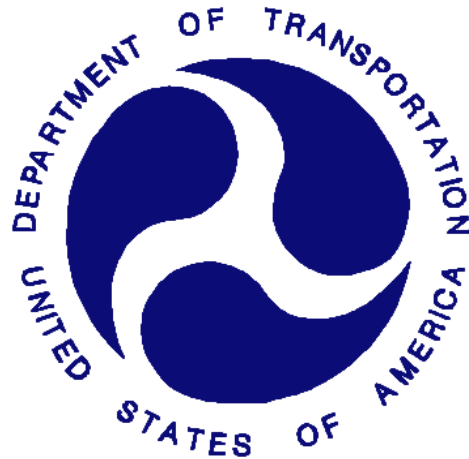


REPORT NUMBER: NCAP-MGA-2013-010

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

**TOYOTA MOTOR MANUFACTURING, KENTUCKY, INC.
2013 Toyota Venza LE AWD 4-Dr SUV
NHTSA No.: YD5101**

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



Test Date: September 6, 2012

Final Report Date: October 1, 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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Prepared by: 
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Approved by: 
Ben Fischer, Project Engineer

Approval Date: October 1, 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: _____

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15. Supplementary Notes																																																							
16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2013 Toyota Venza LE AWD 4-Dr 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 September 6, 2012. The impact velocity was 56.2 km/h and the ambient temperature at the barrier face at the time of impact was 21.7°C. The target vehicle post-test maximum crush was 623 mm located at the vehicle's centerline. The test vehicle's performance was as follows: <table border="1" style="width: 100%; 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>167</td> <td>183</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>52</td> <td>21</td> <td>16</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>1</td> <td>0.34</td> <td>0.48</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>2620</td> <td>1223</td> <td>1073</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>2520</td> <td>135</td> <td>564</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1617</td> <td>1288</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1636</td> <td>954</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	167	183	Maximum Chest Compression	mm	63	52	21	16	Nij	N/A	1	1	0.34	0.48	Neck Tension	N	4170	2620	1223	1073	Neck Compression	N	4000	2520	135	564	Left Femur Force	N	10008	6805	1617	1288	Right Femur Force	N	10008	6805	1636	954
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TABLE OF CONTENTS

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

SECTION 1 PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-12-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 176 load cells was impacted by a 2013 Toyota Venza LE AWD 4-Dr SUV at a velocity of 56.2 km/h. The test was performed at MGA Research Corporation on September 6, 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 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. 138) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 228 channels of data were recorded on an on-board data acquisition system. Appendix B contains the 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 623 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, curtain airbag, and side header. The driver's knees contacted the knee airbag 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 and the curtain airbag. 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)	167	0.34	1223	135	37	21	1617	1636
Passenger (5 th)	183	0.48	1073	564	42	16	1288	954

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

TEST NOTES

Right Rear Seat Crossmember X has no valid data after 44 ms.

Left Brake Caliper X has no valid data after 20 ms.

The driver and passenger shoulder belt load cells were 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 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	YD5101	Traction Control System (TCS)	Yes
Model Year	2013	Auto-Leveling System	No
Make	Toyota	Automatic Door Locks (ADLs)	Yes
Model	Venza	Power Window Auto-Reverse	Yes
Body Style	SUV	Other Optional Feature	N/A
VIN	4T3BA3BB8DU035697	Driver Front Airbag	Yes
Body Color	Classic Silver Metallic	Driver Curtain Airbag	Yes
Odometer (km/mi)	134 / 83	Driver Torso Airbag	Yes
Engine Displacement (L)	2.7	Driver Torso/Pelvis Airbag	No
Type/No. Cylinders	4	Driver Pelvis Airbag	No
Engine Placement	Lateral	Driver Knee Airbag	Yes
Transmission Type	Automatic	Pass. Front Airbag	Yes
Transmission Speeds	6	Pass. Curtain Airbag	Yes
Overdrive	Yes	Pass. Torso Airbag	Yes
Final Drive	AWD	Pass. Torso/Pelvis Airbag	No
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	Yes	Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Pass. Load Limiter	Yes
All-Wheel Drive (AWD)	Yes	Other Safety Restraint	N/A
Does owner's manual provide instructions to turn off automatic door locks?			Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	TOYOTA MOTOR MANUFACTURING, KENTUCKY, INC.	GVWR (kg)	2340
Date of Manufacture	07/12	GAWR Front (kg)	1400
		GAWR Rear (kg)	1270

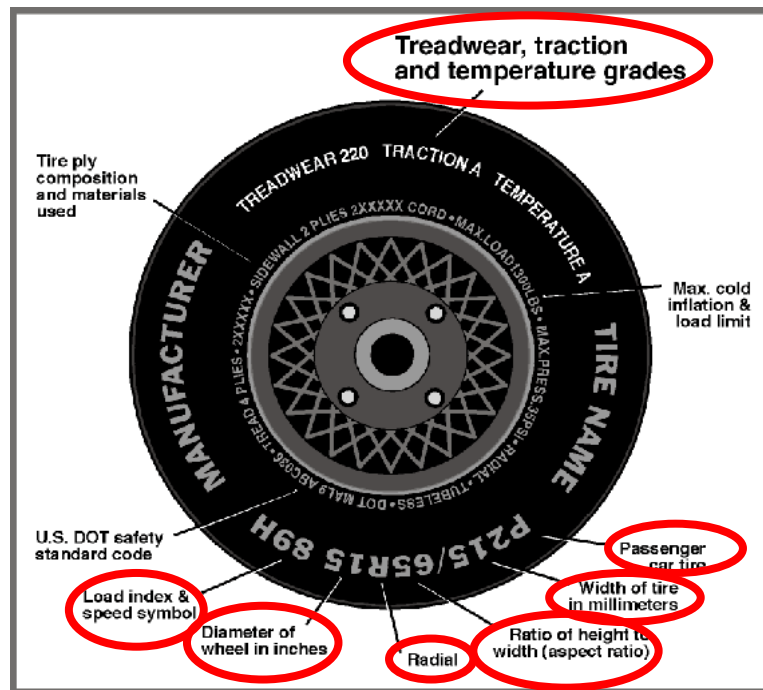
VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				405
Cargo Weight (RCLW) (kg)				58

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

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	220	220
Recommended Tire Size	P245/55R19	P245/55R19

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P245/55R19	P245/55R19
Tire Manufacturer	Toyo	Toyo
Tire Model	Open Country	Open Country
Tire Type	Passenger	Passenger
Tire Width	245	245
Aspect Ratio	55	55
Radial	Yes	Yes
Wheel Diameter	19	19
Load Index/Speed Symbol	103S	103S
Treadwear	300	300
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: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	505.3	404.2		539.3	476.3	
Right	kg	500.8	387.8		529.8	445.9	
Ratio	%	56.0	44.0		53.7	46.3	
Totals	kg	1006.1	792.0	1798.1	1069.1	922.2	1991.3

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1798.1
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	58
Calculated Vehicle Target Weight (TVTW)	kg	1996.7

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	807	815	833	824	1222
As Tested	mm	803	808	803	810	1285
Post Test	mm	810	830	810	809	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2774
Total Vehicle Length at Left Side	mm	4625
Total Vehicle Length at Centerline	mm	4808
Total Vehicle Length at Right Side	mm	4625
Weight of Ballast in Cargo Area	kg	60.8
Weight of Vehicle Components Removed	kg	41.3
Amount of Stoddard Solvent in Fuel Tank	L	62.1

List of components removed: Right taillight, jack and tool kit, spare tire, cargo cover, cargo area plastic, and cargo area carpet.

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

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4808
2	Total Width	1900
3	Bumper Top Height	600
4	Bumper Bottom Height	485
5	Longitudinal Member Top Height	600
6	Distance between Longitudinal Members	950
7	Longitudinal Member Width	88
8	Engine Top Height	913
9	Engine Bottom Height	203
10	Engine and Gearbox Width	870
11	Front Bumper-Engine Distance	330
12	Front Shock Absorber Fixing Height	991
13	Bonnet Leading Edge Height	848
14	Front Shock Absorber Fixing Width	1240
15	Front Bumper – Front Axle Distance	932
16	Front Axle – A-Pillar Distance	487
17	A-Pillar – B-Pillar Distance	1137
18	B-Pillar – Rear Axle Distance	1151
19	B-Pillar – C-Pillar Distance	678
20	Roof Sill Bottom Height	1458
21	Roof Sill Top Height	1569
22	Floor Sill Bottom Height	253
23	Floor Sill Top Height	365

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

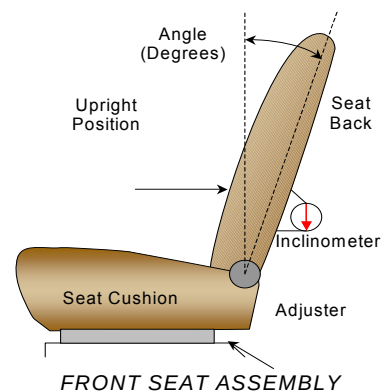
Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

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 May 2012.

	Degrees
Driver Seat Back Angle	3.5° on headrest post
Passenger Seat Back Angle	0.3° on headrest post



SEAT FORE/AFT POSITIONS

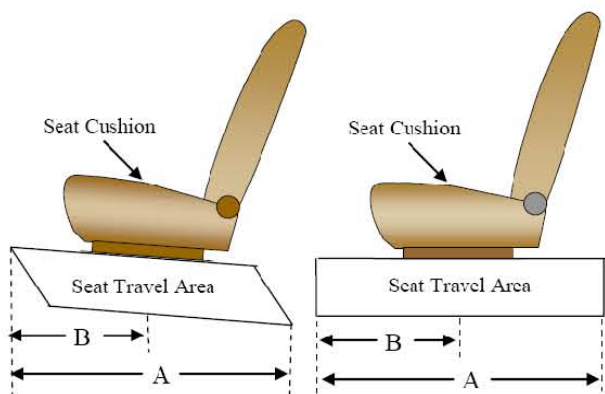
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated May 2012.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	268 mm	134 mm (foremost as 0)
Passenger Seat	242 mm, 16 detents (1 st as 0)	0 detent (foremost as 0)

SEAT BELT UPPER ANCHORAGES

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

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



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

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

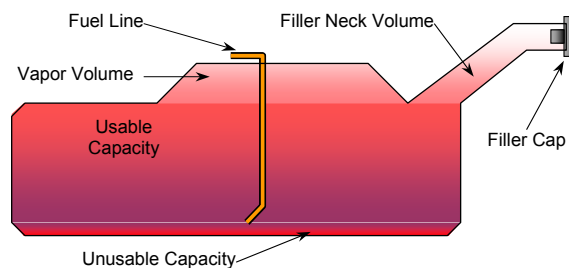
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	67.0
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	61.6 to 63.0
Actual Amount of Solvent used	62.1
1/3 of Usable Capacity	22.3

FUEL PUMP

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

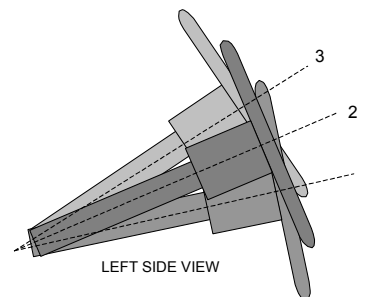
The vehicle is equipped with an electric fuel pump. The fuel pump is activated when the ignition is turned on. The fuel pipe is on the left side.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



LEFT SIDE VIEW

STEERING COLUMN ASSEMBLY

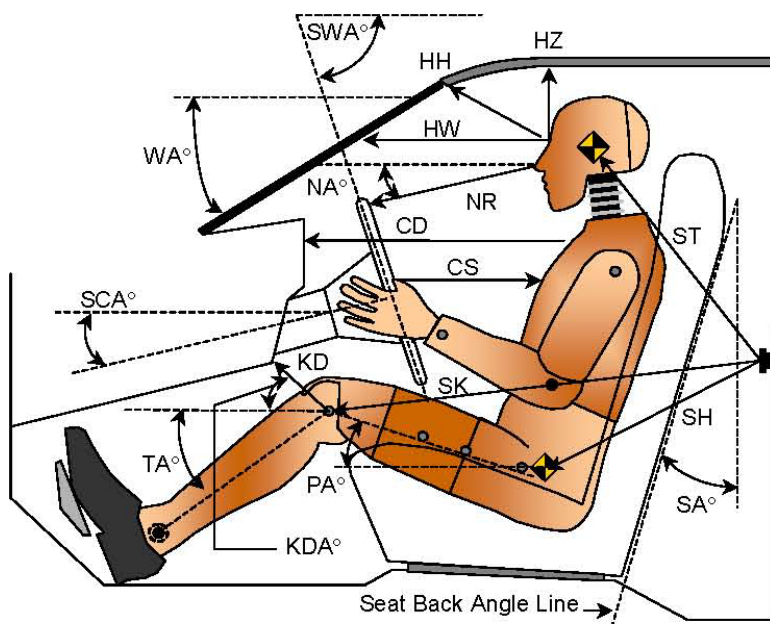
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	67.0	215
Geometric Center Position 2	65.0	195
Uppermost Position 3	63.0	175
Telescoping Steering Wheel Travel		40
Test Position	65.0	195

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
Test Date: 09/06/2012



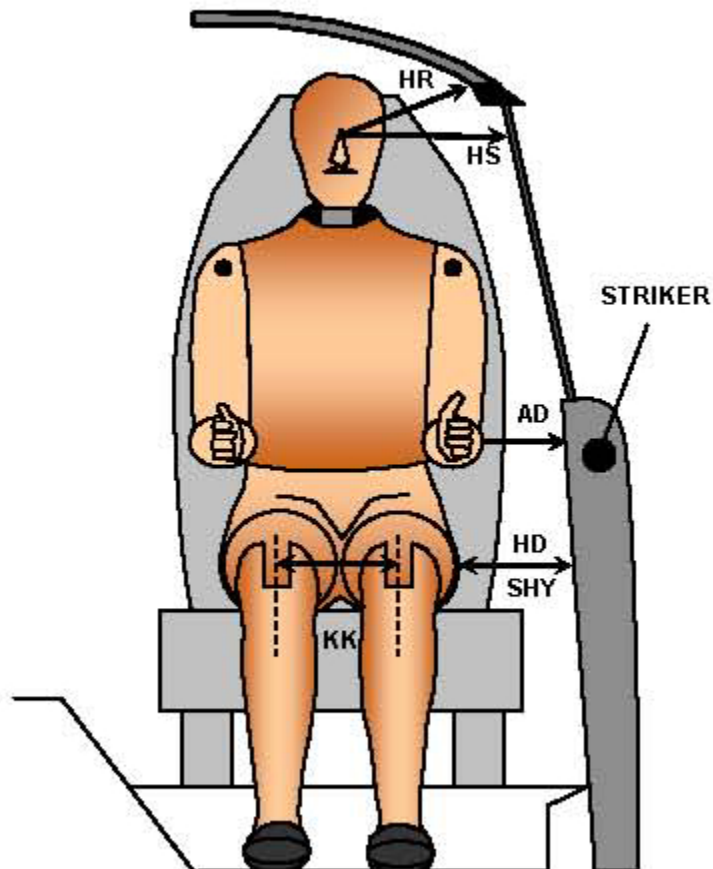
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N 036		Passenger S/N 138	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		25.6		
SWA°	Steering Wheel Angle		65.0		
SCA°	Steering Column Angle		25.0		
SA°	Seat Back Angle (on headrest post)		3.5		0.3
HZ	Head to Roof (Z)	229	90	248	90
HH	Head to Header	404	19.9	302	33.9
HW	Head to Windshield	771	0	733	0
NR	Nose to Rim	450	8.8		
CD	Chest to Dash	557		393	
CS	Chest to Steering Hub	344	2.3		
RA	Rim to Abdomen	226	0		
KDL	Left Knee to Dash	182	32.2	95	31.0
KDR	Right Knee to Dash	177	30.8	104	29.5
PA°	Pelvic Angle		23.7		19.4
TA°	Tibia Angle		45.3		53.3
SK	Striker to Knee	611	103.4	712	103.7
ST	Striker to Head	444	15.1	421	36.8
SH	Striker to H-Point	302	140.8	443	123.9

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012



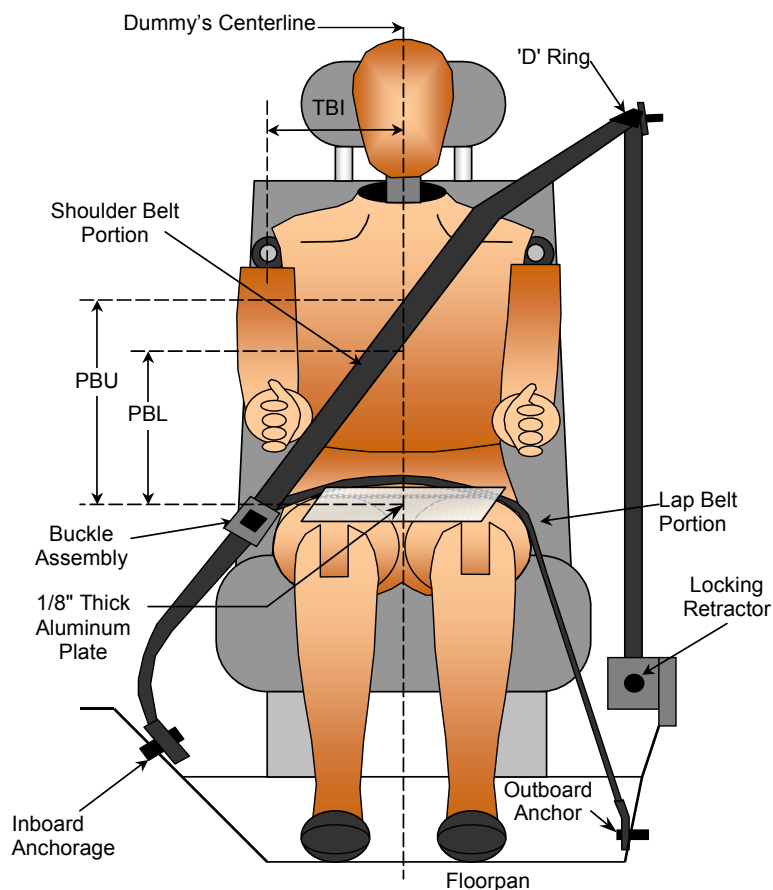
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 036	Passenger S/N 138
		Length (mm)	
AD	Arm to Door	146	93
HD	H-Point to Door	153	180
HR	Head to Side Header	243	270
HS	Head to Side Window	357	387
KK	Knee to Knee	325	229
SHY	Striker to H-Point (Y Direction)	330	358
AA	Ankle to Ankle	305	166

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

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	370	340
PBL - Top surface of reference to belt lower edge	mm	300	250

BELT LENGTH DATA

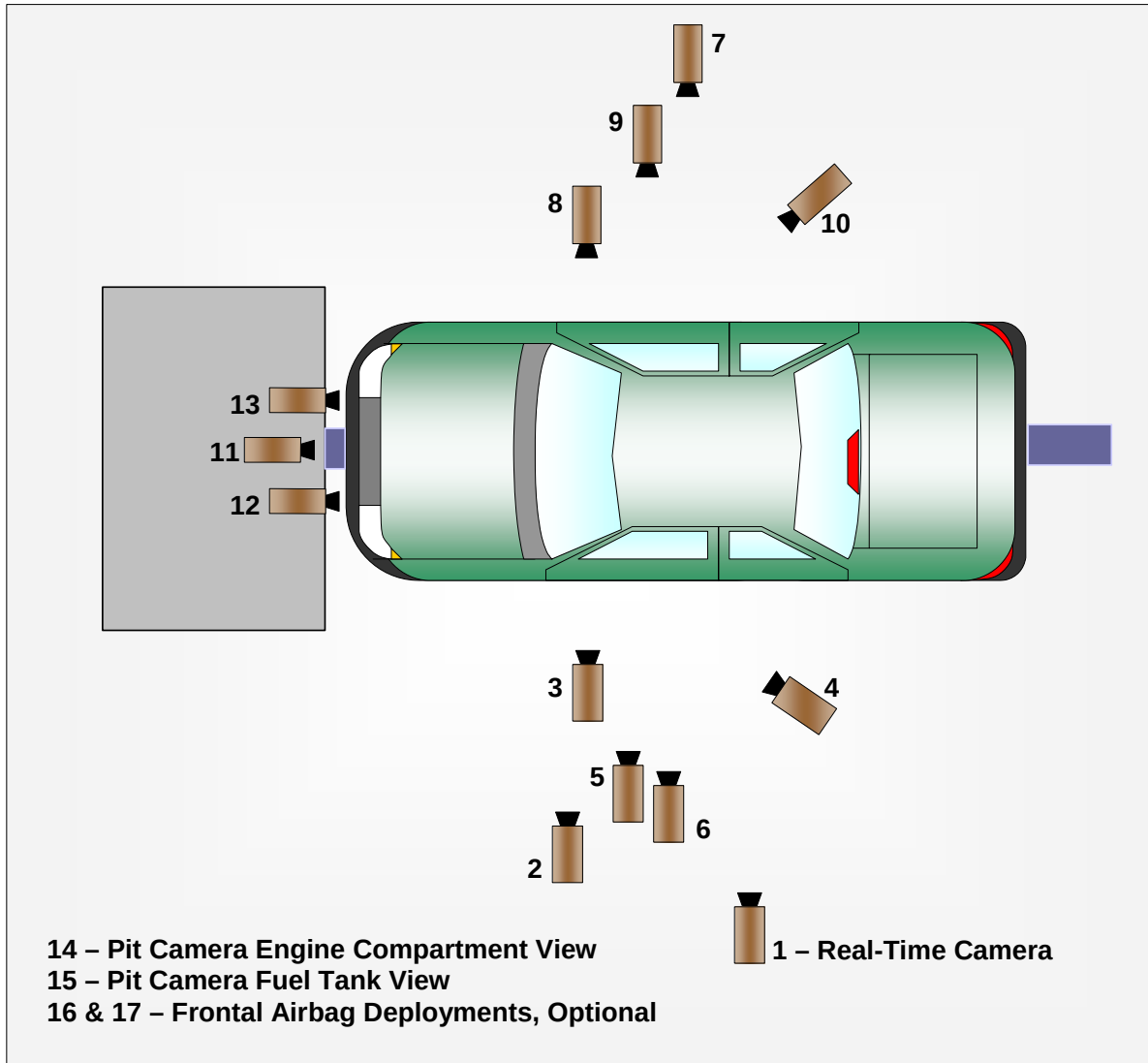
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	885	980
Lap Belt Length as measured on ATD	mm	740	880
Remainder of belt on reel	mm	1675	1410
Total Belt Length for Continuous Webbing Systems	mm	3300	3270

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

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
Test Date: 09/06/2012

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1360	-6850	-1820	35	1000
3	Left Front Half	1130	-5000	-1250	24	1000
4	Left Angle	5350	-5280	-2000	50	1000
5	Steering Column - Top	490	-5070	-1240	24	1000
6	Steering Column - Bottom	490	-5050	-840	24	1000
7	Right Overall	2250	6650	-1220	20	1000
8	Passenger Close-Up	1530	6980	-1900	35	1000
9	Right Front Half	1160	5260	-1270	24	1000
10	Right Angle	5540	4750	-1930	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	990	0	3150	24	1000
15	Pit Rear	3120	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

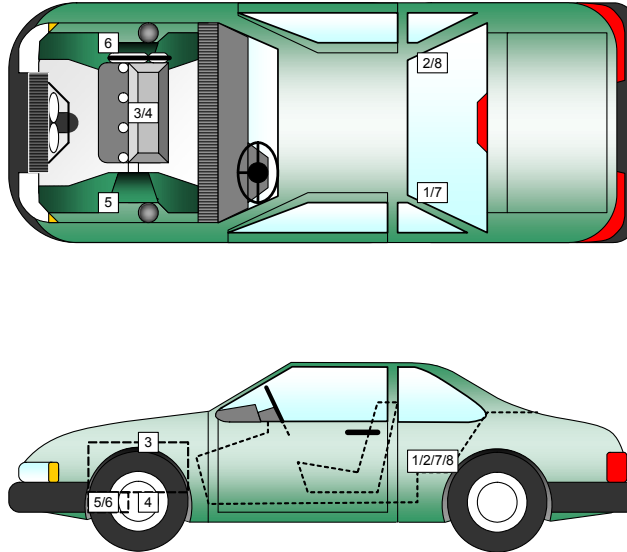
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 16 & 17 were not used for this test.

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

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1924	-463	-320
2	Right Rear Accelerometer – X Direction	1924	452	-275
3	Engine Top X	4111	54	-892
4	Engine Bottom X	4085	0	-332
5	Left Brake Caliper X	4018	-692	-264
6	Right Brake Caliper X	4018	692	-264
7	Left Rear Accelerometer Redundant – X Direction	1924	-463	-320
8	Right Rear Accelerometer Redundant – X Direction	1924	452	-275

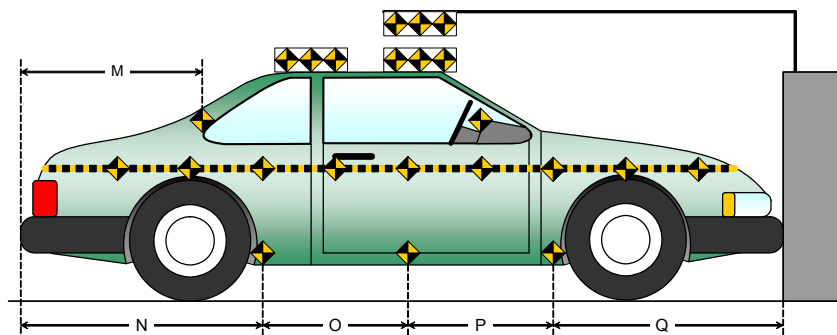
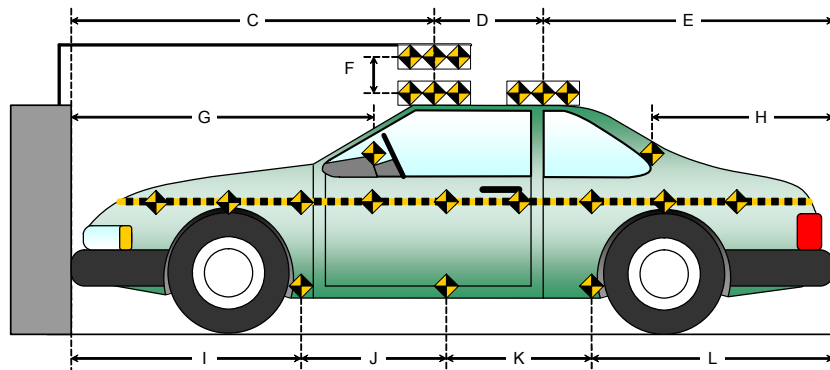
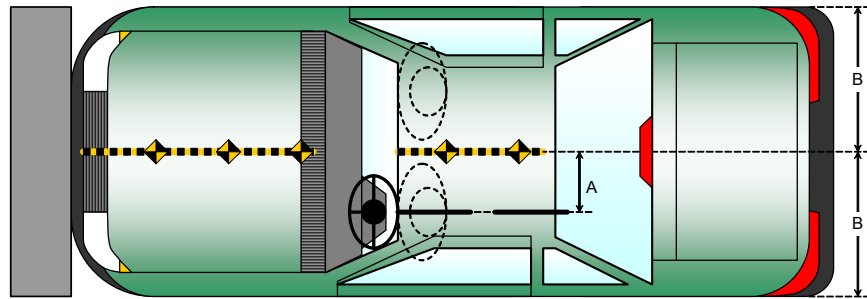
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

Item	Value (mm)
A	380
B	950
C	2400
D	663
E	1745
F	279
G	
H	1456
I	1457
J	907
K	907
L	1537
M	1456
N	1537
O	907
P	907
Q	1457



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

Advanced Research Load Cell Barrier

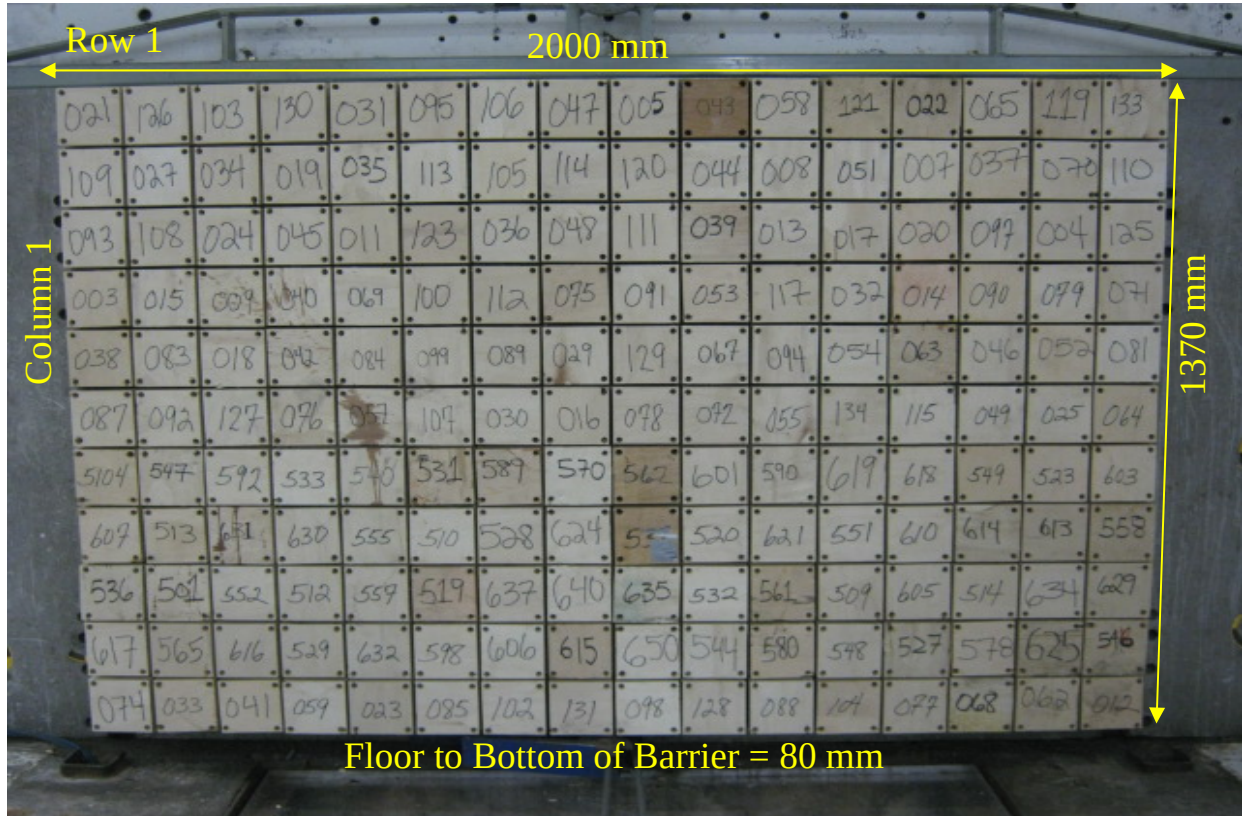


Photo for Reference Only

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

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

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
Test Date: 09/06/2012

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 Toyota Venza LE AWD 4-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
Test Date: 09/06/2012

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 036	HIII 5% / 138
Head Contact	Airbag, Headrest, Curtain Airbag, Side Header	Airbag, Headrest, Curtain Airbag
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag, Steering Column	Glove Box
Right Knee Contact	Knee Airbag, 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	670
Center	mm	670
Right Side	mm	663
Average	mm	668

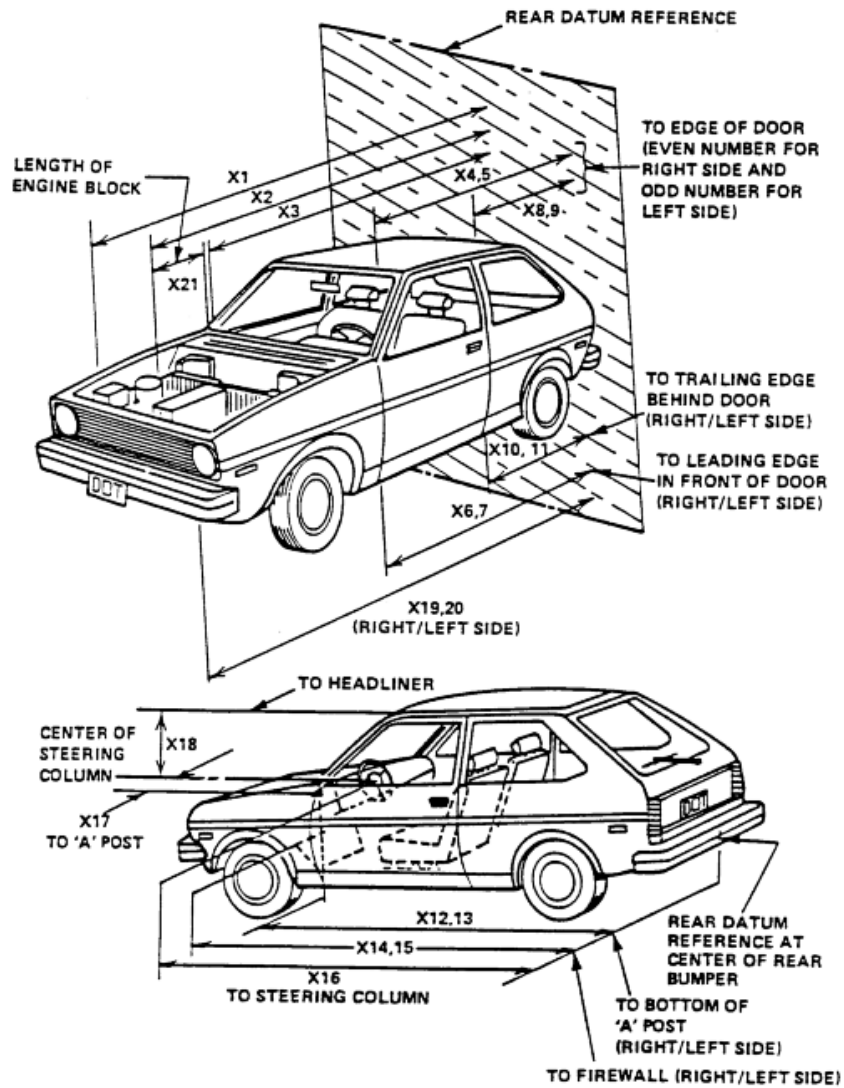
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Right Front (Passenger) P2	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	Yes	Yes	Yes
Torso Side Airbag	Yes	No	Yes	No
Knee Airbag	Yes	Yes	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 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4808	4185	623
2	RSOV to Front of Engine	mm	4100	4011	89
3	RSOV to Firewall	mm	3872	3784	88
4	RSOV to Upper Leading Edge of Right Door	mm	3294	3294	0
5	RSOV to Upper Leading Edge of Left Door	mm	3294	3294	0
6	RSOV to Lower Leading Edge of Right Door	mm	3300	3298	2
7	RSOV to Lower Leading Edge of Left Door	mm	3300	3300	0
8	RSOV to Upper Trailing Edge of Right Door	mm	2226	2226	0
9	RSOV to Upper Trailing Edge of Left Door	mm	2226	2226	0
10	RSOV to Lower Trailing Edge of Right Door	mm	2230	2230	0
11	RSOV to Lower Trailing Edge of Left Door	mm	2230	2230	0
12	RSOV to Bottom of "A" Post of Right Side	mm	3295	3293	2
13	RSOV to Bottom of "A" Post of Left Side	mm	3295	3293	2
14	RSOV to Firewall, Right Side	mm	3698	3678	20
15	RSOV to Firewall, Left Side	mm	3840	3809	31
16	RSOV to Steering Column	mm	2872	2862	10
17	Center of Steering Column to "A" Post	mm	420	402	18
18	Center of Steering Column to Headliner	mm	435	443	-8
19	RSOV to Right Side of Front Bumper	mm	4625	4192	433
20	RSOV to Left Side of Front Bumper	mm	4625	4213	412
21	Length of Engine Block	mm	542	542	0
RD	RSOV to Right Side of Dash Panel	mm	3119	3115	4
CD	RSOV to Center of Dash Panel	mm	3063	3060	3
LD	RSOV to Left Side of Dash Panel	mm	3144	3141	3

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
Test Date: 09/06/2012

VEHICLE INFORMATION

VIN: 4T3BA3BB8DU035697 Wheelbase (mm): 2774
Vehicle Size Category: MPV Test Weight (kg): 1991.3

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15

Cal. Procedure/Interval: MGA procedure / 6 month

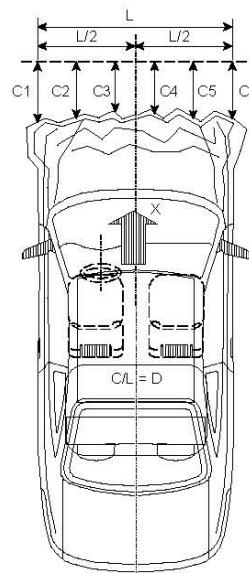
Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.2

Velocity Change (km/h): 60.0

Time of Separation (msec): 107.8



CRUSH PROFILE

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1330

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4625	4213	412
C2	Crush zone 2 at left side	mm	4720	4144	576
C3	Crush zone 3 at left side	mm	4756	4179	577
C4	Crush zone 4 at right side	mm	4756	4182	574
C5	Crush zone 5 at right side	mm	4720	4136	584
C6	Crush zone 6 at right side	mm	4625	4192	433
L	C1 TO C6	mm	1330	1290	40

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

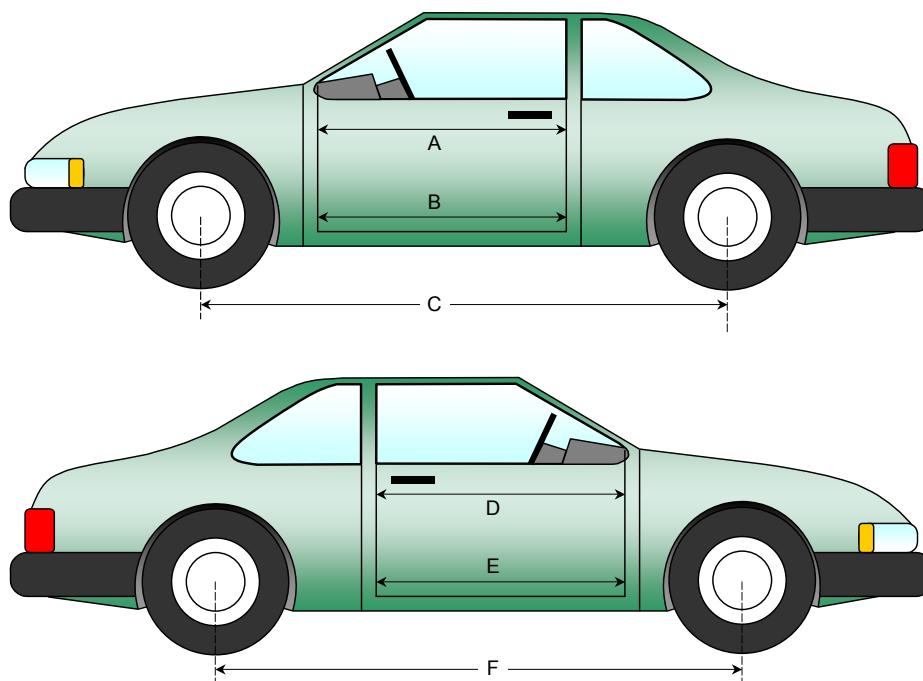
NHTSA No.: YD5101
Test Date: 09/06/2012

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	983	971	12
B	Left Side Lower	mm	915	915	0
D	Right Side Upper	mm	983	983	0
E	Right Side Lower	mm	915	911	4

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2774	2669	105
F	Right Side Wheelbase	mm	2774	2660	114



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

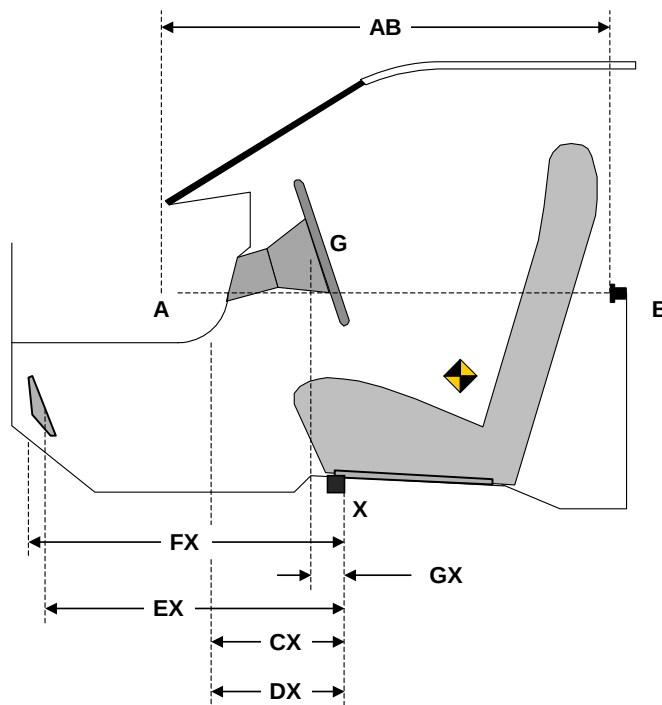
Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	861	861	0
CX	Left Knee Bolster to X	mm	248	266	-18
DX	Right Knee Bolster to X	mm	262	262	0
EX	Brake Pedal to X	mm	558	560	-2
FX	Foot Rest to X	mm	609	564	45
GX	Center of Steering Column Wheel Hub to X	mm	63	117	-54

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 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

Windshield Mounting Details:

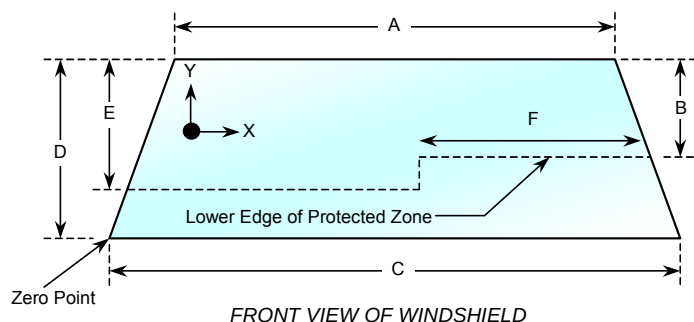
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.7°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2339	2339	100
Right Side	2339	2339	100
Total	4678	4678	100



Item	Units	Value
A	mm	1268
B	mm	608
C	mm	1574
D	mm	918
E	mm	620
F	mm	550

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 Toyota Venza LE AWD 4-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
Test Date: 09/06/2012

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.7°C Test Time: 10:24 a.m.

