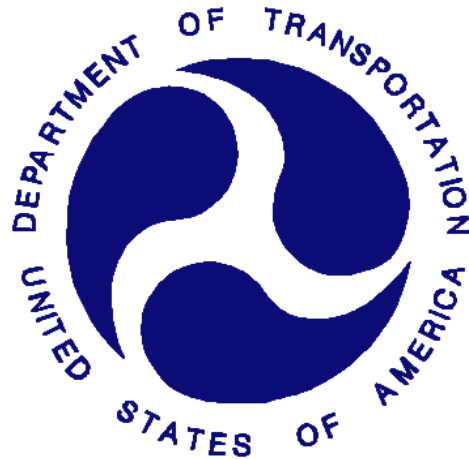


REPORT NUMBER: NCAP-MGA-2013-036

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

**GENERAL MOTORS DE MEXICO, S. DE R.L. DE C.V.
2013 Cadillac SRX AWD SUV
NHTSA No.: GD0102**

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



Test Date: November 28, 2012

Final Report Date: January 10, 2013

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**

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Prepared by: 
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Approved by: 
Ben Fischer, Project Engineer

Approval Date: January 10, 2013

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: _____

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2013 Cadillac SRX AWD SUV 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 28, 2012. The impact velocity was 56.2 km/h and the ambient temperature at the barrier face at the time of impact was 21.2°C. The target vehicle post-test maximum crush was 594 mm located at the vehicle's centerline. The test vehicle's performance was as follows: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <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>282</td> <td>390</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>52</td> <td>17</td> <td>10</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>1</td> <td>0.29</td> <td>0.43</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>2620</td> <td>1763</td> <td>905</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>2520</td> <td>115</td> <td>582</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1371</td> <td>710</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1337</td> <td>1174</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	282	390	Maximum Chest Compression	mm	63	52	17	10	Nij	N/A	1	1	0.29	0.43	Neck Tension	N	4170	2620	1763	905	Neck Compression	N	4000	2520	115	582	Left Femur Force	N	10008	6805	1371	710	Right Femur Force	N	10008	6805	1337	1174
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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 DTNH22-12-D-00258. 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 consisting of 128 load cells was impacted by a 2013 Cadillac SRX AWD SUV at a velocity of 56.2 km/h. The test was performed at MGA Research Corporation on November 28, 2012. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

Two (2) 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 installed on the driver's shoulder belt and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading.

The driver (position 1) ATD (Serial No. 036) and the right-front passenger (position 2) ATD (Serial No. 634) 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 vehicle, load cell barrier, and dummy response data traces.

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

The maximum static crush of the vehicle was 594 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 glove box.

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)	282	0.29	1763	115	48	17	1371	1337
Passenger (5 th)	390	0.43	905	582	46	10	710	1174

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

TEST NOTES

Driver Head Xr has no valid data after 13 ms.

Driver Head Yr has no valid data after 13 ms.

Driver Head Zr has no valid data after 13 ms.

The driver lap belt load cell was not installed for this test.

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: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	GD0102	Traction Control System (TCS)	Yes
Model Year	2013	Power Steering	Yes
Make	Cadillac	Power Window Auto-Reverse	Yes
Model	SRX	Driver Frontal Airbag	Yes
Body Style	MPV	Driver Curtain Airbag	Yes
VIN	3GYFNGE39DS515112	Driver Head/Torso Airbag	No
Body Color	Radiant Silver Metallic	Driver Torso Airbag	No
Odometer (km/mi)	195 / 121	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	3.6	Driver Pelvis Airbag	No
Type/No. Cylinders	6	Driver Knee Airbag	No
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	AWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	Yes	Front Pass. Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	N/A

Does owner's manual provide instructions to turn off automatic door locks?	No
--	----

DATA FROM CERTIFICATION LABEL

Manufactured By	GENERAL MOTORS DE MEXICO, S. DE R.L. DE C.V.	GVWR (kg)	2520
Date of Manufacture	09/12	GAWR Front (kg)	1410
		GAWR Rear (kg)	1300

VEHICLE SEATING AND WEIGHT CAPACITY DATA

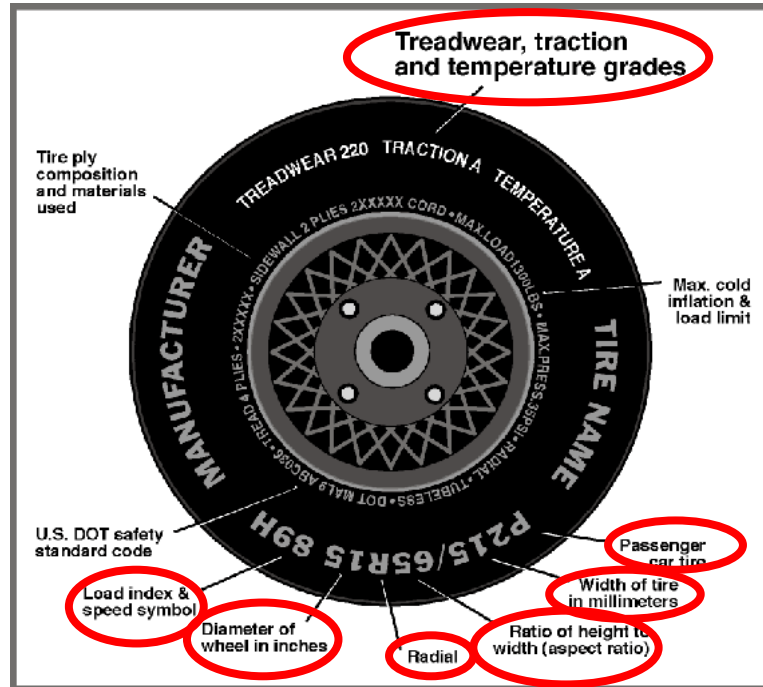
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				443
Cargo Weight (RCLW) (kg)				103

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

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P235/65R18	P235/65R18
Tire Size on Vehicle	P235/65R18	P235/65R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Latitude	Latitude
Treadwear	440	440
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	104H	104H
Tire Material	Rubber	Rubber
DOT Safety Code Left	B9MB 26XX 5512	B9MB 26XX 5512
DOT Safety Code Right	B9MB 26XX 5512	B9MB 26XX 5512

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

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	581.5	467.2		609.2	558.8	
Right	kg	602.4	416.9		629.1	507.6	
Ratio	%	57.2	42.8		53.7	46.3	
Totals	kg	1183.9	884.1	2068.0	1238.3	1066.4	2304.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2068.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	103
Calculated Vehicle Target Weight (TVTW)	kg	2311.6

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	819	821	839	840	1203
As Tested	mm	807	811	803	813	1303
Post Test	mm	843	860	807	808	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2815
Total Vehicle Length at Left Side	mm	4588
Total Vehicle Length at Centerline	mm	4832
Total Vehicle Length at Right Side	mm	4588
Weight of Ballast in Cargo Area	kg	92.5
Weight of Vehicle Components Removed	kg	22.2
Amount of Stoddard Solvent in Fuel Tank	L	73.9

List of components removed: Right taillight, jack and tool kit, cargo storage container, tire repair kit, rear cargo area cover.

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

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4832
2	Total Width	1865
3	Bumper Top Height	653
4	Bumper Bottom Height	241
5	Longitudinal Member Top Height	630
6	Distance between Longitudinal Members	904
7	Longitudinal Member Width	87
8	Engine Top Height	921
9	Engine Bottom Height	242
10	Engine and Gearbox Width	760
11	Front Bumper-Engine Distance	411
12	Front Shock Absorber Fixing Height	1056
13	Bonnet Leading Edge Height	906
14	Front Shock Absorber Fixing Width	1231
15	Front Bumper – Front Axle Distance	1048
16	Front Axle – A-Pillar Distance	545
17	A-Pillar – B-Pillar Distance	1083
18	B-Pillar – Rear Axle Distance	1195
19	B-Pillar – C-Pillar Distance	718
20	Roof Sill Bottom Height	1483
21	Roof Sill Top Height	1625
22	Floor Sill Bottom Height	188
23	Floor Sill Top Height	397

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

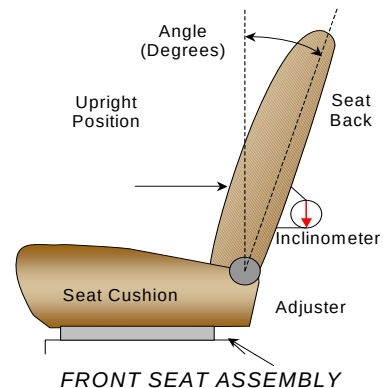
Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

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 September 2012.

	Degrees
Driver Seat Back Angle	-15.2° on headrest post
Passenger Seat Back Angle	-19.3° on headrest post



SEAT FORE/AFT POSITIONS

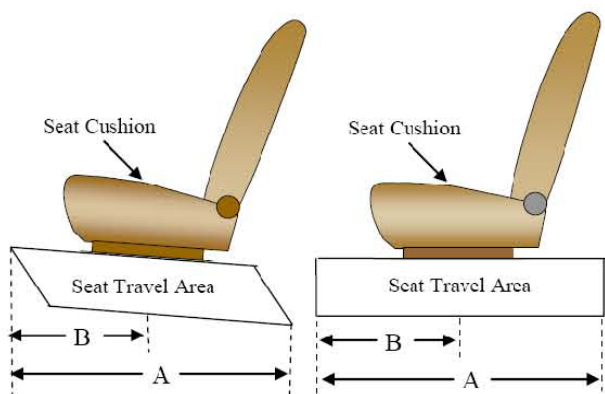
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated September 2012.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	306 mm	153 mm (foremost as 0)
Passenger Seat	243 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	5 (1 st as 1)	0 (uppermost as 0)
Passenger Seat	5 (1 st as 1)	0 (uppermost as 0)



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

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

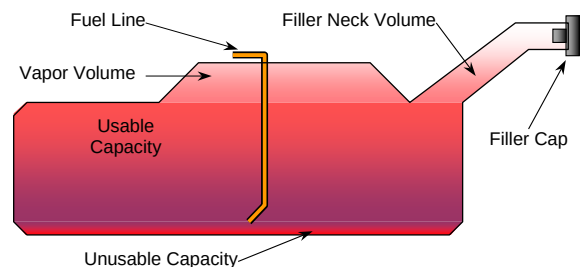
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	79.5
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	73.1 to 74.7
Actual Amount of Solvent used	73.9
1/3 of Usable Capacity	26.5

FUEL PUMP

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

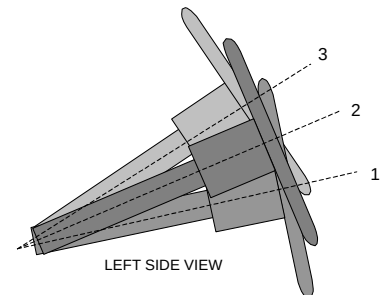
The vehicle is equipped with an electric fuel pump. If ignition button is at "ON" position and engine is not running, the fuel pump only operates for a short duration to prime the fuel system. If the engine is running, then the fuel pump will operate continuously. The fuel pipe is on the right side.



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

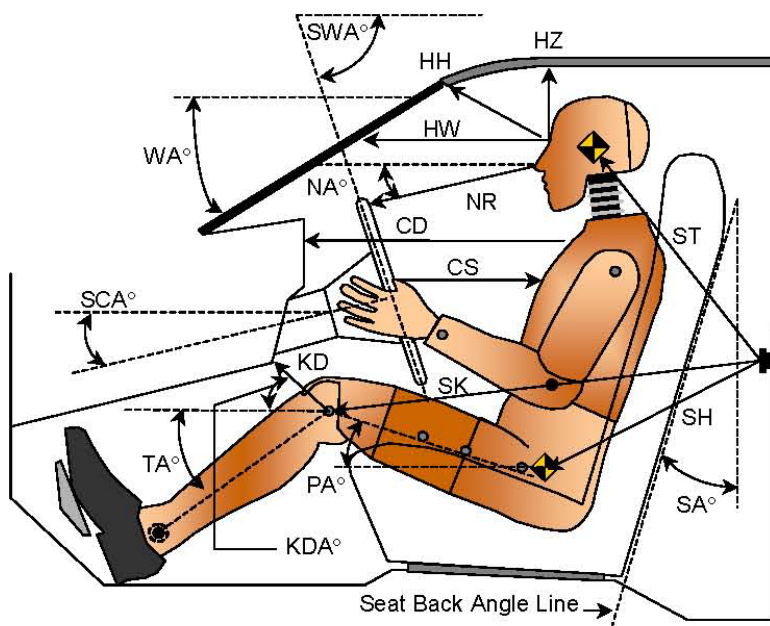
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	69.4	230
Geometric Center Position 2	67.7	205
Uppermost Position 3	66.0	180
Telescoping Steering Wheel Travel		50
Test Position	67.7	205

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012



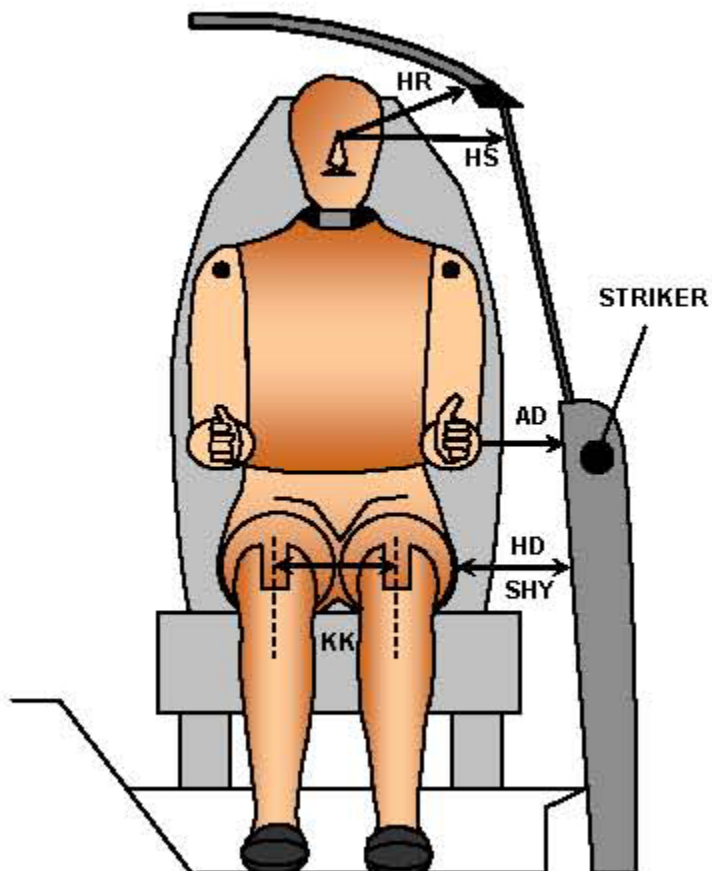
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N 036		Passenger S/N 634	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		26.5		
SWA°	Steering Wheel Angle		67.7		
SCA°	Steering Column Angle		22.3		
SA°	Seat Back Angle (on headrest post)		-15.2		-19.3
HZ	Head to Roof (Z)	208	90	226	90
HH	Head to Header	399	21.3	318	40.1
HW	Head to Windshield	764	0	662	0
NR	Nose to Rim	430	7.3		
CD	Chest to Dash	553		426	
CS	Chest to Steering Hub	346	4.8		
RA	Rim to Abdomen	222	0		
KDL	Left Knee to Dash	186	34.5	111	39.1
KDR	Right Knee to Dash	156	30.9	114	42.3
PA°	Pelvic Angle		24.6		20.4
TA°	Tibia Angle		44.8		55.7
SK	Striker to Knee	548	91.9	637	87.0
ST	Striker to Head	550	6.7	548	22.4
SH	Striker to H-Point	188	121.5	359	98.7

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012



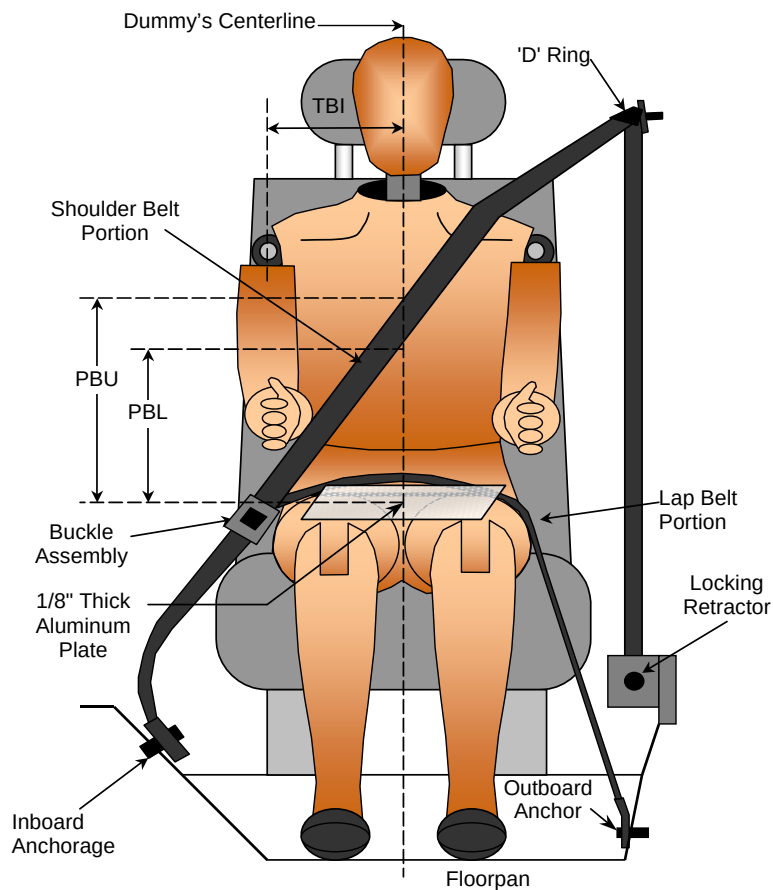
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 036	Passenger S/N 634
		Length (mm)	
AD	Arm to Door	145	102
HD	H-Point to Door	158	168
HR	Head to Side Header	220	231
HS	Head to Side Window	346	327
KK	Knee to Knee	345	227
SHY	Striker to H-Point (Y Direction)	290	300
AA	Ankle to Ankle	360	160

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	390	310
PBL - Top surface of reference to belt lower edge	mm	300	200

BELT LENGTH DATA

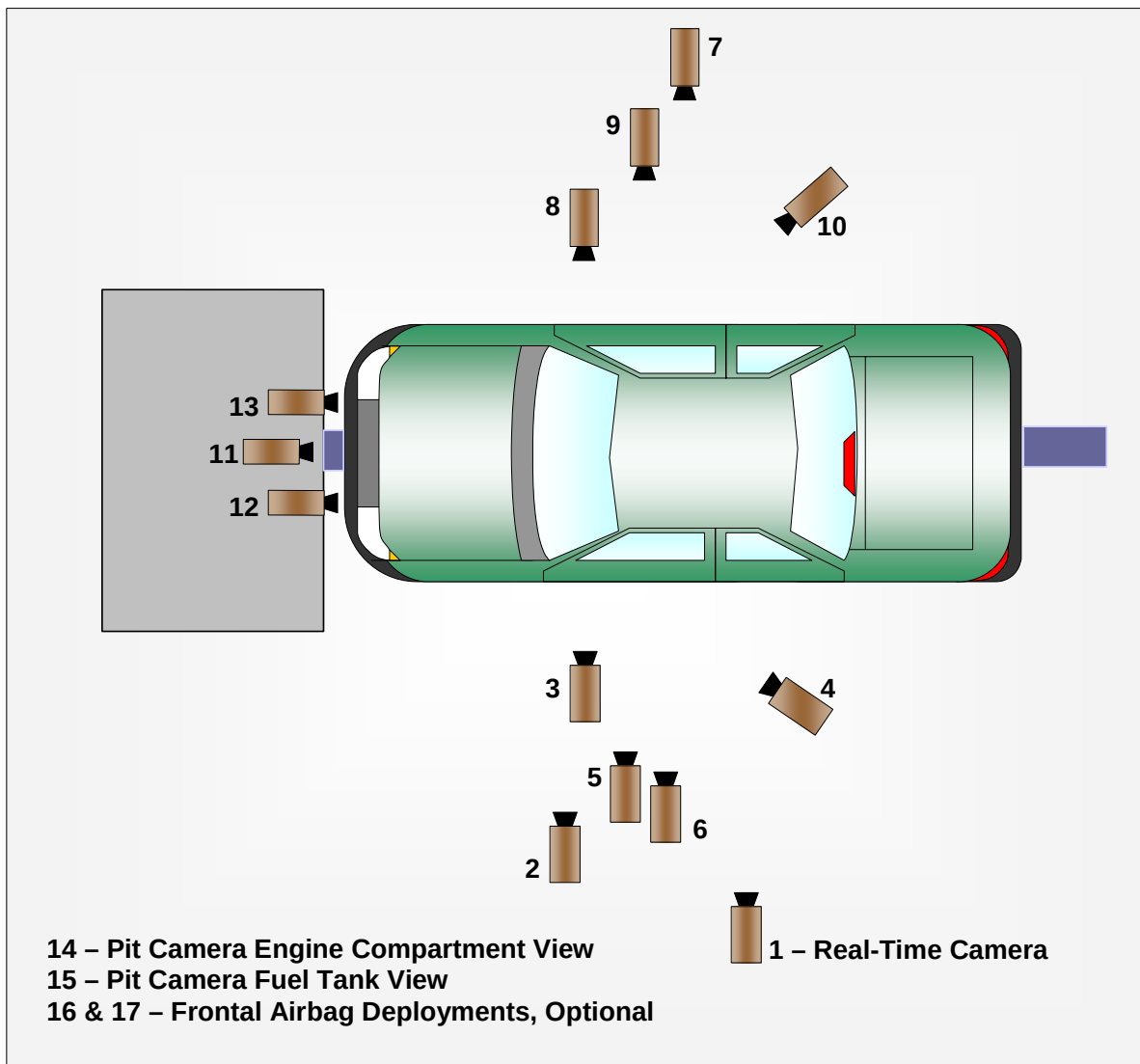
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	805	930
Lap Belt Length as measured on ATD	mm	475	540
Remainder of belt on reel	mm	1620	1480
Total Belt Length for Continuous Webbing Systems	mm	2900	2950

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

Test Vehicle: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1700	-6060	-1940	35	1000
3	Left Front Half	1060	-5070	-1330	24	1000
4	Left Angle	5940	-4850	-2040	50	1000
5	Steering Column - Top	510	-5180	-1250	24	1000
6	Steering Column - Bottom	490	-5140	-840	24	1000
7	Right Overall	2010	6630	-1390	20	1000
8	Passenger Close-Up	1470	6700	-1920	35	1000
9	Right Front Half	1220	5250	-1290	24	1000
10	Right Angle	5970	4670	-2050	50	1000
11	Windshield	-260	0	-2860	24	1000
12	Driver Windshield	-30	-360	-2270	12.5	1000
13	Passenger Windshield	-30	360	-2270	12.5	1000
14	Pit Front	1040	0	3150	24	1000
15	Pit Rear	3090	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

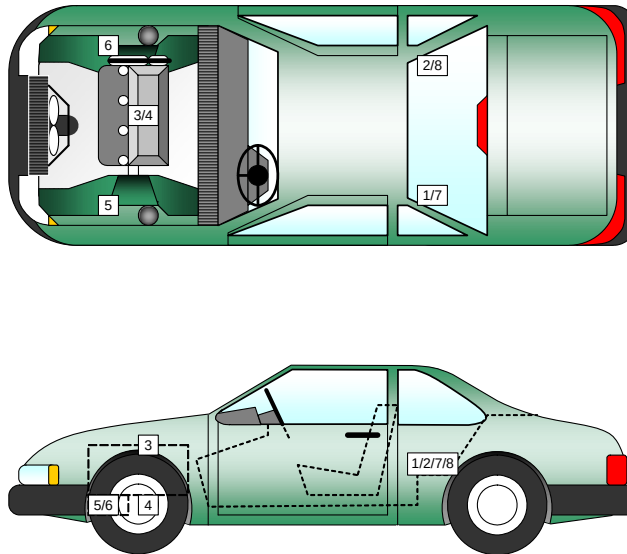
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 16 & 17 were not used for this test.

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

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1886	-374	-390
2	Right Rear Accelerometer – X Direction	1886	374	-390
3	Engine Top X	4093	0	-865
4	Engine Bottom X	4027	68	-235
5	Left Rear Accelerometer – Z Direction	1886	-374	-390
6	Right Rear Accelerometer – Z Direction	1886	374	-390
7	Left Rear Accelerometer Redundant – X Direction	1886	-374	-390
8	Right Rear Accelerometer Redundant – X Direction	1886	374	-390

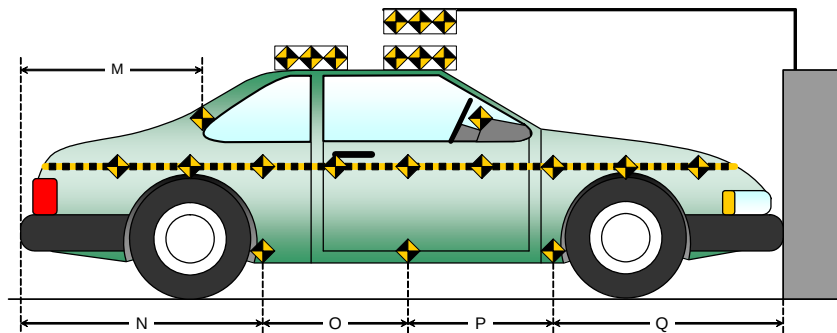
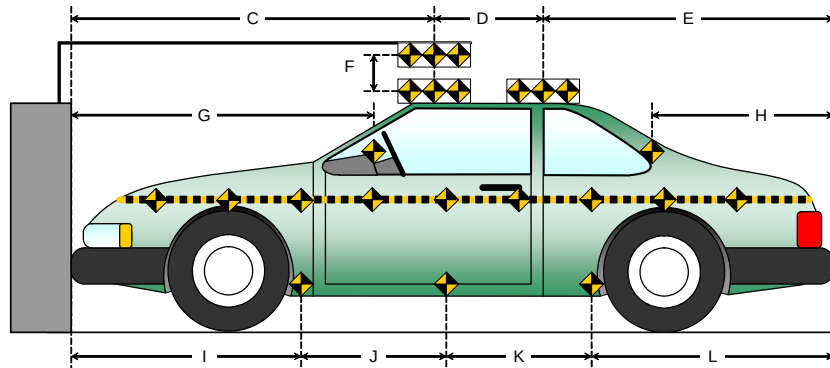
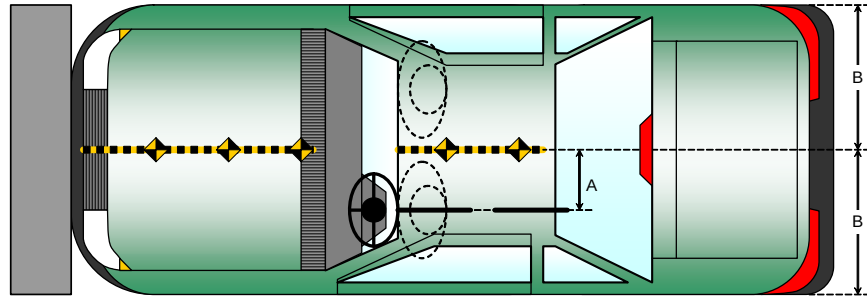
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

Item	Value (mm)
A	365
B	933
C	2475
D	675
E	1682
F	130
G	
H	1390
I	1487
J	899
K	899
L	1547
M	1374
N	1547
O	899
P	899
Q	1487



DATA SHEET NO. 9 **LOAD CELL LOCATIONS ON FIXED BARRIER**

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

Advanced Research Load Cell Barrier

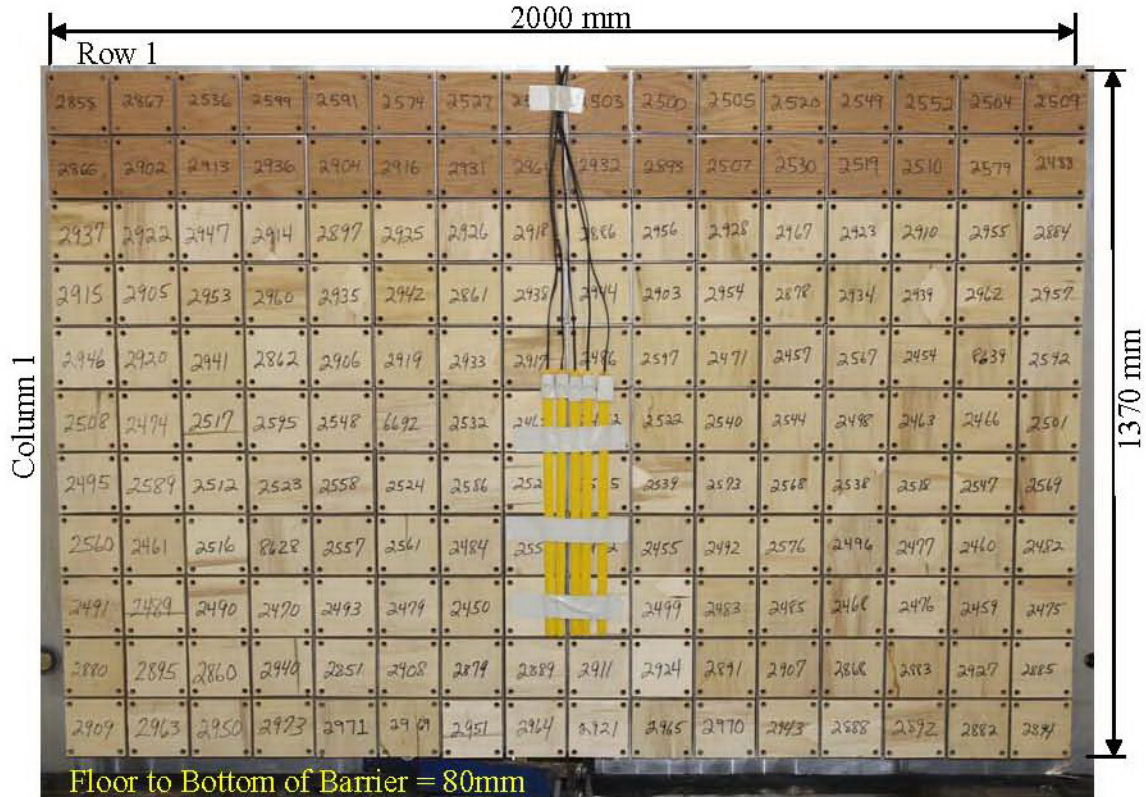


Photo for Reference Only

								Centerline							
A-01	A-02	A-03	A-04	A-05	A-06	A-07	A-08	A-09	A-10	A-11	A-12	A-13	A-14	A-15	A-16
B-01	B-02	B-03	B-04	B-05	B-06	B-07	B-08	B-09	B-10	B-11	B-12	B-13	B-14	B-15	B-16
C-01	C-02	C-03	C-04	C-05	C-06	C-07	C-08	C-09	C-10	C-11	C-12	C-13	C-14	C-15	C-16
D-01	D-02	D-03	D-04	D-05	D-06	D-07	D-08	D-09	D-10	D-11	D-12	D-13	D-14	D-15	D-16
E-01	E-02	E-03	E-04	E-05	E-06	E-07	E-08	E-09	E-10	E-11	E-12	E-13	E-14	E-15	E-16
F-01	F-02	F-03	F-04	F-05	F-06	F-07	F-08	F-09	F-10	F-11	F-12	F-13	F-14	F-15	F-16
G-01	G-02	G-03	G-04	G-05	G-06	G-07	G-08	G-09	G-10	G-11	G-12	G-13	G-14	G-15	G-16
H-01	H-02	H-03	H-04	H-05	H-06	H-07	H-08	H-09	H-10	H-11	H-12	H-13	H-14	H-15	H-16
I-01	I-02	I-03	I-04	I-05	I-06	I-07	I-08	I-09	I-10	I-11	I-12	I-13	I-14	I-15	I-16
J-01	J-02	J-03	J-04	J-05	J-06	J-07	J-08	J-09	J-10	J-11	J-12	J-13	J-14	J-15	J-16
K-01	K-02	K-03	K-04	K-05	K-06	K-07	K-08	K-09	K-10	K-11	K-12	K-13	K-14	K-15	K-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: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012

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: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIIL 50% / 036	HIIL 5% / 634
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

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	None
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1561
Center	mm	1514
Right Side	mm	1545
Average	mm	1540

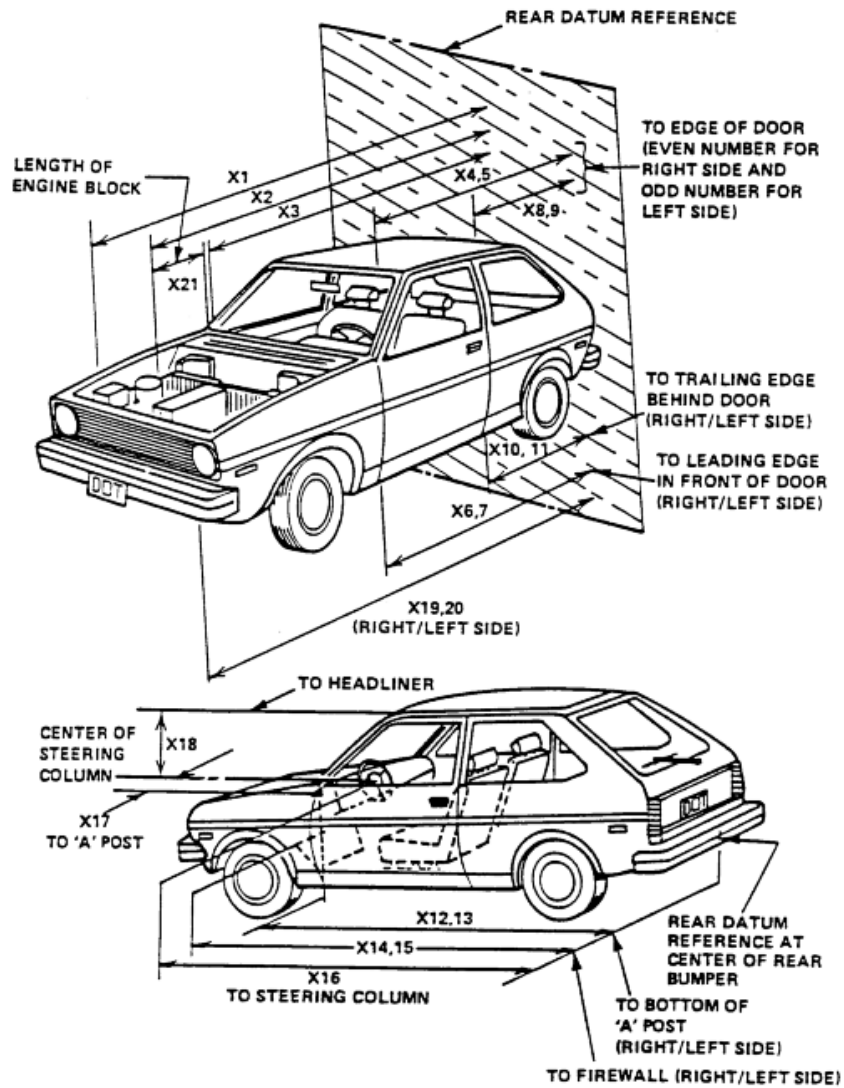
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Right Front (Passenger) P2	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	No	Yes	No
Torso/Pelvis Side Airbag	Yes	No	Yes	No
Knee Airbag	No		No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	
Other	No		No	

DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4832	4238	594
2	RSOV to Front of Engine	mm	4218	4041	177
3	RSOV to Firewall	mm	3664	3657	7
4	RSOV to Upper Leading Edge of Right Door	mm	3194	3197	-3
5	RSOV to Upper Leading Edge of Left Door	mm	3194	3192	2
6	RSOV to Lower Leading Edge of Right Door	mm	3209	3207	2
7	RSOV to Lower Leading Edge of Left Door	mm	3208	3208	0
8	RSOV to Upper Trailing Edge of Right Door	mm	2161	2161	0
9	RSOV to Upper Trailing Edge of Left Door	mm	2160	2161	-1
10	RSOV to Lower Trailing Edge of Right Door	mm	2168	2170	-2
11	RSOV to Lower Trailing Edge of Left Door	mm	2168	2168	0
12	RSOV to Bottom of "A" Post of Right Side	mm	3172	3170	2
13	RSOV to Bottom of "A" Post of Left Side	mm	3188	3190	-2
14	RSOV to Firewall, Right Side	mm	3656	3648	8
15	RSOV to Firewall, Left Side	mm	3675	3662	13
16	RSOV to Steering Column	mm	2805	2820	-15
17	Center of Steering Column to "A" Post	mm	379	355	24
18	Center of Steering Column to Headliner	mm	426	414	12
19	RSOV to Right Side of Front Bumper	mm	4588	4212	376
20	RSOV to Left Side of Front Bumper	mm	4588	4217	371
21	Length of Engine Block	mm	504	504	0
RD	RSOV to Right Side of Dash Panel	mm	2908	2910	-2
CD	RSOV to Center of Dash Panel	mm	2934	2935	-1
LD	RSOV to Left Side of Dash Panel	mm	2908	2915	-7

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012

VEHICLE INFORMATION

VIN: 3GYFNGE39DS515112 Wheelbase (mm): 2815
Vehicle Size Category: MPV Test Weight (kg): 2304.7

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15

Cal. Procedure/Interval: MGA procedure / 6 month

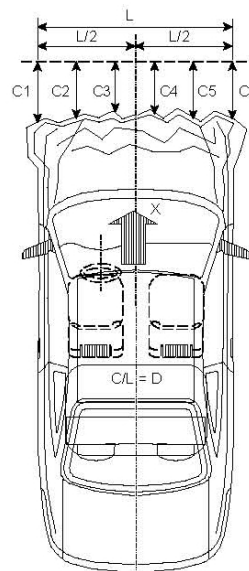
Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.2

Velocity Change (km/h): 64.2

Time of Separation (msec): 96.9



CRUSH PROFILE

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1314

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4588	4217	371
C2	Crush zone 2 at left side	mm	4708	4216	492
C3	Crush zone 3 at left side	mm	4755	4228	527
C4	Crush zone 4 at right side	mm	4755	4234	521
C5	Crush zone 5 at right side	mm	4708	4205	503
C6	Crush zone 6 at right side	mm	4588	4212	376
L	C1 TO C6	mm	1314	1305	9

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

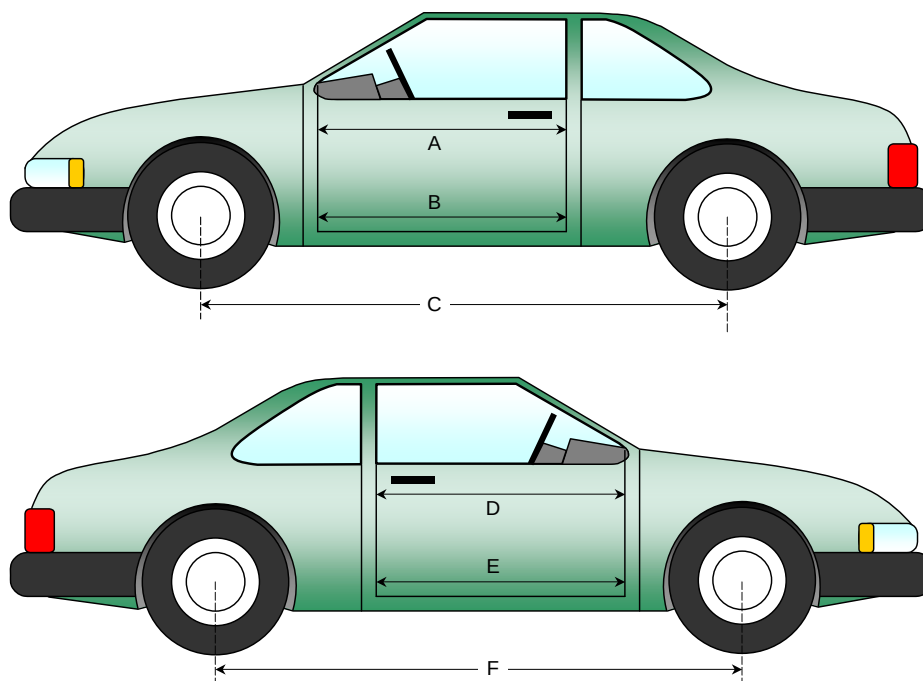
NHTSA No.: GD0102
Test Date: 11/28/2012

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	953	953	0
B	Left Side Lower	mm	894	894	0
D	Right Side Upper	mm	953	953	0
E	Right Side Lower	mm	894	894	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2815	2758	57
F	Right Side Wheelbase	mm	2815	2782	33



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

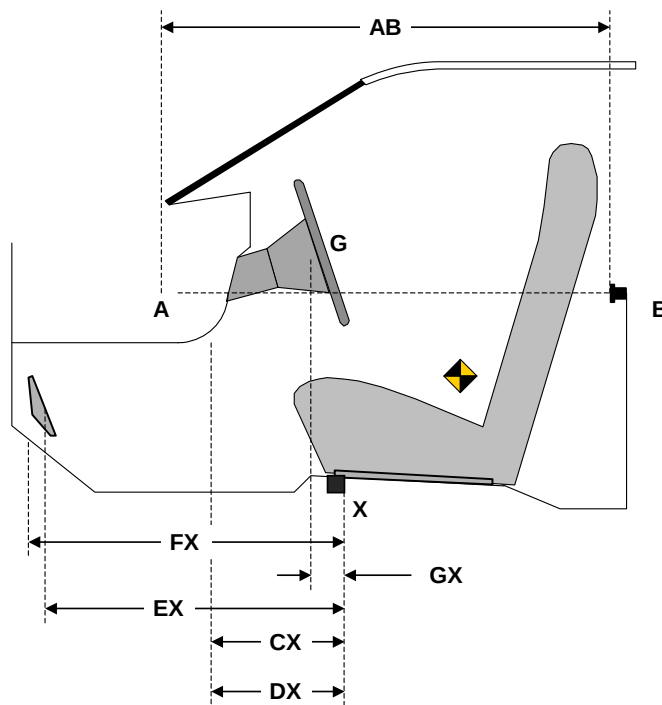
Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	800	800	0
CX	Left Knee Bolster to X	mm	273	269	4
DX	Right Knee Bolster to X	mm	263	255	8
EX	Brake Pedal to X	mm	527	525	2
FX	Foot Rest to X	mm	562	559	3
GX	Center of Steering Column Wheel Hub to X	mm	84	120	-36

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

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

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

Windshield Mounting Details:

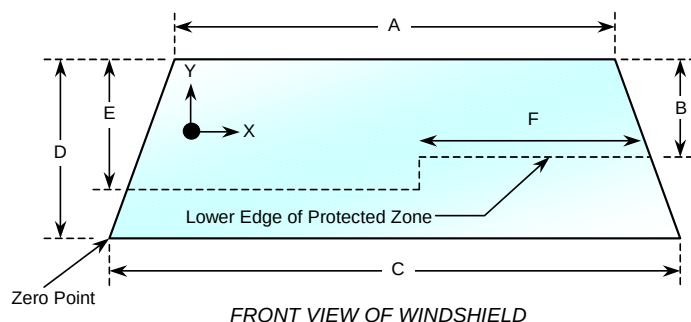
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pre-test 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: 21.2°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	1210
B	mm	476
C	mm	1476
D	mm	878
E	mm	544
F	mm	510

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, FMVSS 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2013 Cadillac SRX AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
Test Date: 11/28/2012

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.2°C Test Time: 10:40 a.m.

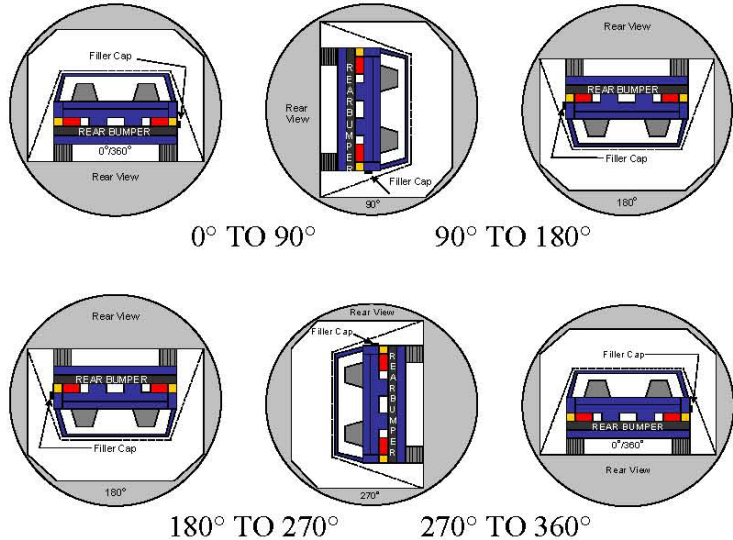
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

DATA SHEET NO. 16 **FMVSS 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012

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°	114	300	414
90° to 180°	111	300	411
180° to 270°	108	300	408
270° to 360°	112	300	412

FMVSS 301 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

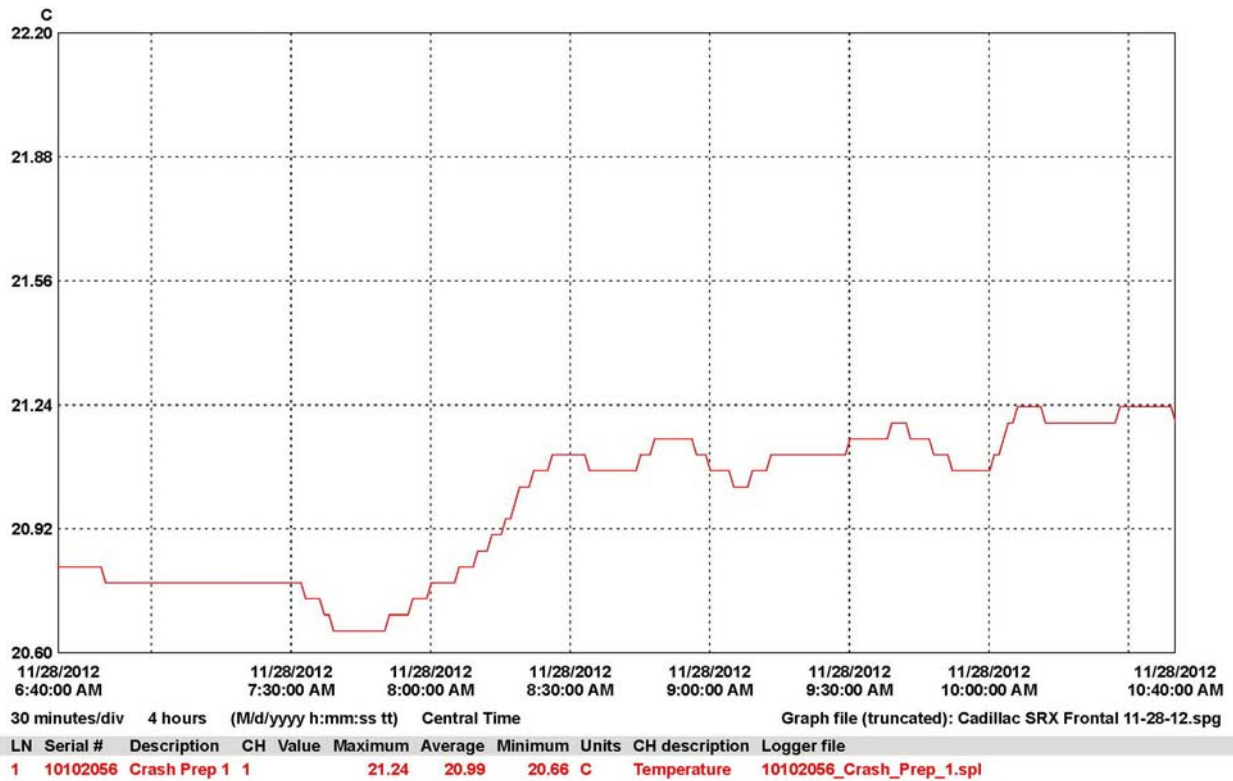
SOLVENT SPILLAGE LOCATION TABLE

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: 2013 Cadillac SRX AWD SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: GD0102
 Test Date: 11/28/2012



**APPENDIX A
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Load Cell Location



Load Cell Wall

GD0102

GM MFD BY GENERAL MOTORS DE MEXICO, S. DE R.L. DE C.V. 09/12

GVWR	GAWR FRT	GAWR RR
2520 KG	1410 KG	1300 KG
5556 LB	3108 LB	2866 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

3GYFNGE39DS515112 TYPE: M.P.V.

