REPORT NUMBER: T8001-MGA-2008-008

VEHICLE TO DEFORMABLE BARRIER CRASH TESTS IN SUPPORT OF NHTSA OFFSET FRONTAL PROGRAM

LEFT 50% OFFSET DEFORMABLE BARRIER IMPACT
PDB BARRIER
TEST DATE: APRIL 2, 2008
ORDER NUMBER: DTRTV-T8001

2007 FORD FIVE HUNDRED SEL 4-DOOR (R70205)

PREPARED BY:
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FINAL REPORT SUBMITTED:
AUGUST 22, 2008

PREPARED FOR:
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This final test report was prepared for the U.S. Department of Transportation, Volpe National Transportation System Center / RITA, in response to Contract Number DTRT57-05-D-30107.

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Technical Report Documentation Page

1. Report No. T8001-MGA-2008-008	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of a Left 50% Offset Deformable Barrier Impact of a 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205		*5. Report Date* August 22, 2008 *6. Performing Organization Code* MGA
7. Author(s) Jessica Gall, Project Engineer		*8. Performing Organization Report No.* T8001-MGA-2008-008
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		*10. Work Unit No.* *11. Contract or Grant No.* DTRT57-05-D-30107
12. Sponsoring Agency Name and Address U.S. Department of Transportation / RITA Volpe National Transportation Systems Center 55 Broadway, RTV-3F Cambridge, MA 02142-1001		*13. Type of Report and Period Covered* Final Report 4/02/2008 – 8/22/2008 *14. Sponsoring Agency Code* RTV-3F
15. Supplementary Notes		

16. Abstract

A 50% frontal offset barrier impact was conducted on a 2007 Ford Five Hundred SEL 4-Door, NHTSA No. R70205, at MGA Research Corporation on April 2, 2008. This test was conducted in accordance with Volpe Order No. DTRTV-T8001 for the evaluation of vehicle and occupant responses. The impact velocity was 59.9 km/h. The ambient temperature at the barrier face at the time of impact was 21 degrees Celsius. The vehicle's maximum static crush was 560 mm located to the left of the vehicle’s centerline.

The driver’s 15 millisecond Head Injury Criteria (HIC) was 330. The driver’s chest maximum resultant acceleration with three milliseconds minimum duration was 31.6 g. The driver’s maximum chest deflection was -27 millimeters. The driver’s left and right femur maximum axial compressive forces were -3234 N and -1241N, respectively.

The left rear passenger’s 15 millisecond Head Injury Criteria (HIC) was 301. The left rear passenger’s chest maximum resultant acceleration with three milliseconds minimum duration was 36.1 g.

17. Key Words 50% Frontal Offset Barrier Impact 2007 Ford Five Hundred SEL 4-Door NHTSA No: R70205		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave, SE Washington, D.C. 20590	
19. Security Classif. (of this report) Unclassified	*20. Security Classif. (of this page)* Unclassified	*21. No. of Pages* 335	22. Price

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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This 60.0 km/h (target speed) Left 50% Offset Deformable Barrier test was conducted for the Volpe National Transportation Systems Center (VNTSC) / RITA by MGA Research Corporation.

The purpose of this testing was to evaluate and compare vehicle and occupant responses during 50% frontal offset vehicle to deformable barrier crash tests. For this test, the subject vehicle was a 2007 Ford Five Hundred SEL 4-Door with one (1) 50th percentile dummy in the front seating position and one 10-year-old dummy in the left rear seating position. The deformable barrier used for this test was the PDB barrier.

TEST PROCEDURE

This test was conducted in accordance with VNTSC's instructions for a 50% offset vehicle to deformable barrier crash test. Data was obtained relative to FMVSS 208, "Occupant Crash Protection" performance, FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle, a 2007 Ford Five Hundred SEL 4-Door, was instrumented with twelve (12) accelerometers to measure longitudinal axis accelerations, four (4) accelerometers to measure lateral axis accelerations, and six (6) accelerometers to measure vertical axis accelerations. The driver and passenger's primary and secondary airbag signals were monitored with inductive pickups. The vehicle impacted a 50% left offset deformable barrier. The vehicle's specified impact velocity range was 59.2 to 60.8 km/h.

The test vehicle contained one (1) Part 572E 50th percentile adult male Hybrid III anthropomorphic test device (dummy) with Thor-Lx legs in the driver position. A Hybrid III 10-Year-Old dummy was placed in the left rear seating position. The 50th percentile dummy was positioned in the left front outboard designated seating positions according to a procedure provided by the COTR. The seating procedure is included as Appendix D. The driver dummy was restrained with a 3-point seat belt and a front airbag. The left rear passenger dummy was in the Graco Highback Turbobooster child seat and restrained with the Type II seat belt.

The Hybrid III 50^{th} dummy was instrumented with an array of twelve (12) accelerometers in the head, and six (6) accelerometers in the chest, oriented to measure longitudinal, lateral, and vertical accelerations. The dummy was also instrumented with 6-channel upper and lower neck moment and force load cells, left and right femur load cells to measure axial forces, a chest deflection potentiometer, and knee displacement potentiometers. The dummy was equipped with Thor-Lx legs, which included upper and lower tibia load cells to measure forces and moments, longitudinal and lateral tibia accelerometers, three (3) foot accelerometers on each foot to measure accelerations in three (3) axes and three (3) rotary potentiometers at each ankle to measure foot rotations about three (3) axes.

TEST PROCEDURE (CONTINUED)

The Hybrid III 10-Year-Old child dummy was instrumented with tri-axial accelerometers in the head, chest, and pelvis oriented to measure longitudinal, lateral, and vertical accelerations. The dummy was also instrumented with 6-channel upper and lower neck moment and force load cells, left and right shoulder load cells, upper and lower sternum X accelerometers, upper and lower spine X accelerometers, 6-channel lumbar moment and force load cells, right/left upper and right/left lower asis load cells.

The vehicle impacted a deformable barrier instrumented with 90 load cells to measure longitudinal forces.

The 235 data channels were digitally sampled and recorded at 10,000 samples per second and processed per SAE J211 March 1995.

The crash event was recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed digital motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

The left 50% offset deformable barrier crash test summary data and all occupant, camera, vehicle, and deformable barrier face measurements are presented in Section 2.0. Appendix A contains the still photographs. Appendix B contains the dummy, vehicle, and barrier data plots. Appendix C contains the dummy verification data. Appendix D contains customer provided seating procedure. Appendix E contains the barrier certification. Appendix F contains an INSIA report that was the basis for the Structural Measurements presented in Data Sheet 10 (page 30) of this report.

SECTION 2

LEFT 50% OFFSET DEFORMABLE BARRIER IMPACT SUMMARY

This 60.0 km/h (target speed) left 50% offset deformable barrier crash test was conducted by MGA Research Corporation on April 2, 2008.

The test vehicle, a 2007 Ford Five Hundred SEL 4-Door, NHTSA Number R70205, was equipped with a 3.0 L, 6-cylinder lateral engine, automatic transmission, power steering, power brakes, and front airbags. The vehicle's test weight was 1915.5 kg. The vehicle's impact speed was 59.9 km/h. The vehicle sustained 560 mm of static crush during the impact.

The occupant injury assessment values are summarized on the following page.

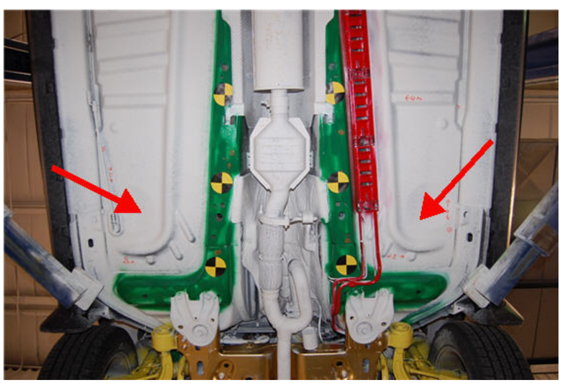
TEST NOTES

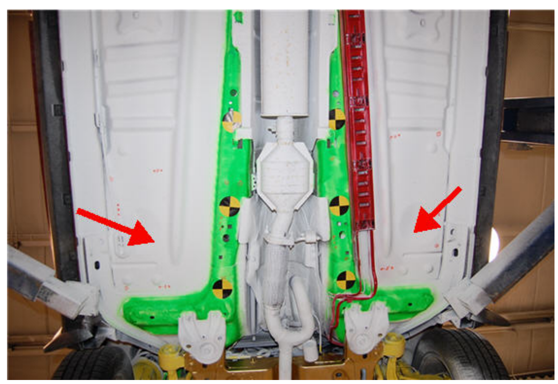
There was no valid data collected for:

Driver Seat Track X between 60-80 msec.
Gas Pedal Z after 100 msec.

CMM Reference: Rear Bumper Top @ Center
+X Forward
+Y Left
+Z Up

The floorboard design for this vehicle (April 2007 manufacture date) was different than the 2007 Ford 500 (May 2006 manufacture date) tested under a previous contract. See photos below.


April 2007


May 2006

SECTION 2 (CONTINUED)

LEFT 50% OFFSET DEFORMABLE BARRIER IMPACT SUMMARY

OCCUPANT INJURY ASSESSMENT VALUES

Injury Criteria		Limit	Driver
HIC 36		1000	379
	T1 (msec)		94.4
	T2 (msec)		130.4
HIC 15		700	330
	T1 (msec)		111.2
	T2 (msec)		126.2
Upper Neck Tension (N)		4170	1108
Upper Neck Compression (N)		4000	-53
Neck Injury (NIJ) N_{te}		1.0	0.20
Neck Injury (NIJ) N_{tf}		1.0	0.25
Neck Injury (NIJ) N_{ce}		1.0	0.00
Neck Injury (NIJ) N_{cf}		1.0	0.06
Clip (g)		60	32
Chest Displacement (mm)		63	-27
Left Femur (N)		9,040	-3234
Right Femur (N)		9,040	-1241
Left Upper Tibia Index		0.91	0.50
Right Upper Tibia Index		0.91	0.33
Left Lower Tibia Index		0.91	0.57
Right Lower Tibia Index		0.91	0.44
Left Upper Tibia Force (N)		-5600	-891
Right Upper Tibia Force (N)		-5600	-1229
Left Lower Tibia Force (N)		-5200	-1175
Right Lower Tibia Force (N)		-5200	-2885
Left Inversion (degrees)		-35	-11.4
Left Eversion (degrees)		35	28.0
Left Plantarflexion (degrees)			-18.2
Left Dorsiflexion (degrees)		35	10.5
Left External Rotation (degrees)			-7.1
Left Internal Rotation (degrees)			15.9
Right Inversion (degrees)		35	0.8
Right Eversion (degrees)		-35	-29.2
Right Plantarflexion (degrees)			-11.1
Right Dorsiflexion (degrees)		35	22.2
Right External Rotation (degrees)			16.3
Right Internal Rotation (degrees)			0.0
Left Knee Shear (mm)		-15	-1.4
Right Knee Shear (mm)		-15	-0.5

SECTION 2 (CONTINUED)

LEFT 50% OFFSET DEFORMABLE BARRIER IMPACT SUMMARY

OCCUPANT INJURY ASSESSMENT VALUES (CONTINUED)

Injury Criteria		Left Rear Passenger
HIC 36		540
	T1 (msec)	87.8
	T2 (msec)	123.8
HIC 15		301
	T1 (msec)	103.2
	T2 (msec)	118.2
Upper Neck Tension (N)		1849
Upper Neck Compression (N)		-1555
Clip (g)		36

DATA SHEET 1

CRASH VEHICLE SUMMARY

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

Description	Value
Test Time	11:30 a.m.
Temperature	21°C
Vehicle Year/ Make / Model / Body Style	2007 Ford Five Hundred SEL 4-Door
Vehicle Test Weight	1915.5 kg
Vehicle / Barrier Impact Angle	0°
Vehicle / Barrier Impact Accuracy	4 mm up / 28 mm right
Impact Velocity	59.9 km/h
Maximum Static Crush	560 mm to the left of the vehicle's C/L
Deformable Barrier	PDB
Number of Data Channels	235
Number of Real-Time Cameras	1
Number of High-Speed Cameras	14

Dummies	Driver	Left Rear Passenger
Type/Serial No.	HIII / 202	HIII 10YO / D001
Type Lower Legs	Thor-Lx	
Serial Numbers of Legs	37R / 36L	
Restraint System	3-Point Seatbelt Front Airbag	Type II Belts Graco Highback Turbobooster

DATA SHEET 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

TEST VEHICLE INFORMATION

Manufacturer	Ford
Model	Five Hundred
Body Style	Sedan
NHTSA No.	R70205
VIN	1FAHP24117G164068
Color	Black
Delivery Date	2/11/2008
Odometer Reading (mile)	24,020
Dealer	Gordie Boucher
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.0
Engine Placement	Lateral
Automatic Door Lock (ADL)	Yes
Owners Manual Details Instructions on Disabling ADLs	Yes
Bucket Seats	Yes

TEST VEHICLE OPTIONS

Front Airbag	Yes
Driver Side Curtain Airbag	Yes
Driver Side Torso Airbag	Yes
Rear Passenger Side Curtain Airbag	Yes
Rear Passenger Side Torso Airbag	No
Force Limiter	Yes
Pretensioner	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Anti-lock Brakes	Yes
Traction Control	No
All Wheel Drive	No
Power Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	04/07

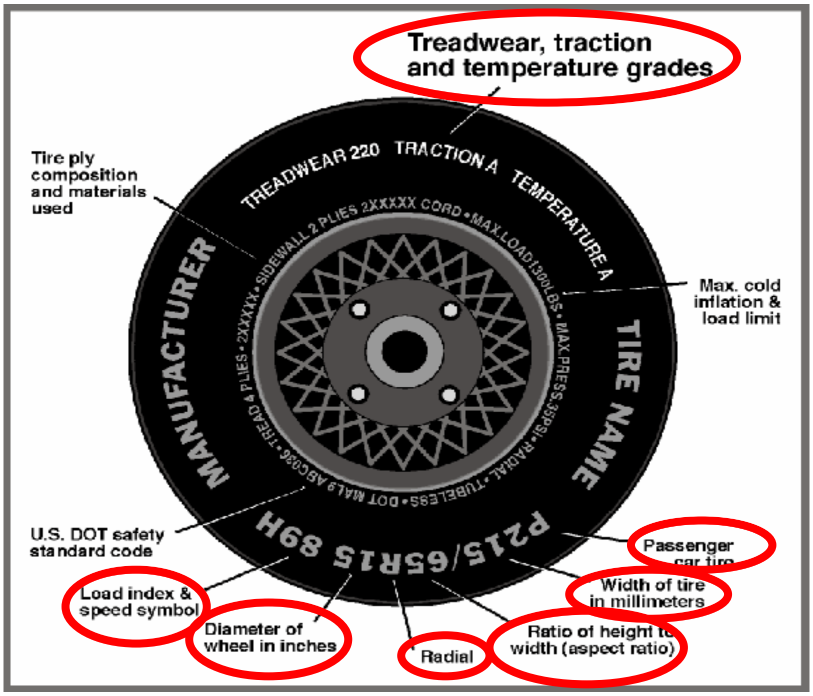
GVWR (kg)	2186
GAWR Front (kg)	1150
GAWR Rear (kg)	1066

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				430
Cargo Wt. (RCLW) (kg)				90

DATA SHEET 2 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P215/60R17	P215/60R17
Tire Size on Vehicle	P215/60R17	P215/60R17
Tire Manufacturer	Continental	Continental
Tire Name	Conti Touring Contact	Conti Touring Contact
Tire Type	Passenger	Passenger
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	17	17
Load Index & Speed Symbol	95T	95T
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET 2 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	505.8	339.3		530.7	427.7	
Right	kg	497.6	337.0		528.9	428.2	
Ratio	%	59.7	40.3		55.3	44.7	
Totals	kg	1003.4	676.3	1679.7	1059.6	855.9	1915.5

Note: Test weight set to match a previous test.

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1679.7
Weight of 2 P572E ATDs & 1 10-Year-Old	kg	191.4
Rated Cargo/Luggage Weight (RCLW)	kg	90
Calculated Vehicle Target Weight (TVTW)	kg	1961.1

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	739	738	747	745	1153
As Tested	mm	709	728	689	709	1280
Post Test	mm	759	711	686	715	

Vehicle Wheelbase (mm): 2864

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

Vehicle Components Removed: Spare tire, jack, exhaust, interiors of right doors, and right rear tail light.

Ballast weight does not include instrumentation and data acquisition system.

DATA SHEET 2 (CONTINUED)

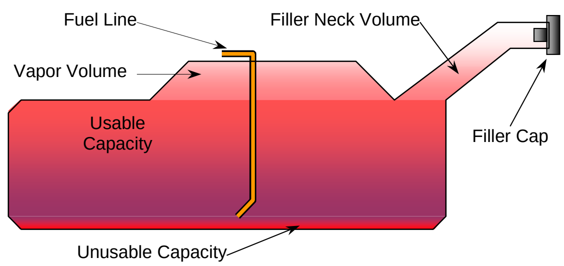
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	75.7
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	69.6 – 71.2
Actual Amount of Solvent used	70.4
1/3 of Usable Capacity	25.2

The test vehicle is equipped with an electric fuel pump. The fuel tank is located in front of rear axle under rear seat. The fuel filler neck enters the tank of right rear corner. The fuel filler cap is located on right rear quarter panel. The fuel lines run along the right side of center tunnel.



VEHICLE FUEL TANK ASSEMBLY

BELT LENGTH DATA

Measurement Description	Units	Driver
Shoulder belt length as measured on ATD	mm	835
Lap belt length as measured on ATD	mm	580
Remainder of belt on reel	mm	1600
Total belt length for continuous webbing systems	mm	3015

SEAT TRACK INFORMATION

Description	Driver	Left Rear Passenger
Seat Track Shift (mm)	0	0
Seat Back Failure	None	None

DATA SHEET 3

POST IMPACT DATA

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

DOOR OPENING AND GLAZING DAMAGE

Description	Left Side	Right Side
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
Glazing Damage	The windshield cracked.	

DUMMY CONTACT POINTS

Description	Driver	Left Rear Passenger
Head Contact	Airbag, headrest	Child seat, C-pillar
Chest Contact	Airbag	None
Abdomen Contact	None	None
Left Knee Contact	Knee bolster	Feet to driver seatback
Right Knee Contact	Knee bolster	Feet to driver seatback

LEFT REAR (P4) CRS POST-TEST INSPECTION

Location	Damage	Remarks
Cracks on CRS	None	
Fabric Tears on CRS	None	
Vehicle Seat Structure	None	
Vehicle Seat Fabric Tears	None	
Child Dummy	None	10-Year-Old

DATA SHEET 4

TEST VEHICLE INFORMATION

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

NORMAL DESIGN RIDING POSITION

Driver seat back angle: 8.3° at headrest post

Left Rear Passenger seat back angle: Fixed

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Left Front Seat	245 mm	52 mm rear of mid
Left Rear Seat	Fixed	Fixed

ADJUSTABLE D-RING POSITION

The driver D-ring was set at the upper-most detent.

STEERING COLUMN POSITION

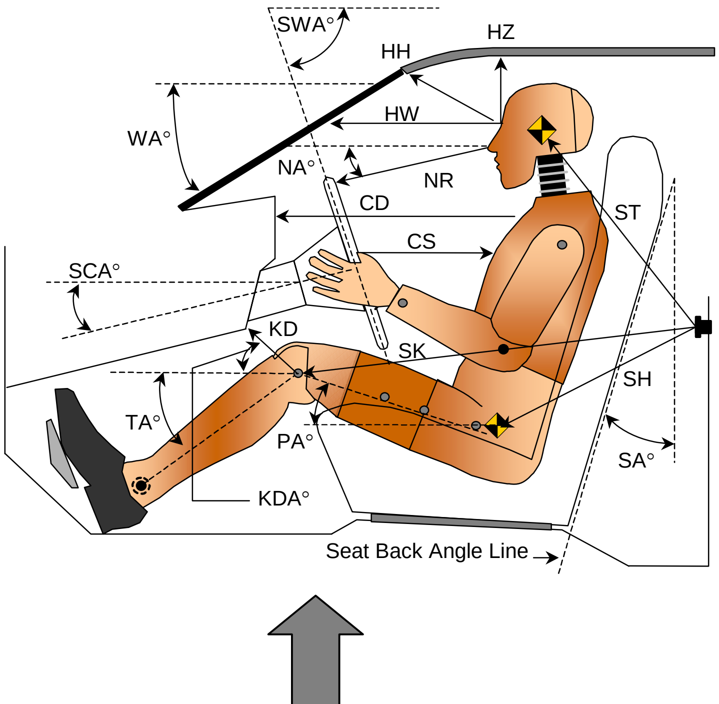
	Fore/Aft Position (mm)	Degrees
Lowermost position No. 1		62.4
Geometric center position No. 2		65.0
Uppermost position No. 3		67.7

DATA SHEET 5

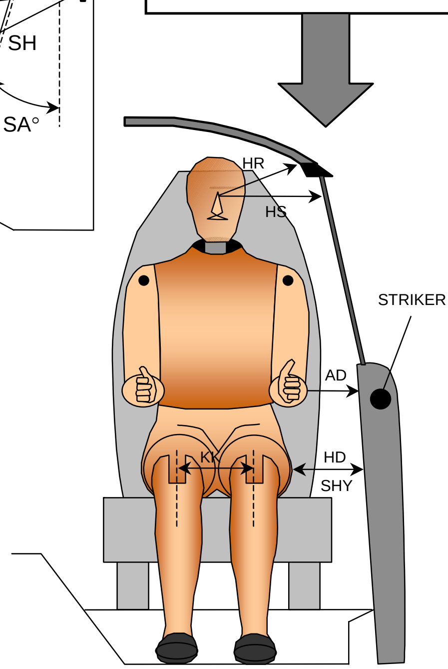
DUMMY POSITIONING IN VEHICLE

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

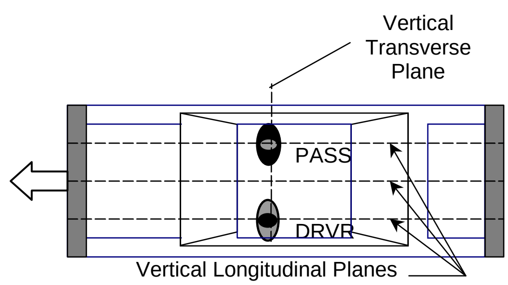
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



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 5 (CONTINUED)

DUMMY POSITIONING IN VEHICLE

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

TEST DUMMY POSITION MEASUREMENTS

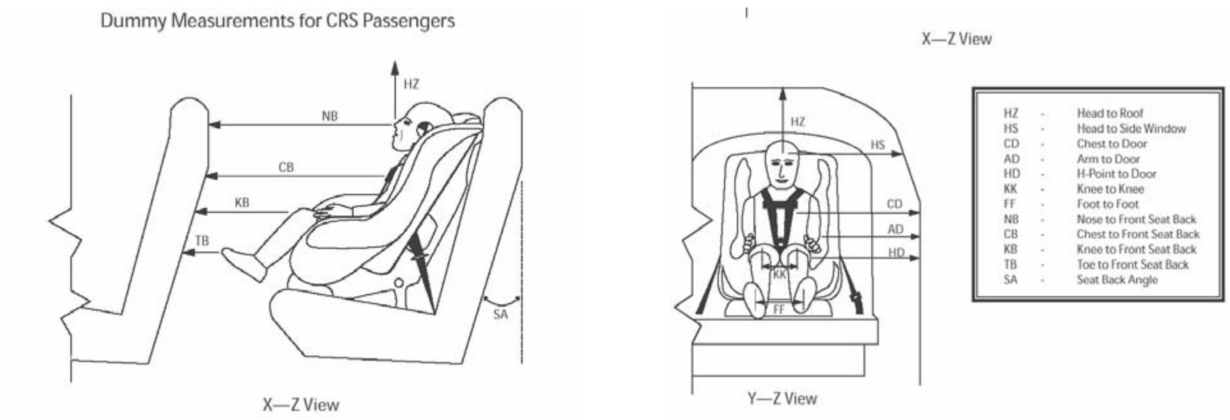
Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
WA	Windshield Angle		26.7
SWA	Steering Wheel Angle		65.0
SCA	Steering Column Angle		25.8
SA	Seat Back Angle (headrest post)		8.3
HZ	Head to Roof (Z)	235	90
HH	Head to Header	391	20.8
HW	Head to Windshield	703	0
HR	Head to Side Header (Y)	243	
NR	Nose to Rim	470	6.7
CD	Chest to Dash	642	
CS	Chest to Steering Hub	375	0.8
RA	Rim to Abdomen	252	0
KDL	Left Knee to Dash	199	26.8
KDR	Right Knee to Dash	193	
PA	Pelvic Angle		24.6
TA	Tibia Angle		43.9
KK	Knee to Knee (Y)	319	
SAN	Striker to Ankle	876	
SK	Striker to Knee	557	
ST	Striker to Head	479	
SH	Striker to H-Point	232	
SHY	Striker to H-Point (Y)	286	
HS	Head to Side Window	359	
HD	H-Point to Door (Y)	175	
AD	Arm to Door (Y)	152	
AA	Ankle to Ankle	271	

DATA SHEET 5 (CONTINUED)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Child Restraint System (Position 4)	Graco Highback Turbobooster (Forward Facing)
Dummy Type / Serial Number	Hybrid III 10-Year-Old / D001



Measurement	Pre-Test (mm)	Post-Test (mm) *
	P4 CRS	P4 CRS
SA (deg)		
HS	347	
CD	347	
AD	166	
HD	176	
HZ	276	
NB	596	
CB	598	
KK	150	
FF	166	
KB - LEFT	331	
KB – RIGHT	328	
TB - LEFT	104	
TB - RIGHT	106	

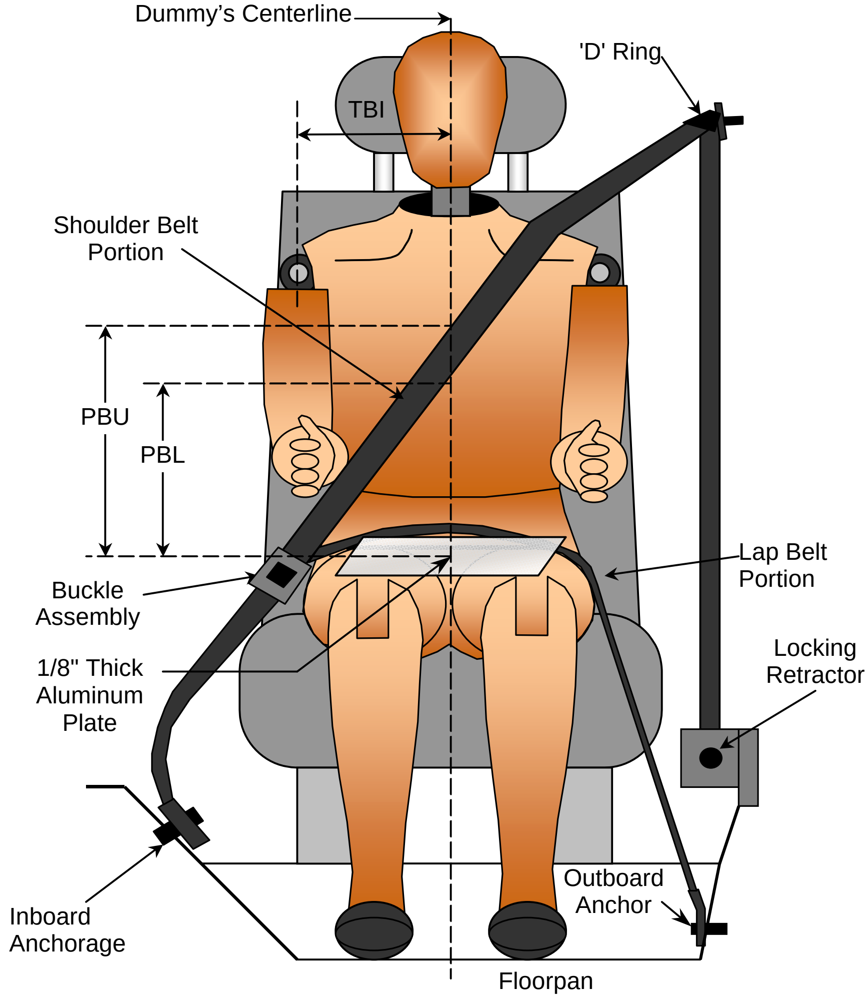
All dimensions in mm (unless noted)
P4 – 2nd Row Left Rear Passenger (Forward Facing)

* Child dummy was removed before post-test measurements were taken.

DATA SHEET 5 (CONTINUED)

DUMMY POSITIONING IN VEHICLE

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Left Rear Passenger
PBU - Top surface of reference to belt upper edge	mm	350	245
PBL - Top surface of reference to belt lower edge	mm	270	165

DATA SHEET 5 (CONTINUED)

DUMMY POSITIONING IN VEHICLE

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

	Driver			Left Rear Passenger		
	X	Y	Z	X	Y	Z
Head CG	2560	-447	-738	1597	-472	-703
Striker	2545	-823	-259	1521	-824	-376
Left Knee	3096	-537	-176	2038	-482	-276
Right Knee	3105	-294	-173			
Tip of Nose	2669	-370	-706	1715	-391	-676
H-Point	2700	-537	-87	1763	-509	-206
Left Ankle	3408	-523	110			
Right Ankle	3437	-264	91			
Left Heel	3401	-505	235			
Right Heel	3454	-234	226			
Right Toe	3650	-215	-34	2358	-294	-40
Left Toe	3640	-489	-15	2351	-470	-31
Right Child Seat				1732	-169	-124
Left Child Seat				1731	-581	-115
Left Shoulder				1580	-482	-511
Right Shoulder				1580	-296	-510
Seat Anchor				1612	-606	-56
Seat Final Placement	2967	-641	101			

DATA SHEET 6

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Accelerometer Location	Measurements (mm)		
	X	Y	Z
Left Rear Seat Crossmember X Left Rear Seat Crossmember Y	2120	-430	383
Right Rear Seat Crossmember X Right Rear Seat Crossmember Y	2120	430	383
Vehicle Center of Gravity X Vehicle Center of Gravity Y Vehicle Center of Gravity Z	2831	0	460
Top of Engine Block X	4396	0	785
Bottom of Engine Block X	4258	175	178
Left Disc Brake Caliper X	4222	-732	255
Right Disc Brake Caliper X	4222	732	255
Instrument Panel X	3272	0	932
Left Side Driver Mid Seat Track X	2548	-576	322
Accelerator Pedal X (at midfoot) Accelerator Pedal Y (at midfoot) Accelerator Pedal Z (at midfoot)	3612	-238	446
Brake Pedal X (at midfoot) Brake Pedal Y (at midfoot) Brake Pedal Z (at midfoot)	3732	-366	400
Footrest X Footrest Y Footrest Z	3592	-574	394

Reference is on the following page.

DATA SHEET 6 (CONTINUED)

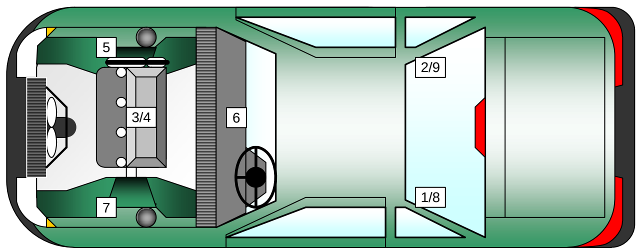
VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

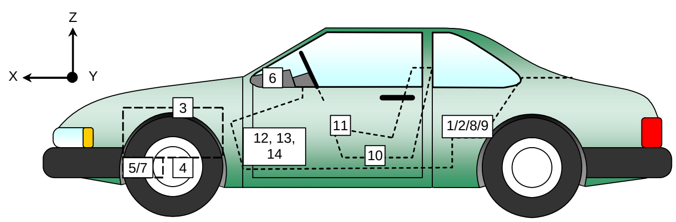
Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

Reference Points: X - Rear Surface of Vehicle (+ forward)

Y - Vehicle Centerline (+ to right)

Z - Ground Plane (+ up)





DATA SHEET 6 (CONTINUED)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Location Number	Description	Maximum Values (g's)			
		Positive	Time, ms	Negative	Time, ms
1	Left Rear Seat Cross Member X	2.4	204.5	-25.5	80.4
2	Right Rear Seat Cross Member X	5.3	300.0	-26.3	73.7
3	Top of Engine Block X	2.9	238.4	-48.4	31.6
4	Bottom of Engine Block X	1.5	155.9	-40.2	46.6
5	Disc Brake Caliper @ Right Side X	22.6	67.8	-46.6	81.3
6	Instrument Panel X	6.7	76.8	-40.0	66.6
7	Disc Brake Caliper @ Left Side X	43.6	80.0	-67.5	54.1
8	Left Rear Seat Cross Member Y	7.2	74.3	-3.7	300.0
9	Right Rear Seat Cross Member Y	7.0	80.3	-2.5	115.9
10	Left Side Driver Mid Seat Track X	(1)	(1)	(1)	(1)
11	Vehicle Center of Gravity X	2.6	65.3	-30.5	72.5
	Vehicle Center of Gravity Y	21.7	68.2	-7.2	102.9
	Vehicle Center of Gravity Z	10.5	122.6	-24.6	65.8
	Vehicle Center of Gravity Resultant	32.2	80.1		
12	Accel Pedal Heel Location X	42.1	123.9	-52.3	56.7
	Accel Pedal Heel Location Y	45.6	83.2	-21.1	73.1
	Accel Pedal Heel Location Z	(2)	(2)	(2)	(2)
	Accel Pedal Heel Location Resultant	(2)	(2)		
13	Brake Pedal Heel Location X	3.0	291.1	-39.0	61.0
	Brake Pedal Heel Location Y	16.6	73.4	-11.4	103.4
	Brake Pedal Heel Location Z	14.1	57.8	-18.6	72.5
	Brake Pedal Heel Location Resultant	41.7	72.9		
14	Outside Footrest X	4.3	300.0	-31.1	61.0
	Outside Footrest Y	17.8	72.7	-15.2	65.9
	Outside Footrest Z	20.7	58.8	-7.0	110.7
	Outside Footrest Resultant	36.1	60.6		

(1) No valid data between 60-80 msec. (2) No valid data after 100 msec.

DATA SHEET 7
DUMMY INJURY CRITERIA VALUES

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

		Maximum Value			
		Driver			
Description	Unit	Positive	Time, ms	Negative	Time, ms
Head X	G	7.9	282.8	-57.7	112.4
Head Y	G	20.4	122.6	-3.5	234.7
Head Z	G	21.6	111.7	-0.9	23.3
Head Resultant	G	62.1	112.3		
Head (FT) Y	G	19.1	126.4	-12.5	114.8
Head (FT) Z	G	26.4	75.8	-3.9	113.5
Head (LT) X	G	8.6	283.7	-74.0	113.8
Head (LT) Z	G	25.4	111.5	-4.6	162.5
Head (TP) X	G	11.2	277.0	-79.1	113.4
Head (TP) Y	G	22.2	125.9	-6.8	230.4
Head Redundant X	G	7.7	283.6	-59.0	113.5
Head Redundant Y	G	19.6	122.3	-3.4	226.4
Head Redundant Z	G	21.7	111.7	-1.4	23.3
Head Resultant Redundant	G	63.2	112.2		
Upper Neck Fx	N	524.0	122.4	-394.2	76.3
Upper Neck Fy	N	434.3	154.9	-151.2	232.0
Upper Neck Fz	N	1108.2	87.1	-52.6	23.2
Upper Neck F Resultant	N	1191.0	115.5		
Upper Neck Mx	N-m	32.0	155.7	-15.2	106.9
Upper Neck My	N-m	41.6	93.8	-26.6	299.2
Upper Neck Mz	N-m	9.8	177.4	-12.9	117.0
Upper Neck M Resultant	N-m	42.4	93.7		
Lower Neck Fx	N	334.1	45.3	-297.5	75.2
Lower Neck Fy	N	520.8	144.2	-163.9	225.7
Lower Neck Fz	N	1582.1	115.9	-193.7	35.6
Lower Neck F Resultant	N	1598.7	115.9		
Lower Neck Mx	N-m	113.8	153.6	-41.6	228.5
Lower Neck My	N-m	53.6	167.9	-87.8	115.5
Lower Neck Mz	N-m	18.7	48.0	-14.3	110.0
Lower Neck M Resultant	N-m	119.8	157.3		
Chest X	G	2.8	257.4	-31.4	74.6
Chest Y	G	13.3	112.2	-4.8	44.9
Chest Z	G	5.3	112.9	-4.5	138.4
Chest Resultant	G	32.7	113.3		
Chest Redundant X	G	2.6	257.4	-31.7	74.6
Chest Redundant Y	G	13.2	111.7	-4.7	44.9
Chest Redundant Z	G	5.3	58.0	-4.4	137.7
Chest Resultant Redundant	G	32.6	113.2		
Chest Displacement	mm			-27.4	77.6

DATA SHEET 7 (CONTINUED)

DUMMY INJURY CRITERIA VALUES

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Description	Unit	Maximum Value Driver			
		Positive	Time, ms	Negative	Time, ms
Pelvis X	G	2.8	245.7	-46.9	71.3
Pelvis Y	G	18.0	89.8	-6.8	132.1
Pelvis Z	G	3.4	296.2	-16.2	88.4
Pelvis Resultant	G	48.5	71.3		
Right Femur	N	951.7	62.3	-1241.0	78.2
Left Femur	N	672.8	56.5	-3233.5	100.8
Right Knee Shear	mm	0.9	71.4	-0.5	120.5
Left Knee Shear	mm	0.9	78.0	-1.4	108.6
Right Upper Tibia Fx	N	104.9	145.0	-395.0	96.7
Right Upper Tibia Fy	N	163.0	118.6	-247.9	86.2
Right Upper Tibia Fz	N	227.6	299.7	-1229.1	111.3
Right Upper Tibia F Resultant	N	1233.7	111.3		
Right Upper Tibia Mx	N-m	33.4	109.7	-48.0	77.0
Right Upper Tibia My	N-m	35.8	168.5	-52.3	114.2
Right Lower Tibia Fx	N	93.9	298.9	-508.8	68.3
Right Lower Tibia Fy	N	230.2	89.5	-258.0	111.9
Right Lower Tibia Fz	N	139.9	192.6	-2884.7	111.1
Right Lower Tibia F Resultant	N	2901.9	111.1		
Right Lower Tibia Mx	N-m	22.4	115.2	-40.2	95.9
Right Lower Tibia My	N-m	15.1	112.6	-38.2	60.2
Right Tibia Mid Shaft X	G	4.1	154.3	-35.7	66.5
Right Tibia Mid Shaft Y	G	51.2	89.5	-15.1	111.4
Rt Dorsi/Plantar Flexion	Deg	22.2	119.1	-11.1	32.7
Rt Inversion/Eversion	Deg	0.8	0.0	-29.2	98.1
Rt Internal/External	Deg	16.3	93.5	0.0	25.8
Right Foot X – Front	G	57.3	90.1	-22.9	75.6
Right Foot Y – Front	G	17.2	77.2	-44.8	58.4
Right Foot Z – Front	G	36.1	53.7	-26.8	74.3
Right Foot - Front Resultant	G	60.1	90.0		
Left Upper Tibia Fx	N	96.3	114.2	-974.4	77.2
Left Upper Tibia Fy	N	320.7	76.6	-219.8	114.9
Left Upper Tibia Fz	N	312.6	177.6	-891.1	38.2
Left Upper Tibia F Resultant	N	1083.4	77.2		
Left Upper Tibia Mx	N-m	30.7	138.4	-23.7	99.0
Left Upper Tibia My	N-m	89.4	77.1	-30.6	136.7
Left Lower Tibia Fx	N	85.3	238.7	-829.1	77.1
Left Lower Tibia Fy	N	344.9	76.6	-249.6	97.9
Left Lower Tibia Fz	N	264.4	174.1	-1174.6	38.2
Left Lower Tibia F Resultant	N	1227.7	76.1		

DATA SHEET 7 (CONTINUED)

DUMMY INJURY CRITERIA VALUES

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205

Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Description	Unit	Maximum Values Driver			
		Positive	Time, ms	Negative	Time, ms
Left Lower Tibia Mx	N-m	22.6	111.7	-19.5	75.7
Left Lower Tibia My	N-m	12.6	135.5	-108.3	77.0
Left Tibia Mid Shaft X	G	5.6	136.5	-102.8	77.0
Left Tibia Mid Shaft Y	G	35.5	84.9	-19.9	97.9
Lt Dorsi/Plantar Flexion	Deg	10.5	128.2	-18.2	256.7
Lt Inversion/Eversion	Deg	28.0	86.0	-11.4	203.1
Lt Internal/External	Deg	15.9	293.2	-7.1	127.7
Left Foot X – Front	G	27.2	80.7	-22.4	119.0
Left Foot Y – Front	G	10.7	123.3	-73.0	81.3
Left Foot Z – Front	G	76.9	75.7	-18.8	239.1
Left Foot – Front Resultant	G	85.3	74.6		
Lap Belt Load	N	5368.7	69.8		
Shoulder Belt Load	N	5810.4	72.7		

Description	Unit	Maximum Value Left Rear Passenger			
		Positive	Time, ms	Negative	Time, ms
Head X	G	45.8	222.1	-36.7	131.2
Head Y	G	3.5	269.7	-12.1	221.4
Head Z	G	50.3	111.2	-3.3	274.6
Head Resultant	G	57.6	222.4		
Upper Neck Fx	N	279.9	226.7	-954.5	131.4
Upper Neck Fy	N	117.0	246.5	-175.3	127.4
Upper Neck Fz	N	1848.7	112.1	-1555.4	229.0
Upper Neck F Resultant	N	2011.2	129.8		
Upper Neck Mx	N-m	33.4	230.1	-10.3	119.1
Upper Neck My	N-m	14.2	125.5	-24.3	76.4
Upper Neck Mz	N-m	3.1	130.8	-7.3	246.5
Upper Neck M Resultant	N-m	35.2	228.8		
Lower Neck Fx	N	136.0	296.5	-2003.3	114.5
Lower Neck Fy	N	100.5	261.1	-471.4	111.7
Lower Neck Fz	N	1342.8	70.2	-1435.2	227.8
Lower Neck F Resultant	N	2133.7	112.5		
Lower Neck Mx	N-m	24.4	263.7	-44.8	112.6
Lower Neck My	N-m	205.8	130.7	-12.9	213.1
Lower Neck Mz	N-m	15.4	144.9	-8.9	235.6
Lower Neck M Resultant	N-m	208.9	130.7		

DATA SHEET 7 (CONTINUED)

DUMMY INJURY CRITERIA VALUES

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

		Maximum Value Left Rear Passenger			
Description	Unit	Positive	Time, ms	Negative	Time, ms
Right Shoulder Fx	N	104.7	97.1	-39.5	244.8
Right Shoulder Fz	N	179.5	116.7	-67.2	226.7
Left Shoulder Fx	N	69.0	214.5	-2452.0	101.7
Left Shoulder Fz	N	937.2	110.4	-18.3	283.4
Chest X	G	10.0	290.1	-36.4	79.1
Chest Y	G	7.3	119.8	-4.4	227.5
Chest Z	G	14.6	226.3	-7.6	136.3
Chest Resultant	G	36.8	79.3		
Chest Displacement	mm			-30.4	102.1
Upper Sternum X	G	12.2	238.4	-40.6	91.2
Lower Sternum X	G	26.8	236.5	-46.1	83.7
Upper Spine X	G	9.9	289.1	-36.2	71.7
Lower Spine X	G	8.6	285.9	-42.8	80.2
Lumbar Fx	N	1716.0	133.0	-471.8	72.5
Lumbar Fy	N	67.6	300.0	-465.9	133.2
Lumbar Fz	N	608.6	180.8	-636.1	97.5
Lumbar F Resultant	N	1788.6	133.1		
Lumbar Mx	N-m	14.9	299.3	-72.0	111.0
Lumbar My	N-m	23.7	258.4	-54.1	131.7
Lumbar Mz	N-m	23.4	135.1	-7.1	233.3
Lumbar M Resultant	N-m	87.2	112.4		
Pelvis X	G	6.5	282.9	-39.2	70.8
Pelvis Y	G	12.2	89.4	-3.7	300.0
Pelvis Z	G	12.1	226.8	-18.9	111.2
Pelvis Resultant	G	43.1	70.8		
Right Upper Asis Fx	N	385.7	83.4	-316.5	122.9
Right Lower Asis Fx	N	605.9	82.9	-8.6	298.5
Left Upper Asis Fx	N	133.6	85.1	-112.0	195.1
Left Lower Asis Fx	N	460.7	73.4	-11.4	250.2
Shoulder Belt Load	N	5369.5	105.3		
Lap Belt Load	N	3766.9	79.2		

DATA SHEET 8

SUMMARY OF FMVSS 212/ 219 (PARTIAL) DATA

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

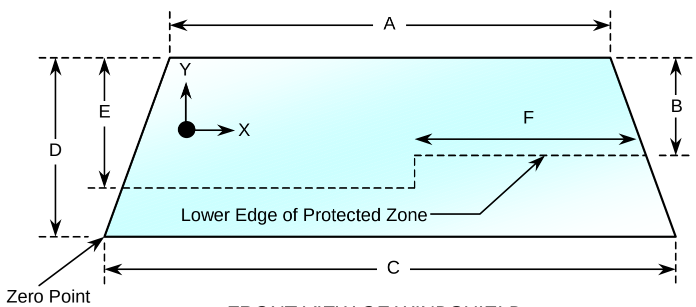
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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	2329	2329	100
Right Side	2329	2329	100
Total	4658	4658	100



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1330
B	mm	490
C	mm	1658
D	mm	835
E	mm	550
F	mm	552

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 9

FMVSS 301 FUEL SYSTEM INTEGRITY DATA

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205

Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Temperature at Time of Impact: 21° C Test Time: 11:30 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)

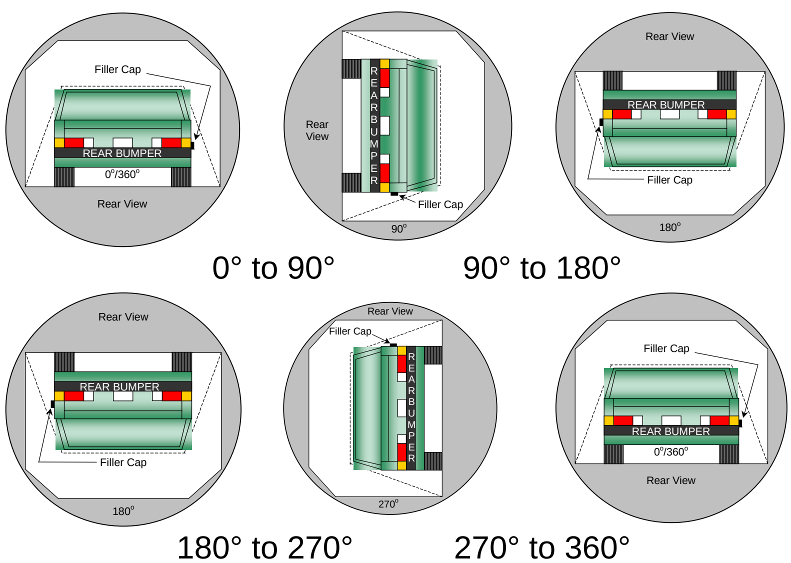
C. For the following 25 minutes: 0 oz.

(Maximum Allowable = 1 oz. /minute)

D. Spillage: None

FMVSS 301 STATIC ROLLOVER DATA

NOT PERFORMED



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).

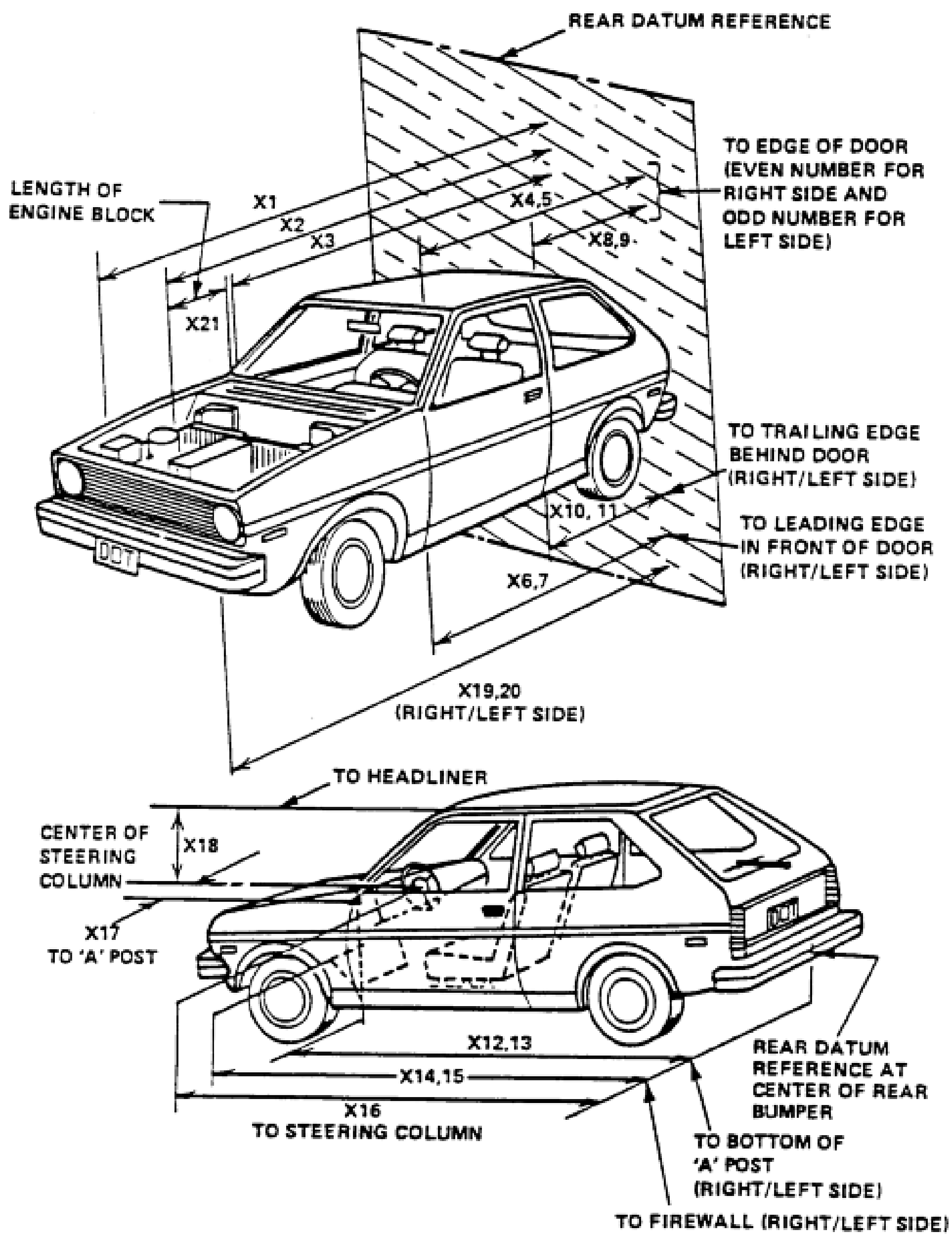
3. Details of Stoddard Solvent spillage locations:

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	N/A		
90° to 180°	N/A		
180° to 270°	N/A		
270° to 360°	N/A		

DATA SHEET 10

TEST VEHICLE MEASUREMENTS

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008



DATA SHEET 10 (CONTINUED)

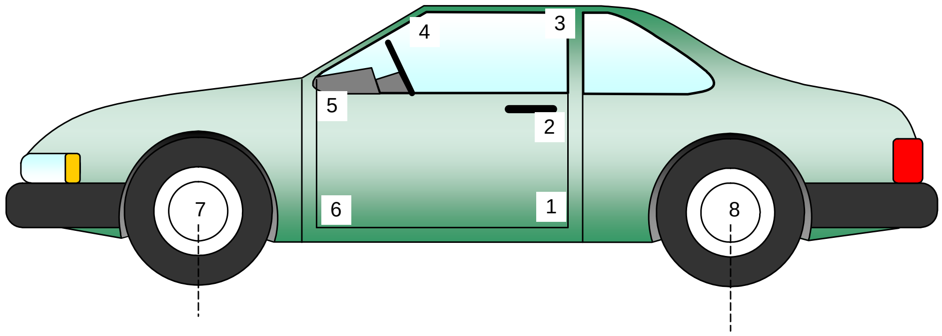
TEST VEHICLE MEASUREMENTS

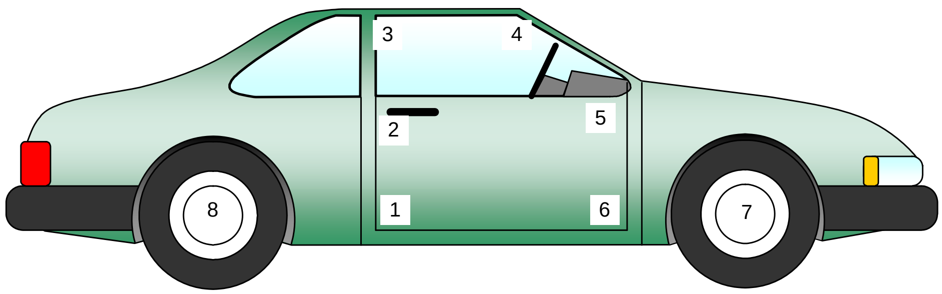
Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

No.	Measurement Description	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
1	Total length of vehicle at centerline	4992	4521	471
2	RSOV to front of engine	4572	4400	172
3	RSOV to firewall centerline	3836	3836	0
4	RSOV to leading edge of right door	3528	3527	1
5	RSOV to leading edge of left door	3526	3515	11
6	RSOV to lower leading edge of right door	3504	3504	0
7	RSOV to lower leading edge of left door	3504	3471	33
8	RSOV to upper leading edge of right door	2421	2424	-3
9	RSOV to upper leading edge of left door	2416	2416	0
10	RSOV to lower trailing edge of right door	2450	2442	8
11	RSOV to lower trailing edge of left door	2441	2424	17
12	RSOV to bottom of right 'A' pillar	3496	3485	11
13	RSOV to bottom of left 'A' pillar	3492	3482	10
14	RSOV to firewall on right side	3924	3929	-5
15	RSOV to firewall on left side	3931	3768	163
16	RSOV to steering column	3038	3065	-27
17	Center of steering column to left 'A' pillar	389	403	-14
18	Center of steering column to headlining	450	455	-5
19	RSOV to right side of front bumper	4919	4924	-5
20	RSOV to left side of front bumper	1918	4727	191
21	Length of engine block	500	500	0
RD	RSOV to right side of dash panel	3224	3223	1
CD	RSOV to center of dash panel	3229	3204	25
LD	RSOV to left side of dash panel	3227	3191	36

DATA SHEET 10 (CONTINUED)
TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008





LEFT FRONT

Point Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
1	2610	-817	-14	2610	-818	-13	0	1	-1
2	2504	-818	-294	2502	-815	-294	-2	-3	0
3	2405	-645	-965	2403	-637	-965	-2	-8	0
4	2926	-684	-887	2926	-674	-889	0	-10	2
5	3470	-815	-293	3456	-827	-291	-14	12	-2
6	3421	-801	112	3418	-818	116	-3	17	-4
7	4081	-886	160	3931	-894	132	-150	8	28
8	1214	-850	201	1222	-854	202	8	4	-1

RIGHT FRONT

Point Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
1	2608	817	-25	2607	819	-27	-1	-2	2
0	2506	817	-296	2503	817	-296	-3	0	0
3	2407	639	-968	2404	636	-969	-3	3	1
4	2928	679	-889	2926	676	-892	-2	3	3
5	3471	816	-292	3472	822	-295	1	-6	3
6	3418	805	110	3420	812	108	2	-7	2
7	4083	894	174	4141	859	148	58	35	26
8	1214	853	189	1229	852	199	15	1	-10

DATA SHEET 10 (CONTINUED)

TEST VEHICLE MEASUREMENTS

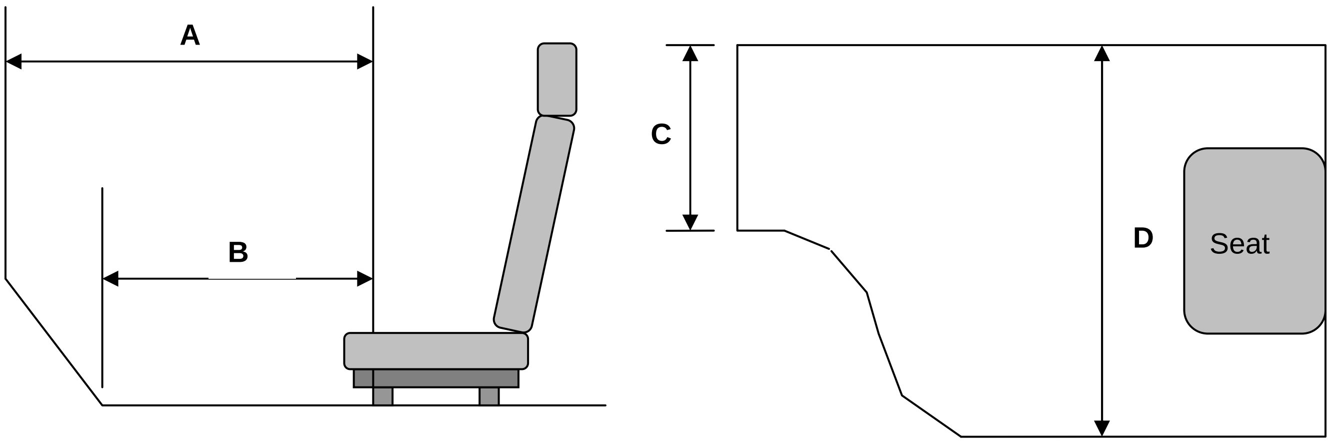
Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

	Elements	Pre-Test (mm)
1	Total Length	4992
2	Total Width	1940
3	Bumper Top Height	549
4	Bumper Bottom Height	386
5	Longitudinal Member Top Height	526
6	Distance between Longitudinal Members	1280
7	Longitudinal Member Width	120
8	Engine Top Height	918
9	Engine Bottom Height	180
10	Engine and gearbox width	850
11	Front bumper-engine distance	420
12	Front shock absorber fixing height	877
13	Bonnet leading edge height	812
14	Front shock absorber fixing width	1255
15	Front bumper – front axle distance	992
16	Front axle – a pillar distance	590
17	A-pillar – B-pillar distance	1050
18	B-Pillar – rear axle distance	1242
19	B-pillar – C-pillar distance	970
20	Roof sill bottom height	1362
21	Roof sill top height	1422
22	Floor sill bottom height	319
23	Floor sill top height	356

DATA SHEET 10 (CONTINUED)

TEST VEHICLE MEASUREMENTS

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008



DRIVER

Measurements	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
A	505	481	24
B	419	416	3
C	367	363	4
D	473	462	11

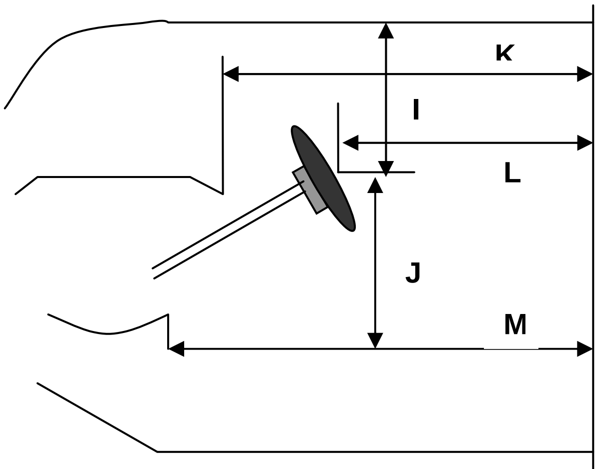
LEFT FRONT PASSENGER

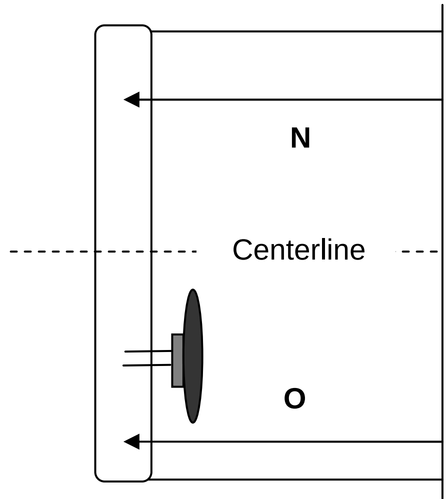
Measurements	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
A	569	565	4
B	390	390	0
C	335	335	0
D	445	445	0

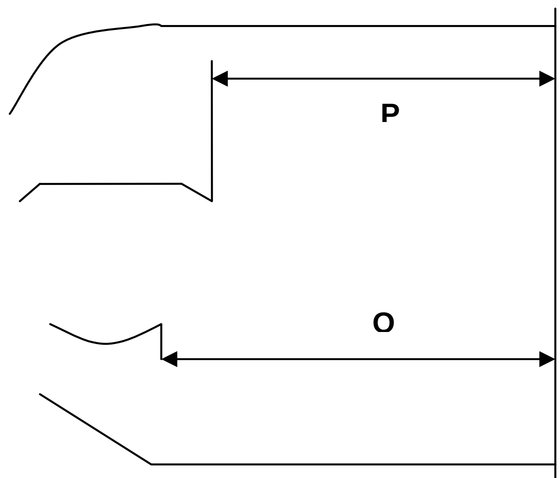
DATA SHEET 10 (CONTINUED)

TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008







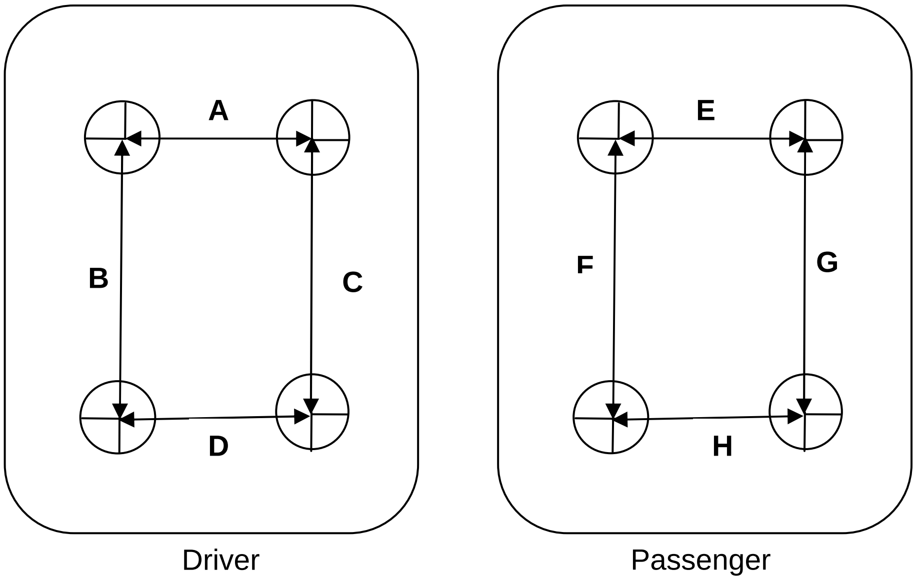
Measurements	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
I	455	460	-5
J	633	625	8
K	2060	2045	15
L	1862	1885	-23
M	2226	2194	32
N	2070	2065	5
O	2094	2078	16
P= K (PASS)	2060	2054	6
Q= M (PASS)	2236	2230	6

Measurements from C-Pillar Belt Anchorage

DATA SHEET 10 (CONTINUED)

TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door   NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier   Test Date: 4/02/2008



UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
A	377	354	23
B	419	415	4
C	366	365	1
D	473	472	1
E	398	396	2
F	390	390	0
G	455	454	1
H	445	445	0

DATA SHEET 10 (CONTINUED)
TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door   NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier   Test Date: 4/02/2008

	Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Lower Bumper Beam	1	4927	-671	30	4730	-834	30	-197	163	0
	2	4991	-402	69	4433	-479	-16	-558	77	85
	3	5004	-132	71	4467	-219	-16	-537	87	87
	4	5005	129	67	4631	-54	-26	-374	183	93
	5	4991	400	67	4810	150	-44	-181	250	111
	6	4928	676	25	4948	397	-89	20	279	114
Upper Bumper Beam	1	4926	-671	-80	4711	-841	-72	-215	170	-8
	2	4991	-401	-76	4389	-467	-153	-602	66	77
	3	5006	-130	-75	4432	-201	-151	-574	71	76
	4	5006	133	-77	4608	-39	-167	-398	172	90
	5	4991	401	-78	4783	163	-184	-208	238	106
	6	4924	677	-83	4928	409	-194	4	268	111
Upper Radiator Support	1	4581	-693	-363	4223	-724	-414	-358	31	51
	2	4783	-414	-349	4268	-381	-396	-515	-33	47
	3	4782	-133	-353	4292	-174	-457	-490	41	104
	4	4782	141	-353	4447	52	-464	-335	89	111
	5	4785	413	-350	4604	271	-448	-181	142	98
	6	4584	698	-370	4554	607	-416	-30	91	46
Front of Hood	1	4644	-749	-378	4227	-764	-608	-417	15	230
	2	4891	-451	-320	4292	-519	-441	-599	68	121
	3	4942	-150	-341	4389	-238	-407	-553	88	66
	4	4942	157	-342	4570	7	-426	-372	150	84
	5	4890	455	-327	4699	278	-473	-191	177	146
	6	4642	754	-389	4597	625	-613	-45	129	224

Reference Photos on the Following Page

DATA SHEET 10 (CONTINUED)
TEST VEHICLE MEASUREMENTS

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

Front of Hood

Lower Bumper Beam / Upper Bumper Beam /
Center Bumper Beam / Upper Radiator Support

DATA SHEET 10 (CONTINUED)

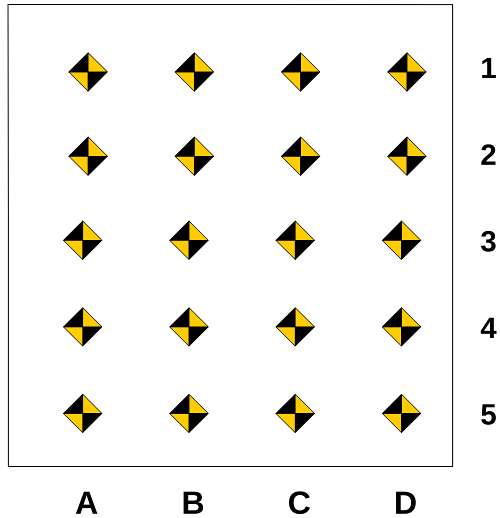
TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

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'S SIDE TOE PAN FLOOR BOARD

Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3635	-559	81	3621	-572	74	-14	13	7
B1	3723	-434	113	3697	-434	92	-26	0	21
C1	3718	-322	115	3693	-322	97	-25	0	18
D1	3733	-192	118	3724	-195	111	-9	3	7
A2	3605	-569	161	3598	-580	156	-7	11	5
B2	3643	-456	179	3630	-460	171	-13	4	8
C2	3645	-317	165	3637	-320	166	-8	3	-1
D2	3648	-188	190	3652	-191	191	4	3	-1
A3	3552	-570	240	3554	-575	246	2	5	-6
B3	3533	-455	241	3537	-460	248	4	5	-7
C3	3535	-323	237	3540	-327	243	5	4	-6
D3	3529	-195	239	3534	-198	242	5	3	-3
A4	3322	-582	243	3323	-587	248	1	5	-5
B4	3325	-477	239	3327	-482	243	2	5	-4
C4	3320	-332	243	3323	-337	247	3	5	-4
D4	3324	-175	239	3328	-179	242	4	4	-3
A5	3130	-648	243	3130	-653	244	0	5	-1
B5	3135	-483	238	3136	-486	241	1	3	-3
C5	3145	-336	235	3146	-338	240	1	2	-5
D5	3163	-171	240	3166	-174	243	3	3	-3
Brake Pedal	3539	-360	40	3489	-341	43	-50	-19	-3
IP Left	3321	-527	-239	3291	-502	-235	-30	-25	-4
IP Right	3323	-227	-236	3302	-205	-231	-21	-22	-5
Steering Column	3061	-375	-468	3073	-347	-455	12	-28	-13
Front Outboard Bolt	3060	-580	156	3063	-583	158	3	3	-2

DATA SHEET 10 (CONTINUED)

TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Driver's Side Toe Pan Floor Board
Additional Measurements

Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3674	-529	50	3650	-538	36	-24	9	14
2	3761	-417	68	3727	-417	40	-34	0	28
3	3759	-242	65	3739	-240	48	-20	-2	17
4	3671	-142	165	3676	-144	168	5	2	-3
5	3585	-150	219	3590	-154	223	5	4	-4
6	3652	-536	88	3635	-547	78	-17	11	10
7	3681	-484	139	3660	-488	123	-21	4	16
8	3562	-490	237	3565	-495	244	3	5	-7
9	3615	-584	83	3605	-599	80	-10	15	3
10	3610	-514	79	3596	-529	73	-14	15	6
11	3470	-507	225	3467	-515	227	-3	8	-2
12	3676	-376	147	3659	-378	136	-17	2	11
13	3599	-380	208	3598	-384	213	-1	4	-5
14	3594	-101	47	3600	-95	53	6	-6	-6
15	3552	-633	116	3556	-654	121	4	21	-5
16	3384	-509	255	3386	-515	258	2	6	-3
17	3639	-168	8	3610	-150	6	-29	-18	2

DATA SHEET 10 (CONTINUED)
TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

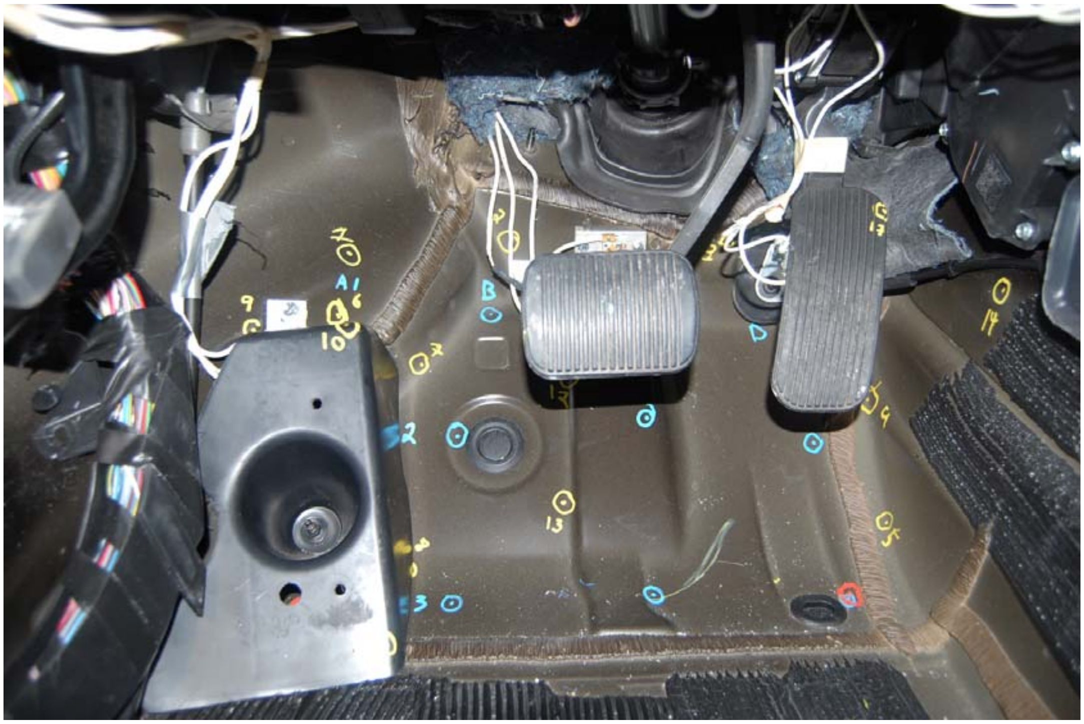
Additional Measurements (Continued)

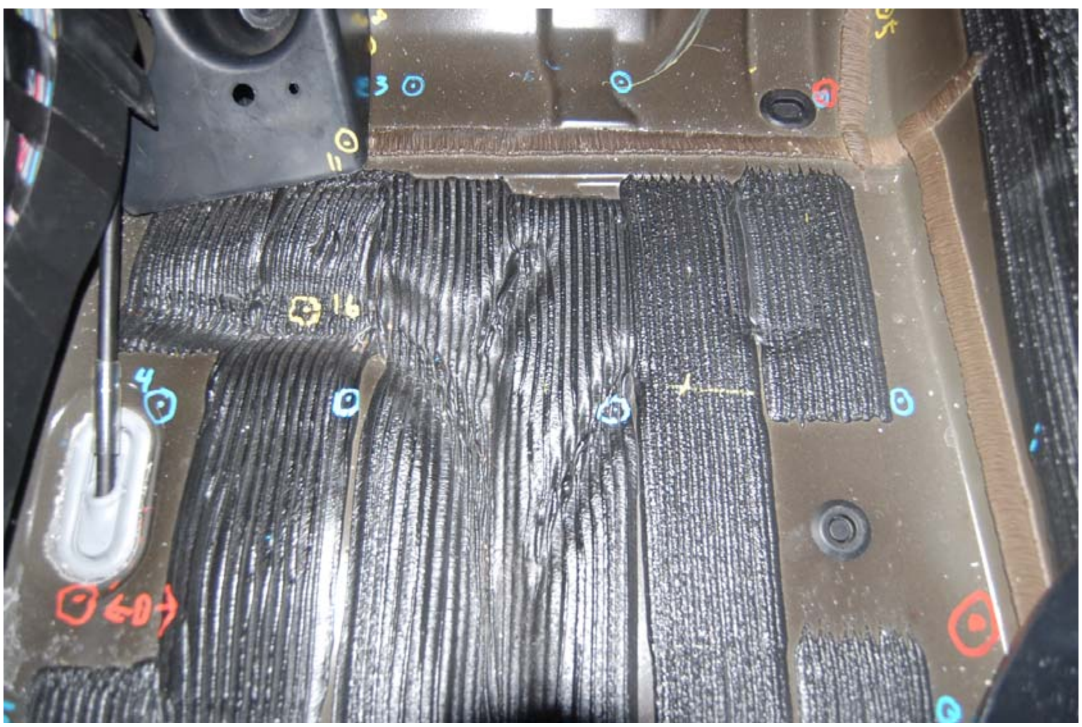
	Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Center of Grill	1	4816	-735	-246	4220	-674	-277	-596	-61	31
	2	4918	-445	-245	4335	-530	-296	-583	85	51
	3	4976	-145	-231	4448	-240	-277	-528	95	46
	4	4975	150	-232	4612	2	-316	-363	148	84
	5	4920	451	-247	4770	257	-389	-150	194	142
	6	4820	736	-246	4800	594	-294	-20	142	48
Top of Bumper Cover	1	4917	-736	-109	4416	-723	-245	-501	-13	136
	2	5025	-452	-104	4401	-581	-165	-624	129	61
	3	5077	-147	-101	4549	-279	-171	-528	132	70
	4	5077	156	-102	4724	-64	-231	-353	220	129
	5	5031	453	-105	4890	183	-278	-141	270	173
	6	4934	731	-107	5006	452	-293	72	279	186
Bumper Centerline	1	4928	-671	-11	4740	-837	-9	-188	166	-2
	2	4978	-553	-12	4743	-707	-16	-235	154	4
	3	4991	-413	-9	4413	-485	-91	-578	72	82
	4	5001	-275	-12	4442	-350	-93	-559	75	81
	5	5007	-139	-15	4466	-215	-96	-541	76	81
	6	5008	-1	-13	4526	-141	-95	-482	140	82
	7	5007	137	-11	4621	-42	-103	-386	95	92
	8	5001	278	-12	4716	62	-112	-285	216	100
	9	4992	412	-12	4804	165	-119	-188	247	107
	10	4979	549	-11	4890	271	-125	-89	278	114
	11	4928	677	-10	4942	400	-123	14	277	113
Bottom of Bumper Cover	1	4936	-737	55	4418	-790	-101	-518	53	156
	2	5039	-450	53	4461	-566	-2	-578	116	55
	3	5086	-152	59	4620	-308	-31	-466	156	90
	4	5087	149	59	4796	-96	-89	-291	53	148
	5	5041	451	55	4966	153	-141	-75	298	196
	6	4941	734	58	5096	421	-164	155	313	222

DATA SHEET 10 (CONTINUED)
TEST VEHICLE MEASUREMENTS

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

Driver's Side Toe Pan Floor Board





DATA SHEET 10 (CONTINUED)

TEST VEHICLE MEASUREMENTS

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

Driver's Side Toe Pan Floor Board

DATA SHEET 10 (CONTINUED)

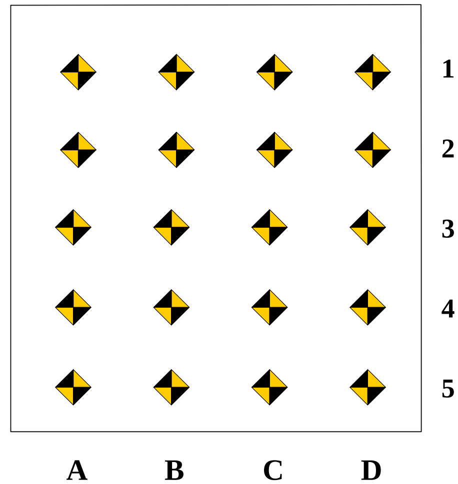
TEST VEHICLE MEASUREMENTS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

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'S SIDE TOE PAN FLOOR BOARD

Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3749	233	94	3749	232	97	0	1	-3
B1	3745	323	87	3744	325	89	-1	-2	-2
C1	3742	441	75	3735	441	70	-7	0	5
D1	3662	562	45	3661	569	41	-1	-7	4
A2	3685	218	162	3685	222	169	0	-3	-7
B2	3669	316	148	3669	319	152	0	-3	-4
C2	3671	468	151	3670	472	148	-1	-4	3
D2	3610	582	122	3612	589	119	2	-7	3
A3	3576	208	236	3578	214	246	2	-6	-10
B3	3563	310	231	3565	316	239	2	-6	-8
C3	3570	484	231	3570	490	235	0	-6	-4
D3	3566	604	232	3568	609	231	2	-5	1
A4	3364	178	241	3367	184	248	3	-6	-7
B4	3352	328	245	3353	333	251	1	-5	-6
C4	3325	459	242	3327	462	245	2	-3	-3
D4	3343	621	236	3345	626	233	2	-5	3
A5	3180	167	241	3183	173	249	3	-6	-8
B5	3153	324	240	3155	328	245	2	-4	-5
C5	3113	465	238	3114	471	240	1	-6	-2
D5	3110	611	237	3112	616	237	2	-5	0
Front Outboard Bolt	3326	223	-236	3310	228	-225	-16	-5	-11
IP Left	3330	527	-235	3325	533	-231	-5	-5	-4
IP Right	3061	586	153	3062	587	153	1	-1	0

DATA SHEET 11

PHOTOGRAPHIC DATA

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

No.	Camera View	Location (mm) *			Lens (mm)	Angle (deg)	Shutter (µs)	Speed (fps)
		X	Y	Z				
1	Left Front Half	455	-5255	1155	24	4.7	500	1000
2	Left SWC Bottom	780	-6170	875	50	3.9	400	1000
3	Left Angle 2	4530	-5240	2135	50	10.4	550	1000
4	Left Overall	1805	-7210	1340	19	6.2	600	1000
5	Right Front Half	555	-5335	155	24	3.3	650	1000
6	Onboard Driver Side				6.5		250	1000
7	Onboard Driver Footwell				6.5		650	1000
8	Onboard Passenger				8	1.8	250	1000
9	Windshield	-2505	0	3095	12.5	38.3	800	1000
10	Overhead Closeup	140	0	4630	50	90	300	1000
11	Overhead Overall	635	0	4630	14	90	1000	1000
12	Pit Front	5	0	-3150	24	90	1000	1000
13	Pit Rear	2165	0	-3150	24	90	1000	1000
14	Left Angle 1	3565	-5330	1655	25	4.2	300	1000
15	Left Close Up	1225	-6465	1440	35	2.6	225	1000
16	Real-Time Camera				13			24

*COORDINATES:

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

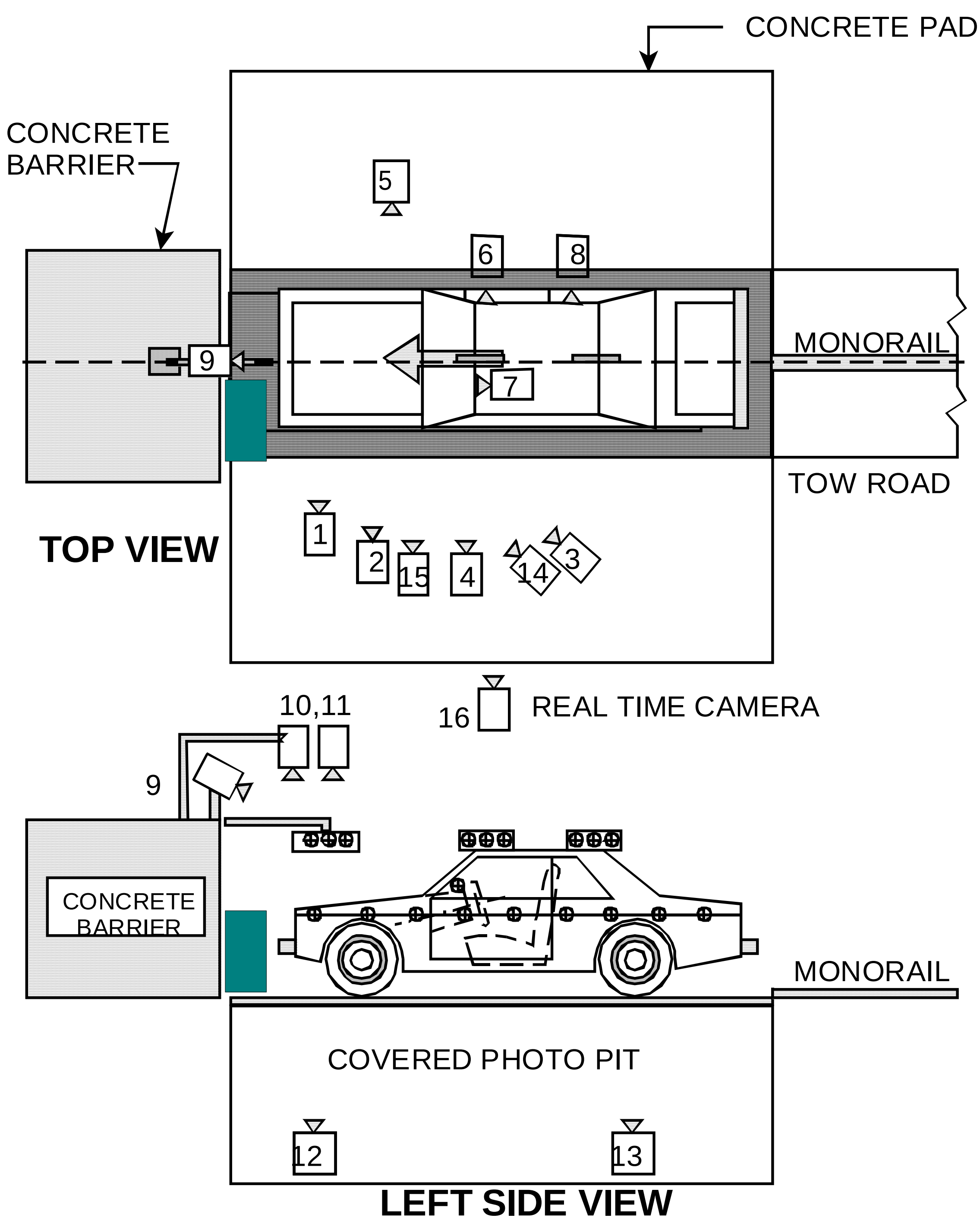
Note: Camera #6 did not run.

DATA SHEET 11 (CONTINUED)

PHOTOGRAPHIC DATA

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

CAMERA POSITIONS FOR FRONTAL IMPACTS



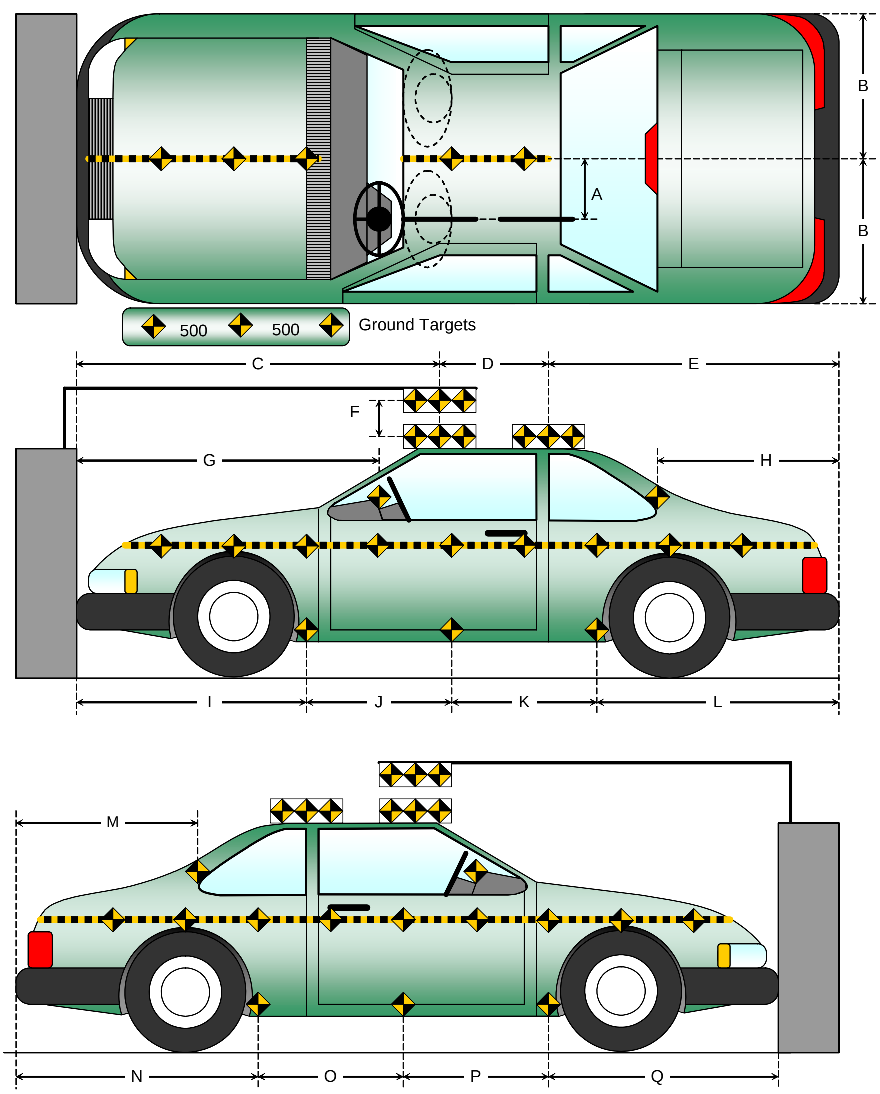
DATA SHEET 12

VEHICLE REFERENCE PHOTO TARGET LOCATIONS

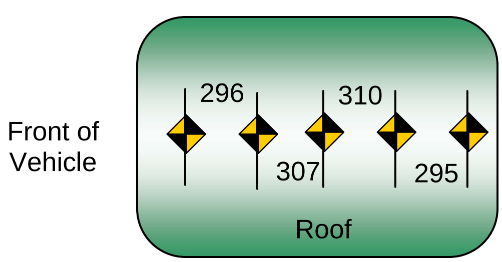
Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

Measurement from roof to overhead cameras: 3130 mm

Item	Value
A	370
B	970
C	2542
D	666
E	1784
F	380
G	
H	1032
I	1519
J	982
K	958
L	1533
M	1041
N	1545
O	961
P	970
Q	1516



Distance between left rear door targets: 200 mm
Overhead camera to ground: 4630 mm
Measurement of roof targets:



DATA SHEET 13

POST TEST AIR BAG DATA

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Air Bag Data	Driver
Number of Vent Holes	2
Size of Vent Holes	30 mm diameter
Shape of Vent Holes	Round
Total Vent Area	1414 mm^2
Length of Deflated Airbag (if square)	
Width of Deflated Airbag (if square)	
Diameter of Deflated Airbag (if round)	520 mm
Is Airbag Tethered?	Yes
Length of Tethers	220 mm

Driver Airbag Part Numbers: P600696500CC04
Ford D219-258
FRF-U3K-3X-BGF

Inflator: FFRU363DACE
H7SU3F0AB0I

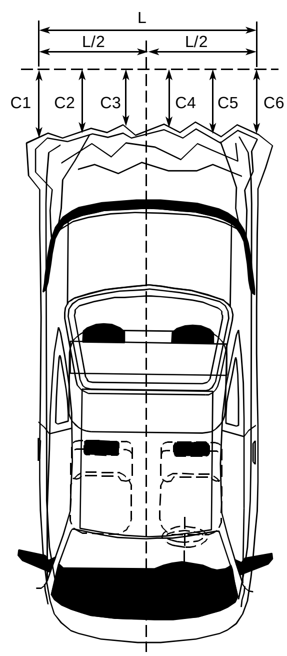
DATA SHEET 14

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

CRUSH DEPTH DIMENSIONS

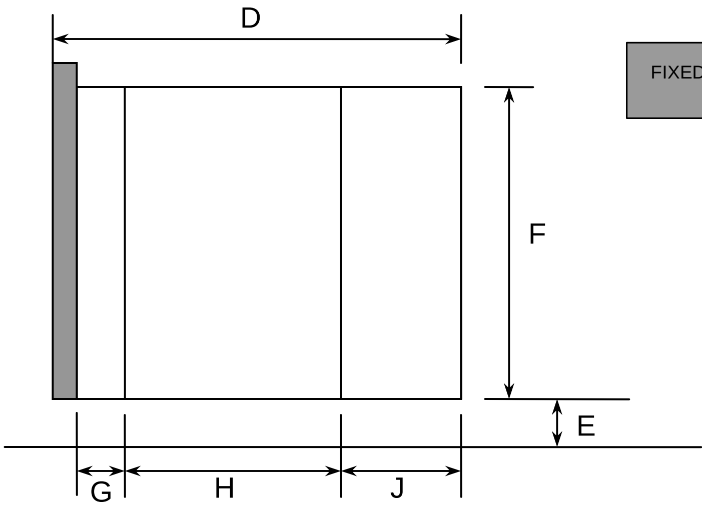
No.	Measurement Description	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
C1	Crush zone 1 at left side	4918	4727	191
C2	Crush zone 2 at left side	4970	4410	560
C3	Crush zone 3 at left side	4988	4445	543
C4	Crush zone 4 at right side	4990	4672	318
C5	Crush zone 5 at right side	4971	4815	156
C6	Crush zone 6 at right side	4919	4924	-5
L	C1 TO C6	1322	1209	113

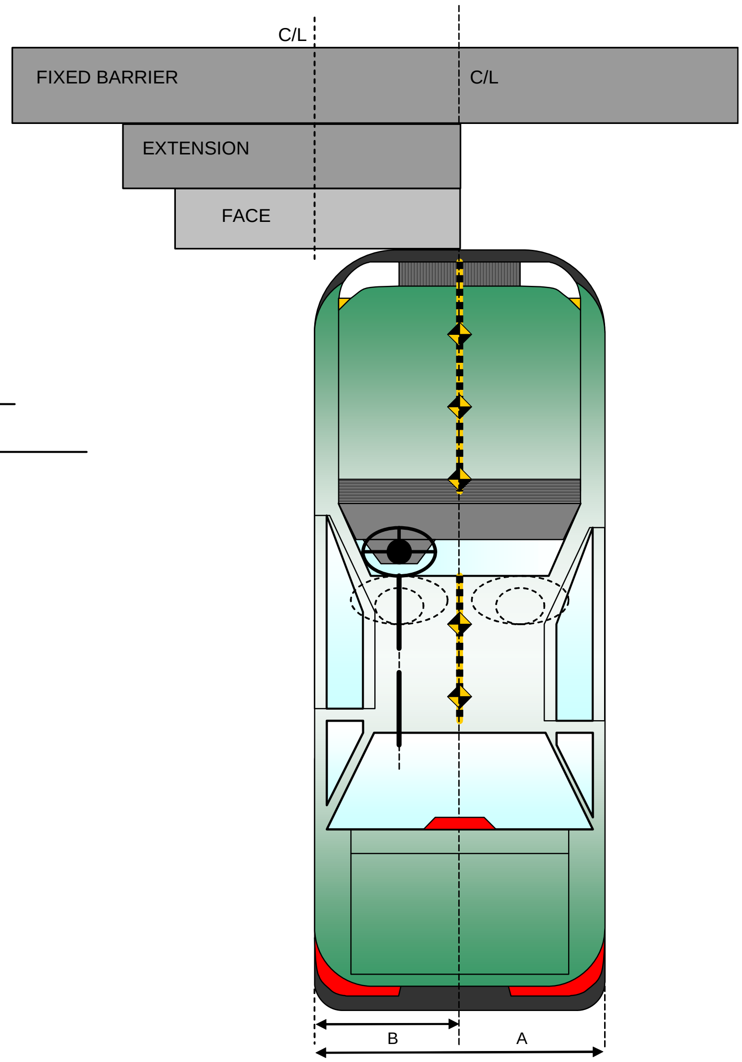


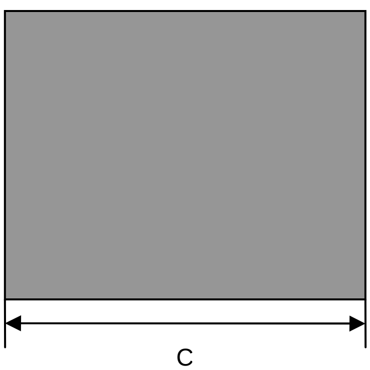
DATA SHEET 15

OFFSET BARRIER AND VEHICLE ORIENTATION

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008





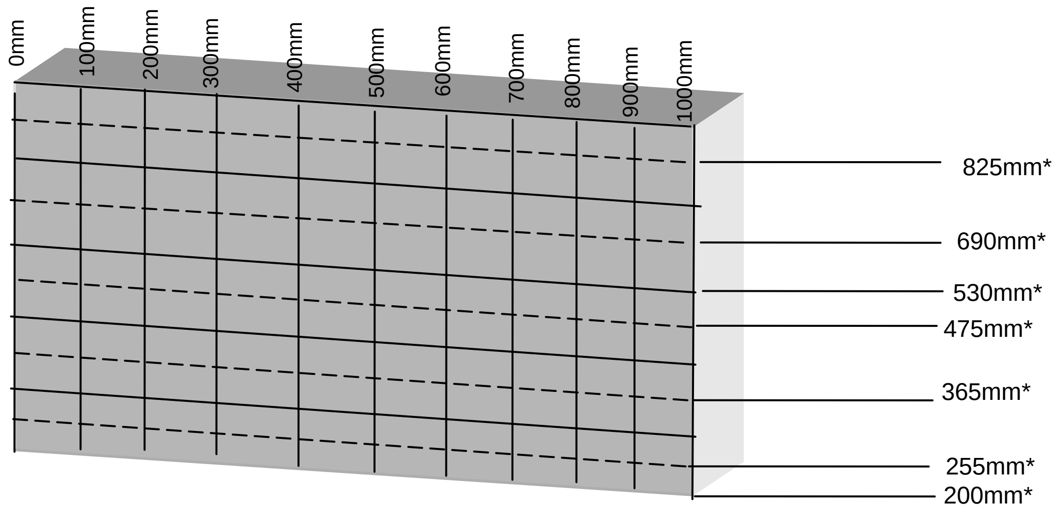


Location	Description	Measurement (mm)
A	Total Vehicle Width	1940
B	50% Overlap Distance	970
C	Deformable Face Width	1000
D	Single Stage Honeycomb Depth	800
E	Lower Edge Height From Ground	199
F	Deformable Barrier Honeycomb Height	700
G	Constant Rear Deformable Core	90
H	Progressive Rear Deformable Core	450
J	Constant Front Deformable Core	250

DATA SHEET 16

DEFORMABLE BARRIER HONEYCOMB CRUSH

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008



*Measurement to Ground

	Points (mm)	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
255 mm	0	794	759	35
	100	794	747	47
	200	794	726	68
	300	794	648	146
	400	794	584	210
	500	794	599	195
	600	794	571	223
	700	794	537	257
	800	795	497	298
	900	795	435	360
	1000	795	365	430
365 mm	0	795	763	32
	100	795	756	39
	200	794	719	75
	300	794	648	146
	400	794	398	396
	500	794	529	265
	600	795	494	301
	700	795	461	334
	800	795	433	362
	900	795	380	415
	1000	795	318	477

DATA SHEET 16 (CONTINUED)

DEFORMABLE BARRIER HONEYCOMB CRUSH

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

	Points (mm)	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
475 mm	0	795	777	18
	100	795	756	39
	200	795	678	117
	300	795	482	313
	400	795	482	310
	500	795	516	279
	600	795	511	284
	700	795	480	315
	800	795	459	336
	900	795	398	397
	1000	796	329	467
530 mm	0	795	781	14
	100	795	749	46
	200	795	663	132
	300	795	530	265
	400	795	523	272
	500	795	553	242
	600	795	543	252
	700	795	509	286
	800	795	474	321
	900	795	418	377
	1000	796	346	450
690 mm	0	796	773	23
	100	796	722	74
	200	795	672	123
	300	795	668	127
	400	795	659	136
	500	795	610	185
	600	796	624	172
	700	796	590	206
	800	796	528	268
	900	796	477	319
	1000	796	423	373
825 mm	0	796	782	14
	100	796	716	80
	200	796	683	113
	300	796	697	99
	400	796	693	103
	500	796	672	124
	600	796	661	135
	700	796	641	155
	800	796	579	217
	900	796	509	287
	1000	796	436	360

DATA SHEET 16 (CONTINUED)

DEFORMABLE BARRIER HONEYCOMB CRUSH

Test Vehicle:	2007 Ford Five Hundred SEL 4-Door	NHTSA No.:	R70205
Test Program:	Left 50% Offset Deformable Barrier	Test Date:	4/02/2008

HOLE FROM FRAME RAIL (OUTER THEN INNER)

Point Location	X (mm)	Y (mm)	Z (mm)
1	408	298	491
2	432	408	471
3	528	450	422
4	575	303	292
5	610	218	423
6	593	243	553
7	542	362	557
8	217	133	313
9	217	142	372
10	192	212	462
11	196	303	381
12	232	294	299
13	197	187	259
14	230	117	296
15	250	105	382

DATA SHEET 17

DEFORMABLE BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2007 Ford Five Hundred SEL 4-Door NHTSA No.: R70205
Test Program: Left 50% Offset Deformable Barrier Test Date: 4/02/2008

Row One	1	11	21	31	41	51	61	71	81
	2	12	22	32	42	52	62	72	82
	3	13	23	33	43	53	63	73	83
	4	14	24	34	44	54	64	74	84
	5	15	25	35	45	55	65	75	85
	6	16	26	36	46	56	66	76	86
	7	17	27	37	47	57	67	77	87
	8	18	28	38	48	58	68	78	88
	9	19	29	39	49	59	69	79	89
Row Ten	10	20	30	40	50	60	70	80	90

Track C/L

90 Load Cells
10 Rows
9 Columns

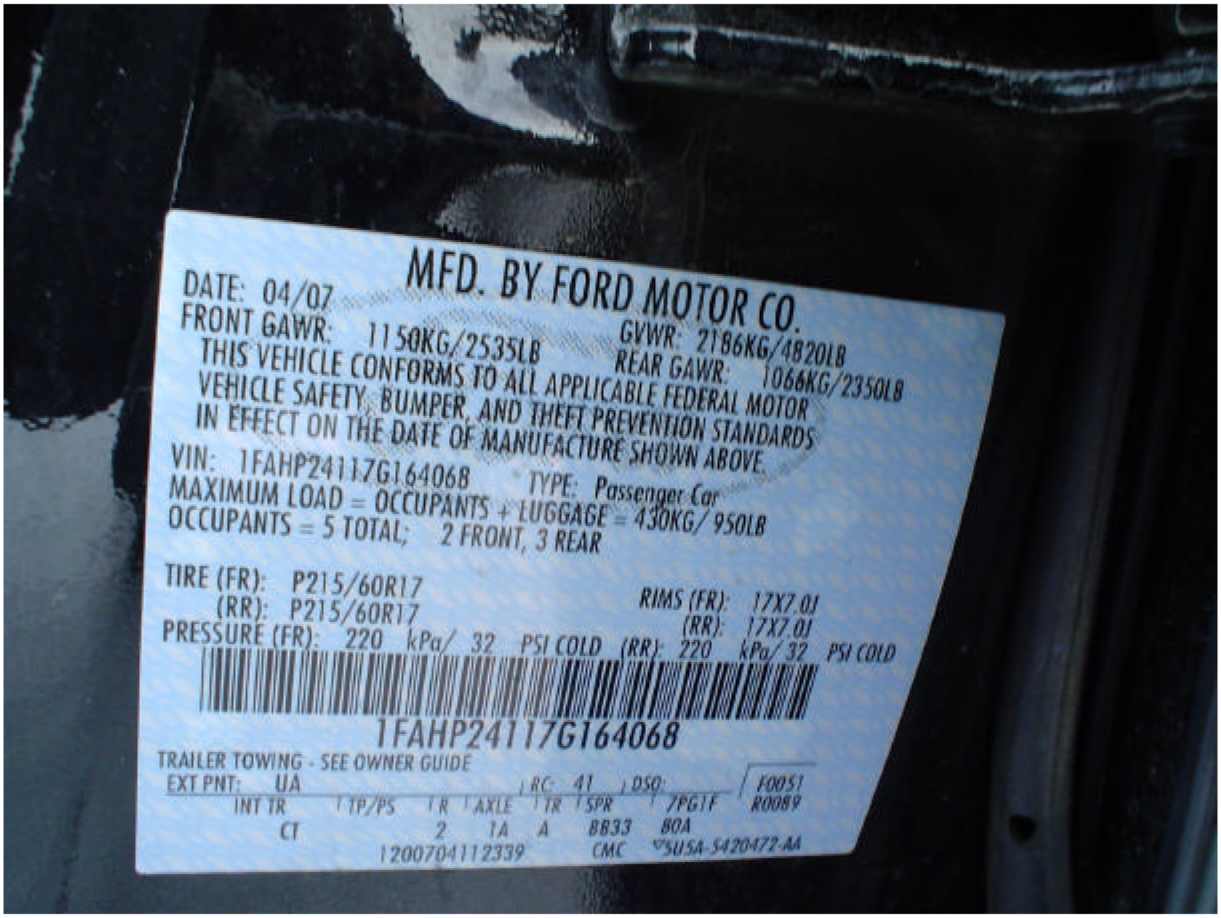
Front View

Load Cells measure 123 mm square and have a 1.5 mm gap.
Distance from LCB to ground measures 125 mm

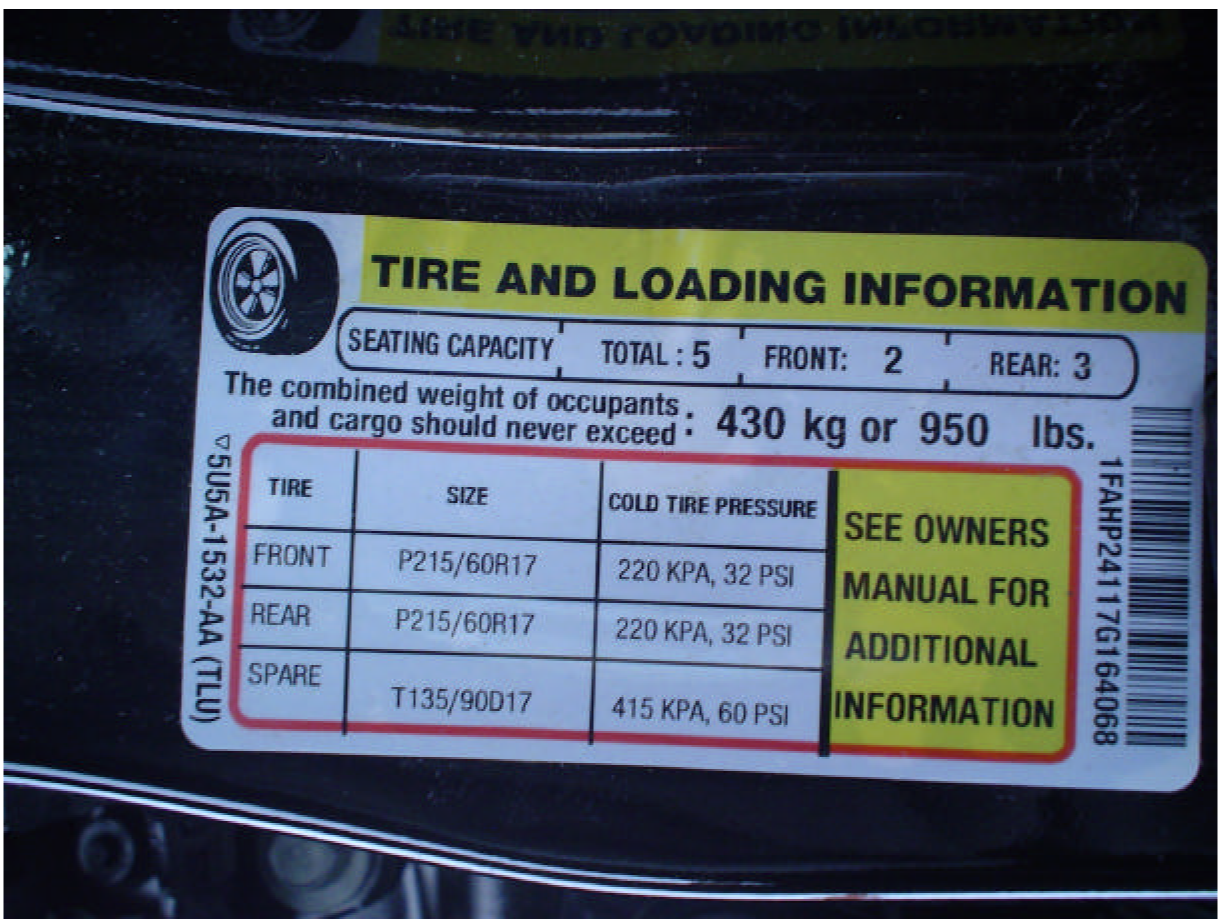
APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS



Manufacturer's Label



Tire Placard

Left Front ¾ View, As Received

Right Rear ¾ View, As Received

Pre-Test Front View

Post-Test Front View

Pre-Test Left Side View

Post-Test Left Side View

Pre-Test Right Side View

Post-Test Right Side View

Pre-Test Right Front ¾ View

Post-Test Right Front ¾ View

Pre-Test Left Front ¾ View

Post-Test Left Front ¾ View

Pre-Test Left Rear ¾ View

Post-Test Left Rear ¾ View

Pre-Test Left Side ¾ View of Doors

Post-Test Left Side ¾ View of Doors After Impact

Pre-Test Right Side ¾ View of Doors

Post-Test Right Side ¾ View of Doors After Impact

Pre-Test Windshield View

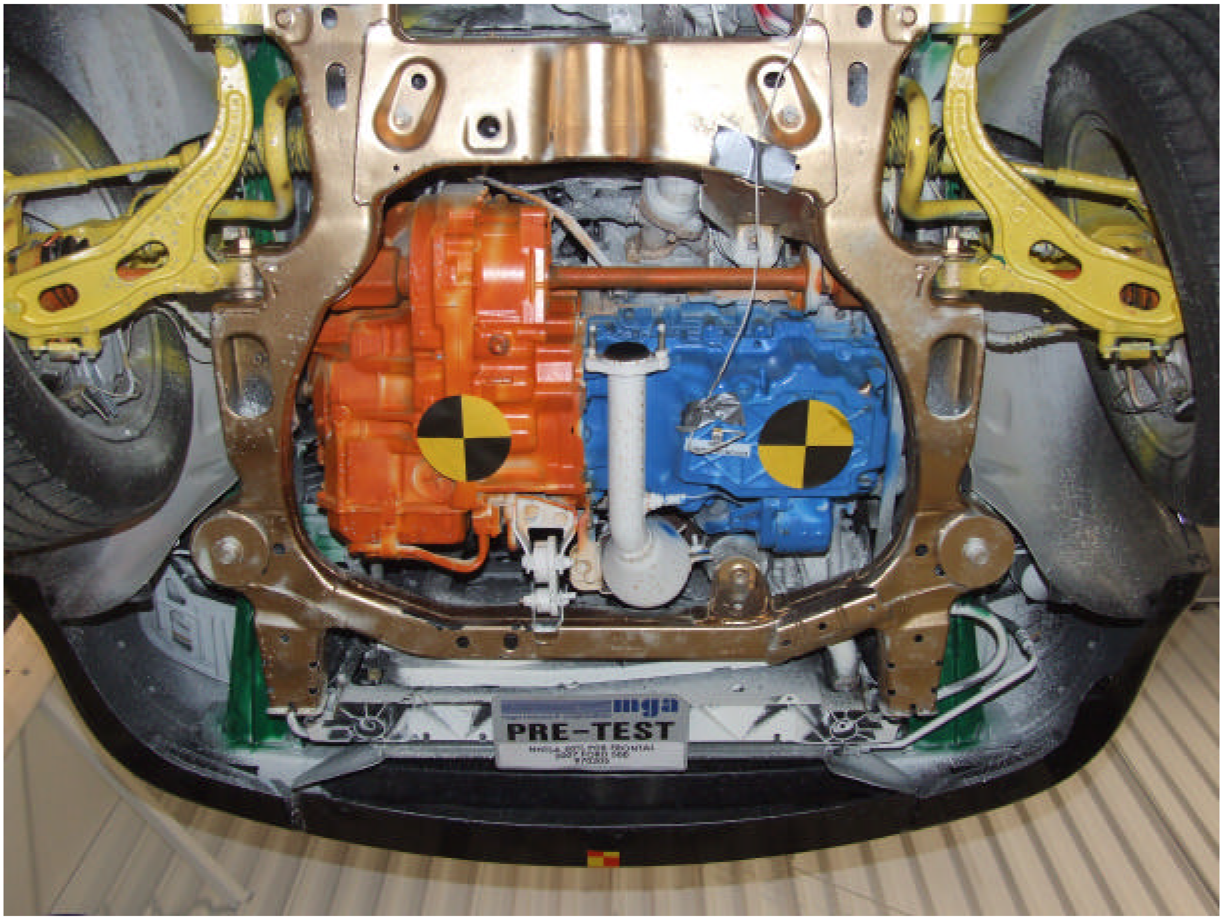
Post-Test Windshield View

Pre-Test Engine Compartment View

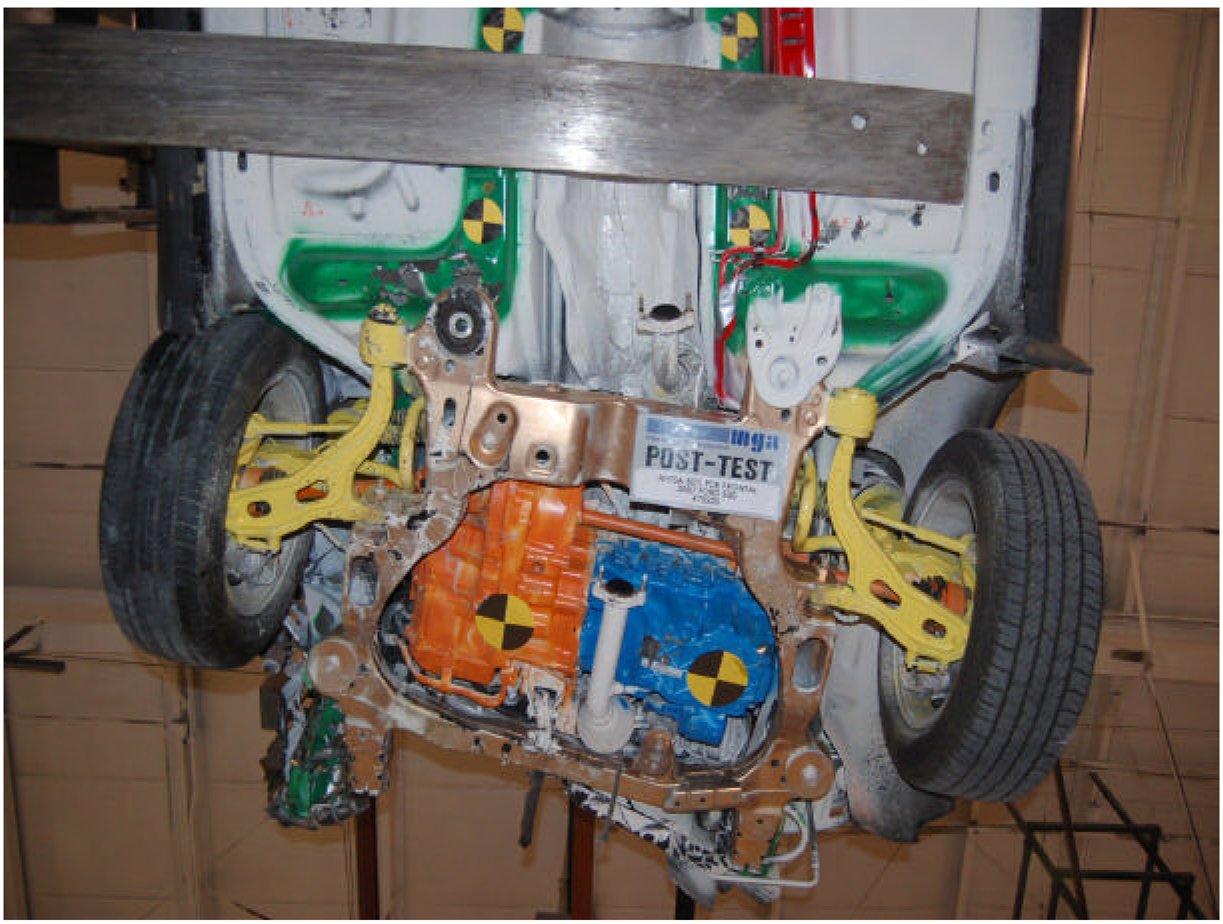
Post-Test Engine Compartment View

Pre-Test Fuel Cap View

Post-Test Fuel Cap View

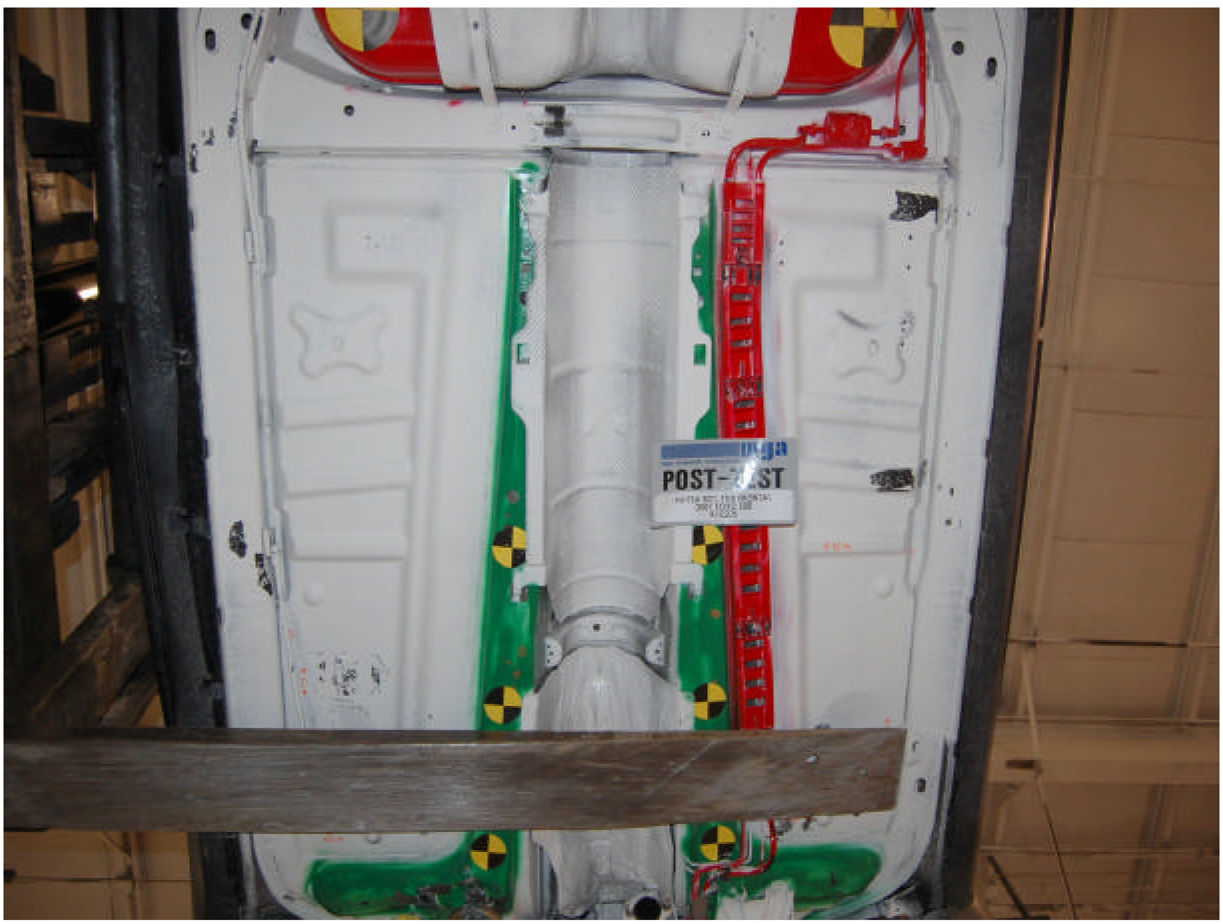


Pre-Test Front Underbody View

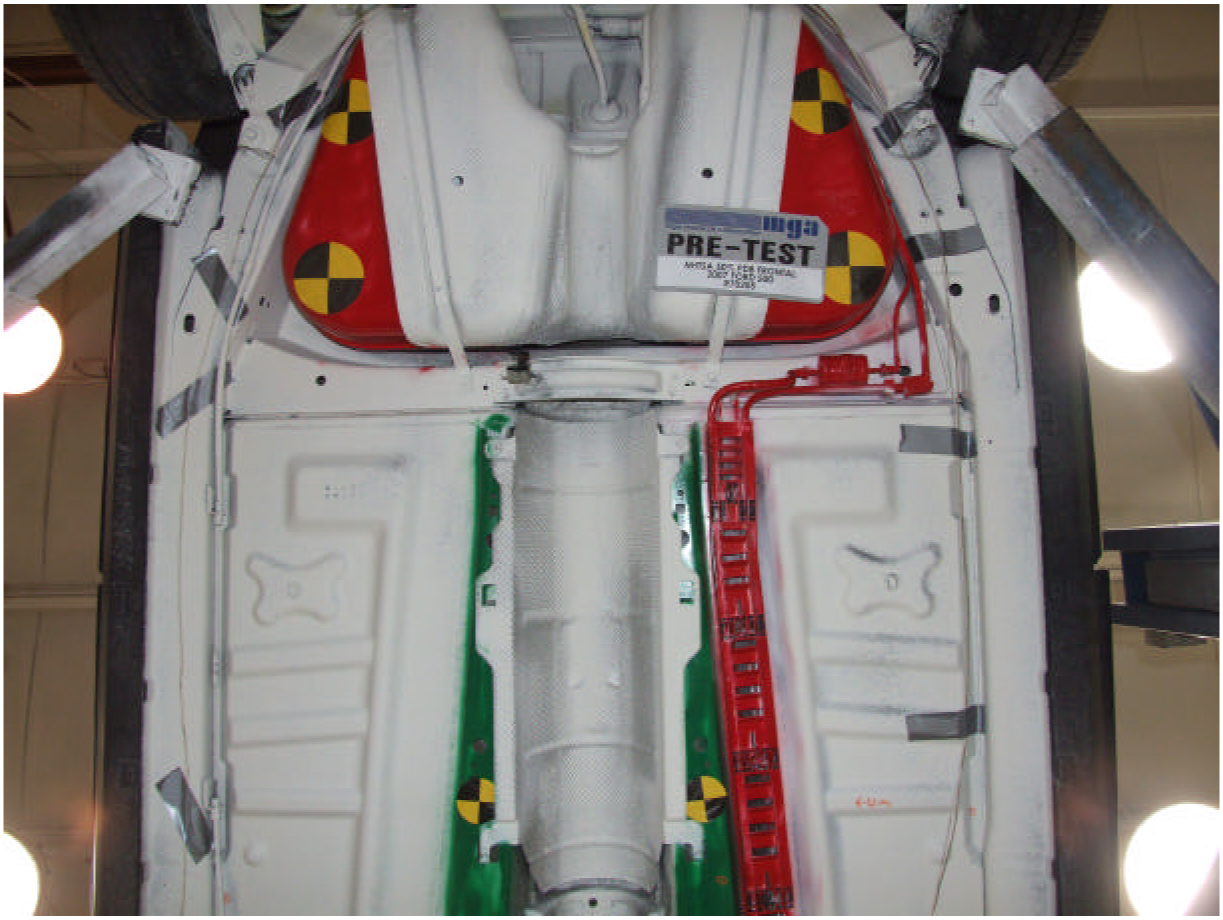


Post-Test Front Underbody View

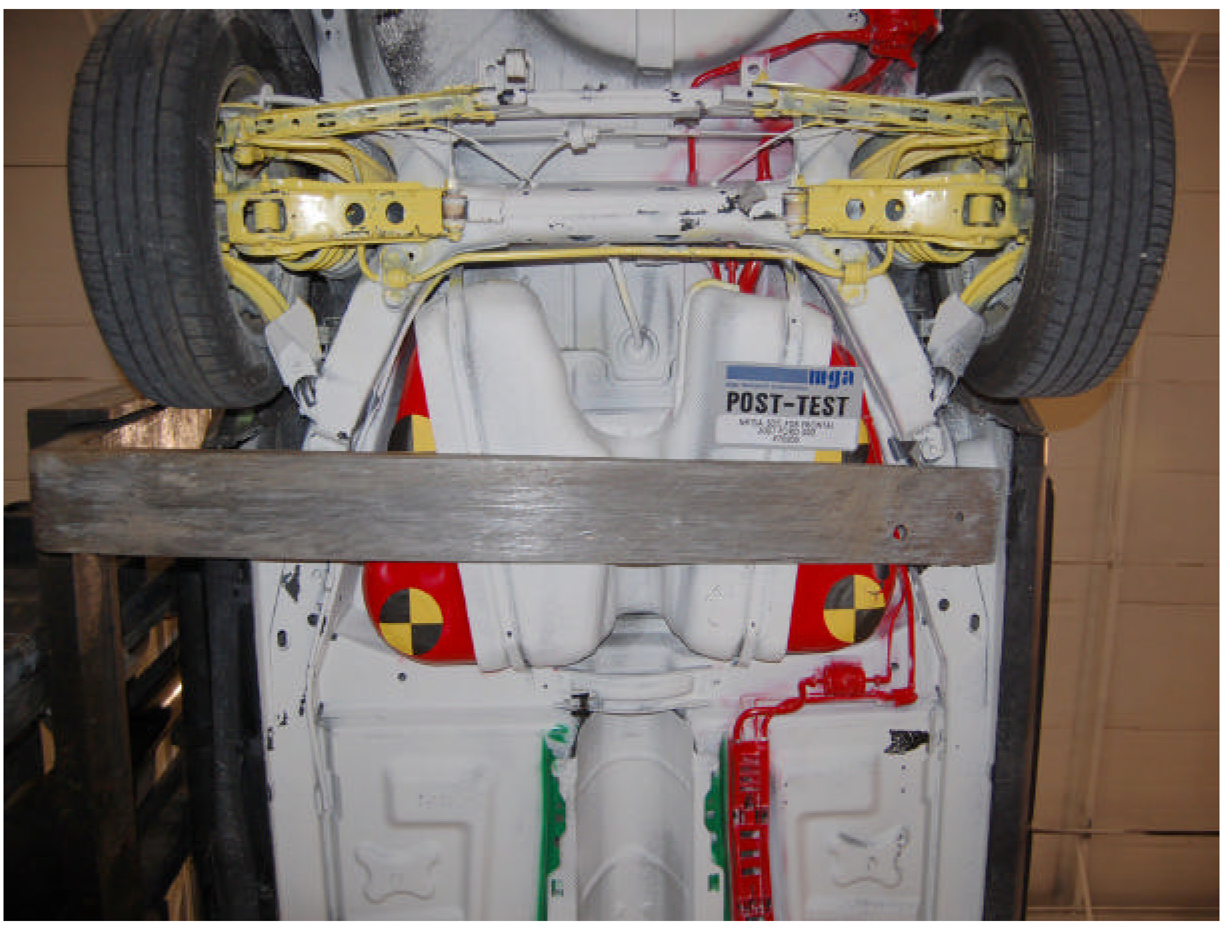
Pre-Test Front Mid Underbody View



Post-Test Front Mid Underbody View

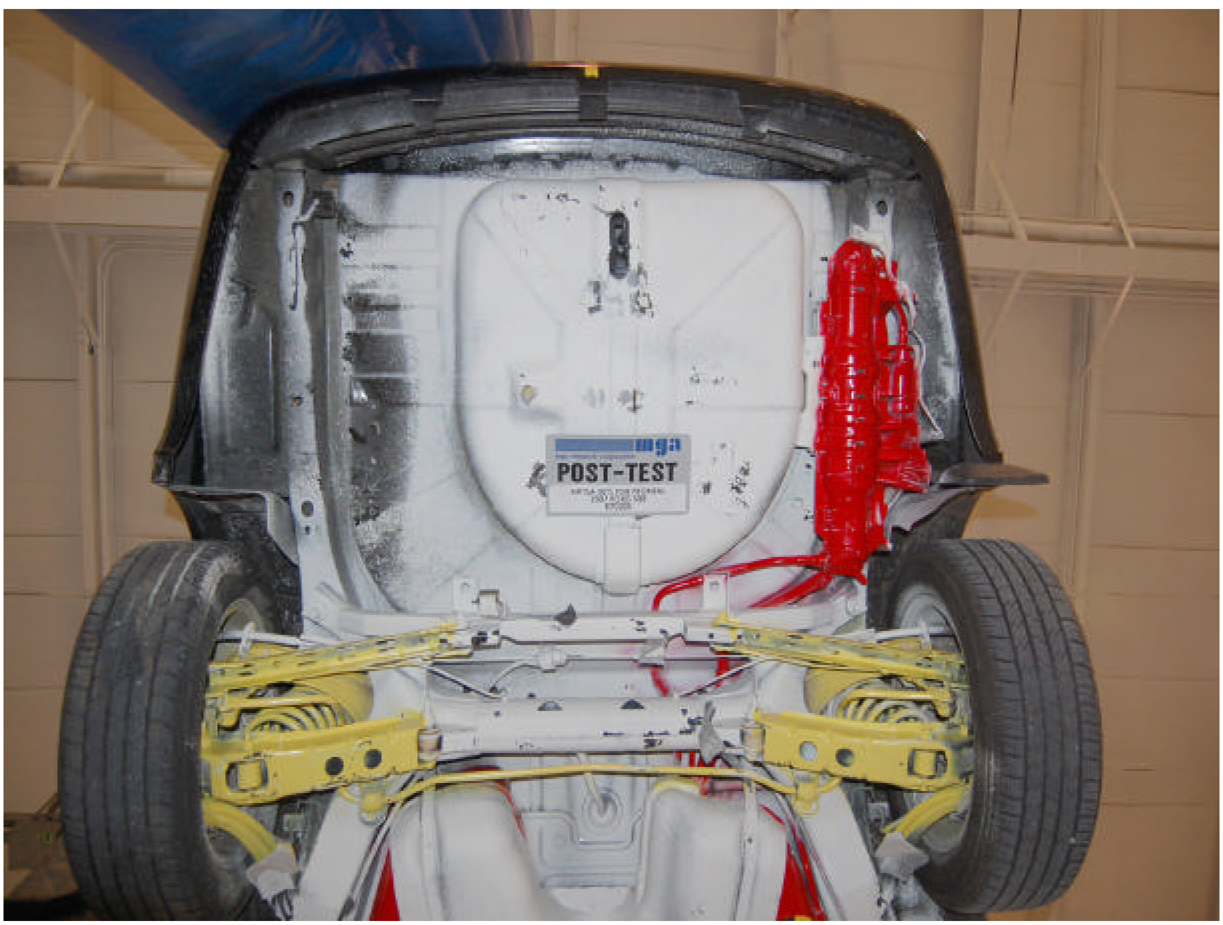


Pre-Test Mid Rear Underbody View



Post-Test Mid Rear Underbody View

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 (Through Window)

Post-Test Driver Dummy (Through Window)

Pre-Test Driver Dummy (Door Open)

Post-Test Driver Dummy (Door Open)

Pre-Test Driver Dummy Abdomen View Close-Up

Post-Test Driver Dummy Abdomen View Close-Up

Pre-Test Driver Dummy Feet

Post-Test Driver Dummy Feet

Pre-Test Driver Dummy Foot/Leg Close-Up

Post-Test Driver Dummy Foot/Leg Close-Up

Pre-Test Driver Side Knee Bolster

Post-Test Driver Side Knee Bolster

Pre-Test Driver Side Floor Pan

Post-Test Driver Side Floor Pan

Post-Test Driver Dummy Head Contact (headrest)

Post-Test Driver Dummy Knee Contact View 1

Post-Test Driver Dummy Knee Contact View 2

Post-Test Driver Dummy Airbag Contact

Pre-Test Left Rear Passenger Dummy (Through Window)

Post-Test Left Rear Passenger Dummy (Through Window)

Pre-Test Left Rear Passenger Dummy (Door Open)

Post-Test Left Rear Passenger Dummy (Door Open)

Pre-Test Left Rear Passenger Dummy Leg Position View

Post-Test Left Rear Passenger Dummy Leg Position View

Pre-Test Left Rear Passenger Dummy Feet Position View

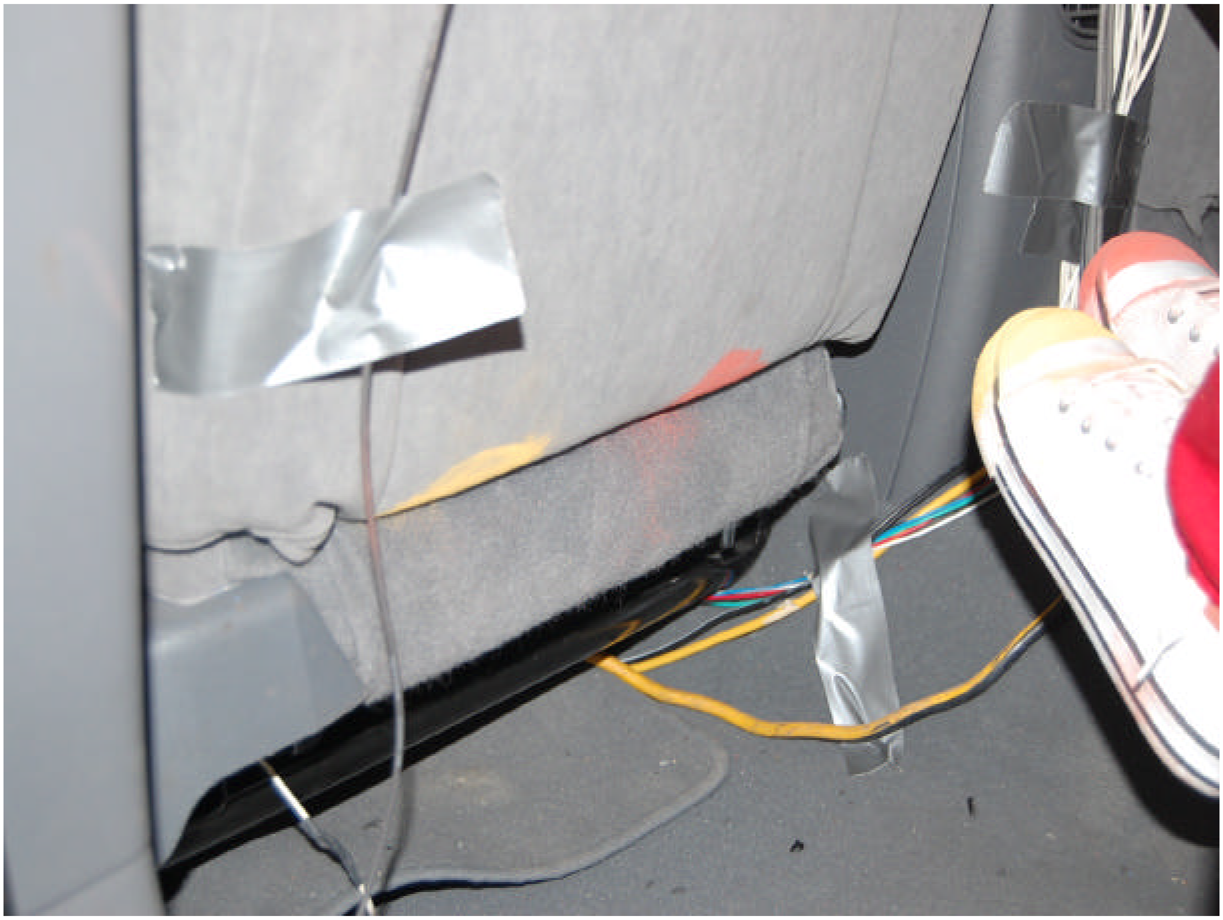
Post-Test Left Rear Passenger Dummy Feet Position View

