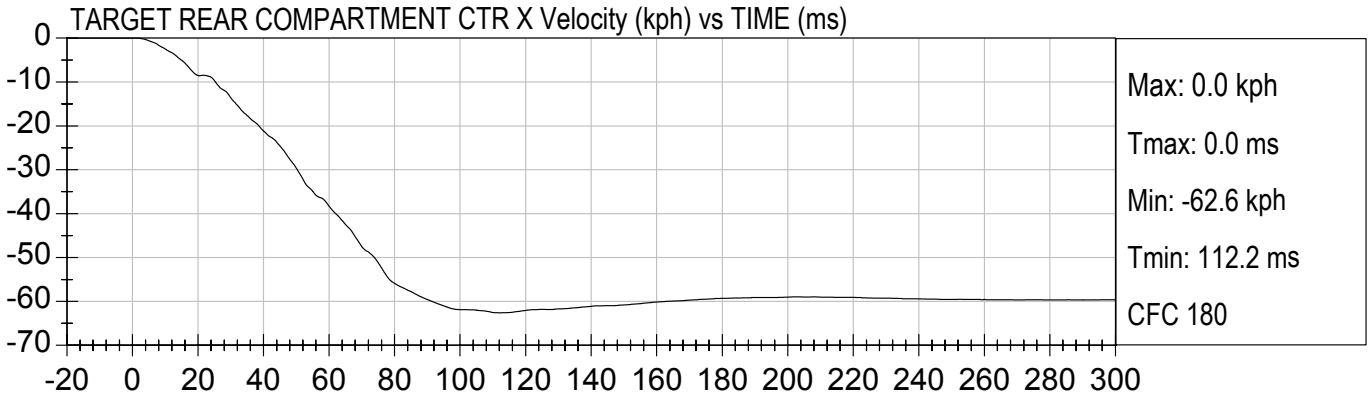









TARGET REAR COMPARTMENT CTR X (G's) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 2.9 G's
Tmax: 118.2 ms
Min: -33.5 G's
Tmin: 50.9 ms
CFC 60


TARGET REAR COMPARTMENT CTR X Velocity (kph) vs TIME (ms)
0
-10
-20
-30
-40
-50
-60
-70
-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: -62.6 kph
Tmin: 112.2 ms
CFC 180

APPENDIX D

BULLET VEHICLE DUMMY CALIBRATION DATA TRACES AND TABLES

Hybrid III Calibration Data Sheet

50th Percentile Male

Head Drop Calibration

ATD Serial No: 110 **Test I.D:** D041421

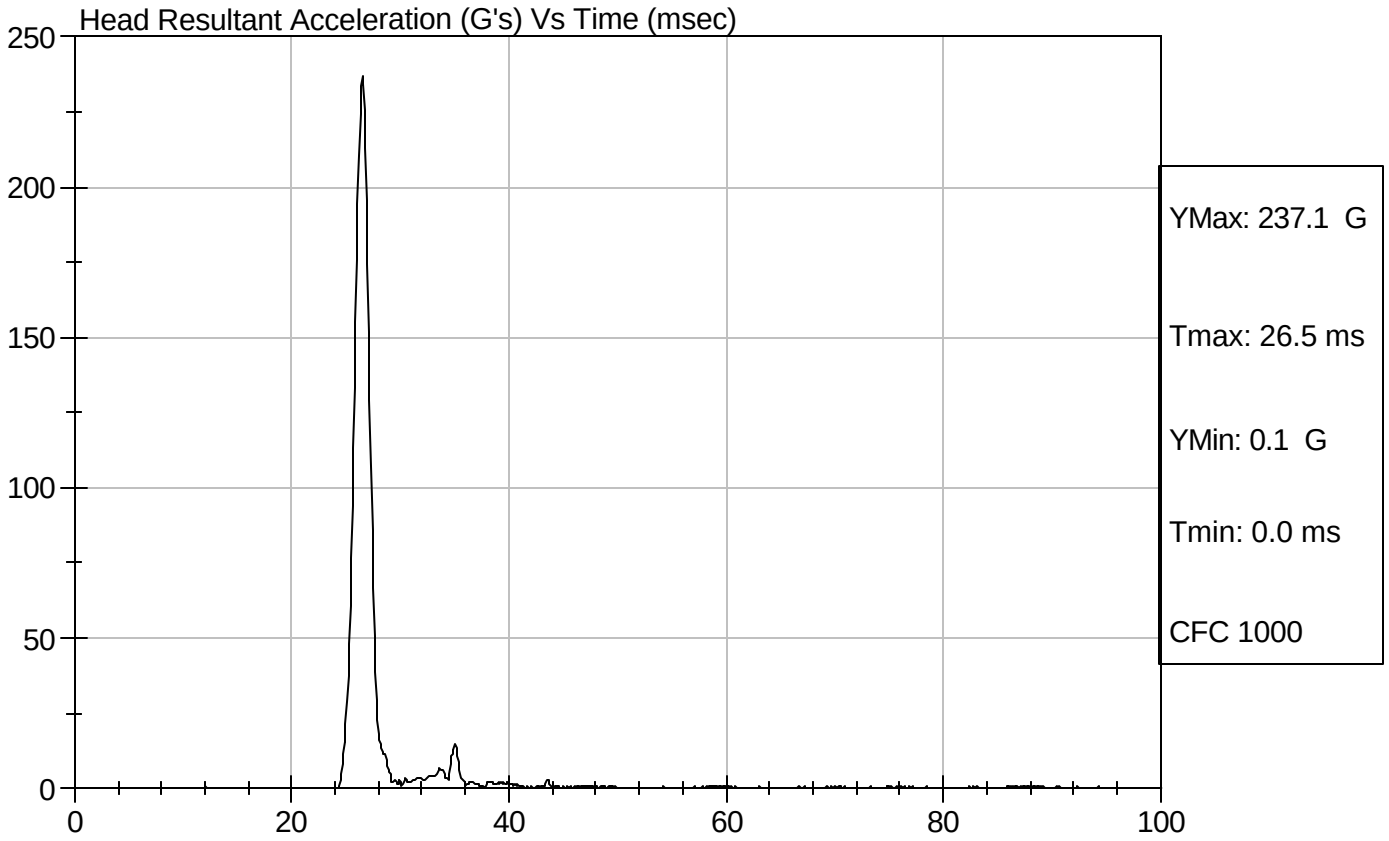
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	237.1	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-5.0	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
		Overall Test Results		Pass

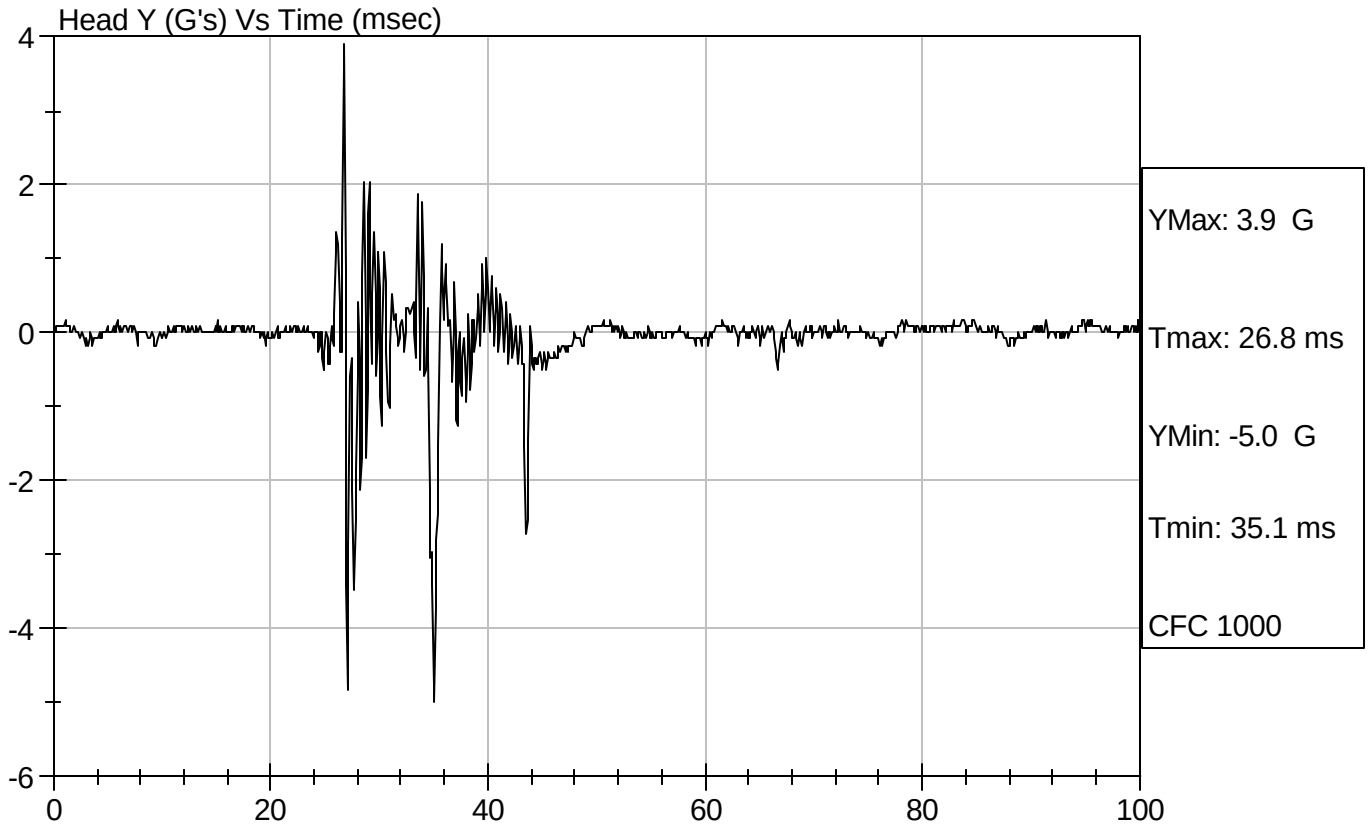
Jessica Gall
Laboratory Technician

06/24/2004
Test Date

David Winkelbauer
Approved By

	Test Description: Head Drop	Test Date: 06/24/2004
	Component: D041421	Speed: 0 ft/s, 0.00 m/s





Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Flexion Test

ATD Serial No: 110 **Test I.D:** D041422

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	44	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.00	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.62	Pass
	20 msec	G's	17.60 to 22.60	21.77	Pass
	30 msec	G's	12.50 to 18.50	16.96	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	16.96	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	36.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	74.6	Pass
	Time	msec	57.0 to 64.0	58.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	118.9	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	106.2	Pass
	Time	msec	47.0 to 58.0	49.8	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	97.9	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

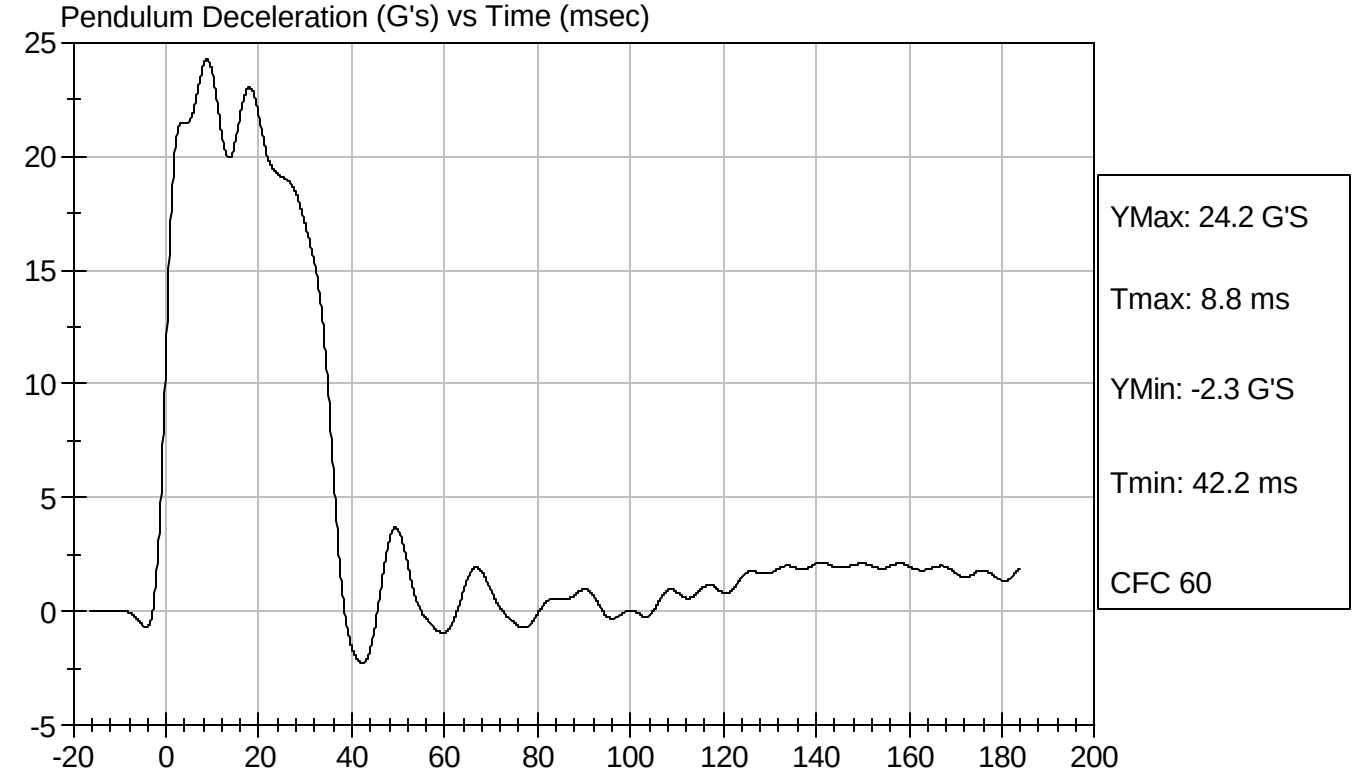
06/24/2004
Test Date

David Winkelbauer
Approved By

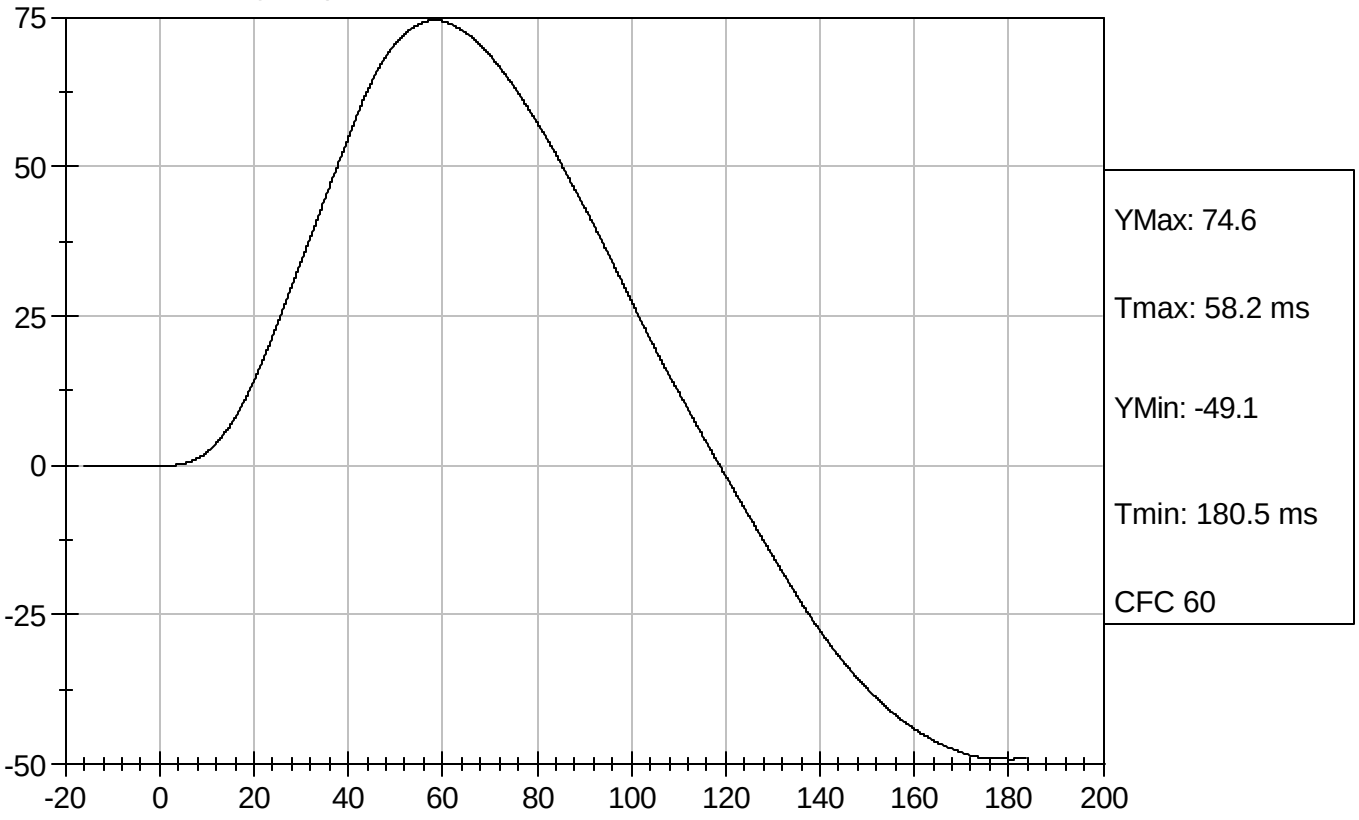
Test Desc: Neck Flexion
Component ID: D041422

Test Date: 06/24/2004
Speed: 22.97 ft/sec, 7.00 m/sec

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

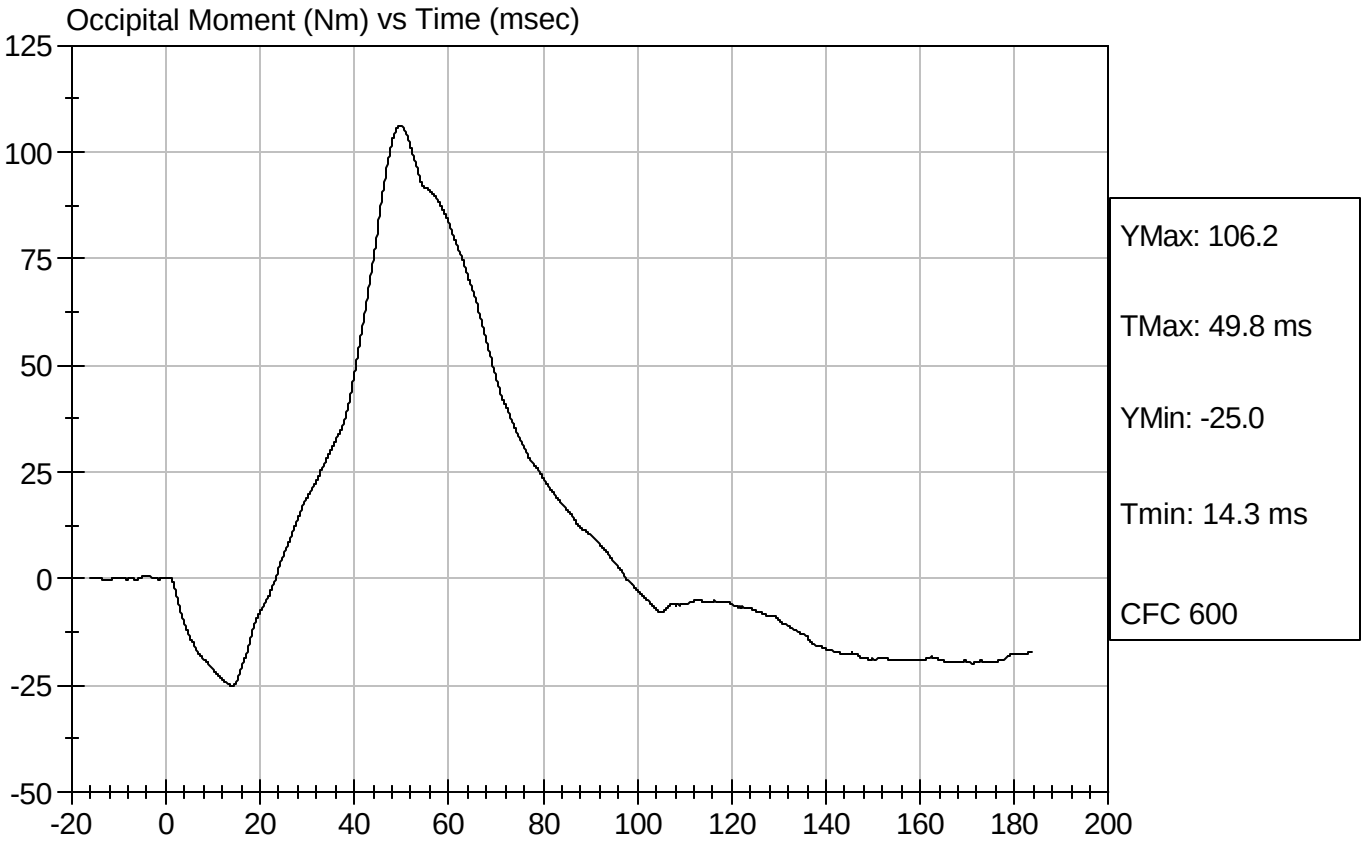


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Flexion
Component ID: D041422

Test Date: 06/24/2004
Speed: 22.97 ft/sec, 7.00 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Extension Test

ATD Serial No: 110 **Test I.D:** D041423

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	44	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.15	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	17.80	Pass
	20 msec	G's	14.00 to 19.00	16.72	Pass
	30 msec	G's	11.00 to 16.00	13.27	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	13.3	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	43.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.5	Pass
	Time	msec	72.0 to 82.0	80.8	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	164.4	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-69.2	Pass
	Time	msec	65.0 to 79.0	74.1	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	142.8	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