MODEL: NG26

NBBF	TIRE SIZE	SPEED RTG	RIM	COLD TIRE PRESSURE
FRT	P235/65R18	H	18X8J	240KPA(35PSI)
RR	P235/65R18	H	18X8J	240KPA(35PSI)
SPA	NONE		NONE	KPA(PSI)

SEE OWNER'S MANUAL  FOR MORE INFORMATION.

Manufacturer's Label

TIRE AND LOADING INFORMATION

 **SEATING CAPACITY** TOTAL 5 FRONT 2 REAR 3

The combined weight of occupants and cargo should never exceed 443 kg or 977 lbs.

TIRE	ORIGINAL SIZE	COLD TIRE PRESSURE
FRONT	P235/65R18 H	240 kPa, 35 PSI
REAR	P235/65R18 H	240 kPa, 35 PSI
SPARE	NONE	NONE

SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

3GYFNGE39DS515112

GD0102

Tire Placard



2013 Cadillac SRX AWD SUV Frontal As Delivered



Left Rear 3-4 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



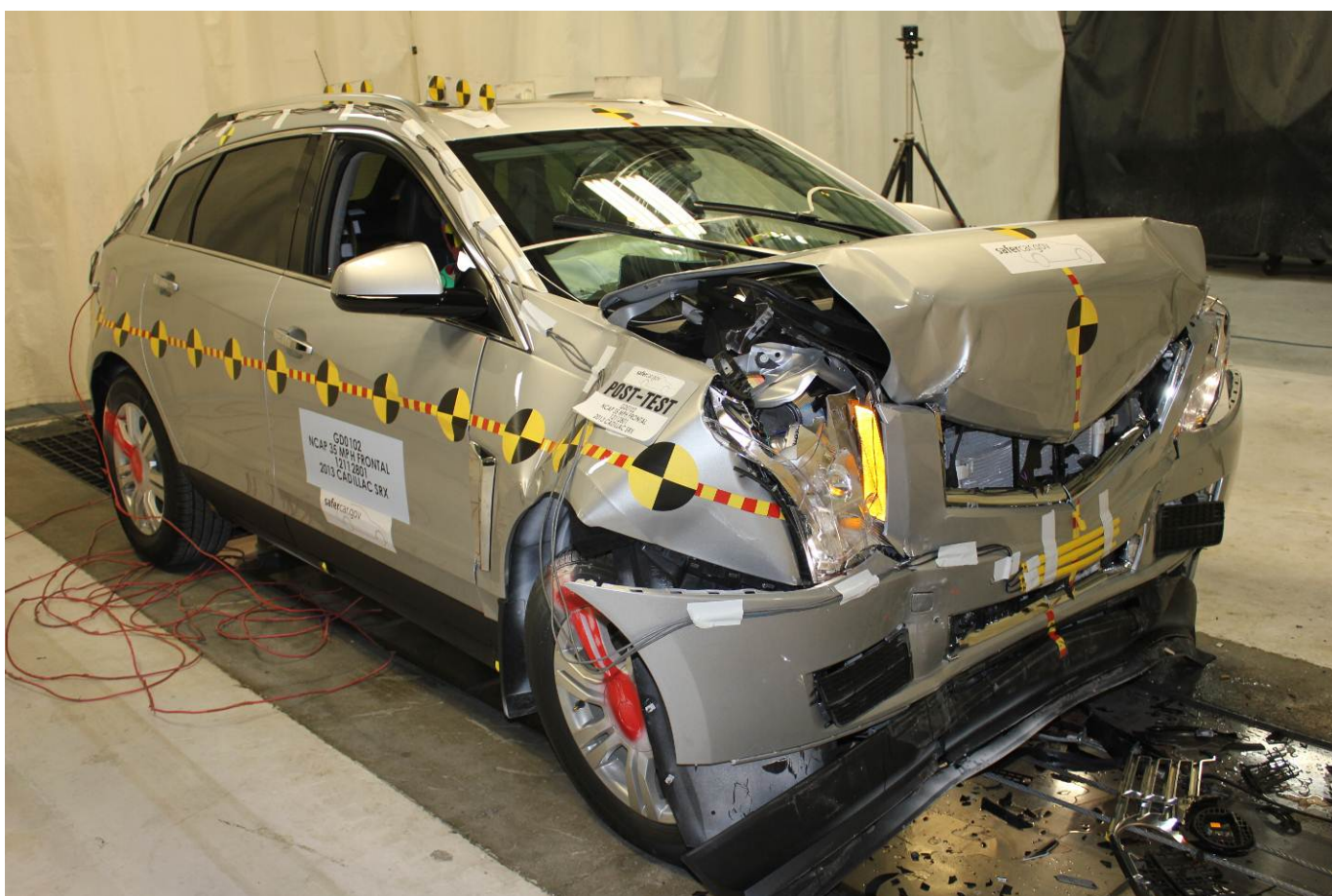
Pre-Test Right View of Test Vehicle



Post-Test Right View of Test Vehicle



Pre-Test Right Front 3-4 View



Post-Test Right Front 3-4 View



Pre-Test Left Rear 3-4 View



Post-Test Left Rear 3-4 View



Pre-Test Windshield View



Post-Test Windshield View



Pre-Test Engine Compartment View



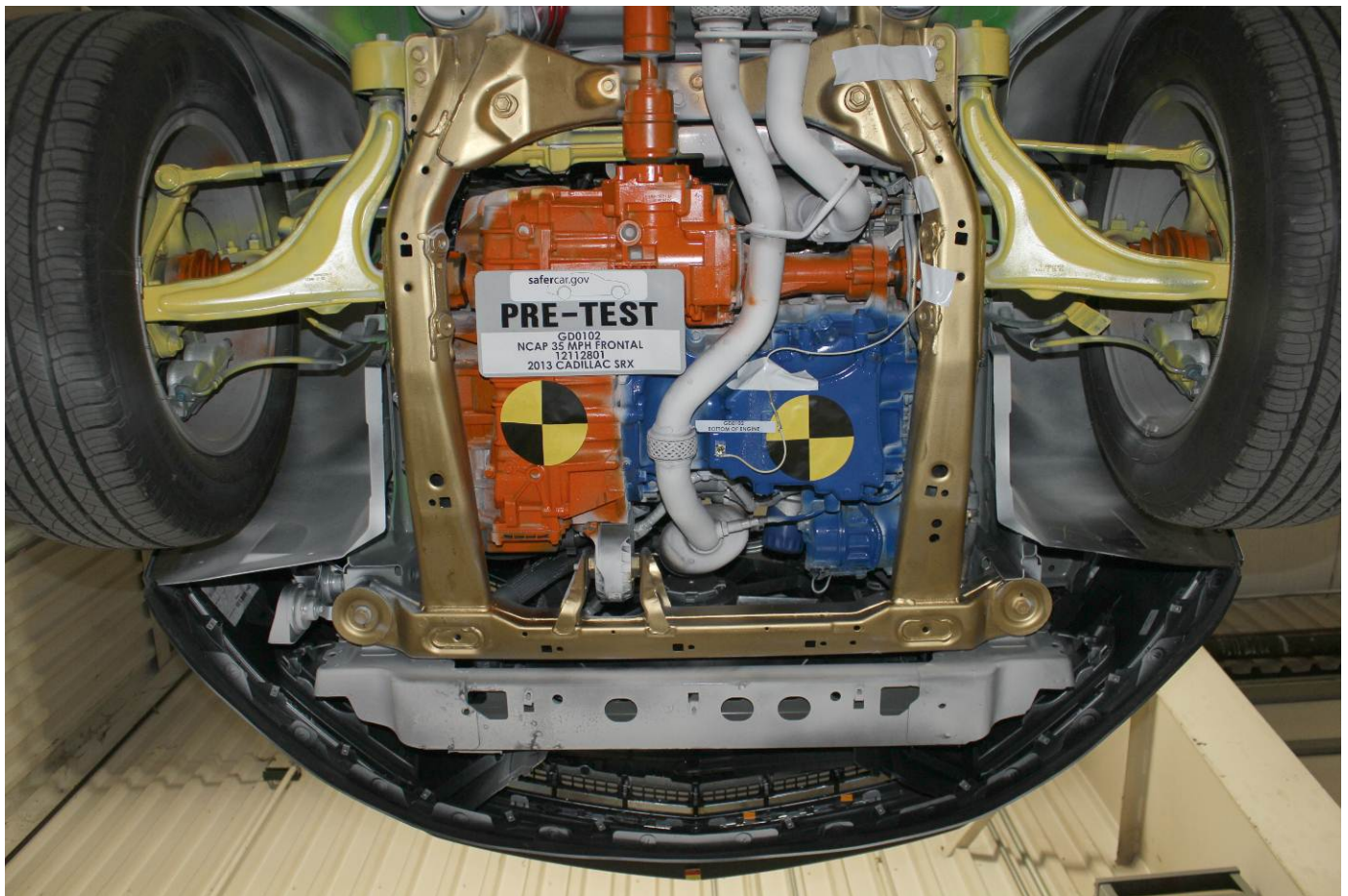
Post-Test Engine Compartment View



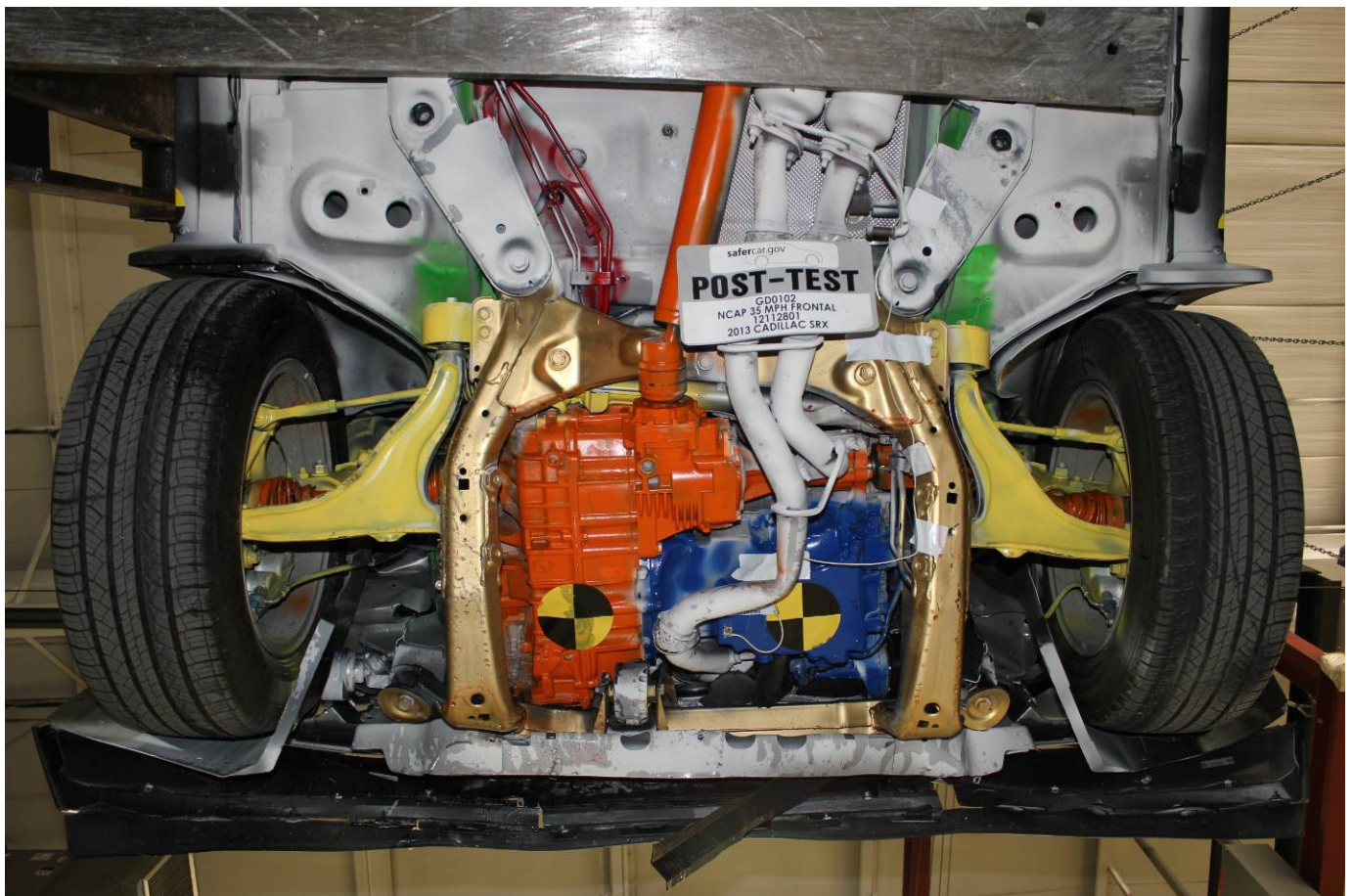
Pre-Test Fuel Filler Cap View



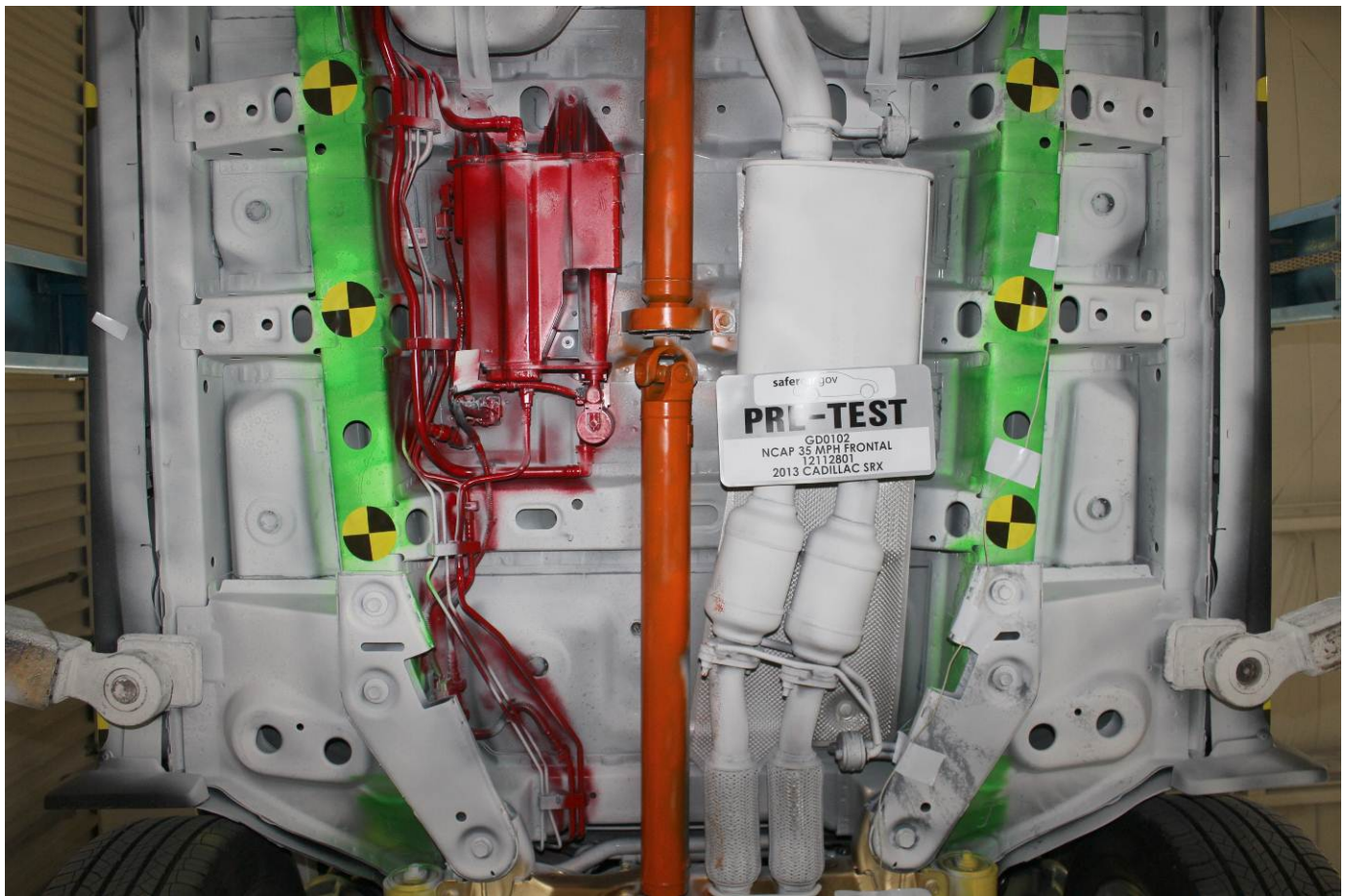
Post-Test Fuel Filler Cap View



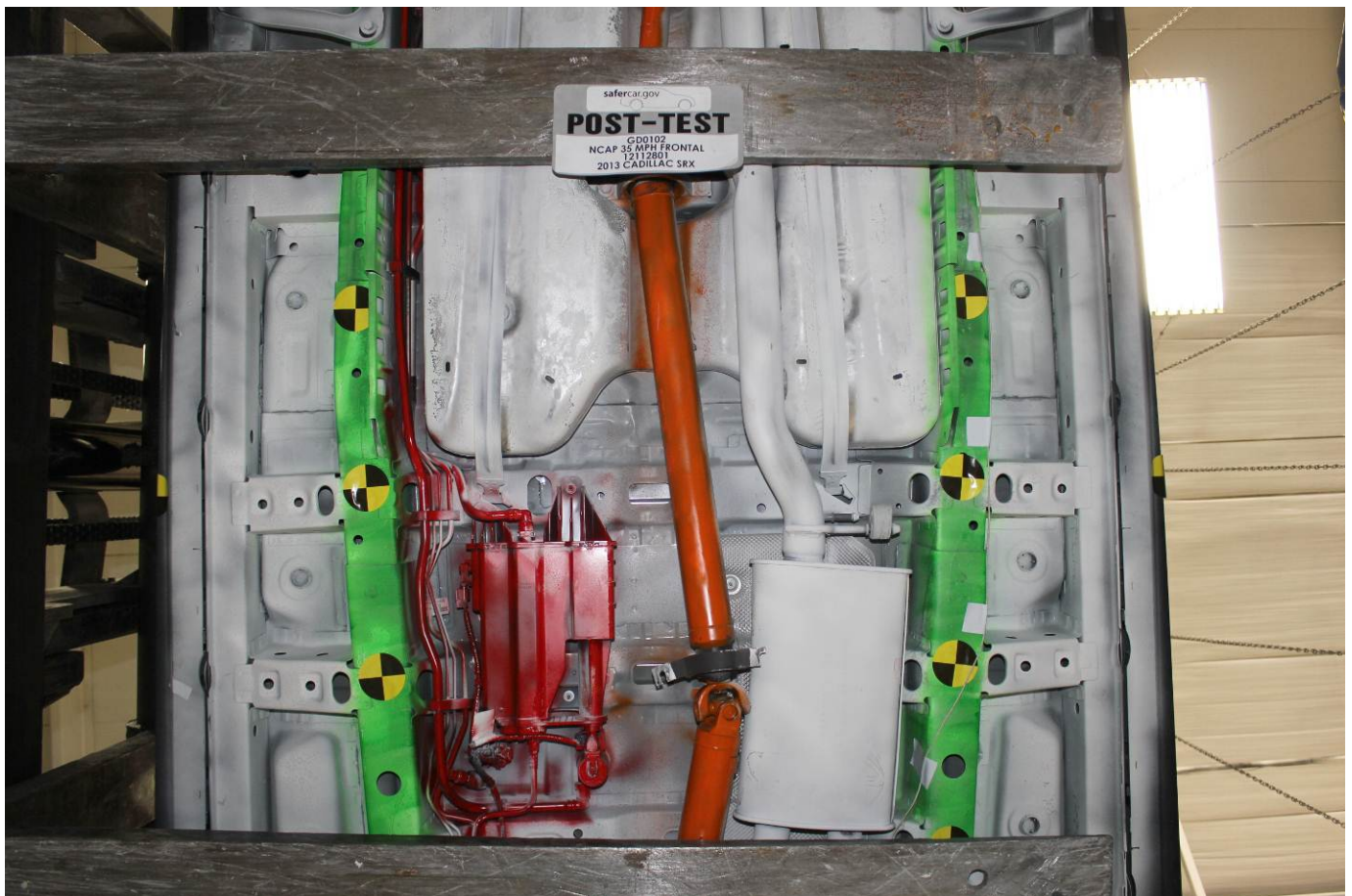
Pre-Test Front Underbody View



Post-Test Front Underbody View



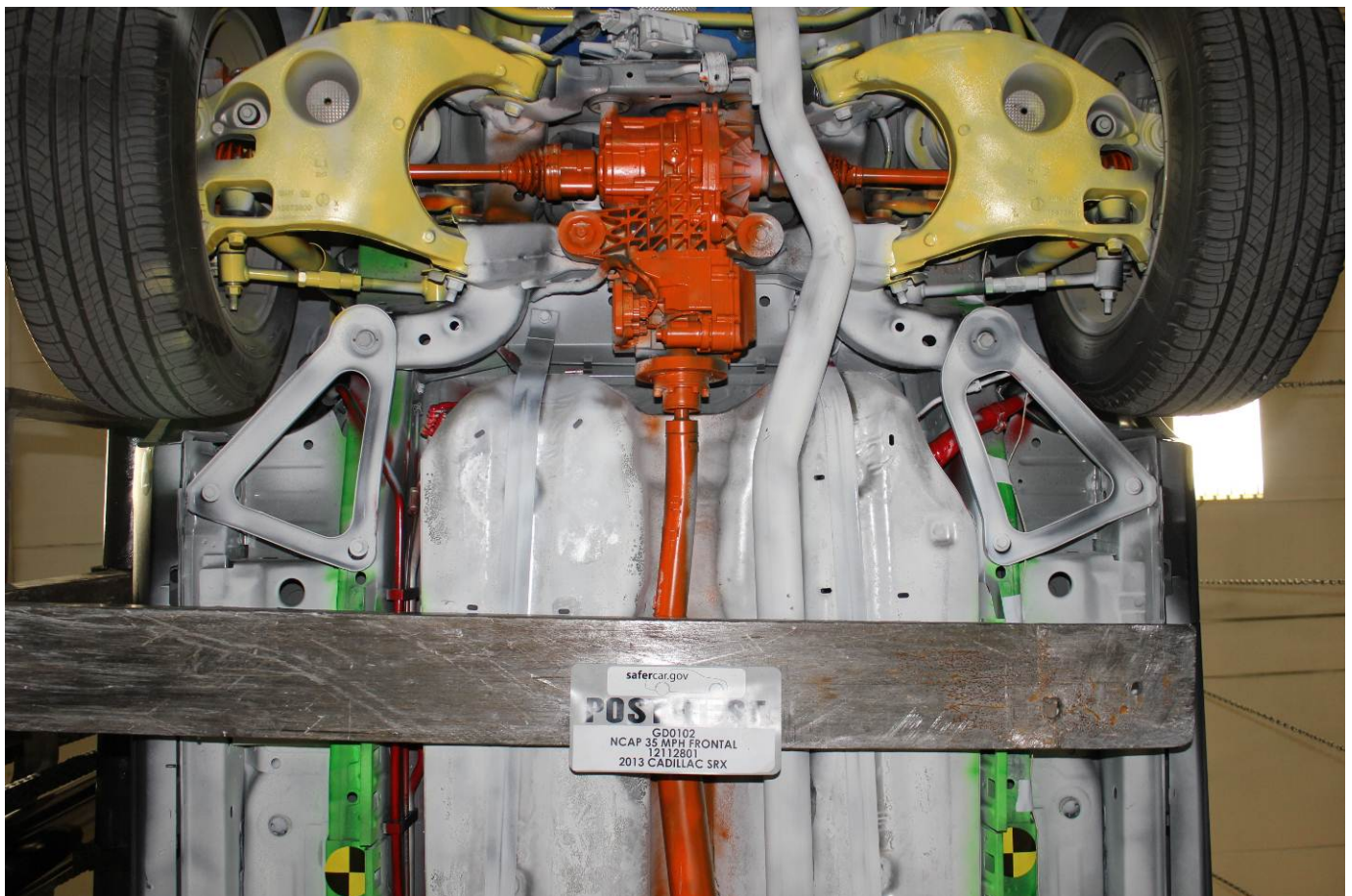
Pre-Test Mid Front Underbody View



Post-Test Mid Front Underbody View



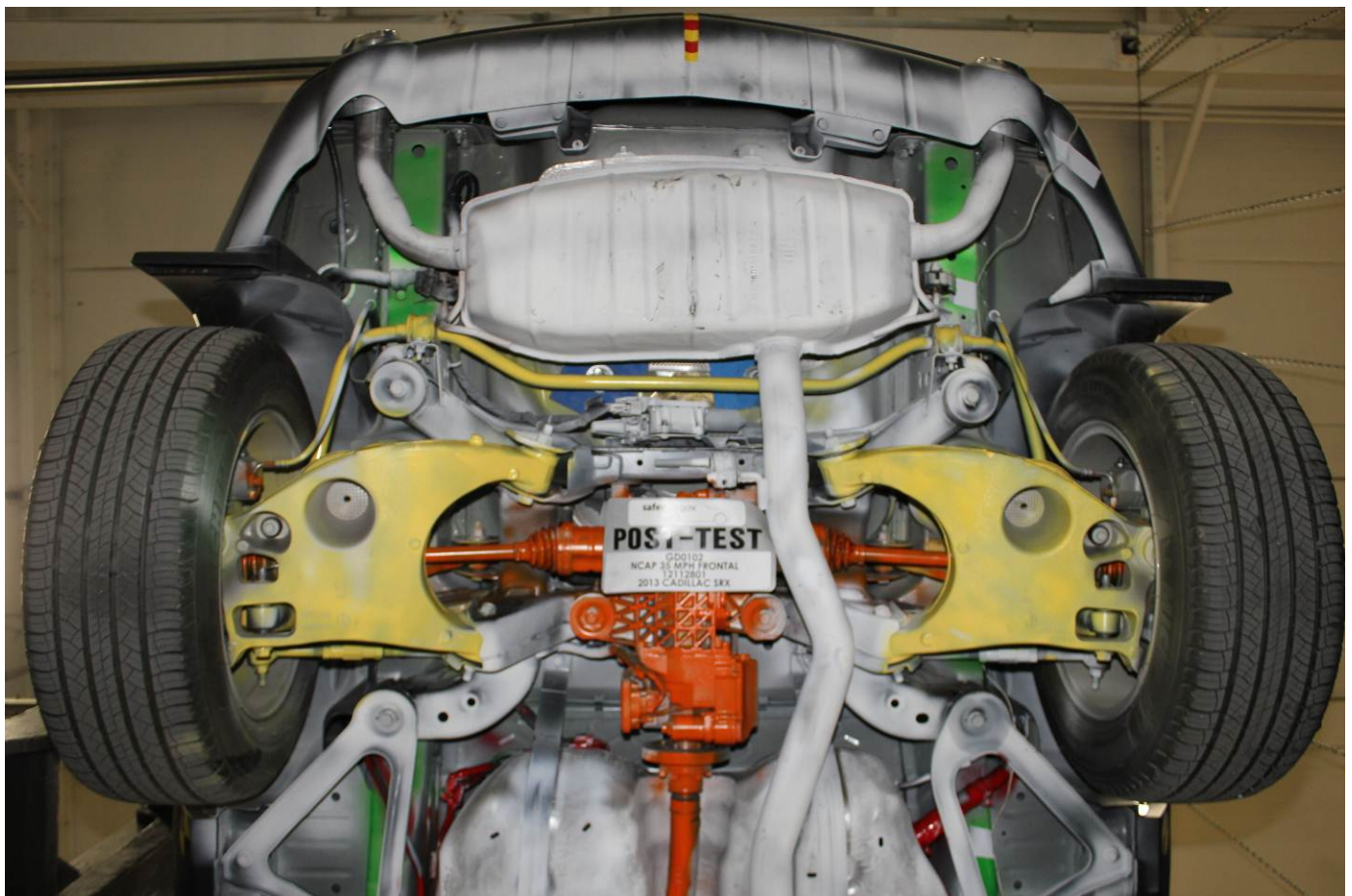
Pre-Test Mid Rear Underbody View



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 View of Belt Anchorage for Driver Dummy



Post-Test View of Belt Anchorage for Driver Dummy



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)



Pre-Test Driver's Side Floorpan



Post-Test Driver's Side Floorpan



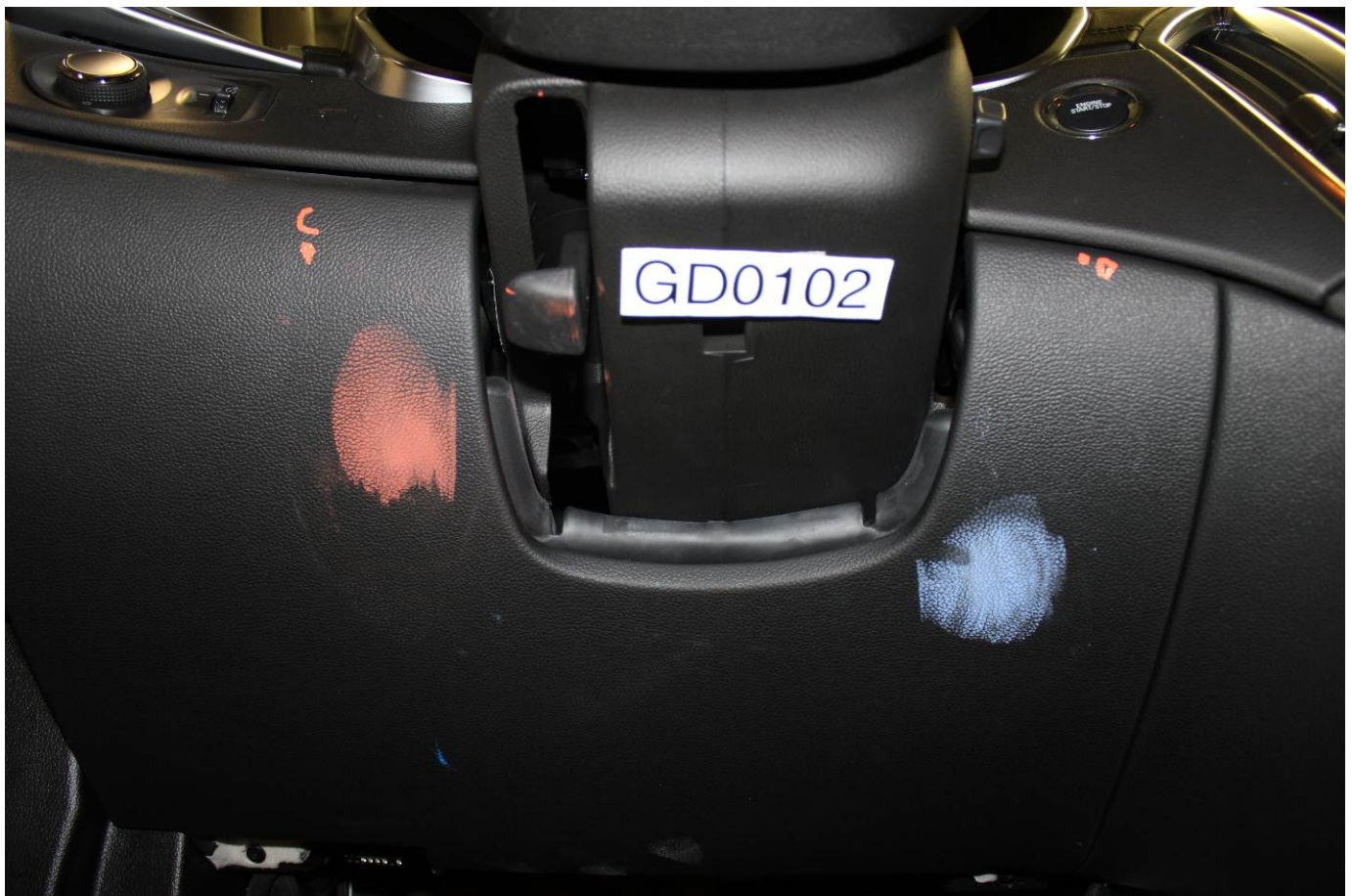
Post-Test Driver Dummy Face



Post-Test Driver Dummy Contact with Airbag



Post-Test Driver Dummy Contact with Headrest



Post-Test Driver Dummy Contact with Knee Bolster



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



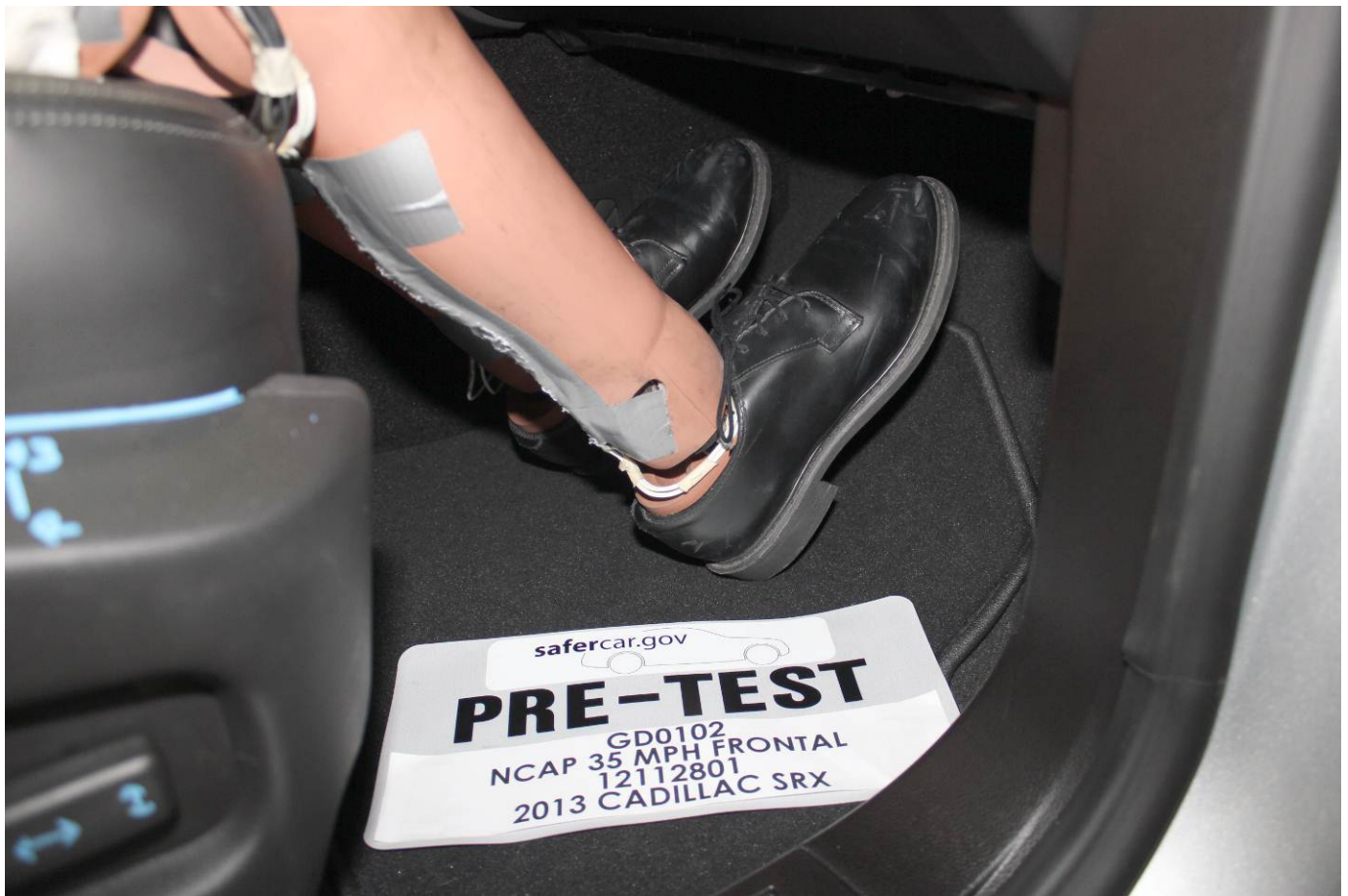
Post-Test Passenger's Seat Fore-Aft Markings



Pre-Test View of Belt Anchorage for Passenger Dummy



Post-Test View of Belt Anchorage for Passenger Dummy



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)



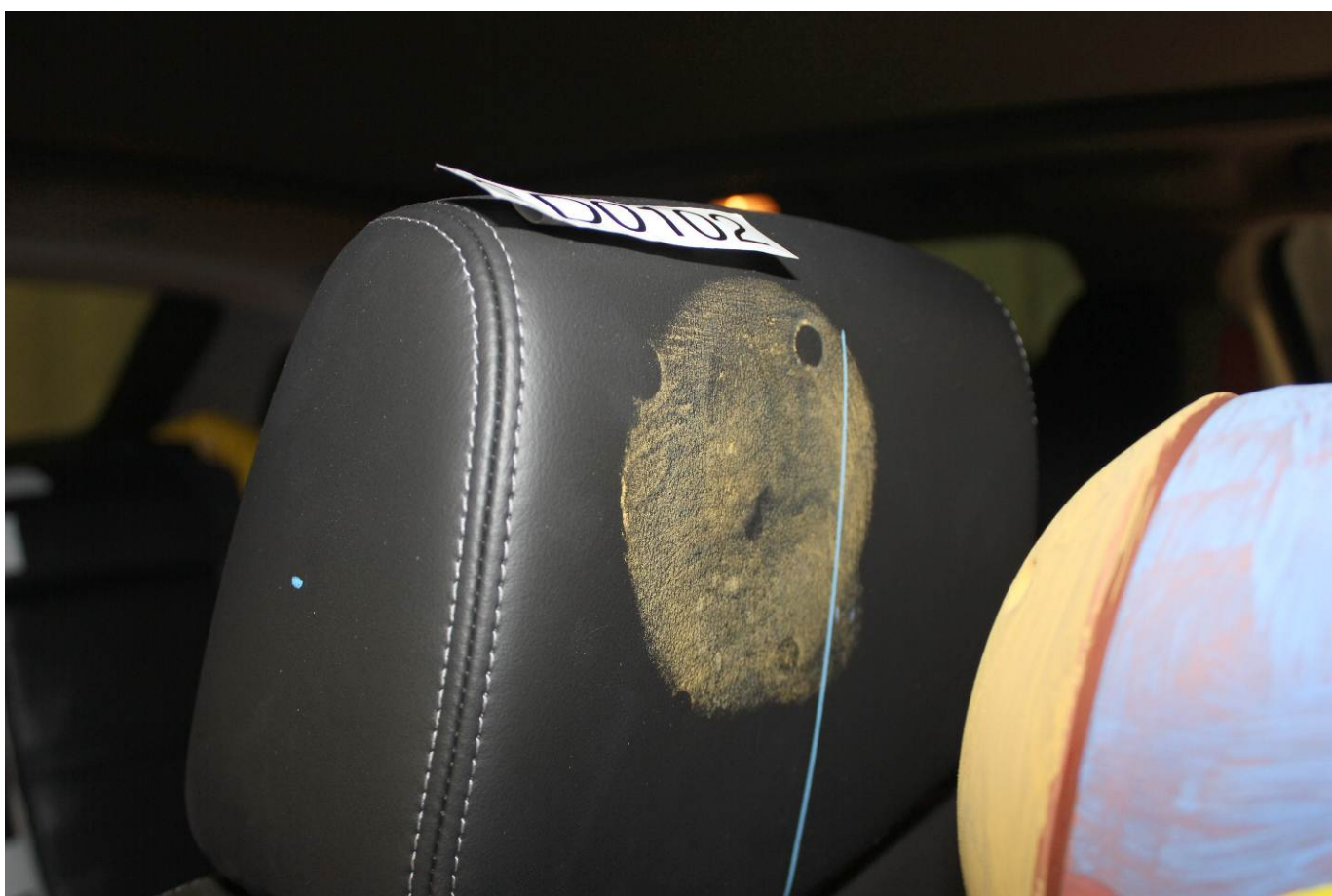
Pre-Test Passenger's Side Floorpan



Post-Test Passenger's Side Floorpan



Post-Test Passenger Dummy Contact with Airbag



Post-Test Passenger Dummy Contact with Headrest



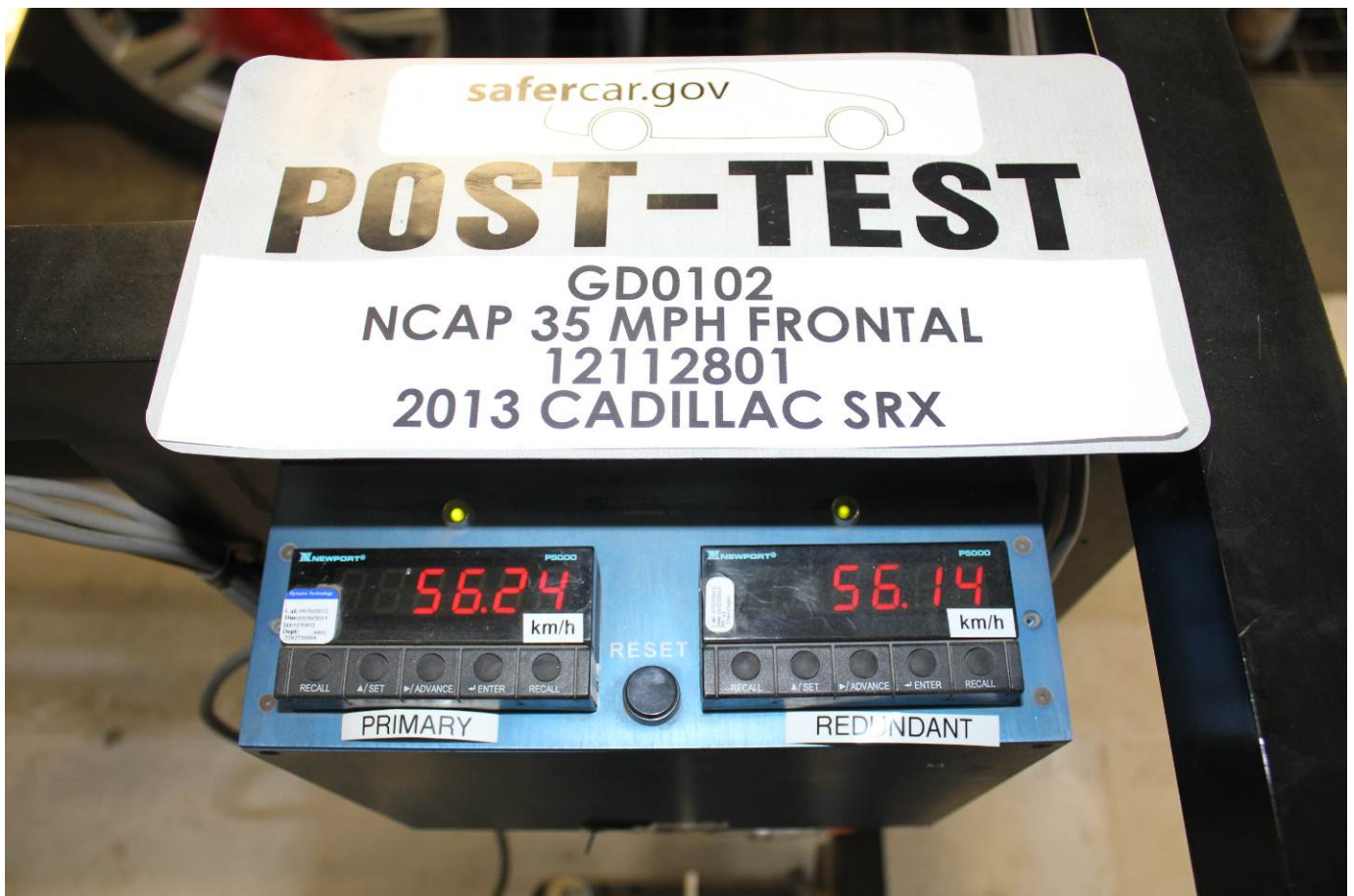
Post-Test Passenger Dummy Contact with Glovebox



Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

Post-Test Stoddard Solvent Spillage Location View



Post-Test Speed Trap Read-Out



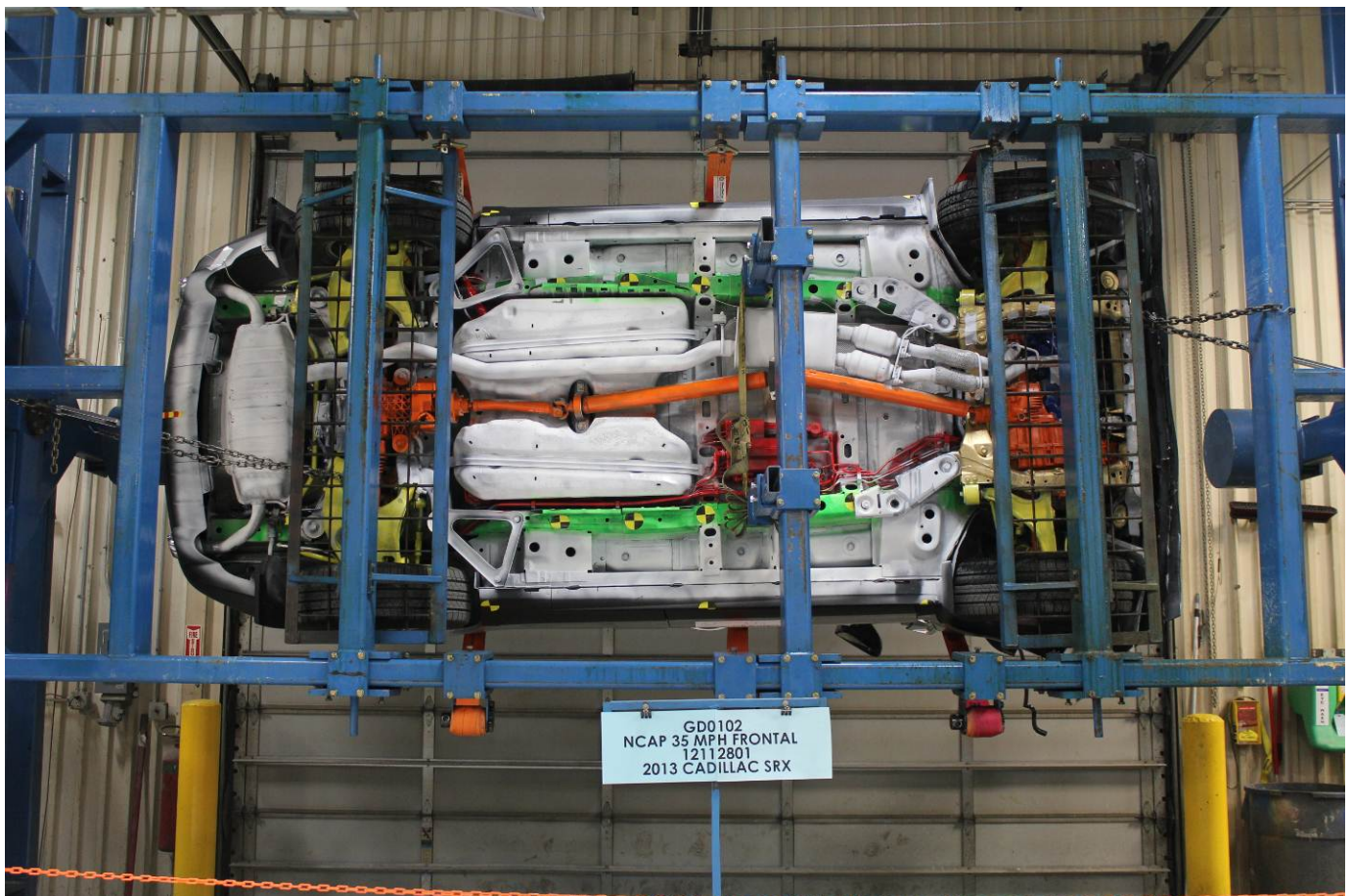
Vehicle at 0° on Static Rollover Device



Vehicle at 90° on Static Rollover Device



Vehicle at 180° on Static Rollover Device



Vehicle at 270° on Static Rollover Device



Vehicle at 360° on Static Rollover Device



2013 Cadillac SRX AWD SUV Frontal Impact Event



Cadillac

2013 SRX AWD LUXURY COLLECTION

119 miles

EXTERIOR: RADIANT SILVER METALLIC ENGINE 3.6L, SIDI V6
INTERIOR: EBONY W/ EBONY ACCENTS TRANSMISSION, 6-SPEED AUTO,

Visit us at www.cadillac.com

STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN.

