

REPORT NUMBER: NCAP-MGA-2007-004

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**NISSAN MOTOR CO., LTD.
2007 NISSAN SENTRA 4-DOOR
NHTSA NUMBER: M75204**

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



Test Date: November 8, 2006

Final Report Date: December 4, 2006

FINAL REPORT

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

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Technical Report Documentation Page

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16. Abstract A frontal barrier impact was conducted on a 2007 Nissan Sentra 4-Door at MGA Research Corporation on November 8, 2006. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The impact velocity was 56.2 km/h. The ambient temperature at the barrier face at the time of impact was 21 degrees Celsius. The vehicle's maximum post test static crush is 507 mm located at the vehicle's centerline. The test vehicle is equipped with a 3-point continuous belt system and an airbag in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;"><u>Measurement Description</u></th> <th style="text-align: left;"><u>Units</u></th> <th style="text-align: left;"><u>Threshold</u></th> <th style="text-align: left;"><u>Driver ATD</u></th> <th style="text-align: left;"><u>Pass. ATD</u></th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC)</td> <td>N/A</td> <td>1000</td> <td>336</td> <td>327</td> </tr> <tr> <td>Max. Thorax Accel. (3ms Clip)</td> <td>G's</td> <td>60</td> <td>42</td> <td>41</td> </tr> <tr> <td>Left Femur Force</td> <td>Newton</td> <td>10009</td> <td>-2016</td> <td>-3462</td> </tr> <tr> <td>Right Femur Force</td> <td>Newton</td> <td>10009</td> <td>-2245</td> <td>-2017</td> </tr> </tbody> </table>				<u>Measurement Description</u>	<u>Units</u>	<u>Threshold</u>	<u>Driver ATD</u>	<u>Pass. ATD</u>	Head Injury Criteria (HIC)	N/A	1000	336	327	Max. Thorax Accel. (3ms Clip)	G's	60	42	41	Left Femur Force	Newton	10009	-2016	-3462	Right Femur Force	Newton	10009	-2245	-2017
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17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2007 Nissan Sentra 4-Door NHTSA No: M75204		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin., Technical Ref. Division, Room 5108 (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590																										
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-06-D-00028. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact in excess of the current 48.3 kph requirements.

SUMMARY

A load cell barrier was impacted by a 2007 Nissan Sentra 4-Door at a velocity of 56.2 kph. The test was performed at MGA Research Corporation on November 8, 2006. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

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

The 102 channels of data were recorded on an on-board data acquisition system. Appendix B contains the dummy head, chest, and femur response data traces.

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

The maximum static crush of the vehicle was 507 mm and both the driver and passenger side doors remained closed and latched during the impact event and were operable after the impact.

The driver's head and chest contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the bolster. The passenger's head and chest contacted the airbag. The passenger's head also contacted the headrest and grab handle. The passenger's knees contacted the glove box.

The occupant data is summarized below:

ATD position	HIC	T ¹	T ²	Clip (g)	T ¹	T ²	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver	336	61.1	97.1	42	57.4	60.4	-24	-2016	-2245
Passenger	327	63.8	99.8	41	75.5	78.5	-24	-3462	-2017

The test data can be found on the NHTSA website at www.nhtsa.dot.gov.

TEST NOTES

None

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
CRASH TEST SUMMARY

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

DOOR OPENING AND SEAT TRACK INFORMATION

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	2080
Center	mm	1975
Right Side	mm	2035
Average	mm	2030

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	874	909
Lap belt length as measured on ATD	mm	851	915
Remainder of belt on reel	mm	1623	1589
Total belt length for continuous webbing systems	mm	3348	3413

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

TEST VEHICLE INFORMATION

Manufacturer	Nissan
Model	Sentra
Body Style	Sedan
NHTSA No.	M75204
VIN	3N1AB61E97L600687
Color	Super Black
Delivery Date	10/24/06
Odometer Reading (mile)	62
Dealer	Boucher Nissan
Transmission	Automatic
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.0
Engine Placement	Longitudinal
Automatic Door Lock (ADL)	No
Owners Manual Details Instructions on Disabling ADLs	N/A
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	No
Traction Control	No
All Wheel Drive	No
Power Seats	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., Ltd.
Date of Manufacture	09/06

GVWR (kg)	1778
GAWR Front (kg)	1010
GAWR Rear (kg)	821

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				385
Cargo Wt. (RCLW) (kg)				45

DATA SHEET NO. 2... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	430.5	248.6		465.8	311.2	
Right	kg	409.1	257.2		445.0	314.8	
Ratio	%	62.4	37.6		59.3	40.7	
Totals	kg	839.6	505.8	1345.4	910.8	626.0	1536.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1345.4
Weight of 2 P572E ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Vehicle Target Weight (TVTW)	kg	1546.4

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	693	694	696	692	1009
As Tested	mm	677	681	664	664	1094
Post Test	mm	688	744	641	677	

Vehicle Wheelbase (mm): 2685

Weight of Ballast secured in cargo area (kg): 13.6

Vehicle Components Removed: Spare tire, jack & tools, right tail light,
wheel well cover, and carpet

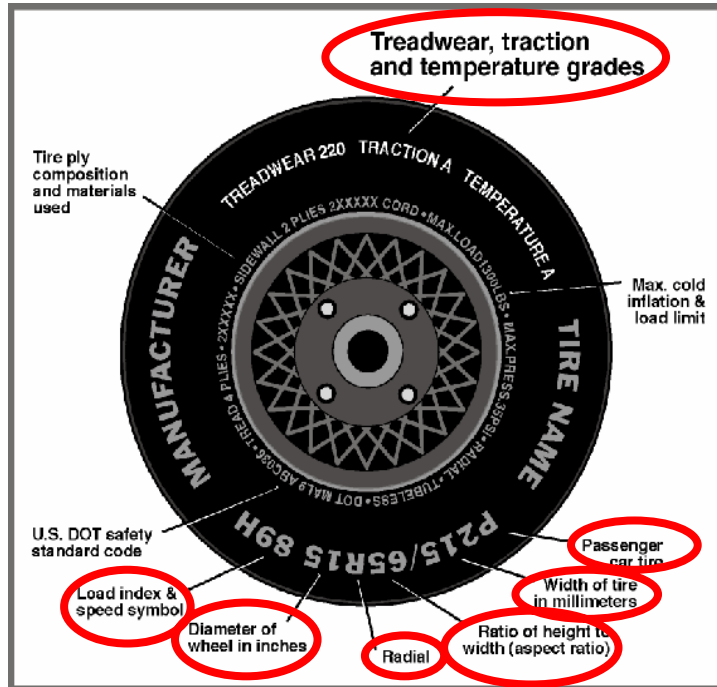
Ballast weight does not include instrumentation and data acquisition system.

DATA SHEET NO. 3

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P205/55R16	P205/55R16
Tire Size on Vehicle	P205/55R16	P205/55R16
Tire Manufacturer	Bridgestone	Bridgestone
Tire Name	Turanza	Turanza
Tire Type	Passenger	Passenger
Tire Width (mm)	205	205
Ratio of Height to Width (aspect ratio)	55	55
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	89H	89H
Treadwear	300	300
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET NO. 4 **TEST VEHICLE INFORMATION**

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

NORMAL DESIGN RIDING POSITION

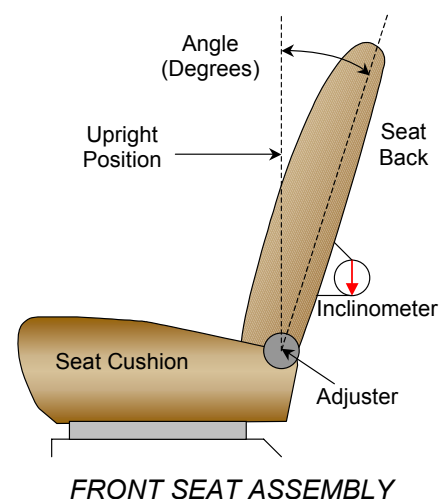
The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows: Zero inclinometer on the sill surface before any measurement is taken. Measure angle from headrest post. Gently push the headrest rearward when taking angle measurements. 7 notches (14 degrees from forward-most locking position), with the forward-most detent defined as 0.

Driver seat back angle: 7th notch (1st as 0)

Passenger seat back angle: : 7th notch (1st as 0)

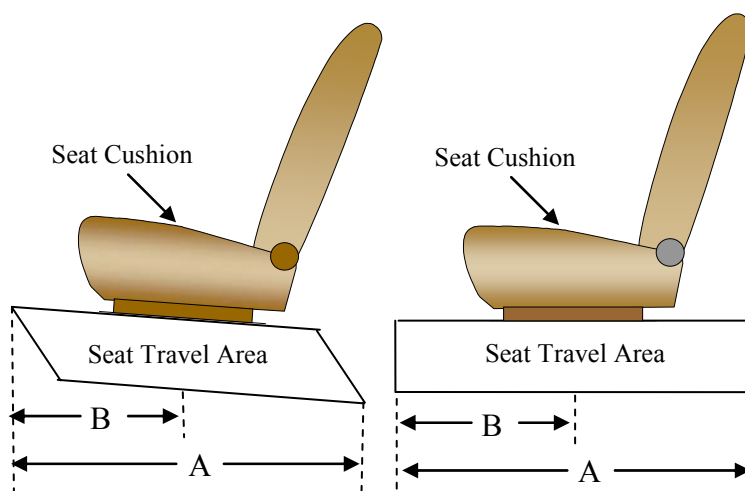
SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	25 detents	10 th detent, 1 st as 0
Passenger Seat	25 detents	12 th detent, 1 st as 0



ADJUSTABLE D-RING POSITION

The driver and passenger D-rings were placed in the full up position.



DATA SHEET NO. 4...(CONTINUED)

TEST VEHICLE INFORMATION

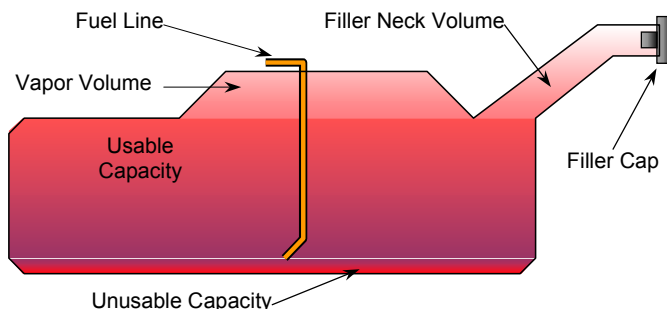
Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	52.6
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	48.4 – 49.4
Actual Amount of Solvent used	49.2
1/3 of Usable Capacity	17.5

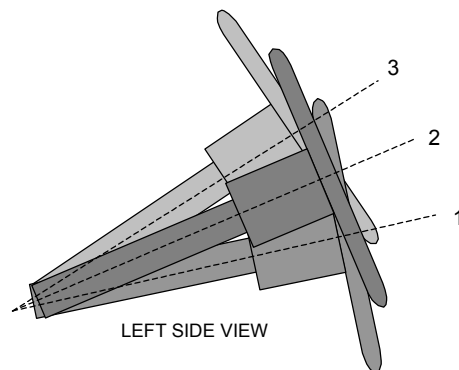
The test vehicle is equipped with an electric fuel pump. Pump will run when the vehicle's electrical system is activated. The fuel pump will pump fuel: 1) for 1.0 seconds after the ignition is switched to "ON". 2) while the engine is running. 3) for 1.5 seconds after the engine stops running.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

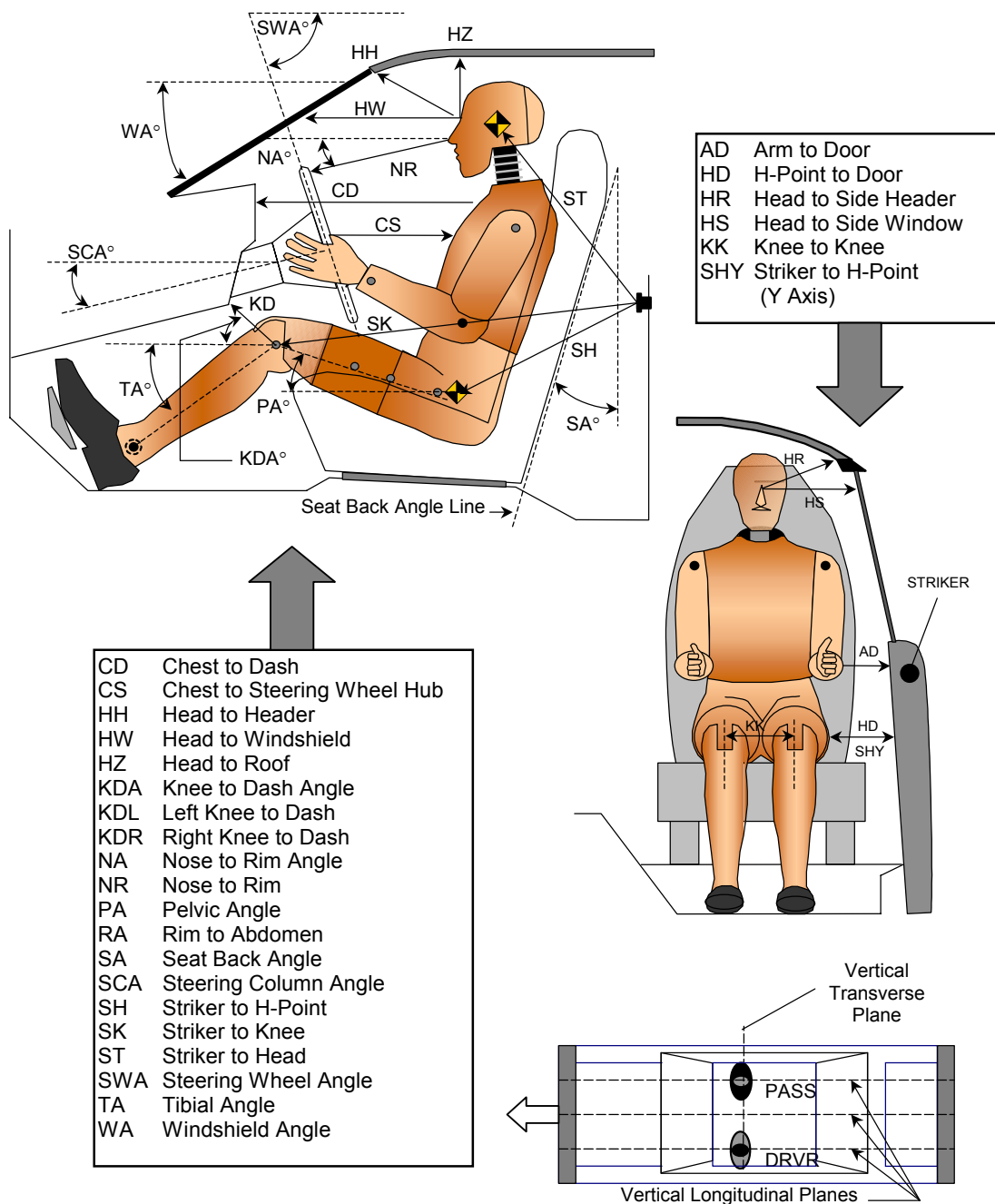
	Fore/Aft Position (mm)	Degrees
Lowermost position No. 1		25.8
Geometric center position No. 2		27.6
Uppermost position No. 3		29.5

DATA SHEET NO. 5 **DUMMY POSITIONING IN VEHICLE**

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



DATA SHEET NO. 5... (CONTINUED)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

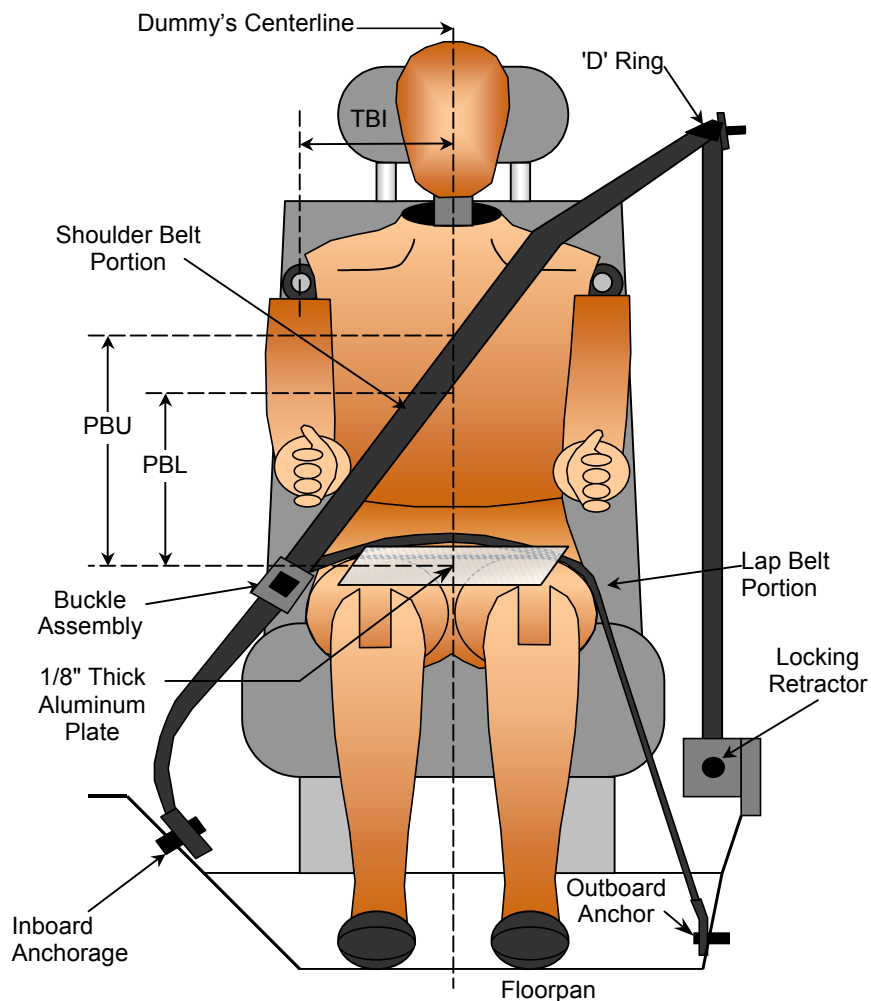
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		25.1		
SWA	Steering Wheel Angle		62.4		
SCA	Steering Column Angle		27.6		
SA	Seat Back Angle (headrest post)		10.8		10.5
HZ	Head to Roof (Z)	198	90	164	90
HH	Head to Header	387	20.3	390	15.8
HW	Head to Windshield	693	0	612	0
HR	Head to Side Header (Y)	224		219	
NR	Nose to Rim	428	10.8		
CD	Chest to Dash	539		517	
CS	Chest to Steering Hub	328	8.2		
RA	Rim to Abdomen	211	0		
KDL	Left Knee to Dash	174	20.6	148	
KDR	Right Knee to Dash	169		161	27.4
PA	Pelvic Angle		22.3		23.9
TA	Tibia Angle		49.1		45.6
KK	Knee to Knee (Y)	304		270	
SK	Striker to Knee	594	91.6	613	92.9
ST	Striker to Head	519	11.9	563	11.5
SH	Striker to H-Point	260	123.0	248	114.0
SHY	Striker to H-Point (Y)	266		266	
HS	Head to Side Window	338		323	
HD	H-Point to Door (Y)	142		150	
AD	Arm to Door (Y)	113		132	
AA	Ankle to Ankle	269		202	

DATA SHEET NO. 6 **SEAT BELT POSITIONING DATA**

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	335	335
PBL - To surface of reference to belt lower edge	mm	260	260

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATIONS

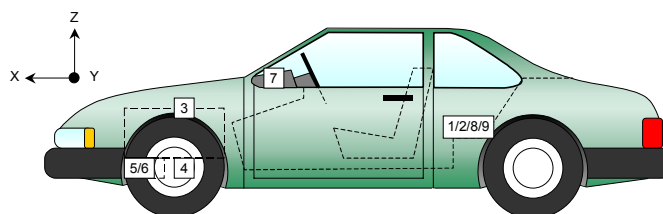
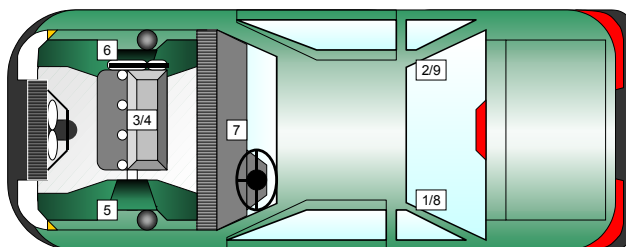
Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member X	1688	-225	535
2	Right Rear X-Member X	1688	225	535
3	Engine Top X	3740	100	878
4	Engine Bottom X	3697	170	185
5	Left Brake Caliper X	3709	-675	225
6	Right Brake Caliper X	3709	675	225
7	Instrument Panel X			
8	Left Rear X-Member Z	1688	-225	535
9	Right Rear X-Member Z	1688	225	535

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



DATA SHEET NO. 8

SUMMARY OF FMVSS 212 AND FMVSS 219 (Partial) DATA

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

Windshield Mounting Details:

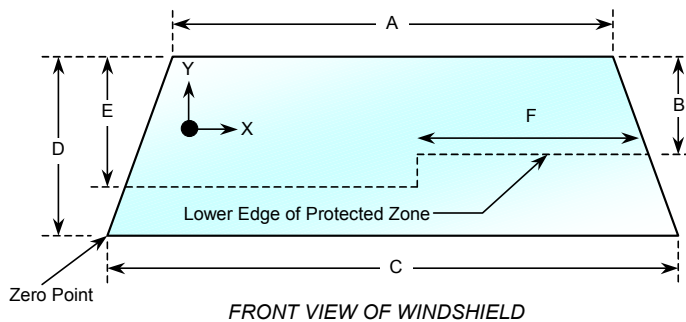
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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	2156	2156	100
Right Side	2156	2156	100
Total	4312	4312	100



Item	Units	Value
A	mm	1178
B	mm	572
C	mm	1464
D	mm	835
E	mm	587
F	mm	417

AREA OF PROTECTED ZONE FAILURES - NONE

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

X	Y

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

X	Y

DATA SHEET NO. 9 **SUMMARY OF FMVSS 301 DATA**

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

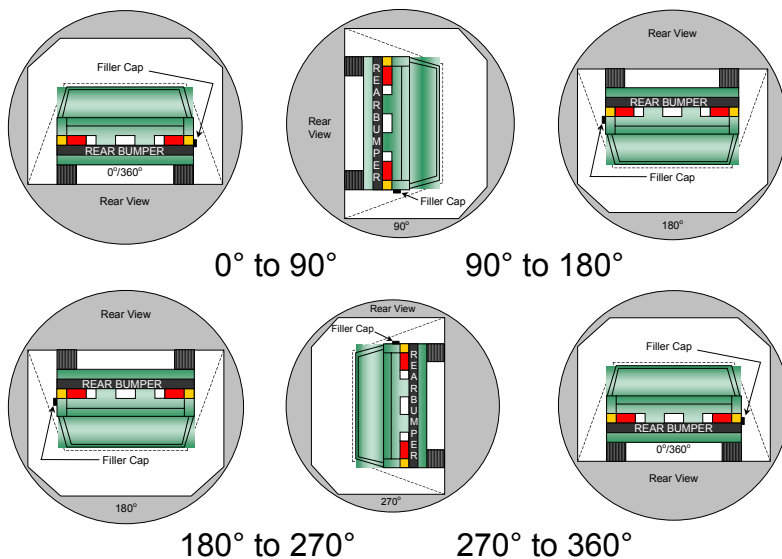
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 10:22 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



1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.

2. The position hold time at each position is 300 seconds (minimum).

3. Details of Stoddard Solvent spillage locations:
None

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	120	300	0
90° to 180°	114	300	0
180° to 270°	111	300	0
270° to 360°	120	300	0

DATA SHEET NO. 10
VEHICLE MEASUREMENTS

Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006

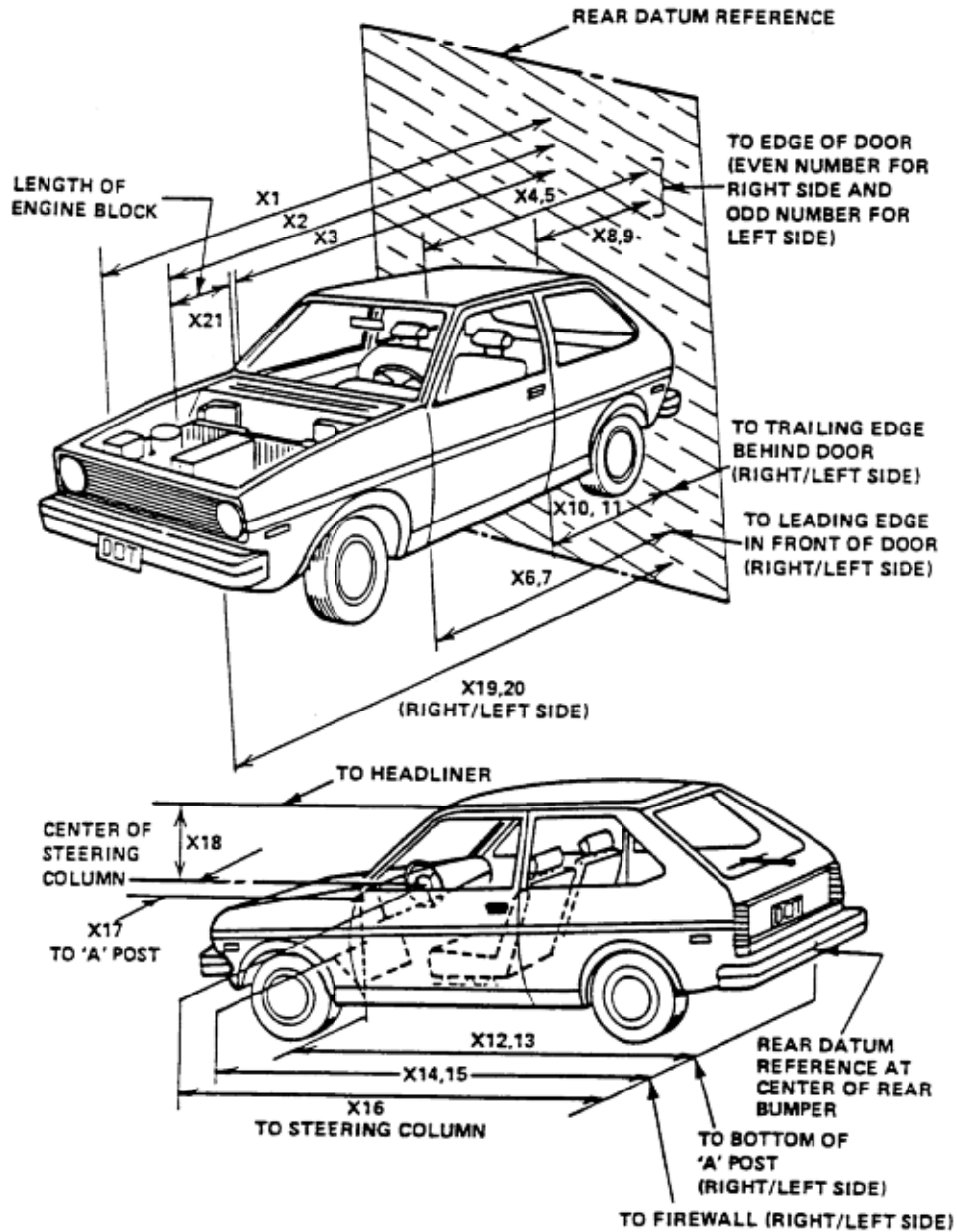
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4511	4004	507
2	RSOV to front of engine	mm	3883	3734	149
3	RSOV to firewall centerline	mm	3540	3540	0
4	RSOV to leading edge of right door	mm	3126	3119	7
5	RSOV to leading edge of left door	mm	3126	3122	4
6	RSOV to lower leading edge of right door	mm	3089	3086	3
7	RSOV to lower leading edge of left door	mm	3085	3084	1
8	RSOV to upper leading edge of right door	mm	2012	2006	6
9	RSOV to upper leading edge of left door	mm	2012	2006	6
10	RSOV to lower trailing edge of right door	mm	1996	1992	4
11	RSOV to lower trailing edge of left door	mm	1996	1992	4
12	RSOV to bottom of right 'A' pillar	mm	3048	3051	-3
13	RSOV to bottom of left 'A' pillar	mm	3050	3050	0
14	RSOV to firewall on right side	mm	3531	3462	69
15	RSOV to firewall on left side	mm	3544	3507	37
16	RSOV to steering column	mm	2665	2687	-22
17	Center of steering column to left 'A' pillar	mm	394	391	3
18	Center of steering column to headlining	mm	430	432	-2
19	RSOV to right side of front bumper	mm	4307	3917	390
20	RSOV to left side of front bumper	mm	4316	3945	371
21	Length of engine block	mm	428	428	0
RD	RSOV to right side of dash panel	mm	2862	2865	-3
CD	RSOV to center of dash panel	mm	2884	2875	9
LD	RSOV to left side of dash panel	mm	2872	2865	7

DATA SHEET NO. 10... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006



DATA SHEET NO. 10... (continued)**VEHICLE MEASUREMENTS**

Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006

Target Vehicle Structural Measurement

	Elements	Pre-Test (mm)
1	Total Length	4511
2	Total Width	1761
3	Bumper Top Height	545
4	Bumper Bottom Height	502
5	Longitudinal Member Top Height	568
6	Distance between Longitudinal Members	755
7	Longitudinal Member Width	60
8	Engine Top Height	870
9	Engine Bottom Height	190
10	Engine and gearbox width	800
11	Front bumper-engine distance	420
12	Front shock absorber fixing height	880
13	Bonnet leading edge height	748
14	Front shock absorber fixing width	1186
15	Front bumper – front axle distance	858
16	Front axle – a pillar distance	443
17	A-pillar – B-pillar distance	1100
18	B-Pillar – rear axle distance	1140
19	B-pillar – C-pillar distance	935
20	Roof sill bottom height	1445
21	Roof sill top height	1510
22	Floor sill bottom height	265
23	Floor sill top height	322

DATA SHEET NO. 11
CAMERA LOCATIONS

Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				13	24
2	Left Front View	980	-4875	1150	19	1000
3	Steering Column Top	1110	-5245	1310	25	1000
4	Steering Column Bottom	1105	-5235	915	25	1000
5	Driver Close-up	1185	-5735	1510	35	1000
6	Driver Angle	7010	-5090	1985	50	1000
7	On board Driver Side					
8	On board Passenger Side					
9	Right Overall	2095	6930	1290	24	1000
10	Right Passenger Half	1160	4900	1140	24	1000
11	Right Close-up	1405	5900	1405	35	1000
12	Right Angle	6920	4960	2060	50	1000
13	Windshield	-285	0	2830	25	1000
14	Top Driver	-150	-375	2205	24	1000
15	Top Passenger	-145	510	2210	24	1000
16	Pit Front	1030	0	-3150	24	1000
17	Pit Rear	3490	0	-3150	24	1000

***COORDINATES:**

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

Note: Cameras 7 and 8 were not used for this test.

