

REPORT NUMBER: NCAP-MGA-2012-033

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Frontal Barrier Impact Test**

**NISSAN MOTOR CO., LTD.
2012 Nissan Maxima S 4-Dr Sedan
NHTSA No.: MC5202**

**MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105**



Test Date: November 30, 2011


Final Report Date: January 10, 2012

FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE
Room W43-410
Washington, DC 20590**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: 
Donna Janovicz, Project Manager

Approved by: 
Ben Fischer, Project Engineer

Approval Date: January 10, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

Technical Report Documentation Page

1. Report No. NCAP-MGA-2012-033	2. Government Accession No.	3. Recipient's Catalog No.																																																			
4. Title and Subtitle Final Report of New Car Assessment Program Frontal Impact Testing of 2012 Nissan Maxima S 4-Dr Sedan, NHTSA No.: MC5202		5. Report Date January 10, 2012																																																			
		6. Performing Organization Code MGA																																																			
7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		8. Performing Organization Report No. NCAP-MGA-2012-033																																																			
		10. Work Unit No.																																																			
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		11. Contract or Grant No. DTNH22-06-D-00028																																																			
		13. Type of Report and Period Covered Final Test Report November 30 to January 10, 2012																																																			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590		14. Sponsoring Agency Code NVS-111																																																			
		15. Supplementary Notes																																																			
16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on the 2012 Nissan Maxima S 4-Dr Sedan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on November 30, 2011. The impact velocity was 56.3 km/h and the ambient temperature at the barrier face at the time of impact was 21.7°C. The target vehicle post-test maximum crush was 432 mm located at the vehicle's centerline. The test vehicle's performance was as follows:																																																					
<table border="1" style="width: 100%; border-collapse: collapse; background-color: #ffff00;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Threshold</th> <th rowspan="2">Driver ATD</th> <th rowspan="2">Passenger ATD</th> </tr> <tr> <th>50th</th> <th>5th</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>700</td> <td>127</td> <td>348</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>52</td> <td>25</td> <td>17</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>1</td> <td>0.30</td> <td>0.77</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>2620</td> <td>1133</td> <td>1047</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>2520</td> <td>425</td> <td>218</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>3802</td> <td>3413</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>3962</td> <td>2957</td> </tr> </tbody> </table>				Measurement Description	Units	Threshold		Driver ATD	Passenger ATD	50 th	5 th	Head Injury Criteria (HIC ₁₅)	N/A	700	700	127	348	Maximum Chest Compression	mm	63	52	25	17	Nij	N/A	1	1	0.30	0.77	Neck Tension	N	4170	2620	1133	1047	Neck Compression	N	4000	2520	425	218	Left Femur Force	N	10008	6805	3802	3413	Right Femur Force	N	10008	6805	3962	2957
Measurement Description	Units	Threshold				Driver ATD	Passenger ATD																																														
		50 th	5 th																																																		
Head Injury Criteria (HIC ₁₅)	N/A	700	700	127	348																																																
Maximum Chest Compression	mm	63	52	25	17																																																
Nij	N/A	1	1	0.30	0.77																																																
Neck Tension	N	4170	2620	1133	1047																																																
Neck Compression	N	4000	2520	425	218																																																
Left Femur Force	N	10008	6805	3802	3413																																																
Right Femur Force	N	10008	6805	3962	2957																																																
17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE, Room E12-100 Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833																																																			
19. Security Classification of Report Unclassified	20. Security Classification of Page Unclassified	21. No. of Pages 159	22. Price																																																		

TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3

<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat Adjustment, Fuel System, and Steering Wheel Data	8
3	Dummy Longitudinal Clearance Dimensions	10
4	Dummy Lateral Clearance Dimensions	11
5	Seat Belt Positioning Data	12
6	High-Speed Camera Locations and Data	13
7	Vehicle Accelerometer Data	15
8	Photographic Reference Target Locations	16
9	Load Cell Locations on Fixed Barrier	17
10	Test Vehicle Summary of Results	18
11	Post-Test Observations	19
12	Vehicle Profile Measurements	20
13	Accident Investigation Division Data	22
14	Vehicle Intrusion Measurements	23
15	Summary of FMVSS 212, 219 (Partial), and 301 Data	26
16	FMVSS 301 Static Rollover Results	28
17	Dummy/Vehicle Temperature Stabilization Data	29

<u>Appendix</u>		
A	Photographs	A
B	Dummy Response Data Traces	B
C	Dummy Calibration and Performance Verification Data	C

SECTION 1 PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-06-D-00028. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure.

SUMMARY

A load cell barrier was impacted by a 2012 Nissan Maxima S 4-Dr Sedan at a velocity of 56.3 kph. The test was performed at MGA Research Corporation on November 30, 2011. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

Two real-time cameras and fourteen (14) 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.

One Part 572E, 50th percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5th percentile female test device (ATD) was placed in the right-front passenger seating position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's shoulder belts to measure dummy torso and pelvic section loading.

The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. 138) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 228 channels of data were recorded on an on-board data acquisition system. Appendix B contains the dummy head, chest displacement, neck, 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 432 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head and chest contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee bolster. The passenger's visible contact points were as follows: The passenger's head and chest contacted the airbag. The passenger's head also contacted the headrest. The passenger's knees contacted the glovebox.

The occupant data is summarized below:

ATD position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th)	127	0.30	1133	425	47	25	3802	3962
Passenger (5 th)	348	0.77	1047	218	48	17	3413	2957

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

TEST NOTES

There was no valid data collected for:

Top of Engine X after 37 msec.

Bottom of Engine X after 41 msec.

Right rear seat crossmember X is questionable data from 40-44 ms.

Left brake caliper X is questionable data from 37-46 ms.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

**SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS**

**DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC5202	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Nissan	Automatic Door Locks (ADLs)	Yes
Model	Maxima	Power Window Auto-Reverse	Yes
Body Style	Sedan	Other Optional Feature	N/A
VIN	1N4AA5AP0CC808948	Driver Front Airbag	Yes
Body Color	Navy Blue	Driver Curtain Airbag	Yes
Odometer (km/mi)	68 / 42	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.5	Driver Torso Airbag	No
Type/No. Cylinders	6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	CVT	Pass. Curtain Airbag	Yes
Overdrive	No	Pass. Head/Torso Airbag	No
Final Drive	Front	Pass. Torso Airbag	No
Roof Rack	No	Pass. Torso/Pelvis Airbag	Yes
Sunroof/T-Top	Yes	Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Pass. Load Limiter	Yes
All-Wheel Drive (AWD)	No	Other Safety Restraint	N/A
Does owner's manual provide instructions to turn off automatic door locks?			Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., Ltd.	GVWR (kg)	2131
Date of Manufacture	10/11	GAWR Front (kg)	1140
Vehicle Type	Passenger Car	GAWR Rear (kg)	1000

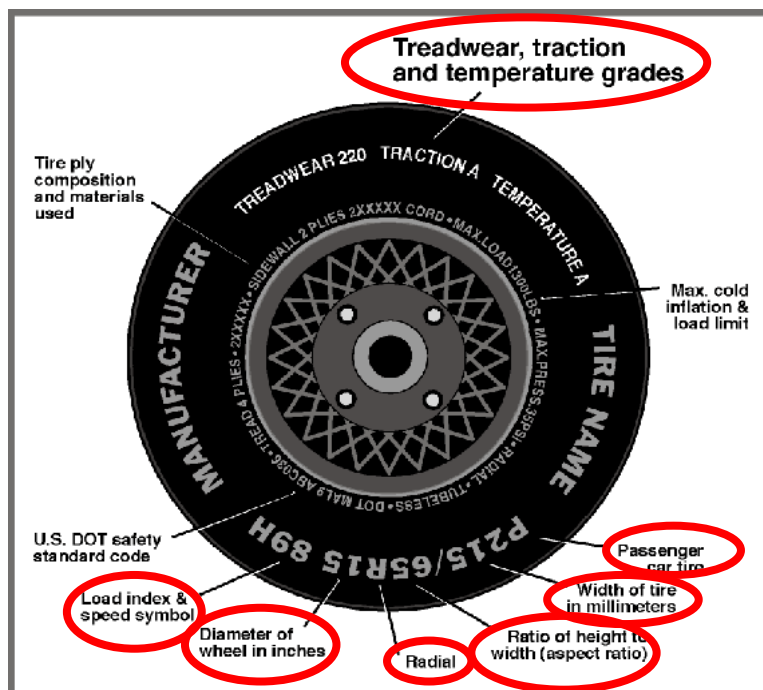
VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				408
Cargo Weight (RCLW) (kg)				68

**DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	230	230
Recommended Tire Size	P245/45R18	P245/45R18

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P245/45R18	P245/45R18
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle	Eagle
Tire Type	Passenger	Passenger
Tire Width	245	245
Aspect Ratio	45	45
Radial	Yes	Yes
Wheel Diameter	18	18
Load Index/Speed Symbol	96V	96V
Treadwear	260	260
Traction Grade	A	A
Temperature Grade	A	A
Tire Material	Rubber	Rubber

**DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	499.0	317.5		522.6	406.4	
Right	kg	489.4	306.2		518.9	367.0	
Ratio	%	61.3	38.7		57.4	42.6	
Totals	kg	988.4	623.7	1612.1	1041.5	773.4	1814.9

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1612.1
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	68
Calculated Vehicle Target Weight (TVTW)	kg	1820.7

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	723	721	735	733	1074
As Tested	mm	715	716	698	700	1183
Post Test	mm	754	743	698	680	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2776
Total Vehicle Length at Left Side	mm	4662
Total Vehicle Length at Centerline	mm	4844
Total Vehicle Length at Right Side	mm	4662
Weight of Ballast in Cargo Area	kg	59.4
Weight of Vehicle Components Removed	kg	22.7
Amount of Stoddard Solvent in Fuel Tank	L	66.9

List of components removed: Right taillight, trunk carpet, jack/tools, spare tire.

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4844
2	Total Width	1812
3	Bumper Top Height	505
4	Bumper Bottom Height	400
5	Longitudinal Member Top Height	555
6	Distance between Longitudinal Members	925
7	Longitudinal Member Width	108
8	Engine Top Height	912
9	Engine Bottom Height	176
10	Engine and Gearbox Width	941
11	Front Bumper-Engine Distance	410
12	Front Shock Absorber Fixing Height	891
13	Bonnet Leading Edge Height	800
14	Front Shock Absorber Fixing Width	1150
15	Front Bumper – Front Axle Distance	966
16	Front Axle – A-Pillar Distance	432
17	A-Pillar – B-Pillar Distance	1235
18	B-Pillar – Rear Axle Distance	1107
19	B-Pillar – C-Pillar Distance	676
20	Roof Sill Bottom Height	1310
21	Roof Sill Top Height	1417
22	Floor Sill Bottom Height	207
23	Floor Sill Top Height	359

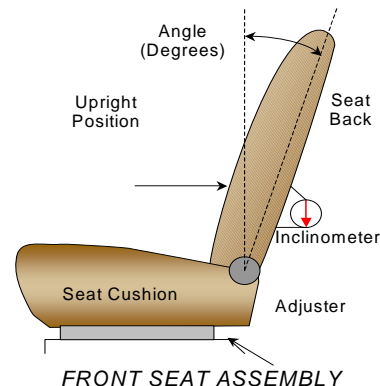
DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011

NOMINAL DESIGN RIDING POSITION

The driver seat back is positioned as close as possible to the manufacturer's design angle. For the passenger seat back, seat back is adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.



SEAT BACK ANGLE	Degrees
Driver Seat Back Angle	12.0° on head rest post
Passenger Seat Back Angle	3.5° on head rest post

SEAT FORE/AFT POSITIONS

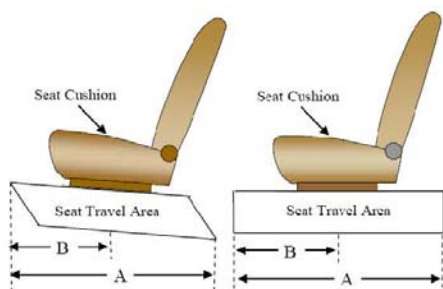
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	300 mm	150 mm (foremost as 0)
Passenger Seat	240 mm	0 mm (foremost as 0)

SEAT BELT UPPER ANCHORAGES

The seat belt upper anchorages are positioning following the manufacturer's specified position as listed in Form 1.

	Total # of Positions	Placed in Position #
Driver Seat	4 (1 st as 0)	0 (uppermost as 0)
Passenger Seat	4 (1 st as 0)	0 (uppermost as 0)



DATA SHEET NO. 2 (CONTINUED)
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011

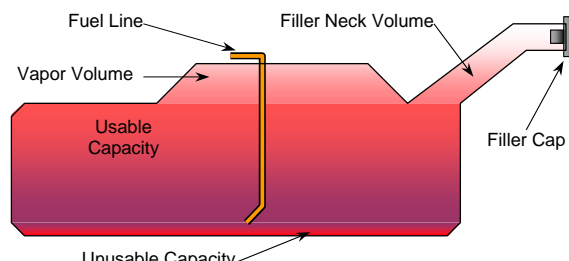
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	71.9
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	66.2 to 67.6
Actual Amount of Solvent used	66.9
1/3 of Usable Capacity	24.0

FUEL PUMP

Describe the fuel pump type, its behavior, and the location of the fuel filler pipe.

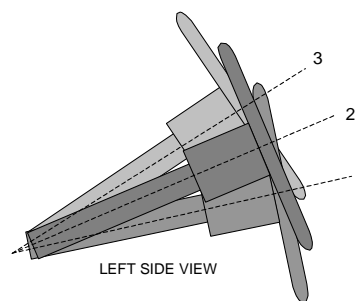
The vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel for: 1) 1.0 seconds after the ignition is switched to "ON", 2) while the engine is running, and 3) for 1.5 seconds after the engine stops running. The fuel pipe is on the left side.



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

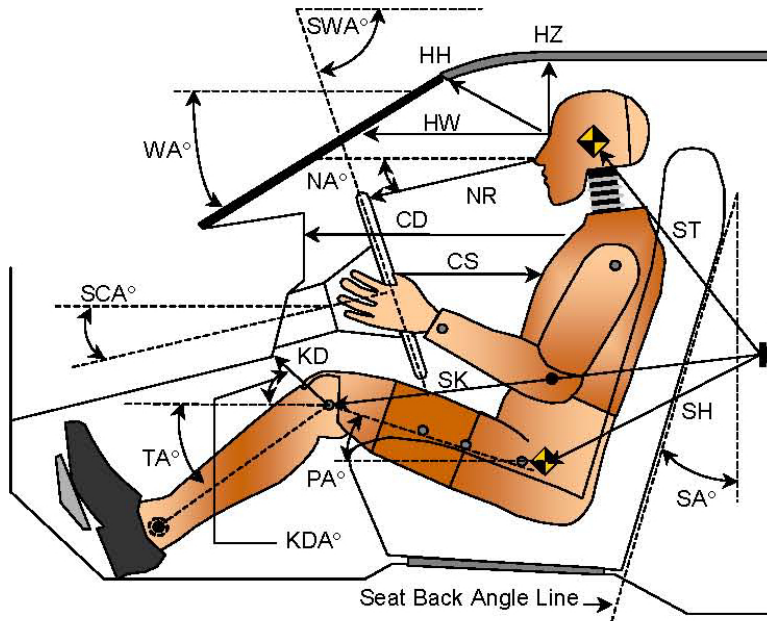
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	74.0	
Geometric Center – Position 2	66.5	
Uppermost – Position 3	59.0	
Telescoping Steering Wheel Travel		
Test Position	68.0	

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011



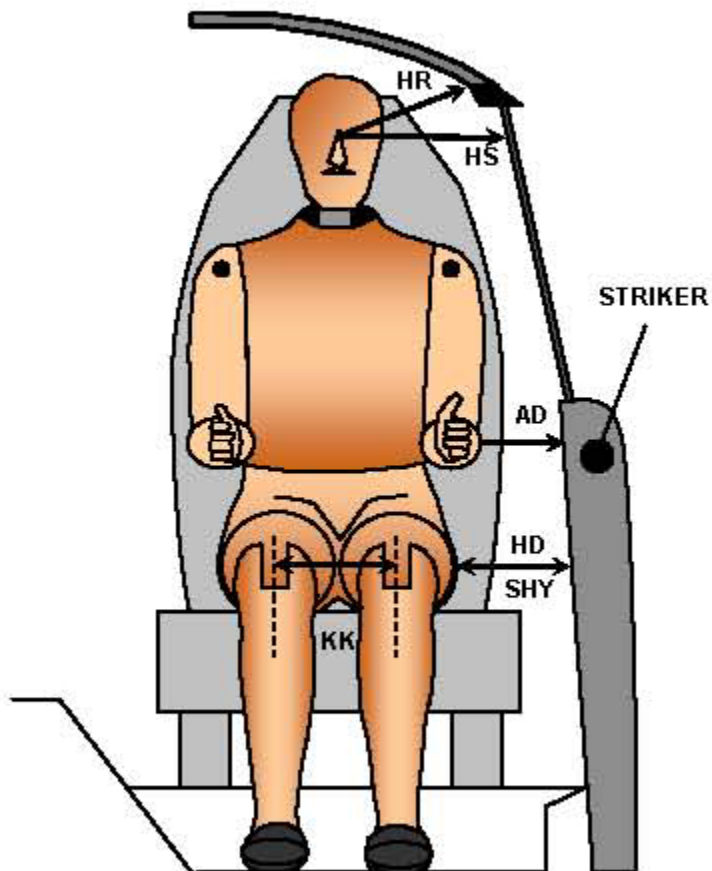
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N 351		Passenger S/N 138	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		24.4		
SWA°	Steering Wheel Angle		68.0		
SCA°	Steering Column Angle		22.0		
SA°	Seat Back Angle (on headrest post)		12.0		3.5
HZ	Head to Roof (Z)	182	90	182	90
HH	Head to Header	368	23.0	258	47.0
HW	Head to Windshield	727	0	615	0
NR	Nose to Rim	381	10.3		
CD	Chest to Dash	528		430	
CS	Chest to Steering Hub	283	0.6		
RA	Rim to Abdomen	186	0		
KDL	Left Knee to Dash	196	33.6	103	38.4
KDR	Right Knee to Dash	183	34.7	97	43.0
PA°	Pelvic Angle		24.0		21.8
TA°	Tibia Angle		41.0		49.1
SK	Striker to Knee	592	92.3	710	92.3
ST	Striker to Head	498	8.6	518	31.1
SH	Striker to H-Point	254	125.6	390	106.0

**DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011



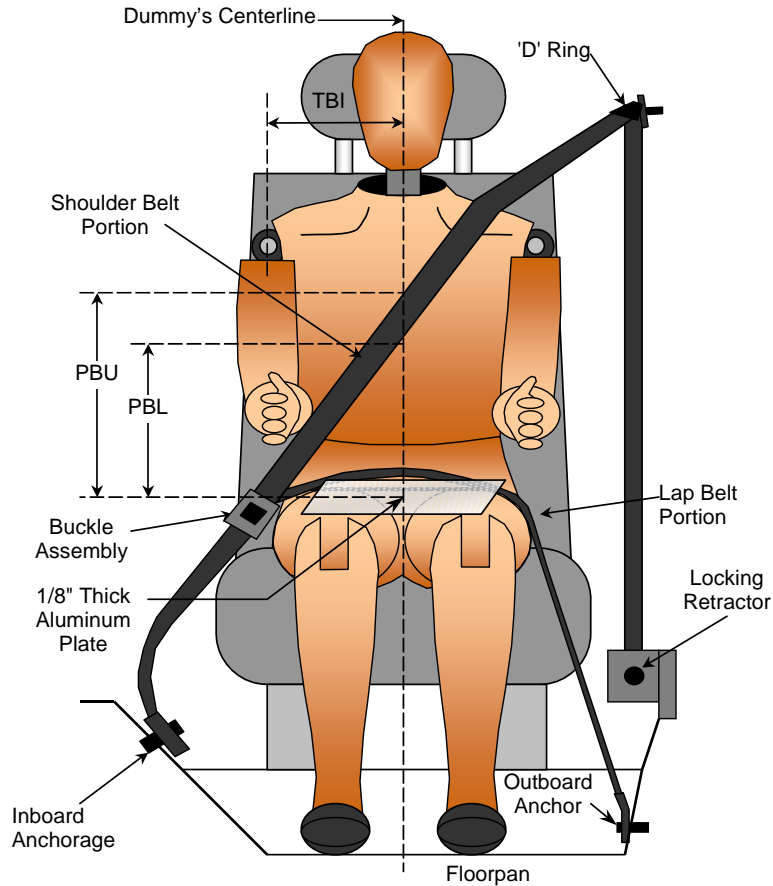
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 351	Passenger S/N 138
		Length (mm)	
AD	Arm to Door	153	78
HD	H-Point to Door	148	183
HR	Head to Side Header	210	223
HS	Head to Side Window	332	385
KK	Knee to Knee	353	226
SHY	Striker to H-Point (Y Direction)	280	324
AA	Ankle to Ankle	350	184

**DATA SHEET NO. 5
SEAT BELT POSITIONING DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	355	320
PBL - Top surface of reference to belt lower edge	mm	275	220

BELT LENGTH DATA

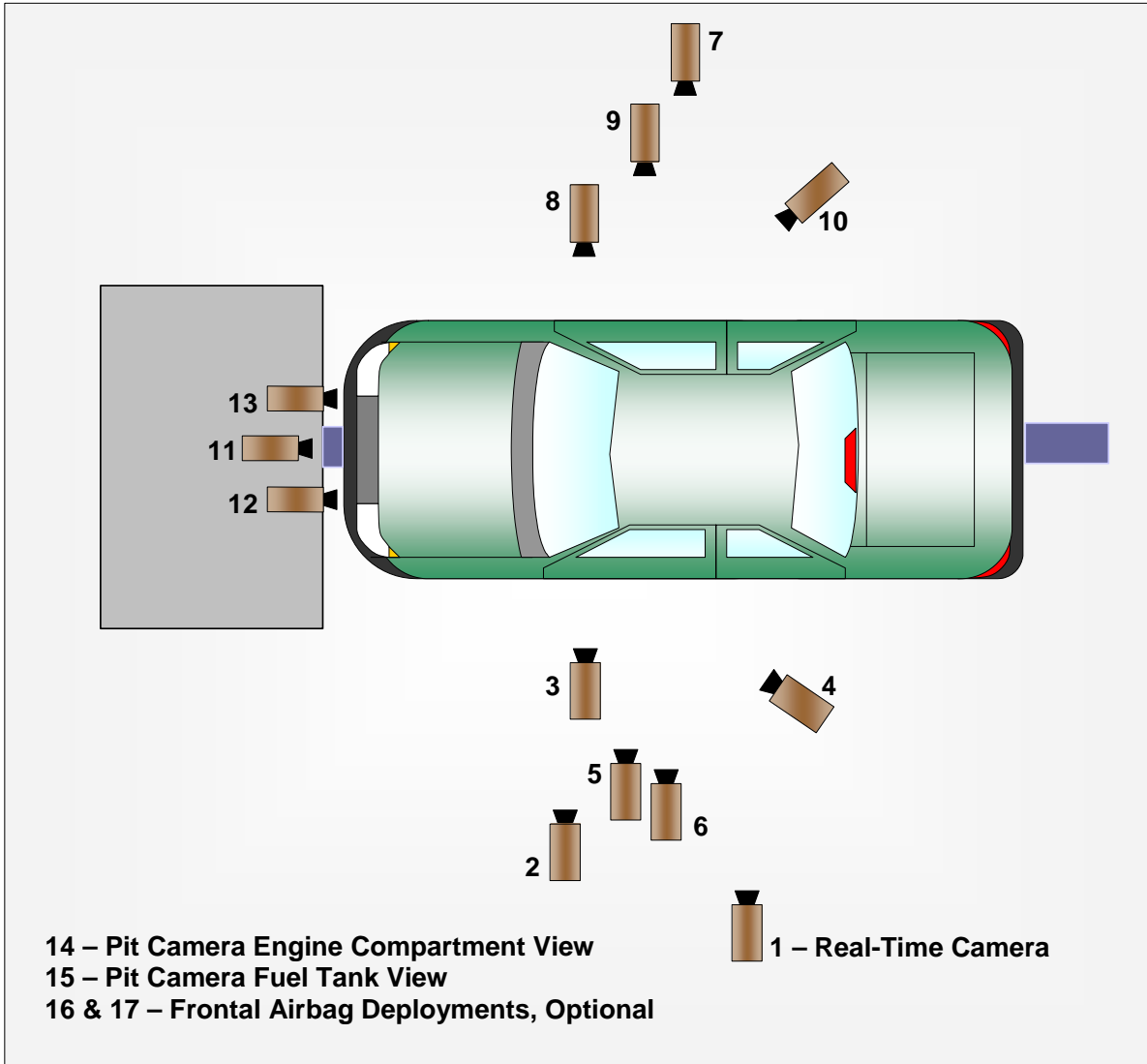
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	830	940
Lap Belt Length as measured on ATD	mm	750	855
Remainder of belt on reel	mm	1570	1355
Total Belt Length for Continuous Webbing Systems	mm	3150	3150

**DATA SHEET NO. 6
HIGH-SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

CAMERA POSITIONS FOR FRONTAL IMPACTS



**DATA SHEET NO. 6 (CONTINUED)
CAMERA LOCATIONS AND DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1320	-6310	-1760	35	1000
3	Left Front Half	1190	-4990	-1090	24	1000
4	Left Angle	5590	-4780	-1880	50	1000
5	Steering Column - Top	530	-5120	-1240	24	1000
6	Steering Column - Bottom	500	-5100	-830	24	1000
7	Right Overall	1850	6120	-1050	20	1000
8	Passenger Close-Up	1330	6300	-1780	35	1000
9	Right Front Half	1180	5050	-1080	24	1000
10	Right Angle	5630	4780	-1860	50	1000
11	Windshield	-130	0	-2810	24	1000
12	Driver Windshield	250	-450	-2030	12.5	1000
13	Passenger Windshield	250	450	-2030	12.5	1000
14	Pit Front	1340	0	3150	24	1000
15	Pit Rear	3100	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

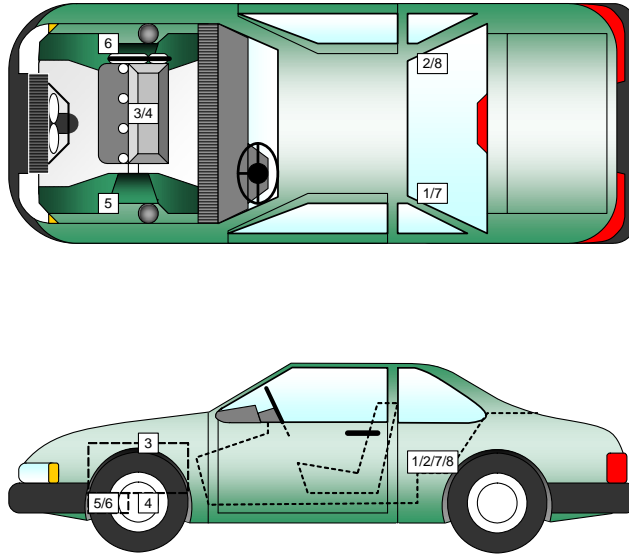
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 16 & 17 were not used for this test.

**DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1952	-490	-227
2	Right Rear Accelerometer – X Direction	1952	375	-227
3	Engine Top X	3875	0	-912
4	Engine Bottom X	4229	35	-171
5	Left Brake Caliper X	3999	-710	-252
6	Right Brake Caliper X	3999	710	-252
7	Left Rear Accelerometer Redundant – X Direction	1952	-490	-227
8	Right Rear Accelerometer Redundant – X Direction	1952	375	-227

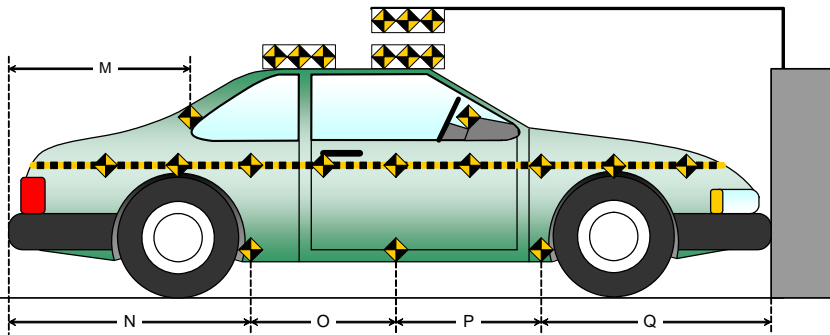
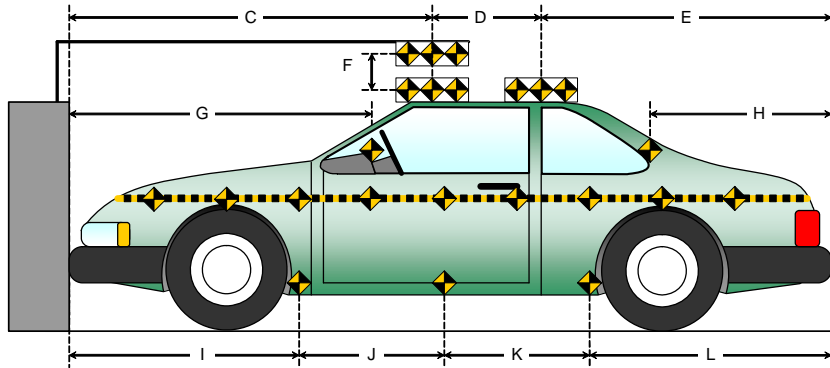
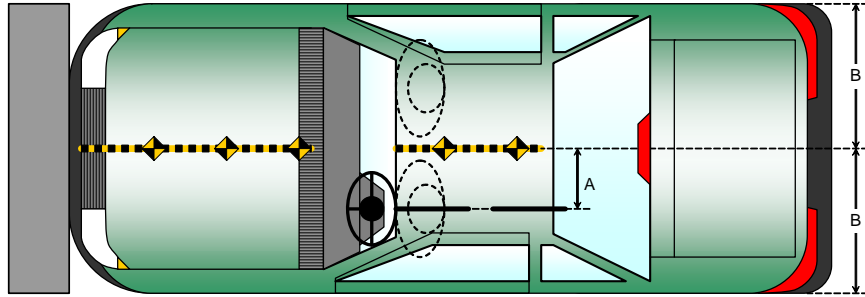
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011

Item	Value (mm)
A	380
B	906
C	2400
D	670
E	1774
F	132
G	
H	1420
I	1840
J	952
K	952
L	1100
M	1420
N	1100
O	952
P	952
Q	1840



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

Advanced Research Load Cell Barrier



1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16
2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	2-9	2-10	2-11	2-12	2-13	2-14	2-15	2-16
3-1	3-2	3-3	3-4	3-5	3-6	3-7	3-8	3-9	3-10	3-11	3-12	3-13	3-14	3-15	3-16
4-1	4-2	4-3	4-4	4-5	4-6	4-7	4-8	4-9	4-10	4-11	4-12	4-13	4-14	4-15	4-16
5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	5-12	5-13	5-14	5-15	5-16
6-1	6-2	6-3	6-4	6-5	6-6	6-7	6-8	6-9	6-10	6-11	6-12	6-13	6-14	6-15	6-16
7-1	7-2	7-3	7-4	7-5	7-6	7-7	7-8	7-9	7-10	7-11	7-12	7-13	7-14	7-15	7-16
8-1	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10	8-11	8-12	8-13	8-14	8-15	8-16
9-1	9-2	9-3	9-4	9-5	9-6	9-7	9-8	9-9	9-10	9-11	9-12	9-13	9-14	9-15	9-16
10-1	10-2	10-3	10-4	10-5	10-6	10-7	10-8	10-9	10-10	10-11	10-12	10-13	10-14	10-15	10-16
11-1	11-2	11-3	11-4	11-5	11-6	11-7	11-8	11-9	11-10	11-11	11-12	11-13	11-14	11-15	11-16

Load Cells are 121 mm x 121 mm with a 7 mm gap in between each load cell.

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

INSTRUMENTATION

Driver Dummy Data Channels	46
Passenger Dummy Data Channels	46
Vehicle Structure Accelerometers	8
Barrier Channels	128
Total	228

CAMERA COVERAGE

High-Speed Vehicle Onboard	0
High-Speed Offboard	14
Real-Time	2
Total	16

**DATA SHEET NO. 11
POST-TEST OBSERVATIONS**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 351	HIII 5% / 138
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were locked	Doors were locked
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

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Cracked
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1075
Center	mm	1006
Right Side	mm	1025
Average	mm	1035

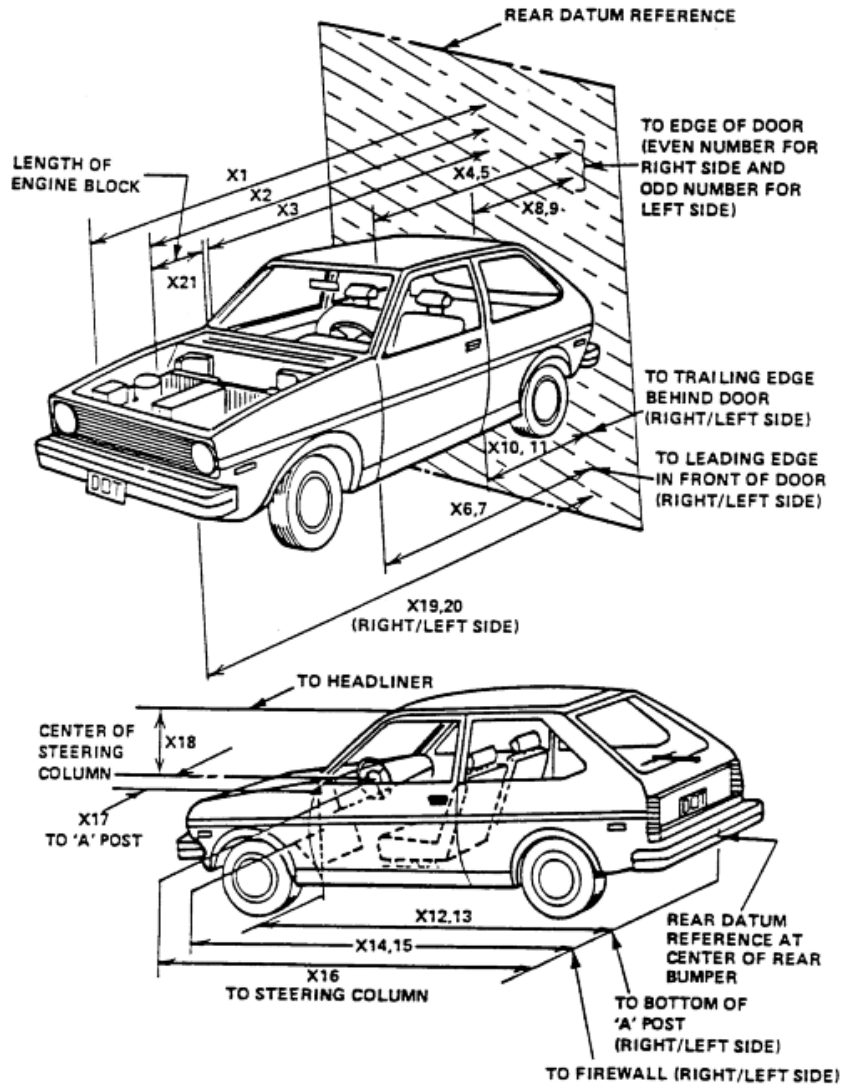
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Right Front (Passenger)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Knee Airbag	No		No	
Curtain Side Airbag	Yes	No	Yes	No
Torso/Pelvis Side Airbag	Yes	No	Yes	No
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	

DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4844	4412	432
2	RSOV to Front of Engine	mm	4335	4110	225
3	RSOV to Firewall	mm	3740	3695	45
4	RSOV to Upper Leading Edge of Right Door	mm	3339	3335	4
5	RSOV to Upper Leading Edge of Left Door	mm	3339	3334	5
6	RSOV to Lower Leading Edge of Right Door	mm	3337	3336	1
7	RSOV to Lower Leading Edge of Left Door	mm	3337	3334	3
8	RSOV to Upper Trailing Edge of Right Door	mm	2182	2176	6
9	RSOV to Upper Trailing Edge of Left Door	mm	2182	2175	7
10	RSOV to Lower Trailing Edge of Right Door	mm	2181	2180	1
11	RSOV to Lower Trailing Edge of Left Door	mm	2181	2178	3
12	RSOV to Bottom of "A" Post of Right Side	mm	3340	3338	2
13	RSOV to Bottom of "A" Post of Left Side	mm	3340	3340	0
14	RSOV to Firewall, Right Side	mm	3775	3676	99
15	RSOV to Firewall, Left Side	mm	3760	3670	90
16	RSOV to Steering Column	mm	2822	2810	12
17	Center of Steering Column to "A" Post	mm	364	390	-26
18	Center of Steering Column to Headliner	mm	435	476	-41
19	RSOV to Right Side of Front Bumper	mm	4662	4341	321
20	RSOV to Left Side of Front Bumper	mm	4662	4335	327
21	Length of Engine Block	mm	534	534	0
RD	RSOV to Right Side of Dash Panel	mm	3064	3065	-1
CD	RSOV to Center of Dash Panel	mm	3045	3045	0
LD	RSOV to Left Side of Dash Panel	mm	3057	3057	0

**DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

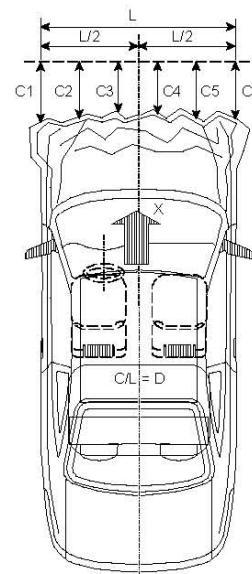
NHTSA No.: MC5202
Test Date: 11/30/2011

VEHICLE INFORMATION

VIN: 1N4AA5AP0CC808948 Wheelbase (mm): 2776
Vehicle Size Category: Sedan Test Weight (kg): 1814.9

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15
Cal. Procedure/Interval: MGA procedure / 6 month
Integration Algorithm: Trapezoidal Linearity: > 99%
Impact Velocity (km/h): 56.3
Velocity Change (km/h): 60.6
Time of Separation (msec): 91.6



CRUSH PROFILE

Collision Deformation Classification: Frontal
Midpoint of Damage: Centerline
Damage Region Length (mm): 1356
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4662	4335	327
C2	Crush zone 2 at left side	mm	4761	4346	415
C3	Crush zone 3 at left side	mm	4805	4383	422
C4	Crush zone 4 at right side	mm	4805	4391	414
C5	Crush zone 5 at right side	mm	4761	4354	407
C6	Crush zone 6 at right side	mm	4662	4341	321
L	C1 TO C6	mm	1356	1353	3

**DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

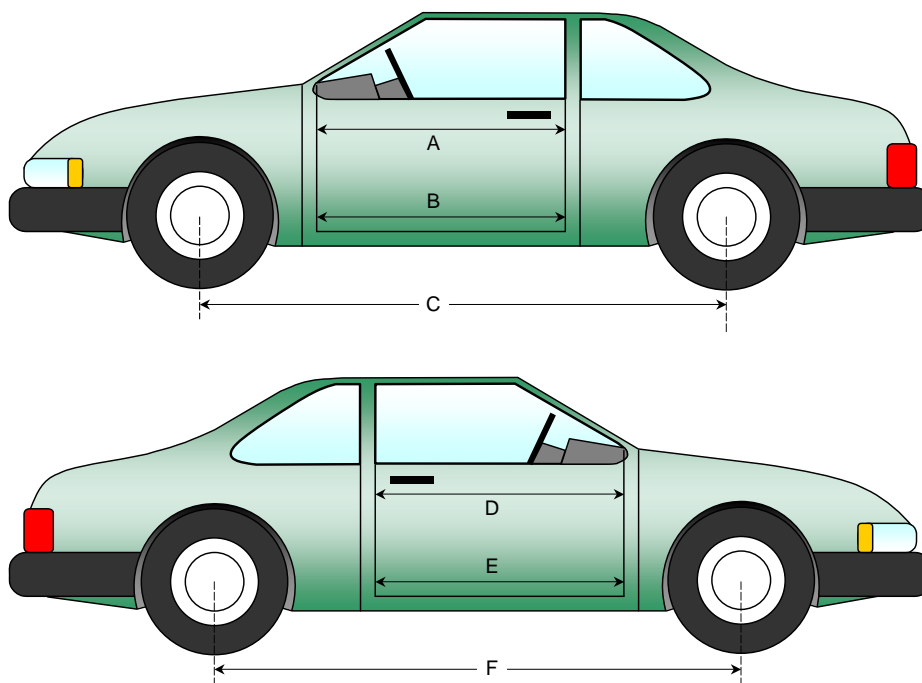
NHTSA No.: MC5202
 Test Date: 11/30/2011

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1065	1065	0
B	Left Side Lower	mm	960	960	0
D	Right Side Upper	mm	1065	1065	0
E	Right Side Lower	mm	960	960	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2776	2775	1
F	Right Side Wheelbase	mm	2776	2697	79



**DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS**

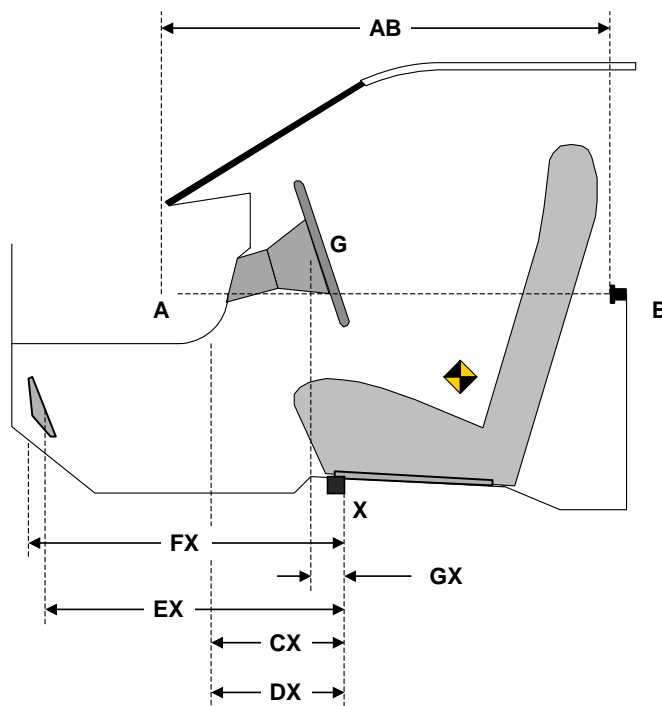
Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	805	805	0
CX	Left Knee Bolster to X	mm	257	244	13
DX	Right Knee Bolster to X	mm	272	220	52
EX	Brake Pedal to X	mm	570	530	40
FX	Foot Rest to X	mm	620	608	12
GX	Center of Steering Column Wheel Hub to X	mm	41	47	-6

X = Front of Seat Track (stationary)

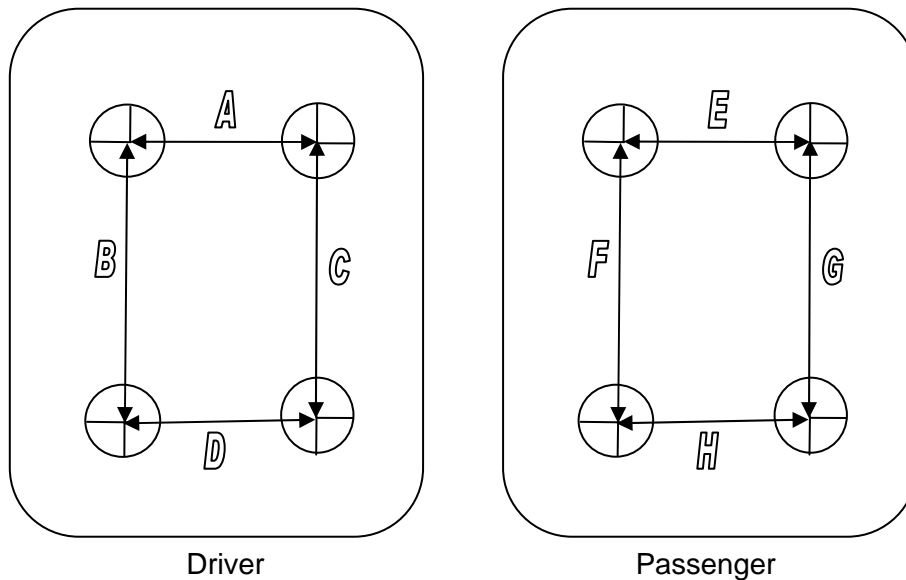


DRIVER COMPARTMENT

**DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011



TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	335	335	0
B	mm	335	335	0
C	mm	335	335	0
D	mm	335	335	0
E	mm	335	335	0
F	mm	335	335	0
G	mm	335	335	0
H	mm	335	335	0

DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011

Windshield Mounting Details:

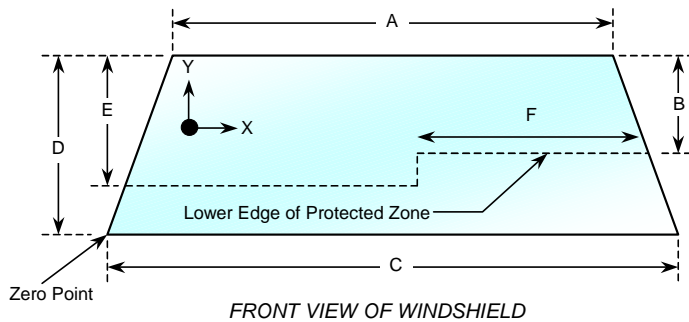
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.7°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2221	2221	100
Right Side	2221	2221	100
Total	4442	4442	100



Item	Units	Value
A	mm	1198
B	mm	492
C	mm	1500
D	mm	872
E	mm	566
F	mm	430

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. 15 (CONTINUED)
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
Test Date: 11/30/2011