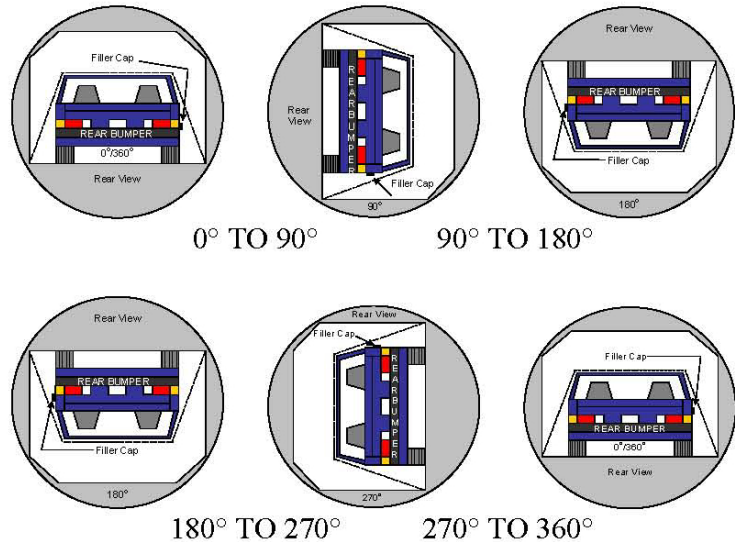
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012

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°	108	300	408
90° to 180°	111	300	411
180° to 270°	108	300	408
270° to 360°	110	300	410

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

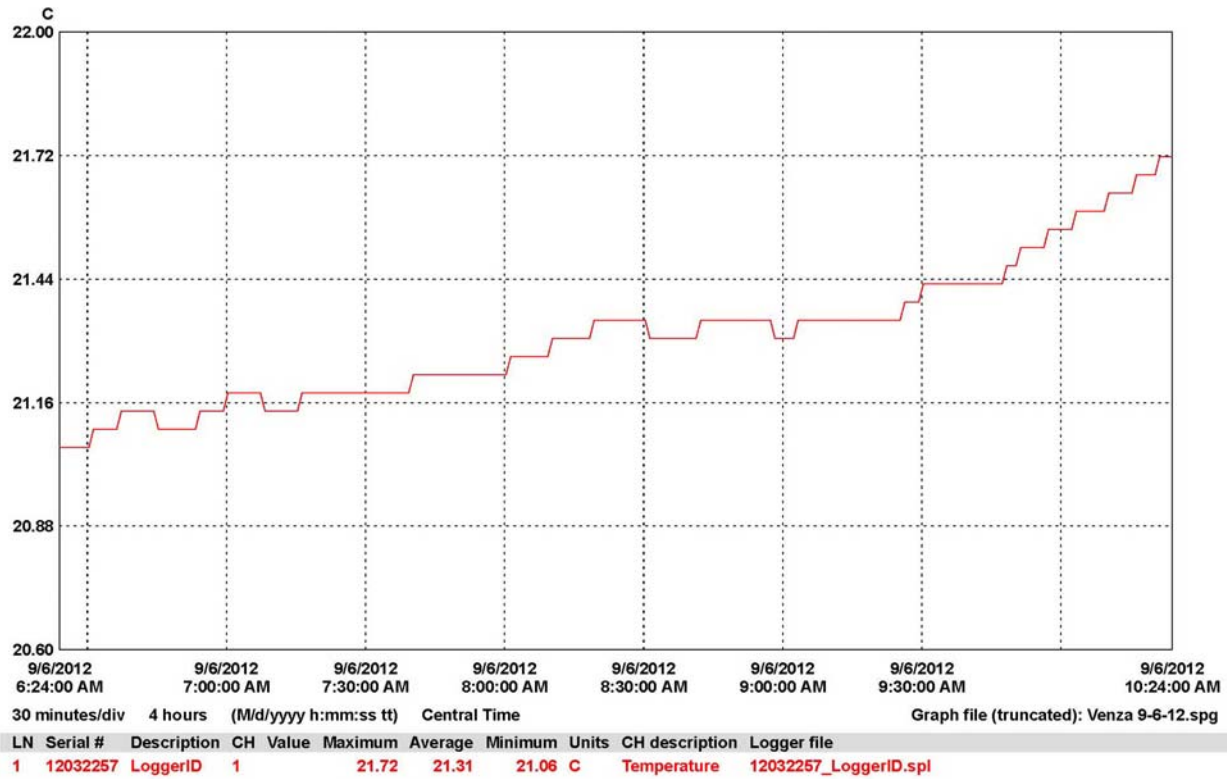
SOLVENT SPILLAGE LOCATION TABLE

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 Toyota Venza LE AWD 4-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: YD5101
 Test Date: 09/06/2012



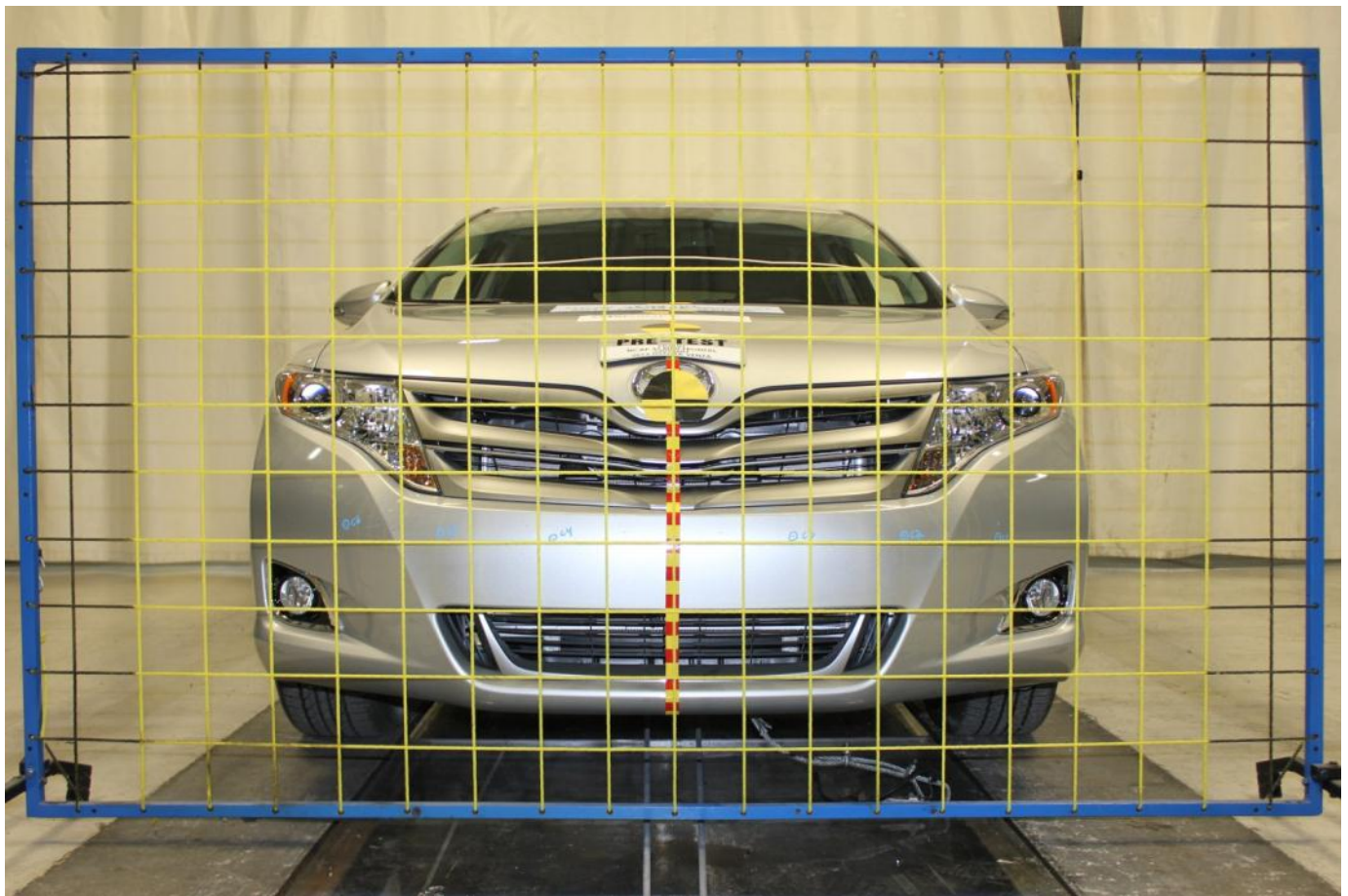
APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

	<u>Page No.</u>
Photo No. 1. Load Cell Location	A-1
Photo No. 2. Load Cell Wall	A-1
Photo No. 3. Manufacturer's Label	A-2
Photo No. 4. Reduced Load Carrying Capacity	A-2
Photo No. 5. Tire Placard	A-3
Photo No. 6. 2013 Toyota Venza Frontal As Delivered	A-3
Photo No. 7. Left Rear 3-4 View, As Received	A-4
Photo No. 8. Pre-Test Front View of Test Vehicle	A-4
Photo No. 9. Post-Test Front View of Test Vehicle	A-5
Photo No. 10. Pre-Test Left View of Test Vehicle	A-5
Photo No. 11. Post-Test Left View of Test Vehicle	A-6
Photo No. 12. Pre-Test Right View of Test Vehicle	A-6
Photo No. 13. Post-Test Right View of Test Vehicle	A-7
Photo No. 14. Pre-Test Right Front 3-4 View	A-7
Photo No. 15. Post-Test Right Front 3-4 View	A-8
Photo No. 16. Pre-Test Left Rear 3-4 View	A-8
Photo No. 17. Post-Test Left Rear 3-4 View	A-9
Photo No. 18. Pre-Test Windshield View	A-9
Photo No. 19. Post-Test Windshield View	A-10
Photo No. 20. Pre-Test Engine Compartment View	A-10
Photo No. 21. Post-Test Engine Compartment View	A-11
Photo No. 22. Pre-Test Fuel Filler Cap View	A-11
Photo No. 23. Post-Test Fuel Filler Cap View	A-12
Photo No. 24. Pre-Test Front Underbody View	A-12
Photo No. 25. Post-Test Front Underbody View	A-13
Photo No. 26. Pre-Test Mid Front Underbody View	A-13
Photo No. 27. Post-Test Mid Front Underbody View	A-14
Photo No. 28. Pre-Test Mid Rear Underbody View	A-14
Photo No. 29. Post-Test Mid Rear Underbody View	A-15
Photo No. 30. Pre-Test Rear Underbody View	A-15

	<u>Page No.</u>
Photo No. 31. Post-Test Rear Underbody View	A-16
Photo No. 32. Pre-Test Dummy Cable Routing	A-16
Photo No. 33. Post-Test Dummy Cable Routing	A-17
Photo No. 34. Pre-Test Driver Dummy Front View	A-17
Photo No. 35. Post-Test Driver Dummy Front View	A-18
Photo No. 36. Pre-Test Driver Dummy Window View	A-18
Photo No. 37. Post-Test Driver Dummy Window View	A-19
Photo No. 38. Pre-Test Driver Dummy and Vehicle Interior (Door Open)	A-19
Photo No. 39. Post-Test Driver Dummy and Vehicle Interior (Door Open)	A-20
Photo No. 40. Post-Test Driver Dummy and Vehicle Interior (Door Open/Without Airbag)	A-20
Photo No. 41. Pre-Test Driver's Seat Fore-Aft Markings	A-21
Photo No. 42. Post-Test Driver's Seat Fore-Aft Markings	A-21
Photo No. 43. Pre-Test View of Belt Anchorage for Driver Dummy	A-22
Photo No. 44. Post-Test View of Belt Anchorage for Driver Dummy	A-22
Photo No. 45. Pre-Test Driver Dummy Feet	A-23
Photo No. 46. Post-Test Driver Dummy Feet	A-23
Photo No. 47. Pre-Test Driver's Side Knee Bolster (without dummy)	A-24
Photo No. 48. Post-Test Driver's Side Knee Bolster (without dummy)	A-24
Photo No. 49. Pre-Test Driver's Side Floorpan	A-25
Photo No. 50. Post-Test Driver's Side Floorpan	A-25
Photo No. 51. Post-Test Driver Dummy Face	A-26
Photo No. 52. Post-Test Driver Dummy Contact with Airbag	A-26
Photo No. 53. Post-Test Driver Dummy Contact with Headrest	A-27
Photo No. 54. Post-Test Driver Dummy Contact with Curtain Airbag	A-27
Photo No. 55. Post-Test Driver Dummy Contact with Side Header	A-28
Photo No. 56. Post-Test Driver Dummy Contact with Knee Airbag	A-28
Photo No. 57. Post-Test Driver Dummy Contact with Steering Column	A-29
Photo No. 58. Pre-Test View of the Steering Wheel	A-29
Photo No. 59. Post-Test View of the Steering Wheel	A-30
Photo No. 60. Pre-Test Passenger Dummy Front View	A-30

	<u>Page No.</u>
Photo No. 61. Post-Test Passenger Dummy Front View	A-31
Photo No. 62. Pre-Test Passenger Dummy Window View	A-31
Photo No. 63. Post-Test Passenger Dummy Window View	A-32
Photo No. 64. Pre-Test Passenger Dummy and Vehicle Interior (Door Open)	A-32
Photo No. 65. Post-Test Passenger Dummy and Vehicle Interior (Door Open)	A-33
Photo No. 66. Post-Test Passenger Dummy and Vehicle Interior (Door Open/Without Airbag)	A-33
Photo No. 67. Pre-Test Passenger's Seat Fore-Aft Markings	A-34
Photo No. 68. Post-Test Passenger's Seat Fore-Aft Markings	A-34
Photo No. 69. Pre-Test View of Belt Anchorage for Passenger Dummy	A-35
Photo No. 70. Post-Test View of Belt Anchorage for Passenger Dummy	A-35
Photo No. 71. Pre-Test Passenger Dummy Feet	A-36
Photo No. 72. Post-Test Passenger Dummy Feet	A-36
Photo No. 73. Pre-Test Passenger's Side Knee Bolster (without dummy)	A-37
Photo No. 74. Post-Test Passenger's Side Knee Bolster (without dummy)	A-37
Photo No. 75. Pre-Test Passenger's Side Floorpan	A-38
Photo No. 76. Post-Test Passenger's Side Floorpan	A-38
Photo No. 77. Post-Test Passenger Dummy Contact with Airbag	A-39
Photo No. 78. Post-Test Passenger Dummy Contact with Curtain Airbag	A-39
Photo No. 79. Post-Test Passenger Dummy Contact with Headrest	A-40
Photo No. 80. Post-Test Passenger Dummy Contact with Glove Box	A-40
Photo No. 81. Ballast Installed in Vehicle	A-41
Photo No. 82. Post-Test Stoddard Solvent Spillage Location View	A-41
Photo No. 83. Post-Test Speed Trap Read-Out	A-42
Photo No. 84. Vehicle at 0° on Static Rollover Device	A-42
Photo No. 85. Vehicle at 90° on Static Rollover Device	A-43
Photo No. 86. Vehicle at 180° on Static Rollover Device	A-43
Photo No. 87. Vehicle at 270° on Static Rollover Device	A-44
Photo No. 88. Vehicle at 360° on Static Rollover Device	A-44
Photo No. 89. 2013 Toyota Venza Frontal Impact Event	A-45
Photo No. 90. Monroney Label	A-45



Load Cell Location



Load Cell Wall



Manufacturer's Label



Reduced Load Carrying Capacity



Tire Placard



2013 Toyota Venza Frontal As Delivered



Left Rear 3-4 View, As Received



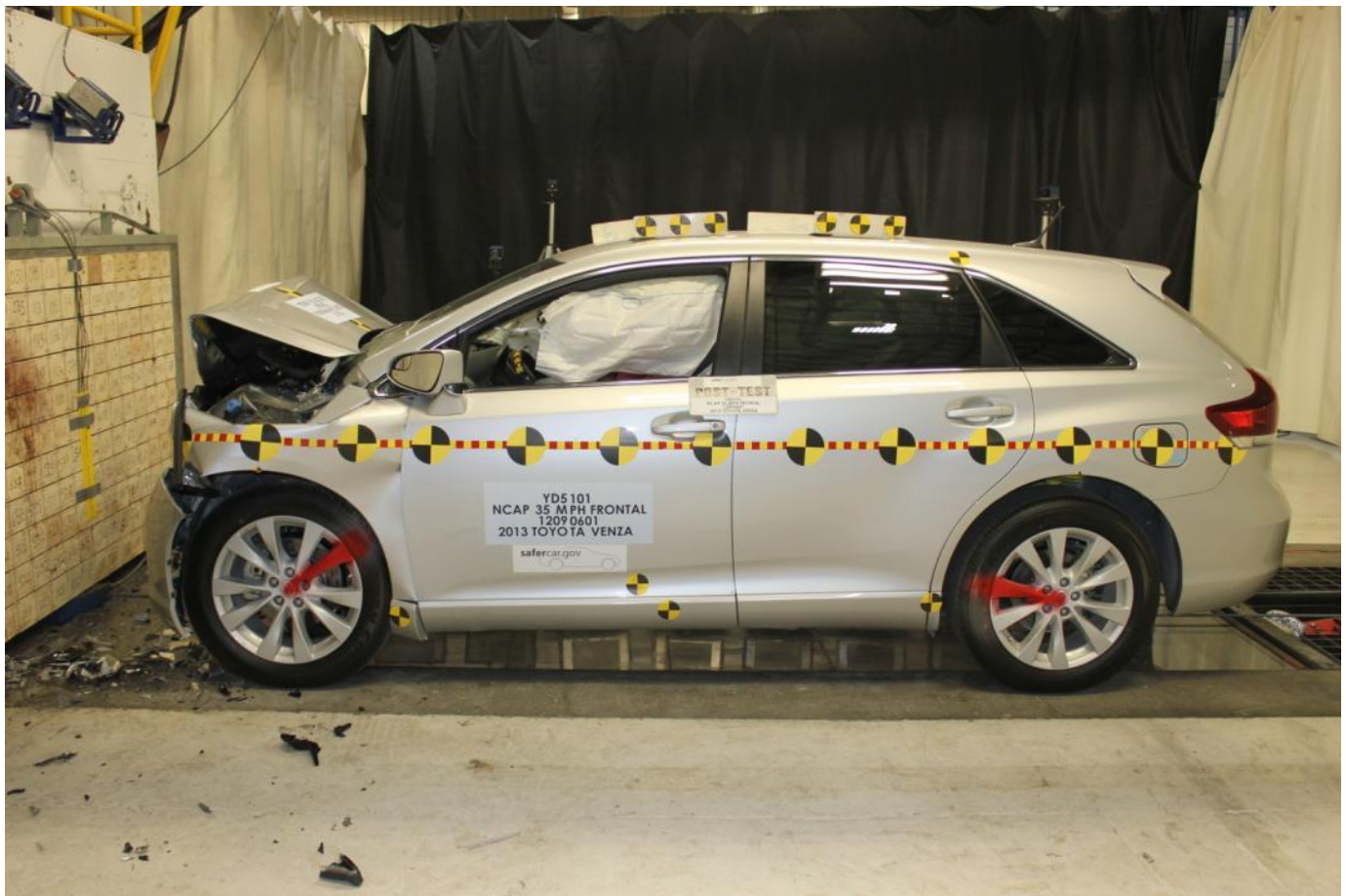
Pre-Test Front View of Test Vehicle



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



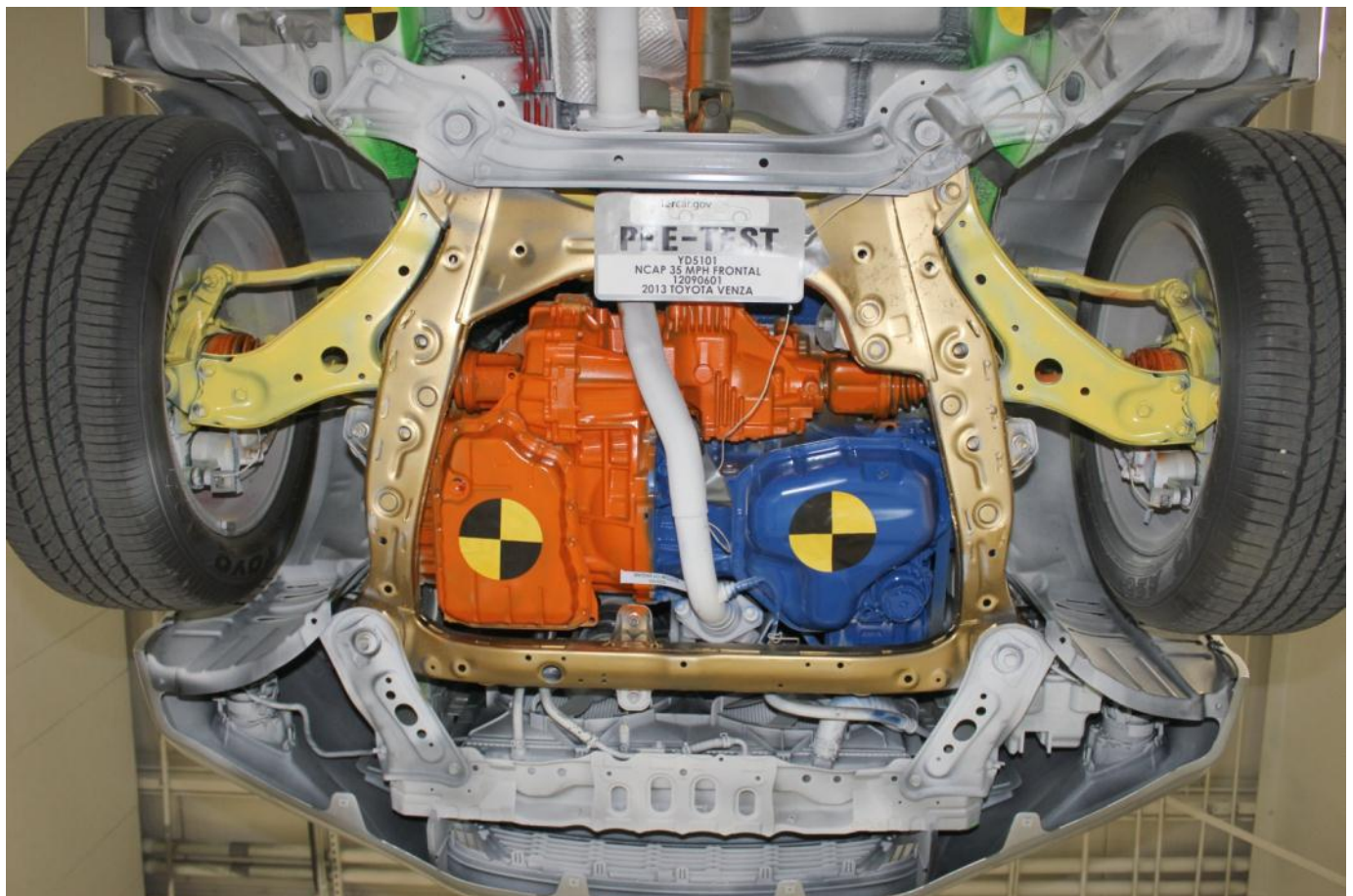
Post-Test Engine Compartment View



Pre-Test Fuel Filler Cap View



Post-Test Fuel Filler Cap View



Pre-Test Front Underbody View



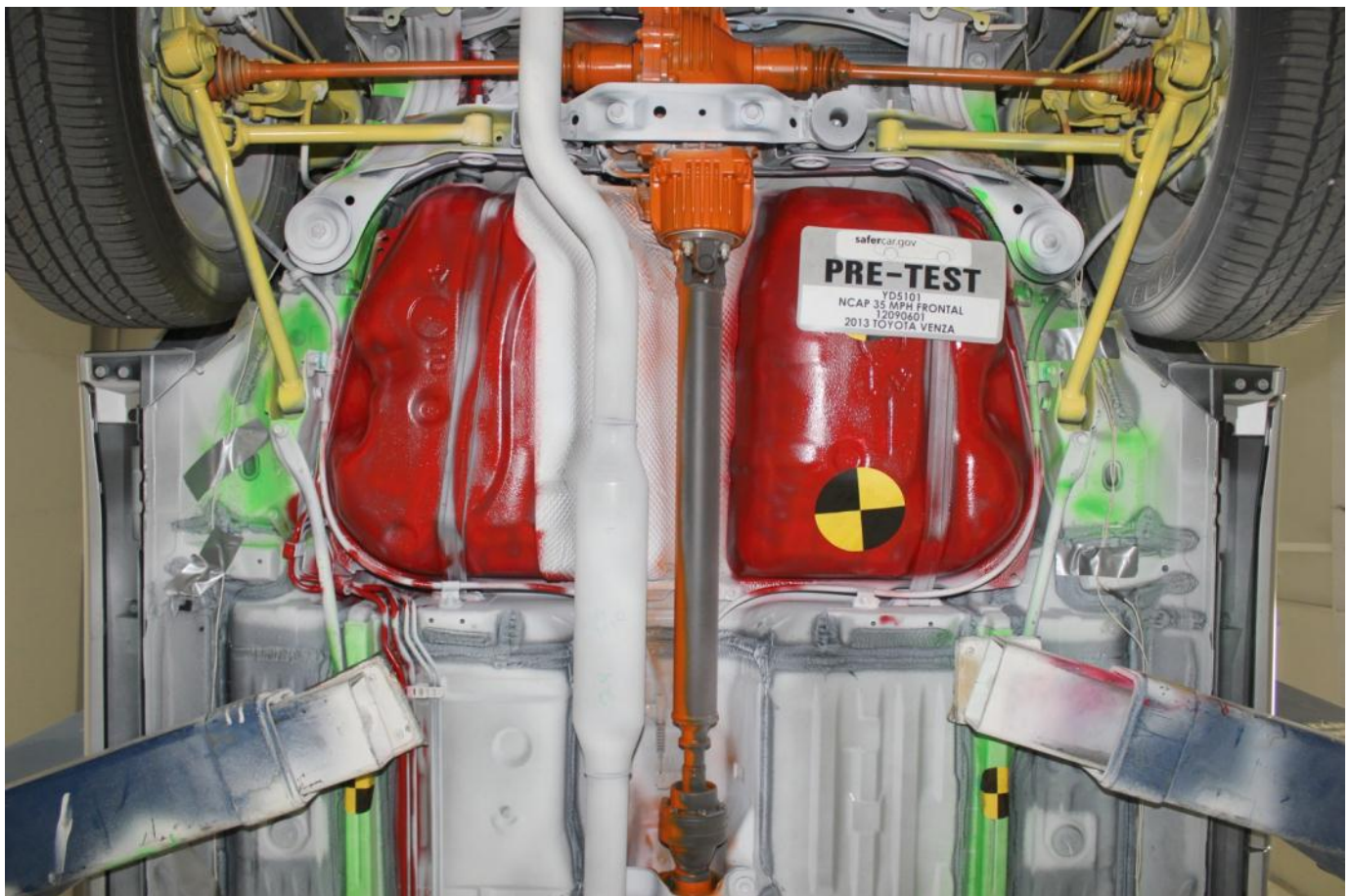
Post-Test Front Underbody View



Pre-Test Mid Front Underbody View



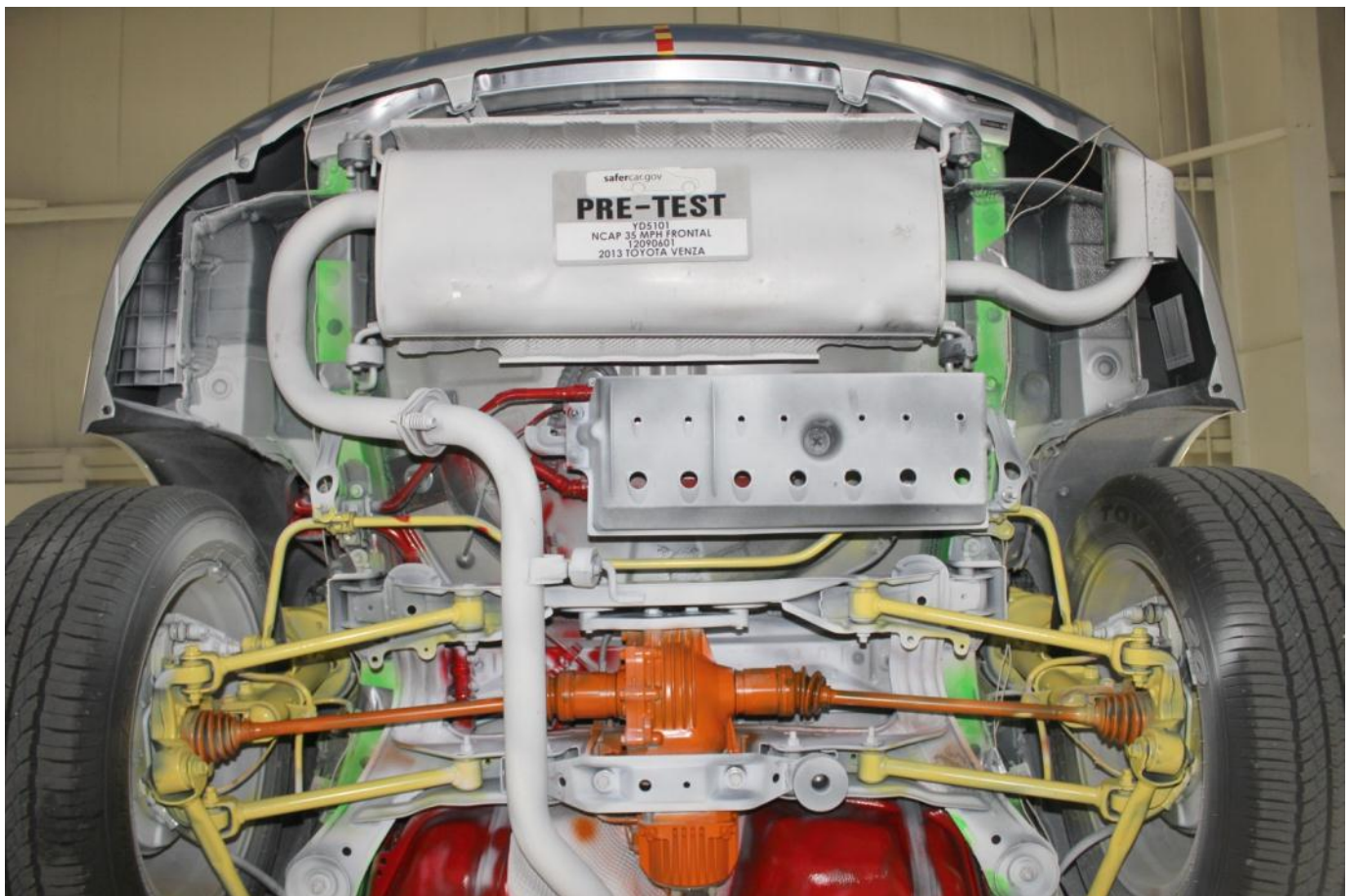
Post-Test Mid Front Underbody View



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)



Post-Test Driver Dummy and Vehicle Interior (Door Open/Without Airbag)



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



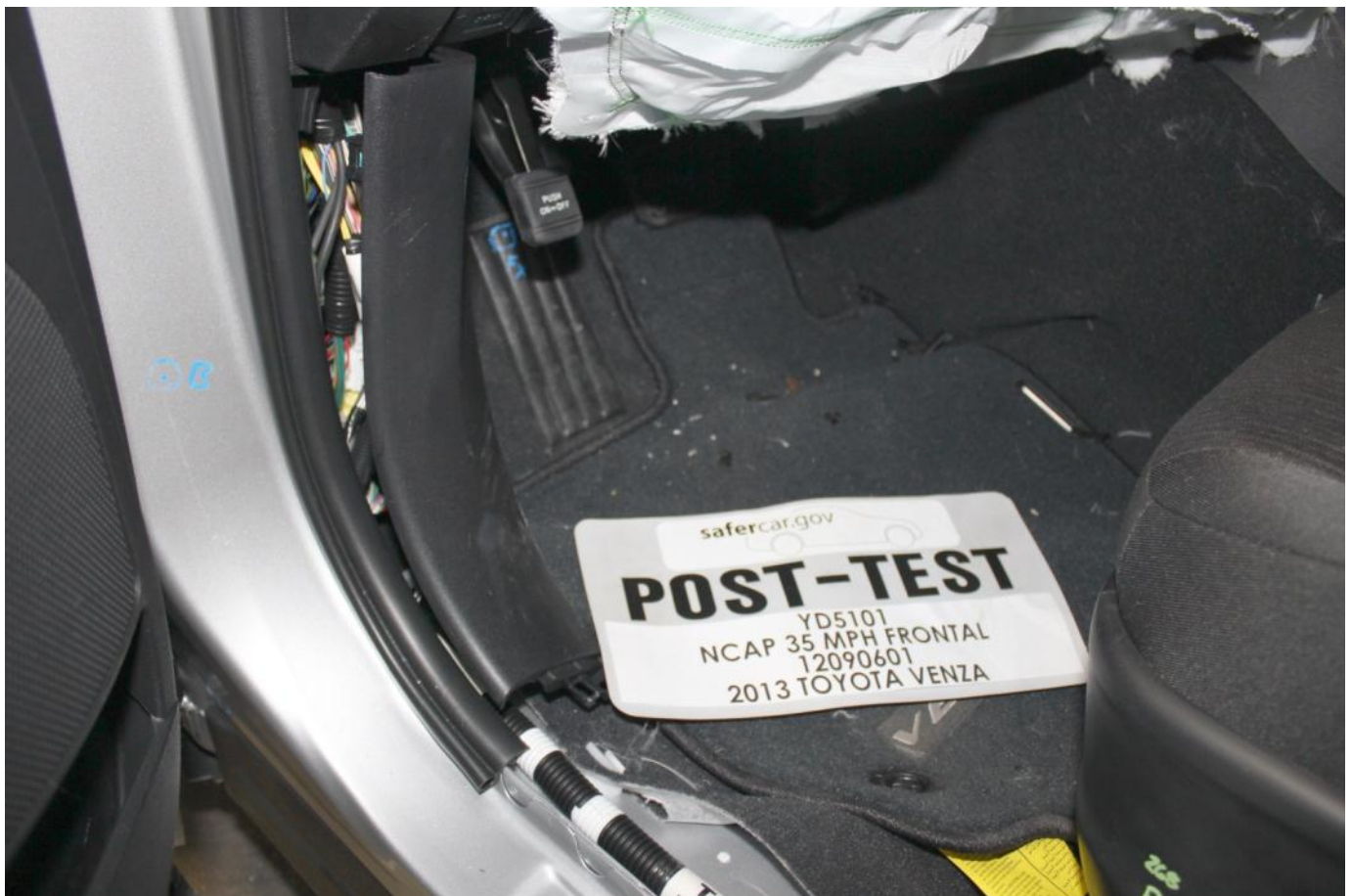
Pre-Test Driver's Side Knee Bolster (without dummy)



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



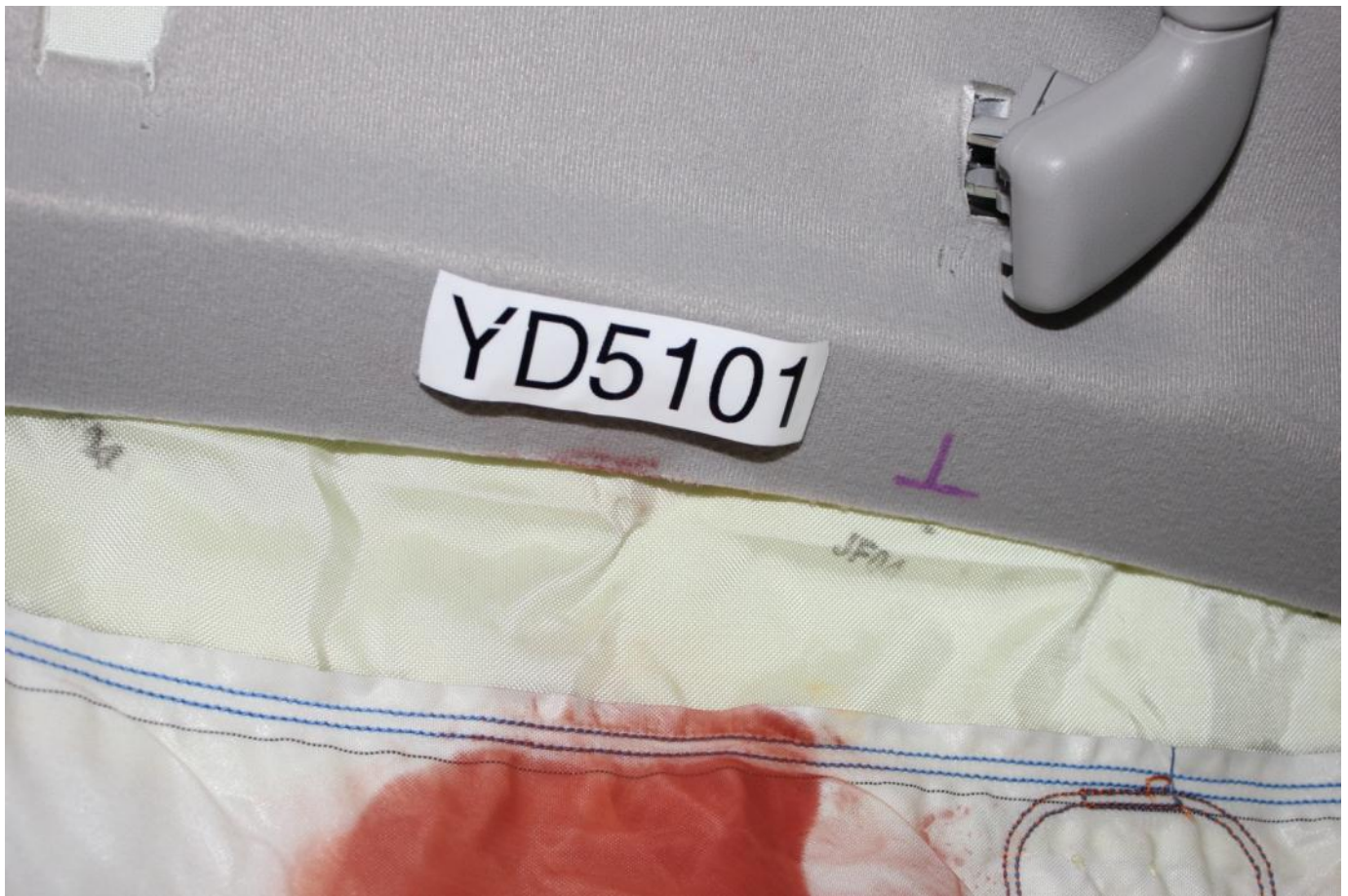
Post-Test Driver Dummy Contact with Airbag



Post-Test Driver Dummy Contact with Headrest



Post-Test Driver Dummy Contact with Curtain Airbag



Post-Test Driver Dummy Contact with Side Header



Post-Test Driver Dummy Contact with Knee Airbag



Post-Test Driver Dummy Contact with Steering Column



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)



Post-Test Passenger Dummy and Vehicle Interior (Door Open/Without Airbag)



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)



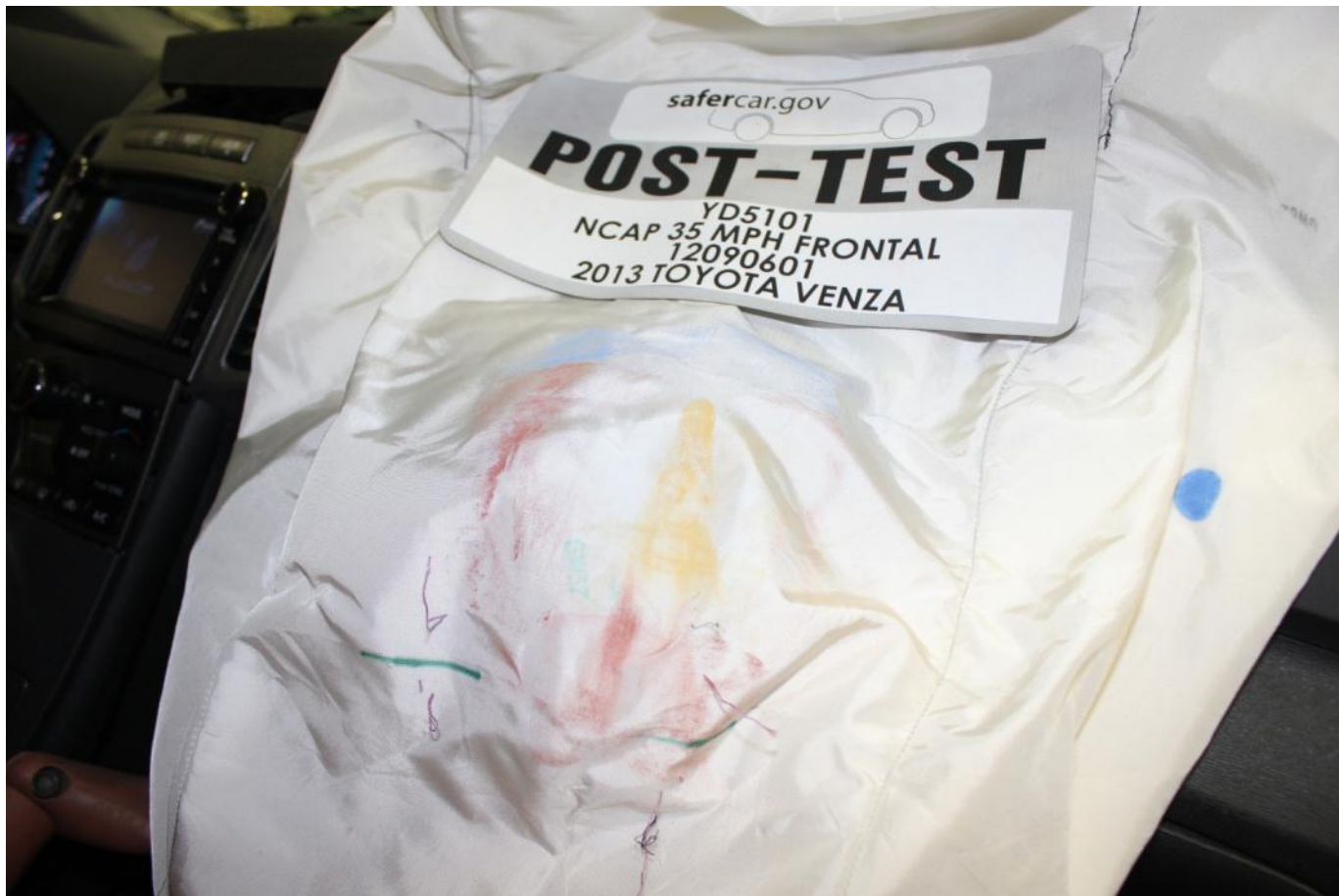
Post-Test Passenger's Side Knee Bolster (without dummy)



Pre-Test Passenger's Side Floorpan



Post-Test Passenger's Side Floorpan



Post-Test Passenger Dummy Contact with Airbag



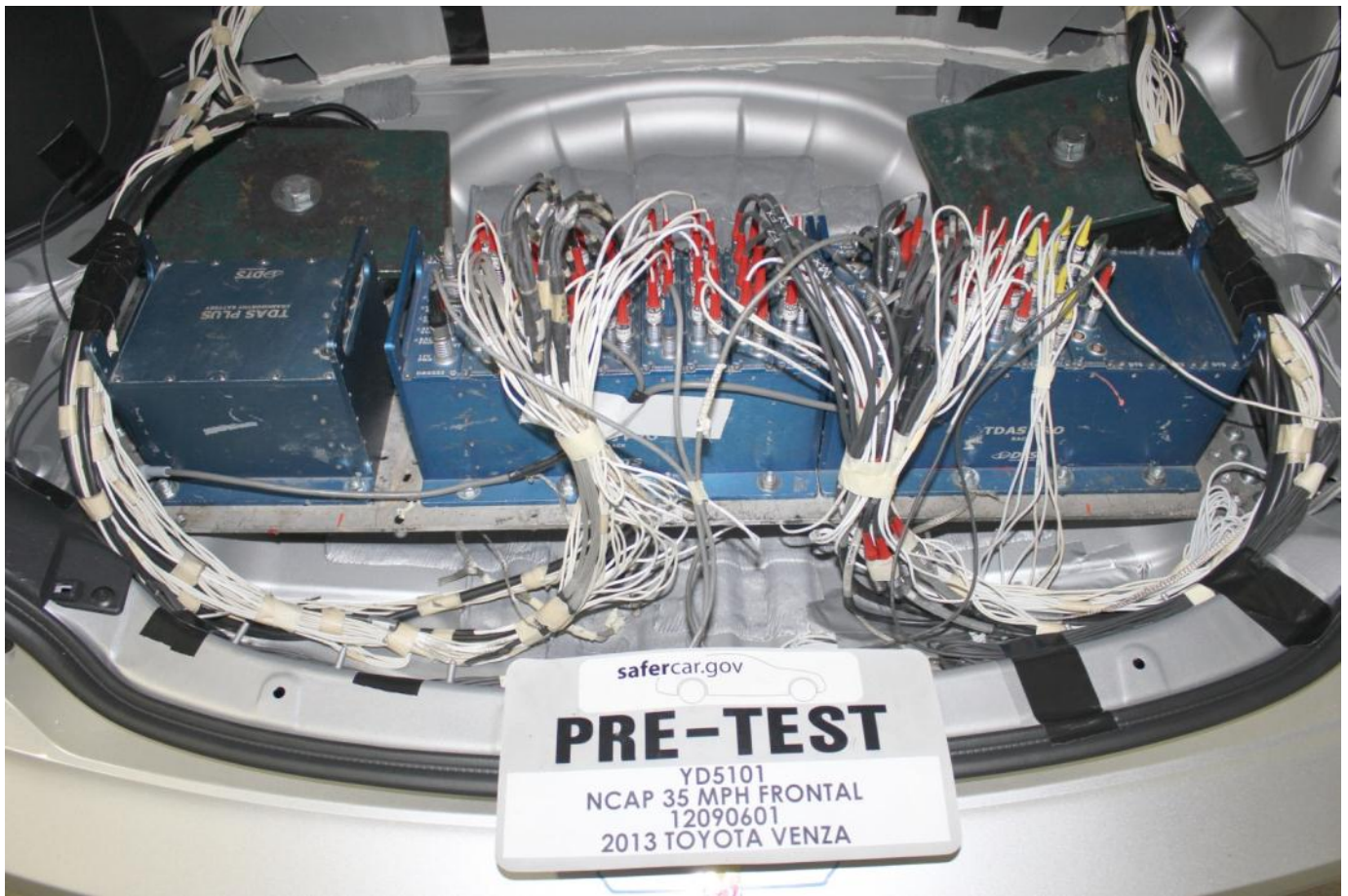
Post-Test Passenger Dummy Contact with Curtain Airbag



Post-Test Passenger Dummy Contact with Headrest



Post-Test Passenger Dummy Contact with Glove Box



Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

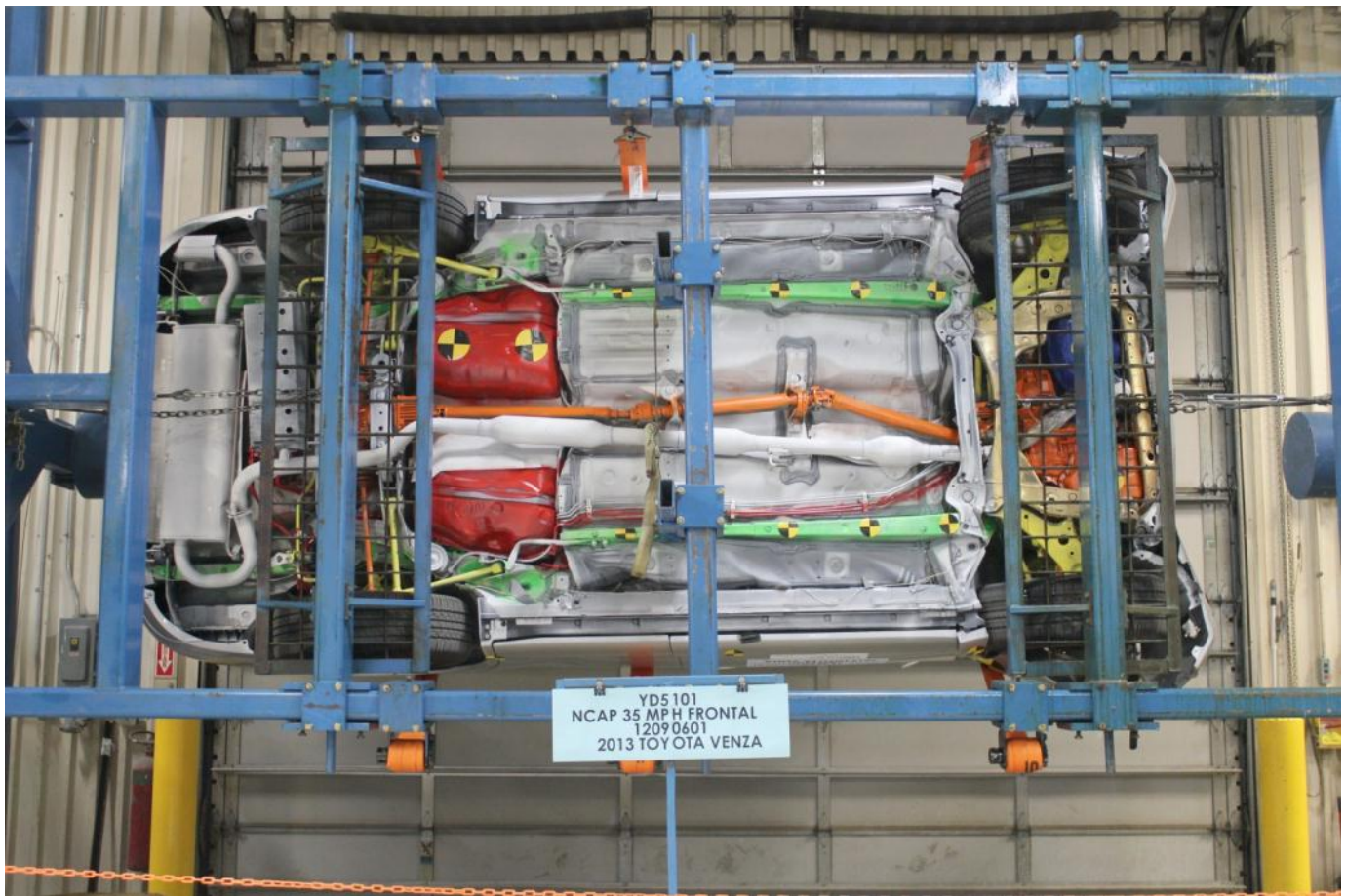
Post-Test Stoddard Solvent Spillage Location View



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 Toyota Venza Frontal Impact Event

TOYOTA moving forward DESC: VENZA LE L4 AWD VIN: 4T3BA3BB8DU035697 YR/MDL: 2013/2620A CLR: CLASSIC SILVER MET/BLACK (01F7/28) PORT/PLANT: Georgetown, KY/TMMK RAILHEAD:			STANDARD EQUIPMENT MECHANICAL & PERFORMANCE • 2.7L iCHT 18-Valve iCVT with Dual VVT-i • 6-Spd Elect Controlled Auto Transmission • All Wheel Drive & Wheel-Ind Suspension • 19" Alloy Wheels w/P245/55R19 Tires • Electric Power Steering (EPS) SAFETY & CONVENIENCE • Star Safety System: Includes Enhanced Vehicle Stability Control, Traction Control, Anti-Lock Brake System, Electronic Brake-Force Distribution, Brake Assist & Smart Stop Technology • Driver & Front Pass Adv Airbag System w/ Front Seat-Mounted Side Airbags; Fr & Rr Side Curtain Airbags; Driver Knee Airbag • Driver/Front Passenger Active Headrests • LATCH/L-ner Anchors & Tethers for Children • Daytime Running Lights (DRL) with On/Off • TirePressure Monitor, Engine Immobilizer EXTERIOR • Projector-Beam Headlamps; Fog Lamps • Hot Per Outside Mirrors w/Turn Signal Indicator, Puddle Lamps, Blind Spot Mirror • Var Int Wiper/Washers & Wiper De-Icer • Privacy Glass: Rr Side-Quarter & Liftgate • Rear Spoiler w/LED High-Mount Stop Lamp INTERIOR • Dual Zone Auto Climate Control w/Filter • Display Audio: 6.1" Touch Screen, AM/FM/CD w/ MP3/WMA, 6 Spkrs, Aux Jack, USB w/ iPod Conn & Bluetooth • 5.5-Inch Multi-Information Display • 8-Way Power Adjustable Driver's Seat • 60/40 Split, Reclining, One Touch Fold-Flat Rear Seats with Center Armrest • Tilt/Telescopic Steering Whl w/Controls • Remote Keyless Entry, Cruise Control • Power Windows, All With Auto Up/Down • Auto Dimming Rearview Mirror w/Compass • Front Map Lamps & Sunglasses Storage • Homelink; Three-12V Aux Power Outlets • Center Console w/Storage Armrest • Rear Reading Lamps and Air Vents ***Full Tank of Gas***		MANUFACTURER'S SUGGESTED RETAIL PRICE \$29,150.00 OPTIONAL EQUIPMENT FE 50 State Emissions CF Floor Mats & Cargo Mat 290.00														
GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score Not Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight. <table border="1"> <tr> <td>Frontal Crash Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.</td> <td>Driver Passenger Not Rated</td> <td>Not Rated</td> </tr> <tr> <td>Side Crash Based on the risk of injury in a side impact.</td> <td>Front seat Rear seat Not Rated</td> <td>Not Rated</td> </tr> <tr> <td>Rollover Based on the risk of rollover in a single-vehicle crash.</td> <td colspan="2">★★★★</td> </tr> </table> 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			Frontal Crash Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.	Driver Passenger Not Rated	Not Rated	Side Crash Based on the risk of injury in a side impact.	Front seat Rear seat Not Rated	Not Rated	Rollover Based on the risk of rollover in a single-vehicle crash.	★★★★		EPA DOT Fuel Economy and Environment <table border="1"> <tr> <td colspan="2"> Fuel Economy 22 MPG combined city/hwy 4.5 gallons per 100 miles </td> <td> Smell DVS: range from 15 to 32 MPG The best vehicle rates 112 MPG </td> </tr> <tr> <td colspan="2"> You spend \$400 more in fuel costs over 5 years compared to the average new vehicle. </td> <td> Gasoline Vehicle </td> </tr> </table>		Fuel Economy 22 MPG combined city/hwy 4.5 gallons per 100 miles		Smell DVS: range from 15 to 32 MPG The best vehicle rates 112 MPG	You spend \$400 more in fuel costs over 5 years compared to the average new vehicle.		Gasoline Vehicle
Frontal Crash Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.	Driver Passenger Not Rated	Not Rated																	
Side Crash Based on the risk of injury in a side impact.	Front seat Rear seat Not Rated	Not Rated																	
Rollover Based on the risk of rollover in a single-vehicle crash.	★★★★																		
Fuel Economy 22 MPG combined city/hwy 4.5 gallons per 100 miles		Smell DVS: range from 15 to 32 MPG The best vehicle rates 112 MPG																	
You spend \$400 more in fuel costs over 5 years compared to the average new vehicle.		Gasoline Vehicle																	
Annual fuel cost \$2,400 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 \$3.00 per gallon. EPA's miles per gallon estimate, vehicle emissions and a significant cause of climate change and smog.			Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only) The vehicle emits 282 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and delivering fuel also create emissions, from more at fuel economy.gov.																
fuel economy.gov Calculate personalized estimates and compare vehicles.			DELIVERY PROCESSING AND HANDLING FEE 810.00 TOTAL \$30,250.00 The New Vehicle Limited Warranty provides 3-year/50,000-mile basic coverage. 5-year/100,000-mile powertrain coverage, plus 24-hour roadside assistance coverage. See Warranty and Maintenance Guide for details. Ask dealer for details. Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. 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. Toyota Care, which covers normal factory scheduled maintenance for two years or 25,000 miles, whichever occurs first, is included as part of the sales price of the vehicle for qualifying buyers. See participating dealer for eligibility and coverage details.																
Get more info on this Toyota. Just snap and text this tag. (Message and data rates may apply.)			Dealer Name / Address: 12034 ELMHURST TOYOTA 440 WEST LAKE STREET ELMHURST IL 60126 Ship to: IL60126																

Monroney Label

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Page No.