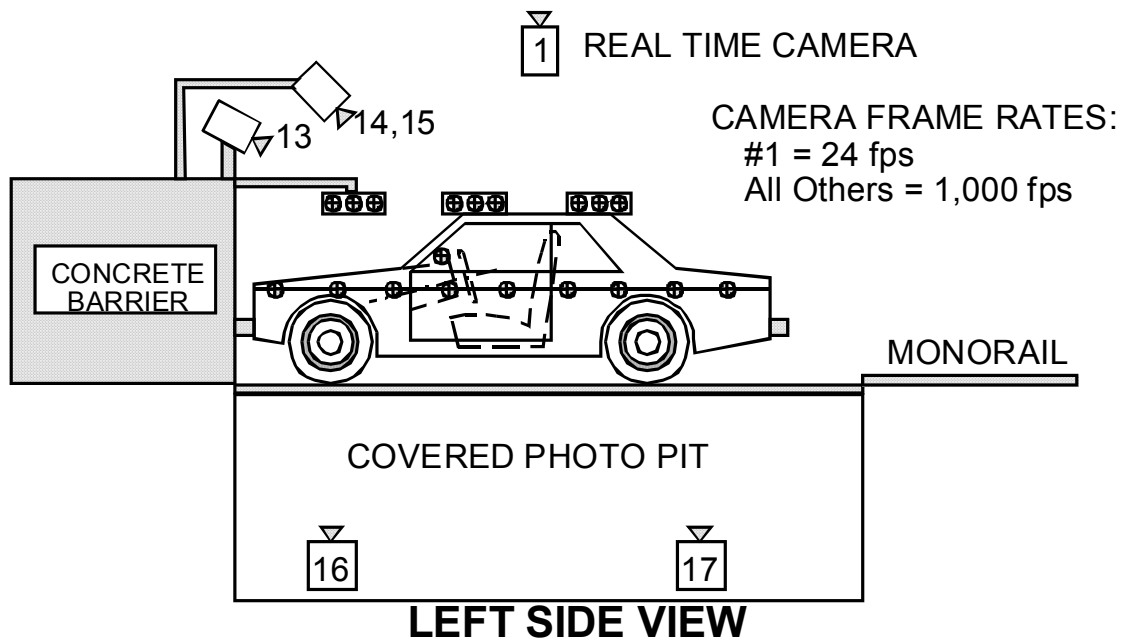
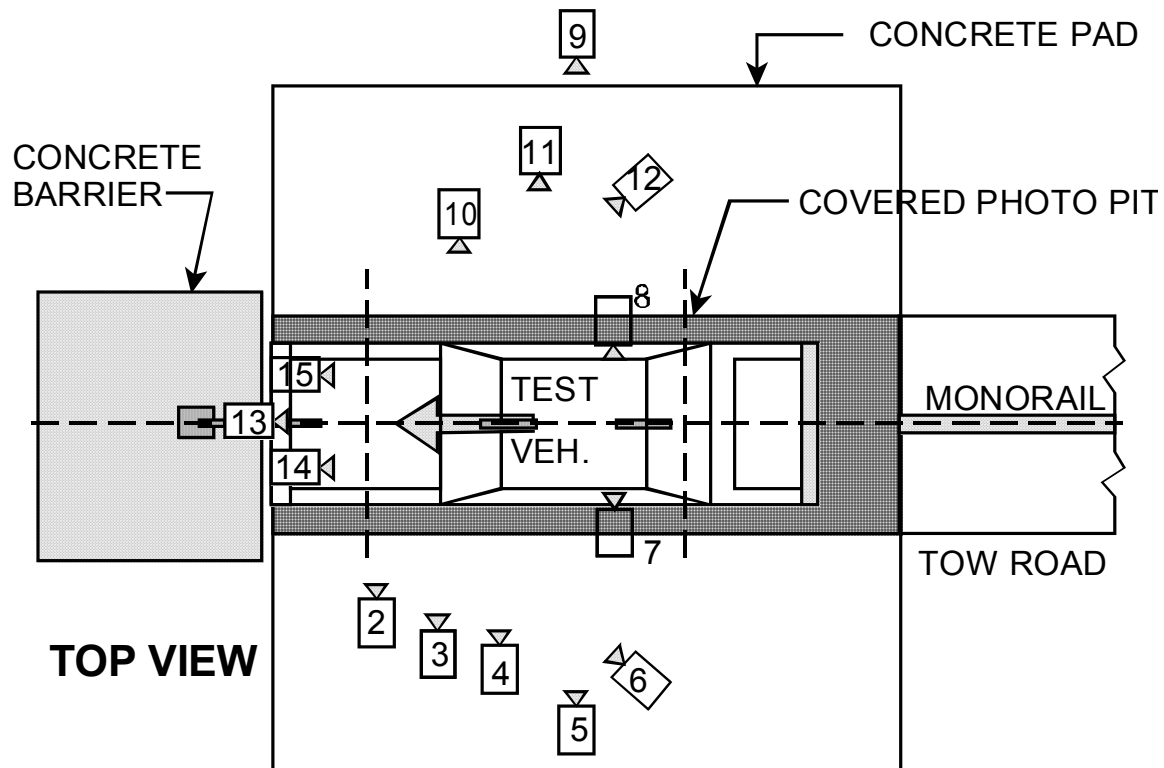
DATA SHEET NO. 11... (continued)

CAMERA LOCATIONS

Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006

CAMERA POSITIONS FOR FRONTAL IMPACTS

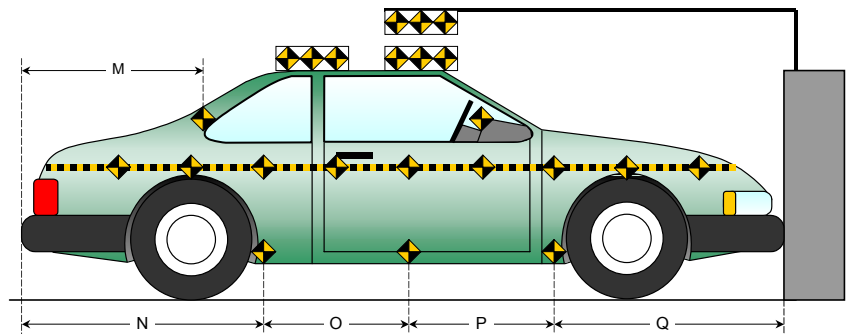
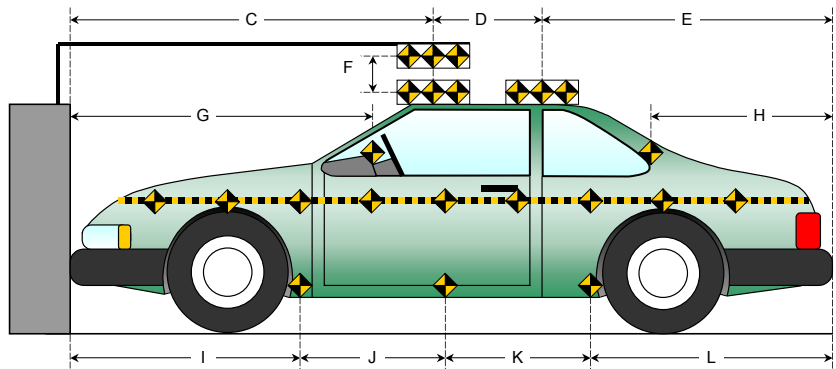
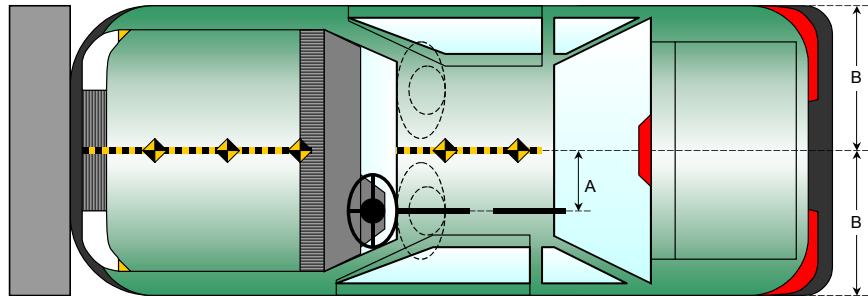


DATA SHEET NO. 12 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

Item	Value
A	376
B	880
C	2304
D	611
E	1596
F	1508
G	
H	923
I	1451
J	873
K	872
L	1315
M	926
N	1320
O	872
P	872
Q	1447



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

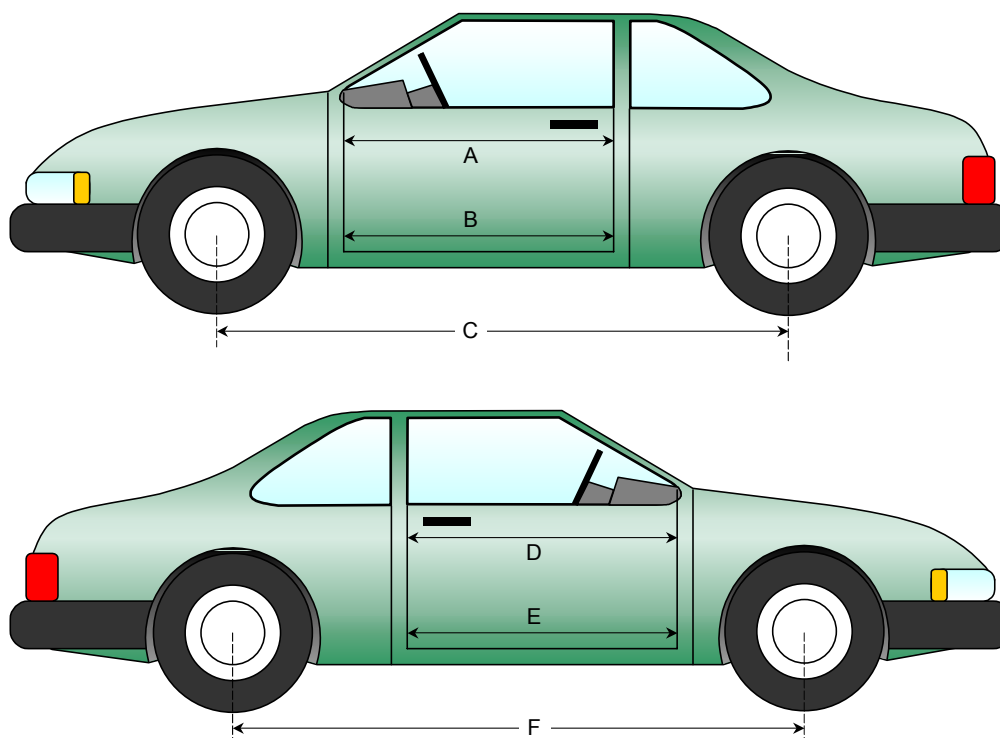
NHTSA No.: M75204
 Test Date: 11/08/2006

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	993	1001	-8
B	Left Side Lower	mm	975	976	-1
D	Right Side Upper	mm	991	1002	-11
E	Right Side Lower	mm	978	983	-5

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2685	2659	26
F	Right Side Wheelbase	mm	2686	2672	14



DATA SHEET NO. 13... (continued)
VEHICLE INTRUSION MEASUREMENTS

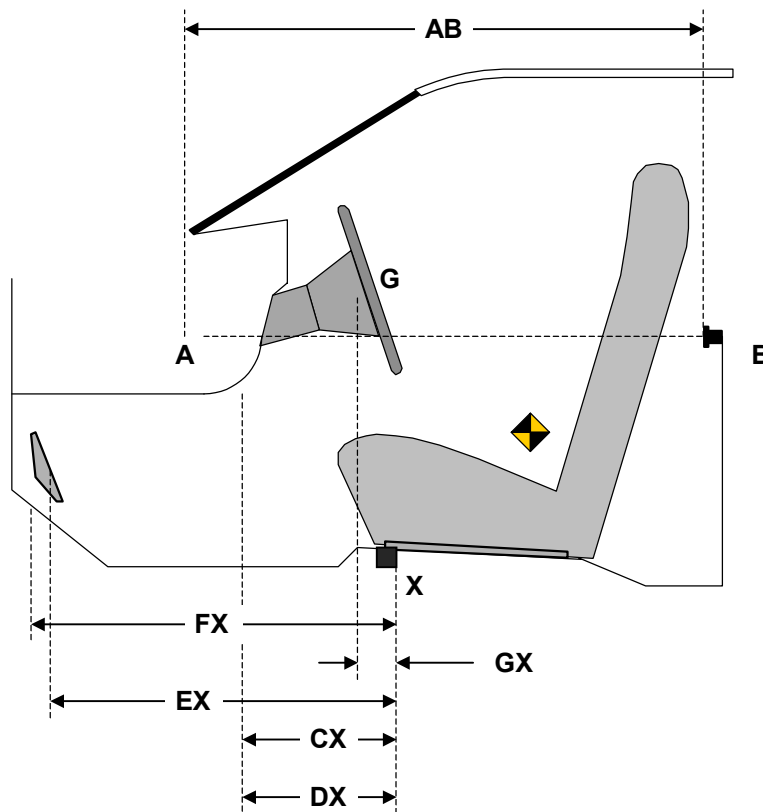
Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	841	846	-5
CX	Left Knee Bolster to X	mm	394	398	-4
DX	Right Knee Bolster to X	mm	352	376	-24
EX	Brake Pedal to X	mm	618	532	86
FX	Foot Rest to X	mm	625	598	27
GX	Center of Steering Column Wheel Hub to X	mm	139	173	-34

X = Front of Seat Track (stationary)

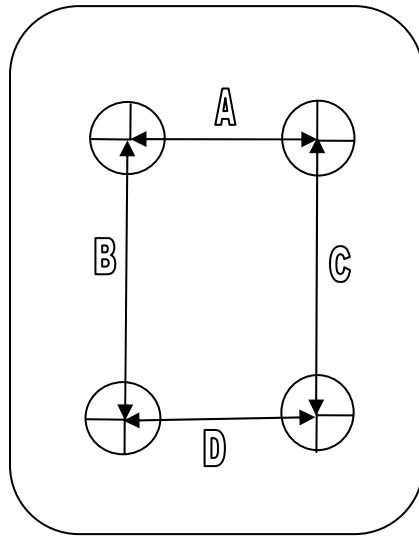


DRIVER COMPARTMENT

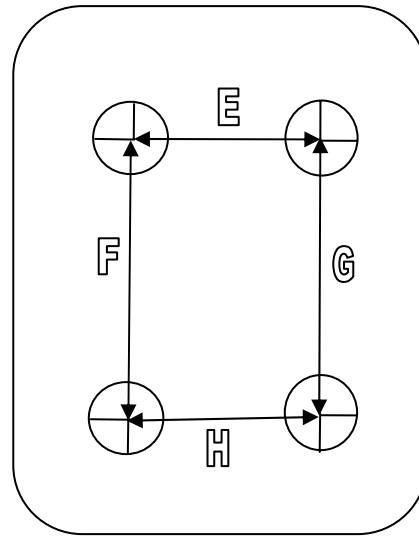
DATA SHEET NO. 13... (continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006



Driver



Passenger

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	220	225	-5
B	240	236	4
C	246	243	3
D	220	215	5
E	207	206	1
F	215	213	2
G	217	214	3
H	202	197	5

DATA SHEET NO. 14

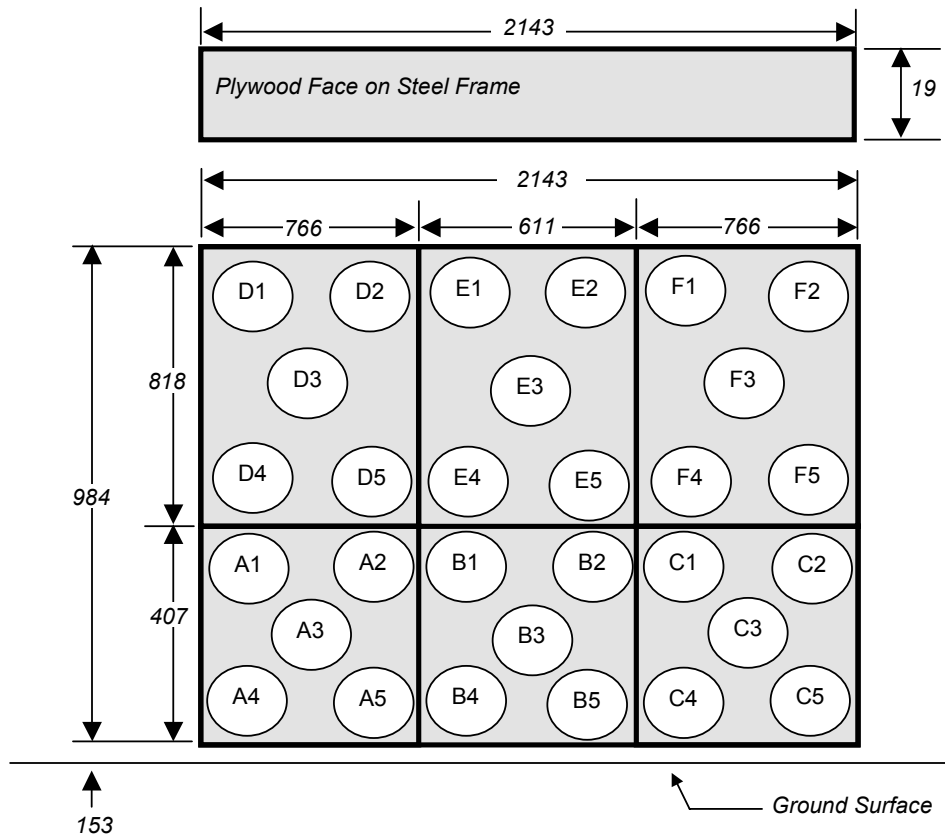
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2007 Nissan Sentra 4-Door
 Test Program: 35mph Frontal Impact

NHTSA No.: M75204
 Test Date: 11/08/2006

30 Load Cell Rigid Barrier

Load Cell Locations on Fixed Barrier



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

6 Groups of 5 Load Cells Each

DATA SHEET NO. 15
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2007 Nissan Sentra 4-Door NHTSA No.: M75204
 Test Program: 35mph Frontal Impact Test Date: 11/08/2006

VEHICLE INFORMATION

VIN: 3N1AB61E97L600687 Wheelbase (mm) : 2685
 Vehicle Size Category: Sedan Test Weight (kg) : 1536.8

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 12
 Cal. Procedure/Interval: MGA procedure / 6 month
 Integration Algorithm: Trapezoidal Linearity: > 99%
 Impact Velocity (km/h): 56.2
 Velocity Change (km/h): 64.0 Time of Separation (msec): 85

CRUSH PROFILE

Collision Deformation Classification: Frontal Midpoint of Damage: Centerline
 Damage Region Length (mm): 1213 Impact Mode: Frontal

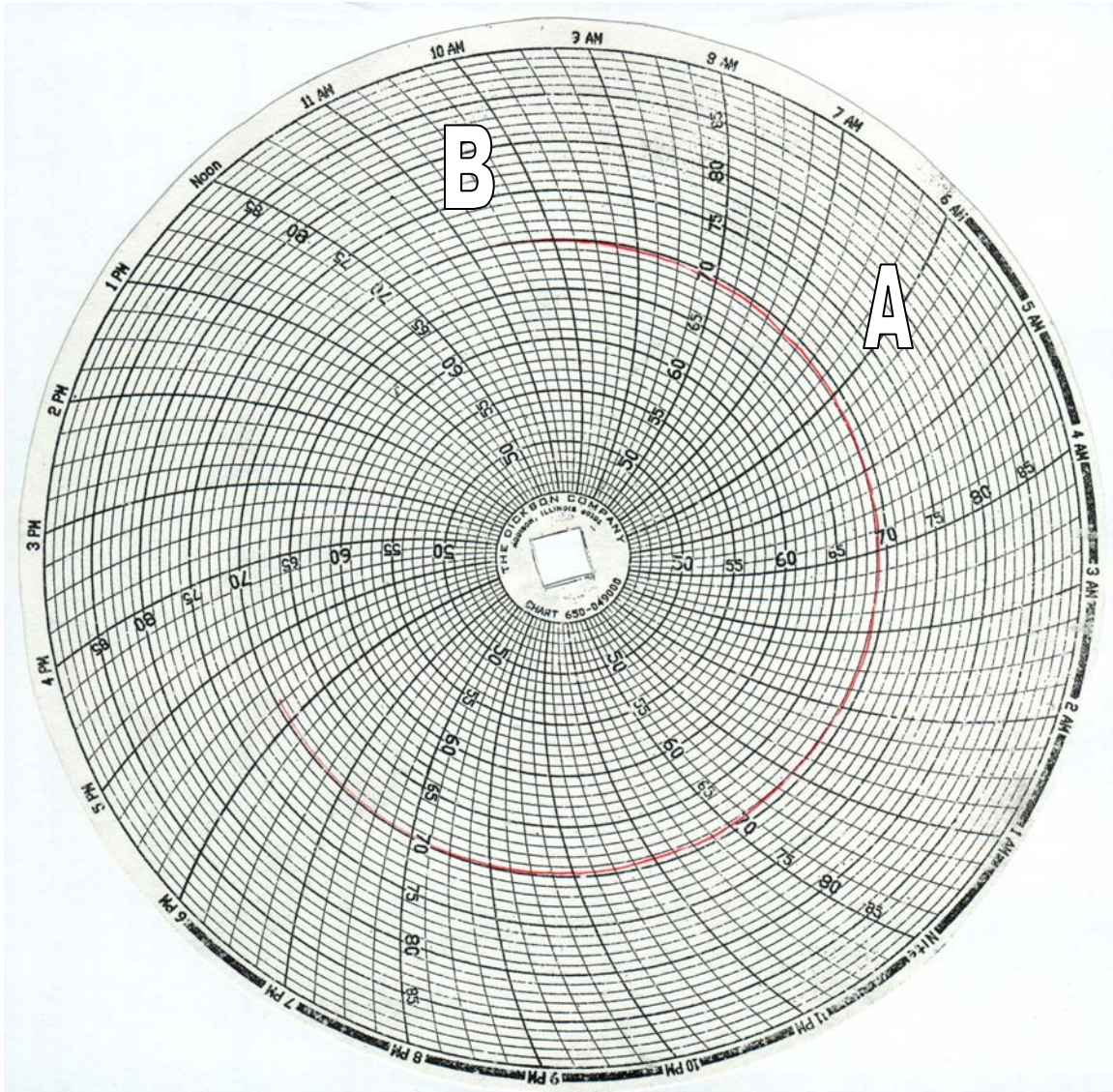
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4316	3945	371
C2	Crush zone 2 at left side	mm	4439	3974	465
C3	Crush zone 3 at left side	mm	4497	4011	486
C4	Crush zone 4 at right side	mm	4494	3997	497
C5	Crush zone 5 at right side	mm	4438	3992	446
C6	Crush zone 6 at right side	mm	4307	3917	390
L	C1 TO C6	mm	1496	1490	6

DATA SHEET NO. 16

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2007 Nissan Sentra 4-Door
Test Program: 35mph Frontal Impact