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Time: 10:23 am

Temperature: 21.7° C

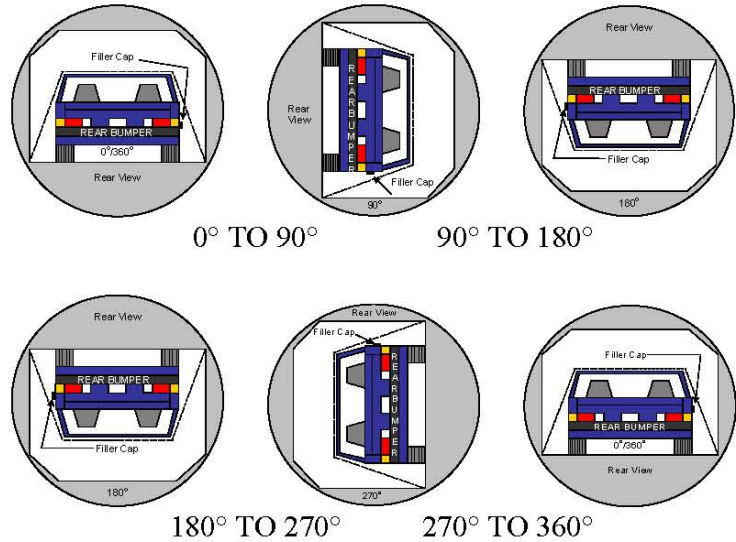
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: None
(Maximum allowable = 5 ounces)
- C. For the following 25 minutes: None
(Maximum allowable = 1 oz./minute)
- D. Spillage Details: None

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011

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: **None**



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	116	300	416
90° to 180°	111	300	411
180° to 270°	104	300	404
270° to 360°	112	300	412

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

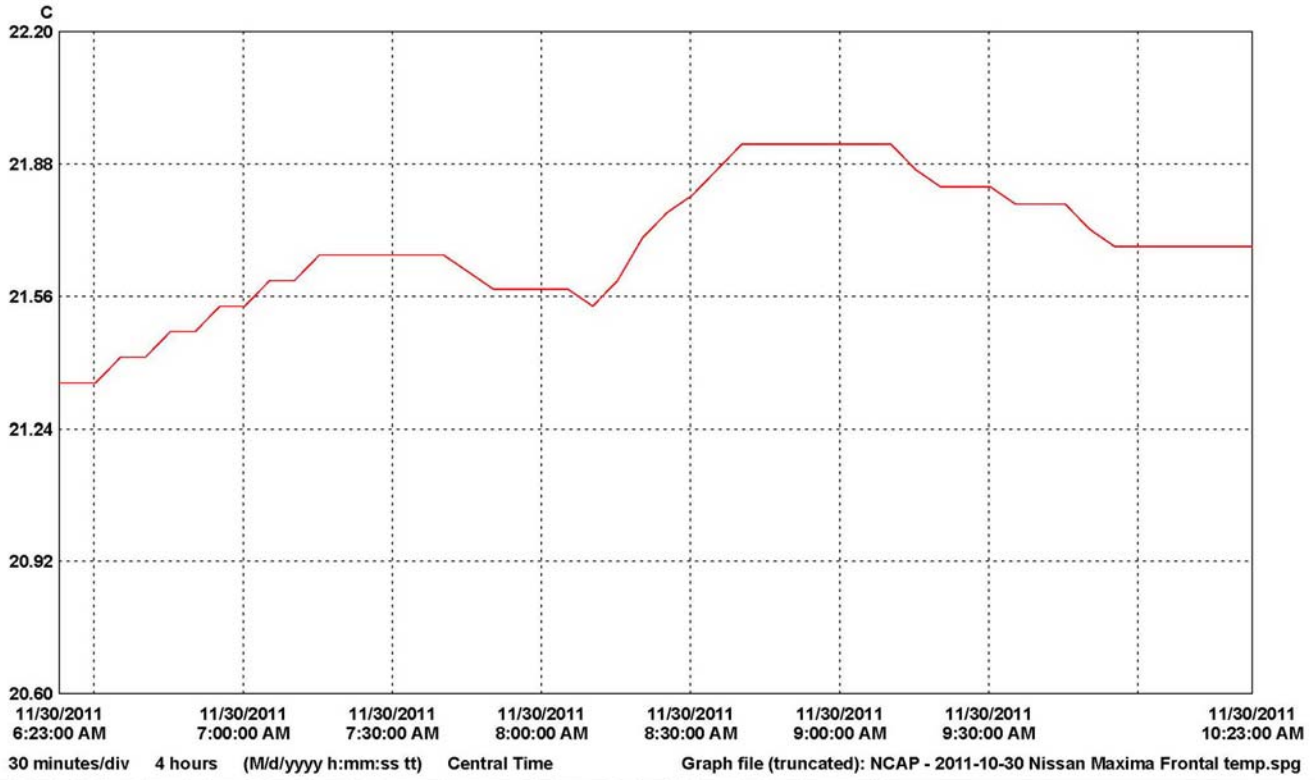
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

**DATA SHEET NO. 17
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA**

Test Vehicle: 2012 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5202
 Test Date: 11/30/2011



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	04042132	MGA logger 1			21.93	21.69	21.35	C	Temperature	04042132_MGA_logger.spl

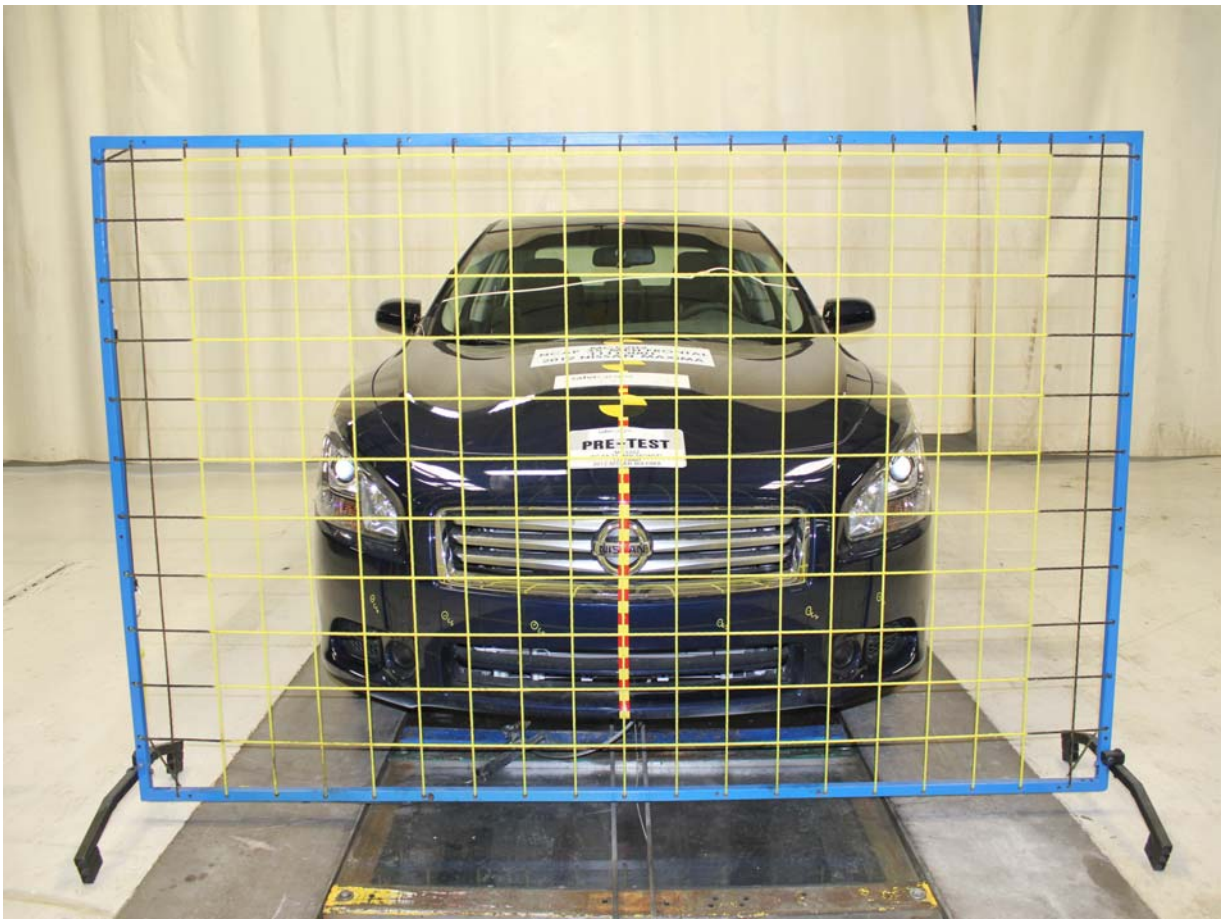
APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

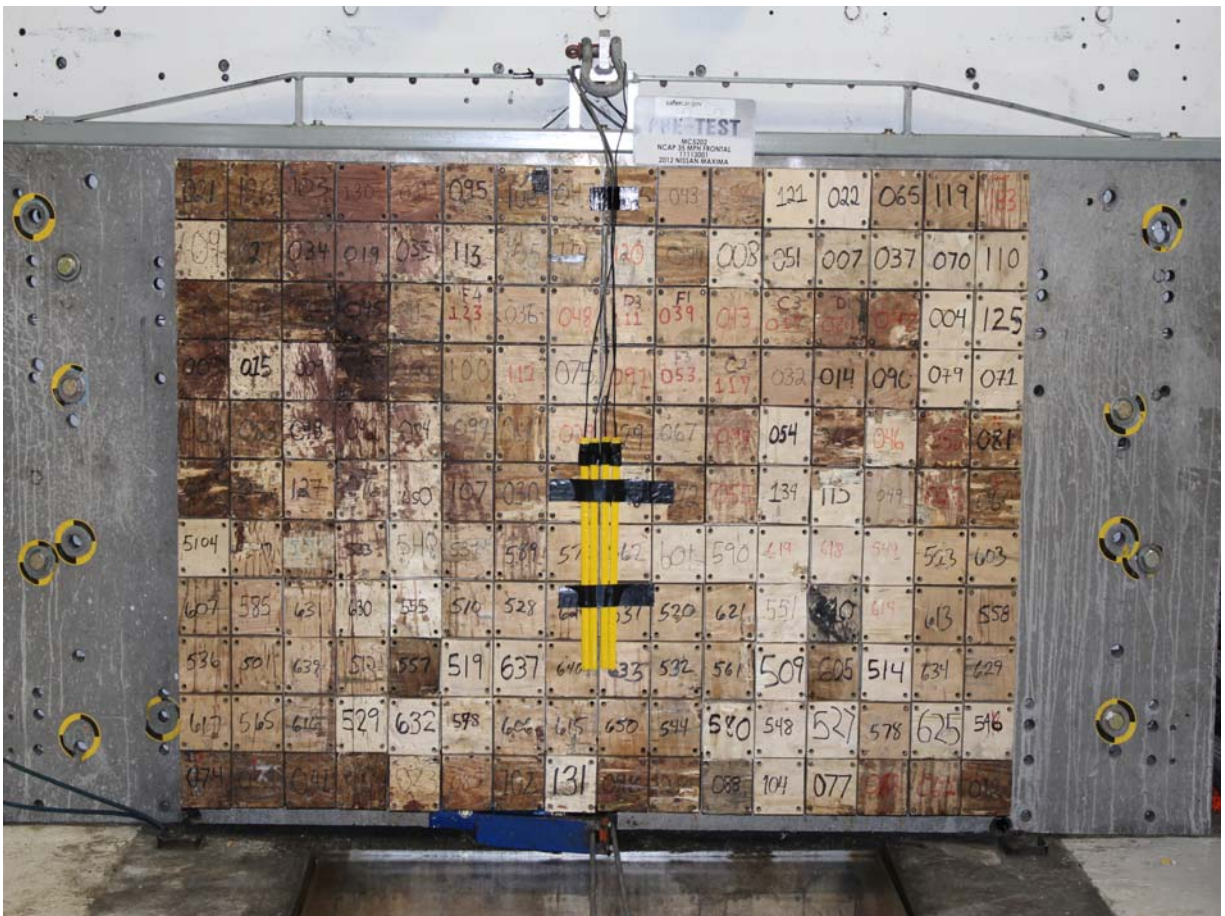
		<u>Page No.</u>
Photo No. 1.	Load Cell Location	A-1
Photo No. 2.	Load Cell Wall	A-1
Photo No. 3.	Manufacturer's Label	A-2
Photo No. 4.	Tire Placard	A-2
Photo No. 5.	2012 Nissan Maxima Frontal As Delivered	A-3
Photo No. 6.	Left Rear Three-Quarter View, As Received	A-3
Photo No. 7.	Pre-Test Front View of Test Vehicle	A-4
Photo No. 8.	Post-Test Front View of Test Vehicle	A-4
Photo No. 9.	Pre-Test Left View of Test Vehicle	A-5
Photo No. 10.	Post-Test Left View of Test Vehicle	A-5
Photo No. 11.	Pre-Test Right View of Test Vehicle	A-6
Photo No. 12.	Post-Test Right View of Test Vehicle	A-6
Photo No. 13.	Pre-Test Right Front Three-Quarter View	A-7
Photo No. 14.	Post-Test Right Front Three-Quarter View	A-7
Photo No. 15.	Pre-Test Left Rear Three-Quarter View	A-8
Photo No. 16.	Post-Test Left Rear Three-Quarter View	A-8
Photo No. 17.	Pre-Test Windshield View	A-9
Photo No. 18.	Post-Test Windshield View	A-9
Photo No. 19.	Pre-Test Engine Compartment View	A-10
Photo No. 20.	Post-Test Engine Compartment View	A-10
Photo No. 21.	Pre-Test Fuel Filler Cap View	A-11
Photo No. 22.	Post-Test Fuel Filler Cap View	A-11
Photo No. 23.	Pre-Test Front Underbody View	A-12
Photo No. 24.	Post-Test Front Underbody View	A-12
Photo No. 25.	Pre-Test Mid Front Underbody View	A-13
Photo No. 26.	Post-Test Mid Front Underbody View	A-13
Photo No. 27.	Pre-Test Mid Rear Underbody View	A-14

		<u>Page No.</u>
Photo No. 28.	Post-Test Mid Rear Underbody View	A-14
Photo No. 29.	Pre-Test Rear Underbody View	A-15
Photo No. 30.	Post-Test Rear Underbody View	A-15
Photo No. 31.	Pre-Test Dummy Cable Routing	A-16
Photo No. 32.	Post-Test Dummy Cable Routing	A-16
Photo No. 33.	Pre-Test Driver Dummy Front View	A-17
Photo No. 34.	Post-Test Driver Dummy Front View	A-17
Photo No. 35.	Pre-Test Driver Dummy Window View	A-18
Photo No. 36.	Post-Test Driver Dummy Window View	A-18
Photo No. 37.	Pre-Test Driver Dummy and Vehicle Interior (Door Open)	A-19
Photo No. 38.	Post-Test Driver Dummy and Vehicle Interior (Door Open)	A-19
Photo No. 39.	Pre-Test Driver's Seat Fore-Aft Markings	A-20
Photo No. 40.	Post-Test Driver's Seat Fore-Aft Markings	A-20
Photo No. 41.	Pre-Test Driver Dummy Feet	A-21
Photo No. 42.	Post-Test Driver Dummy Feet	A-21
Photo No. 43.	Pre-Test Driver's Side Knee Bolster (without dummy)	A-22
Photo No. 44.	Post-Test Driver's Side Knee Bolster (without dummy)	A-22
Photo No. 45.	Post-Test Driver's Side Knee Bolster (without dummy)	A-23
Photo No. 46.	Pre-Test Driver's Side Floorpan	A-23
Photo No. 47.	Post-Test Driver's Side Floorpan	A-24
Photo No. 48.	Post-Test Driver Dummy Face	A-24
Photo No. 49.	Post-Test Driver Dummy Contact with Airbag	A-25
Photo No. 50.	Post-Test Driver Dummy Contact with Headrest	A-25
Photo No. 51.	Pre-Test View of the Steering Wheel	A-26
Photo No. 52.	Post-Test View of the Steering Wheel	A-26
Photo No. 53.	Pre-Test Passenger Dummy Front View	A-27
Photo No. 54.	Post-Test Passenger Dummy Front View	A-27
Photo No. 55.	Pre-Test Passenger Dummy Window View	A-28

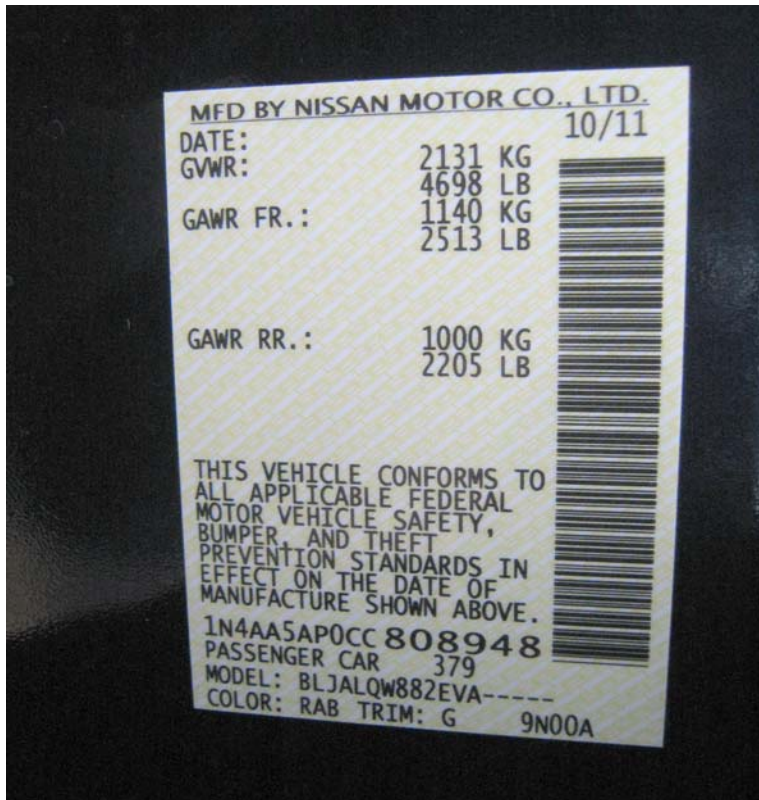
		<u>Page No.</u>
Photo No. 56.	Post-Test Passenger Dummy Window View	A-28
Photo No. 57.	Pre-Test Passenger Dummy and Vehicle Interior (Door Open)	A-29
Photo No. 58.	Post-Test Passenger Dummy and Vehicle Interior (Door Open)	A-29
Photo No. 59.	Pre-Test Passenger's Seat Fore-Aft Markings	A-30
Photo No. 60.	Post-Test Passenger's Seat Fore-Aft Markings	A-30
Photo No. 61.	Pre-Test Passenger Dummy Feet	A-31
Photo No. 62.	Post-Test Passenger Dummy Feet	A-31
Photo No. 63.	Pre-Test Passenger's Side Knee Bolster (without dummy)	A-32
Photo No. 64.	Post-Test Passenger's Side Knee Bolster (without dummy)	A-32
Photo No. 65.	Post-Test Passenger's Side Knee Bolster (without dummy)	A-33
Photo No. 66.	Pre-Test Passenger's Side Floorpan	A-33
Photo No. 67.	Post-Test Passenger's Side Floorpan	A-34
Photo No. 68.	Post-Test Passenger Dummy Contact with Airbag	A-34
Photo No. 69.	Post-Test Passenger Dummy Contact with Headrest	A-35
Photo No. 70.	Ballast Installed in Vehicle	A-35
Photo No. 71.	Post-Test Stoddard Solvent Spillage Location View	A-36
Photo No. 72.	Post-Test Speed Trap Read-Out	A-36
Photo No. 73.	Vehicle at 0 Degrees on Static Rollover Device	A-37
Photo No. 74.	Vehicle at 90 Degrees on Static Rollover Device	A-37
Photo No. 75.	Vehicle at 180 Degrees on Static Rollover Device	A-38
Photo No. 76.	Vehicle at 270 Degrees on Static Rollover Device	A-38
Photo No. 77.	Vehicle at 360 Degrees on Static Rollover Device	A-39
Photo No. 78.	2012 Nissan Maxima Frontal Impact Event	A-39
Photo No. 79.	Monroney Label	A-40



