REPORT NUMBER: NCAP-MGA-2004-006

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

Honda Motor Company
2004 Acura TSX 4-Door
NHTSA NUMBER: M45303

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

Test Date: January 13, 2004

Report Date: February 18, 2004

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-01-D-12005.

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FINAL REPORT ACCEPTED BY:

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Manager, New Car Assessment Program

_____
Date of Acceptance

_____
COTR, NCAP Frontal Impact Program

_____
Date of Acceptance

Technical Report Documentation Page

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16. Abstract

A 35.1 mph (56.5 km/h) frontal barrier impact was conducted on a 2004 Acura TSX 4-Dr at MGA Research Corporation on January 13, 2004. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The impact velocity was 56.5 km/h. The ambient temperature at the barrier face at the time of impact was 21 degrees Celsius. The vehicle's maximum post test static crush is 473 mm located to the right of the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system and an airbag in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:

Measurement Description	Units	Threshold	Driver ATD	Pass. ATD
Head Injury Criteria (HIC)	N/A	1000	268	214
Max. Thorax Accel. (3msec Clip)	G's	60	42	43
Left Femur Force	Newton	10009	-832	-3582
Right Femur Force	Newton	10009	-951	-1559

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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.5 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-01-D-12005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact in excess of the current 48.3 kph requirements.

SUMMARY

A load cell barrier consisting of 30 load cells was impacted by a 2004 Acura TSX 4-Dr at a velocity of 56.5 kph. The test was performed at MGA Research Corporation on January 13, 2004. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometer, upper neck transducers, right/left femur load cells, and lower leg instrumentation. The driver (position 1) ATD (Serial No. 066) and right-front passenger (position 2) ATD (Serial No. 065) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 161 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard Solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 473 mm and both the driver and passenger side doors remained closed and latched during the impact event and were operable after the impact.

The driver’s head and chest contacted the airbag. The driver’s head also contacted the headrest. The driver’s knees contacted the bolster. The driver’s abdomen contacted the airbag. The passenger’s head, chest and abdomen contacted the airbag. The passenger's head contacted the headrest. The passenger’s knees contacted the glove box.

The occupant data is summarized below:

ATD position	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)
Driver	268	42	-21	-832	-951	*
Passenger	214	43	-19	-3582	-1559	*

* Not recorded

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

CONVERSION FACTORS USED IN THIS REPORT*

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

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

DATA SHEET NO. 1
CRASH TEST SUMMARY

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/hr	56.5
Test Weight	kg	1693.3
Average Rebound	mm	493
Maximum Static Crush	mm	473
Impact Angle	degrees	0

DOOR OPENING AND SEAT TRACK INFORMATION

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

TEST DUMMY INFORMATION

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

16mm MOVIE COVERAGE

High Speed	16
Real Time	1
Total	17

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

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

TEST VEHICLE INFORMATION

Manufacturer	Honda
Model	Acura TSX 4-Dr
Body Style	Sedan
NHTSA No.	M45303
VIN	JH4CL96844C019837
Color	Dark Blue
Delivery Date	01/07/04
Odometer Reading (mile)	96
Dealer	McGrath Acura
Transmission	Automatic
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.4
Engine Placement	Lateral
Automatic Door Lock (ADL)	No
Owner's Manual Details Instructions on Disabling ADLs	Not Applicable

TEST VEHICLE OPTIONS

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda Motor Company
Date of Manufacture	11/03

GVWR (kg)	1950.5
GAWR Front (kg)	1059.2
GAWR Rear (kg)	920.8

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	240	240
Cold Pressure (kPa)	220	210
Recommended Tire Size	P215/50R17	P215/50R17
Tire Size on Vehicle	P215/50R17	P215/50R17
Tire Manufacturer	Michelin	Michelin

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	NA	
Number Of Occupants	2	3	0	5
Capacity Wt. (VCW) (kg)				385
Cargo Wt. (RCLW) (kg)				45.4

DATA SHEET NO. 2... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	456.8	296.7		507.6	342.0	
Right	kg	456.3	289.4		502.1	341.6	
Ratio	%	60.9	39.1		59.6	40.4	
Totals	kg	913.1	586.1	1499.2	1009.7	683.6	1693.3

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1499.2
Weight of 2 P572E ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	45.4
Calculated Vehicle Target Weight (TVTW)	kg	1700.6

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	692	695	693	692	1044
As Tested	mm	678	680	681	682	1078
Post Test	mm	754	700	688	650	

Vehicle Wheelbase (mm): 2671

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

Vehicle Components Removed: Rear bumper, Tail lights, Mufflers, Trunk

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

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual (L): 64.7

Usable Capacity Figure Furnished by COTR (L): 65.1

Actual Test Volume (L): 22.3

Test Fluid Type: Stoddard Solvent; Specific Gravity: 0.77

Is Vehicle Fuel Pump Electric or Mechanical? Electric

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

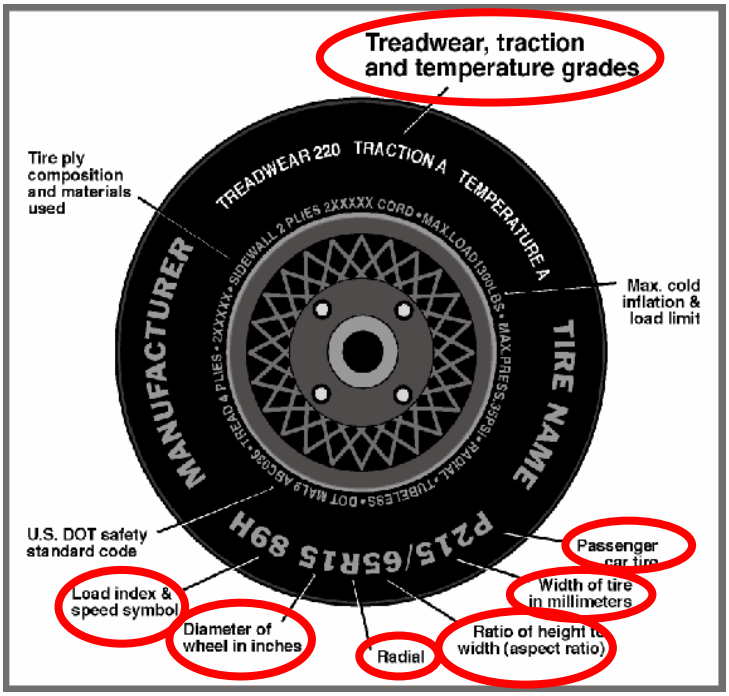
DATA SHEET NO. 3

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

Vehicle Year	2004	Vehicle Make	Acura
VIN	JH4CL96844C019837	Vehicle Model	TSX 4 Door



	Front	Rear
Tire Manufacturer	Michelin	Michelin
Tire Name	MXM4	MXM4
Tire Type	Touring	Touring
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	50	50
Radial	R	R
Wheel Diameter	17	17
Load Index & Speed Symbol	93V	93V
Treadwear	300	300
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET NO. 4

POST IMPACT DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.5 – 57.1	56.5
Trap No. 1 Entry Distance	mm	<1524	1300
Trap No. 1 Exit Distance	mm	<1524	300
Trap No. 2 Velocity (Redundant)	km/h	55.5 – 57.1	56.5
Trap No. 2 Entry Distance	mm	<1524	1425
Trap No. 2 Exit Distance	mm	<1524	425

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4407	4101	306
Center	mm	4622	4152	470
Right Side	mm	4394	4096	298

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	482
Center	mm	471
Right Side	mm	525
Average	mm	493

DATA SHEET NO. 5

TEST VEHICLE INFORMATION

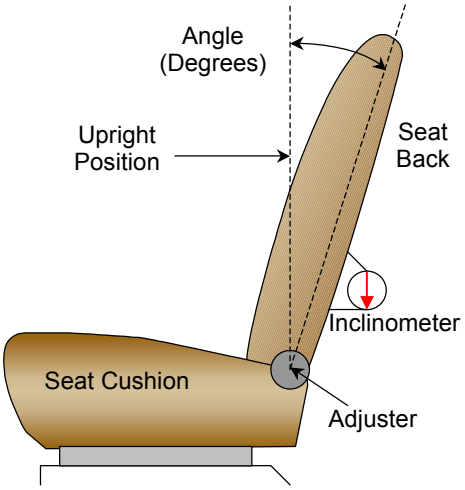
Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04

NORMAL DESIGN RIDING POSITION

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

Four detents rearward from the first locking detent.

Driver seat back angle: 12.5° on headrest post
Passenger seat back angle: 12.7° on headrest post



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

The driver seat was power adjustable. The passenger seat was adjustable manually.

Driver seat fore/aft total travel: 240 mm
Passenger seat fore/aft total travel: 25 notches
Driver seat fore/aft position: 120 mm
Passenger seat fore/aft position: 13 of 25

SEAT BELT UPPER ANCHORAGE

The front outboard D-rings were placed in the highest position.

DATA SHEET NO. 5... (continued)

TEST VEHICLE INFORMATION

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

FUEL TANK CAPACITY DATA

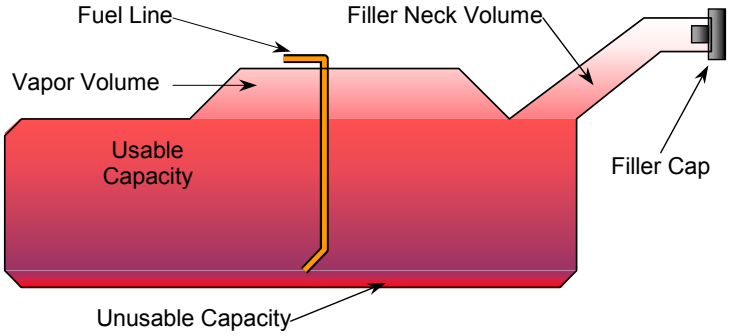
The "Usable Capacity" of the standard equipment fuel tank is: 64.7 liters

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

The "Usable Capacity" used for certification to FMVSS 301 requirements: 65.1 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 22.3 liters

After the ignition key is turned from lock to on position, the pump will be filled up for two seconds, and then the pressure is maintained.

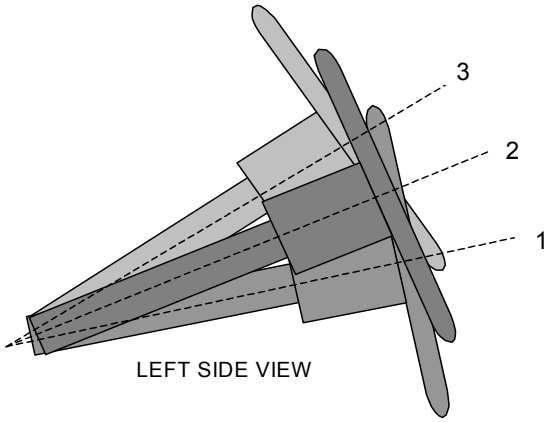


VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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

Lowermost, position 1: 25.7 °
Geometric center, position 2: 22.3 °
Uppermost. Position 3: 19.0 °



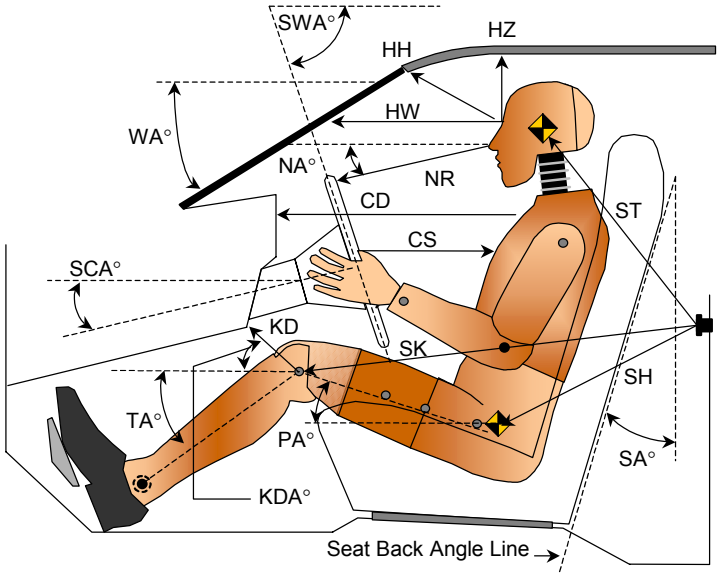
STEERING COLUMN ASSEMBLY

DATA SHEET NO. 6

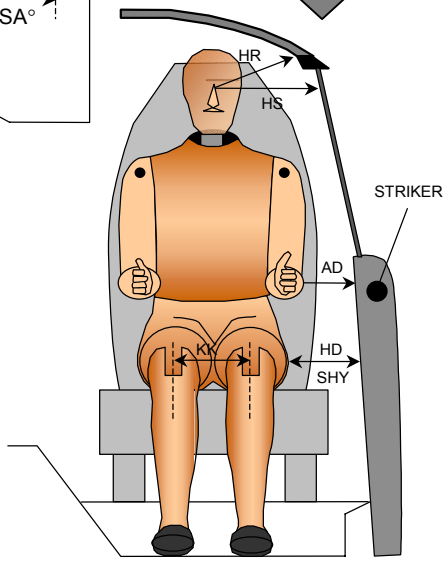
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04

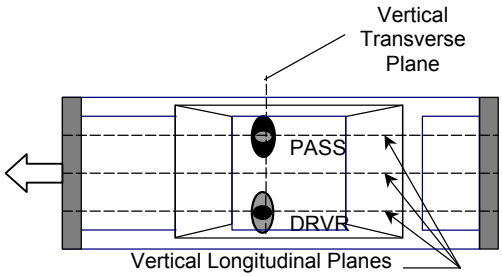
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



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



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



DATA SHEET NO. 6... (continued)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

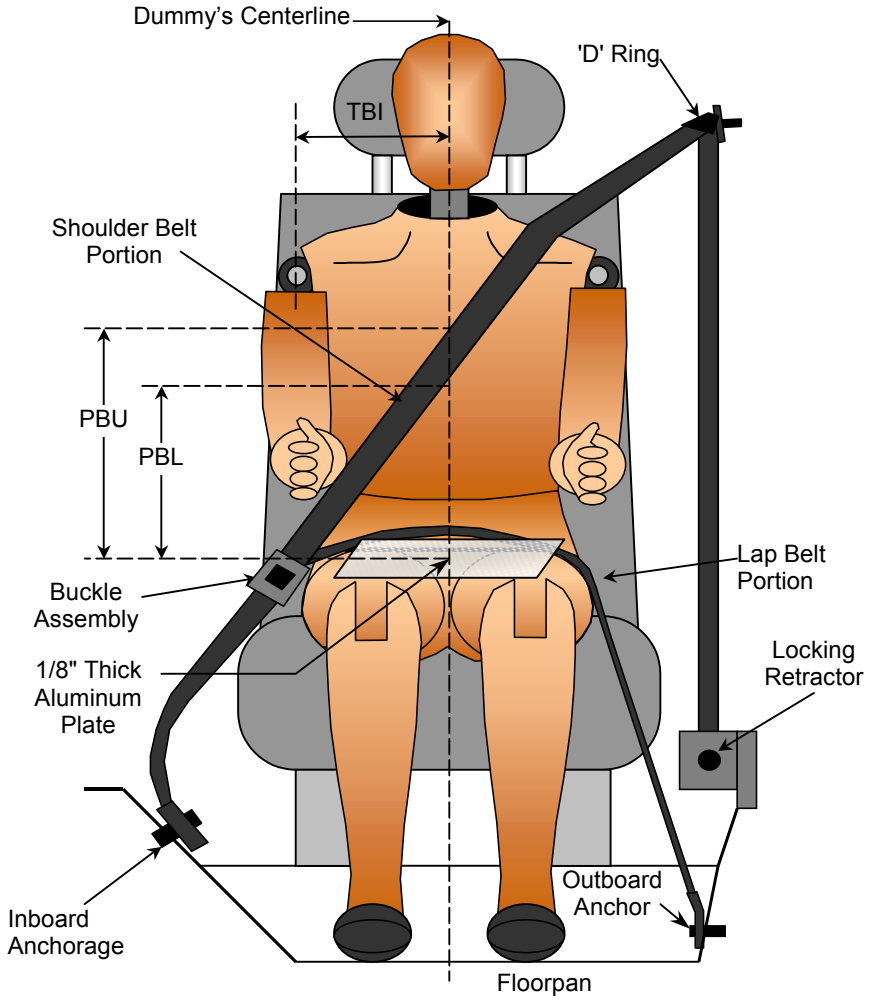
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		25.8		
SWA	Steering Wheel Angle		68.0		
SCA	Steering Column Angle		22.5		
SA	Seat Back Angle		12.5		12.7
HZ	Head to Roof (Z)	158	90.0	146	90.0
HH	Head to Header	341	22.1	338	20.5
HW	Head to Windshield	613	0.0	595	0.0
HR	Head to Side Header (Y)	209		219	
NR	Nose to Rim	386	9.2		
CD	Chest to Dash	512		553	
CS	Chest to Steering Hub	311	4.6		
RA	Rim to Abdomen	179	0.0		
KDL	Left Knee to Dash	166	28.7	156	
KDR	Right Knee to Dash	164		153	25.4
PA	Pelvic Angle		22.2		24.3
TA	Tibia Angle		41.5		44.1
KK	Knee to Knee (Y)	330		249	
SK	Striker to Knee	581	96.7	617	95.2
ST	Striker to Head	469	10.2	515	15.4
SH	Striker to H-Point	262	127.8	262	125.2
SHY	Striker to H-Point (Y)	250		230	
HS	Head to Side Window	308		327	
HD	H-Point to Door (Y)	144		151	
AD	Arm to Door (Y)	131		127	
AA	Ankle to Ankle	308		206	

DATA SHEET NO. 7

SEAT BELT POSITIONING DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	170	170
PBU - Top surface of reference to belt upper edge	mm	341	337
PBL - To surface of reference to belt lower edge	mm	269	252

DATA SHEET NO. 8

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

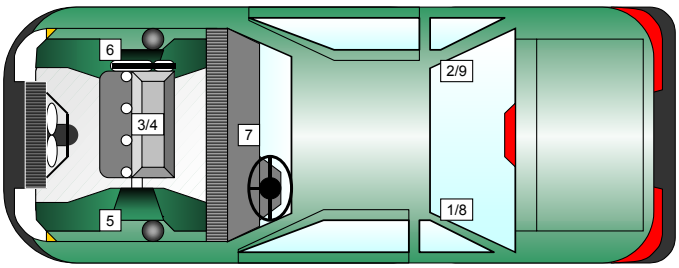
NHTSA No.: M45303
Test Date: 01/13/04

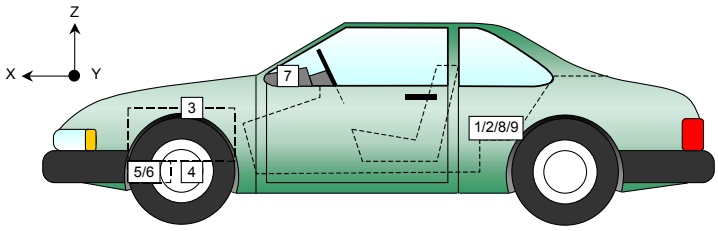
VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member X	1792	-430	365	G's	3.1	130	-35.7	50
2	Right Rear X-Member X	1794	540	371	G's	3.5	132	-39.2	47
3	Engine Top X	3830	-5	775	G's	41.6	46	-146.8	30
4	Engine Bottom X	3945	21	192	G's	36.8	47	-129.3	30
5	Left Brake Caliper X	3790	-815	245	G's	12.2	39	-100.0	32
6	Right Brake Caliper X	3788	817	242	G's	*	*	*	*
7	Instrument Panel X	3040	0	1005	G's	16.8	25	-57.2	51
8	Left Rear X-Member Z	1792	-430	365	G's	2.4	100	-11.7	61
9	Right Rear X-Member Z	1795	540	371	G's	4.7	87	-11.9	55

* No valid data collected after 25 msec.

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





DATA SHEET NO. 9

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	1.3	198	-45.8	72	0.3	19	-42.3	76
Head CG	Y	G's	4.3	32	-7.7	73	16.2	30	-16.9	30
Head CG	Z	G's	14.1	40	-8.8	51	15.7	103	-8.8	70
Head CG Resultant	N/A	G's	46.3	72			42.6	76		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.9	171	-41.3	72	2.6	189	-43.9	69
Chest CG	Y	G's	1.6	138	-5.4	50	6.2	88	-6.3	74
Chest CG	Z	G's	6.6	30	-13.6	64	8.2	93	-11.5	57
Chest CG Resultant	N/A	G's	42.4	71			44.9	68		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	428	25	-832	50	618	33	-3582	51
Right Femur	Z	Newtons	513	41	-951	50	816	67	-1559	57

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	5991	53			6687	58		
Shoulder Belt Force	N/A	Newtons	3031	37			4424	38		

HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg. G's	T^1	T^2	HIC	Avg. G's	T^1	T^2
Head CG Primary	268.4	35.4	50.8	86.8	214.3	32.4	61.1	97.1

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	42.1	69.1	72.1	42.9	66.7	69.7

DATA SHEET NO. 9... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	10.3	172	-40.8	52	10.2	191	-82.4	52
Pelvis	Y	G's	9.6	73	-7.1	52	5.1	99	-3.6	66
Pelvis	Z	G's	6.0	180	-35.5	68	3.7	186	-36.1	56

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	726	61	-478	101	291	85	-487	133
Neck Force	Y	Newtons	131	109	-140	109	66	65	-93	91
Neck Force	Z	Newtons	843	57	-194	137	971	40	-91	146
Neck Moment	X	N•m	5.2	138	-6.9	98	8.3	88	-4.4	129
Neck Moment	Y	N•m	58.6	61	-29.6	94	43.3	121	-32.8	95
Neck Moment	Z	N•m	5.4	89	-4.2	54	3.5	78	-3.8	58

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	4.2	190	-46.2	24	19.5	43	-80.1	32
Left Foot Aft	Z	G's	12.3	200	-33.3	26	14.2	55	-79.1	40
Left Foot Fore	Z	G's	52.3	24	-58.5	20	23.7	56	-132.6	31
Right Foot Aft	X	G's	7.4	74	-62.8	48	34.8	39	-67.0	31
Right Foot Aft	Z	G's	2.7	194	-81.9	35	4.9	20	-63.1	39
Right Foot Fore	Z	G's	46.2	29	-159.7	35	25.5	53	-101.8	33

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	22.9	66	-1.0	169	19.8	39	-57.1	50
Left Lower Moment	Y	N•m	13.7	50	-17.4	62	50.6	32	-49.9	40
Left Lower Force	Z	Newtons	171	109	-2443	26	107	158	-4301	50
Left Upper Moment	X	N•m	28.5	43	-41.2	63	39.3	128	-66.8	41
Left Upper Moment	Y	N•m	32.6	61	-61.1	27	19.9	197	-107.1	67
Left Upper Force	Z	Newtons	281	109	-1734	26	66	156	-4203	50
Right Lower Moment	X	N•m	11.8	33	-49.9	39	42.4	75	-31.4	40
Right Lower Moment	Y	N•m	27.1	82	-18.0	40	70.4	39	-36.7	33
Right Lower Force	Z	Newtons	102	109	-2864	34	95	158	-3670	39
Right Upper Moment	X	N•m	55.1	51	-32.4	83	25.0	67	-57.5	47
Right Upper Moment	Y	N•m	47.3	52	-85.1	39	27.9	46	-94.9	54
Right Upper Force	Z	Newtons	76	133	-2199	36	78	158	-2901	39

DATA SHEET NO. 9... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	mm			-20.5	79			-18.6	79

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	0.5	200	-46.6	74	0.3	19	-42.2	74
Head CG	Y	G's	6.1	133	-8.0	73	17.2	31	-15.7	31
Head CG	Z	G's	14.1	39	-9.6	51	16.5	104	-10.1	70
Head CG Resultant	N/A	G's	47.3	74			42.4	74		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.8	170	-41.7	71	2.6	181	-44.0	69
Chest CG	Y	G's	0.8	81	-4.5	49	6.3	88	-5.3	67
Chest CG	Z	G's	6.6	28	-13.8	65	8.1	43	-12.8	57
Chest CG Resultant	N/A	G's	43.1	70			45.0	68		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg.	T^1	T^2	HIC	Avg.	T^1	T^2
Head CG Primary Redundant	280.8	36.1	50.6	86.5	212.8	32.3	61.1	97.1

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary Redundant	42.3	69.2	72.2	42.5	66.7	69.7

DATA SHEET NO. 10

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

SEAT BELT PLACEMENT MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	170	170
PBU - Top surface of reference to belt upper edge	mm	341	337
PBL - Top surface of reference to belt lower edge	mm	269	252

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to "D" ring	mm	148	148
Shoulder belt length as measured on ATD	mm	878	873
Lap belt length as measured on ATD	mm	768	779
Remainder of belt on reel	mm	1361	1313
Total belt length for continuous webbing systems	mm	3155	3113

SHOULDER BELT SPOOL-OUT DATA

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

DATA SHEET NO. 11

SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

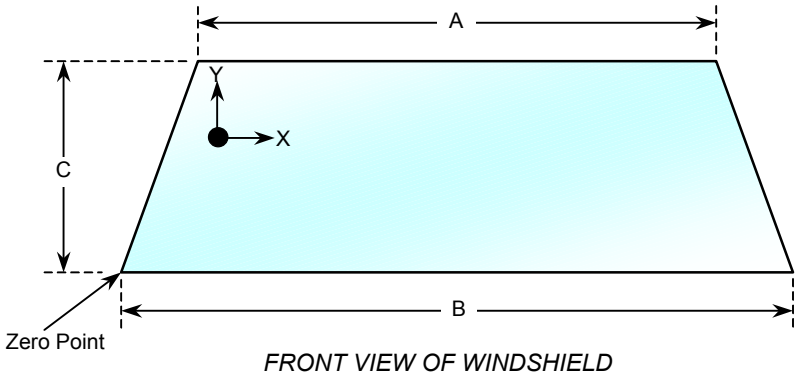
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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

Temperature of windshield molding during test: 21 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2103	2103	100
Right Side	2103	2103	100
Total	4206	4206	100



FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

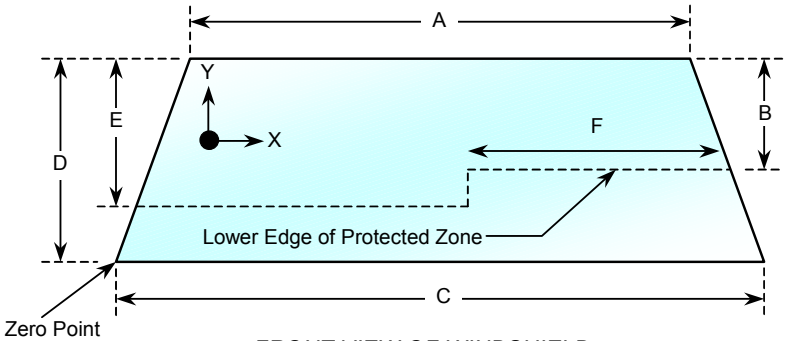
Item	Units	Segment Length	Molding Width
A	mm	1136	17
B	mm	1419	9
C	mm	825	22

DATA SHEET NO. 12

WINDSHIELD ZONE INTRUSION FMVSS 219 (Partial) DATA

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1136
B	mm	453
C	mm	1419
D	mm	825
E	mm	515
F	mm	473

AREA OF PROTECTED ZONE FAILURES - NONE

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

X	Y

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

X	Y

DATA SHEET NO. 13

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

Temperature at Time of Impact: 21° C Test Time: 11:32 am

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum Allowable = 5 ounces)

C. For the following 25 minutes: 0 oz.
(Maximum Allowable = 1 oz. /minute)

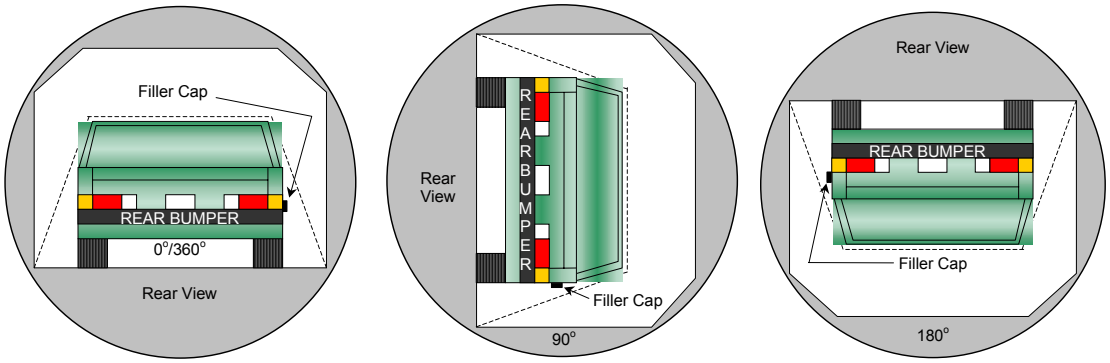
D. Spillage: None

DATA SHEET NO. 14

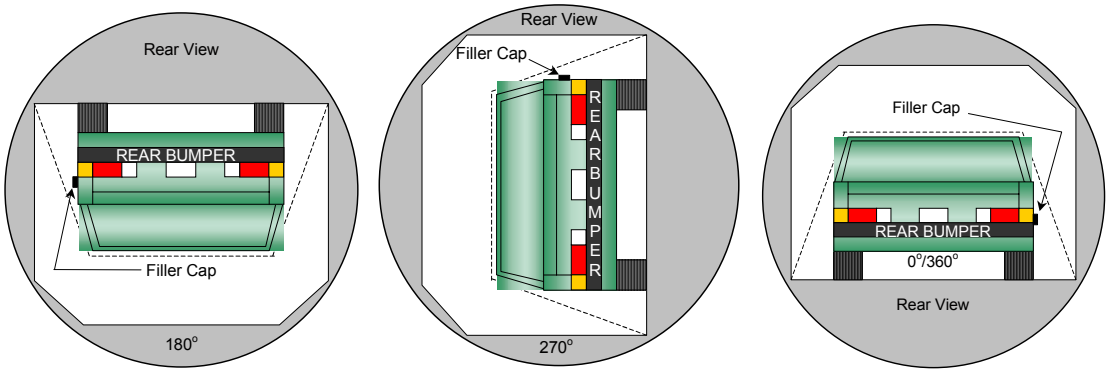
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

Test Time: 11:32 am



0° to 90° 90° to 180°



180° to 270° 270° to 360°

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

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	172	300	0
90° to 180°	151	300	0
180° to 270°	137	300	0
270° to 360°	160	300	0

DATA SHEET NO. 15

VEHICLE MEASUREMENTS

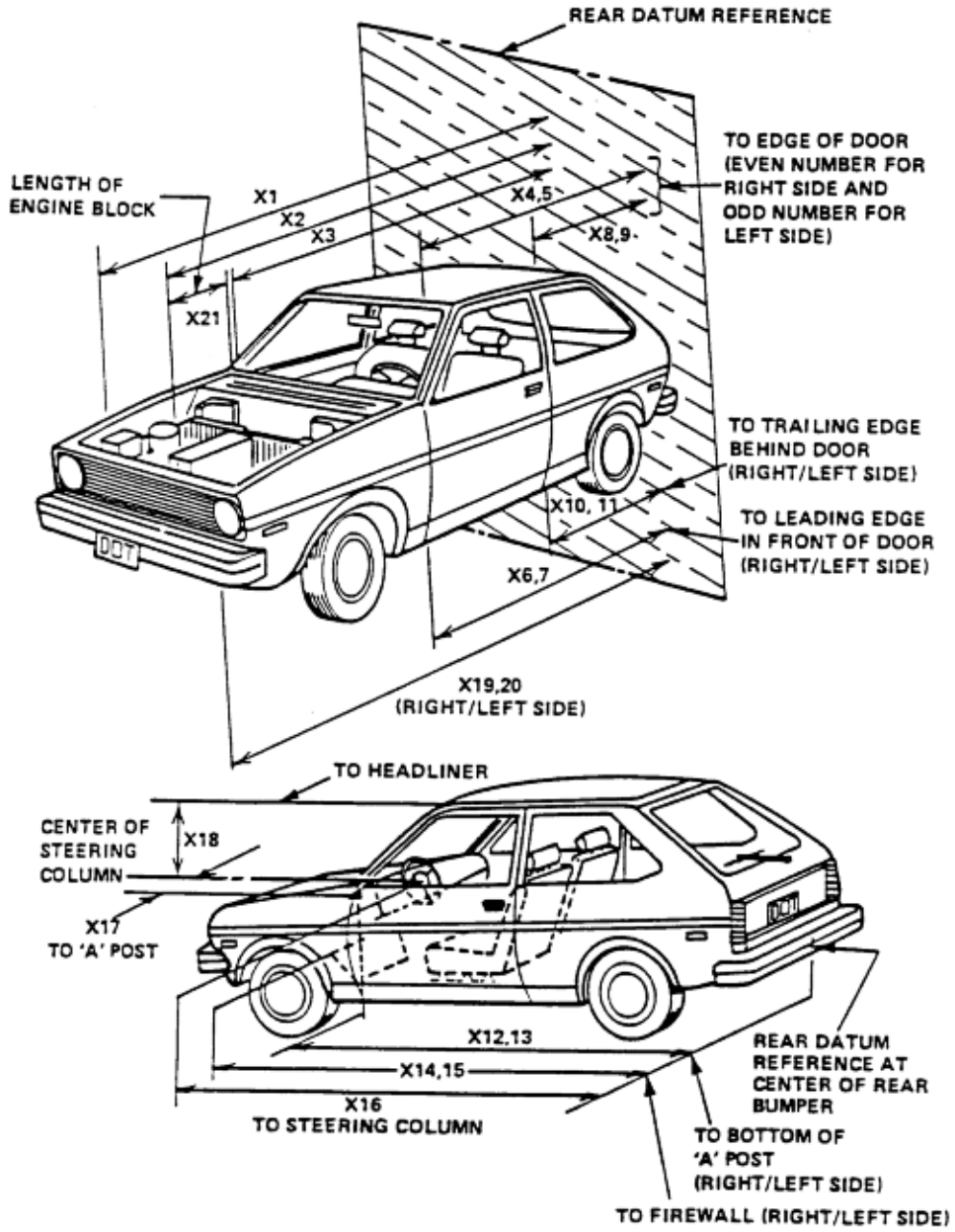
Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4622	4152	470
2	RSOV to front of engine	mm	3862	3805	57
3	RSOV to firewall centerline	mm	3290	3286	4
4	RSOV to leading edge of right door	mm	3175	3176	-1
5	RSOV to leading edge of left door	mm	3191	3181	10
6	RSOV to lower leading edge of right door	mm	3174	3171	3
7	RSOV to lower leading edge of left door	mm	3190	3183	7
8	RSOV to upper leading edge of right door	mm	2055	2040	15
9	RSOV to upper leading edge of left door	mm	2046	2053	-7
10	RSOV to lower trailing edge of right door	mm	2056	2057	-1
11	RSOV to lower trailing edge of left door	mm	2072	2068	4
12	RSOV to bottom of right 'A' pillar	mm	3130	3108	22
13	RSOV to bottom of left 'A' pillar	mm	3148	3139	9
14	RSOV to firewall on right side	mm	3476	3466	10
15	RSOV to firewall on left side	mm	3495	3482	13
16	RSOV to steering column	mm	3669	3689	-20
17	Center of steering column to left 'A' pillar	mm	345	310	35
18	Center of steering column to headlining	mm	415	375	40
19	RSOV to right side of front bumper	mm	4394	4096	298
20	RSOV to left side of front bumper	mm	4407	4101	306
21	Length of engine block	mm	446	446	0
RD	RSOV to right side of dash panel	mm	2970	2980	-10
CD	RSOV to center of dash panel	mm	3021	3053	-32
LD	RSOV to left side of dash panel	mm	2962	2986	-24

DATA SHEET NO. 15... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04



DATA SHEET NO. 15... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

Target Vehicle Structural Measurement

	Elements	Pre-Test (mm)
1	Total Length	4622
2	Total Width	1764
3	Bumper Top Height	518
4	Bumper Bottom Height	428
5	Longitudinal Member Top Height	200
6	Distance between Longitudinal Members	775
7	Longitudinal Member Width	97
8	Engine Top Height	850
9	Engine Bottom Height	188
10	Engine and gearbox width	850
11	Front bumper-engine distance	410
12	Front shock absorber fixing height	845
13	Bonnet leading edge height	693
14	Front shock absorber fixing width	945
15	Front bumper – front axle distance	1005
16	Front axle – a pillar distance	480
17	A-pillar – B-pillar distance	1125
18	B-Pillar – rear axle distance	1054
19	B-pillar – C-pillar distance	630
20	Roof sill bottom height	1370
21	Roof sill top height	1435
22	Floor sill bottom height	210
23	Floor sill top height	315

DATA SHEET NO. 16

CAMERA LOCATIONS

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				13	24
2	Left Front View	1000	-8000	1390	25	1020
3	Steering Column Top	2000	-8000	1570	25	1010
4	Steering Column Bottom	2000	-8010	1040	25	1015
5	Driver Close-up	1500	-8800	1350	50	1010
6	Driver Angle	4440	-5000	2010	50	1093
7	Left Rear				13	524
8	Right Rear				13	*
9	Right Overall	2030	6870	1500	13	613
10	Right Passenger Half	9200	7530	1480	25	508
11	Right Close-up	1460	9050	1450	50	1111
12	Right Angle	4800	5570	2100	50	873
13	Windshield	460	0	2960	13	1015
14	Top Driver	-120	-500	2280	13	1010
15	Top Passenger	-120	530	2280	13	1010
16	Pit Front	1130	0	-3020	13	1010
17	Pit Rear	3010	0	-3010	13	1010

*COORDINATES:

+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

+Z = film plane above ground level

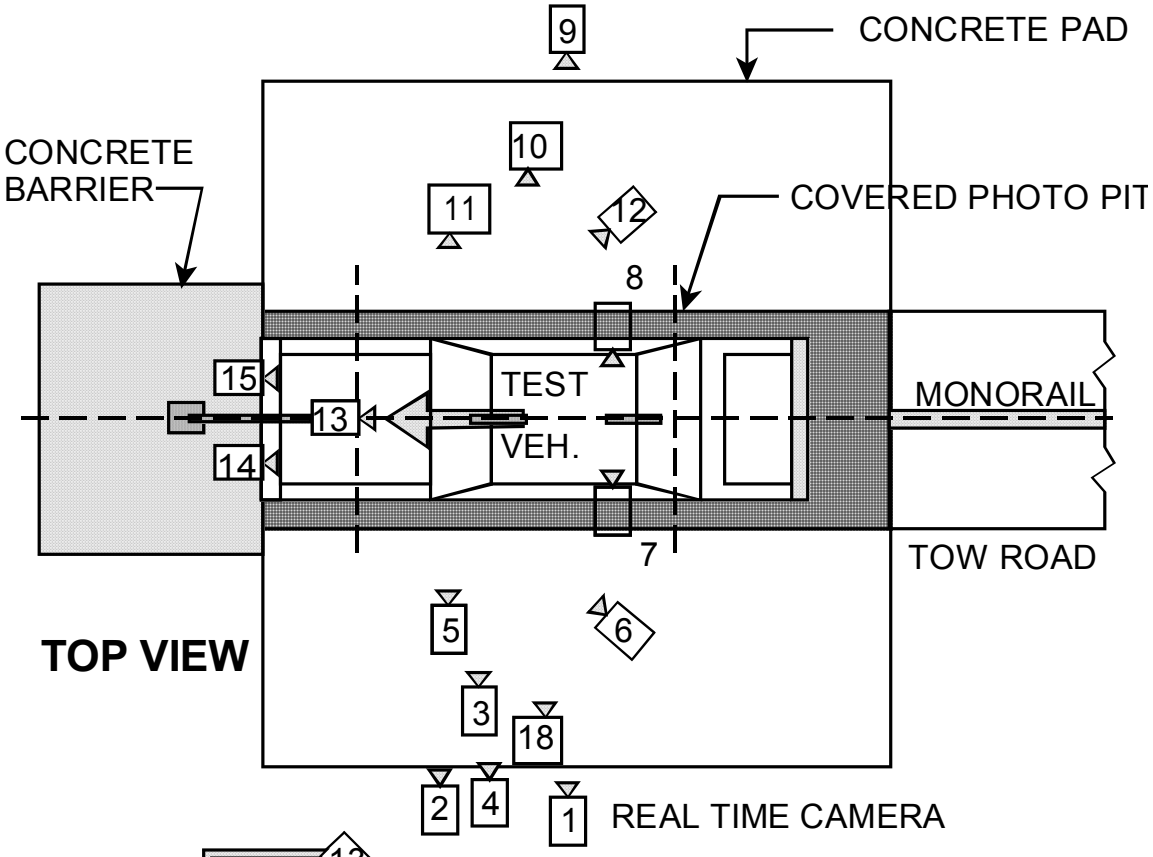
* No timing marks

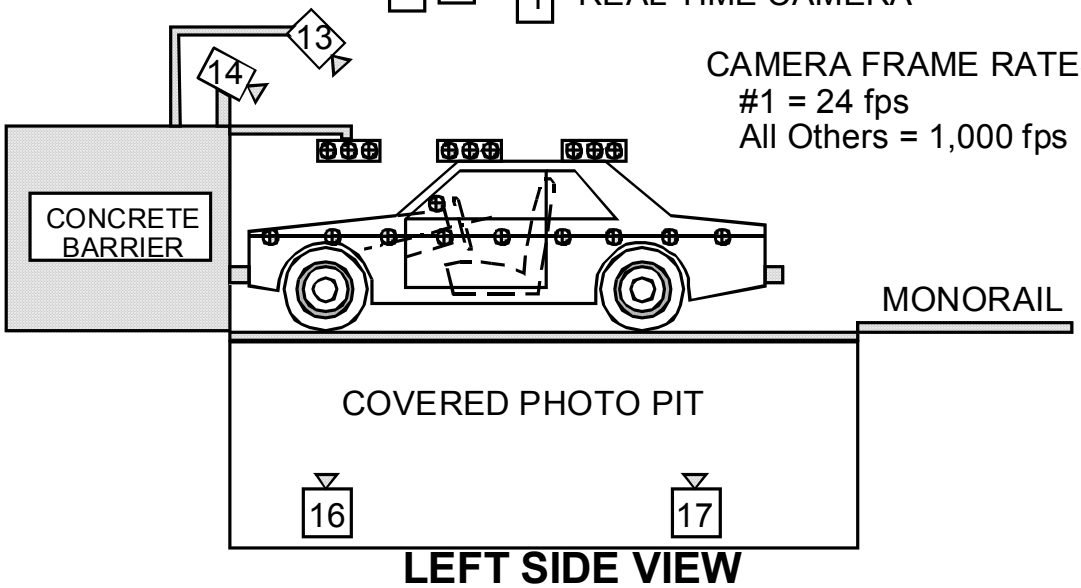
DATA SHEET NO. 16... (continued)

CAMERA LOCATIONS

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

CAMERA POSITIONS FOR FRONTAL IMPACTS





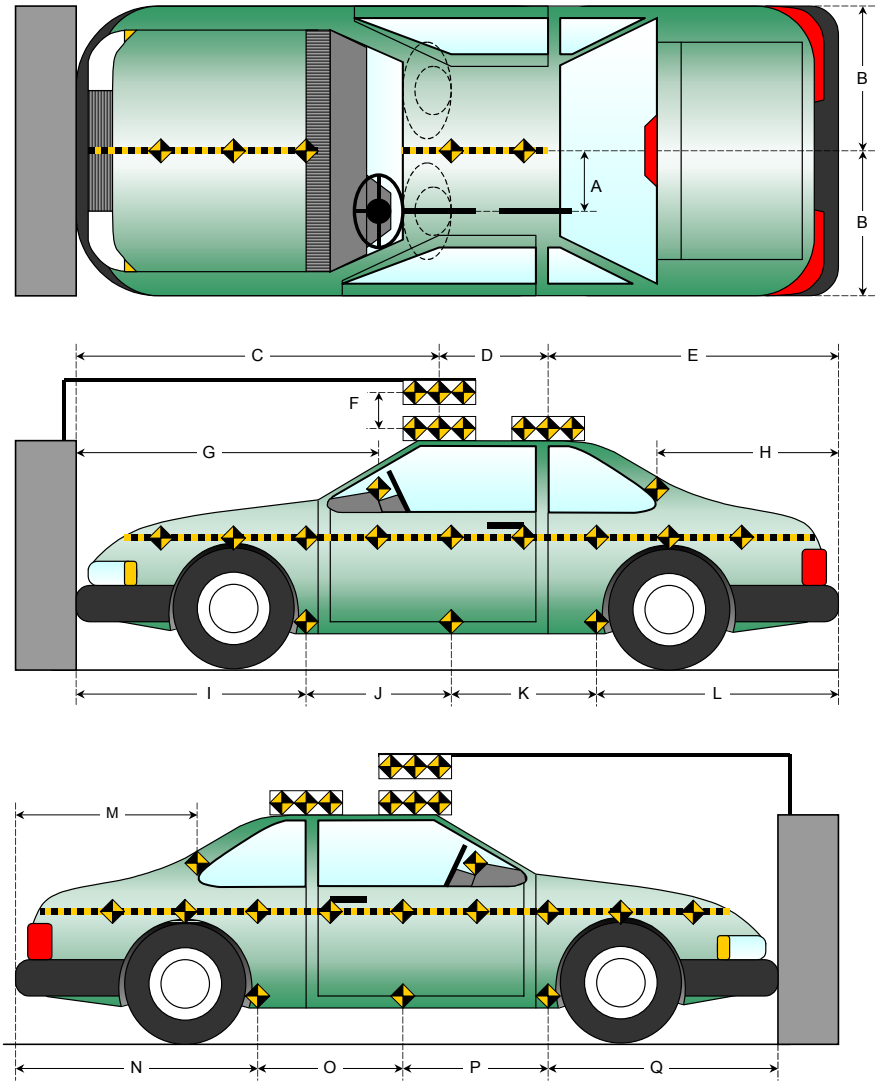
DATA SHEET NO. 17

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04

Item	Value
A	478
B	770
C	1250
D	609
E	1604
F	89
G	
H	954
I	1462
J	862
K	863
L	1435
M	913
N	1462
O	866
P	858
Q	1436



DATA SHEET NO. 18

VEHICLE INTRUSION MEASUREMENTS

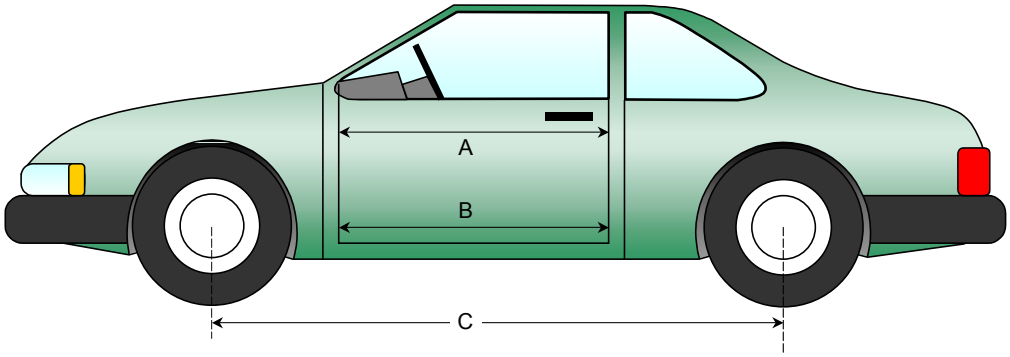
Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04

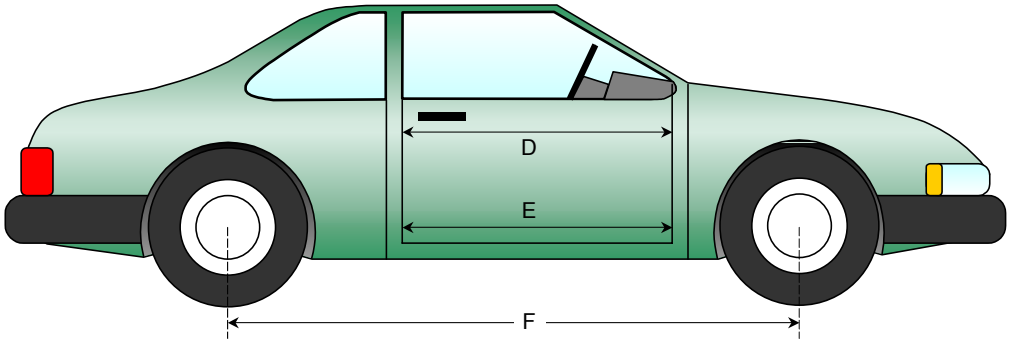
DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1045	1044	1
B	Left Side Lower	mm	980	979	1
D	Right Side Upper	mm	1048	1048	0
E	Right Side Lower	mm	953	949	4

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2665	2558	107
F	Right Side Wheelbase	mm	2660	2548	112





DATA SHEET NO. 18... (continued)

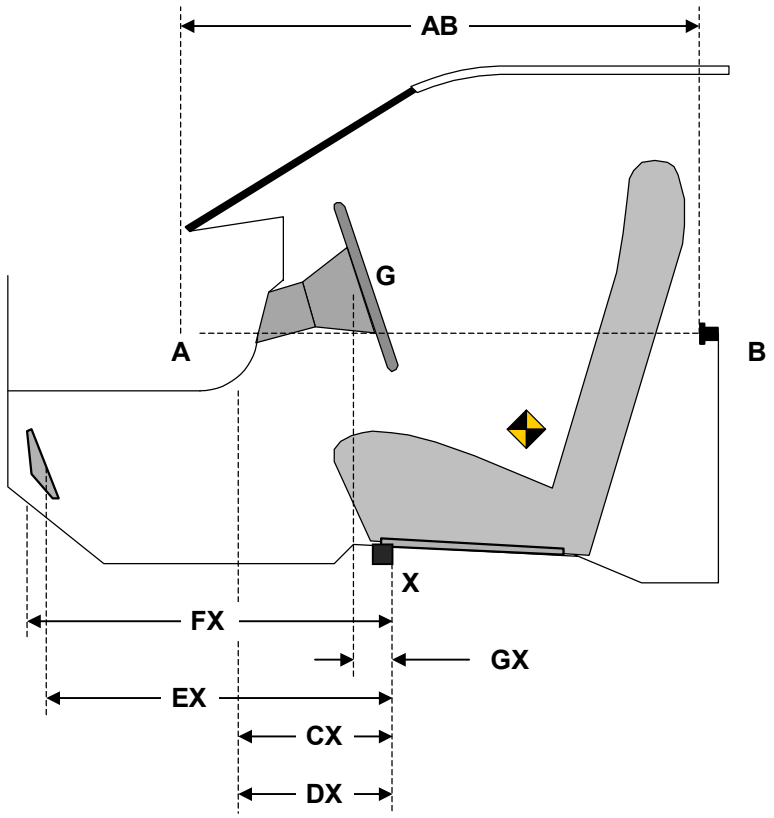
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1045	1044	1
CX	Left Knee Bolster to X	mm	336	356	-20
DX	Right Knee Bolster to X	mm	354	359	-5
EX	Brake Pedal to X	mm	564	592	-28
FX	Foot Rest to X	mm	603	623	-20
GX	Center of Steering Column Wheel Hub to X	mm	84	109	-25

X = Left Front Seat Front Outboard Anchor Bolt Head



DRIVER COMPARTMENT

DATA SHEET NO. 18... (continued)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

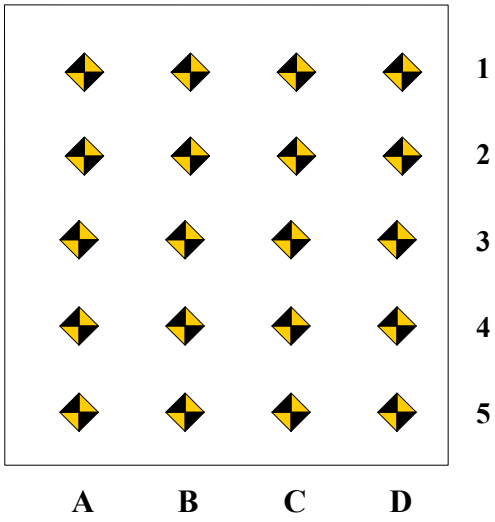
NHTSA No.: M45303
Test Date: 01/13/04

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

Columns A through D are evenly spaced.

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

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



DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	759	778	772	755	717	740	724	703	42	38	48	52
2	628	665	650	589	619	655	633	556	9	10	17	33
3	542	508	507	505	545	511	504	504	-3	-3	3	1
4	384	355	350	348	376	352	349	349	8	3	1	-1
5	186	191	184	191	190	189	184	191	-4	2	0	0

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	170	124	98	105	173	140	128	118	-3	-16	-30	-13
2	75	0	5	91	66	5	10	54	9	-5	-5	37
3	-52	-50	-50	-41	-57	-57	-60	-74	5	7	10	33
4	-59	-58	-50	-15	-67	-59	-69	-52	8	1	19	37
5	-59	-48	-41	0	-70	-58	-60	-40	11	10	19	40

DATA SHEET NO. 18... (continued)

VEHICLE INTRUSION MEASUREMENTS

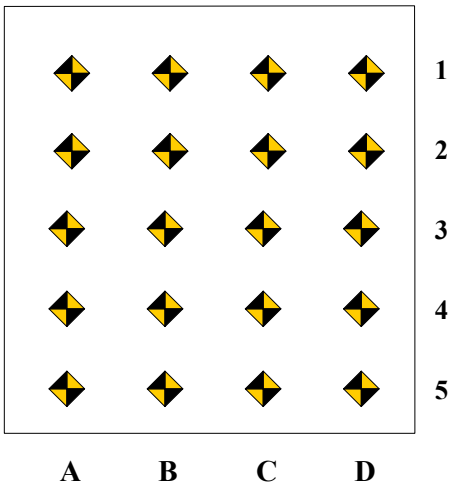
Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact
NHTSA No.: M45303
Test Date: 01/13/04

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

Columns A through D are evenly spaced.

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

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



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	810	802	811	764	725	713	707	674	85	89	104	90
2	693	688	691	702	662	634	654	668	31	54	37	34
3	543	545	550	558	541	546	555	555	2	-1	-5	3
4	371	394	395	396	371	393	403	394	0	1	-8	2
5	217	231	235	230	213	234	234	232	4	-3	1	-2

PASSENGER FLOOR PAN Z-AXIS

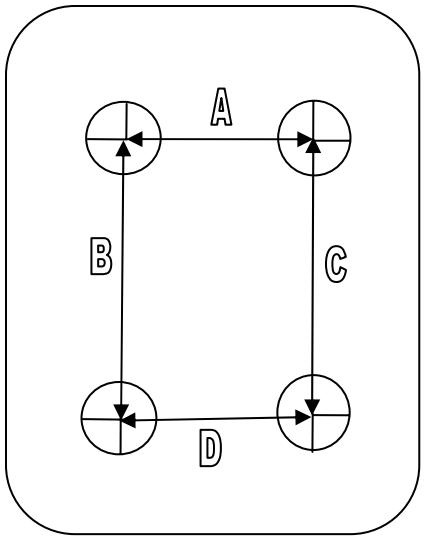
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	95	91	93	155	128	134	143	149	-33	-43	-50	6
2	-28	-40	-35	-28	0	-4	-3	-9	-28	-36	-32	-19
3	-89	-96	-85	-89	-107	-112	-96	-105	18	16	11	16
4	-81	-87	-81	-91	-123	-109	-105	-113	42	22	24	22
5	-45	-82	-86	-83	-84	-108	-104	-104	39	26	18	21

DATA SHEET NO. 18... (continued)

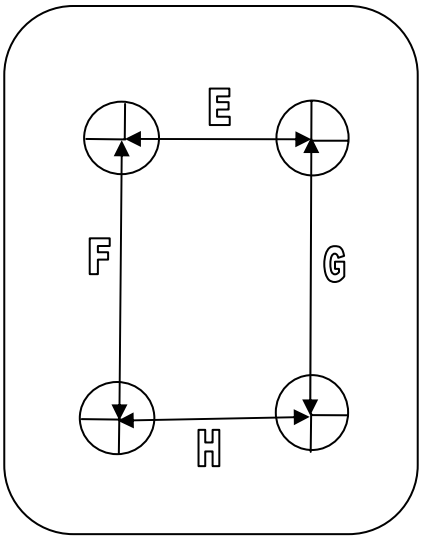
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Acura TSX 4-Dr
Test Program: 35mph Frontal Impact

NHTSA No.: M45303
Test Date: 01/13/04



Driver



Passenger

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	355	356	-1
B	594	590	4
C	591	587	4
D	329	333	-4
E	297	293	4
F	517	529	-12
G	522	523	-1
H	334	336	-2

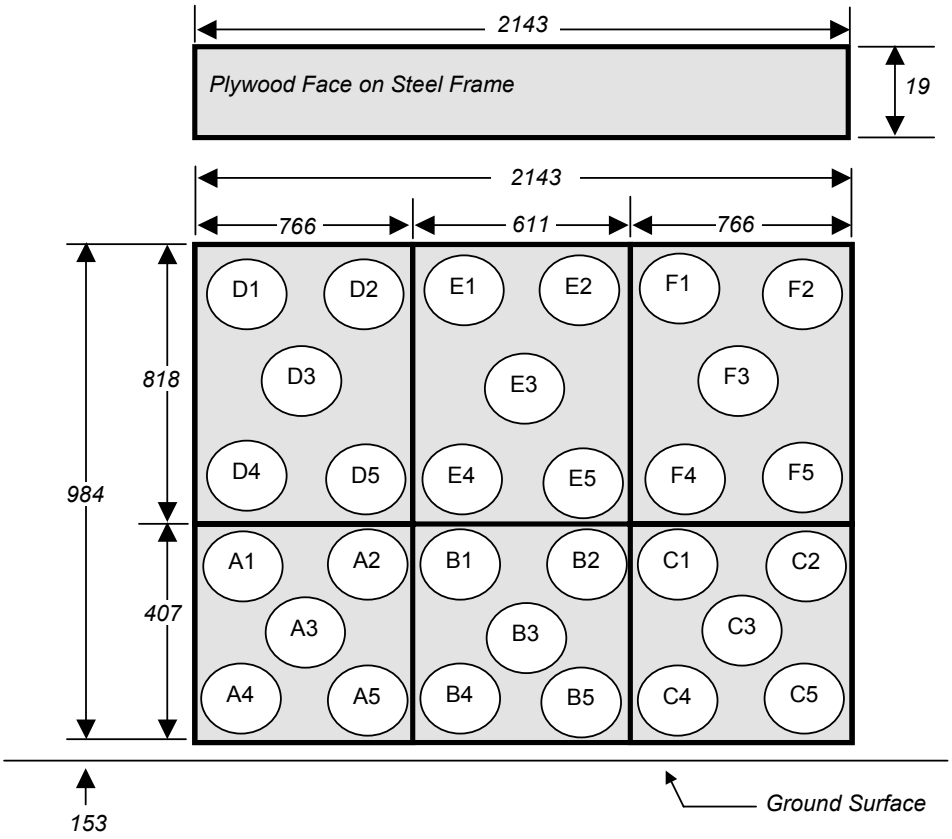
DATA SHEET NO. 19

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

30 Load Cell Rigid Barrier

Load Cell Locations on Fixed Barrier



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

6 Groups of 5 Load Cells Each

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

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

DATA SHEET NO. 20

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04

VEHICLE INFORMATION

VIN: JH4CL96844C019837 Wheelbase (mm) : 2671
Vehicle Size Category: Sedan Test Weight (kg) : 1693.3

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 14
Cal. Procedure/Interval: MGA procedure / 6 month
Integration Algorithm: Trapezoidal Linearity: > 99%
Impact Velocity (km/h): 56.5
Velocity Change (km/h): 68.2 Time of Separation (msec): 102

CRUSH PROFILE

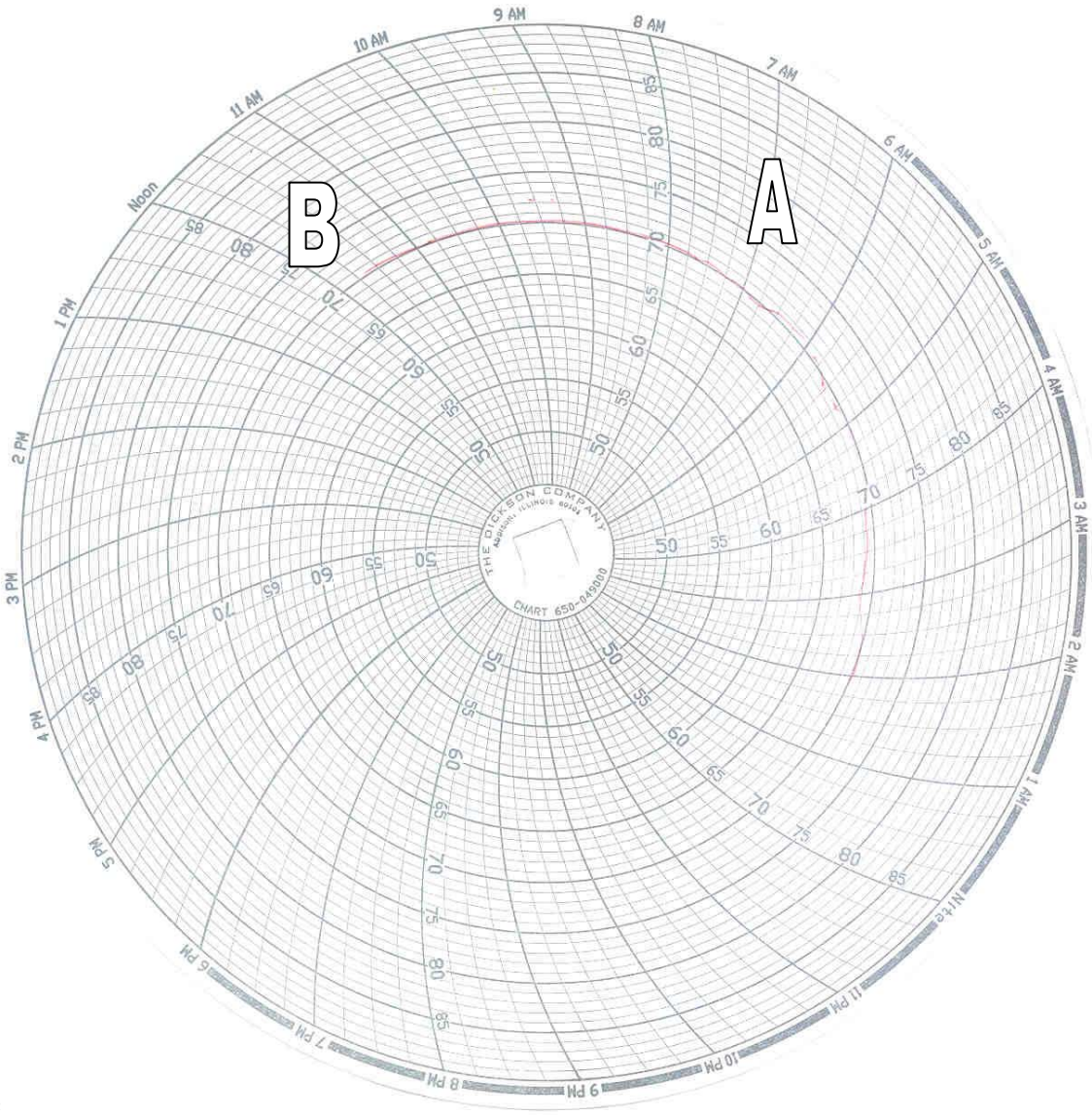
Collision Deformation Classification: Frontal Midpoint of Damage: Centerline
Damage Region Length (mm): 1532 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4407	4101	306
C2	Crush zone 2 at left side	mm	4557	4113	444
C3	Crush zone 3 at left side	mm	4609	4142	467
C4	Crush zone 4 at right side	mm	4604	4131	473
C5	Crush zone 5 at right side	mm	4533	4094	439
C6	Crush zone 6 at right side	mm	4394	4096	298
L	C1 TO C6	mm	1532	1502	30

DATA SHEET NO. 21

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2004 Acura TSX 4-Dr NHTSA No.: M45303
Test Program: 35mph Frontal Impact Test Date: 01/13/04



A = Dummies installed in vehicle at 7:00 a.m.

B = Test conducted at 11:32 a.m.

APPENDIX A

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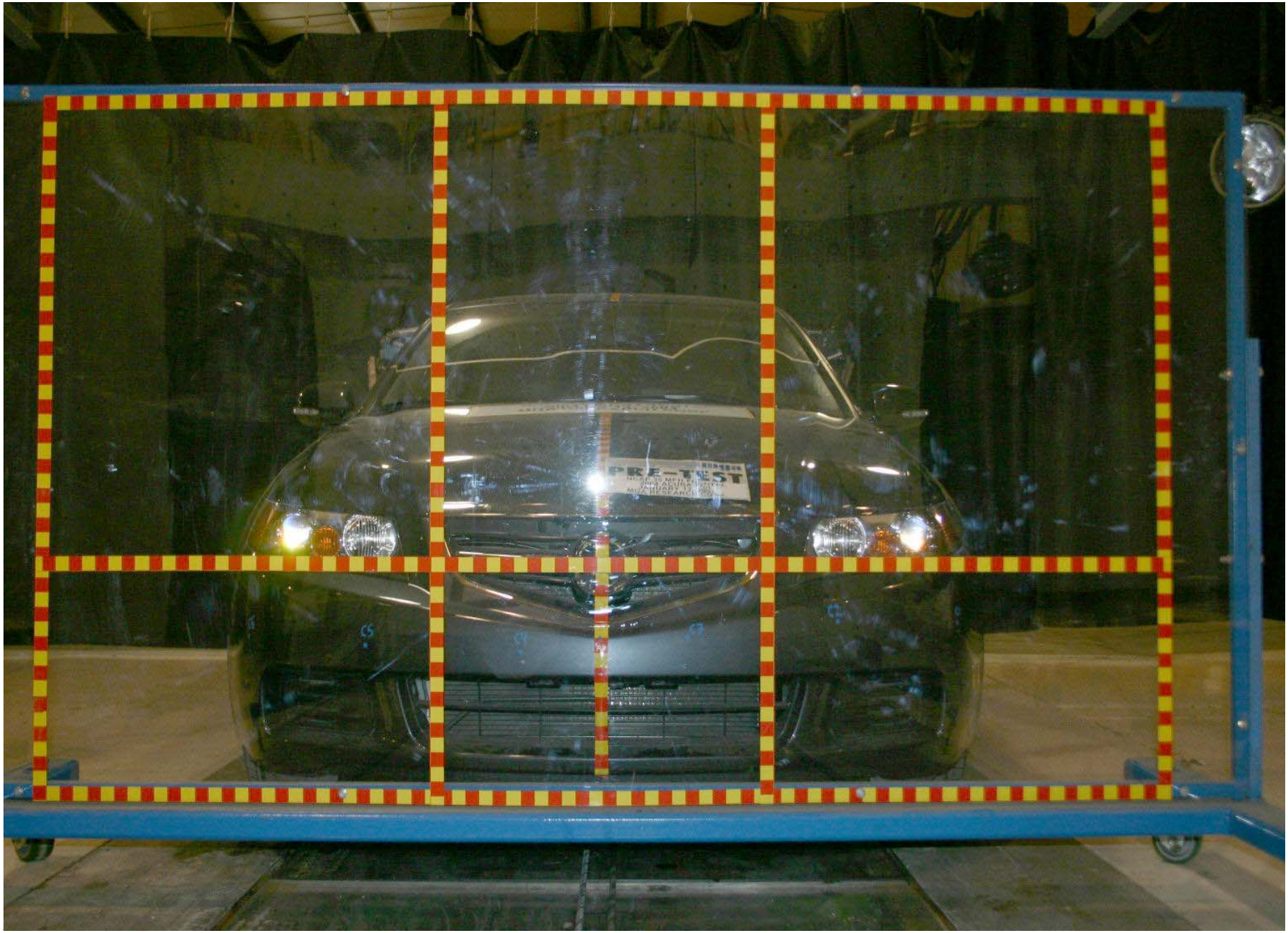


Load Cell Location

A-1.

