

REPORT NUMBER: NCAP-MGA-2012-081

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

**MITSUBISHI MOTORS CORPORATION, JAPAN
2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
NHTSA No.: MC5607**

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



Test Date: May 21, 2012


Final Report Date: June 15, 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**

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Approval Date: June 15, 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

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on the 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback 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), 305, and foot well intrusion performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on May 21, 2012. The impact velocity was 56.1 km/h and the ambient temperature at the barrier face at the time of impact was 21.1°C. The target vehicle post-test maximum crush was 501 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>193</td> <td>203</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>52</td> <td>26</td> <td>12</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>1</td> <td>0.33</td> <td>0.46</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>2620</td> <td>2009</td> <td>1046</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>2520</td> <td>562</td> <td>161</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>4244</td> <td>2777</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1993</td> <td>2724</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	193	203	Maximum Chest Compression	mm	63	52	26	12	Nij	N/A	1	1	0.33	0.46	Neck Tension	N	4170	2620	2009	1046	Neck Compression	N	4000	2520	562	161	Left Femur Force	N	10008	6805	4244	2777	Right Femur Force	N	10008	6805	1993	2724
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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 DTNH22-06-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 Mitsubishi i-MiEV ES 5-Dr Hatchback at a velocity of 56.1 kph. The test was performed at MGA Research Corporation on May 21, 2012. 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 installed on the driver's and passenger's lap 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 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.

The maximum static crush of the vehicle was 501 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 and steering column. 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)	193	0.33	2009	562	40	26	4244	1993
Passenger (5 th)	203	0.46	1046	161	42	12	2777	2724

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

TEST NOTES

Right Rear Seat Crossmember Xr is questionable from 53-55 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 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC5607	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Mitsubishi	Automatic Door Locks (ADLs)	No
Model	i-MiEV	Power Window Auto-Reverse	No
Body Style	5-Dr Hatchback	Other Optional Feature	N/A
VIN	JA3215H19CU016564	Driver Front Airbag	Yes
Body Color	Cool Silver Metallic	Driver Curtain Airbag	Yes
Odometer (km/mi)	200 / 124	Driver Torso Airbag	No
Engine Displacement (L)	N/A	Driver Torso/Pelvis Airbag	Yes
Type/No. Cylinders	N/A	Driver Pelvis Airbag	No
Engine Placement	Lateral	Driver Knee Airbag	No
Transmission Type	Single Fixed Reduction	Pass. Front Airbag	Yes
Transmission Speeds	1	Pass. Curtain Airbag	Yes
Overdrive	N/A	Pass. Torso Airbag	No
Final Drive	Rear	Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Pass. Knee Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	No	Pass. Seat Belt Pretensioner	Yes
Power Seats	No	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?			N/A

DATA FROM CERTIFICATION LABEL

Manufactured By	MITSUBISHI MOTORS CORPORATION, JAPAN
Date of Manufacture	DEC 2011
Vehicle Type	Passenger Car

GVWR (kg)	1510
GAWR Front (kg)	675
GAWR Rear (kg)	890

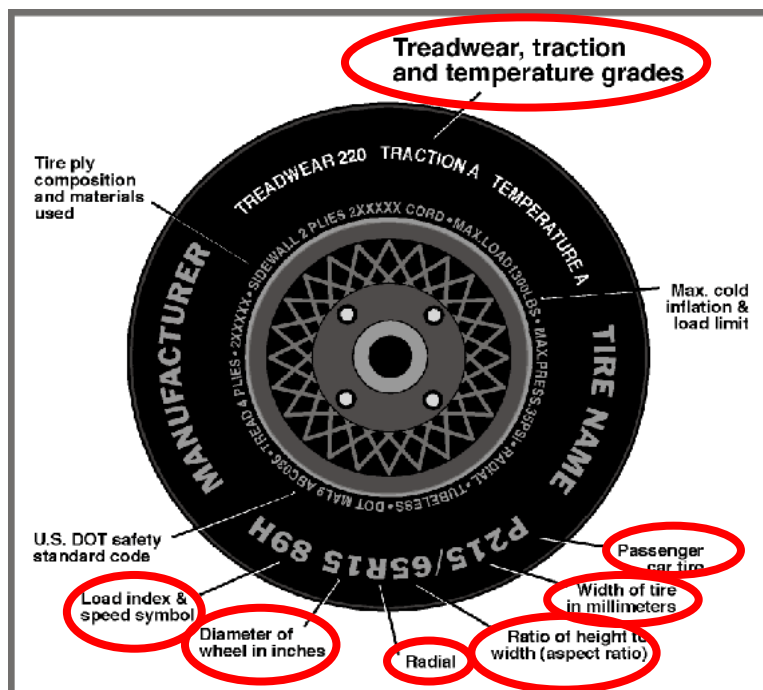
VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Designated Seating Capacity (DSC)	2	2		4
Capacity Weight (VCW) (kg)				300
Cargo Weight (RCLW) (kg)				28

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	250	250
Recommended Tire Size	145/65R15	175/60R15

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Tire Size on Vehicle	145/65R15	175/60R15
Tire Manufacturer	Dunlop	Dunlop
Tire Name	ENASAVE	ENASAVE
Tire Type	Passenger	Passenger
Tire Width	145	175
Aspect Ratio	65	60
Radial	Yes	Yes
Wheel Diameter	15	15
Load Index/Speed Symbol	72H	81H
Treadwear	340	340
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 Mitsubishi i-MiEV ES 5-Dr Hatchback
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 Test Date: 05/21/2012

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	271.7	316.2		318.0	354.7	
Right	kg	263.1	320.2		303.9	357.4	
Ratio	%	45.7	54.3		46.6	53.4	
Totals	kg	534.8	636.4	1171.2	621.9	712.1	1334.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1171.2
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	28
Calculated Vehicle Target Weight (TVTW)	kg	1339.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	632	631	653	657	1387
As Tested	mm	617	617	632	635	1362
Post Test	mm	597	594	638	630	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2552
Total Vehicle Length at Left Side	mm	3565
Total Vehicle Length at Centerline	mm	3681
Total Vehicle Length at Right Side	mm	3565
Weight of Ballast in Cargo Area	kg	0.0
Weight of Vehicle Components Removed	kg	5.0
Amount of Stoddard Solvent in Fuel Tank	L	

List of components removed: Right taillight, trunk carpet, rear floor mats, left taillight, and rear seat cushions.

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	3681
2	Total Width	1585
3	Bumper Top Height	650
4	Bumper Bottom Height	385
5	Longitudinal Member Top Height	525
6	Distance between Longitudinal Members	618
7	Longitudinal Member Width	101
8	Engine Top Height	470
9	Engine Bottom Height	210
10	Engine and Gearbox Width	520
11	Front Bumper-Engine Distance	2740
12	Front Shock Absorber Fixing Height	755
13	Bonnet Leading Edge Height	650
14	Front Shock Absorber Fixing Width	1000
15	Front Bumper – Front Axle Distance	566
16	Front Axle – A-Pillar Distance	378
17	A-Pillar – B-Pillar Distance	1068
18	B-Pillar – Rear Axle Distance	1111
19	B-Pillar – C-Pillar Distance	767
20	Roof Sill Bottom Height	1450
21	Roof Sill Top Height	1550
22	Floor Sill Bottom Height	251
23	Floor Sill Top Height	398

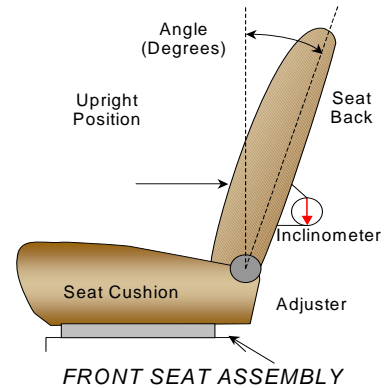
**DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

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 January 2010.



SEAT BACK ANGLE	Degrees
Driver Seat Back Angle	7.9° on headrest post
Passenger Seat Back Angle	9.5° on headrest post

SEAT FORE/AFT POSITIONS

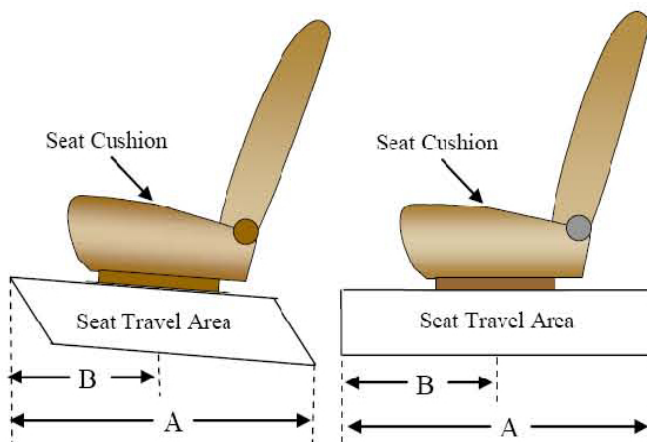
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	22 detents	10 th detent (1 st as 0)
Passenger Seat	22 detents	0 (1 st 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)	1 (uppermost as 0)
Passenger Seat	4 (1 st as 0)	1 (uppermost as 0)



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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

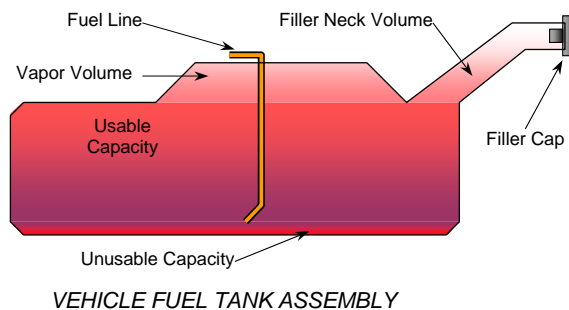
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	
Actual Amount of Solvent used	
1/3 of Usable Capacity	

FUEL PUMP

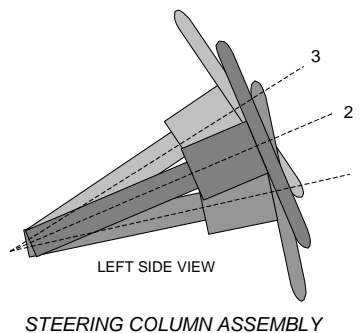
Describe the fuel pump type, its behavior, and the location of the fuel filler pipe.

Not Applicable



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.



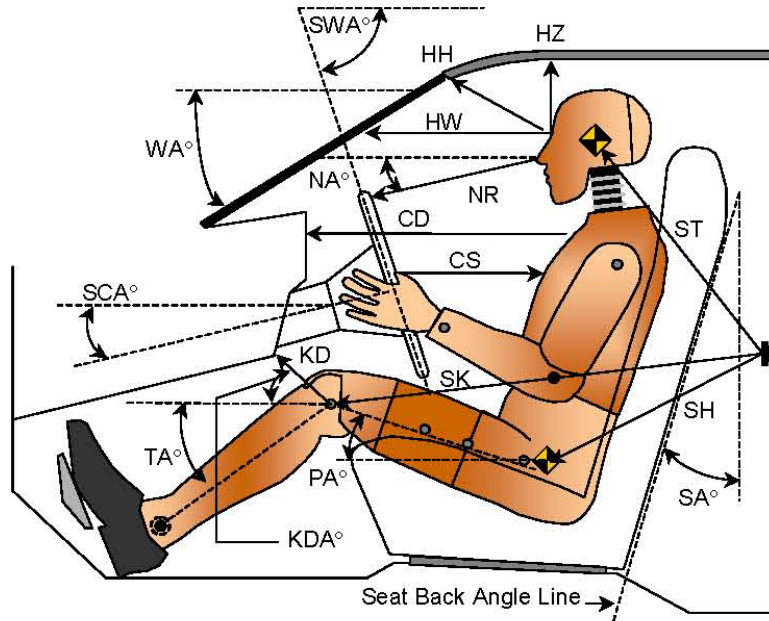
STEERING COLUMN POSITION

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
Test Date: 05/21/2012



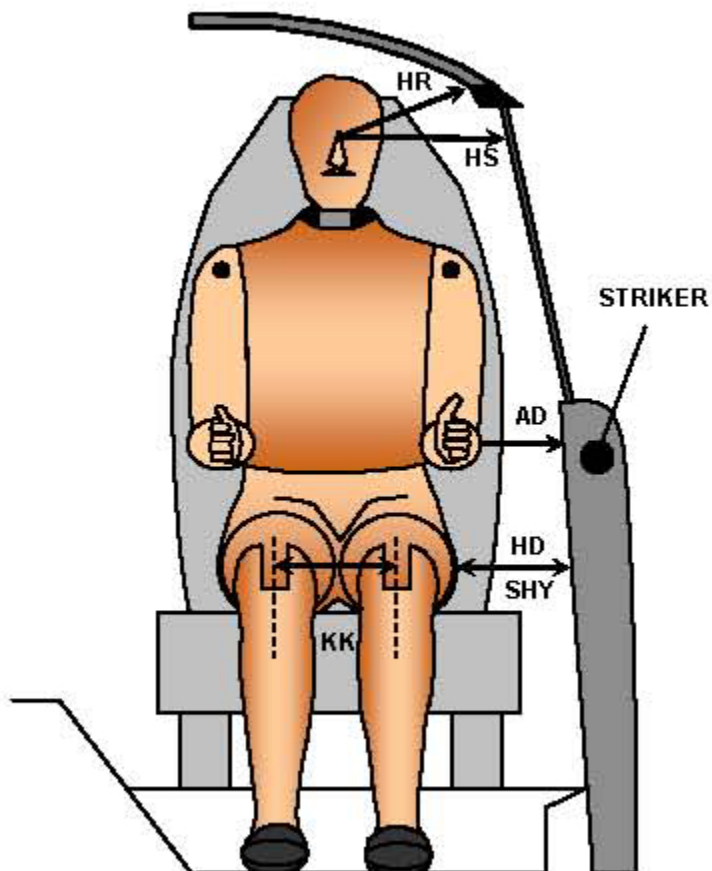
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N 036		Passenger S/N 634	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		25.0		
SWA°	Steering Wheel Angle		26.7		
SCA°	Steering Column Angle		63.3		
SA°	Seat Back Angle (on headrest post)		7.9		9.5
HZ	Head to Roof (Z)	181	90	240	90
HH	Head to Header	339	22.9	312	37.5
HW	Head to Windshield	643	0	740	0
NR	Nose to Rim	347	11.2		
CD	Chest to Dash	506		408	
CS	Chest to Steering Hub	254	1.1		
RA	Rim to Abdomen	146	0		
KDL	Left Knee to Dash	120	21.8	68	28.5
KDR	Right Knee to Dash	116	22.4	73	28.1
PA°	Pelvic Angle		25.0		21.5
TA°	Tibia Angle		59.0		51.5
SK	Striker to Knee	594	88.0	687	91.8
ST	Striker to Head	532	15.7	518	20.8
SH	Striker to H-Point	263	123.5	352	110.1

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012



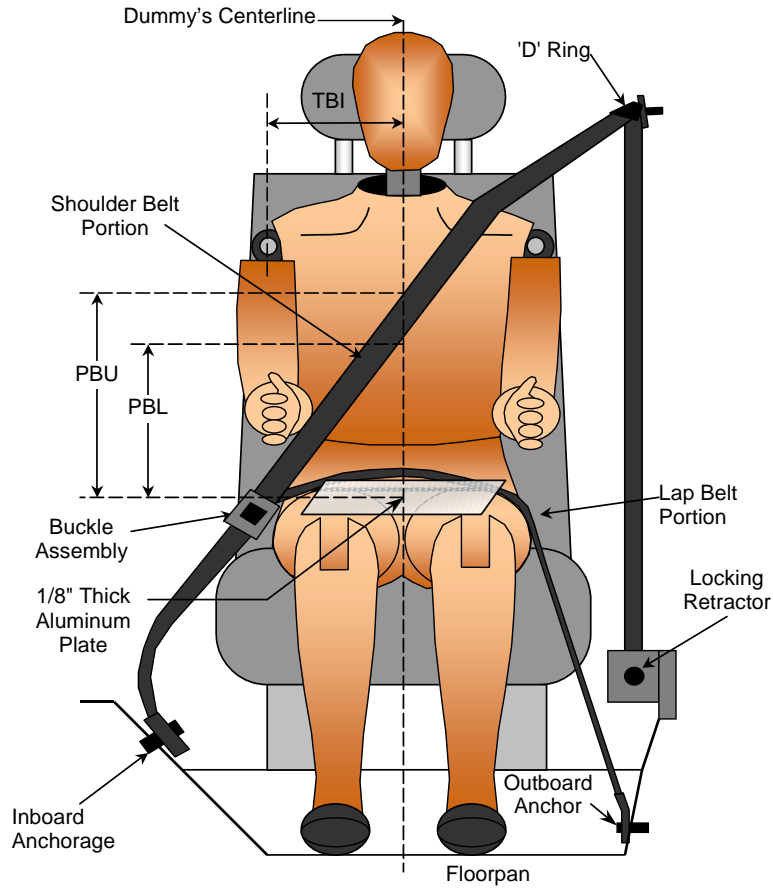
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 036	Passenger S/N 634
		Length (mm)	
AD	Arm to Door	69	124
HD	H-Point to Door	154	180
HR	Head to Side Header	283	289
HS	Head to Side Window	378	441
KK	Knee to Knee	357	225
SHY	Striker to H-Point (Y Direction)	250	290
AA	Ankle to Ankle	339	168

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	345	340
PBL - Top surface of reference to belt lower edge	mm	275	250

BELT LENGTH DATA

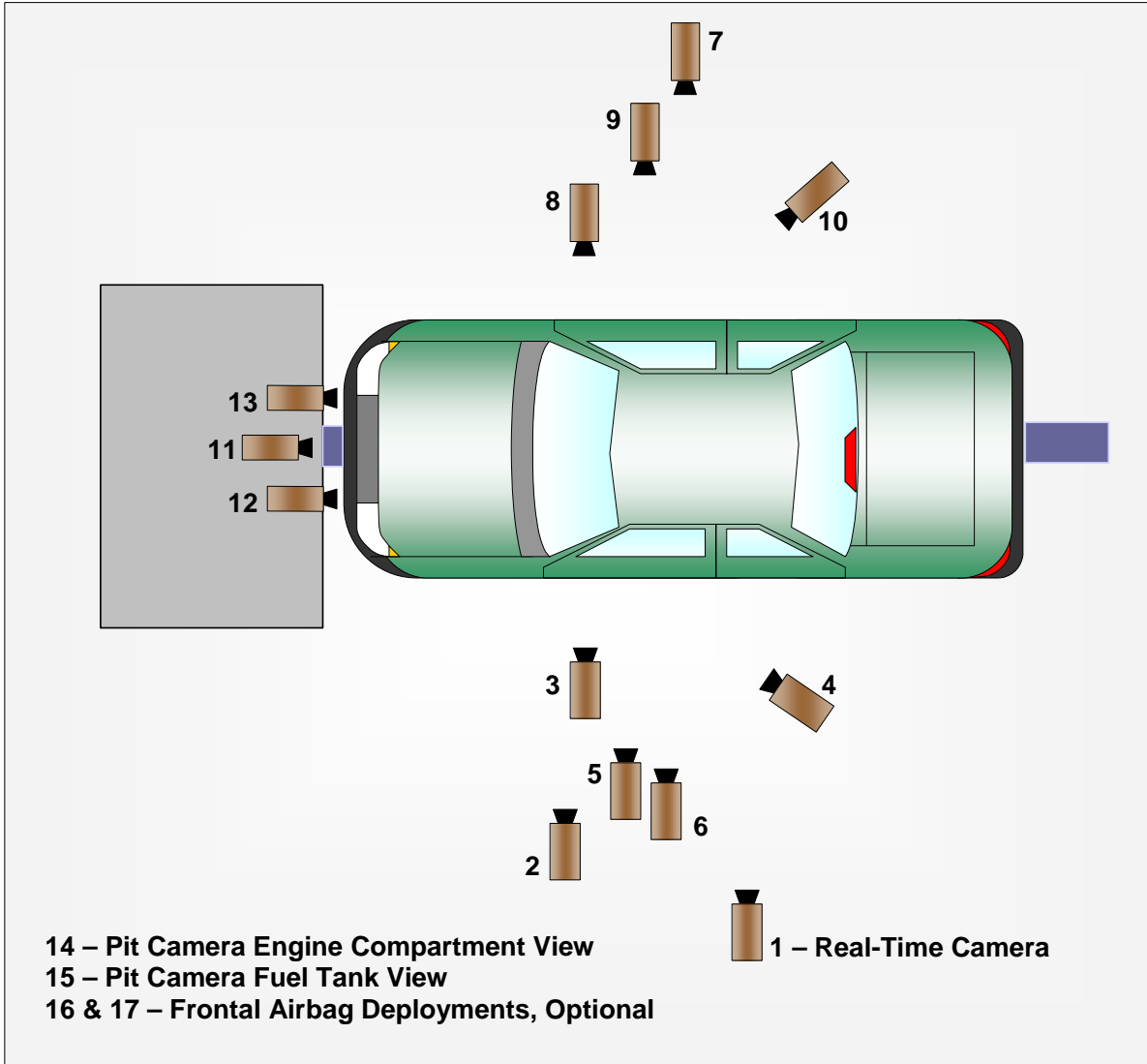
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	900	920
Lap Belt Length as measured on ATD	mm	890	890
Remainder of belt on reel	mm		
Total Belt Length for Continuous Webbing Systems	mm		

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
Test Date: 05/21/2012

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
Test Date: 05/21/2012

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1300	-6600	-1890	35	1000
3	Left Front Half	1090	-4490	-1080	24	1000
4	Left Angle	5710	-5100	-2040	50	1000
5	Steering Column - Top	610	-4810	-1230	24	1000
6	Steering Column - Bottom	600	-4860	-830	24	1000
7	Right Overall	1850	5520	-1070	20	1000
8	Passenger Close-Up	1230	6850	-1820	35	1000
9	Right Front Half	1130	4570	-1050	24	1000
10	Right Angle	5660	4880	-1950	50	1000
11	Windshield	-130	0	-2810	20	1000
12	Driver Windshield	250	-450	-2030	8.5	1000
13	Passenger Windshield	250	450	-2030	8.5	1000
14	Pit Front	1100	0	3150	24	1000
15	Pit Rear	2890	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

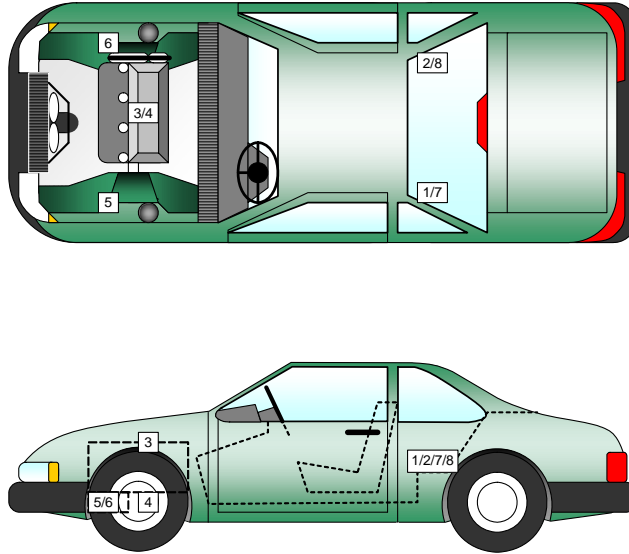
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 16 & 17 were not used for this test.

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1461	-305	-344
2	Right Rear Accelerometer – X Direction	1461	305	-344
3	Engine Top X	725	151	-470
4	Engine Bottom X	767	35	-221
5	Left Brake Caliper X	3183	-632	-210
6	Right Brake Caliper X	3183	632	-210
7	Left Rear Accelerometer Redundant – X Direction			
8	Right Rear Accelerometer Redundant – X Direction			

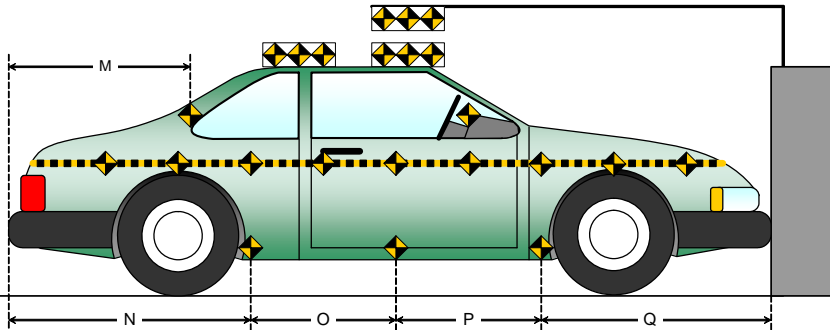
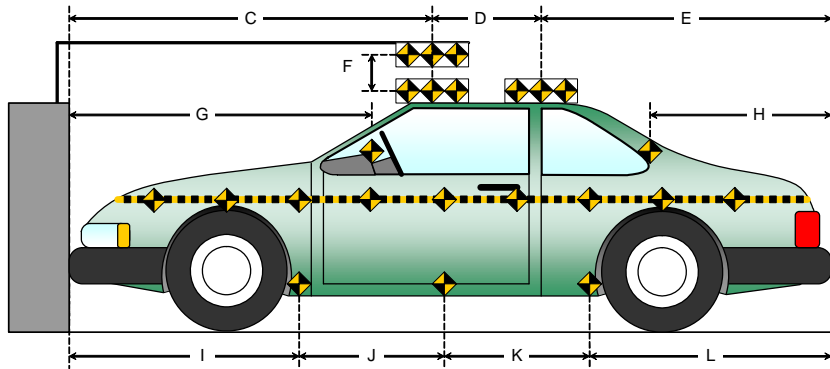
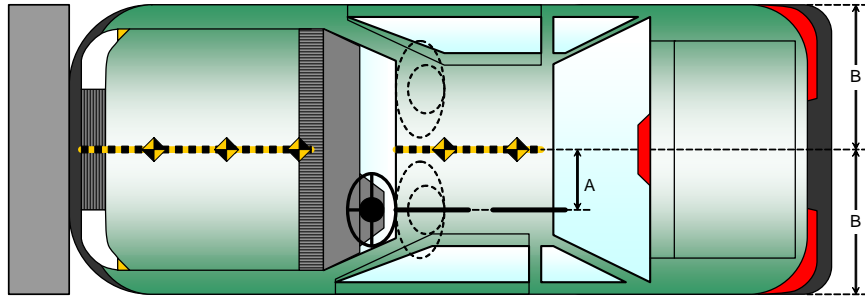
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

Item	Value (mm)
A	300
B	793
C	1830
D	670
E	1181
F	203
G	
H	620
I	950
J	921
K	921
L	889
M	620
N	889
O	921
P	921
Q	950



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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

Advanced Research Load Cell Barrier

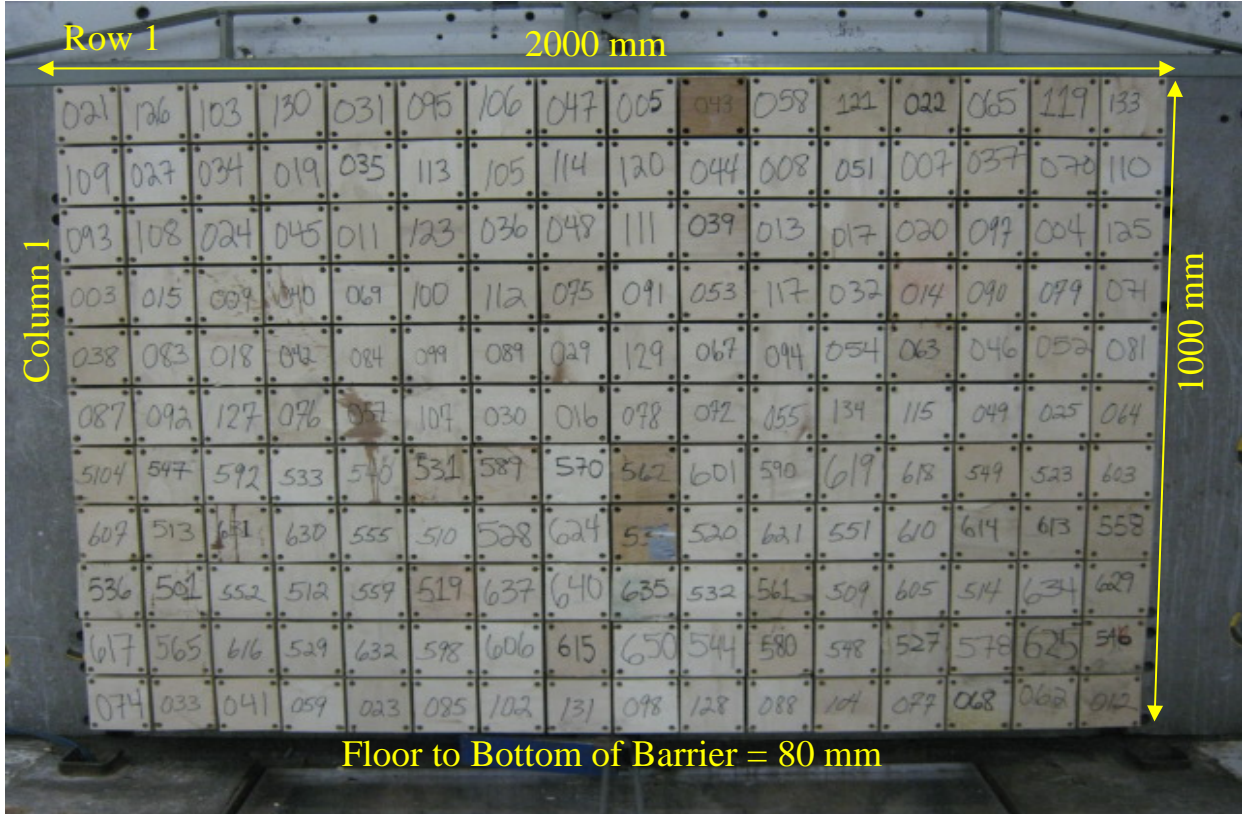


Photo for Reference Only

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 121 mm with a 7 mm gap in between each load cell.

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
Test Date: 05/21/2012

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: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 036	HIII 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, Steering Column	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

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

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	1363
Center	mm	1333
Right Side	mm	1375
Average	mm	1357

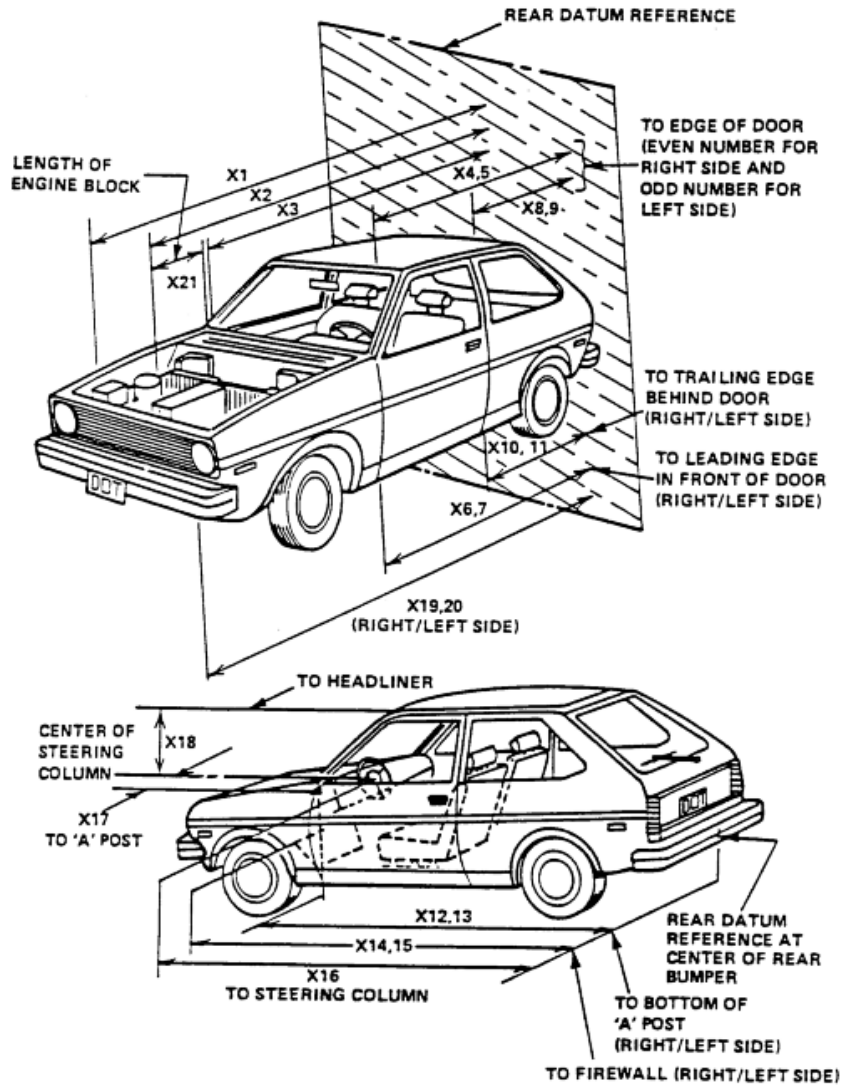
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Right Front (Passenger) P2	
	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 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012



**DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
Test Date: 05/21/2012

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	3681	3180	501
2	RSOV to Front of Engine	mm	834	834	0
3	RSOV to Firewall	mm	3174	3004	170
4	RSOV to Upper Leading Edge of Right Door	mm	2684	2683	1
5	RSOV to Upper Leading Edge of Left Door	mm	2684	2682	2
6	RSOV to Lower Leading Edge of Right Door	mm	2595	2593	2
7	RSOV to Lower Leading Edge of Left Door	mm	2595	2592	3
8	RSOV to Upper Trailing Edge of Right Door	mm	1635	1635	0
9	RSOV to Upper Trailing Edge of Left Door	mm	1635	1635	0
10	RSOV to Lower Trailing Edge of Right Door	mm	1635	1635	0
11	RSOV to Lower Trailing Edge of Left Door	mm	1635	1633	2
12	RSOV to Bottom of "A" Post of Right Side	mm	2606	2602	4
13	RSOV to Bottom of "A" Post of Left Side	mm	2606	2600	6
14	RSOV to Firewall, Right Side	mm	2960	2938	22
15	RSOV to Firewall, Left Side	mm	2951	2934	17
16	RSOV to Steering Column	mm	2220	2261	-41
17	Center of Steering Column to "A" Post	mm	391	435	-44
18	Center of Steering Column to Headliner	mm	401	460	-59
19	RSOV to Right Side of Front Bumper	mm	3565	3143	422
20	RSOV to Left Side of Front Bumper	mm	3565	3135	430
21	Length of Engine Block	mm	315	315	0
RD	RSOV to Right Side of Dash Panel	mm	2504	2404	0
CD	RSOV to Center of Dash Panel	mm	2454	2452	2
LD	RSOV to Left Side of Dash Panel	mm	2485	2485	0

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
Test Program: NCAP Frontal Barrier Impact Test

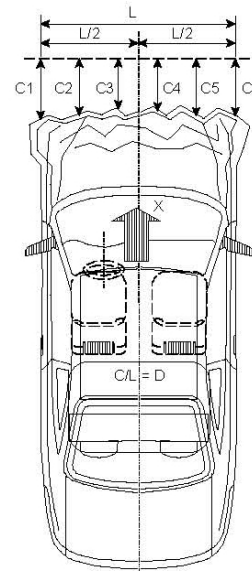
NHTSA No.: MC5607
Test Date: 05/21/2012

VEHICLE INFORMATION

VIN: JA3215H19CU016564 Wheelbase (mm): 2552
Vehicle Size Category: Passenger Test Weight (kg): 1334.0

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): 56.1
Velocity Change (km/h): 68.3
Time of Separation (msec): 116.9



CRUSH PROFILE

Collision Deformation Classification: Frontal
Midpoint of Damage: Centerline
Damage Region Length (mm): 1064
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	3565	3135	430
C2	Crush zone 2 at left side	mm	3606	3165	441
C3	Crush zone 3 at left side	mm	3634	3198	436
C4	Crush zone 4 at right side	mm	3634	3193	441
C5	Crush zone 5 at right side	mm	3606	3166	440
C6	Crush zone 6 at right side	mm	3565	3143	422
L	C1 TO C6	mm	1064	1049	15

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

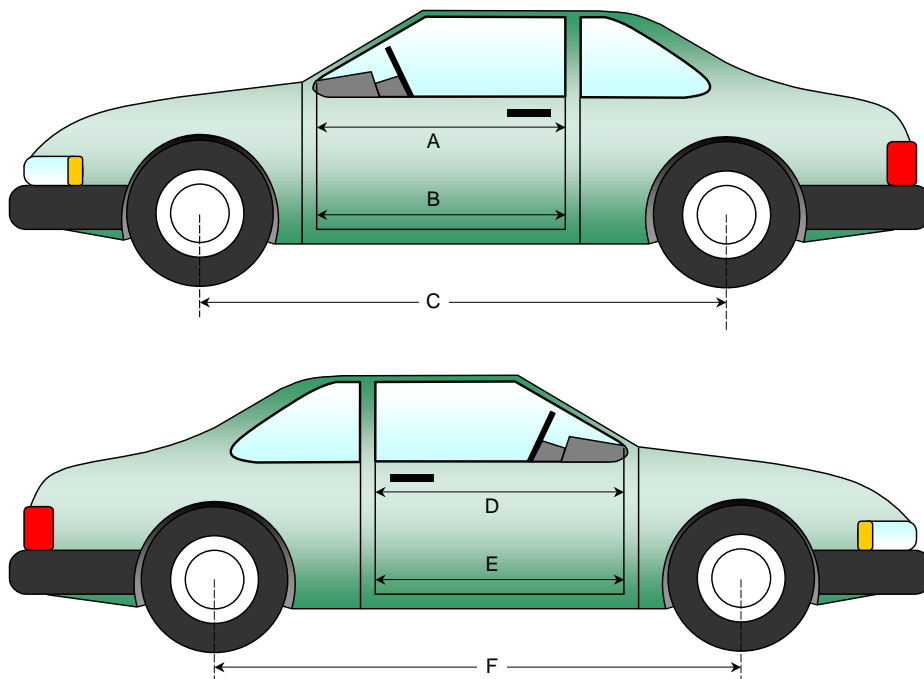
NHTSA No.: MC5607
 Test Date: 05/21/2012

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	950	950	0
B	Left Side Lower	mm	895	895	0
D	Right Side Upper	mm	950	950	0
E	Right Side Lower	mm	895	895	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2552	2362	190
F	Right Side Wheelbase	mm	2552	2361	191



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

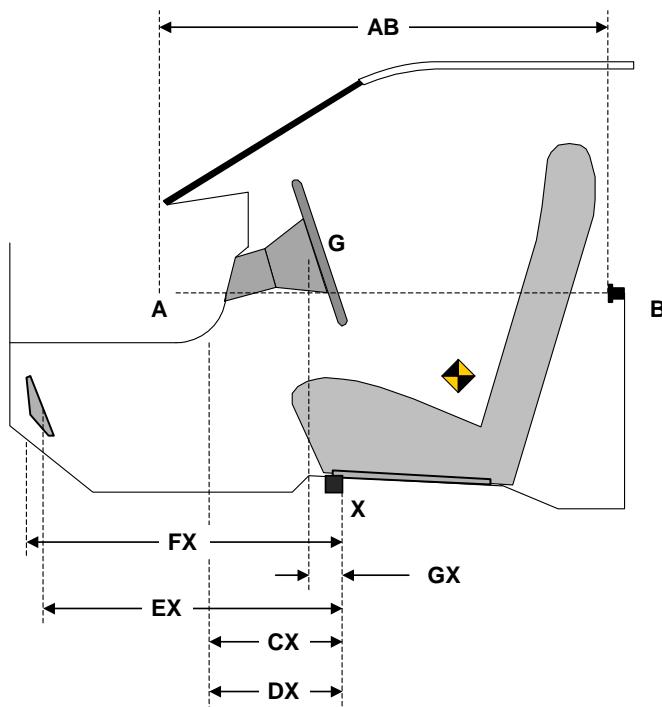
Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	851	851	0
CX	Left Knee Bolster to X	mm	215	245	-30
DX	Right Knee Bolster to X	mm	201	233	-32
EX	Brake Pedal to X	mm	455	441	14
FX	Foot Rest to X	mm	502	520	-18
GX	Center of Steering Column Wheel Hub to X	mm	0	60	-60

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

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

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

Windshield Mounting Details:

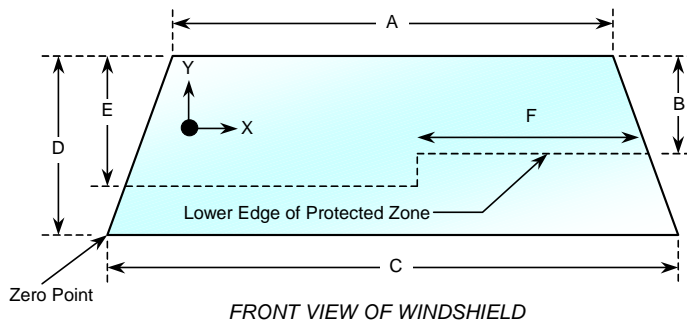
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the 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: 21.1°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2106	2106	100
Right Side	2106	2106	100
Total	4212	4212	100



Item	Units	Value
A	mm	1112
B	mm	566
C	mm	1300
D	mm	900
E	mm	550
F	mm	518

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 Mitsubishi i-MiEV ES 5-Dr Hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
Test Date: 05/21/2012