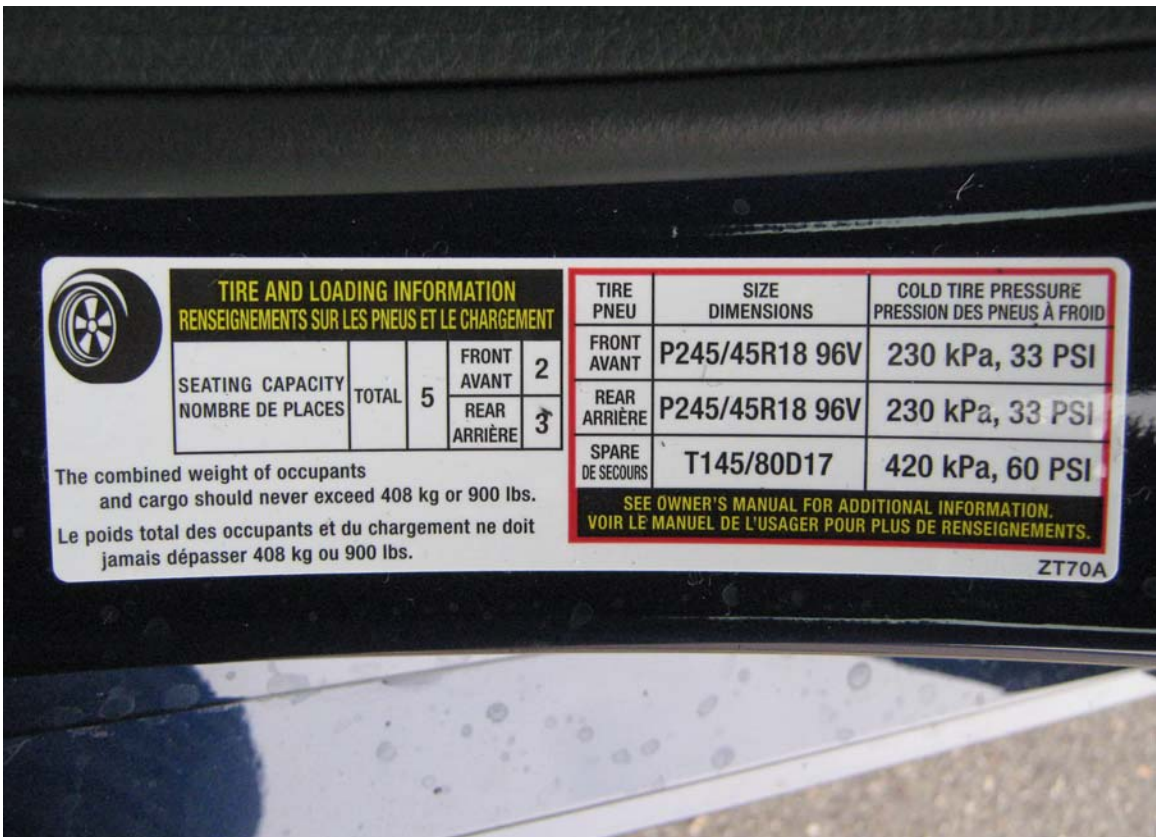
Load Cell Location



Load Cell Wall



Manufacturer's Label



Tire Placard



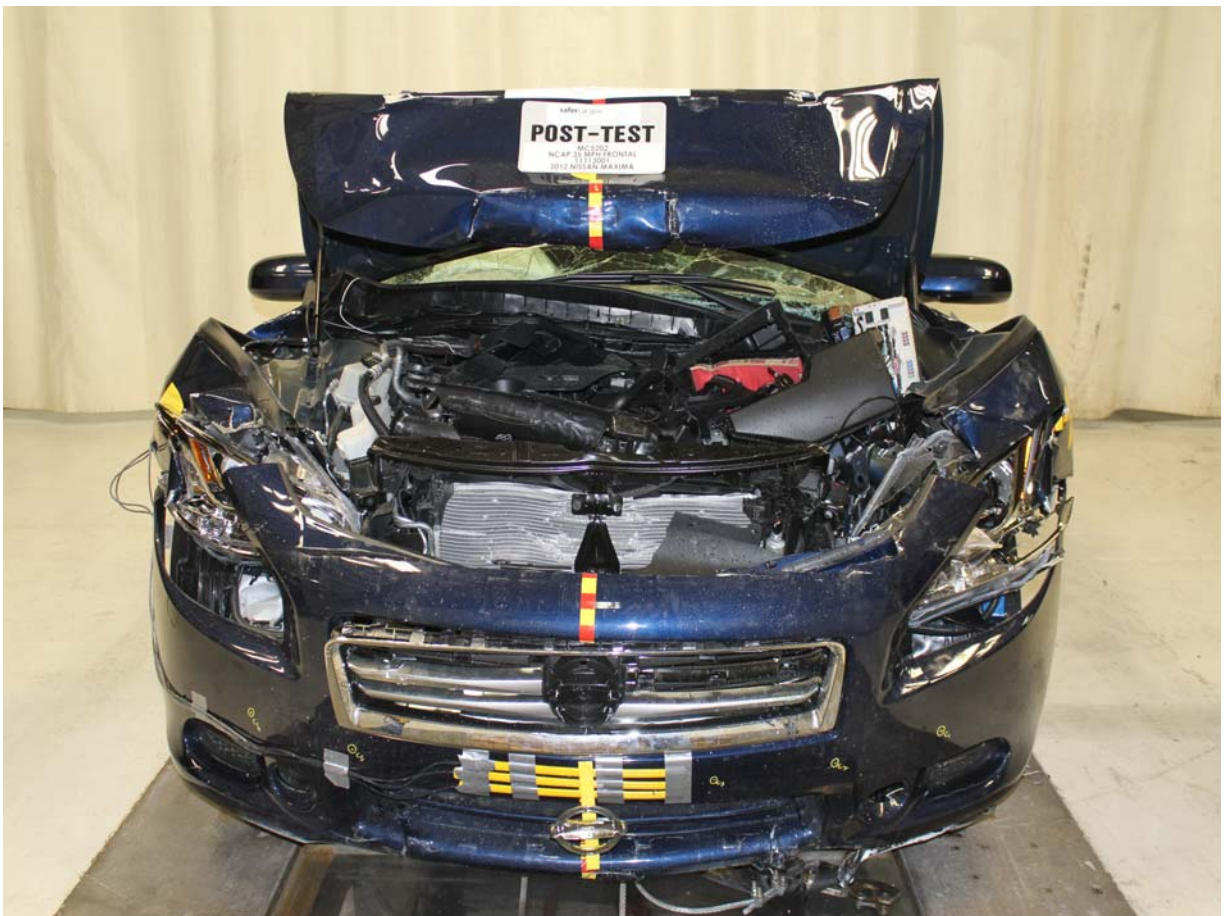
2012 Nissan Maxima Frontal As Delivered



Left Rear Three-Quarter View, As Received



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle



Pre-Test Left View of Test Vehicle



Post-Test Left View of Test Vehicle



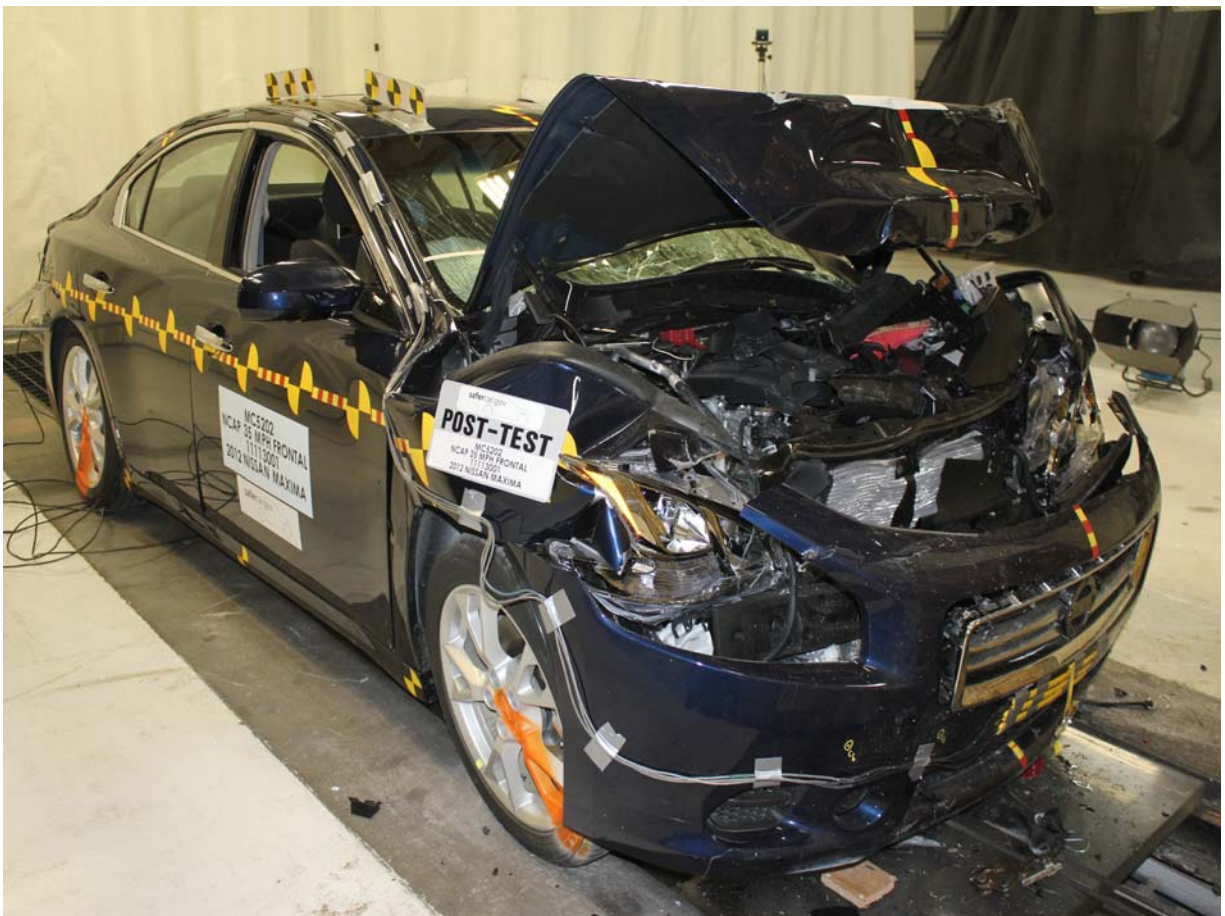
Pre-Test Right View of Test Vehicle



Post-Test Right View of Test Vehicle



Pre-Test Right Front Three-Quarter View



Post-Test Right Front Three-Quarter View



Pre-Test Left Rear Three-Quarter View



Post-Test Left Rear Three-Quarter View



Pre-Test Windshield View



Post-Test Windshield View



Pre-Test Engine Compartment View



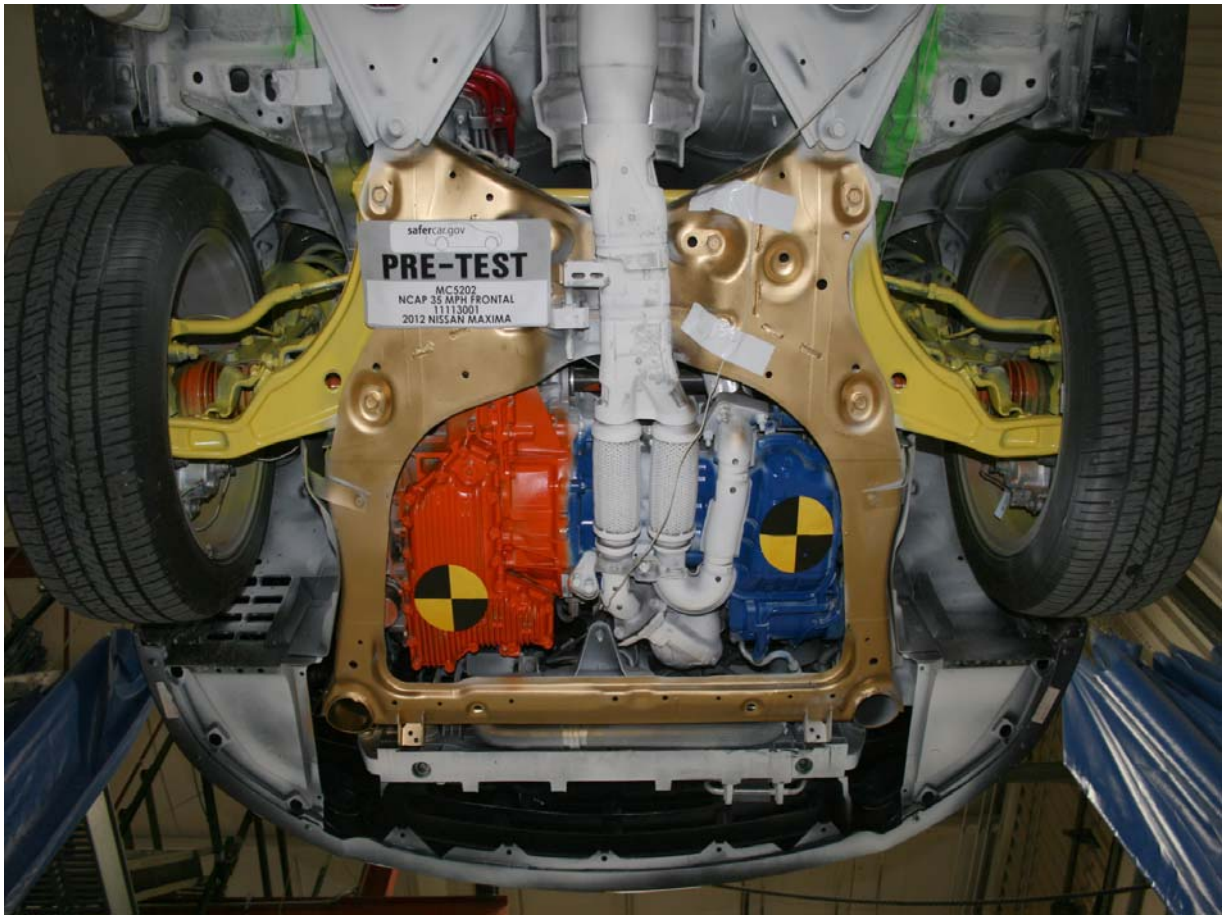
Post-Test Engine Compartment View



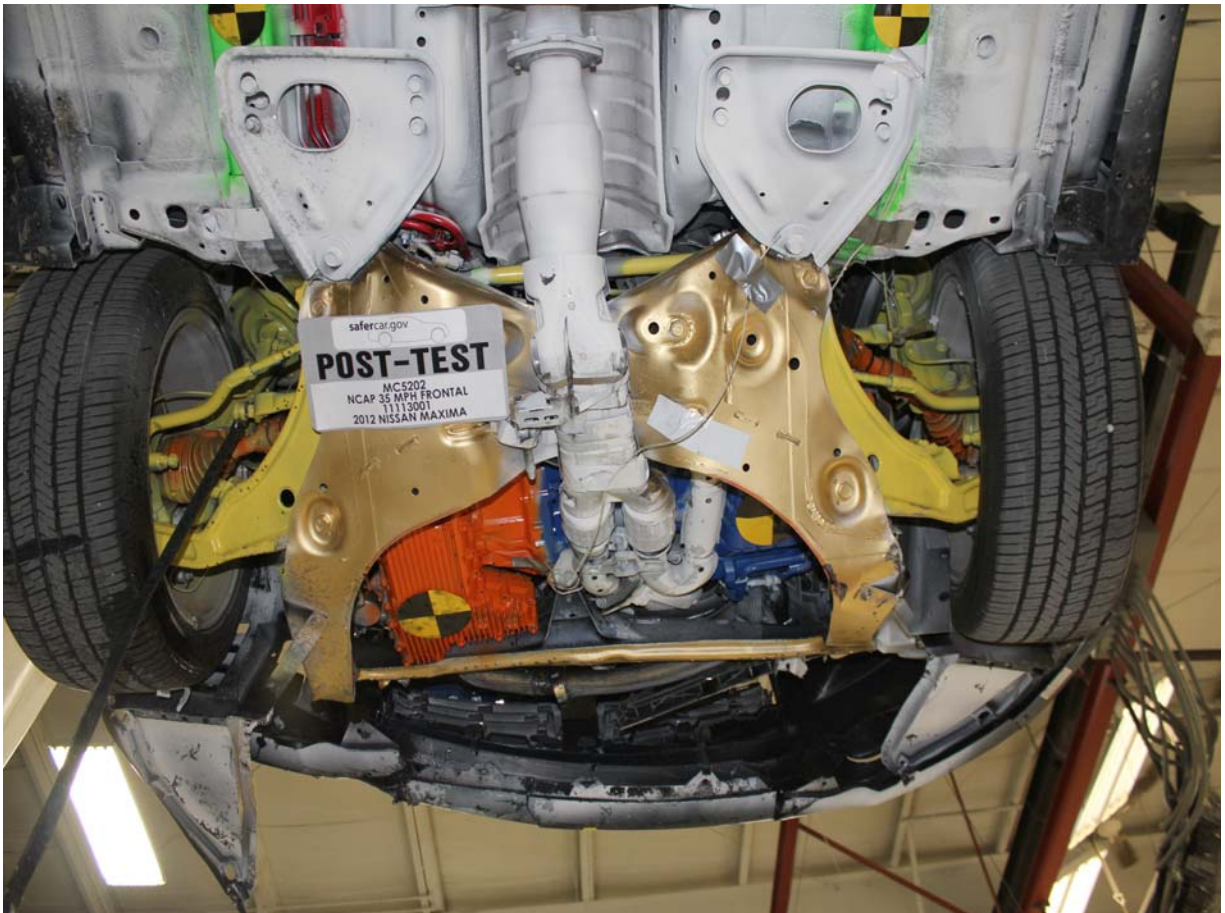
Pre-Test Fuel Filler Cap View



Post-Test Fuel Filler Cap View



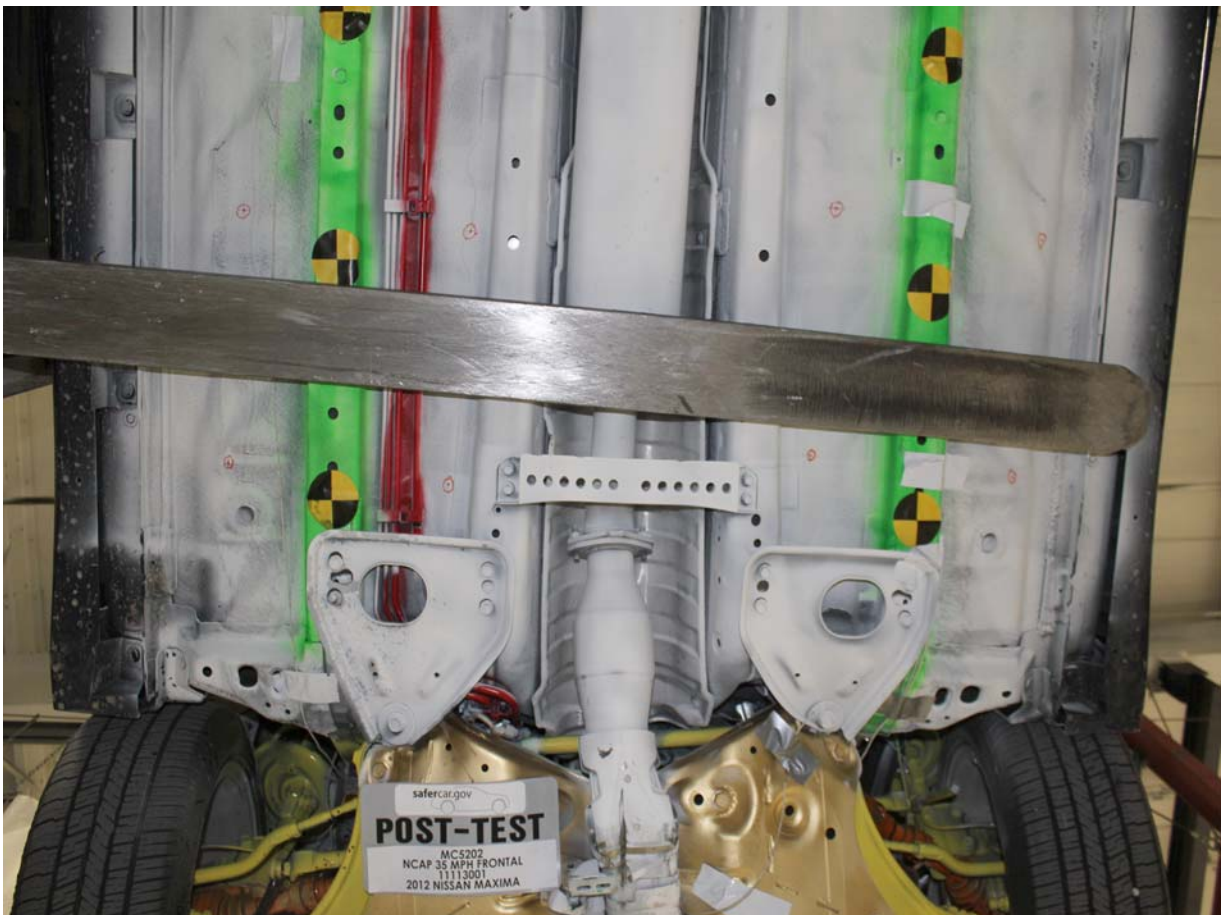
Pre-Test Front Underbody View



Post-Test Front Underbody View



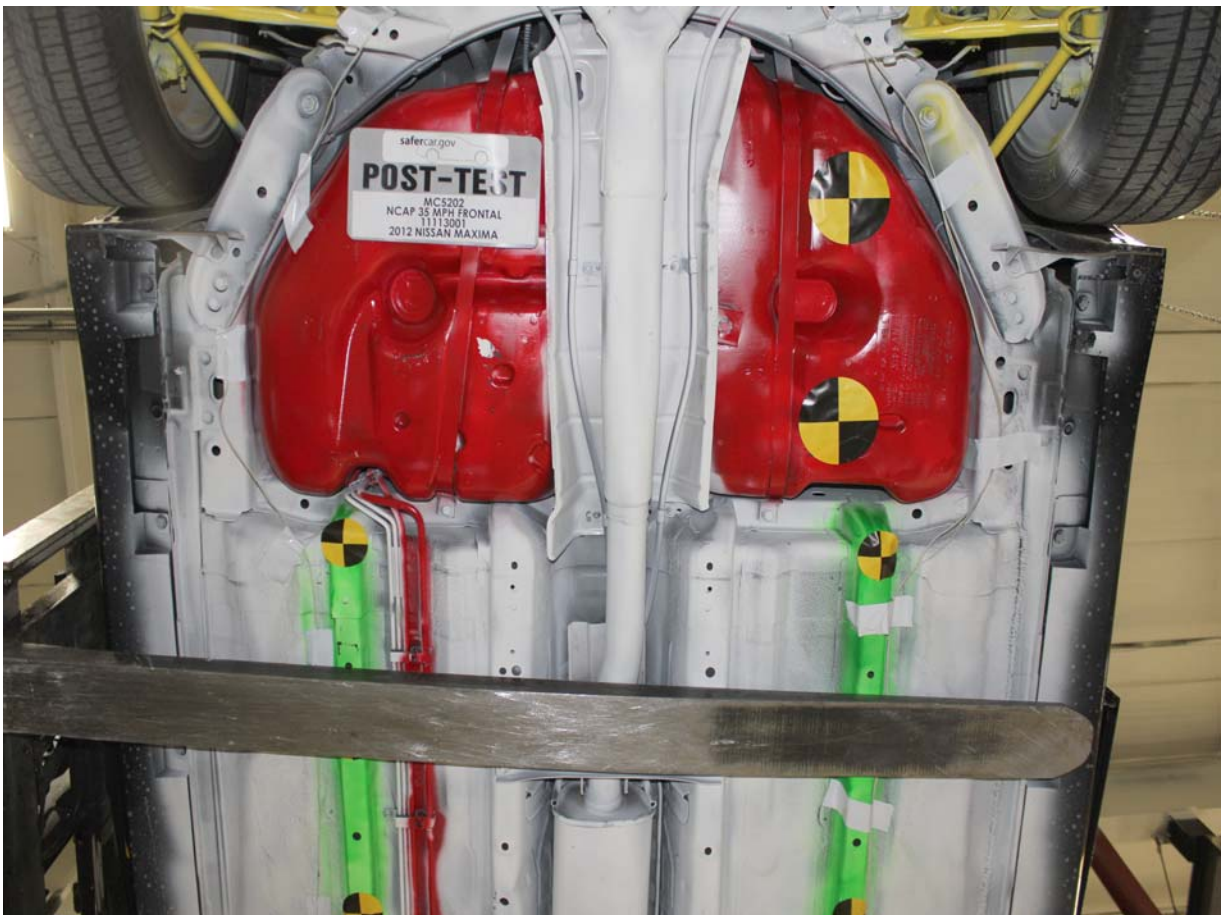
Pre-Test Mid Front Underbody View



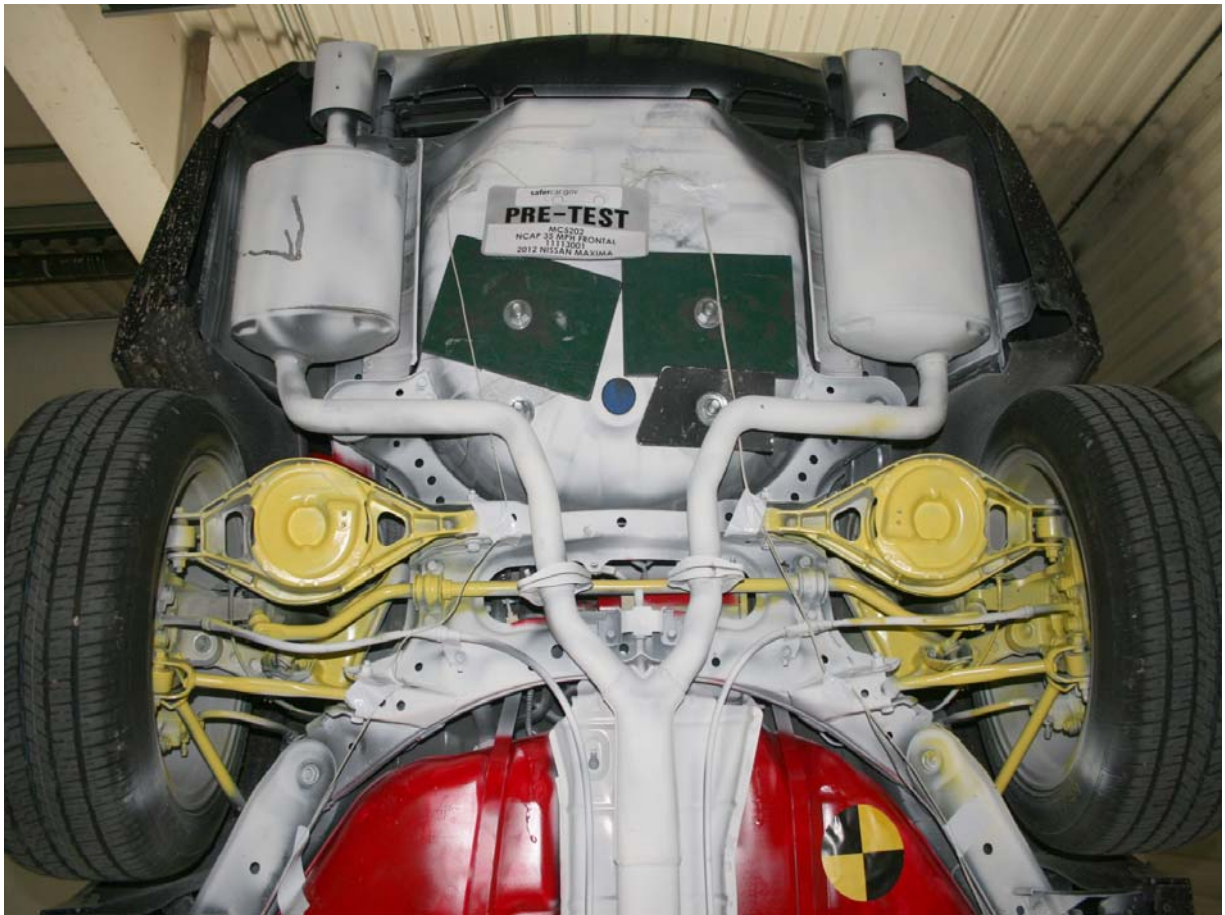
Post-Test Mid Front Underbody View



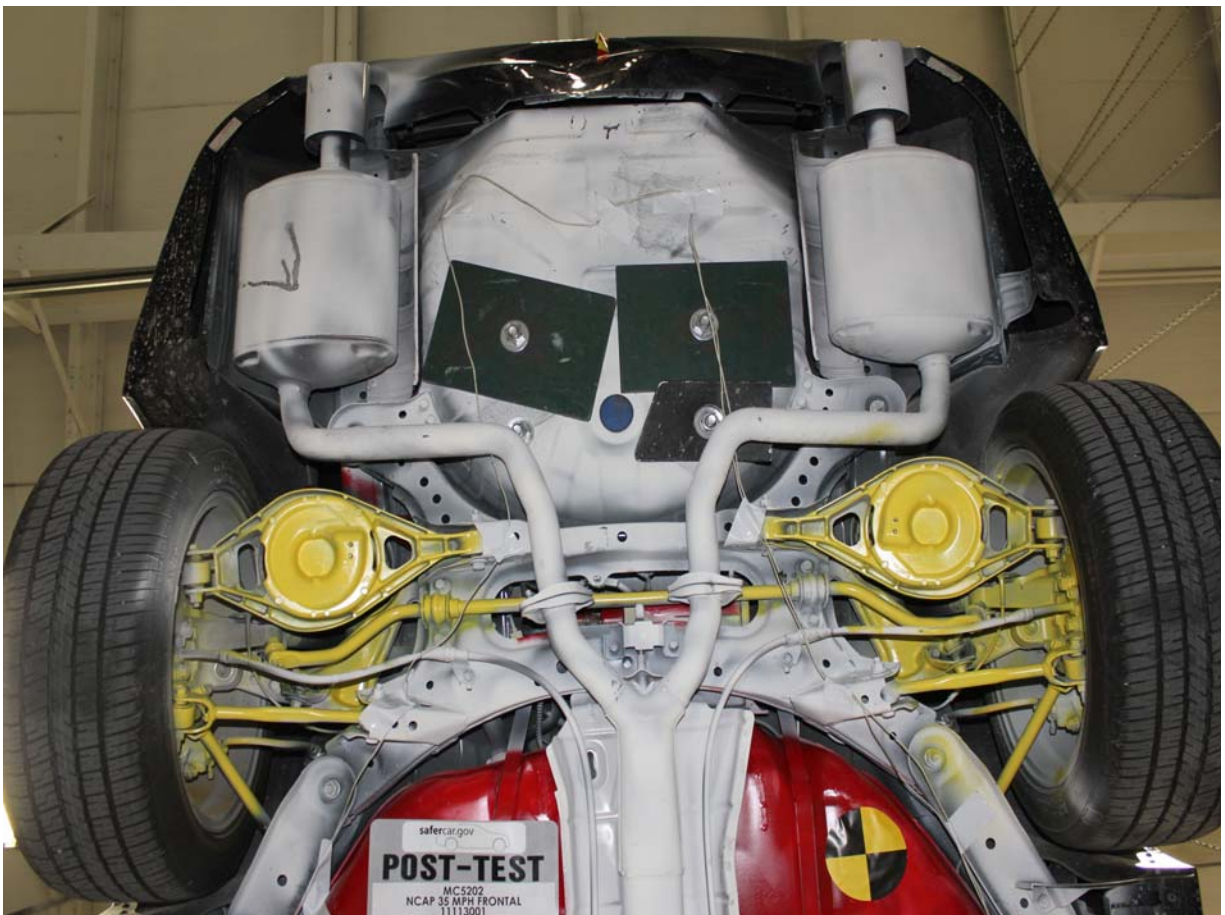
Pre-Test Mid Rear Underbody View



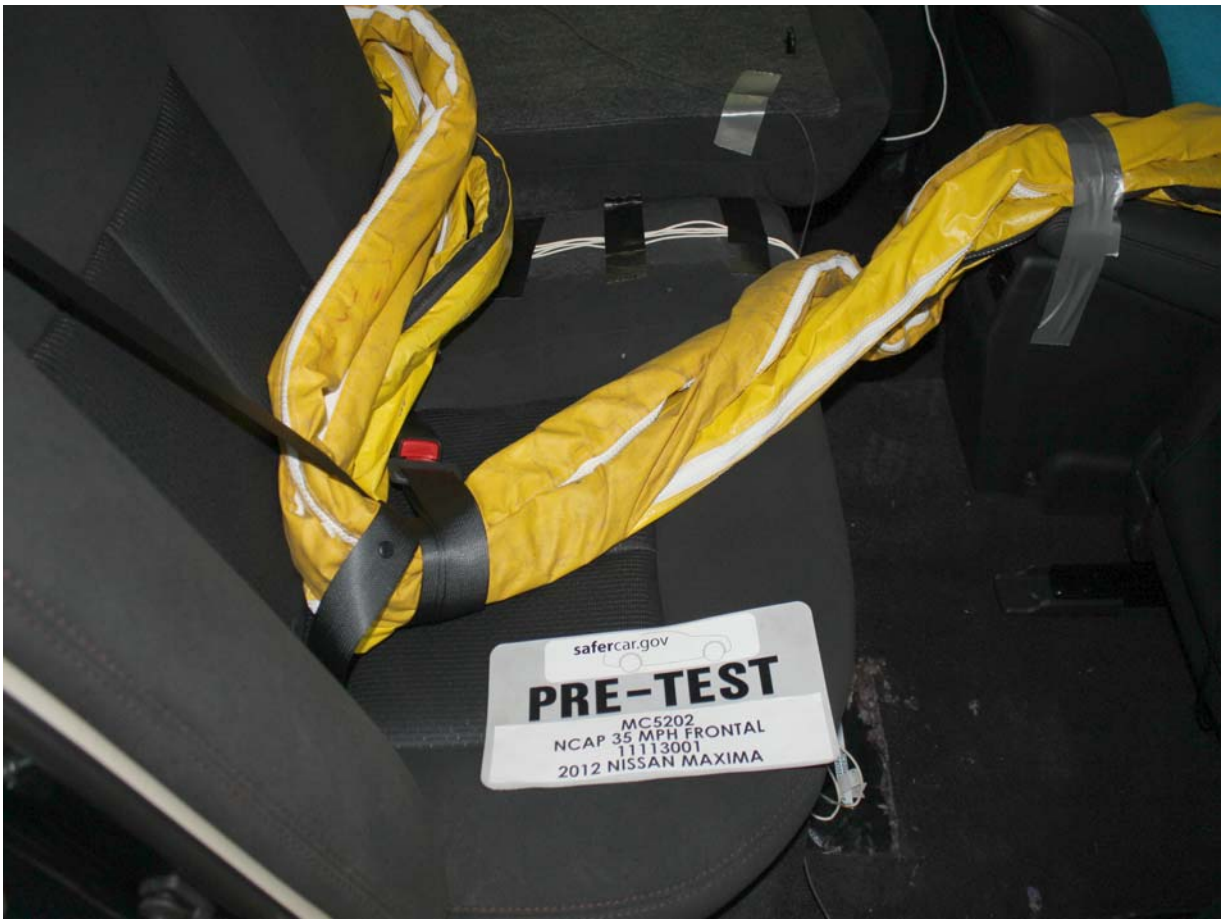
Post-Test Mid Rear Underbody View



Pre-Test Rear Underbody View



Post-Test Rear Underbody View



Pre-Test Dummy Cable Routing



Post-Test Dummy Cable Routing



Pre-Test Driver Dummy Front View



Post-Test Driver Dummy Front View



Pre-Test Driver Dummy Window View



Post-Test Driver Dummy Window View



Pre-Test Driver Dummy and Vehicle Interior (Door Open)



Post-Test Driver Dummy and Vehicle Interior (Door Open)



Pre-Test Driver's Seat Fore-Aft Markings



Post-Test Driver's Seat Fore-Aft Markings



Pre-Test Driver Dummy Feet



Post-Test Driver Dummy Feet



Pre-Test Driver's Side Knee Bolster (without dummy)



Post-Test Driver's Side Knee Bolster (without dummy)



Post-Test Driver's Side Knee Bolster (without dummy)



Pre-Test Driver's Side Floorpan



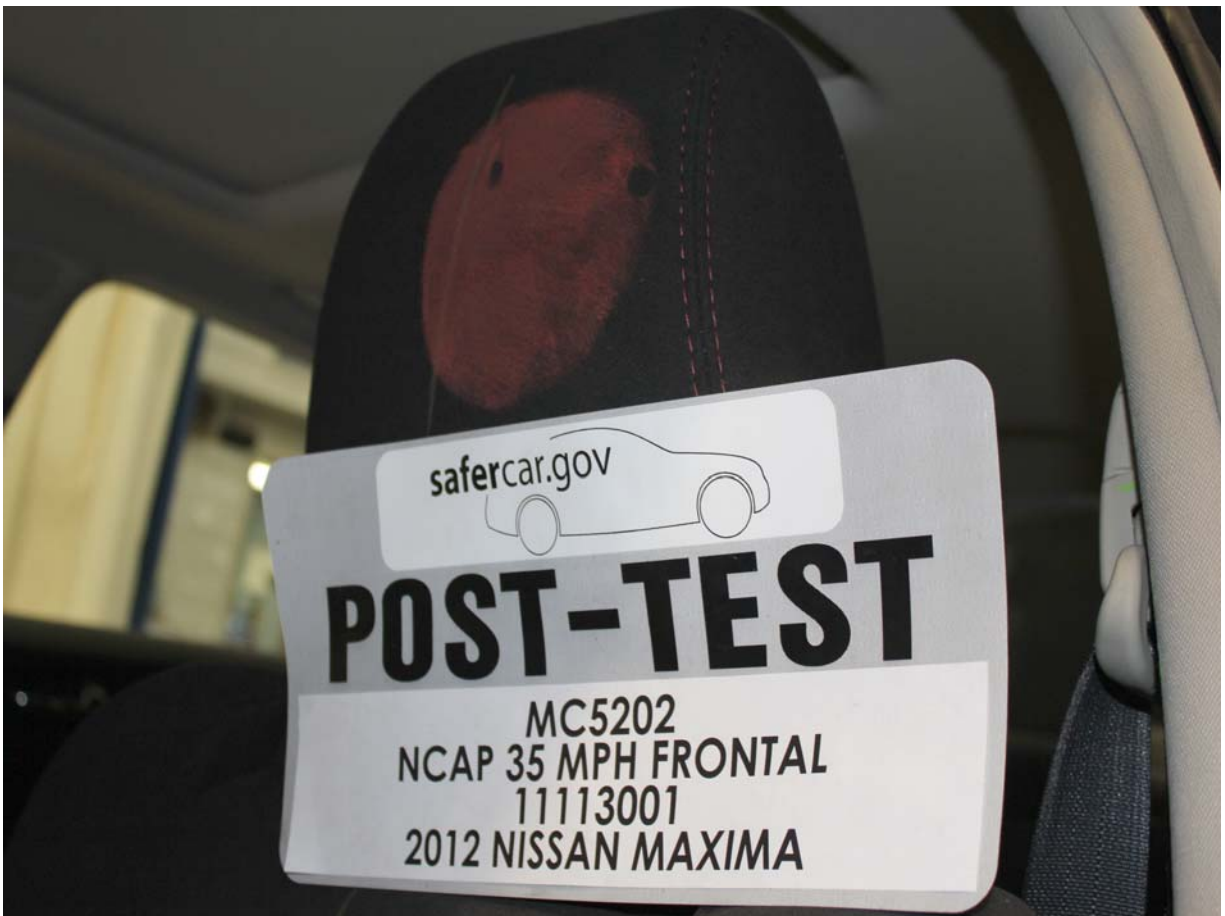
Post-Test Driver's Side Floorpan



Post-Test Driver Dummy Face



Post-Test Driver Dummy Contact with Airbag



Post-Test Driver Dummy Contact with Headrest



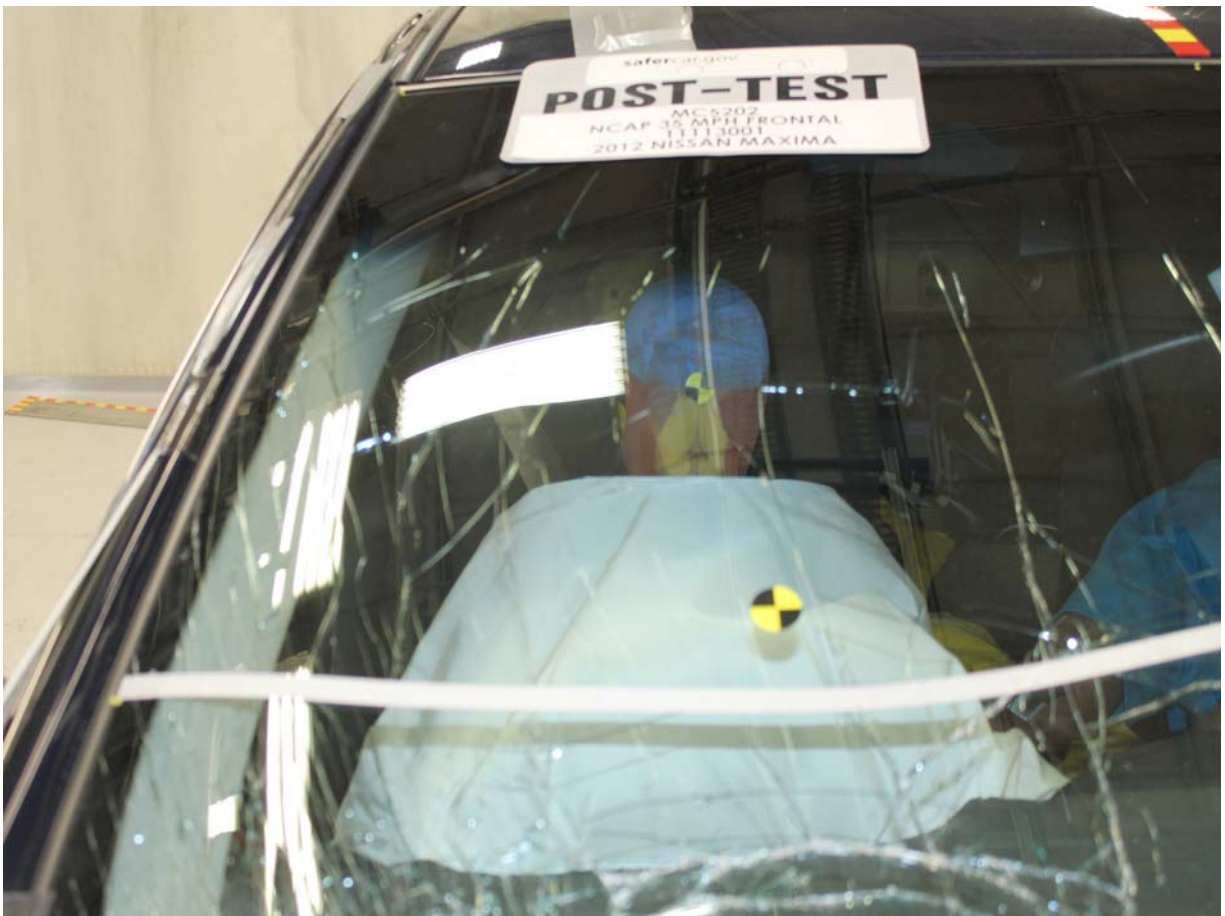
Pre-Test View of the Steering Wheel



Post-Test View of the Steering Wheel



Pre-Test Passenger Dummy Front View



Post-Test Passenger Dummy Front View



Pre-Test Passenger Dummy Window View



Post-Test Passenger Dummy Window View



Pre-Test Passenger Dummy and Vehicle Interior (Door Open)



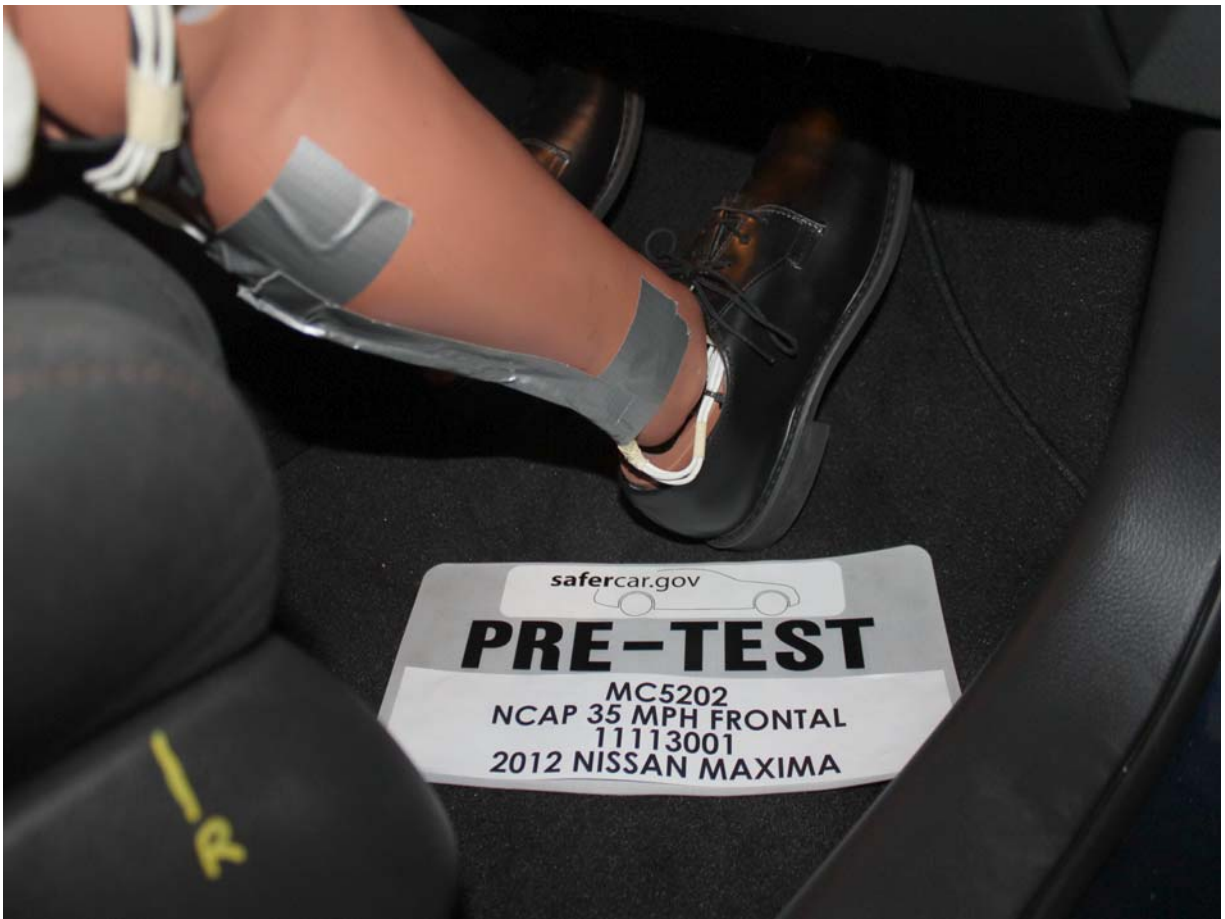
Post-Test Passenger Dummy and Vehicle Interior (Door Open)



Pre-Test Passenger's Seat Fore-Aft Markings



Post-Test Passenger's Seat Fore-Aft Markings



Pre-Test Passenger Dummy Feet



Post-Test Passenger Dummy Feet



Pre-Test Passenger's Side Knee Bolster (without dummy)



Post-Test Passenger's Side Knee Bolster (without dummy)



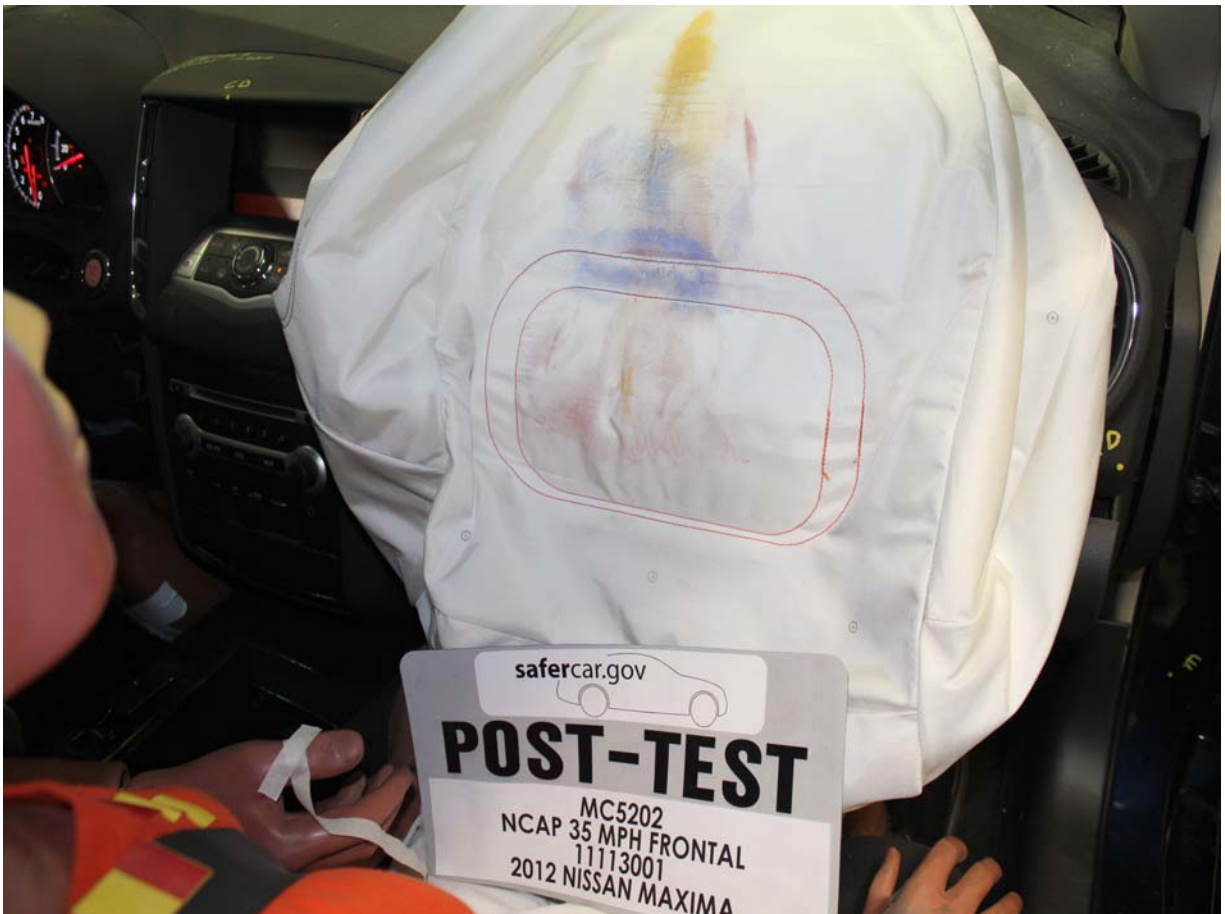
Post-Test Passenger's Side Knee Bolster (without dummy)



Pre-Test Passenger's Side Floorpan



Post-Test Passenger's Side Floorpan



Post-Test Passenger Dummy Contact with Airbag



Post-Test Passenger Dummy Contact with Headrest



Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

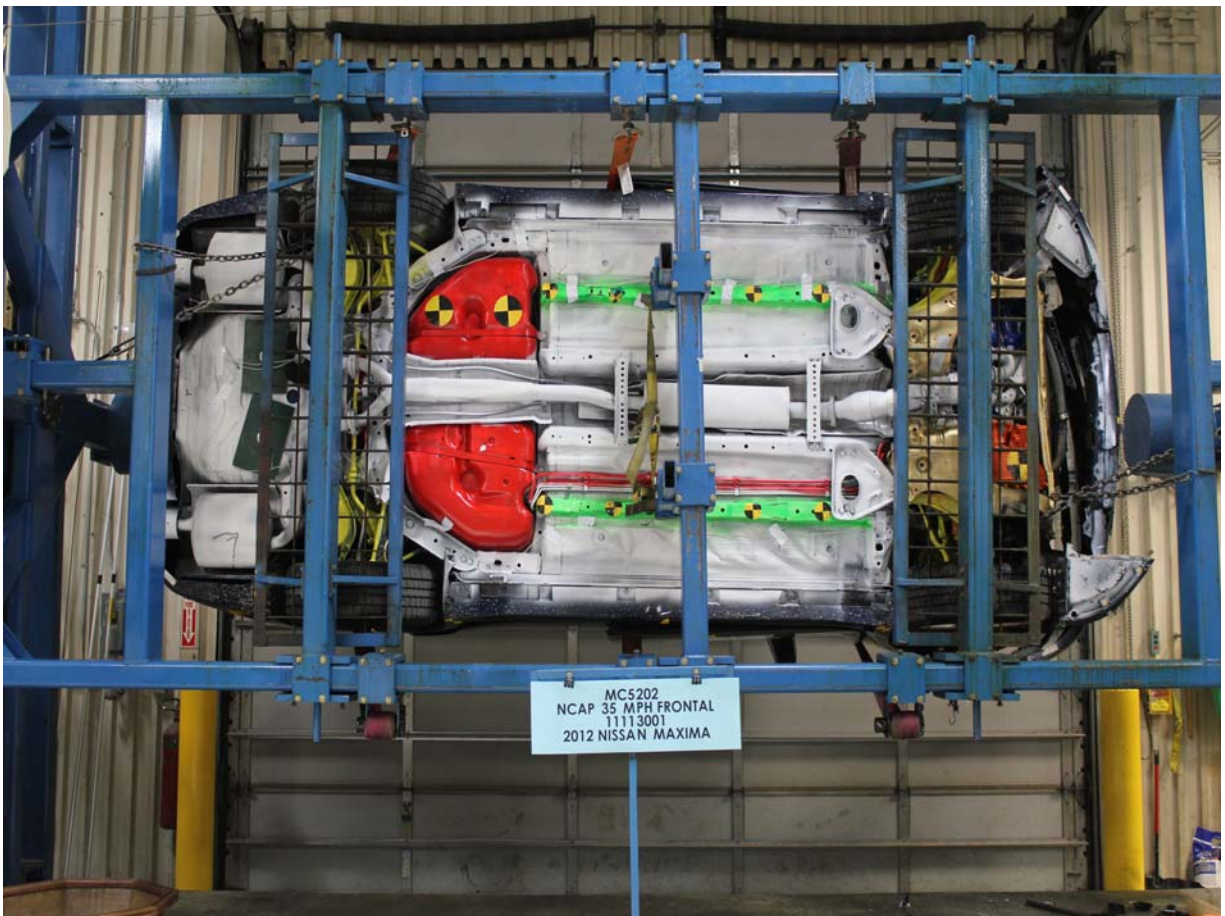
Post-Test Stoddard Solvent Spillage Location View



Post-Test Speed Trap Read-Out



Vehicle at 0 Degrees on Static Rollover Device



Vehicle at 90 Degrees on Static Rollover Device



Vehicle at 180 Degrees on Static Rollover Device



Vehicle at 270 Degrees on Static Rollover Device



Vehicle at 360 Degrees on Static Rollover Device



2012 Nissan Maxima Frontal Impact Event



2012 MAXIMA 3.5 S

THE 4-DOOR SPORTS CAR®

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE

3.5-liter DOHC 24-valve V6 Engine
290 Horsepower & 261 lb-ft Torque
Continuously Variable Transmission (CVT)
18" Alloy Wheels

SAFETY & SECURITY

Nissan Advanced Air Bag System (AABS)
Front Seat-mounted Side-impact Supplemental Air Bags
Rear-mounted Curtain Side-impact Supplemental Air Bags
Anti-lock Braking System (ABS)
Brake Assist (BA)
Electronic Brake-force Distribution (EBD)
Traction Control System (TCS)
Vehicle Dynamic Control (VDC)
Tire Pressure Monitoring System (TPMS)
Lower Anchors and Tethers for Children (LATCH) System
Child Safety Rear Door Locks
Vehicle Security System (VSS)

COMFORT & CONVENIENCE

8-way Power Driver's Seat
Driver's Seat Manual Lumbar Support
4-way Power Front Passenger's Seat
60/40 Split Fold-down Rear Bench Seat
Leather-wrapped Steering Wheel
Leather-wrapped Shift Knob
Manual Tilt/Telescopic Steering Column
Cruise Control
Steering Wheel-mounted Audio Controls
AM/FM/dash 6-CD Changer & MP3/WMA CD
Playback Capability w/8 Speakers
Auxiliary Audio Input Jack
Bluetooth® Hands-free Phone System
Multi-function Trip Computer
Dual Zone Auto Temp Control (ATC)
with Rear A/C Vents
Nissan Intelligent Key™
w/Push Button Ignition
Power Windows w/Driver & Front Passenger
One-touch Auto-up/Down With Auto-reverse
Power Sliding Moonroof
W/Tilt Feature and Manual Sliding Sunshade
Auto-dimming Inside Mirror
Auto On/Off Headlights
Sun Viscors w/Illuminated Vanity
Mirrors & Extensions

EXTERIOR FEATURES

Rear Combination Lamps With LED
Power Outside Mirrors

Manufacturer's Suggested Retail Base Price:	\$31,750.00
Options Included by Manufacturer: FLOOR MATS & TRUNK MAT (5-piece set)	195.00
Destination Charges:	700.00
Total*	\$32,705.00

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

EPA Fuel Economy Estimates

CITY MPG 19
Expected range for most drivers 15 to 23 MPG

Estimated Annual Fuel Cost \$2,696
based on 15,000 miles at \$3.95 per gallon

HIGHWAY MPG 26
Expected range for most drivers 21 to 31 MPG

Your actual mileage will vary depending on how you drive and maintain your vehicle.

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	To Be Rated
		To Be Rated

Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat Rear seat	To Be Rated
		To Be Rated

Star ratings based on the risk of injury in a side impact.

Rollover	★★★★★
-----------------	-------

Star ratings based on the risk of rollover in a single vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).

www.saforcar.gov or 1-888-327-4235

This Vehicle qualifies for Nissan's Security+Plus Vehicle Protection Plan

The only service agreement backed by Nissan! Ask your dealer for details, or call 1-800-NISSAN-1 for more information

DELIVERY

VEHICLE COLORS:
EXT: NAVY BLUE
INT: CHARCOAL

FINAL ASSEMBLY POINT:
SMYRNA

TRANSPORT METHOD:
TRUCK

DEALER:
ROSEN NISSAN OF GURNEE
7000 GRAND AVENUE
GURNEE IL 60031

VIN: 1N4AASAP0C808648
EMS: 50 STATE EMISSIONS
MDL: 16112-808948 RAB-G
OPT: E-C03L92

2011101401253AS5033

Monroney Label

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Page No.

List of Data Plots Provided in the Test Report

Figure No. 1.	Driver Head X Acceleration vs. Time	B-1
Figure No. 2.	Driver Head Y Acceleration vs. Time	B-1
Figure No. 3.	Driver Head Z Acceleration vs. Time	B-1
Figure No. 4.	Driver Head Resultant Acceleration vs. Time	B-1
Figure No. 5.	Driver Chest Displacement vs. Time	B-2
Figure No. 6.	Driver Chest X Acceleration vs. Time	B-3
Figure No. 7.	Driver Chest Y Acceleration vs. Time	B-3
Figure No. 8.	Driver Chest Z Acceleration vs. Time	B-3
Figure No. 9.	Driver Chest Resultant Acceleration vs. Time	B-3
Figure No. 10.	Driver Neck Force X vs. Time	B-4
Figure No. 11.	Driver Neck Force Z vs. Time	B-4
Figure No. 12.	Driver Neck Moment Y vs. Time	B-4
Figure No. 13.	Driver Nij (NTF) vs. Time	B-5
Figure No. 14.	Driver Nij (NTE) vs. Time	B-5
Figure No. 15.	Driver Nij (NCF) vs. Time	B-5
Figure No. 16.	Driver Nij (NCE) vs. Time	B-5
Figure No. 17.	Driver Left Femur Force vs. Time	B-6
Figure No. 18.	Driver Right Femur Force vs. Time	B-6
Figure No. 19.	Passenger Head X Acceleration vs. Time	B-7
Figure No. 20.	Passenger Head Y Acceleration vs. Time	B-7
Figure No. 21.	Passenger Head Z Acceleration vs. Time	B-7
Figure No. 22.	Passenger Head Resultant Acceleration vs. Time	B-7
Figure No. 23.	Passenger Chest Displacement vs. Time	B-8
Figure No. 24.	Passenger Chest X Acceleration vs. Time	B-9
Figure No. 25.	Passenger Chest Y Acceleration vs. Time	B-9
Figure No. 26.	Passenger Chest Z Acceleration vs. Time	B-9
Figure No. 27.	Passenger Chest Resultant Z Acceleration vs. Time	B-9

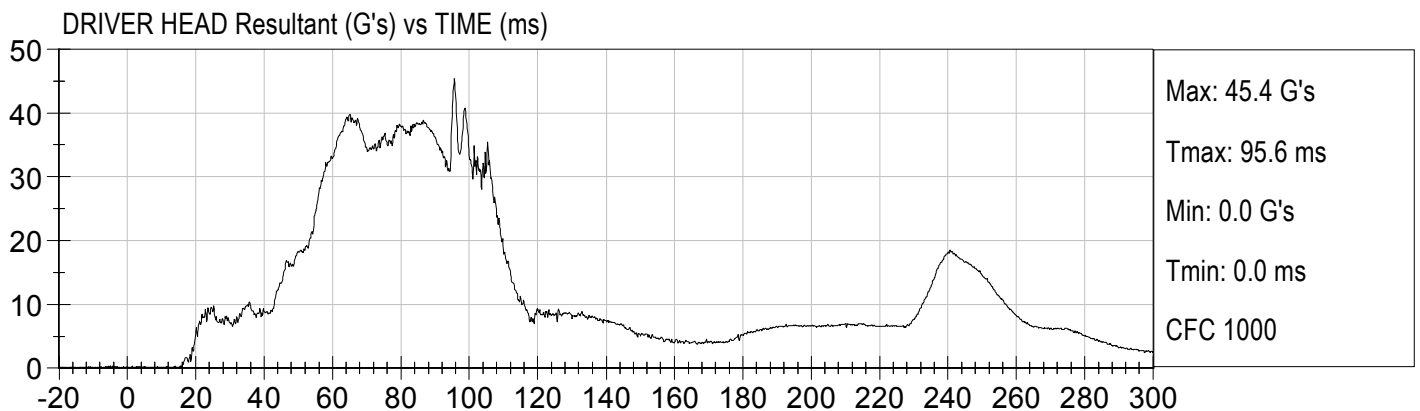
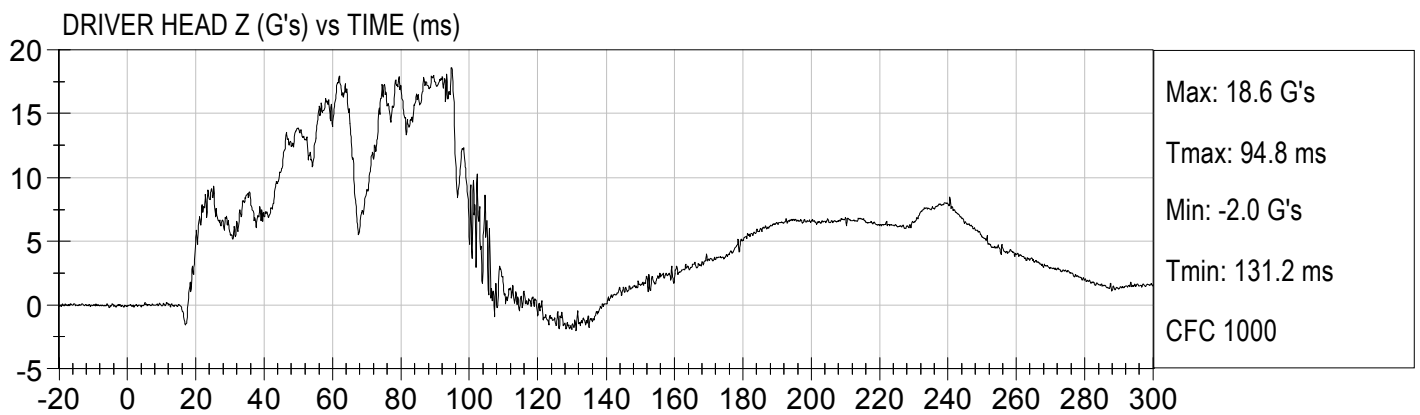
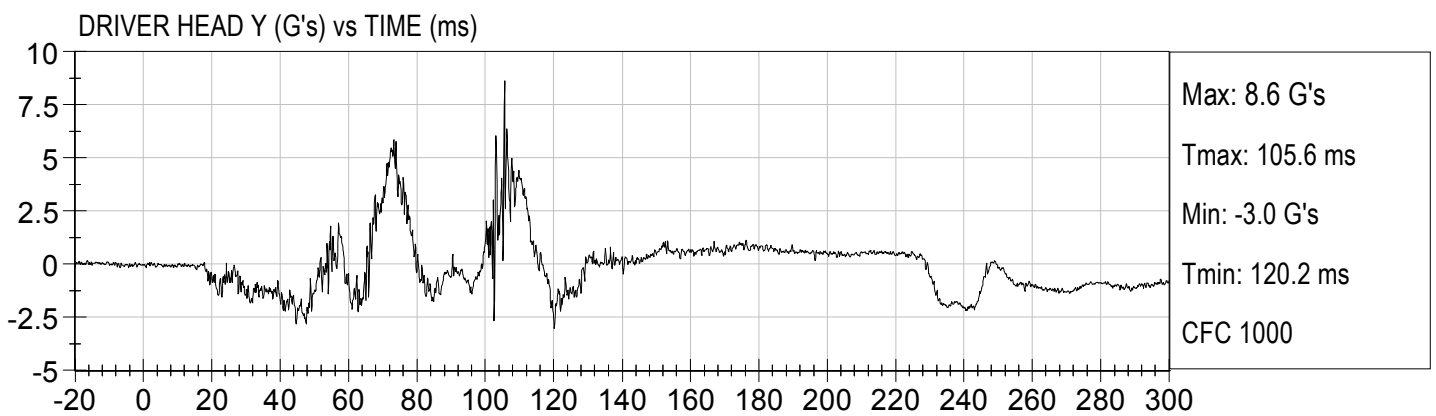
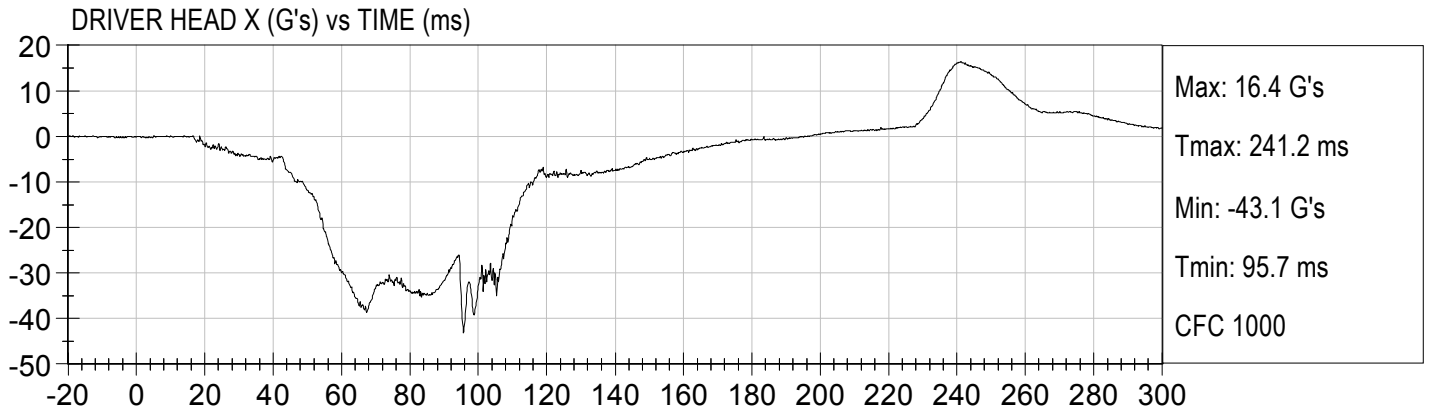
	<u>Page No.</u>
Figure No. 28. Passenger Neck Force X vs. Time	B-10
Figure No. 29. Passenger Neck Force Z vs. Time	B-10
Figure No. 30. Passenger Neck Moment Y vs. Time	B-10
Figure No. 31. Passenger Nij (NTF) vs. Time	B-11
Figure No. 32. Passenger Nij (NTE) vs. Time	B-11
Figure No. 33. Passenger Nij (NCF) vs. Time	B-11
Figure No. 34. Passenger Nij (NCE) vs. Time	B-11
Figure No. 35. Passenger Left Femur Force vs. Time	B-12
Figure No. 36. Passenger Right Femur Force vs. Time	B-12

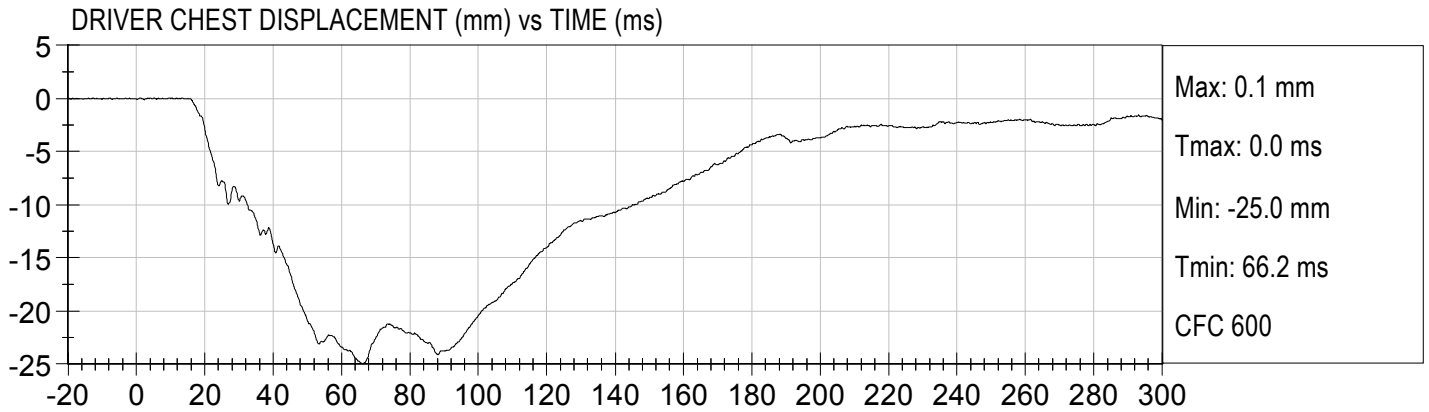
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