Vehicle Certification Label

Tire Placard

Right Front View of Test Vehicle, as received

Left Rear View of Test Vehicle, as received

Pre-Test Front View of Test Vehicle

Post-Test Front View of Test Vehicle

Pre-Test Left Side View of Test Vehicle

Post-Test Left Side View of Test Vehicle

Pre-Test Right Side View of Test Vehicle

Post-Test Right Side View of Test Vehicle

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

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

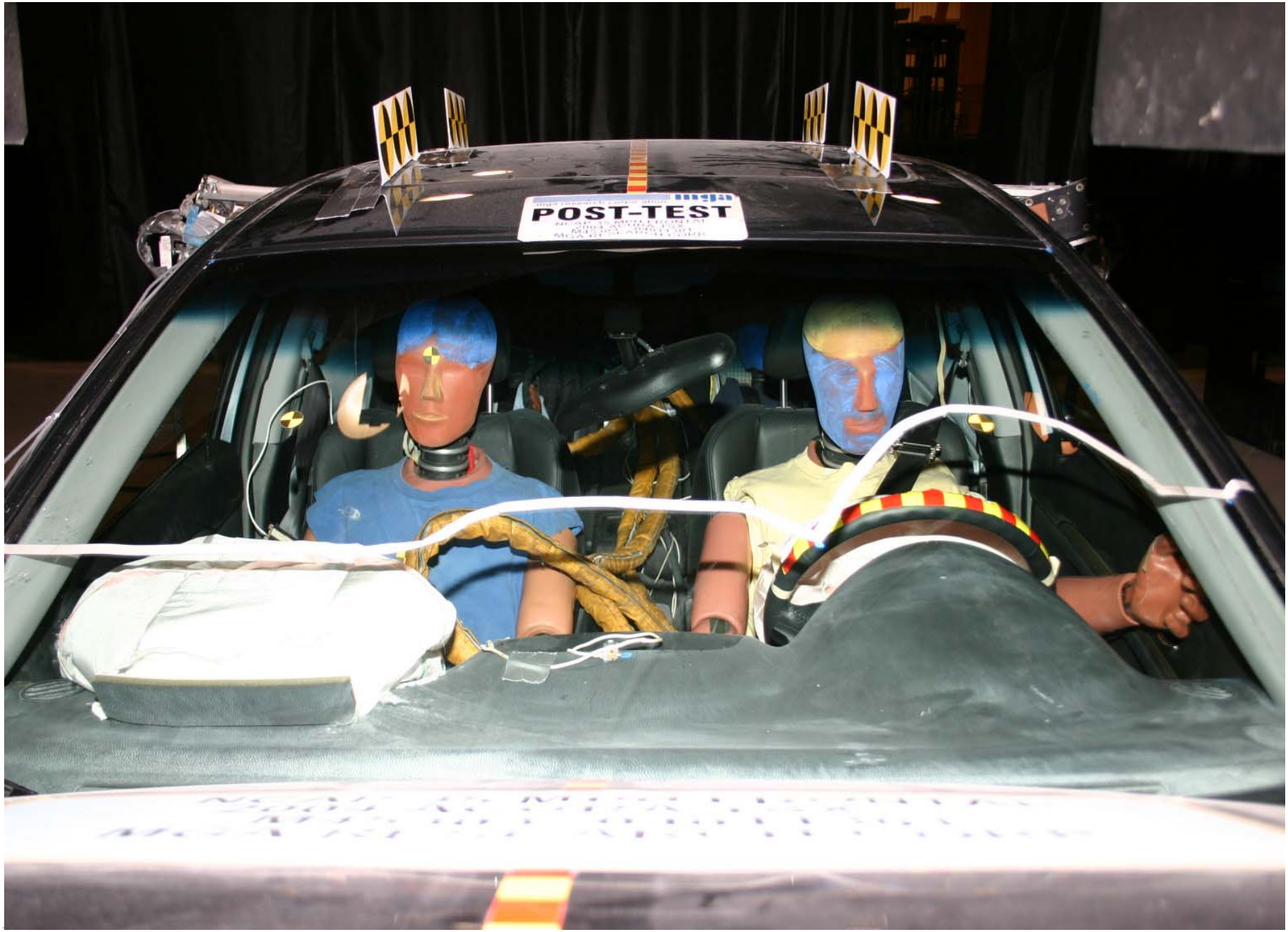
Pre-Test Left Rear Three-Quarter View of Test Vehicle

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

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

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

Pre-Test Windshield View



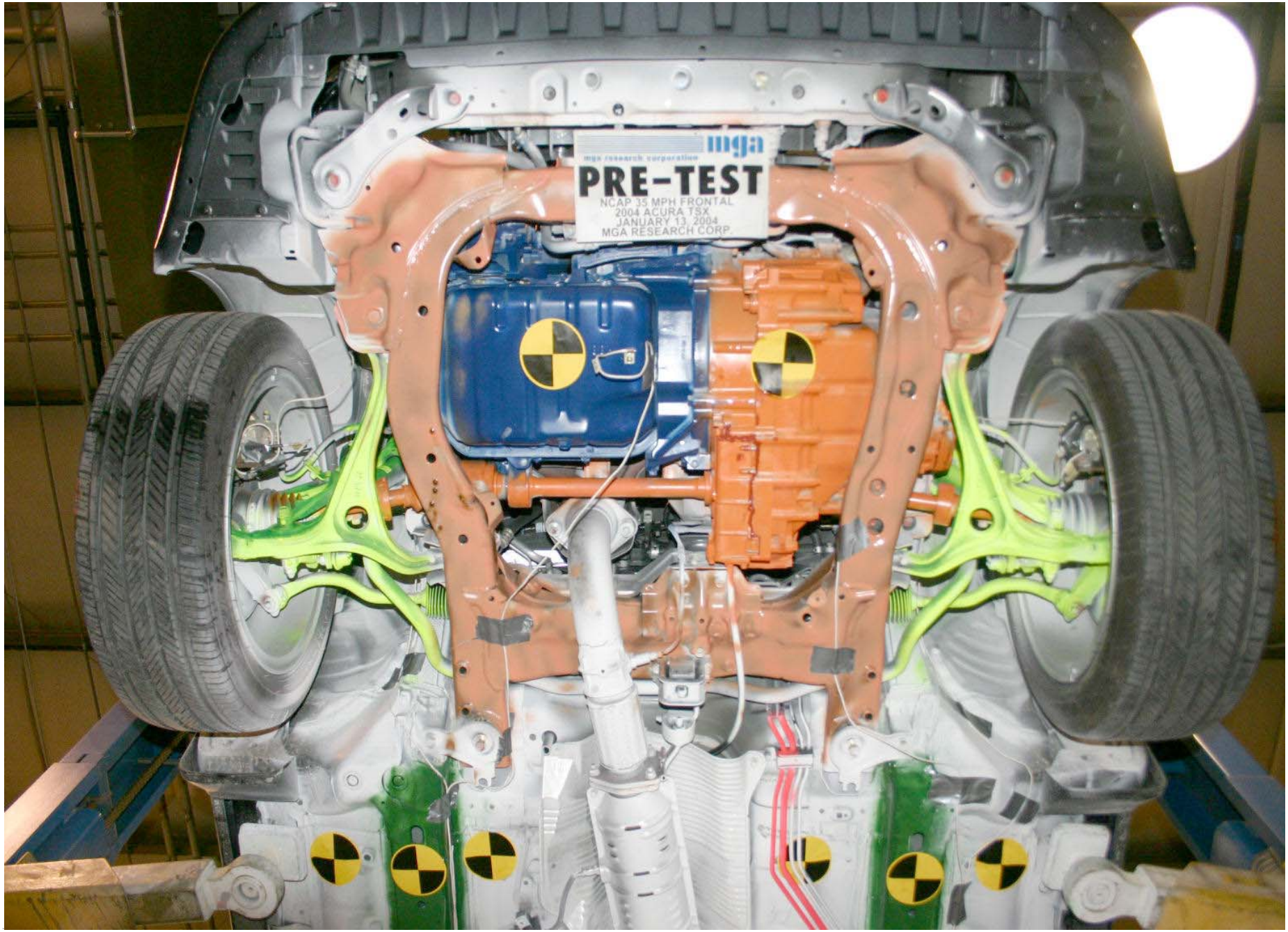
Post-Test Windshield View

Pre-Test Engine Compartment View

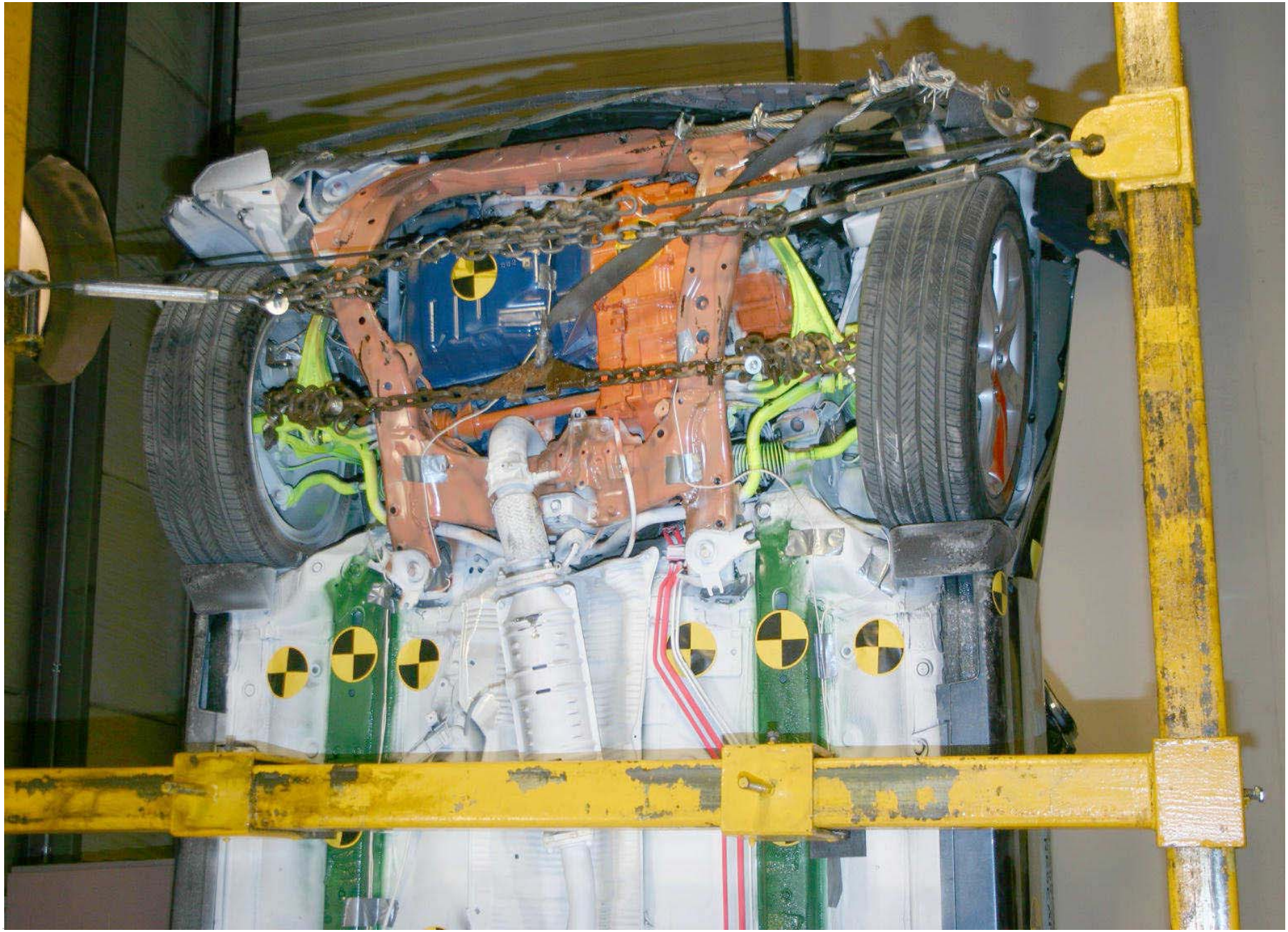
Post-Test Engine Compartment View

Pre-Test Fuel Filler Cap View

Post-Test Fuel Filler Cap View



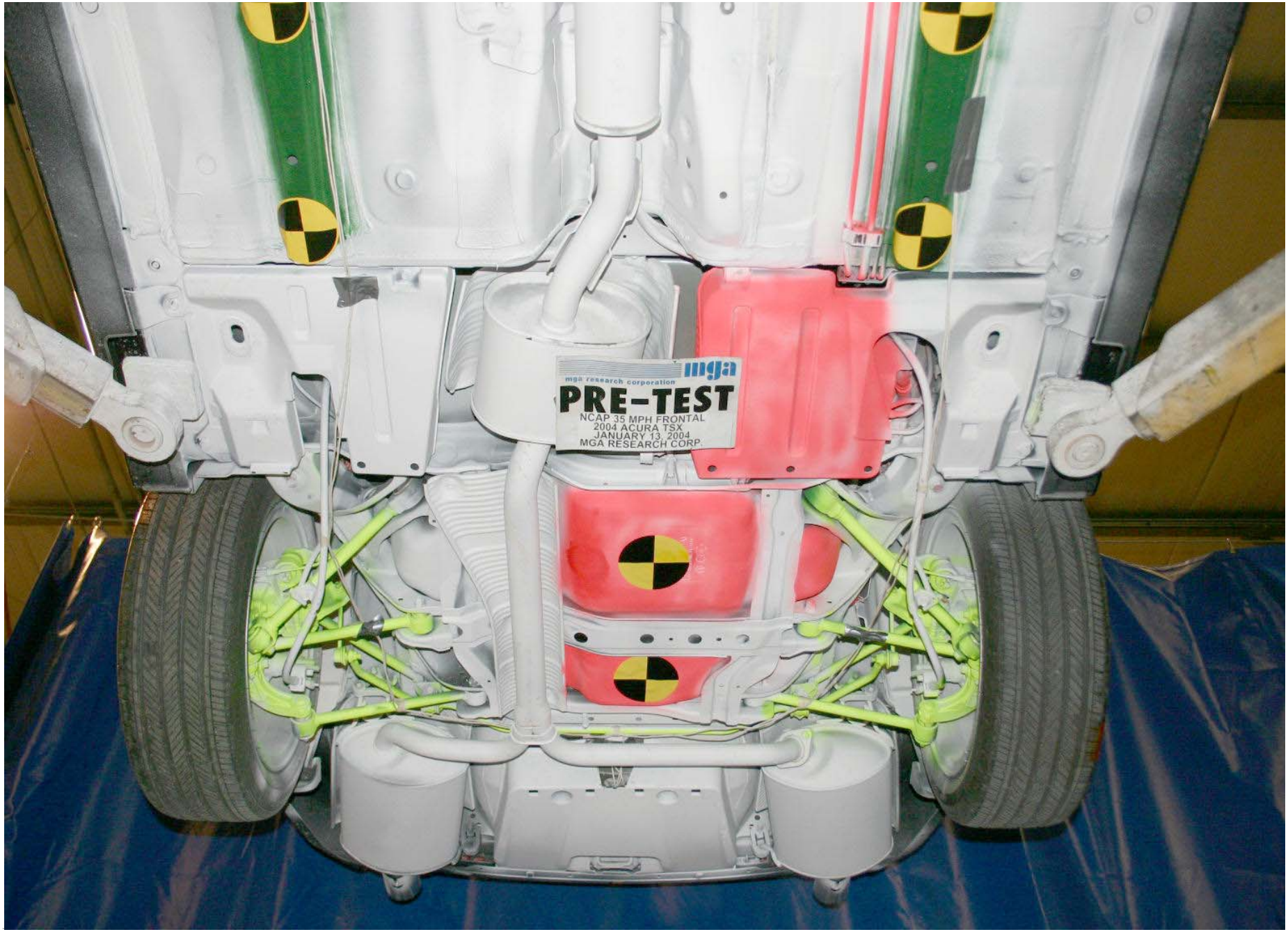
Pre-Test Front Underbody View



Post-Test Front Underbody View

Pre-Test Mid Underbody

Post-Test Mid Underbody



Pre-Test Rear Underbody View

Post-Test Rear Underbody View

Pre-Test Driver Dummy Front View (head position)

Post-Test Driver Dummy Front View (head position)

Pre-Test Driver Dummy Position Left Side View

Post-Test Driver Dummy Position Left Side View

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

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

Pre-Test Driver Dummy Feet Position

Post-Test Driver Dummy Feet Position

Pre-Test Driver Side Knee Bolster View

Post-Test Driver Side Knee Bolster View

Pre-Test Driver Side Floor Pan View

Post-Test Driver Side Floor Pan View

Post-Test Driver Dummy Head Contact

Post-Test Driver Dummy Knee Contact

Post-Test Driver Dummy Airbag Contact

Pre-Test Passenger Dummy Front View (head position)

Post-Test Passenger Dummy Front View (head position)

Pre-Test Passenger Dummy Position Right Side View

Post-Test Passenger Dummy Position Right Side View

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

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

Pre-Test Passenger Dummy Feet Position

Post-Test Passenger Dummy Feet Position

Pre-Test Passenger Knee Bolster View

Post-Test Passenger Knee Bolster View

Pre-Test Passenger Side Floor Pan View

Post-Test Passenger Side Floor Pan View

Post-Test Passenger Dummy Head Contact

Post-Test Passenger Dummy Knee Contact

Post-Test Passenger Dummy Airbag Contact

Rollover 90 Degrees

Rollover 180 Degrees

Rollover 270 Degrees

Rollover 360 Degrees

Vehicle Impact

APPENDIX B

DUMMY AND VEHICLE RESPONSE DATA TRACES

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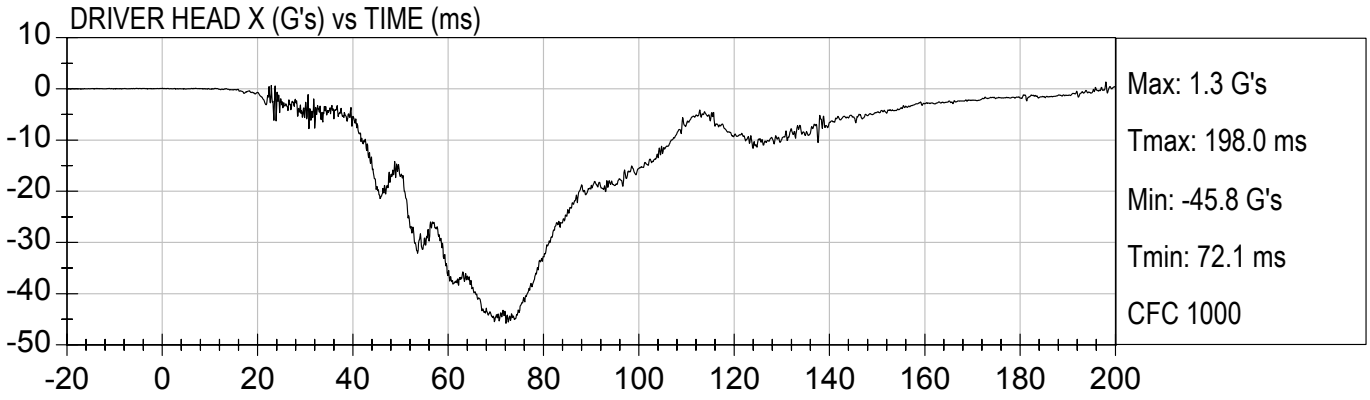
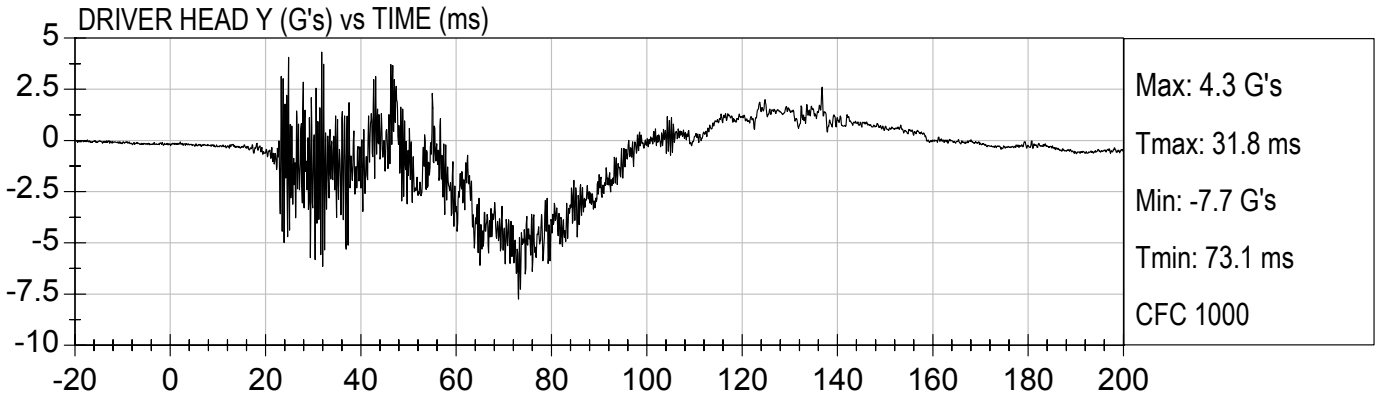
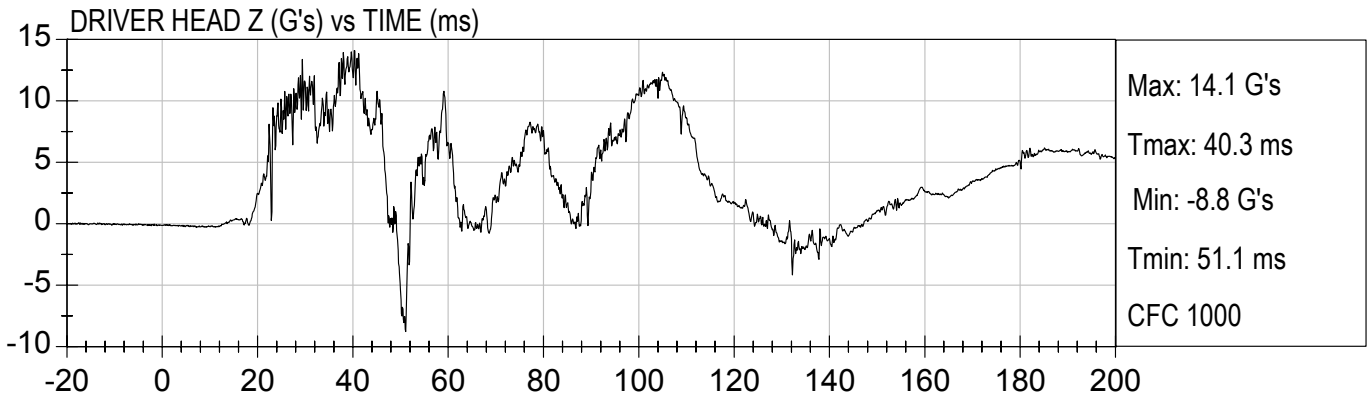
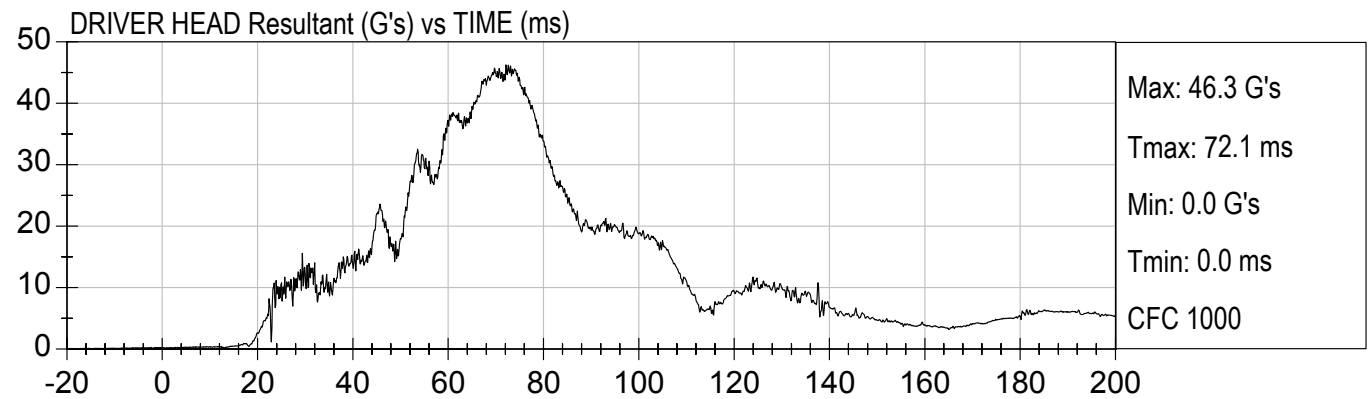
35MPH NCAP FRONTAL
2004 ACURA TSX

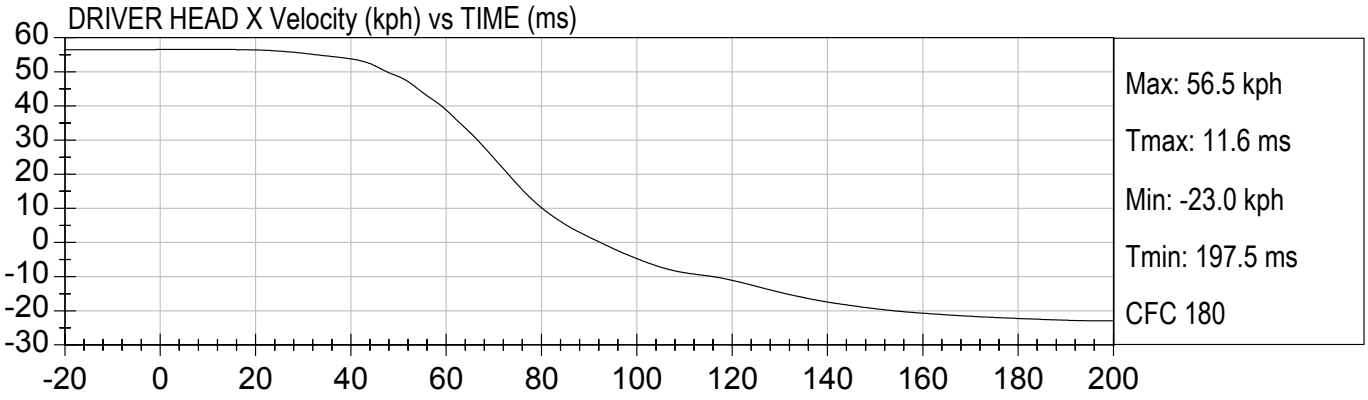
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

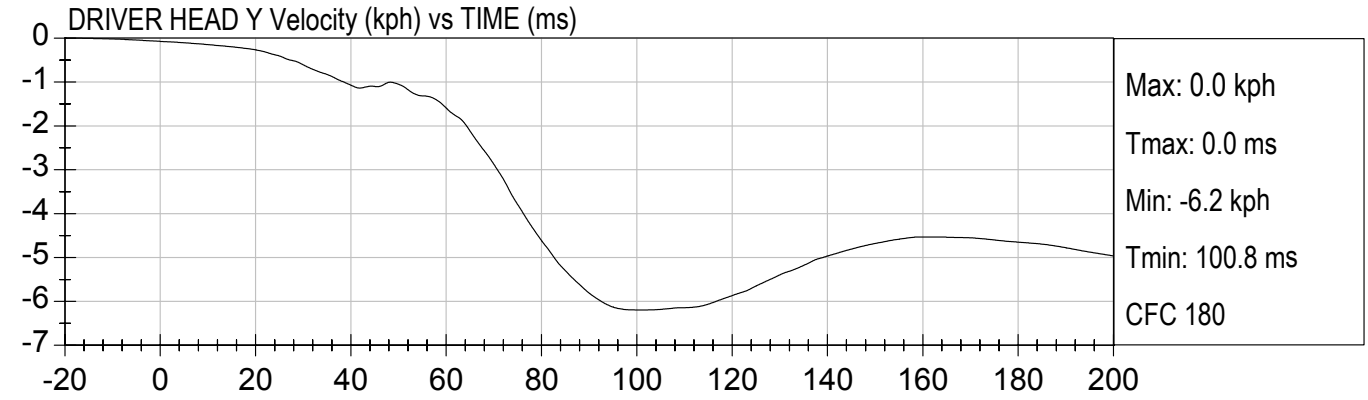


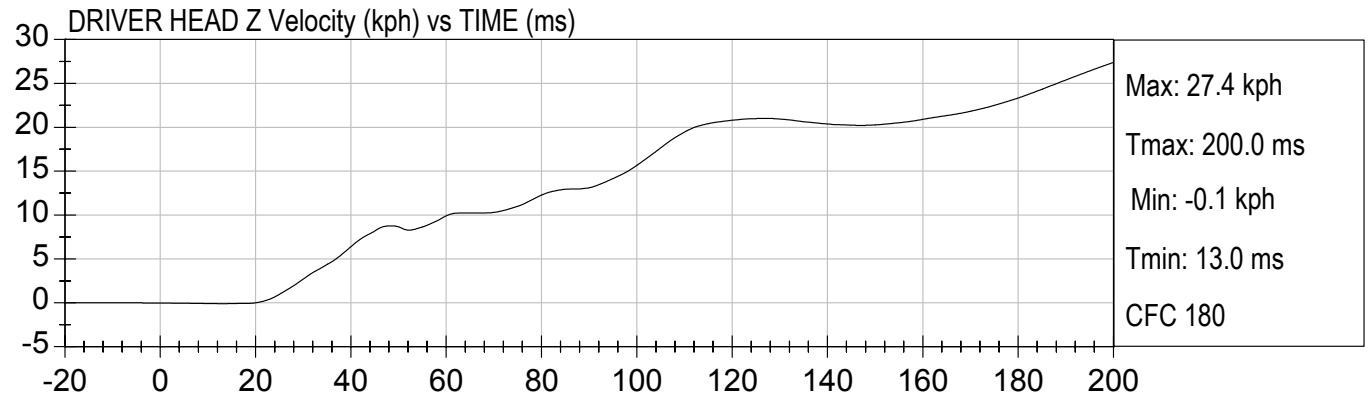






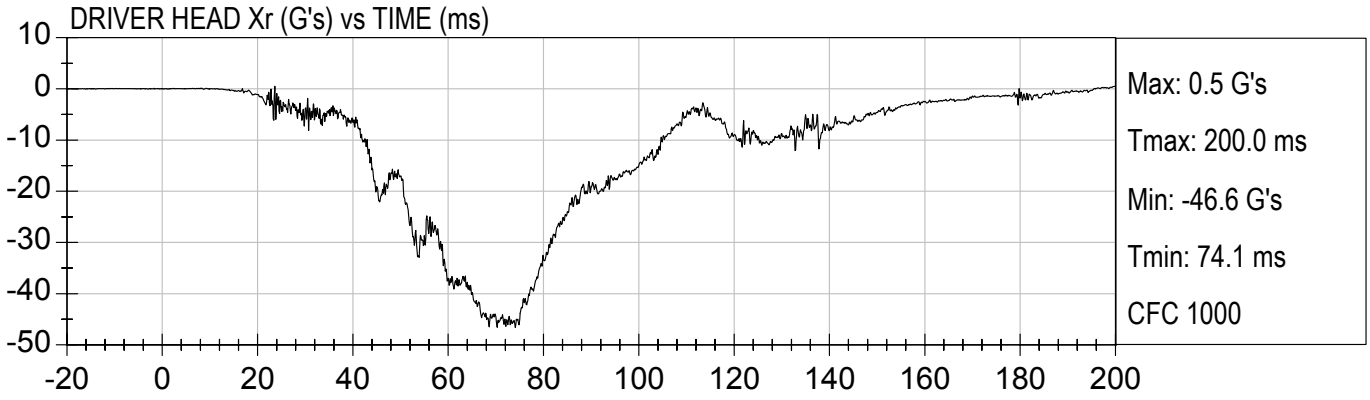

DRIVER HEAD X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 11.6 ms
Min: -23.0 kph
Tmin: 197.5 ms
CFC 180

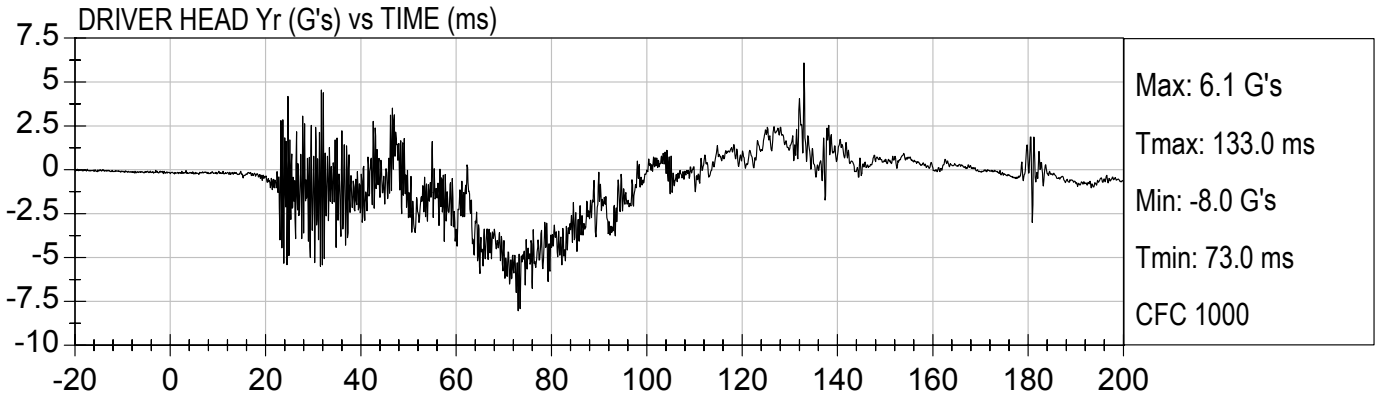

DRIVER HEAD Y Velocity (kph) vs TIME (ms)
0
-1
-2
-3
-4
-5
-6
-7
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.0 kph
Tmax: 0.0 ms
Min: -6.2 kph
Tmin: 100.8 ms
CFC 180

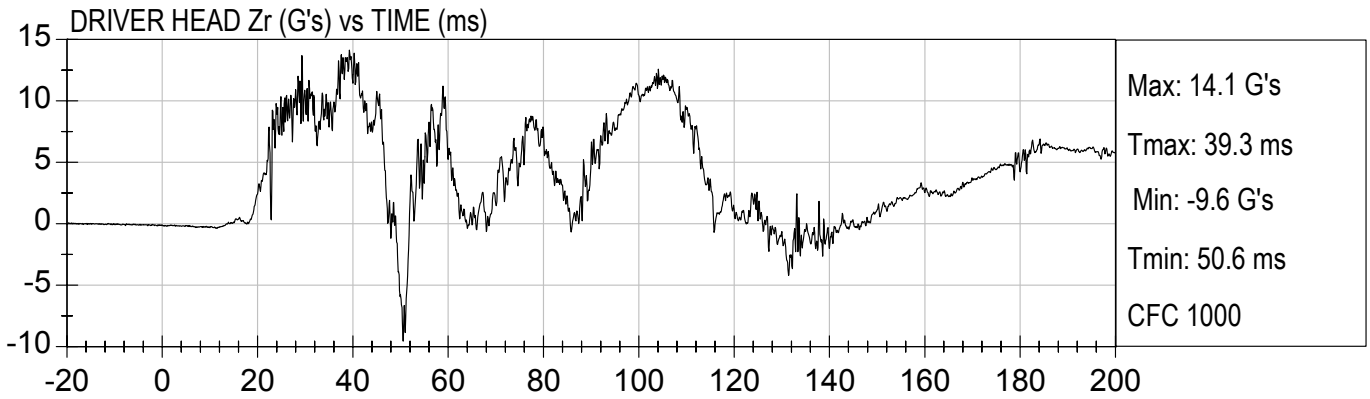

DRIVER HEAD Z Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 27.4 kph
Tmax: 200.0 ms
Min: -0.1 kph
Tmin: 13.0 ms
CFC 180

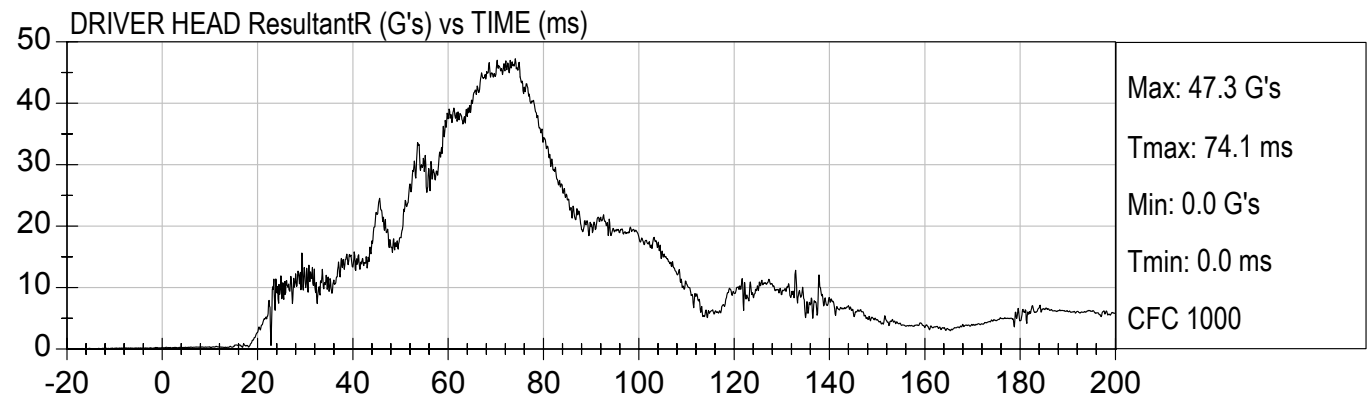
35MPH NCAP FRONTAL
2004 ACURA TSX

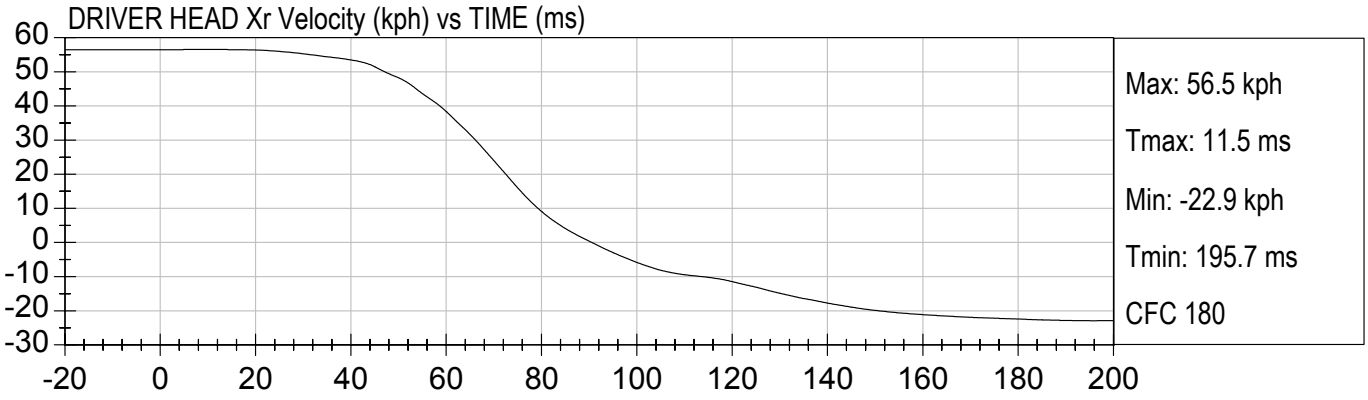
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

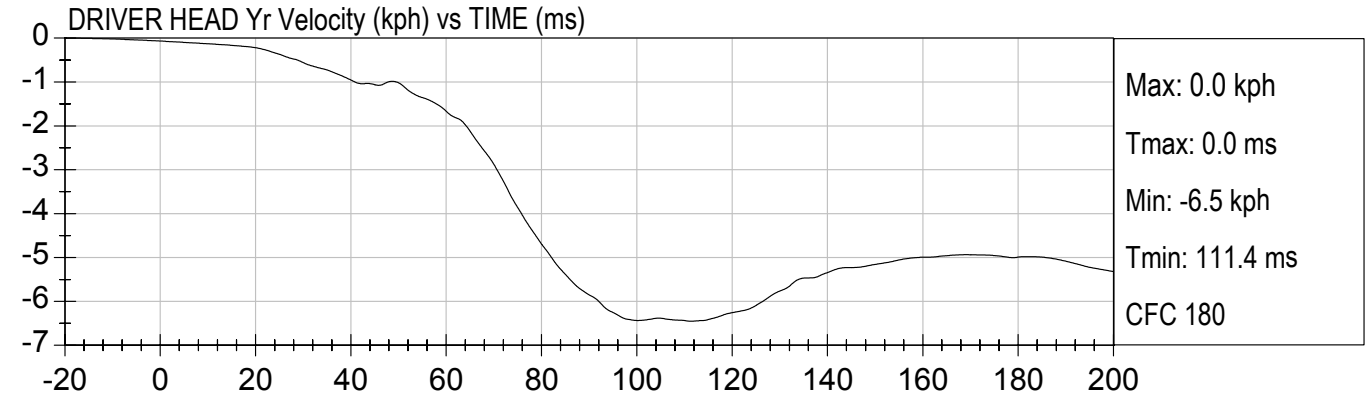


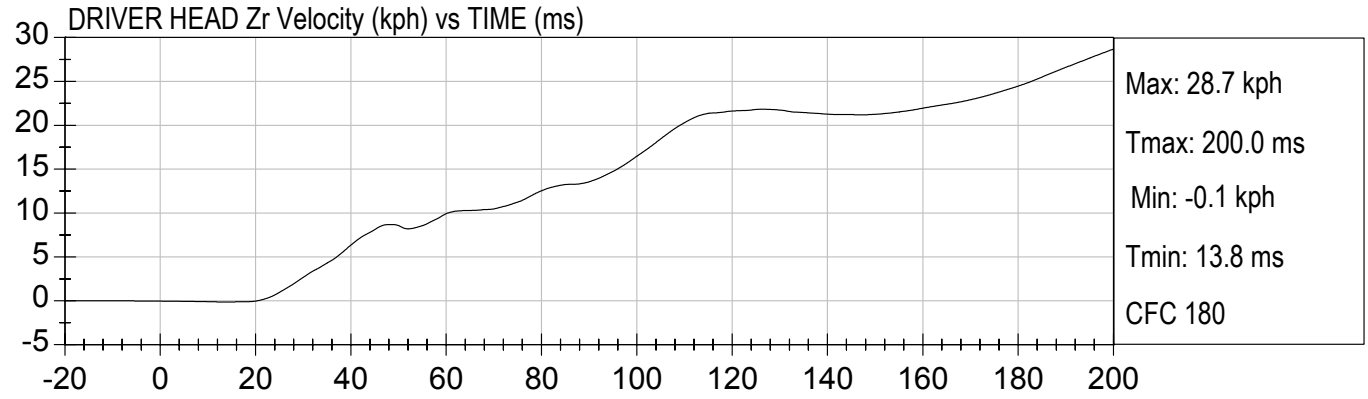






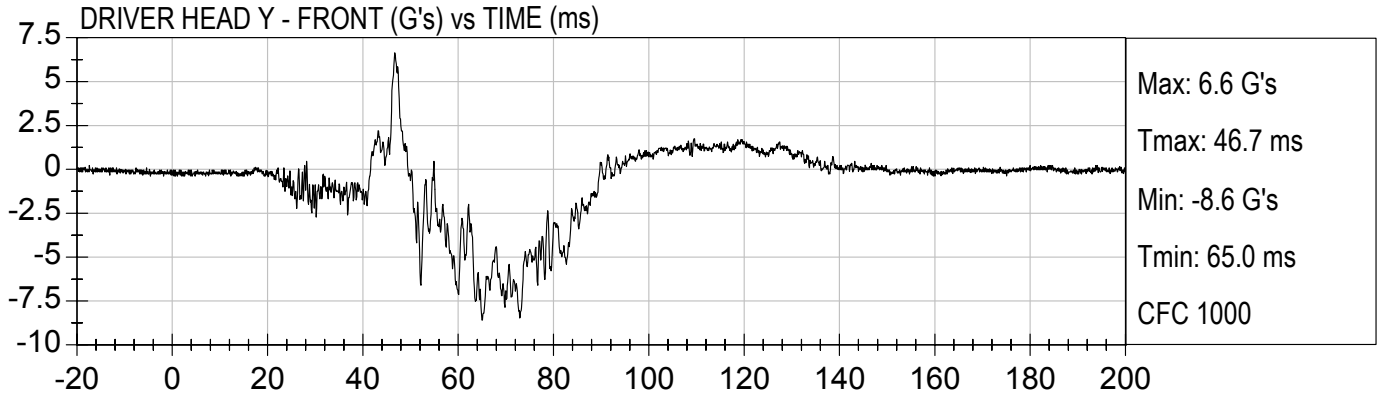

DRIVER HEAD Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-30
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 11.5 ms
Min: -22.9 kph
Tmin: 195.7 ms
CFC 180

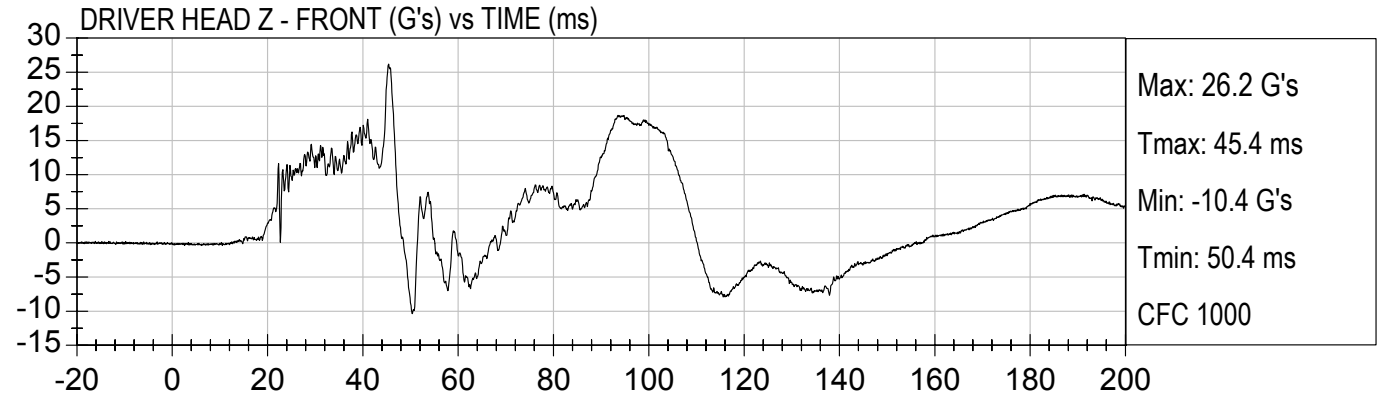

DRIVER HEAD Yr Velocity (kph) vs TIME (ms)
0
-1
-2
-3
-4
-5
-6
-7
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.0 kph
Tmax: 0.0 ms
Min: -6.5 kph
Tmin: 111.4 ms
CFC 180

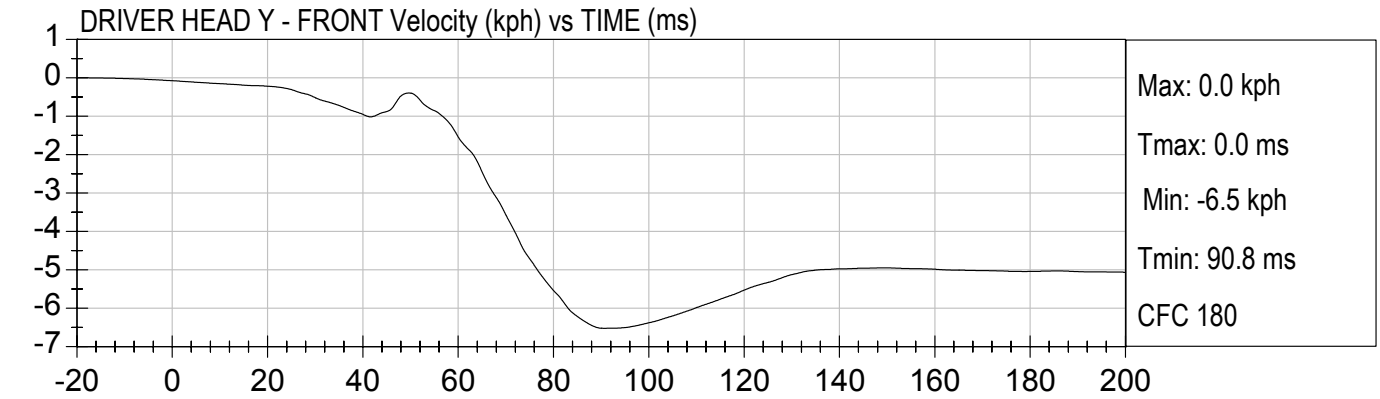

DRIVER HEAD Zr Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 28.7 kph
Tmax: 200.0 ms
Min: -0.1 kph
Tmin: 13.8 ms
CFC 180

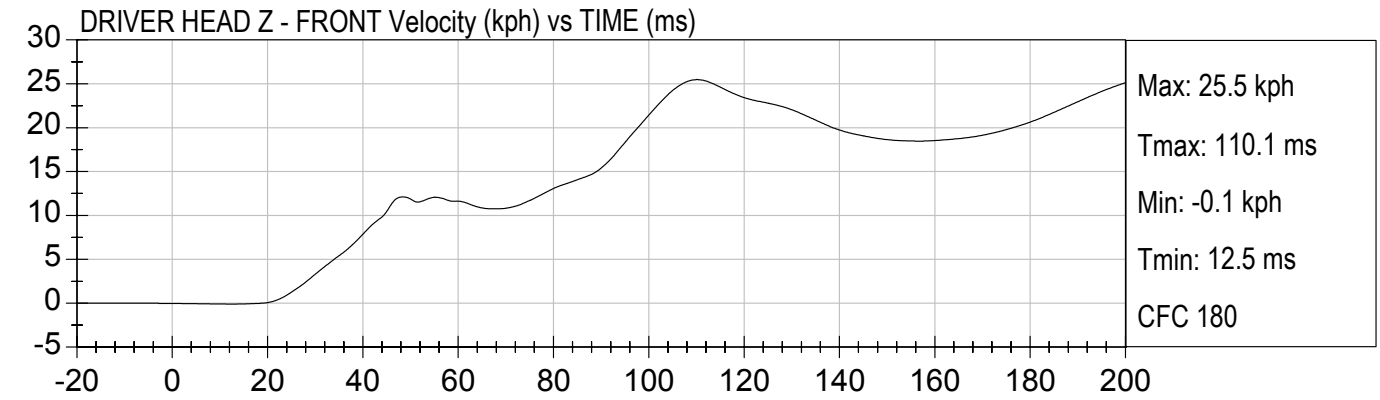
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



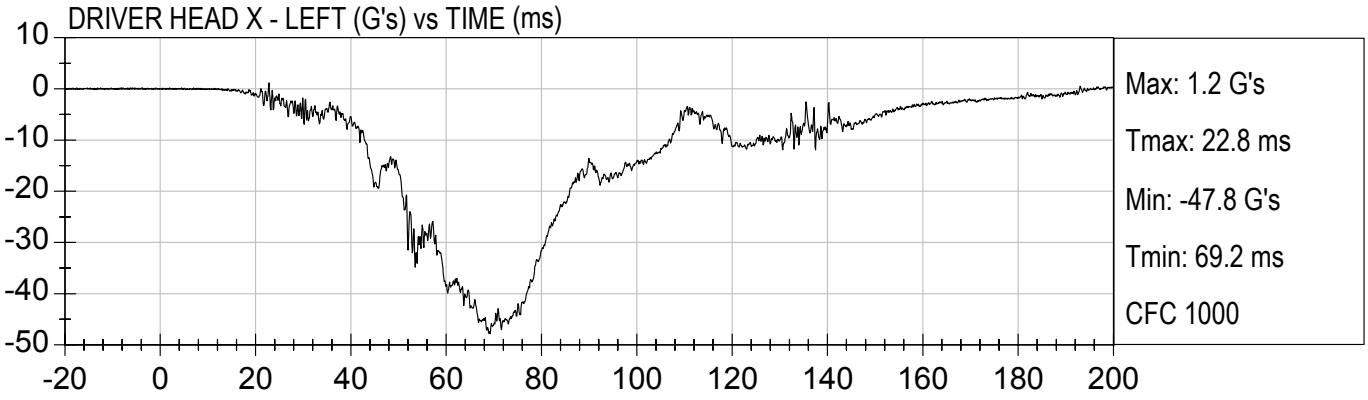


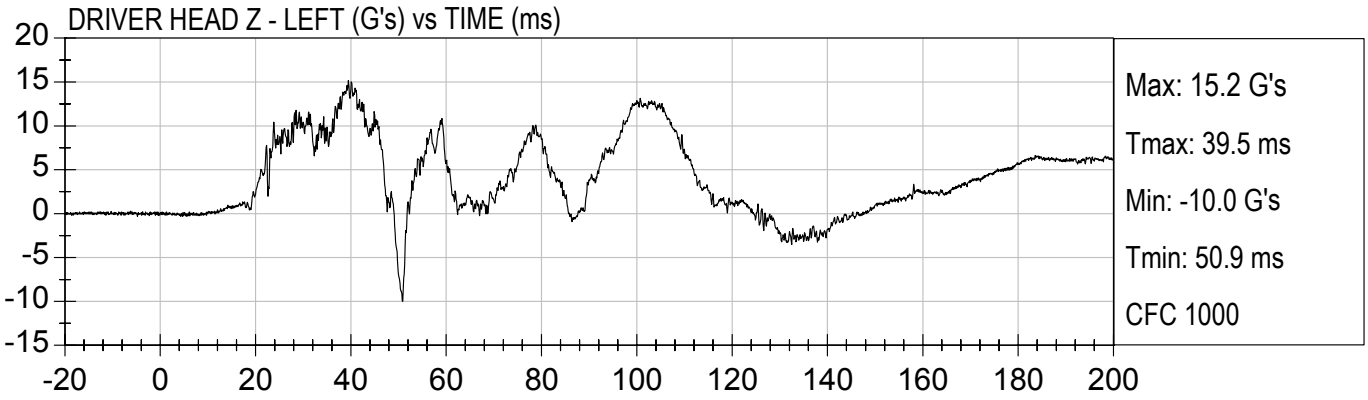


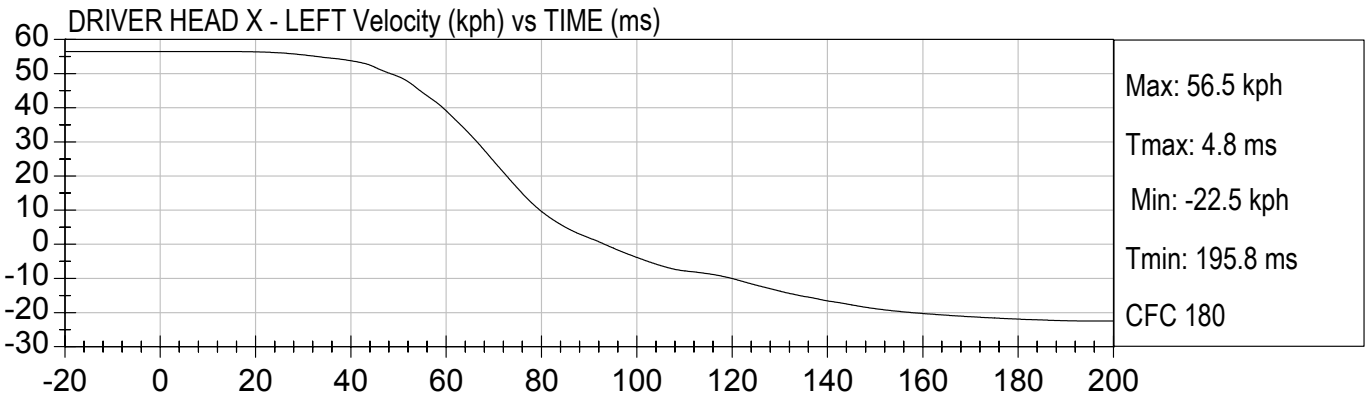


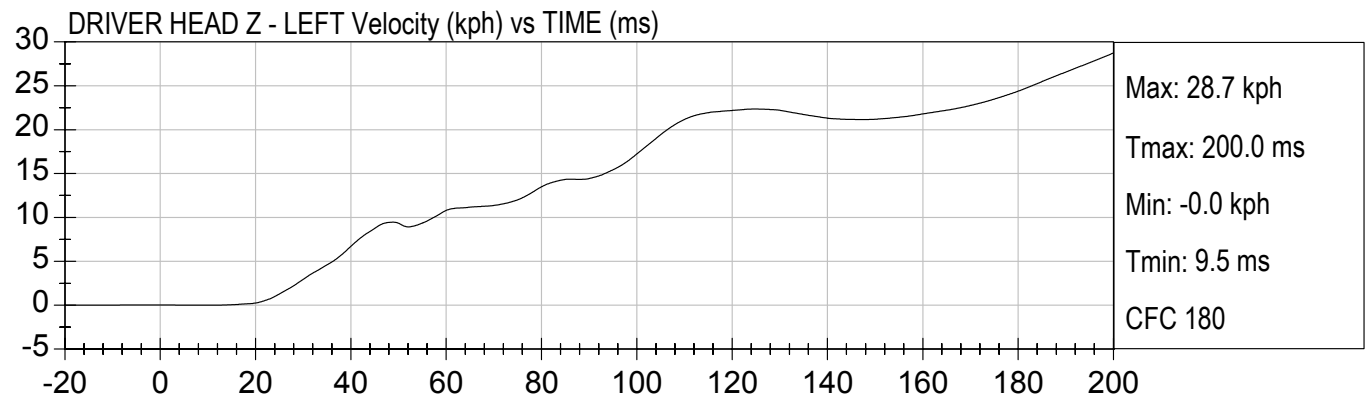
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



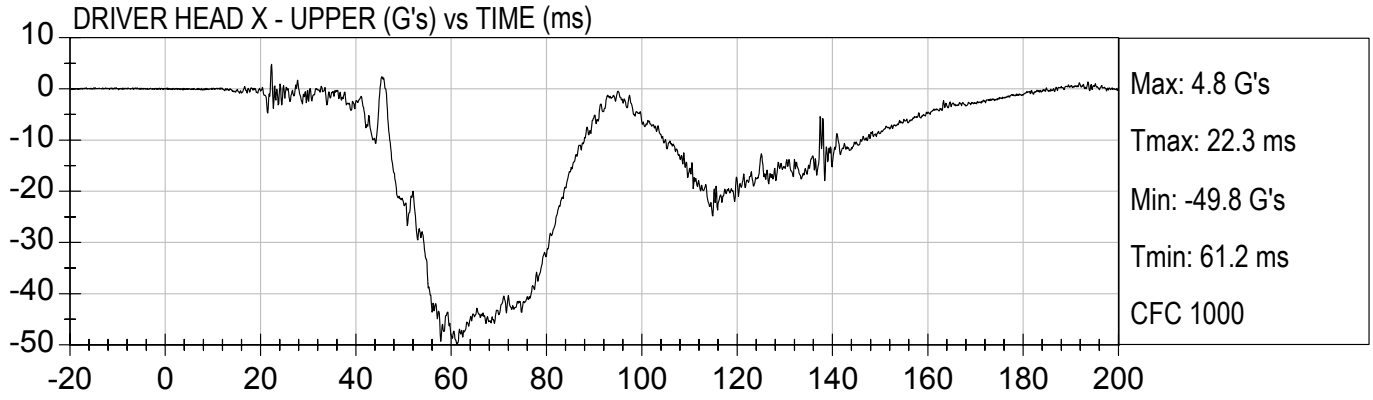


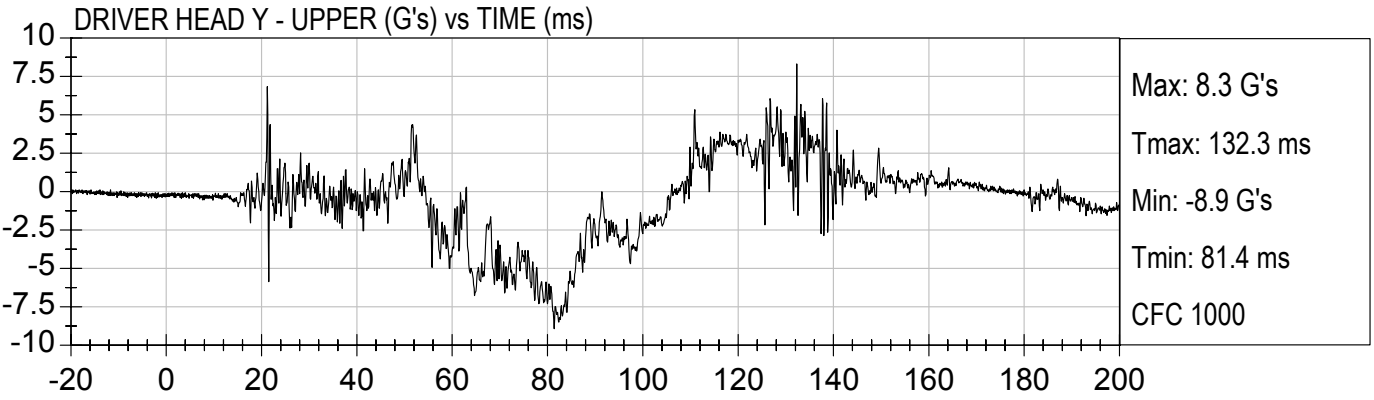


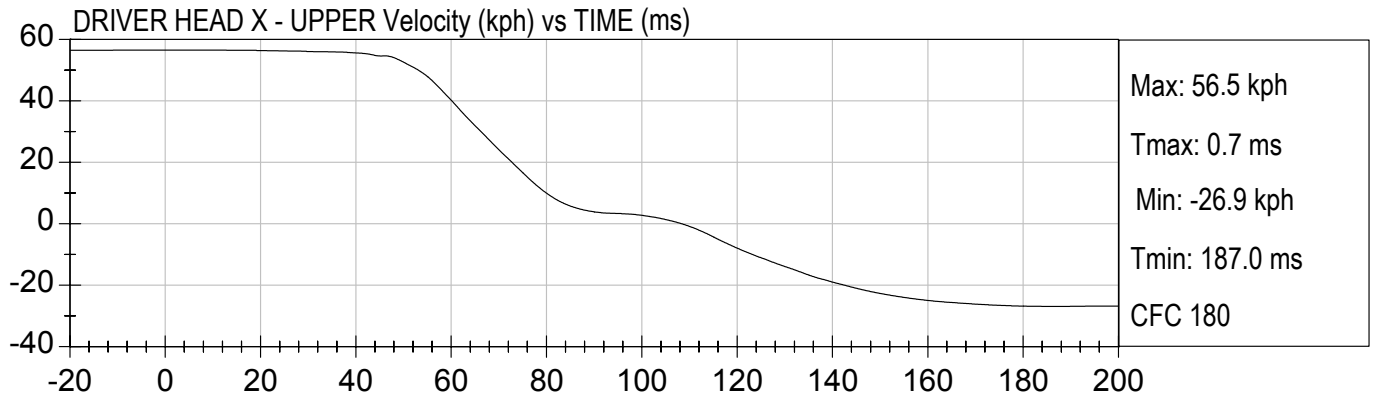


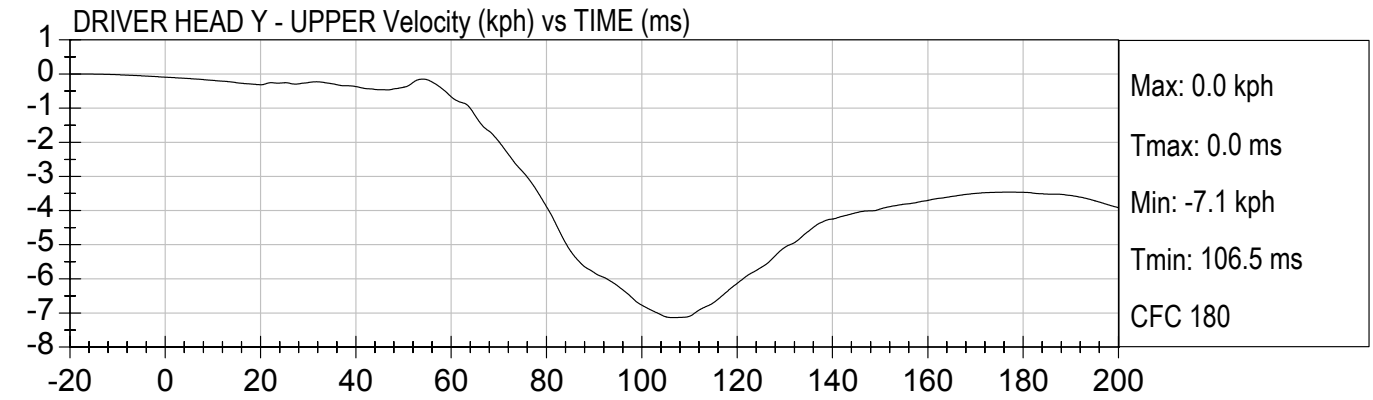
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



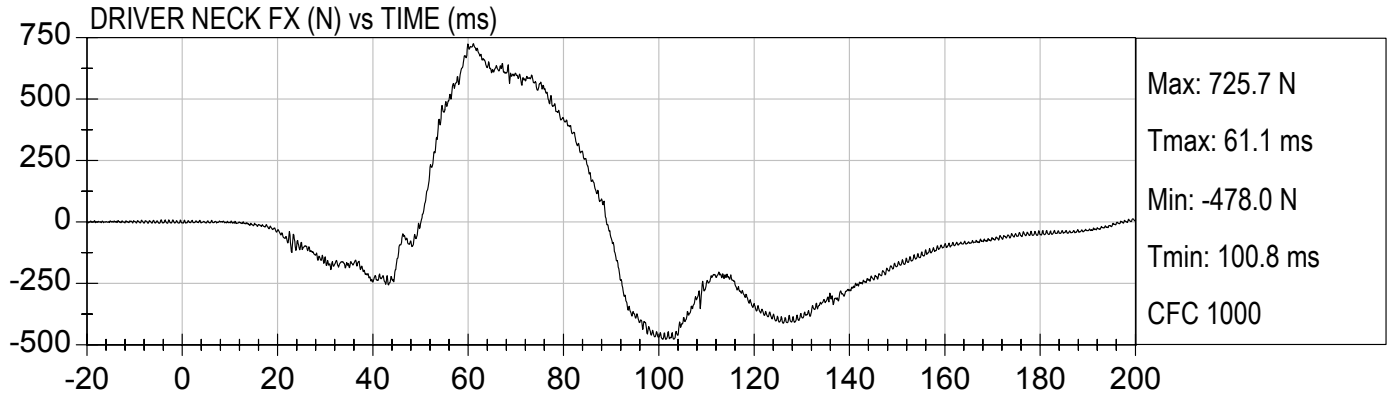


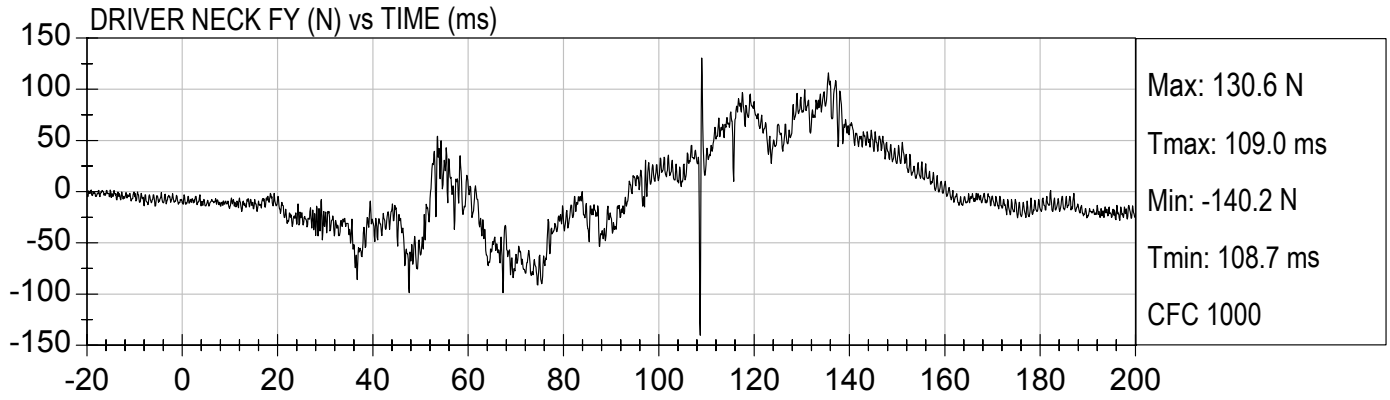


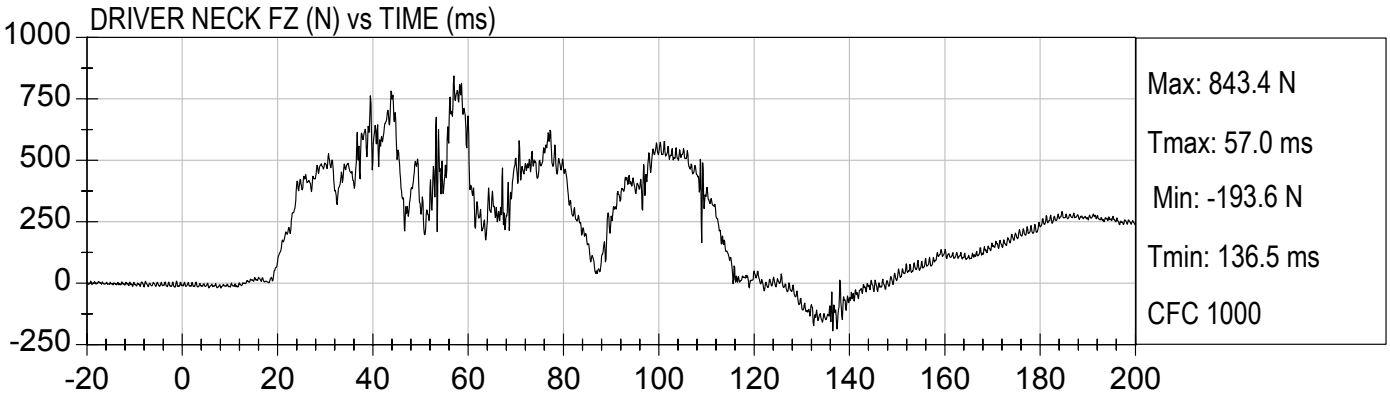


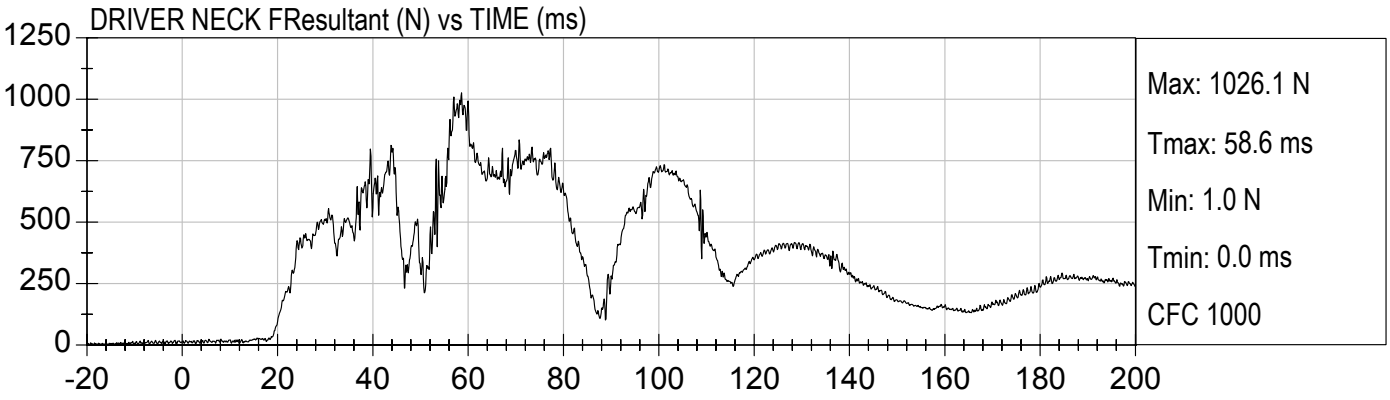
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