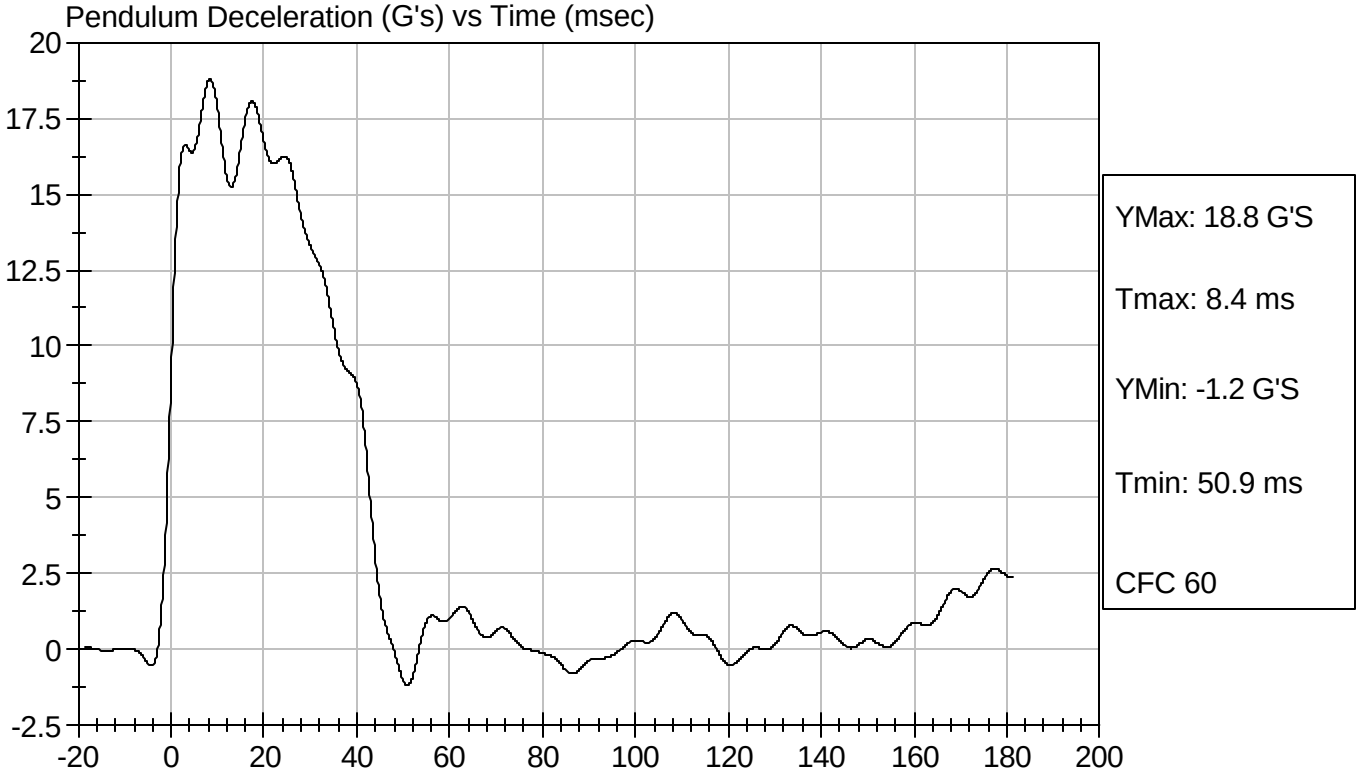
06/24/2004
Test Date

David Winkelbauer
Approved By

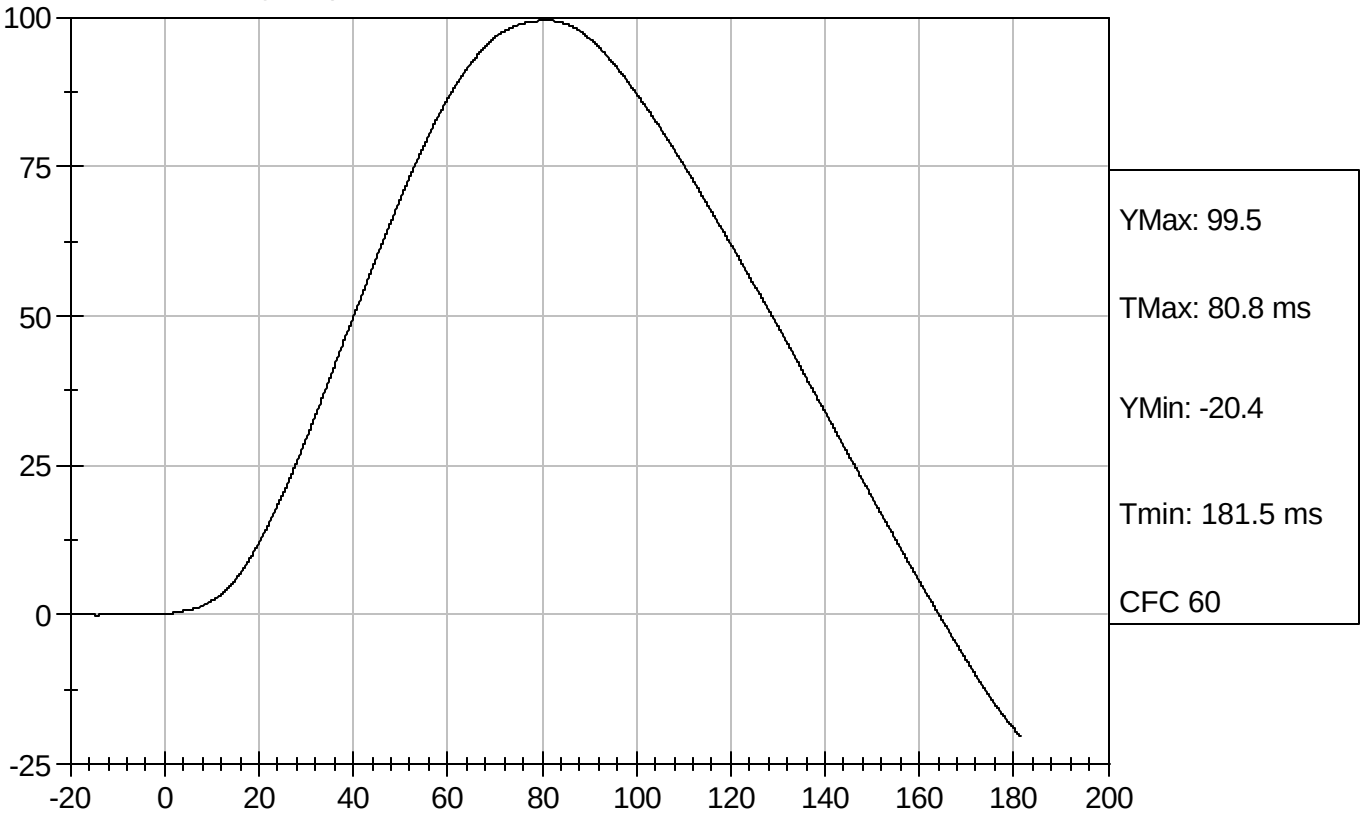
Test Desc: Neck Extension
Component ID: D041423

Test Date: 06/24/2004
Speed: 20.18 ft/sec, 6.15 m/sec

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

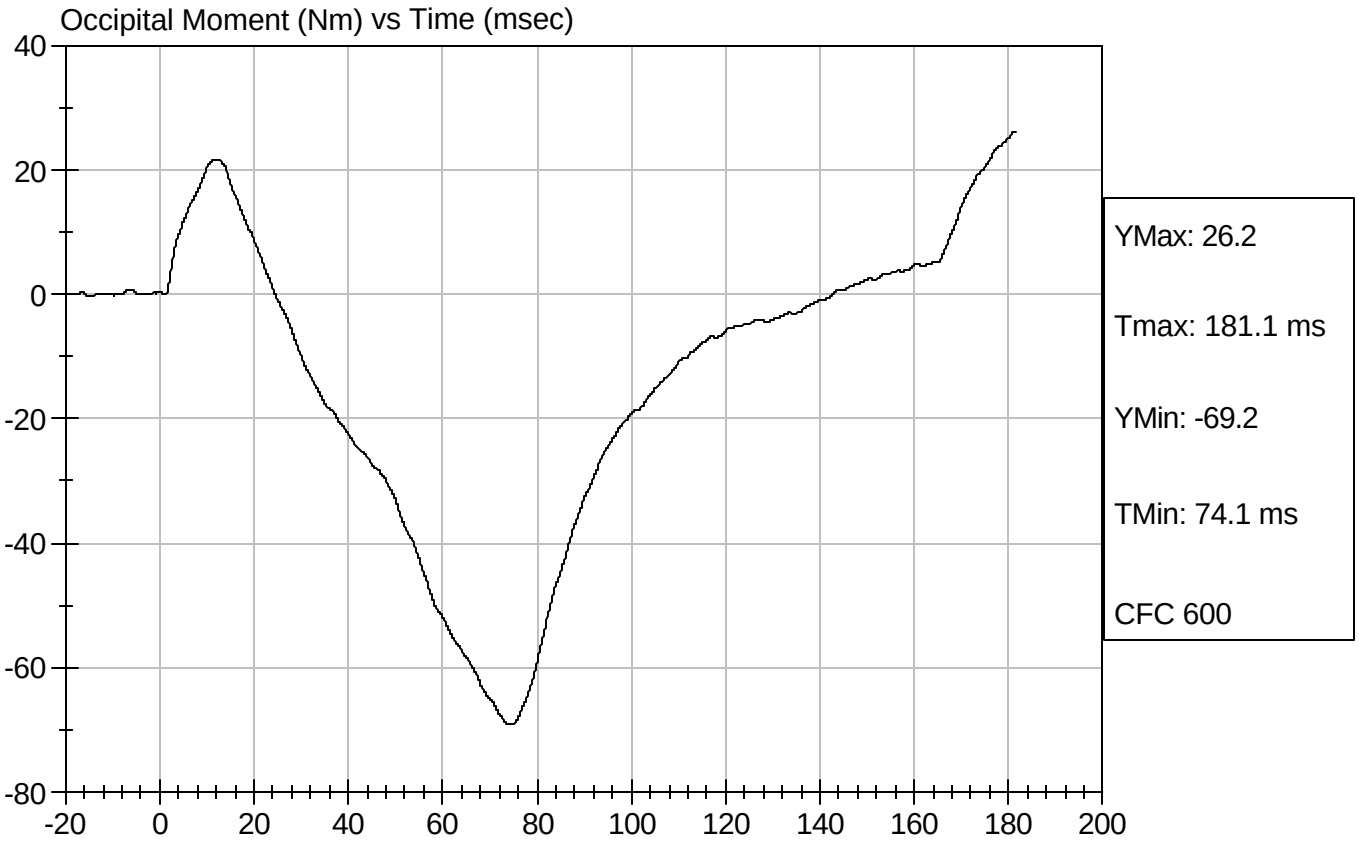


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Extension
Component ID: D041423

Test Date: 06/24/2004
Speed: 20.18 ft/sec, 6.15 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Thorax Impact Test

ATD Serial No: 110 **Test I.D:** D041424

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	6.58 to 6.82	6.72	Pass
Peak Probe Force	Newtons	5159 to 5893	5,777	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.53	Pass
Internal Hysteresis	%	69 to 85	70	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

06/24/2004
Test Date

David Winkelbauer
Approved By

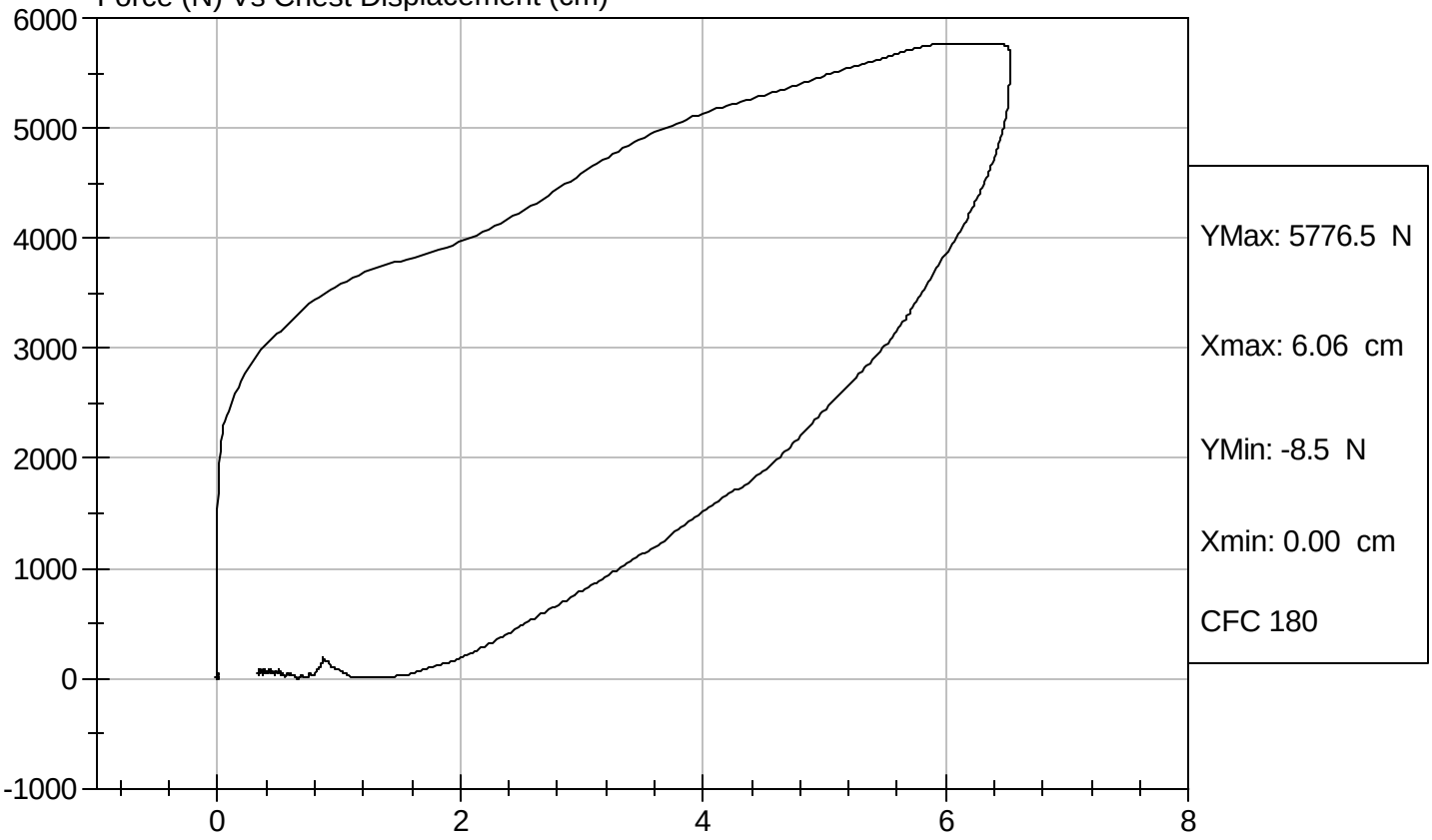
Test Description: Thorax Impact

Test Date: 06/24/2004

Component: D041424

Speed: 22.05 ft/sec, 6.72 m/sec

Force (N) Vs Chest Displacement (cm)



Hybrid III Calibration Data Sheet

50th Percentile Male

Right Knee Impact Test

ATD Serial No: 110 **Test I.D:** D041425

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	Newtons	4715 to 5782	5,355	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

06/24/2004
Test Date

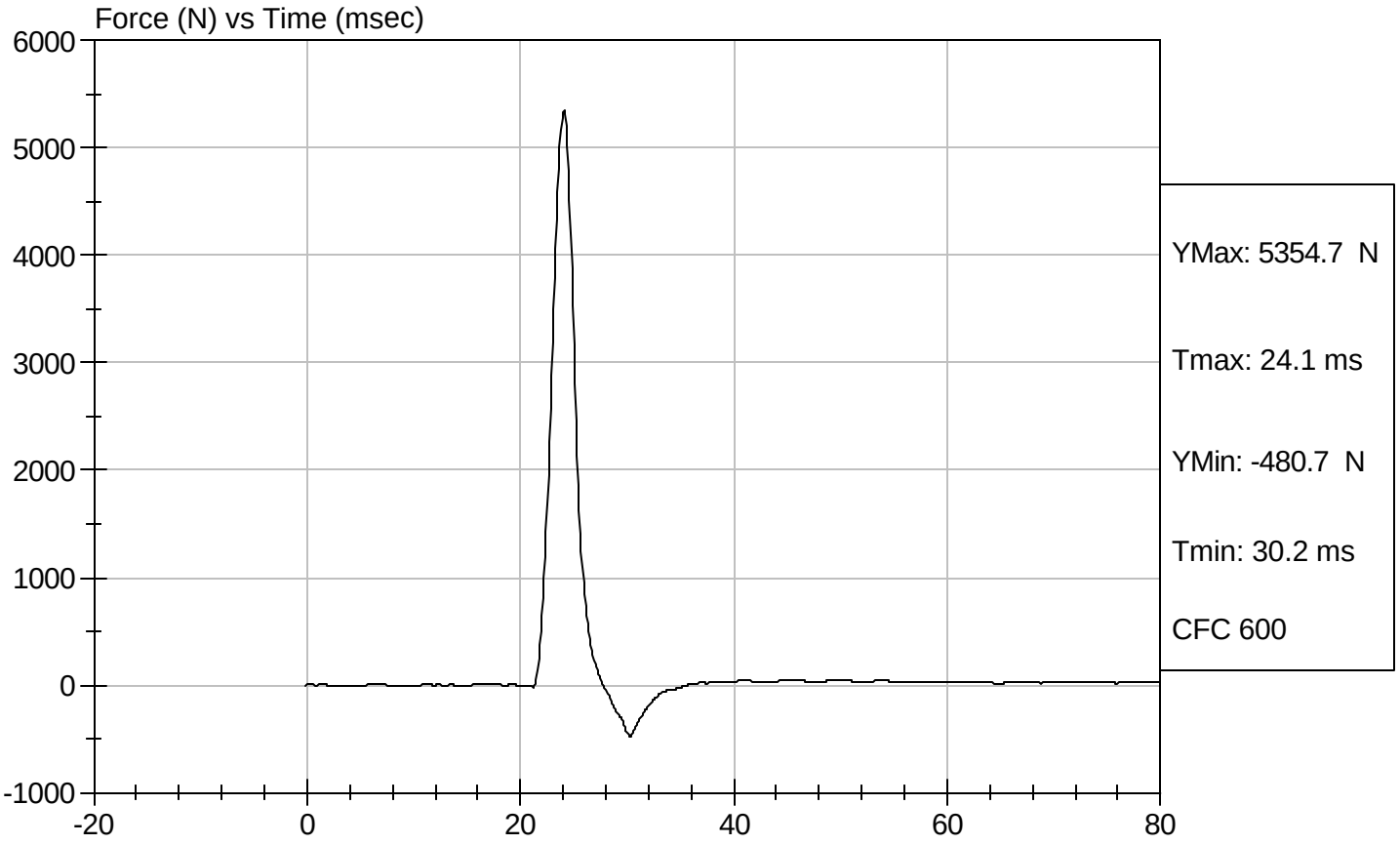
David Winkelbauer
Approved By

Test Description: Right Knee

Test Date: 06/24/2004

Component: D041425

Speed: 6.801 ft/sec, 2.073 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Left Knee Impact Test

ATD Serial No: 110 **Test I.D:** D041426

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5,262	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

06/24/2004
Test Date

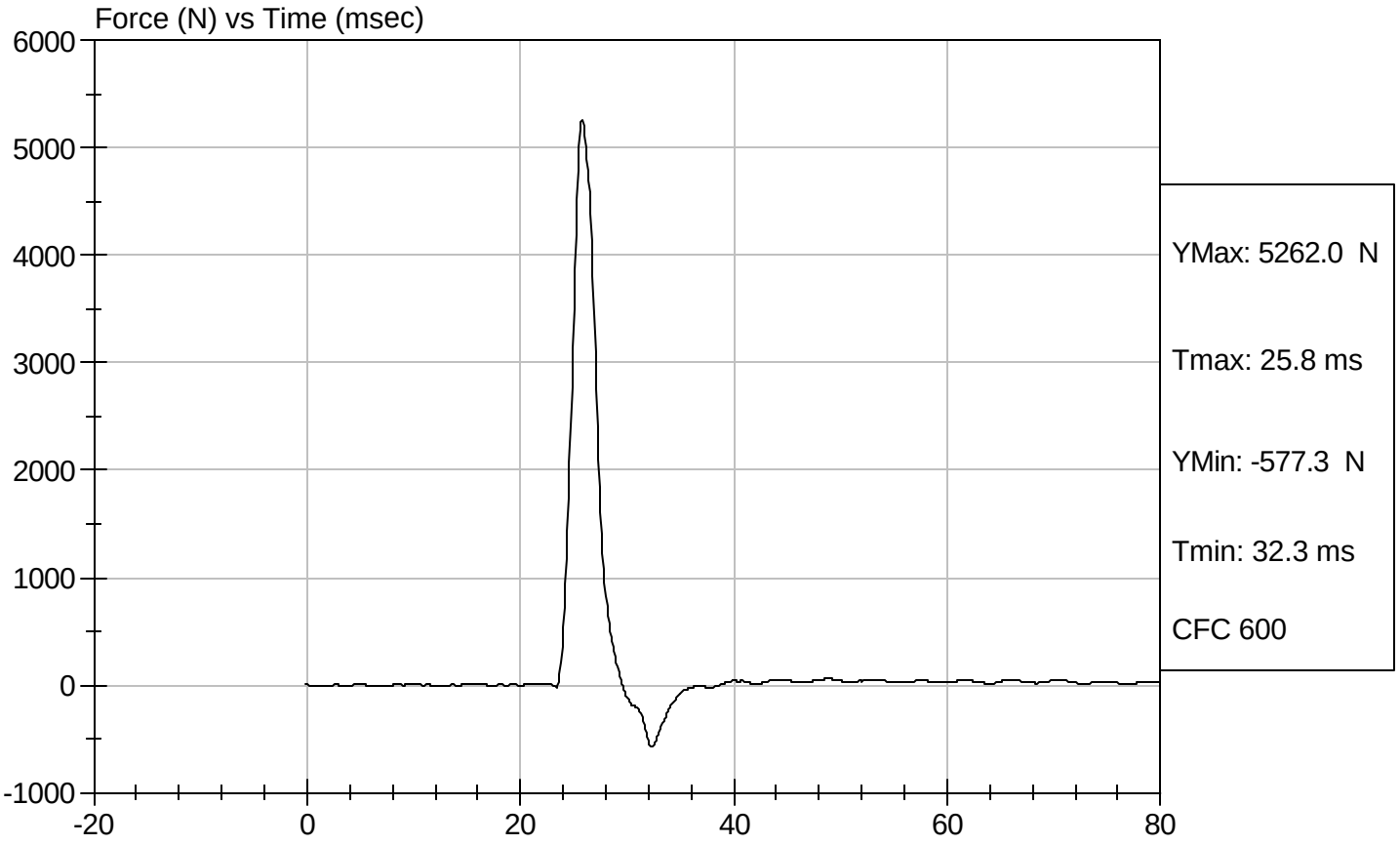
David Winkelbauer
Approved By

Test Description: Left Knee

Test Date: 06/24/2004

Component: D041426

Speed: 6.93 ft/sec, 2.112 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Hip-Femur Flexion Test

ATD Serial No: 110 **Test I.D:** D041420

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.4	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	46	46	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	94.1	80.9	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	44	45	Pass
		Overall Test Results			Pass