List of Data Plots Provided in the Test Report

Figure No. 1.	Driver Head X Acceleration vs. Time	B-1
Figure No. 2.	Driver Head Y Acceleration vs. Time	B-1
Figure No. 3.	Driver Head Z Acceleration vs. Time	B-1
Figure No. 4.	Driver Head Resultant Acceleration vs. Time	B-1
Figure No. 5.	Driver Chest Displacement vs. Time	B-2
Figure No. 6.	Driver Chest X Acceleration vs. Time	B-3
Figure No. 7.	Driver Chest Y Acceleration vs. Time	B-3
Figure No. 8.	Driver Chest Z Acceleration vs. Time	B-3
Figure No. 9.	Driver Chest Resultant Acceleration vs. Time	B-3
Figure No. 10.	Driver Neck Force X vs. Time	B-4
Figure No. 11.	Driver Neck Force Z vs. Time	B-4
Figure No. 12.	Driver Neck Moment Y vs. Time	B-4
Figure No. 13.	Driver Nij (NTF) vs. Time	B-5
Figure No. 14.	Driver Nij (NTE) vs. Time	B-5
Figure No. 15.	Driver Nij (NCF) vs. Time	B-5
Figure No. 16.	Driver Nij (NCE) vs. Time	B-5
Figure No. 17.	Driver Left Femur Force vs. Time	B-6
Figure No. 18.	Driver Right Femur Force vs. Time	B-6
Figure No. 19.	Passenger Head X Acceleration vs. Time	B-7
Figure No. 20.	Passenger Head Y Acceleration vs. Time	B-7
Figure No. 21.	Passenger Head Z Acceleration vs. Time	B-7
Figure No. 22.	Passenger Head Resultant Acceleration vs. Time	B-7
Figure No. 23.	Passenger Chest Displacement vs. Time	B-8
Figure No. 24.	Passenger Chest X Acceleration vs. Time	B-9
Figure No. 25.	Passenger Chest Y Acceleration vs. Time	B-9
Figure No. 26.	Passenger Chest Z Acceleration vs. Time	B-9
Figure No. 27.	Passenger Chest Resultant Z Acceleration vs. Time	B-9
Figure No. 28.	Passenger Neck Force X vs. Time	B-10
Figure No. 29.	Passenger Neck Force Z vs. Time	B-10

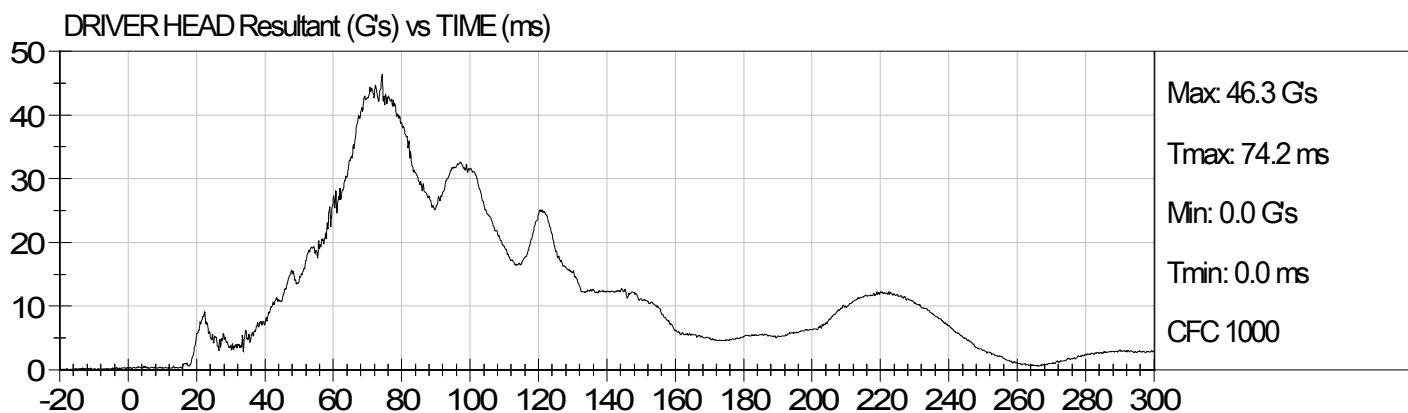
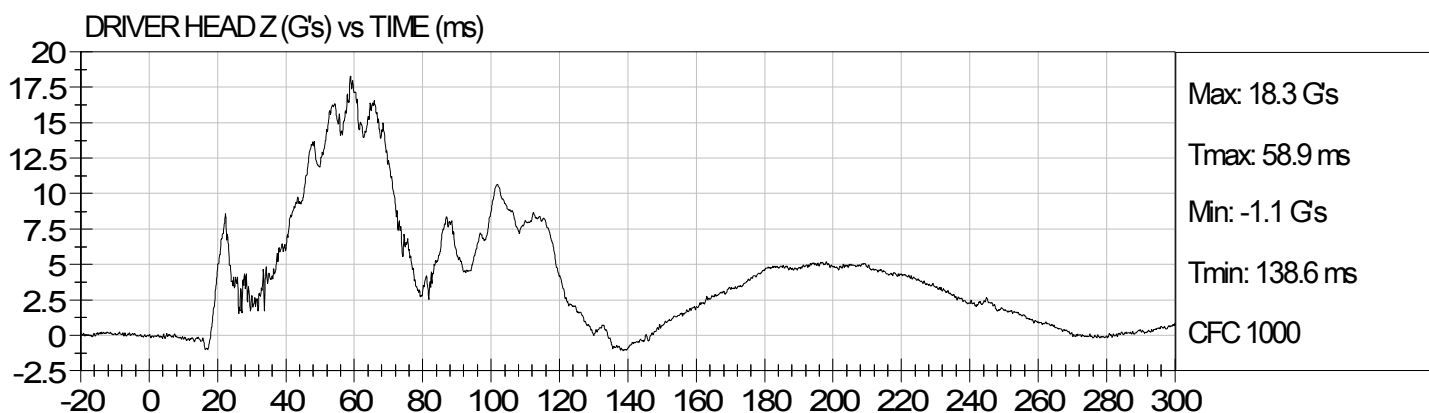
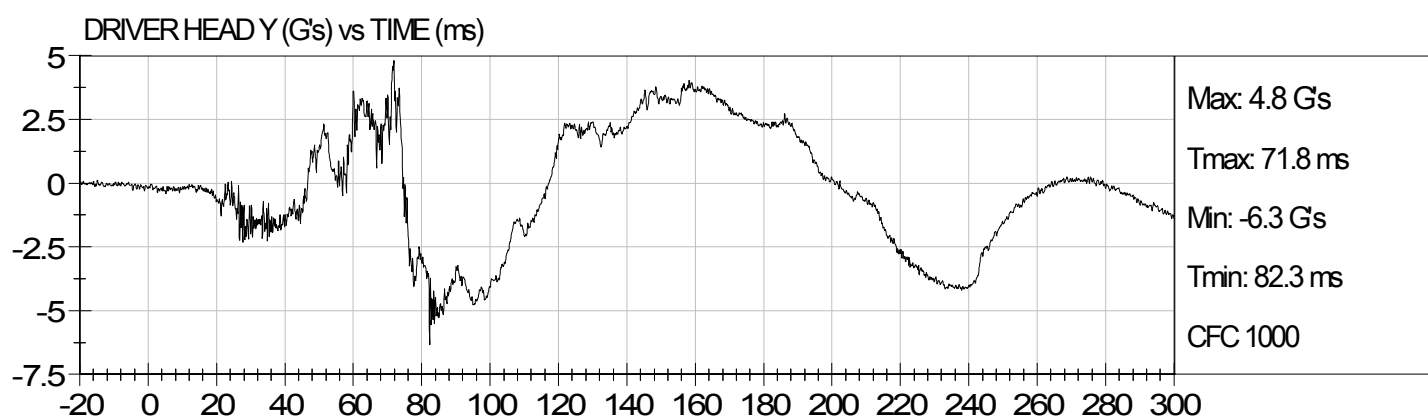
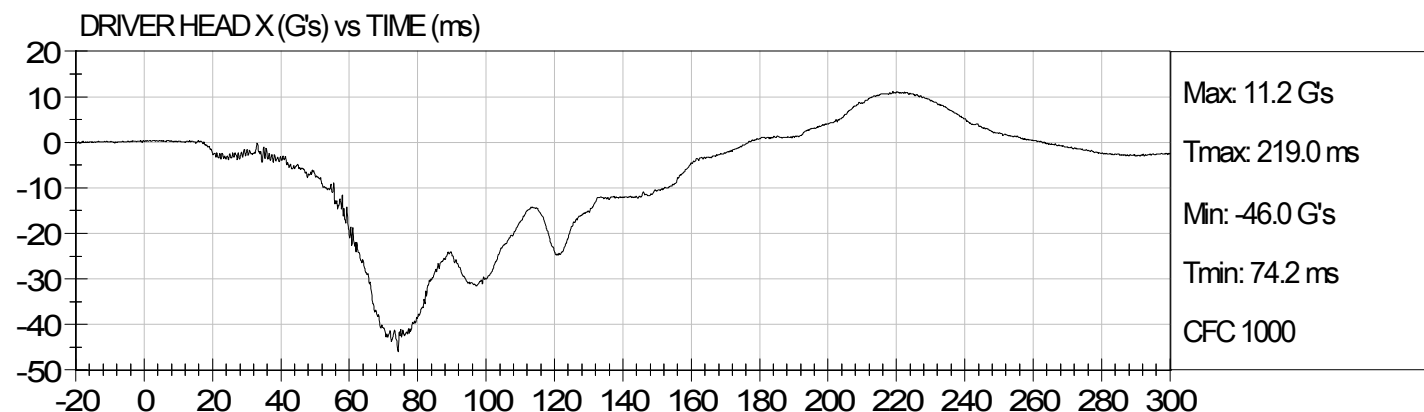
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Figure No. 30.	Passenger Neck Moment Y vs. Time	B-10
Figure No. 31.	Passenger Nij (NTF) vs. Time	B-11
Figure No. 32.	Passenger Nij (NTE) vs. Time	B-11
Figure No. 33.	Passenger Nij (NCF) vs. Time	B-11
Figure No. 34.	Passenger Nij (NCE) vs. Time	B-11
Figure No. 35.	Passenger Left Femur Force vs. Time	B-12
Figure No. 36.	Passenger Right Femur Force vs. Time	B-12

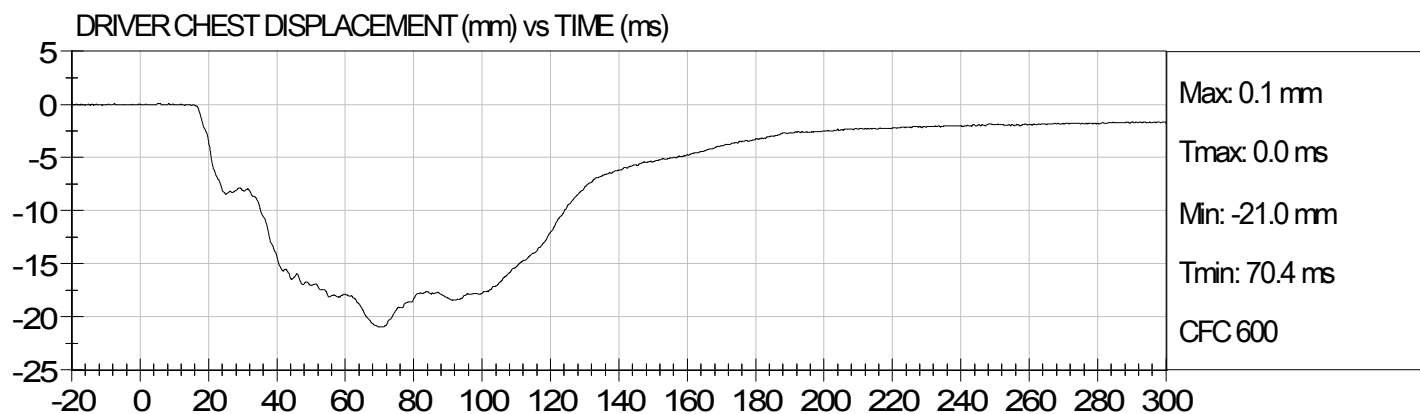
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

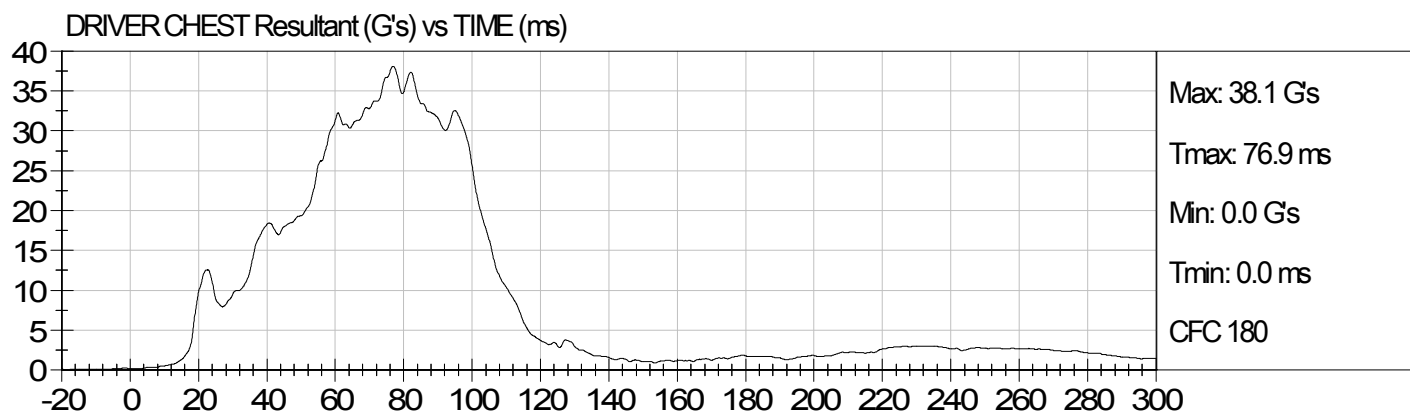
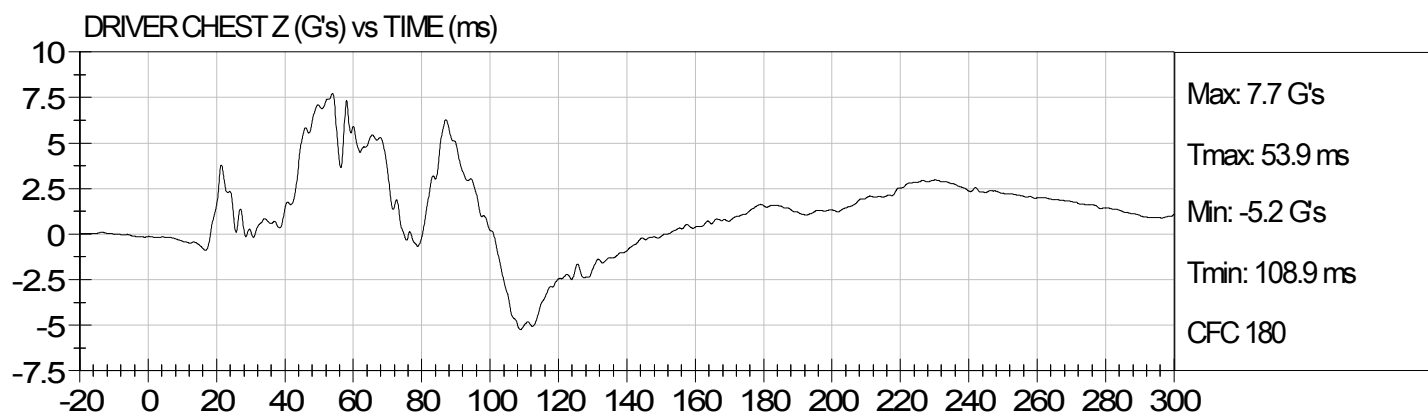
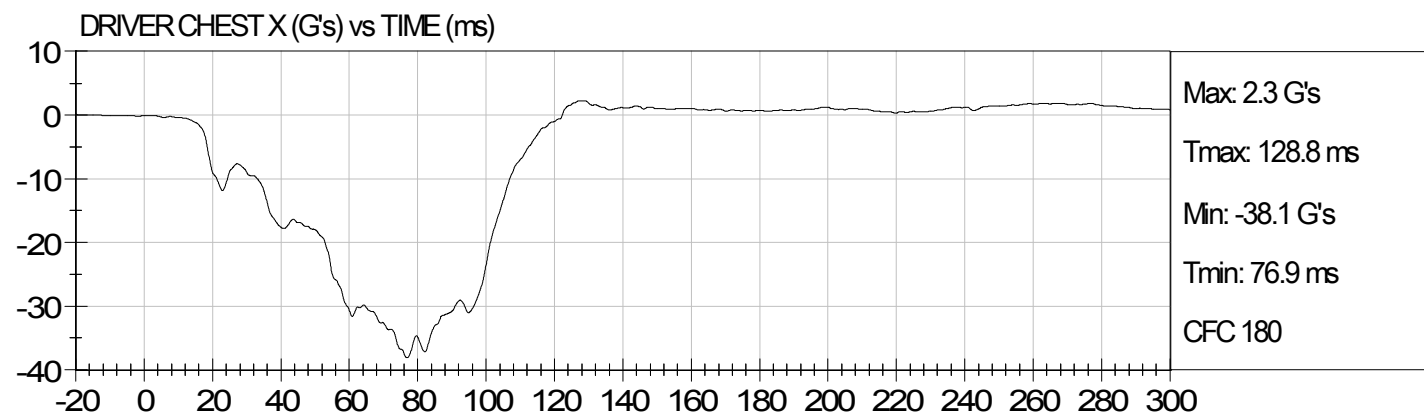
Driver Head X Redundant
 Driver Head Y Redundant
 Driver Head Z Redundant
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 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant
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 Driver Chest Z Redundant
 Driver Pelvis 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
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 Driver Right Upper Tibia Moment X
 Driver Right Upper Tibia Moment Y

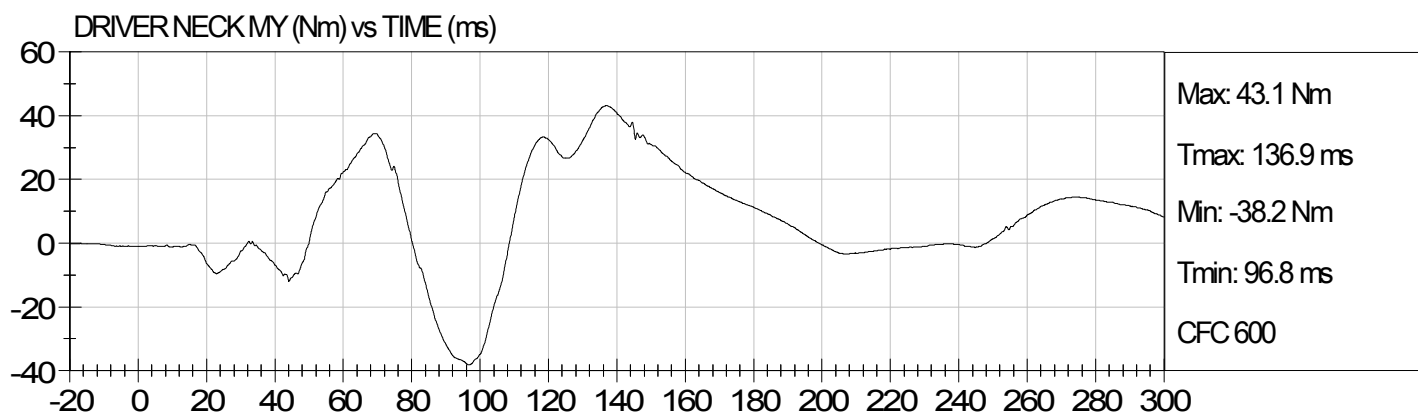
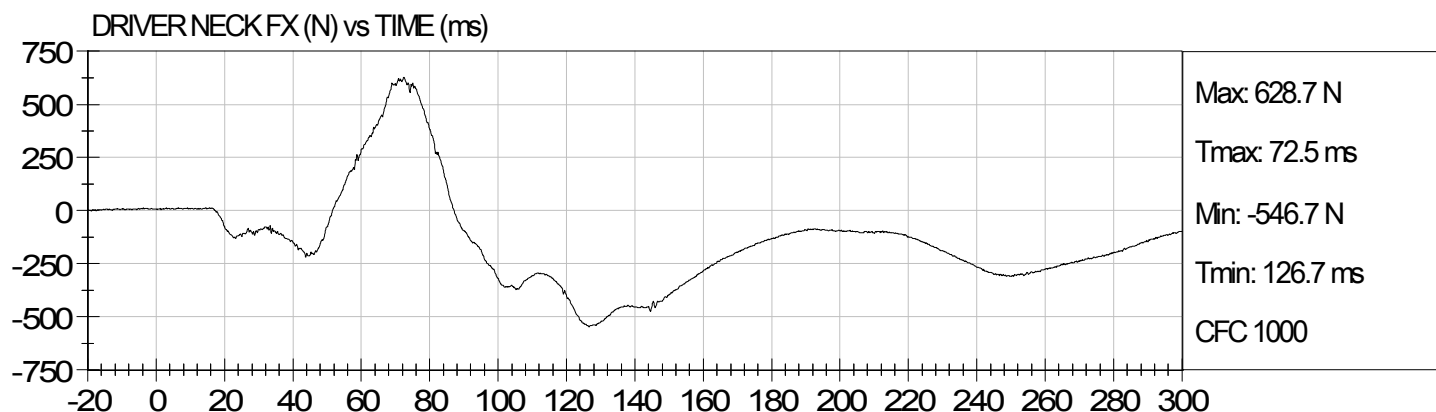
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Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver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

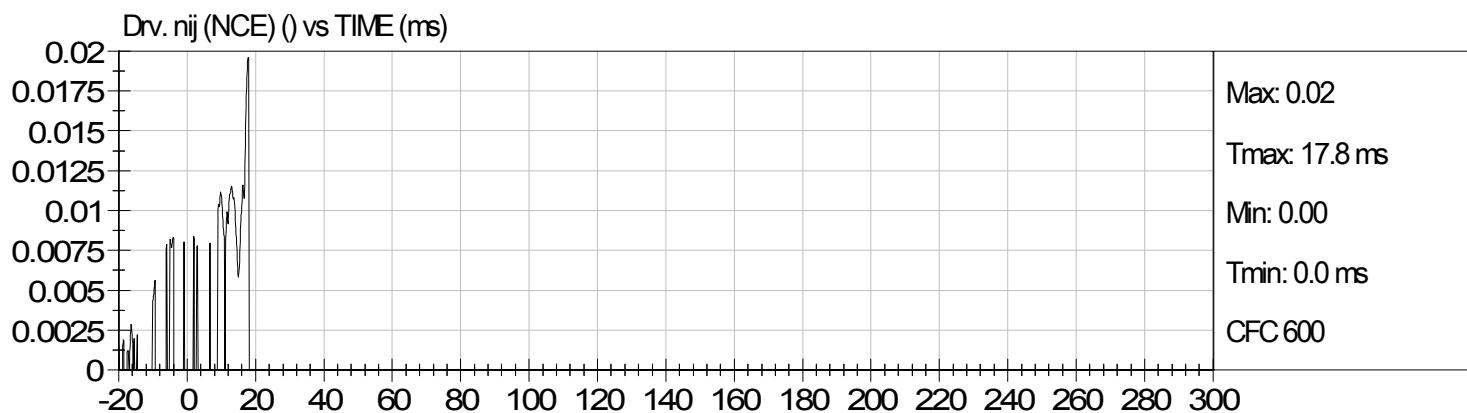
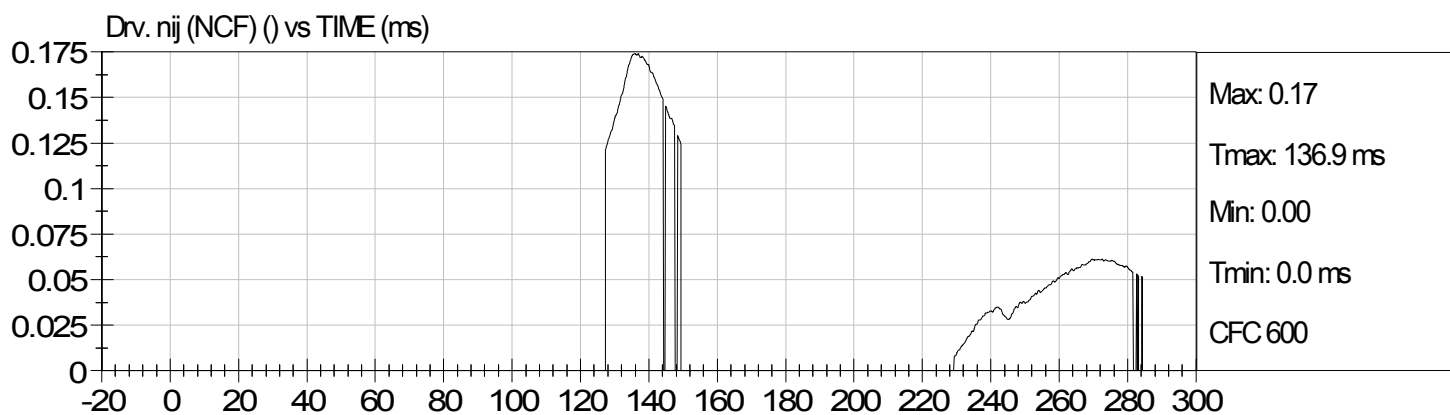
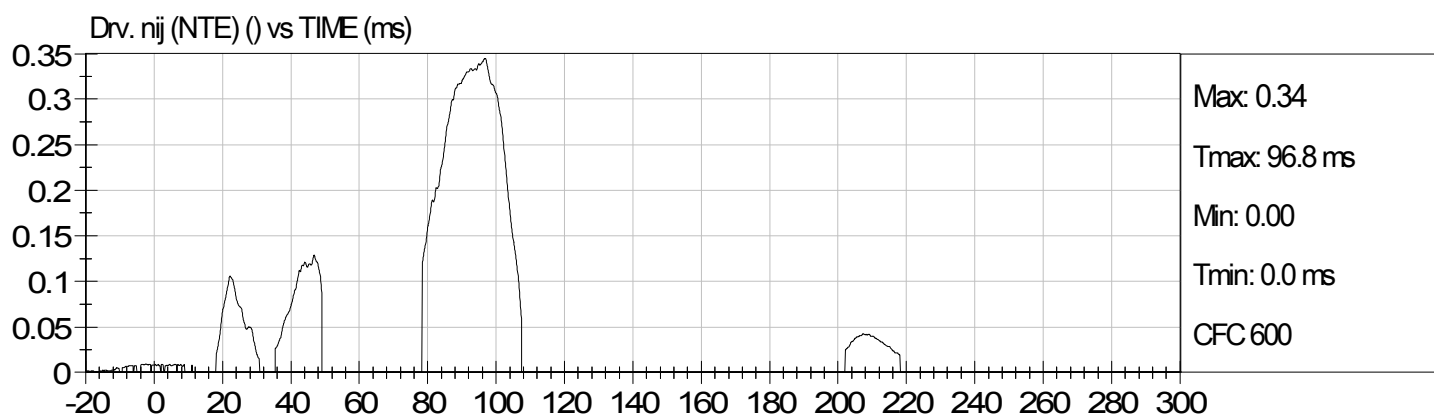
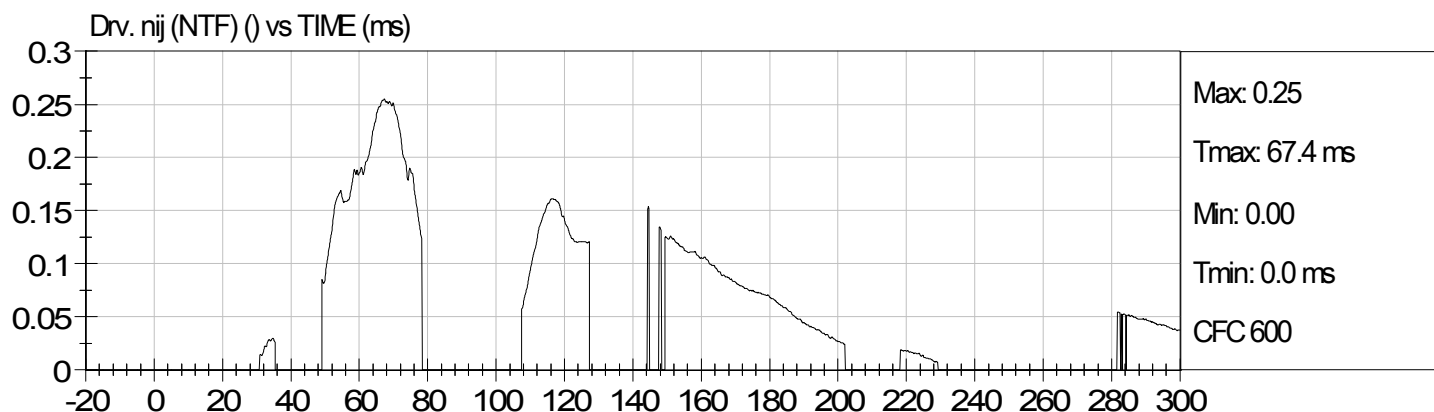
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger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

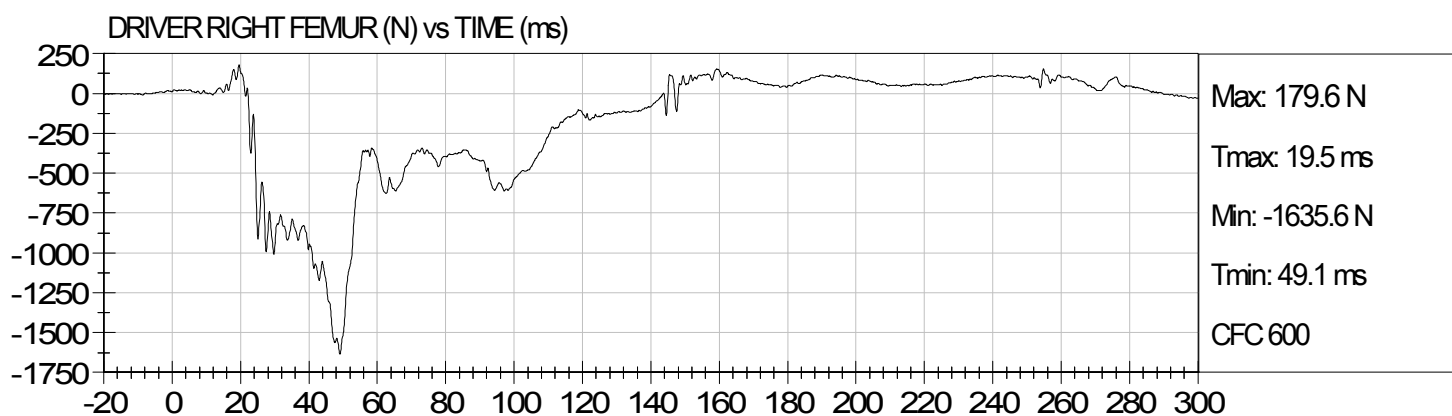
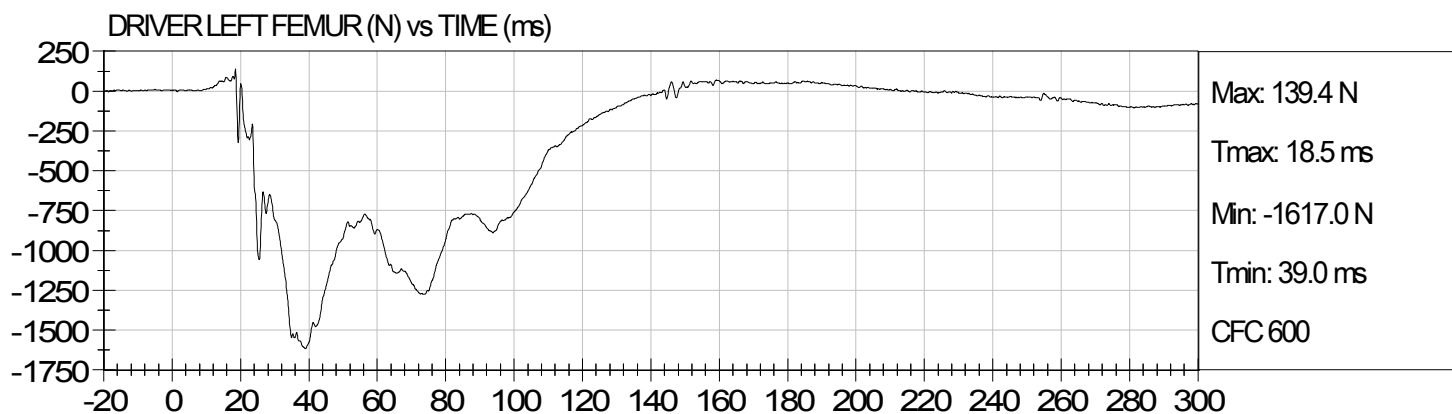


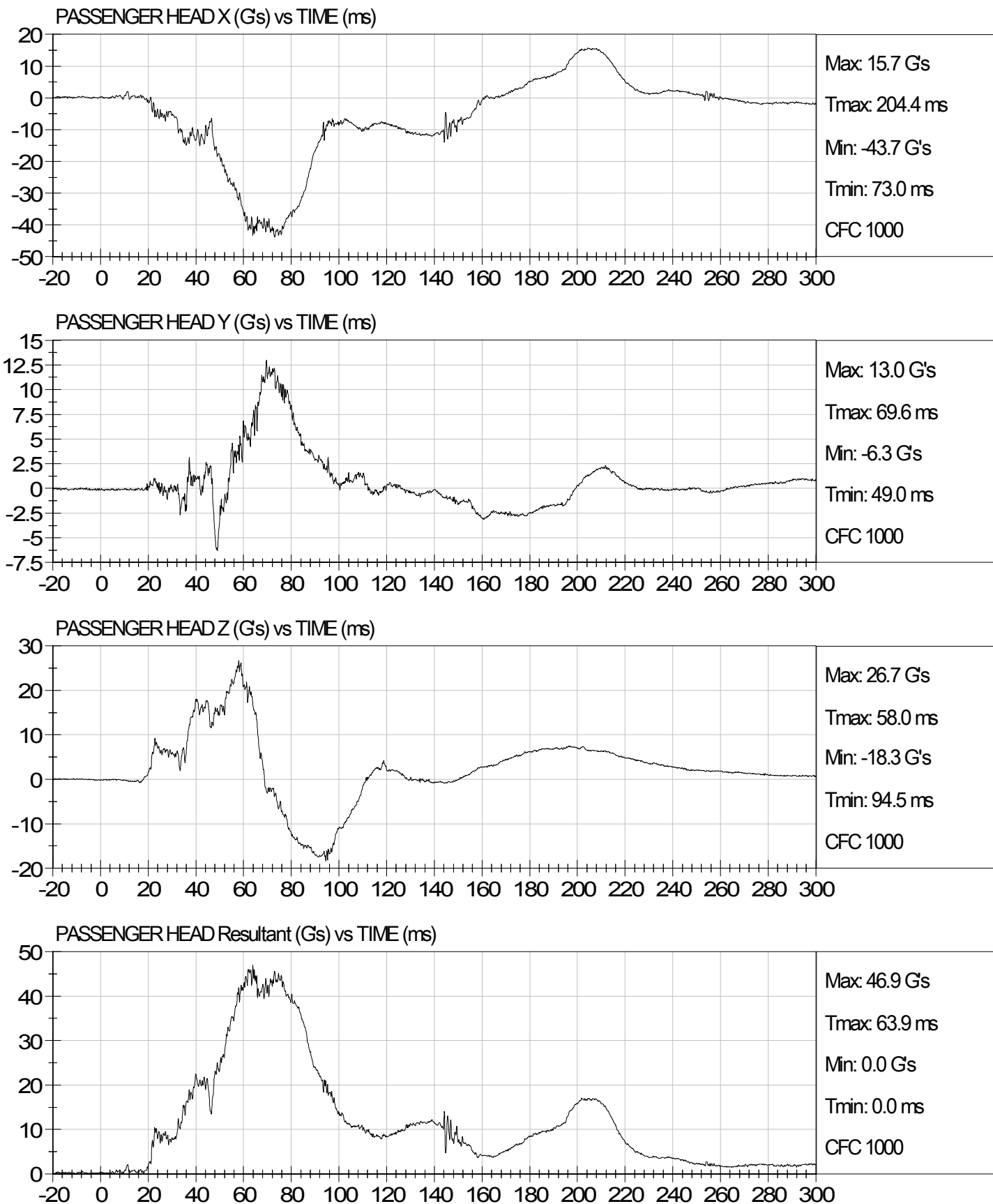


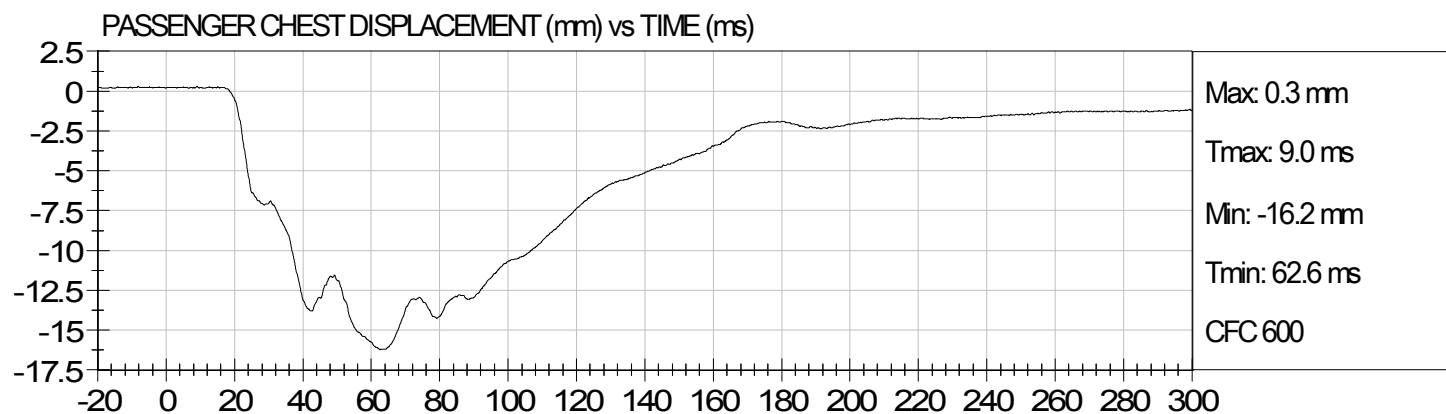


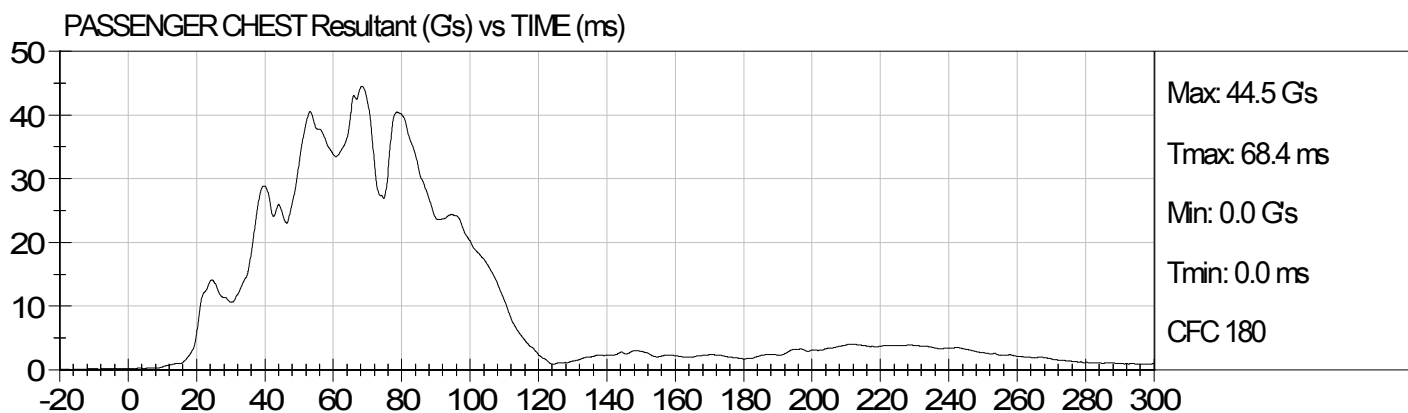
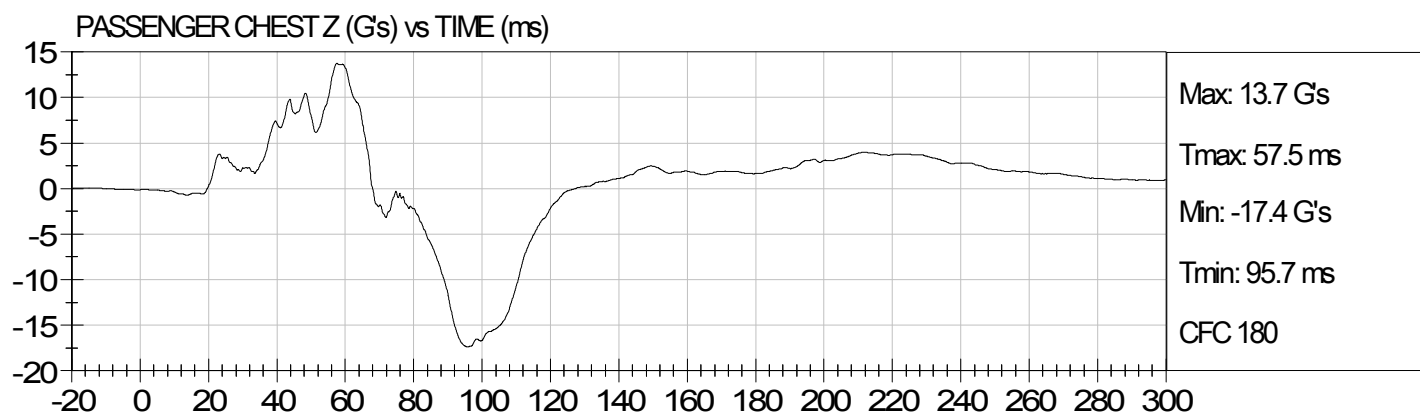
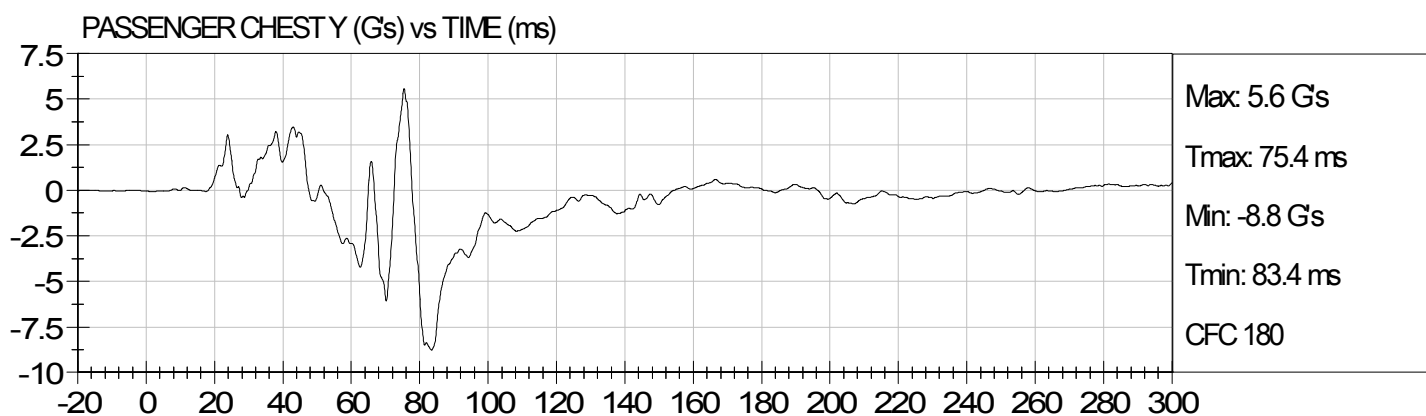
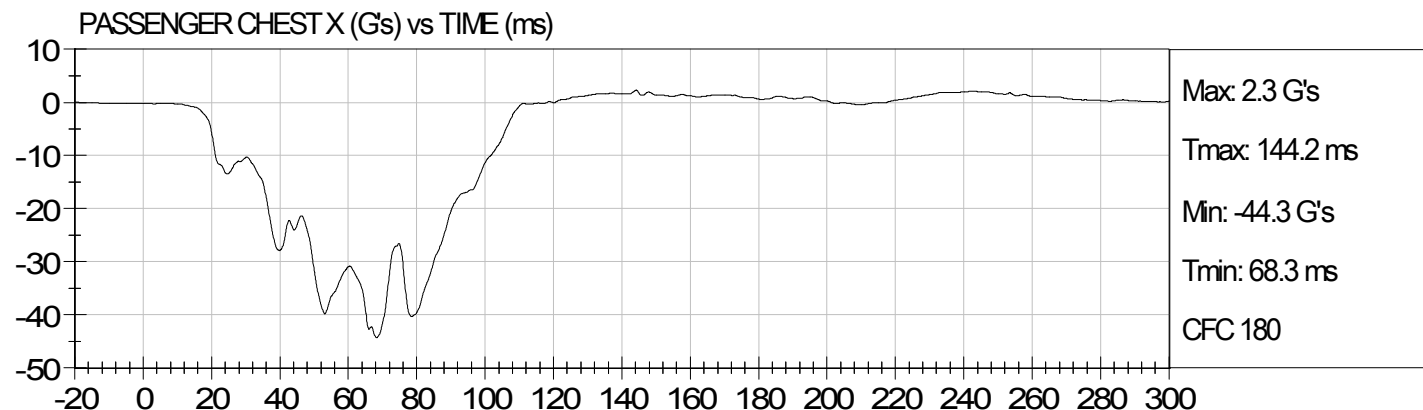