NHTSA No.: M75204
Test Date: 11/08/2006



A = Dummies installed in vehicle at 6:00 am

B = Test conducted at 10:22 am

APPENDIX A
PHOTOGRAPHS

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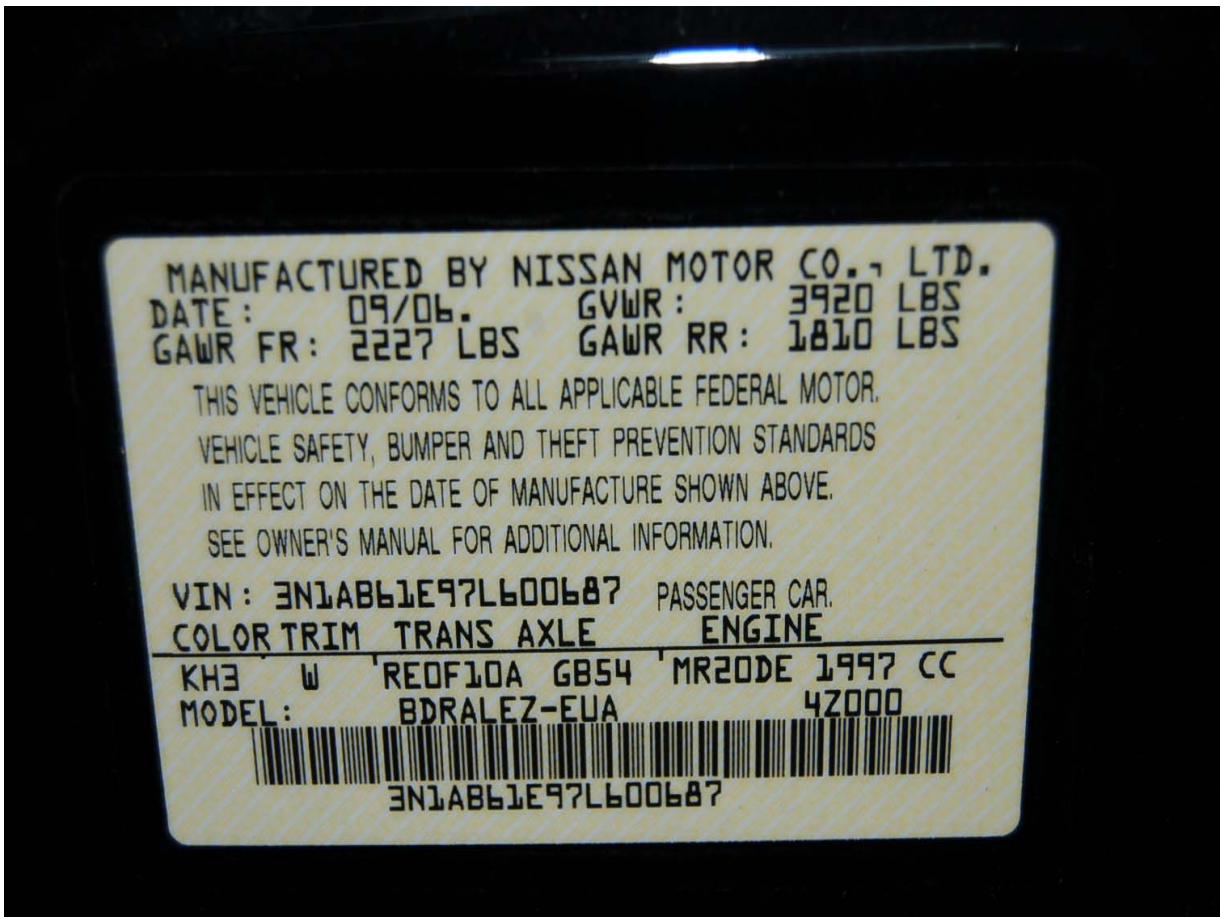
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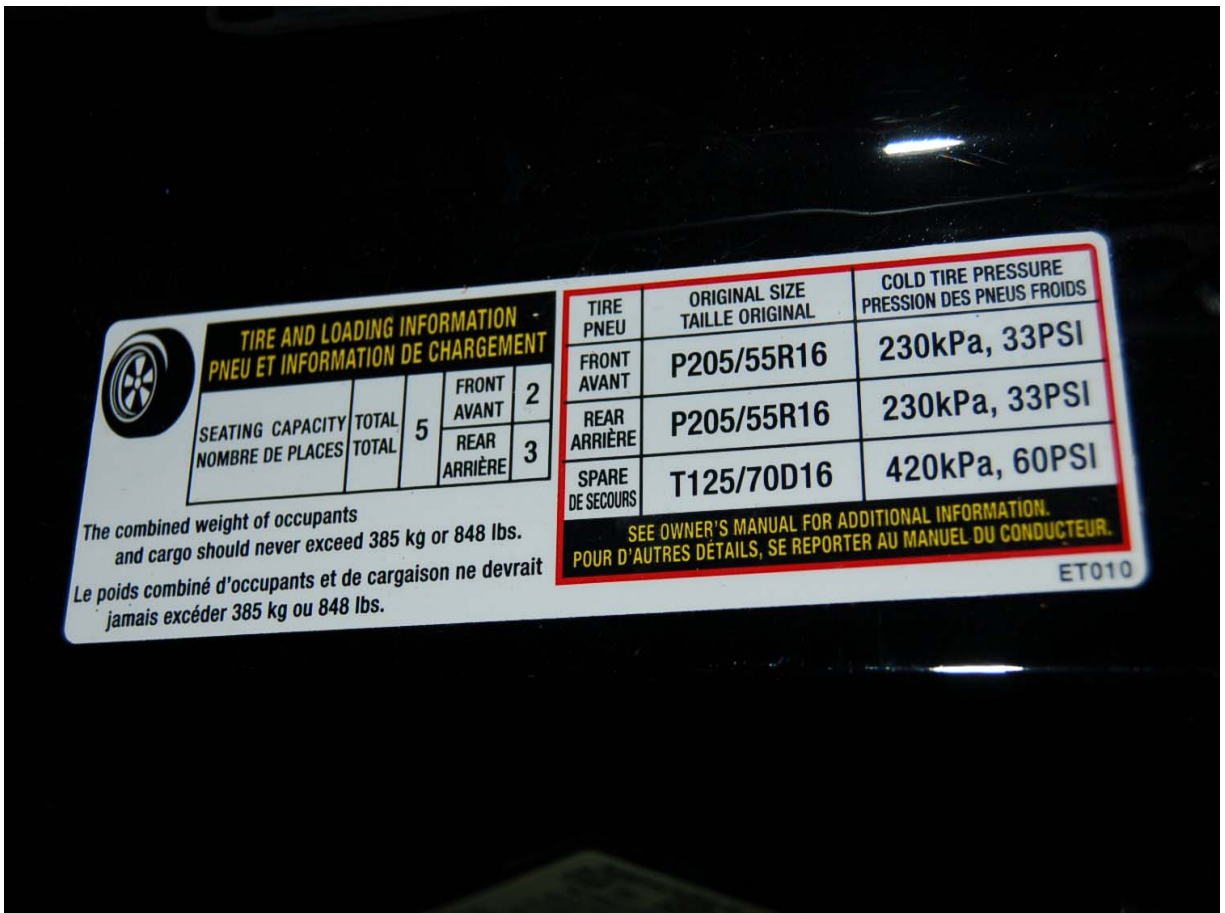
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Load Cell Location



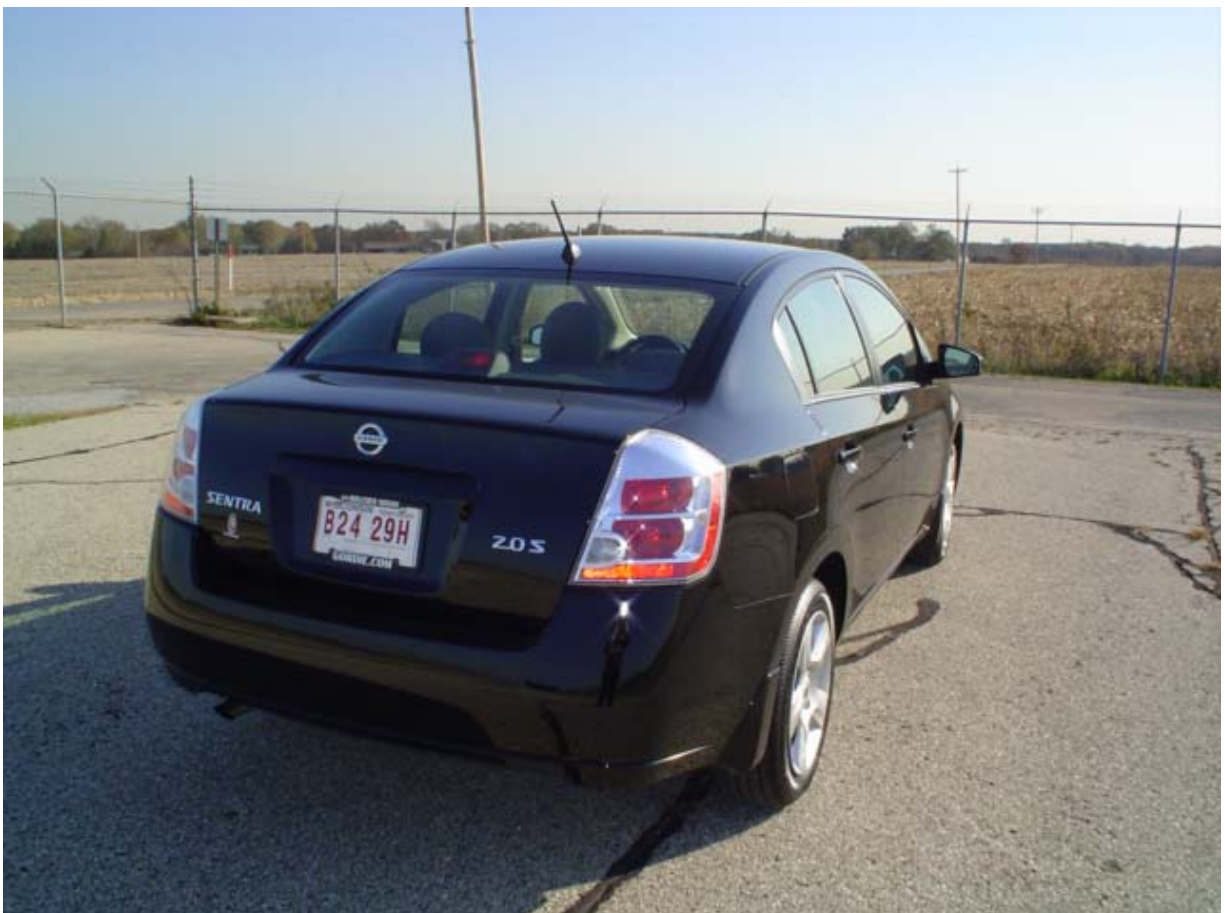
Manufacturer's Label



Tire Placard



Left Front $\frac{3}{4}$ View, As Received



Right Rear $\frac{3}{4}$ 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 $\frac{3}{4}$ View



Post-Test Right Front $\frac{3}{4}$ View



Pre-Test Left Rear $\frac{3}{4}$ View



Post-Test Left Rear $\frac{3}{4}$ View



Pre-Test Left Side 3/4 View of Doors



Post-Test Left Side 3/4 View of Doors After Impact



Pre-Test Right Side 3/4 View of Doors



Post-Test Right Side 3/4 View of Doors After Impact



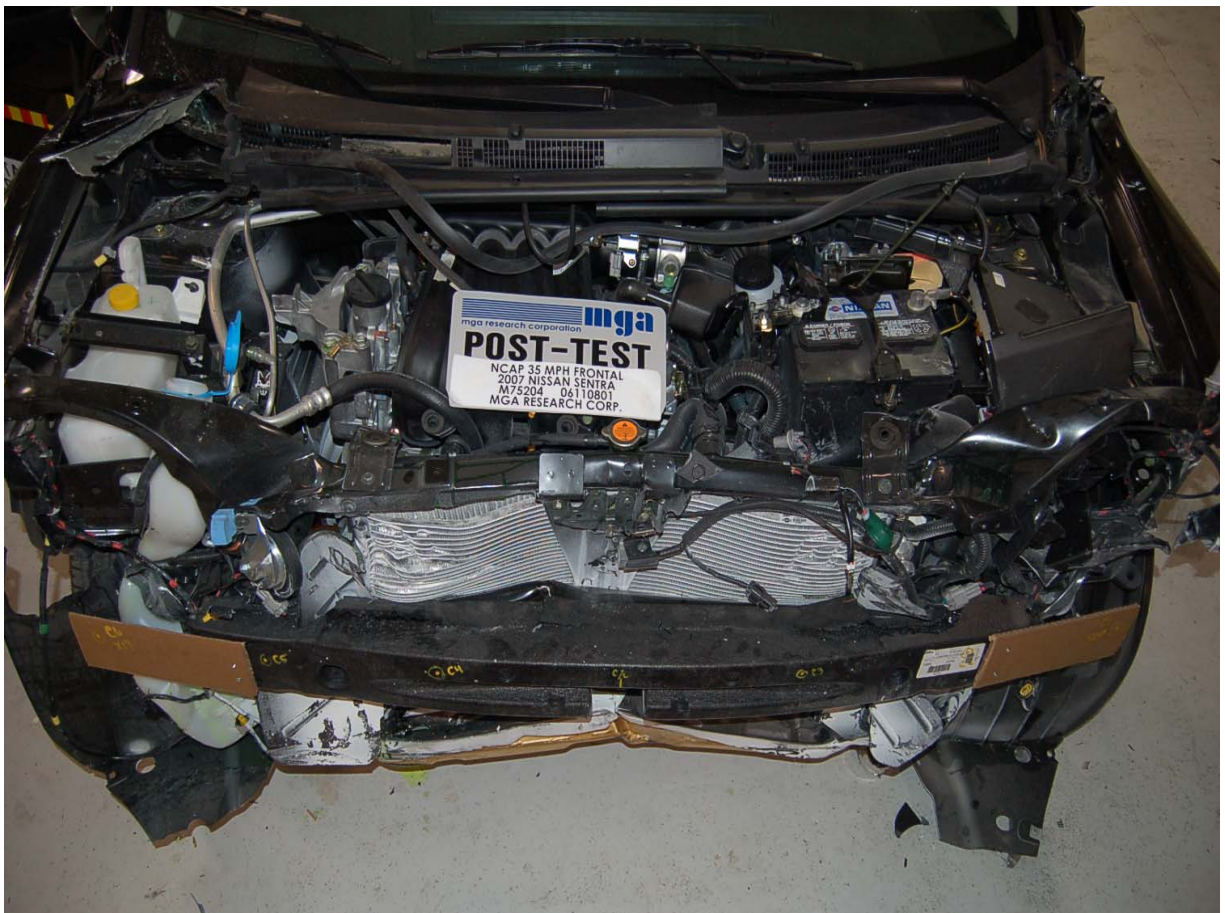
Pre-Test Windshield View



Post-Test Windshield View



Pre-Test Engine Compartment View



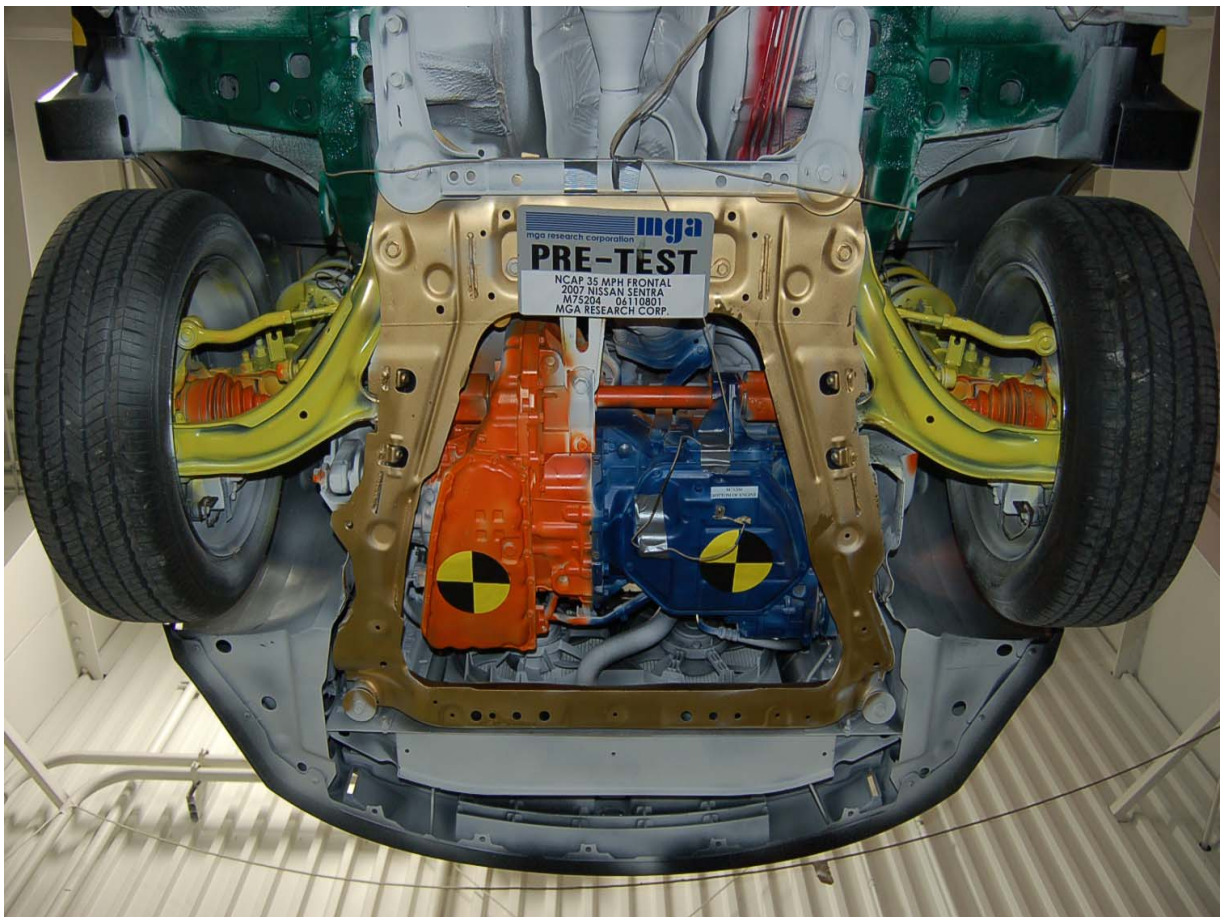
Post-Test Engine Compartment View



Pre-Test Fuel Cap View



Post-Test Fuel Cap View



Pre-Test Front Underbody View



Post-Test Front Underbody View



Pre-Test Mid Underbody View



Post-Test Mid 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 Feet



Post-Test Driver Dummy Feet



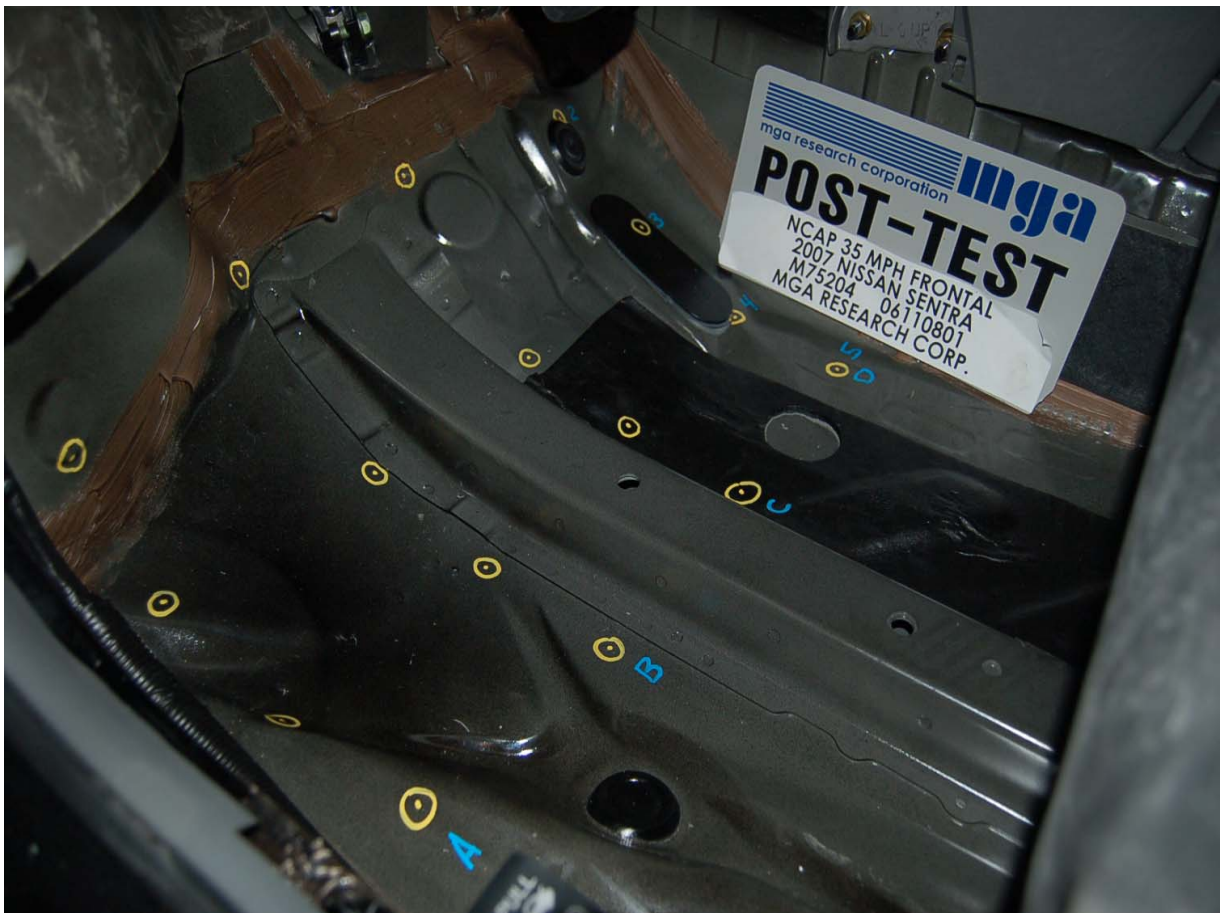
Pre-Test Driver Side Knee Bolster



Post-Test Driver Side Knee Bolster



Pre-Test Driver Side Floor Pan



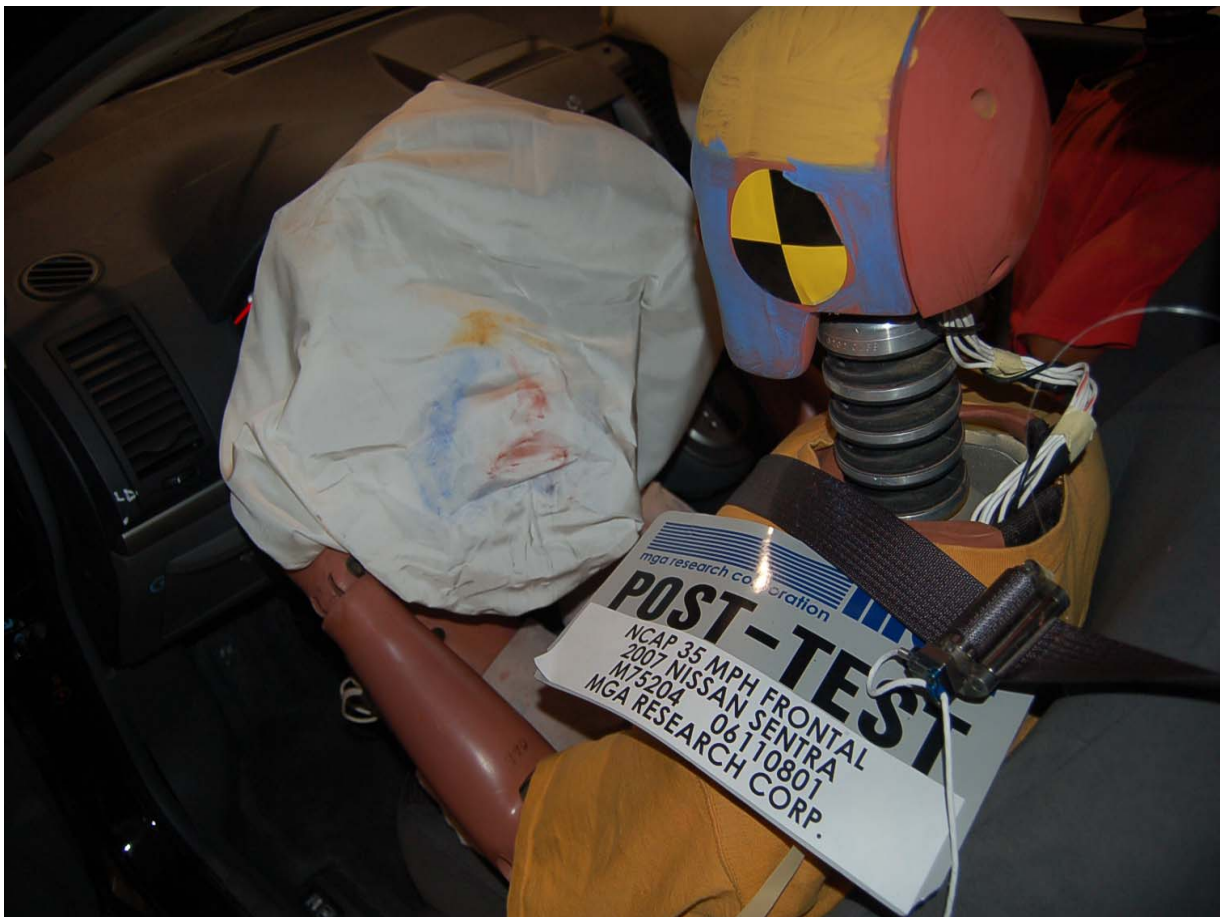
Post-Test Driver Side Floor Pan



Post-Test Driver Dummy Head Contact (headrest)



Post-Test Driver Dummy Knee Contact



Post-Test Driver Dummy Airbag Contact



Pre-Test Passenger Dummy Front View (Head Position)



Post-Test Passenger Dummy Front View (Head Position)



Pre-Test Passenger Dummy (Through Window)



Post-Test Passenger Dummy (Through Window)



Pre-Test Passenger Dummy (Door Open)



Post-Test Passenger Dummy (Door Open)



Pre-Test Passenger Dummy Feet



Post-Test Passenger Dummy Feet



Pre-Test Passenger Side Glove Box



Post-Test Passenger Side Glove Box



Pre-Test Passenger Side Floor Pan



Post-Test Passenger Side Floor Pan



Post-Test Passenger Dummy Head Contact



Post-Test Passenger Dummy Head Contact (grab handle)



Post-Test Passenger Dummy Knee Contact



Post-Test Passenger Dummy Airbag Contact



Rollover 90 Degrees



Rollover 180 Degrees



Rollover 270 Degrees



Rollover 360 Degrees



Vehicle Impact

APPENDIX B
DUMMY RESPONSE DATA TRACES

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The following dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

Driver Head X Redundant

Driver Head Y Redundant

Driver Head Z Redundant

Driver Upper Neck Force X

Driver Upper Neck Force Y

Driver Upper Neck Force Z

Driver Upper Neck Moment X

Driver Upper Neck Moment Y

Driver Upper Neck Moment Z

Driver Chest X Redundant

Driver Chest Y Redundant

Driver Chest Z Redundant

Driver Chest Displacement

Driver Pelvis X

Driver Pelvis Y

Driver Pelvis Z

Driver Shoulder Belt Force

Driver Lap Belt Force

Driver Left Upper Tibia Moment X

Driver Left Upper Tibia Moment Y

Driver Left Upper Tibia Force Z

Driver Left Lower Tibia Moment X

Driver Left Lower Tibia Moment Y

Driver Left Lower Tibia Force Z

Driver Right Upper Tibia Moment X

Driver Right Upper Tibia Moment Y

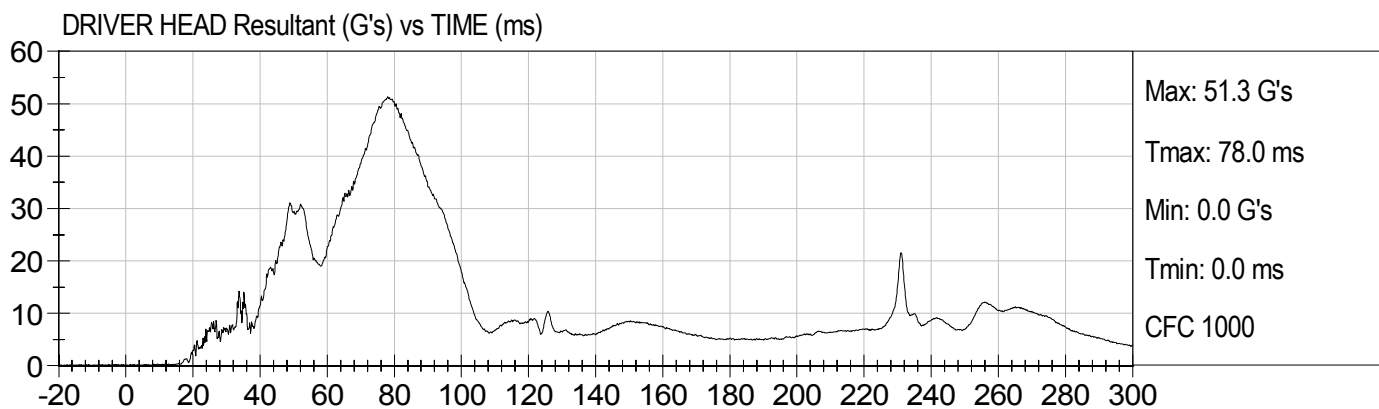
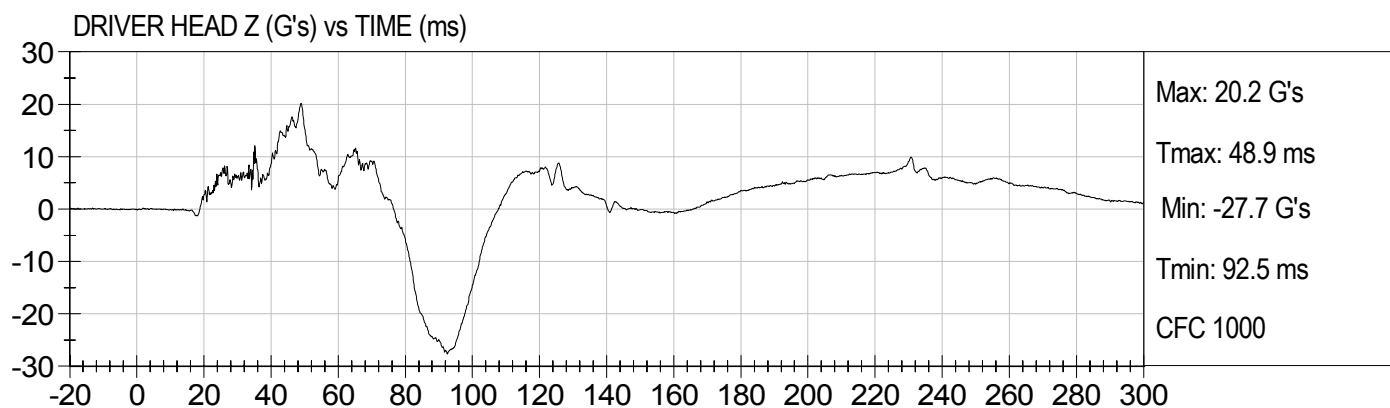
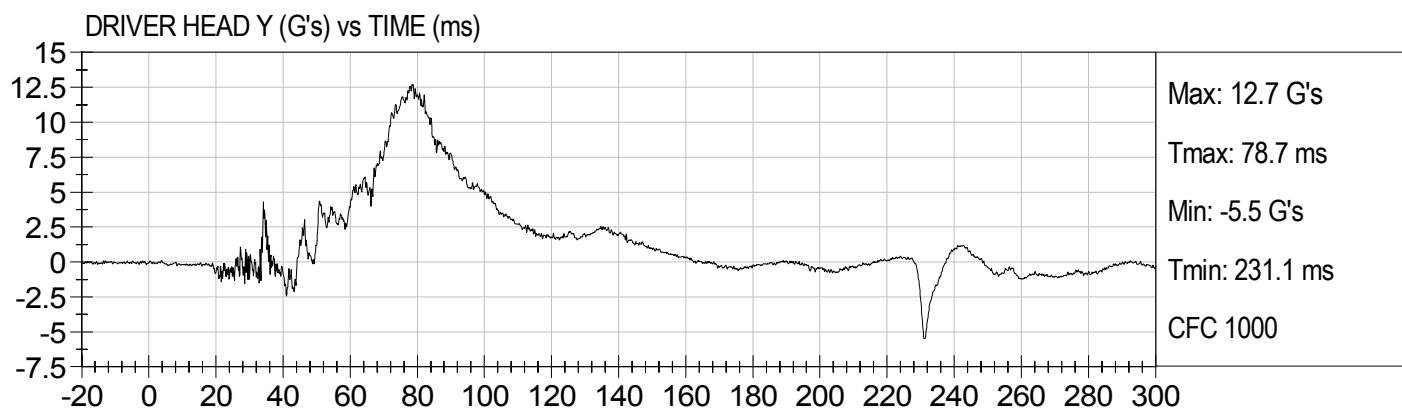
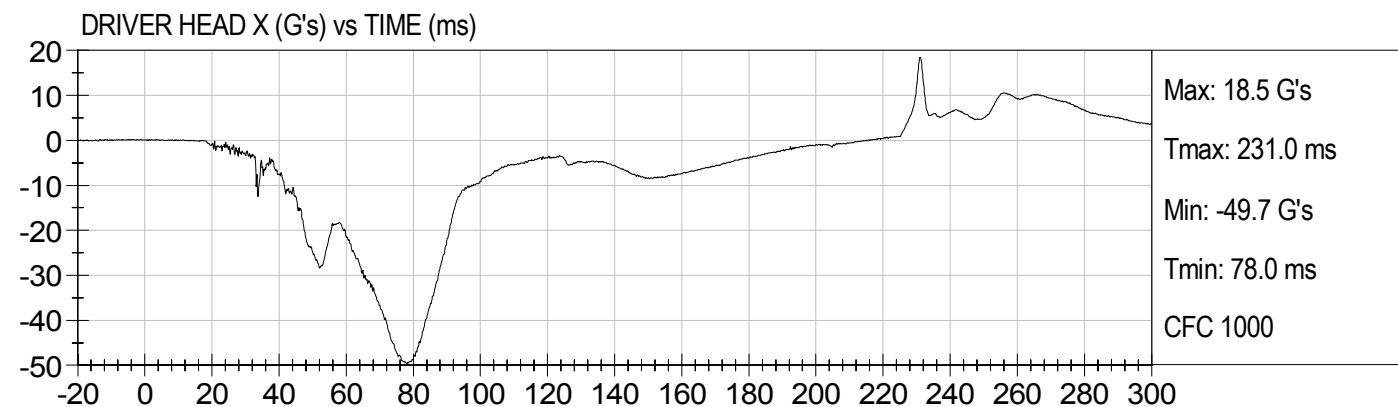
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Passenger Head X Redundant
Passenger Head Y Redundant
Passenger Head Z Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Y
Passenger Upper Neck Force Z
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Y
Passenger Upper Neck Moment Z
Passenger Chest X Redundant
Passenger Chest Y Redundant
Passenger Chest Z Redundant
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X