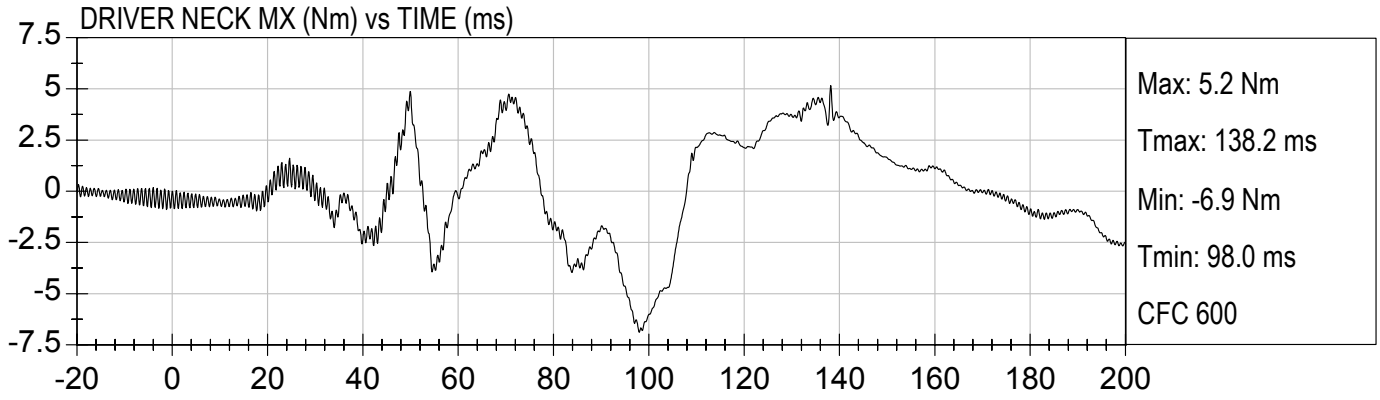


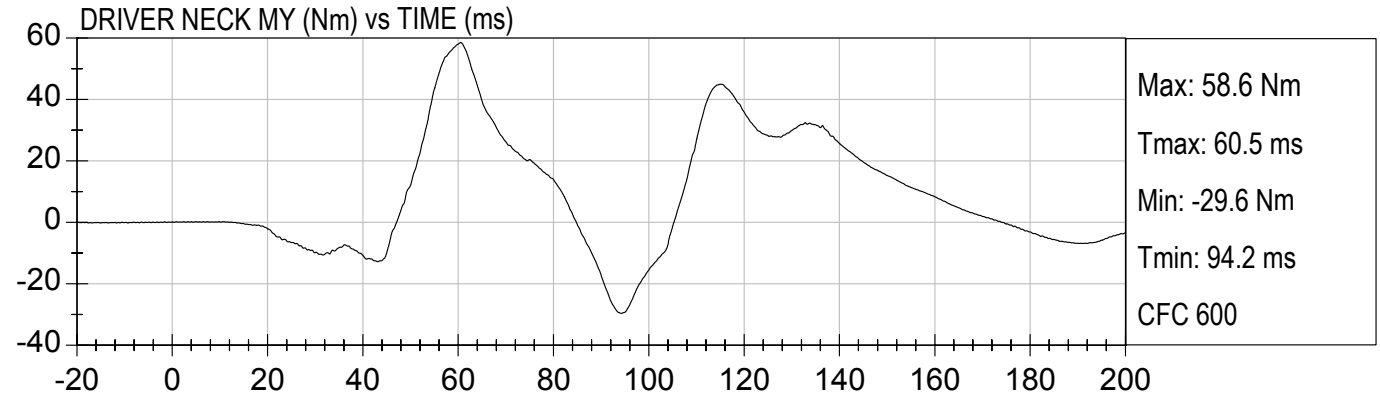


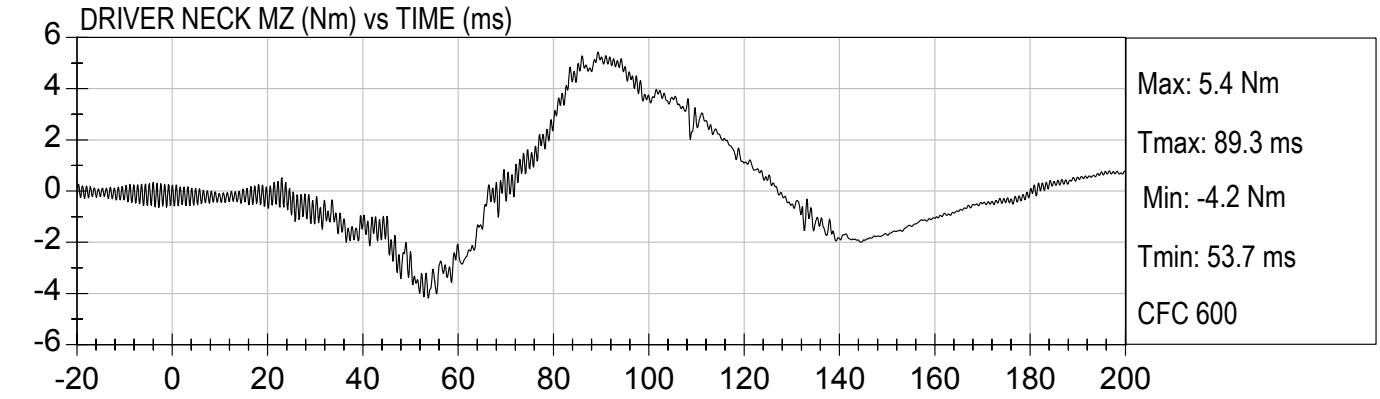


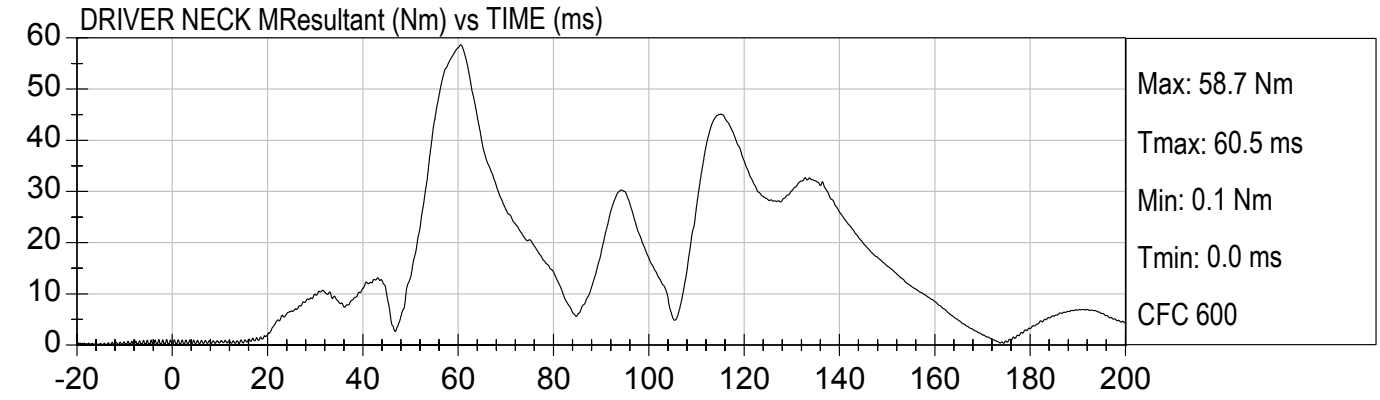
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



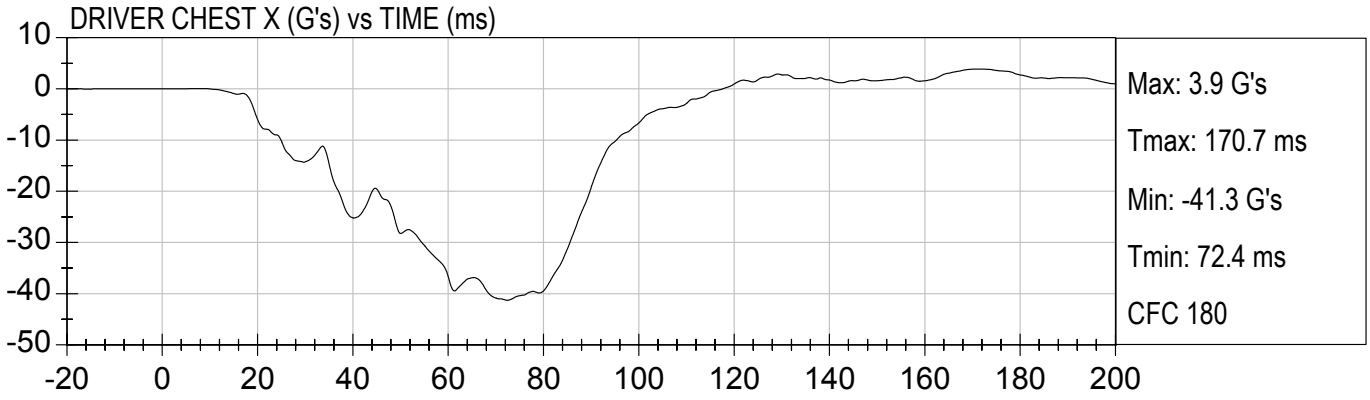


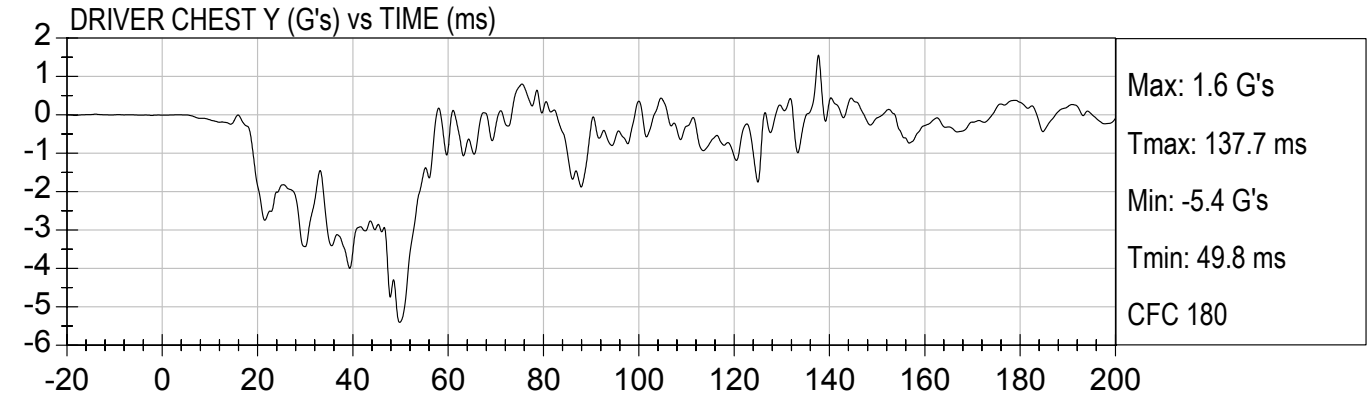


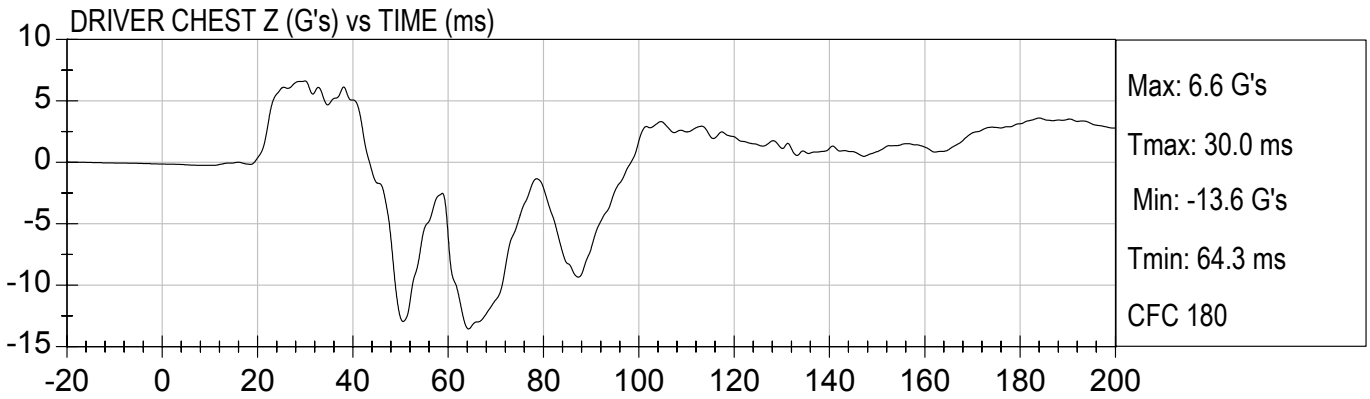


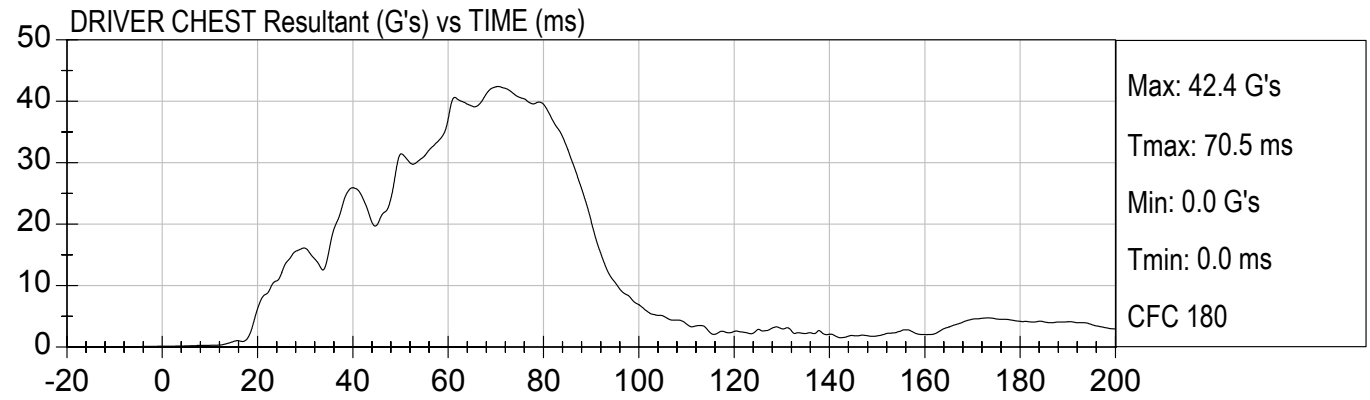
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



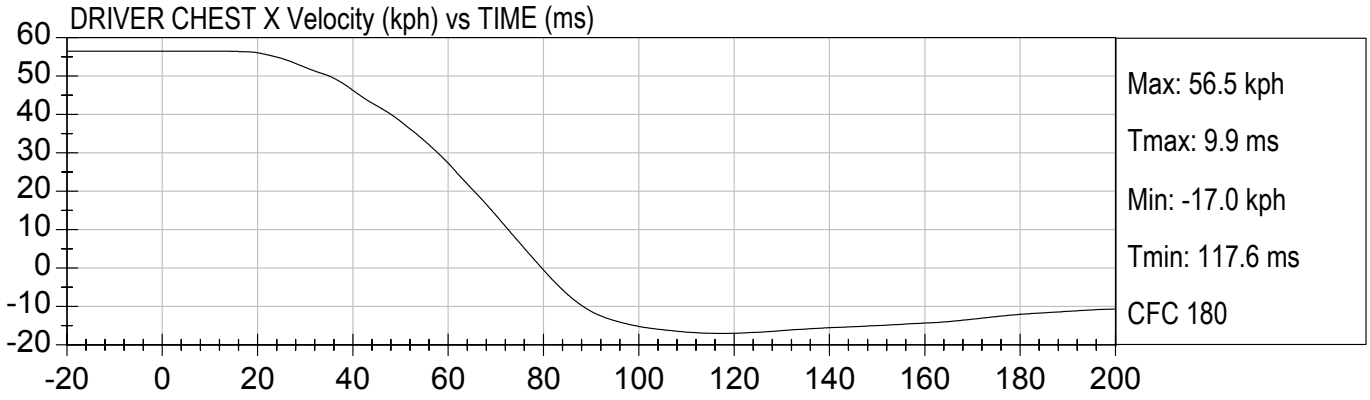


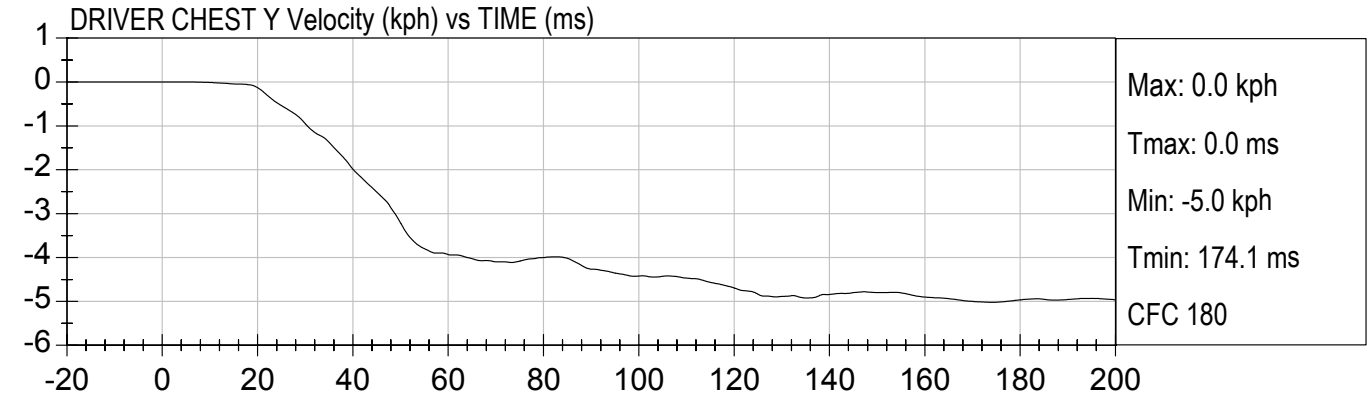


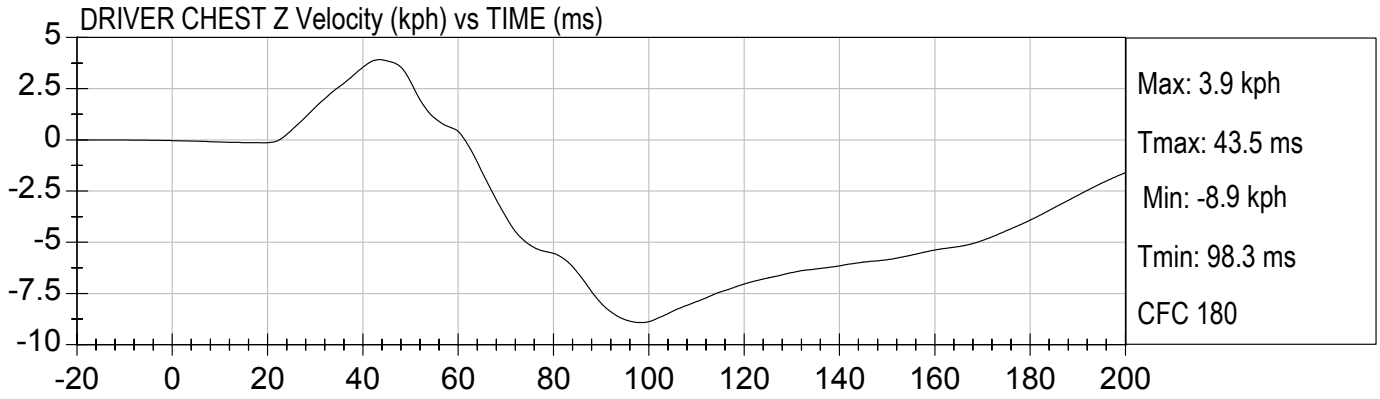


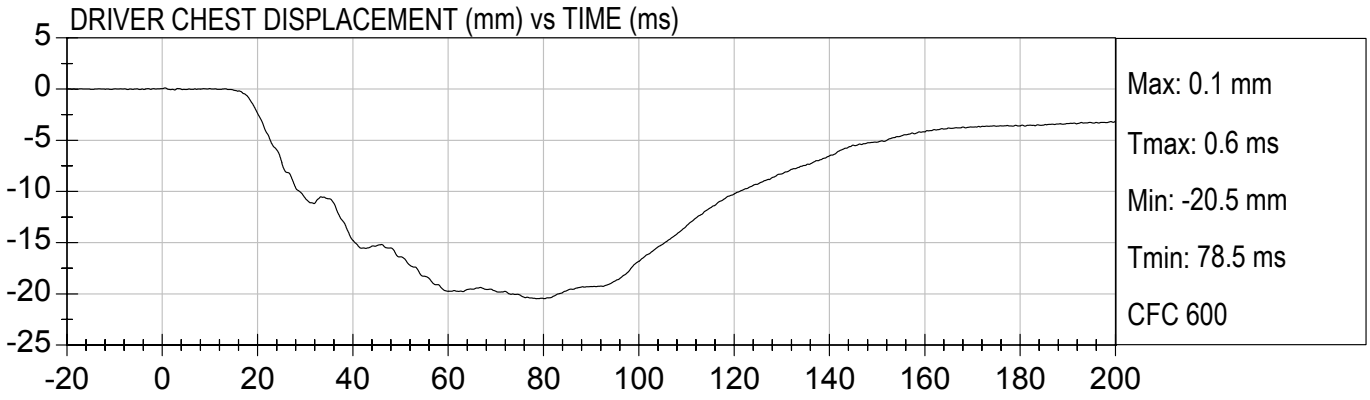
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



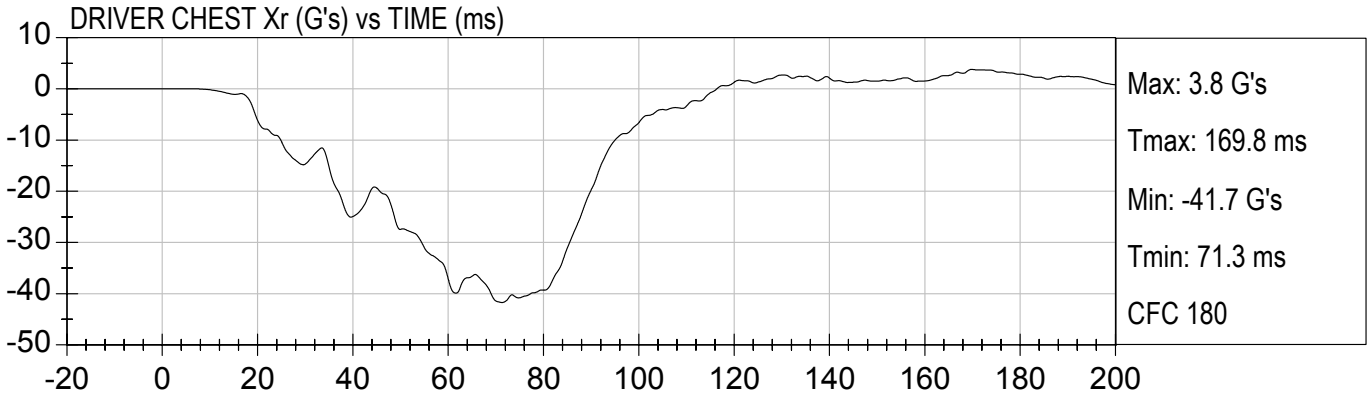


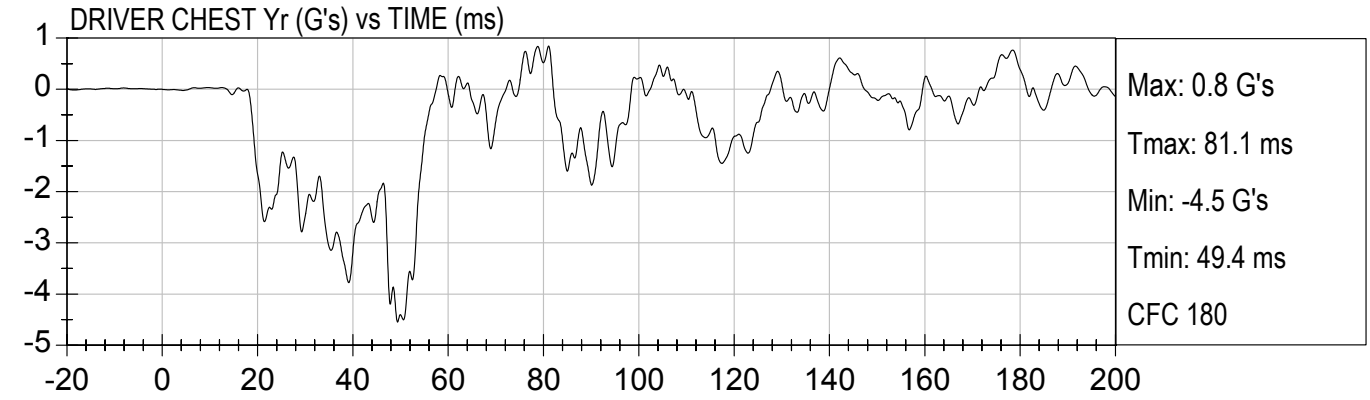


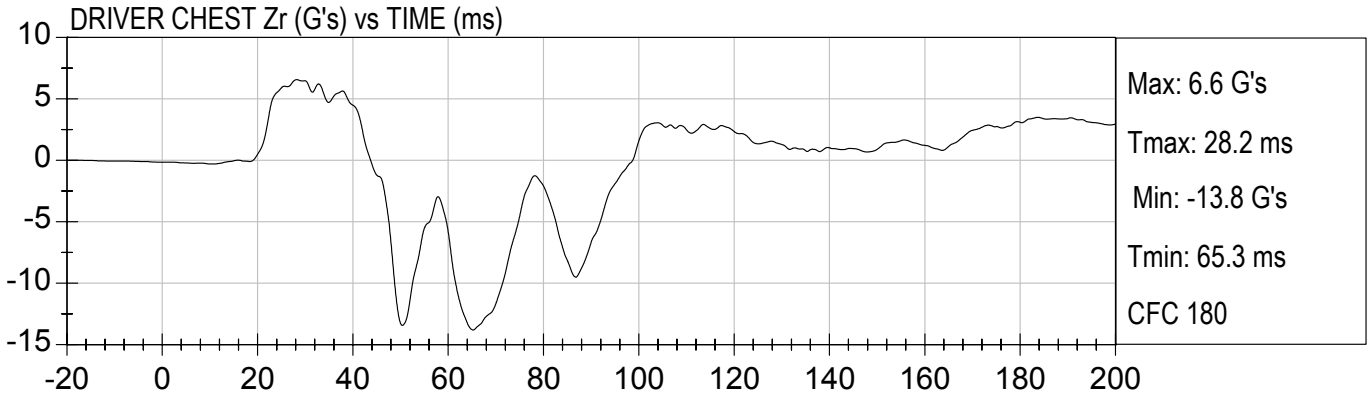


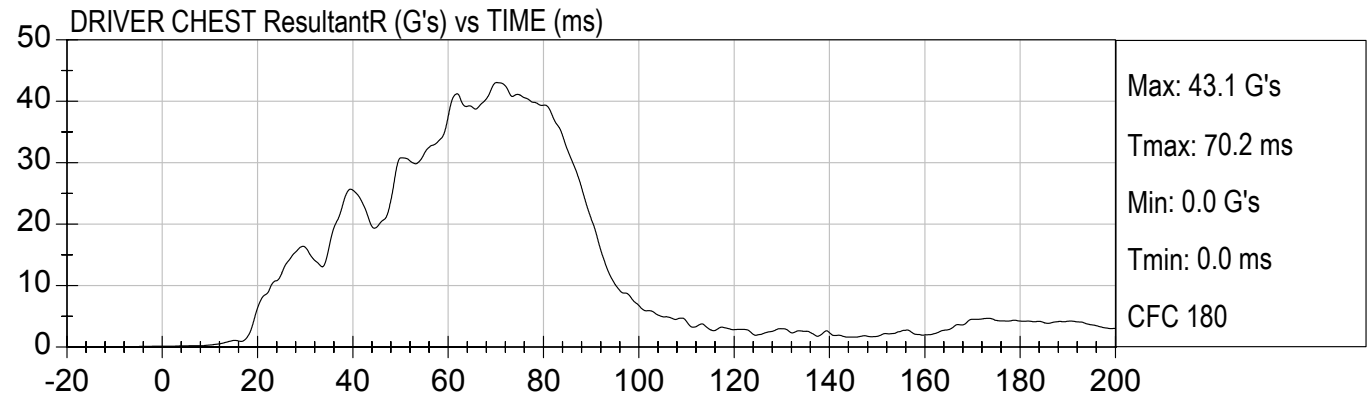
35MPH NCAP FRONTAL
2004 ACURA TSX

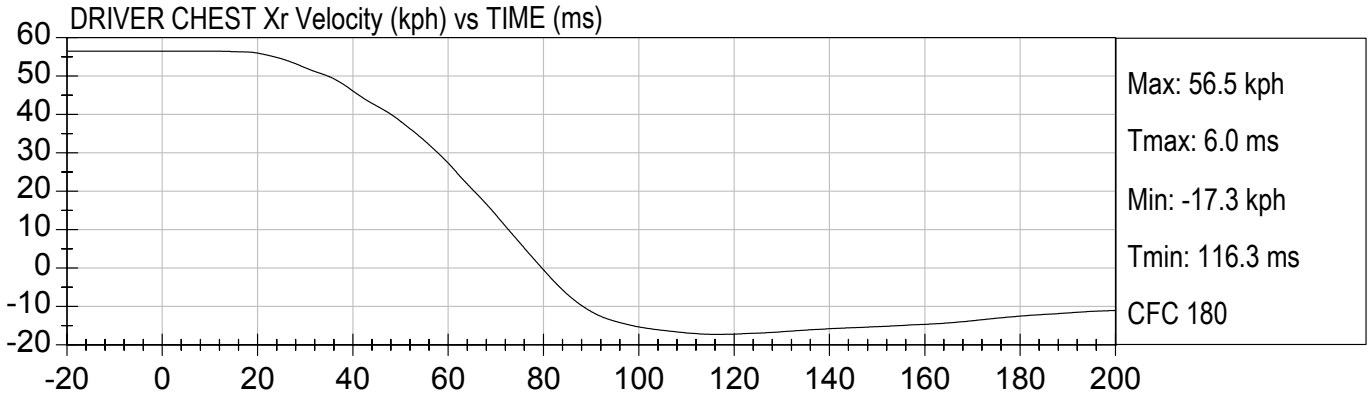
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

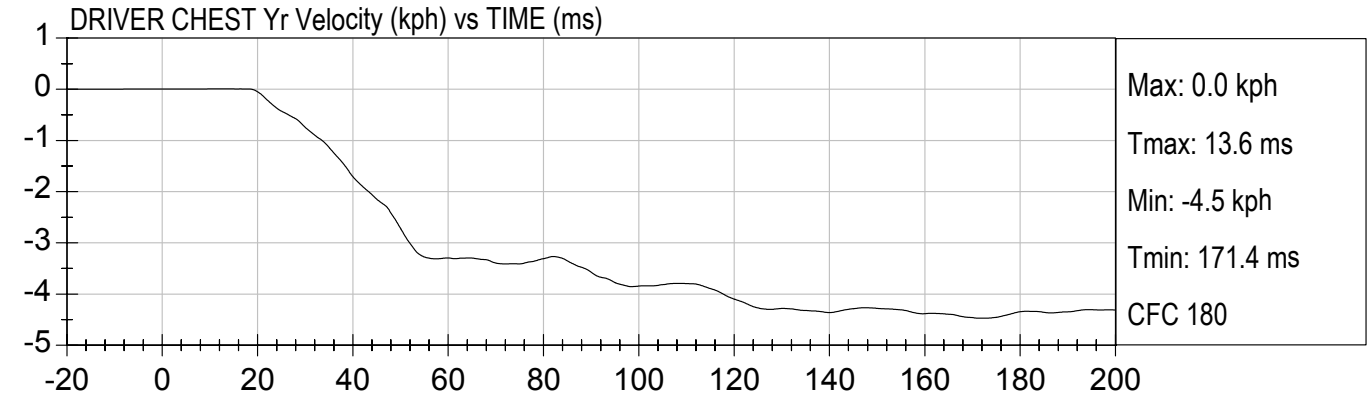


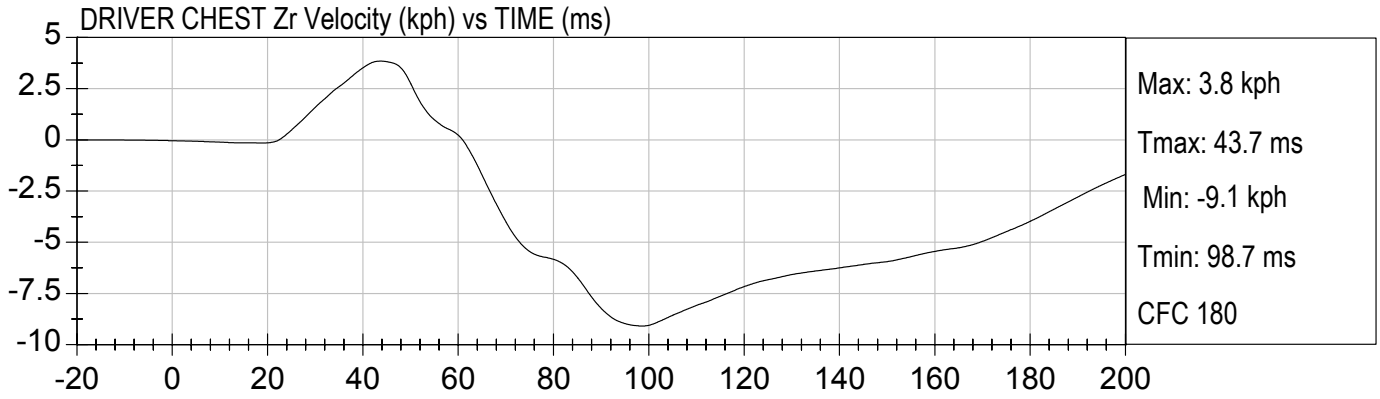






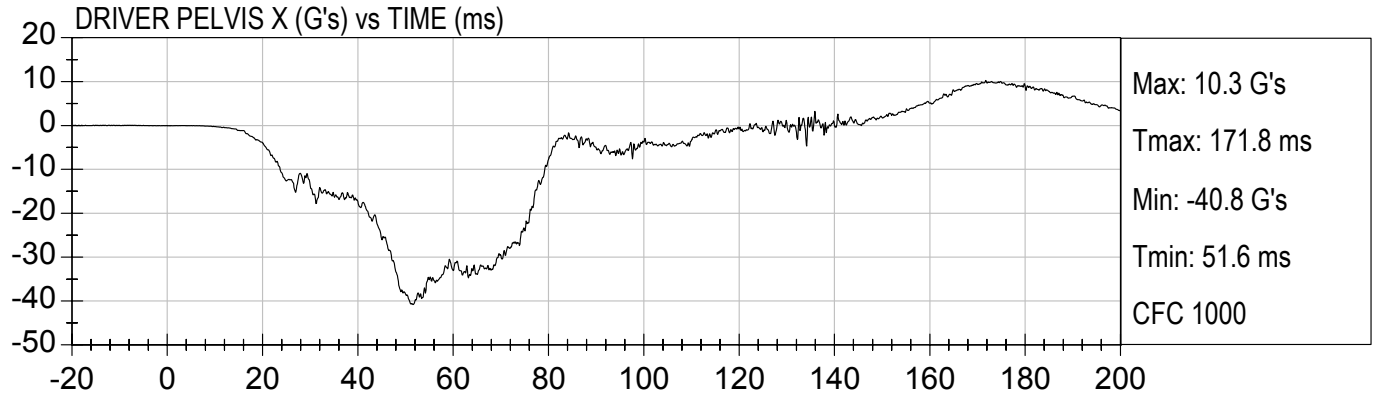

DRIVER CHEST Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 6.0 ms
Min: -17.3 kph
Tmin: 116.3 ms
CFC 180

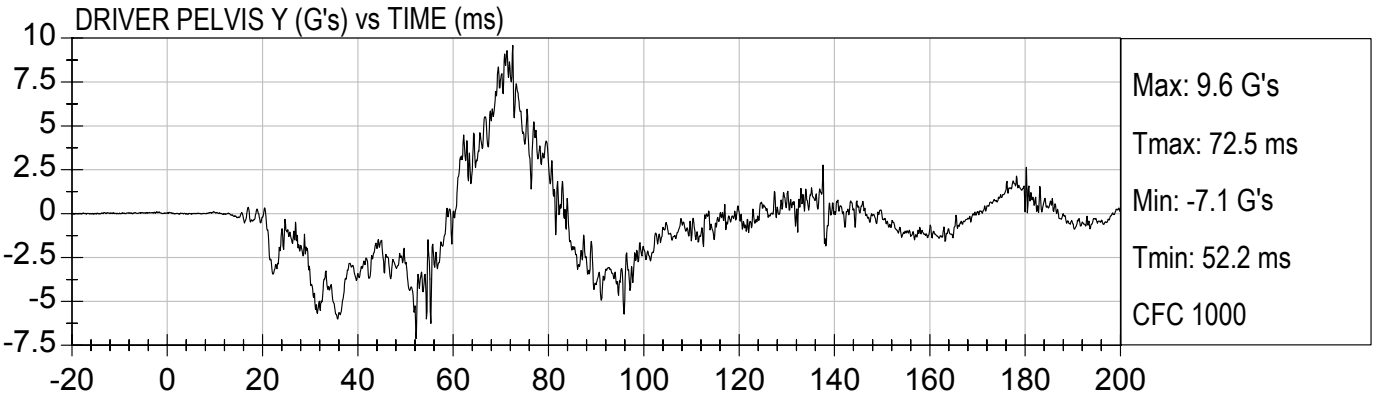

DRIVER CHEST Yr Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.0 kph
Tmax: 13.6 ms
Min: -4.5 kph
Tmin: 171.4 ms
CFC 180

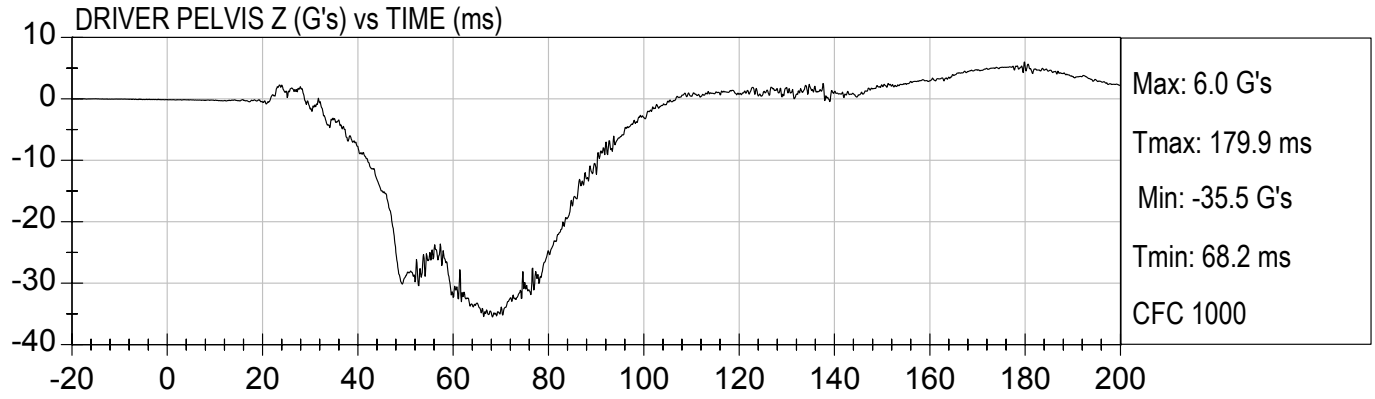

DRIVER CHEST Zr Velocity (kph) vs TIME (ms)
5
2.5
0
-2.5
-5
-7.5
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 3.8 kph
Tmax: 43.7 ms
Min: -9.1 kph
Tmin: 98.7 ms
CFC 180

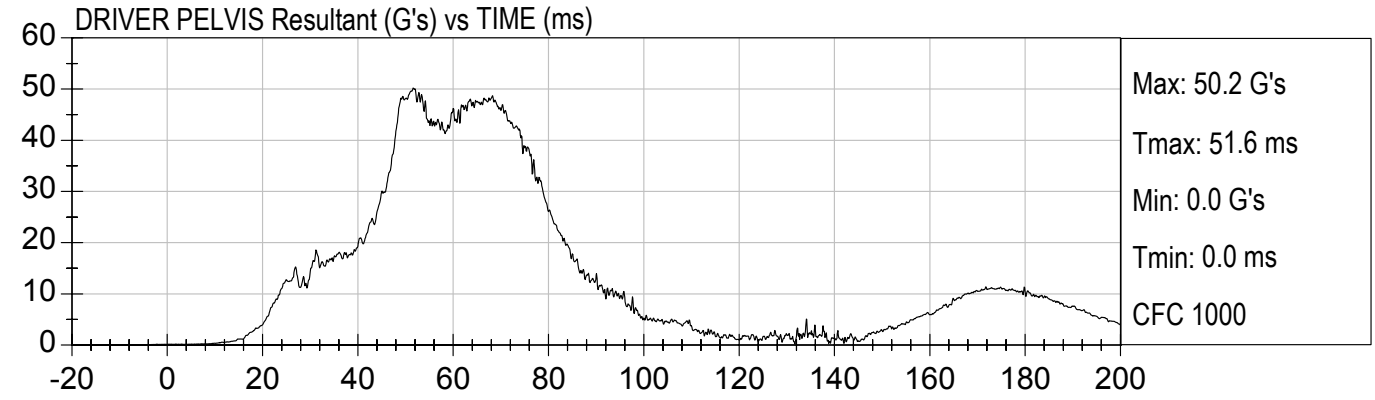
35MPH NCAP FRONTAL
2004 ACURA TSX

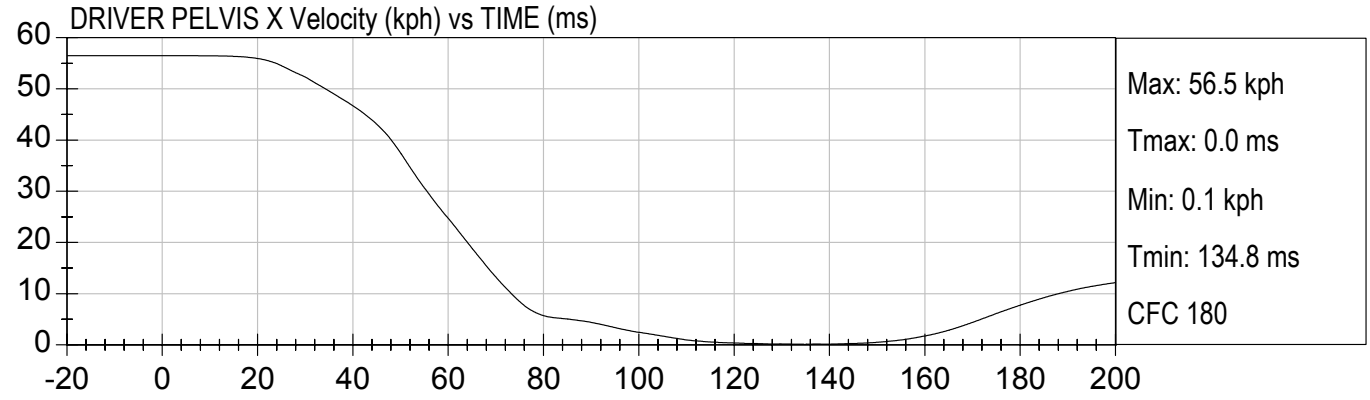
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

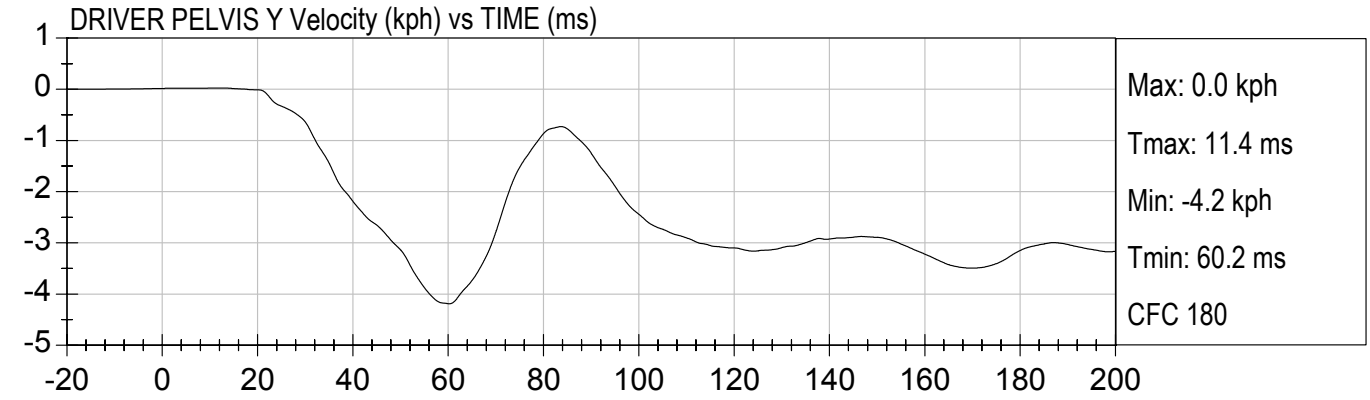


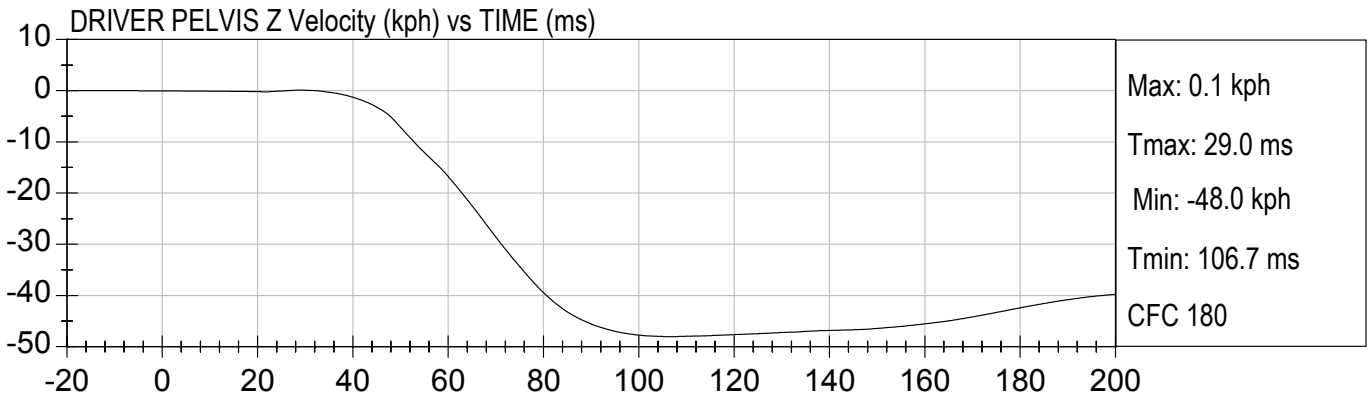






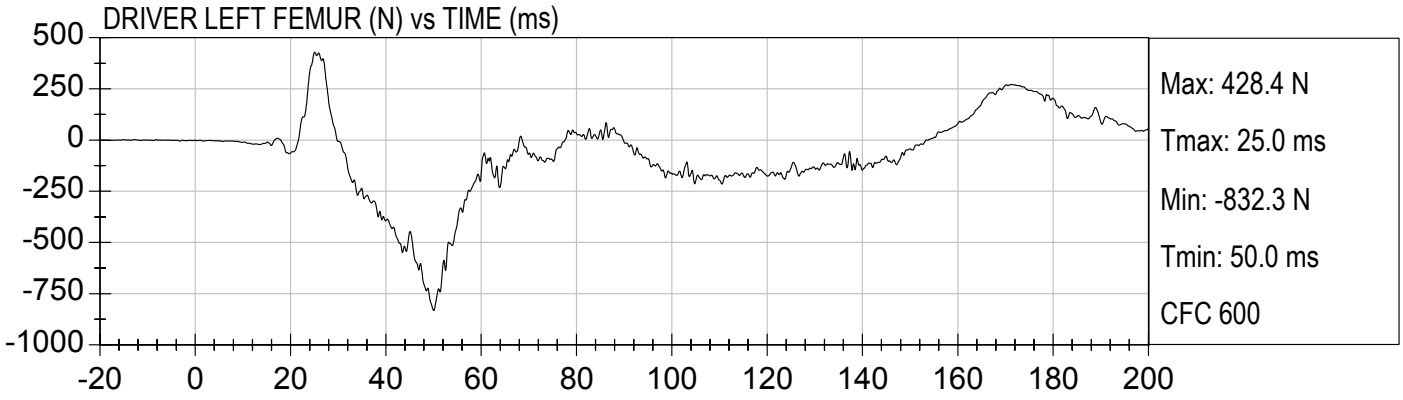

DRIVER PELVIS X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: 0.1 kph
Tmin: 134.8 ms
CFC 180

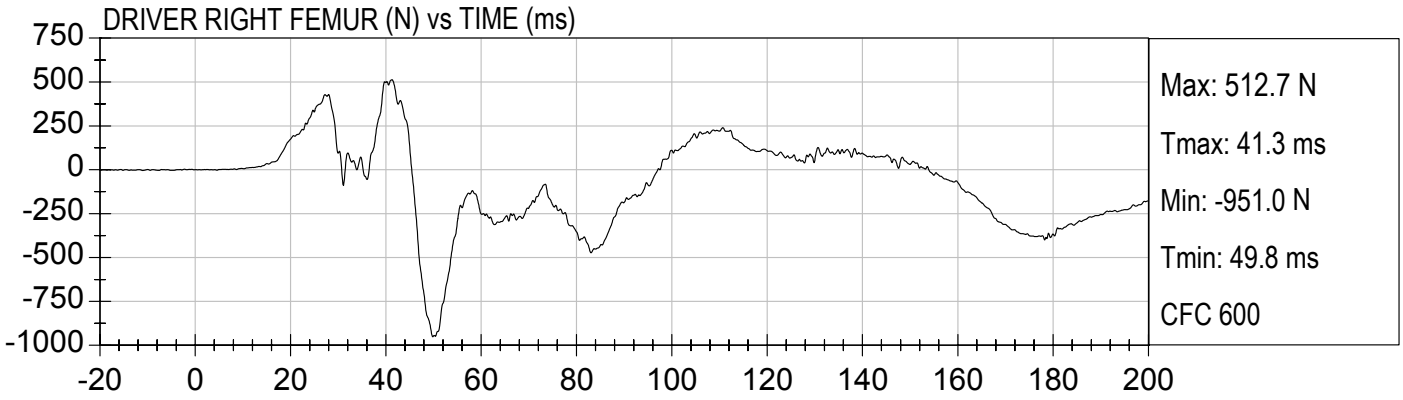

DRIVER PELVIS Y Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.0 kph
Tmax: 11.4 ms
Min: -4.2 kph
Tmin: 60.2 ms
CFC 180

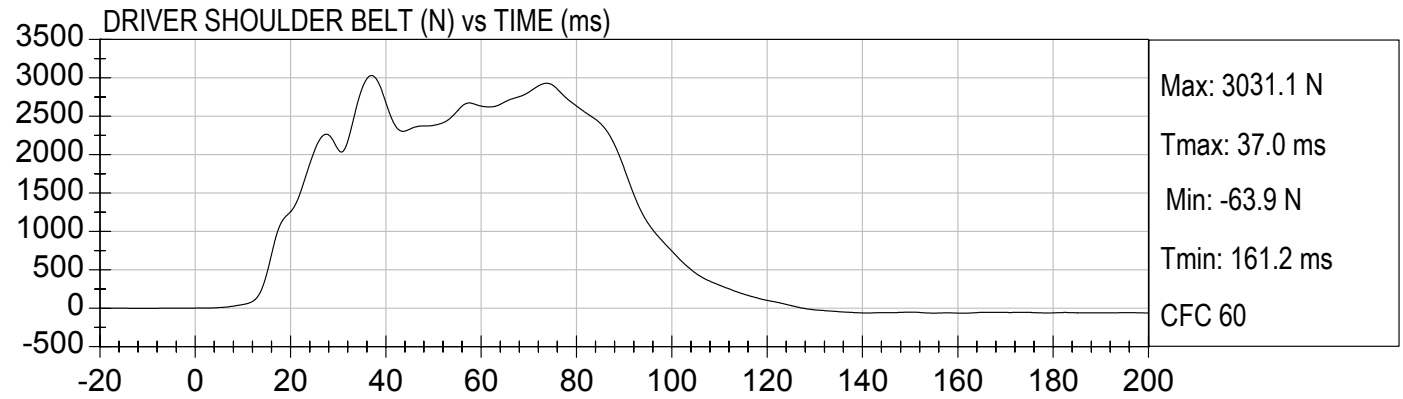

DRIVER PELVIS Z Velocity (kph) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.1 kph
Tmax: 29.0 ms
Min: -48.0 kph
Tmin: 106.7 ms
CFC 180

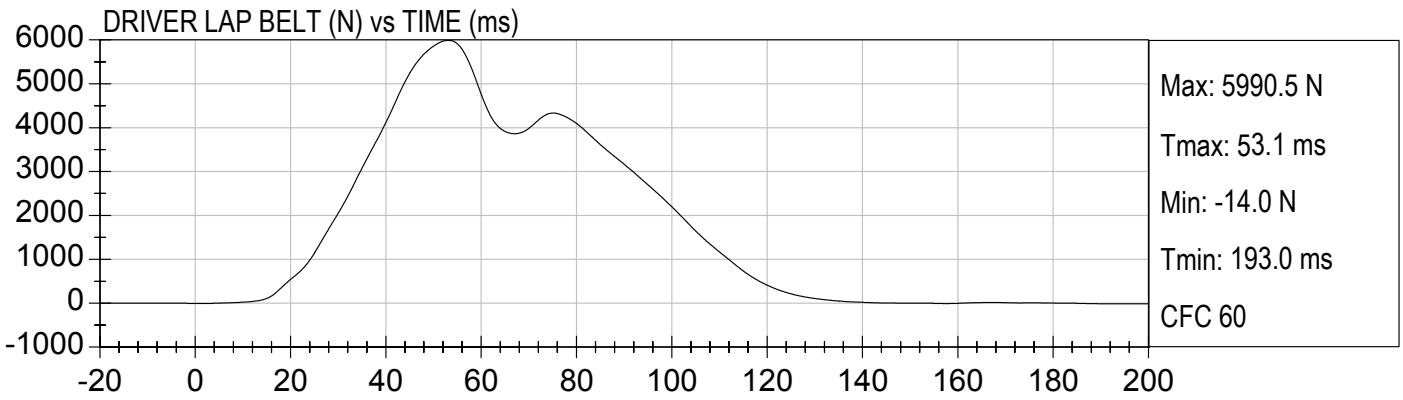
35MPH NCAP FRONTAL
2004 ACURA TSX

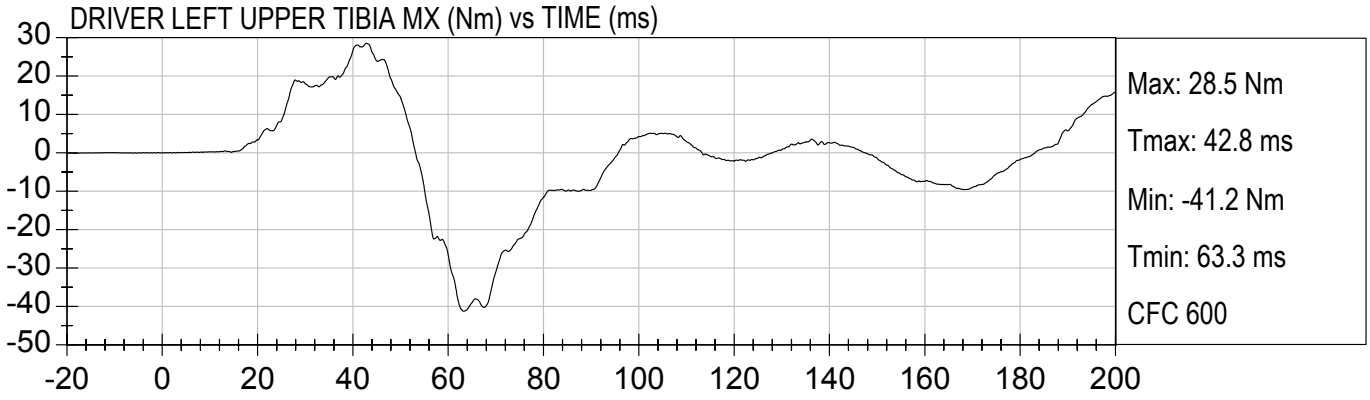
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

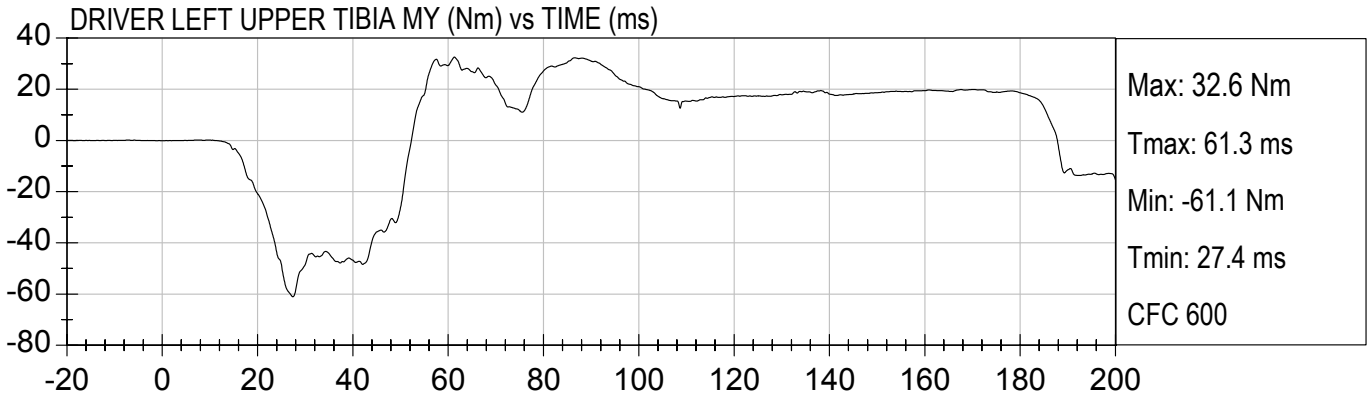


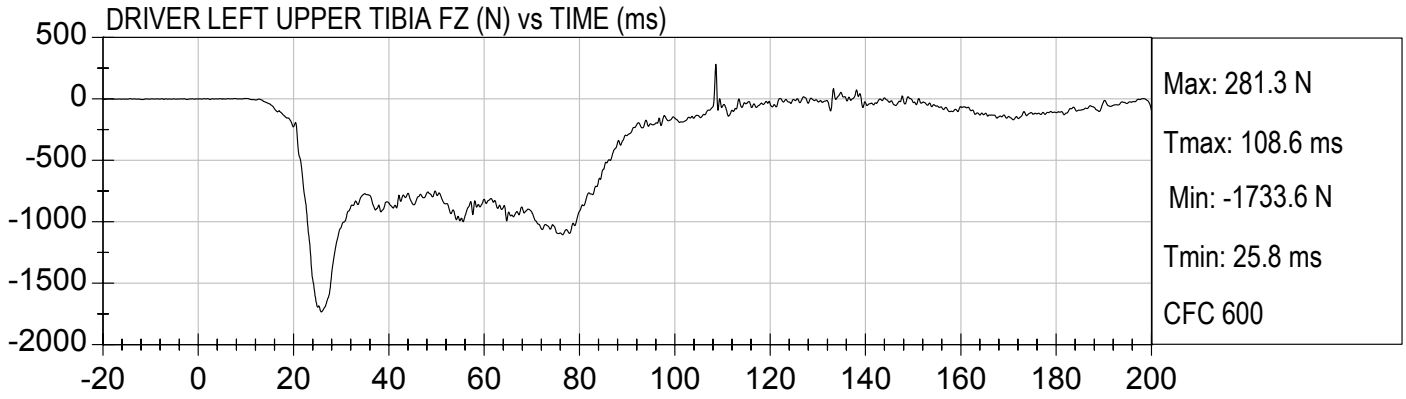






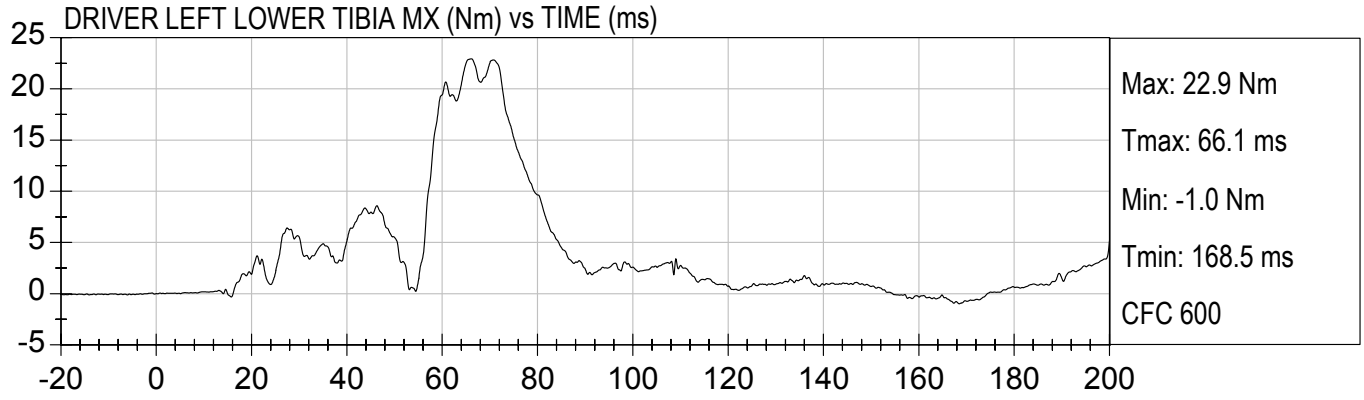

DRIVER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)
30
20
10
0
-10
-20
-30
-40
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 28.5 Nm
Tmax: 42.8 ms
Min: -41.2 Nm
Tmin: 63.3 ms
CFC 600

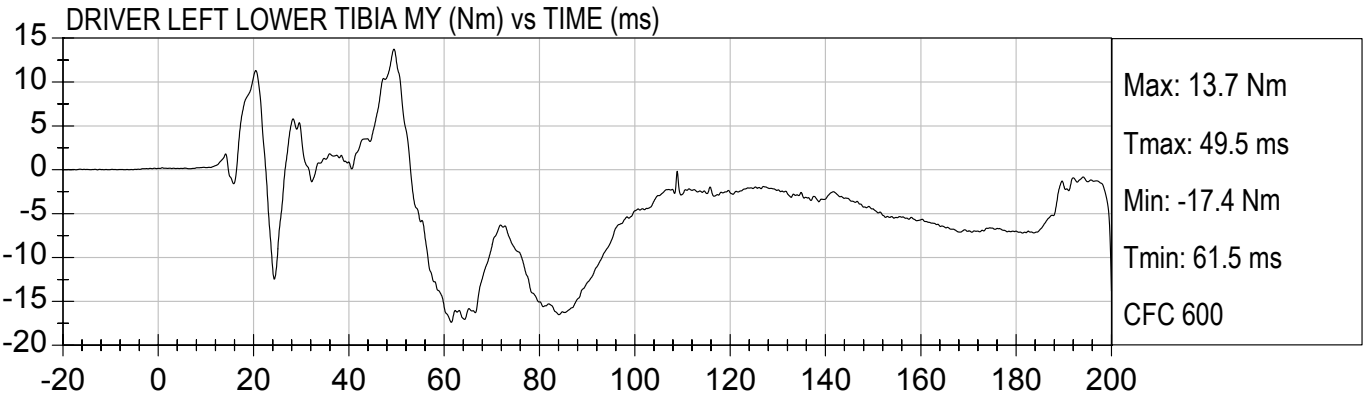

DRIVER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)
40
20
0
-20
-40
-60
-80
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 32.6 Nm
Tmax: 61.3 ms
Min: -61.1 Nm
Tmin: 27.4 ms
CFC 600

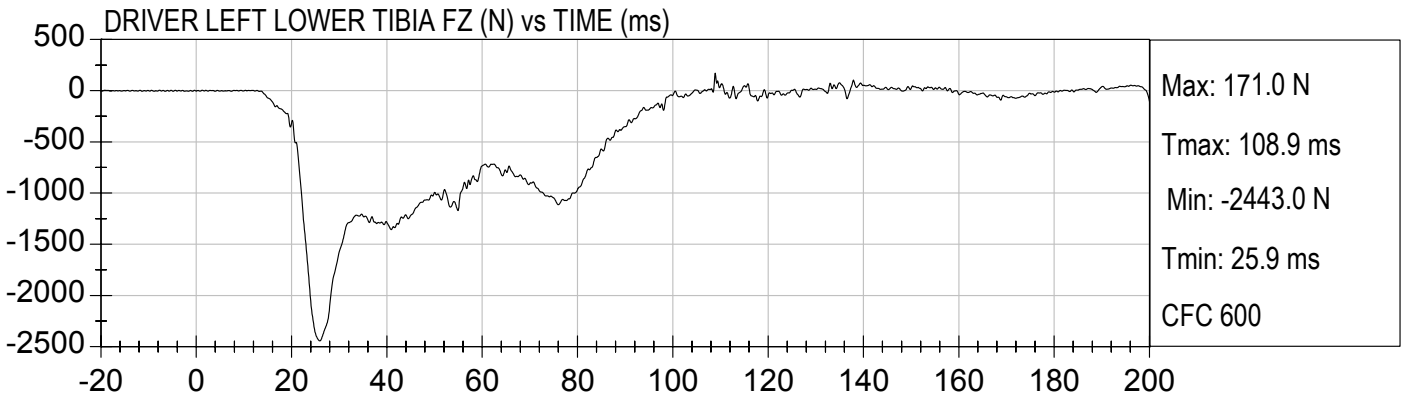

DRIVER LEFT UPPER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 281.3 N
Tmax: 108.6 ms
Min: -1733.6 N
Tmin: 25.8 ms
CFC 600