- ***"CADILLAC SHIELD"***
- 4 YEAR / 50,000 MILE* BUMPER-TO-BUMPER WARRANTY
- 6 YEAR / 70,000 MILE* POWERTRAIN LIMITED WARRANTY
- 4 YEAR / 50,000 MILE* PREMIUM CARE MAINTENANCE
- 6 YEAR / 70,000 MILE* COURTESY TRANSPORTATION
- 6 YEAR / 70,000 MILE* ROADSIDE ASSISTANCE
- *WHICHEVER COMES FIRST. SEE DEALER FOR DETAILS.

PERFORMANCE

- ENGINE 3.6L, SIDI V6
- E85 CAPABLE
- DRIVETRAIN, ALL WHEEL DRIVE
- DIFFERENTIAL, LIMITED SLIP
- WHEELS, 18" ALUMINUM, BRIGHT FINISH

LUXURY/CONVENIENCE

- AUDIO SYSTEM, BOSE 8 SPEAKER
- SIRIUSXM AND HD RADIO + SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUSXM AFTER 3 MONTHS
- HEATED STEERING WHEEL
- STEERING COLUMN, RAKE AND TELESOPING
- CRUISE CONTROL
- ADJUSTABLE PEDALS
- DRIVER & FRONT PASSENGER HEATED LEATHER SEATS
- PWR SEAT ADJUST, DRIVER 8 WAY
- PWR SEAT ADJUST, FRONT PASSENGER 8-WAY
- REAR SEAT, 60/40 SPLIT FOLD
- ADAPTIVE REMOTE START
- EZ KEY PASSIVE ENTRY SYSTEM
- CARGO MANAGEMENT SYSTEM
- WIPERS, RAIN-SENSITIVE
- SAPELE WOOD-TRIM INTERIOR
- ULTRANAV POWER SUNROOF

- AIR CONDITIONING, DUAL ZONE CLIMATE CONTROL
- INSIDE REARVIEW MIRROR, AUTO DIMMING
- MIRRORS, OUTSIDE HEATED, POWER, FOLDING, DRIVER SIDE
- EXHAUST TIPS, DUAL CHROME
- POWER PROGRAMMABLE LIFTGATE
- LED INTERIOR AMBIENT LIGHTING
- UNIVERSAL HOME REMOTE
- FRONT & REAR PARKING ASSIST
- ROOF RAILS, CHROME

SAFETY AND SECURITY

- AIRBAGS, DRIVER & FRONT PASS. FRONT / SIDE IMPACT
- AIRBAGS - SIDE HEAD CURTAIN
- AIRBAG SENSING SYSTEM, PASSENGER
- REAR VISION CAMERA SYSTEM
- CARGO SHADE, RETRACTABLE
- TIRE PRESSURE MONITOR SYSTEM

- REAR DR LOCKS, CHILD SECURITY
- THEFT DETERRENT SYSTEM
- STABILITRAK - STABILITY CONTROL SYSTEM W/ TRACTION CONTROL
- WINDOWS, POWER FRONT EXPRESS UP & DOWN, REAR EXPRESS DOWN
- SIDE BLIND ZONE ALERT
- REAR CROSS TRAFFIC ALERT
- 12 MOS. ONSTAR DIRECTIONS AND CONNECTIONS W/ AUTOMATIC CRASH RESPONSE, TURN-BY-TURN NAVIGATION, AND ONSTAR REMOTELINK (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)

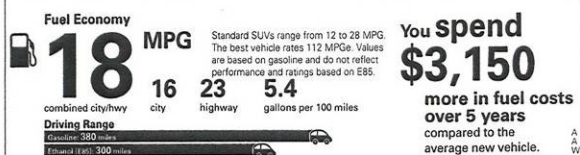
OTHER

- TIRE INFLATION KIT IN PLACE OF SPARE TIRE

OPTIONS & PRICING

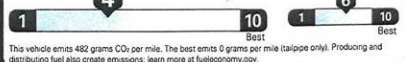
MANUFACTURER'S SUGGESTED RETAIL PRICE	
STANDARD VEHICLE PRICE	\$45,025.00
OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)	
DRIVER AWARENESS PACKAGE:	445.00
• FORWARD COLLISION ALERT	
• LANE DEPARTURE WARNING	
• SAFETY ALERT SEAT	
MOLDED SPLASH GUARDS (DEALER INSTALLED)	170.00
TOTAL OPTIONS	\$815.00
TOTAL VEHICLE & OPTIONS	\$45,840.00
DESTINATION CHARGE	875.00
TOTAL VEHICLE PRICE*	\$46,515.00

EPA DOT Fuel Economy and Environment



Annual fuel cost \$2,950

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **Smog Rating** (tailpipe only)



Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and costs \$11,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.55 per gallon. This is a dual fueled automobile. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles



GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 26%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 65%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
RAMOS ARIZPE, CZ MEXICO
COUNTRY OF ORIGIN:
ENGINE: MEXICO
TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law - Do not remove prior to delivery to the ultimate purchaser. *Includes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above. Local taxes or license fees.

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ORDER NO QMS03V SALES CODE E
SALES MODEL CODE 03AR
DEALER NO 37318
FINAL ASSEMBLY:
RAMOS ARIZPE, CZ MEXICO

VIN 3GYFNGE39D5S15112

DEALER TO WHOM DELIVERED
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3400 S BUSINESS DR
SHEBOYGAN, WI 53081-7022



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Monroney Label

APPENDIX B
DUMMY RESPONSE DATA TRACES

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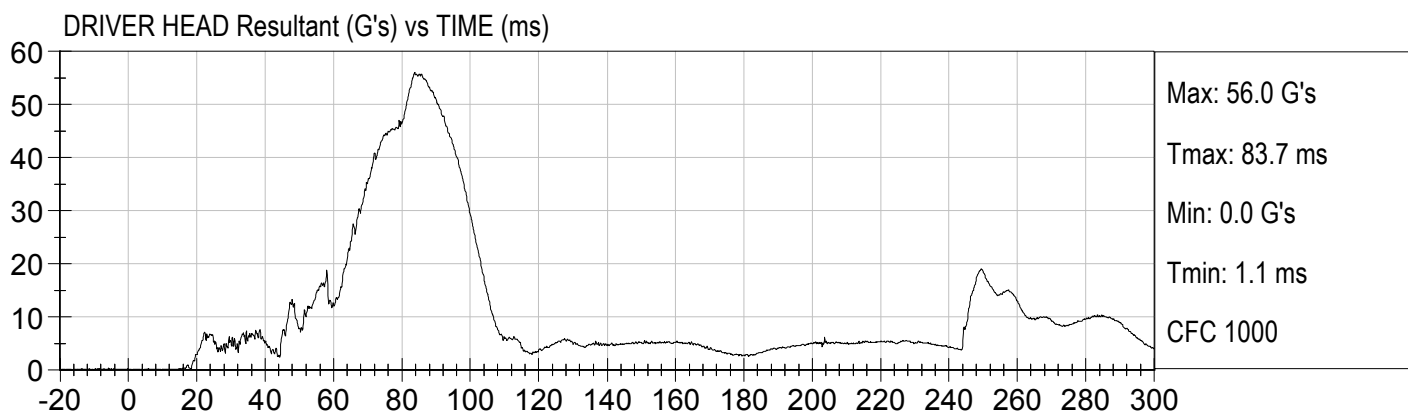
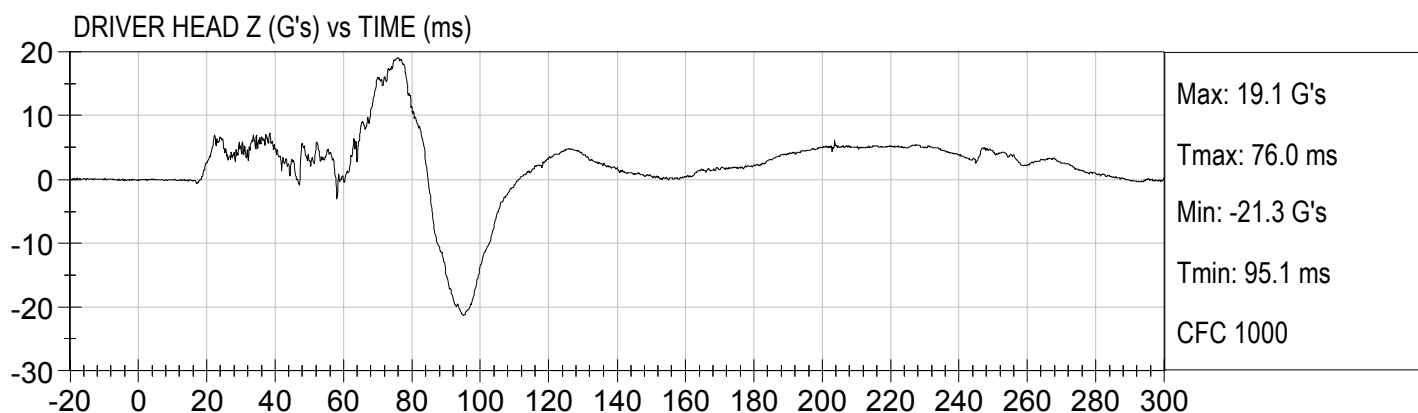
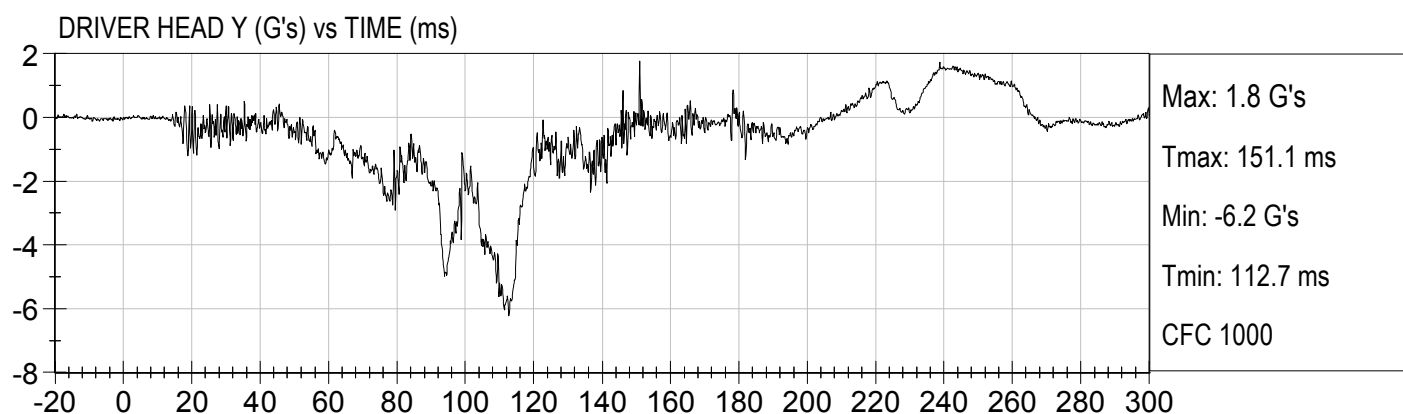
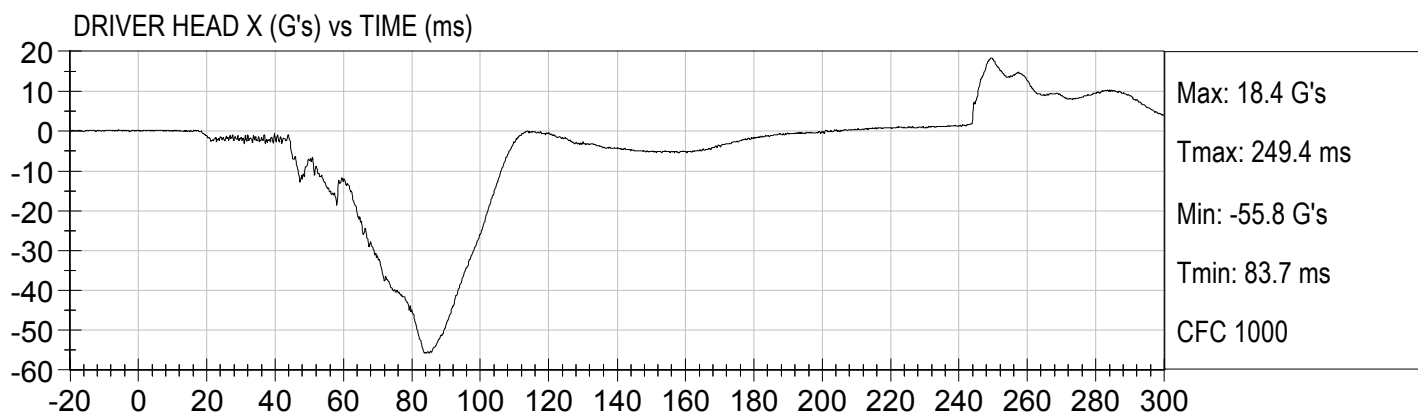
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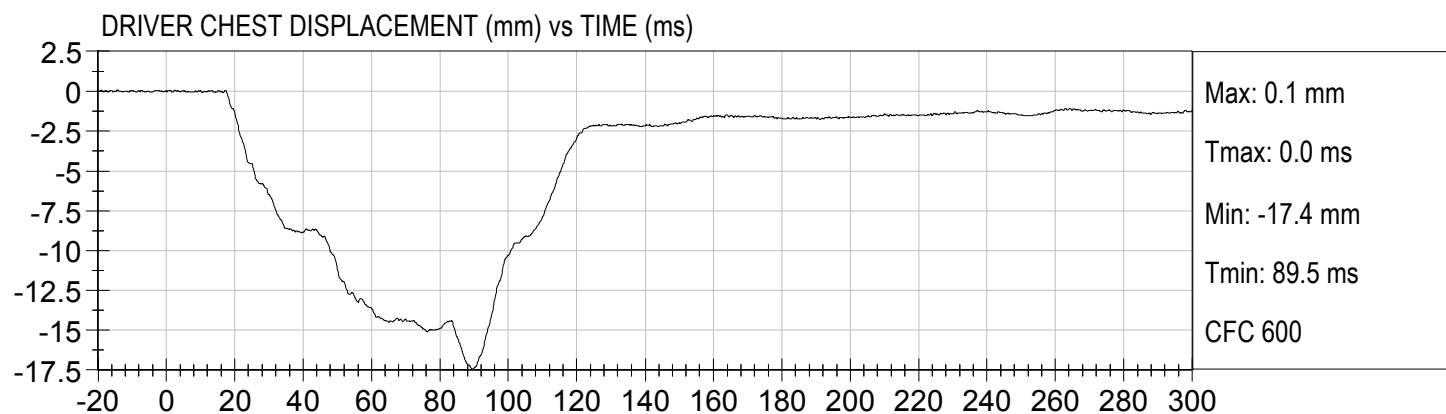
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

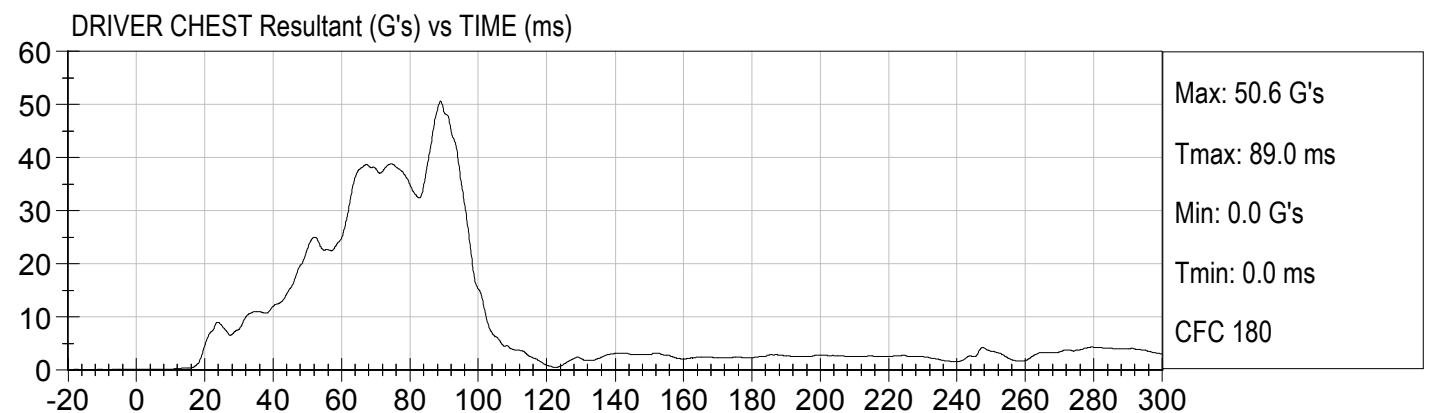
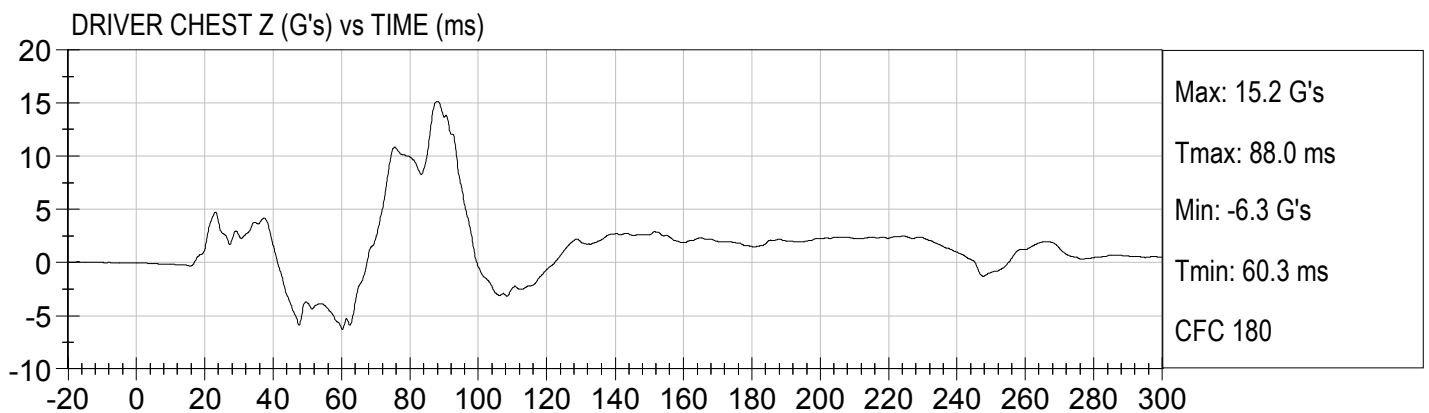
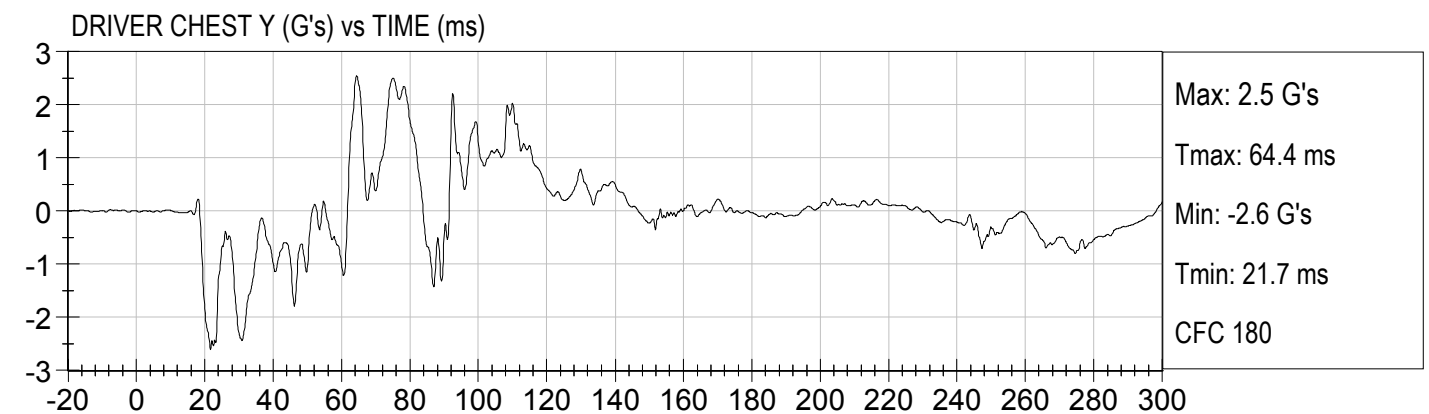
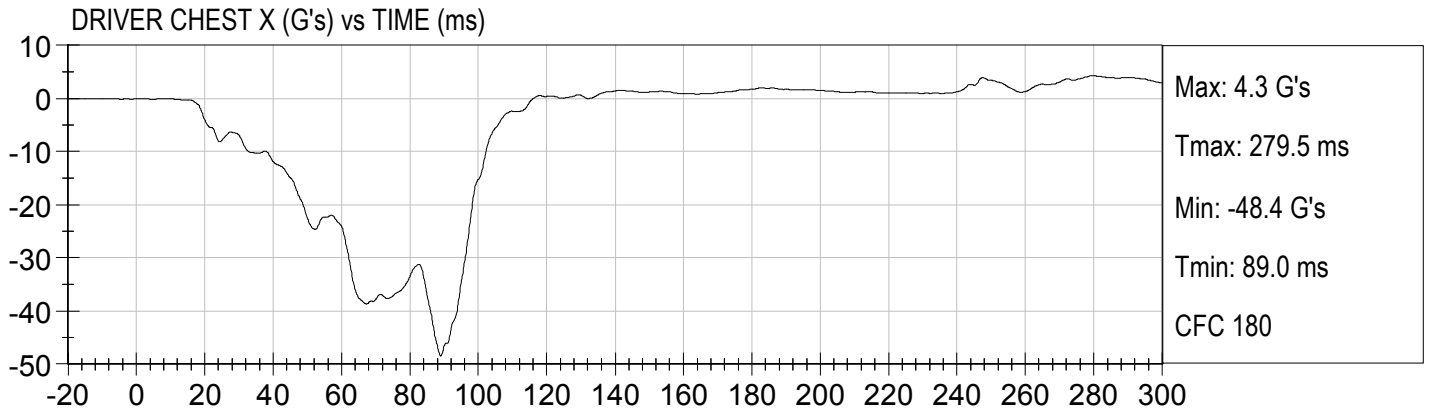
Driver Head X Redundant
 Driver Head Y Redundant
 Driver Head Z Redundant
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant
 Driver Chest Y Redundant
 Driver Chest Z Redundant
 Driver Pelvis X
 Driver Pelvis Y
 Driver Pelvis Z
 Driver Left Femur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

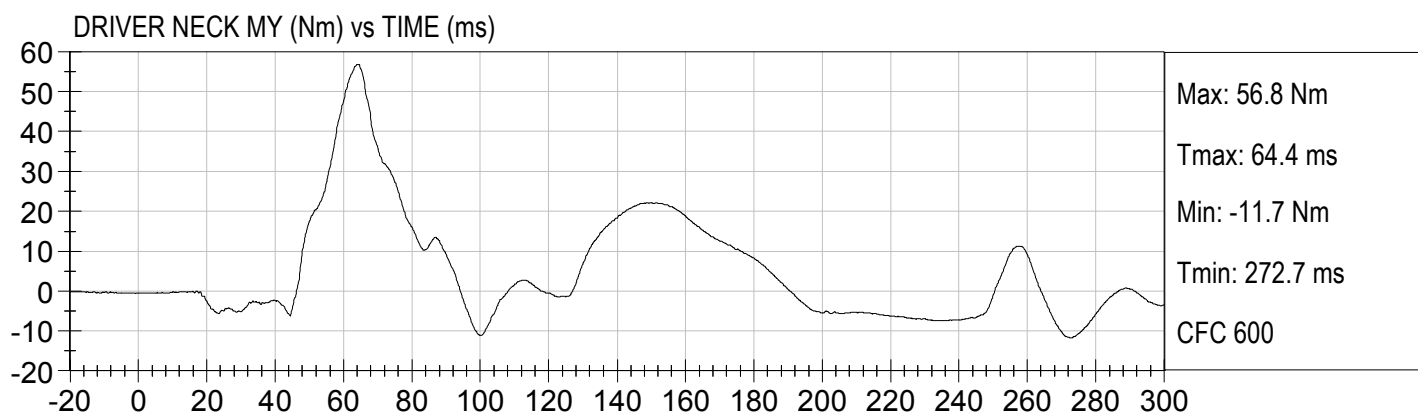
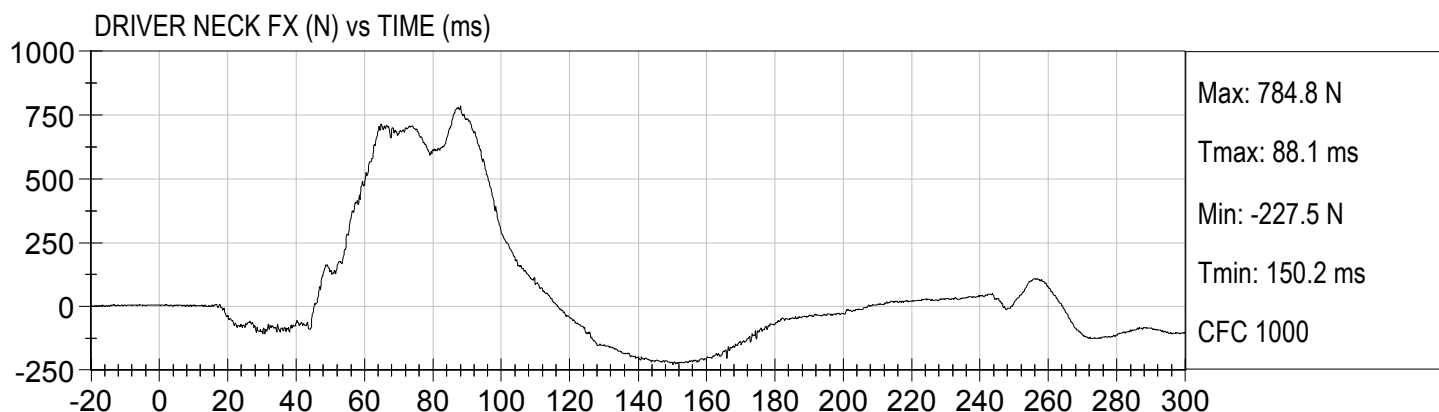
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left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

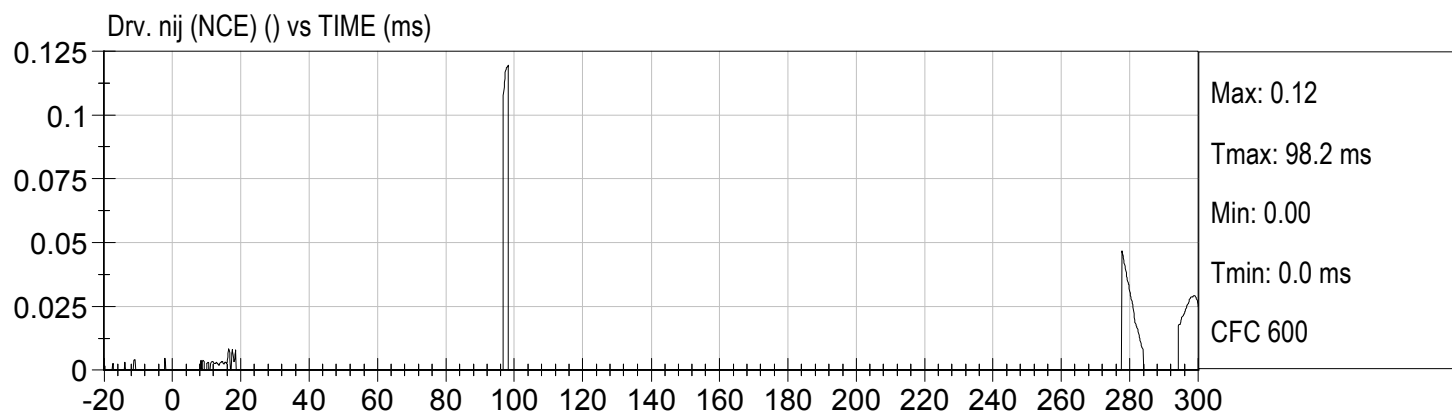
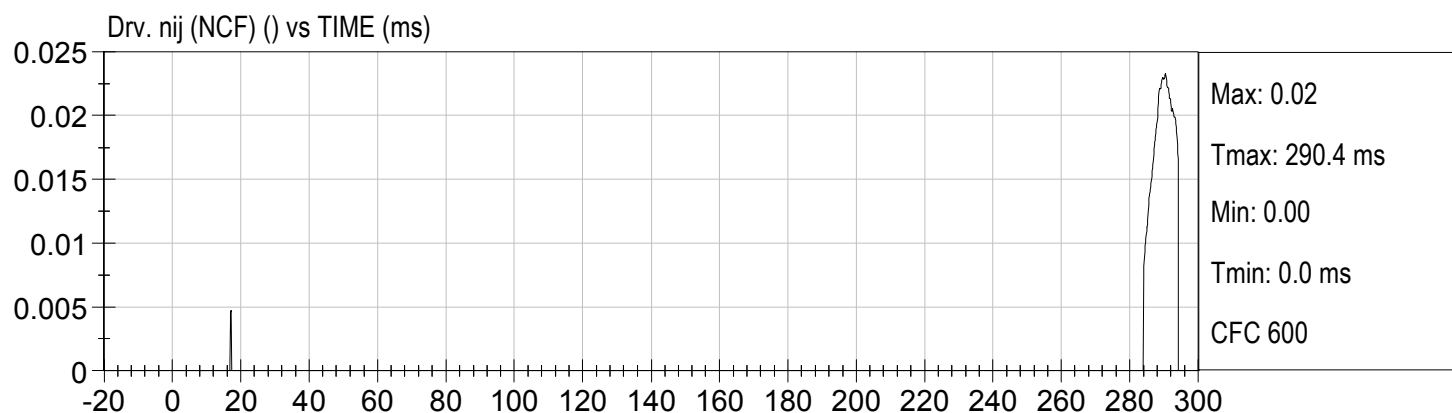
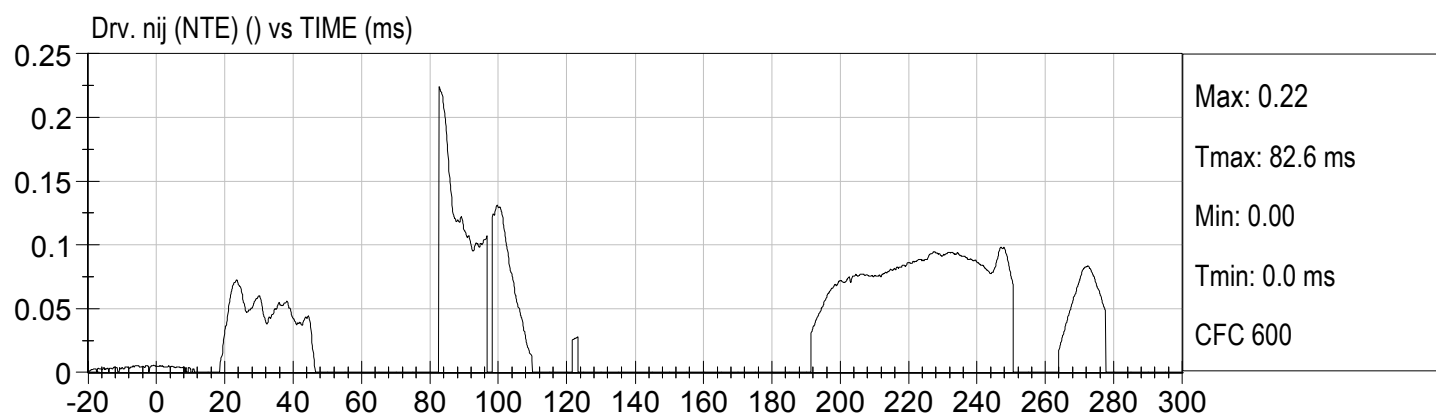
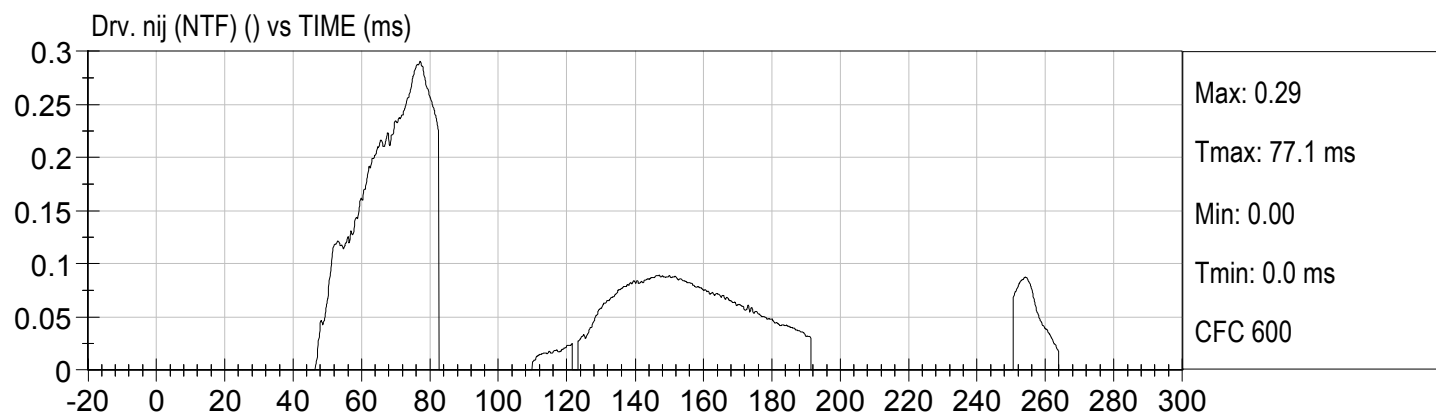
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
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Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
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Passenger Right Lower Tibia Moment Y
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Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
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Passenger Right Foot Aft Z
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Vehicle Engine Bottom X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember Xr
Right Rear Seat Crossmember Xr
Advanced Research Load Cell Barrier – 128 channels

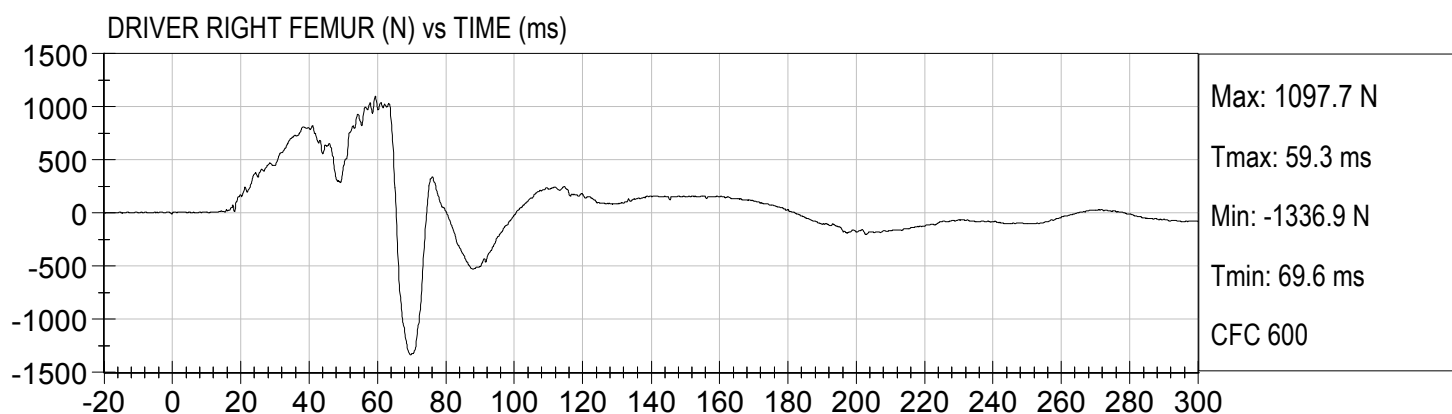
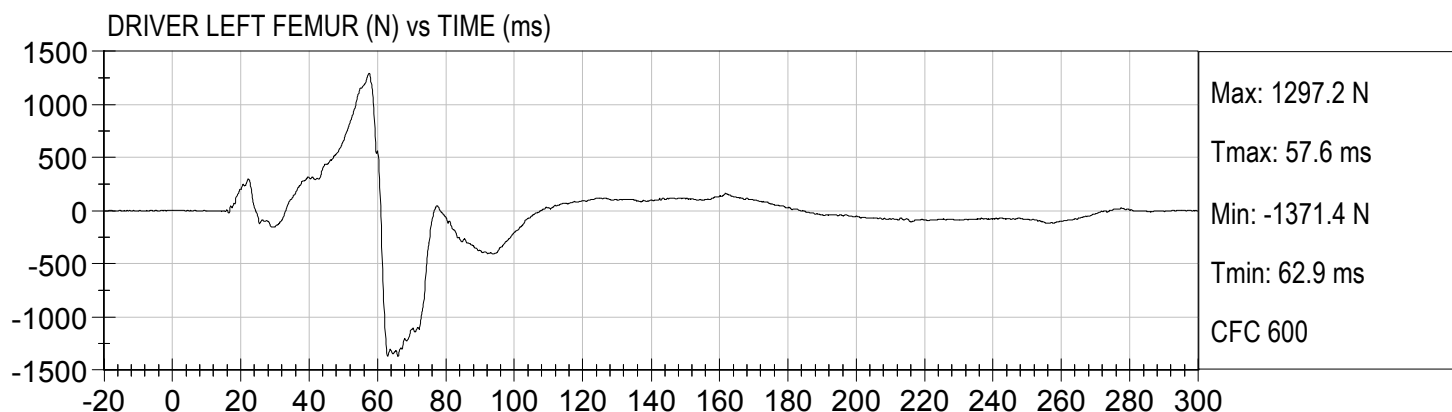


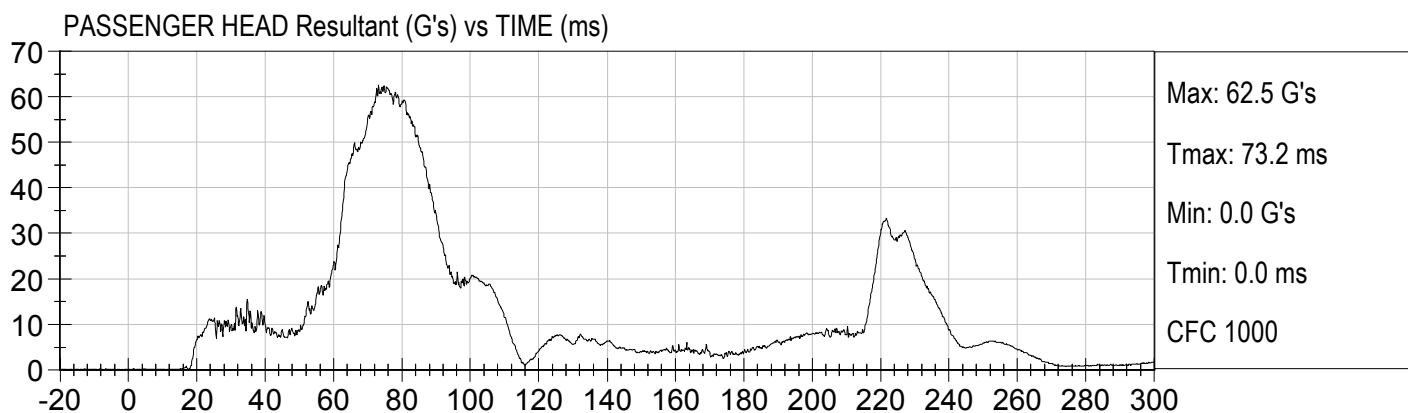
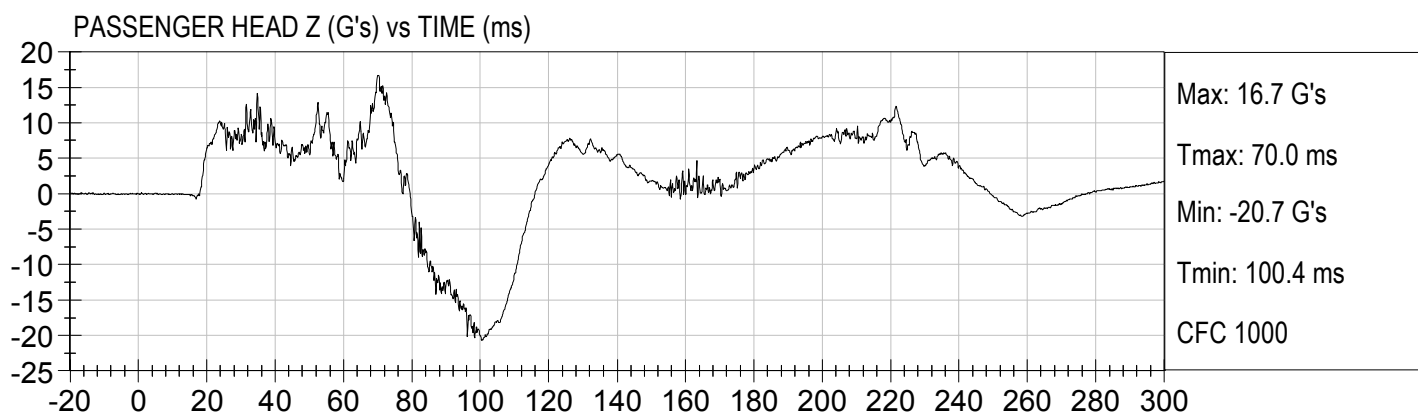
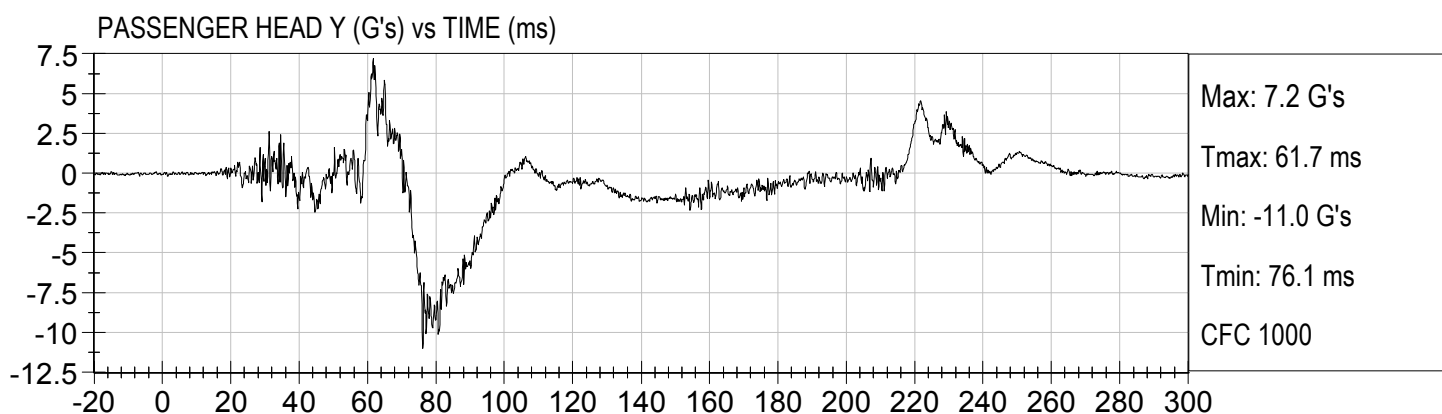
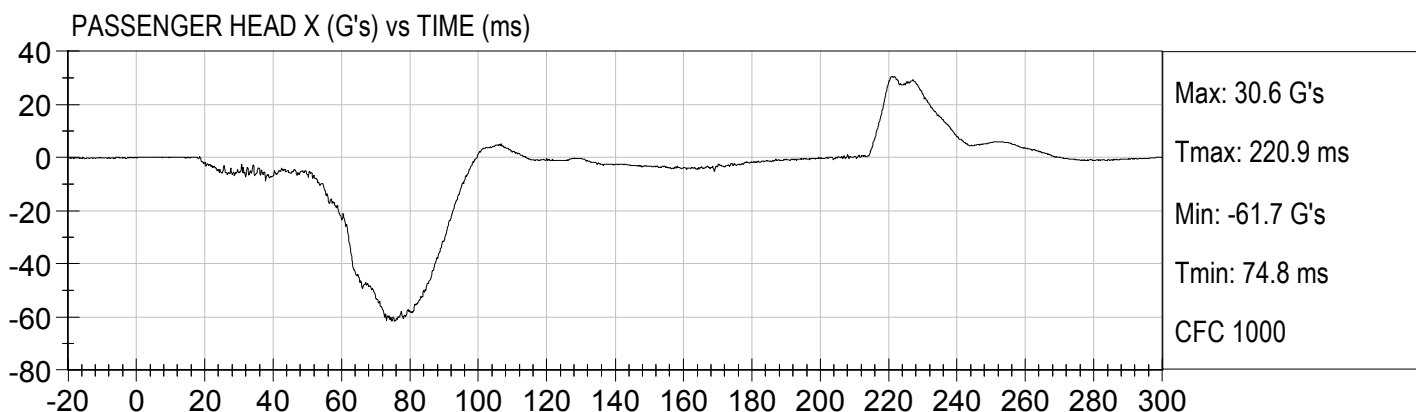