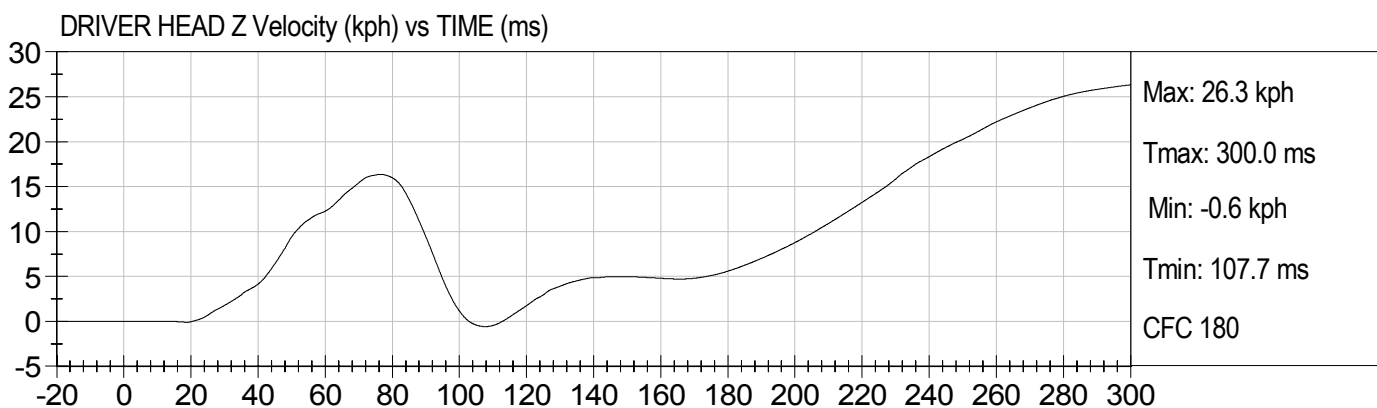
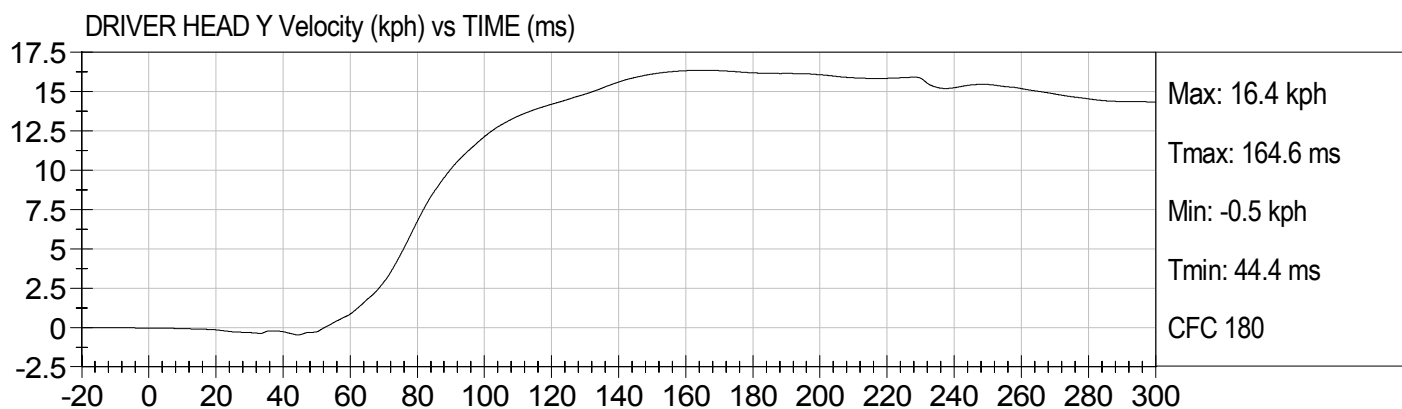
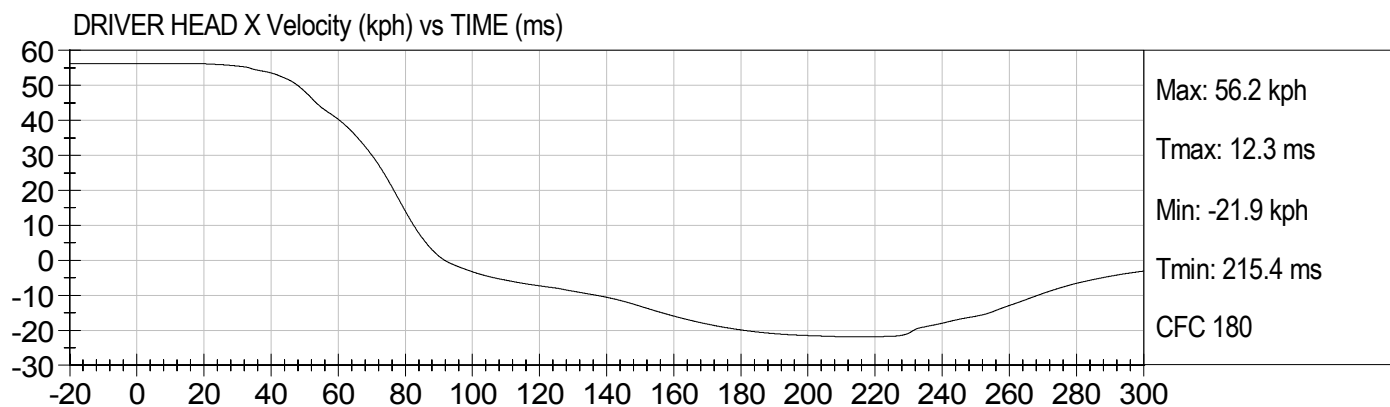
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Brake Caliper X
Vehicle Right Brake Caliper X

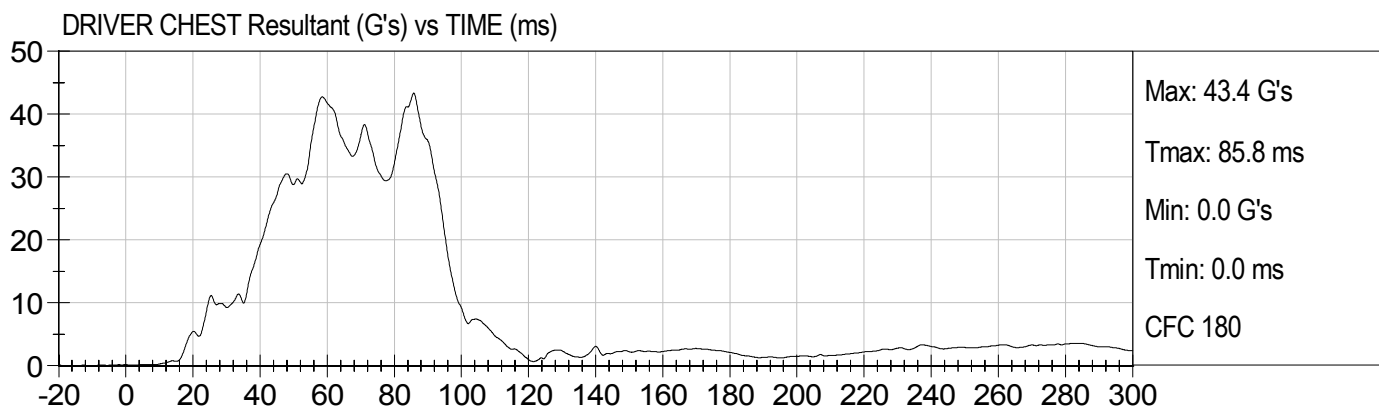
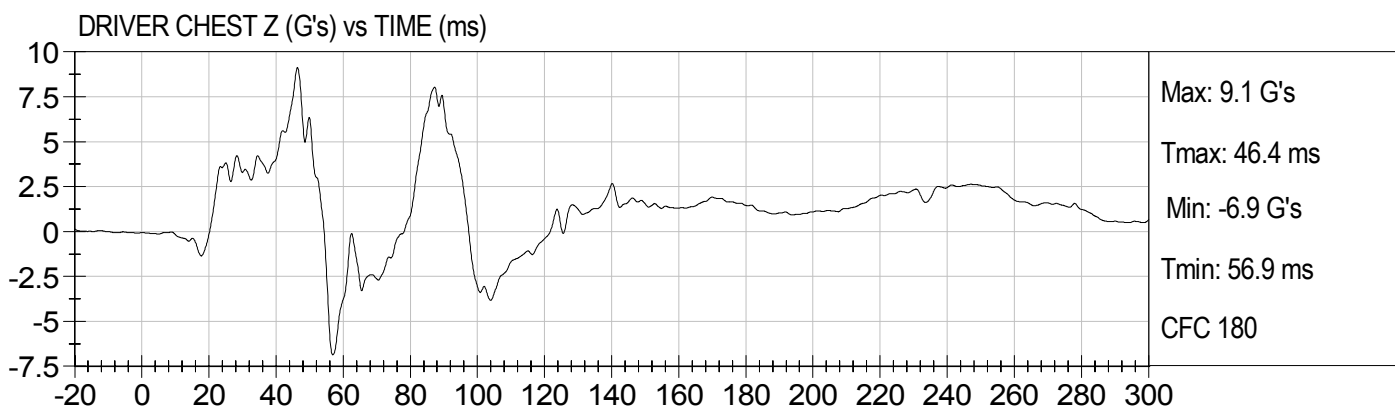
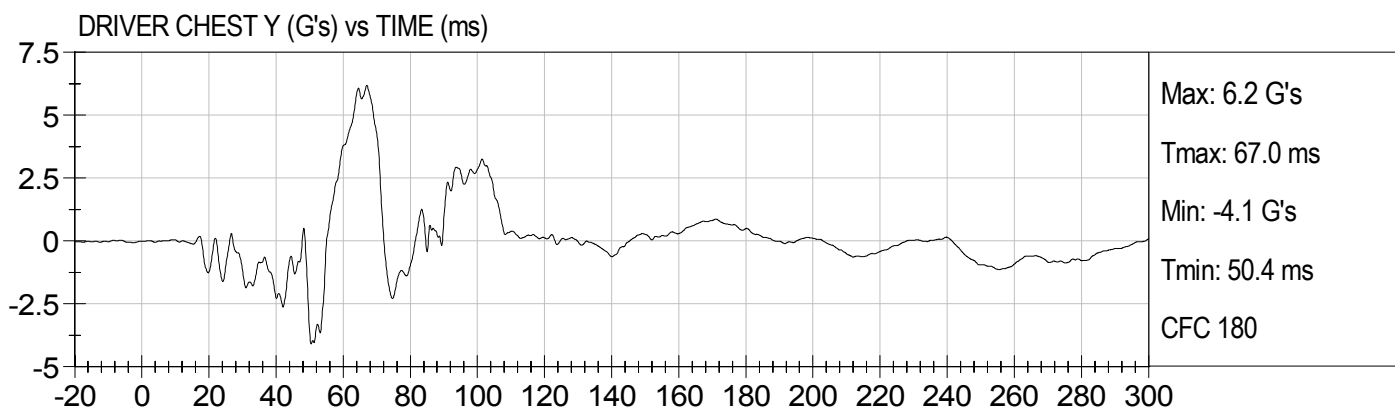
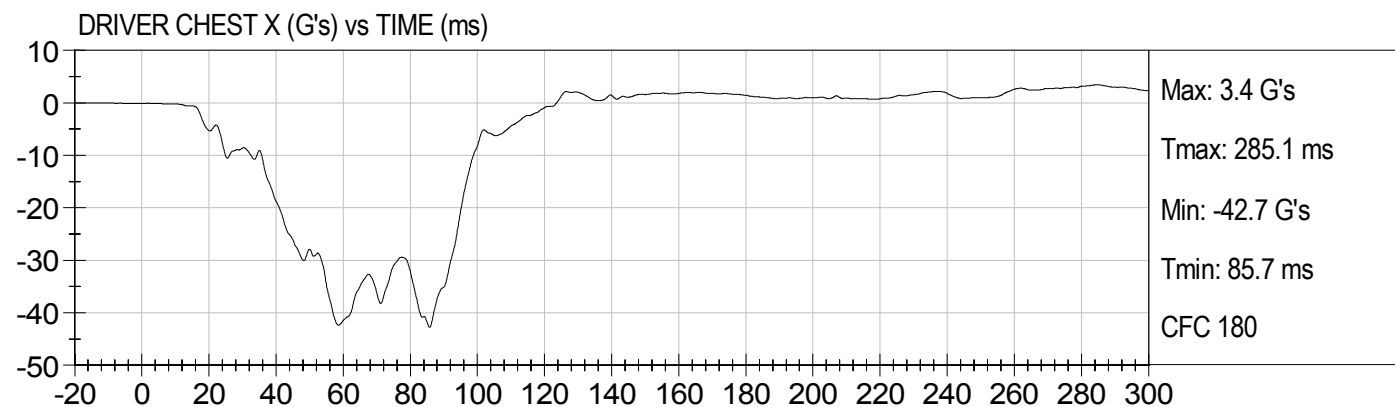


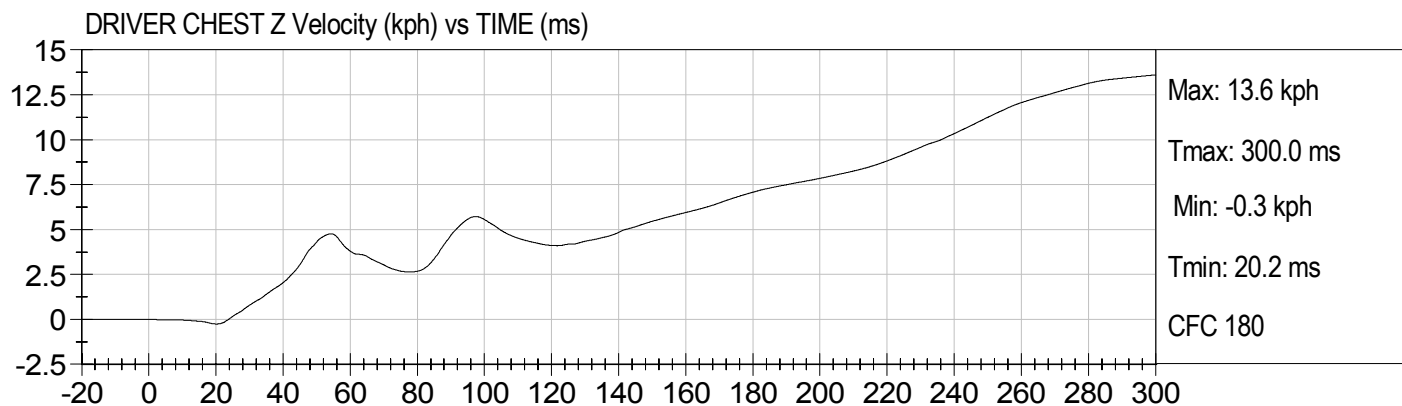
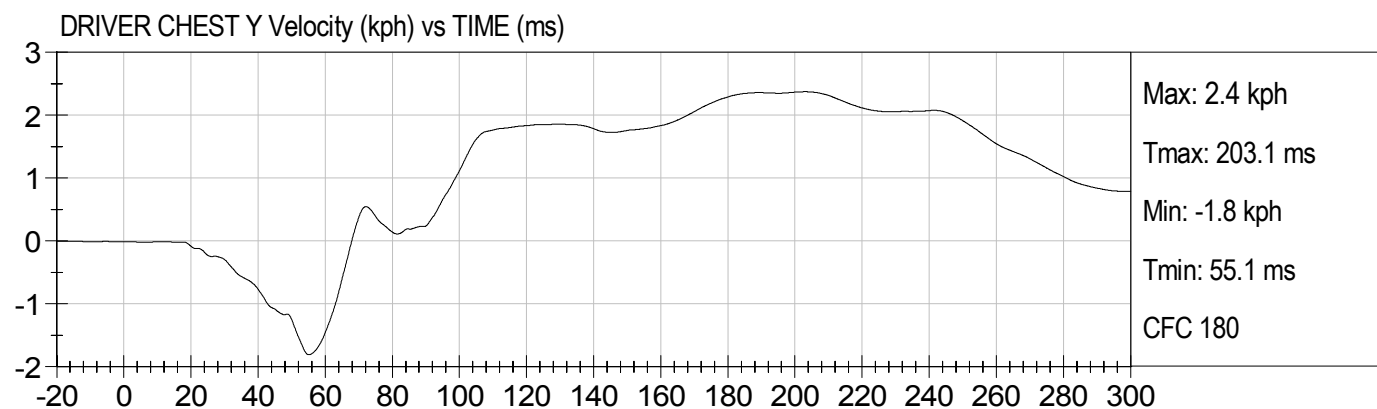
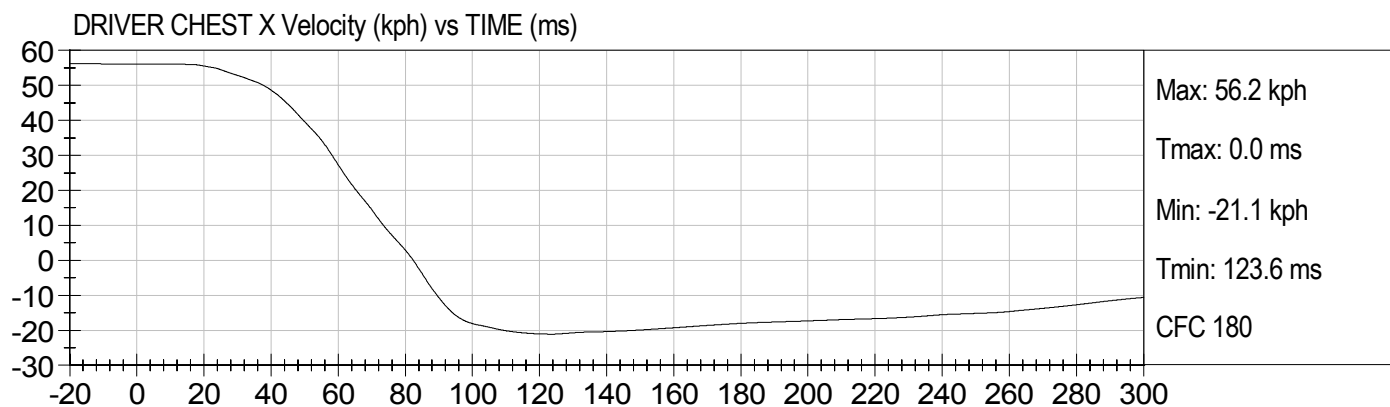
NCAP 35 MPH FRONTAL
2007 NISSAN SENTRA

Test Date: 11/08/2006
Speed: 34.9 mph (56.2 km/h)





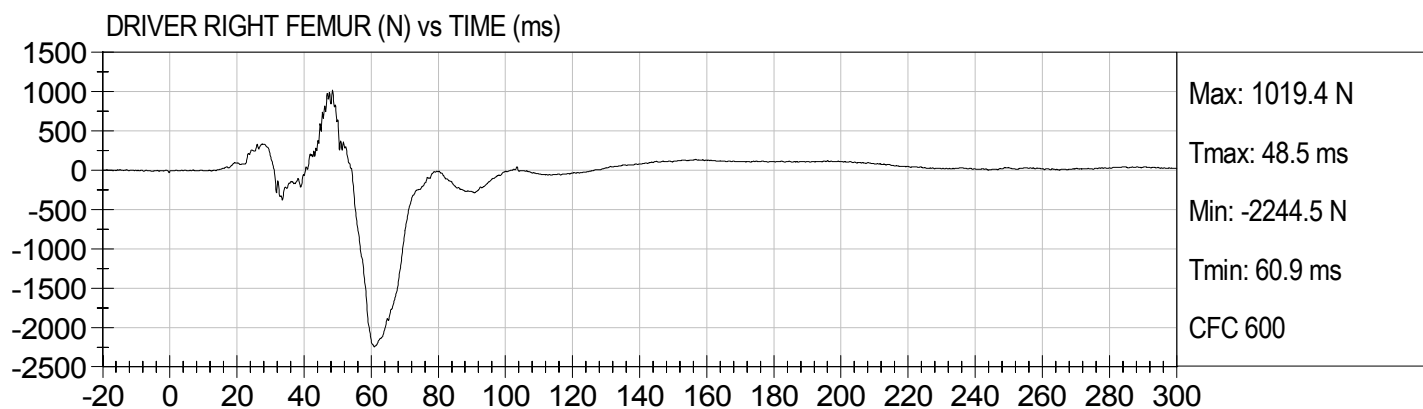
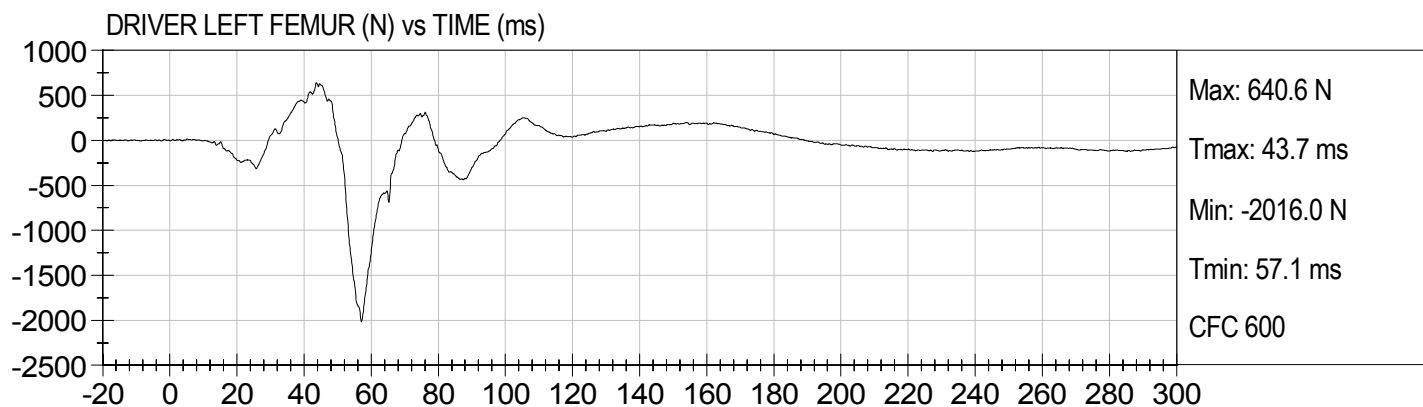