35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

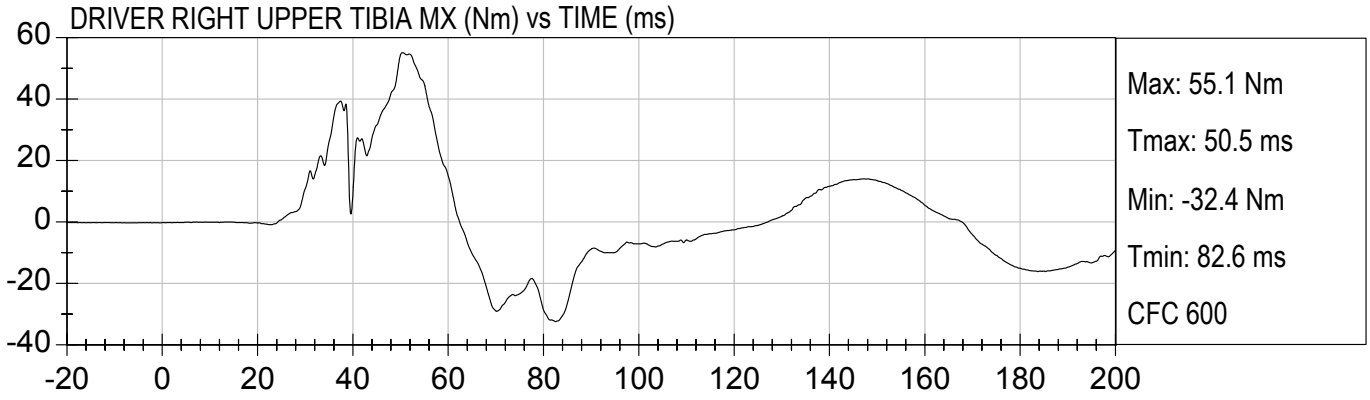


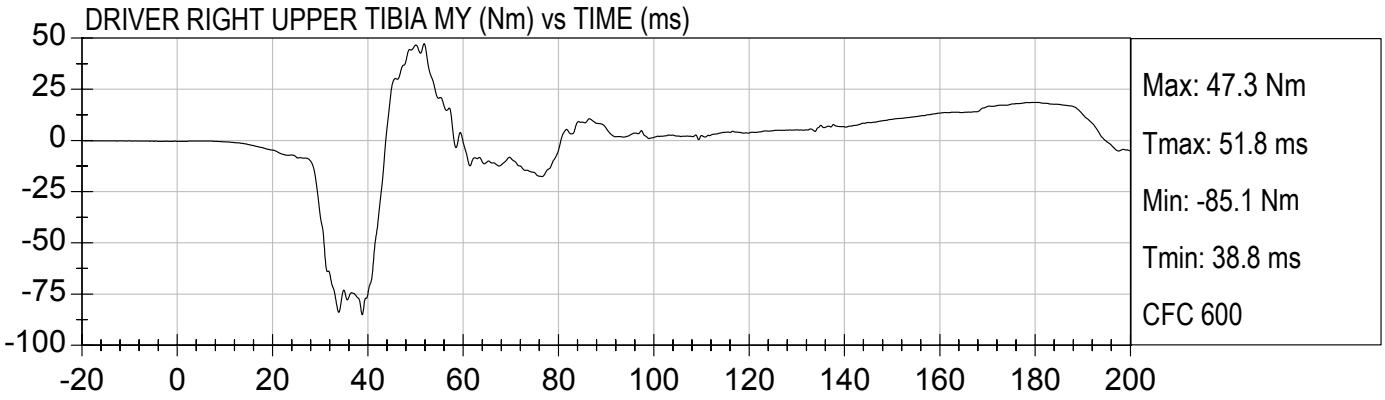


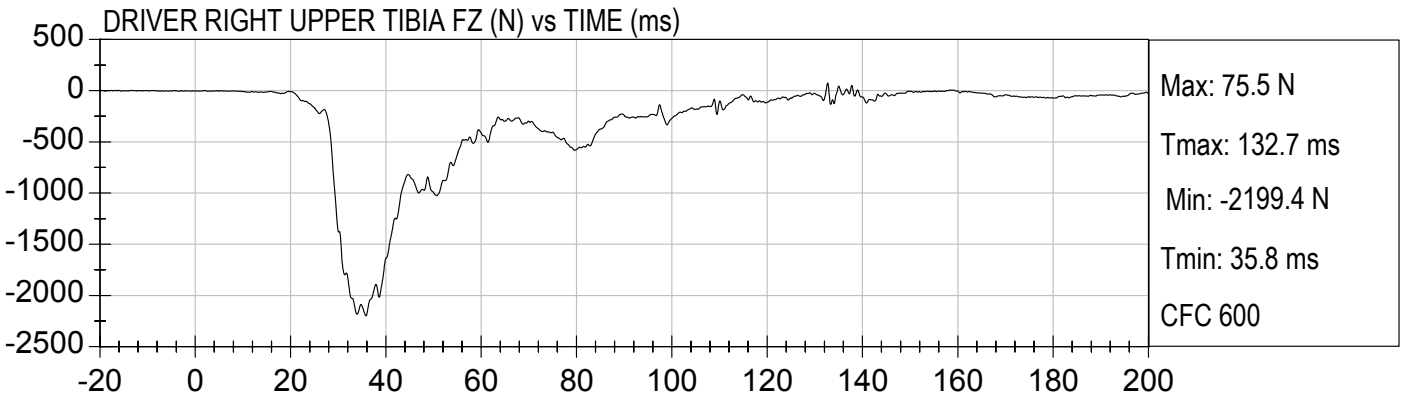


35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

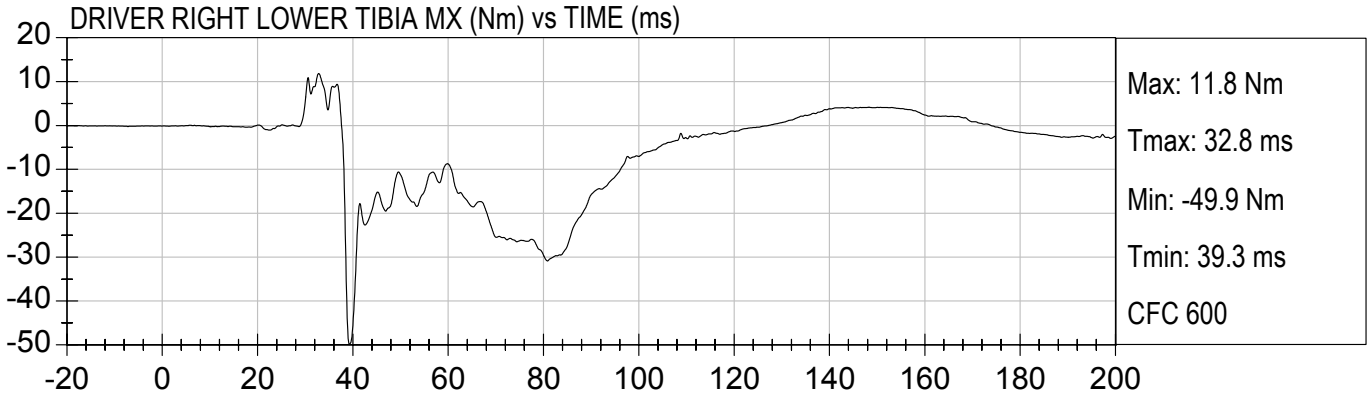


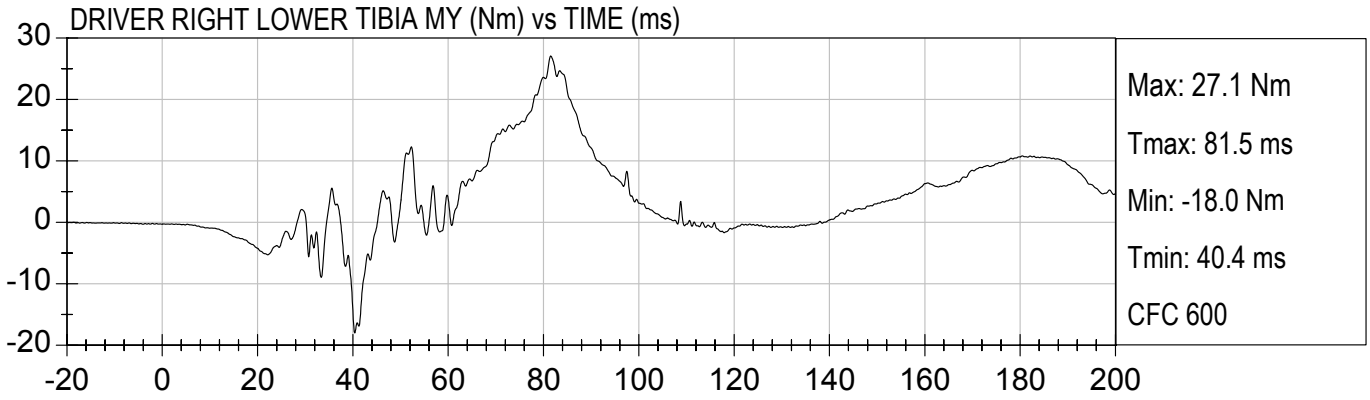


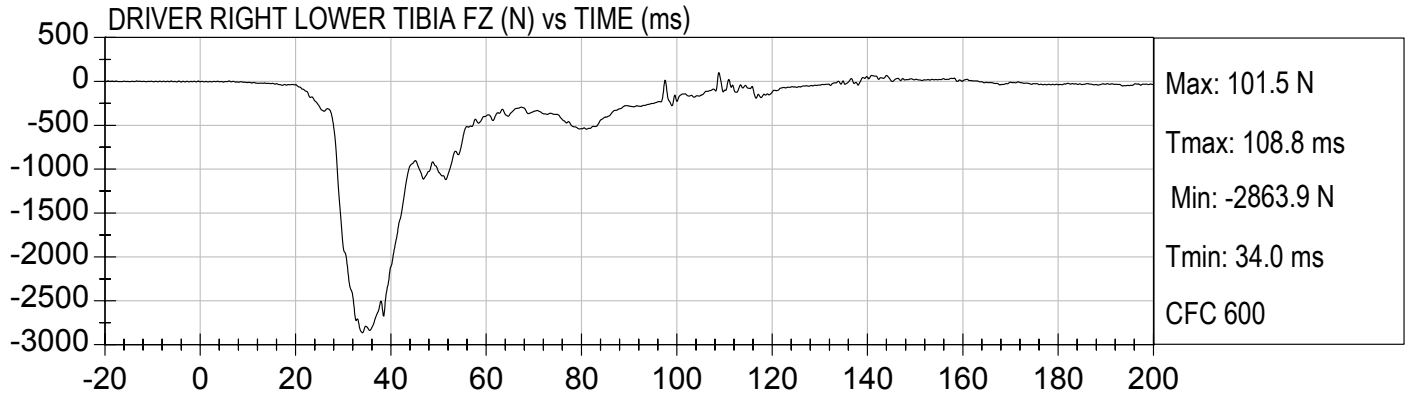


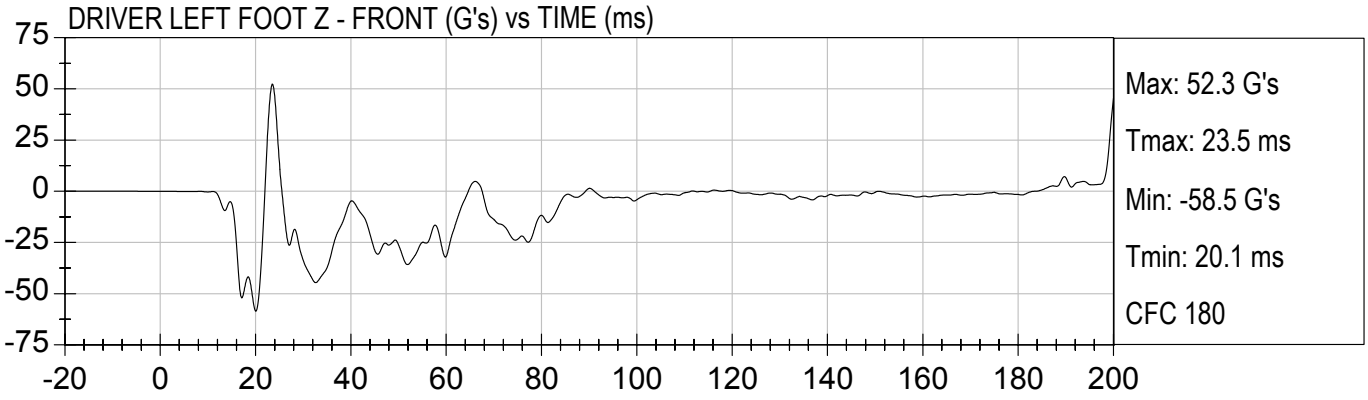
35MPH NCAP FRONTAL
2004 ACURA TSX

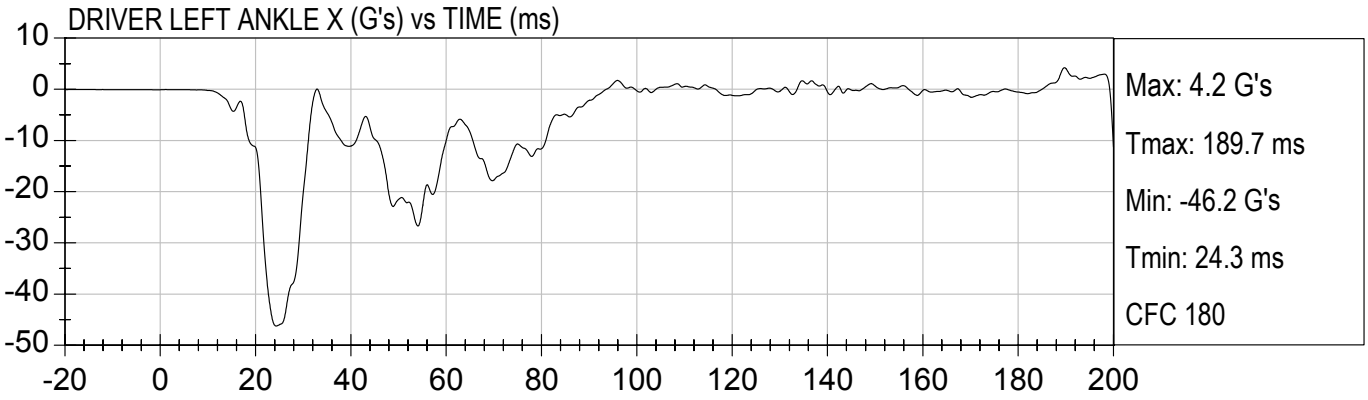
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

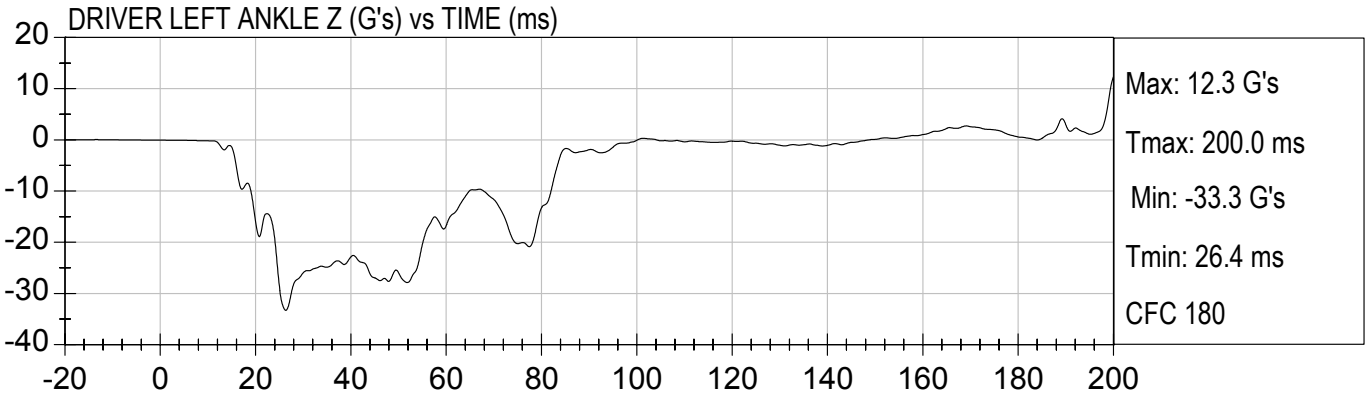






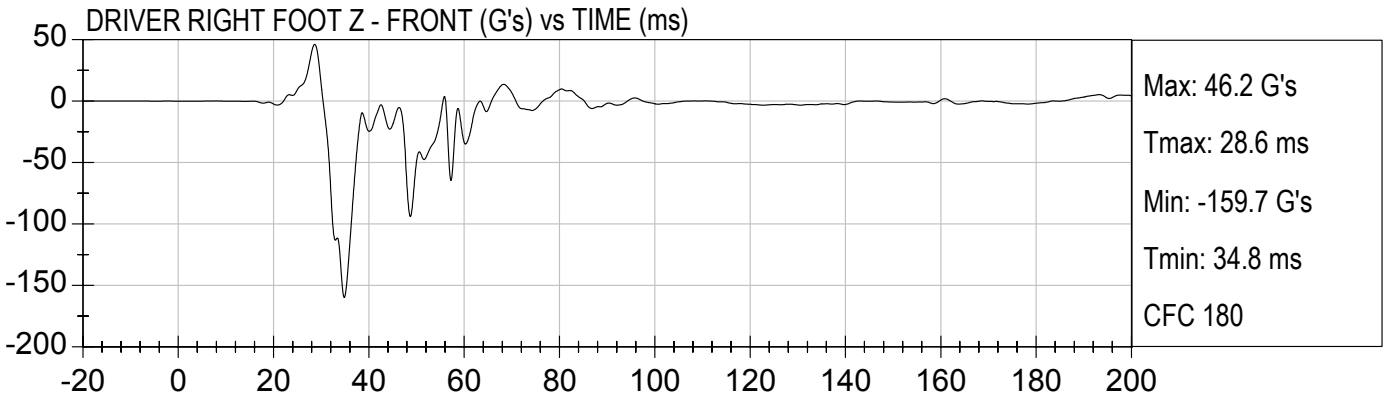

DRIVER LEFT FOOT Z - FRONT (G's) vs TIME (ms)
75
50
25
0
-25
-50
-75
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 52.3 G's
Tmax: 23.5 ms
Min: -58.5 G's
Tmin: 20.1 ms
CFC 180

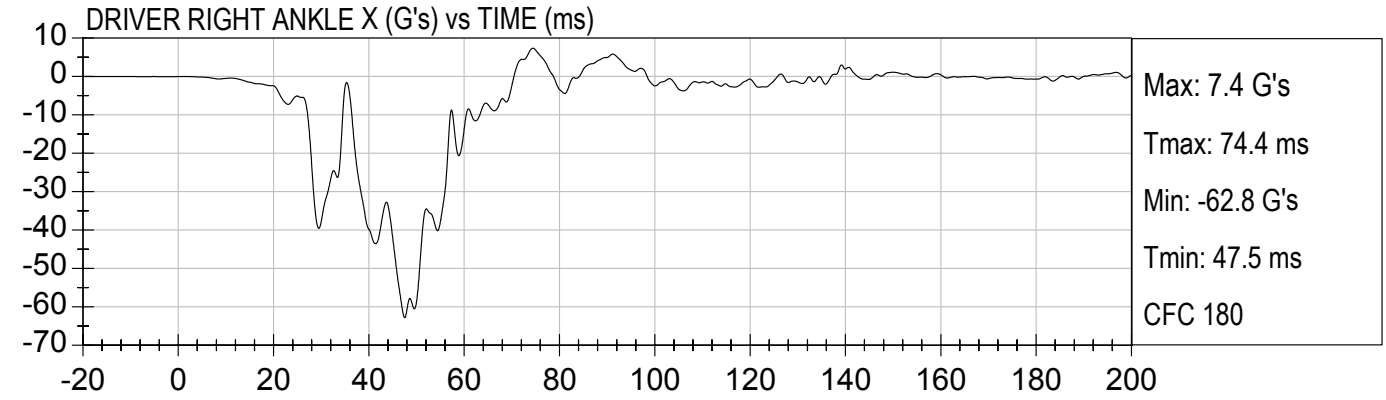

DRIVER LEFT ANKLE X (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 4.2 G's
Tmax: 189.7 ms
Min: -46.2 G's
Tmin: 24.3 ms
CFC 180

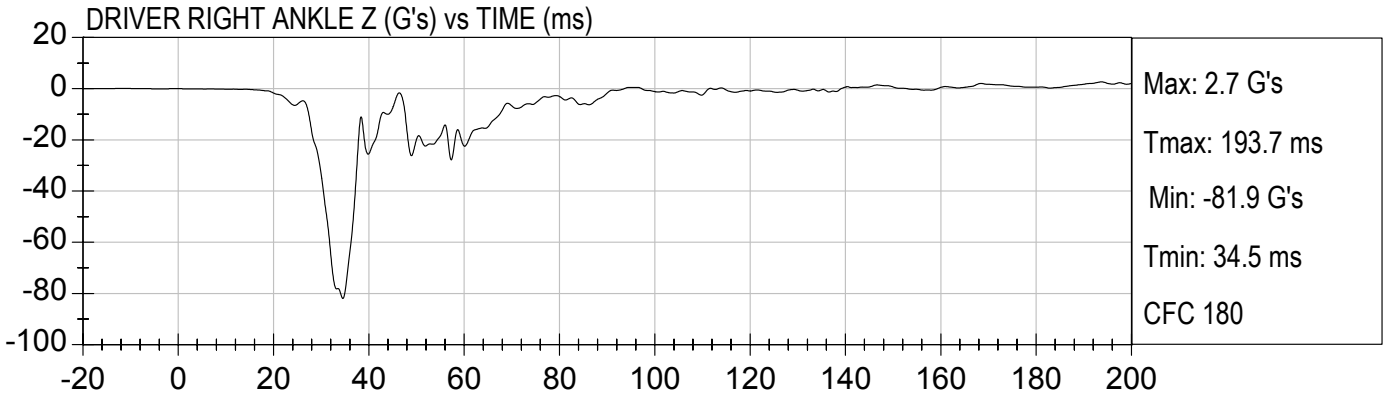

DRIVER LEFT ANKLE Z (G's) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 12.3 G's
Tmax: 200.0 ms
Min: -33.3 G's
Tmin: 26.4 ms
CFC 180

35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

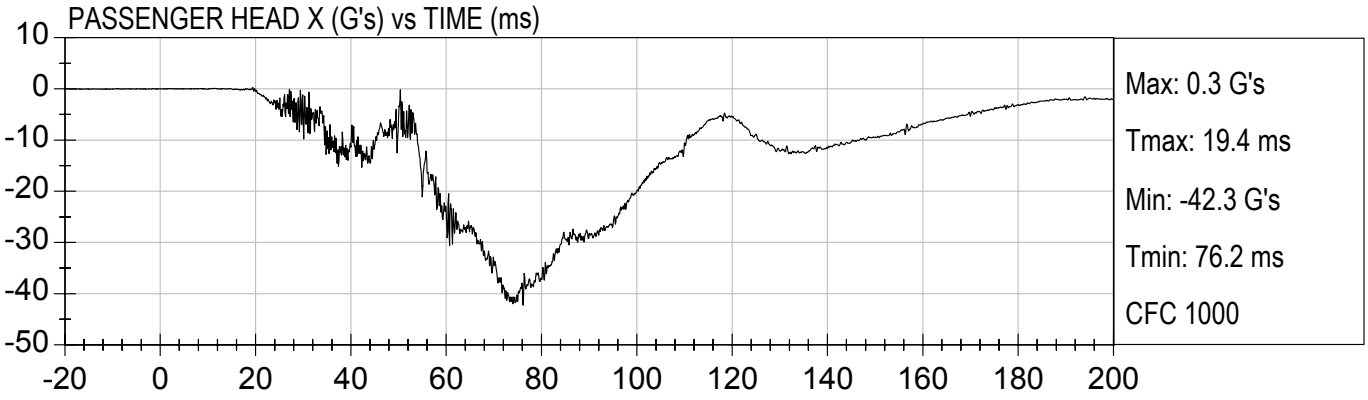


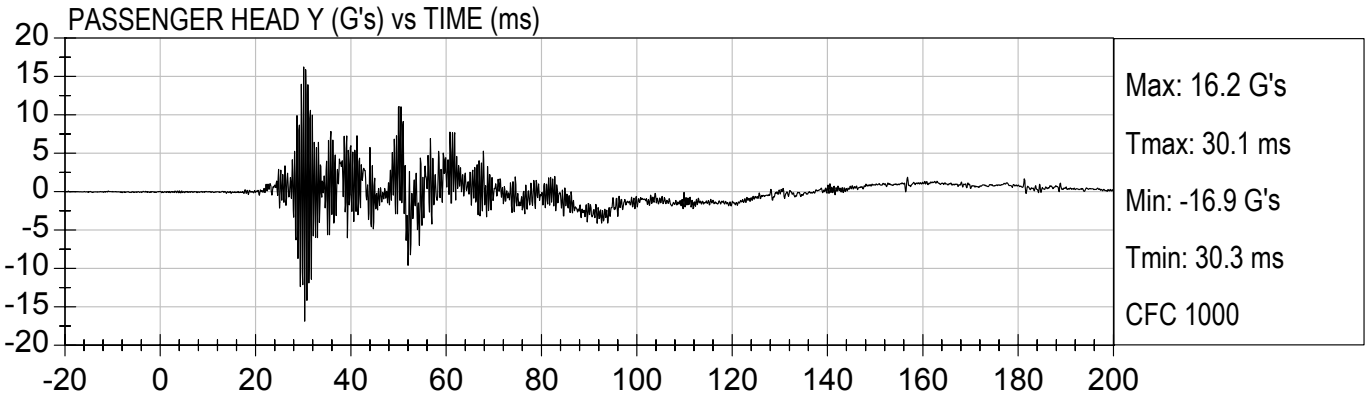


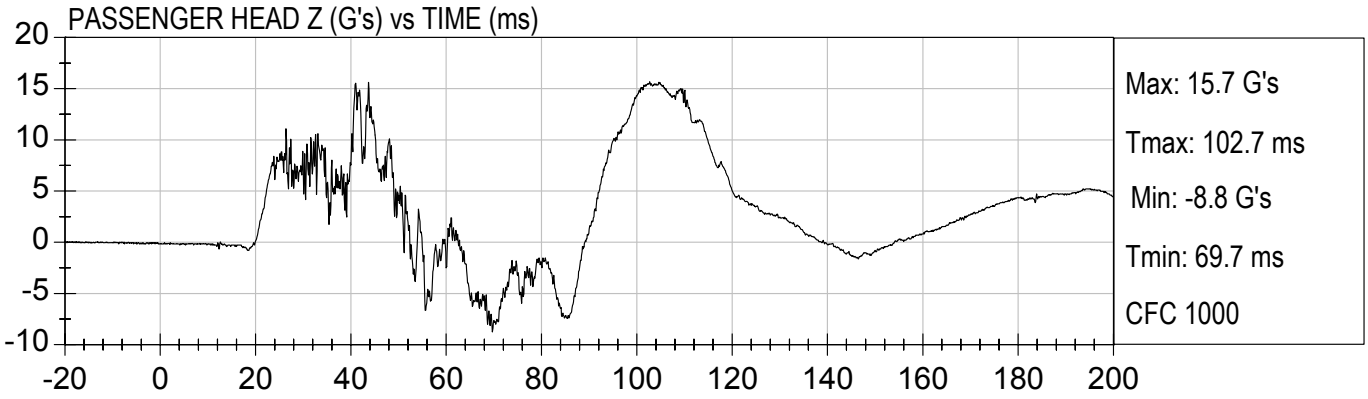


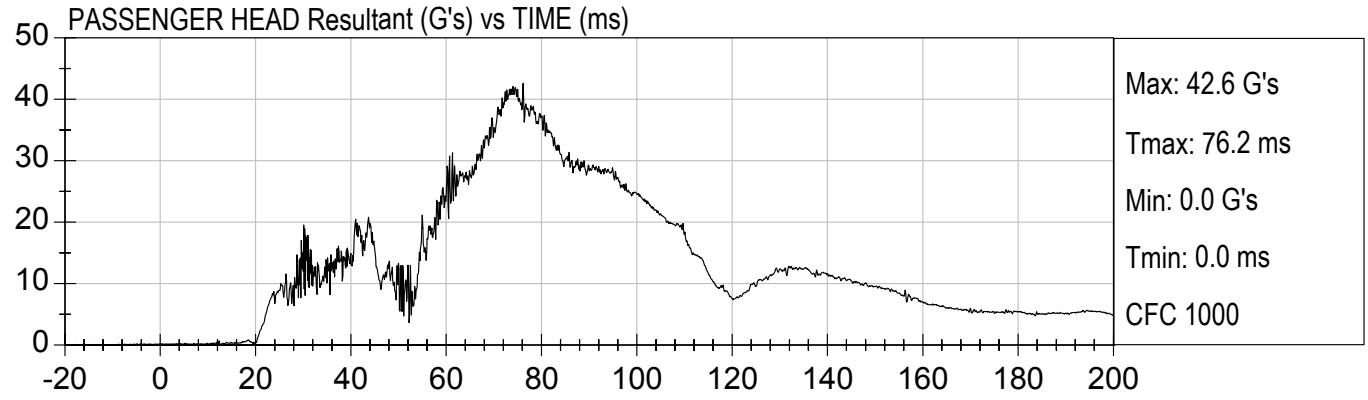
35MPH NCAP FRONTAL
2004 ACURA TSX

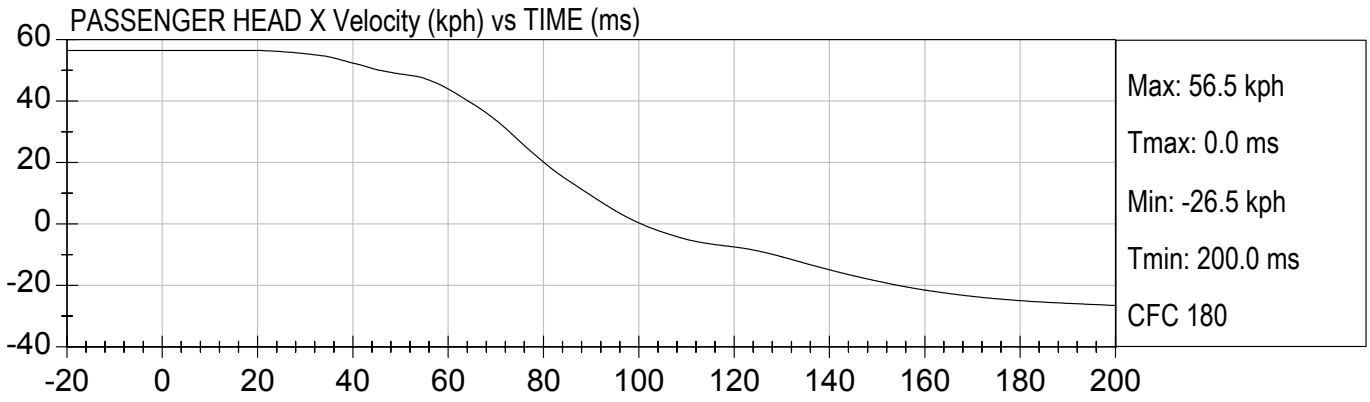
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

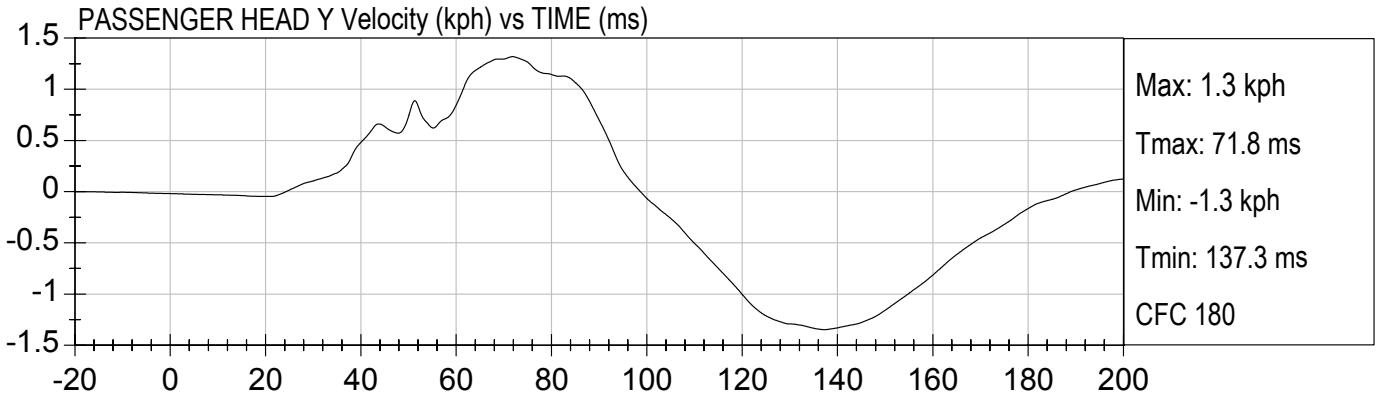


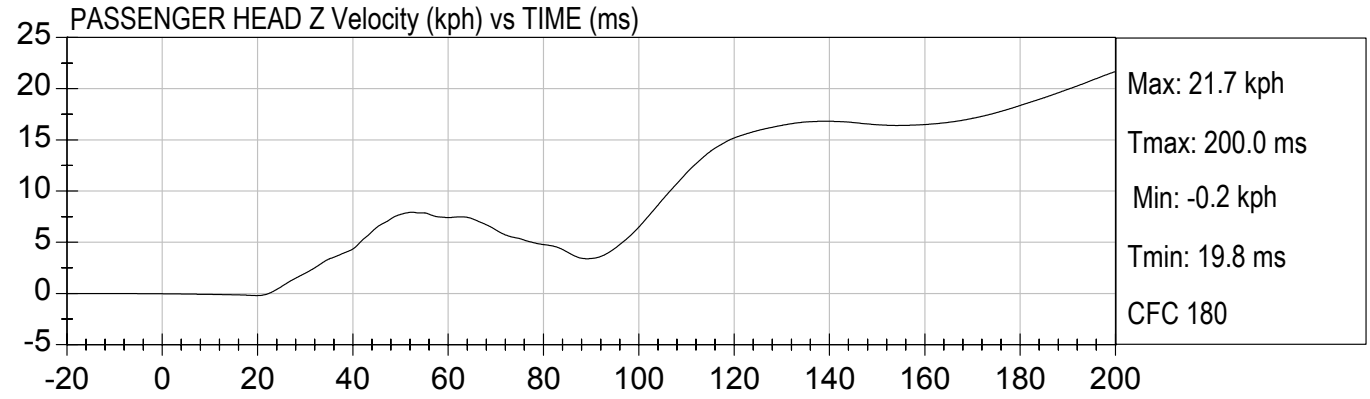






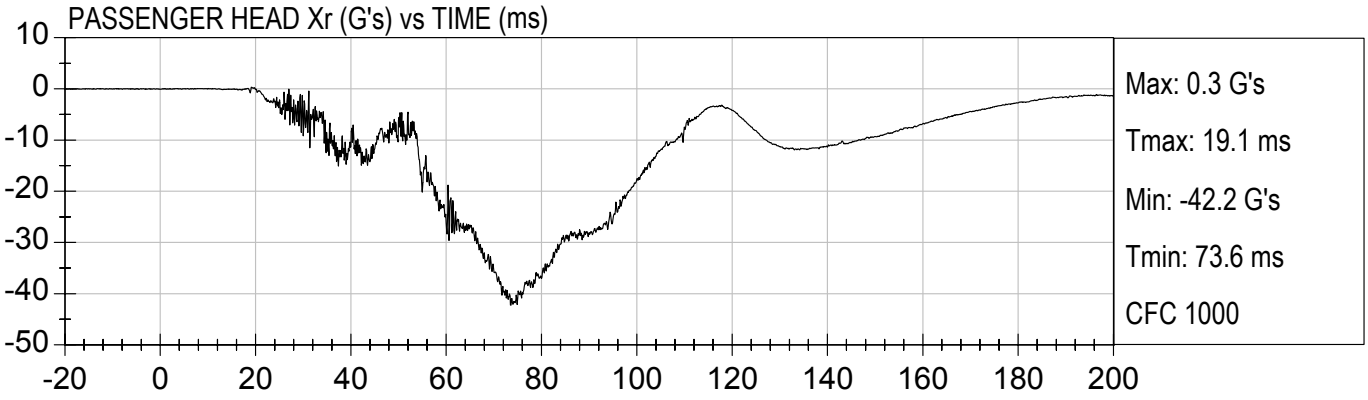

PASSENGER HEAD X Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -26.5 kph
Tmin: 200.0 ms
CFC 180

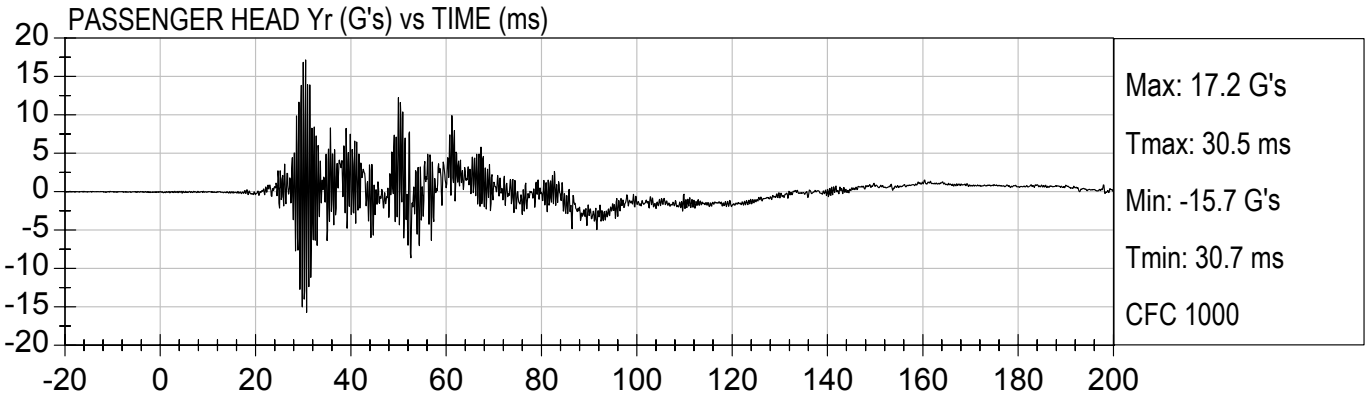

PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
1.5
1
0.5
0
-0.5
-1
-1.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 1.3 kph
Tmax: 71.8 ms
Min: -1.3 kph
Tmin: 137.3 ms
CFC 180

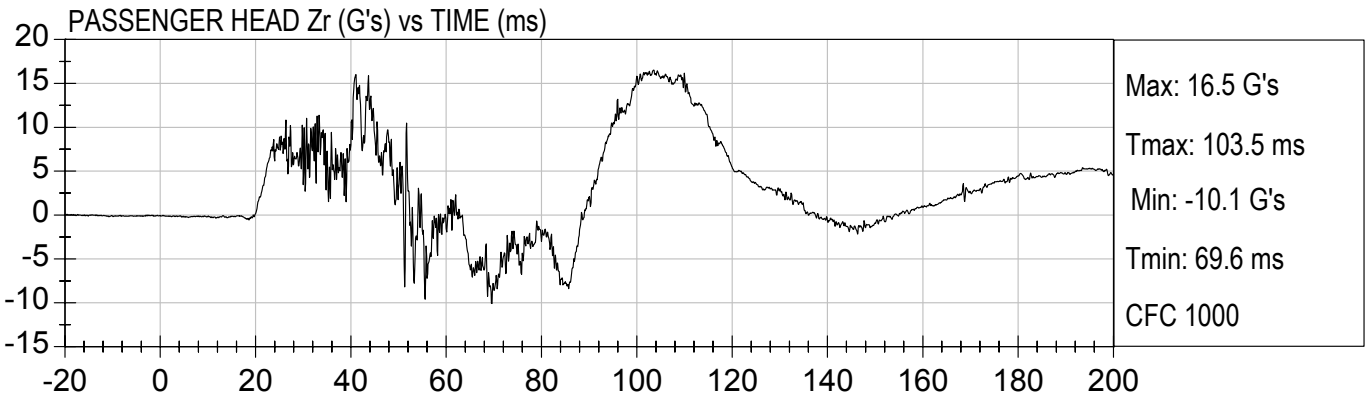

PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 21.7 kph
Tmax: 200.0 ms
Min: -0.2 kph
Tmin: 19.8 ms
CFC 180

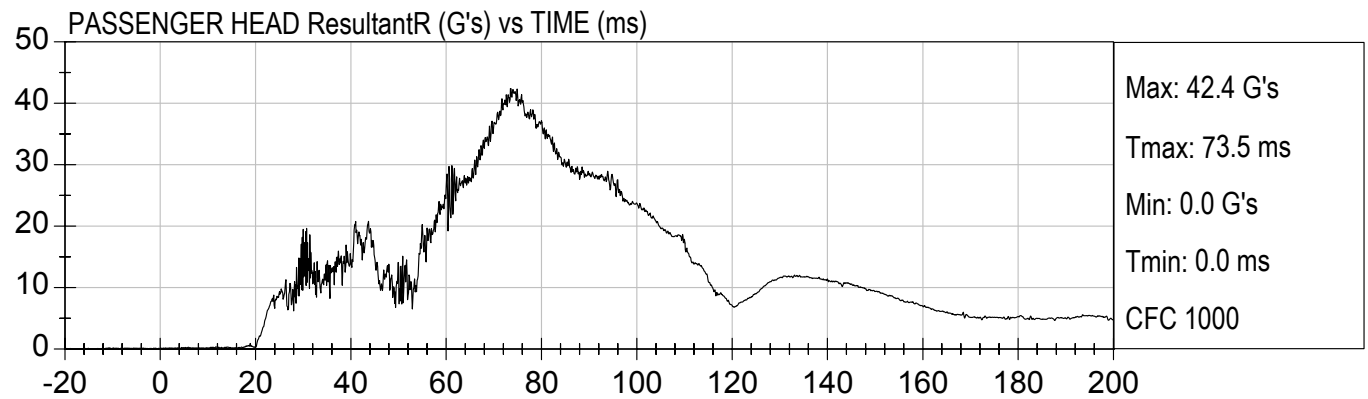
35MPH NCAP FRONTAL
2004 ACURA TSX

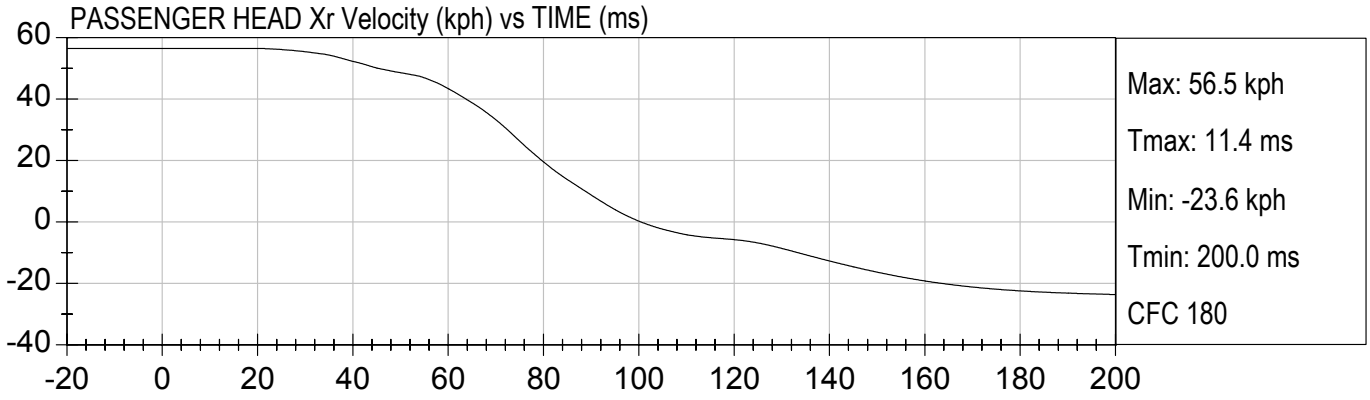
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

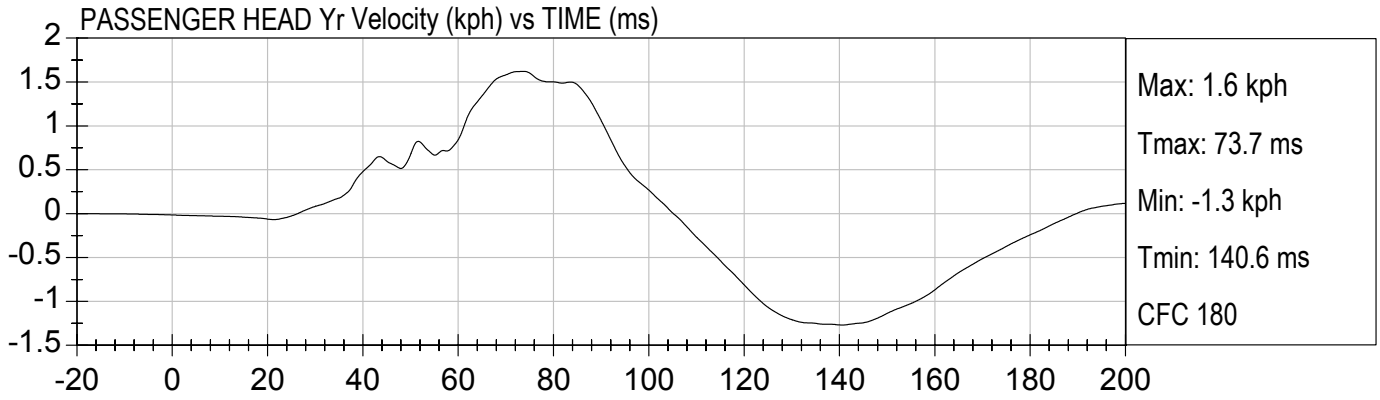


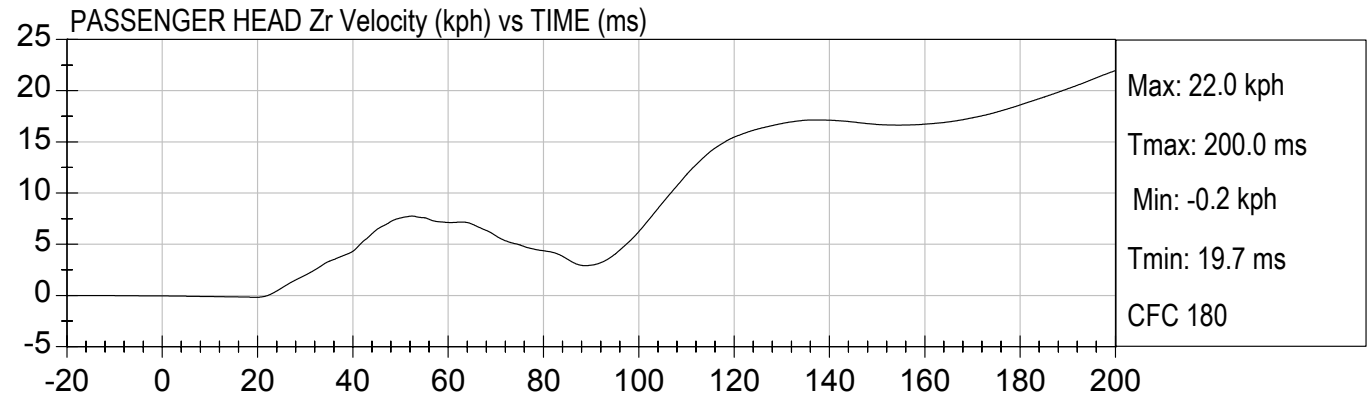






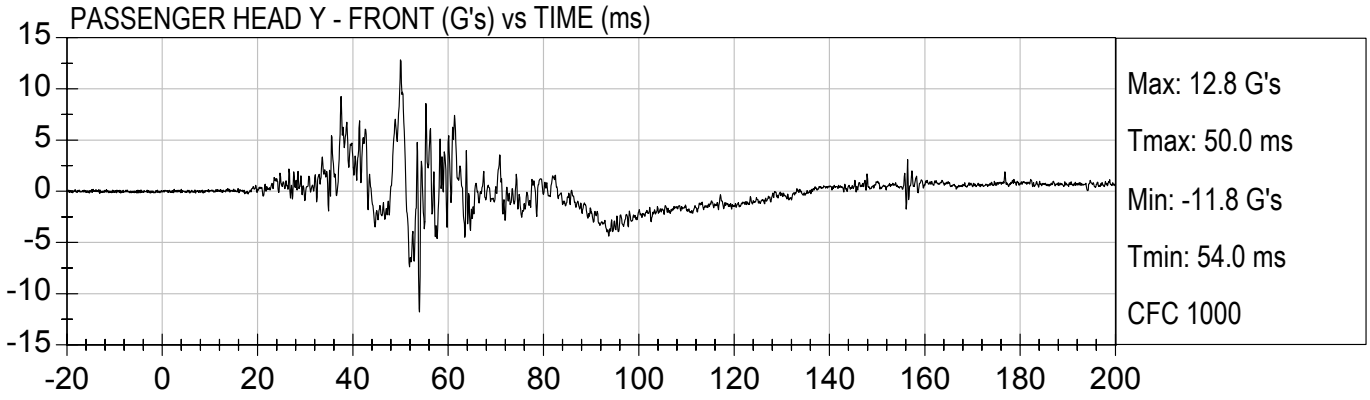

PASSENGER HEAD Xr Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 11.4 ms
Min: -23.6 kph
Tmin: 200.0 ms
CFC 180

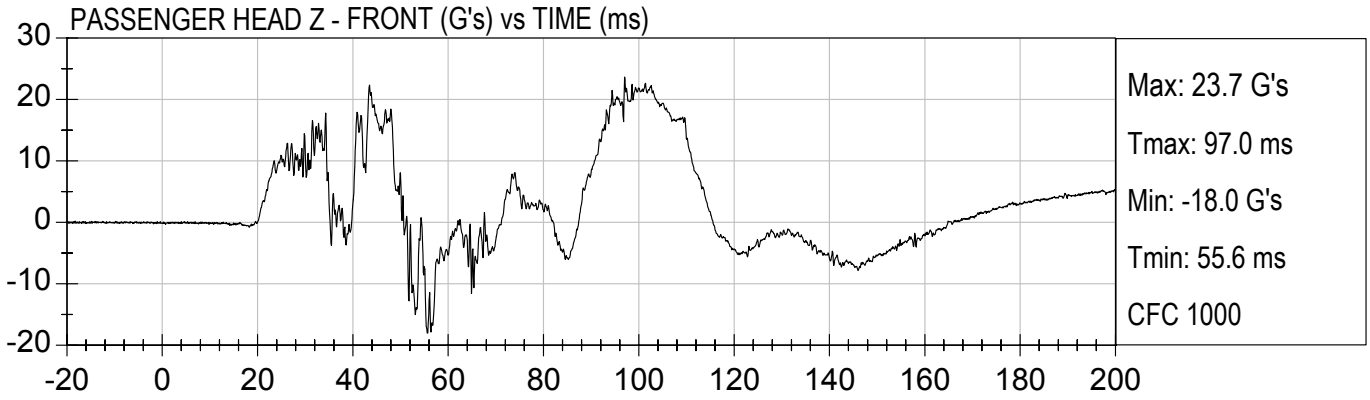

PASSENGER HEAD Yr Velocity (kph) vs TIME (ms)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 1.6 kph
Tmax: 73.7 ms
Min: -1.3 kph
Tmin: 140.6 ms
CFC 180

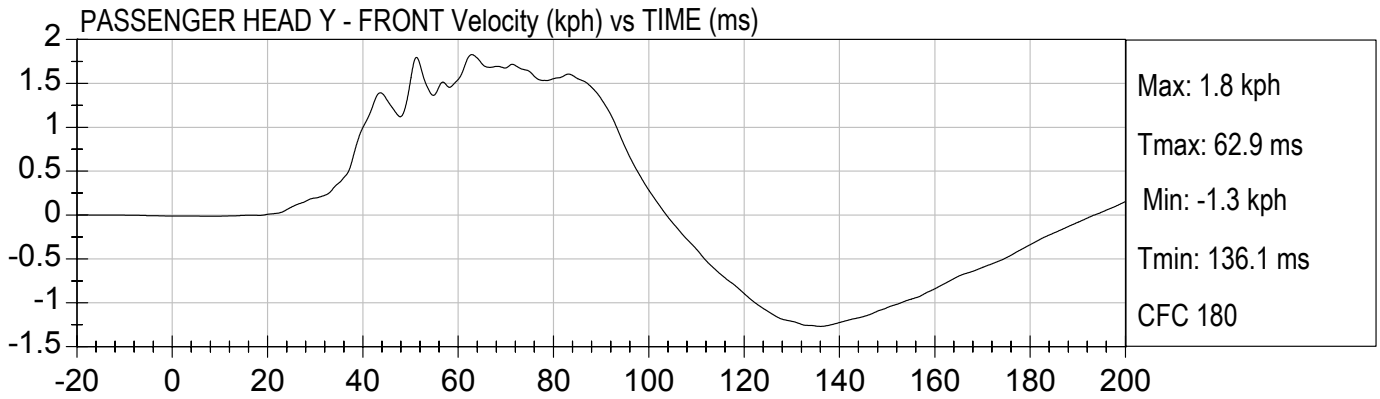

PASSENGER HEAD Zr Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 22.0 kph
Tmax: 200.0 ms
Min: -0.2 kph
Tmin: 19.7 ms
CFC 180

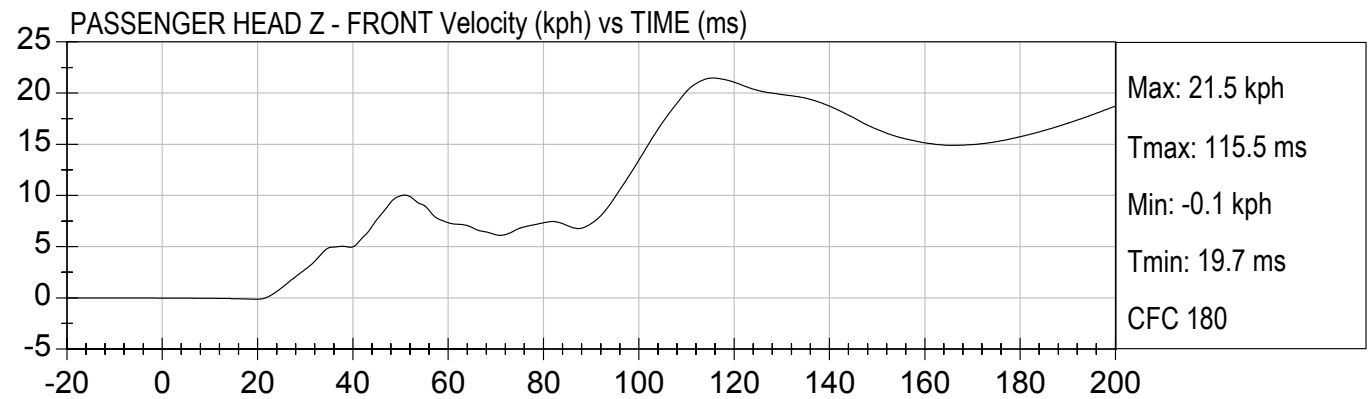
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



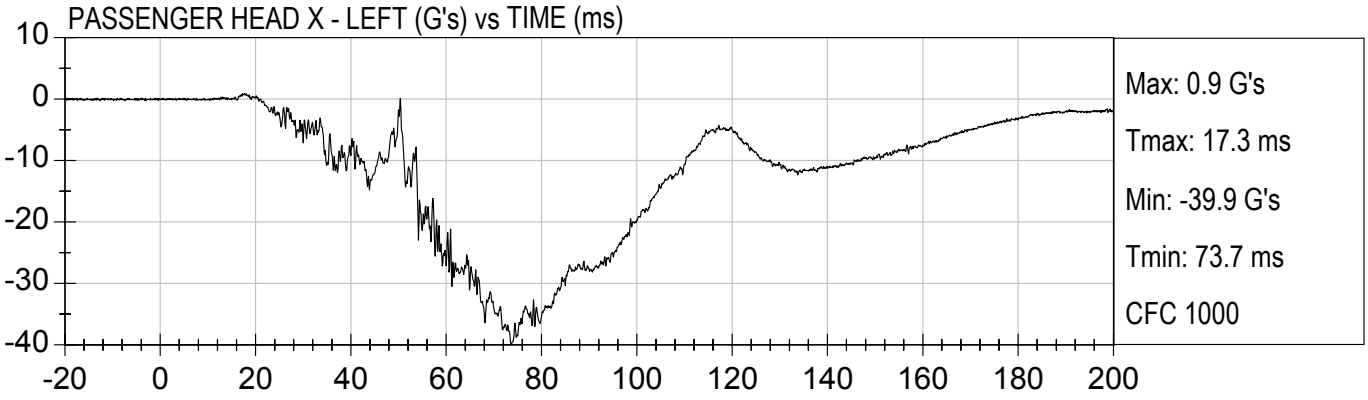


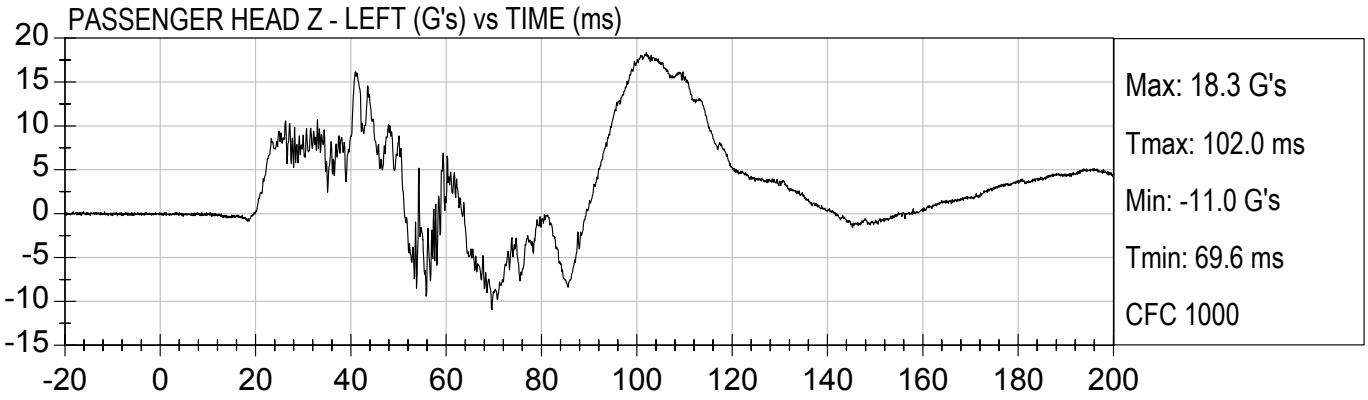


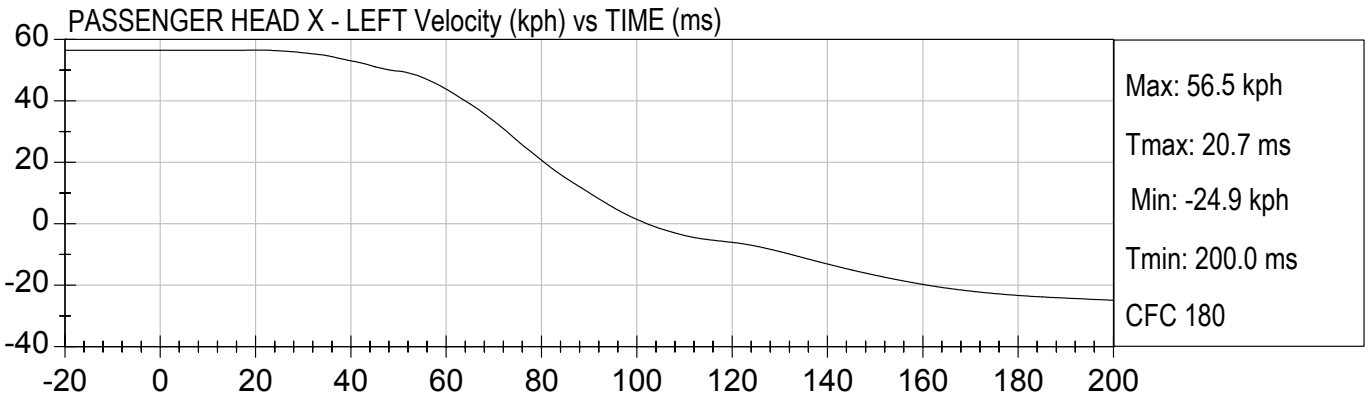


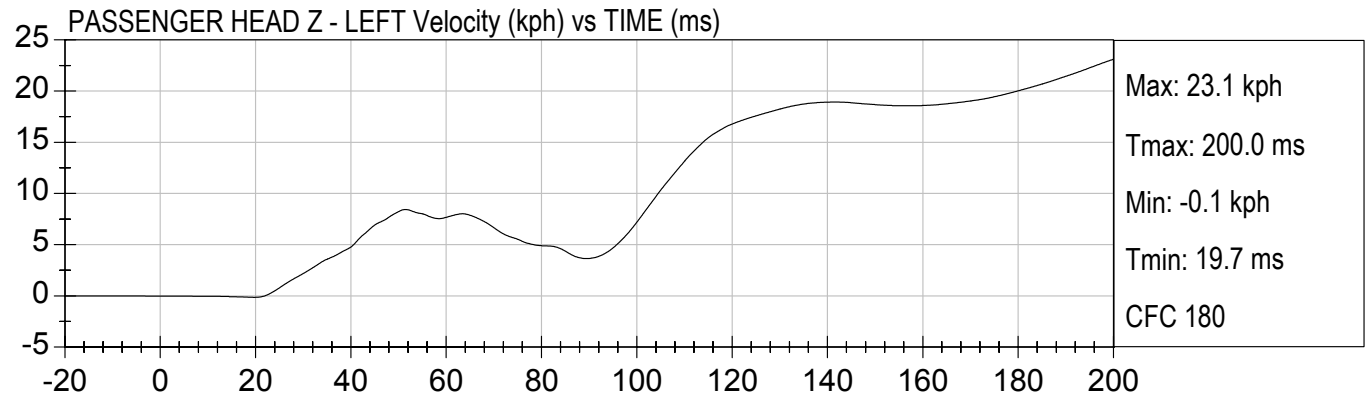
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



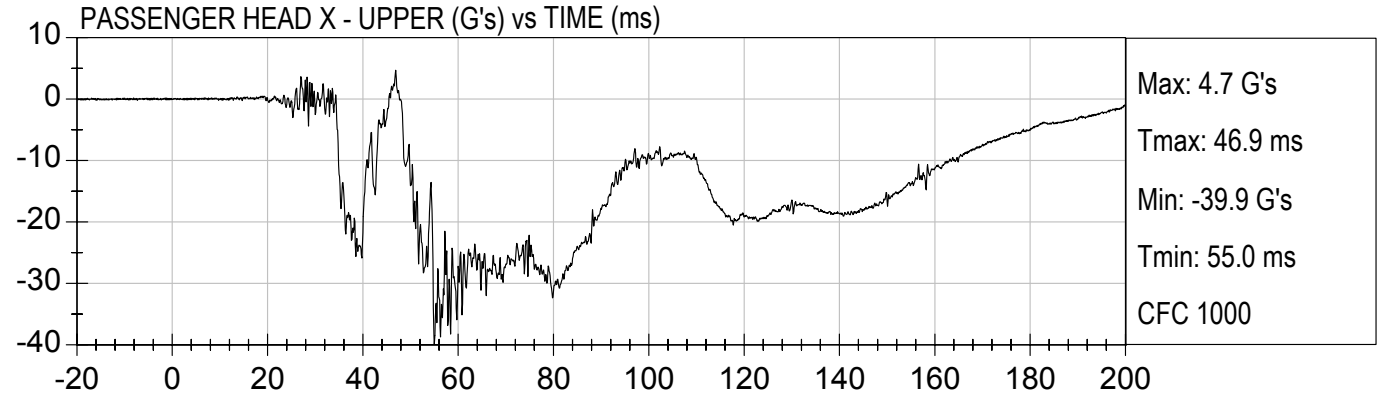


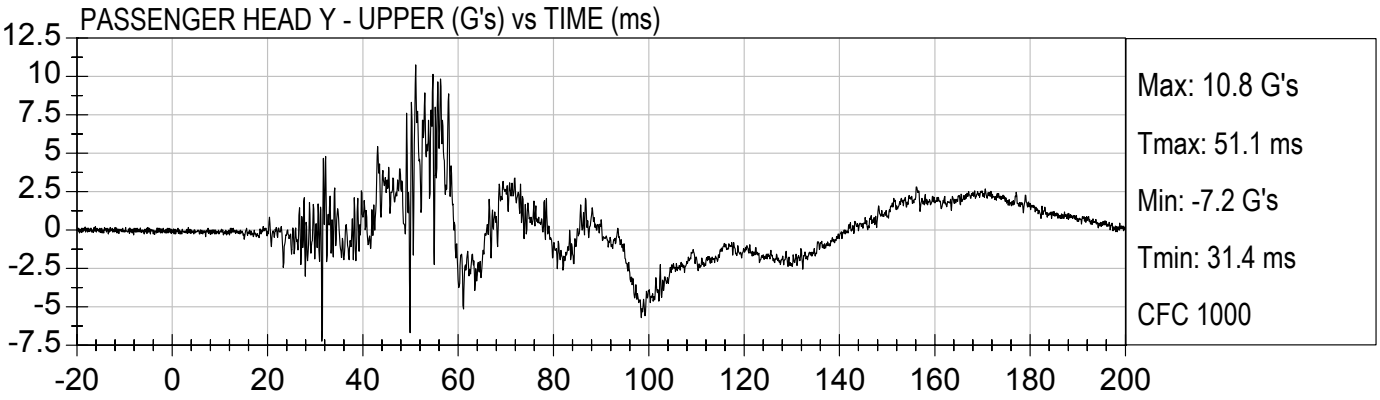


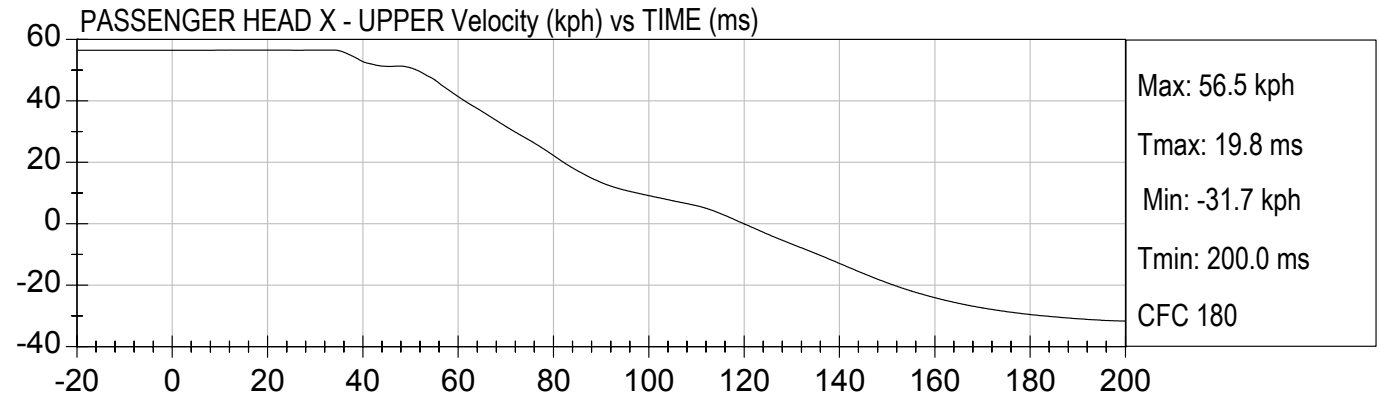


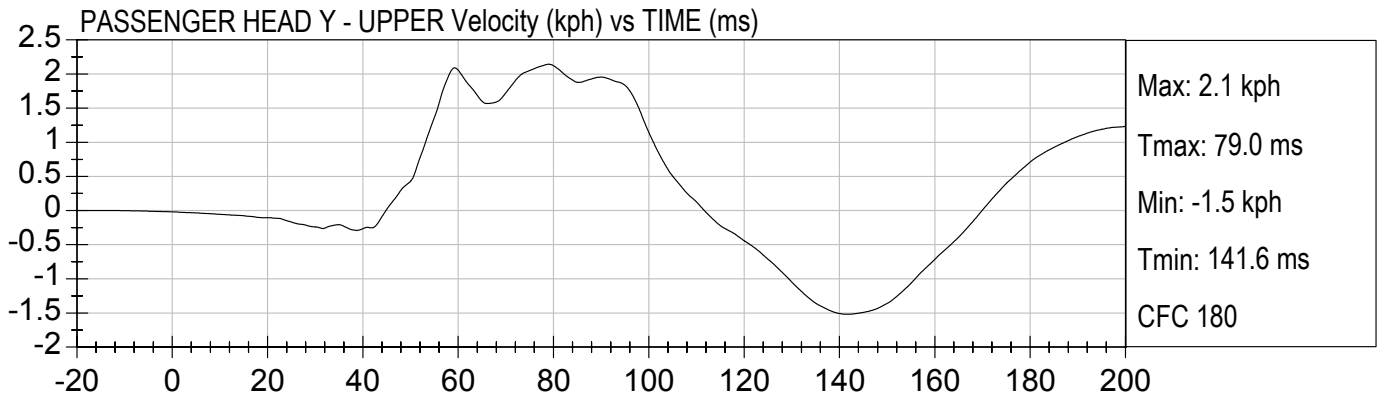
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