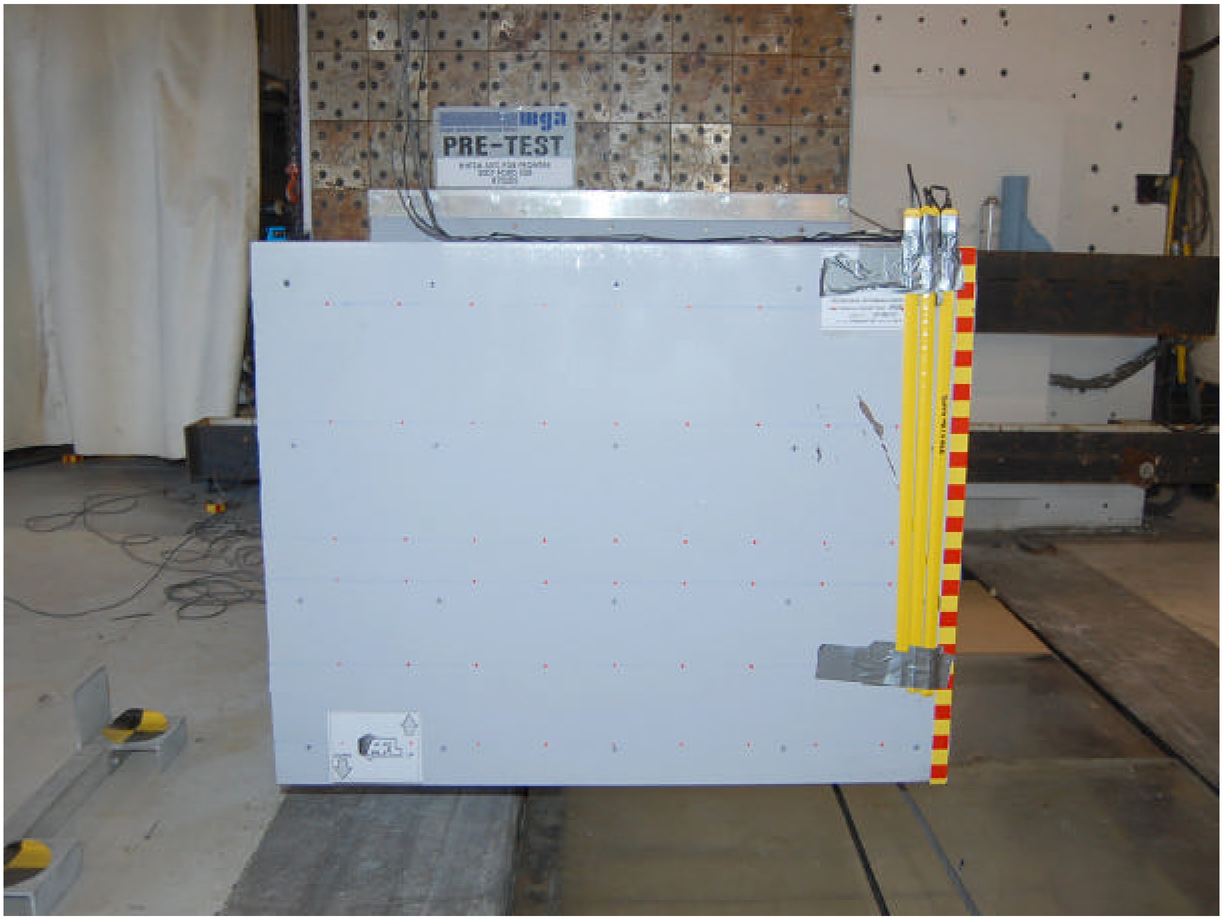
Pre-Test Left Rear Passenger Dummy Right Side View

Post-Test Left Rear Passenger Dummy Right Side View

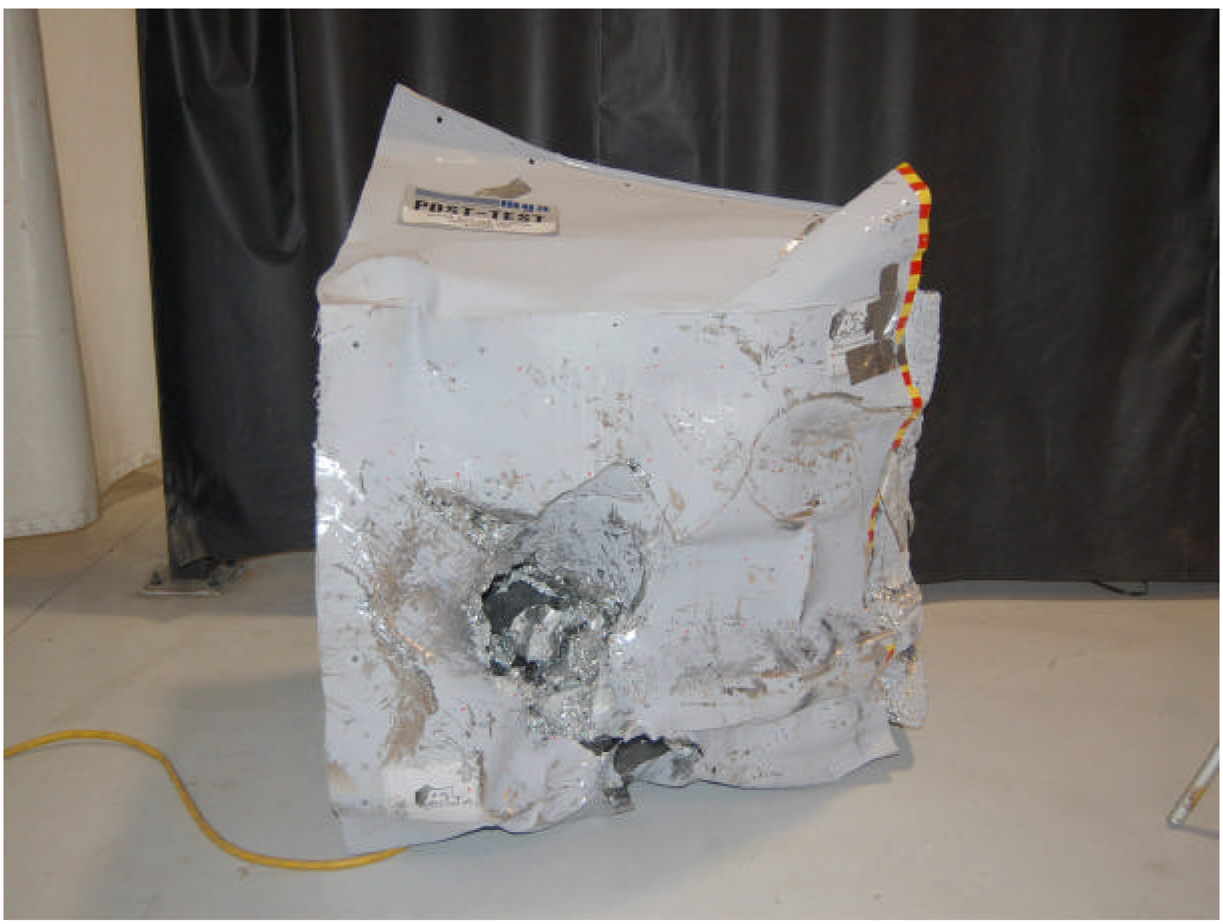
Post-Test Left Rear Passenger Dummy Head Contact View 1


Post-Test Left Rear Passenger Dummy Head Contact View 2


Post-Test Left Rear Passenger Dummy Foot Contact View

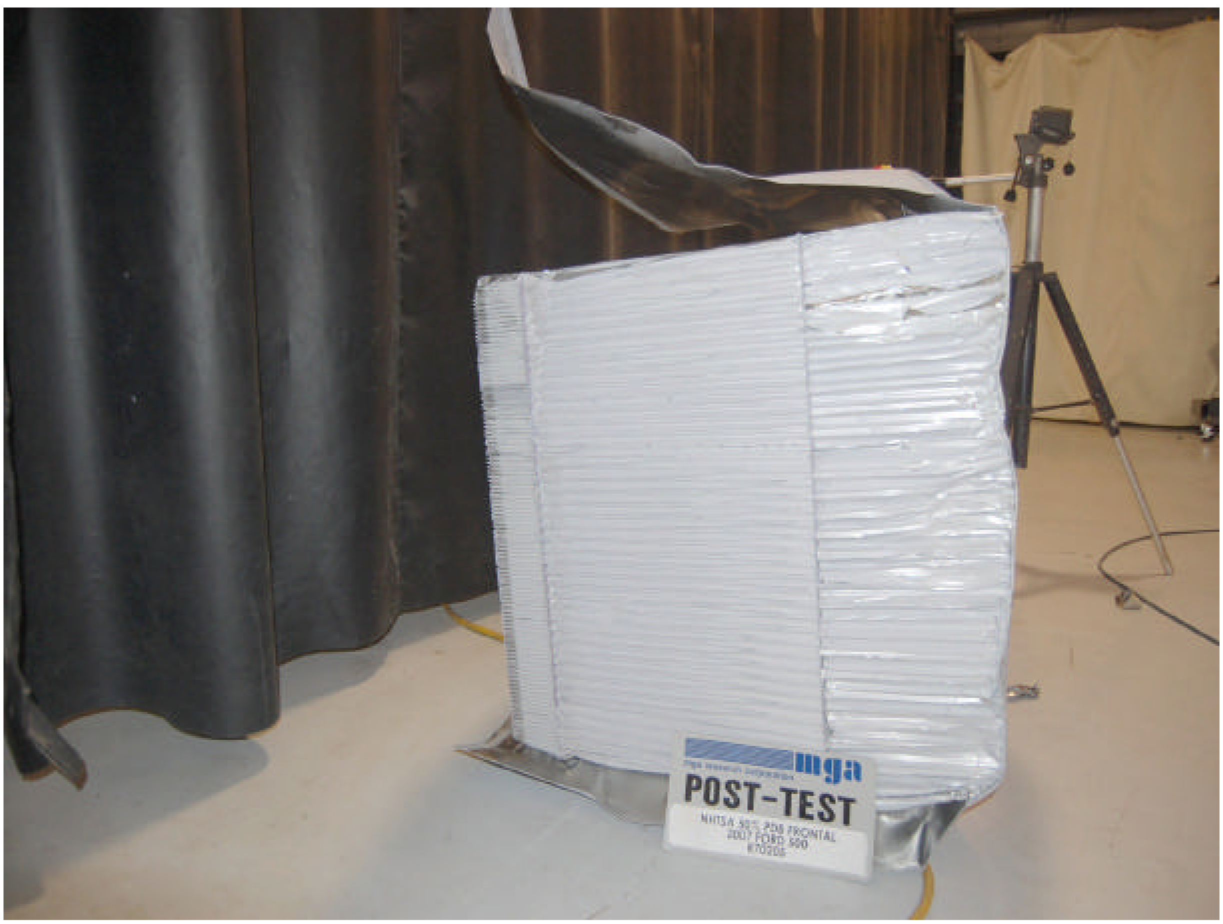


Pre-Test Offset Deformable Barrier Front View



Post-Test Offset Deformable Barrier Front View

Pre-Test Offset Deformable Barrier Left Side View



Post-Test Offset Deformable Barrier Left Side View

Pre-Test Offset Deformable Barrier Left Side ¾ View

Post-Test Offset Deformable Barrier Left Side ¾ View

Pre-Test Offset Deformable Barrier Right Side View

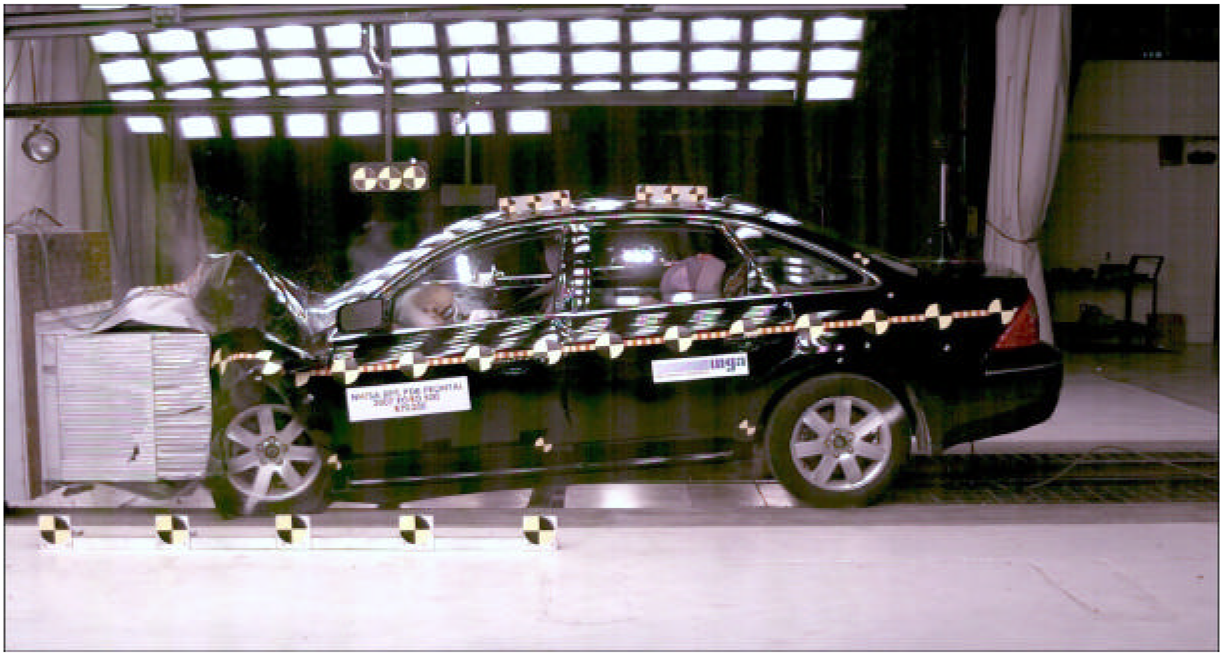
Post-Test Offset Deformable Barrier Right Side View

Pre-Test Offset Deformable Barrier Right Side ¾ View

Post-Test Offset Deformable Barrier Right Side ¾ View

Pre-Test Offset Deformable Barrier Overhead View

Post-Test Offset Deformable Barrier Overhead View



Vehicle Impact

Pre-Test Left Side A Pillar (Frontal View)

Post-Test Left Side A Pillar (Frontal View)

Pre-Test Left Side A Pillar (¾ Frontal View)

Post-Test Left Side A Pillar (¾ Frontal View)

Pre-Test Left Side A Pillar (¾ Rear View)

Post-Test Left Side A Pillar (¾ Rear View)

Pre-Test Left Side B Pillar (¾ Front View)

Post-Test Left Side B Pillar (¾ Front View)

Pre-Test Left Side B Pillar (Left Side View)

Post-Test Left Side B Pillar (Left Side View)

Pre-Test Left Side B Pillar (¾ Rear View)

Post-Test Left Side B Pillar (¾ Rear View)

Pre-Test Left Side C Pillar (Frontal View)

Pre-Test Left Side C Pillar (Left Side View)

Post-Test Left Side C Pillar (Left Side View)

Pre-Test Left Side C Pillar (¾ Rear View)

Post-Test Left Side C Pillar (¾ Rear View)

Pre-Test Left Side Sill Front Half View

Post-Test Left Side Sill Front Half View

Pre-Test Left Side Sill Rear Half View

Post-Test Left Side Sill Rear Half View

Pre-Test Right Side A Pillar (Frontal View)

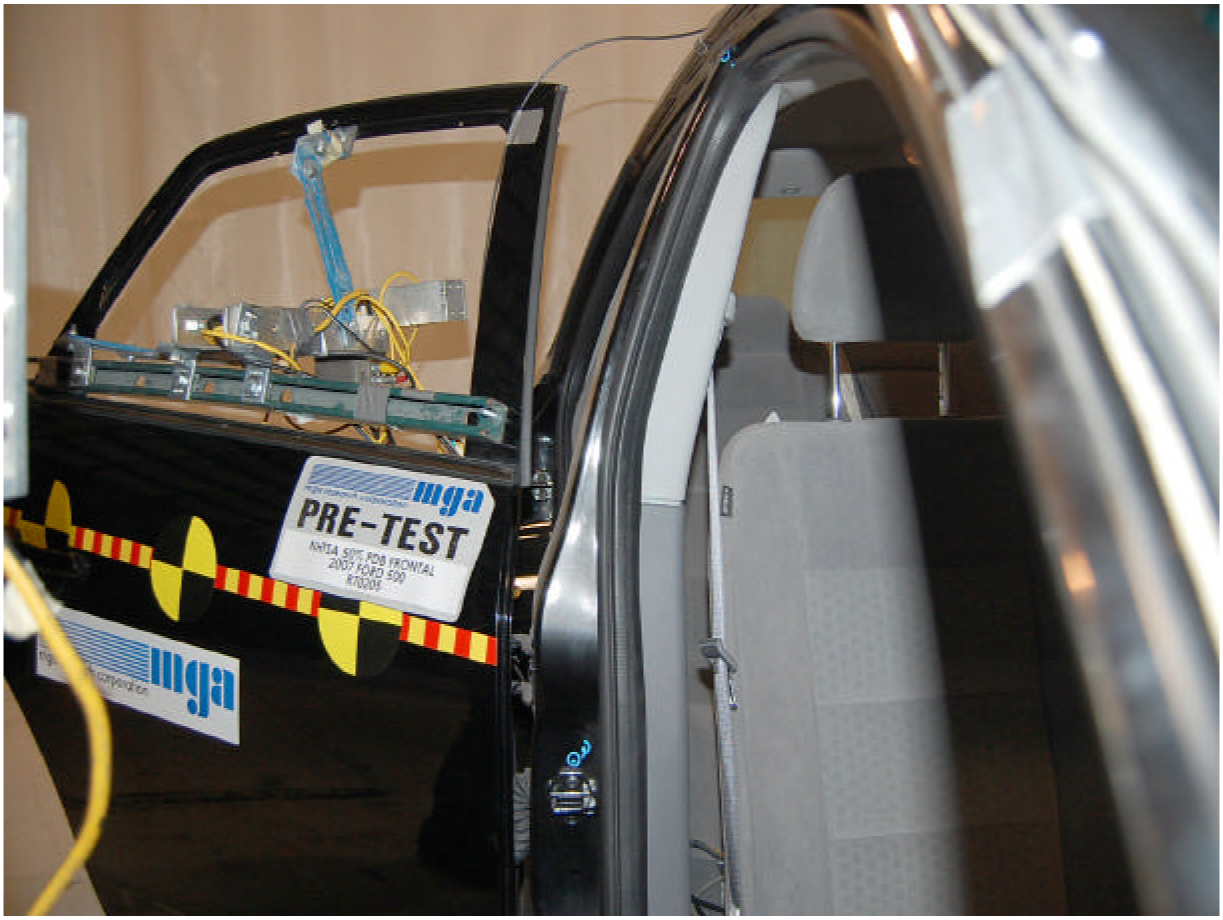
Post-Test Right Side A Pillar (Frontal View)

Pre-Test Right Side A Pillar (¾ Front View)

Post-Test Right Side A Pillar (¾ Front View)

Pre-Test Right Side A Pillar (¾ Rear View)

Post-Test Right Side A Pillar (¾ Rear View)



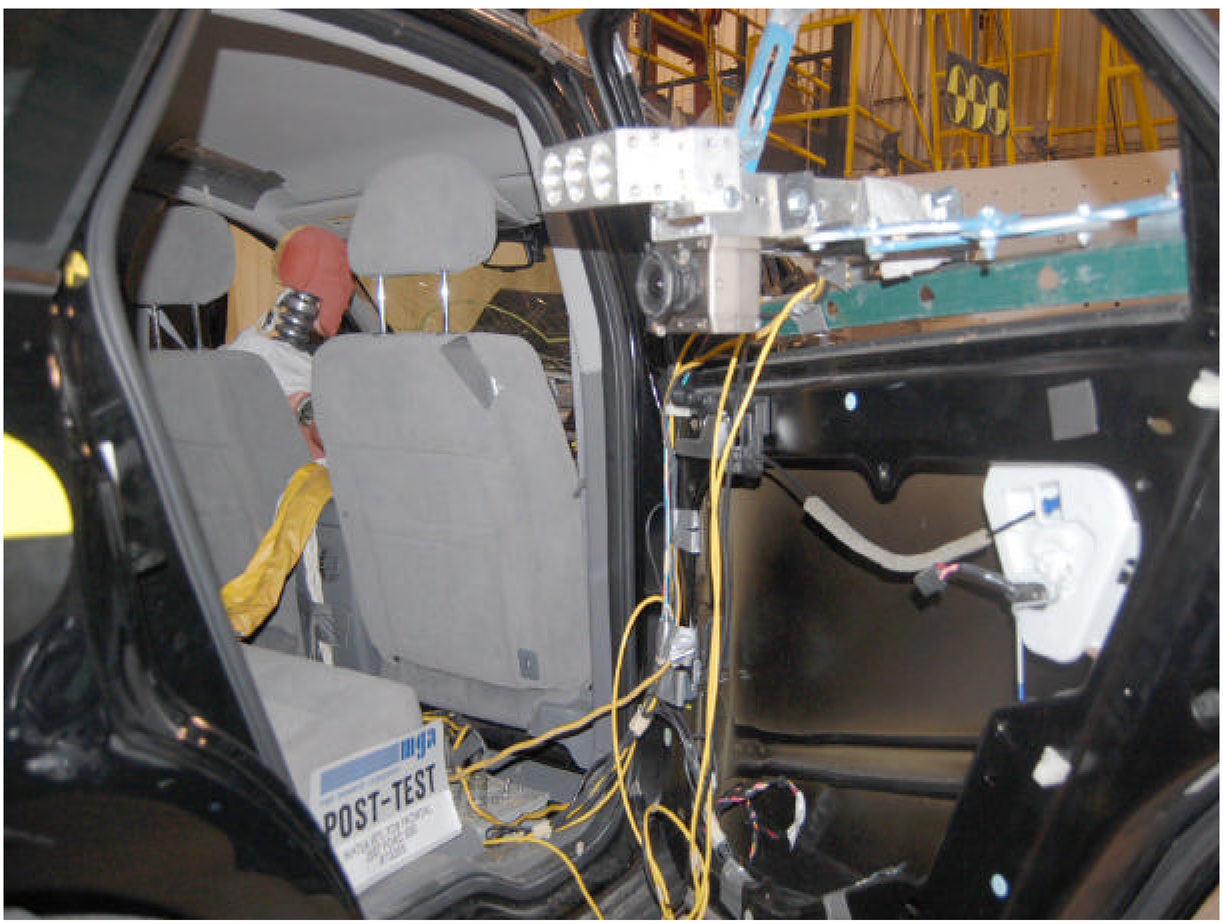
Pre-Test Right Side B Pillar (¾ Front View)

Post-Test Right Side B Pillar (¾ Front View)

Pre-Test Right Side B Pillar (Right Side View)

Post-Test Right Side B Pillar (Right Side View)

Pre-Test Right Side B Pillar (¾ Rear View)



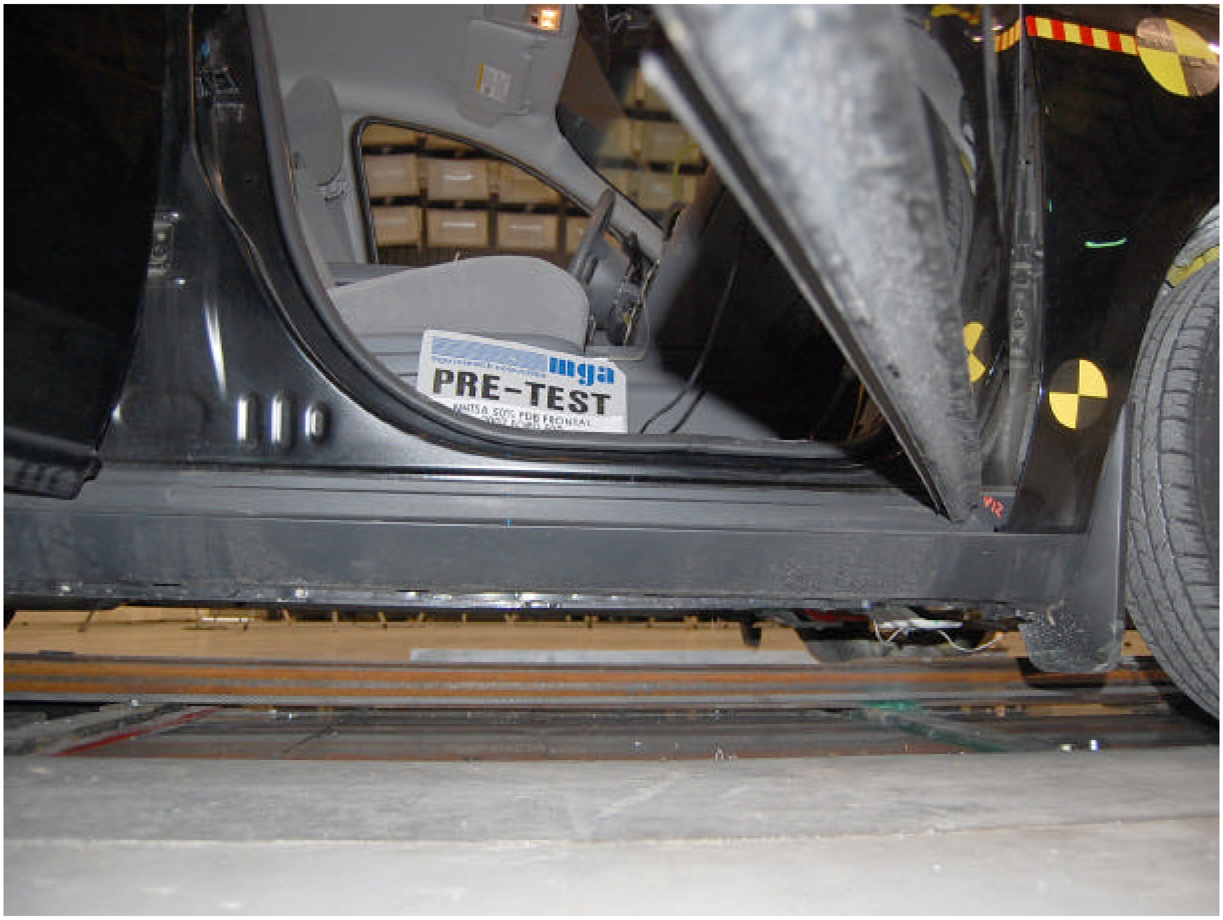
Post-Test Right Side B Pillar (¾ Rear View)

Pre-Test Right Side C Pillar (Frontal View)

Post-Test Right Side C Pillar (Frontal View)

Pre-Test Right Side C Pillar (¾ Front View)

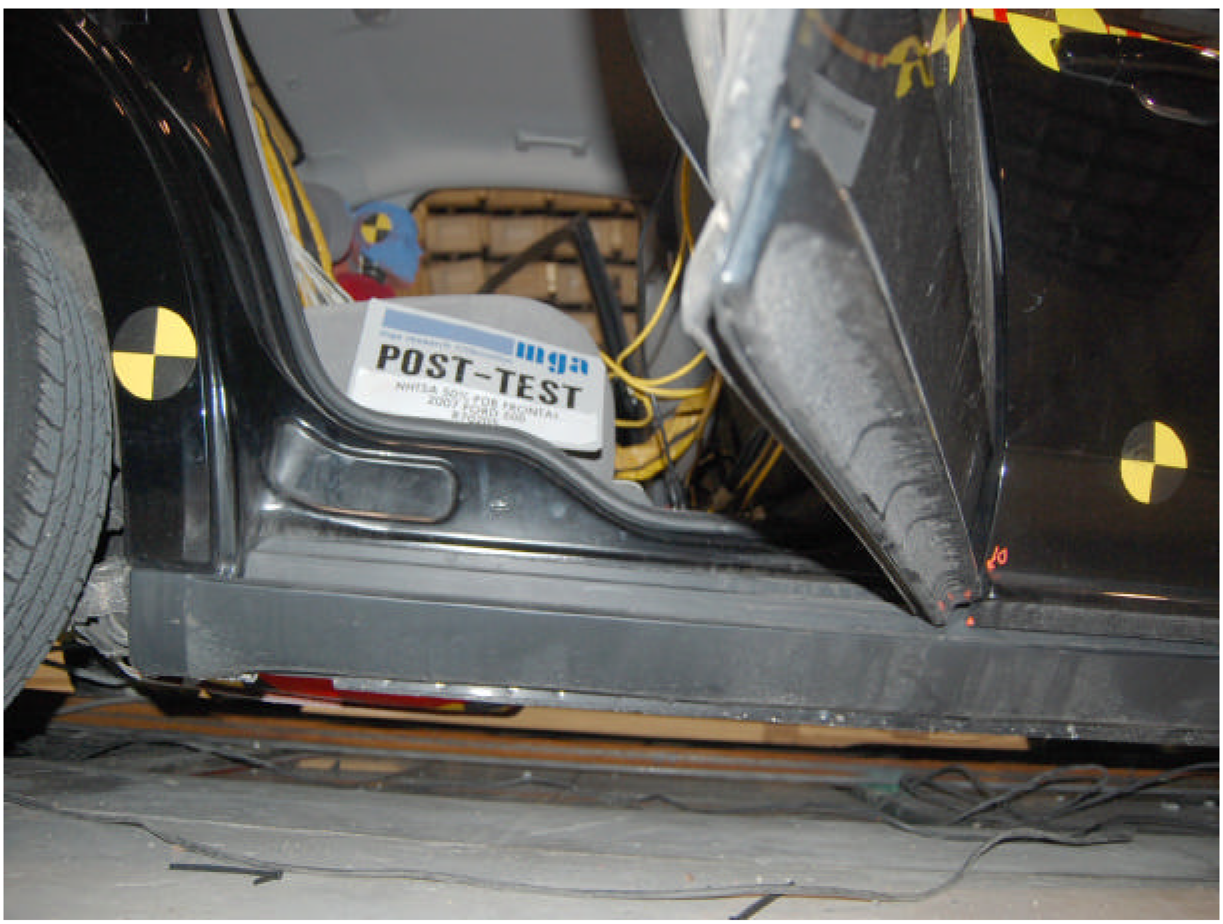
Post-Test Right Side C Pillar (¾ Front View)



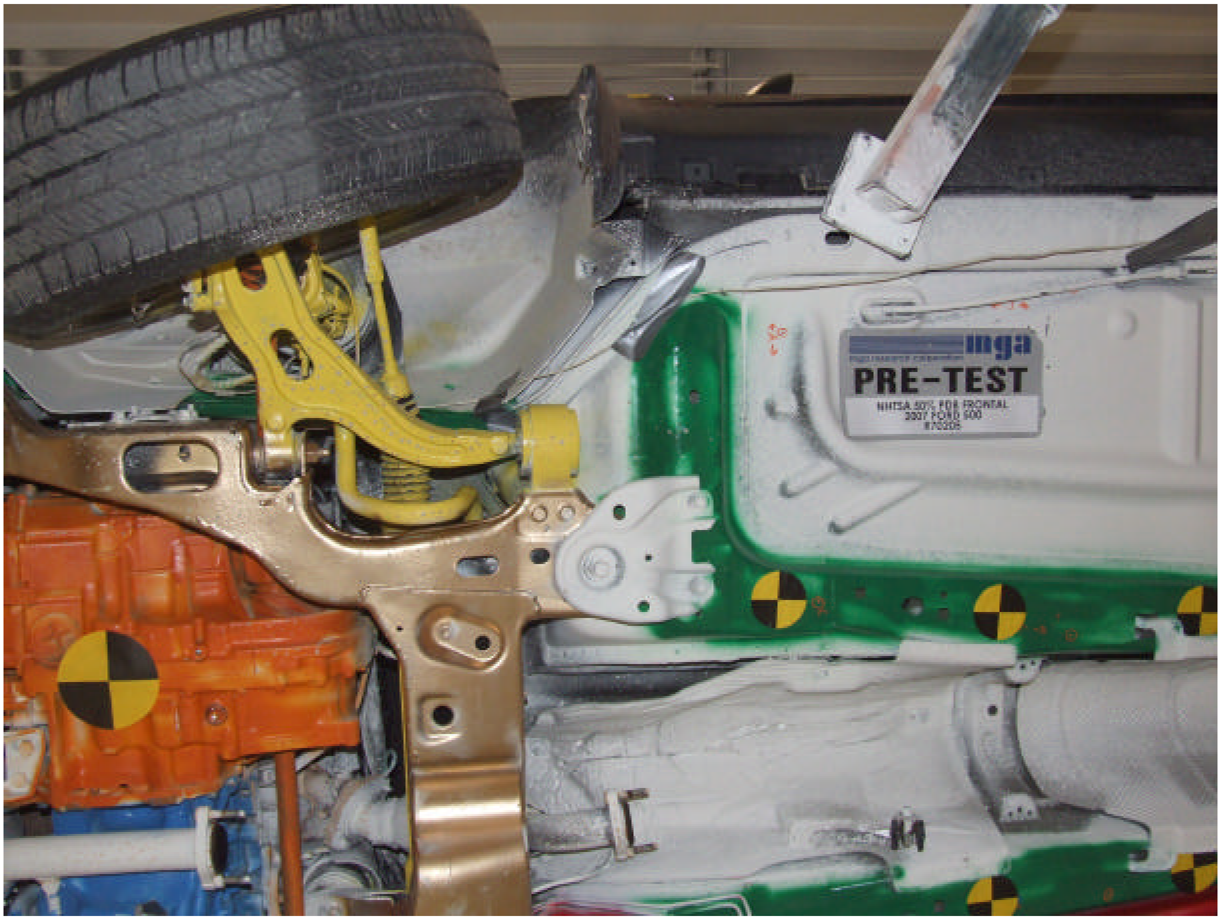
Pre-Test Right Side Sill Front Half View

Post-Test Right Side Sill Front Half View

Pre-Test Right Side Sill Rear Half View



Post-Test Right Side Sill Rear Half View



Pre-Test Left Side Rocker View 1

Post-Test Left Side Rocker View 1

Pre-Test Left Side Rocker View 2

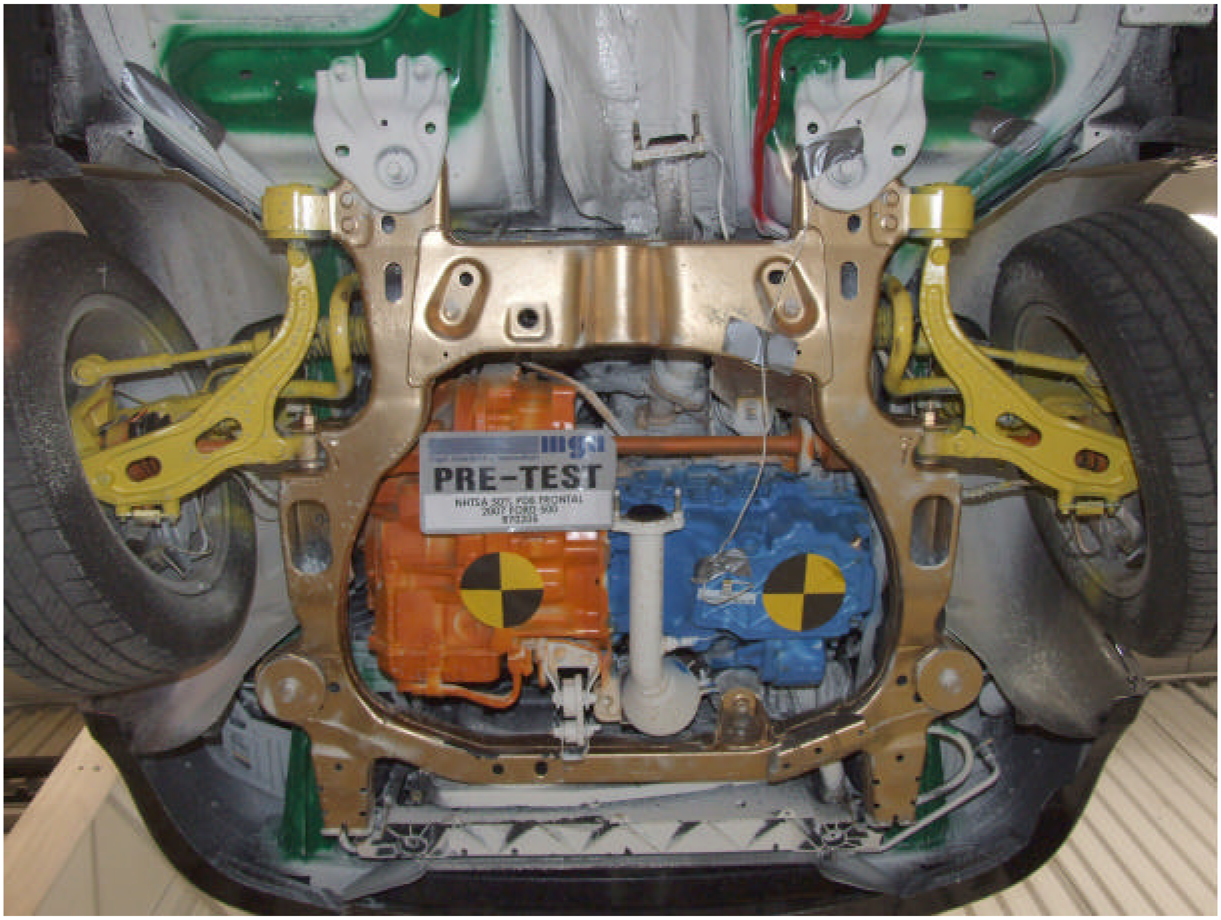
Post-Test Left Side Rocker View 2

Pre-Test Left Front Wheel Well

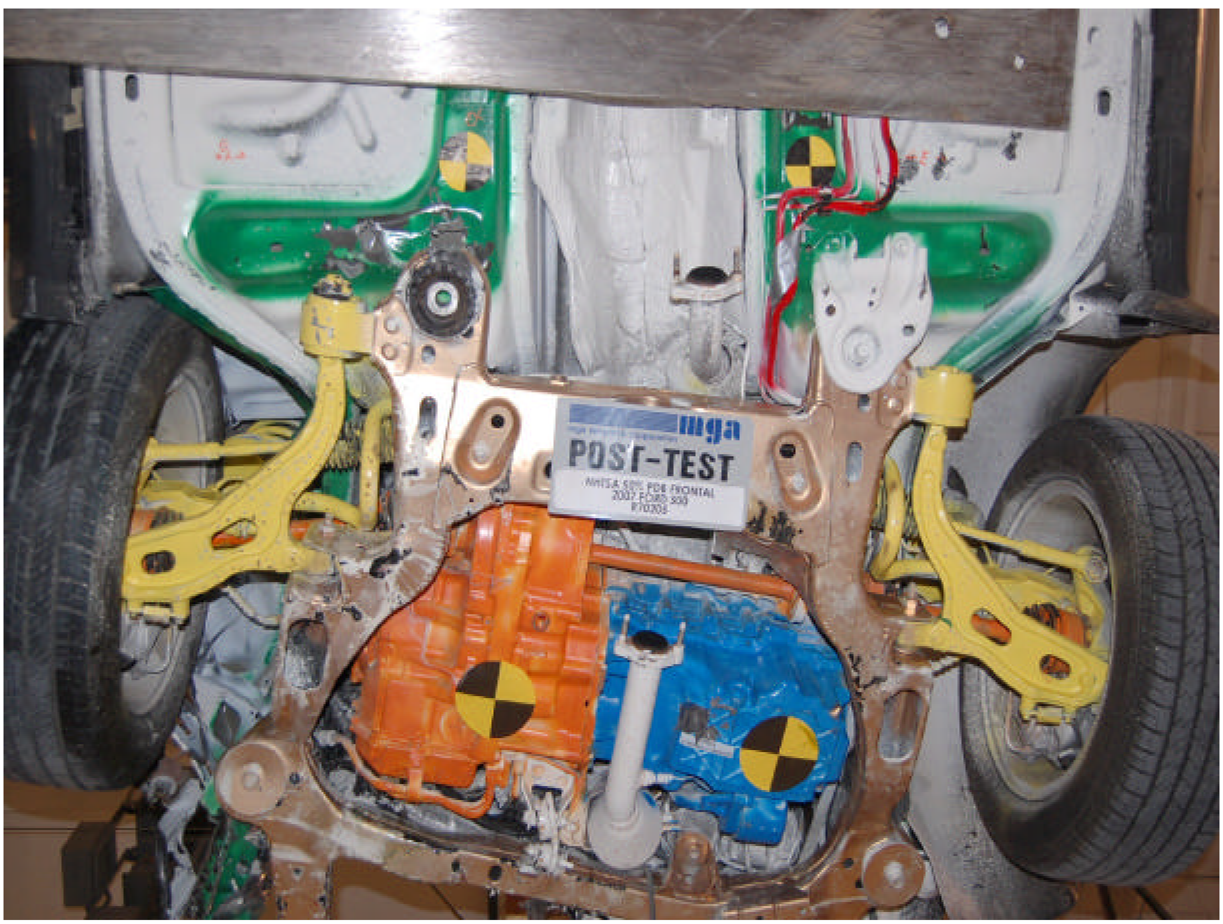
Post-Test Left Front Wheel Well

Pre-Test Left Front Shotgun

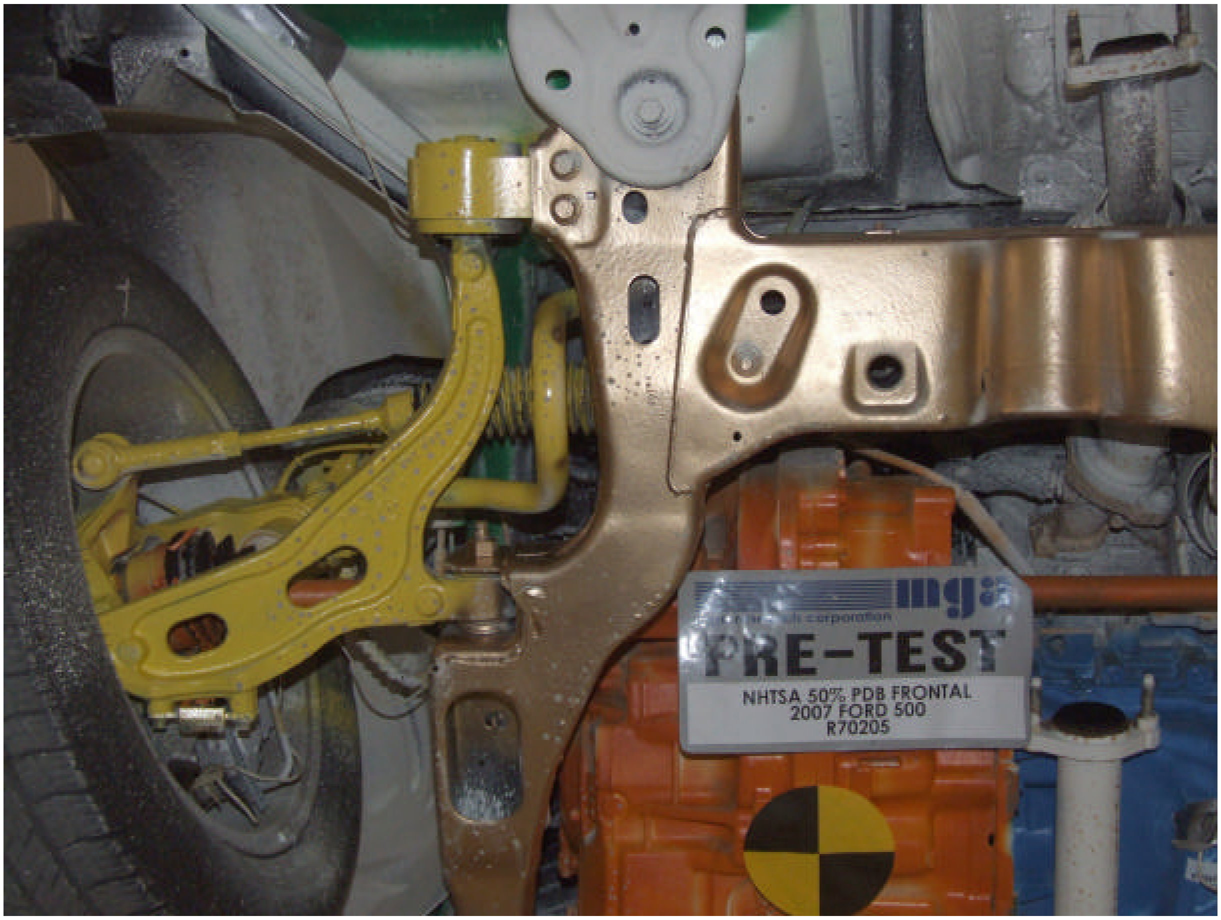
Post-Test Left Front Shotgun



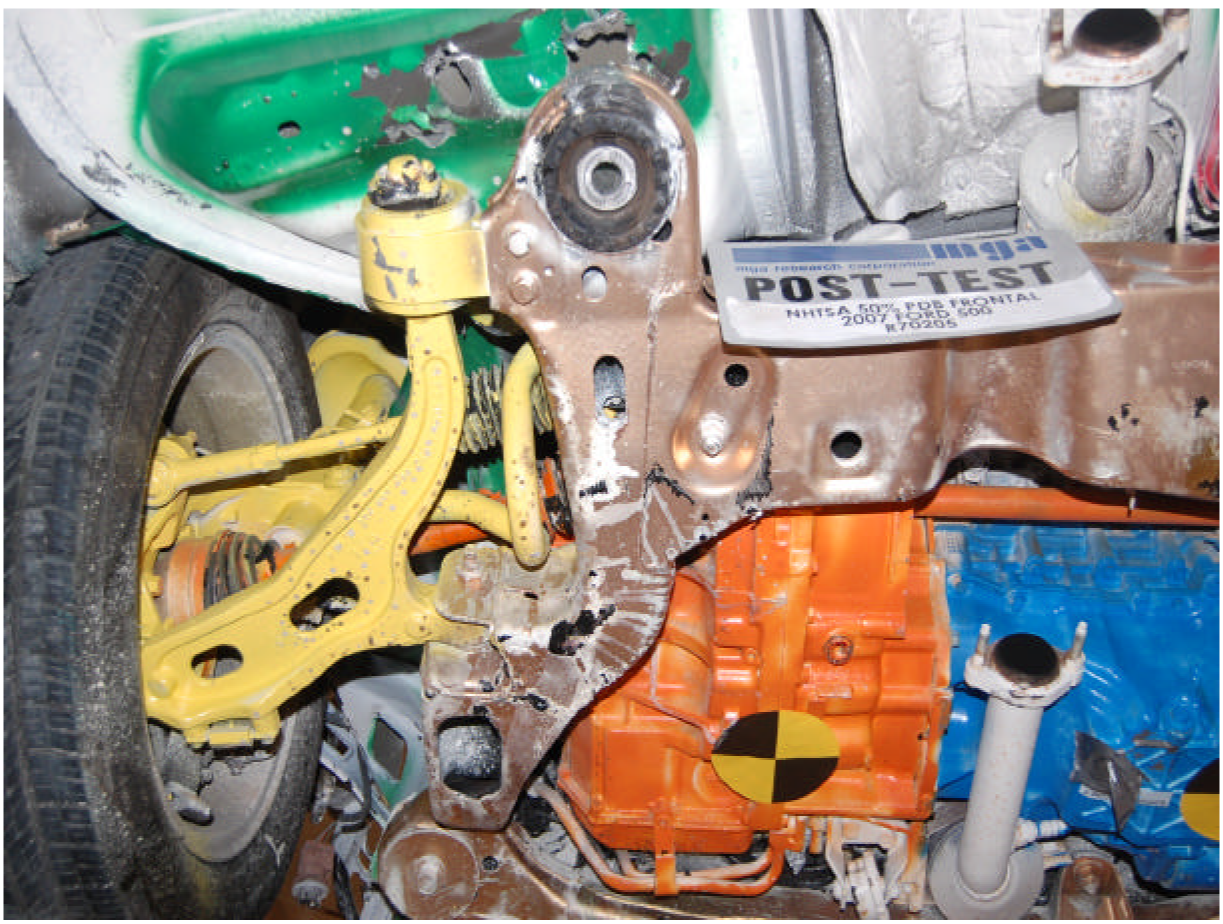
Pre-Test Steering Rack View



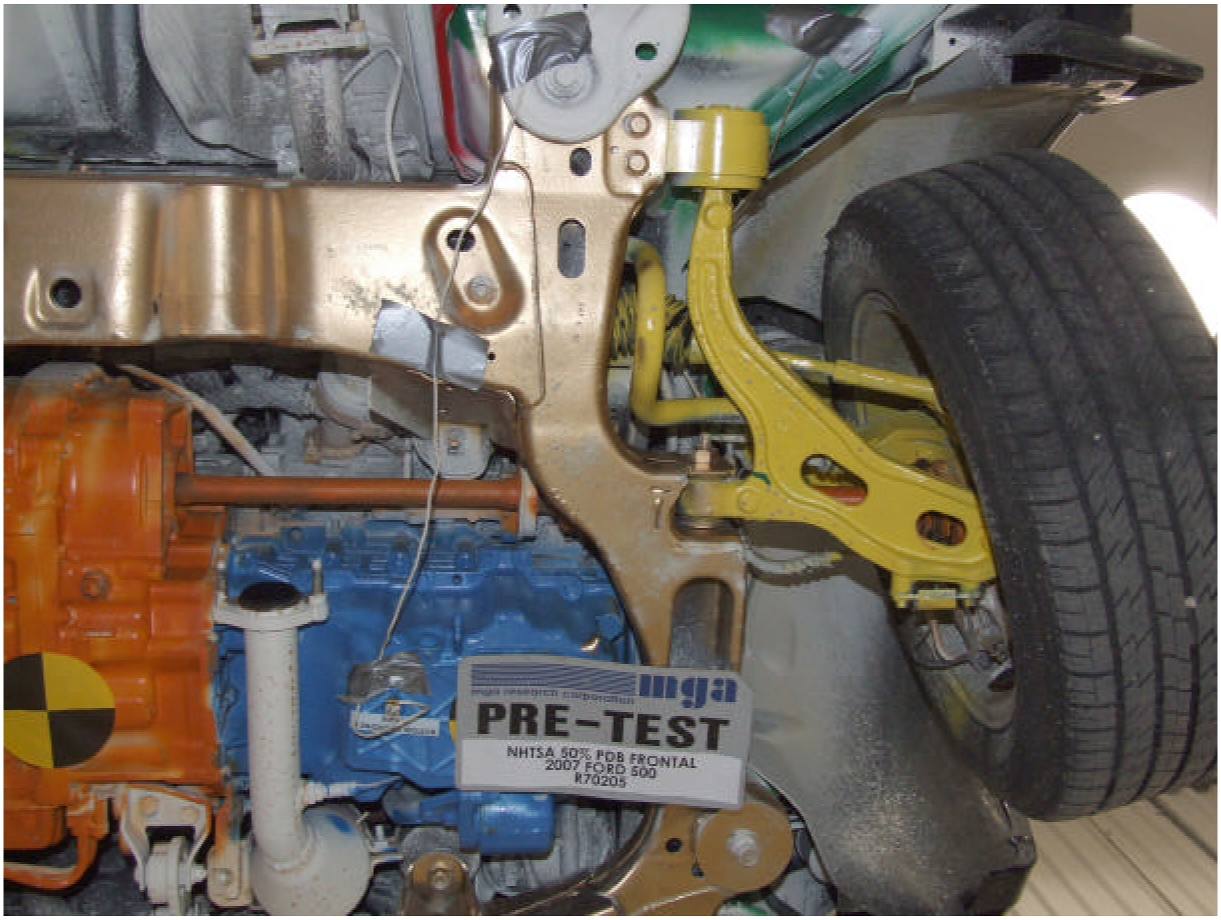
Post-Test Steering Rack View



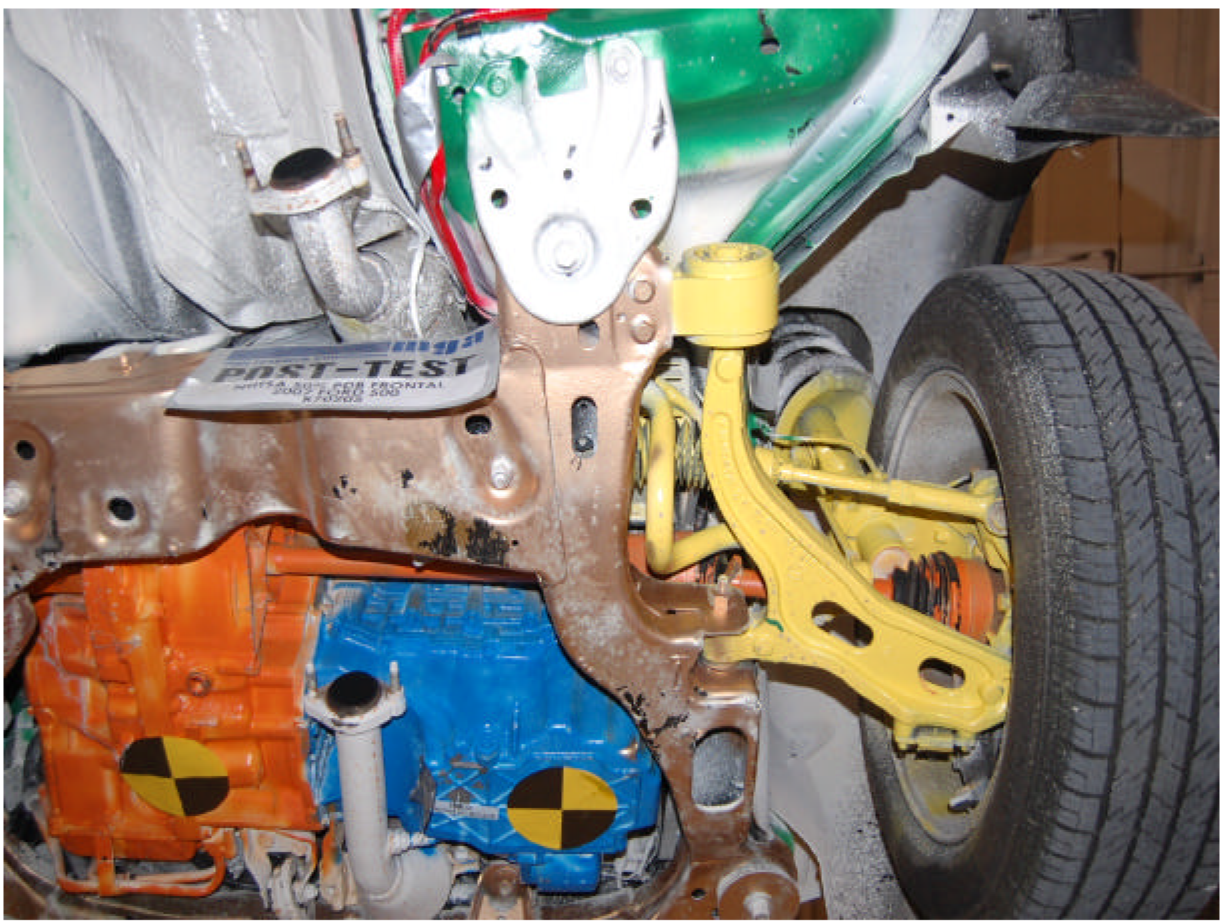
Pre-Test Steering Rack Left Side View



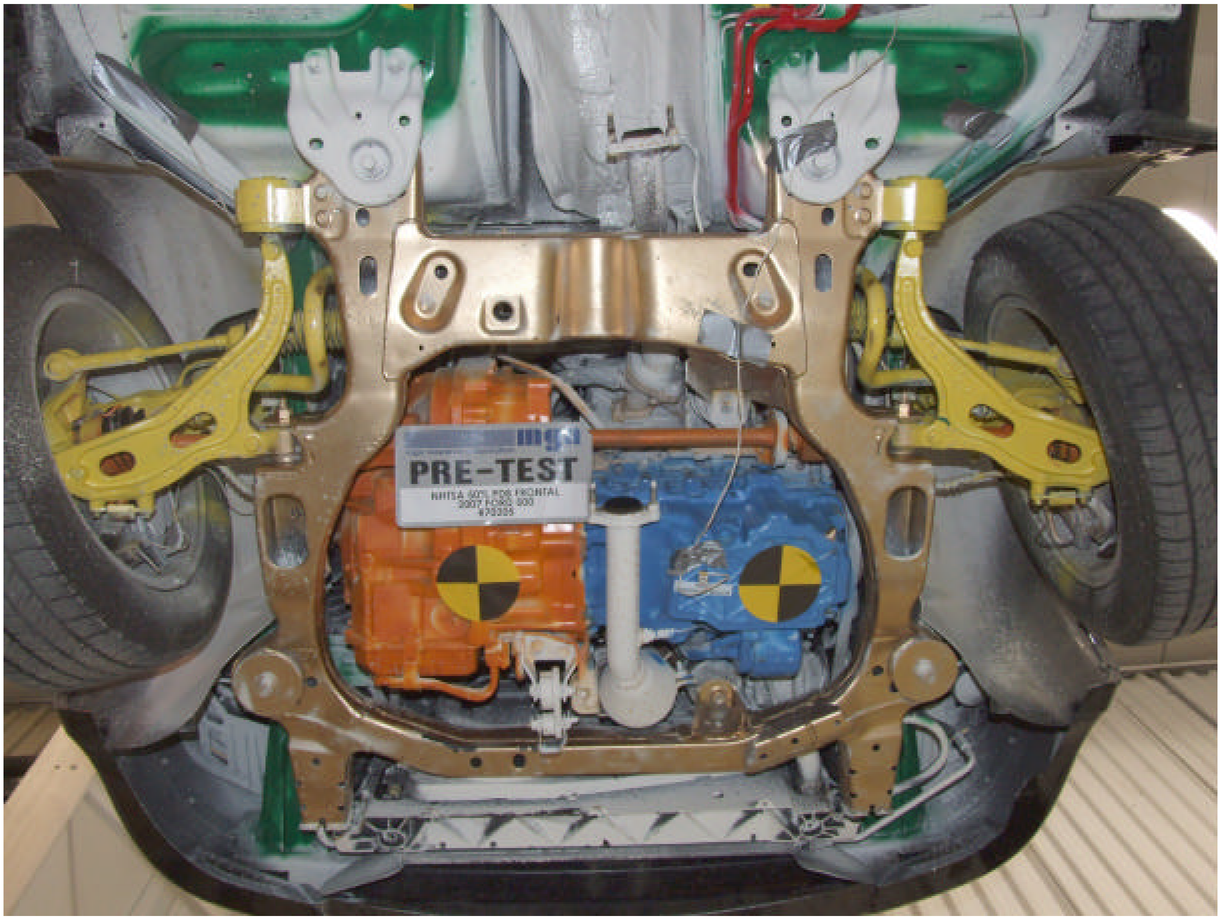
Post-Test Steering Rack Left Side View



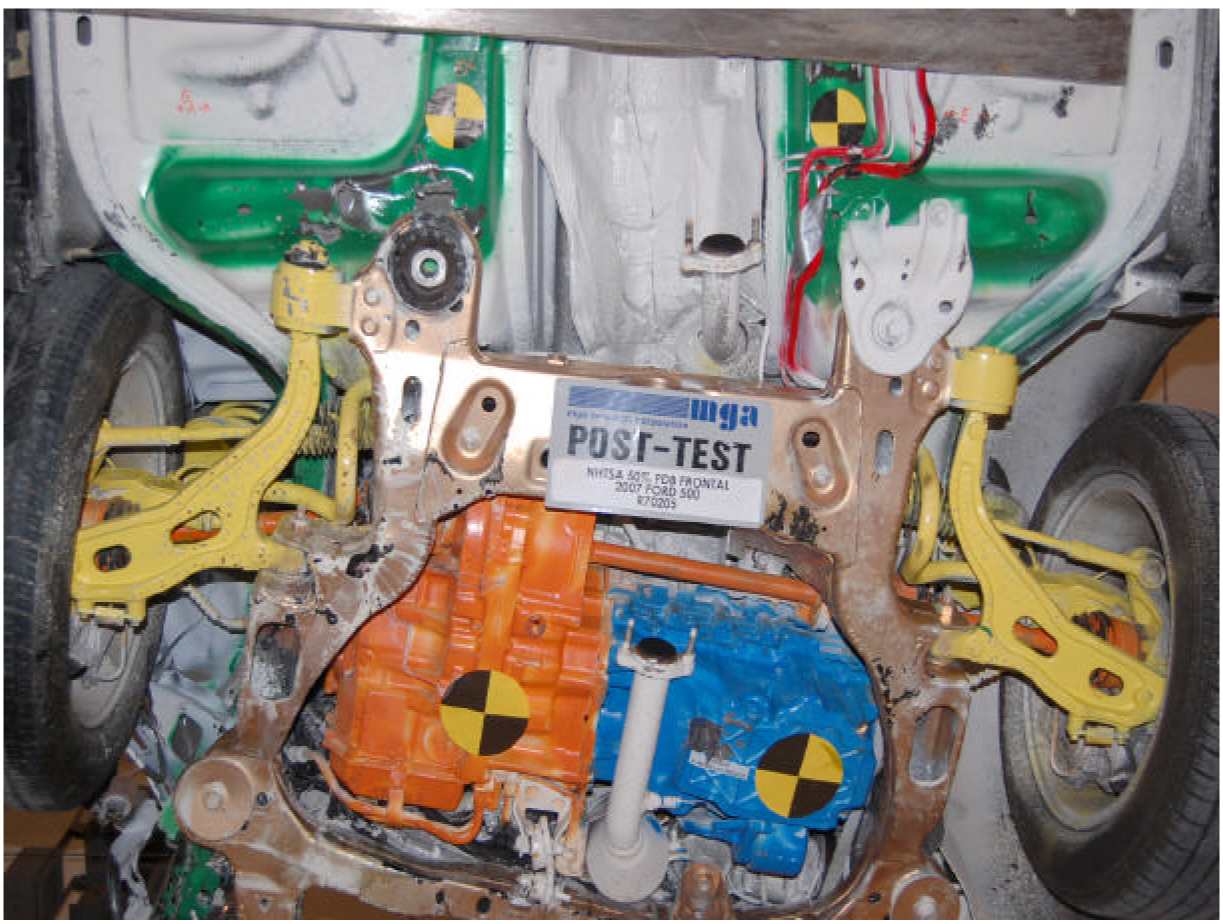
Pre-Test Steering Rack Right Side View



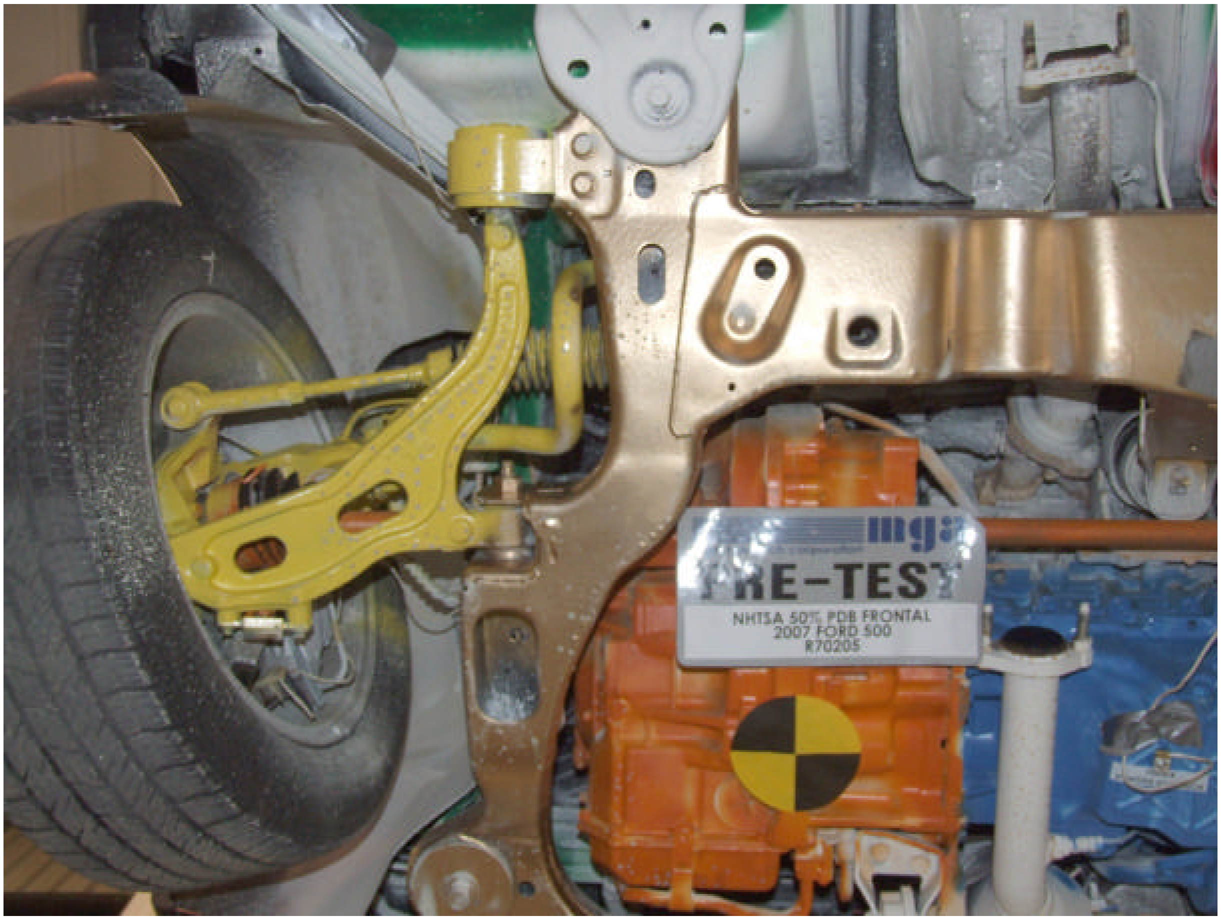
Post-Test Steering Rack Right Side View



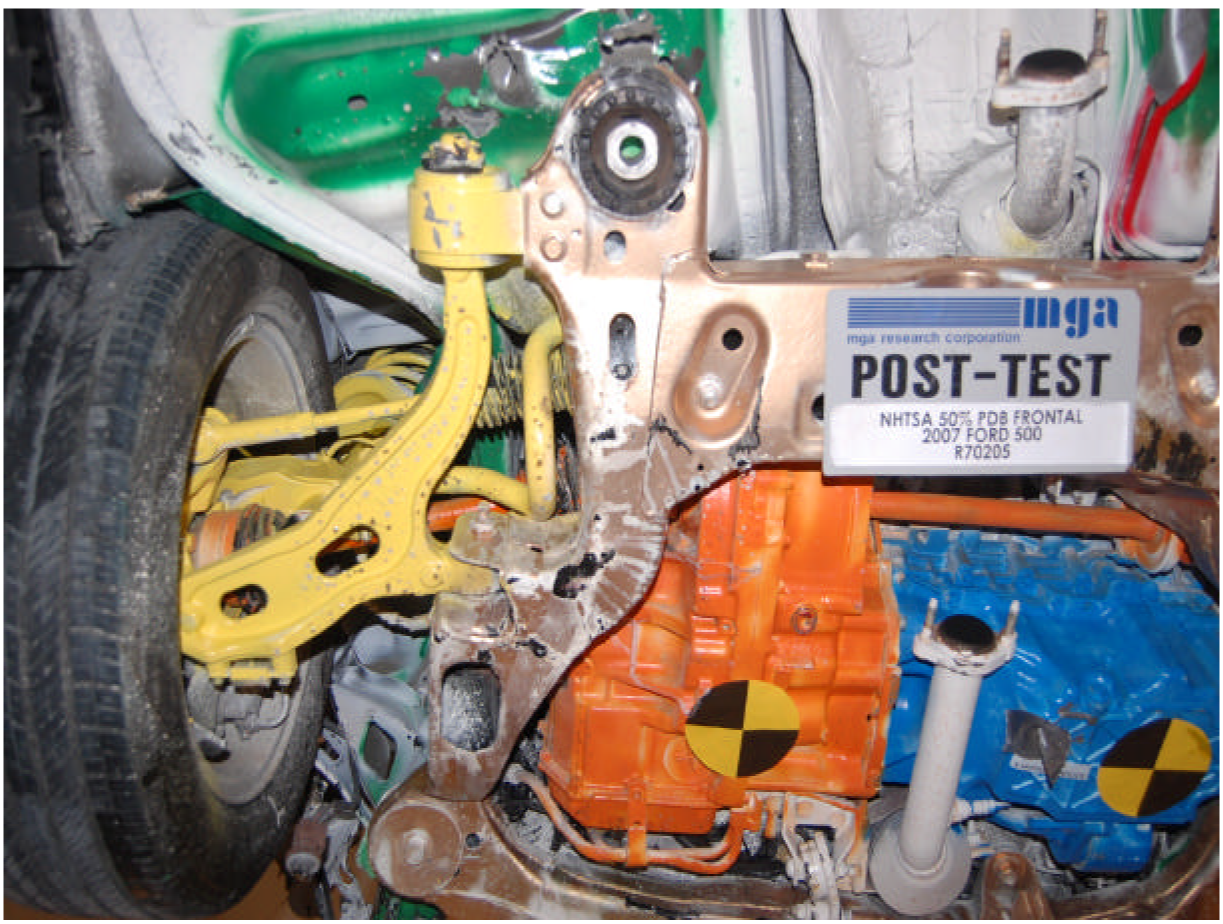
Pre-Test Sway Bar View



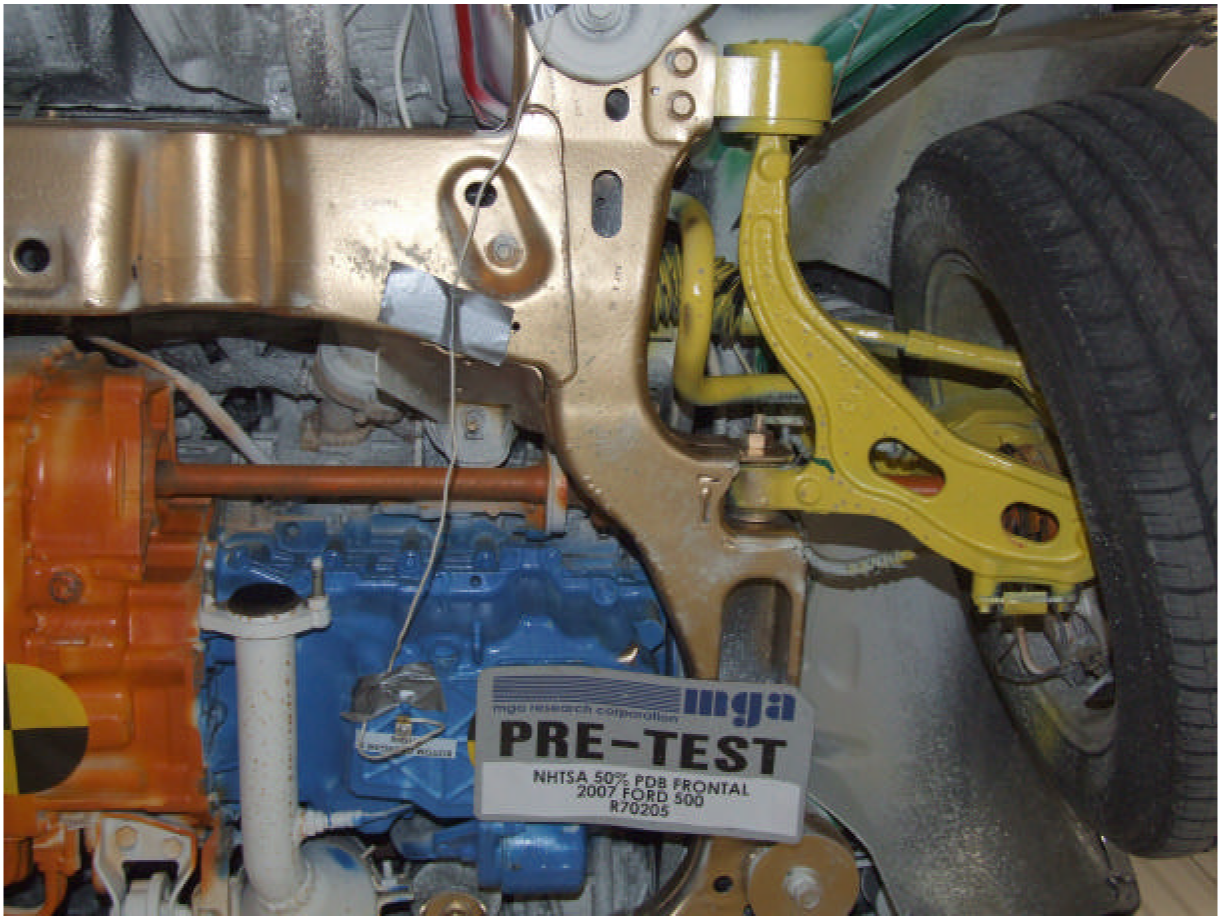
Post-Test Sway Bar View



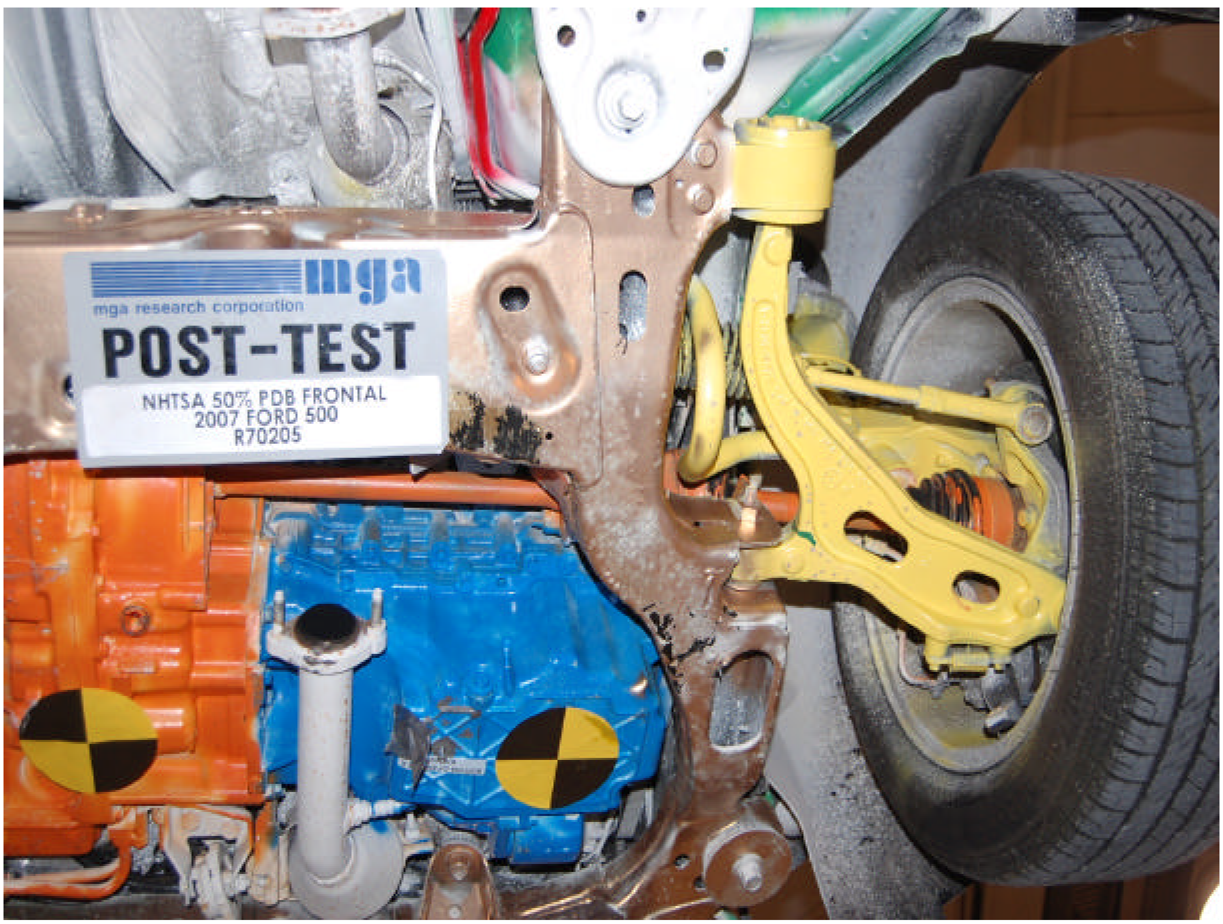
Pre-Test Sway Bar Left Side View



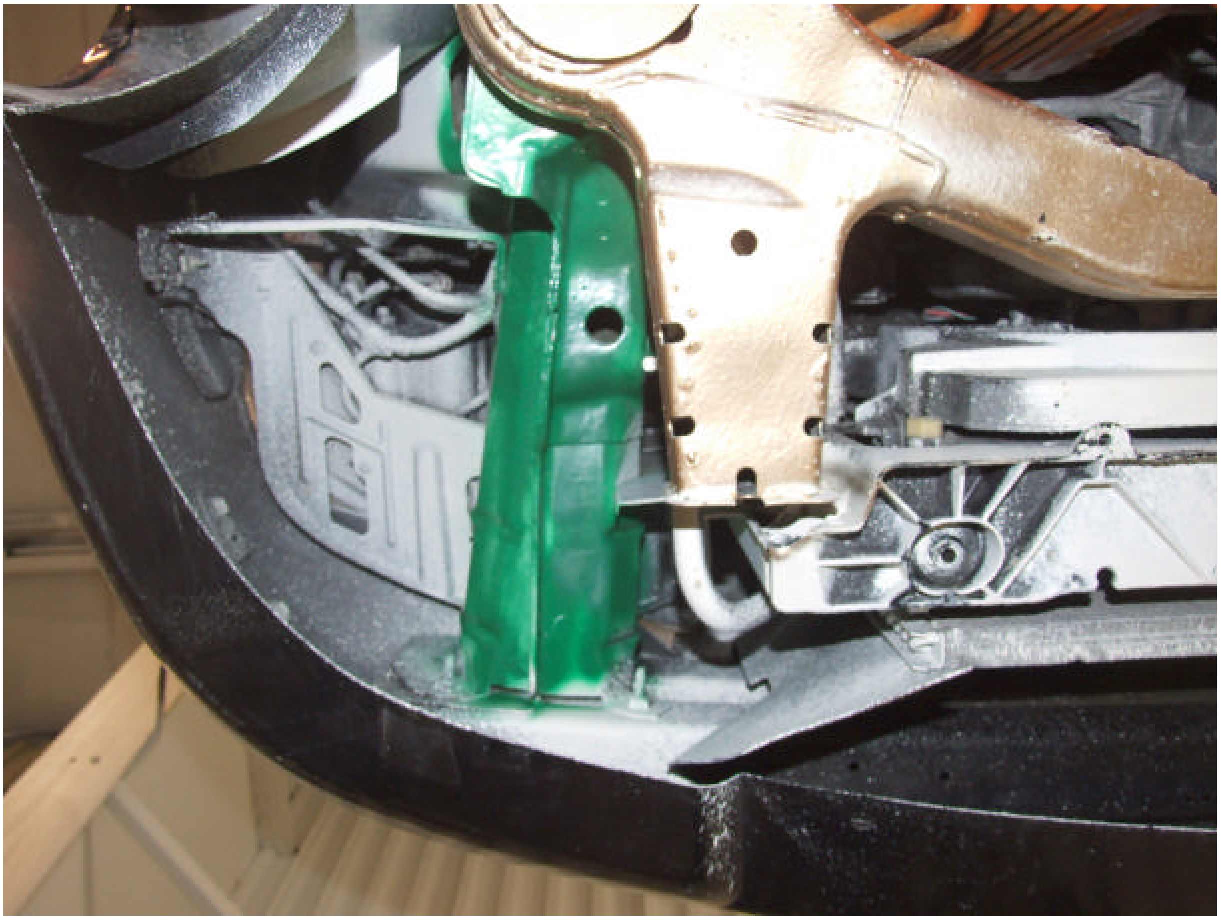
Post-Test Sway Bar Left Side View



Pre-Test Sway Bar Right Side View

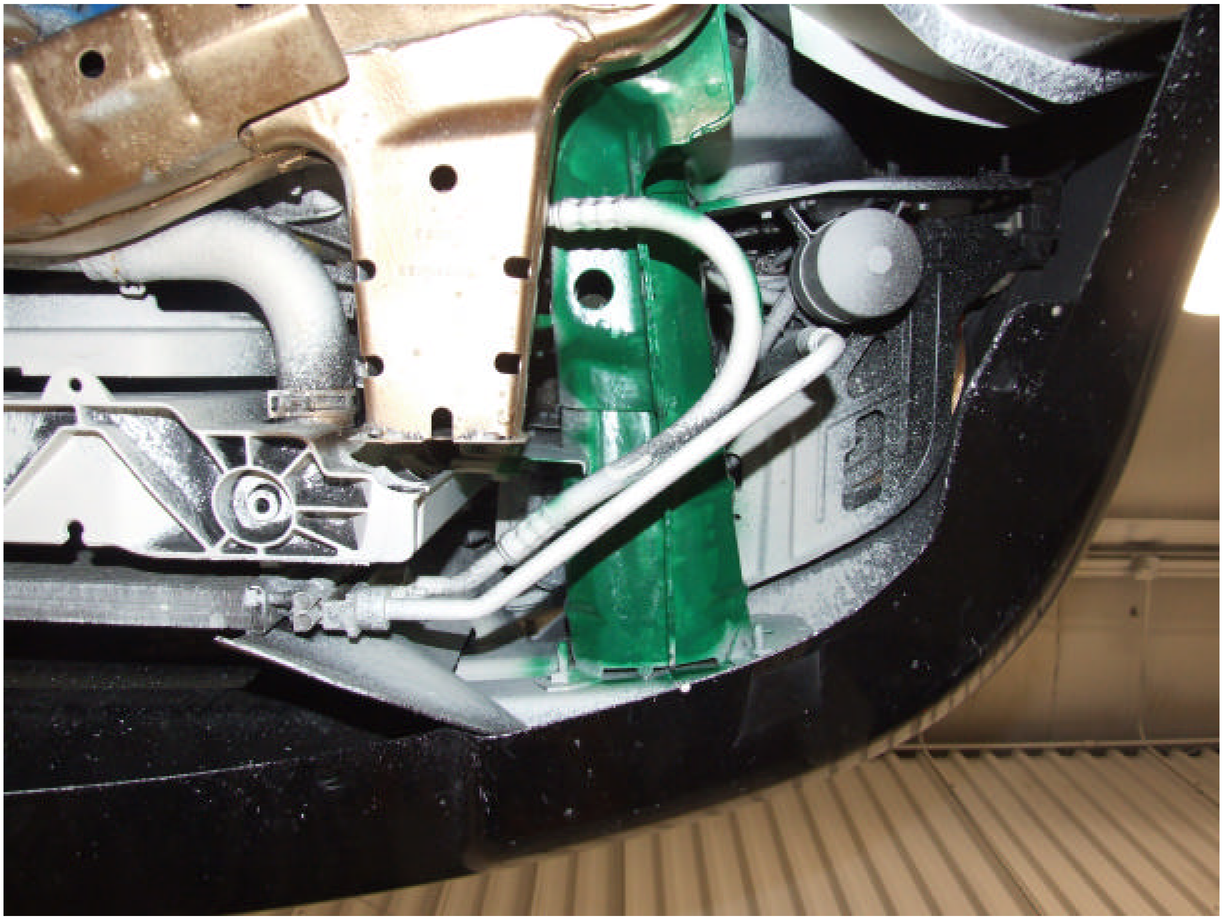


Post-Test Sway Bar Right Side View



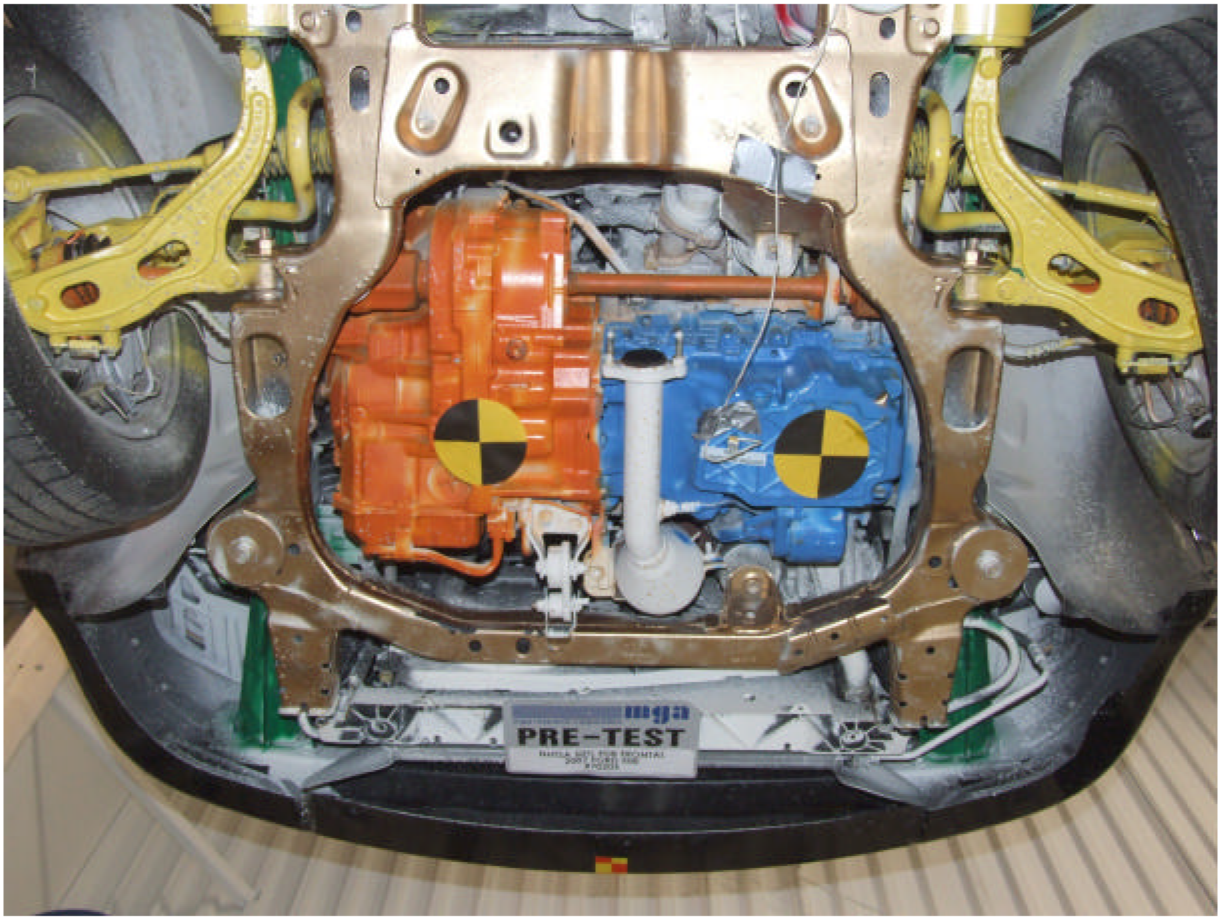
Pre-Test Left Bumper to Rail Attachment View

Post-Test Left Bumper to Rail Attachment View

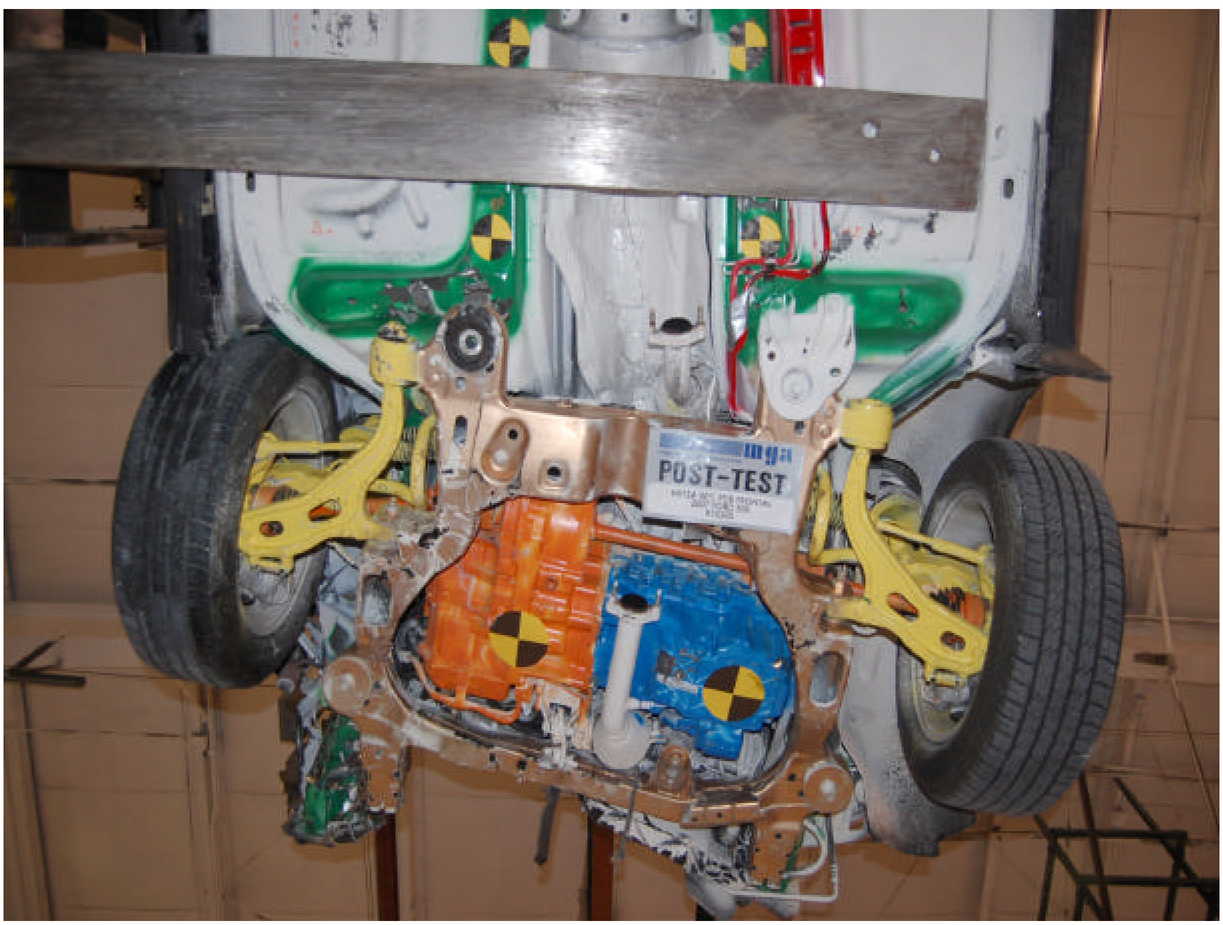


Pre-Test Right Bumper to Rail Attachment View

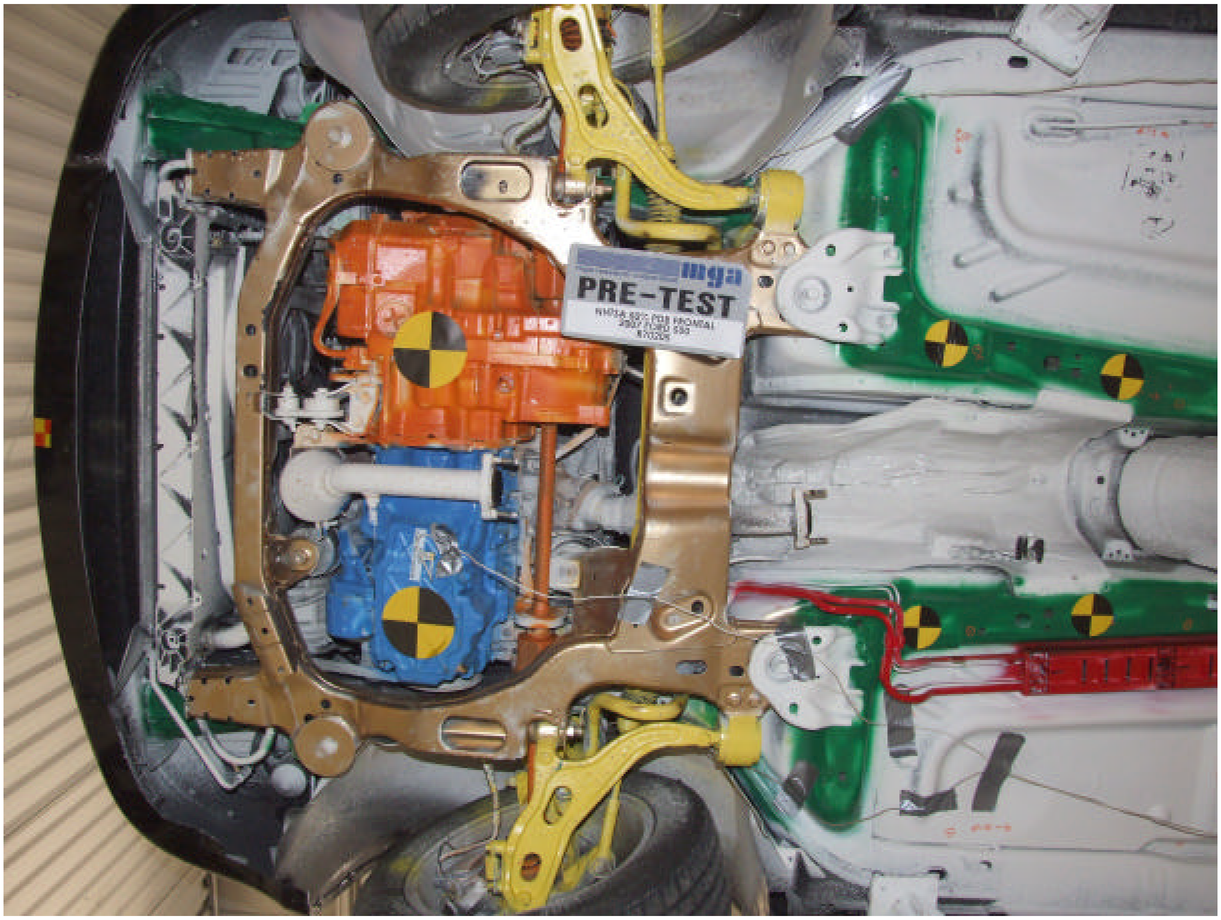
Post-Test Right Bumper to Rail Attachment View



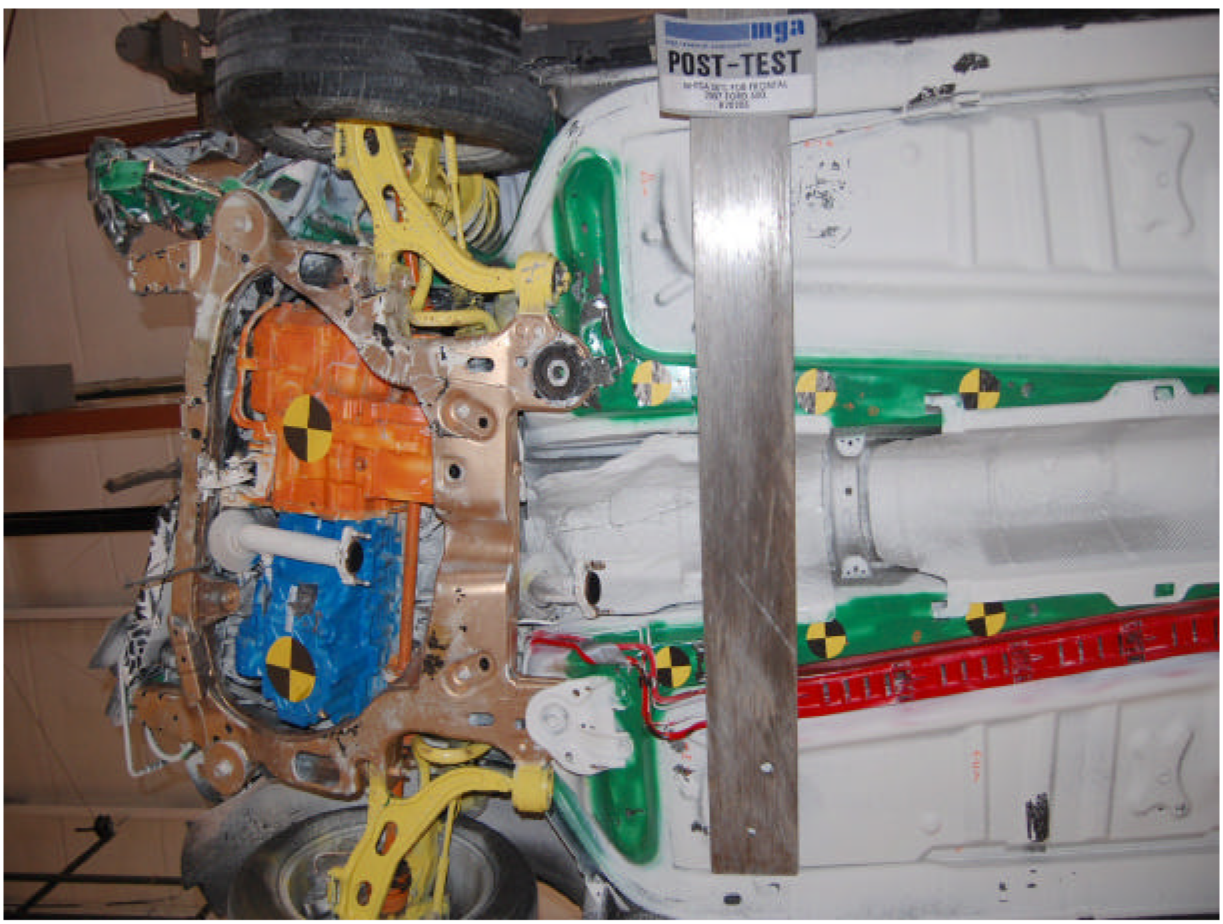
Pre-Test Front Underbody



Post-Test Front Underbody

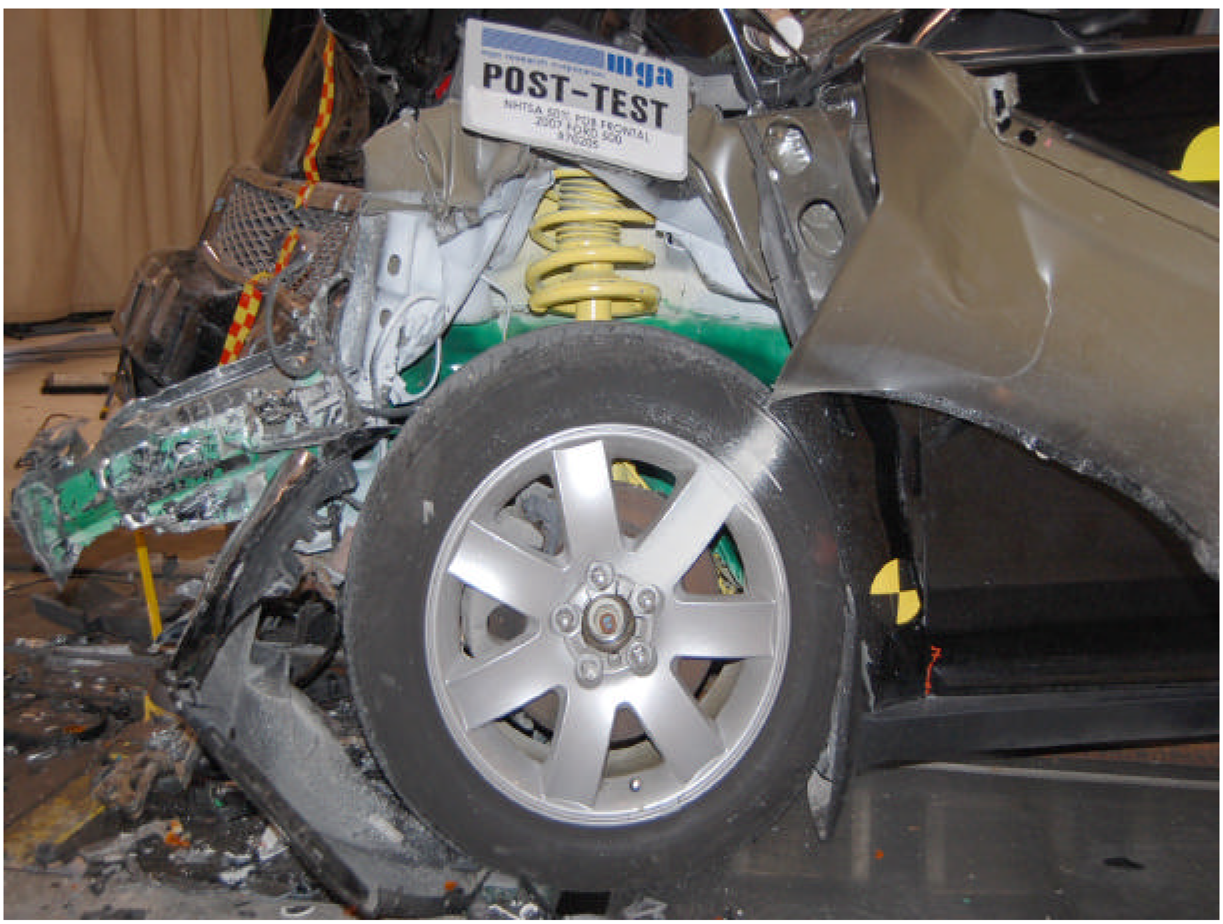


Pre-Test Front Underbody Perpendicular View



Post-Test Front Underbody Perpendicular View

Pre-Test Left Front Wheel Contact View



Post-Test Left Front Wheel Contact View

Pre-Test Left Front Wheel Contact Close Up View

Post-Test Left Front Wheel Contact Close Up View

Pre-Test Over Toepan/Floorpan Left of Seat, Seat Cushion Height

Post-Test Over Toepan/Floorpan Left of Seat, Seat Cushion Height

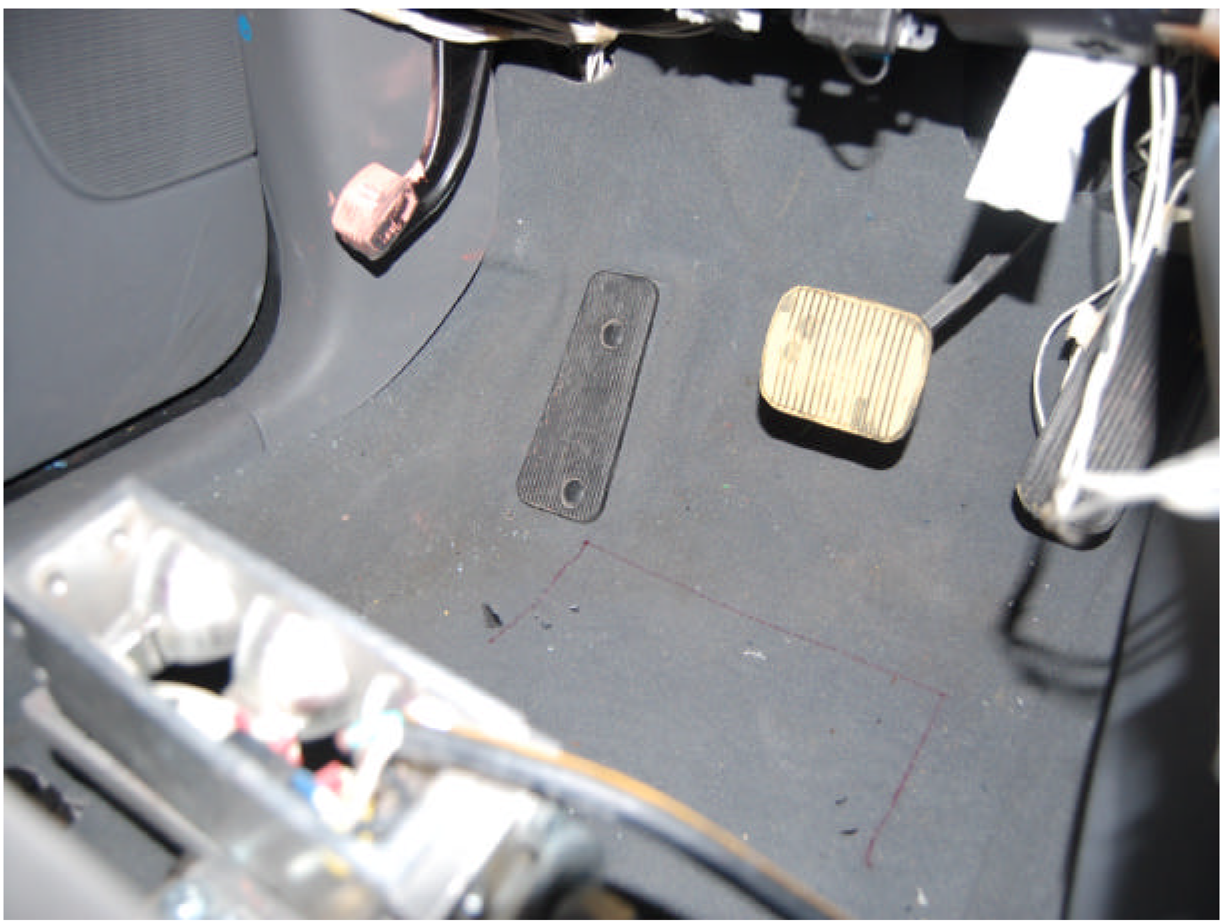
Pre-Test Over Toepan/Floorpan Left of Seat, Sill Height

Post-Test Over Toepan/Floorpan Left of Seat, Sill Height

Pre-Test Over Toepan/Floorpan Center of Seat, Seat Cushion Height

Post-Test Over Toepan/Floorpan Center of Seat, Seat Cushion Height

Pre-Test Over Toepan/Floorpan Right of Seat, Seat Cushion Height


Post-Test Over Toepan/Floorpan Right of Seat, Seat Cushion Height

Pre-Test Footrest Seat Cushion Height

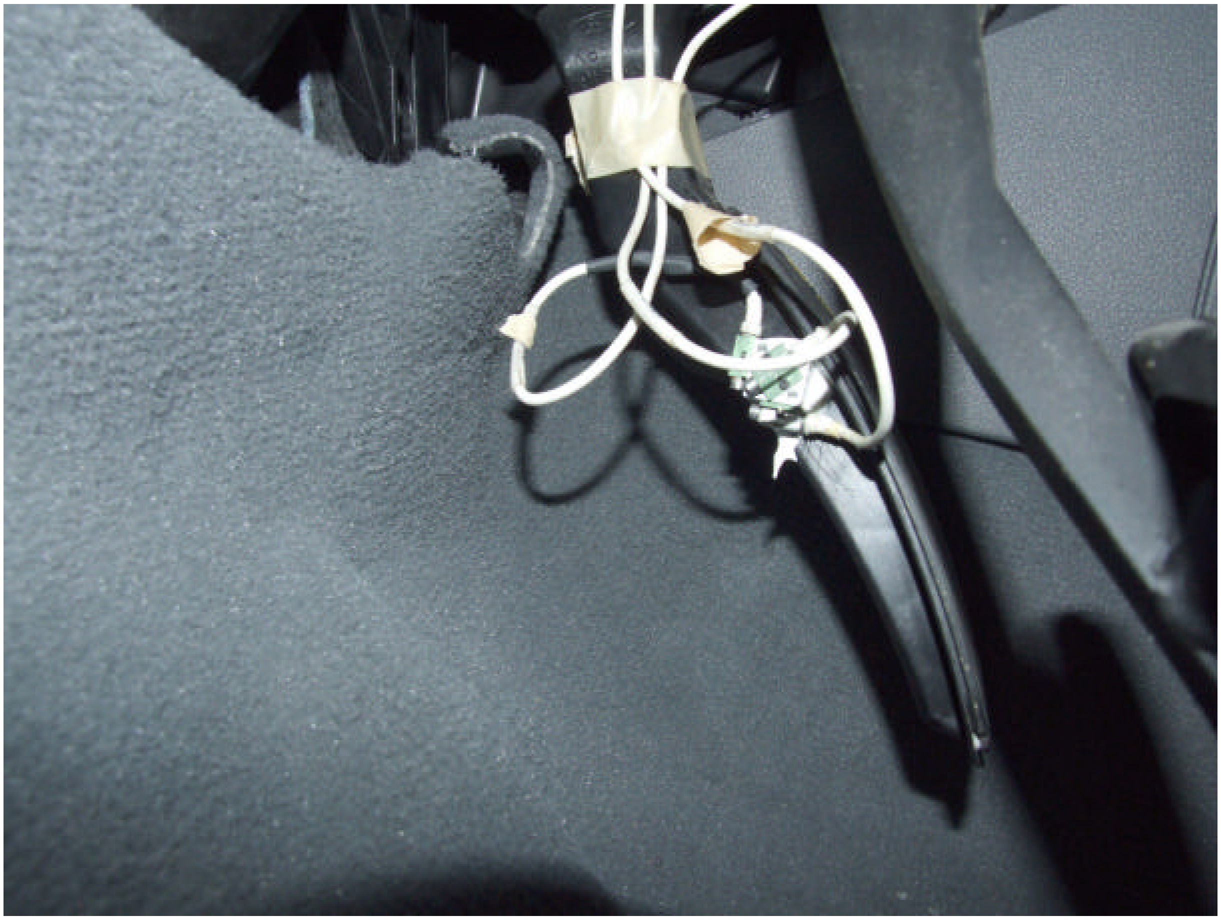
Post-Test Footrest Seat Cushion Height

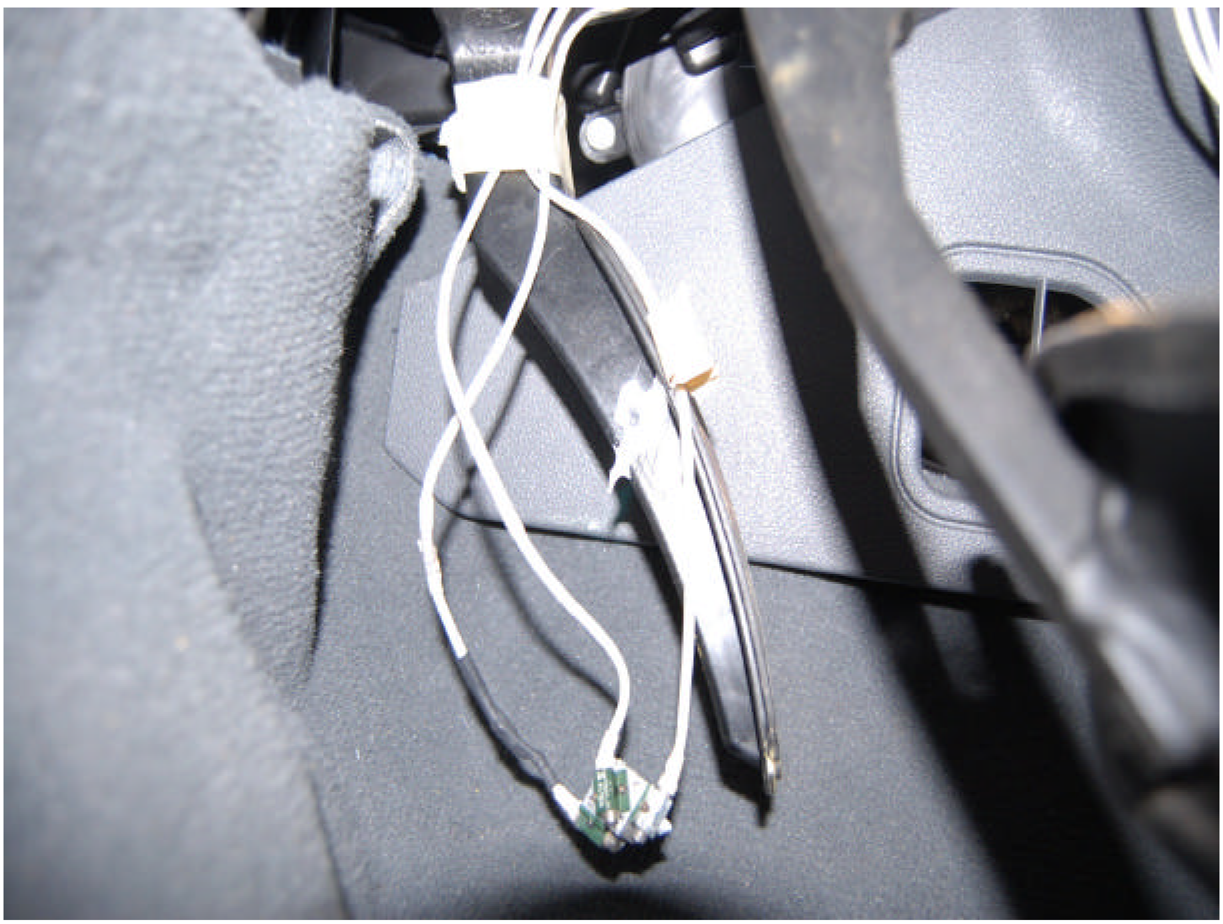
Pre-Test Footrest Seat Sill Height

Post-Test Footrest Seat Sill Height

Pre-Test Accelerometer Pedal Close Up

Post-Test Accelerometer Pedal Close Up


Pre-Test Accelerometer Pedal Left Side View


Post-Test Accelerometer Pedal Left Side View

Pre-Test Right Side Floorpan, Right of Seat, Seat Cushion Height

Post-Test Right Side Floorpan, Right of Seat, Seat Cushion Height

Pre-Test Right Side Floorpan, Right of Seat, Sill Height

Post-Test Right Side Floorpan, Right of Seat, Sill Height

Pre-Test Right Side Floorpan, Center of Seat, Seat Cushion Height

Post-Test Right Side Floorpan, Center of Seat, Seat Cushion Height

Pre-Test Right Side Floorpan, Left of Seat


Post-Test Right Side Floorpan, Left of Seat

Pre-Test Front View of CRS

Post-Test Front View of CRS

Pre-Test Rear View of CRS

Post-Test Rear View of CRS

Pre-Test Left Side View of CRS

Post-Test Left Side View of CRS

Pre-Test Right Side View of CRS

Post-Test Right Side View of CRS

APPENDIX B

DUMMY, VEHICLE AND BARRIER DATA PLOTS

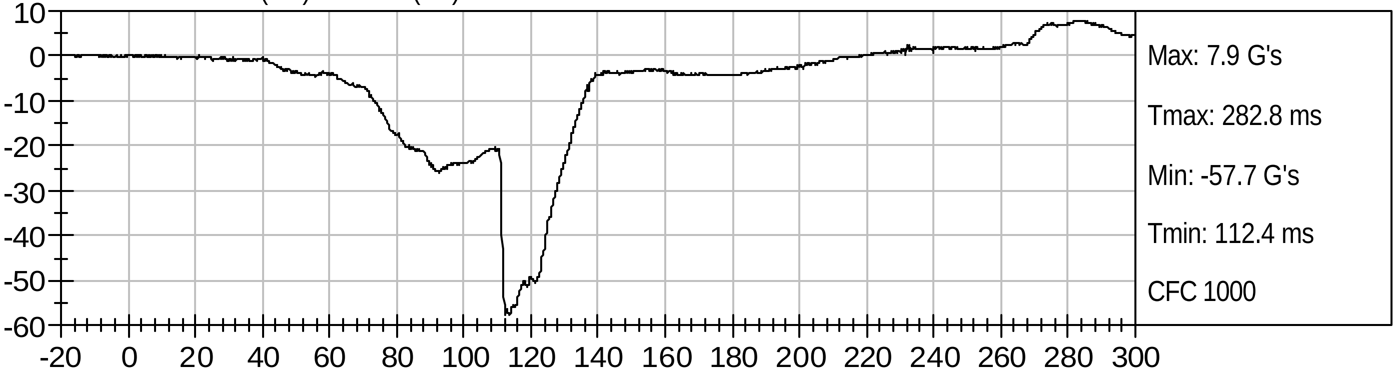
TABLE OF DATA PLOTS

Page No.