NCAP 35 MPH FRONTAL
2007 NISSAN SENTRA

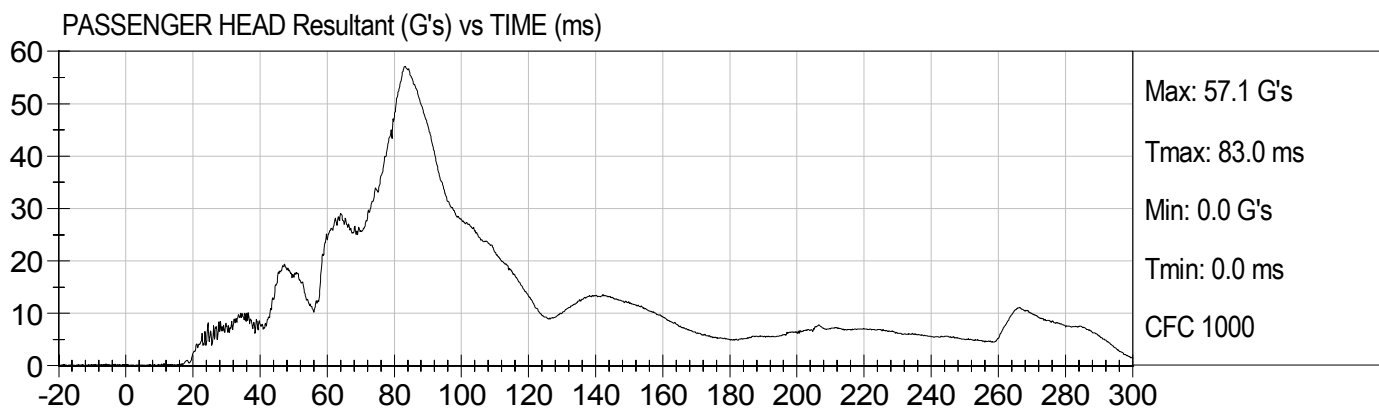
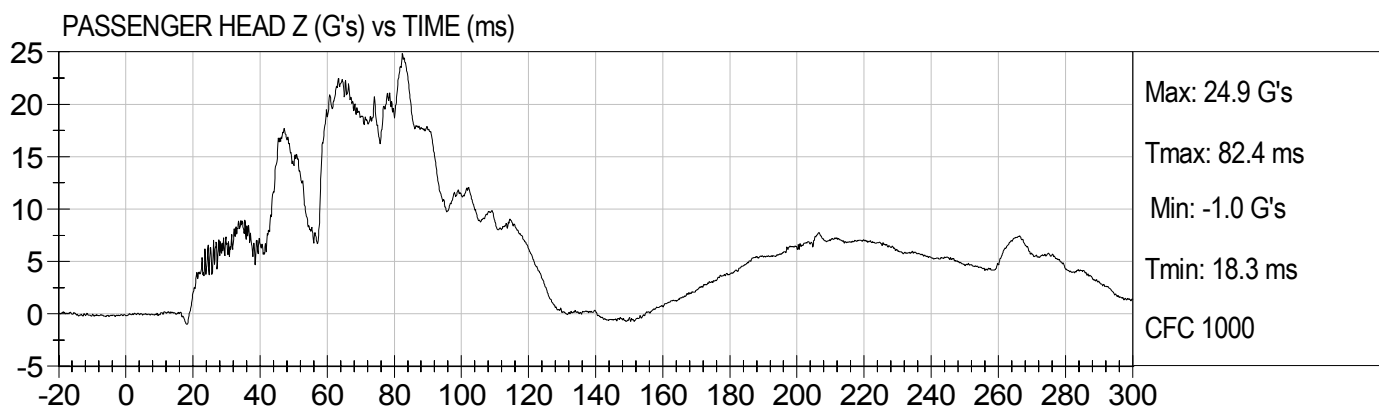
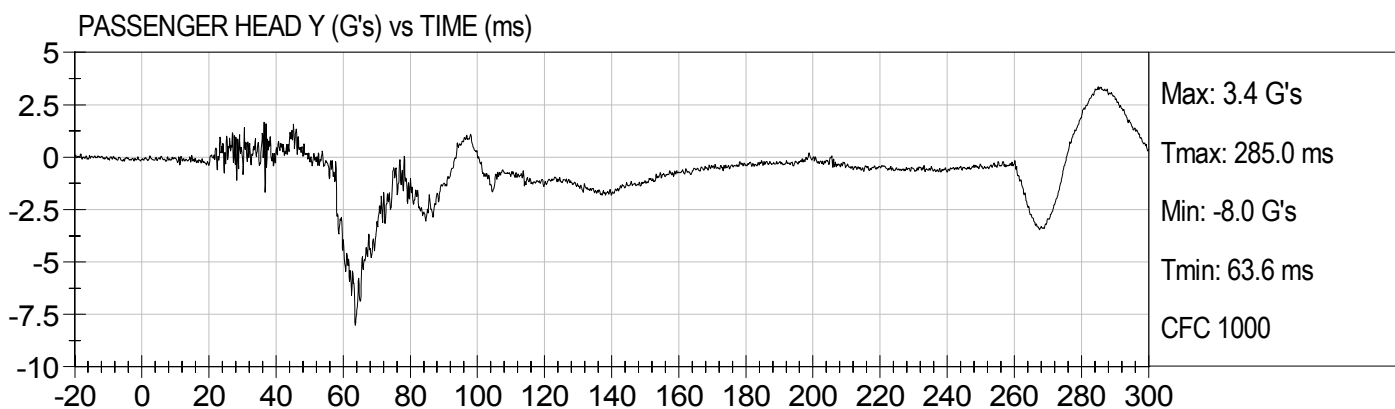
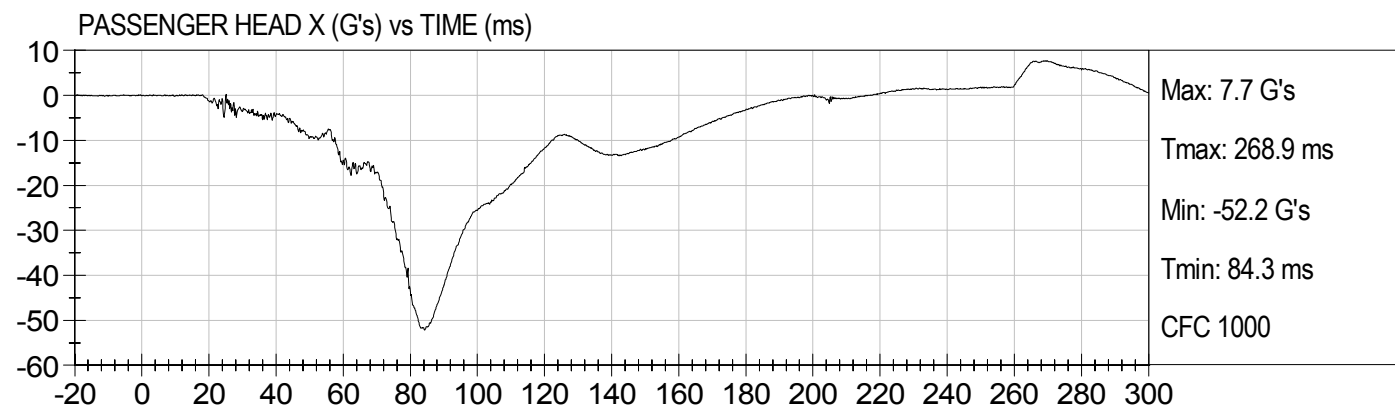
Test Date: 11/08/2006
Speed: 34.9 mph (56.2 km/h)

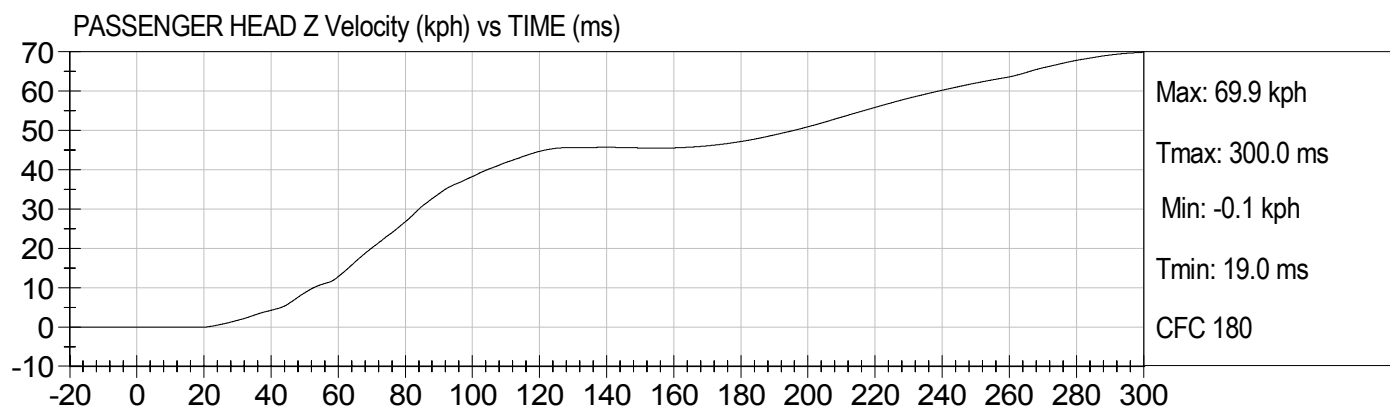
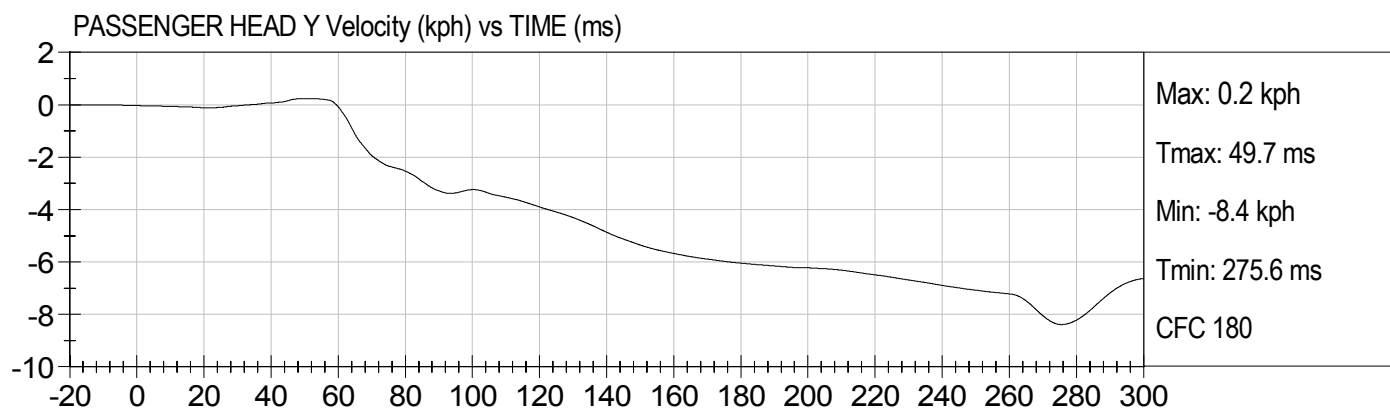
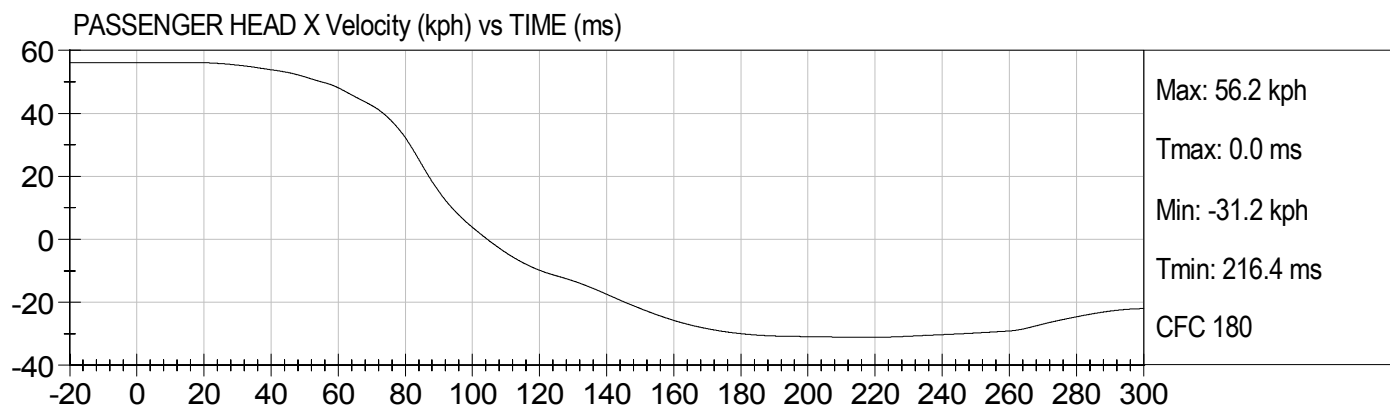




NCAP 35 MPH FRONTAL
2007 NISSAN SENTRA

Test Date: 11/08/2006
Speed: 34.9 mph (56.2 km/h)

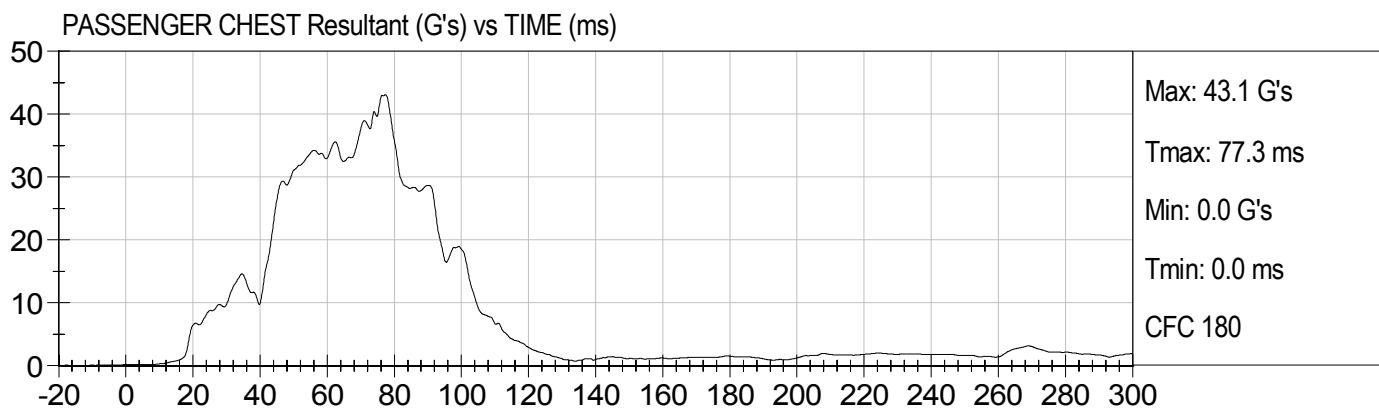
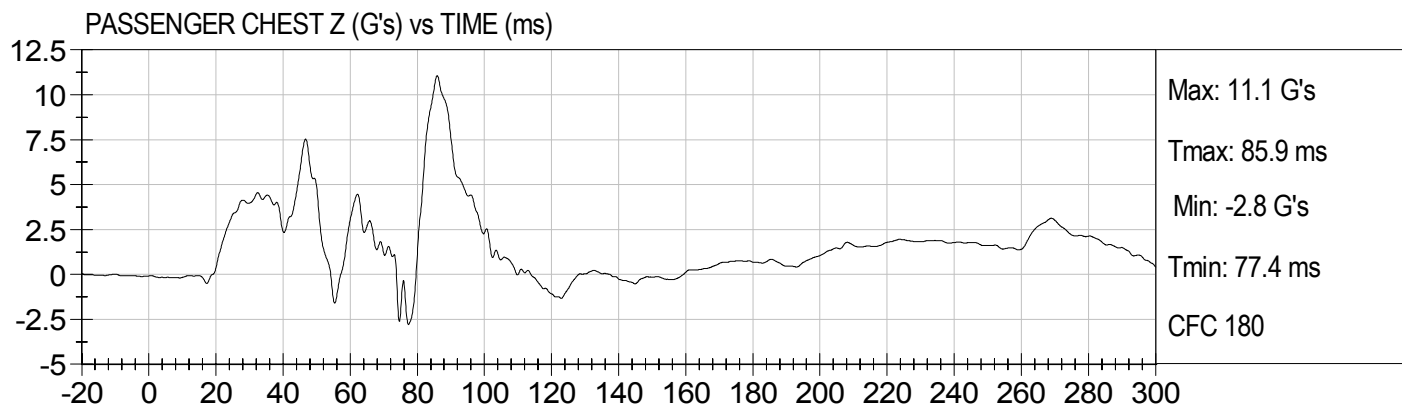
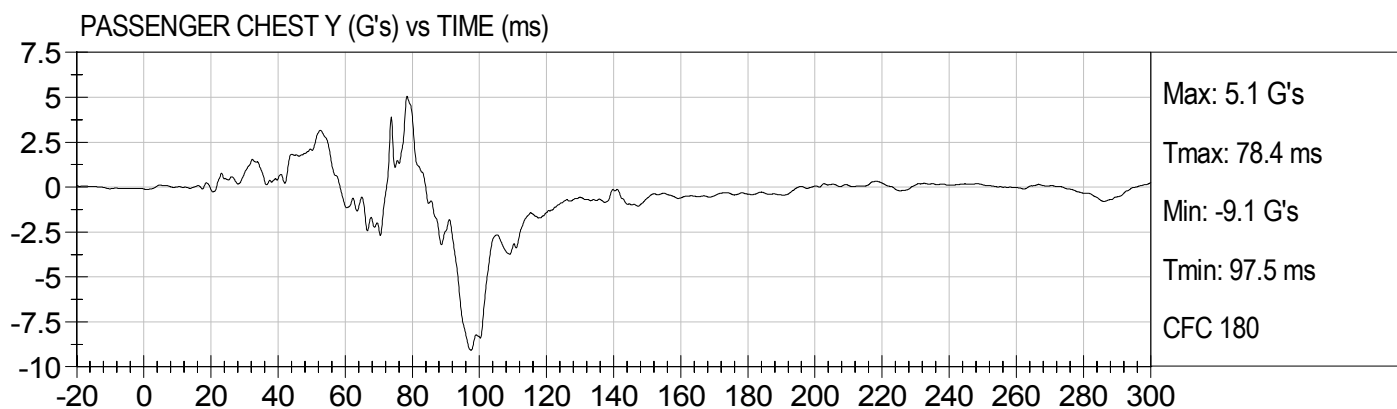
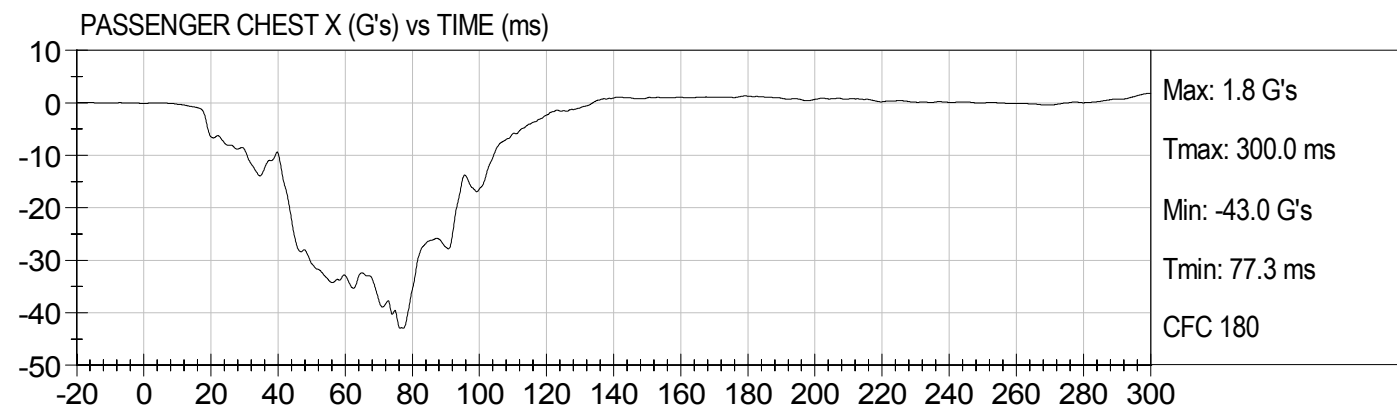


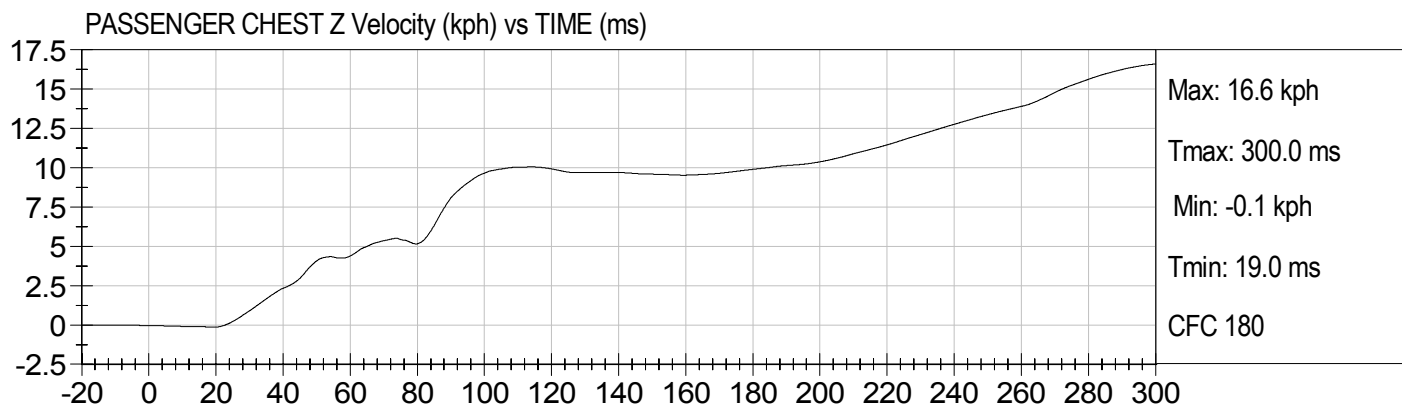
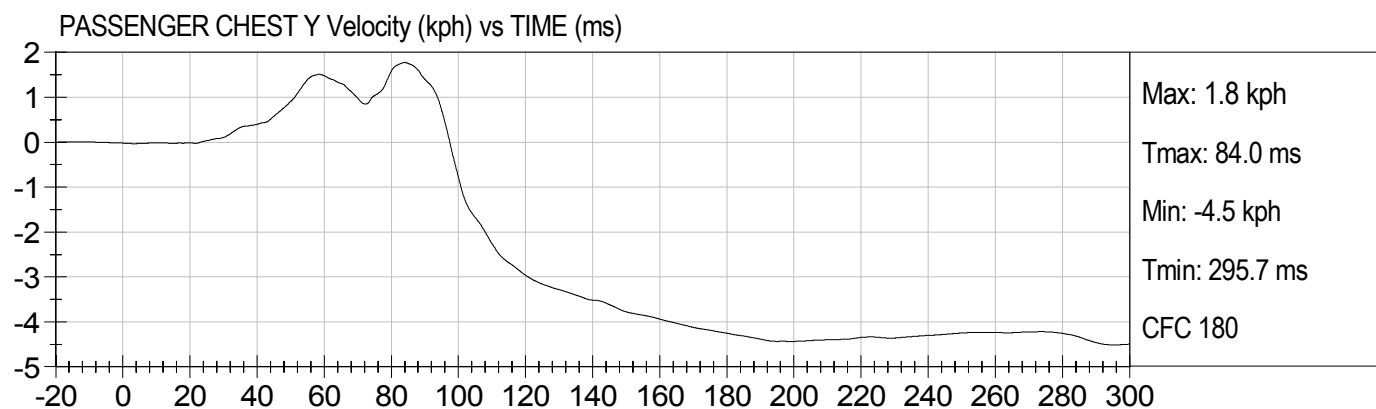
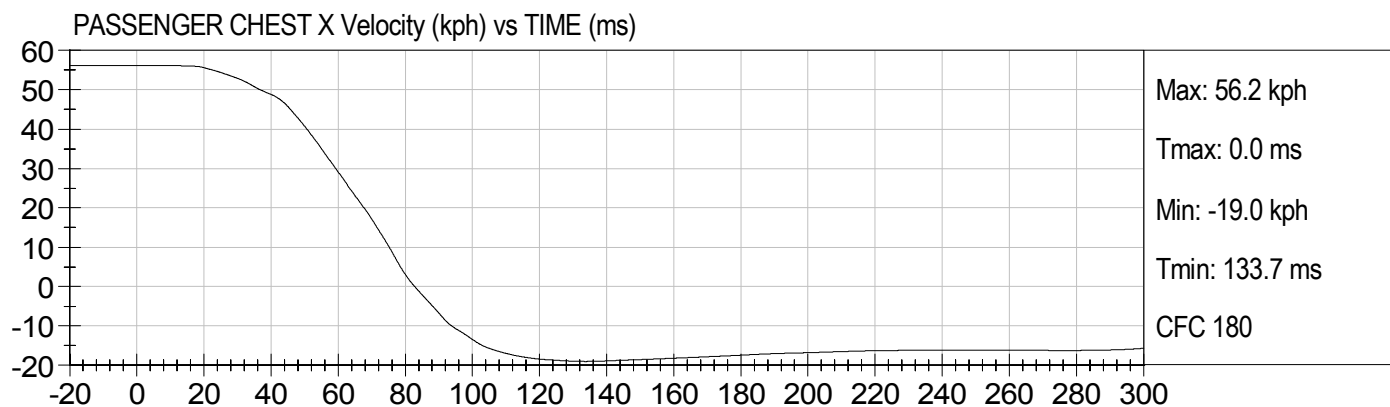


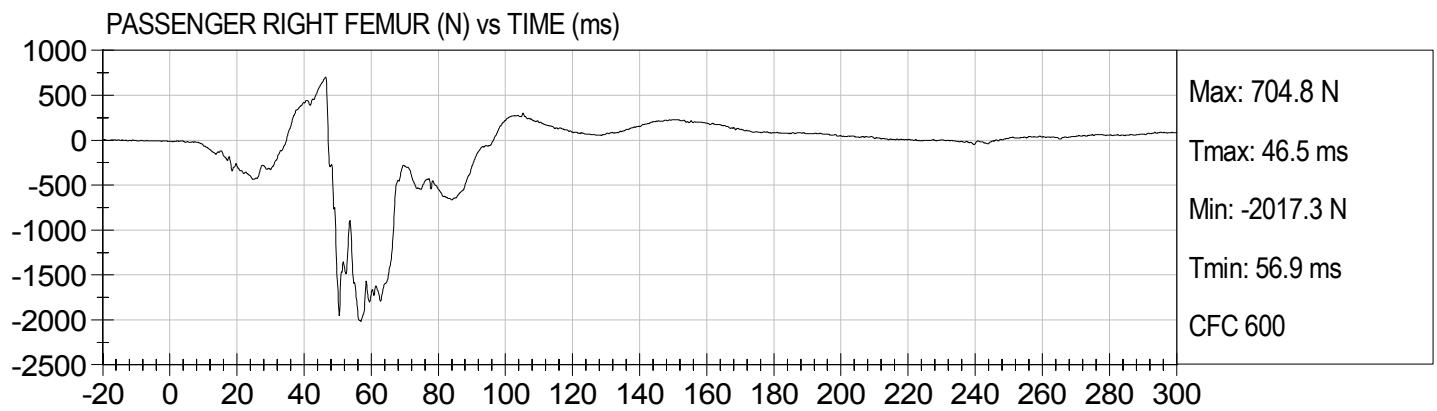
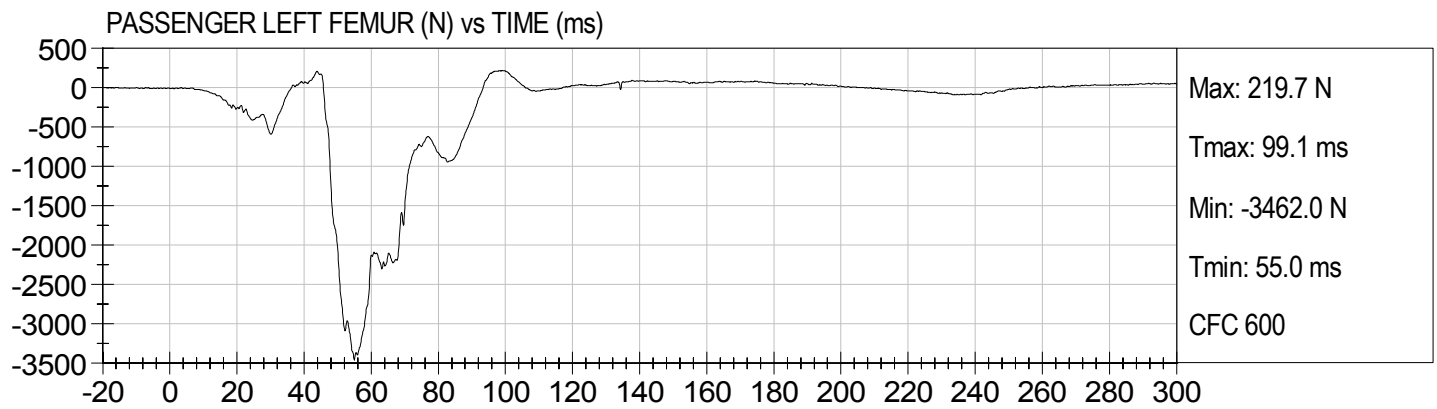


NCAP 35 MPH FRONTAL
2007 NISSAN SENTRA

Test Date: 11/08/2006
Speed: 34.9 mph (56.2 km/h)







APPENDIX C
DUMMY CALIBRATION DATA

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066

Test ID: D062701

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	225 - 275	258	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-12.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