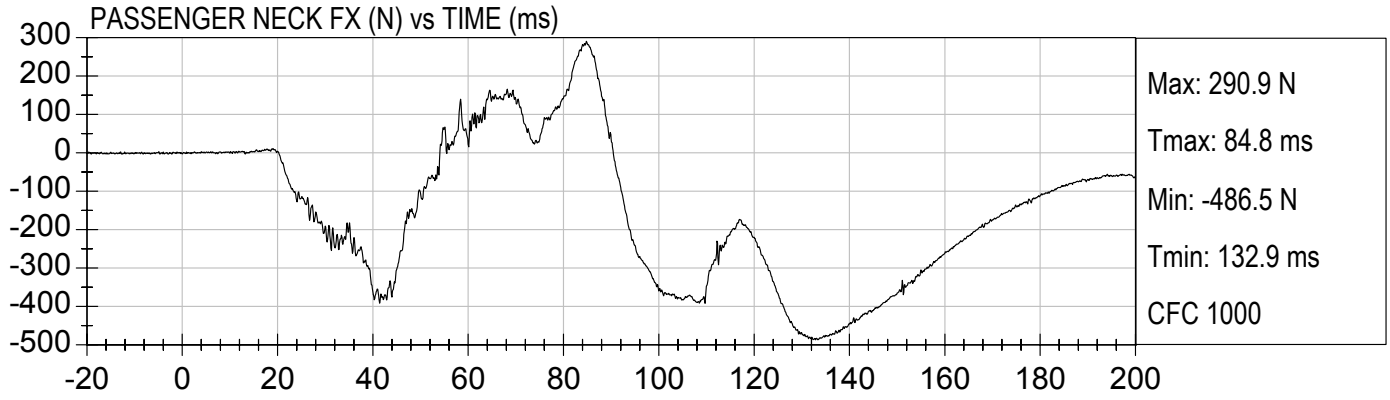


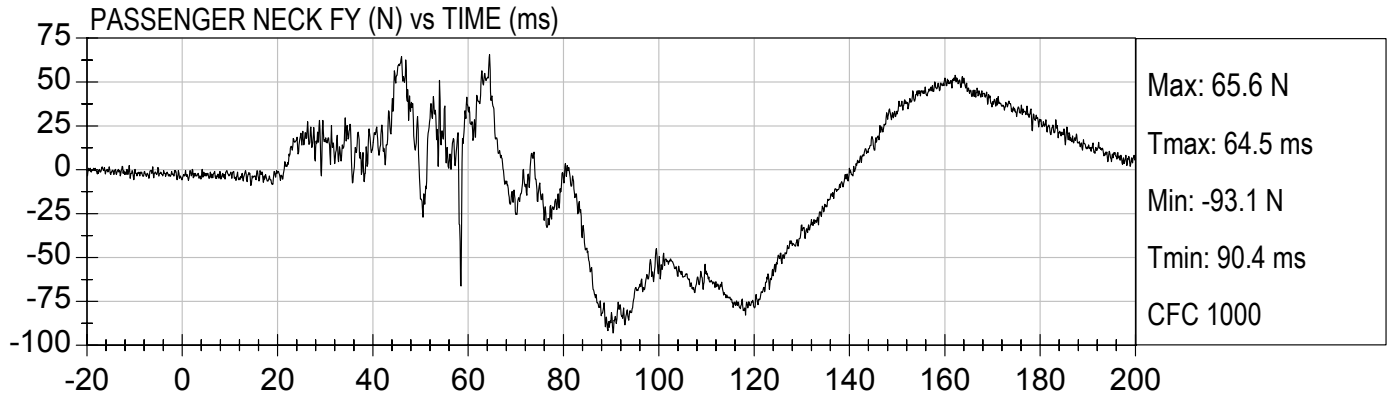


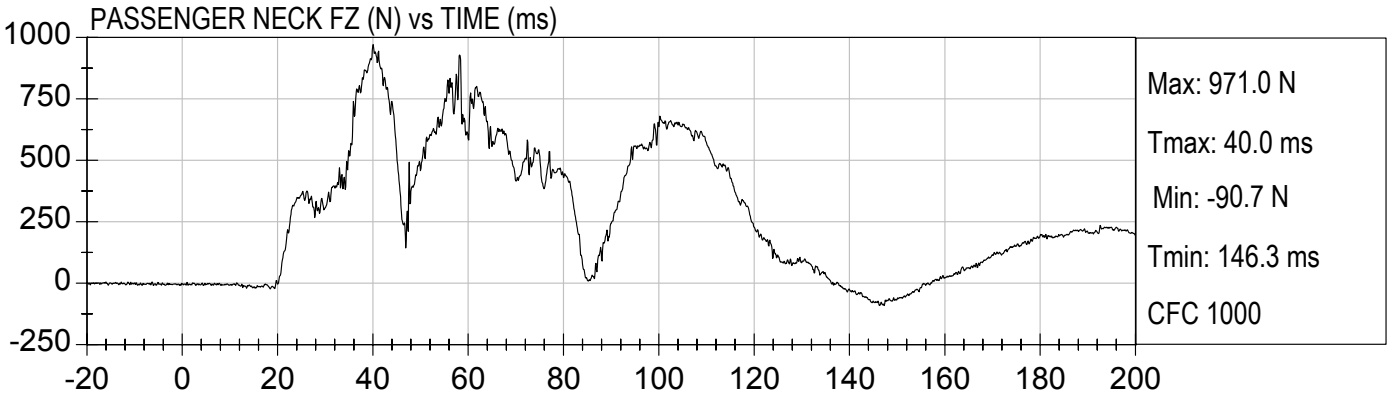


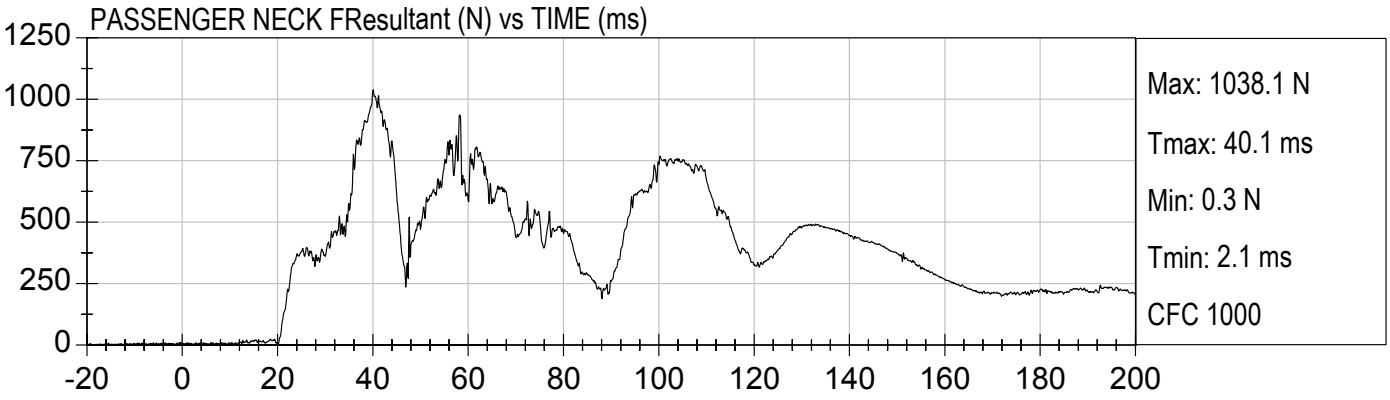
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



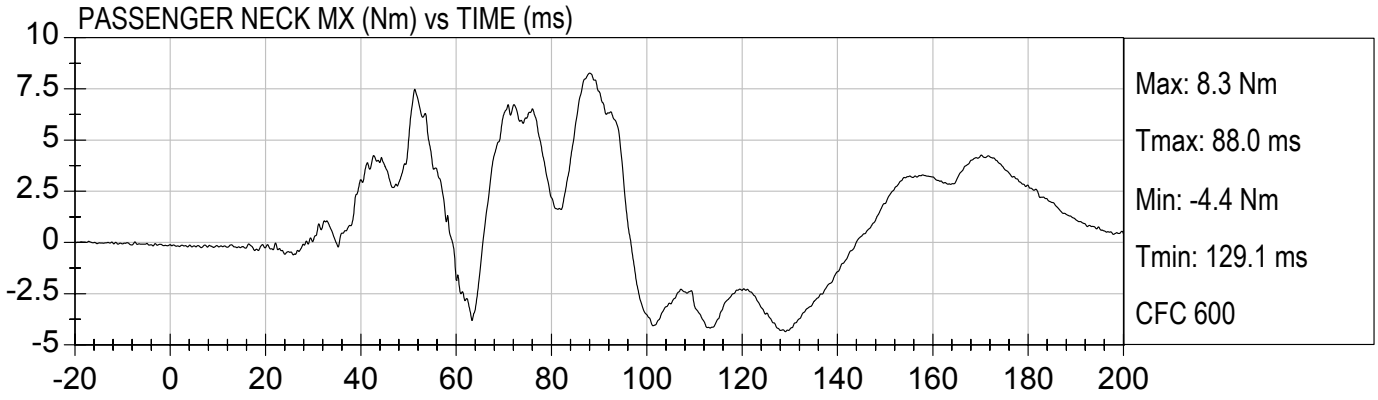


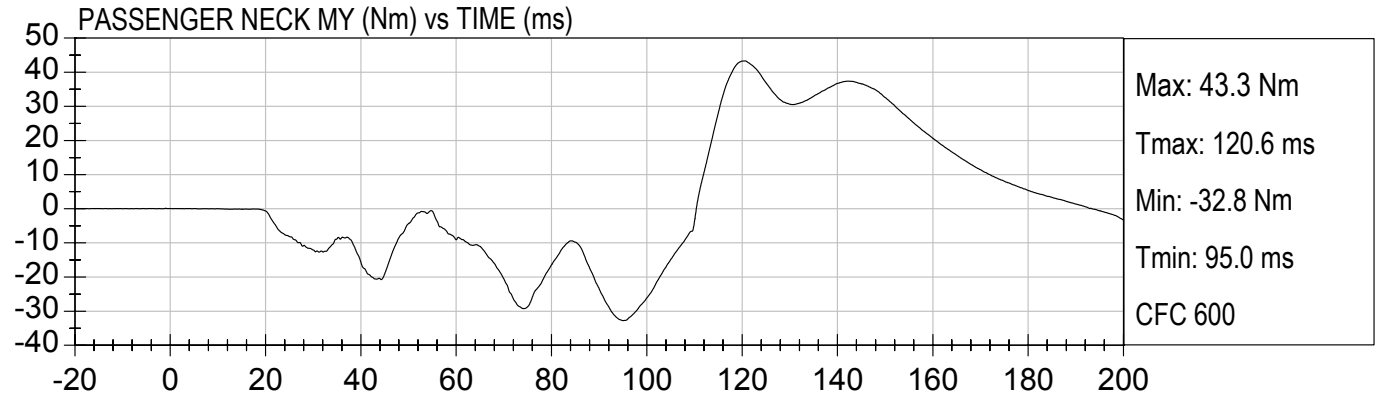


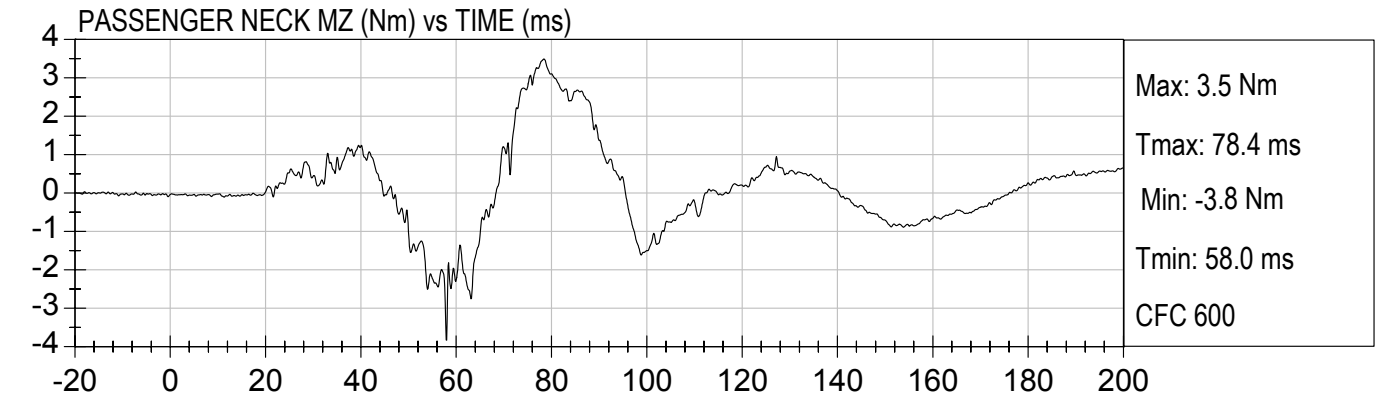


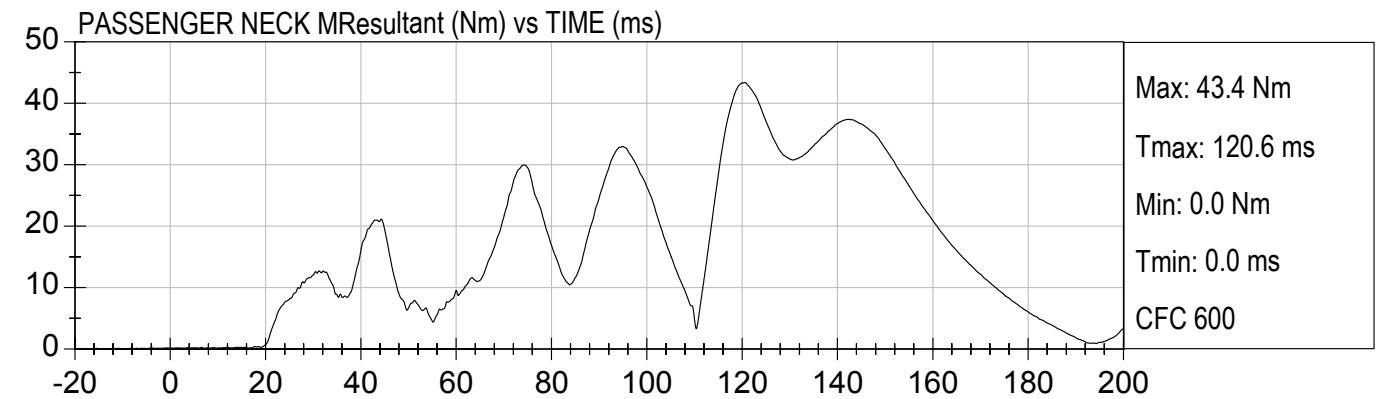
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



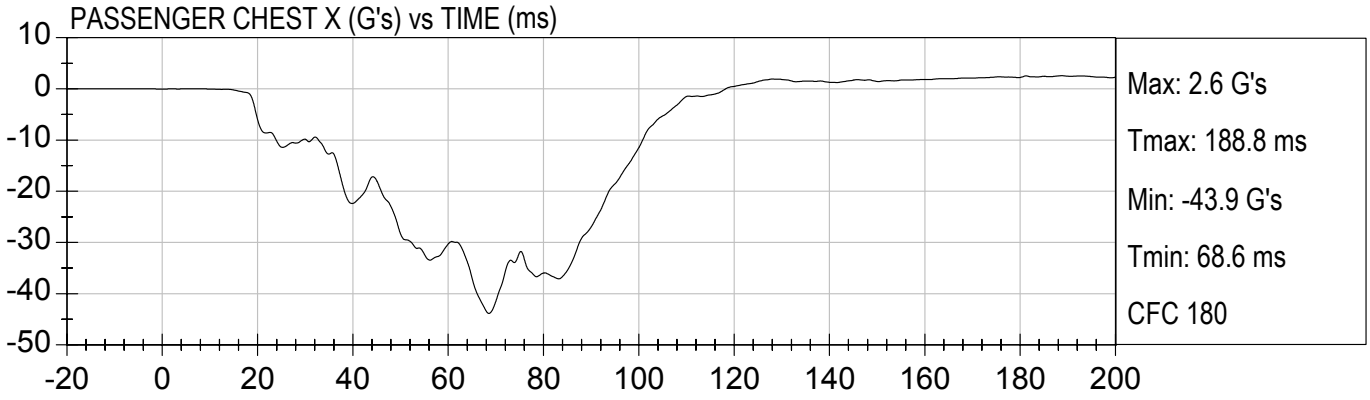


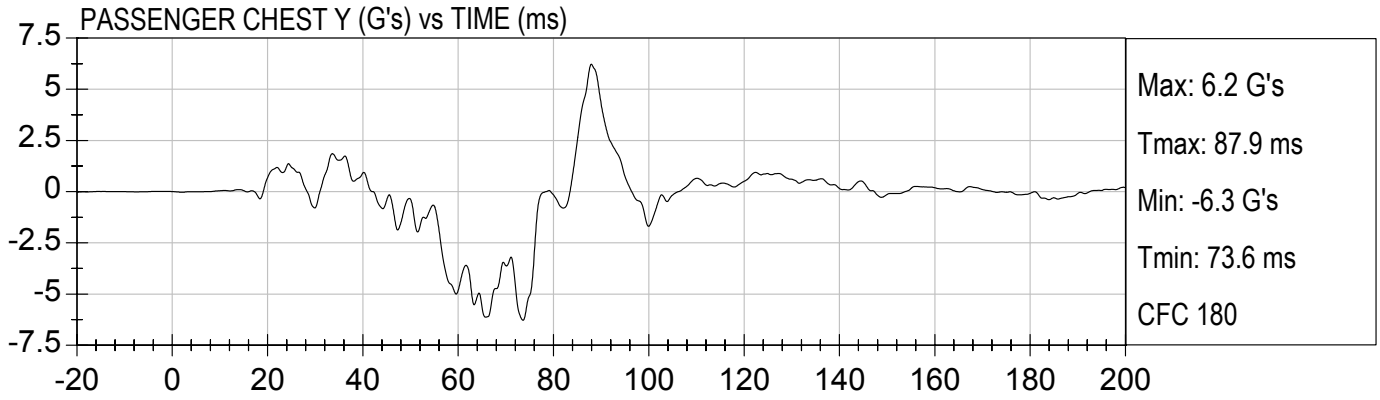


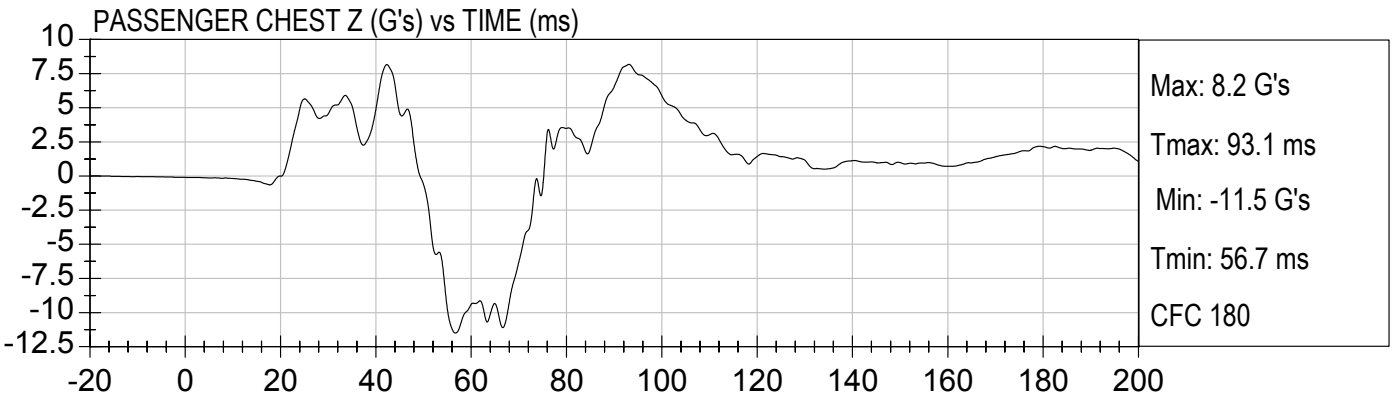


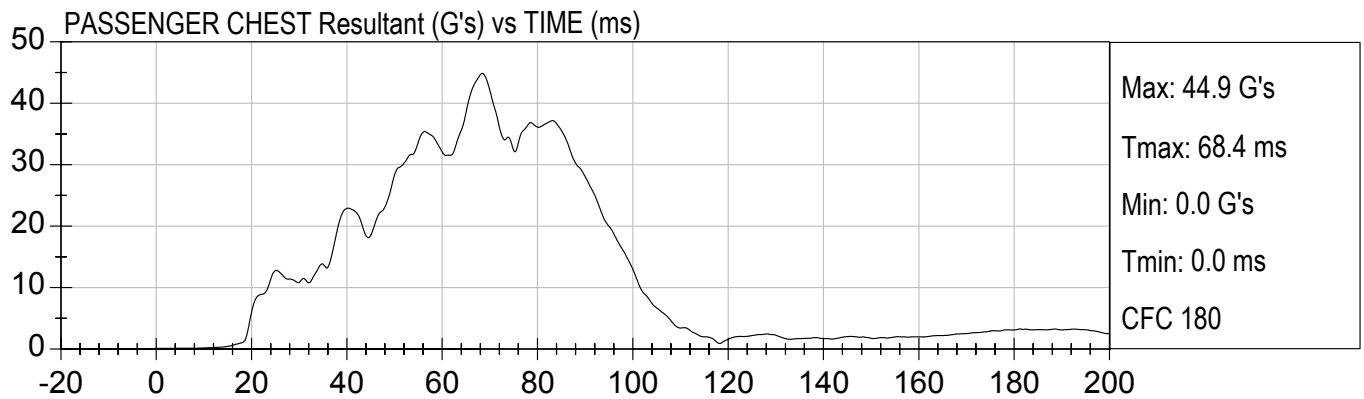
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



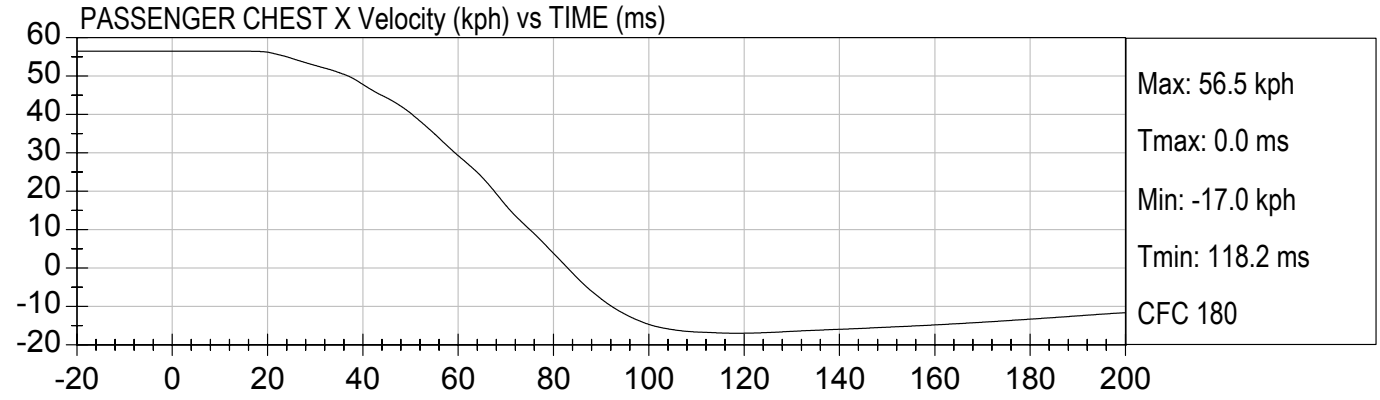


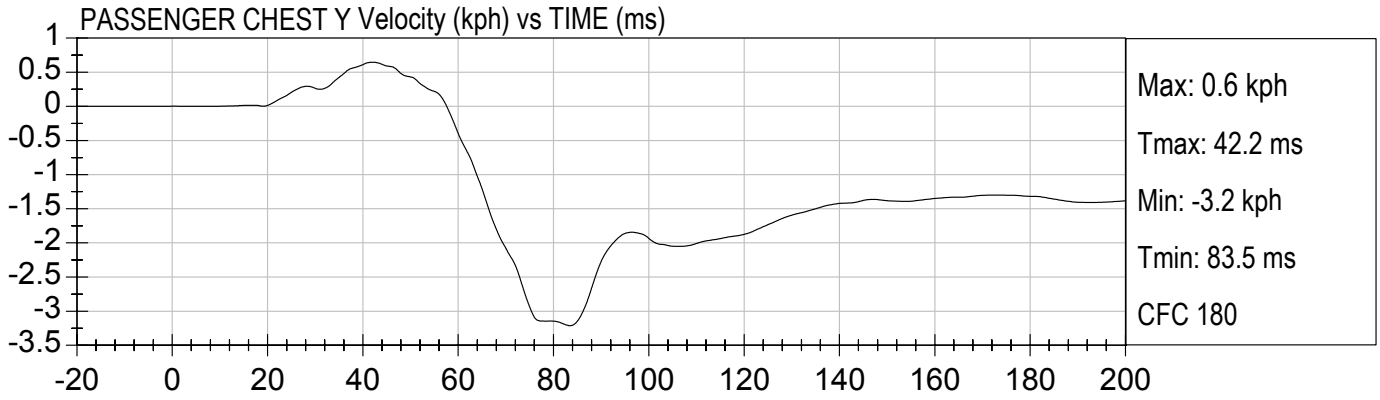


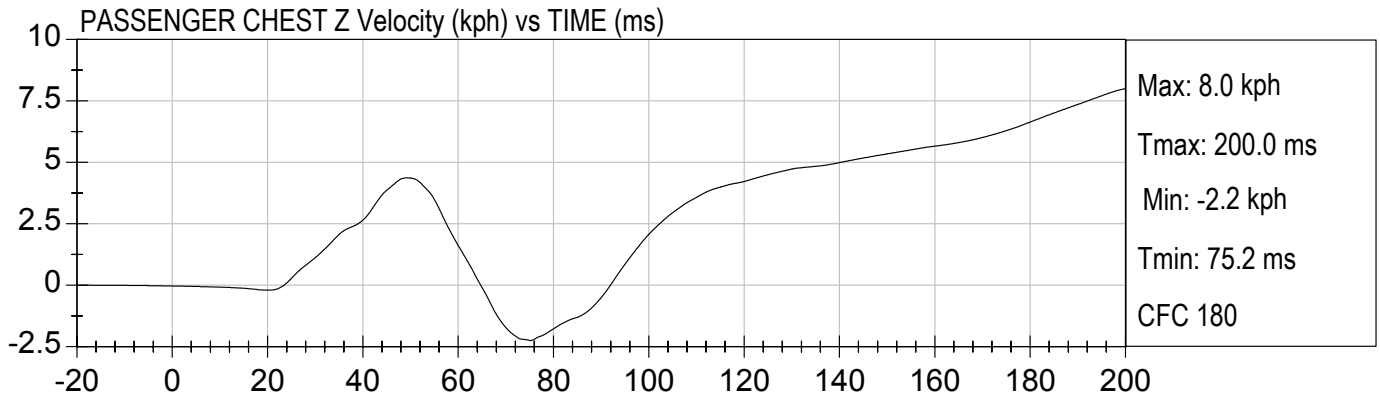


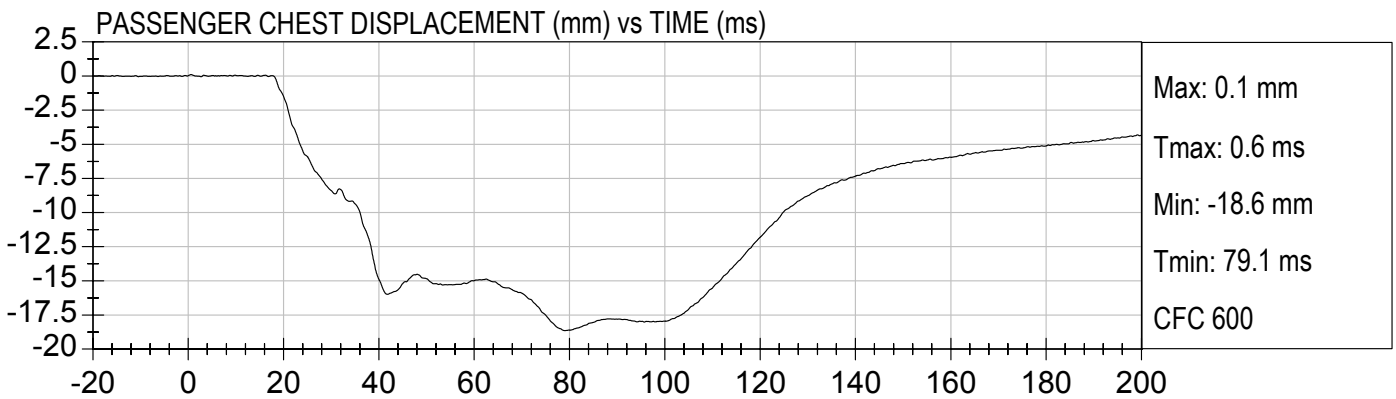
35MPH NCAP FRONTAL
2004 ACURA TSX

Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)



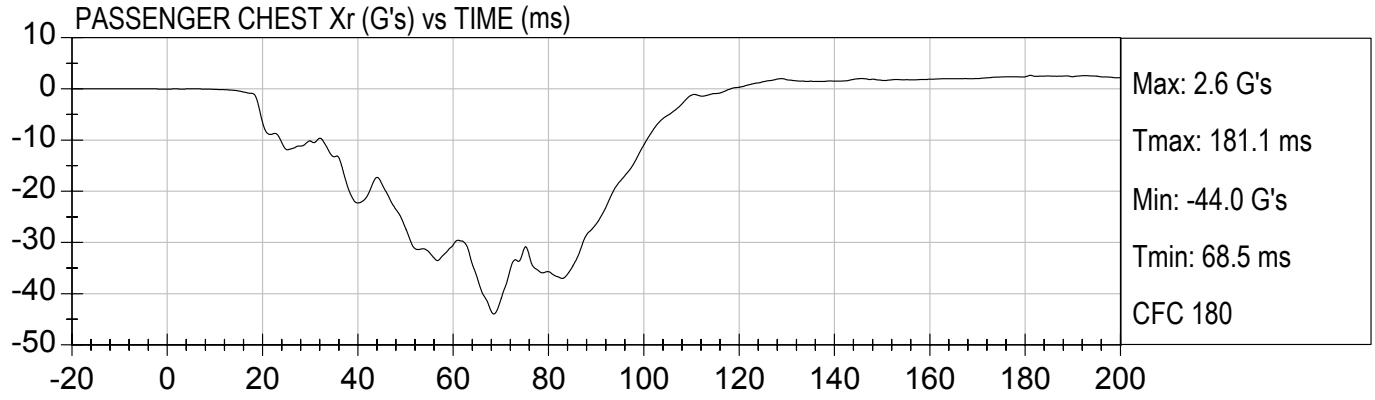


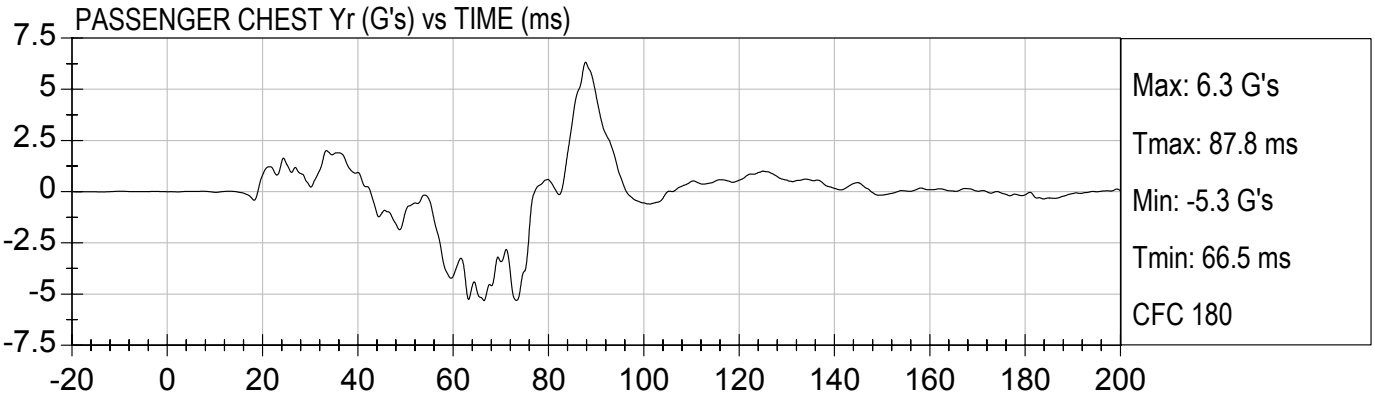


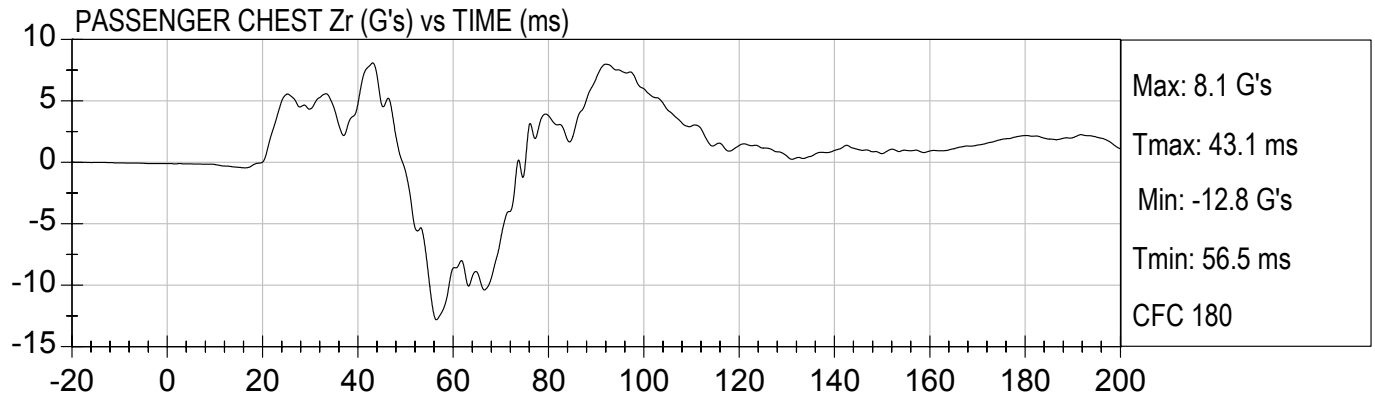


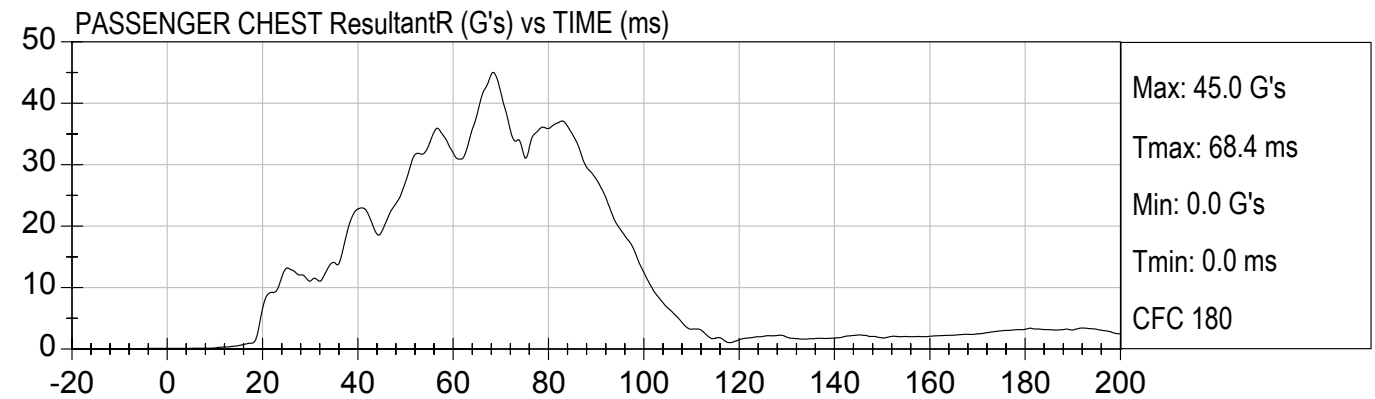
35MPH NCAP FRONTAL
2004 ACURA TSX

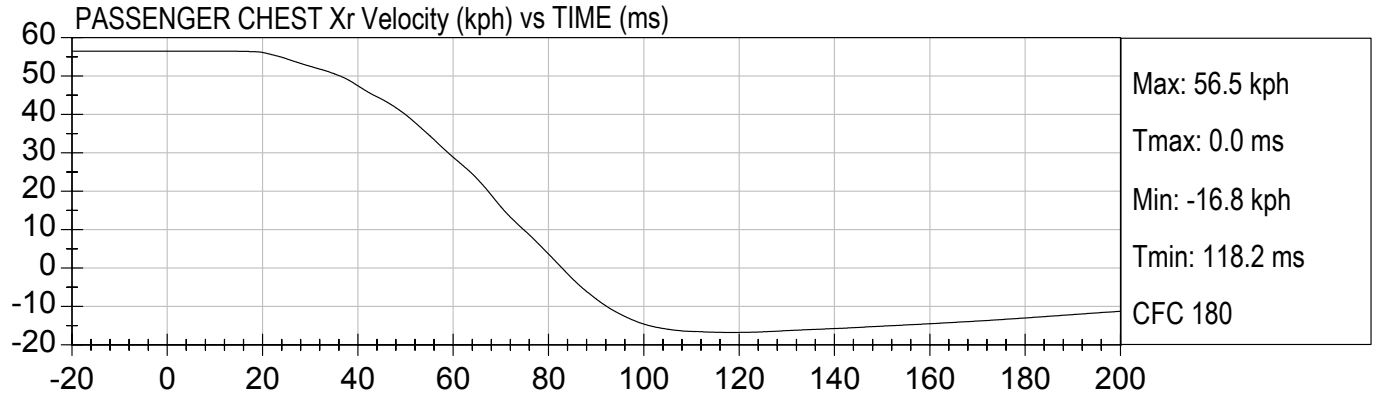
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

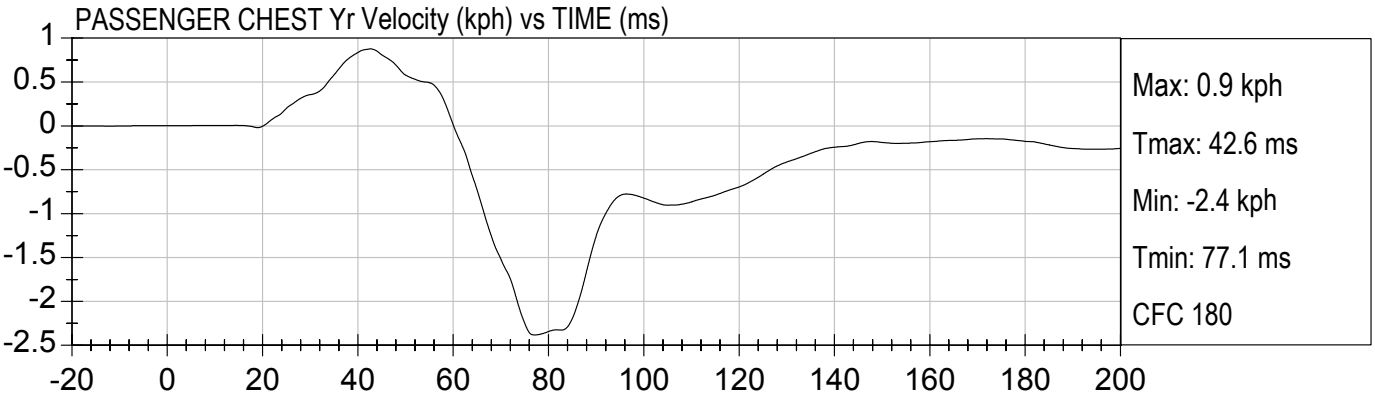


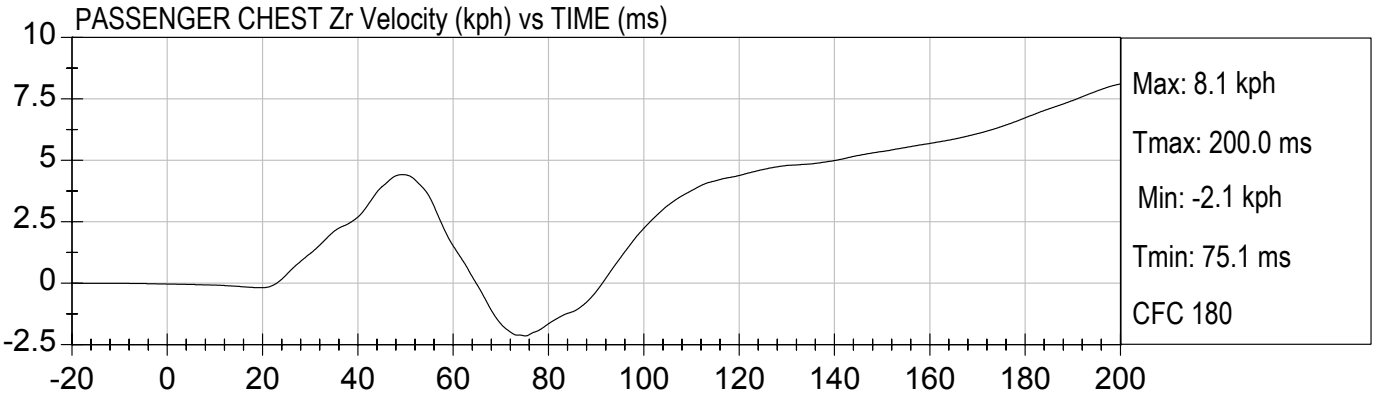






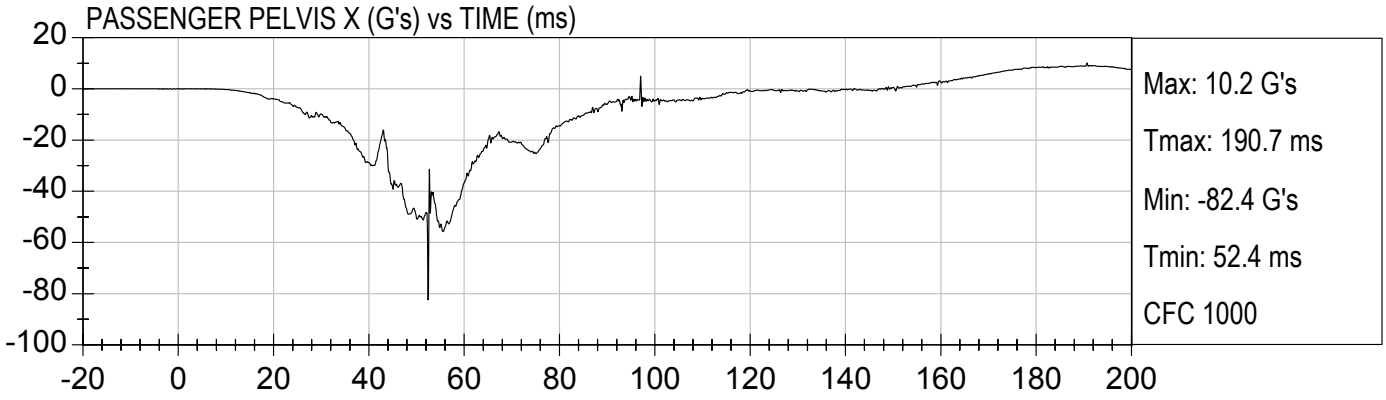

PASSENGER CHEST Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -16.8 kph
Tmin: 118.2 ms
CFC 180

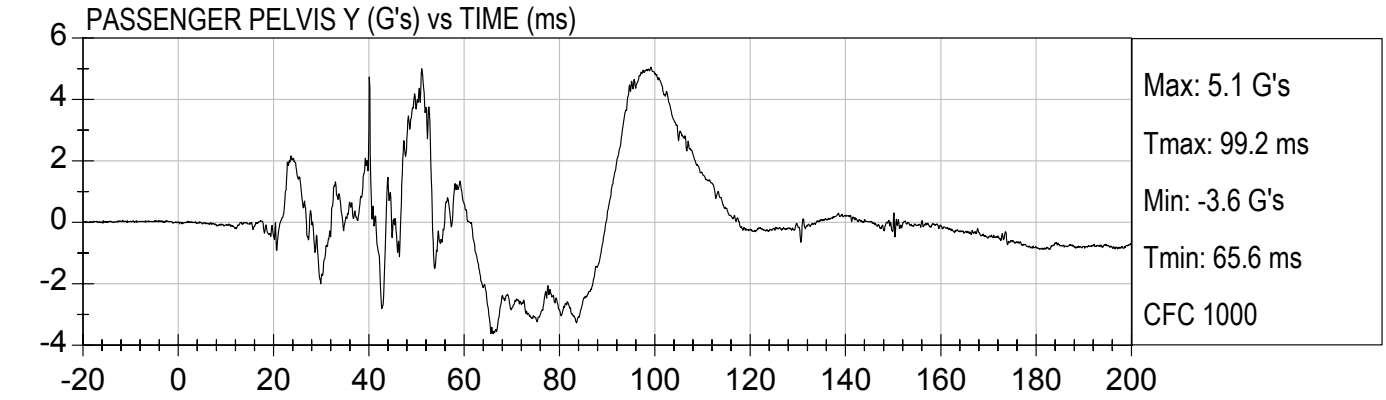

PASSENGER CHEST Yr Velocity (kph) vs TIME (ms)
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.9 kph
Tmax: 42.6 ms
Min: -2.4 kph
Tmin: 77.1 ms
CFC 180

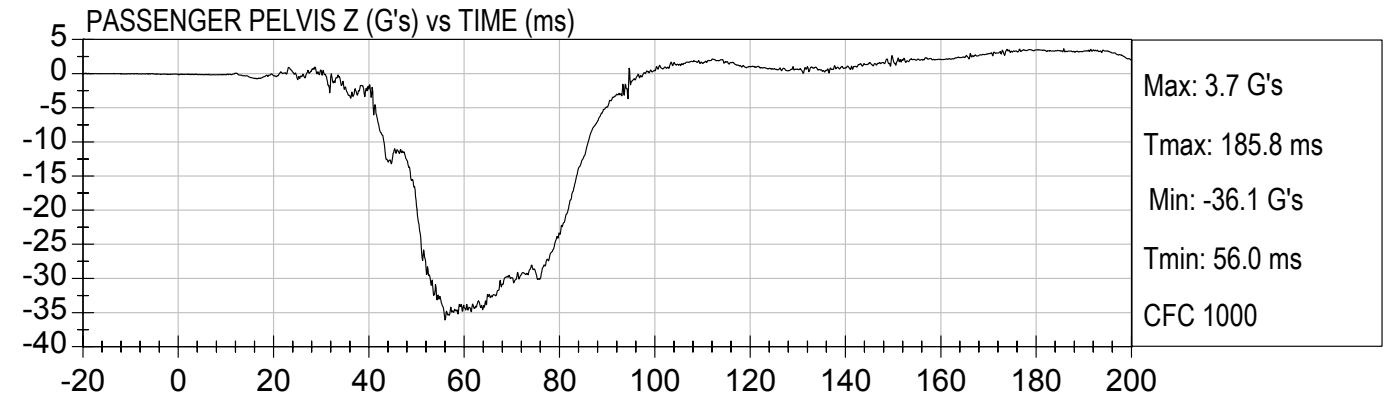

PASSENGER CHEST Zr Velocity (kph) vs TIME (ms)
10
7.5
5
2.5
0
-2.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 8.1 kph
Tmax: 200.0 ms
Min: -2.1 kph
Tmin: 75.1 ms
CFC 180

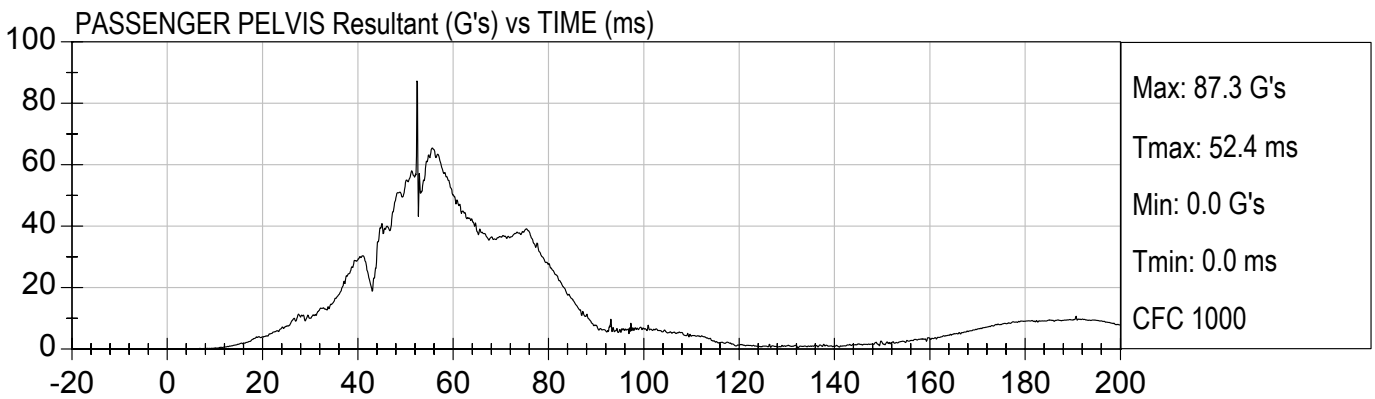
35MPH NCAP FRONTAL
2004 ACURA TSX

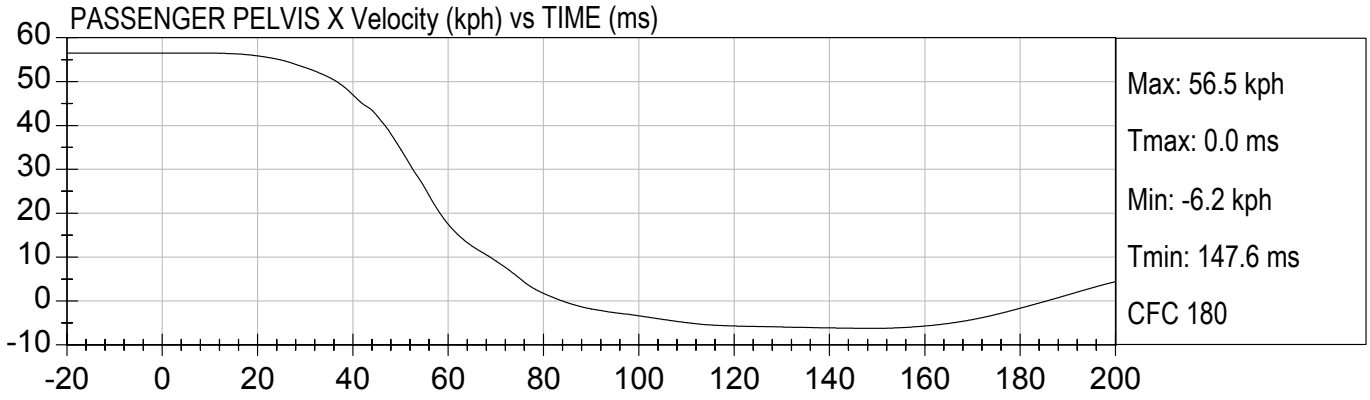
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

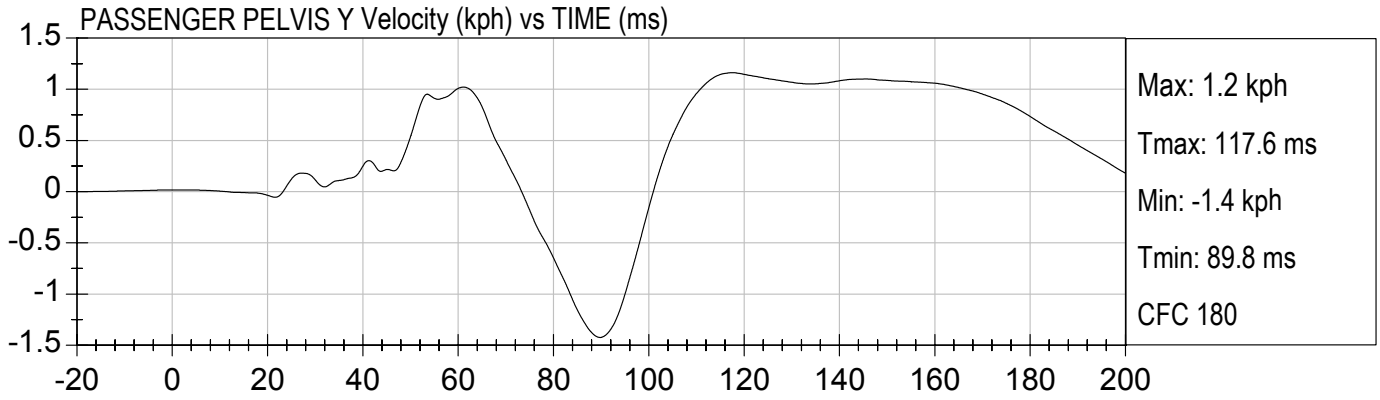


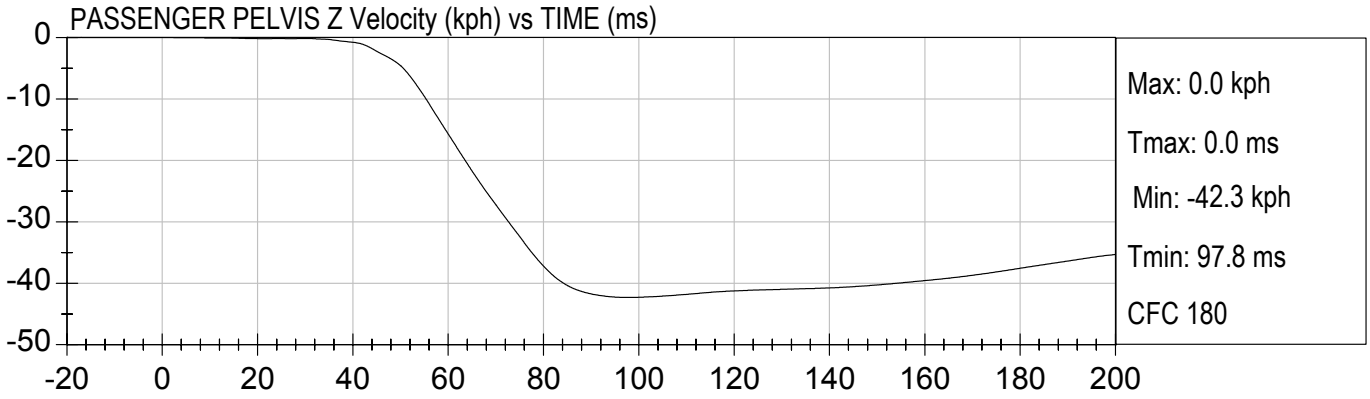






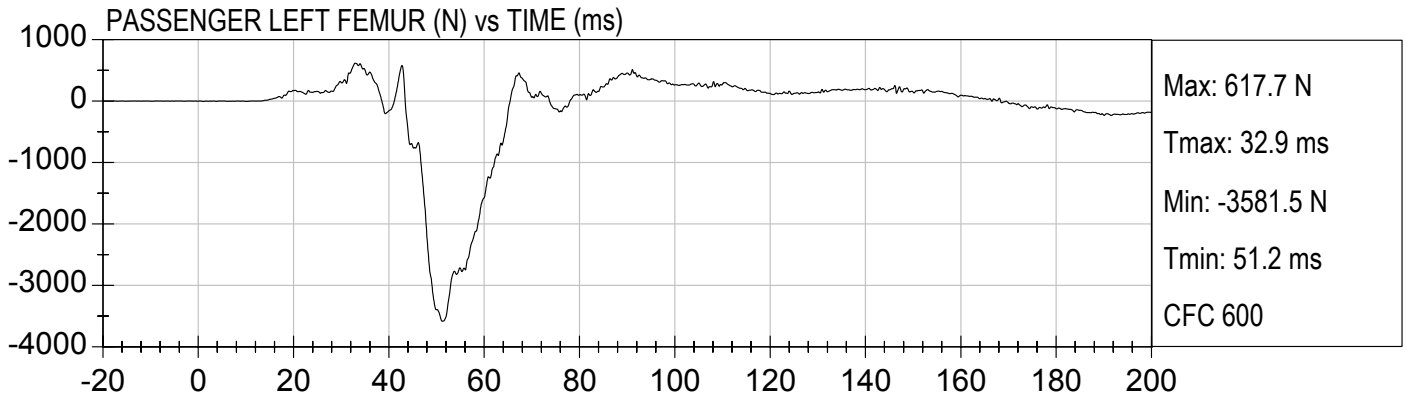

PASSENGER PELVIS X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -6.2 kph
Tmin: 147.6 ms
CFC 180

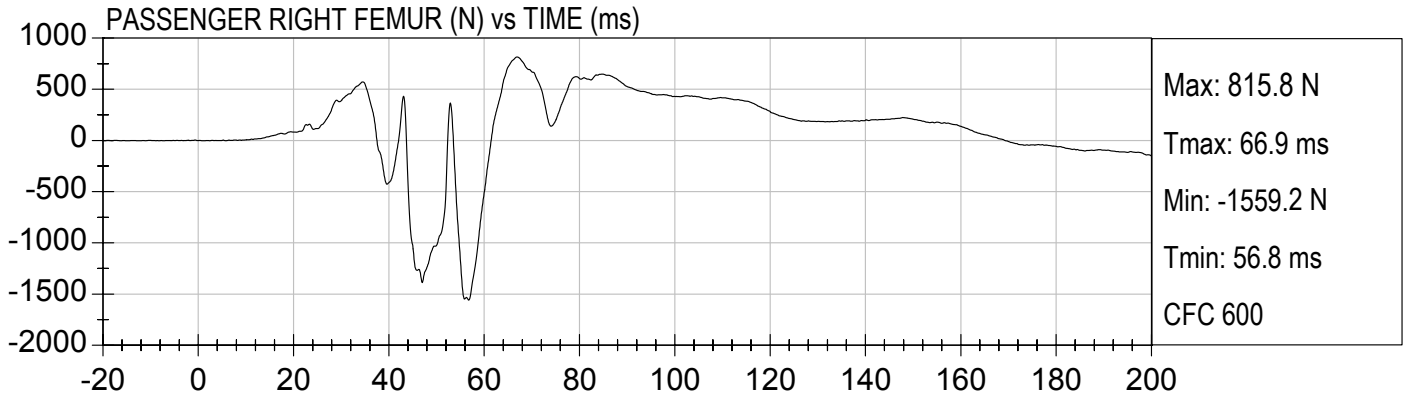

PASSENGER PELVIS Y Velocity (kph) vs TIME (ms)
1.5
1
0.5
0
-0.5
-1
-1.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 1.2 kph
Tmax: 117.6 ms
Min: -1.4 kph
Tmin: 89.8 ms
CFC 180

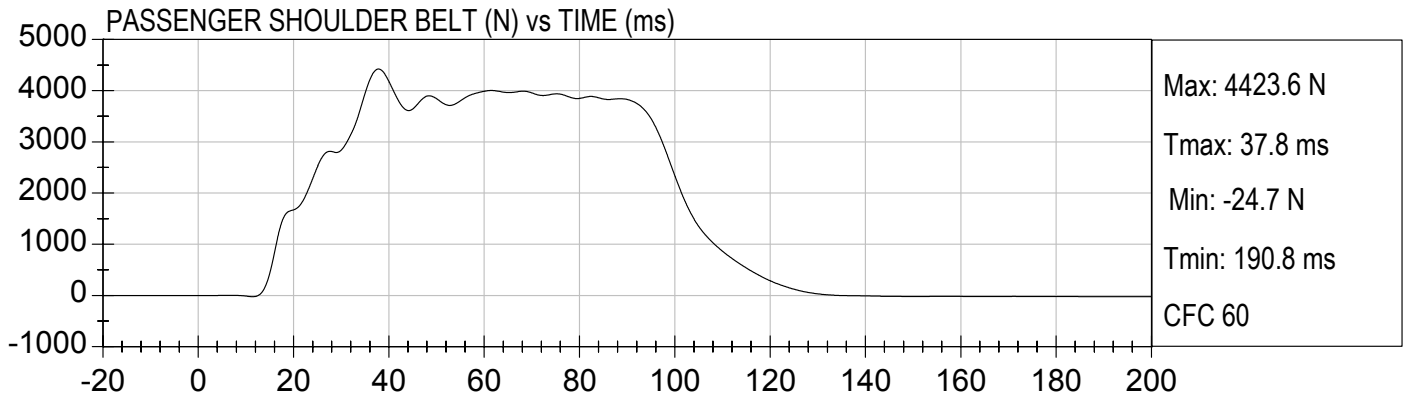

PASSENGER PELVIS Z Velocity (kph) vs TIME (ms)
0
-10
-20
-30
-40
-50
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.0 kph
Tmax: 0.0 ms
Min: -42.3 kph
Tmin: 97.8 ms
CFC 180

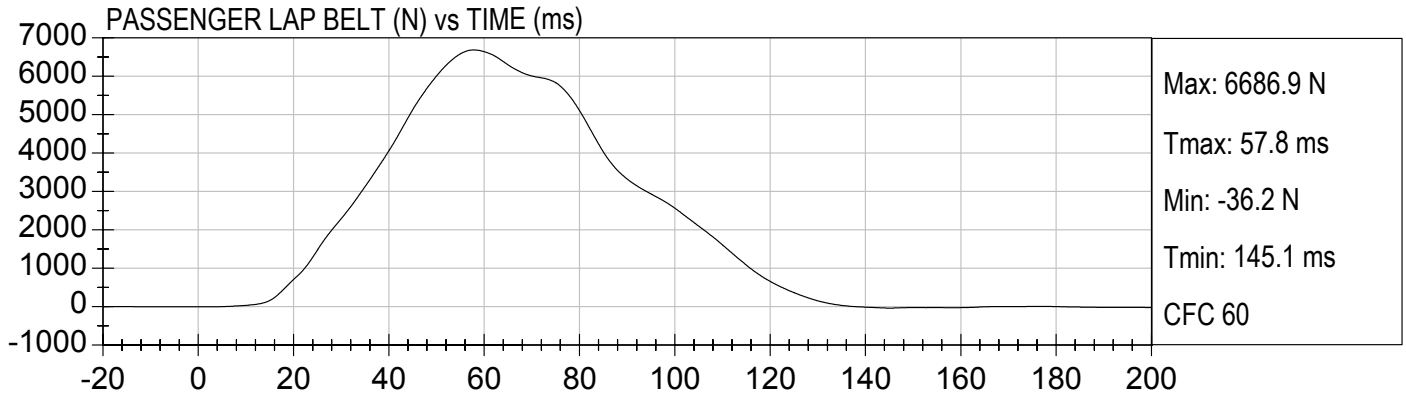
35MPH NCAP FRONTAL
2004 ACURA TSX

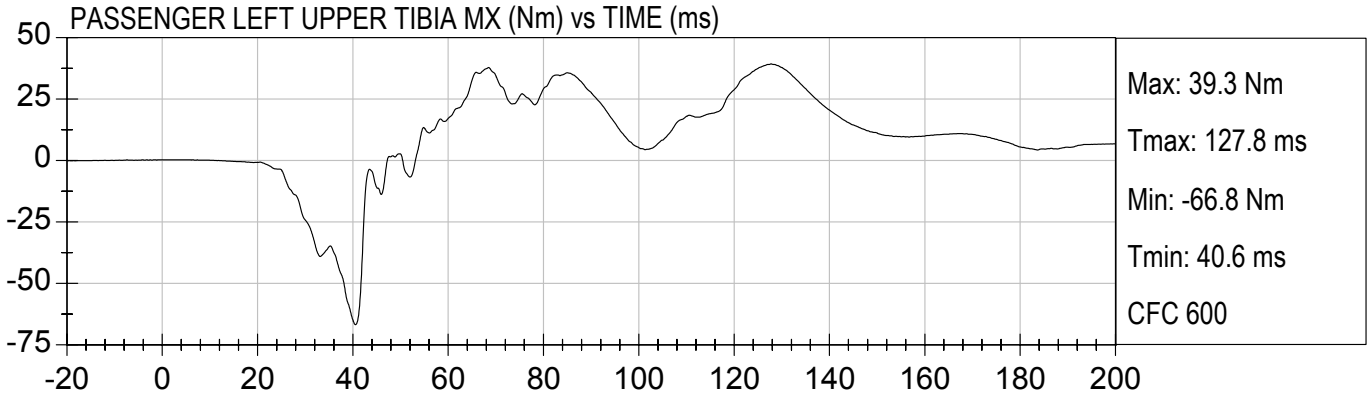
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

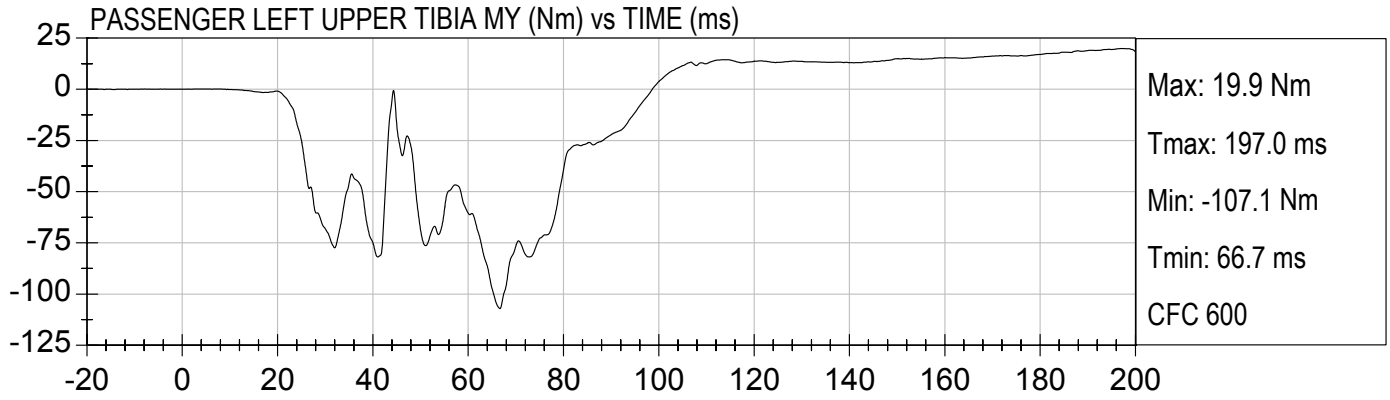


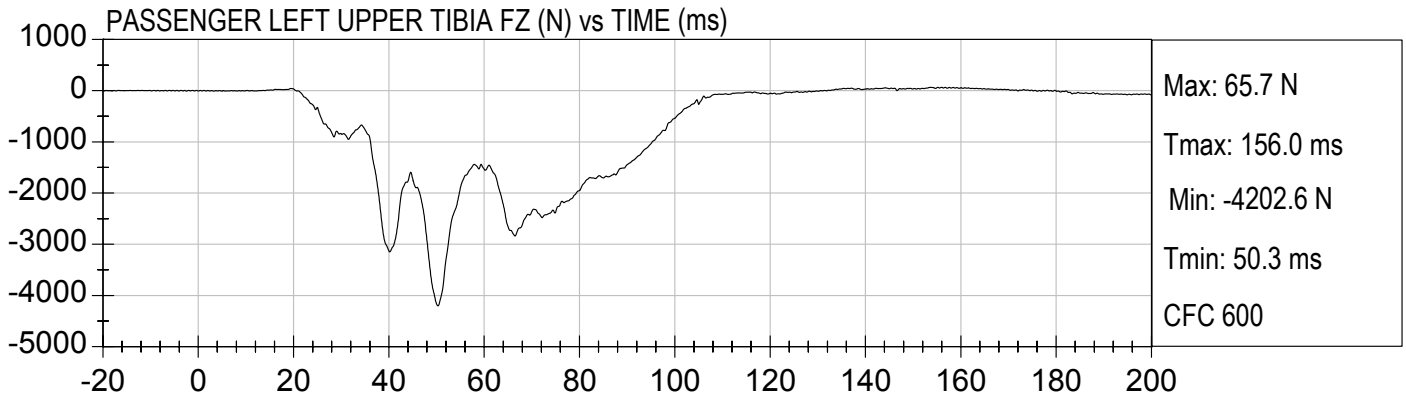


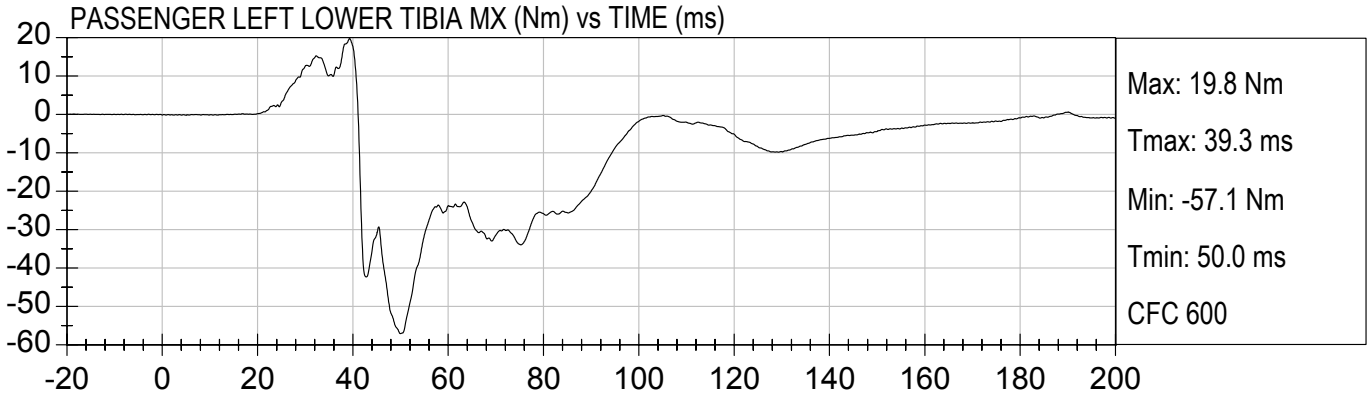


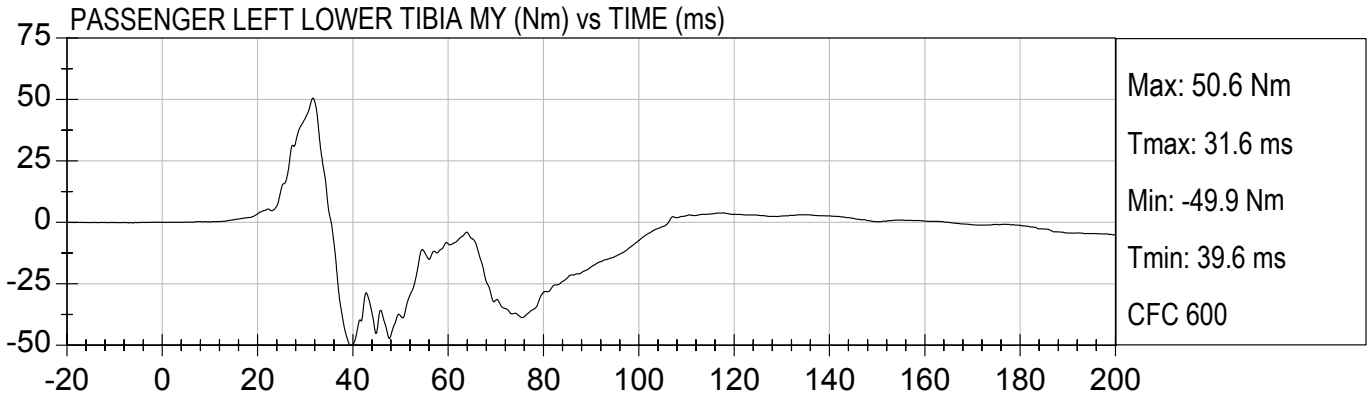


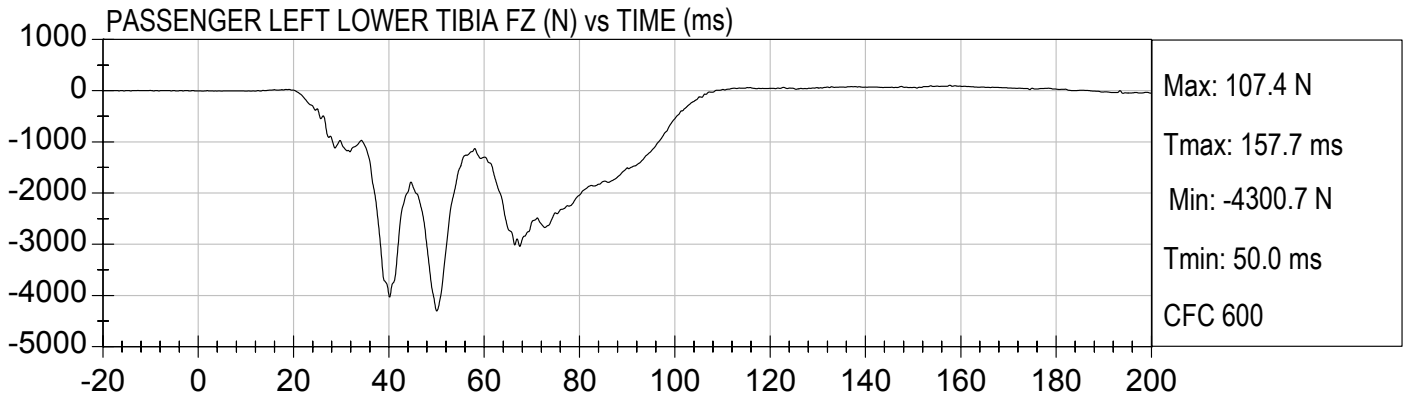

PASSENGER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)
50
25
0
-25
-50
-75
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 39.3 Nm
Tmax: 127.8 ms
Min: -66.8 Nm
Tmin: 40.6 ms
CFC 600