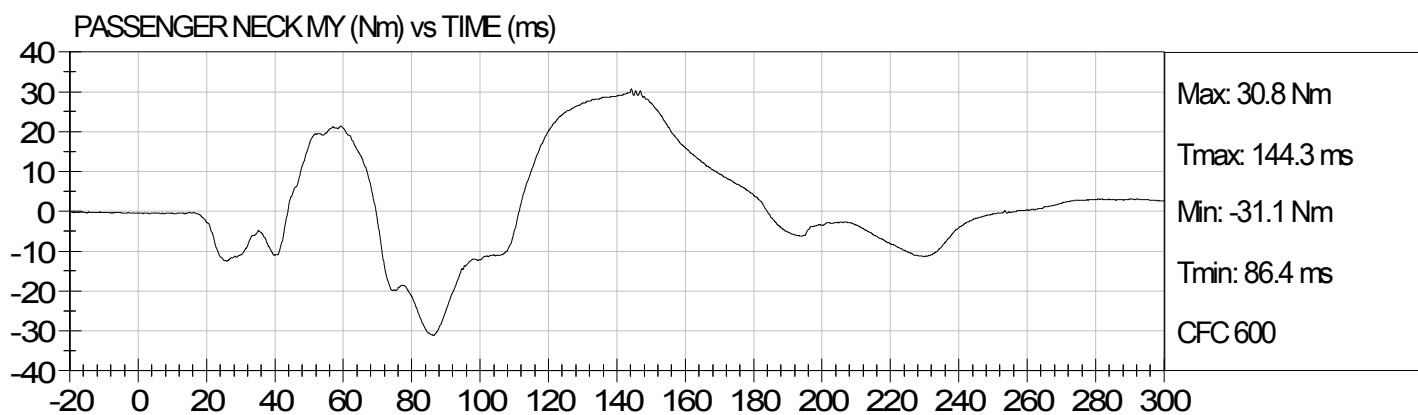
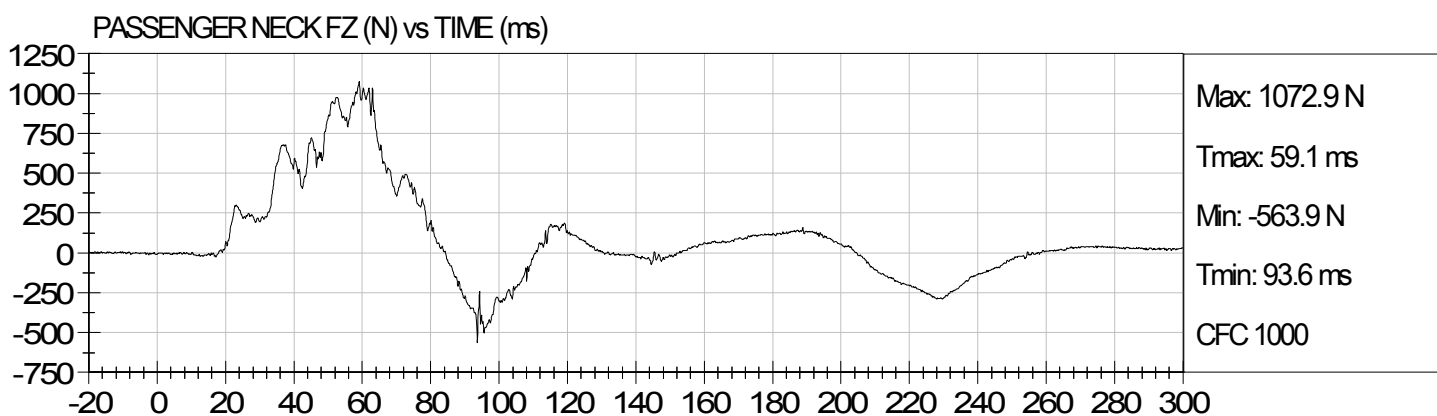
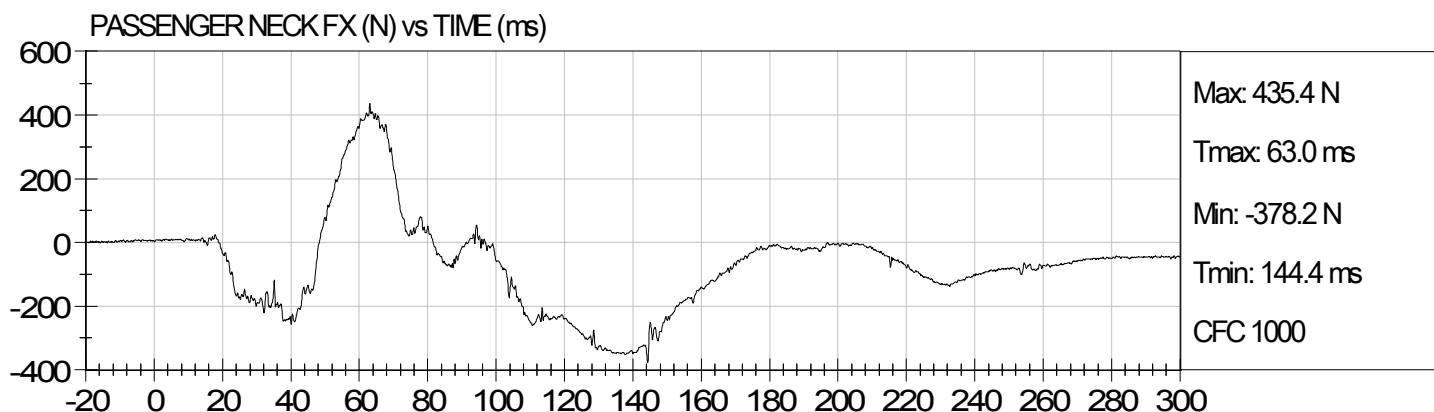


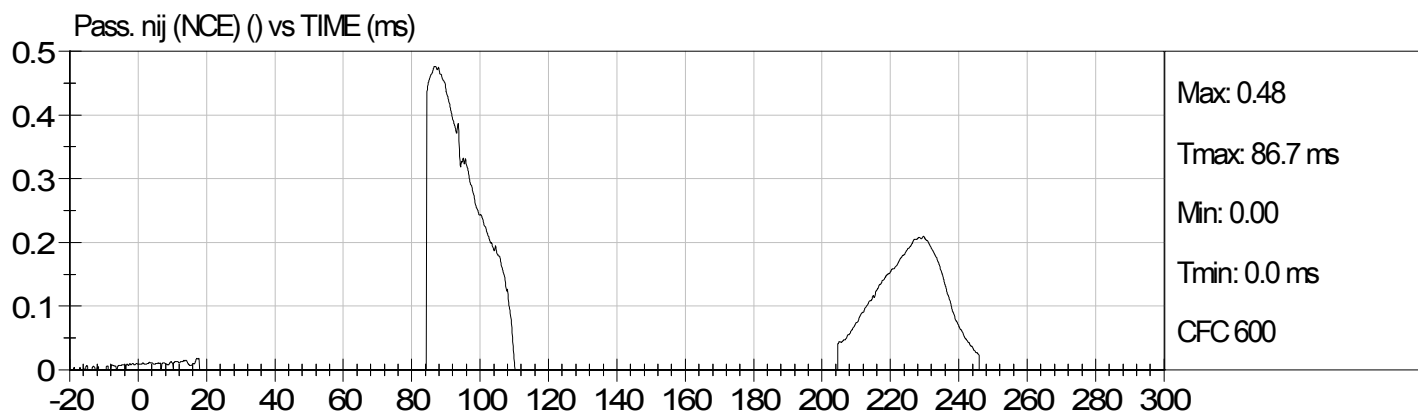
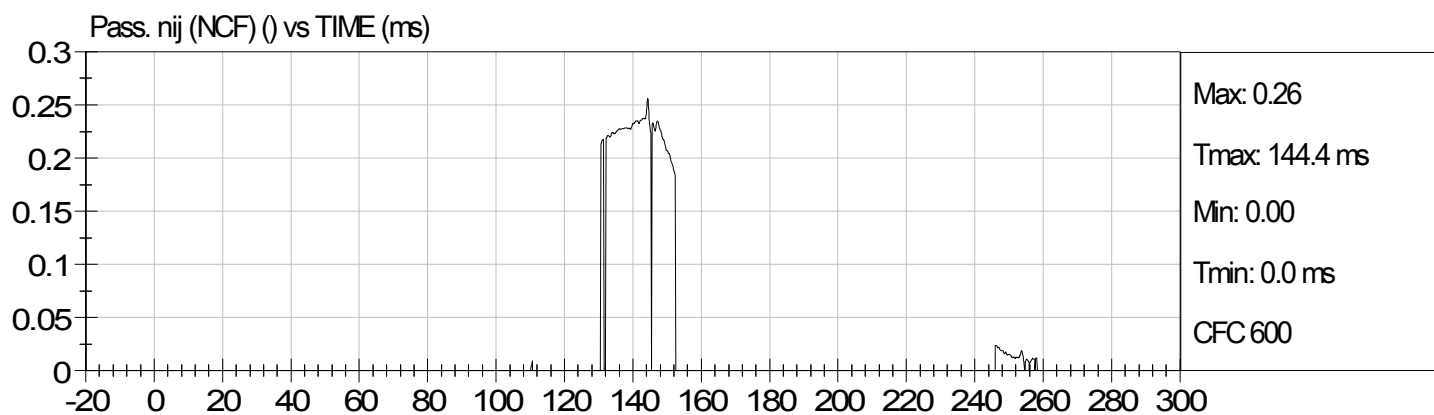
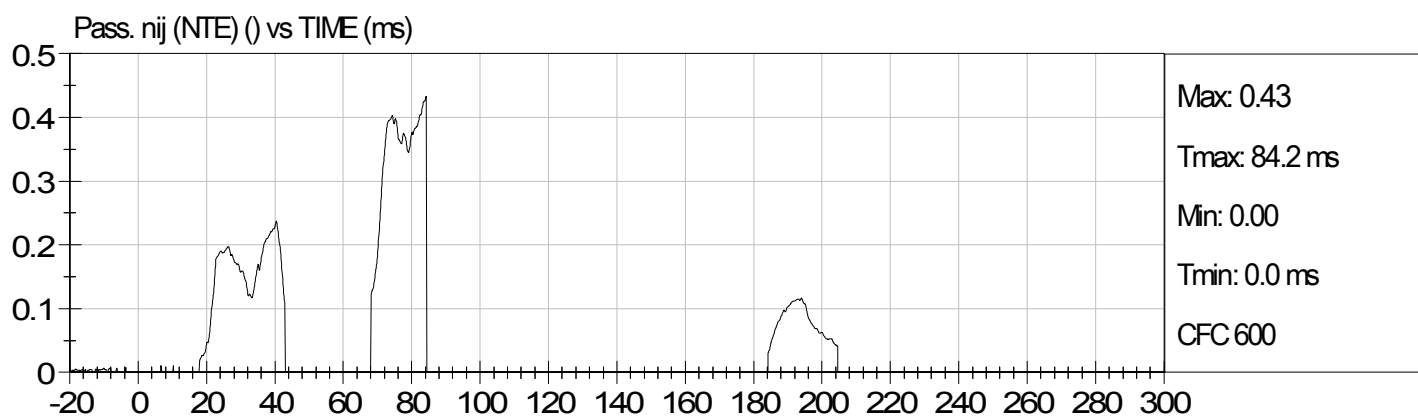
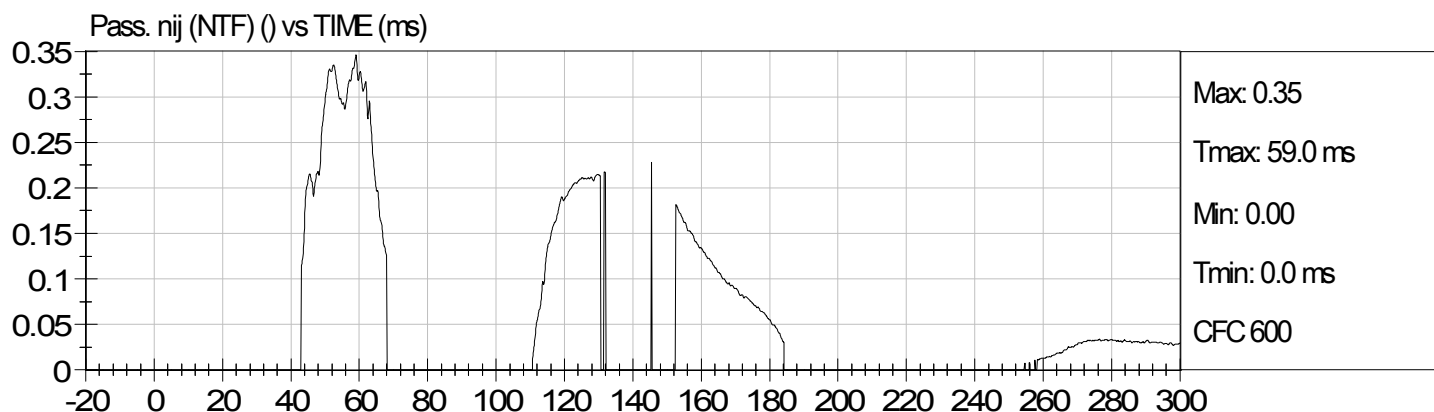


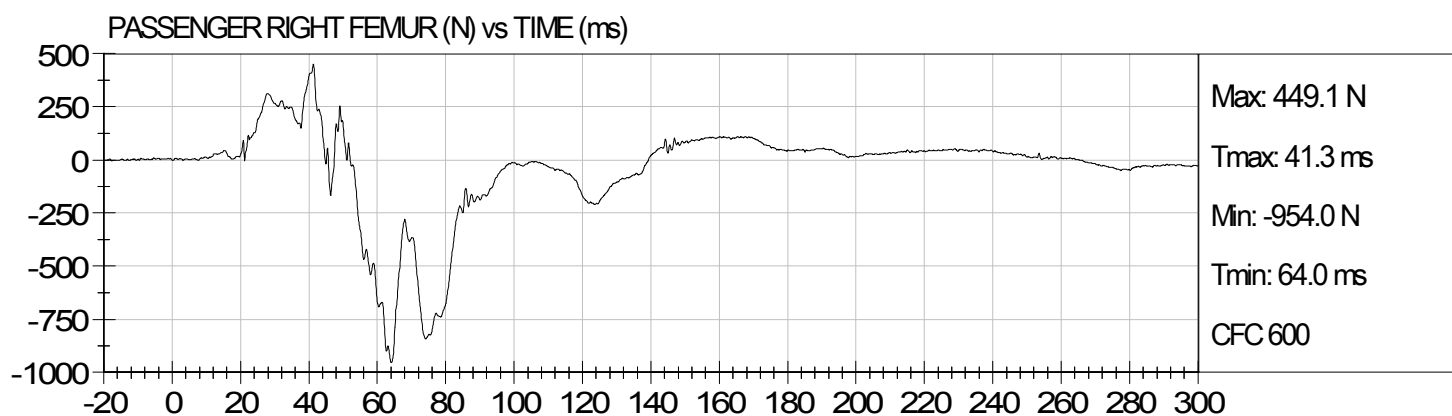
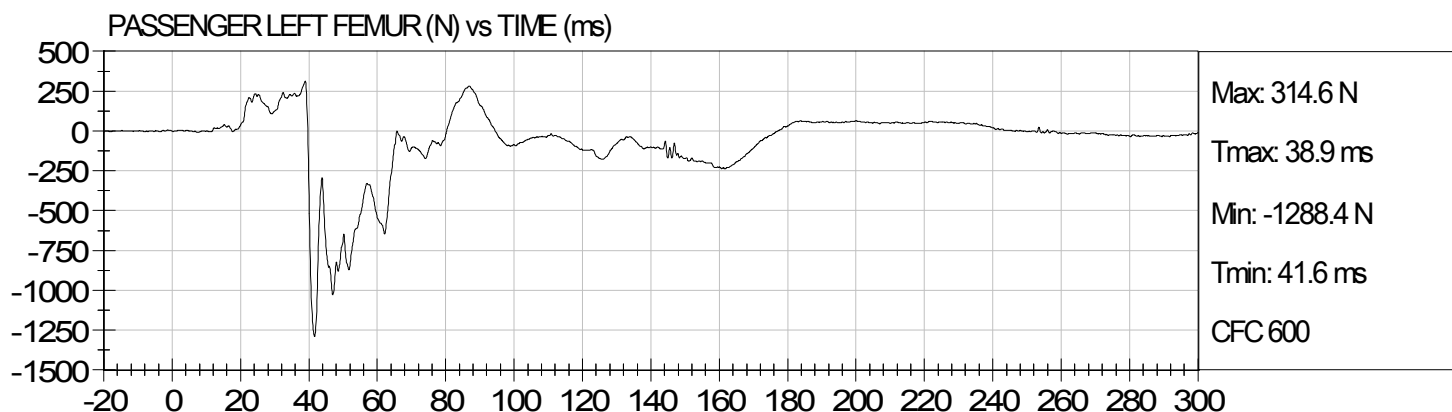












APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

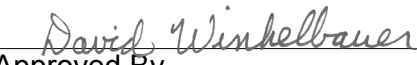
Test ID: D123171

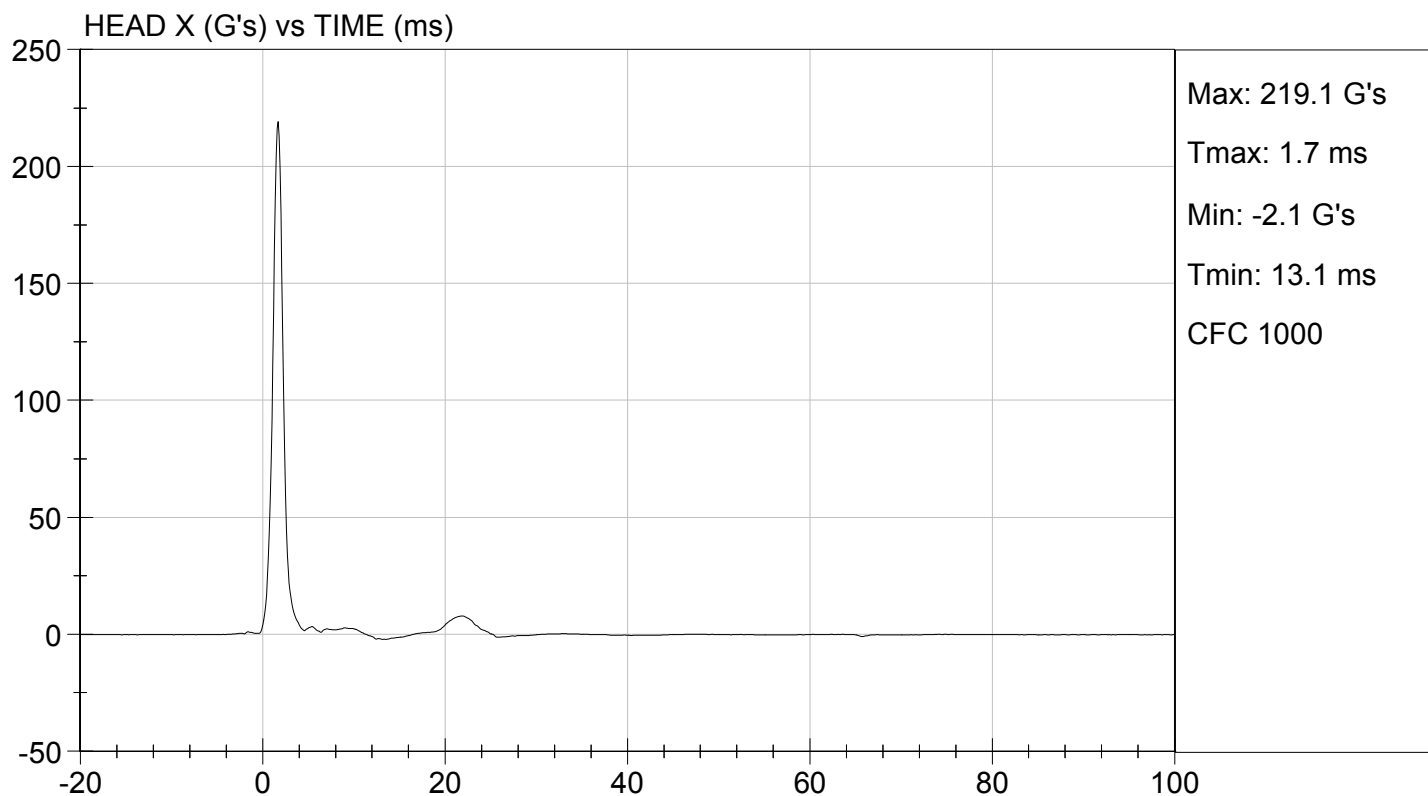
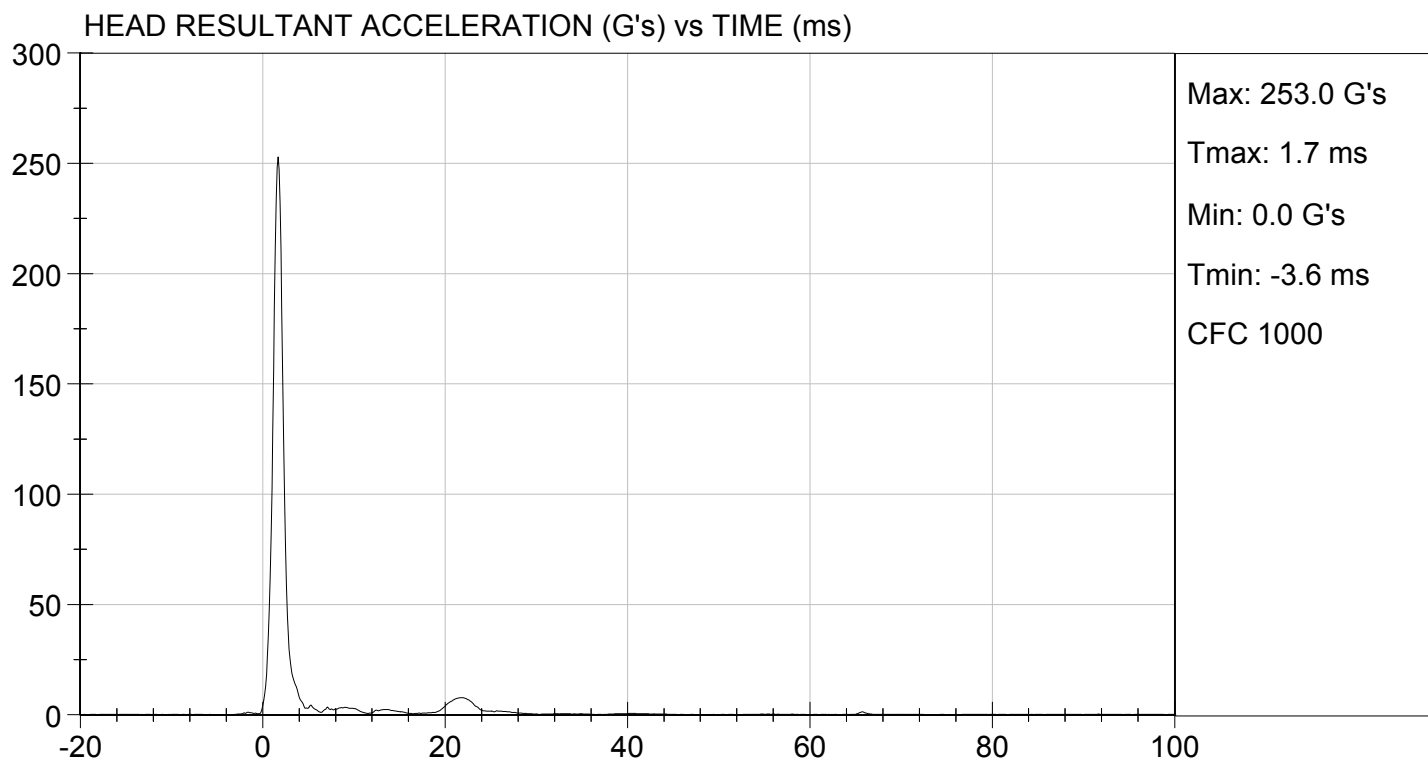
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Peak Resultant Acceleration	G's	225 to 275	253	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-7.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

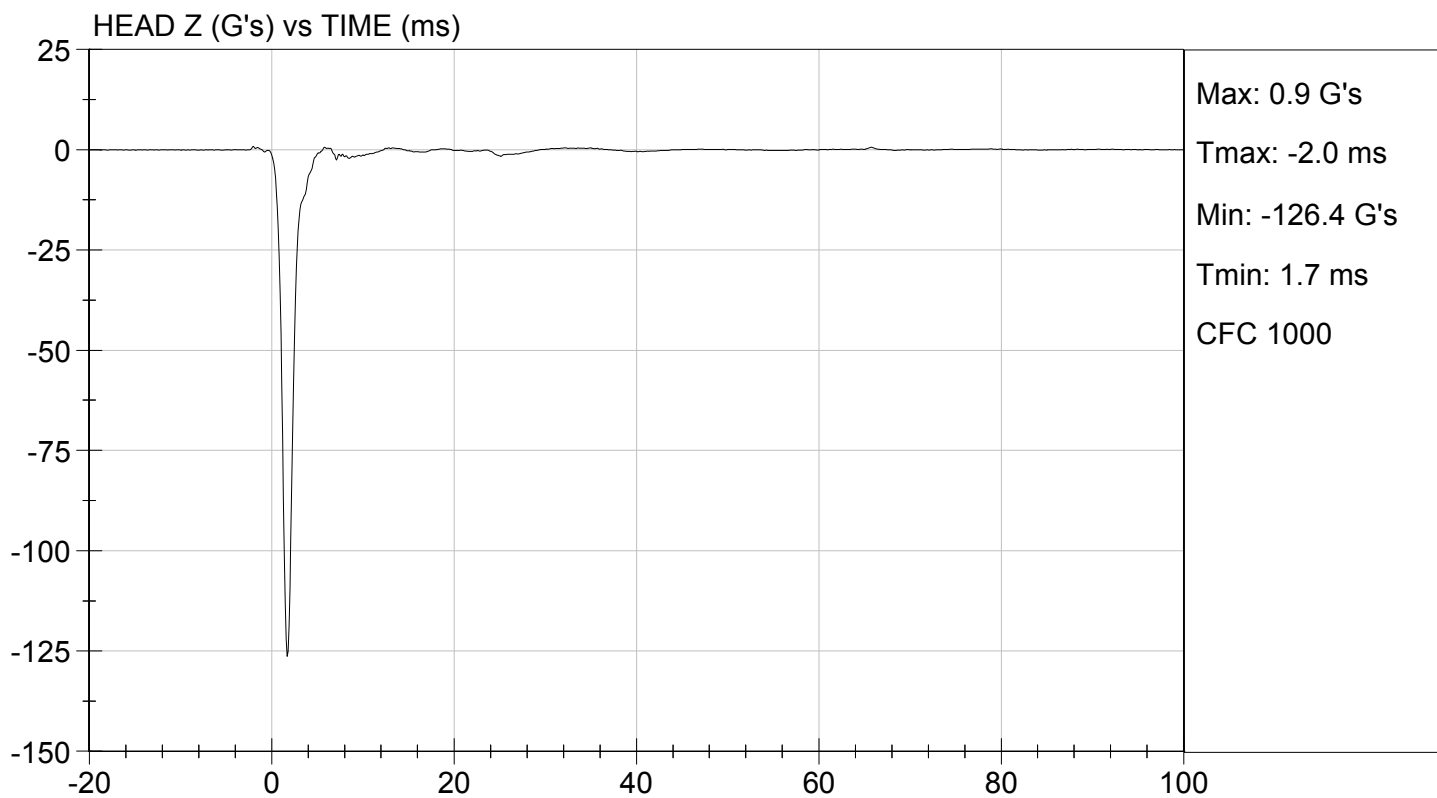
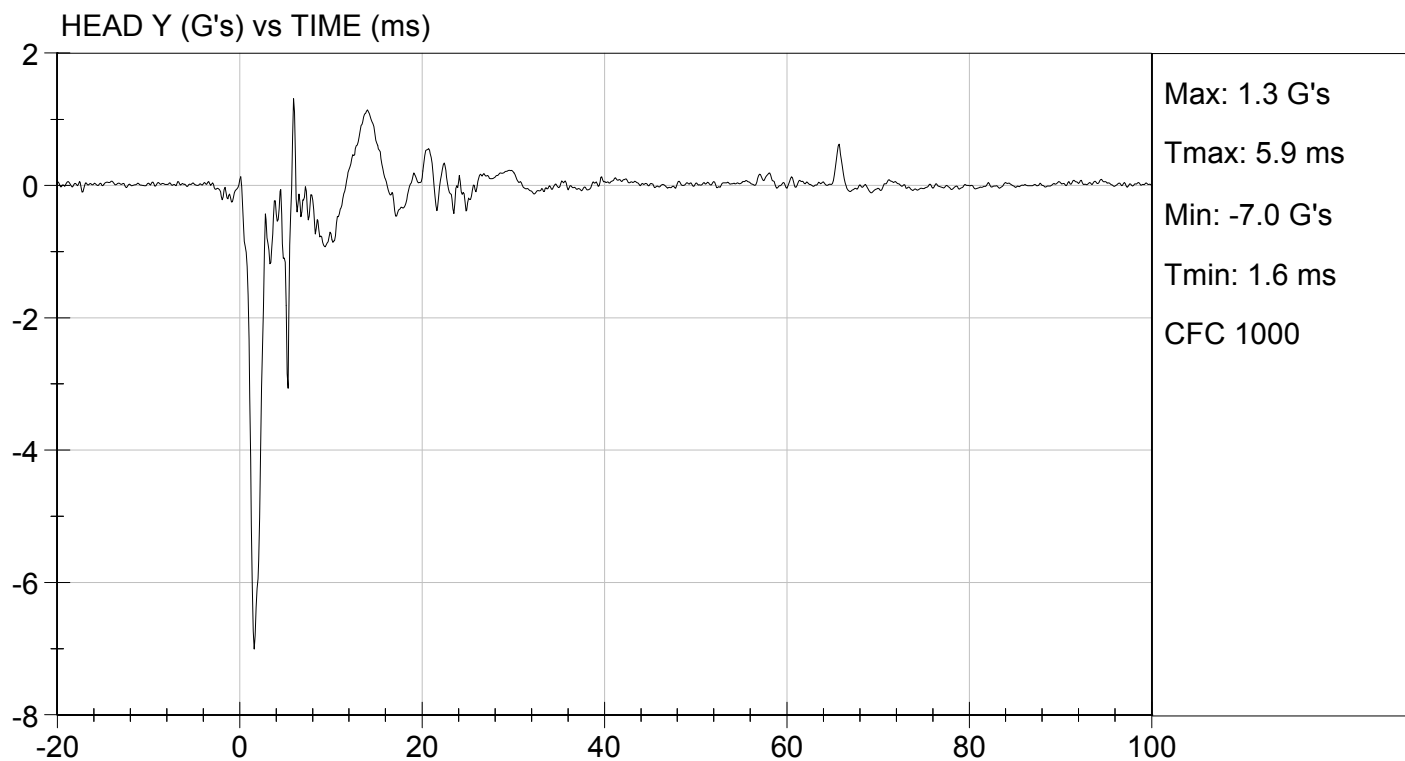

Laboratory Technician

08/29/2012

Test Date


Approved By





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

ATD Serial No: 036

Test I.D: D123172

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	49	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.11	Pass
	20 ms	G's	17.60 to 22.60	20.16	Pass
	30 ms	G's	12.50 to 18.50	15.00	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.2	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	71.2	Pass
	Time	ms	57.0 to 64.0	60.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	117.9	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	92.4	Pass
	Time	ms	47.0 to 58.0	47.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.3	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

08/30/2012

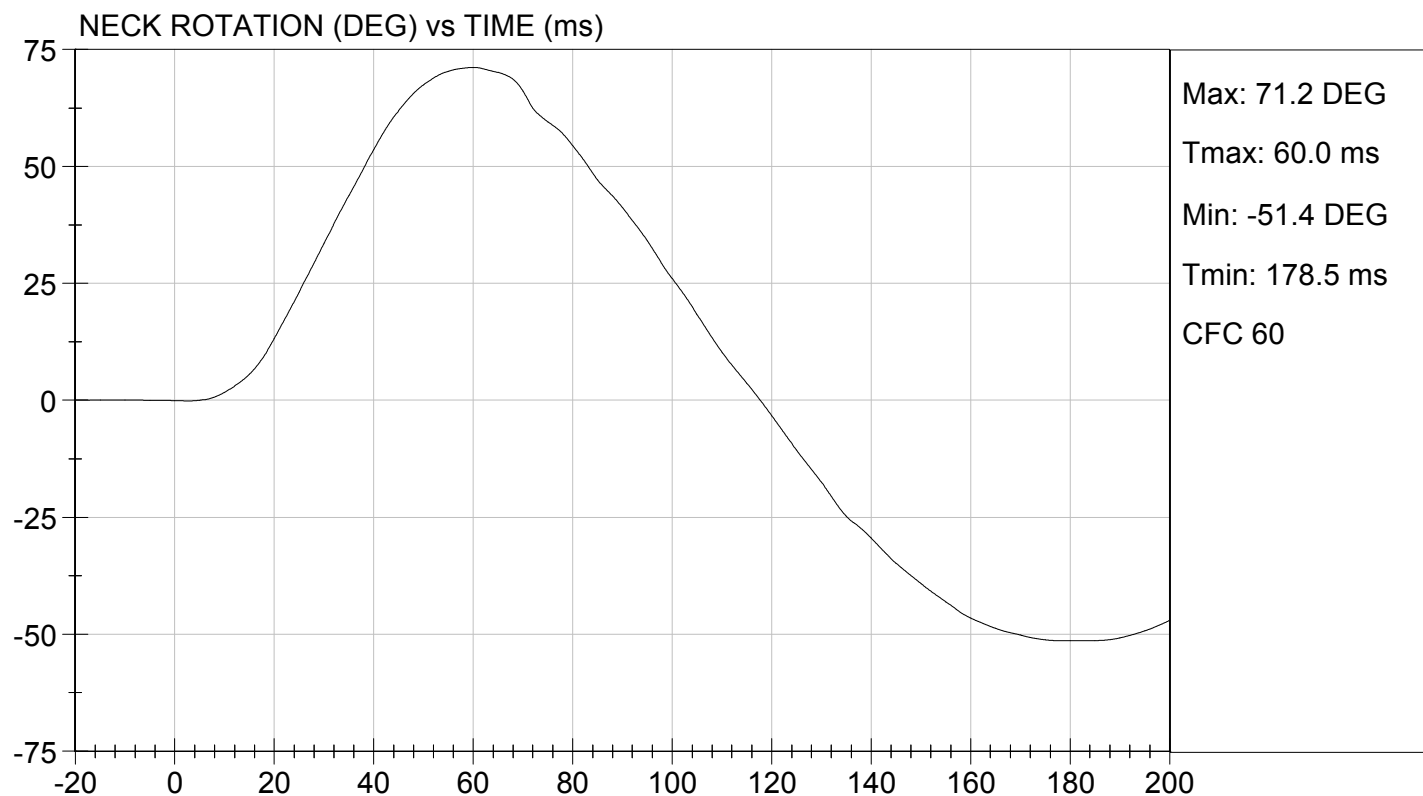
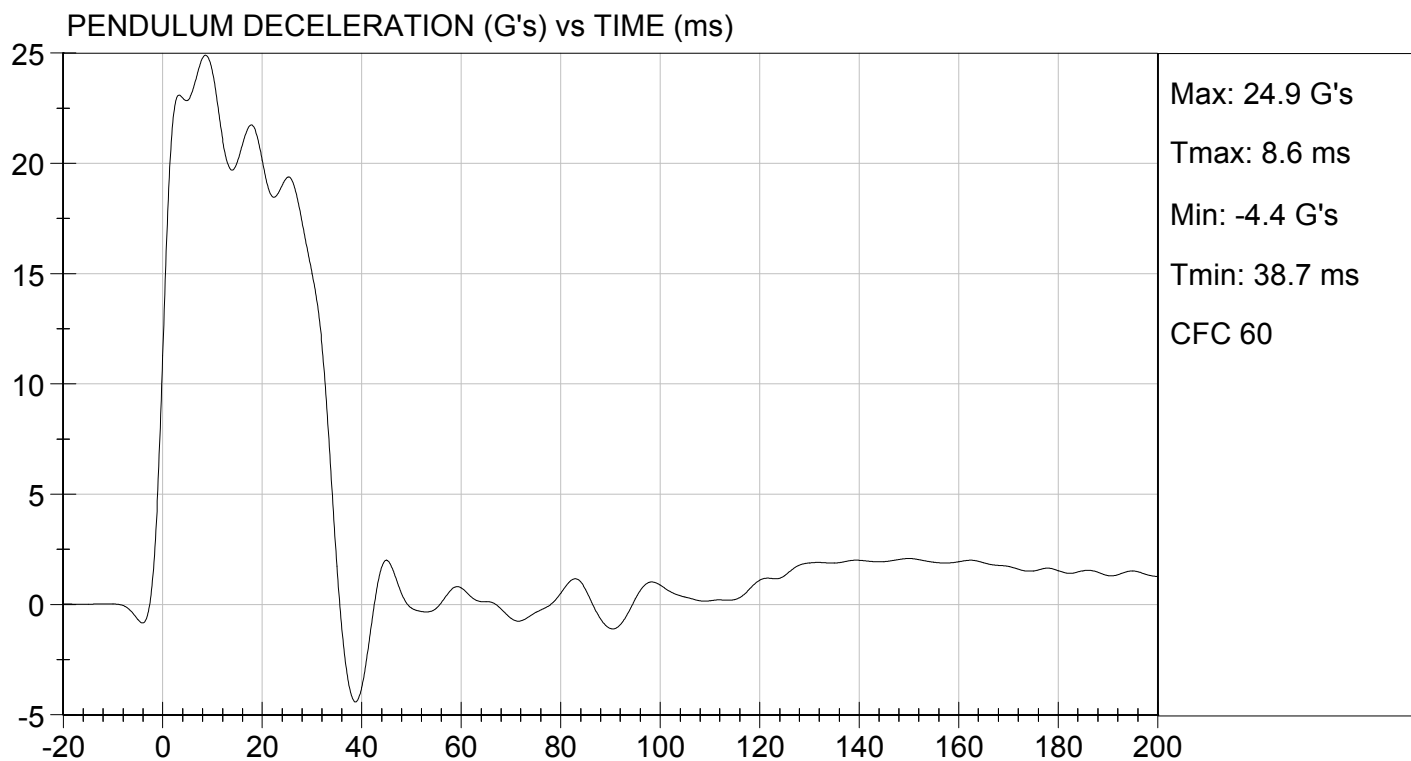
Test Date