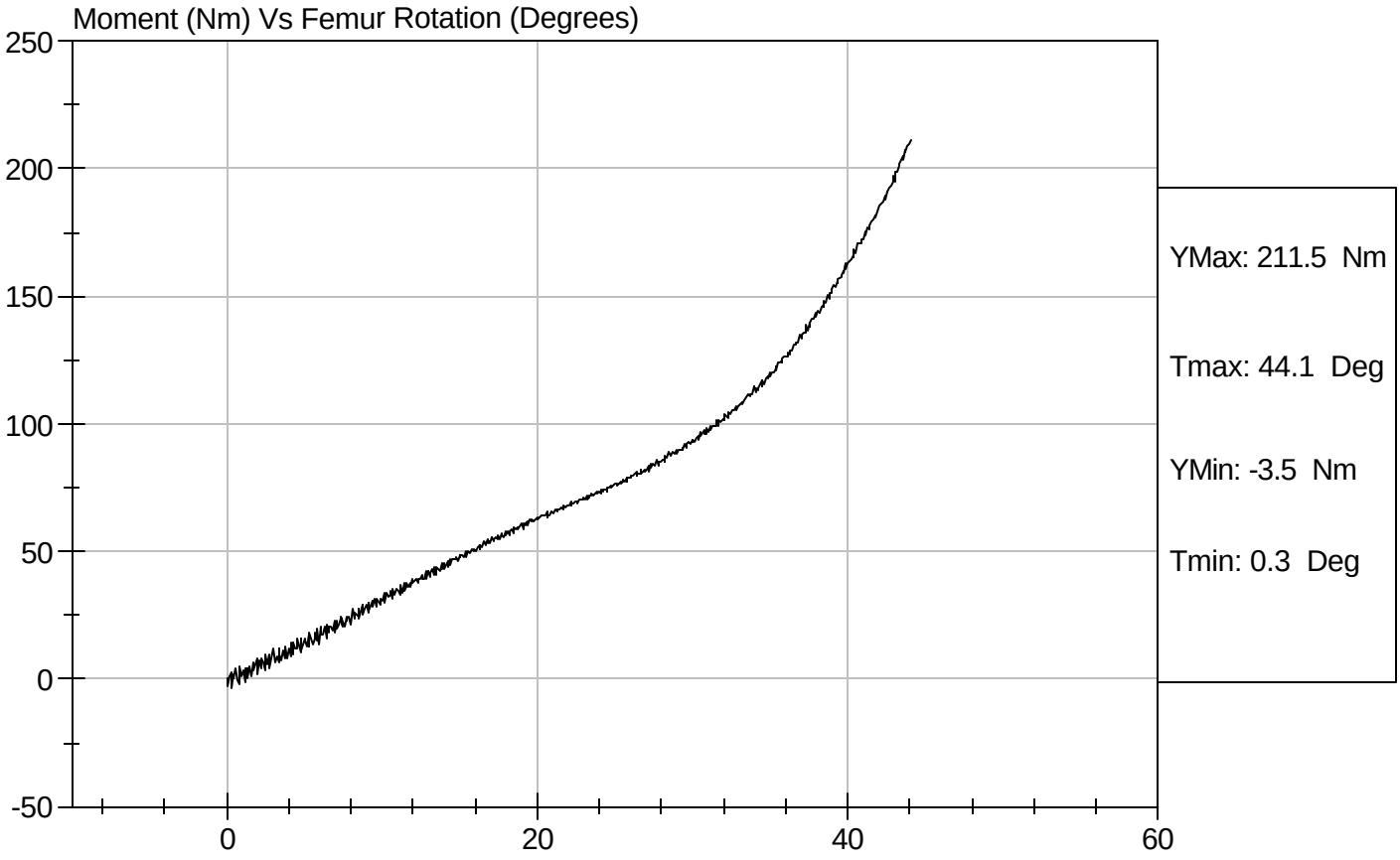
Jessica Gall
Laboratory Technician

06/24/2004
Test Date

David Winkelbauer
Approved By

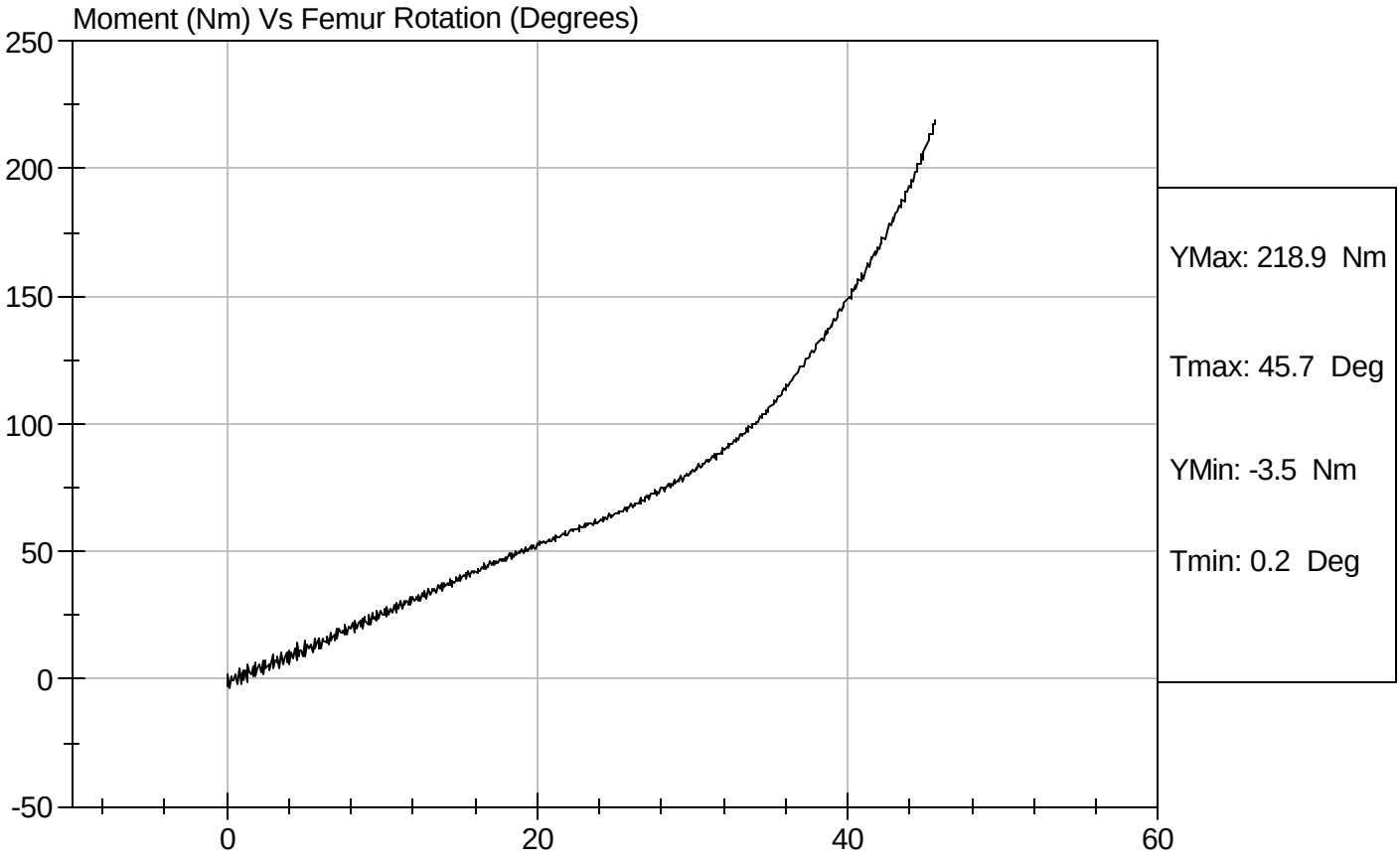
Test Description: Hip Femur Flexion | Test Date: 06/24/2004

Component: D041429 | Speed: 0 ft/sec, 0.00 m/sec



Test Description: Hip Femur Flexion | Test Date: 06/24/2004

Component: D041420 | Speed: 0 ft/sec, 0.00 m/sec



MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 324 **Test ID:** D041431

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	250 - 300	260	Pass
Peak Lateral Acceleration	G's	+/- 15	-11.2	Pass
Unimodal	Yes/No	NA	Yes	Pass
Oscillations	Yes/No	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Joe Fleck
Laboratory Technician

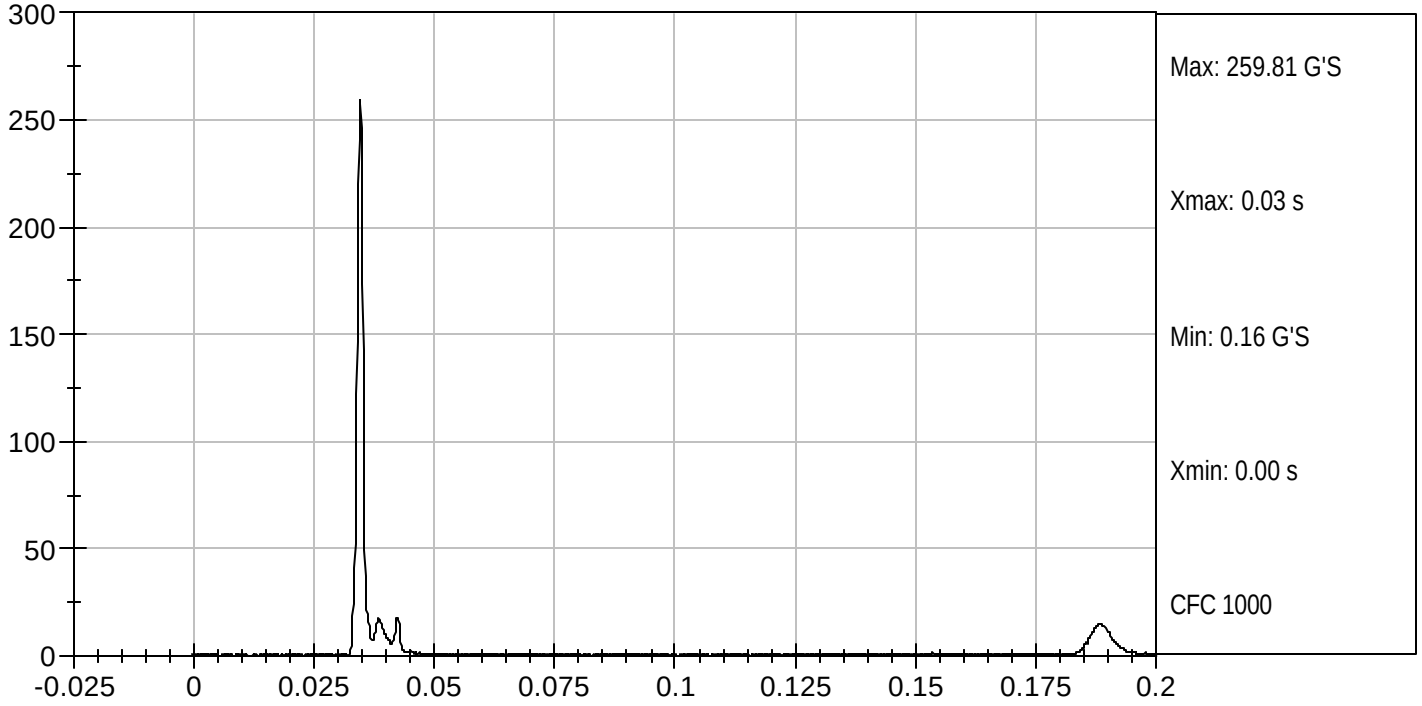
06/24/2004
Test Date

David Winkelbauer
Approved By

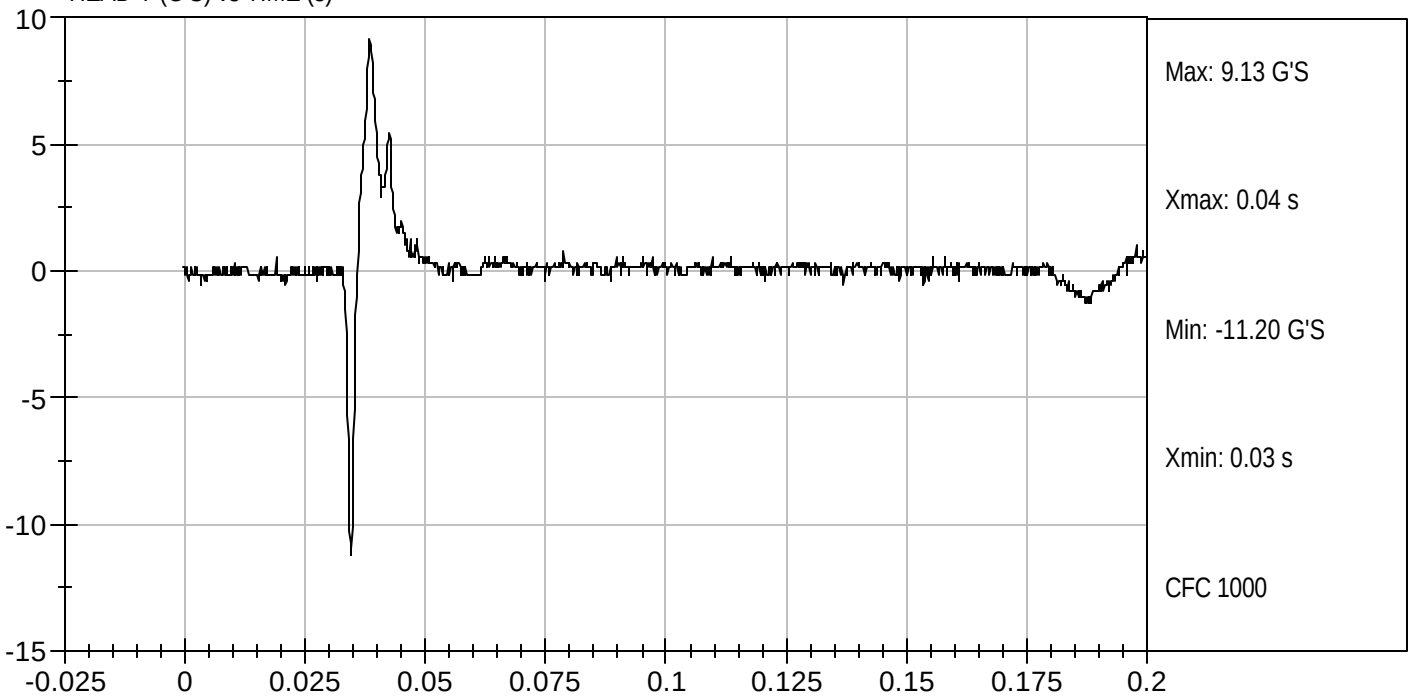
Test Desc: Head Drop
Componet ID: D041431

Test Date: 06/24/2004
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G'S) vs TIME (s)



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



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 324 **Test I.D:** D041432

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Speed		m/sec	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/sec	2.1 to 2.5	2.5	Pass
	20 msec	m/sec	4.0 to 5.0	4.8	Pass
	30 msec	m/sec	5.8 to 7.0	6.8	Pass
D Plane Rotation	Max	deg	77 to 91	82	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	83	Pass
Positive Moment Time Curve Decay to 10 Nm		msec	80 to 100	83	Pass
			Overall Results		Pass

Joe Fleck

Laboratory Technician

06/24/2004

Test Date

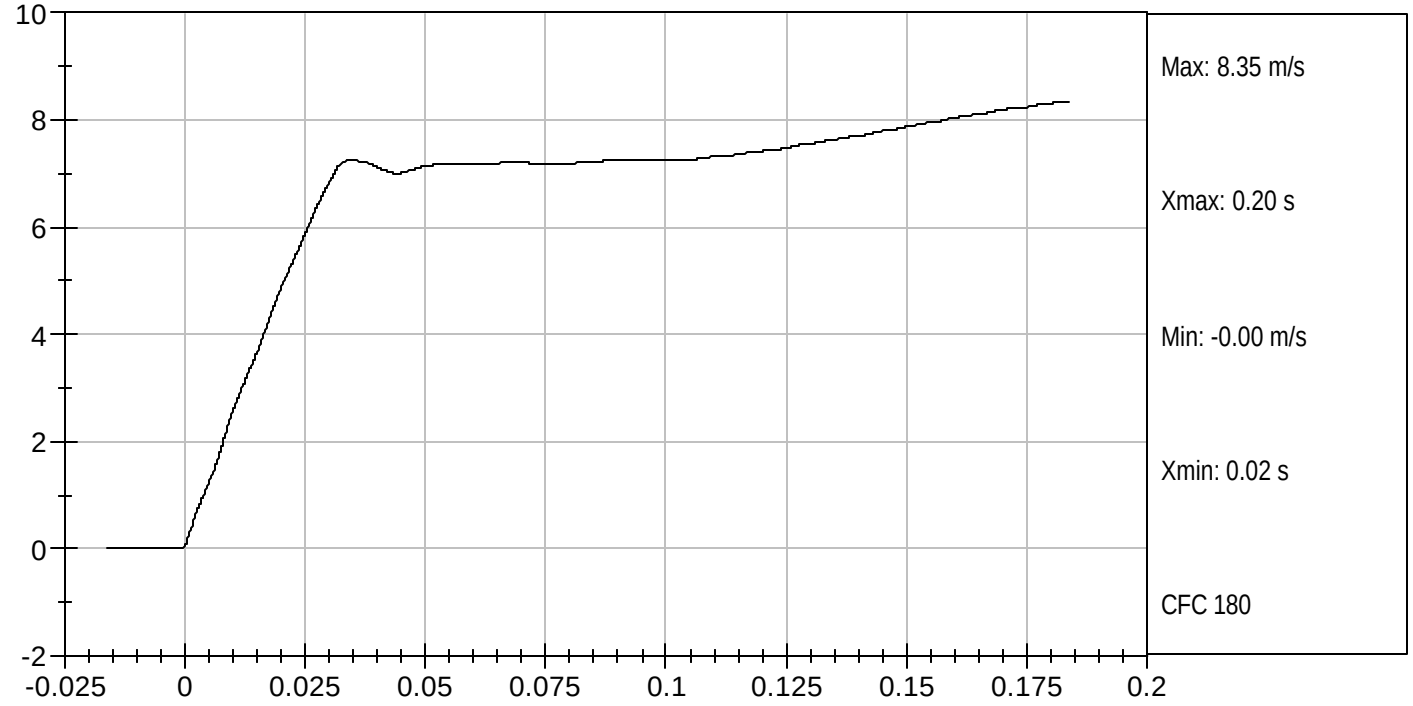
David Winkelbauer

Approved By

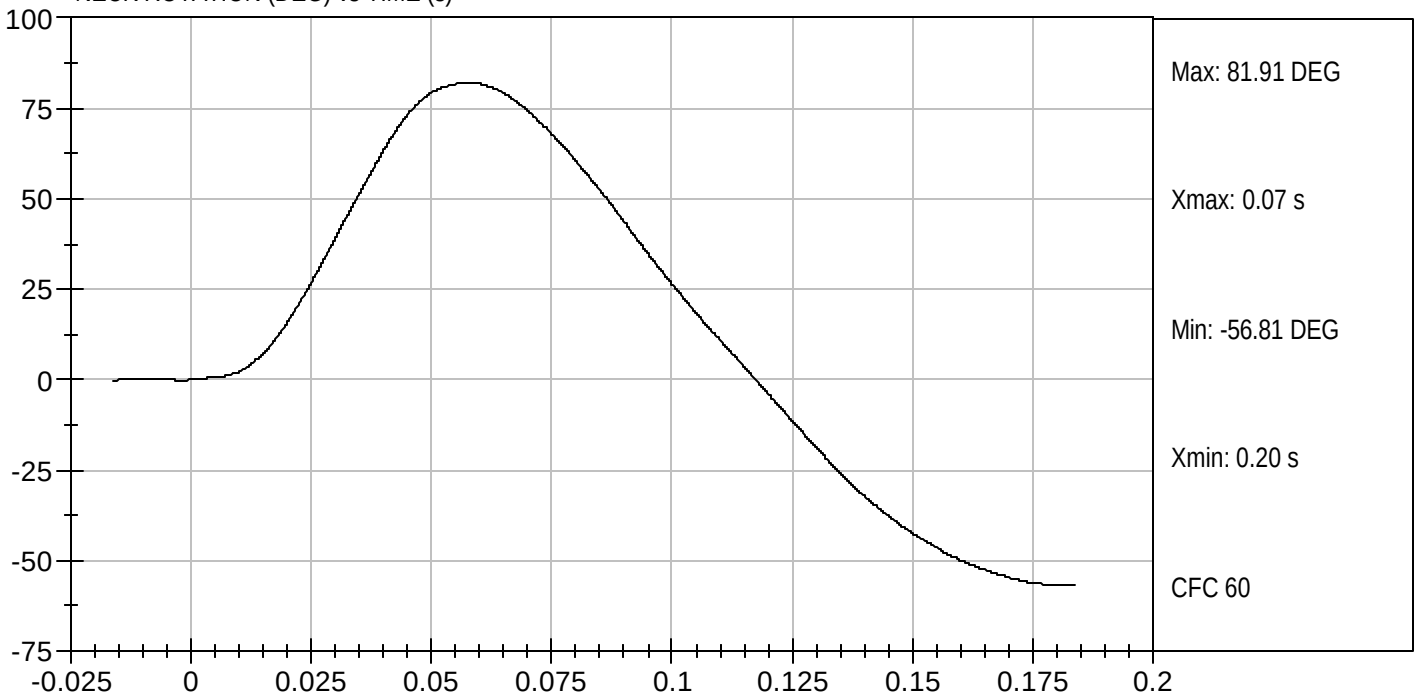
Test Desc: Neck Flexion
Componet ID: D041432

Test Date: 06/24/2004
Velocity: 23.15 ft/s, 7.06 m/s

PENDULUM DECELERATION (m/s) vs TIME (s)

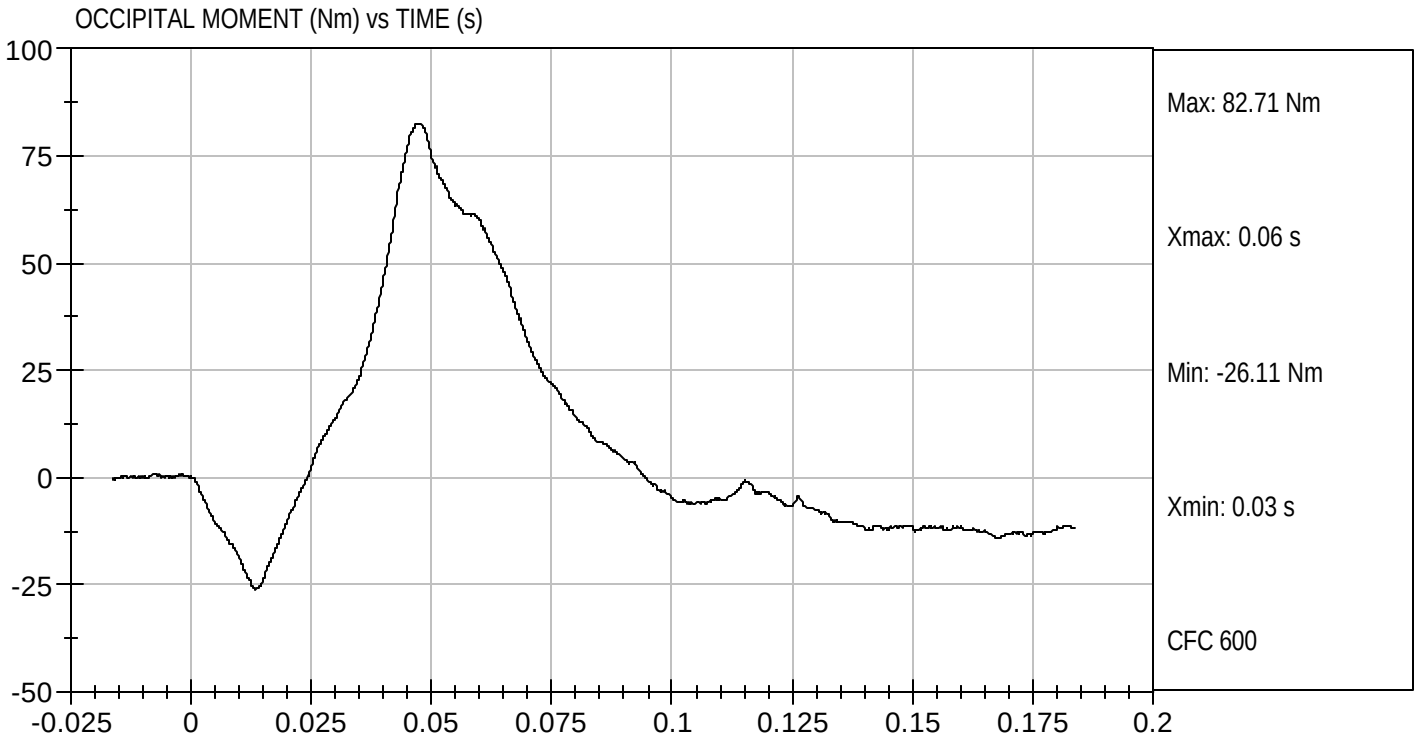


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Flexion
Componet ID: D041432

Test Date: 06/24/2004
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 324 **Test I.D:** D041433

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Speed		m/sec	5.95 to 6.19	6.19	Pass
Pendulum Deceleration	10 msec	m/sec	1.5 to 1.9	1.8	Pass
	20 msec	m/sec	3.1 to 3.9	3.6	Pass
	30 msec	m/sec	4.6 to 5.6	5.0	Pass
D Plane Rotation	Max	deg	99 to 114	106	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-55	Pass
Negative Moment Time Curve Decay to -10 Nm		msec	94 to 114	103	Pass
			Overall Results		Pass