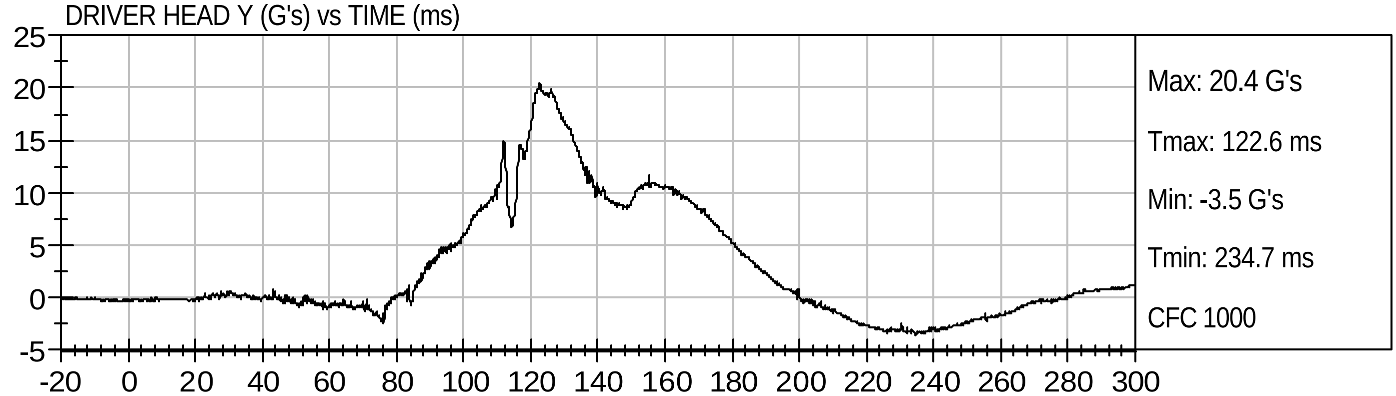
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

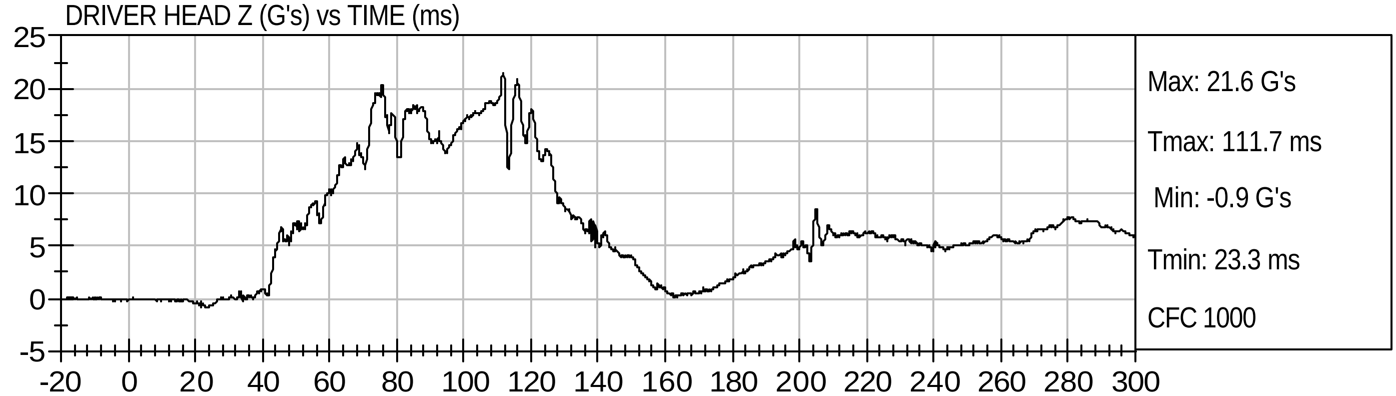
DRIVER HEAD X (G's) vs TIME (ms)



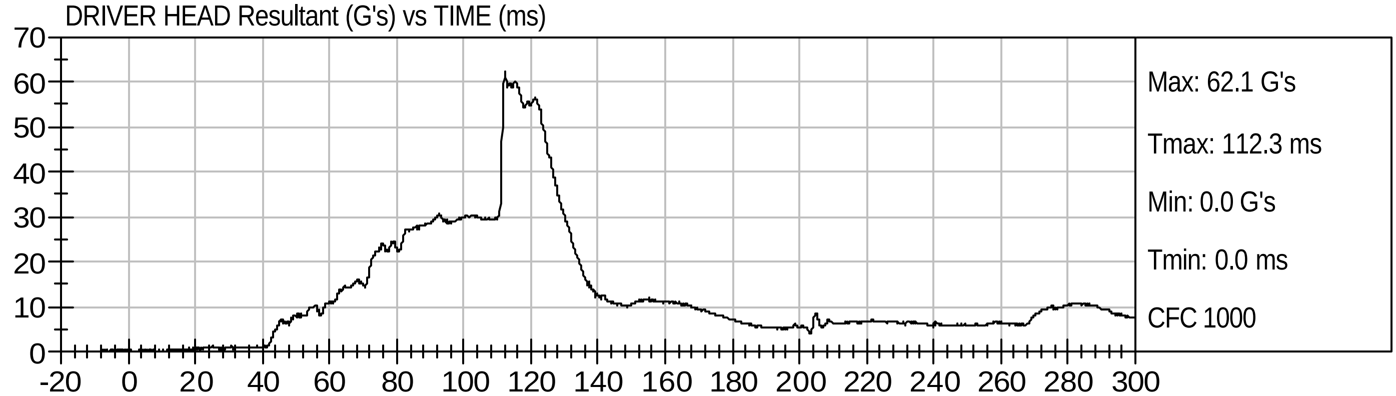
DRIVER HEAD Y (G's) vs TIME (ms)



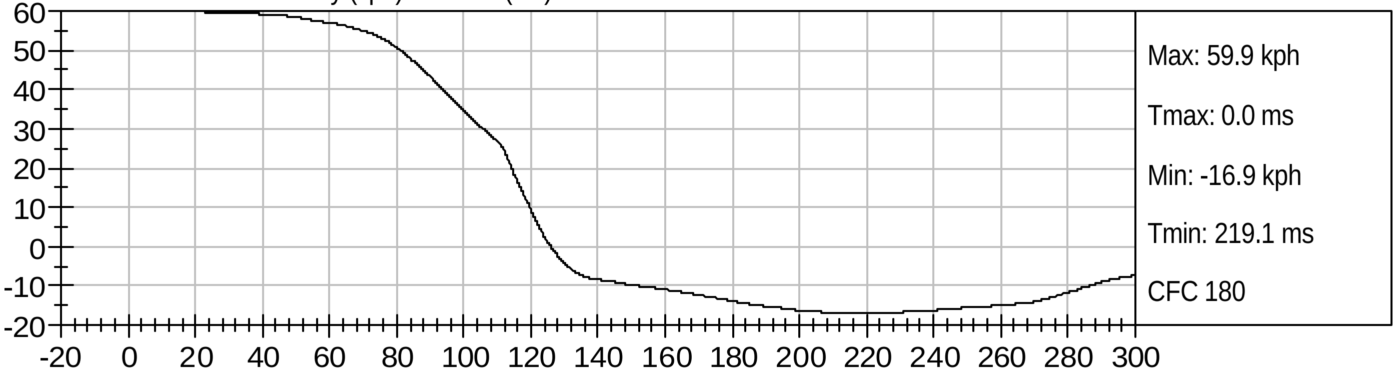
DRIVER HEAD Z (G's) vs TIME (ms)



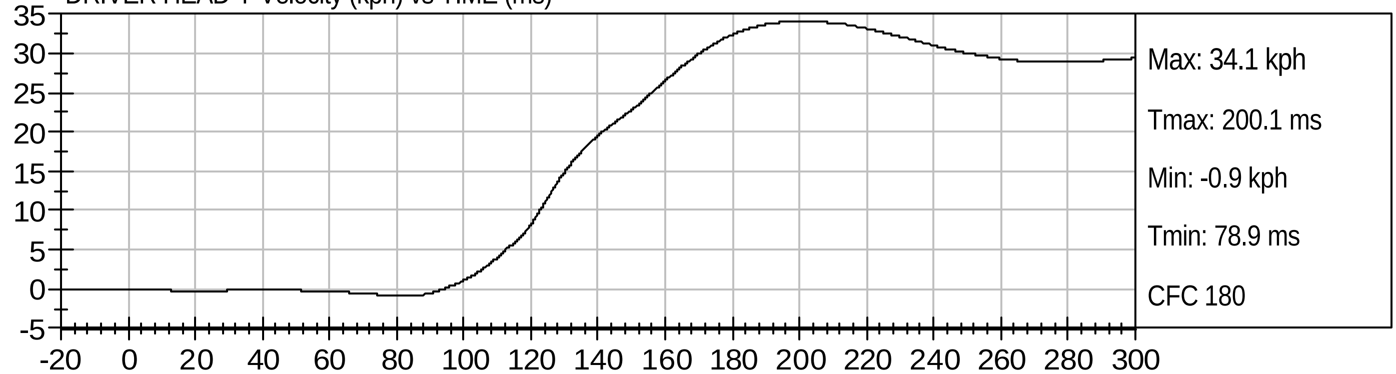
DRIVER HEAD Resultant (G's) vs TIME (ms)



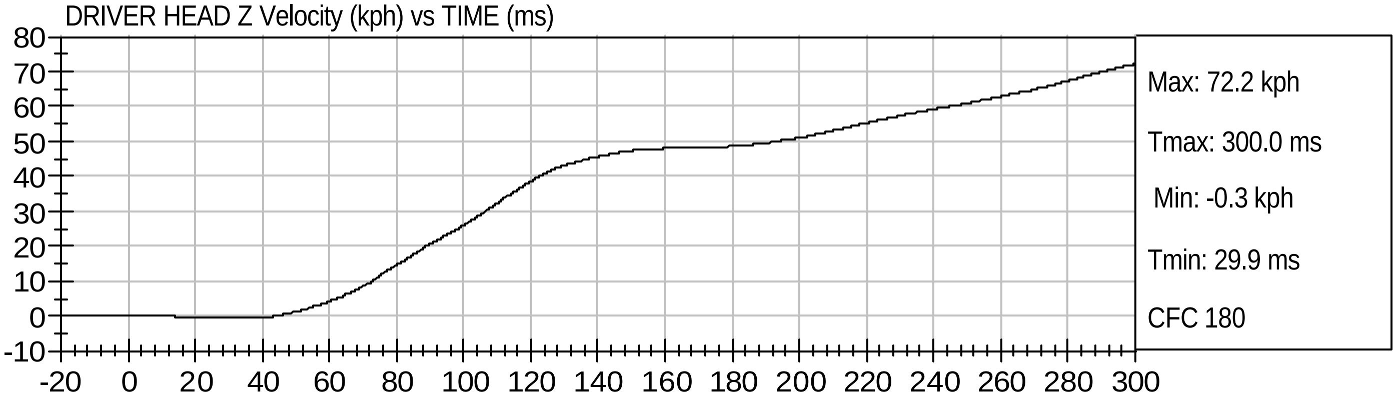
DRIVER HEAD X Velocity (kph) vs TIME (ms)



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

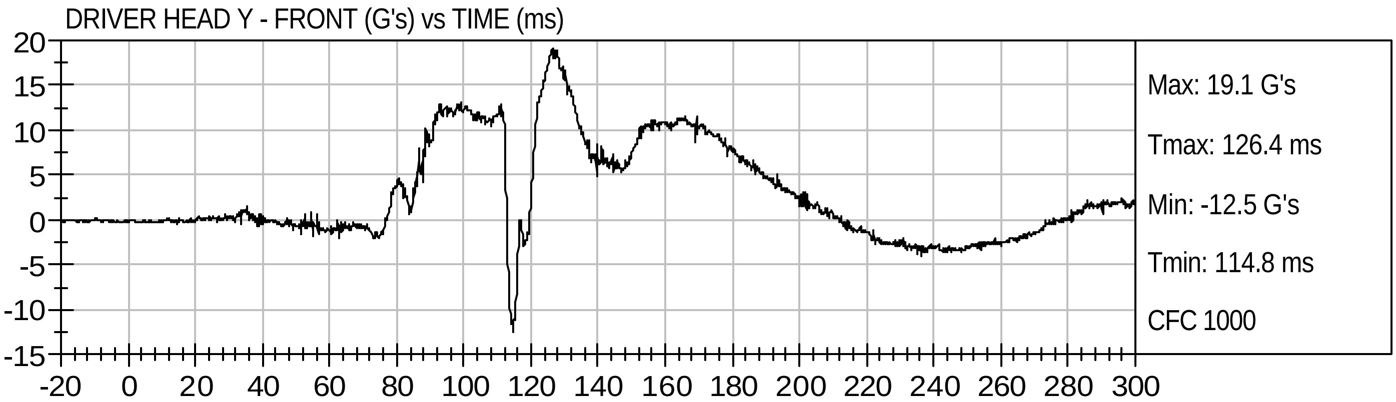


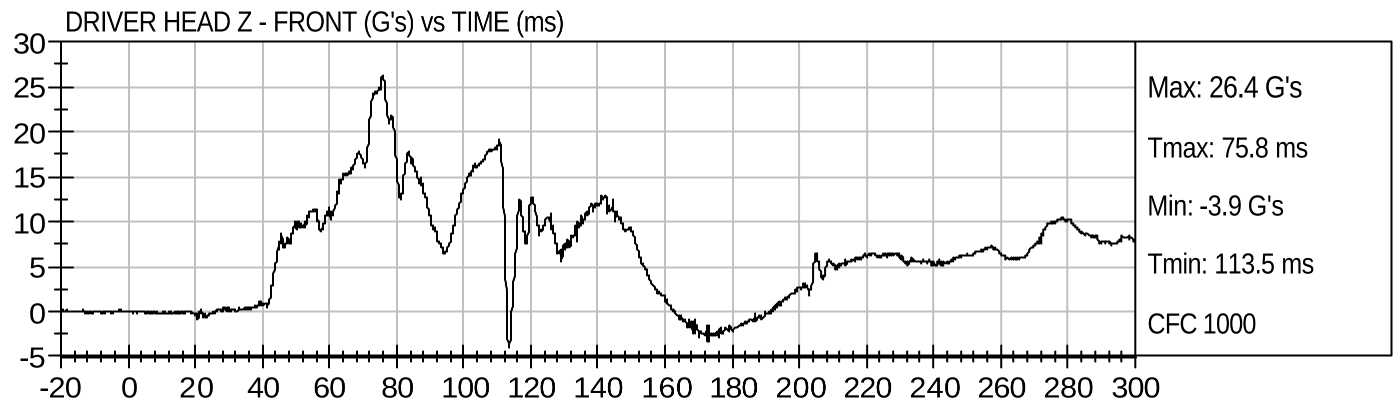
DRIVER HEAD Z Velocity (kph) vs TIME (ms)

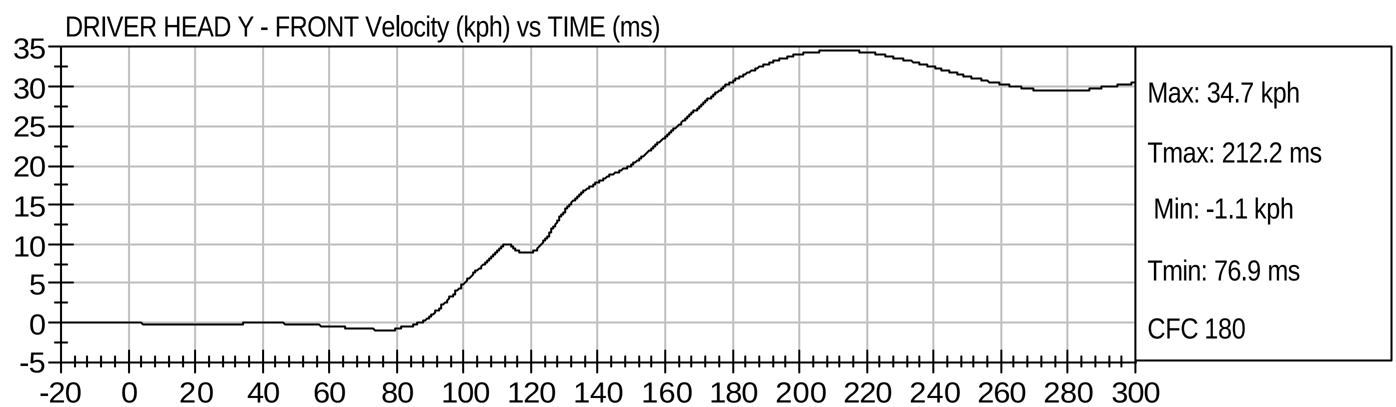


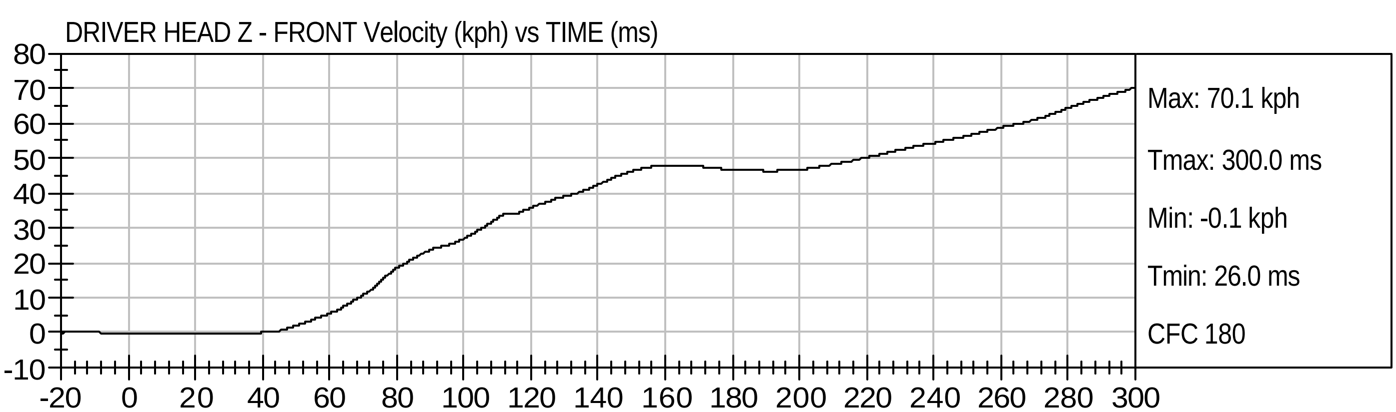
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





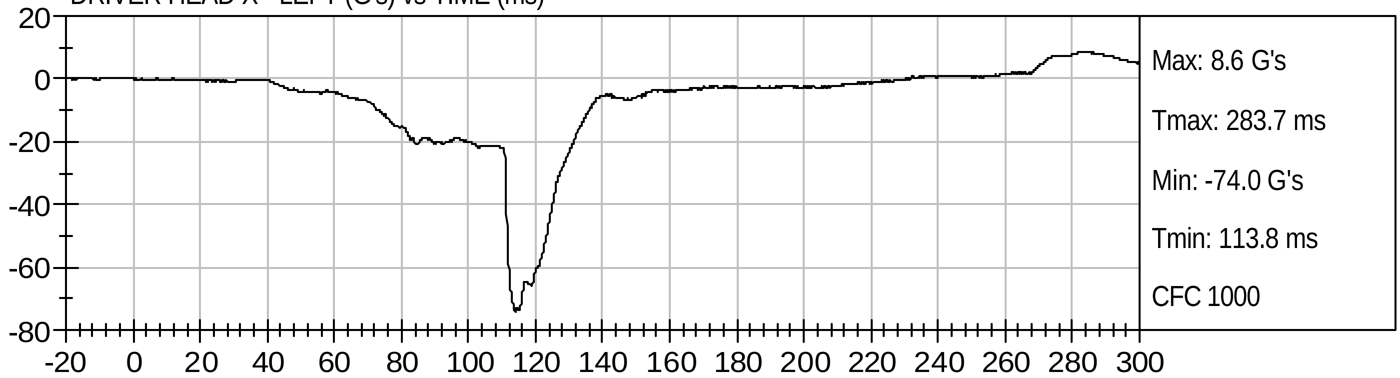




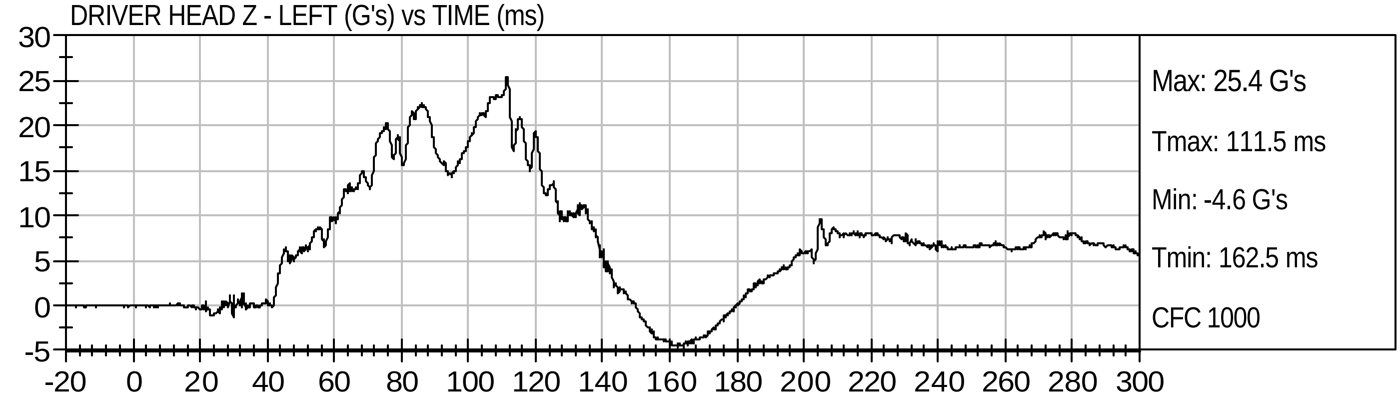
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

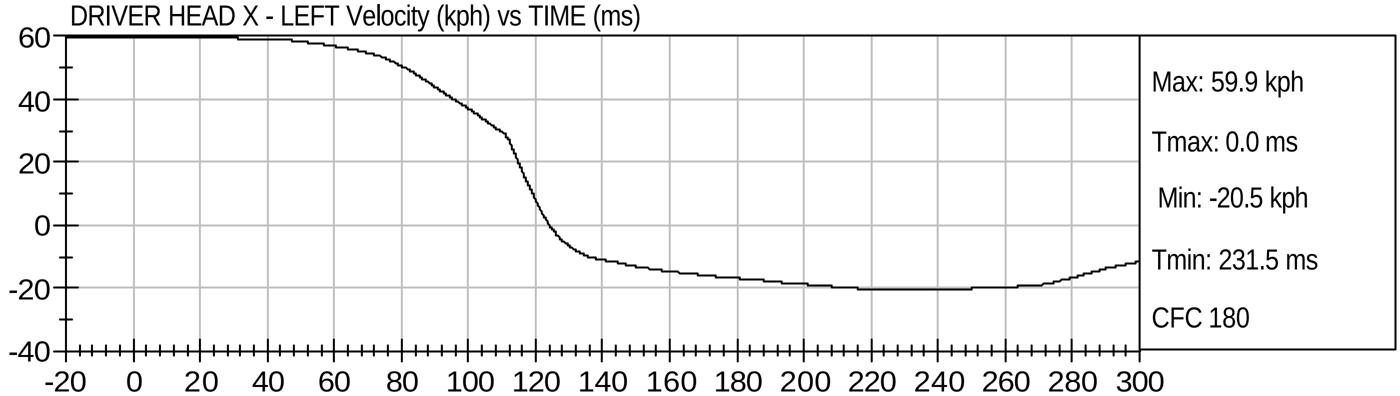
DRIVER HEAD X - LEFT (G's) vs TIME (ms)



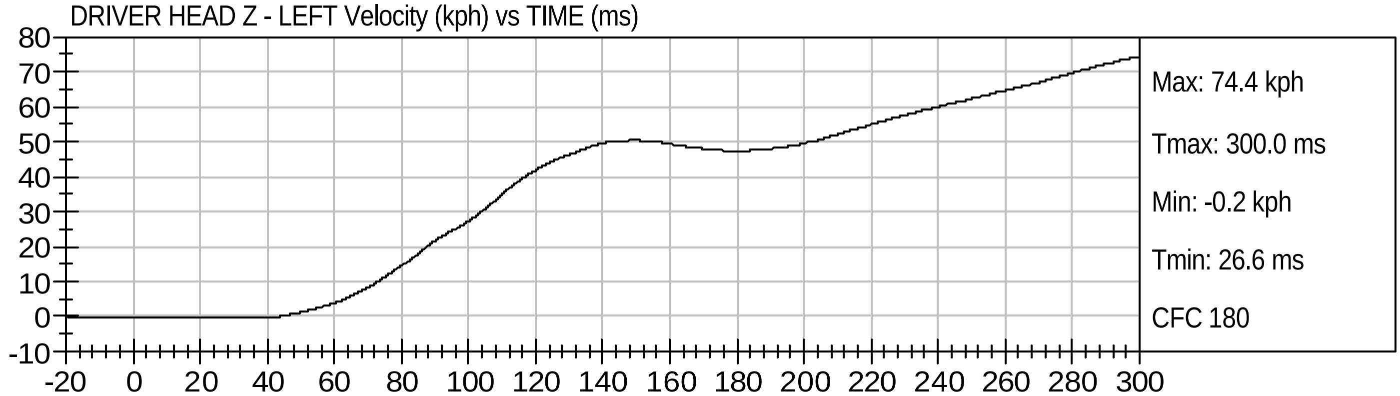
DRIVER HEAD Z - LEFT (G's) vs TIME (ms)



DRIVER HEAD X - LEFT Velocity (kph) vs TIME (ms)



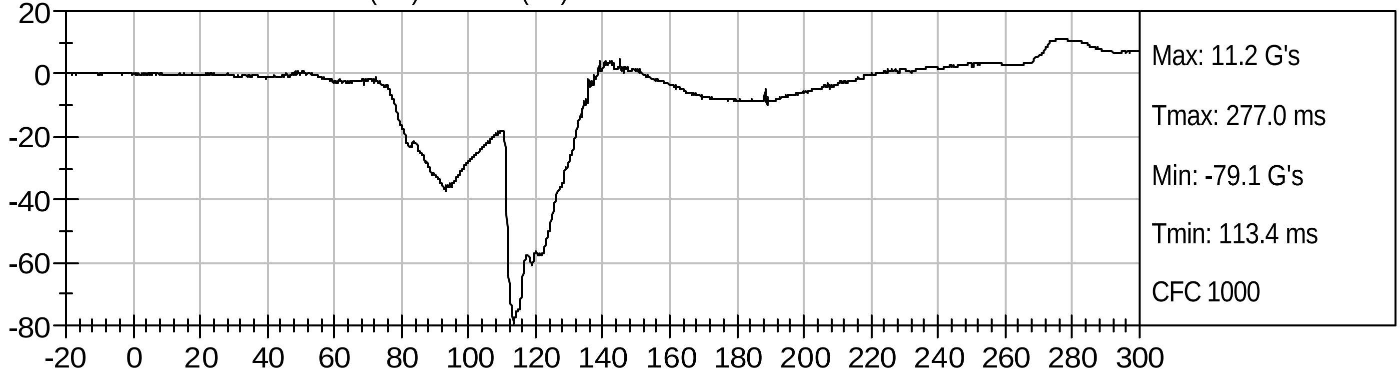
DRIVER HEAD Z - LEFT Velocity (kph) vs TIME (ms)



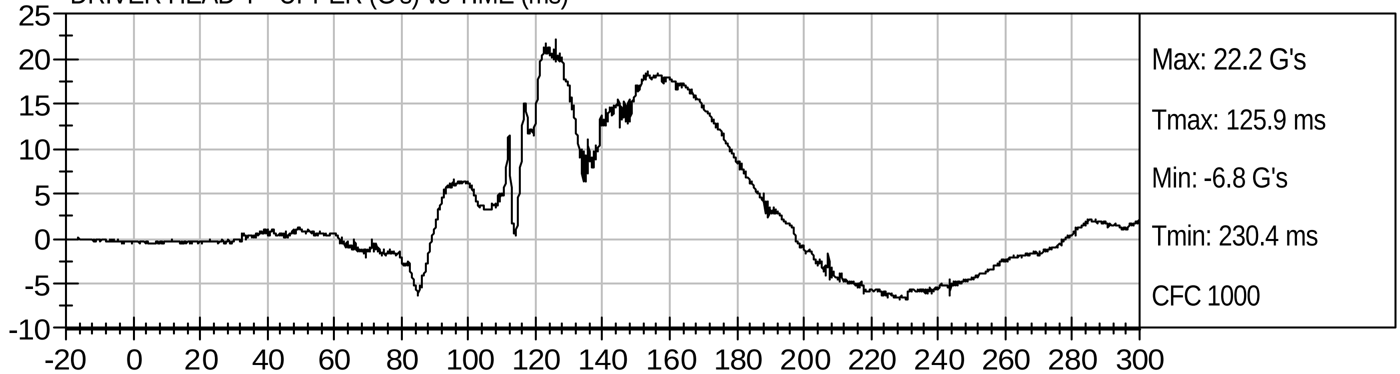
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

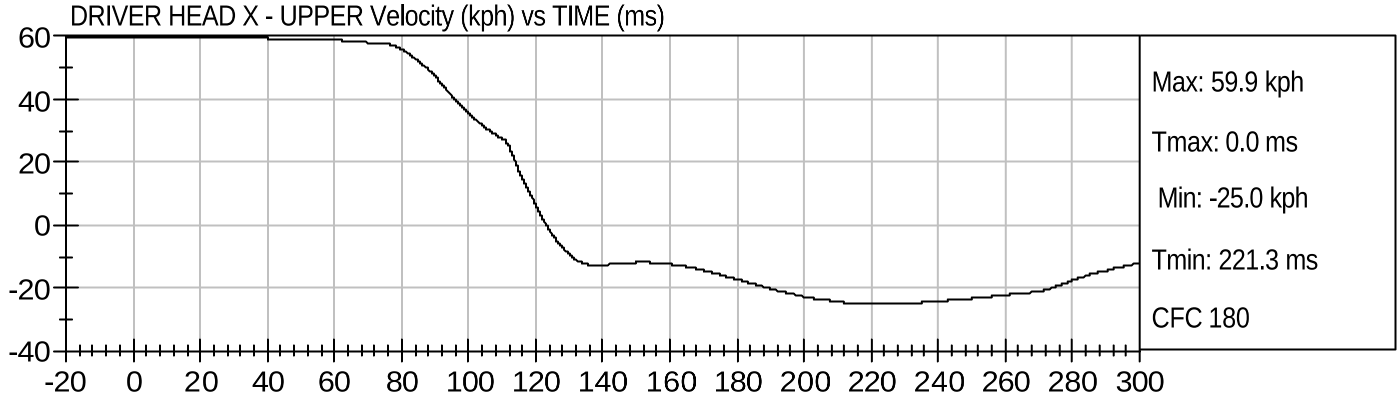
DRIVER HEAD X - UPPER (G's) vs TIME (ms)



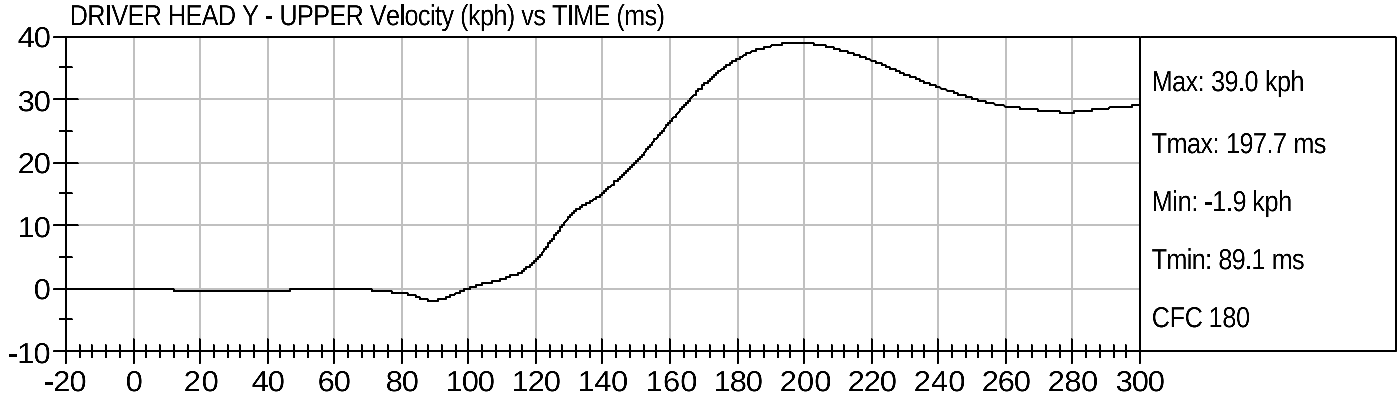
DRIVER HEAD Y - UPPER (G's) vs TIME (ms)



DRIVER HEAD X - UPPER Velocity (kph) vs TIME (ms)



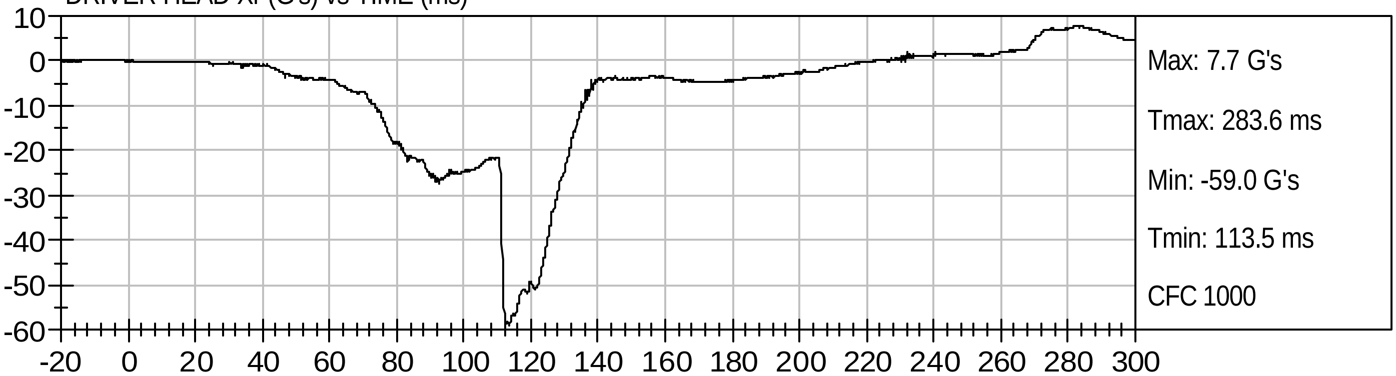
DRIVER HEAD Y - UPPER Velocity (kph) vs TIME (ms)



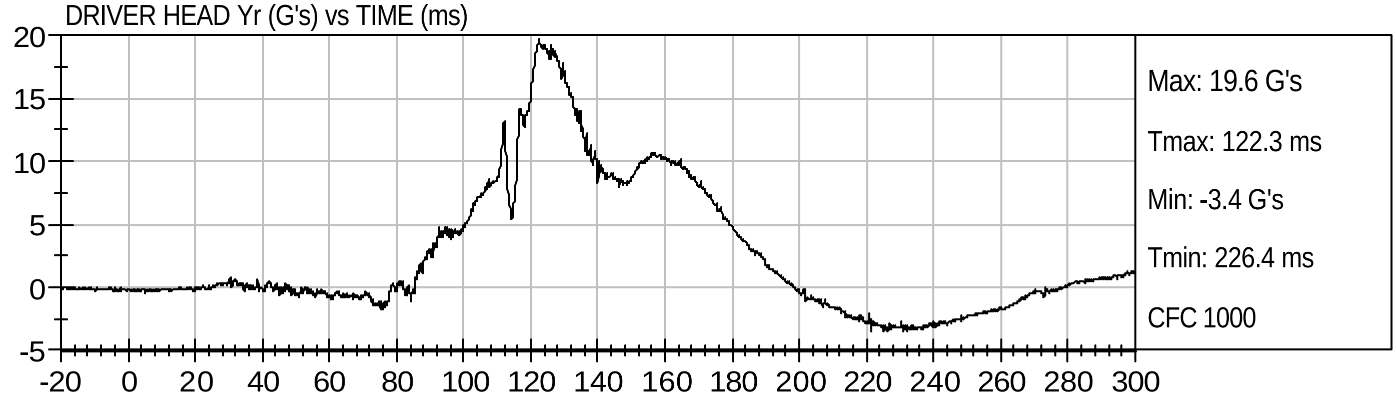
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

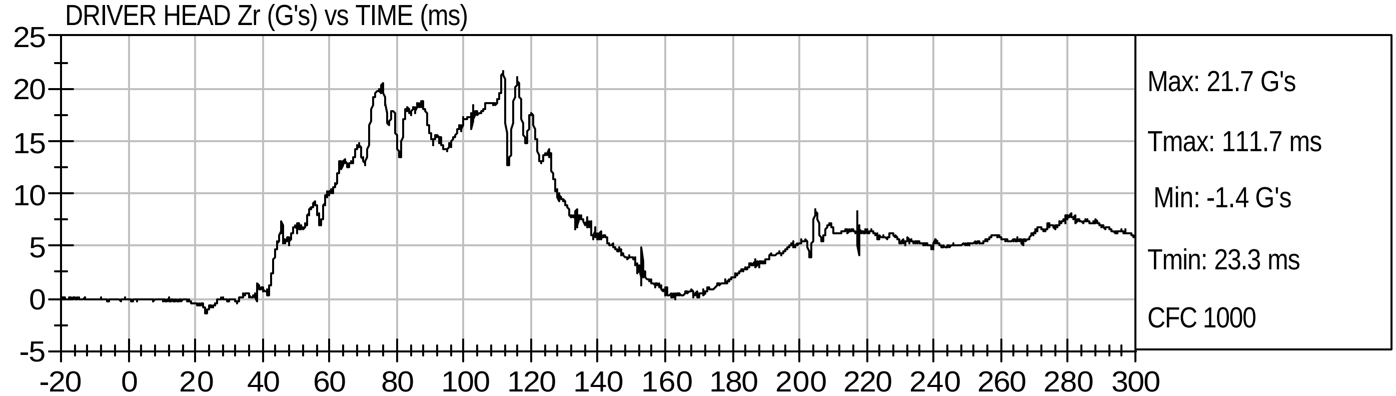
DRIVER HEAD Xr (G's) vs TIME (ms)



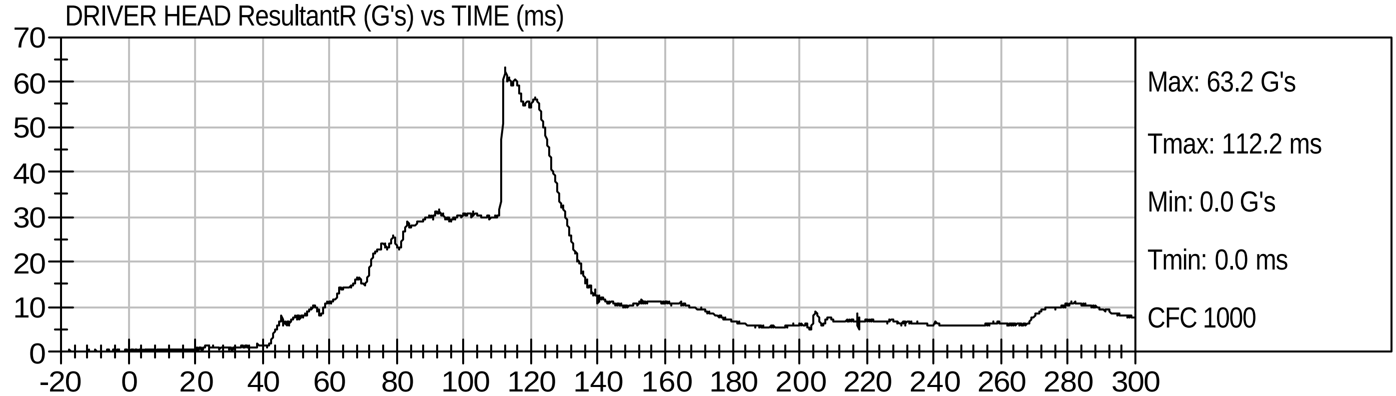
DRIVER HEAD Yr (G's) vs TIME (ms)



DRIVER HEAD Zr (G's) vs TIME (ms)

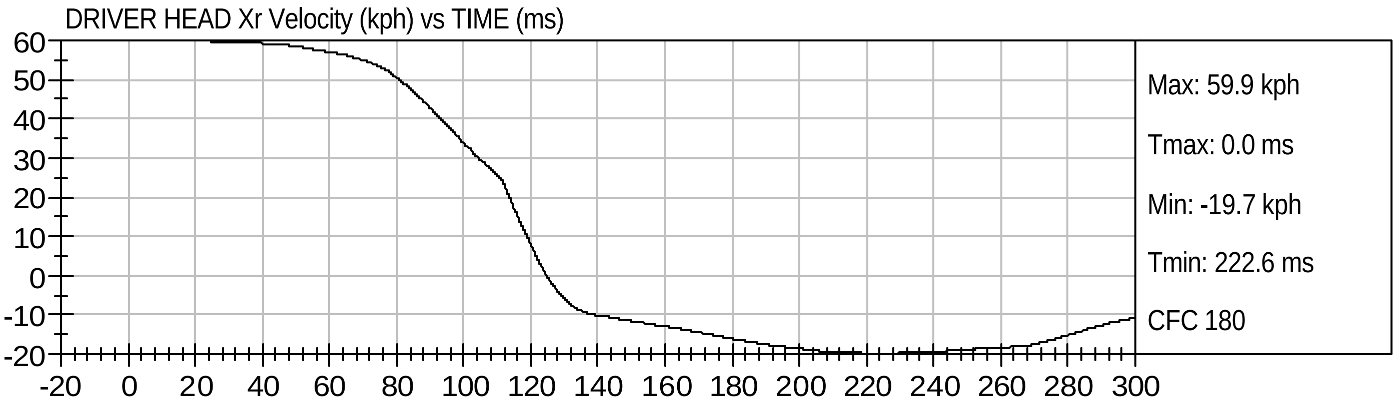


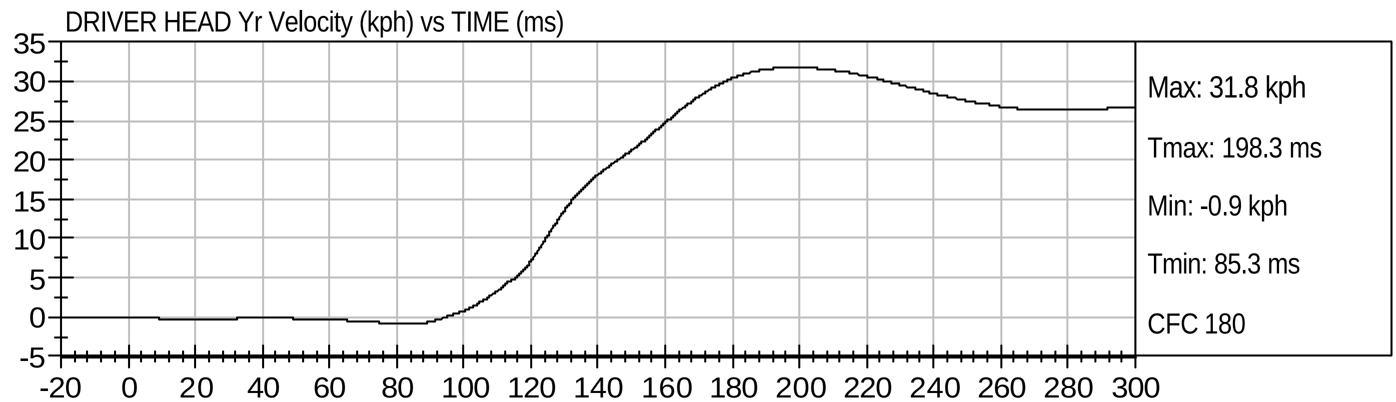
DRIVER HEAD ResultantR (G's) vs TIME (ms)

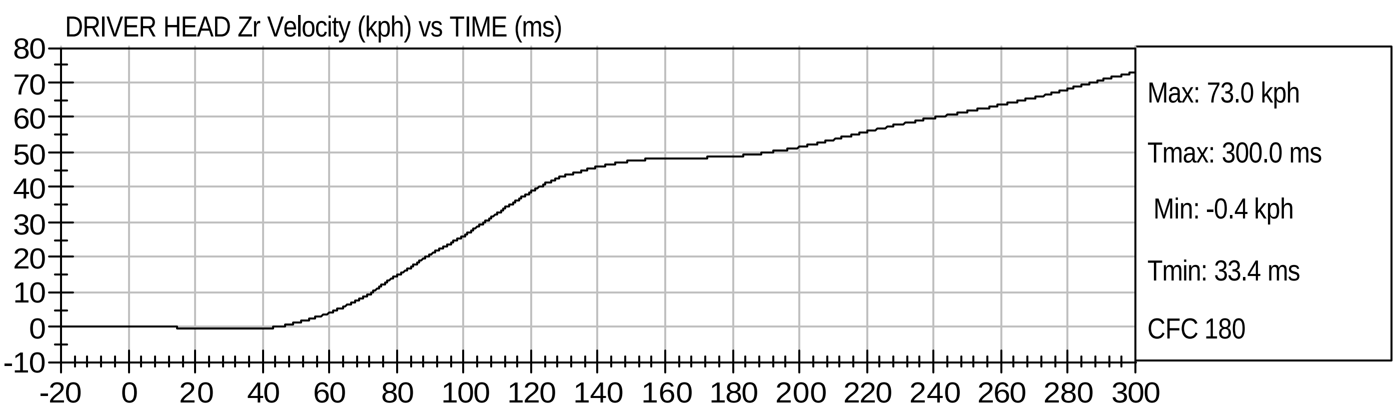


NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

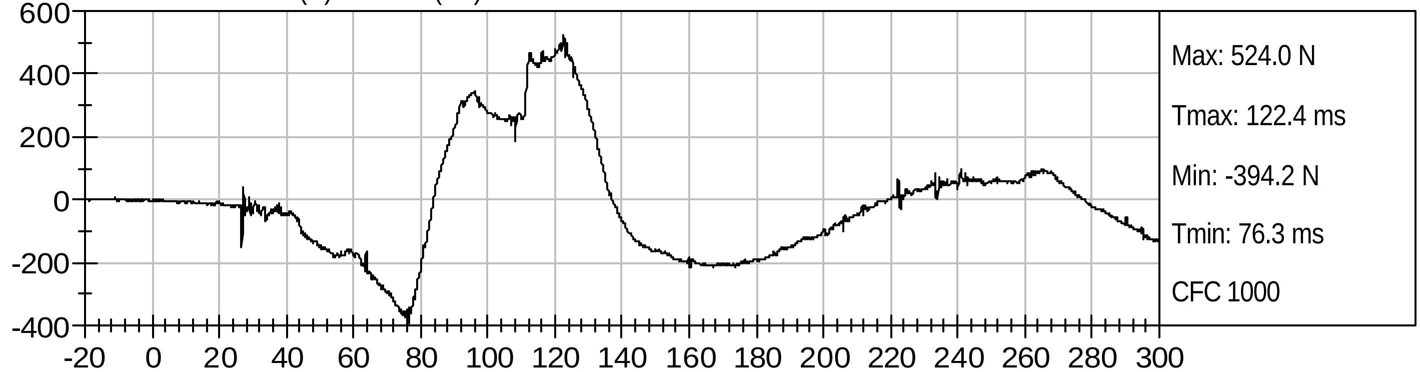
Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)



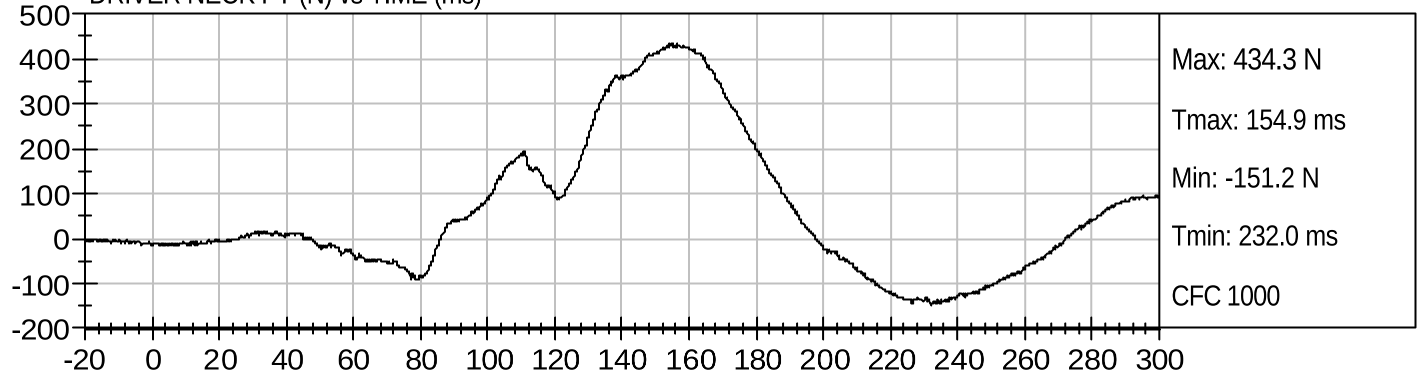




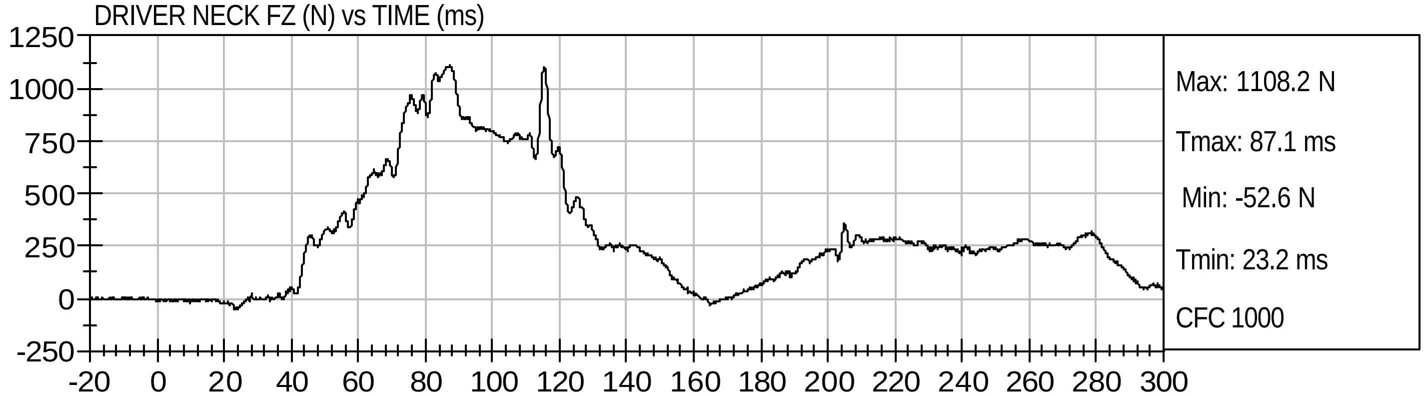
DRIVER NECK FX (N) vs TIME (ms)



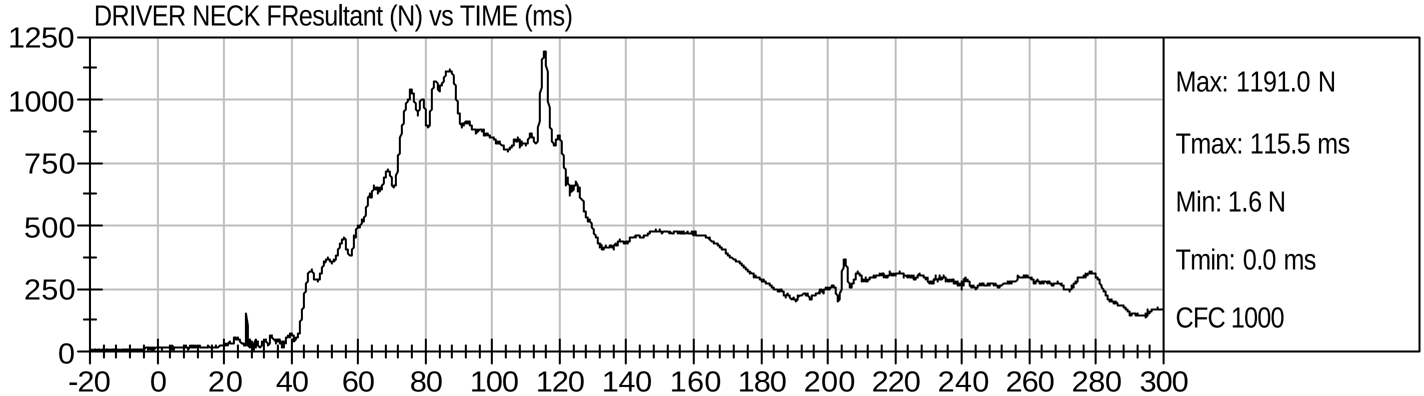
DRIVER NECK FY (N) vs TIME (ms)



DRIVER NECK FZ (N) vs TIME (ms)



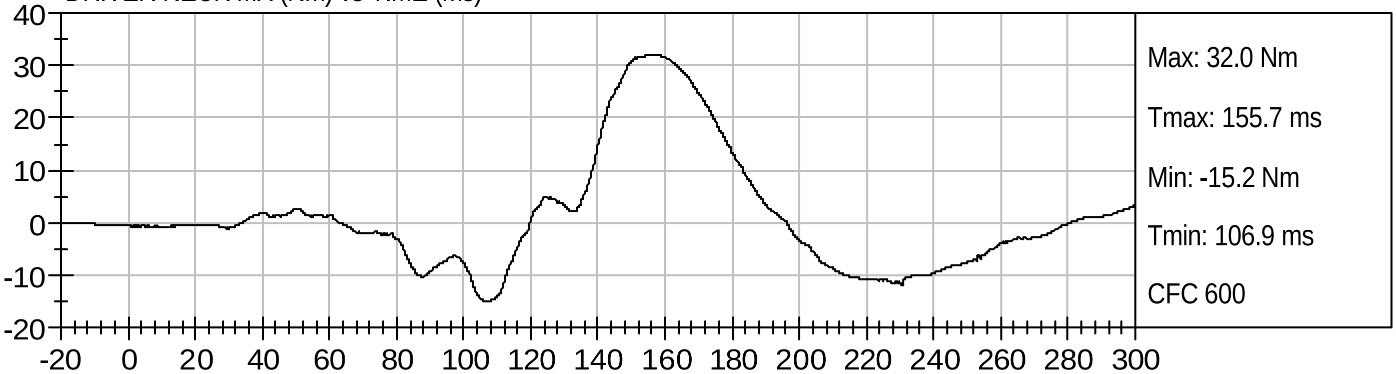
DRIVER NECK FResultant (N) vs TIME (ms)



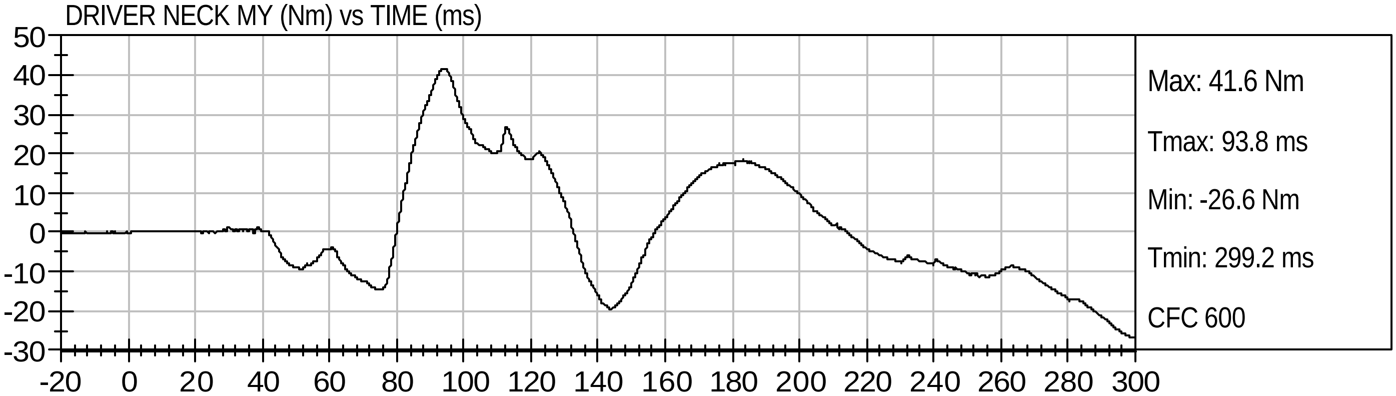
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

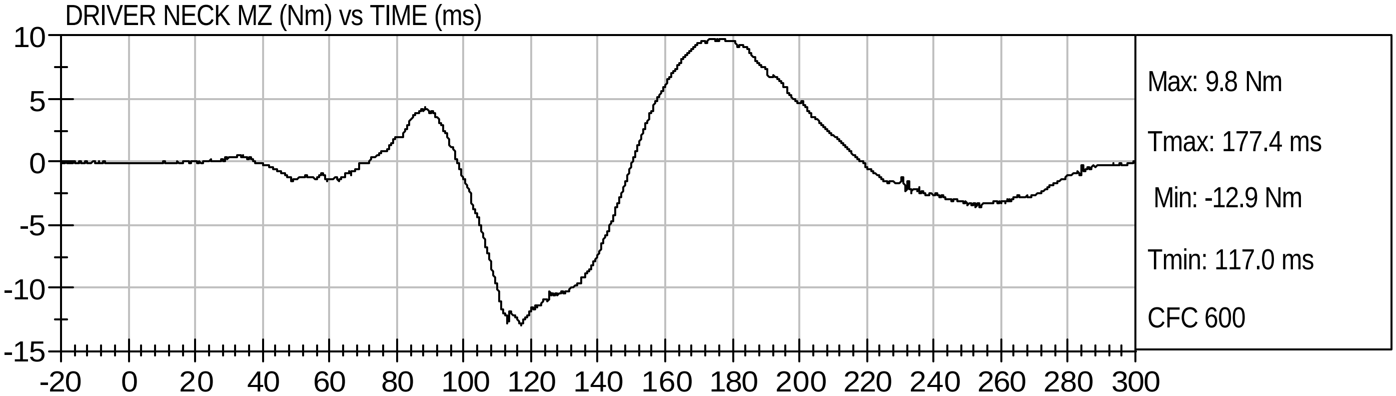
DRIVER NECK MX (Nm) vs TIME (ms)



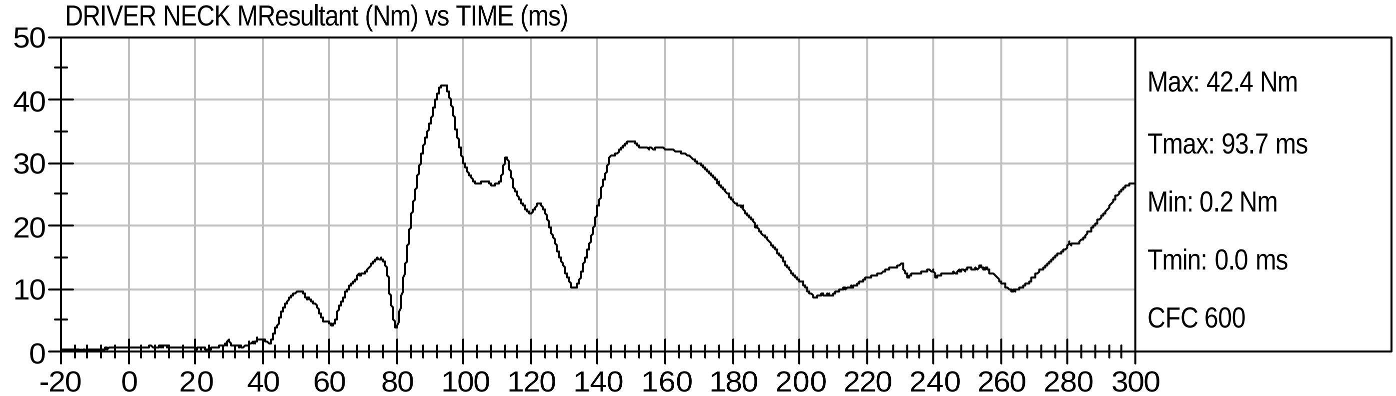
DRIVER NECK MY (Nm) vs TIME (ms)



DRIVER NECK MZ (Nm) vs TIME (ms)

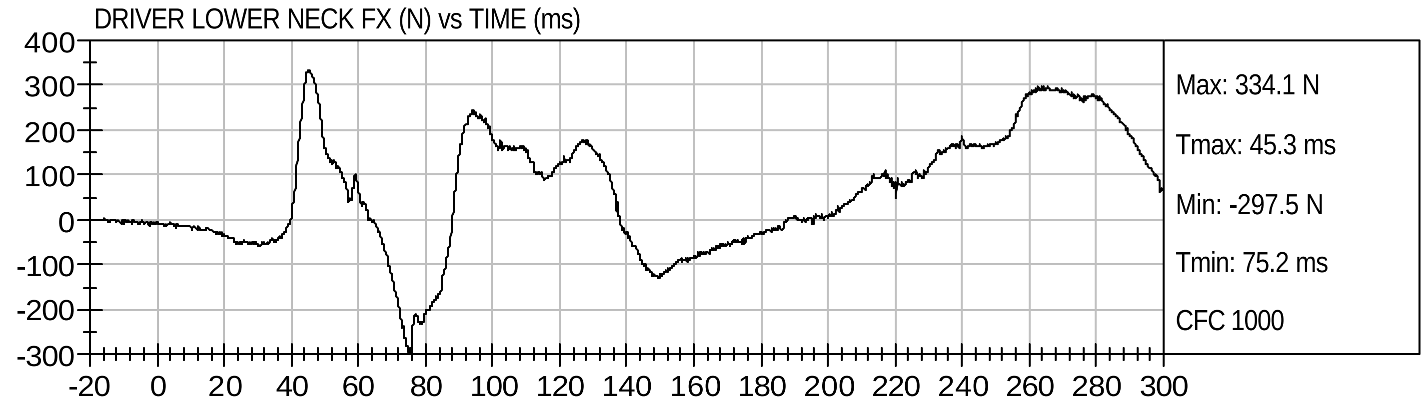


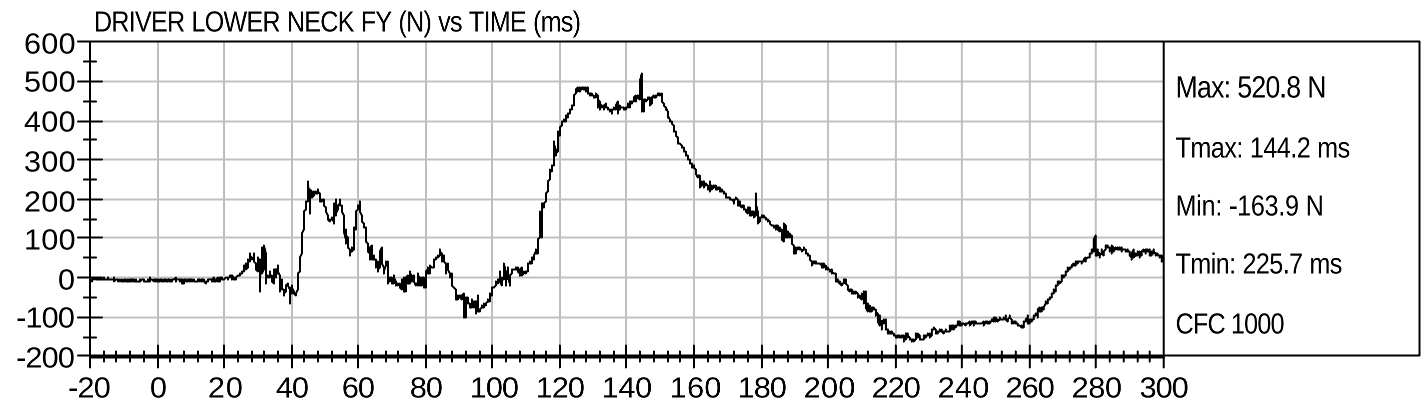
DRIVER NECK MResultant (Nm) vs TIME (ms)

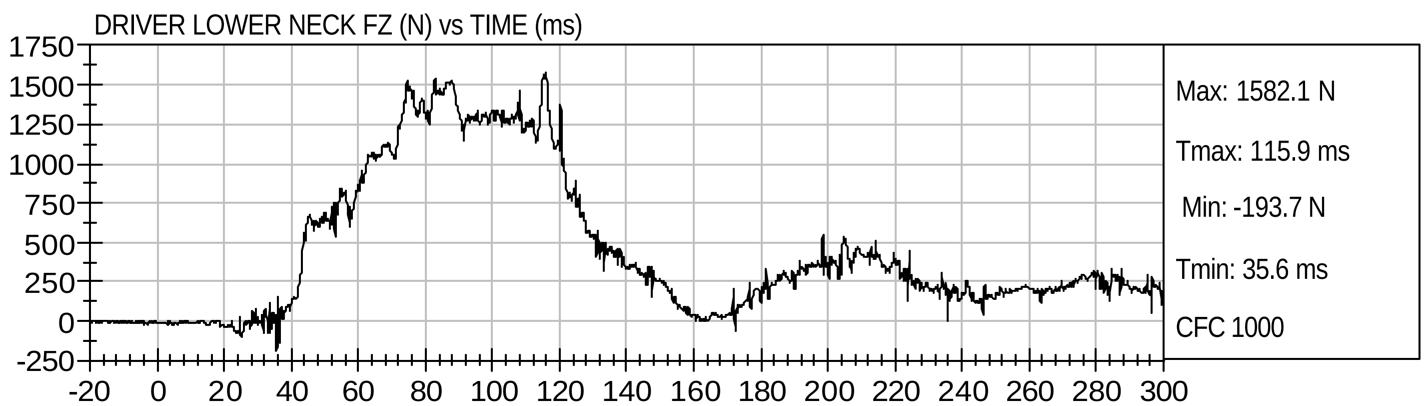


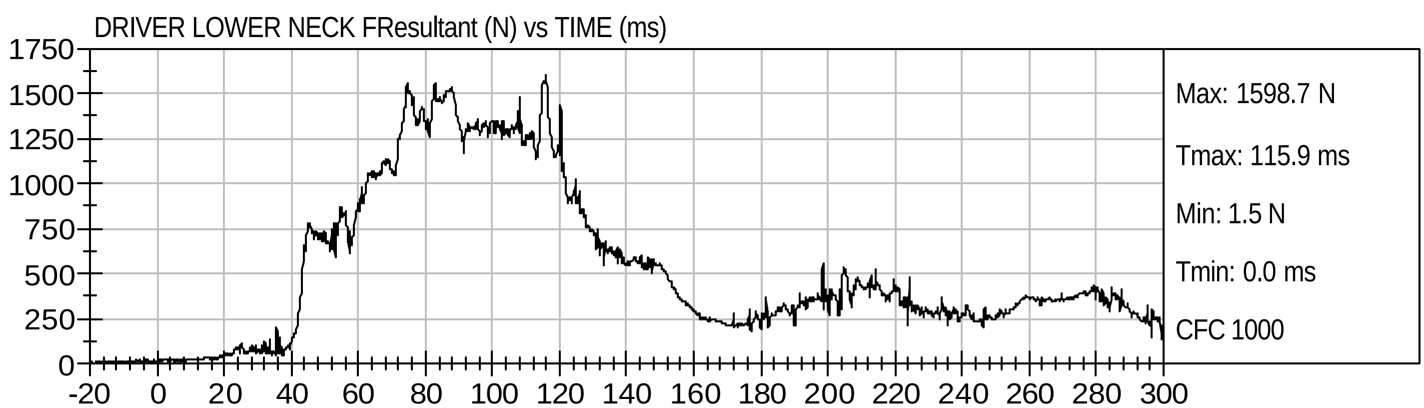
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

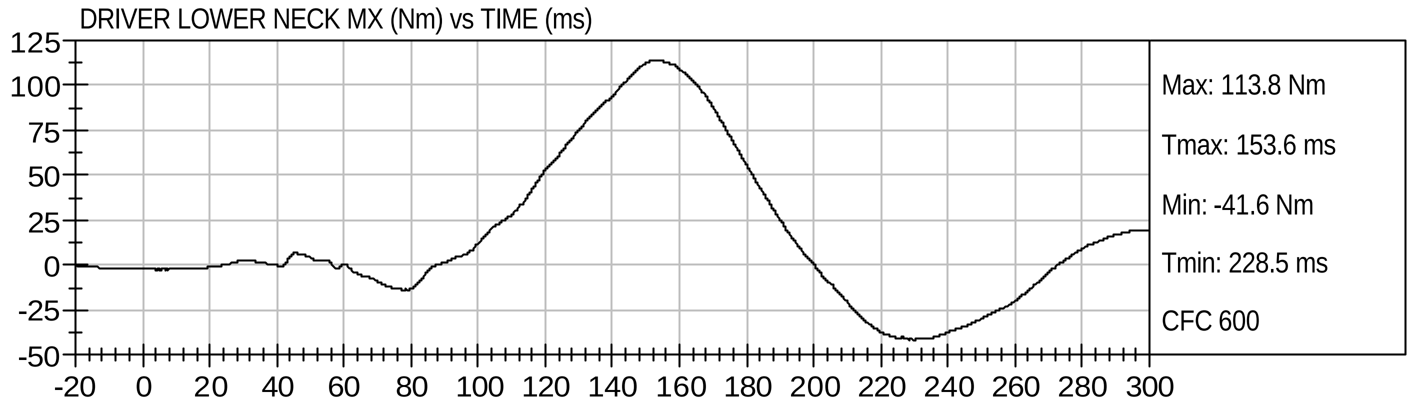
Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

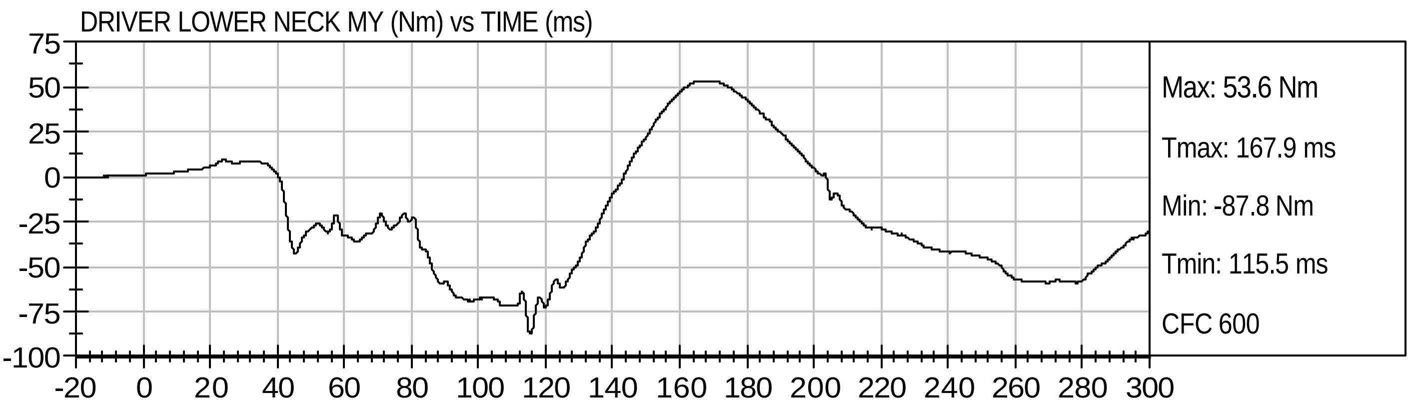


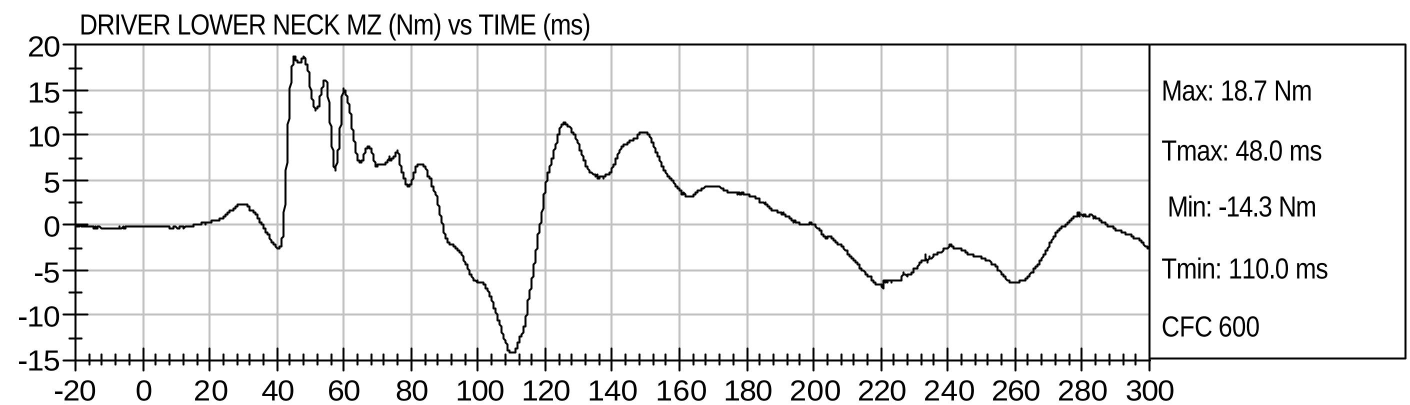


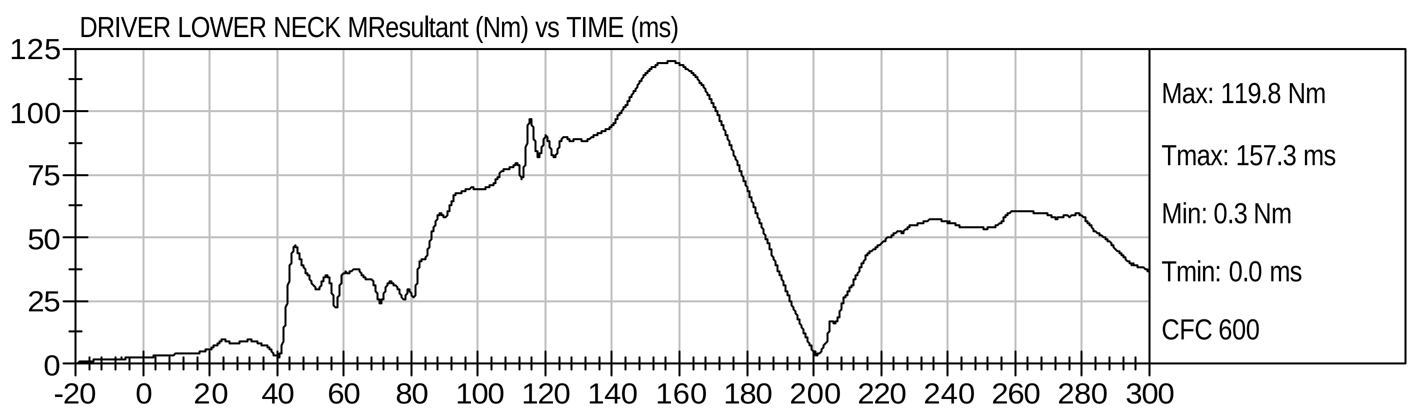





DRIVER LOWER NECK MX (Nm) vs TIME (ms)
125
100
75
50
25
0
-25
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 113.8 Nm
Tmax: 153.6 ms
Min: -41.6 Nm
Tmin: 228.5 ms
CFC 600


DRIVER LOWER NECK MY (Nm) vs TIME (ms)
75
50
25
0
-25
-50
-75
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 53.6 Nm
Tmax: 167.9 ms
Min: -87.8 Nm
Tmin: 115.5 ms
CFC 600

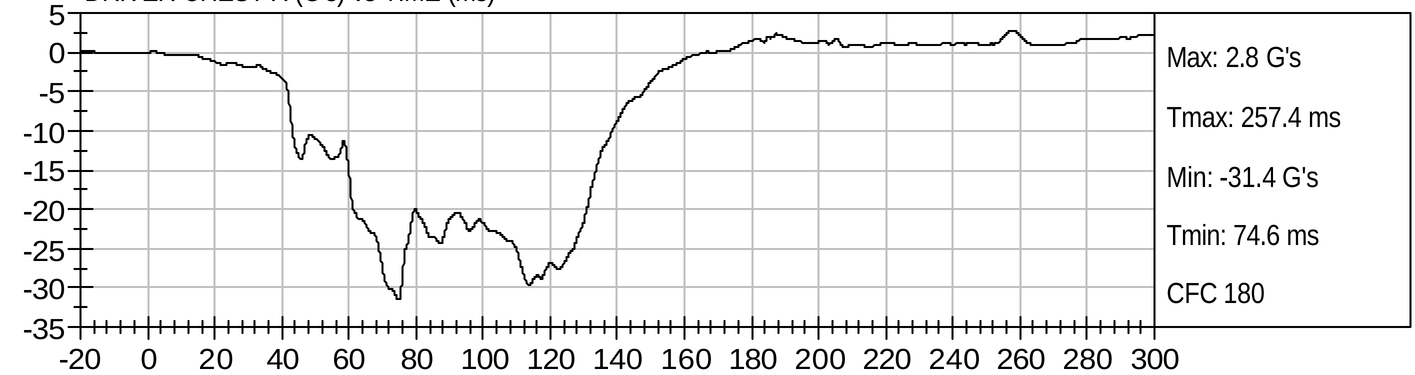

DRIVER LOWER NECK MZ (Nm) vs TIME (ms)
20
15
10
5
0
-5
-10
-15
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 18.7 Nm
Tmax: 48.0 ms
Min: -14.3 Nm
Tmin: 110.0 ms
CFC 600


DRIVER LOWER NECK MResultant (Nm) vs TIME (ms)
125
100
75
50
25
0
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 119.8 Nm
Tmax: 157.3 ms
Min: 0.3 Nm
Tmin: 0.0 ms
CFC 600

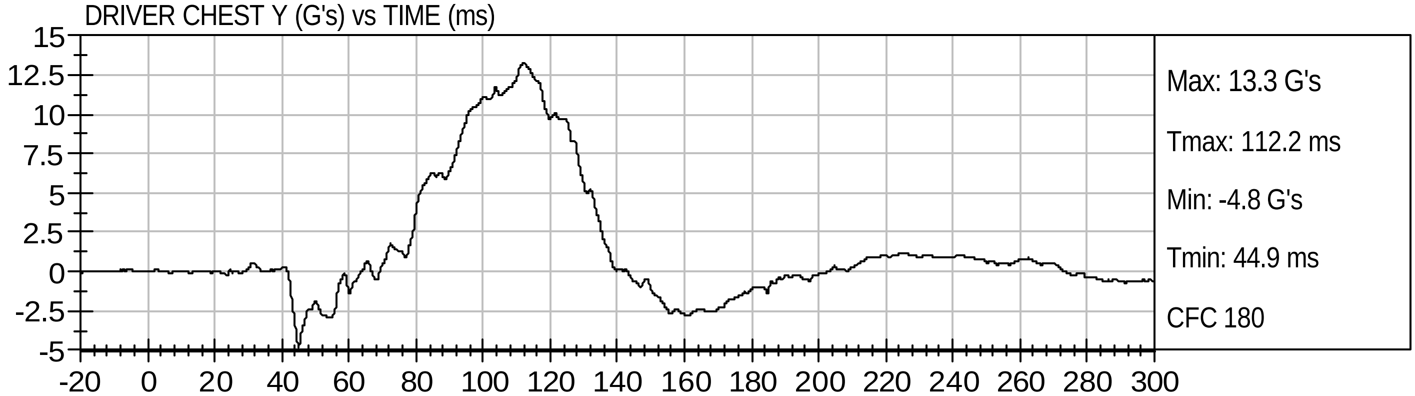
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

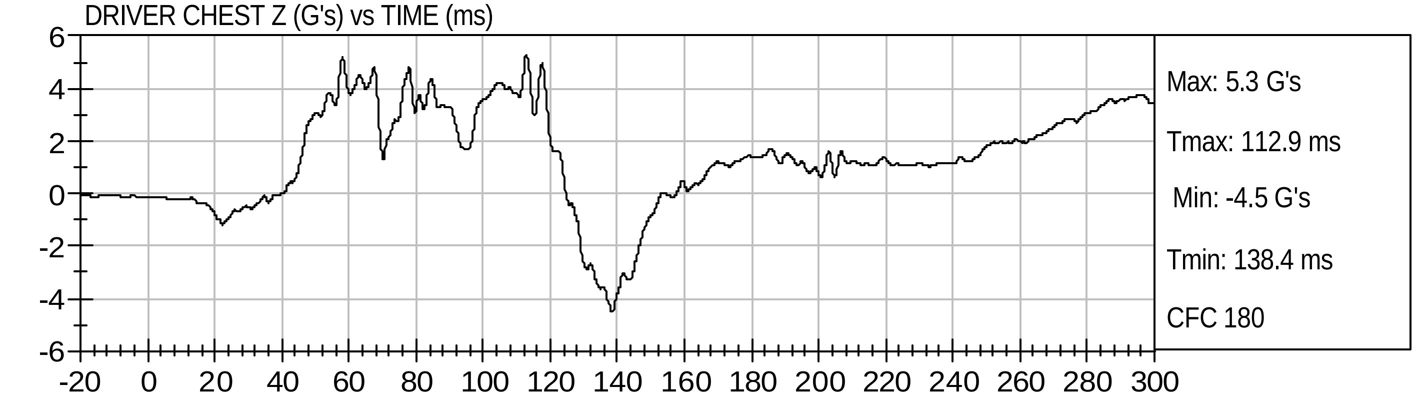
DRIVER CHEST X (G's) vs TIME (ms)



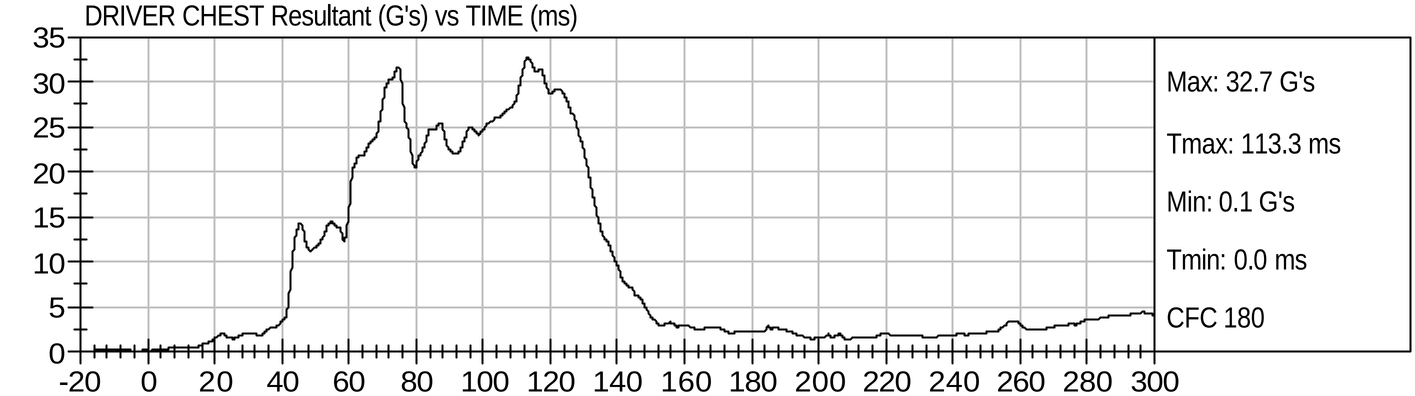
DRIVER CHEST Y (G's) vs TIME (ms)



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



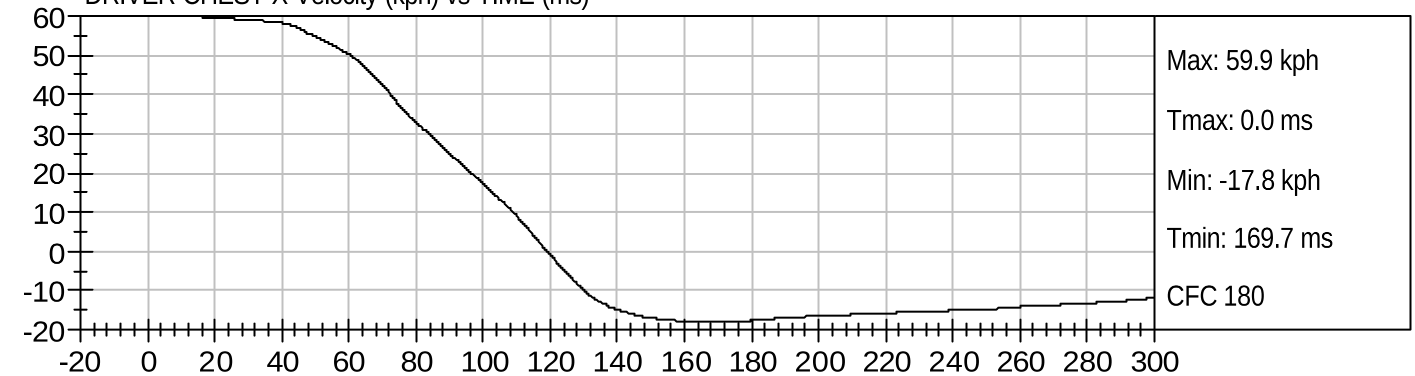
DRIVER CHEST Resultant (G's) vs TIME (ms)



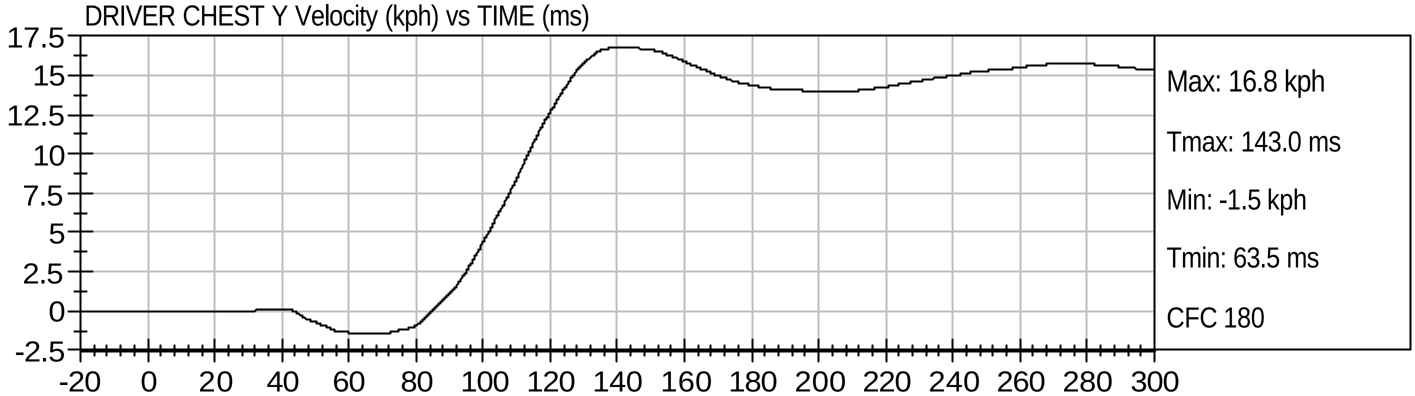
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

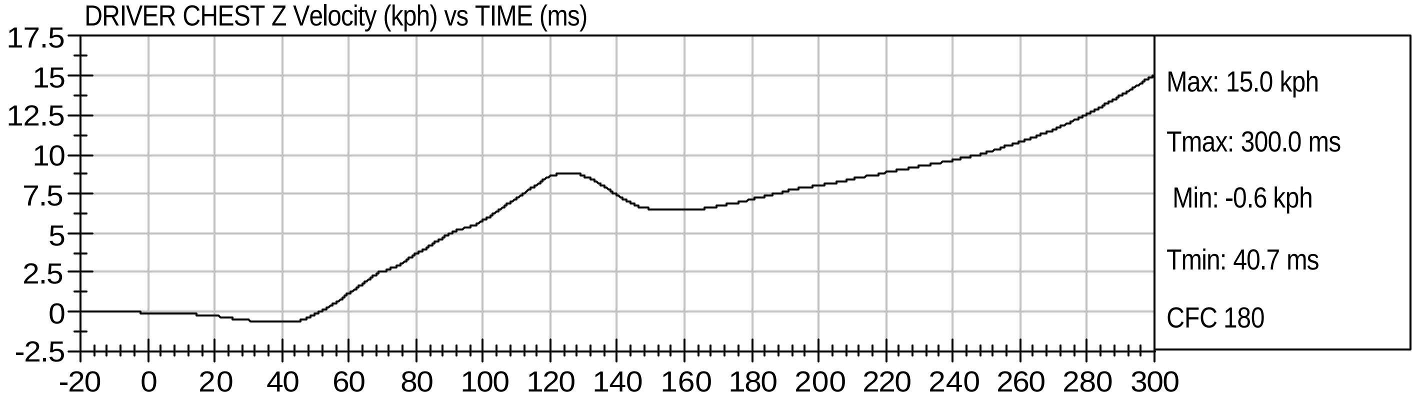
DRIVER CHEST X Velocity (kph) vs TIME (ms)



DRIVER CHEST Y Velocity (kph) vs TIME (ms)



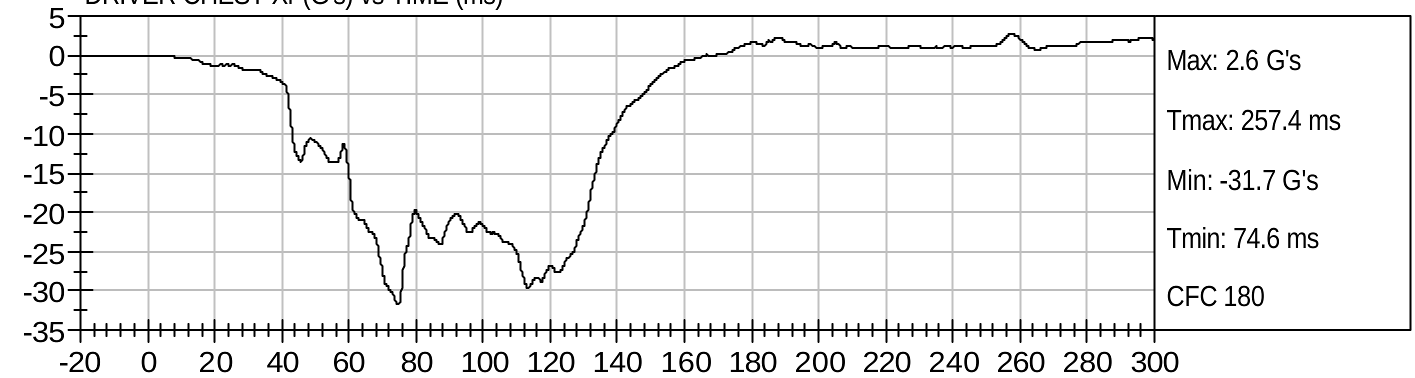
DRIVER CHEST Z Velocity (kph) vs TIME (ms)



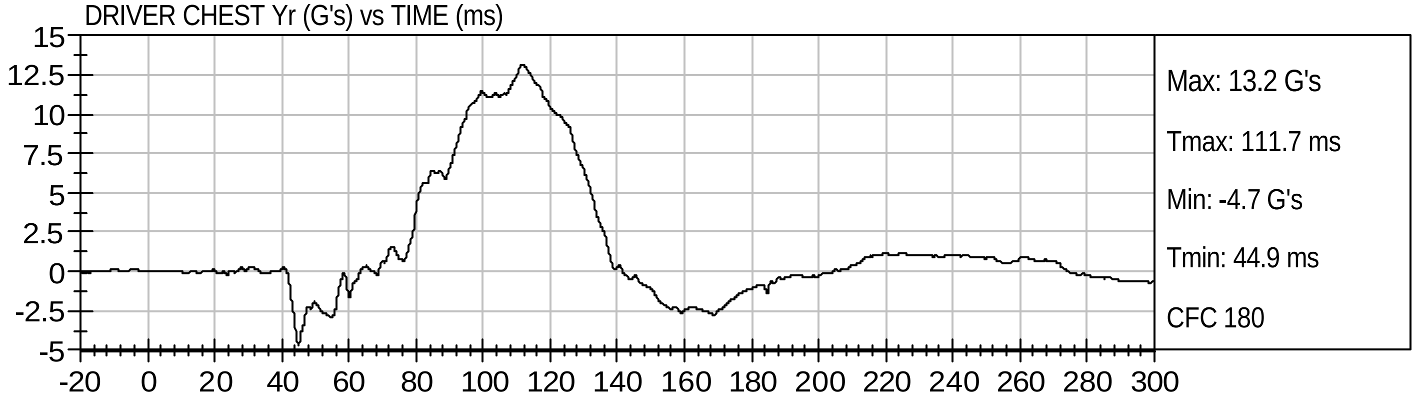
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

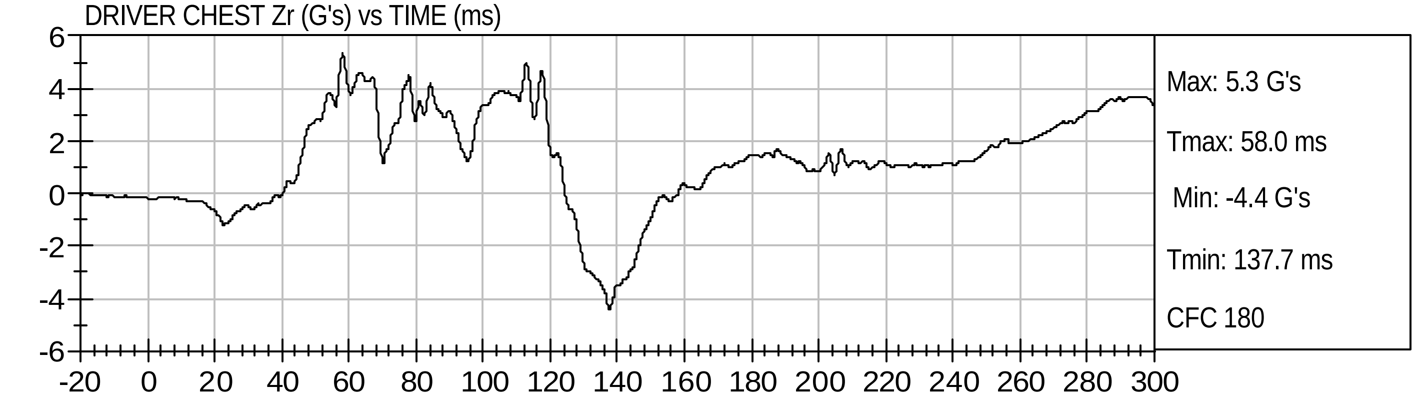
DRIVER CHEST Xr (G's) vs TIME (ms)



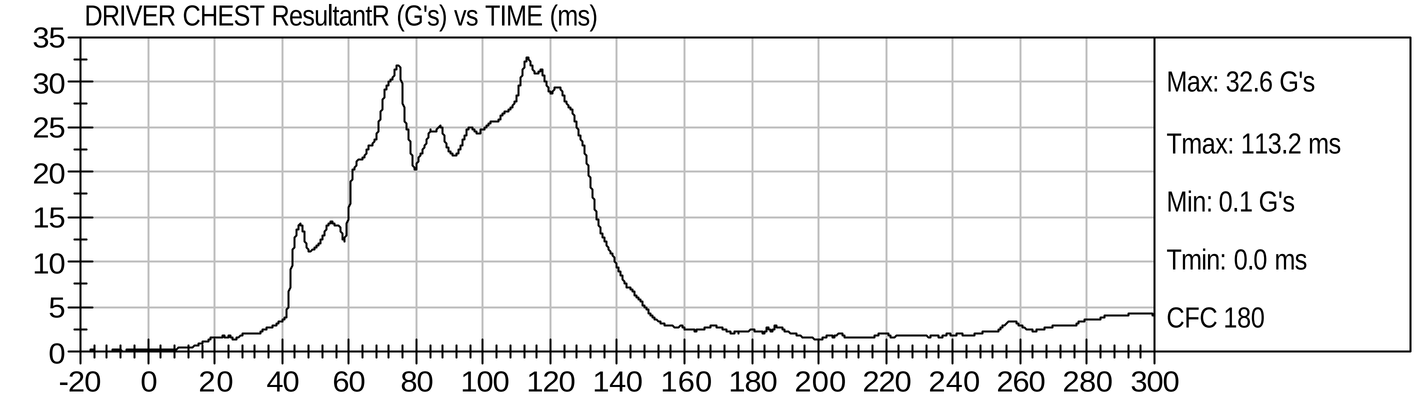
DRIVER CHEST Yr (G's) vs TIME (ms)



DRIVER CHEST Zr (G's) vs TIME (ms)



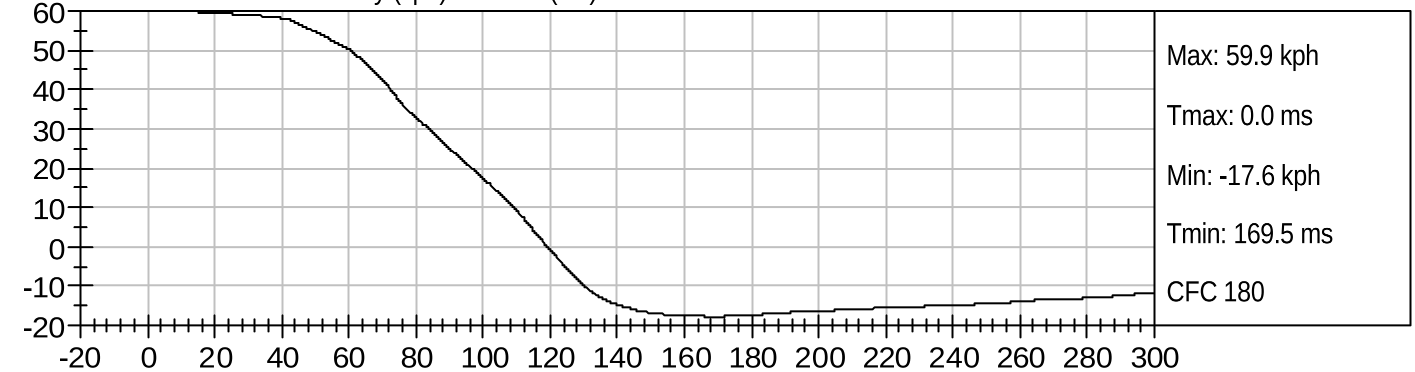
DRIVER CHEST ResultantR (G's) vs TIME (ms)



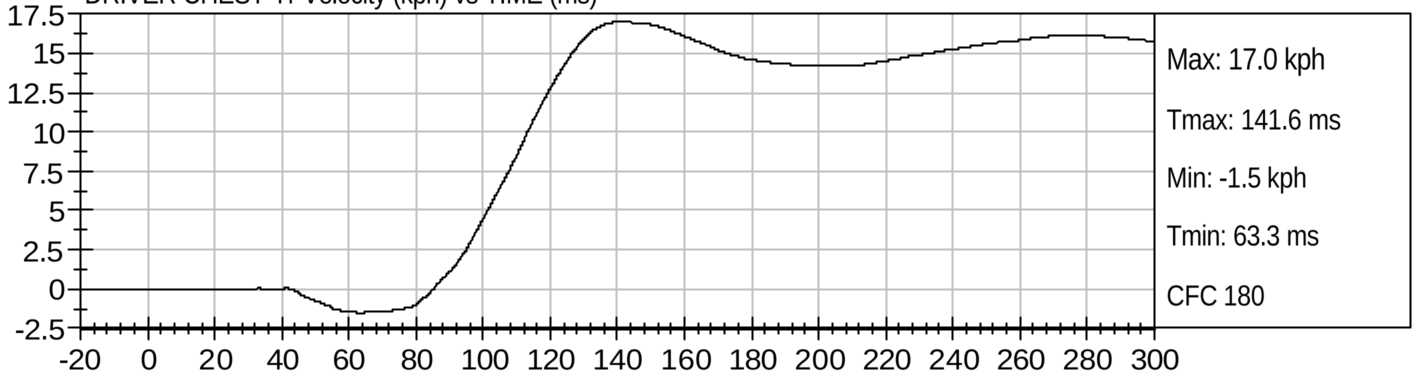
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

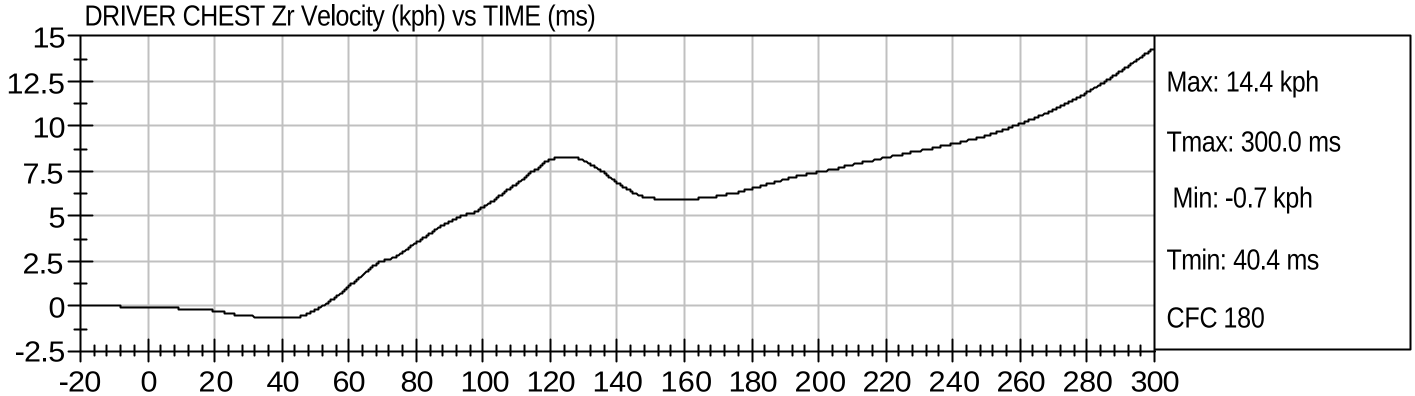
DRIVER CHEST Xr Velocity (kph) vs TIME (ms)



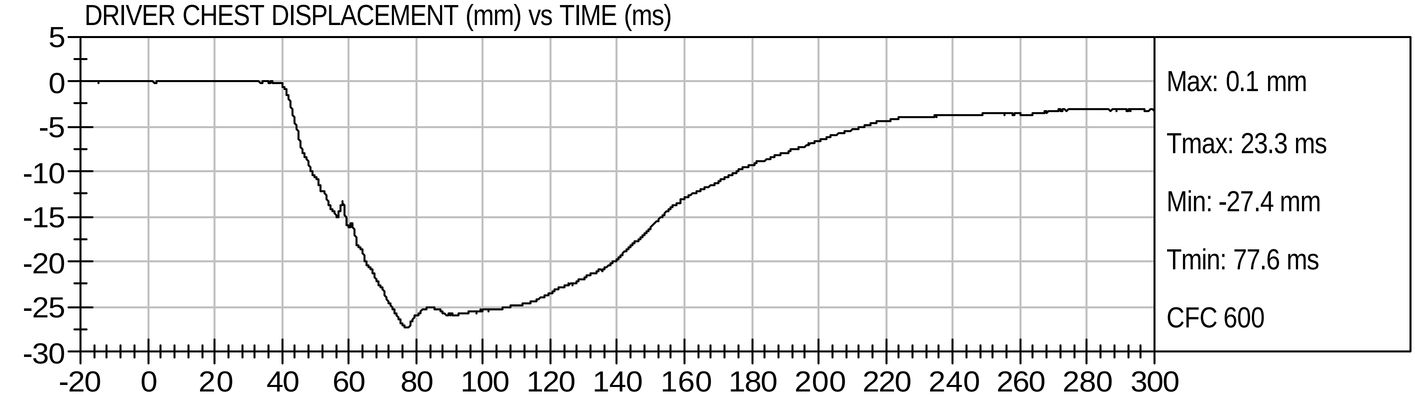
DRIVER CHEST Yr Velocity (kph) vs TIME (ms)



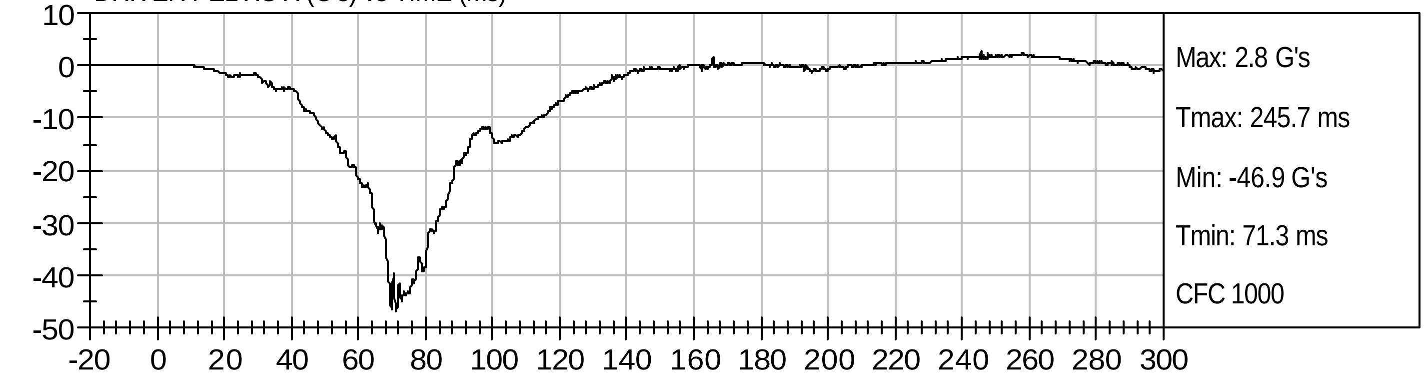
DRIVER CHEST Zr Velocity (kph) vs TIME (ms)



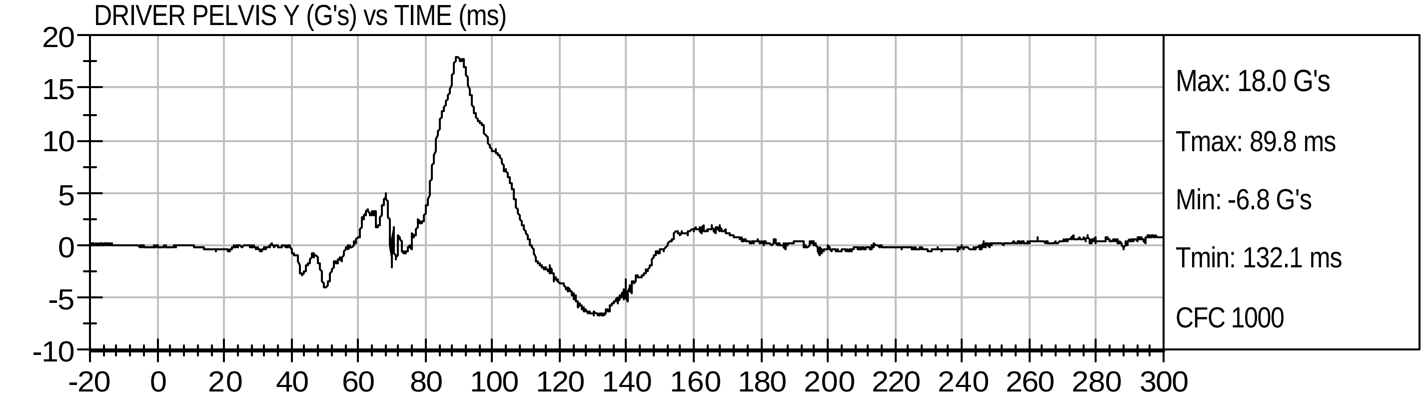
DRIVER CHEST DISPLACEMENT (mm) vs TIME (ms)



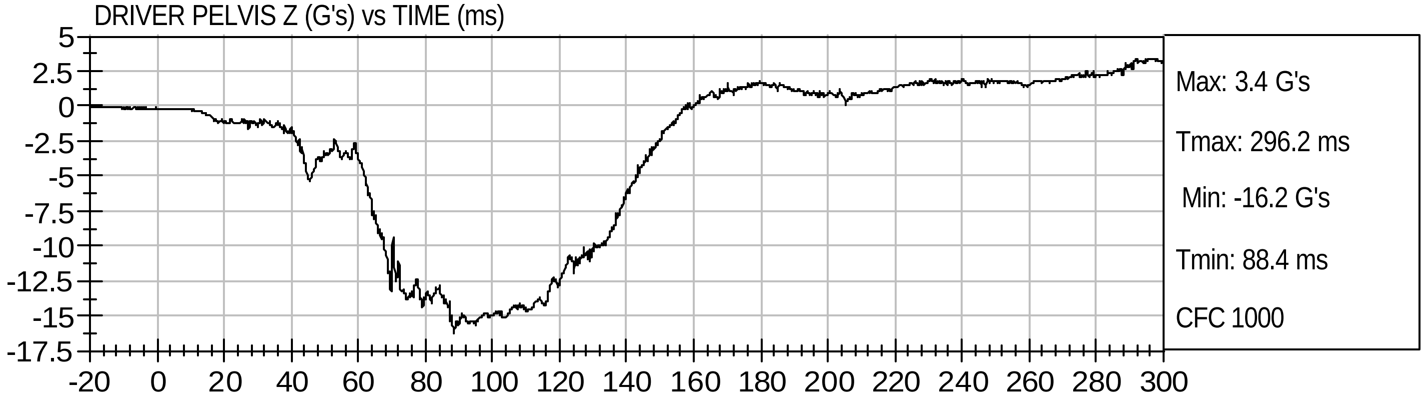
DRIVER PELVIS X (G's) vs TIME (ms)



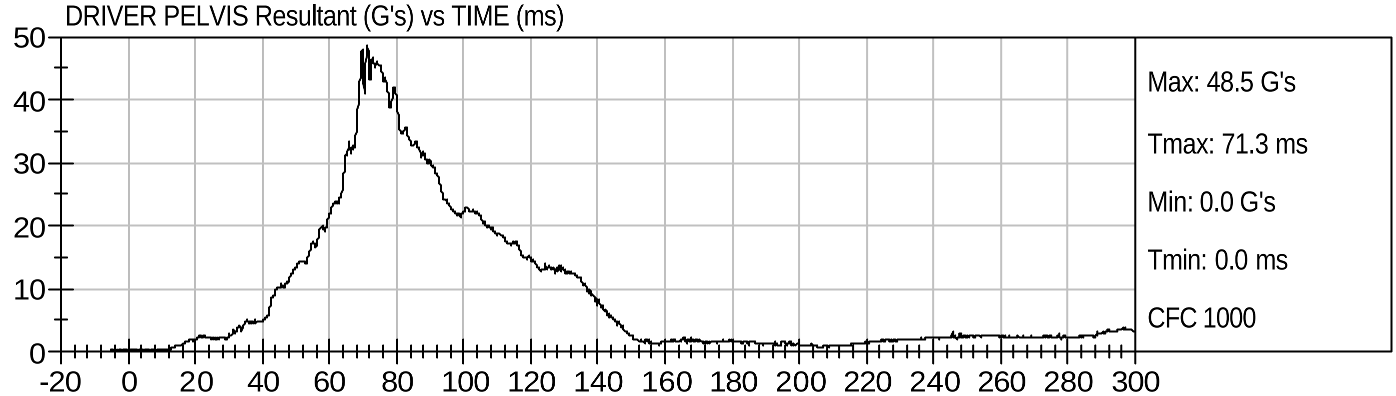
DRIVER PELVIS Y (G's) vs TIME (ms)



DRIVER PELVIS Z (G's) vs TIME (ms)

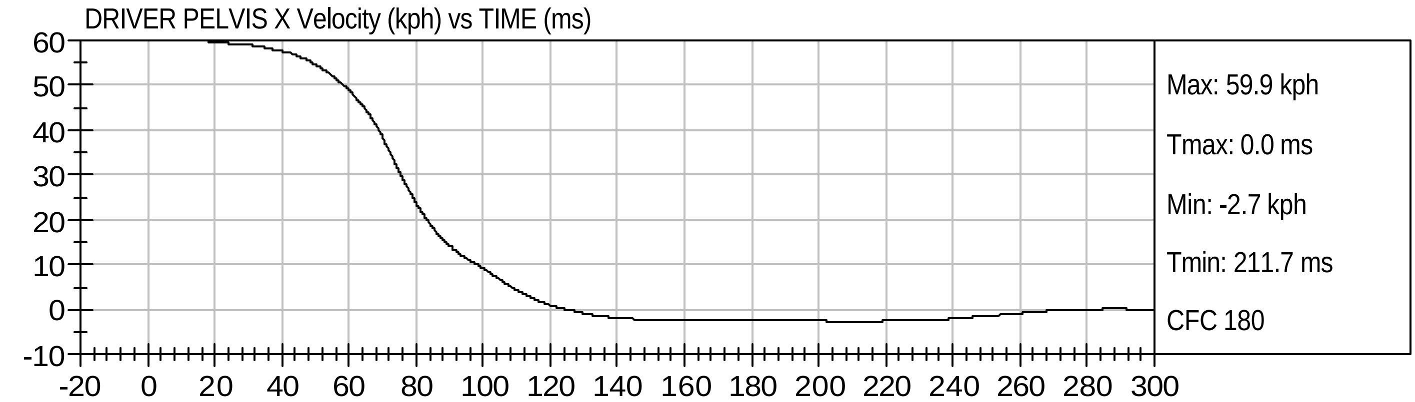


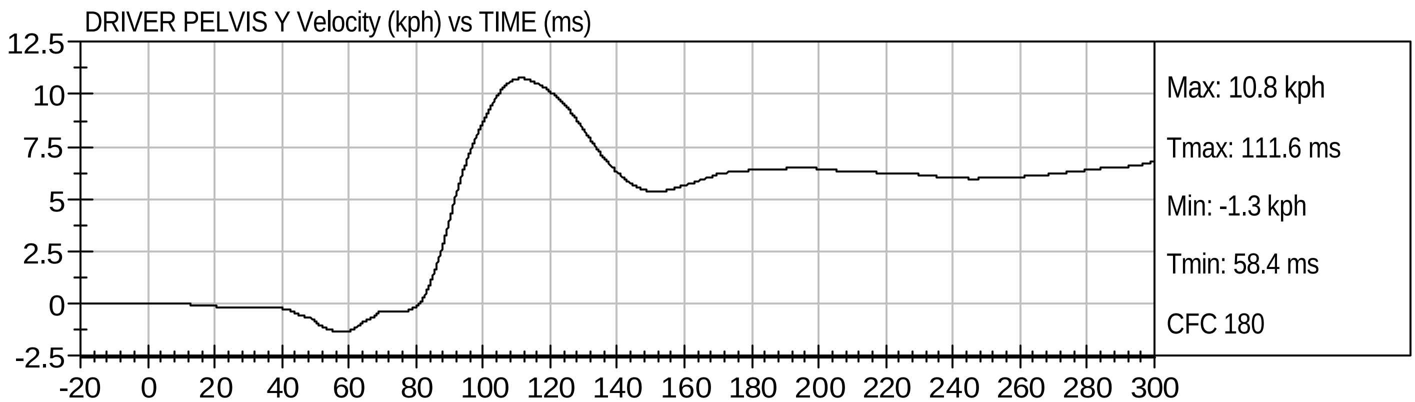
DRIVER PELVIS Resultant (G's) vs TIME (ms)

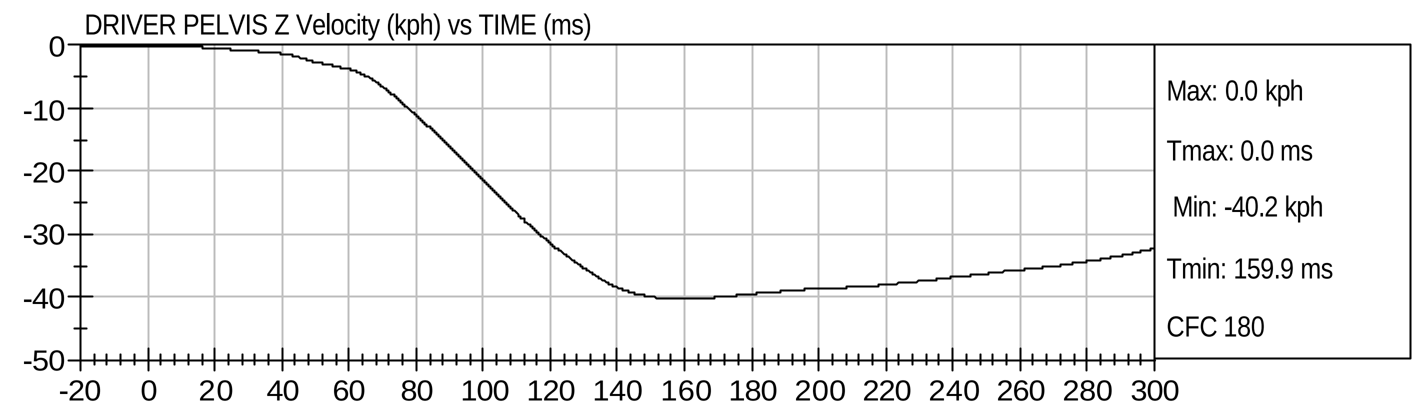


NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

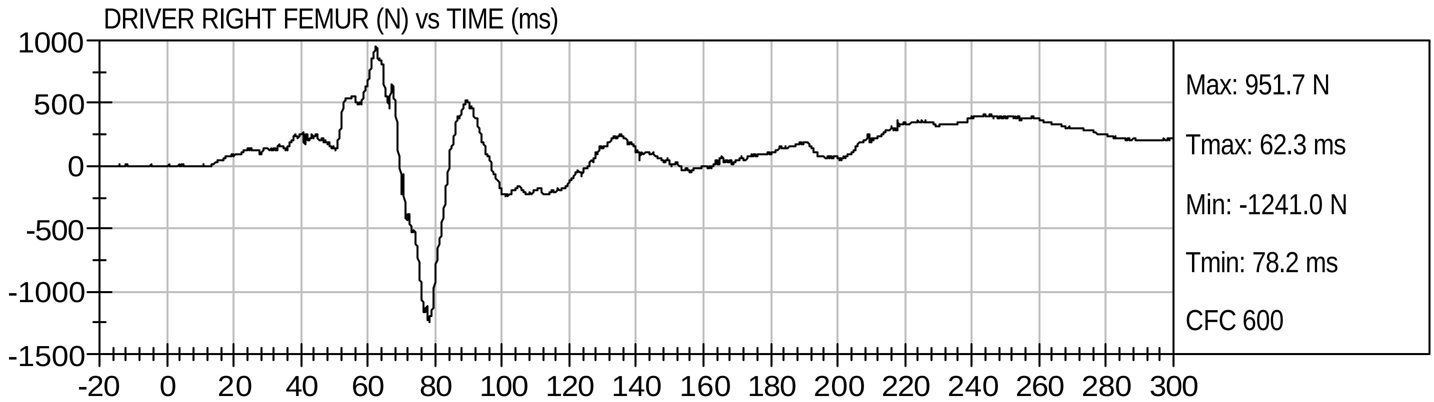


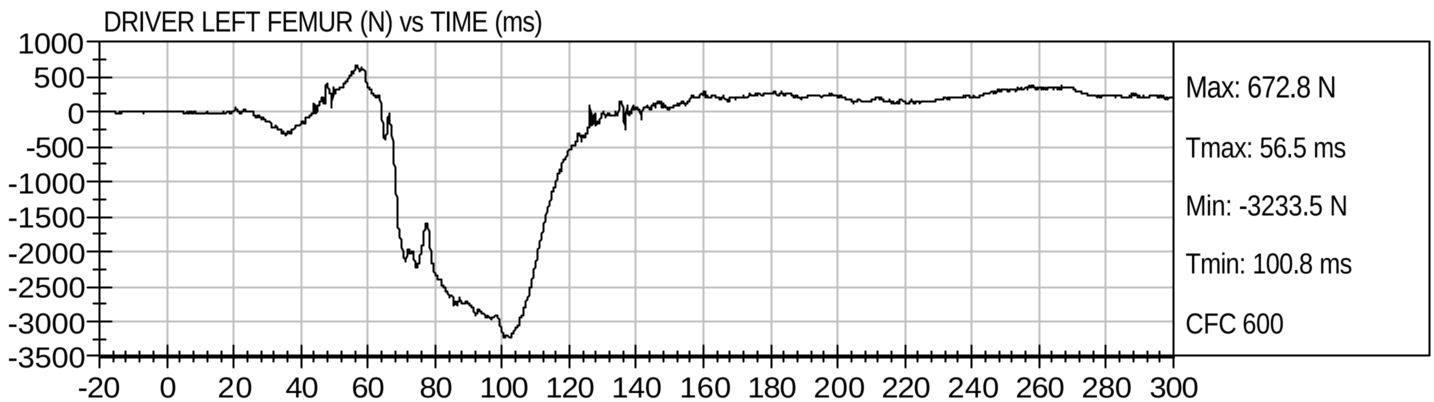


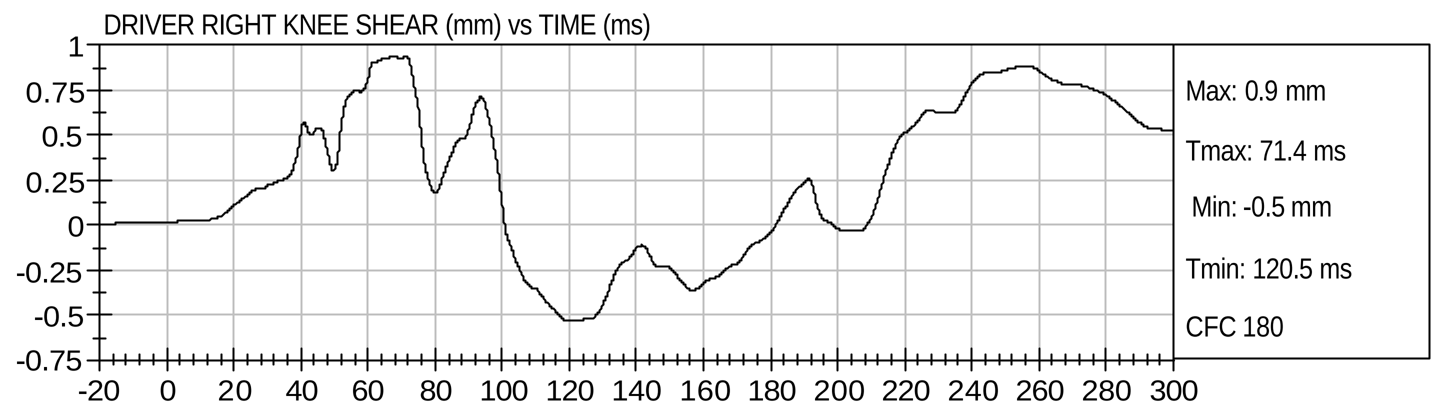


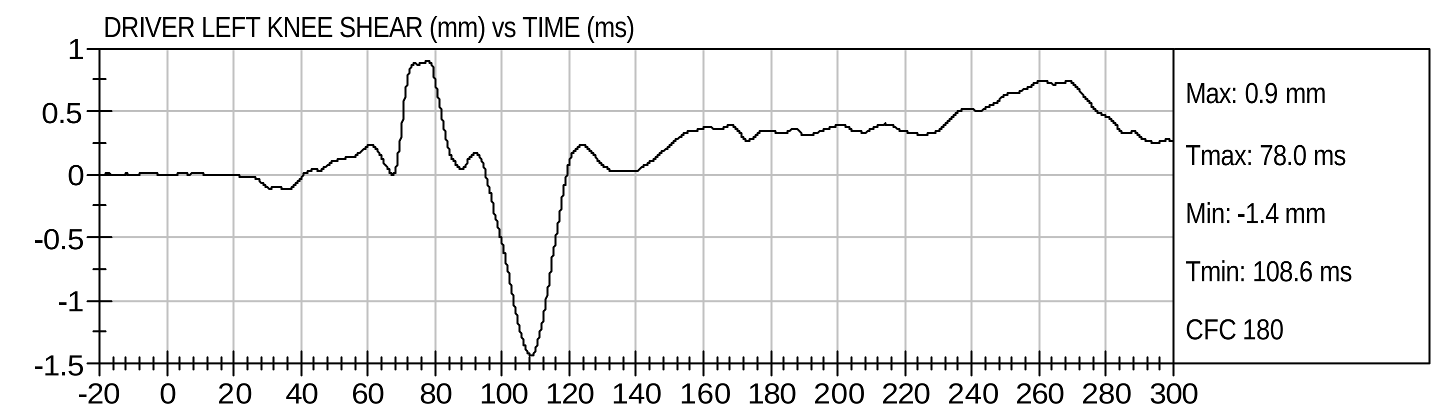
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





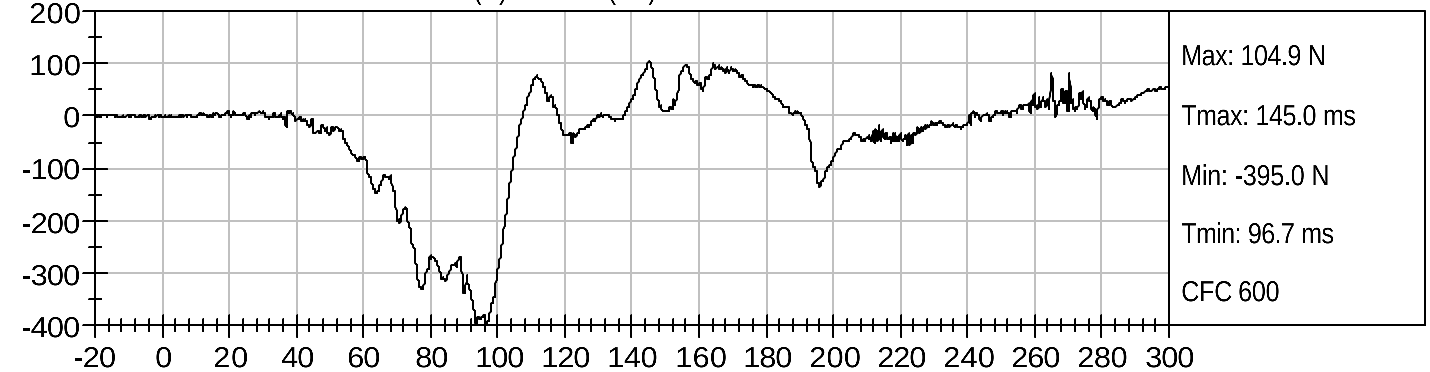




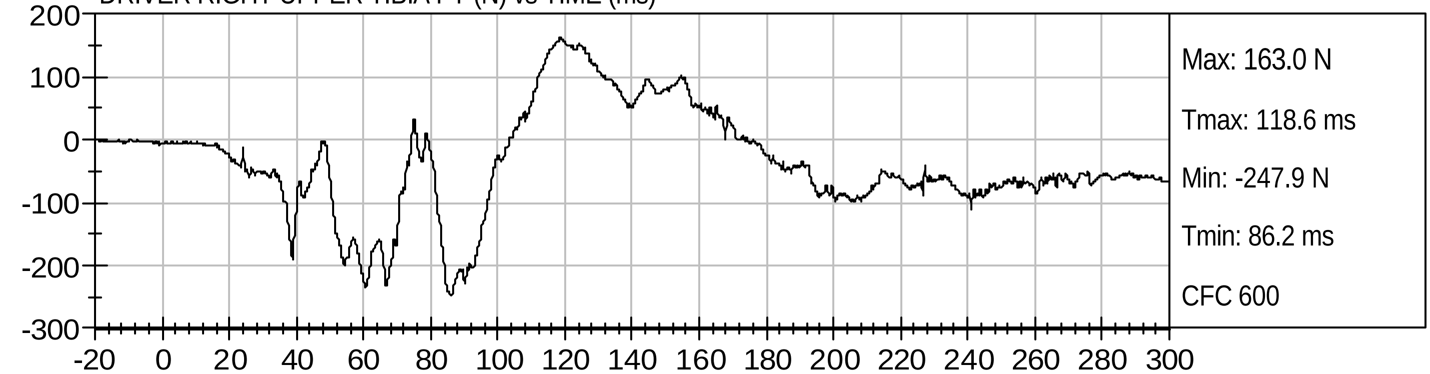
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

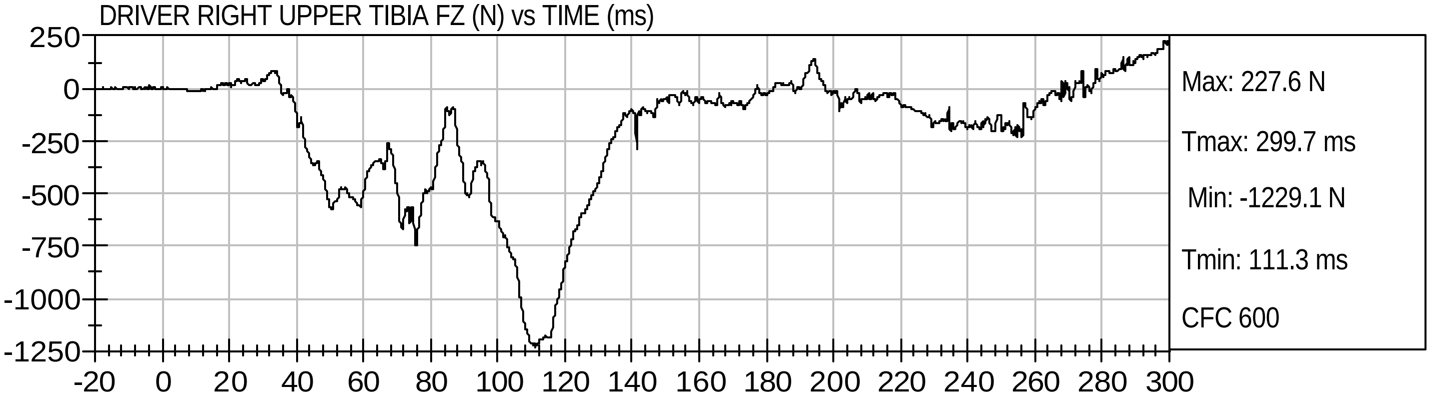
DRIVER RIGHT UPPER TIBIA FX (N) vs TIME (ms)



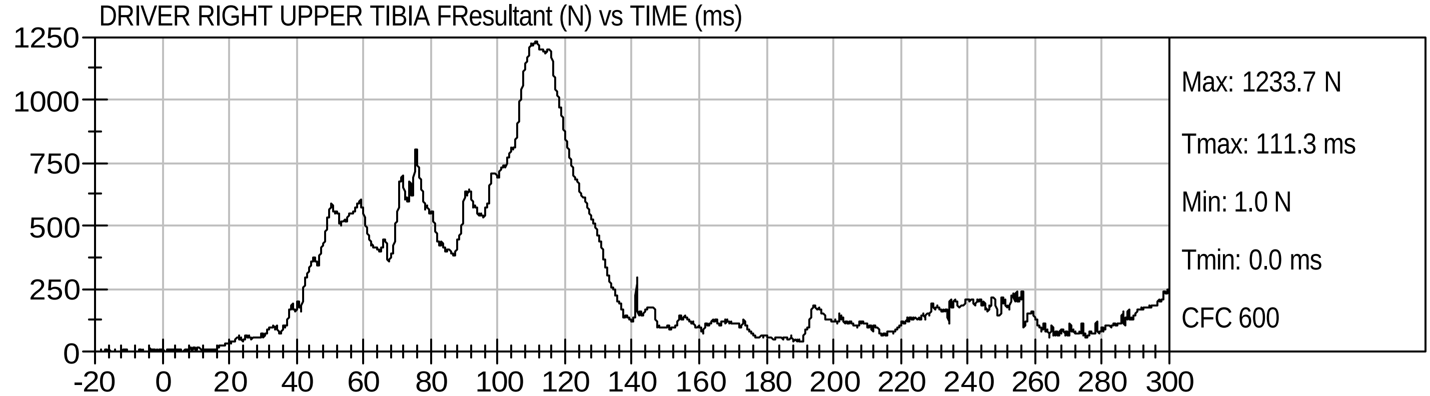
DRIVER RIGHT UPPER TIBIA FY (N) vs TIME (ms)



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

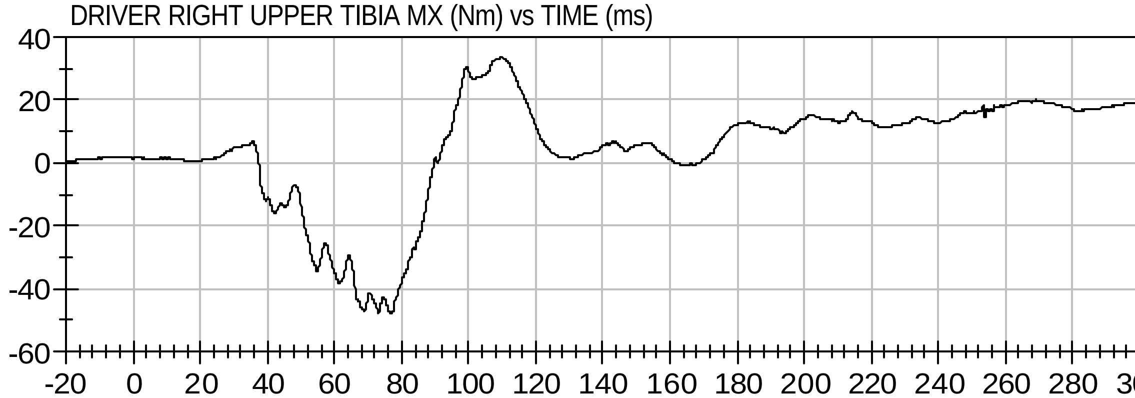


DRIVER RIGHT UPPER TIBIA FResultant (N) vs TIME (ms)



NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)



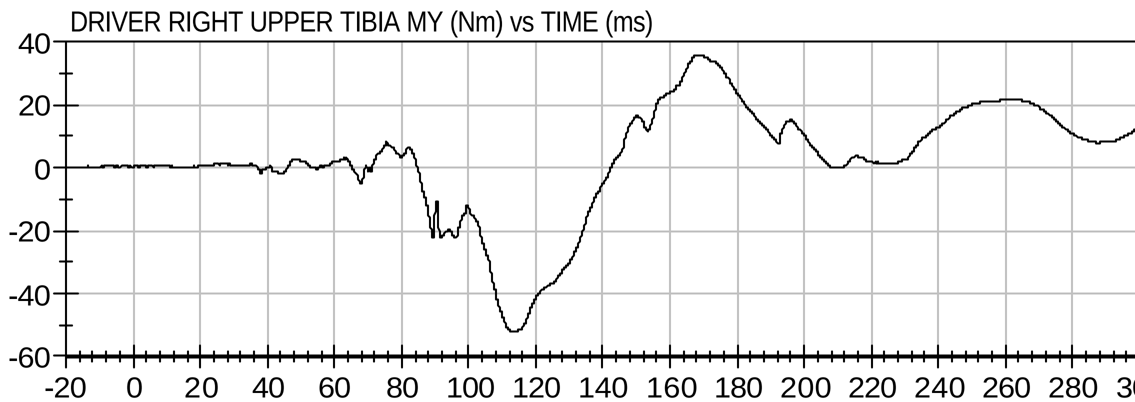
Max: 33.4 Nm

Tmax: 109.7 ms

Min: -48.0 Nm

Tmin: 77.0 ms

CFC 600



Max: 35.8 Nm

Tmax: 168.5 ms

Min: -52.3 Nm

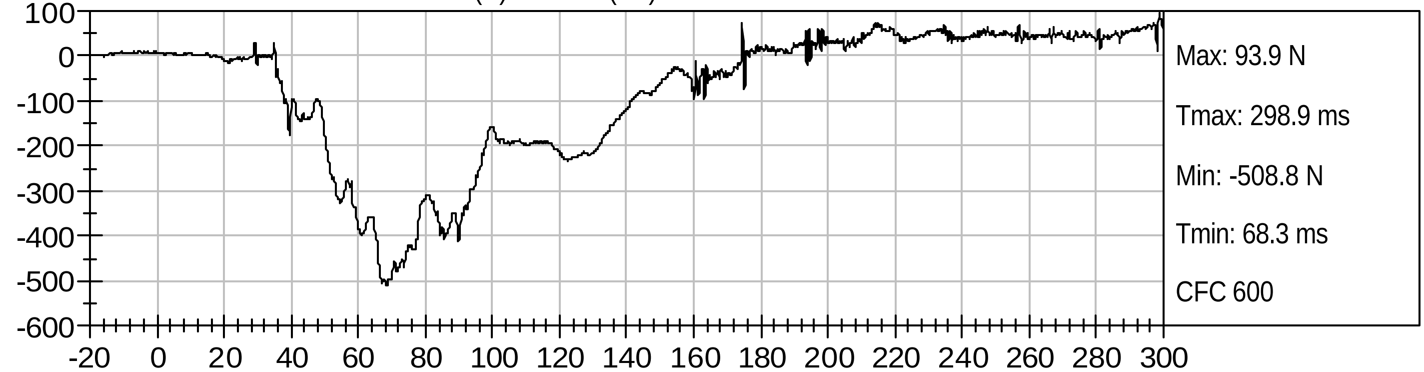
Tmin: 114.2 ms

CFC 600

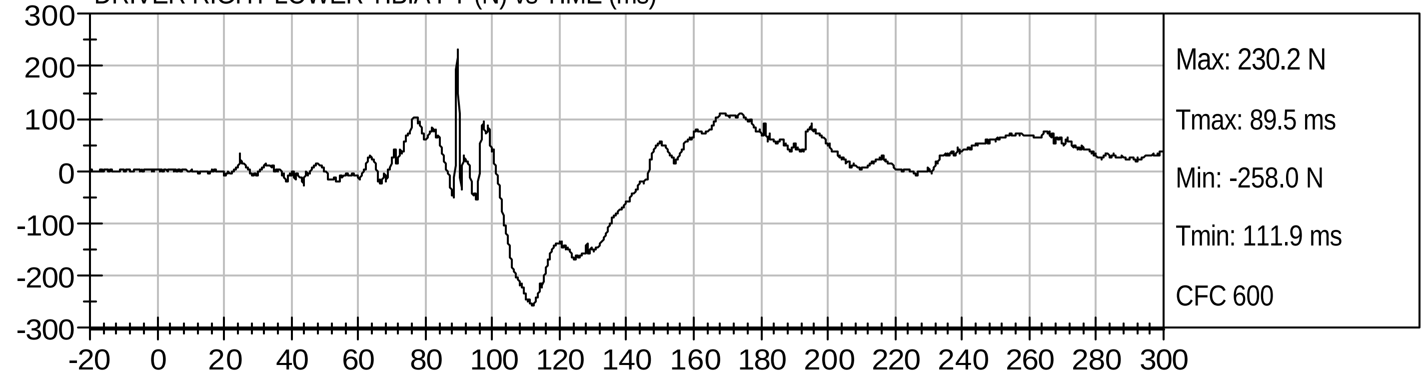
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

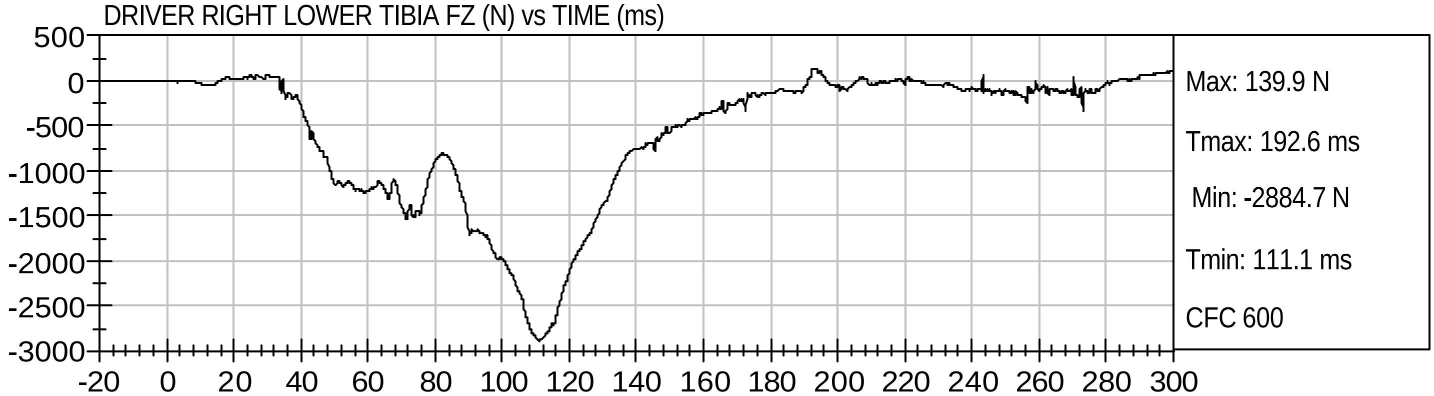
DRIVER RIGHT LOWER TIBIA FX (N) vs TIME (ms)



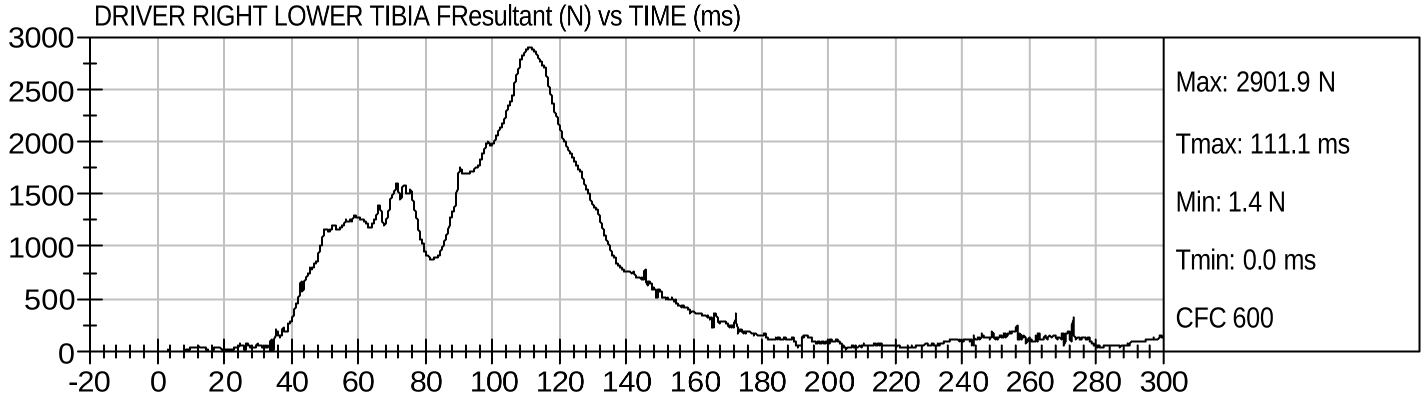
DRIVER RIGHT LOWER TIBIA FY (N) vs TIME (ms)



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

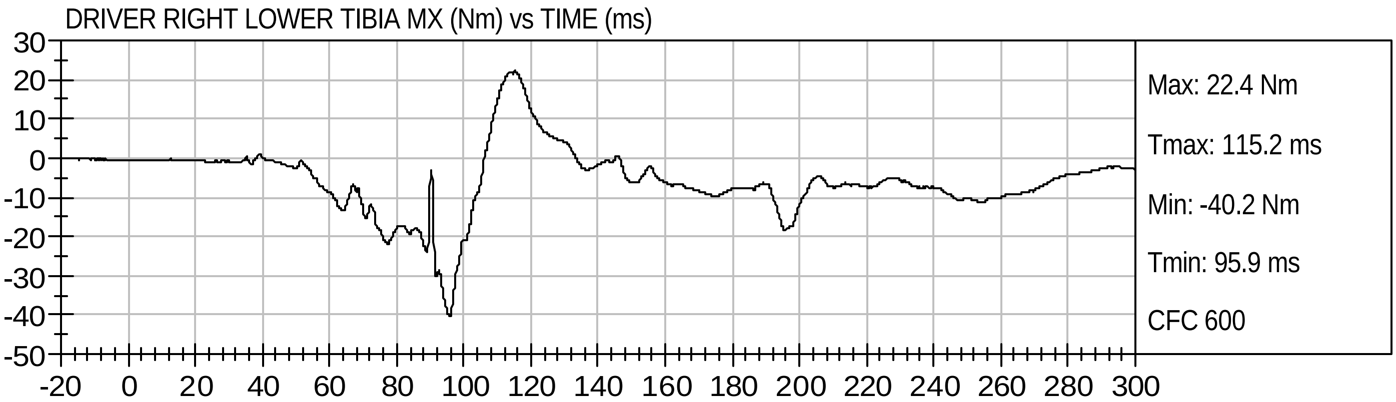


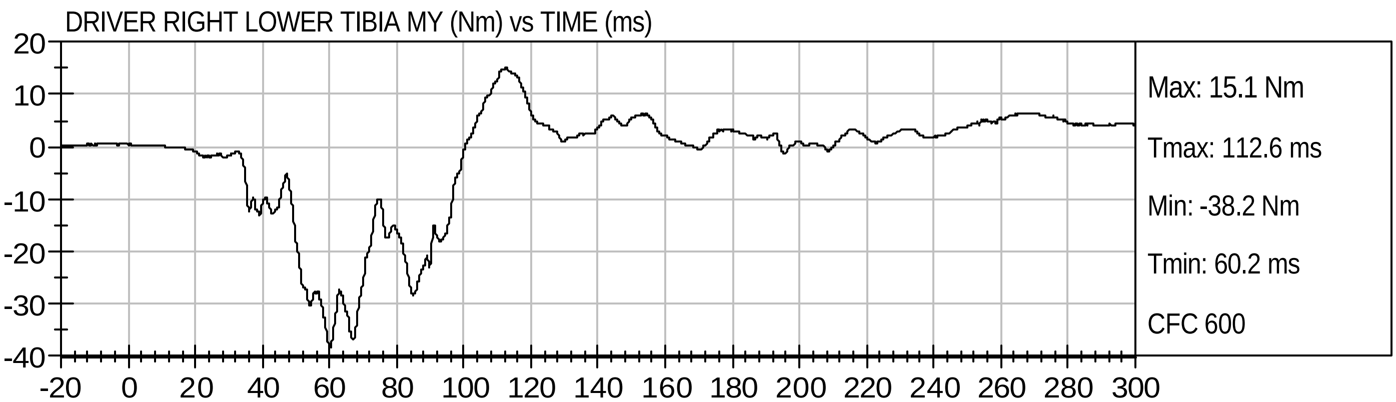
DRIVER RIGHT LOWER TIBIA FResultant (N) vs TIME (ms)



NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)