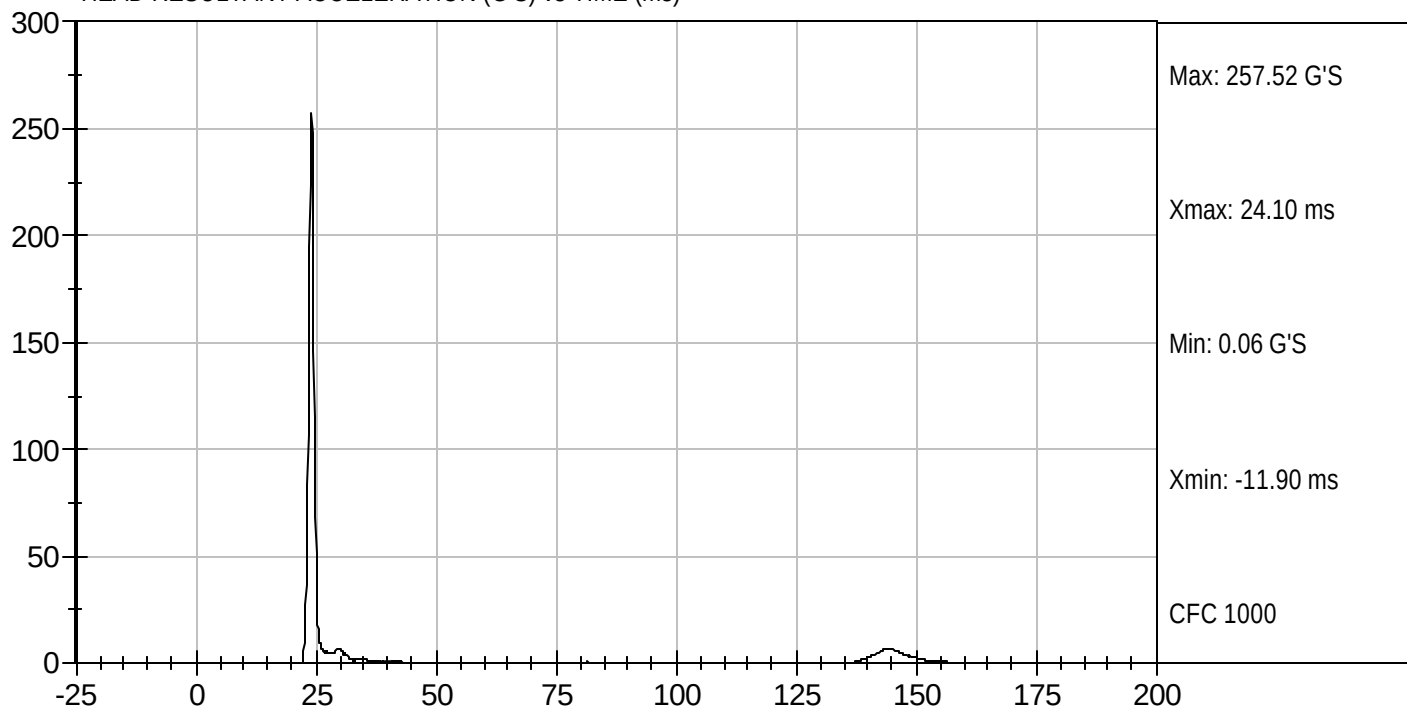
09/07/2006
Test Date



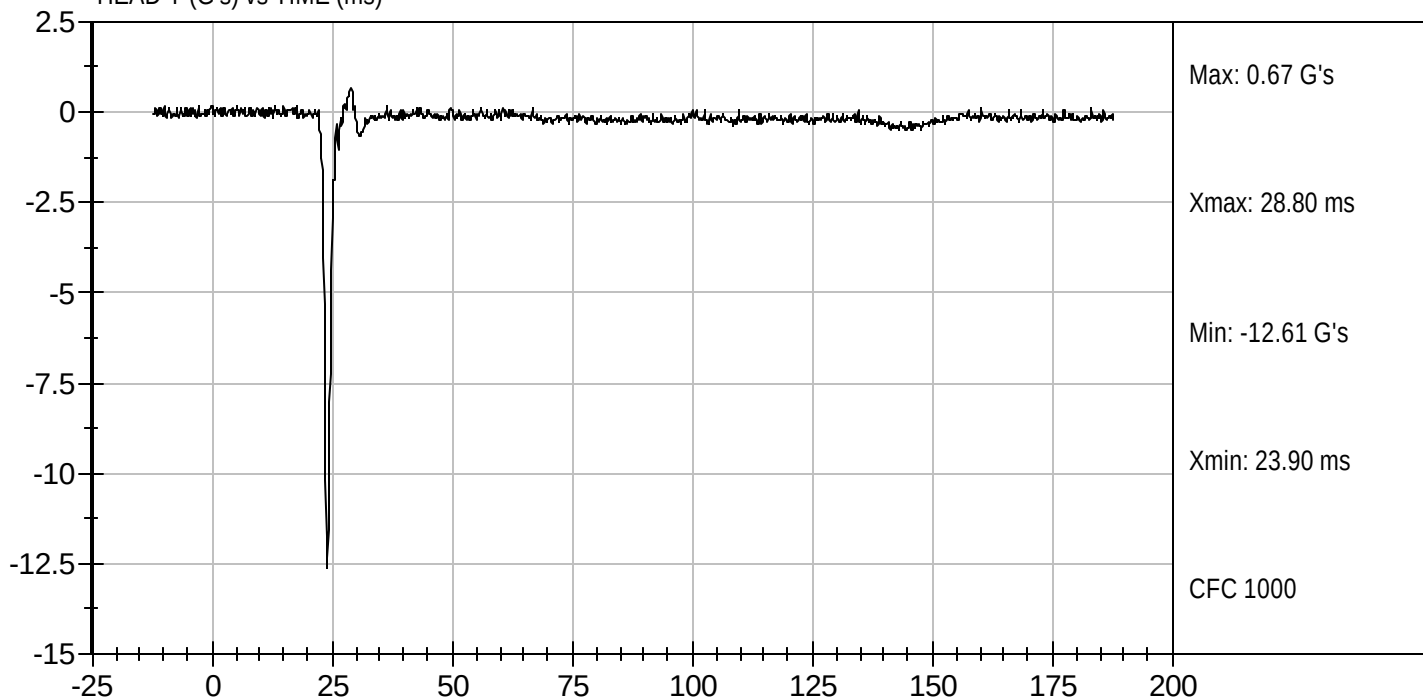
Test Desc: Head Drop
Componet ID: D062701

Test Date: 09/07/2006
Velocity: 0 ft/s, 0.00 m/s

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



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



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066

Test I.D: D062702

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	44	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.97	Pass
	20 msec	G's	17.60 to 22.60	19.84	Pass
	30 msec	G's	12.50 to 18.50	14.51	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	14.55	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	37.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	64.6	Pass
	Time	msec	57.0 to 64.0	59.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	114.7	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	94.5	Pass
	Time	msec	47.0 to 58.0	48.8	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	102.5	Pass
Overall Test Results					Pass


 Laboratory Technician

09/08/2006
 Test Date

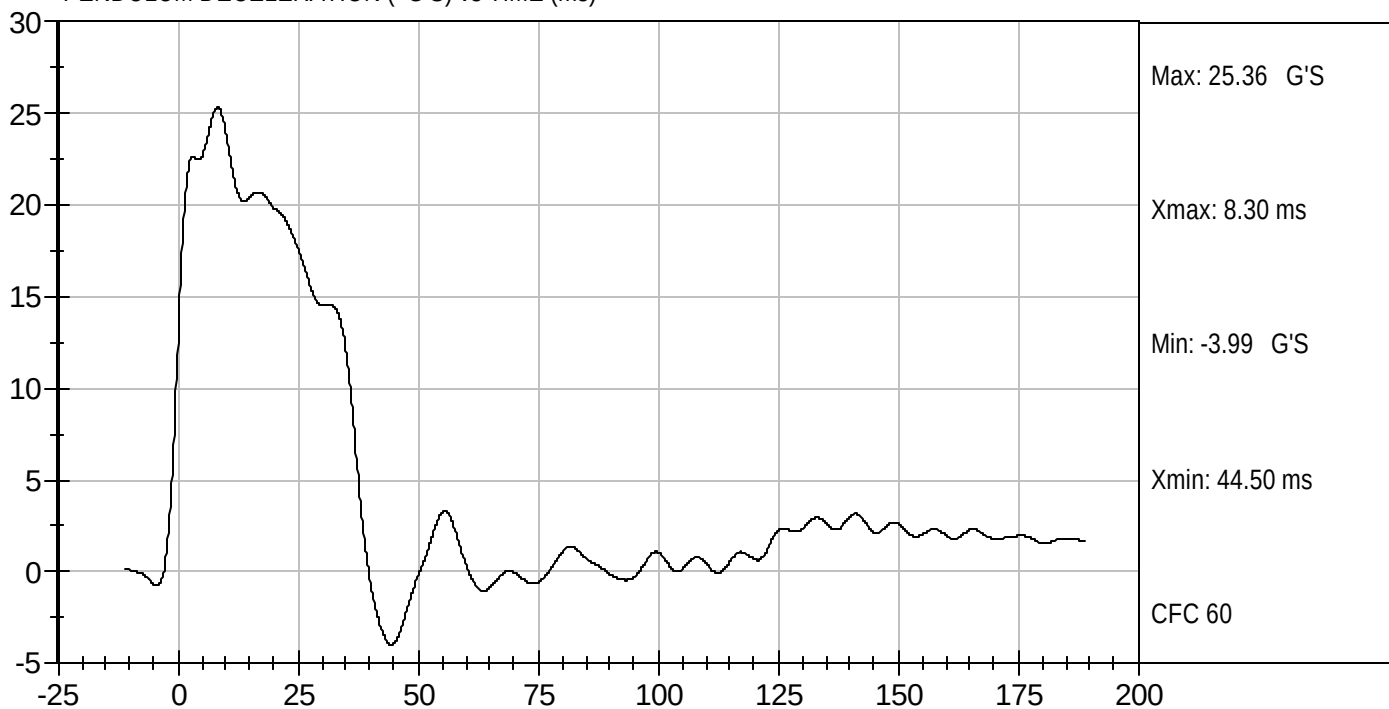

 Approved By



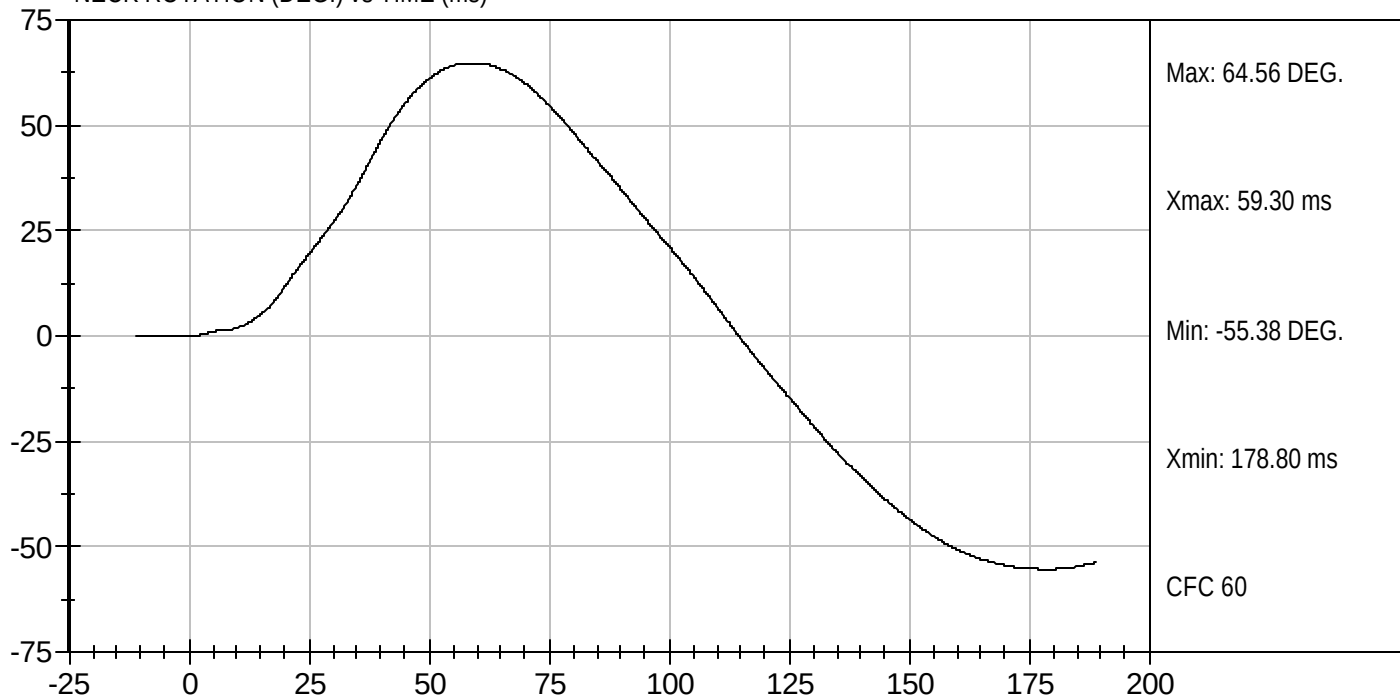
Test Desc: Neck Flexion
Componet ID: D062702

Test Date: 09/08/2006
Velocity: 23.12 ft/s, 7.05 m/s

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



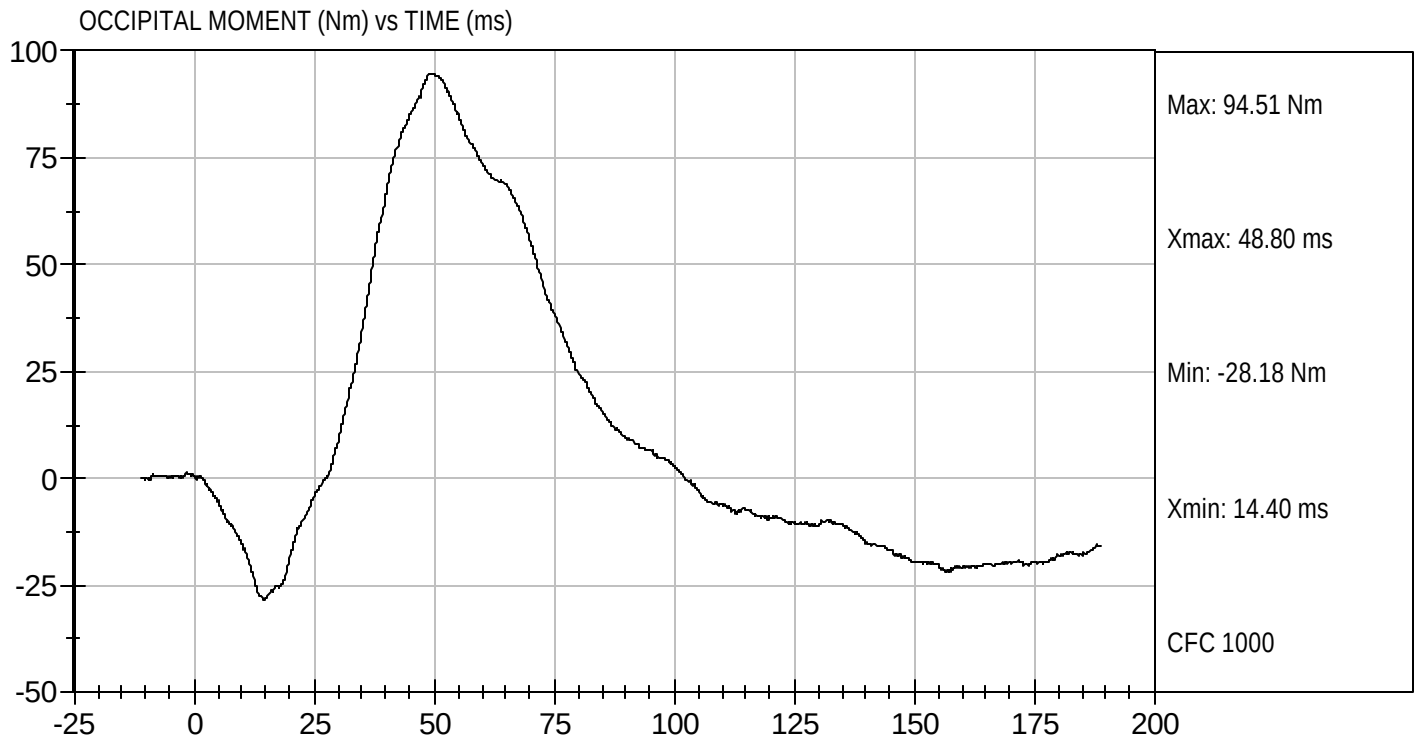
NECK ROTATION (DEG.) vs TIME (ms)





Test Desc: Neck Flexion
Componet ID: D062702

Test Date: 09/08/2006
Velocity: 23.12 ft/s, 7.05 m/s



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066

Test I.D: D062703

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.04	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.59	Pass
	20 msec	G's	14.00 to 19.00	16.14	Pass
	30 msec	G's	11.00 to 16.00	12.85	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	12.80	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	39.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	100.4	Pass
	Time	msec	72.0 to 82.0	77.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	157.5	Pass
Moment About Occipital Condyle	Maximum	N m	-52.9 to -79.9	-67.2	Pass
	Time	msec	65.0 to 79.0	73.1	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	147.1	Pass
Overall Test Results				Pass	


 Laboratory Technician

09/08/2006
 Test Date

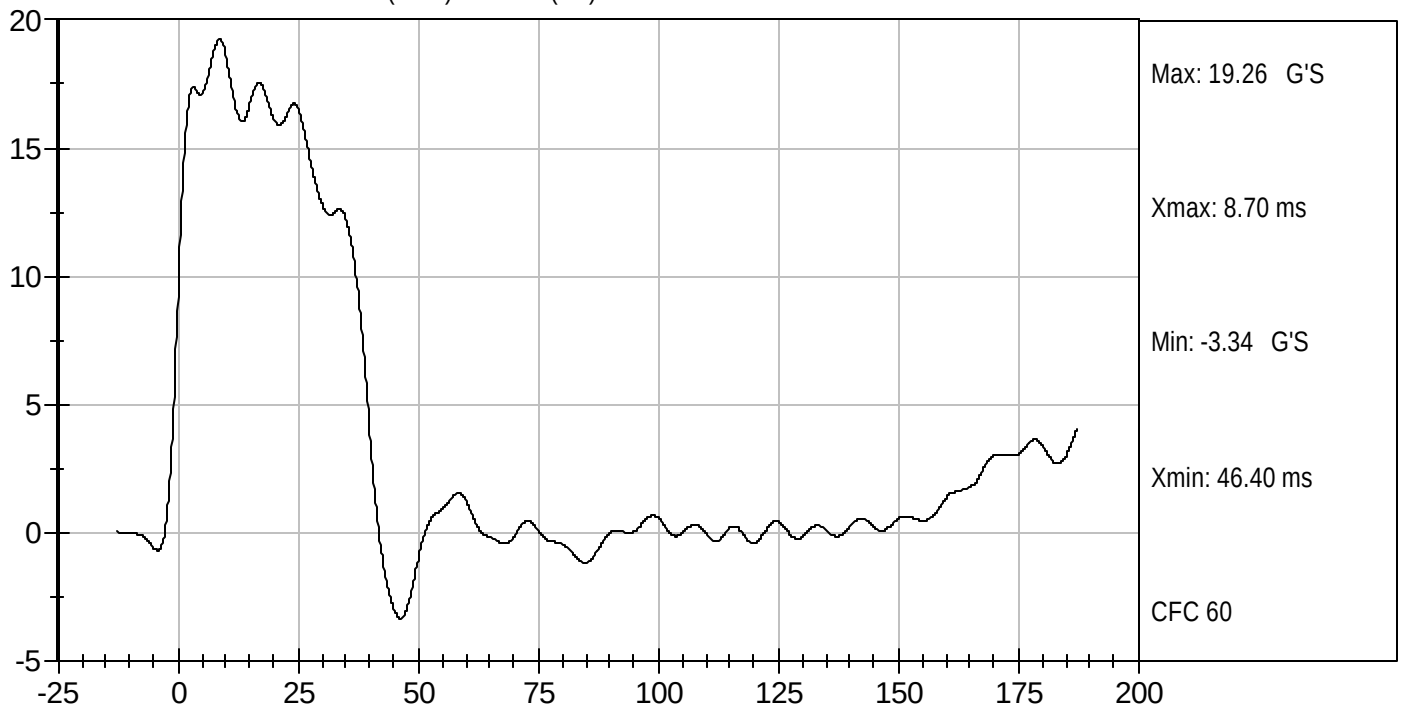

 Approved By



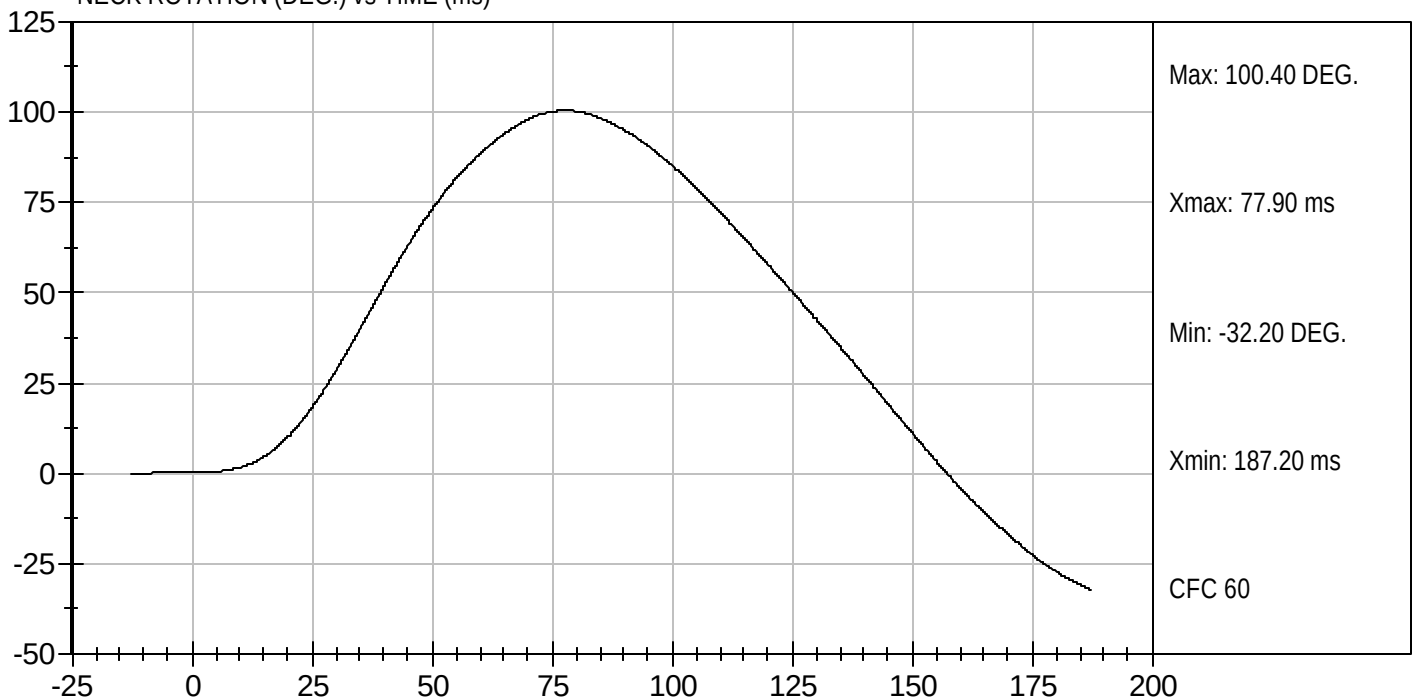
Test Desc: Neck Extension
Componet ID: D062703

Test Date: 09/08/2006
Velocity: 19.8 ft/s, 6.04 m/s

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



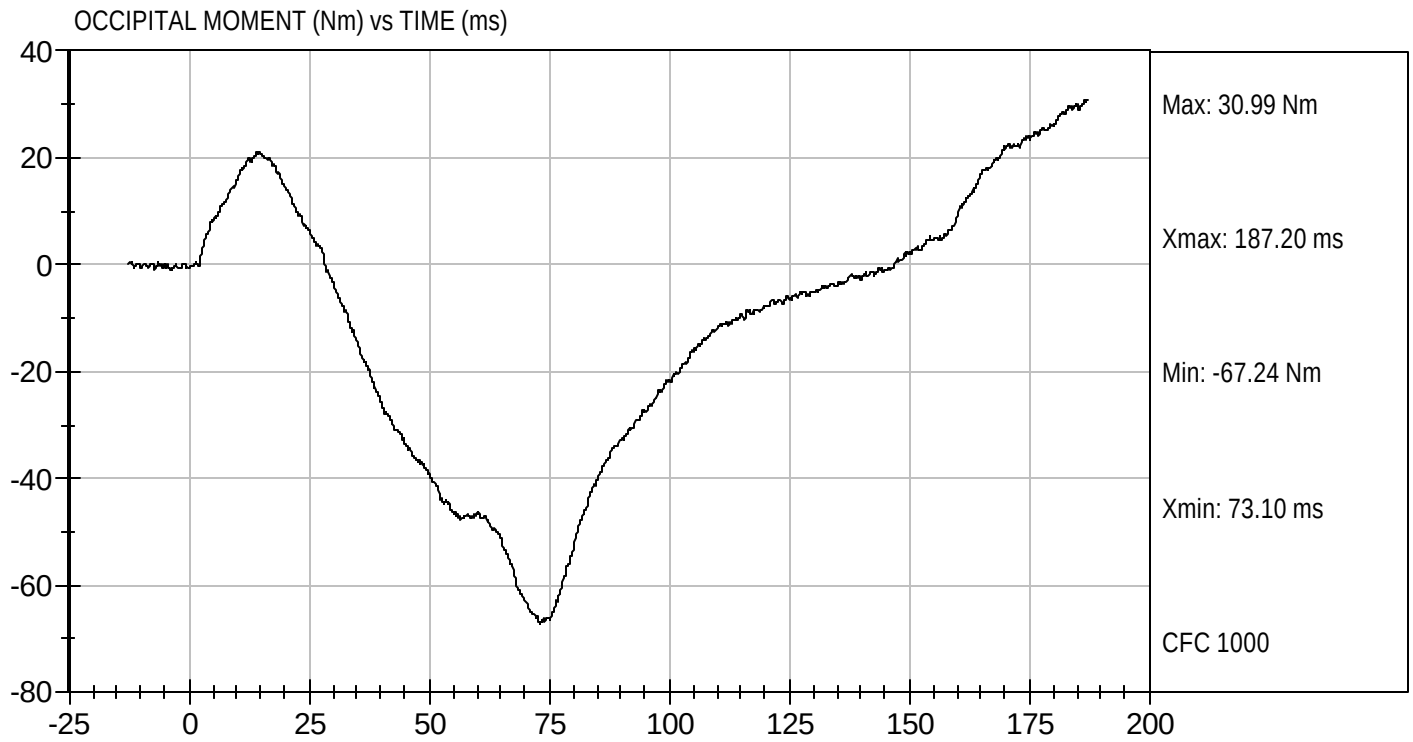
NECK ROTATION (DEG.) vs TIME (ms)





Test Desc: Neck Extension
Componet ID: D062703

Test Date: 09/08/2006
Velocity: 19.8 ft/s, 6.04 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066

Test I.D: D062704

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Probe Velocity	m/s	6.58 to 6.82	6.63	Pass
Peak Probe Force	N	5159 to 5893	5,388	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.85	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results			Pass	


Laboratory Technician

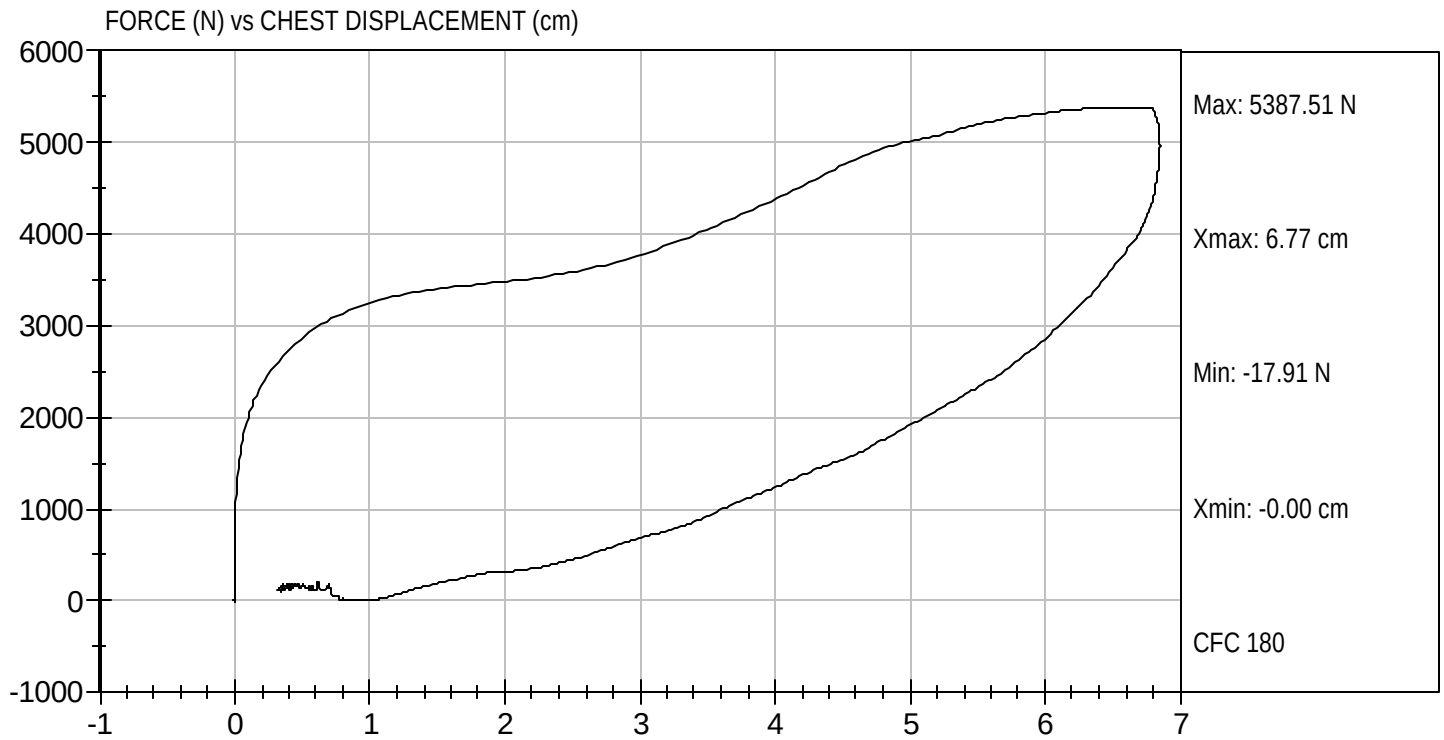

Approved By

09/07/2006
Test Date



Test Desc: Thorax Impact
Componet ID: D062704

Test Date: 09/07/2006
Velocity: 21.76 ft/s, 6.63 m/s



MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066

Test I.D: D062705

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,680	Pass
Overall Test Results				Pass