David Winkelbauer
Approved By



TEST DESC: NECK FLEXION
VELOCITY: 22.83 ft/s, 6.96 m/s

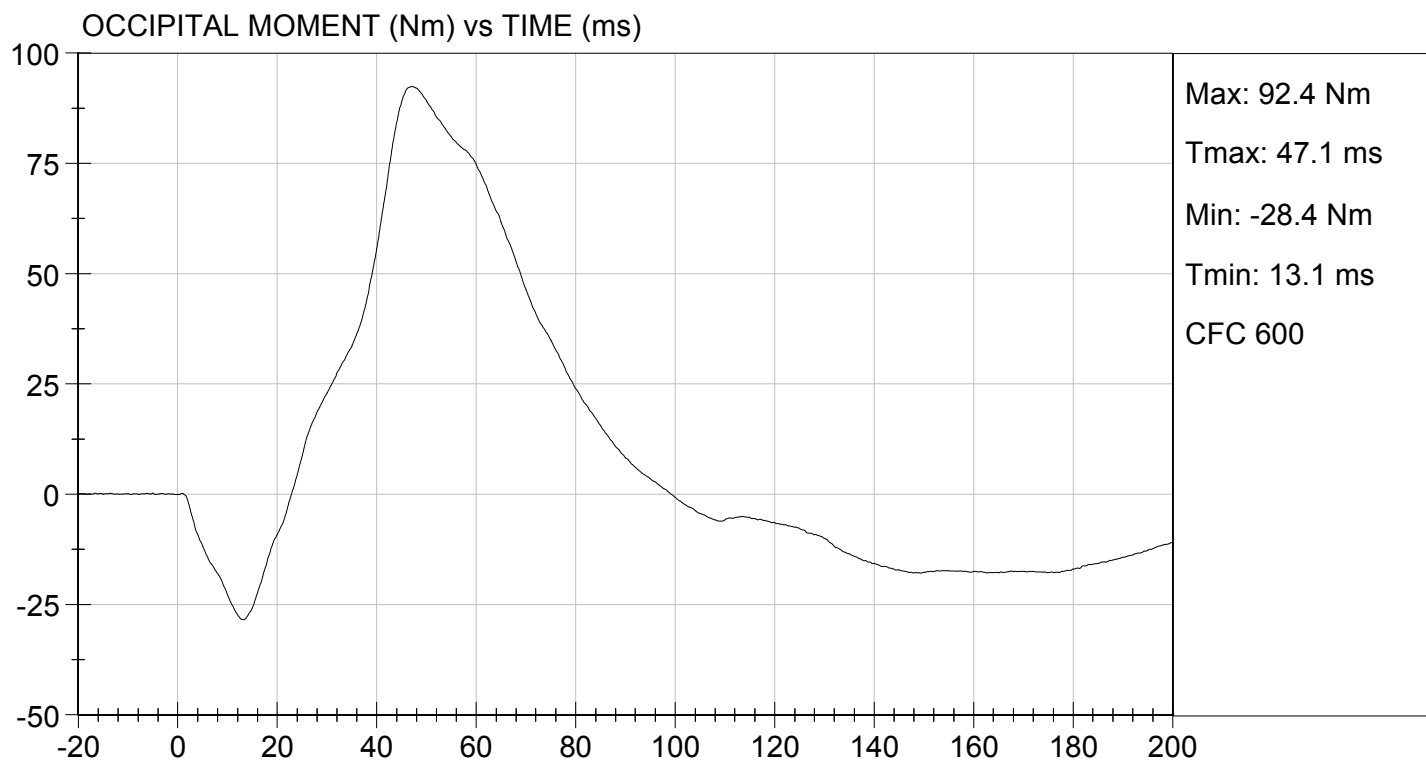
TEST DATE: 08/30/2012
TEST #: D123172





TEST DESC: NECK FLEXION
VELOCITY: 22.83 ft/s, 6.96 m/s

TEST DATE: 08/30/2012
TEST #: D123172

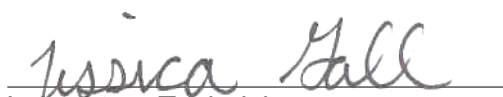


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

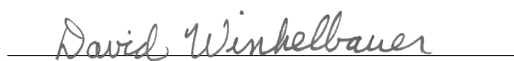
Test I.D: D123173

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	49	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.84	Pass
	20 ms	G's	14.00 to 19.00	17.84	Pass
	30 ms	G's	11.00 to 16.00	14.78	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	14.8	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	98.1	Pass
	Time	ms	72.0 to 82.0	77.8	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	160.2	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-68.0	Pass
	Time	ms	65.0 to 79.0	69.7	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	144.9	Pass
Overall Test Results					Pass


Laboratory Technician

08/30/2012

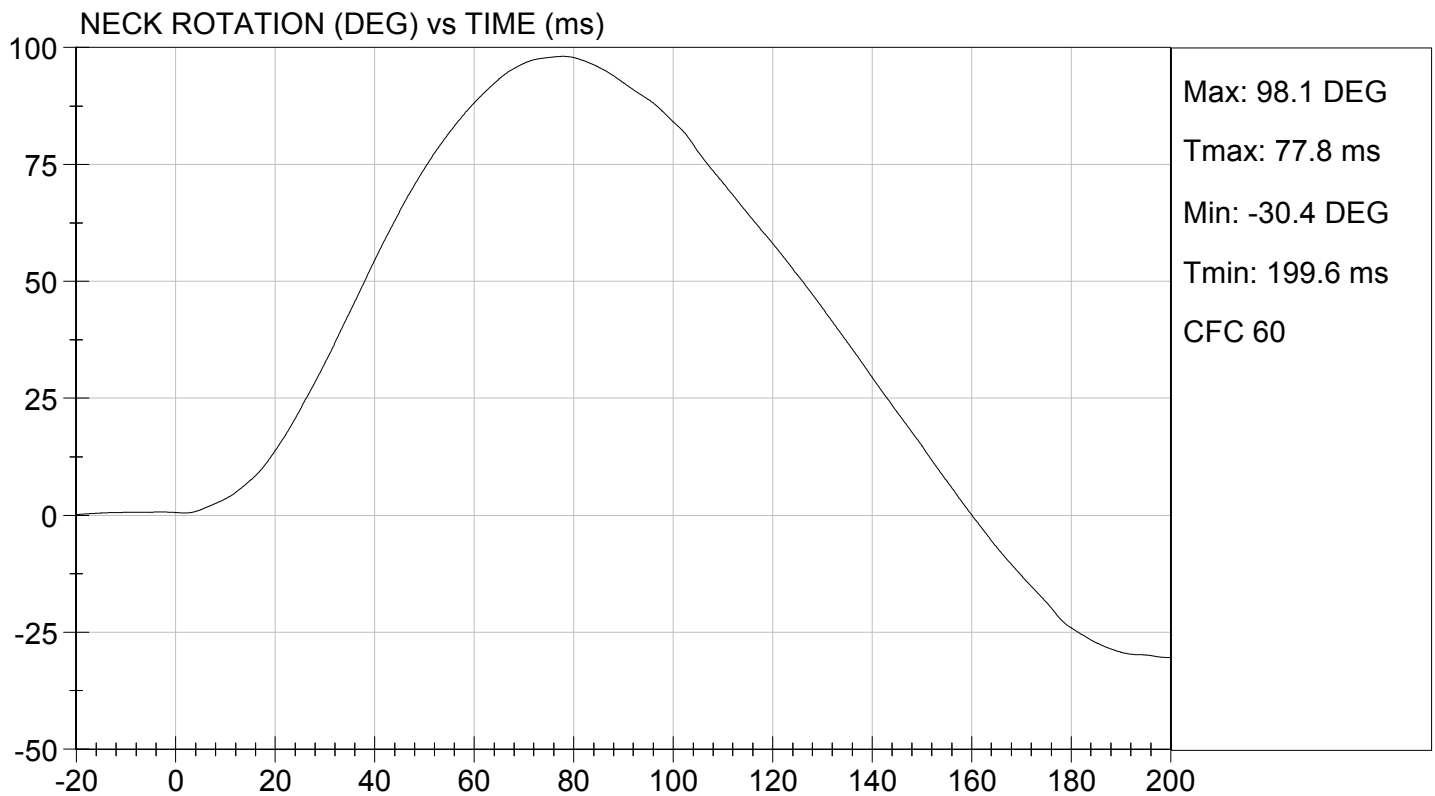
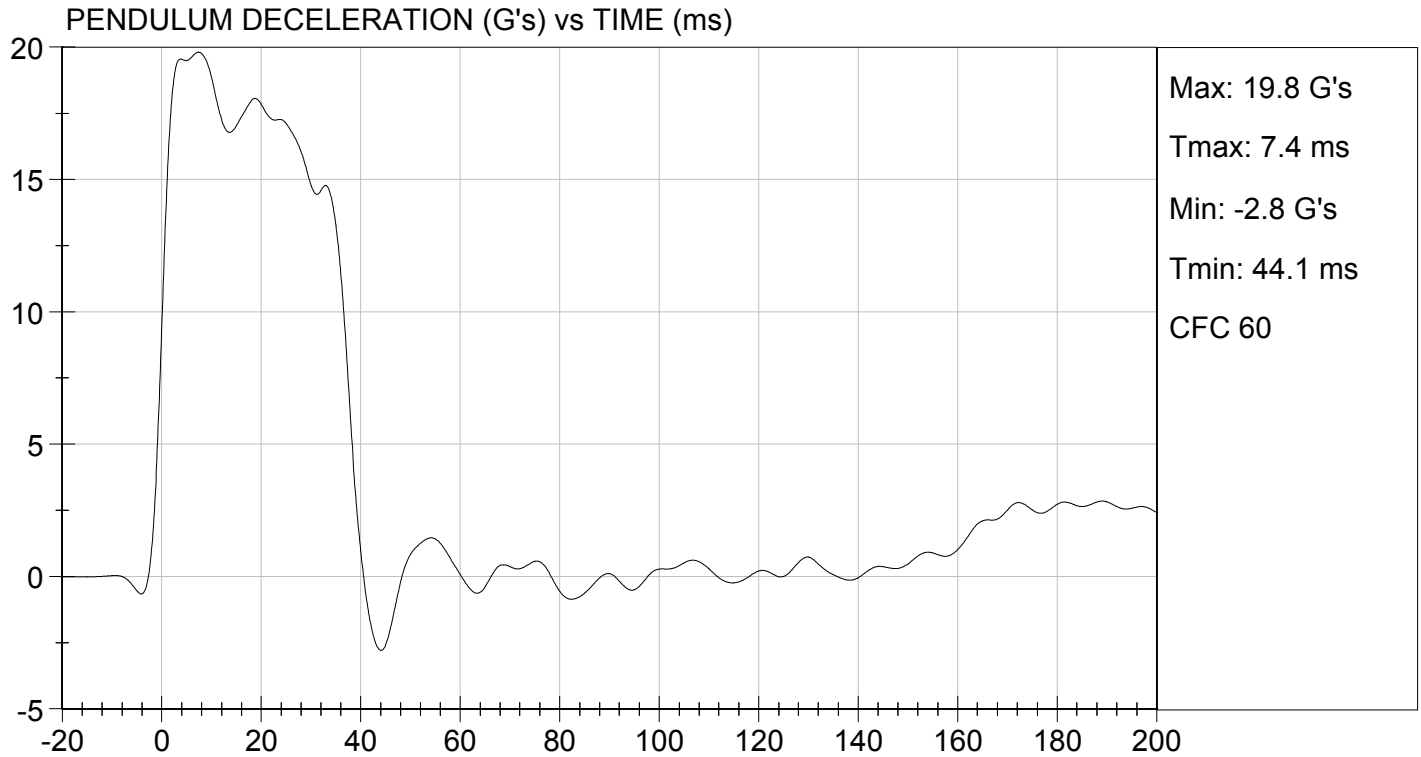
Test Date


Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 19.84 ft/s, 6.05 m/s

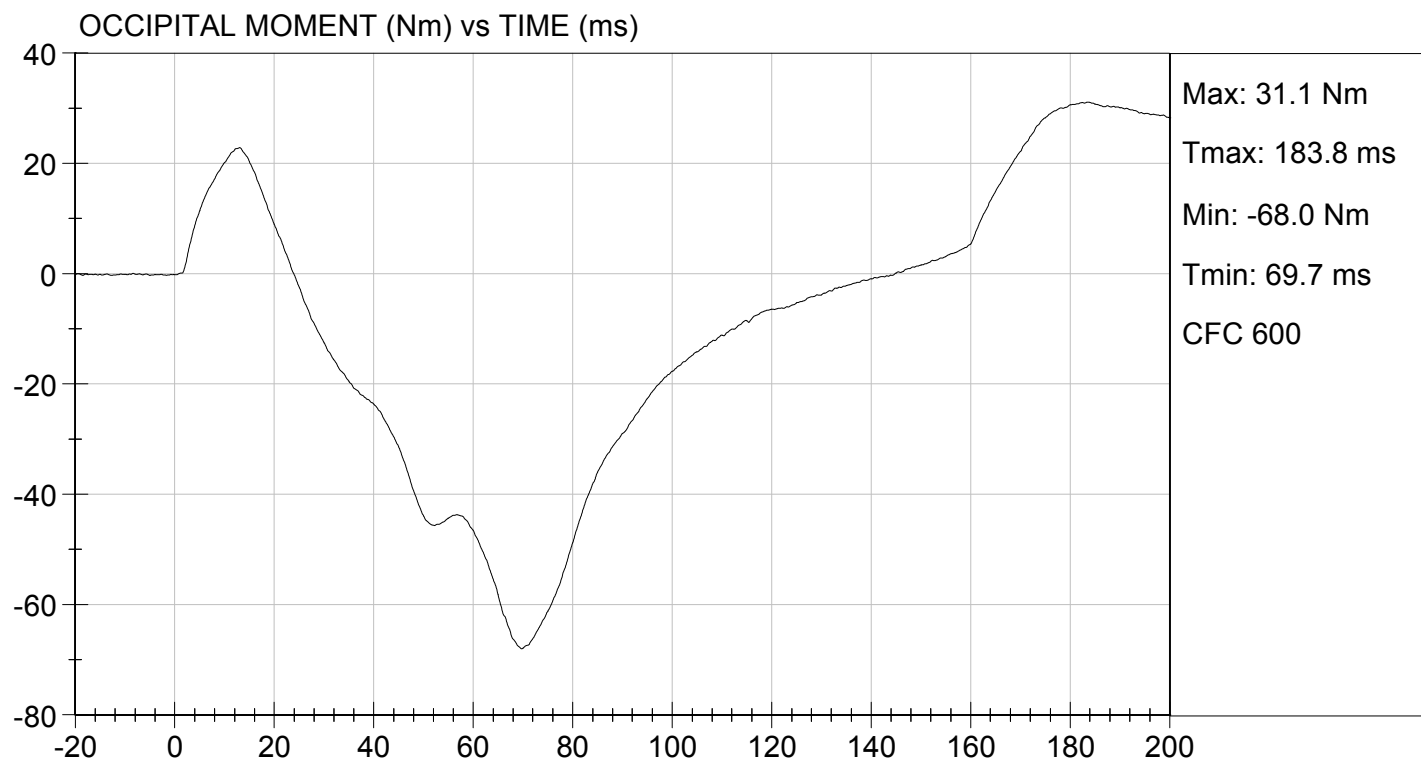
TEST DATE: 08/30/2012
TEST #: D123173





TEST DESC: NECK EXTENSION
VELOCITY: 19.84 ft/s, 6.05 m/s

TEST DATE: 08/30/2012
TEST #: D123173

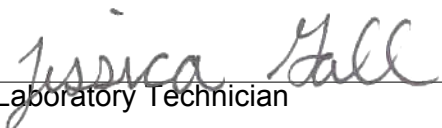


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

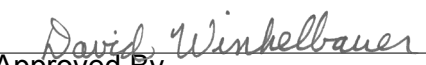
ATD Serial No: 036

Test I.D: D123174

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	48	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,434	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.89	Pass
Internal Hysteresis	%	69 to 85	71	Pass
			Overall Test Results	Pass


Laboratory Technician

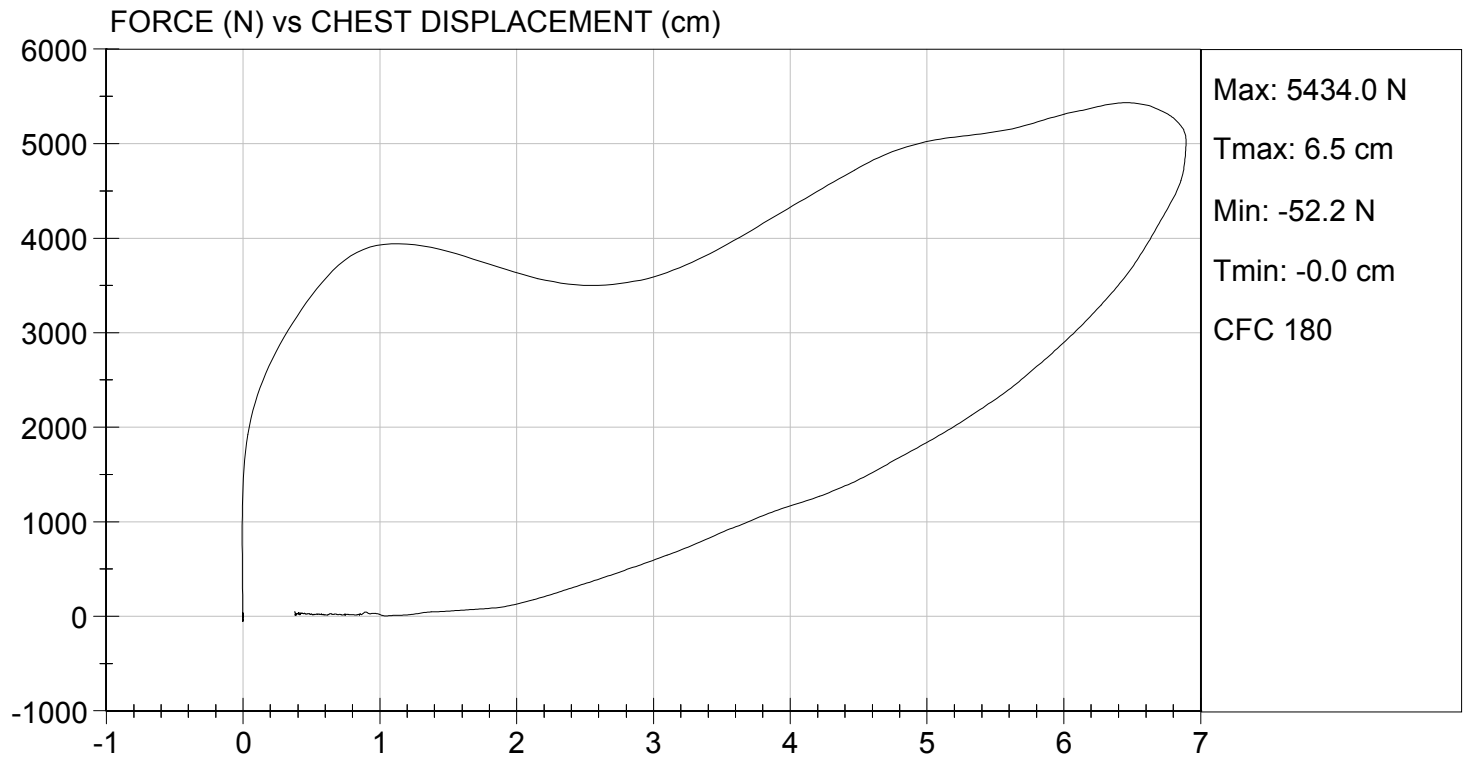
08/30/2012
Test Date


Approved By



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

TEST DATE: 08/30/2012
TEST #: D123174



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

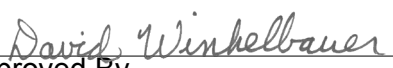
ATD Serial No: 036

Test I.D: D123175

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	49	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	4,818	Pass
Overall Test Results				Pass


Laboratory Technician

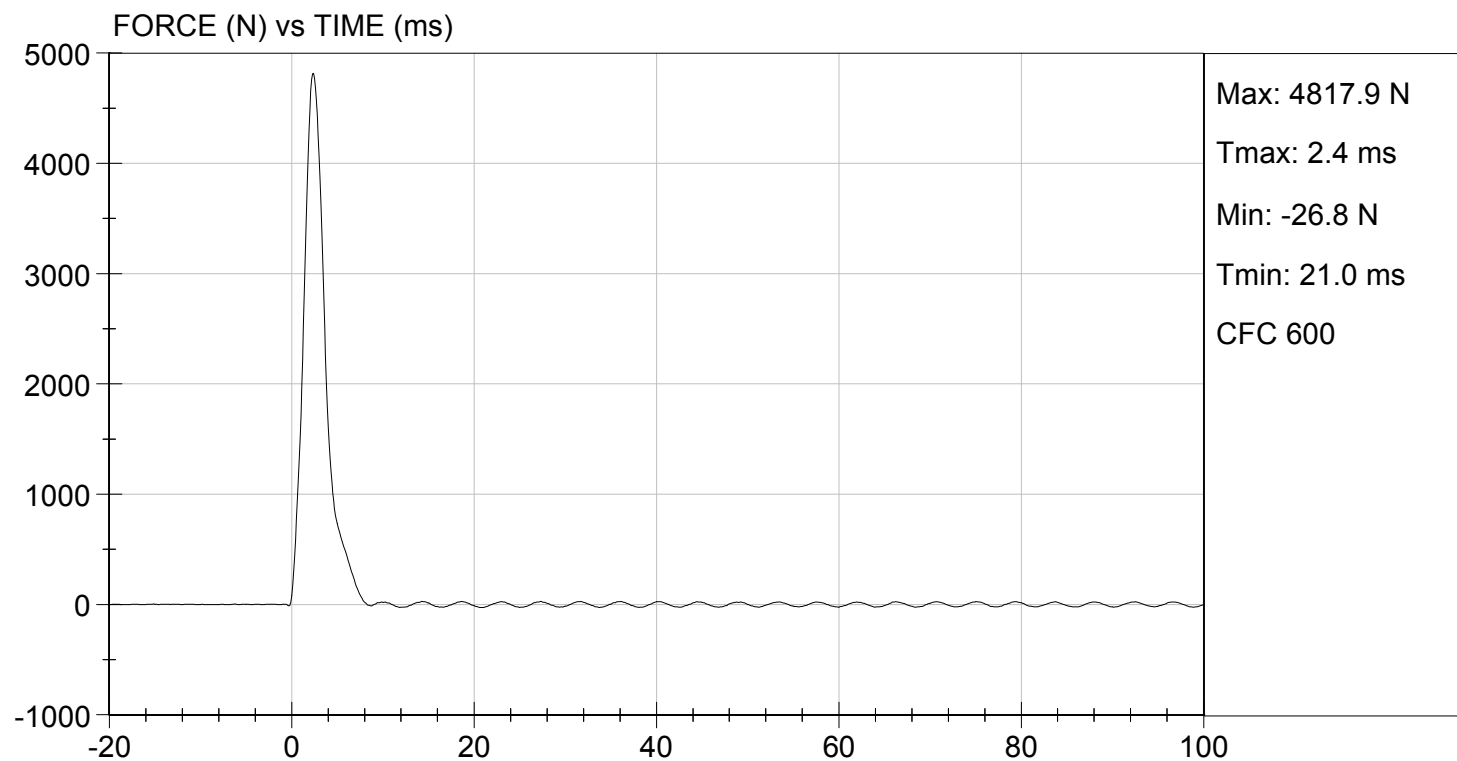
08/30/2012
Test Date


Approved By



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

TEST DATE: 08/30/2012
TEST #: D123175



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

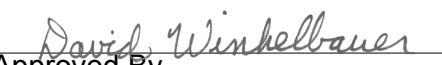
ATD Serial No: 036

Test I.D: D123176

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	49	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,184	Pass
Overall Test Results				Pass


Laboratory Technician

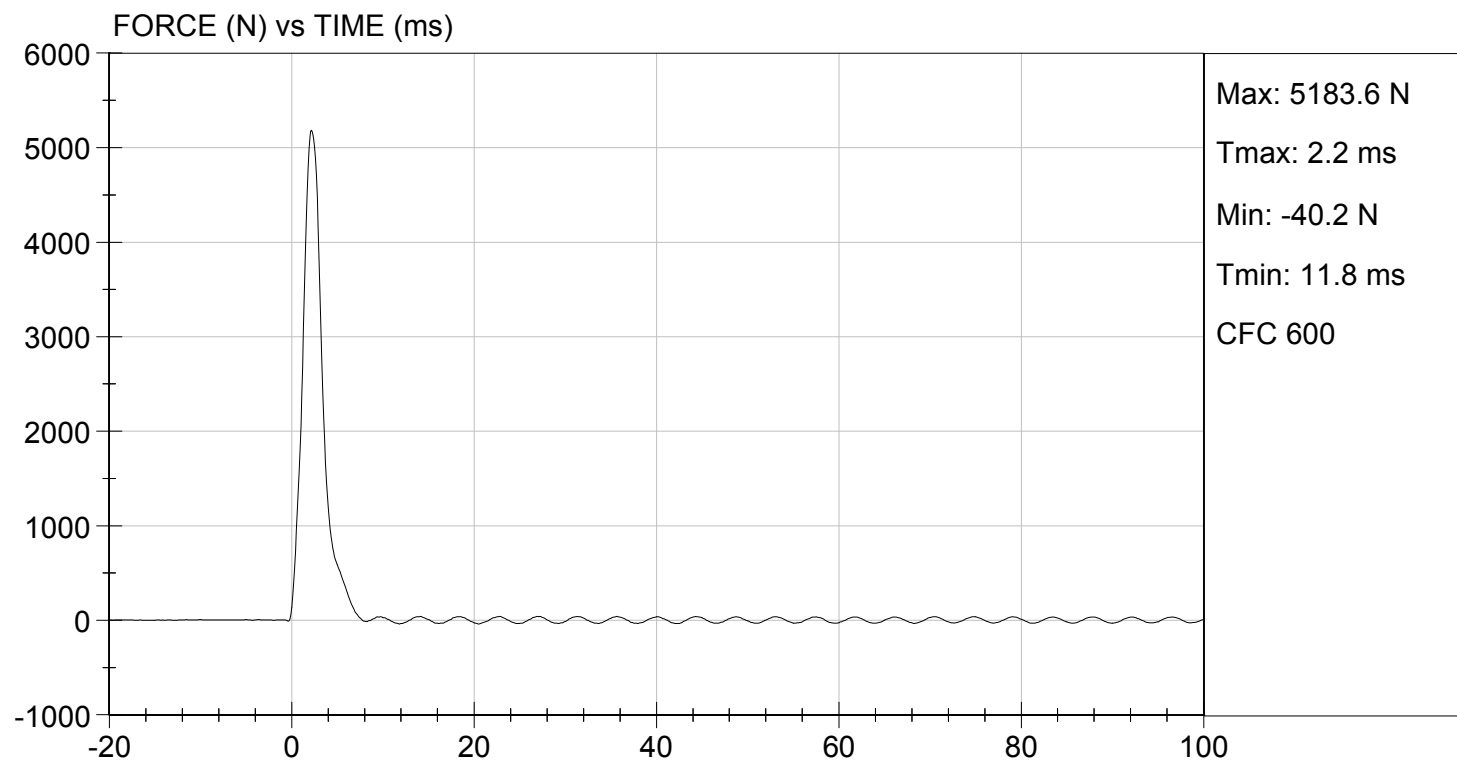
08/30/2012
Test Date


Approved By



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

TEST DATE: 08/30/2012
TEST #: D123176



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

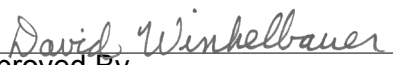
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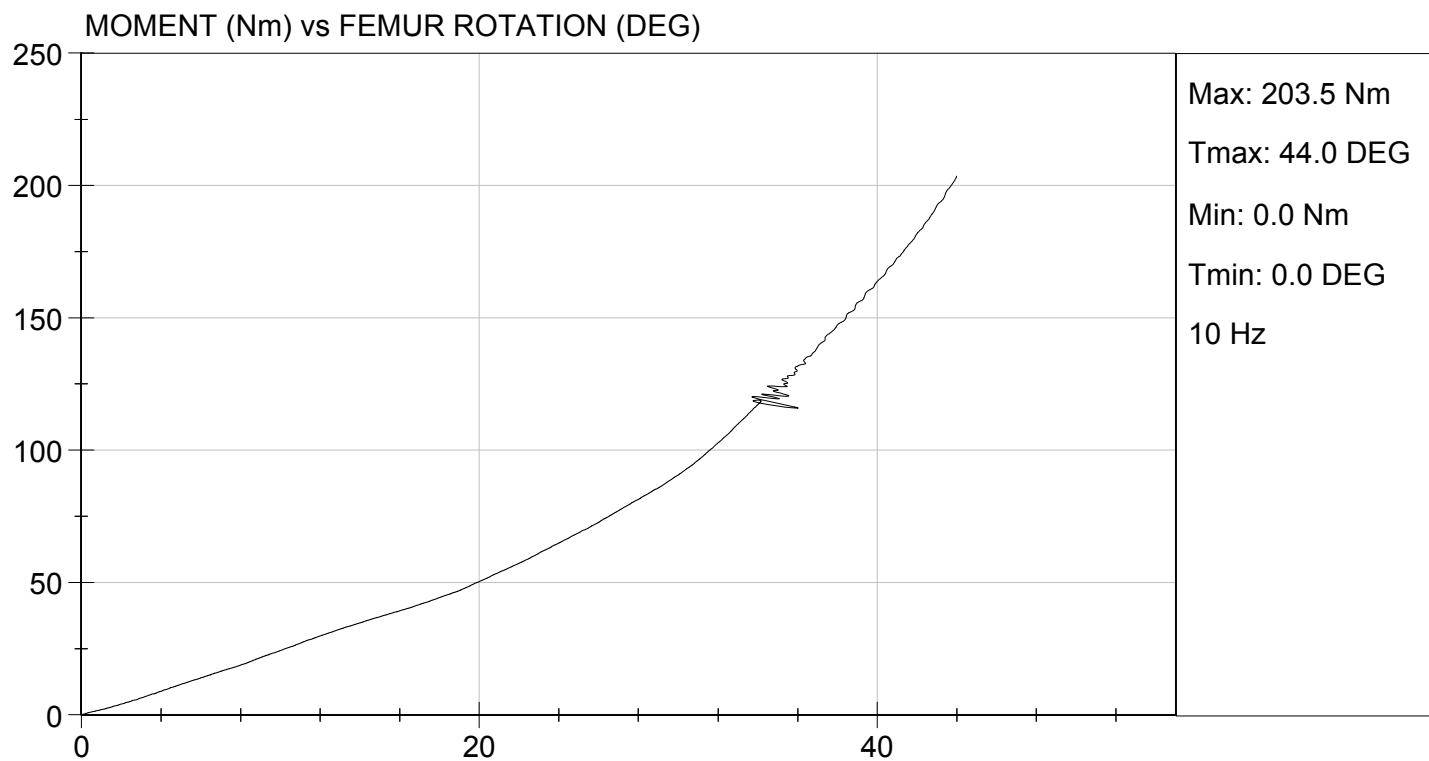
Test I.D: D123170

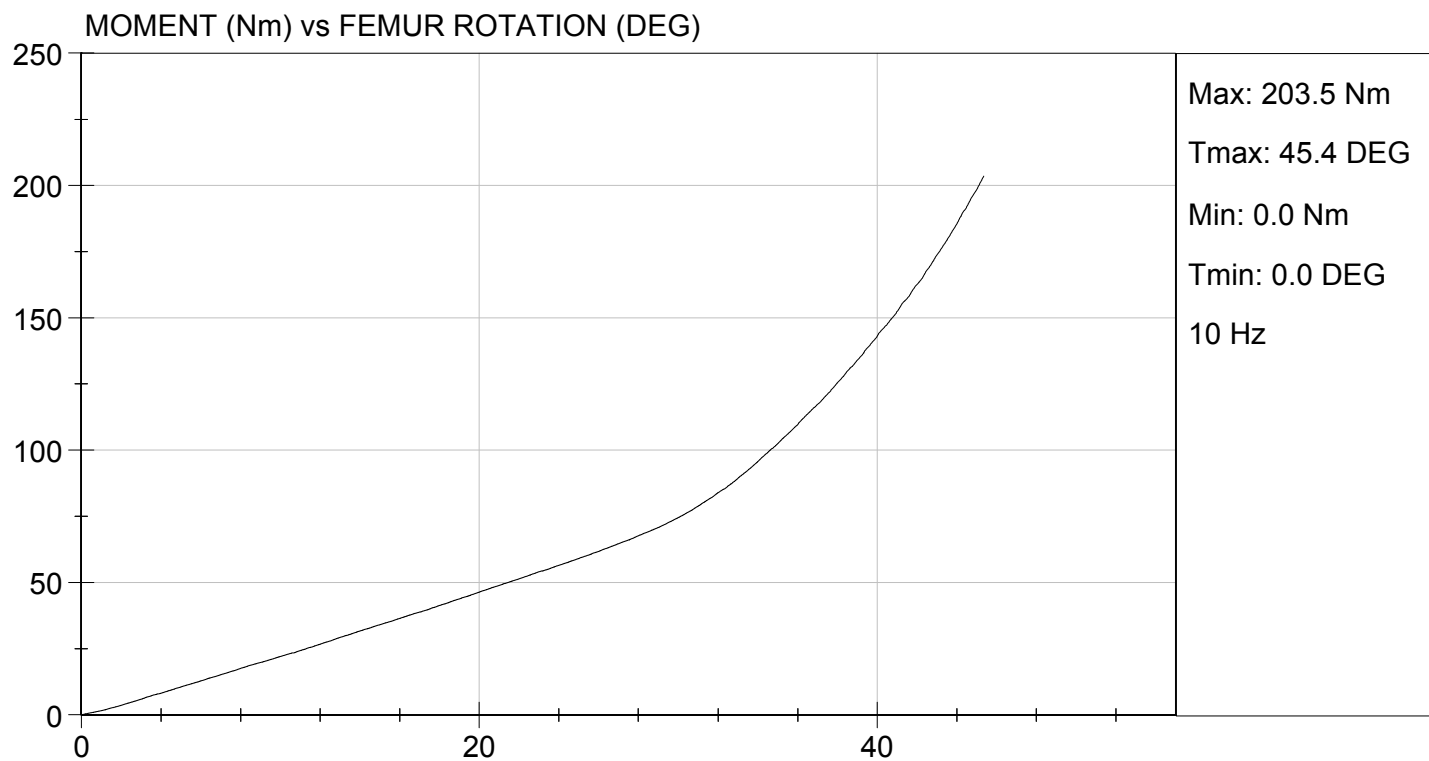
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	47	47	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	90.7	74.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.0	45.4	Pass
Overall Test Results					Pass


 Laboratory Technician

08/29/2012
 Test Date


 Approved By





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

ATD Serial No: 036

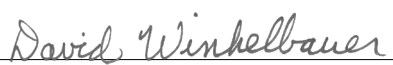
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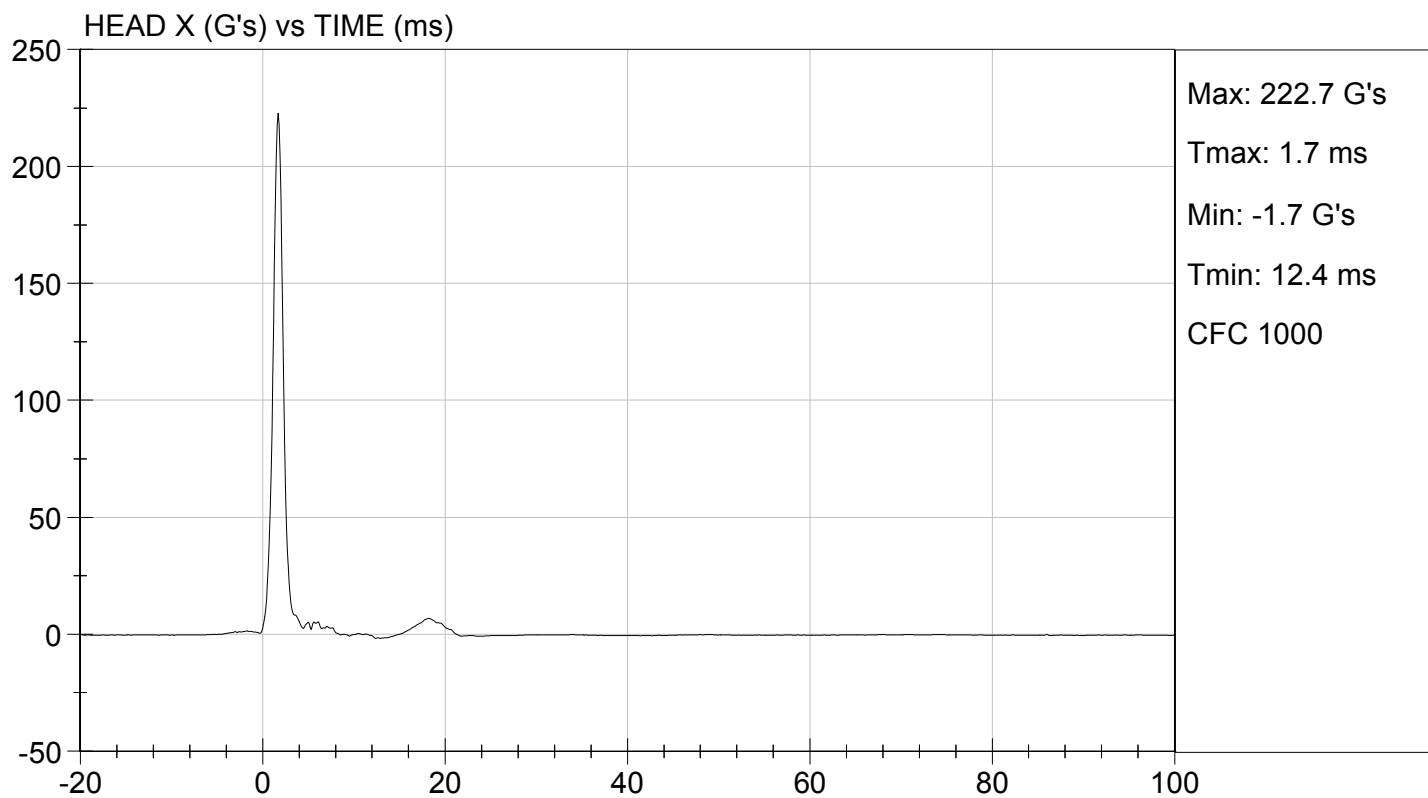
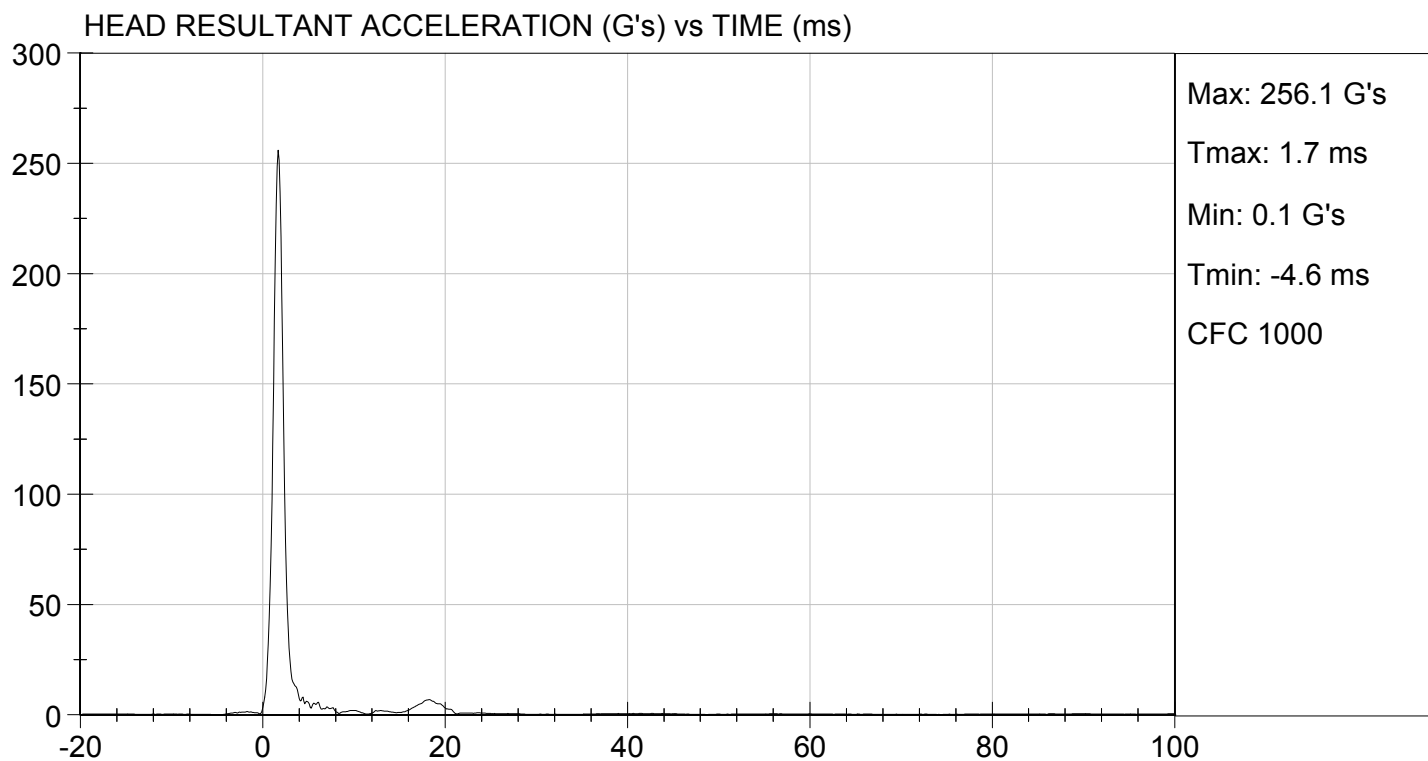
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	225 to 275	256	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

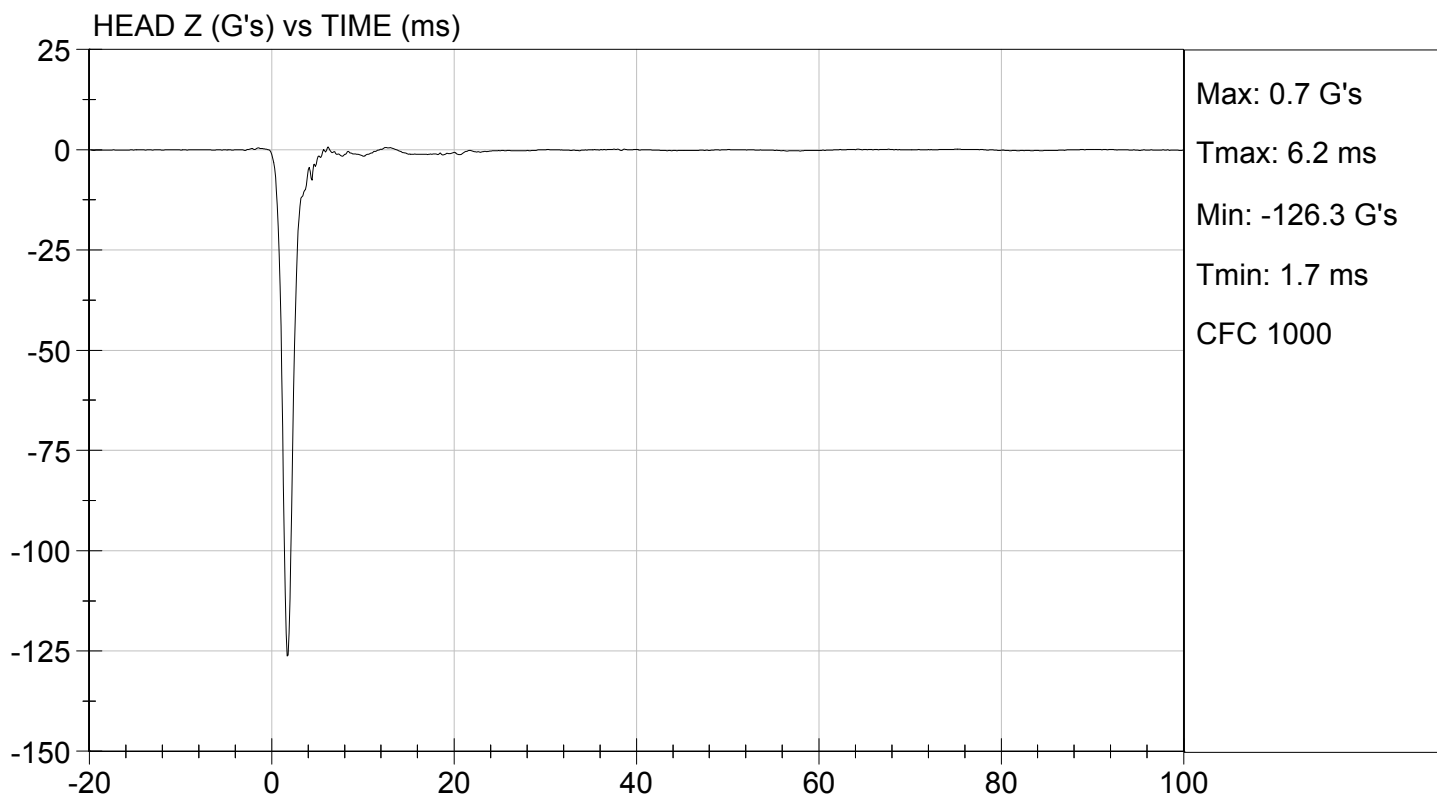
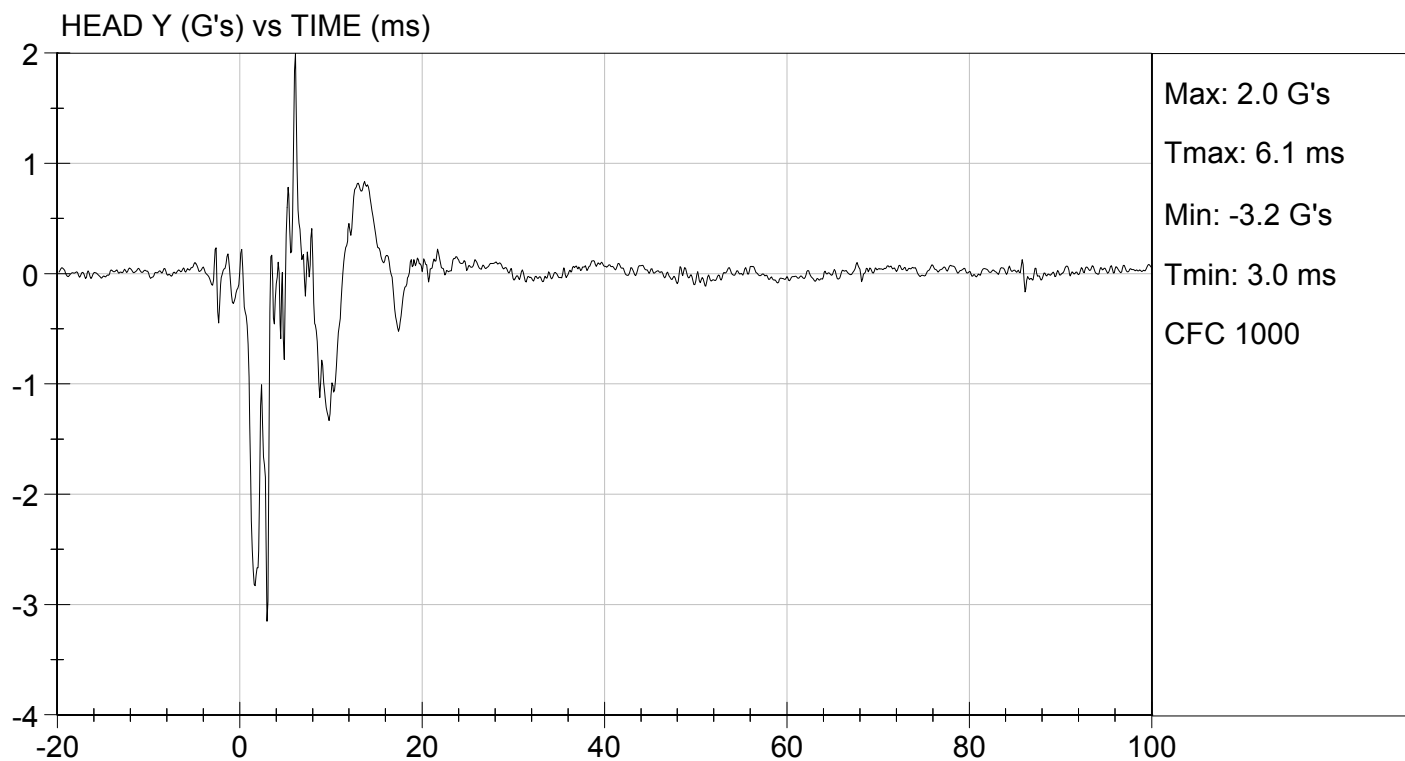