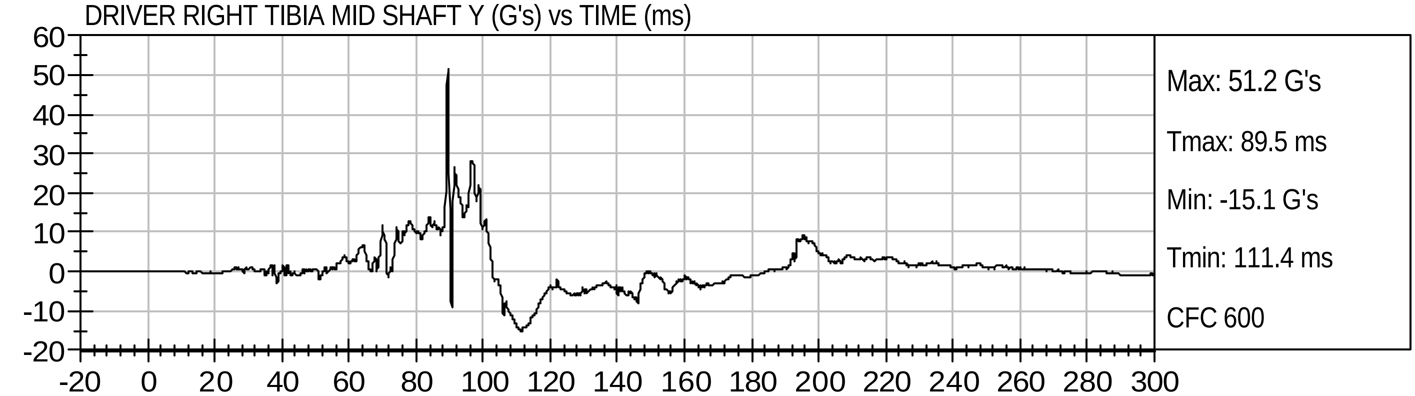


NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

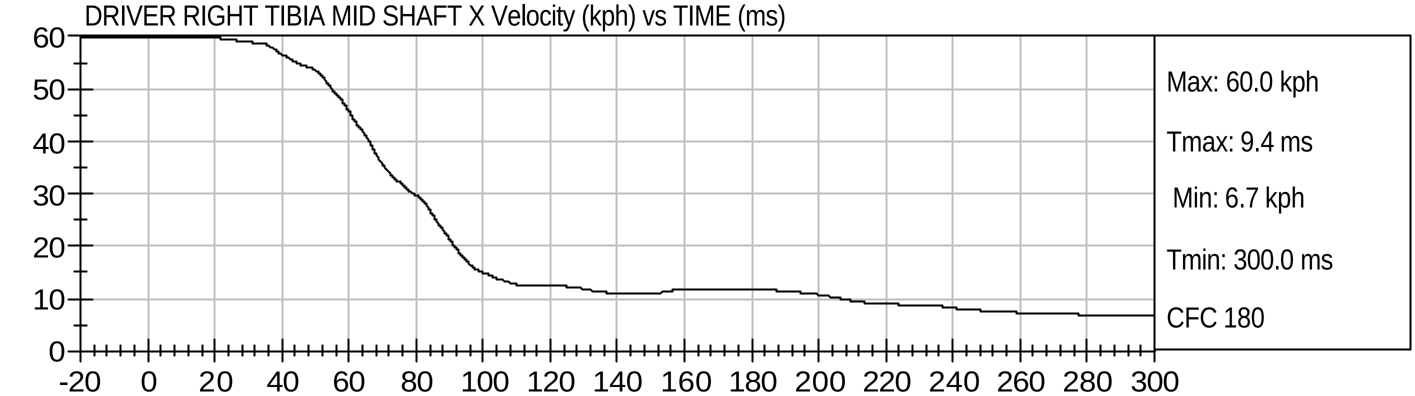
Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

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

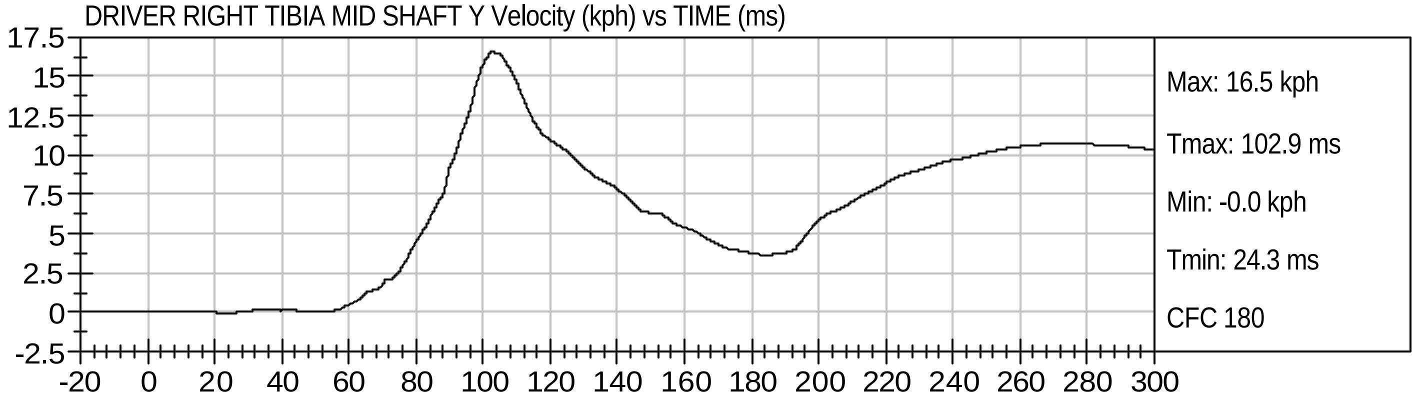
DRIVER RIGHT TIBIA MID SHAFT Y (G's) vs TIME (ms)



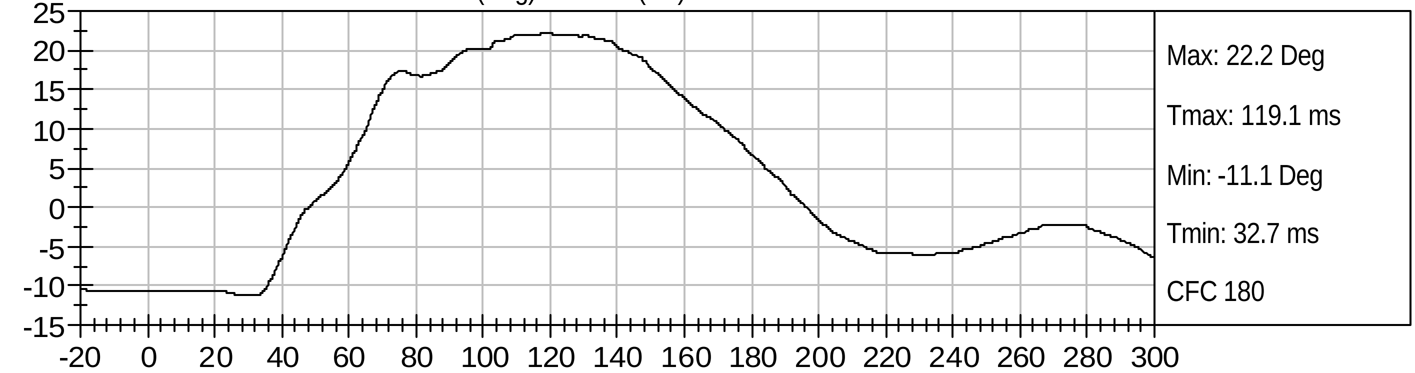
DRIVER RIGHT TIBIA MID SHAFT X Velocity (kph) vs TIME (ms)



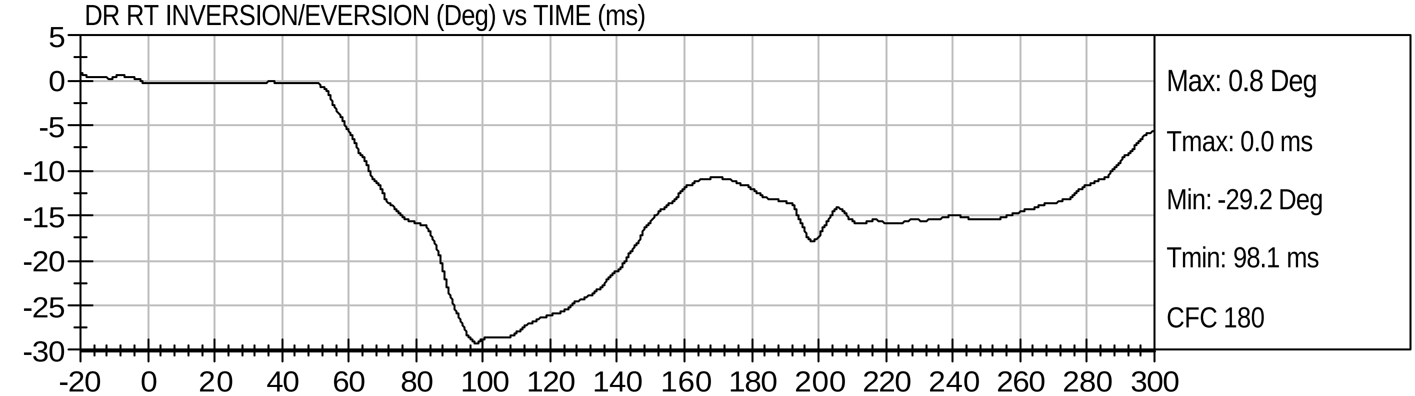
DRIVER RIGHT TIBIA MID SHAFT Y Velocity (kph) vs TIME (ms)



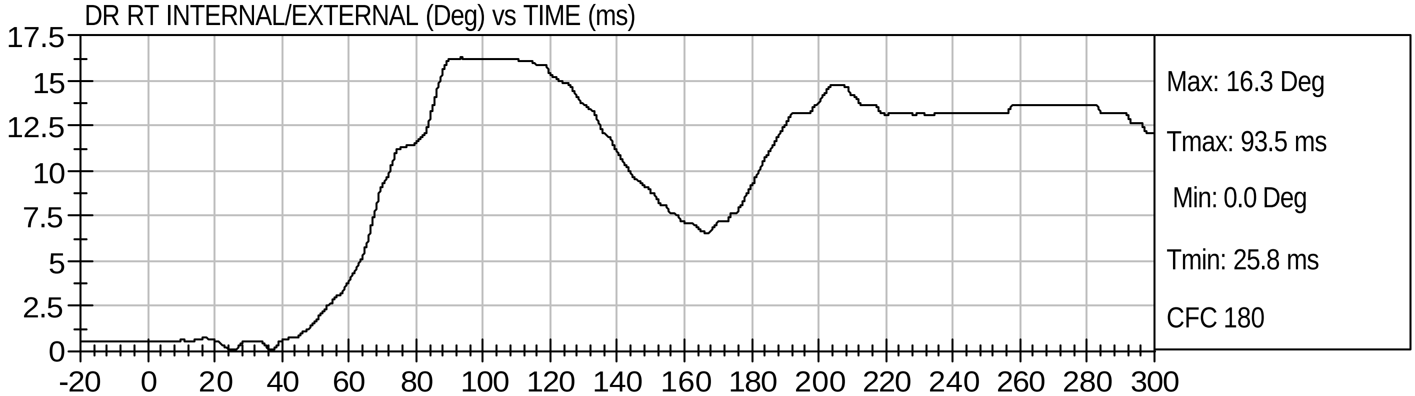
DR RT DORSI/PLANTAR FLEXION (Deg) vs TIME (ms)



DR RT INVERSION/EVERSION (Deg) vs TIME (ms)



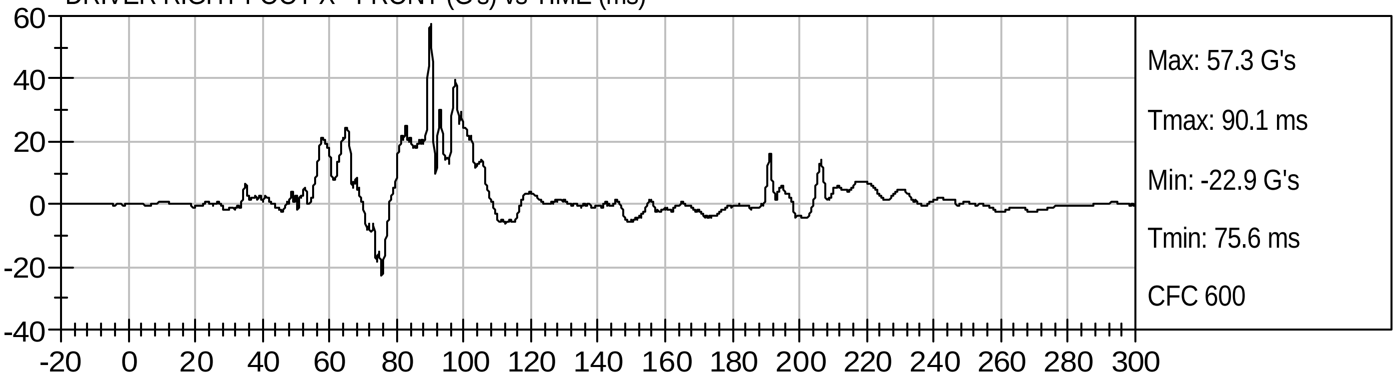
DR RT INTERNAL/EXTERNAL (Deg) vs TIME (ms)



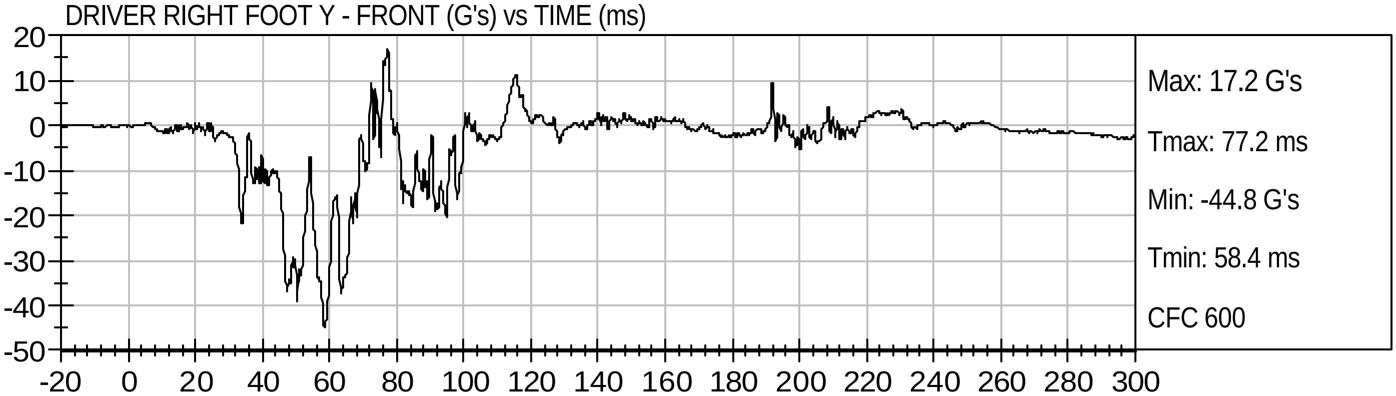
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

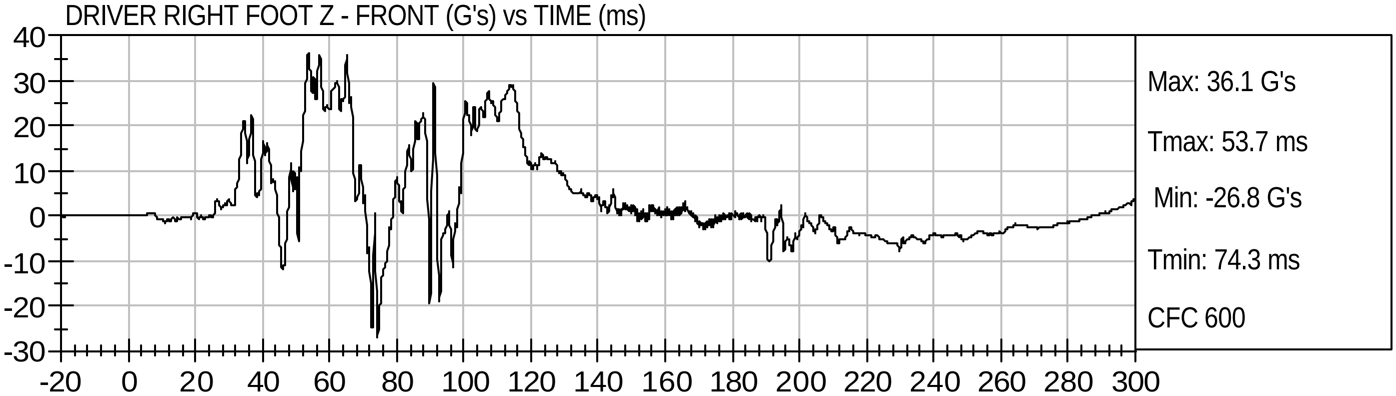
DRIVER RIGHT FOOT X - FRONT (G's) vs TIME (ms)



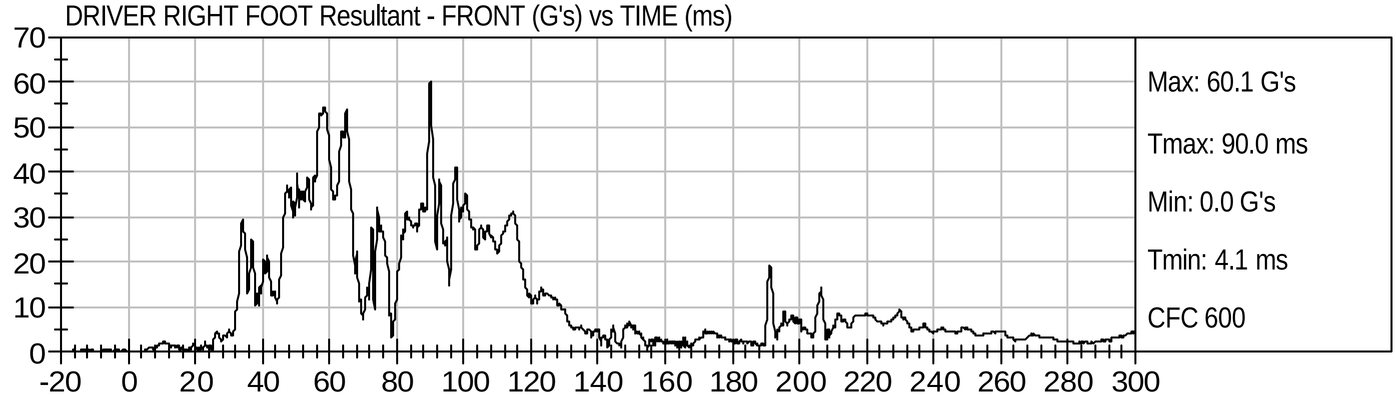
DRIVER RIGHT FOOT Y - FRONT (G's) vs TIME (ms)



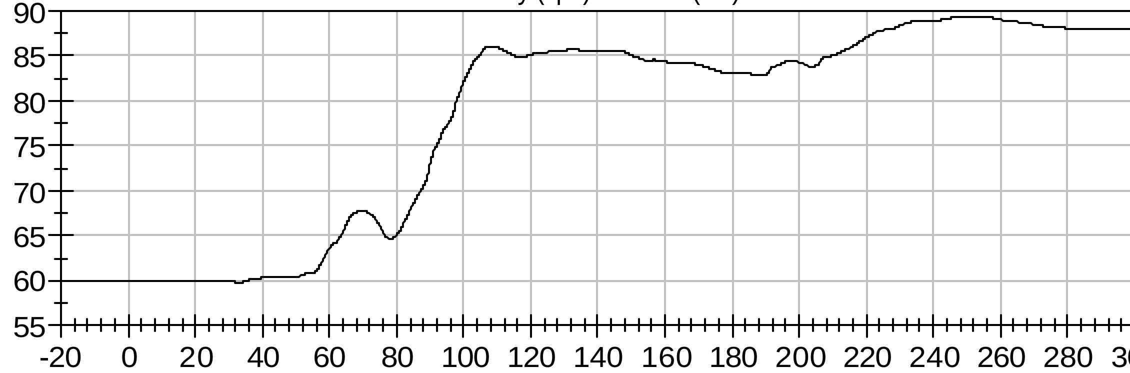
DRIVER RIGHT FOOT Z - FRONT (G's) vs TIME (ms)



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

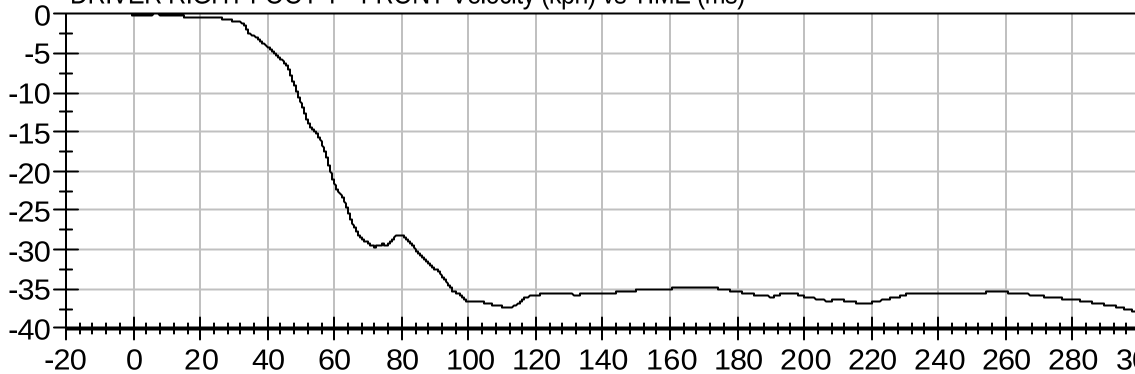


DRIVER RIGHT FOOT X - FRONT Velocity (kph) vs TIME (ms)



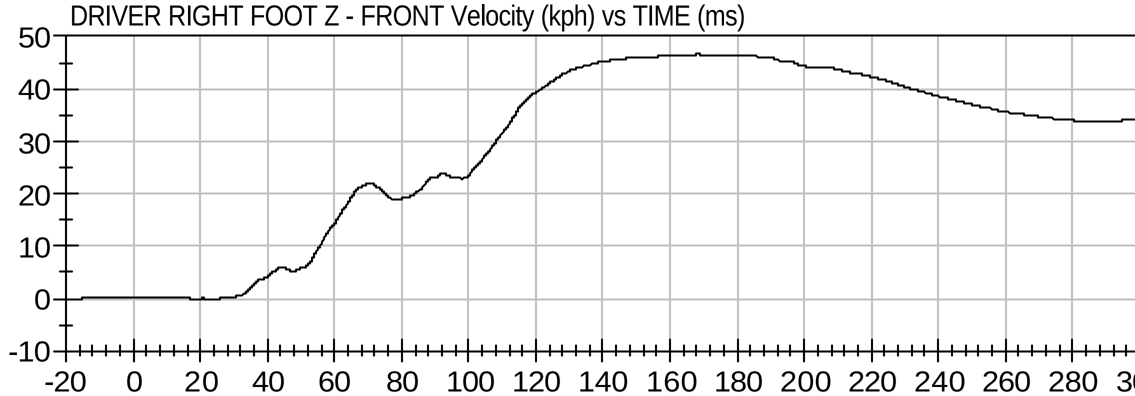
Max: 89.3 kph
Tmax: 252.0 ms
Min: 59.7 kph
Tmin: 33.6 ms
CFC 180

DRIVER RIGHT FOOT Y - FRONT Velocity (kph) vs TIME (ms)



Max: 0.0 kph
Tmax: 0.0 ms
Min: -37.9 kph
Tmin: 300.0 ms
CFC 180

DRIVER RIGHT FOOT Z - FRONT Velocity (kph) vs TIME (ms)

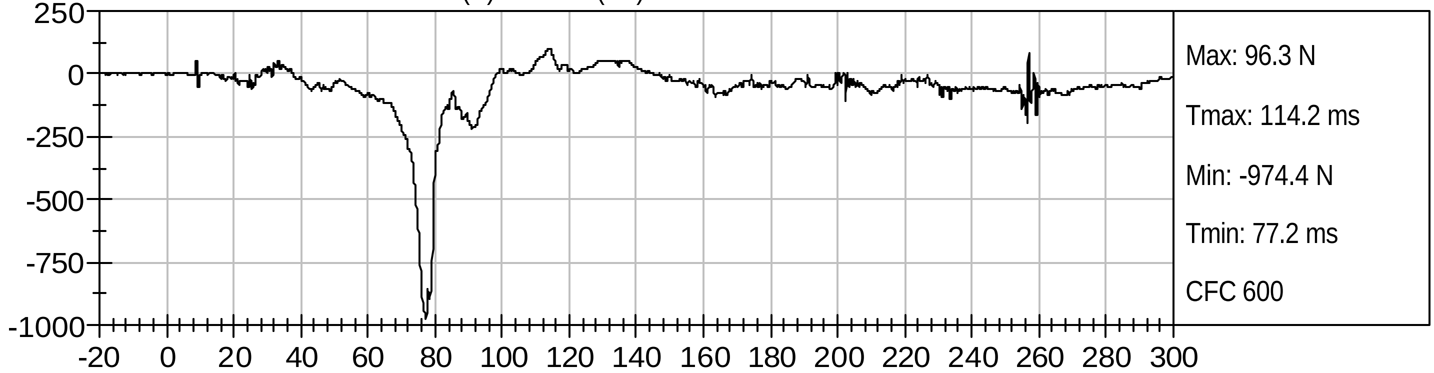


Max: 46.6 kph
Tmax: 168.4 ms
Min: -0.0 kph
Tmin: 25.0 ms
CFC 180

NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

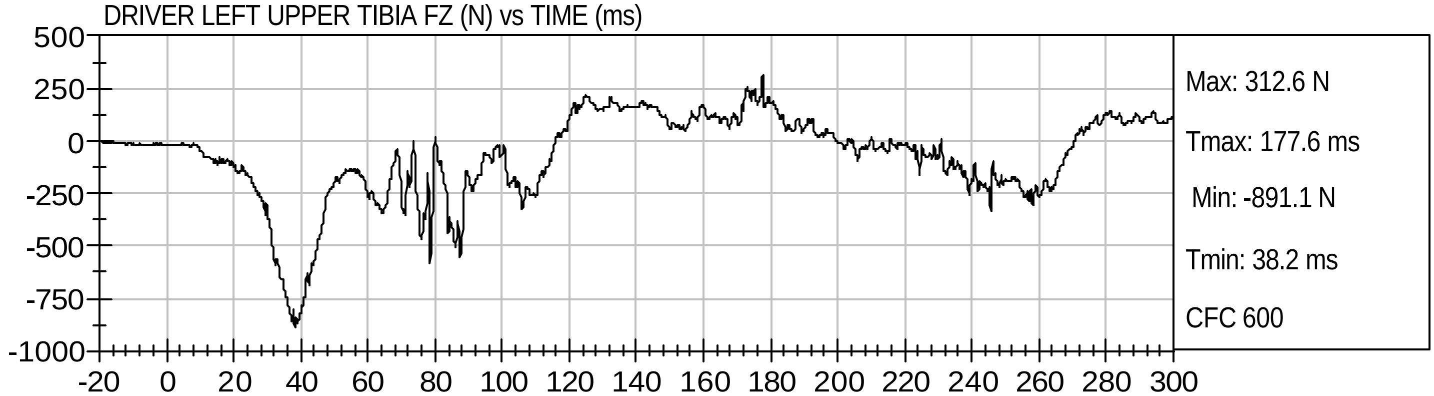
Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

DRIVER LEFT UPPER TIBIA FX (N) vs TIME (ms)

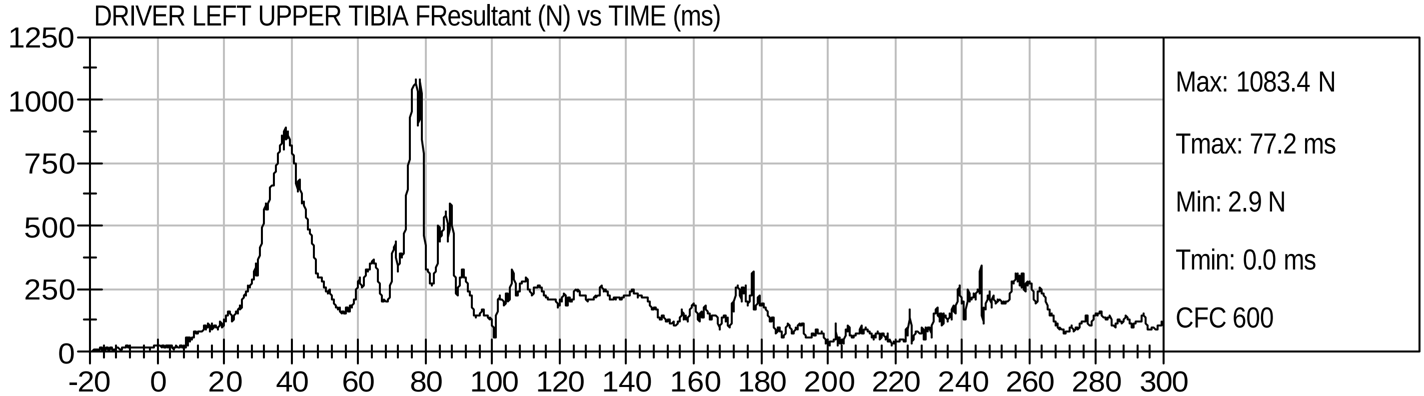


DRIVER LEFT UPPER TIBIA FY (N) vs TIME (ms)

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

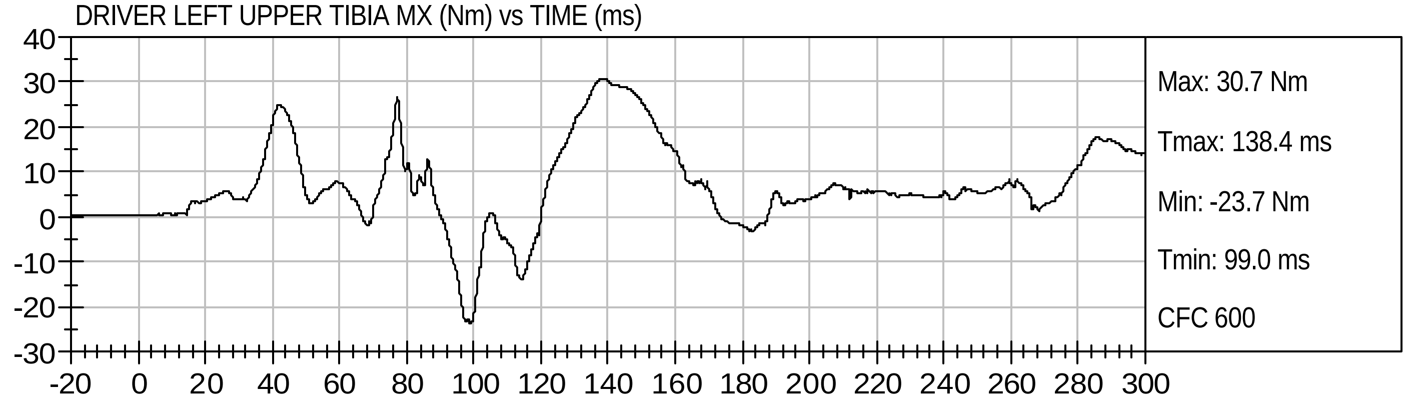


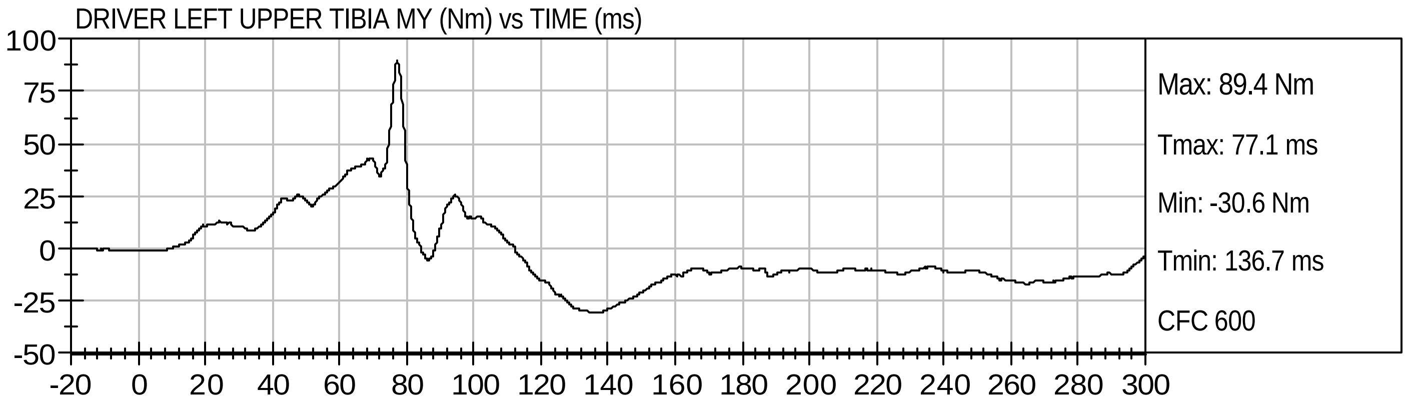
DRIVER LEFT UPPER TIBIA FResultant (N) vs TIME (ms)



NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

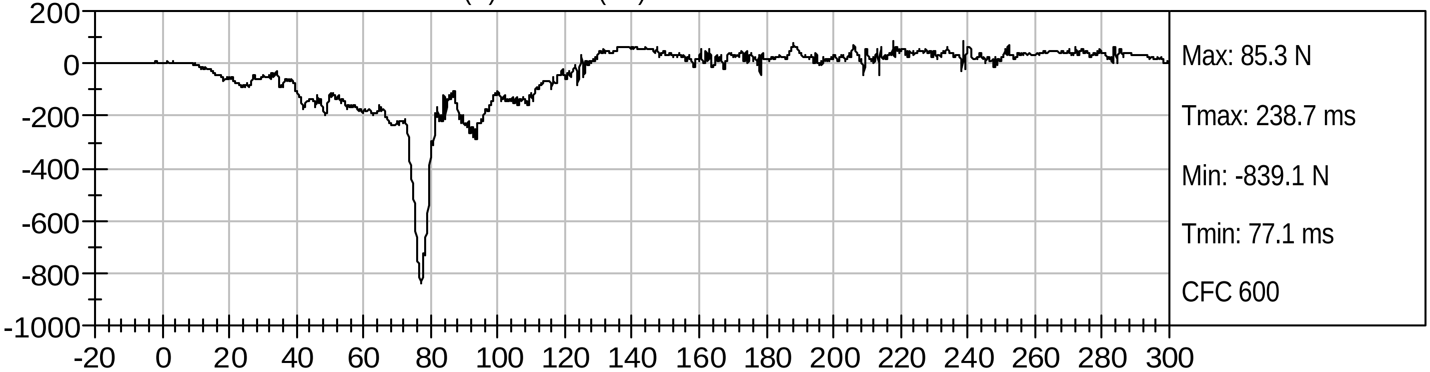




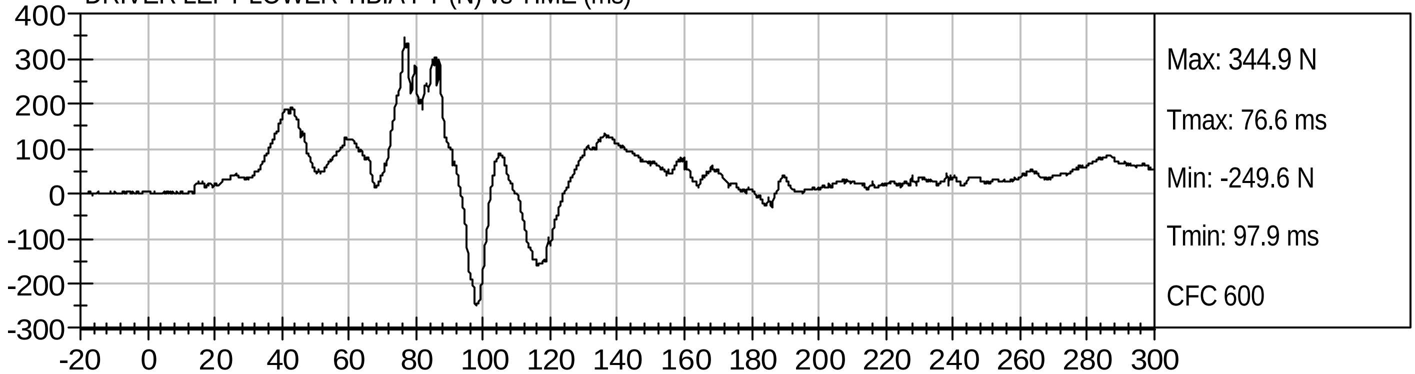
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

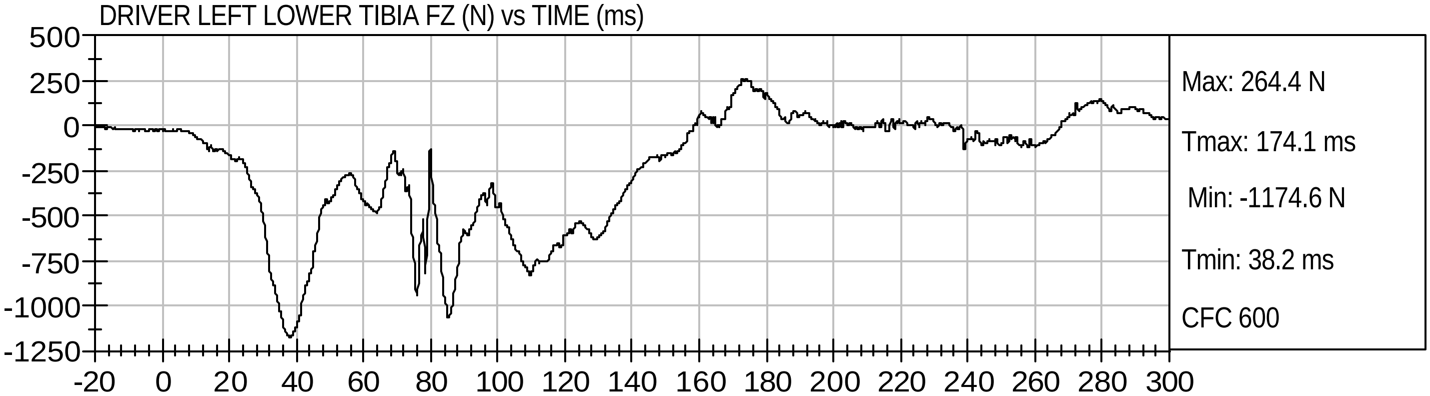
DRIVER LEFT LOWER TIBIA FX (N) vs TIME (ms)



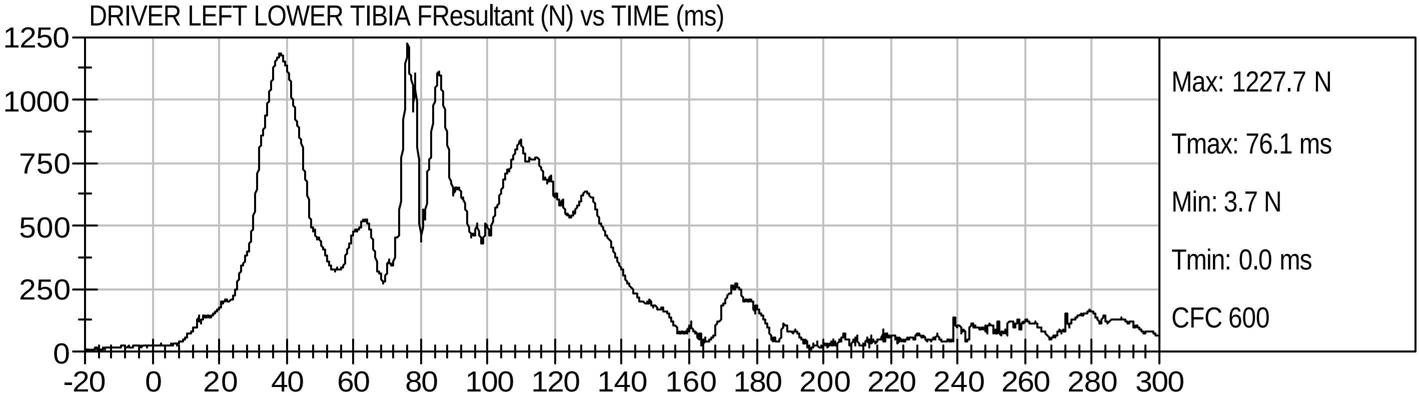
DRIVER LEFT LOWER TIBIA FY (N) vs TIME (ms)



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

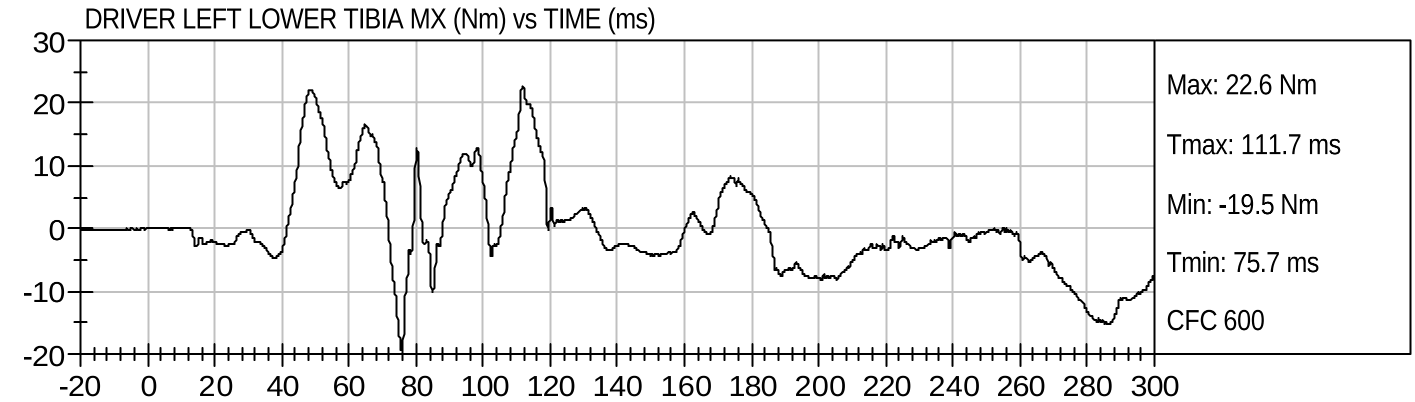


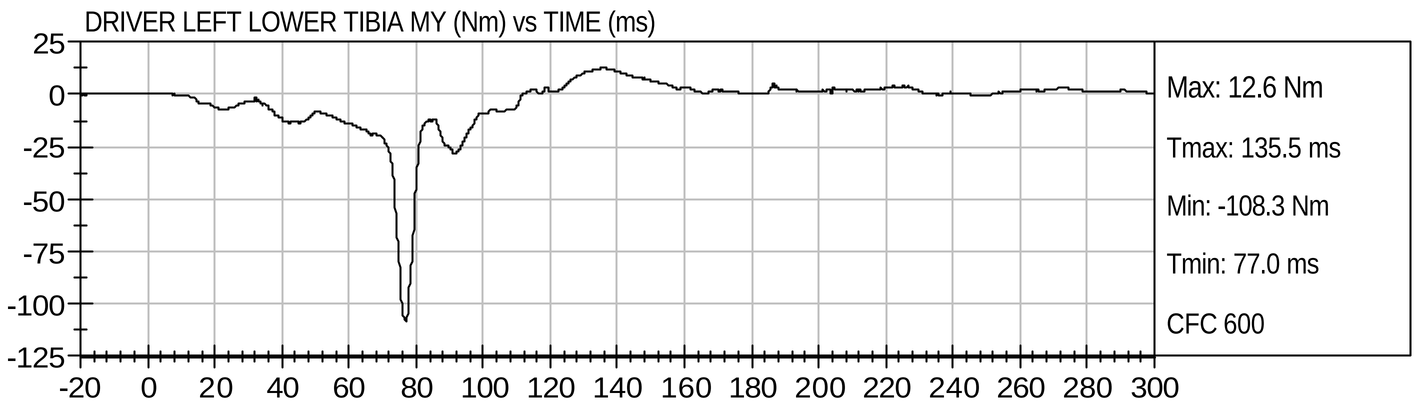
DRIVER LEFT LOWER TIBIA FResultant (N) vs TIME (ms)



NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

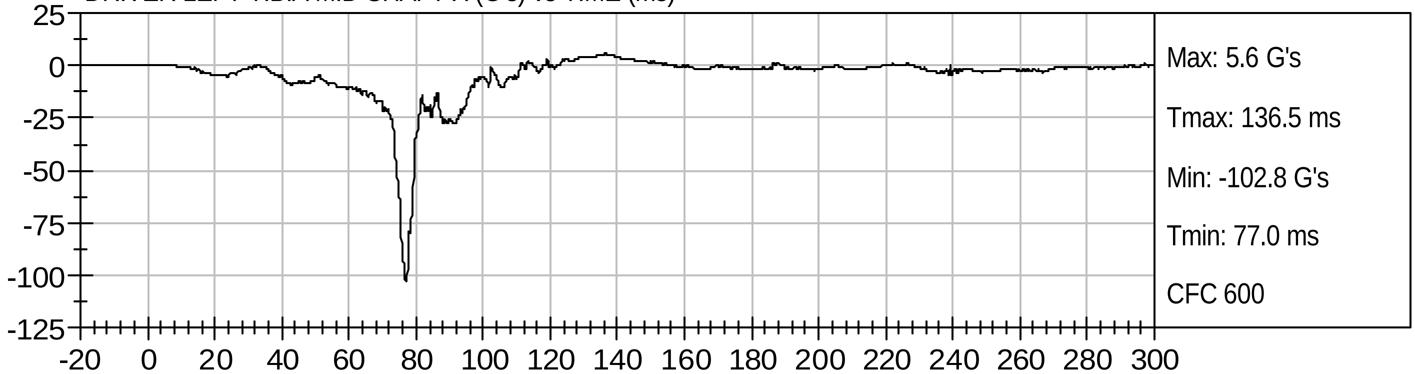




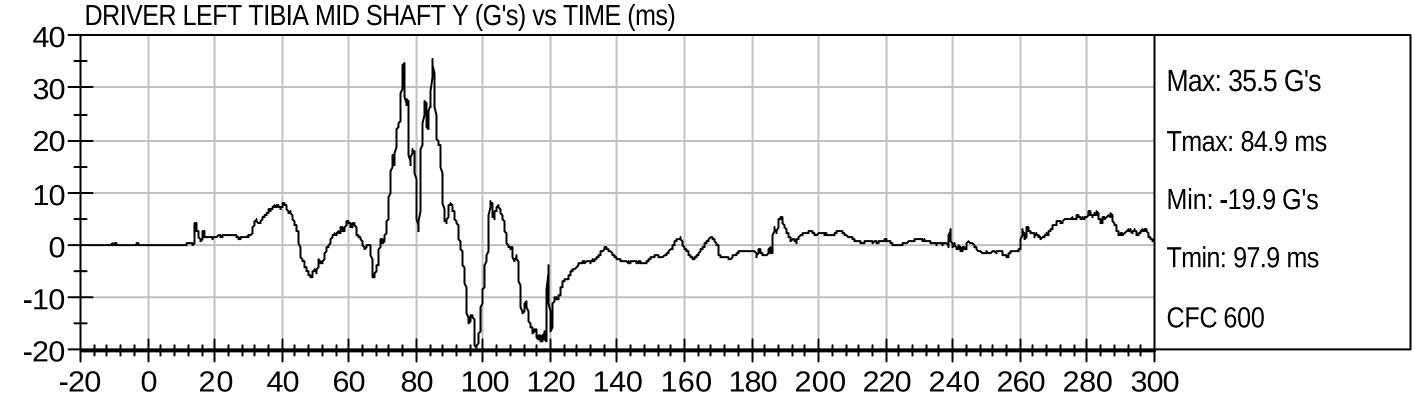
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

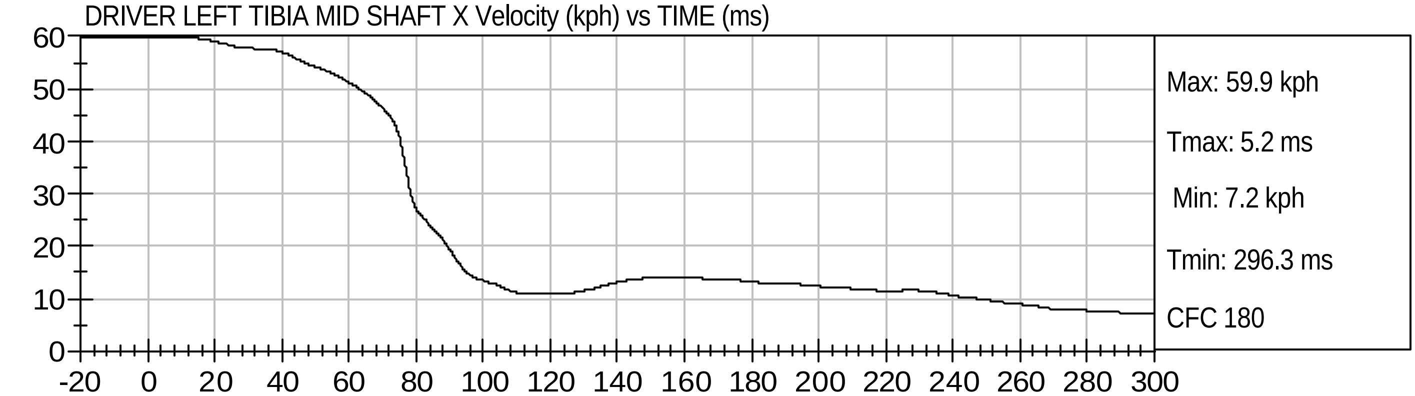
DRIVER LEFT TIBIA MID SHAFT X (G's) vs TIME (ms)



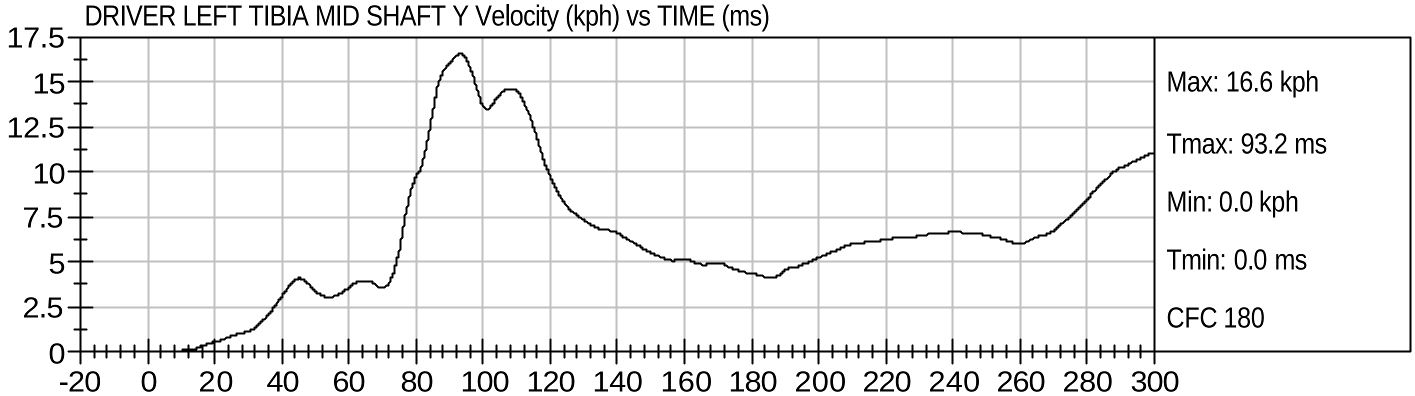
DRIVER LEFT TIBIA MID SHAFT Y (G's) vs TIME (ms)



DRIVER LEFT TIBIA MID SHAFT X Velocity (kph) vs TIME (ms)

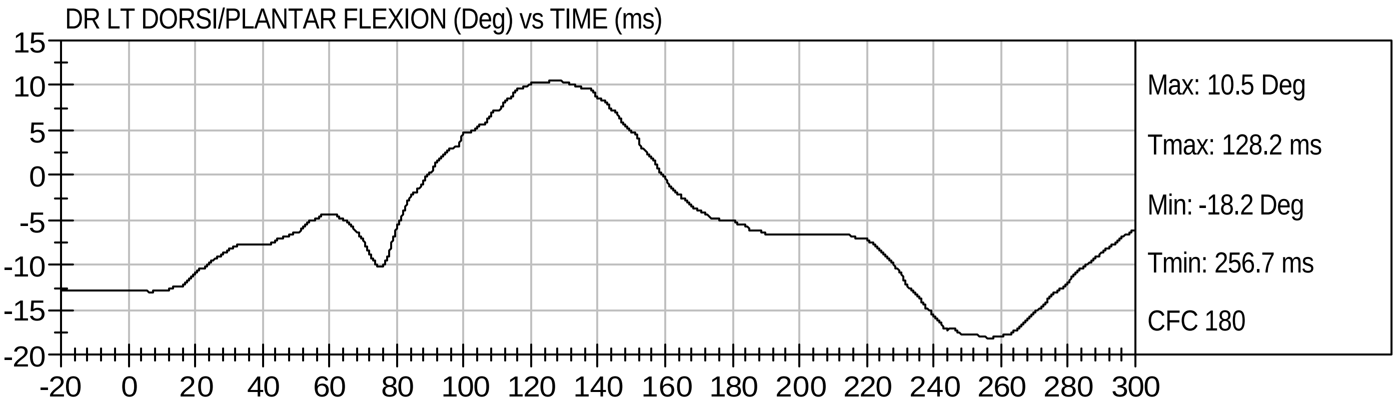


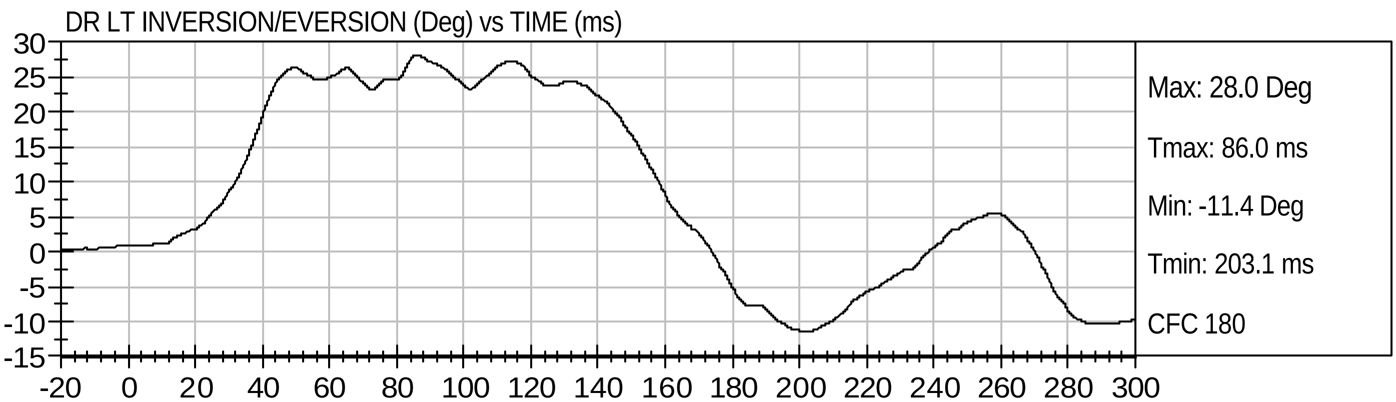
DRIVER LEFT TIBIA MID SHAFT Y Velocity (kph) vs TIME (ms)

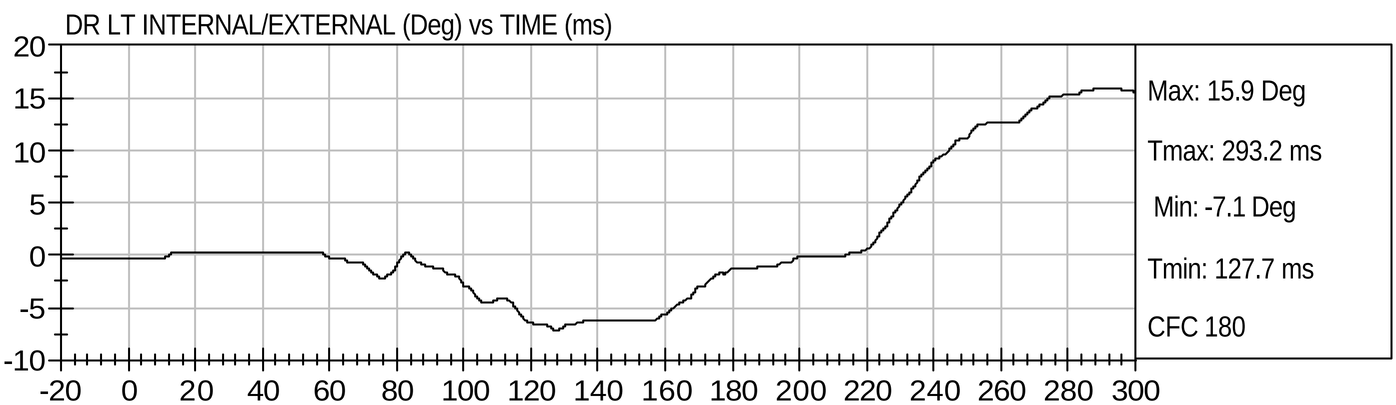


NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

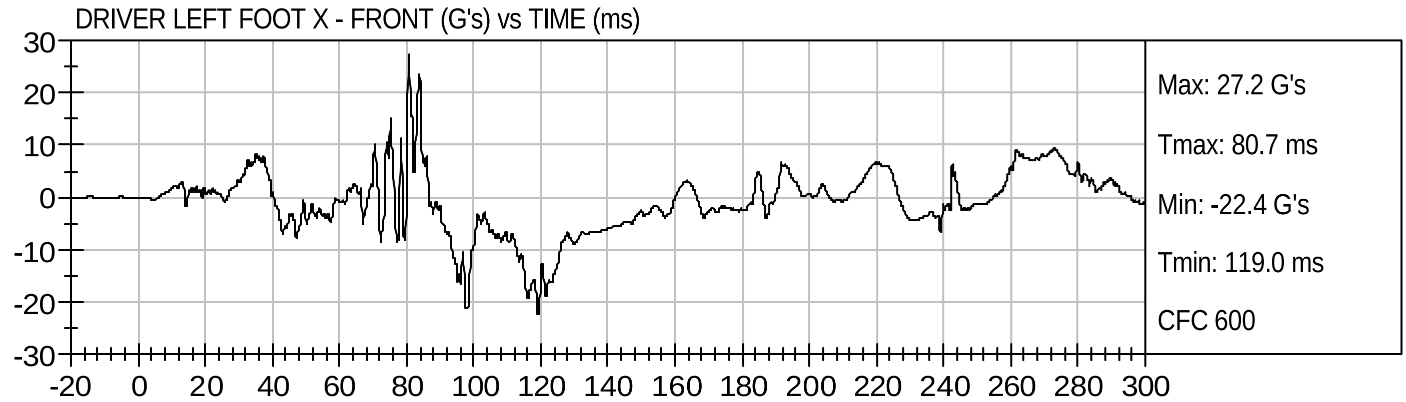


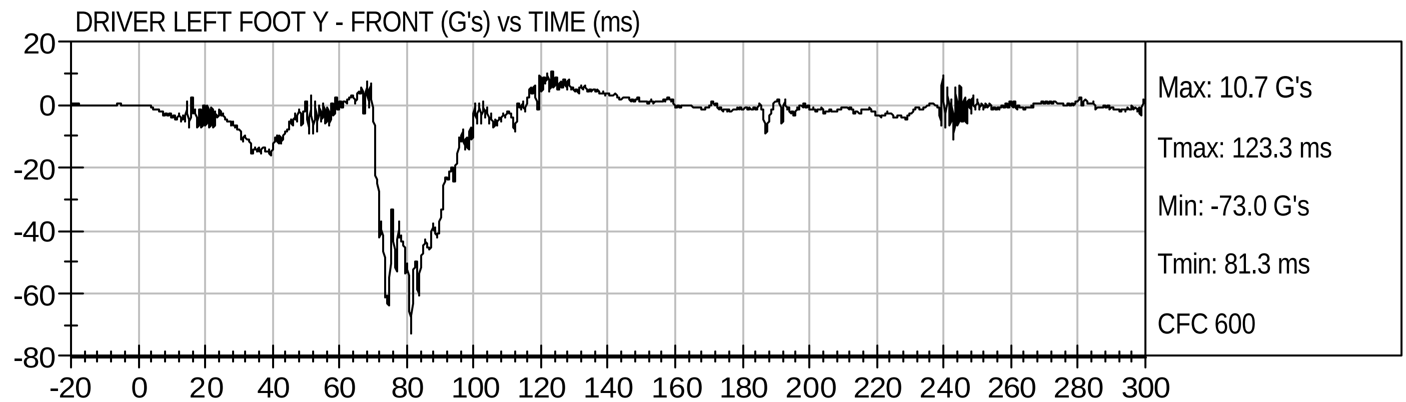


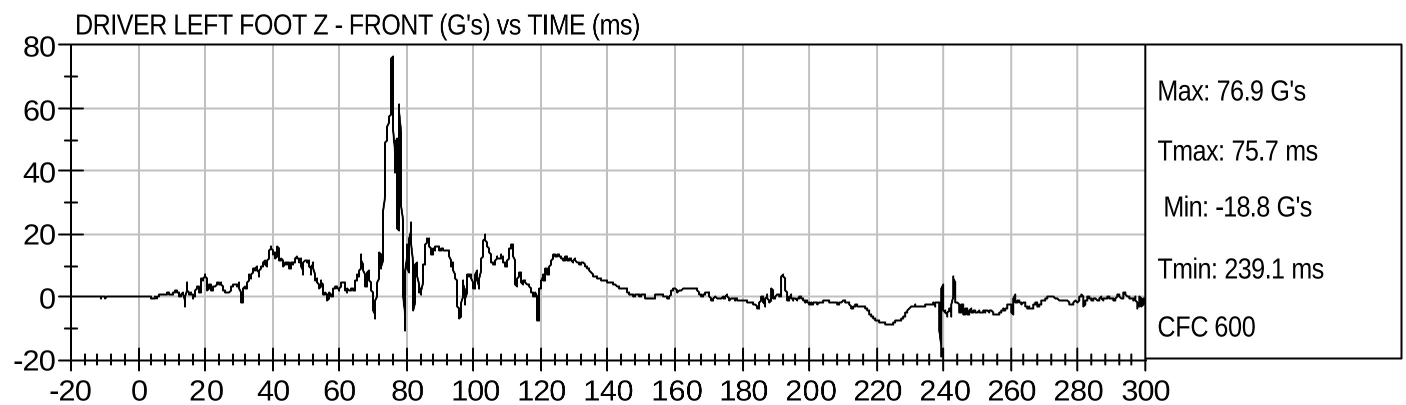


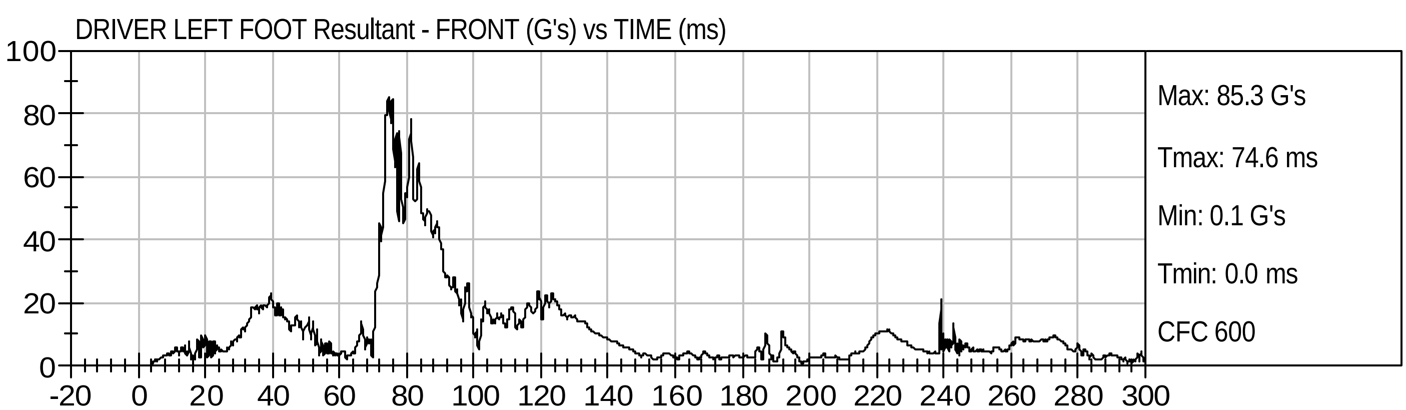
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

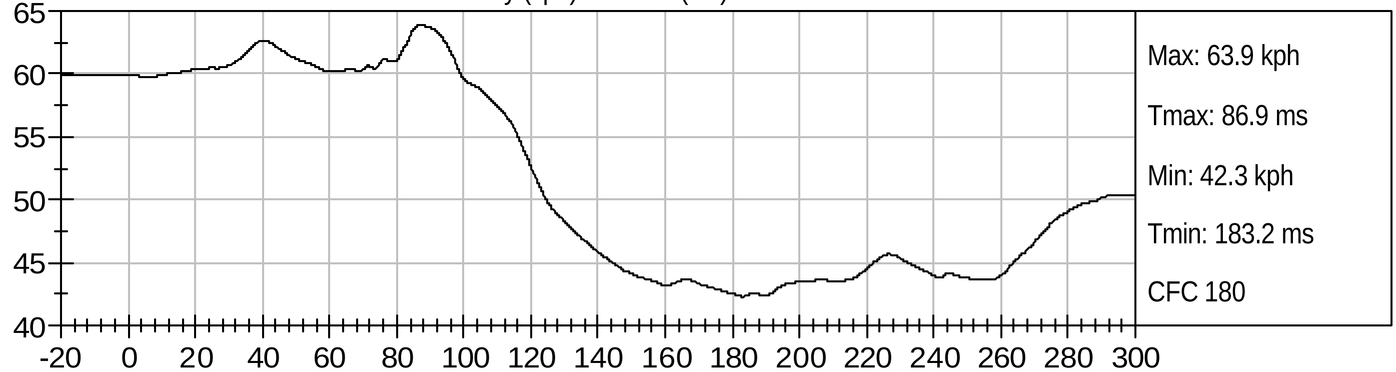




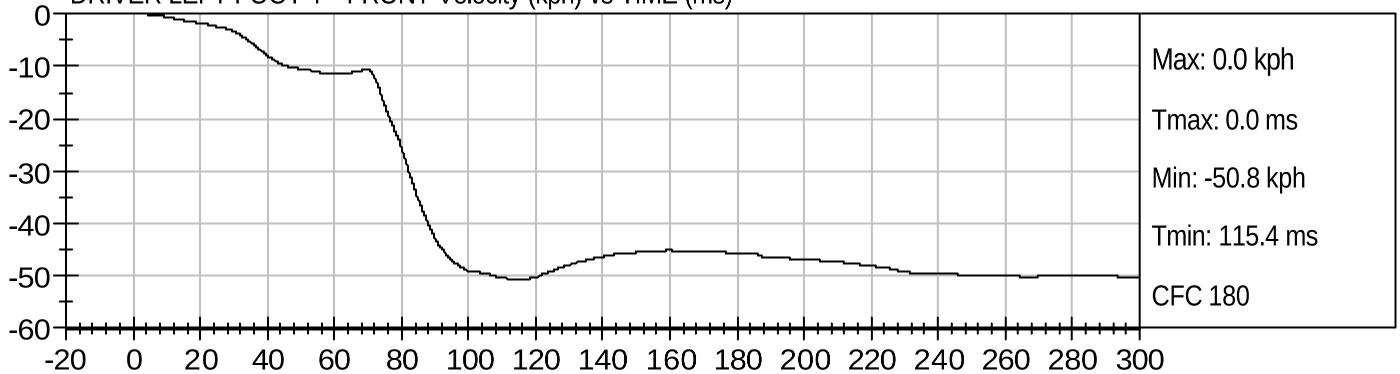




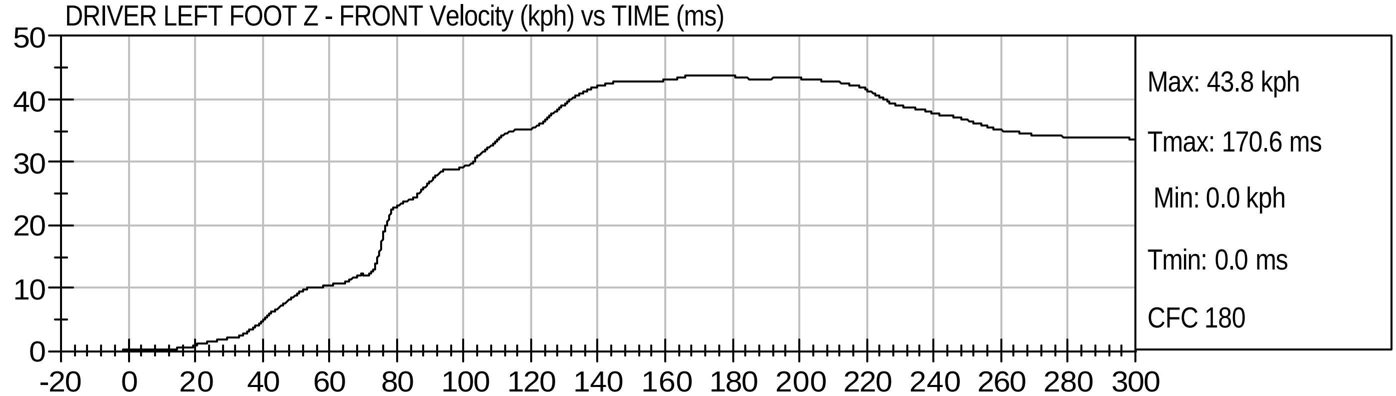
DRIVER LEFT FOOT X - FRONT Velocity (kph) vs TIME (ms)



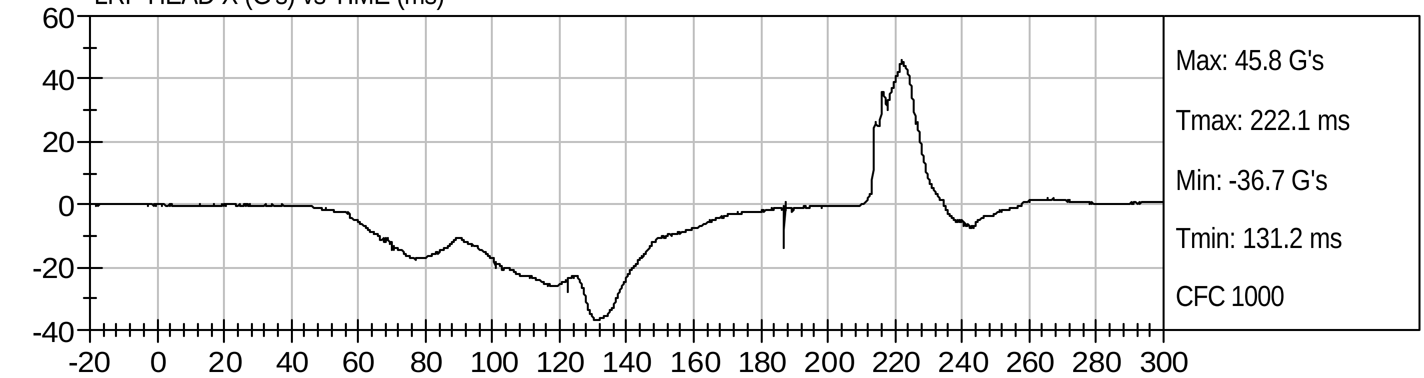
DRIVER LEFT FOOT Y - FRONT Velocity (kph) vs TIME (ms)



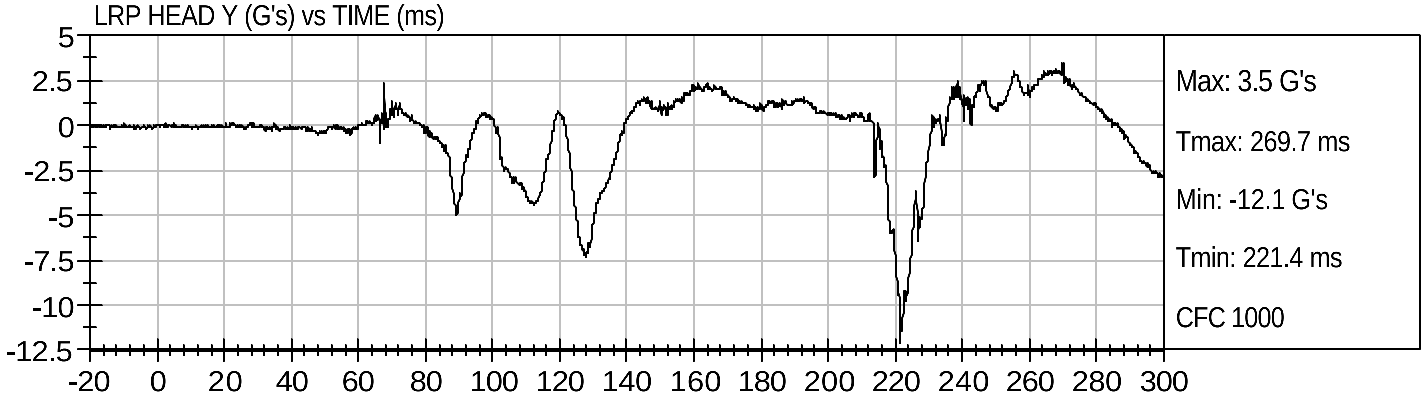
DRIVER LEFT FOOT Z - FRONT Velocity (kph) vs TIME (ms)



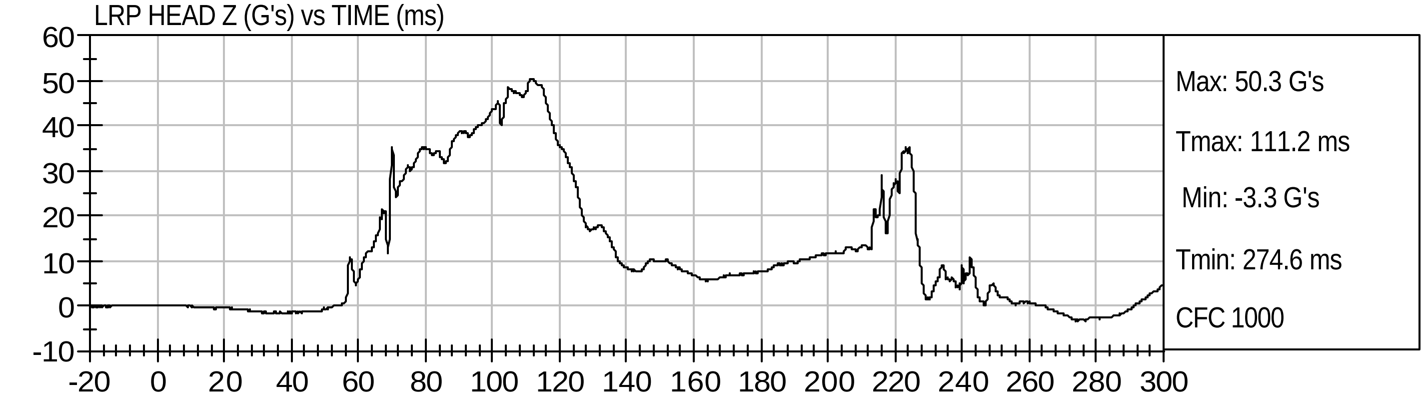
LRP HEAD X (G's) vs TIME (ms)



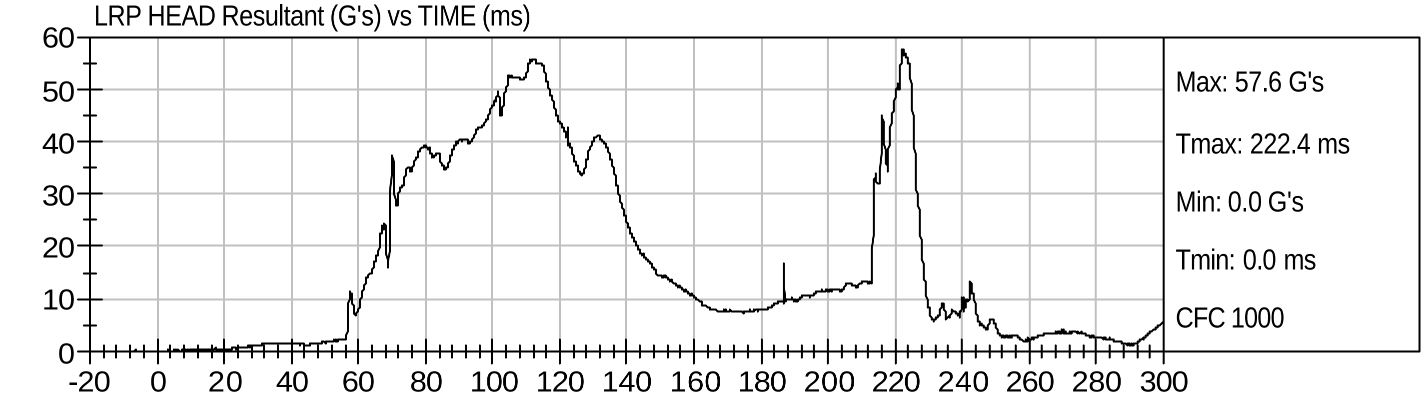
LRP HEAD Y (G's) vs TIME (ms)



LRP HEAD Z (G's) vs TIME (ms)



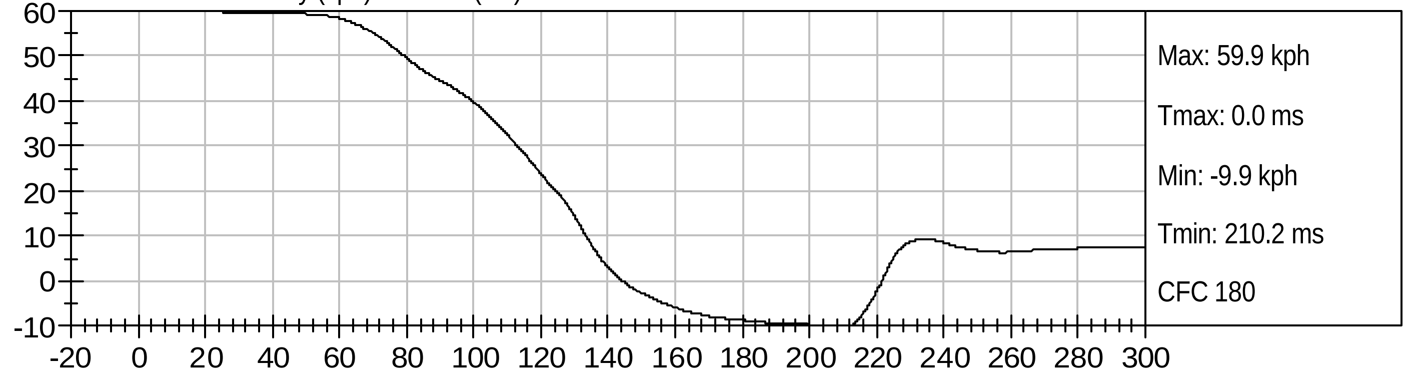
LRP HEAD Resultant (G's) vs TIME (ms)



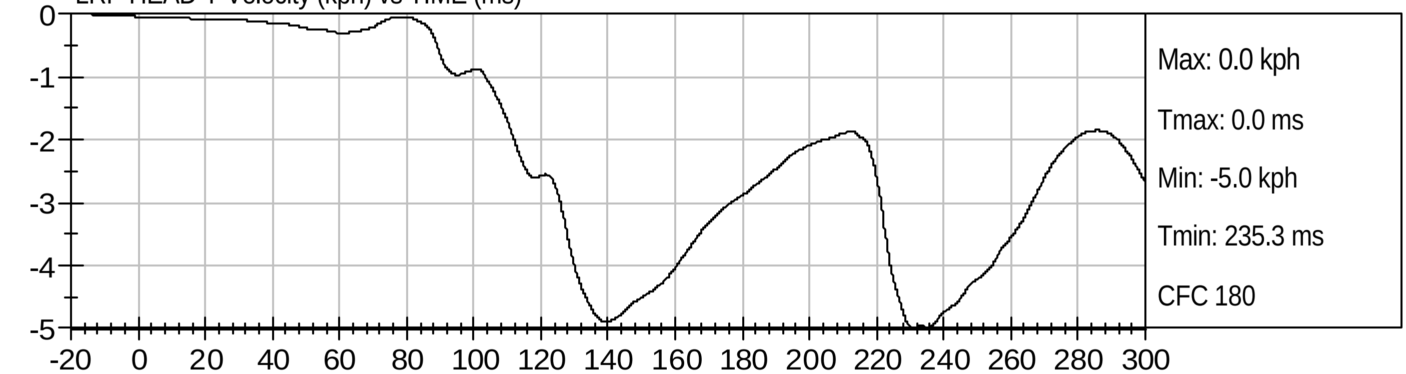
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

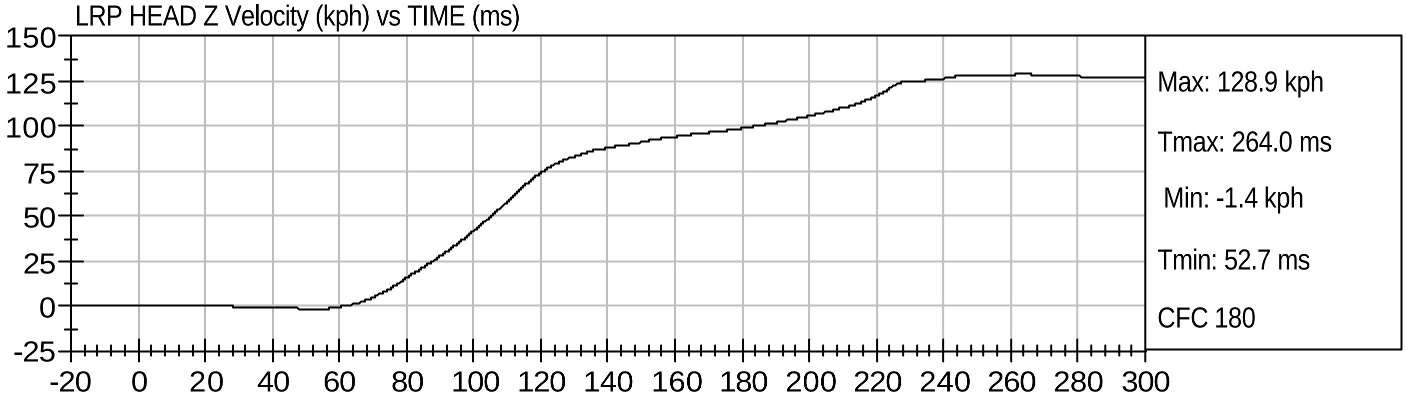
LRP HEAD X Velocity (kph) vs TIME (ms)



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

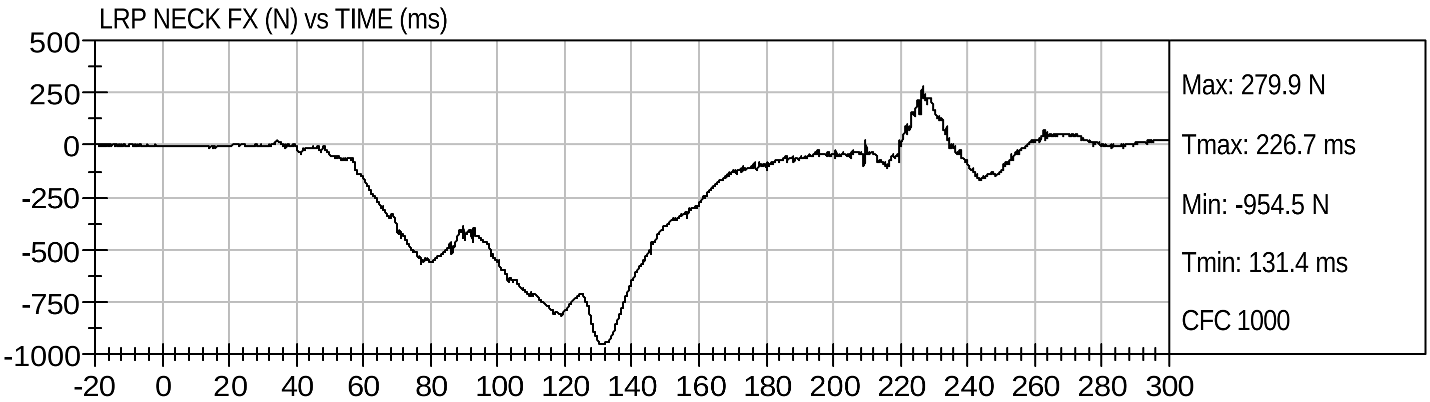


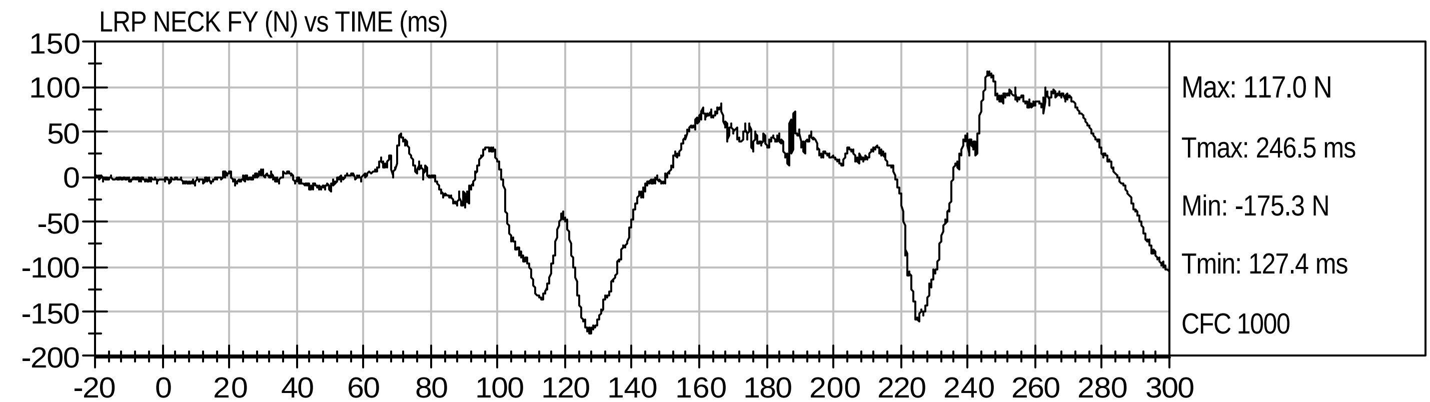
LRP HEAD Z Velocity (kph) vs TIME (ms)

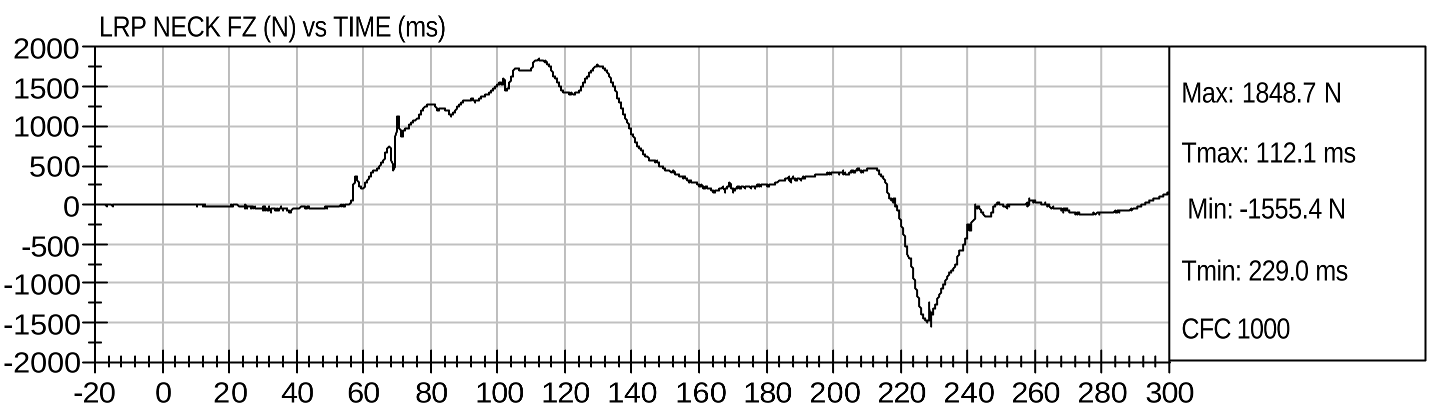


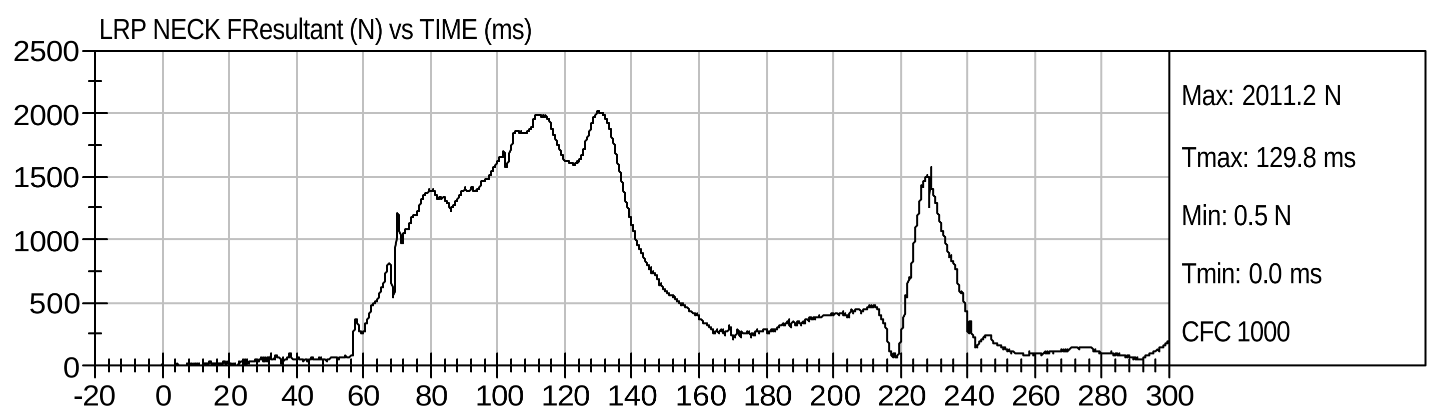
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





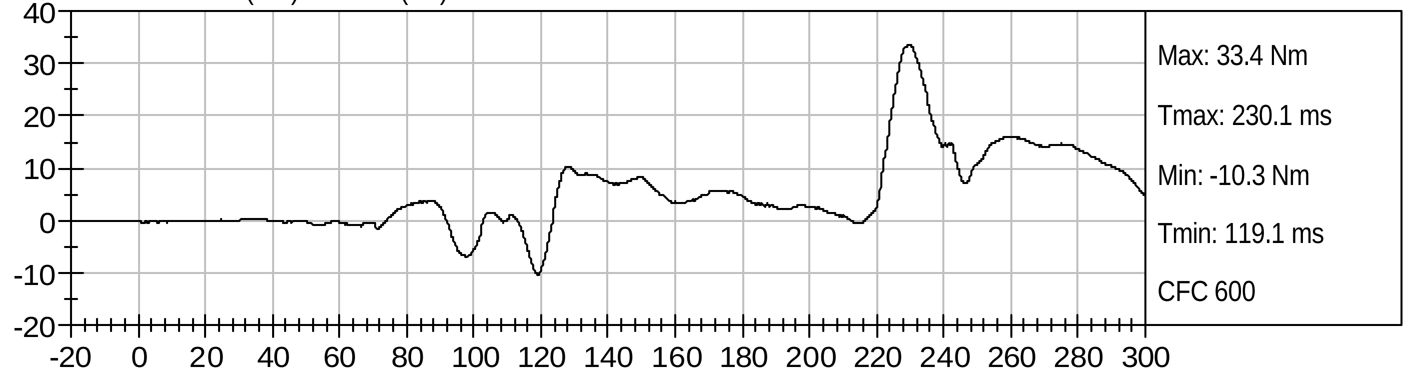




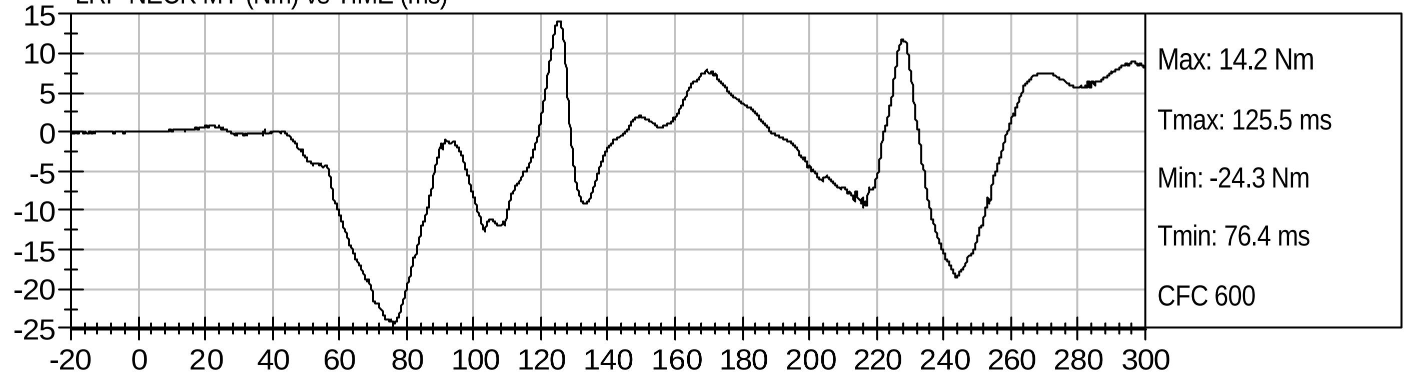
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

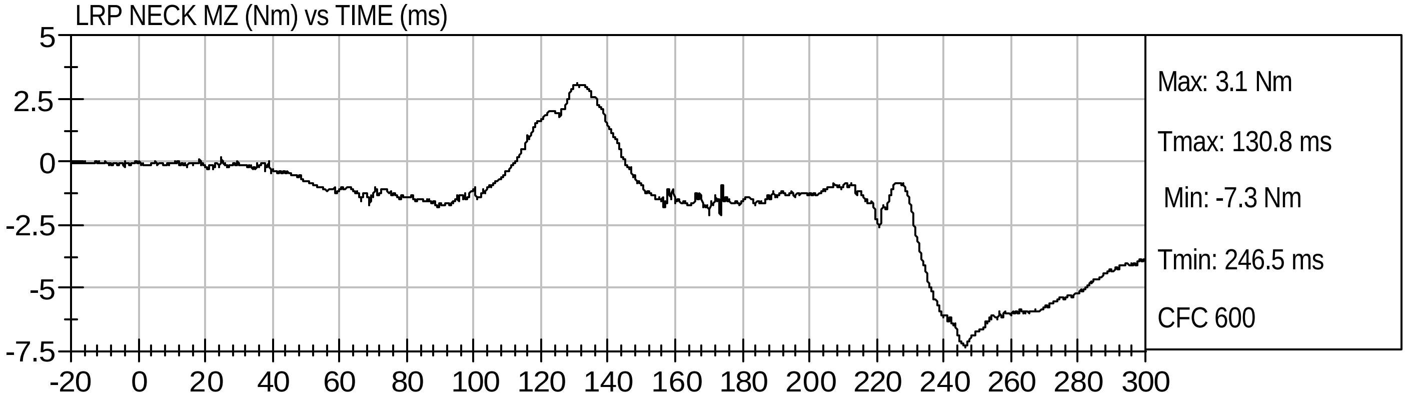
LRP NECK MX (Nm) vs TIME (ms)



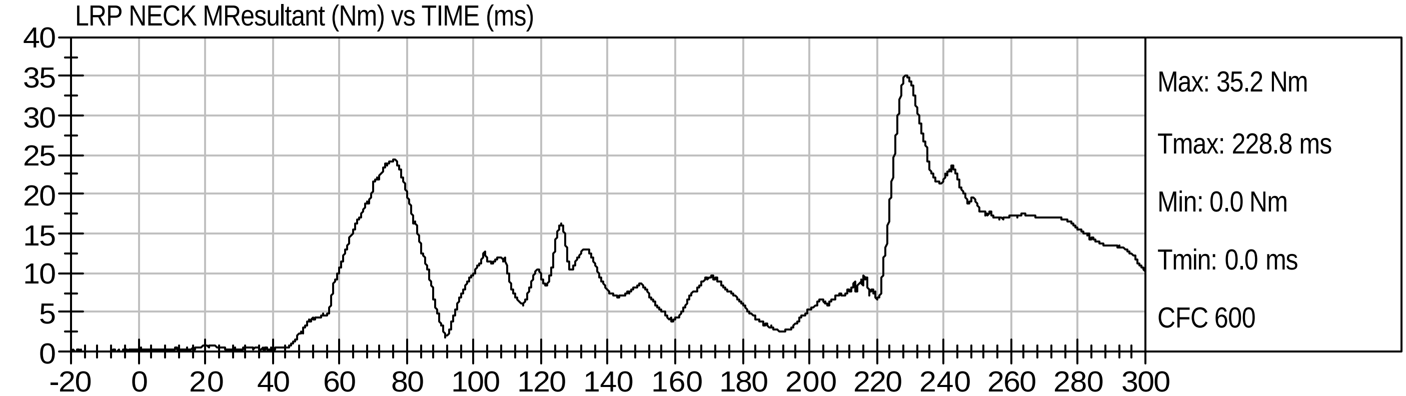
LRP NECK MY (Nm) vs TIME (ms)



LRP NECK MZ (Nm) vs TIME (ms)

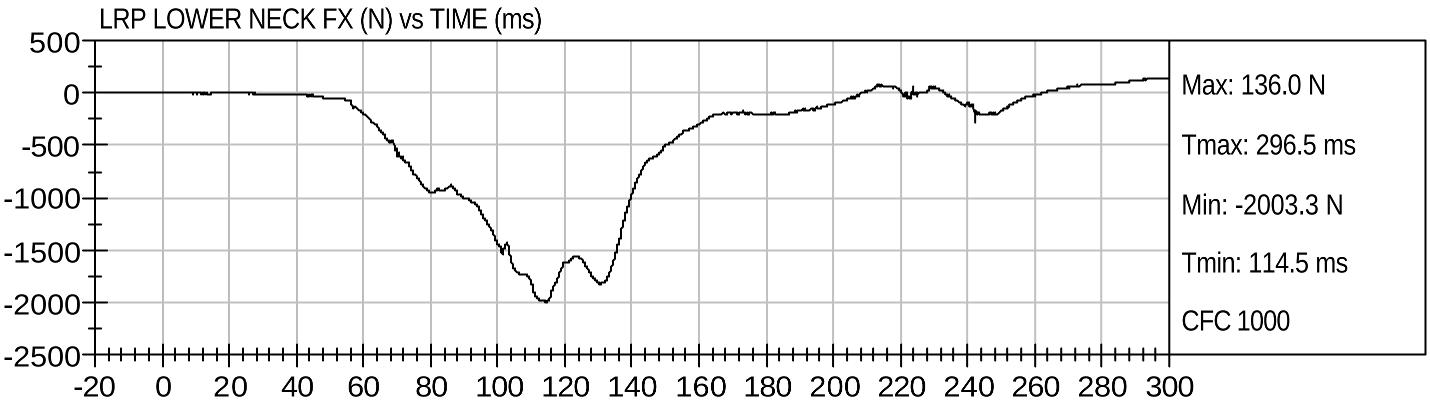


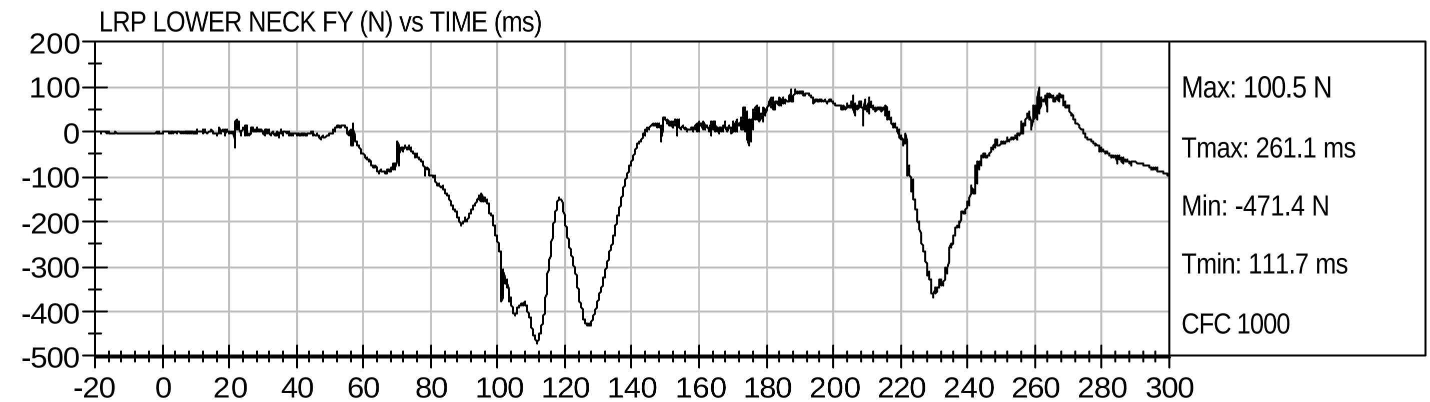
LRP NECK MResultant (Nm) vs TIME (ms)

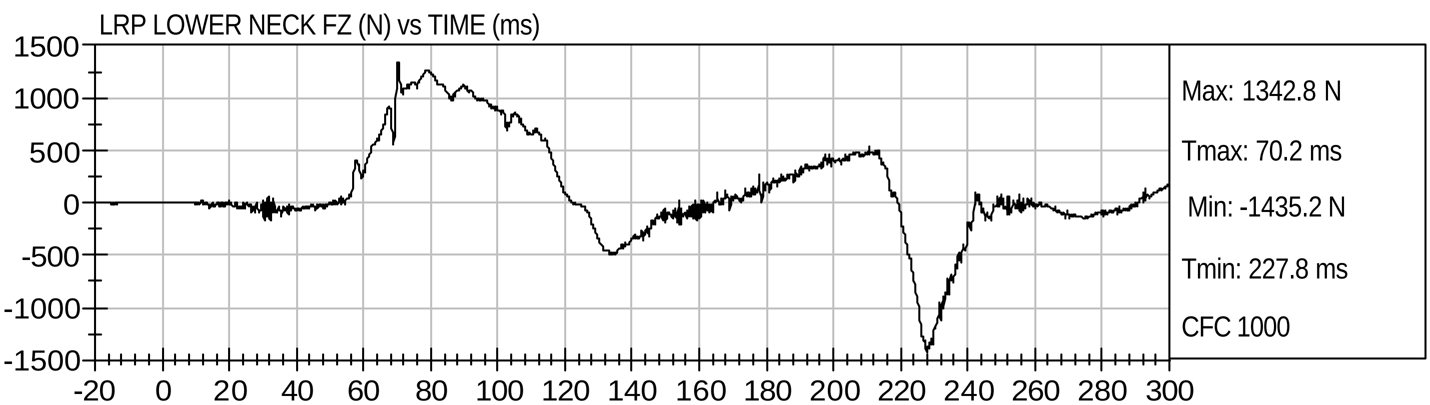


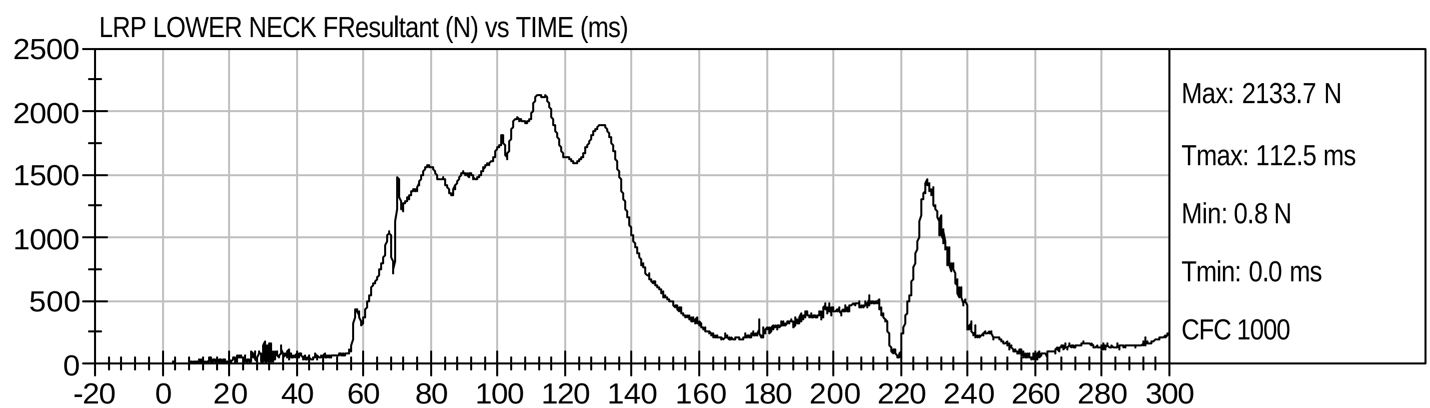
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





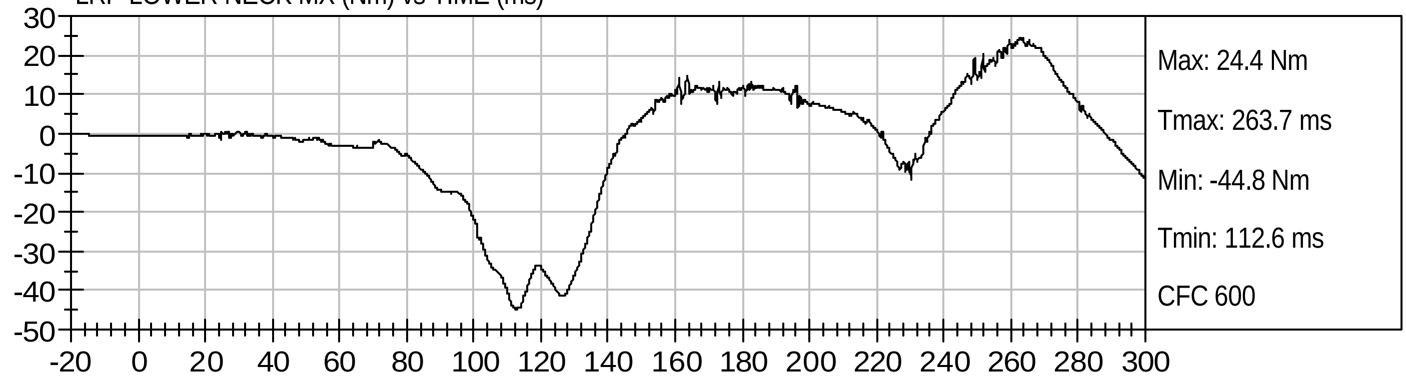




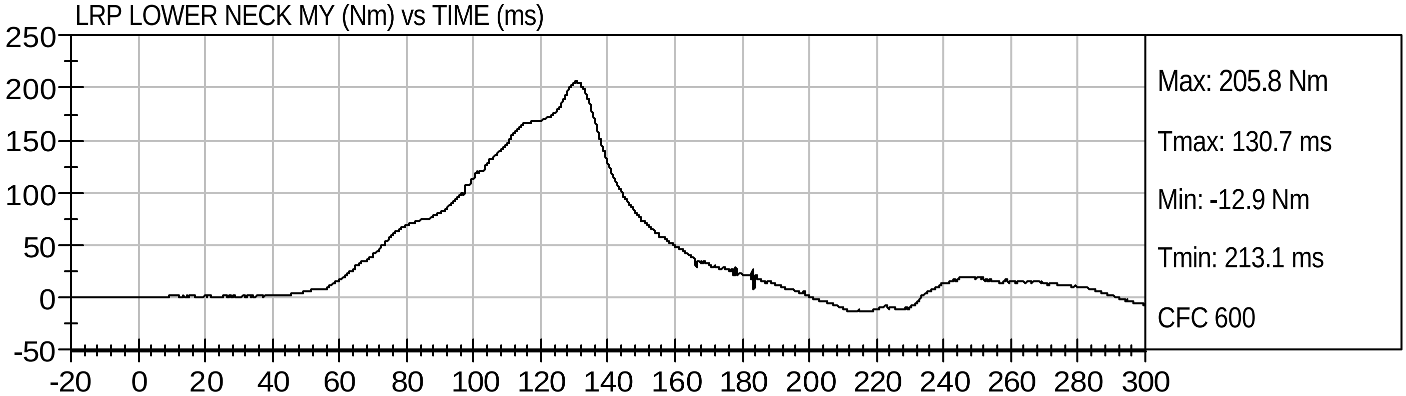
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

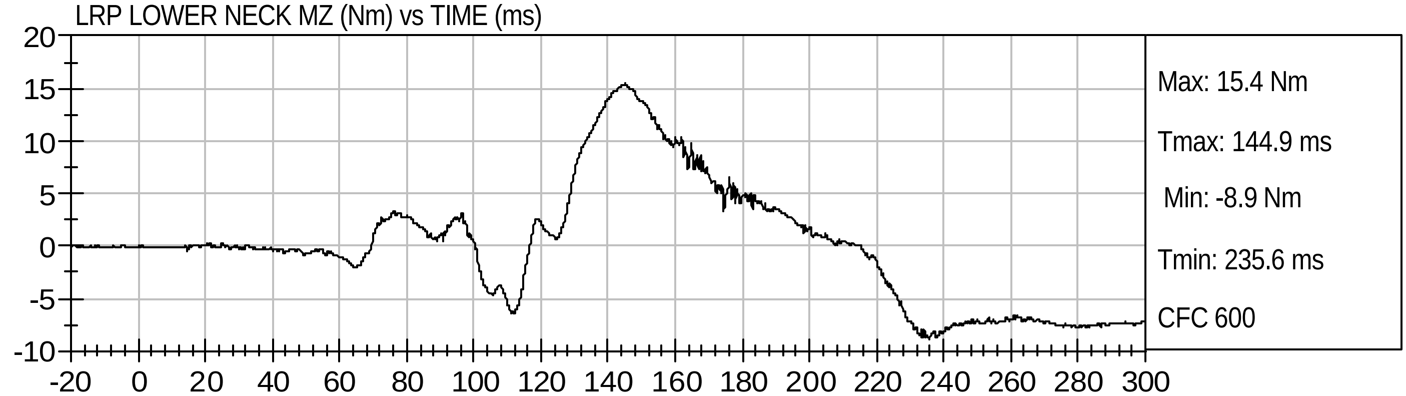
LRP LOWER NECK MX (Nm) vs TIME (ms)



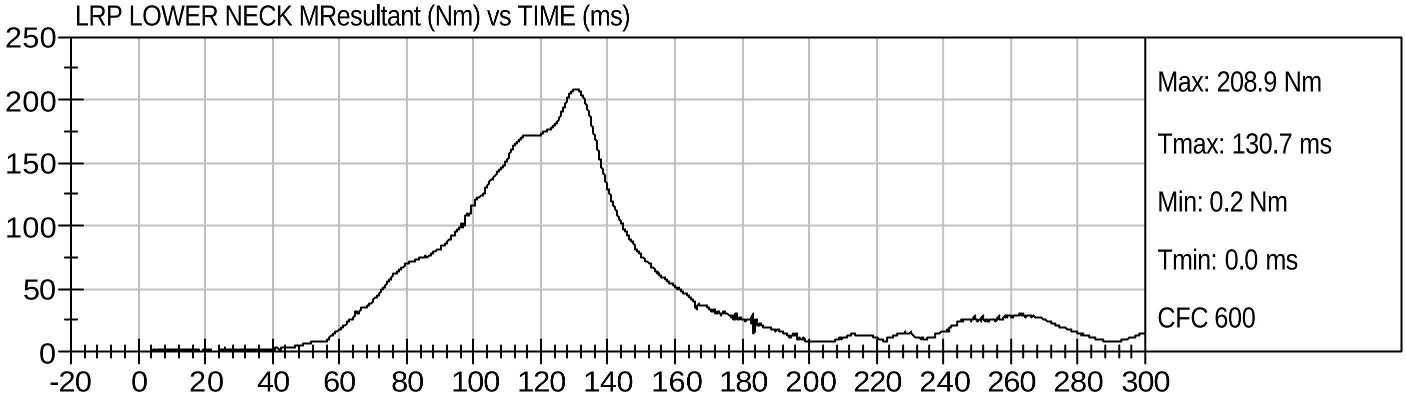
LRP LOWER NECK MY (Nm) vs TIME (ms)



LRP LOWER NECK MZ (Nm) vs TIME (ms)

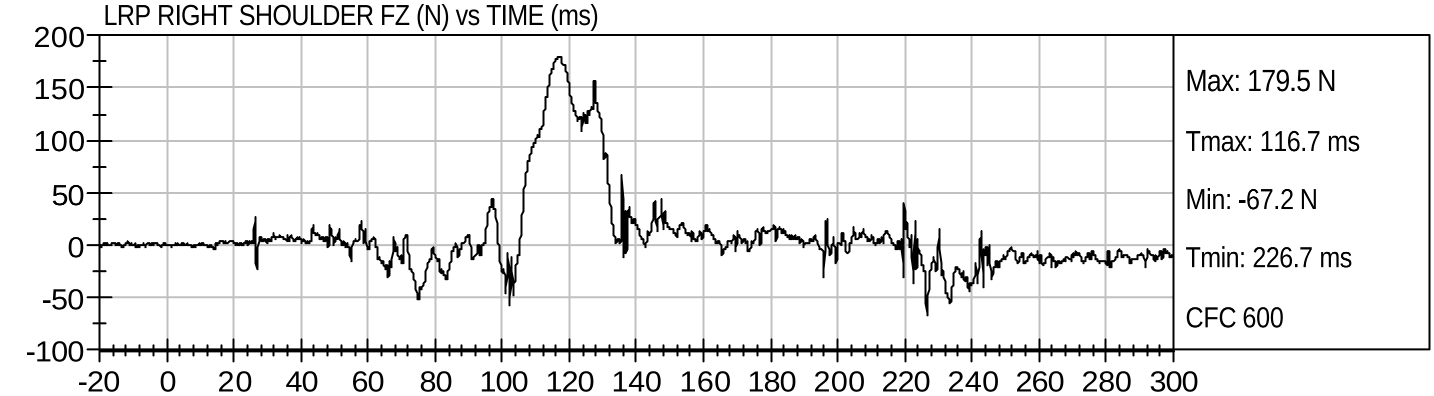


LRP LOWER NECK MResultant (Nm) vs TIME (ms)

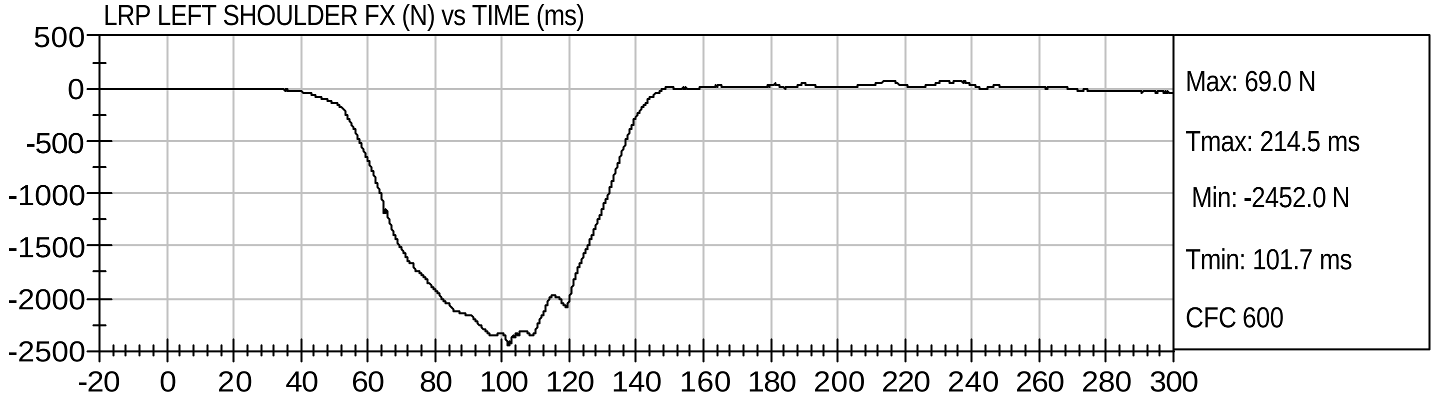


LRP RIGHT SHOULDER FX (N) vs TIME (ms)

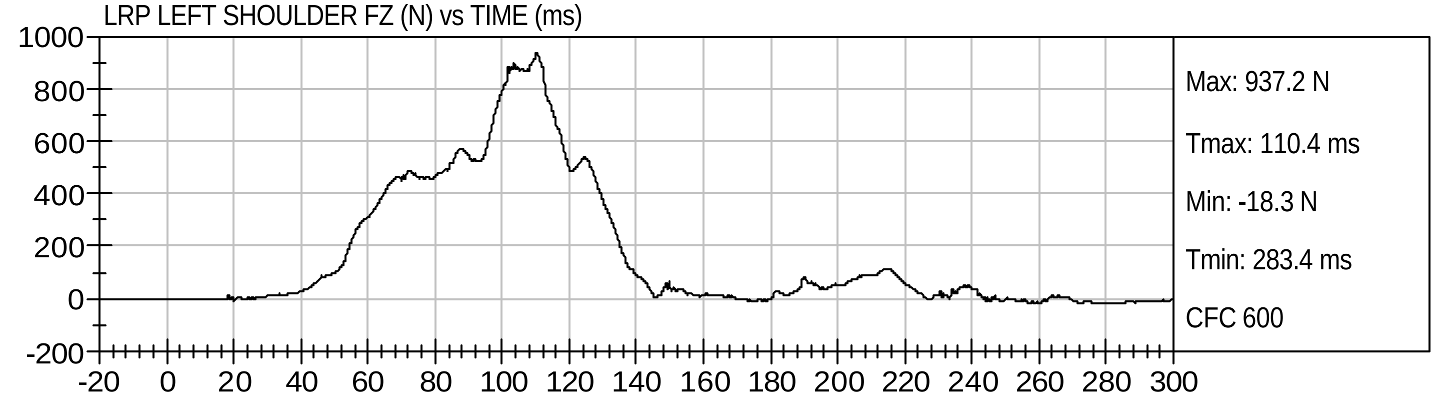
LRP RIGHT SHOULDER FZ (N) vs TIME (ms)



LRP LEFT SHOULDER FX (N) vs TIME (ms)



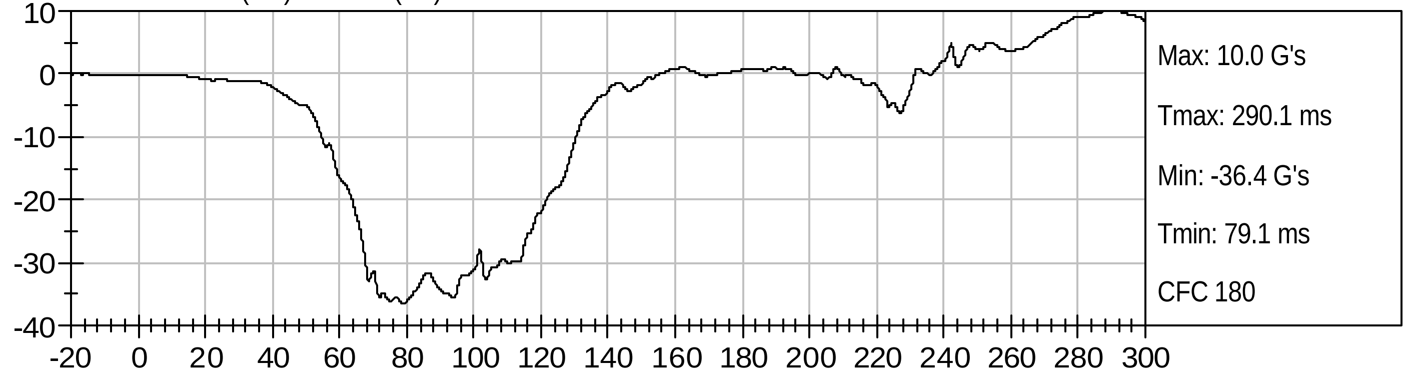
LRP LEFT SHOULDER FZ (N) vs TIME (ms)



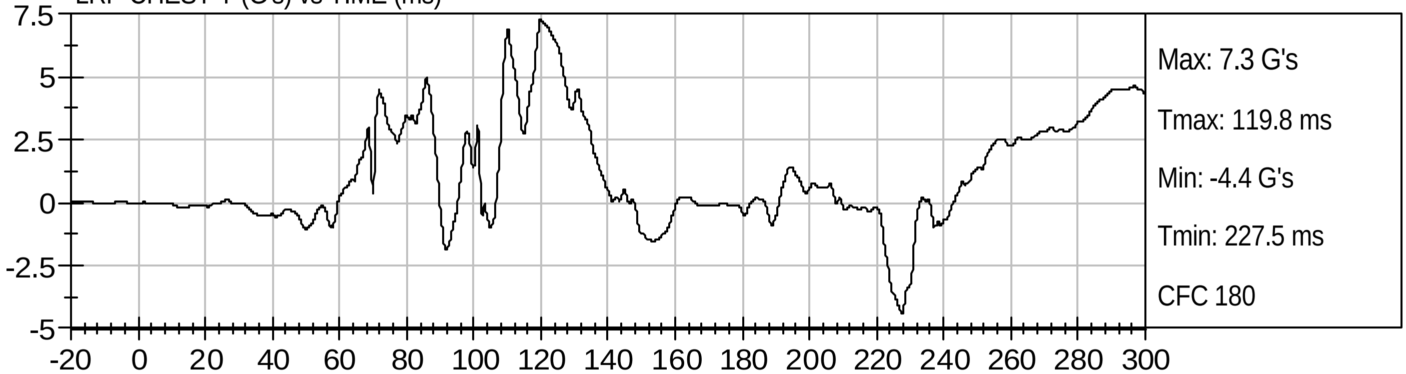
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

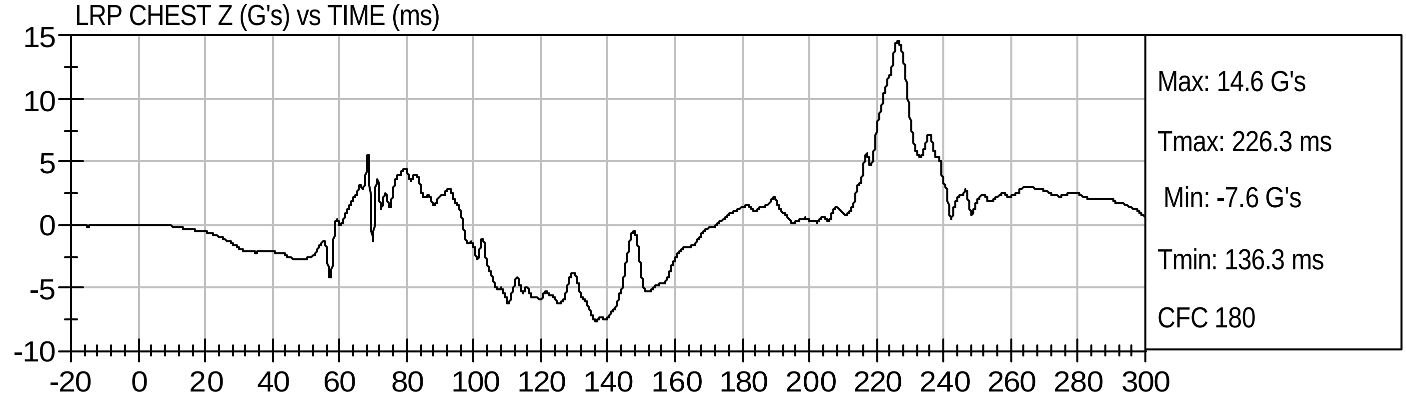
LRP CHEST X (G's) vs TIME (ms)



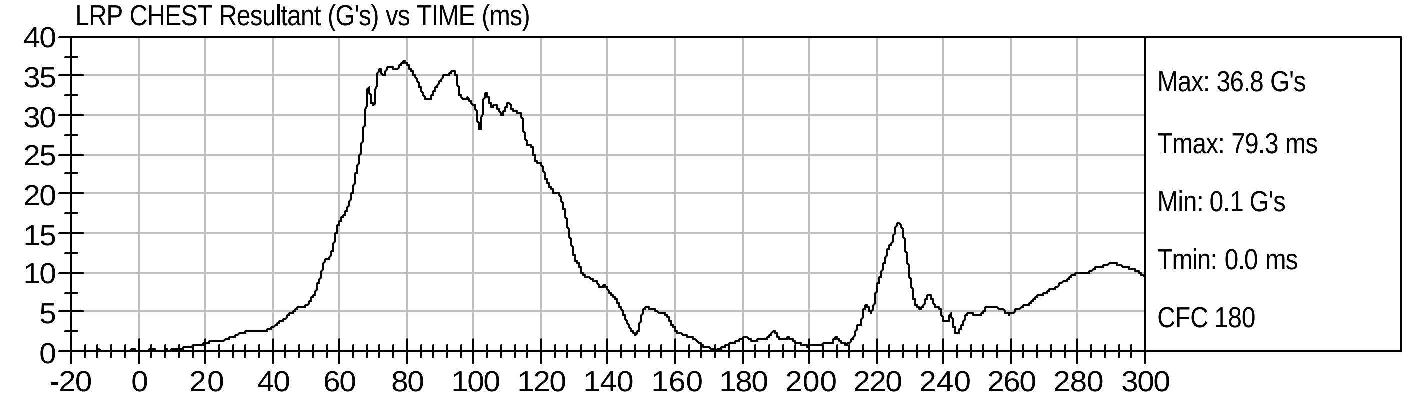
LRP CHEST Y (G's) vs TIME (ms)



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



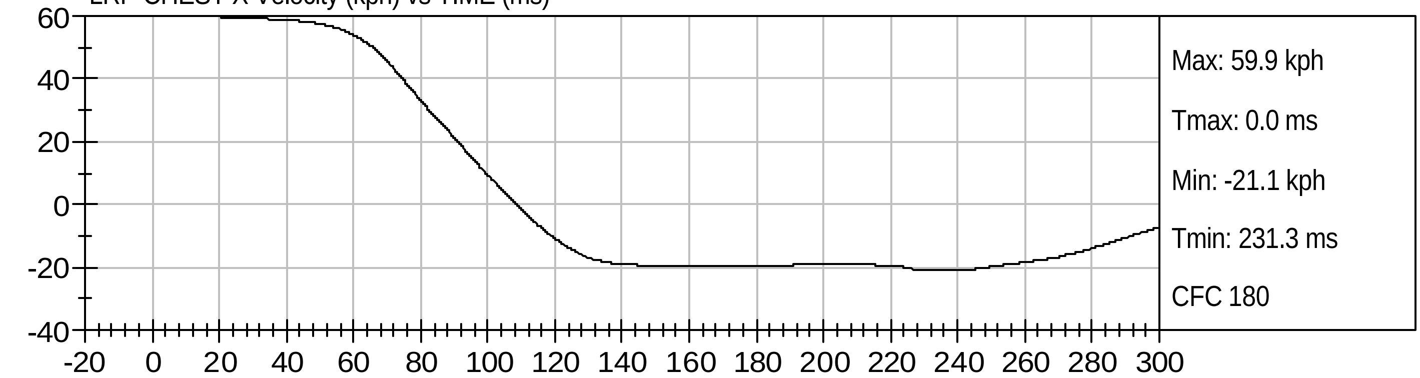
LRP CHEST Resultant (G's) vs TIME (ms)



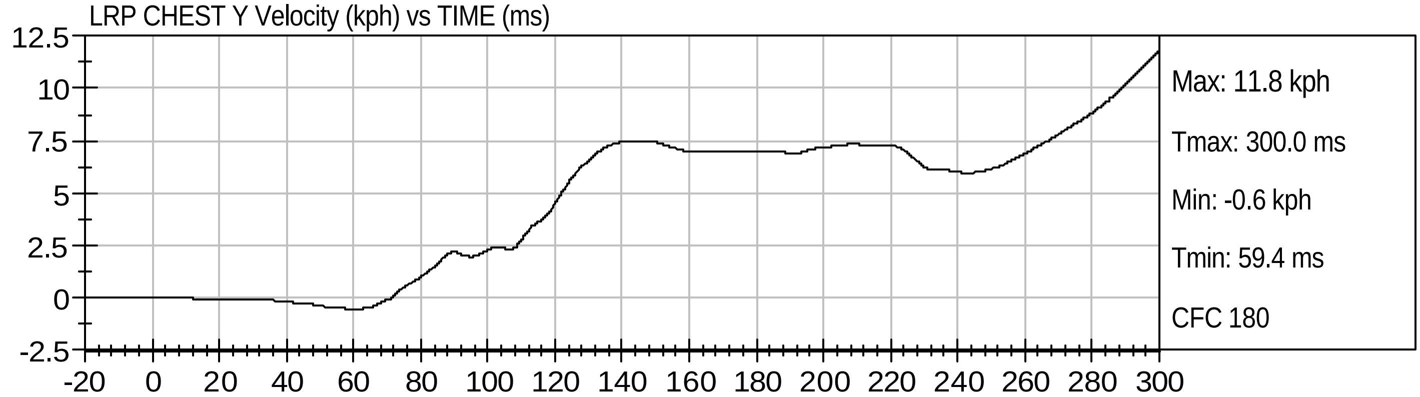
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

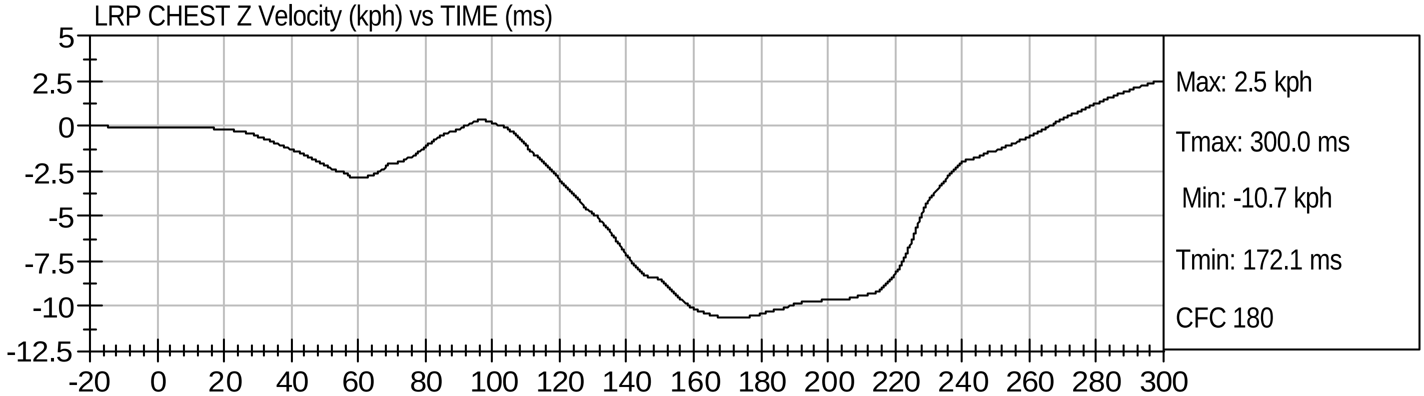
LRP CHEST X Velocity (kph) vs TIME (ms)



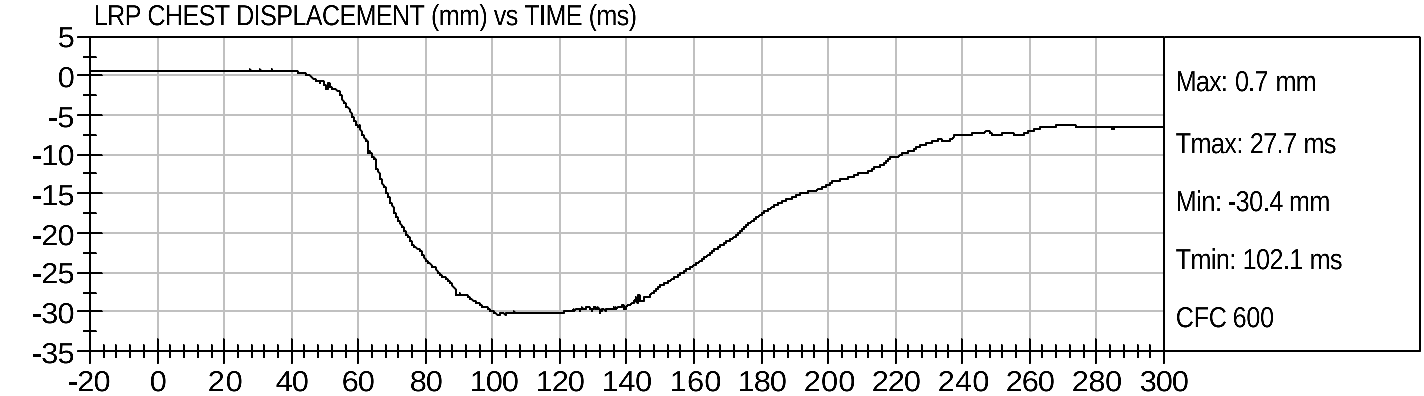
LRP CHEST Y Velocity (kph) vs TIME (ms)