Jim Carney

Laboratory Technician

06/24/2004

Test Date

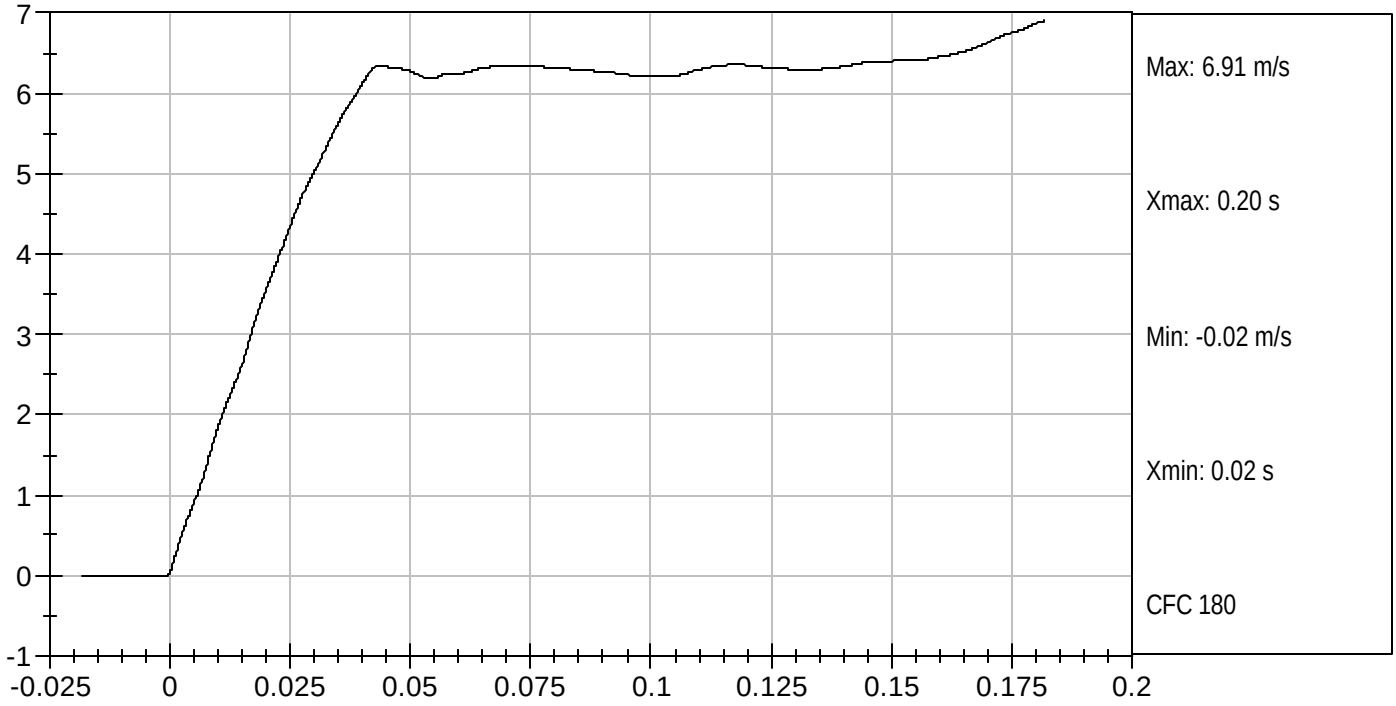
David Winkelbauer

Approved By

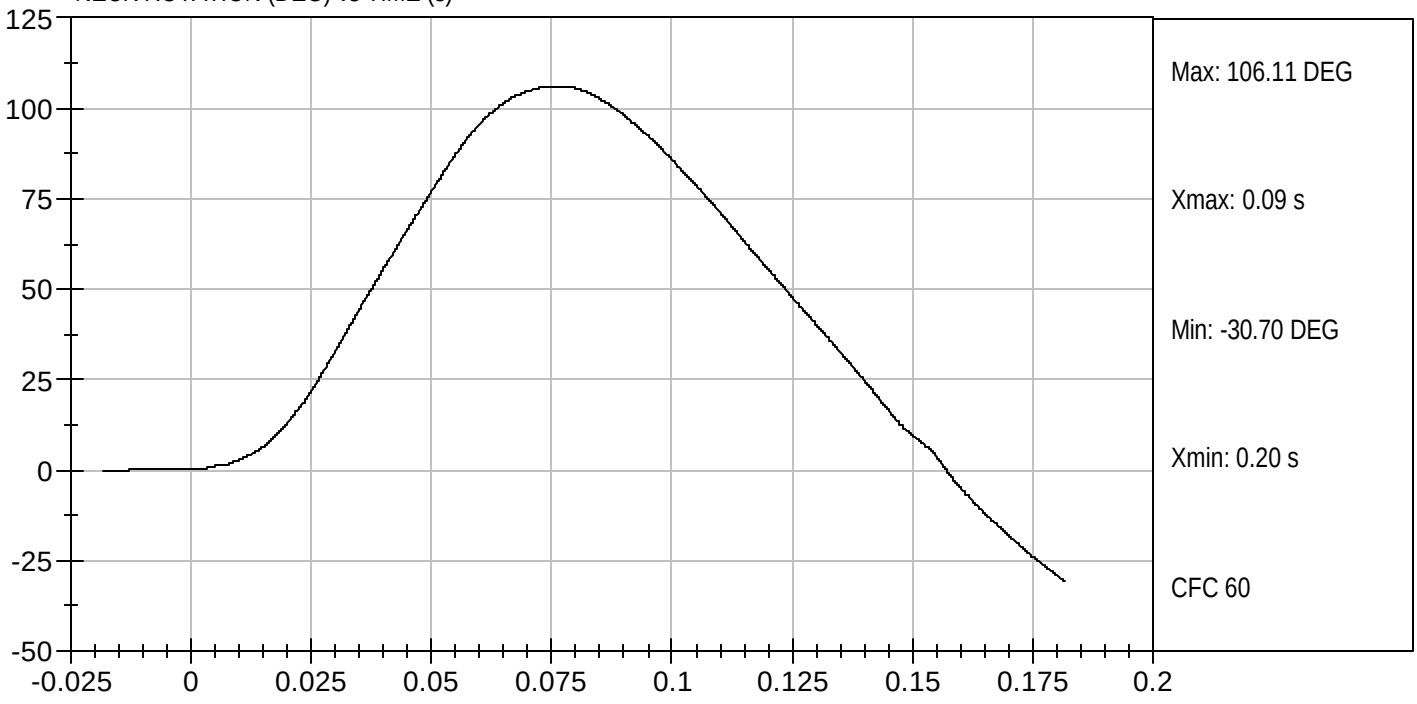
Test Desc: Neck Extension
Componet ID: D041433

Test Date: 06/24/2004
Velocity: 20.30 ft/s, 6.19 m/s

PENDULUM DECELERATION (m/s) vs TIME (s)



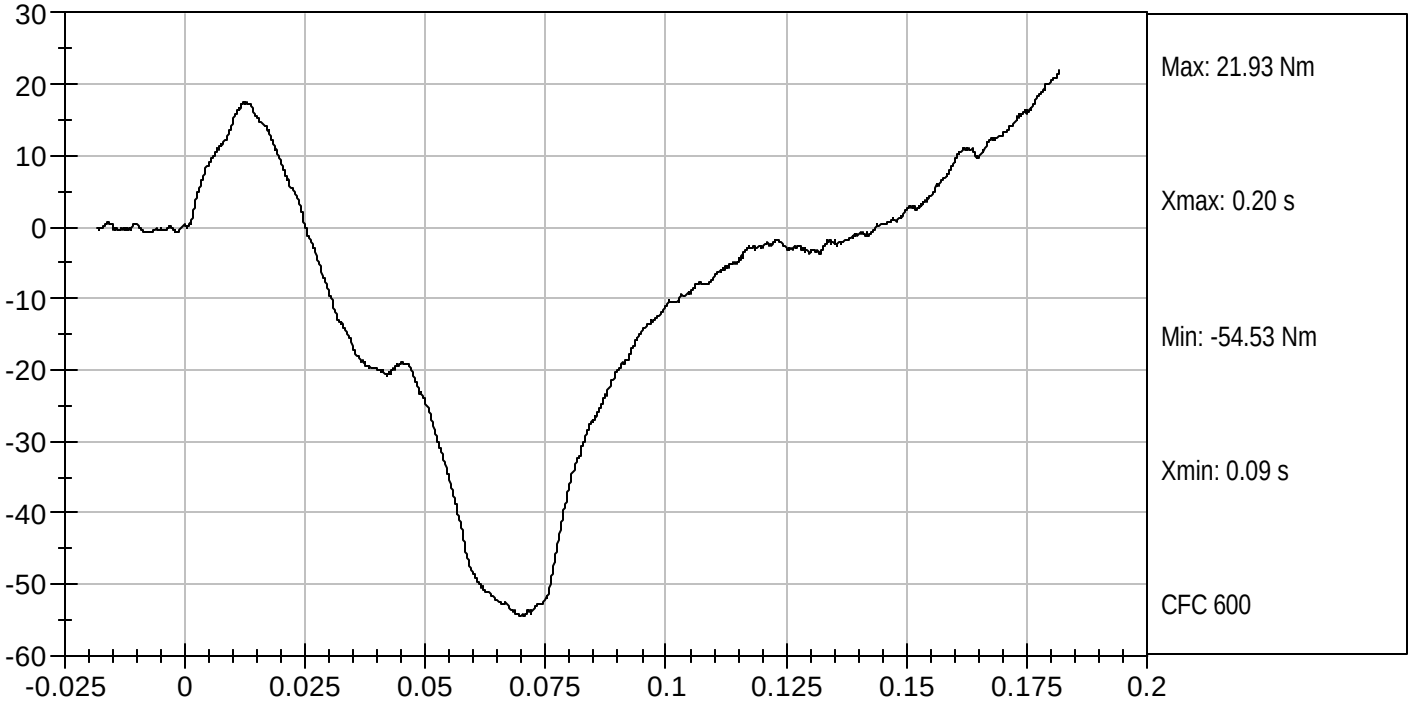
NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Extension
Componet ID: D041433

Test Date: 06/24/2004
Velocity: 20.30 ft/s, 6.19 m/s

OCCIPITAL MOMENT (Nm) vs TIME (s)



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 324 **Test I.D:** D041434

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21	Pass
Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	6.59 to 6.83	6.70	Pass
Peak Deflection	mm	50 to 58	57.8	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.2	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	Yes/No	< 4600 N	Yes	Pass
		Overall Test Results		Pass

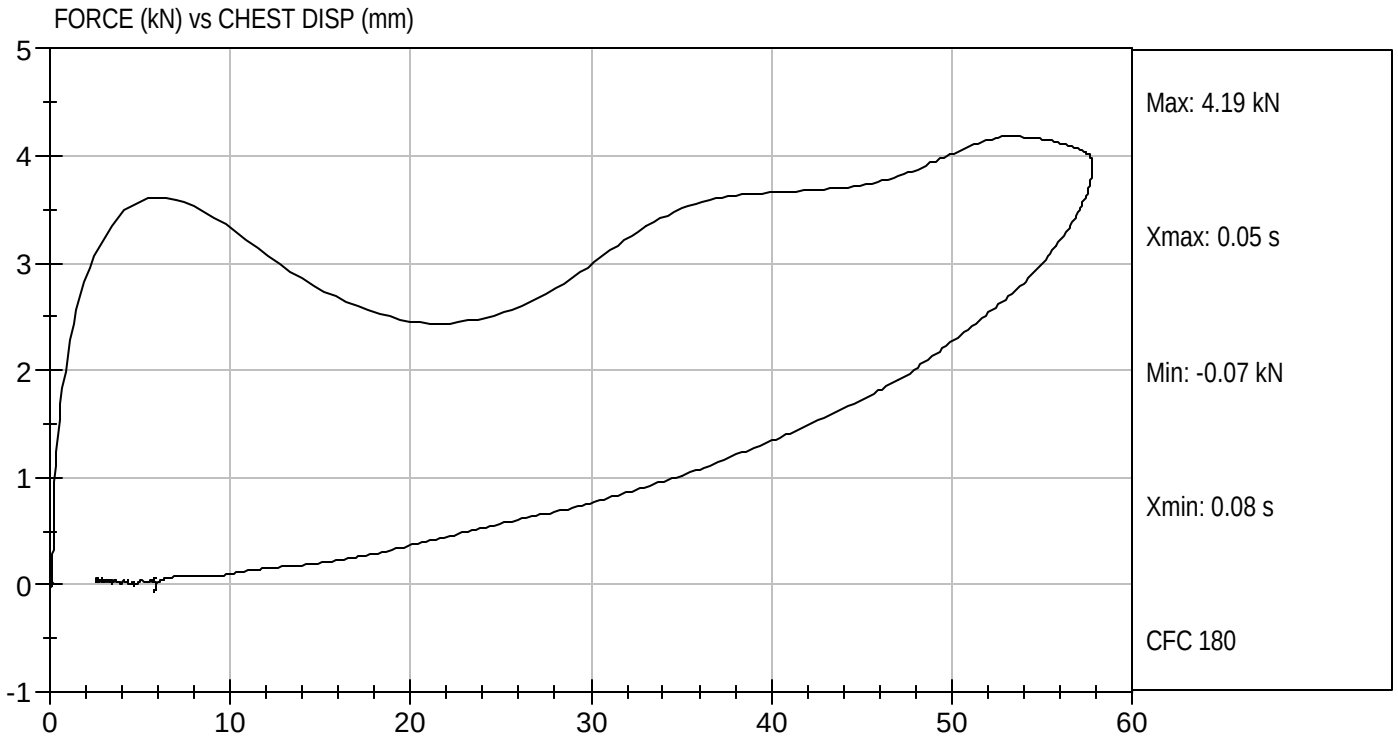
Jessica Hall
Laboratory Technician

06/25/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Componet ID: D041434

Test Date: 06/25/2004
Velocity: 21.98 ft/s, 6.70 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 324 **Test I.D:** D041435

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/sec	2.07 to 2.13	2.11	Pass
Maximum Force	kN	3.45 to 4.06	3.46	Pass
		Overall Test Results		Pass

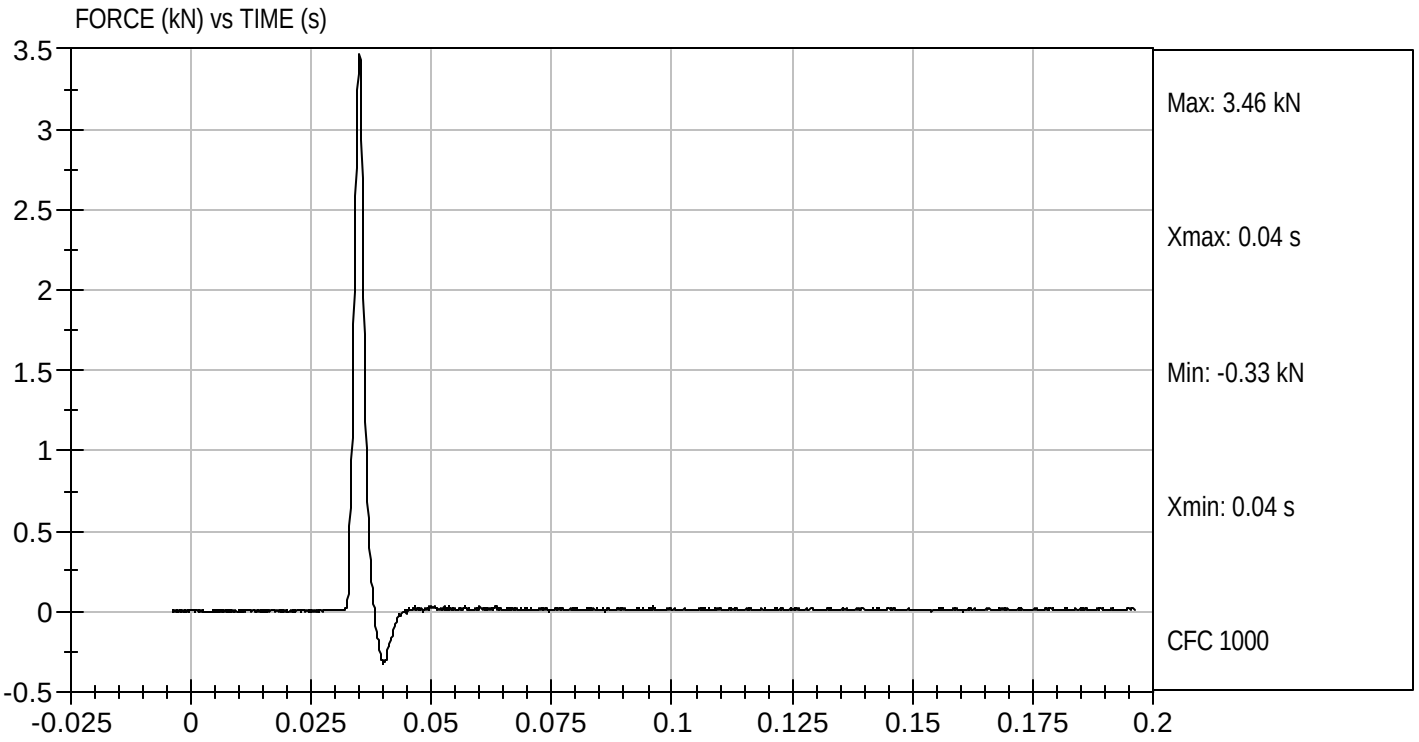
Joe Fleck
Laboratory Technician

06/24/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Componet ID: D041435

Test Date: 06/24/2004
Velocity: 6.92 ft/s, 2.11 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 324 **Test I.D:** D041436

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/sec	2.07 to 2.13	2.11	Pass
Maximum Force	kN	3.45 to 4.06	3.57	Pass
		Overall Test Results		Pass

Joe Fleck

Laboratory Technician

06/24/2004

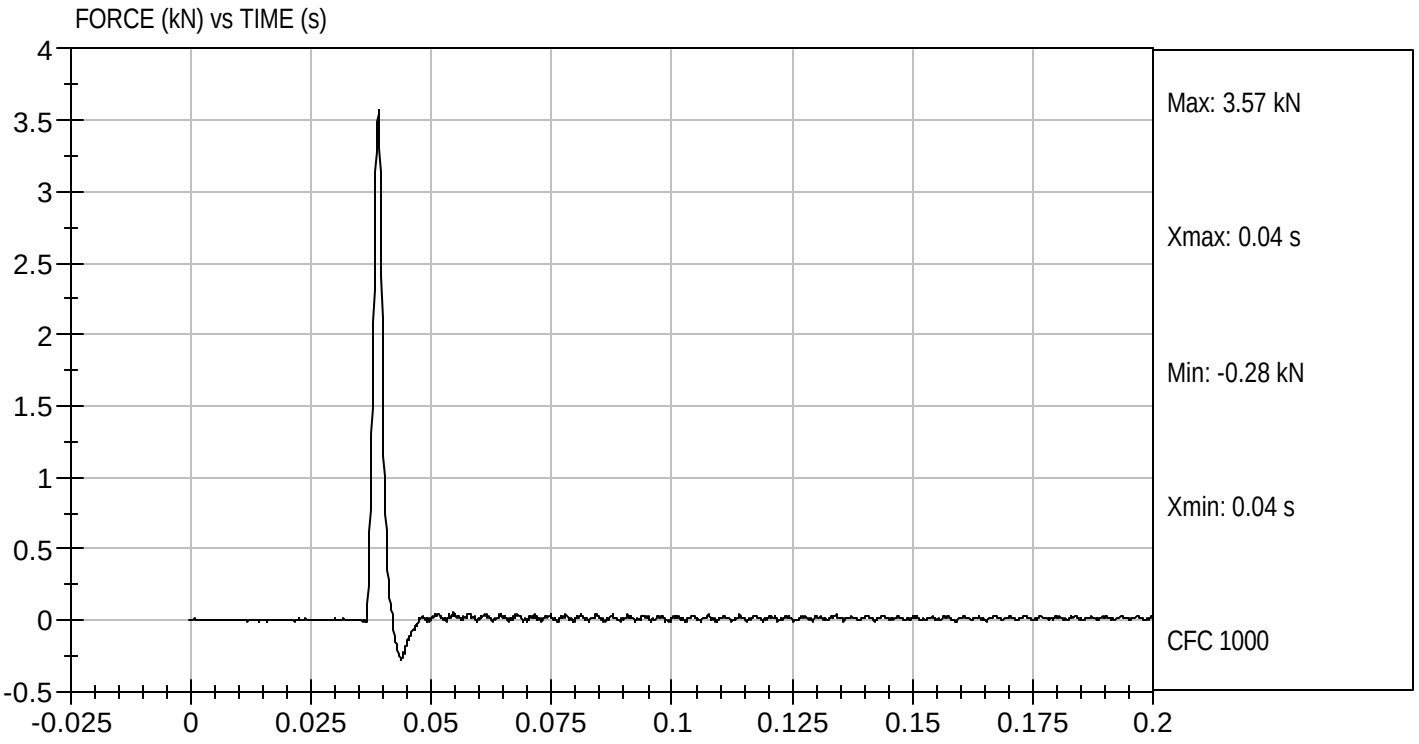
Test Date

David Winkelbauer

Approved By

Test Desc: Left Knee
Componet ID: D041436

Test Date: 06/24/2004
Velocity: 6.92 ft/s, 2.11 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 324 **Test I.D:** D041437

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	3	Pass
Force at 45 deg	N	320 to 390	363	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 - 1.5	Yes	Pass
		Overall Result		Pass

Joe Fleck
Laboratory Technician

06/25/2004
Test Date

David Winkelbauer
Approved By

TARGET VEHICLE DUMMY CALIBRATION DATA TRACES AND TABLES

Hybrid III Calibration Data Sheet

50th Percentile Male

Head Drop Calibration

ATD Serial No: 090 **Test I.D:** D041411

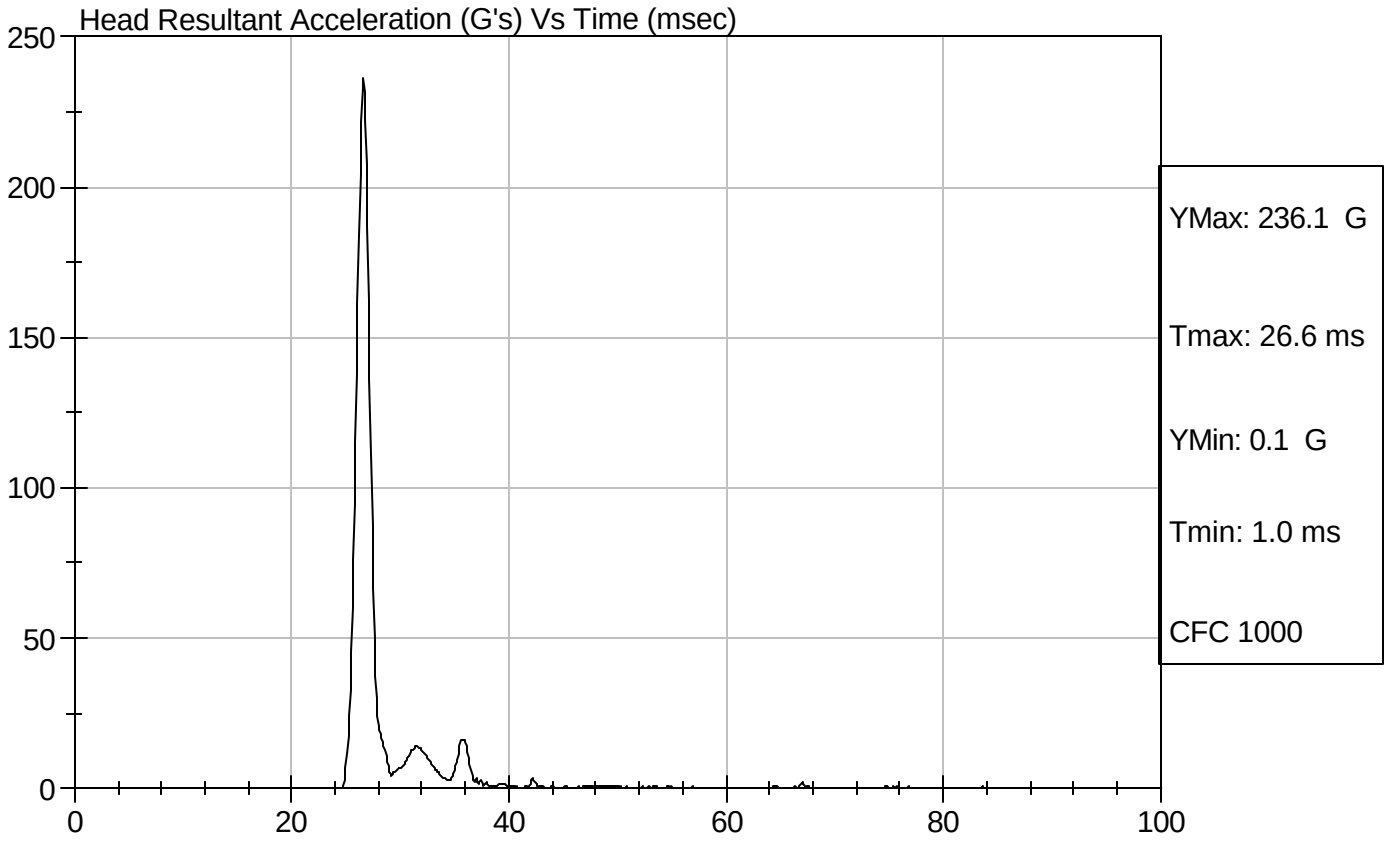
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	236.1	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	9.1	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
		Overall Test Results		Pass