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

ELECTRIC VEHICLE – NOT APPLICABLE

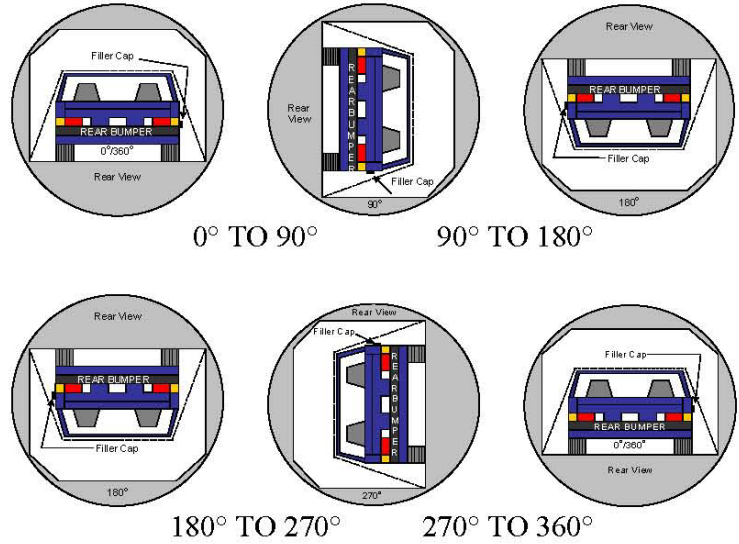
- | | |
|---|-----------------------|
| A. From impact until vehicle motion ceases:
(Maximum Allowable = 1 ounce) | <u>Not Applicable</u> |
| B. For the 5 minute period after motion ceases:
(Maximum allowable = 5 ounces) | <u>Not Applicable</u> |
| C. For the following 25 minutes:
(Maximum allowable = 1 oz./minute) | <u>Not Applicable</u> |
| D. Spillage Details: | <u>Not Applicable</u> |

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012

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: **Not Applicable**



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°			
90° to 180°			
180° to 270°			
270° to 360°			

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

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

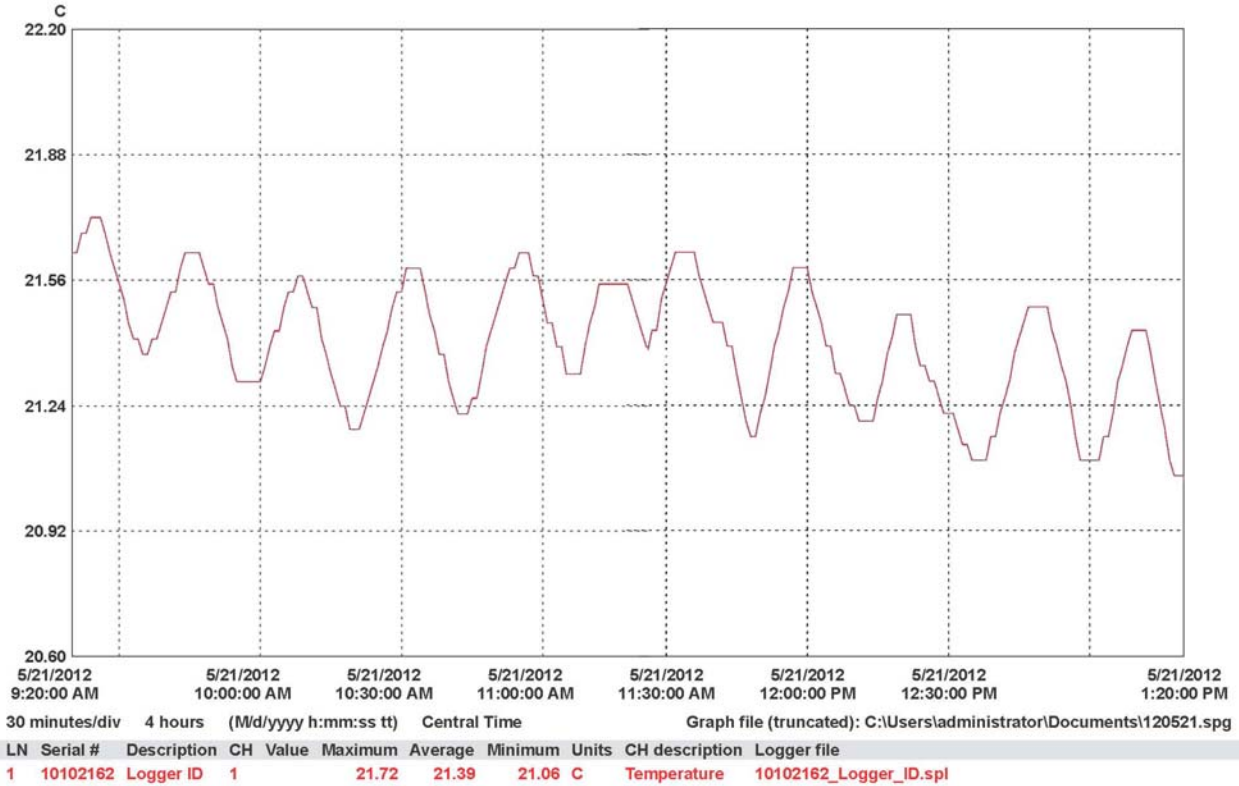
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Mitsubishi i-MiEV ES 5-Dr Hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5607
 Test Date: 05/21/2012



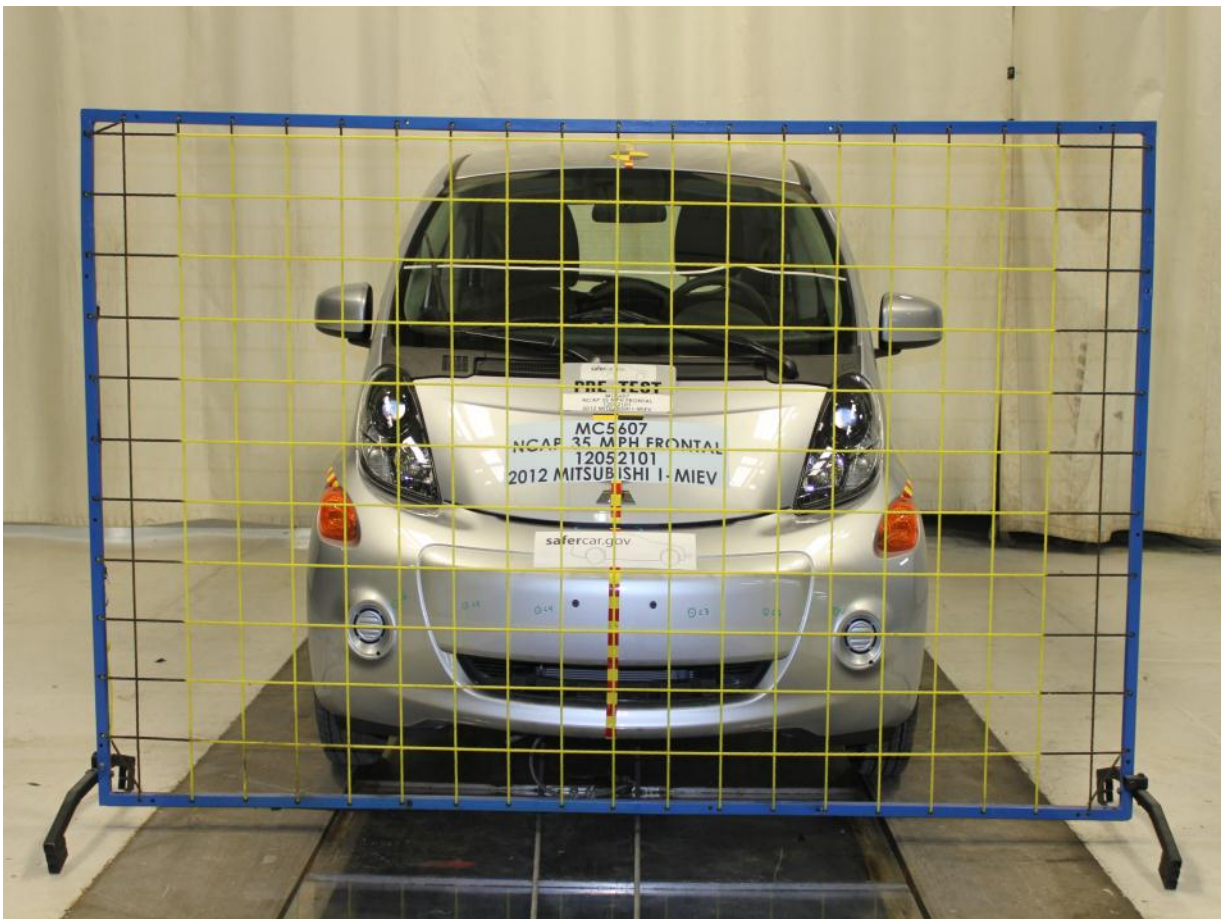
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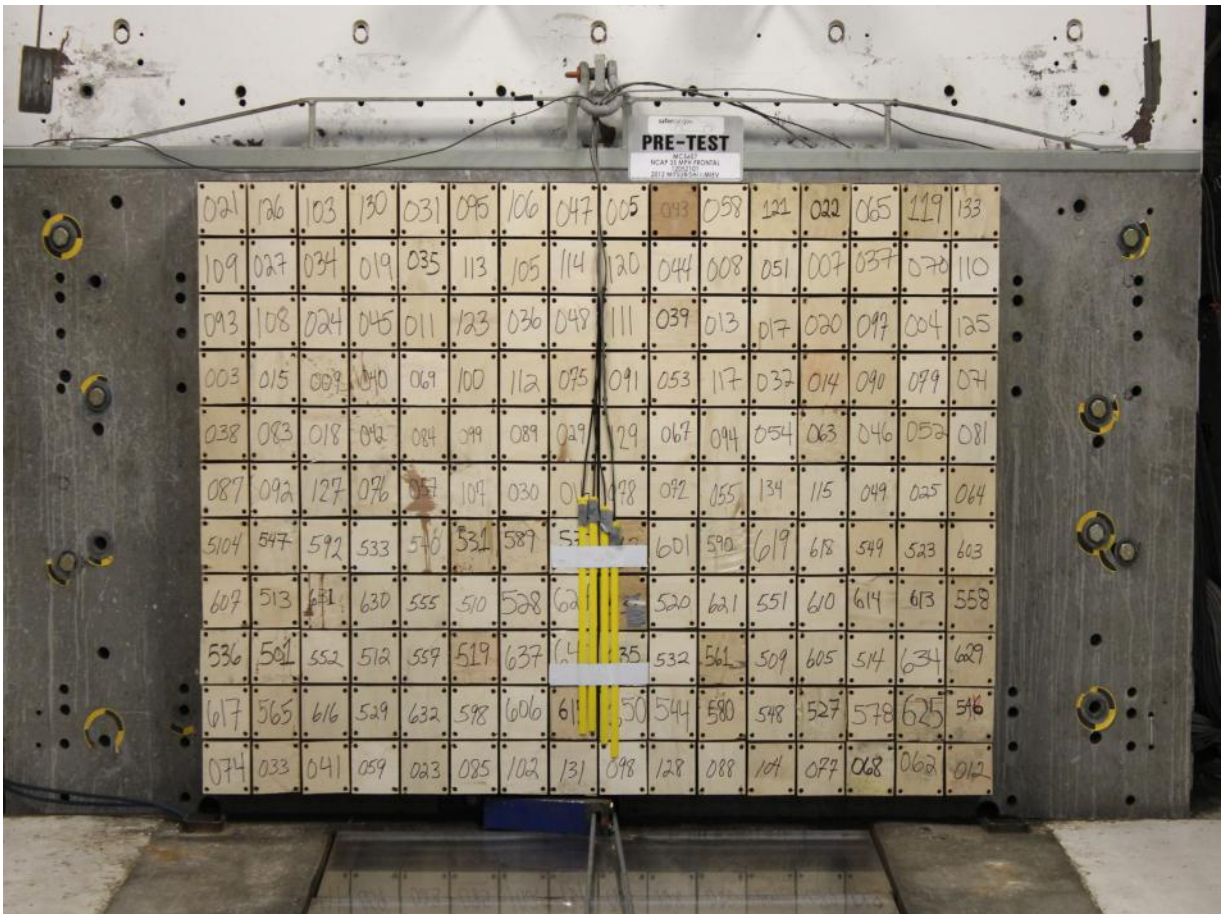
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Load Cell Location



Load Cell Wall



Manufacturer's Label



Tire Placard



2012 Mitsubishi i-MiEV Frontal As Delivered



Left Rear Three-Quarter View, As Received



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle



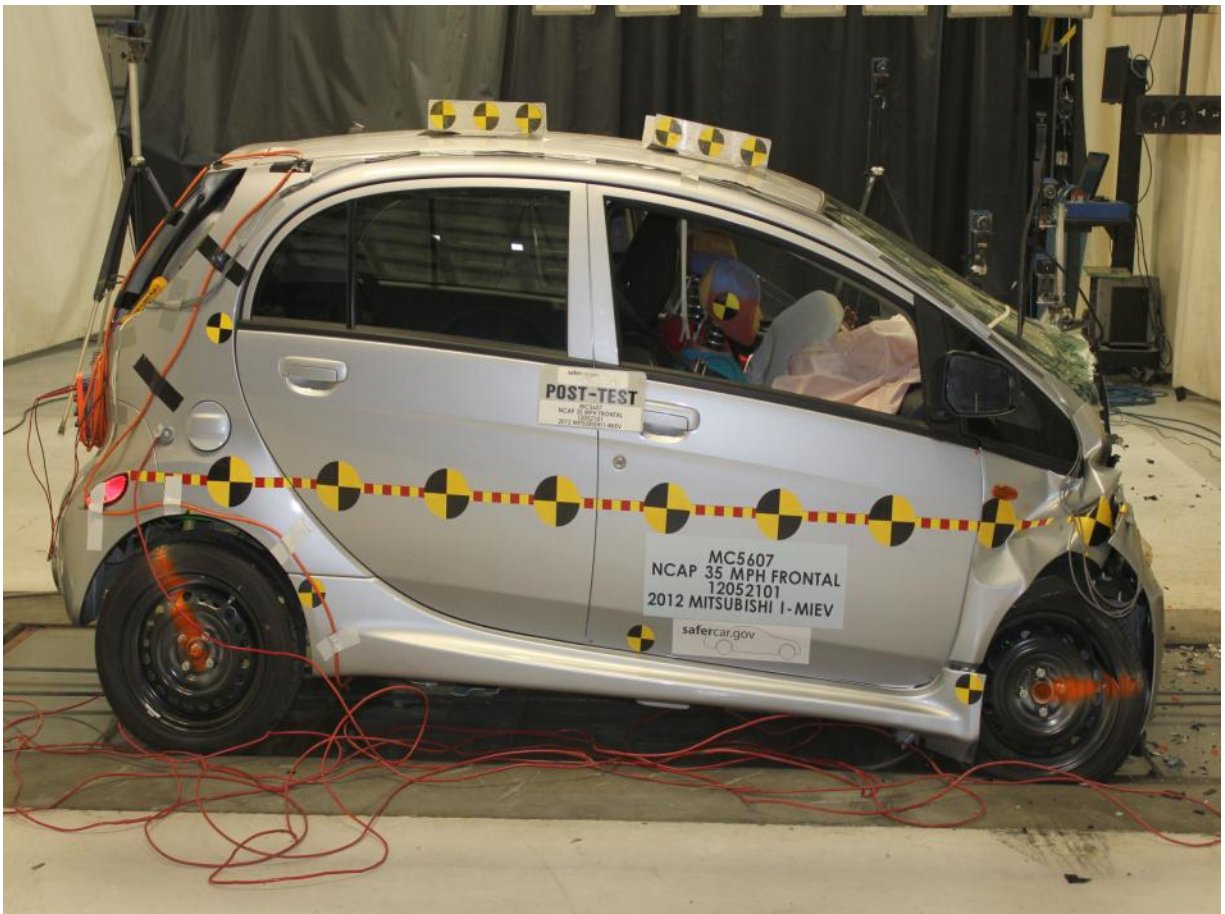
Pre-Test Left View of Test Vehicle



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

PHOTOGRAPH NOT APPLICABLE

Pre-Test Fuel Filler Cap View

PHOTOGRAPH NOT APPLICABLE

Post-Test Fuel Filler Cap View



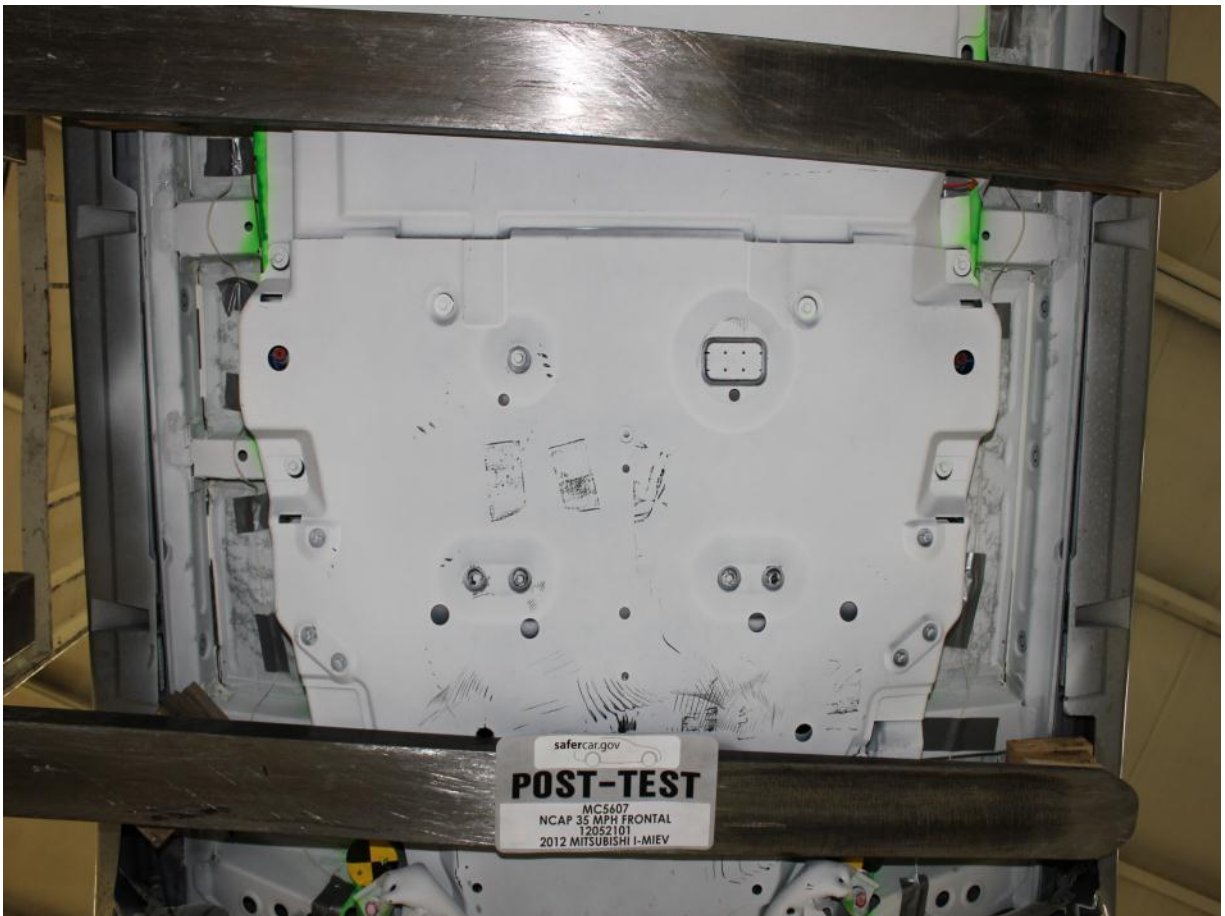
Pre-Test Front Underbody View



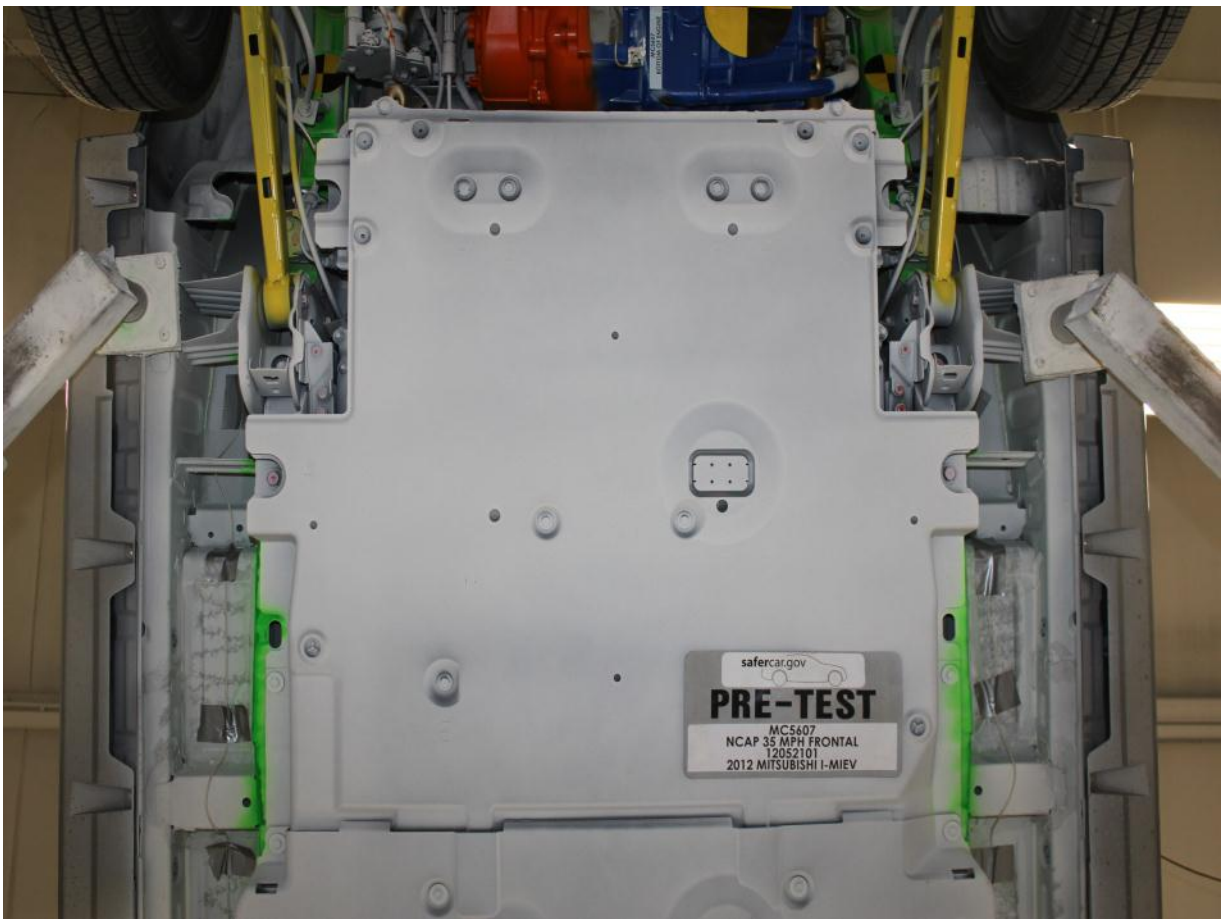
Post-Test Front Underbody View



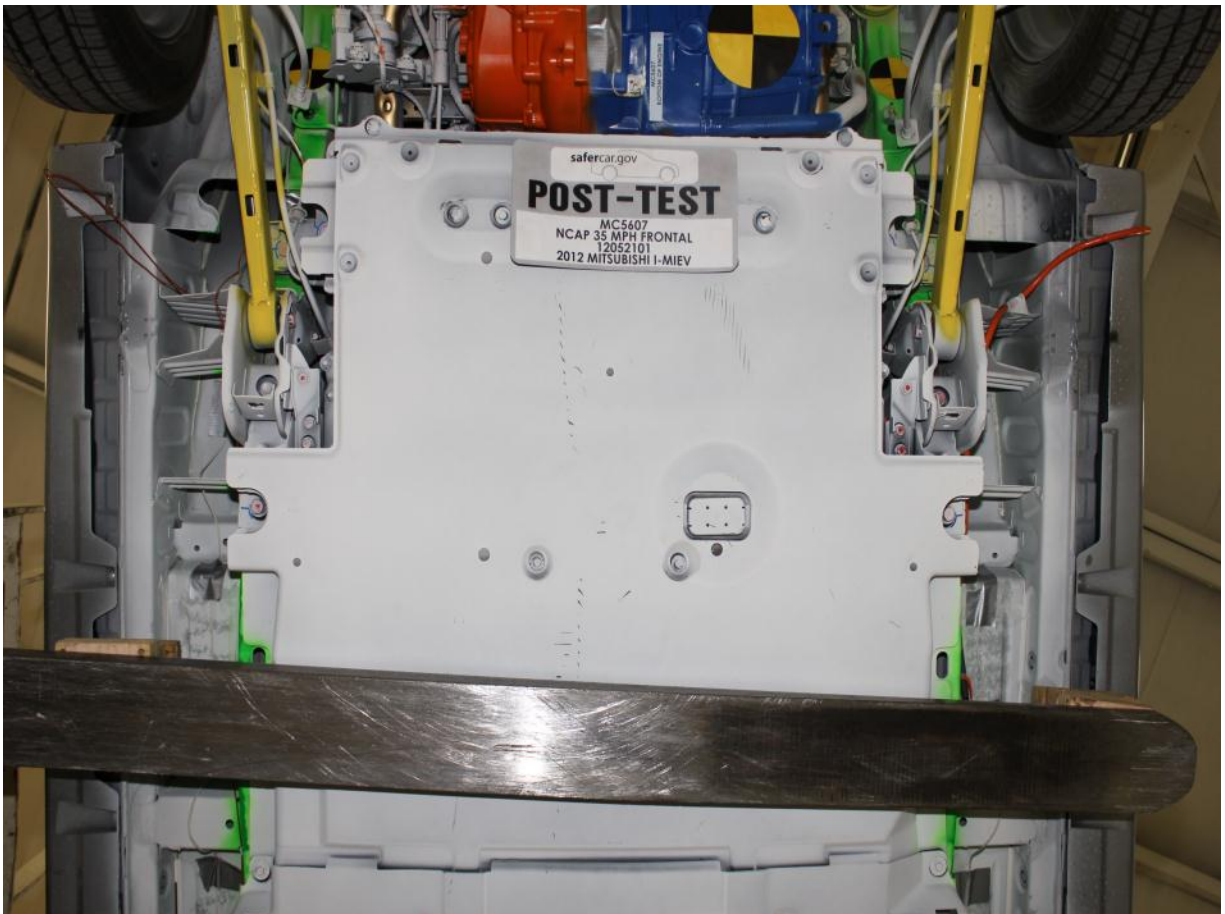
Pre-Test Mid Front Underbody View



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)



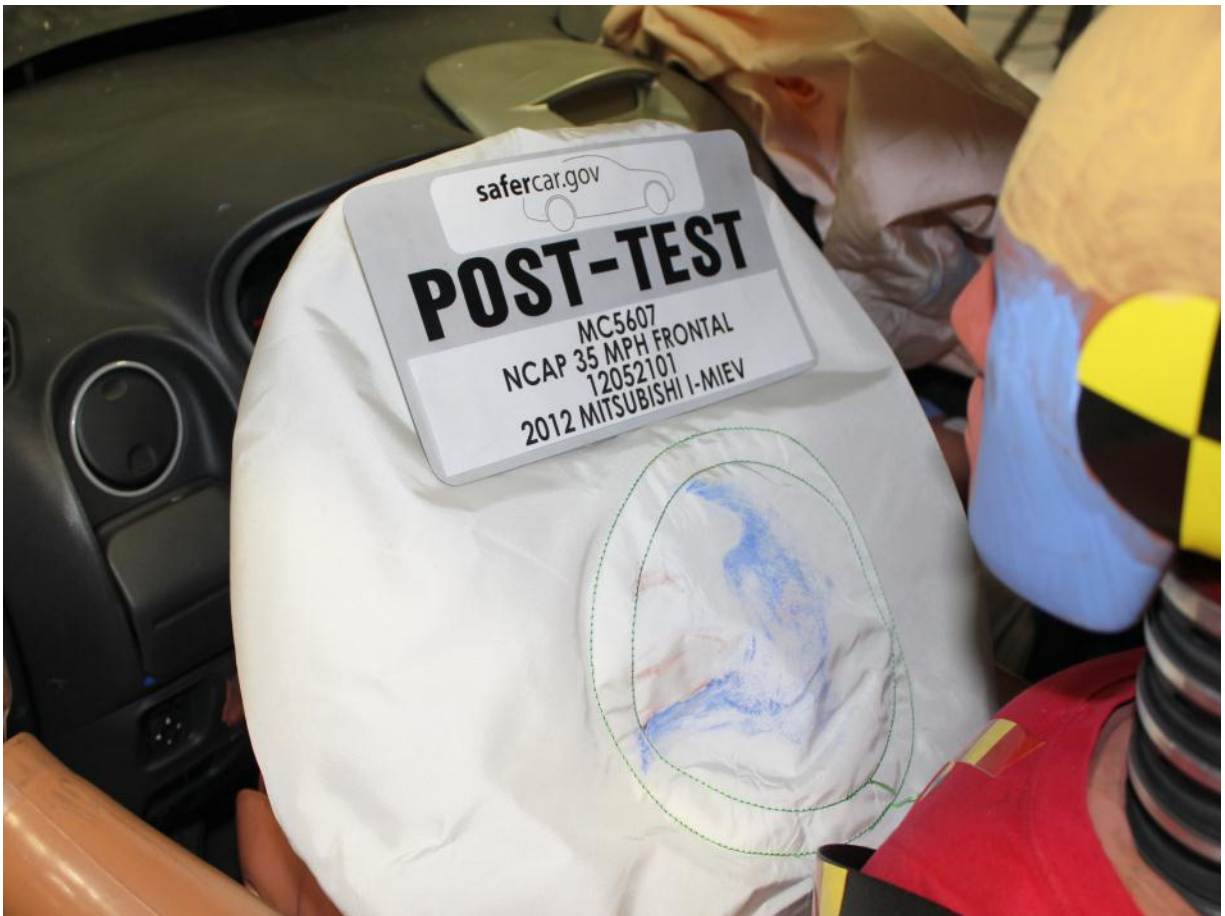
Pre-Test Driver's Side Floorpan



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 K nee 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 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 Airbag



Post-Test Passenger Dummy Contact with Headrest



Post-Test Passenger Dummy Contact with Glove Box

PHOTOGRAPH NOT APPLICABLE

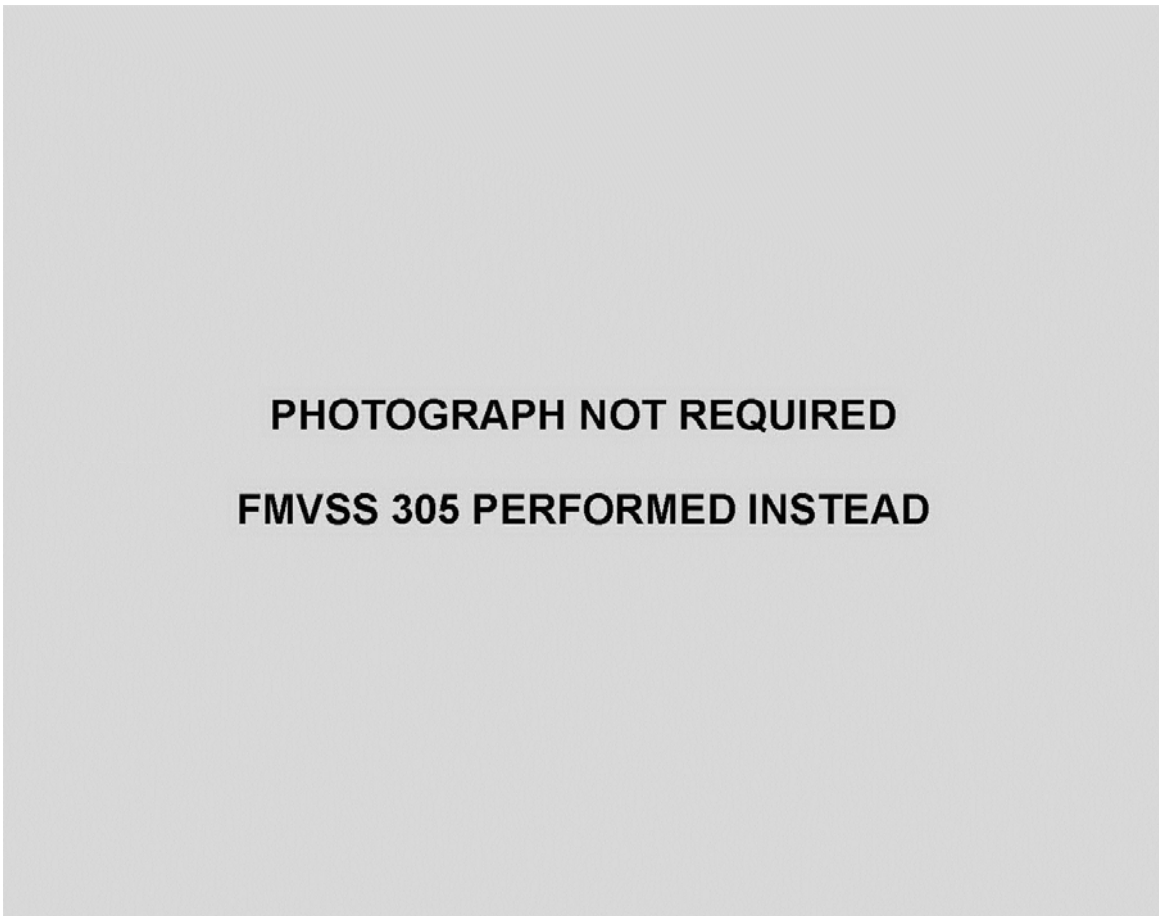
Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

Post-Test Stoddard Solvent Spillage Location View



Post-Test Speed Trap Read-Out



Vehicle at 0 Degrees on Static Rollover Device

PHOTOGRAPH NOT REQUIRED
FMVSS 305 PERFORMED INSTEAD

Vehicle at 90 Degrees on Static Rollover Device

PHOTOGRAPH NOT REQUIRED
FMVSS 305 PERFORMED INSTEAD

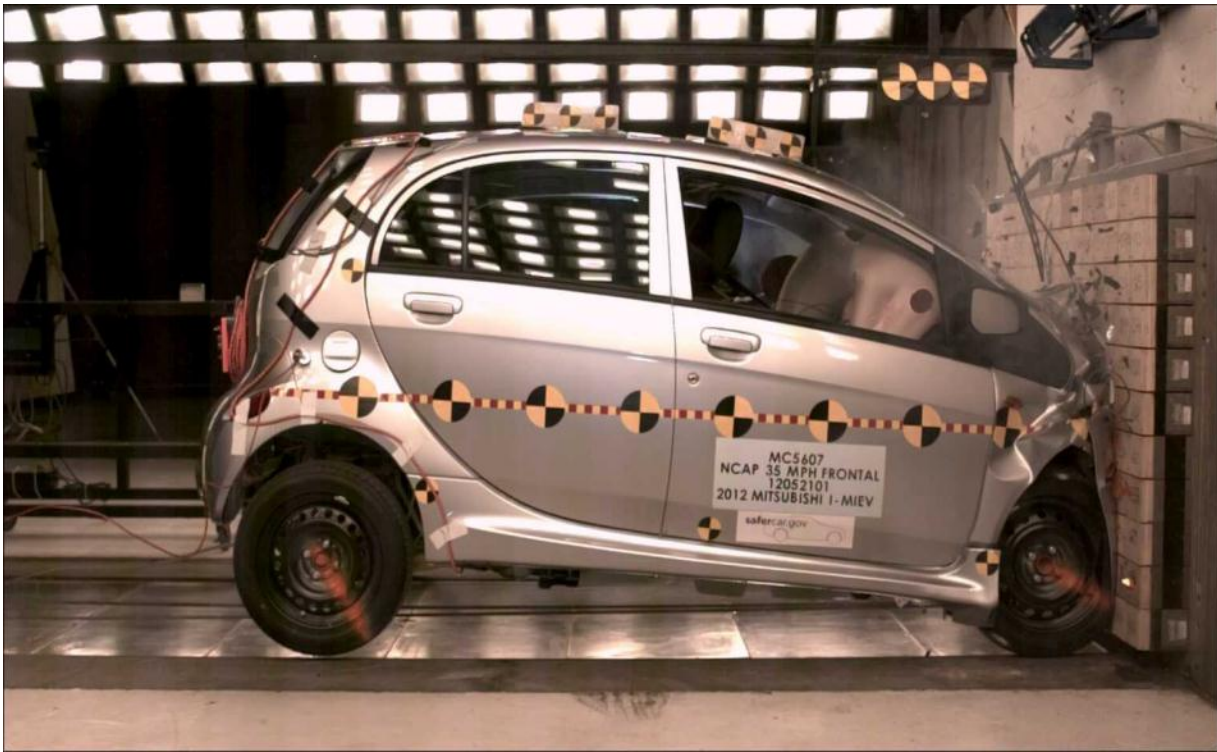
Vehicle at 180 Degrees on Static Rollover Device

PHOTOGRAPH NOT REQUIRED
FMVSS 305 PERFORMED INSTEAD


Vehicle at 270 Degrees on Static Rollover Device

PHOTOGRAPH NOT REQUIRED
FMVSS 305 PERFORMED INSTEAD

Vehicle at 360 Degrees on Static Rollover Device



2012 Mitsubishi i-MiEV Frontal Impact Event

 <p>2012 I-MIEV ES 5-DOOR HATCHBACK COOL SILVER METALLIC / BLACK</p> <p>AC SYNCHRONOUS MOTOR 1 SPEED TRANSMISSION 50-STATE EMISSIONS STANDARDS</p> <p>ELECTRIC MOTOR AND BATTERY</p> <ul style="list-style-type: none"> 100% ELECTRIC ZERO EMISSIONS 49KW AC SYNCHRONOUS MOTOR 16KWH LITHIUM-ION BATTERY 120V PORTABLE CHARGER AND CABLE 100% ON-BOARD RECHARGING SYSTEM SINGLE FIXED REDUCTION GEAR TRANSMISSION MIEV REMOTE SYSTEM 3 MODE DRIVE SELECTOR (D,ECO,B) ENERGY METER (CHARGE ECO,POWER) LOW BATTERY WARNING INDICATOR BRAKE ENERGY REGENERATING SYSTEM <p>SAFETY</p> <ul style="list-style-type: none"> ADVANCED DUAL FRONT AIRBAGS FRONT SEAT MOUNTED SIDE AIRBAGS SIDE CURTAIN AIRBAGS FRONT AND REAR HEIGHT-ADJUSTABLE HEADRESTS ACTIVE STABILITY CONTROL (ASC) W/ TRACTION CONTROL LOGIC (TCL) TIRE PRESSURE MONITORING SYSTEM LATCH SYSTEM FOR CHILD SEATS ANTI-THEFT ALARM SYSTEM VEHICLE IMMOBILIZER SYSTEM HIGH VOLTAGE CUT-OFF SYSTEM ACOUSTIC VEHICLE ALERT SYSTEM (AVAS) FOR PEDESTRIANS <p>BRAKES AND SUSPENSION</p> <ul style="list-style-type: none"> FRONT DISC BRAKES W/ ABS ELECTRONIC BRAKEFORCE DISTRIBUTION BRAKE ASSIST INDEPENDENT FRONT SUSPENSION W/ STABILIZER BAR REAR 3 LINK DE DION SUSPENSION ASSISTED ELECTRIC POWER STEERING <p>COMFORT/CONVENIENCE</p> <ul style="list-style-type: none"> AIR CONDITIONING W/ MICROFILTR ELECTRIC CABIN HEATER <p>COMFORT/CONVENIENCE (cont'd)</p> <ul style="list-style-type: none"> AM/FM/CD/MP3 HEAD UNIT W/ 4 SPEAKERS HEATED DRIVER SEAT POWER DOOR & TAILGATE LOCKS POWER WINDOWS & SIDEVIEW MIRRORS VARIABLE INTERMITTENT WIPERS REAR WINDOW DEFROSTER FRONT AND REAR ASSIST GRIPS FRONT CUP HOLDERS REMOTE KEYLESS ENTRY 50/50 SPLIT FOLD-DOWN REAR SEATS 12V ACCESSORY OUTLET FLOOR MATS <p>EXTERIOR</p> <ul style="list-style-type: none"> 15" STEEL WHEELS W/ FULL COVERS HALOGEN PROJECTION HEADLAMPS SIDE TURN INDICATORS COLOR-KEYED OUTER DOOR HANDLES AND SIDEVIEW MIRRORS REAR LED TAIL LIGHTS REAR INTERMITTENT WIPER AND WASHER 	<p>Optional Equipment</p> <p>COLD ZONE PACKAGE BATTERY WARMING SYSTEM HEATED SIDEVIEW MIRRORS</p> <p>\$150.00</p>	<p>EPA DOT Fuel Economy and Environment Electric Vehicle</p> <p>Fuel Economy</p> <p>112 MPGe combined city/hwy</p> <p>126 city 99 highway 30 city/mile per 100 miles</p> <p>Driving Range: 62 miles</p> <p>Charge Time: 7 hours (240V)</p> <p>You save \$9,850 in fuel costs over 5 years compared to the average new vehicle.</p> <p>Annual fuel Cost \$550</p> <p>Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only)</p> <p>1 10 10 1 10 10</p> <p>This vehicle emits 0 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Does not include emissions from generating electricity. Learn more at safercar.gov.</p> <p>Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 22 MPG and costs \$12,600 to fuel over 5 years. Cost estimates are based on 55,000 miles per year at 50.3¢ per kWh. (MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.)</p> <p>fuelconomy.gov Calculate personalized estimates and compare vehicles.</p>
<p>Environmental Performance</p> <p>Protect the environment, choose vehicles with higher scores:</p> <p>Global Warming Score</p> <p>Average New Vehicle: 10 Cleanest: 10</p> <p>Smog Score</p> <p>Average New Vehicle: 10 Cleanest: 10</p> <p>Vehicle emissions are a primary contributor to global warming and smog. Scores are determined by the California Air Resources Board based on this vehicle's measured emissions. Please visit www.DriveClean.ca.gov for more information.</p> <p>AIR RESOURCES BOARD</p>	<p>MSRP: \$29,125.00 Total Optional Equipment: \$150.00 Subtotal: \$29,275.00 Destination/Handling: \$850.00 Total MSRP: \$30,125.00</p> <p>Visit us at www.mitsubishicars.com</p>	<p>8-year 100,000-mile MAJOR DRIVE LITHIUM-ION BATTERY WARRANTY</p> <p>5"/60,000" Roadside 7"/100,000" Anti-rust/corrosion protection 3"/36,000" New parts (excludes electrical) 3"/36,000" New parts (excludes electrical)</p> <p>Parts Content Information</p> <p>For vehicles in this category: U.S./Canadian Major Sources of Parts Content: Foreign Parts Content: 0% JAPAN 100%</p> <p>For this vehicle: Final Assembly Point: MIZUSHIMA, JAPAN Country of Origin: JAPAN Engine: Transmission: JAPAN</p> <p>Note: Parts content does not include final assembly, distribution, or other non-parts costs.</p> <p>GOVERNMENT 5-STAR SAFETY RATINGS</p> <p>Overall Vehicle Score To Be Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</p> <p>Frontal Crash Driver To Be Rated Passenger To Be Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.</p> <p>Side Crash Front seat To Be Rated Rear seat To Be Rated Based on the risk of injury in a side impact.</p> <p>Rollover To Be Rated Based on the risk of rollover in a single-vehicle crash.</p> <p>Star ratings range from 1 to 5 stars (*****), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA), www.safercar.gov or 1-888-327-4236</p> <p>Ship To: (DBA) BILL JACOBS MITSUBISHI 2001 W. JEFFERSON STREET JOLIET, IL 60435-0123 Sold To: (Name unless indicated)</p> <p>Method of Transport: RAIL VIN: J43215H19CU01654 Plans/Port of Entry: TACOMA, WA Route Code: RJO</p> <p>Cumulative Accessory Weight is 3.7 lbs. Gasoline, license and title fees, applicable federal, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price. This label has been applied to this vehicle pursuant to federal law and cannot be moved or altered prior to delivery to the ultimate purchaser.</p>