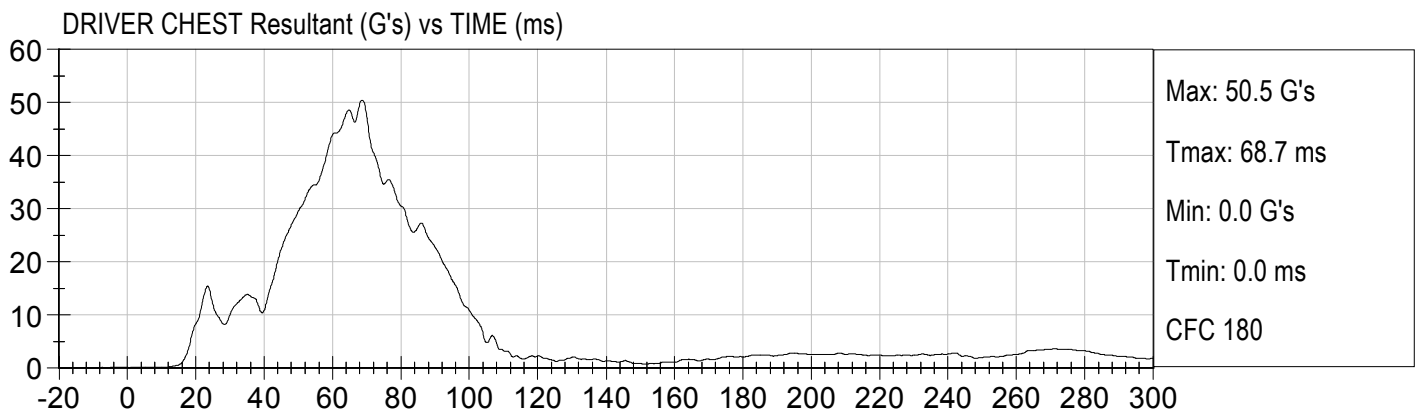
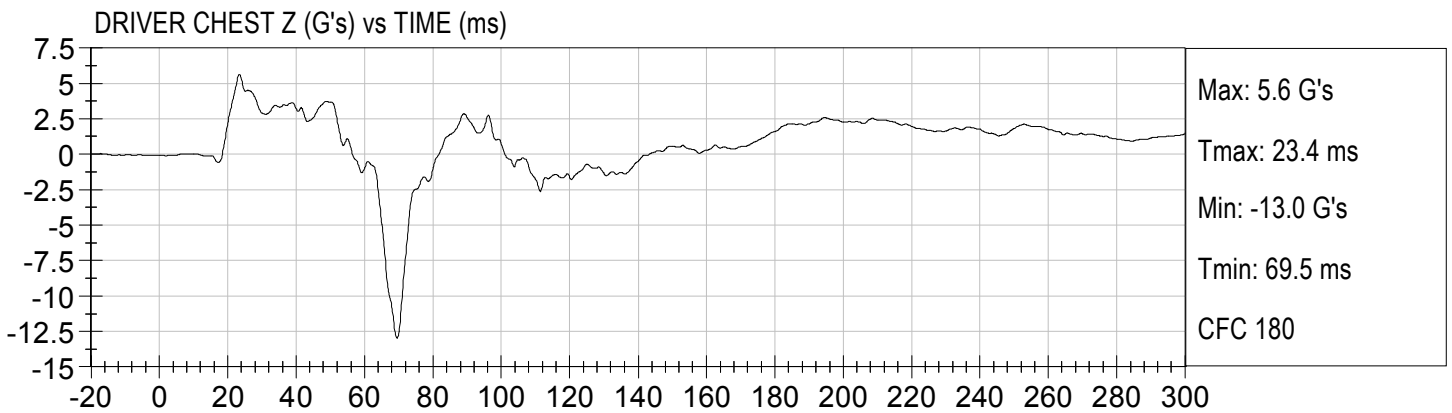
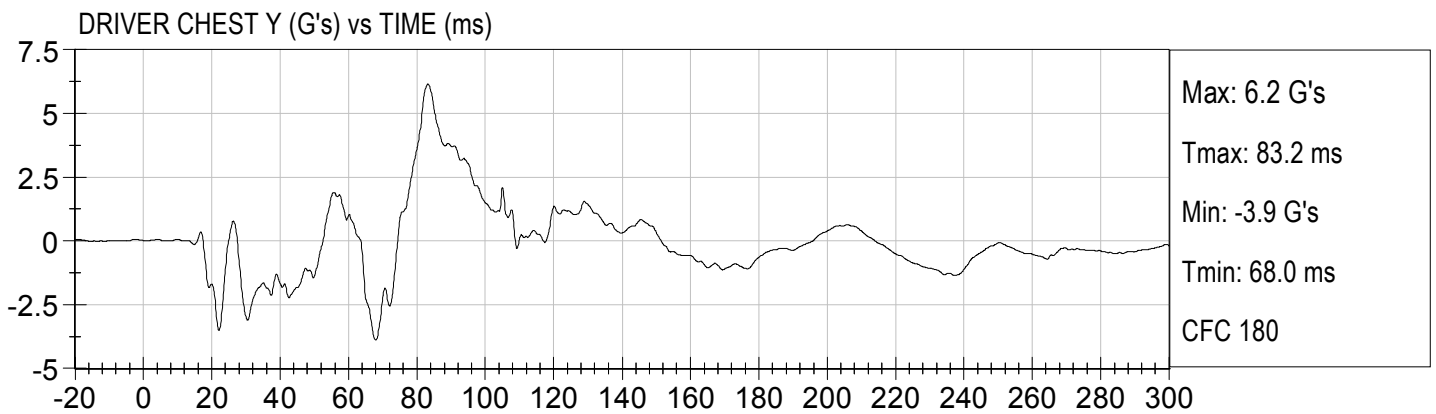
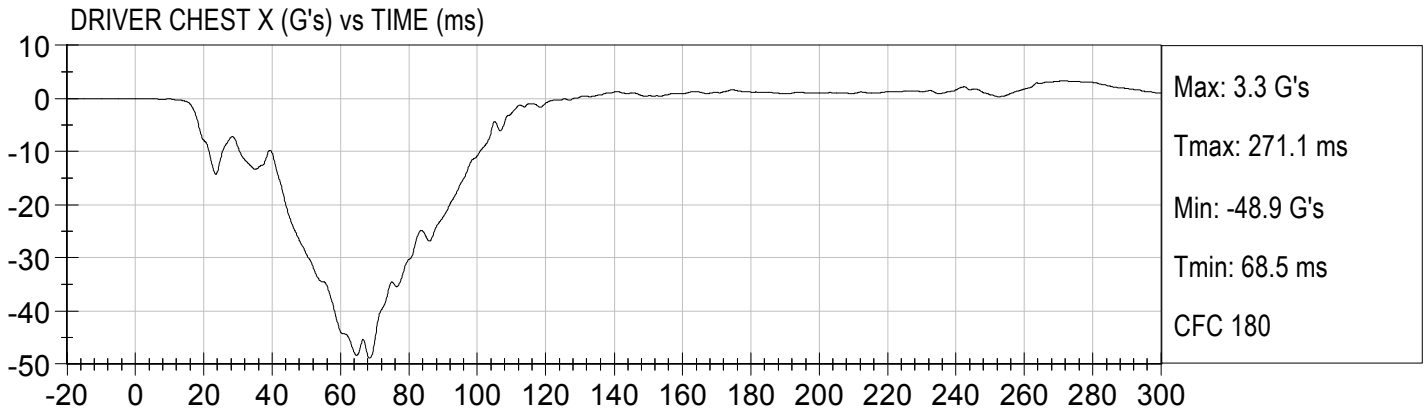
Driver Head X Redundant
 Driver Head Y Redundant
 Driver Head Z Redundant
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant
 Driver Chest Y Redundant
 Driver Chest Z Redundant
 Driver Pelvis X
 Driver Pelvis Y
 Driver Pelvis Z
 Driver Left Femur Redundant
 Driver Right Femur Redundant
 Driver Left Upper Tibia Moment X
 Driver Left Upper Tibia Moment Y
 Driver Left Upper Tibia Force Z
 Driver Left Lower Tibia Moment X

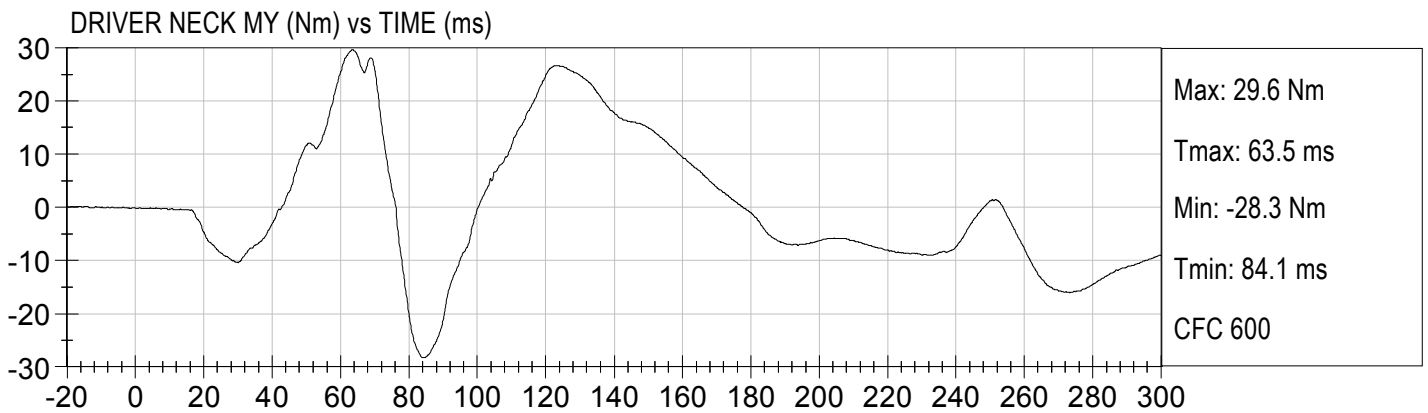
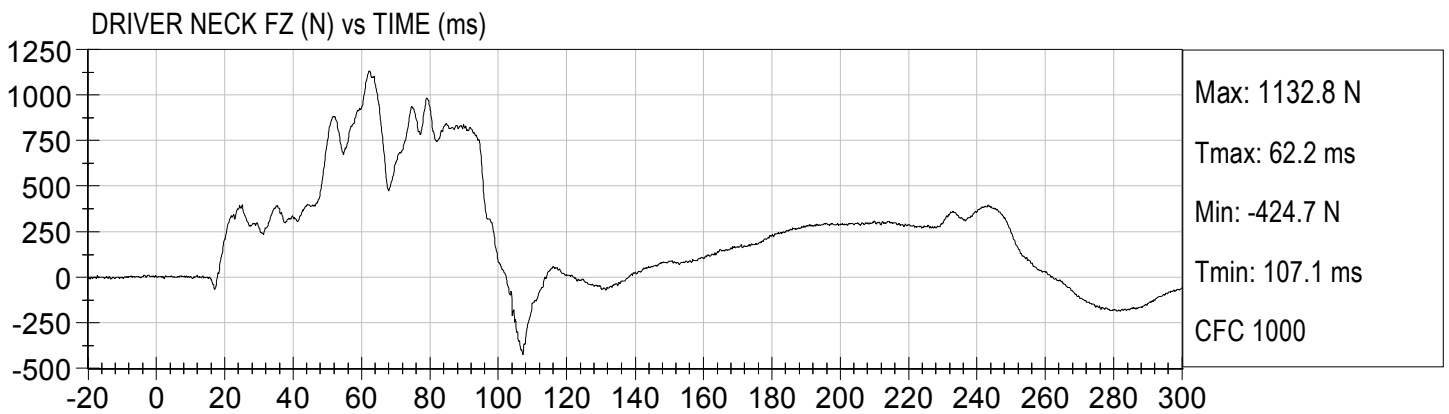
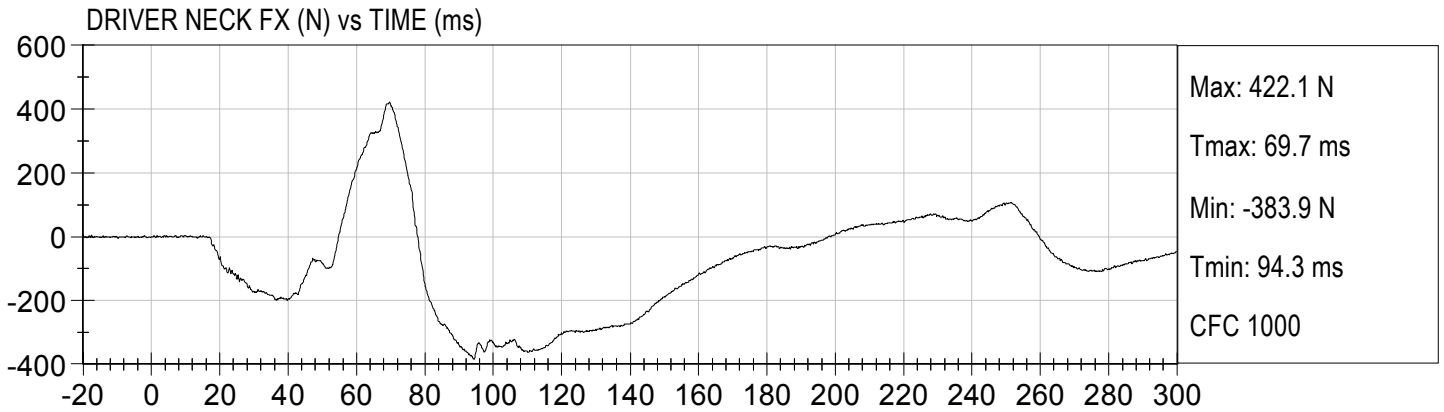
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left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

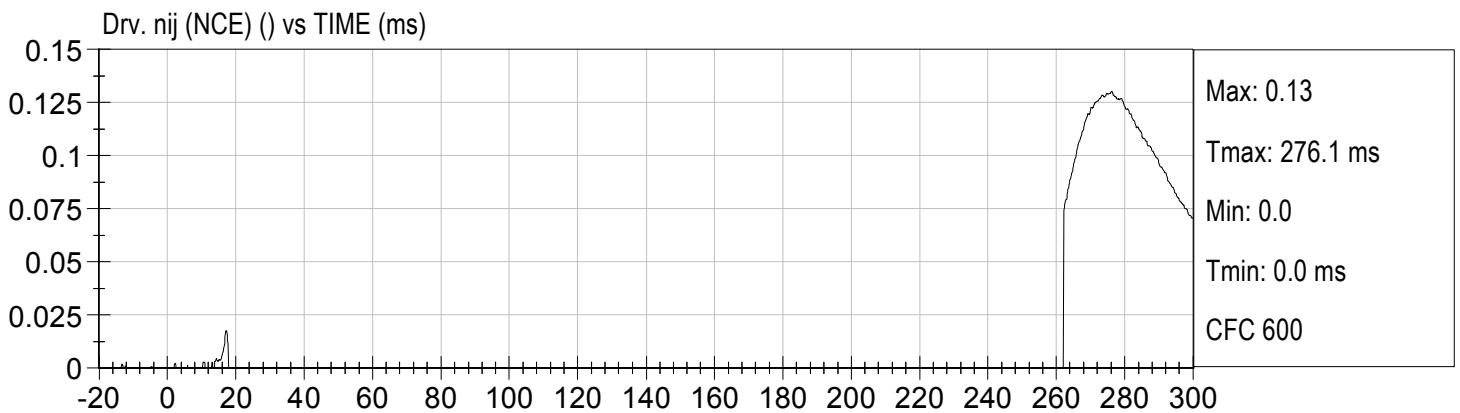
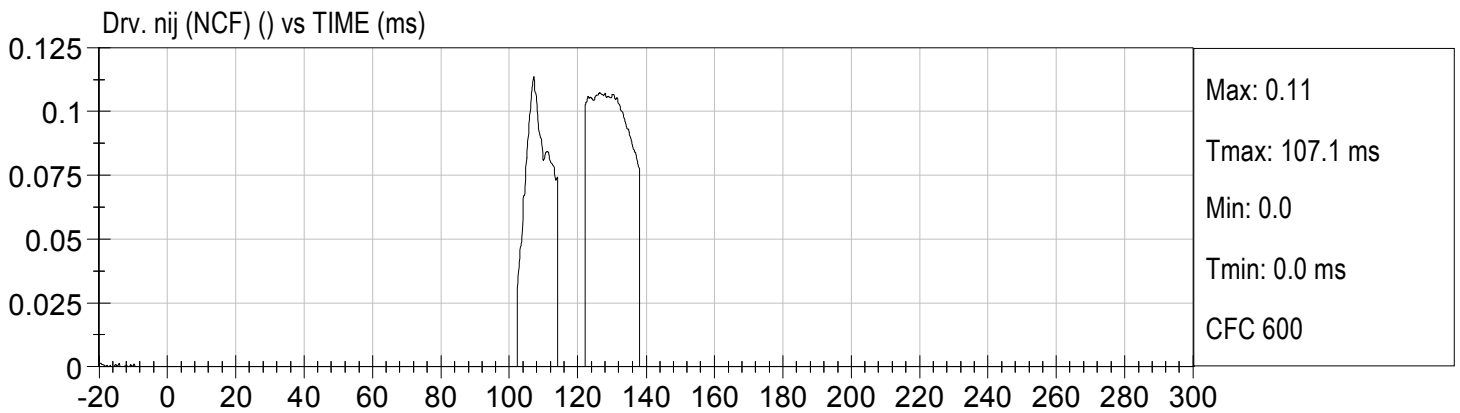
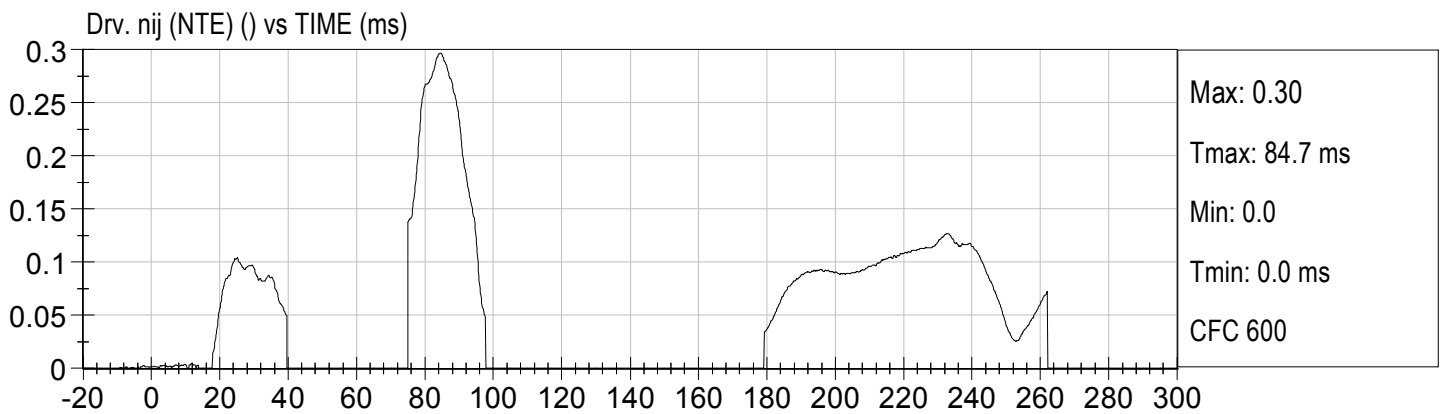
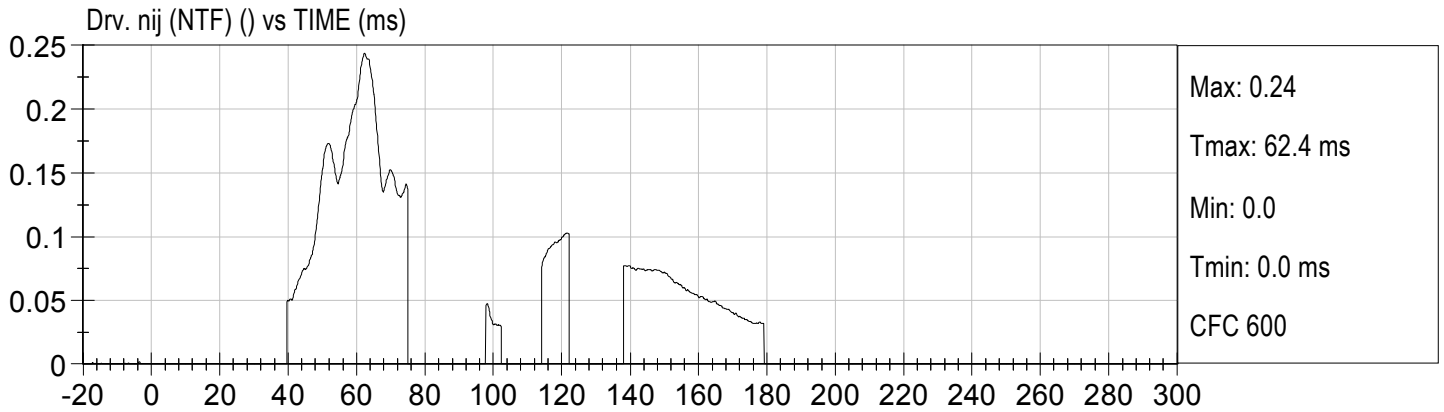
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right 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
Passenger Lap Belt Force
Passenger Shoulder Belt Force (Not Installed)
Left Rear Seat Crossmember X
Right Rear Seat Crossmember X
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Brake Caliper X
Vehicle Right Brake Caliper X
Left Rear Seat Crossmember Xr
Right Rear Seat Crossmember Xr
Advanced Research Load Cell Barrier – 128 channels

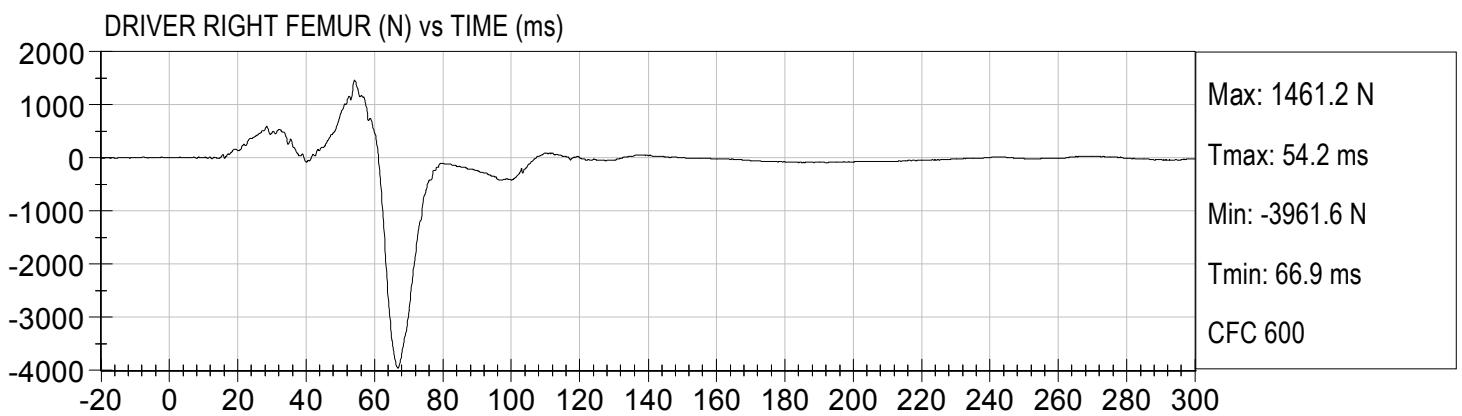
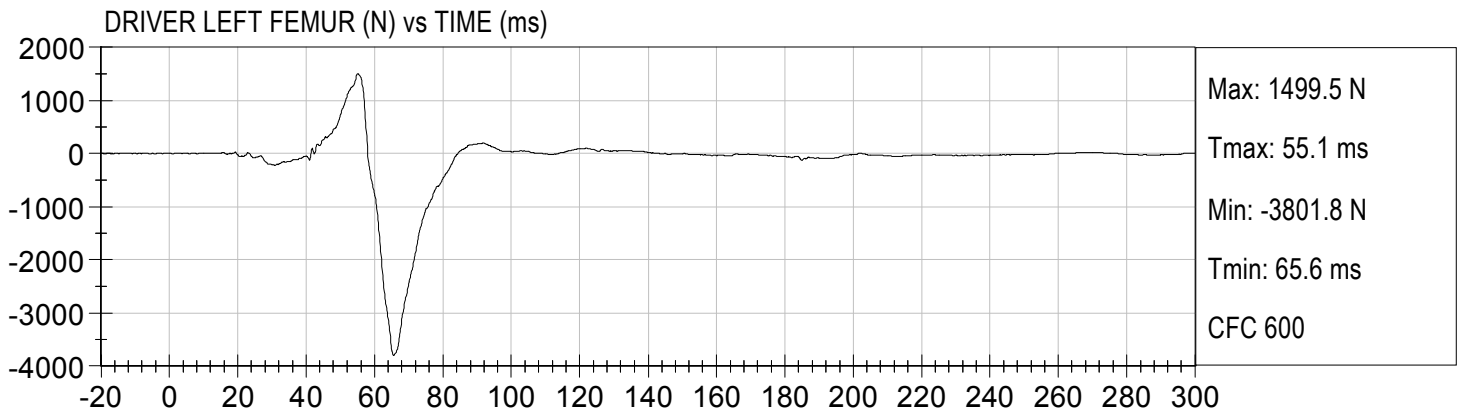


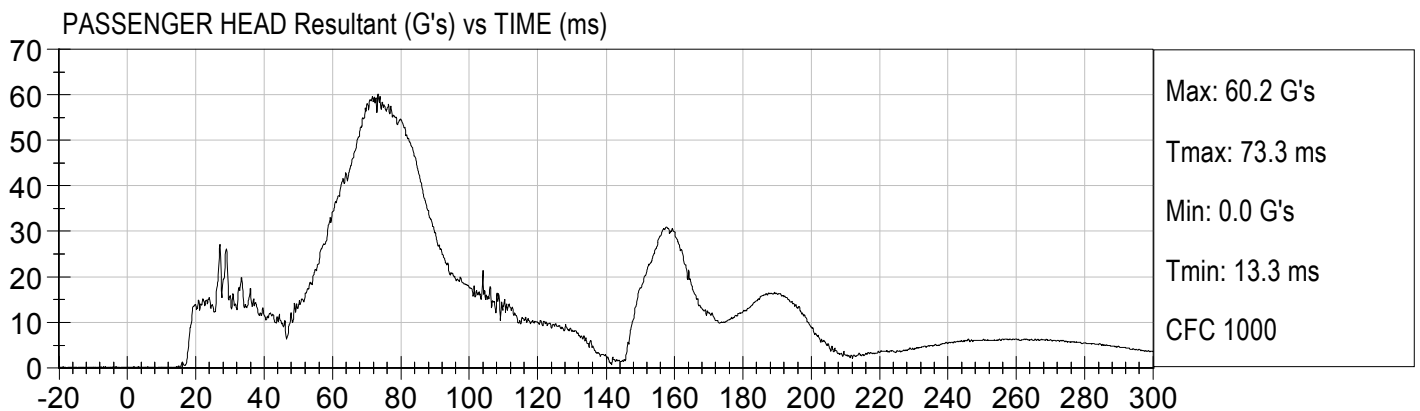
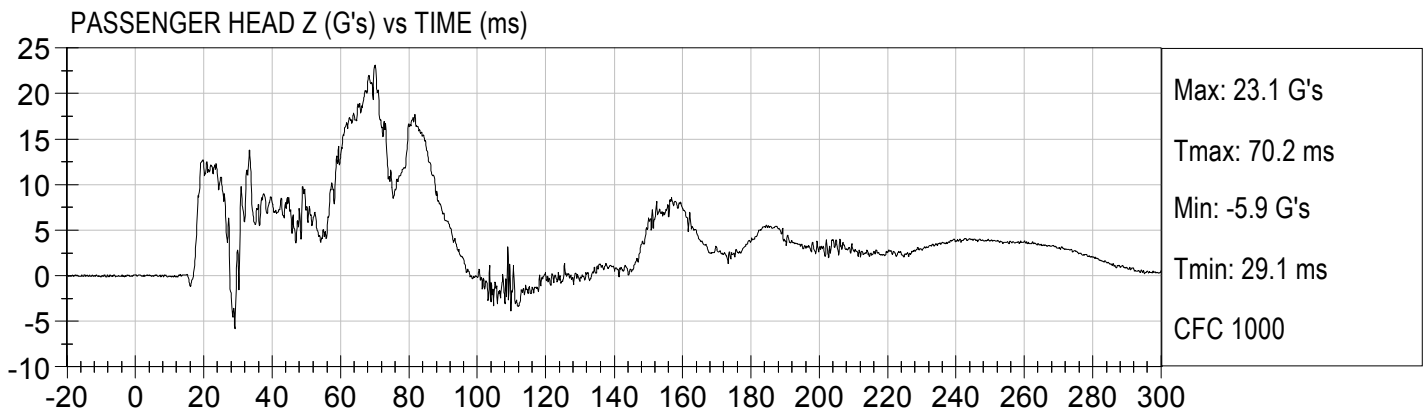
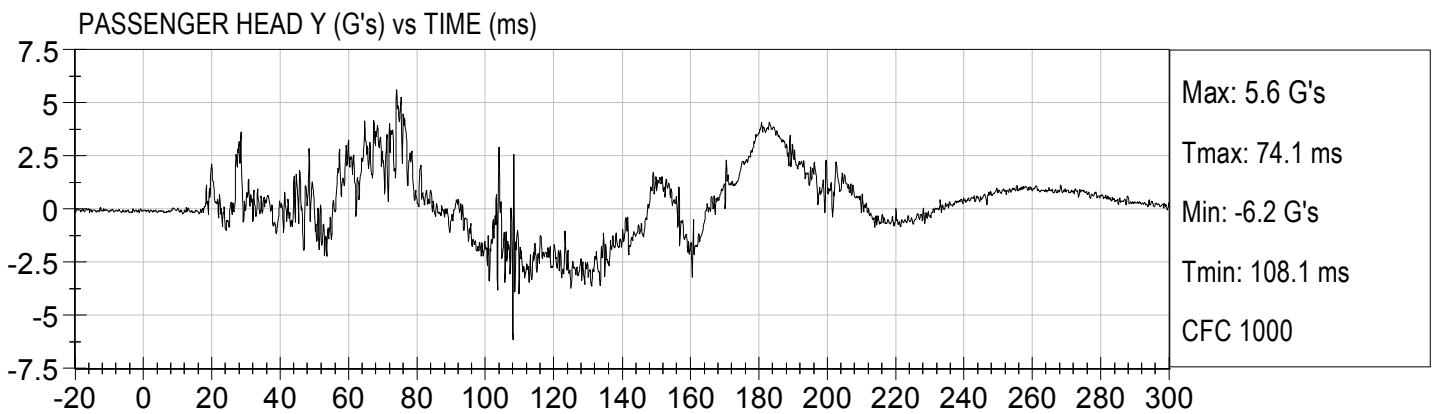
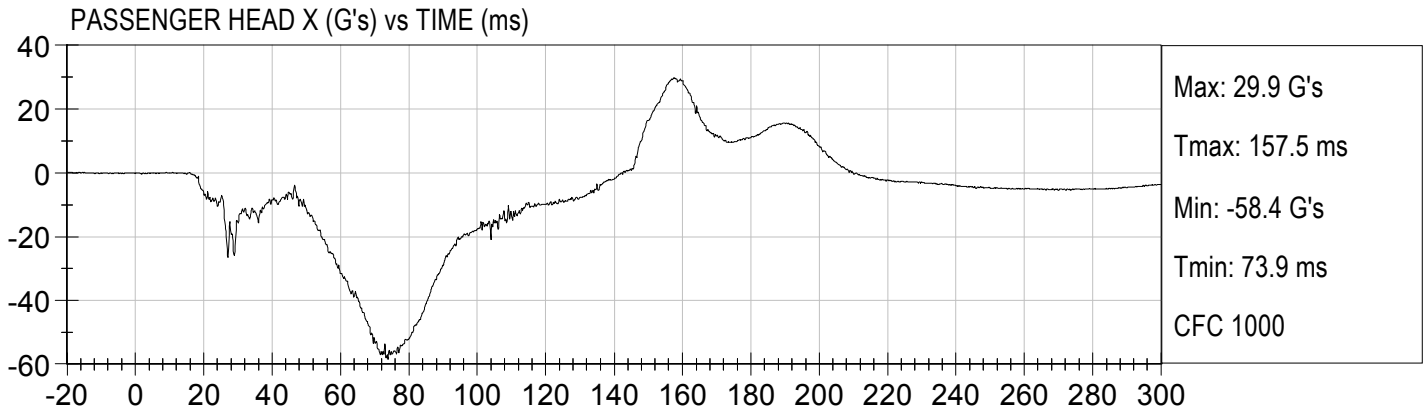


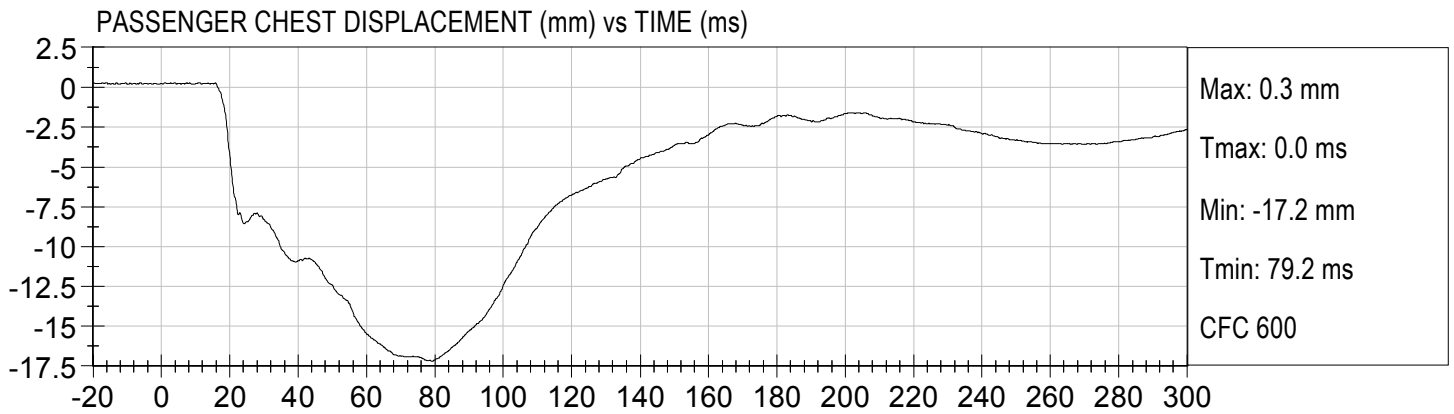


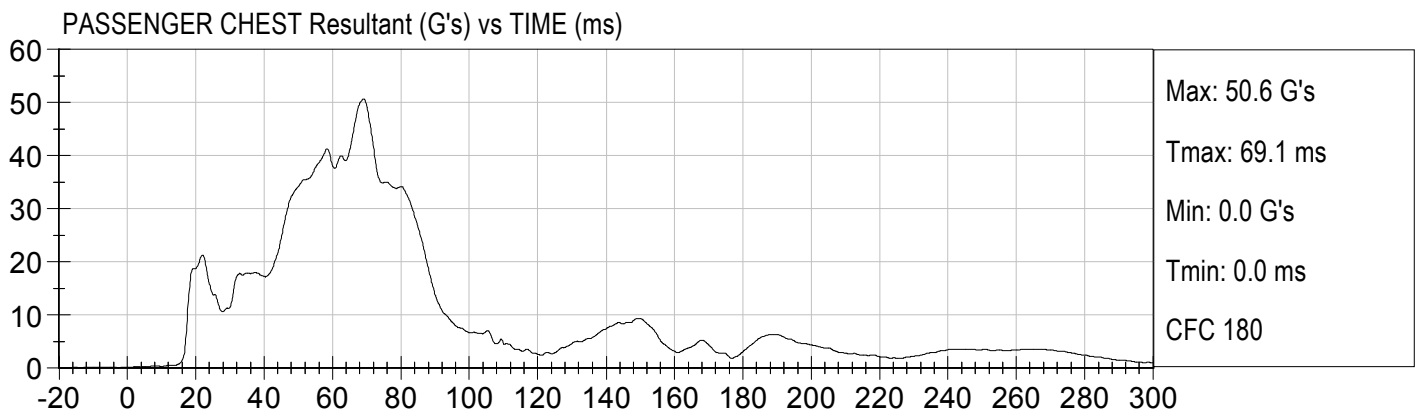
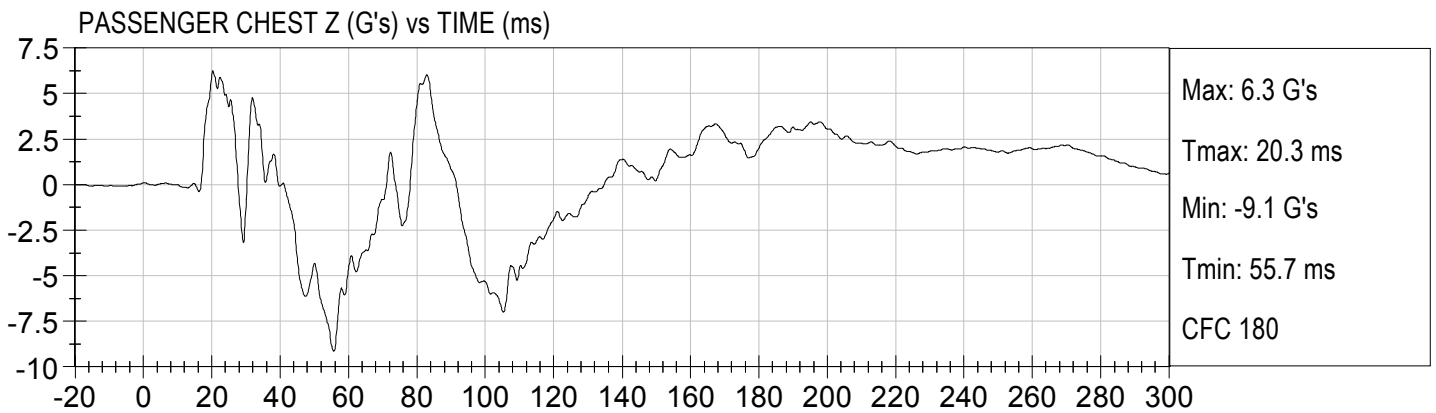
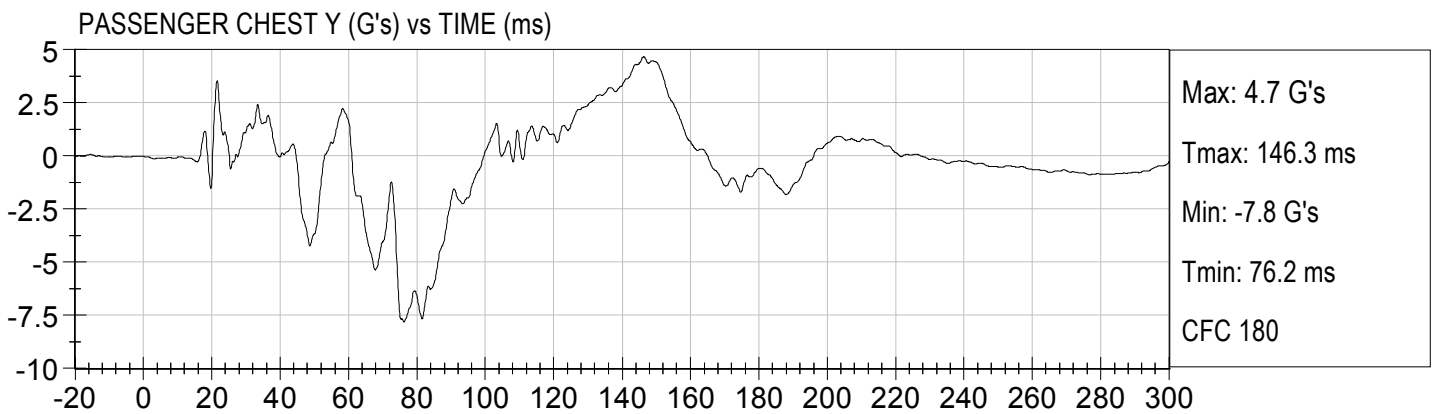
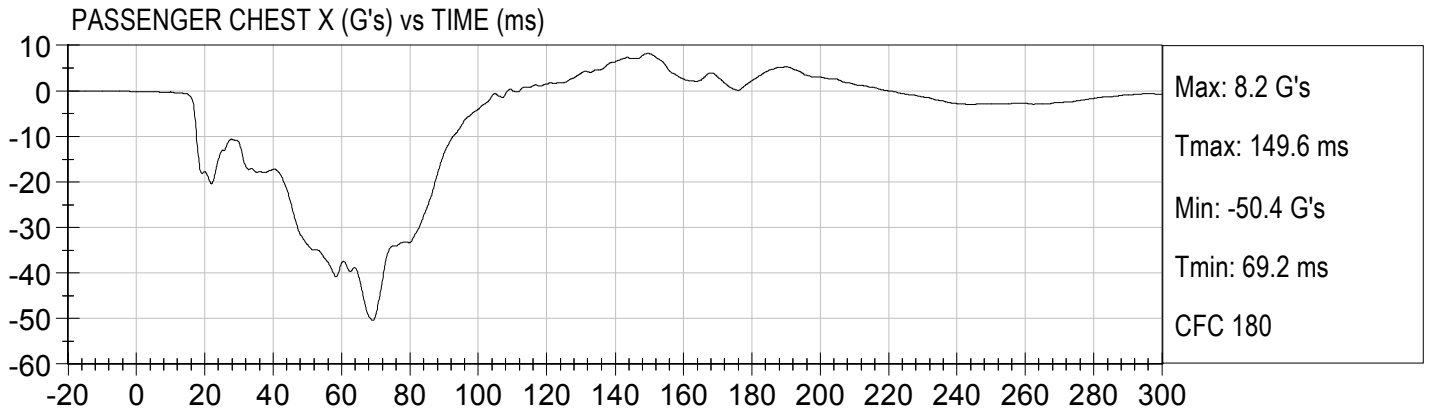


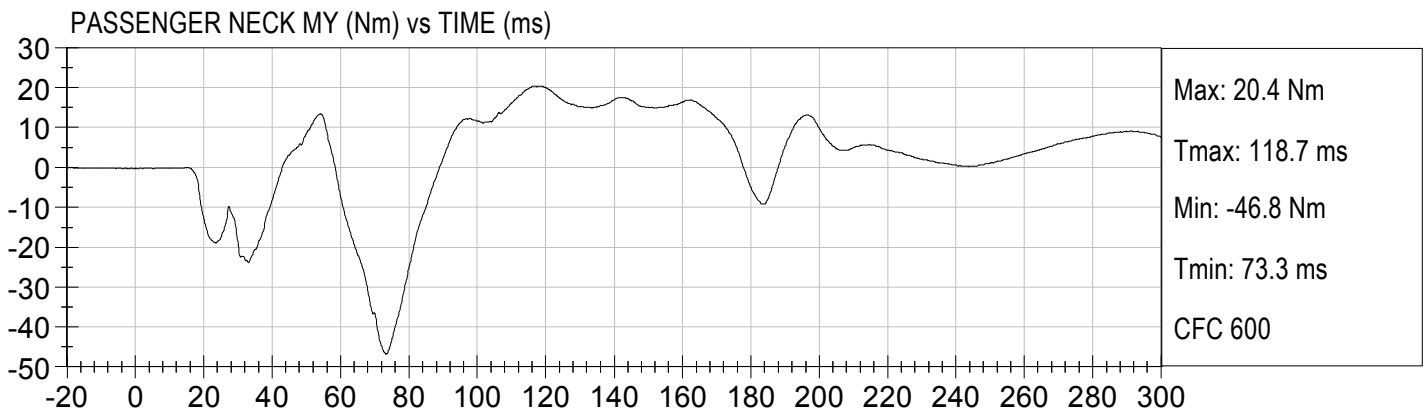
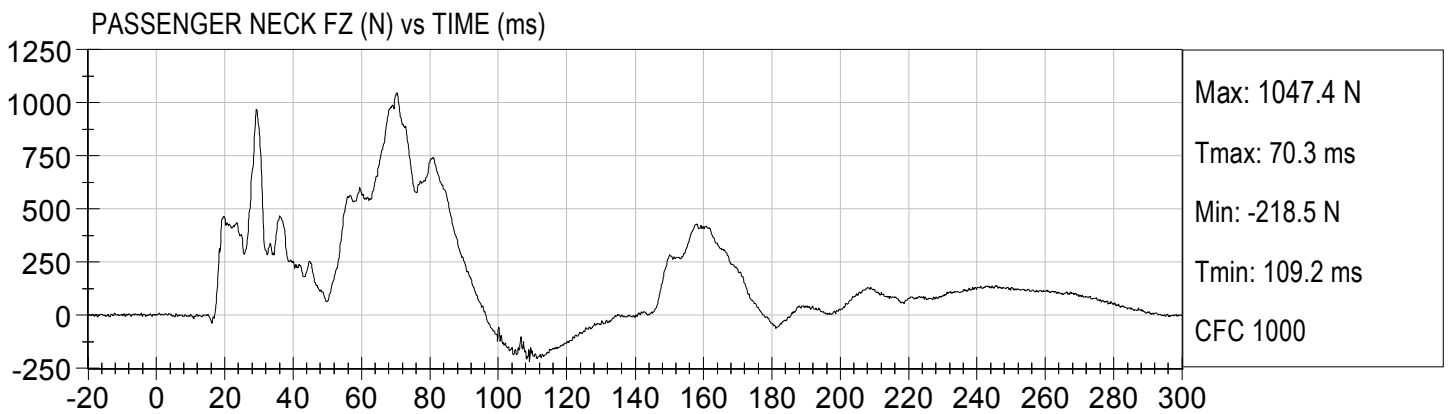
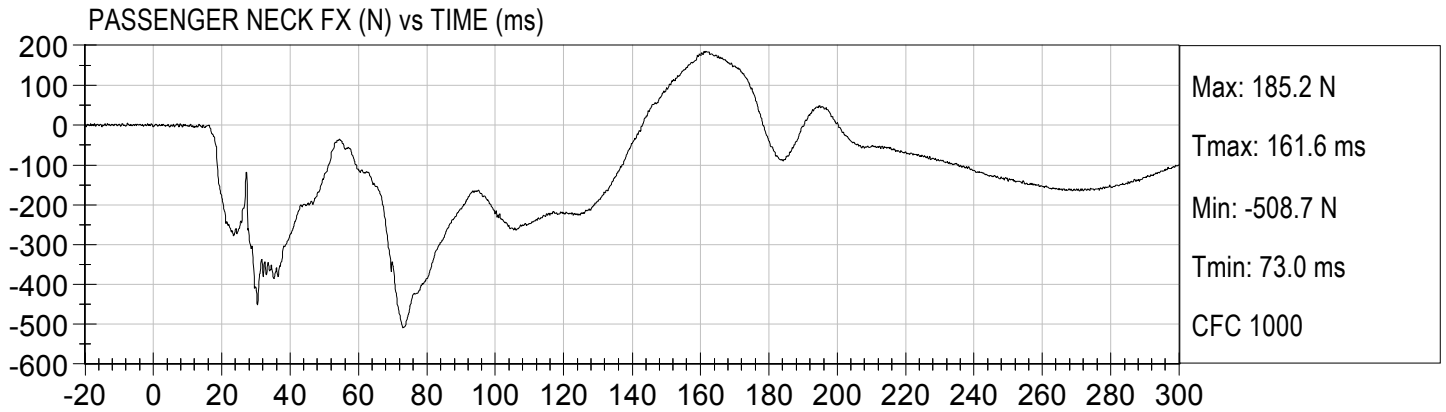