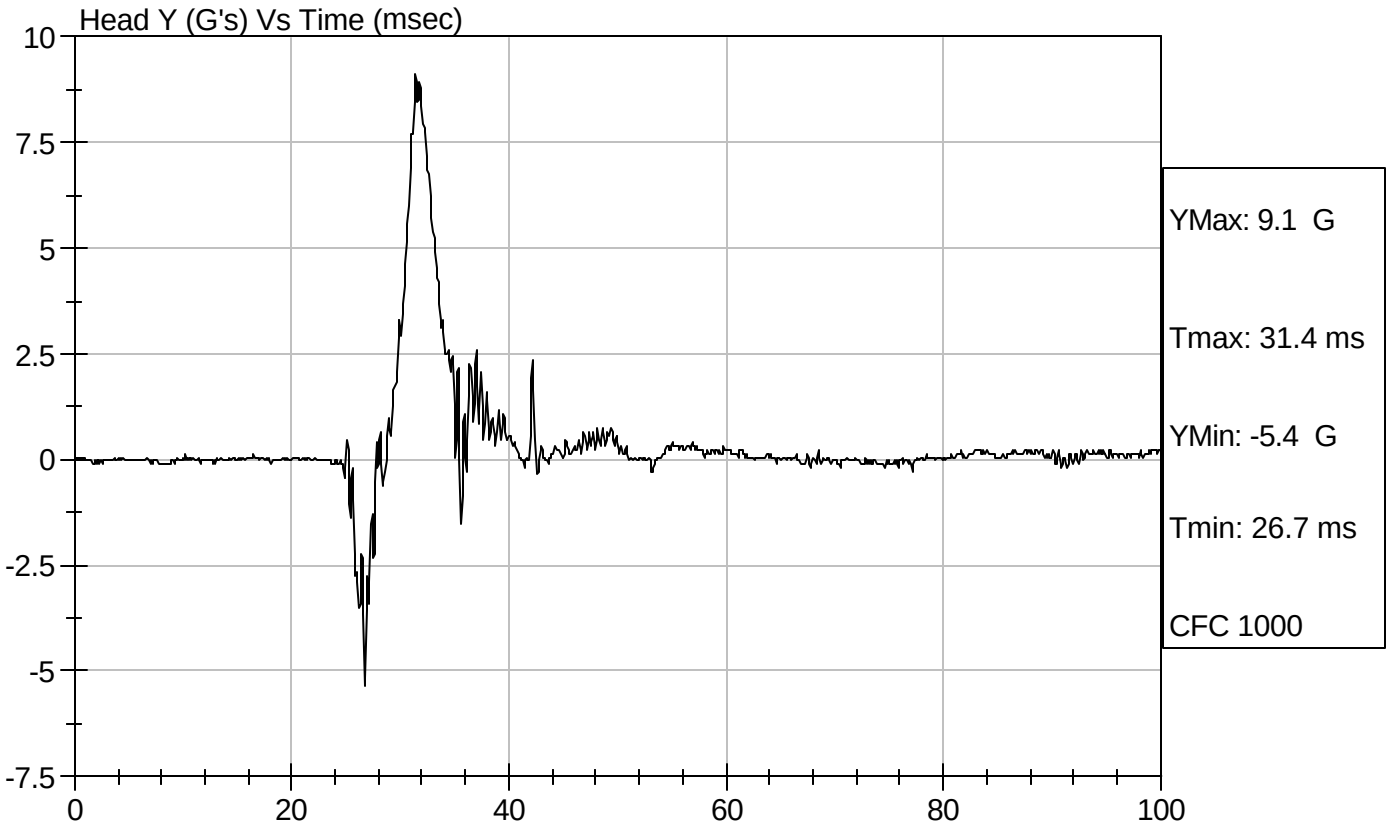
Jessica Gall
Laboratory Technician

06/24/2004
Test Date

David Winkelbauer
Approved By

	Test Description: Head Drop	Test Date: 06/24/2004
	Component: D041411	Speed: 0 ft/s, 0.00 m/s





Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Flexion Test

ATD Serial No: 090 **Test I.D:** D041412

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	44	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	22.58	Pass
	20 msec	G's	17.60 to 22.60	20.25	Pass
	30 msec	G's	12.50 to 18.50	16.65	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	16.65	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	37.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	73.8	Pass
	Time	msec	57.0 to 64.0	60.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	117.5	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	99.1	Pass
	Time	msec	47.0 to 58.0	50.9	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	100.7	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

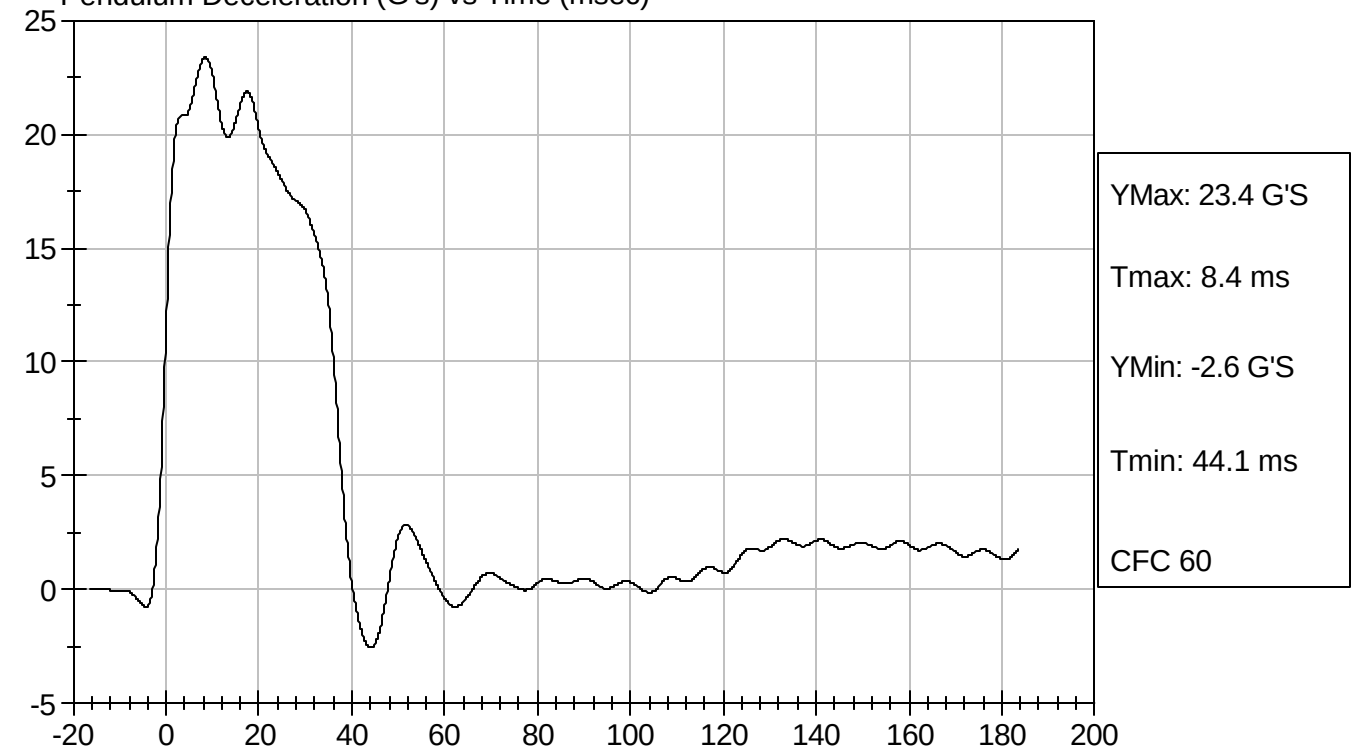
06/24/2004
Test Date

David Winkelbauer
Approved By

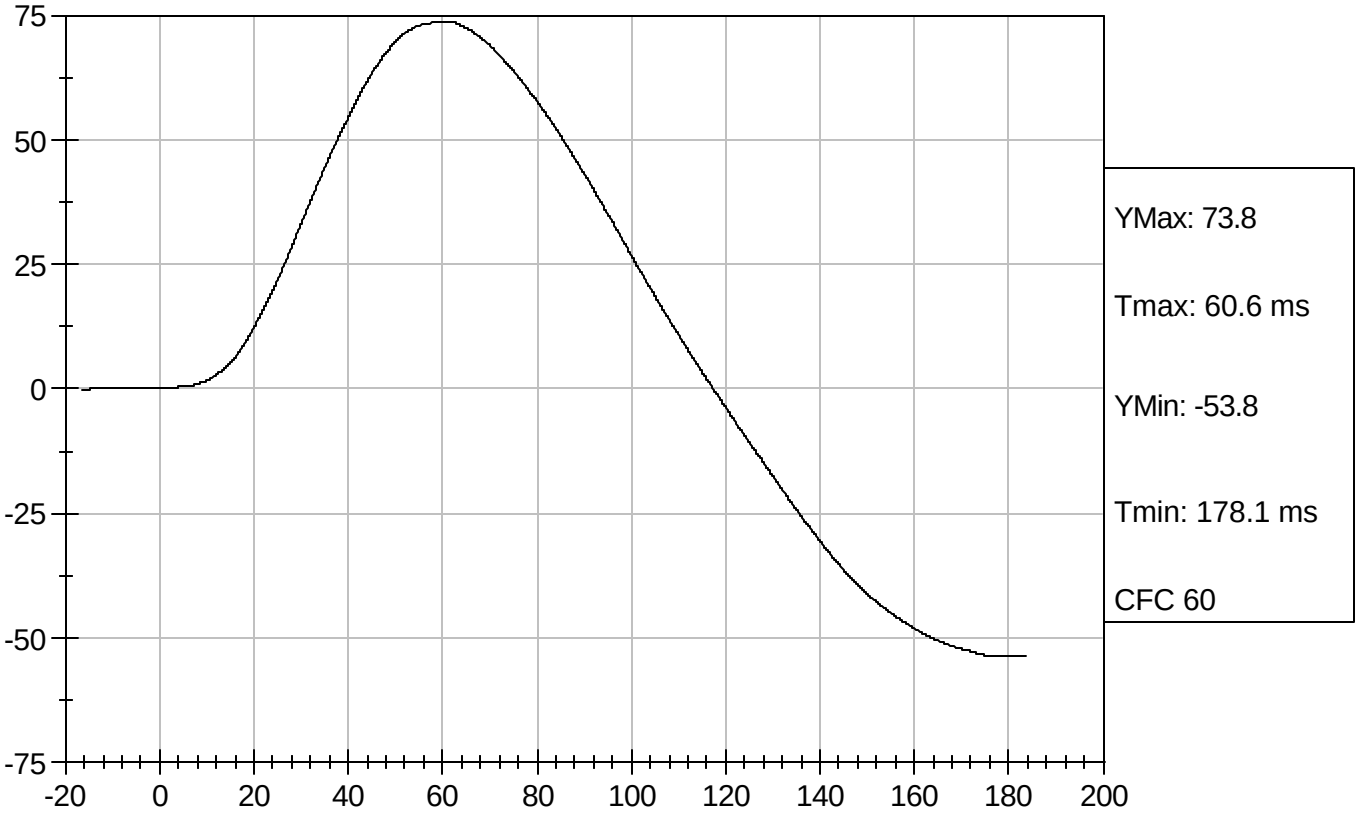
Test Desc: Neck Flexion
Component ID: D041412

Test Date: 06/24/2004
Speed: 23.14 ft/sec, 7.05 m/sec

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

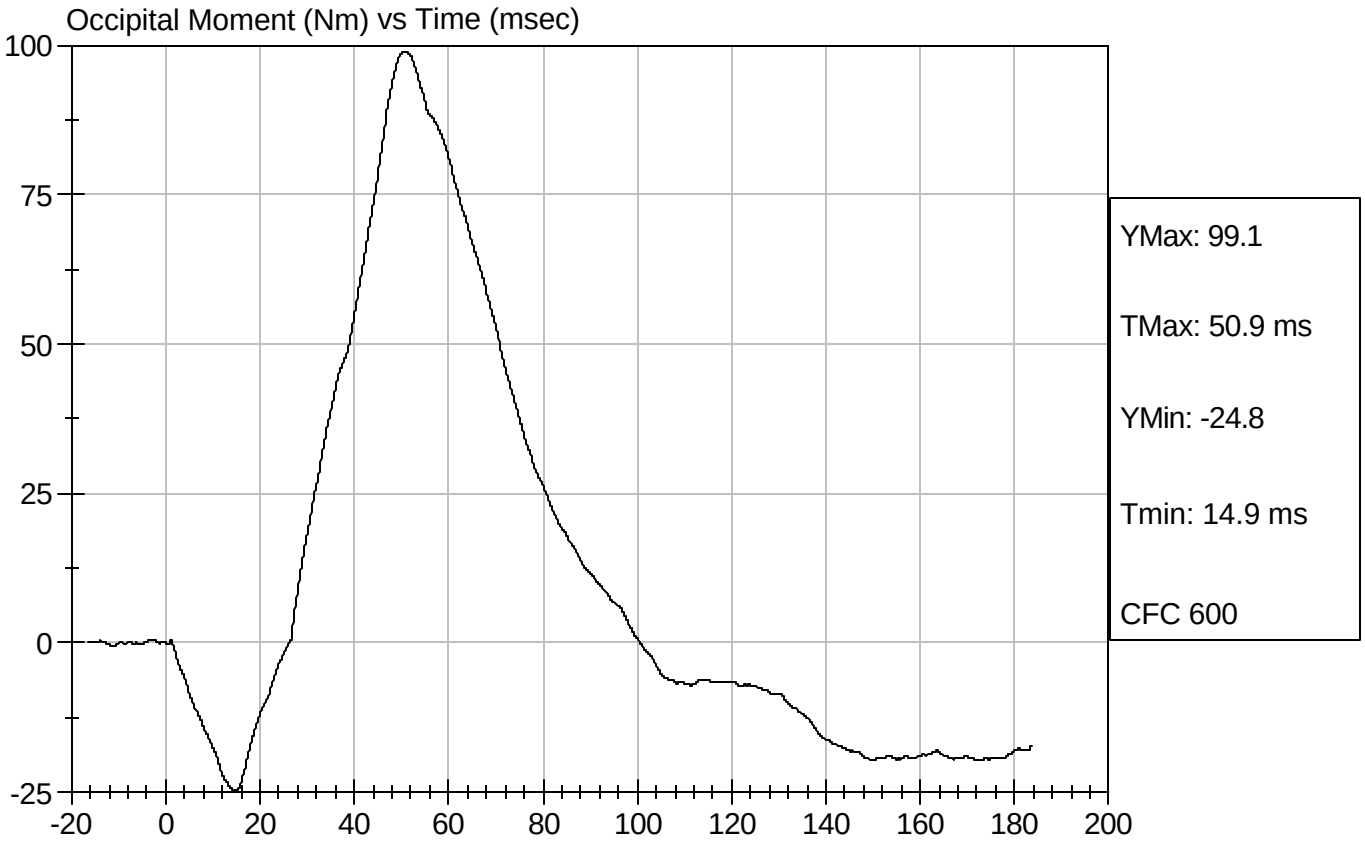


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Flexion
Component ID: D041412

Test Date: 06/24/2004
Speed: 23.14 ft/sec, 7.05 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Extension Test

ATD Serial No: 090 **Test I.D:** D041413

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	44	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.18	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.97	Pass
	20 msec	G's	14.00 to 19.00	17.00	Pass
	30 msec	G's	11.00 to 16.00	13.53	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	13.5	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	41.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.6	Pass
	Time	msec	72.0 to 82.0	77.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	156.9	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-73.1	Pass
	Time	msec	65.0 to 79.0	71.5	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	145.8	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

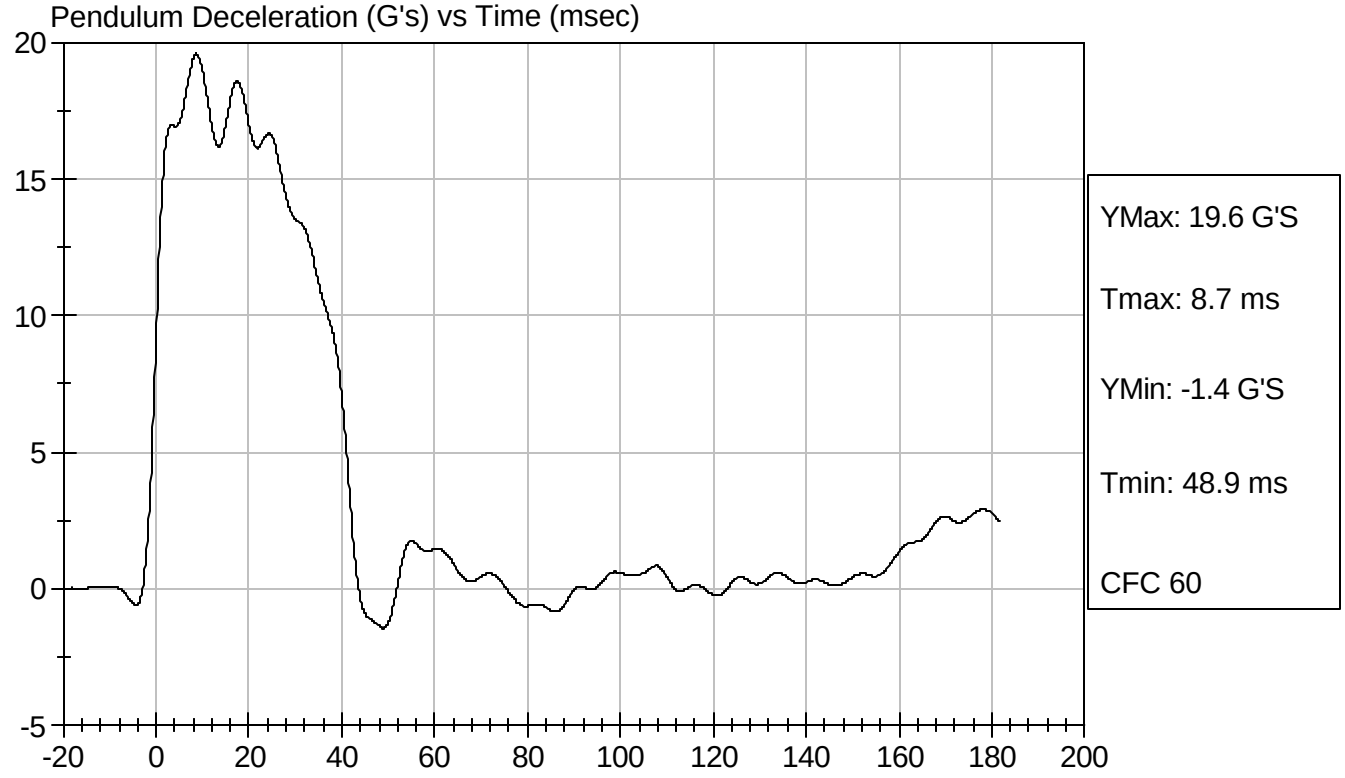
06/24/2004
Test Date

David Winkelbauer
Approved By

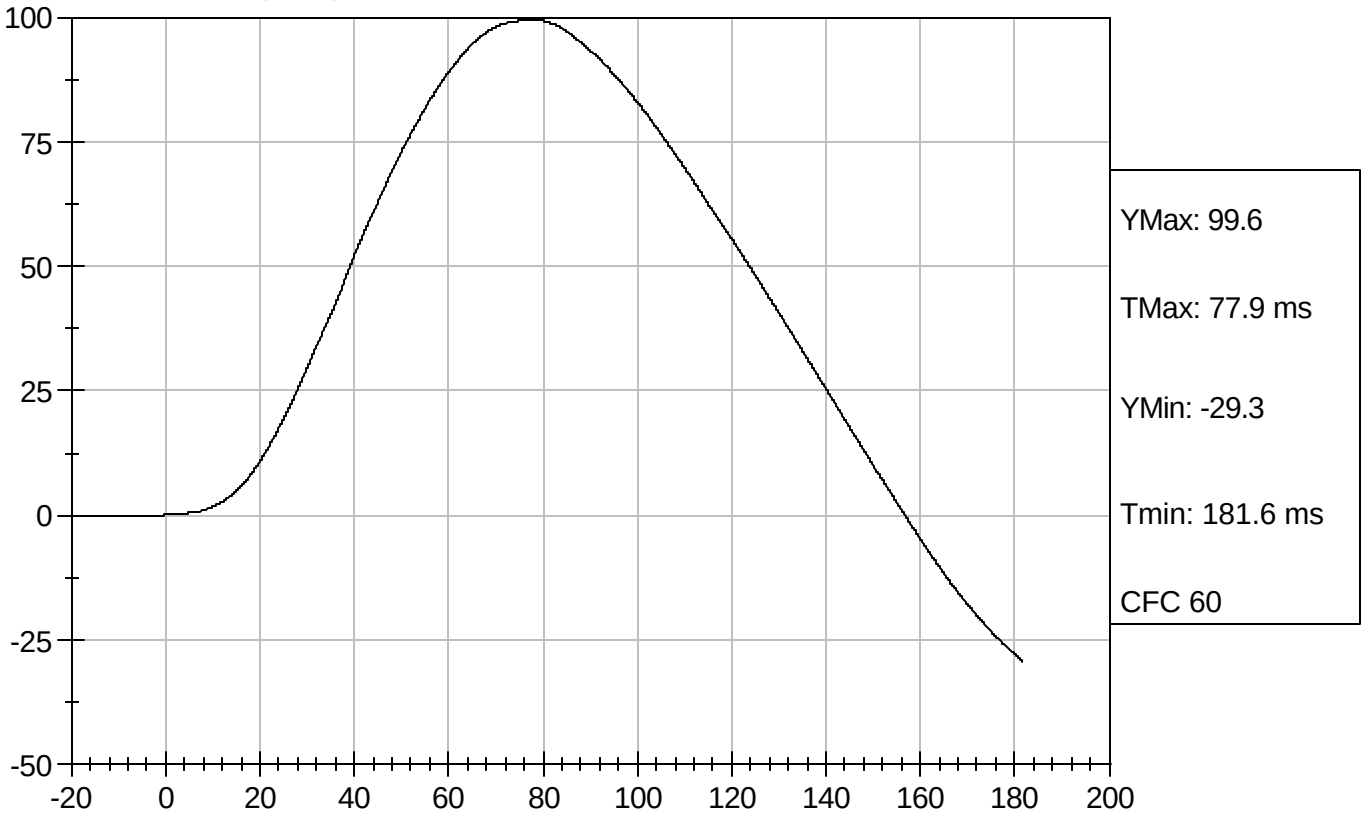
Test Desc: Neck Extension
Component ID: D041413

Test Date: 06/24/2004
Speed: 20.27 ft/sec, 6.18 m/sec

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

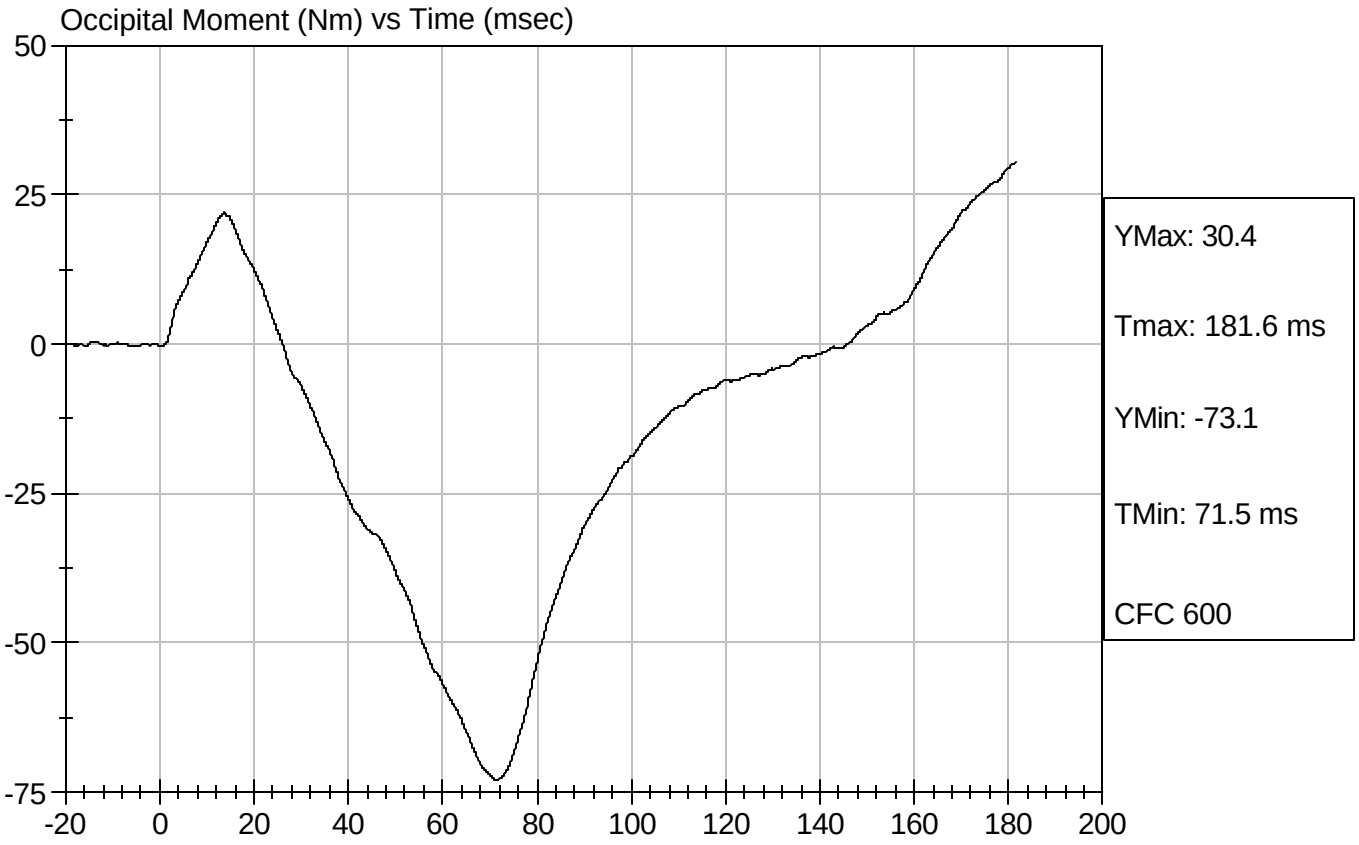


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Extension
Component ID: D041413