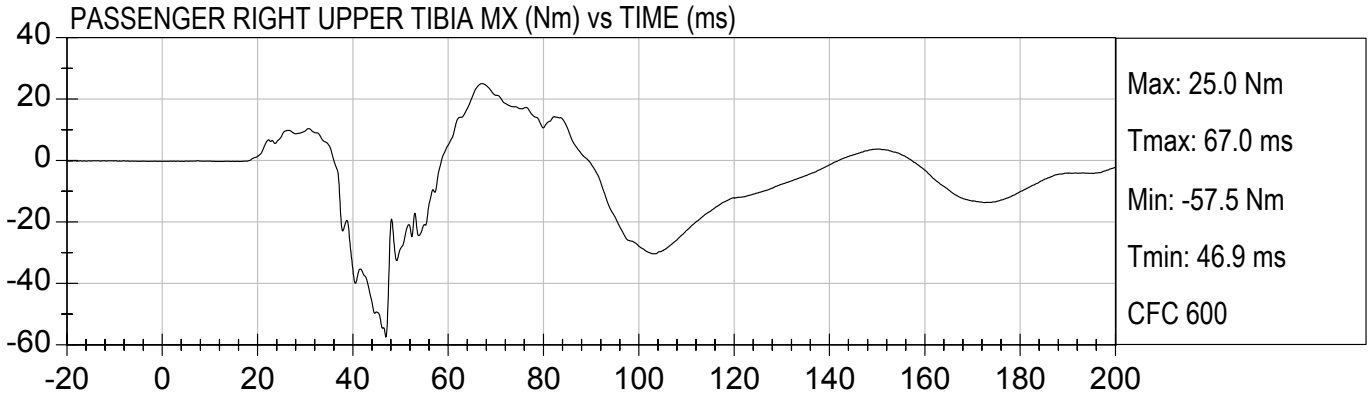

PASSENGER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 19.9 Nm
Tmax: 197.0 ms
Min: -107.1 Nm
Tmin: 66.7 ms
CFC 600

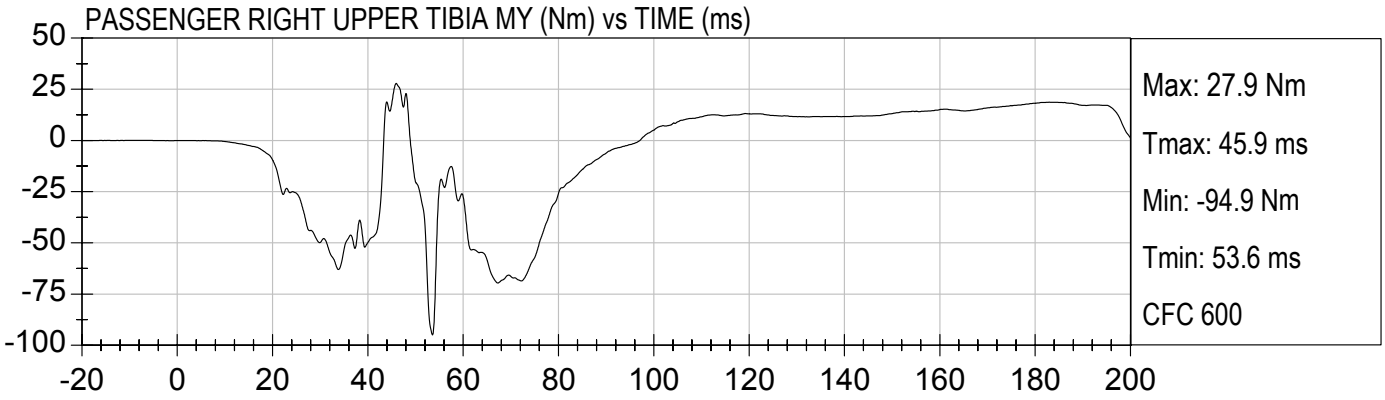

PASSENGER LEFT UPPER TIBIA FZ (N) vs TIME (ms)
1000
0
-1000
-2000
-3000
-4000
-5000
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 65.7 N
Tmax: 156.0 ms
Min: -4202.6 N
Tmin: 50.3 ms
CFC 600

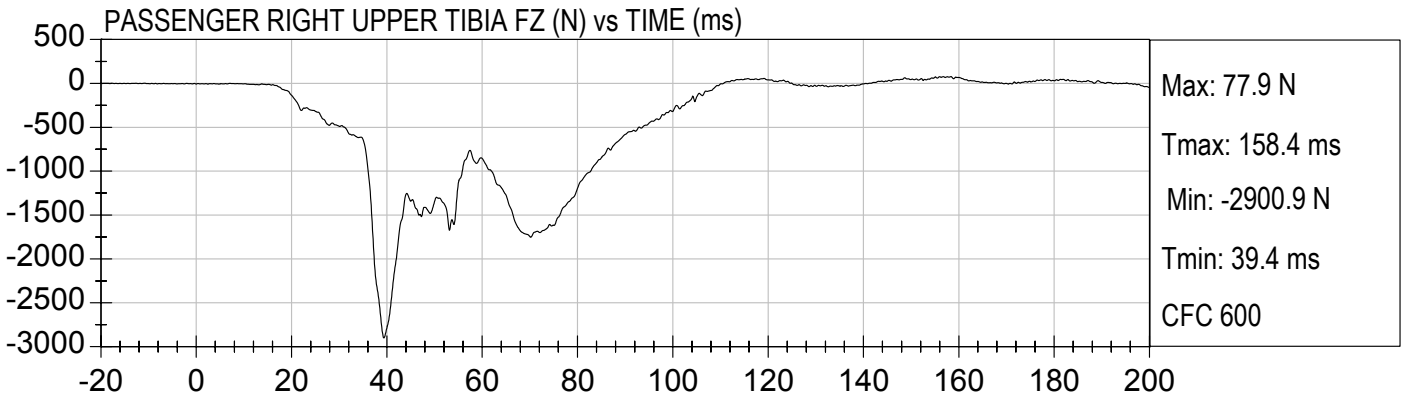

PASSENGER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-50
-60
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 19.8 Nm
Tmax: 39.3 ms
Min: -57.1 Nm
Tmin: 50.0 ms
CFC 600

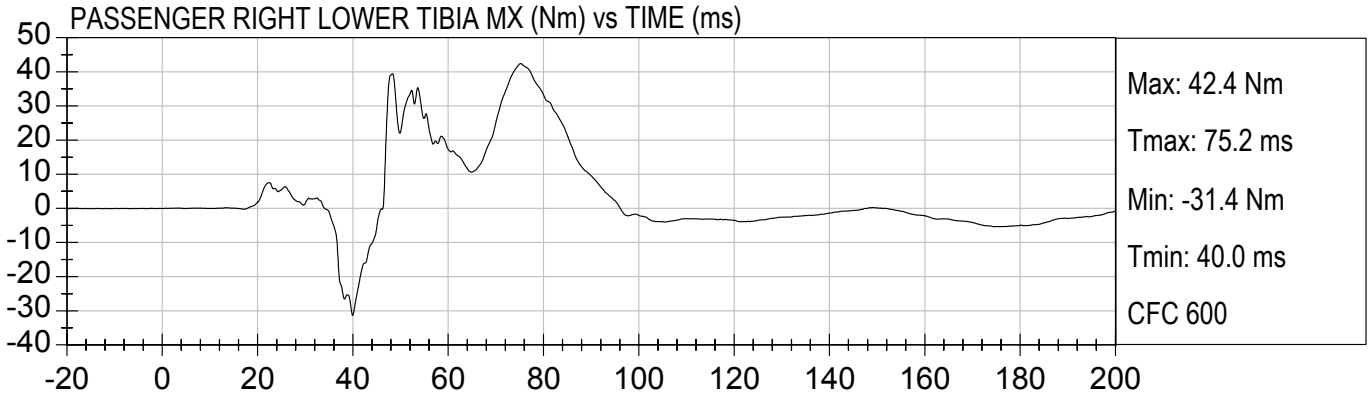

PASSENGER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)
75
50
25
0
-25
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 50.6 Nm
Tmax: 31.6 ms
Min: -49.9 Nm
Tmin: 39.6 ms
CFC 600

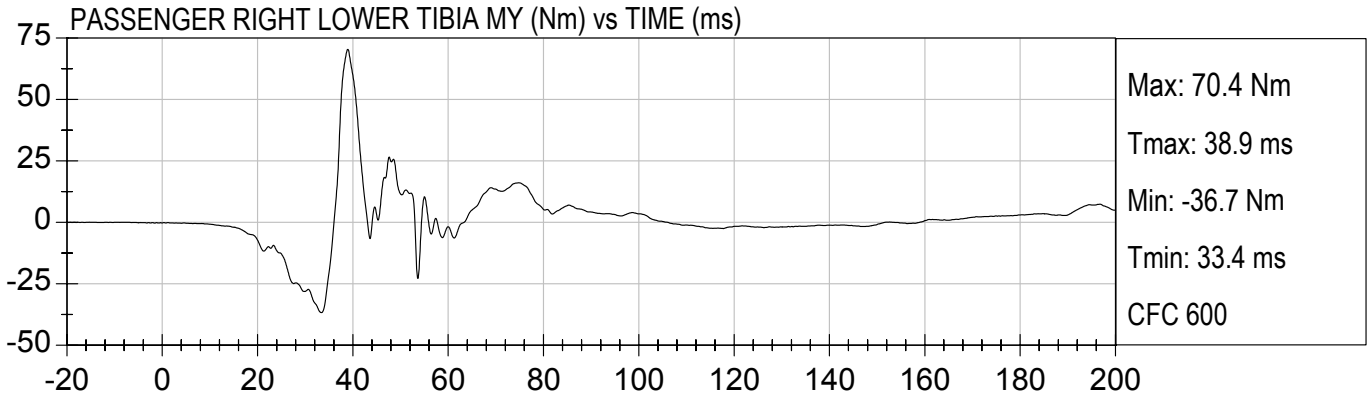

PASSENGER LEFT LOWER TIBIA FZ (N) vs TIME (ms)
1000
0
-1000
-2000
-3000
-4000
-5000
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 107.4 N
Tmax: 157.7 ms
Min: -4300.7 N
Tmin: 50.0 ms
CFC 600

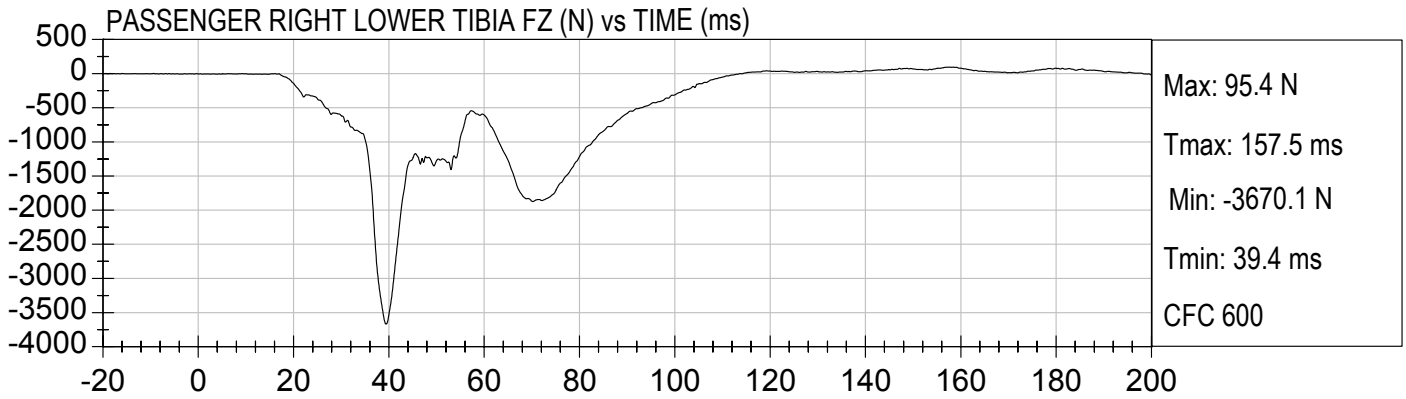

PASSENGER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)
40
20
0
-20
-40
-60
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 25.0 Nm
Tmax: 67.0 ms
Min: -57.5 Nm
Tmin: 46.9 ms
CFC 600


PASSENGER RIGHT UPPER TIBIA MY (Nm) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 27.9 Nm
Tmax: 45.9 ms
Min: -94.9 Nm
Tmin: 53.6 ms
CFC 600


PASSENGER RIGHT UPPER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 77.9 N
Tmax: 158.4 ms
Min: -2900.9 N
Tmin: 39.4 ms
CFC 600

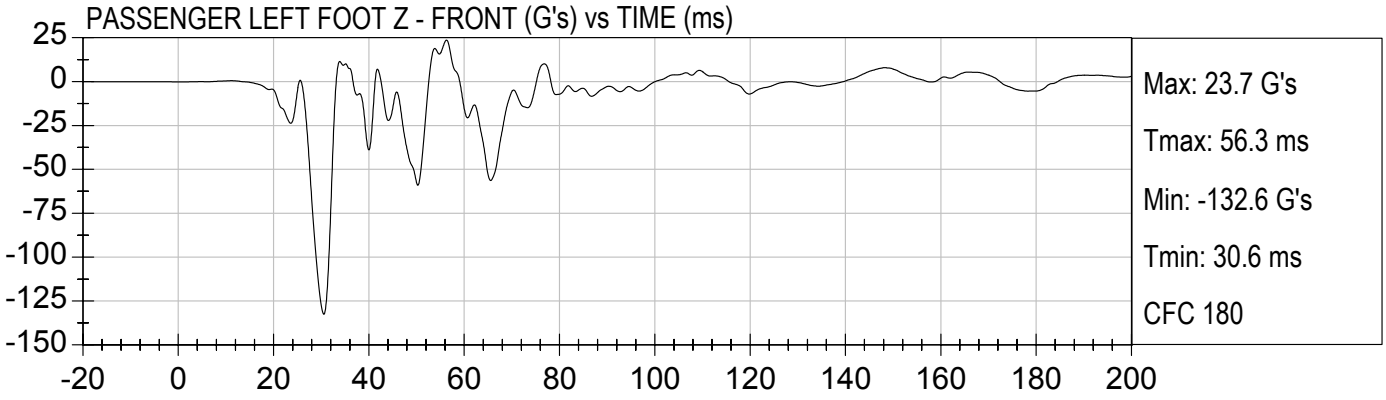

PASSENGER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)
50
40
30
20
10
0
-10
-20
-30
-40
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 42.4 Nm
Tmax: 75.2 ms
Min: -31.4 Nm
Tmin: 40.0 ms
CFC 600

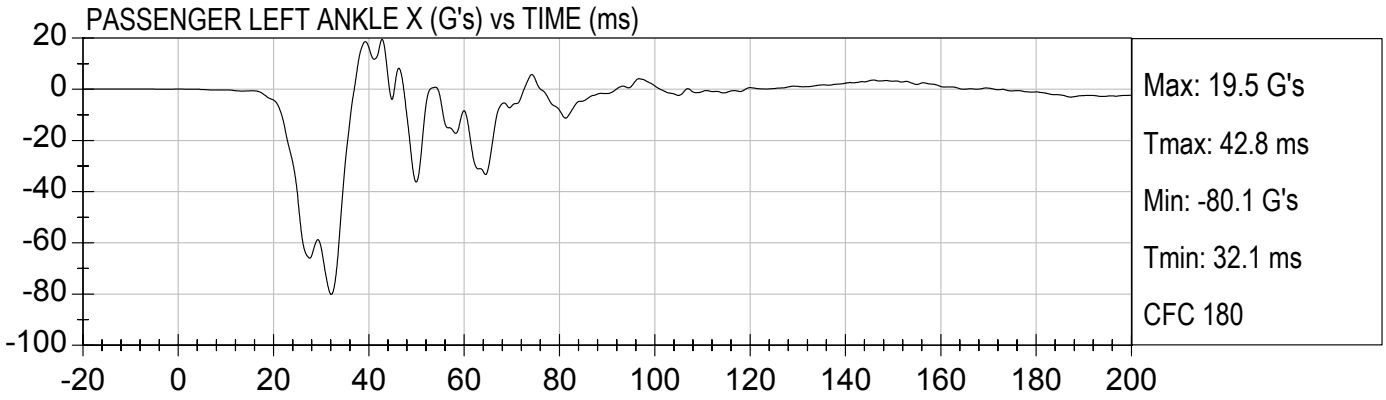

PASSENGER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)
75
50
25
0
-25
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 70.4 Nm
Tmax: 38.9 ms
Min: -36.7 Nm
Tmin: 33.4 ms
CFC 600

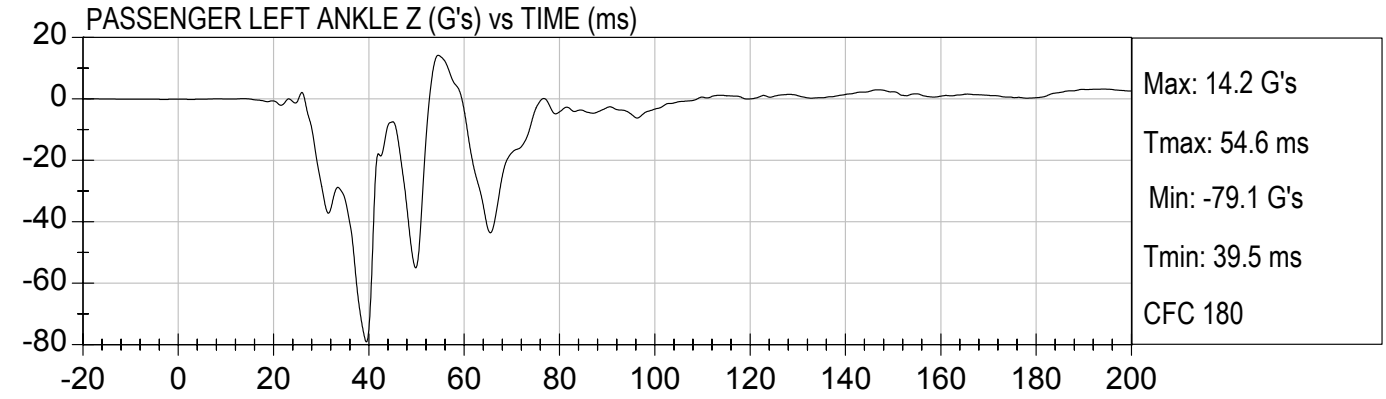

PASSENGER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 95.4 N
Tmax: 157.5 ms
Min: -3670.1 N
Tmin: 39.4 ms
CFC 600

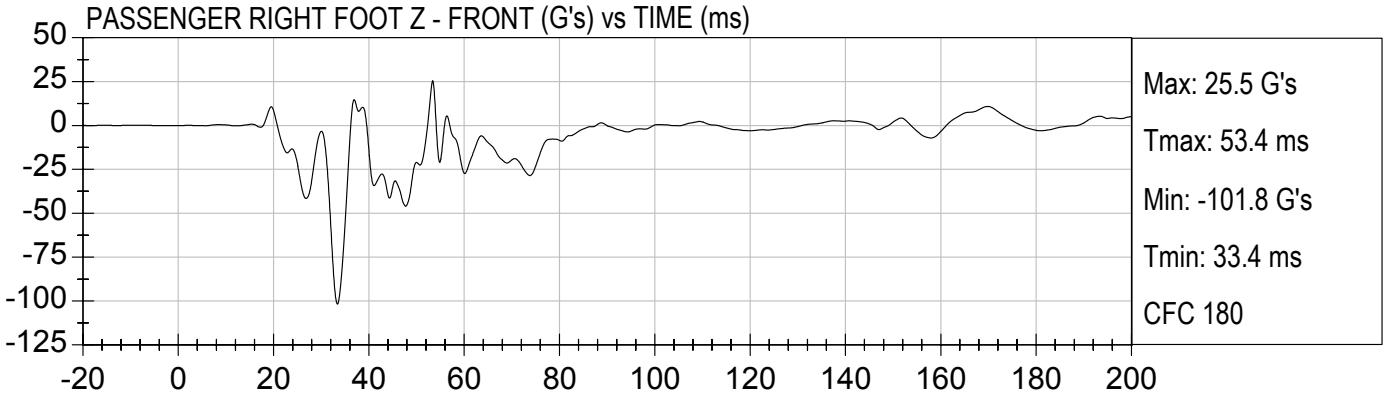
35MPH NCAP FRONTAL
2004 ACURA TSX

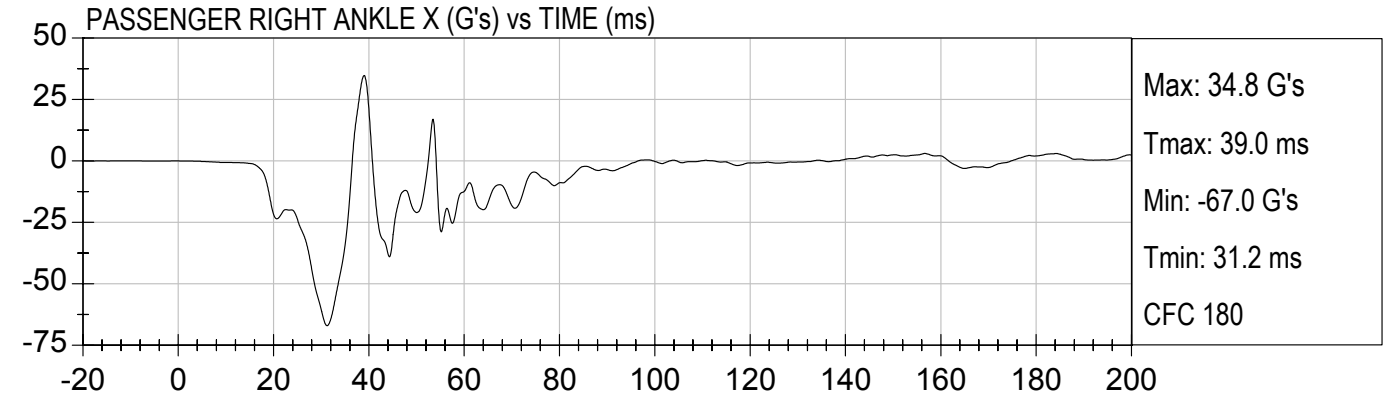
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

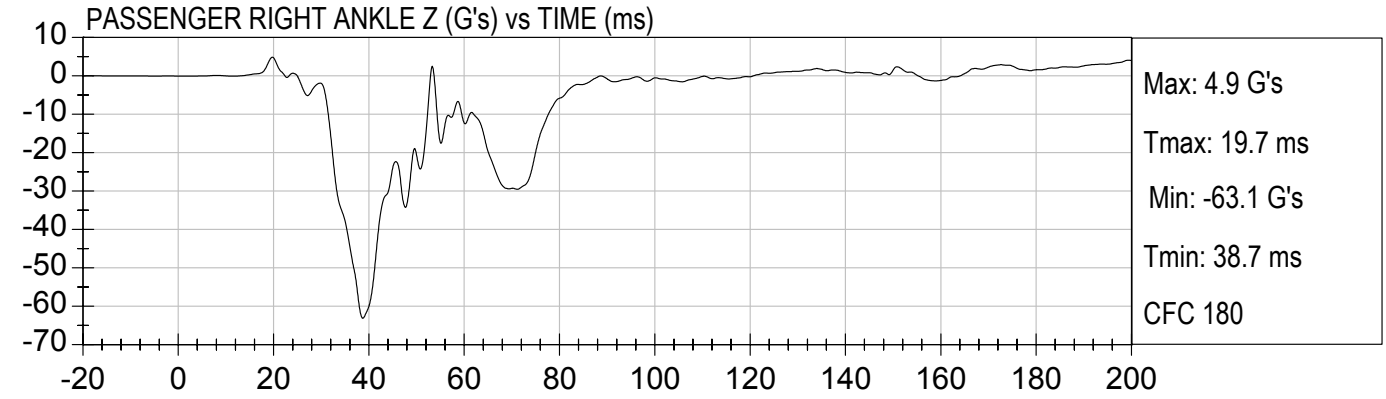


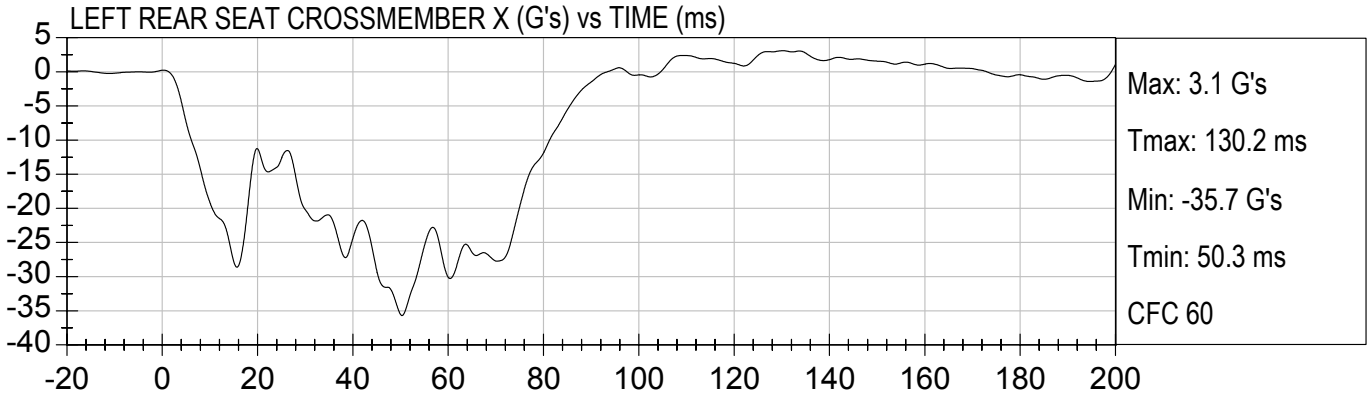


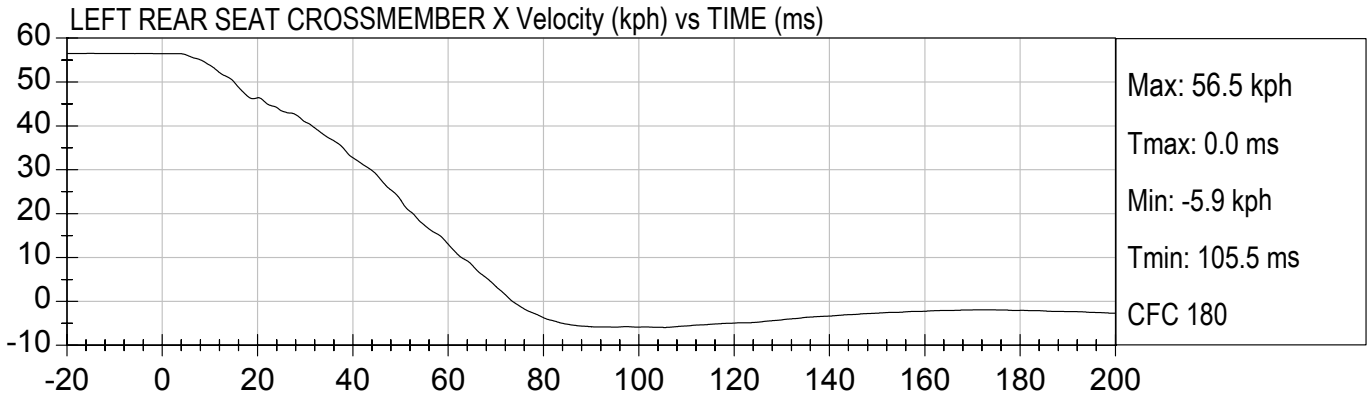


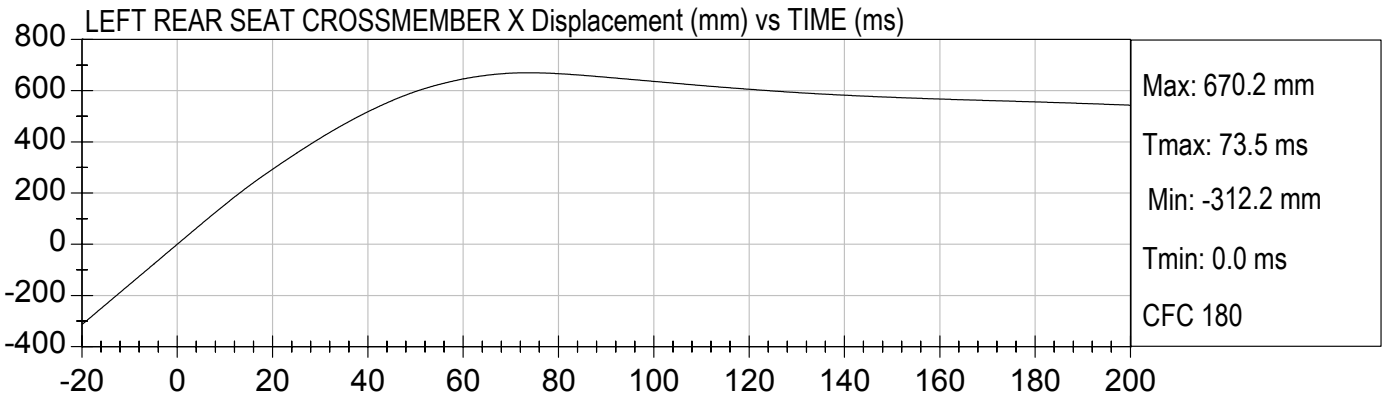

PASSENGER RIGHT FOOT Z - FRONT (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 25.5 G's
Tmax: 53.4 ms
Min: -101.8 G's
Tmin: 33.4 ms
CFC 180


PASSENGER RIGHT ANKLE X (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 34.8 G's
Tmax: 39.0 ms
Min: -67.0 G's
Tmin: 31.2 ms
CFC 180


PASSENGER RIGHT ANKLE Z (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 4.9 G's
Tmax: 19.7 ms
Min: -63.1 G's
Tmin: 38.7 ms
CFC 180

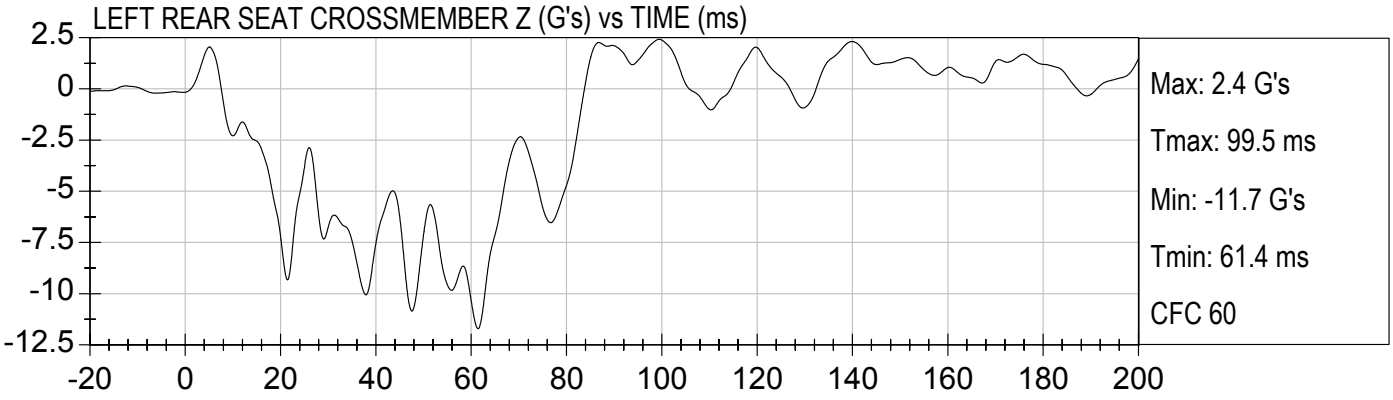

LEFT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 3.1 G's
Tmax: 130.2 ms
Min: -35.7 G's
Tmin: 50.3 ms
CFC 60

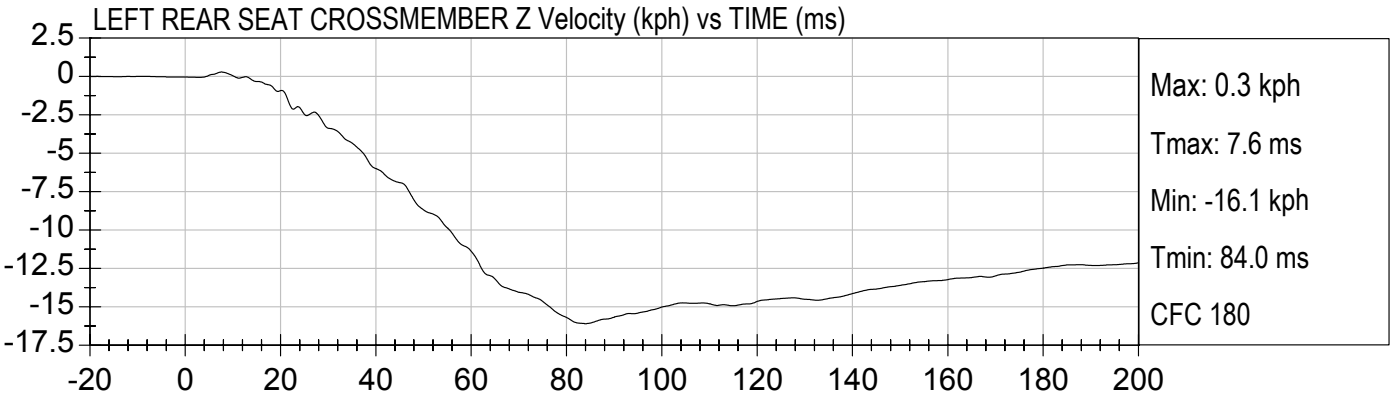

LEFT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -5.9 kph
Tmin: 105.5 ms
CFC 180

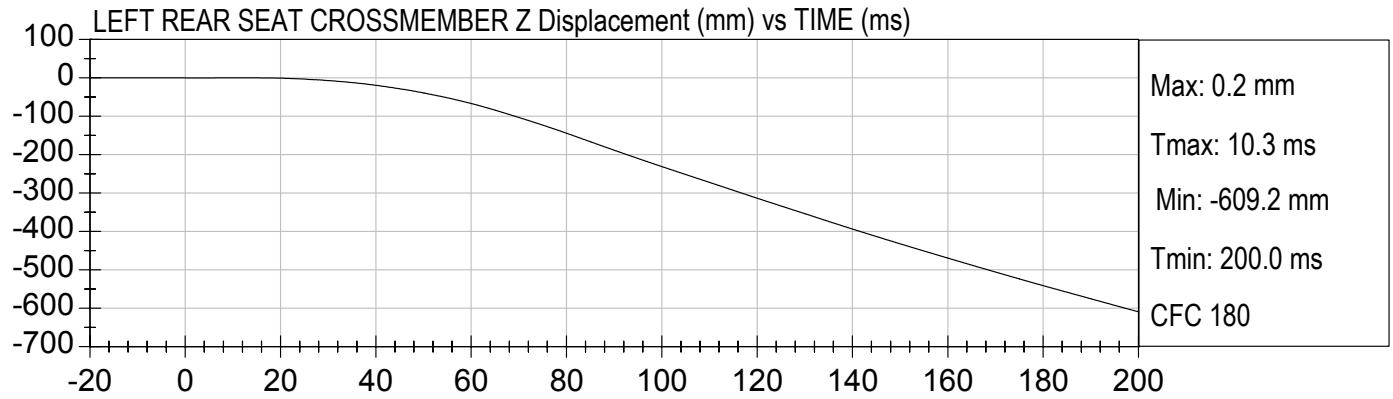

LEFT REAR SEAT CROSSMEMBER X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 670.2 mm
Tmax: 73.5 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

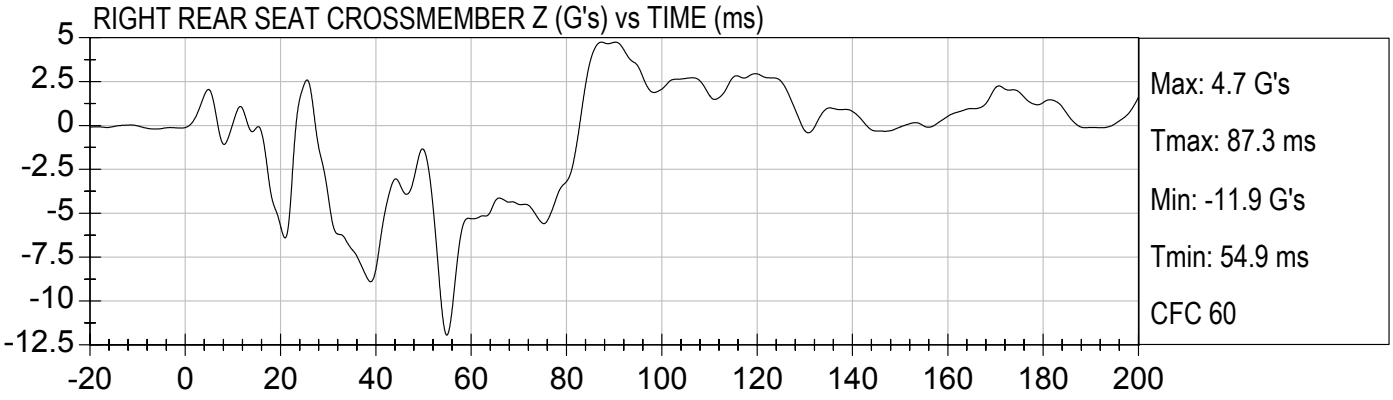
35MPH NCAP FRONTAL
2004 ACURA TSX

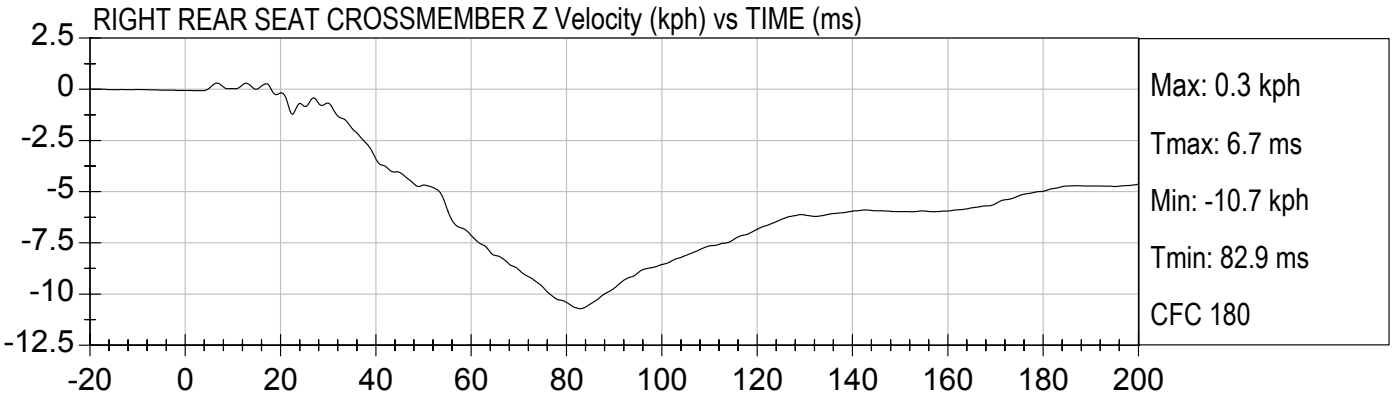
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

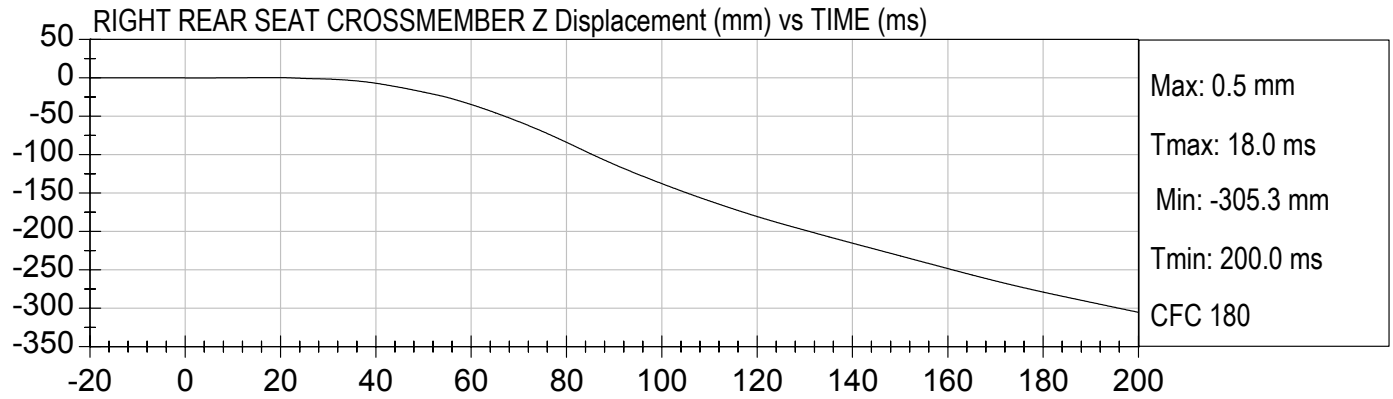


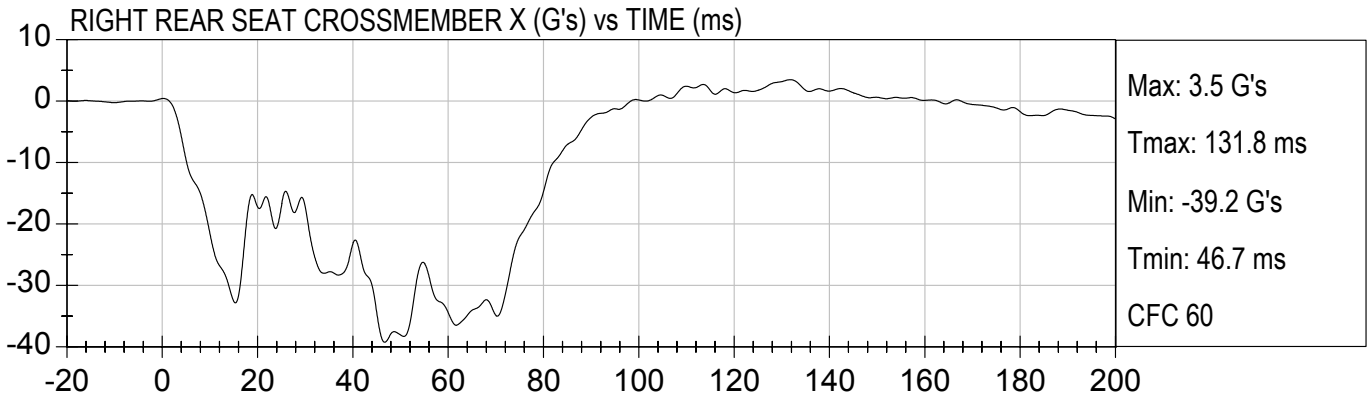


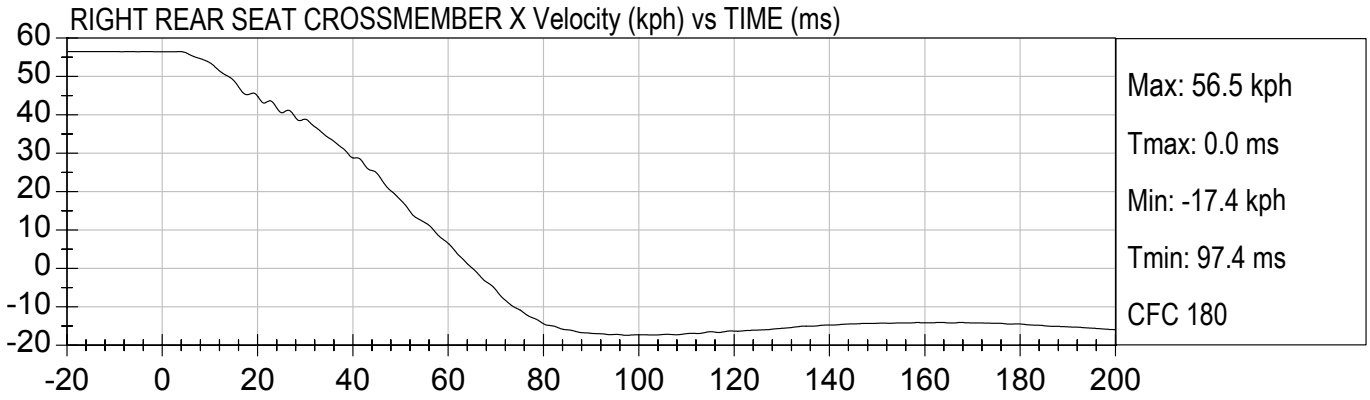


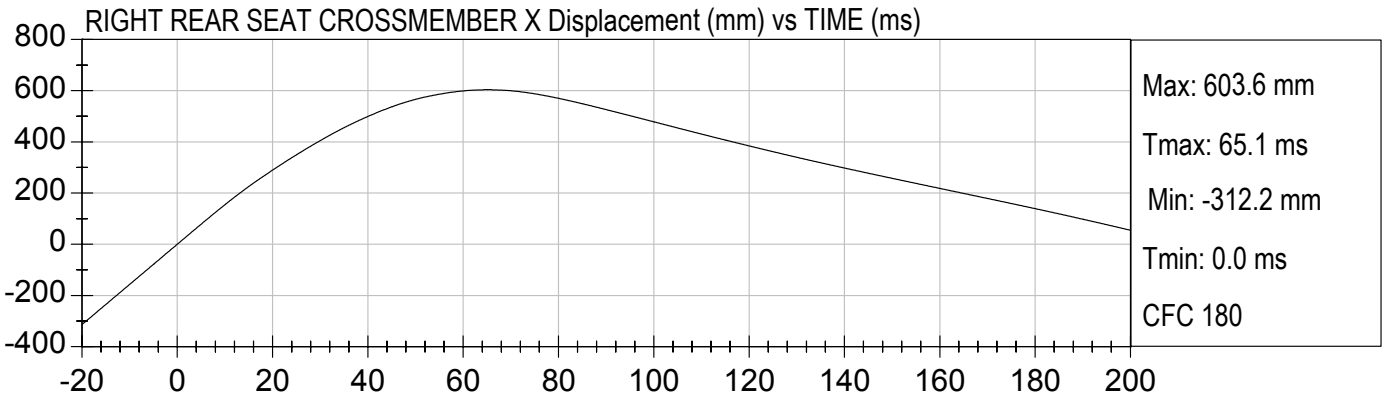

RIGHT REAR SEAT CROSSMEMBER Z (G's) vs TIME (ms)
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 4.7 G's
Tmax: 87.3 ms
Min: -11.9 G's
Tmin: 54.9 ms
CFC 60

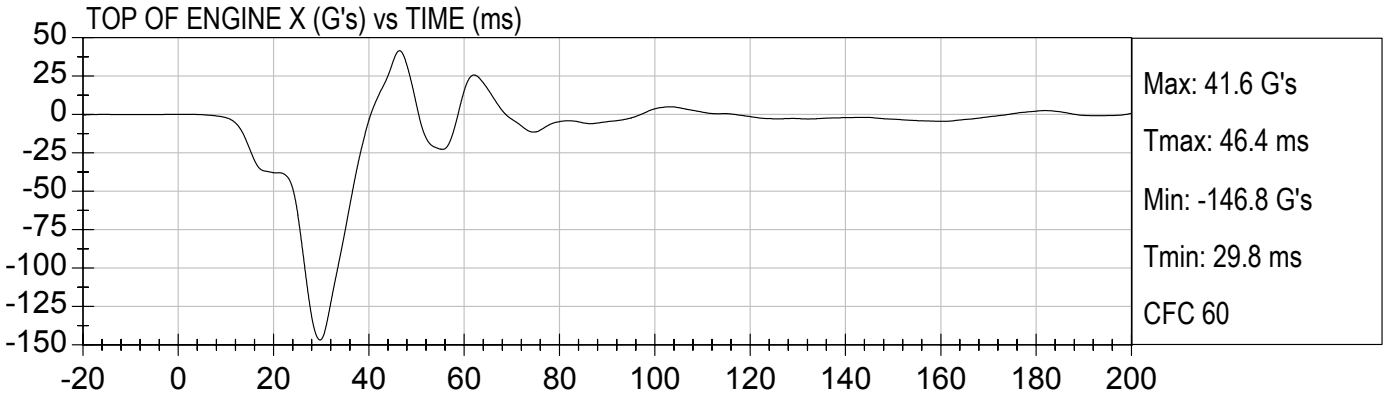

RIGHT REAR SEAT CROSSMEMBER Z Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.3 kph
Tmax: 6.7 ms
Min: -10.7 kph
Tmin: 82.9 ms
CFC 180

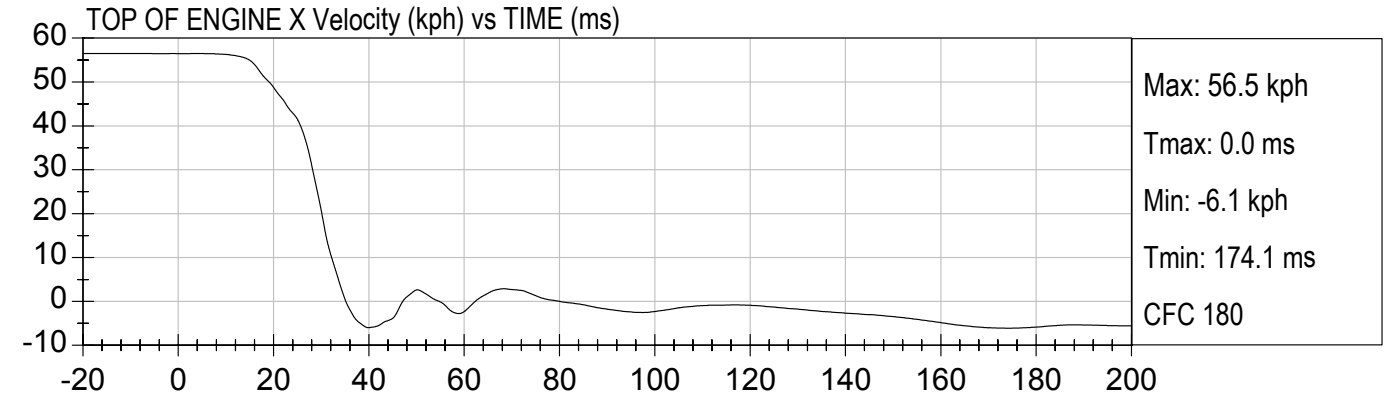

RIGHT REAR SEAT CROSSMEMBER Z Displacement (mm) vs TIME (ms)
50
0
-50
-100
-150
-200
-250
-300
-350
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.5 mm
Tmax: 18.0 ms
Min: -305.3 mm
Tmin: 200.0 ms
CFC 180

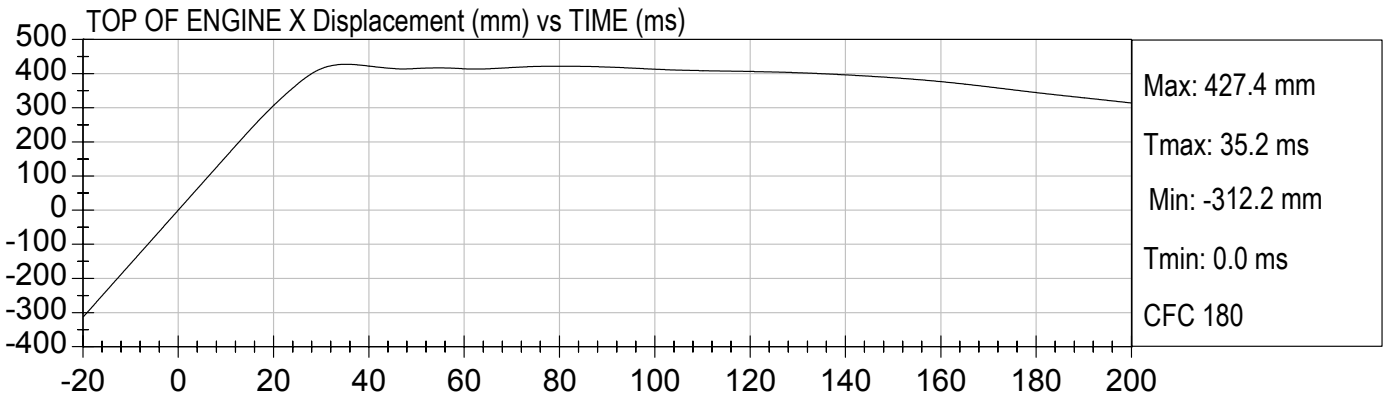

RIGHT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 3.5 G's
Tmax: 131.8 ms
Min: -39.2 G's
Tmin: 46.7 ms
CFC 60


RIGHT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -17.4 kph
Tmin: 97.4 ms
CFC 180


RIGHT REAR SEAT CROSSMEMBER X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 603.6 mm
Tmax: 65.1 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

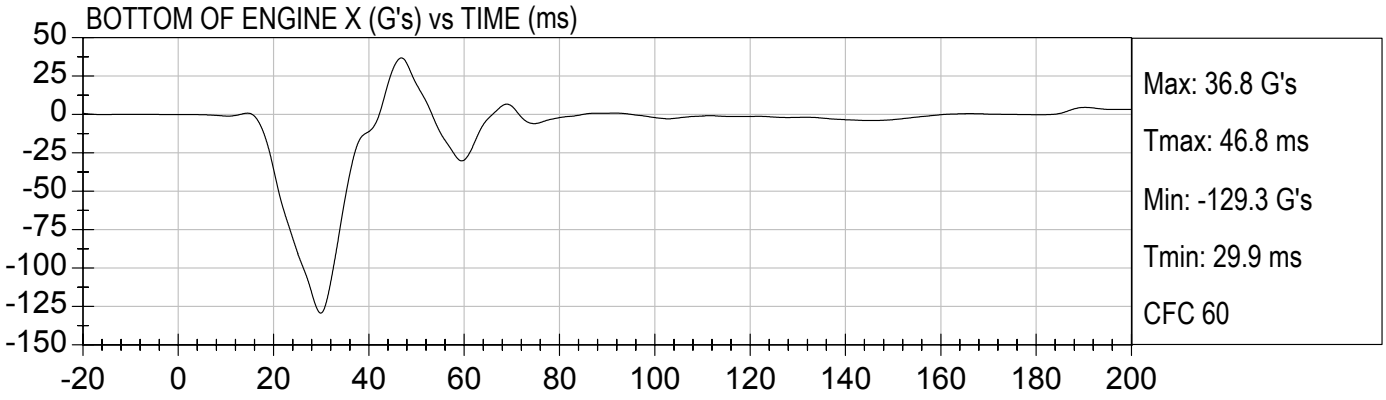

TOP OF ENGINE X (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-125
-150
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 41.6 G's
Tmax: 46.4 ms
Min: -146.8 G's
Tmin: 29.8 ms
CFC 60

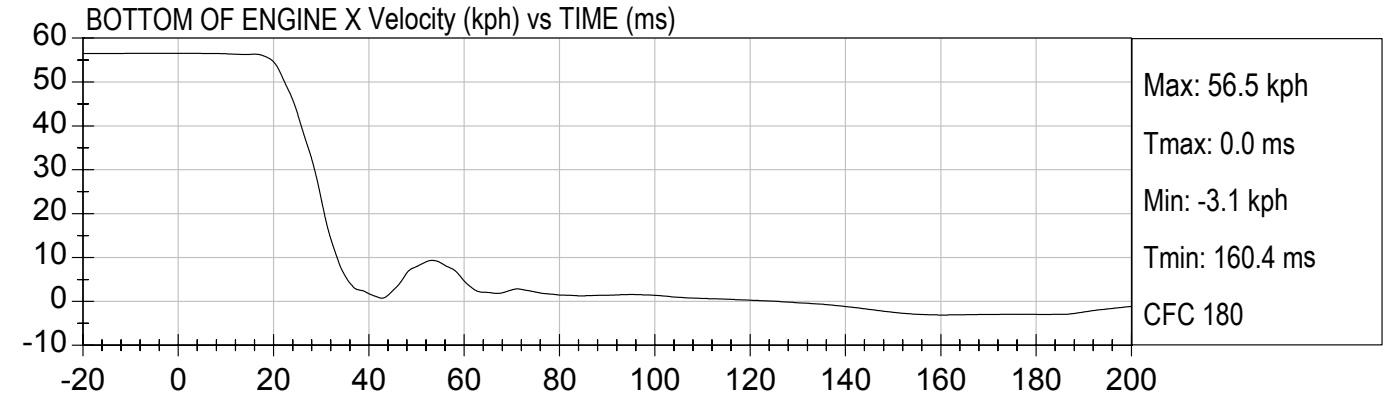

TOP OF ENGINE X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -6.1 kph
Tmin: 174.1 ms
CFC 180

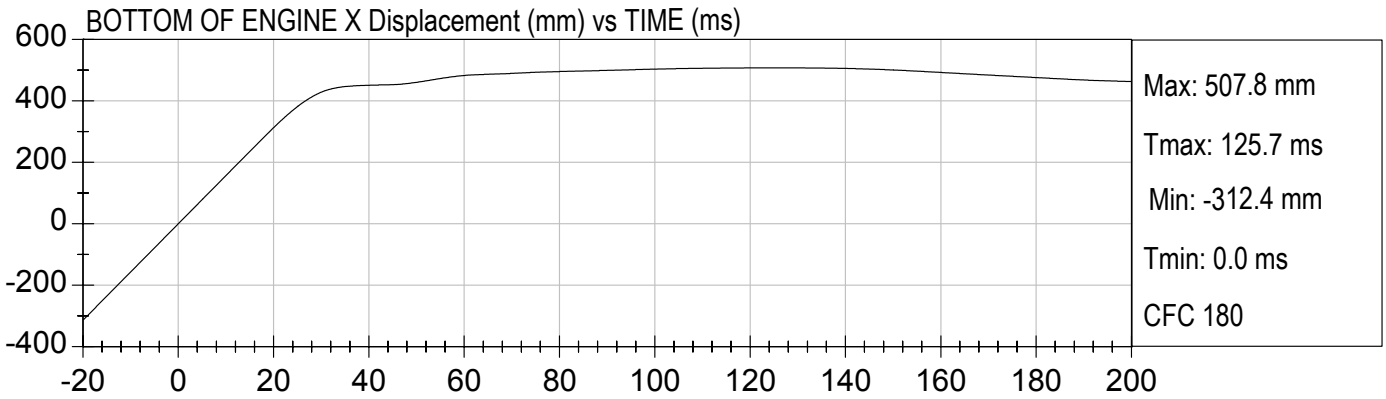

TOP OF ENGINE X Displacement (mm) vs TIME (ms)
500
400
300
200
100
0
-100
-200
-300
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 427.4 mm
Tmax: 35.2 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

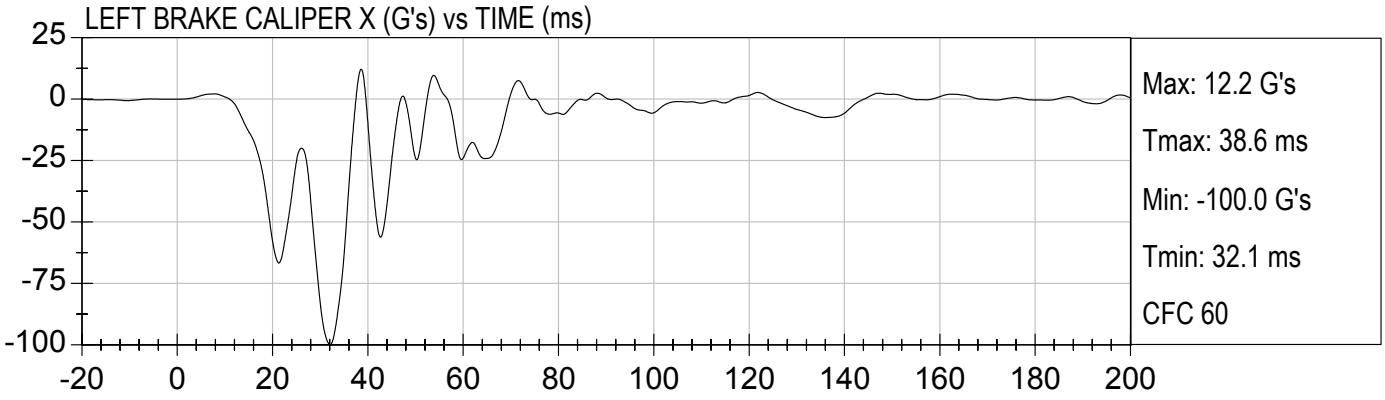
35MPH NCAP FRONTAL
2004 ACURA TSX

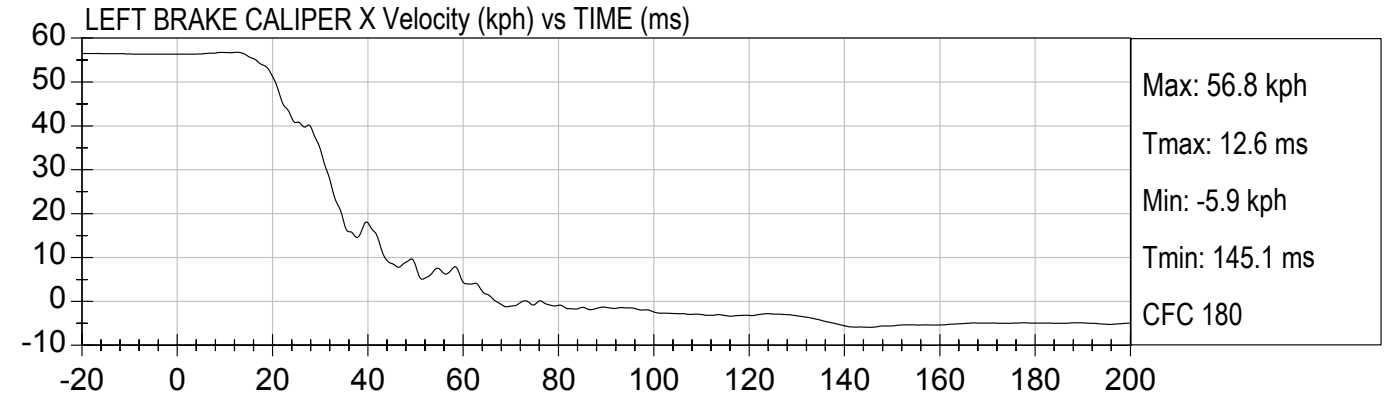
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

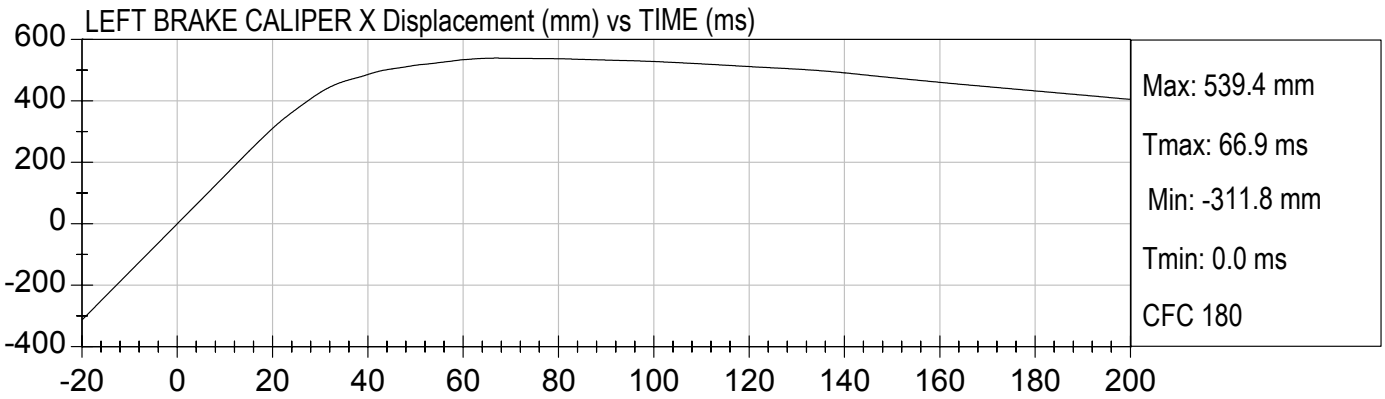






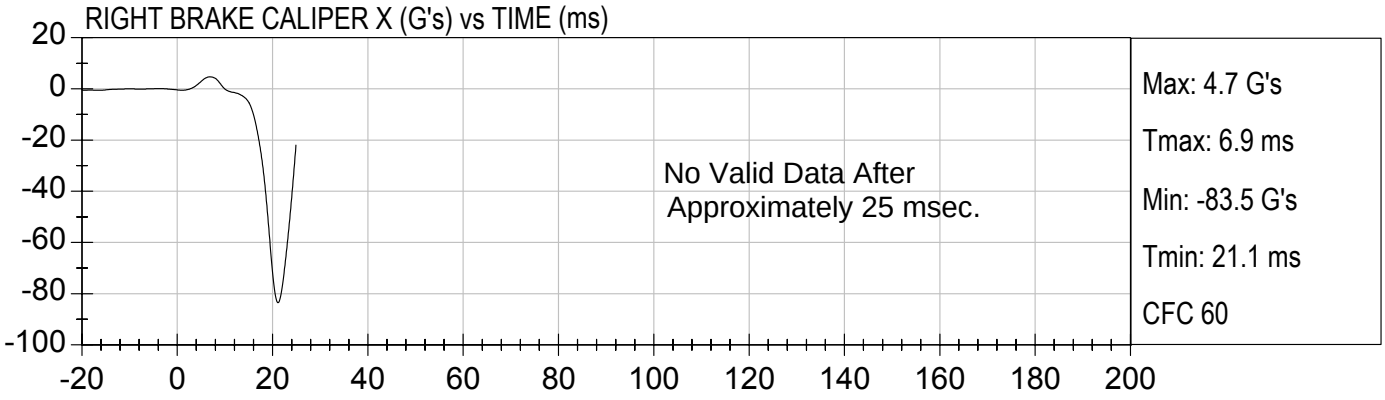

LEFT BRAKE CALIPER X (G's) vs TIME (ms)
25
0
-25
-50
-75
-100
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 12.2 G's
Tmax: 38.6 ms
Min: -100.0 G's
Tmin: 32.1 ms
CFC 60

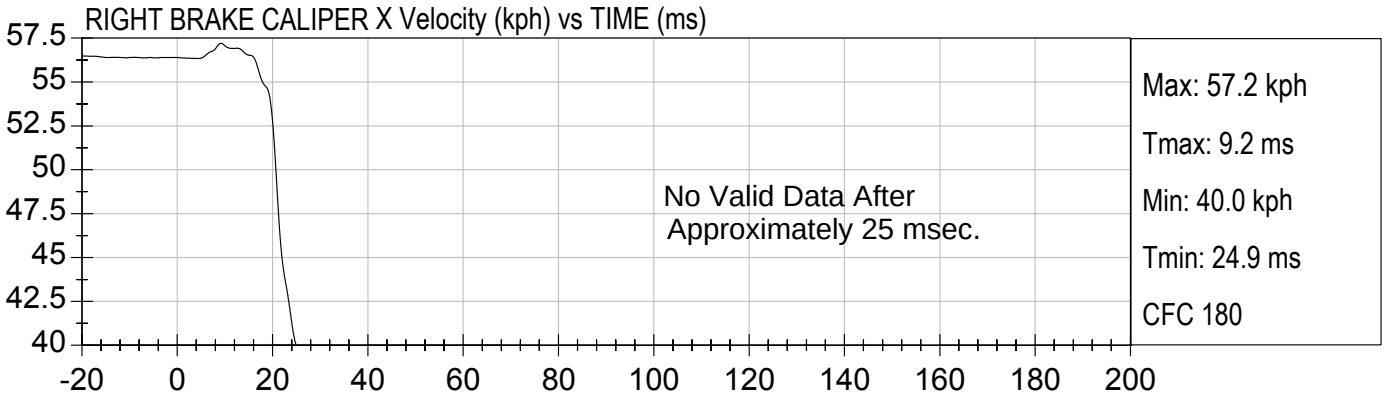

LEFT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.8 kph
Tmax: 12.6 ms
Min: -5.9 kph
Tmin: 145.1 ms
CFC 180

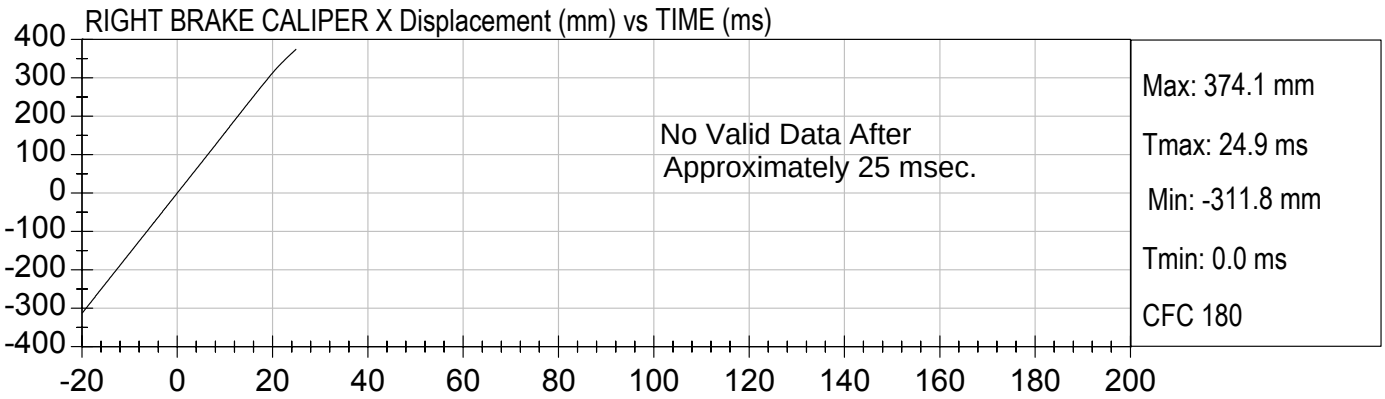

LEFT BRAKE CALIPER X Displacement (mm) vs TIME (ms)
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 539.4 mm
Tmax: 66.9 ms
Min: -311.8 mm
Tmin: 0.0 ms
CFC 180