Laboratory Technician

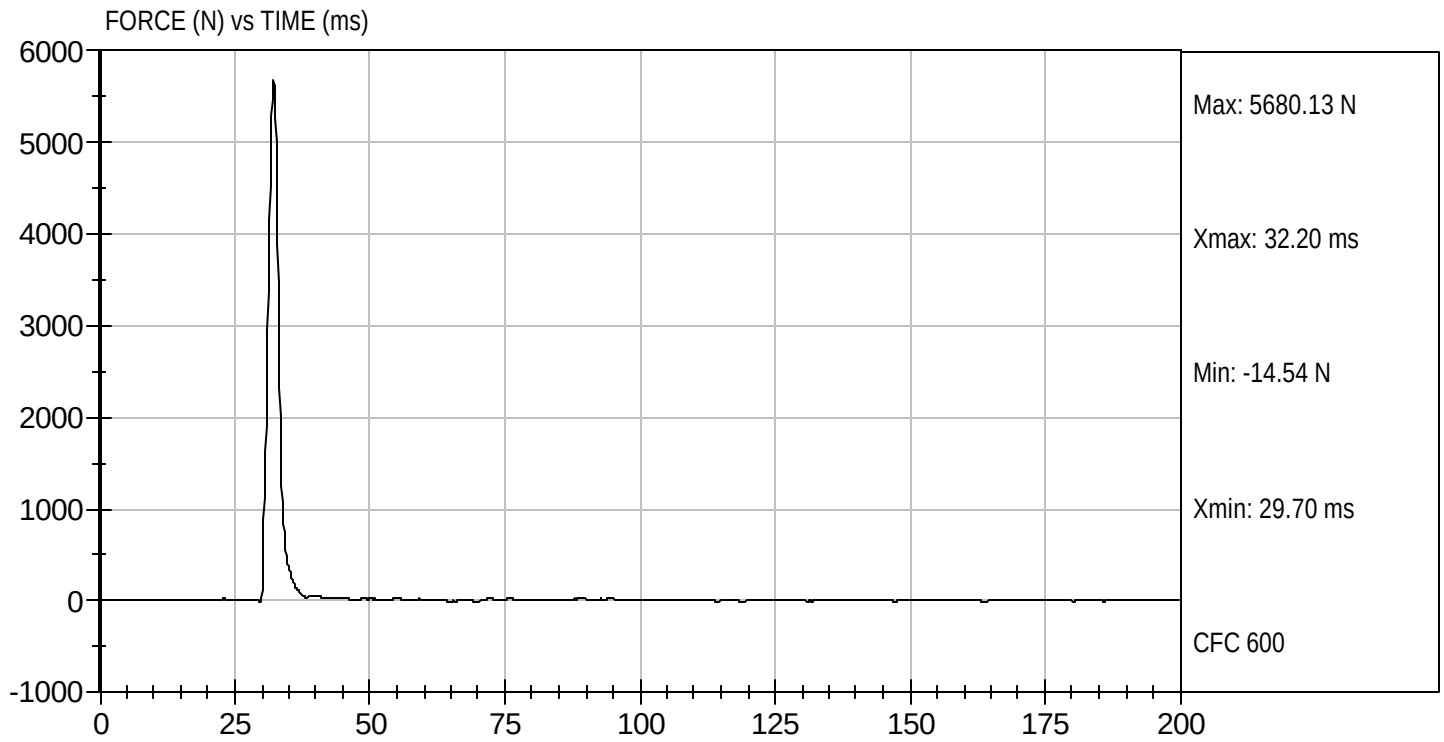

Approved By

09/08/2006
Test Date



Test Desc: Right Knee
Componet ID: D062705

Test Date: 09/08/2006
Velocity: 6.88 ft/s, 2.10 m/s



MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066

Test I.D: D062706

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,167	Pass
Overall Test Results				Pass


Laboratory Technician

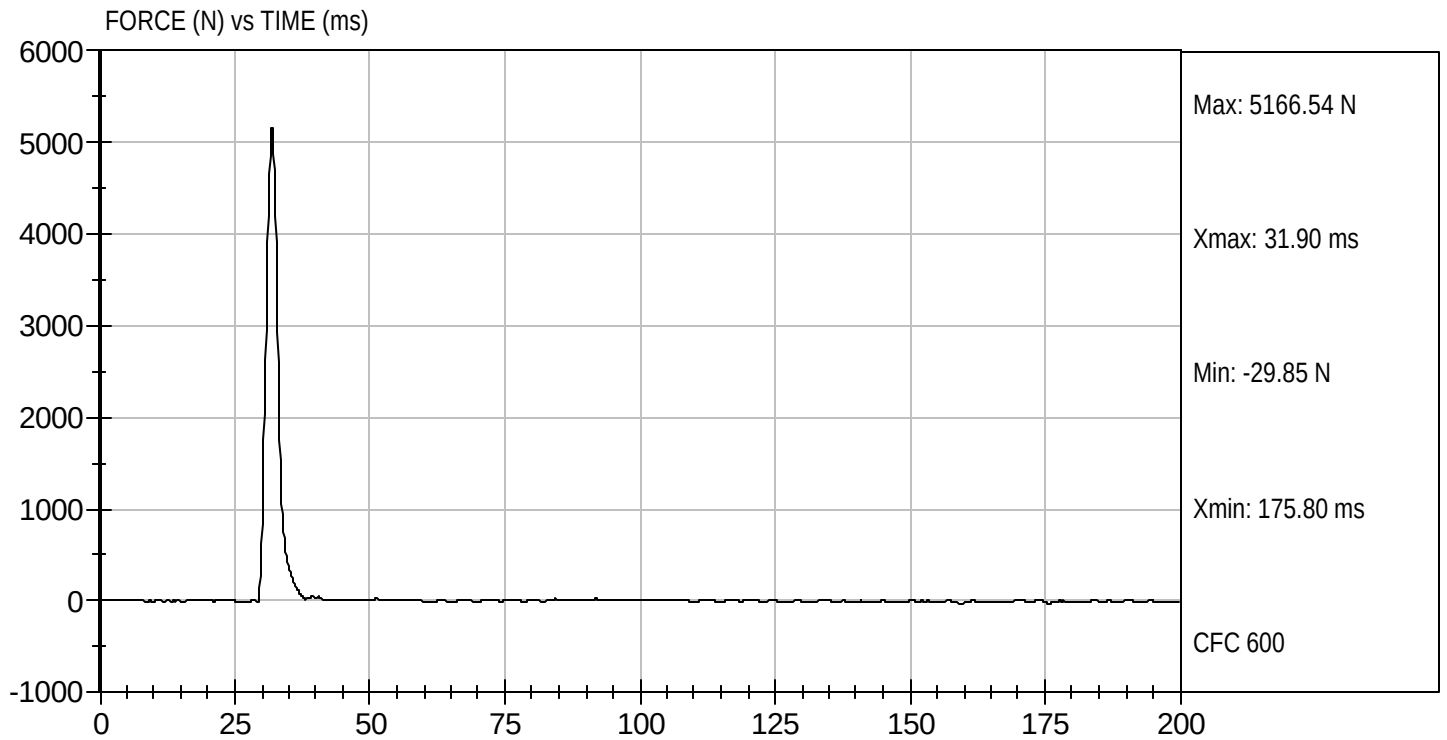

Approved By

09/08/2006
Test Date



Test Desc: Left Knee
Componet ID: D062706

Test Date: 09/08/2006
Velocity: 6.87 ft/s, 2.09 m/s



MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

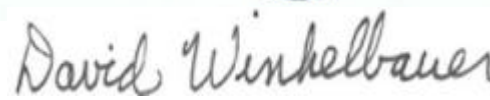
ATD Serial No: 066

Test I.D: D062709

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.0	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	43	43	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	87.7	76.4	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	43	40	Pass
Overall Test Results				Pass	


 Laboratory Technician

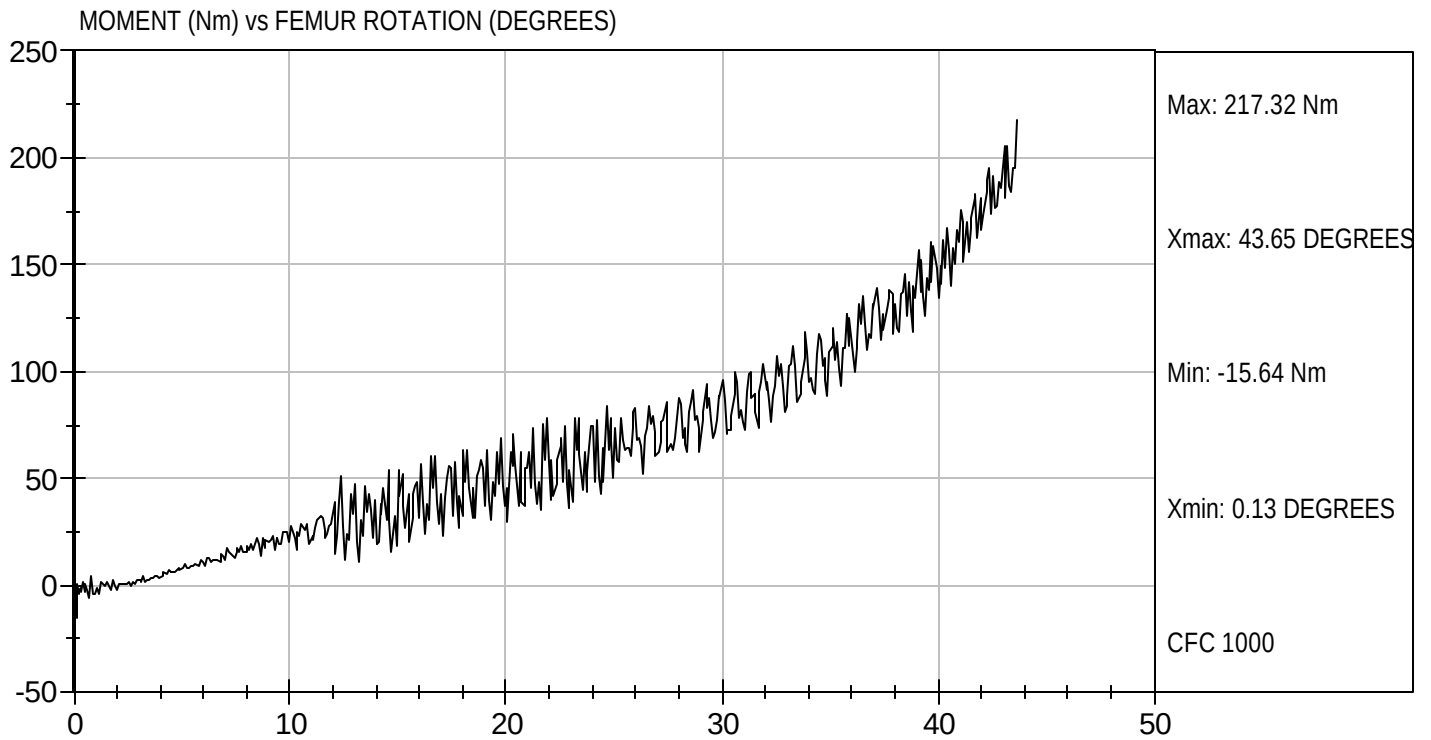
09/08/2006
 Test Date


 Approved By



Test Desc: Hip Femur Flexion
Componet ID: D062709

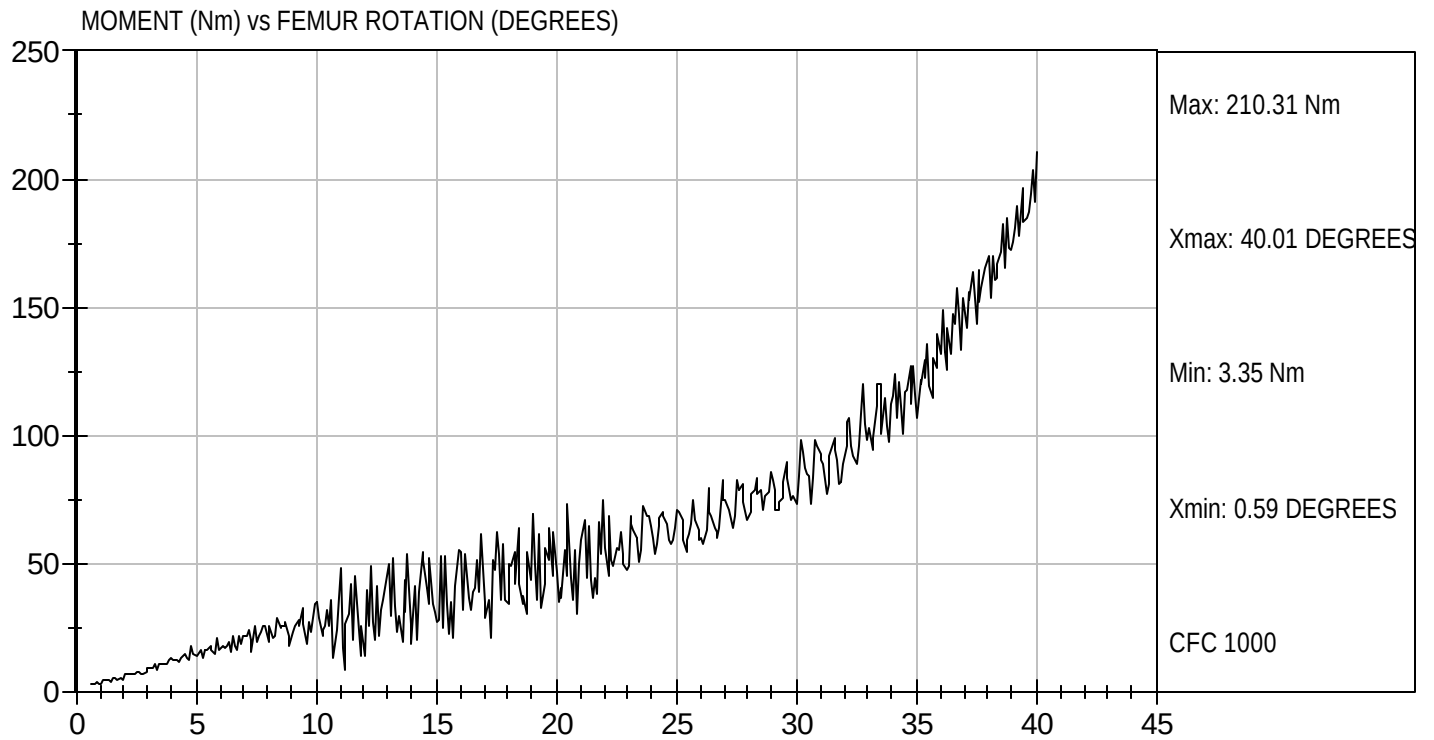
Test Date: 09/08/2006
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Componet ID: D062700

Test Date: 09/08/2006
Velocity: 0 ft/s, 0.00 m/s



MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065

Test ID: D062691

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	225 - 275	254	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-14.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

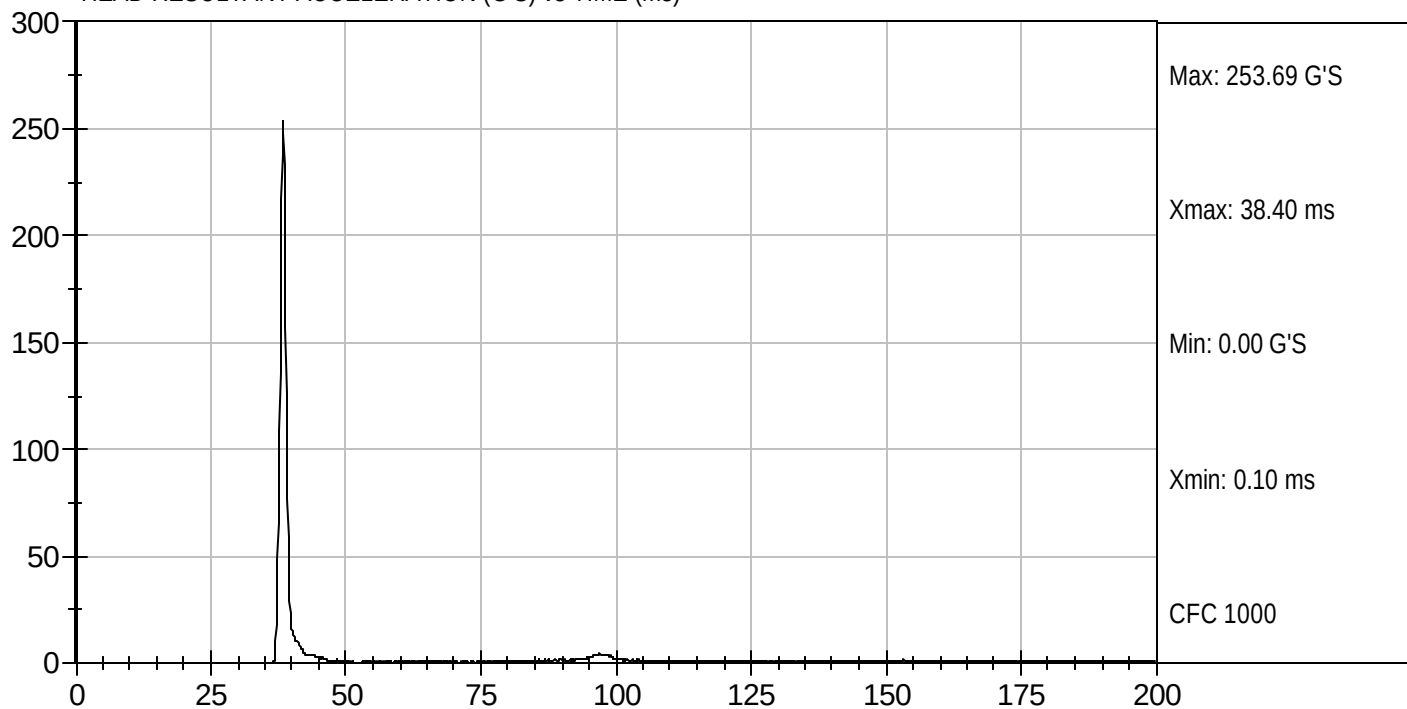
09/07/2006
Test Date



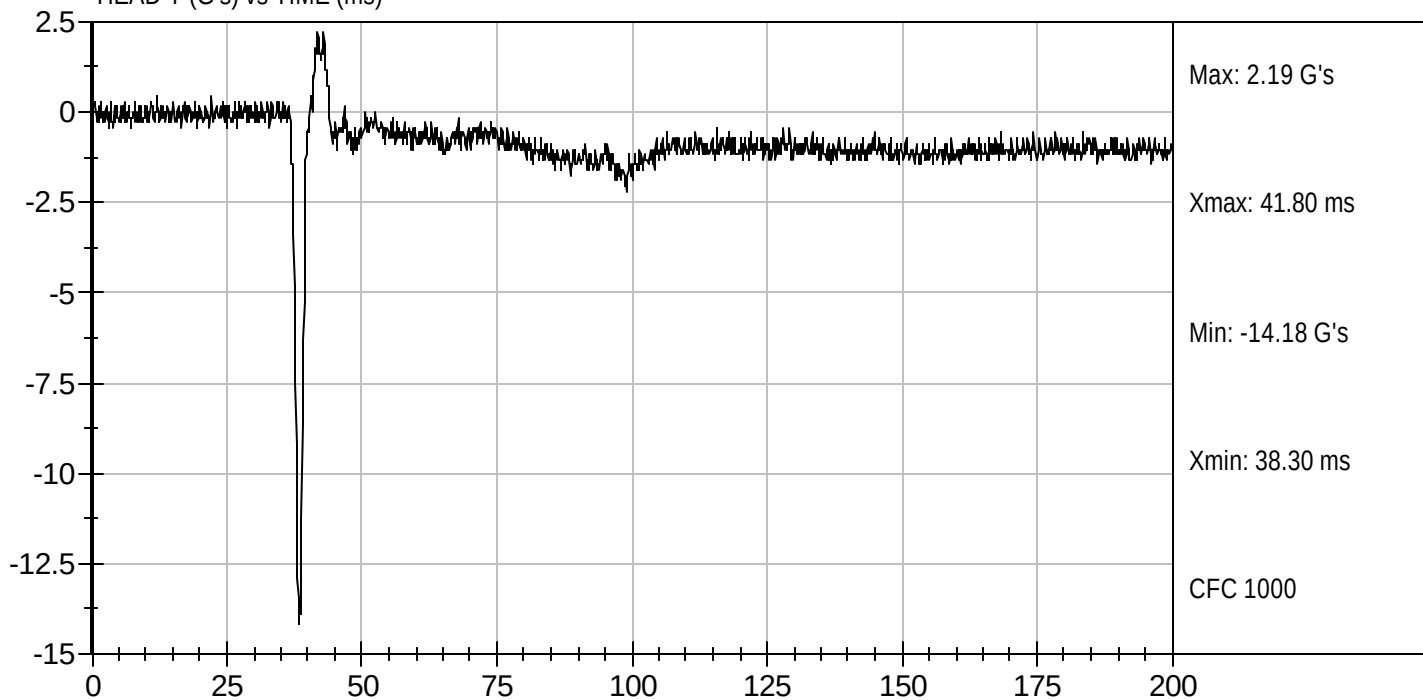
Test Desc: Head Drop
Componet ID: D062691

Test Date: 09/07/2006
Velocity: 0 ft/s, 0.00 m/s

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



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



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065

Test I.D: D062692

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.01	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.78	Pass
	20 msec	G's	17.60 to 22.60	18.49	Pass
	30 msec	G's	12.50 to 18.50	15.38	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	15.34	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	37.3	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	75.8	Pass
	Time	msec	57.0 to 64.0	58.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	114.9	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	95.0	Pass
	Time	msec	47.0 to 58.0	49.3	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	103.9	Pass
Overall Test Results					Pass


 Laboratory Technician

09/07/2006
 Test Date

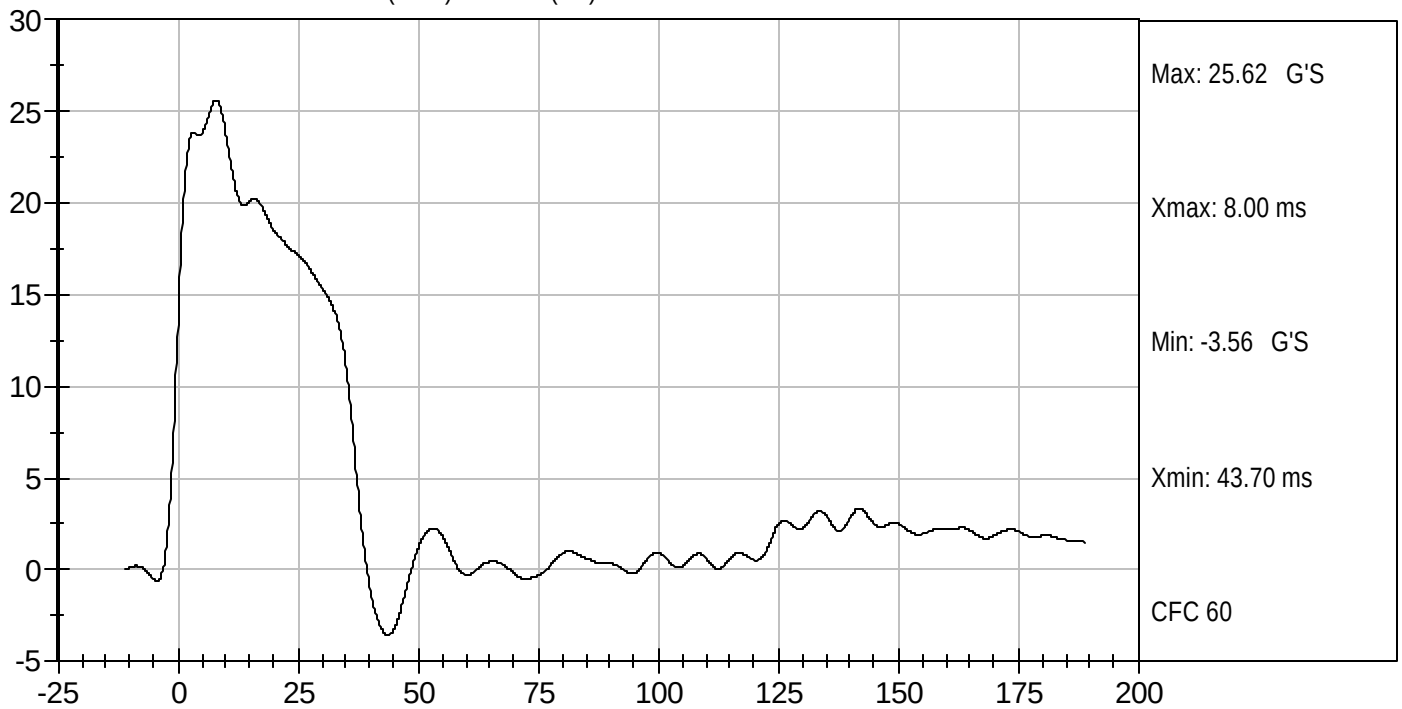

 Approved By



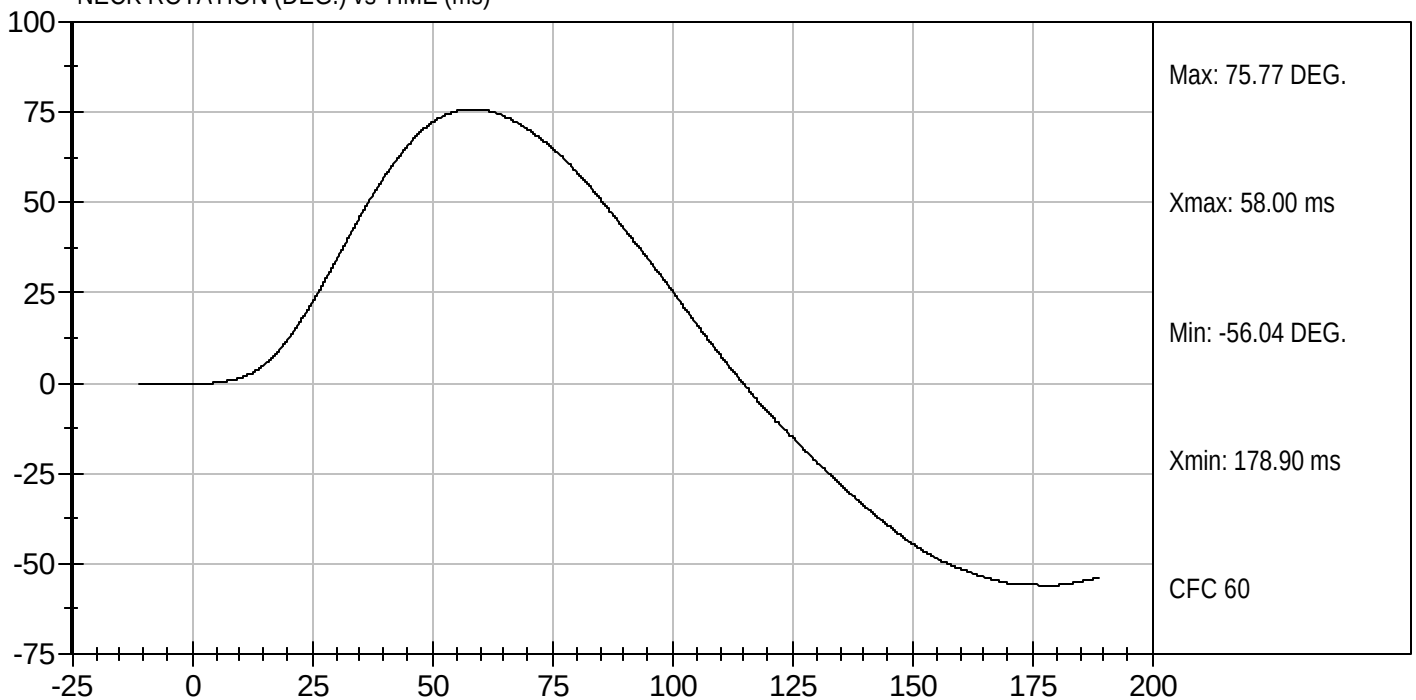
Test Desc: Neck Flexion
Componet ID: D062692