Test Date: 06/24/2004
Speed: 20.27 ft/sec, 6.18 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Thorax Impact Test

ATD Serial No: 090 **Test I.D:** D041414

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	6.58 to 6.82	6.76	Pass
Peak Probe Force	Newtons	5159 to 5893	5,613	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.95	Pass
Internal Hysteresis	%	69 to 85	72	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

06/24/2004
Test Date

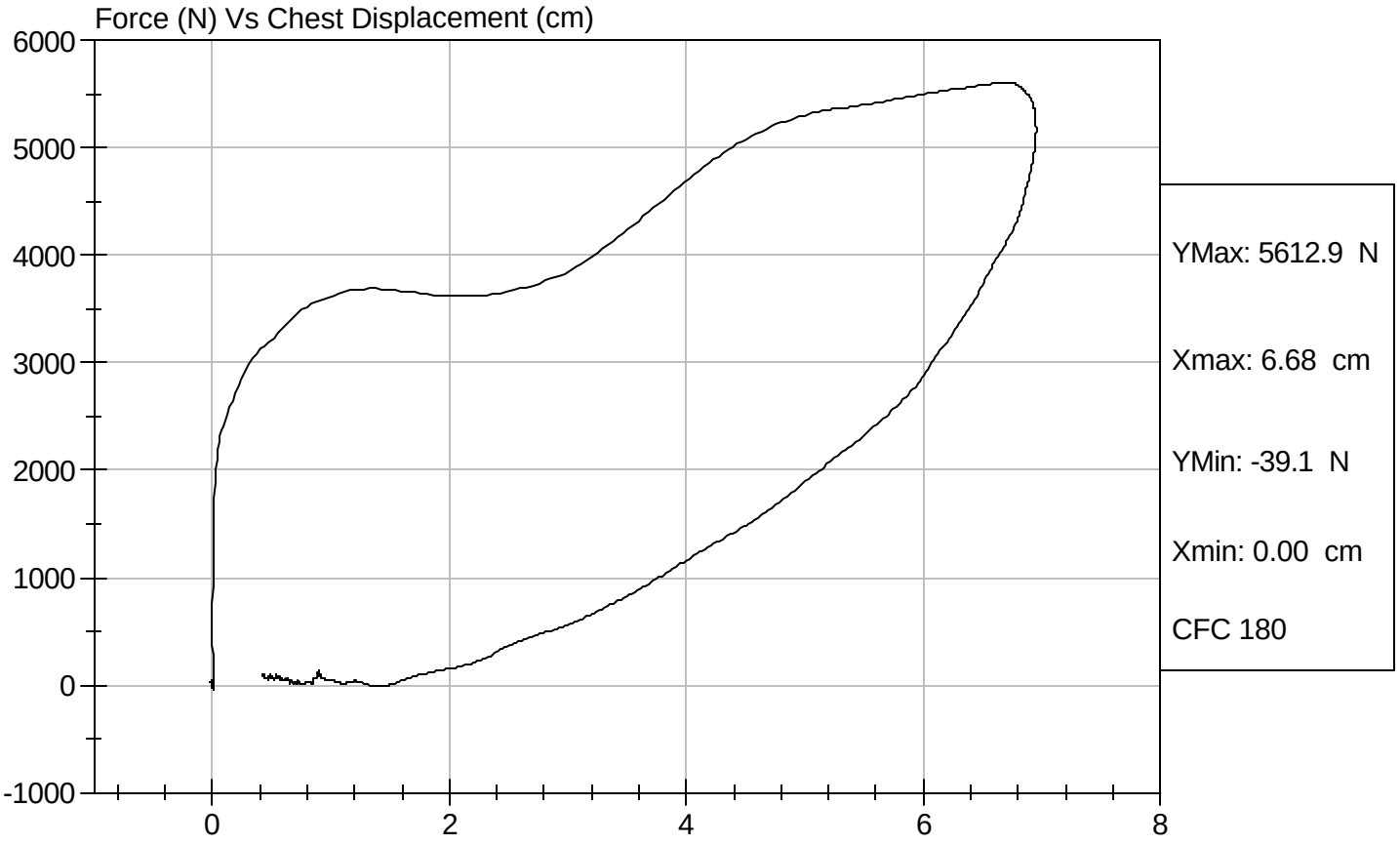
David Winkelbauer
Approved By

Test Description: Thorax Impact

Test Date: 06/24/2004

Component: D041414

Speed: 22.18 ft/sec, 6.76 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Right Knee Impact Test

ATD Serial No: 090 **Test I.D:** D041415

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5,132	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

06/24/2004
Test Date

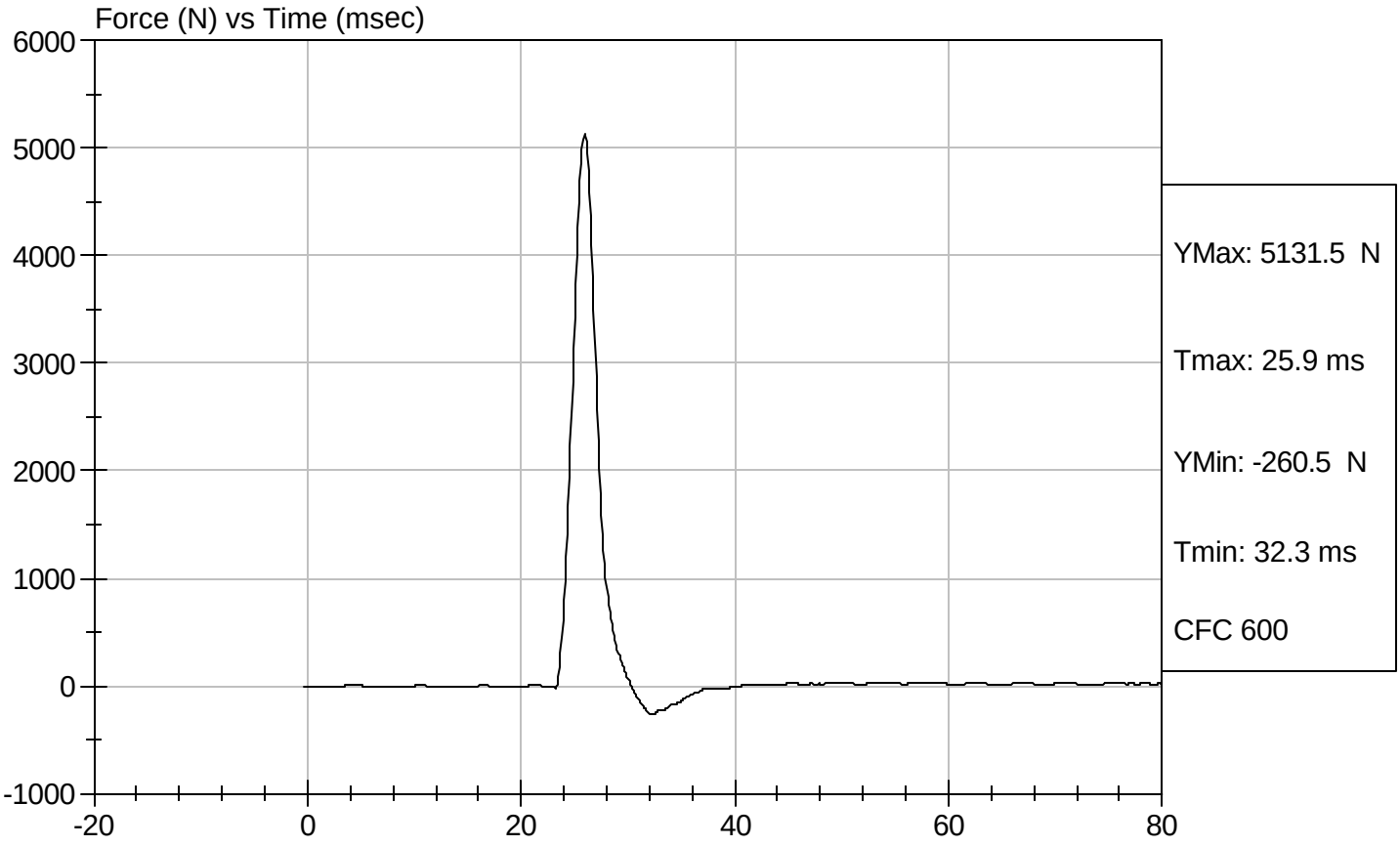
David Winkelbauer
Approved By

Test Description: Right Knee

Test Date: 06/24/2004

Component: D041415

Speed: 6.817 ft/sec, 2.078 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Left Knee Impact Test

ATD Serial No: 090 **Test I.D:** D041416

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,057	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

06/24/2004
Test Date

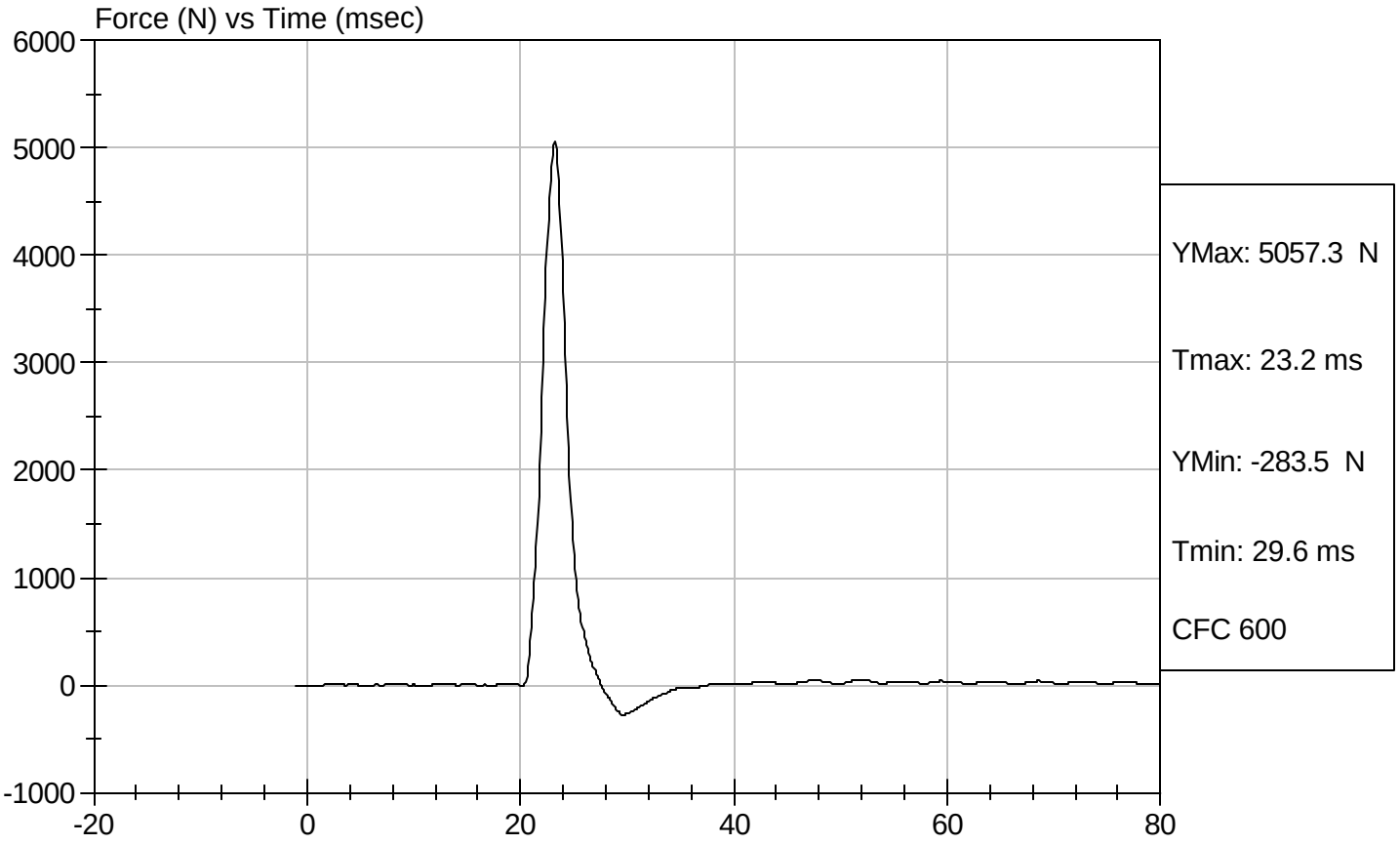
David Winkelbauer
Approved By

Test Description: Left Knee

Test Date: 06/24/2004

Component: D041416

Speed: 6.89 ft/sec, 2.100 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Hip-Femur Flexion Test

ATD Serial No: 090 **Test I.D:** D041410

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.4	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	46	46	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	94.2	84.9	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	40	41	Pass
		Overall Test Results			Pass

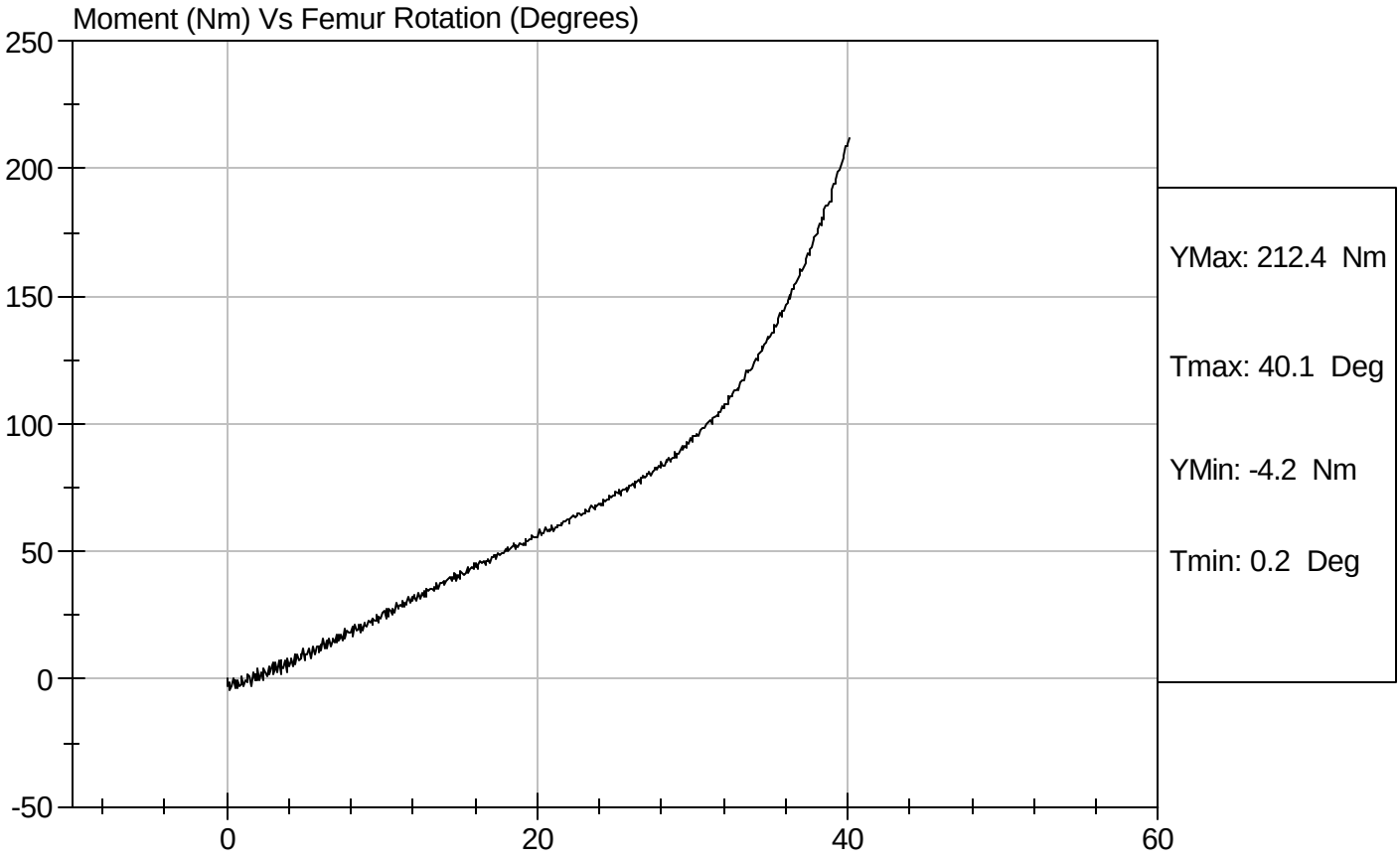
Jessica Gall
Laboratory Technician

06/24/2004
Test Date

David Winkelbauer
Approved By

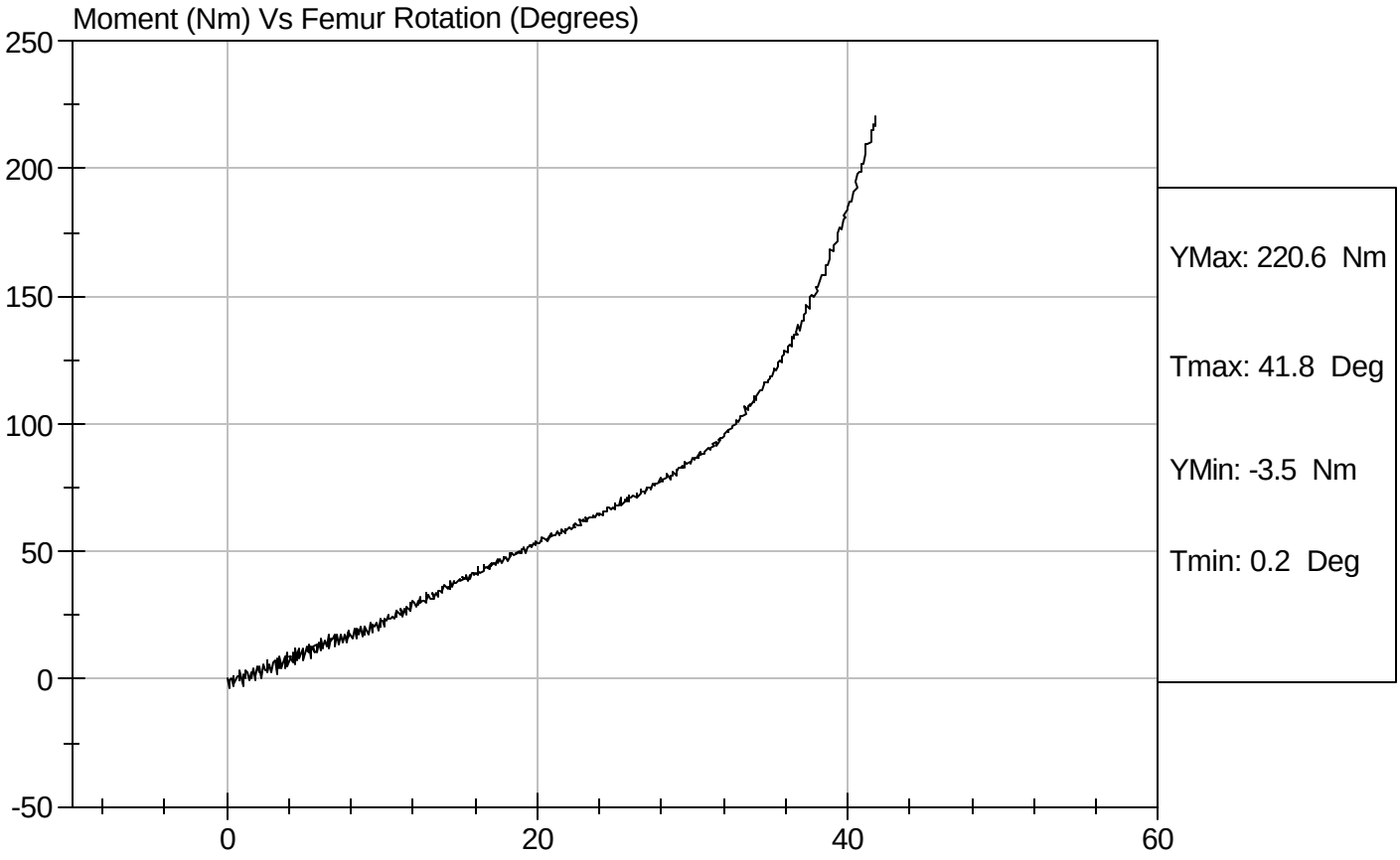
Test Description: Hip Femur Flexion | Test Date: 06/24/2004

Component: D041419 | Speed: 0 ft/sec, 0.00 m/sec



Test Description: Hip Femur Flexion | Test Date: 06/24/2004

Component: D041410 | Speed: 0 ft/sec, 0.00 m/sec



MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 547 **Test ID:** D041441

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	250 - 300	252	Pass
Peak Lateral Acceleration	G's	+/- 15	7.9	Pass
Unimodal	Yes/No	NA	Yes	Pass
Oscillations	Yes/No	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Joe Fleck