LRP CHEST Z Velocity (kph) vs TIME (ms)



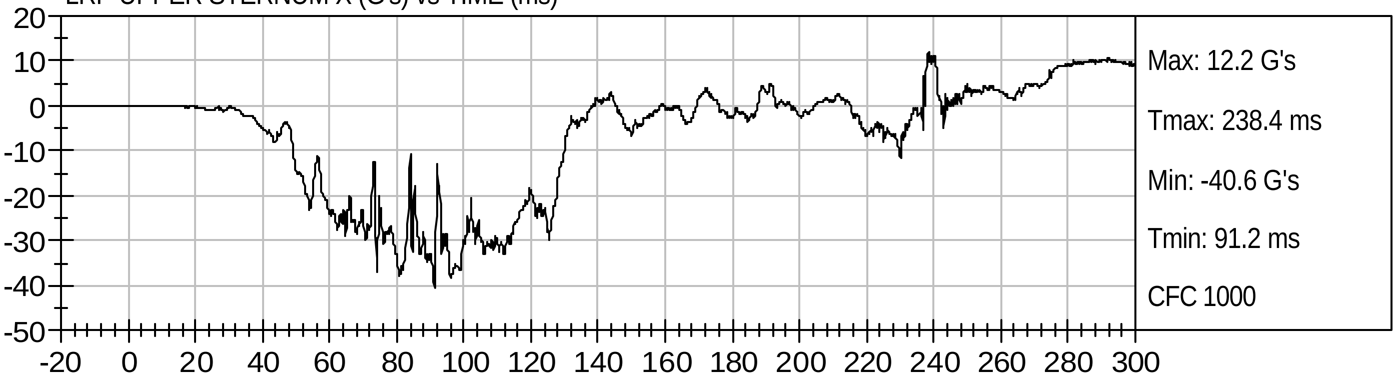
LRP CHEST DISPLACEMENT (mm) vs TIME (ms)



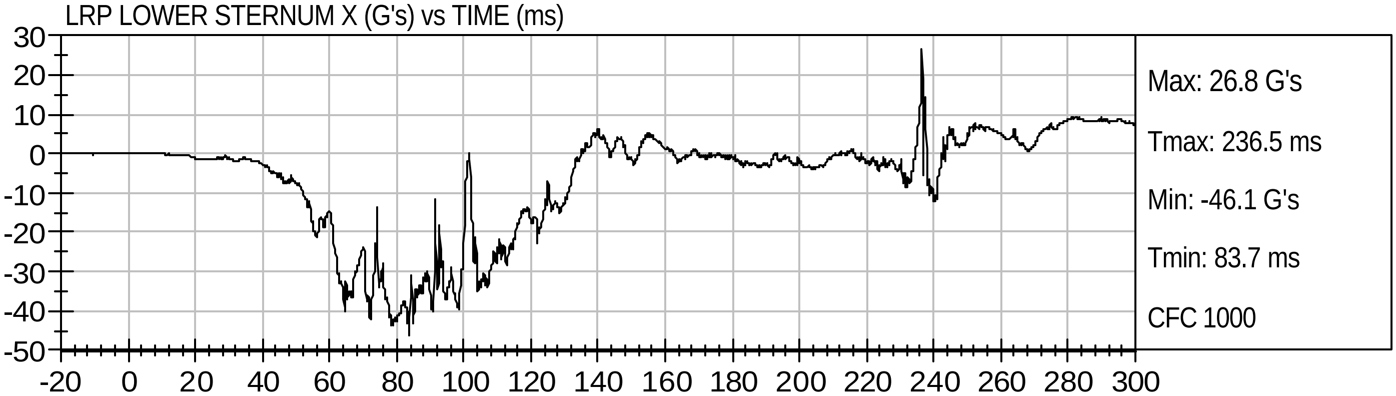
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

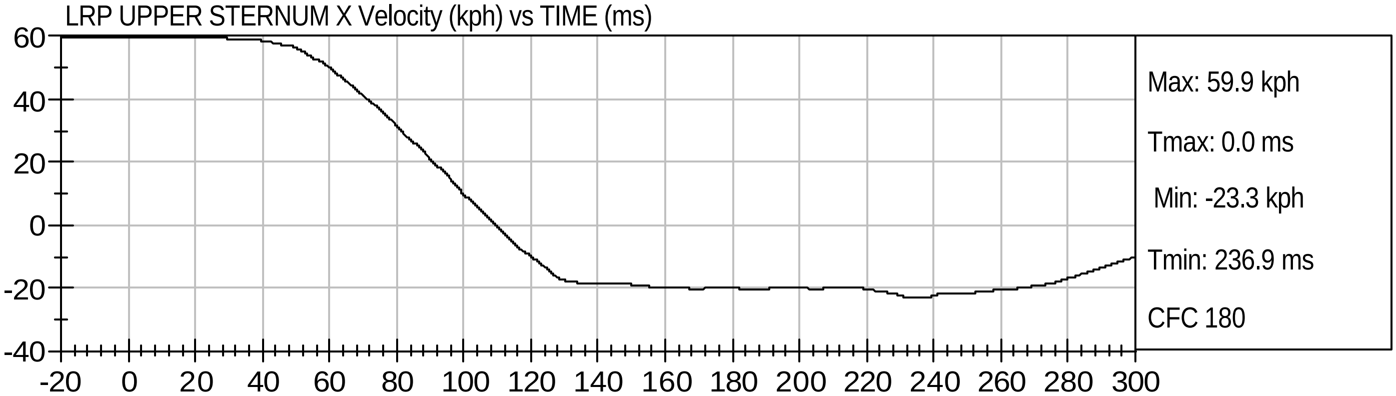
LRP UPPER STERNUM X (G's) vs TIME (ms)



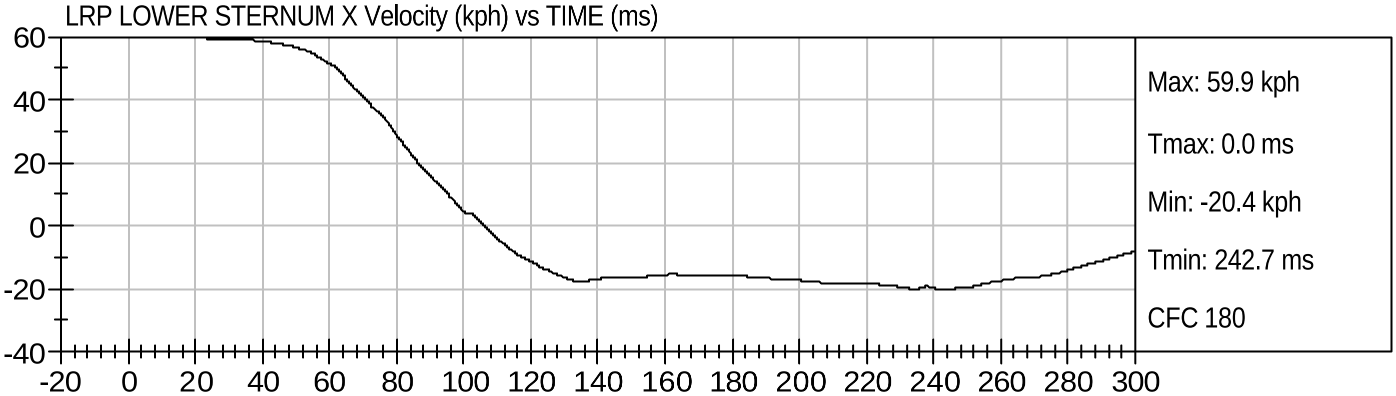
LRP LOWER STERNUM X (G's) vs TIME (ms)



LRP UPPER STERNUM X Velocity (kph) vs TIME (ms)



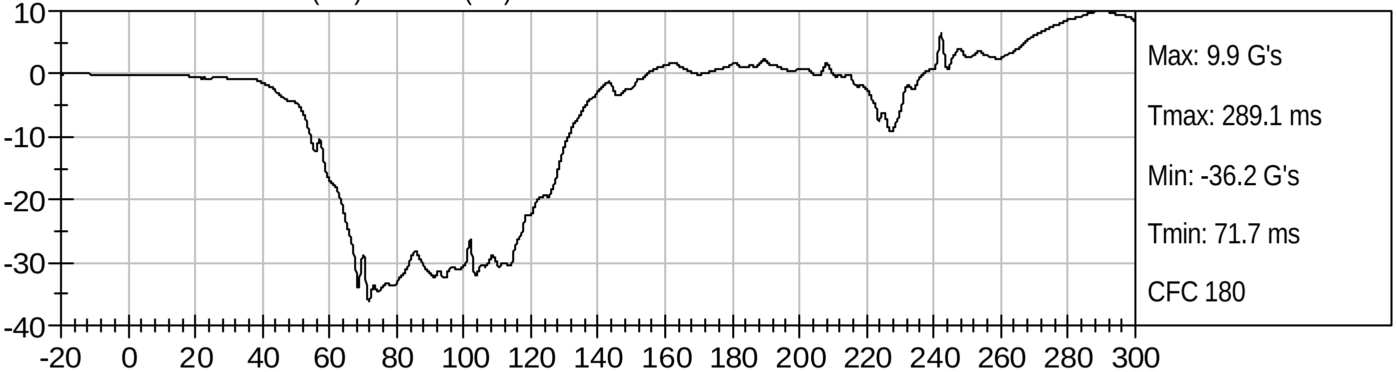
LRP LOWER STERNUM X Velocity (kph) vs TIME (ms)



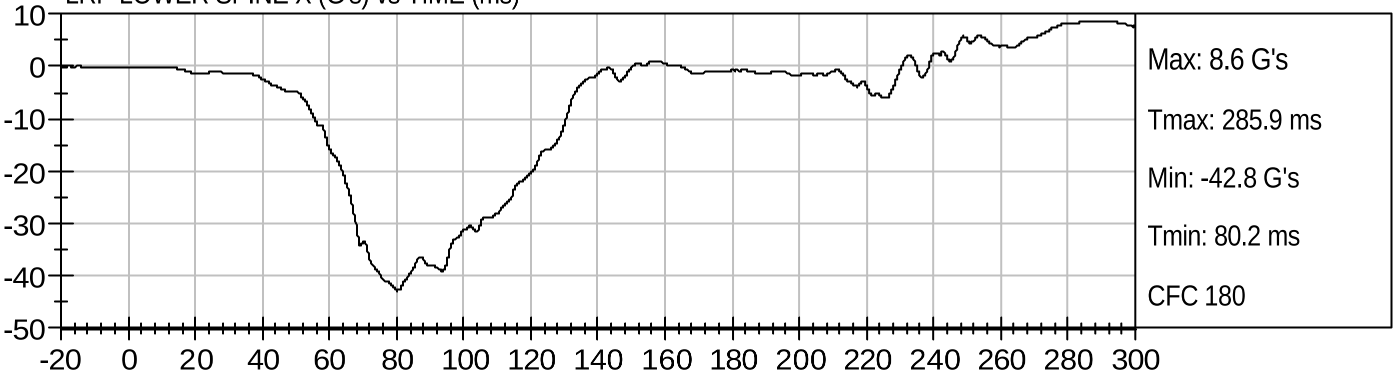
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

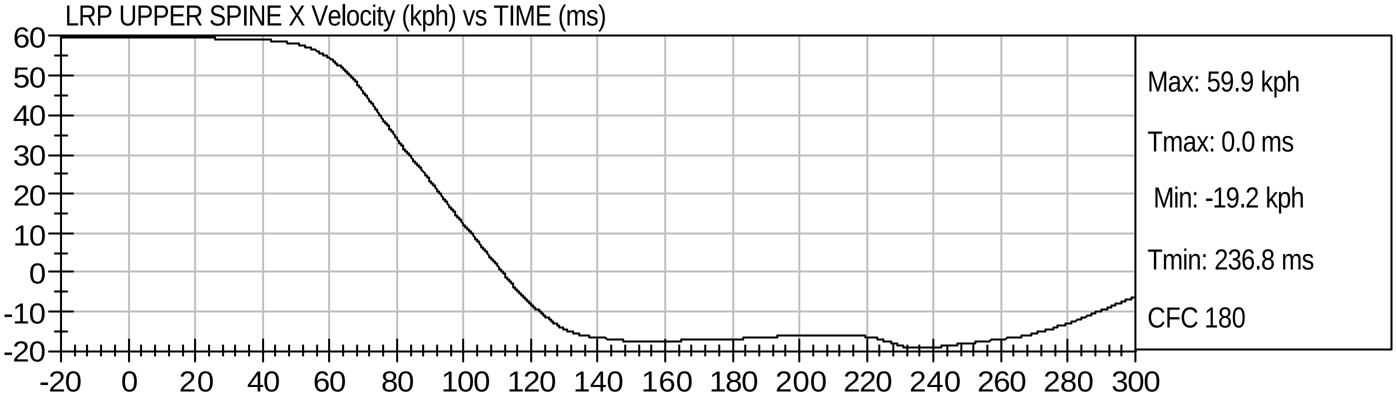
LRP UPPER SPINE X (G's) vs TIME (ms)



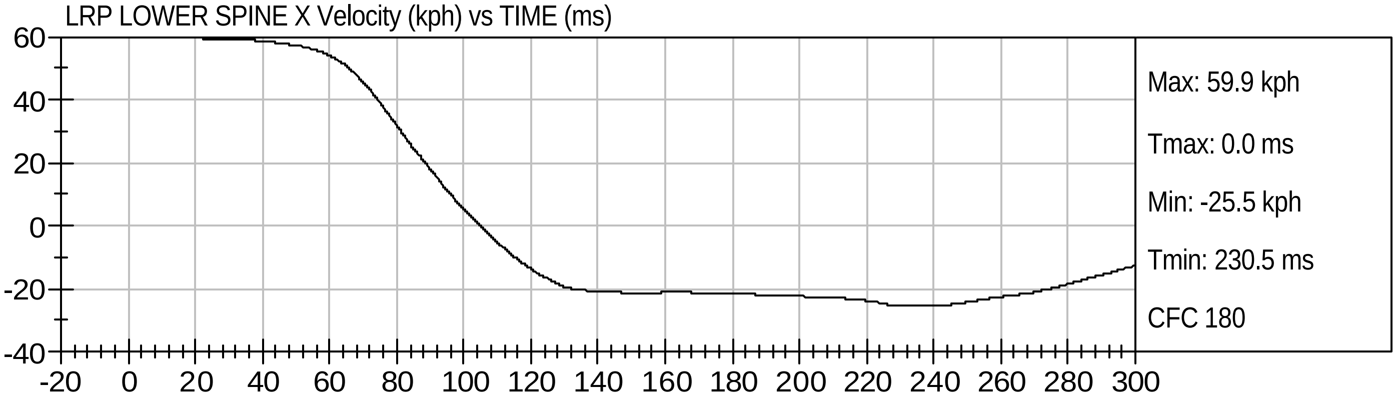
LRP LOWER SPINE X (G's) vs TIME (ms)



LRP UPPER SPINE X Velocity (kph) vs TIME (ms)



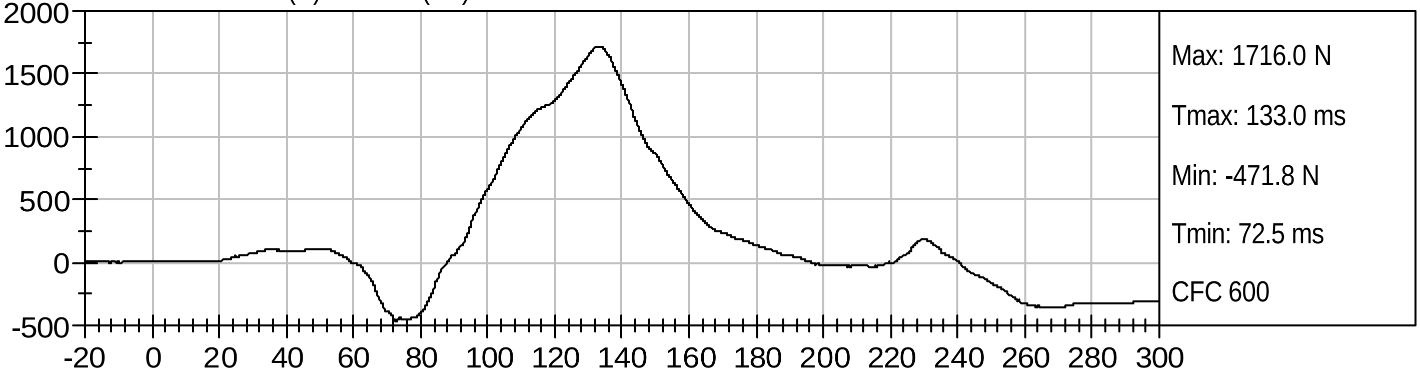
LRP LOWER SPINE X Velocity (kph) vs TIME (ms)



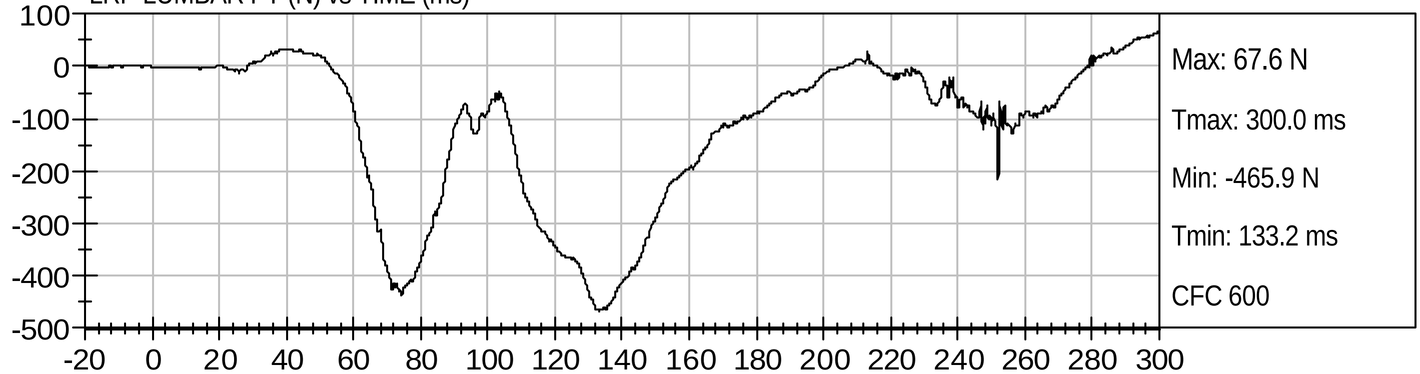
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

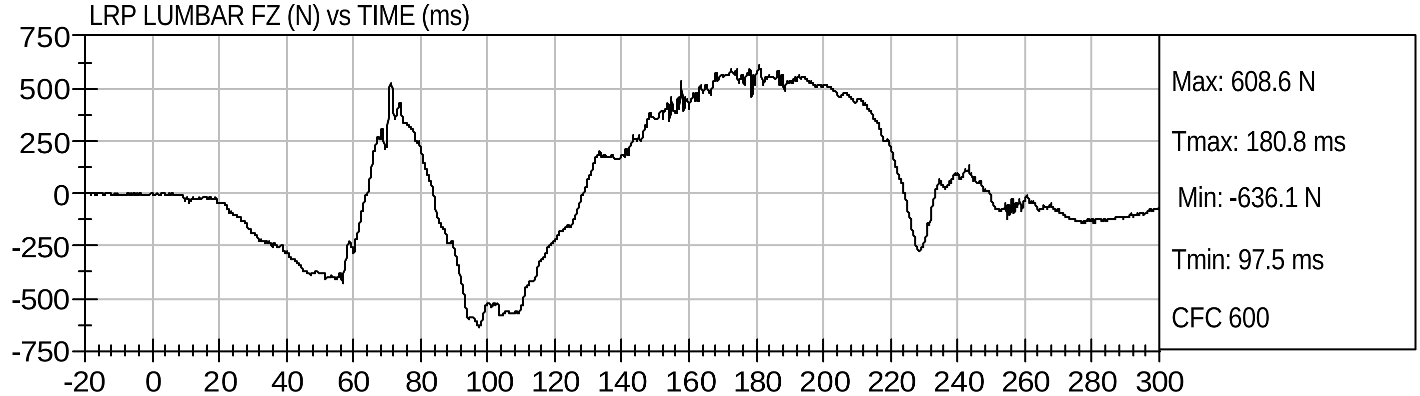
LRP LUMBAR FX (N) vs TIME (ms)



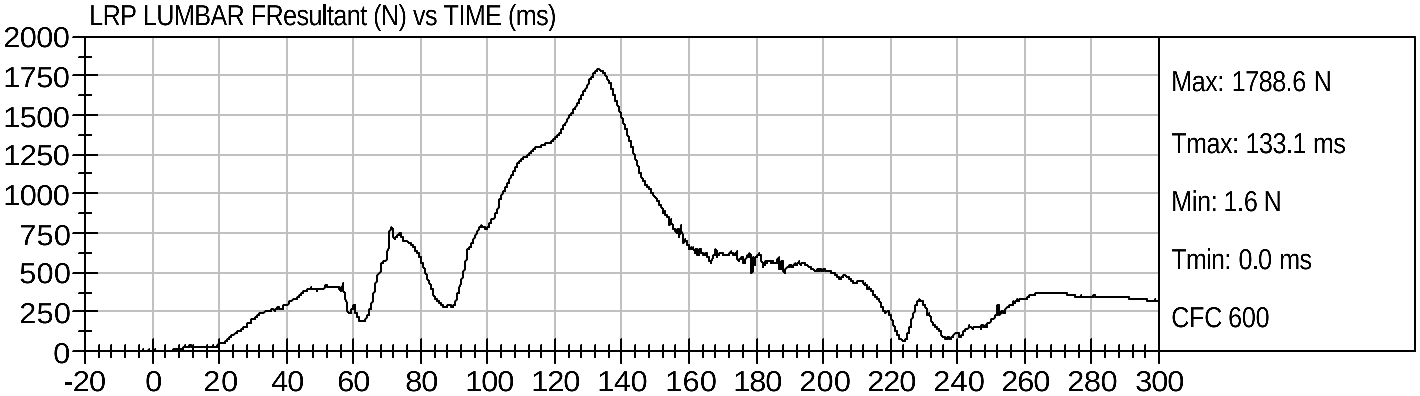
LRP LUMBAR FY (N) vs TIME (ms)



LRP LUMBAR FZ (N) vs TIME (ms)

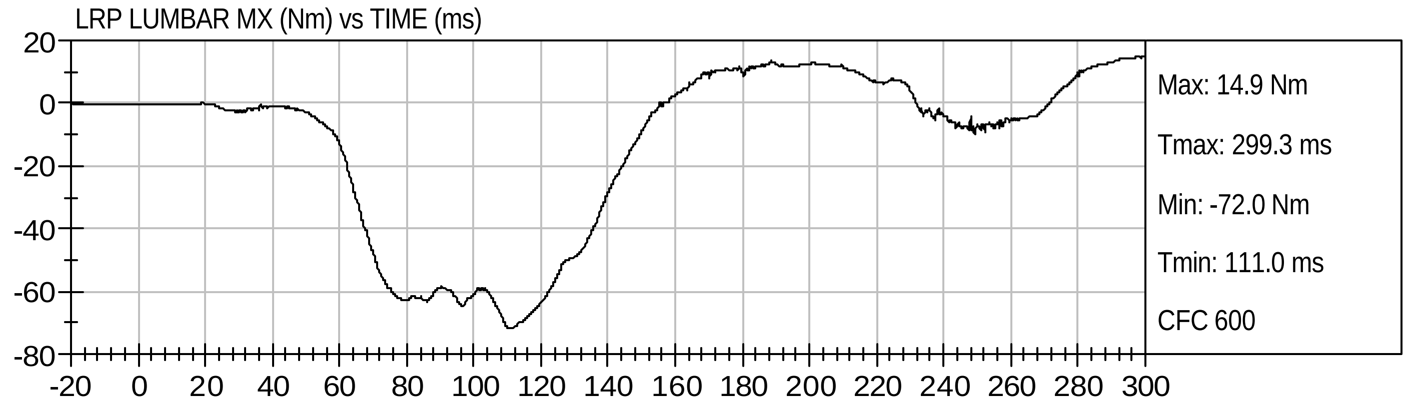


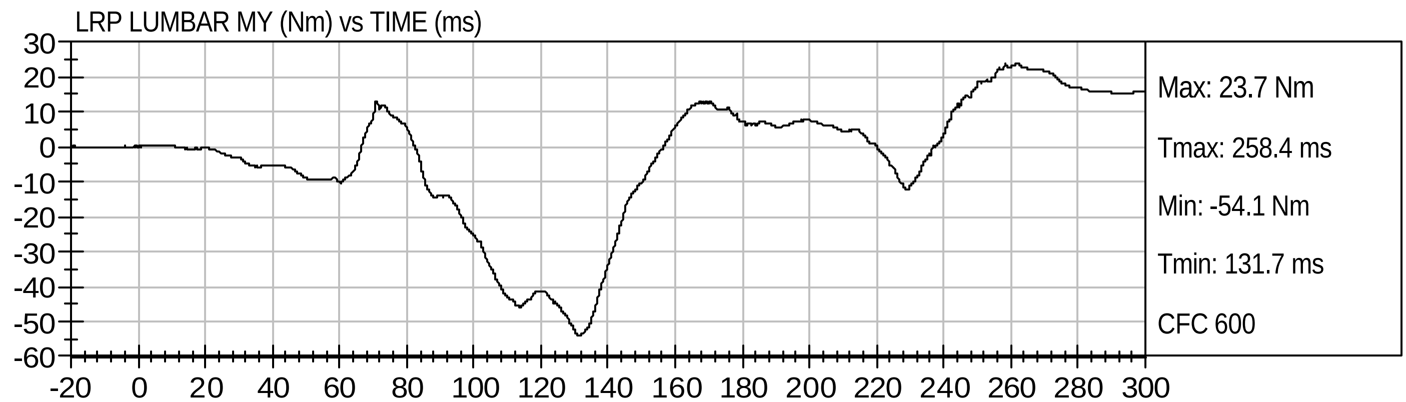
LRP LUMBAR FResultant (N) vs TIME (ms)

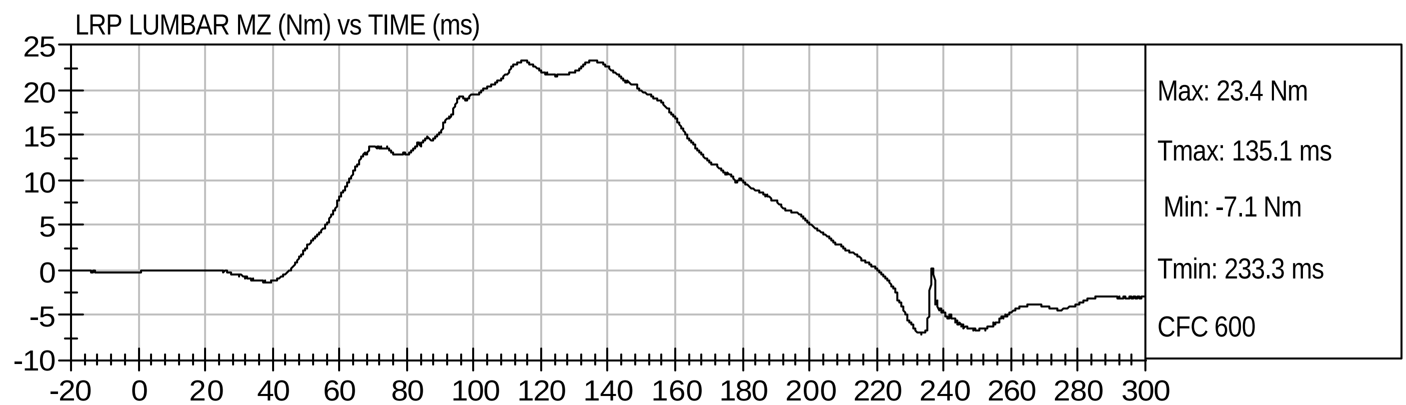


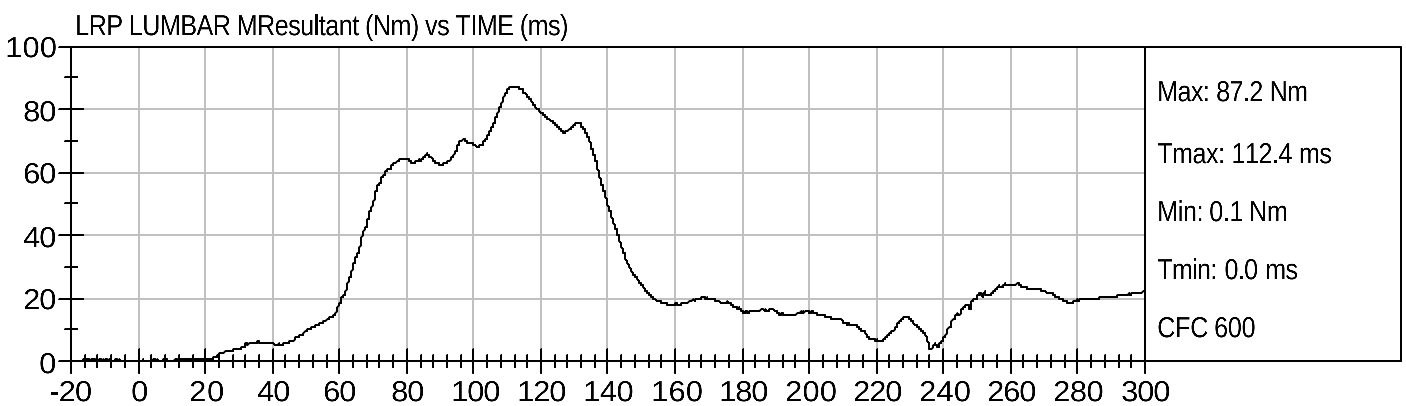
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

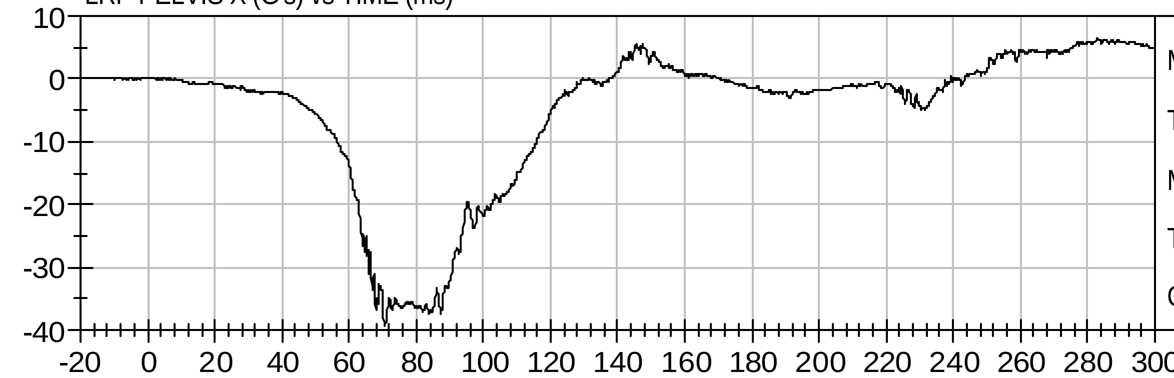








LRP PELVIS X (G's) vs TIME (ms)



Max: 6.5 G's

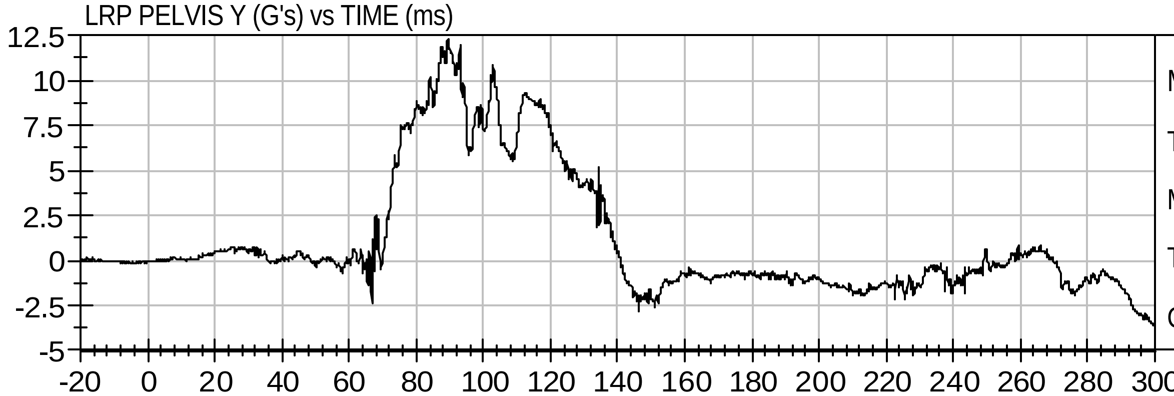
Tmax: 282.9 ms

Min: -39.2 G's

Tmin: 70.8 ms

CFC 1000

LRP PELVIS Y (G's) vs TIME (ms)



Max: 12.2 G's

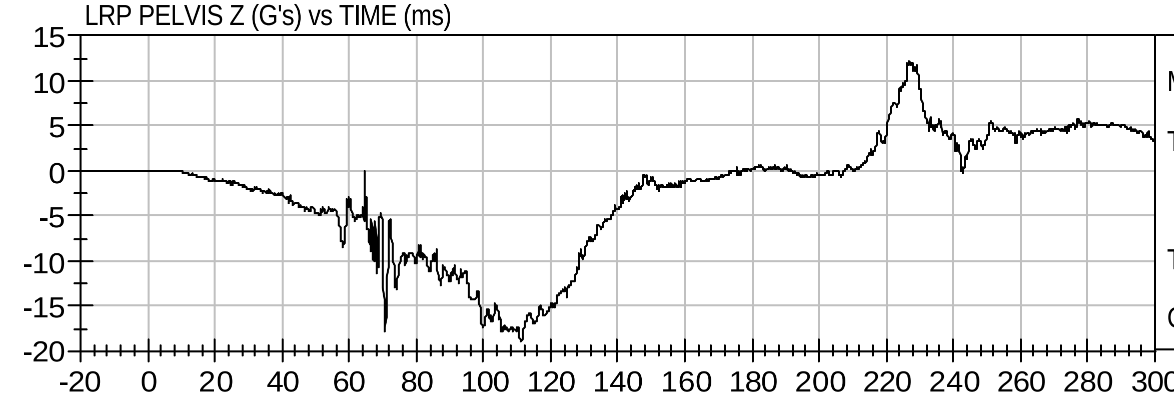
Tmax: 89.4 ms

Min: -3.7 G's

Tmin: 300.0 ms

CFC 1000

LRP PELVIS Z (G's) vs TIME (ms)



Max: 12.1 G's

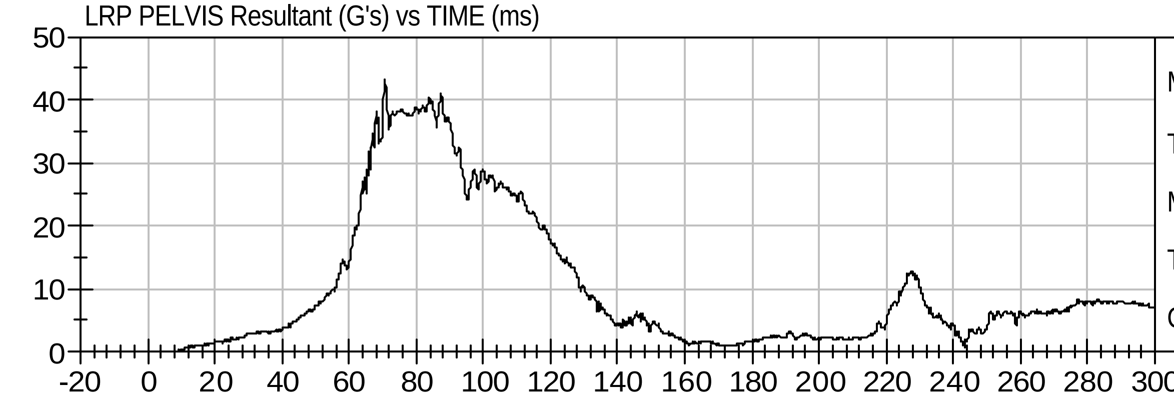
Tmax: 226.8 ms

Min: -18.9 G's

Tmin: 111.2 ms

CFC 1000

LRP PELVIS Resultant (G's) vs TIME (ms)



Max: 43.1 G's

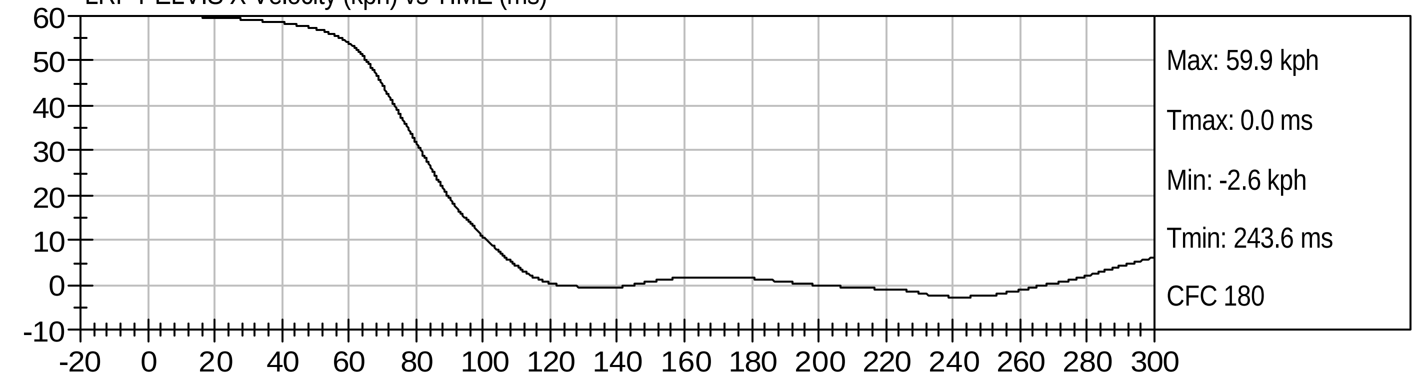
Tmax: 70.8 ms

Min: 0.0 G's

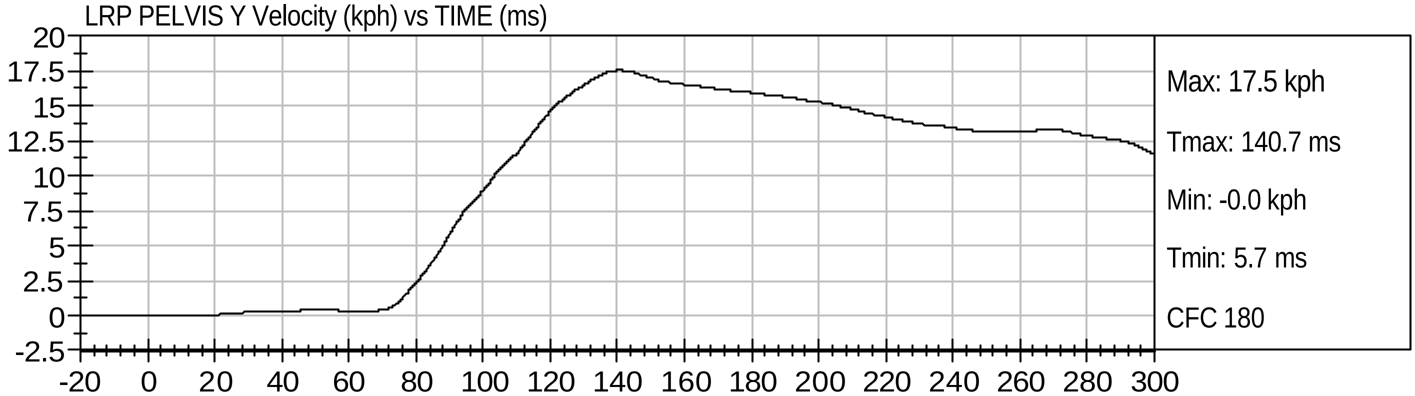
Tmin: 3.3 ms

CFC 1000

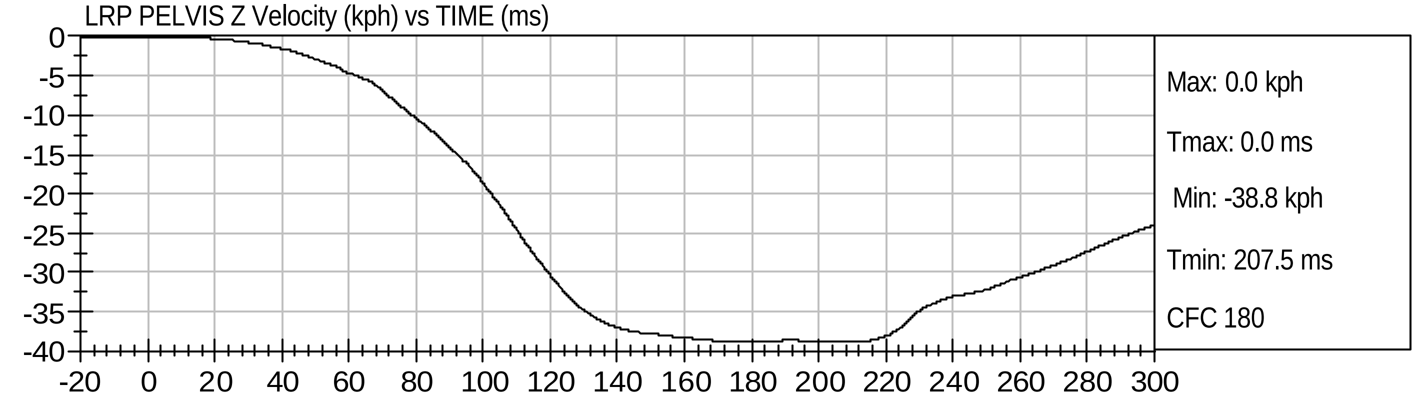
LRP PELVIS X Velocity (kph) vs TIME (ms)



LRP PELVIS Y Velocity (kph) vs TIME (ms)



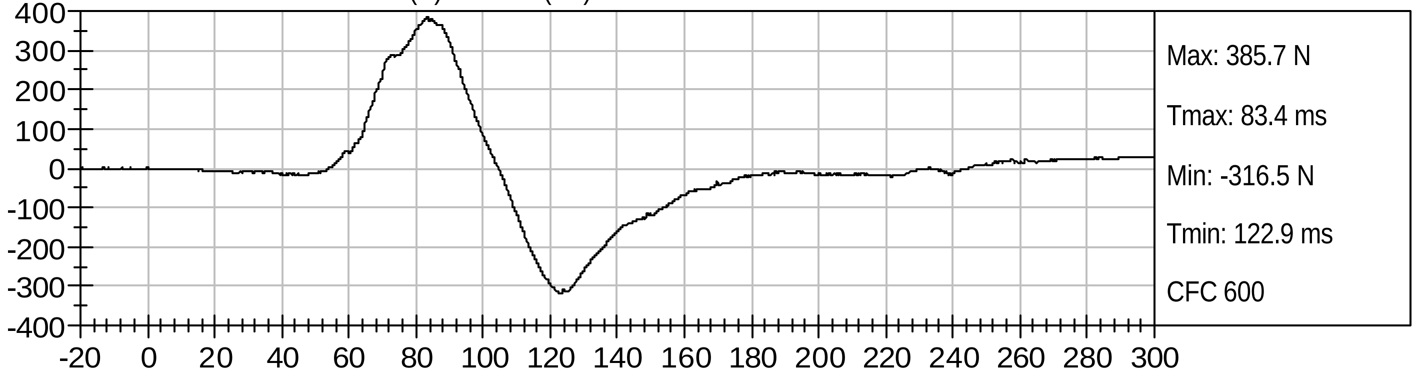
LRP PELVIS Z Velocity (kph) vs TIME (ms)



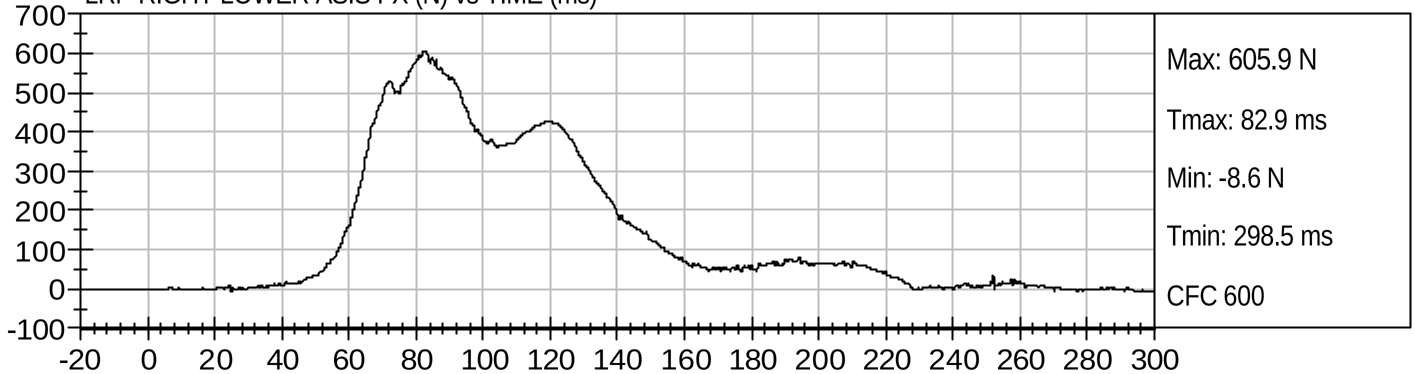
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

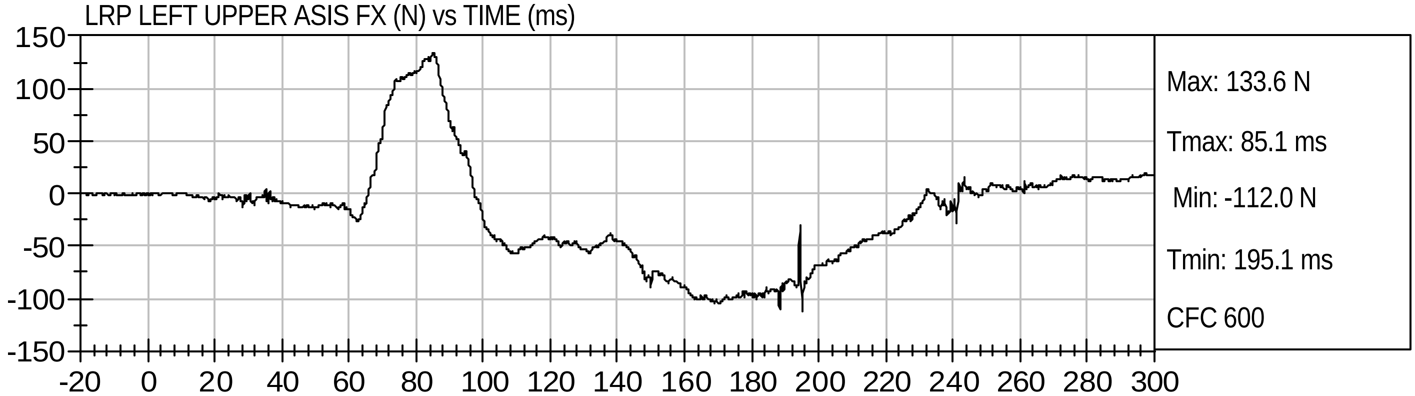
LRP RIGHT UPPER ASIS FX (N) vs TIME (ms)



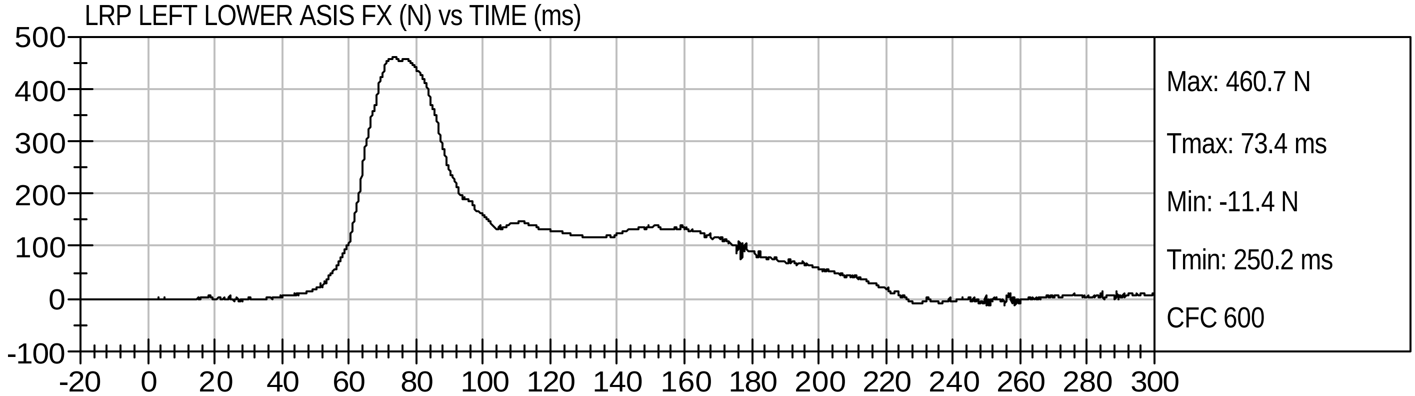
LRP RIGHT LOWER ASIS FX (N) vs TIME (ms)



LRP LEFT UPPER ASIS FX (N) vs TIME (ms)



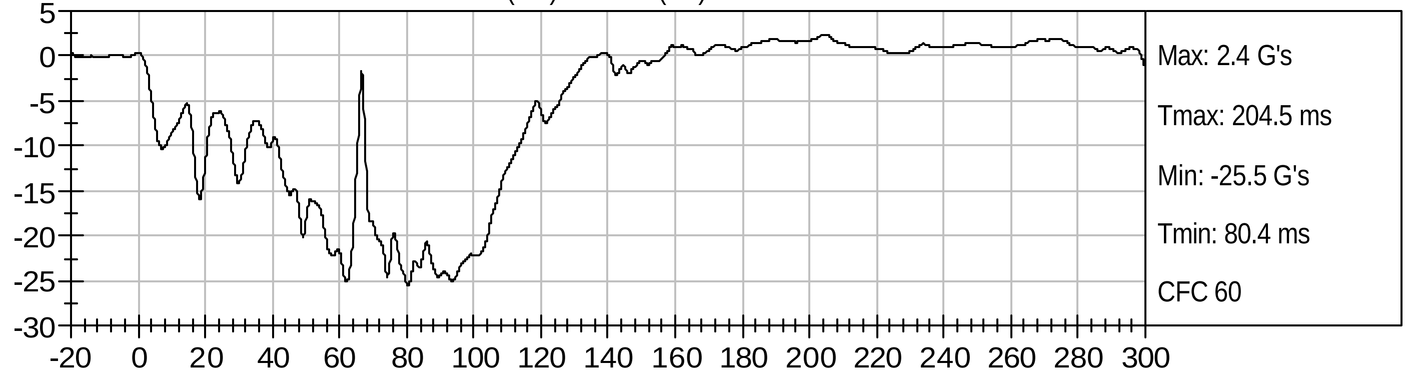
LRP LEFT LOWER ASIS FX (N) vs TIME (ms)



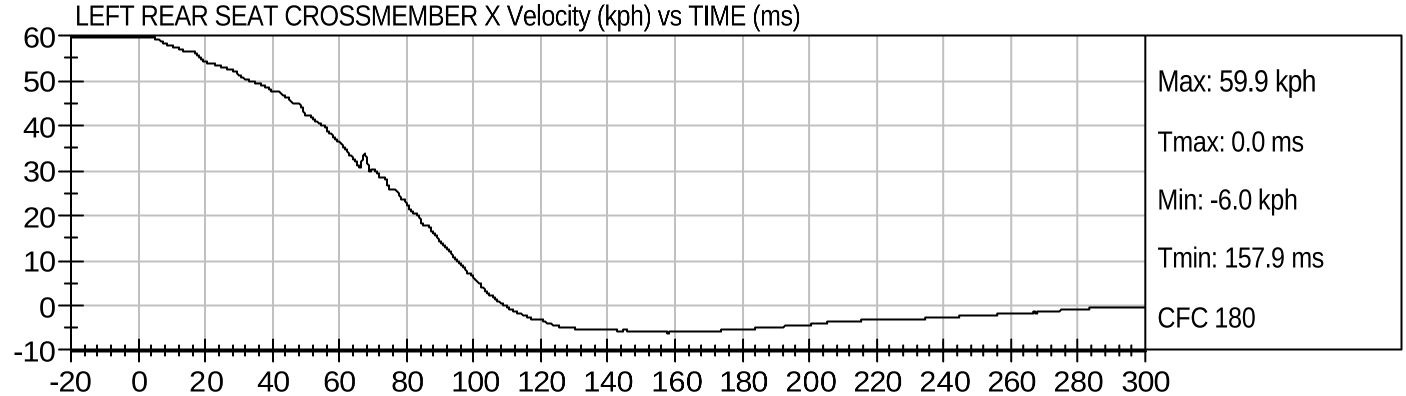
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

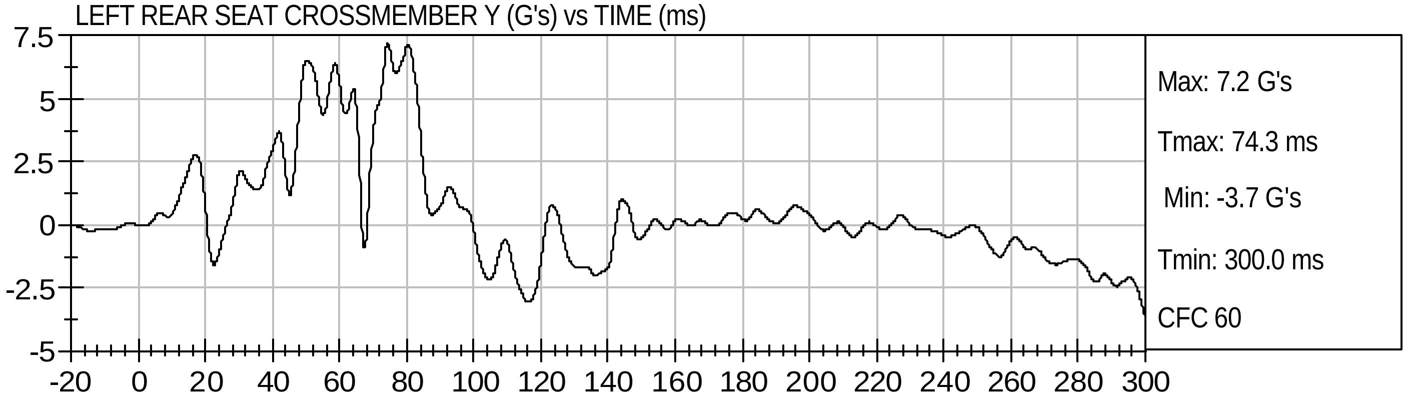
LEFT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)



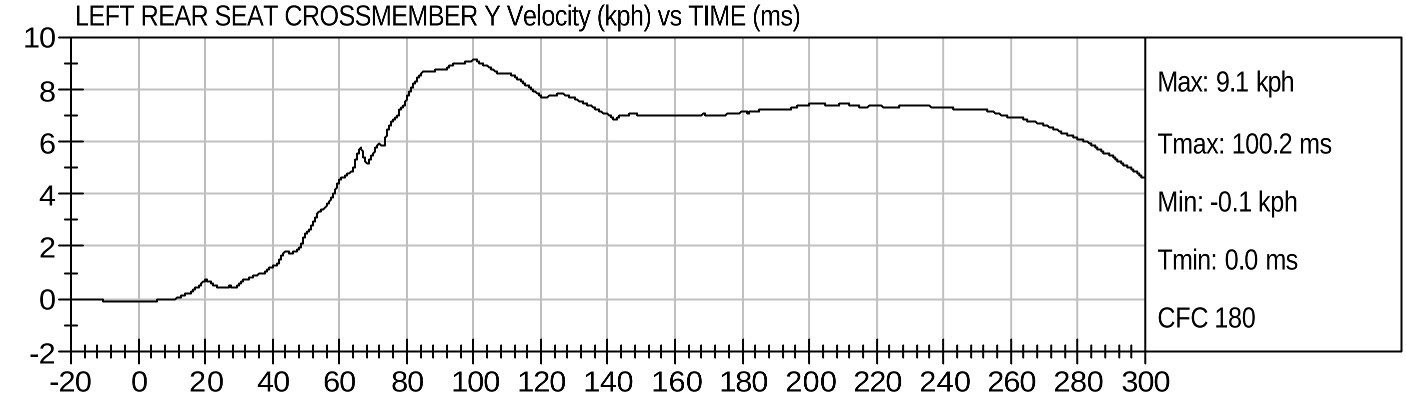
LEFT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)



LEFT REAR SEAT CROSSMEMBER Y (G's) vs TIME (ms)

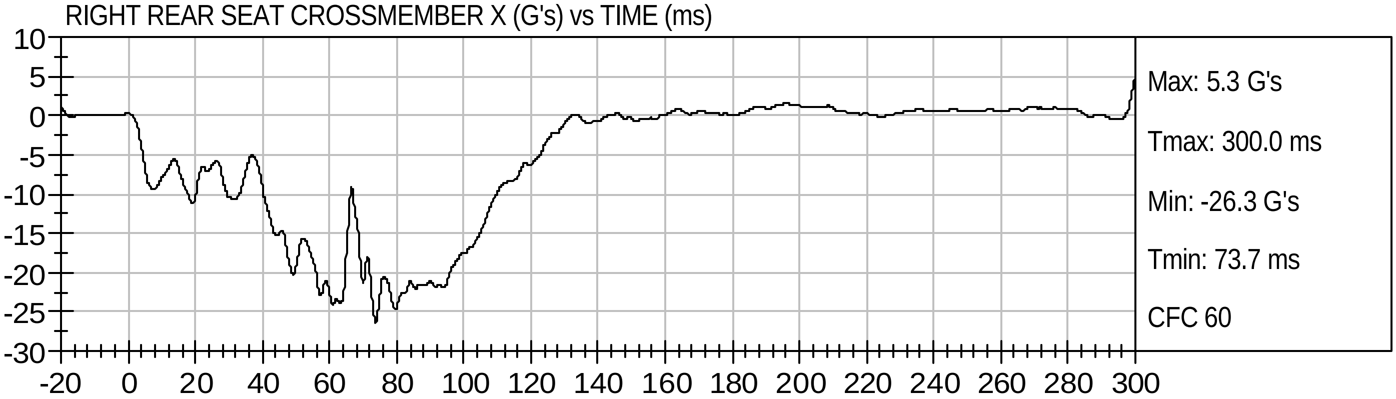


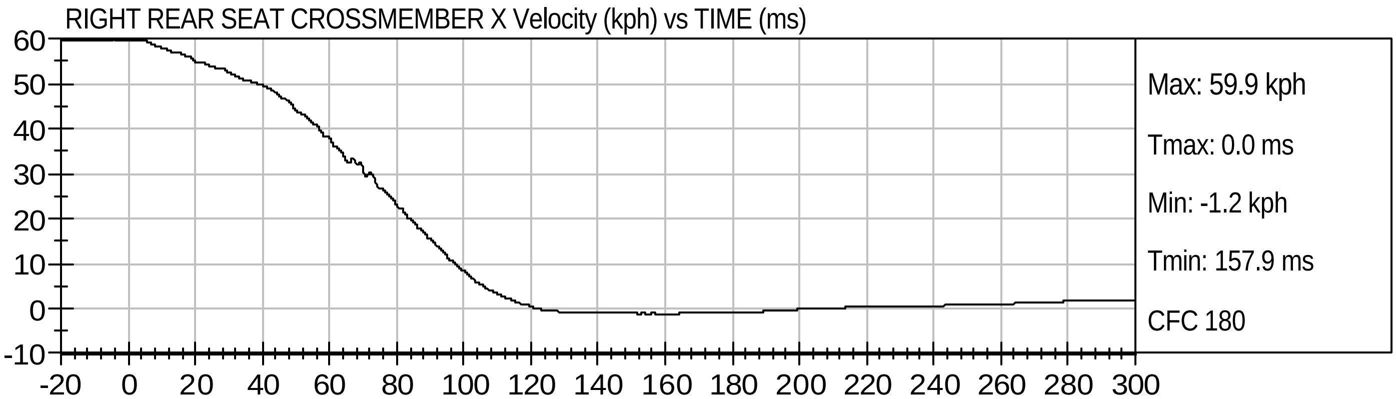
LEFT REAR SEAT CROSSMEMBER Y Velocity (kph) vs TIME (ms)

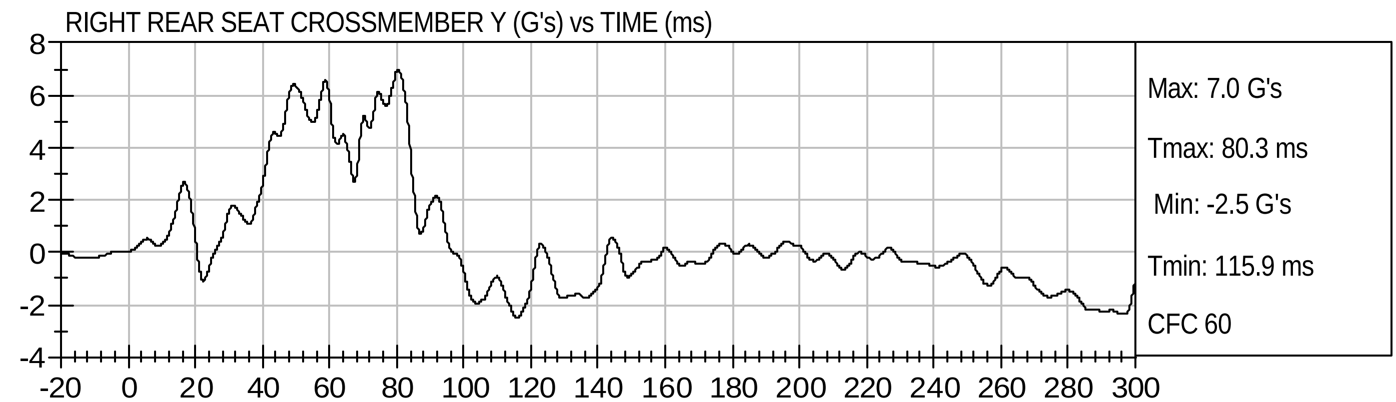


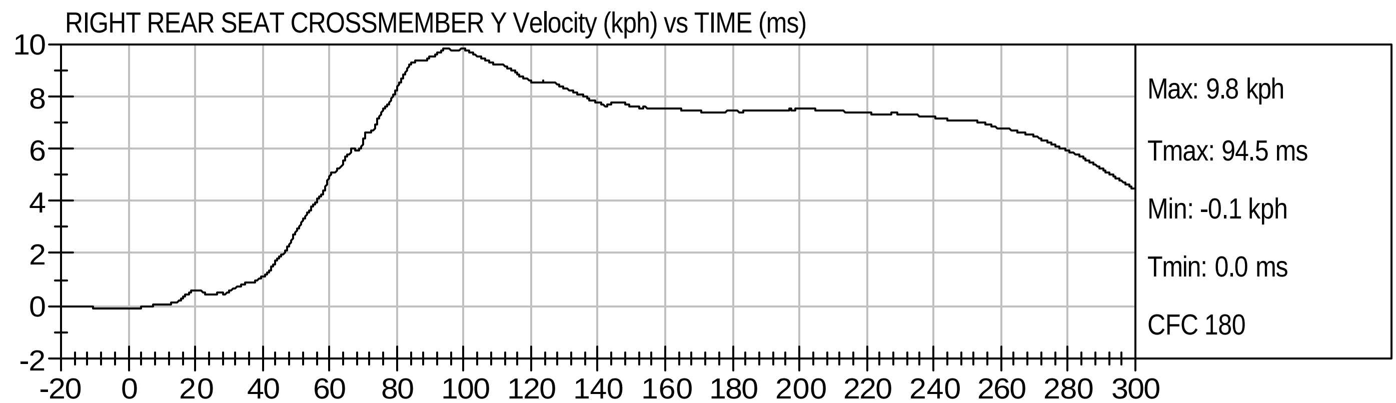
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





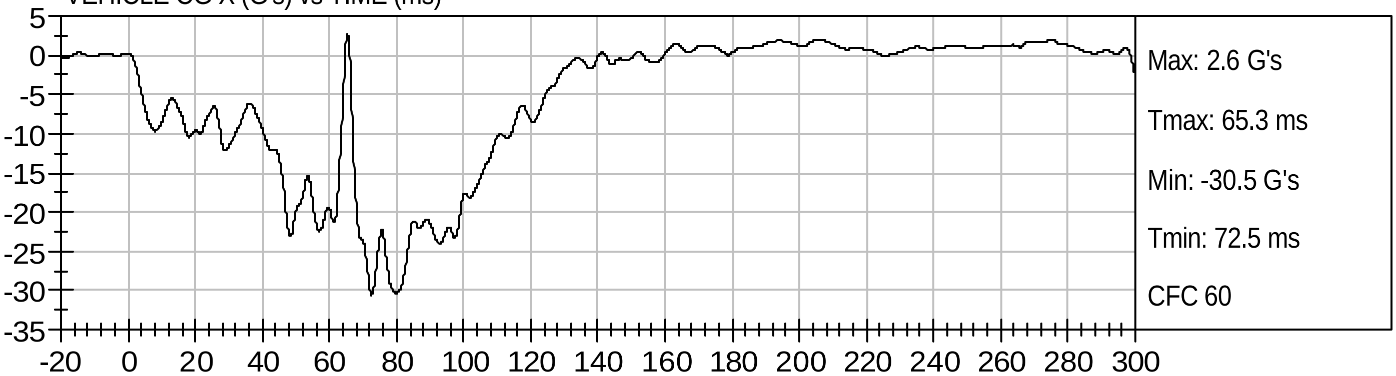




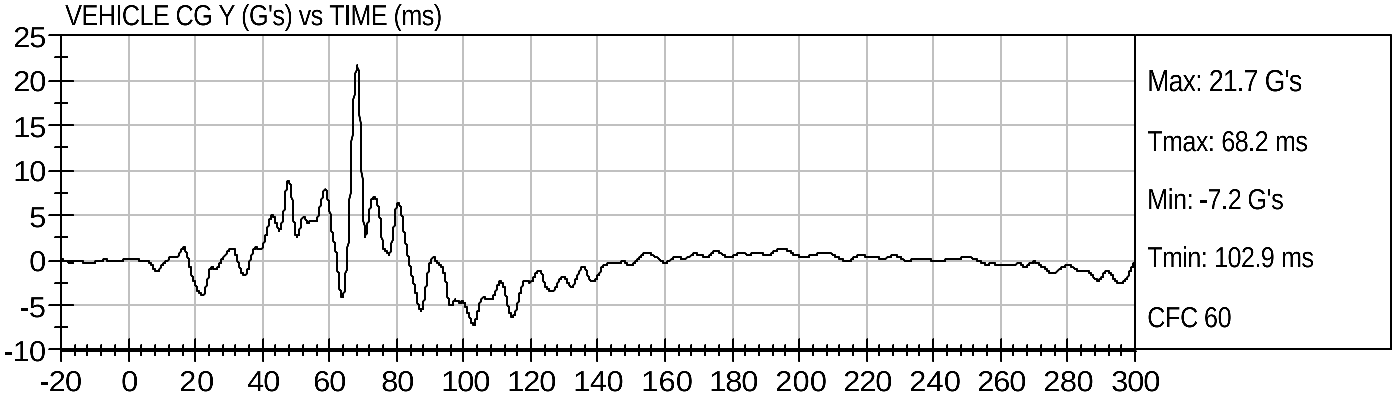
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

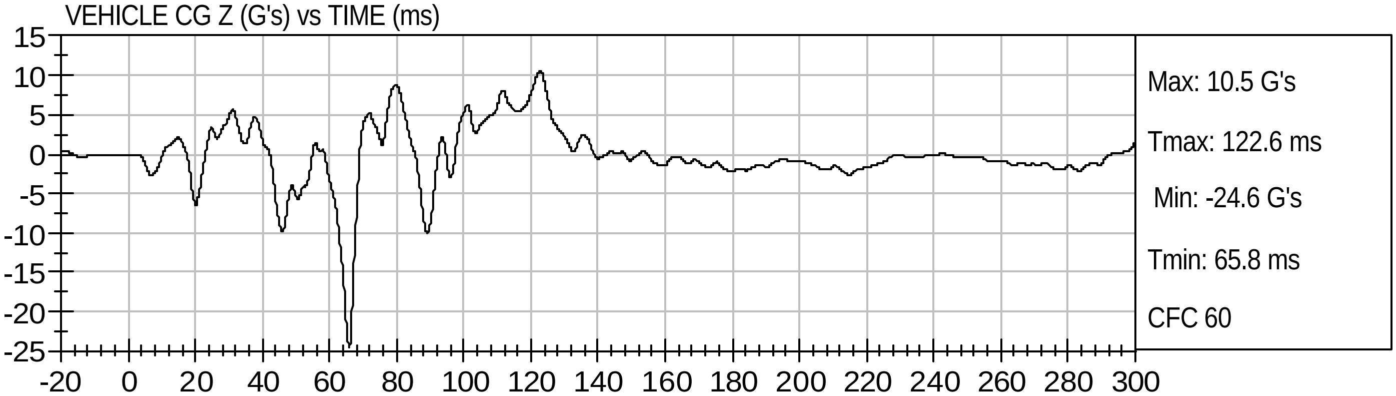
VEHICLE CG X (G's) vs TIME (ms)



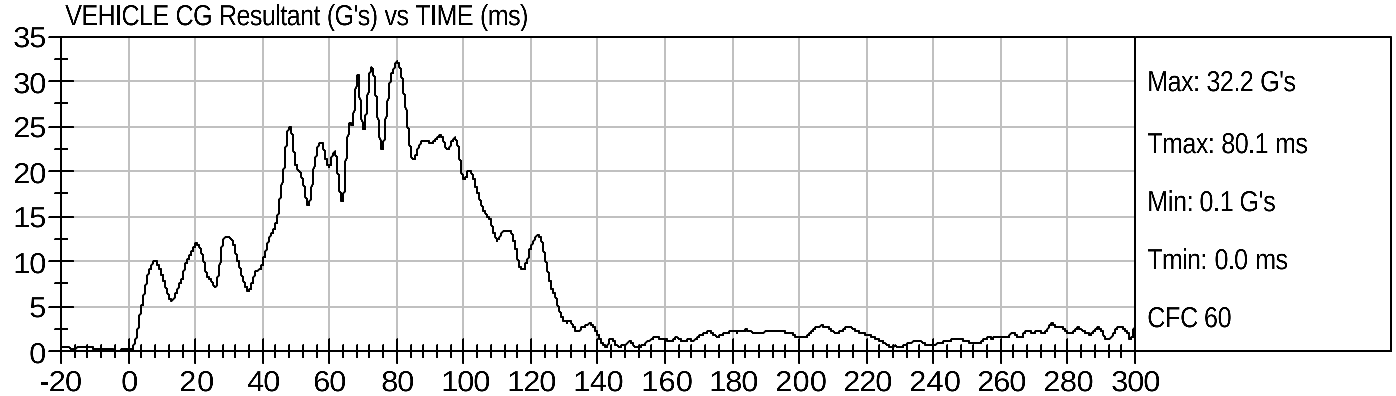
VEHICLE CG Y (G's) vs TIME (ms)



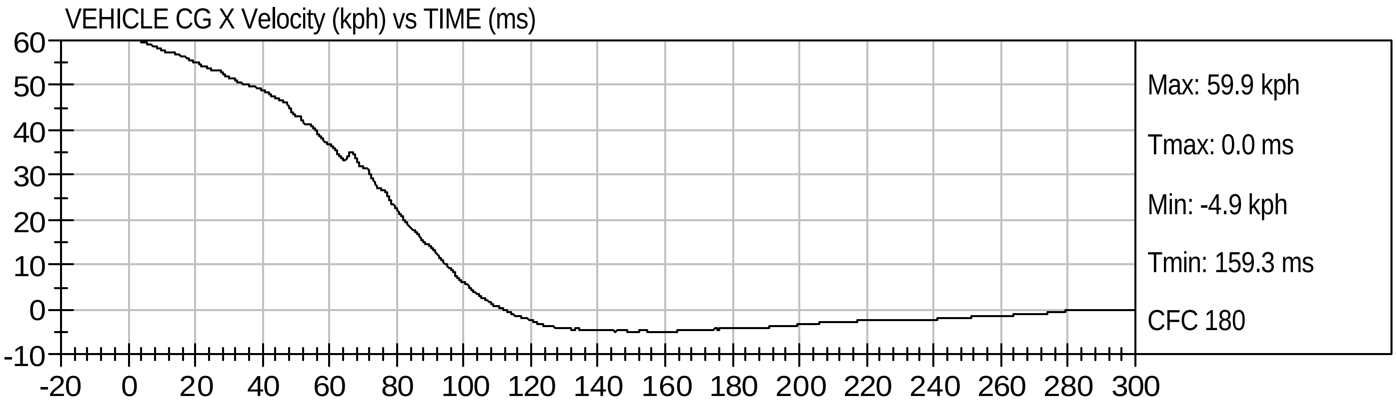
VEHICLE CG Z (G's) vs TIME (ms)

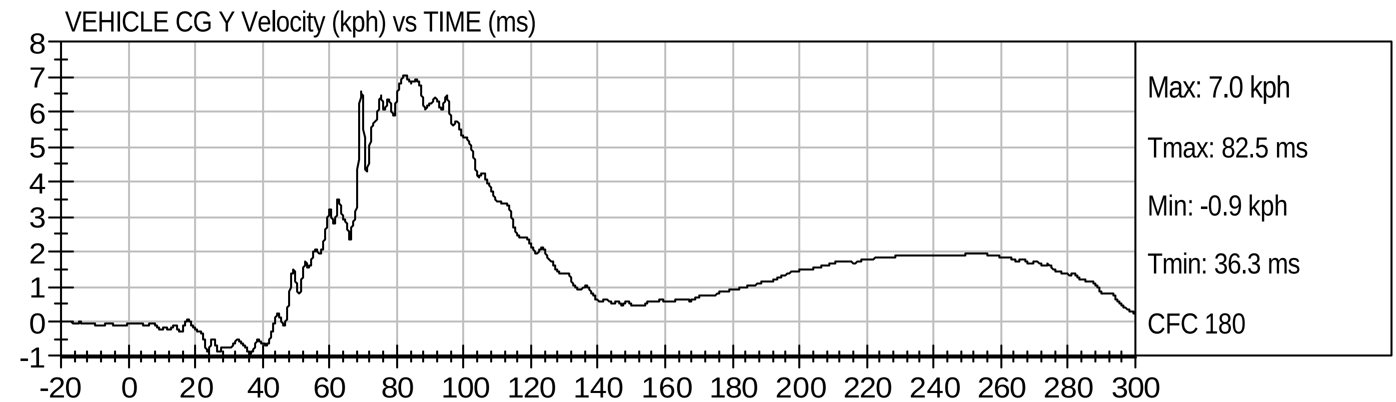


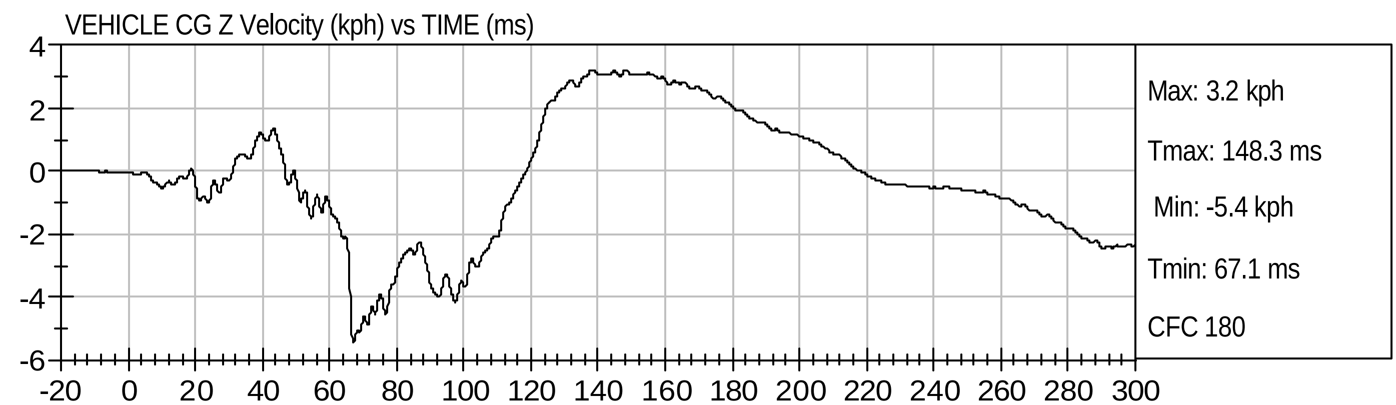
VEHICLE CG Resultant (G's) vs TIME (ms)



NHTSA 50% OFFSET PDB FRONTAL		Test Date: 04/02/2008
2007 FORD 500	R70205	Speed: 37.2 mph (59.9 km/h)



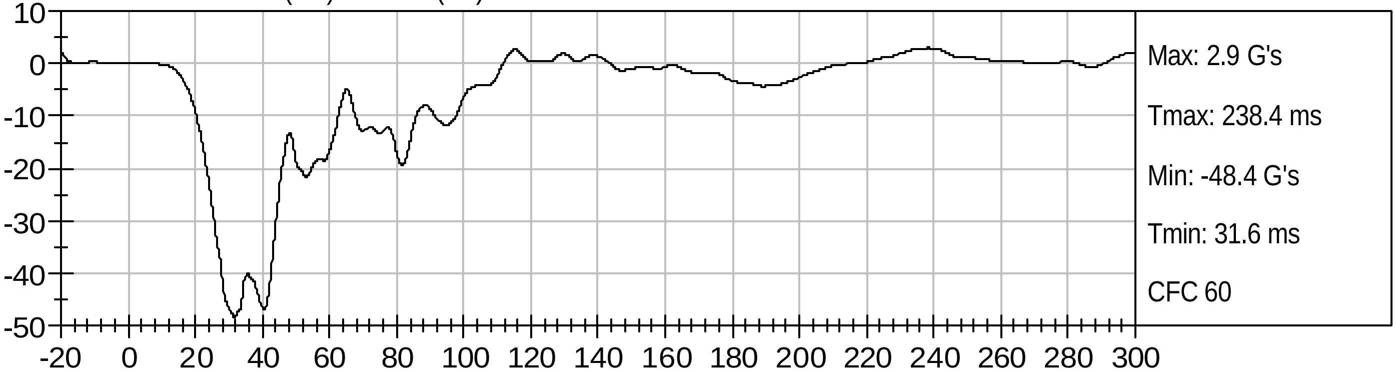




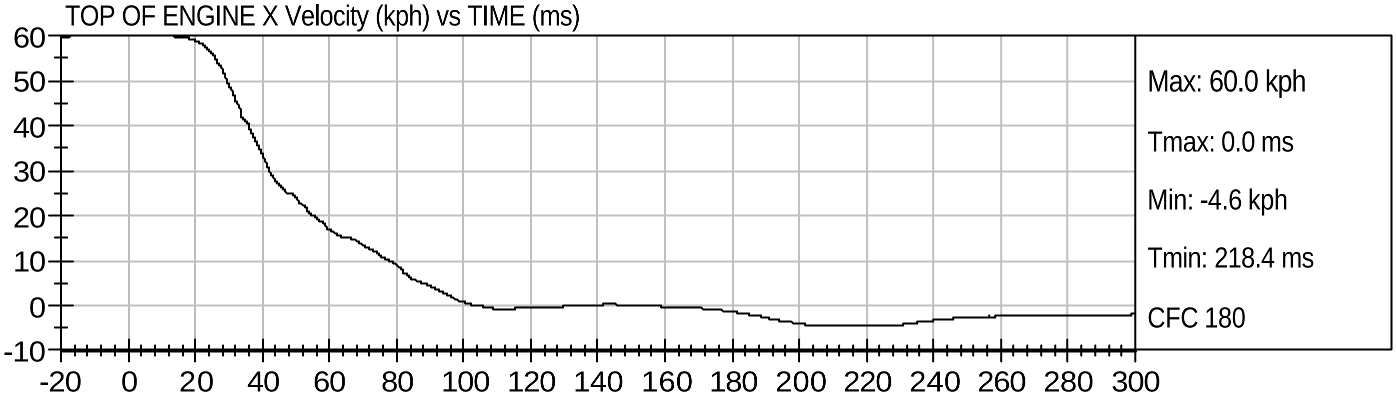
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

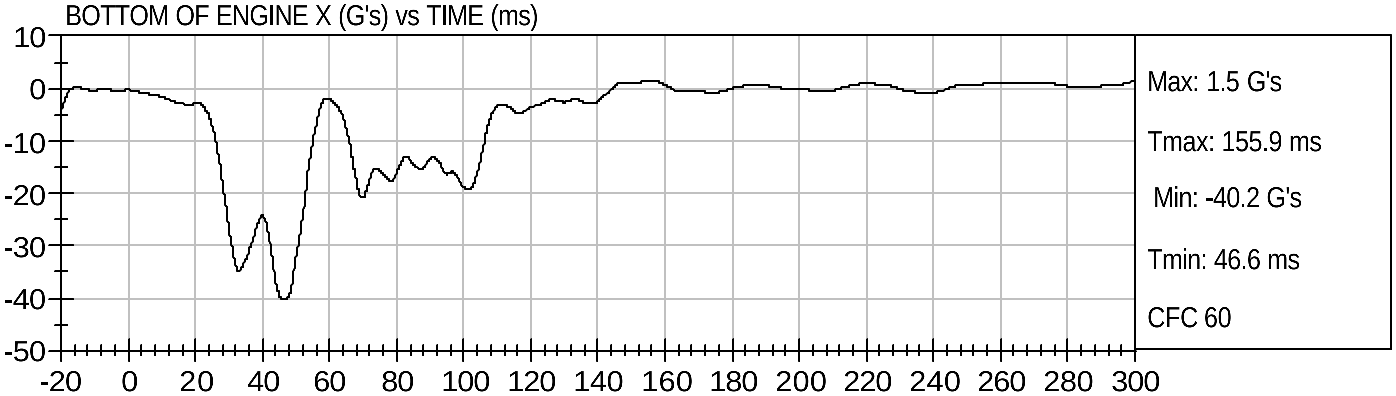
TOP OF ENGINE X (G's) vs TIME (ms)



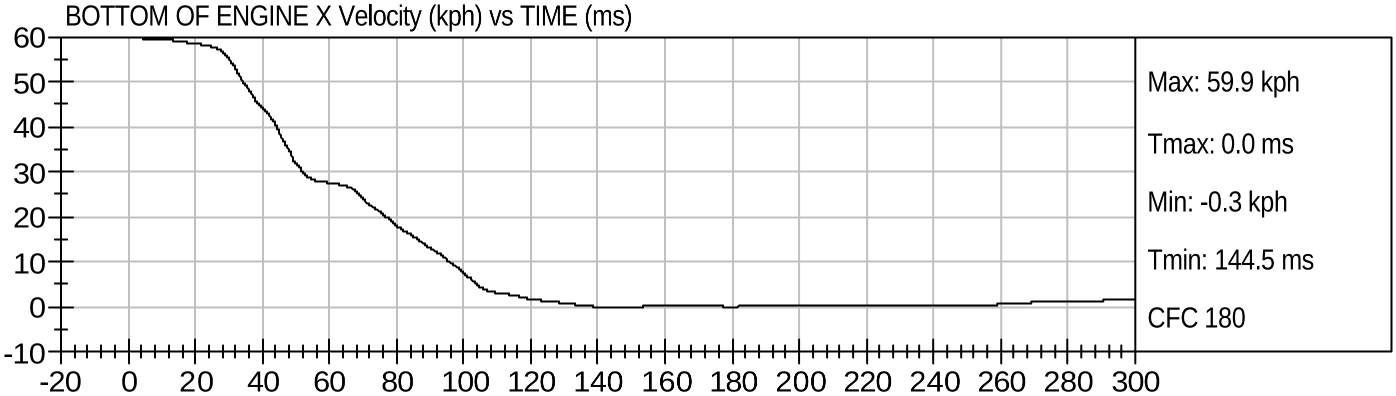
TOP OF ENGINE X Velocity (kph) vs TIME (ms)



BOTTOM OF ENGINE X (G's) vs TIME (ms)



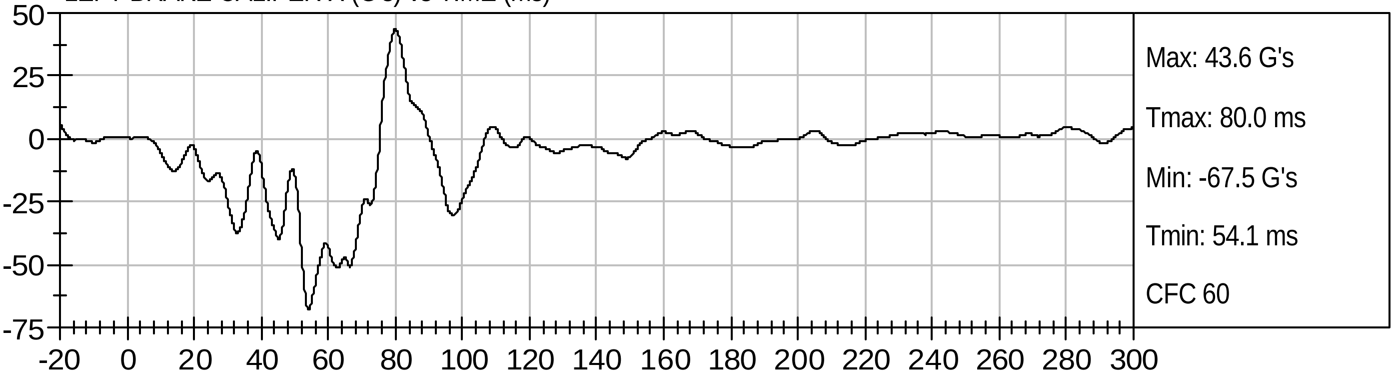
BOTTOM OF ENGINE X Velocity (kph) vs TIME (ms)



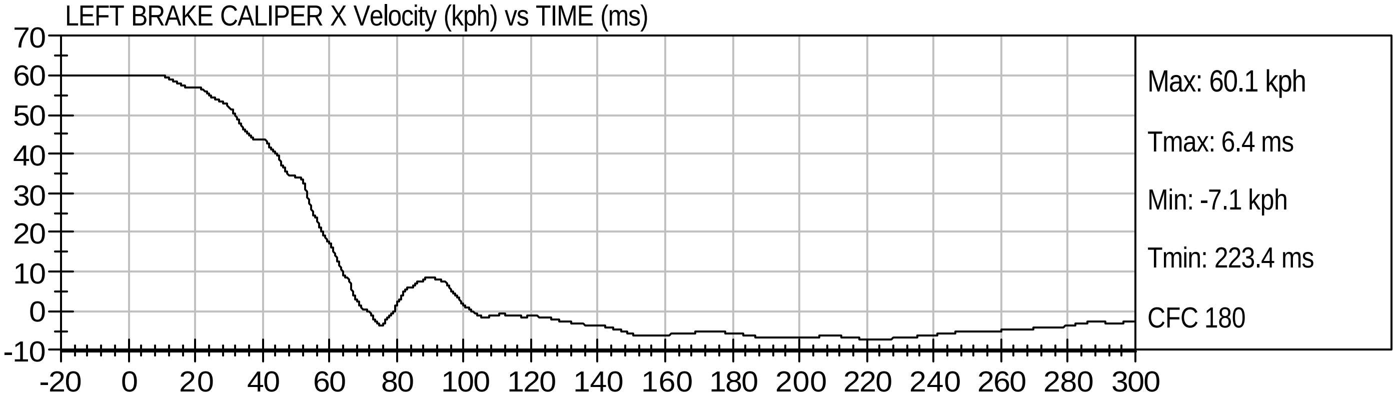
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

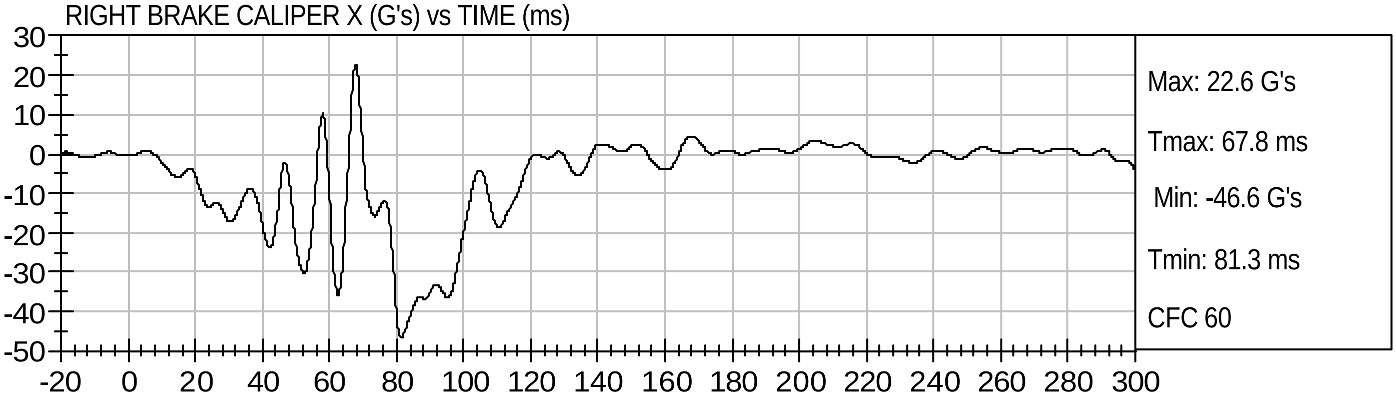
LEFT BRAKE CALIPER X (G's) vs TIME (ms)



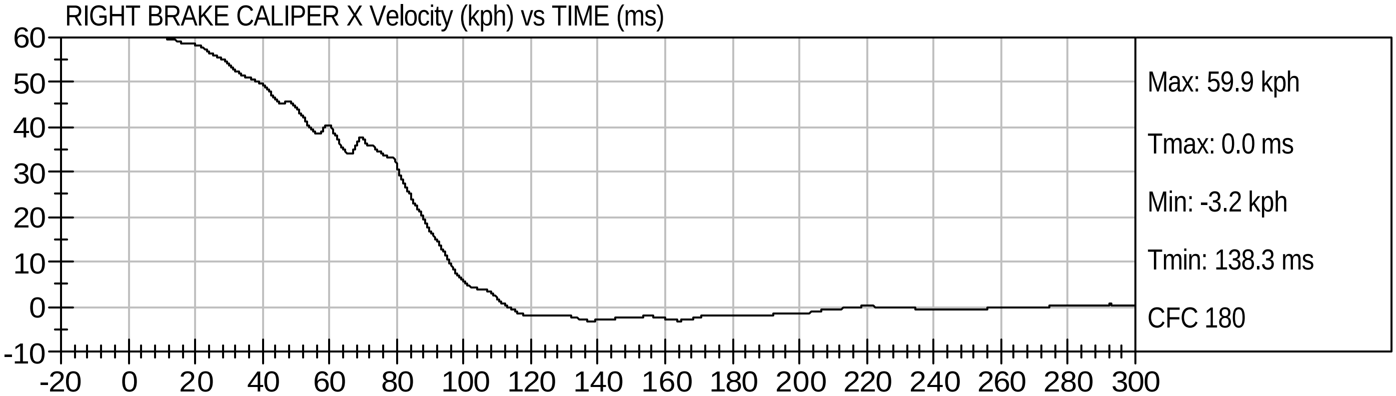
LEFT BRAKE CALIPER X Velocity (kph) vs TIME (ms)



RIGHT BRAKE CALIPER X (G's) vs TIME (ms)



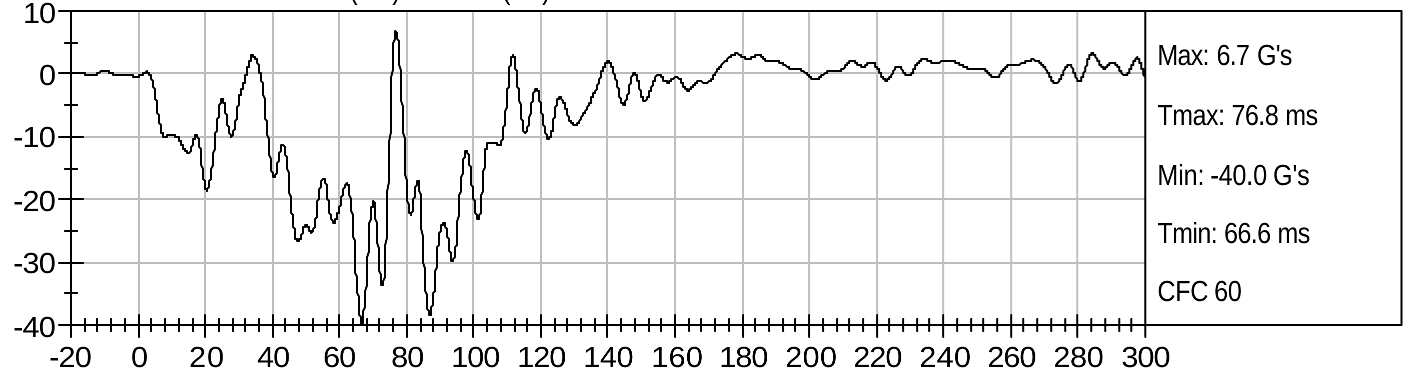
RIGHT BRAKE CALIPER X Velocity (kph) vs TIME (ms)



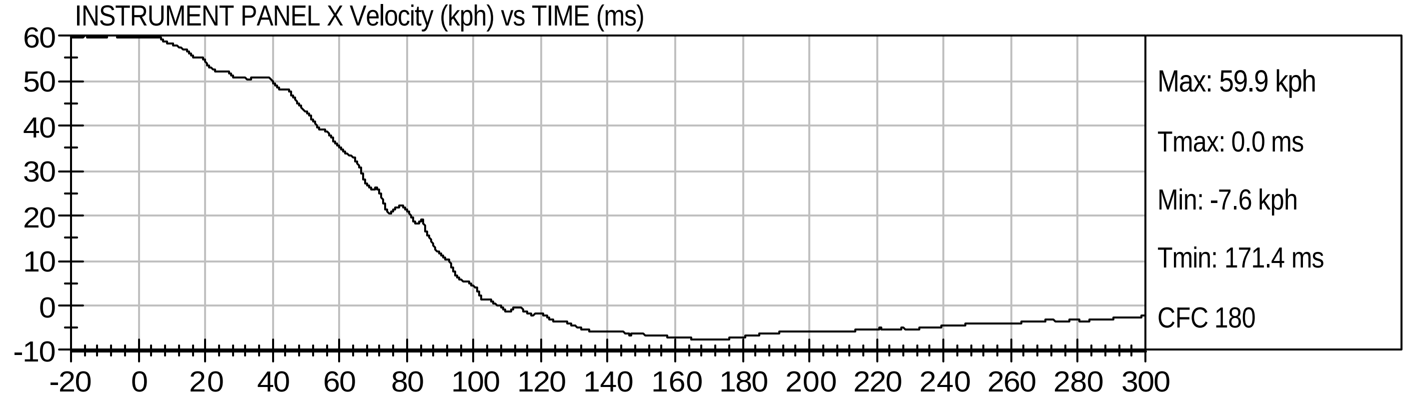
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

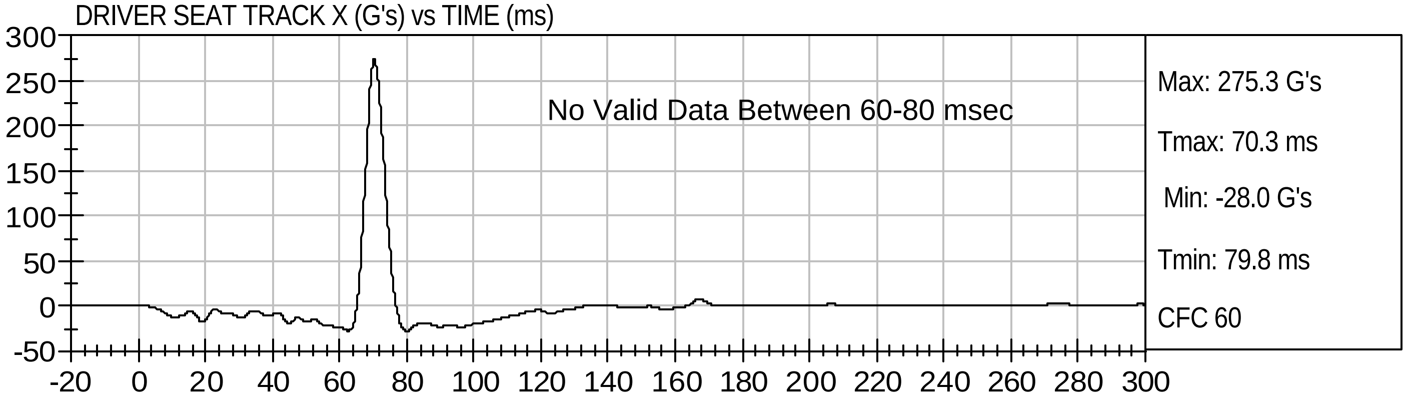
INSTRUMENT PANEL X (G's) vs TIME (ms)



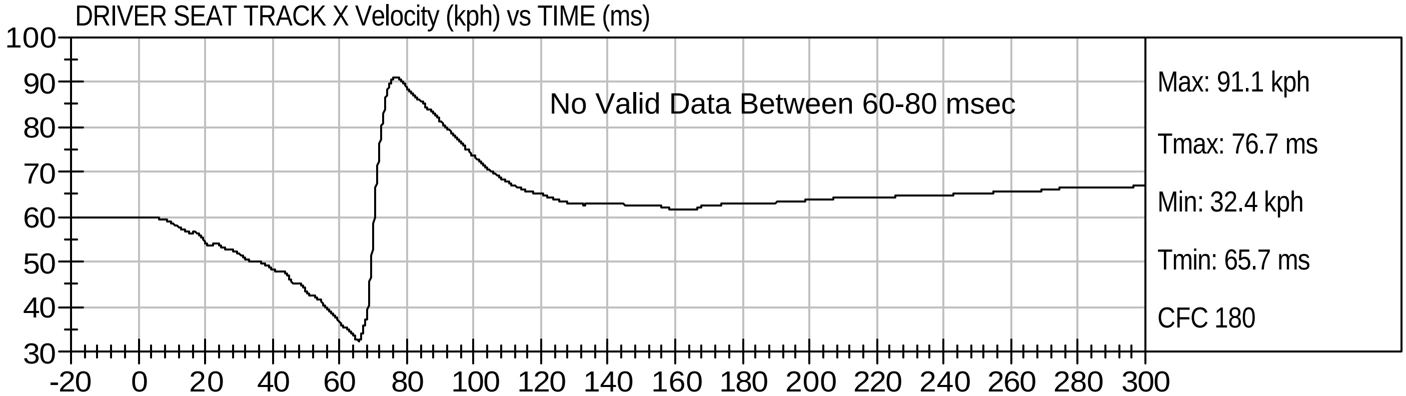
INSTRUMENT PANEL X Velocity (kph) vs TIME (ms)



DRIVER SEAT TRACK X (G's) vs TIME (ms)



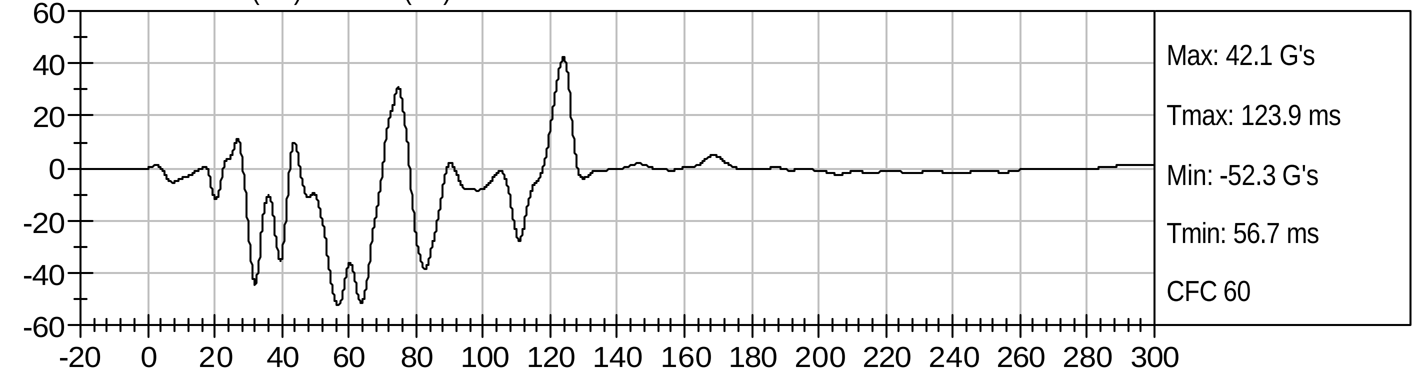
DRIVER SEAT TRACK X Velocity (kph) vs TIME (ms)



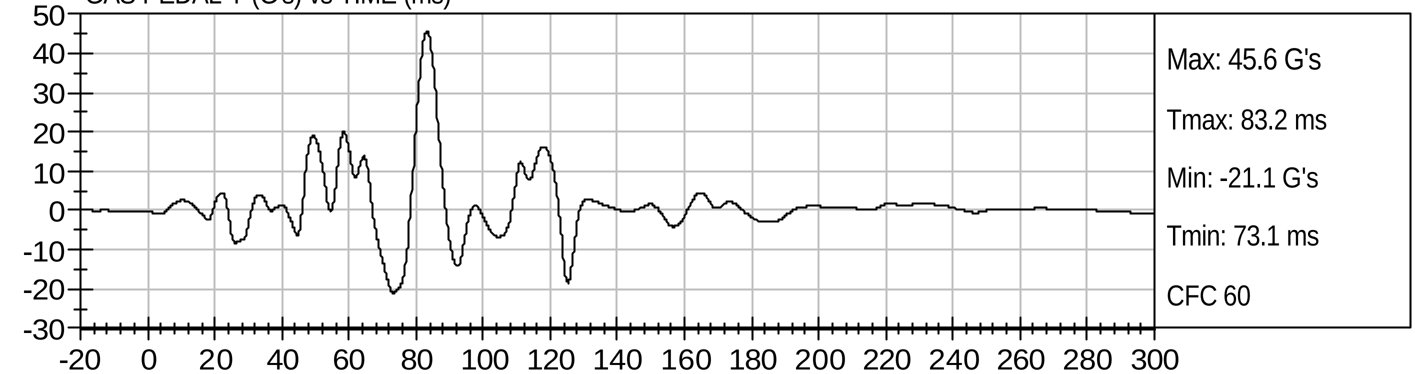
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

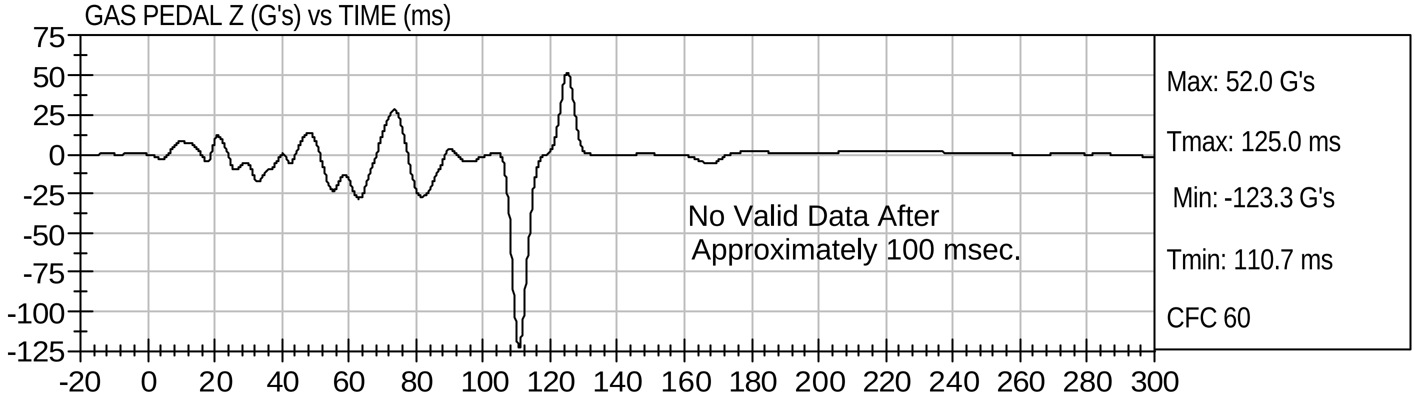
GAS PEDAL X (G's) vs TIME (ms)



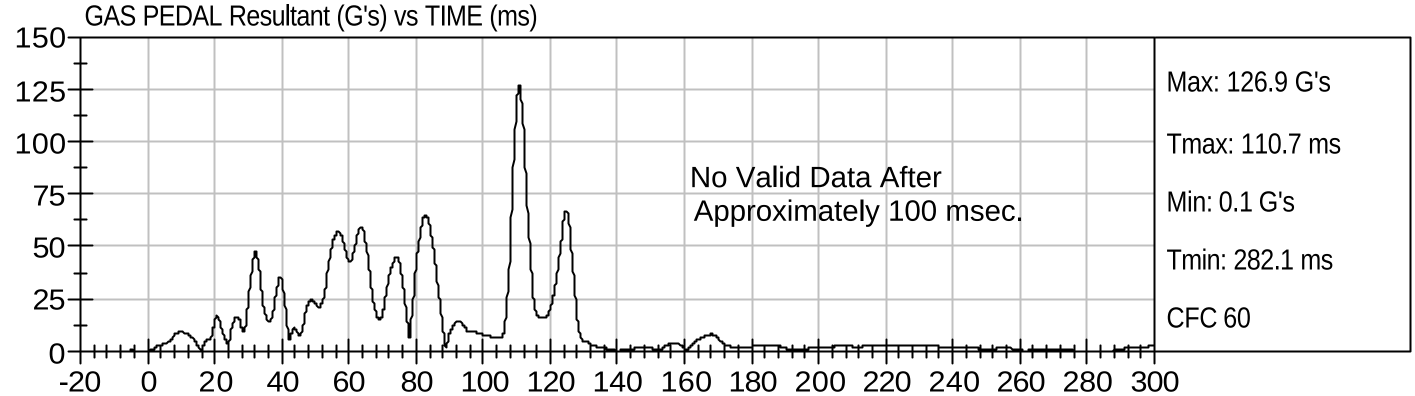
GAS PEDAL Y (G's) vs TIME (ms)



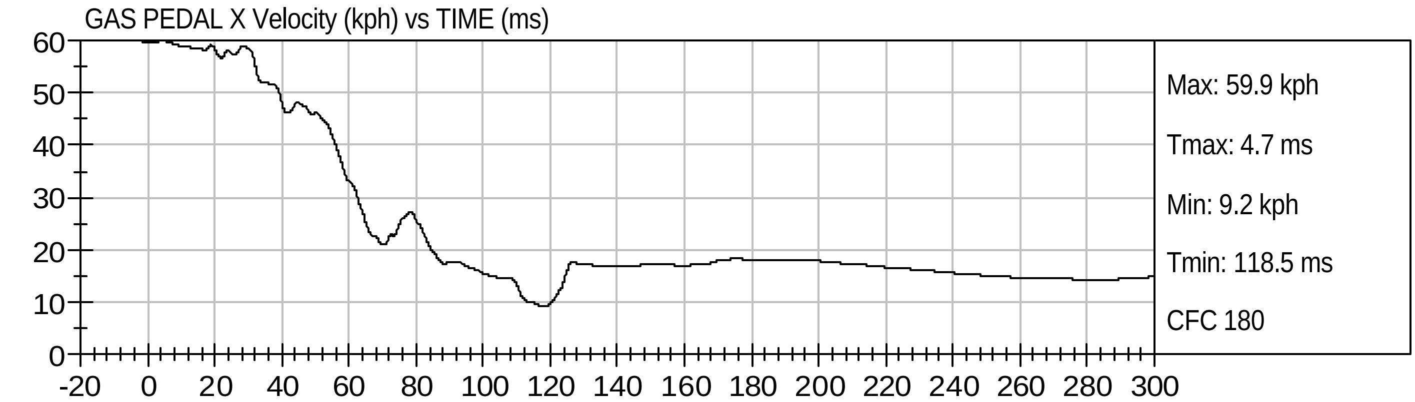
GAS PEDAL Z (G's) vs TIME (ms)

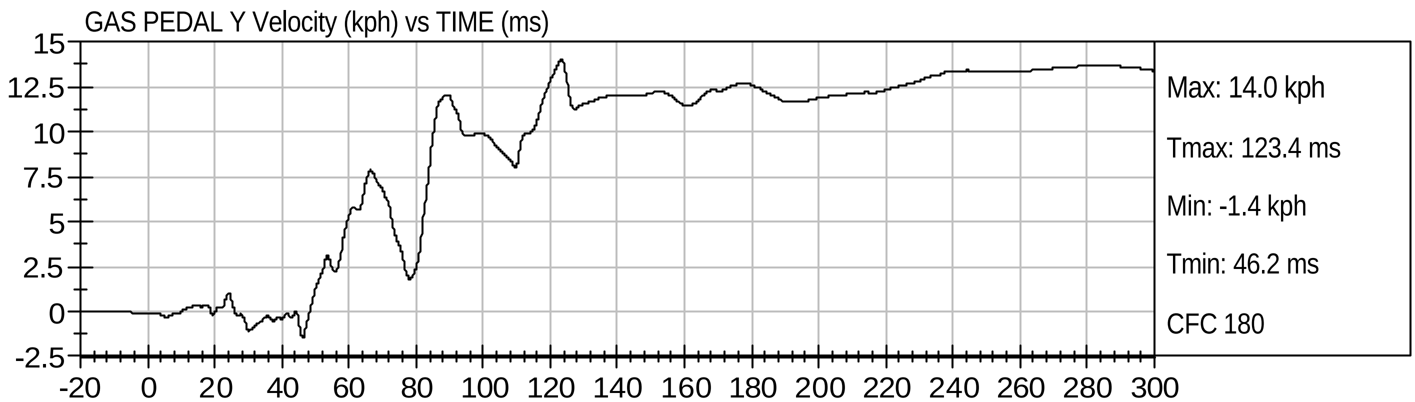


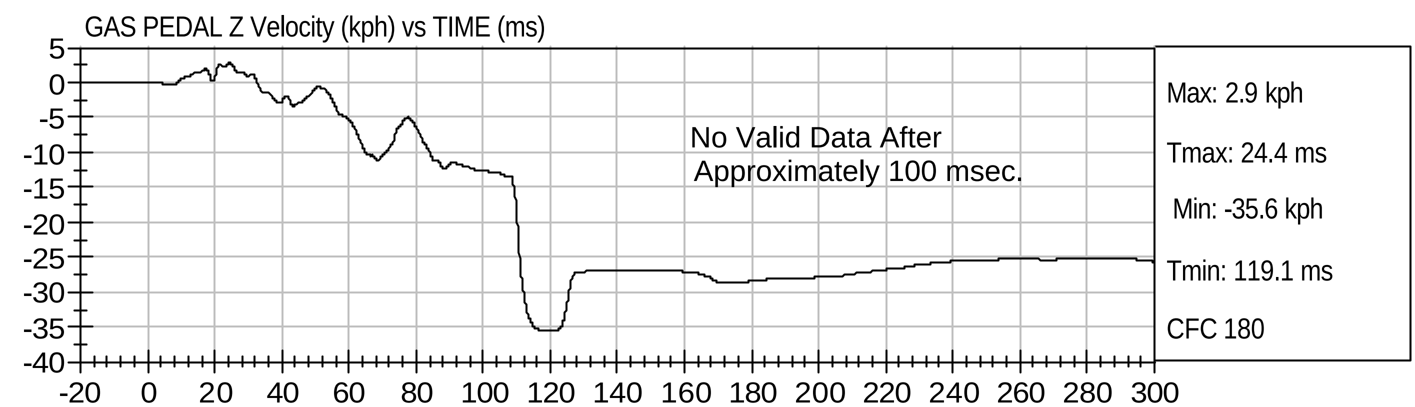
GAS PEDAL Resultant (G's) vs TIME (ms)



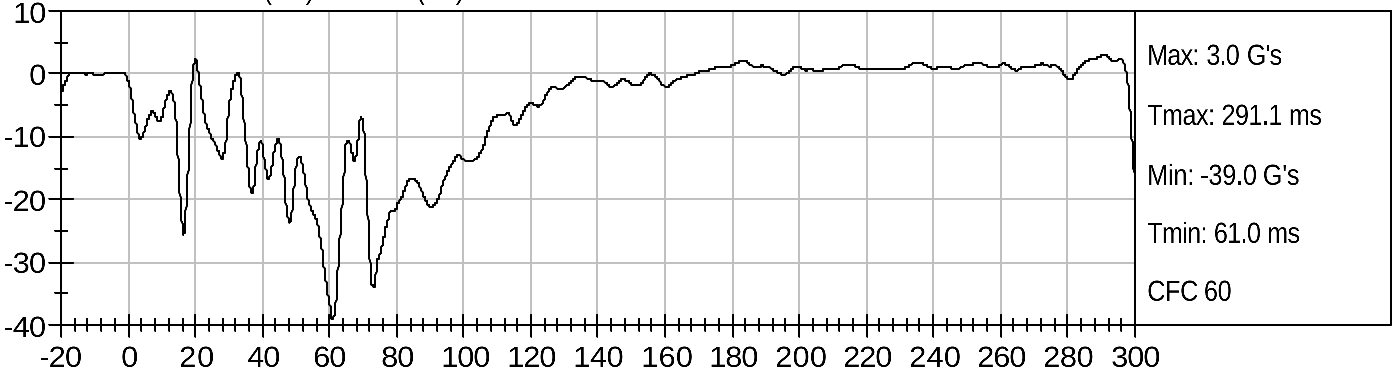
NHTSA 50% OFFSET PDB FRONTAL 2007 FORD 500 R70205	Test Date: 04/02/2008 Speed: 37.2 mph (59.9 km/h)



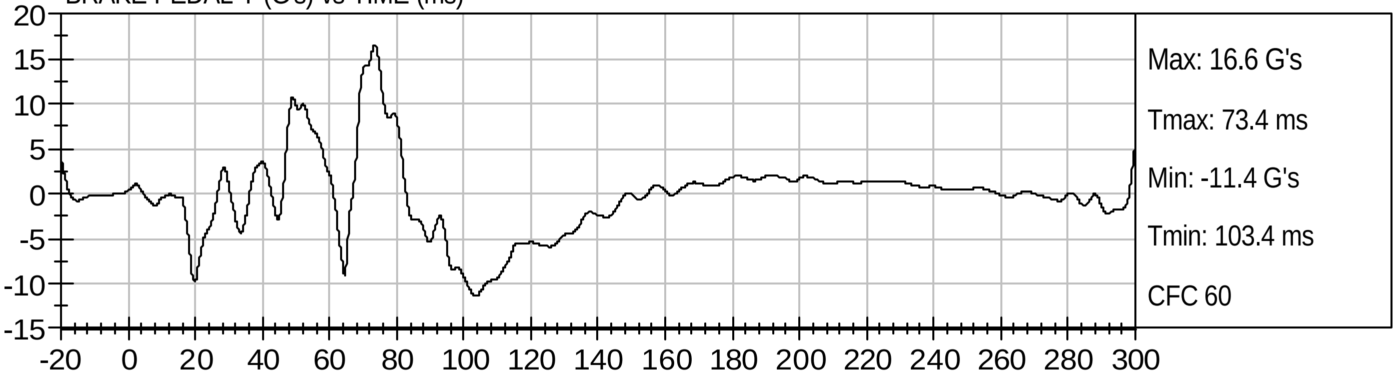




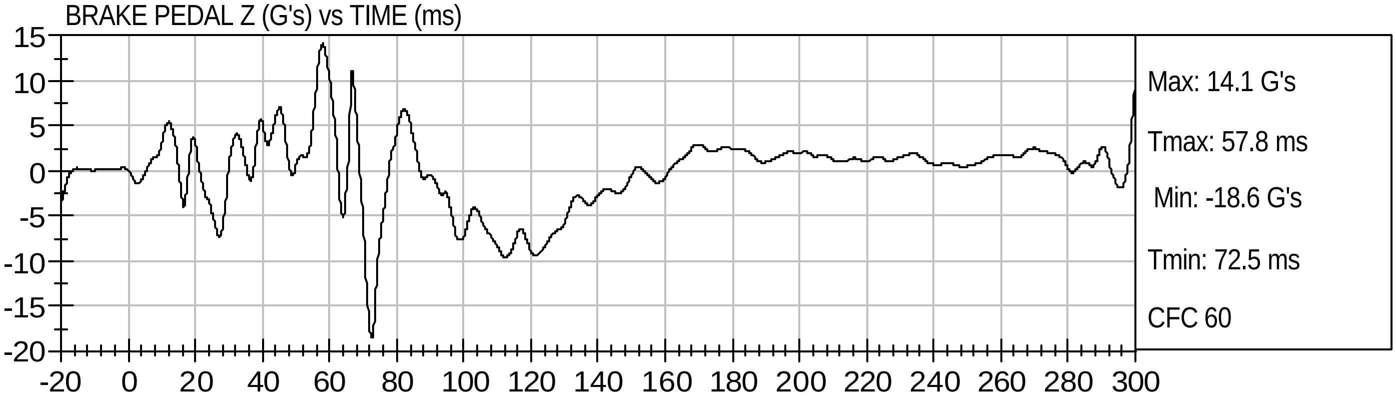
BRAKE PEDAL X (G's) vs TIME (ms)



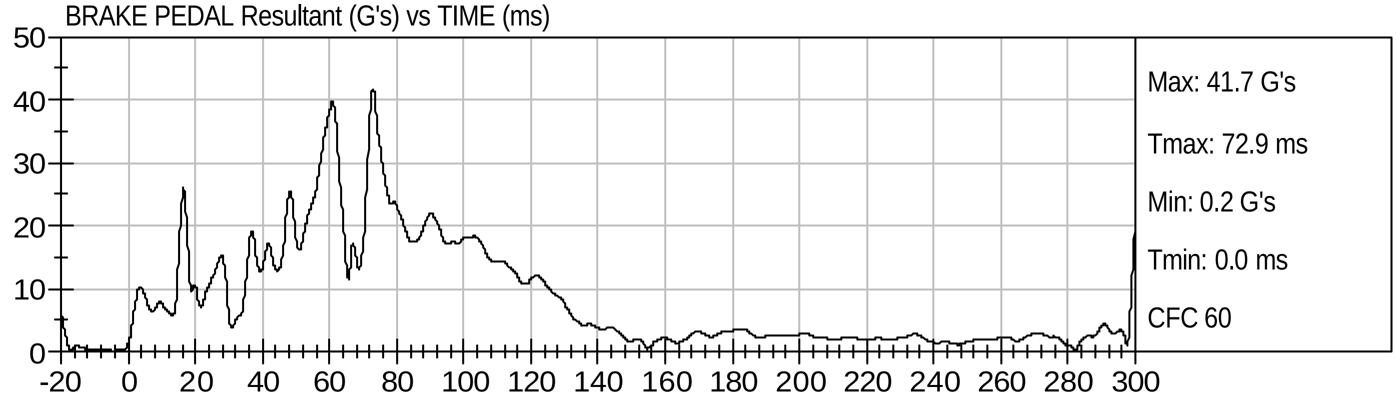
BRAKE PEDAL Y (G's) vs TIME (ms)



BRAKE PEDAL Z (G's) vs TIME (ms)



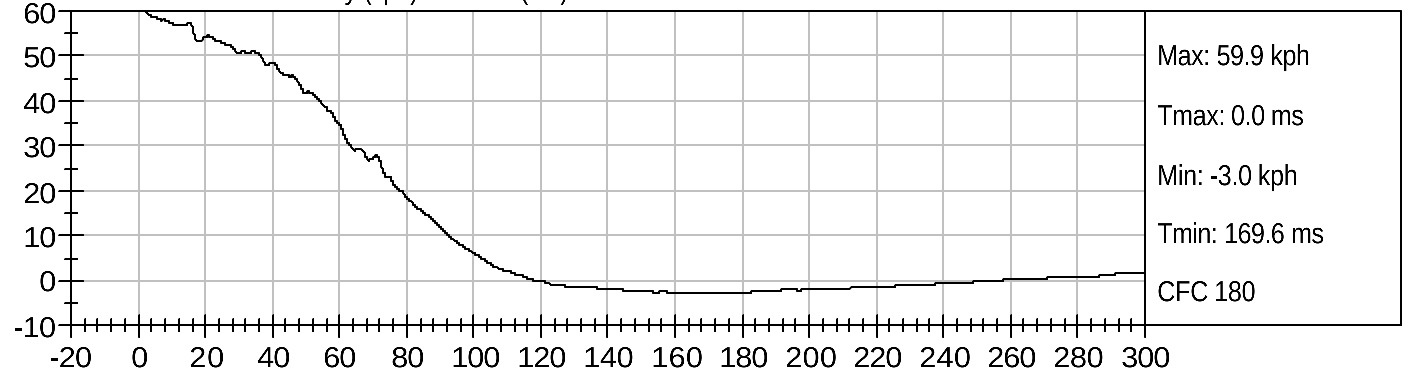
BRAKE PEDAL Resultant (G's) vs TIME (ms)



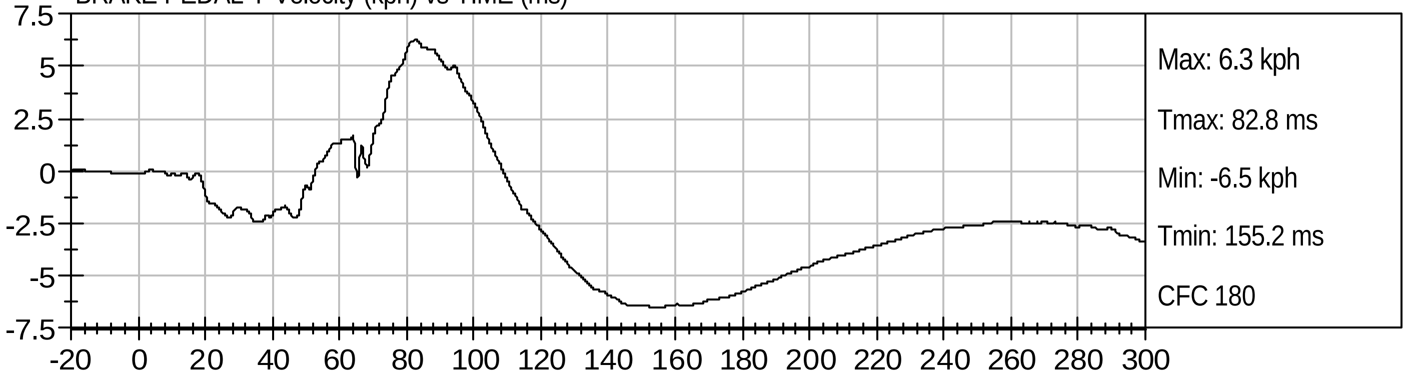
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

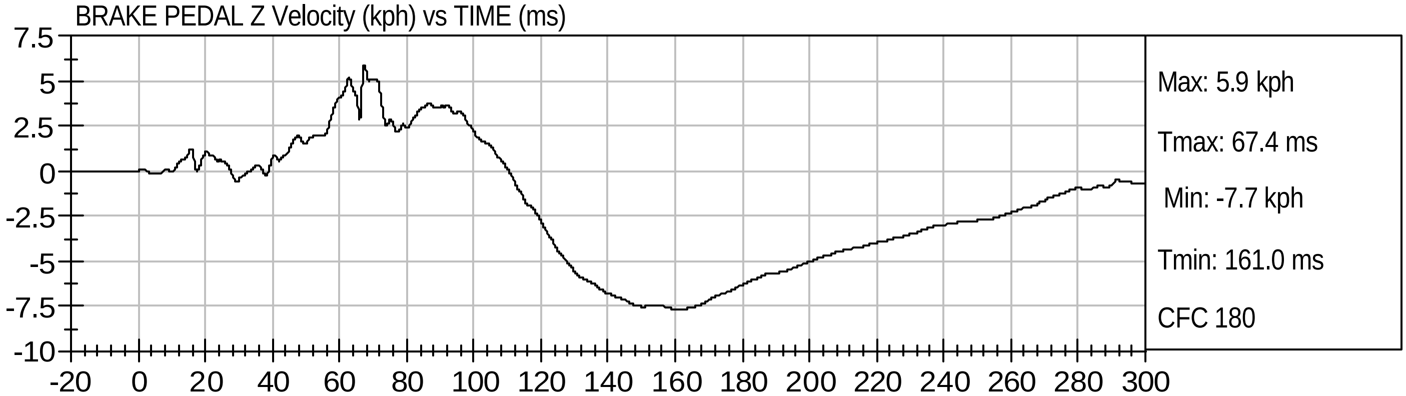
BRAKE PEDAL X Velocity (kph) vs TIME (ms)



BRAKE PEDAL Y Velocity (kph) vs TIME (ms)



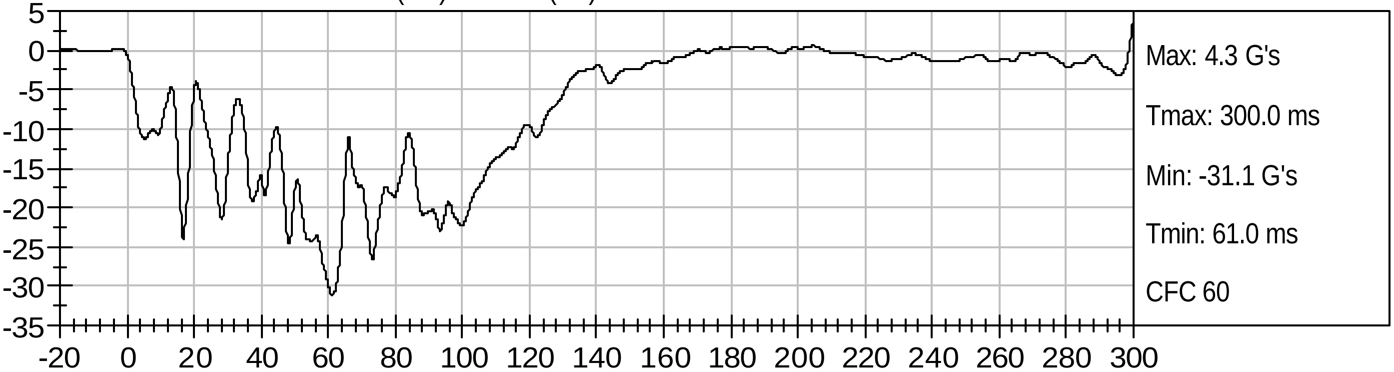
BRAKE PEDAL Z Velocity (kph) vs TIME (ms)



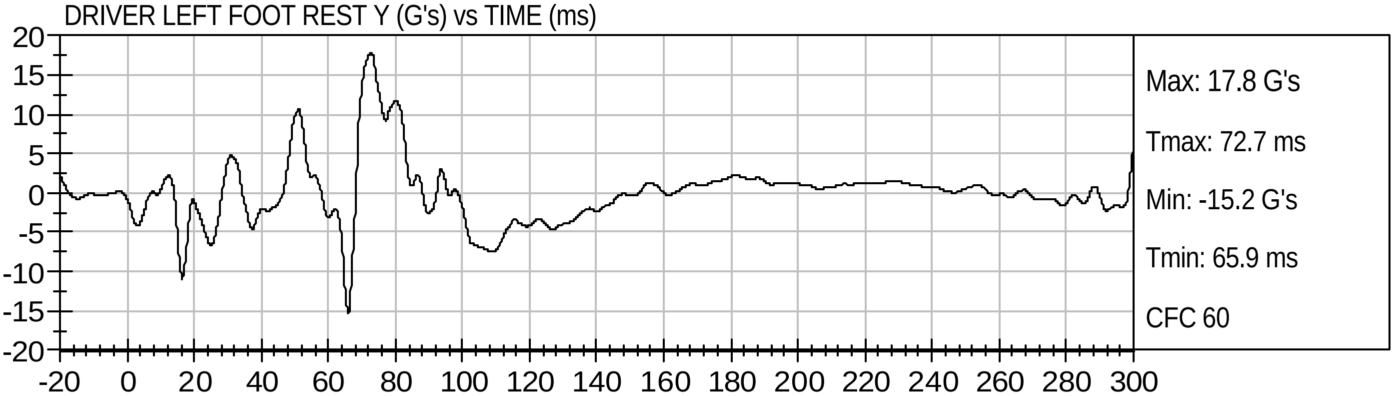
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

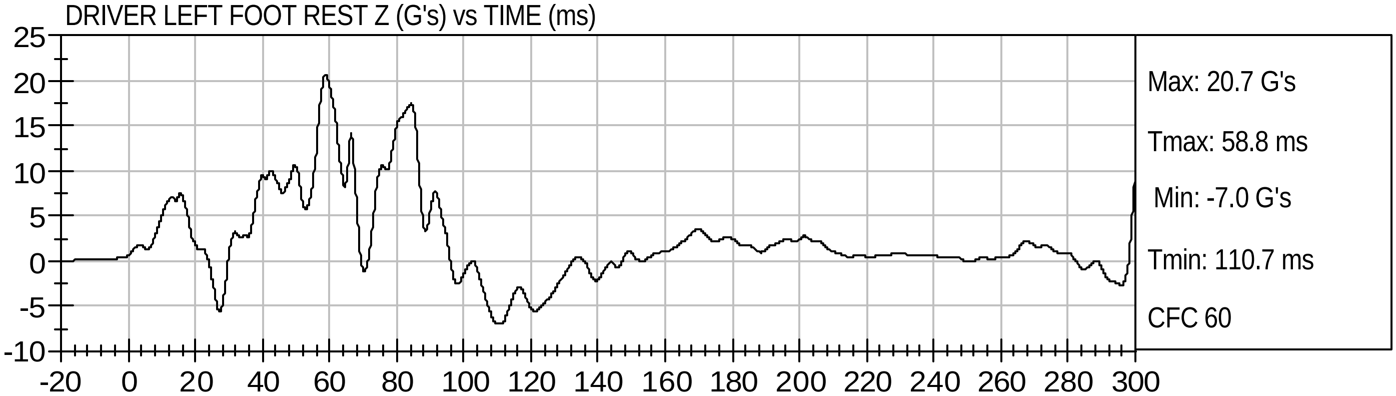
DRIVER LEFT FOOT REST X (G's) vs TIME (ms)



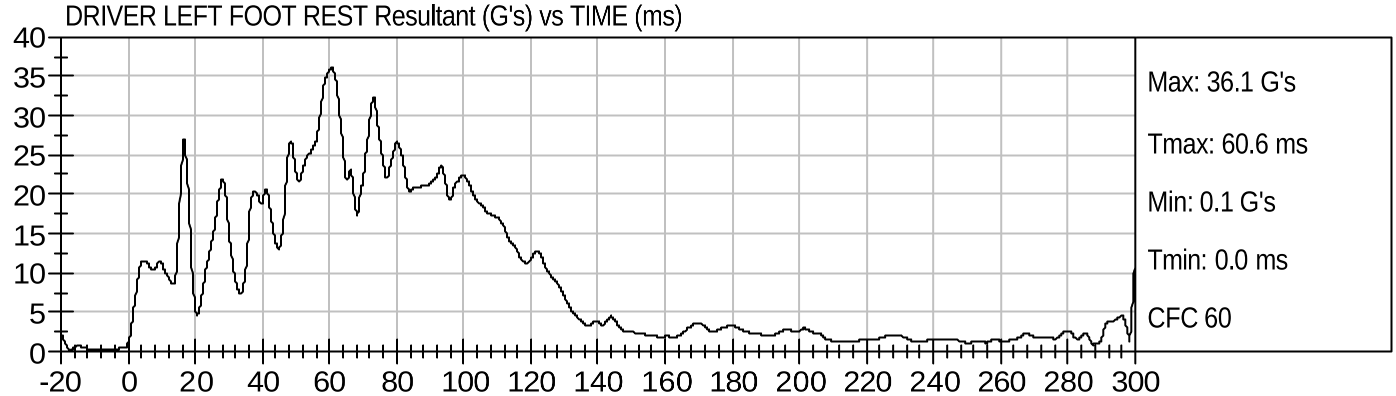
DRIVER LEFT FOOT REST Y (G's) vs TIME (ms)