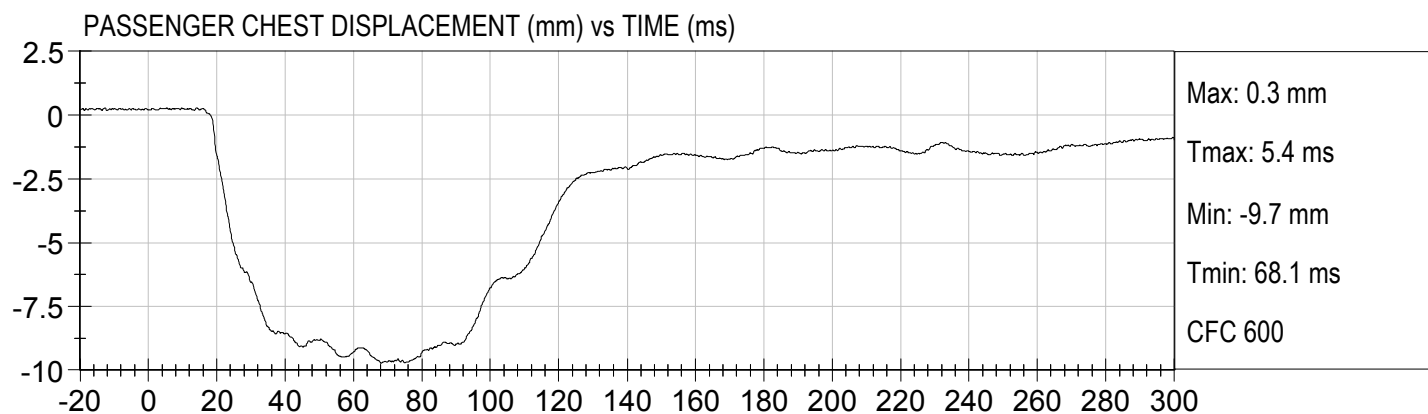


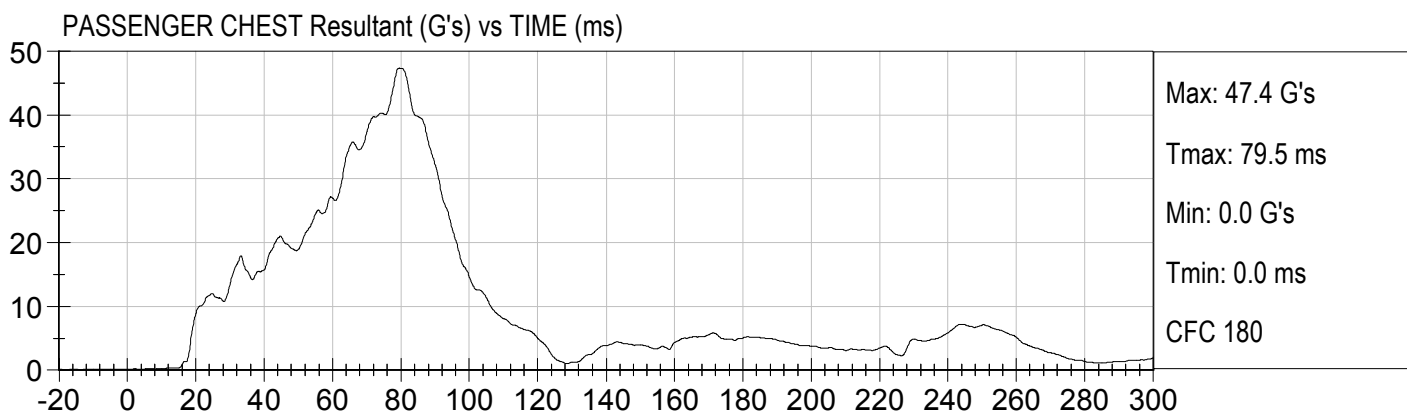
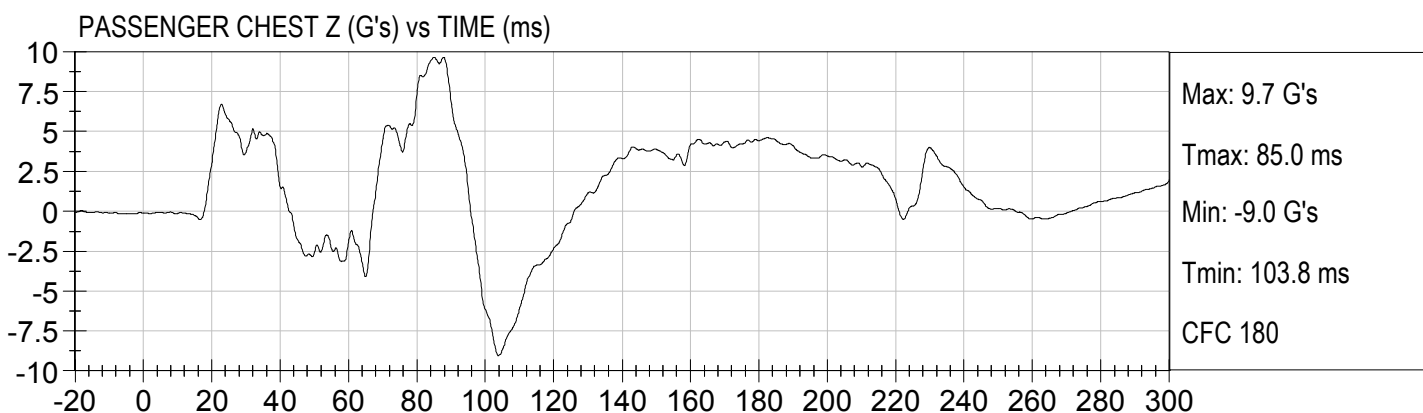
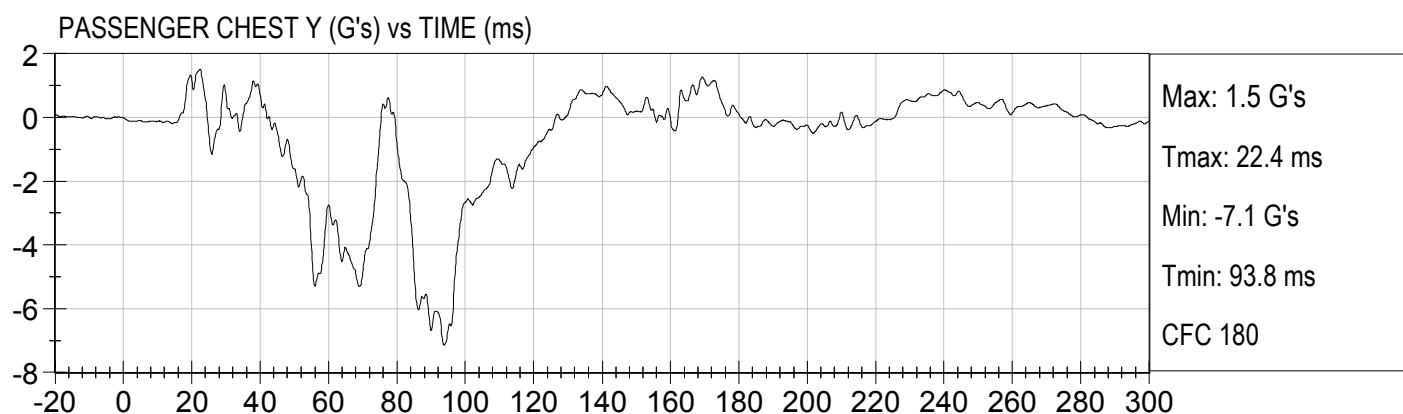
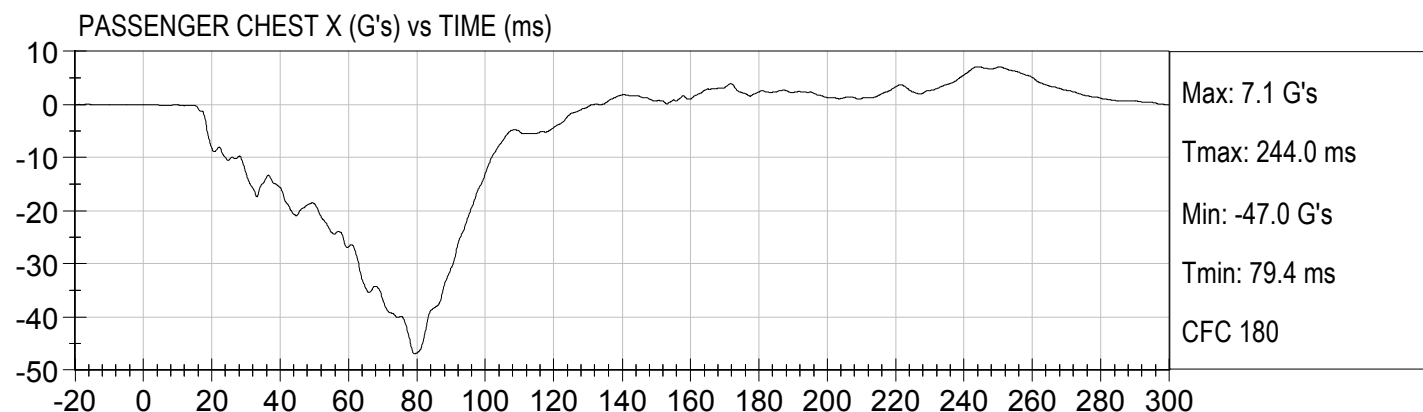


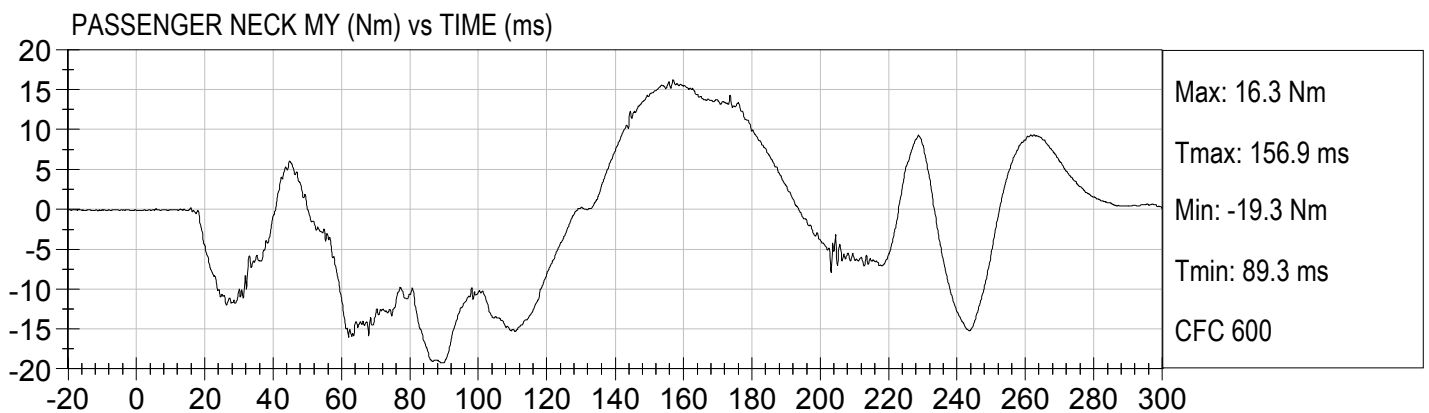
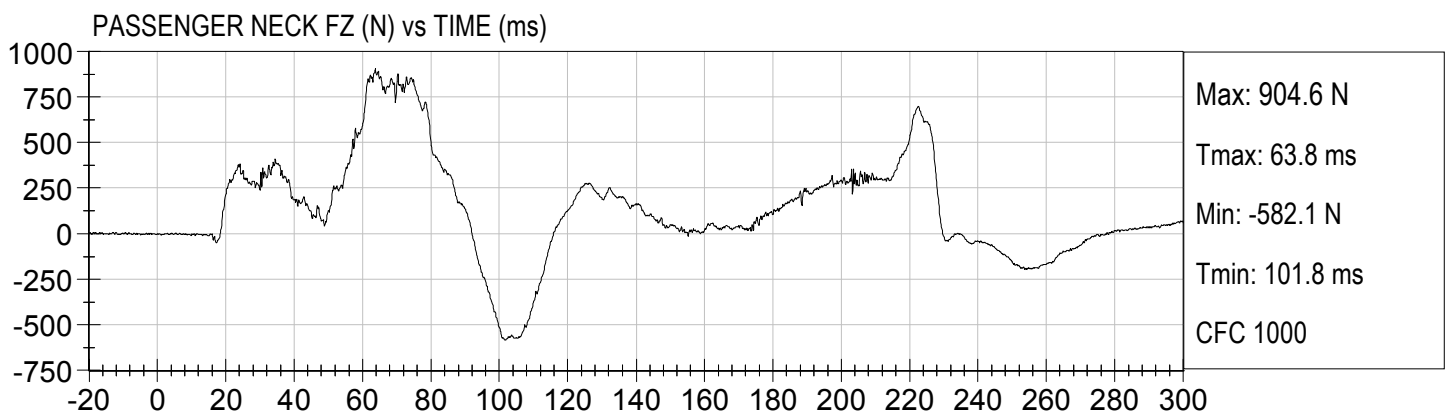
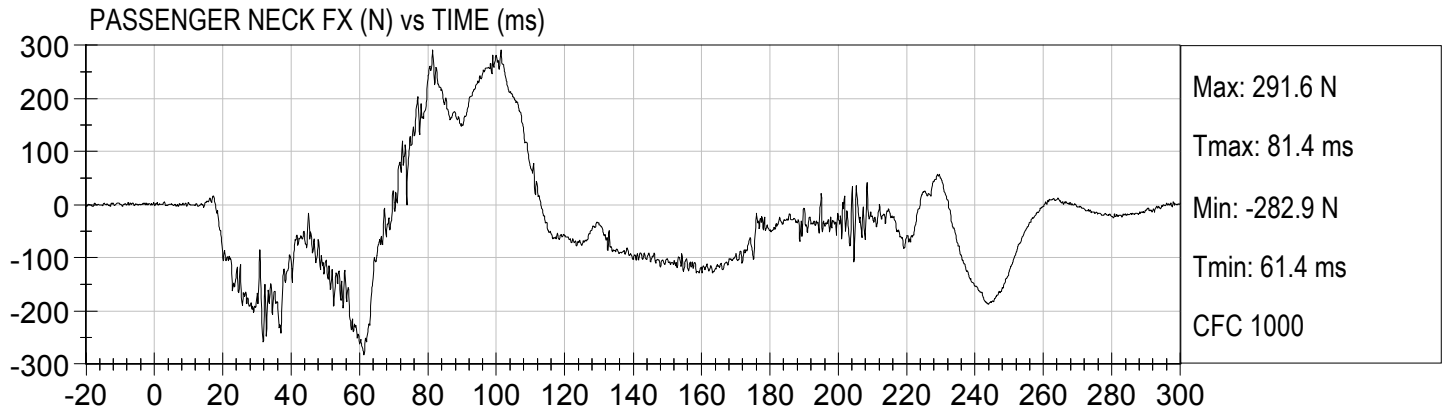


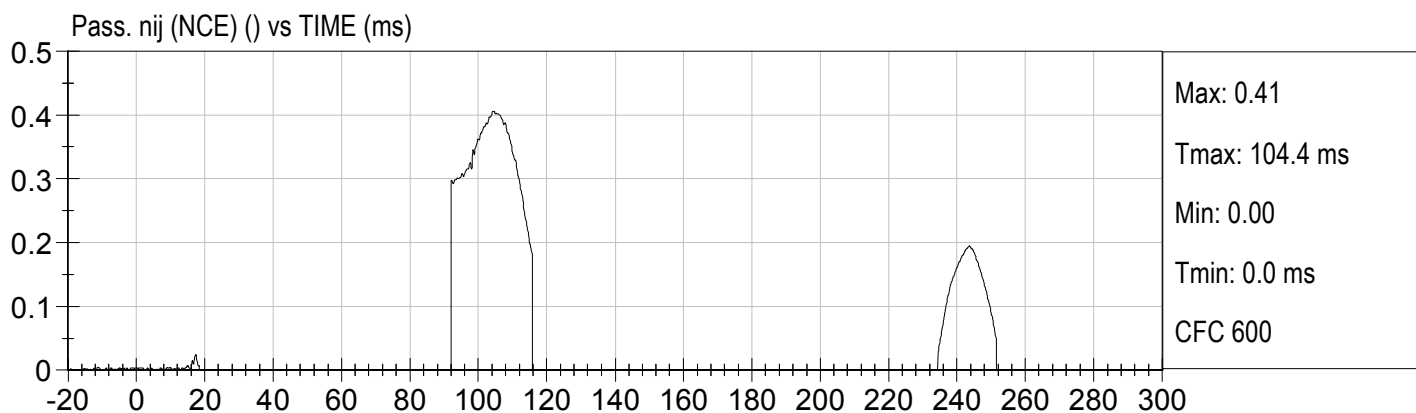
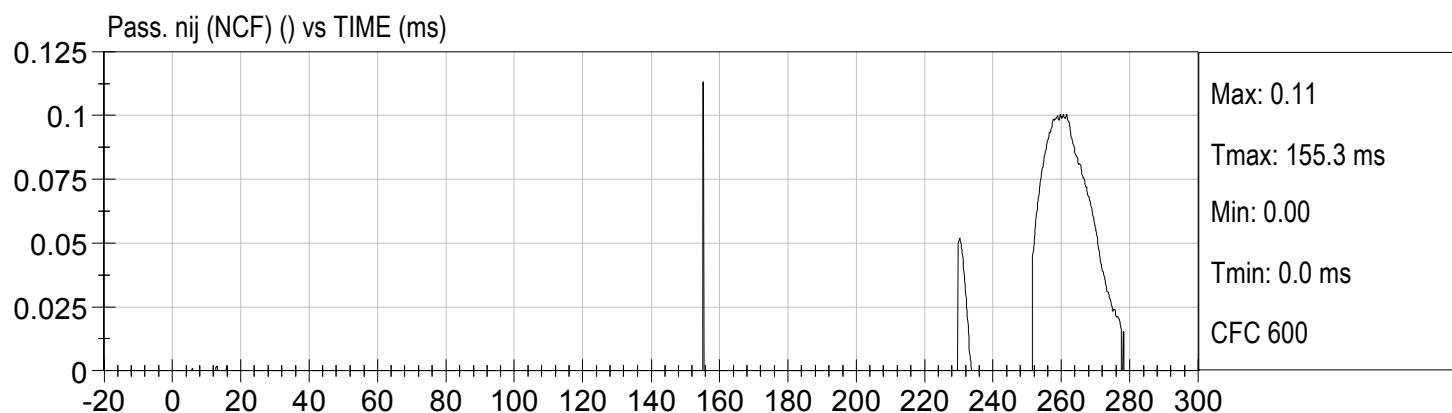
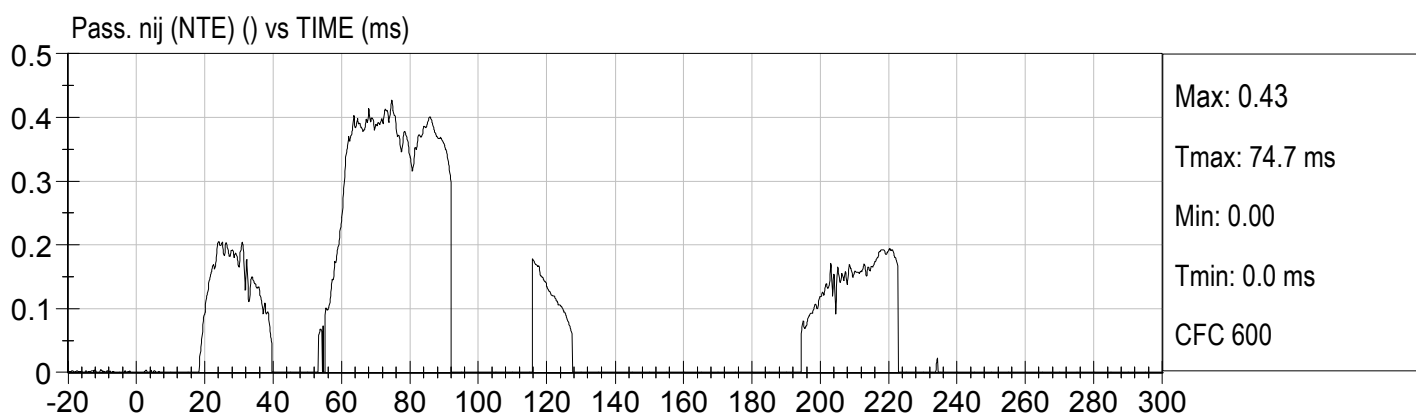
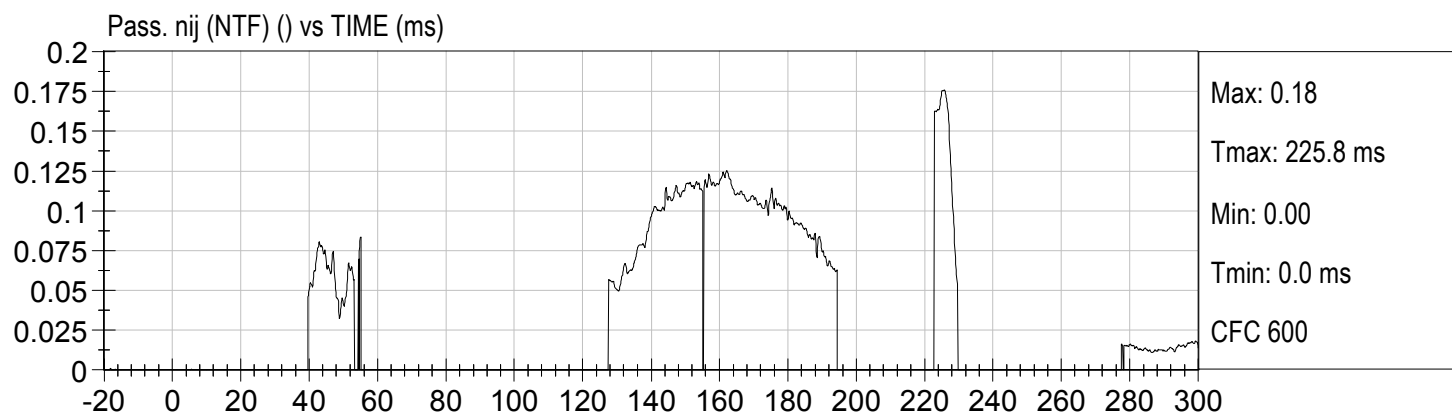


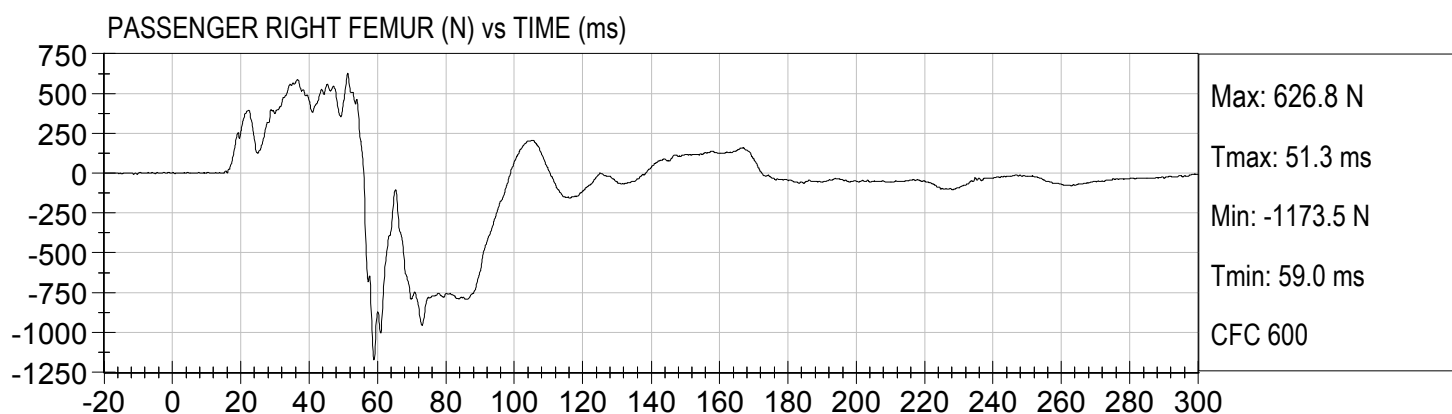
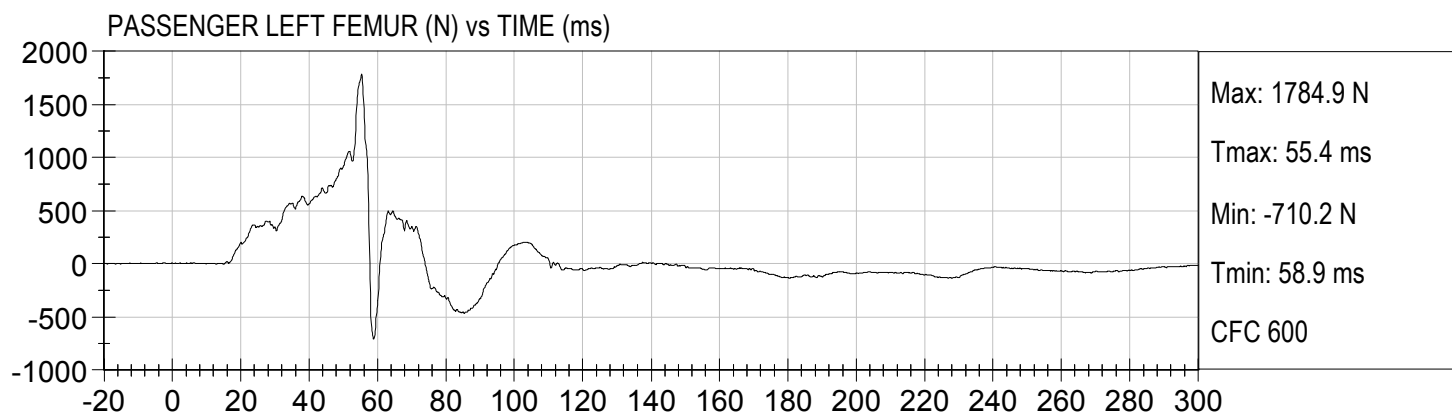












APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

Hybrid III, 50th External Measurements
SN: 036

HYBRID III, PART 572, SUBPART E EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (inches)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	34.6–35.0	34.7
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	19.9-20.5	20.0
C	H-POINT HEIGHT	Reference	3.3-3.5	3.4
D	H-POINT LOCATION FROM BACKLINE	Reference	5.3-5.5	5.4
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	3.3-3.7	3.6
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	5.5-6.1	5.8
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	11.4-12.0	11.5
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	1.6-1.8	1.7
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	13.0-13.6	13.0
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	7.5-8.3	7.9
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	22.8-23.8	23.8
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	16.9-17.9	17.3
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	19.1-19.7	19.5
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. "K".	17.8-18.8	17.9

HYBRID III, SUBPART E EXTERIOR DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS		ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 16.9-17.1 in. above seat surface	8.4-9.0	8.8
P	FOOT LENGTH	Tip of toe to rear of heel	9.9-10.5	10.0
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	16.3-17.2	16.4
W	FOOT BREADTH	The widest part of the foot	3.6-4.2	4.1
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 16.9-17.1 in. above seat surface	38.2-39.4	38.4
Z	WAIST CIRCUMFERENCE	Measured 8.9-9.1 in. above seat surface	32.9-34.1	34.0
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	16.9-17.1	17.0
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	8.9-9.1	9.0

NOTE: THE H-POINT IS LOCATED 1.83 INCHES FORWARD AND 2.57 INCHES DOWN FROM THE CENTER OF THE PELVIS ANGLE REFERENCE HOLE.

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

ATD Serial No: 036

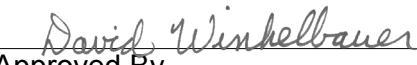
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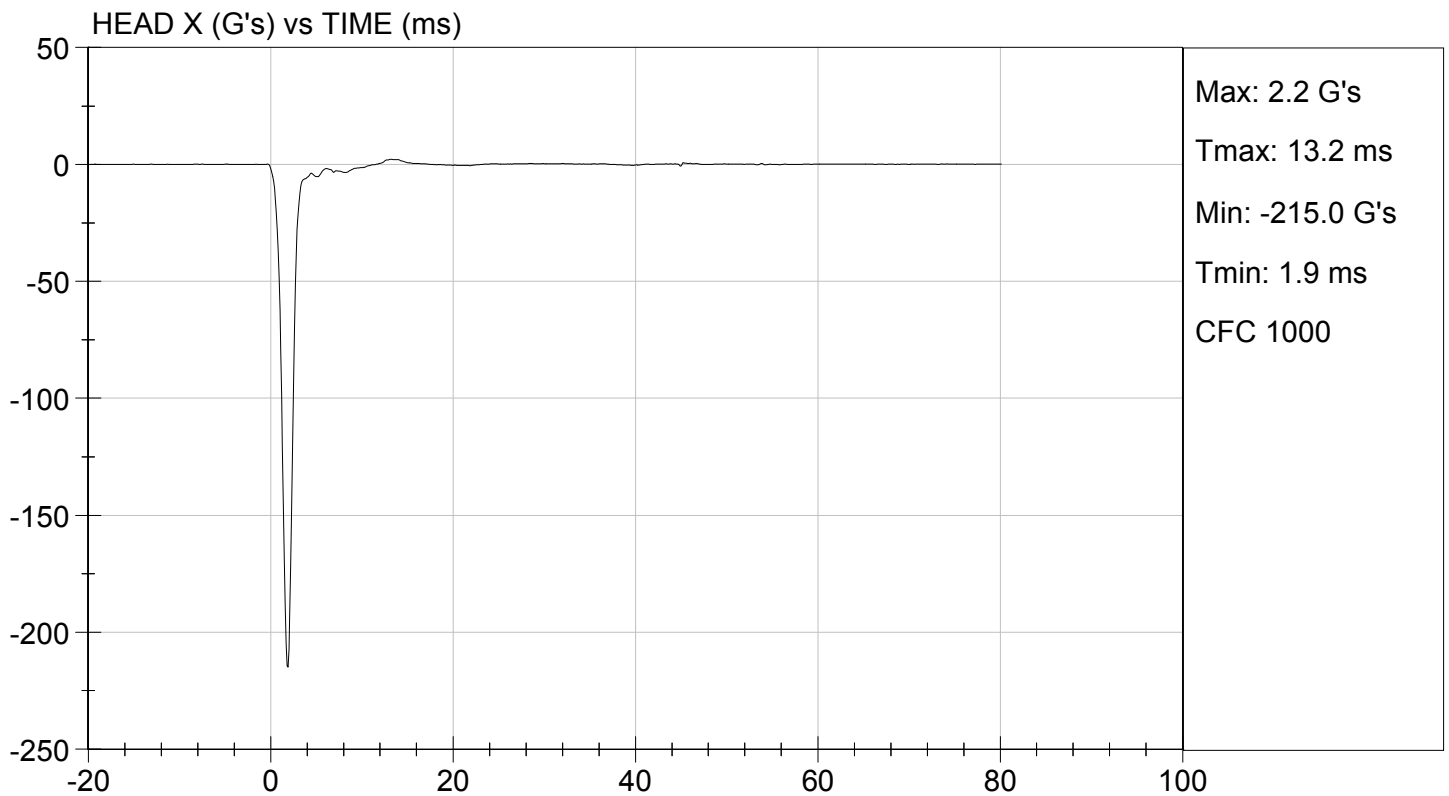
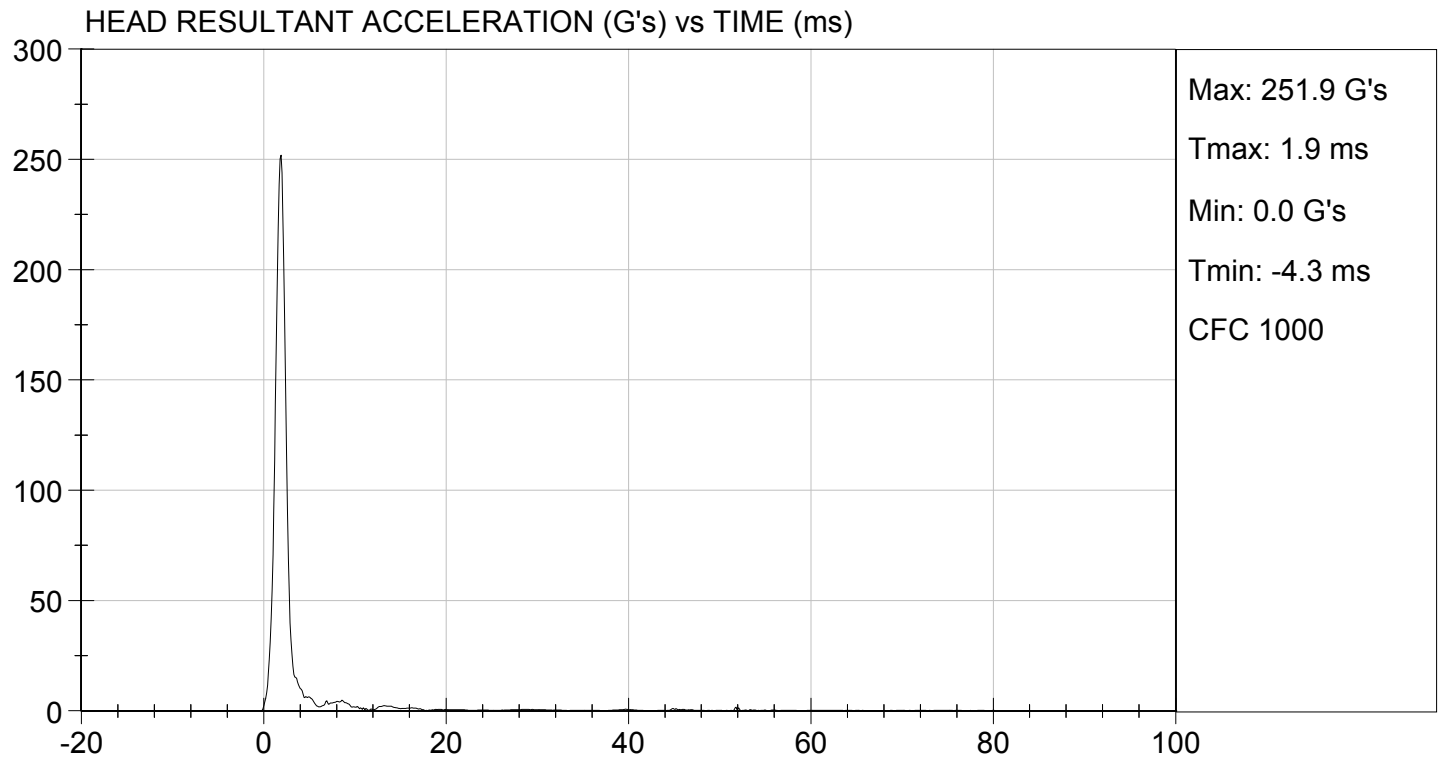
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Peak Resultant Acceleration	G's	225 to 275	252	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	2.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

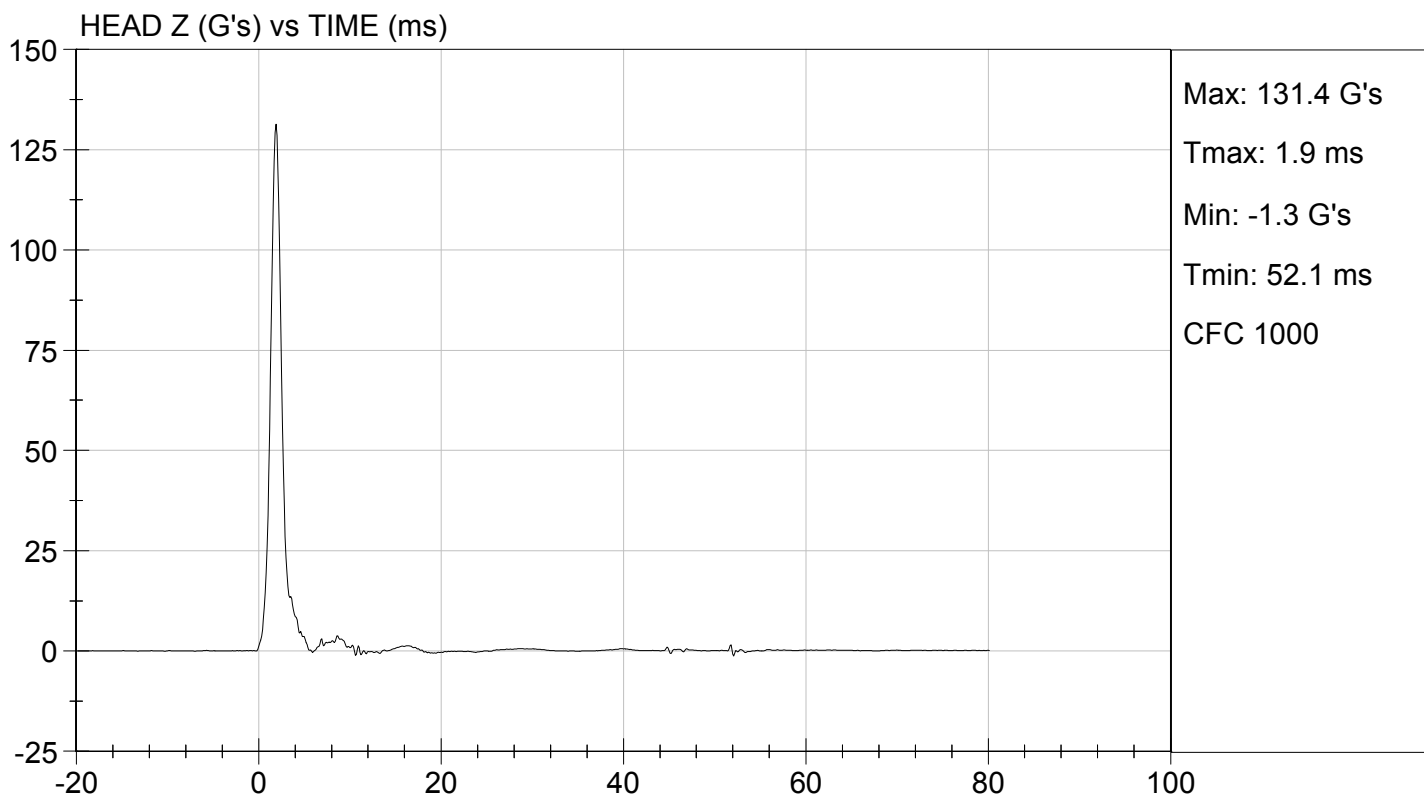
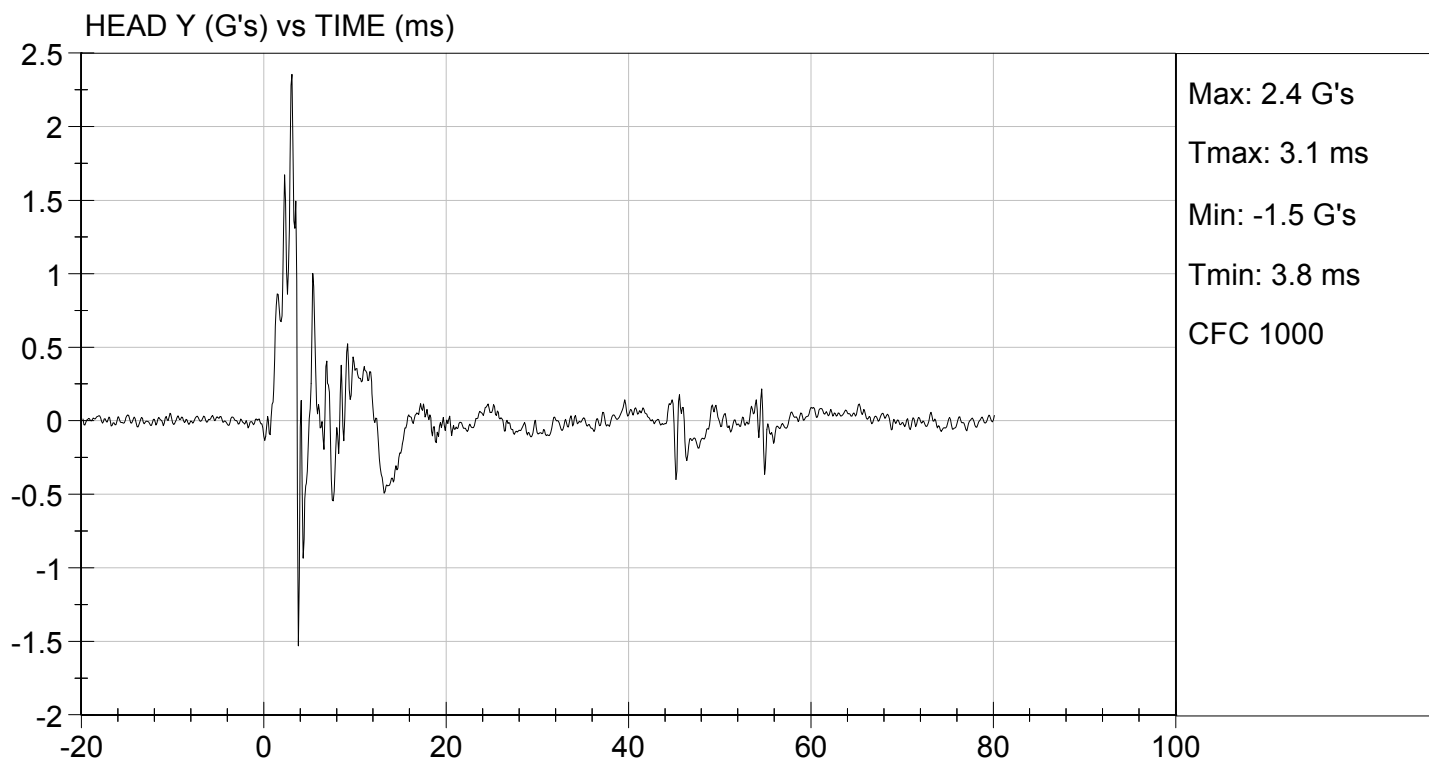

Laboratory Technician

11/16/2012

Test Date


Approved By





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

ATD Serial No: 036

Test I.D: D124432

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	32	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.06	Pass
	20 ms	G's	17.60 to 22.60	20.34	Pass
	30 ms	G's	12.50 to 18.50	16.4	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	16.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.1	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	68.0	Pass
	Time	ms	57.0 to 64.0	57.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	120.6	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	92.0	Pass
	Time	ms	47.0 to 58.0	47.9	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.8	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

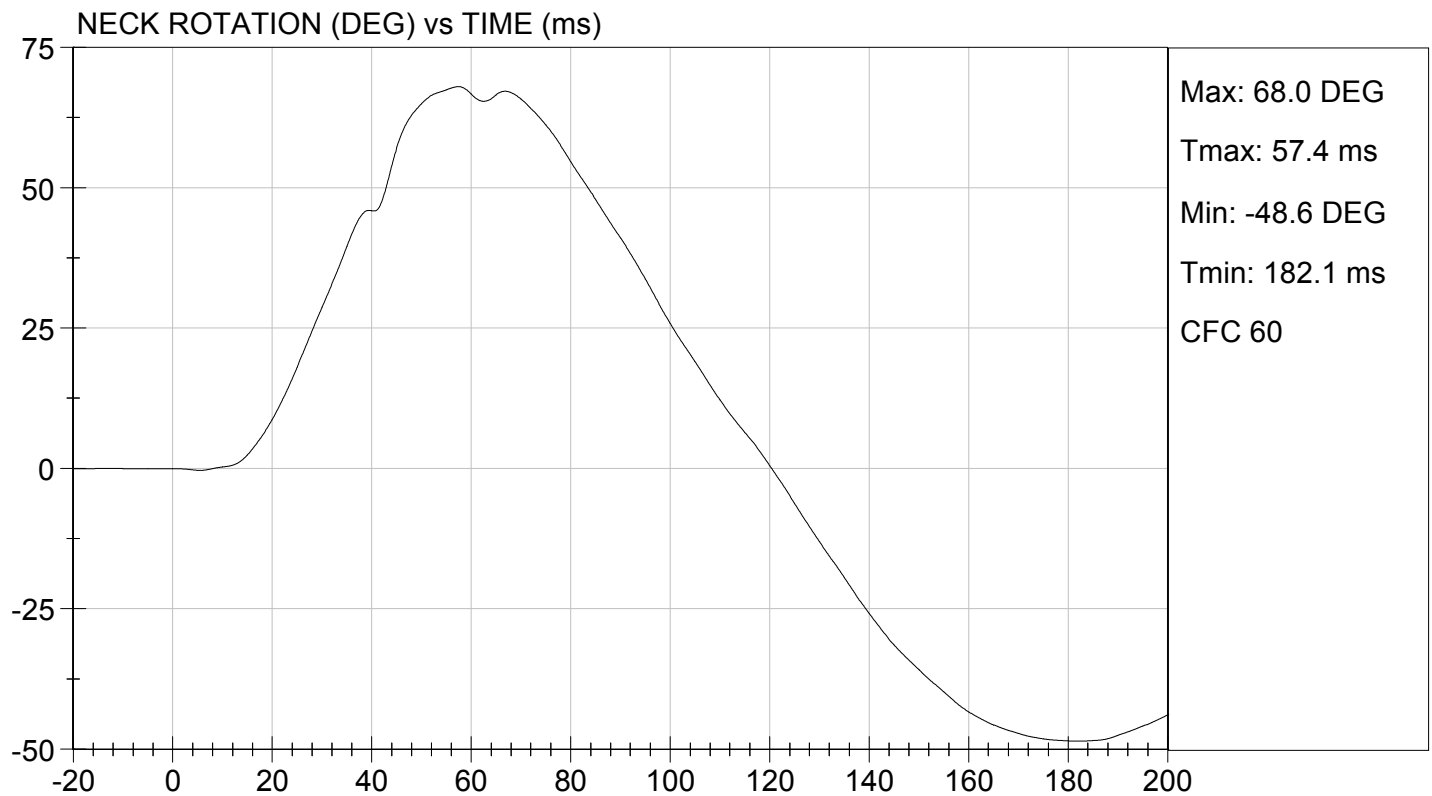
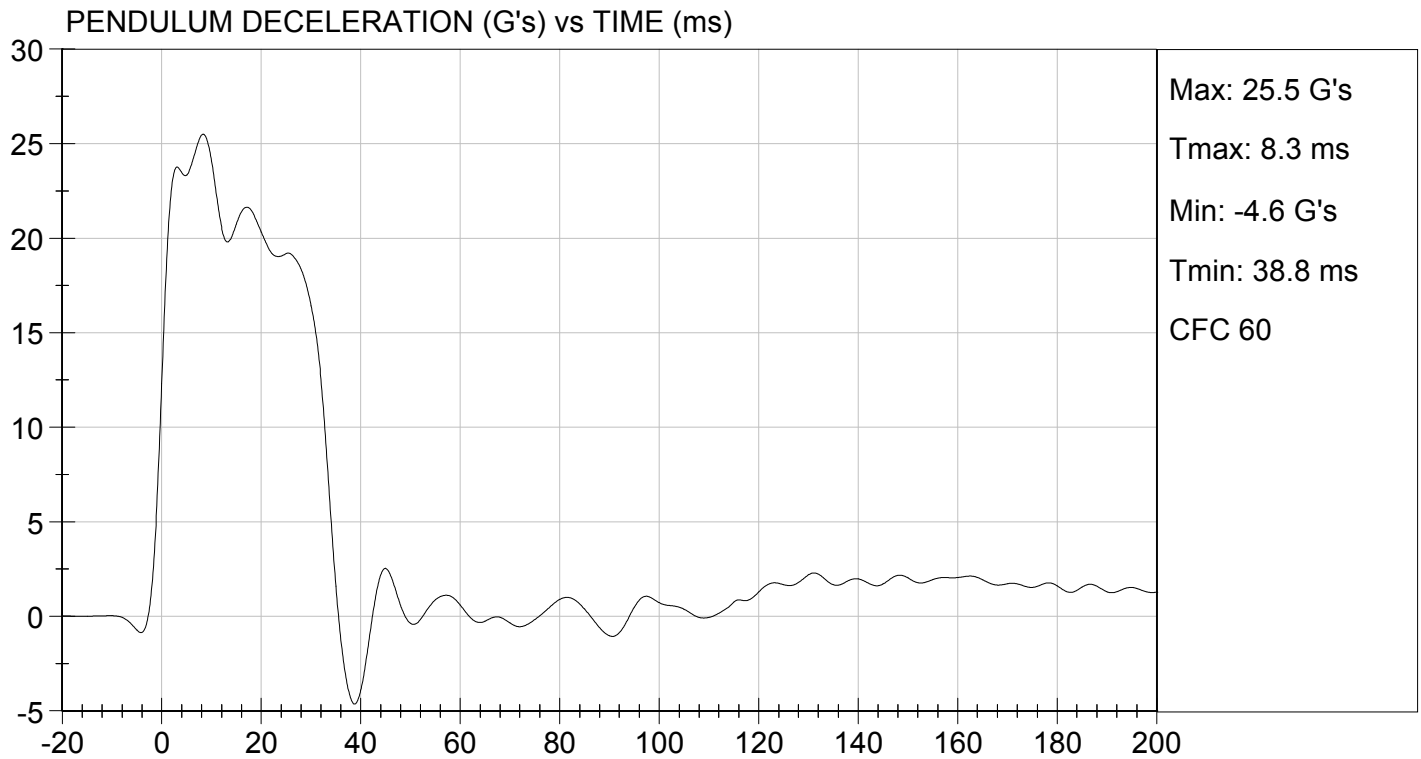
11/16/2012
Test Date