Test Date: 09/07/2006
Velocity: 23.01 ft/s, 7.01 m/s

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



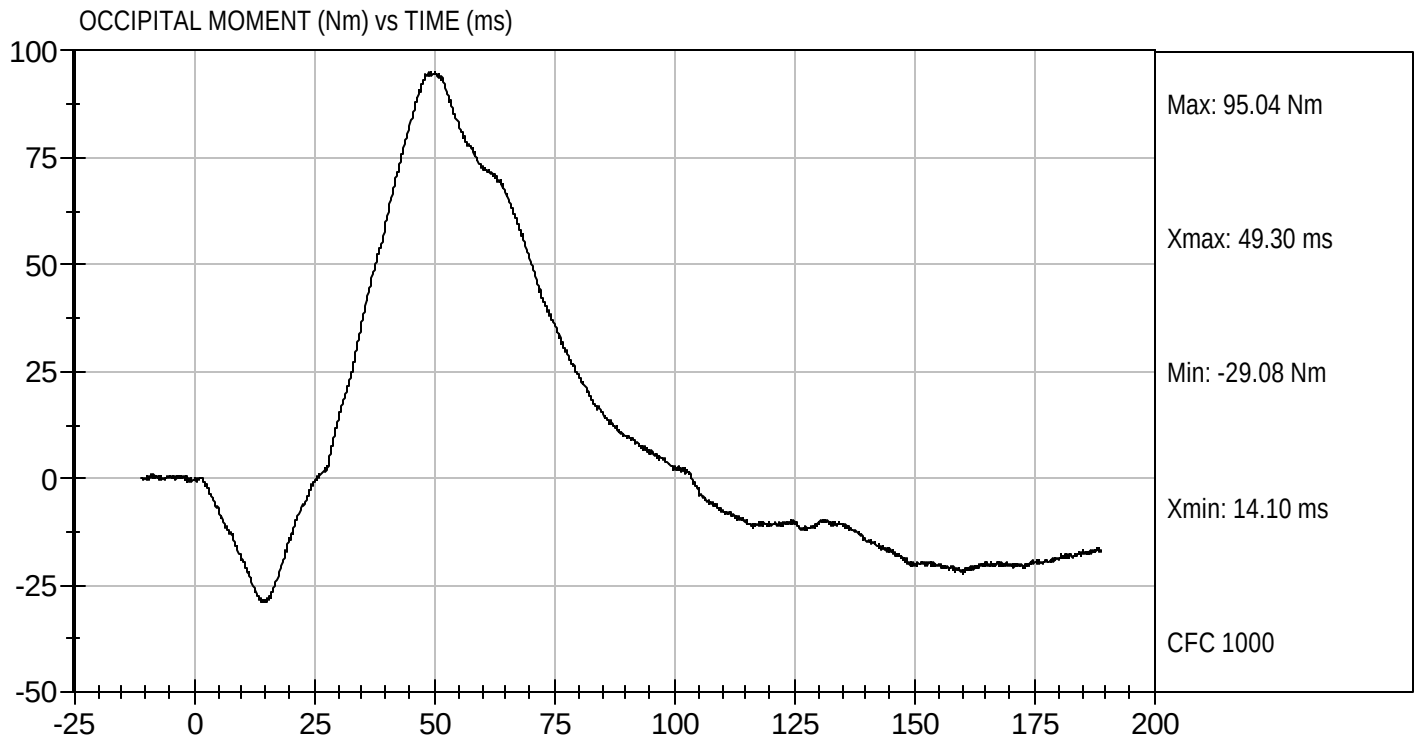
NECK ROTATION (DEG.) vs TIME (ms)





Test Desc: Neck Flexion
Componet ID: D062692

Test Date: 09/07/2006
Velocity: 23.01 ft/s, 7.01 m/s



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065

Test I.D: D062693

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	44	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.04	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.90	Pass
	20 msec	G's	14.00 to 19.00	16.20	Pass
	30 msec	G's	11.00 to 16.00	13.45	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	13.49	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	39.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.5	Pass
	Time	msec	72.0 to 82.0	77.5	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	-67.3	Pass
	Time	msec	65.0 to 79.0	73.1	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	144.5	Pass
Overall Test Results				Pass	


 Laboratory Technician

09/08/2006
 Test Date

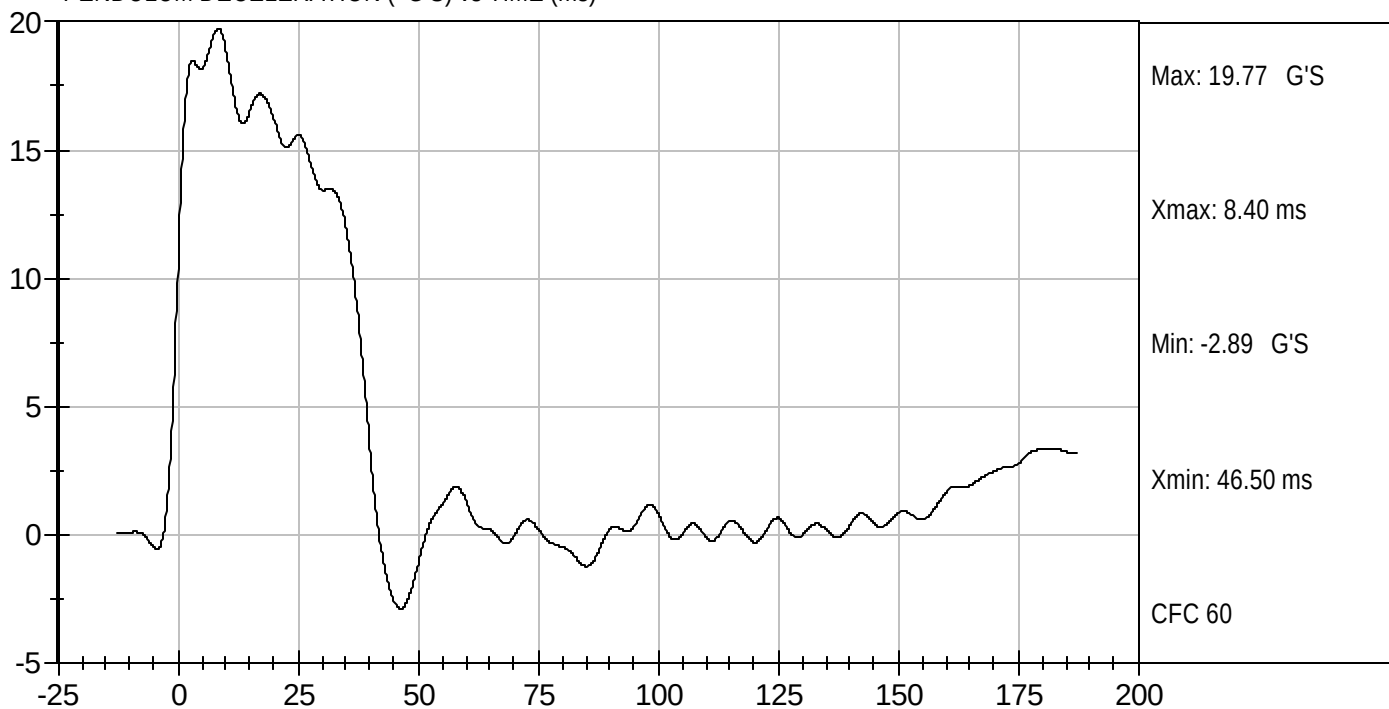

 Approved By



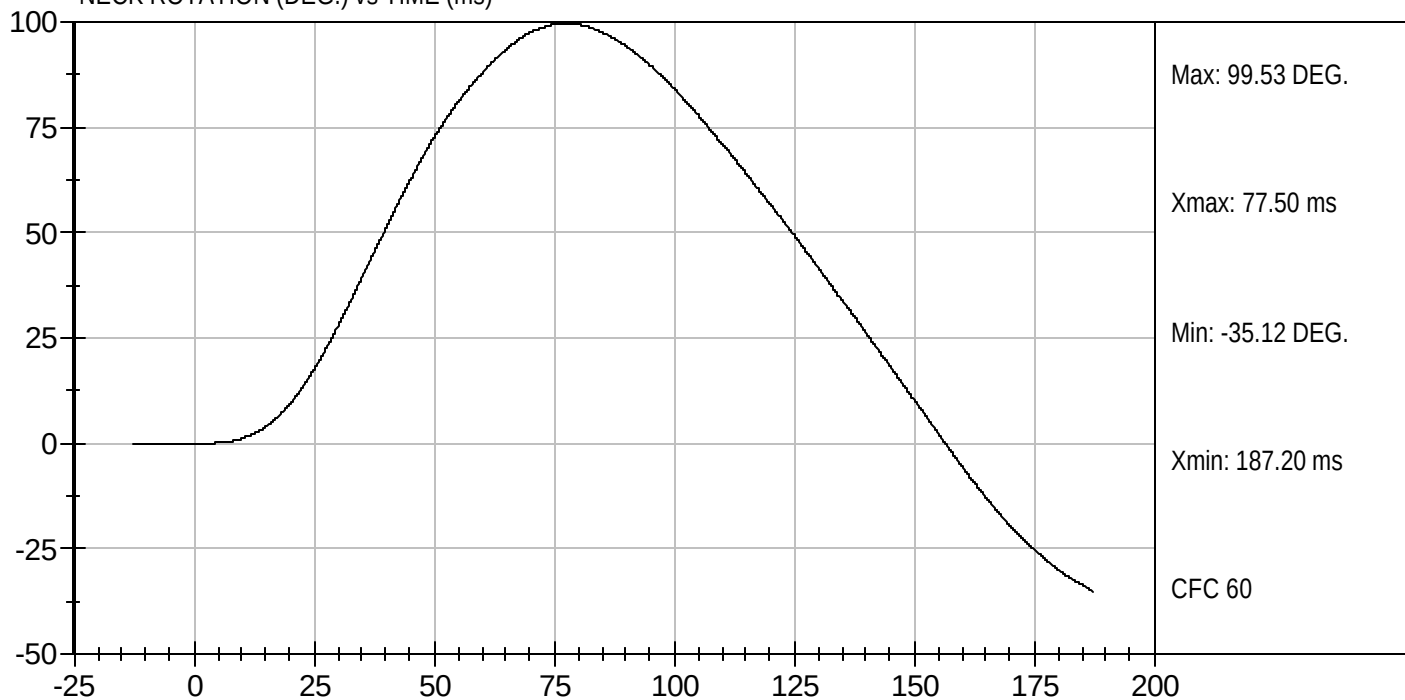
Test Desc: Neck Extension
Componet ID: D062693

Test Date: 09/08/2006
Velocity: 19.83 ft/s, 6.04 m/s

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



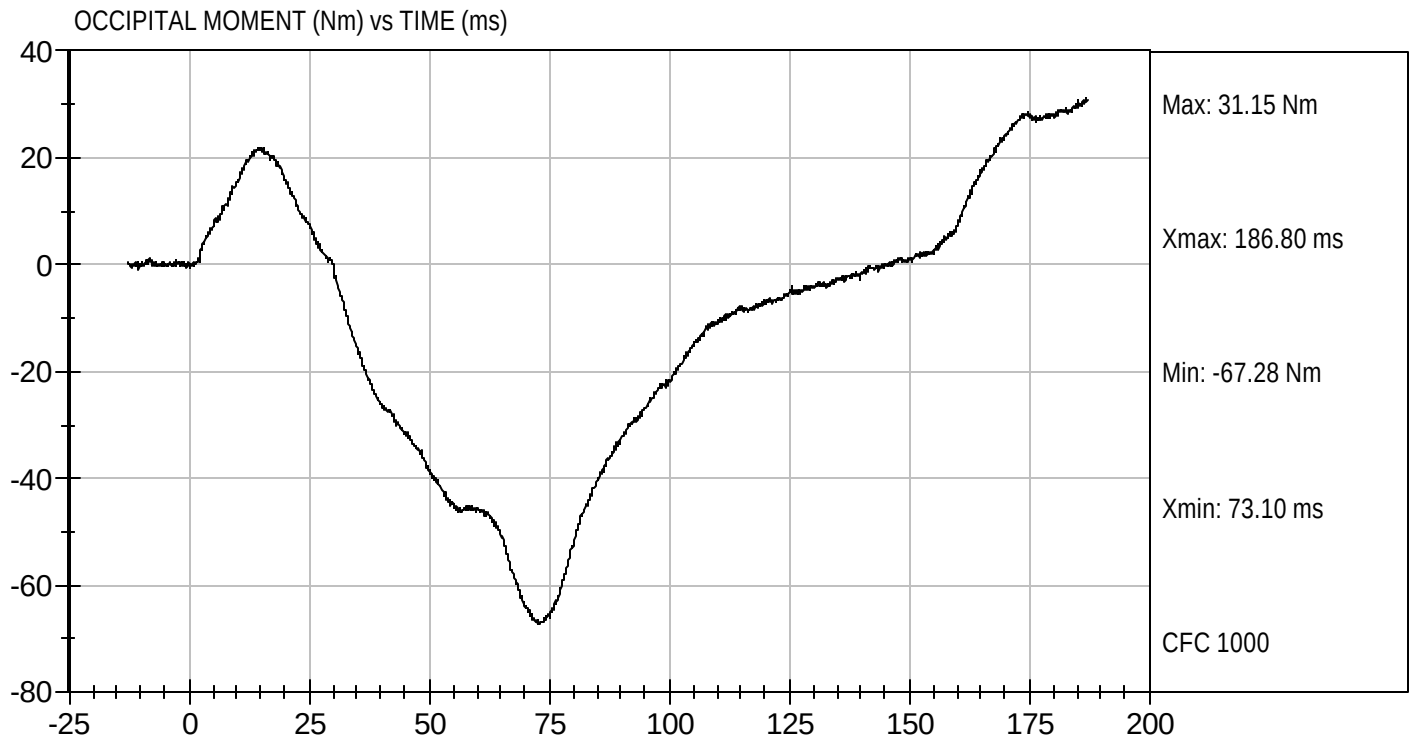
NECK ROTATION (DEG.) vs TIME (ms)





Test Desc: Neck Extension
Componet ID: D062693

Test Date: 09/08/2006
Velocity: 19.83 ft/s, 6.04 m/s



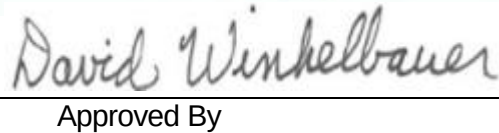
MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065

Test I.D: D062694

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	6.58 to 6.82	6.66	Pass
Peak Probe Force	N	5159 to 5893	5,428	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.14	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Overall Test Results			Pass	


Laboratory Technician

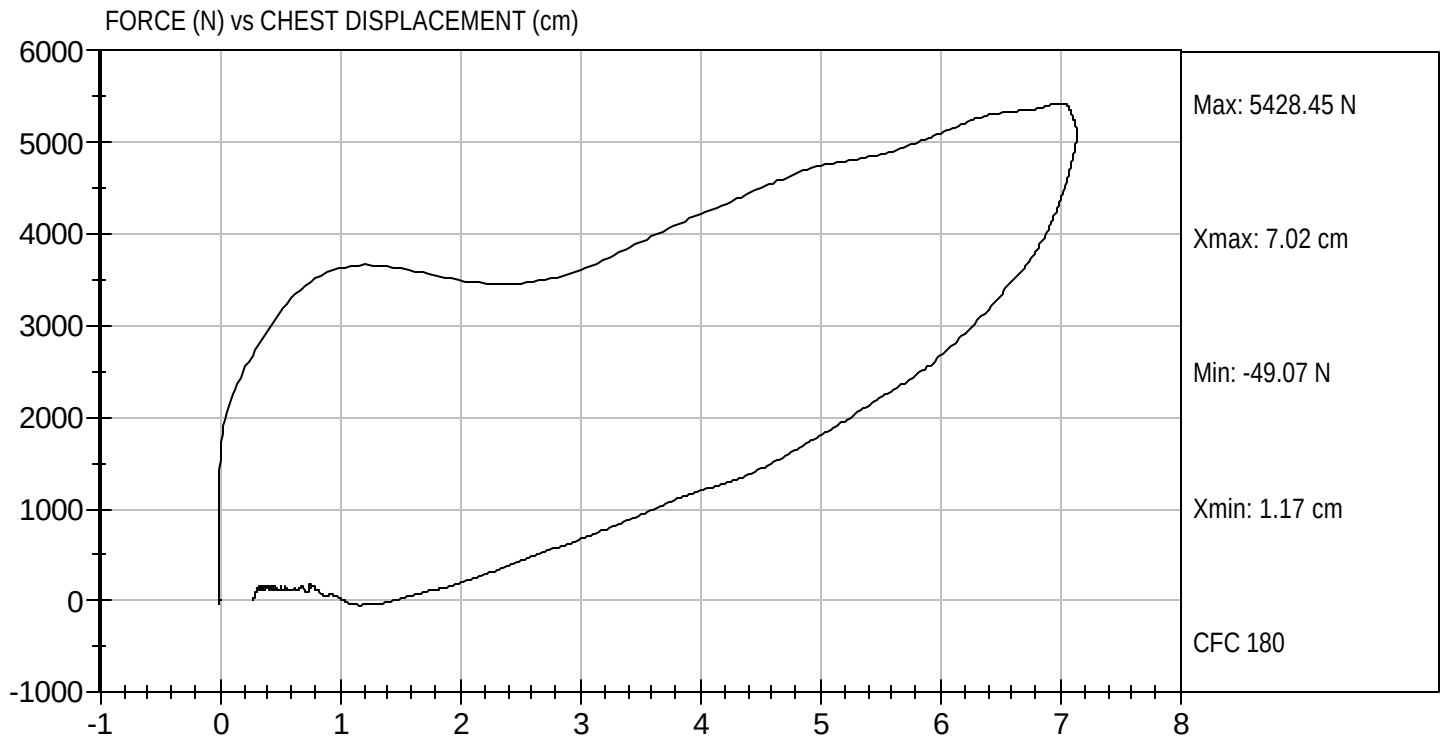

Approved By

09/07/2006
Test Date



Test Desc: Thorax Impact
Componet ID: D062694

Test Date: 09/07/2006
Velocity: 21.86 ft/s, 6.66 m/s



MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065

Test I.D: D062695

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,137	Pass
Overall Test Results				Pass


Laboratory Technician

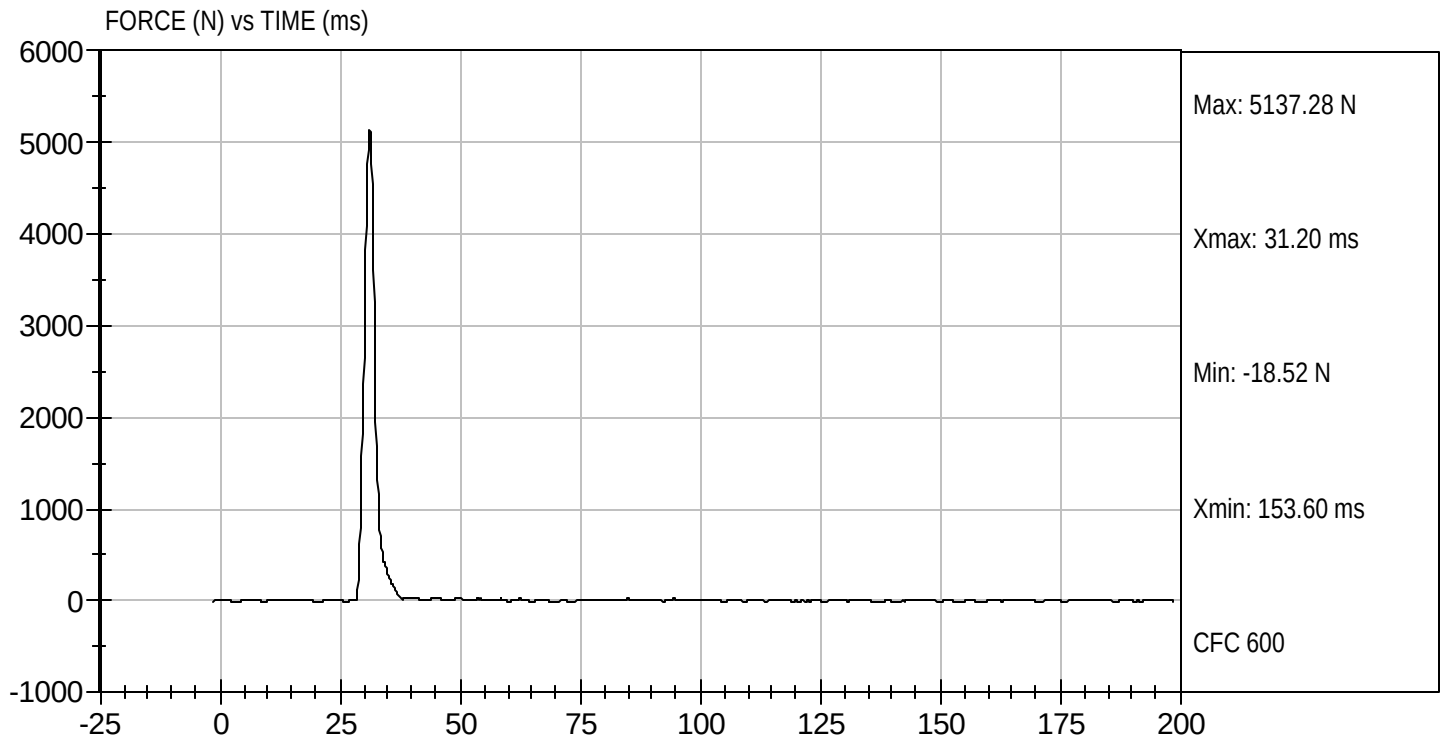

Approved By

09/08/2006
Test Date



Test Desc: Right Knee
Componet ID: D062695

Test Date: 09/08/2006
Velocity: 6.86 ft/s, 2.09 m/s



MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065

Test I.D: D062696

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.07	Pass
Peak Probe Force	Newtons	4715 to 5782	5,469	Pass
Overall Test Results				Pass


Laboratory Technician

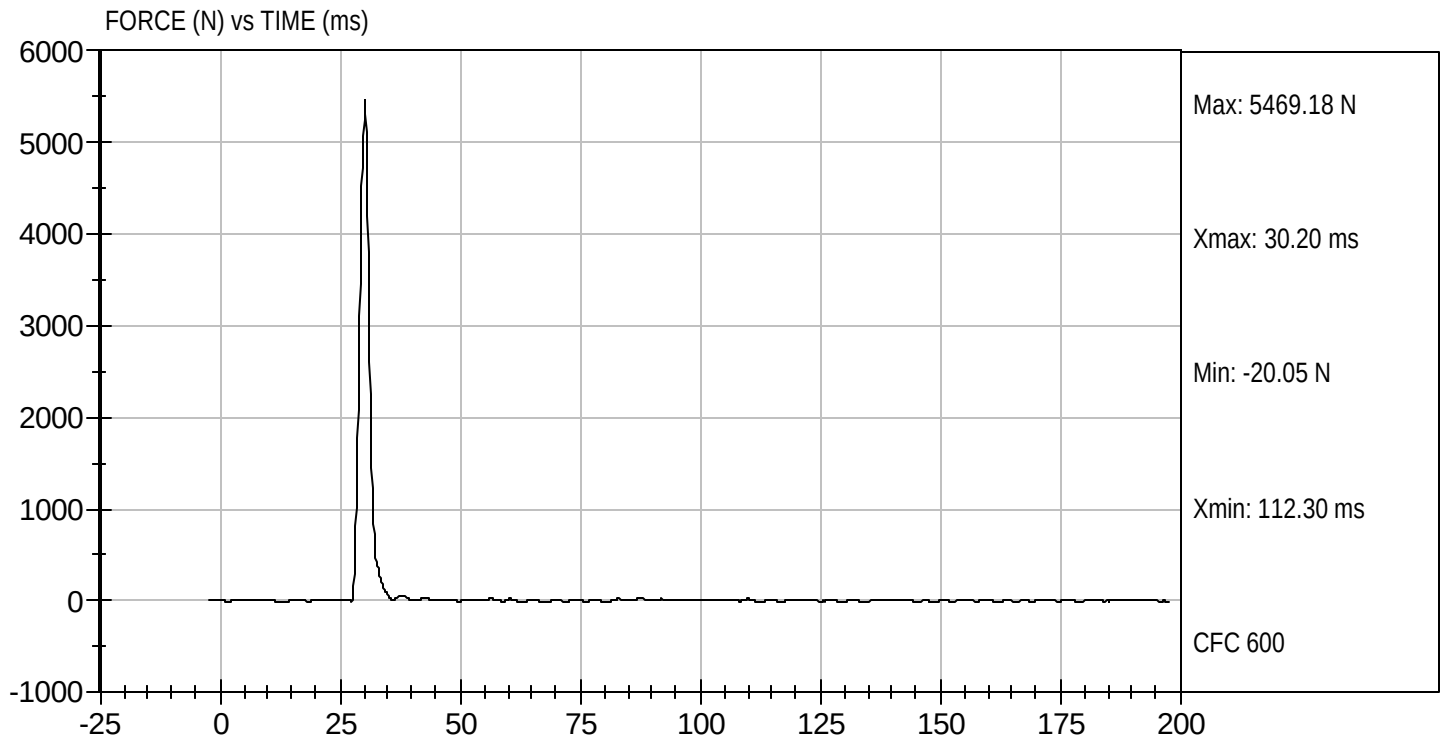

Approved By

09/08/2006
Test Date



Test Desc: Left Knee
Componet ID: D062696

Test Date: 09/08/2006
Velocity: 6.8 ft/s, 2.07 m/s



MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065

Test I.D: D062690

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.0	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	43	43	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	61.9	69.2	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	44	43	Pass
Overall Test Results				Pass	


 Laboratory Technician

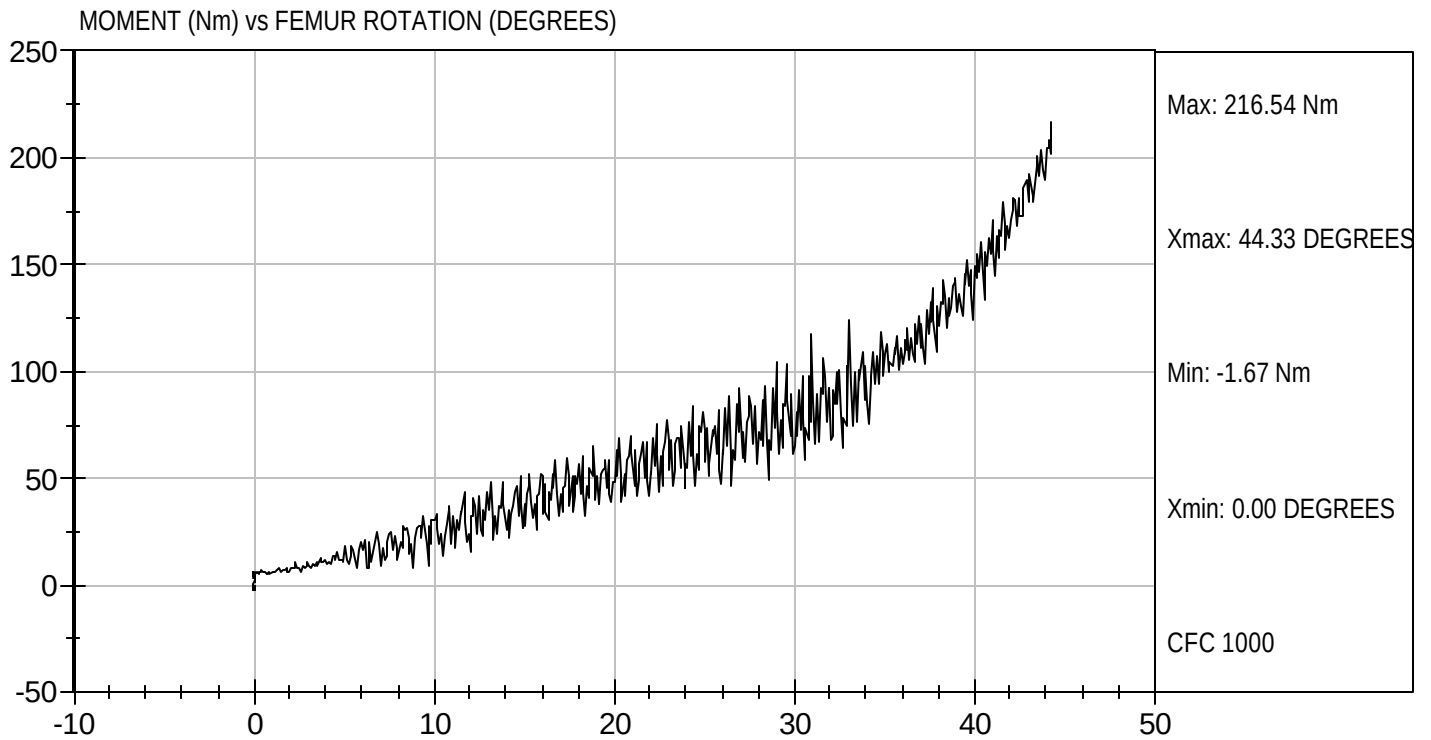
09/08/2006
 Test Date


 Approved By



Test Desc: Hip Femur Flexion
Componet ID: D062699

Test Date: 09/08/2006
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Componet ID: D062690

Test Date: 09/08/2006
Velocity: 0 ft/s, 0.00 m/s