Monroney Label

APPENDIX B
DUMMY RESPONSE DATA TRACES

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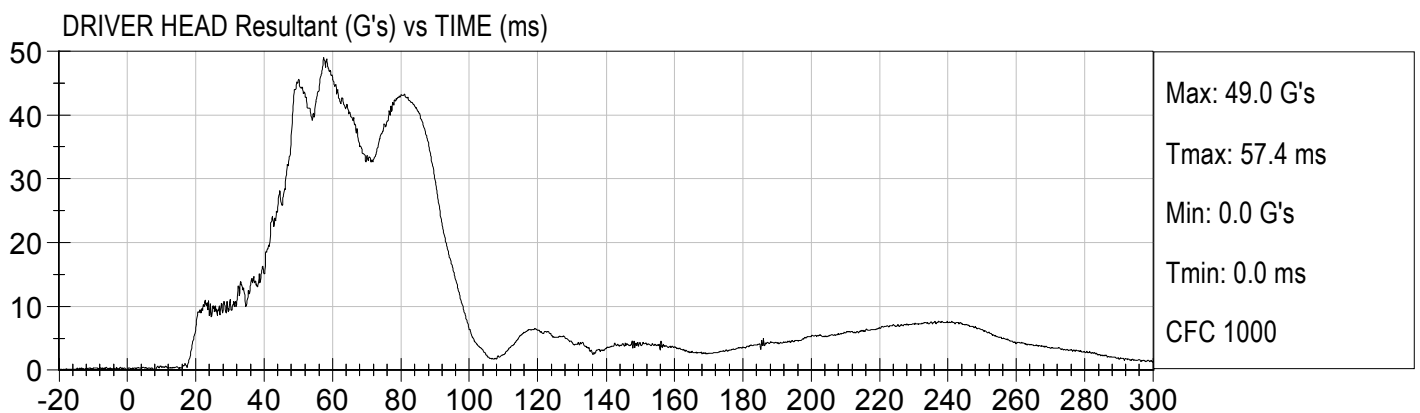
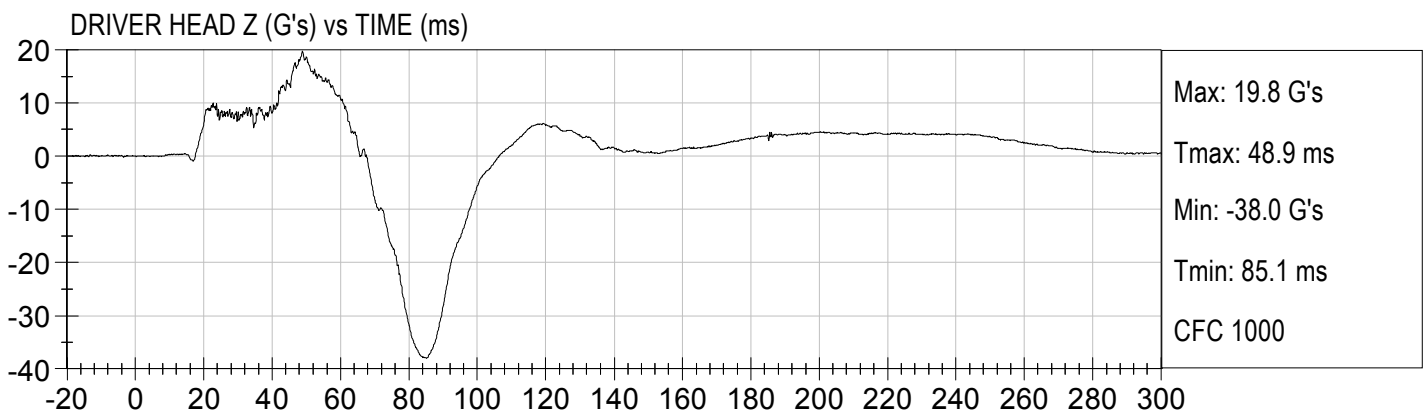
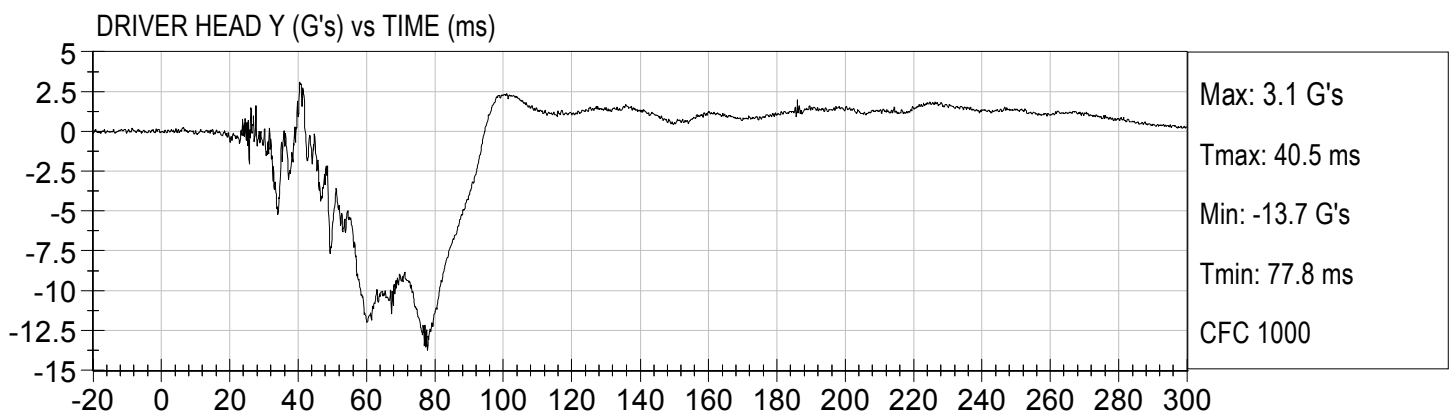
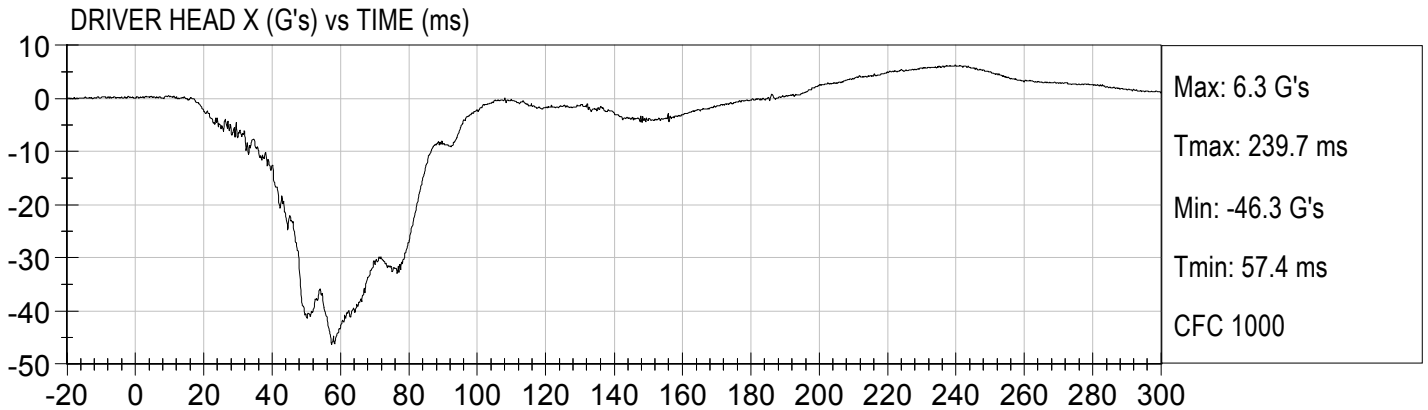
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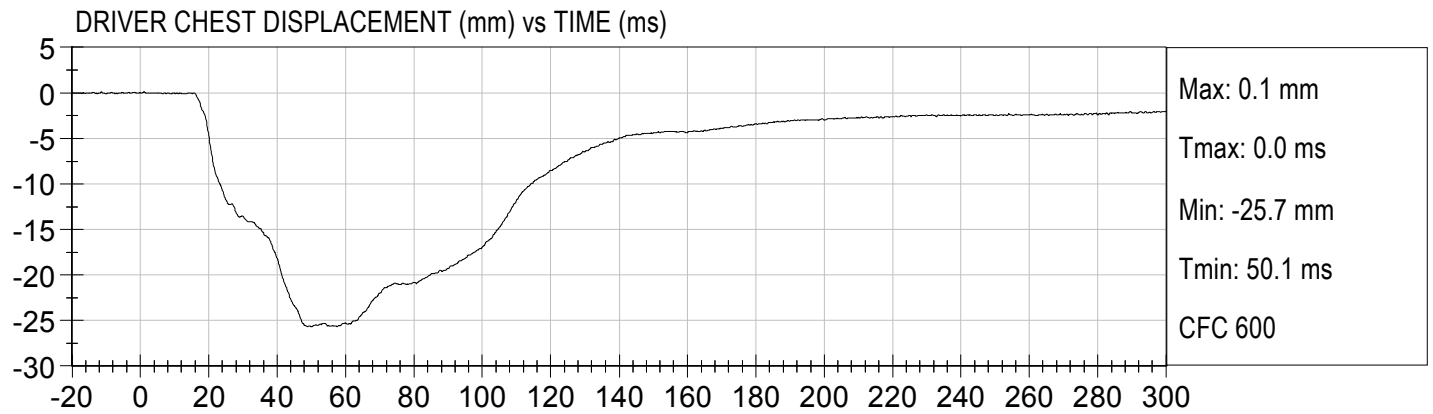
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

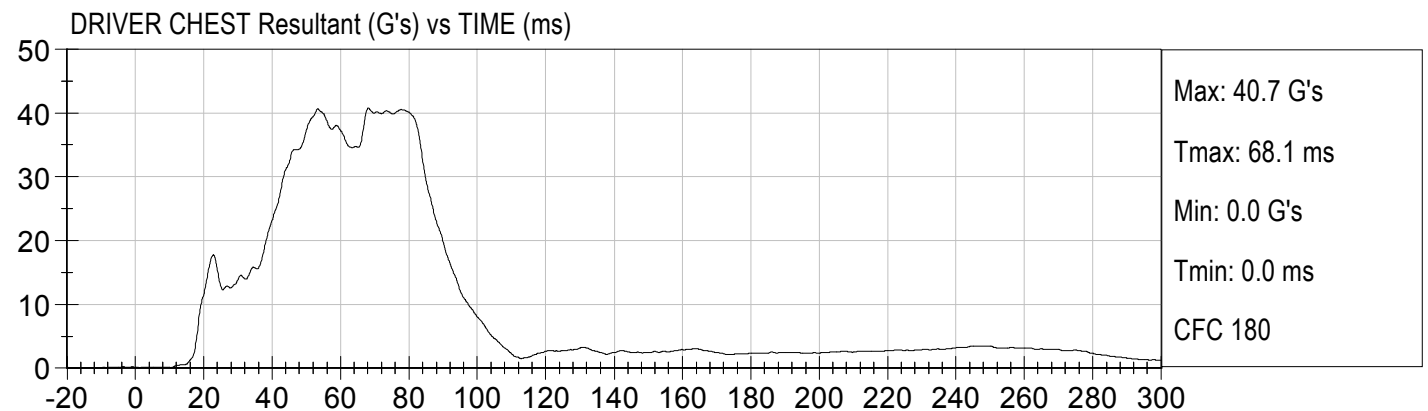
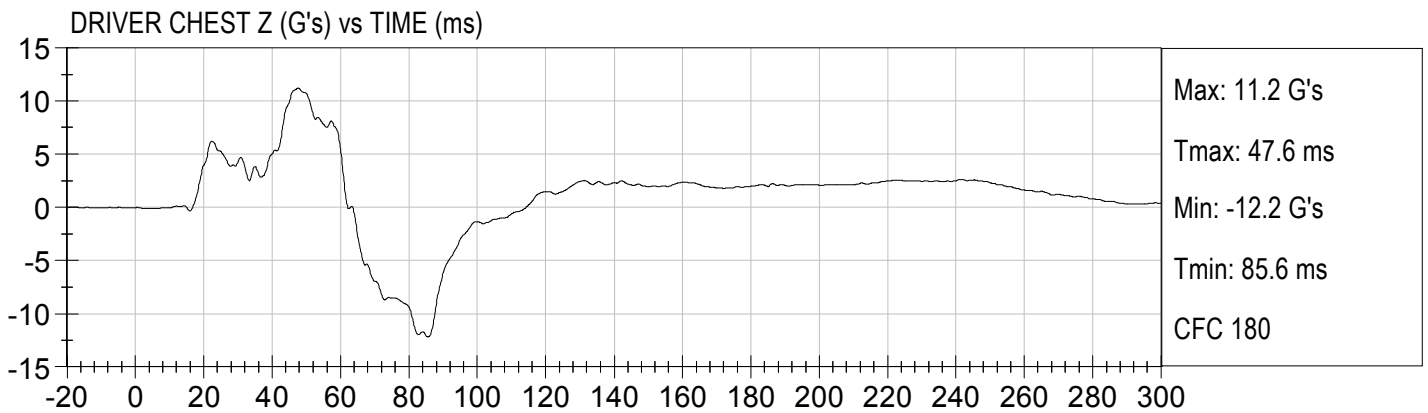
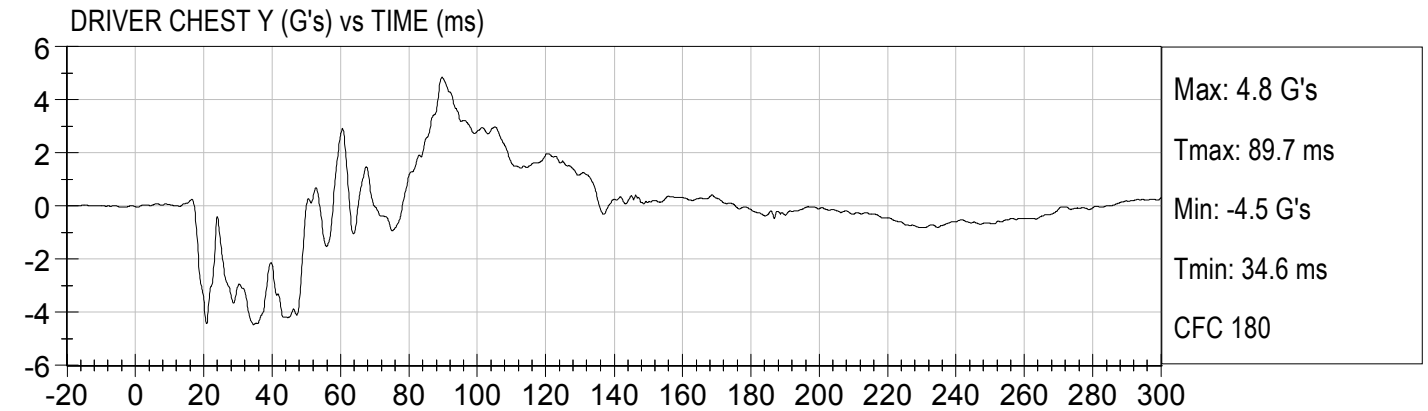
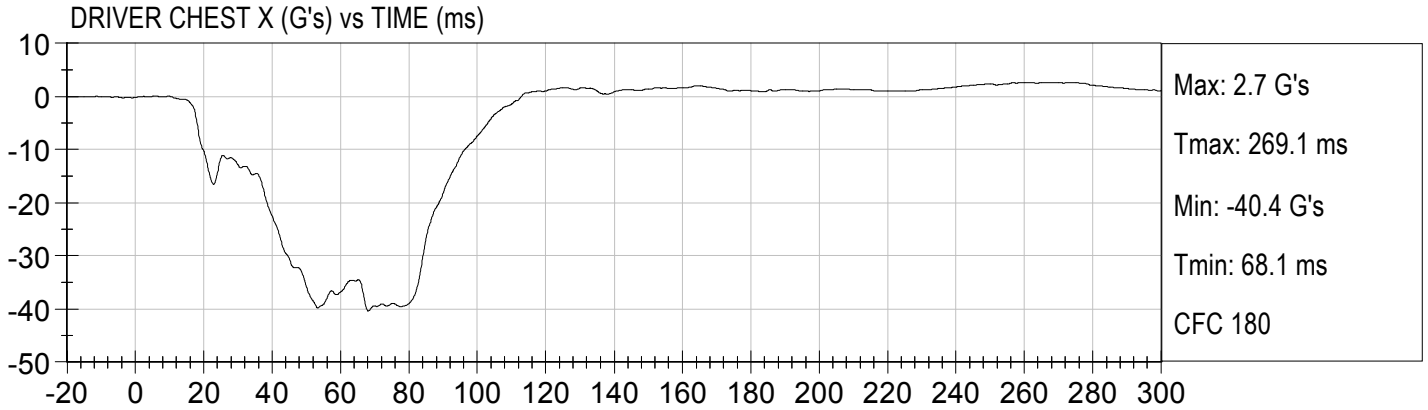
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 Driver Chest Z Redundant
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Passenger Right Foot Aft Z
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Passenger Shoulder Belt Force
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Right Rear Seat Crossmember X
Vehicle Engine Top X
Vehicle Engine Bottom X
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Advanced Research Load Cell Barrier – 128 channels

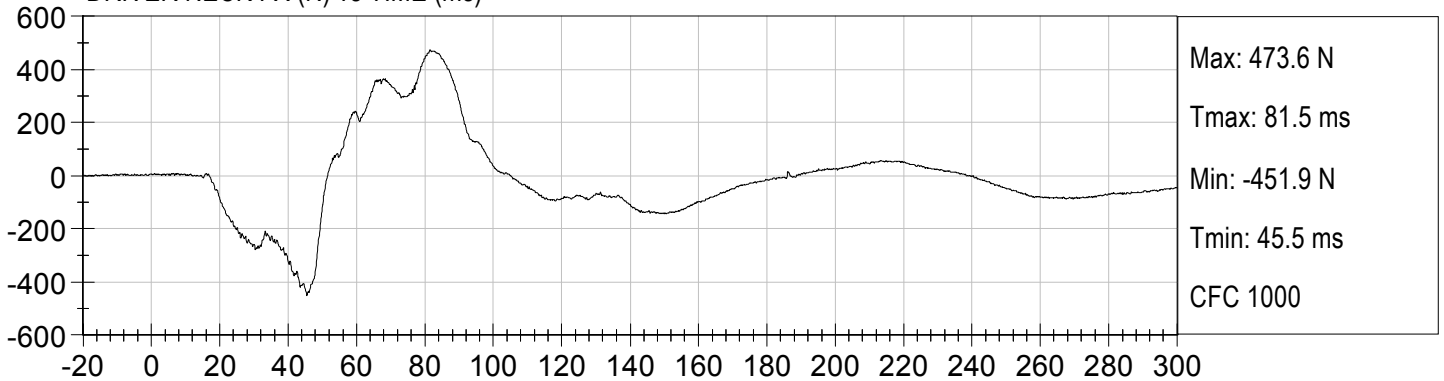




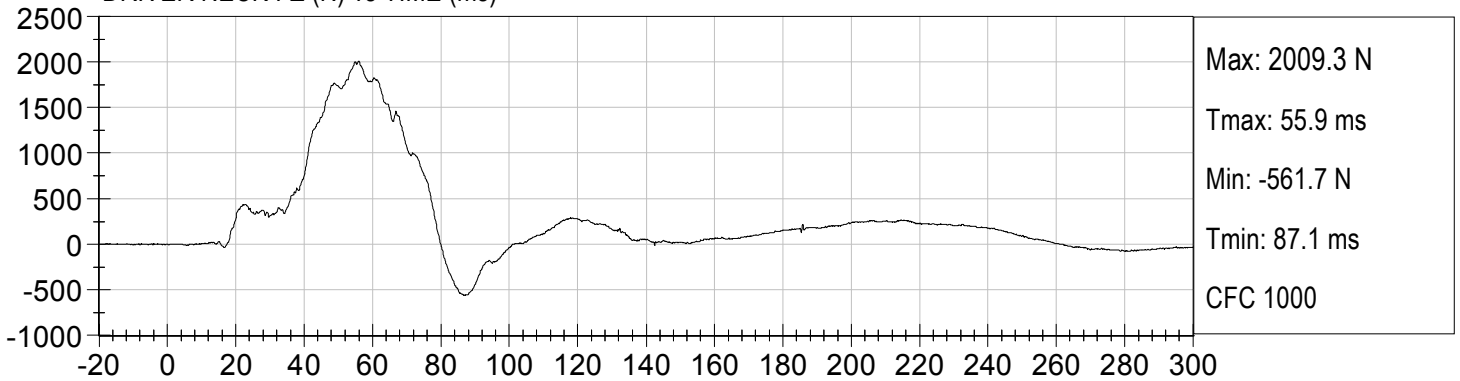




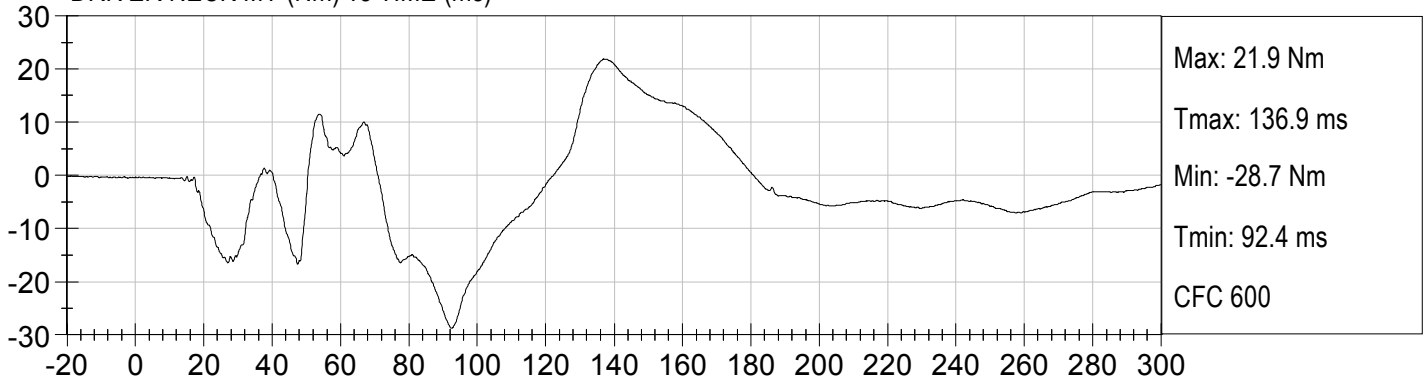
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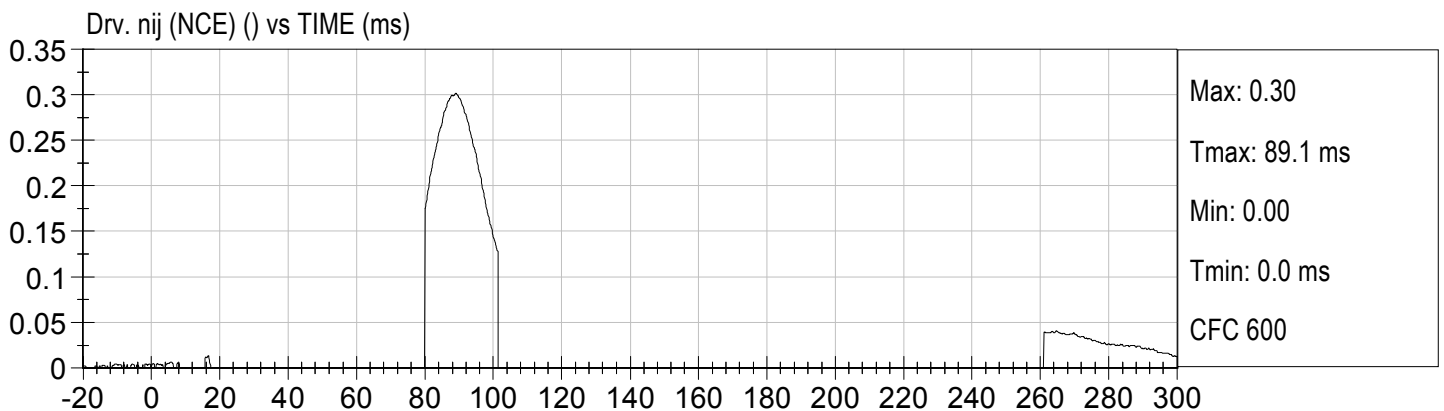
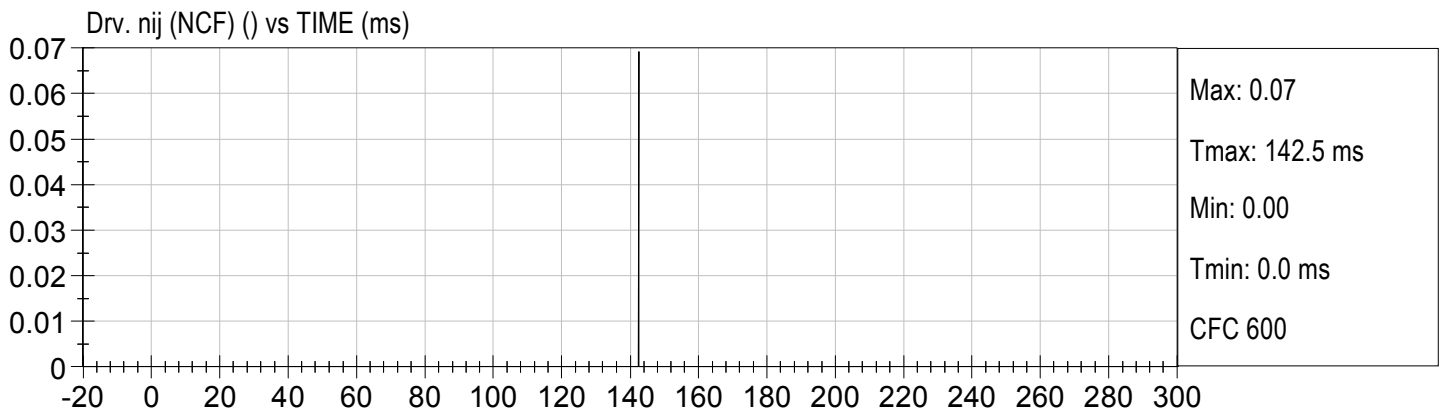
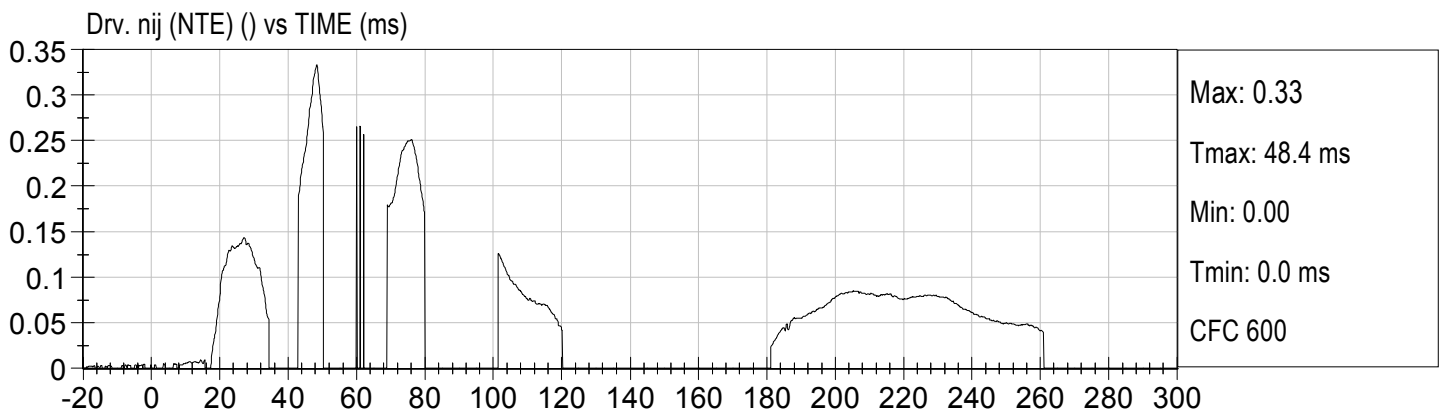
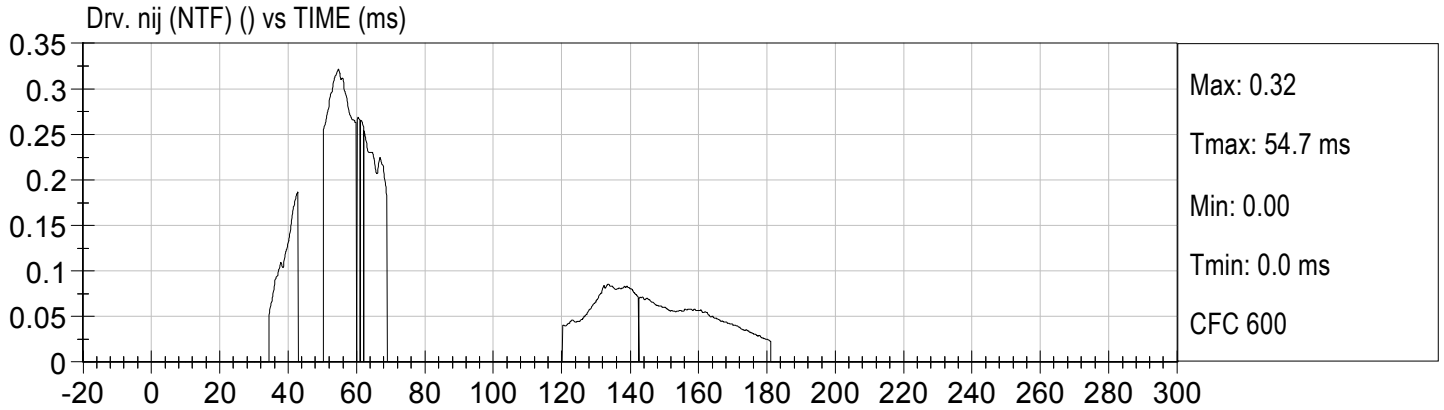


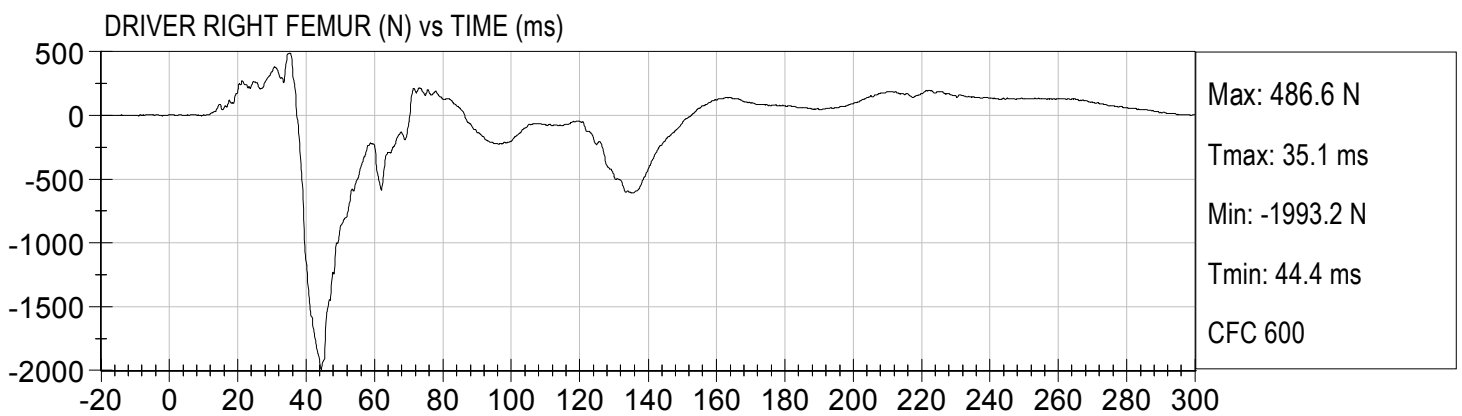
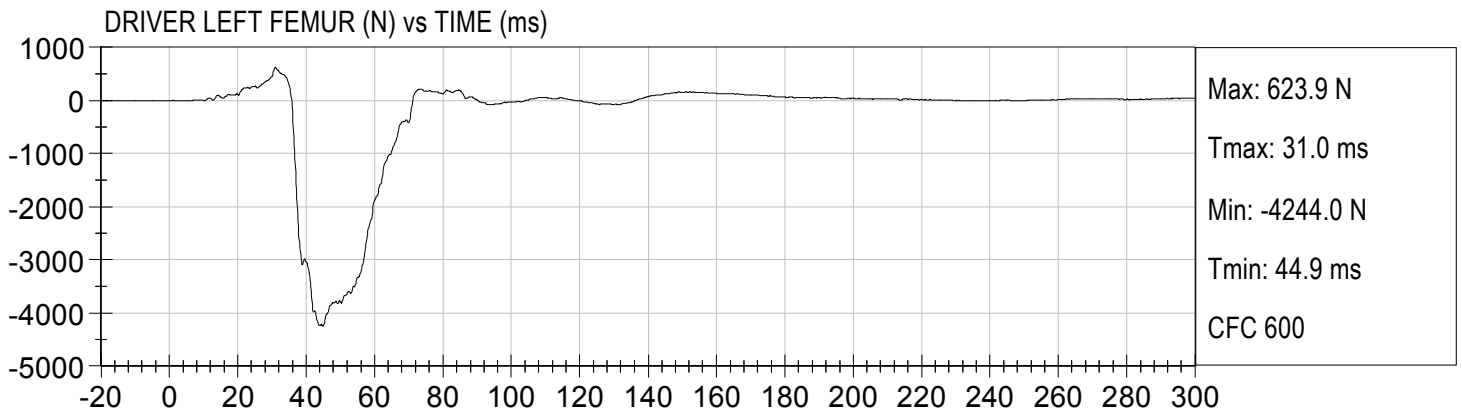
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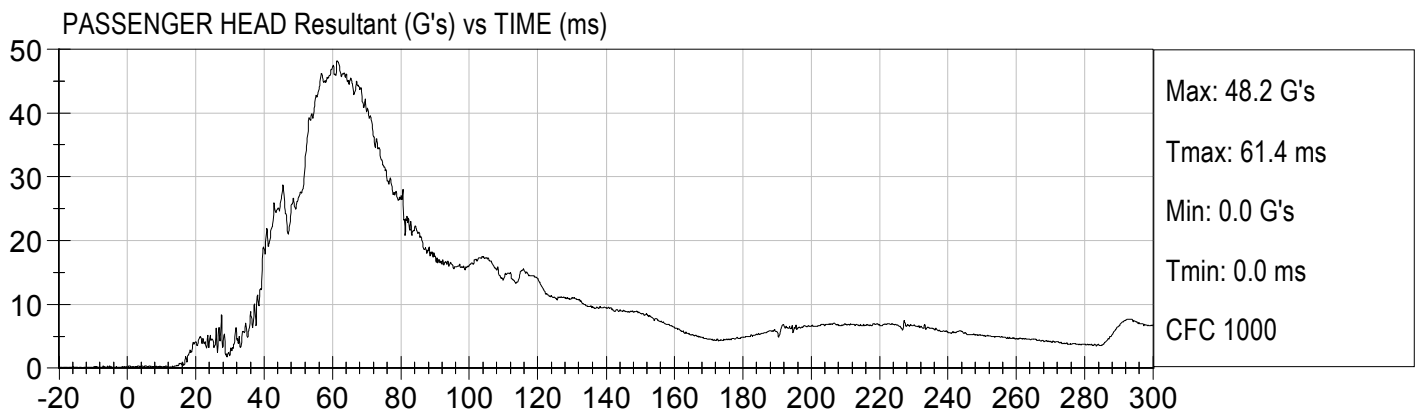
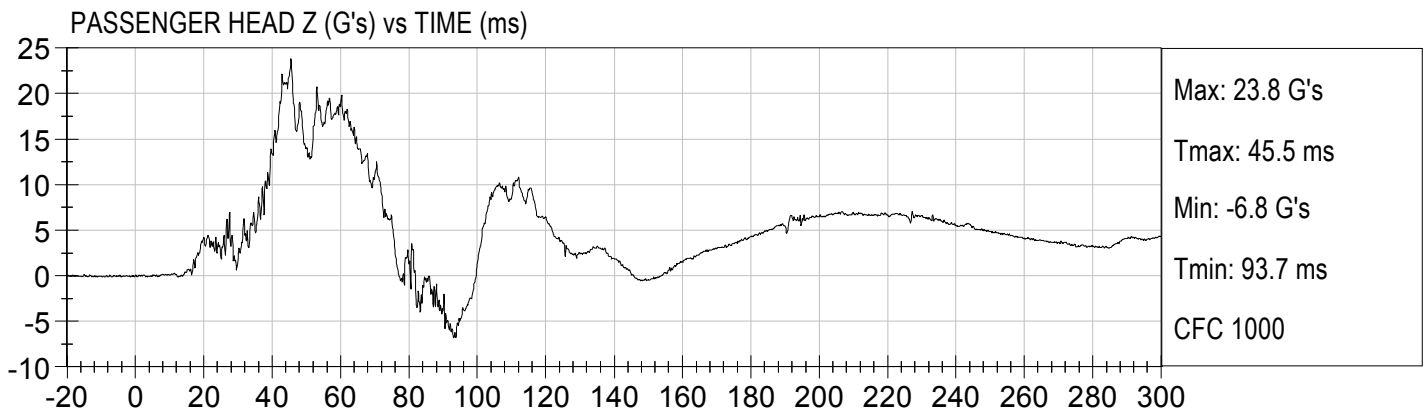
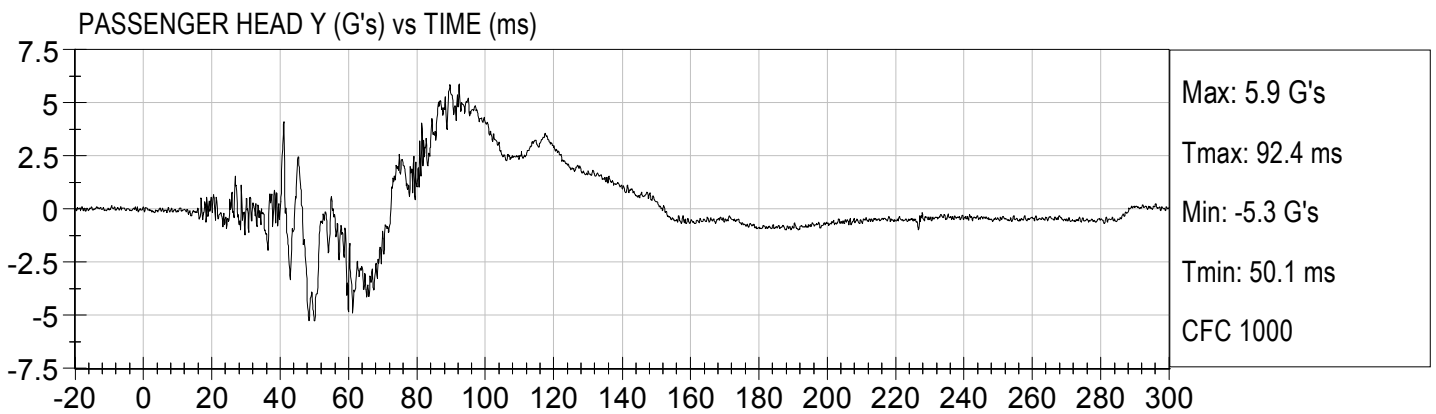
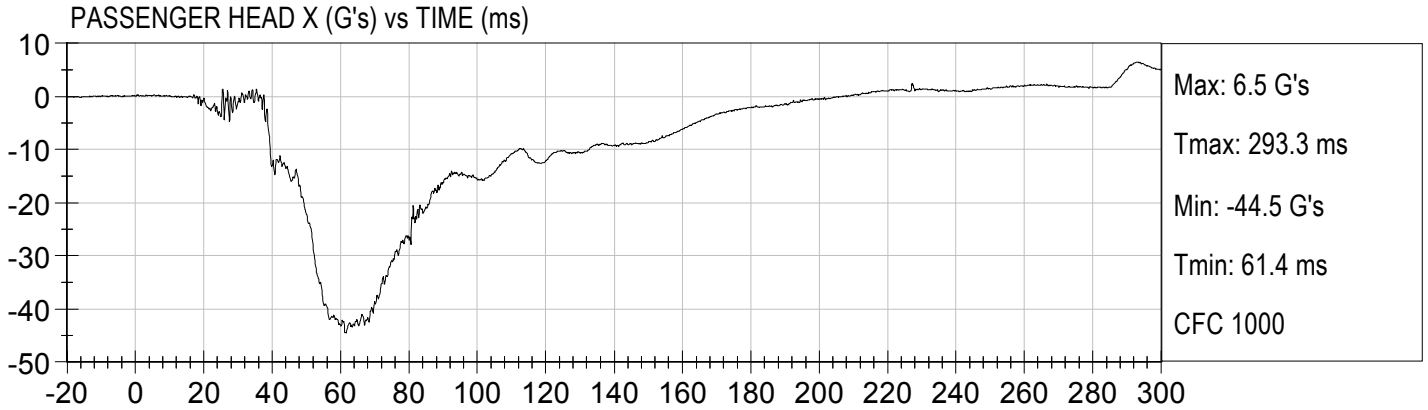