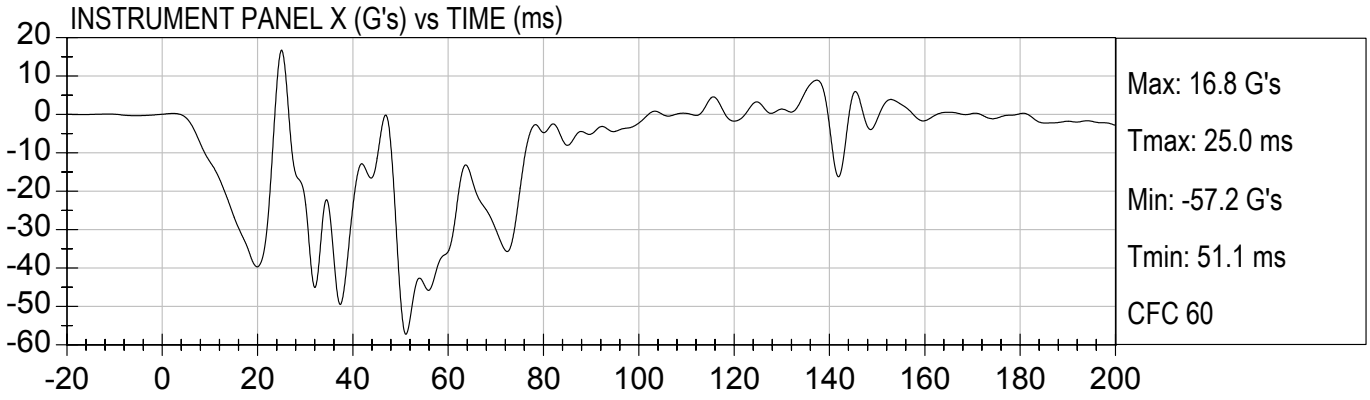
35MPH NCAP FRONTAL
2004 ACURA TSX

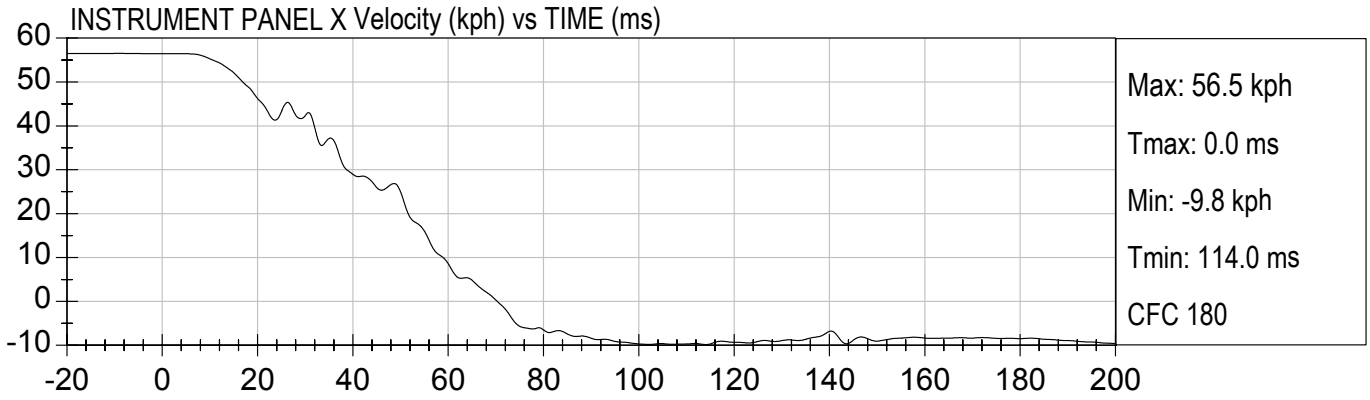
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)

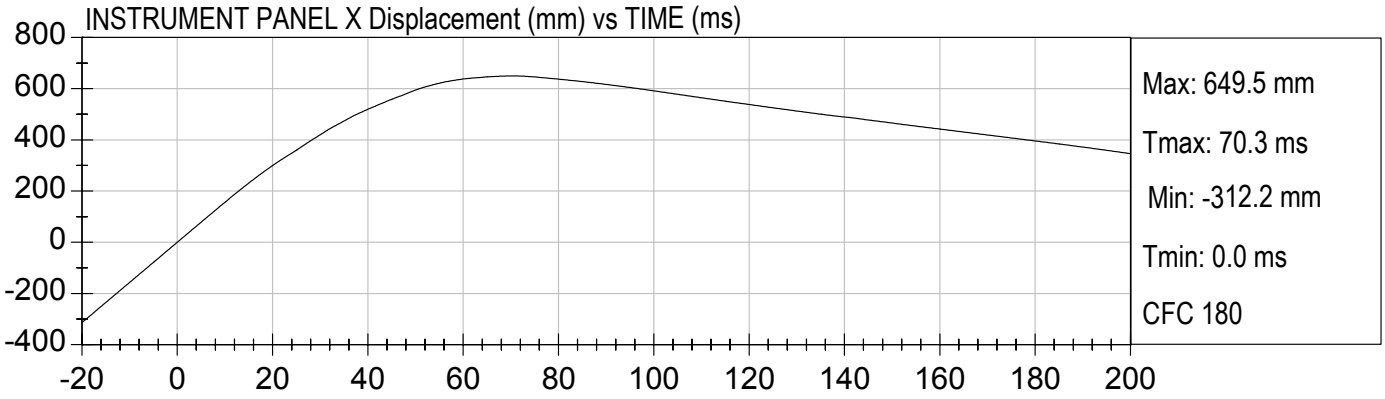


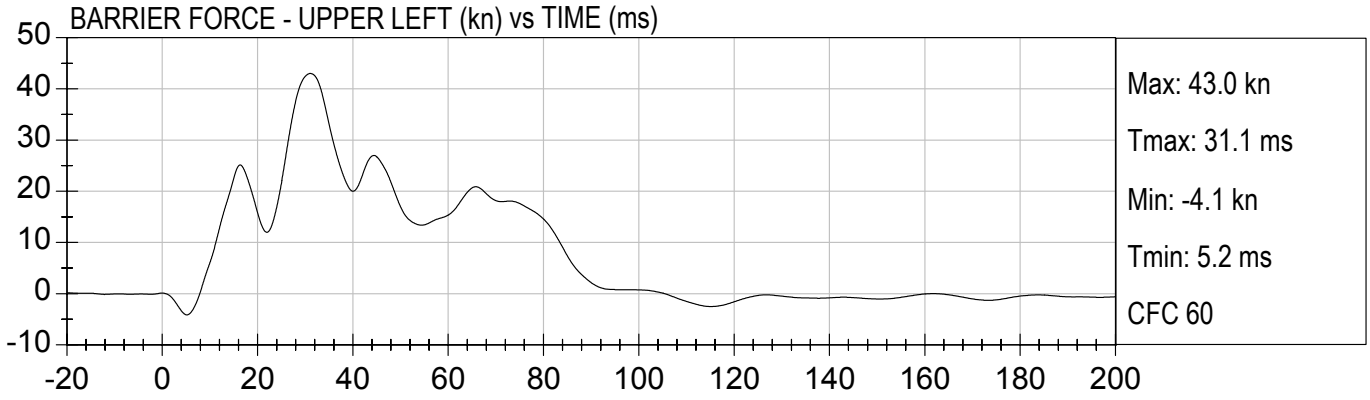


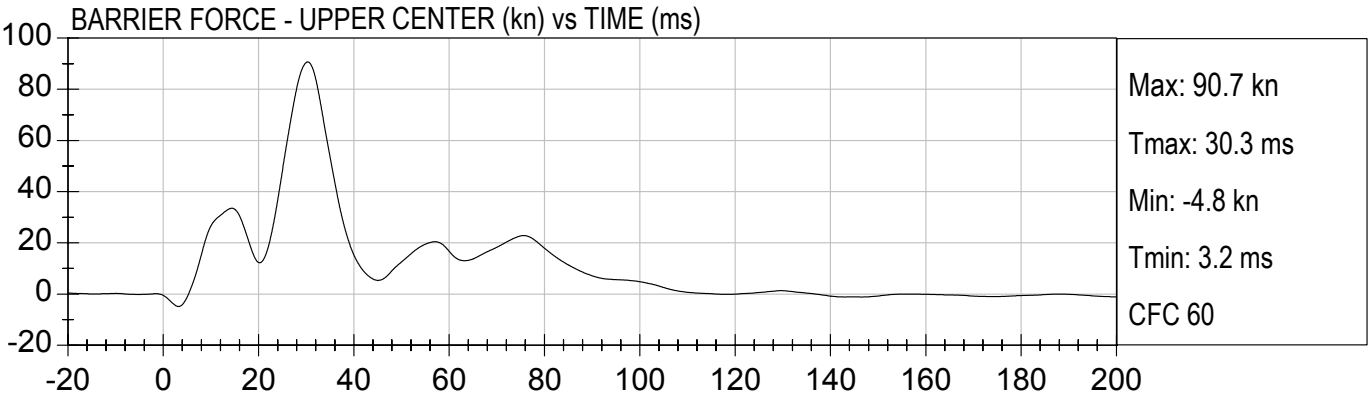


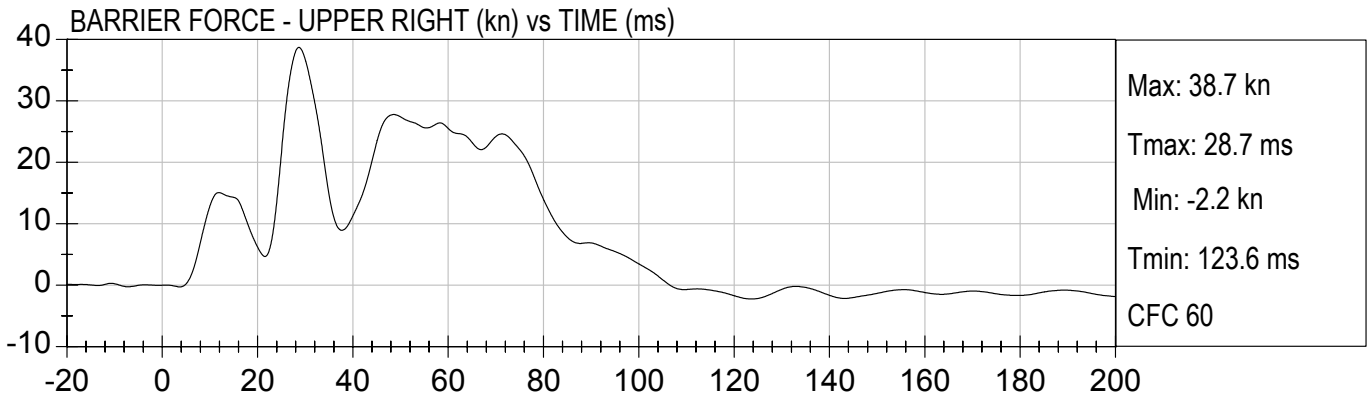

INSTRUMENT PANEL X (G's) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-50
-60
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 16.8 G's
Tmax: 25.0 ms
Min: -57.2 G's
Tmin: 51.1 ms
CFC 60

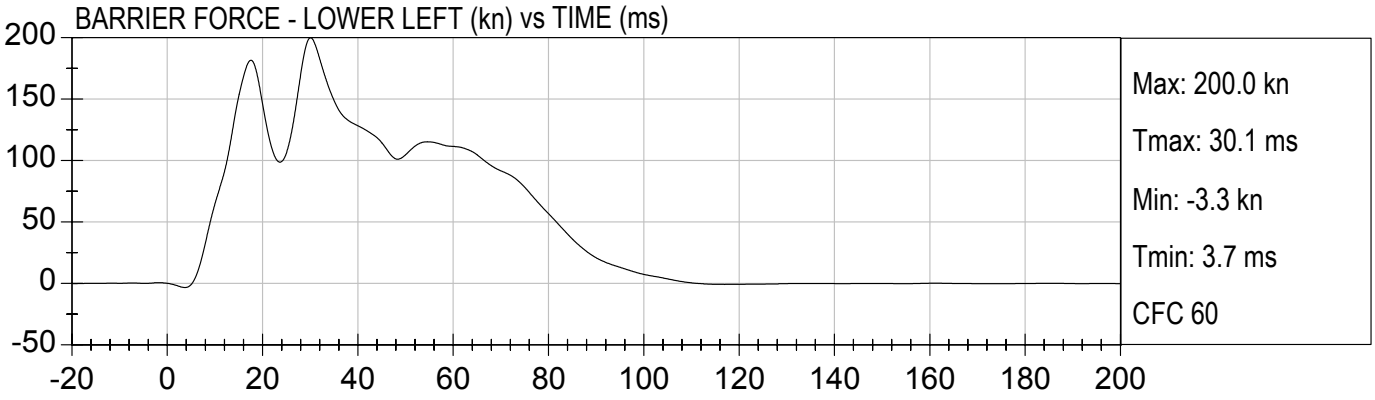

INSTRUMENT PANEL X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -9.8 kph
Tmin: 114.0 ms
CFC 180

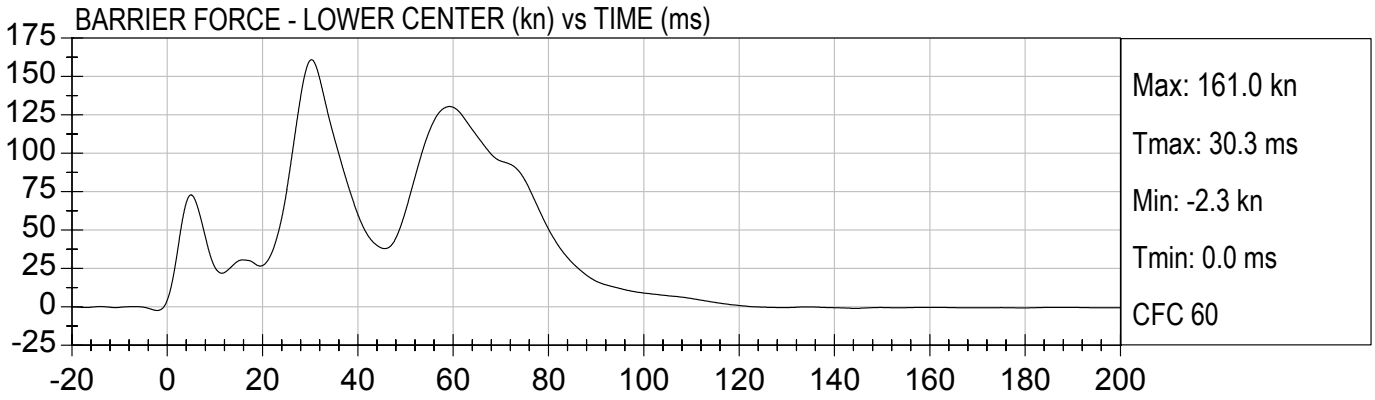

INSTRUMENT PANEL X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 649.5 mm
Tmax: 70.3 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

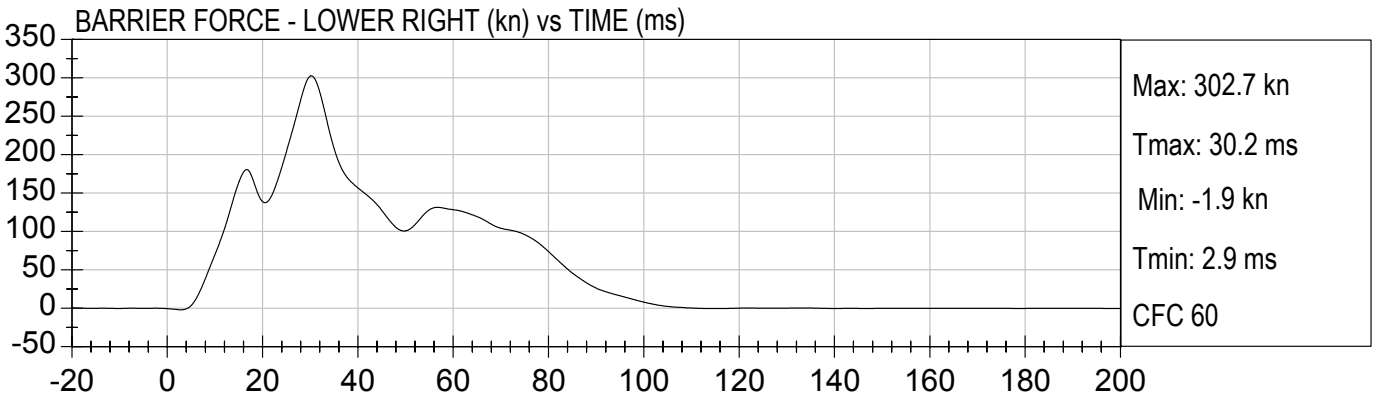

BARRIER FORCE - UPPER LEFT (kn) vs TIME (ms)
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 43.0 kn
Tmax: 31.1 ms
Min: -4.1 kn
Tmin: 5.2 ms
CFC 60


BARRIER FORCE - UPPER CENTER (kn) vs TIME (ms)
100
80
60
40
20
0
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 90.7 kn
Tmax: 30.3 ms
Min: -4.8 kn
Tmin: 3.2 ms
CFC 60


BARRIER FORCE - UPPER RIGHT (kn) vs TIME (ms)
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 38.7 kn
Tmax: 28.7 ms
Min: -2.2 kn
Tmin: 123.6 ms
CFC 60

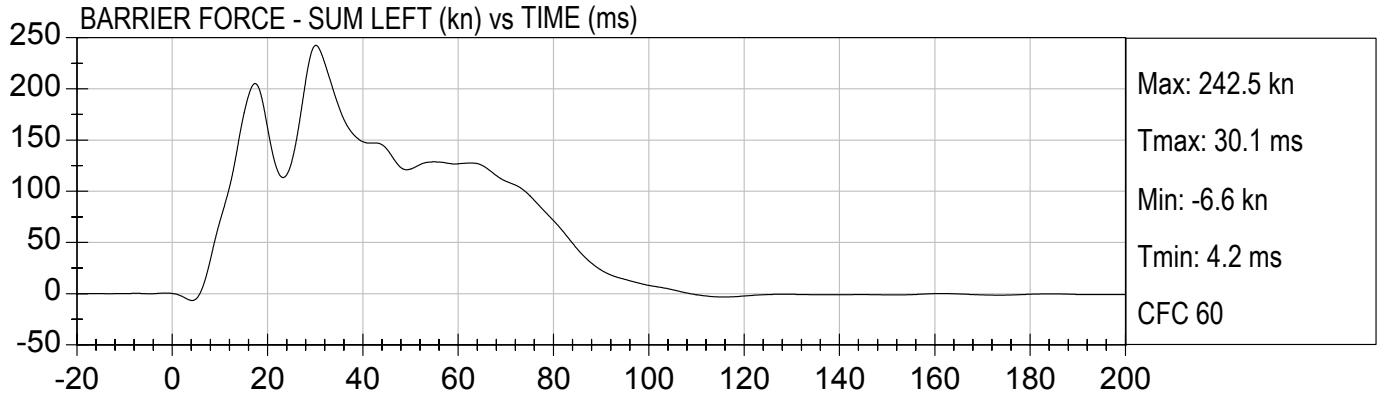

BARRIER FORCE - LOWER LEFT (kn) vs TIME (ms)
200
150
100
50
0
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 200.0 kn
Tmax: 30.1 ms
Min: -3.3 kn
Tmin: 3.7 ms
CFC 60

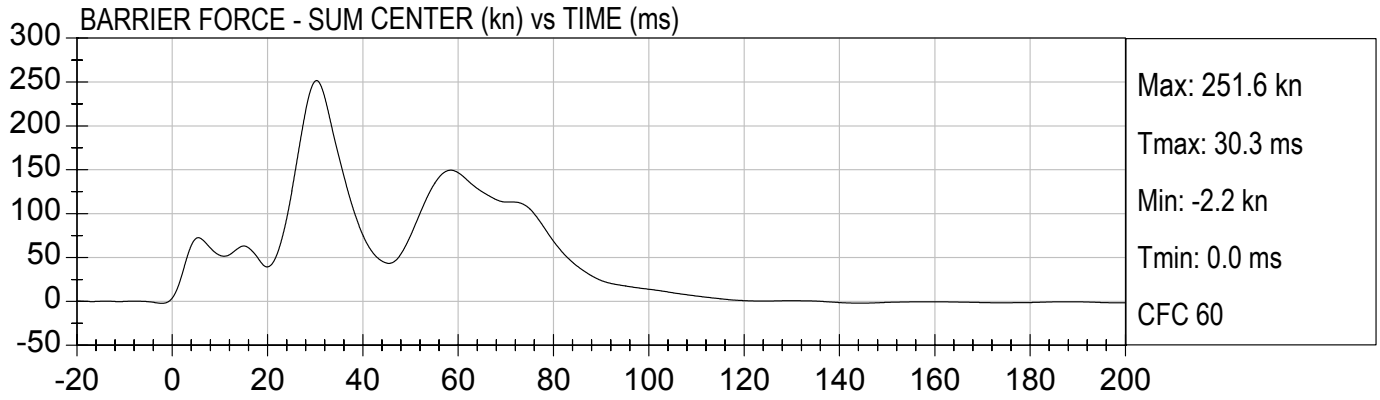

BARRIER FORCE - LOWER CENTER (kn) vs TIME (ms)
175
150
125
100
75
50
25
0
-25
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 161.0 kn
Tmax: 30.3 ms
Min: -2.3 kn
Tmin: 0.0 ms
CFC 60

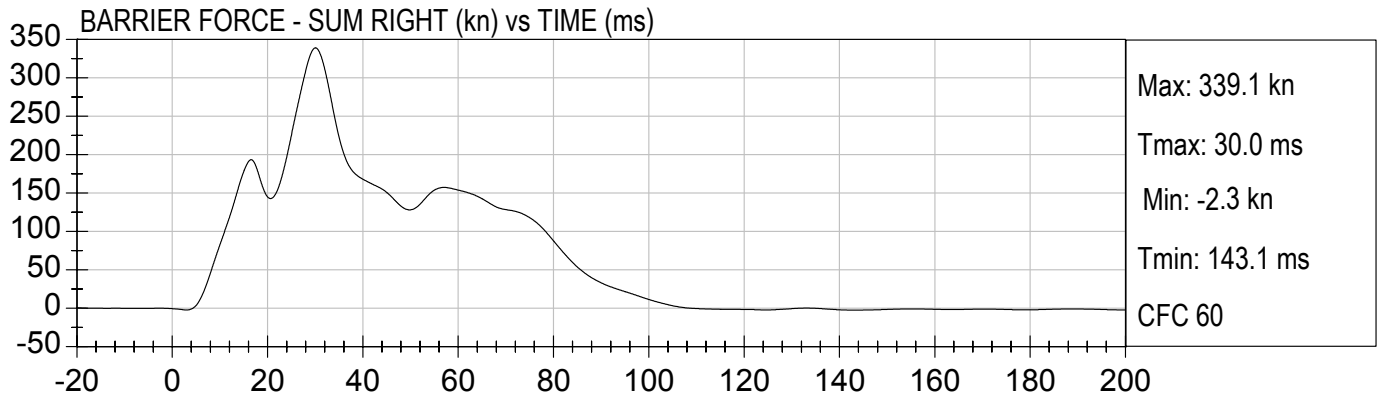

BARRIER FORCE - LOWER RIGHT (kn) vs TIME (ms)
350
300
250
200
150
100
50
0
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 302.7 kn
Tmax: 30.2 ms
Min: -1.9 kn
Tmin: 2.9 ms
CFC 60

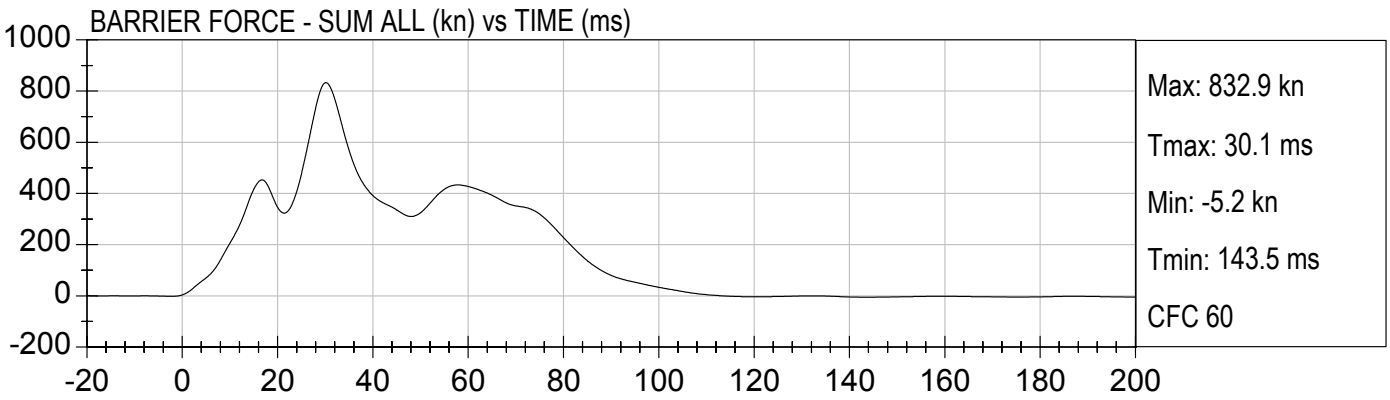
35MPH NCAP FRONTAL
2004 ACURA TSX

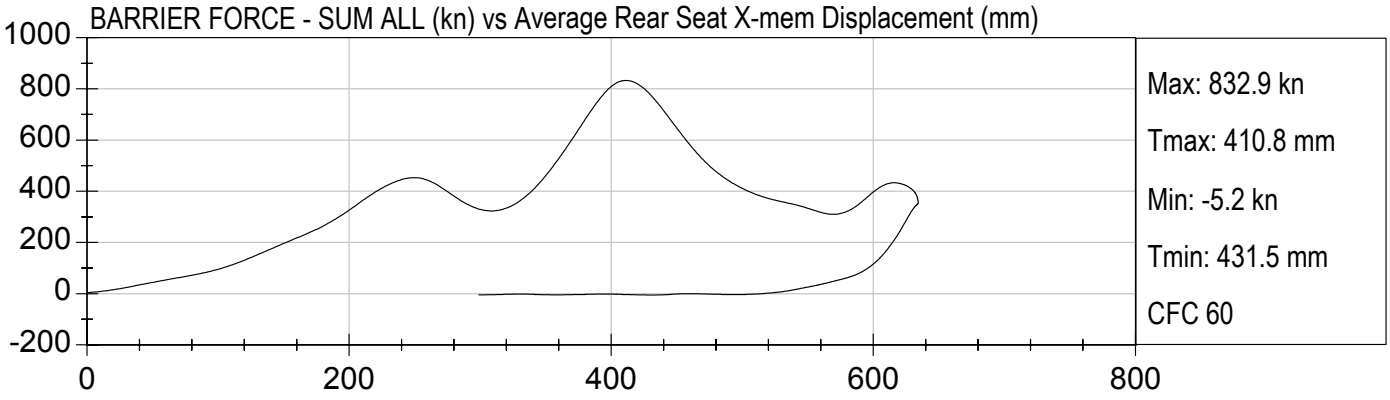
Test Date: 1/13/2004
Speed: 35.1 mph (56.5 km/h)










BARRIER FORCE - SUM ALL (kn) vs Average Rear Seat X-mem Displacement (mm)
1000
800
600
400
200
0
-200
0
200
400
600
800
Max: 832.9 kn
Tmax: 410.8 mm
Min: -5.2 kn
Tmin: 431.5 mm
CFC 60

APPENDIX C

DUMMY CALIBRATION DATA TRACES AND TABLES

CERTIFICATION DATA

Dummy Serial Number: 066

Calibration Test Results Summary

Dummy Serial Number: 066

Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Flexion Test:	The neck passed all flexion test requirements.
Neck Extension Test:	The neck passed all extension test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Knee Impact Tests:	Both knees passed all impact test requirements.
Hip-Femur Flexion Tests:	Both femurs passed all flexion test requirements.

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Dummy Serial Number: 066

Date of Verification: 9/29/03

Test Number: D03190

DESCRIPTION	SPECIFICATION	TEST RESULTS
Temperature (°F)	20.6 – 22.2	21.7
Relative Humidity	10 – 70 %	29
AA - Location for Chest Circumference	429.3 – 434.3 mm	431.8
BB - Location for Waist Circumference	226.1 – 231.1 mm	228.6
A - Total Sitting Height	878.8 – 889.0 mm	879.5
B – Shoulder Pivot Height	505.5 – 520.7 mm	514.4
C – H Point Height	82.9 – 88.9 mm	88.9
D – H Point from Seat Back	134.7 – 139.7 mm	136.5
E – Shoulder Pivot From Backline	84.8 – 94.0 mm	94.0
F – Thigh Clearance	139.7 – 154.9 mm	146.1
G – Back of Elbow to Wrist Pivot	289.6 – 304.8 mm	292.1
H – Skull Cap Skin to Backline	40.7 – 45.7 mm	44.5
I – Shoulder Elbow Length	330.2 – 345.4 mm	330.2
J – Elbow Rest Height	190.5 – 210.9 mm	205.7
K – Buttock Knee Length	579.1 – 604.5 mm	596.9
L – Popliteal Height	429.3 – 454.7 mm	438.2
M – Knee Pivot Height	485.2 – 500.4 mm	495.3
N – Buttock Popliteal Length	452.1 – 477.5 mm	463.6
O – Chest Depth at 3rd Rib	213.4 – 228.6 mm	215.9
P – Foot Length	251.5 – 266.7 mm	260.4
V – Shoulder Breadth	421.7 – 436.9 mm	436.9
W – Foot Breadth	91.5 – 106.7 mm	101.6
Y – Chest Circumference	970.3 – 1000.7 mm	984.3
Z – Waist Circumference	835.7 – 866.1 mm	866.1

Technician: Jessica Gall

Approved By: Shefalika Jaiswal

Hybrid III Calibration Data Sheet

50th Percentile Male

Head Drop Calibration

ATD Serial No: 066 **Test I.D:** D031901

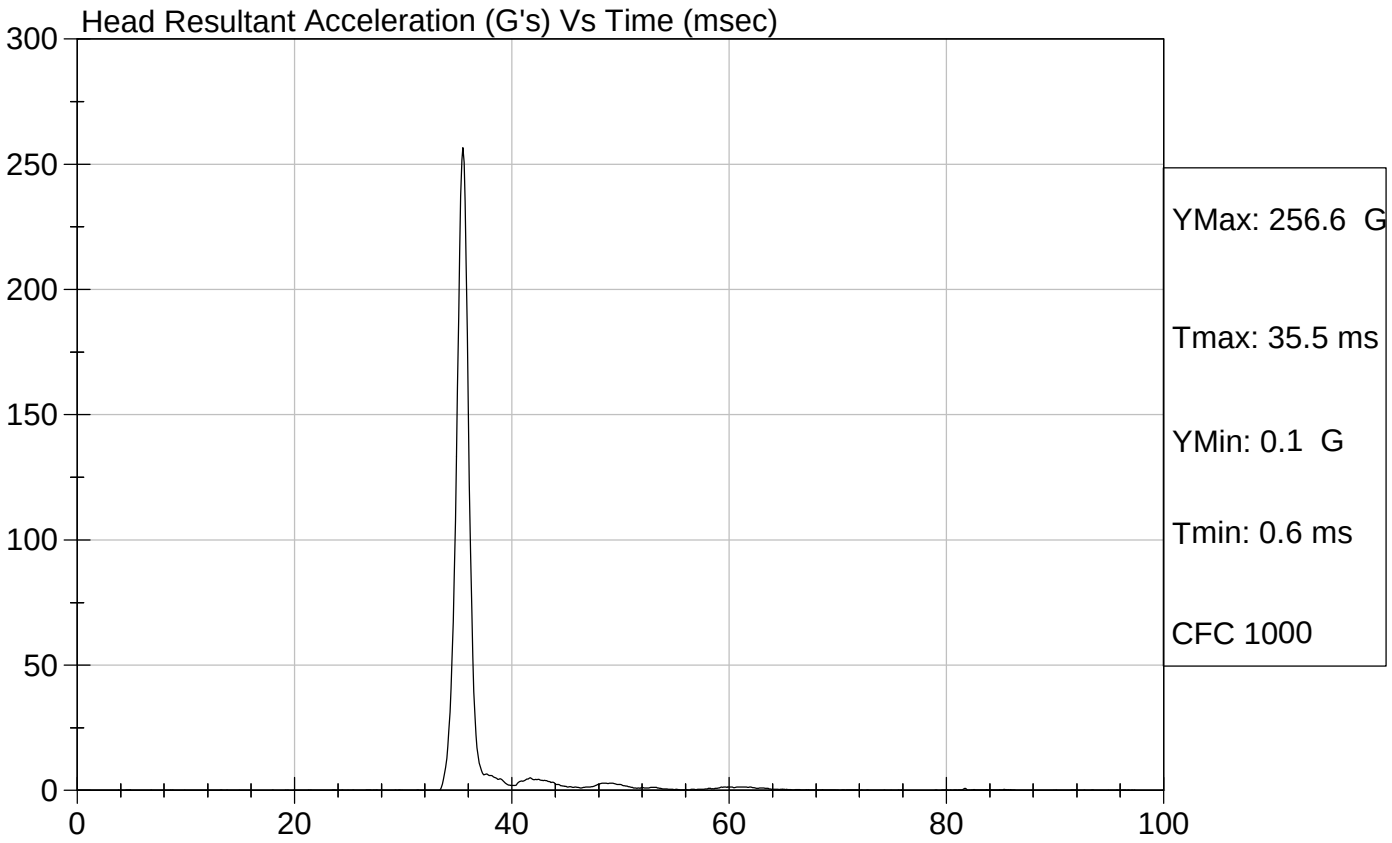
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	256.6	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	1.1	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
		Overall Test Results		Pass

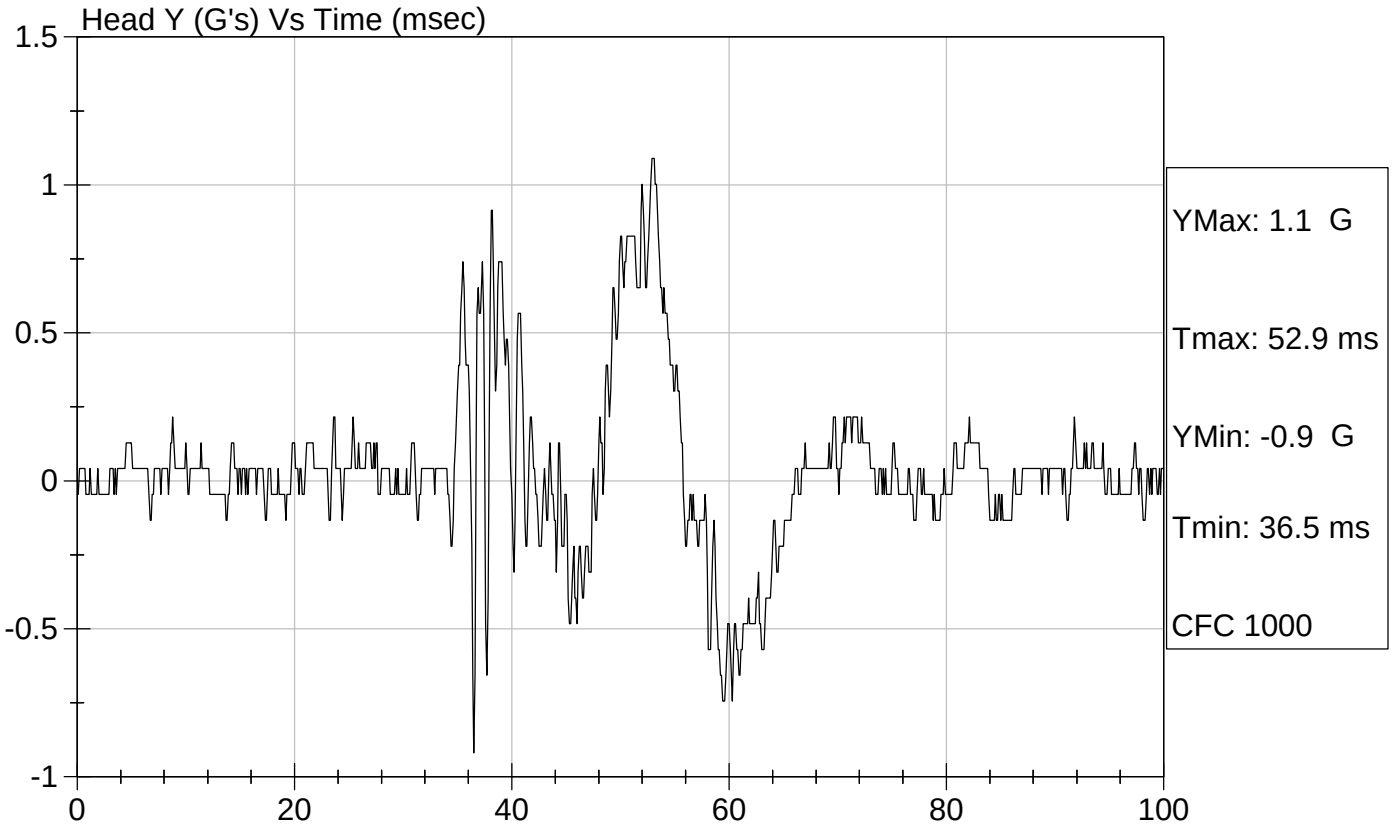
Jessica Hall
Laboratory Technician

11/19/2003
Test Date

Shafaliba Agarwal
Approved By

	Test Description: Head Drop	Test Date: 11/19/2003
	Component: D031901	Speed: 0 ft/s, 0.00 m/s





Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Flexion Test

ATD Serial No: 066 **Test I.D:** D031902

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	26	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.12	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.05	Pass
	20 msec	G's	17.60 to 22.60	19.52	Pass
	30 msec	G's	12.50 to 18.50	15.93	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	15.93	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	39.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	73.3	Pass
	Time	msec	57.0 to 64.0	57.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	113.0	Pass
Moment About Occipital Condyle	Maximum	N m	84.1 to 108.5	94.5	Pass
	Time	msec	47.0 to 58.0	52.5	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	101.0	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

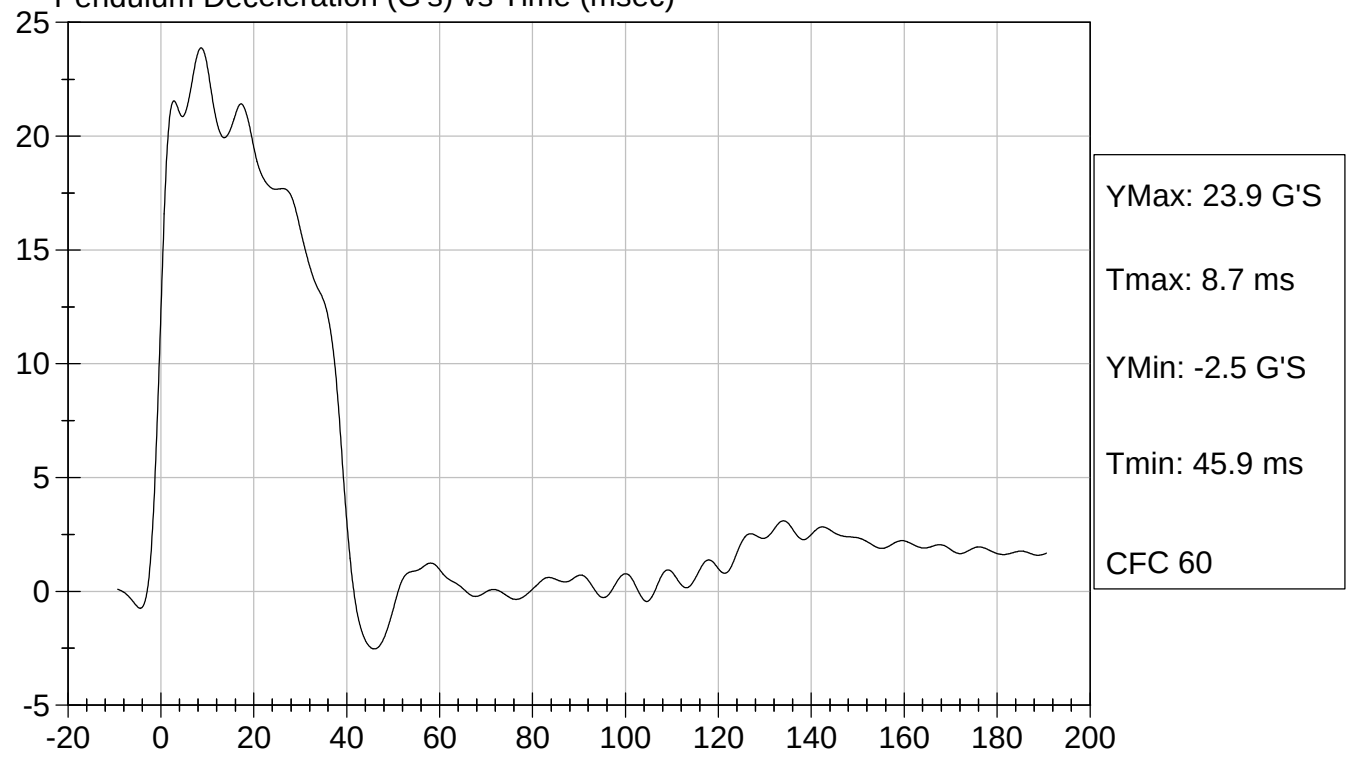
11/22/2003
Test Date

Shefalika Jgarwal
Approved By

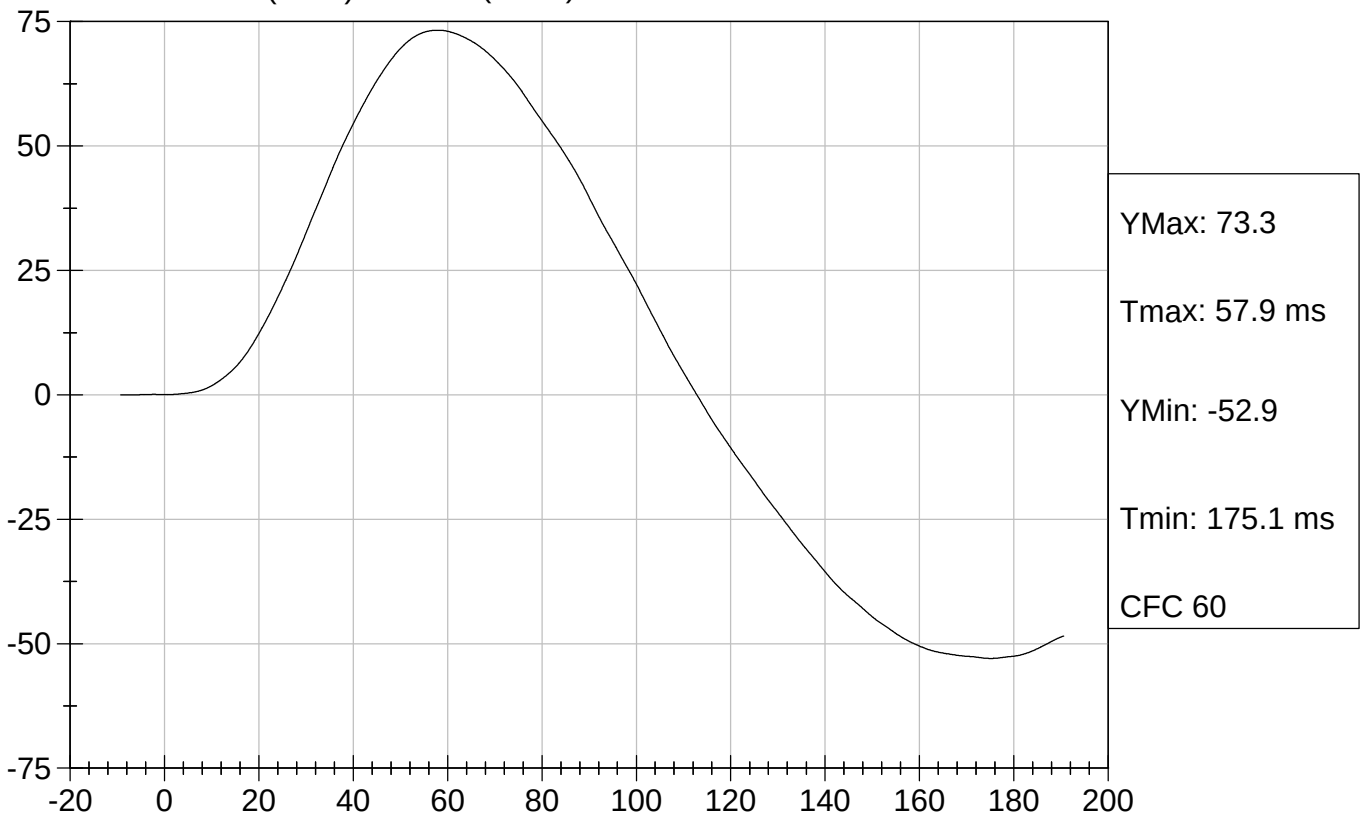
Test Desc: Neck Flexion
Component ID: D031902

Test Date: 11/22/2003
Speed: 23.36 ft/sec, 7.12 m/sec

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

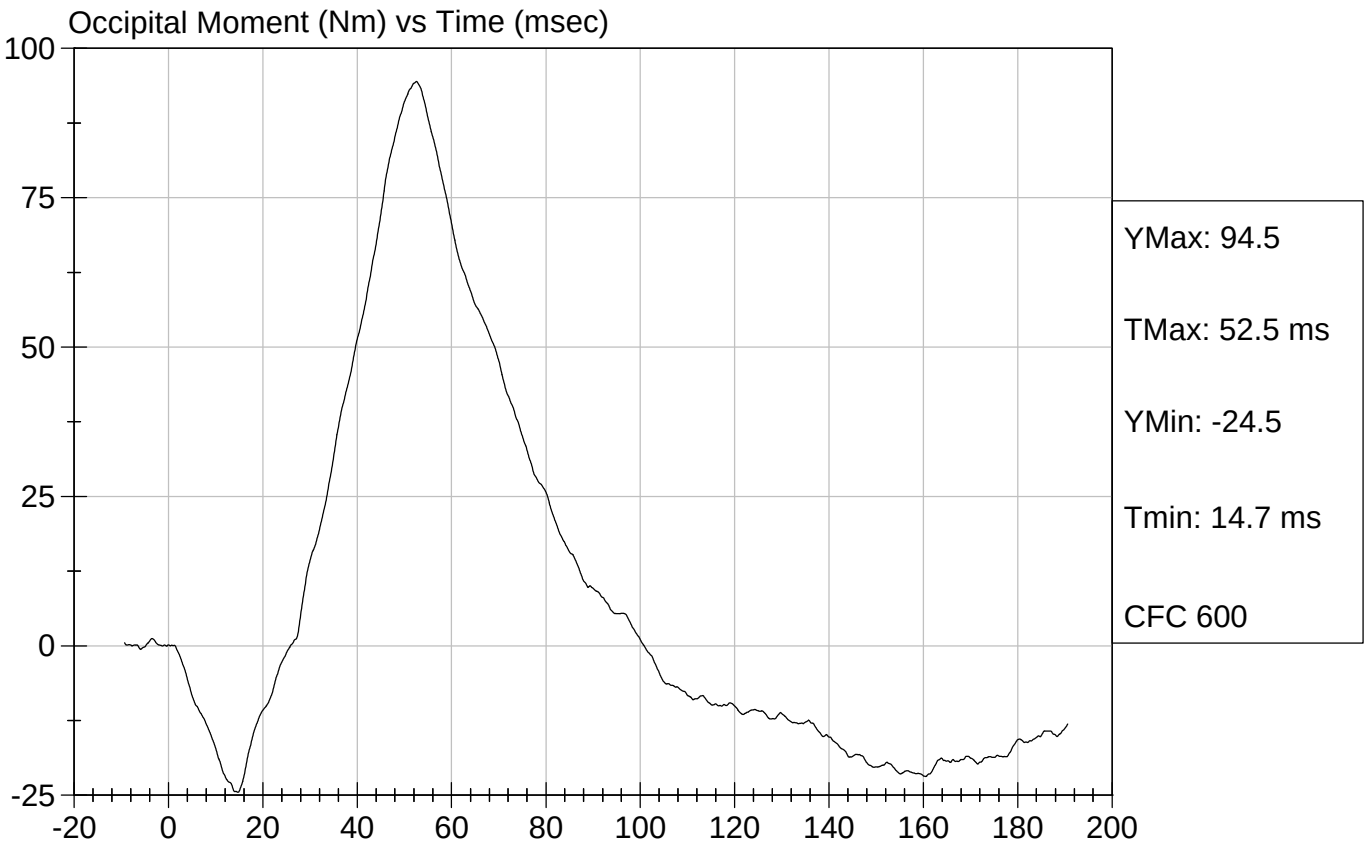


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Flexion
Component ID: D031902

Test Date: 11/22/2003
Speed: 23.36 ft/sec, 7.12 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Extension Test

ATD Serial No: 066 **Test I.D:** D031903

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	26	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.18	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.81	Pass
	20 msec	G's	14.00 to 19.00	15.74	Pass
	30 msec	G's	11.00 to 16.00	13.25	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	42.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.4	Pass
	Time	msec	72.0 to 82.0	76.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	151.5	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-68.7	Pass
	Time	msec	65.0 to 79.0	71.5	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	140.8	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

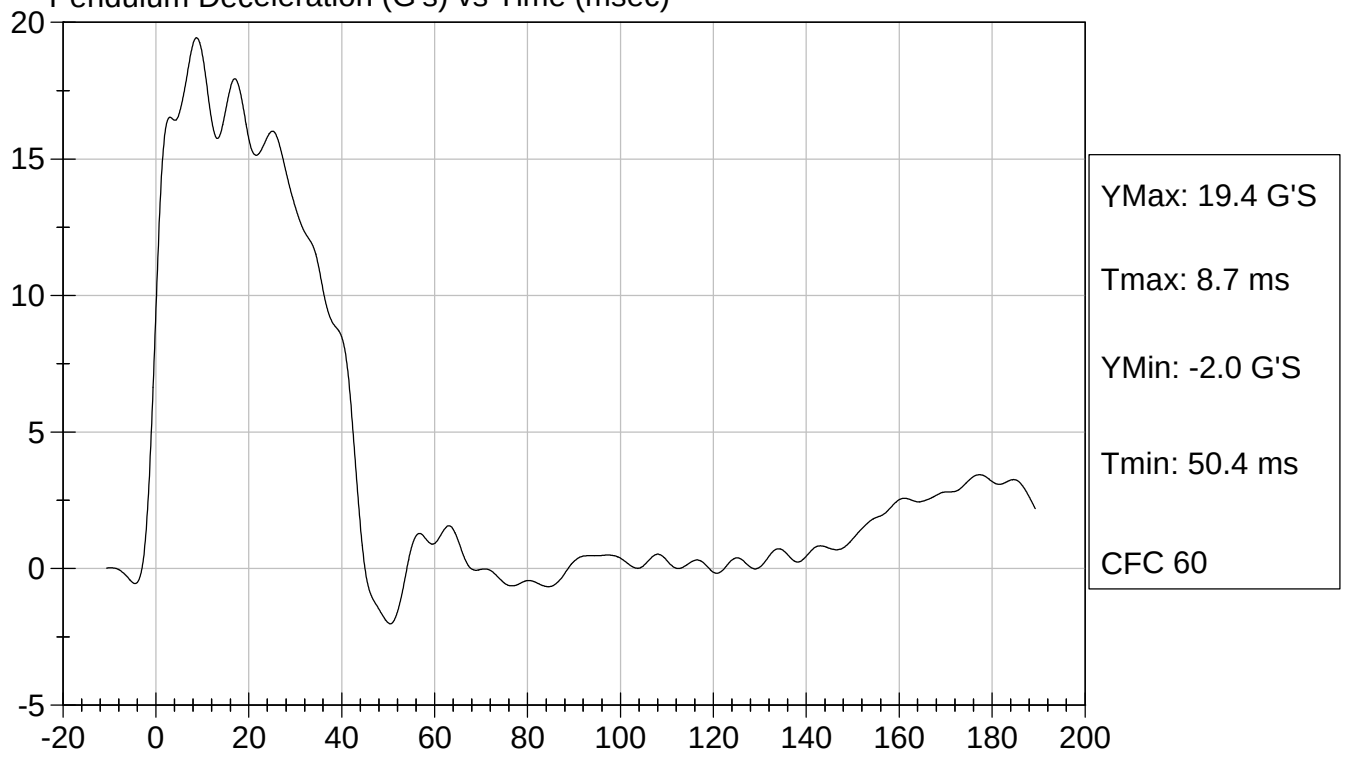
11/22/2003
Test Date

Shefalika Jgarwal
Approved By

Test Desc: Neck Extension
Component ID: D031903

Test Date: 11/22/2003
Speed: 20.28 ft/sec, 6.18 m/sec

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



YMax: 19.4 G'S

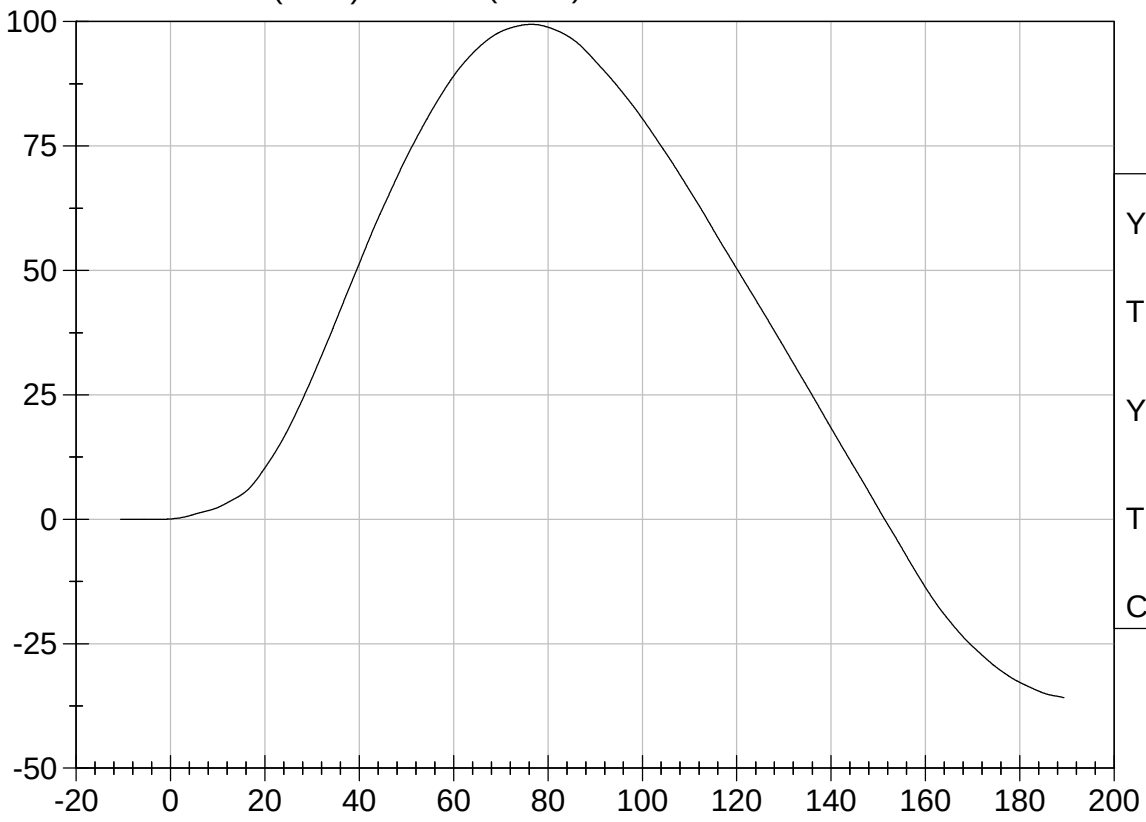
Tmax: 8.7 ms

YMin: -2.0 G'S

Tmin: 50.4 ms

CFC 60

Neck Rotation (DEG) vs Time (msec)



YMax: 99.4

TMax: 76.4 ms

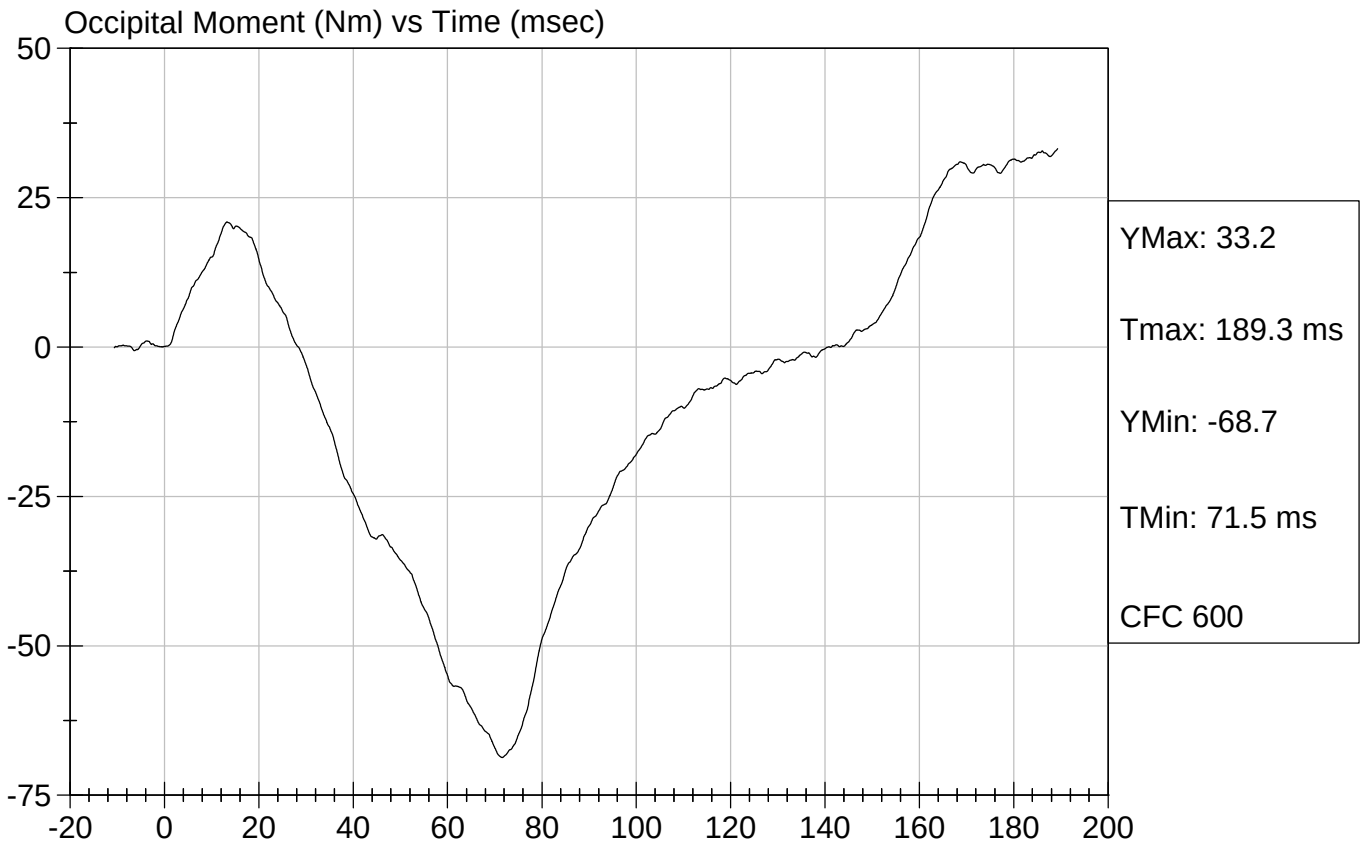
YMin: -35.8

Tmin: 189.3 ms

CFC 60

Test Desc: Neck Extension
Component ID: D031903

Test Date: 11/22/2003
Speed: 20.28 ft/sec, 6.18 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Thorax Impact Test

ATD Serial No: 066 **Test I.D:** D031904

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Probe Velocity	m/s	6.58 to 6.82	6.82	Pass
Peak Probe Force	Newtons	5159 to 5893	5,595	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.57	Pass
Internal Hysteresis	%	69 to 85	72	Pass
		Overall Test Results		Pass

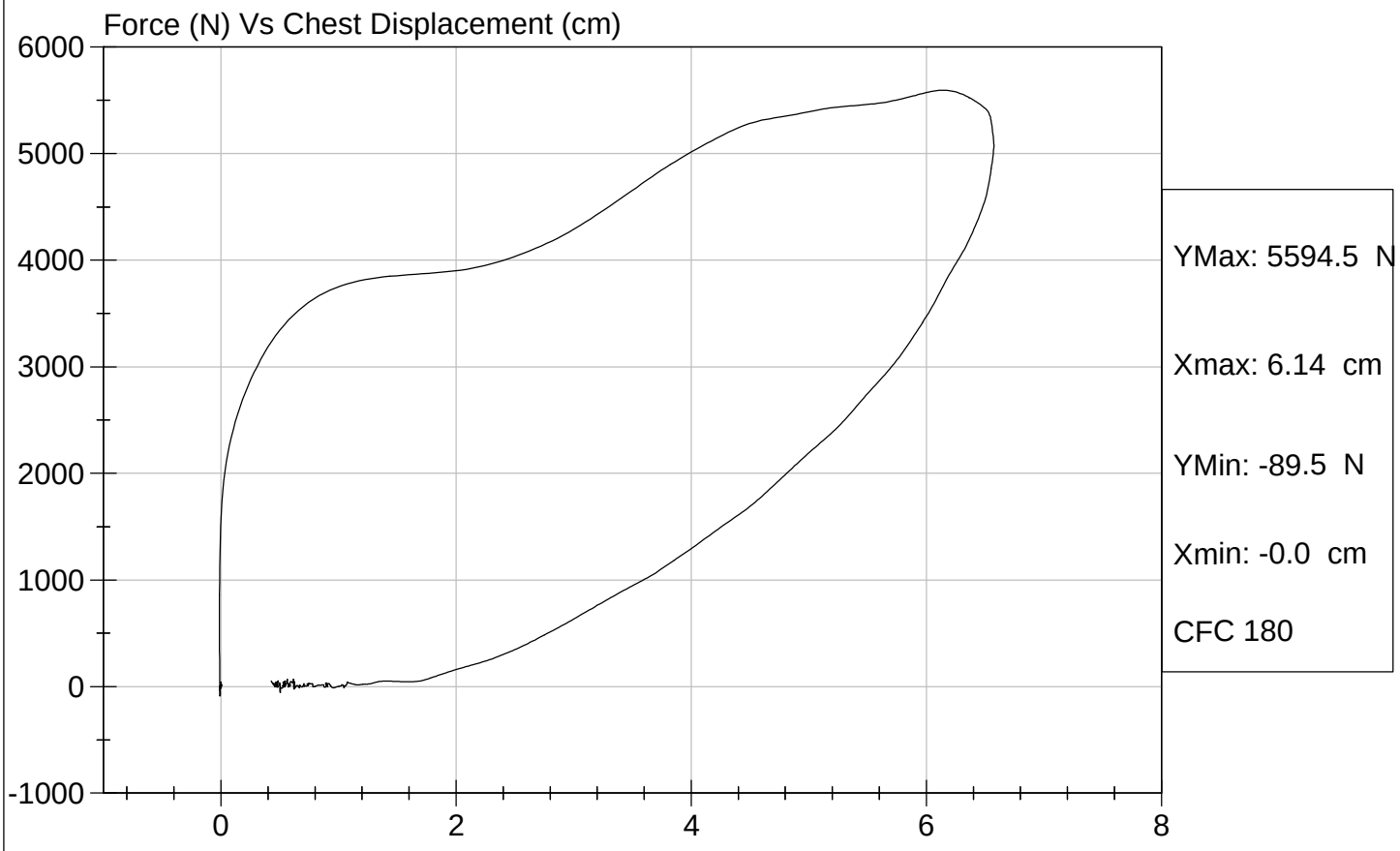
Jessica Hall
Laboratory Technician

11/24/2003
Test Date

Shafaliba Agarwal
Approved By

Test Description: Thorax Impact | Test Date: 11/24/2003

Component: D031904 | Speed: 22.37 ft/sec, 6.82 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Right Knee Impact Test

ATD Serial No: 066 **Test I.D:** D031905

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	Newtons	4715 to 5782	5,277	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

11/22/2003
Test Date

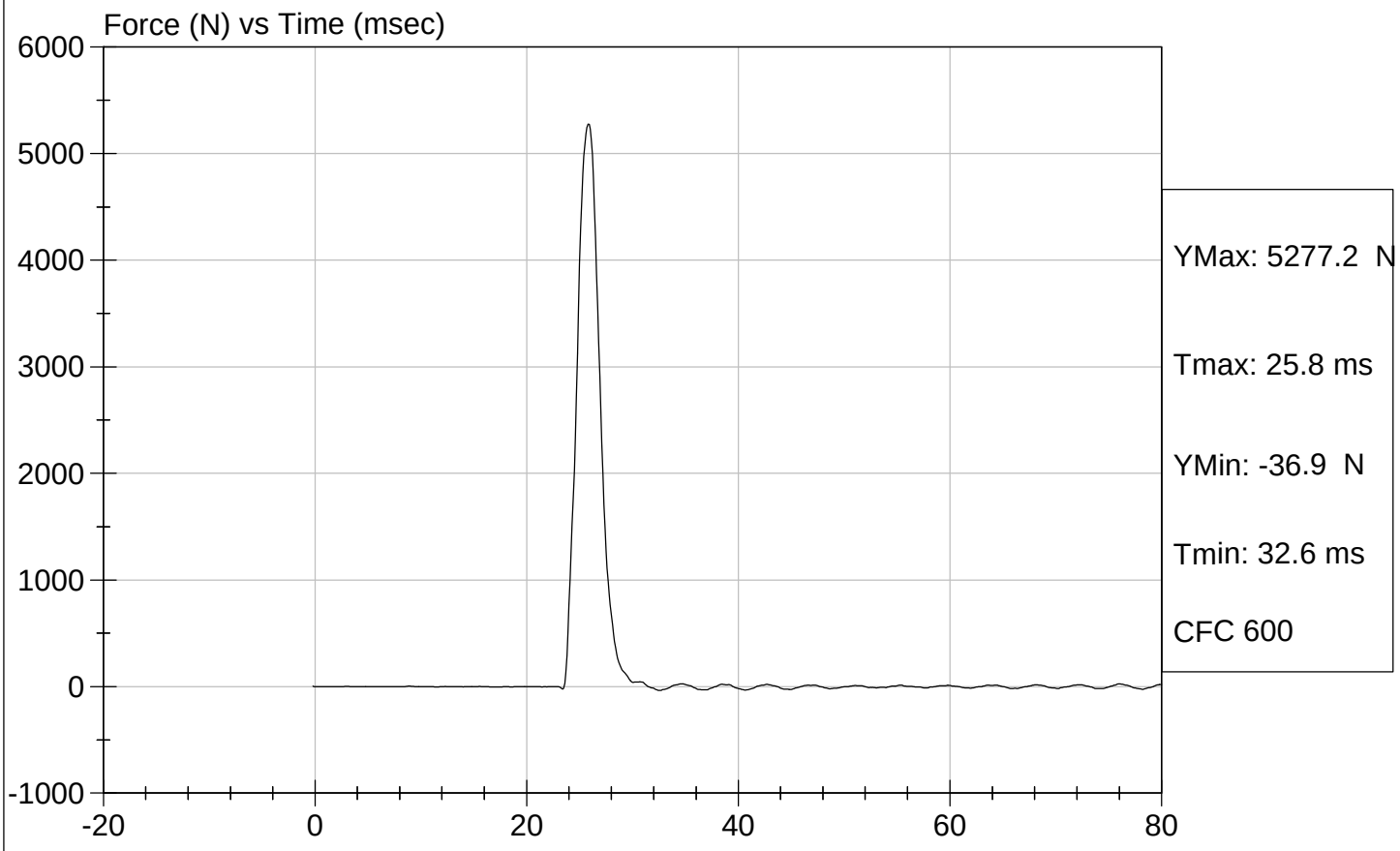
Shafaliha Agarwal
Approved By

Test Description: Right Knee

Test Date: 11/22/2003

Component: D031905

Speed: 6.8 ft/sec, 2.073 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Left Knee Impact Test

ATD Serial No: 066 **Test I.D:** D031906

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,105	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