David Winkelbauer
Approved By



TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

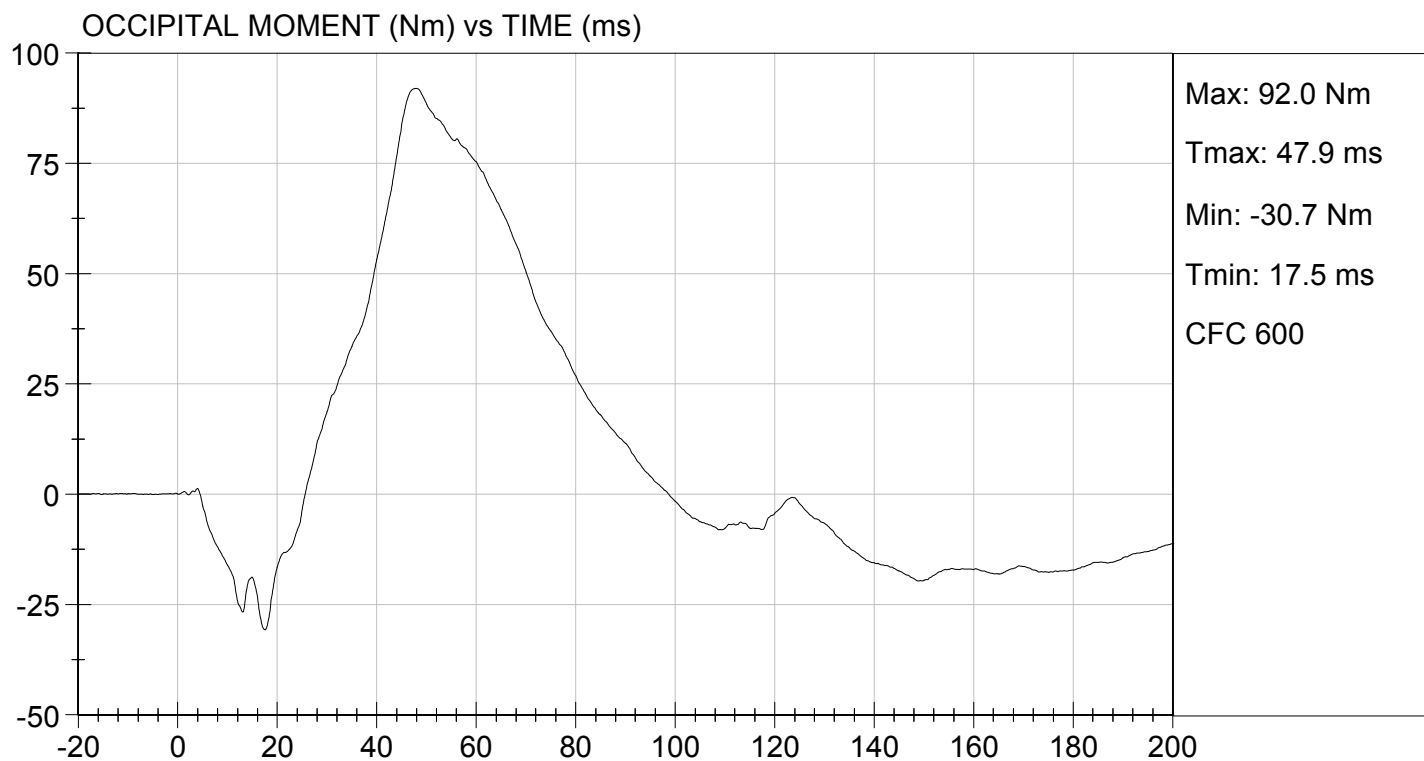
TEST DATE: 11/16/2012
TEST #: D124432





TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 11/16/2012
TEST #: D124432

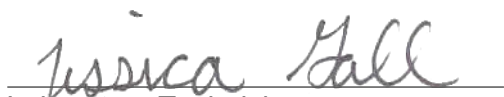


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

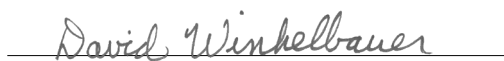
Test I.D: D124433

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	32	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.36	Pass
	20 ms	G's	14.00 to 19.00	18.18	Pass
	30 ms	G's	11.00 to 16.00	15.67	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	15.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.3	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.3	Pass
	Time	ms	72.0 to 82.0	73.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	159.8	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-66.3	Pass
	Time	ms	65.0 to 79.0	69.2	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.6	Pass
Overall Test Results					Pass


Laboratory Technician

11/16/2012

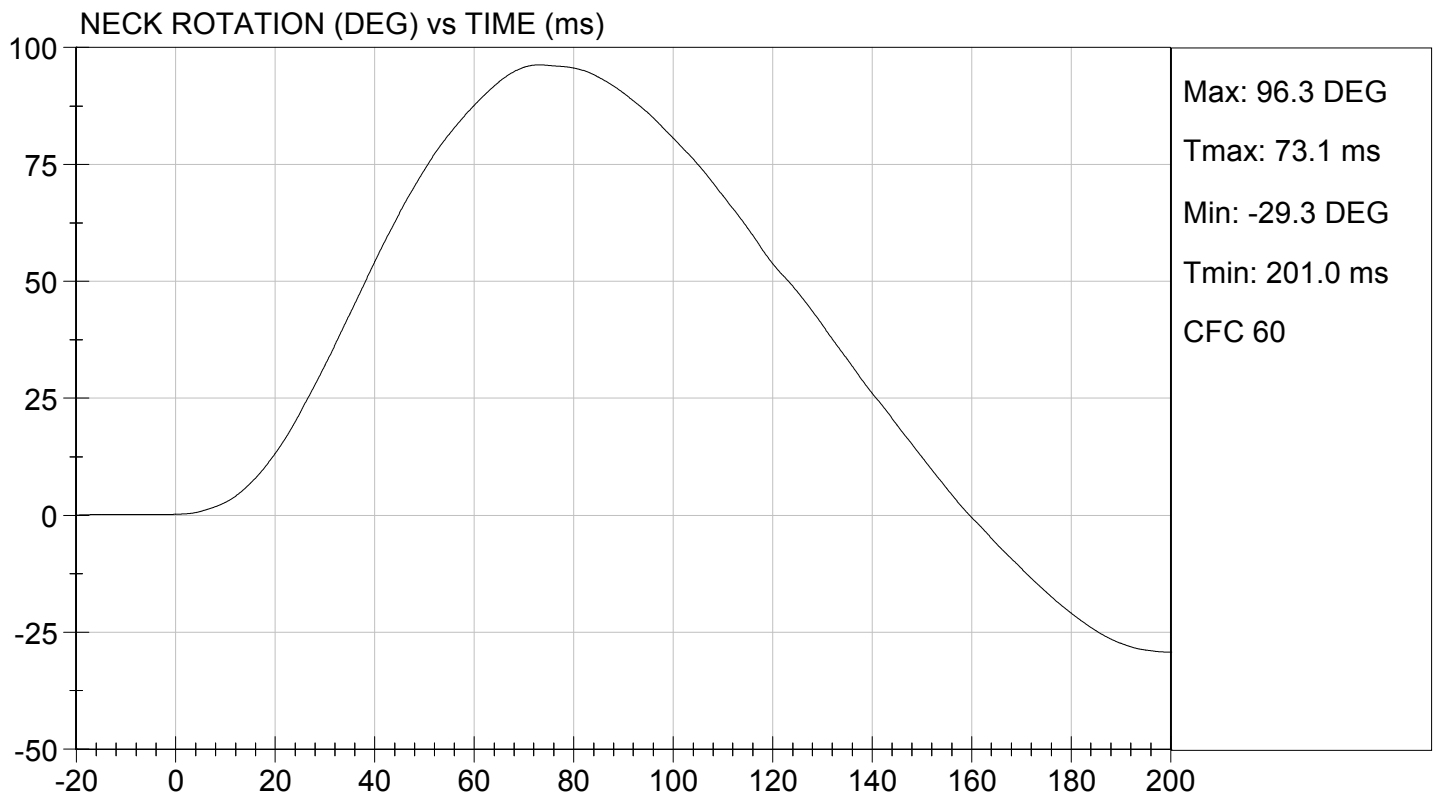
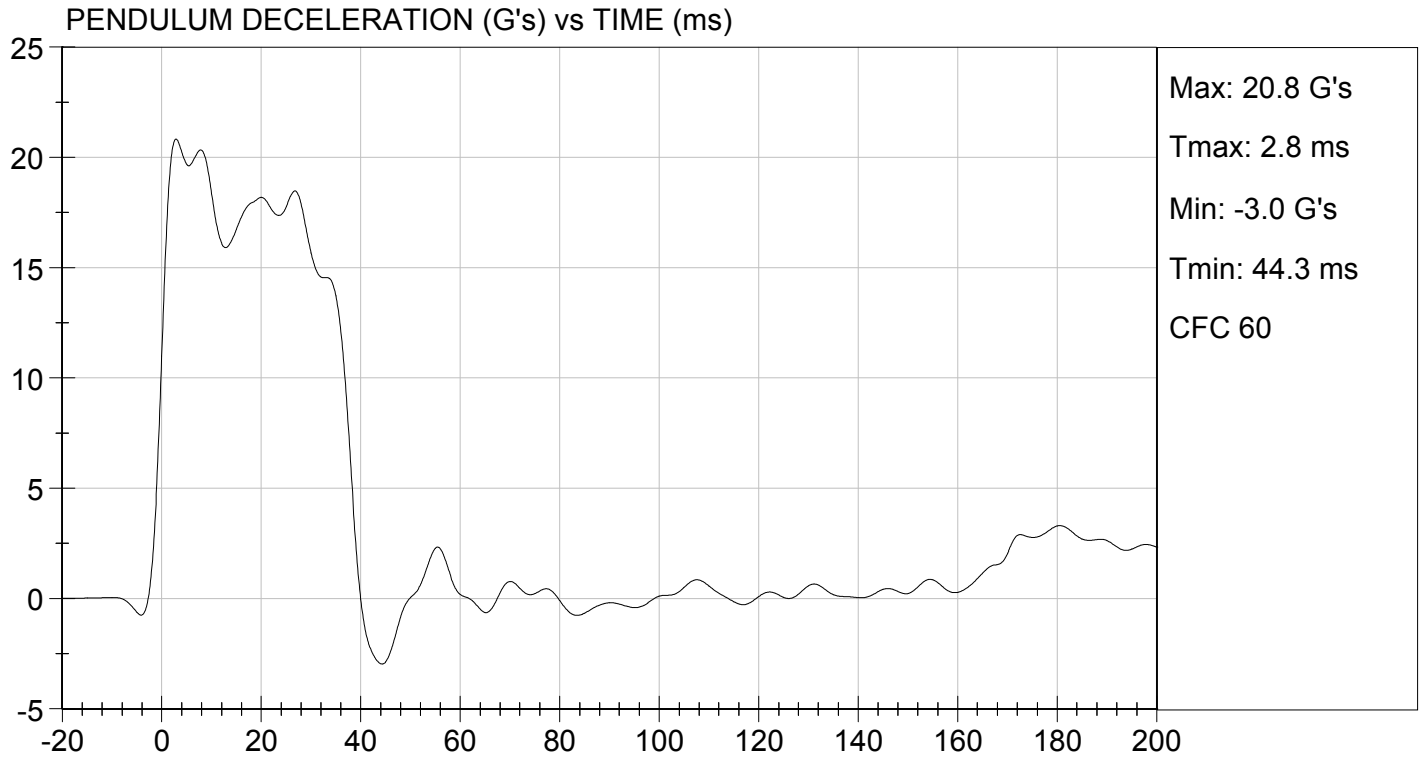
Test Date


Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 20.08 ft/s, 6.12 m/s

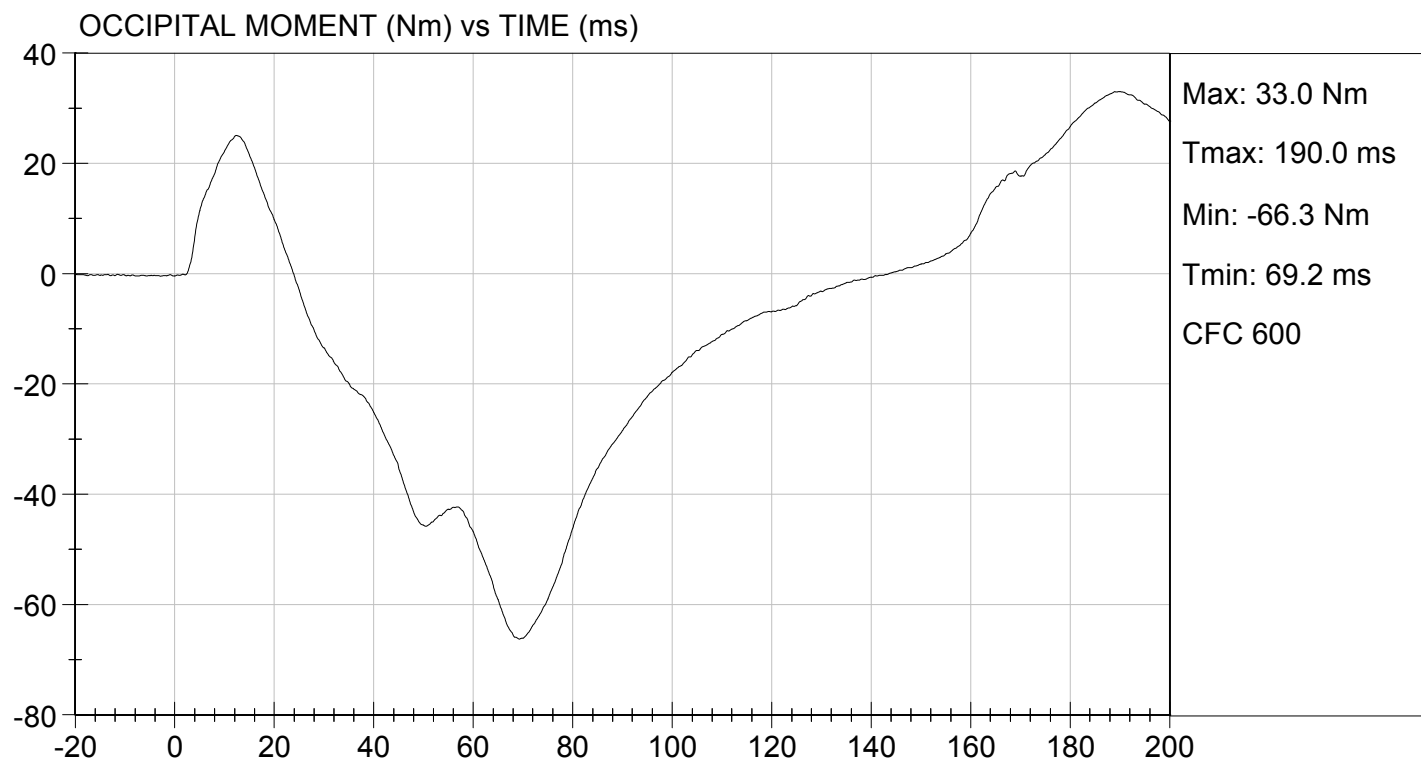
TEST DATE: 11/16/2012
TEST #: D124433





TEST DESC: NECK EXTENSION
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 11/16/2012
TEST #: D124433



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

Test I.D: D124434

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,355	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.00	Pass
Internal Hysteresis	%	69 to 85	71	Pass
			Overall Test Results	Pass


Laboratory Technician

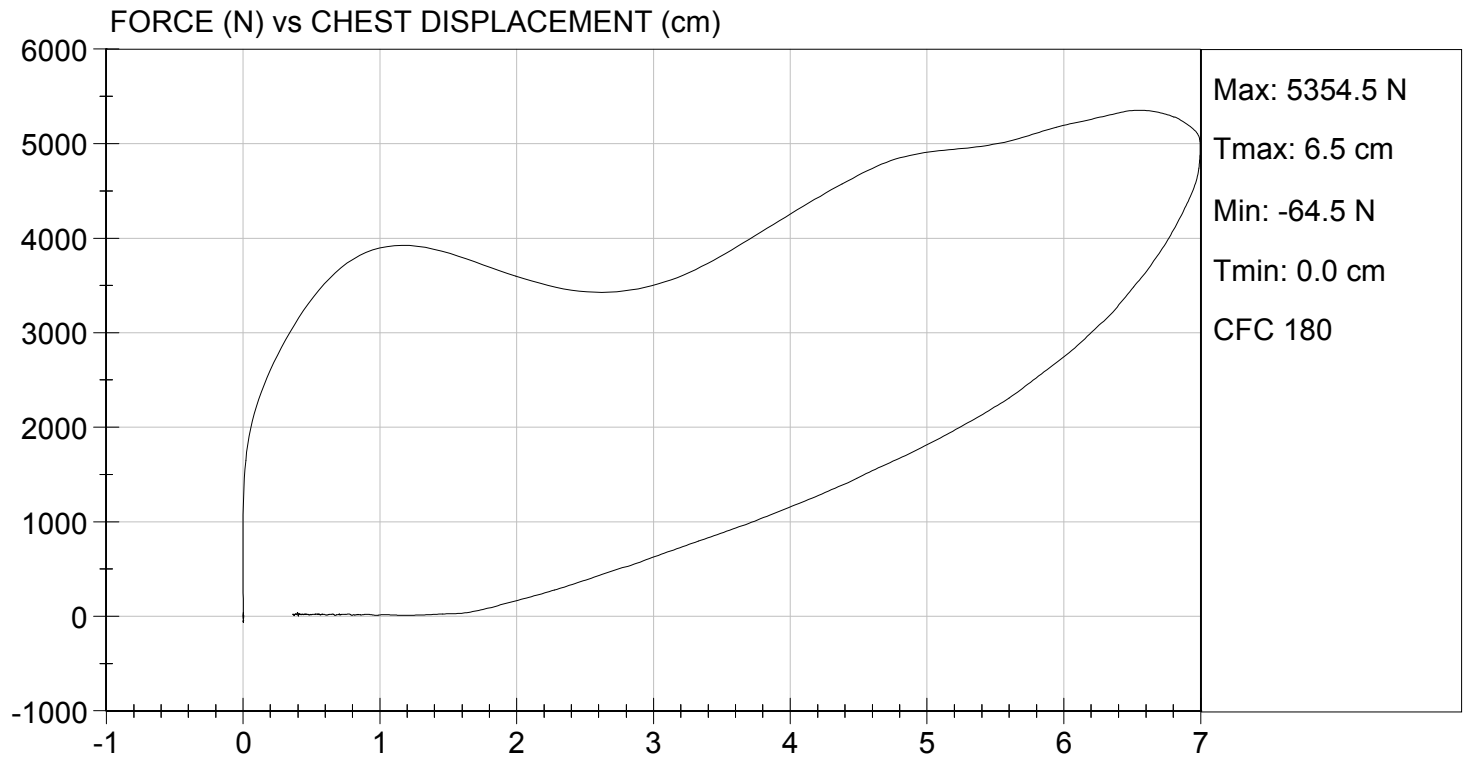
11/16/2012
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/16/2012
TEST #: D124434



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

ATD Serial No: 036

Test I.D: D124435

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	33	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,023	Pass
Overall Test Results				Pass


Laboratory Technician

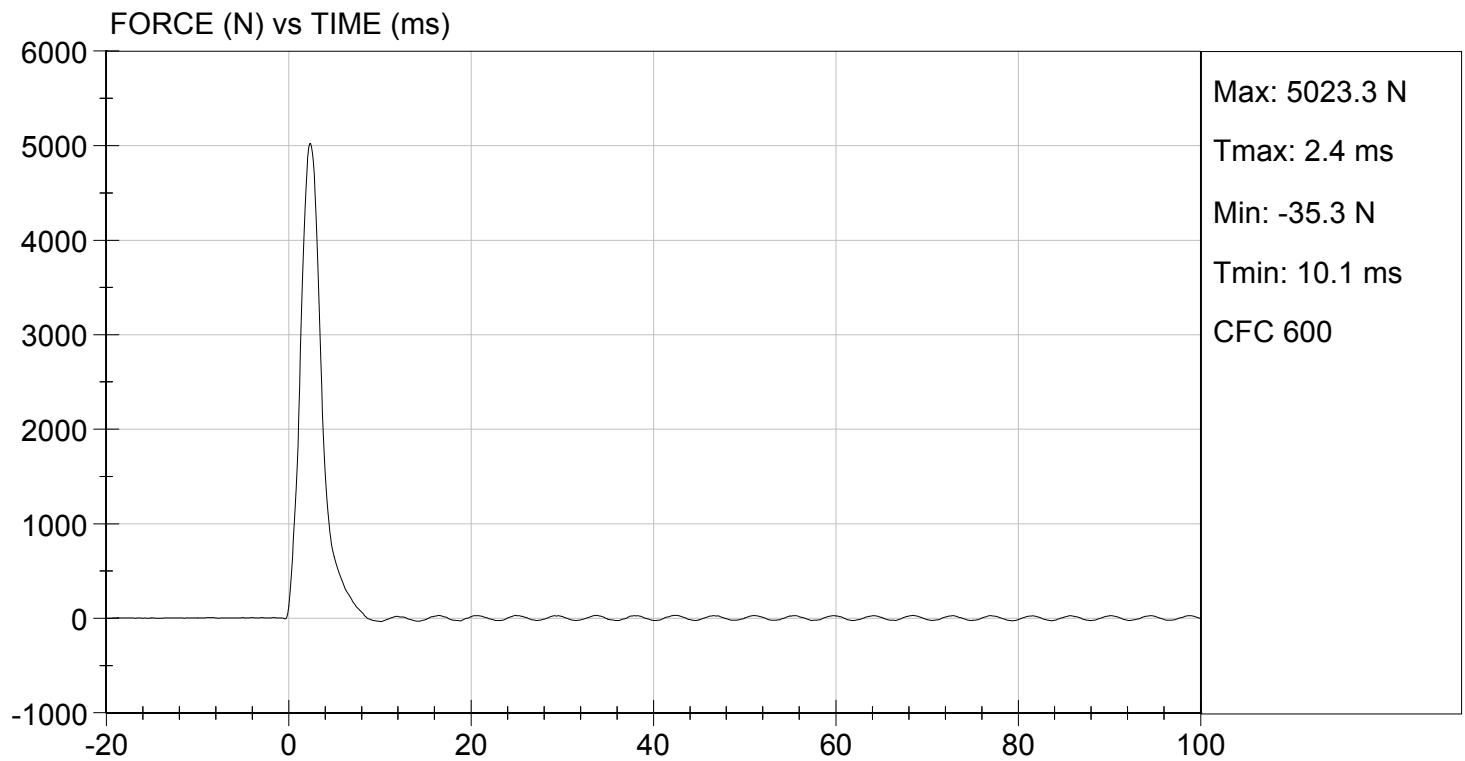
11/16/2012
Test Date


Approved By



TEST DESC: RIGHT KNEE
VELOCITY: 6.97 ft/s, 2.12 m/s

TEST DATE: 11/16/2012
TEST #: D124435

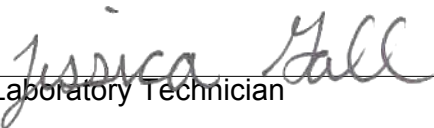


MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

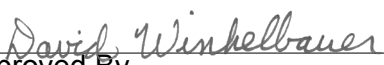
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Test I.D: D124436

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	33	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,681	Pass
			Overall Test Results	Pass


Laboratory Technician

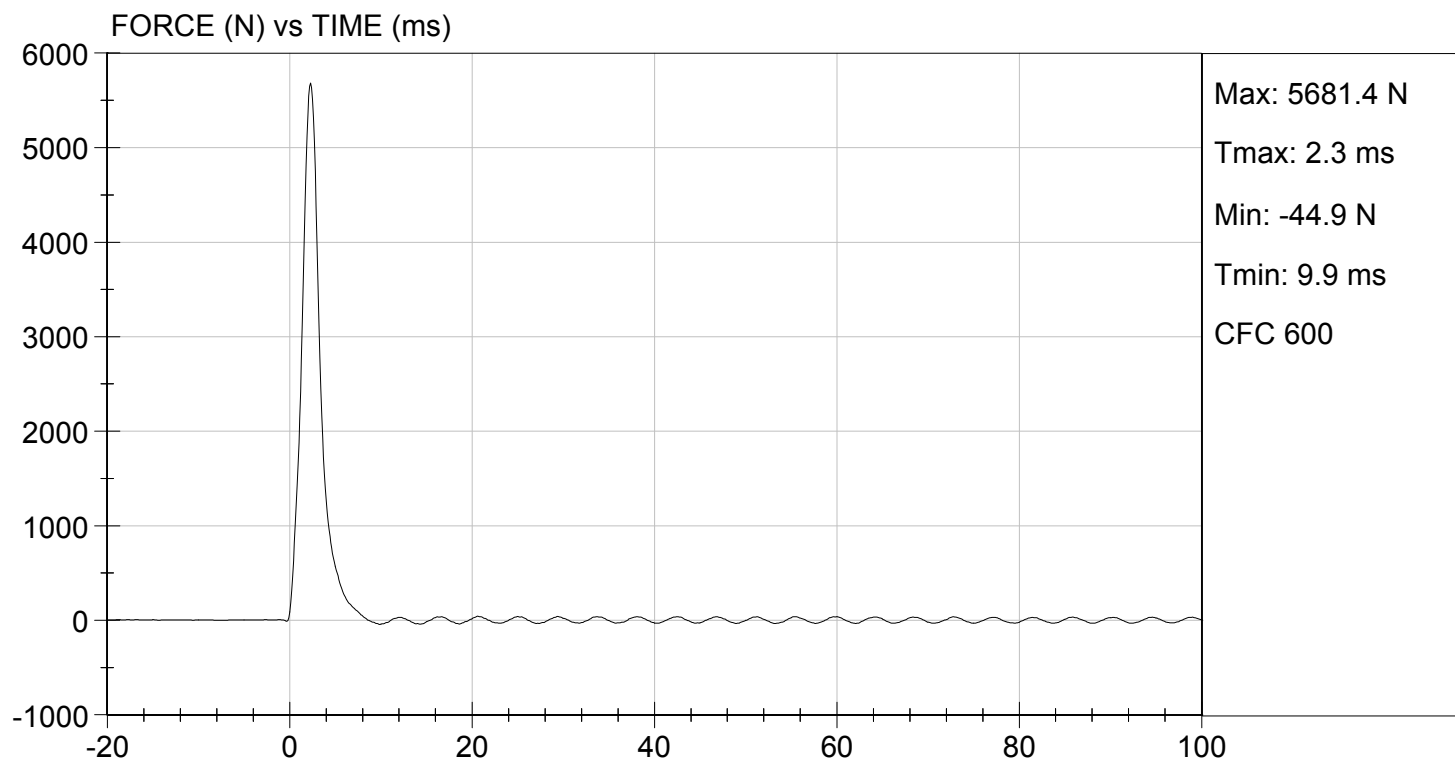
11/16/2012
Test Date


Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.97 ft/s, 2.12 m/s

TEST DATE: 11/16/2012
TEST #: D124436



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

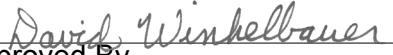
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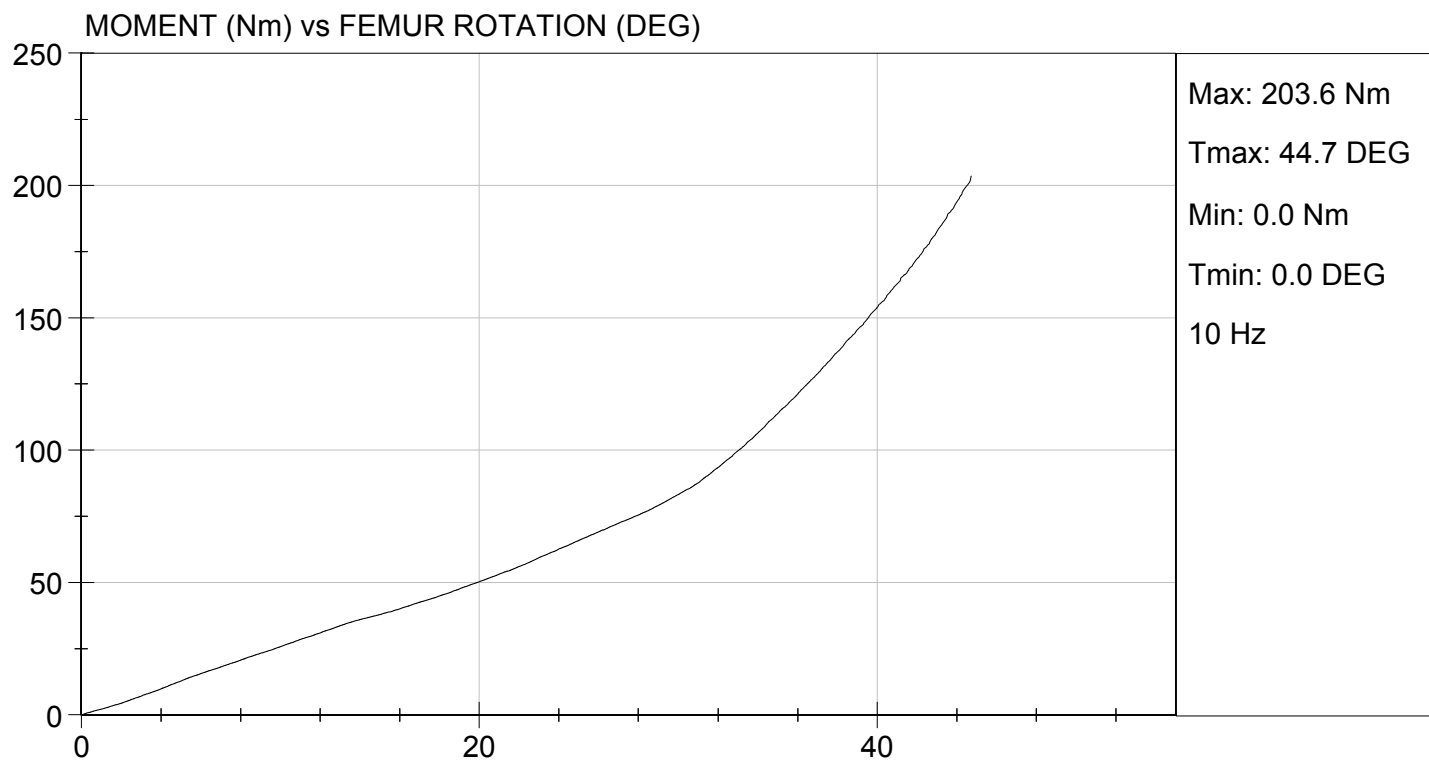
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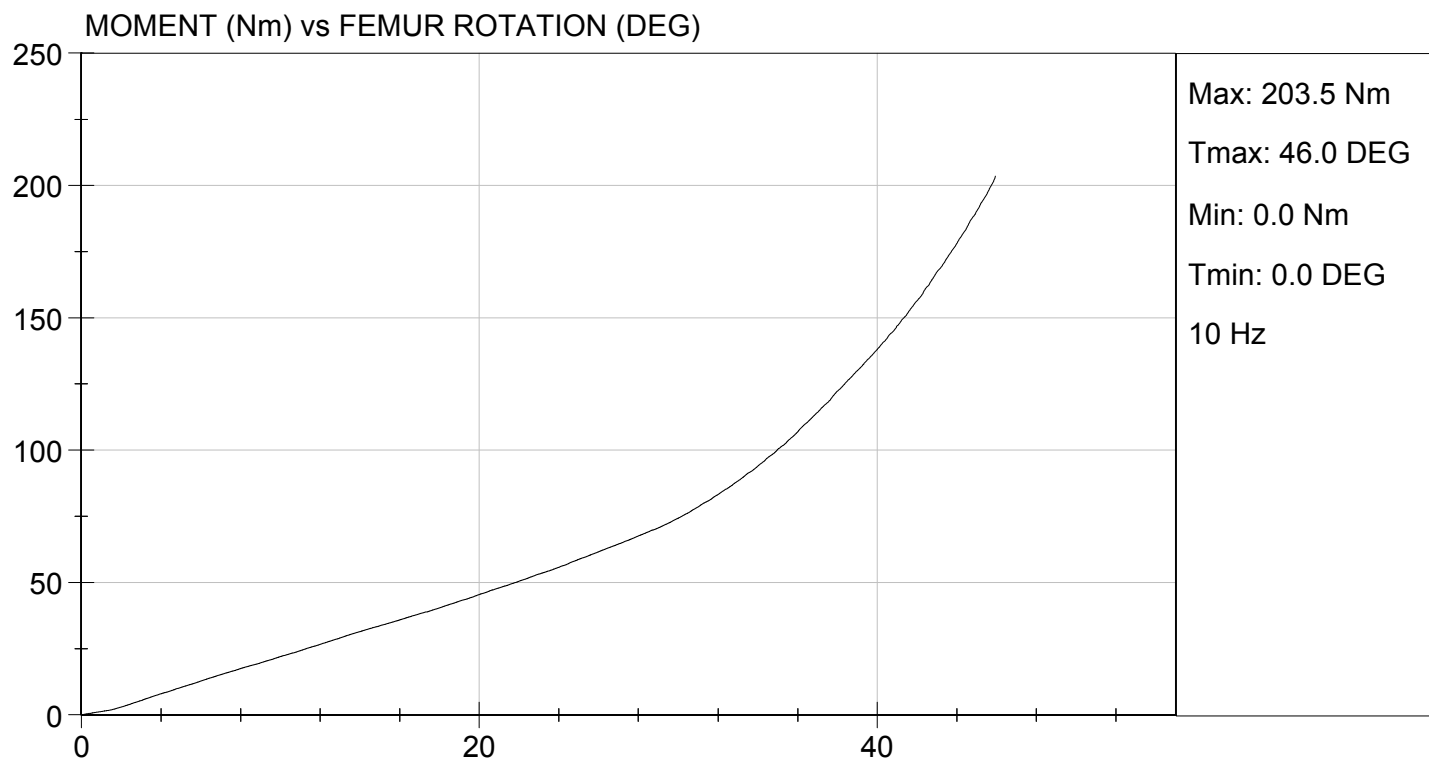
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.0	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	31	31	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.3	Pass
30 Degrees	Nm	94.9 Nm Max	83.2	74.4	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.7	46.0	Pass
Overall Test Results					Pass


Laboratory Technician

11/16/2012
Test Date


Approved By





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

ATD Serial No: 036

Test ID: D124531

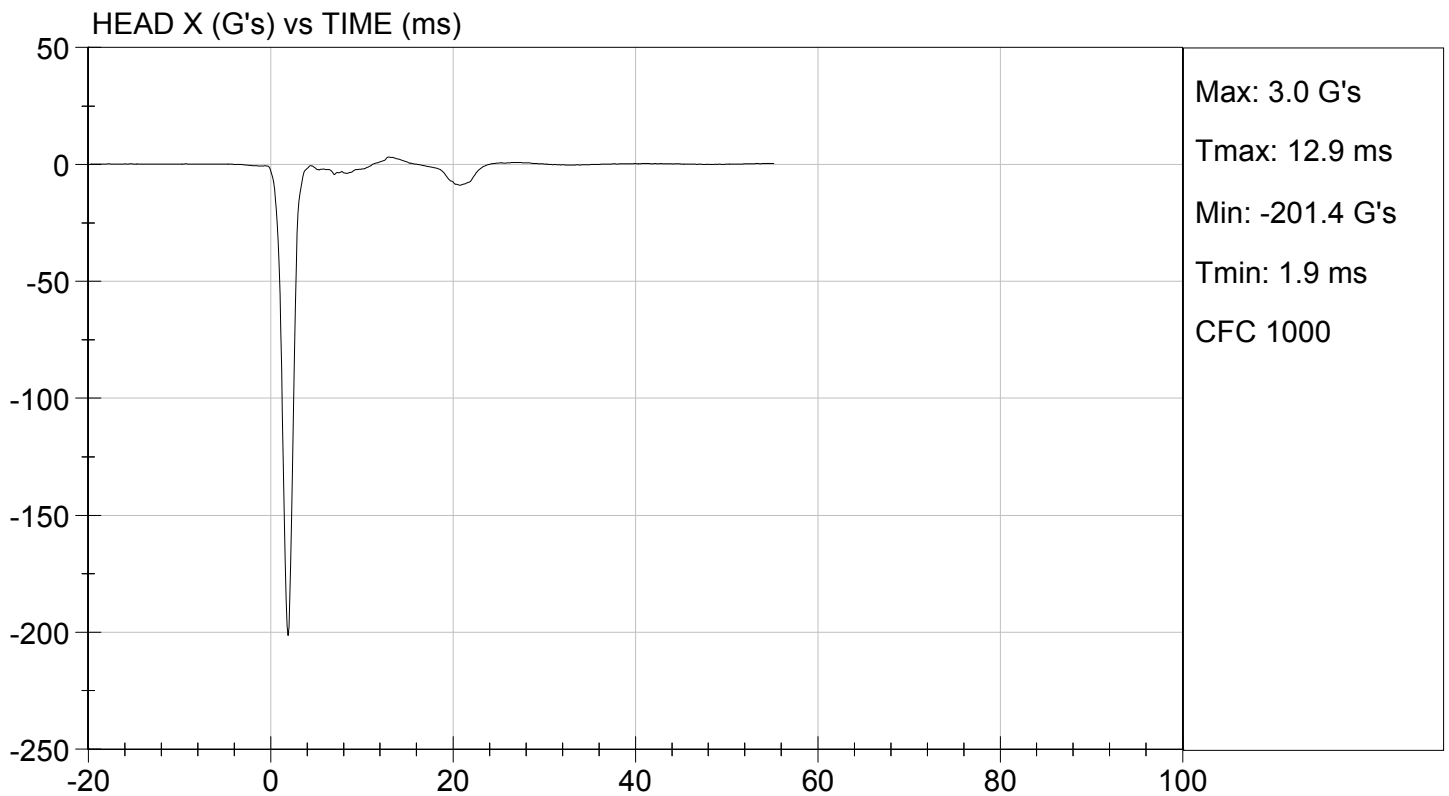
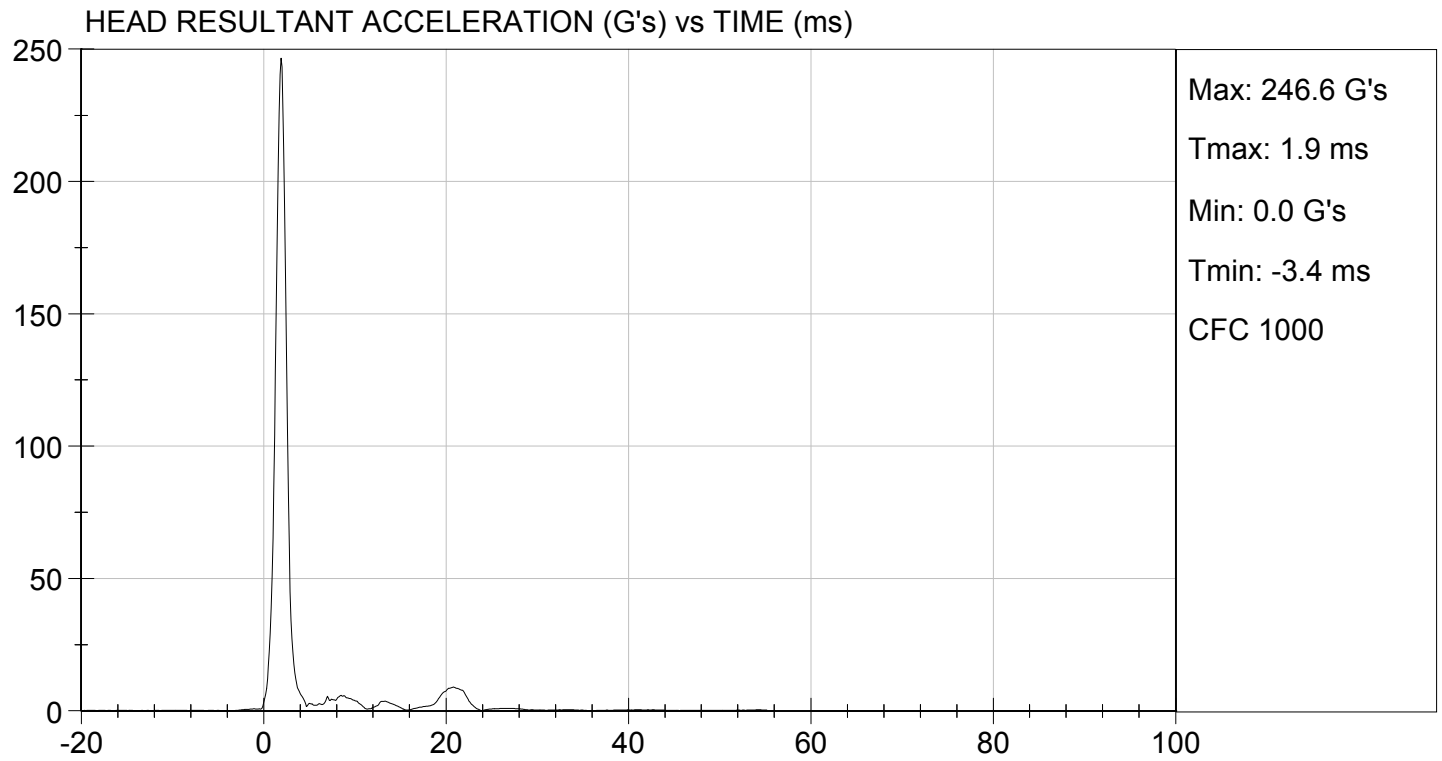
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	22.0	Pass
Peak Resultant Acceleration	G's	225 to 275	247	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	5.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

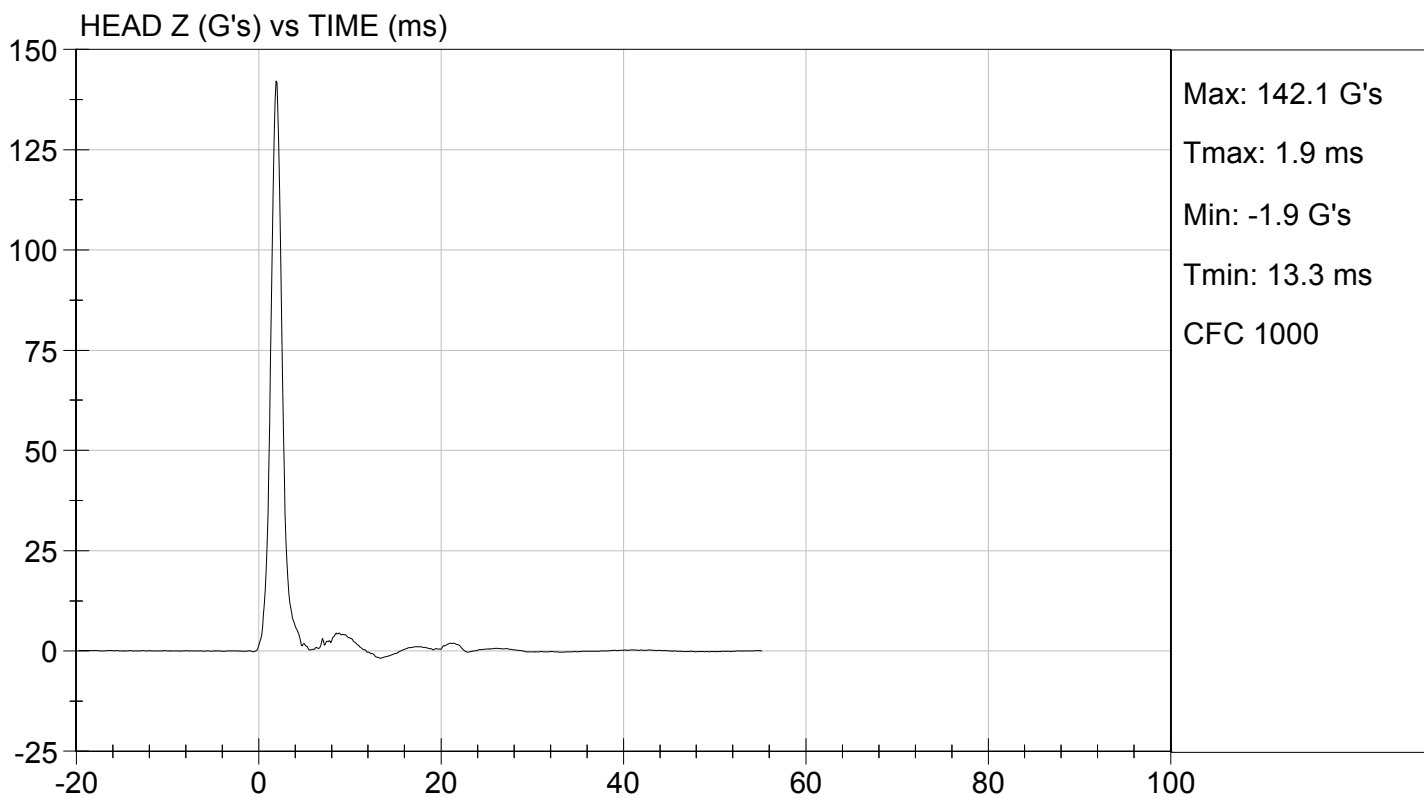
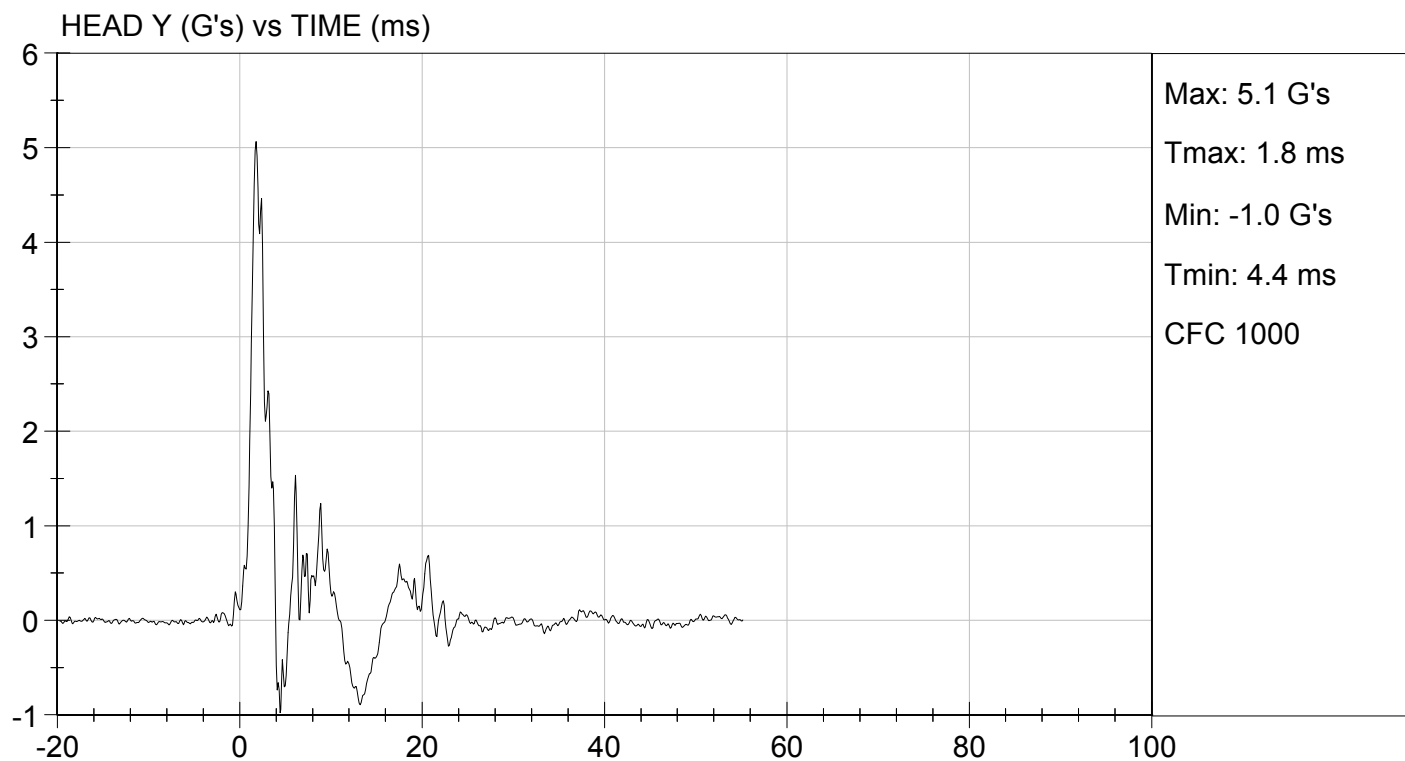
Jessica Hall
Laboratory Technician