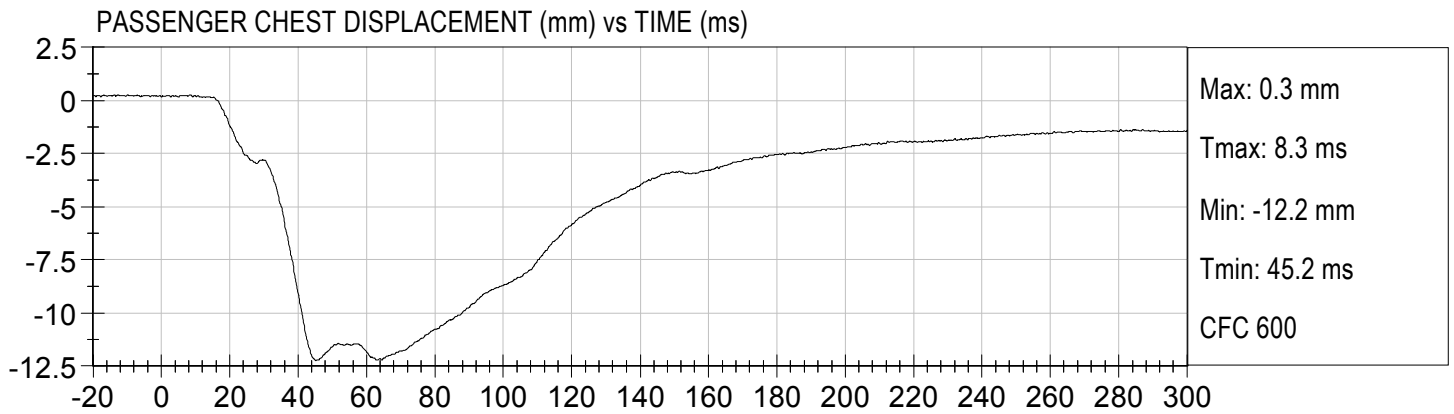
DRIVER NECK MY (Nm) vs TIME (ms)

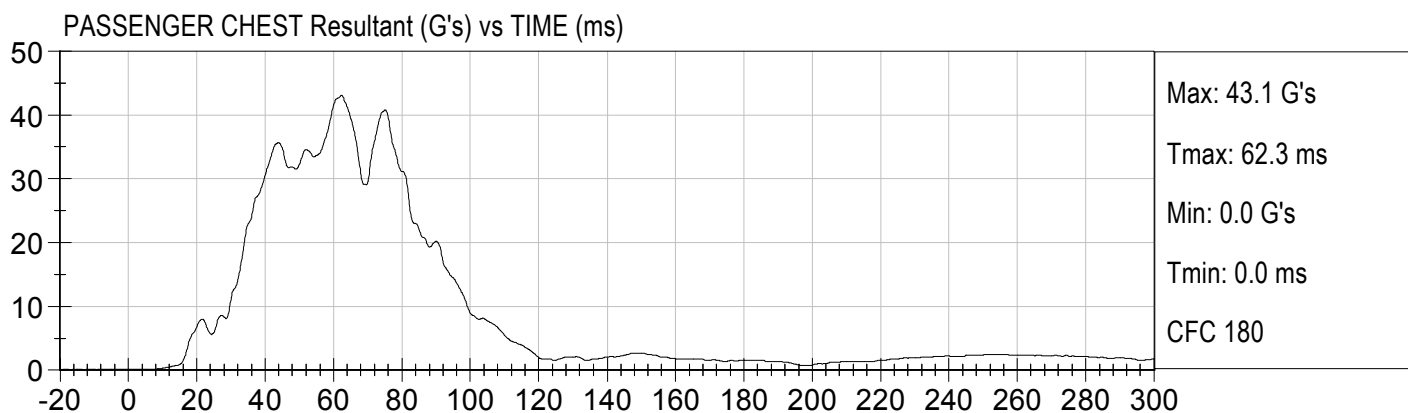
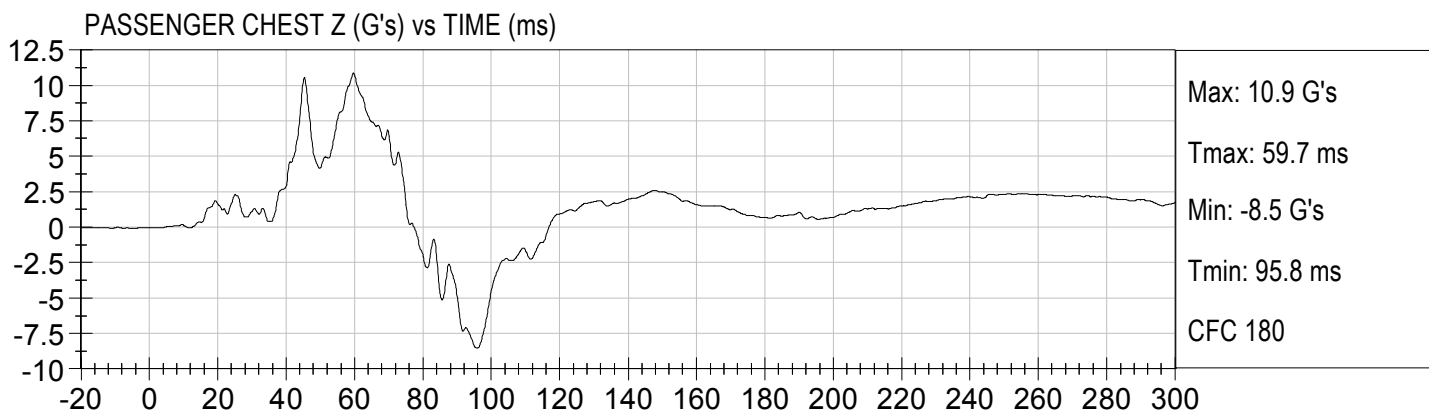
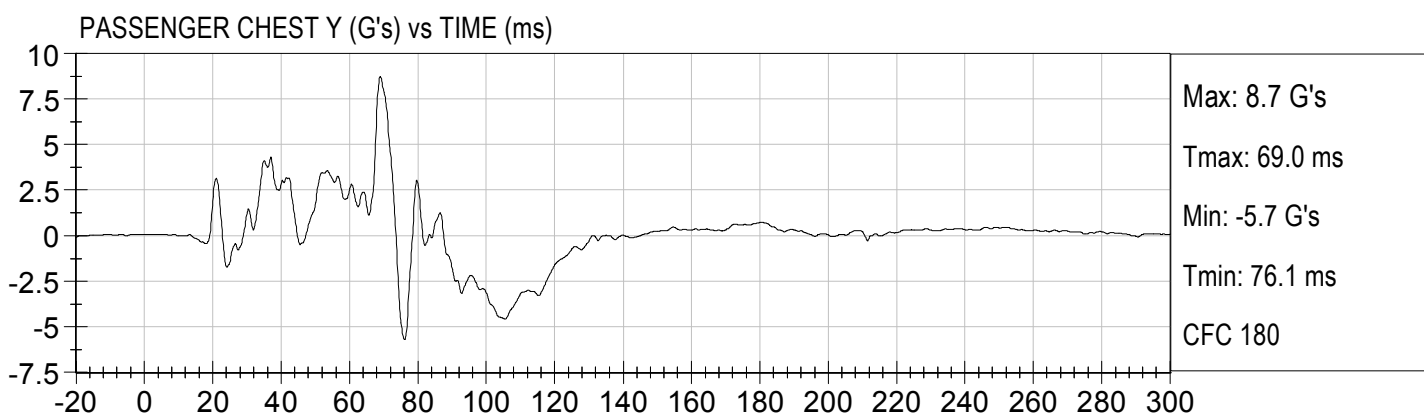
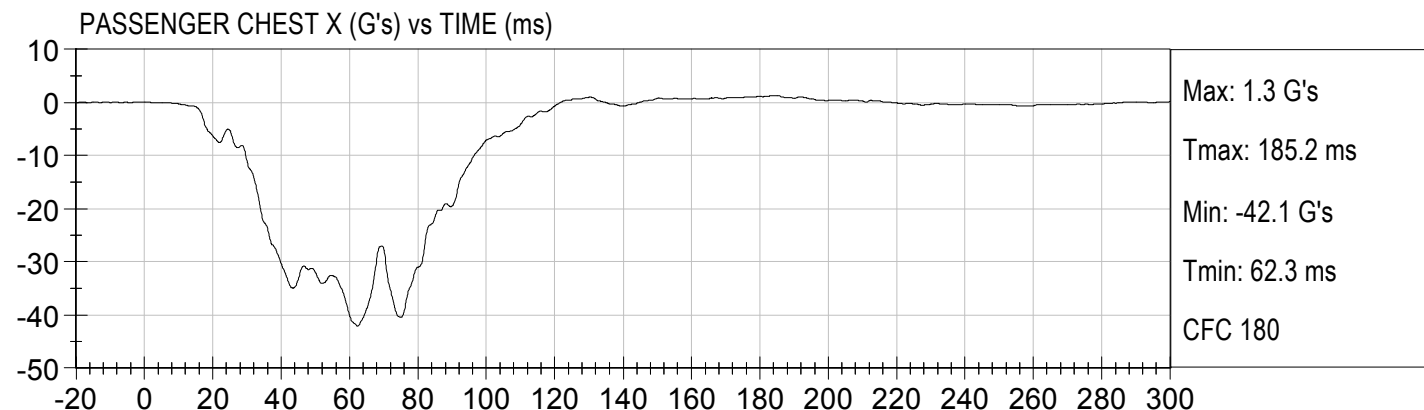


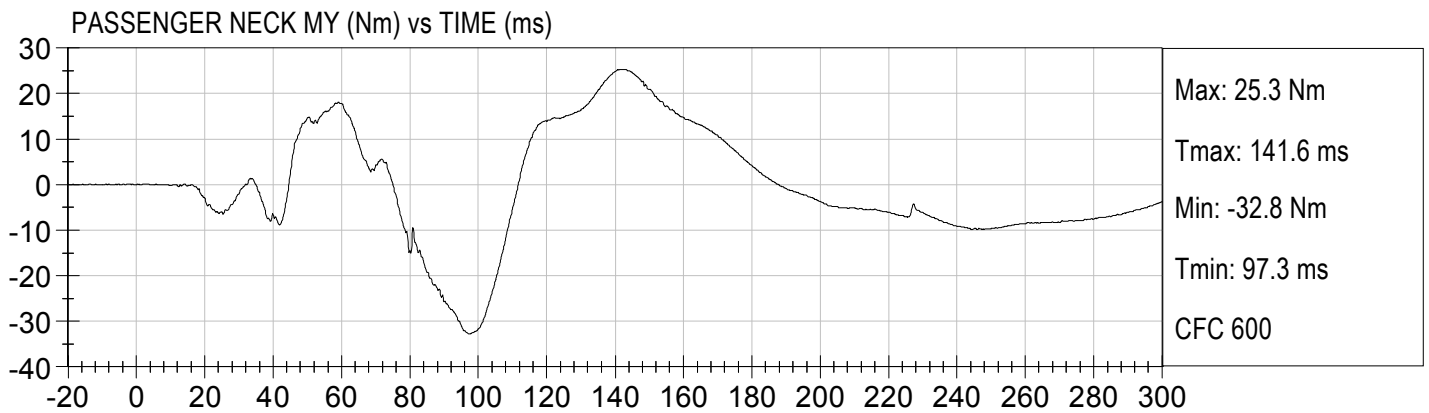
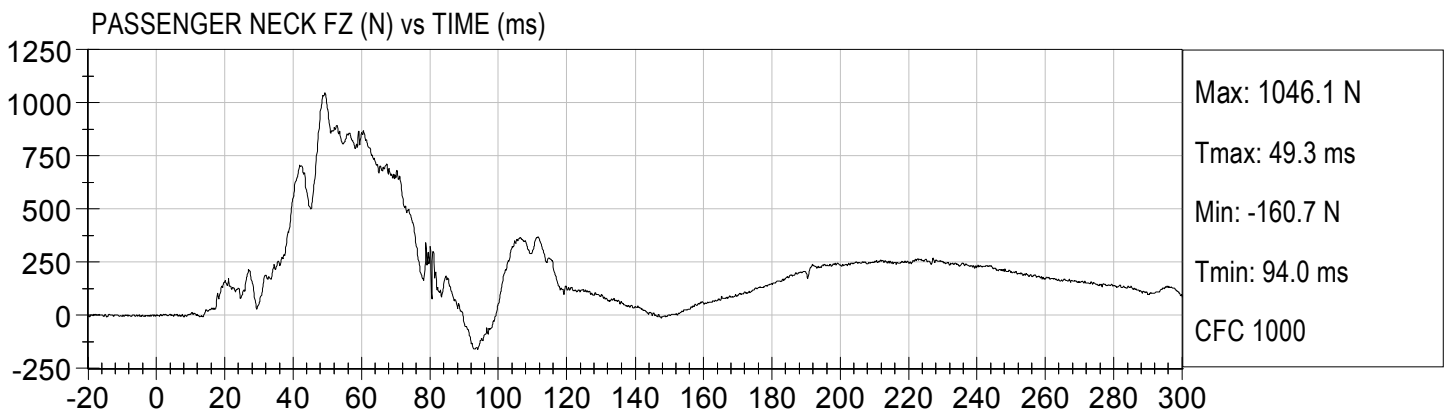
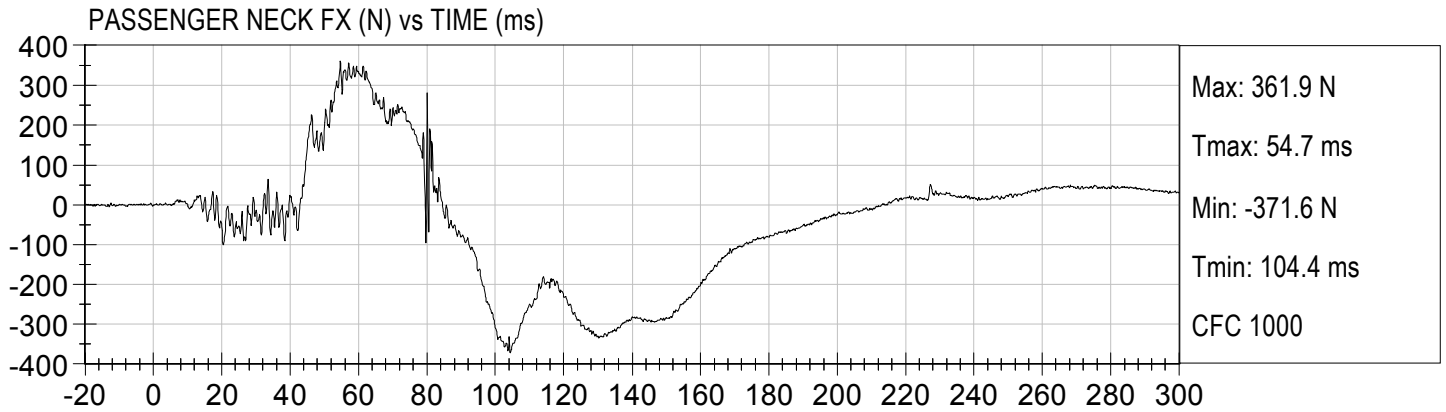


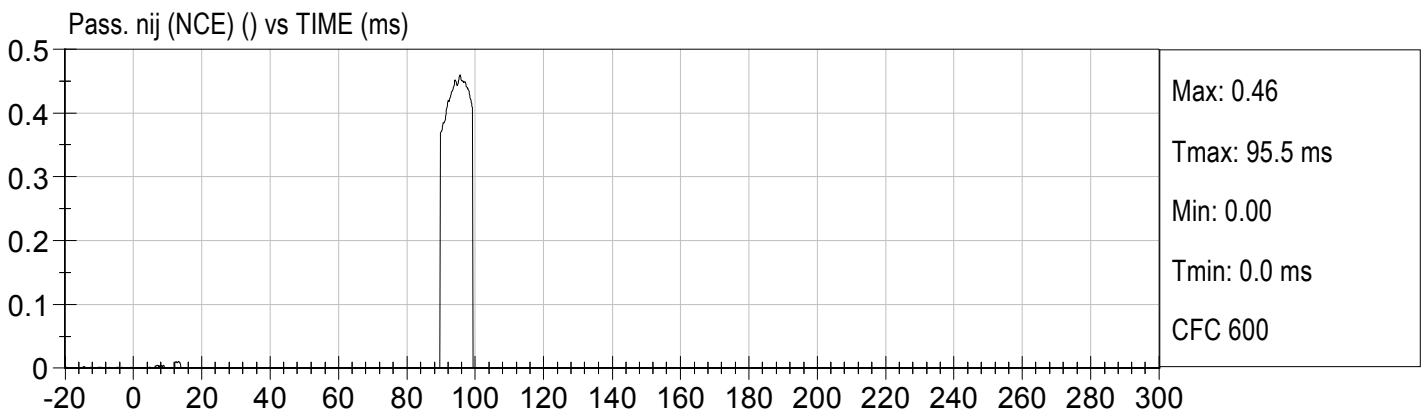
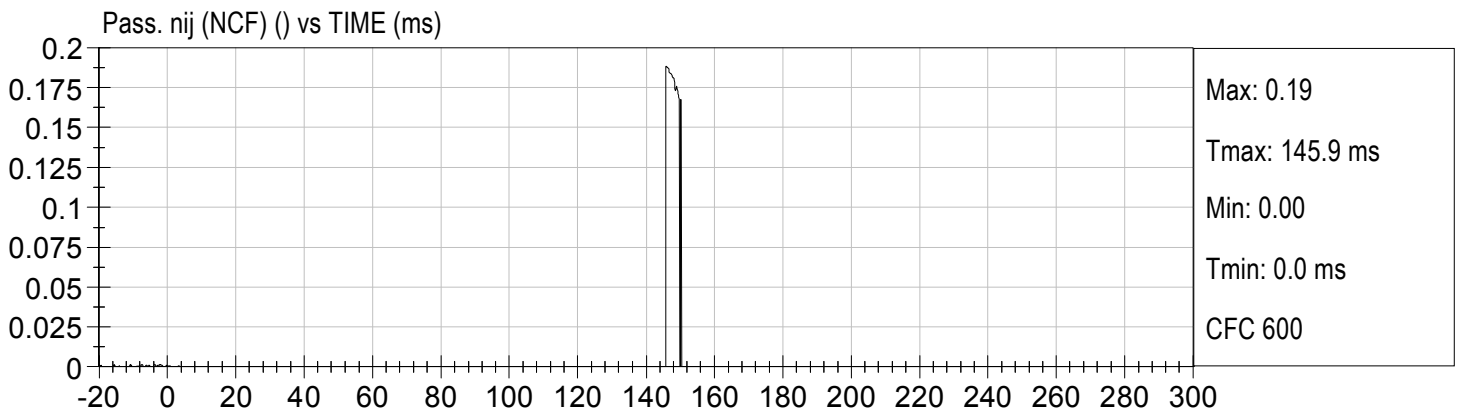
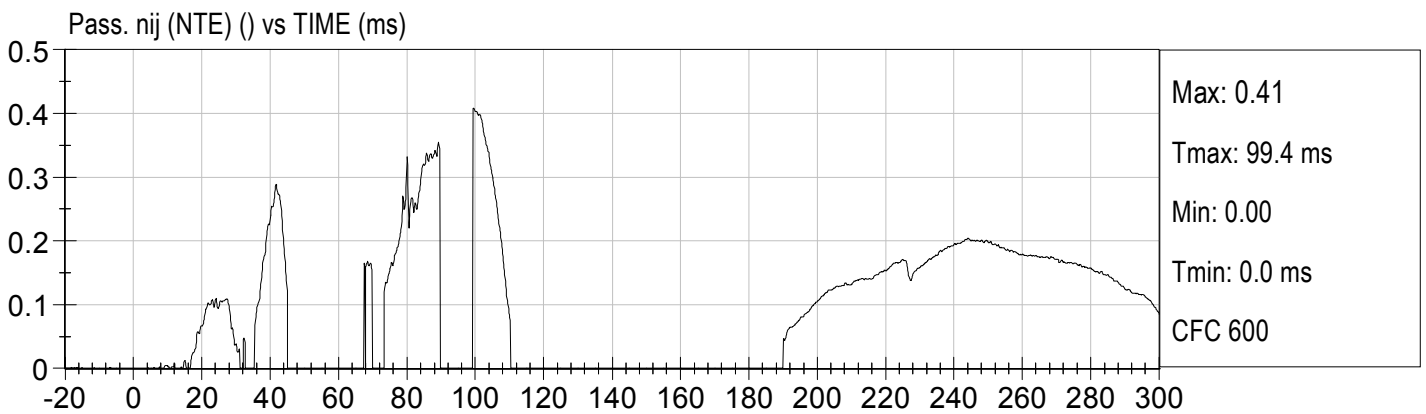
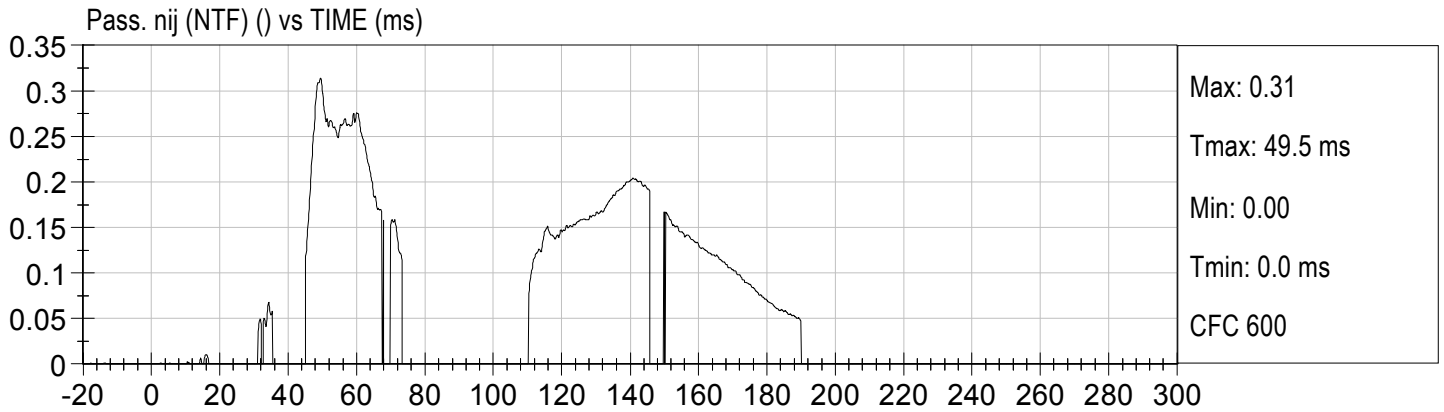


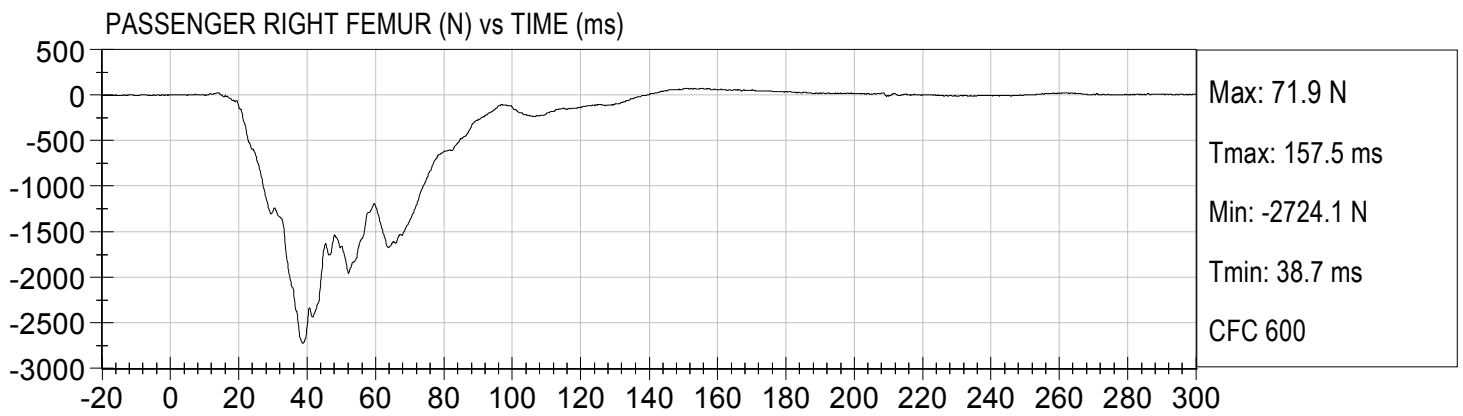
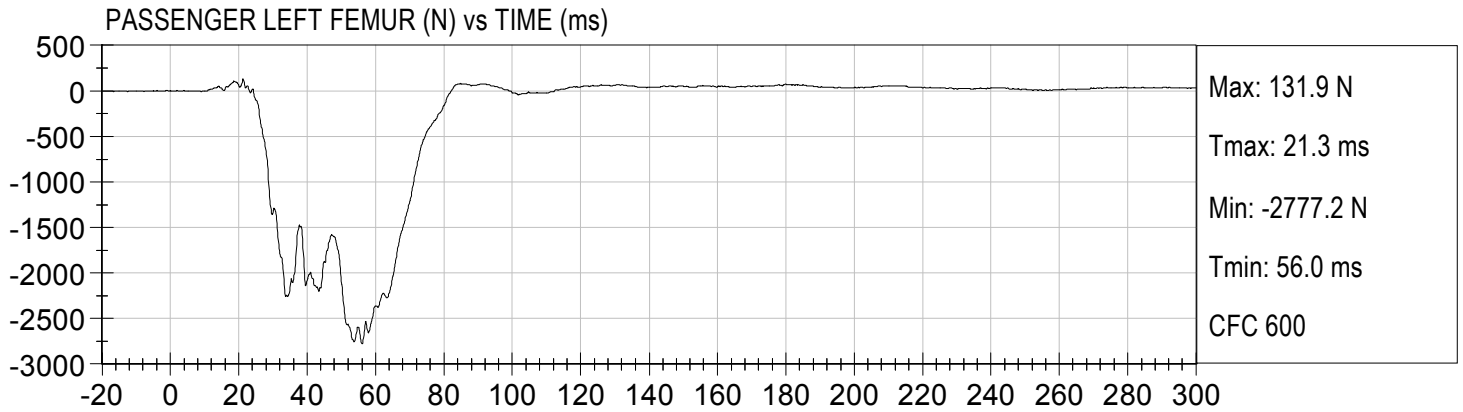












APPENDIX C

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

Test ID: D121611

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Peak Resultant Acceleration	G's	225 - 275	241	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-12.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

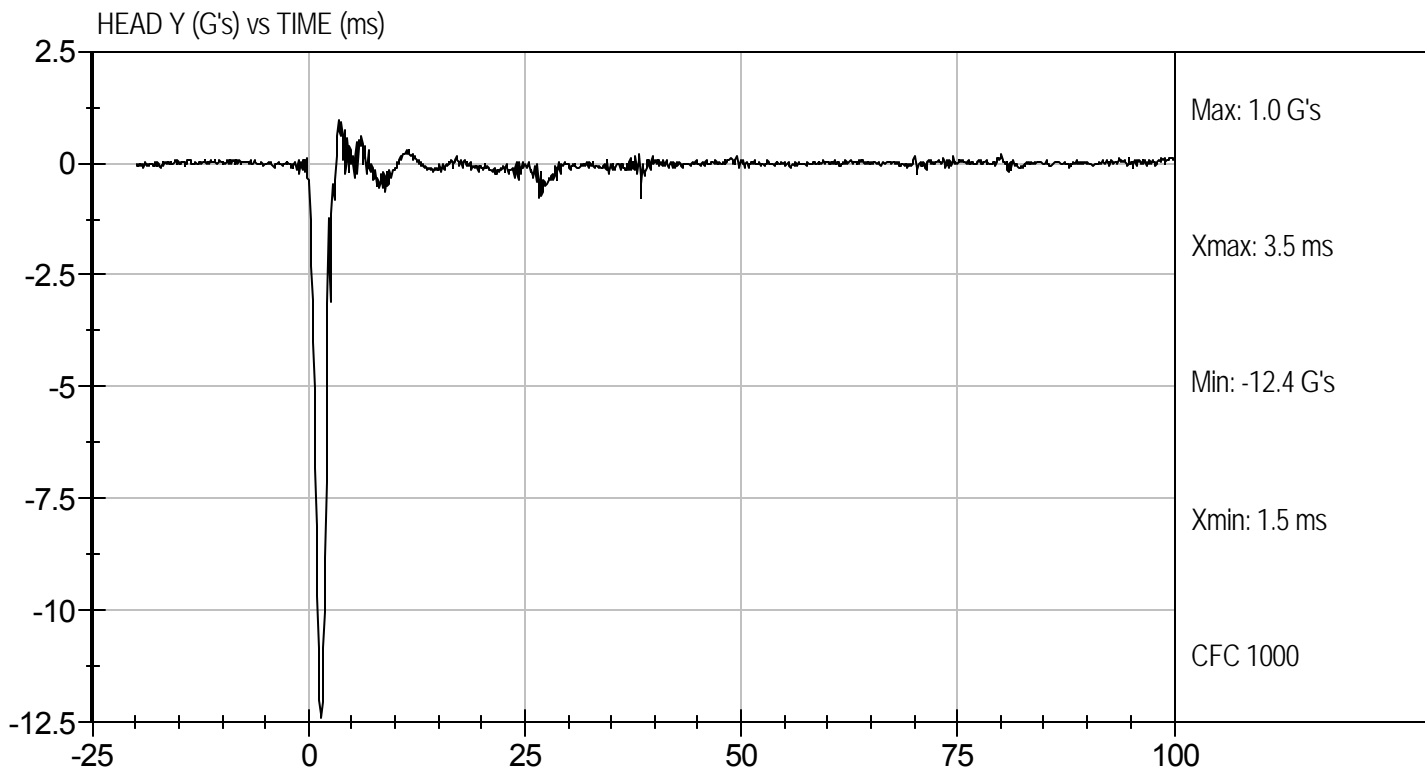
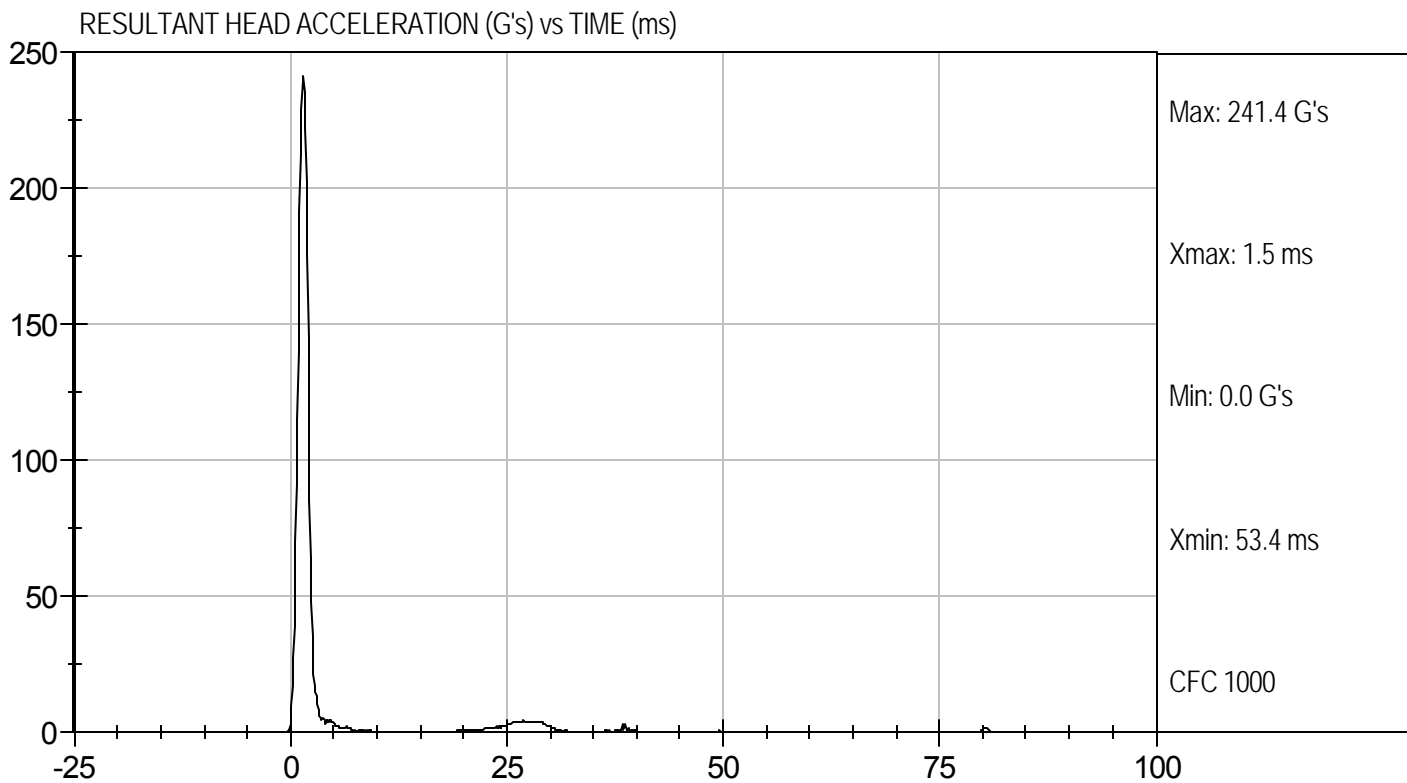
5/3/12
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D121611

Test Date: 5/3/12
Velocity: 0 ft/s, 0 m/s




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


ATD Serial No: 036

Test I.D.: D121612

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	50	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.74	Pass
	20 ms	G's	17.60 to 22.60	17.93	Pass
	30 ms	G's	12.50 to 18.50	13.47	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.4	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	69.2	Pass
	Time	ms	57.0 to 64.0	59.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	118.4	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	92.9	Pass
	Time	ms	47.0 to 58.0	49.6	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.1	Pass
Overall Test Results					Pass


Laboratory Technician

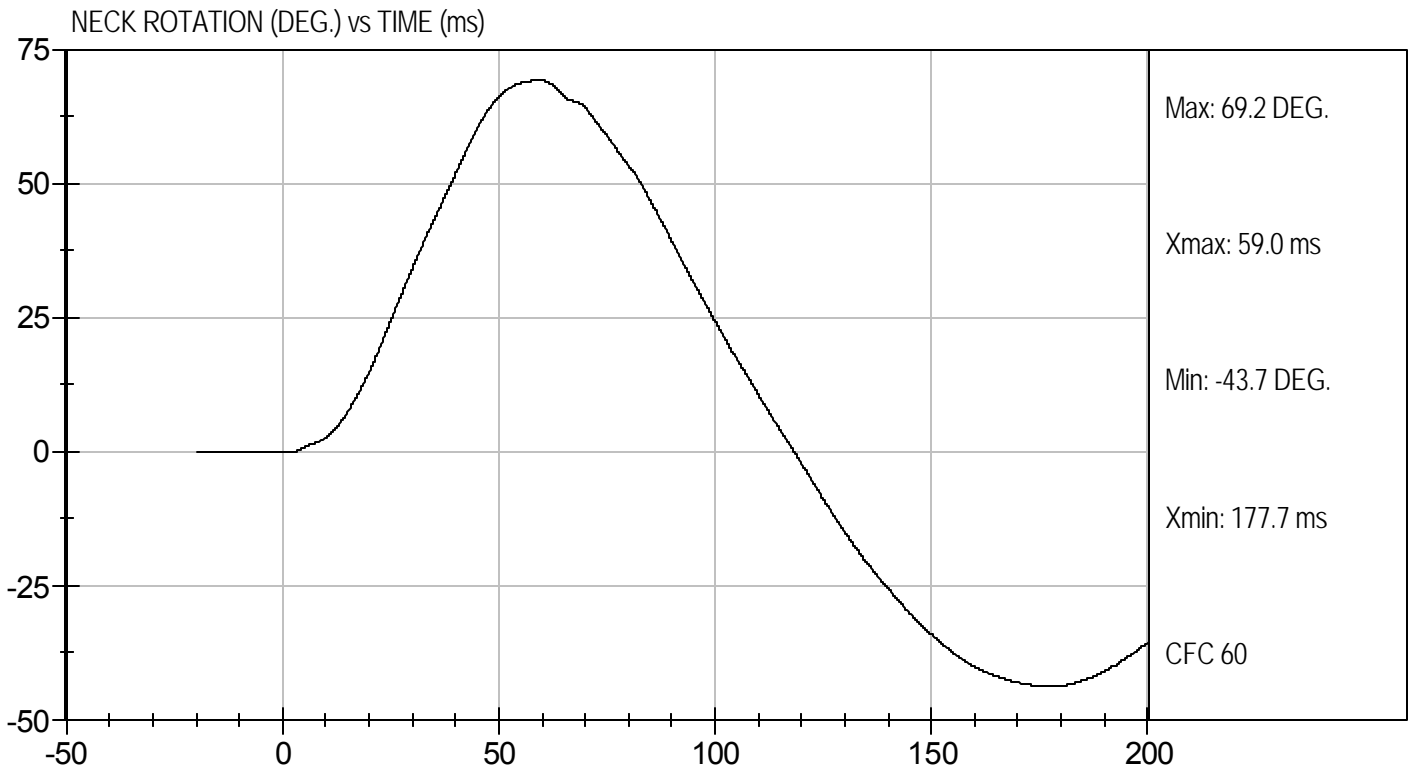
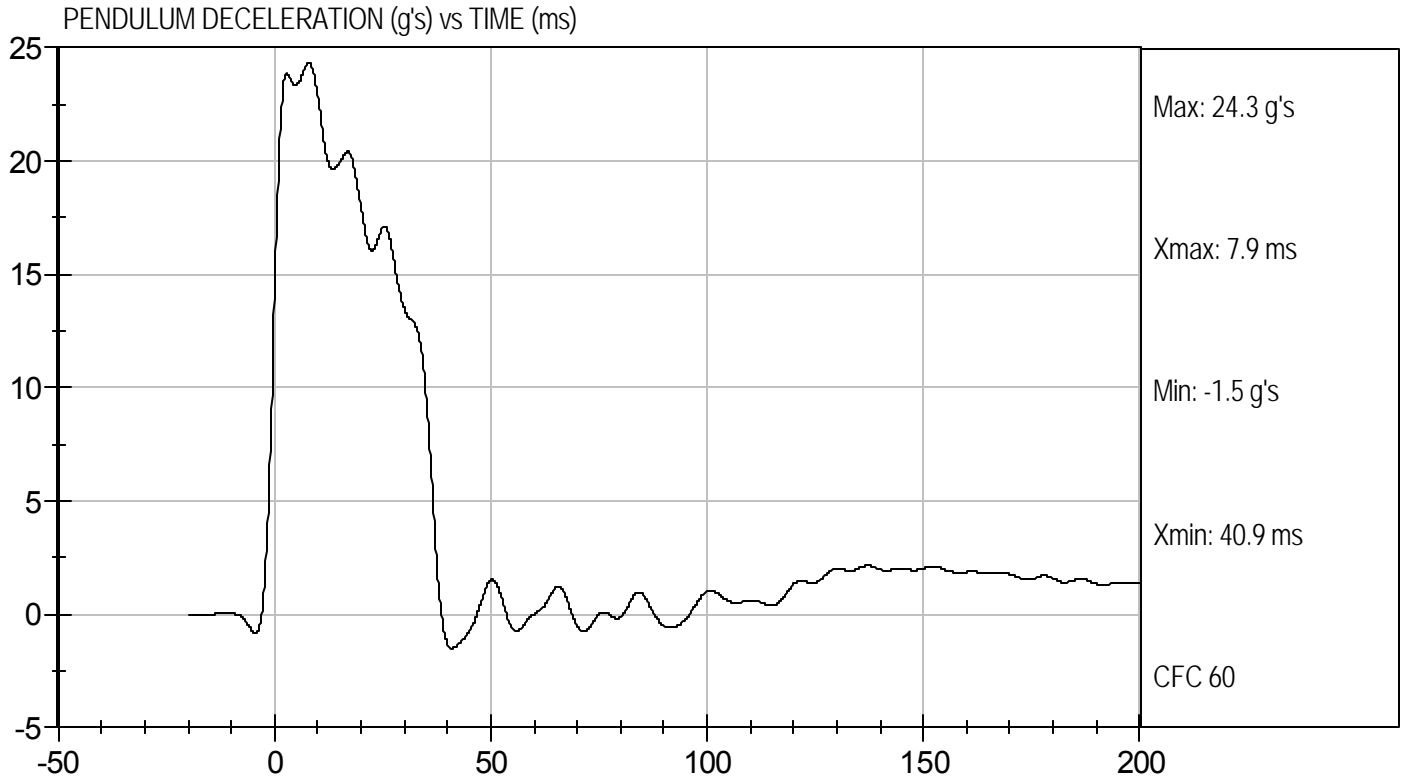
5/3/12
Test Date