Laboratory Technician

06/24/2004

Test Date

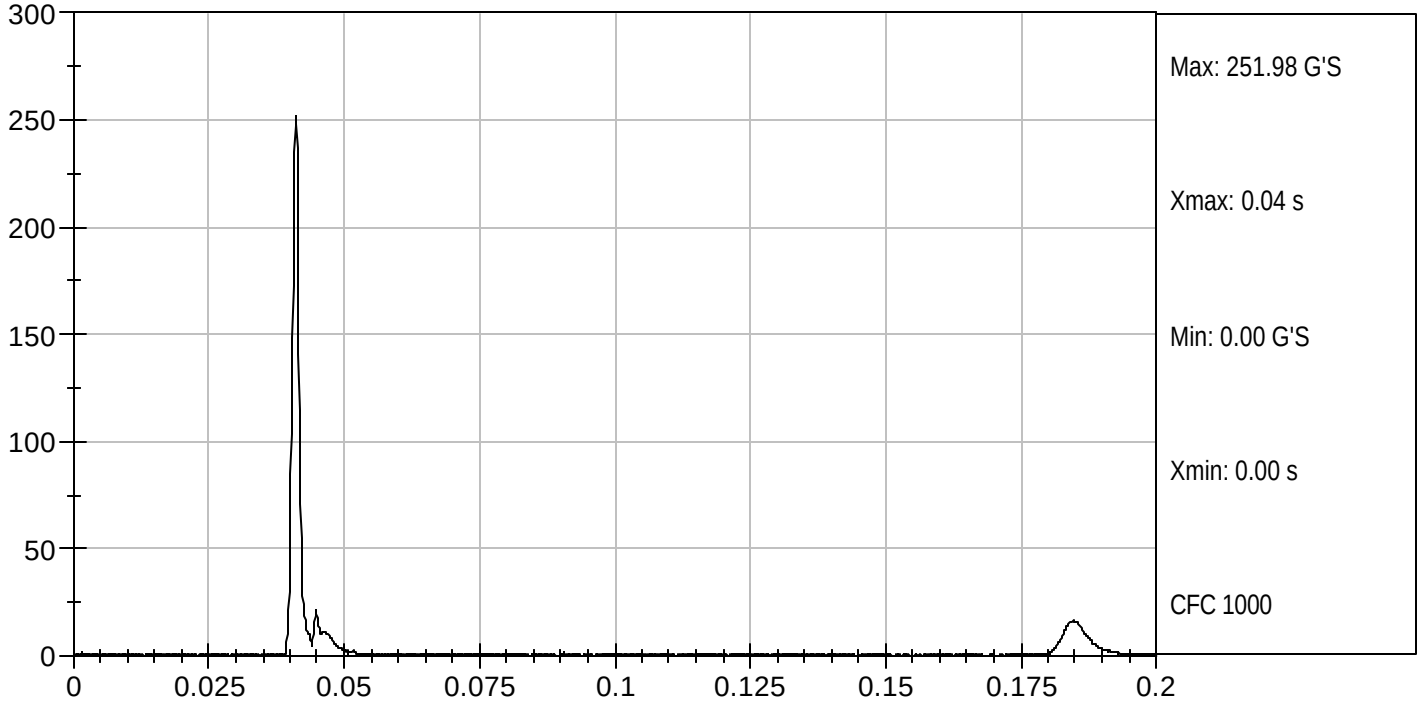
David Winkelbauer

Approved By

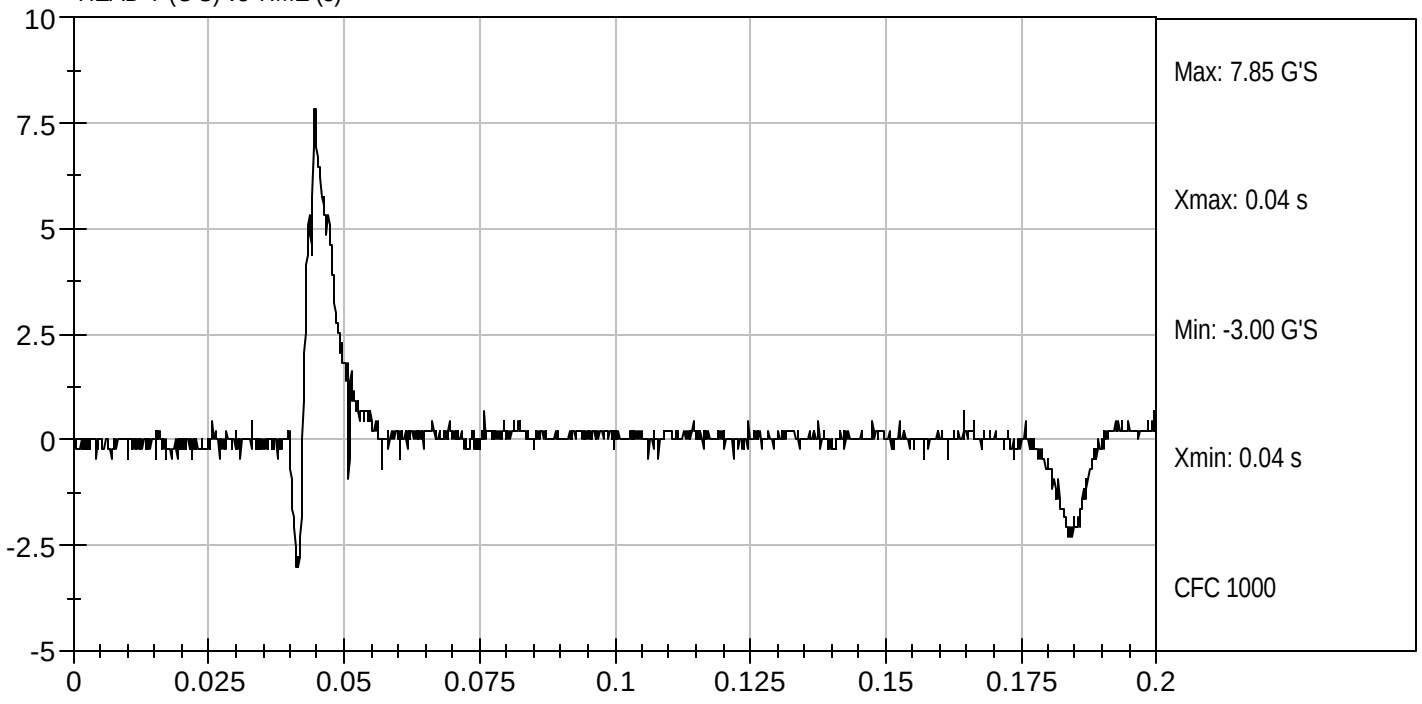
Test Desc: Head Drop
Componet ID: D041441

Test Date: 06/24/2004
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G'S) vs TIME (s)



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



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 547 **Test I.D:** D041442

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Speed		m/sec	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 msec	m/sec	2.1 to 2.5	2.4	Pass
	20 msec	m/sec	4.0 to 5.0	4.6	Pass
	30 msec	m/sec	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	82	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	81	Pass
Positive Moment Time Curve Decay to 10 Nm		msec	80 to 100	86	Pass
			Overall Results		Pass

Jim Carney
Laboratory Technician

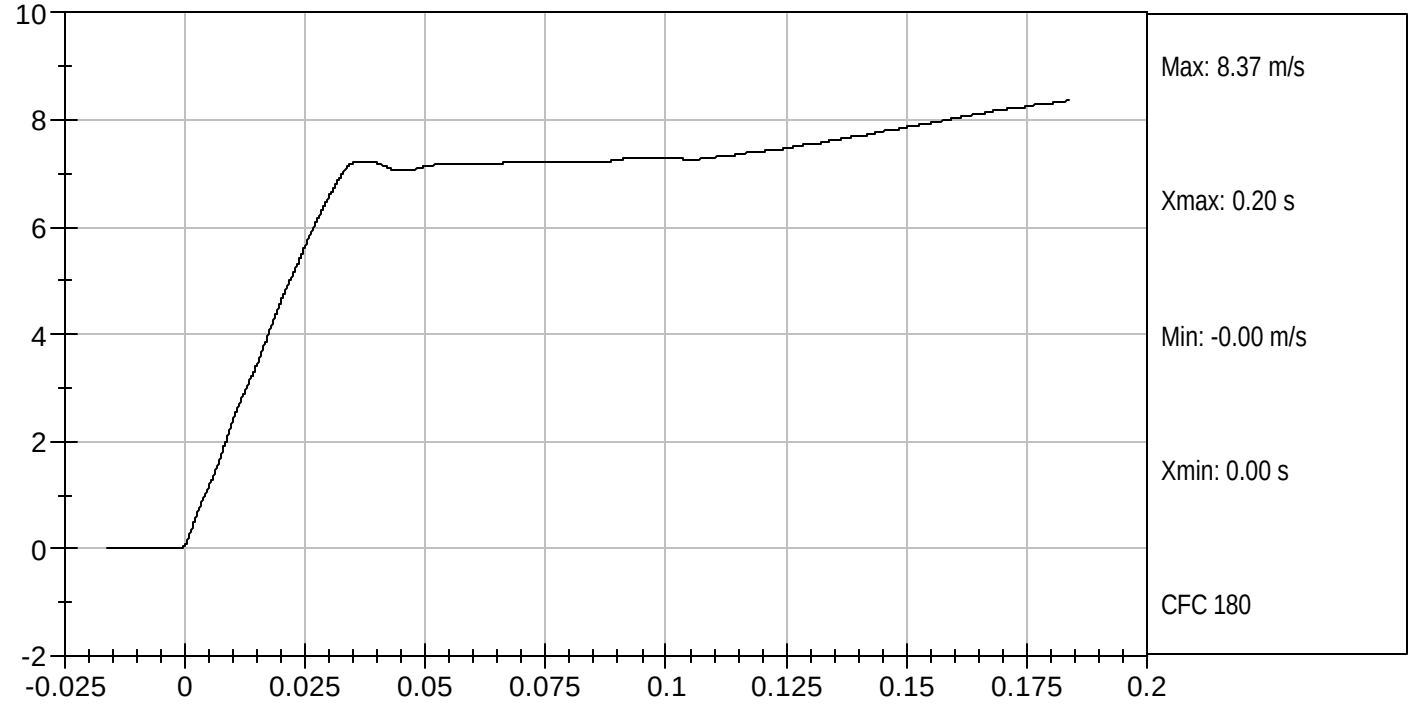
06/24/2004
Test Date

David Winkelbauer
Approved By

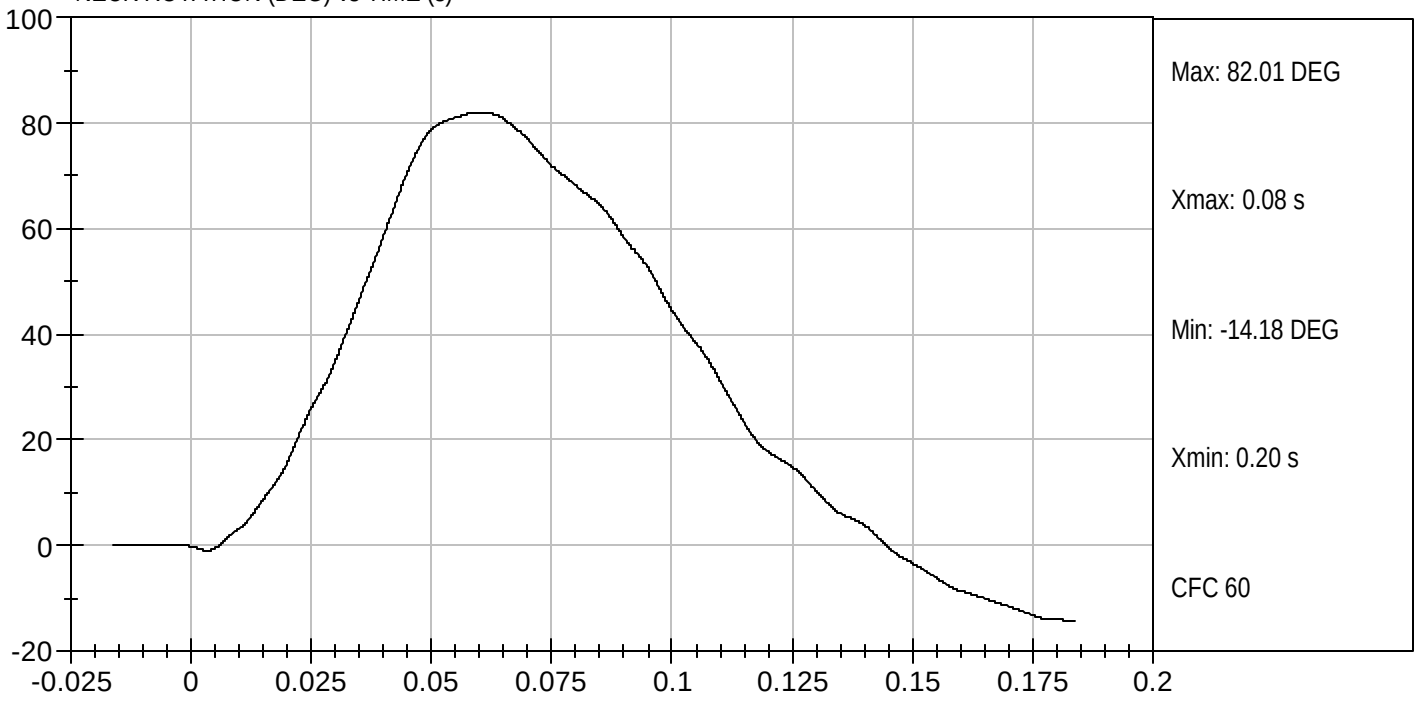
Test Desc: Neck Flexion
Componet ID: D041442

Test Date: 06/24/2004
Velocity: 23.28 ft/s, 7.10 m/s

PENDULUM DECELERATION (m/s) vs TIME (s)

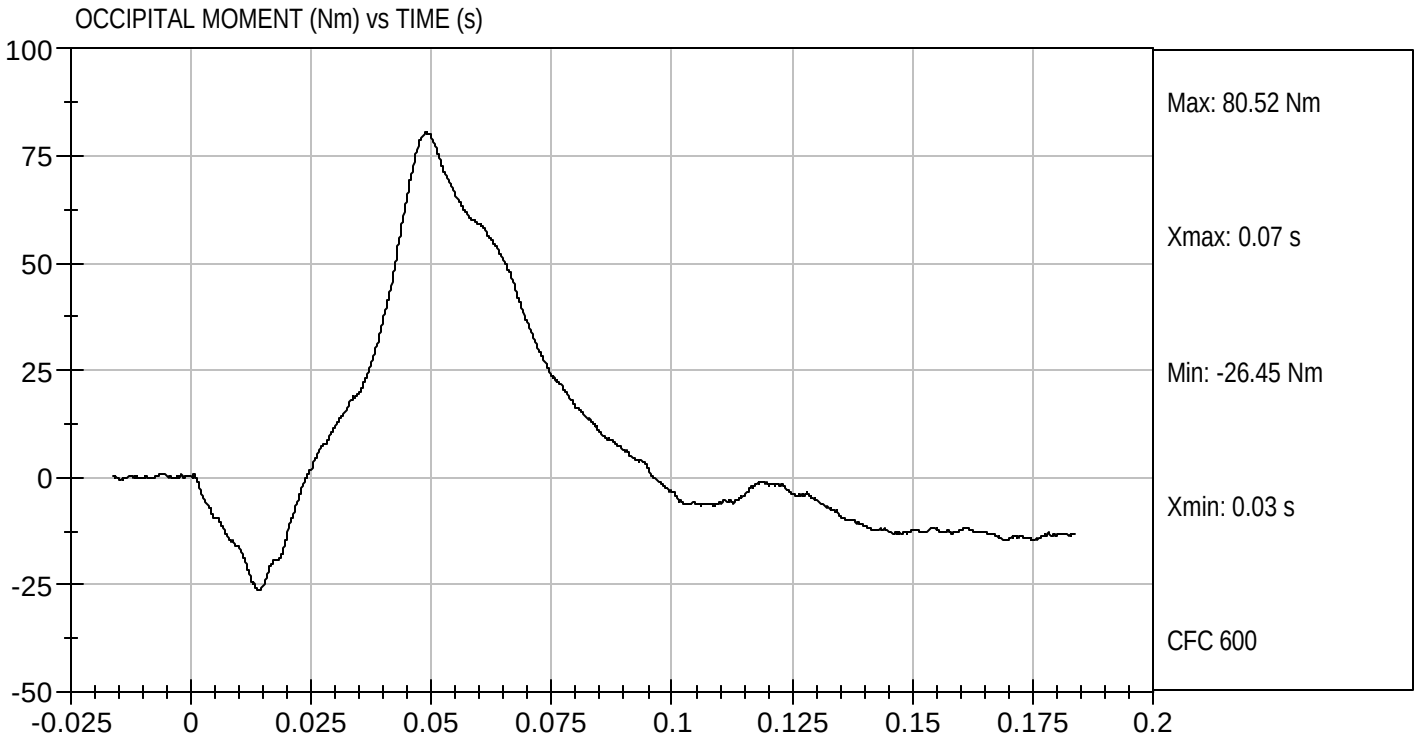


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Flexion
Componet ID: D041442

Test Date: 06/24/2004
Velocity: 23.28 ft/s, 7.10 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 547 **Test I.D:** D041443

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Speed		m/sec	5.95 to 6.19	6.19	Pass
Pendulum Deceleration	10 msec	m/sec	1.5 to 1.9	1.8	Pass
	20 msec	m/sec	3.1 to 3.9	3.6	Pass
	30 msec	m/sec	4.6 to 5.6	5.2	Pass
D Plane Rotation	Max	deg	99 to 114	108	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-59	Pass
Negative Moment Time Curve Decay to -10 Nm		msec	94 to 114	96	Pass
			Overall Results		Pass

Jim Carney

Laboratory Technician

06/24/2004

Test Date

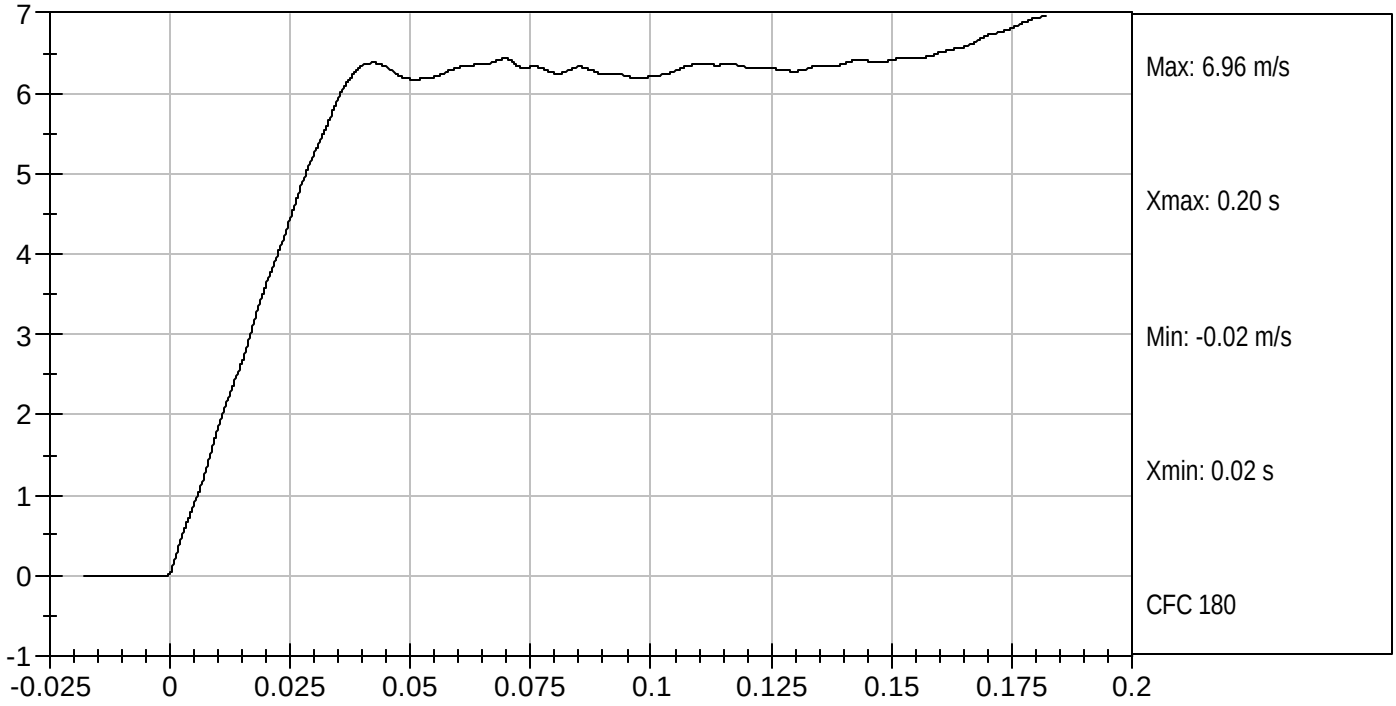
David Winkelbauer

Approved By

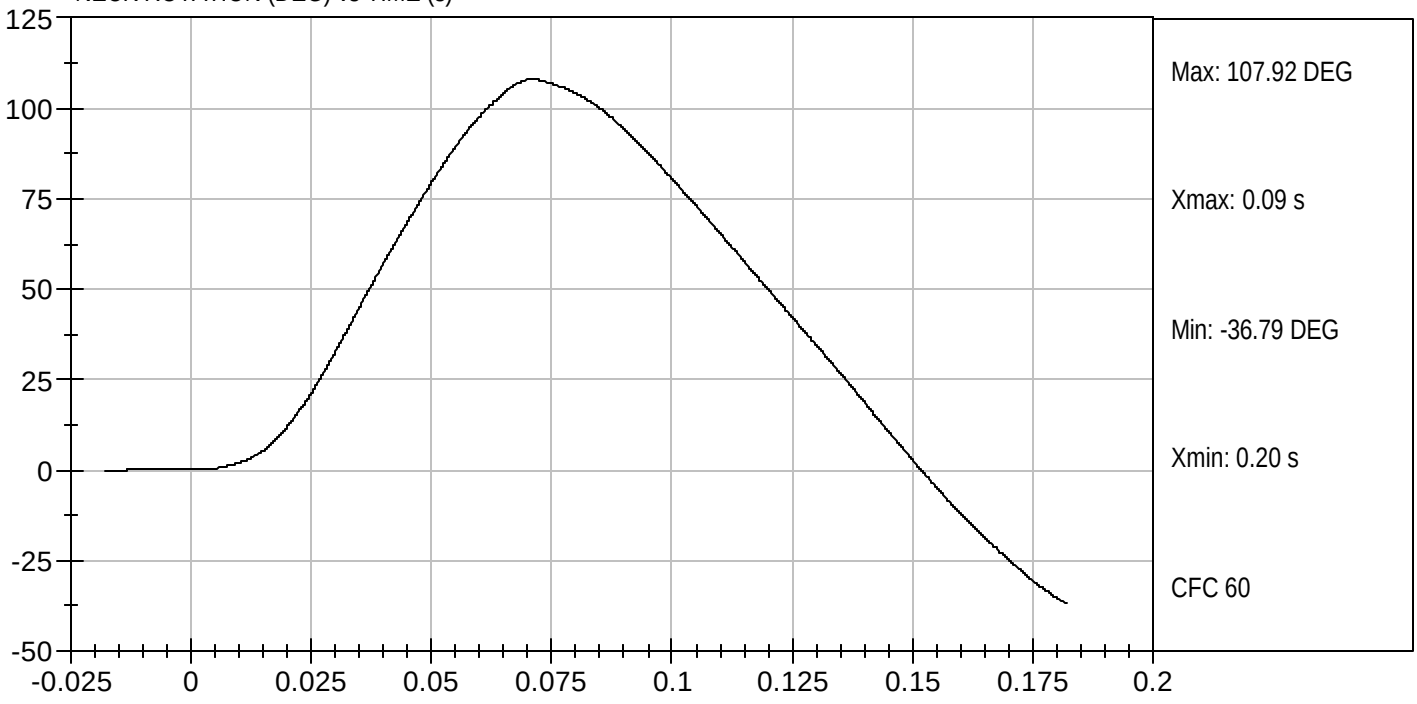
Test Desc: Neck Extension
Componet ID: D041443

Test Date: 06/24/2004
Velocity: 20.30 ft/s, 6.19 m/s

PENDULUM DECELERATION (m/s) vs TIME (s)