Laboratory Technician

09/06/2012

Test Date


Approved By



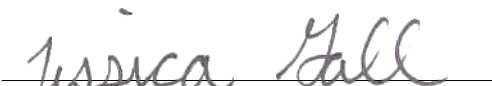


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

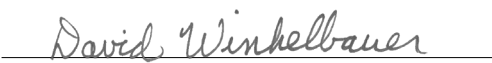
Test I.D: D123252

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	42	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.76	Pass
	20 ms	G's	17.60 to 22.60	17.77	Pass
	30 ms	G's	12.50 to 18.50	14.0	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.7	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	67.7	Pass
	Time	ms	57.0 to 64.0	57.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	119.9	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	93.4	Pass
	Time	ms	47.0 to 58.0	50.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.6	Pass
Overall Test Results					Pass


 Laboratory Technician

09/06/2012

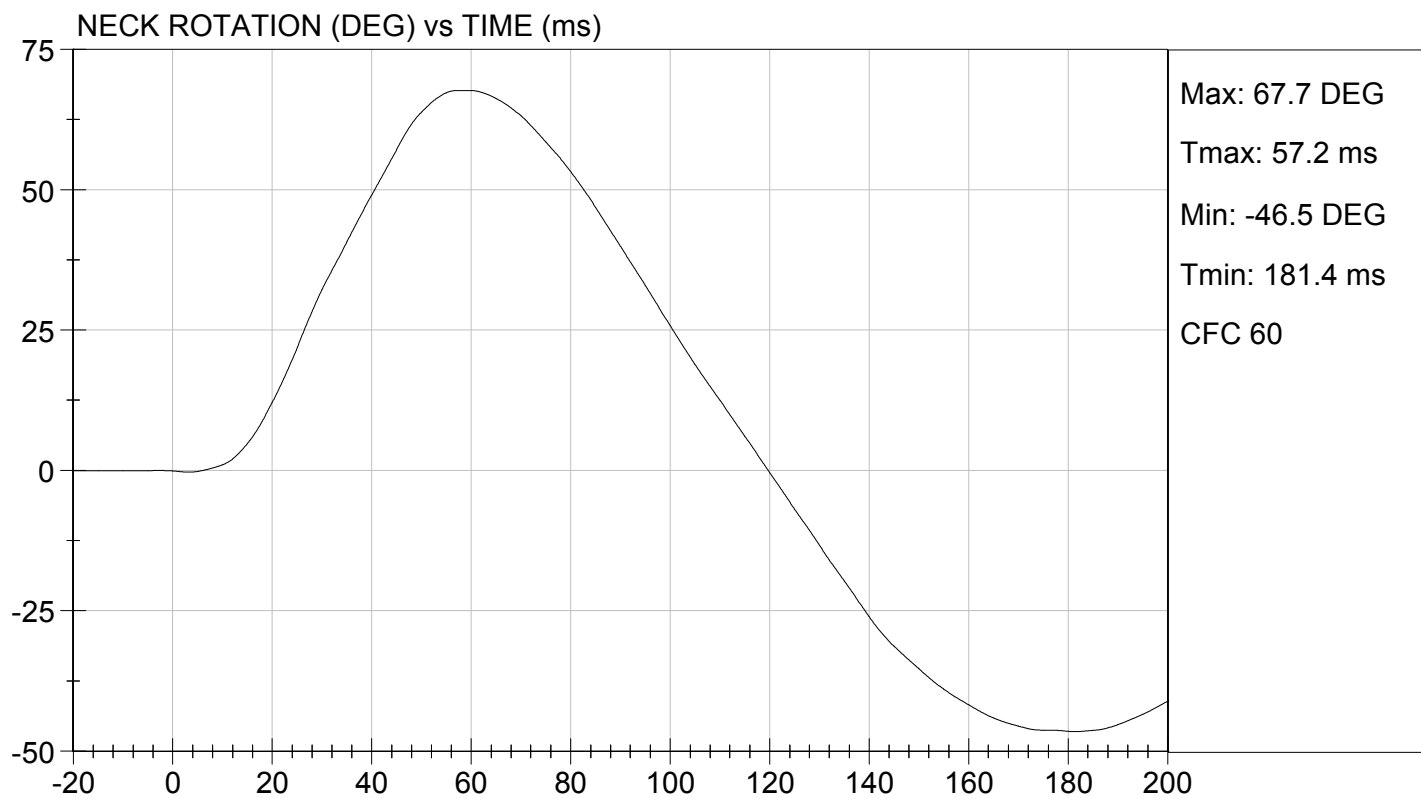
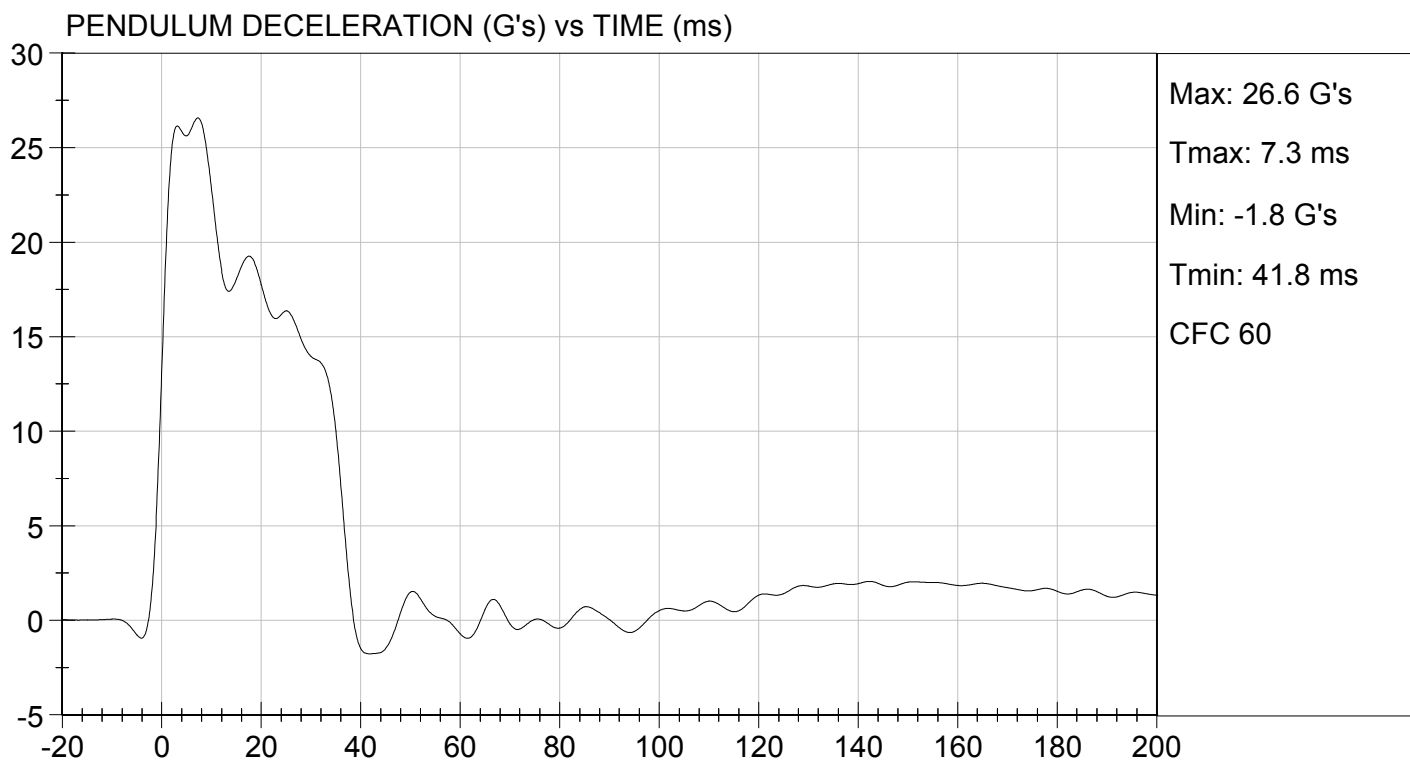
Test Date


 Approved By



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

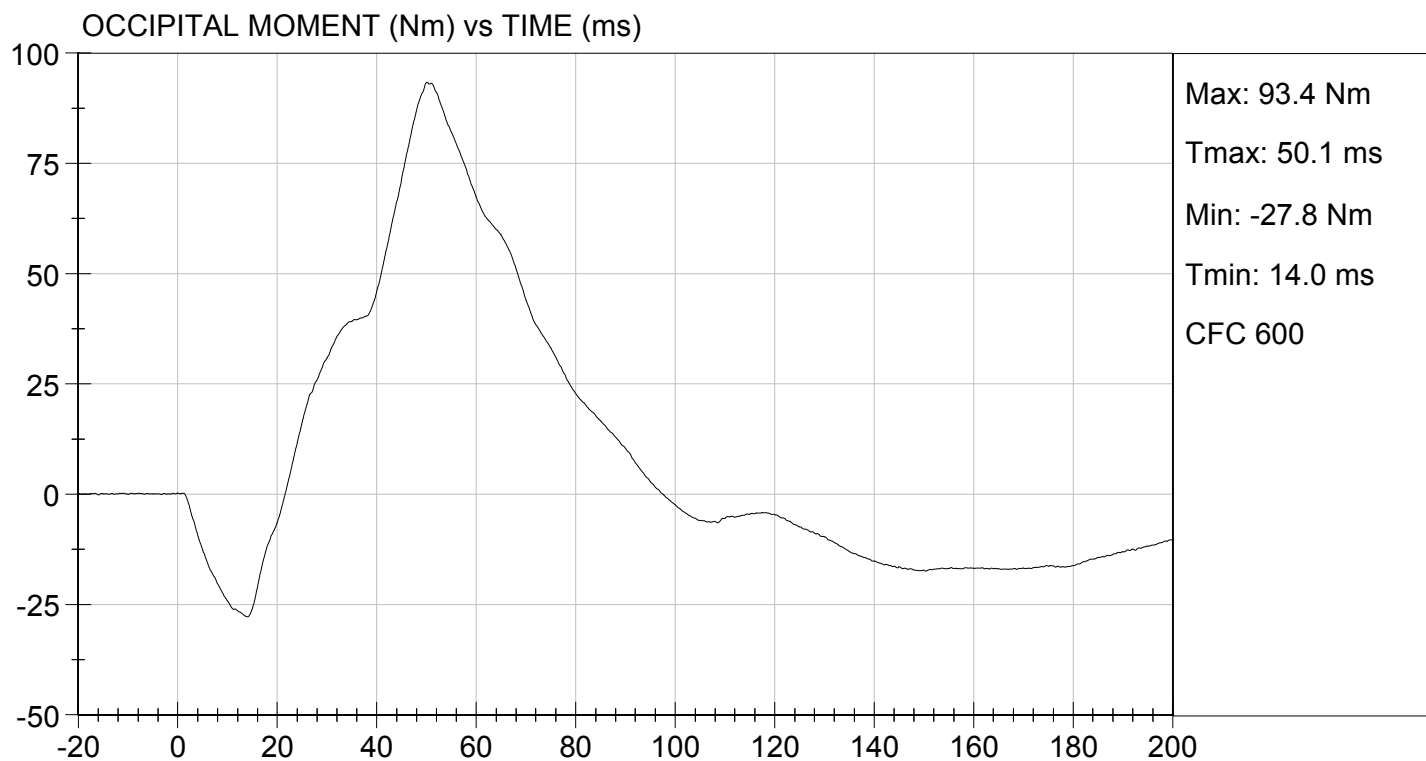
TEST DATE: 09/06/2012
TEST #: D123252





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

TEST DATE: 09/06/2012
TEST #: D123252

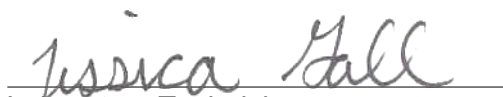


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

Test I.D: D123253

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	42	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	20.95	Pass
	20 ms	G's	14.00 to 19.00	17.15	Pass
	30 ms	G's	11.00 to 16.00	15.41	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	15.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	97.0	Pass
	Time	ms	72.0 to 82.0	75.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	157.7	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-69.2	Pass
	Time	ms	65.0 to 79.0	69.0	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.0	Pass
Overall Test Results					Pass


Laboratory Technician

09/06/2012

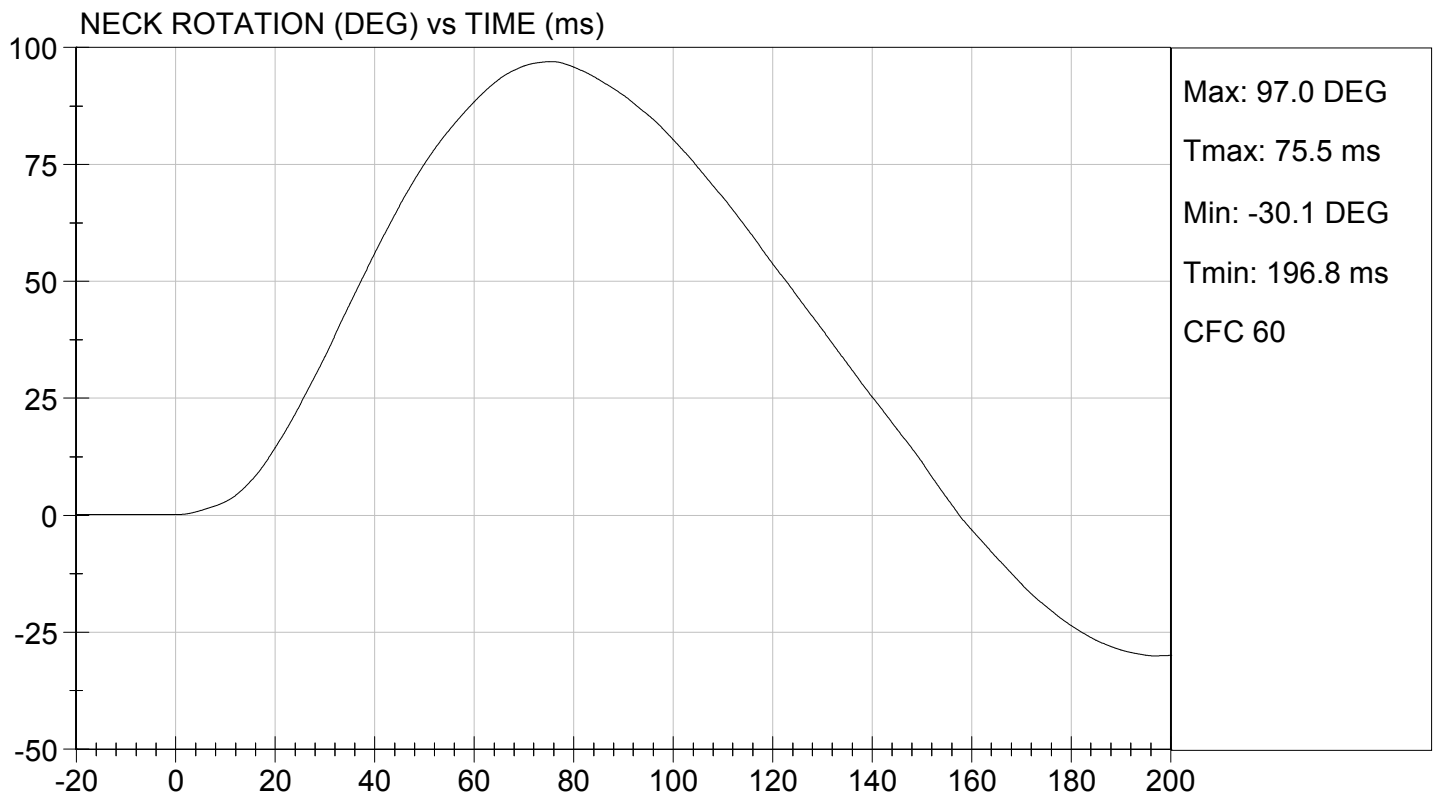
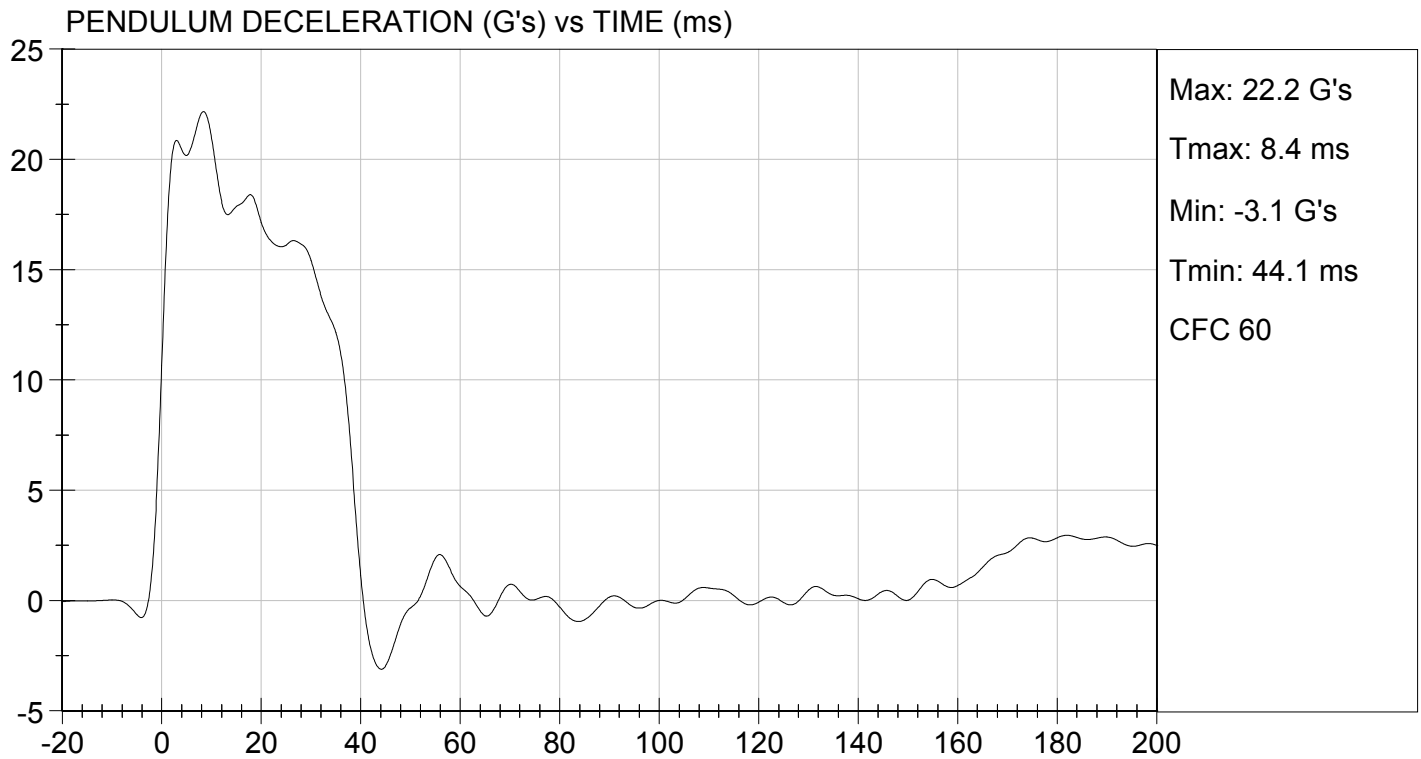
Test Date


Approved By



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

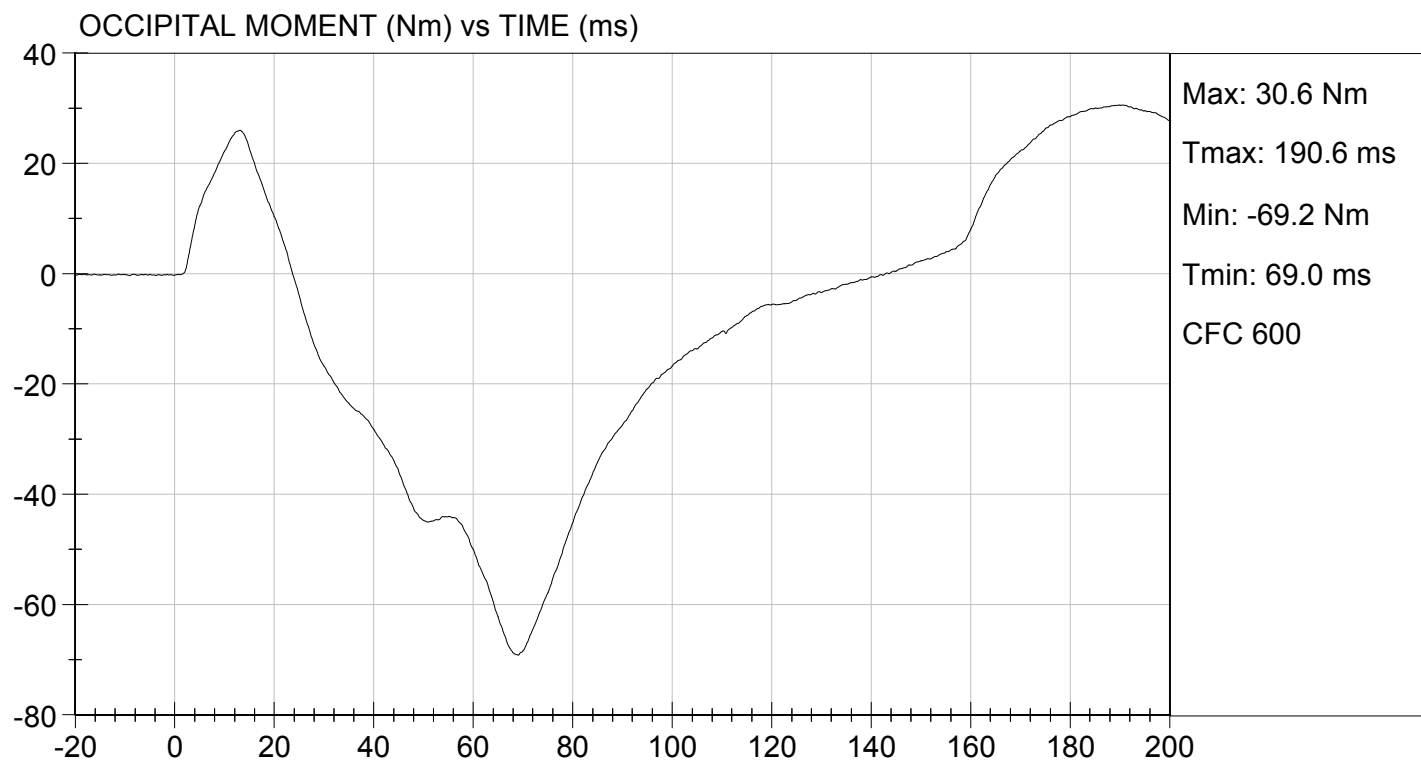
TEST DATE: 09/06/2012
TEST #: D123253





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

TEST DATE: 09/06/2012
TEST #: D123253

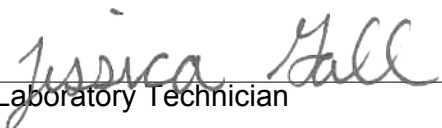


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036

Test I.D: D123254

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	42	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,372	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.80	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Overall Test Results			Pass	


Laboratory Technician

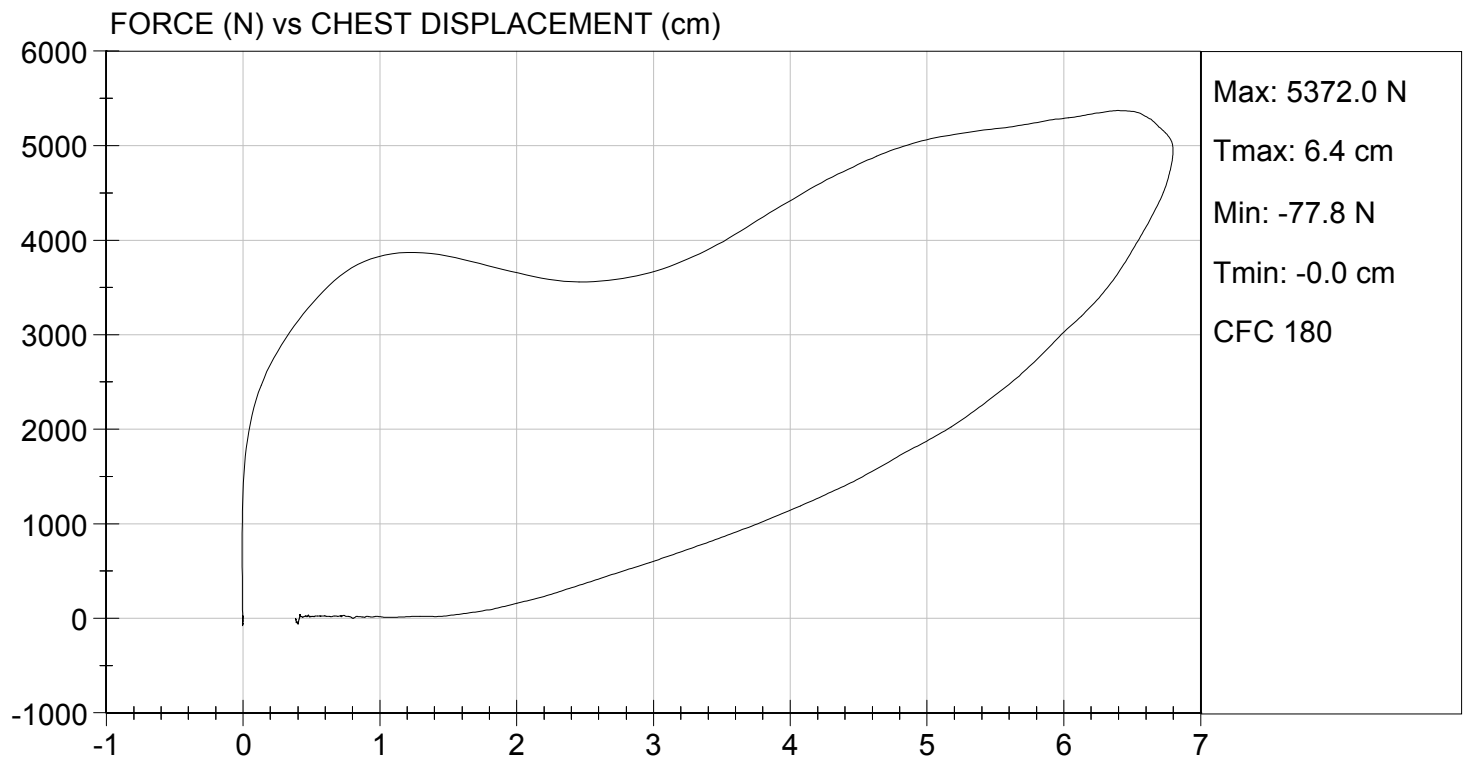
09/06/2012
Test Date


Approved By



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

TEST DATE: 09/06/2012
TEST #: D123254



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

ATD Serial No: 036

Test I.D: D123255

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	42	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	4,821	Pass
Overall Test Results				Pass


Laboratory Technician

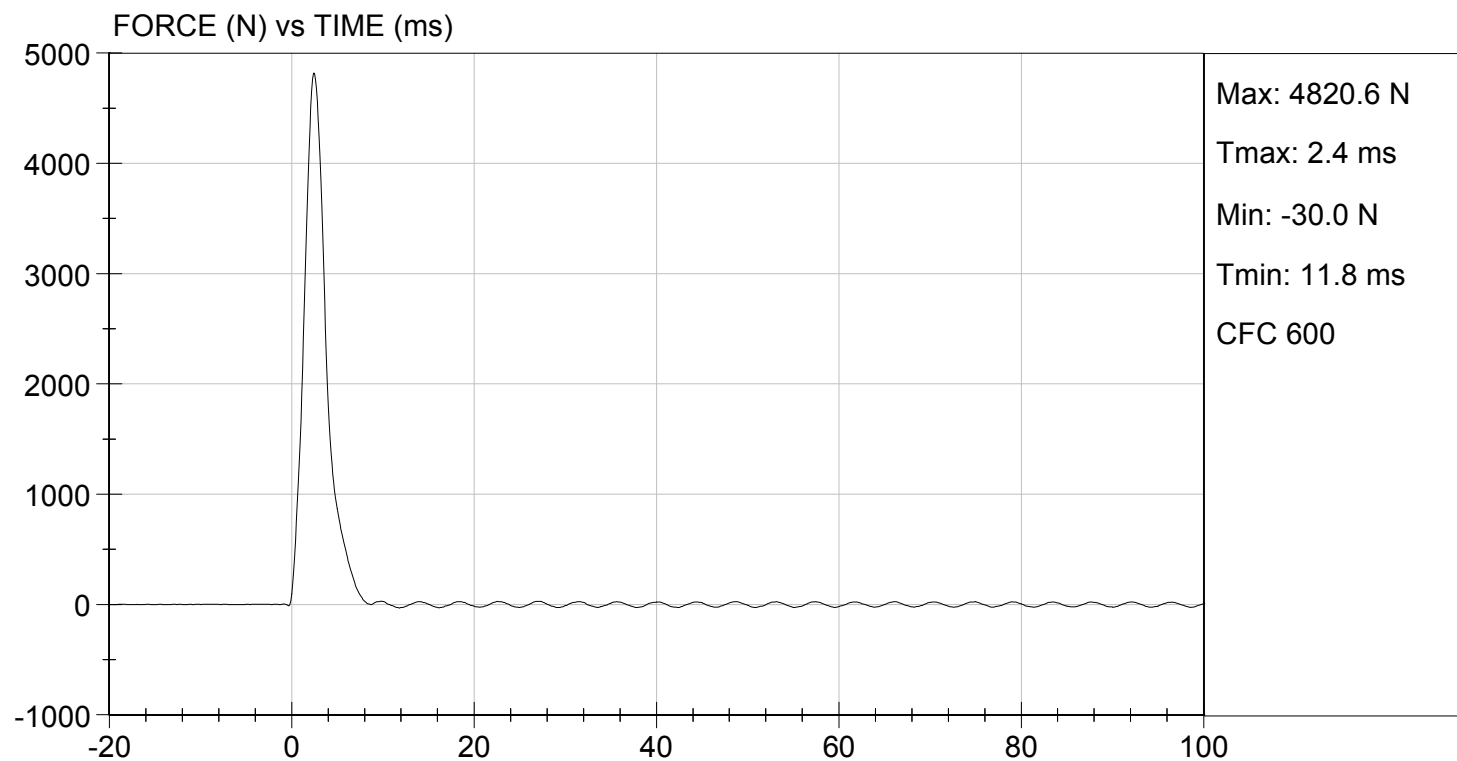
09/06/2012
Test Date


Approved By



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

TEST DATE: 09/06/2012
TEST #: D123255



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

ATD Serial No: 036

Test I.D: D123256

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	42	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	4,717	Pass
Overall Test Results				Pass


Laboratory Technician

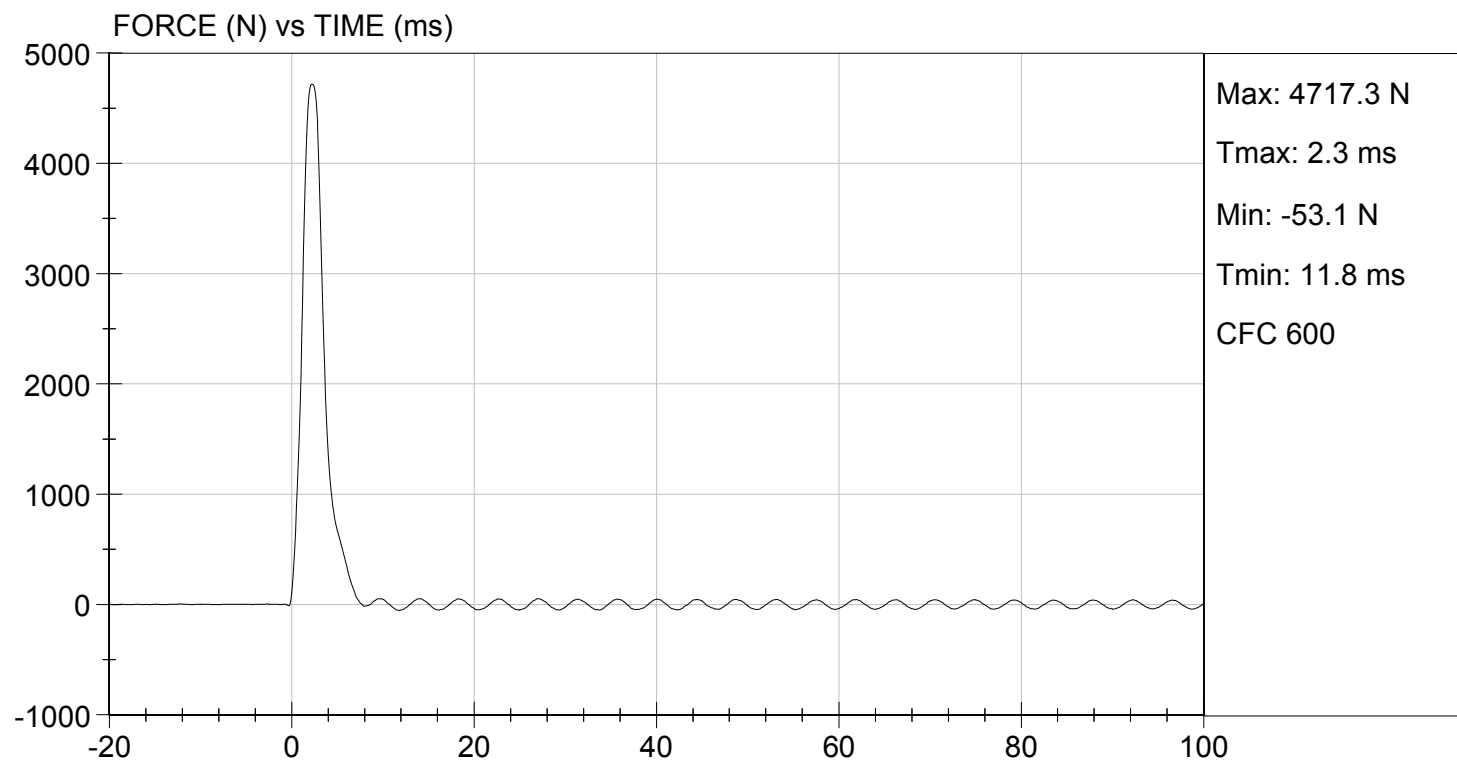
09/06/2012
Test Date


Approved By



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

TEST DATE: 09/06/2012
TEST #: D123256



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

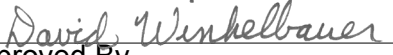
ATD Serial No: 036

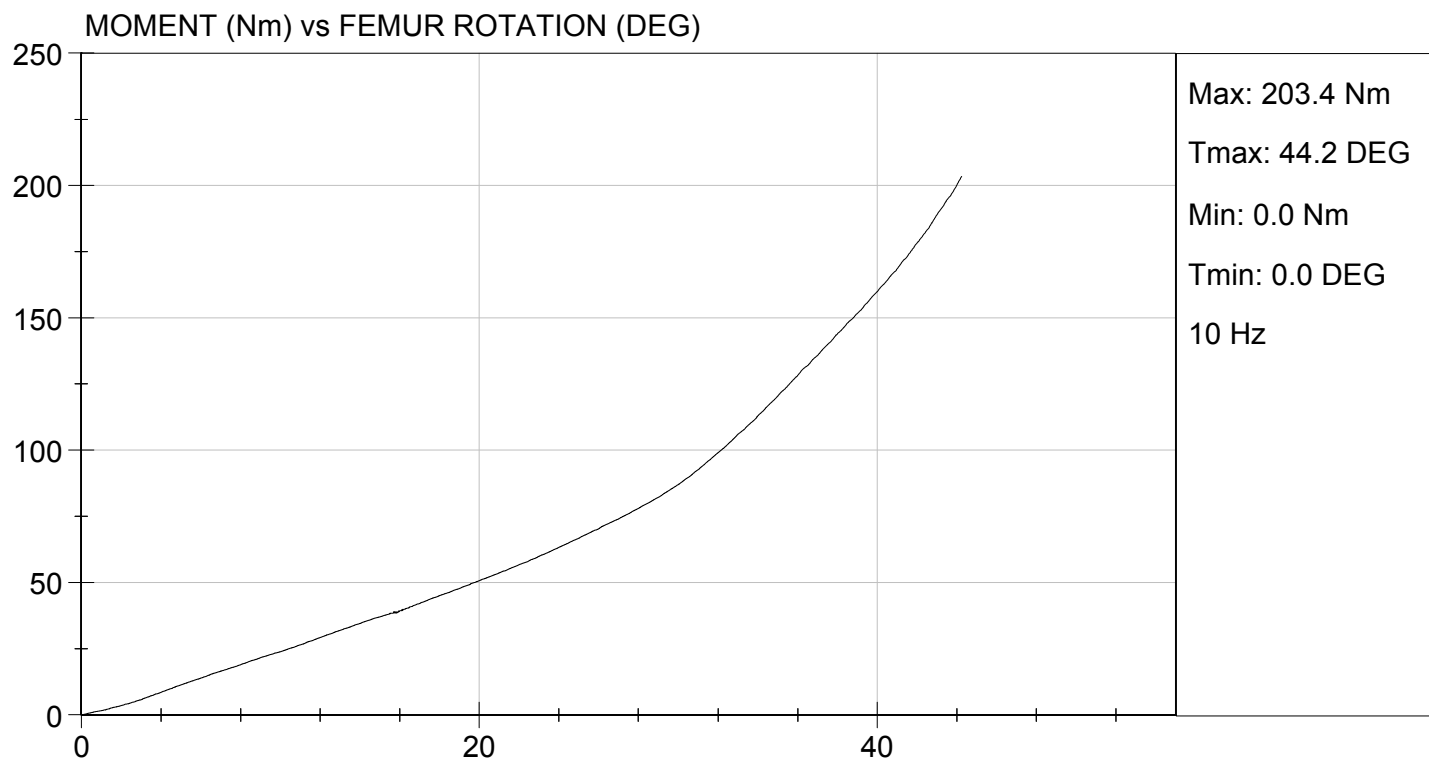
Test I.D: D123250

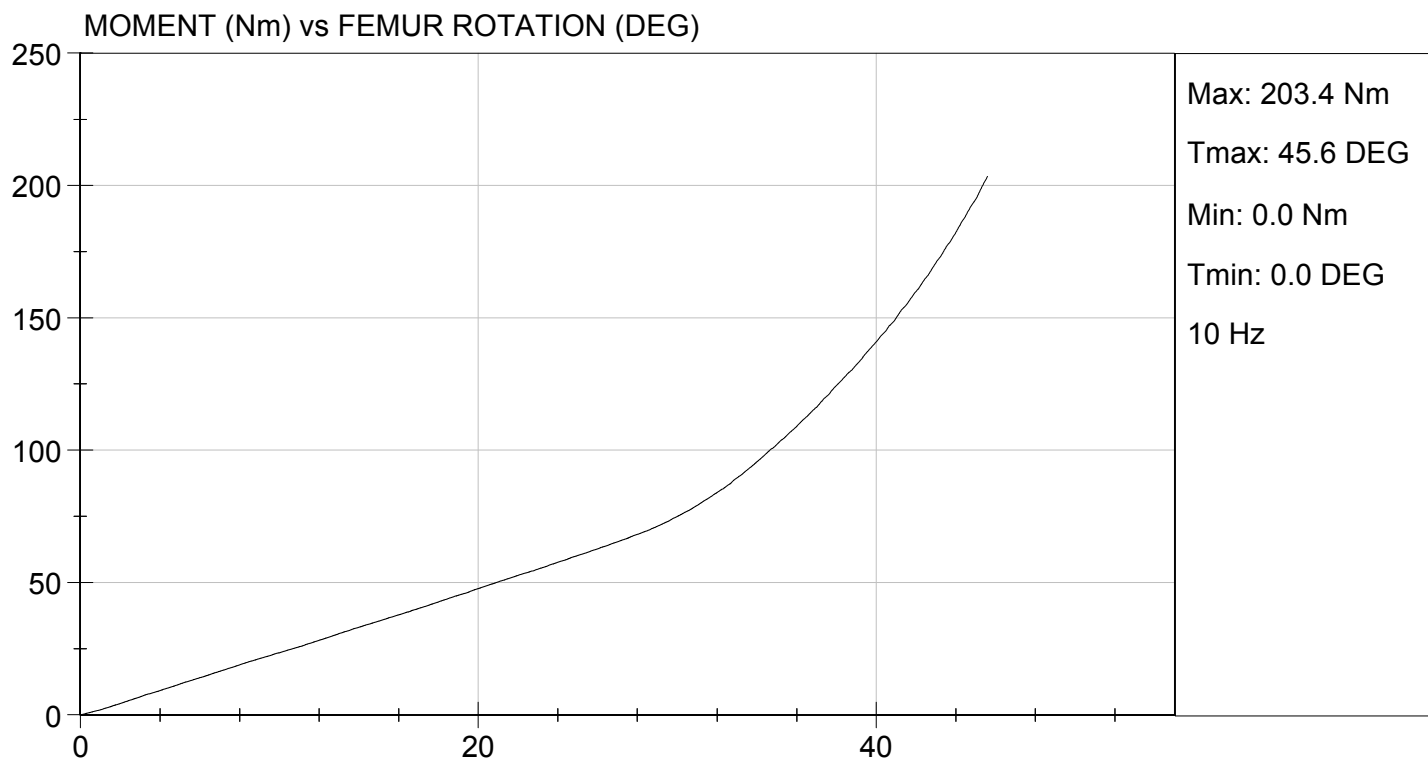
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.0	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	42	42	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	87.1	75.0	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.2	45.6	Pass
Overall Test Results					Pass


Laboratory Technician

09/06/2012
Test Date


Approved By





Hybrid III, 5th External Measurements
SN: 138

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	785.1
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	456.8
C	H-POINT HEIGHT	Reference	81.3-86.3	84.0
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	146.2
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	78.0
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	127.5
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	249.6
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	280.2
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	201.9
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	526.7
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376.0	362.3
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	398.0
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	430.5

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	184.6
P	FOOT LENGTH	Tip of toe to rear of heel	218.5-233.7	221.0
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	472.6
S	HEAD BREADTH	The widest part of the head	137.1-147.3	141.9
T	HEAD DEPTH	Back of the head to the forehead	177.8-188.0	184.2
U	HIP BREADTH	The widest part of the hip	299.7-314.9	307.4
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	350.5-365.7	360.5
W	FOOT BREADTH	The widest part of the foot	78.8-94.0	85.0
X	HEAD CIRCUMFERENCE	Measured at the point as in dim. "T"	528.3-548.7	546.2
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 345.4 ± 12.7 mm above seat surface	850.9-881.3	875.1
Z	WAIST CIRCUMFERENCE	Measured 165.1 ± 5.1 mm above seat surface	759.5-789.9	785.4
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: 138