DRIVER LEFT FOOT REST Z (G's) vs TIME (ms)

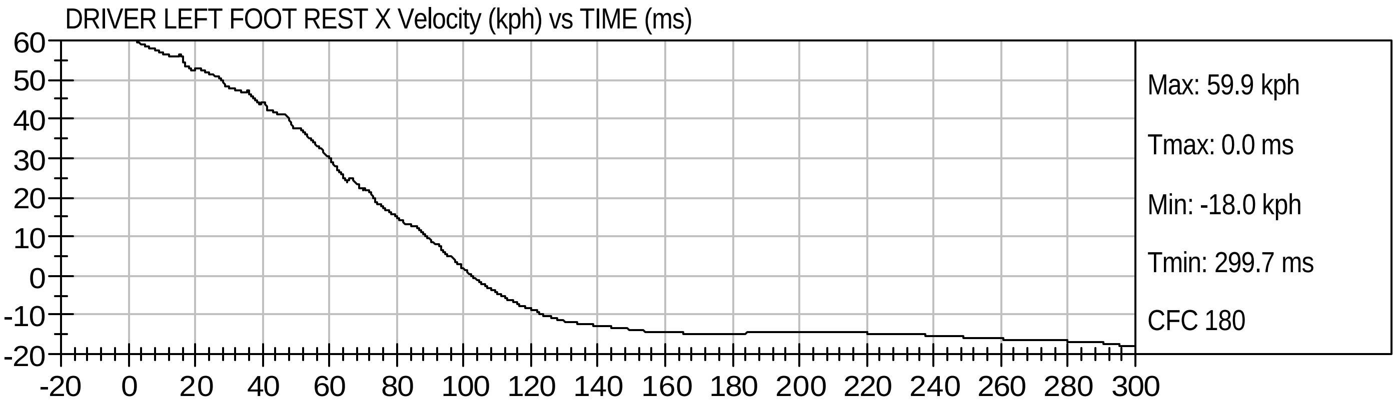


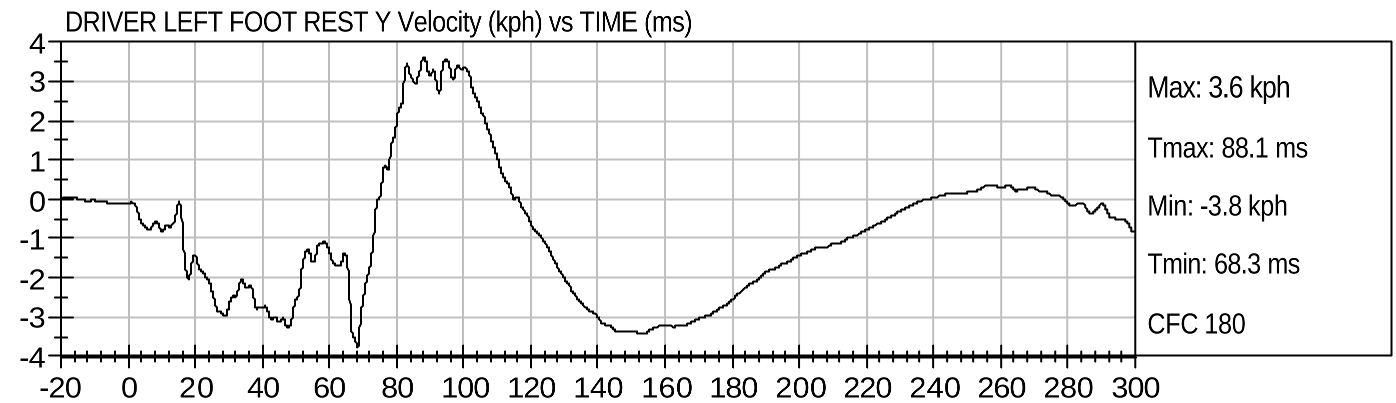
DRIVER LEFT FOOT REST Resultant (G's) vs TIME (ms)

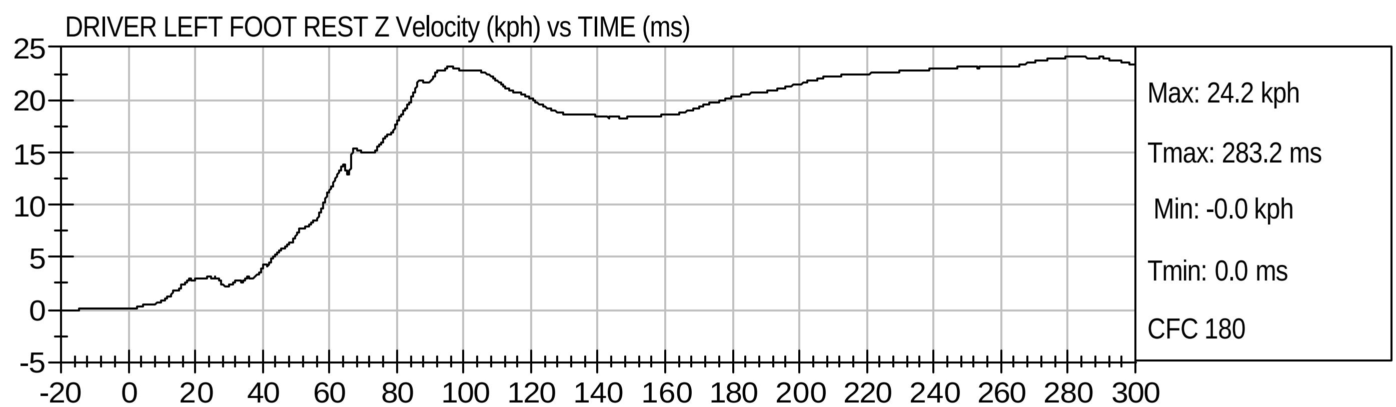


NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

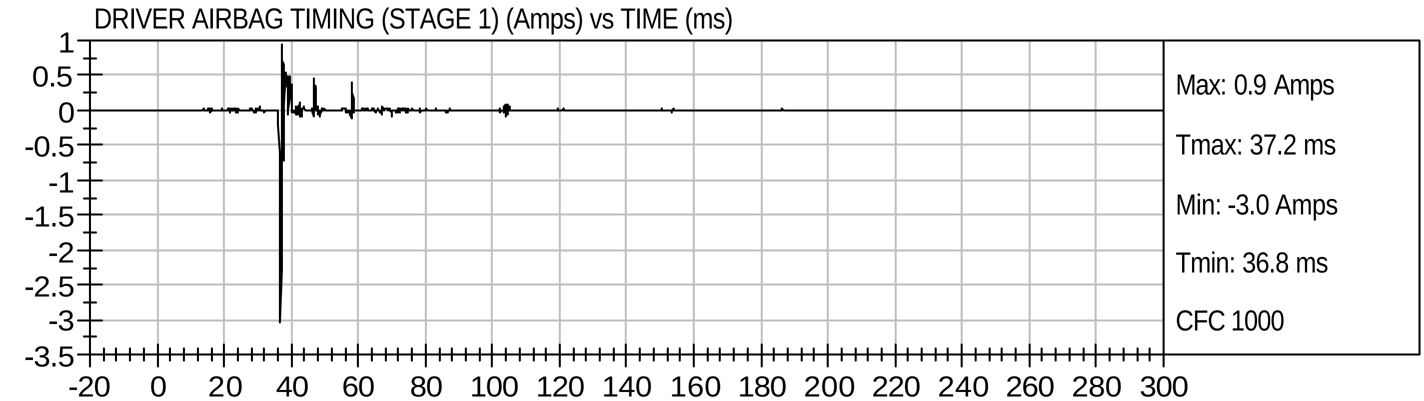


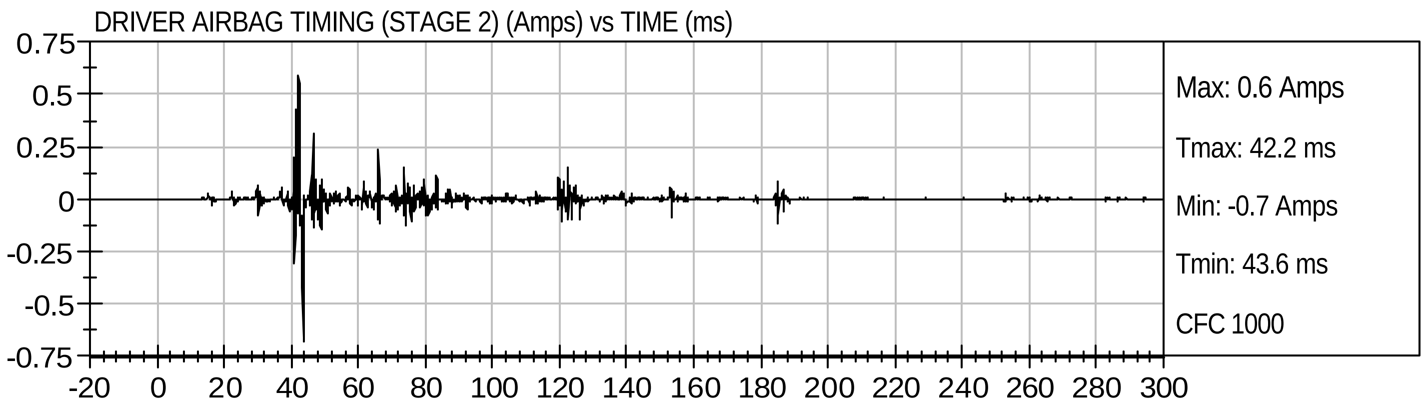




NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

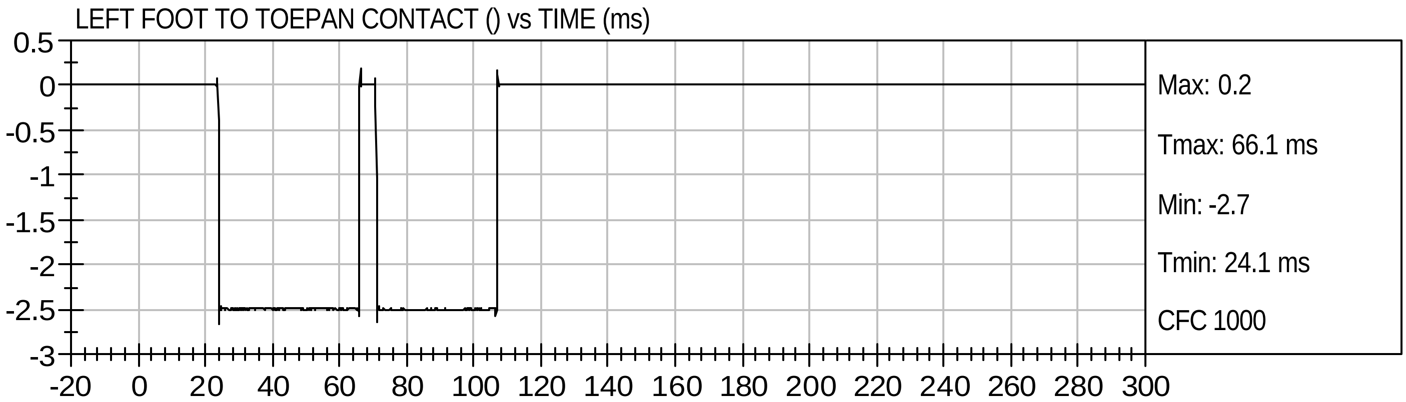
Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

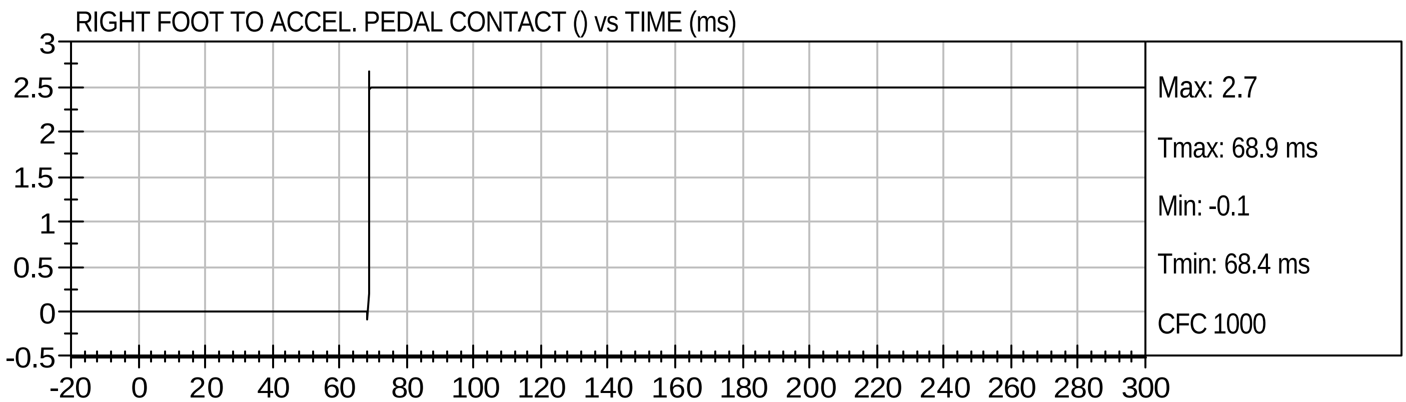


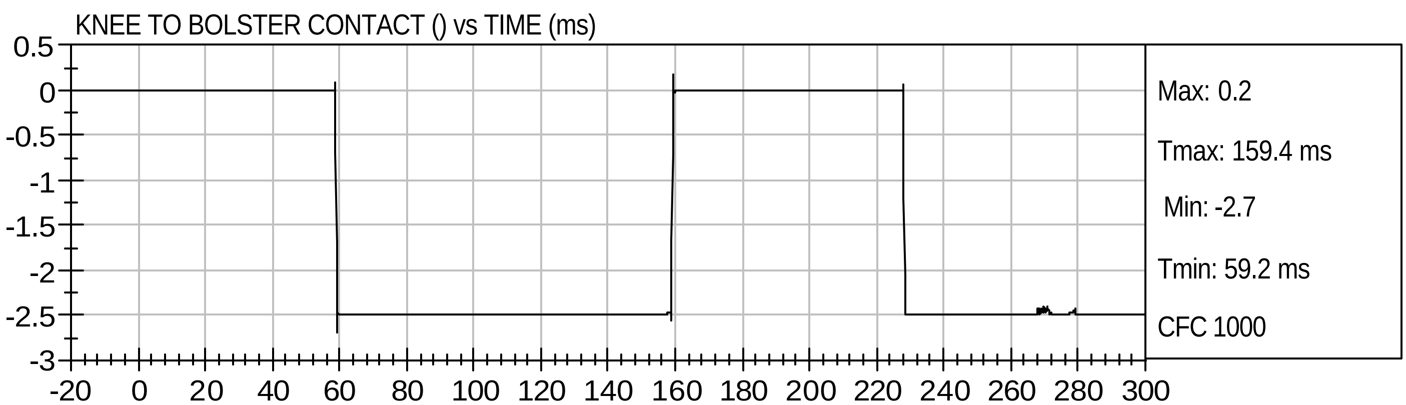


NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)



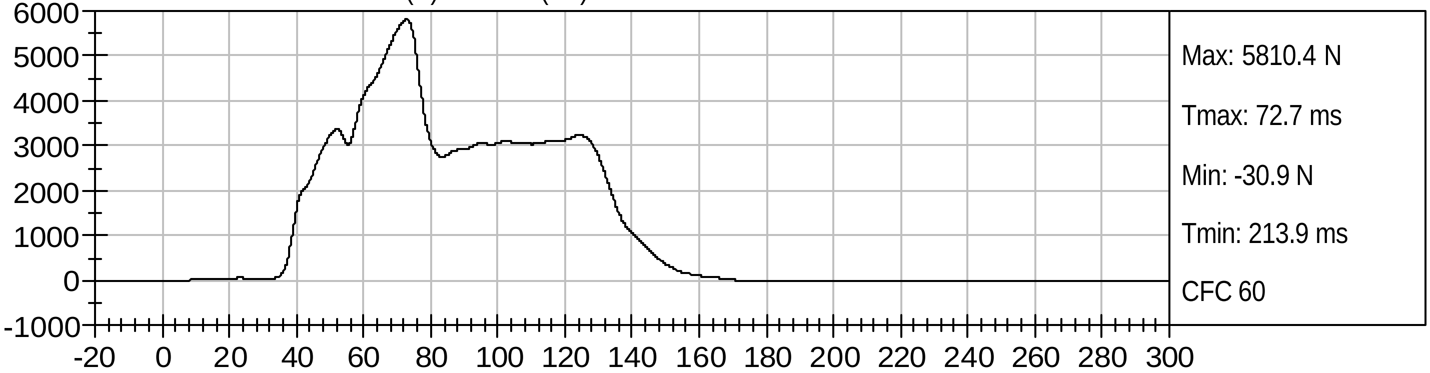




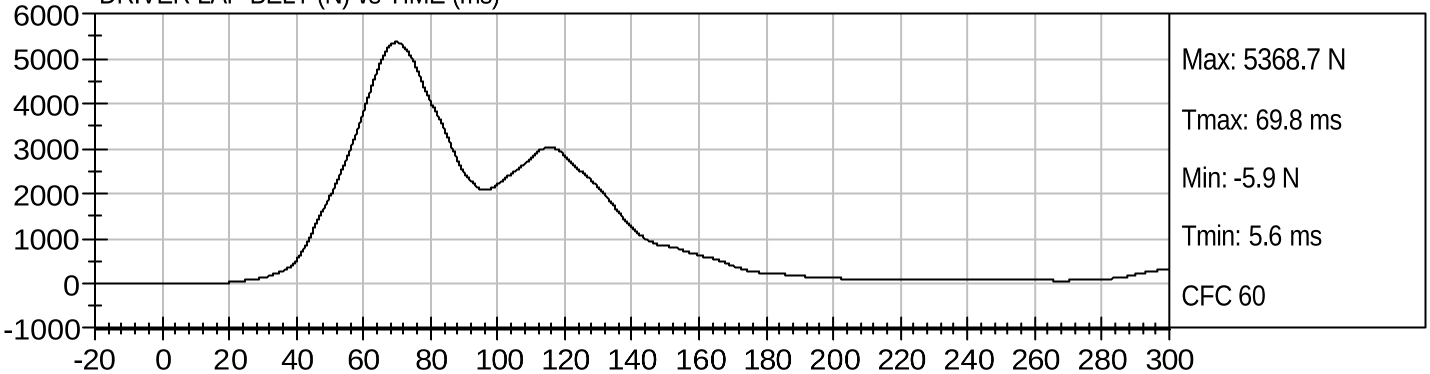
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

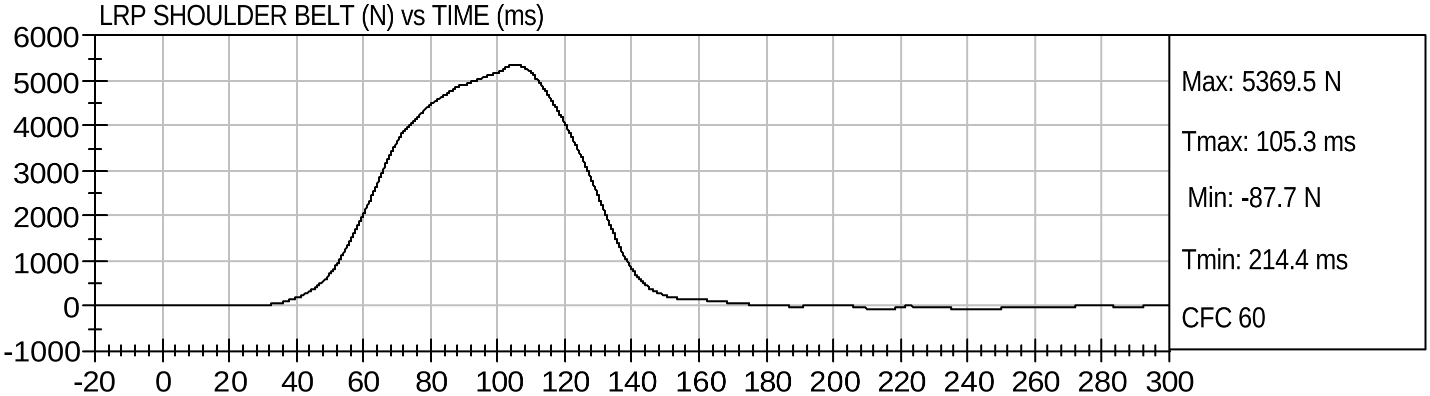
DRIVER SHOULDER BELT (N) vs TIME (ms)



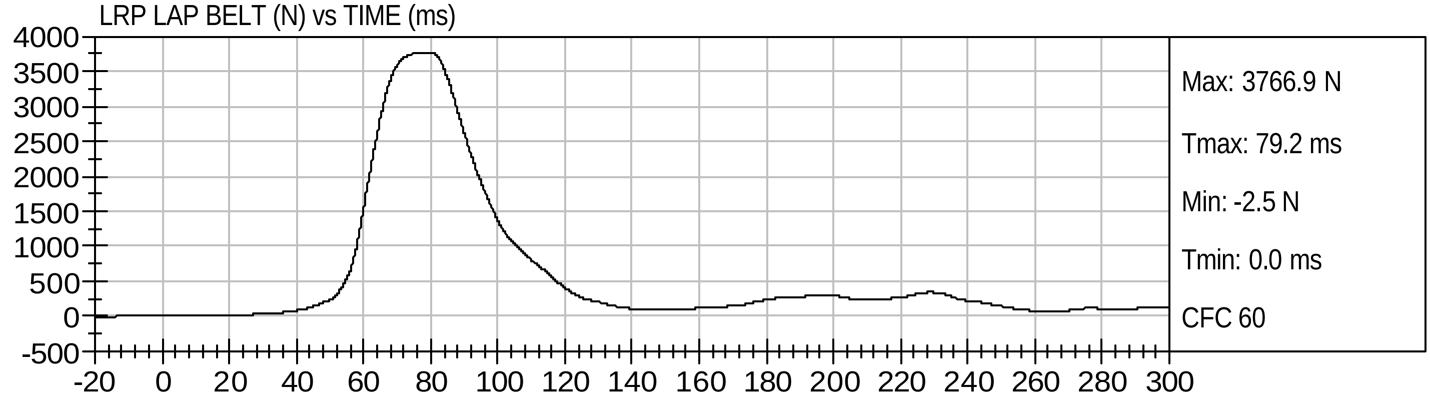
DRIVER LAP BELT (N) vs TIME (ms)



LRP SHOULDER BELT (N) vs TIME (ms)



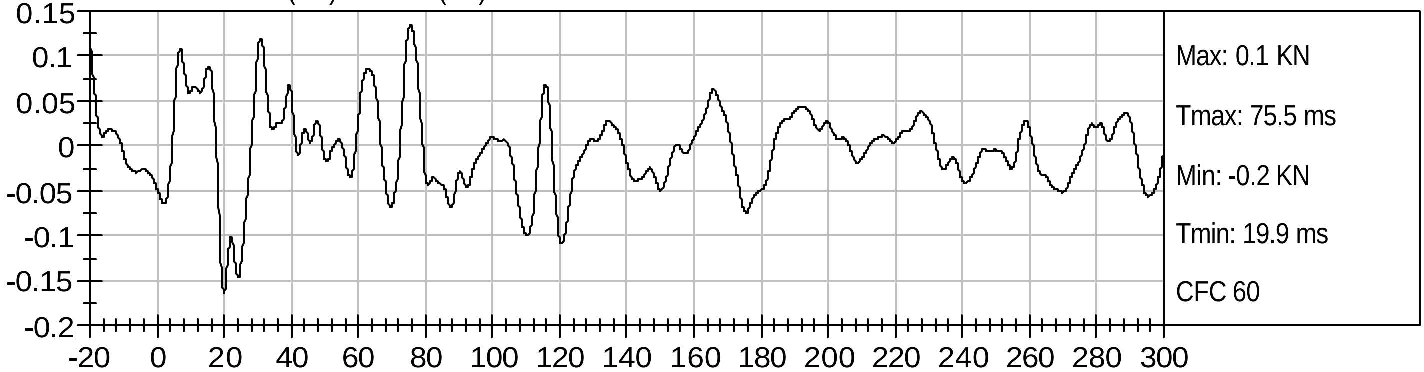
LRP LAP BELT (N) vs TIME (ms)



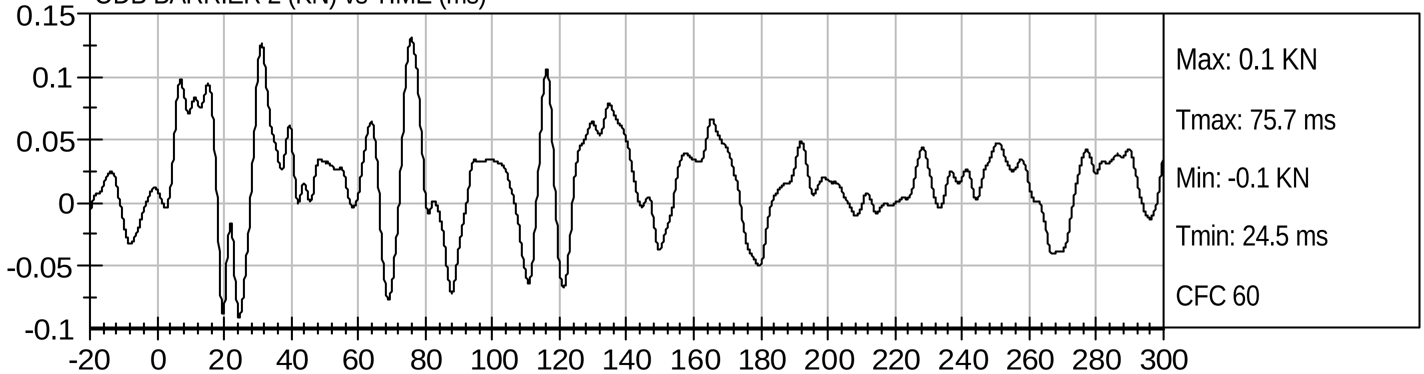
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

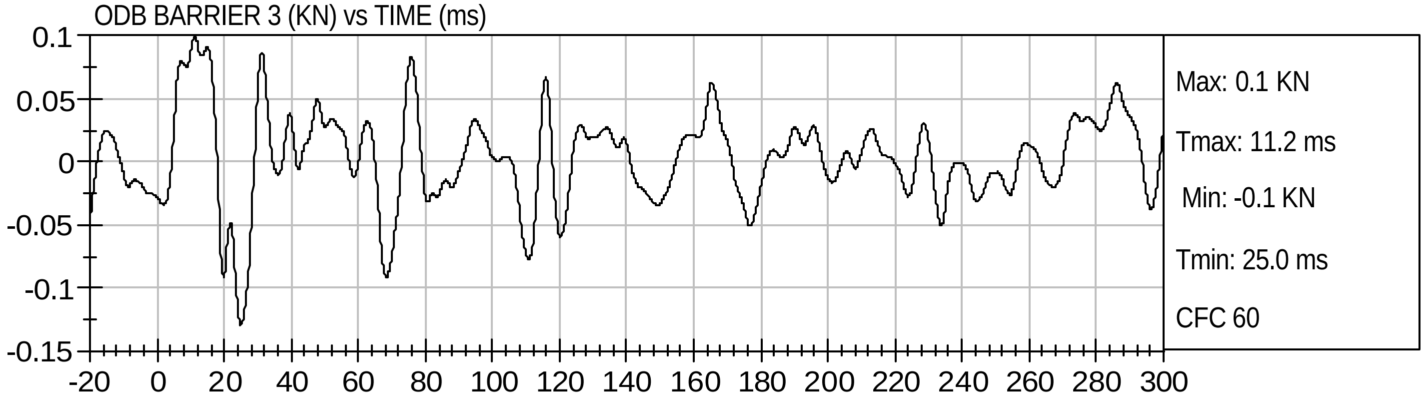
ODB BARRIER 1 (KN) vs TIME (ms)



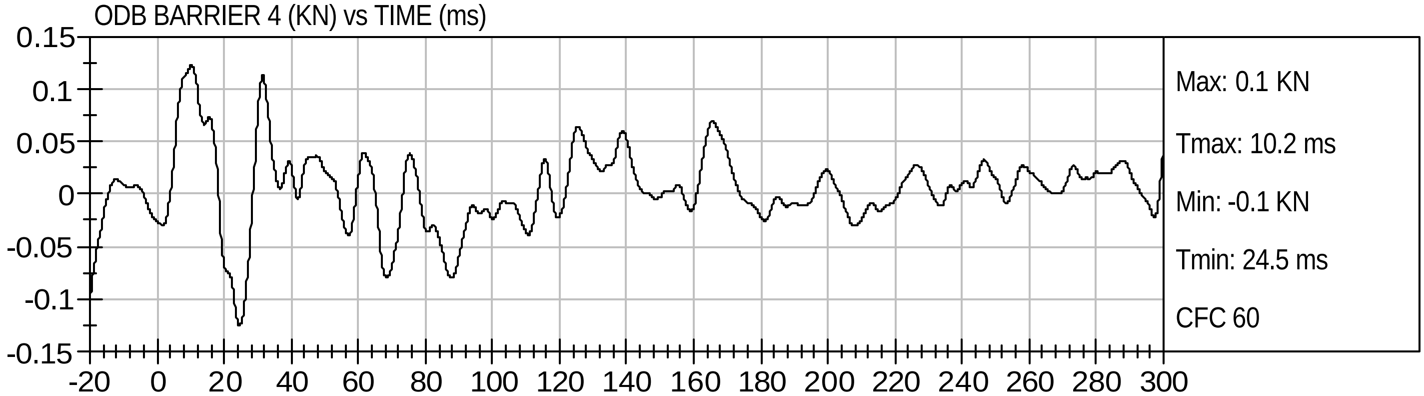
ODB BARRIER 2 (KN) vs TIME (ms)



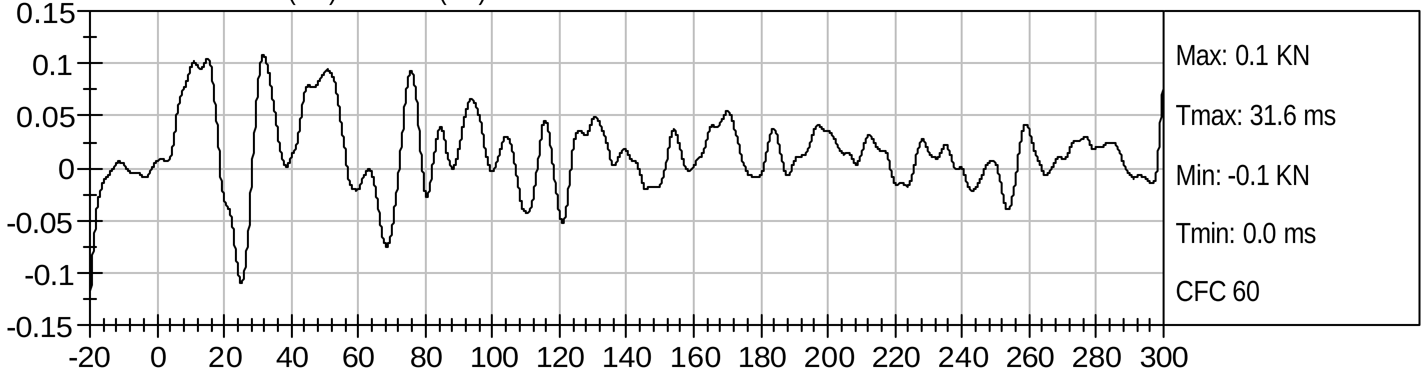
ODB BARRIER 3 (KN) vs TIME (ms)



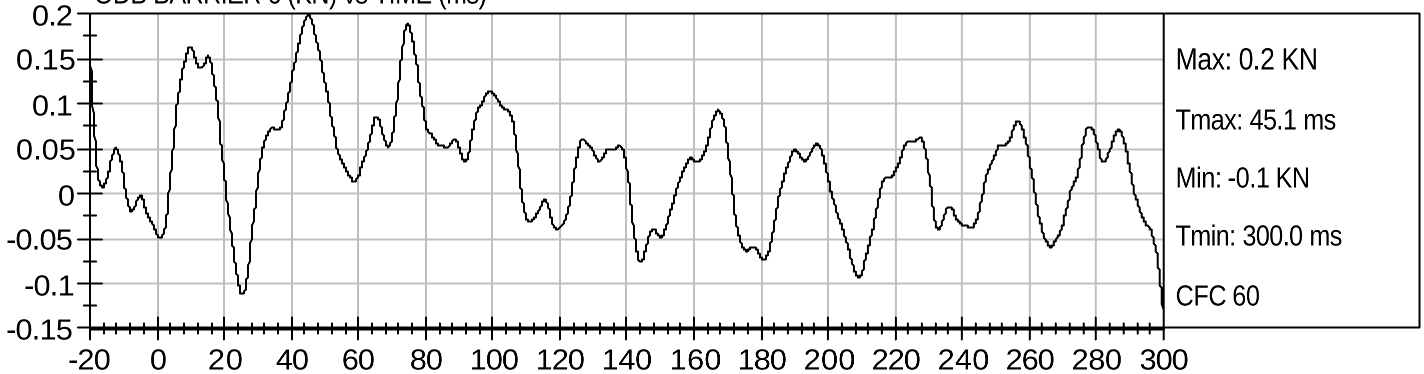
ODB BARRIER 4 (KN) vs TIME (ms)



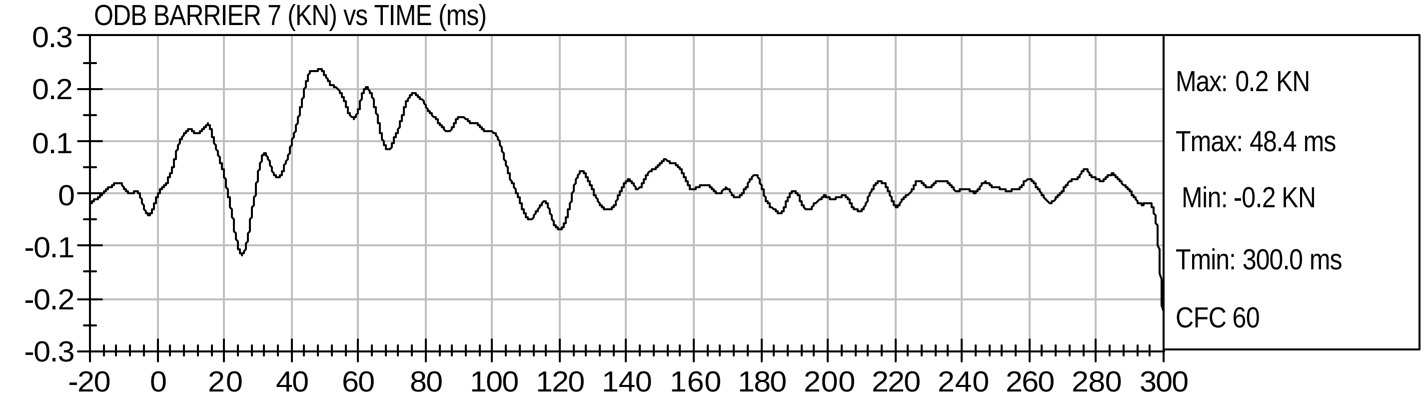
ODB BARRIER 5 (KN) vs TIME (ms)



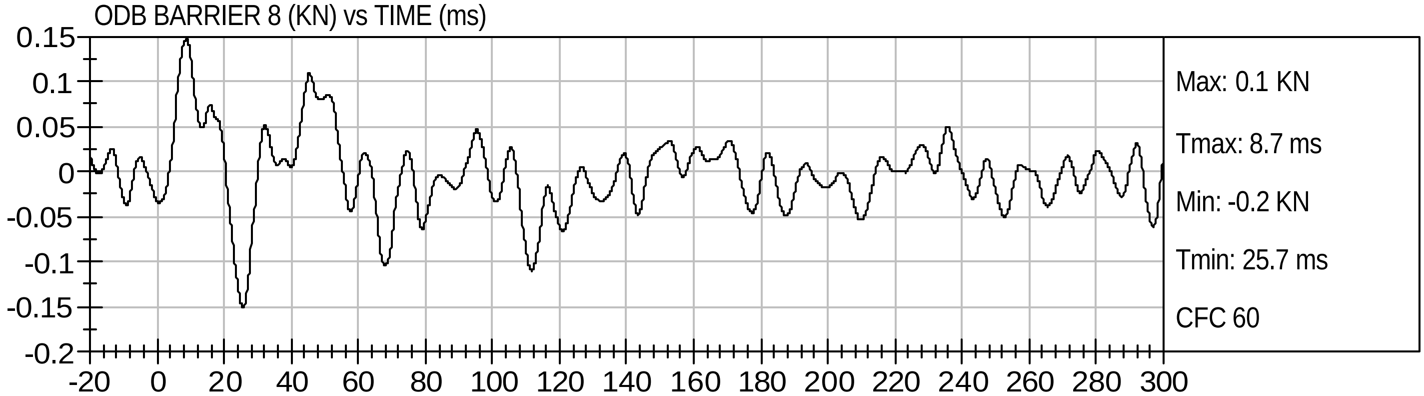
ODB BARRIER 6 (KN) vs TIME (ms)



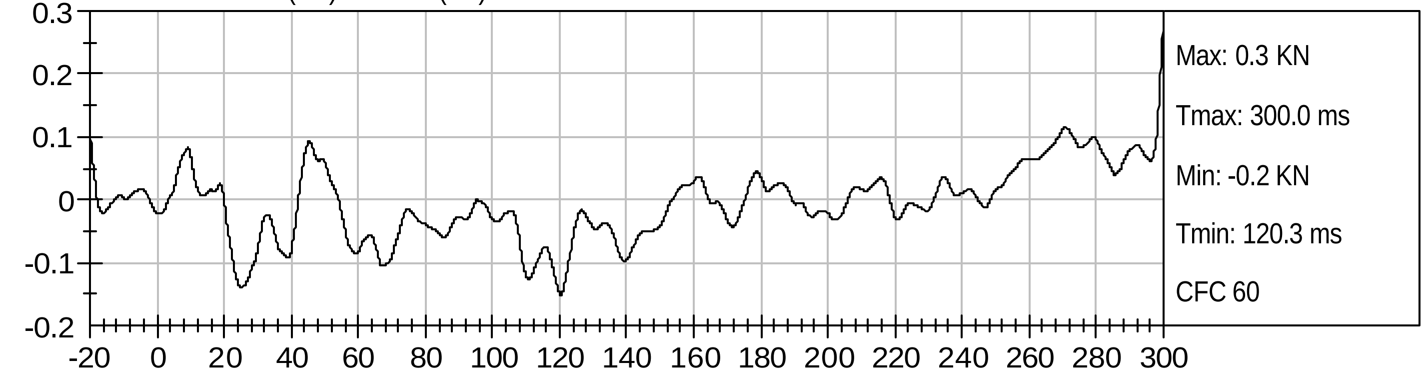
ODB BARRIER 7 (KN) vs TIME (ms)



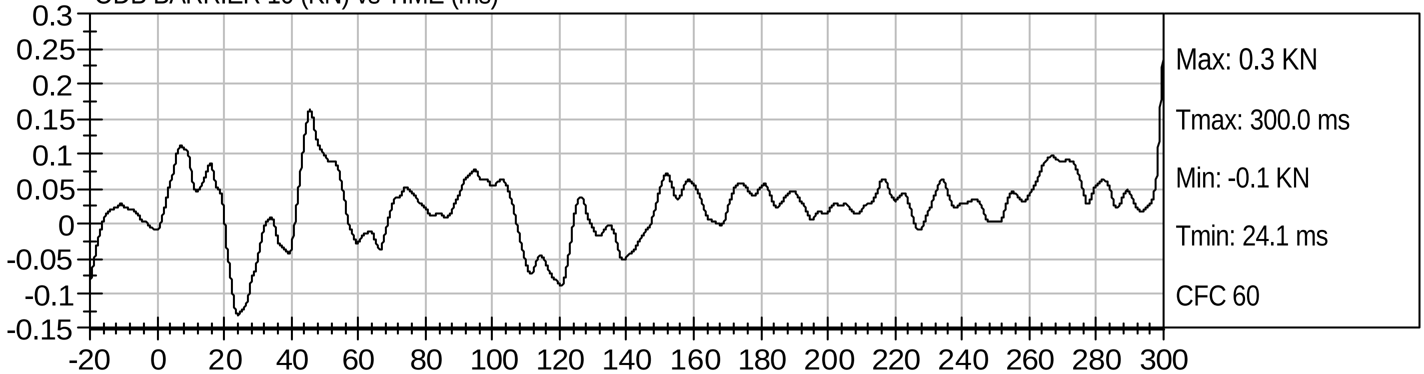
ODB BARRIER 8 (KN) vs TIME (ms)



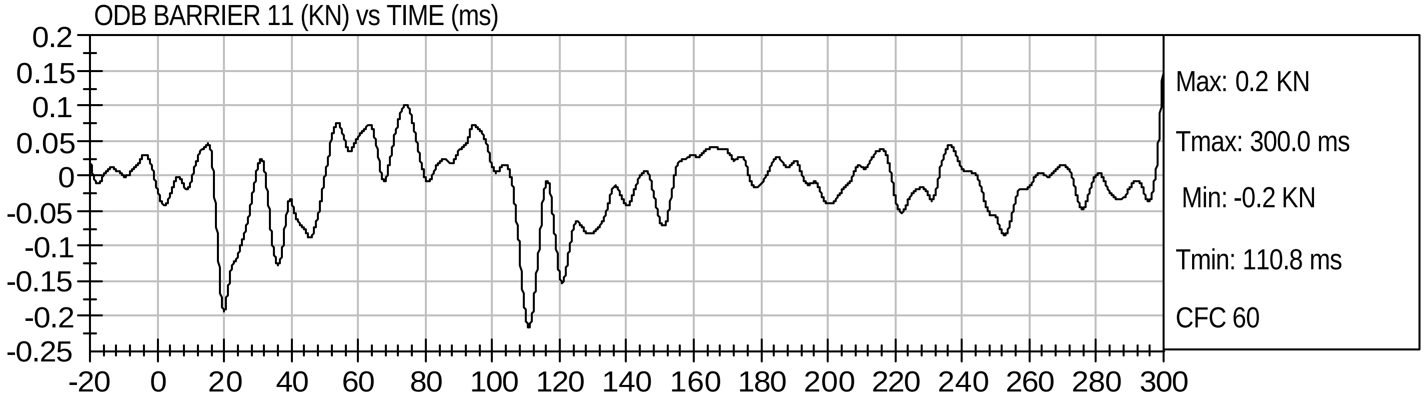
ODB BARRIER 9 (KN) vs TIME (ms)



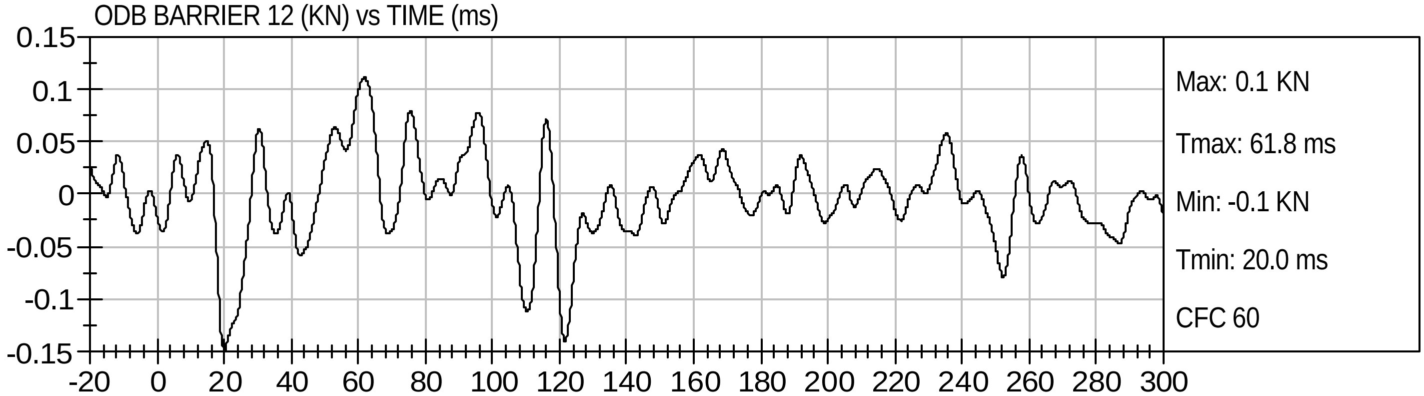
ODB BARRIER 10 (KN) vs TIME (ms)



ODB BARRIER 11 (KN) vs TIME (ms)



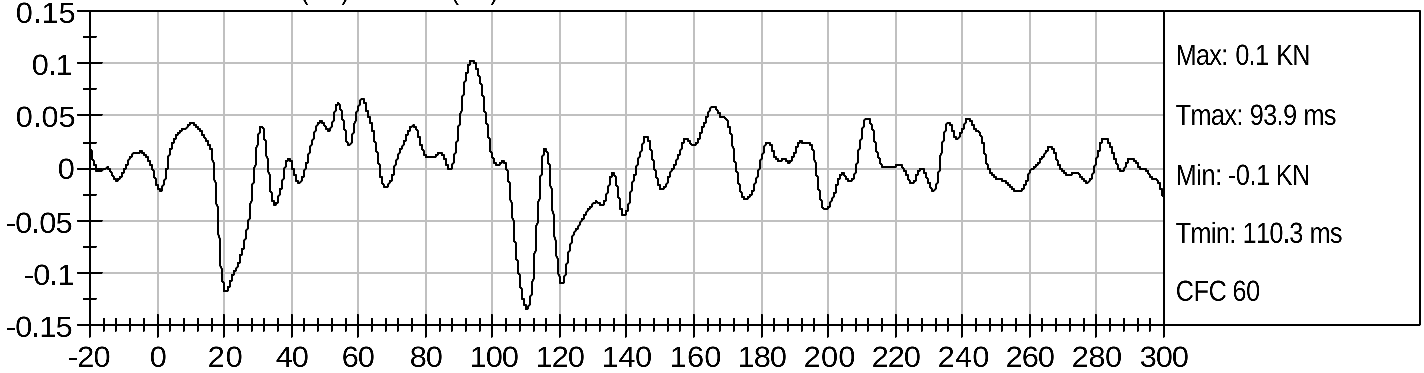
ODB BARRIER 12 (KN) vs TIME (ms)



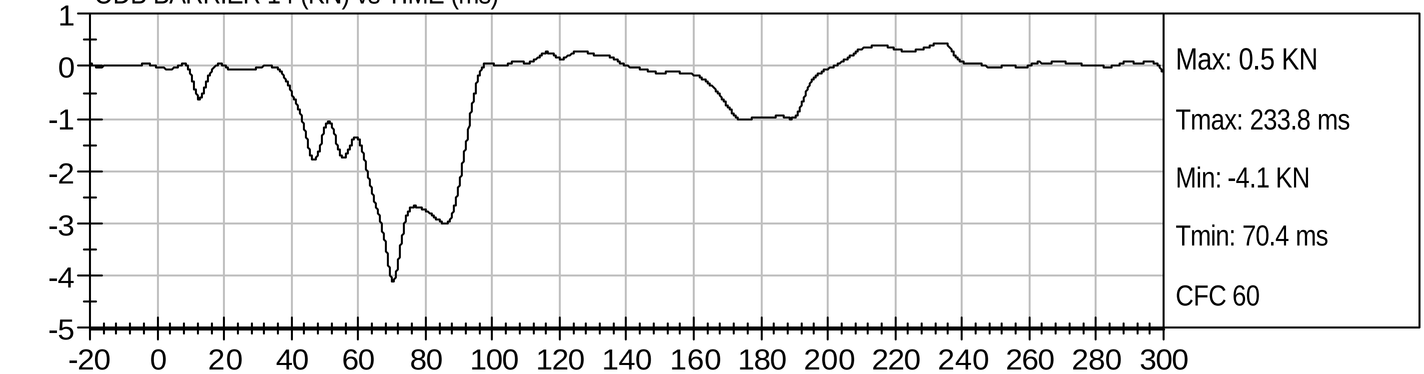
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

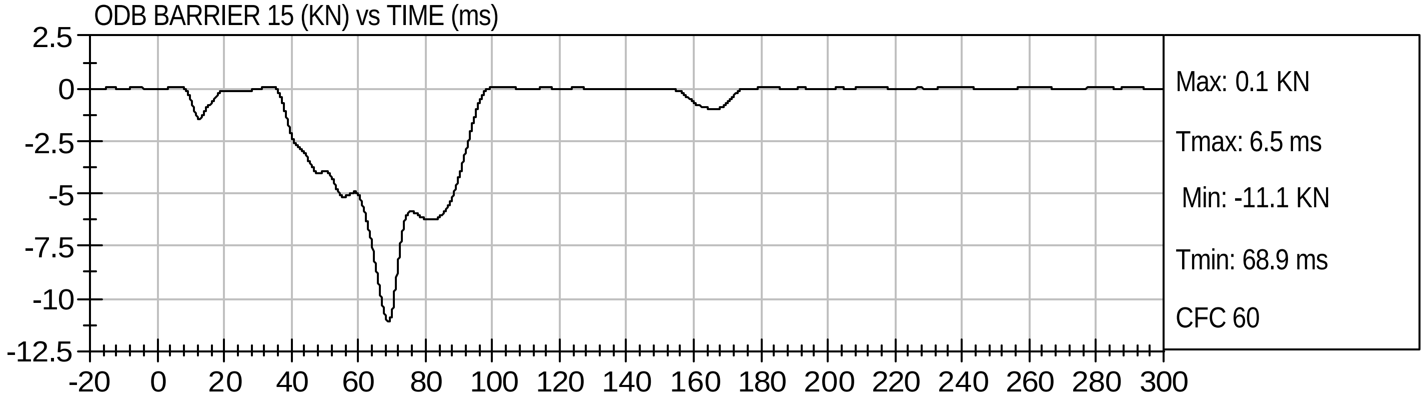
ODB BARRIER 13 (KN) vs TIME (ms)



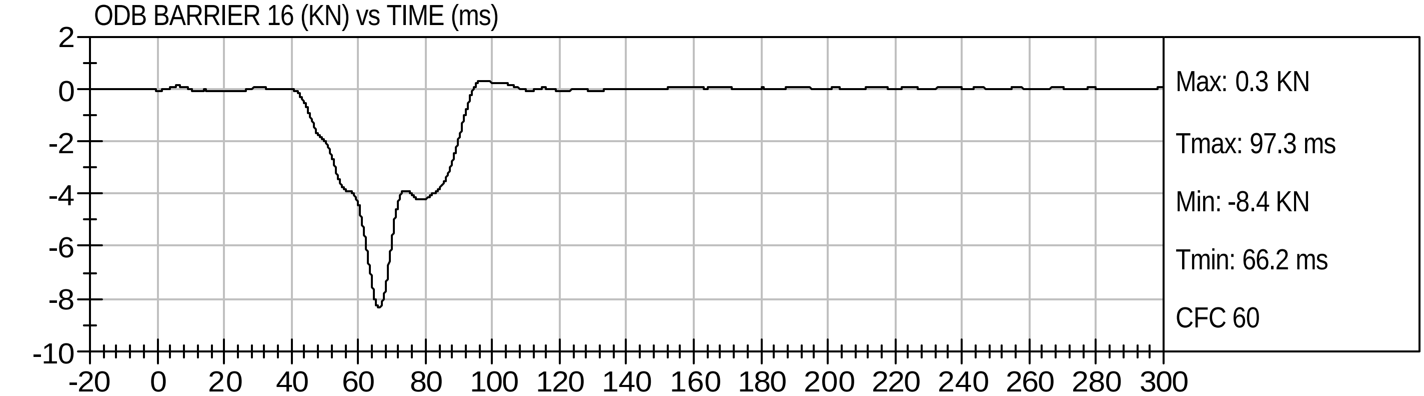
ODB BARRIER 14 (KN) vs TIME (ms)



ODB BARRIER 15 (KN) vs TIME (ms)



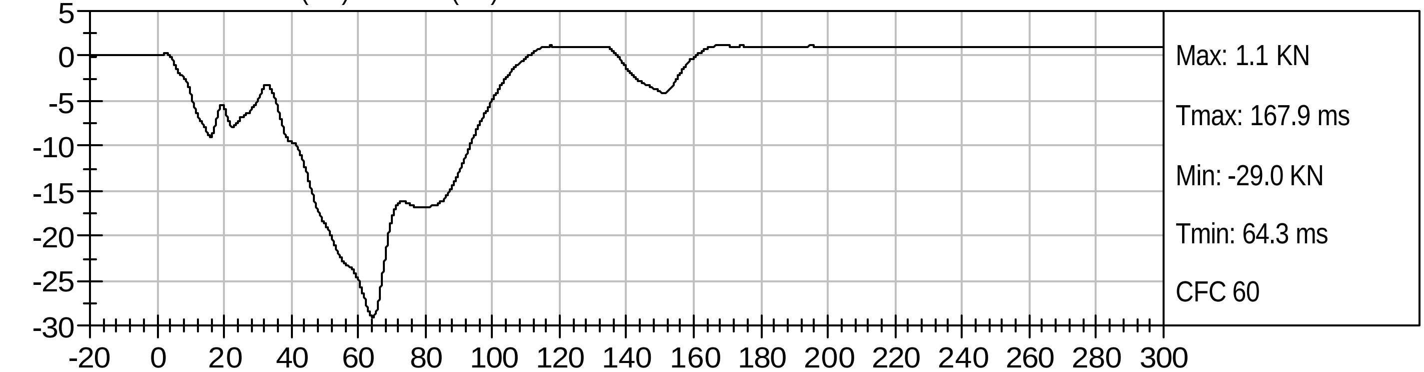
ODB BARRIER 16 (KN) vs TIME (ms)



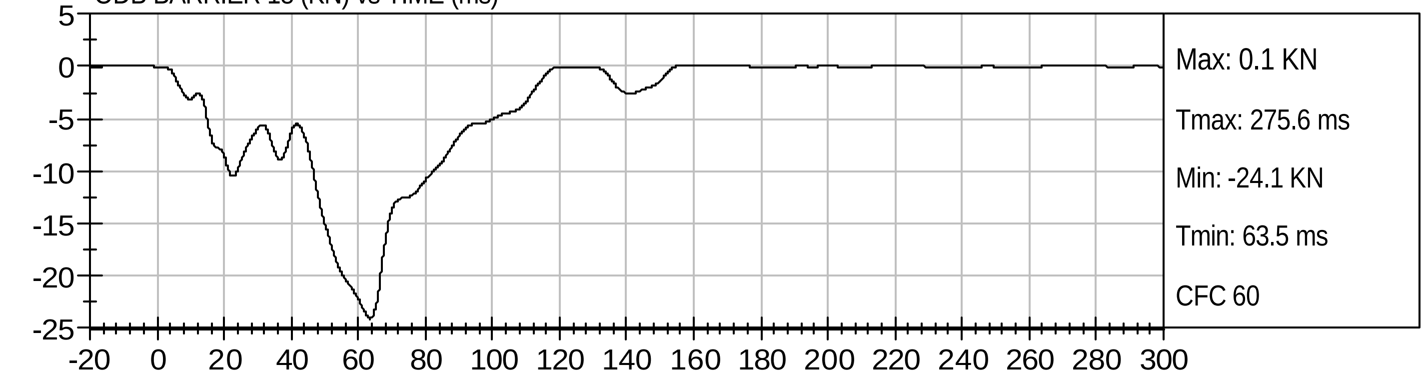
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

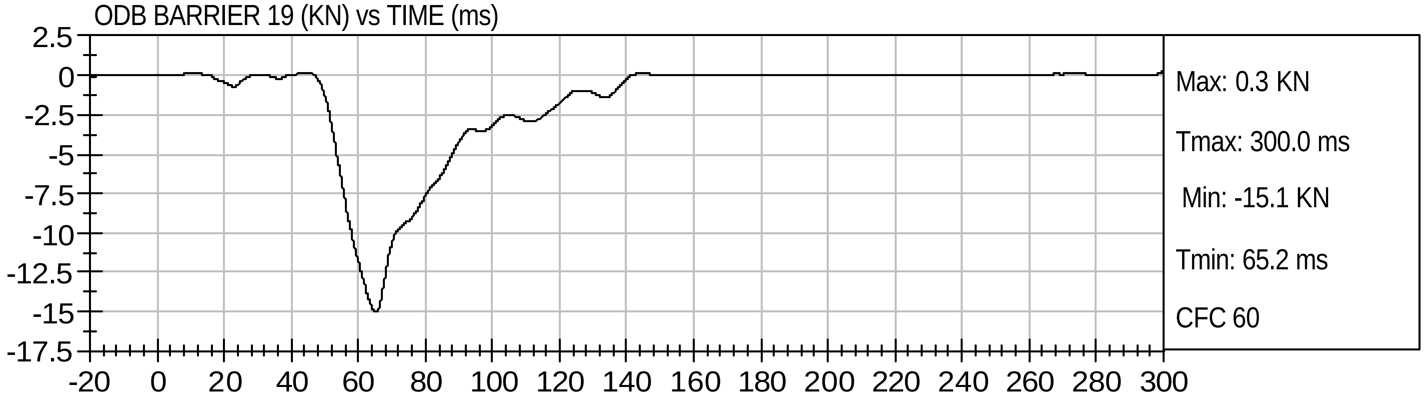
ODB BARRIER 17 (KN) vs TIME (ms)



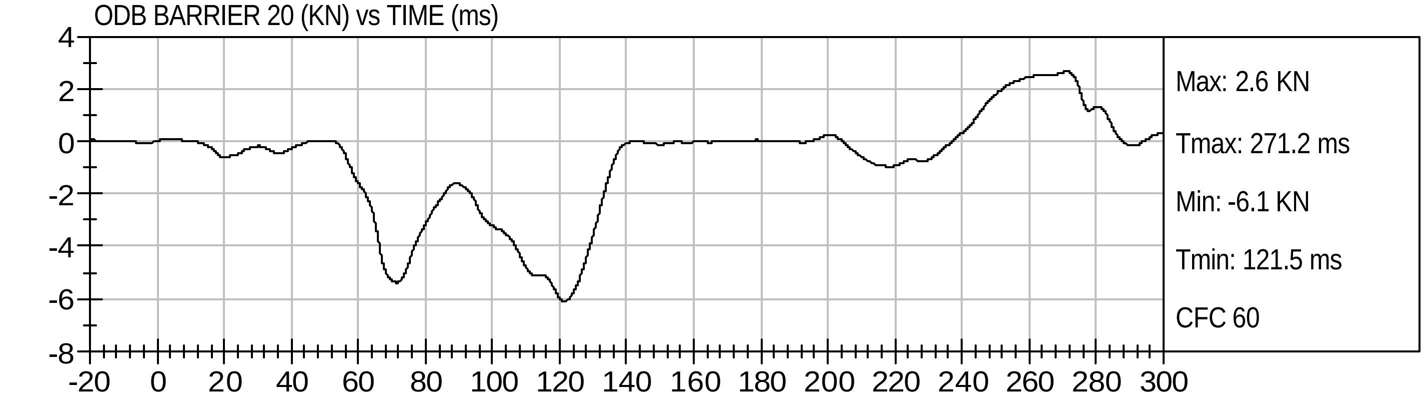
ODB BARRIER 18 (KN) vs TIME (ms)



ODB BARRIER 19 (KN) vs TIME (ms)



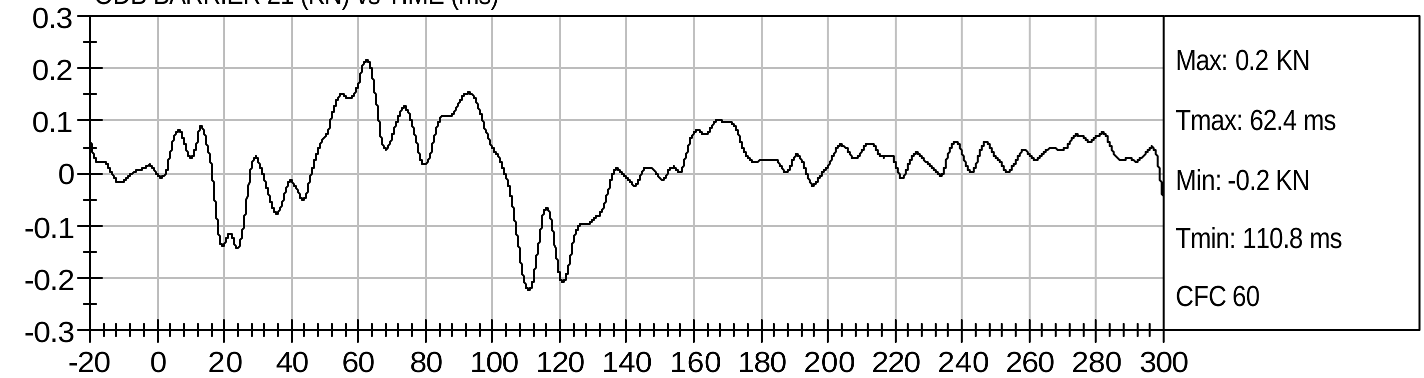
ODB BARRIER 20 (KN) vs TIME (ms)



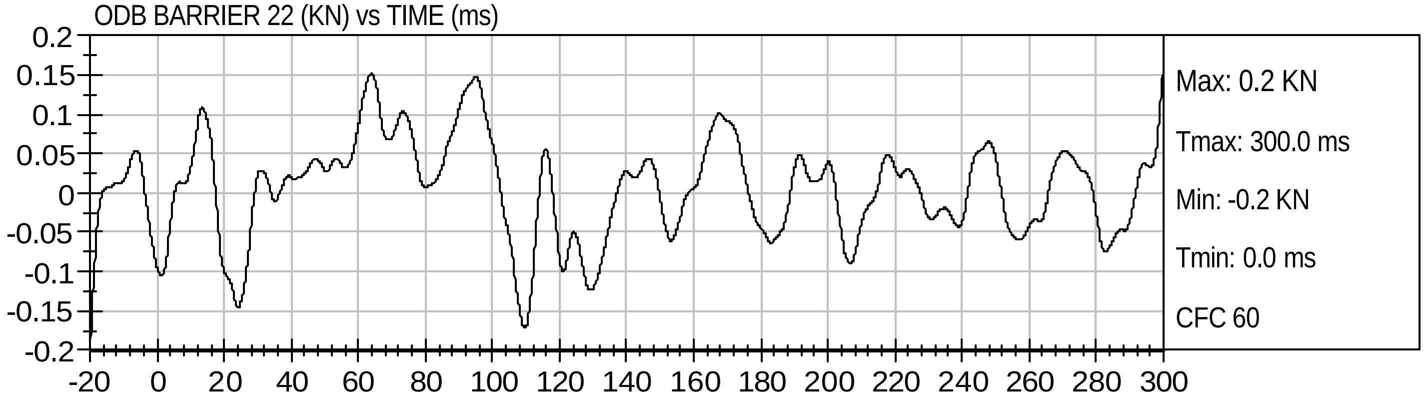
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

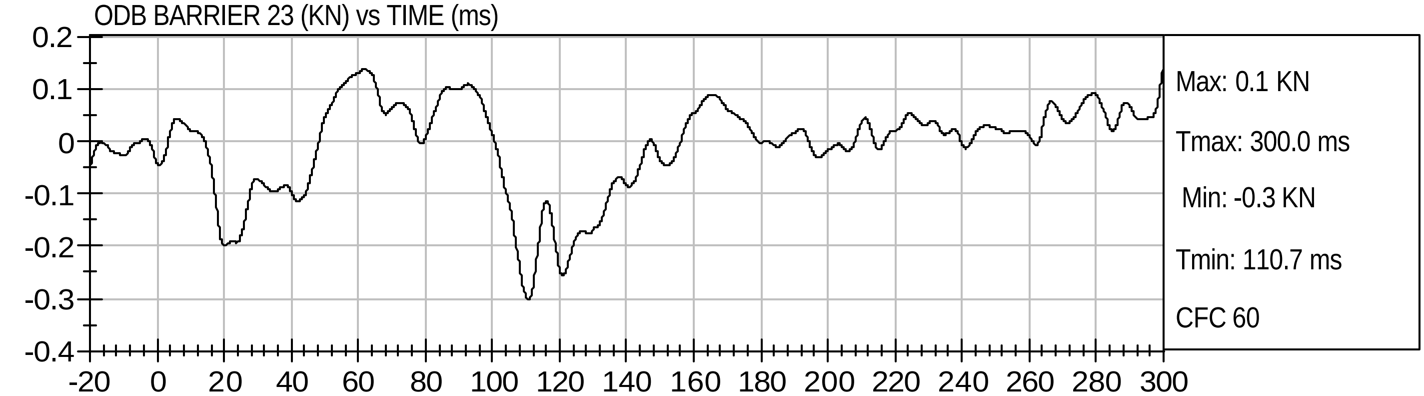
ODB BARRIER 21 (KN) vs TIME (ms)



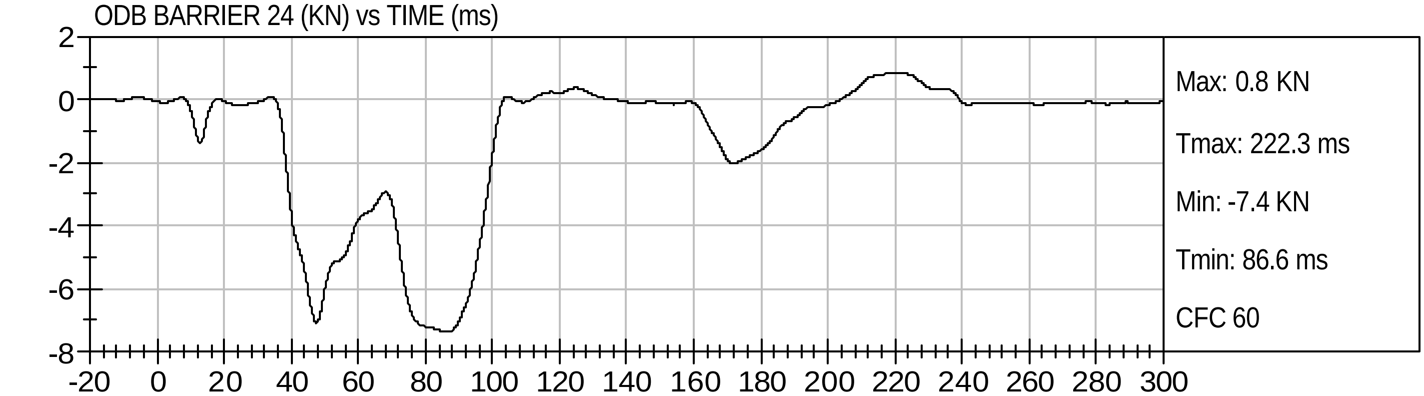
ODB BARRIER 22 (KN) vs TIME (ms)



ODB BARRIER 23 (KN) vs TIME (ms)

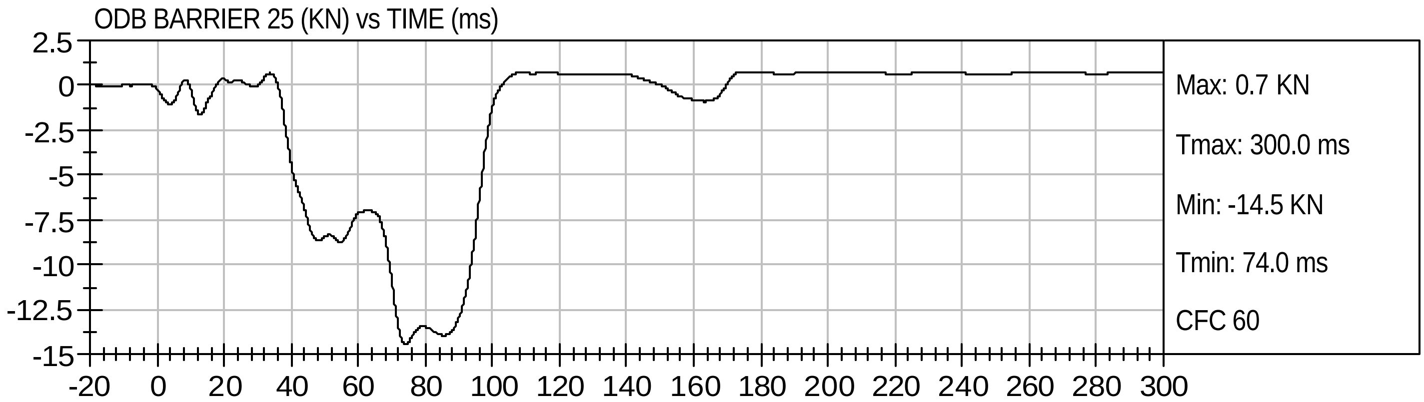


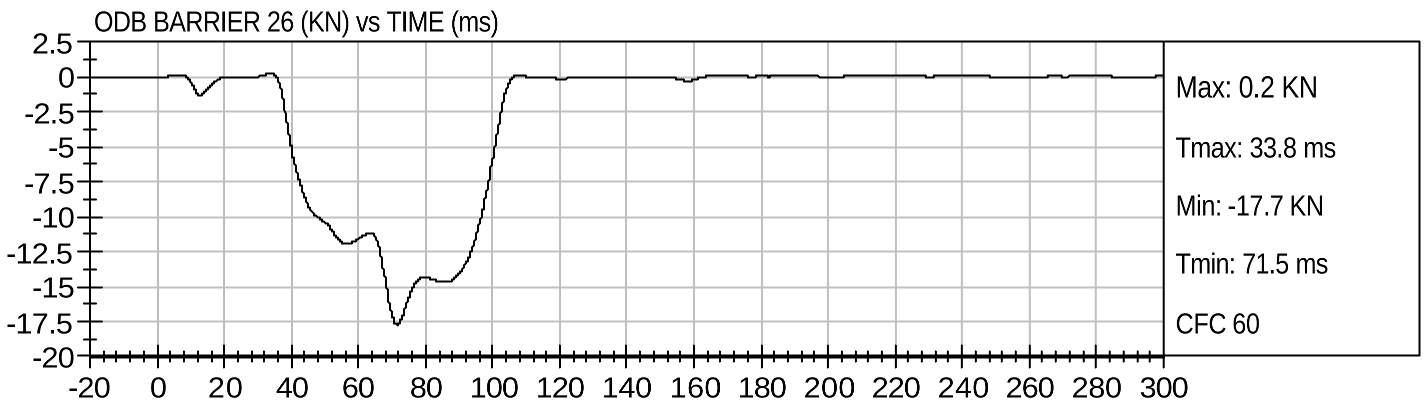
ODB BARRIER 24 (KN) vs TIME (ms)

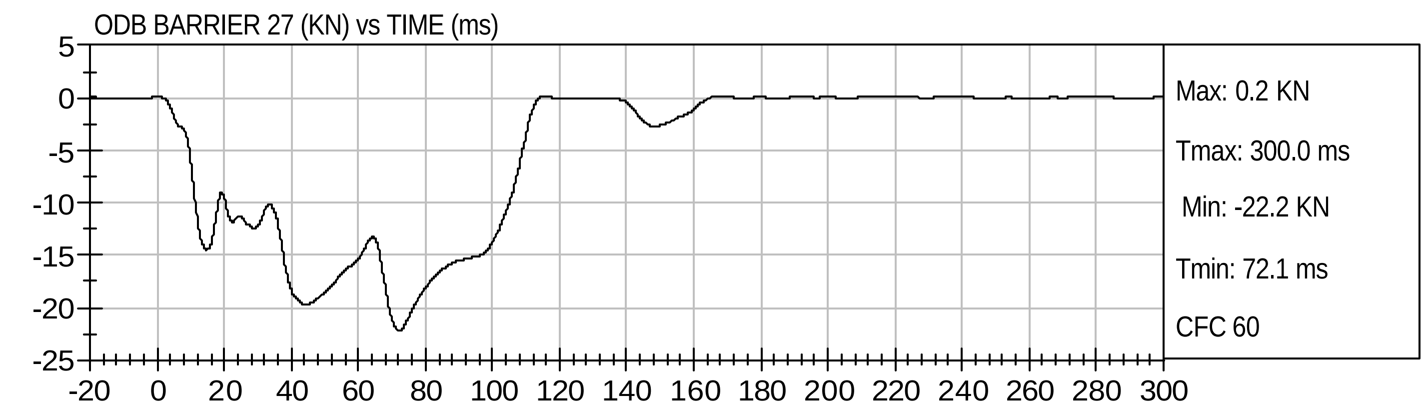


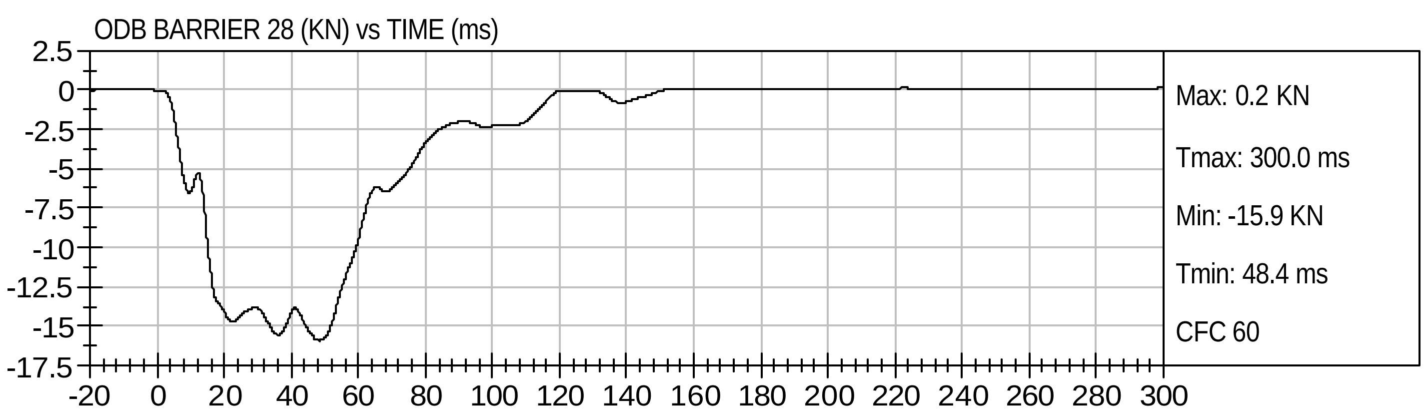
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)



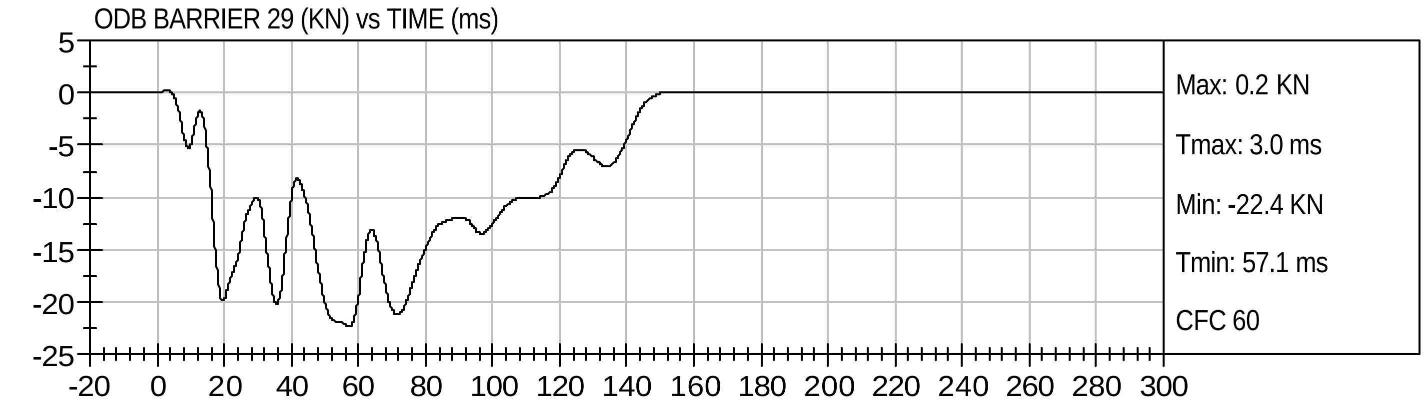


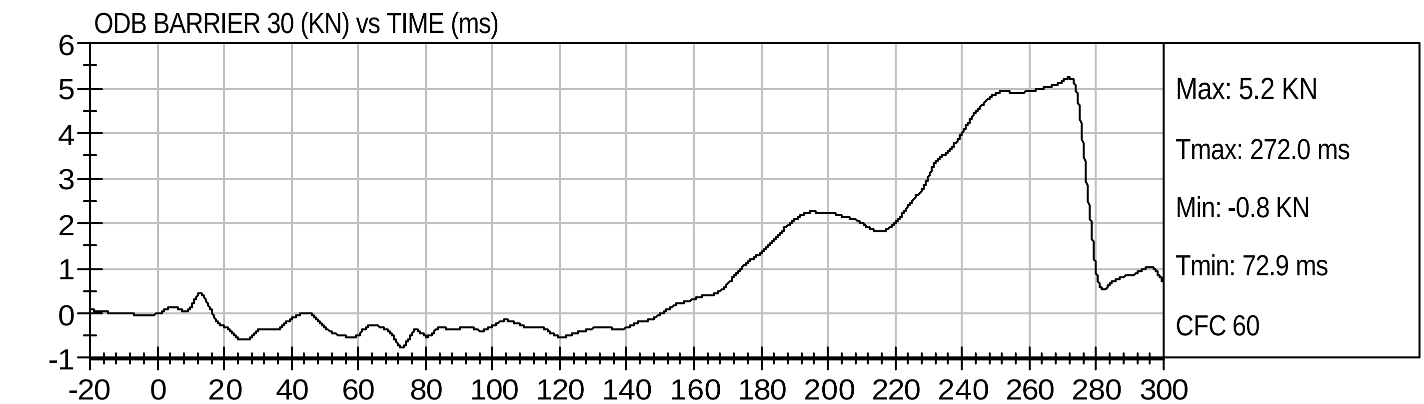


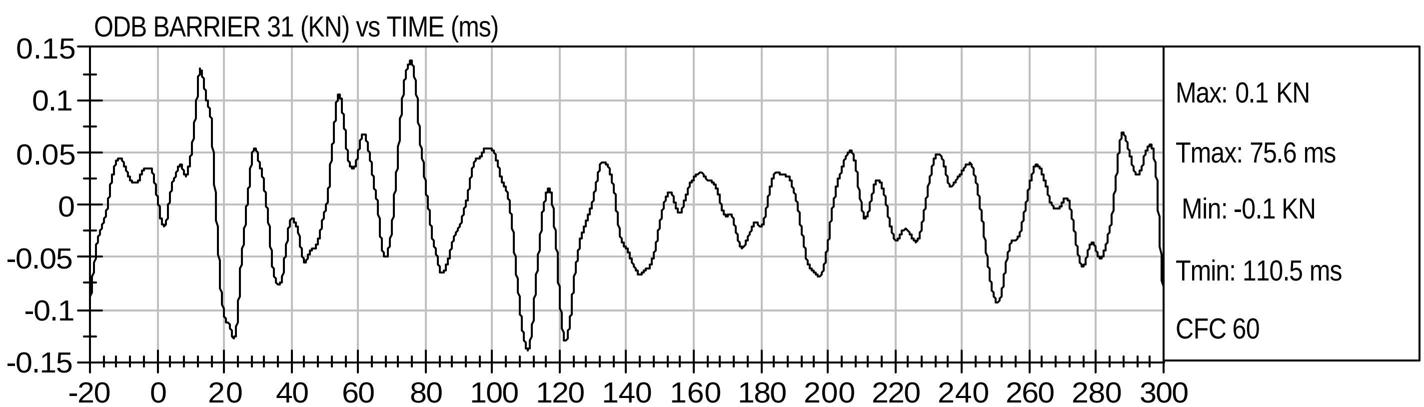


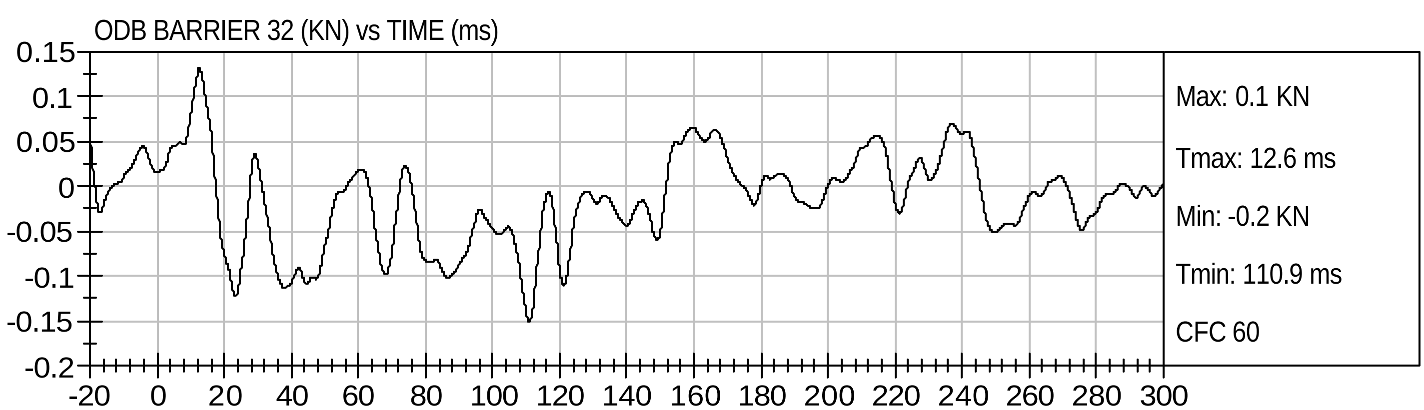
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





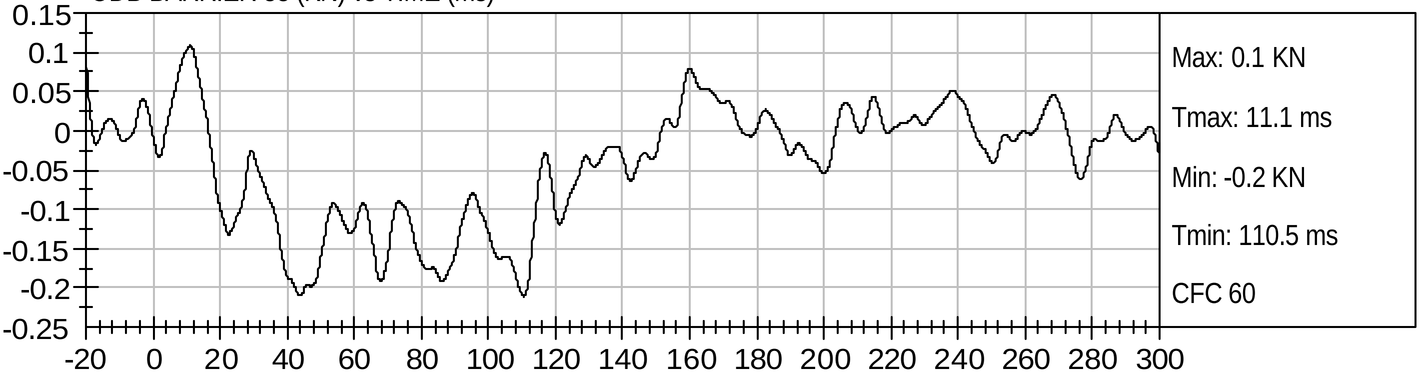




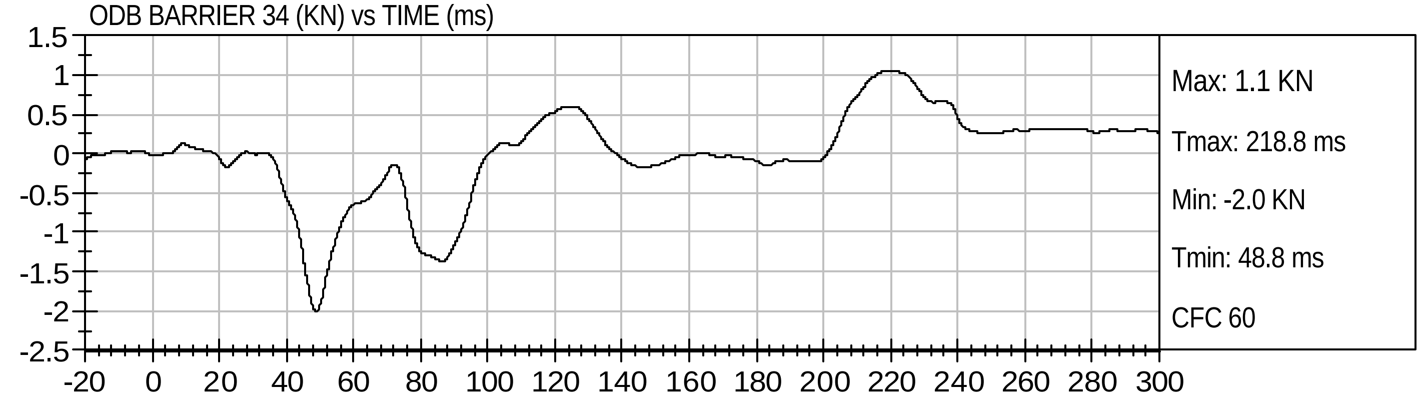
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

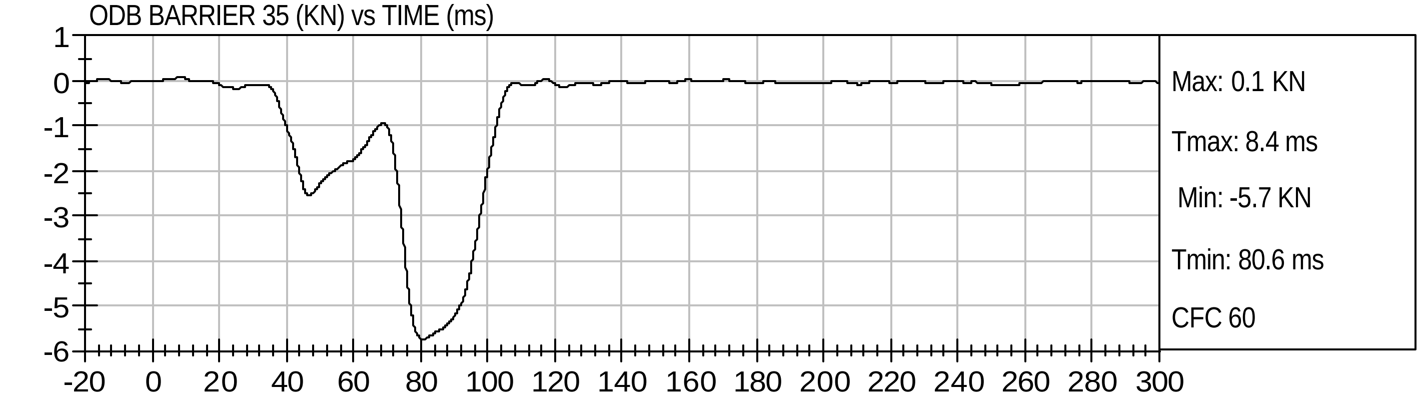
ODB BARRIER 33 (KN) vs TIME (ms)



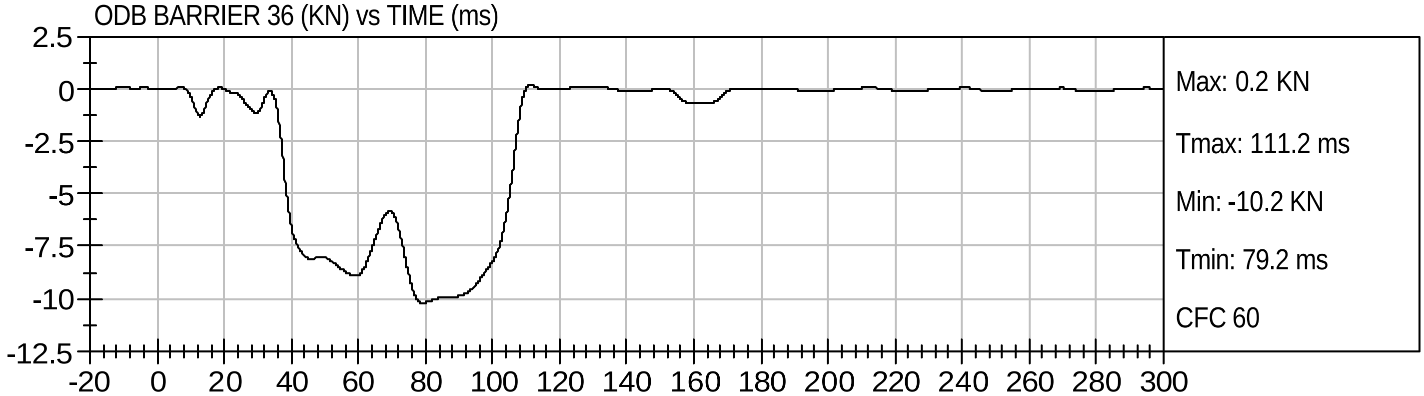
ODB BARRIER 34 (KN) vs TIME (ms)



ODB BARRIER 35 (KN) vs TIME (ms)



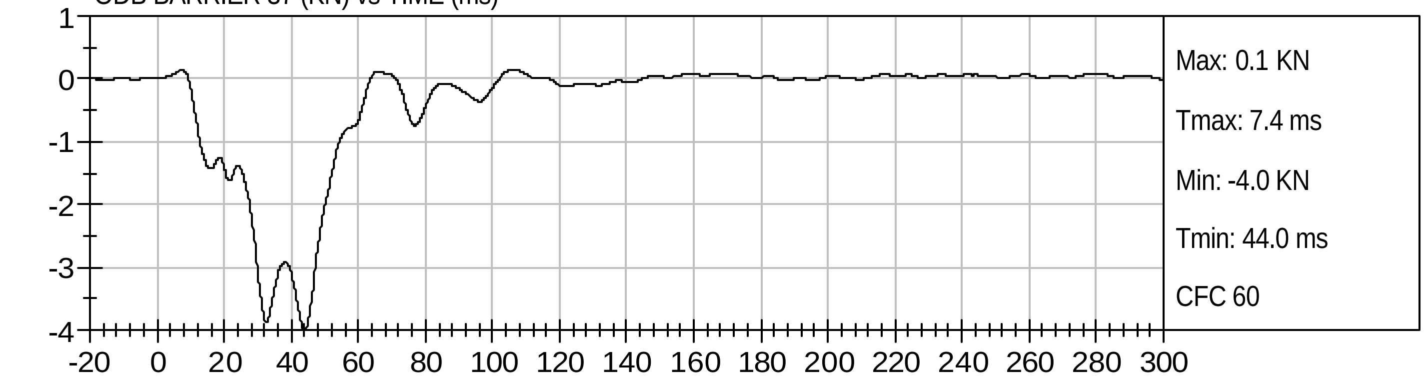
ODB BARRIER 36 (KN) vs TIME (ms)



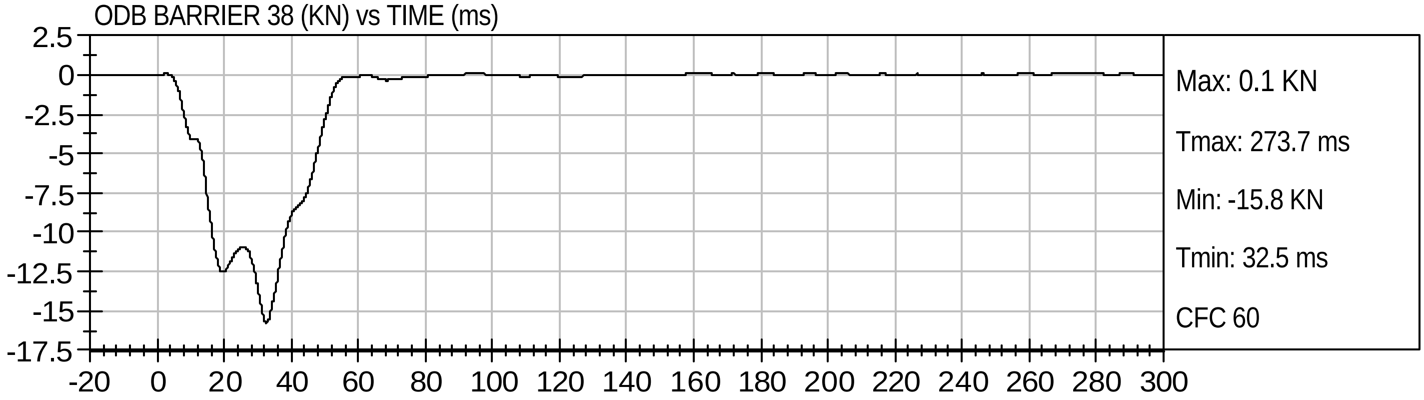
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

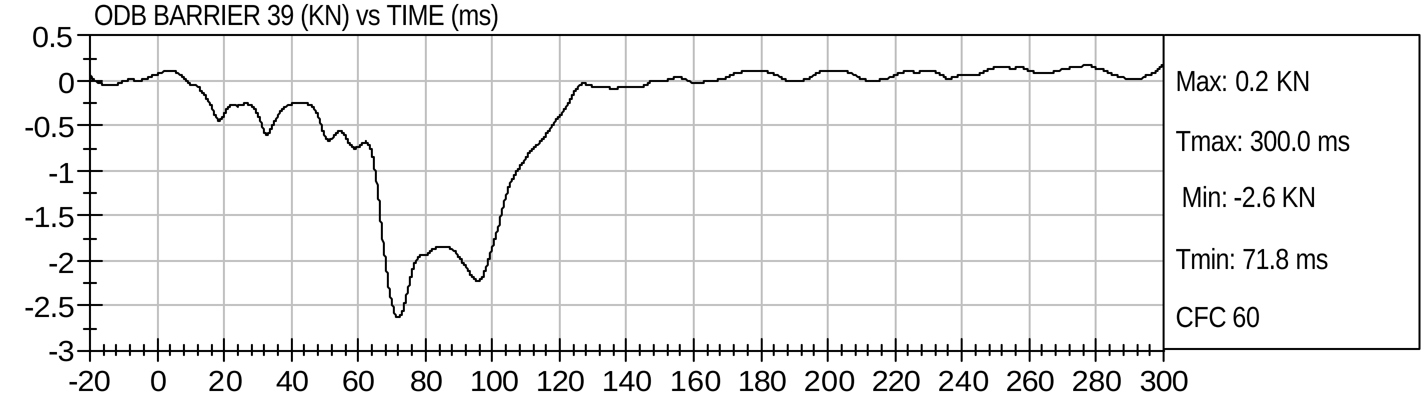
ODB BARRIER 37 (KN) vs TIME (ms)



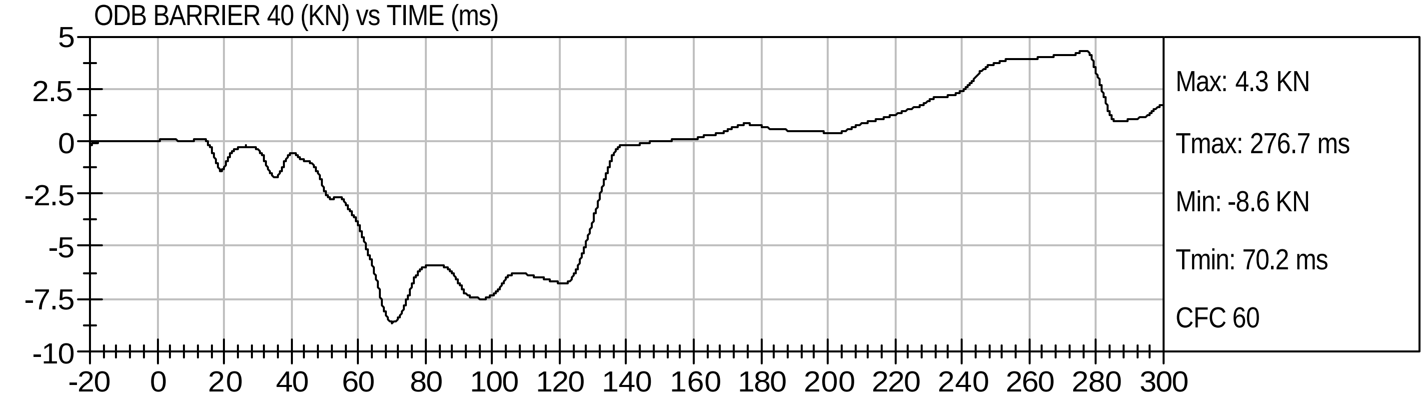
ODB BARRIER 38 (KN) vs TIME (ms)



ODB BARRIER 39 (KN) vs TIME (ms)



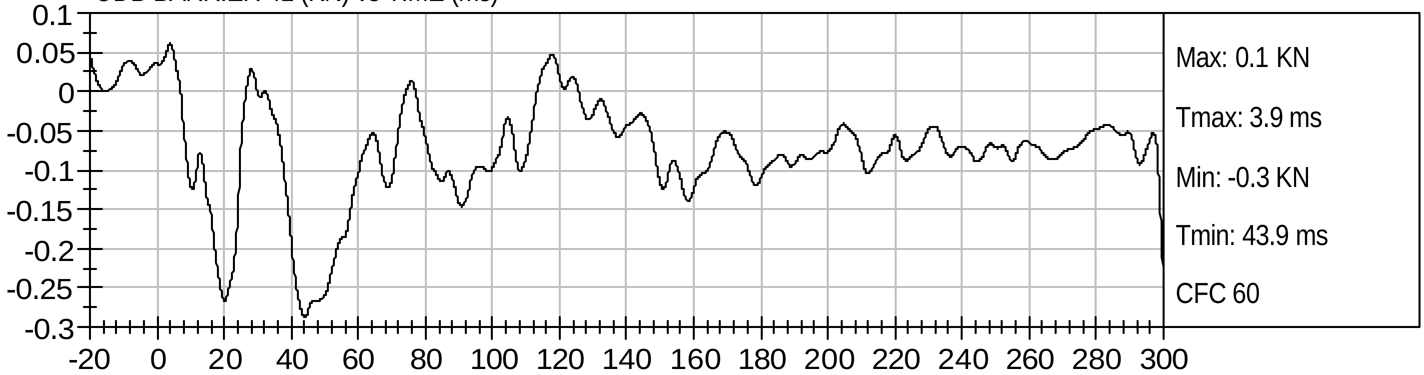
ODB BARRIER 40 (KN) vs TIME (ms)



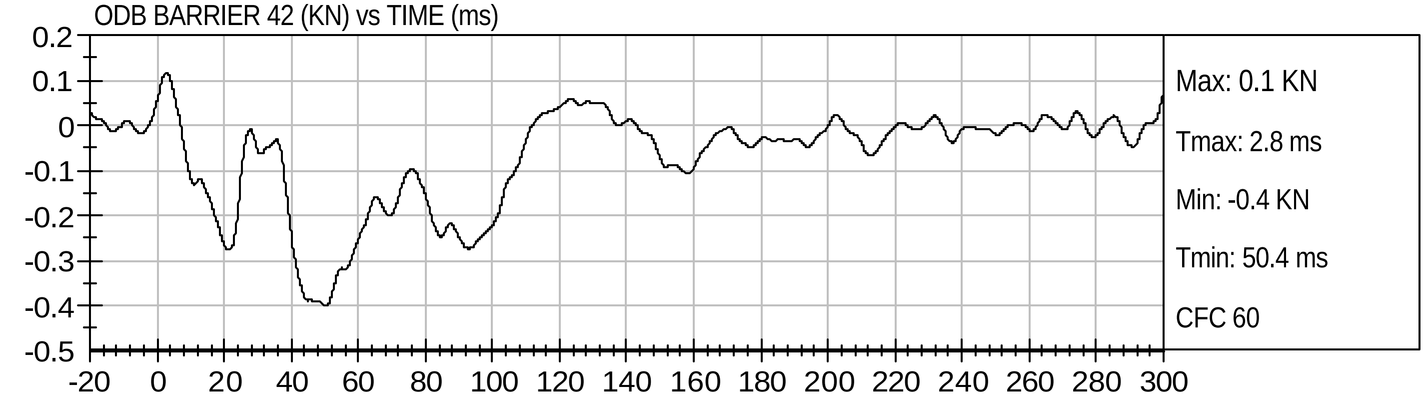
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

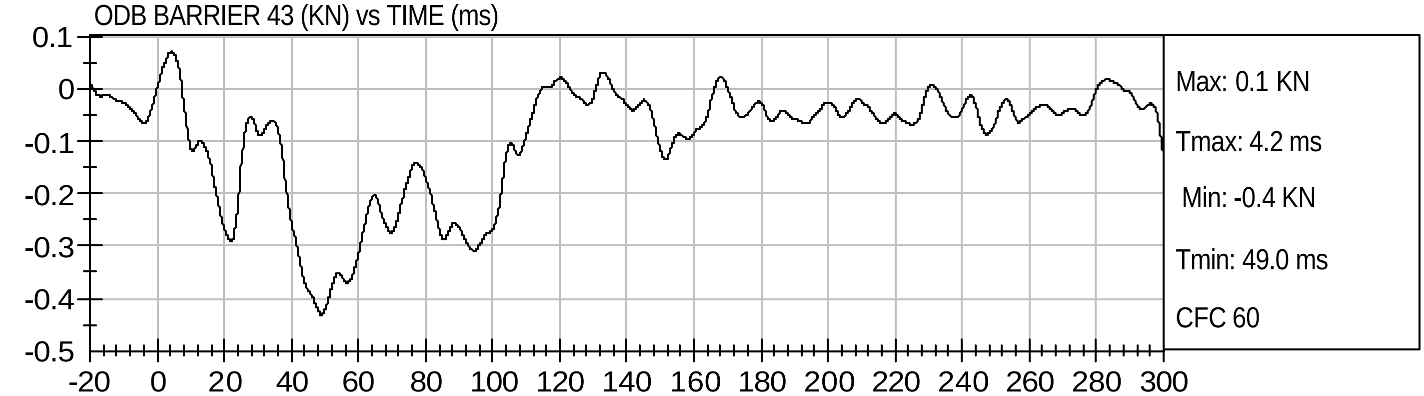
ODB BARRIER 41 (KN) vs TIME (ms)



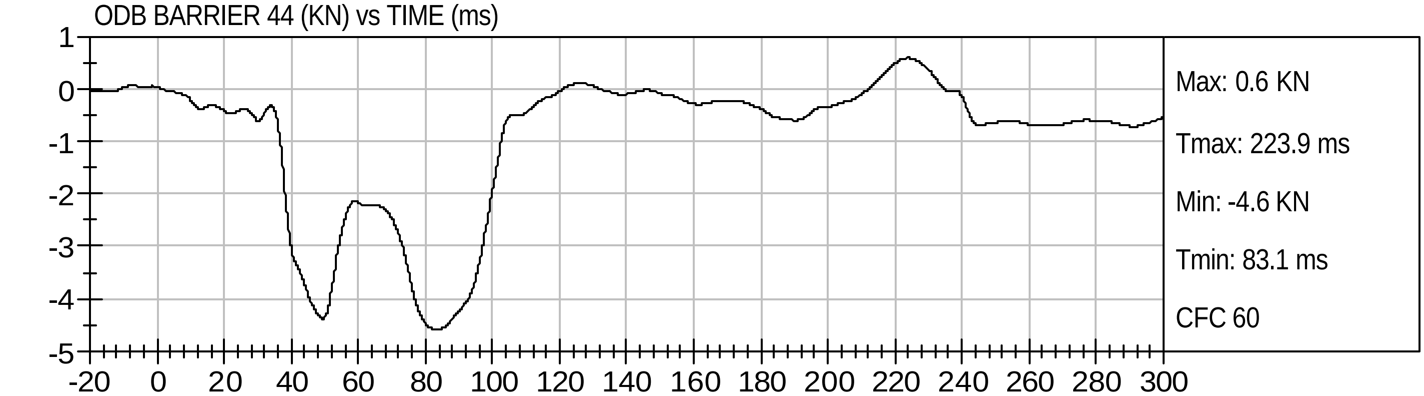
ODB BARRIER 42 (KN) vs TIME (ms)

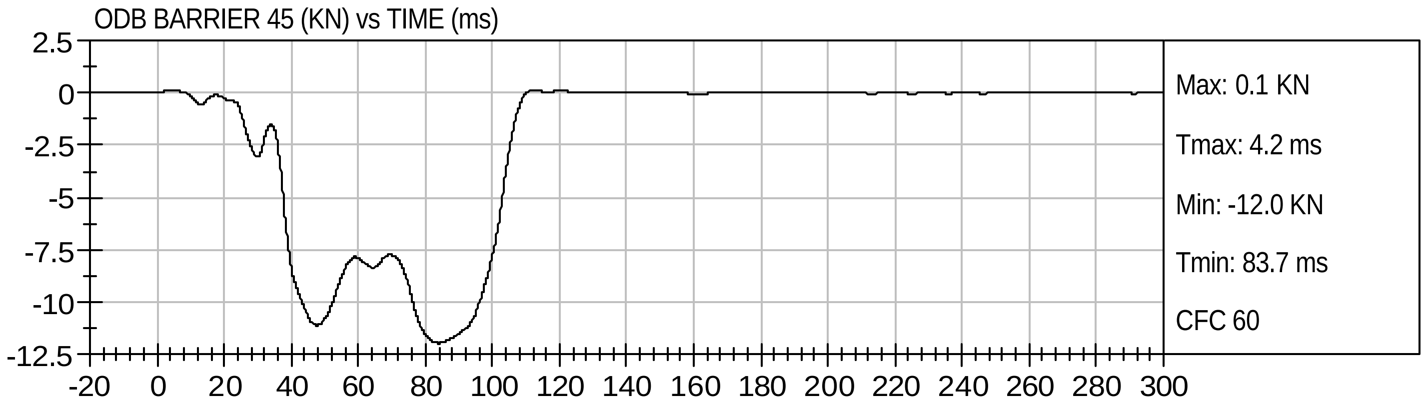


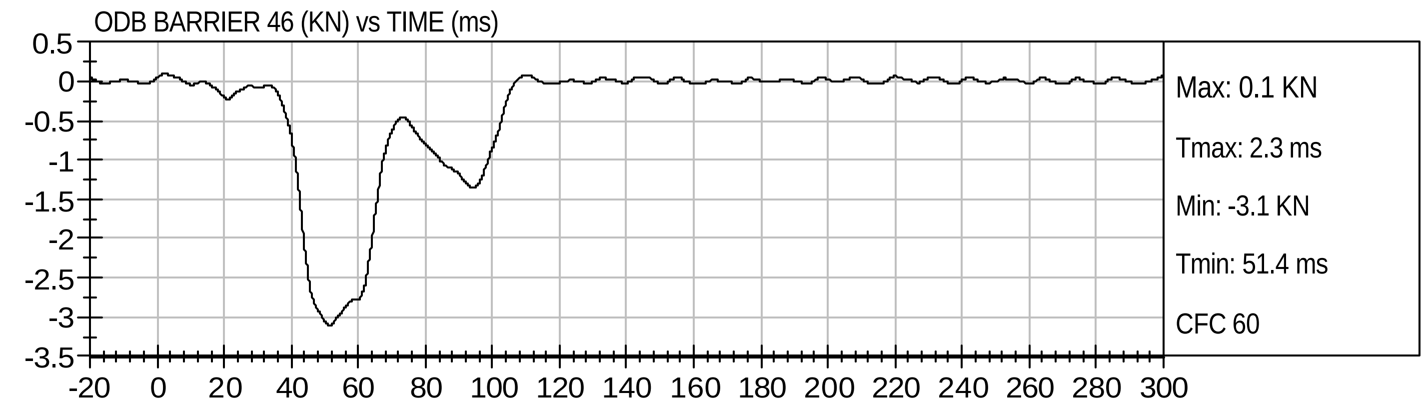
ODB BARRIER 43 (KN) vs TIME (ms)

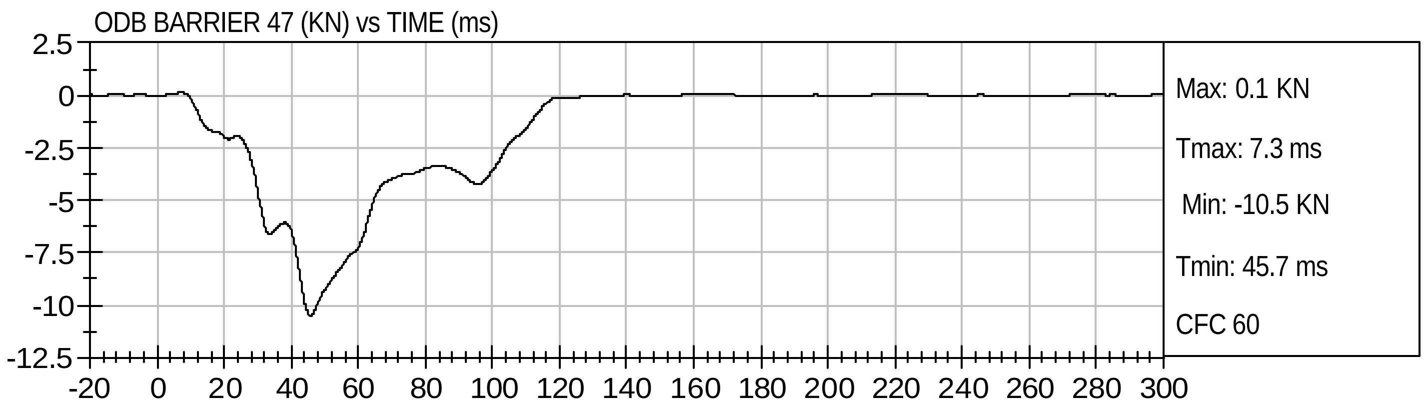


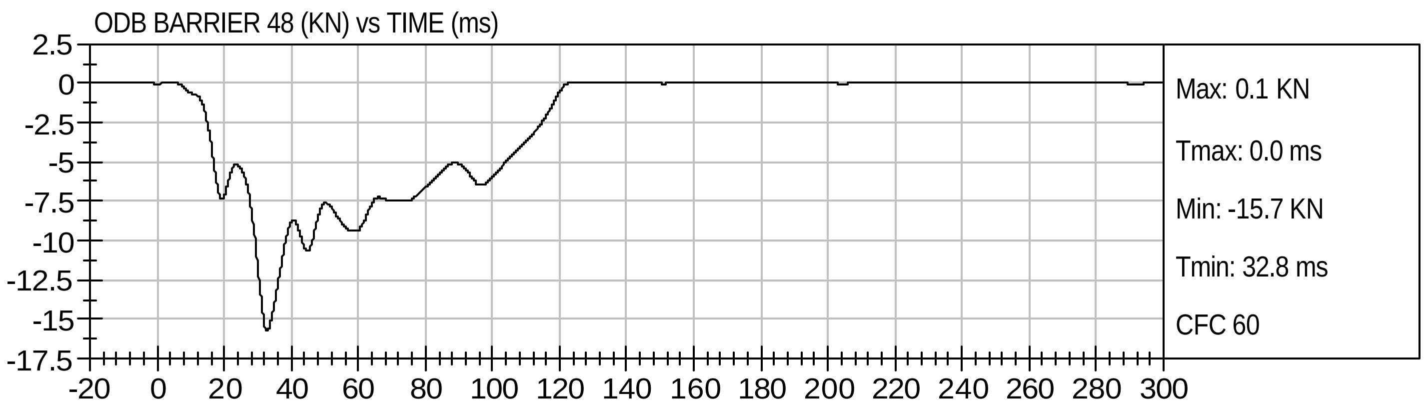
ODB BARRIER 44 (KN) vs TIME (ms)




ODB BARRIER 45 (KN) vs TIME (ms)
Max: 0.1 KN
Tmax: 4.2 ms
Min: -12.0 KN
Tmin: 83.7 ms
CFC 60


ODB BARRIER 46 (KN) vs TIME (ms)
Max: 0.1 KN
Tmax: 2.3 ms
Min: -3.1 KN
Tmin: 51.4 ms
CFC 60

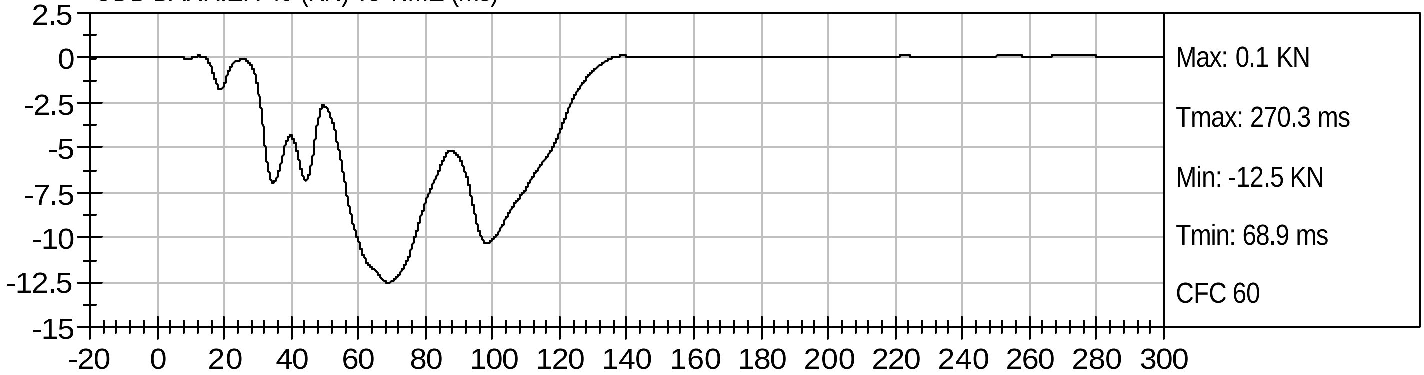

ODB BARRIER 47 (KN) vs TIME (ms)
Max: 0.1 KN
Tmax: 7.3 ms
Min: -10.5 KN
Tmin: 45.7 ms
CFC 60


ODB BARRIER 48 (KN) vs TIME (ms)
Max: 0.1 KN
Tmax: 0.0 ms
Min: -15.7 KN
Tmin: 32.8 ms
CFC 60

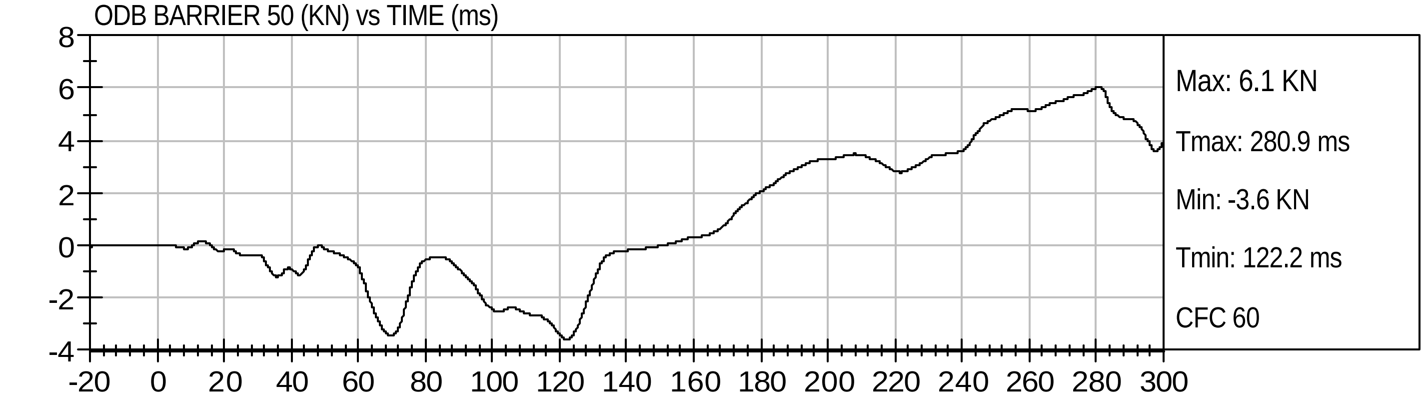
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

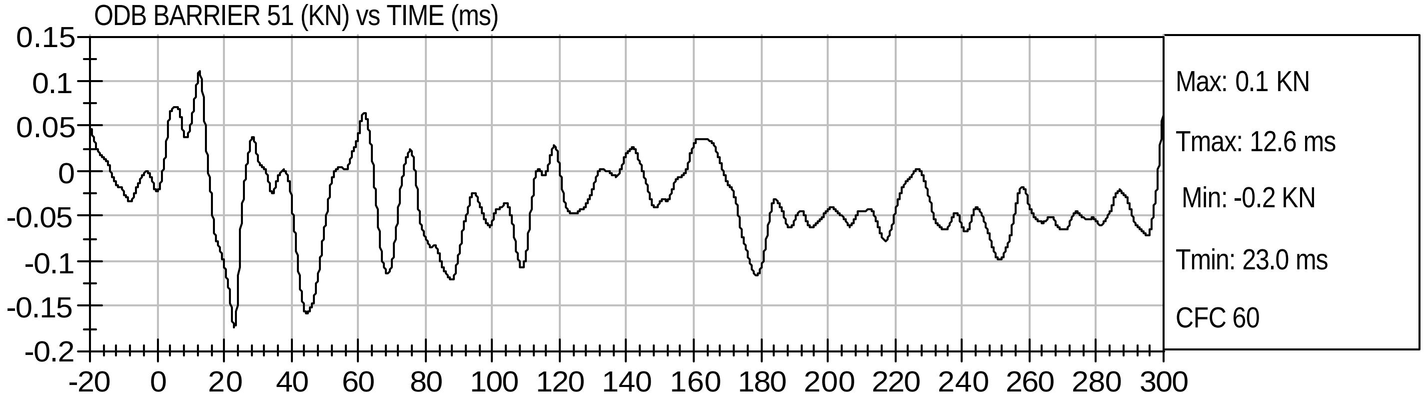
ODB BARRIER 49 (KN) vs TIME (ms)



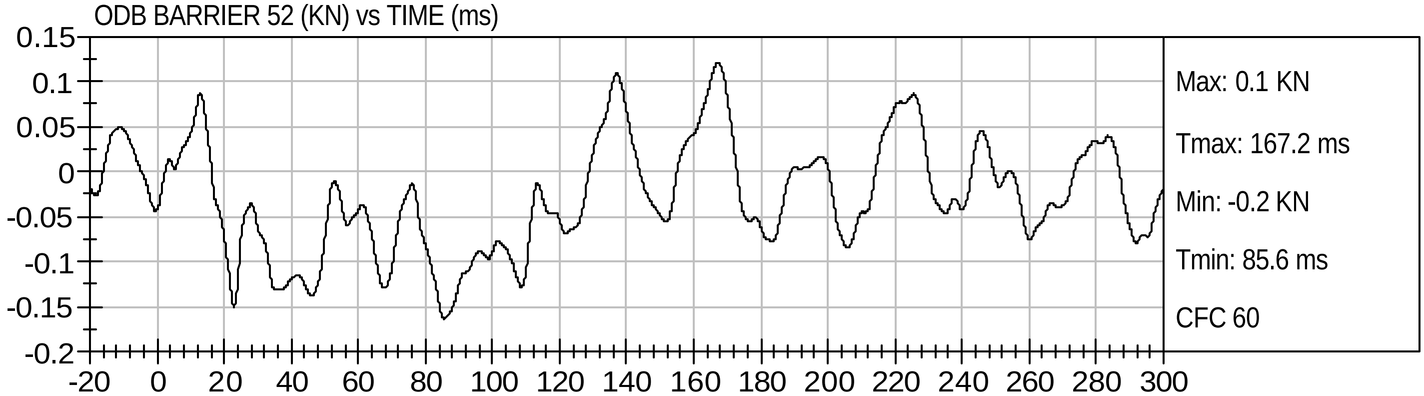
ODB BARRIER 50 (KN) vs TIME (ms)



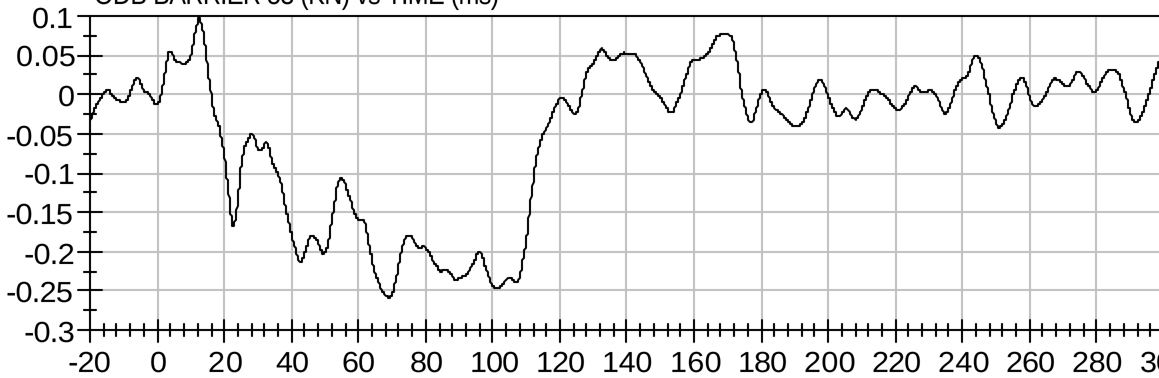
ODB BARRIER 51 (KN) vs TIME (ms)



ODB BARRIER 52 (KN) vs TIME (ms)

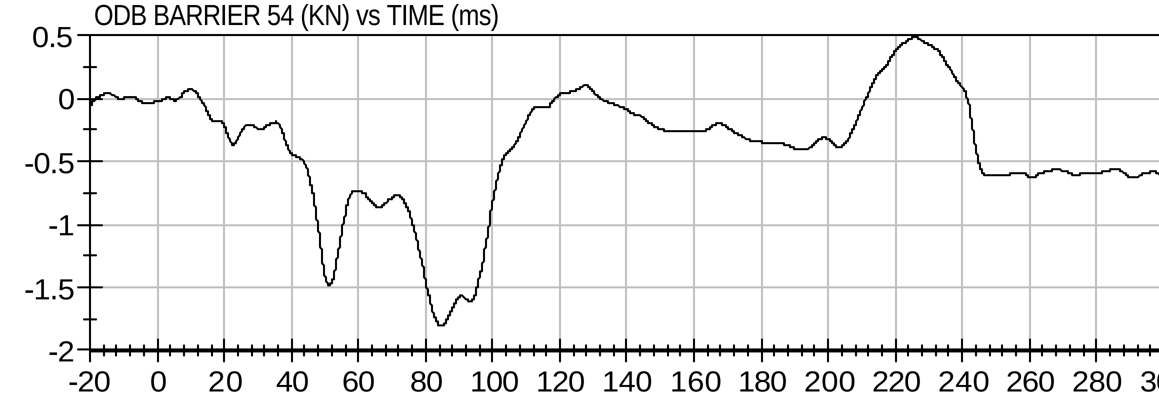


ODB BARRIER 53 (KN) vs TIME (ms)



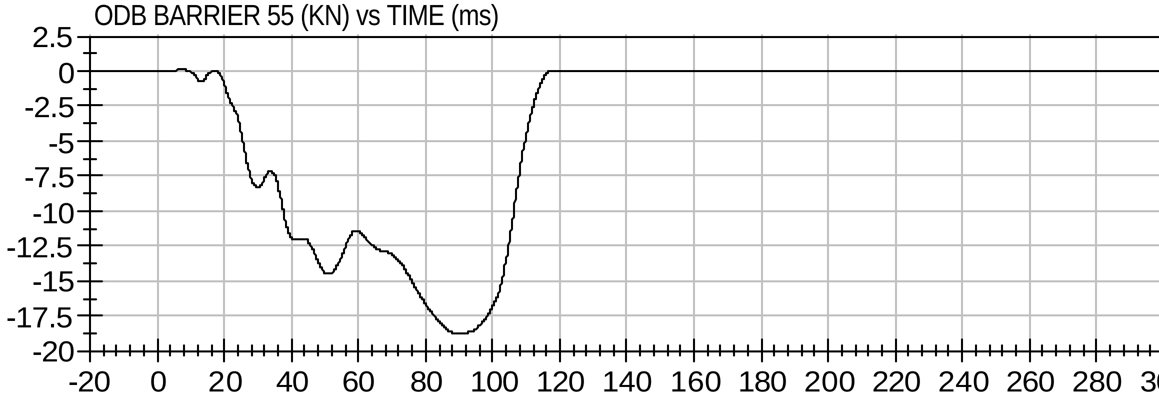
Max: 0.1 KN
Tmax: 12.5 ms
Min: -0.3 KN
Tmin: 69.1 ms
CFC 60

ODB BARRIER 54 (KN) vs TIME (ms)



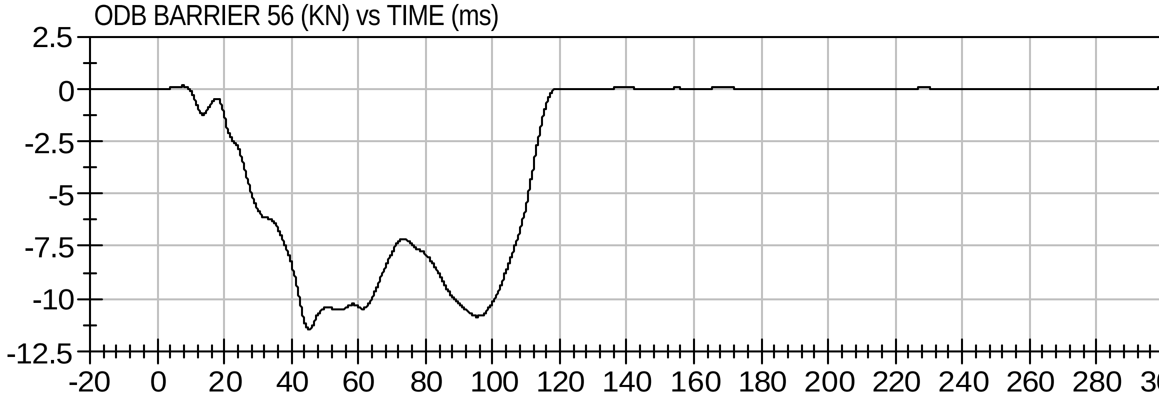
Max: 0.5 KN
Tmax: 225.7 ms
Min: -1.8 KN
Tmin: 84.7 ms
CFC 60

ODB BARRIER 55 (KN) vs TIME (ms)



Max: 0.1 KN
Tmax: 7.7 ms
Min: -18.8 KN
Tmin: 89.4 ms
CFC 60

ODB BARRIER 56 (KN) vs TIME (ms)

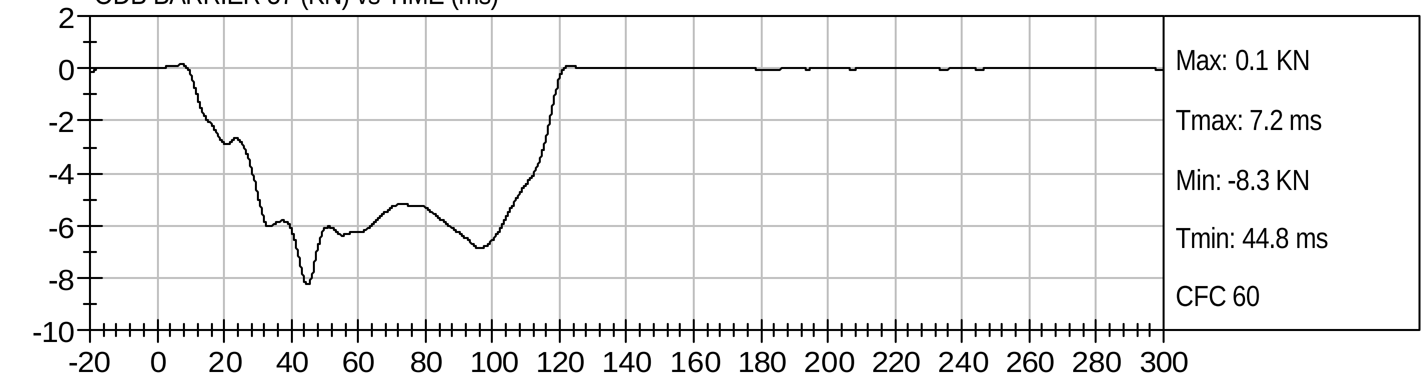


Max: 0.1 KN
Tmax: 300.0 ms
Min: -11.5 KN
Tmin: 45.2 ms
CFC 60

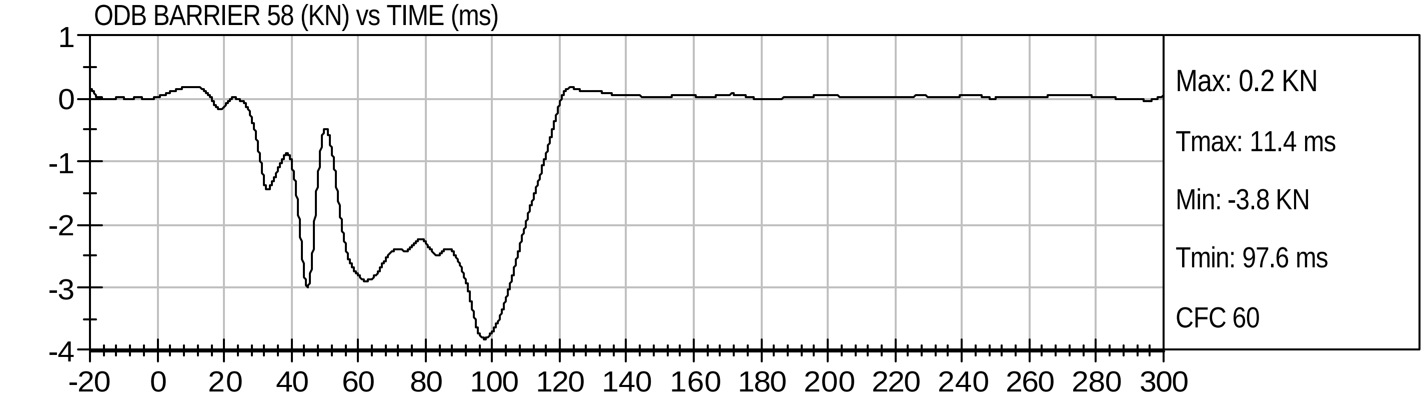
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

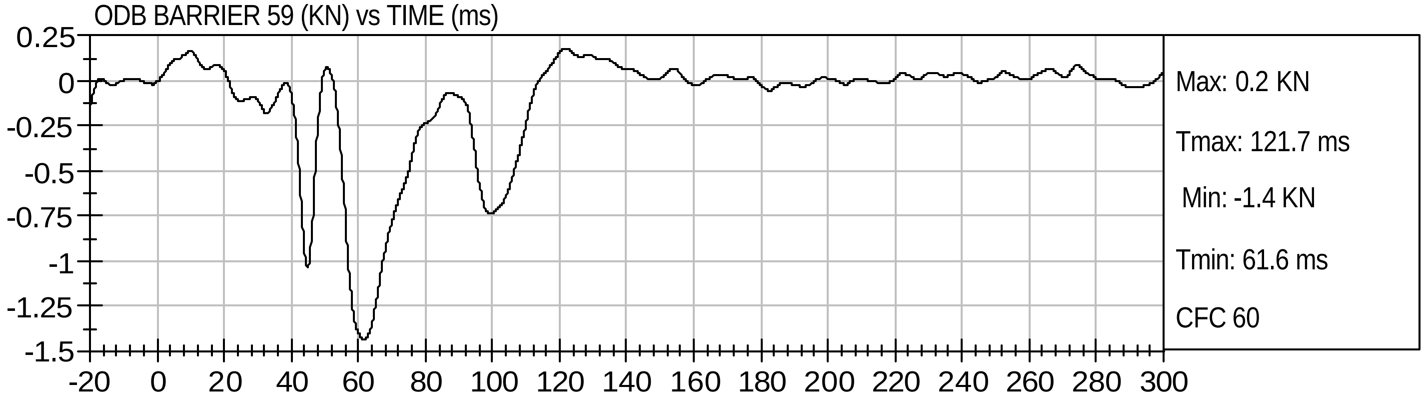
ODB BARRIER 57 (KN) vs TIME (ms)