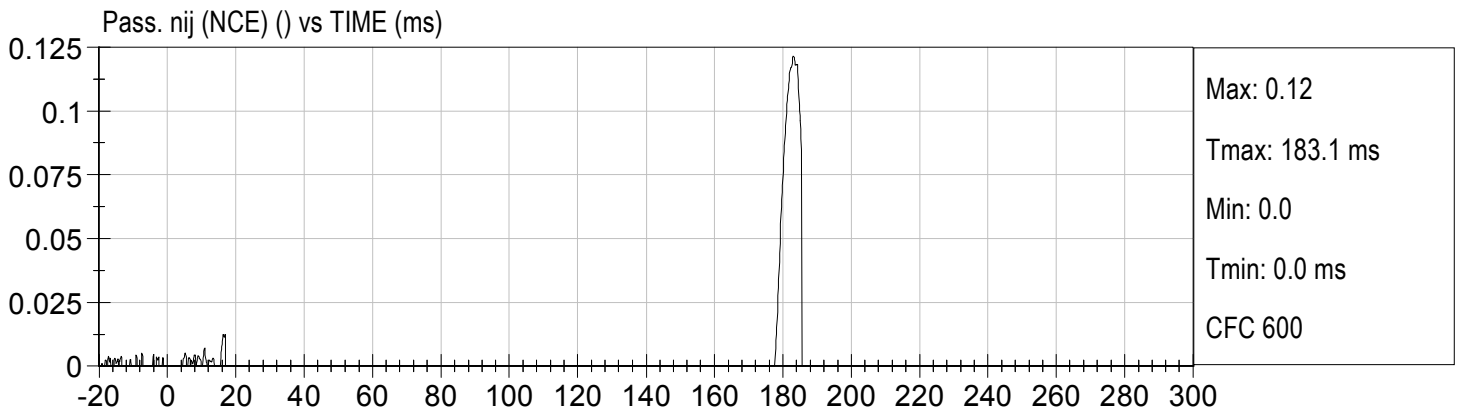
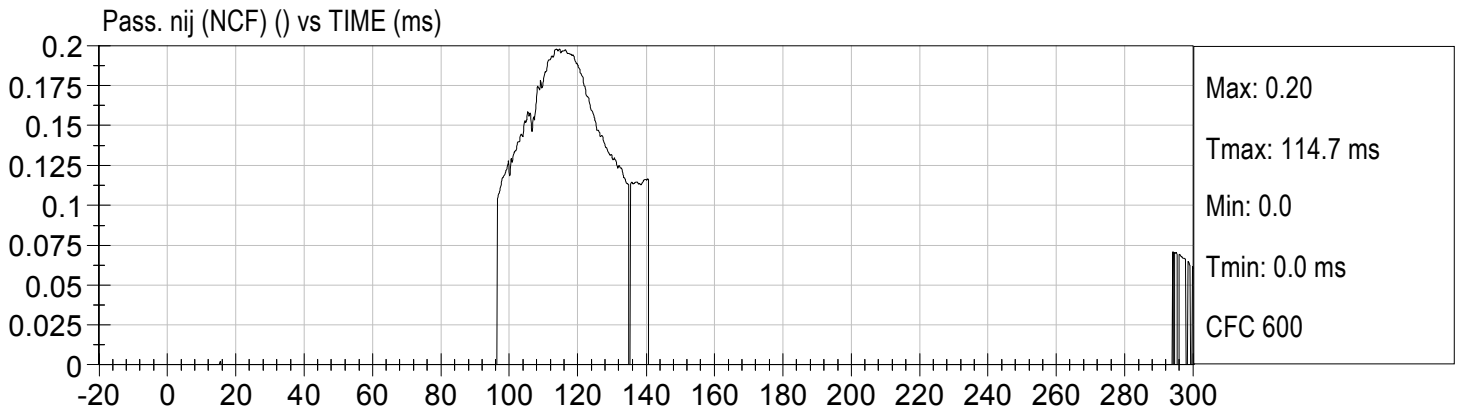
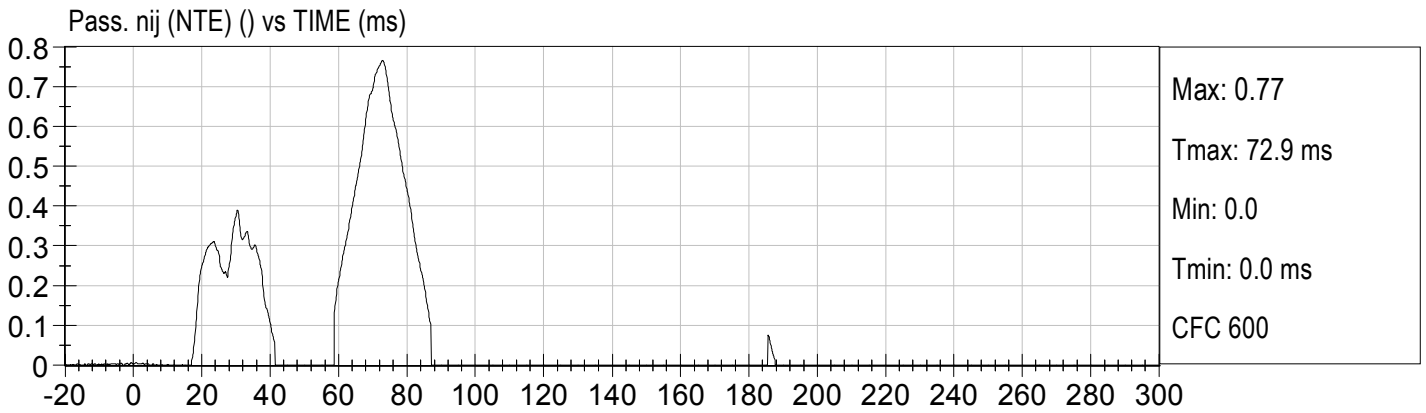
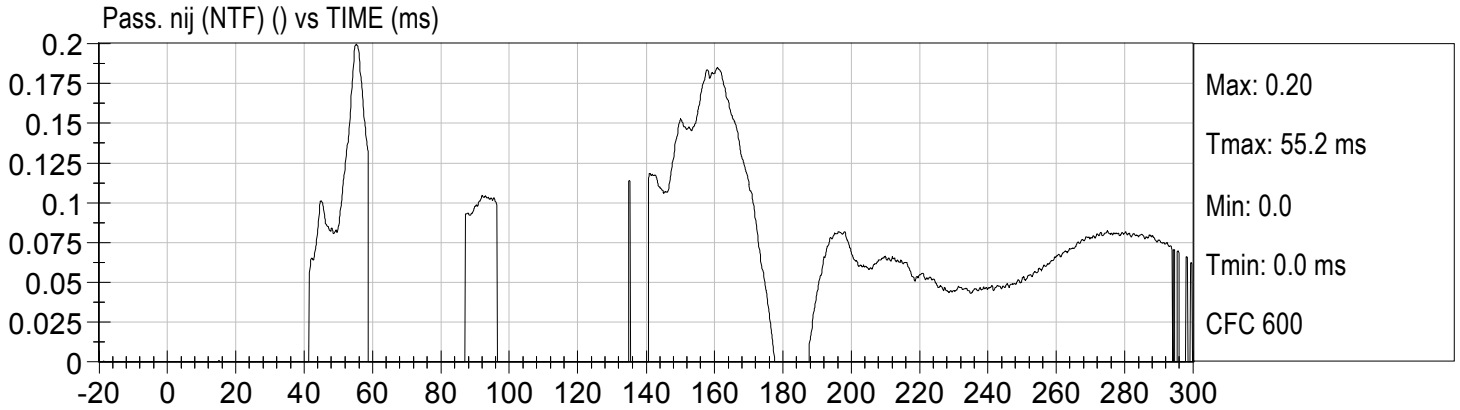


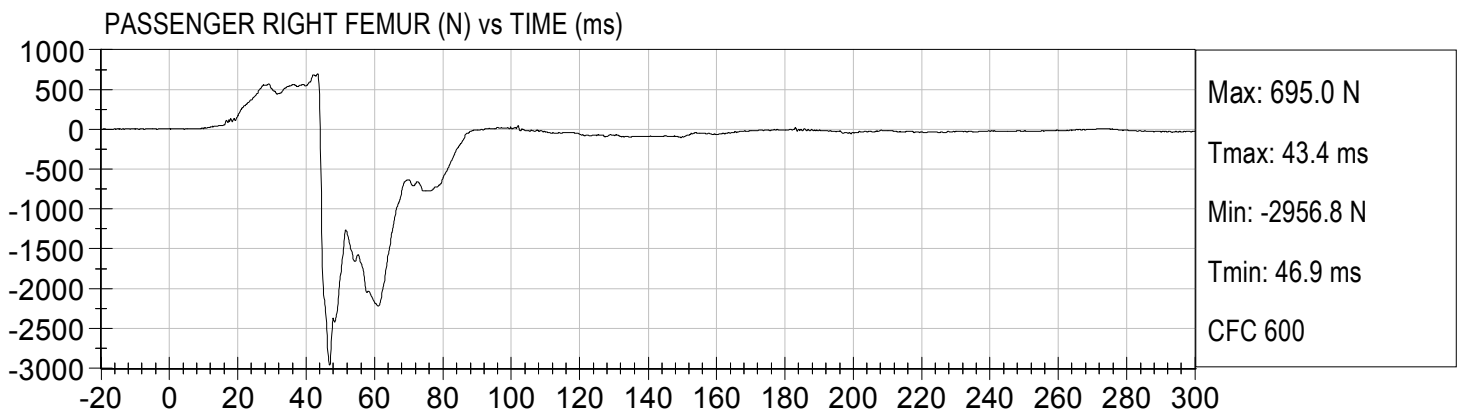
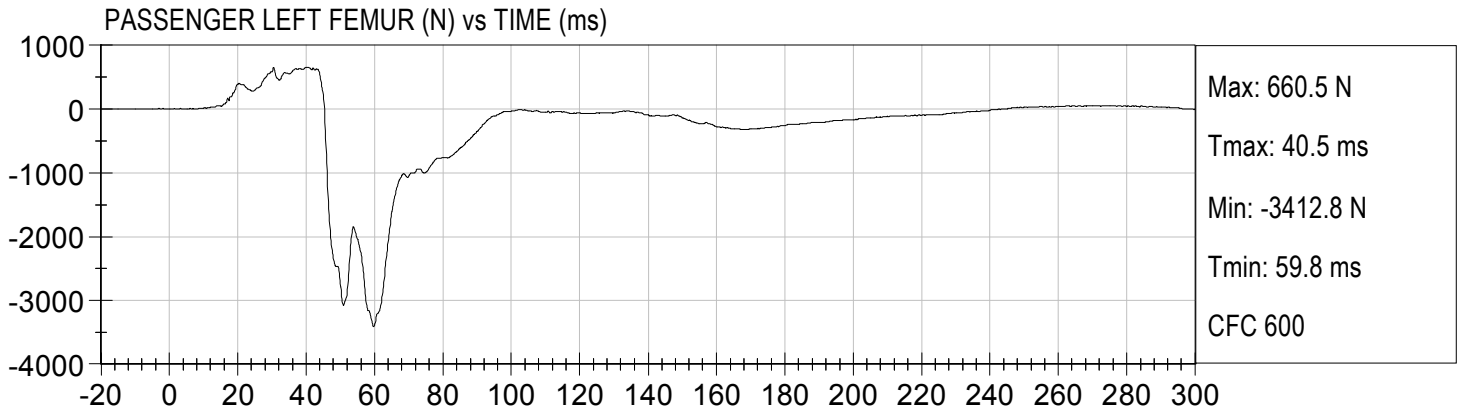












APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

ATD Serial No: 351

Test ID: D113911

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225 - 275	260	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-10.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

11/22/11
Test Date

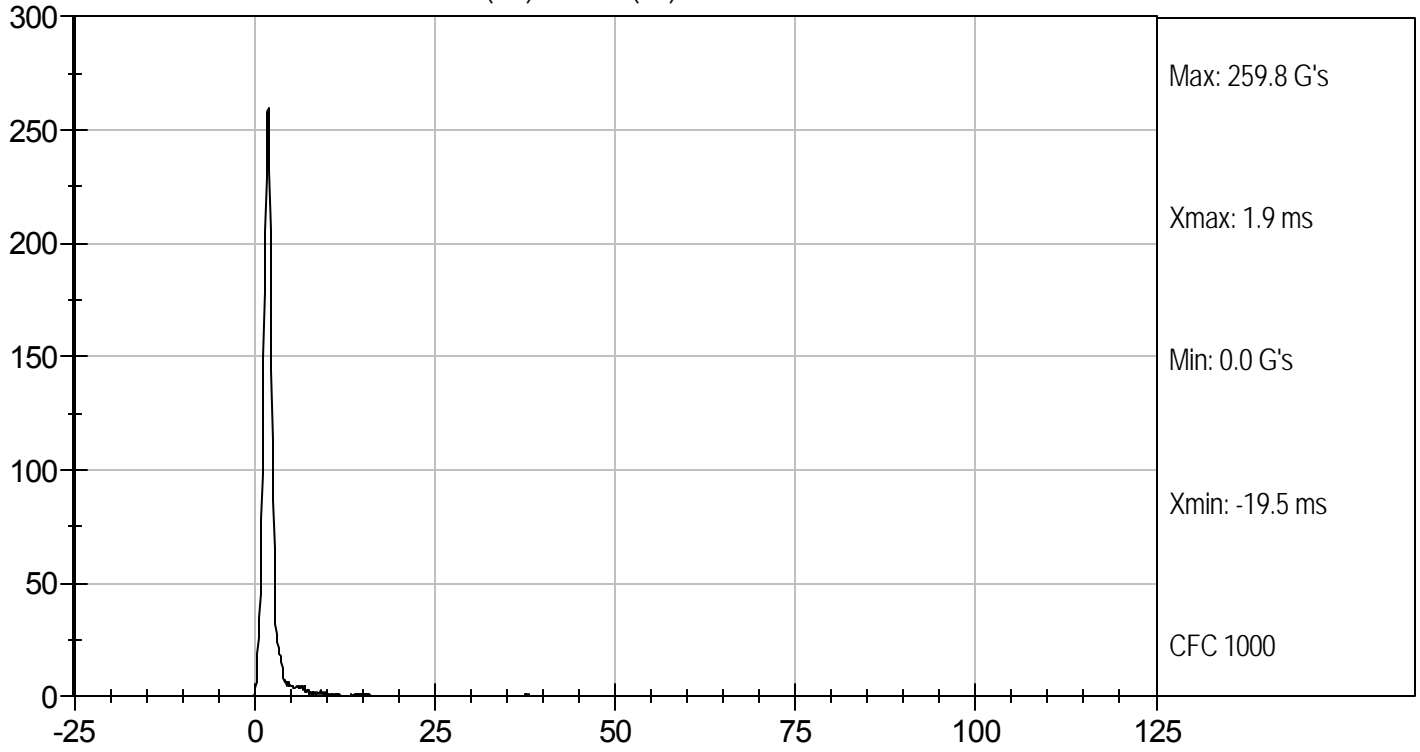
David Winkelbauer
Approved By



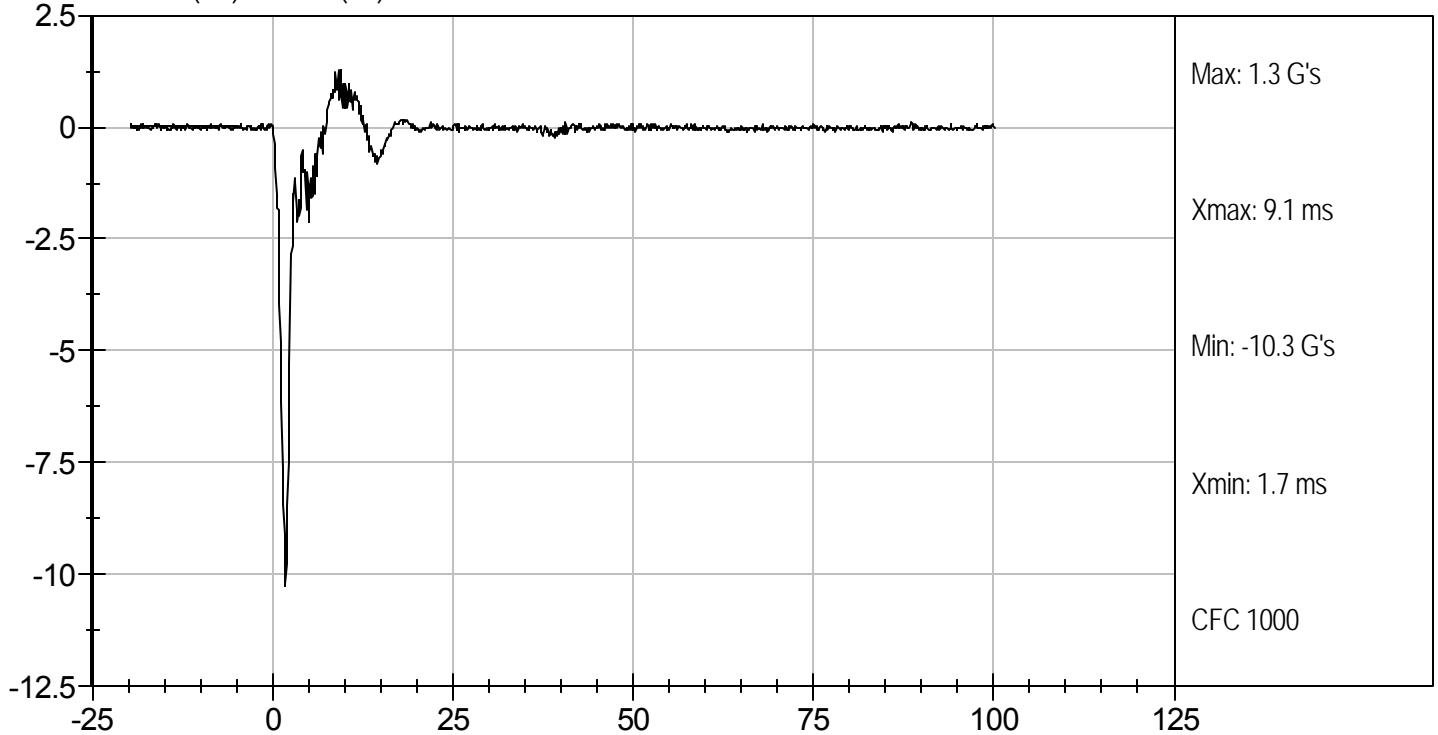
Test Desc: Head Drop
Component ID: D113911

Test Date: 11/22/11
Velocity: 0 ft/s, 0.00 m/s

RESULTANT HEAD 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: 351

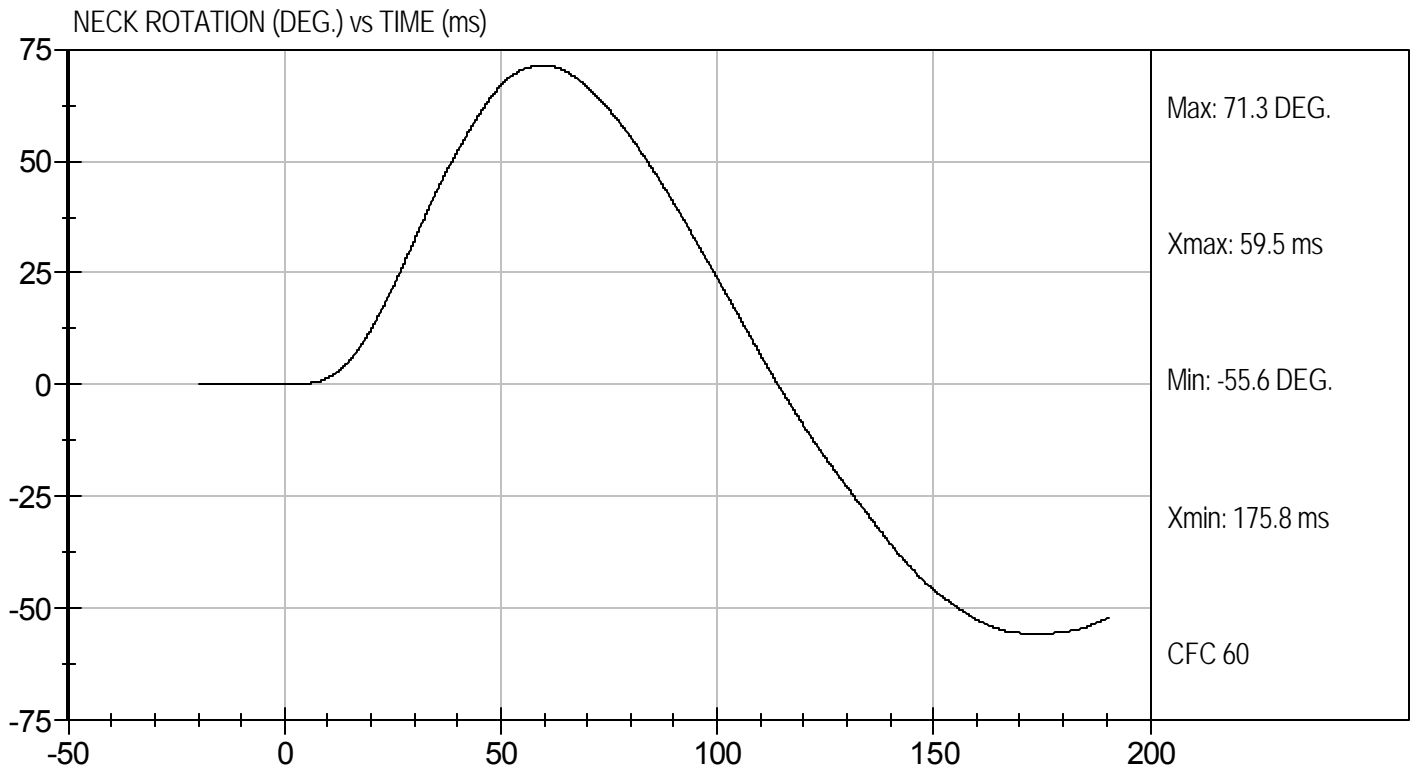
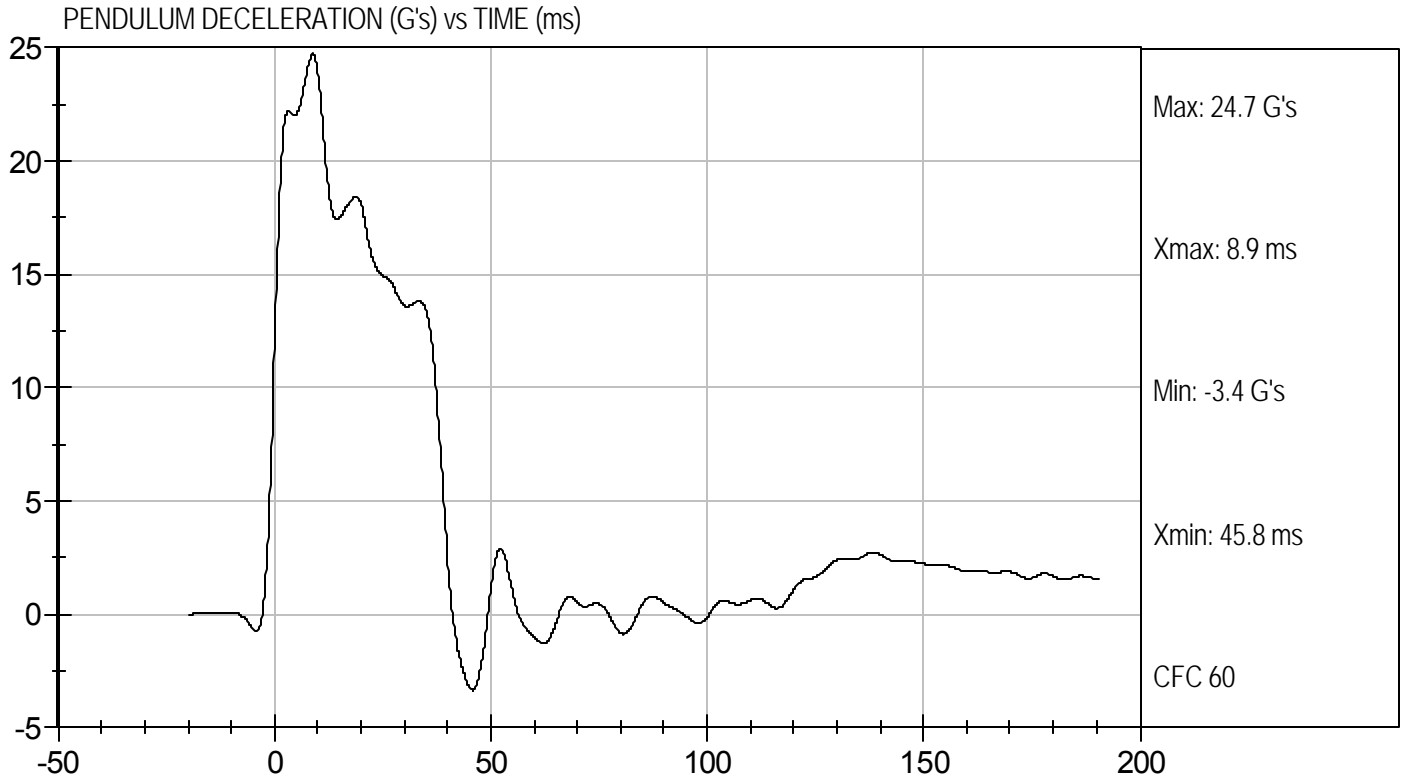
Test I.D.: D113912

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.90	Pass
	20 ms	G's	17.60 to 22.60	18.02	Pass
	30 ms	G's	12.50 to 18.50	13.61	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.8	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	39.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	71.3	Pass
	Time	ms	57.0 to 64.0	59.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	114.2	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	93.5	Pass
	Time	ms	47.0 to 58.0	52.2	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	101.5	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

11/22/11
Test Date

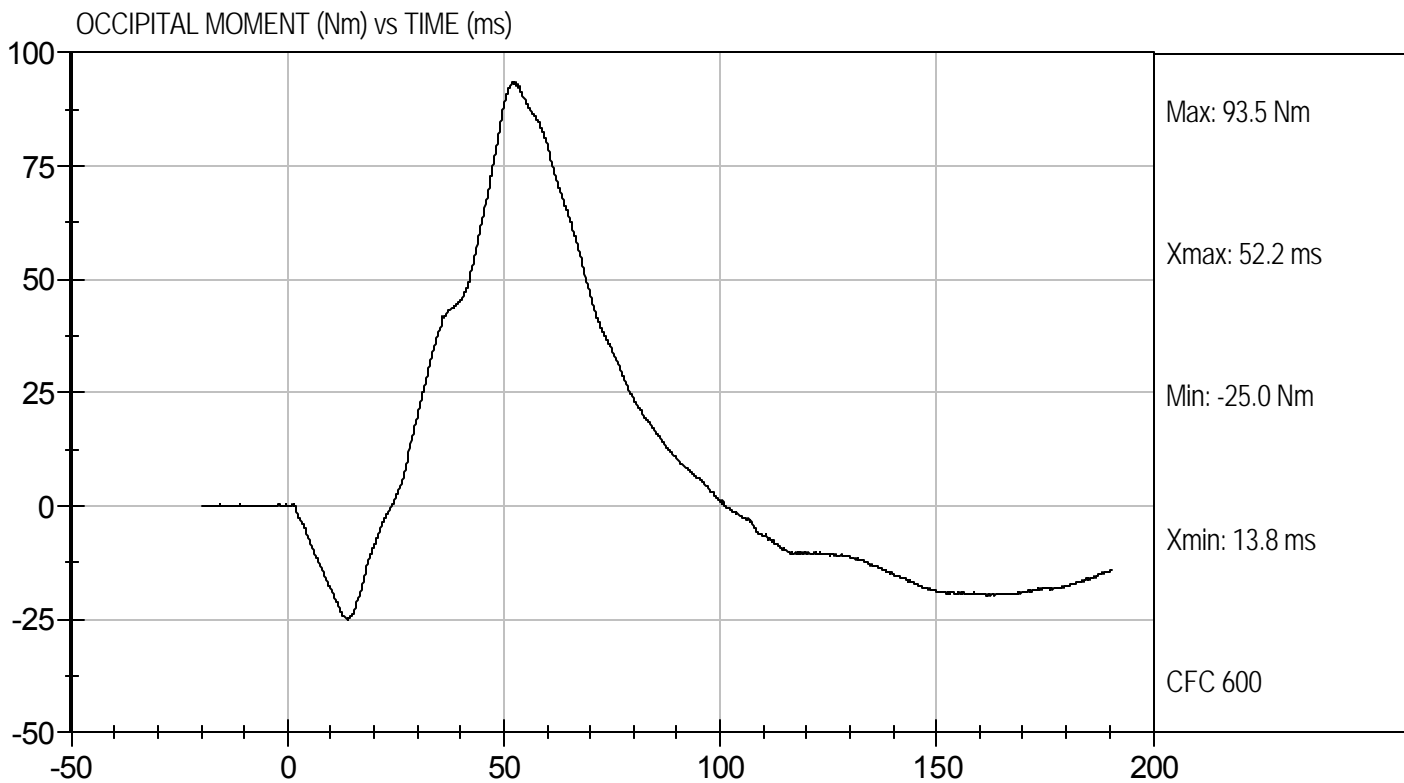
David Winkelbauer
Approved By





Test Desc: Neck Flexion
Component ID: D113912

Test Date: 11/22/11
Velocity: 23.2 ft/s, 7.07 m/s



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

ATD Serial No: 351

Test I.D.: D113913

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.38	Pass
	20 ms	G's	14.00 to 19.00	14.62	Pass
	30 ms	G's	11.00 to 16.00	11.07	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	11.4	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	40.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.9	Pass
	Time	ms	72.0 to 82.0	80.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	158.8	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.0	Pass
	Time	ms	65.0 to 79.0	71.9	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	145.7	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

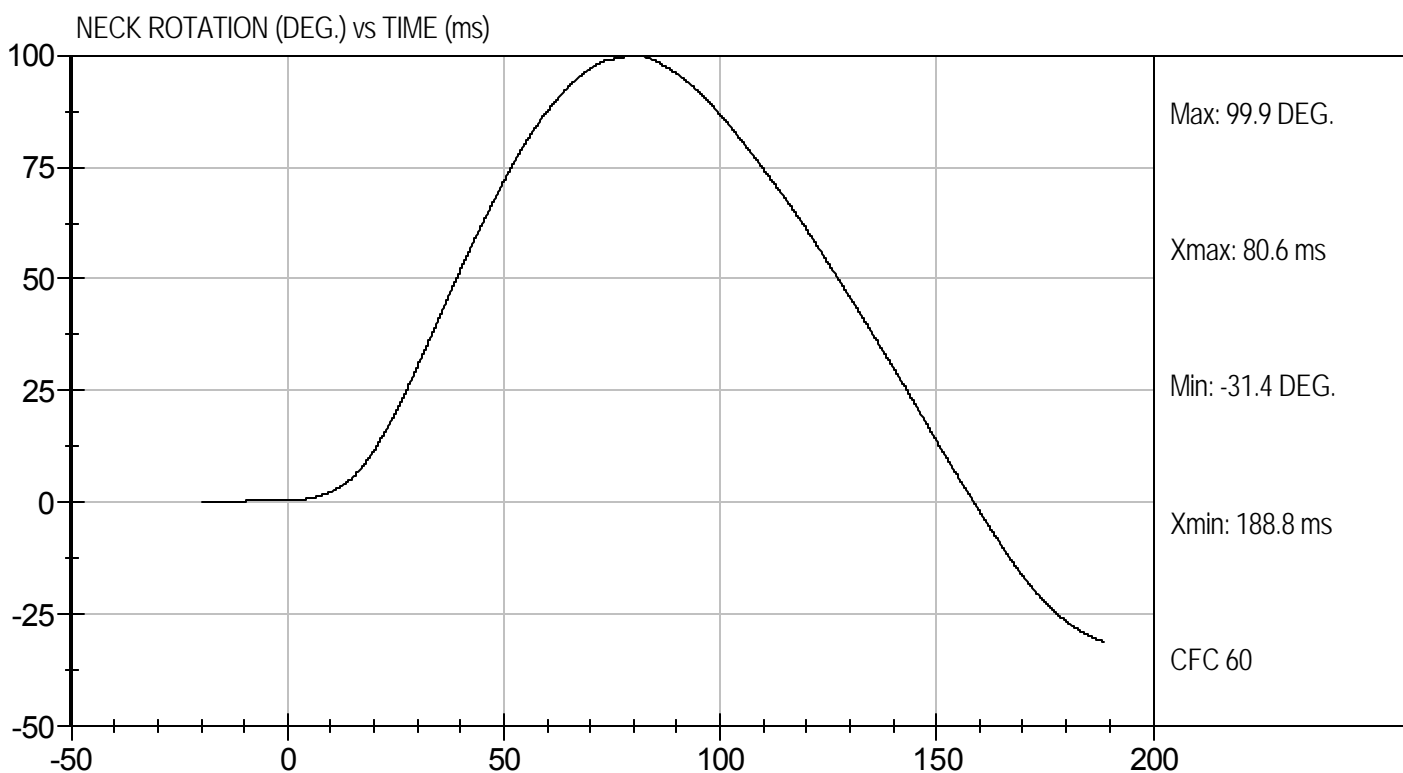
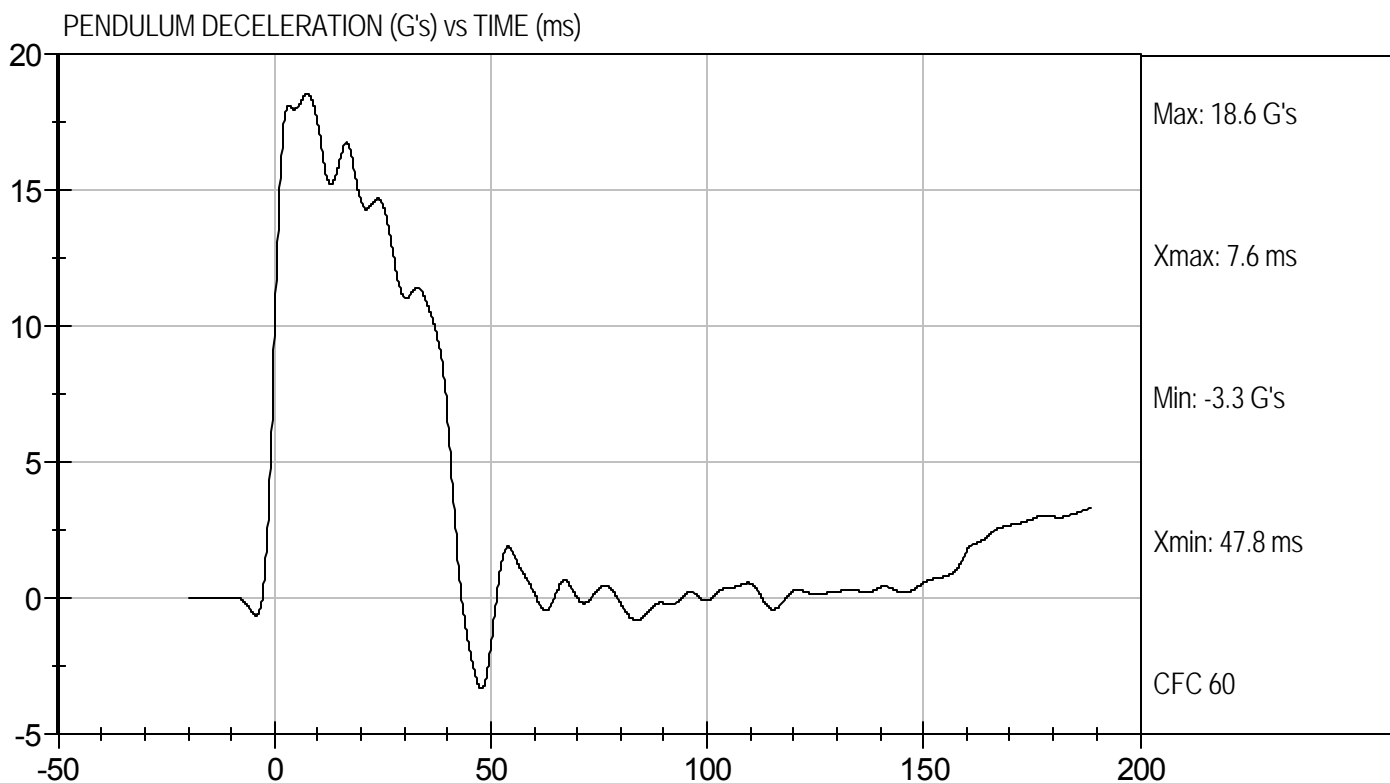
11/22/11
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D113913

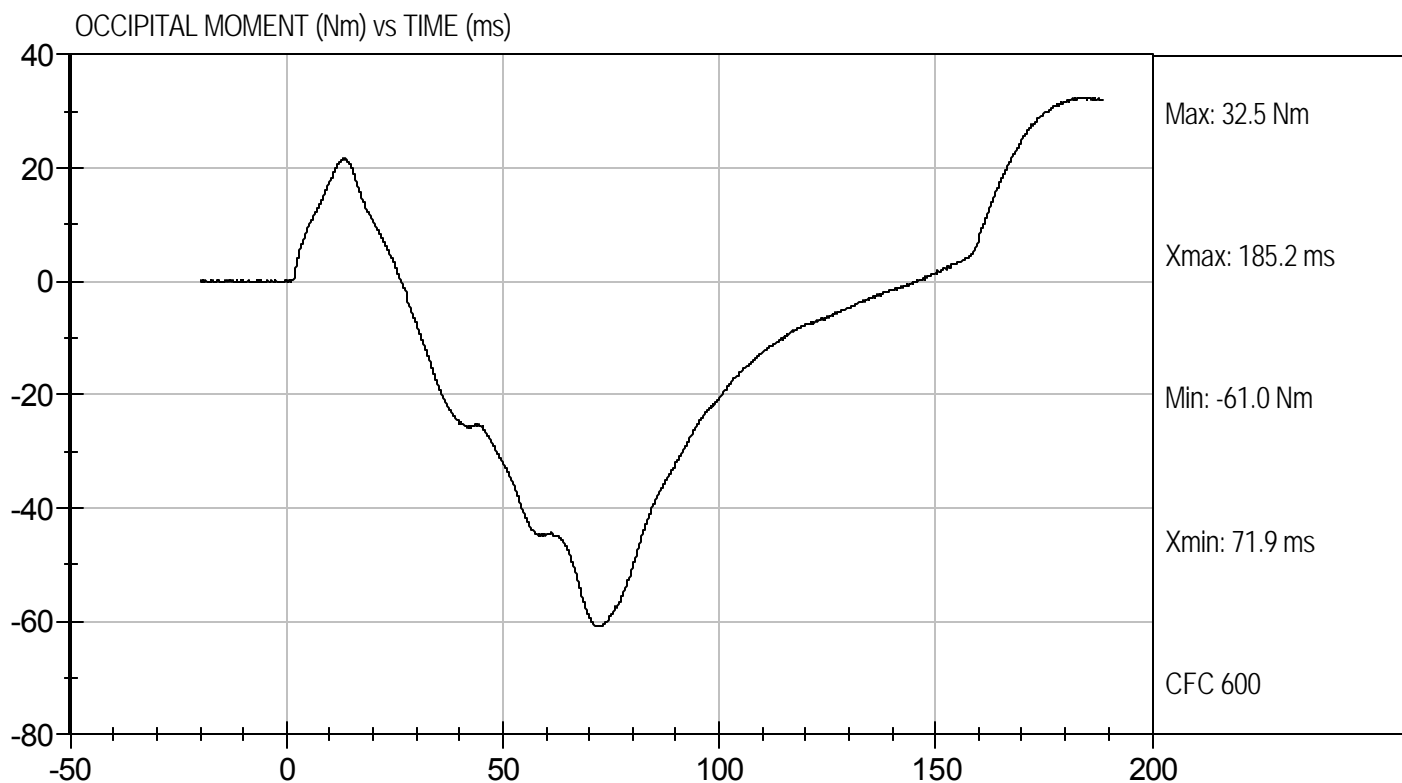
Test Date: 11/22/11
Velocity: 20.10 ft/s, 6.13 m/s





Test Desc: Neck Extension
Component ID: D113913

Test Date: 11/22/11
Velocity: 20.10 ft/s, 6.13 m/s



**MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE**

ATD Serial No: 351

Test I.D: D113914

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,244	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.55	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

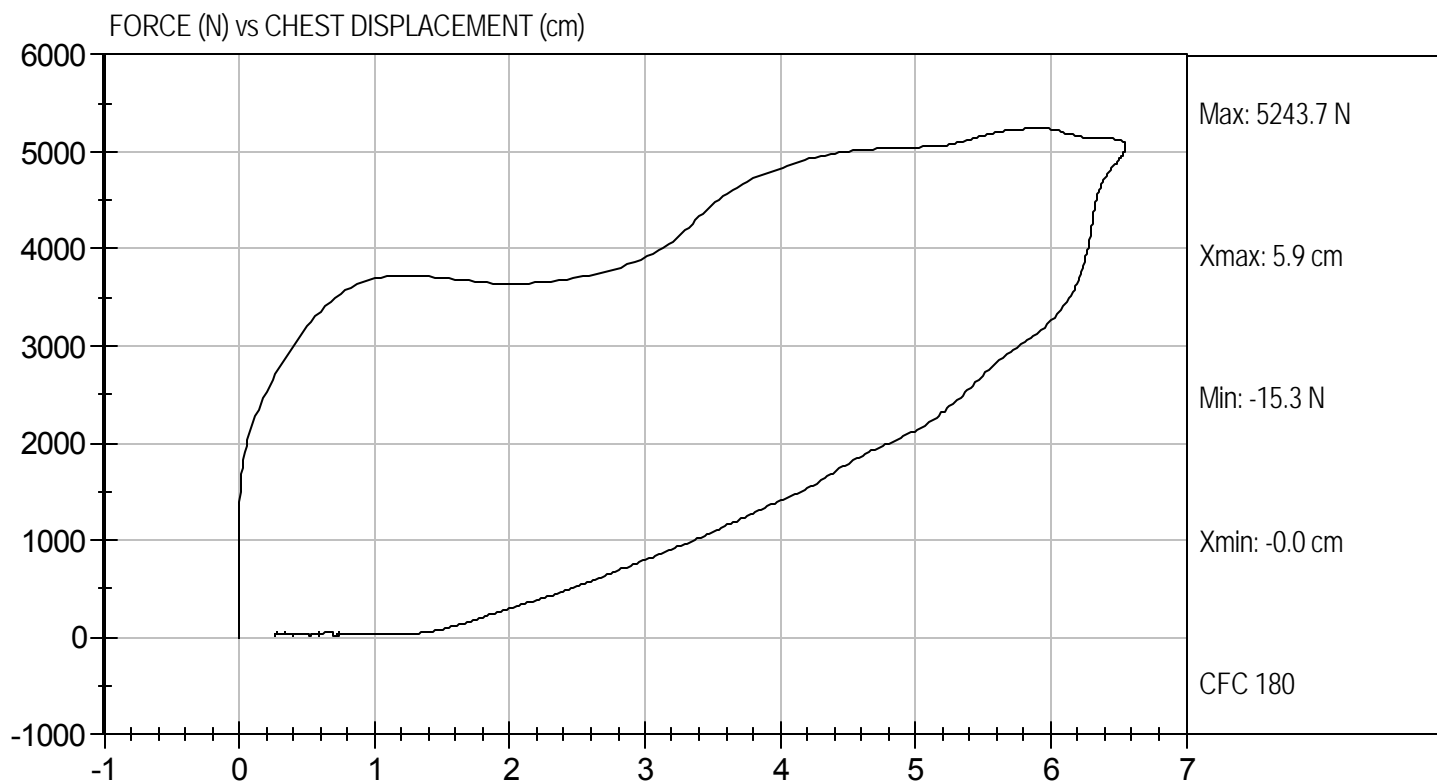
11/22/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D113914

Test Date: 11/22/11
Velocity: 22.22 ft/s, 6.77 m/s



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

ATD Serial No: 351

Test I.D: D113915

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5,178	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

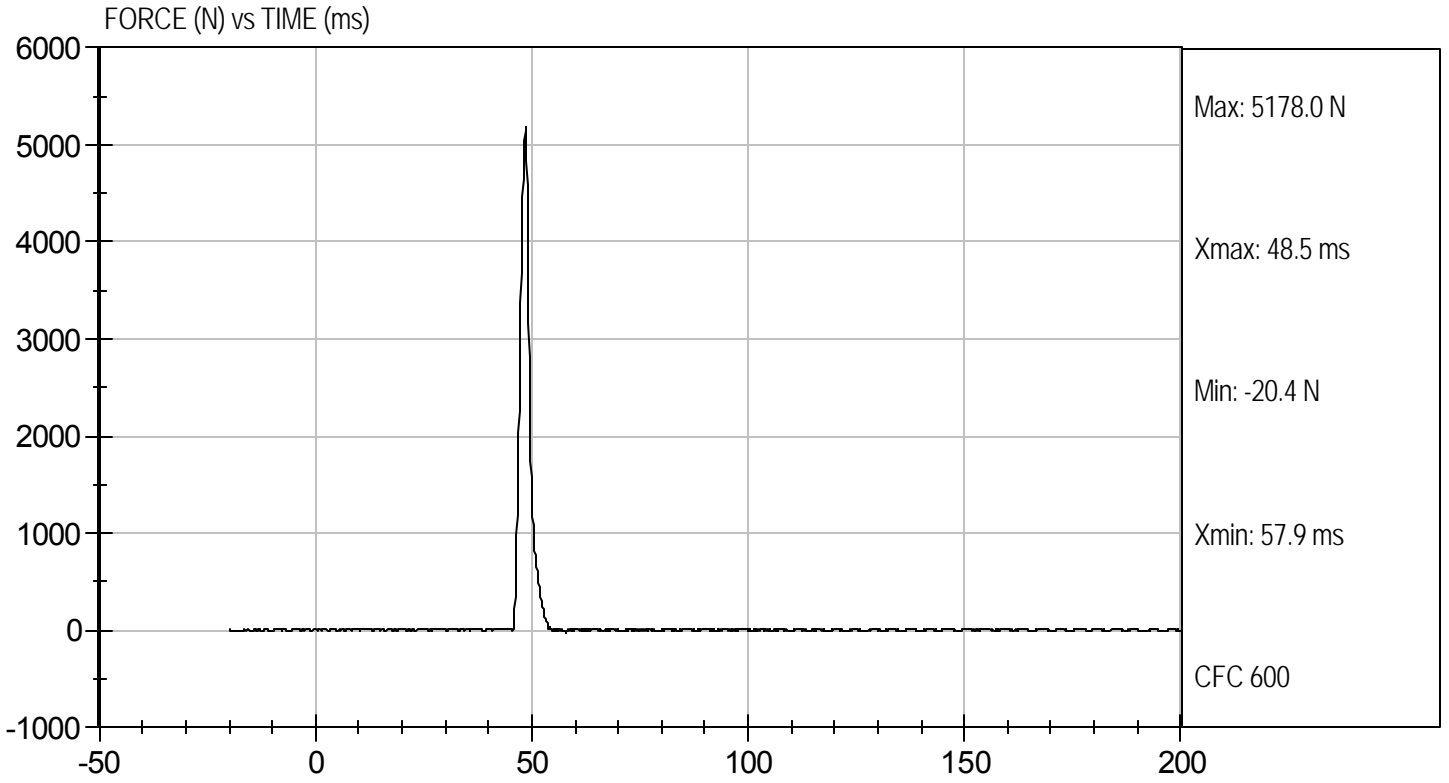
11/22/11
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D113915

Test Date: 11/22/11
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 351

Test I.D: D113916

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5,240	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