11/22/2003
Test Date

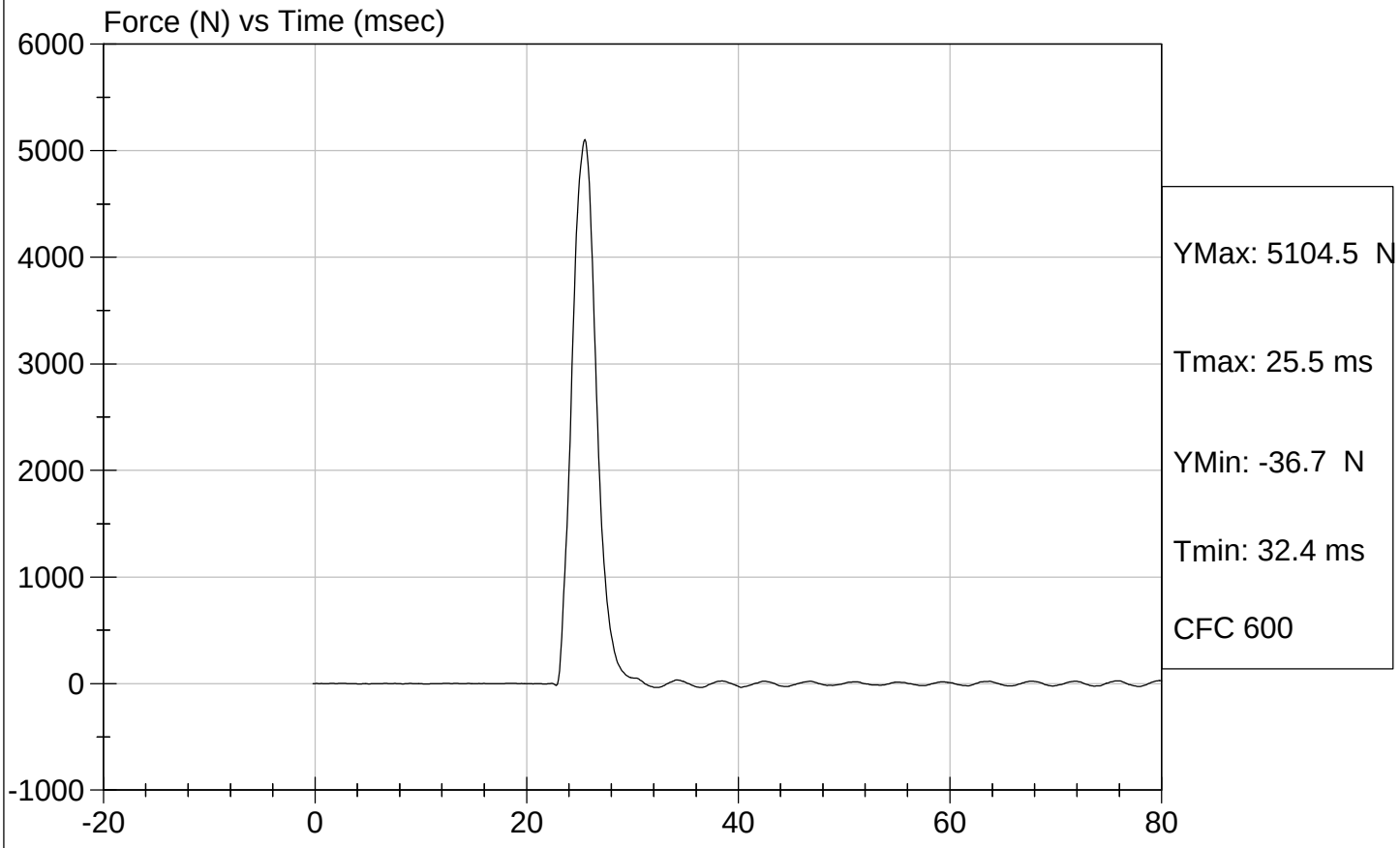
Shafaliha Agarwal
Approved By

Test Description: Left Knee

Test Date: 11/22/2003

Component: D031906

Speed: 6.84 ft/sec, 2.085 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Hip-Femur Flexion Test

ATD Serial No: 066 **Test I.D:** D031900

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.1	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	30	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	78.1	81.2	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	44	40	Pass
		Overall Test Results			Pass

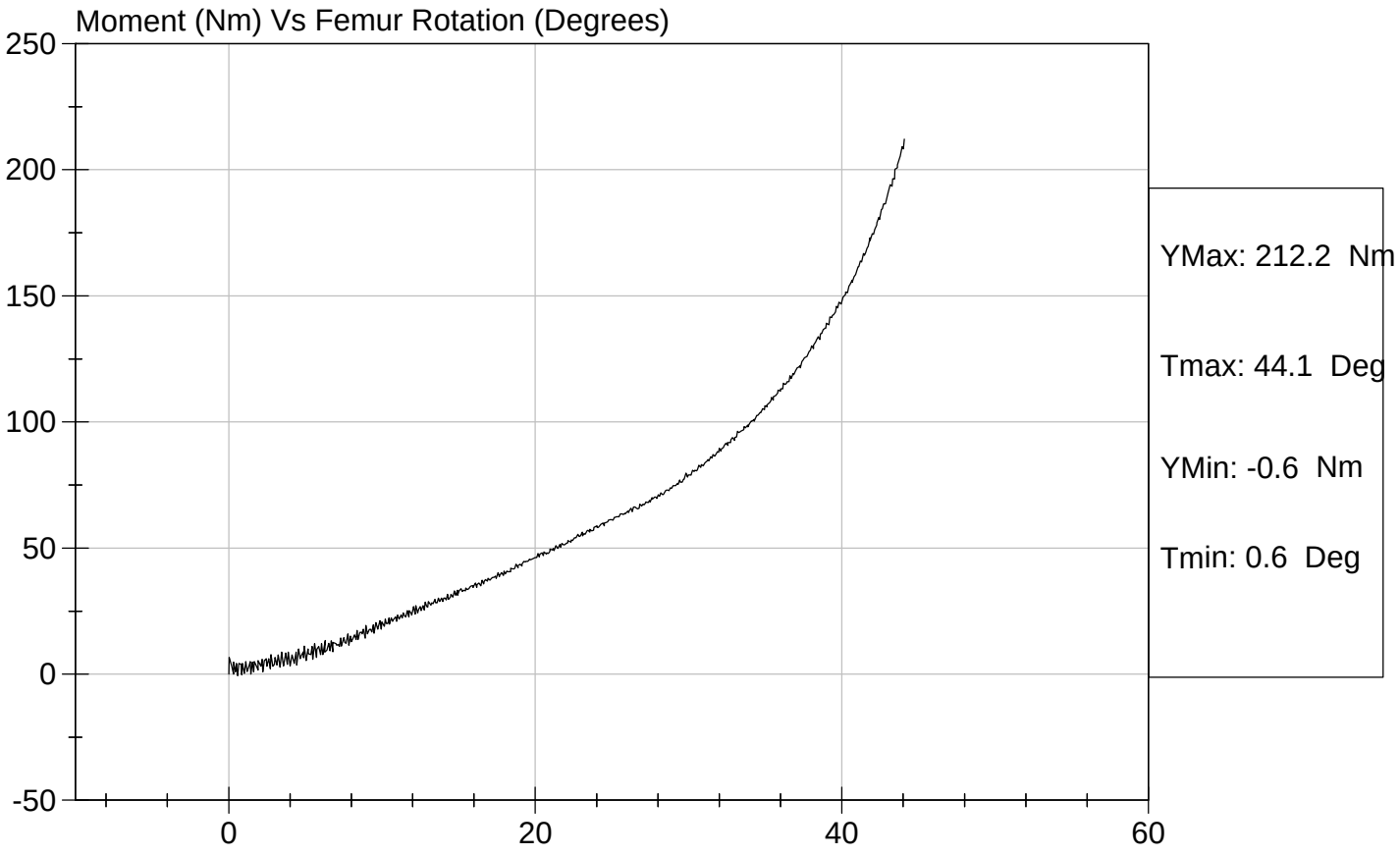
Jessica Hall
Laboratory Technician

11/21/2003
Test Date

Shafaliba Agarwal
Approved By

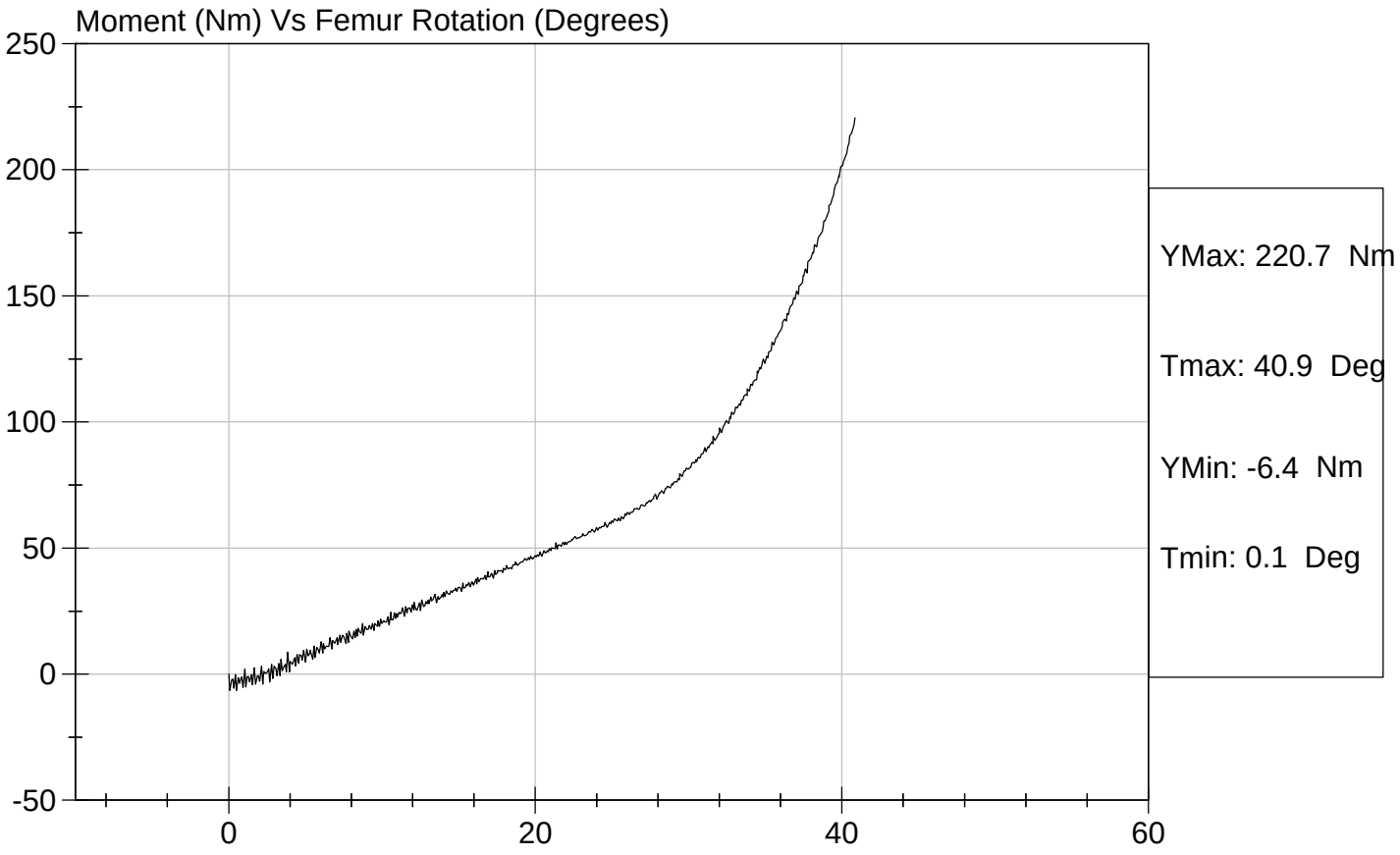
Test Description: Hip Femur Flexion | Test Date: 11/21/2003

Component: D031909 | Speed: 0 ft/sec, 0.00 m/sec



Test Description: Hip Femur Flexion | Test Date: 11/21/2003

Component: D031900 | Speed: 0 ft/sec, 0.00 m/sec



DUMMY INSPECTION CHECKLIST

Type: Hybrid III

Dummy Serial Number: 066

Inspected By: Jessica Gall

Date: 11/24/03

Part	Items Checked	Comments
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque, nodding blocks	OK
Clavicles	visual, bumpers, range of motion	OK
Arms/Hands	visual, bumpers, range of motion	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual, bumpers	OK
Lumbar spine	visual, cable torque	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual, load cell bolts	OK
Knees	visual, stops, inserts, sliders	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

Notes (include component/problem/action/reason):

CERTIFICATION DATA

Dummy Serial Number: 065

Calibration Test Results Summary

Dummy Serial Number: 065

Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Flexion Test:	The neck passed all flexion test requirements.
Neck Extension Test:	The neck passed all extension test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Knee Impact Tests:	Both knees passed all impact test requirements.
Hip-Femur Flexion Tests:	Both femurs passed all flexion test requirements.

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Dummy Serial Number: 065

Date of Verification: 9/29/03

Test Number: D03189

DESCRIPTION	SPECIFICATION	TEST RESULTS
Temperature (°F)	20.6 – 22.2	21.1
Relative Humidity	10 – 70 %	30
AA - Location for Chest Circumference	429.3 – 434.3 mm	431.8
BB - Location for Waist Circumference	226.1 – 231.1 mm	228.6
A - Total Sitting Height	878.8 – 889.0 mm	882.7
B – Shoulder Pivot Height	505.5 – 520.7 mm	508.0
C – H Point Height	82.9 – 88.9 mm	88.9
D – H Point from Seat Back	134.7 – 139.7 mm	139.7
E – Shoulder Pivot From Backline	84.8 – 94.0 mm	94.0
F – Thigh Clearance	139.7 – 154.9 mm	146.1
G – Back of Elbow to Wrist Pivot	289.6 – 304.8 mm	292.1
H – Skull Cap Skin to Backline	40.7 – 45.7 mm	44.5
I – Shoulder Elbow Length	330.2 – 345.4 mm	330.2
J – Elbow Rest Height	190.5 – 210.9 mm	196.9
K – Buttock Knee Length	579.1 – 604.5 mm	603.3
L – Popliteal Height	429.3 – 454.7 mm	444.5
M – Knee Pivot Height	485.2 – 500.4 mm	488.2
N – Buttock Popliteal Length	452.1 – 477.5 mm	469.9
O – Chest Depth at 3rd Rib	213.4 – 228.6 mm	215.9
P – Foot Length	251.5 – 266.7 mm	254.0
V – Shoulder Breadth	421.7 – 436.9 mm	434.3
W – Foot Breadth	91.5 – 106.7 mm	98.4
Y – Chest Circumference	970.3 – 1000.7 mm	977.9
Z – Waist Circumference	835.7 – 866.1 mm	844.6

Technician: Jessica Hall

Approved By: Shefalika Jaiswal

Hybrid III Calibration Data Sheet

50th Percentile Male

Head Drop Calibration

ATD Serial No: 065 **Test I.D:** D031891

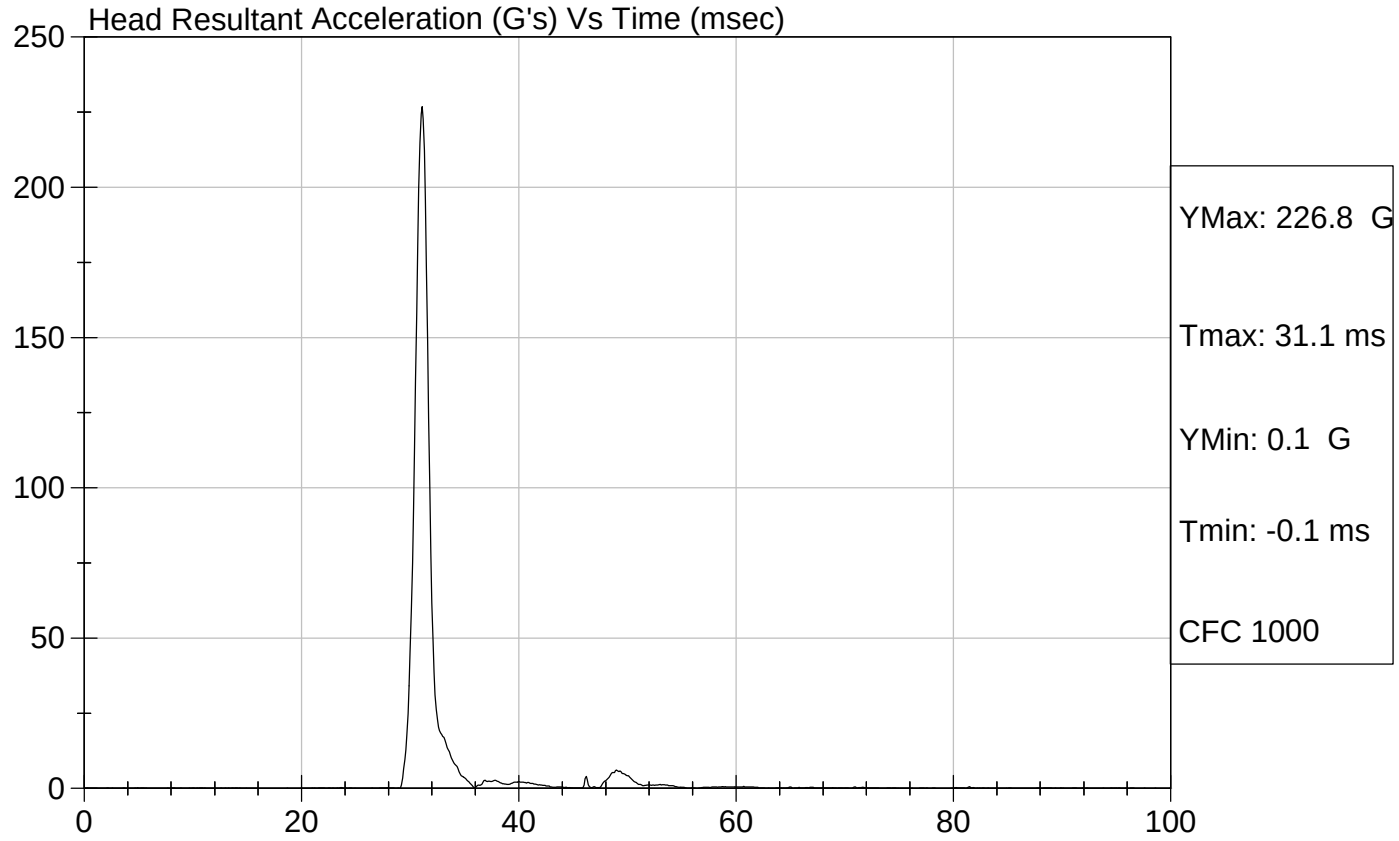
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	226.8	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	12.3	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
		Overall Test Results		Pass

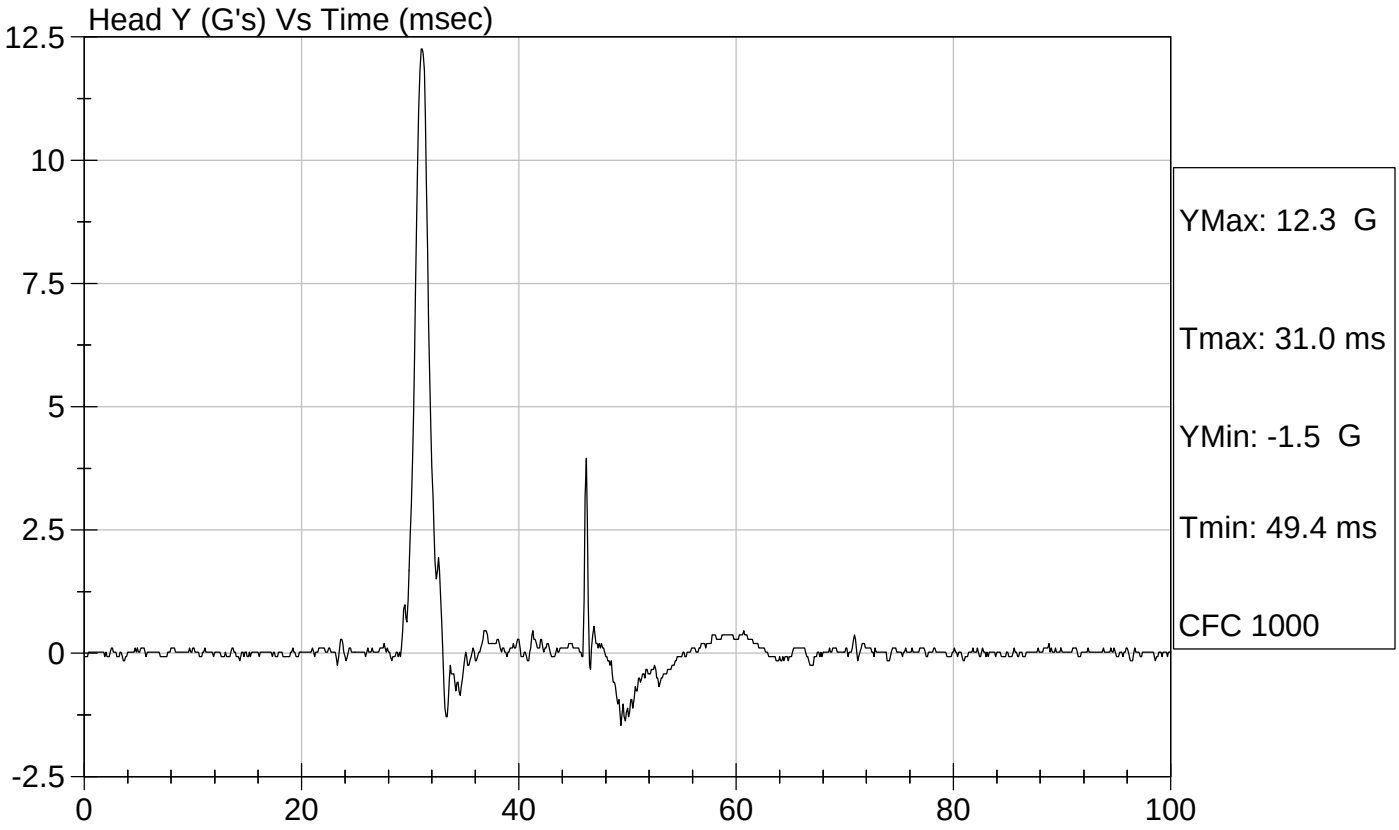
Jessica Hall
Laboratory Technician

11/19/2003
Test Date

Shafaliba Agarwal
Approved By

	Test Description: Head Drop	Test Date: 11/19/2003
	Component: D031891	Speed: 0 ft/s, 0.00 m/s





Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Flexion Test

ATD Serial No: 065 **Test I.D:** D031892

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.89	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	22.58	Pass
	20 msec	G's	17.60 to 22.60	19.05	Pass
	30 msec	G's	12.50 to 18.50	14.62	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	14.62	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	38.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	65.9	Pass
	Time	msec	57.0 to 64.0	58.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	114.3	Pass
Moment About Occipital Condyle	Maximum	N m	84.1 to 108.5	85.5	Pass
	Time	msec	47.0 to 58.0	50.7	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	104.3	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

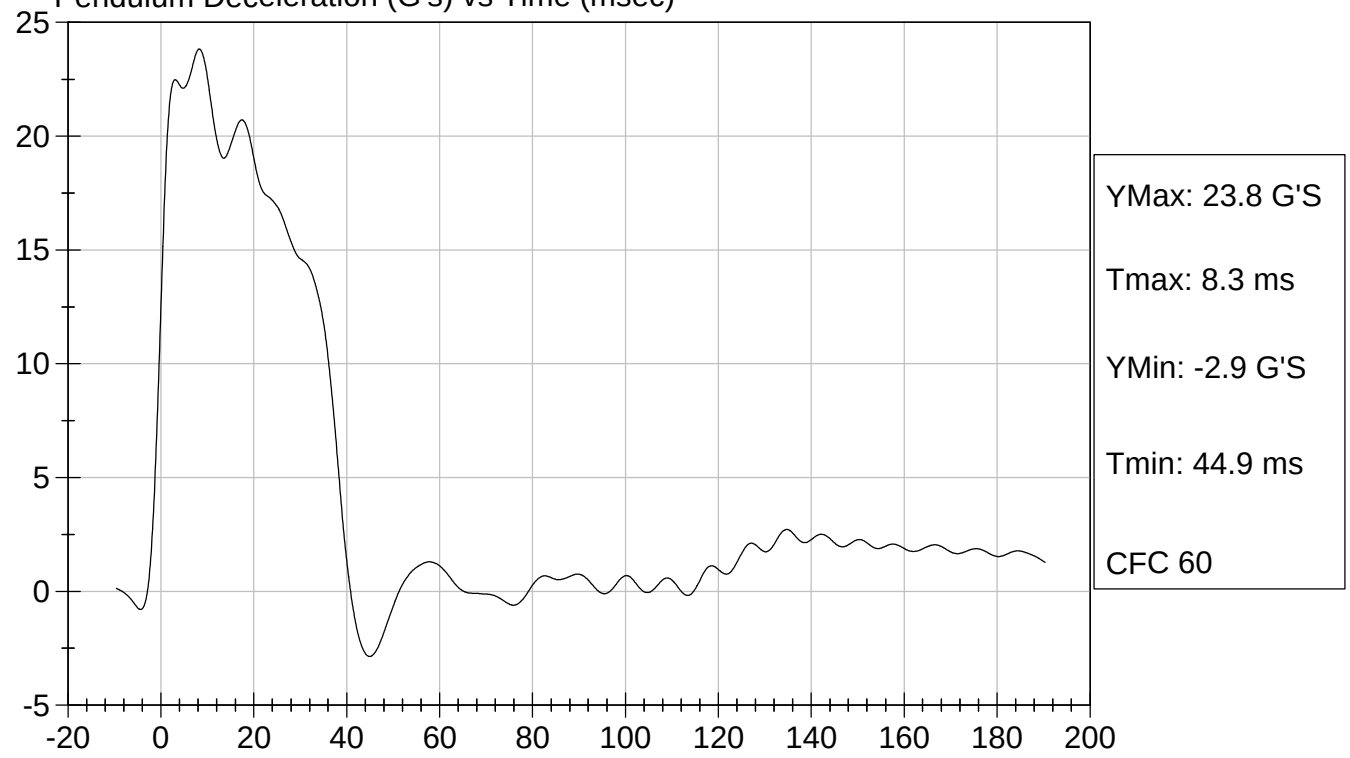
11/19/2003
Test Date

Shefalika Jgarwal
Approved By

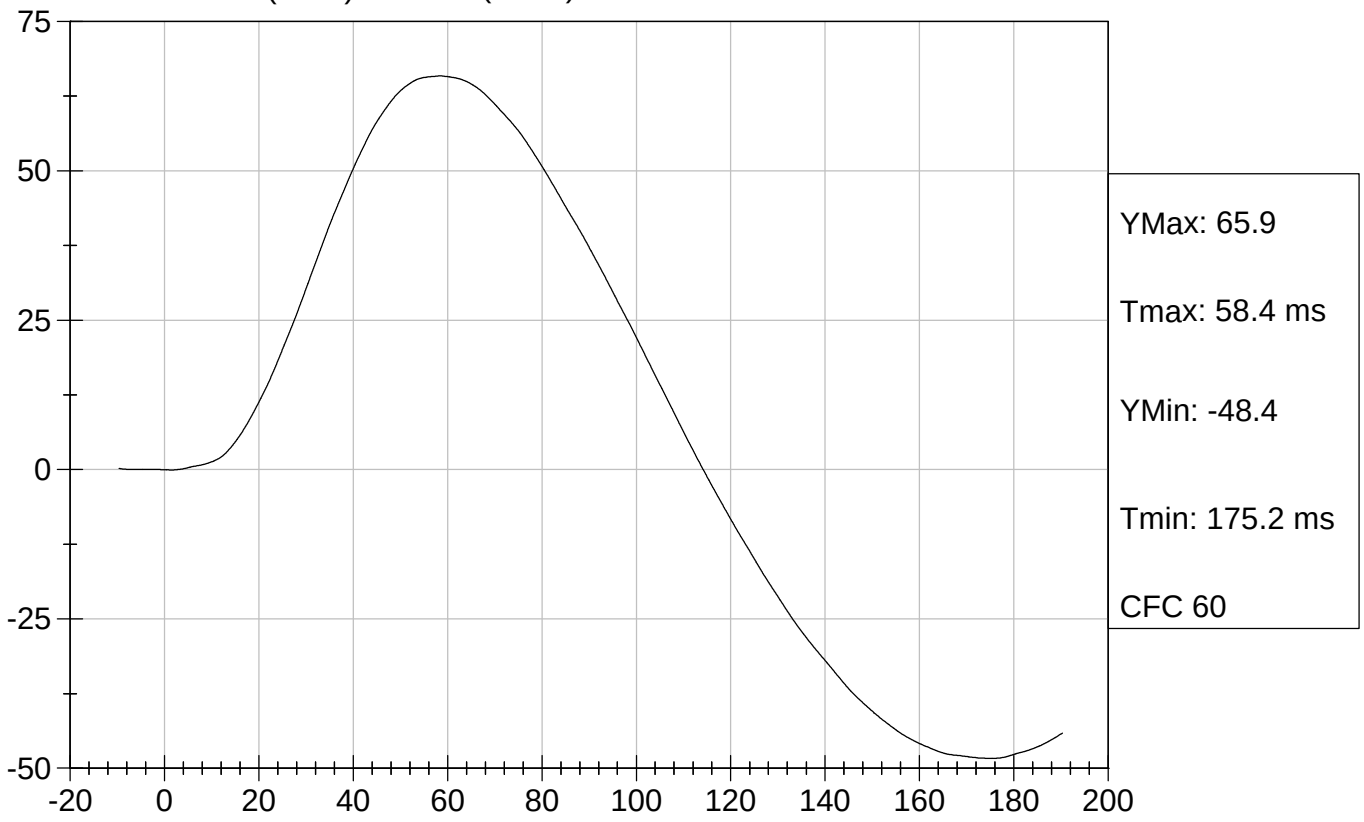
Test Desc: Neck Flexion
Component ID: D031892

Test Date: 11/19/2003
Speed: 22.61 ft/sec, 6.89 m/sec

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

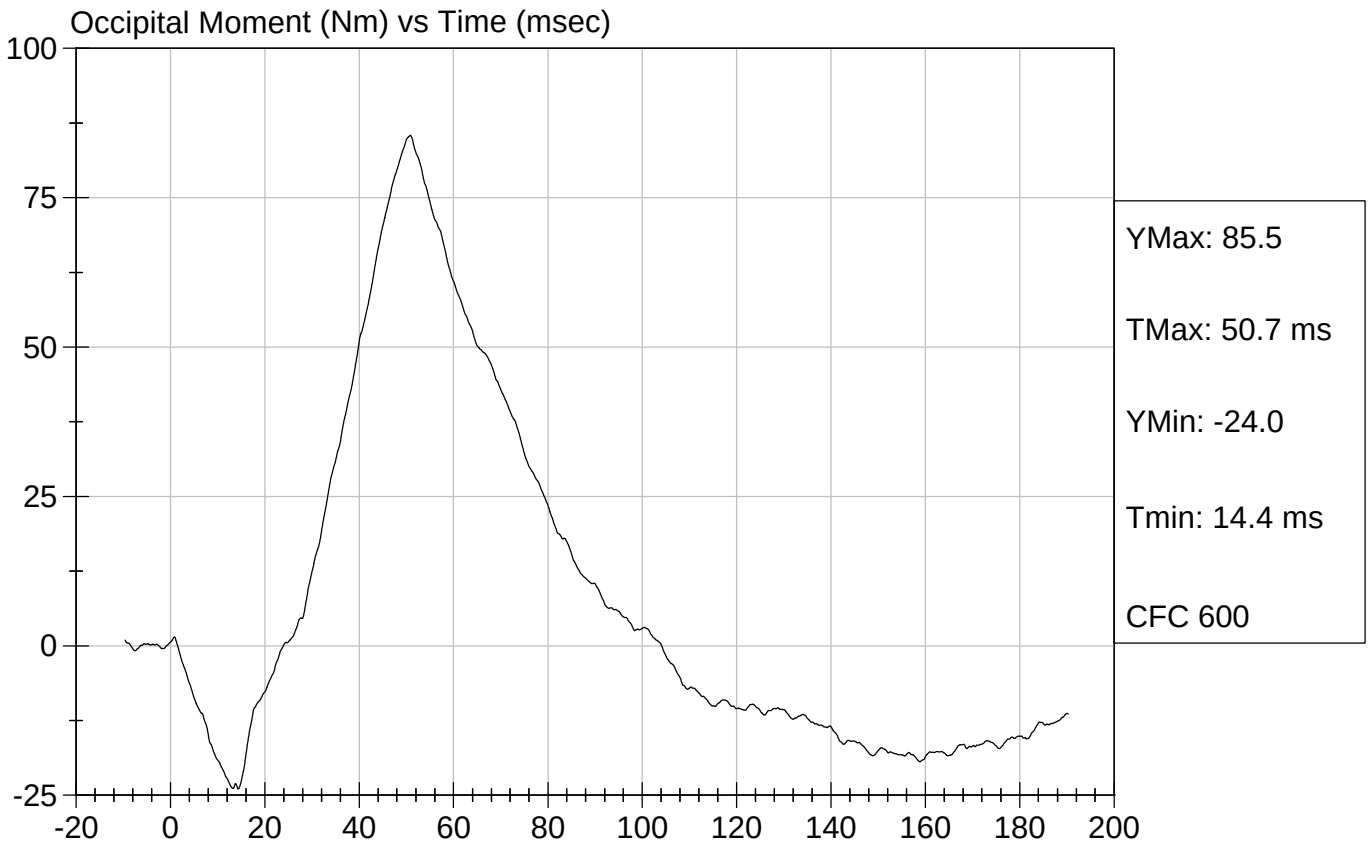


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Flexion
Component ID: D031892

Test Date: 11/19/2003
Speed: 22.61 ft/sec, 6.89 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Extension Test

ATD Serial No: 065 **Test I.D:** D031893

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	19.43	Pass
	20 msec	G's	14.00 to 19.00	16.84	Pass
	30 msec	G's	11.00 to 16.00	13.41	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	13.7	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	38.8	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	101.4	Pass
	Time	msec	72.0 to 82.0	75.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	153.9	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-71.2	Pass
	Time	msec	65.0 to 79.0	70.7	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	139.3	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

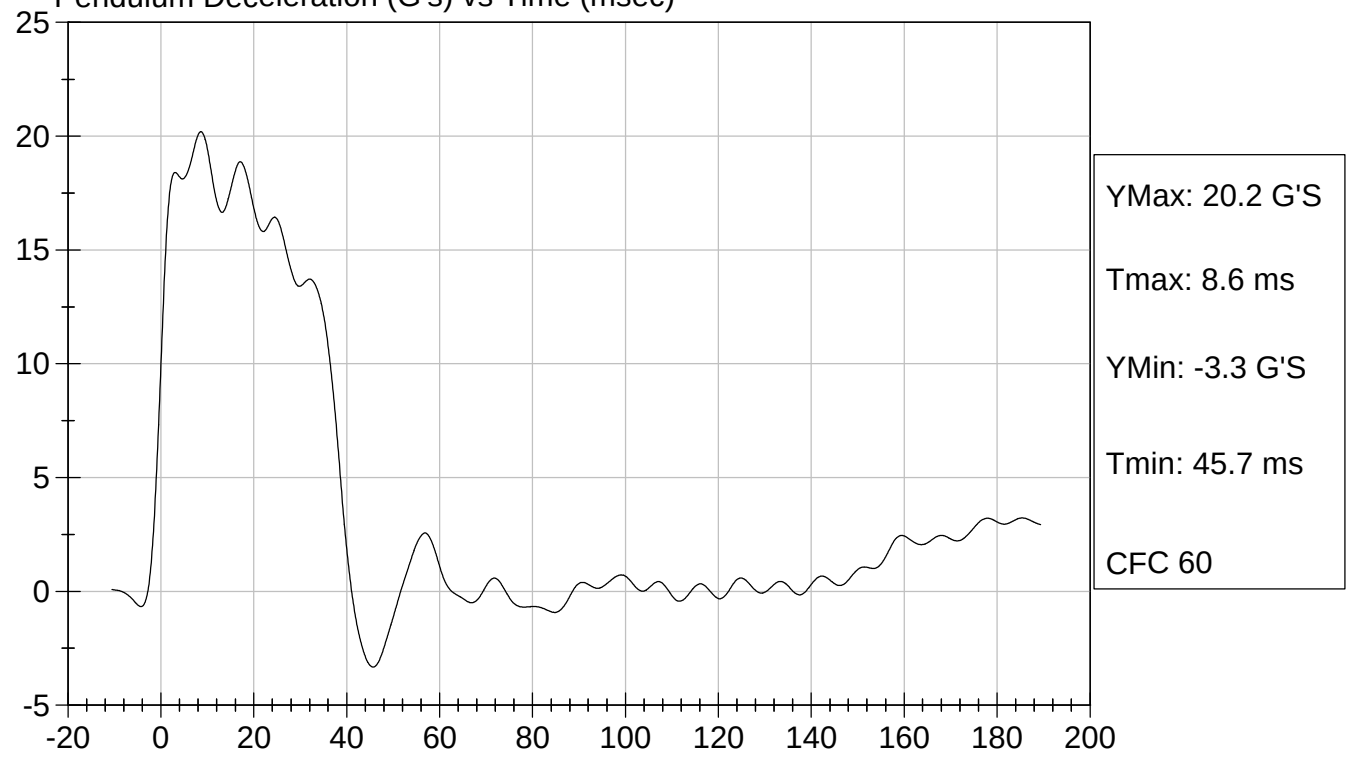
11/19/2003
Test Date

Shafaliba Agarwal
Approved By

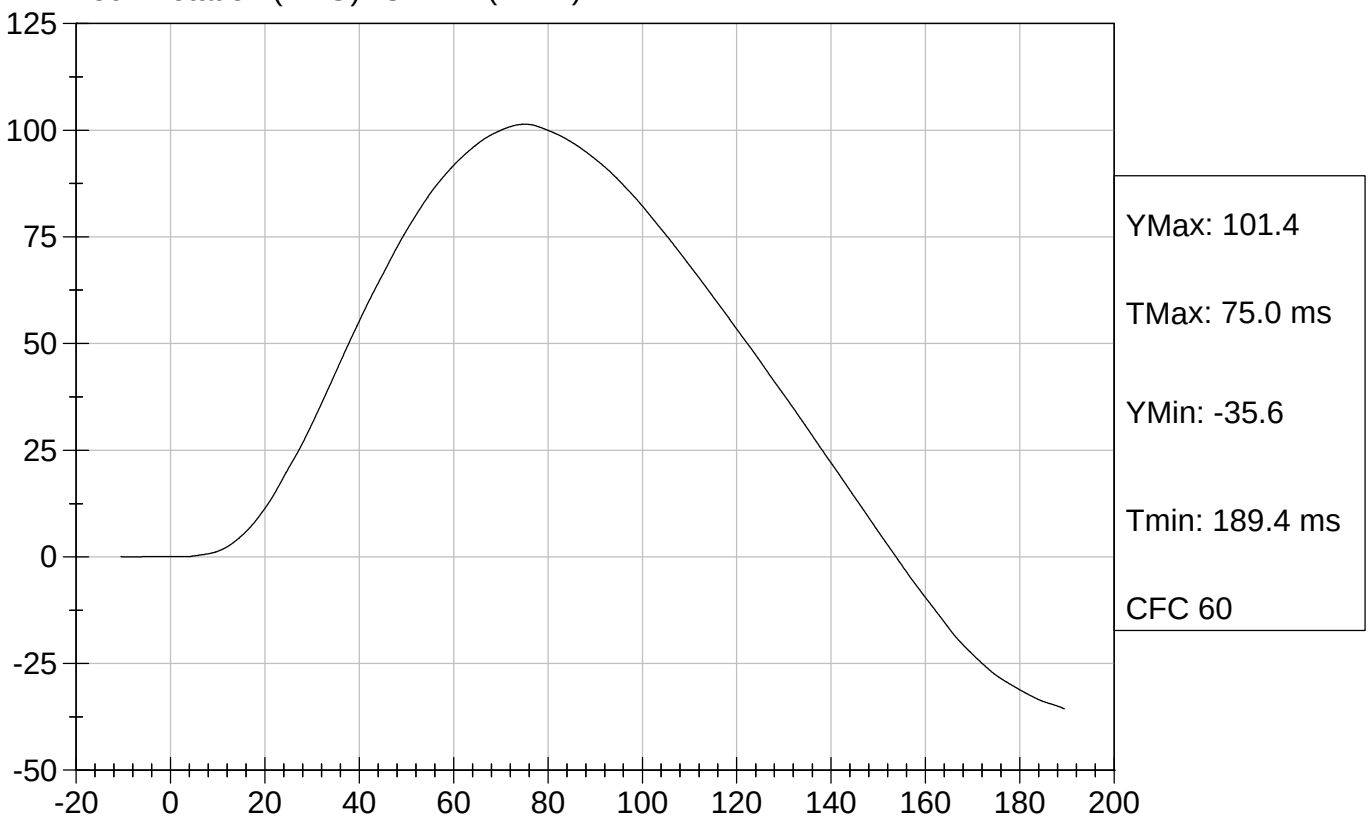
Test Desc: Neck Extension
Component ID: D031893

Test Date: 11/19/2003
Speed: 20.07 ft/sec, 6.12 m/sec

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

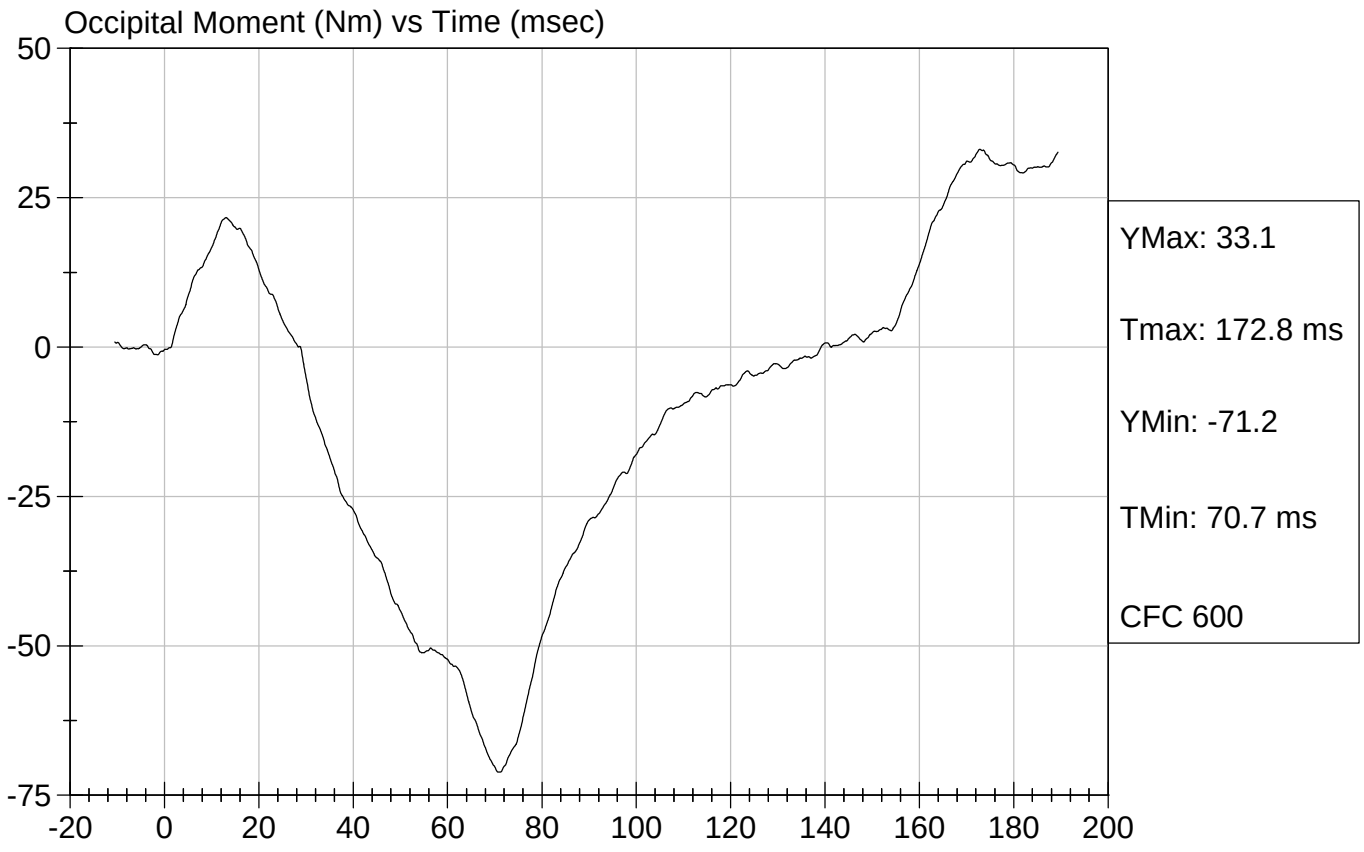


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Extension
Component ID: D031893

Test Date: 11/19/2003
Speed: 20.07 ft/sec, 6.12 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Thorax Impact Test

ATD Serial No: 065 **Test I.D:** D031894

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	16	Pass
Probe Velocity	m/s	6.58 to 6.82	6.72	Pass
Peak Probe Force	Newtons	5159 to 5893	5,515	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.55	Pass
Internal Hysteresis	%	69 to 85	72	Pass
		Overall Test Results		Pass

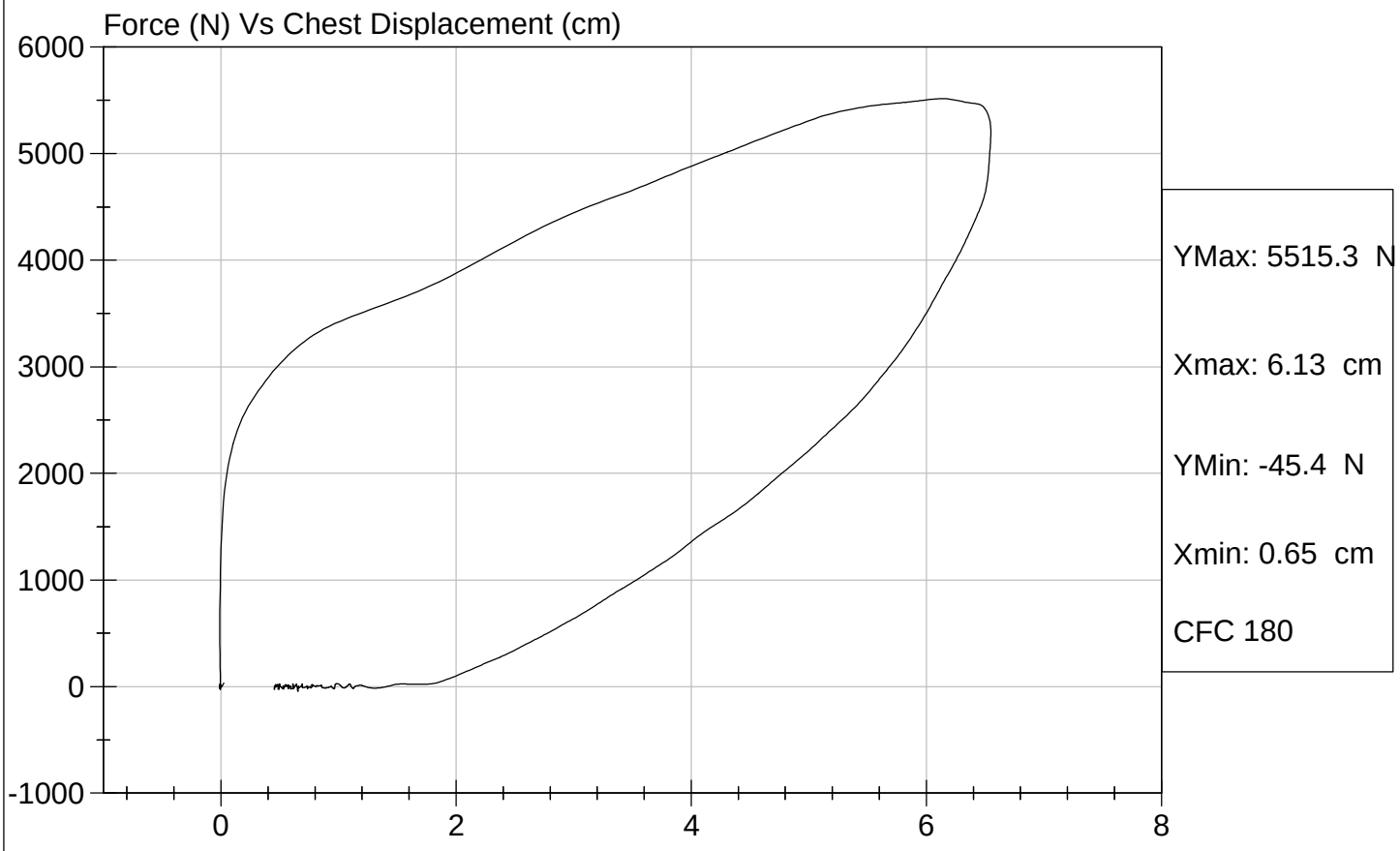
Jessica Hall
Laboratory Technician

11/24/2003
Test Date

Shafaliba Agarwal
Approved By

Test Description: Thorax Impact | Test Date: 11/24/2003

Component: D031894 | Speed: 22.06 ft/sec, 6.72 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Right Knee Impact Test

ATD Serial No: 065 **Test I.D:** D031895

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5,371	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

11/22/2003
Test Date

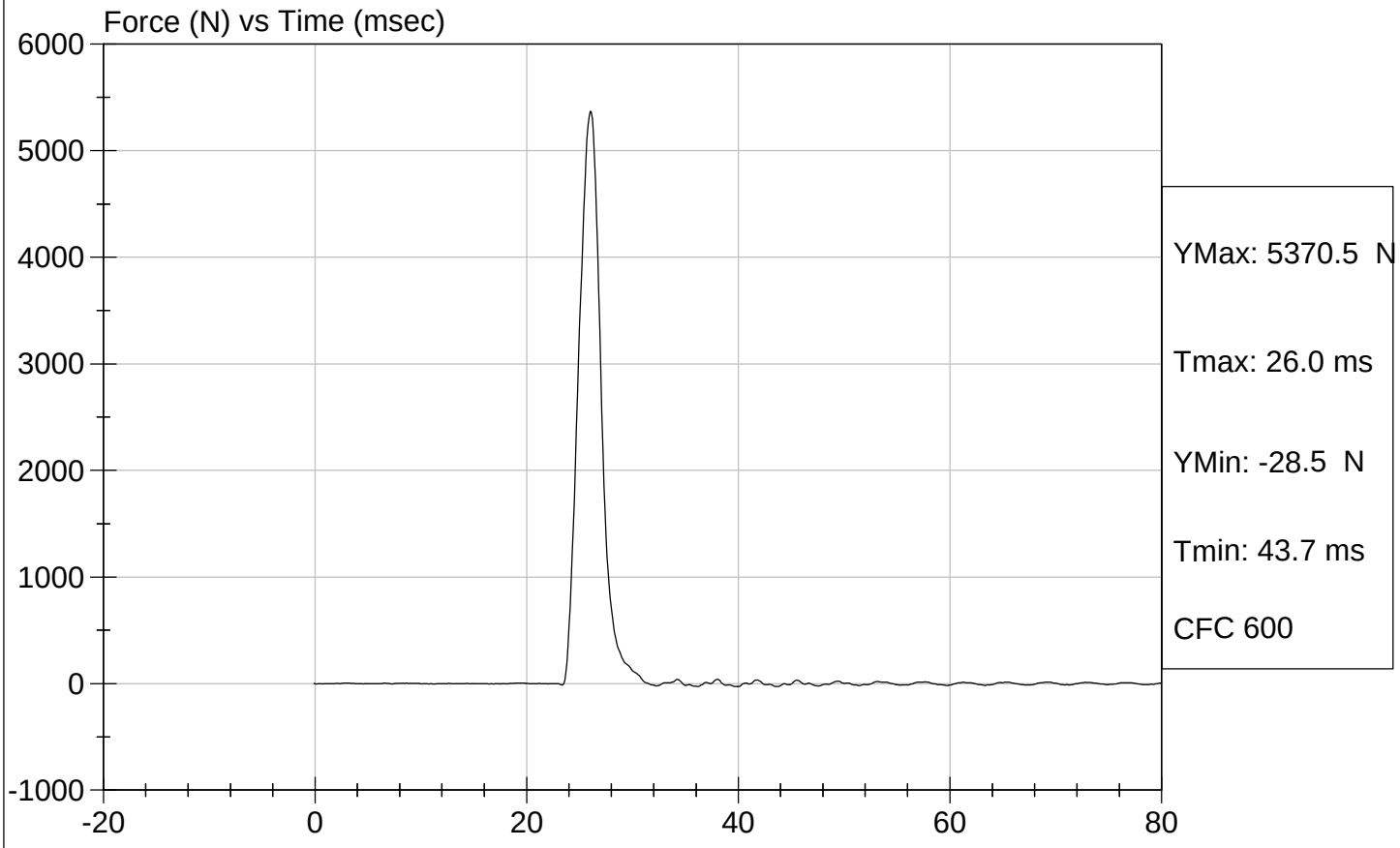
Shafaliha Agarwal
Approved By

Test Description: Right Knee

Test Date: 11/22/2003

Component: D031895

Speed: 6.81 ft/sec, 2.076 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Left Knee Impact Test

ATD Serial No: 065 **Test I.D:** D031896

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5,216	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

11/22/2003
Test Date

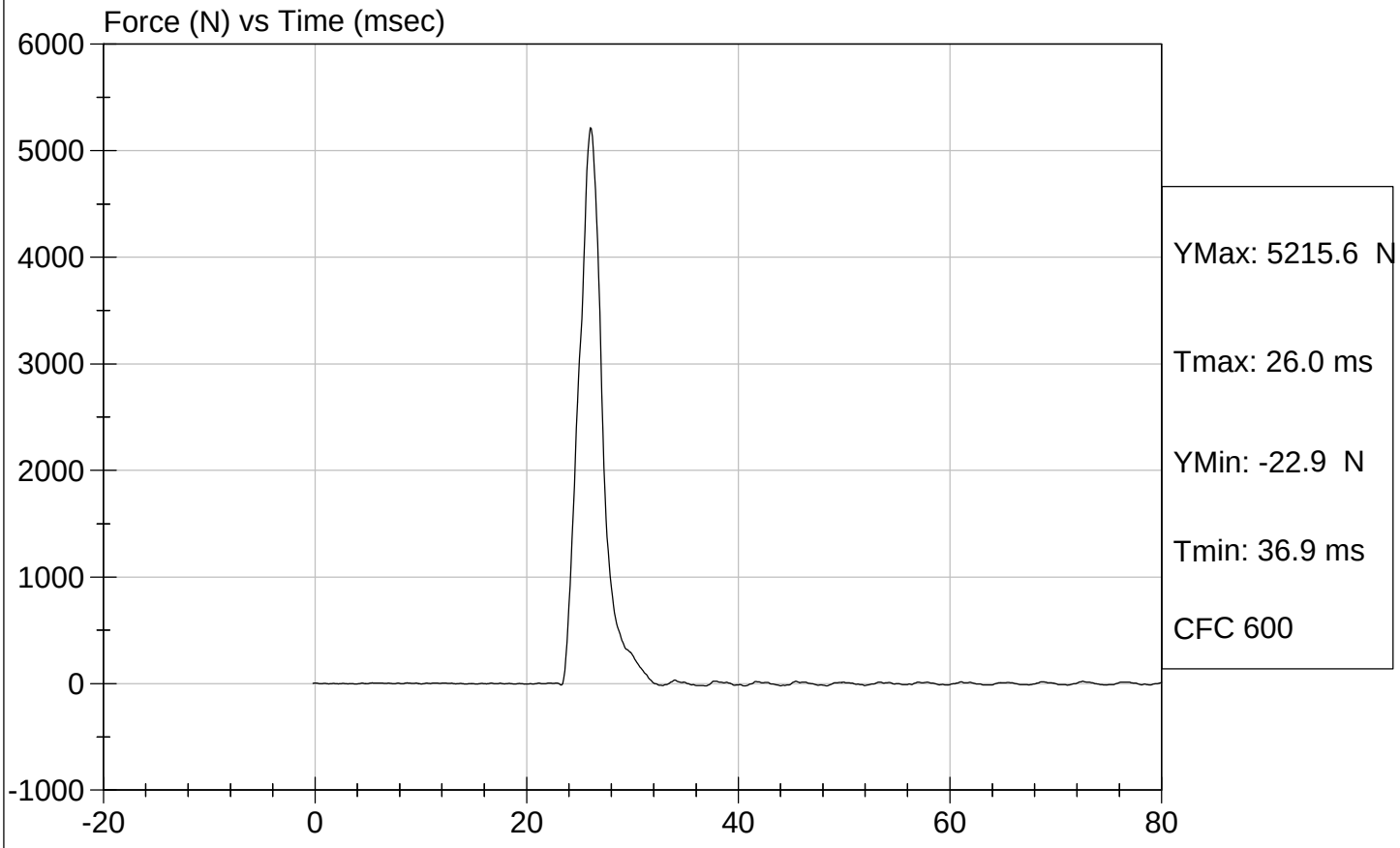
Shafaliha Agarwal
Approved By

Test Description: Left Knee

Test Date: 11/22/2003

Component: D031896

Speed: 6.81 ft/sec, 2.076 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Hip-Femur Flexion Test

ATD Serial No: 065 **Test I.D:** D031890

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.1	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	30	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	61.3	63.8	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	47	44	Pass
		Overall Test Results			Pass

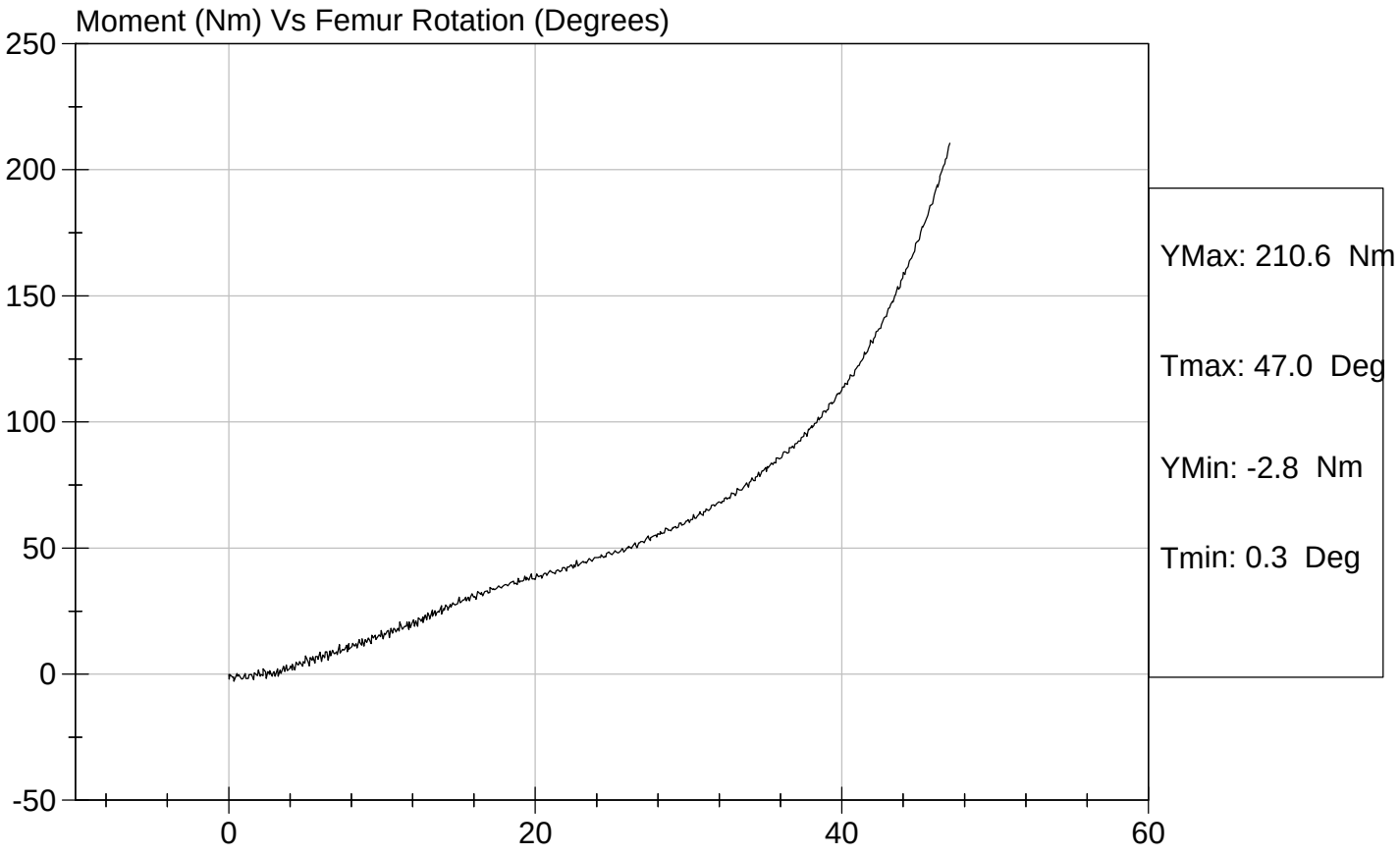
Jessica Hall
Laboratory Technician

11/21/2003
Test Date

Shafaliba Agarwal
Approved By

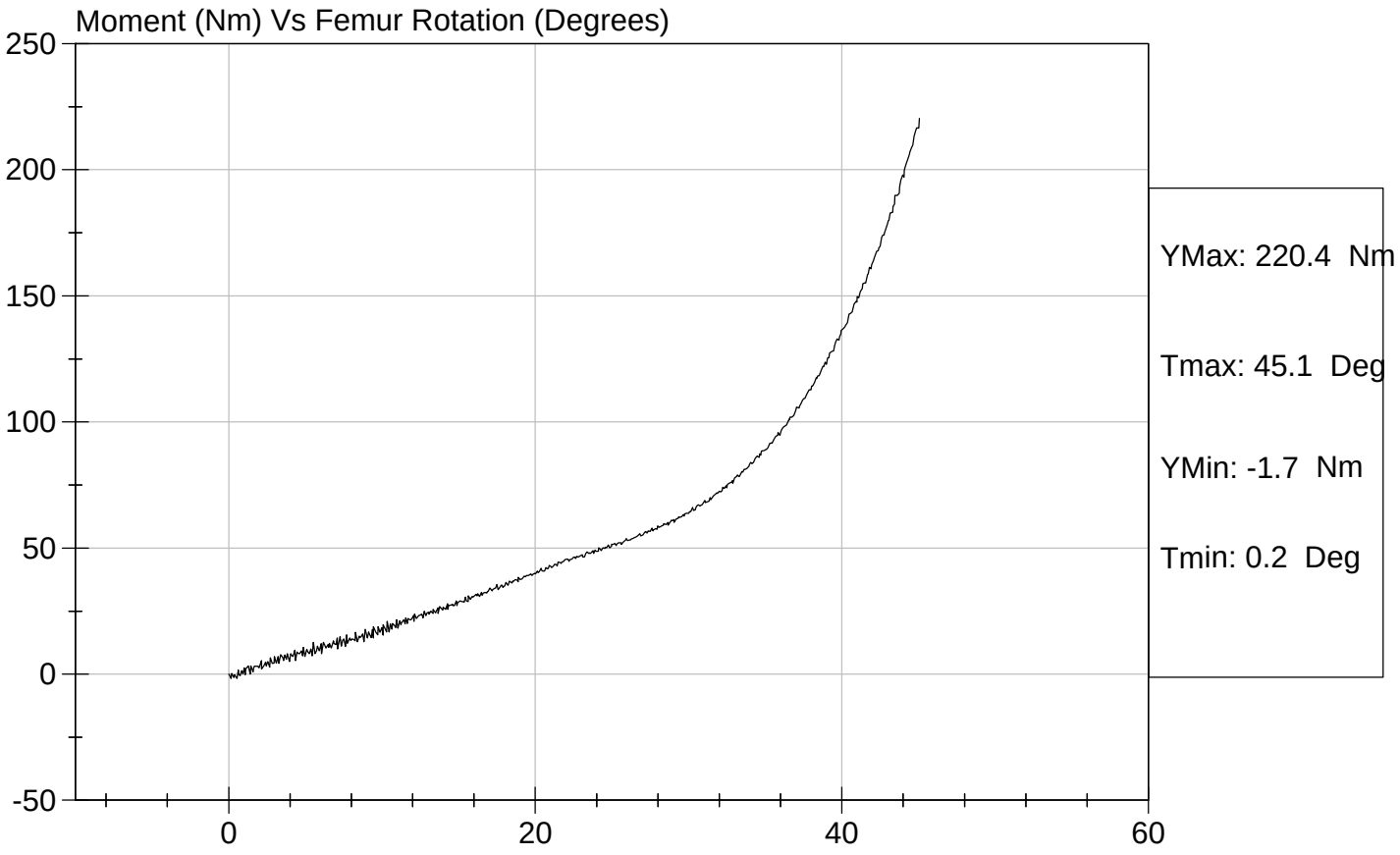
Test Description: Hip Femur Flexion | Test Date: 11/20/2003

Component: D031899 | Speed: 0 ft/sec, 0.00 m/sec



Test Description: Hip Femur Flexion | Test Date: 11/21/2003

Component: D031890 | Speed: 0 ft/sec, 0.00 m/sec



DUMMY INSPECTION CHECKLIST

Type: Hybrid III

Dummy Serial Number: 065

Inspected By: Jessica Gall

Date: 11/24/03

Part	Items Checked	Comments
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque, nodding blocks	OK
Clavicles	visual, bumpers, range of motion	OK
Arms/Hands	visual, bumpers, range of motion	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual, bumpers	OK
Lumbar spine	visual, cable torque	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual, load cell bolts	OK
Knees	visual, stops, inserts, sliders	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

Notes (include component/problem/action/reason):

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

INSTRUMENTS FOR DRIVER DUMMY NO. 066

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACC61	Endevco	10/03/03
Head Y	AAMN8	Endevco	10/03/03
Head Z	ACCW9	Endevco	10/03/03
Head X Redundant	J21988	Endevco	10/03/03
Head Y Redundant	J19884	Endevco	10/03/03
Head Z Redundant	J28986	Endevco	10/03/03
Head Y – Front	AH0D1	Endevco	12/05/03
Head Z – Front	AH0M0	Endevco	12/05/03
Head X – Left	J22034	Endevco	12/05/03
Head Z – Left	AHRP6	Endevco	12/05/03
Head X – Upper	AP170	Endevco	12/05/03
Head Y – Upper	AP2G9	Endevco	12/05/03
Neck Load Cell	443	Denton	8/20/03
Chest X	ACCY1	Endevco	10/06/03
Chest Y	ACCC8	Endevco	10/06/03
Chest Z	ACCT7	Endevco	10/06/03
Chest Displacement	066	Servo	9/30/03
Chest X Redundant	J13541	Endevco	10/06/03
Chest Y Redundant	J20093	Endevco	10/06/03
Chest Z Redundant	J19440	Endevco	10/06/03
Pelvis X	J22033	Endevco	10/03/03
Pelvis Y	J21691	Endevco	10/03/03
Pelvis Z	J21970	Endevco	10/03/03
Left Femur Load Cell	262	Denton	8/20/03
Right Femur Load Cell	261	Denton	8/20/03
Left Upper Tibia Load Cell	109	Denton	8/19/03
Left Lower Tibia Load Cell	138	Denton	8/19/03
Right Upper Tibia Load Cell	106	Denton	8/20/03
Right Lower Tibia Load Cell	135	Denton	8/20/03
Left Foot Z – Front	J28988	Endevco	10/03/03
Left Ankle X	J22036	Endevco	10/03/03
Left Ankle Z	J20569	Endevco	10/03/03
Right Foot Z – Front	J20382	Endevco	8/07/03
Right Ankle X	J20165	Endevco	8/07/03
Right Ankle Z	J28708	Endevco	8/07/03
Shoulder Belt Load Cell	104	Denton	11/04/03
Lap Belt Load Cell	195	Denton	9/04/03

INSTRUMENTS FOR PASSENGER DUMMY NO. 065

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	J13941	Endevco	10/06/03
Head Y	ACCY6	Endevco	10/03/03
Head Z	AAMW5	Endevco	10/03/03
Head X Redundant	J18724	Endevco	10/06/03
Head Y Redundant	J14235	Endevco	10/08/03
Head Z Redundant	AJ5R0	Endevco	10/03/03
Head Y – Front	ALBA7	Endevco	11/10/03
Head Z – Front	AMP82	Endevco	11/10/03
Head X – Left	AKAA6	Endevco	11/10/03
Head Z – Left	AP2C4	Endevco	11/10/03
Head X – Upper	J18953	Endevco	11/10/03
Head Y – Upper	J18843	Endevco	11/10/03
Neck Load Cell	442	Denton	8/20/03
Chest X	ACC78	Endevco	10/03/03
Chest Y	ACCE6	Endevco	10/03/03
Chest Z	ACCY3	Endevco	10/03/03
Chest Deflection Gauge	065	Servo	9/30/03
Chest X Redundant	J19927	Endevco	10/03/03
Chest Y Redundant	J20580	Endevco	10/03/03
Chest Z Redundant	J23914	Endevco	10/03/03
Pelvis X	AHTN3	Endevco	10/03/03
Pelvis Y	AH0C3	Endevco	10/03/03
Pelvis Z	AHT12	Endevco	10/03/03
Left Femur Load Cell	259	Denton	8/20/03
Right Femur Load Cell	256	Denton	8/20/03
Left Upper Tibia Load Cell	105	Denton	8/20/03
Left Lower Tibia Load Cell	133	Denton	8/19/03
Right Upper Tibia Load Cell	103	Denton	8/19/03
Right Lower Tibia Load Cell	134	Denton	8/20/03
Left Foot Z – Front	J14120	Endevco	10/08/03
Left Ankle X	J23774	Endevco	10/06/03
Left Ankle Z	APYY3	Endevco	10/08/03
Right Foot Z – Front	J18736	Endevco	10/06/03
Right Ankle X	J23946	Endevco	10/06/03
Right Ankle Z	J27513	Endevco	10/06/03
Shoulder Belt Load Cell	158	Denton	8/21/03
Lap Belt Load Cell	199	Denton	12/09/03

INSTRUMENTS FOR VEHICLE AND LABORATORY

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	K21-N05	Entran	8/13/03
Left Rear Seat Crossmember Z	E01-F17	Entran	11/11/03
Right Rear Seat Crossmember X	H01-N12	Entran	9/11/03
Right Rear Seat Crossmember Z	H01-N12	Entran	9/11/03
Top of Engine X	D07-N01	Entran	11/11/03
Bottom of Engine X	99F15A	Entran	8/15/03
Left Brake Caliper X	I08-Z06	Entran	11/11/03
Right Brake Caliper X	99F159	Entran	9/11/03
Instrument Panel X	F20-G10	Entran	10/08/03

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