Approved By



Test Desc: Neck Flexion
Component ID: D121612

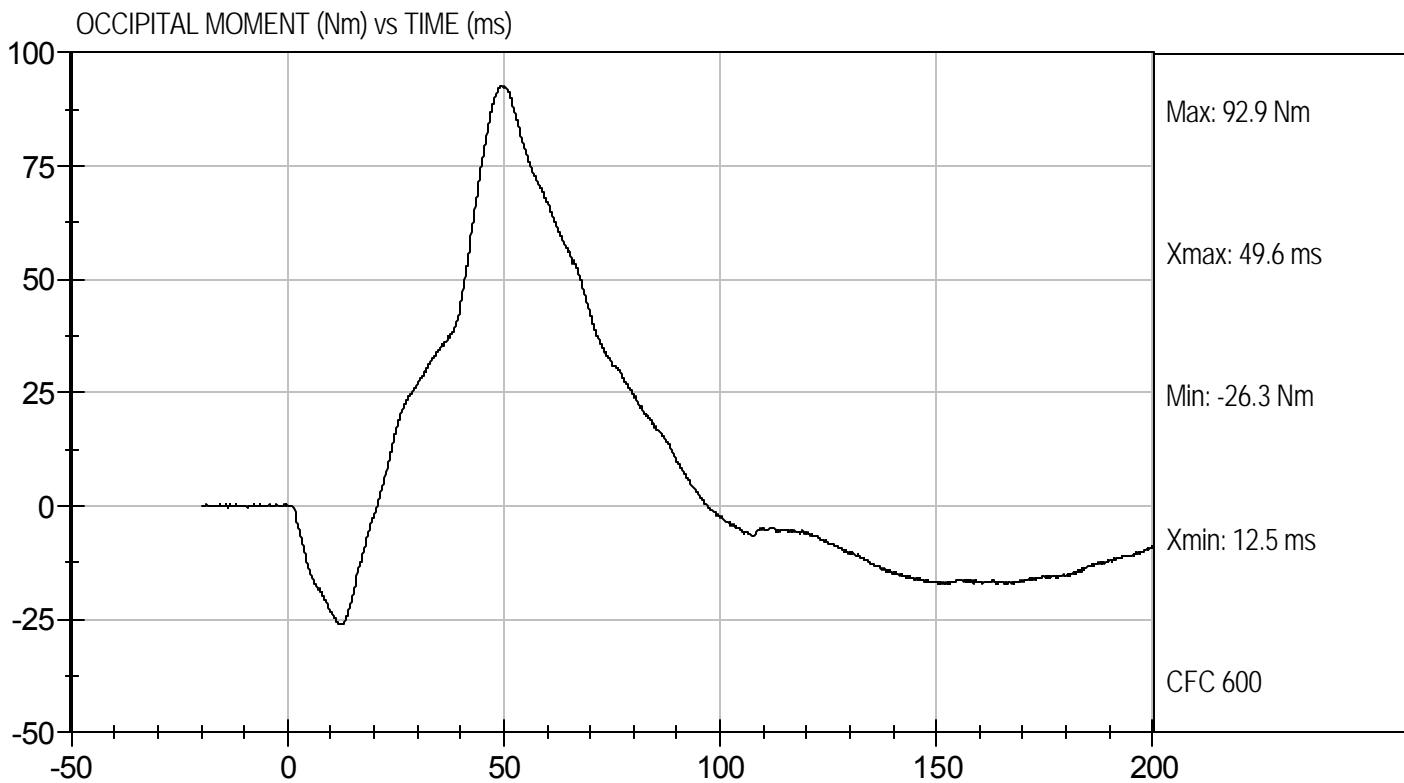
Test Date: 5/3/12
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D121612

Test Date: 5/3/12
Velocity: 23.15 ft/s, 7.06 m/s



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

ATD Serial No: 036

Test I.D.: D121613

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	50	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.61	Pass
	20 ms	G's	14.00 to 19.00	14.85	Pass
	30 ms	G's	11.00 to 16.00	12.37	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	45.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	87.0	Pass
	Time	ms	72.0 to 82.0	79.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	158.3	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-55.9	Pass
	Time	ms	65.0 to 79.0	73.1	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.5	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

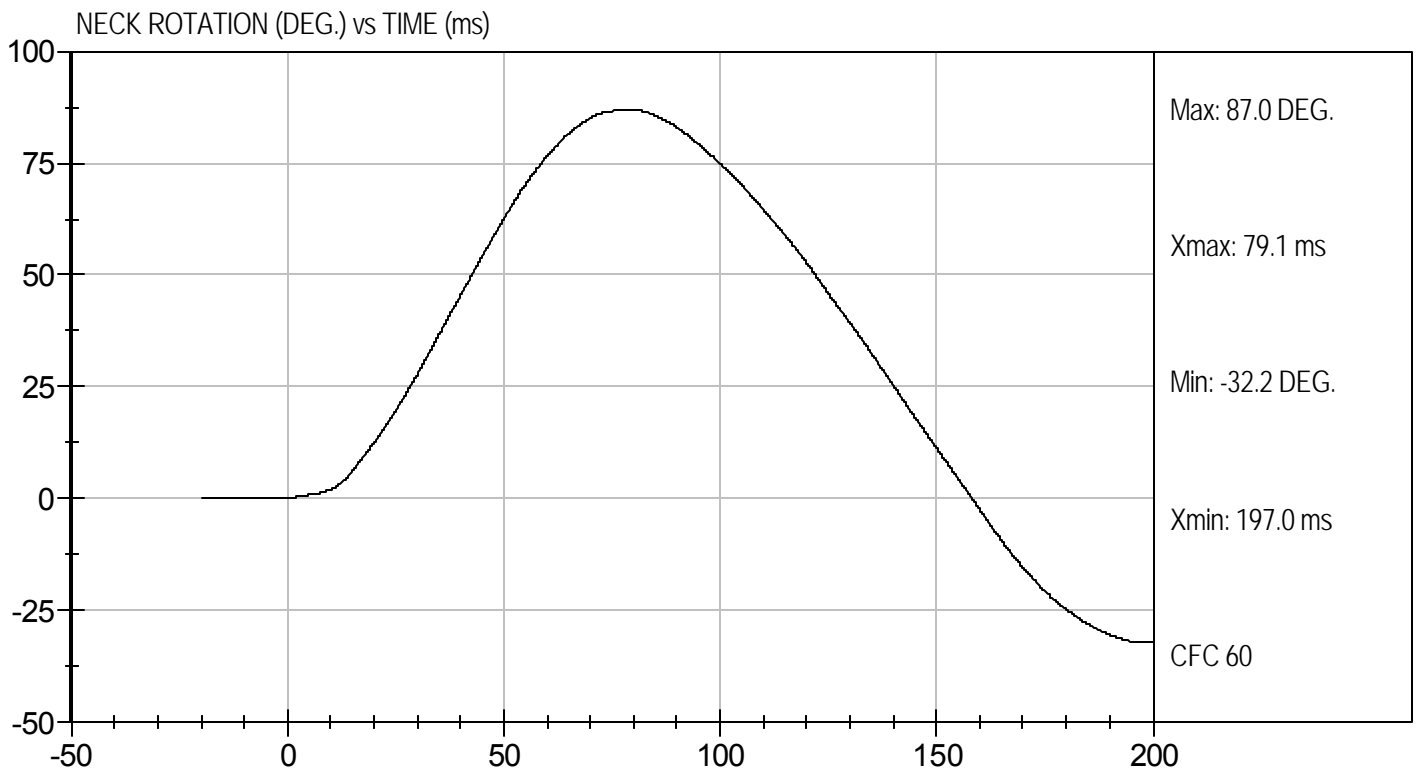
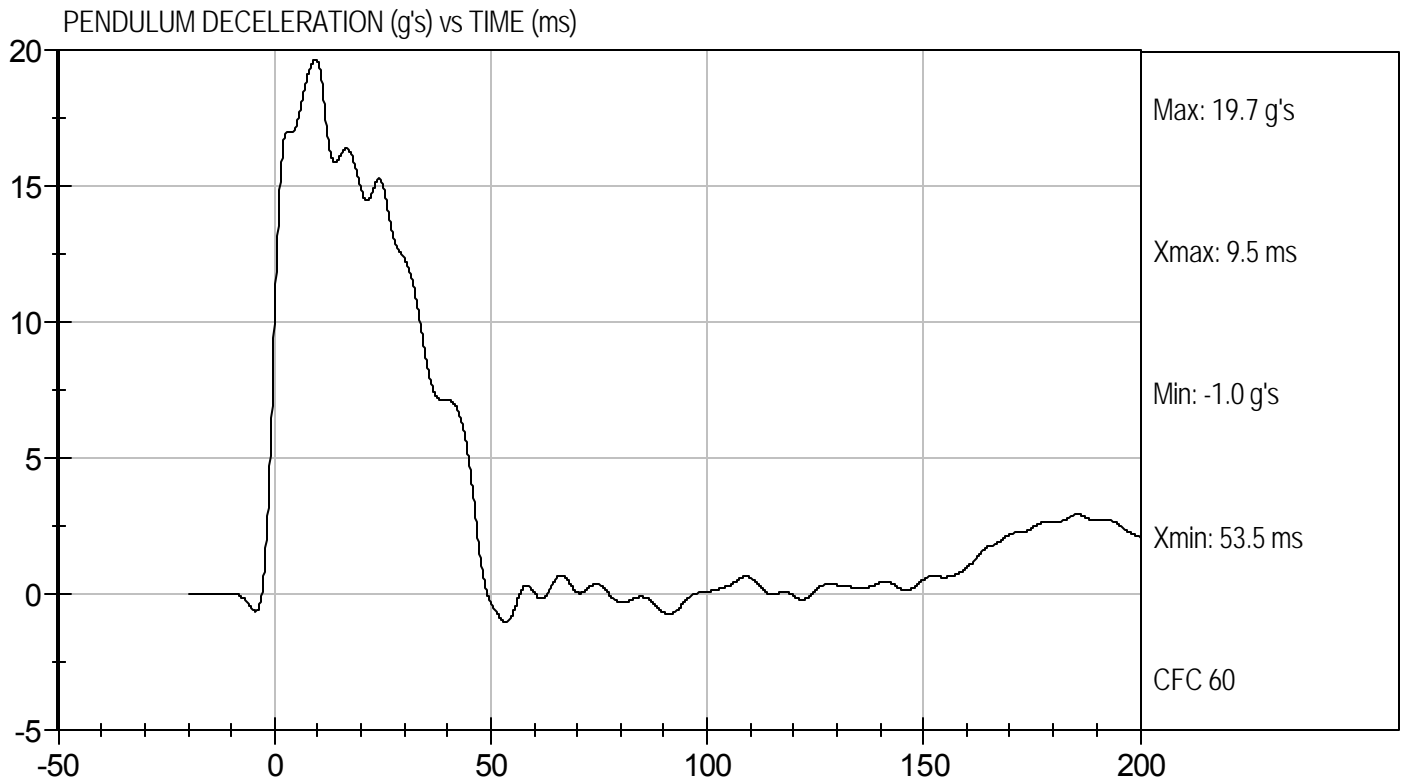
5/3/12
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D121613

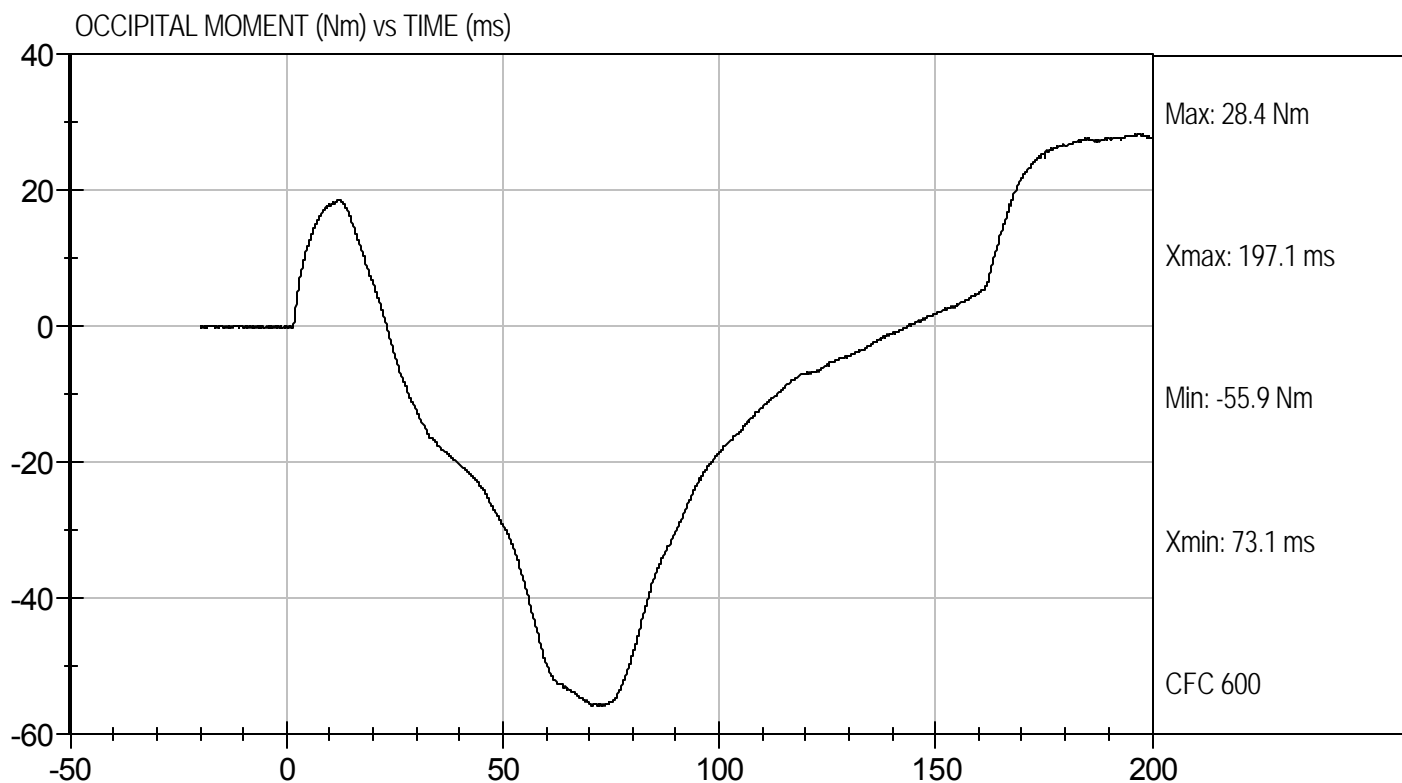
Test Date: 5/3/12
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D121613

Test Date: 5/3/12
Velocity: 20.08 ft/s, 6.12 m/s



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

ATD Serial No: 036

Test I.D: D121614

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,369	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.70	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

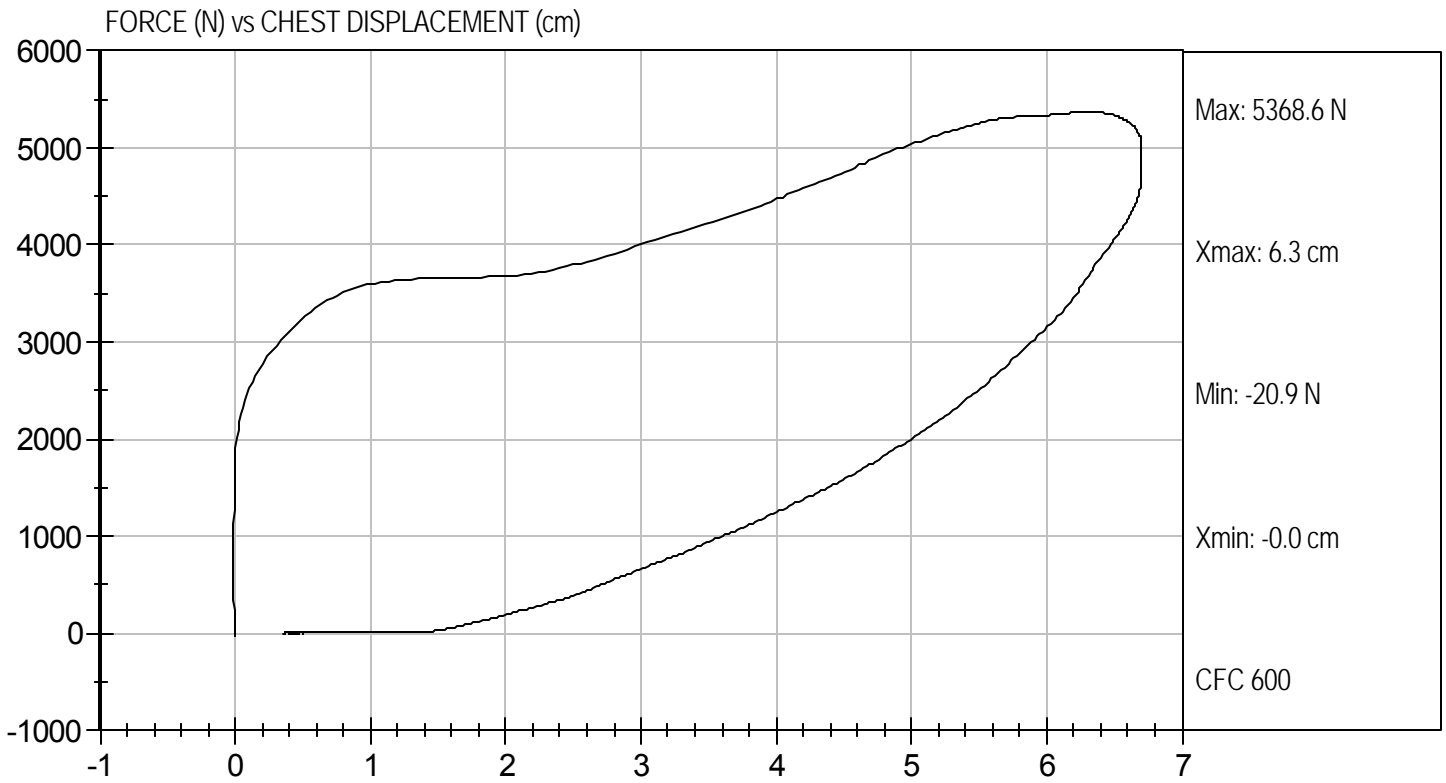
5/3/12
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D121614

Test Date: 5/3/12
Velocity: 21.93 ft/s, 6.68 m/s



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

ATD Serial No: 036

Test I.D: D121615

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	4,838	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

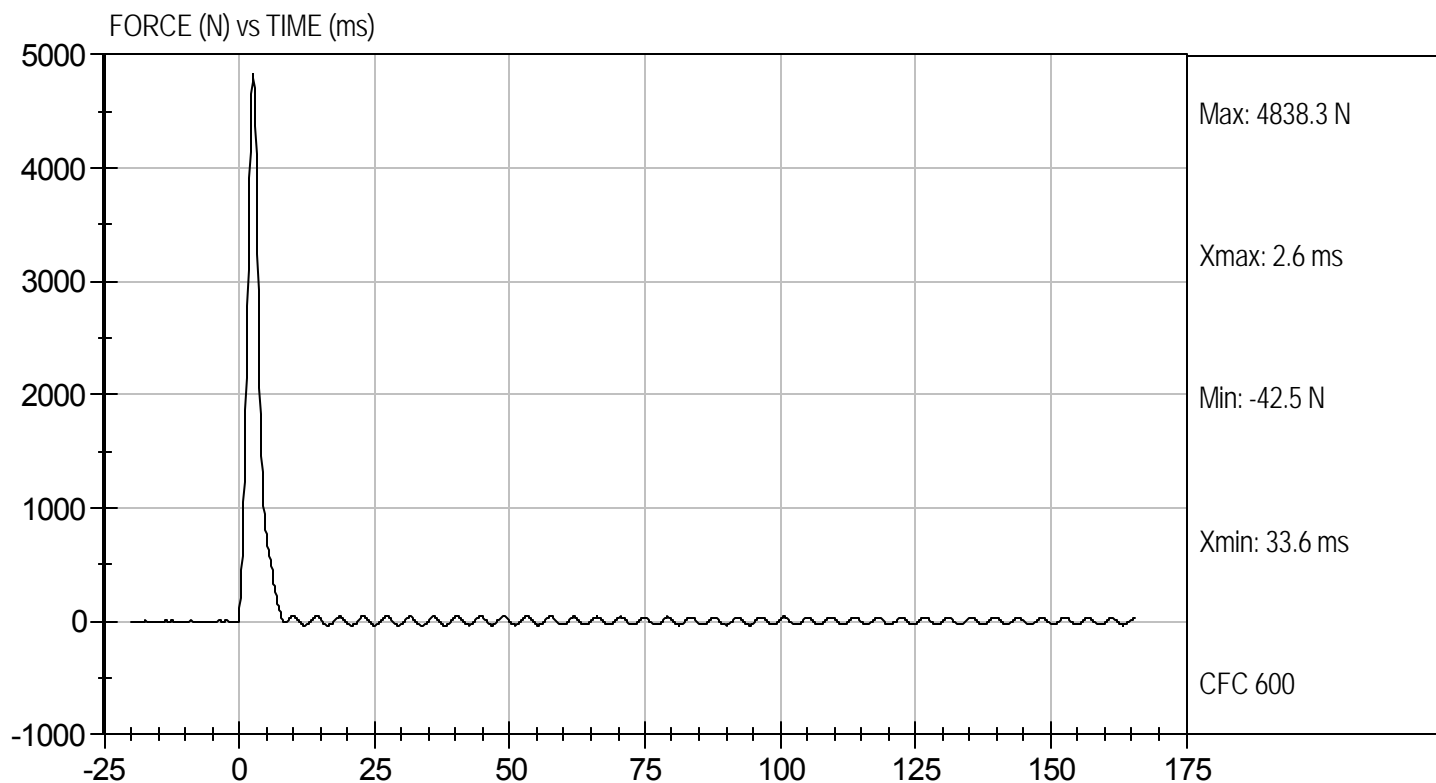
5/3/12
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D121615

Test Date: 5/3/12
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 036

Test I.D: D121616

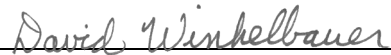
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	4,957	Pass
Overall Test Results				Pass



Laboratory Technician

5/3/12

Test Date

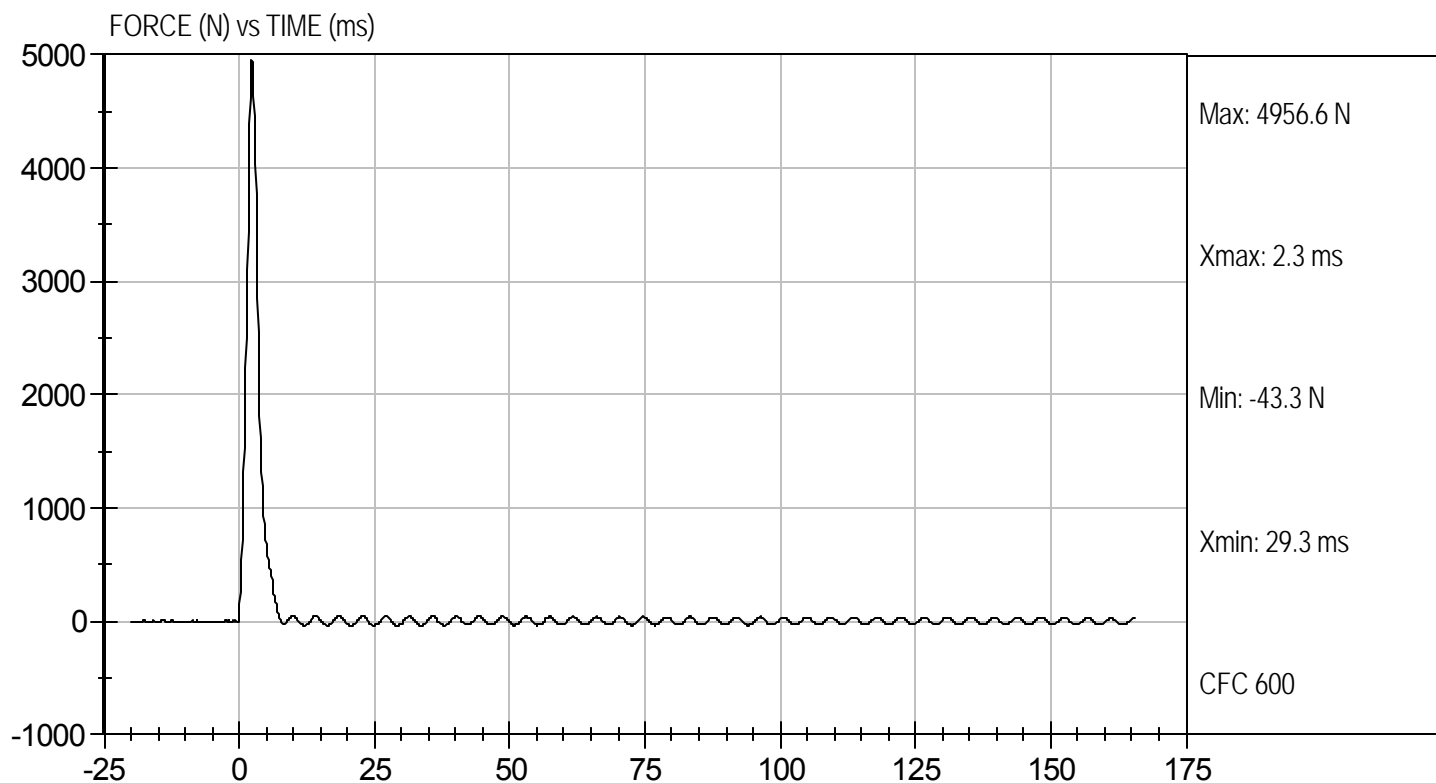


Approved By



Test Desc: Left Knee
Component ID: D121616

Test Date: 5/3/12
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 036

Test I.D: D121610

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	50	50	Pass
Rotation Rate	deg/s	5.0 -10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	91.9	75.2	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	44.0	45.3	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

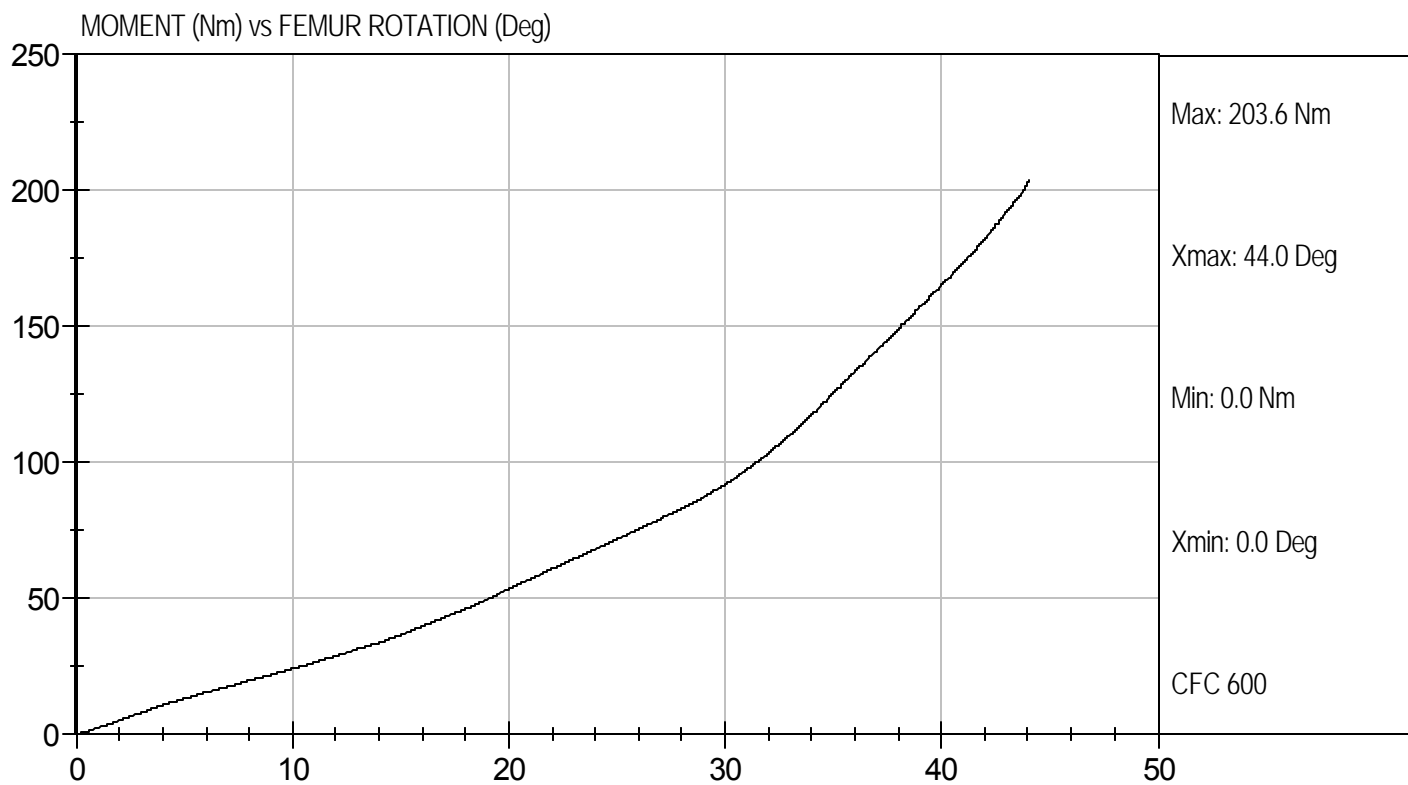
5/3/12
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D121619

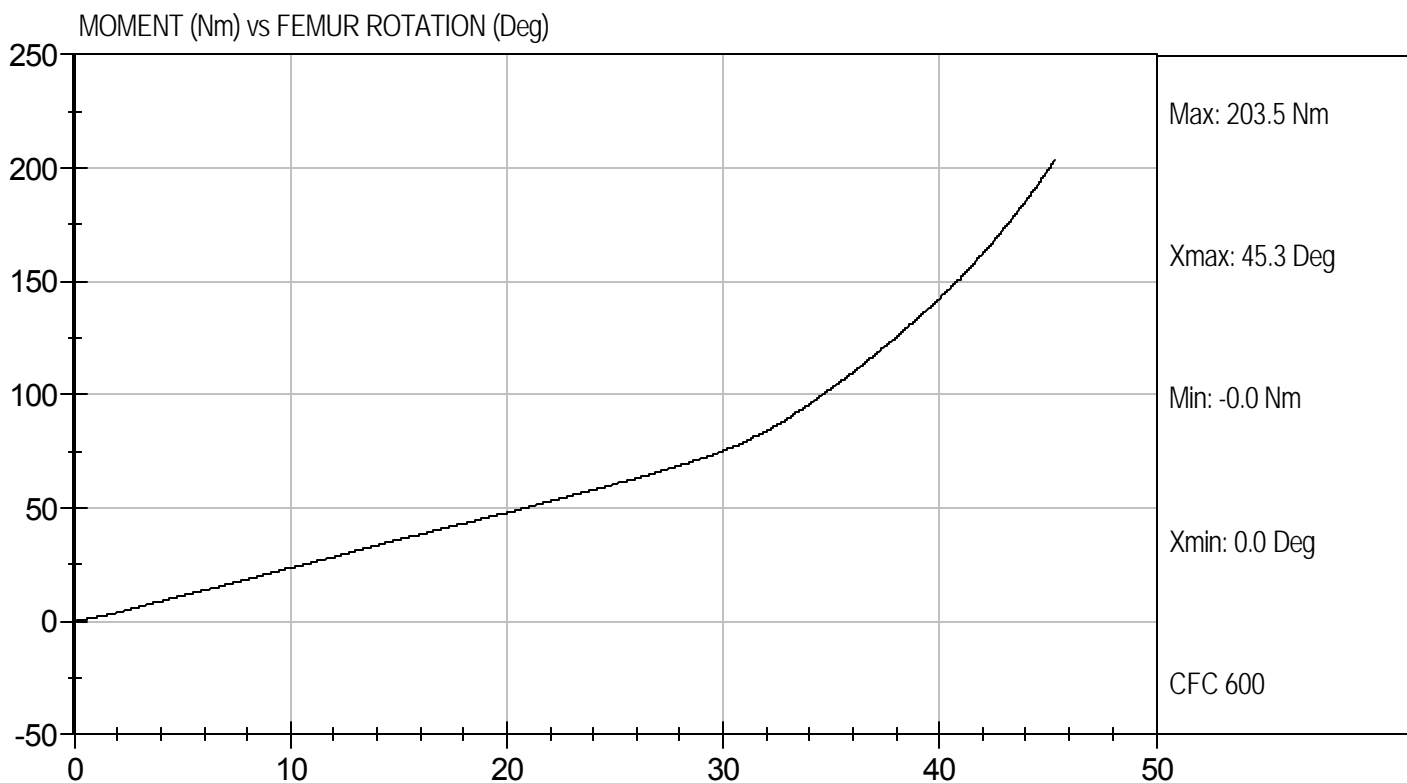
Test Date: 5/3/12
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D121610

Test Date: 5/3/12
Velocity: 0 ft/s, 0.00 m/s



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

ATD Serial No: 036

Test ID: D121881

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	225 - 275	231	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-7.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

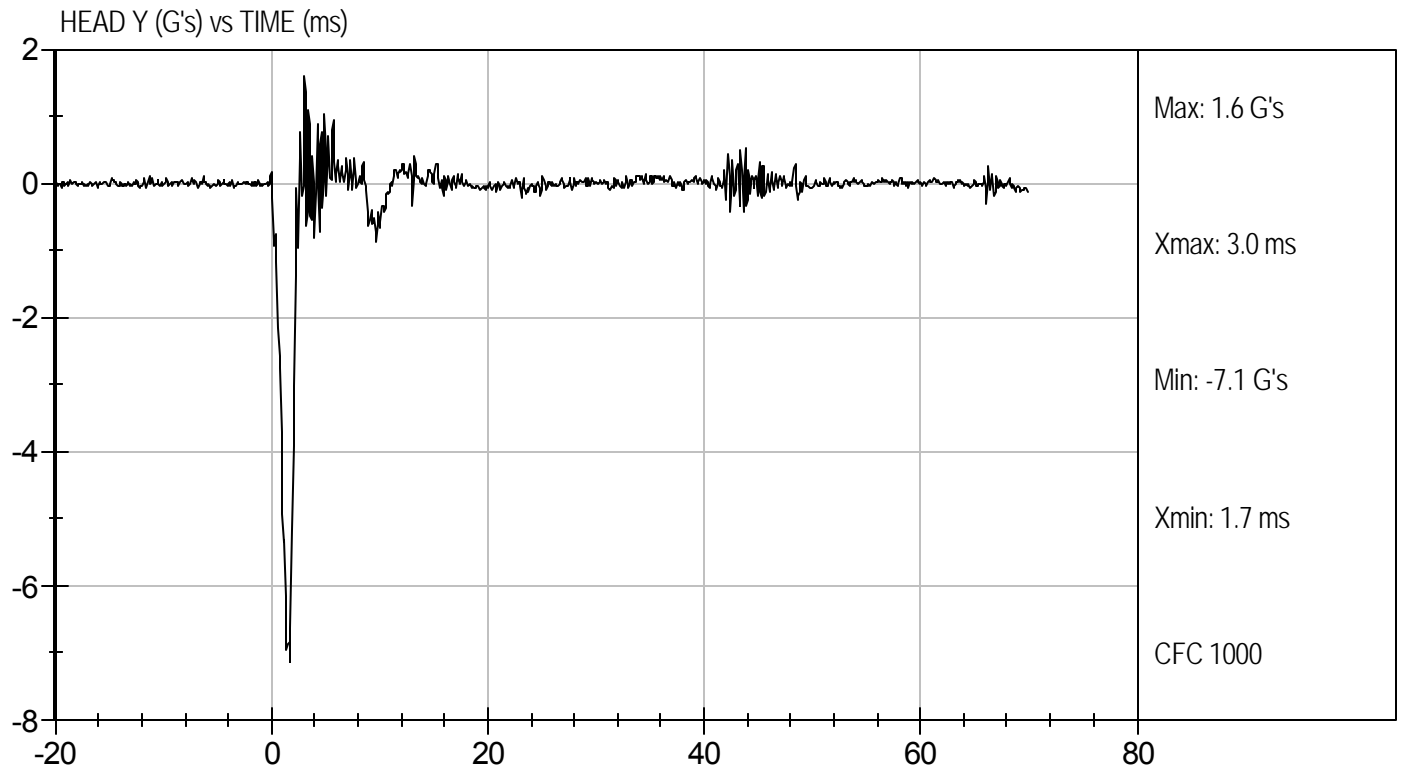
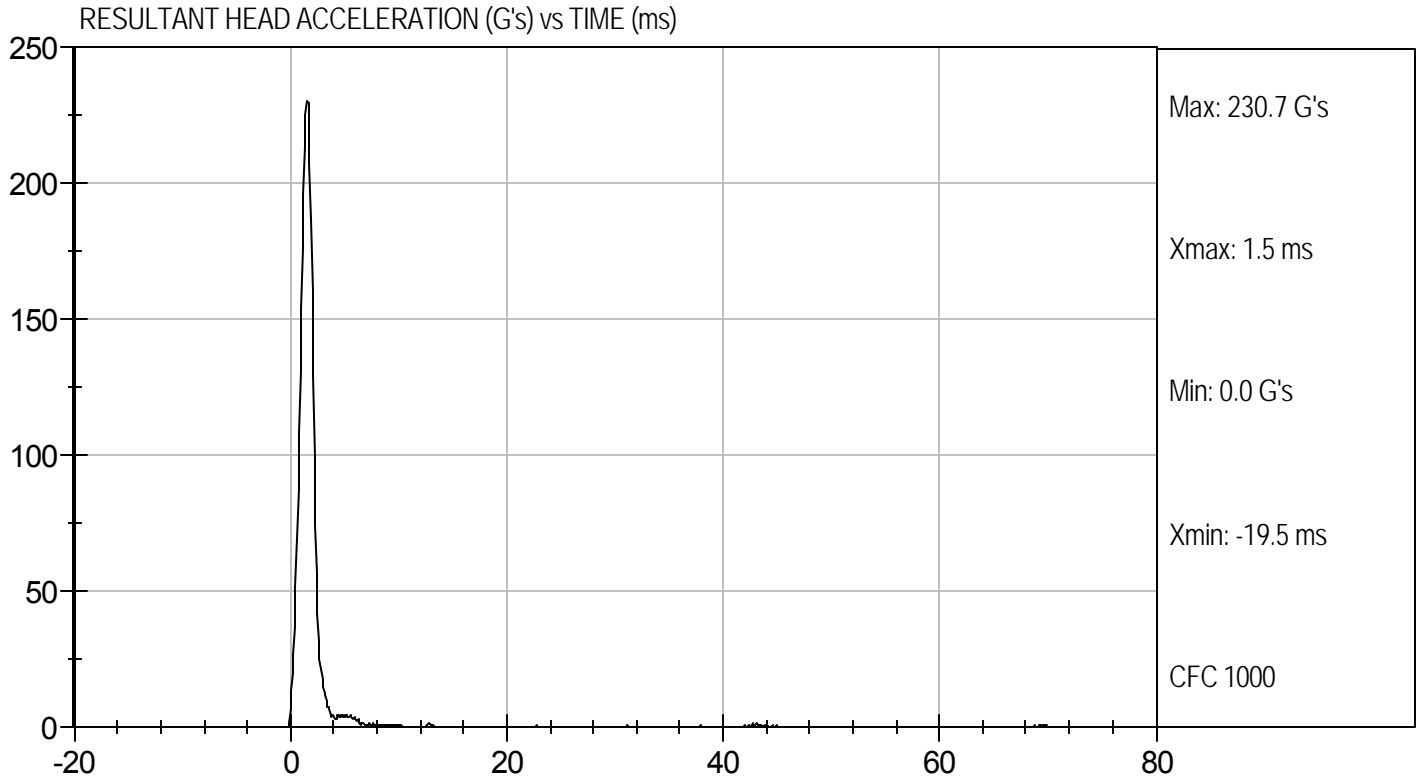
5/21/12
 Test Date