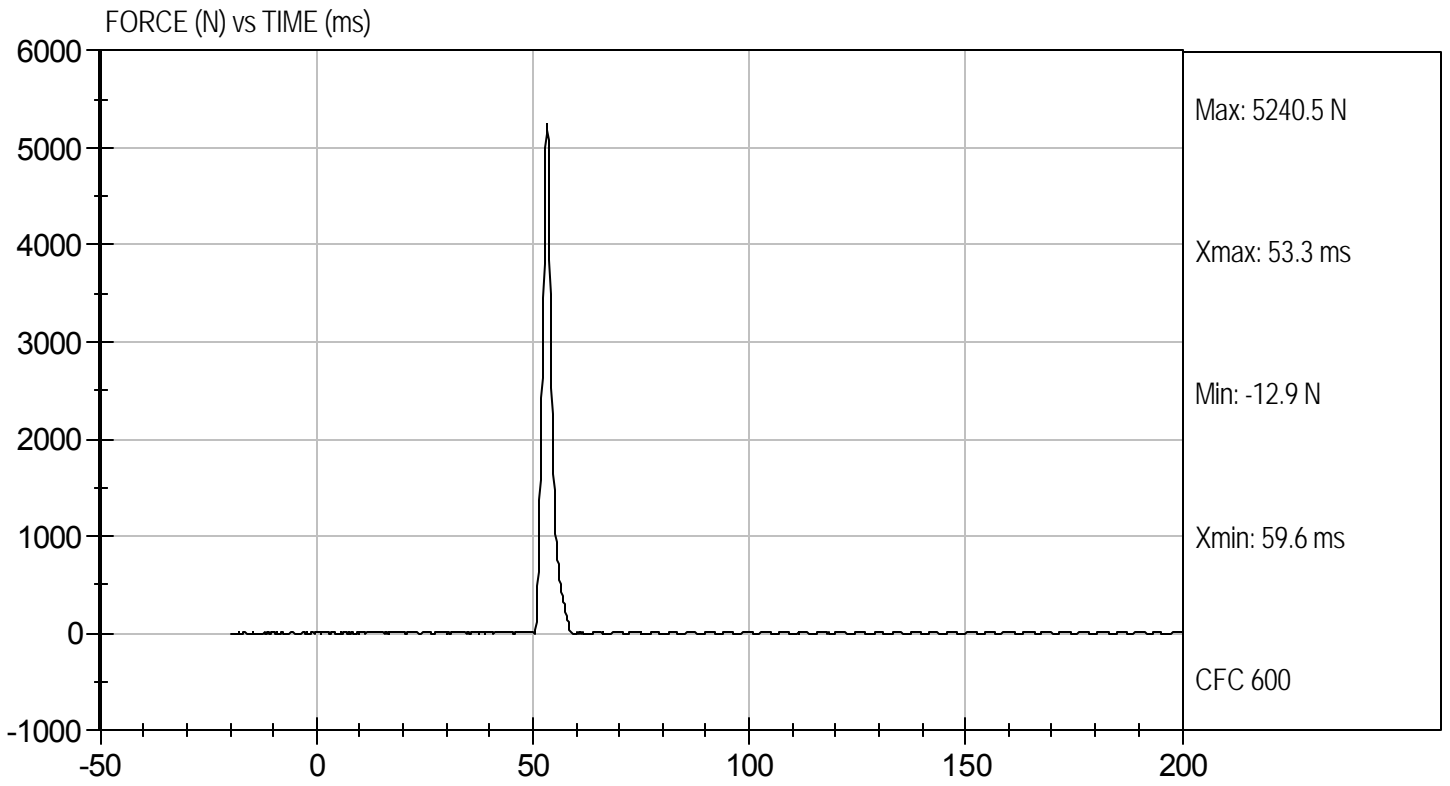
11/22/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Left Knee
Component ID: D113916

Test Date: 11/22/11
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 351

Test I.D: D113910

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.8	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	30	30	Pass
Rotation Rate	deg/s	5.0 -10.0	5.7	5.7	Pass
30 Degrees	Nm	94.9 Nm Max	63.6	62.0	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	42.4	41.9	Pass
Overall Test Results					Pass

Jessica Gall
Laboratory Technician

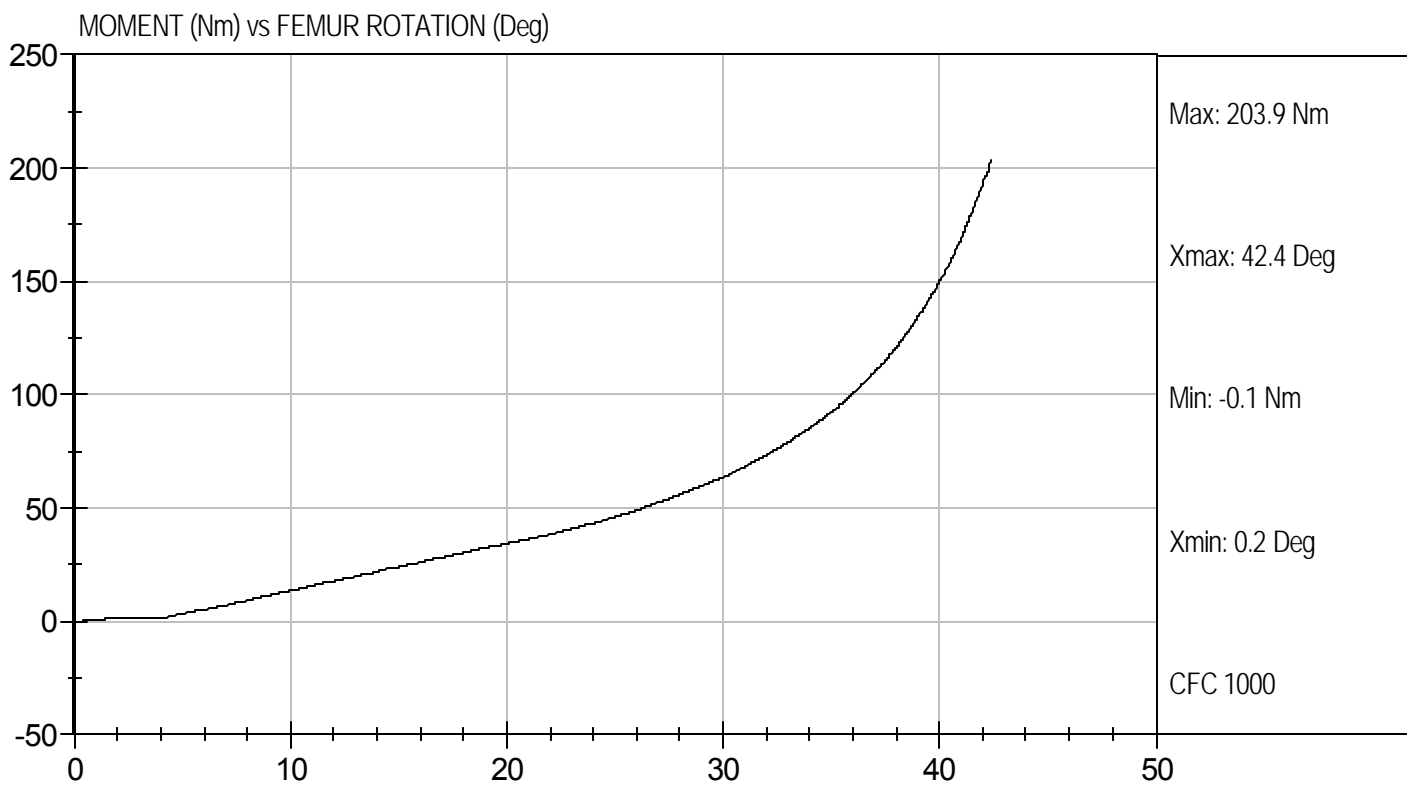
11/22/11
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D113919

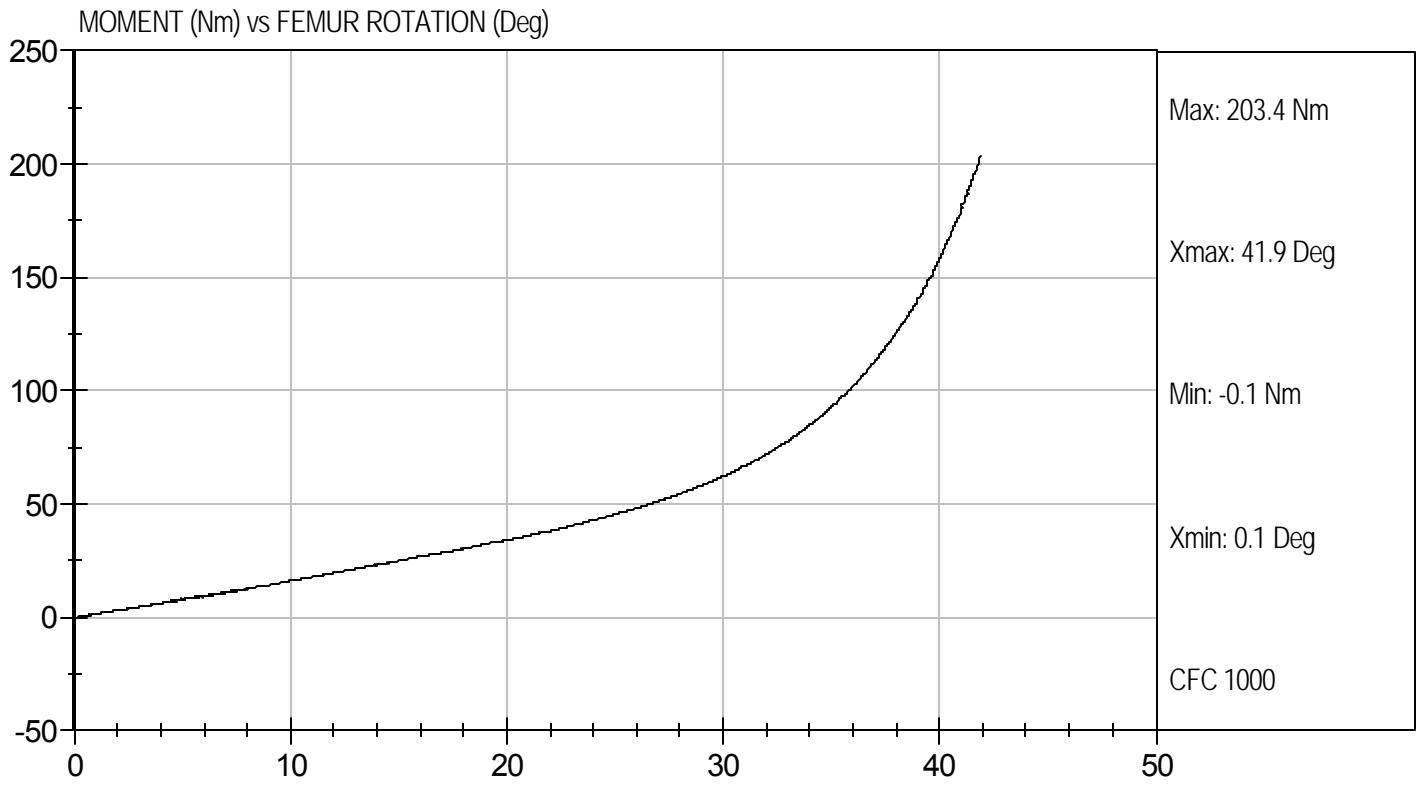
Test Date: 11/22/11
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D113910

Test Date: 11/22/11
Velocity: 0 ft/s, 0.00 m/s



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

ATD Serial No: 351

Test ID: D114011

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Peak Resultant Acceleration	G's	225 - 275	248	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 Hall
Laboratory Technician

11/30/11
Test Date

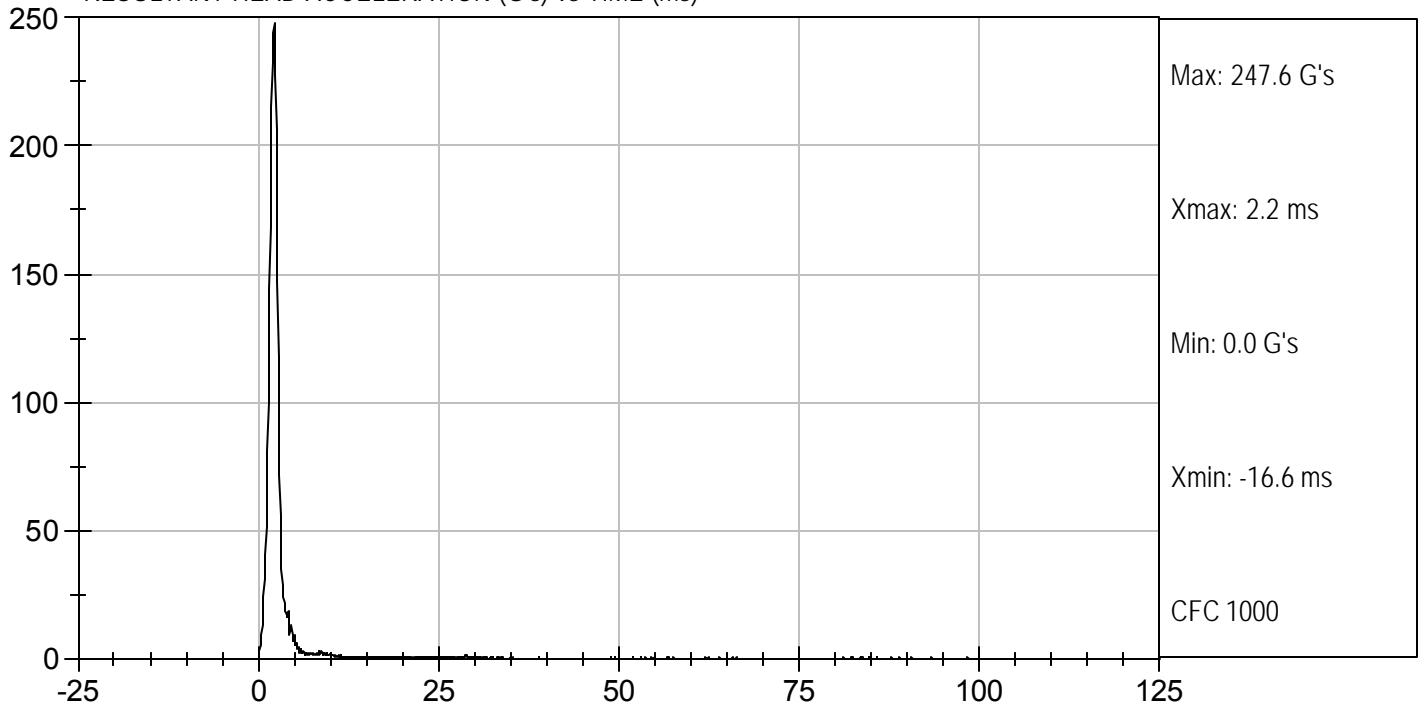
David Winkelbauer
Approved By



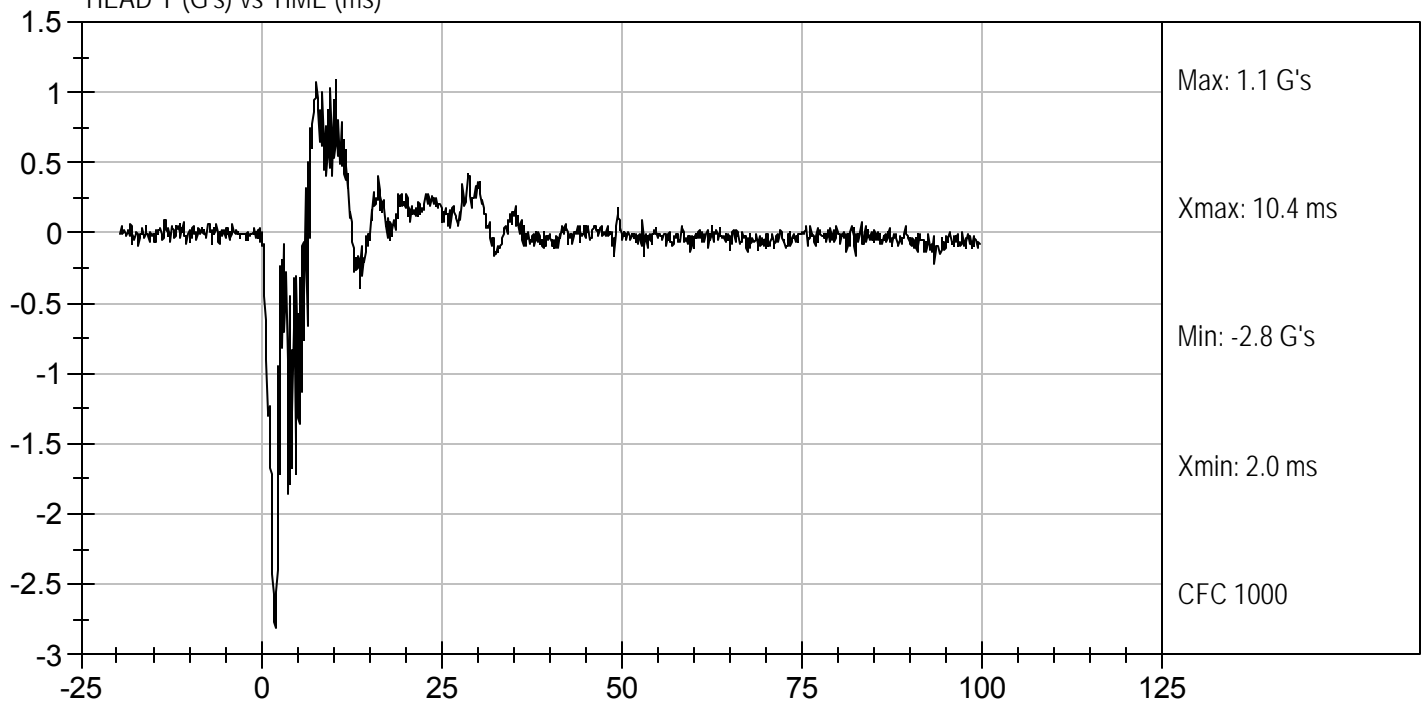
Test Desc: Head Drop
Component ID: D114011

Test Date: 11/30/11
Velocity: 0 ft/s, 0.00 m/s

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



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



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

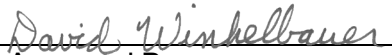
ATD Serial No: 351

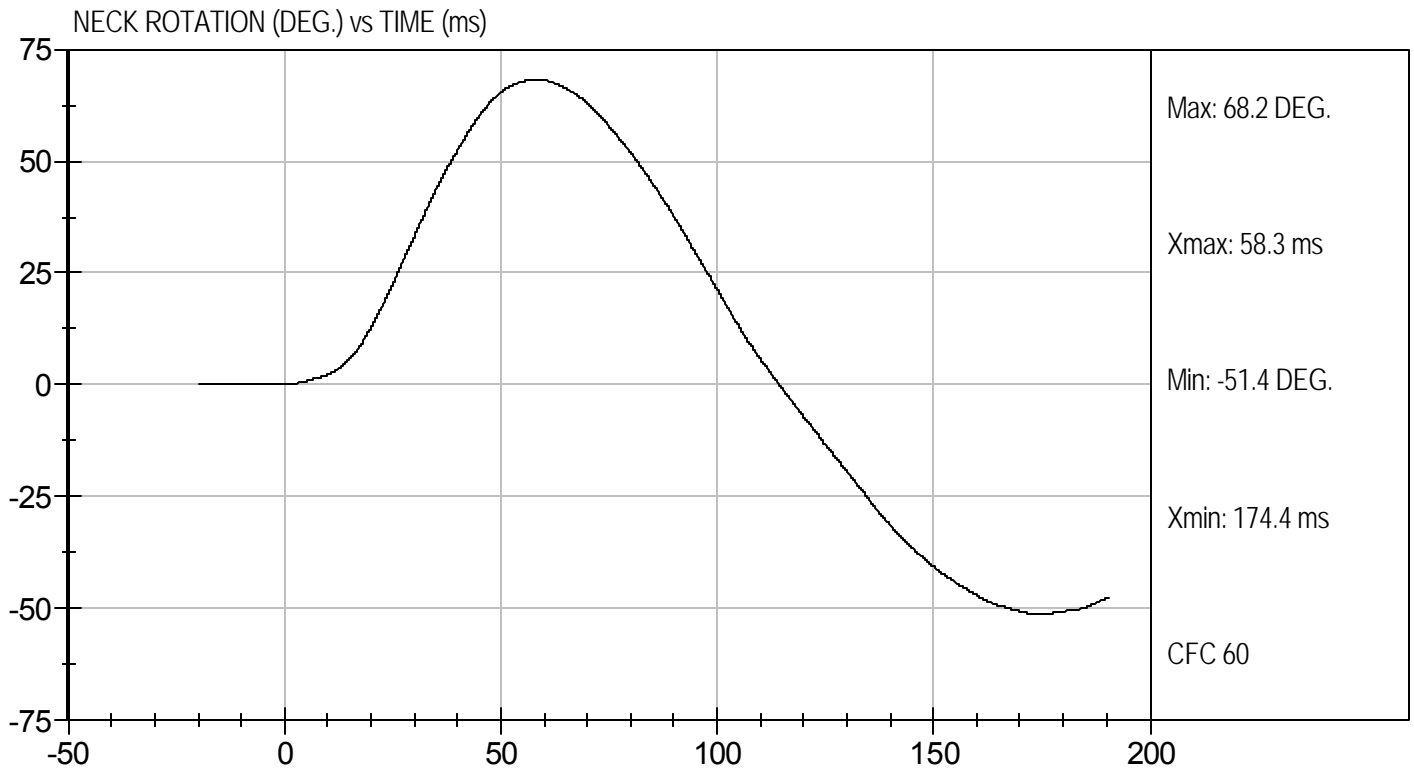
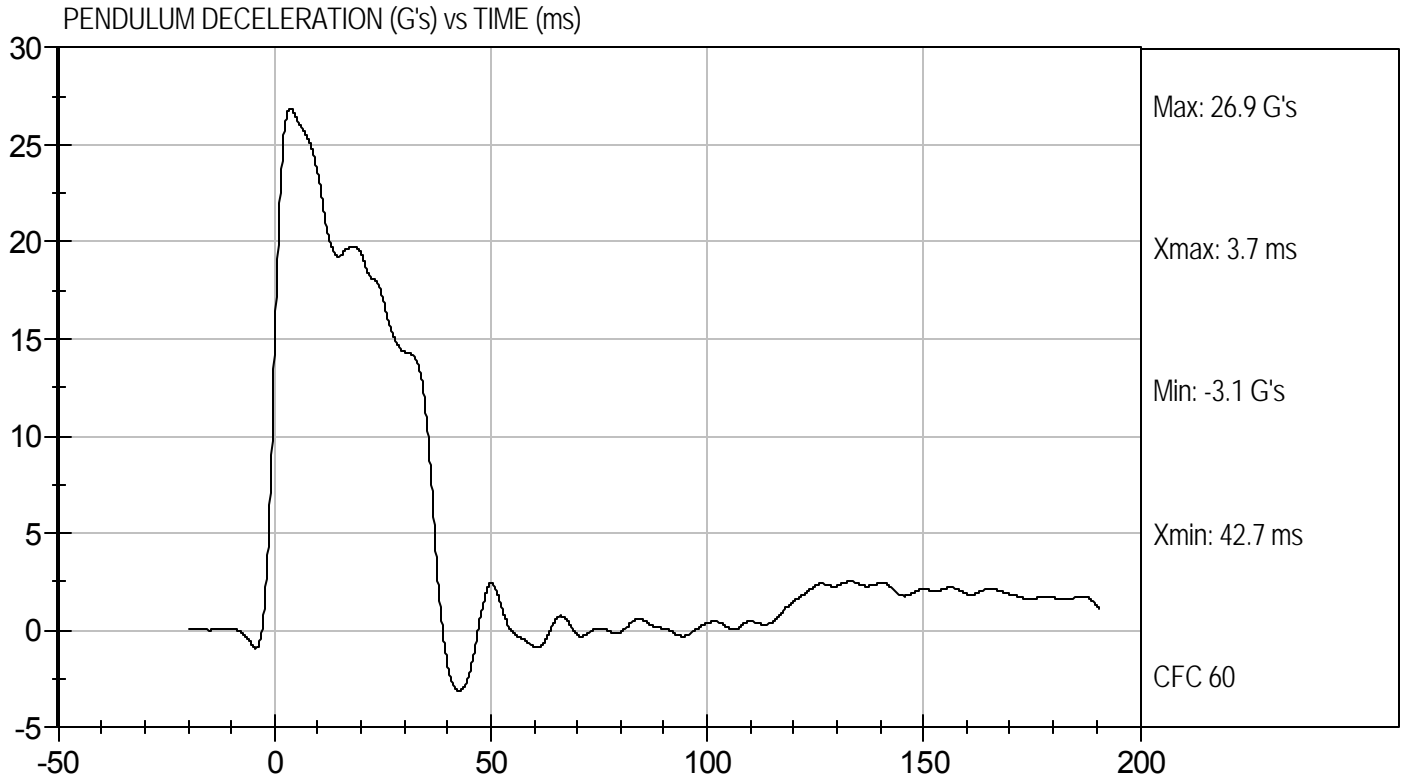
Test I.D.: D114012

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	16	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.43	Pass
	20 ms	G's	17.60 to 22.60	19.41	Pass
	30 ms	G's	12.50 to 18.50	14.34	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	37.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	68.2	Pass
	Time	ms	57.0 to 64.0	58.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	114.5	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	90.1	Pass
	Time	ms	47.0 to 58.0	50.2	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	100.2	Pass
Overall Test Results					Pass


Laboratory Technician

11/30/11
Test Date

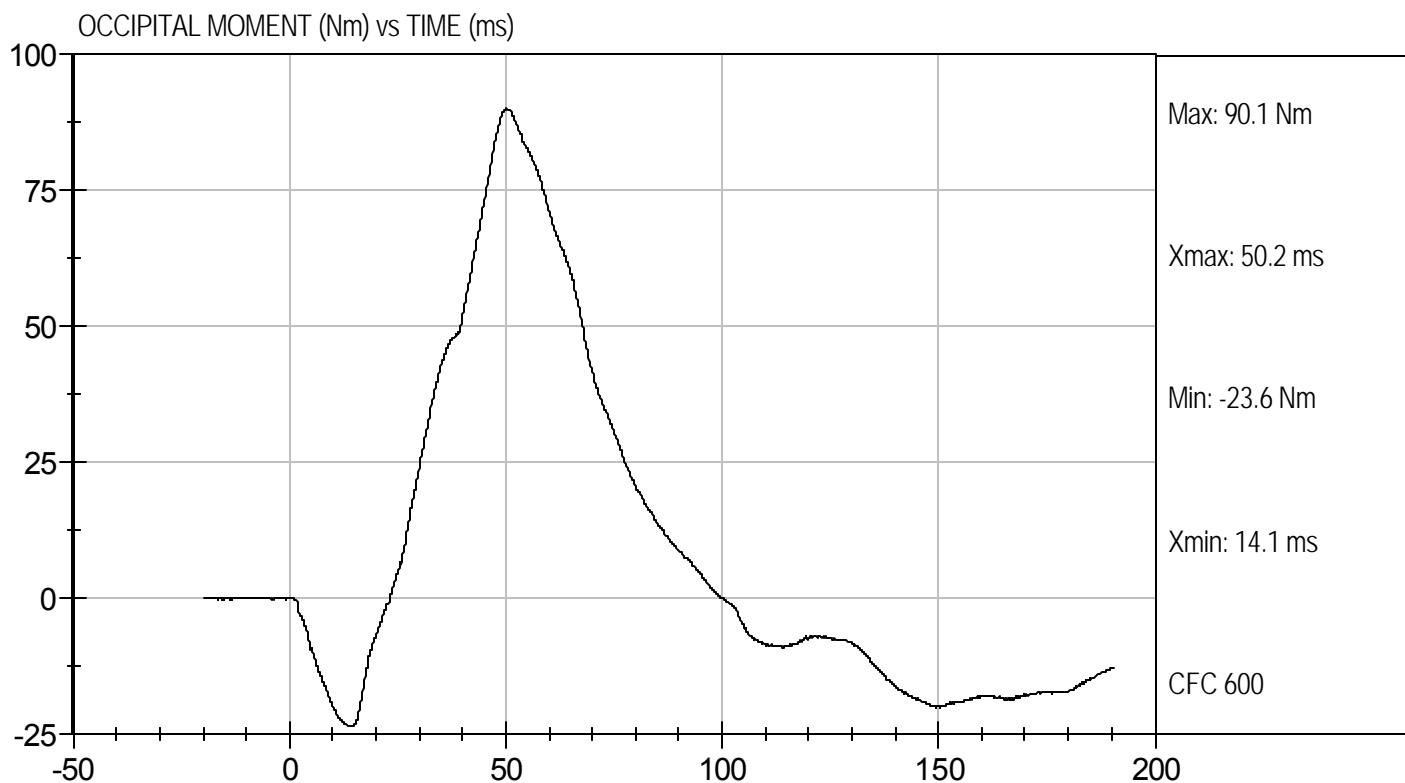

Approved By





Test Desc: Neck Flexion
Component ID: D114012

Test Date: 11/30/11
Velocity: 23.15 ft/s, 7.06 m/s



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

ATD Serial No: 351

Test I.D.: D114013

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	16	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.24	Pass
	20 ms	G's	14.00 to 19.00	15.90	Pass
	30 ms	G's	11.00 to 16.00	11.92	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	97.5	Pass
	Time	ms	72.0 to 82.0	76.8	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	156.3	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.7	Pass
	Time	ms	65.0 to 79.0	71.0	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.2	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

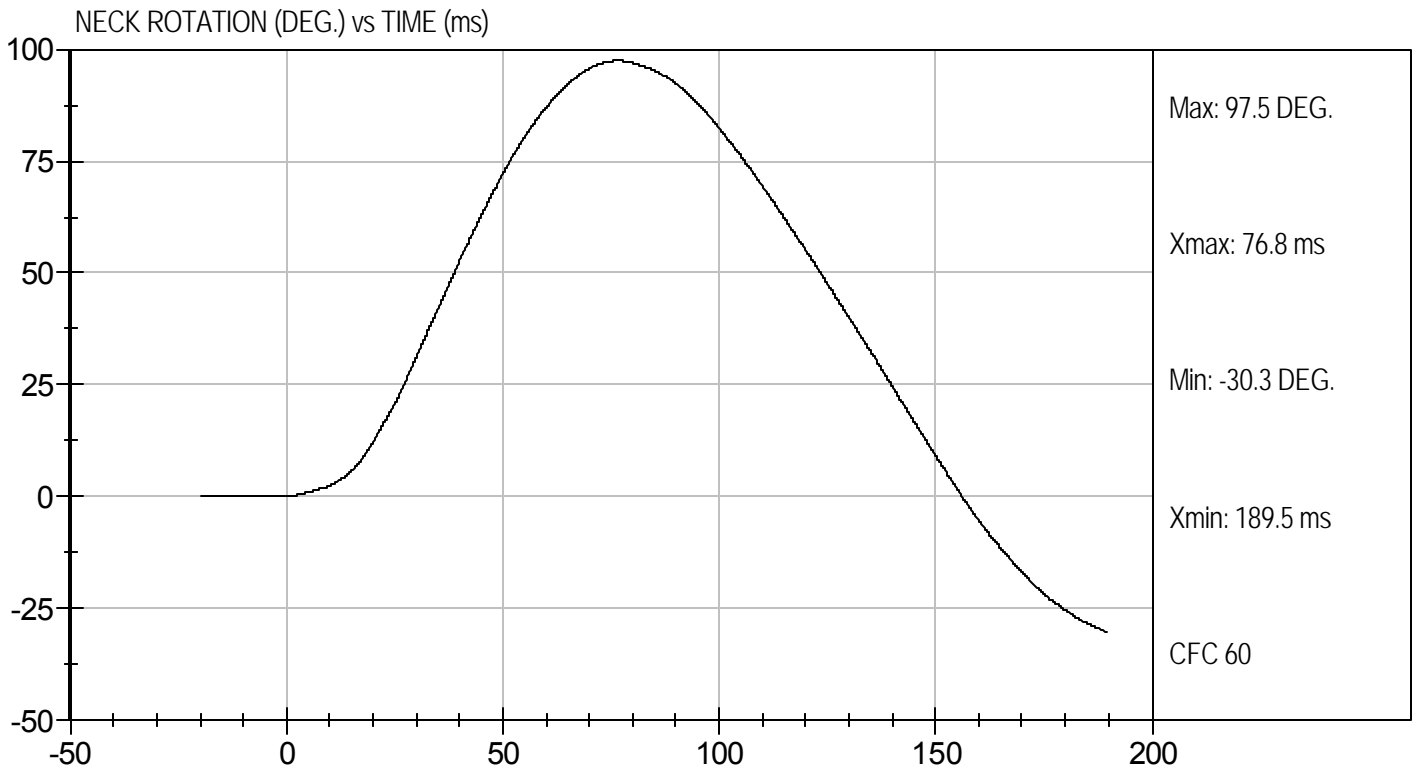
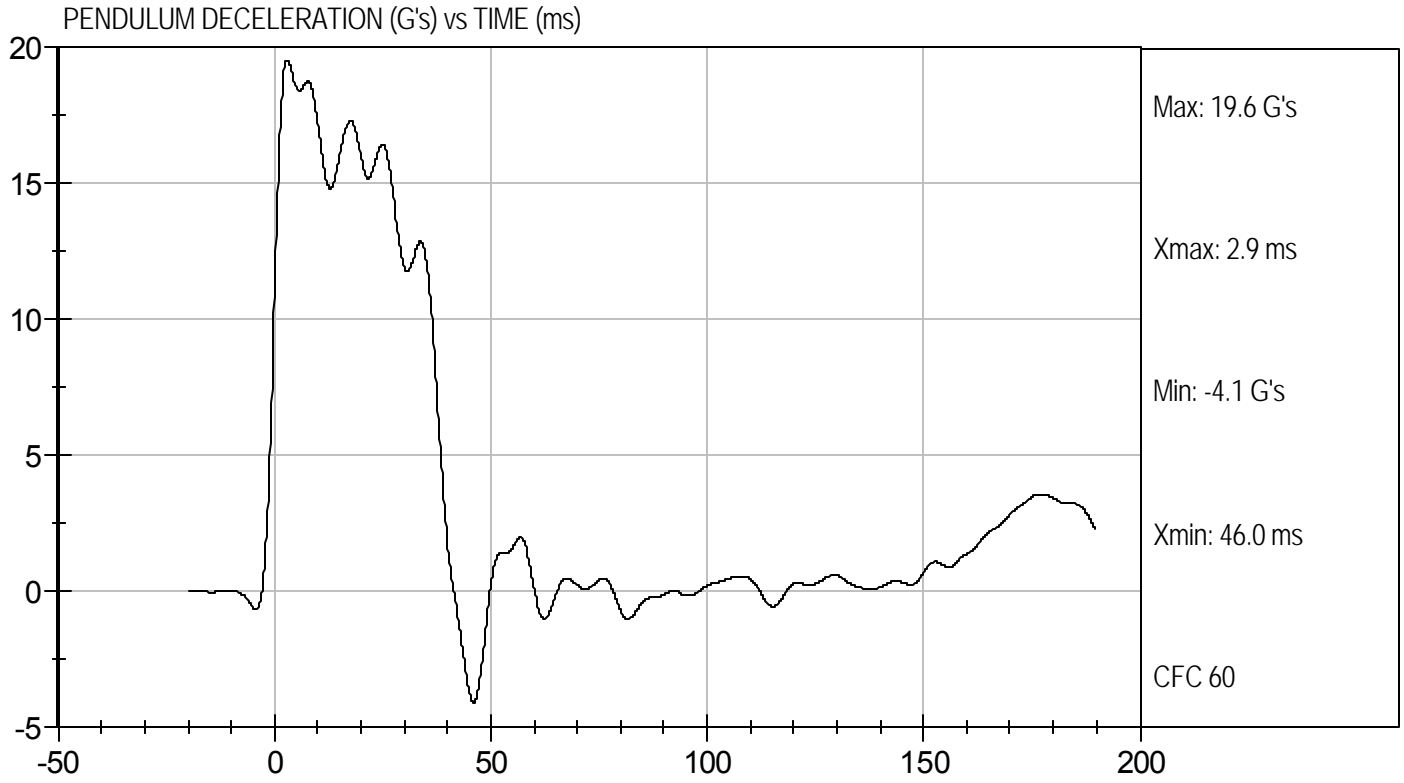
11/30/11
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D114013

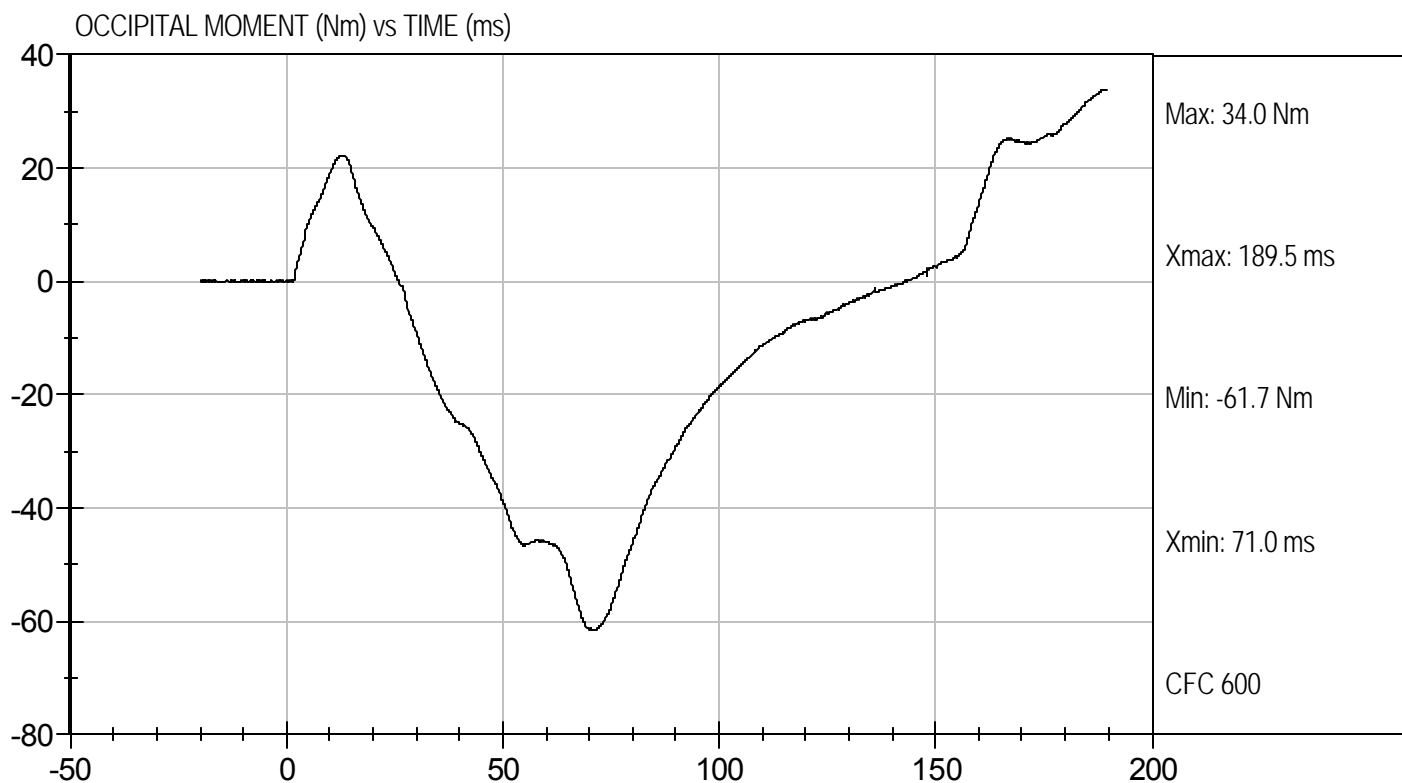
Test Date: 11/30/11
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D114013

Test Date: 11/30/11
Velocity: 20.08 ft/s, 6.12 m/s



**MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE**


ATD Serial No: 351

Test I.D.: D114014

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,187	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.78	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results				Pass


Laboratory Technician

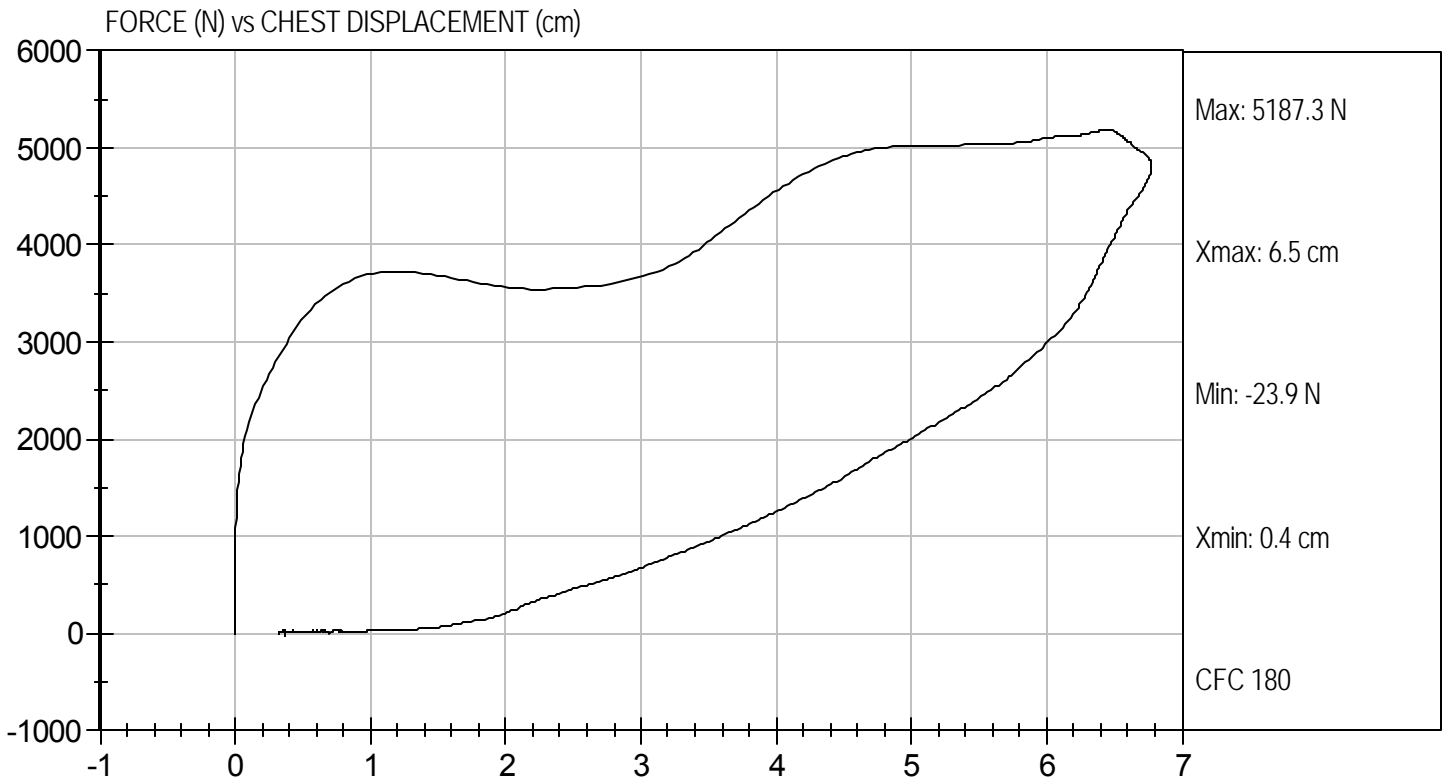
12/1/11
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D114014

Test Date: 12/1/11
Velocity: 22.2 ft/s, 6.77 m/s



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

ATD Serial No: 351

Test I.D: D114015

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	17	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5,411	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

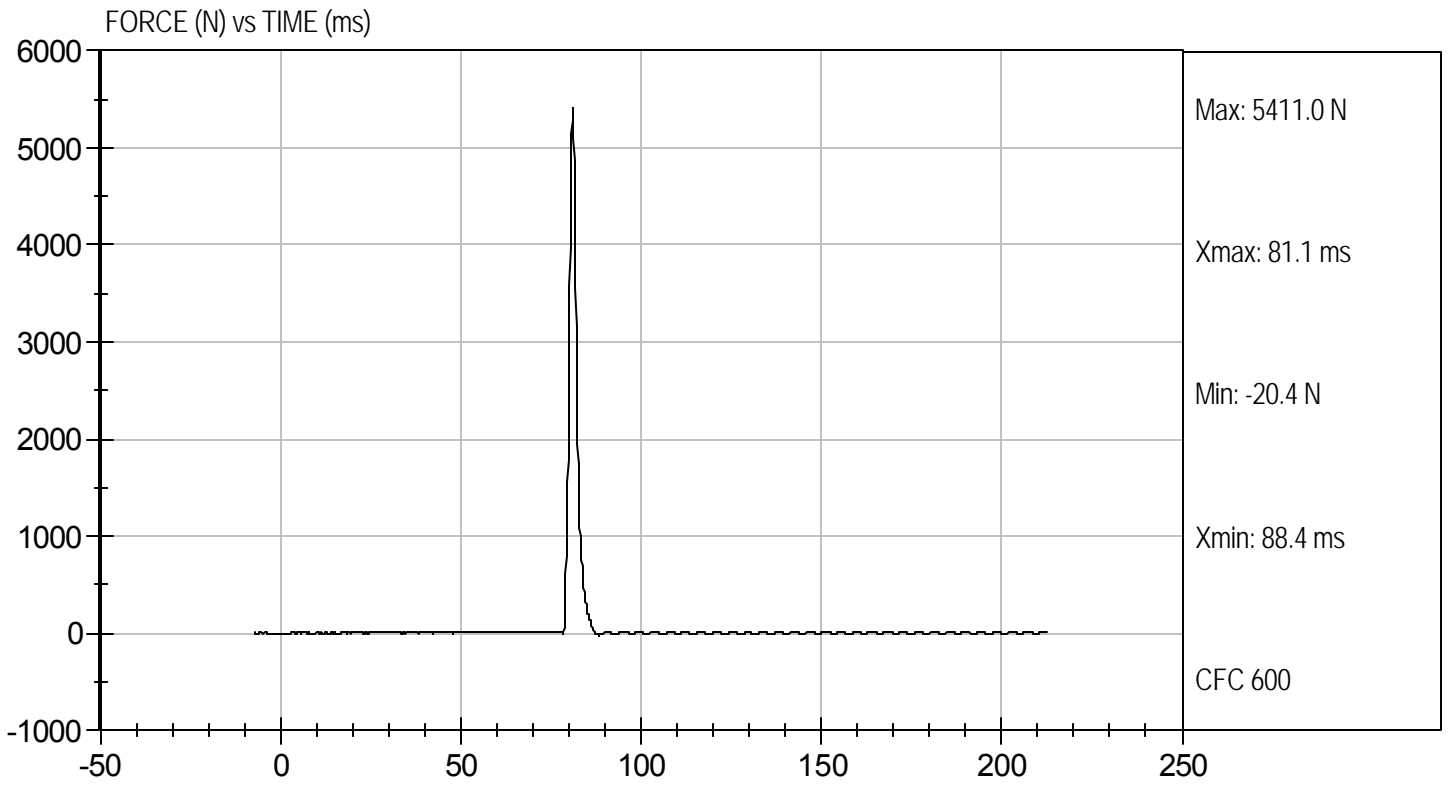
11/30/11
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D114015