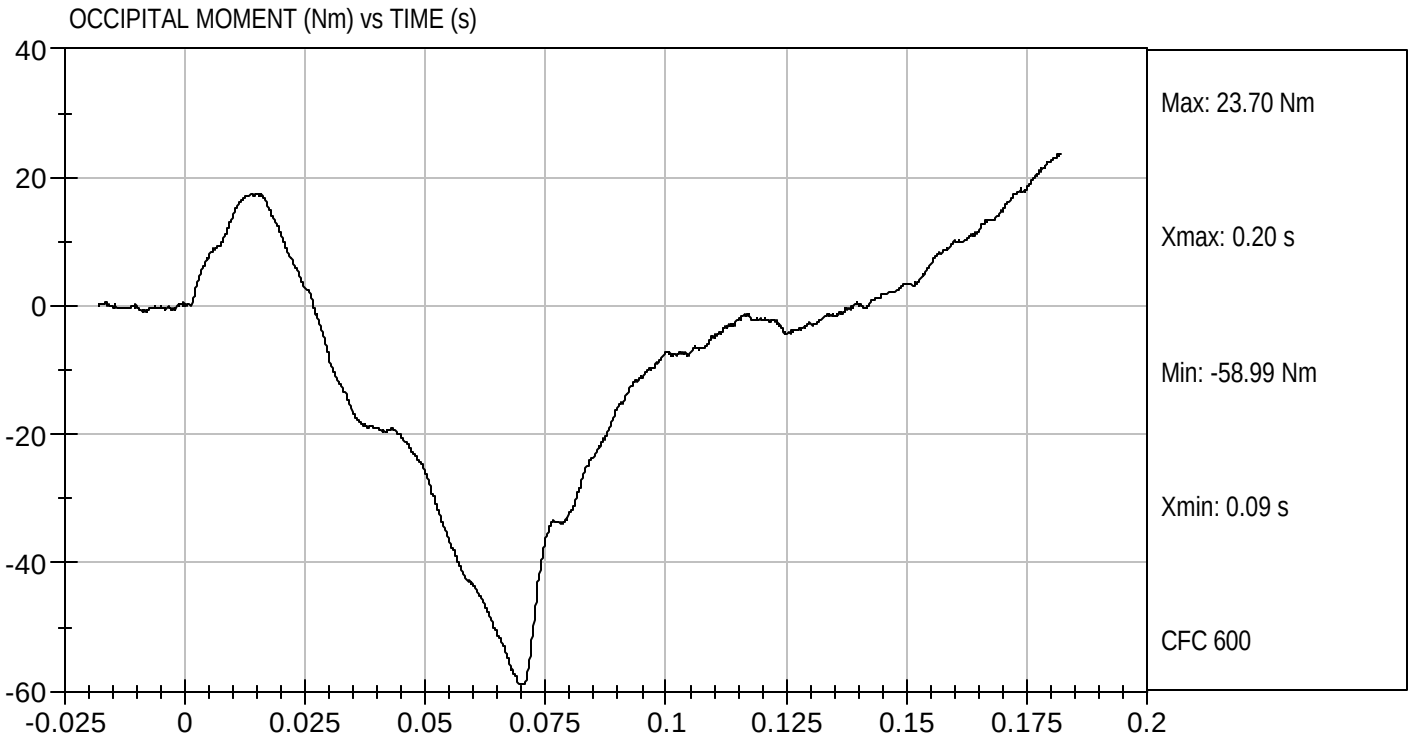


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Extension
Componet ID: D041443

Test Date: 06/24/2004
Velocity: 20.30 ft/s, 6.19 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 547 **Test I.D:** D041444

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21	Pass
Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	6.59 to 6.83	6.80	Pass
Peak Deflection	mm	50 to 58	54.7	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.1	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Peak Force 18 mm - 50 mm	Yes/No	< 4600 N	Yes	Pass
		Overall Test Results		Pass

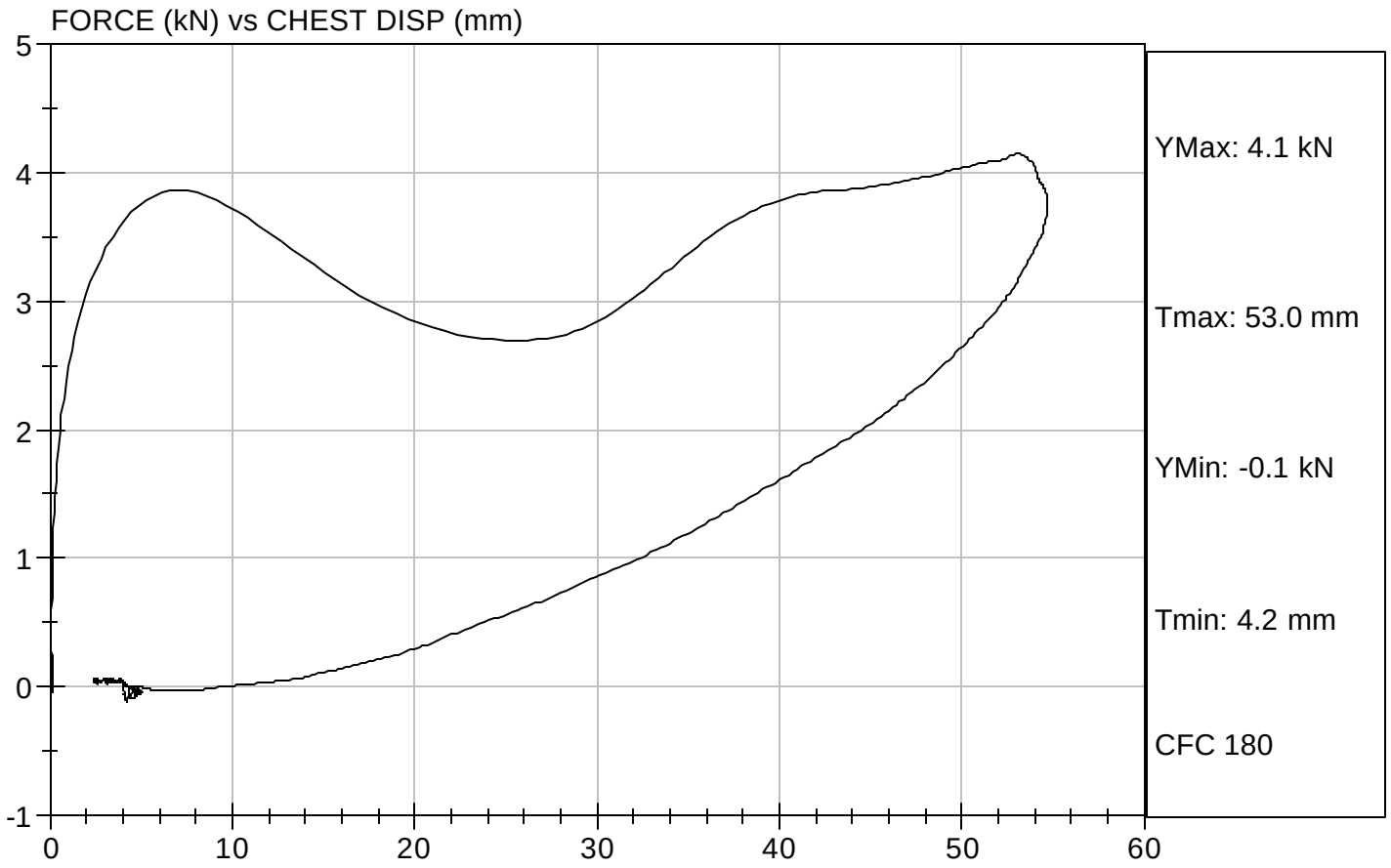
Jessica Hall
Laboratory Technician

06/28/2004
Test Date

David Winkelbauer
Approved By

Test Description: Thorax Impact Test Date: 06/28/2004

Component: D041444 Speed: 22.32 ft/sec, 6.80 m/sec



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 547 **Test I.D:** D041445

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/sec	2.07 to 2.13	2.08	Pass
Maximum Force	kN	3.45 to 4.06	3.84	Pass
		Overall Test Results		Pass

Joe Fleck

Laboratory Technician

06/24/2004

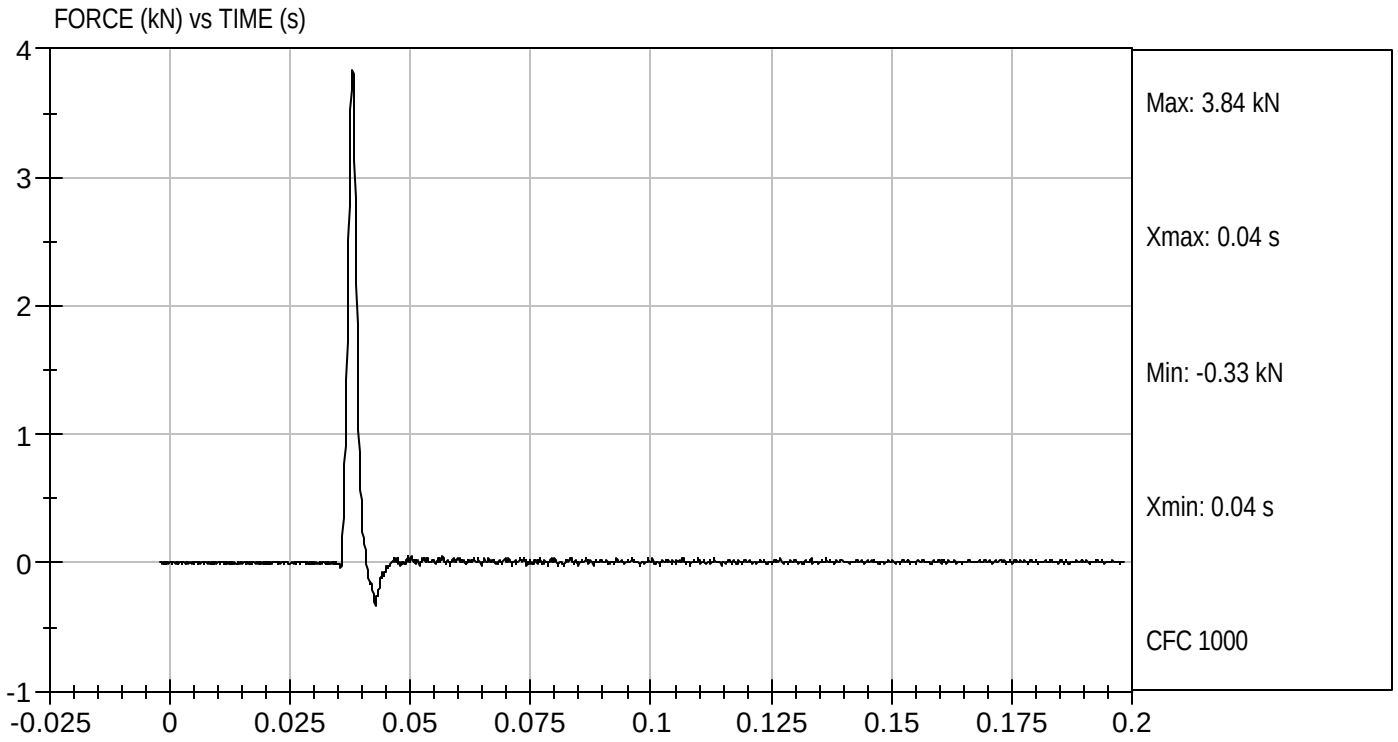
Test Date

David Winkelbauer

Approved By

Test Desc: Right Knee
Componet ID: D041445

Test Date: 06/24/2004
Velocity: 6.83 ft/s, 2.08 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 547 **Test I.D:** D041446

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/sec	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.6	Pass
		Overall Test Results		Pass

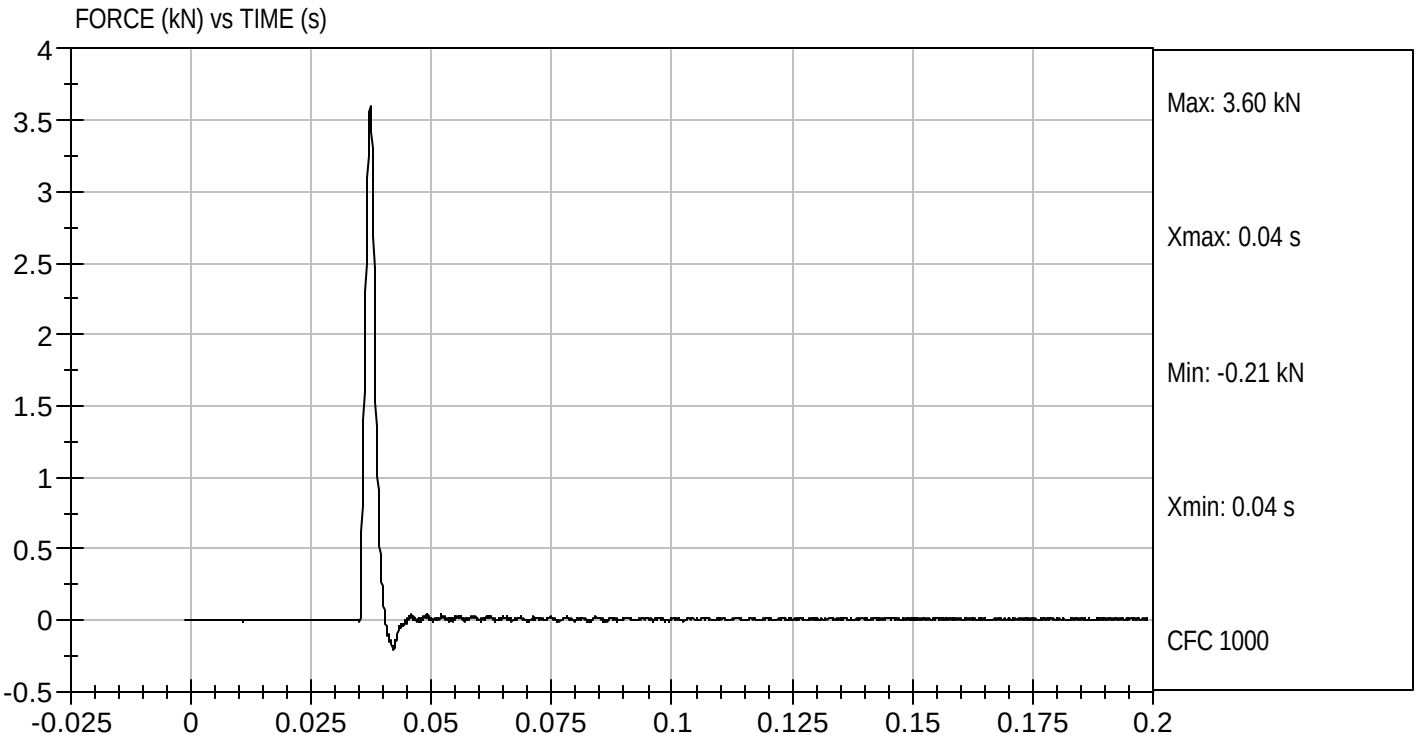
Joe Fleck
Laboratory Technician

06/24/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Componet ID: D041446

Test Date: 06/24/2004
Velocity: 6.95 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 547 **Test I.D:** D041447

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	337	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 - 1.5	Yes	Pass
		Overall Result		Pass

Joe Fleck
Laboratory Technician

06/25/2004
Test Date

David Winkelbauer
Approved By

APPENDIX E
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

DUMMY CALIBRATION DATA - BULLET VEHICLE

	INSTRUMENTS FOR DRIVER DUMMY: 110		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	L20-A34	Entran	4/7/04
Head Y Accelerometer	ALFP5	Entran	1/14/04
Head Z Accelerometer	A16-A12	Entran	4/7/04
Head X Redundant	L13-F71	Entran	4/7/04
Head Y Redundant	L13-F32	Entran	4/6/04
Head Z Redundant	H02-N07	Entran	4/7/04
Head X Front	I05-F14	Entran	4/7/04
Head Y Front	E18-F03	Entran	4/7/04
Head Z Front	G18-F13	Entran	4/7/04
Head X Left	A18-N07	Entran	4/7/04
Head Y Left	G19-F02	Entran	4/7/04
Head Z Left	J02-F16	Entran	4/7/04
Head X Upper	G18-F18	Entran	4/7/04
Head Y Upper	E21-M06	Entran	4/7/04
Head Z Upper	E29-N04	Entran	4/7/04
Upper Neck Load Cell	1039	Denton	1/28/04
Lower Neck Load Cell	215	Denton	9/9/03
Chest X	G18-F08	Entran	4/7/04
Chest Y	E29-N09	Entran	4/7/04
Chest Z	E20-N06	Entran	4/7/04
Chest Displacement	110	Denton	4/1/04
Chest X Redundant	J02-F06	Entran	4/7/04
Chest Y Redundant	F09-N06	Entran	4/7/04
Chest Z Redundant	F09-N14	Entran	4/7/04
Left Femur Load Cell	96661	GSE	1/28/04
Right Femur Load Cell	96662	GSE	1/28/04
Right Knee Shear	026975	Space Age	4/6/04
Shoulder Belt	190	Denton	4/12/04
Lap Belt	192	Denton	4/12/04
Left Upper Tibia Load Cell	T94	Denton	3/30/04
Left Lower Tibia Load Cell	A94	Denton	3/30/04
Right Upper Tibia Load Cell	T92	Denton	3/30/04
Right Lower Tibia Load Cell	AG92	Denton	3/30/04

DUMMY CALIBRATION DATA – BULLET VEHICLE

	INSTRUMENTS FOR PASSENGER DUMMY DUMMY: 324		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	F09-N09	Entran	4/6/04
Head Y Accelerometer	E18-F06	Entran	4/6/04
Head Z Accelerometer	I10-N24	Entran	4/6/04
Head X Redundant	G25-N16	Entran	4/6/04
Head Y Redundant	E29-N13	Entran	4/6/04
Head Z Redundant	L20-A13	Entran	4/6/04
Head X Front	A29-N11	Entran	4/19/04
Head Y Front	E20-N01	Entran	4/6/04
Head Z Front	F09-N12	Entran	4/6/04
Head X Left	F09-N03	Entran	4/6/04
Head Y Left	E18-F10	Entran	4/6/04
Head Z Left	A09-F04	Entran	4/6/04
Head X Upper	H13-F19	Entran	4/6/04
Head Y Upper	E21-M01	Entran	4/6/04
Head Z Upper	E18-F21	Entran	4/6/04
Upper Neck Load Cell	1561	Denton	1/13/04
Lower Neck Load Cell	99	Denton	3/30/04
Chest X	D30-N08	Entran	4/6/04
Chest Y	E30-M02	Entran	4/6/04
Chest Z	A18-N13	Entran	4/6/04
Chest Displacement	324	Denton	4/6/04
Chest X Redundant	H10-F13	Entran	4/6/04
Chest Y Redundant	I10-N12	Entran	4/6/04
Chest Z Redundant	D30-N01	Entran	4/6/04
Left Femur Load Cell	932	GSE	1/26/04
Right Femur Load Cell	729	GSE	1/27/04
Shoulder Belt	193	Denton	4/12/04
Lap Belt	199	Denton	6/8/04

DUMMY CALIBRATION DATA – TARGET VEHICLE

	INSTRUMENTS FOR DRIVER DUMMY: 090		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	G18-F02	Entran	4/6/04
Head Y Accelerometer	L20-A08	Entran	4/6/04
Head Z Accelerometer	L13-F37	Entran	4/6/04
Head X Redundant	F09-N04	Entran	4/9/04
Head Y Redundant	J02-F07	Entran	4/6/04
Head Z Redundant	I10-N01	Entran	4/6/04
Head X Front	A12-Z06	Entran	2/10/04
Head Y Front	A12-Z05	Entran	2/10/04
Head Z Front	A12-Z02	Entran	2/10/04
Head X Left	A12-Z22	Entran	2/10/04
Head Y Left	J14-J11	Entran	2/10/04
Head Z Left	A12-Z08	Entran	2/10/04
Head X Upper	C15-Z02	Entran	4/23/04
Head Y Upper	C17-J01	Entran	4/23/04
Head Z Upper	A12-Z12	Entran	2/10/04
Upper Neck Load Cell	810	Denton	1/28/04
Lower Neck Load Cell	121	FTSS	9/18/03
Chest X	AMTG3	Endevco	2/20/04
Chest Y	ALC37	Endevco	2/20/04
Chest Z	J21691	Endevco	4/8/04
Chest Displacement	090	Servo	4/1/04
Chest X Redundant	AMTL6	Endevco	2/20/04
Chest Y Redundant	J22033	Endevco	4/8/04
Chest Z Redundant	J21970	Endevco	4/8/04
Left Femur Load Cell	741	GSE	1/28/04
Right Femur Load Cell	631	GSE	1/28/04
Left Knee Shear	14696	Servo	4/6/04
Right Knee Shear	14672	Servo	4/6/04
Left Upper Tibia Load Cell	97	Denton	8/21/03
Left Lower Tibia Load Cell	80	Denton	8/22/03
Right Upper Tibia Load Cell	T79	Denton	8/21/03
Right Lower Tibia Load Cell	A79	Denton	8/22/03
Left Tibia Mid Shaft X	ANBP7	Endevco	4/2/04
Left Tibia Mid Shaft Y	J13709	Endevco	4/2/04
Right Tibia Mid Shaft X	J14774	Endevco	4/16/04
Right Tibia Mid Shaft Y	J14028	Endevco	4/16/04
Left Mid Foot X	AAMN8	Endevco	3/31/04
Left Mid Foot Y	ACC61	Endevco	3/31/04
Left Mid Foot Z	ACCW9	Endevco	3/31/04
Right Mid Foot X	P22805	Endevco	4/2/04
Right Mid Foot Y	P22190	Endevco	4/2/04
Right Mid Foot Z	P22180	Endevco	4/2/04
LT Inversion/Eversion	LX117X	Contelec	11/17/03
LT Dorsi/Plantar Flexion	LX117Y	Contelec	11/17/03
LT Internal/External	LX117Z	Contelec	11/17/03

RT Inversion/Eversion	LX116X	Contelec	11/17/03
RT Dorsi/Plantar Flexion	LX116Y	Contelec	11/17/03
RT Internal/External	LX116Z	Contelec	11/17/03
Shoulder Belt	167	Denton	5/21/04
Lap Belt	802	Denton	5/21/04

DUMMY CALIBRATION DATA – TARGET VEHICLE

	INSTRUMENTS FOR PASSENGER DUMMY: 547		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	L13-F39	Entran	4/7/04
Head Y Accelerometer	E20-N12	Entran	4/7/04
Head Z Accelerometer	E29-N11	Entran	4/7/04
Head X Redundant	E18-F22	Entran	4/7/04
Head Y Redundant	E21-M08	Entran	4/7/04
Head Z Redundant	G25-N18	Entran	4/7/04
Head X Front	AH1G2	Endevco	4/2/04
Head Y Front	J13942	Endevco	4/2/04
Head Z Front	AM751	Endevco	4/2/04
Head X Left	J13649	Endevco	4/2/04
Head Y Left	J13653	Endevco	4/2/04
Head Z Left	J13713	Endevco	4/2/04
Head X Upper	J13422	Endevco	4/2/04
Head Y Upper	J11630	Endevco	4/2/04
Head Z Upper	AJ411	Endevco	4/2/04
Upper Neck Load Cell	606	Denton	3/24/04
Lower Neck Load Cell	86	Denton	9/10/03
Chest X	A16-A08	Entran	4/7/04
Chest Y	A18-N03	Entran	4/7/04
Chest Z	G18-F12	Entran	4/7/04
Chest Displacement	547	Servo	6/25/04
Chest X Redundant	A25-N05	Entran	4/7/04
Chest Y Redundant	E29-N10	Entran	4/7/04
Chest Z Redundant	H02-N02	Entran	4/7/04
Left Femur Load Cell	1362	Denton	3/3/04
Right Femur Load Cell	1361	Denton	3/3/04
Left Knee Shear	015022	Space Age	4/6/04
Right Knee Shear	014682	Space Age	4/6/04
Shoulder Belt	195	Denton	5/21/04
Lap Belt	799	Denton	5/21/04

VEHICLE INSTRUMENTS CALIBRATION - BULLET VEHICLE

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Top of Engine	L17-D22	Entran	3/30/04
Bottom of Engine	L19-K06	Entran	1/23/04
Left Brake Caliper	A08-M02	Entran	3/9/04
Right Brake Caliper	H05-F07	Entran	6/4/04
Rear Deck	A29-B04	Entran	3/11/04
Dash Panel Center X	L17-D39	Entran	1/23/04
Toe Pan Next to Accel. X	E01-F09	Entran	5/28/04
Toe Pan Next to Accel. Z	E01-F04	Entran	5/28/04
Toe Pan Above Footrest X	L18-N11	Entran	6/4/04
Toe Pan Above Footrest. Z	A27-R01	Entran	4/16/04
Left Rear Seat Crossmember	L17-D25	Entran	3/30/04
Right Rear Seat Crossmember	A29-N05	Entran	3/11/04
Rear Compartment Center	H20-R01	Entran	4/19/04

VEHICLE INSTRUMENTS CALIBRATION - TARGET VEHICLE

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Top of Engine	L18-N15	Entran	1/30/04
Bottom of Engine	L17-D04	Entran	1/23/04
Left Brake Caliper	K07-R09	Entran	1/21/04
Right Brake Caliper	G10-F06	Entran	4/19/04
Rear Deck	A27-R06	Entran	3/9/04
Dash Panel Center X	L17-D29	Entran	3/30/04
Toe Pan Next to Accel. X	I16-B11	Entran	5/28/04
Toe Pan Next to Accel. Z	A27-R13	Entran	5/28/04
Toe Pan Above Footrest X	K18-D25	Entran	1/21/04
Toe Pan Above Footrest. Z	L17-D21	Entran	1/30/04
Left Rear Seat Crossmember	K11-Z01	Entran	1/21/04
Right Rear Seat Crossmember	H21-J06	Entran	4/16/04
Rear Compartment Center	K18-D17	Entran	1/21/04