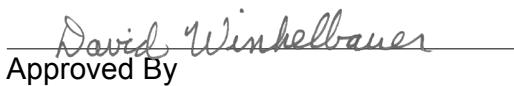
Test ID: D123181

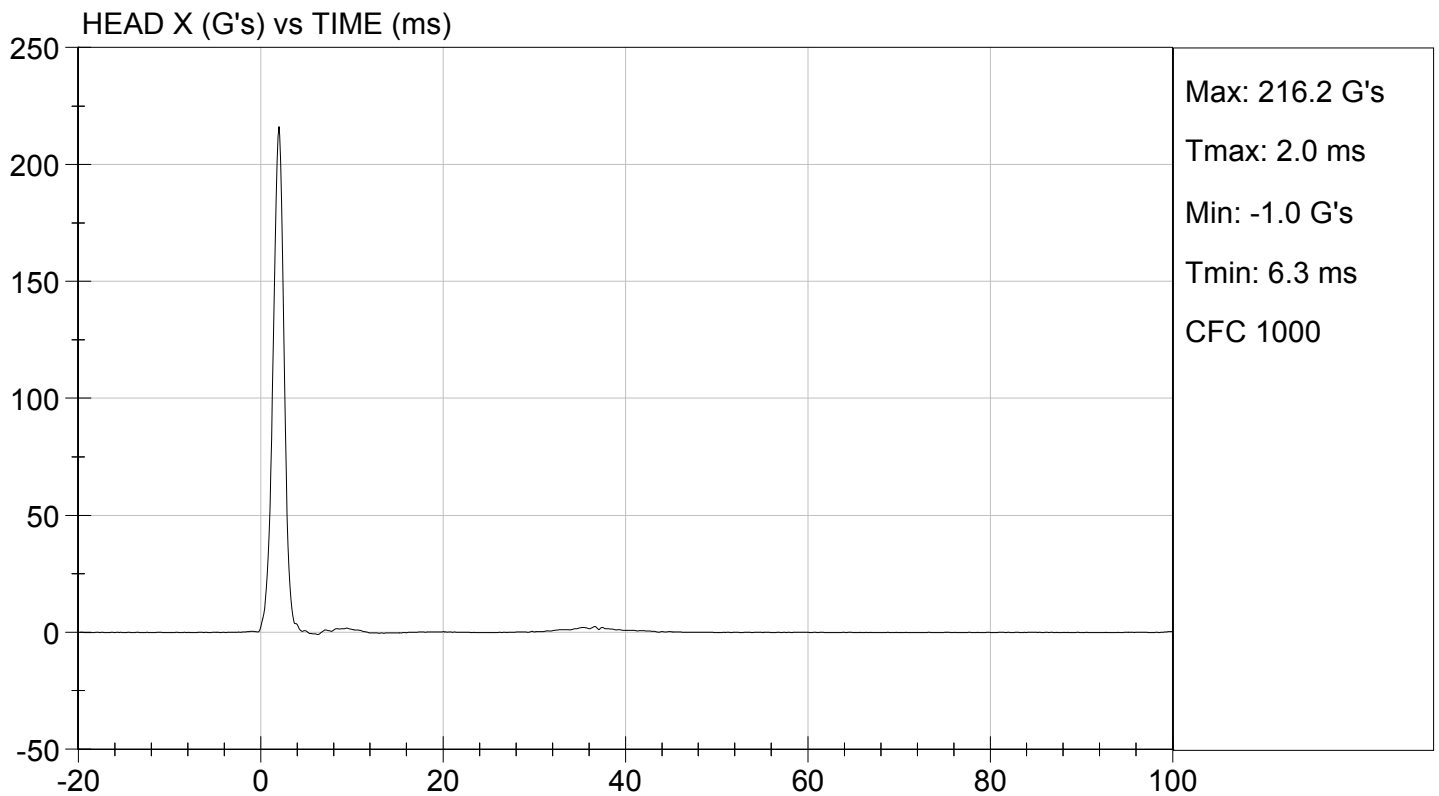
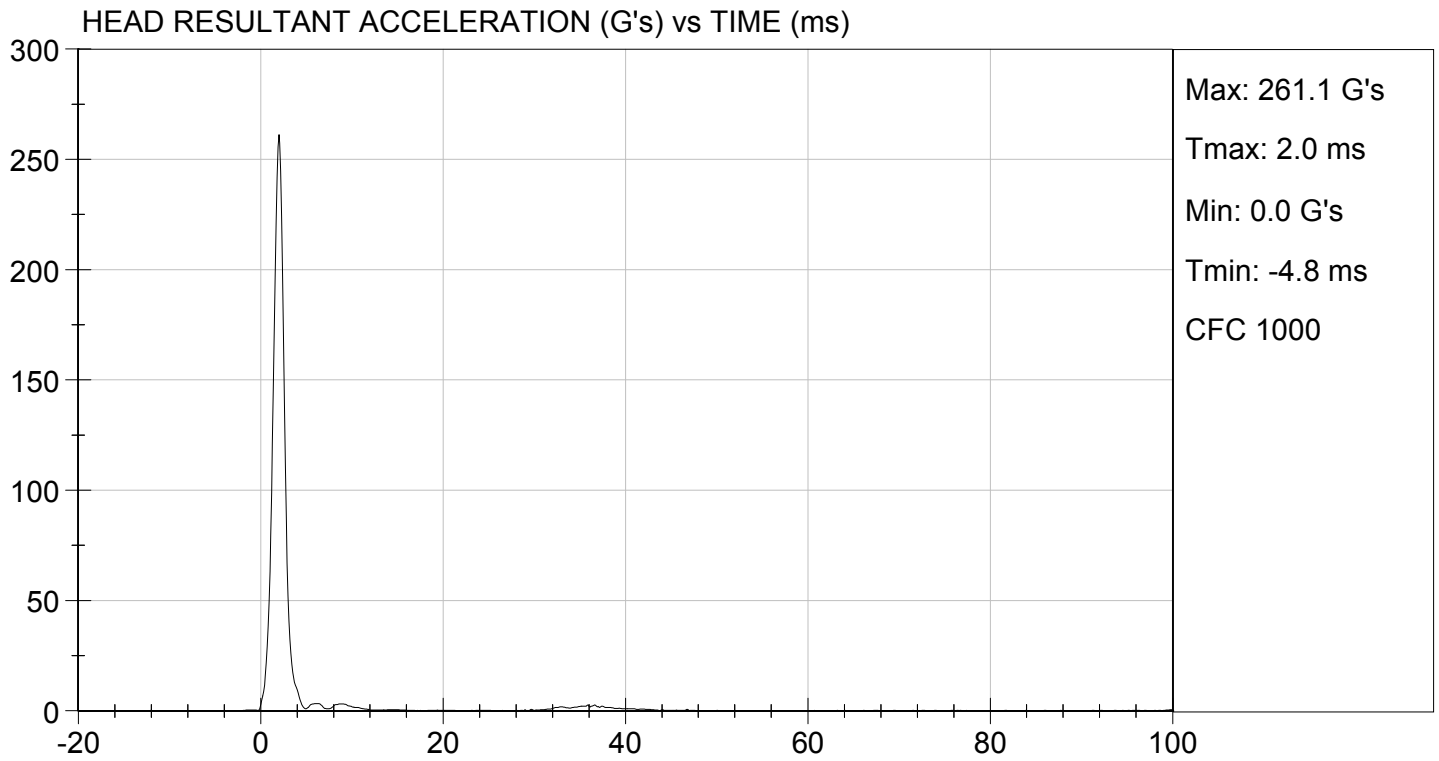
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Peak Resultant Acceleration	G's	250 to 300	261	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-5.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

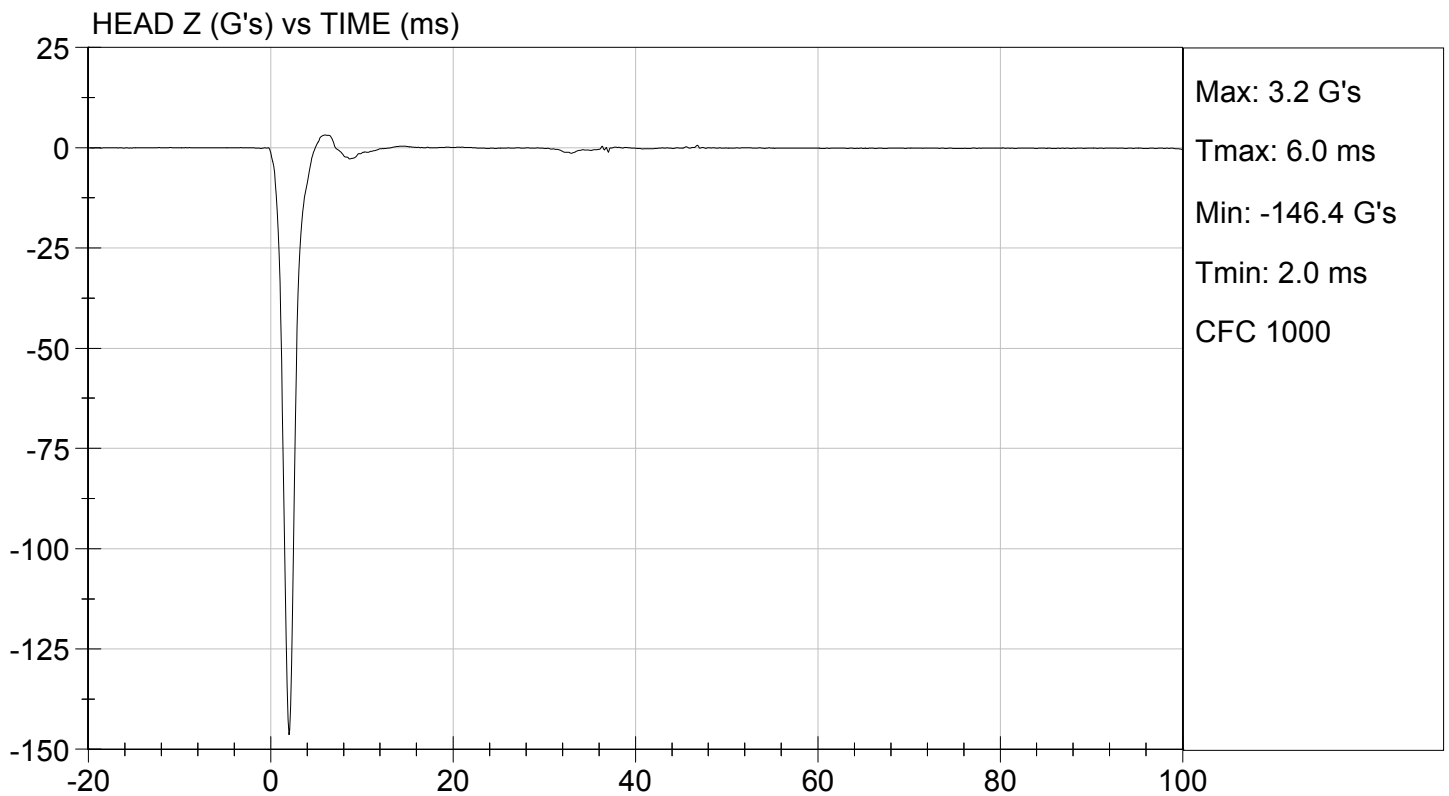
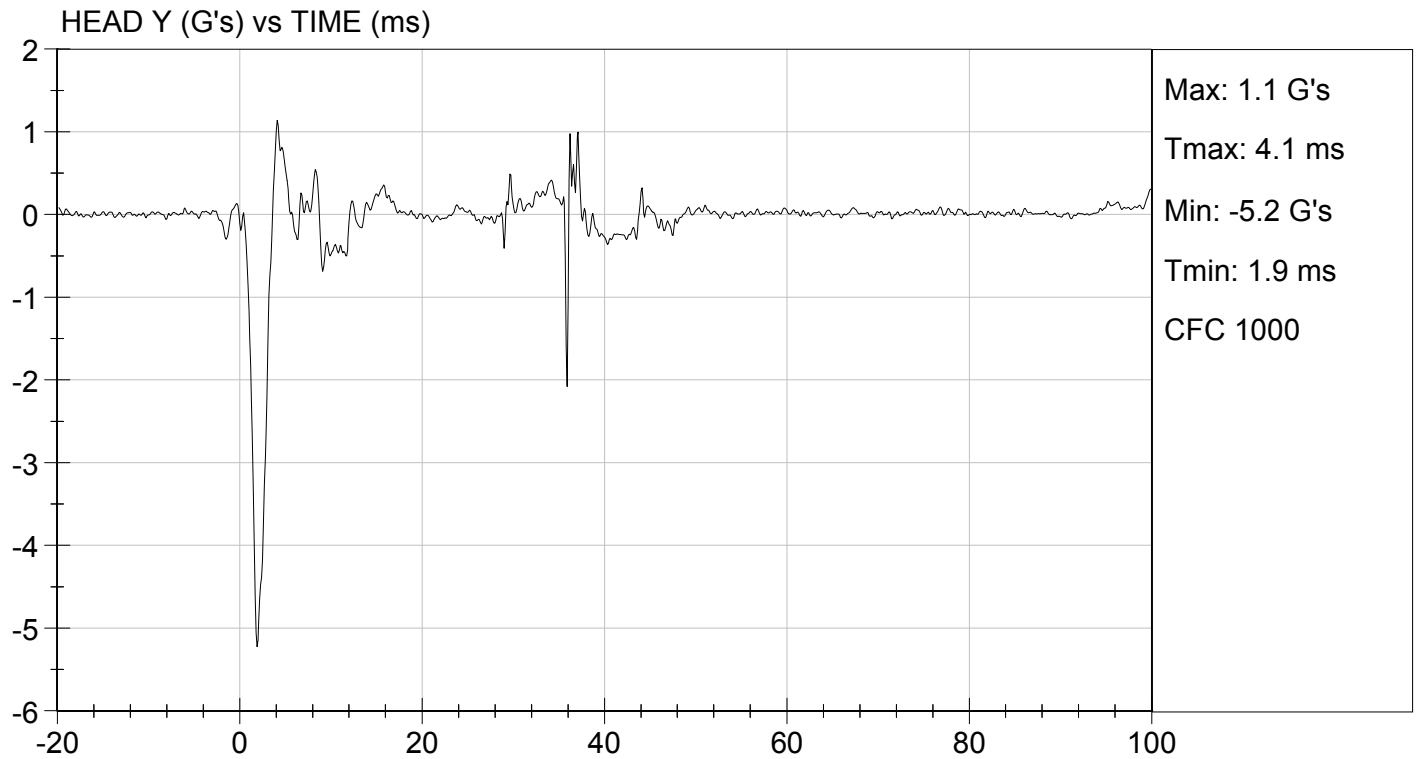

Laboratory Technician

08/29/2012

Test Date


Approved By





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D123182

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	47	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	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.3	Pass
D Plane Rotation	Max	deg	77 to 91	77	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	72	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	88	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

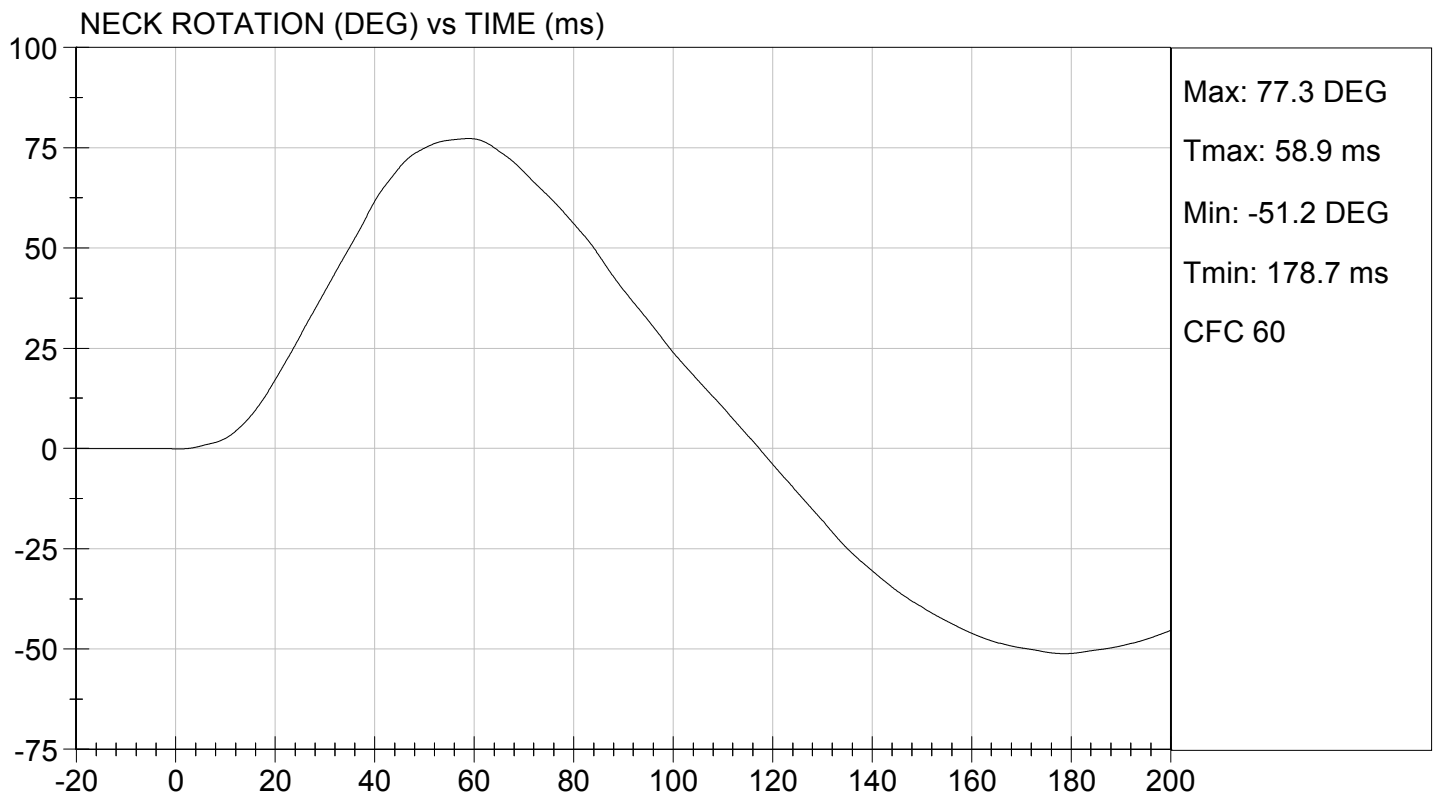
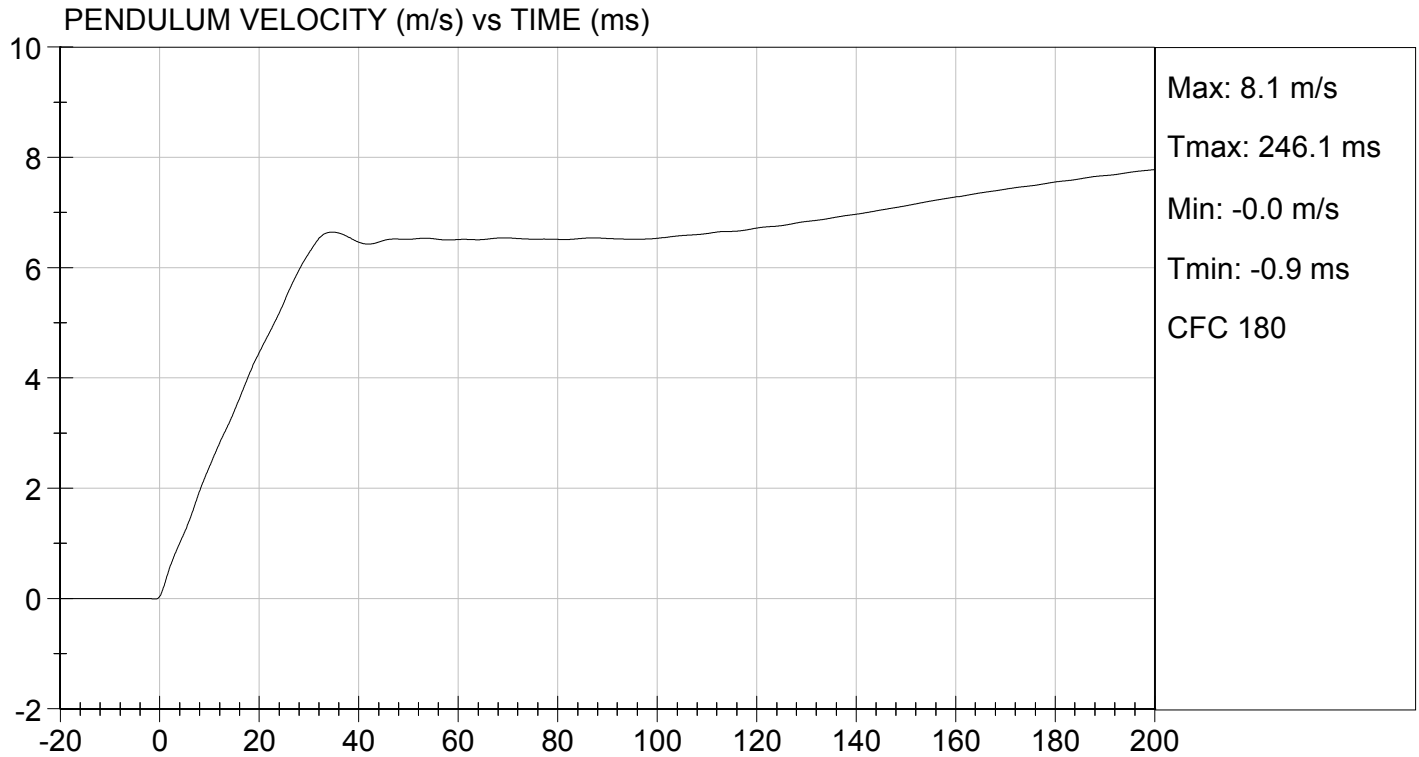
08/29/2012
Test Date

David Winkelbauer
Approved By



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

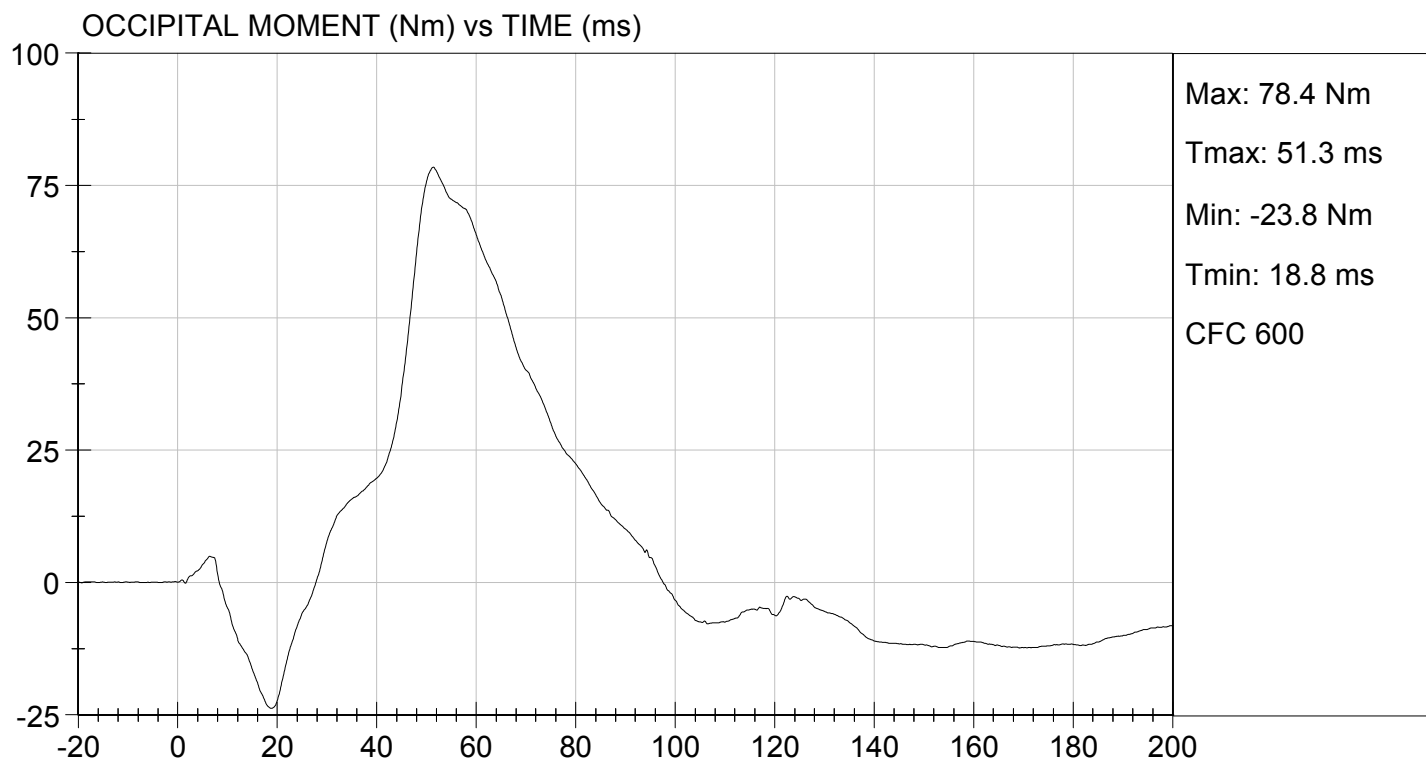
TEST DATE: 08/29/2012
TEST #: D123182





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

TEST DATE: 08/29/2012
TEST #: D123182



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

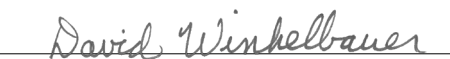
ATD Serial No: 138

Test I.D: D123183

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	47	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.7	Pass
	20 ms	m/s	3.1 to 3.9	3.5	Pass
	30 ms	m/s	4.6 to 5.6	5.1	Pass
D Plane Rotation	Max	deg	99 to 114	101	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-54	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	102	Pass
Overall Results					Pass


Laboratory Technician

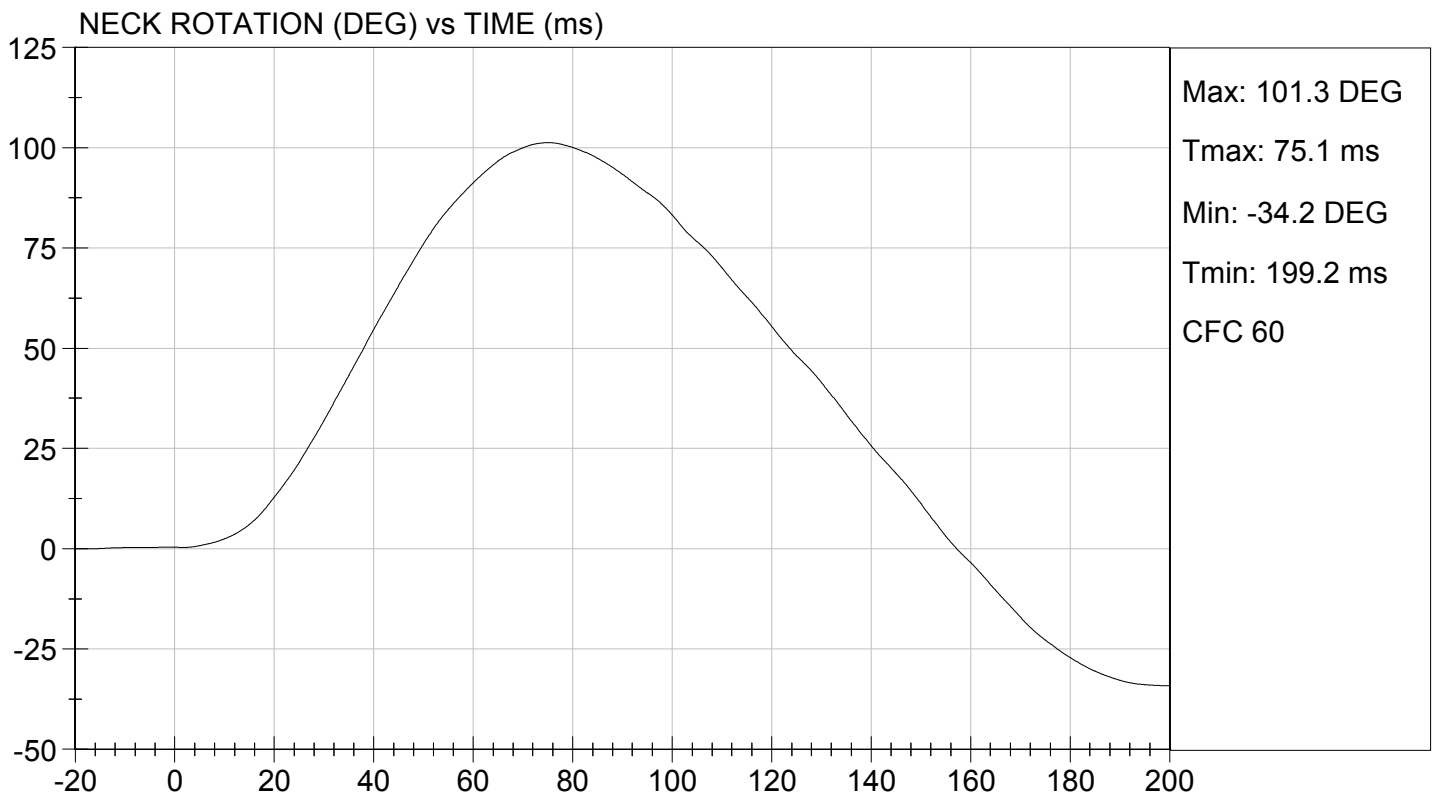
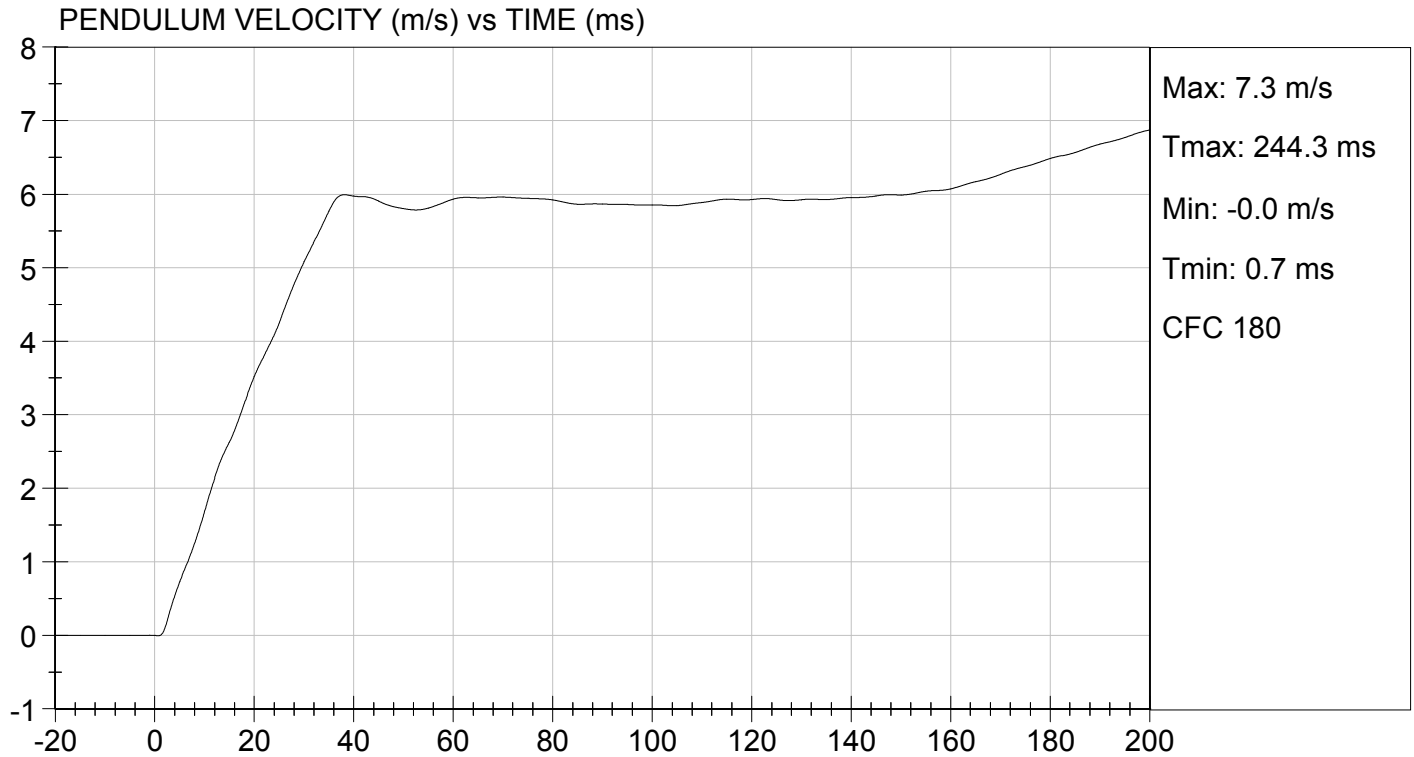
08/29/2012
Test Date


Approved By



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

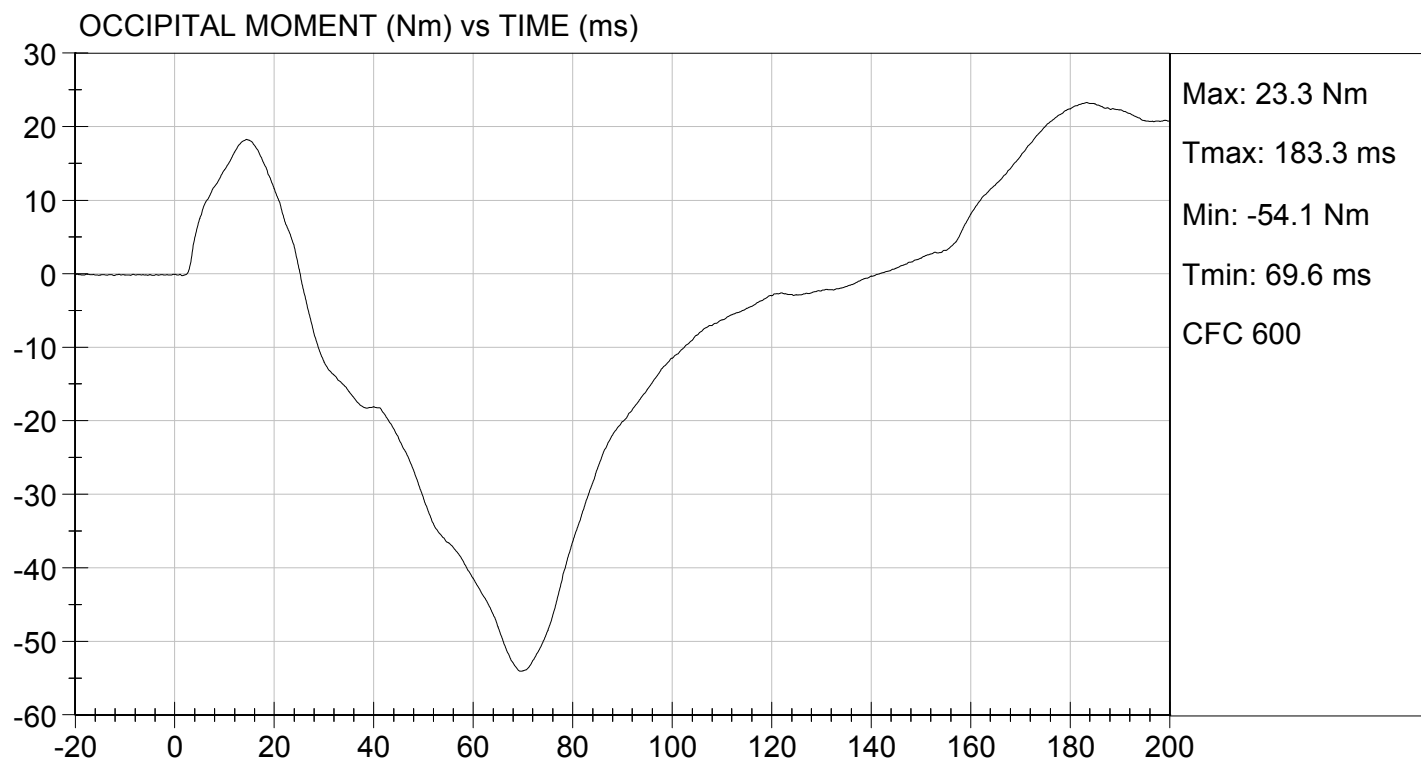
TEST DATE: 08/29/2012
TEST #: D123183





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

TEST DATE: 08/29/2012
TEST #: D123183

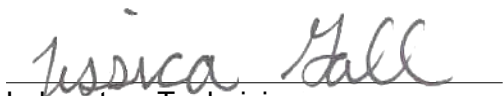


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D123184

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	56	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4161	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4057	Pass
Overall Test Results				Pass


Laboratory Technician

08/30/2012

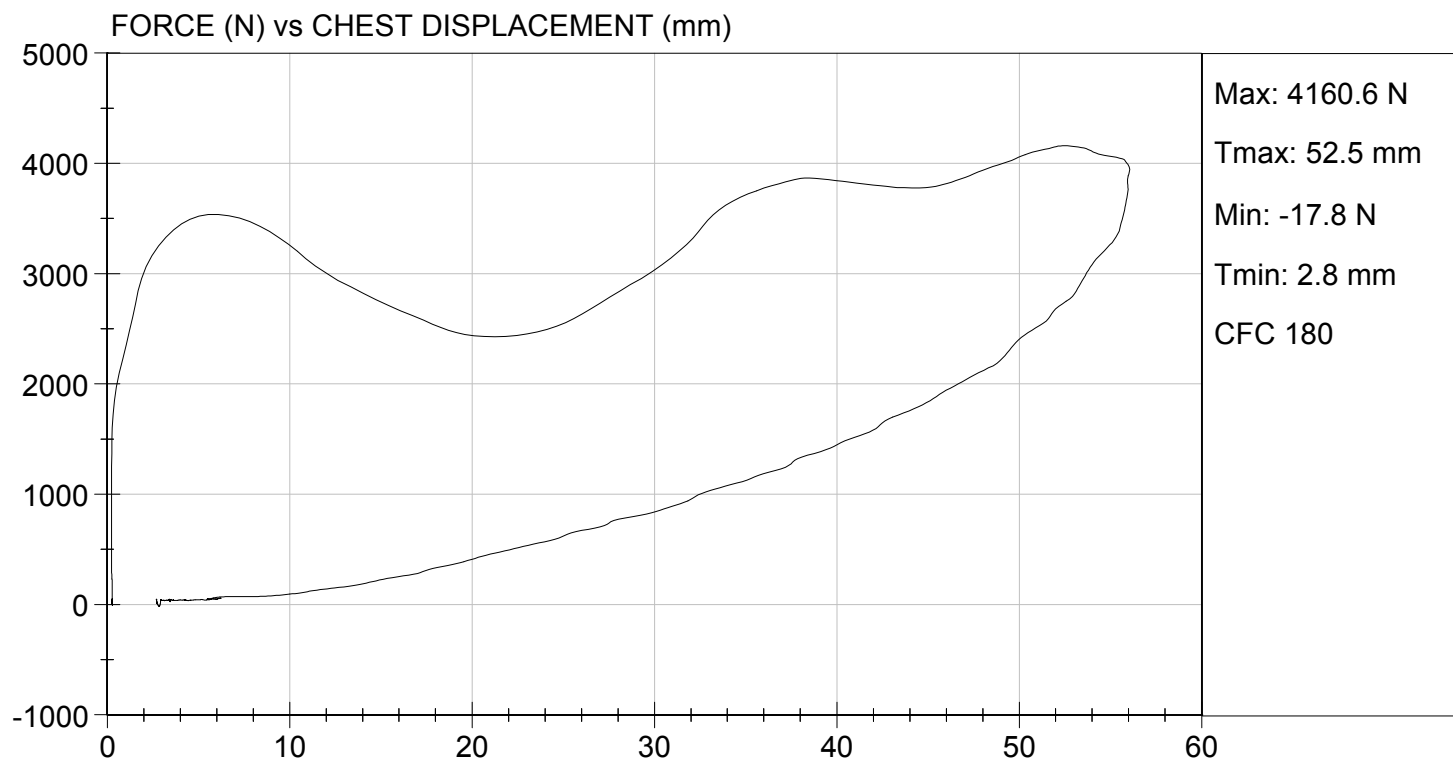
Test Date


Approved By



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

TEST DATE: 08/30/2012
TEST #: D123184



MGA RESEARCH CORPORATION

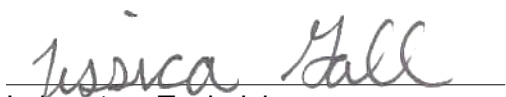
RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

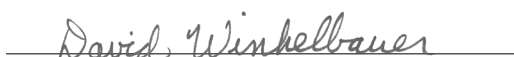
ATD Serial No: 138

Test I.D: D123185

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	47	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3461	Pass
Overall Test Results				Pass


Laboratory Technician

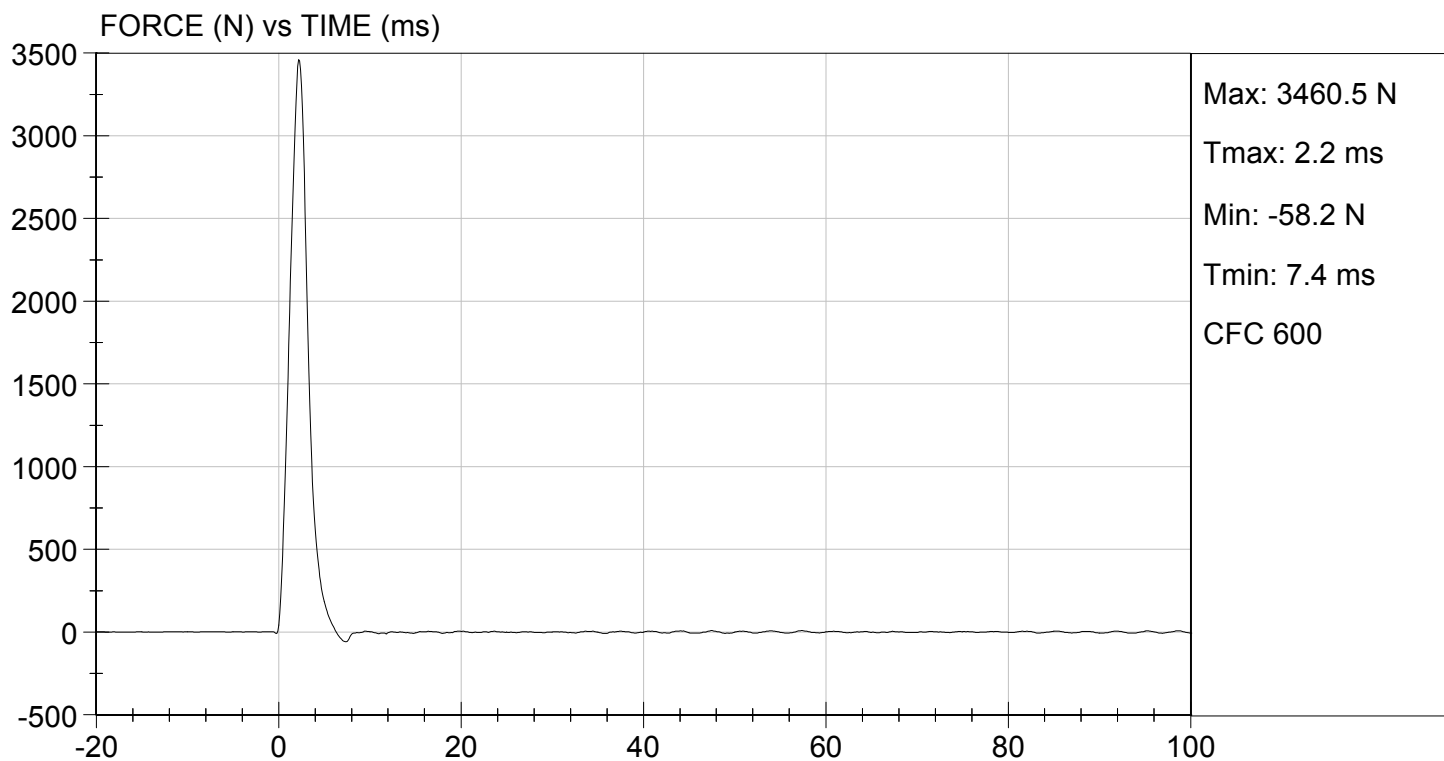
08/29/2012
Test Date


Approved By



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

TEST DATE: 08/29/2012
TEST #: D123185



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D123186

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	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3471	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