Test Date: 11/30/11
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 351

Test I.D: D114016

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	17	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	4,973	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

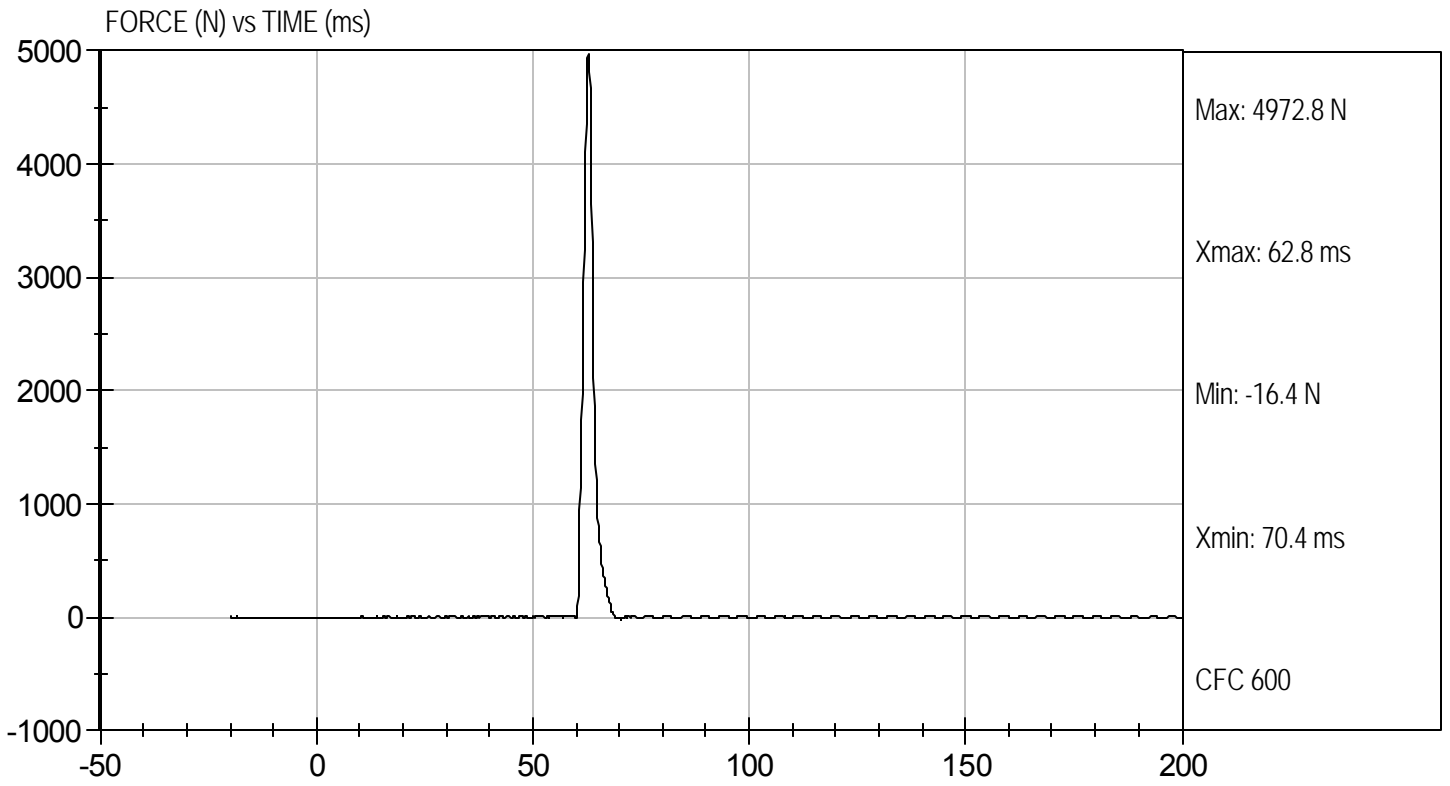
11/30/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Left Knee
Component ID: D114016

Test Date: 11/30/11
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 351

Test I.D: D114010

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.1	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	21	21	Pass
Rotation Rate	deg/s	5.0 -10.0	5.7	5.7	Pass
30 Degrees	Nm	94.9 Nm Max	56.9	59.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	43.2	42.3	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

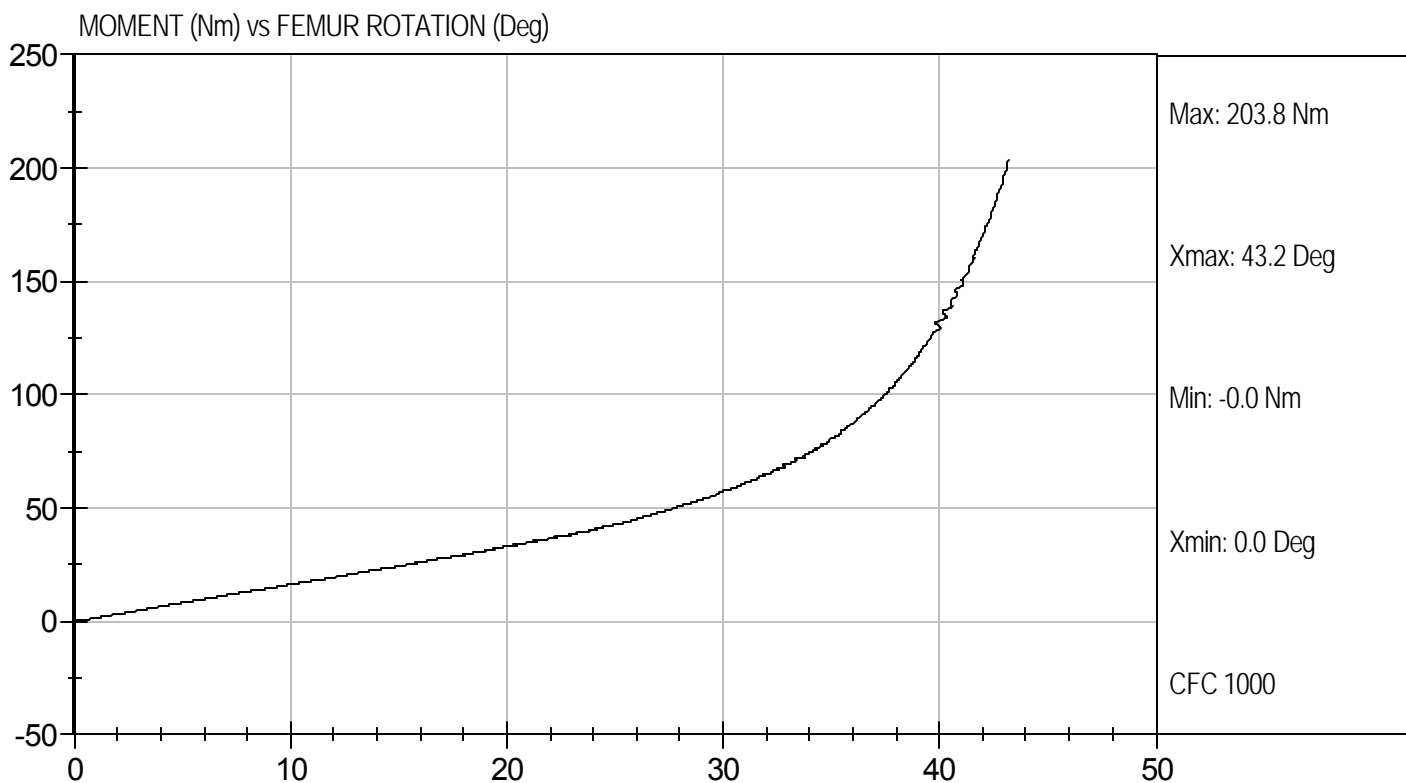
11/30/11
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D114019

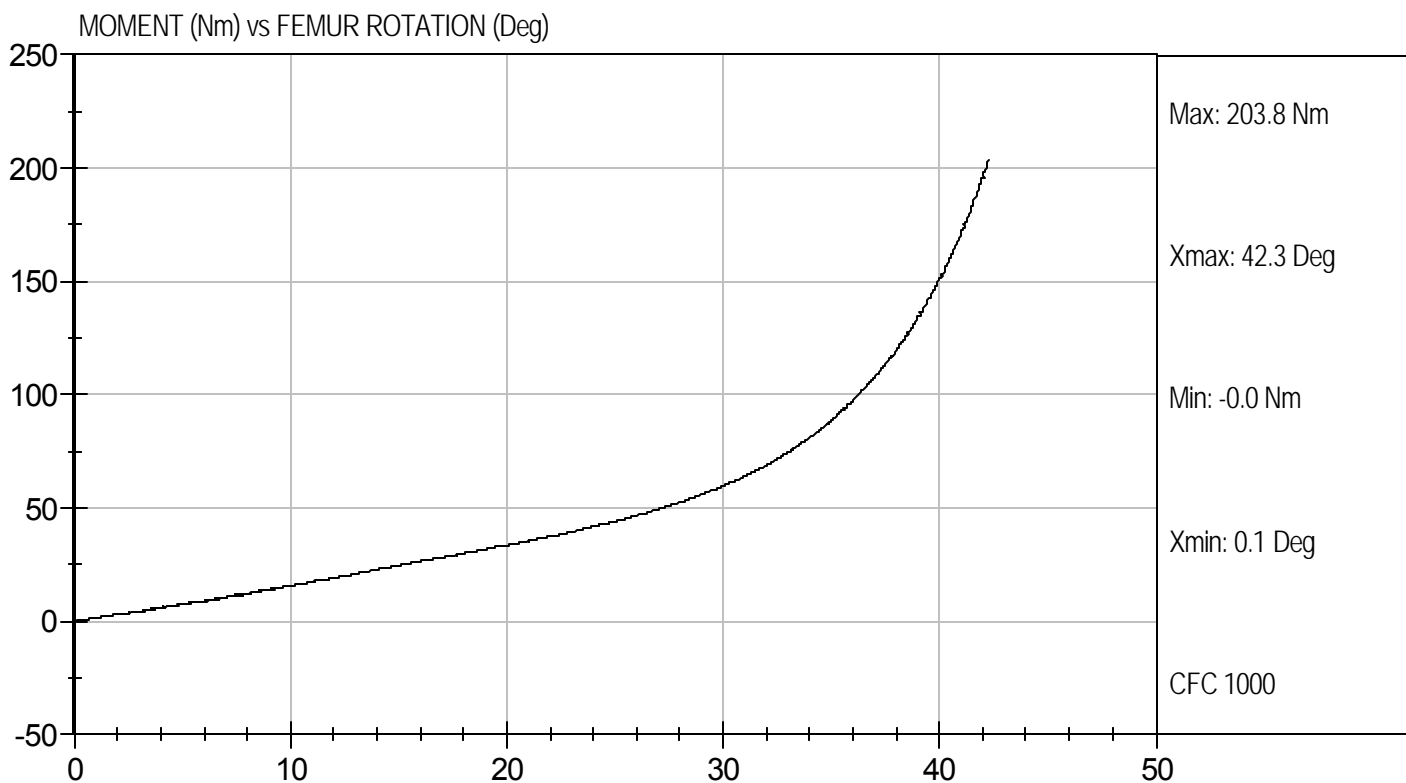
Test Date: 11/30/11
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D114010

Test Date: 11/30/11
Velocity: 0 ft/s, 0.00 m/s



**MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE**

ATD Serial No: 138

Test ID: D113891

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	250 to 300	288	Pass
Peak Lateral Acceleration	G's	+/- 15	-7.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

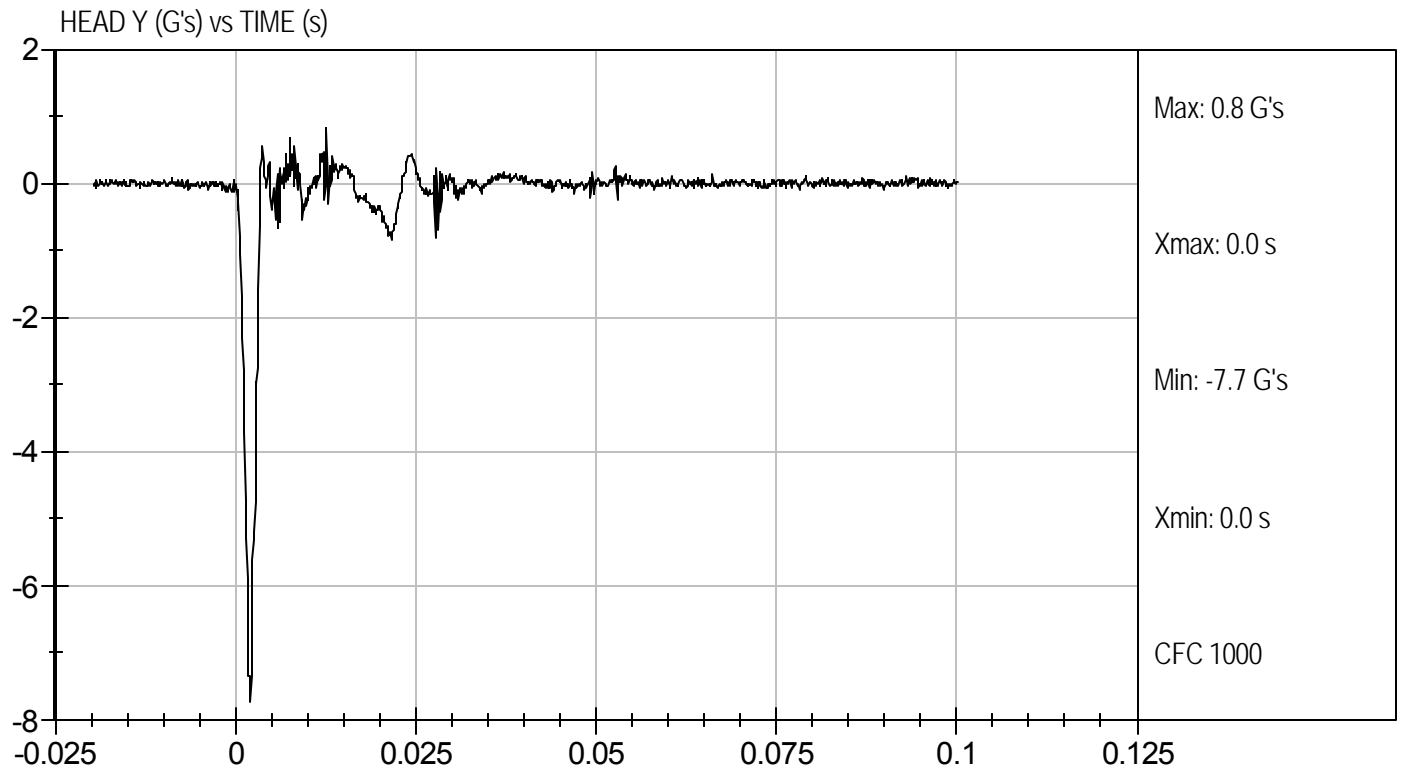
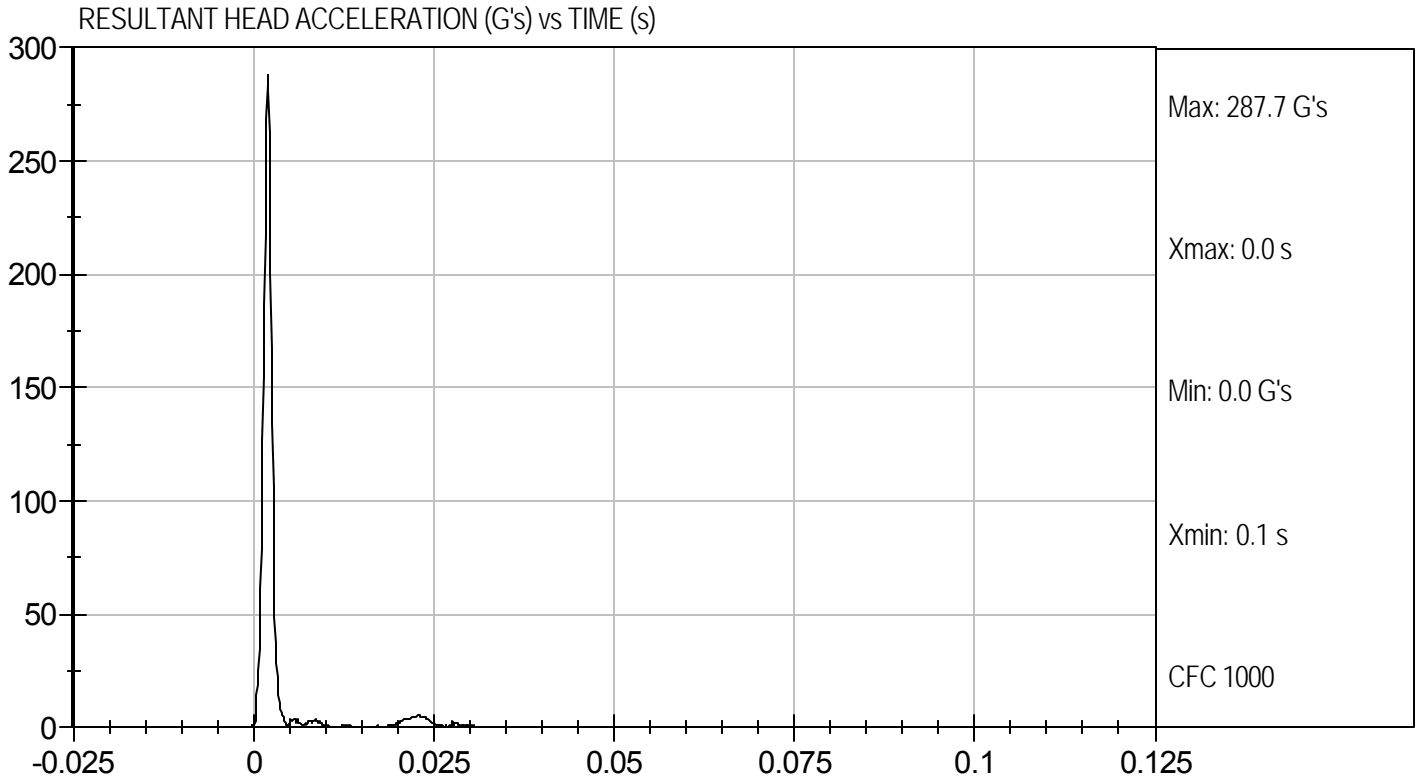
11/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D113891

Test Date: 11/21/11
Velocity: 0 ft/s, 0 m/s



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D.: D113892

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.05	Pass
Pendulum Pulse	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.3	Pass
	30 ms	m/s	5.8 to 7.0	5.8	Pass
D Plane Rotation	Max	deg	77 to 91	78	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	76	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	87	Pass
				Overall Results	Pass

Jessica Hall
Laboratory Technician

11/22/11
Test Date

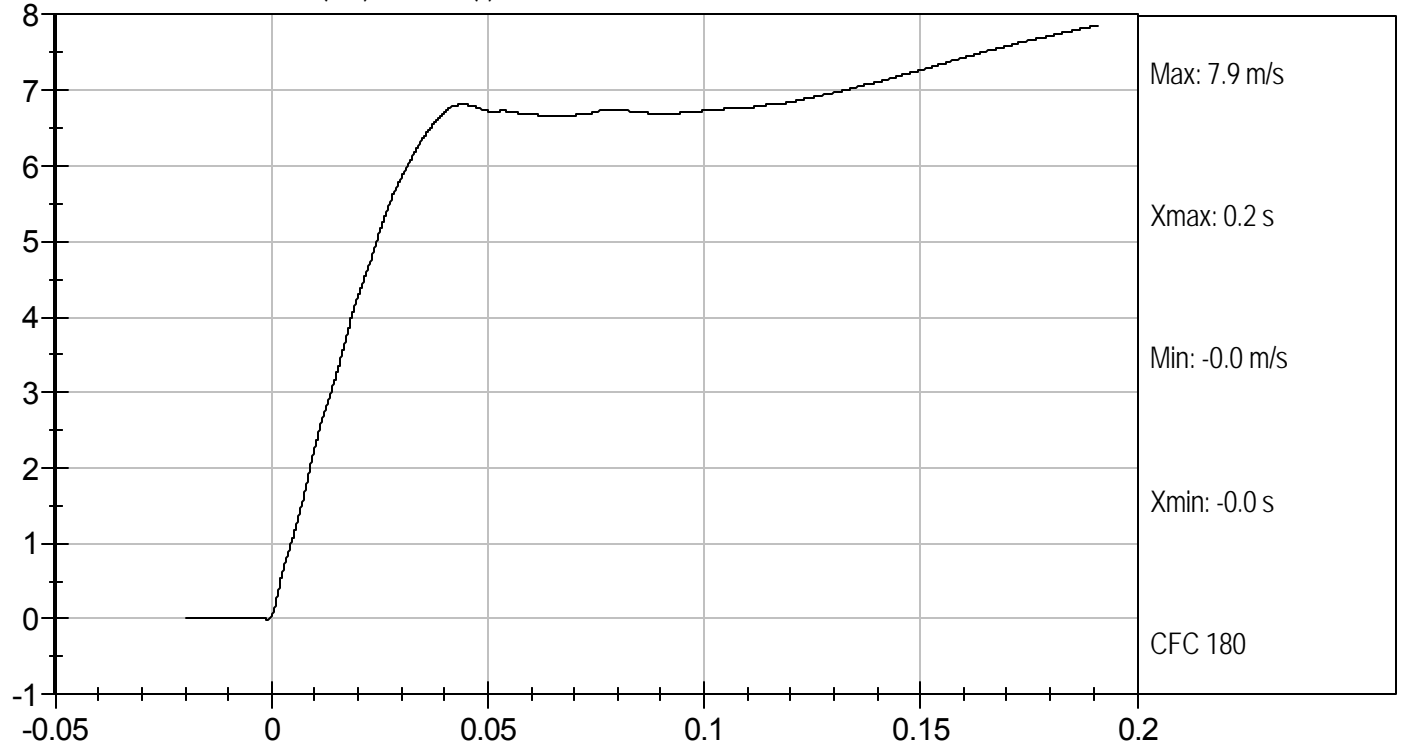
David Winkelbauer
Approved By



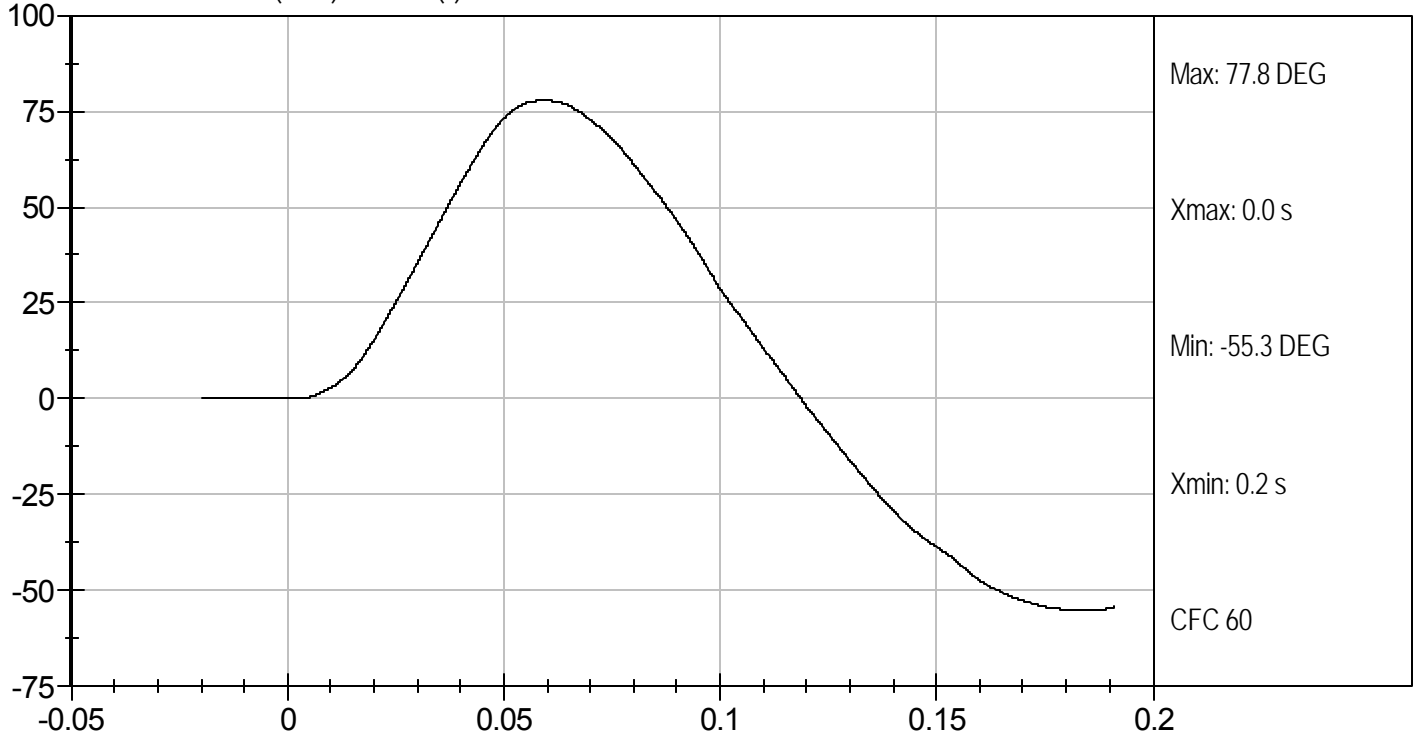
Test Desc: Neck Flexion
Component ID: D113892

Test Date: 11/22/11
Velocity: 23.14 ft/s, 7.05 m/s

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



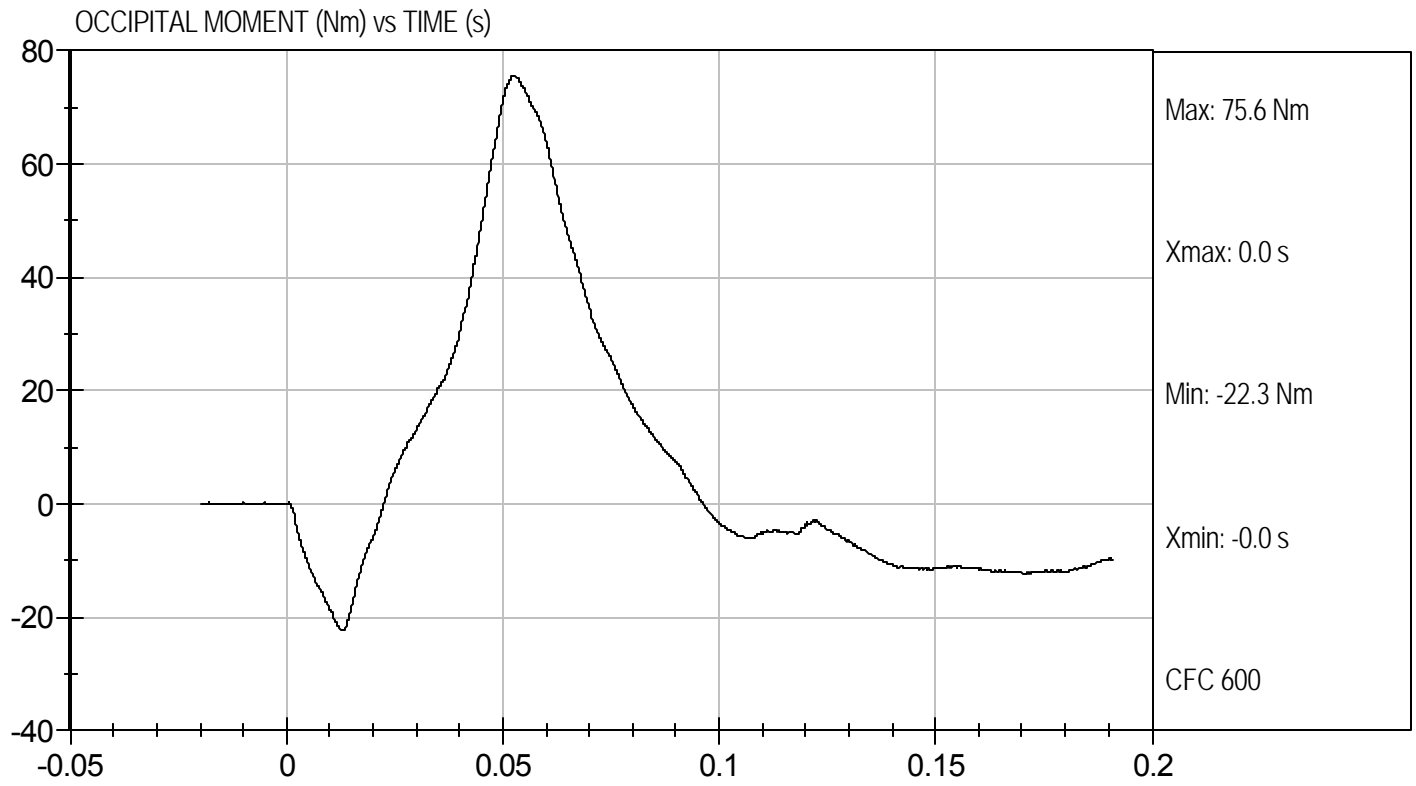
NECK ROTATION (DEG) vs TIME (s)





Test Desc: Neck Flexion
Component ID: D113892

Test Date: 11/22/11
Velocity: 23.14 ft/s, 7.05 m/s

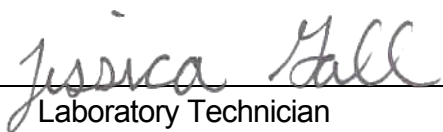


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE


ATD Serial No: 138

Test I.D.: D113893

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Pulse	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.1	Pass
D Plane Rotation	Max	deg	99 to 114	106	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-57	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	102	Pass
Overall Results					Pass


 Laboratory Technician

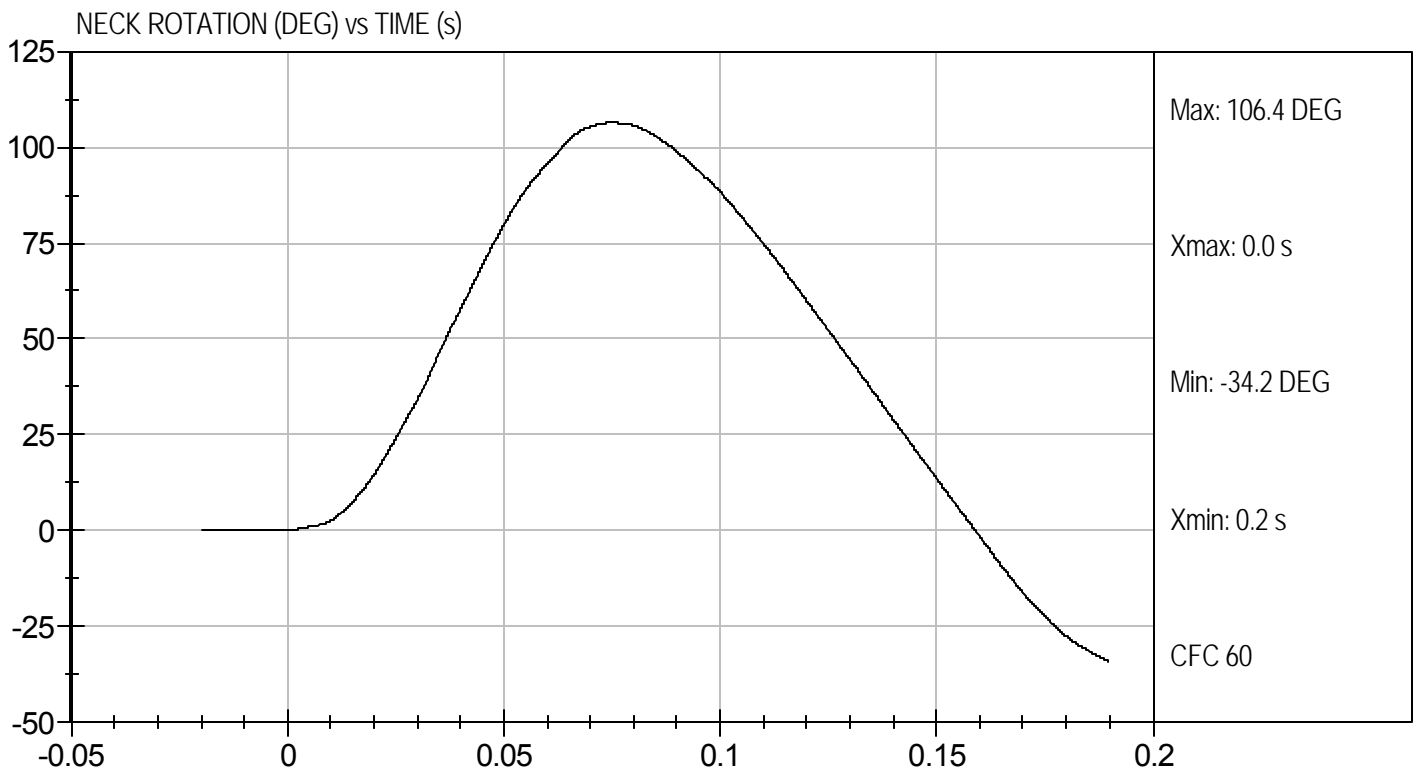
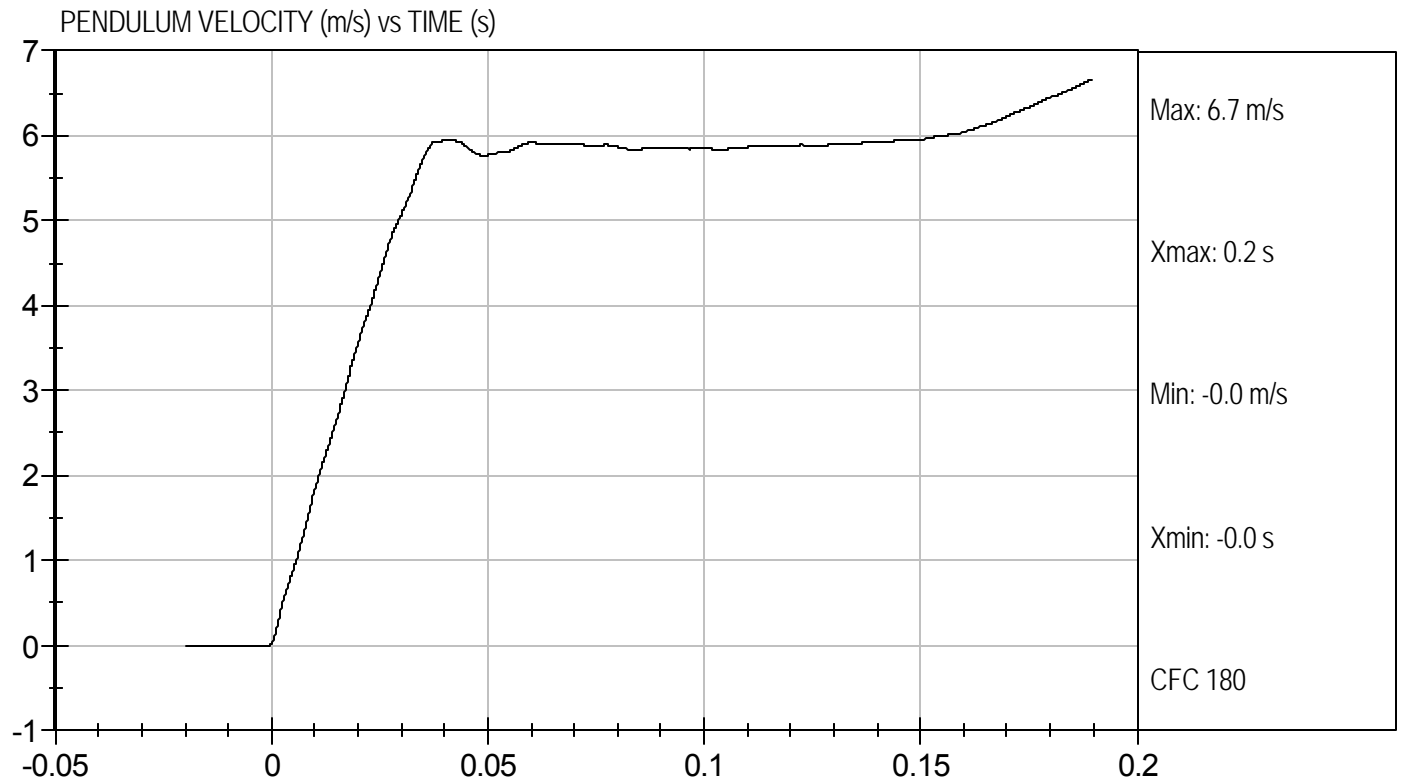
11/22/11
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D113893

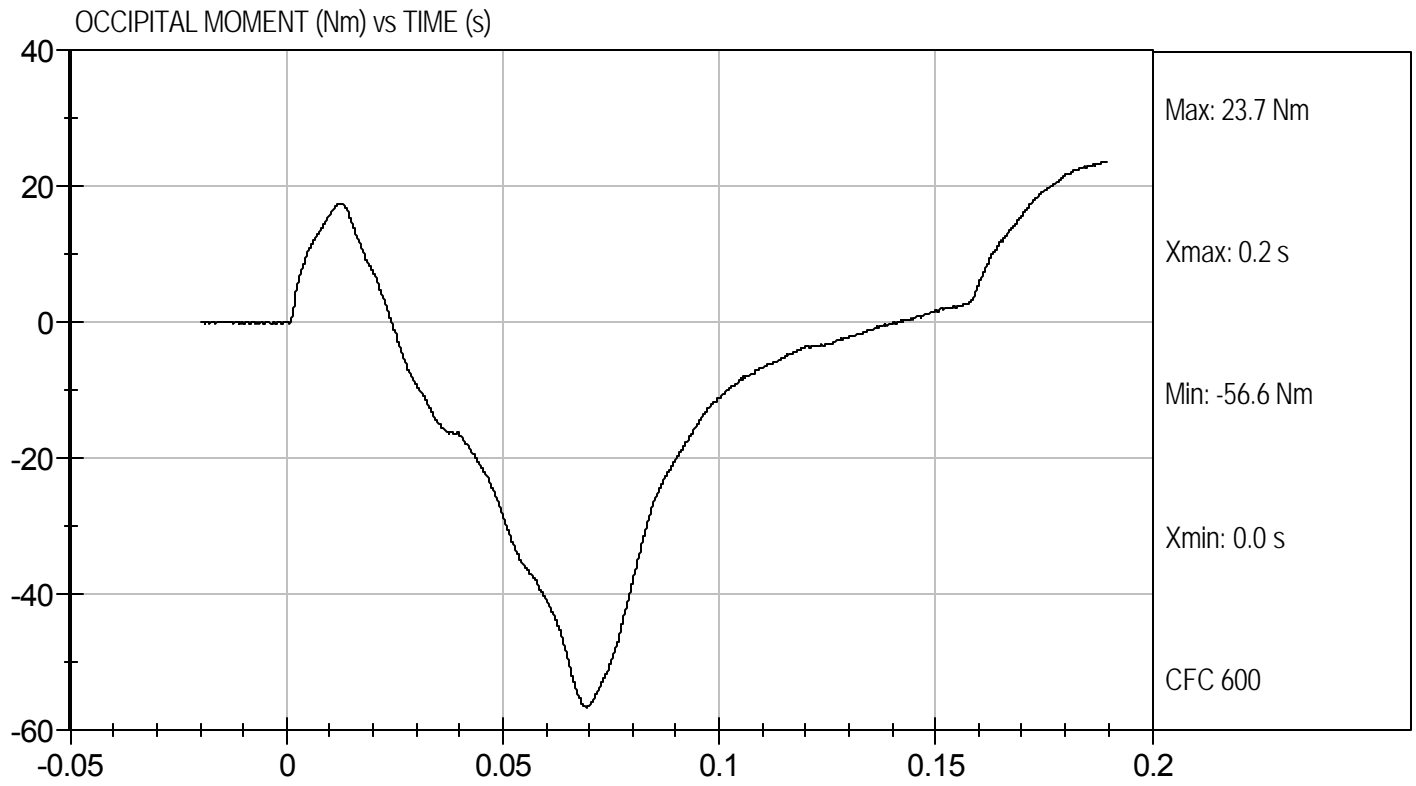
Test Date: 11/22/11
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D113893

Test Date: 11/22/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D113894

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Relative Humidity	%	10 to 70	29	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	56	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.1	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	3984	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

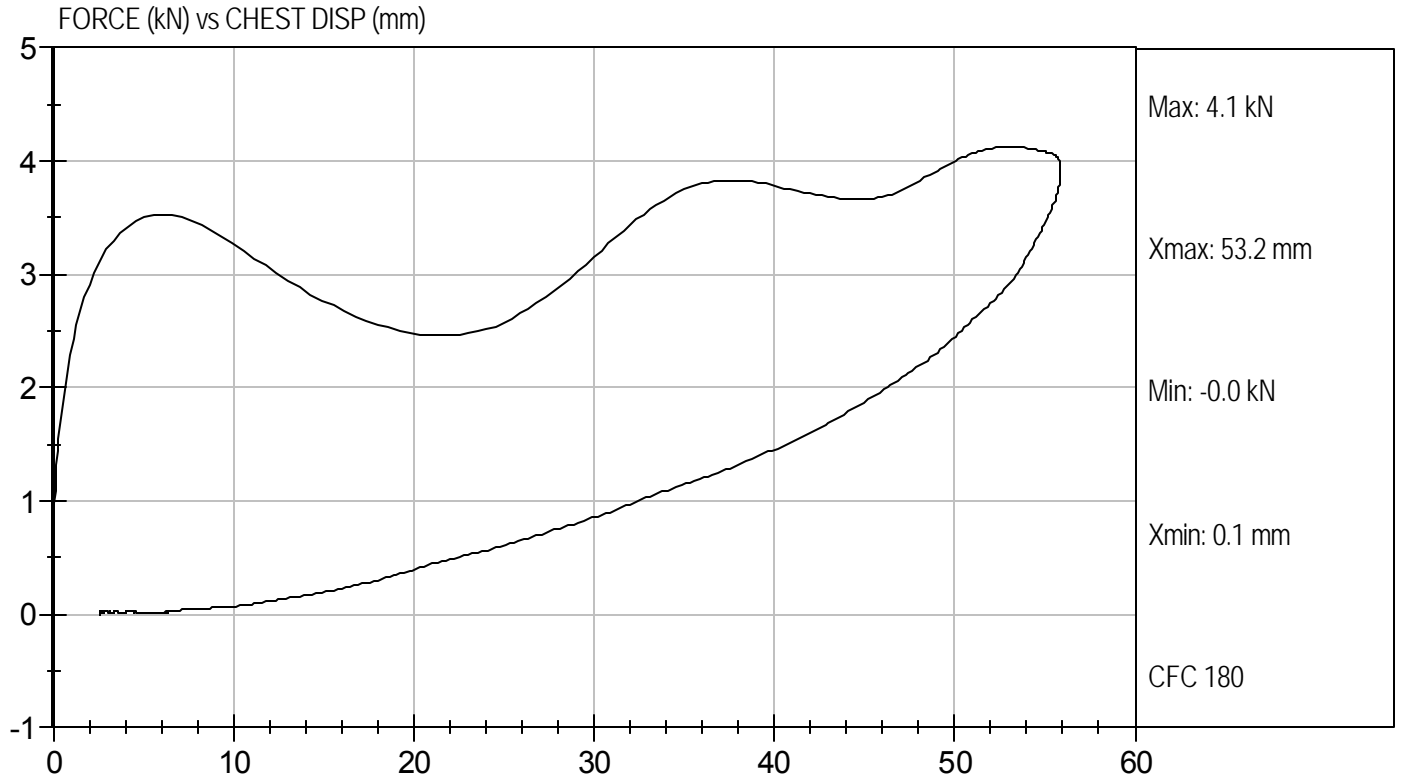
11/22/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Thorax Impact
Component ID: D113894

Test Date: 11/22/11
Velocity: 22.2 ft/s, 6.77 m/s



**MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE**

ATD Serial No: 138

Test I.D: D113895

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.57	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

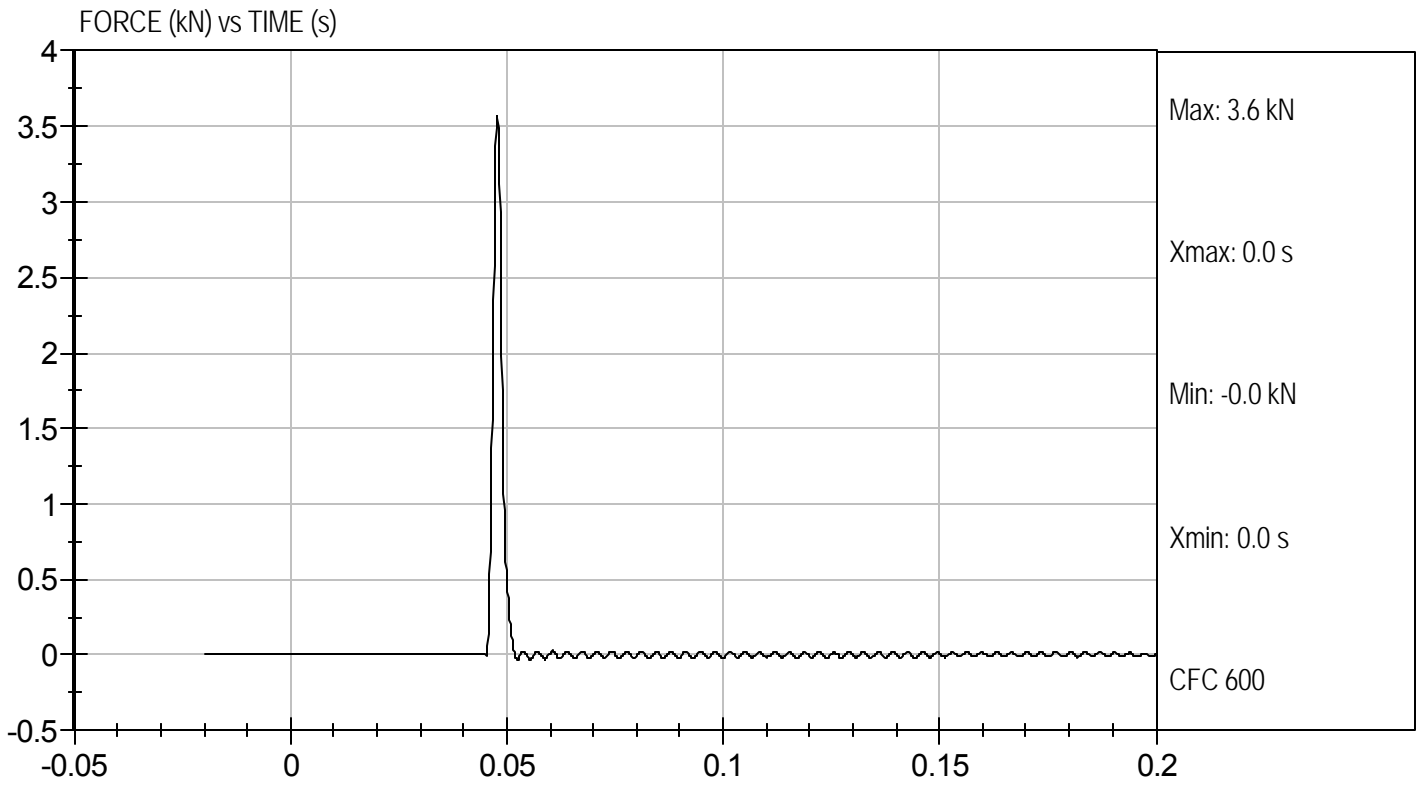
11/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D113895