David Winkelbauer
 Approved By



Test Desc: Head Drop
Component ID: D121881

Test Date: 5/21/12
Velocity: 0 ft/s, 0 m/s



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

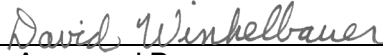
ATD Serial No: 036

Test I.D.: D121882

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.55	Pass
	20 ms	G's	17.60 to 22.60	18.24	Pass
	30 ms	G's	12.50 to 18.50	12.77	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	12.7	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	38.8	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	70.3	Pass
	Time	ms	57.0 to 64.0	59.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	119.3	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	92.3	Pass
	Time	ms	47.0 to 58.0	52.4	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.9	Pass
Overall Test Results					Pass


 Laboratory Technician

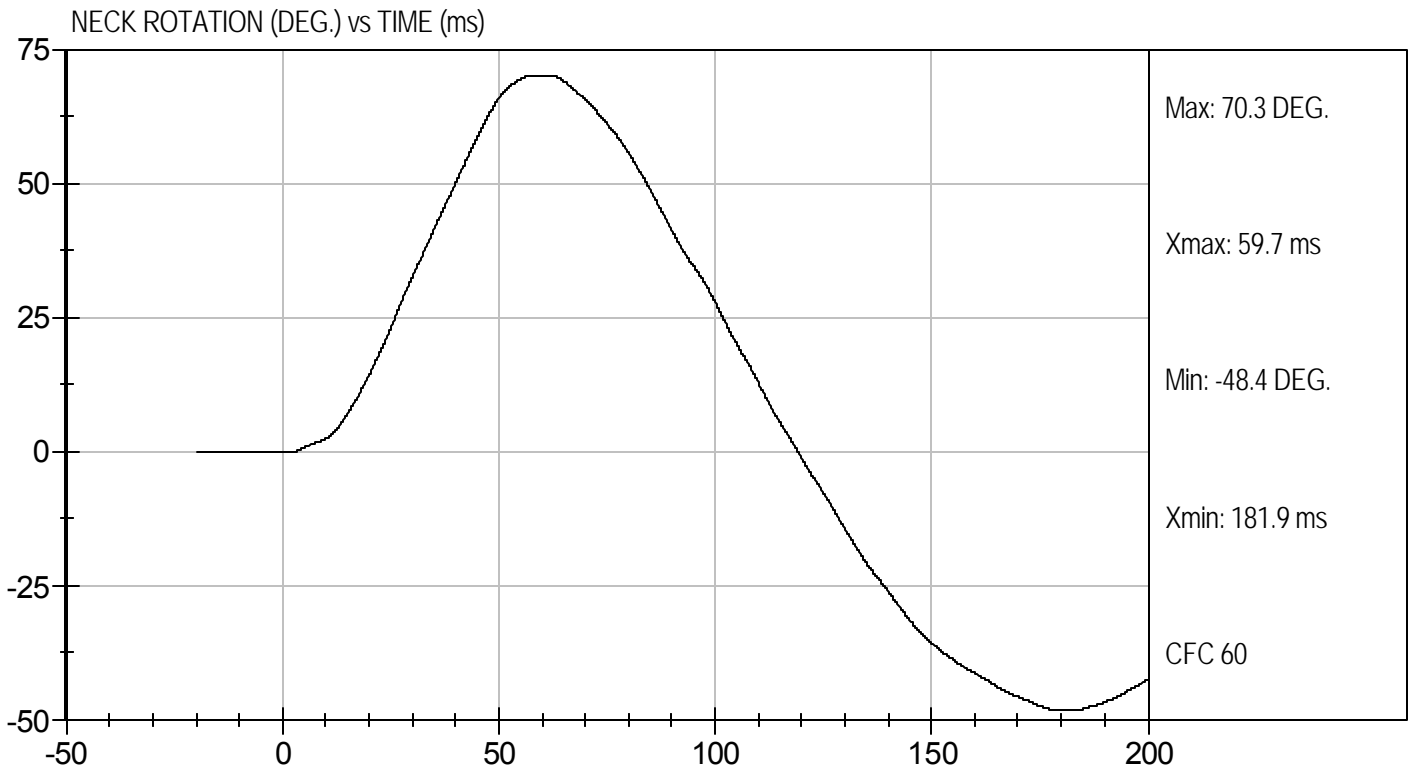
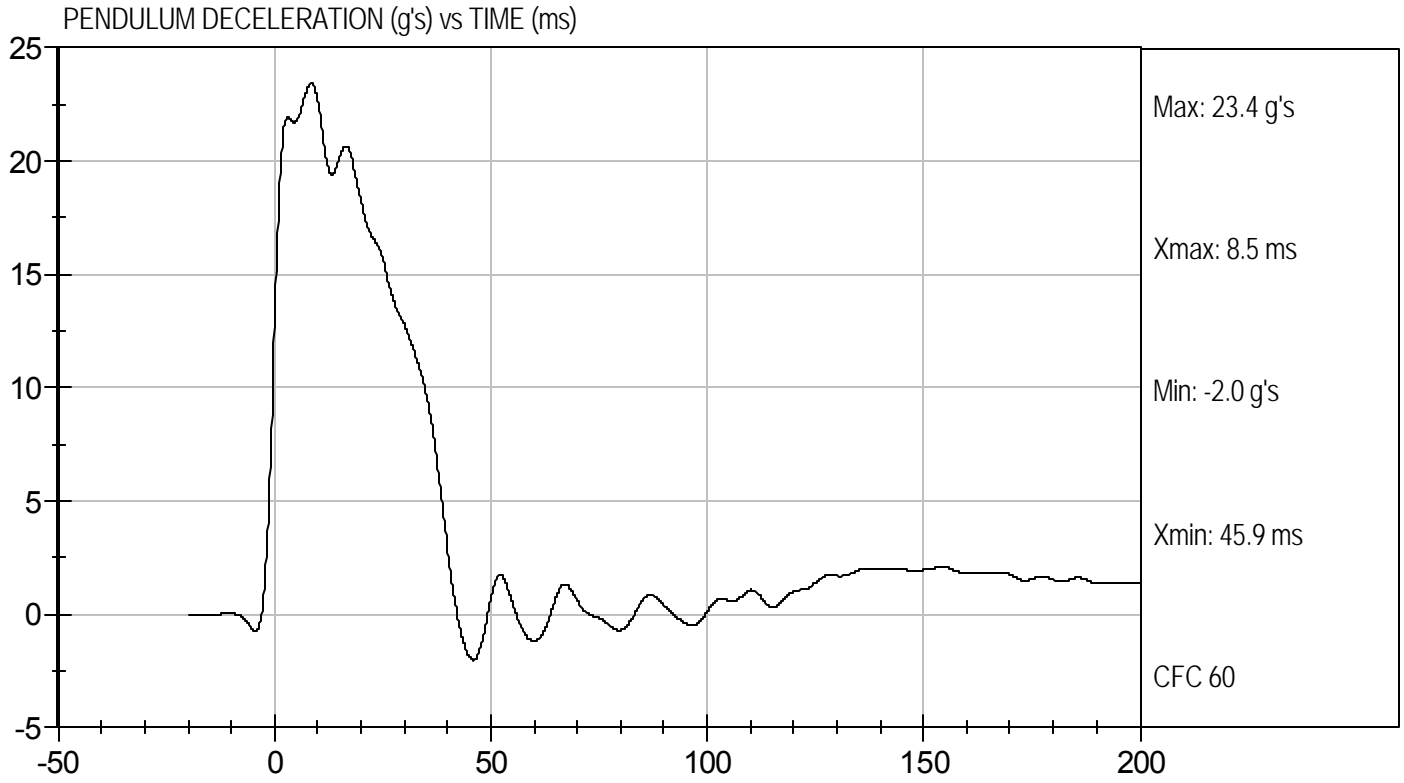
5/21/12
 Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D121882

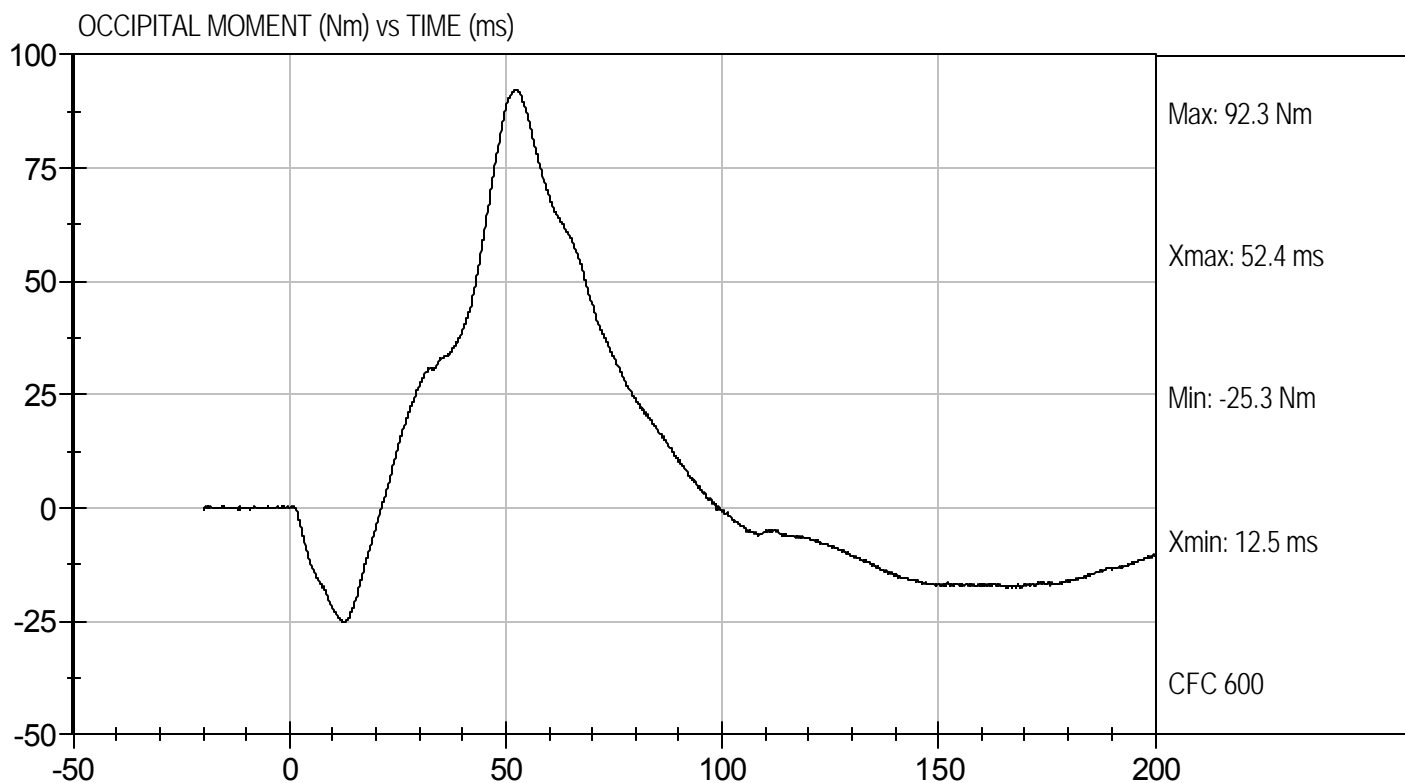
Test Date: 5/21/12
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D121882

Test Date: 5/21/12
Velocity: 23.15 ft/s, 7.06 m/s



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

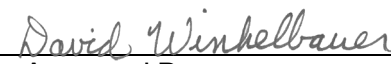
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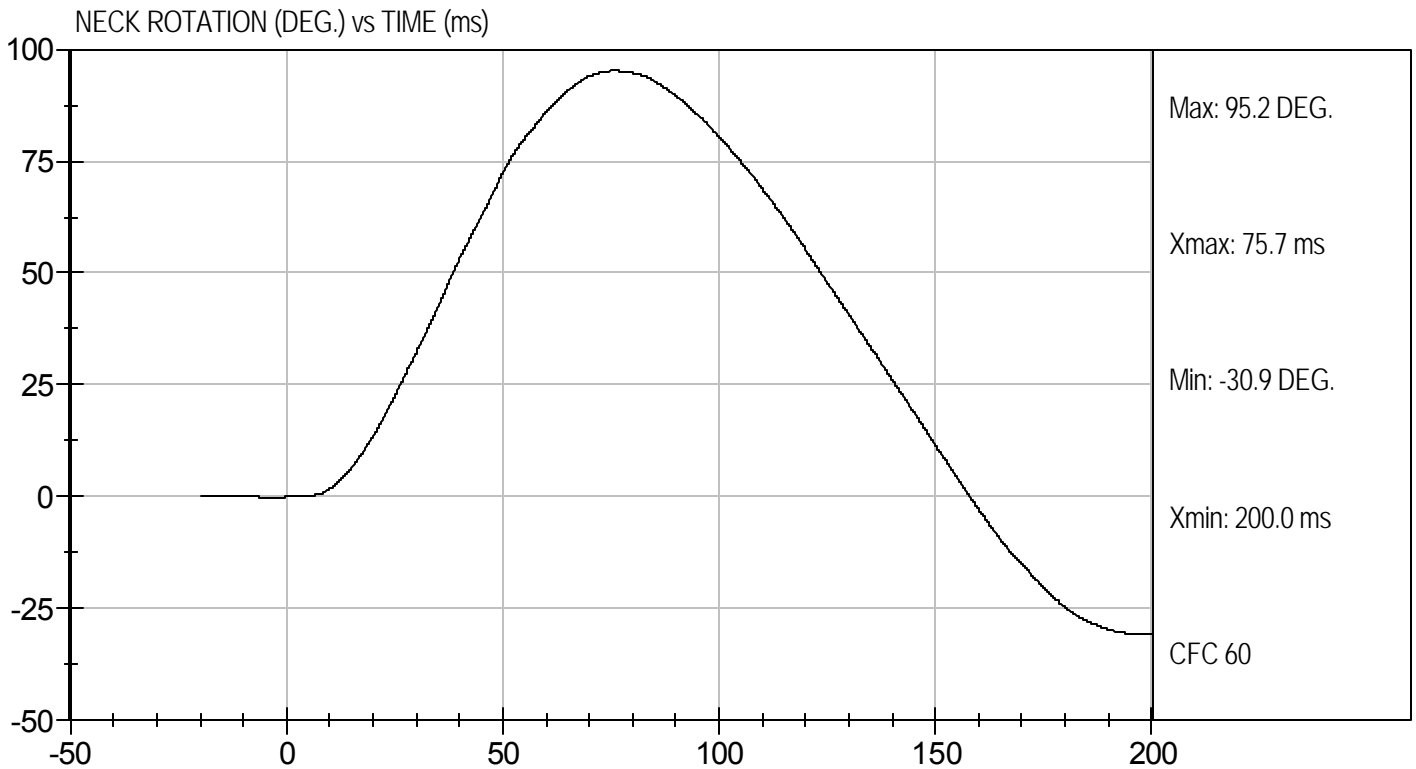
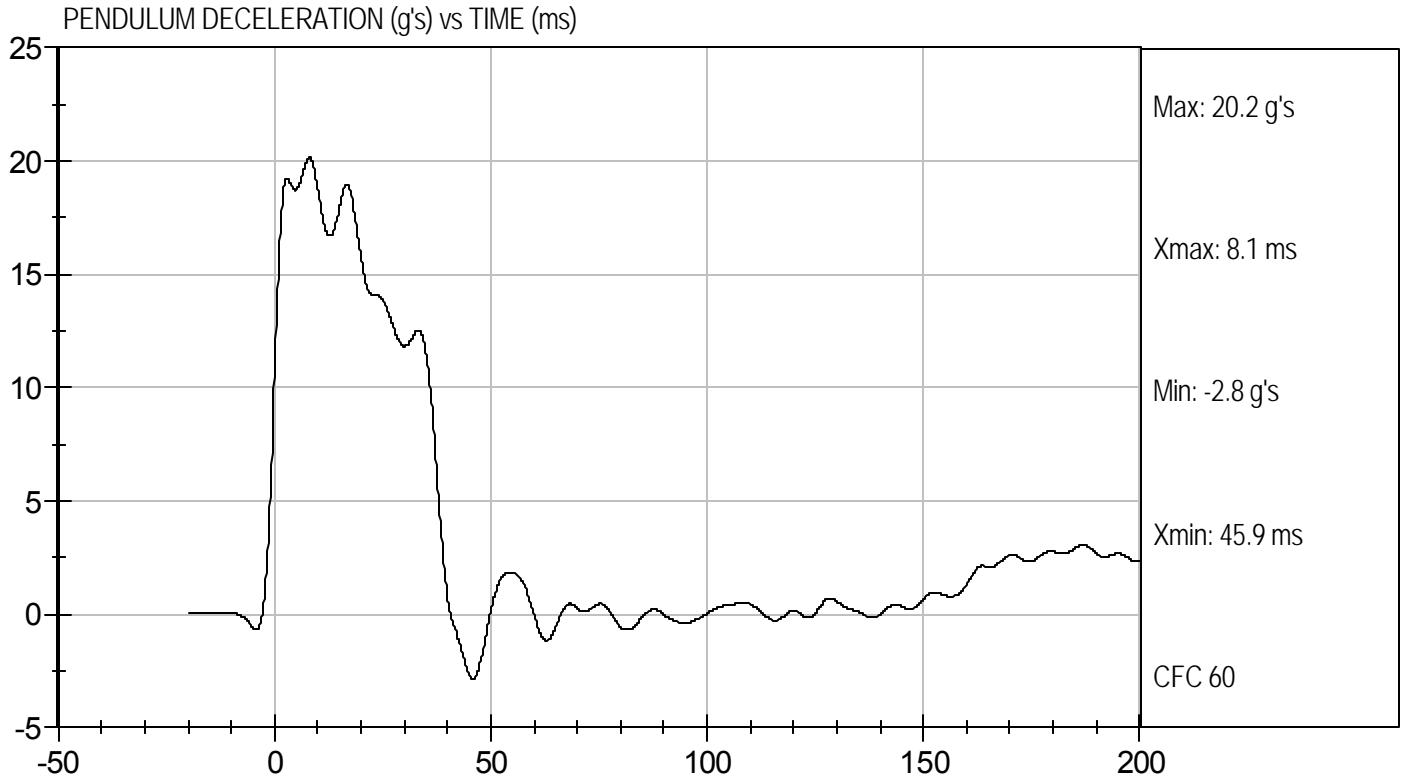
Test I.D.: D121883

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.78	Pass
	20 ms	G's	14.00 to 19.00	15.59	Pass
	30 ms	G's	11.00 to 16.00	11.82	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.5	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	95.2	Pass
	Time	ms	72.0 to 82.0	75.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	158.1	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.7	Pass
	Time	ms	65.0 to 79.0	70.0	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	142.0	Pass
Overall Test Results					Pass


Laboratory Technician

5/21/12
Test Date

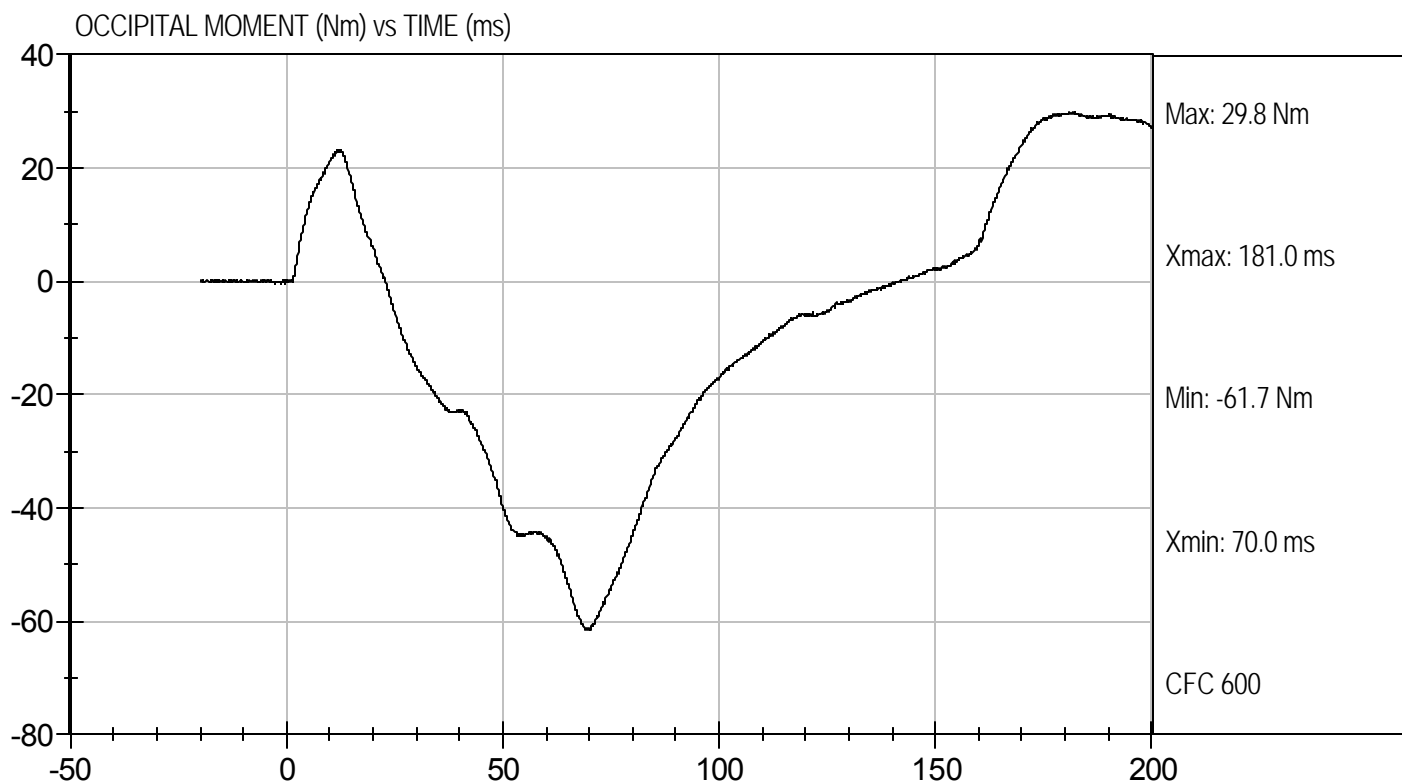

Approved By





Test Desc: Neck Extension
Component ID: D121883

Test Date: 5/21/12
Velocity: 20.1 ft/s, 6.13 m/s



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

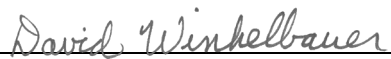
ATD Serial No: 036

Test I.D: D121884

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	38	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,608	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.56	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Overall Test Results				Pass


Laboratory Technician

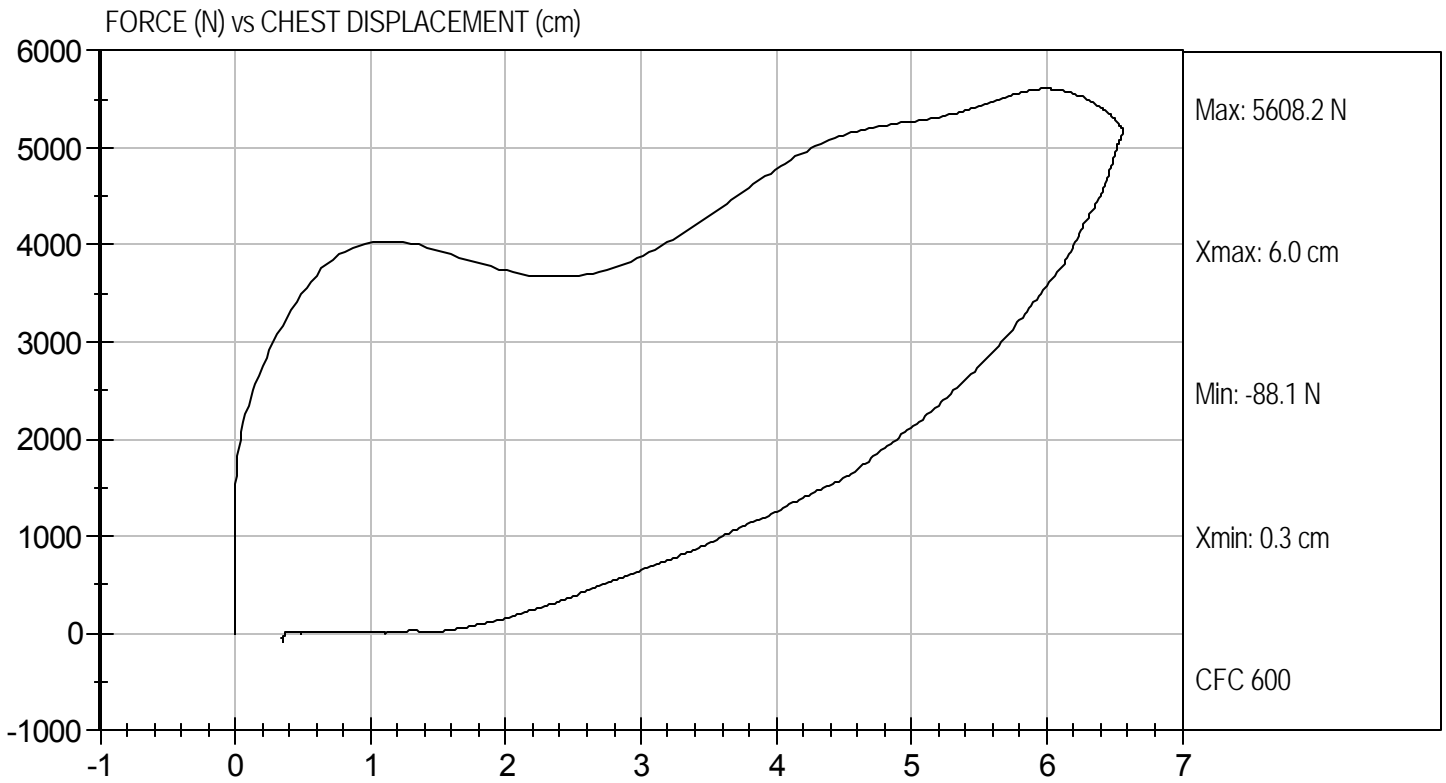
5/22/12
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D121884

Test Date: 5/22/12
Velocity: 22.22 ft/s, 6.77 m/s



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

ATD Serial No: 036

Test I.D: D121885

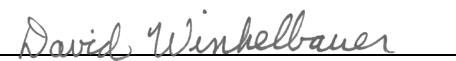
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	4,724	Pass
Overall Test Results				Pass



 Laboratory Technician

5/21/12

 Test Date

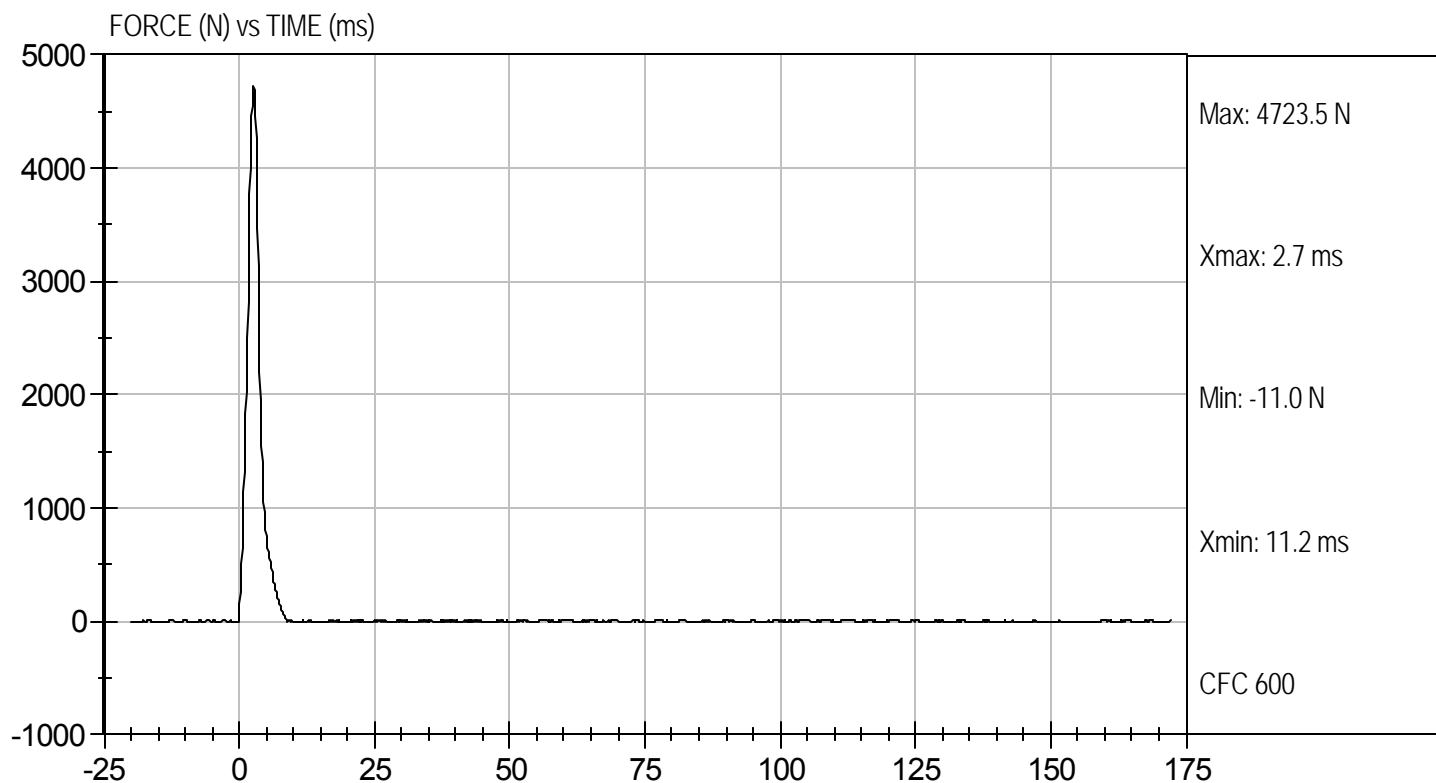


 Approved By



Test Desc: Right Knee
Component ID: D121885

Test Date: 5/21/12
Velocity: 6.94 ft/s, 2.12 m/s



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

ATD Serial No: 036

Test I.D: D121886

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	4,848	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

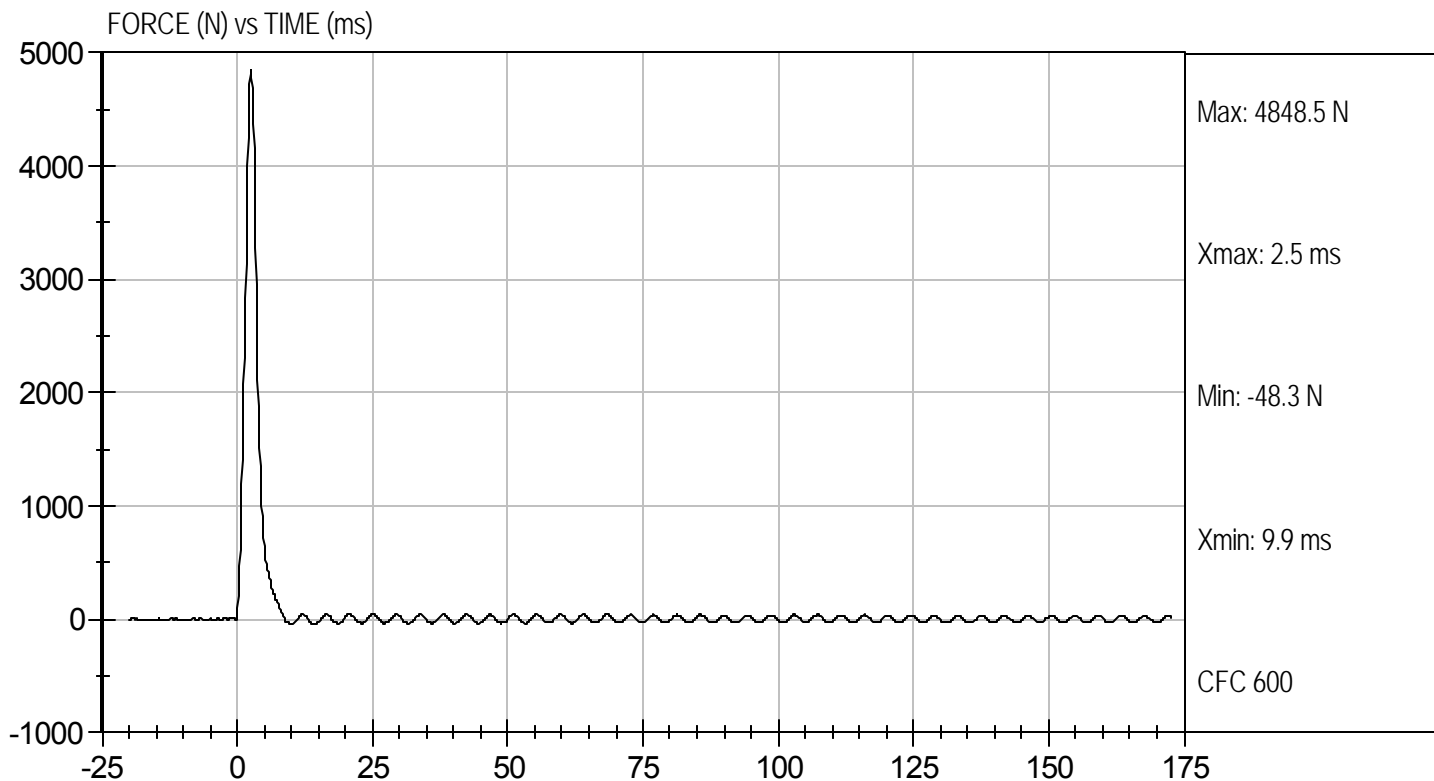
5/21/12
 Test Date

David Winkelbauer
 Approved By



Test Desc: Left Knee
Component ID: D121886

Test Date: 5/21/12
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 036

Test I.D: D121880

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.3	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	39	39	Pass
Rotation Rate	deg/s	5.0 -10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	93.5	76.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	43.9	45.2	Pass
Overall Test Results					Pass

Jessica Gall
Laboratory Technician

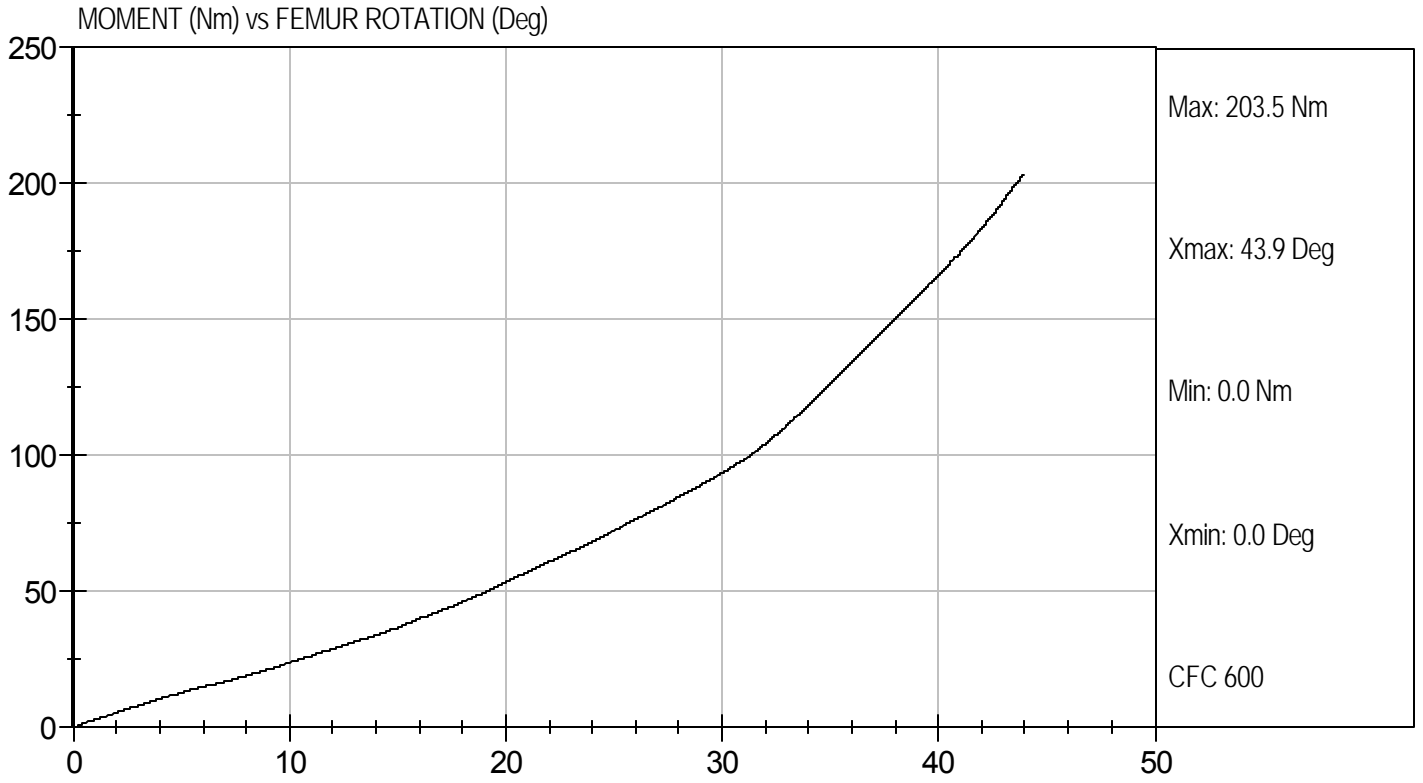
5/21/12
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D121889

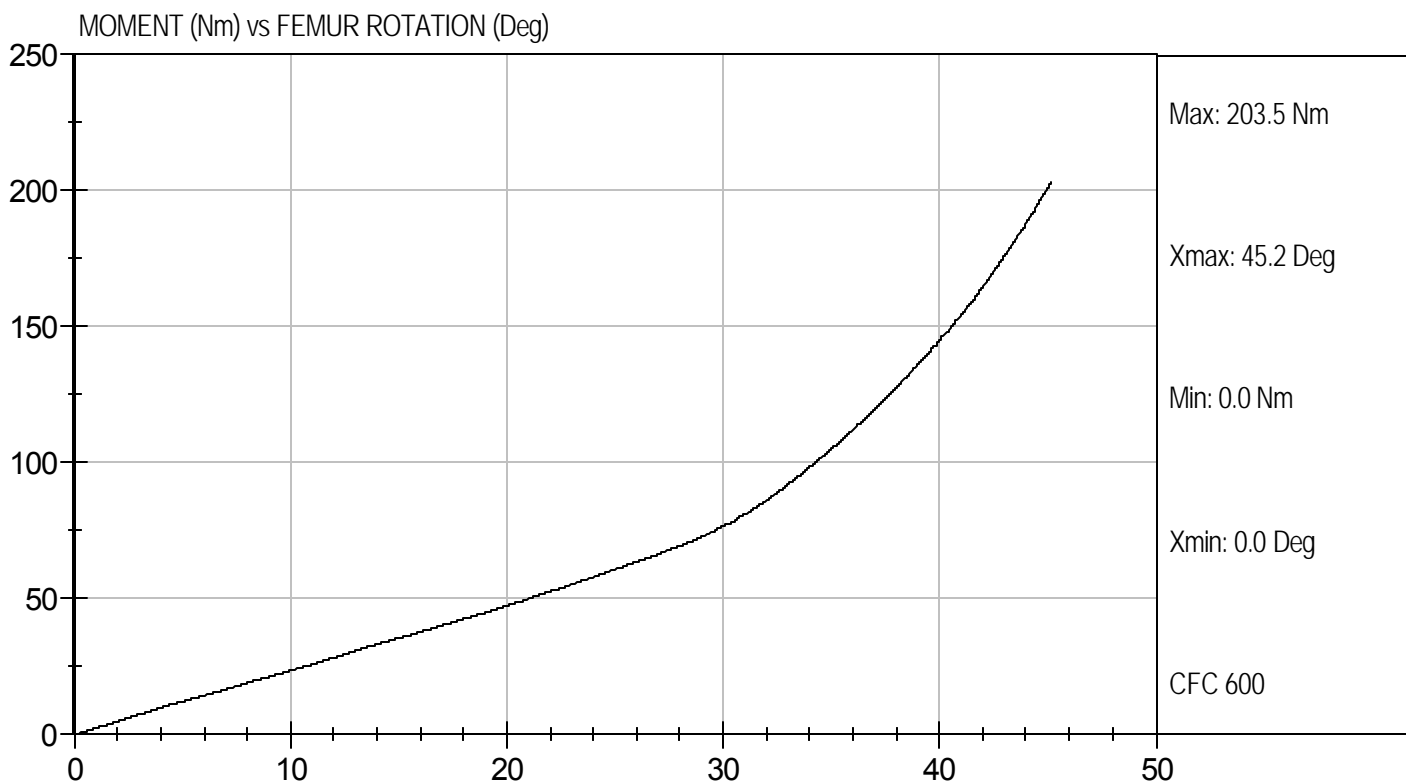
Test Date: 5/21/12
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D121880