11/29/2012

Test Date

David Winkelbauer
Approved By





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

ATD Serial No: 036

Test I.D: D124532

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.06	Pass
	20 ms	G's	17.60 to 22.60	18.77	Pass
	30 ms	G's	12.50 to 18.50	14.81	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.1	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.8	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	68.4	Pass
	Time	ms	57.0 to 64.0	59.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	118.8	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	95.3	Pass
	Time	ms	47.0 to 58.0	50.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.5	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

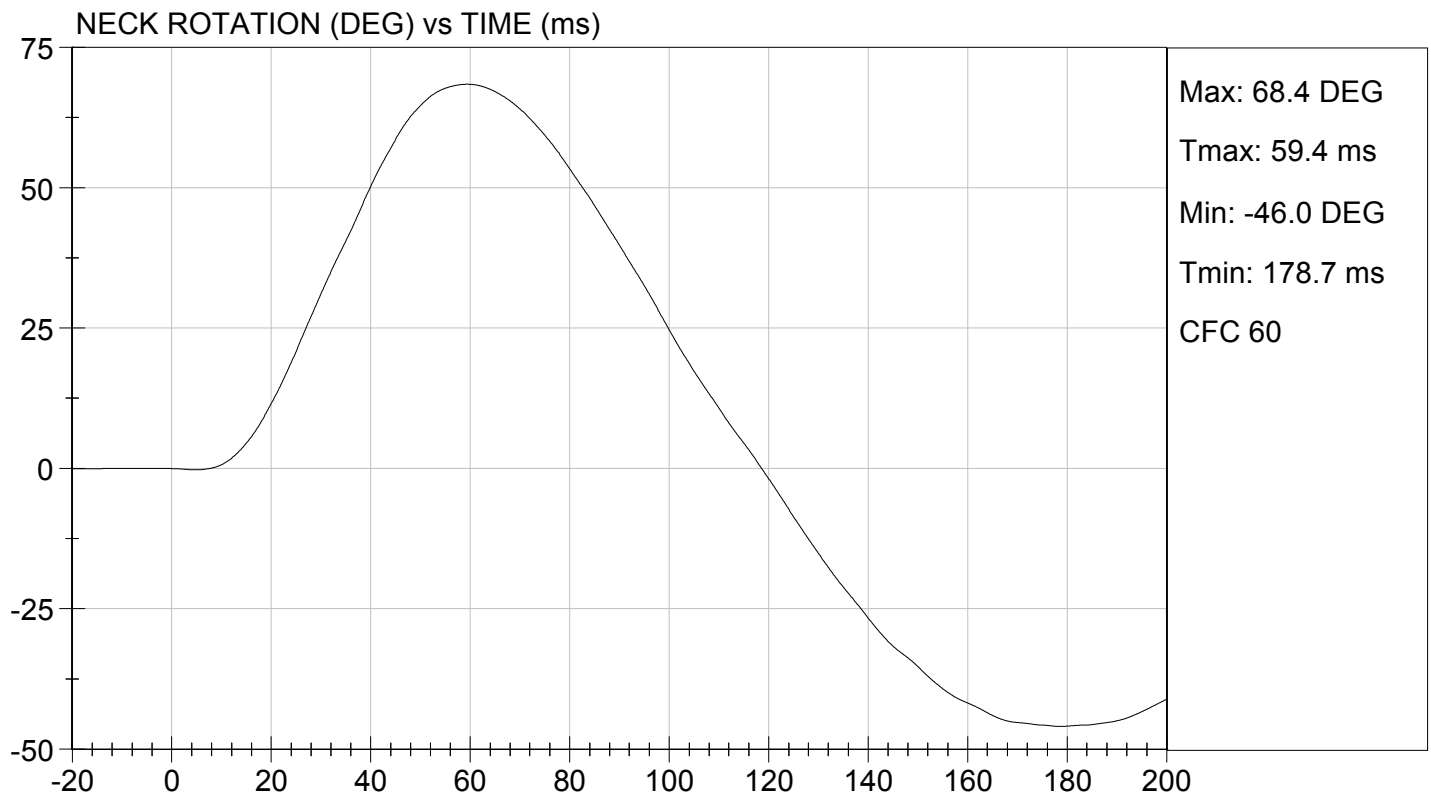
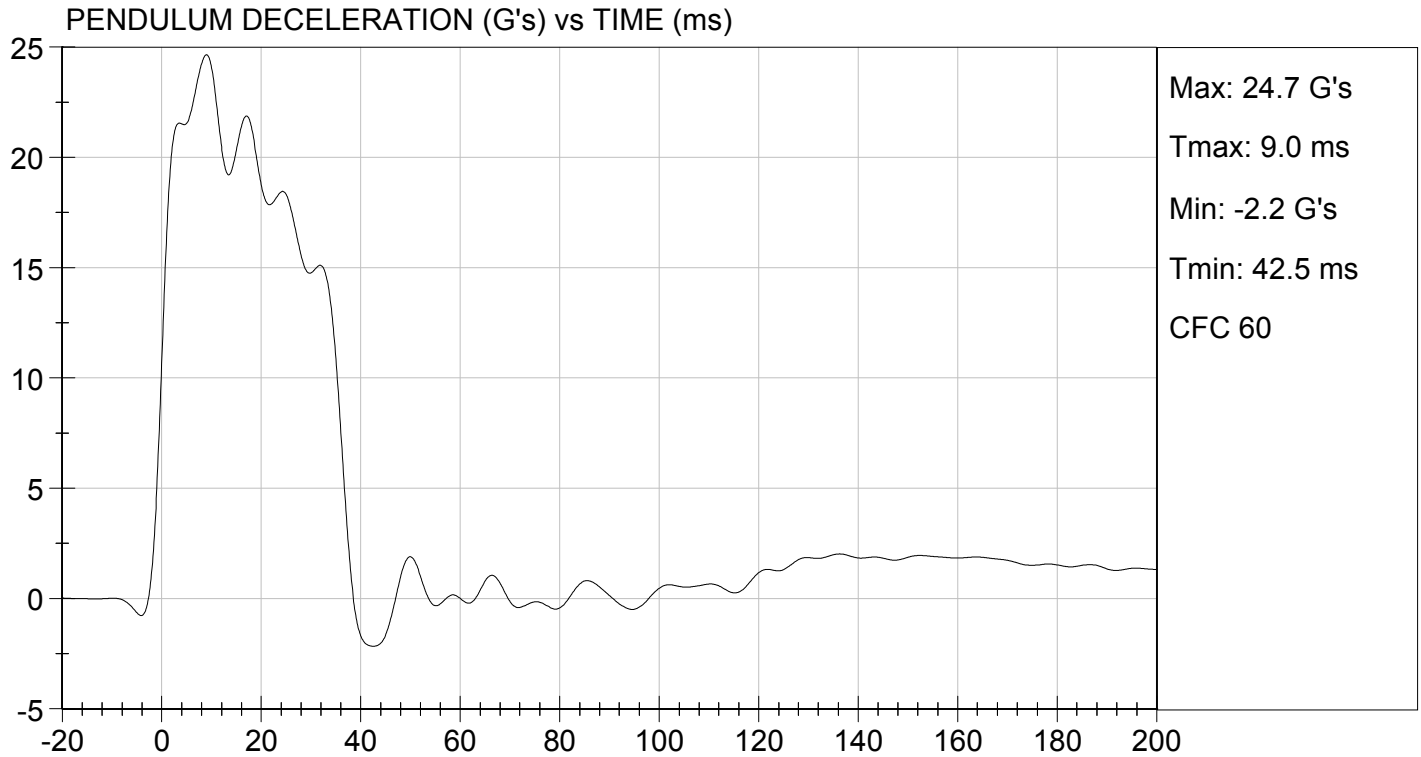
11/29/2012
Test Date

David Winkelbauer
Approved By



TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

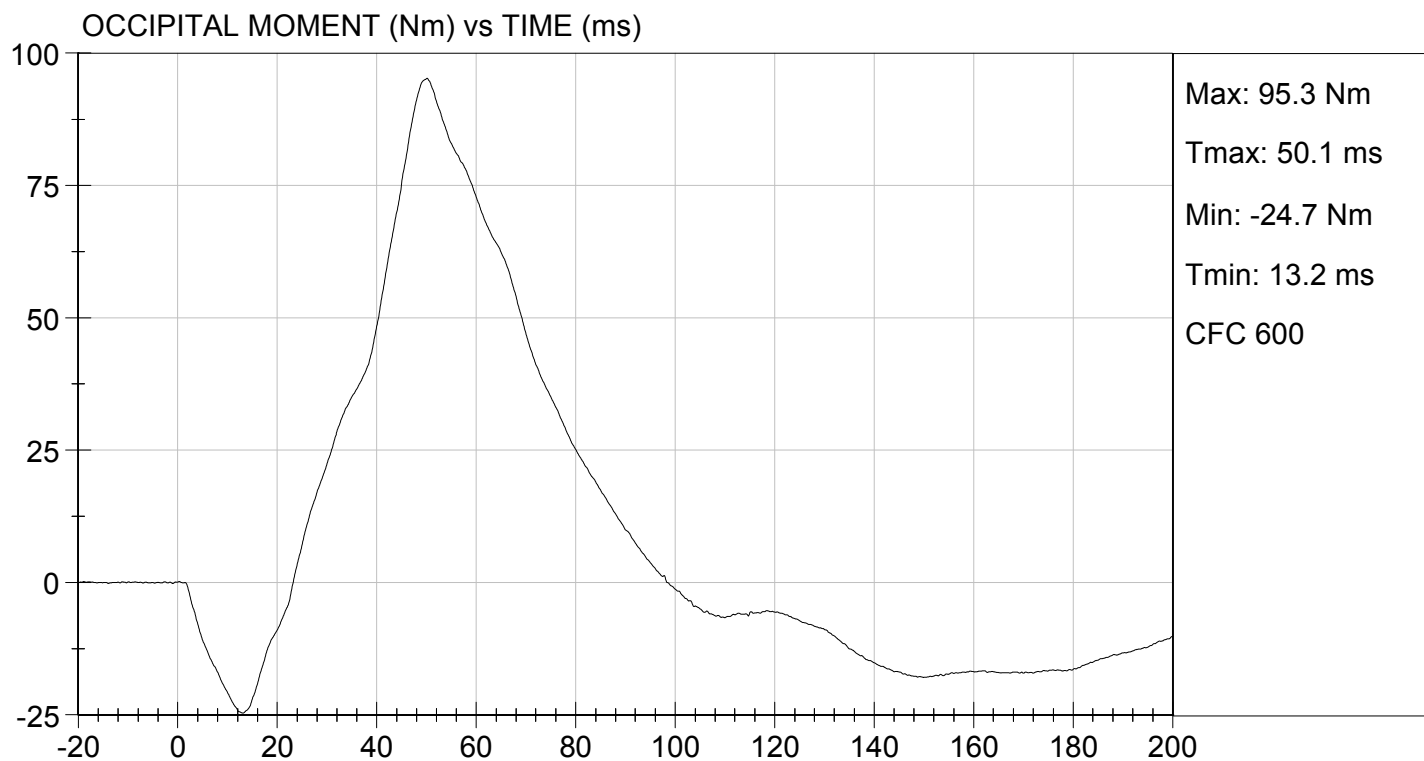
TEST DATE: 11/29/2012
TEST #: D124532





TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 11/29/2012
TEST #: D124532



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

ATD Serial No: 036

Test I.D: D124533

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.45	Pass
	20 ms	G's	14.00 to 19.00	15.68	Pass
	30 ms	G's	11.00 to 16.00	11.51	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	11.5	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	42.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.0	Pass
	Time	ms	72.0 to 82.0	81.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	162.2	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-63.4	Pass
	Time	ms	65.0 to 79.0	73.3	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	144.9	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

11/29/2012

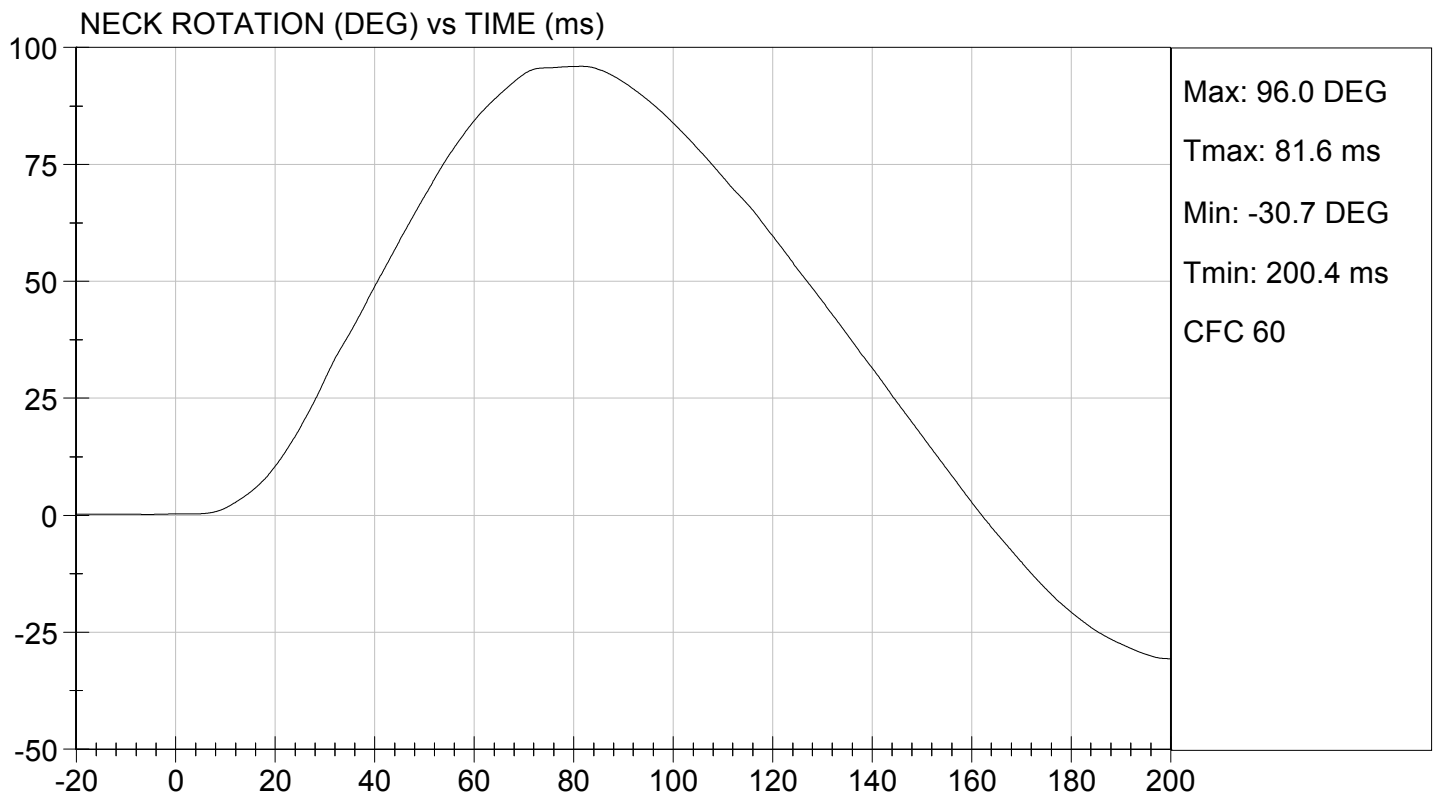
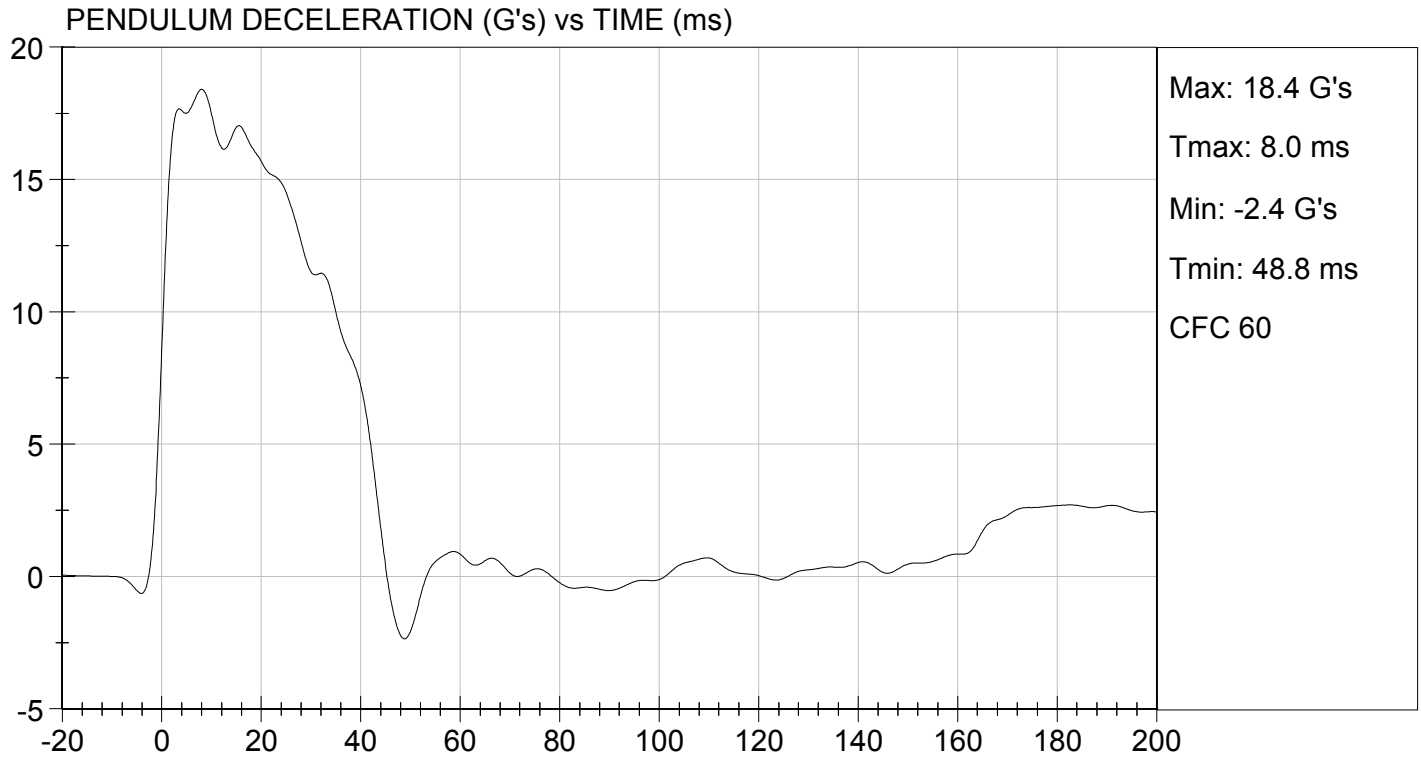
Test Date

David Winkelbauer
Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 20.10 ft/s, 6.13 m/s

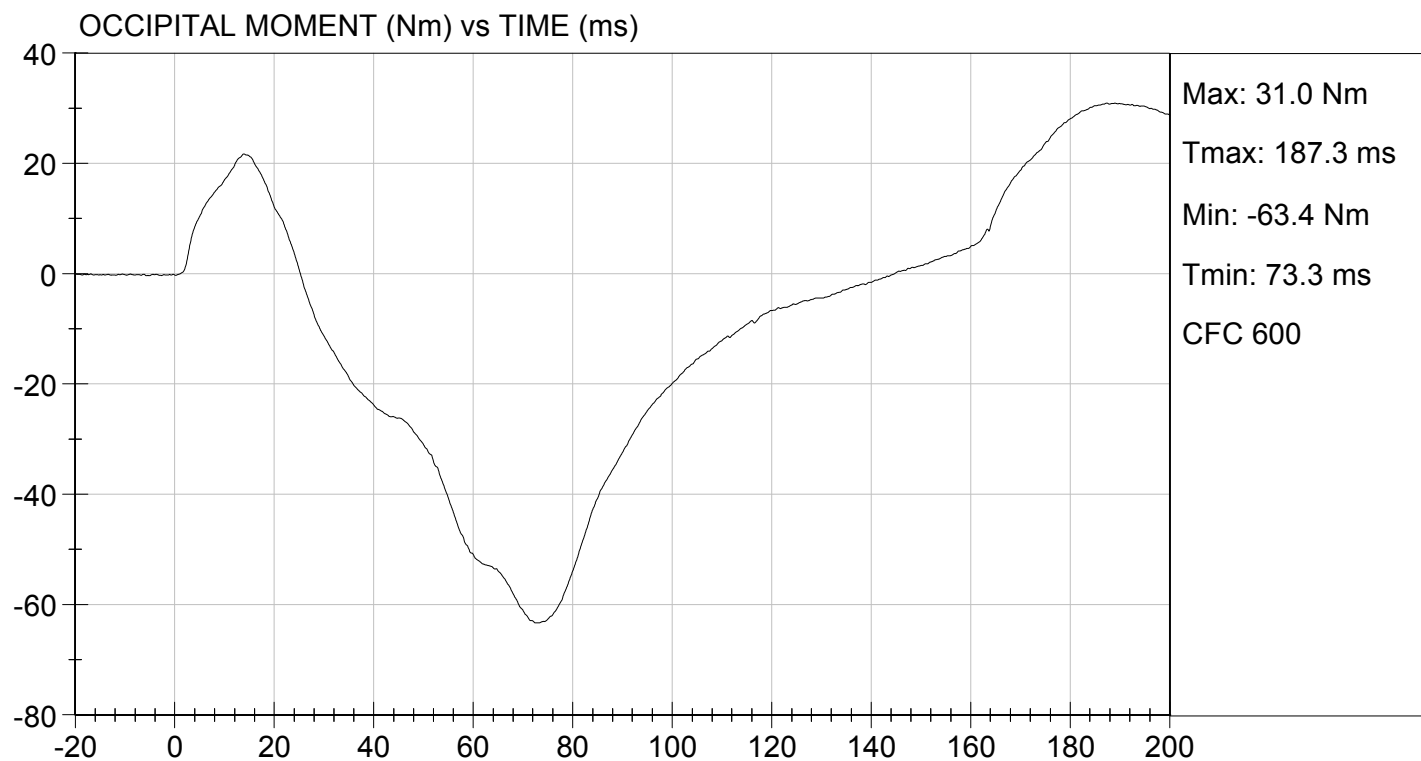
TEST DATE: 11/29/2012
TEST #: D124533





TEST DESC: NECK EXTENSION
VELOCITY: 20.10 ft/s, 6.13 m/s

TEST DATE: 11/29/2012
TEST #: D124533



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

Test I.D: D124534

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
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,442	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.83	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results			Pass	


Laboratory Technician

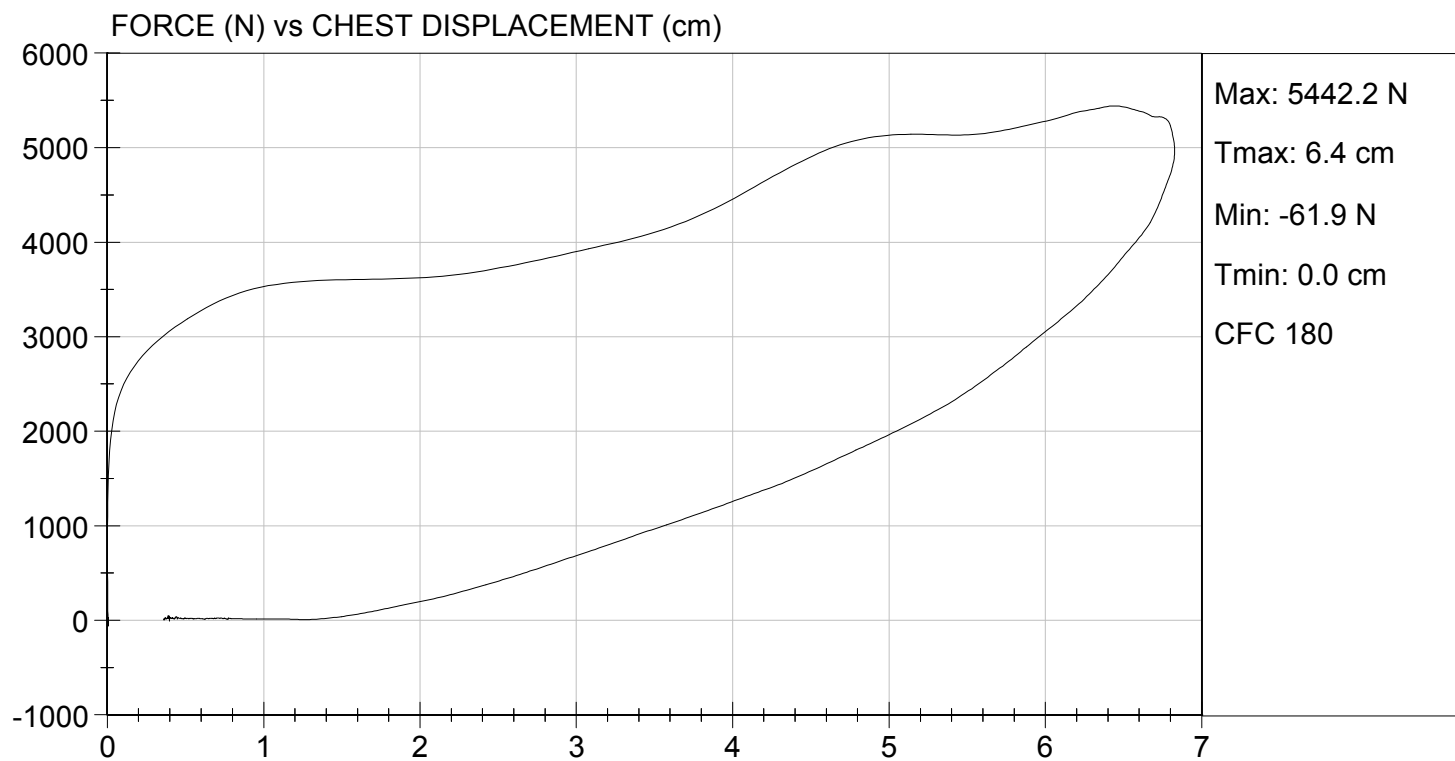
11/28/2012
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 11/28/2012
TEST #: D124534



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

ATD Serial No: 036

Test I.D: D124535

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	4,955	Pass
Overall Test Results				Pass


Laboratory Technician

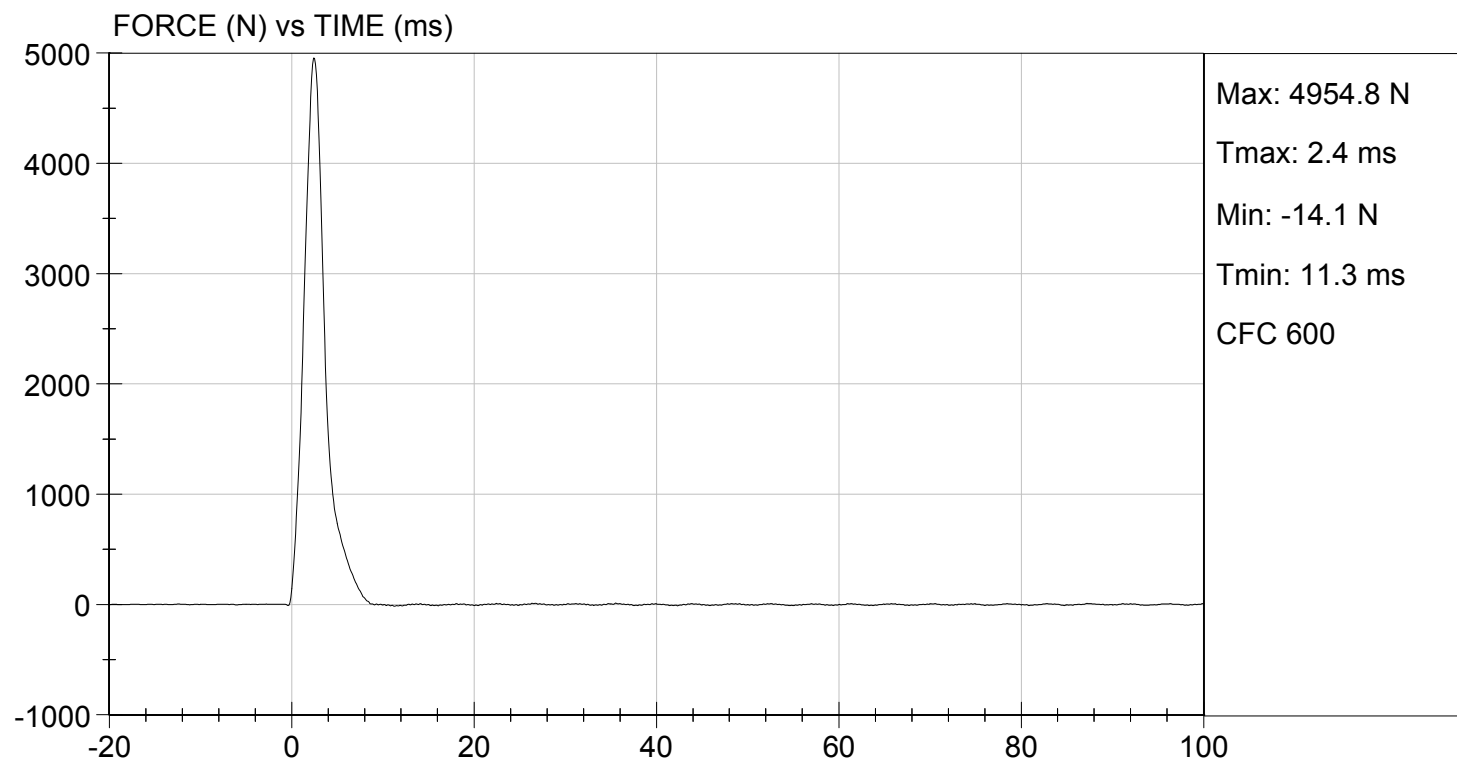
11/29/2012
Test Date


Approved By



TEST DESC: RIGHT KNEE
VELOCITY: 6.97 ft/s, 2.12 m/s

TEST DATE: 11/29/2012
TEST #: D124535



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

ATD Serial No: 036

Test I.D: D124536

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,022	Pass
Overall Test Results				Pass


Laboratory Technician

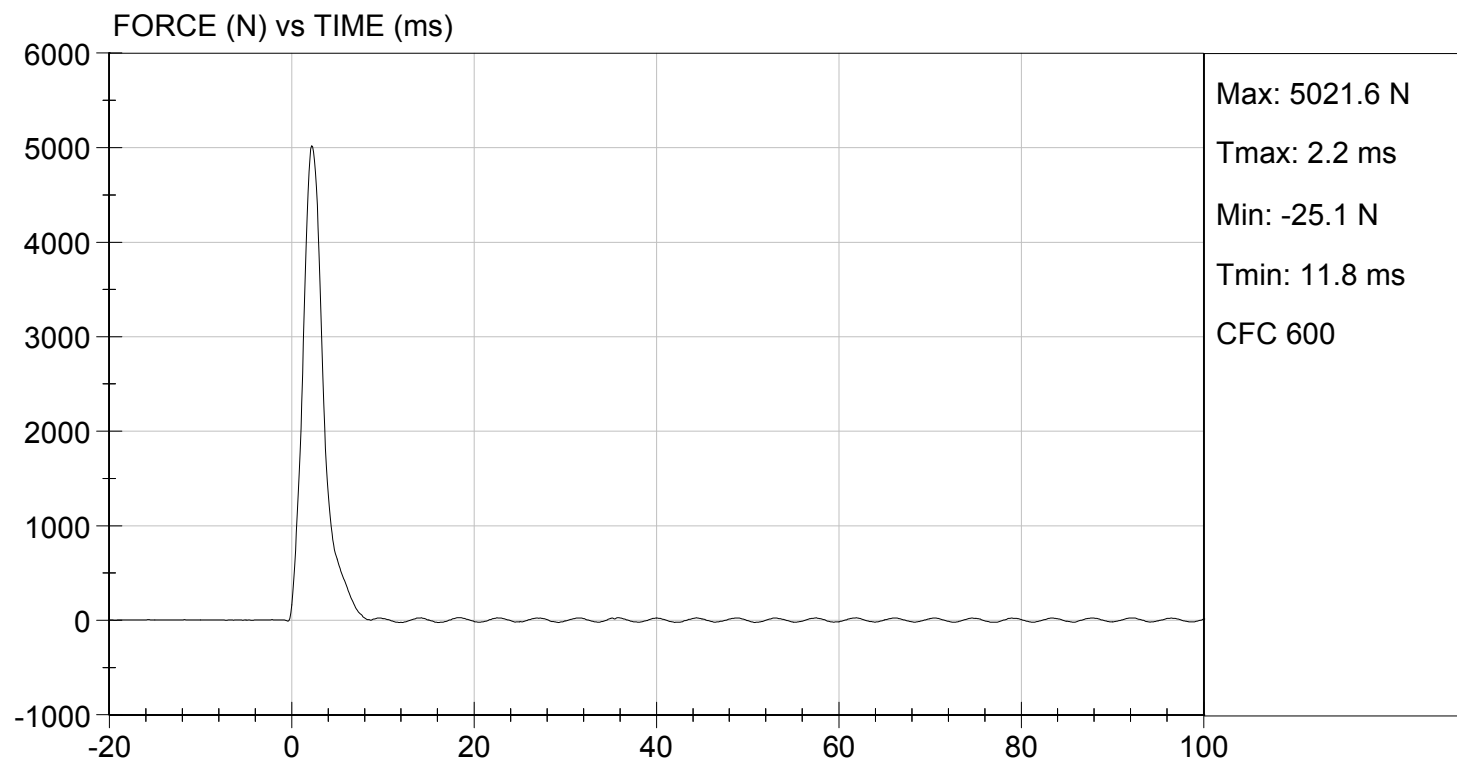
11/29/2012
Test Date


Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.97 ft/s, 2.12 m/s

TEST DATE: 11/29/2012
TEST #: D124536

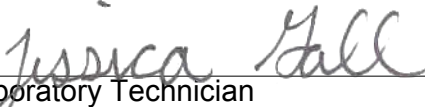


MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

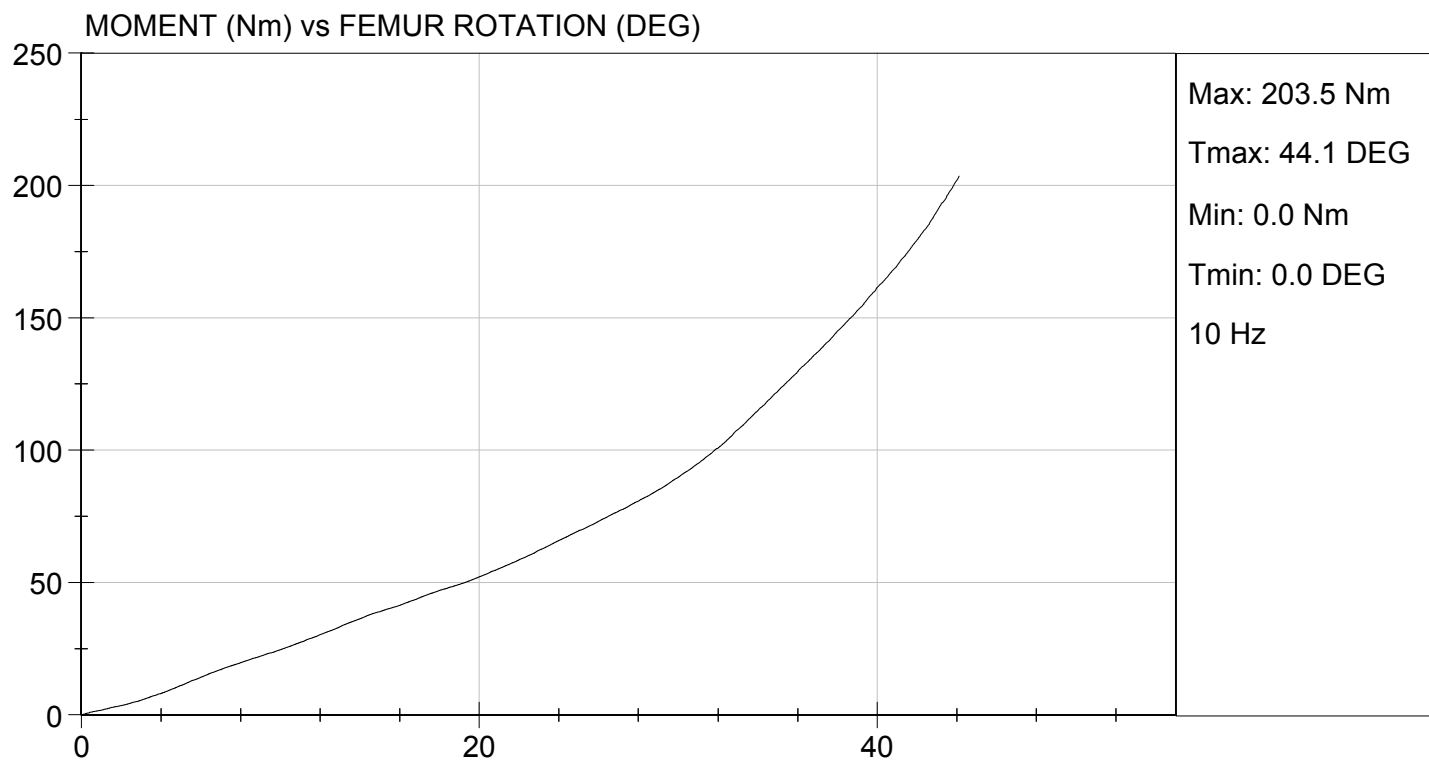
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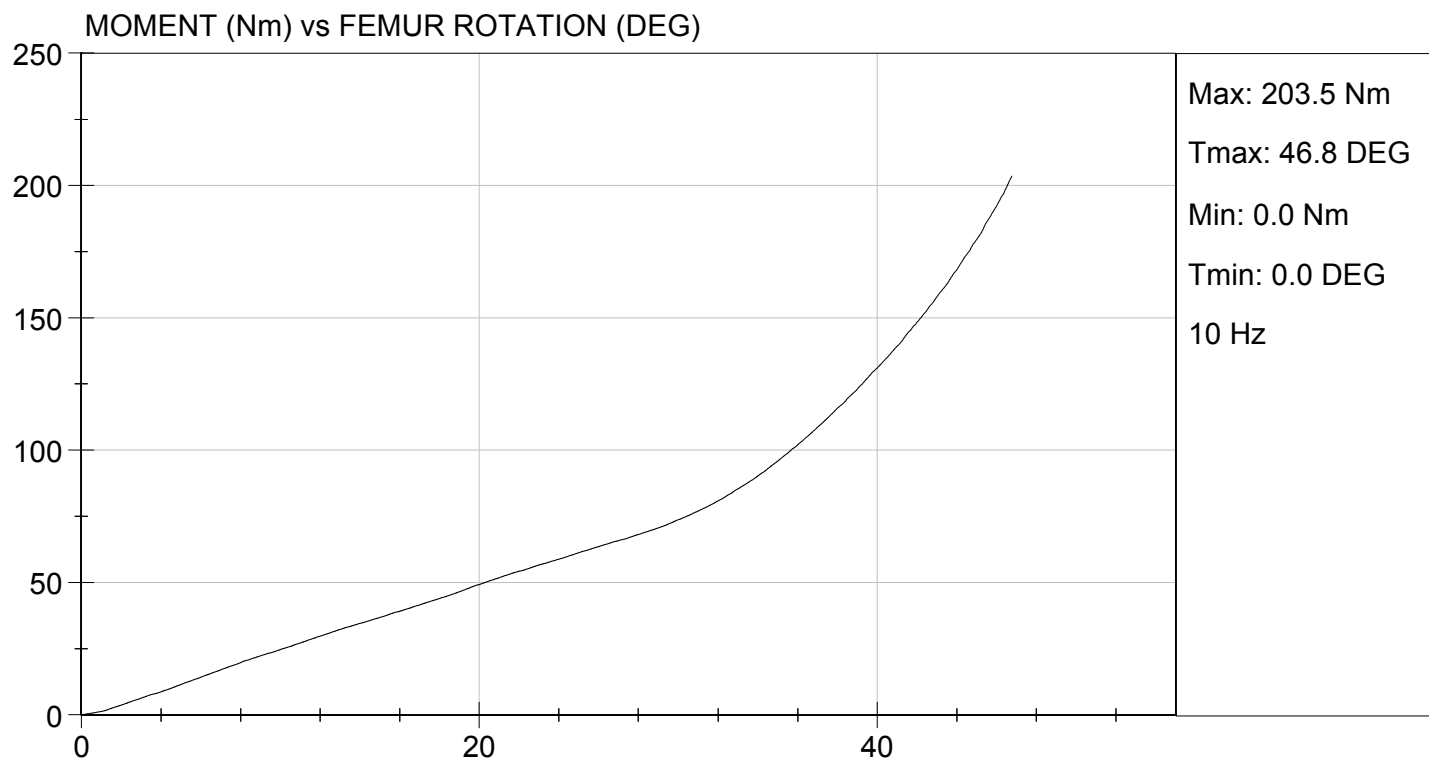
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.9	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	22.0	22.0	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.3	Pass
30 Degrees	Nm	94.9 Nm Max	89.8	73.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.1	46.8	Pass
Overall Test Results					Pass


 Laboratory Technician

11/29/2012
 Test Date


 Approved By





Hybrid III, 5th External Measurements
SN: 634

HYBRID III, PART 572, SUBPART O EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	774.7-800.1	784.6
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	449.0
C	H-POINT HEIGHT	Reference	81.3-86.3	85.0
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	145.0
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	79.2
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	125.6
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	243.9-259.1	253.4
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	43.2-48.2	45.0
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	276.8-297.2	277.8
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	197.5
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	520.7-546.1	541.4
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376.0	362.1
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	400.4
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. "K".	414-439.4	428.6

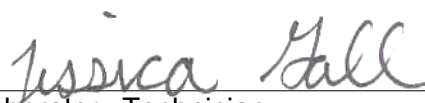
HYBRID III, SUBPART O EXTERNAL DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 304.8 ± 5.1 mm above seat surface	175.3-190.5	181.6
eP	FOOT LENGTH	Tip of toe to rear of heel	218.5-233.7	224.7
Q	STANDING HEIGHT	(THEORETICAL)	1501.1	N/A
R	BUTTOCK TO KNEE PIVOT LENGTH	The rear surface of the buttocks to the knee pivot bolt	457.2-482.6	482.0
S	HEAD BREADTH	The widest part of the head	137.1-147.3	139.6
T	HEAD DEPTH	Back of the head to the forehead	177.8-188.0	179.2
U	HIP BREADTH	The widest part of the hip	299.7-314.9	306.1
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	350.5-365.7	355.5
W	FOOT BREADTH	The widest part of the foot	78.8-94.0	90.0
X	HEAD CIRCUMFERENCE	Measured at the point as in dim. "T"	528.3-548.7	540.6
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 345.4 ± 12.7 mm above seat surface	850.9-881.3	868.7
Z	WAIST CIRCUMFERENCE	Measured 165.1 ± 5.1 mm above seat surface	759.5-789.9	786.8
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	332.7-358.1	345.4
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	160.1-170.2	165.1