Test Date: 11/21/11
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D113896

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.67	Pass
Overall Test Results				Pass

Jessica Hall

 Laboratory Technician

11/21/11

 Test Date

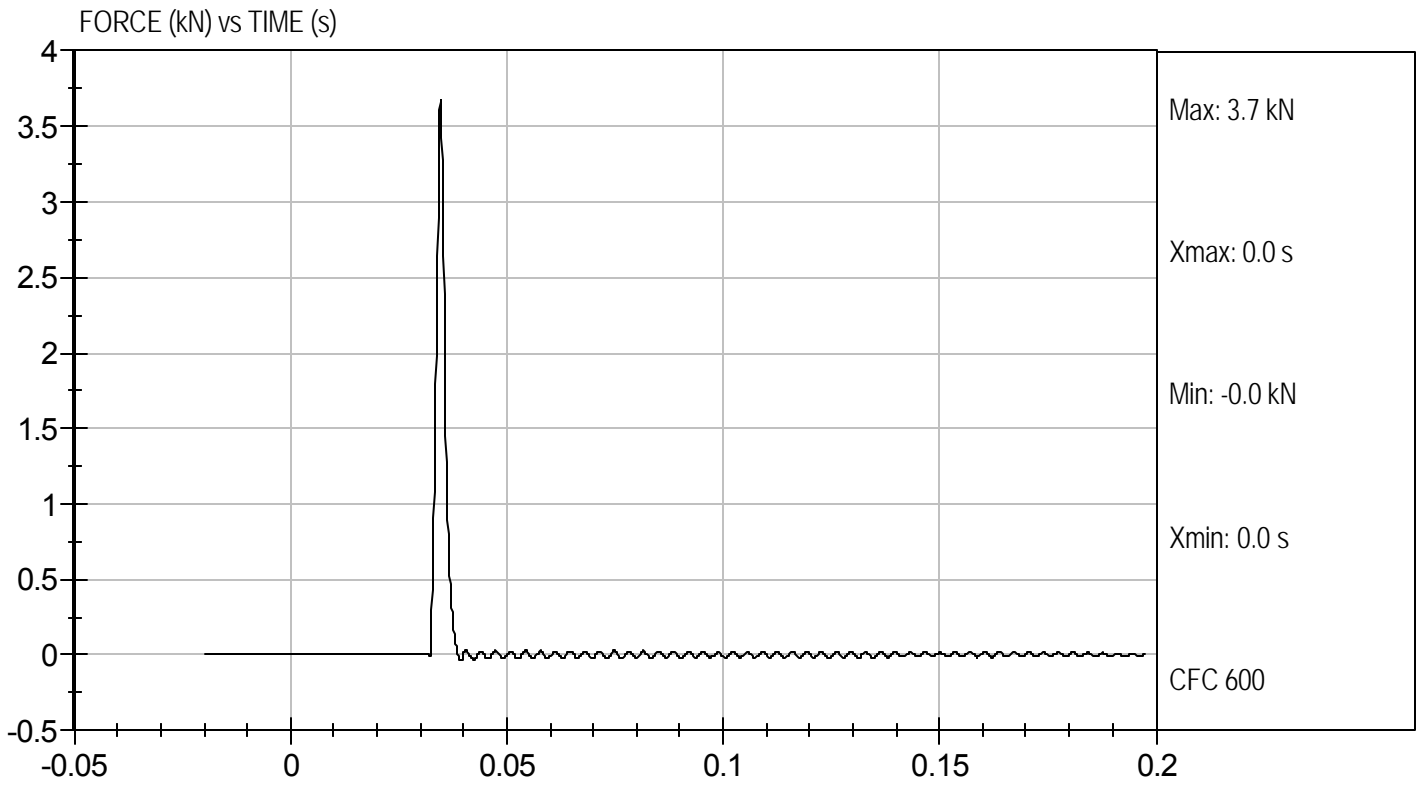
David Winkelbauer

 Approved By



Test Desc: Left Knee
Component ID: D113896

Test Date: 11/21/11
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D113897

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Initial Angle	deg	0 to 20	13	Pass
Return Angle	deg	+/- 8	7	Pass
Force at 45 deg	N	320 to 390	387	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass

Jessica Gall
 Laboratory Technician

11/21/11
 Test Date

David Winkelbauer
 Approved By

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test ID: D114021

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Peak Resultant Acceleration	G's	250 to 300	273	Pass
Peak Lateral Acceleration	G's	+/- 15	-12	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

11/30/11
 Test Date

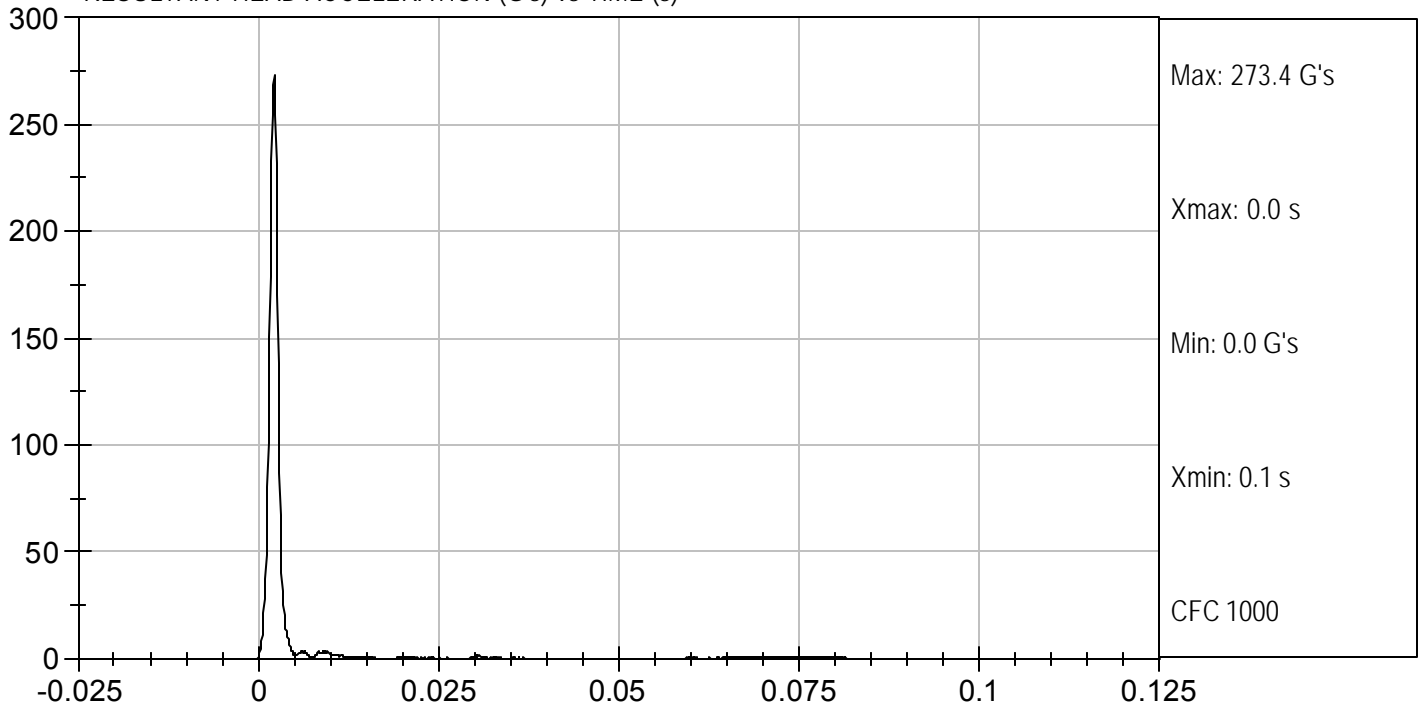
David Winkelbauer
 Approved By



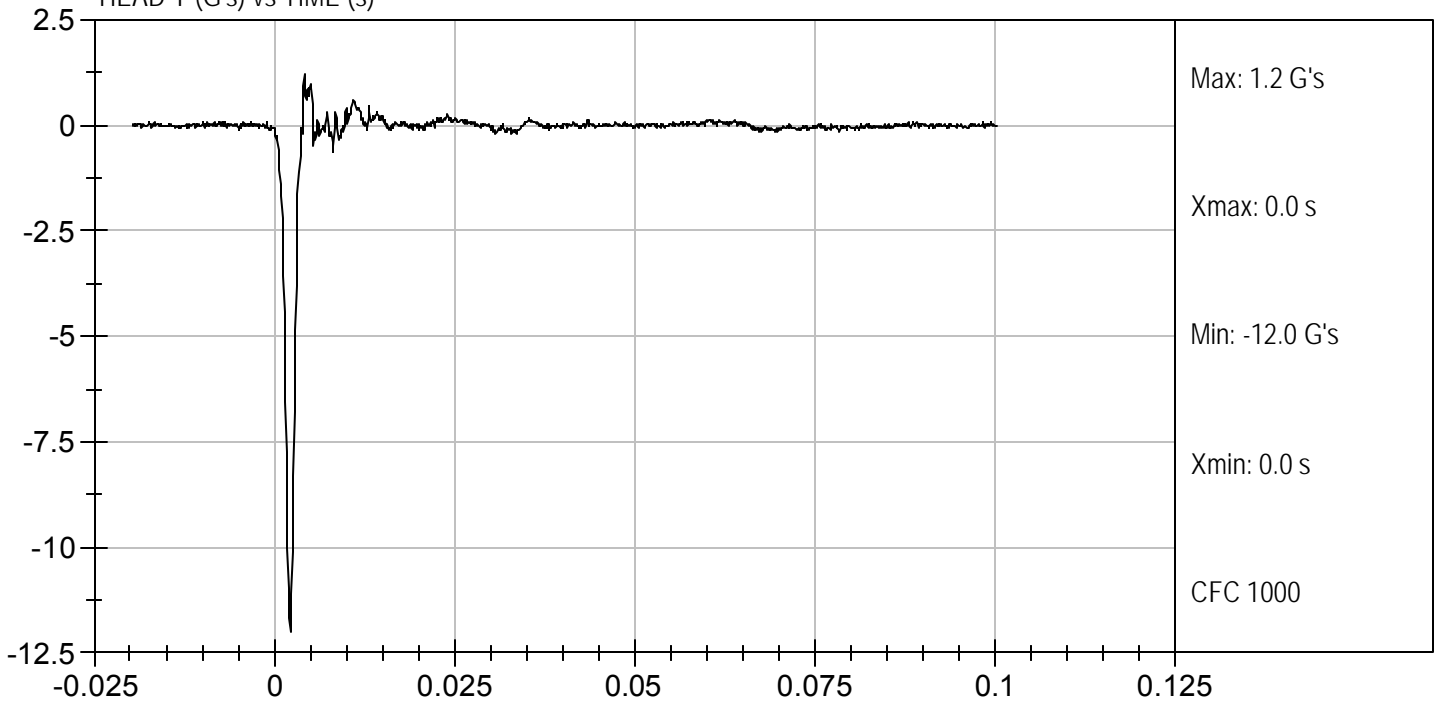
Test Desc: Head Drop
Component ID: D114021

Test Date: 11/30/11
Velocity: 0 ft/s, 0 m/s

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



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



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D.: D114022

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	16	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Pulse	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.3	Pass
D Plane Rotation	Max	deg	77 to 91	77	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	77	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

11/30/11
Test Date

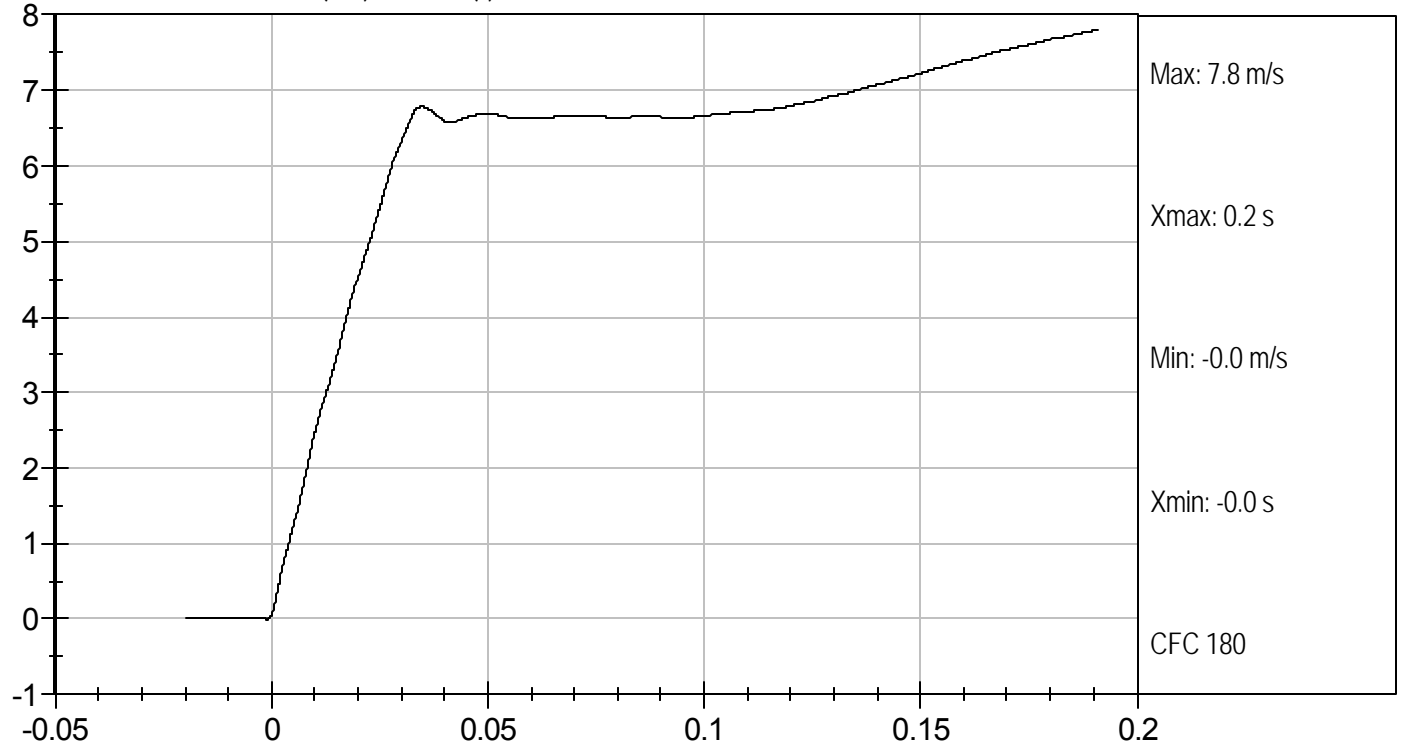
David Winkelbauer
Approved By



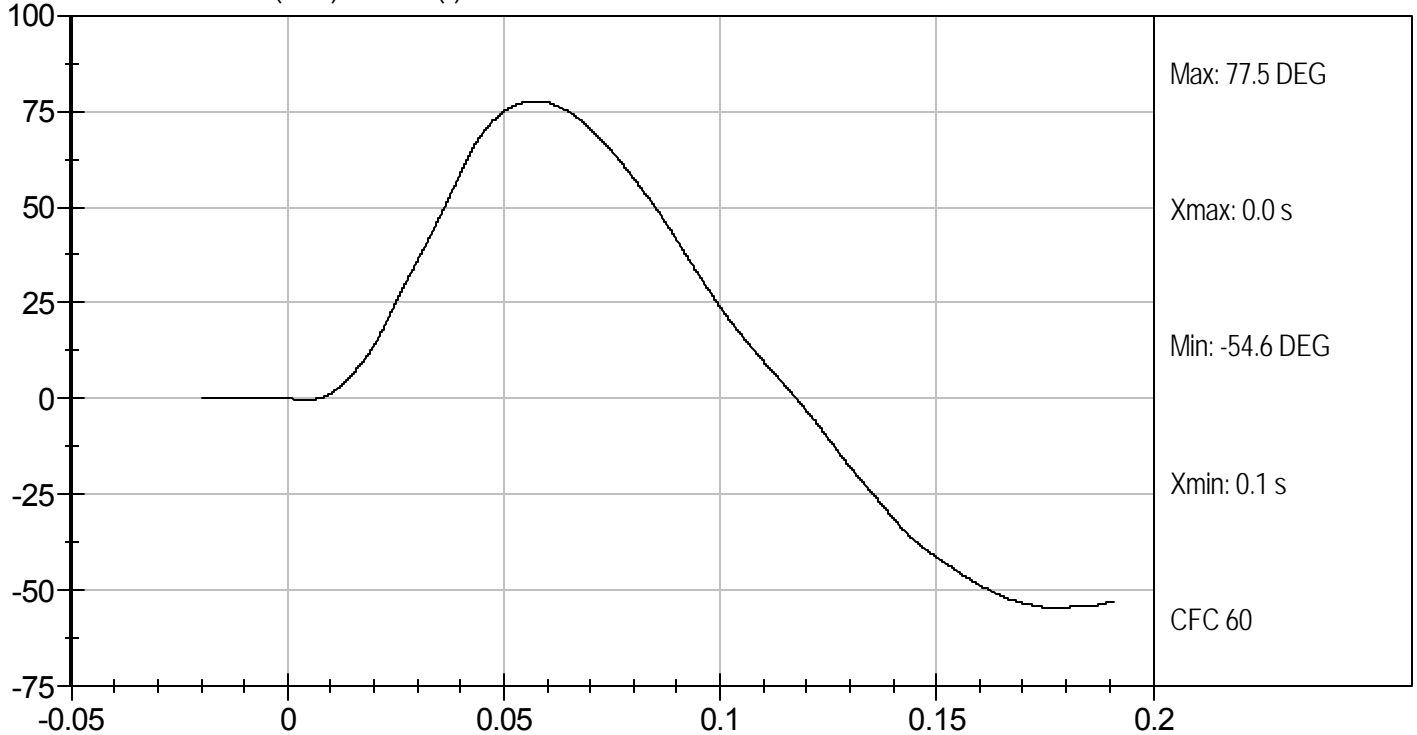
Test Desc: Neck Flexion
Component ID: D114022

Test Date: 11/30/11
Velocity: 23.15 ft/s, 7.06 m/s

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



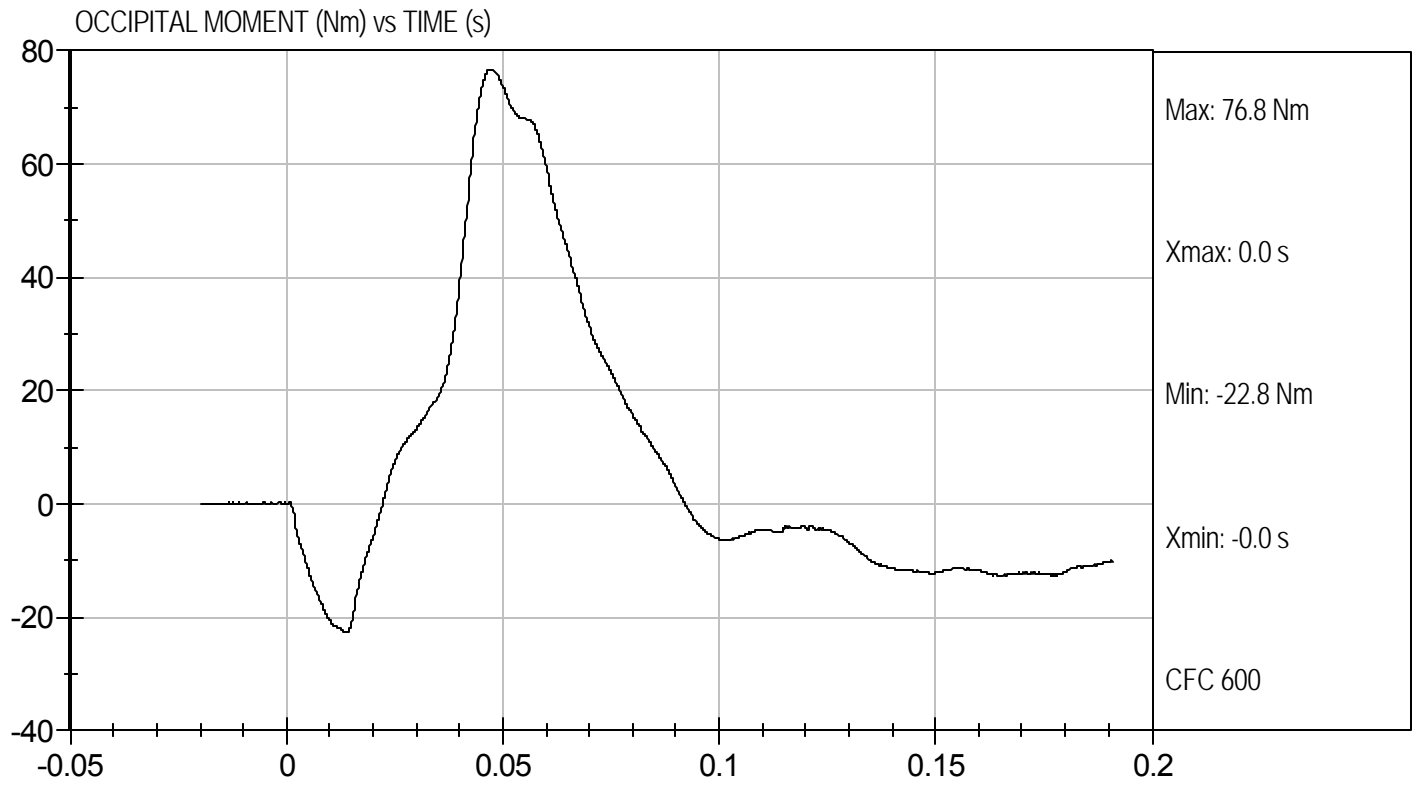
NECK ROTATION (DEG) vs TIME (s)





Test Desc: Neck Flexion
Component ID: D114022

Test Date: 11/30/11
Velocity: 23.15 ft/s, 7.06 m/s

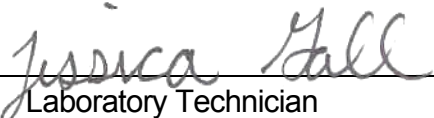


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

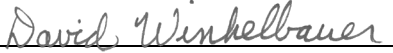
ATD Serial No: 138

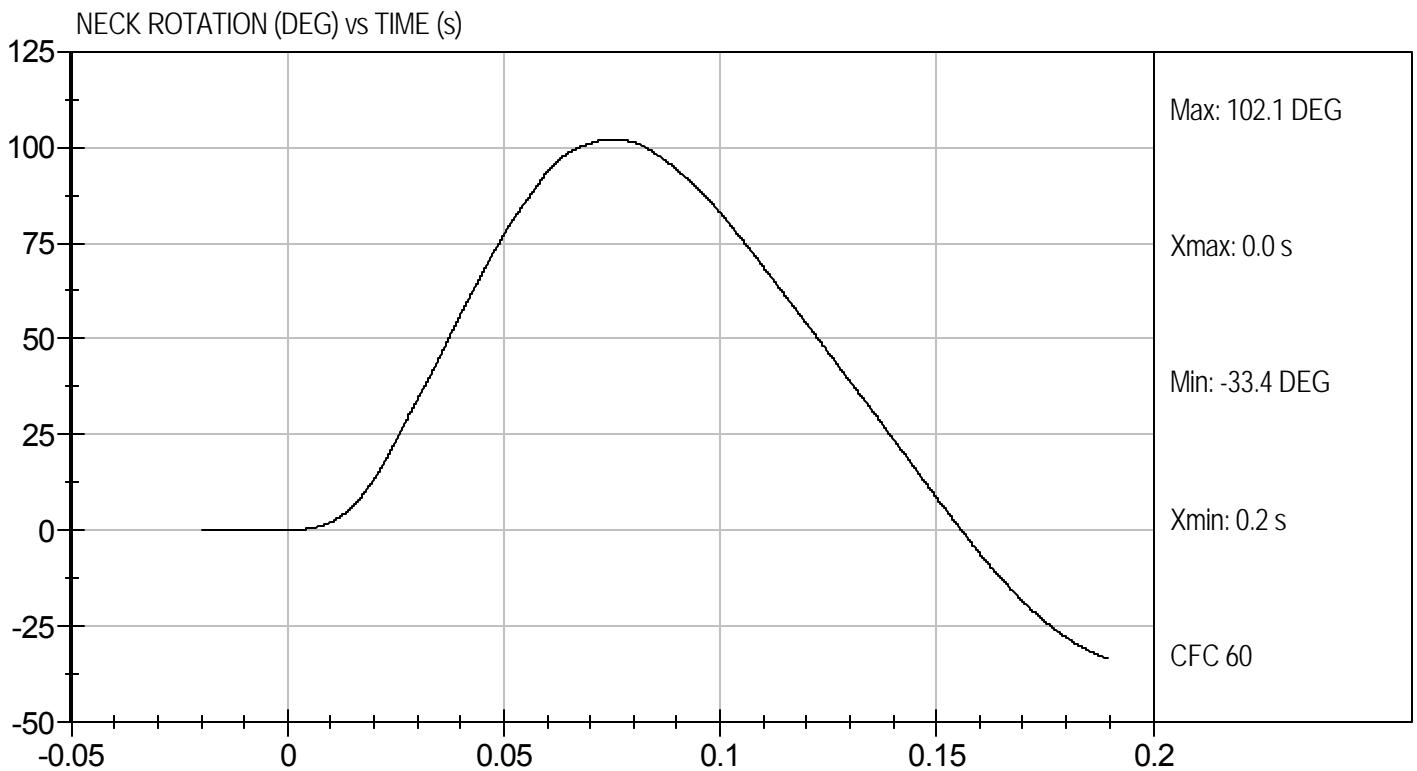
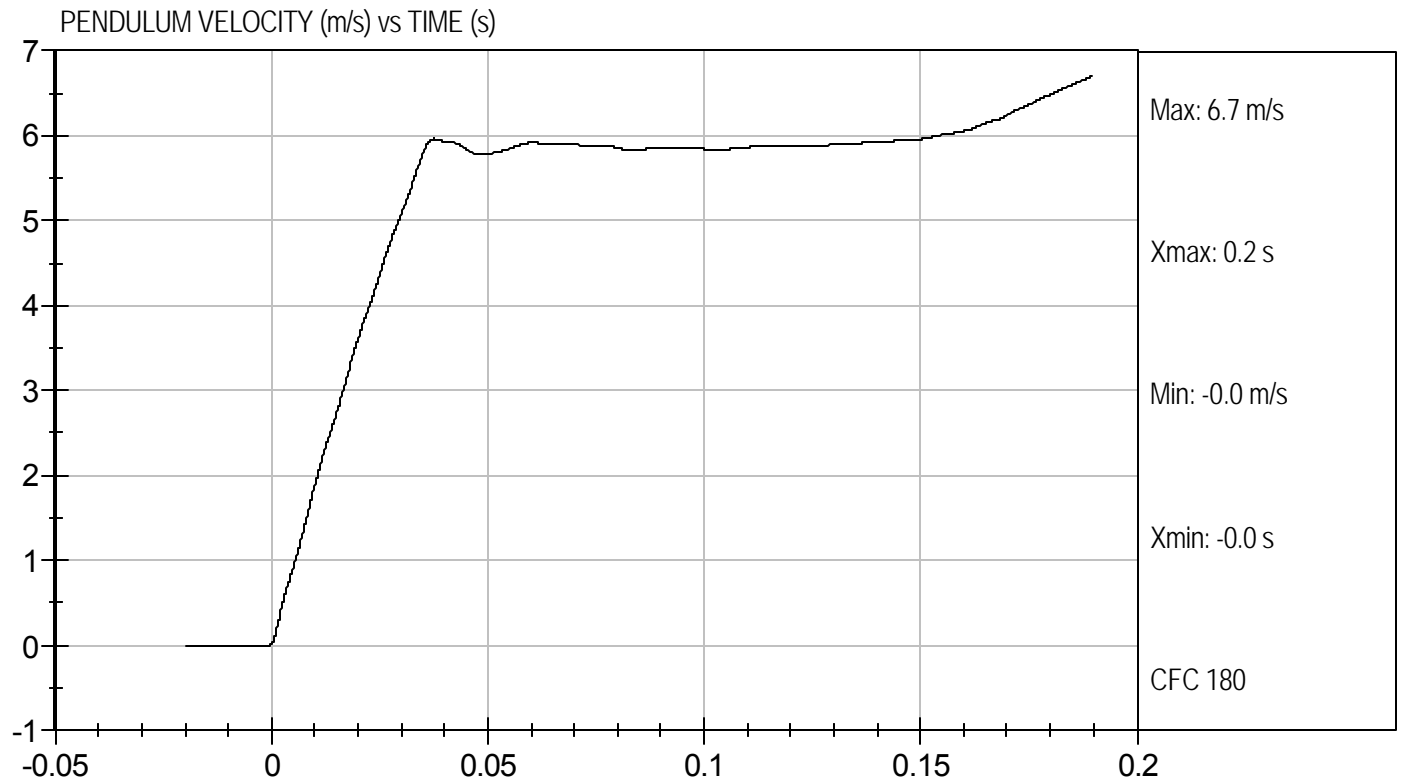
Test I.D.: D114023

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	18	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Pulse	10 ms	m/s	1.5 to 1.9	1.9	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.1	Pass
D Plane Rotation	Max	deg	99 to 114	102	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-56	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	101	Pass
Overall Results					Pass


 Laboratory Technician

11/30/11
 Test Date

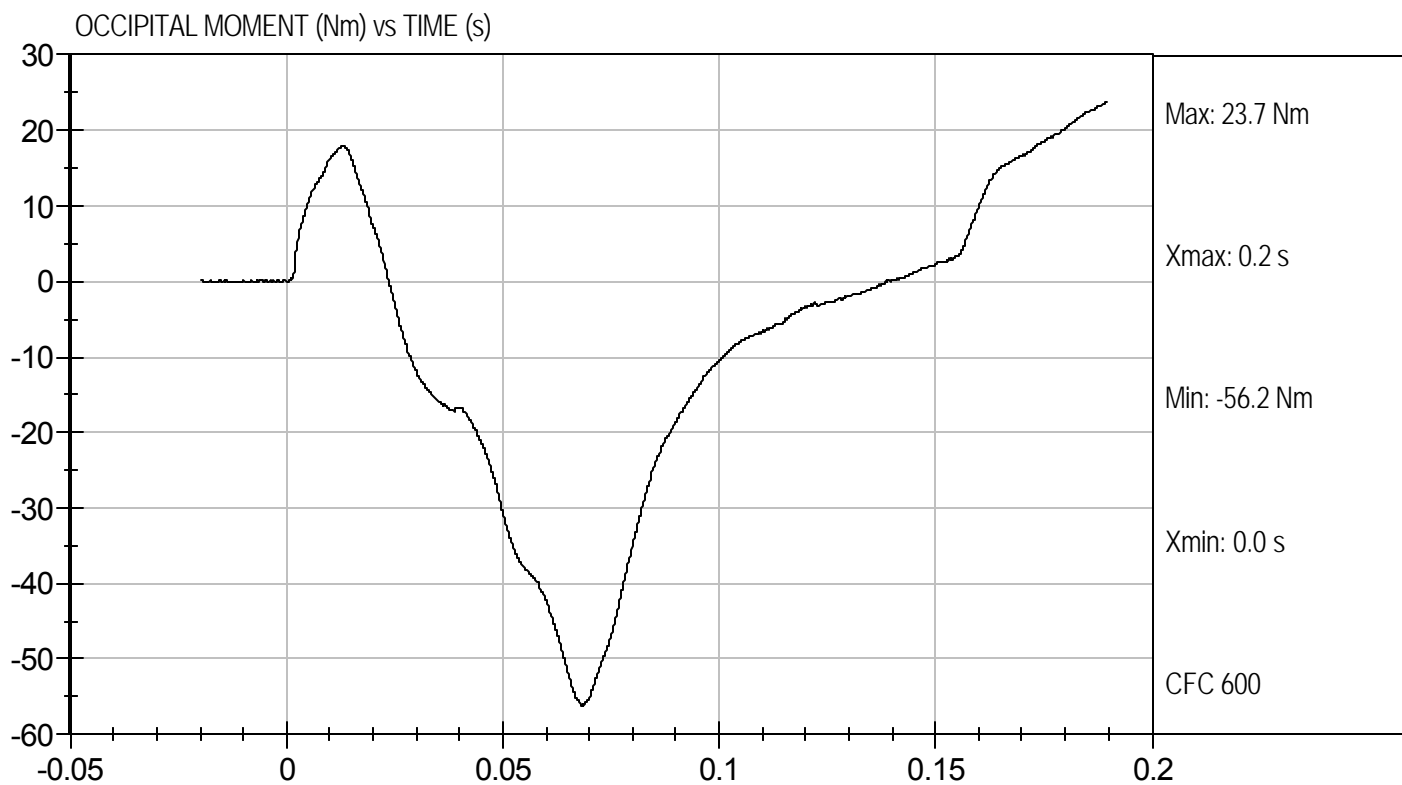

 Approved By





Test Desc: Neck Extension
Component ID: D114023

Test Date: 11/30/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE


ATD Serial No: 138

Test I.D: D114024

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Relative Humidity	%	10 to 70	20	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	56	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.0	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	3906	Pass
Overall Test Results				Pass


 Laboratory Technician

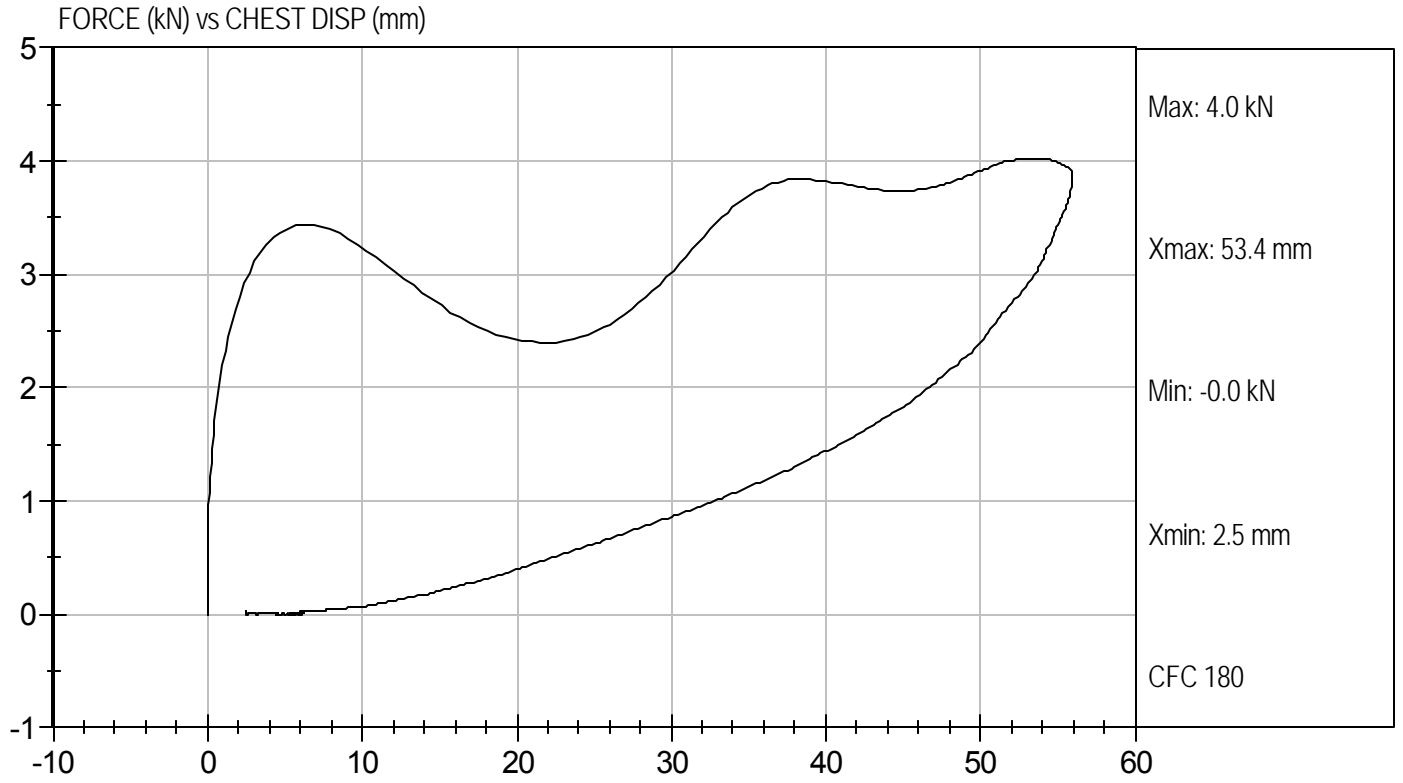
12/1/11
 Test Date


 Approved By



Test Desc: Thorax Impact
Component ID: D114024

Test Date: 12/1/11
Velocity: 22.22 ft/s, 6.77 m/s



**MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE**

ATD Serial No: 138

Test I.D: D114025

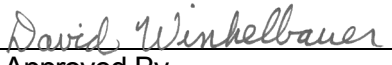
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.59	Pass
Overall Test Results				Pass



 Laboratory Technician

11/30/11

 Test Date

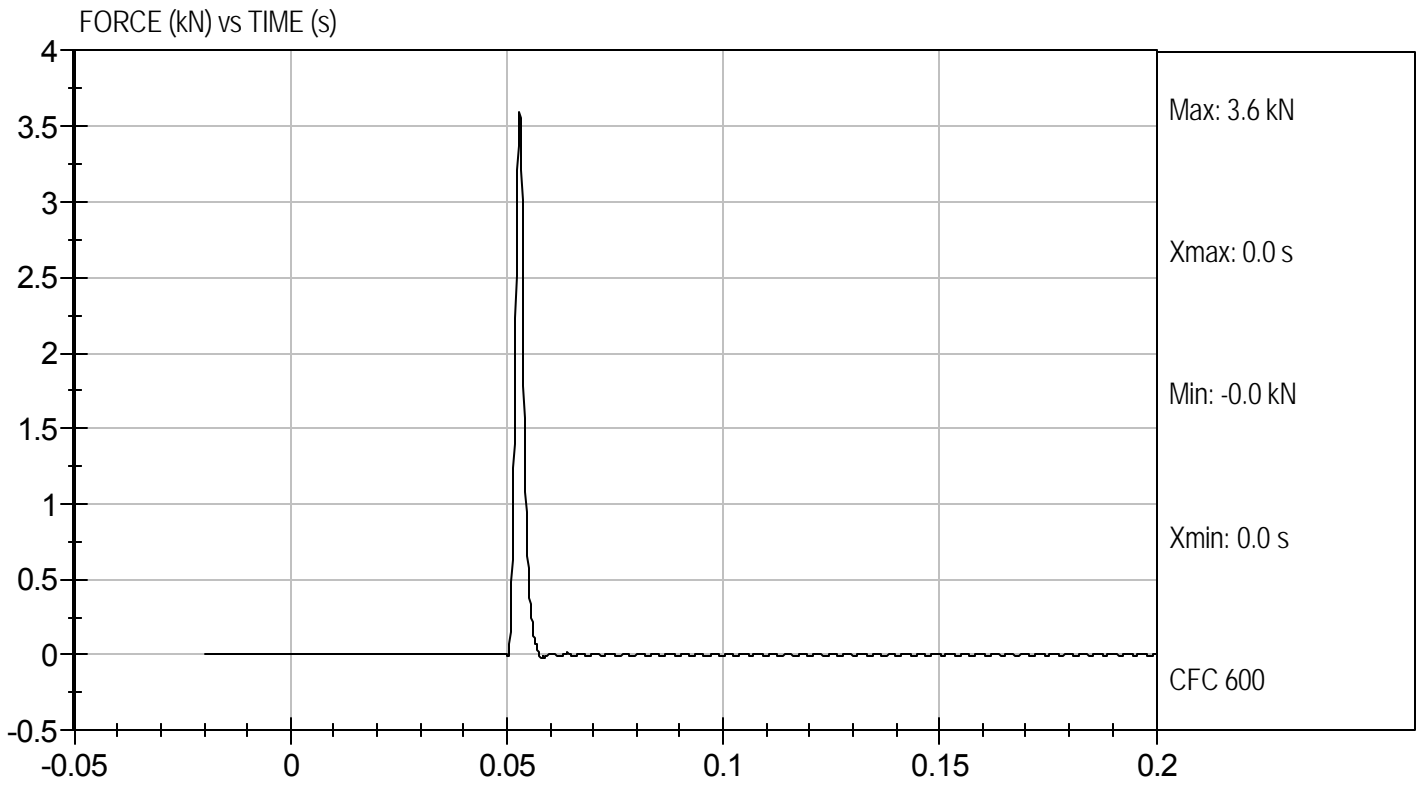


 Approved By



Test Desc: Right Knee
Component ID: D114025

Test Date: 11/30/11
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

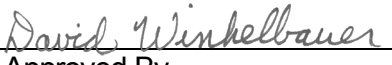
ATD Serial No: 138

Test I.D: D114026

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	18	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.57	Pass
Overall Test Results				Pass


 Laboratory Technician

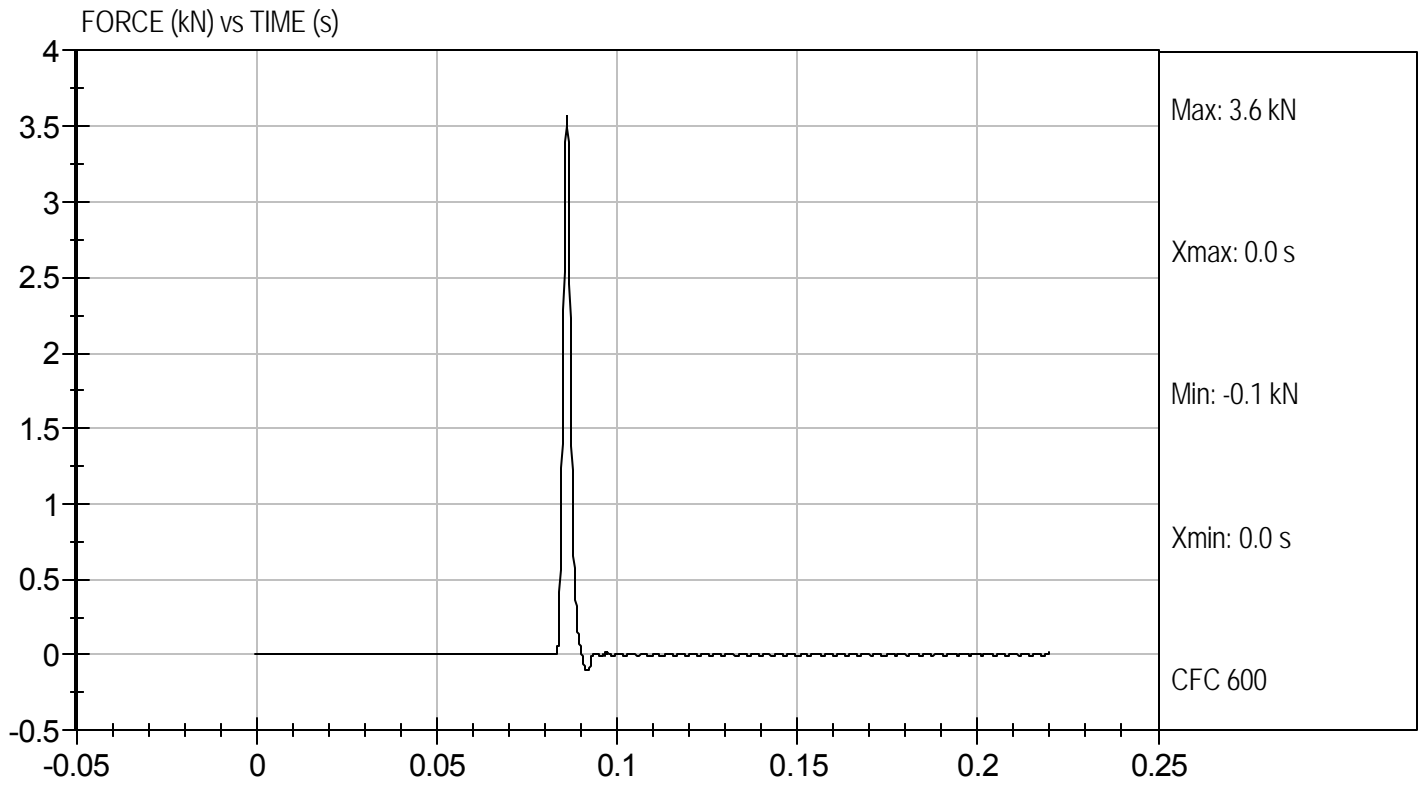
11/30/11
 Test Date


 Approved By



Test Desc: Left Knee
Component ID: D114026

Test Date: 11/30/11
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

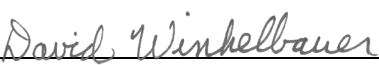
ATD Serial No: 138

Test I.D: D114027

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Initial Angle	deg	0 to 20	14	Pass
Return Angle	deg	+/- 8	7	Pass
Force at 45 deg	N	320 to 390	378	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass


 Laboratory Technician

11/30/11
 Test Date


 Approved By