Test Date: 5/21/12
Velocity: 0 ft/s, 0.00 m/s



**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
P	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: D121621

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Peak Resultant Acceleration	G's	250 to 300	270	Pass
Peak Lateral Acceleration	G's	+/- 15	-7.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

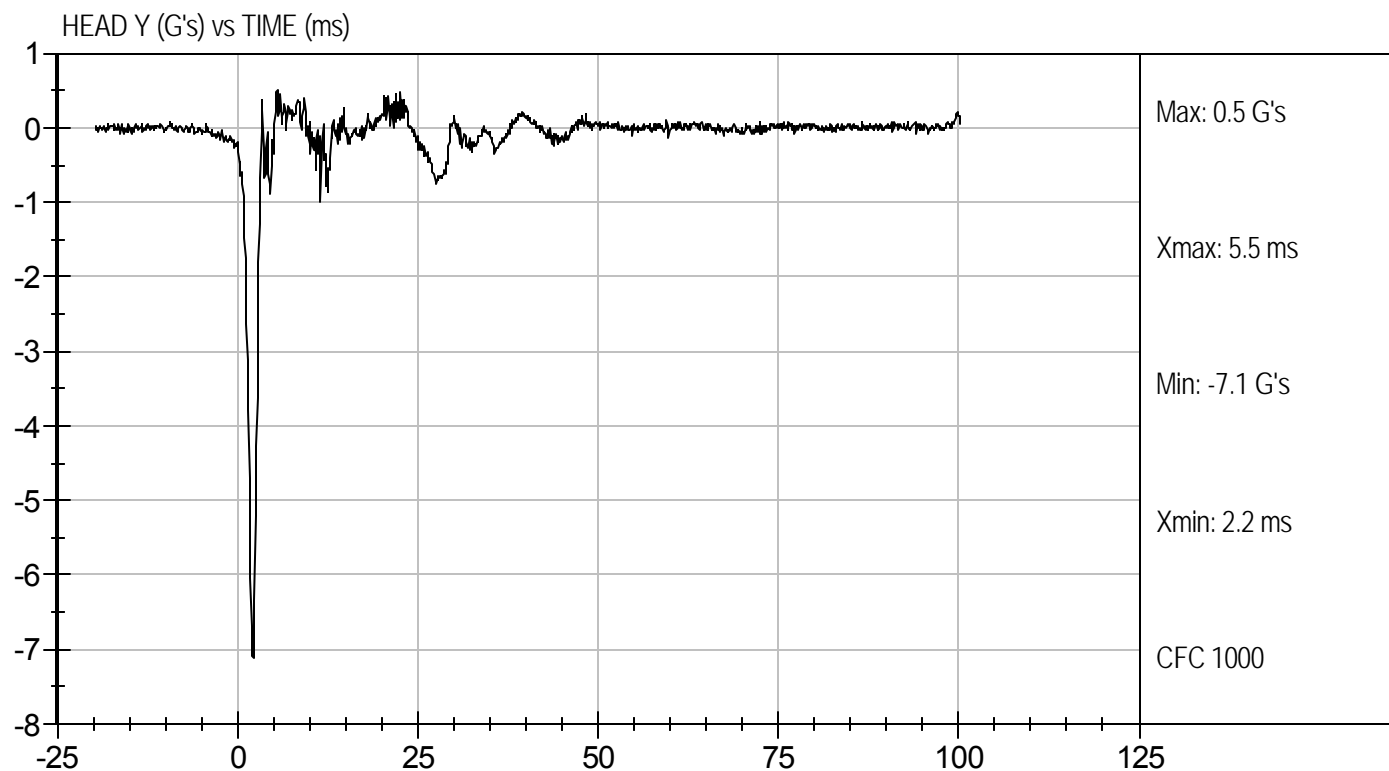
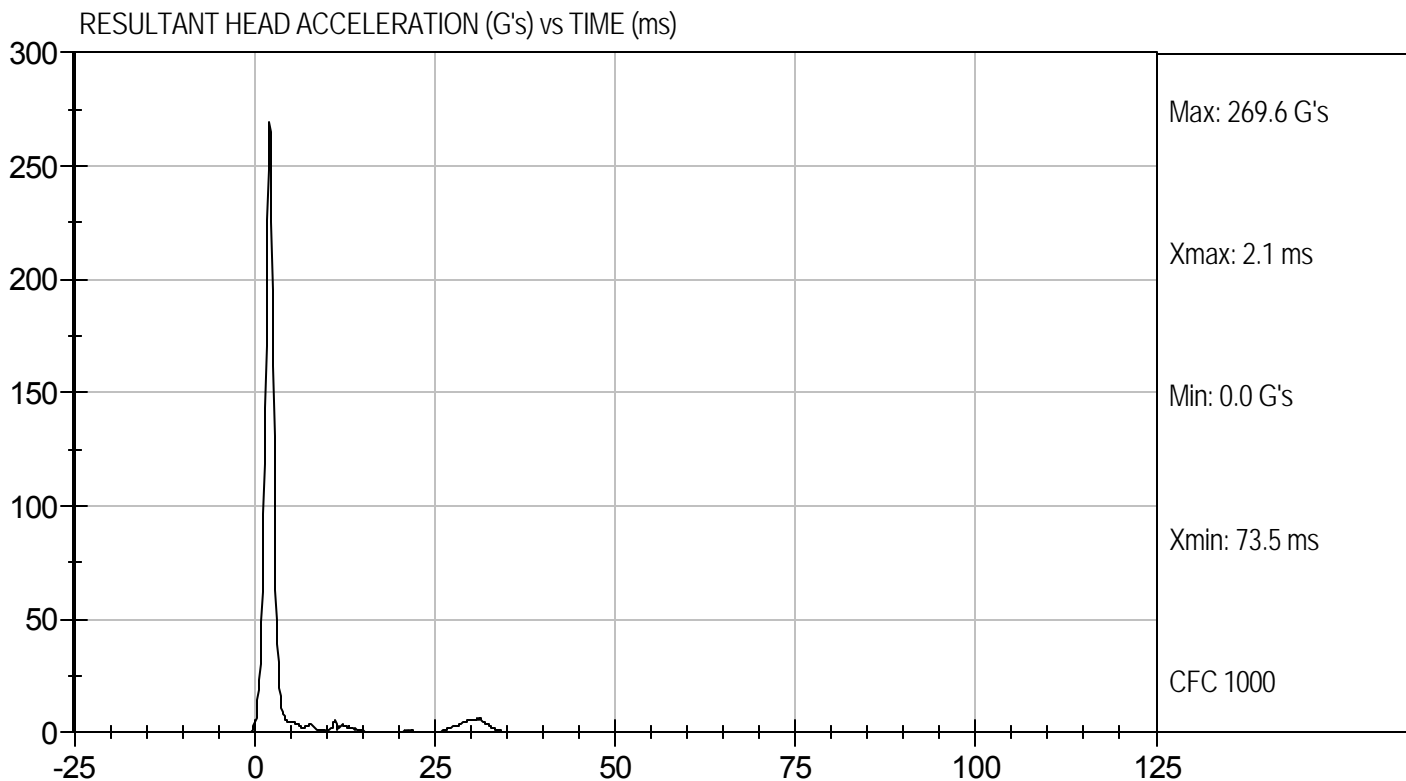
5/3/12
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D121621

Test Date: 5/3/12
Velocity: 0 ft/s, 0 m/s



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D.: D121622

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Speed		m/s	6.89 to 7.13	6.96	Pass
Pendulum Pulse	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.6	Pass
	30 ms	m/s	5.8 to 7.0	6.3	Pass
D Plane Rotation	Max	deg	77 to 91	86	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	69	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	87	Pass
Overall Results					Pass

Jessica Hall
 Laboratory Technician

5/3/12
 Test Date

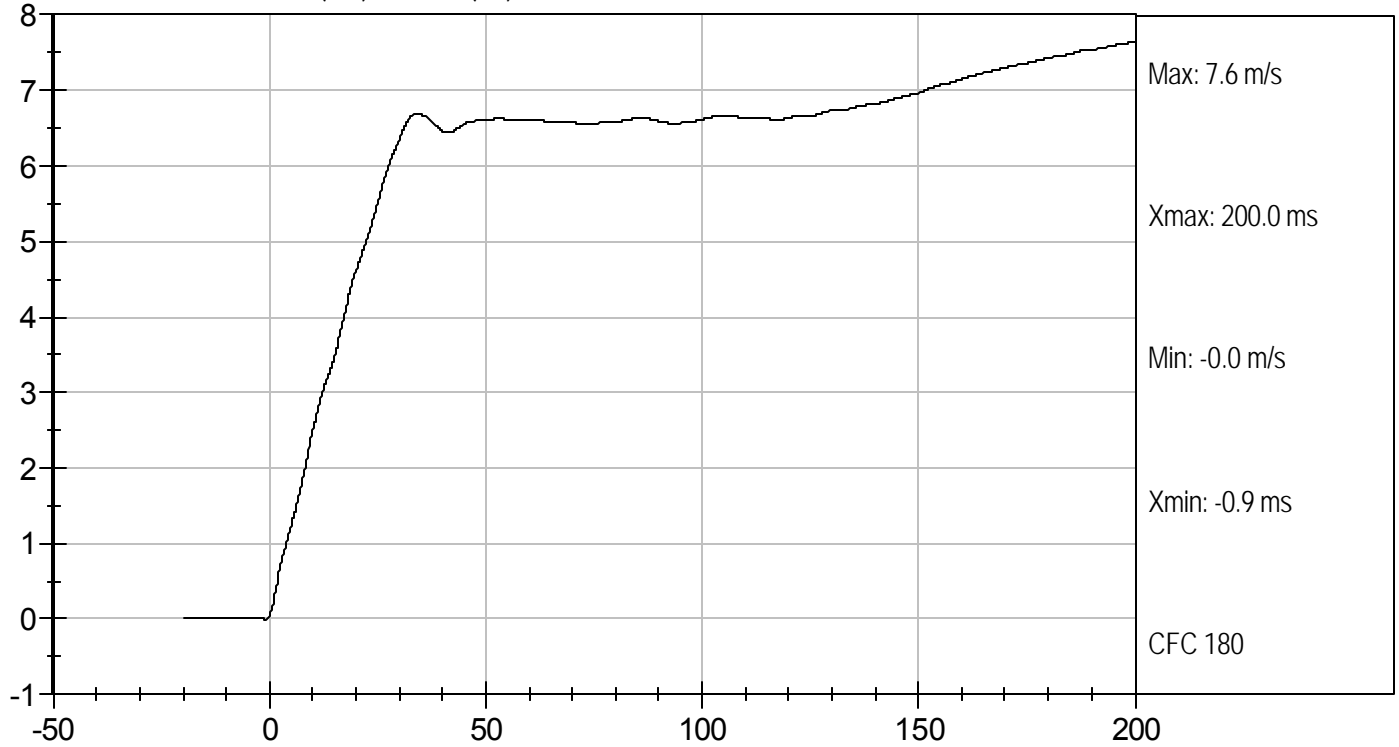
David Winkelbauer
 Approved By



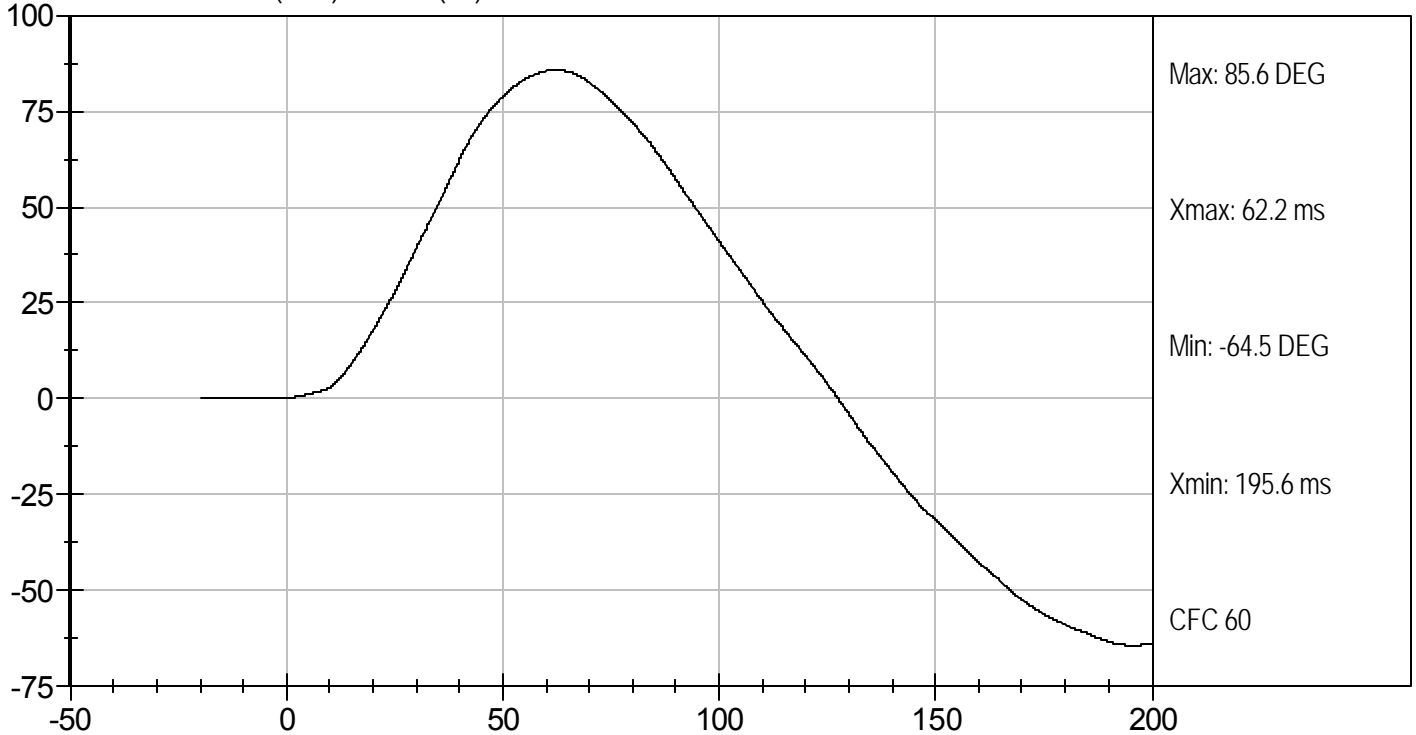
Test Desc: Neck Flexion
Component ID: D121622

Test Date: 5/3/12
Velocity: 22.83 ft/s, 6.96 m/s

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



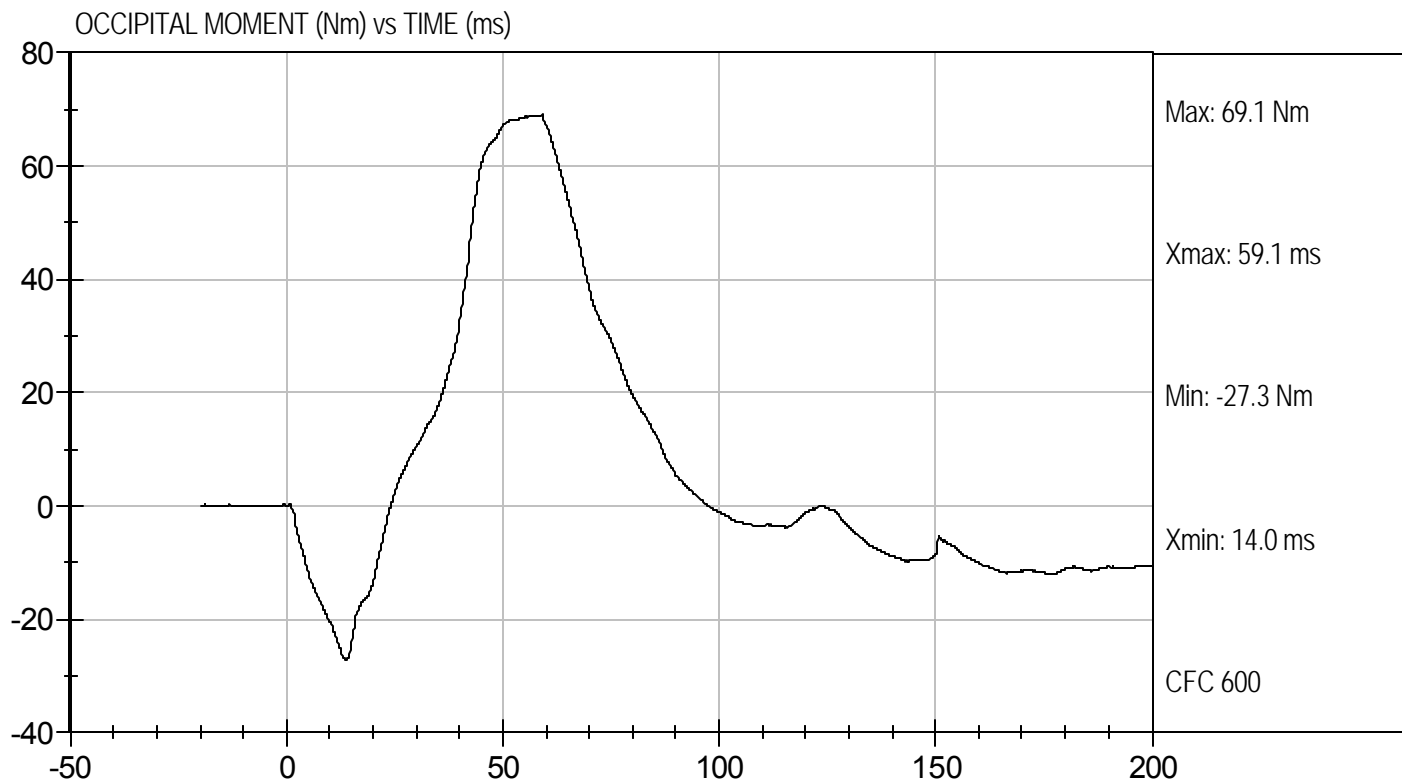
NECK ROTATION (DEG) vs TIME (ms)





Test Desc: Neck Flexion
Component ID: D121622

Test Date: 5/3/12
Velocity: 22.83 ft/s, 6.96 m/s




MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

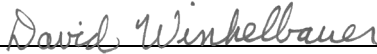
ATD Serial No: 634

Test I.D.: D121623

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.16	Pass
Pendulum Pulse	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.3	Pass
D Plane Rotation	Max	deg	99 to 114	105	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-62	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	96	Pass
Overall Results					Pass


 Laboratory Technician

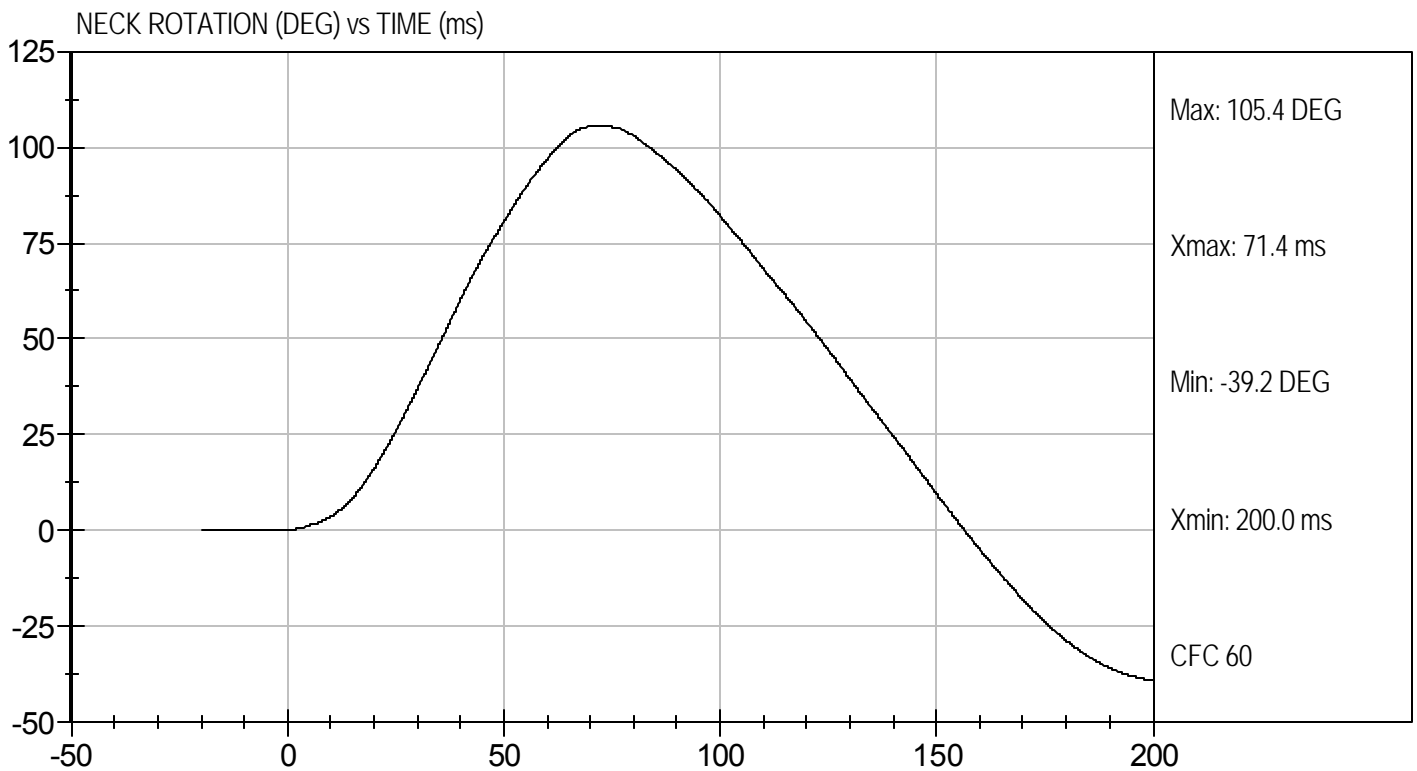
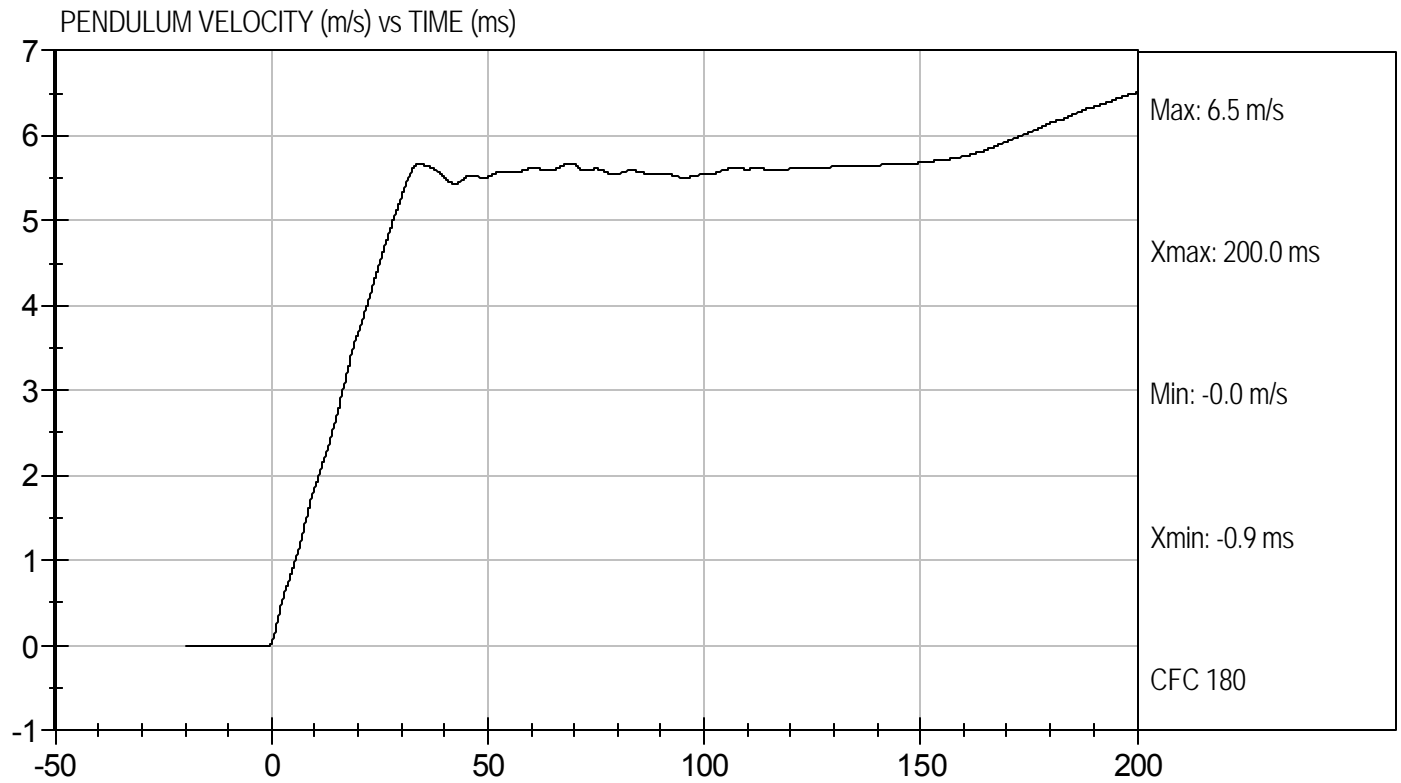
5/3/12
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D121623

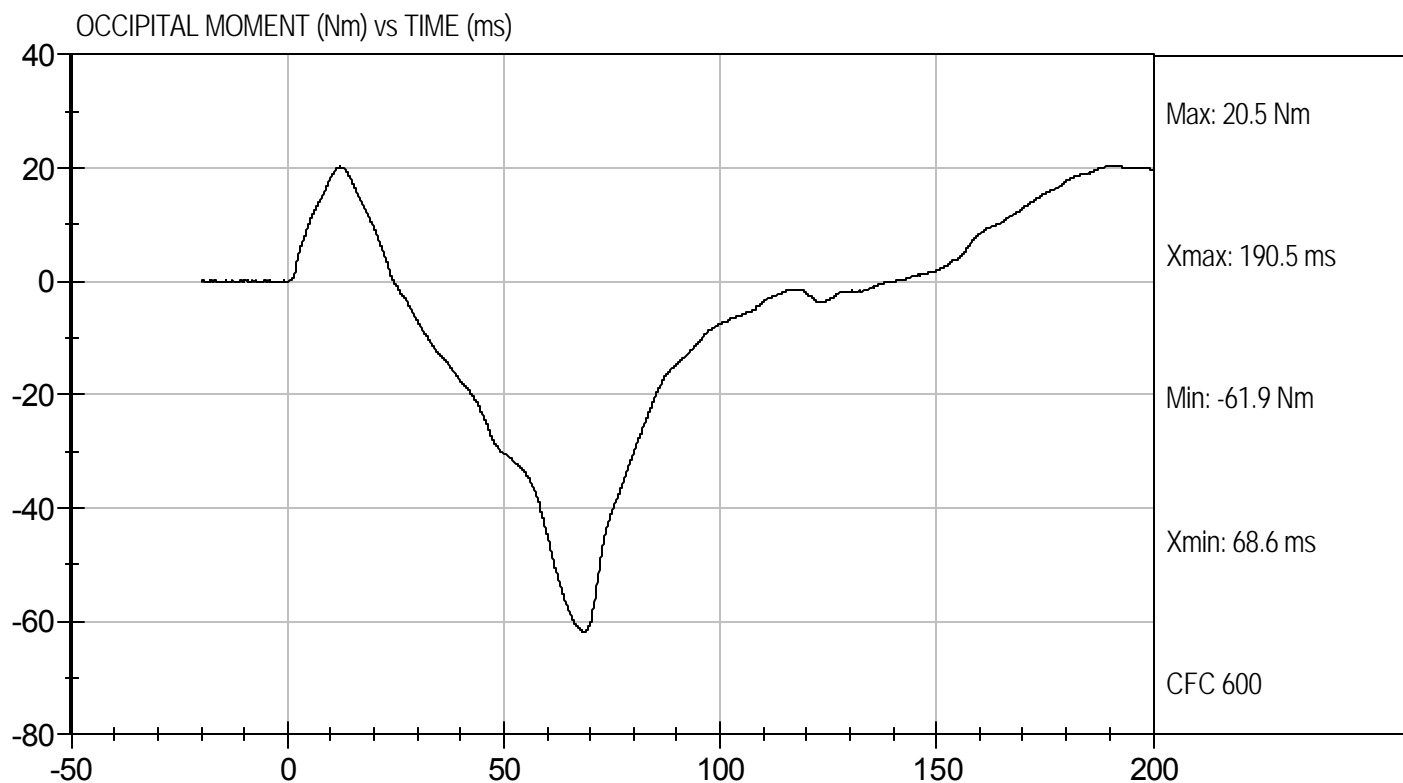
Test Date: 5/3/12
Velocity: 20.2 ft/s, 6.16 m/s





Test Desc: Neck Extension
Component ID: D121623

Test Date: 5/3/12
Velocity: 20.2 ft/s, 6.16 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D121624

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Relative Humidity	%	10 to 70	45	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	kN	3.9 to 4.4	3.98	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4185	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

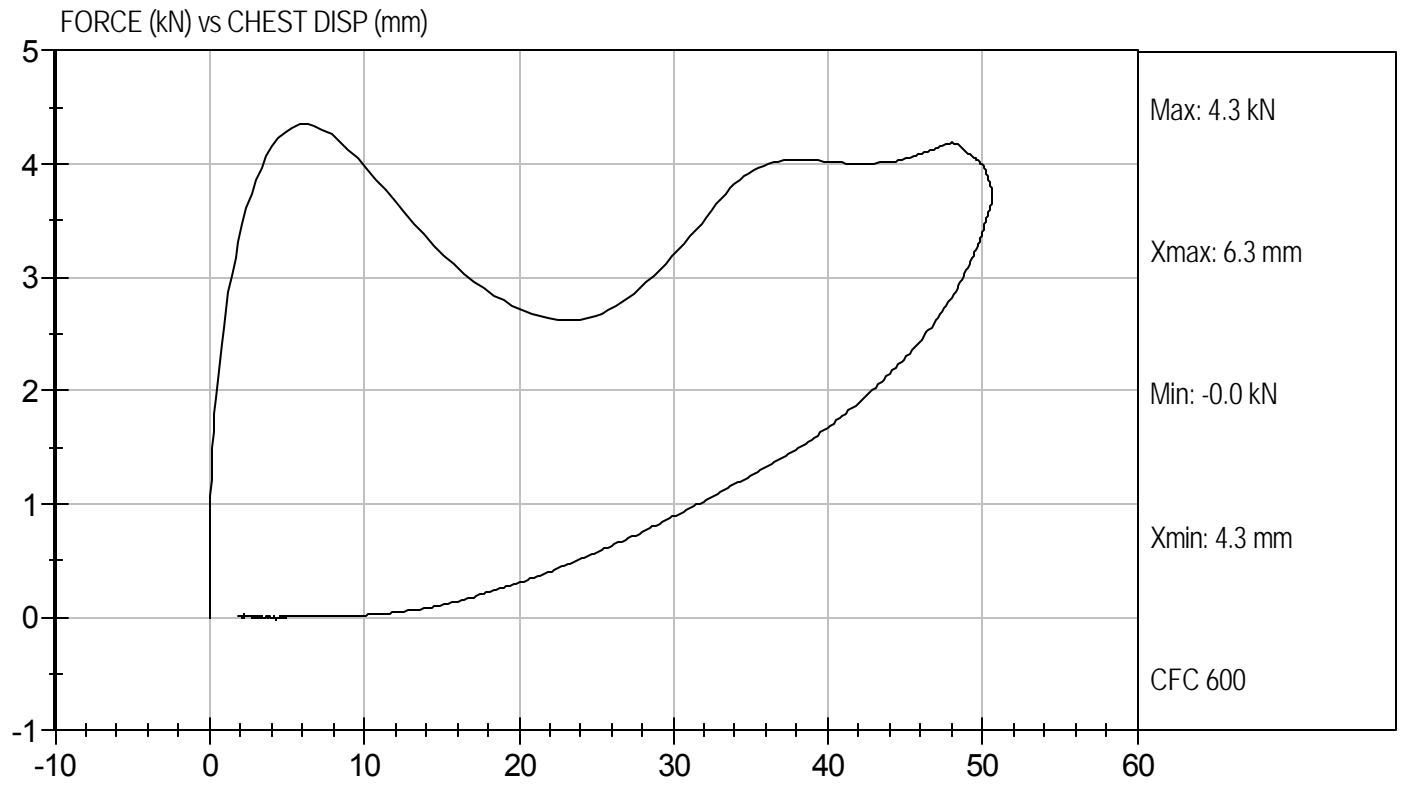
5/4/12
 Test Date

David Winkelbauer
 Approved By



Test Desc: Thorax Impact
Component ID: D121624

Test Date: 5/4/12
Velocity: 21.93 ft/s, 6.68 m/s

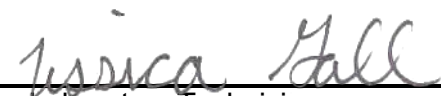


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D121625


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	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.74	Pass
Overall Test Results				Pass



 Laboratory Technician

5/3/12

 Test Date

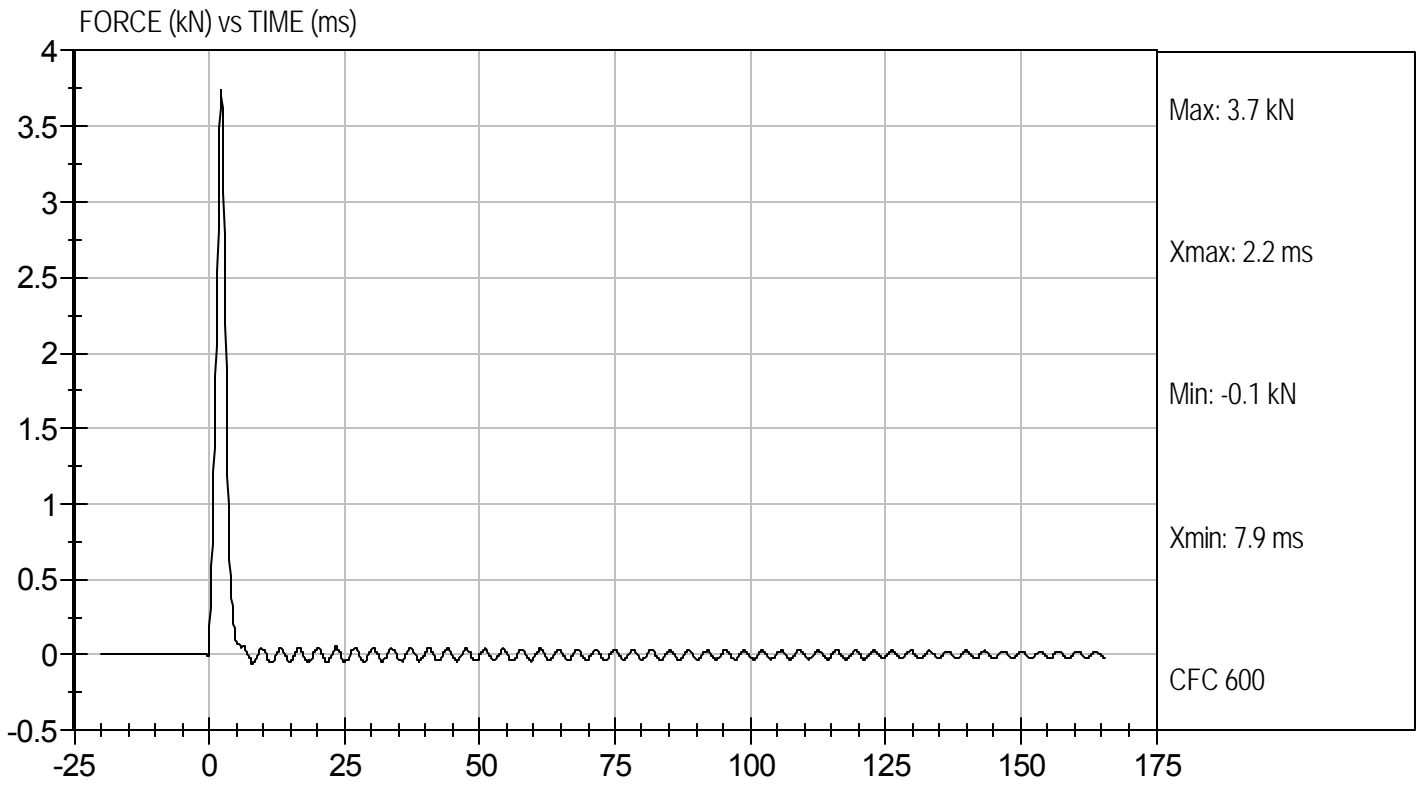


 Approved By



Test Desc: Right Knee
Component ID: D121625

Test Date: 5/3/12
Velocity: 6.97 ft/s, 2.12 m/s



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

ATD Serial No: 634

Test I.D: D121626

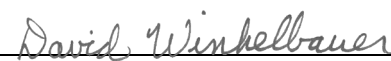
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.66	Pass
Overall Test Results				Pass



 Laboratory Technician

5/3/12

 Test Date

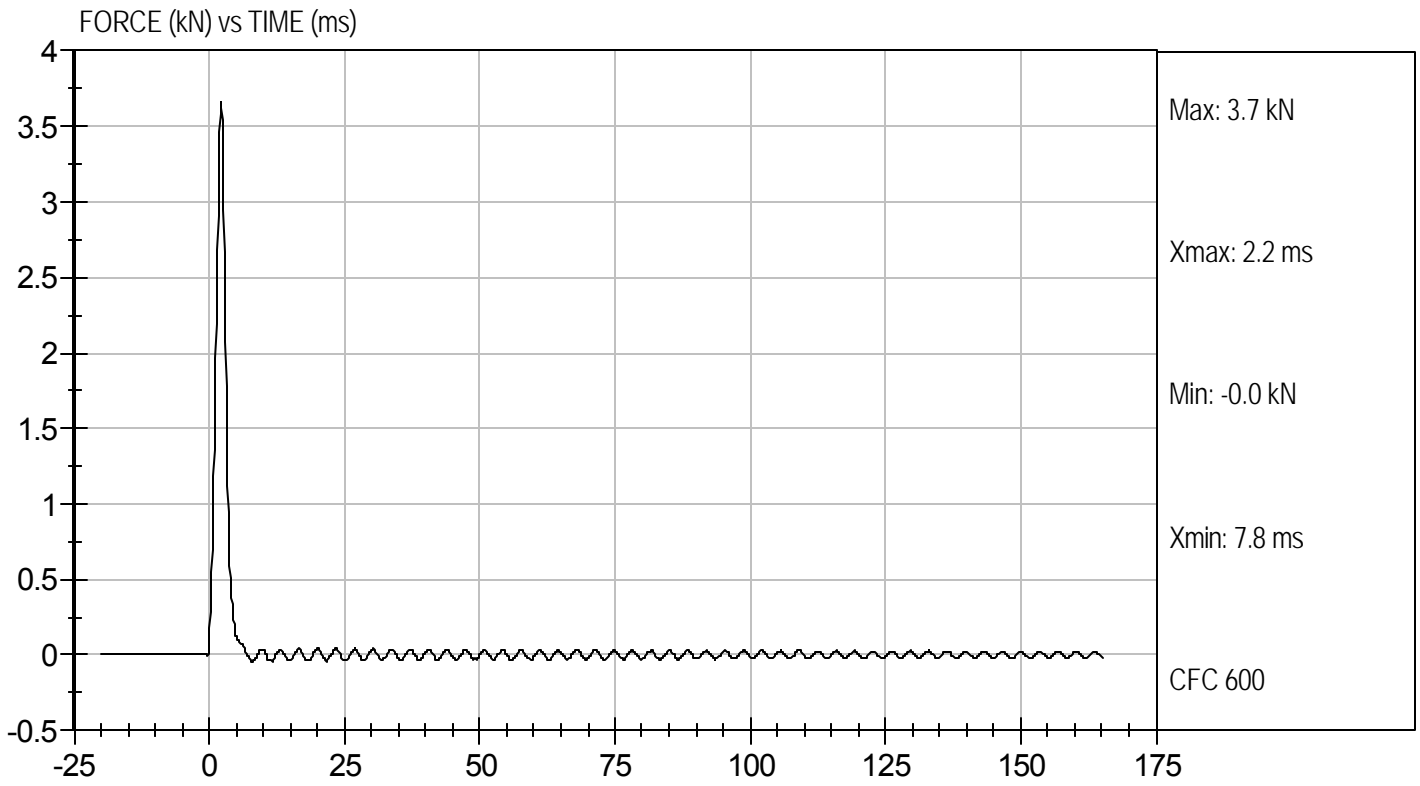


 Approved By



Test Desc: Left Knee
Component ID: D121626

Test Date: 5/3/12
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE


ATD Serial No: 634

Test I.D: D121627

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	367	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass


 Laboratory Technician

5/3/12
 Test Date


 Approved By

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

ATD Serial No: 634

Test ID: D121891

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	250 to 300	269	Pass
Peak Lateral Acceleration	G's	+/- 15	6.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

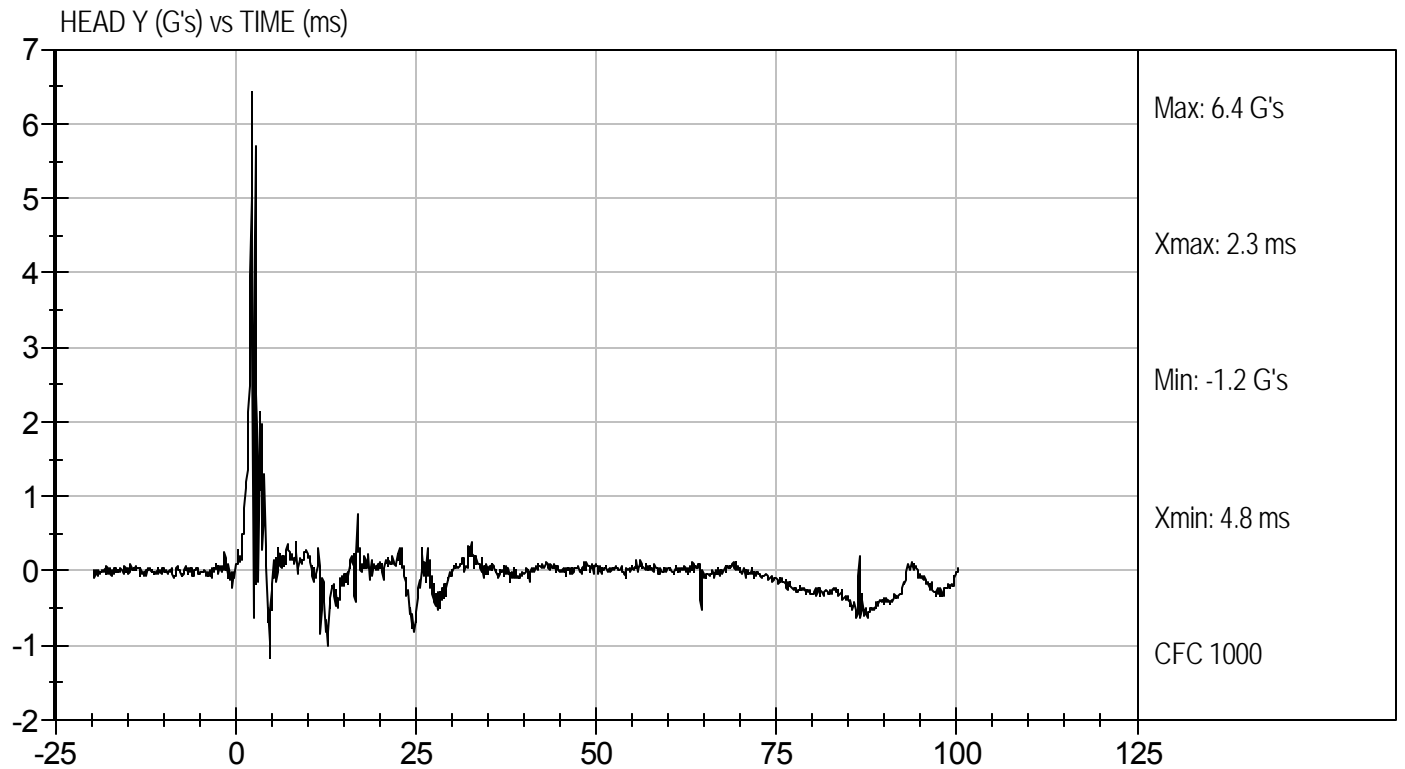
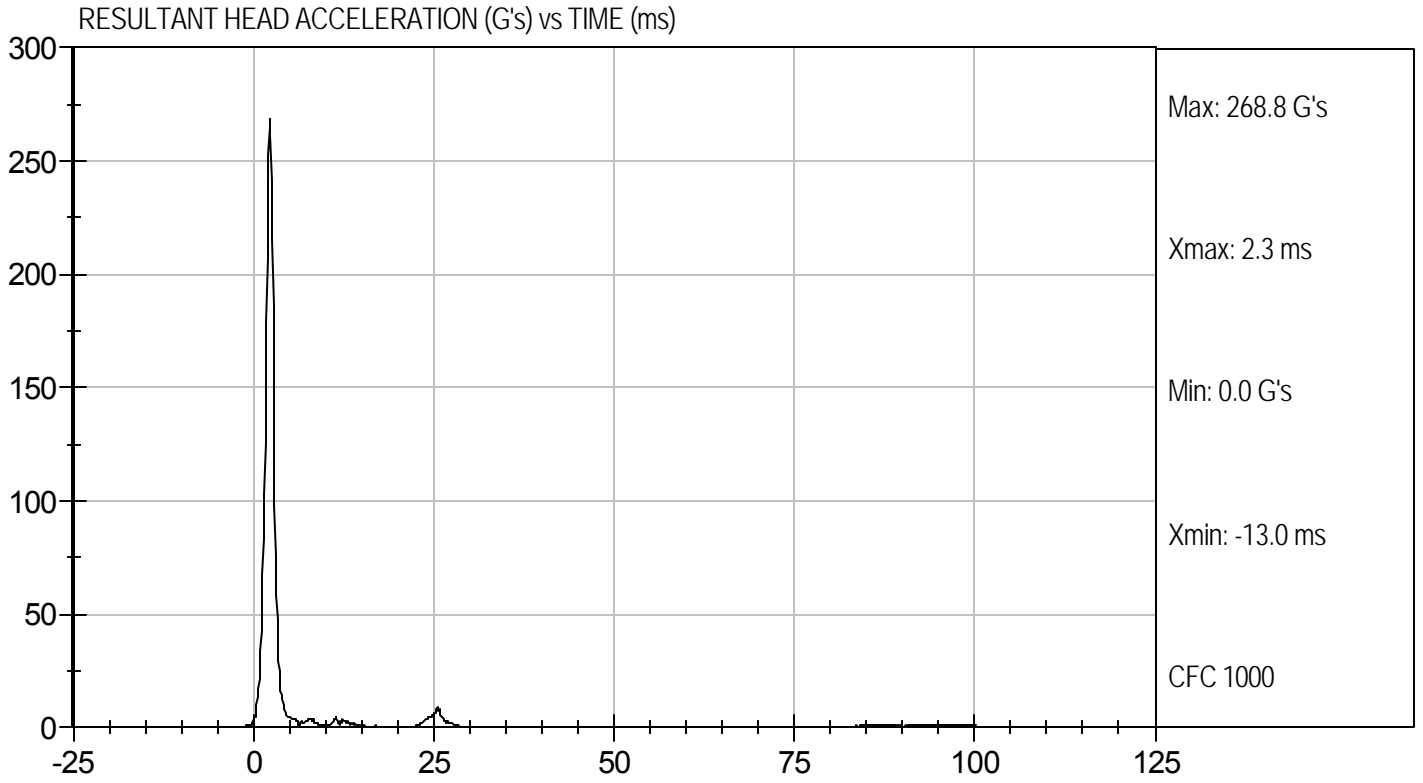
5/21/12
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D121891

Test Date: 5/21/12
Velocity: 0 ft/s, 0 m/s



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D.: D121892

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	41	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	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.3	Pass
D Plane Rotation	Max	deg	77 to 91	79	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

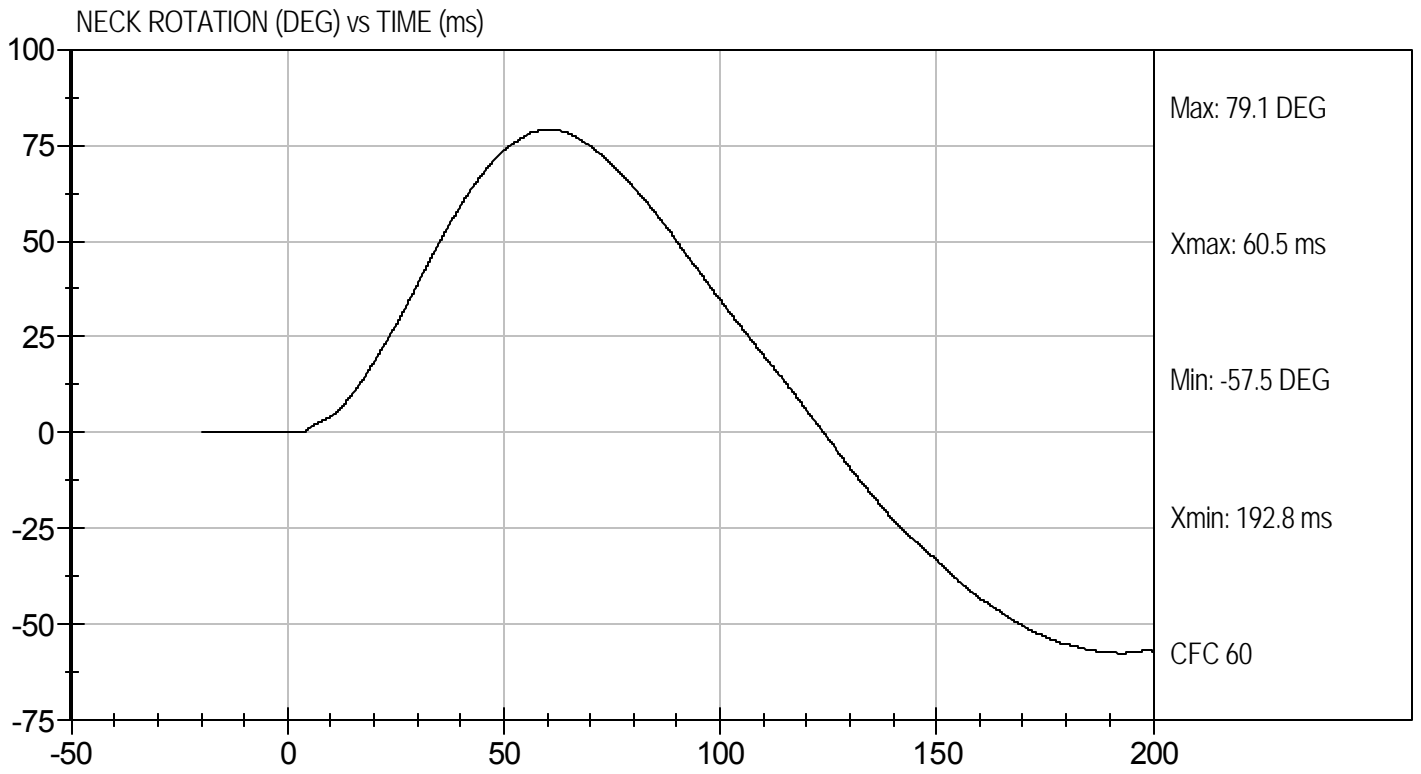
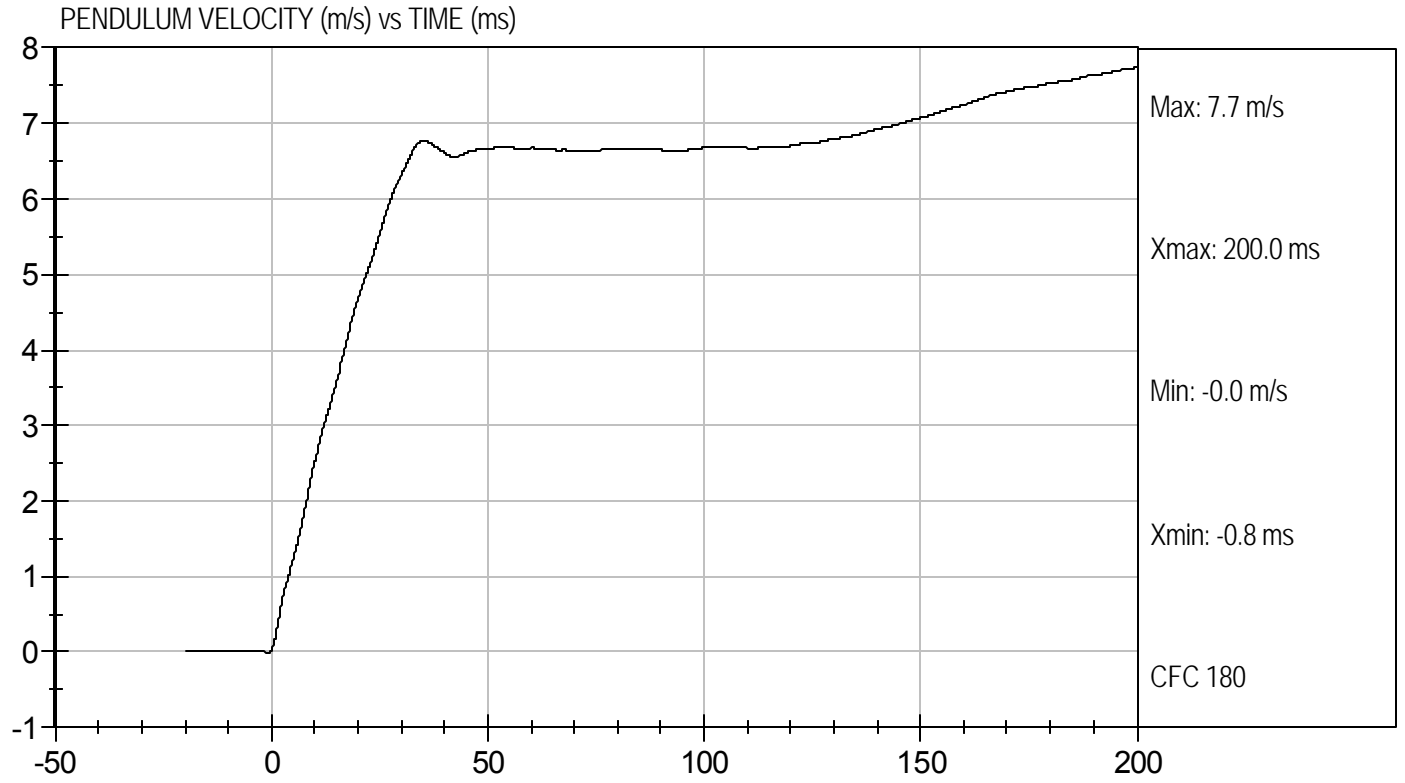
5/21/12
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Flexion
Component ID: D121892

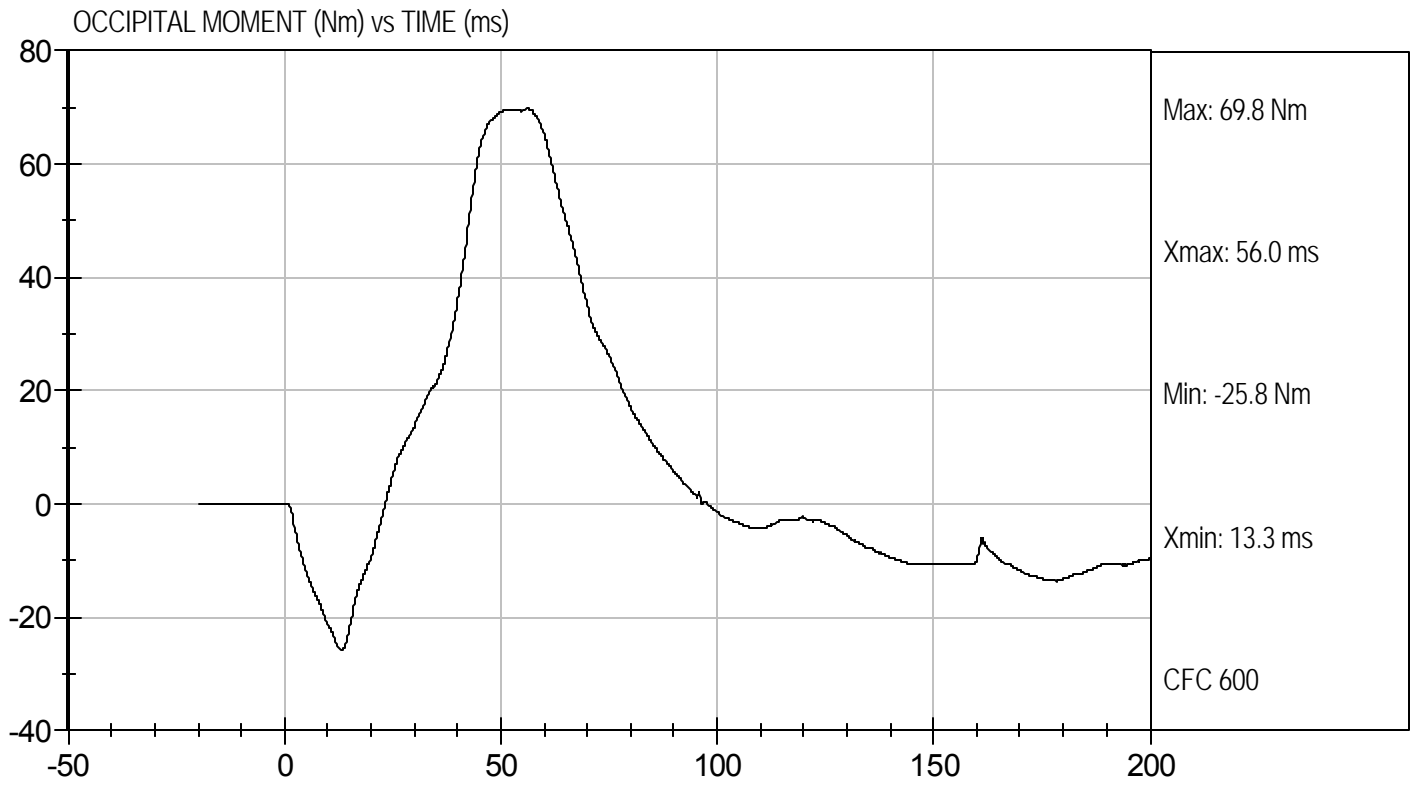
Test Date: 5/21/12
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D121892

Test Date: 5/21/12
Velocity: 23.15 ft/s, 7.06 m/s

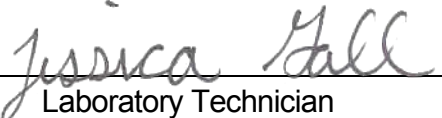


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

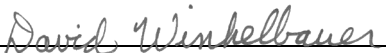
ATD Serial No: 634

Test I.D.: D121893

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	37	Pass	
Pendulum Speed	m/s	5.95 to 6.19	6.16	Pass	
Pendulum Pulse	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.5	Pass
	30 ms	m/s	4.6 to 5.6	5.0	Pass
D Plane Rotation	Max	deg	99 to 114	100	Pass
Occipital Condyle Moment within Deflection Corridor	Nm	-65 to -53	-64	Pass	
Negative Moment Time Curve Decay to -10 Nm	ms	94 to 114	95	Pass	
Overall Results				Pass	


 Laboratory Technician

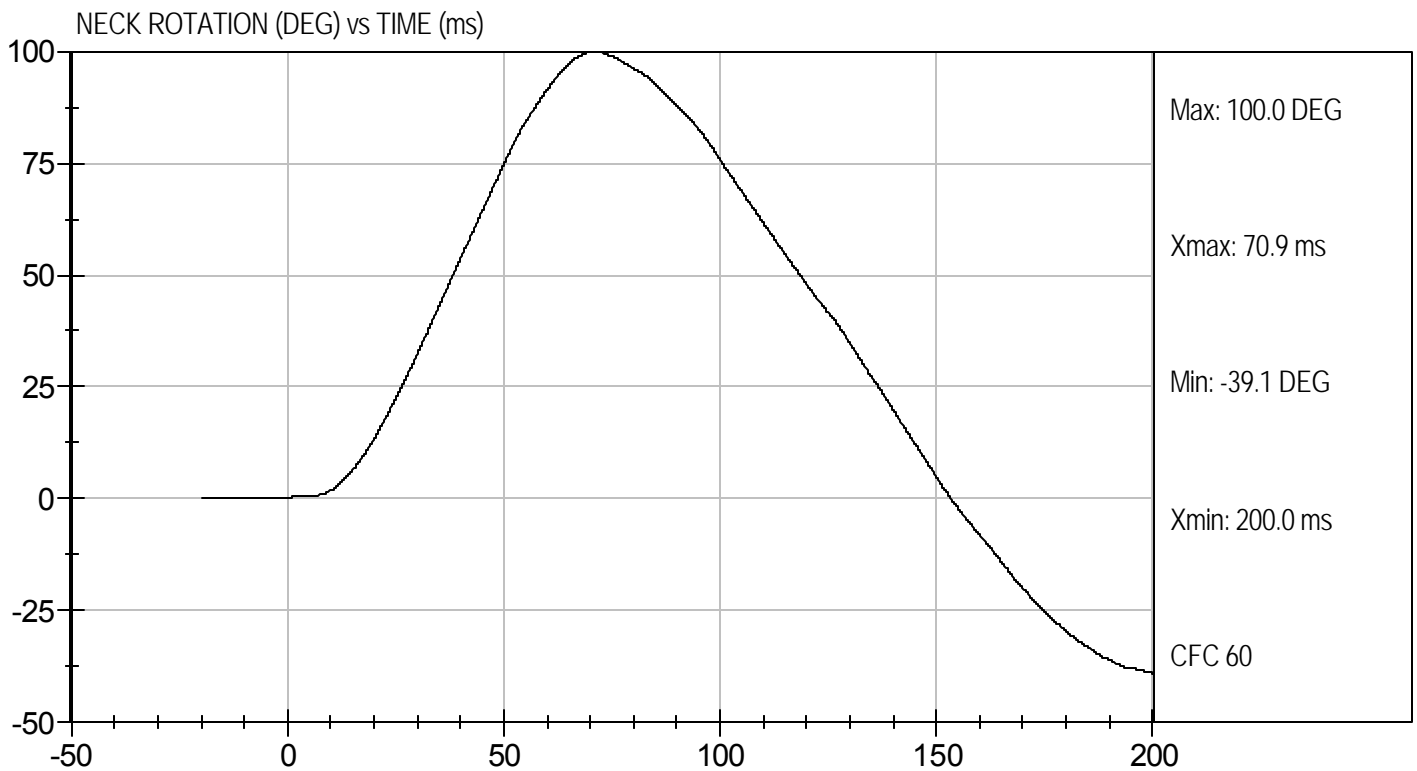
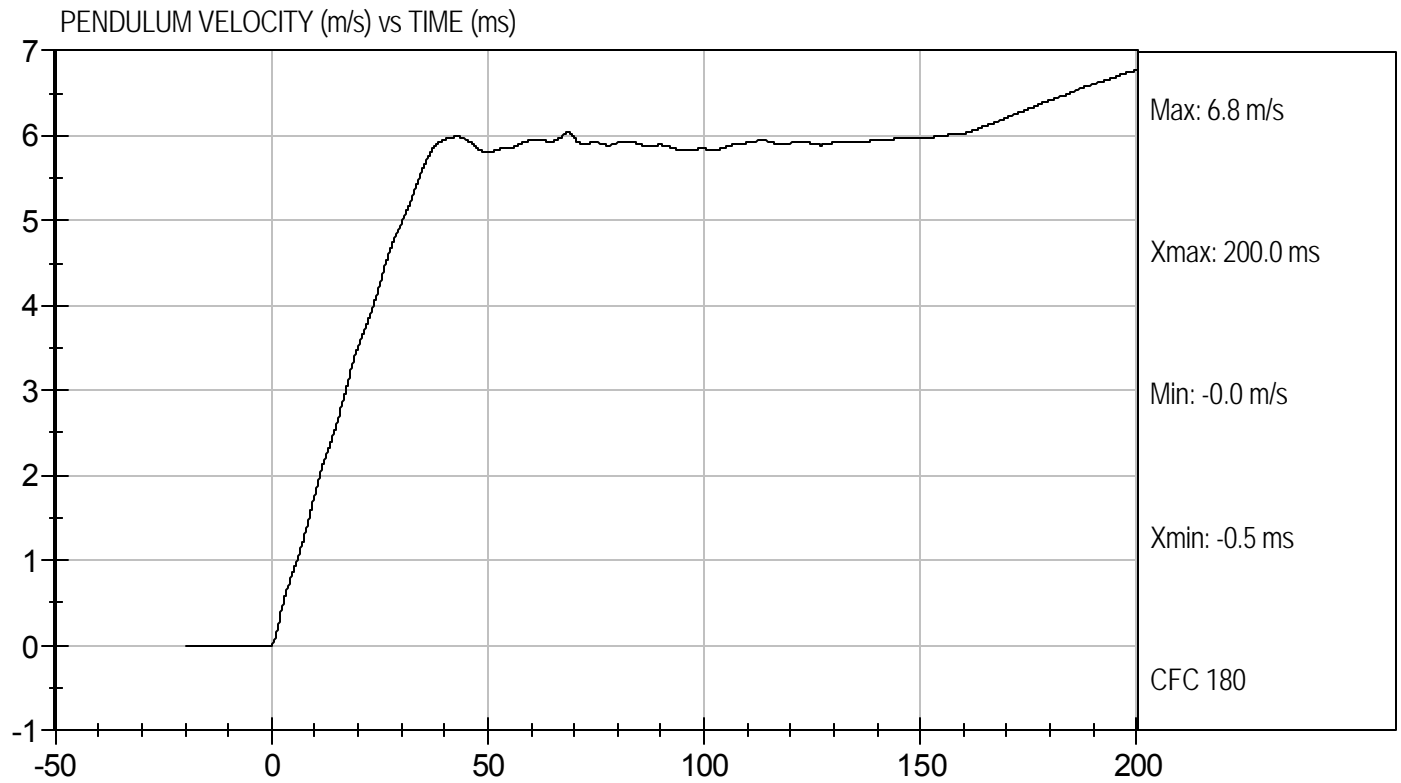
5/22/12
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D121893

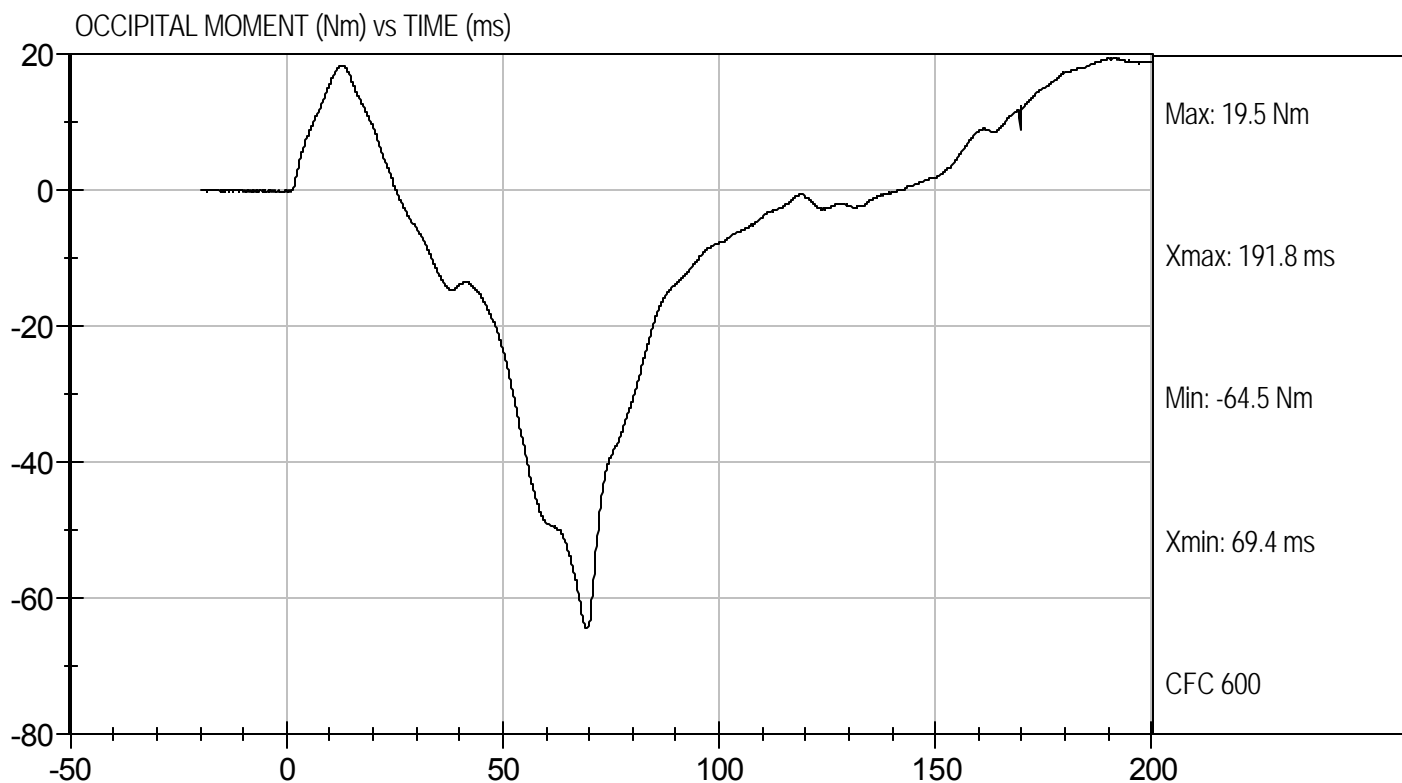
Test Date: 5/22/12
Velocity: 20.2 ft/s, 6.16 m/s





Test Desc: Neck Extension
Component ID: D121893

Test Date: 5/22/12
Velocity: 20.2 ft/s, 6.16 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

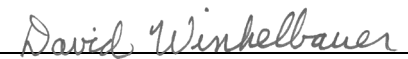
ATD Serial No: 634

Test I.D: D121894

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Relative Humidity	%	10 to 70	38	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	kN	3.9 to 4.4	4.04	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4038	Pass
Overall Test Results				Pass


 Laboratory Technician

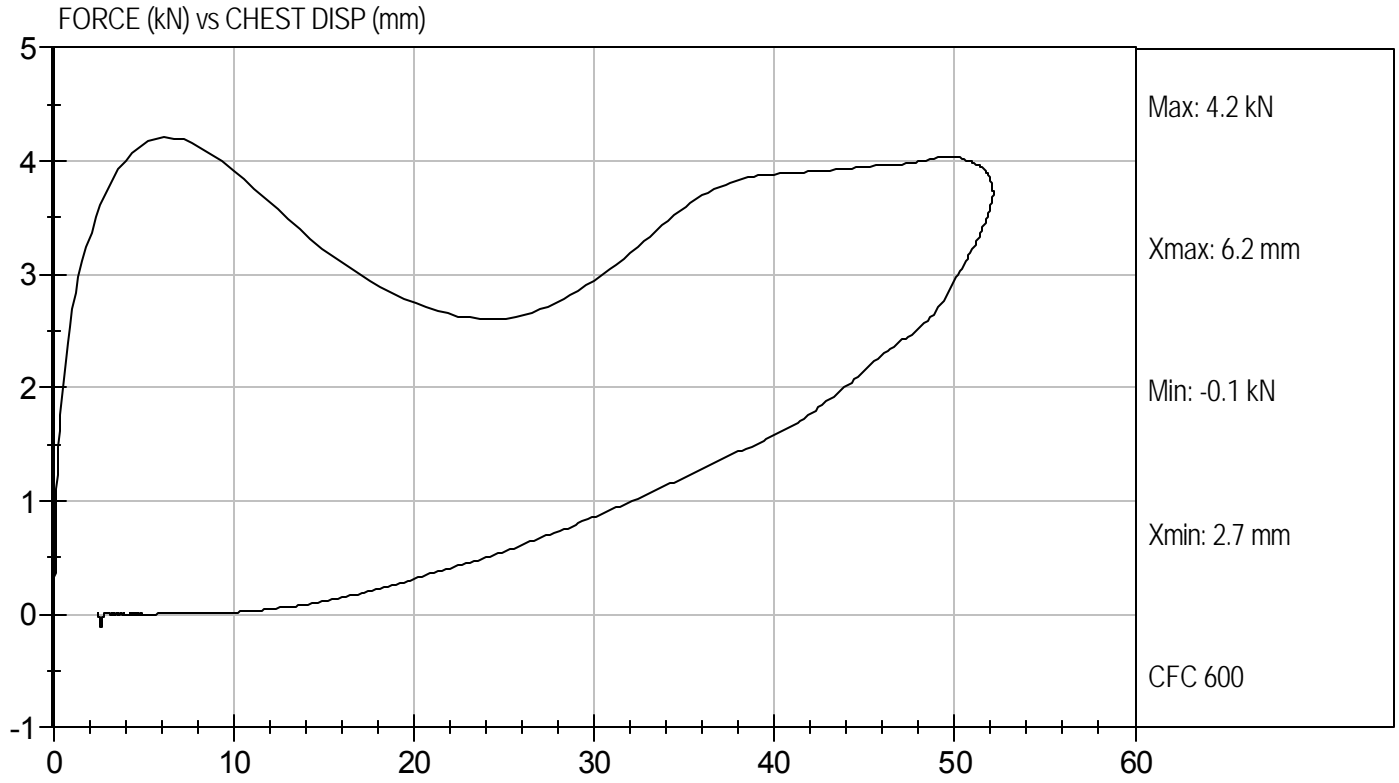
5/22/12
 Test Date


 Approved By



Test Desc: Thorax Impact
Component ID: D121894

Test Date: 5/22/12
Velocity: 22.22 ft/s, 6.77 m/s



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

ATD Serial No: 634

Test I.D: D121895

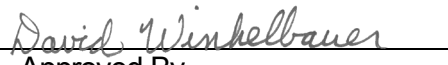
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.80	Pass
Overall Test Results				Pass



 Laboratory Technician

5/21/12

 Test Date

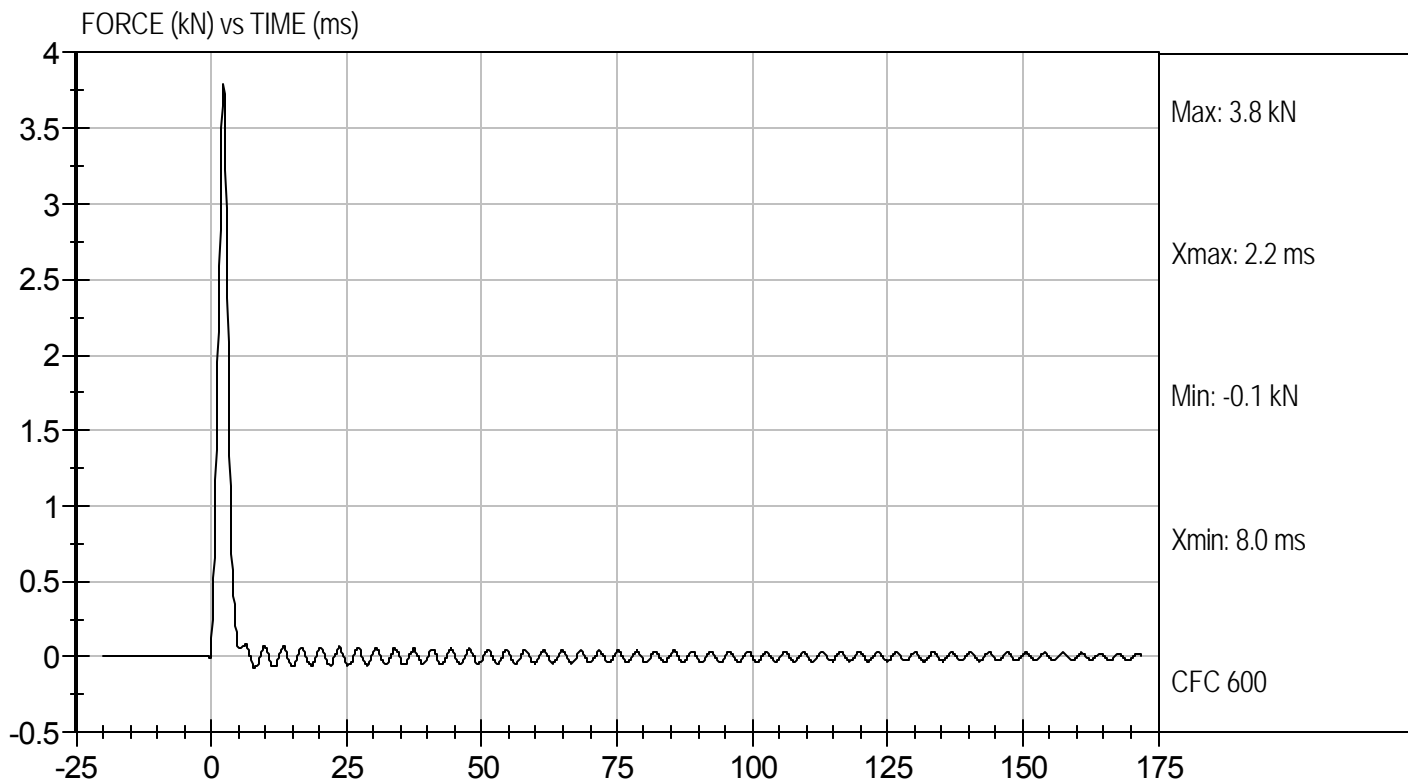


 Approved By



Test Desc: Right Knee
Component ID: D121895

Test Date: 5/21/12
Velocity: 6.97 ft/s, 2.12 m/s

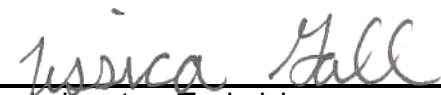


MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D121896


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	kN	3.45 to 4.06	3.57	Pass
Overall Test Results				Pass



 Laboratory Technician

5/21/12

 Test Date

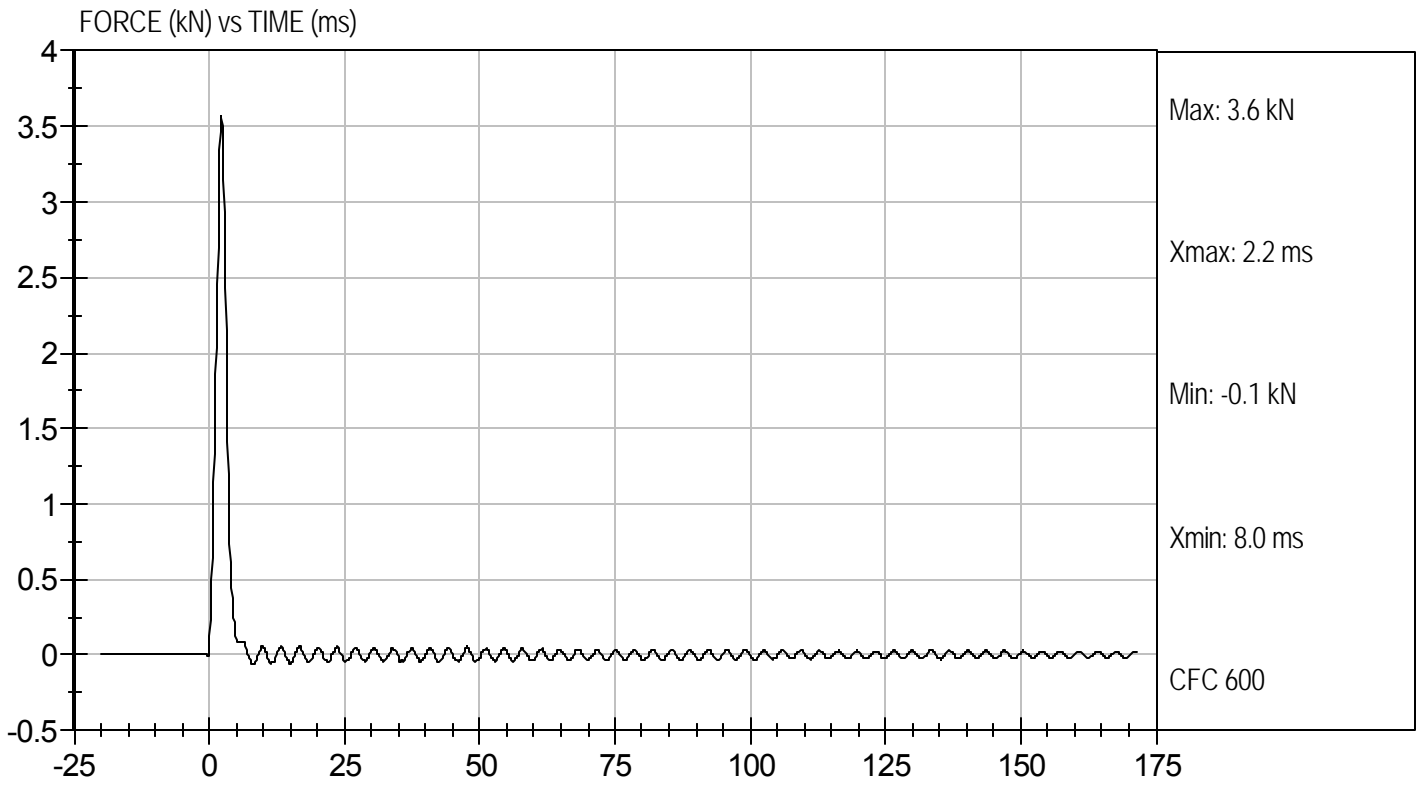


 Approved By



Test Desc: Left Knee
Component ID: D121896

Test Date: 5/21/12
Velocity: 6.92 ft/s, 2.11 m/s



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D121897

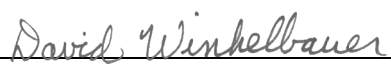
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	363	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass



 Laboratory Technician

5/21/12

 Test Date



 Approved By