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D124281

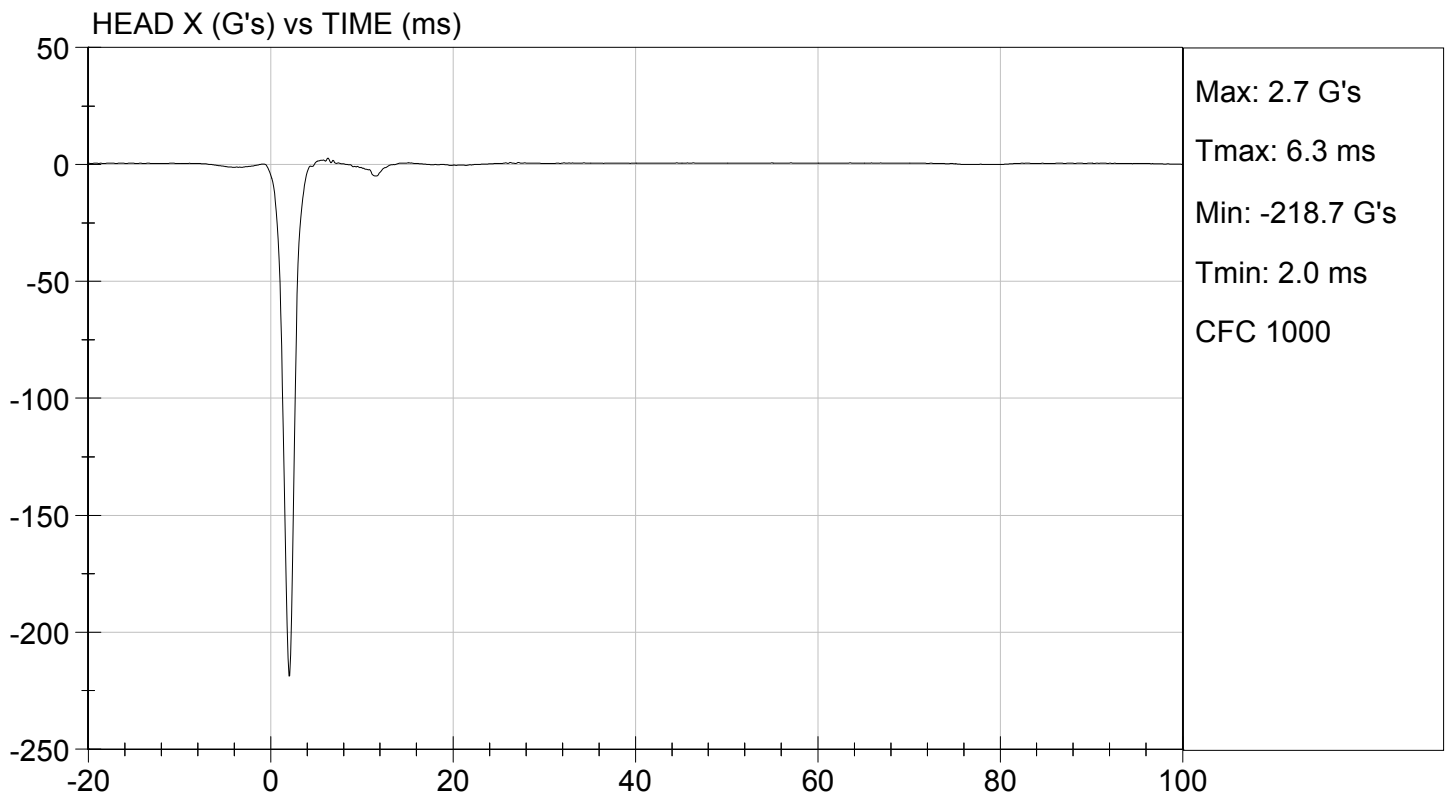
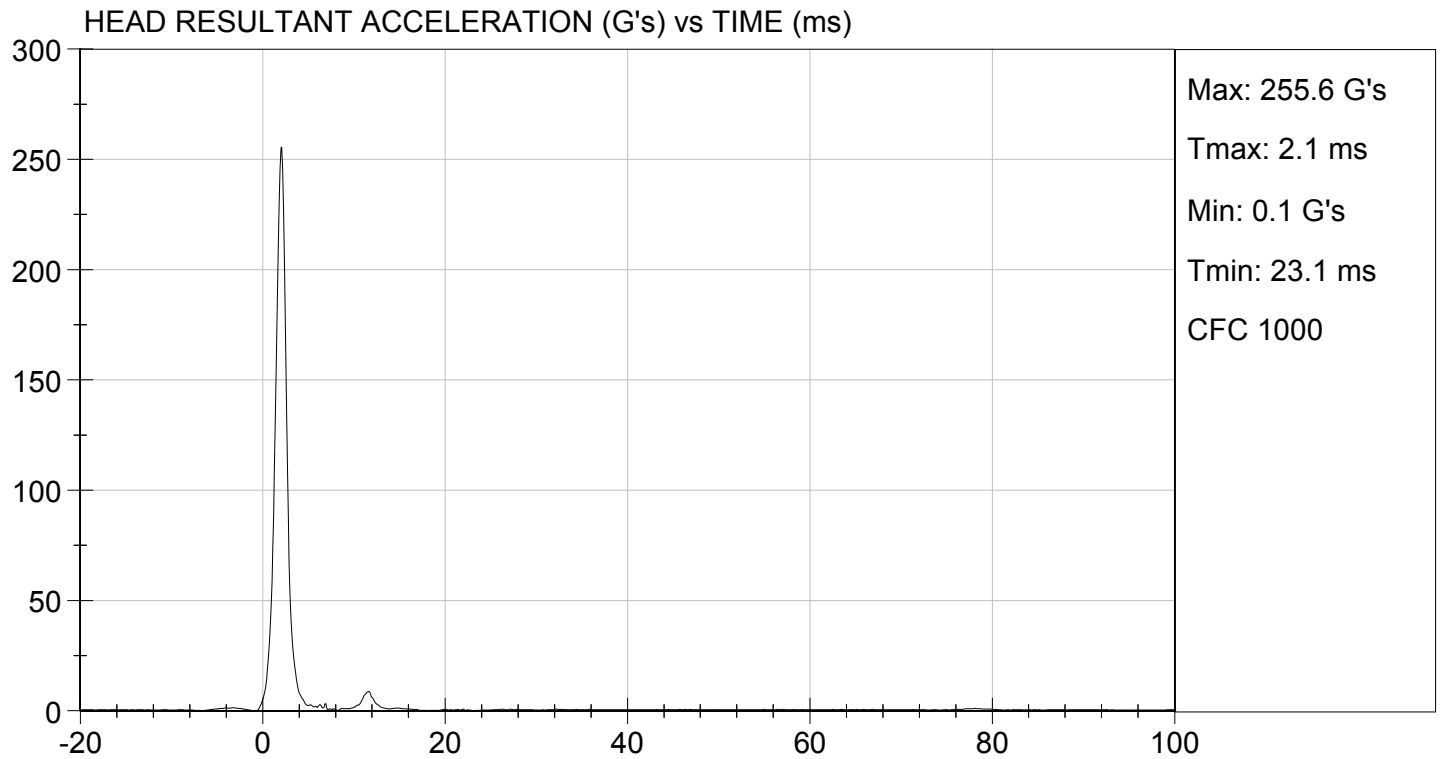
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Peak Resultant Acceleration	G's	250 to 300	256	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-2.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

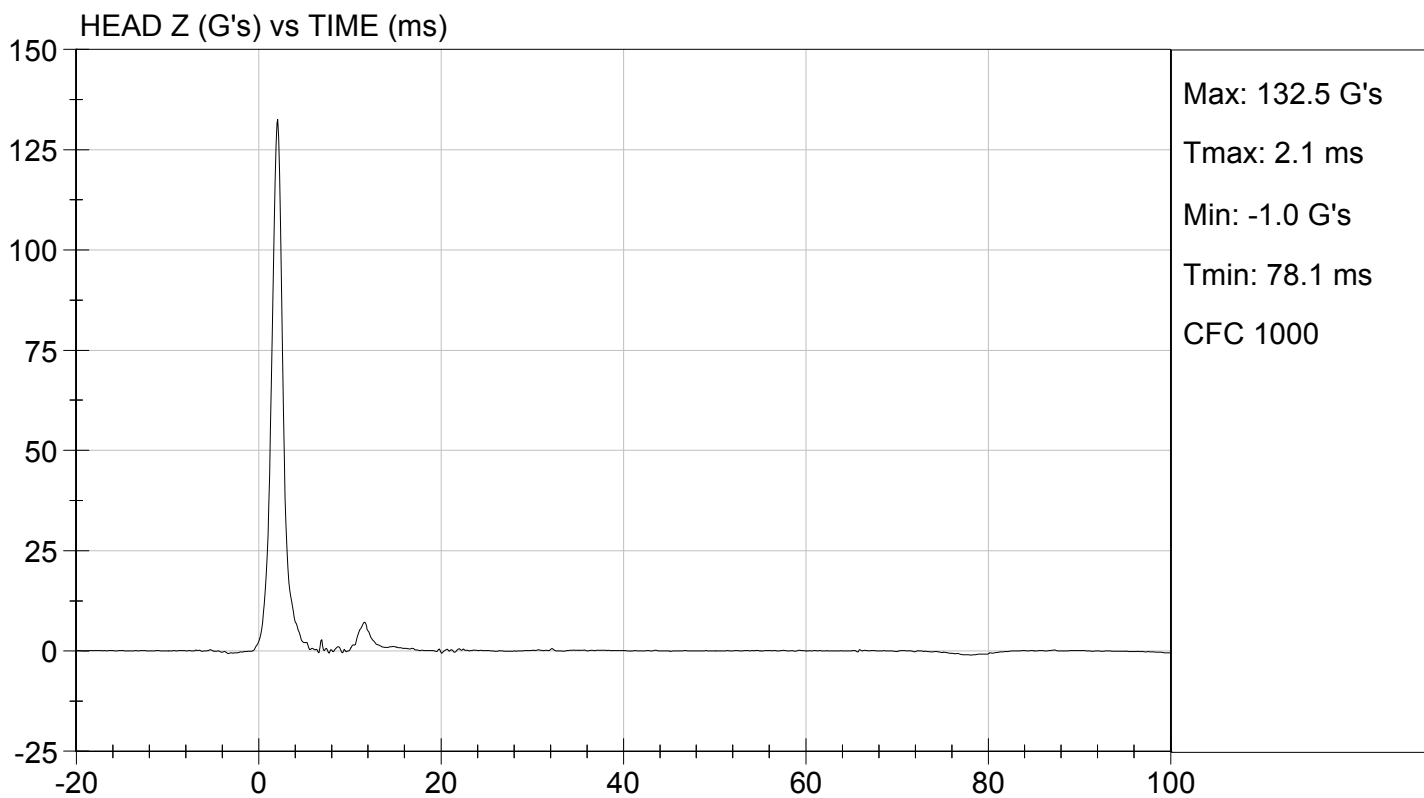
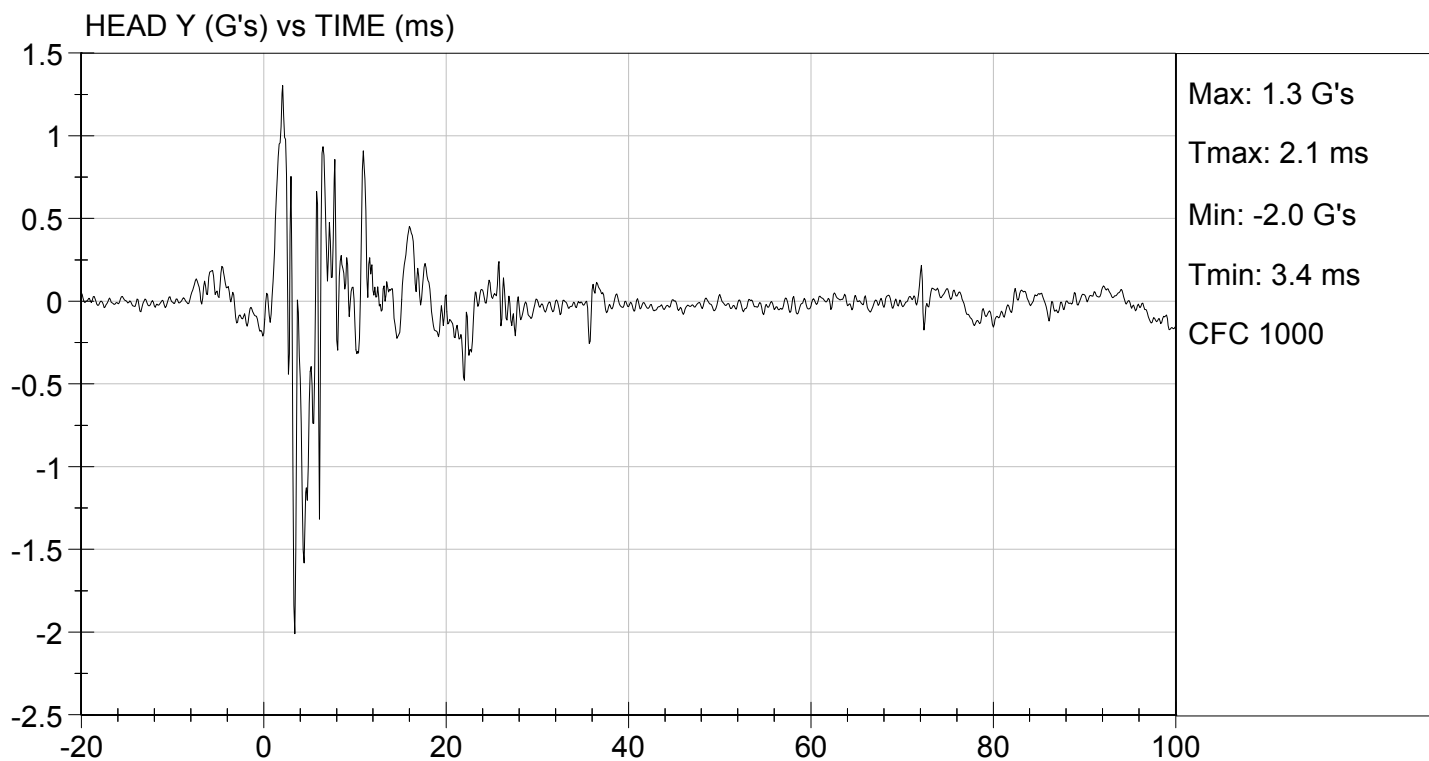

Laboratory Technician

11/08/2012

Test Date


Approved By





MGA RESEARCH CORPORATION

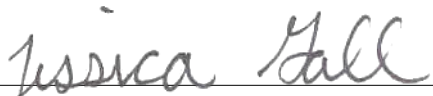
NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D124282

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	30	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.4	Pass
	30 ms	m/s	5.8 to 7.0	6.1	Pass
D Plane Rotation	Max	deg	77 to 91	84	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	71.9	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results					Pass


Laboratory Technician

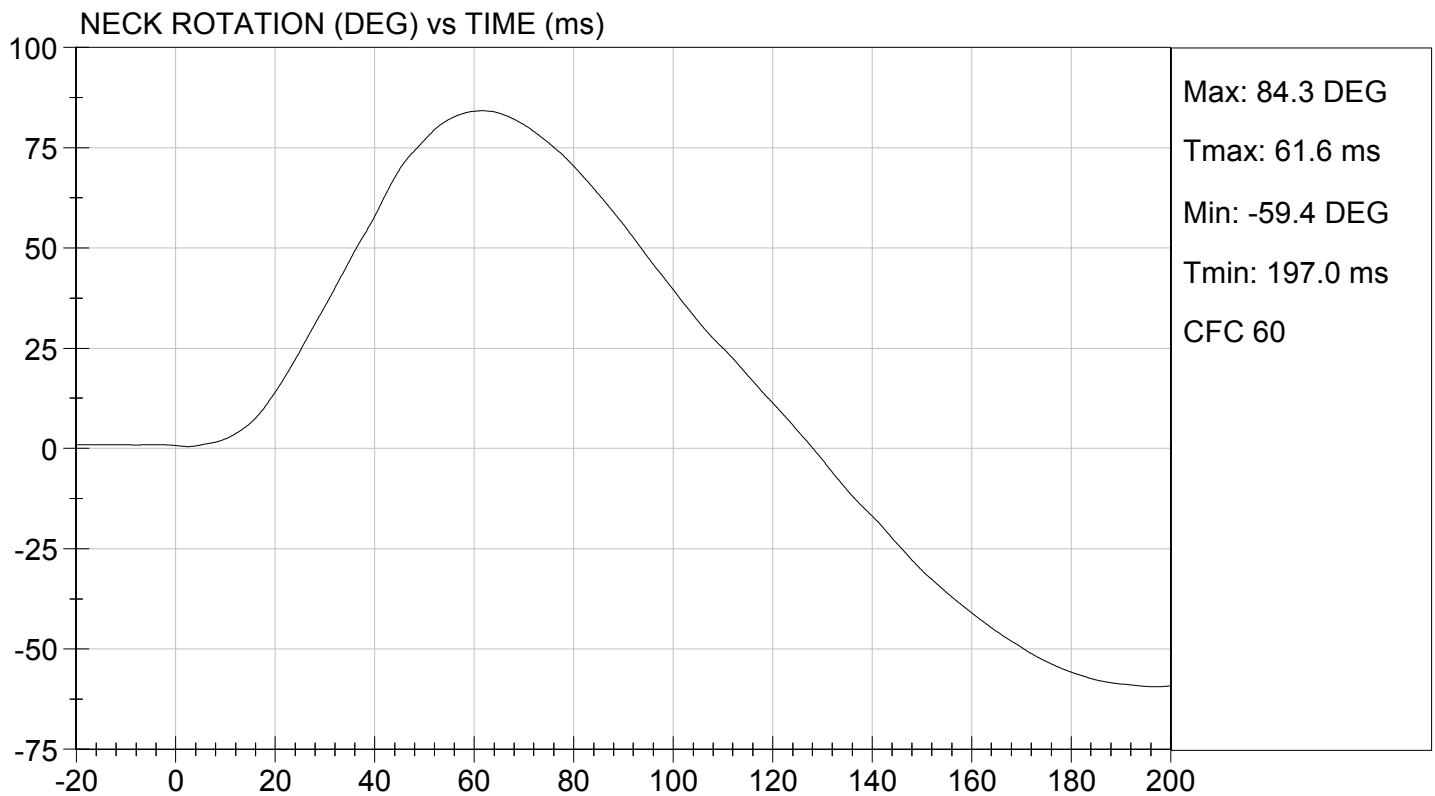
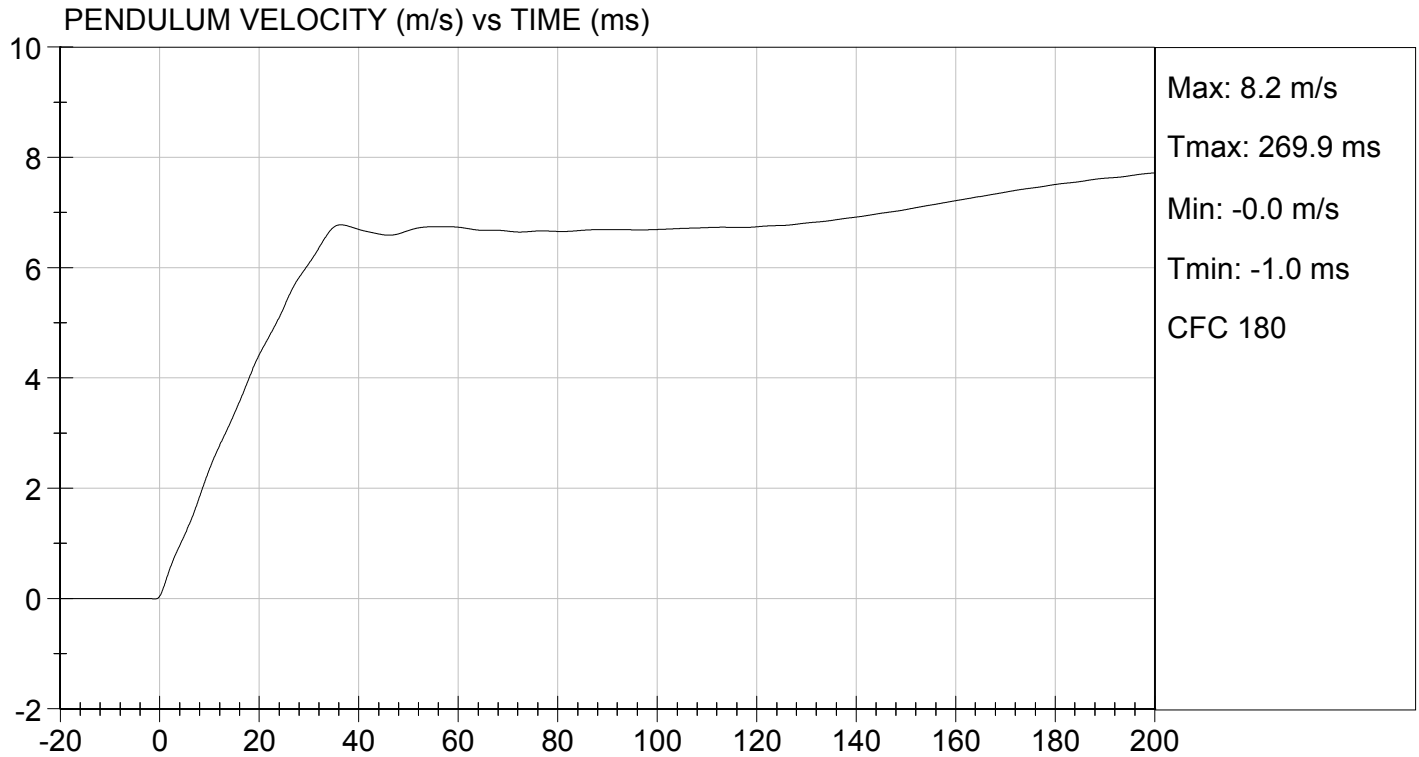
11/08/2012
Test Date

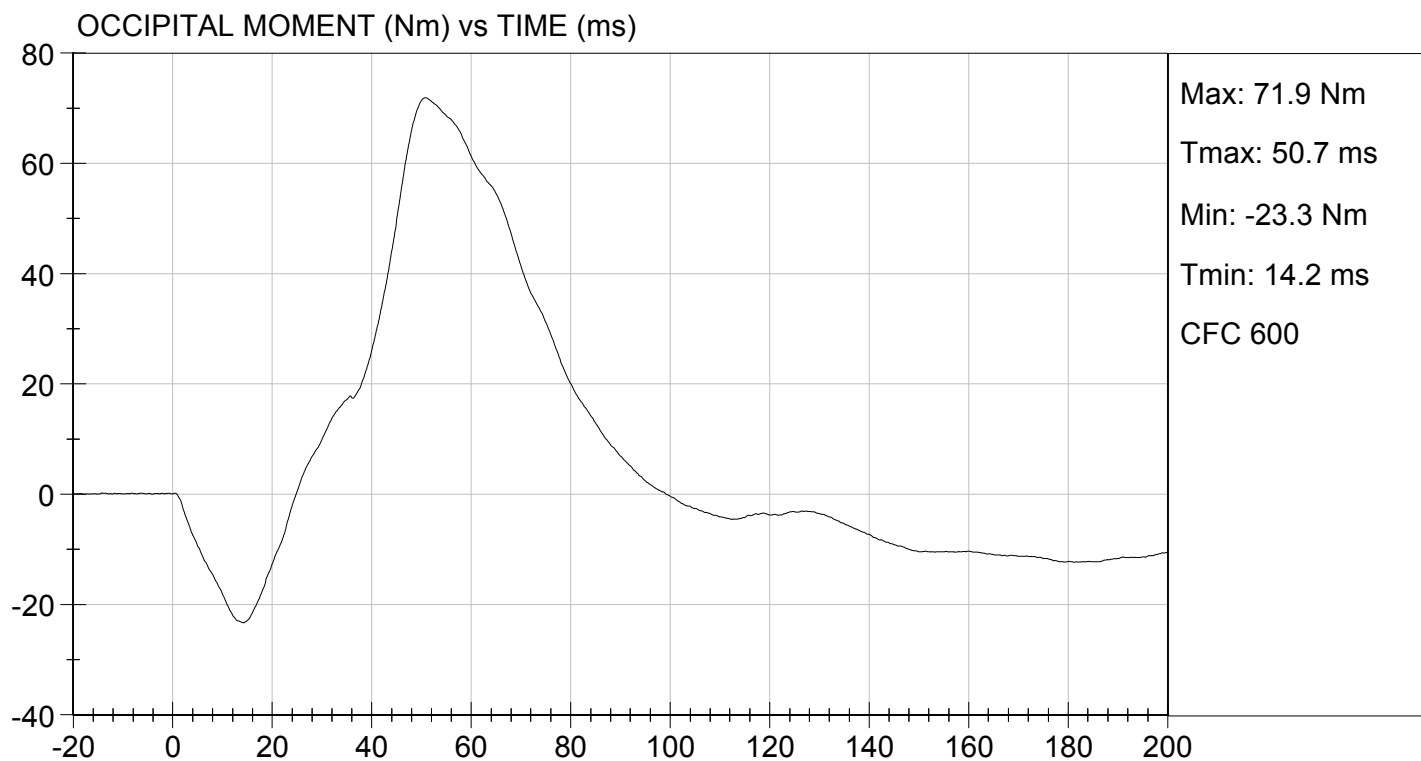

Approved By



TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 11/08/2012
TEST #: D124282



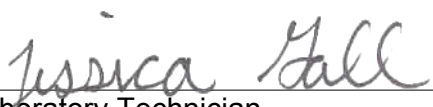


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

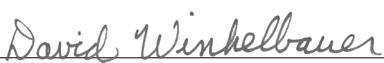
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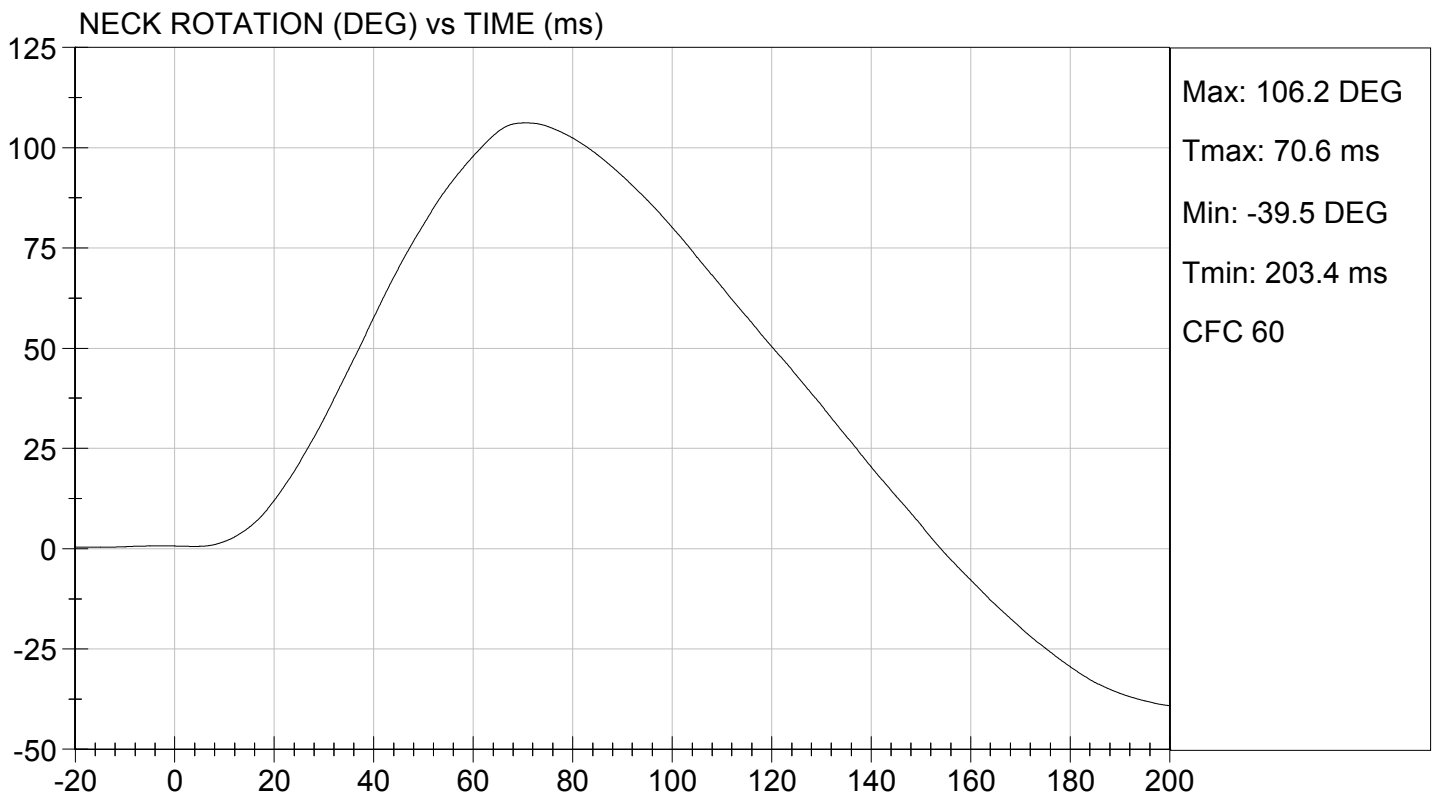
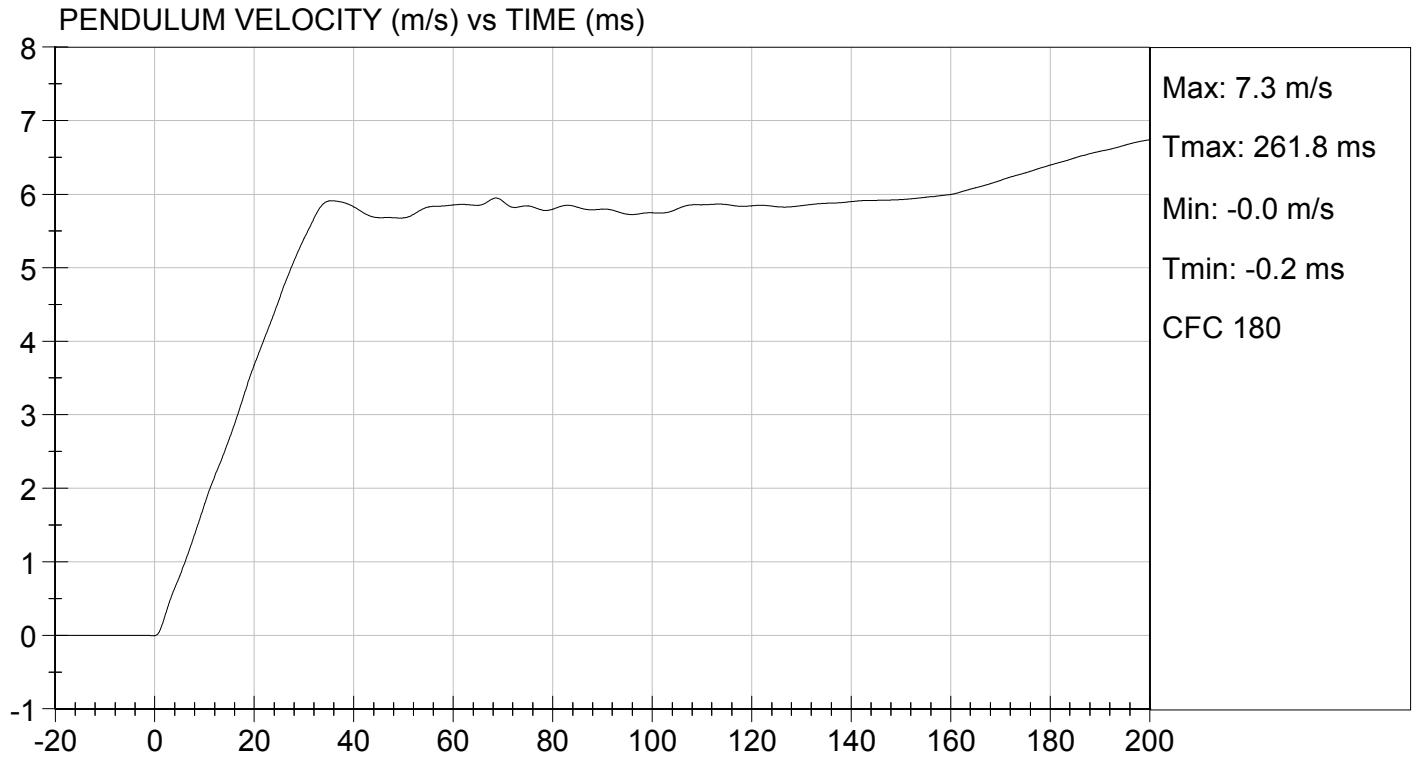
Test I.D: D124283

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	30	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.13	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	106	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-60.4	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	94	Pass
Overall Results					Pass


 Laboratory Technician

11/08/2012
 Test Date

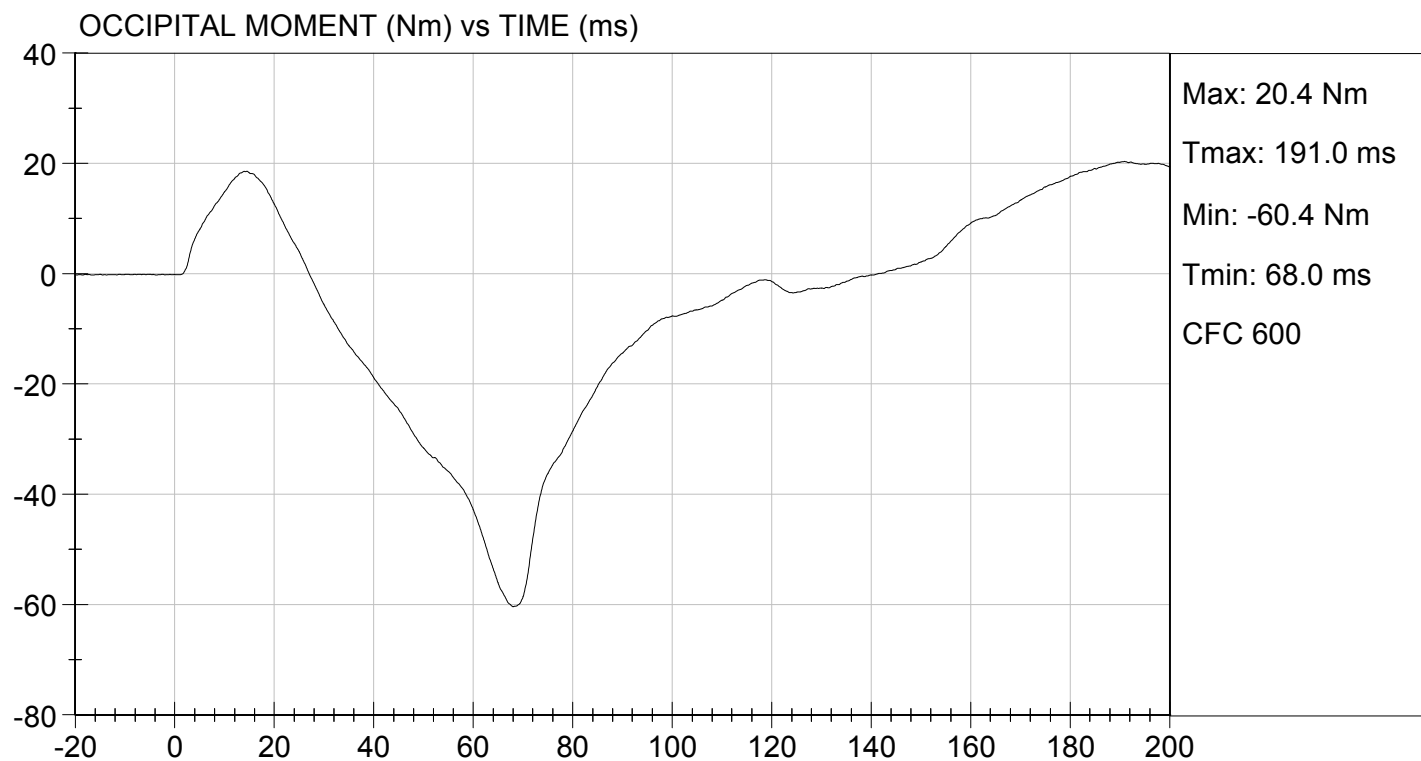

 Approved By





TEST DESC: NECK EXTENSION
VELOCITY: 20.10 ft/s, 6.13 m/s

TEST DATE: 11/08/2012
TEST #: D124283

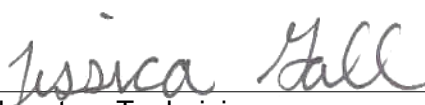


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D124284

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Relative Humidity	%	10 to 70	31	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4074	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4169	Pass
Overall Test Results				Pass


Laboratory Technician

11/08/2012

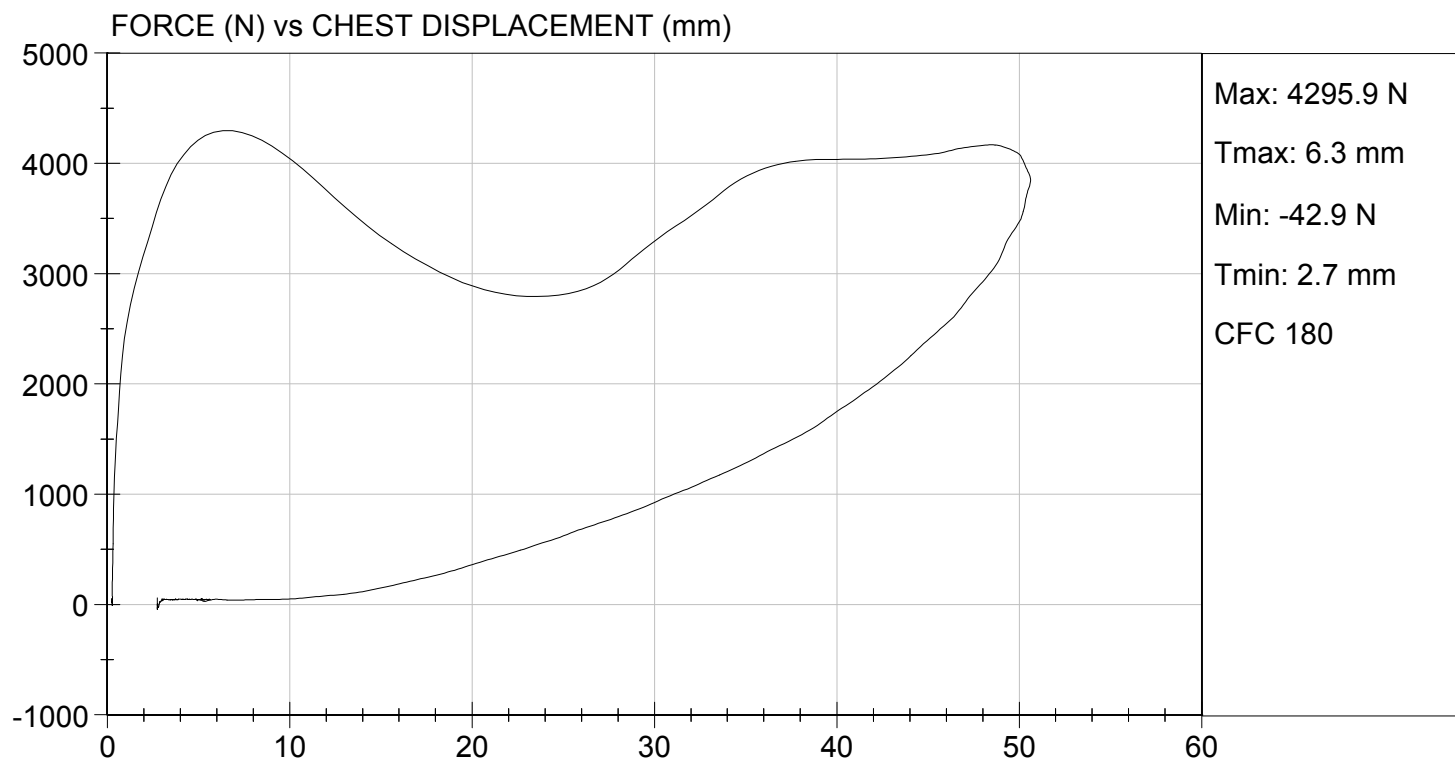
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/08/2012
TEST #: D124284



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D124285

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3734	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

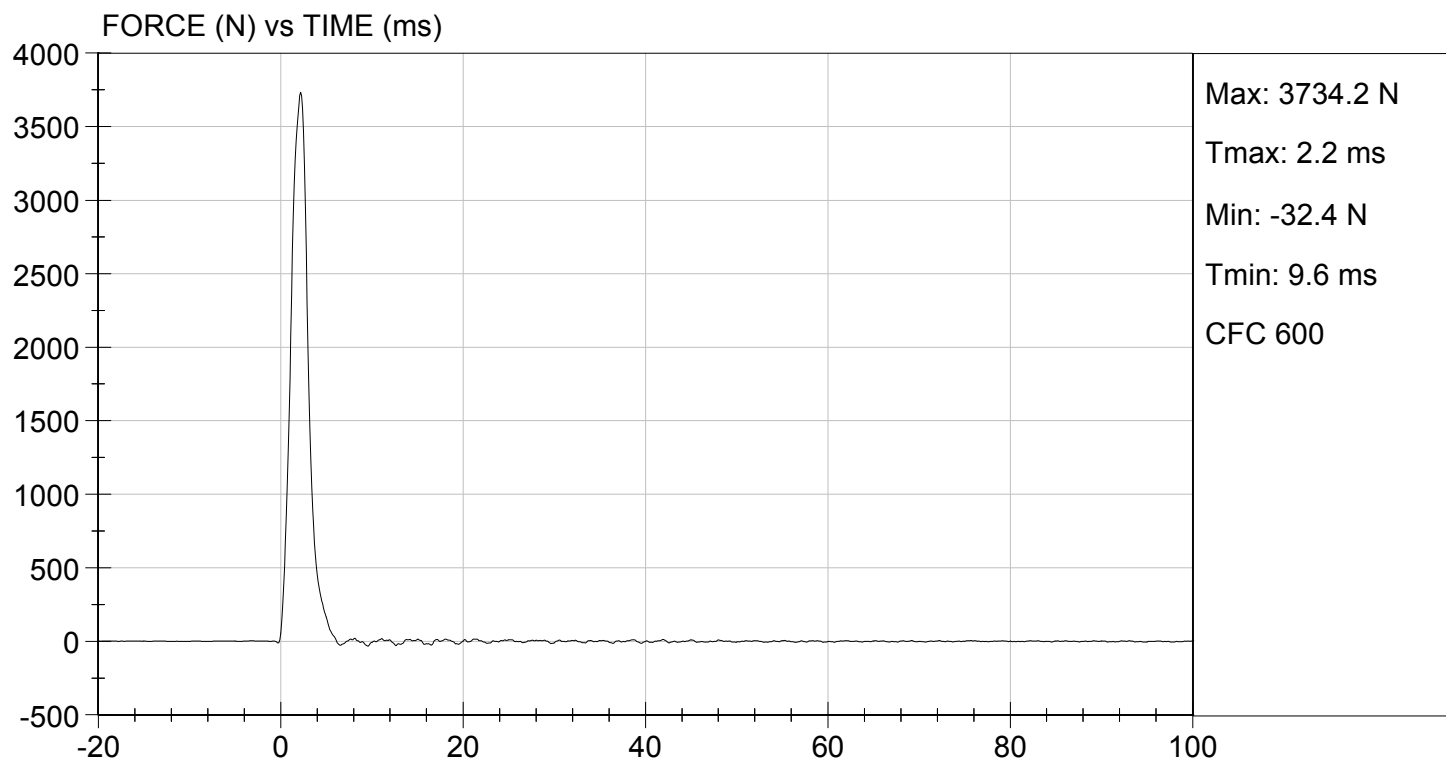
11/08/2012
Test Date

David Winkelbauer
Approved By



TEST DESC: RIGHT KNEE
VELOCITY: 6.97 ft/s, 2.12 m/s

TEST DATE: 11/08/2012
TEST #: D124285



MGA RESEARCH CORPORATION

**LEFT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE**

ATD Serial No: 634

Test I.D: D124286

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3881	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

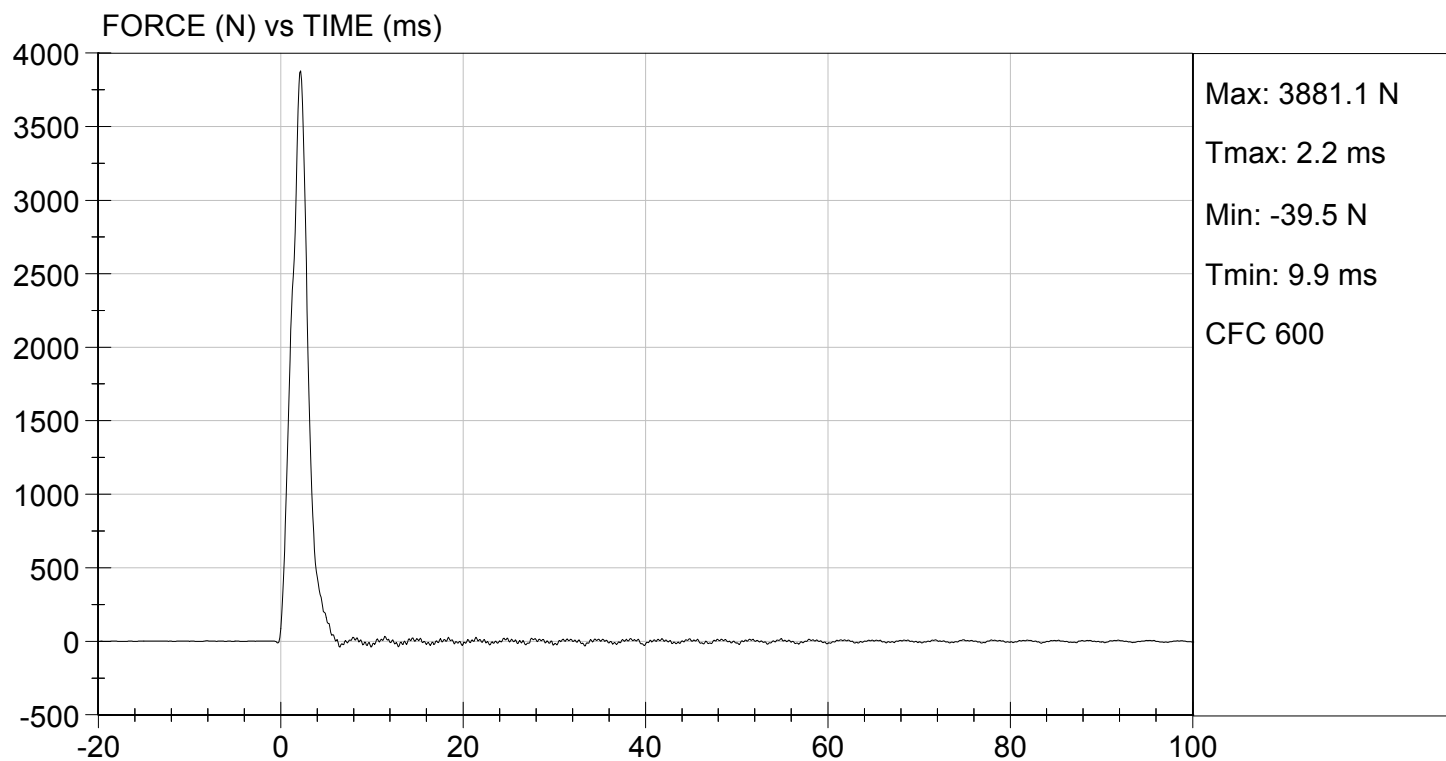
11/08/2012
Test Date

David Winkelbauer
Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.97 ft/s, 2.12 m/s

TEST DATE: 11/08/2012
TEST #: D124286



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D124287

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	357	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	1.0	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

11/08/2012

Test Date

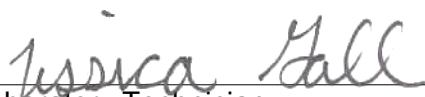
David Winkelbauer
Approved By

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D124541

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Peak Resultant Acceleration	G's	250 to 300	256	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-1.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