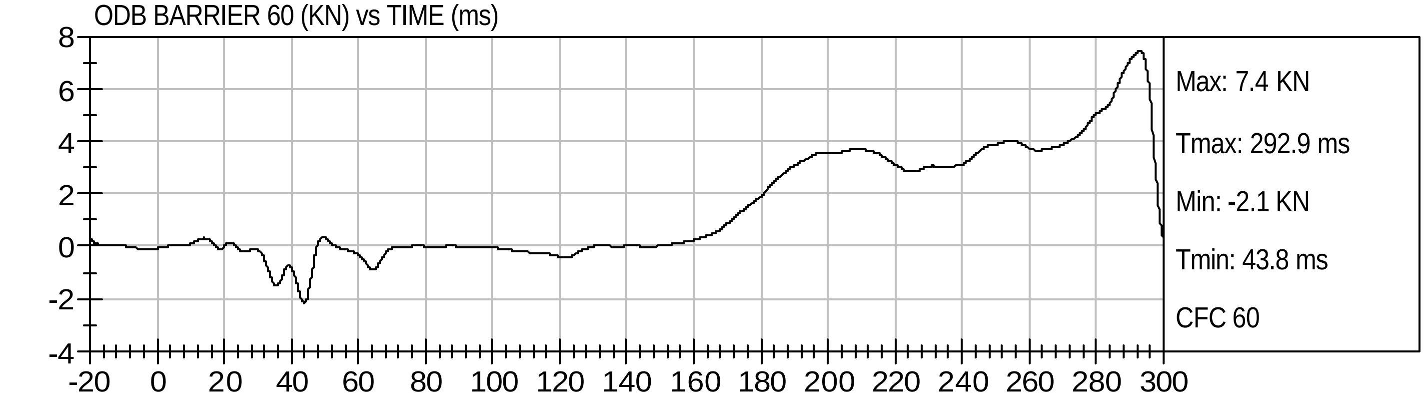
ODB BARRIER 58 (KN) vs TIME (ms)



ODB BARRIER 59 (KN) vs TIME (ms)

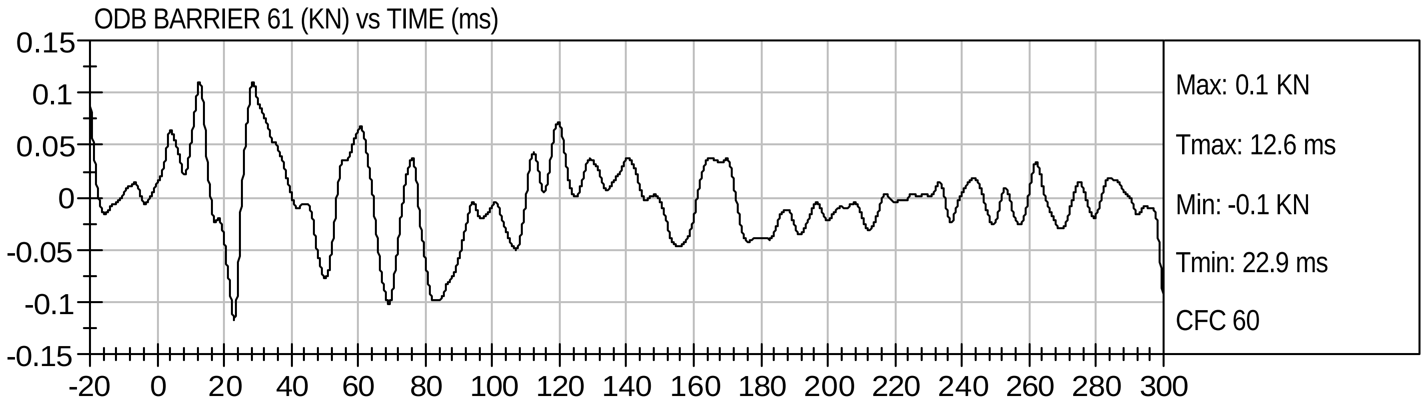


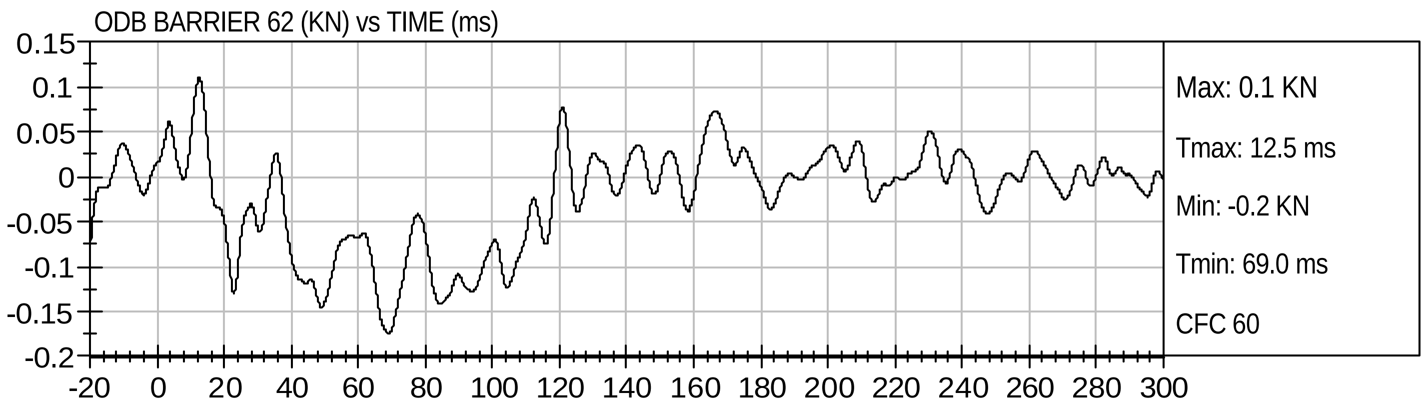
ODB BARRIER 60 (KN) vs TIME (ms)

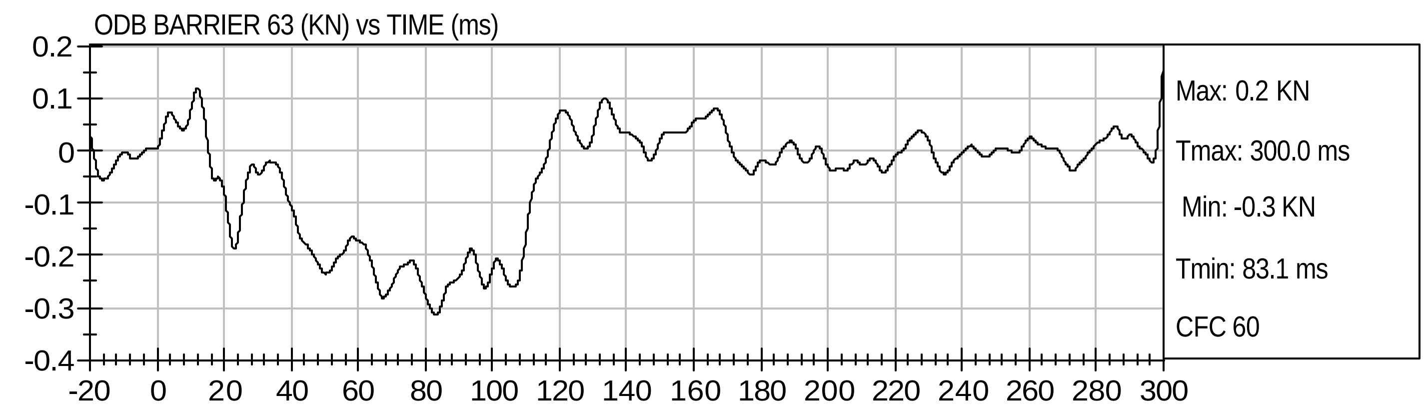


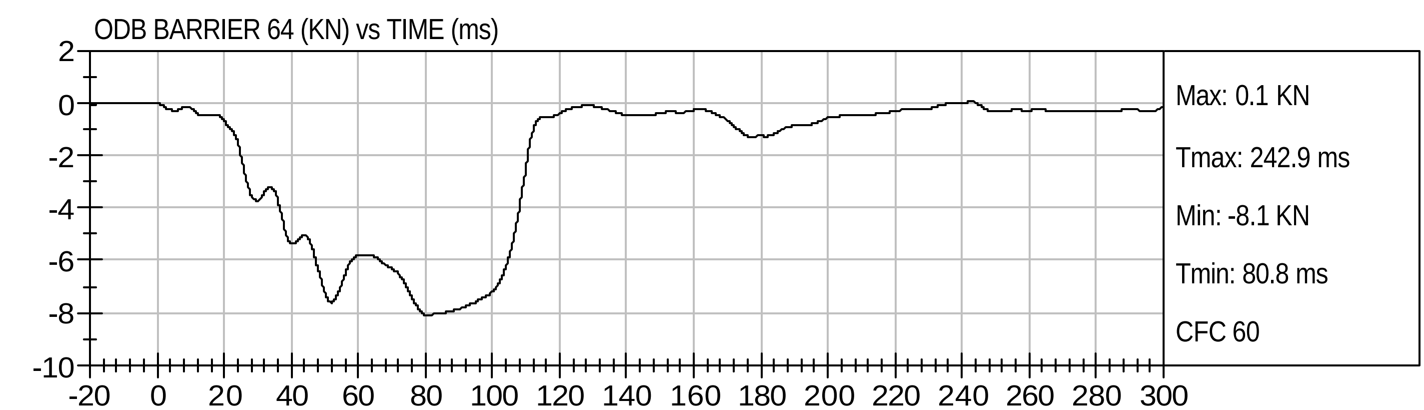
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





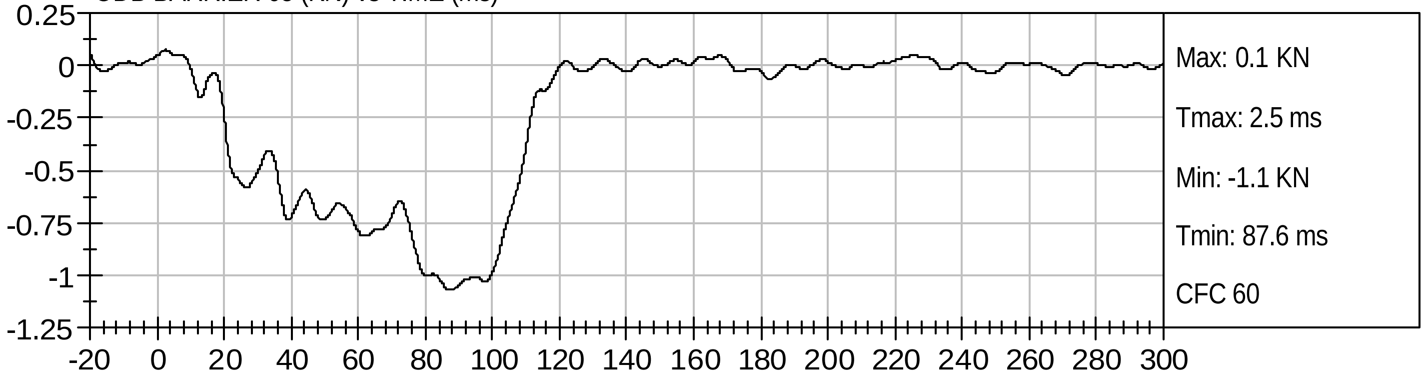




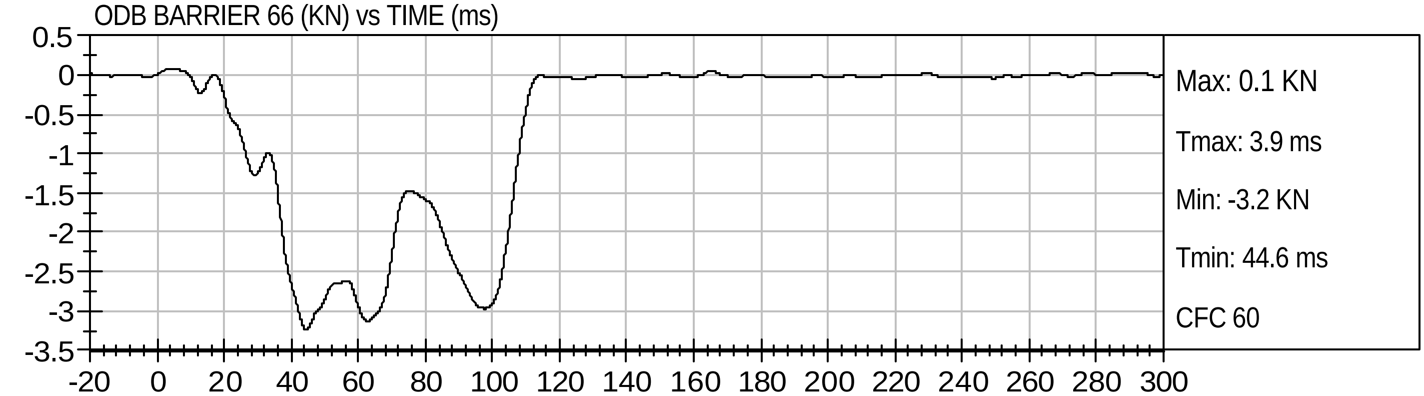
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

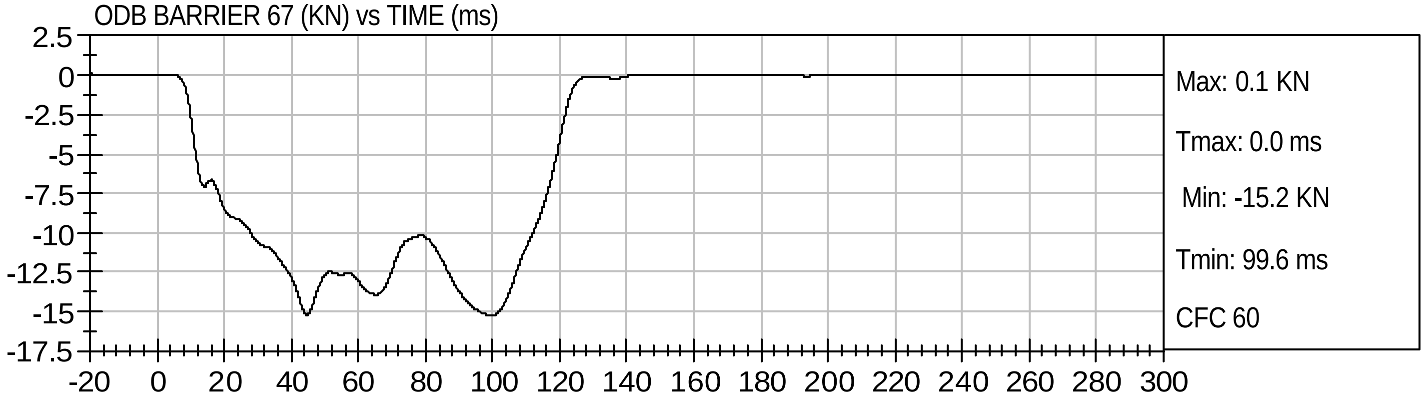
ODB BARRIER 65 (KN) vs TIME (ms)



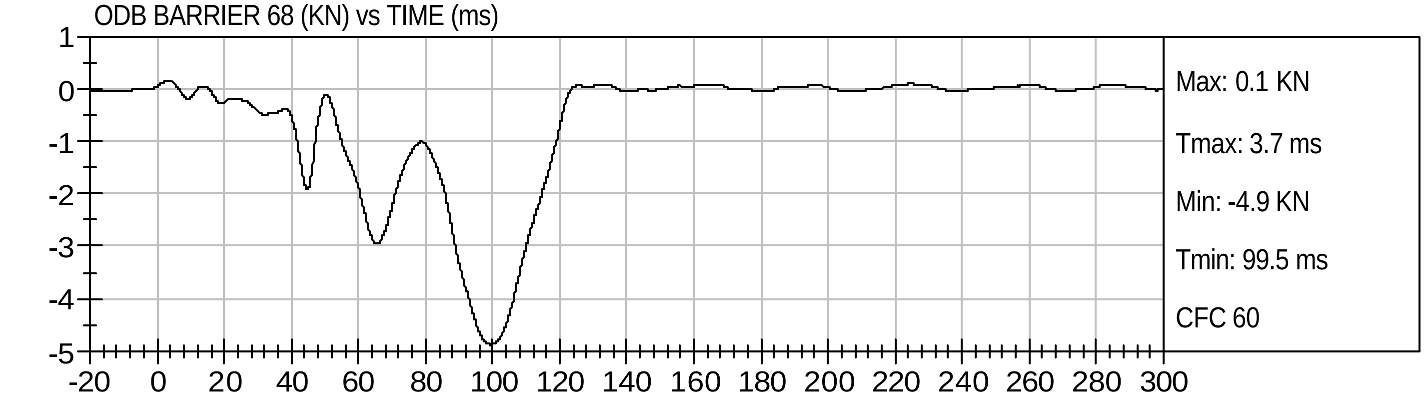
ODB BARRIER 66 (KN) vs TIME (ms)



ODB BARRIER 67 (KN) vs TIME (ms)



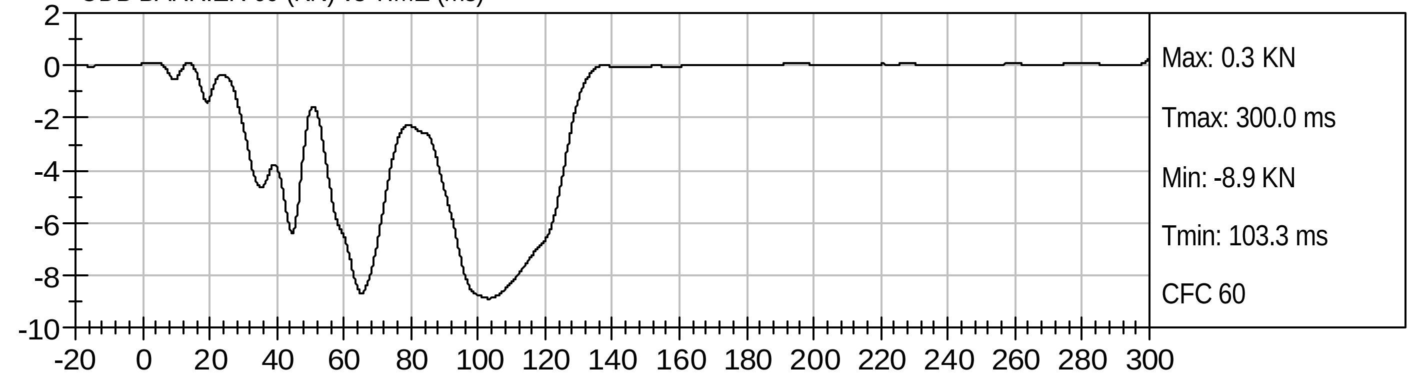
ODB BARRIER 68 (KN) vs TIME (ms)



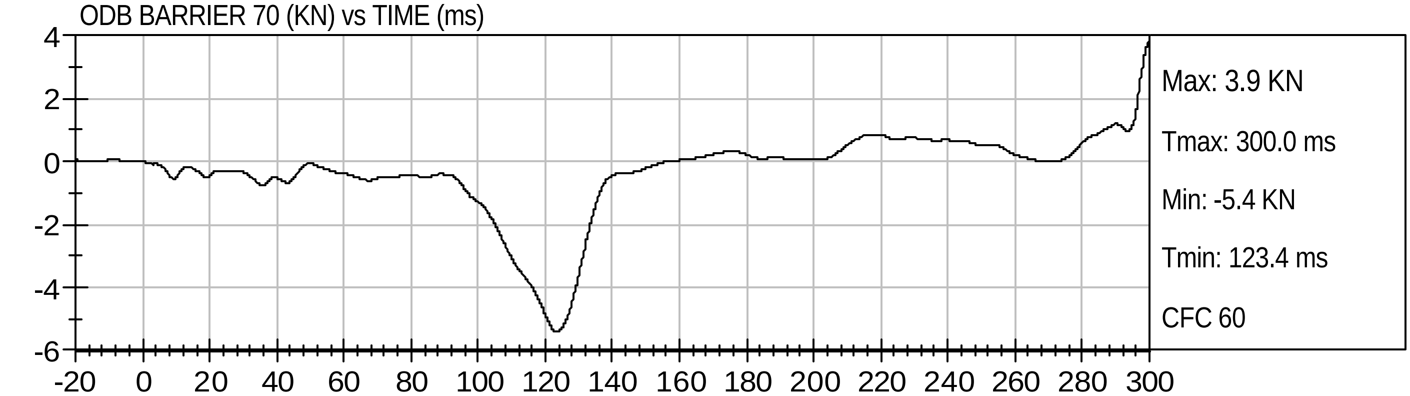
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

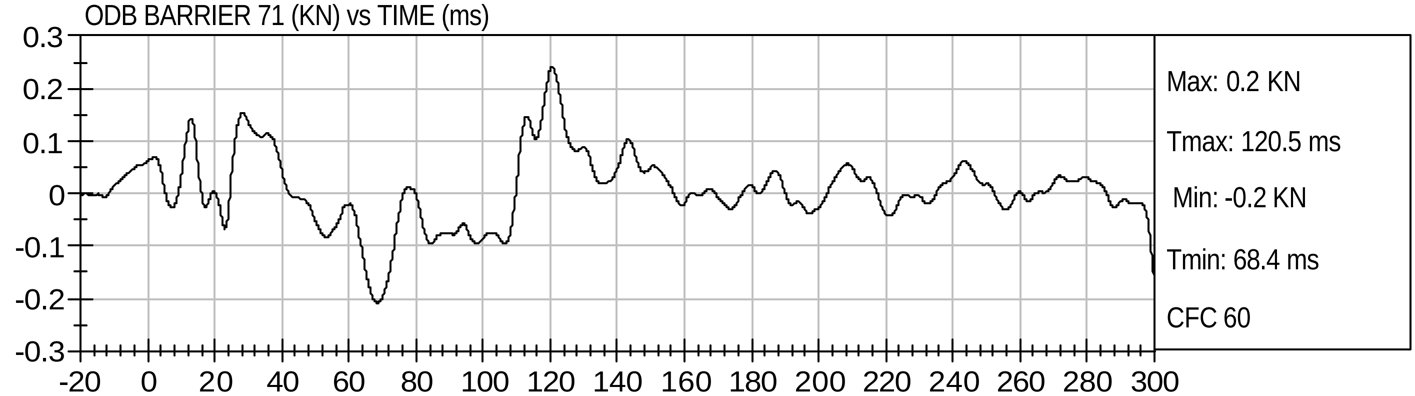
ODB BARRIER 69 (KN) vs TIME (ms)



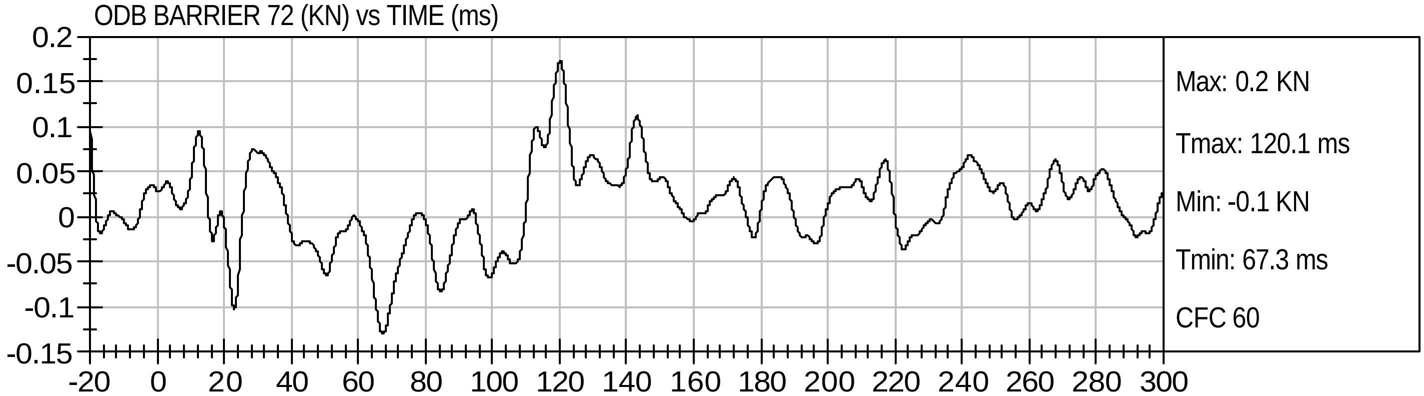
ODB BARRIER 70 (KN) vs TIME (ms)

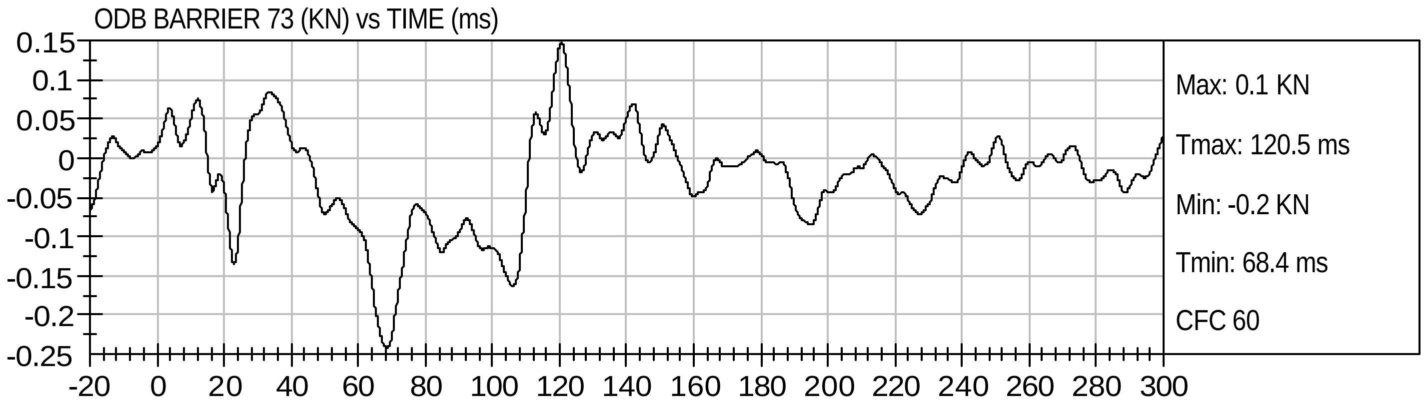


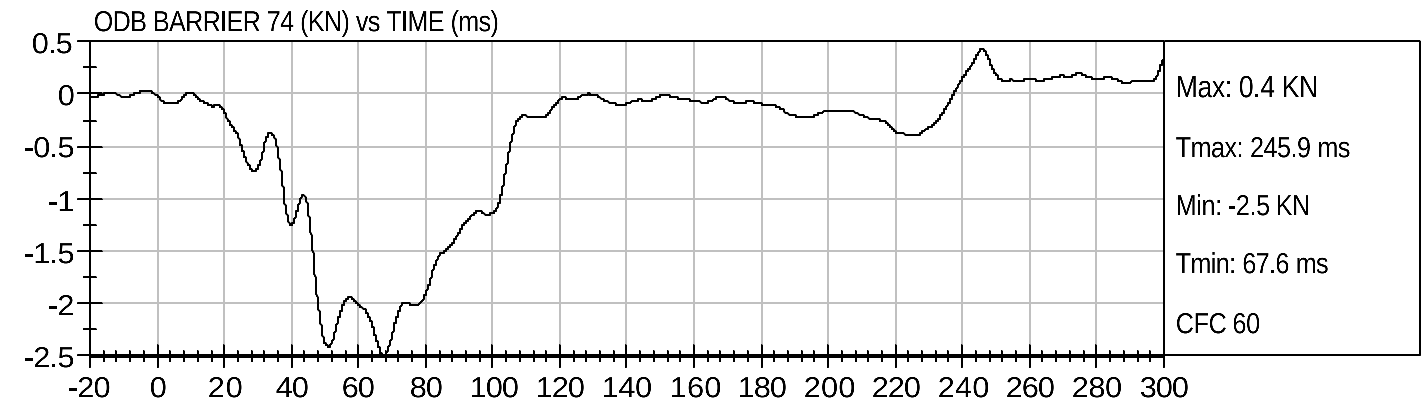
ODB BARRIER 71 (KN) vs TIME (ms)

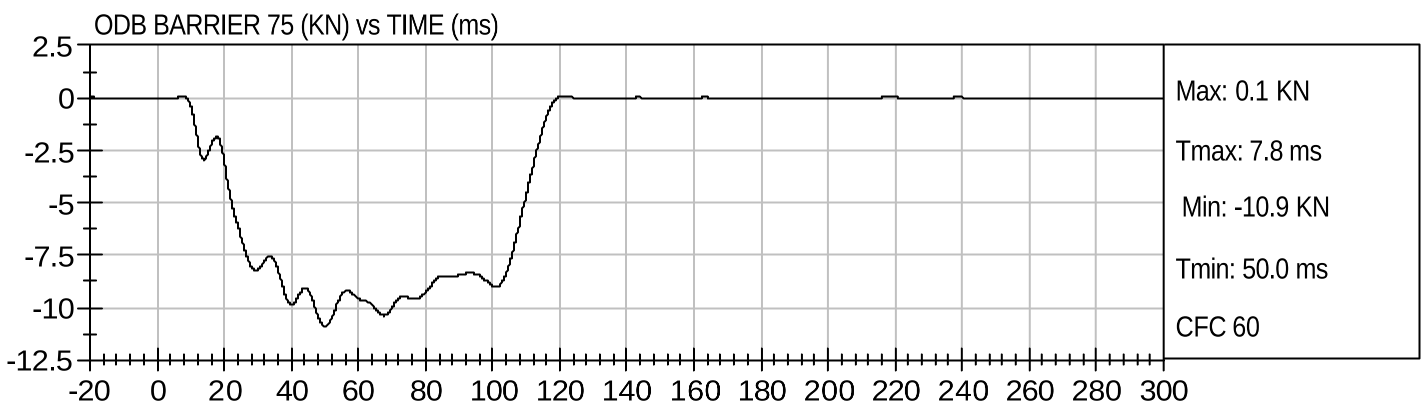


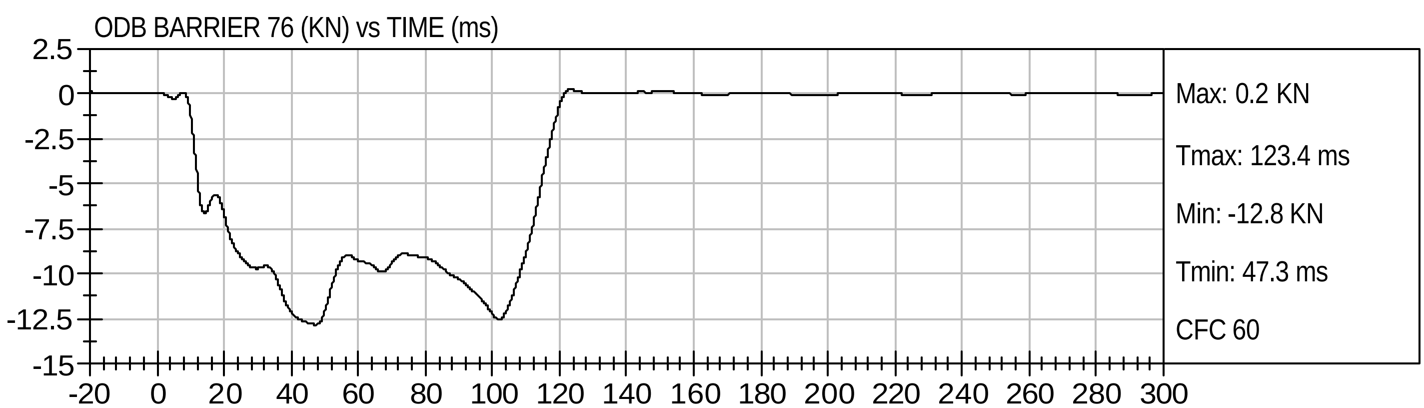
ODB BARRIER 72 (KN) vs TIME (ms)




ODB BARRIER 73 (KN) vs TIME (ms)
Max: 0.1 KN
Tmax: 120.5 ms
Min: -0.2 KN
Tmin: 68.4 ms
CFC 60


ODB BARRIER 74 (KN) vs TIME (ms)
Max: 0.4 KN
Tmax: 245.9 ms
Min: -2.5 KN
Tmin: 67.6 ms
CFC 60

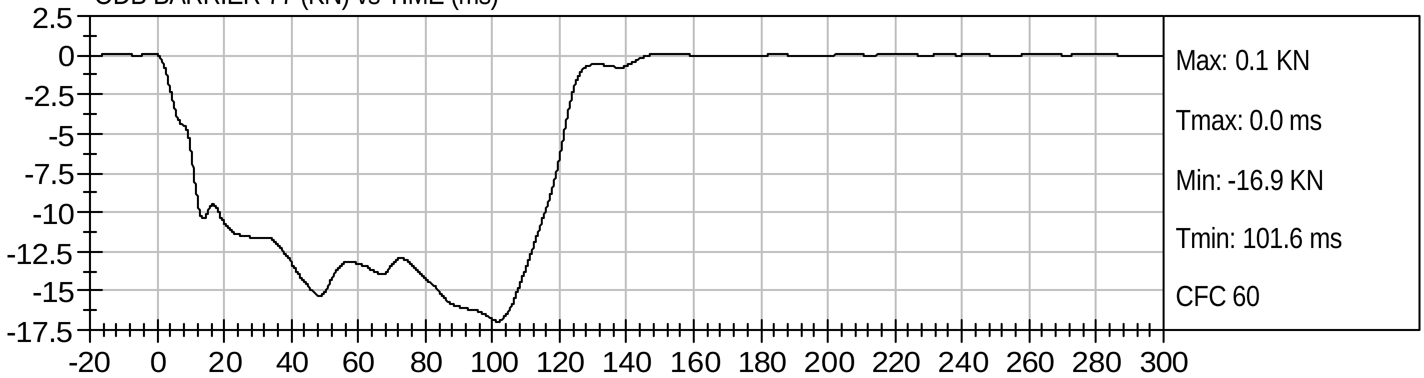

ODB BARRIER 75 (KN) vs TIME (ms)
Max: 0.1 KN
Tmax: 7.8 ms
Min: -10.9 KN
Tmin: 50.0 ms
CFC 60


ODB BARRIER 76 (KN) vs TIME (ms)
Max: 0.2 KN
Tmax: 123.4 ms
Min: -12.8 KN
Tmin: 47.3 ms
CFC 60

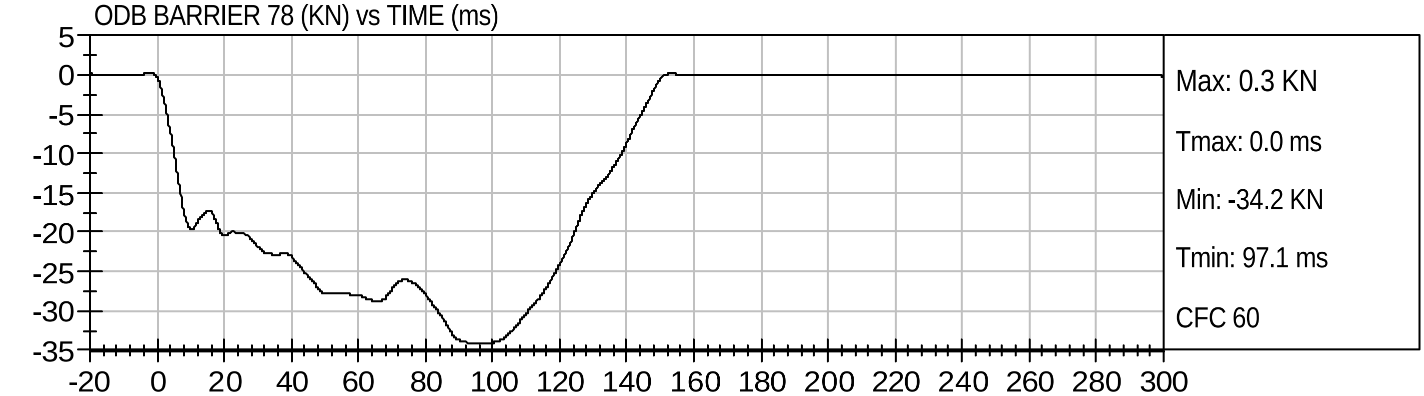
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

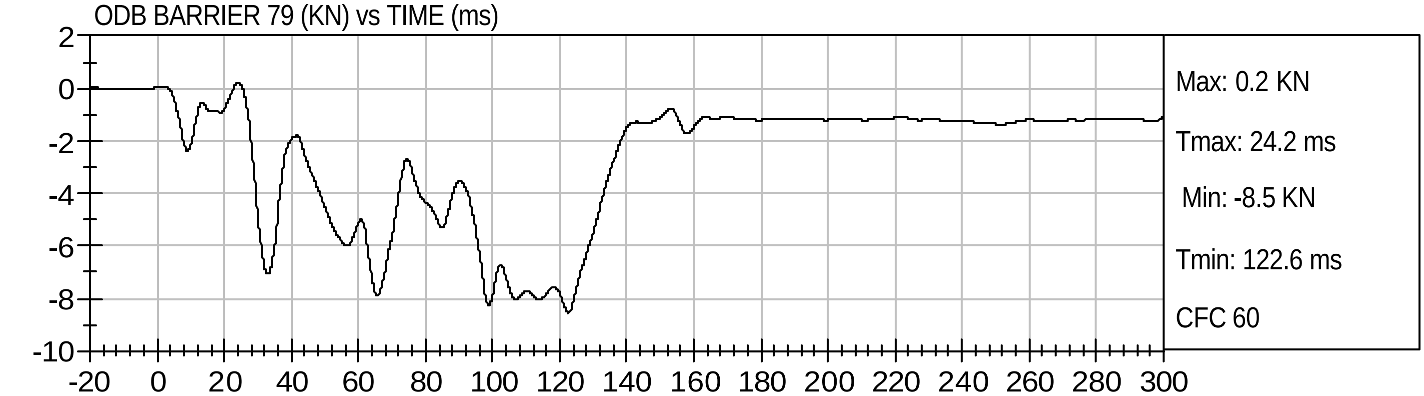
ODB BARRIER 77 (KN) vs TIME (ms)



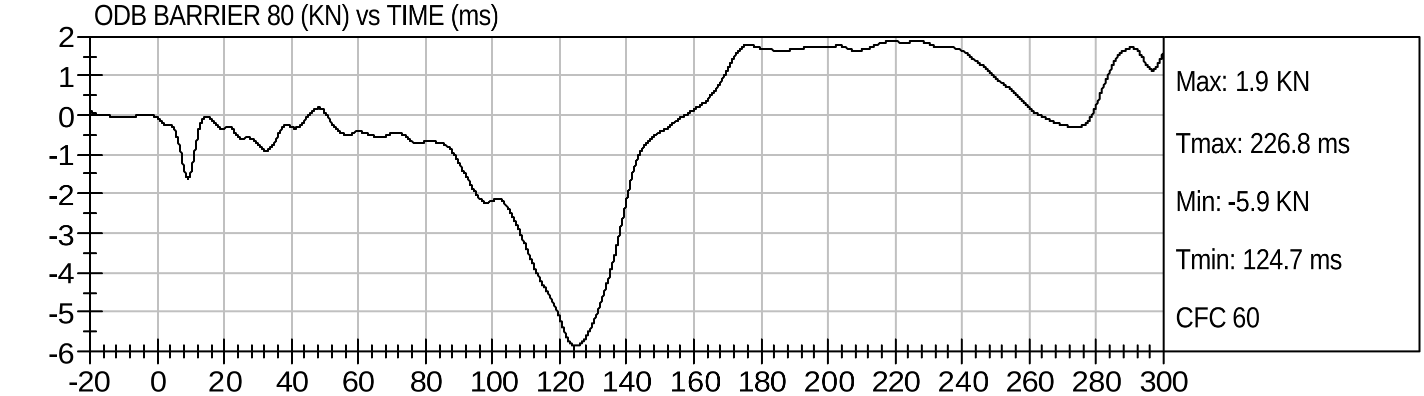
ODB BARRIER 78 (KN) vs TIME (ms)



ODB BARRIER 79 (KN) vs TIME (ms)



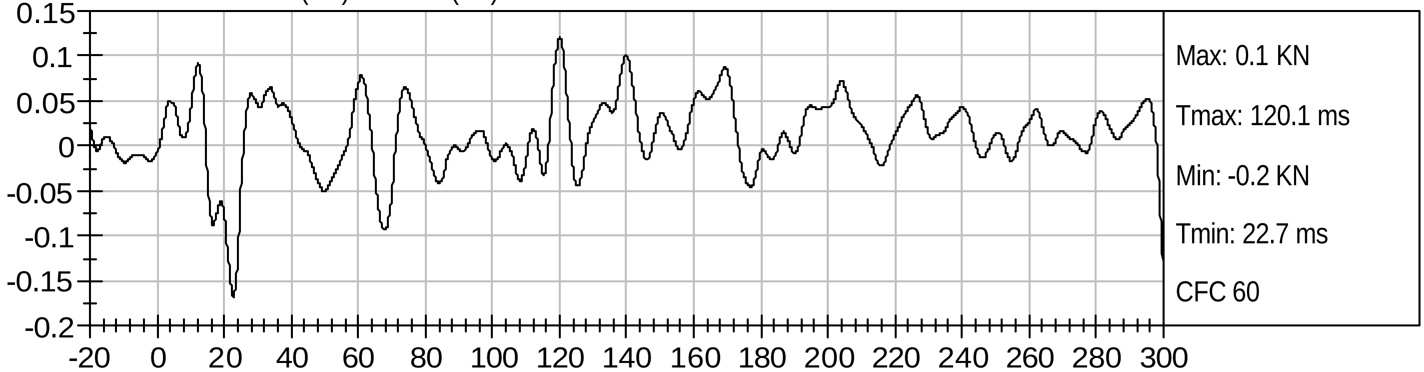
ODB BARRIER 80 (KN) vs TIME (ms)



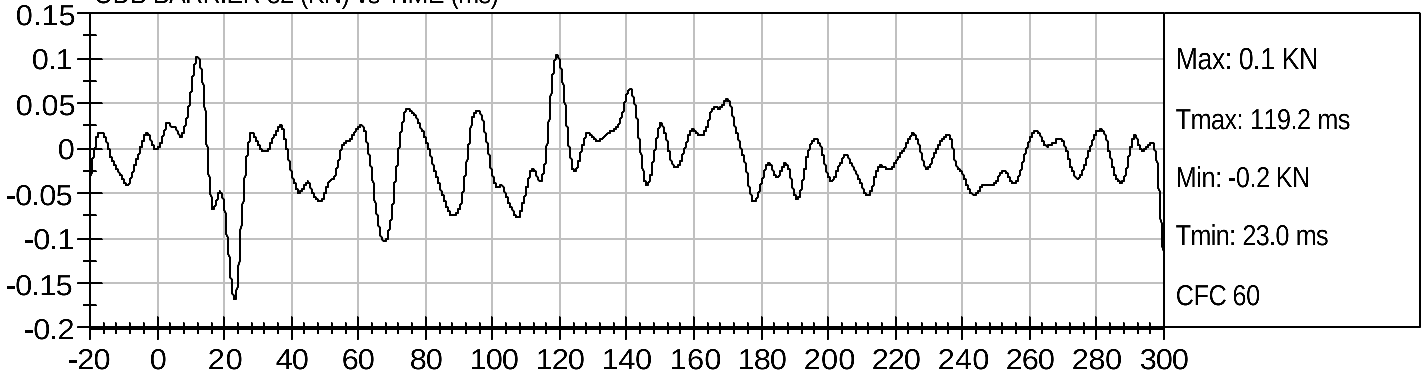
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

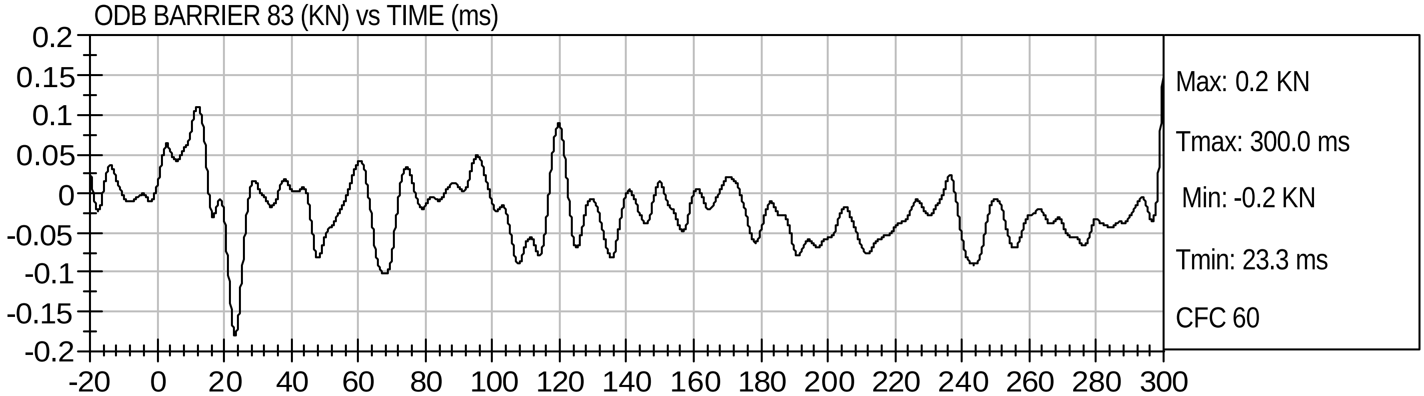
ODB BARRIER 81 (KN) vs TIME (ms)



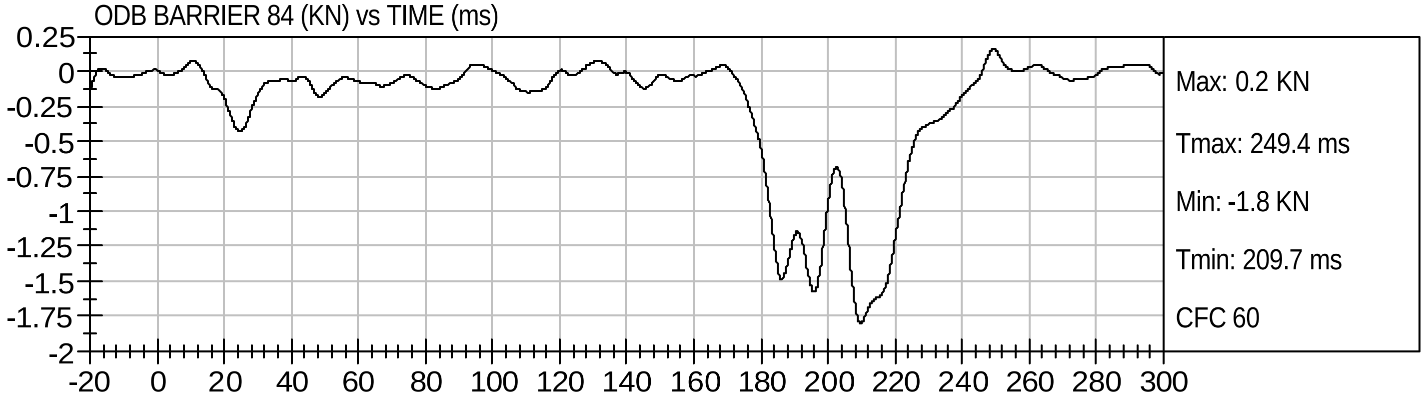
ODB BARRIER 82 (KN) vs TIME (ms)



ODB BARRIER 83 (KN) vs TIME (ms)



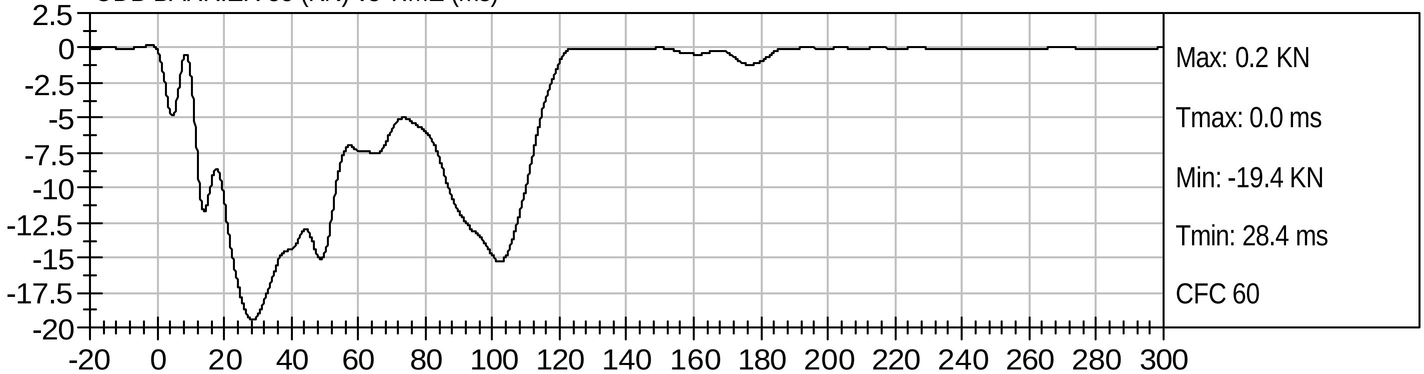
ODB BARRIER 84 (KN) vs TIME (ms)



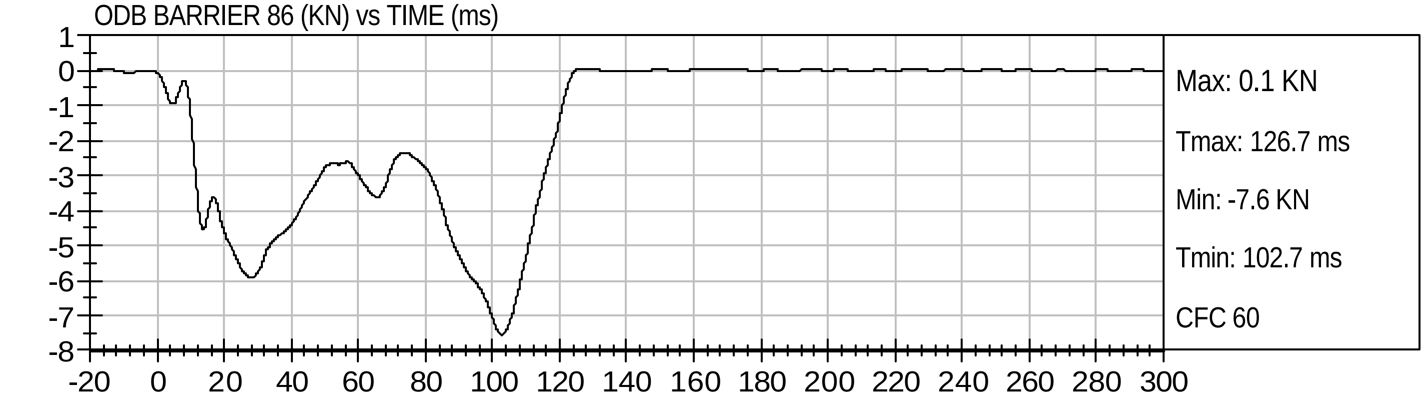
NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)

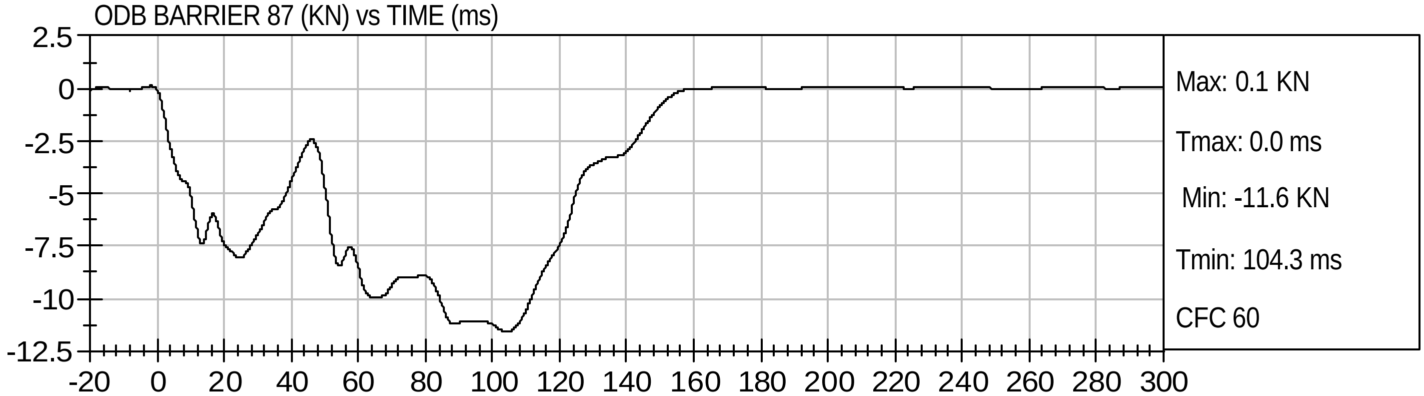
ODB BARRIER 85 (KN) vs TIME (ms)



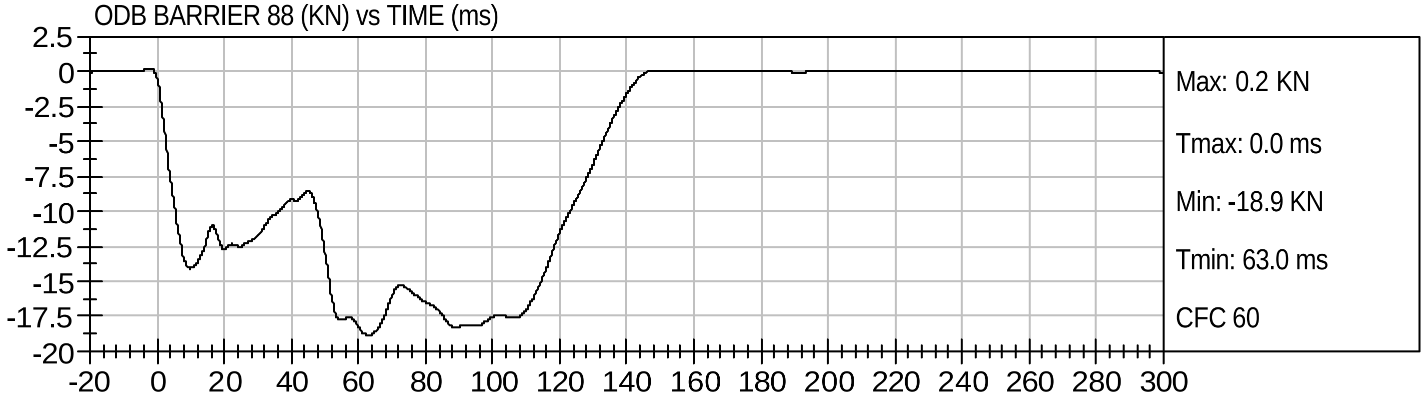
ODB BARRIER 86 (KN) vs TIME (ms)



ODB BARRIER 87 (KN) vs TIME (ms)

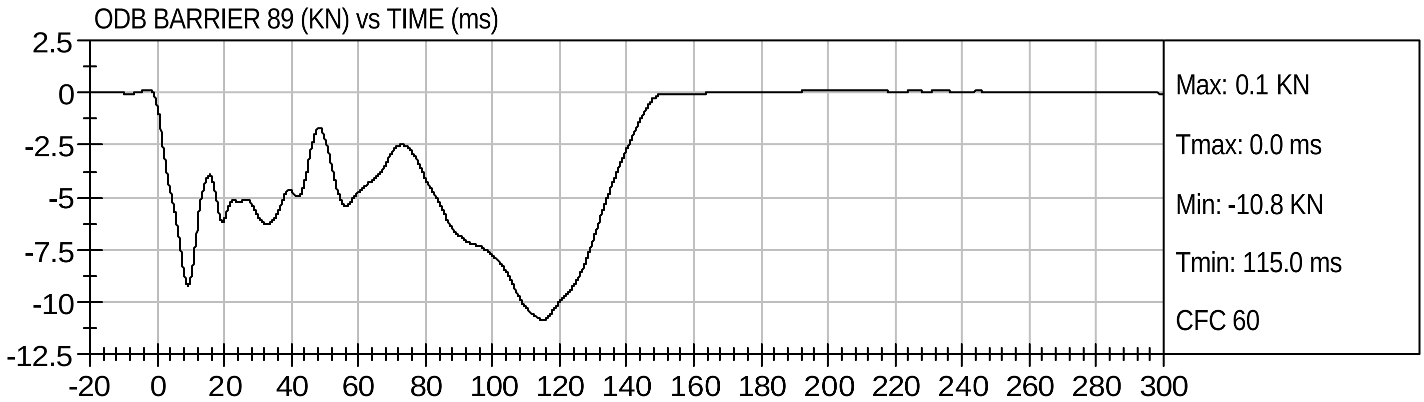


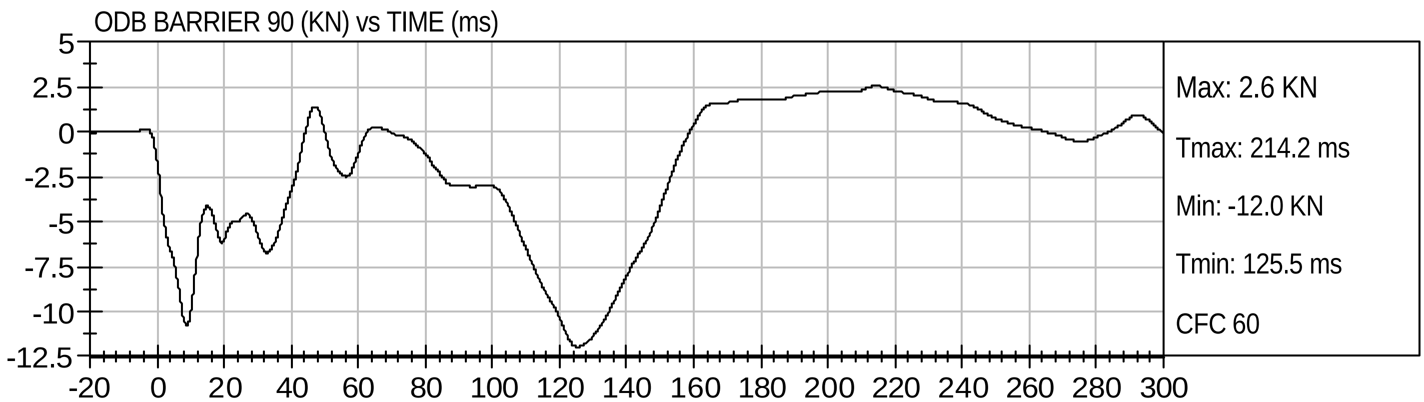
ODB BARRIER 88 (KN) vs TIME (ms)



NHTSA 50% OFFSET PDB FRONTAL
2007 FORD 500 R70205

Test Date: 04/02/2008
Speed: 37.2 mph (59.9 km/h)





APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 202 **Test ID:** D08481

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Peak Resultant Acceleration	G's	225 - 275	256	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	2.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Gall

Laboratory Technician

2/27/08

Test Date

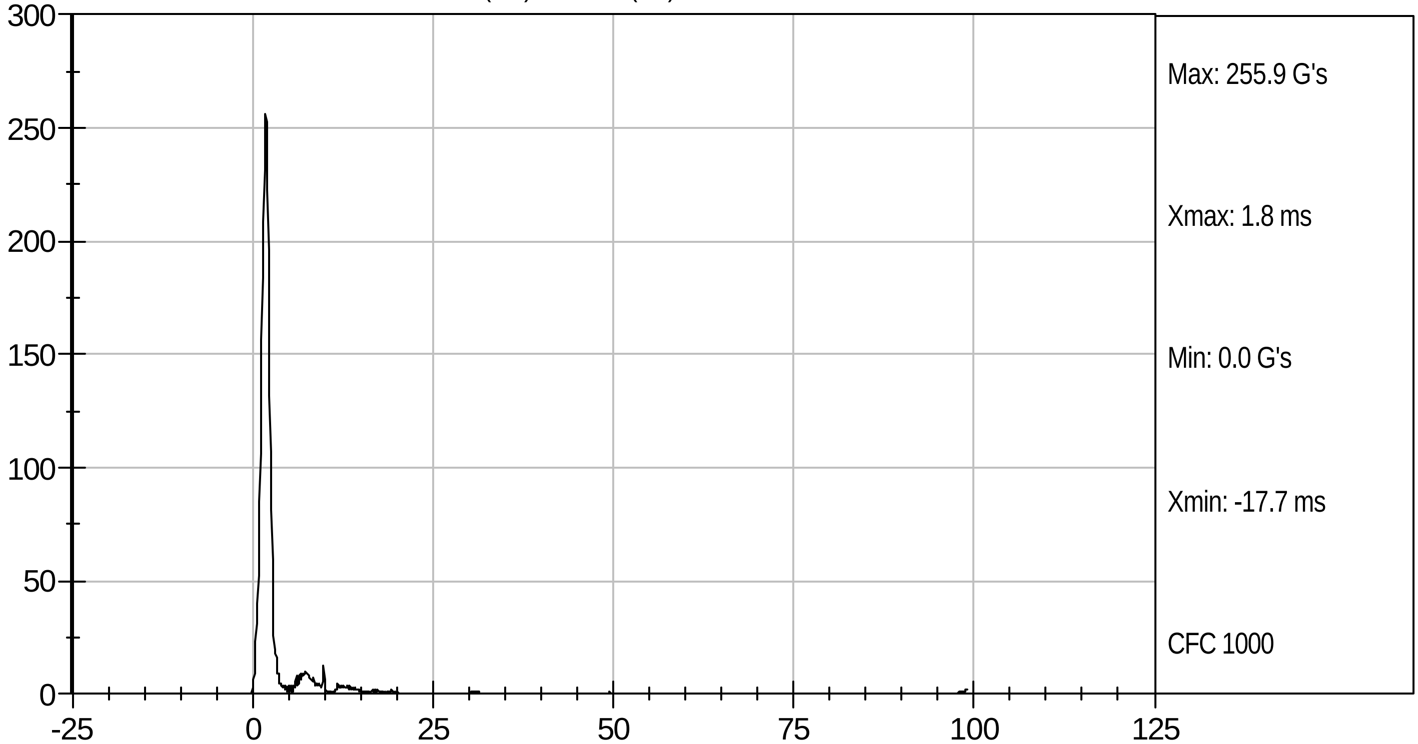
David Winkelbauer

Approved By

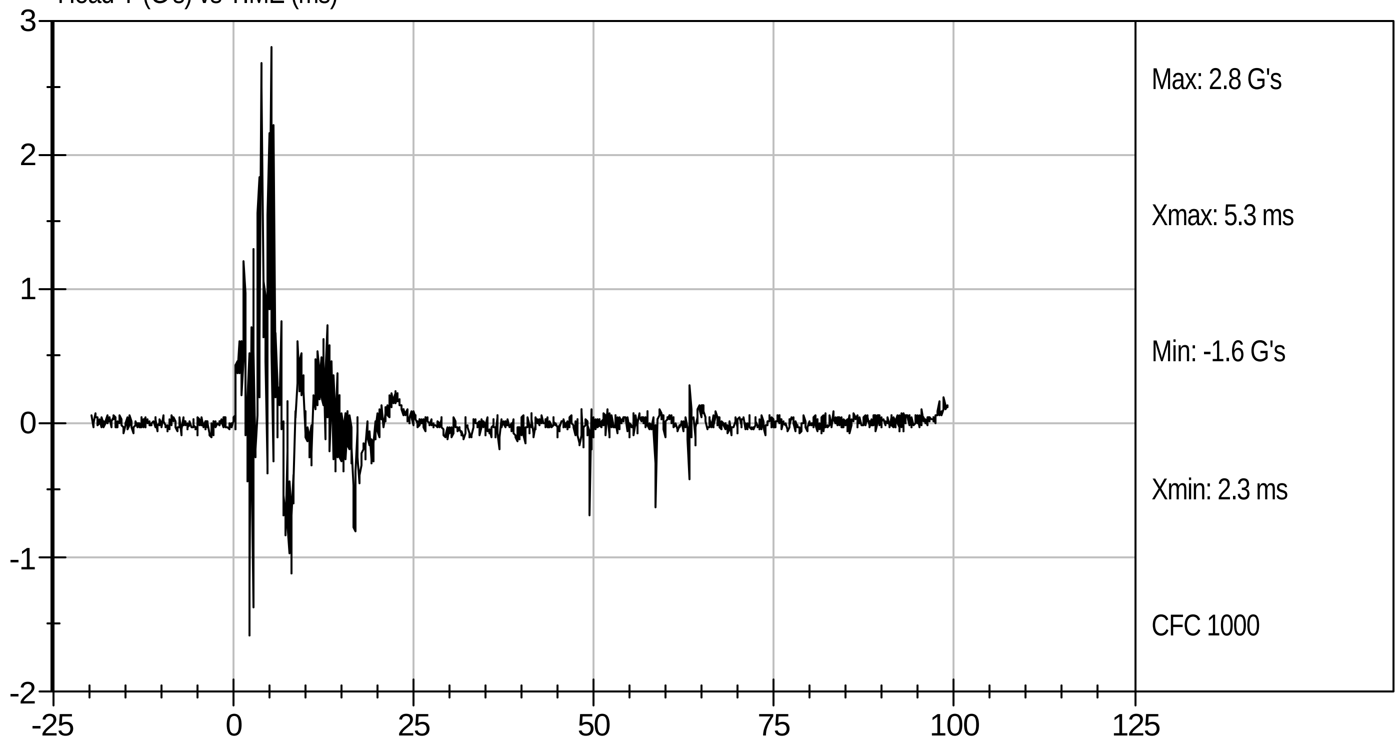
Test Desc: Head Drop
Component ID: D08481

Test Date: 2/27/08
Velocity: 0 ft/s, 0.00 m/s

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



Head Y (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 202 **Test I.D:** D08482

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity		%	10 to 70	13	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	26.22	Pass
	20 msec	G's	17.60 to 22.60	20.16	Pass
	30 msec	G's	12.50 to 18.50	13.66	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	14.11	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	37.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	72.4	Pass
	Time	msec	57.0 to 64.0	57.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	114.8	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	96.0	Pass
	Time	msec	47.0 to 58.0	50.4	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	97.6	Pass

Overall Test Results	Pass

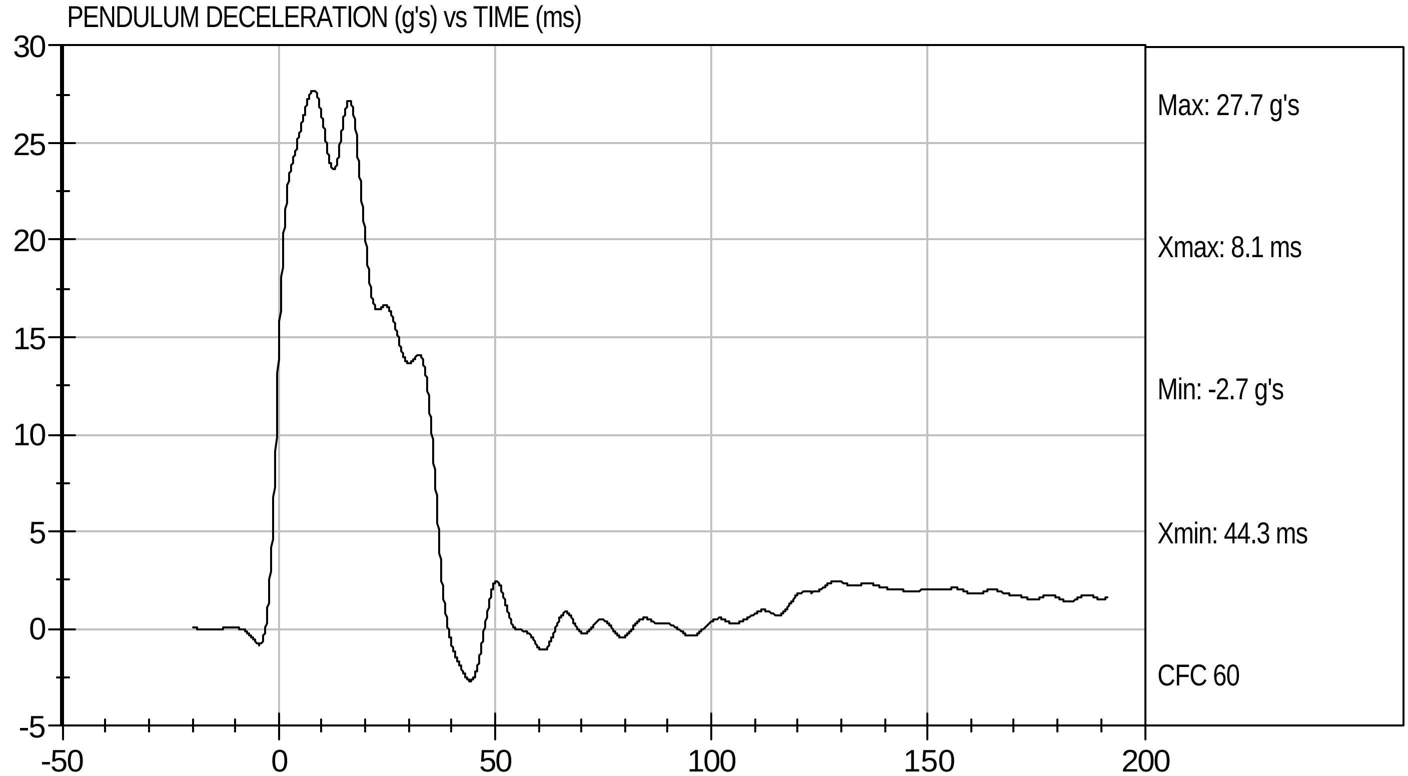
Tim Bratz
Laboratory Technician

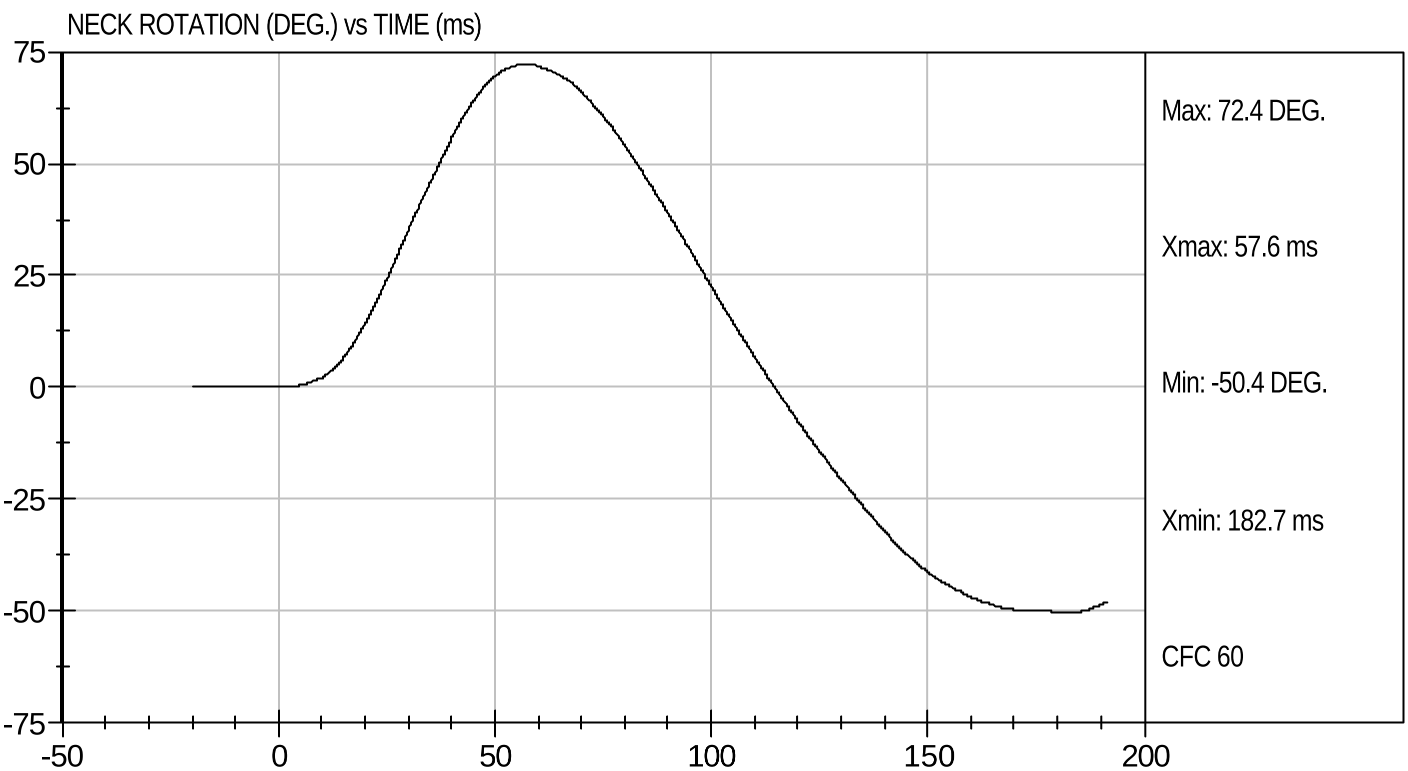
2/28/08
Test Date

David Winkelbauer
Approved By

Test Desc: Neck Flexion
Component ID: D08482

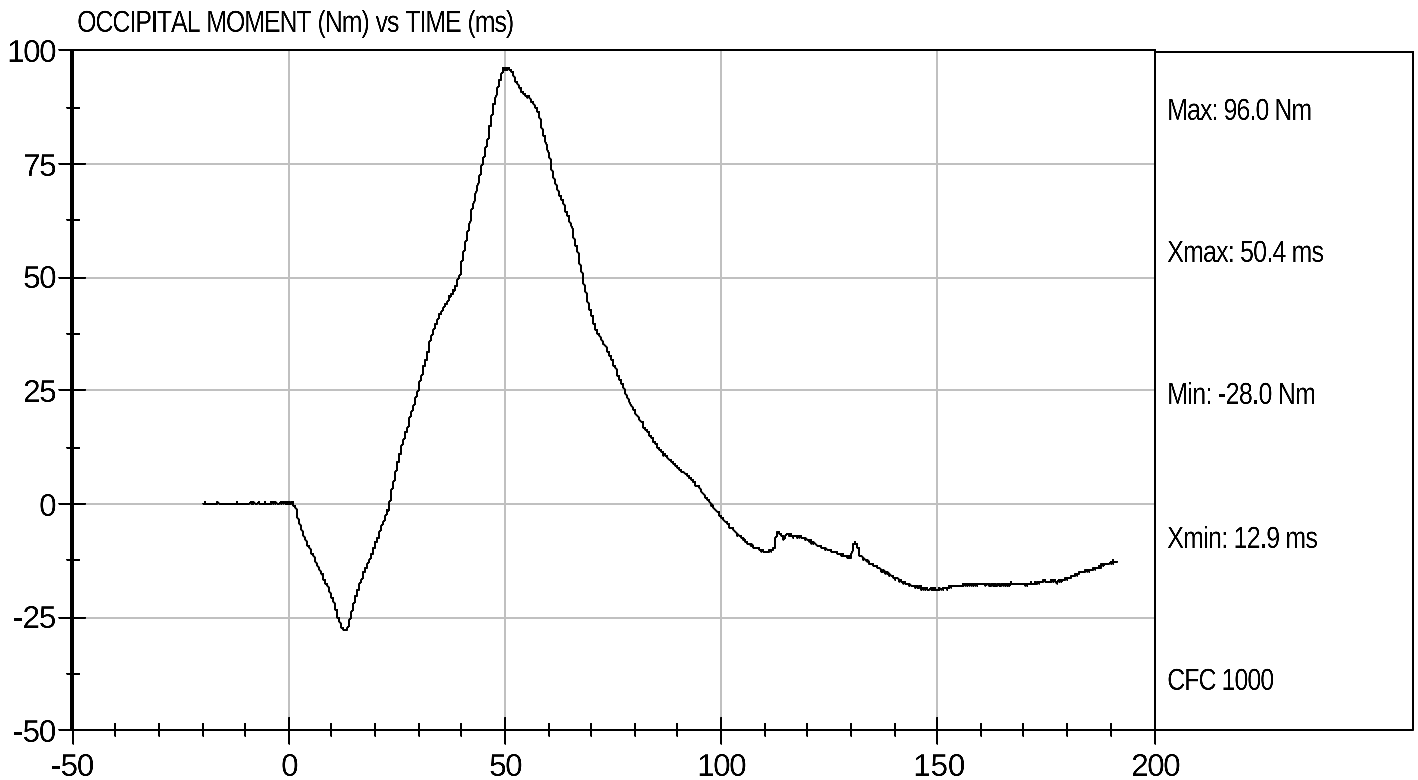
Test Date: 2/28/08
Velocity: 23.14 ft/s, 7.05 m/s





Test Desc: Neck Flexion
Component ID: D08482

Test Date: 2/28/08
Velocity: 23.14 ft/s, 7.05 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 202 **Test I.D:** D08483

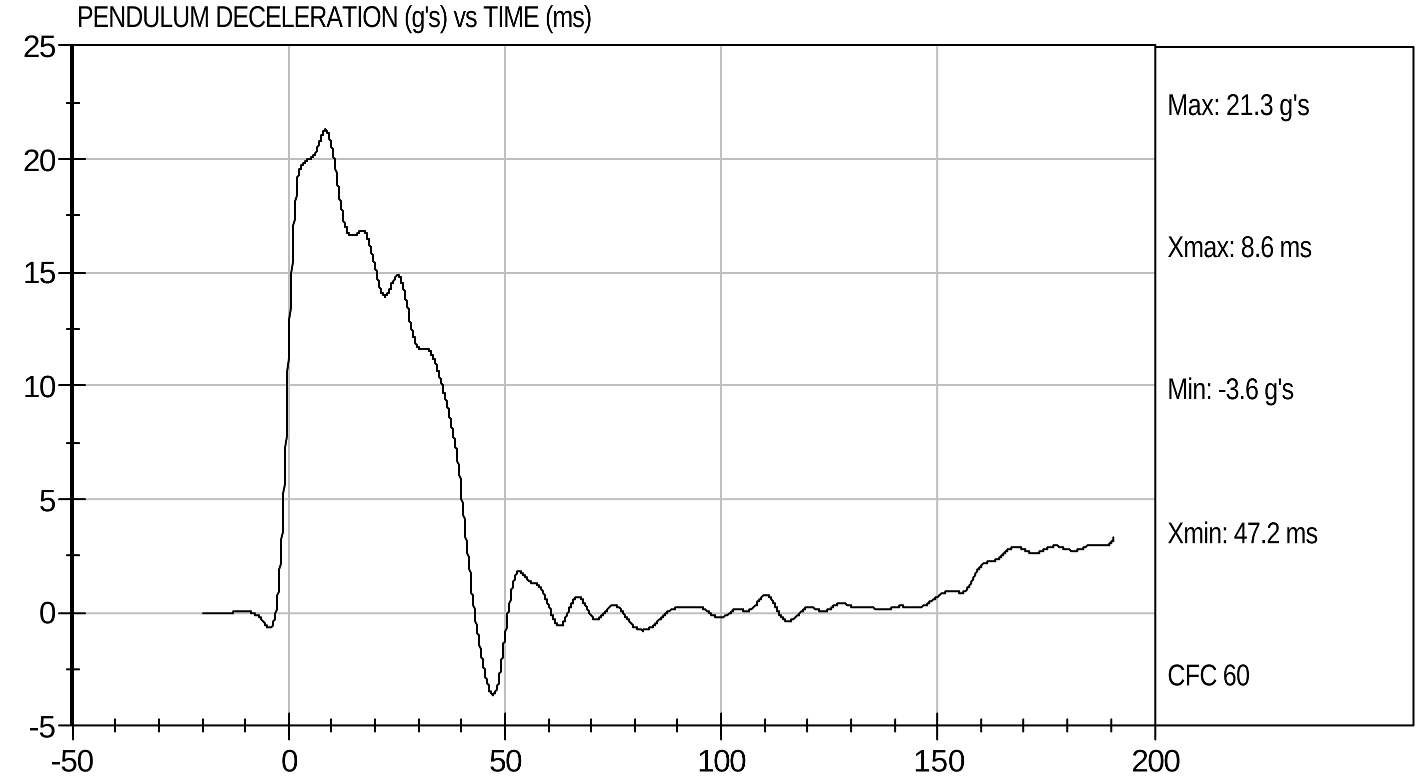
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity		%	10 to 70	14	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	20.43	Pass
	20 msec	G's	14.00 to 19.00	15.21	Pass
	30 msec	G's	11.00 to 16.00	11.67	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	11.65	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	40.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.9	Pass
	Time	msec	72.0 to 82.0	79.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	156.7	Pass
Moment About Occipital Condyle	Maximum	N m	-52.9 to -79.9	-63.0	Pass
	Time	msec	65.0 to 79.0	71.2	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	140.7	Pass
			Overall Test Results		Pass

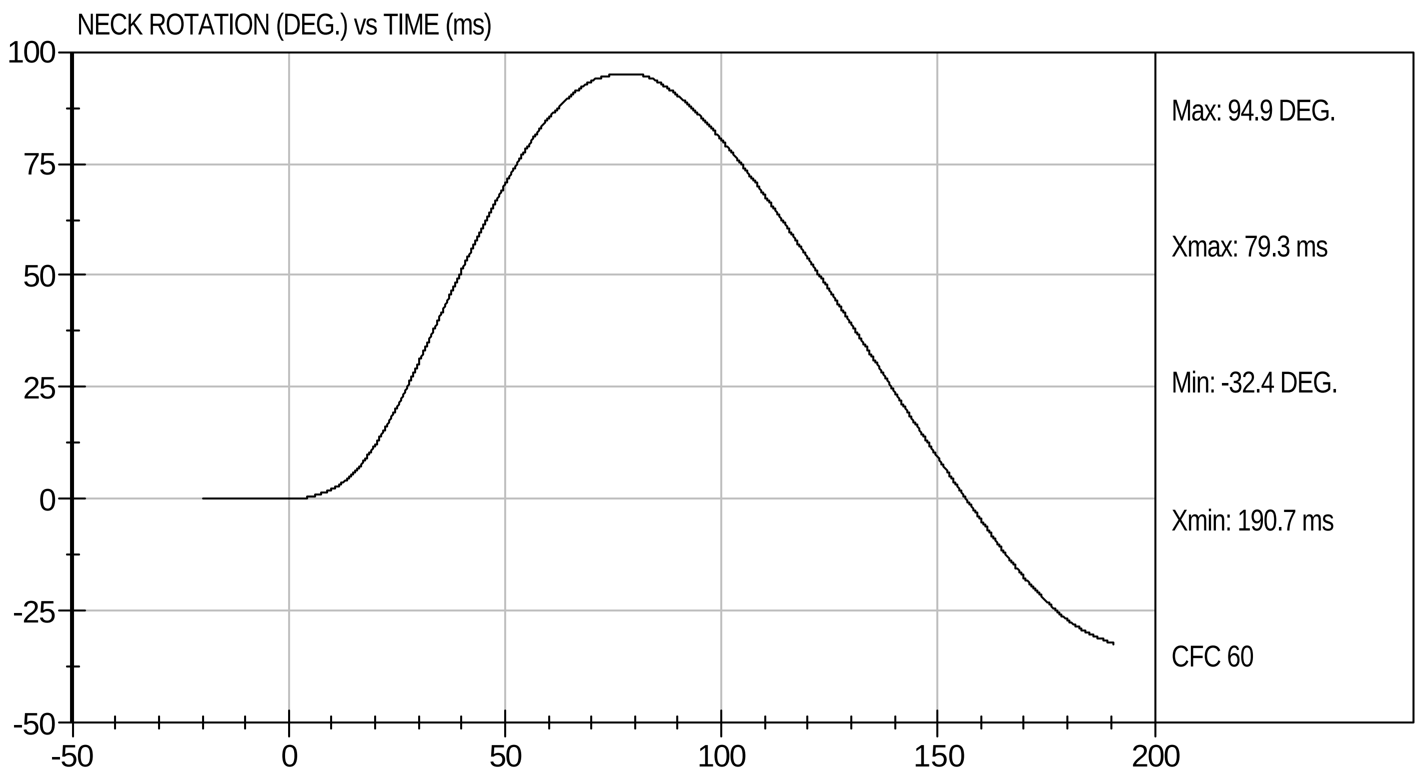
Tim Bratz
Laboratory Technician

2/28/08
Test Date

David Winkelbauer
Approved By

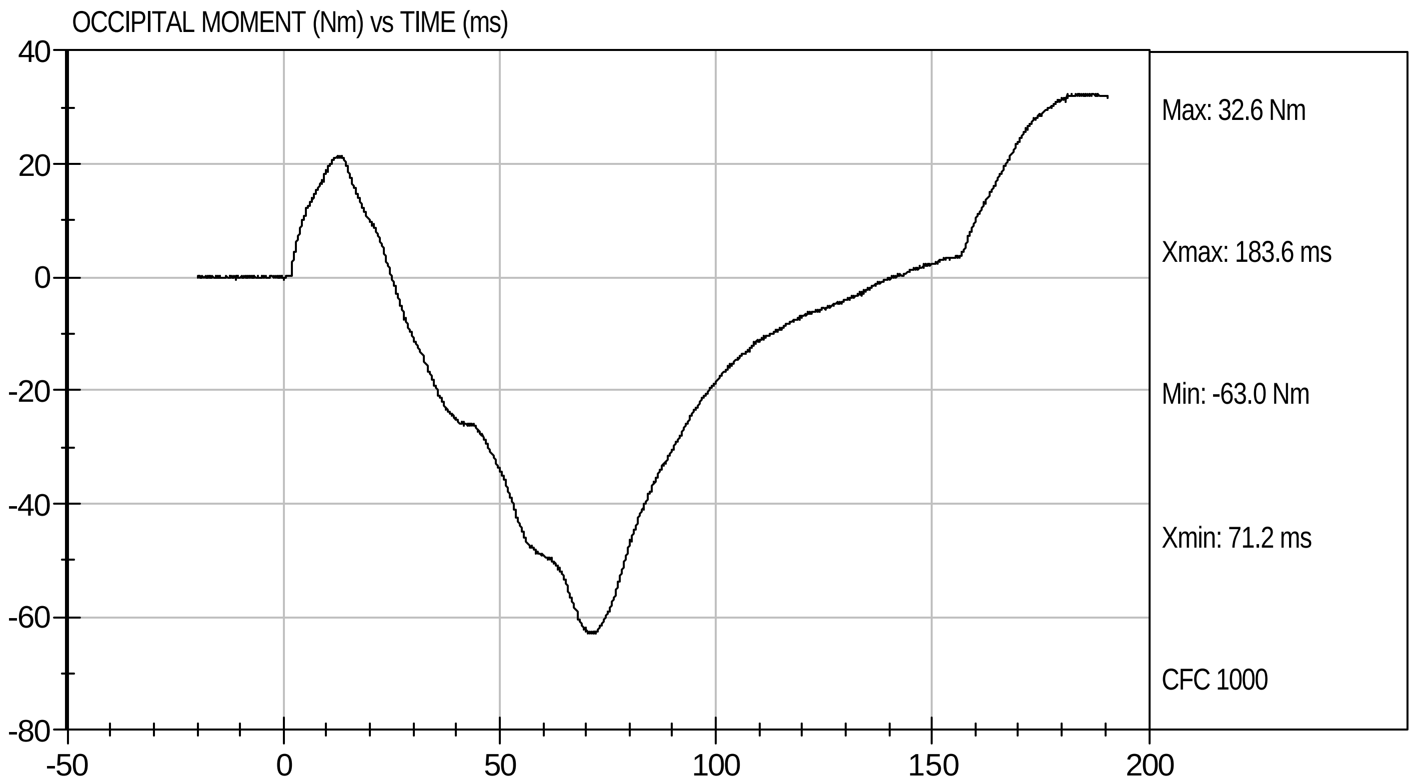
Test Desc: Neck Extension	Test Date: 2/28/08
Component ID: D08483	Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D08483

Test Date: 2/28/08
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 202 **Test I.D:** D08484

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,715	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.48	Pass
Internal Hysteresis	%	69 to 85	71	Pass
		Overall Test Results		Pass

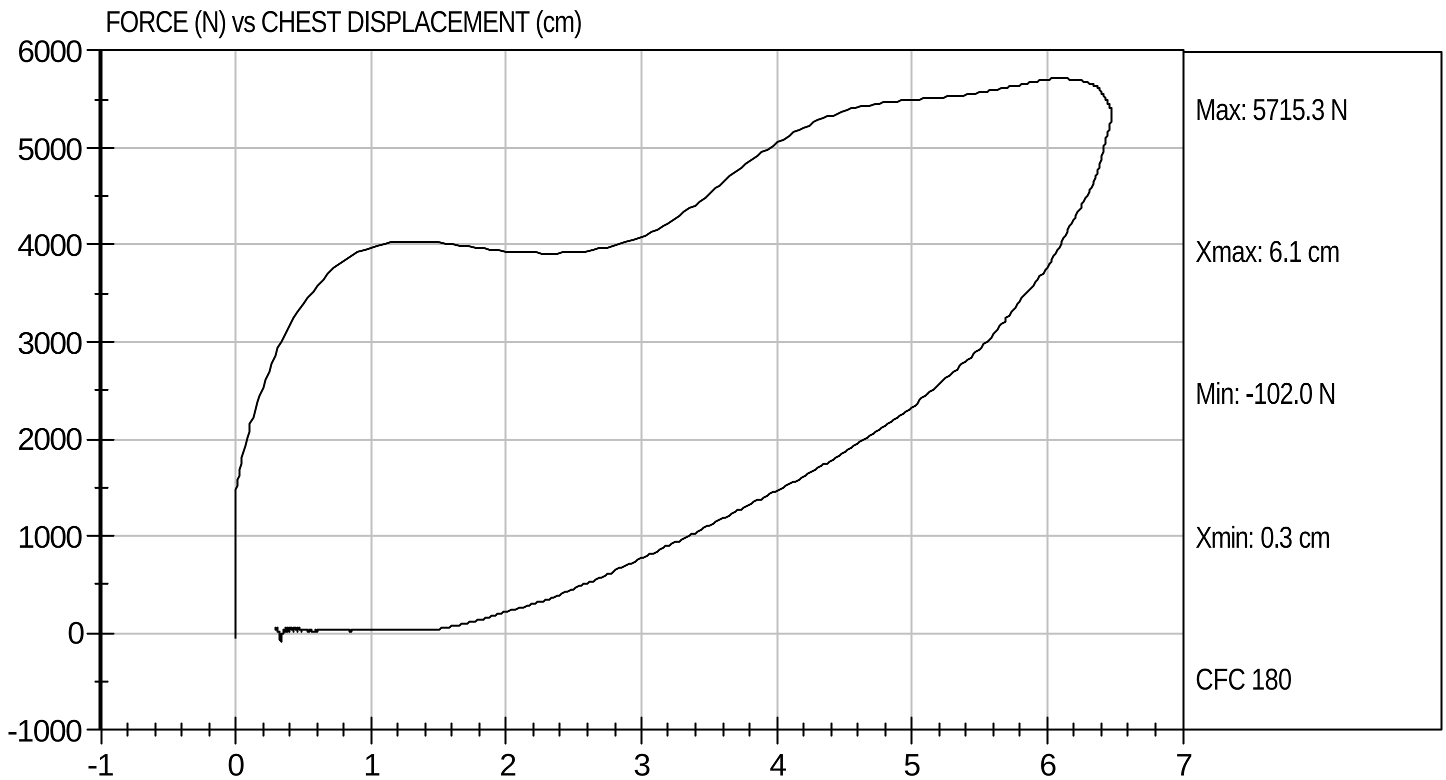
Jessica Gall
Laboratory Technician

2/27/08
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D08484

Test Date: 2/27/08
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 202 **Test I.D:** D08485

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.1	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,346	Pass
		Overall Test Results		Pass

Laboratory Technician

3/4/08

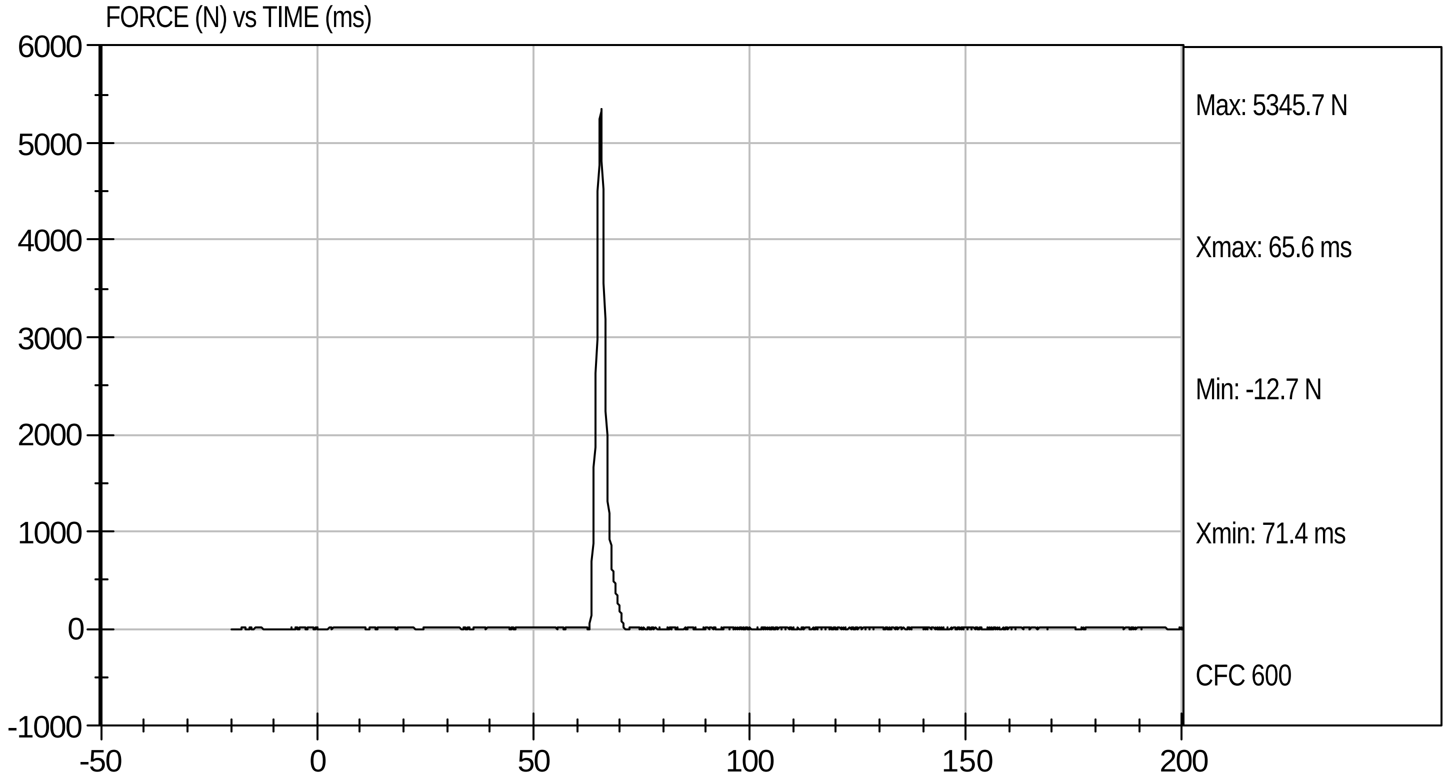
Test Date

David Winkelbauer

Approved By

Test Desc: Right Knee
Component ID: D08485

Test Date: 3/4/08
Velocity: 6.89 ft/s, 2.10 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 202 **Test I.D:** D08486

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.1	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,223	Pass
		Overall Test Results		Pass

Laboratory Technician

3/4/08

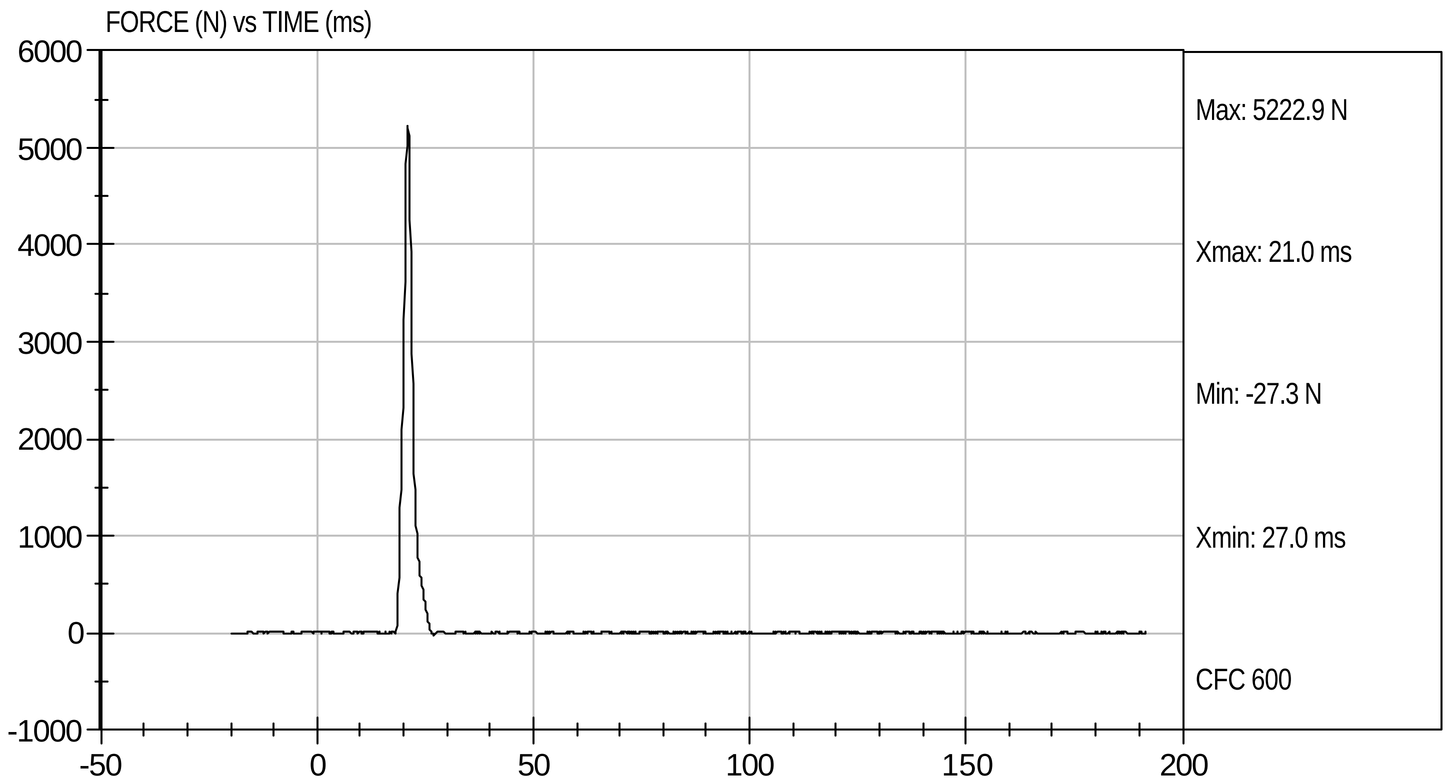
Test Date

David Winkelbauer

Approved By

Test Desc: Left Knee
Component ID: D08486

Test Date: 3/4/08
Velocity: 6.89 ft/s, 2.10 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 202 **Test I.D:** D08480

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.3	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	17	17	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	86.5	83.6	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	41	43	Pass
		Overall Test Results			Pass

Laboratory Technician

2/27/08

Test Date

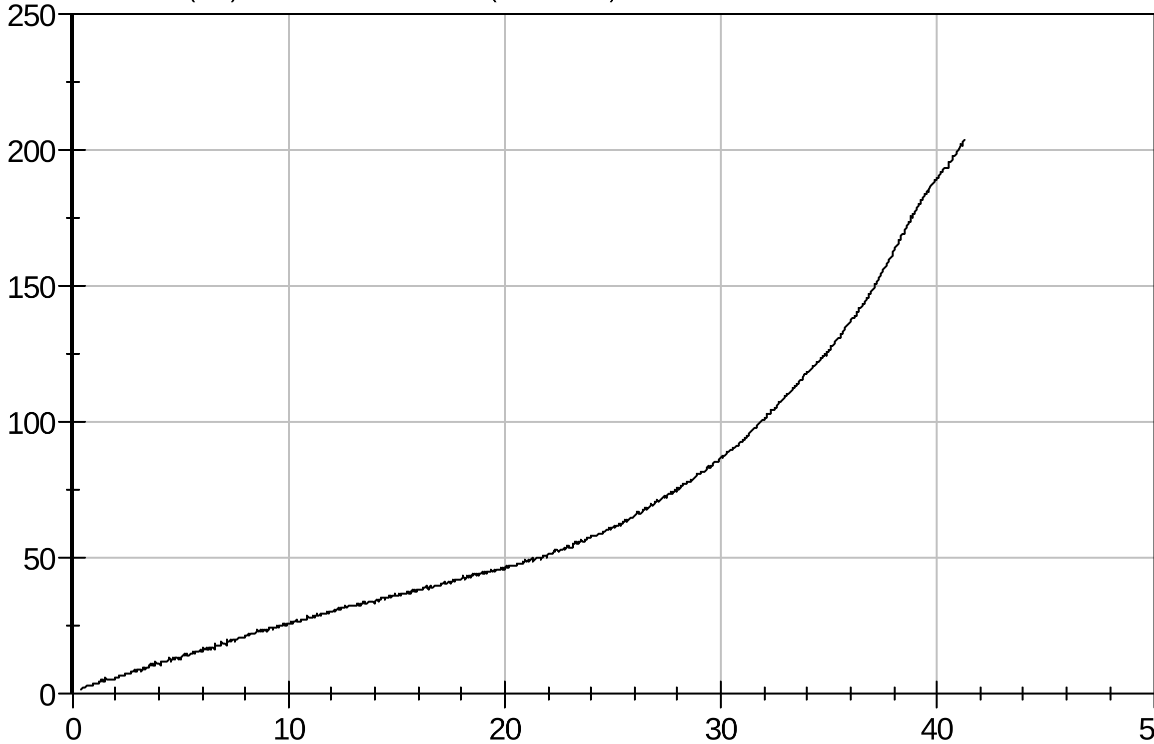
David Winkelbauer

Approved By

Test Desc: Hip Femur Flexion
Component ID: D08489

Test Date: 2/27/08
Velocity: 0 ft/s, 0.00 m/s

MOMENT (Nm) vs FEMUR ROTATION (DEGREES)



Max: 203.6 Nm

Xmax: 41.2 DEGREES

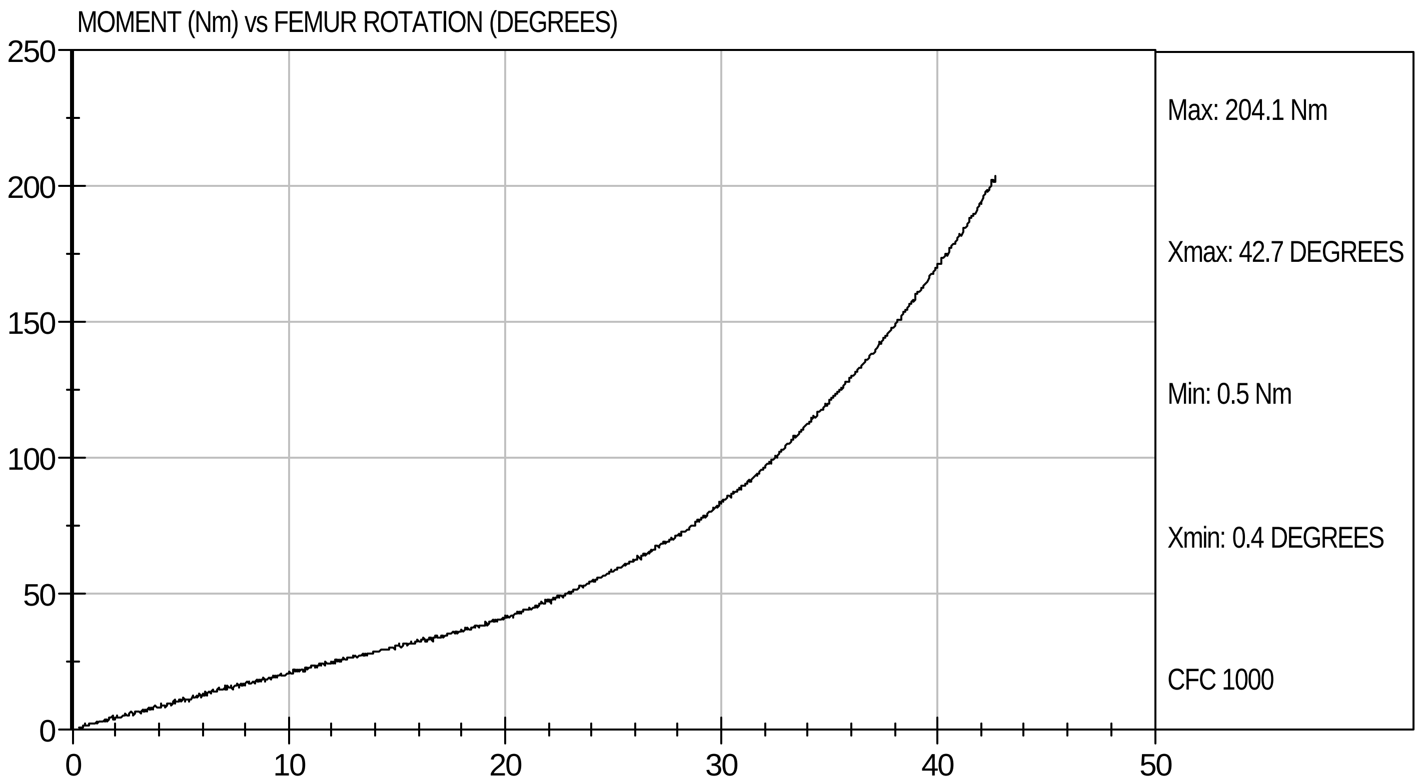
Min: 1.4 Nm

Xmin: 0.4 DEGREES

CFC 1000

Test Desc: Hip Femur Flexion
Component ID: D08480

Test Date: 2/27/08
Velocity: 0 ft/s, 0.00 m/s



CERTIFICATION DATA

THOR Lx Legs #036 & #037

Installed in Hybrid III 50th Percentile Male Dummy #202

GESAC, INC

DESIGN | MANUFACTURE | TEST | SOFTWARE DEVELOPMENT | ERGONOMICS
125 Orchard Drive, Boonsboro, MD 21713
Tel (301) 432-5885 Fax (301) 432-6199

Thor-LX Test Report

Dynamic Ball of Foot Impact Test (page 1)

Engineer	S.Kamalakkannan	**Test Date**	February 27, 2008
		Temp (C)/Hum.(%)	21.7/23
Customer	MGA	**Serial No.**	LX037
Description	Right Lower Extremities		

Testing Summary

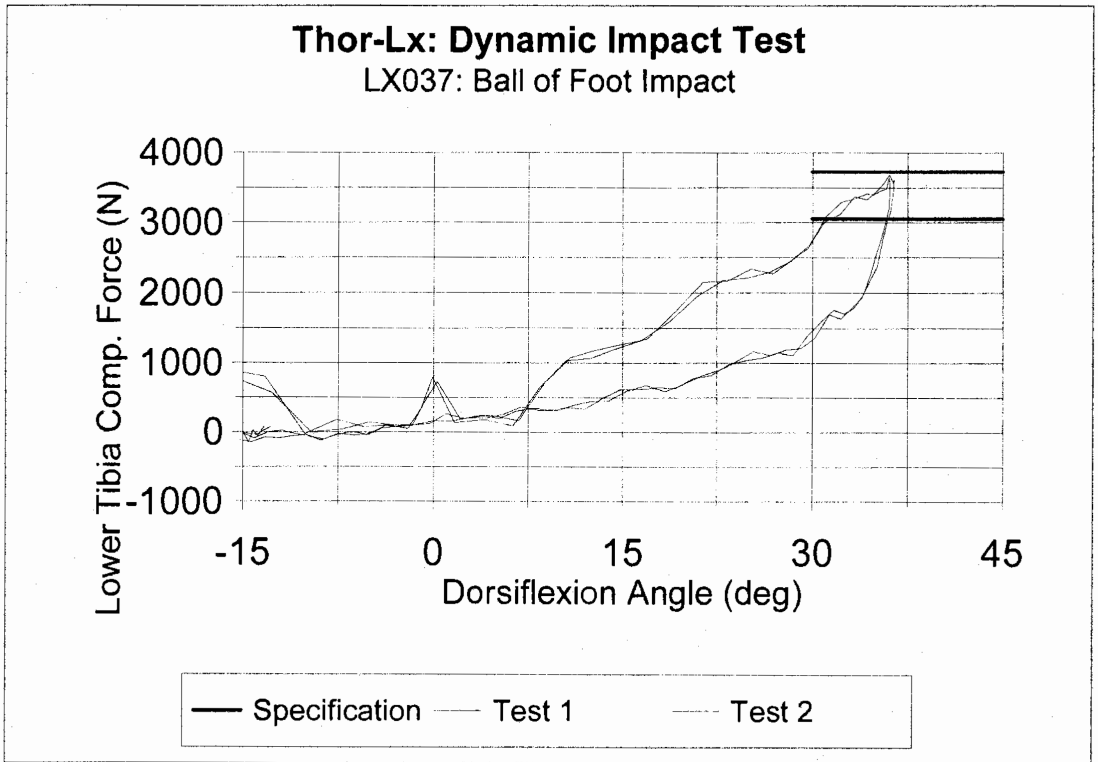
Impact Speed	5.0 m/s	**Scan Rate**	10000 scans/sec
Impact Effective Mass	5.0 kg	**Filter**	CFC 600
Impactor	NHTSA Dynamic Impactor (TLX-9000-013)		

Response

Peak Lower Tibia Compressive Force* (N)	Specification (N)	Within Reference
3667	**3058 - 3738**	Yes

*Average Value

Test Plot



Tested by: K. Salh Bl. Date: 2/27/08

Analyzed by: K. Salh Bl. Date: 2/27/08

GESAC, INC
DESIGN | MANUFACTURE | TEST | SOFTWARE DEVELOPMENT | ERGONOMICS
125 Orchard Drive, Boonsboro, MD 21713
Tel (301) 432-5885 Fax (301) 432-6199

Thor-LX Test Report

Dynamic Ball of Foot Impact Test (page 2)

Engineer	S.Kamalakkannan	**Test Date**	February 27, 2008
		Temp (C)/Hum.(%)	21.7/23
Customer	MGA	**Serial No.**	LX037
Description	Right Lower Extremities		

Testing Summary

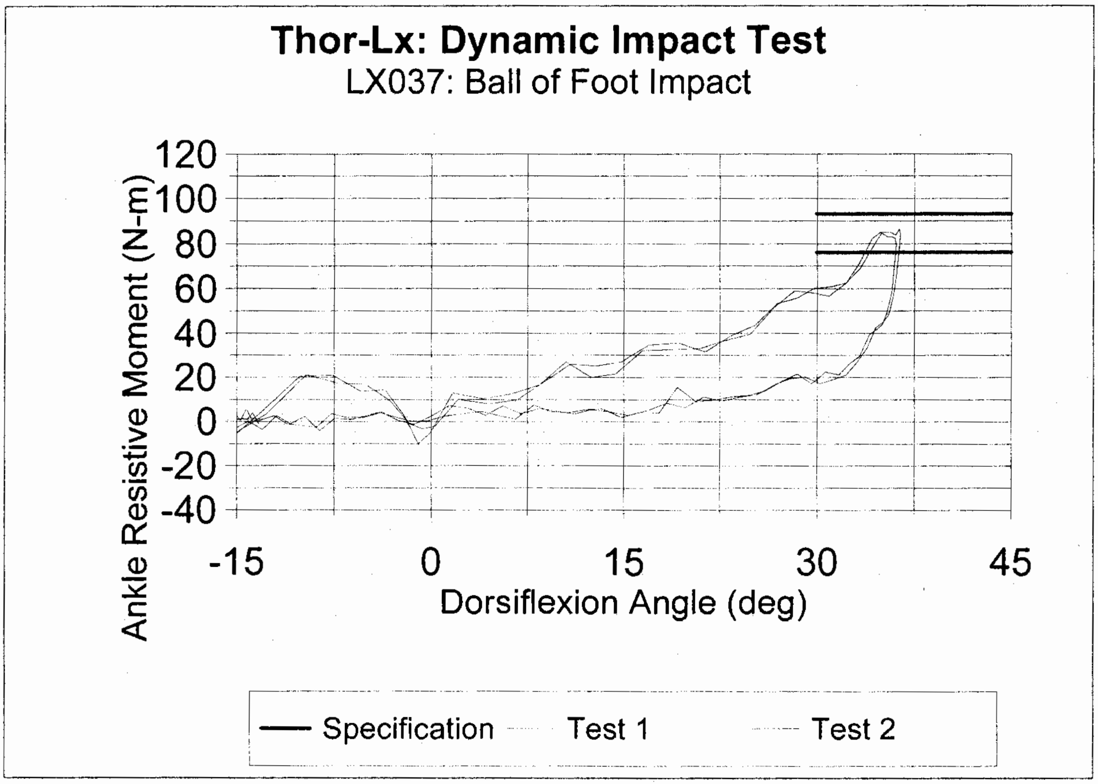
Impact Speed	5.0 m/s	**Scan Rate**	10000 scans/sec
Impact Effective Mass	5.0 kg	**Filter**	CFC 600
Impactor	NHTSA Dynamic Impactor (TLX-9000-013)		

Response

Peak Ankle Resistive Moment* (N-m)	Specification (N-m)	Within Reference
85.8	76.2 - 93.2	Yes

*Average Value

Test Plot



Tested by: K. Salh Bl. Date: 2/27/08

Analyzed by: K. Salh Bl. Date: 2/27/08

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Thor-LX Test Report

Dynamic Heel of Foot Impact Test

Engineer	S.Kamalakkannan	**Test Date**	February 27, 2008
		Temp (C)/Hum.(%)	20.7/23
Customer	MGA	**Serial No.**	LX037
Description	Right Lower Extremities		

Testing Summary

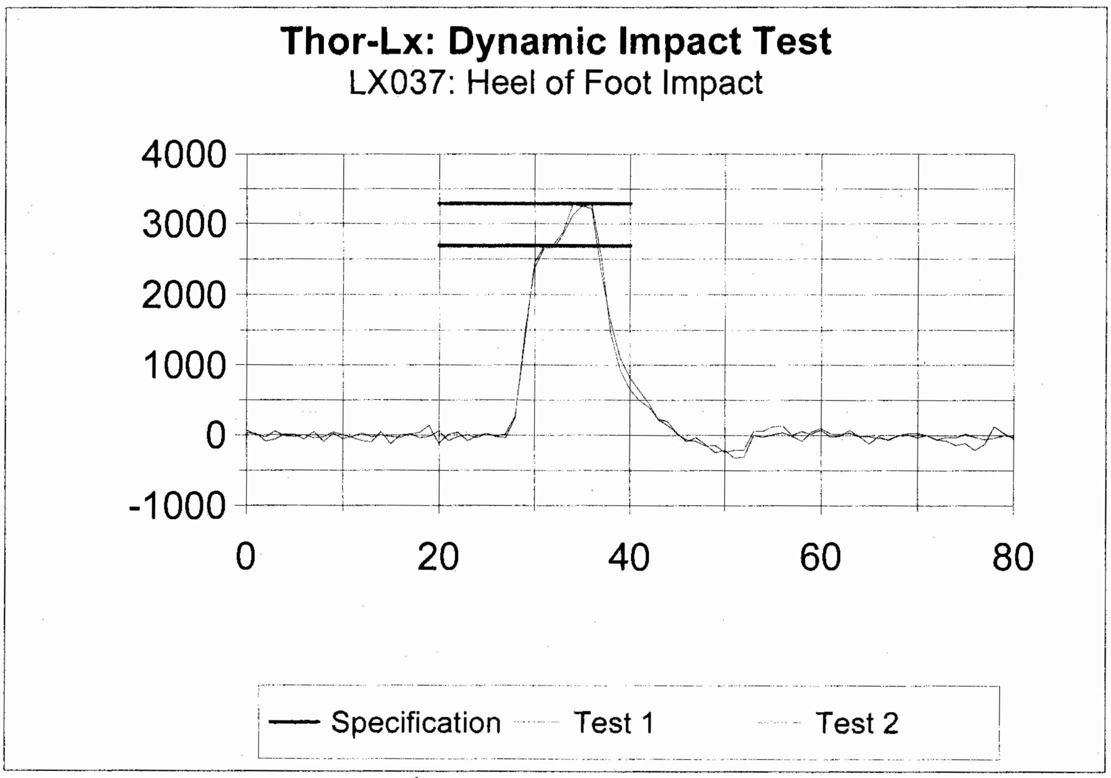
Impact Speed	4.0 m/s	**Scan Rate**	10000 scans/sec
Impact Effective Mass	5.0 kg	**Filter**	CFC 600
Impactor	NHTSA Dynamic Impactor (TLX-9000-013)		

Response

Peak Lower Tibia Compressive Force* (N)	Specification (N)	Within Reference
3272	**2694 - 3292**	Yes

*Average Value

Test Plot



Tested by: K. Suth Bal Date: 2/27/08

Analyzed by: K. Suth Bal Date: 2/27/08

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Thor-Lx Test Report

Inversion Quasi-Static Test

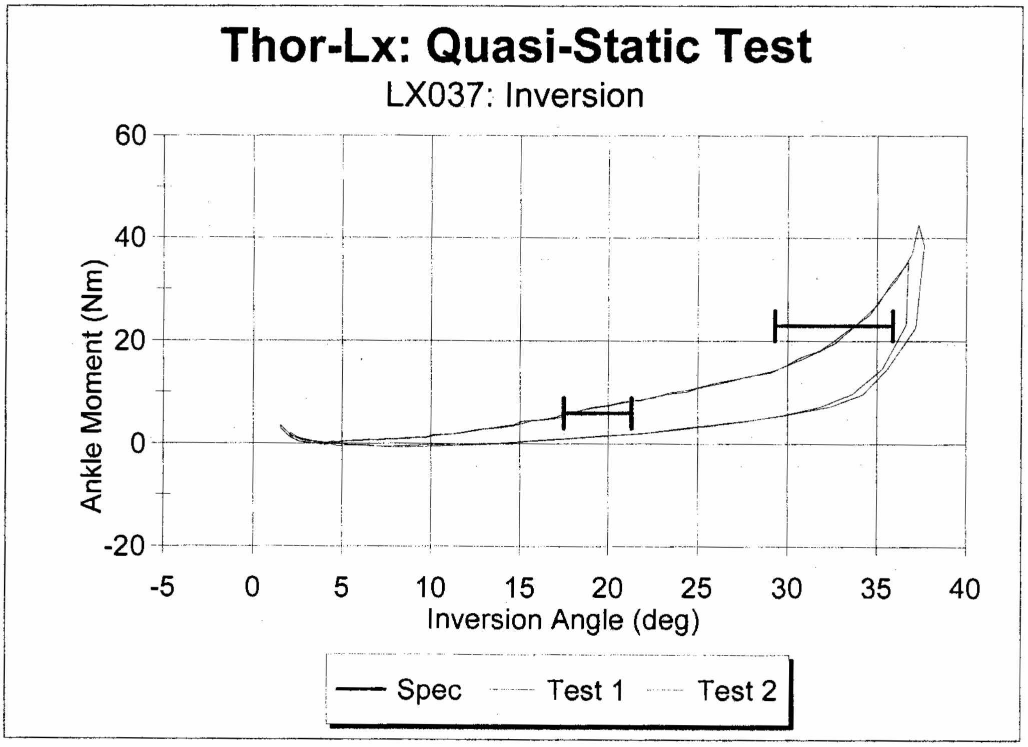
Engineer	S.Kamalakkannan	**Test Date**	February 28, 2008
		Temp. (C)/Hum.(%)	20.7/20
Customer	MGA	**Serial No.**	LX037
Description	Right Lower Extremity		

Testing Summary (Design Reference)

Ankle Moment (Nm)	Inversion Angle (Degree)	Reference Specification (Degree)	Within Reference?
6	17.8	17.5 - 21.3	Yes
23	33.8	29.3 - 35.9	Yes

*Average Value

Result Plot



Tested by: K. Salh Bl   Date: 2/28/08

Analyzed by: K. Salh Bl   Date: 2/28/08

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Thor-Lx Test Report

Eversion Quasi-Static Test

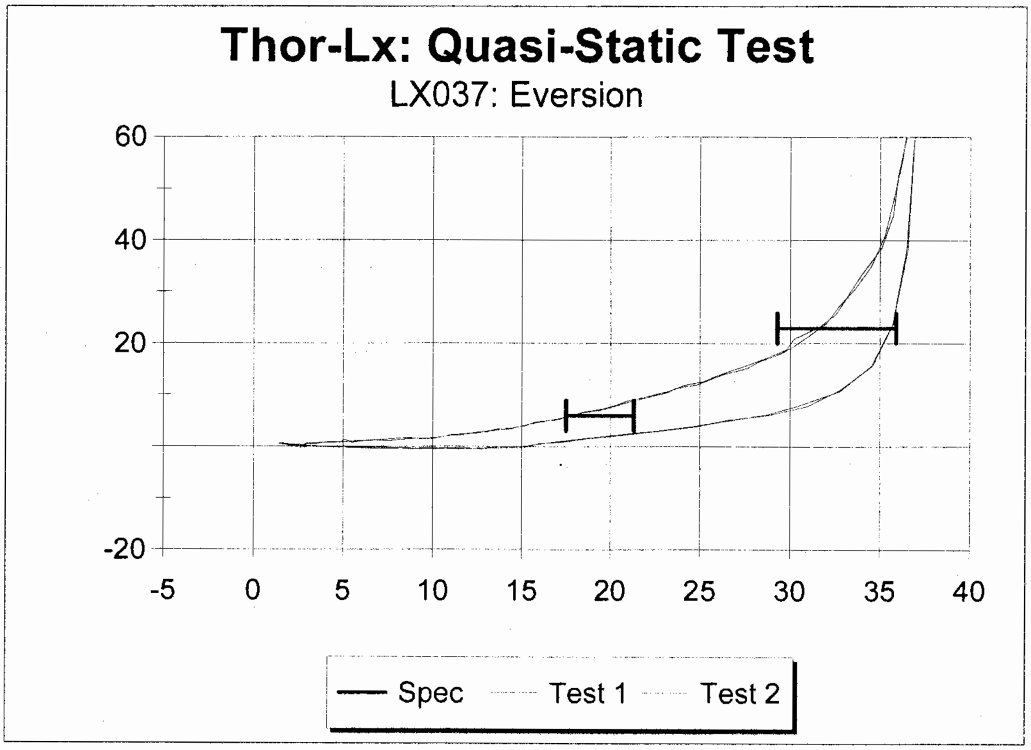
Engineer	S.Kamalakkannan	**Test Date**	February 28, 2008
		Temp. (C)/Hum.(%)	20.7/23
Customer	MGA	**Serial No.**	LX037
Description	Right Lower Extremity		

Testing Summary (Design Reference)

Ankle Moment (Nm)	Eversion Angle (Degree)	Reference Specification (Degree)	Within Reference?
6	17.8	**17.5 - 21.3**	Yes
23	31.6	**29.3 - 35.9**	Yes

*Average Value

Result Plot



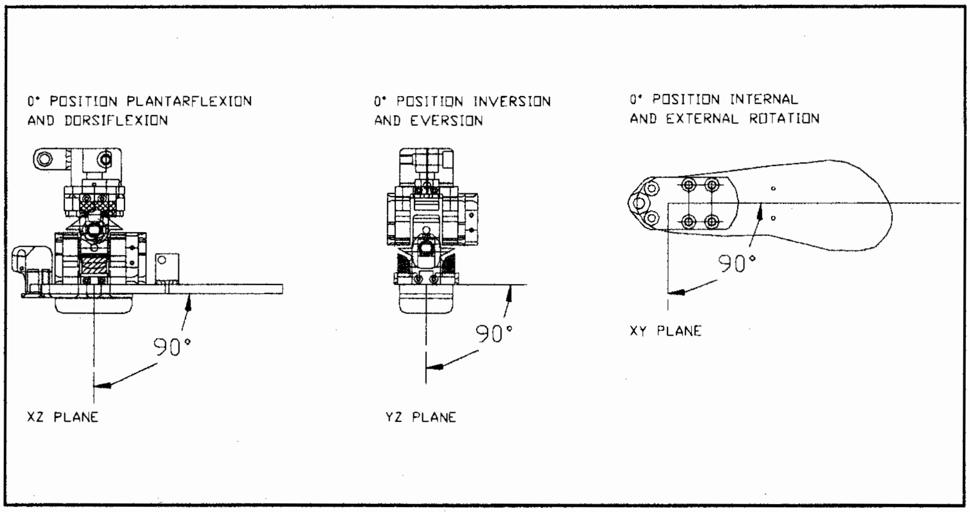
Tested by: K. Subh Bl Date: 2/28/08

Analyzed by: K. Subh Bl Date: 2/28/08

THOR - LX Rotary Potentiometer Calibration

The figure below shows the three primary calibration positions for the THOR-LX Rotary Potentiometer Units.

The following table provides the expected potentiometer outputs at 10V excitation for each of the positions shown in the Figure below. The X potentiometer measures inversion / eversion rotation; the Y potentiometer measures dorsiflexion / plantarflexion rotation, and the Z potentiometer measures internal and external rotation. The voltage for each potentiometer should be verified at the zero position prior to testing.



Rotary Potentiometer Calibrations for Right Leg - Serial # LX-037

Pot	**Rotary Pot Serial #**	**Sensitivity at 10 V Excitation**	**Units**	**Volts @ 0 Position**	**Units**
X	PD210-4B 7921-0368	31.71	Volts/Degree	5.01	Volts
Y	PD210-4B 7921-0369	32.10	Volts/Degree	4.92	Volts
Z	PD210-4B 7921-0370	31.88	Volts/Degree	4.90	Volts

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Thor-LX Test Report

Dynamic Ball of Foot Impact Test (page 1)

Engineer	S.Kamalakkannan	**Test Date**	February 26, 2008
		Temp (C)/Hum.(%)	21.7/21
Customer	MGA	**Serial No.**	LX036
Description	Left Lower Extremities		

Testing Summary

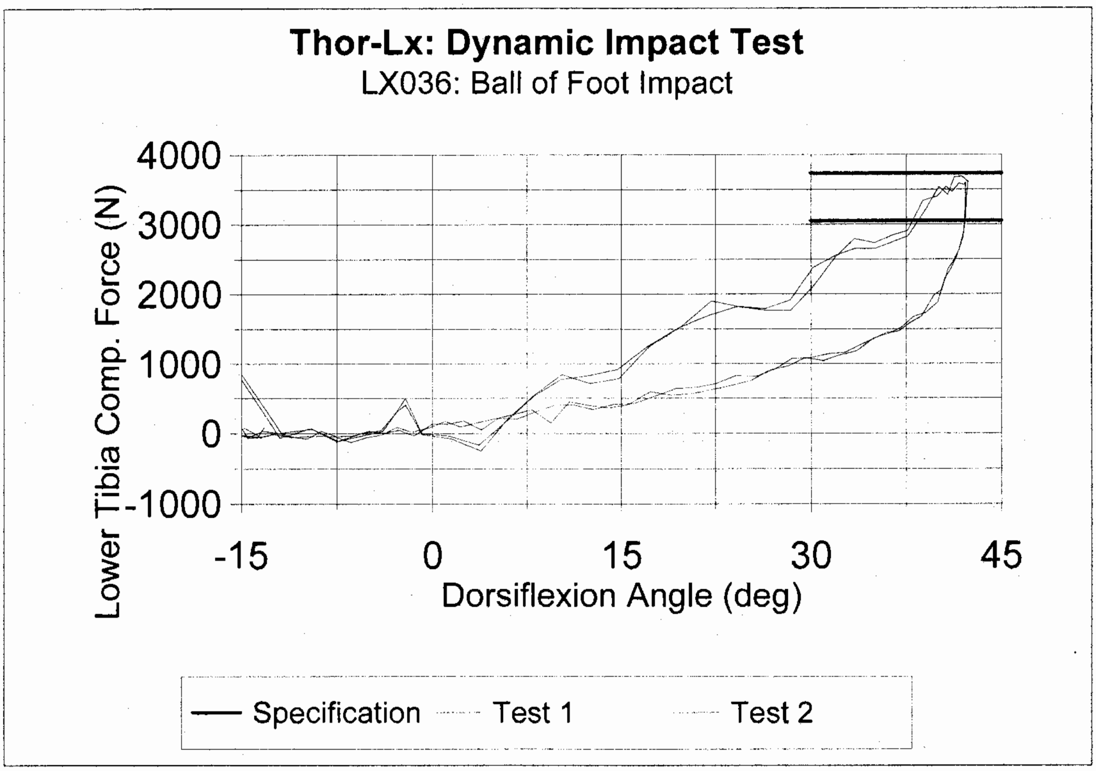
Impact Speed	5.0 m/s	**Scan Rate**	10000 scans/sec
Impact Effective Mass	5.0 kg	**Filter**	CFC 600
Impactor	NHTSA Dynamic Impactor (TLX-9000-013)		

Response

Peak Lower Tibia Compressive Force* (N)	Specification (N)	Within Reference
3645	**3058 - 3738**	Yes

*Average Value

Test Plot



Tested by: K. Salh Bl Date: 2/26/08

Analyzed by: K. Salh Rl Date: 2/26/08

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Thor-LX Test Report

Dynamic Ball of Foot Impact Test (page 2)

Engineer	S.Kamalakkannan	**Test Date**	February 26, 2008
		Temp (C)/Hum.(%)	21.7/21
Customer	MGA	**Serial No.**	LX036
Description	Left Lower Extremities		

Testing Summary

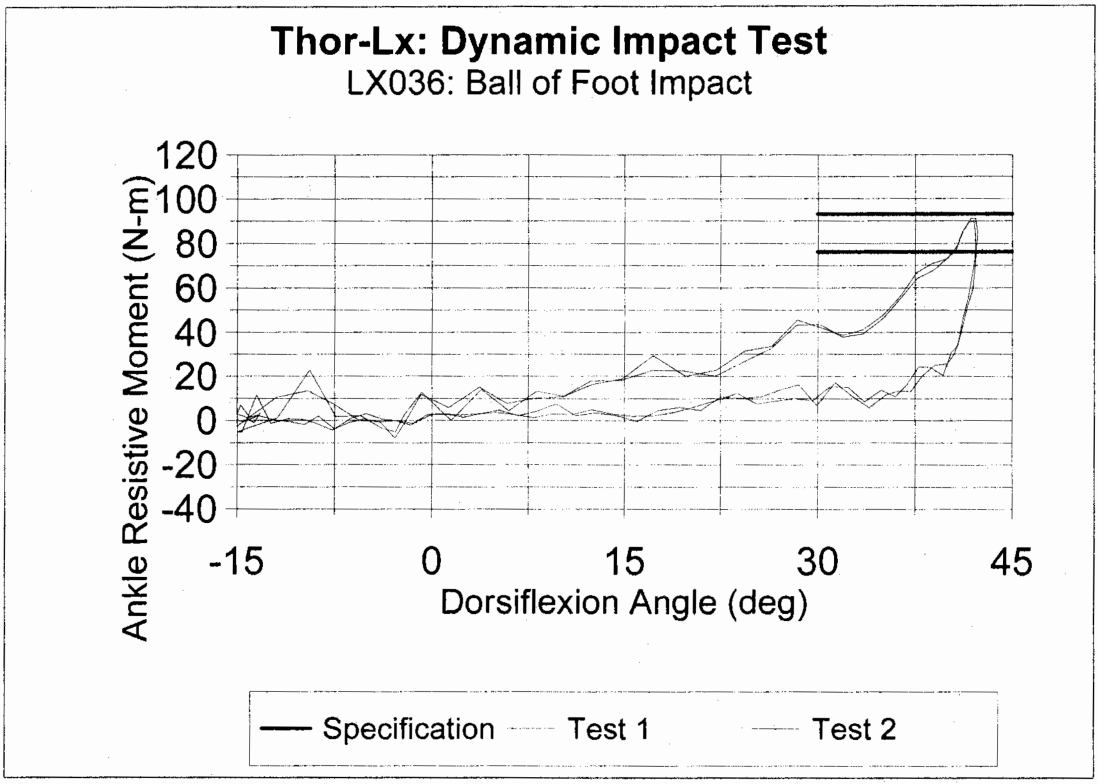
Impact Speed	5.0 m/s	**Scan Rate**	10000 scans/sec
Impact Effective Mass	5.0 kg	**Filter**	CFC 600
Impactor	NHTSA Dynamic Impactor (TLX-9000-013)		

Response

Peak Ankle Resistive Moment* (N-m)	Specification (N-m)	Within Reference
90.8	76.2 - 93.2	Yes

*Average Value

Test Plot



Tested by: K·Sukh Bl. Date: 2/26/08

Analyzed by: K·Sukh Bl Date: 2/26/08

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Thor-LX Test Report

Dynamic Heel of Foot Impact Test

Engineer	S.Kamalakkannan	**Test Date**	February 22, 2008
		Temp (C)/Hum.(%)	20.7/20
Customer	MGA	**Serial No.**	LX036
Description	Left Lower Extremities		

Testing Summary

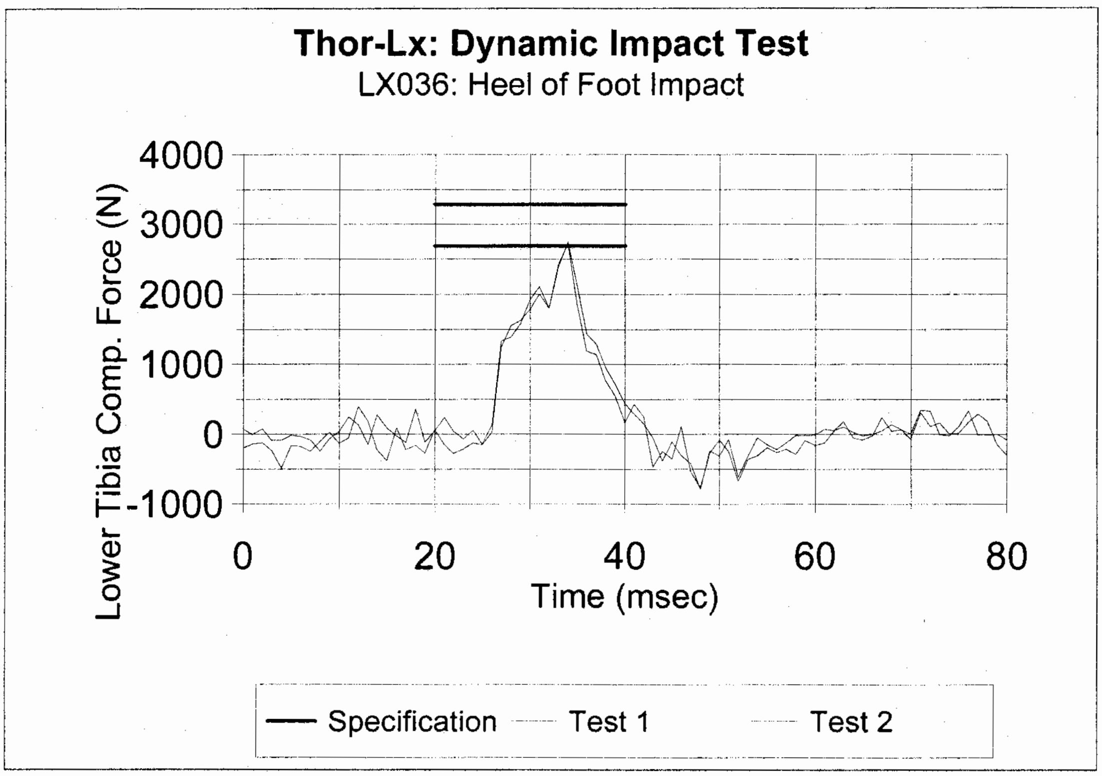
Impact Speed	4.0 m/s	**Scan Rate**	10000 scans/sec
Impact Effective Mass	5.0 kg	**Filter**	CFC 600
Impactor	NHTSA Dynamic Impactor (TLX-9000-013)		

Response

Peak Lower Tibia Compressive Force* (N	Specification (N)	Within Reference
2740	**2694 - 3292**	Yes

*Average Value

Test Plot



Tested by: K.Sulh Bl. Date: 2/22/08

Analyzed by: K.Sulh Bl. Date: 2/22/08

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Thor-Lx Test Report

Inversion Quasi-Static Test

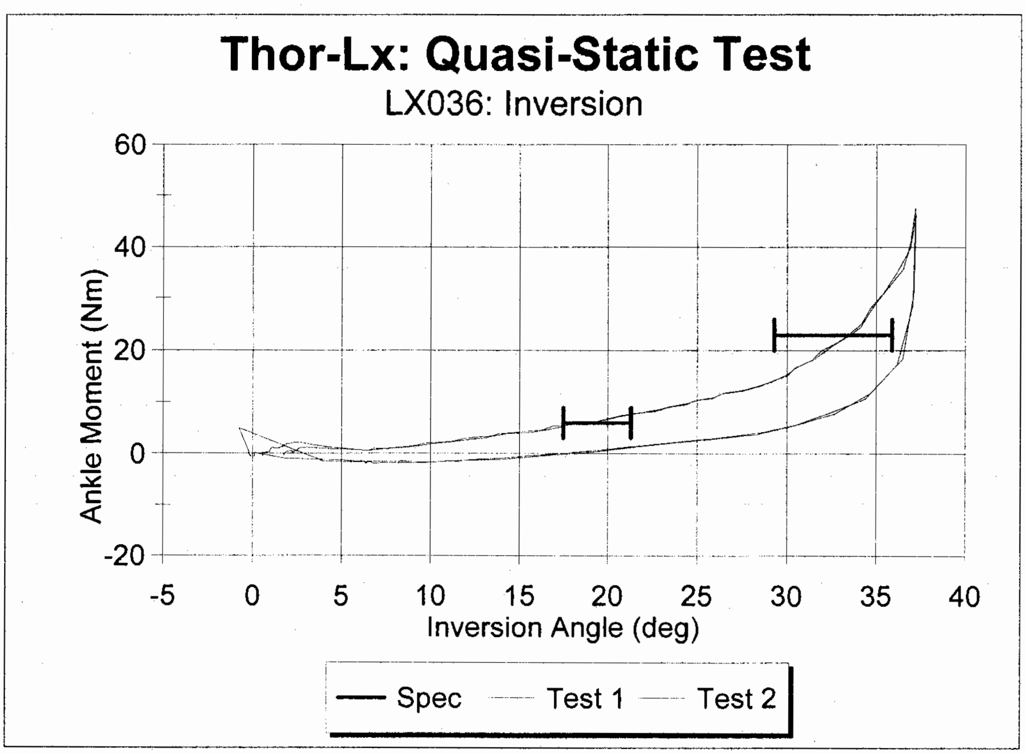
Engineer	S.Kamalakkannan	**Test Date**	February 26, 2008
		Temp. (C)/Hum.(%)	20.7/20
Customer	MGA	**Serial No.**	LX036
Description	Left Lower Extremity		

Testing Summary (Design Reference)

Ankle Moment (Nm)	Inversion Angle (Degree)	Reference Specification (Degree)	Within Reference?
6	18.5	**17.5 - 21.3**	Yes
23	33.5	**29.3 - 35.9**	Yes

*Average Value

Result Plot



Tested by: K. Sulh BJ Date: 2/26/08

Analyzed by: K. Sulh Bl Date: 2/26/08

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Thor-Lx Test Report

Eversion Quasi-Static Test

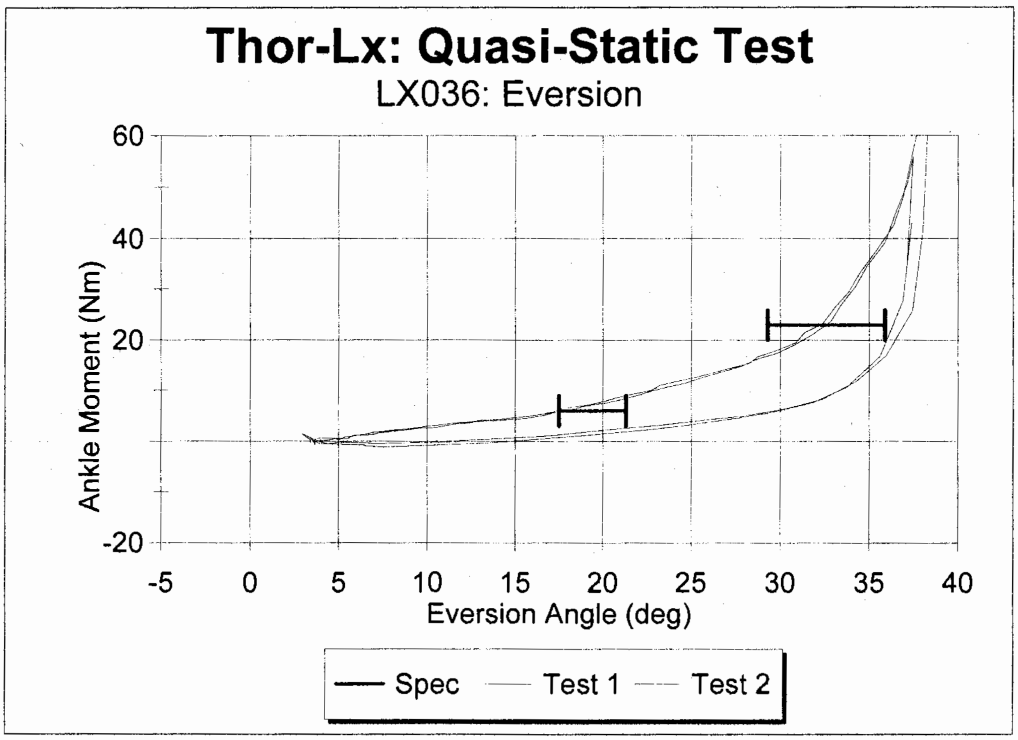
Engineer	S.Kamalakkannan	**Test Date**	February 27, 2008
		Temp. (C)/Hum.(%)	20.7/23
Customer	MGA	**Serial No.**	LX036
Description	Left Lower Extremity		

Testing Summary (Design Reference)

Ankle Moment (Nm)	Eversion Angle (Degree)	Reference Specification (Degree)	Within Reference?
6	17.6	**17.5 - 21.3**	Yes
23	32.4	**29.3 - 35.9**	Yes

*Average Value

Result Plot



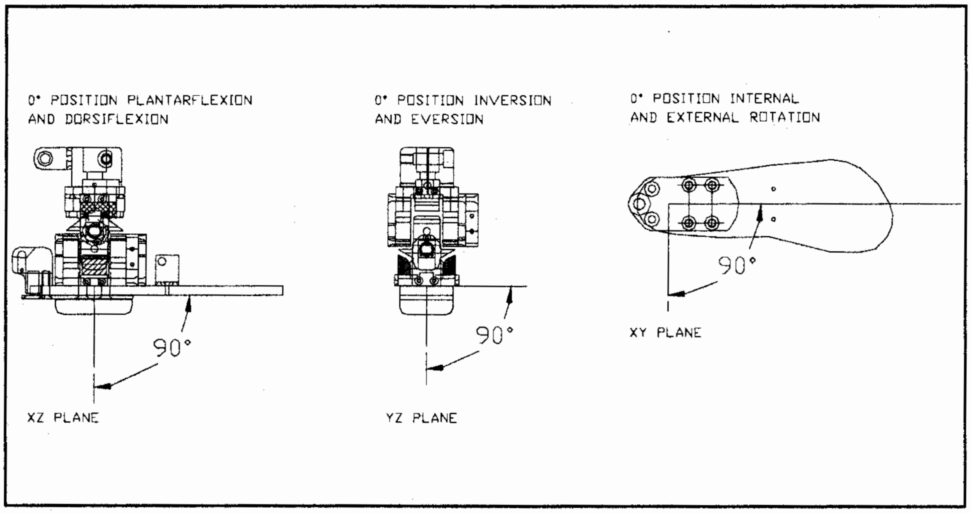
Tested by: K. Selh Bl. Date: 2/27/08

Analyzed by: K. Selh Bl. Date: 2/27/08

THOR - LX Rotary Potentiometer Calibration

The figure below shows the three primary calibration positions for the THOR-LX Rotary Potentiometer Units.

The following table provides the expected potentiometer outputs at 10V excitation for each of the positions shown in the Figure below. The X potentiometer measures inversion / eversion rotation; the Y potentiometer measures dorsiflexion / plantarflexion rotation, and the Z potentiometer measures internal and external rotation. The voltage for each potentiometer should be verified at the zero position prior to testing.



Rotary Potentiometer Calibrations for Left Leg - Serial # LX -036

Pot	Rotary Pot Serial #	Sensitivity at 10 V Excitation	Units	Volts @ 0 Position	Units
X	PD210-4B 7921-0371	32.06	Volts/Degree	4.97	Volts
Y	PD210-4B 7921-0367	31.74	Volts/Degree	5.43	Volts
Z	PD210-4B 7921-0365	31.78	Volts/Degree	3.50	Volts

Transportation Research Center Inc.

Front Head Drop
HIII 10YO   Serial No. D001 Certification No. 14-1
Test Date: 6/12/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 ºC	21.2 ºC	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	270.3 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	9.1 g	Yes
Is Acceleration Curve Unimodal	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.12.2007 12:52:36 732

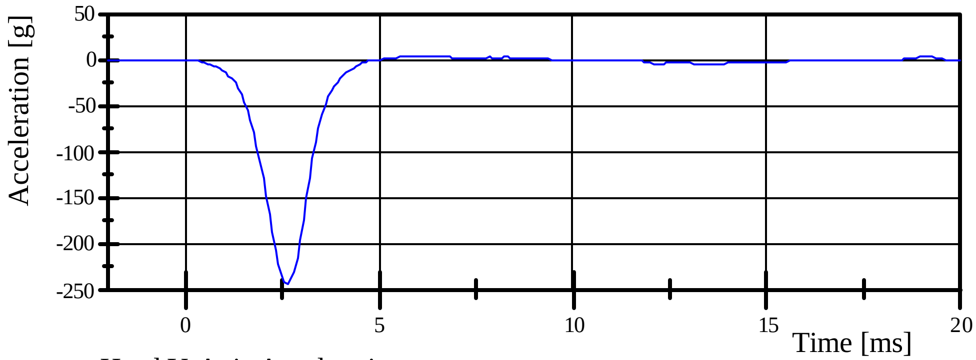
Transportation Research Center Inc.

Front Head Drop

HIII 10YO   Serial No. D001 Certification No. 14-1

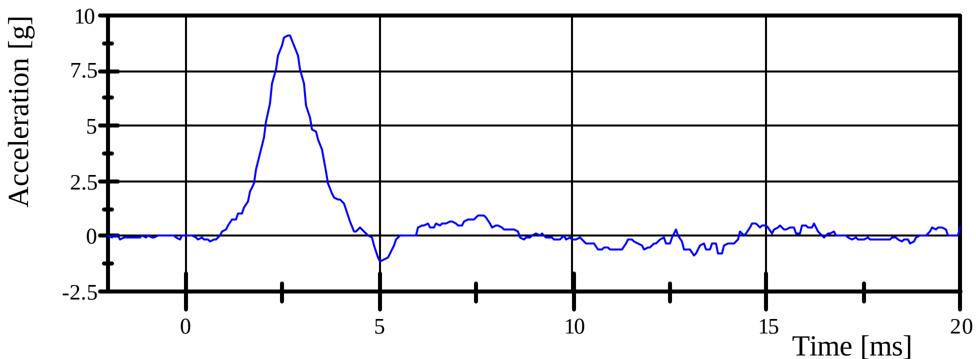
Test Date: 6/12/2007

Head X-Axis Acceleration



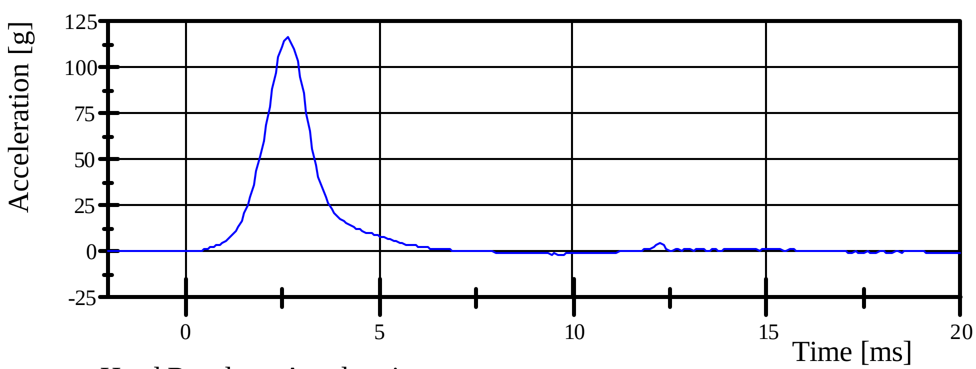
Filter Class: CFC_1000
Max: 4.4 g at 5.9 ms
Min: -243.9 g at 2.6 ms

Head Y-Axis Acceleration



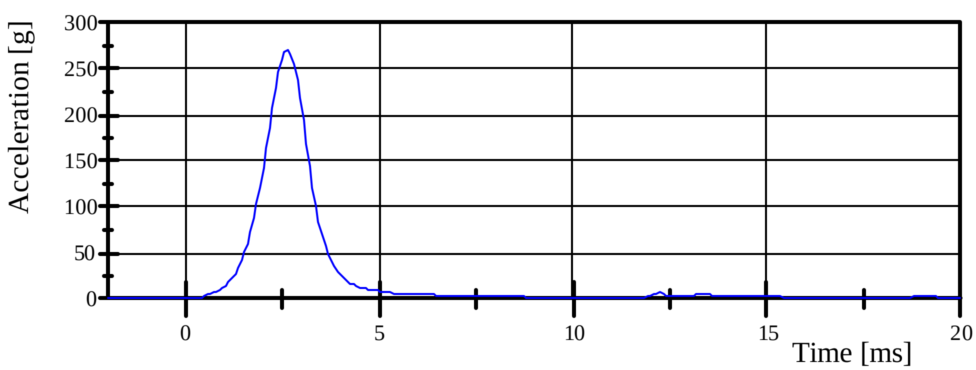
Filter Class: CFC_1000
Max: 9.1 g at 2.6 ms
Min: -1.1 g at 5.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 116.1 g at 2.6 ms
Min: -1.3 g at 9.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 270.3 g at 2.6 ms
Min: 0.0 g at -1.6 ms

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.12.2007 12:52:49 732

TRC

Transportation Research Center Inc.

Neck Flexion
HIII 10YO   Serial No. D001 Certification No. 14-2
Test Date: 6/13/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	21.1 ºC	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Impact Velocity	5.98 - 6.22 m/s	6.073 m/s	Yes
Pendulum Integrated Velocity at 10ms	(-1.64) - (-2.04) m/s	-1.648 m/s	Yes
Pendulum Integrated Velocity at 20ms	(-3.04) - (-4.04) m/s	-3.189 m/s	Yes
Pendulum Integrated Velocity at 30ms	(-4.45) - (-5.65) m/s	-4.692 m/s	Yes
Total Head D-Plane Rotation	(-76.0) - (-90.0) º	-82.31 º	Yes
Total Neck Occipital Condyles Moment Between -74º and -88º Rotation	50.0 - 62.0 Nm	52.09 Nm	Yes
Neck Occipital Condyles Moment Decay to 10 Nm	86.0 - 105.0 ms	100.64 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 14:49:16 1176

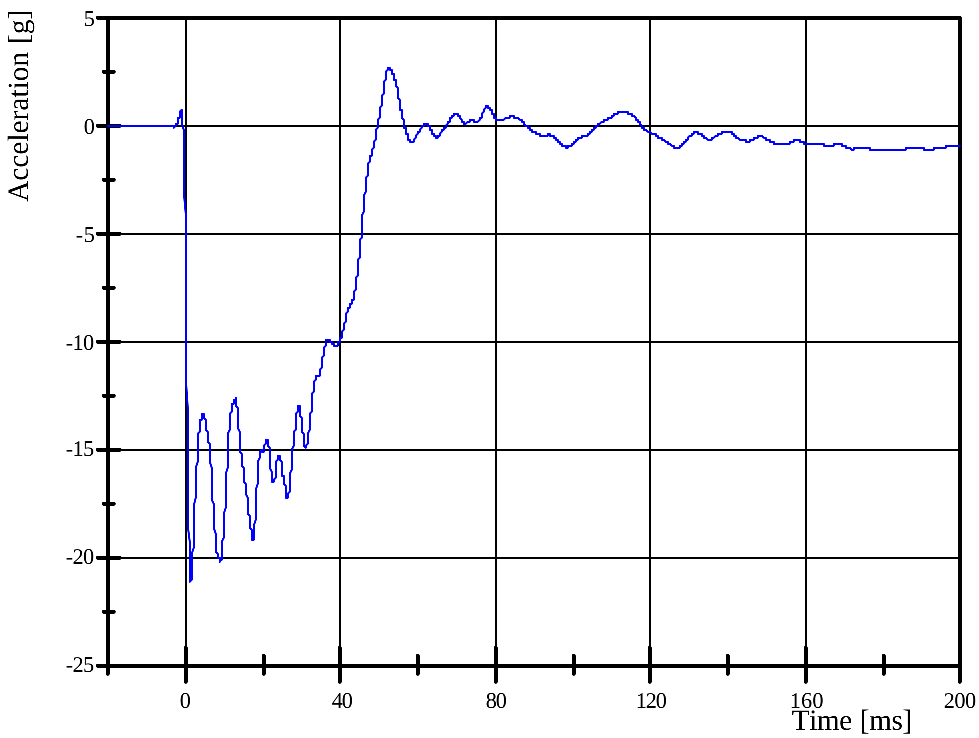
Transportation Research Center Inc.

Neck Flexion

HIII 10YO Serial No. D001 Certification No. 14-2

Test Date: 6/13/2007

Pendulum Acceleration

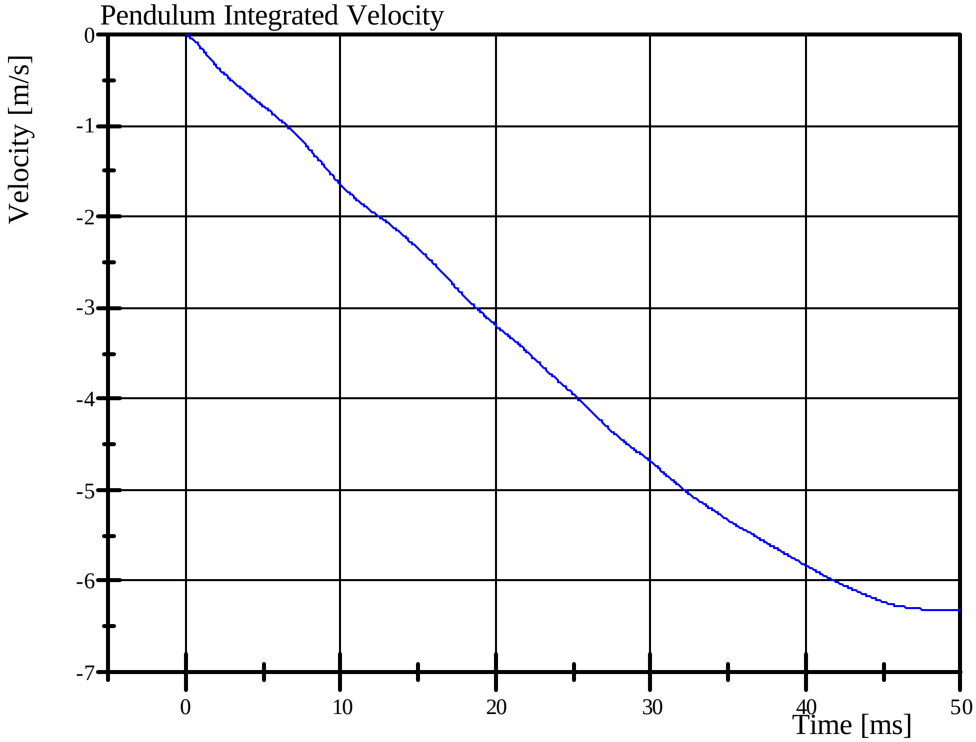


Filter Class: CFC_180

Max: 2.7 g at 52.6 ms

Min: -21.2 g at 1.3 ms

Pendulum Integrated Velocity



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -6.3 m/s at 49.5 ms

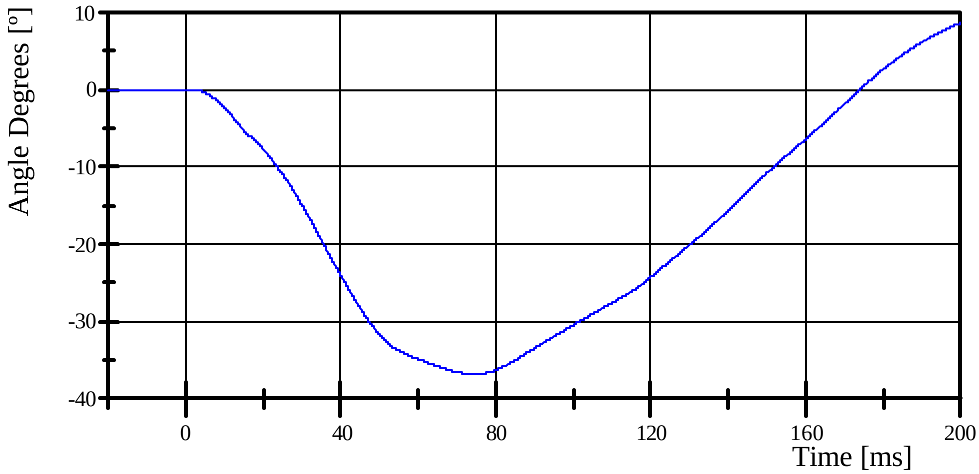
Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 14:49:30 1176

Transportation Research Center Inc.

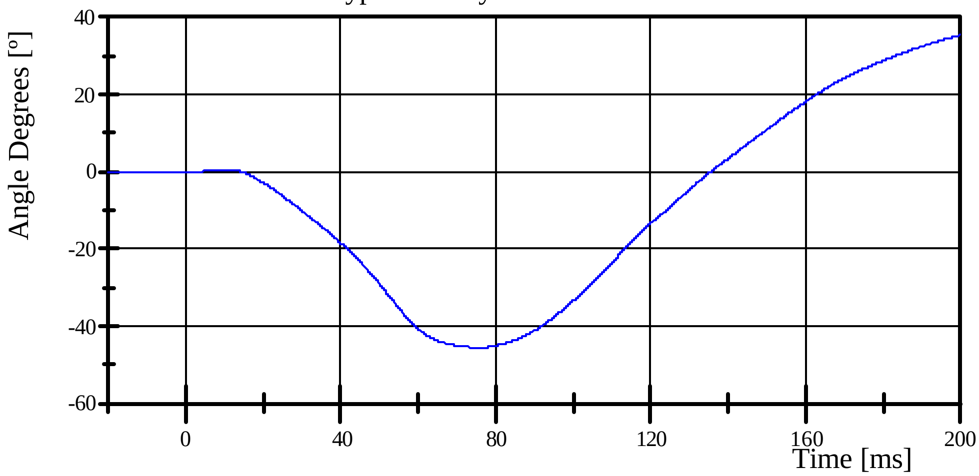
Neck Flexion
HIII 10YO   Serial No. D001 Certification No. 14-2
Test Date: 6/13/2007

Pot Rotation at the Base of Neck



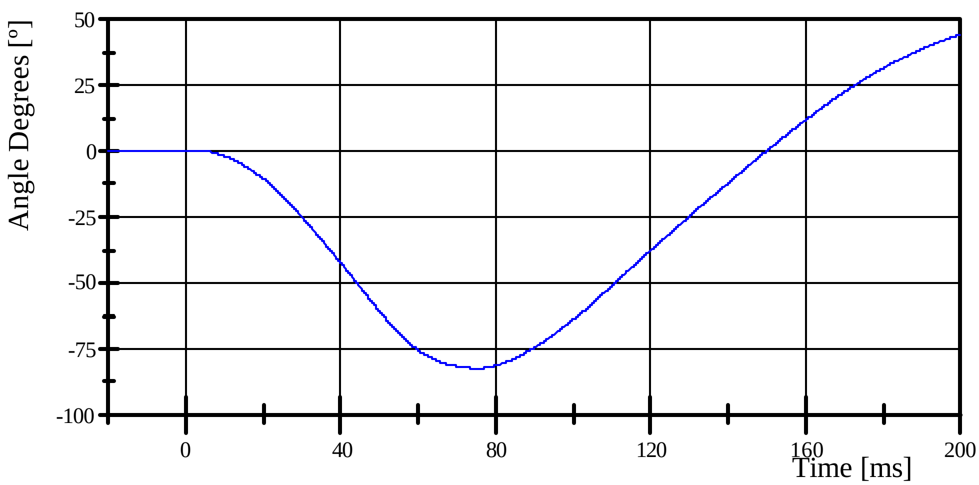
Filter Class: CFC_60
Max: 8.7 ° at 200.0 ms
Min: -36.8 ° at 74.3 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 35.4 ° at 200.0 ms
Min: -45.6 ° at 75.7 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 44.1 ° at 200.0 ms
Min: -82.3 ° at 75.3 ms

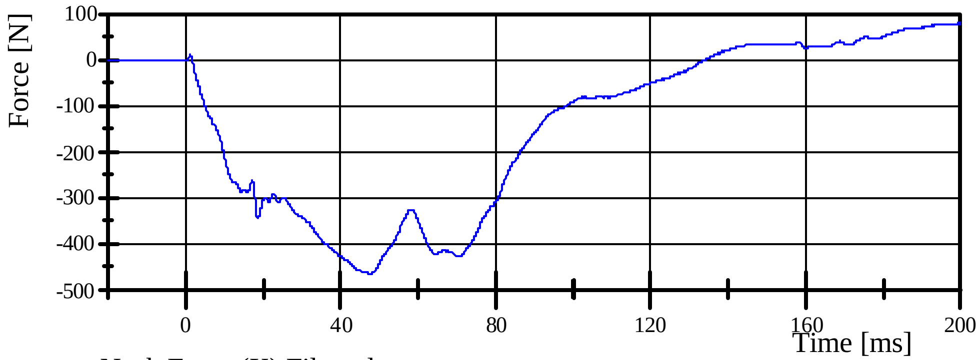
Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 14:49:31 1176

Transportation Research Center Inc.

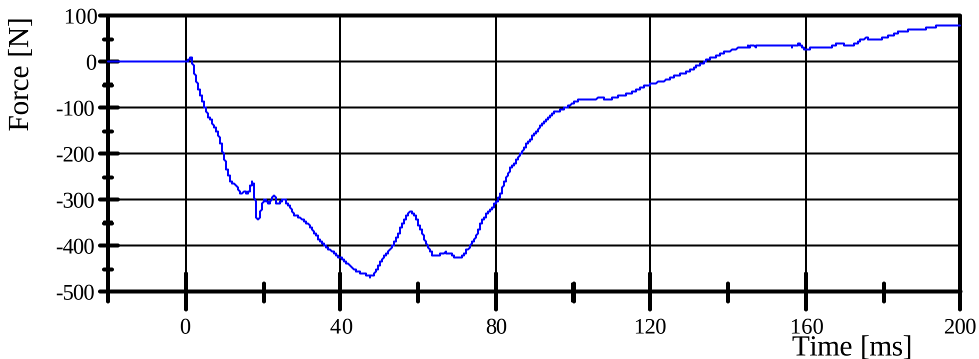
Neck Flexion
HIII 10YO   Serial No. D001 Certification No. 14-2
Test Date: 6/13/2007

Neck Force (X)



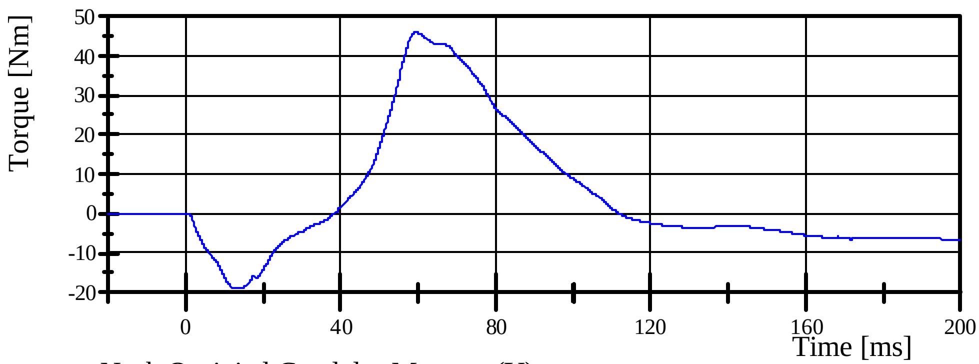
Filter Class: CFC_1000
Max: 80.1 N at 199.8 ms
Min: -467.0 N at 47.6 ms

Neck Force (X) Filtered



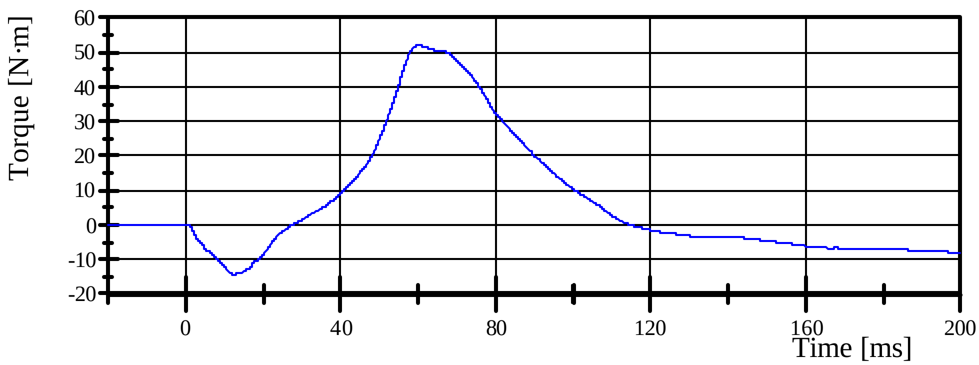
Filter Class: CFC_600
Max: 79.9 N at 200.0 ms
Min: -466.7 N at 47.5 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 45.9 Nm at 59.6 ms
Min: -19.1 Nm at 14.1 ms

Neck Occipital Condyles Moment (Y)



Filter Class: CFC_600
Max: 52.1 N·m at 60.2 ms
Min: -14.3 N·m at 12.8 ms

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 14:49:31 1176

Transportation Research Center Inc.

Neck Extension
HIII 10YO Serial No. D001 Certification No. 14-1
Test Date: 6/13/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	21.3 ºC	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Impact Velocity	4.91 - 5.15 m/s	5.018 m/s	Yes
Pendulum Integrated Velocity at 10ms	1.49 - 1.89 m/s	1.789 m/s	Yes
Pendulum Integrated Velocity at 20ms	2.88 - 3.68 m/s	3.403 m/s	Yes
Pendulum Integrated Velocity at 30ms	4.20 - 5.20 m/s	4.899 m/s	Yes
Total Head D-Plane Rotation	96.0 - 115.0 º	103.19 º	Yes
Total Neck Occipital Condyles Moment Between 99º and 114º Rotation	(-37.0) - (-46.0) Nm	-43.33 Nm	Yes
Neck Occipital Condyles Moment Decay to -10 Nm	100.0 - 116.0 ms	107.36 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 15:23:13 1295

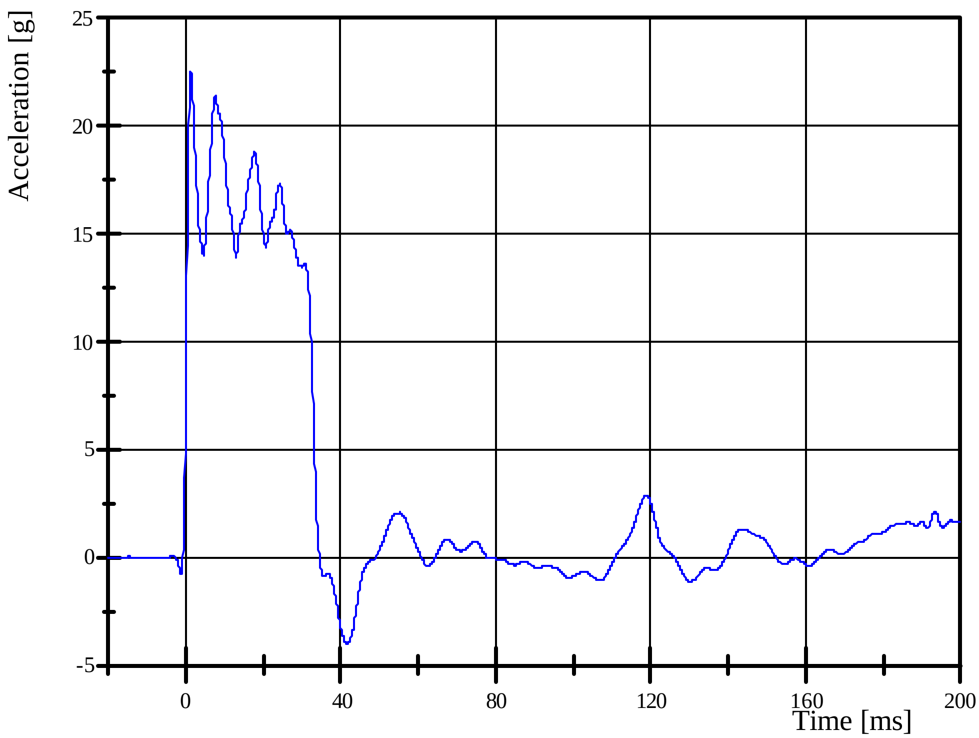
Transportation Research Center Inc.

Neck Extension

HIII 10YO Serial No. D001 Certification No. 14-1

Test Date: 6/13/2007

Pendulum Acceleration

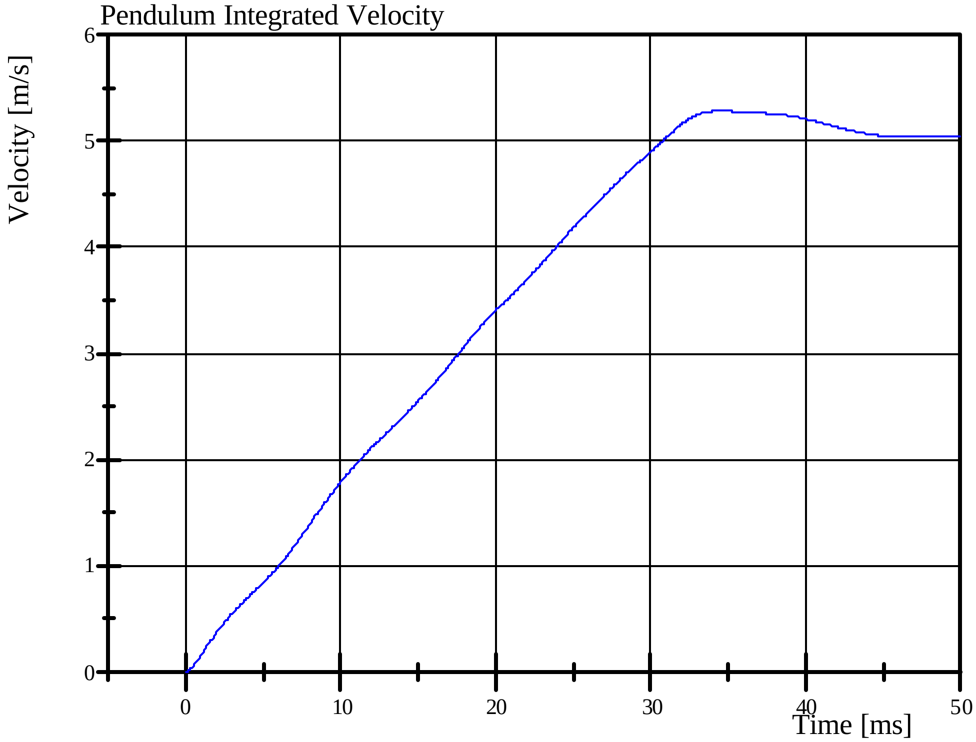


Filter Class: CFC_180

Max: 22.5 g at 1.2 ms

Min: -4.0 g at 41.5 ms

Pendulum Integrated Velocity



Filter Class: CFC_180

Max: 5.3 m/s at 34.5 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 15:23:28 1295

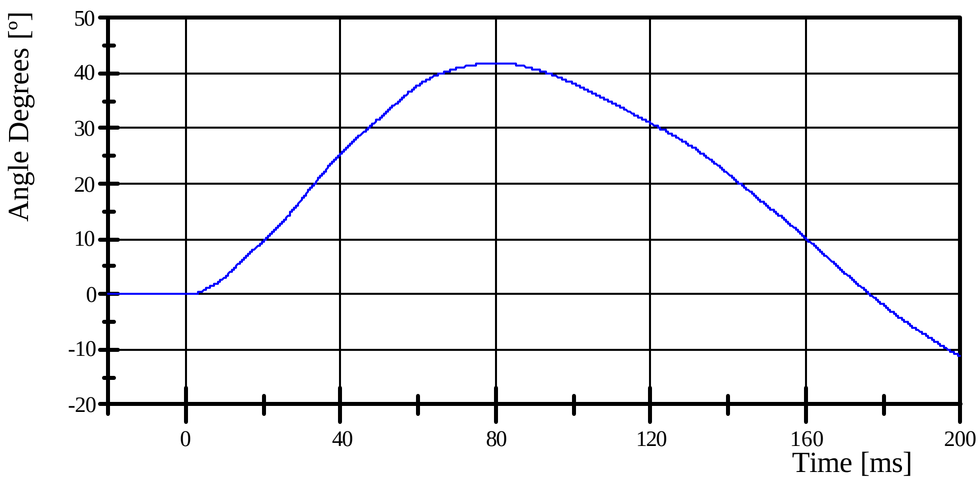
Transportation Research Center Inc.

Neck Extension

HIII 10YO   Serial No. D001 Certification No. 14-1

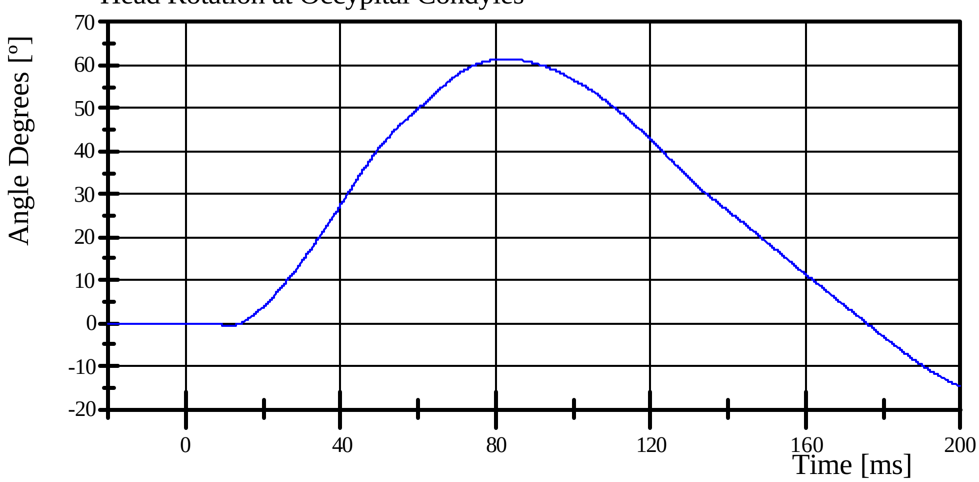
Test Date: 6/13/2007

Pot Rotation at the Base of Neck



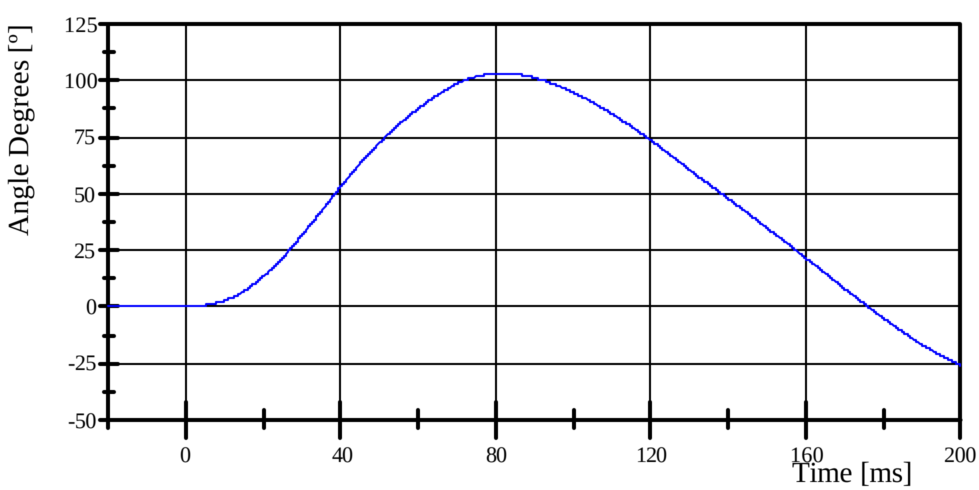
Filter Class: CFC_60
Max: 41.8 º at 80.1 ms
Min: -11.2 º at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 61.4 º at 83.0 ms
Min: -14.7 º at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 103.2 º at 81.8 ms
Min: -25.9 º at 200.0 ms

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 15:23:28 1295

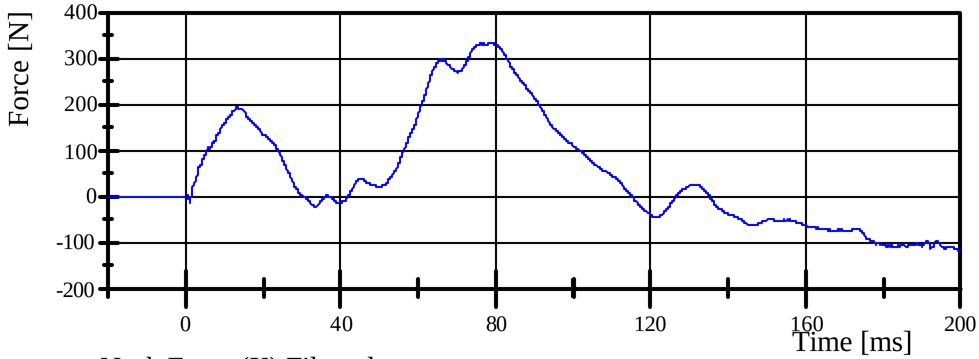
Transportation Research Center Inc.

Neck Extension

HIII 10YO   Serial No. D001 Certification No. 14-1

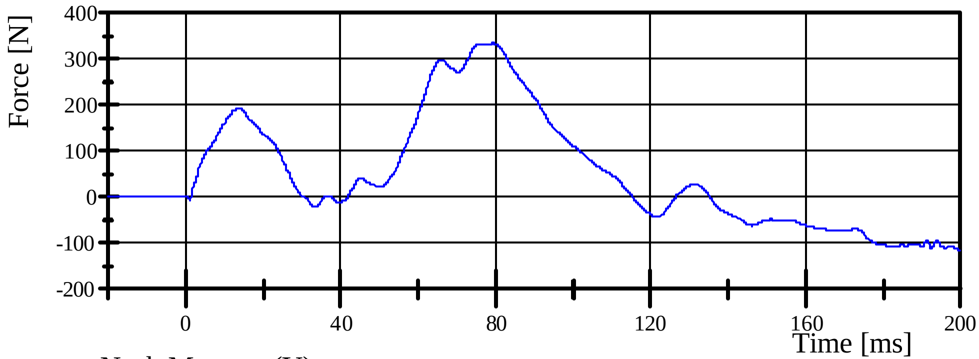
Test Date: 6/13/2007

Neck Force (X)



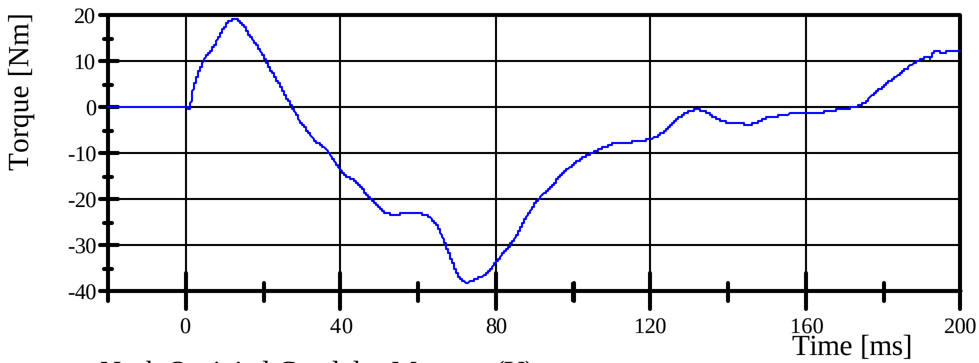
Filter Class: CFC_1000
Max: 333.9 N at 79.3 ms
Min: -118.3 N at 200.0 ms

Neck Force (X) Filtered



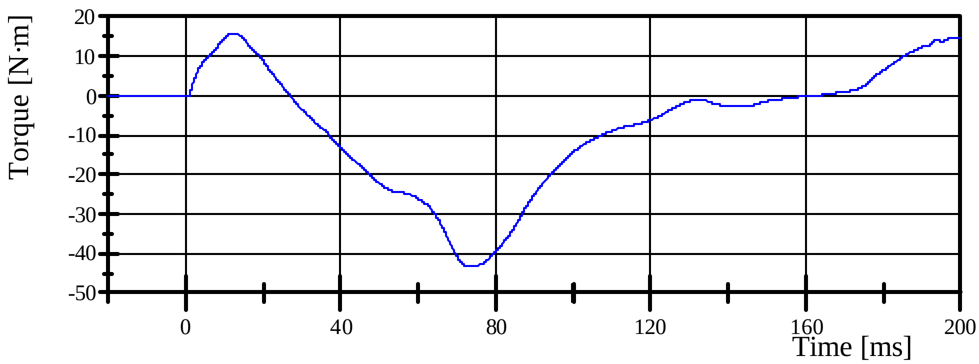
Filter Class: CFC_600
Max: 333.5 N at 79.3 ms
Min: -118.2 N at 200.0 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 19.3 Nm at 13.0 ms
Min: -38.0 Nm at 72.6 ms

Neck Occipital Condyles Moment (Y)



Filter Class: CFC_600
Max: 15.9 N·m at 12.3 ms
Min: -43.3 N·m at 73.4 ms

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 15:23:29 1295

Transportation Research Center Inc.

Front Thorax
HIII 10YO Serial No. D001 Certification No. 14-2
Test Date: 6/13/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	21.0 ºC	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Probe Velocity	5.88 - 6.12 m/s	5.946 m/s	Yes
Probe Force Peak Between 37.0 mm and 46.0 mm Chest Deflection	(-2,000) - (-2,450) N	-2,255.5 N	Yes
Probe Force Peak Between 20.0 mm and 40.5 mm Chest Deflection	>= (-2,450) N	-2,218.4 N	Yes
Maximum Chest Compression	(-37) - (-46) mm	-45.6 mm	Yes
Internal Hysteresis	69 - 85 %	79.2 %	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 13:36:57 1588

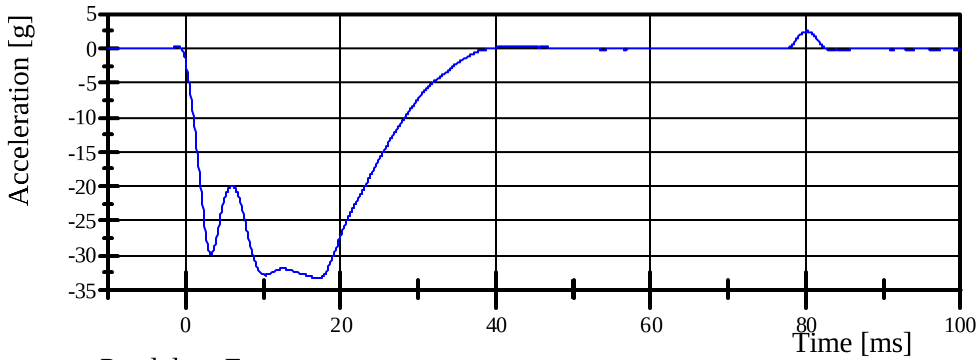
Transportation Research Center Inc.

Front Thorax

HIII 10YO   Serial No. D001 Certification No. 14-2

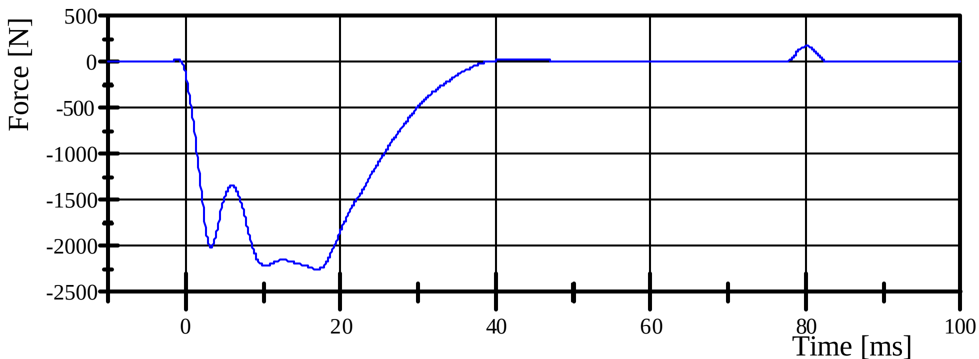
Test Date: 6/13/2007

Pendulum Acceleration



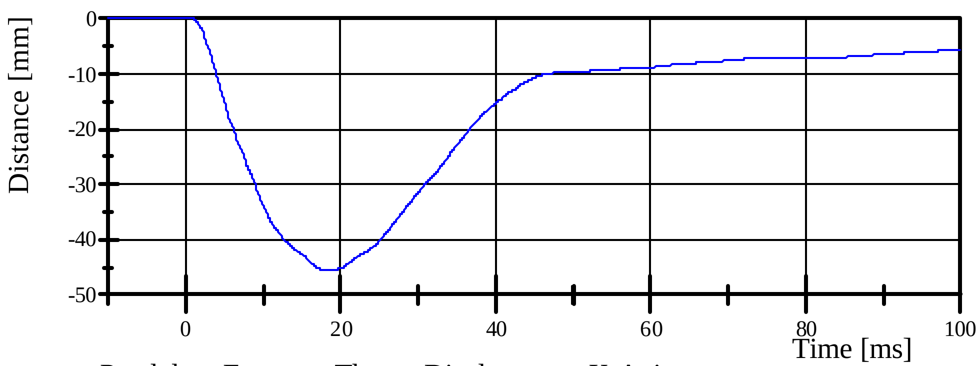
Filter Class: CFC_180
Max: 2.5 g at 80.2 ms
Min: -33.4 g at 17.0 ms

Pendulum Force



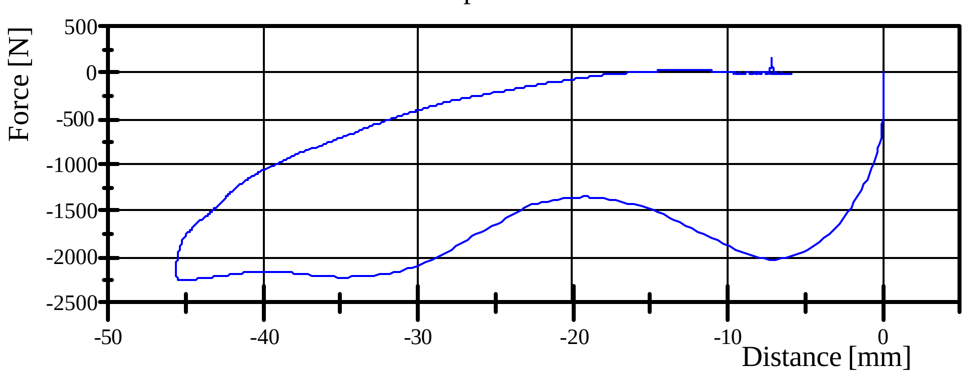
Filter Class: CFC_180
Max: 169.5 N at 80.2 ms
Min: -2,255.5 N at 17.0 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -5.9 ms
Min: -45.6 mm at 18.5 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 169.5 N at -7.2 mm
Min: -2,255.5 N at -45.1 mm

Specification Source: CFR49 Part 572 Subpart T
with Polarity in accordance with J211

06.13.2007 13:37:11 1588

POST-TEST DUMMY INSPECTION

Position:	Driver
Dummy:	Hybrid III 50^{th} Percentile Male with Thor-Lx Legs
Serial Number:	#202 (Right Leg #037; Left Leg #036)
Inspected By:	Jessica Gall
Date:	April 2, 2008
Comments:	No Damage.

Position:	Left Rear Passenger
Dummy:	Hybrid III 10 year old
Serial Number:	#D001
Inspected By:	Jessica Gall
Date:	April 2, 2008
Comments:	No Damage.

APPENDIX D

CUSTOMER PROVIDED SEATING PROCEDURE

CONTROL LOG

50th Percentile Male Dummy - Driver side

Rev. No.	Date	Description
00	1/16/2008	Original release by VRTC
01	1/22/2008	Modified left foot placement to avoid pedals (modified step 30 and 35)

A.2 50th Percentile Male Dummy - Driver side

__1. Position the seat's adjustable lumbar supports so that the lumbar supports are in the lowest, retracted or deflated adjustment positions.
__ N/A – No lumbar adjustment

__2. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position.
__ N/A – No additional support adjustment

__3. Position an adjustable leg support system in its rearmost position
__N/A – No adjustable leg support system

__4. Mark a point (seat cushion reference point) on the side of the seat cushion that is between 150 mm and 250 mm from the front edge of the seat cushion.

__5. Draw a line (seat cushion reference line) through the seat cushion reference point.

__6. Use only the controls that primarily move the seat in the fore-aft direction to move the seat cushion reference point to the rearmost position.

__7. If the seat cushion adjusts fore-aft, independent of the seat back, use only the controls that primarily move the seat cushion in the fore-aft direction to move the seat cushion reference point to the rearmost position.
__ N/A – No independent fore-aft seat cushion adjustment

__8. Use any part of any control, other than the parts just used for fore-aft positioning, to determine the range of angles of the seat cushion reference line and to set the seat cushion reference line at the mid-angle.
Maximum angle ________
Minimum angle ________
Mid-angle _______

__9. If the seat and/or seat cushion height is adjustable, use any part of any control other than the parts which primarily move the seat or seat cushion fore-aft, to put the seat cushion reference point in its lowest position with the seat cushion reference line angle at the mid-angle found in 8.
__N/A – No seat height adjustment

__10. Use only the controls that primarily move the seat in the fore-aft direction to verify the seat is in the rearmost position.

__11. Place seat back at angle specified by the manufacturer. If angle is not provided, place seat back at 25 degrees from vertical.
__ N/A – No seat back angle adjustment
Manufacturer's design seat back angle _______________

__12. Is the seat a bucket seat?
__Yes, go to 13 and skip 14
__No, go to 14 and skip 13

__13. Bucket seats:
Locate and mark for future reference the longitudinal centerline of the seat cushion. The intersection of the vertical longitudinal plane that passes through the SgRP and the seat cushion upper surface determines the longitudinal centerline of a bucket seat cushion.

__14. Bench seats
Locate and mark for future reference the longitudinal line on the seat cushion that marks the intersection of the vertical longitudinal plane through the centerline of the steering wheel and the seat cushion upper surface.

__15. Head Restraint Position
__N/A Vehicle contains automatic head restraints.
__N/A, there is no head restraint adjustment
__Adjust the head restraint to its highest position.

__16. Place any adjustable seat belt anchorages at the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant
__N/A – No adjustable upper seat belt anchorage
Manufacturer's specified anchorage position. ______________________________
Tested anchorage position ______________________________

__17. Place adjustable pedals in the full forward position (towards the front of the vehicle.)
__N/A – the pedals are not adjustable.

__18 Locate and mark the right heel point (RHP) on the carpet.
Flat accelerator pedals: Extend a line through the axis of symmetry (that is closest to the vertical plane) of the accelerator pedal. The RHP is the intersection of that line with the floorpan.
Curved accelerator pedals: Construct a line in the side view tangent to the accelerator pedal such that the distance from the contact point on the pedal to the floorpan, along the tangent line, is 200 mm. The RHP is at the intersection of this tangent line and the floorpan

__19 Locate a longitudinal line L1 and a transverse line T1 on the floorpan through the RHP. Locate a Left Heel Point (LHP) point on the line T1 that is to the left of the seat centerline at the same distance from the seat centerline as the RHP. Locate a longitudinal line L2 through the LHP.

__20. Set the steering wheel hub at the geometric center of the full range of driving positions including any telescoping positions as determined in data sheet 14.3.

__21. Verify that the seat is in the rearmost seat track position and full down height adjustment with the seat cushion at the mid-angle with the seat back at the manufacturer's nominal seat back angle or as determined in step 11

__22 With the seat in the rearmost, full down, mid-angle position, determine the H-point using SAE J826 and the FMVSS 208 leg and thigh dimensions. Record the measurements.

__23. Place the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings and the upper torso resting against the seat back.

__24. Rest the thighs on the seat cushion.

__25. Set the distance between the outboard knee clevis flange surfaces at 10.6 inches.
__measured distance (10.6 inches)

__26. Set the heels of the feet on the floor pan.

__27. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point determined in step 22 Measure the pelvic angle with respect to the horizontal using the pelvic angle gage. Adjust the dummy position until these three measurements are within the specifications.
____horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.)
____vertical inches from the point 0.25 below the determined H-point (0.5 inch max.)
____pelvic angle (20^o to 25^o)
The H-point and pelvic angle are not adjusted after this step.

__28. Set the left and right feet in the neutral position (longitudinal centerline of foot in the same plane as the lower leg/thigh, foot Y angle at -15 degrees +/- 2 degrees to lower leg), as determined by the output of the potentiometers at the ankle.

__29. Without moving the seat, and while keeping the right thigh and leg in the same vertical plane, set the right foot heel on Line L1. If the vehicle interior prevents the heel from reaching L1, place the heel as close to L1 as possible, while maintaining a clearance of 0.25" from the vehicle interior.

__30 Without moving the seat, and while keeping the left thigh and leg in the same vertical plane, move the left foot laterally to the left **until any of the following occurs first**:
- The right edge of the foot is clear of the brake or clutch pedal by 0.25" laterally or
- The left edge of the shoe contacts the vehicle interior

__31. Place a 100 N +0, -5N weight (e.g. 100 N shot bag), no larger than 4" x 4", on each knee-thigh area. The weight should be centered on the assembly-hole on the top of the knee.

__32. Raise the heels off the floor pan so that the seat can be moved forward.

__33. Using only the control that primarily moves the seat in the fore-aft direction, move the seat forward and rest the rearmost point of the right foot heel on the floor pan such that:
- the heel is on the line L1
- the foot is in the same plane as the lower leg/thigh, foot at -15 degrees +/- 2 degrees (about the Y- axis) to lower leg,

- foot is contacting the accelerator pedal
- the thighs are resting on the seat cushion
- the thigh, leg and foot are in the same vertical plane

__33.1 If the heel is unable to reach line L1 because the foot contacts the vehicle interior, place the foot as close to the line L1 as possible while maintaining a gap of no more than 5 mm between the shoe and the vehicle interior.

__33.2 If the left foot contacts the brake or clutch pedals or the vehicle interior, then stop the forward movement of the left foot, raising the left knee off the seat cushion if needed. The pedals should not be depressed.

__34. If the right foot does not reach the accelerator pedal, move the adjustable pedal until it contacts the foot. Locate a new heel point. Repeat steps 18 – 33 to re-position the seat. If the pedals are not adjustable, place the heel at the point closest to the pedal, in the same longitudinal vertical plane as the line L1.

__N/A – the accelerator pedal is not adjustable

__N/A – the accelerator pedal did not need to be moved.

__35. Verify that the left thigh and leg are in a vertical longitudinal plane, the foot in the neutral position (longitudinal centerline of foot in the same plane as the lower leg/thigh, foot at -15 degrees +/- 2 degrees (Y-axis) to lower leg), the heel on the floor pan. Place the heel on the line L2, unless the left edge of the shoe contacts the vehicle, preventing the heel from reaching Line L2. If there is overlap with the pedal, move the leg to the left until a lateral clearance of 0.25” from the pedal is attained, unless the left edge of the shoe contacts the vehicle. If the left edge of the shoe contacts the vehicle interior, maintain a clearance of 0.25” from the vehicle interior.

__36. Remove the leg weights.

__37. Verify that the right foot is in the neutral position, at the lateral location determined in step 30, and is contacting the accelerator pedal. If the foot is not contacting the accelerator pedal, move the seat forward to rest the right foot on the accelerator pedal, keeping the foot in the neutral position

__38. While holding the thighs in place, push with a 50 lb force on a 3 inch diameter area of the chest that is centered 5" (127mm) vertically below the chin on the midsaggital plane of the dummy.

__39.1 Fasten the seat belt around the dummy.

__39.2 Remove all slack from the lap belt portion.

__39.3 Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times.

__39.4 Apply a 2 to 4 pound tension load to the lap belt.

____pound load applied

__39.5 Is the belt system equipped with a tension-relieving device?

__Yes, continue

__No, go to 40

__39.6 Introduce the maximum amount of slack into the upper torso belt that is recommended by the vehicle manufacturer in the vehicle owner’s manual..

__40. Place the upper arms adjacent to the torso with the centerline as close to a vertical plane as possible.

__41. Adjust the head level within ± 0.5 degrees using the seat back adjustment. Check the head angle after pushing on the chest with a 50 lb force on a 3 inch diameter area of the chest that is centered 5" (127mm) vertically below the chin on the midsaggital plane of the dummy, while holding the thighs in place, and releasing.

__42 No seat back adjustment. Adjust the neck bracket to achieve head level within ± 0.5 degrees Record neck bracket setting. __________

__43. Maintaining the head alignment as determined above, place the right hand with the palm in contact with the steering wheel at the rim’s horizontal centerline and with the thumb over the steering wheel.

__44. Maintaining the head alignment as determined above place the left hand with the palm in contact with the steering wheel at the rim’s horizontal centerline and with the thumb over the steering wheel.

__45. If the hands don't reach the steering wheel at the horizontal centerline, maintaining the head alignment place them at symmetric location on the wheel, below the horizontal centerline.

__46. Tape the thumb of each hand to the steering wheel by using masking tape with a width of 0.25 inch. The length of the tape shall only be enough to go around the thumb and steering wheel one time.

__47 Verify that the feet are in the neutral position (+/- 2 deg), and at lateral locations determined in step 30 (right foot) and step 35 (left foot), and the head is level (+/- 0.5 deg). Adjust and repeat until the feet position and angles and head angles are within their ranges.

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

Memorandum

Vehicle Research and Test Center P.O. Box B37
East Liberty, Ohio 43319
(937) 666-4511

Subject: VRTC Seating Procedure for FMVSS 213-Type Booster Seat Testing with the Hybrid III 6 Year Old & 10 Year Old Child Dummies

OCT 24 2007

From: Joseph N. Kanianthra, Ph.D.
Associate Administrator for
Vehicle Safety Research

To: Docket NHTSA-2005-21245

Thru: Anthony M. Cooke
for Chief Counsel

VRTC Seating Procedure for Hybrid III 6 Year Old Child Dummy for Testing Belt Positioning Booster Seats

~~Use~~ VRTC ~~s~~ uses the following procedure to position the dummy in the belt positioning booster seat:

Or 10/24/07

a) Place the booster seat on the FMVSS 213 bench seat such that it is centered between the lap belt anchor positions and the booster is pushed rearward until the intersection of the booster's back and bottom contacts the intersection of the FMVSS 213 bench seat's back and base cushions.
b) Place the dummy in the booster seat so that the mid-sagittal line of the dummy is coincident with the centerline of the booster.
c) Measure the X and Z locations of the left and right shoulder pivots. Position the dummy so that the difference between the X and Z values for these two points is less than or equal to 1 cm (see Figure 1).
d) As illustrated in Figure 2 of this section, calculate the H-point location of the dummy relative to the FMVSS 213 seat Z point (see Figure 1B in FMVSS 213) by
    a. Measuring the X and Z coordinates of the knee pivot (X_{KP} and Z_{KP}) and head center of gravity (X_{CG} and Z_{CG}).
    b. Mathematically locating the intersection point of two circles using the knee pivot and head center of gravity as the centers and the known dummy anthropometric lengths as radii. The equations for calculating the H-point are as follows:

$$X_{HP} = X_{CG} + \frac{A(X_{KP} - X_{CG})}{B} + \frac{\sqrt{473^2 - A^2}(Z_{KP} - Z_{CG})}{B}$$

$$Z_{HP} = Z_{CG} + \frac{A(Z_{KP} - Z_{CG})}{B} - \frac{\sqrt{473^2 - A^2}(X_{KP} - X_{CG})}{B}$$

Where:

$$A = \frac{(473^2 - 238^2 + B^2)}{2B}$$

$$B = \sqrt{(X_{KP} - X_{CG})^2 + (Z_{KP} - Z_{CG})^2}$$

e) Use the H-point location and head center of gravity location to determine the torso angle relative to vertical. This angle is calculated using

$$\text{Torso Angle} = \arctan\left(\frac{X_{HP} - X_{CG}}{Z_{CG} - Z_{HP}}\right)\left(\frac{180}{\pi}\right)$$

f) Adjust the dummy until the torso angle is 14 ± 0.5 degrees from vertical.

g) Secure the dummy and booster with belt restraint, following booster manufacturer's instructions for routing the shoulder and lap belts. Apply standard FMVSS 213 belt tensions.

h) Locate the shoulder belt such that its outboard edge is inside of the outer edge of the chest jacket (see Figure 3). If it is not feasible to get the outboard edge of the belt inside the outer edge of the chest jacket, document the closest distance from the belt to the chest jacket that is obtainable.

i) The straight line distance from the bottom of the dummy's chin to the center of the shoulder belt/middle of the sternum along the dummy's mid-sagittal line should be 15.5 ± 0.5 cm (see Figure 4). Measure and document the intersection of the dummy's mid-sagittal line and vertical center of shoulder belt's width.

j) Measure and document the angle of the shoulder belt relative to horizontal. The shoulder belt angle should be $50^\circ \pm 10^\circ$. If it is not feasible to achieve the specified shoulder belt angle while following the manufacturer's instructions for belt routing, document angle that is obtainable.

k) Locate the lap belt such that the top of the belt is 2.54 cm or more below the top rim of the pelvis molded skin at the dummy's mid-sagittal line (Figure 4). If it is not feasible to locate the lap belt at least 2.54 cm below the top of the pelvis while following the manufacturer's instructions for belt routing, position belt as low as possible on pelvis.

l) Measure and document the intersection of the dummy's mid-sagittal line and center of lap belt width.

m) Put upper arms as close as possible to, and in alignment with, the upper torso on sides and bend at elbows such that the hands are resting on the booster seat cushion if possible; otherwise bend lower arm perpendicular to upper arm and have hands pointed forward.

n) Level the top of the dummy's head $\pm 1^{\circ}$ off of horizontal.
o) Document final H-point, Head CG, and Knee Pivot coordinates in addition to the torso angle.

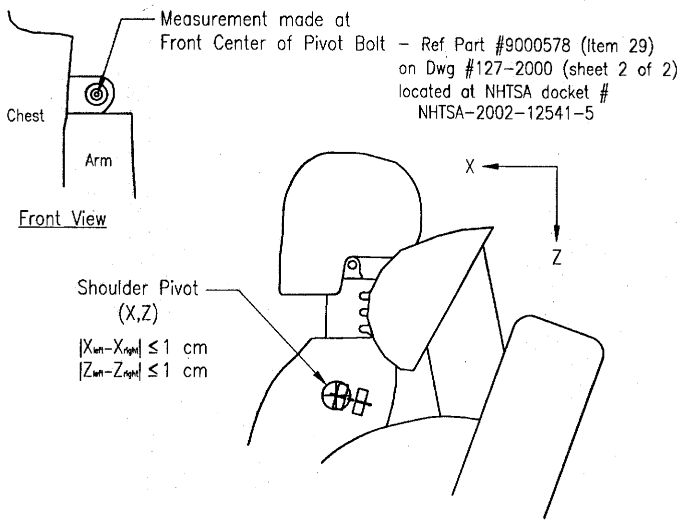


Figure 1. Shoulder Pivot Bolt Alignment

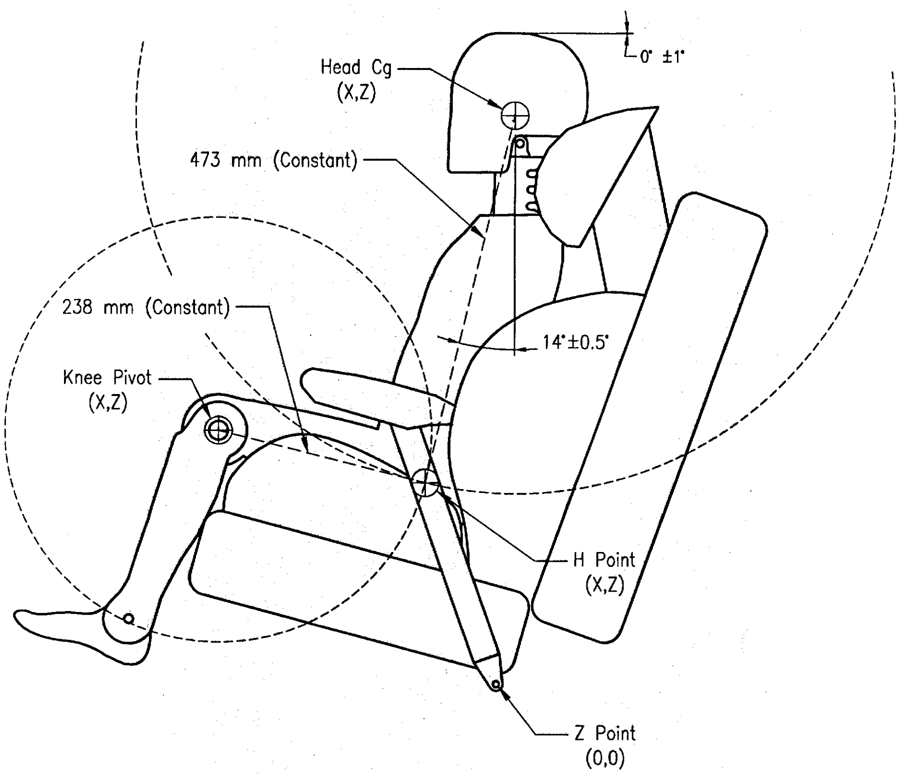


Figure 2. Locating the H-Point so that HIII-6C Torso Angle is 14 ± 0.5 Degrees from Vertical

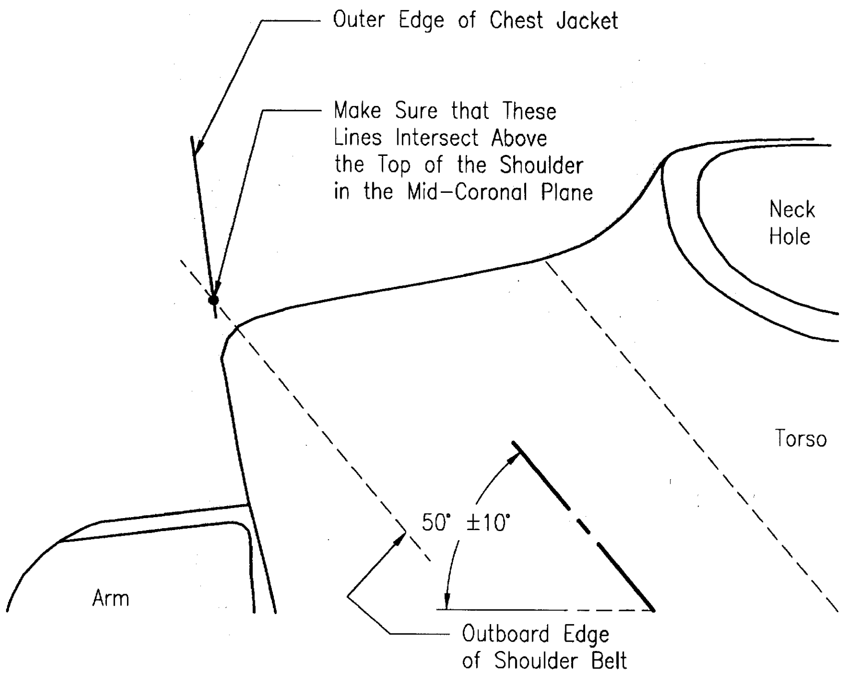


Figure 3. Shoulder Belt Placement

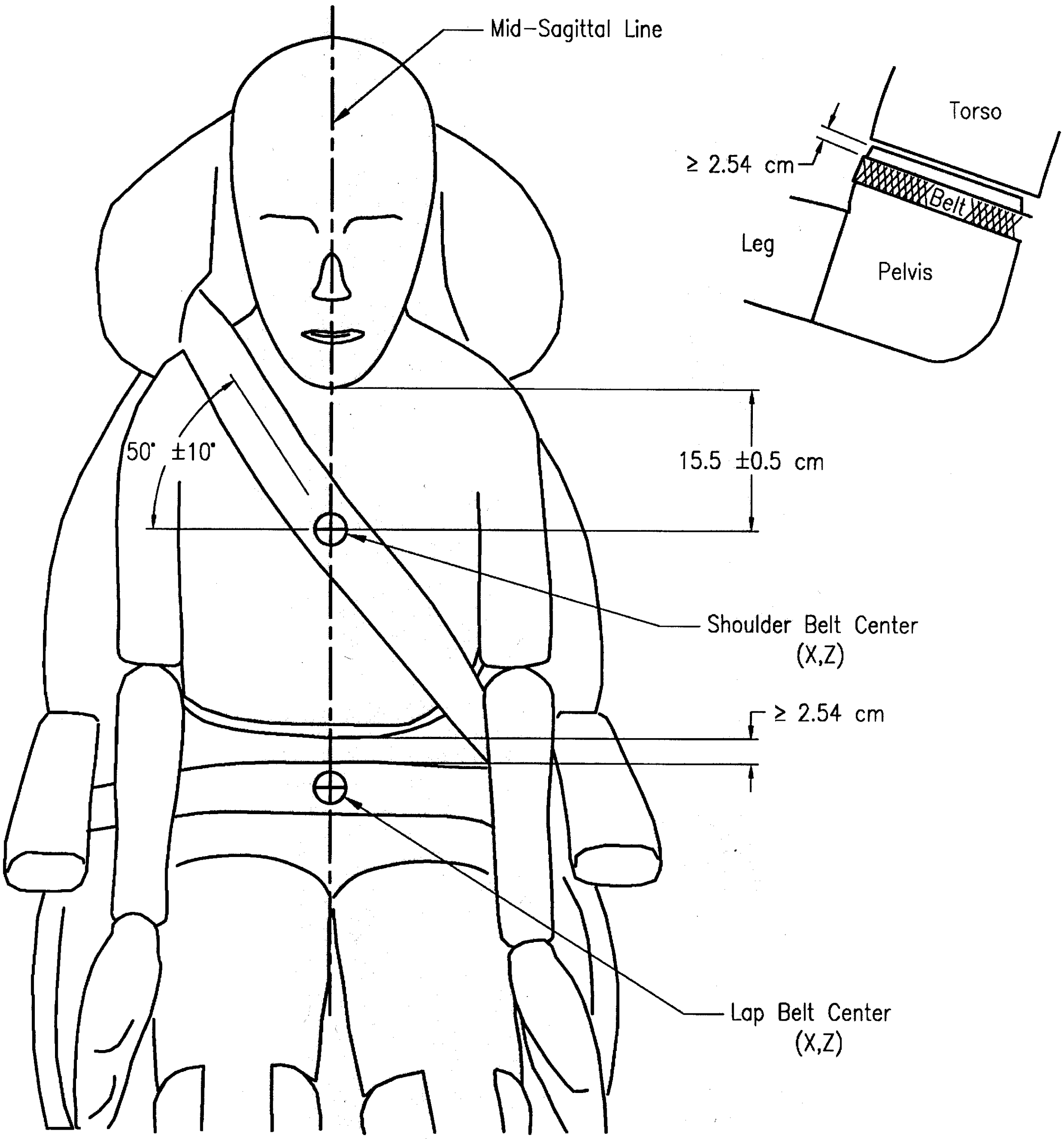


Figure 4. Overall Belt Placement for HIII-6C Dummy

VRTC Seating Procedure for Hybrid III 10 Year Old Child Dummy for Testing Belt Positioning Booster Seats

Use the following procedure to position the dummy in the belt positioning booster seat:

a) Set the dummy's neck angle at the SP-16 setting (Figure 5a). See also Figure 20 of PADI (NHTSA-2005-21247-8) for more detail.
b) Set the dummy's lumbar angle at the SP-12 setting ("SP" means standard posture), see Figure 5b. This is done by aligning the notch on the lumbar adjustment bracket with the SP-12 notch on the lumbar attachment. See also Figure 45 of PADI for more detail.
c) Place the booster seat on the FMVSS 213 bench seat such that it is centered between the lap belt anchor positions and the booster is pushed rearward until the intersection of the booster's back and bottom contacts the intersection of the FMVSS 213 bench seat's back and base cushions.
d) Place the dummy in the booster seat so that the mid-sagittal line of the dummy is coincident with the centerline of the booster.
e) Measure the X and Z locations of the left and right shoulder pivots. Position the dummy so that the difference between the X and Z values for these two points is less than or equal to 1 cm (see Figure 6).
f) As illustrated in Figure 7 of this section, calculate the H-point location of the dummy relative to the FMVSS 213 seat Z point (see Figure 1B in FMVSS 213) by
    1. Measuring the X and Z coordinates of the knee pivot (X_{KP} and Z_{KP}) and head center of gravity (X_{CG} and Z_{CG}).
    2. Mathematically locating the intersection point of two circles using the knee pivot and head center of gravity as the centers and the known dummy anthropometric lengths as radii. The equations for calculating the H-point are as follows:

$$X_{HP} = X_{CG} + \frac{A(X_{KP} - X_{CG})}{B} + \frac{\sqrt{527^2 - A^2}(Z_{KP} - Z_{CG})}{B}$$

$$Z_{HP} = Z_{CG} + \frac{A(Z_{KP} - Z_{CG})}{B} - \frac{\sqrt{527^2 - A^2}(X_{KP} - X_{CG})}{B}$$

Where:

$$A = \frac{(527^2 - 288^2 + B^2)}{2B}$$

$$B = \sqrt{(X_{KP} - X_{CG})^2 + (Z_{KP} - Z_{CG})^2}$$

g) Use the H-point location and head center of gravity location to determine the torso angle relative to vertical. This angle is calculated using

$$\text{Torso Angle} = \arctan\left(\frac{X_{HP} - X_{CG}}{Z_{CG} - Z_{HP}}\right)\left(\frac{180}{\pi}\right)$$

h) Adjust the dummy until the torso angle is 14 ± 0.5 degrees from vertical.
i) Secure the dummy and booster with belt restraint, following booster manufacturer's instructions for routing the shoulder and lap belts. Apply standard FMVSS 213 belt tensions.
j) Locate the shoulder belt such that its outboard edge is inside of the outer edge of the chest jacket (see Figure 8). If it is not feasible to get the outboard edge of the belt inside the outer edge of the chest jacket, document the closest distance from the belt to the chest jacket that is obtainable.
k) The straight line distance from the bottom of the dummy's chin to the center of the shoulder belt/middle of the sternum along the dummy's mid-sagittal line should be 16 ± 0.5 cm (see Figure 9). Measure and document the intersection of the dummy's mid-sagittal line and vertical center of shoulder belt's width.
l) Measure and document the angle of the shoulder belt relative to horizontal. The shoulder belt angle should be $50^\circ \pm 10^\circ$. If it is not feasible to achieve the specified shoulder belt angle while following the manufacturer's instructions for belt routing, document angle that is obtainable.
m) Locate the lap belt such that the top of the belt is 2.54 cm or more below the top rim of the pelvis molded skin at the dummy's mid-sagittal line (Figure 9). If it is not feasible to locate the lap belt at least 2.54 cm below the top of the pelvis while following the manufacturer's instructions for belt routing, position belt as low as possible on pelvis.
n) Measure and document the intersection of the dummy's mid-sagittal line and center of lap belt width.
o) Put upper arms as close as possible to, and in alignment with, the upper torso on sides and bend at elbows such that the hands are resting on the booster seat cushion if possible; otherwise bend lower arm perpendicular to upper arm and have hands pointed forward.
p) Level dummy's head $\pm 1^\circ$ off of horizontal.
q) Document final H-point, Head CG, and Knee Pivot coordinates in addition to the torso angle.

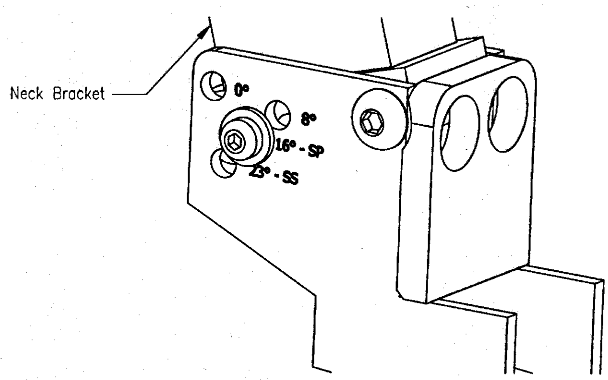


Figure 5a. Neck Angle Setting is SP-16 Degrees

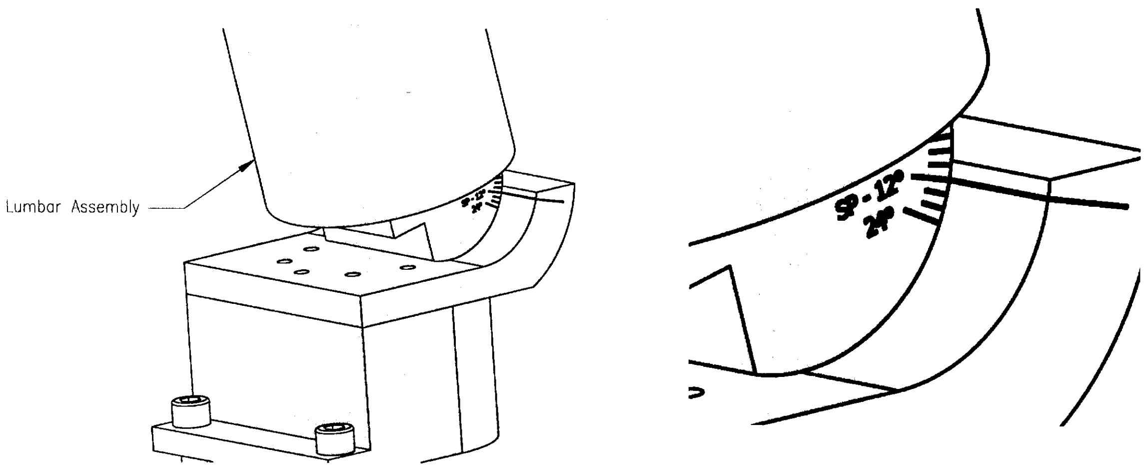


Figure 5b. Lumbar Angle Setting is SP-12 Degrees

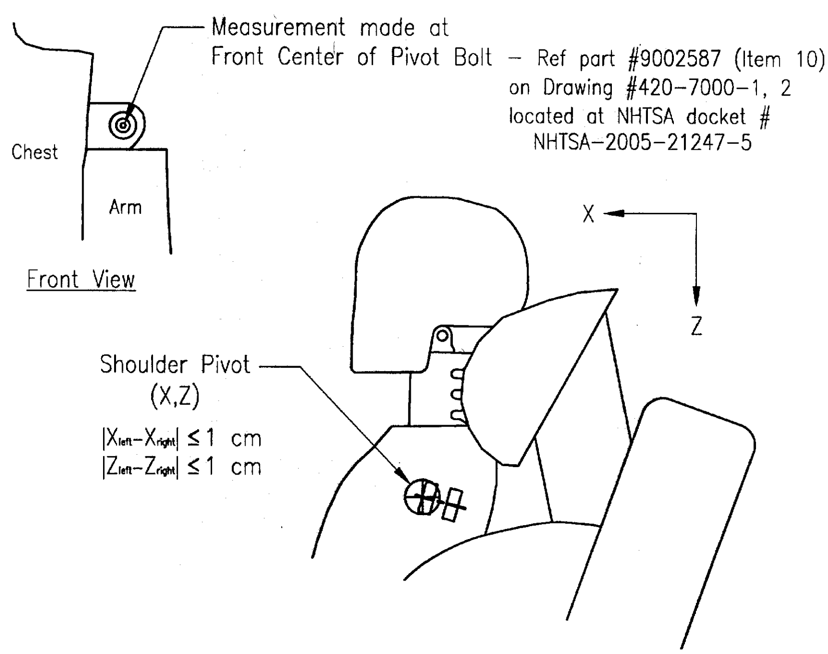


Figure 6. Shoulder Pivot Bolt Alignment

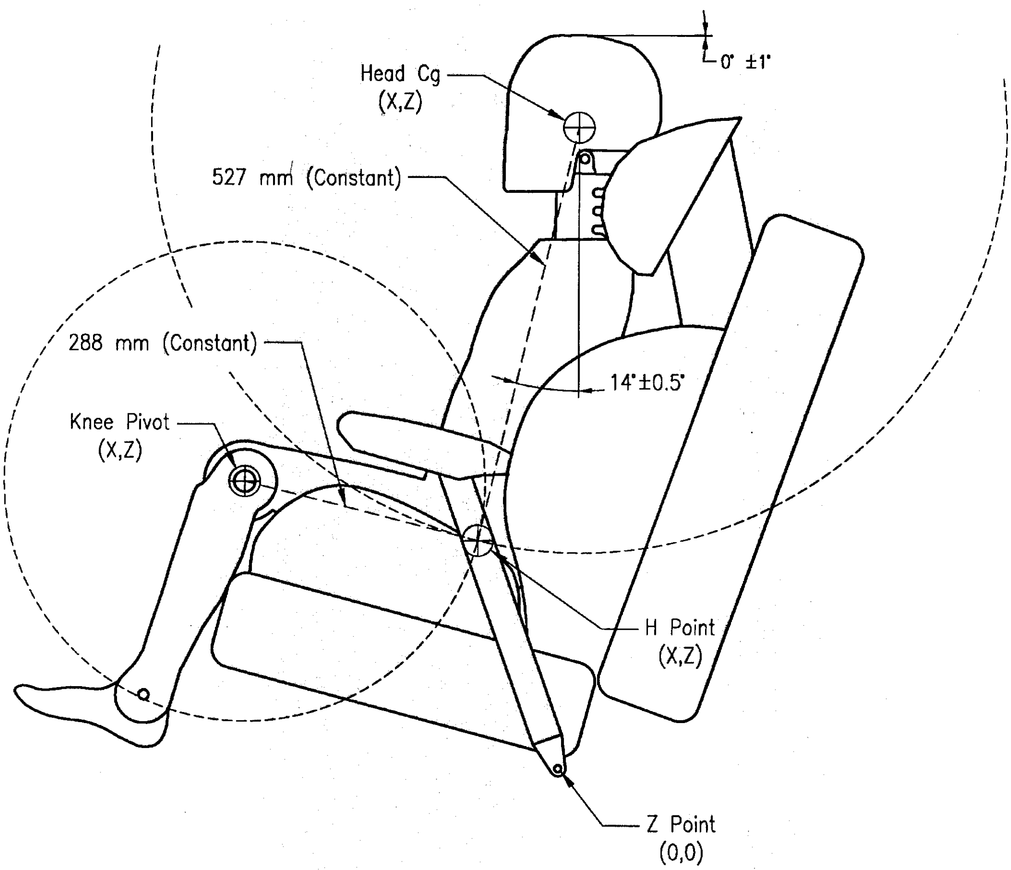


Figure 7. Locating the H-Point so that HIII-10C Torso Angle is 14 ± 0.5 Degrees from Vertical

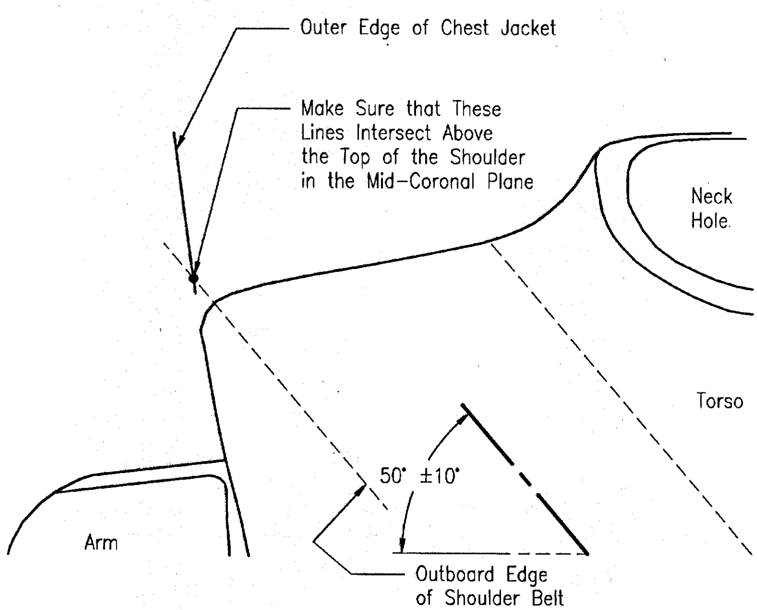


Figure 8. Shoulder Belt Placement

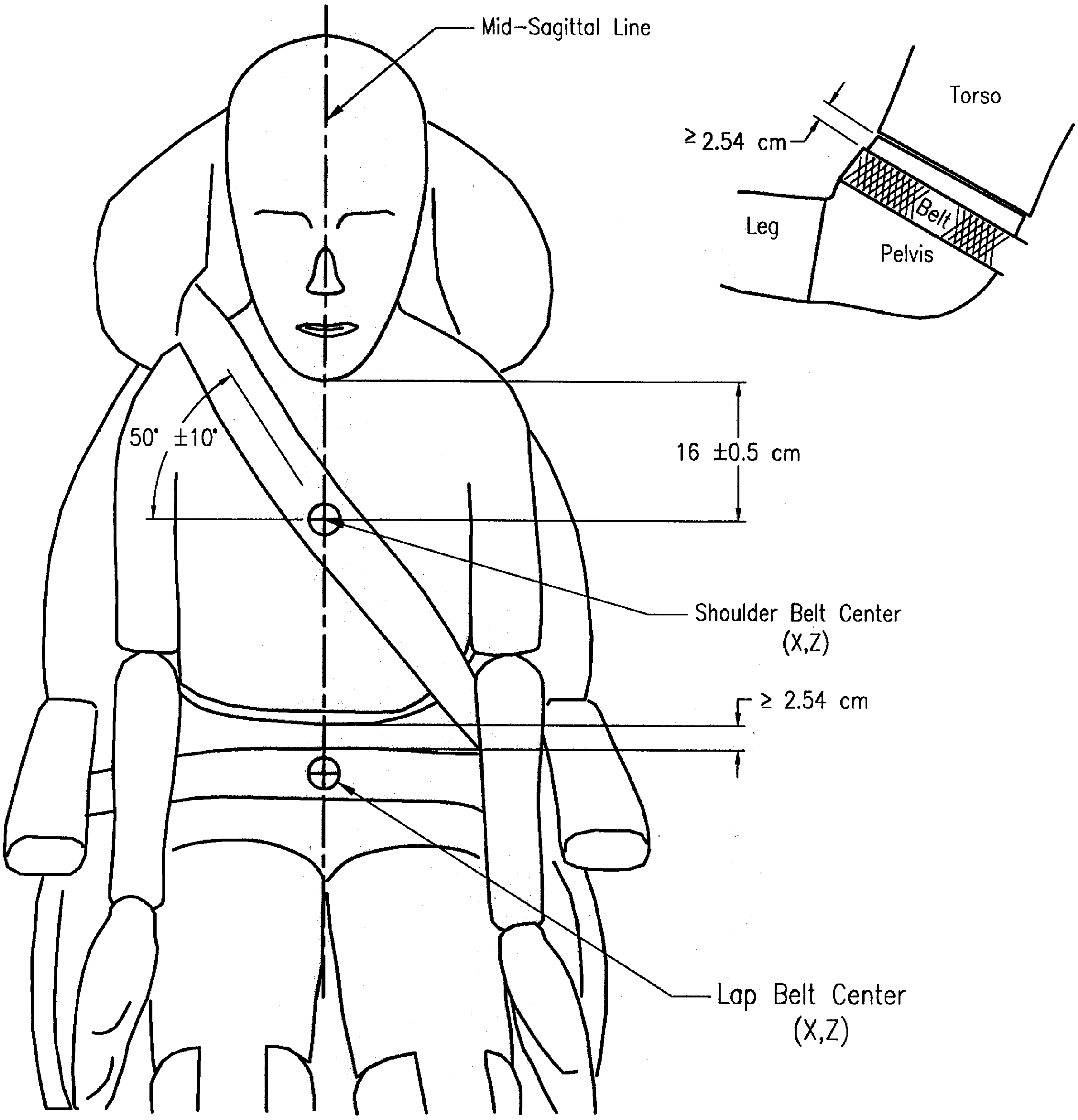


Figure 9. Overall Belt Placement for HIII-10C Dummy

VRTC DUMMY SETUP SHEET

Dummy S/N ______________ Test Date ______________ Test No. ____________

DUMMY CONFIGURATION

Lumbar Angle Setting (10YO only) ____ Neck Angle Setting (10YO only) ____

DUMMY ALIGNMENT

Dummy/Booster Centerline Coincident (check when confirmed) ☐

Left Shoulder Pivot Bolt: X _____ Z _____
Right Shoulder Pivot Bolt: X _____ Z _____

BELT PLACEMENT

Belt routed per manufacturer instructions (check when confirmed) ☐

Shoulder Belt Tension _________ lbs
Lap Belt Tension _________ lbs

Outside edge of shoulder belt inside outer edge of chest jacket (circle one)? Yes / No
If "No", what is distance from outside edge of belt to outer edge of chest jacket (along top of shoulder)? _________ mm

Intersection of mid-sagittal plane and center of shoulder belt: X____ Y____ Z____
Shoulder belt angle relative to horizontal (50 ± 10 degrees): _______ deg

Top edge of lap belt ≥ 2.54 cm from pelvis rim (circle one)? Yes / No
If "No", is belt positioned as low as possible (check when confirmed) ☐

Intersection of mid-sagittal plane and center of lap belt: X____ Y____ Z____

DUMMY POSTURE

Arms positioned correctly (check when confirmed) ☐

Head is level (0 ± 1 degree): _______ deg

Head Center of Gravity (outboard side): X_______ Y_______ Z_______
H-Point (outboard side): X_______ Y_______ Z_______
Knee Pivot (outboard side): X_______ Y_______ Z_______

Torso Angle (14 ± 0.5 degrees): ________ deg

APPENDIX E

BARRIER CERTIFICATION

AFL Honeycomb Structures

DECLARATION DE CONFORMITE / STATEMENT OF CONFORMITY

(NF L 00-015C)

AFAQ ISO 9001 AFAQ N° 2000/14901

N° Déclaration / Statement N° **DC 2007-11-199**

N° Contrat / Order N° : Your Purchase order N°: 03-08-0119

Client / Customer :

MGA RESEARCH Corp
5000, Warren road
WI
53105 BURLINGTON
USA

Contact : M. David WINKELBAUER

N°	Code	Désignation	Qté
1	PROD101XT	Progressive Deformable Barrier for frontal offset test PDB-XT	7.000
2		**Informations Tracabilité / Qualité**	
	QUAL1	N° de lot / Batch Number: CP0801003	
	QUAL1	N° de lot / Batch Number: CP0801004	
	QUAL1	N° de lot / Batch Number: CP0801006	
	QUAL1	N° de lot / Batch Number: CP0801007	
	QUAL1	N° de lot / Batch Number: CP0801009	
	QUAL1	N° de lot / Batch Number: CP0801012	
	QUAL1	N° de lot / Batch Number: CP0801011	
3		**Informations d'expédition**	
	BL	Bon de livraison N° / Delivery Note N° : BL 2007-11-199	

Nous déclarons que la fourniture citée est conforme aux exigences du contrat et que, après vérifications et essais, elle répond en tout point, aux exigences et règlements applicables, sauf exceptions, réserves ou dérogations énumérées dans la présente déclaration de conformité.

We hereby declare, barring exceptions, reservations, or exemptions listed in this statement of conformity, that the listed supplies comply with the contract requirements and that, after completion of testing and verification, they completely satisfy all specified requirements, and applicable standards and regulations.

Responsable Qualité Fournisseur / Supplier Quality Manager **Date : 17 janvier 2008**

Nom et fonction / Name and title : Karine LAIGNEL **Signature :** Laigne

1419, Route de Viroy
BP 60120 - 45201 MONTARGIS - FRANCE
Tél : 02 38 89 14 00
Fax : 02 38 89 12 30
Email : contact@afl-honeycomb.com

Barrier: Progressive Deformable Barrier for Frontal Offset Test PDB-XT
Batch Number: CP0801011

APPENDIX F

INSIA REPORT ON STRUCTURAL MEASUREMENTS

STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY

APARICIO IZQUIERDO, FRANCISCO

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28031 – MADRID – (SPAIN)

March, 1999

REPORT DOCUMENTATION PAGE

Title:
STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY

Author(s):
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Performing Organisation name and address:
INSIA – University Institute for Automobile Research
Carretera de Valencia, Km. 7 – Campus Sur de la Universidad Politécnica de Madrid
28031 – Madrid – Spain

Suplementary notes:
Under contract to:

THE EUROPEAN COMMUNITY
Project: “Improvement of Crash Compatibility between Cars”
Contract Nº: RO – 97 – SC.1064

Abstract:

The main aim of this working package -*Structural Survey of Cars*- is the reduction of incompatibilities, both structural and geometric, between passenger vehicles and their potential collision partners. The understanding of these incompatibilities needs a previous step for the knowledge of the existing car fleet.

Firstly, it is necessary to select the main resistant elements in the car body. These elements have to be chosen from the point of view of the sort of collision that we want to study, that is to say, frontal and side impacts.

Detailed measurements have been taken from exterior and interior elements, spread to a total number of 74 models selected from the main vehicle manufacturers at Spain. All of them are being sold this year. Using the information available from the previous measurements in vehicles, the geometric characteristics of the main resistant elements involved in the geometric compatibility between cars will be defined.

This report shows the methodology followed to get these measurements.

Subject terms:
Crash compatibility, geometric compatibility, resistant elements, measure methodology

Date:
March, 1999

1.- METHODOLOGY.

Detailed measurements have been taken from exterior and interior elements. Using the information available from the previous measurements in vehicles, the geometric characteristics of the main resistant elements involved in the geometric compatibility between cars have been defined. These elements are presented in the following figures, and have been divided in two main groups according to the vehicle zones studied in this project.

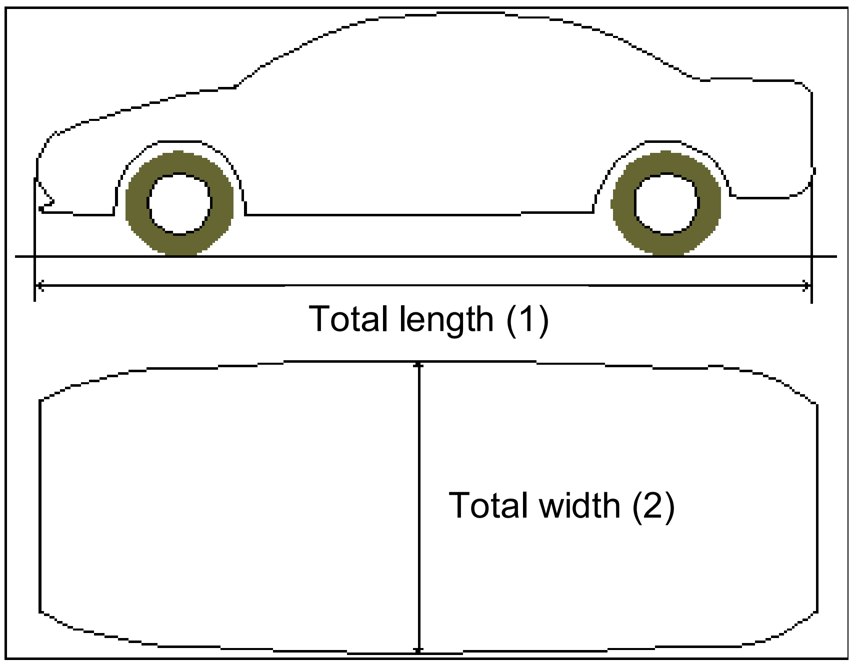


Figure 1.- Definition of the main resistant elements. General dimensions.

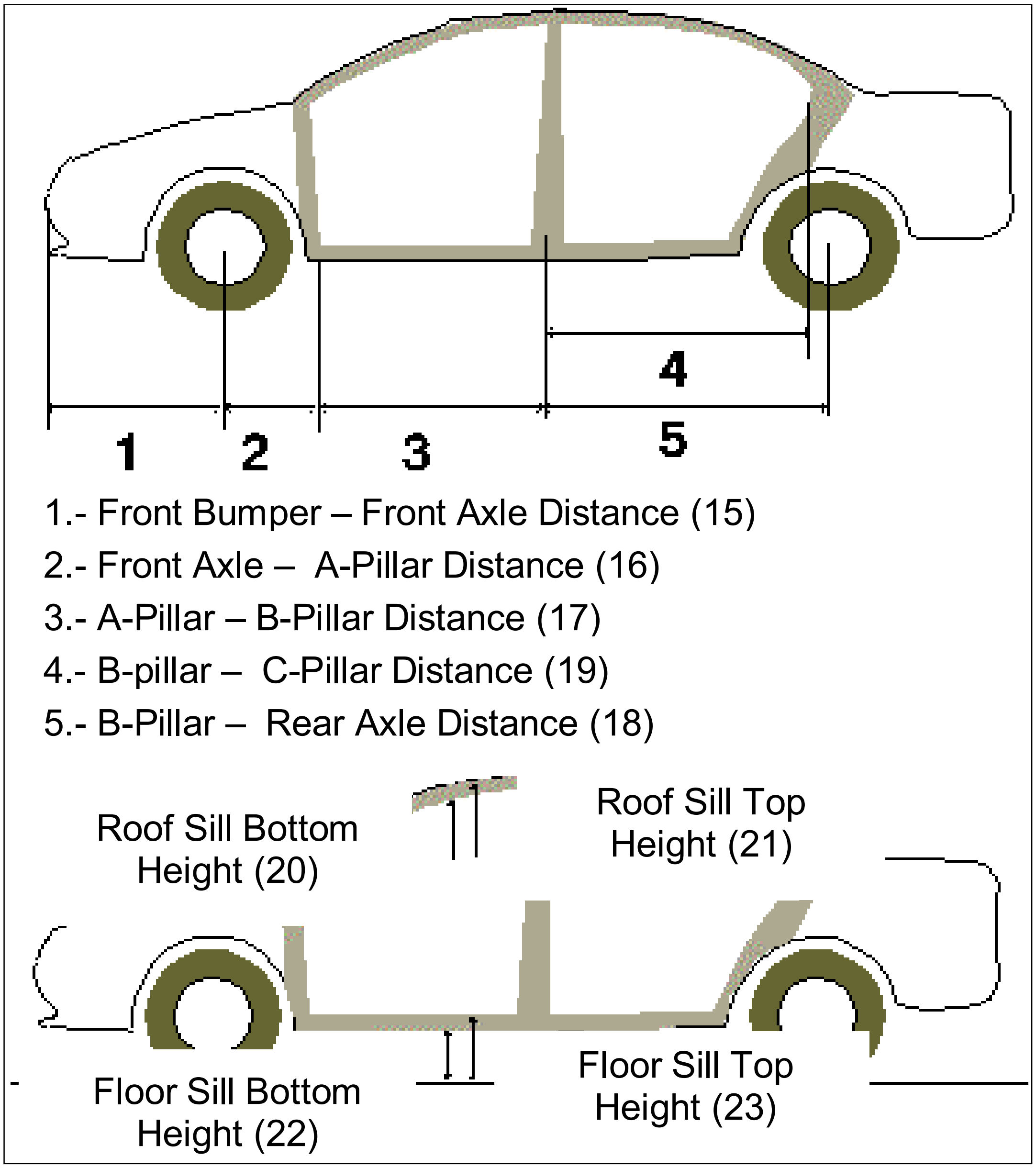


Figure 2.- Definition of the main resistant elements. Side elements.

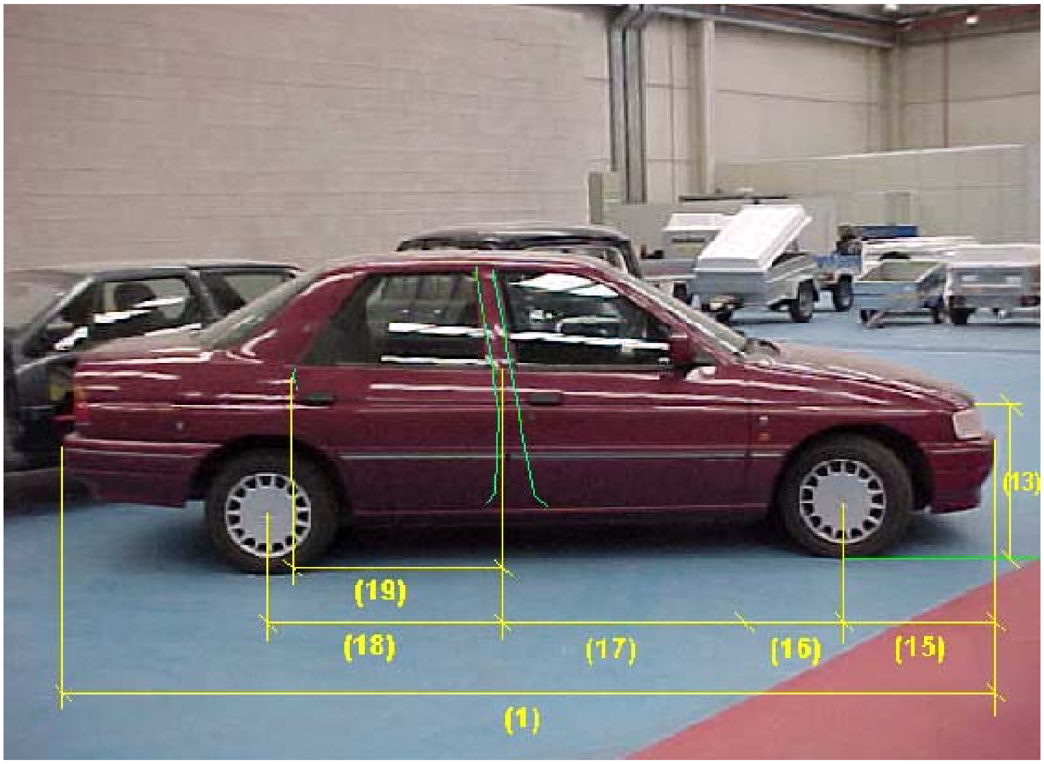
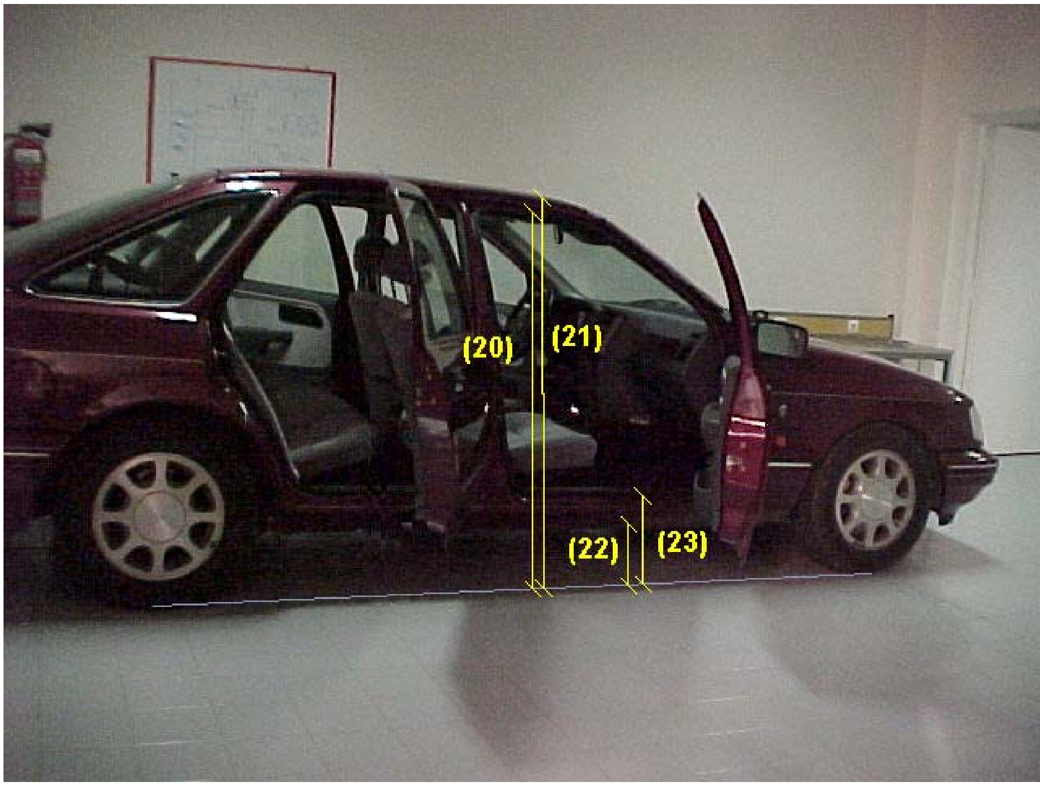


Figure 3.- Measurements of the side resistant elements (outer).

Figure 4.- Measurements of the side resistant elements (inner).



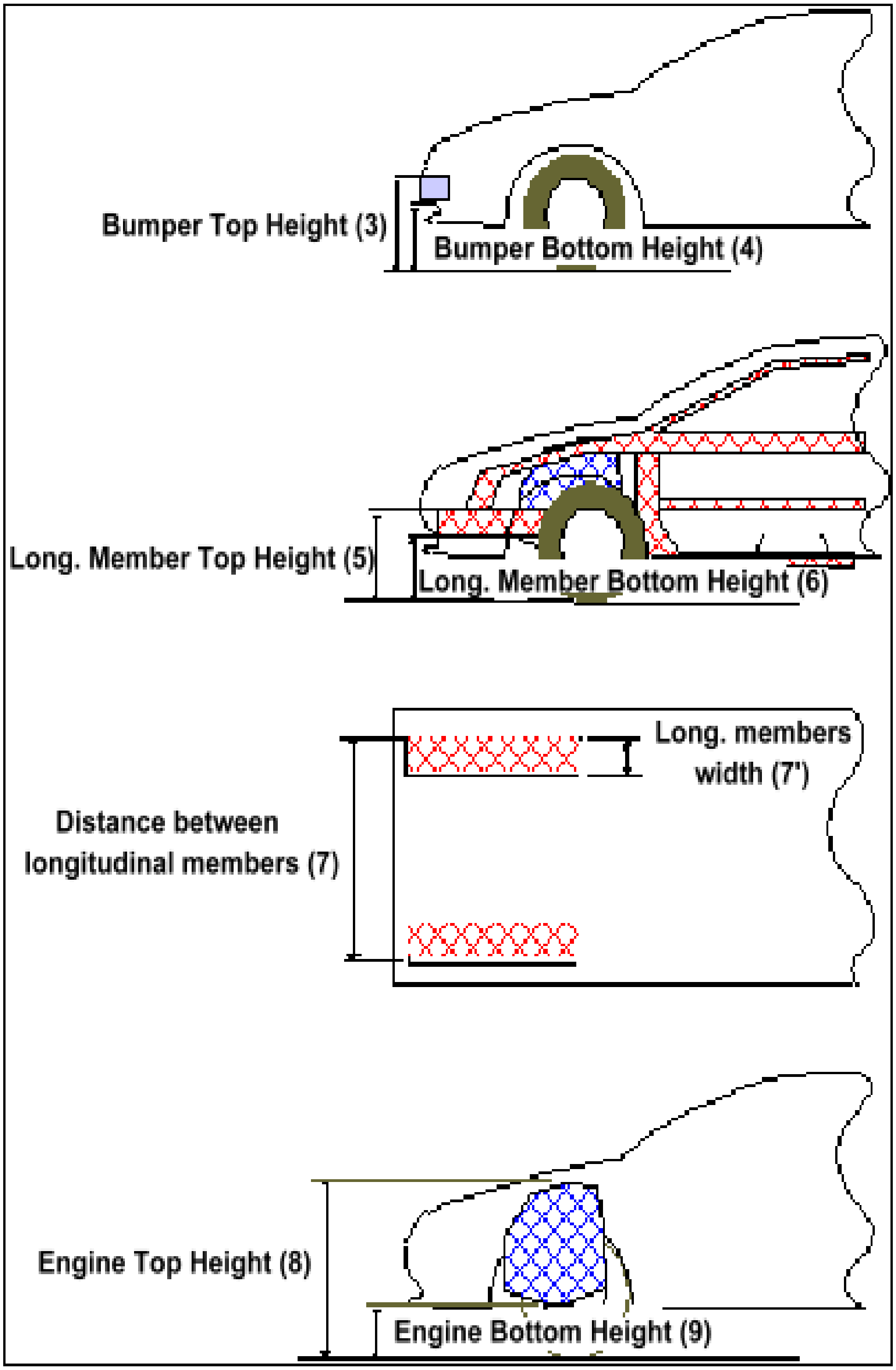


Figure 5.- Definition of the main resistant elements. Front elements.

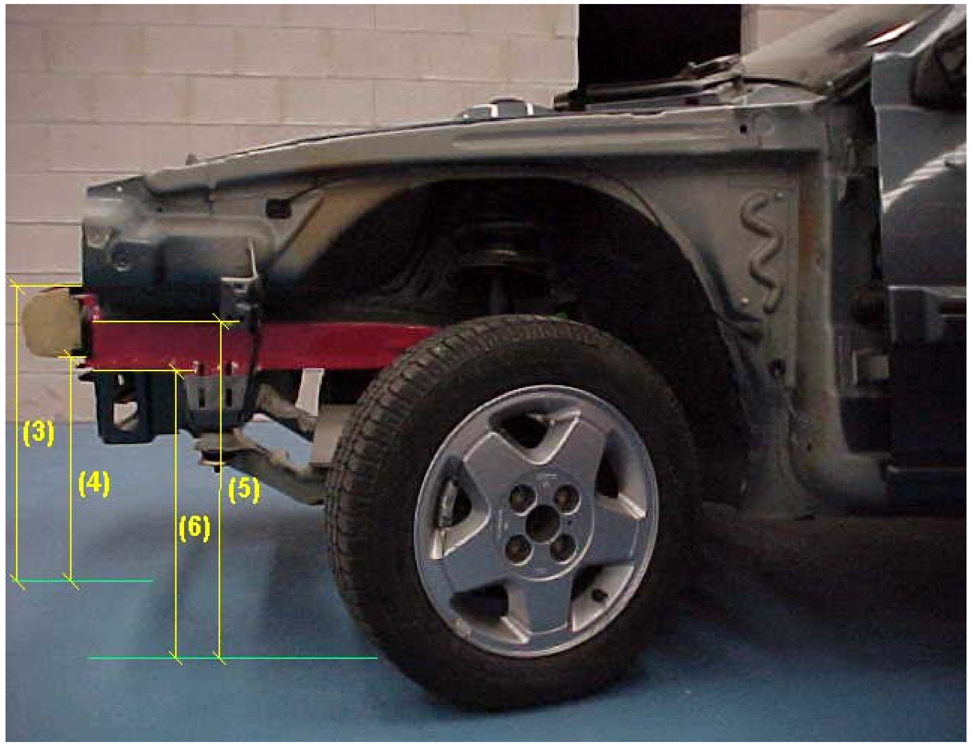


Figure 6.- Measurements of the main resistant elements. Front elements 1.

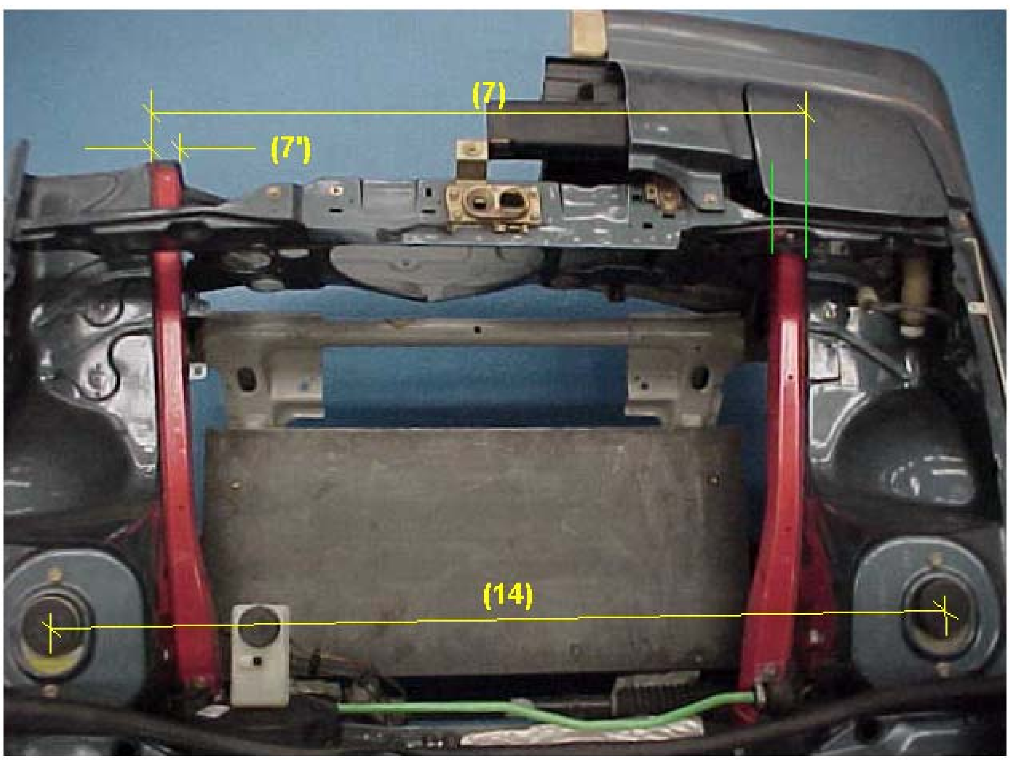


Figure 7.- Measurements of the main resistant elements. Front elements 2.

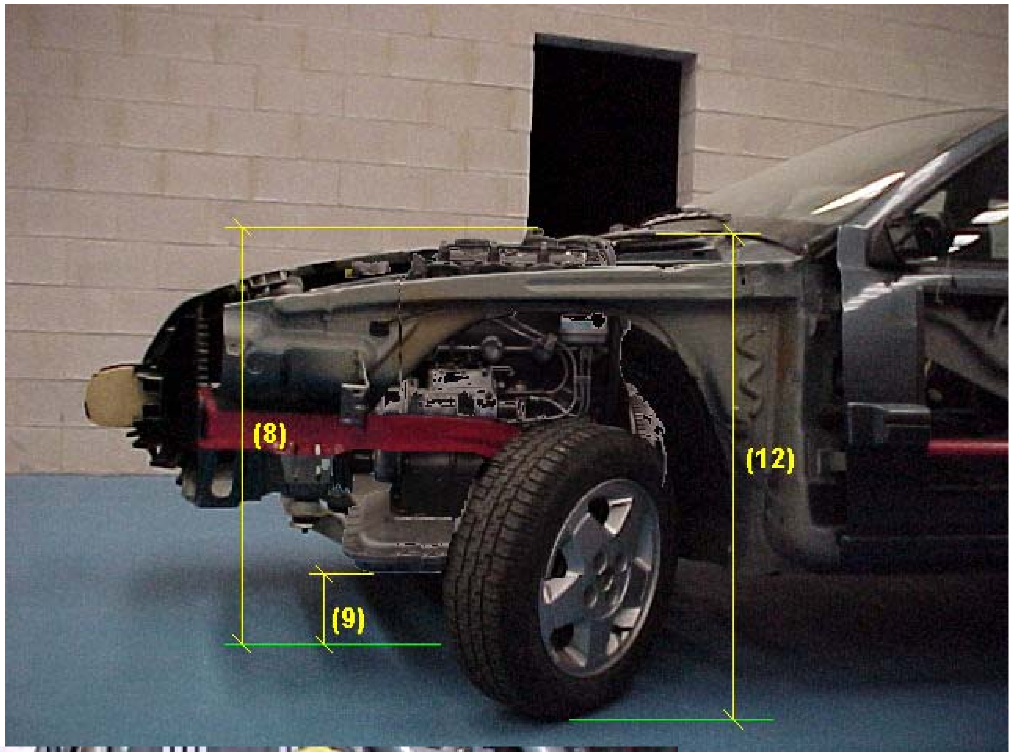


Figure 8.- Measurements of the main resistant elements. Front elements 3.

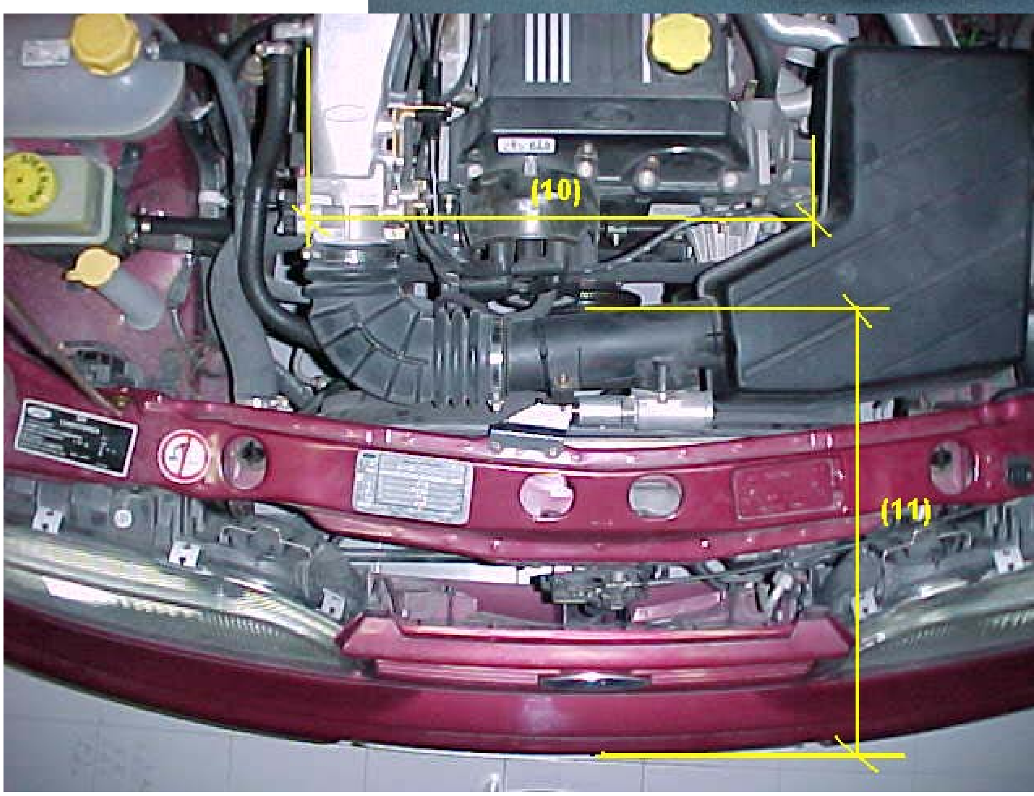


Figure 9.- Definition of the main resistant elements. Front elements (Longitudinal engine).

The procedure considered to measure these elements is described as follows, where it is indicated the location of these ones in the Excel Sheet (SURVEY.XLS) into brackets:

FRONT ELEMENTS

• **Total Length –(1)- (Side & Front Sheets - C column)**: distance between the point in the front bumper further on and the point in the rear bumper further back.

• **Weight (Side & Front Sheets - D column)**: mass, including an average driver weight (70 kg), and the fuel tank mass (at half-capacity).

• **Total Width –(2)- (Side & Front Sheets - E column)**: distance between the outer side points in a transverse plane of the vehicle (middle plane between the front and rear axles).

• **Bumper bottom height –(4)- (Front Sheet G column)**: distance between the ground and the lowest point on the front bumper, being a resistant member (aerodynamic elements under the front bumper are not considered).

• **Bumper top height –(3)- (Front Sheet H column)**: distance between the ground and the highest point on the front bumper, being a resistant member (aerodynamic elements are not considered).

• **Longitudinal member top height –(5)- (Front Sheet I column)**: distance between the ground and the highest point on the longitudinal members, measured approximately in the front bumper-longitudinal member joint (when accessible).

• **Longitudinal member bottom height –(6)- (Front Sheet J column)**: distance between the ground and the lowest point on the longitudinal members, measured approximately in the front bumper-longitudinal member joint.

• **Distance between longitudinal members (Front Sheet K column)**: transverse distance between extreme points in longitudinal members, measured approximately in the front bumper-longitudinal member joint.

Depending on the accessibility of these members, the extreme points are the inner points (I) or the outer points (O).

• **Longitudinal member width -7'- (Front Sheet L column)**: width of one of the longitudinal members, measured approximately in the front bumper-longitudinal member joint.

• **Engine top height (8) (Front Sheet N column)**: distance between the ground and the highest point on the engine that can be a resistant member in case of accident (usually, the highest point on the head, or the highest point of the inlet or exhaust manifolds).

• **Engine bottom height (9) (Front Sheet M column)**: distance between the ground and the lowest point on the engine (usually, the lowest point on the crankcase).

• **Engine and Gearbox width (10) (Front Sheet O & P columns)**:

- Transverse *configuration engine*: distance between extreme points in the gearbox-cylinder block unit or others resistant members attached to the cylinder block unit, i.e. fan belts (from a front point of view).

- *Longitudinal configuration engine*: distance between extreme points in the cylinder block unit (from a front point of view).

• **Front bumper - Engine distance (11) (Front Sheet Q column)**: distance between the point in the front bumper further on and the point in the engine further on that is a resistant element, i.e. the further on point of the exhaust manifold placed in the front of the engine.

• **Front shock absorber fixing width (14) (Front Sheet R column)**: transverse distance between the front shock absorber - body car joints.

• **Front shock absorber fixing height (12) (Front Sheet S column)**: distance between the ground and the front shock absorber-body car joint.

• **Bonnet leading edge height (Front Sheet T column)**: distance between the ground and the bonnet edge further on.

SIDE ELEMENTS

• **Front bumper - Front axle distance (15) (Side Sheet G column)**: distance between the point in the front bumper further on and the middle point in the front tyre-road contact patch.

• **Front axle - A Pillar distance (16) (Side Sheet H column)**: distance between the middle point in the front tyre-road contact patch and the point in the A-pillar further back.

• **A Pillar - B Pillar distance (17) (Side Sheet I column)**: distance between the point in the A-pillar further back and the middle point in the B-pillar.

• **B Pillar - C Pillar distance (19) (Side Sheet J column)**: distance between the middle point in the B-pillar and the point in the C-pillar further back (only 4/5-door vehicles).

• **B Pillar - Rear axle distance (18) (Side Sheet K column)**: distance between the middle point in the B-pillar and the middle point in the rear tyre-road contact patch.

• **Roof sill bottom height (20) (Side Sheet L column)**: distance between the ground and the lowest point on the roof sill, measured in the front door middle point.

• **Roof sill top height (21) (Side Sheet M column)**: distance between the ground and the highest point on the roof sill (usually located in the sill-roof joint), measured in the front door middle point.

• **Floor sill bottom height (22) (Side Sheet N column)**: distance between the ground and the lowest point on the floor sill, measured in the front door middle point.

• **Floor sill top height (23) (Side Sheet O column)**: distance between the ground and the highest point on the floor sill, measured in the front door middle point.

NOTE

- N/A: dimension not available.