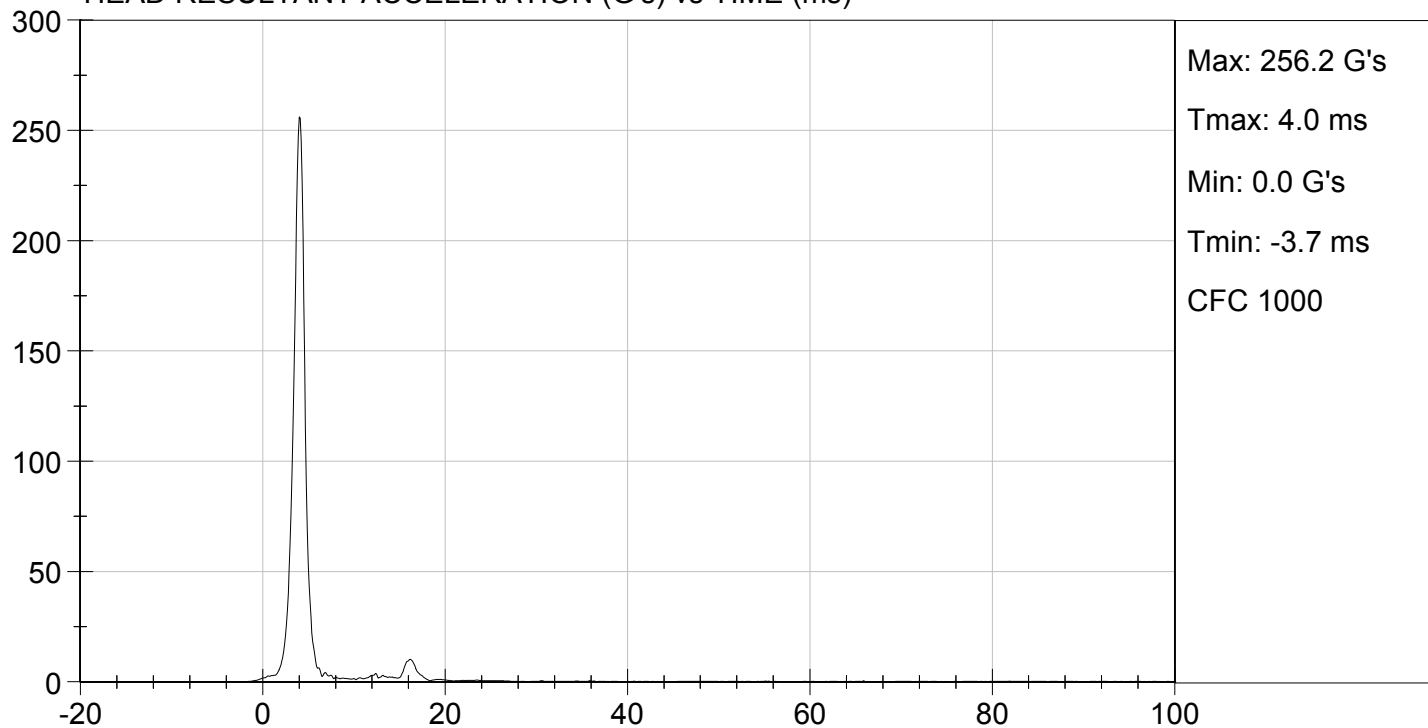
11/28/2012

Test Date

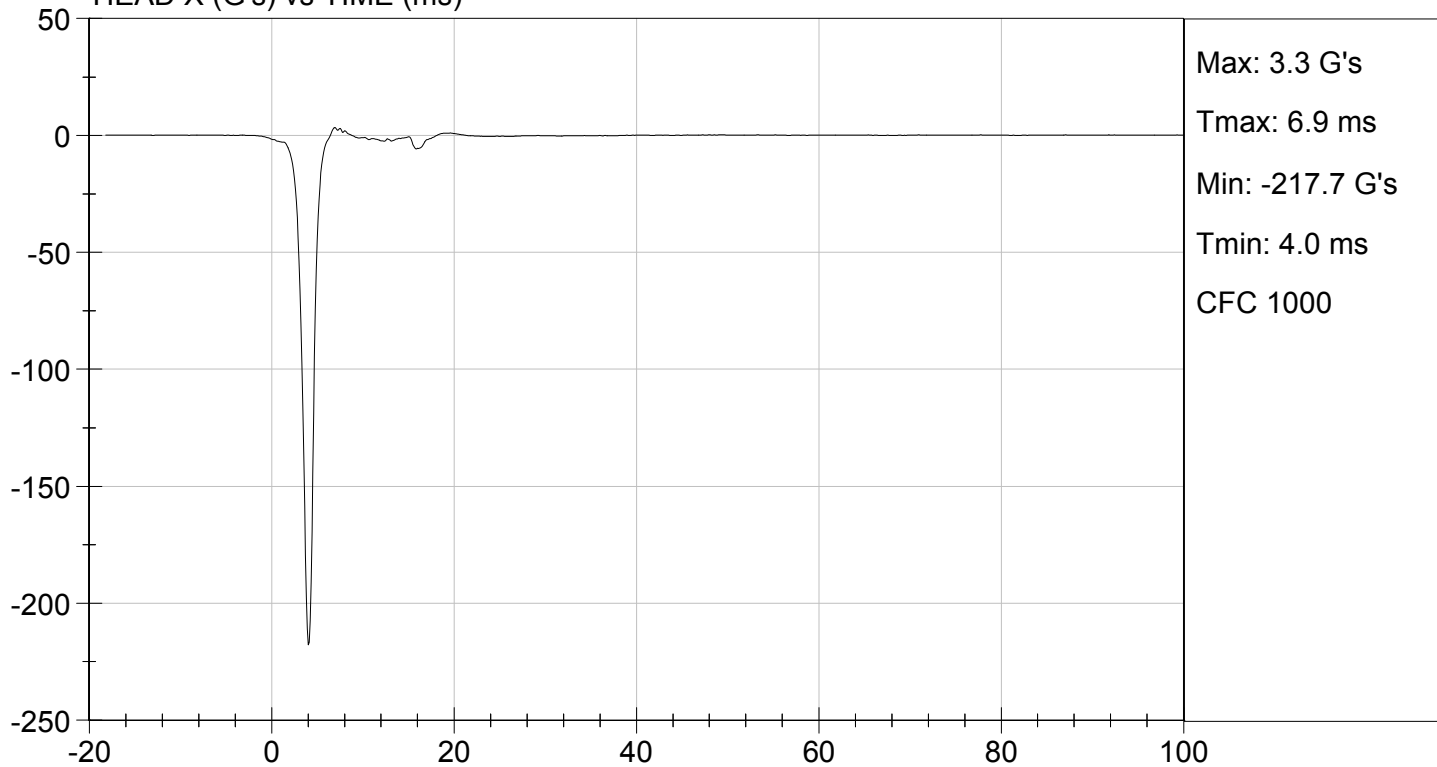

Approved By

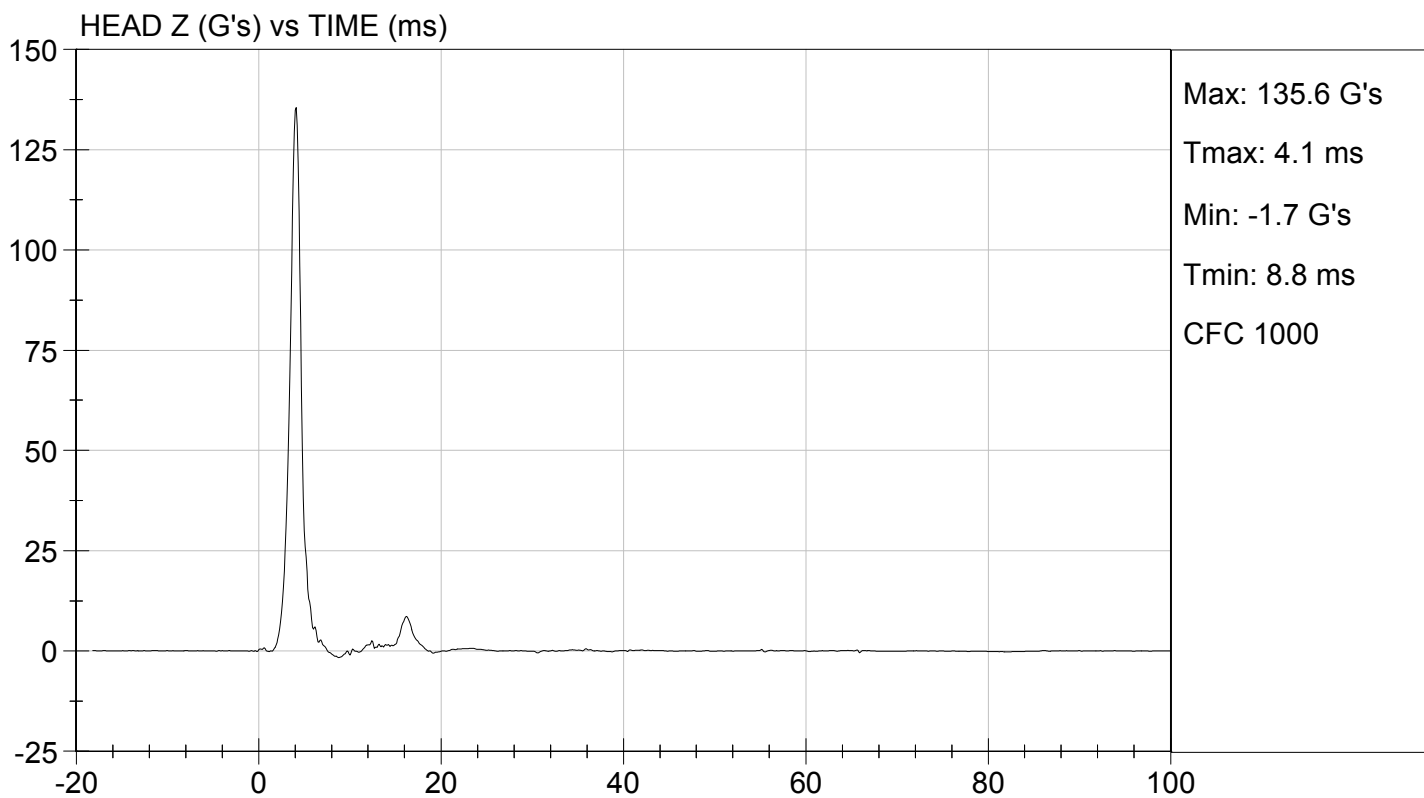
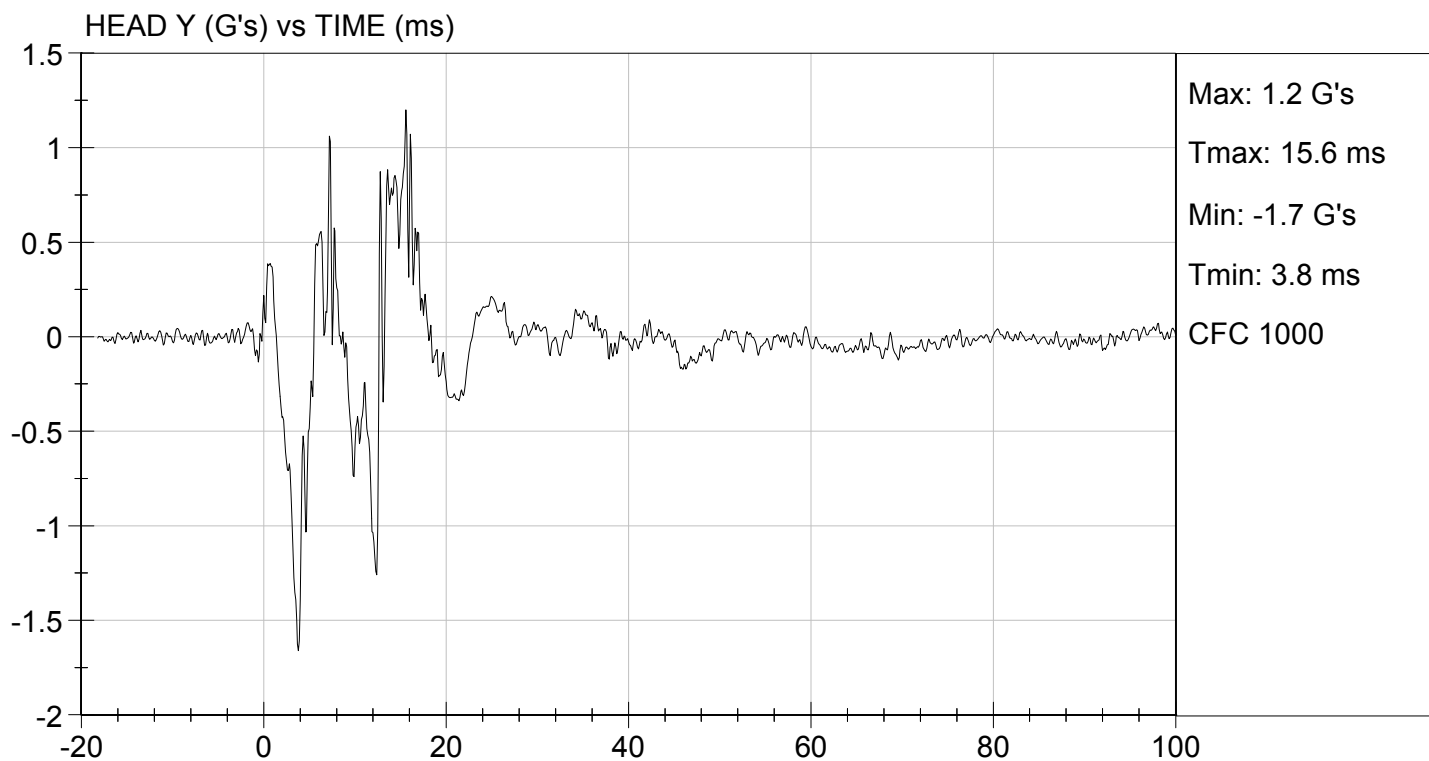


HEAD RESULTANT ACCELERATION (G's) vs TIME (ms)



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





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

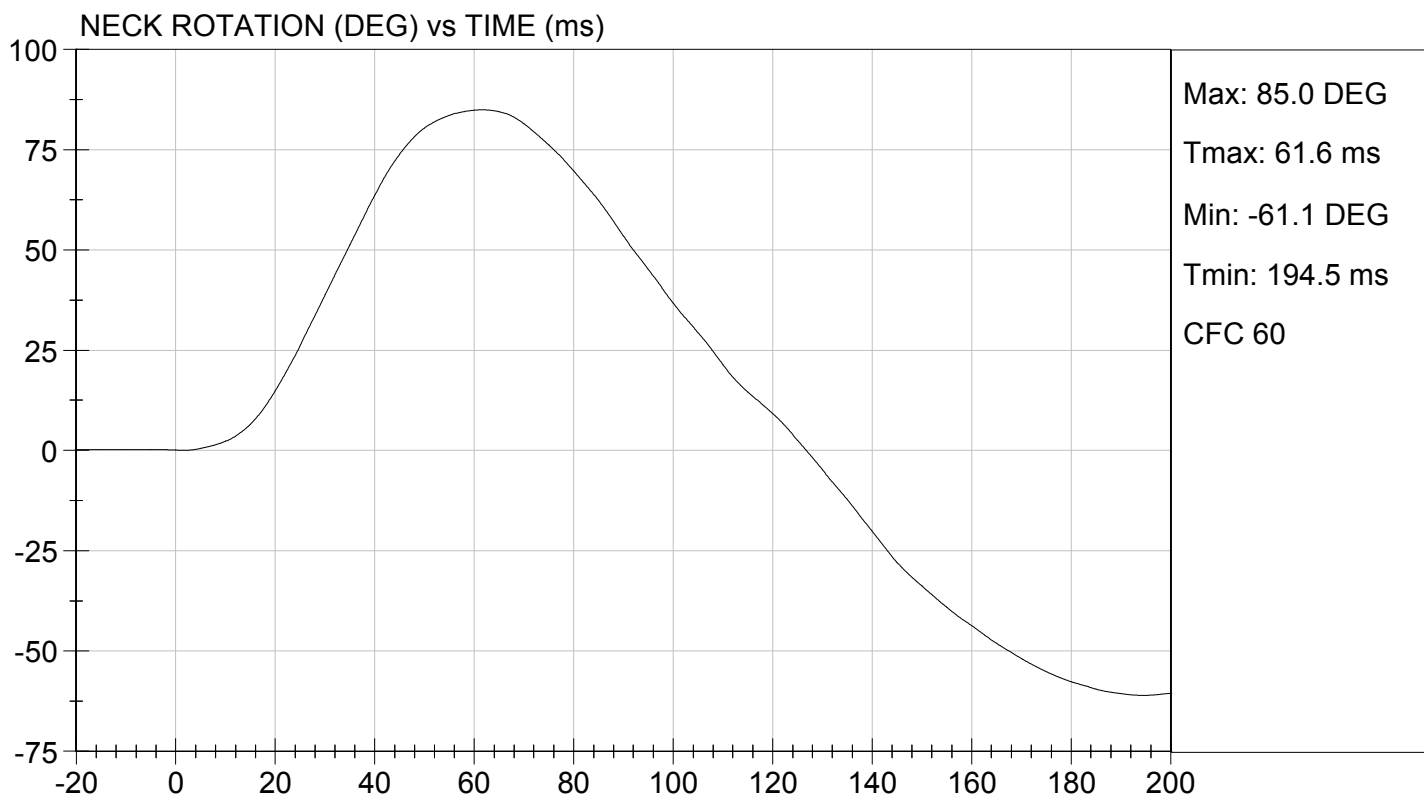
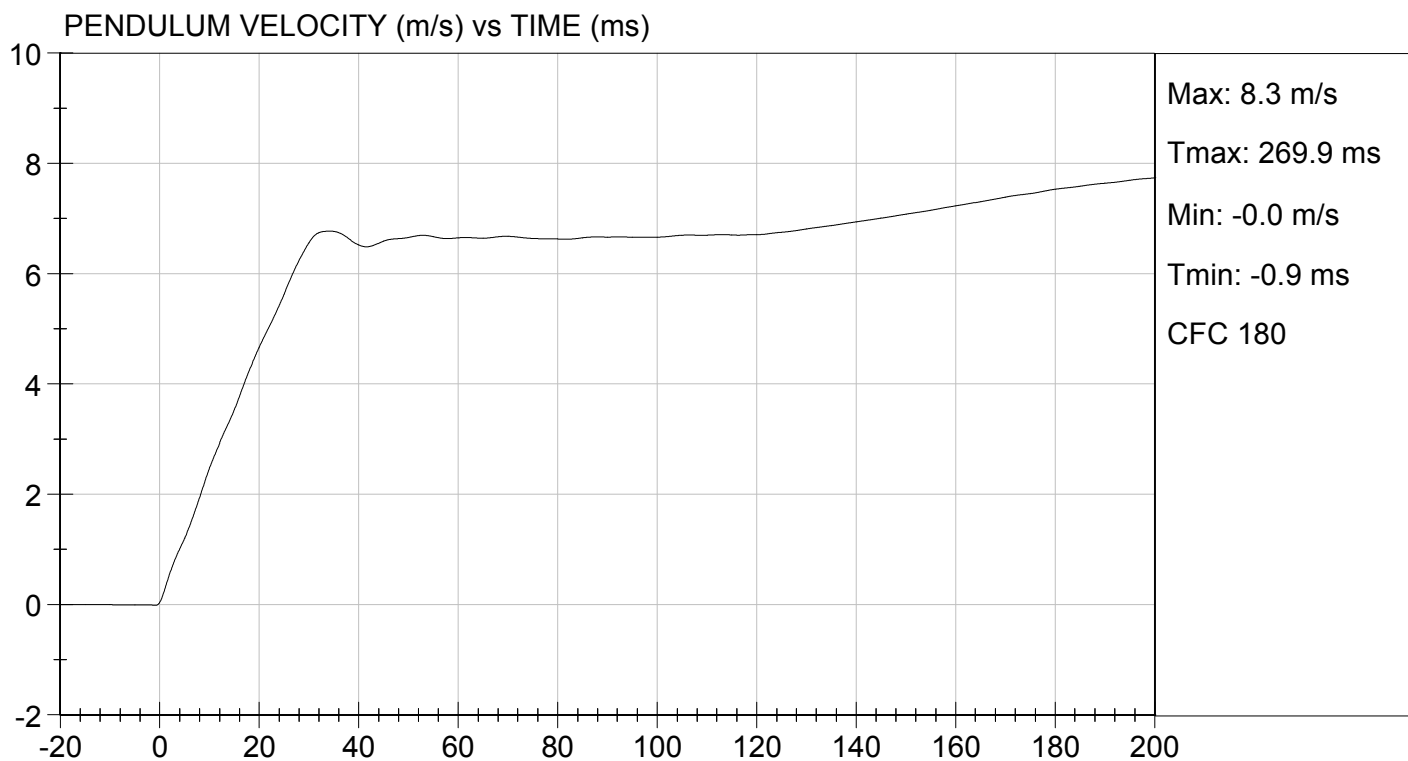
Test I.D: D124542

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	19	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	85	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	88	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

11/28/2012
Test Date

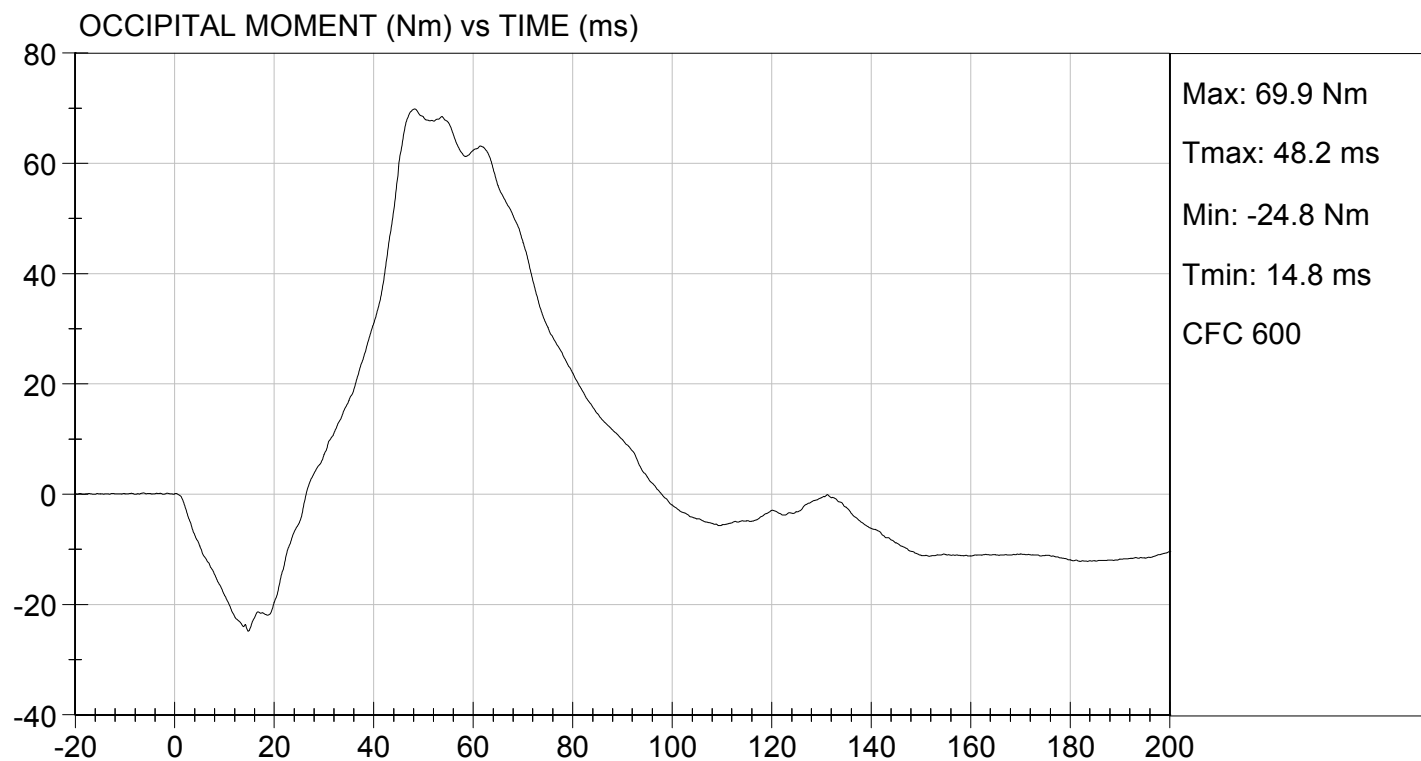
David Winkelbauer
Approved By





TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 11/28/2012
TEST #: D124542

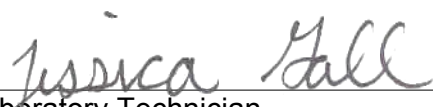


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D124543

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	19	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	109	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-60	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	95	Pass
Overall Results					Pass


 Laboratory Technician

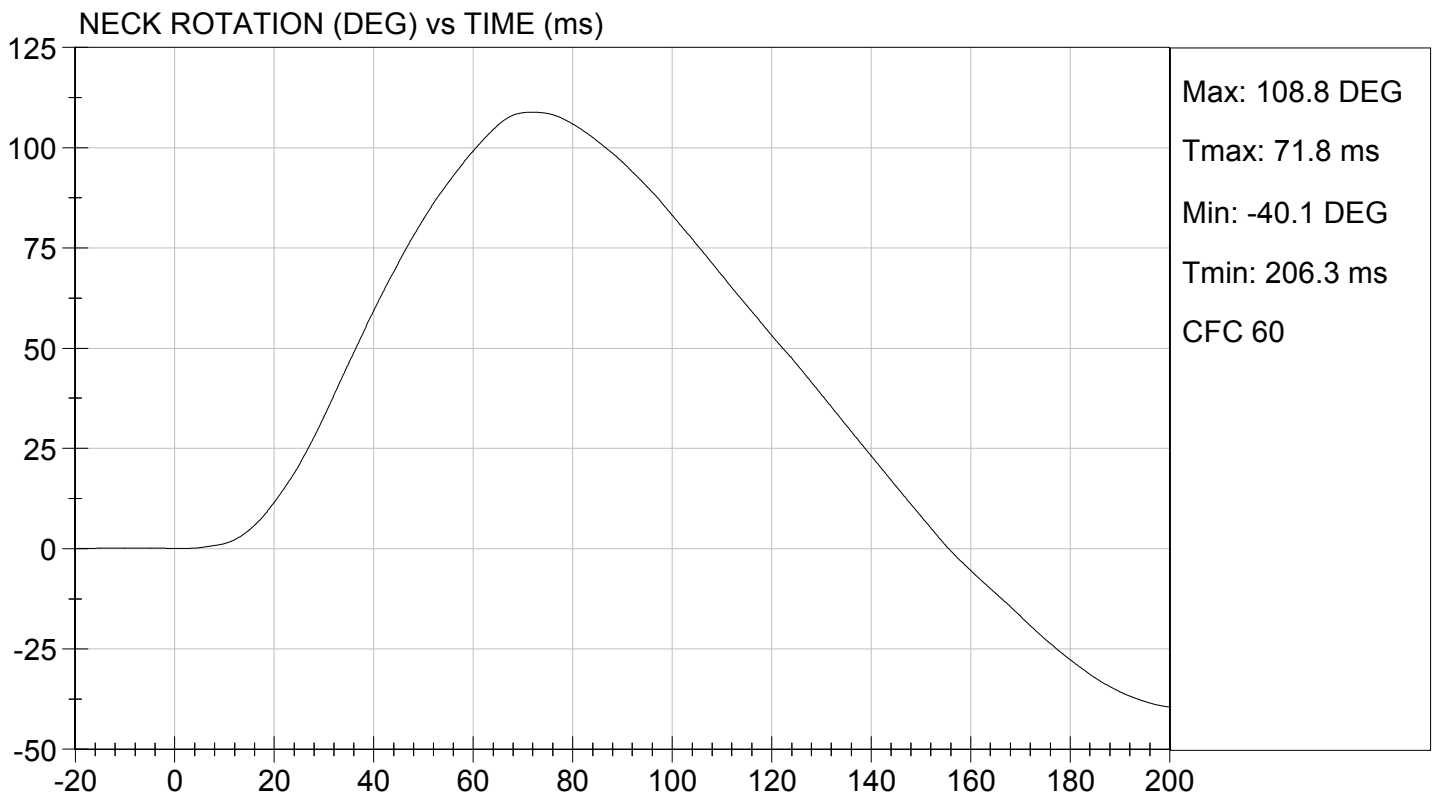
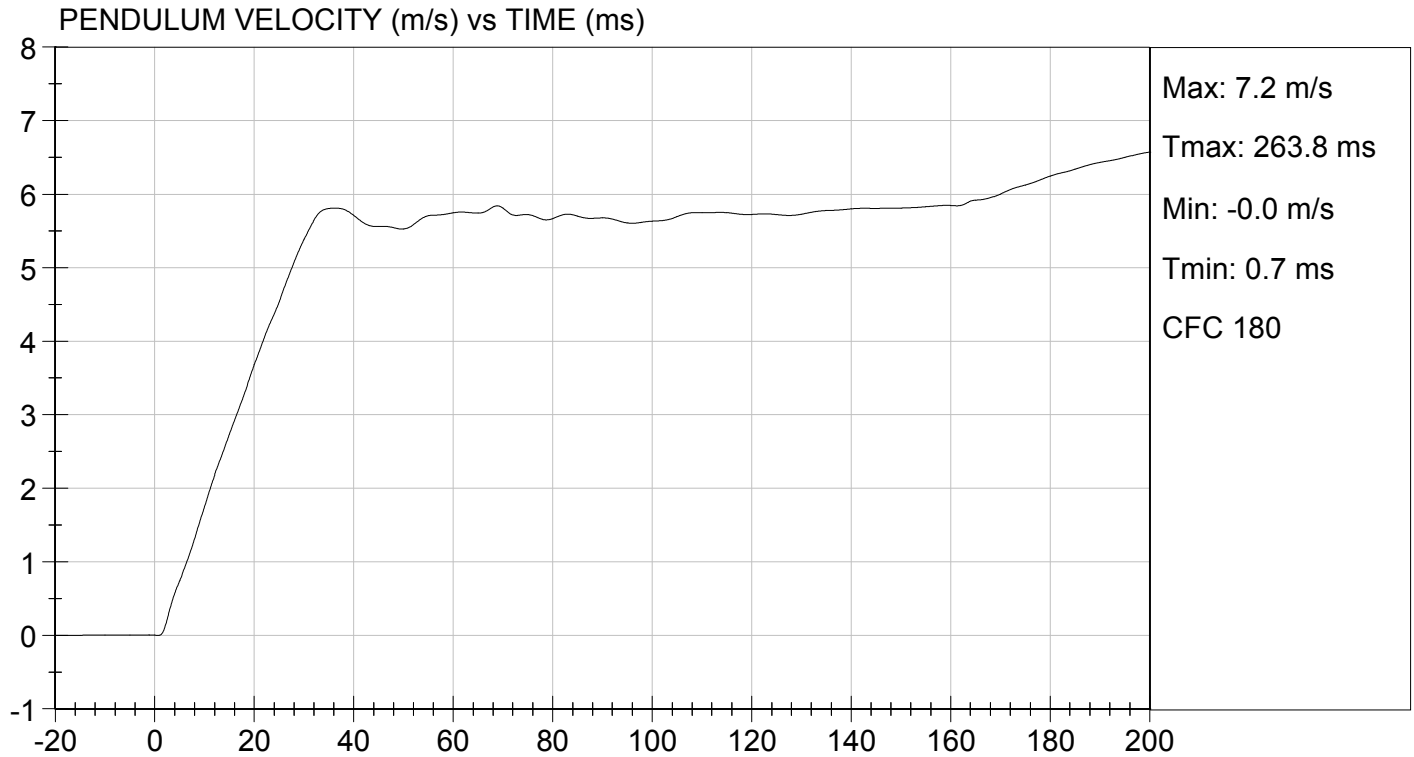
11/28/2012
 Test Date


 Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 20.08 ft/s, 6.12 m/s

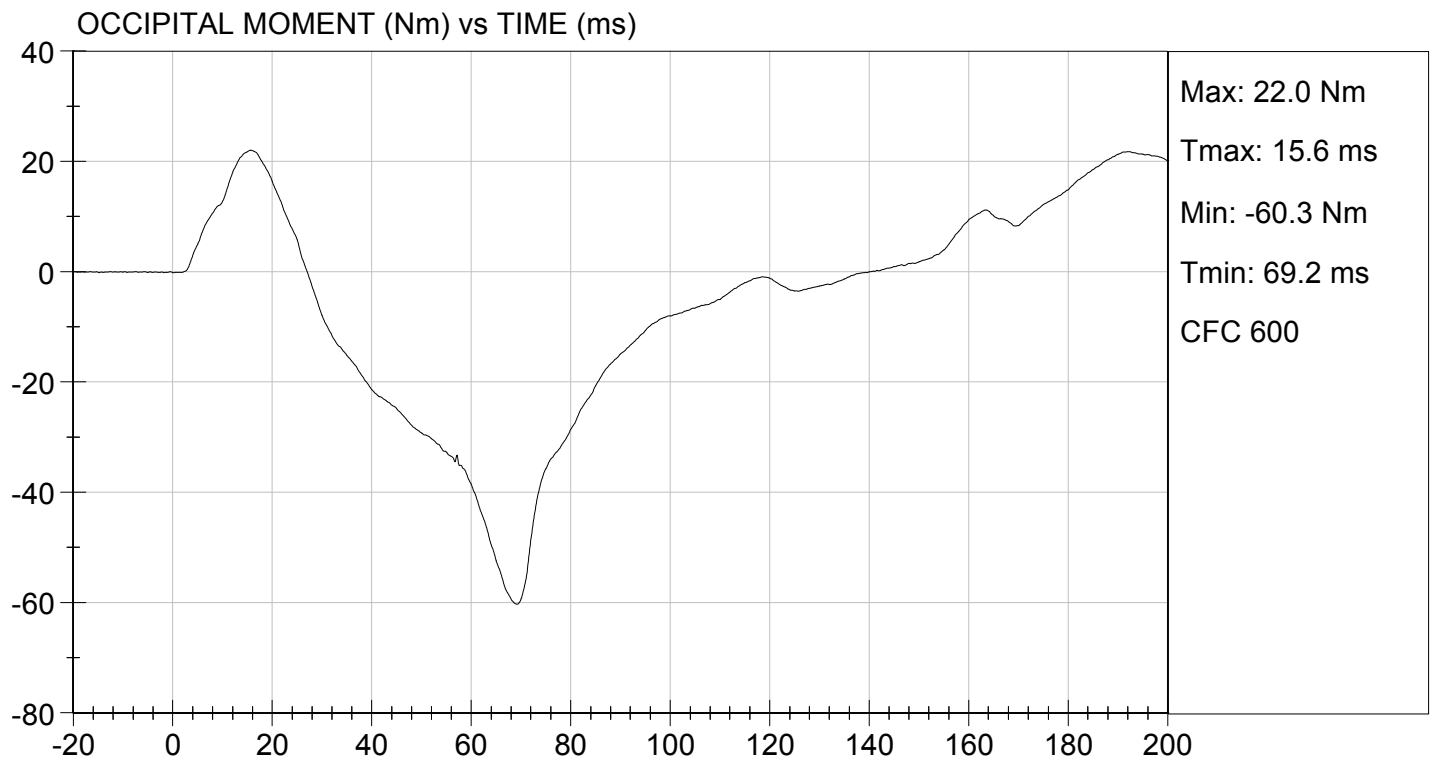
TEST DATE: 11/28/2012
TEST #: D124543





TEST DESC: NECK EXTENSION
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 11/28/2012
TEST #: D124543

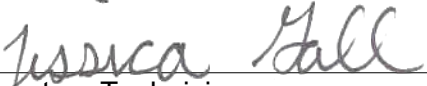


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D124544

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Relative Humidity	%	10 to 70	21.1	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	52	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4107	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4106	Pass
Overall Test Results				Pass


Laboratory Technician

11/29/2012

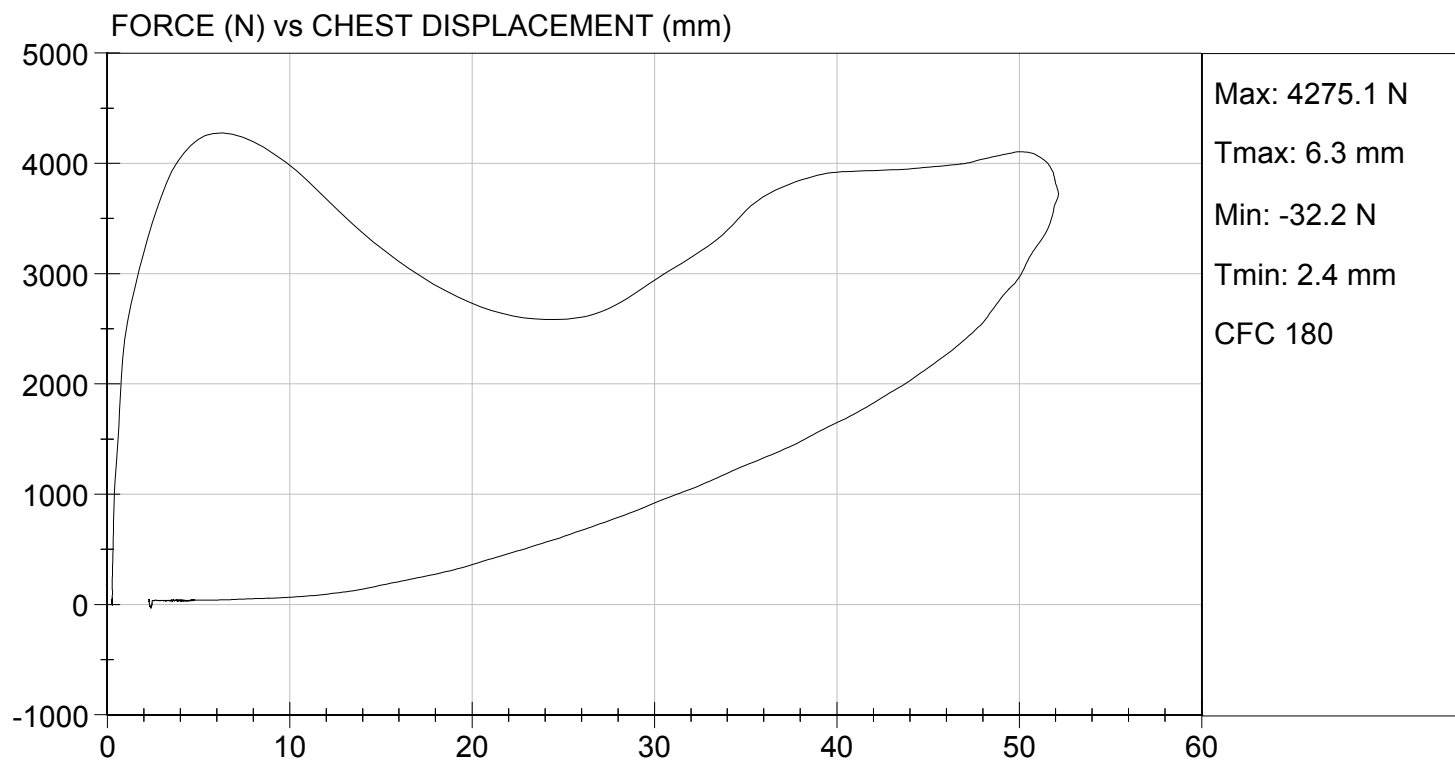
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 11/29/2012
TEST #: D124544



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D124545

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	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	N	3450 to 4060	3556	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

11/28/2012

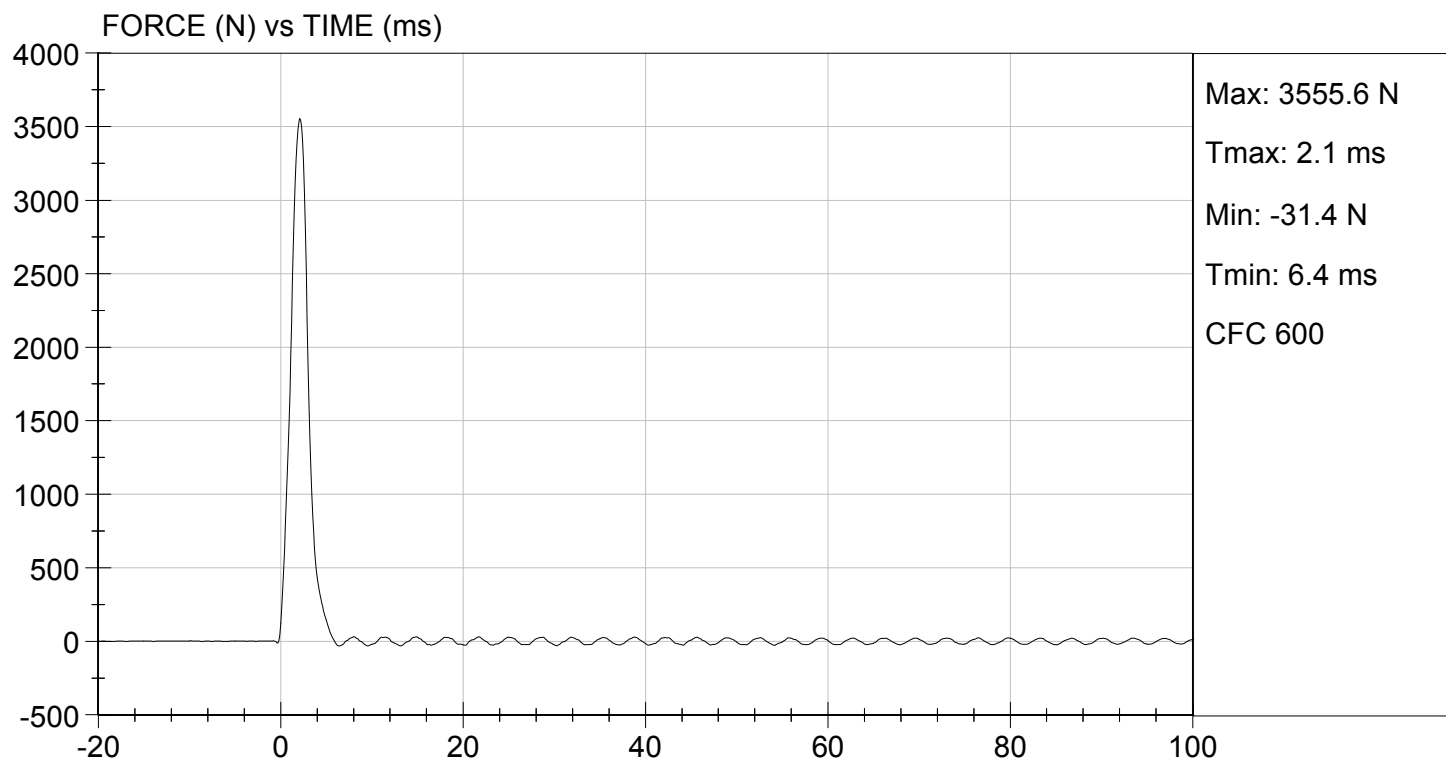
Test Date

David Winkelbauer
Approved By



TEST DESC: RIGHT KNEE
VELOCITY: 6.94 ft/s, 2.12 m/s

TEST DATE: 11/28/2012
TEST #: D124545



MGA RESEARCH CORPORATION

**LEFT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE**

ATD Serial No: 634

Test I.D: D124546

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	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	N	3450 to 4060	3698	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

11/28/2012

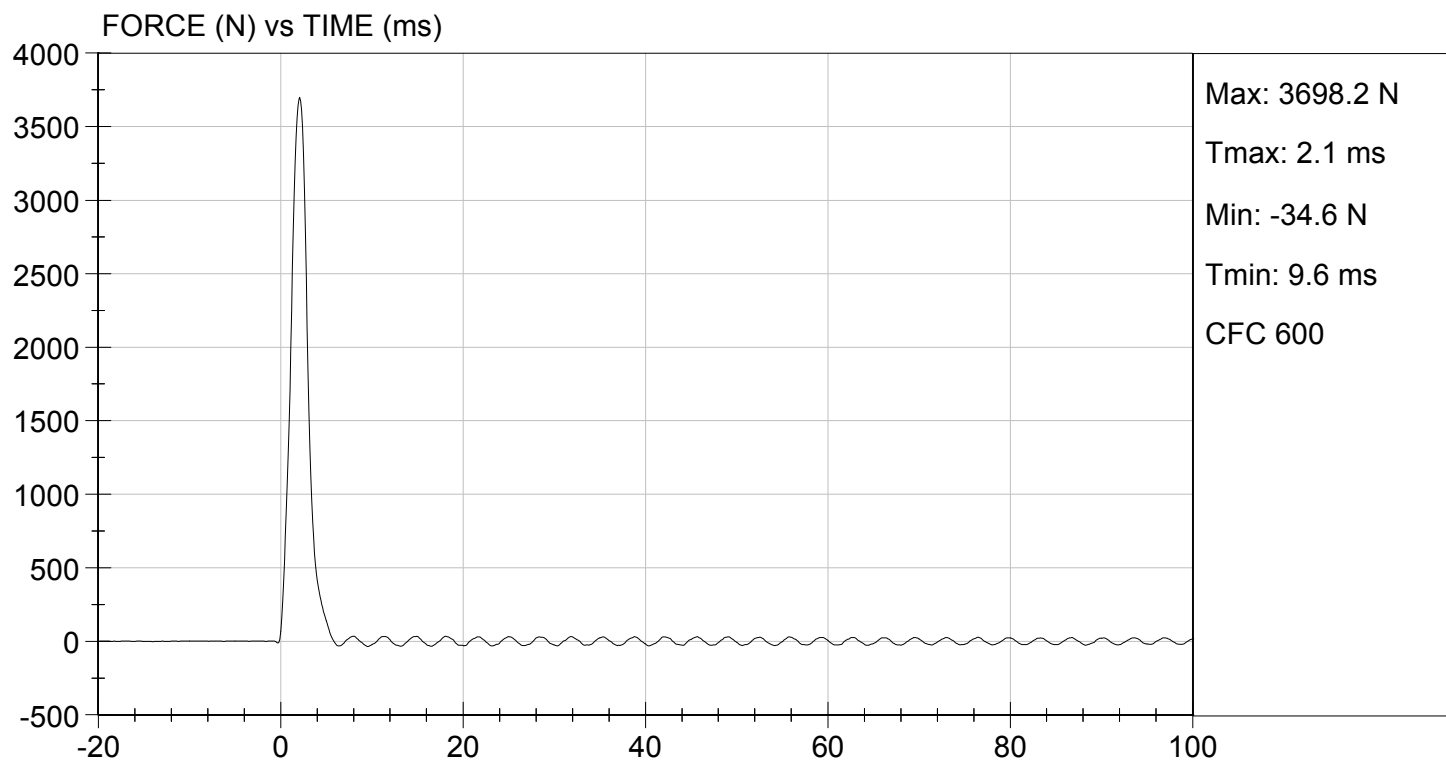
Test Date

David Winkelbauer
Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.97 ft/s, 2.12 m/s

TEST DATE: 11/28/2012
TEST #: D124546



MGA RESEARCH CORPORATION

**TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE**

ATD Serial No: 634

Test I.D: D124547

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	21.1	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	341	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

11/29/2012

Test Date

David Winkelbauer
Approved By