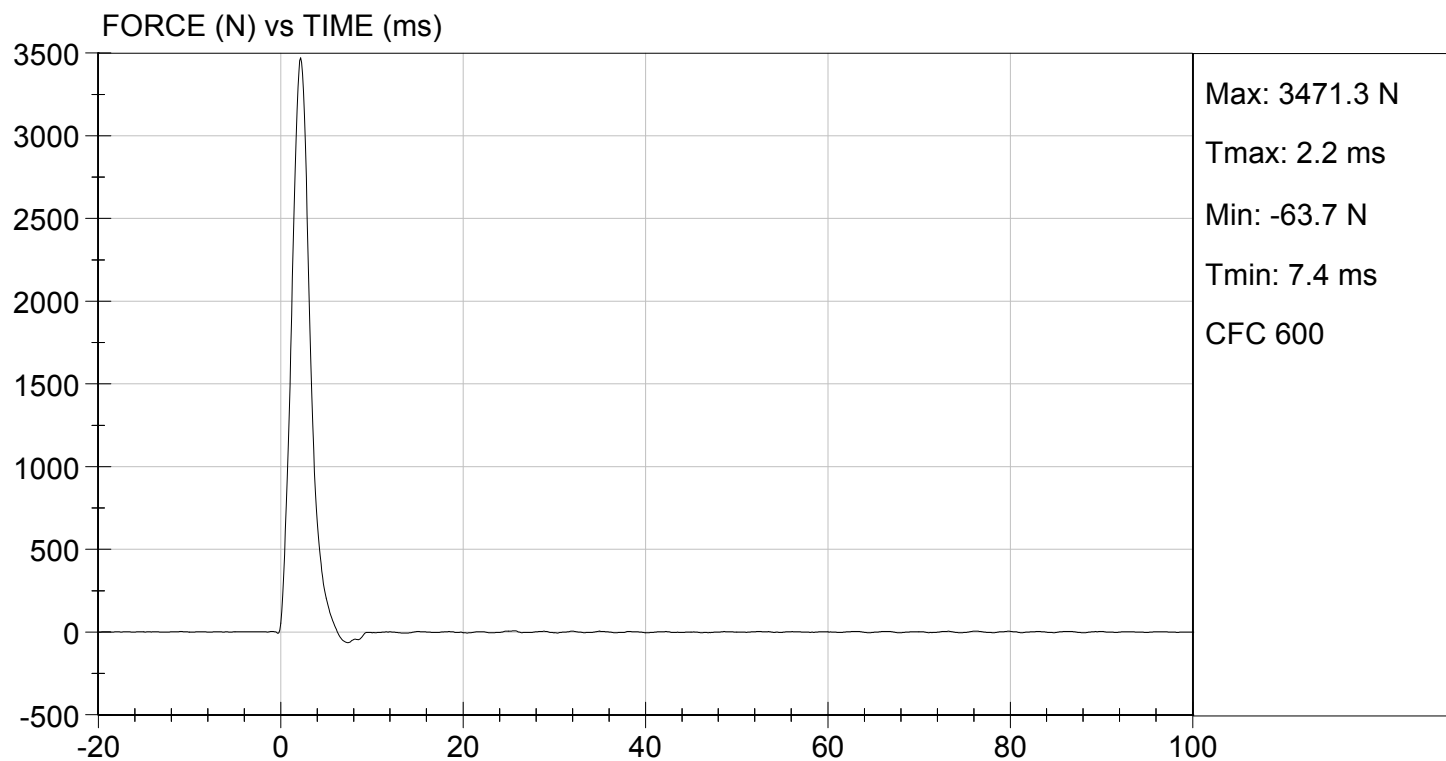
08/30/2012
Test Date

David Winkelbauer
Approved By



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

TEST DATE: 08/30/2012
TEST #: D123186



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D123187

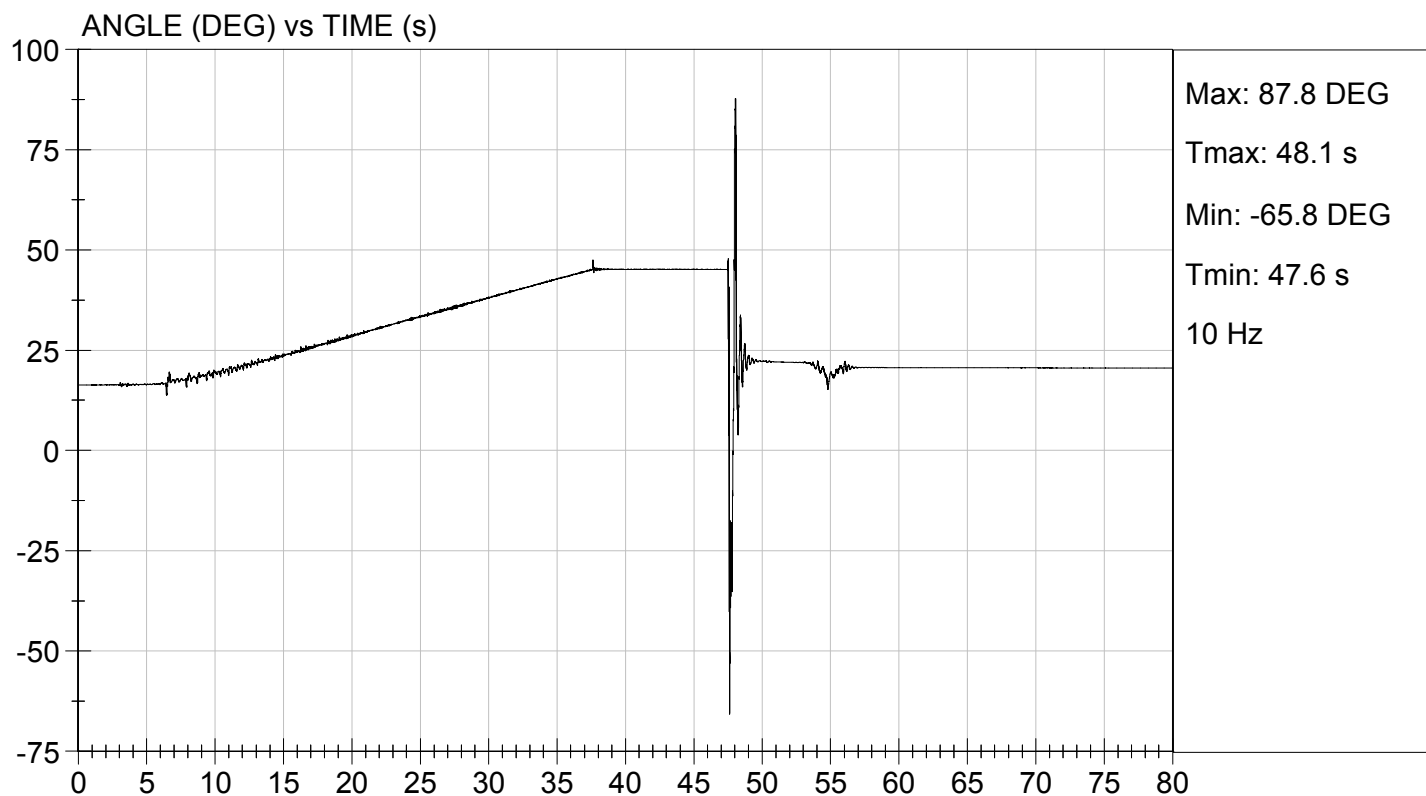
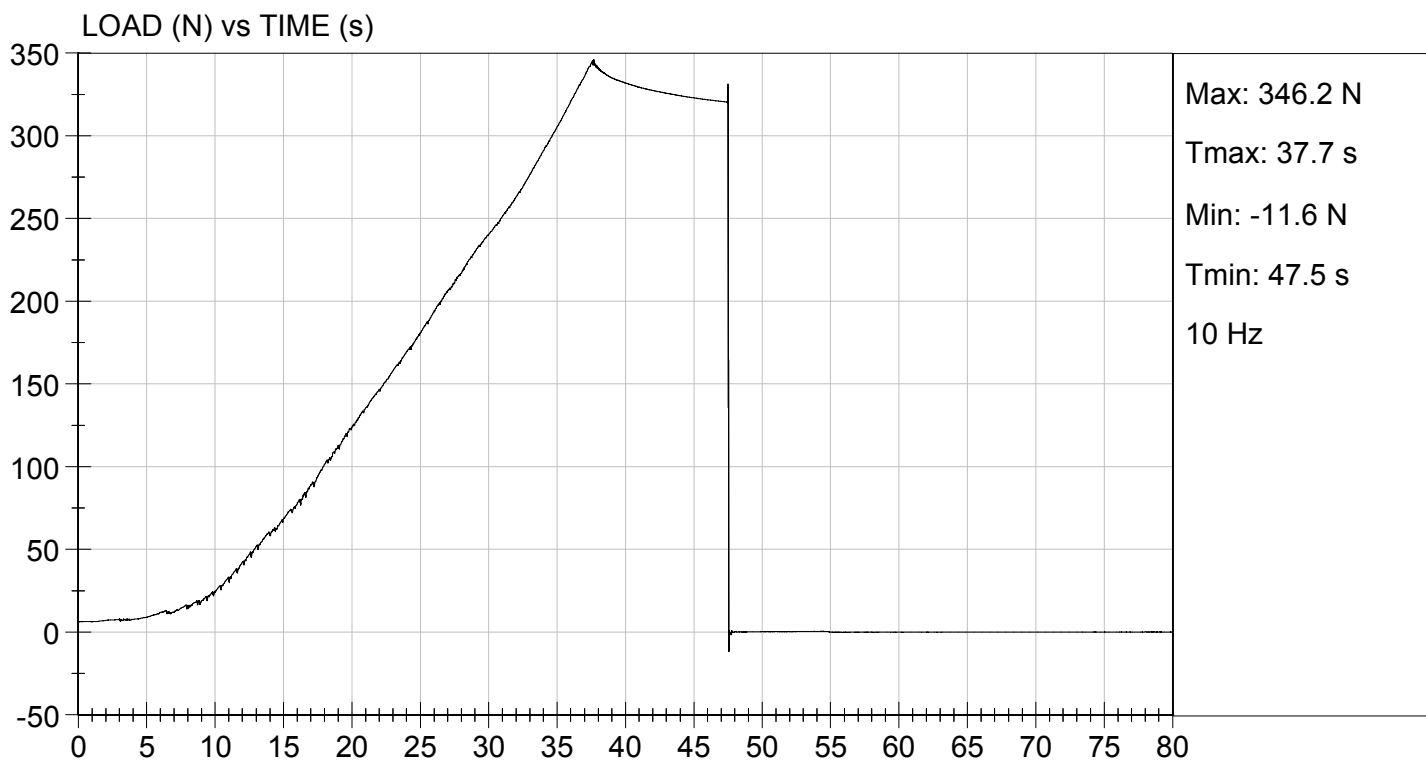
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Initial Angle	deg	0 to 20	16	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	346	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.8	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

08/29/2012

Test Date

David Winkelbauer
Approved By



MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test ID: D123261

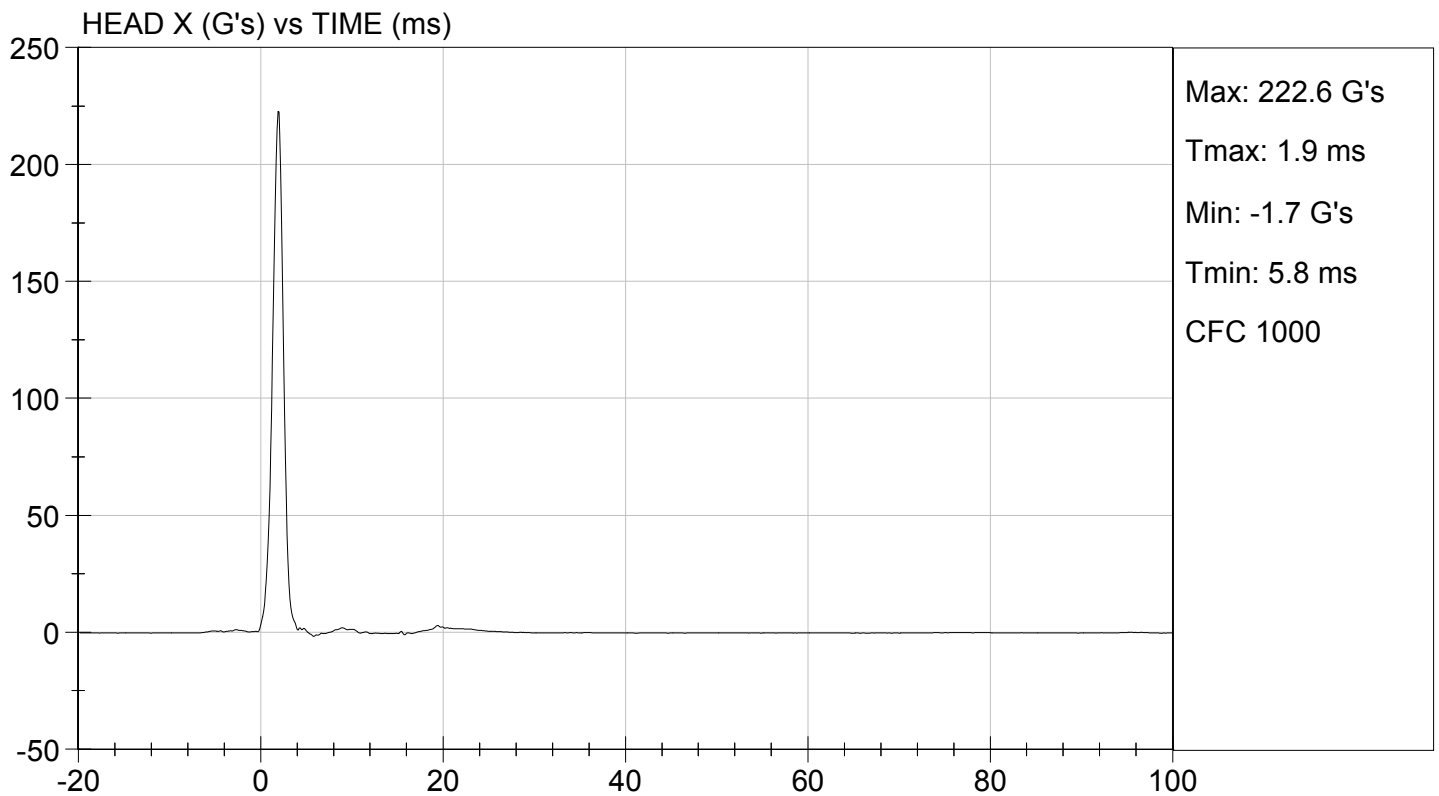
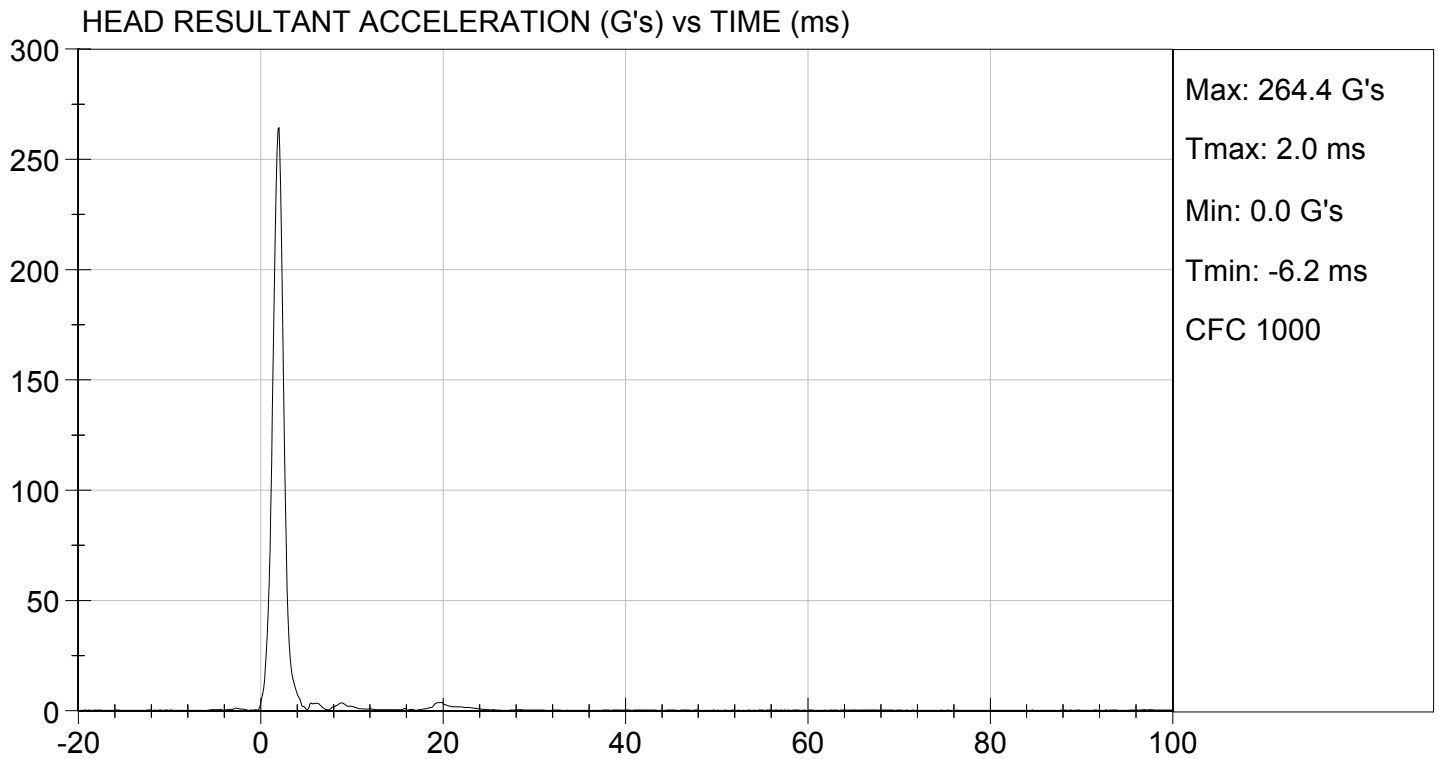
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	250 to 300	264	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-5.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

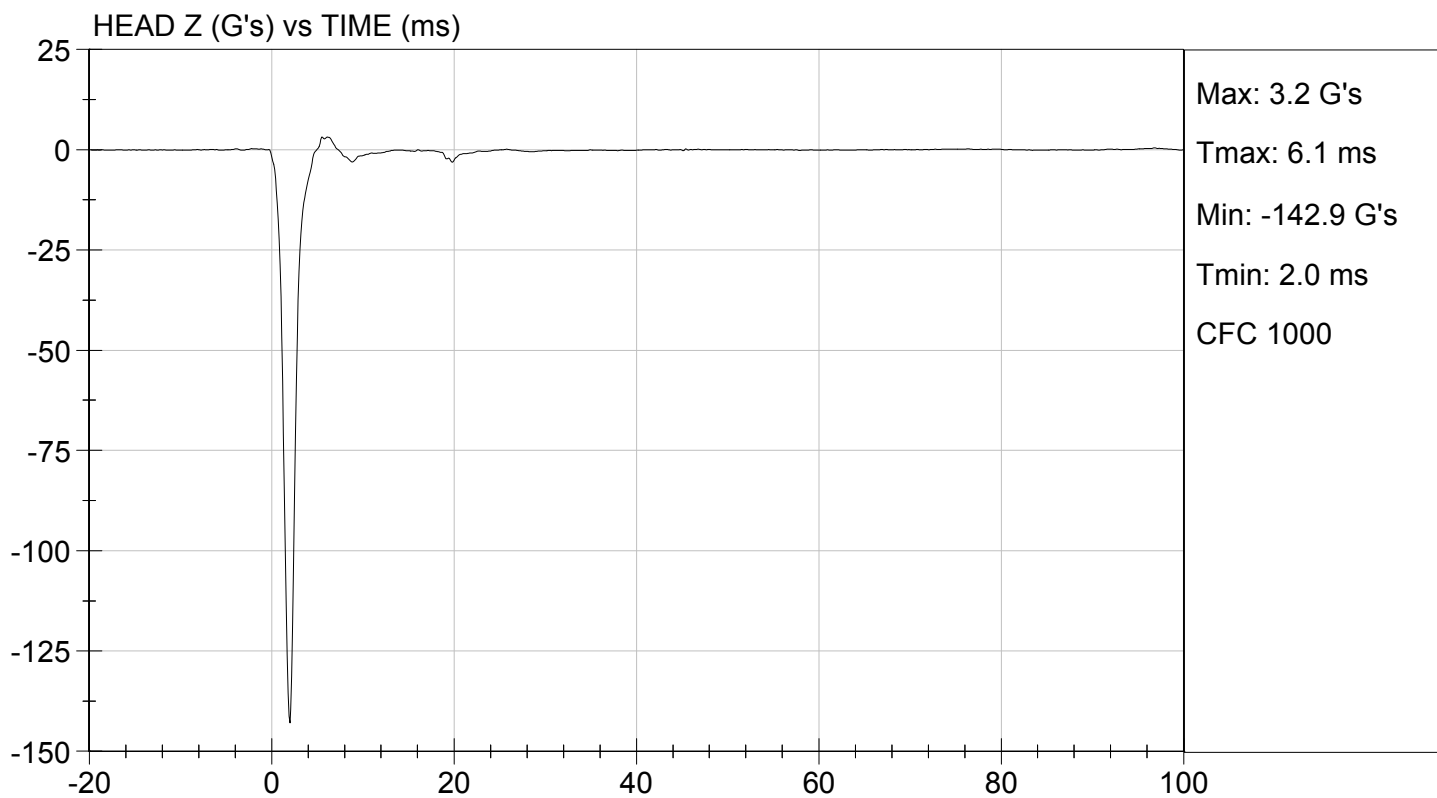
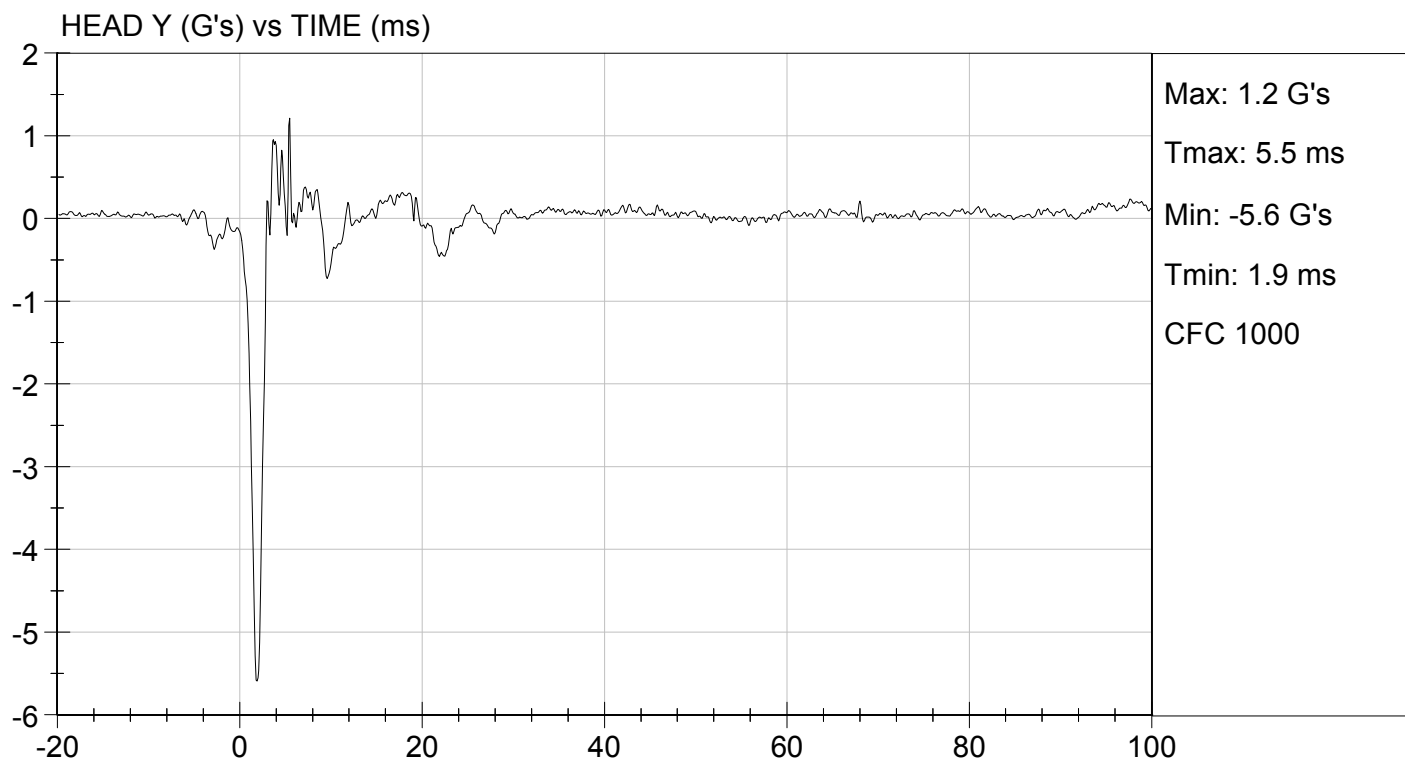

Laboratory Technician

09/06/2012

Test Date


Approved By





MGA RESEARCH CORPORATION

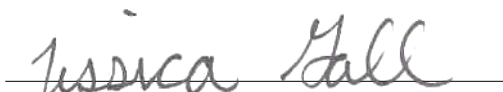
NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D123262

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	44	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	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	77	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	77	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	92	Pass
Overall Results					Pass


 Laboratory Technician

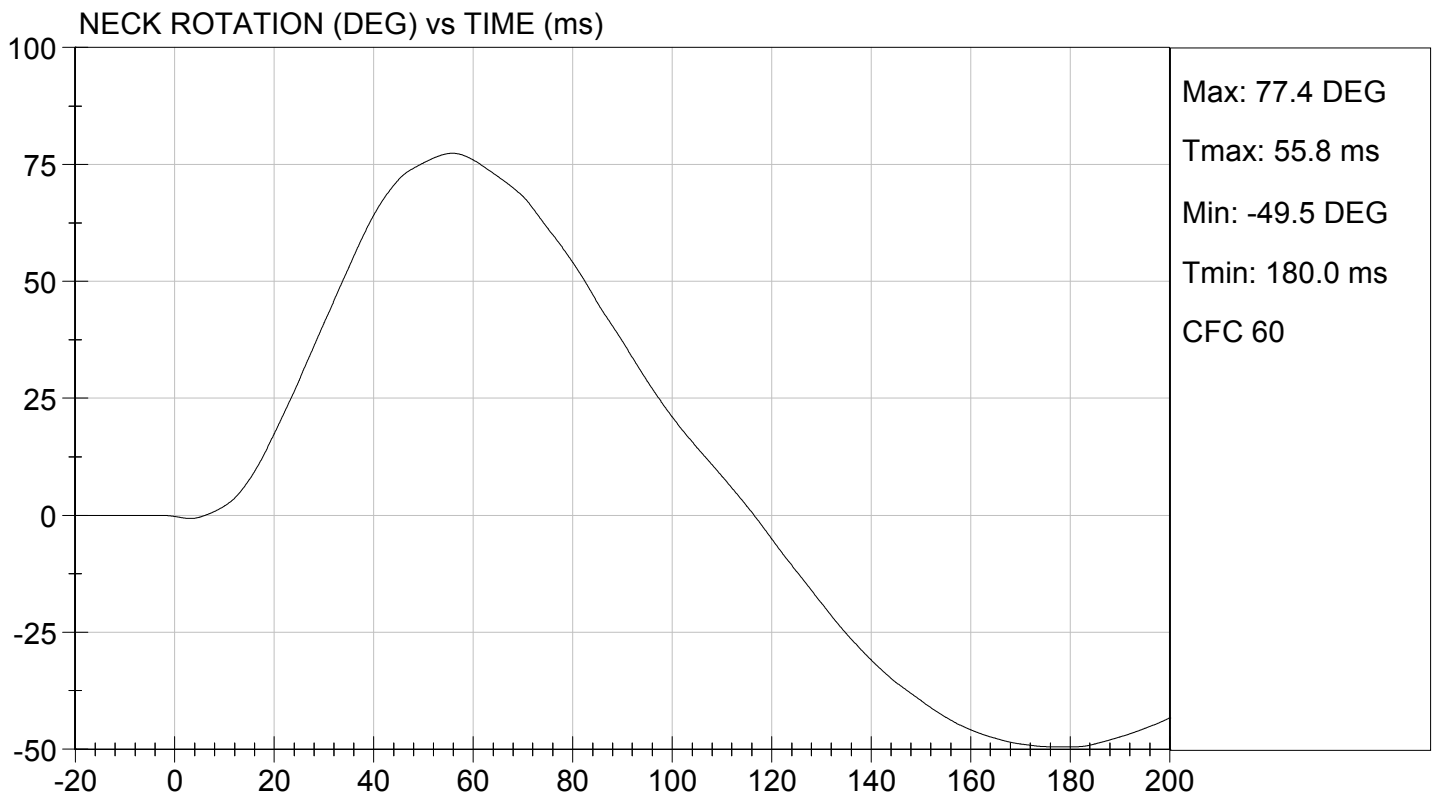
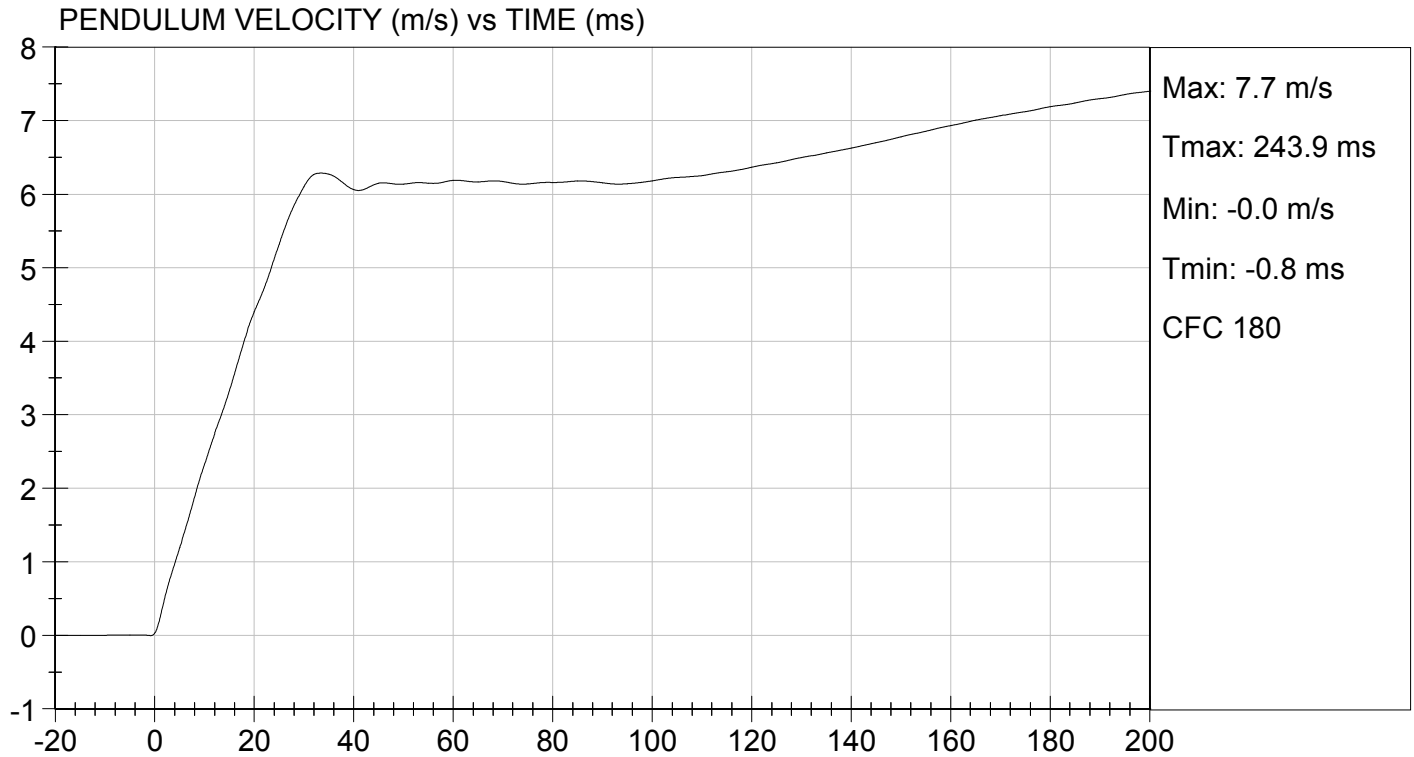
09/06/2012
 Test Date


 Approved By



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

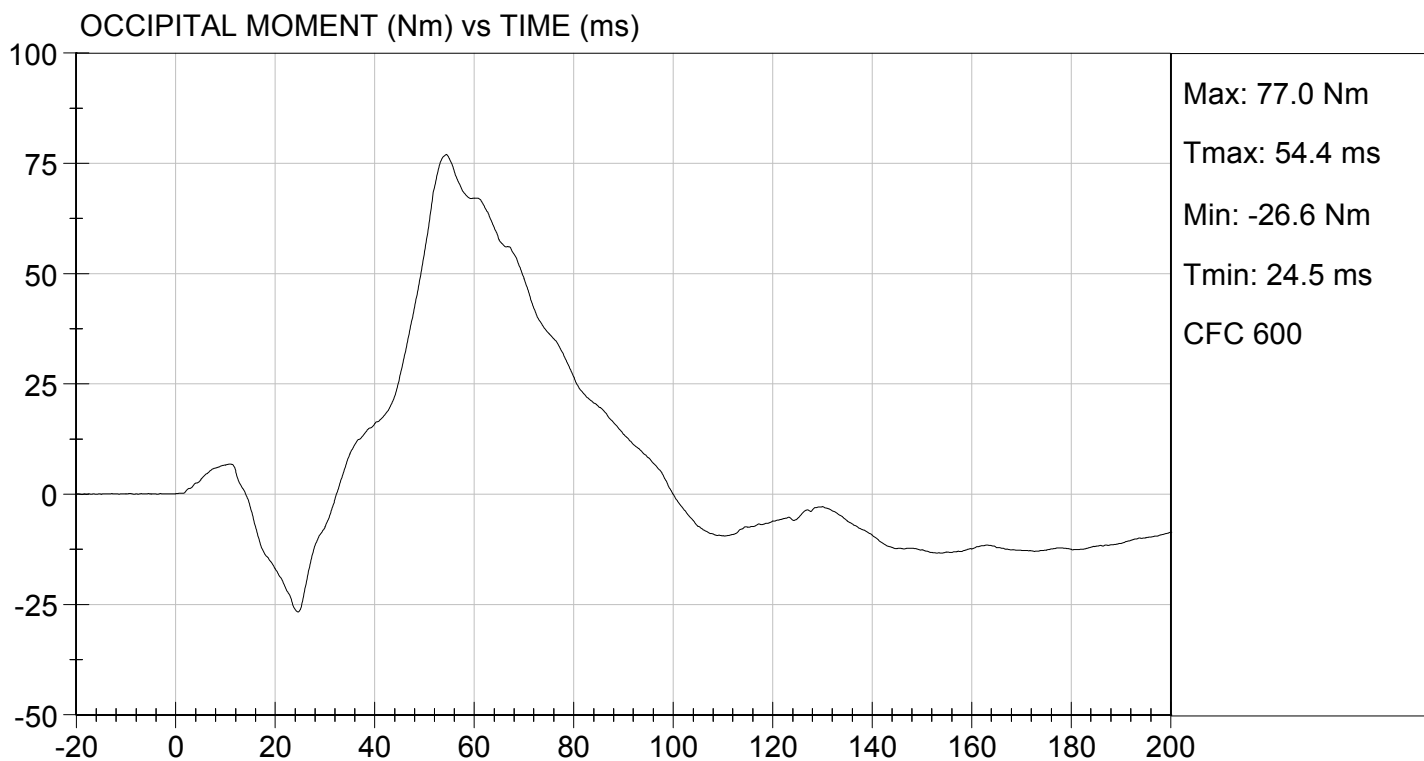
TEST DATE: 09/06/2012
TEST #: D123262





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

TEST DATE: 09/06/2012
TEST #: D123262



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

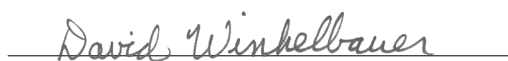
ATD Serial No: 138

Test I.D: D123263

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	44	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.7	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.2	Pass
D Plane Rotation	Max	deg	99 to 114	102	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-56	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	99	Pass
Overall Results					Pass


Laboratory Technician

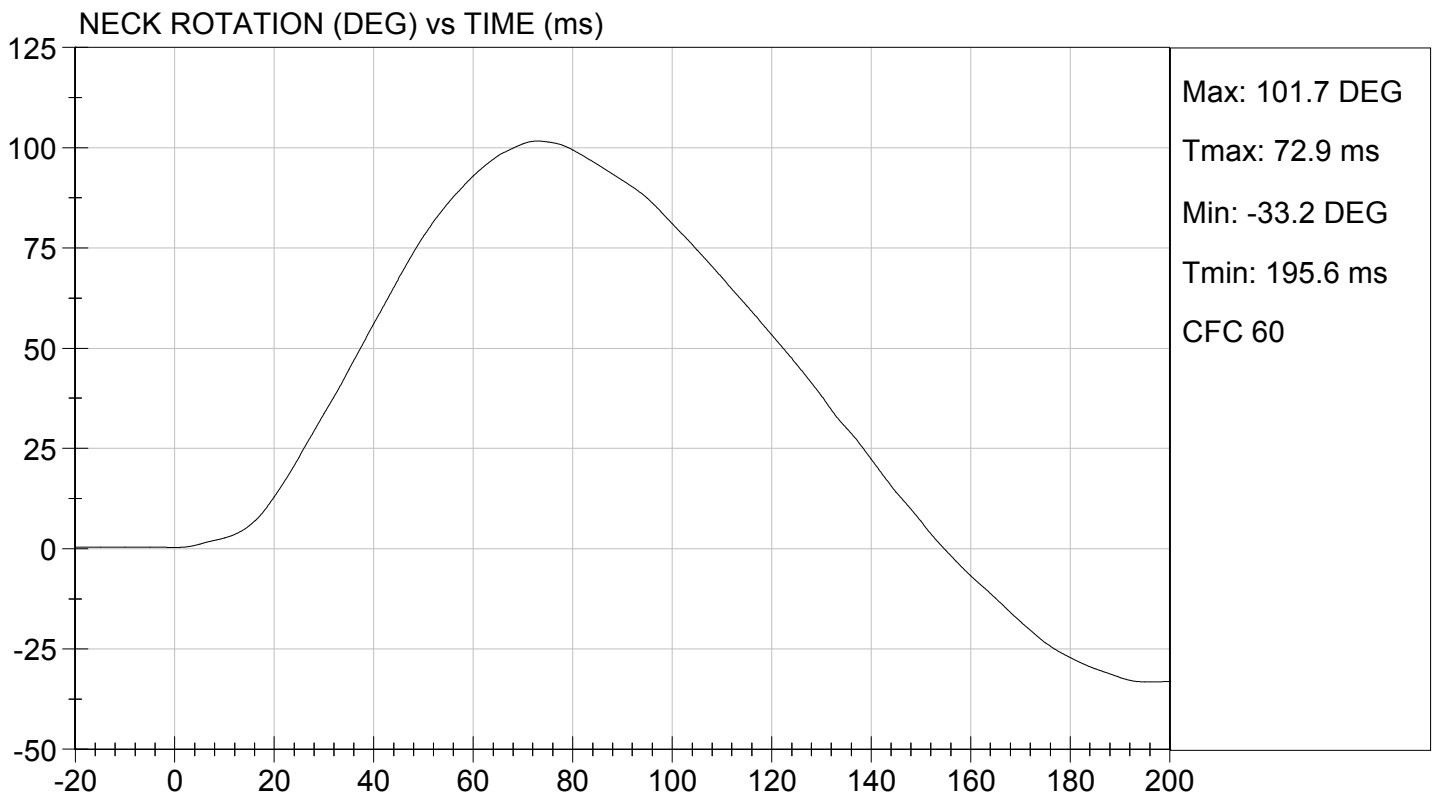
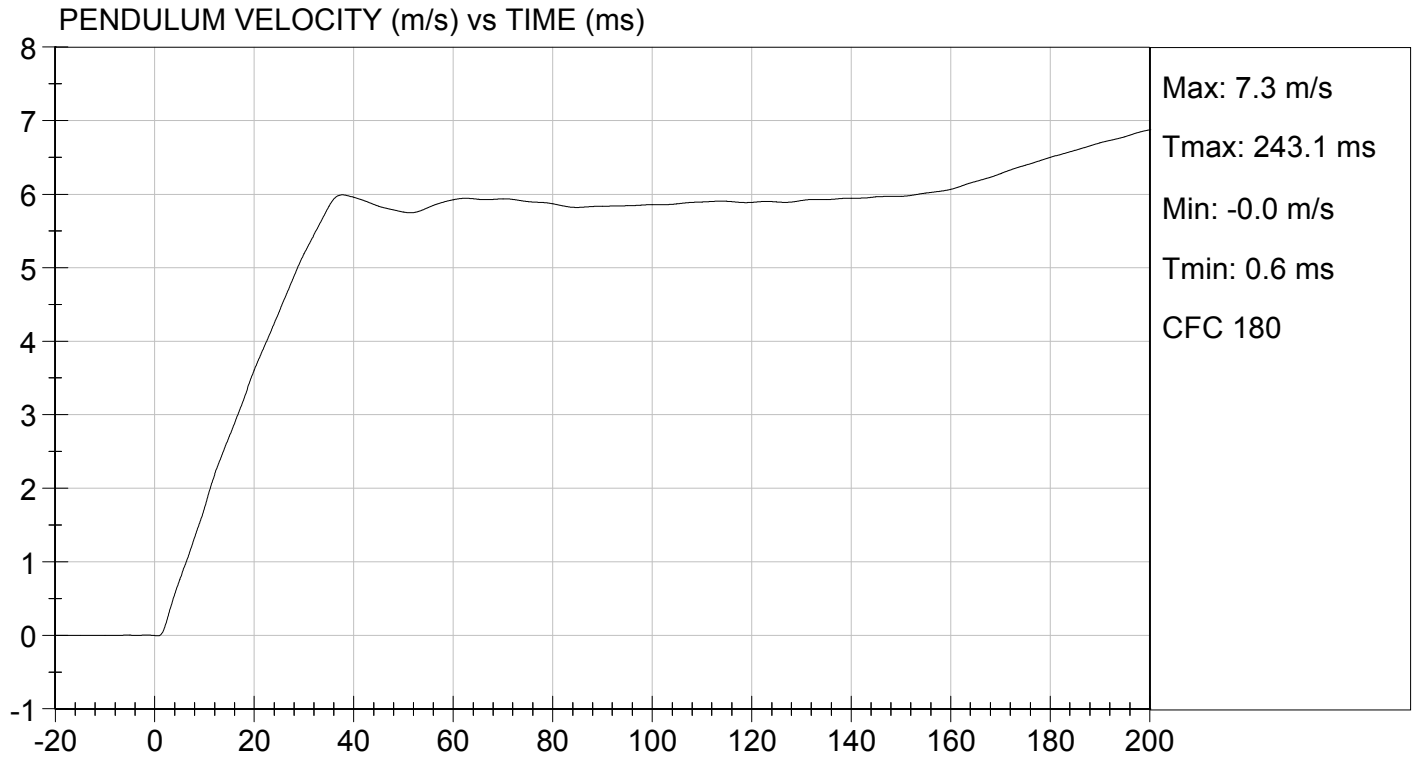
09/06/2012
Test Date


Approved By



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

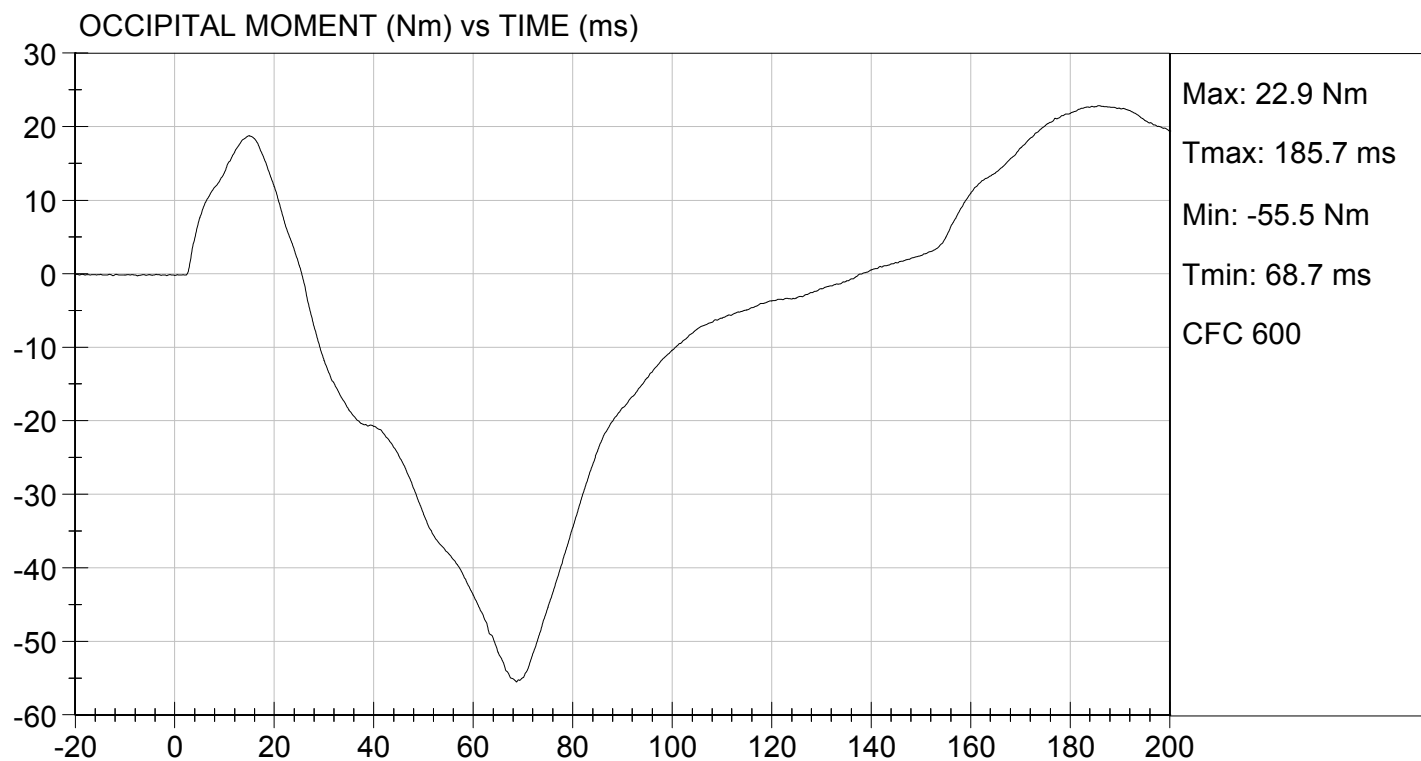
TEST DATE: 09/06/2012
TEST #: D123263





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

TEST DATE: 09/06/2012
TEST #: D123263

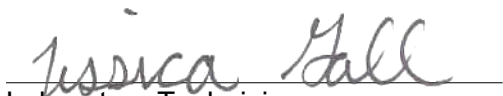


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

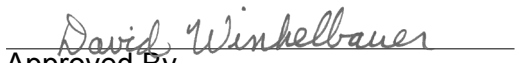
Test I.D: D123264

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Relative Humidity	%	10 to 70	42	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	56	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4085	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	3930	Pass
Overall Test Results				Pass


Laboratory Technician

09/06/2012

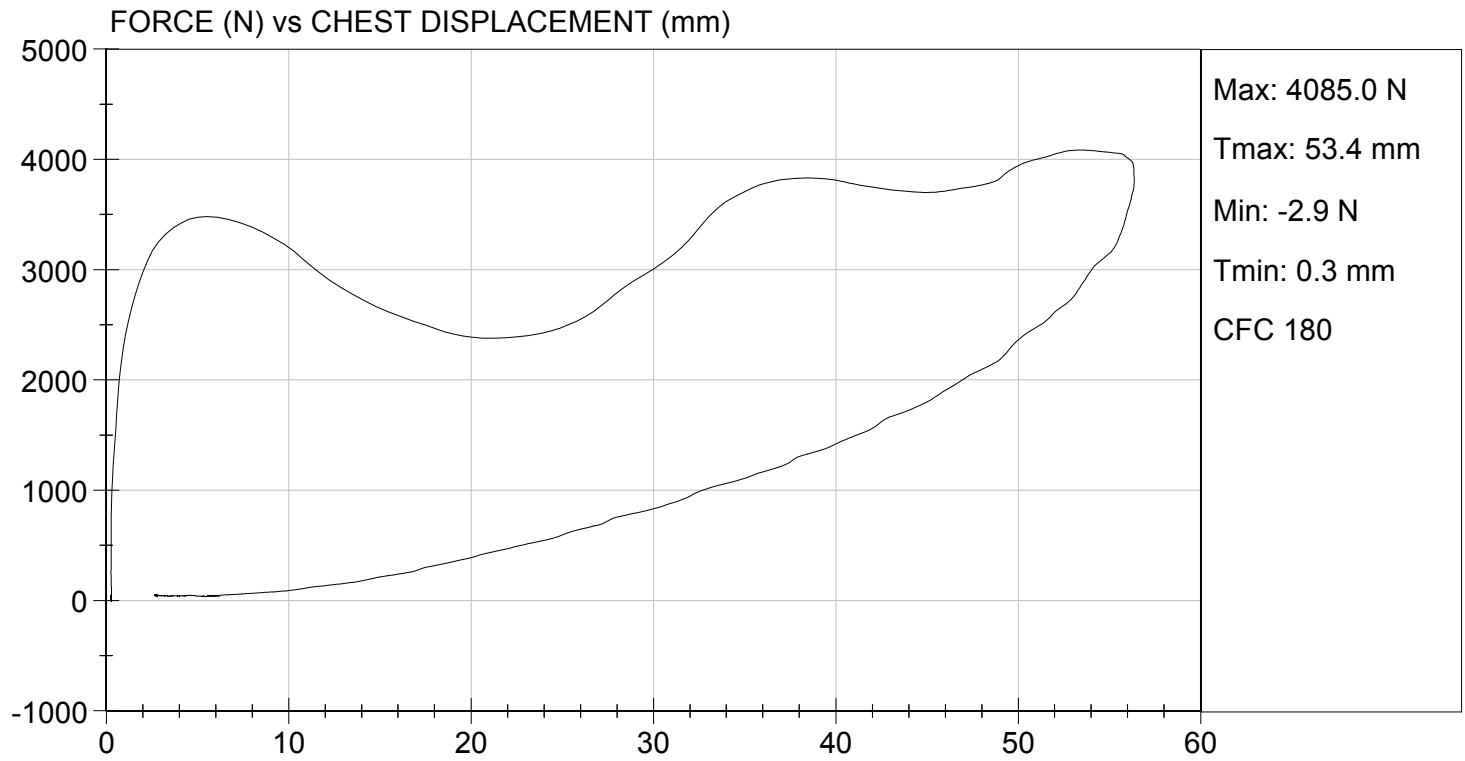
Test Date


Approved By



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

TEST DATE: 09/06/2012
TEST #: D123264



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D123265

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	42	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3544	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

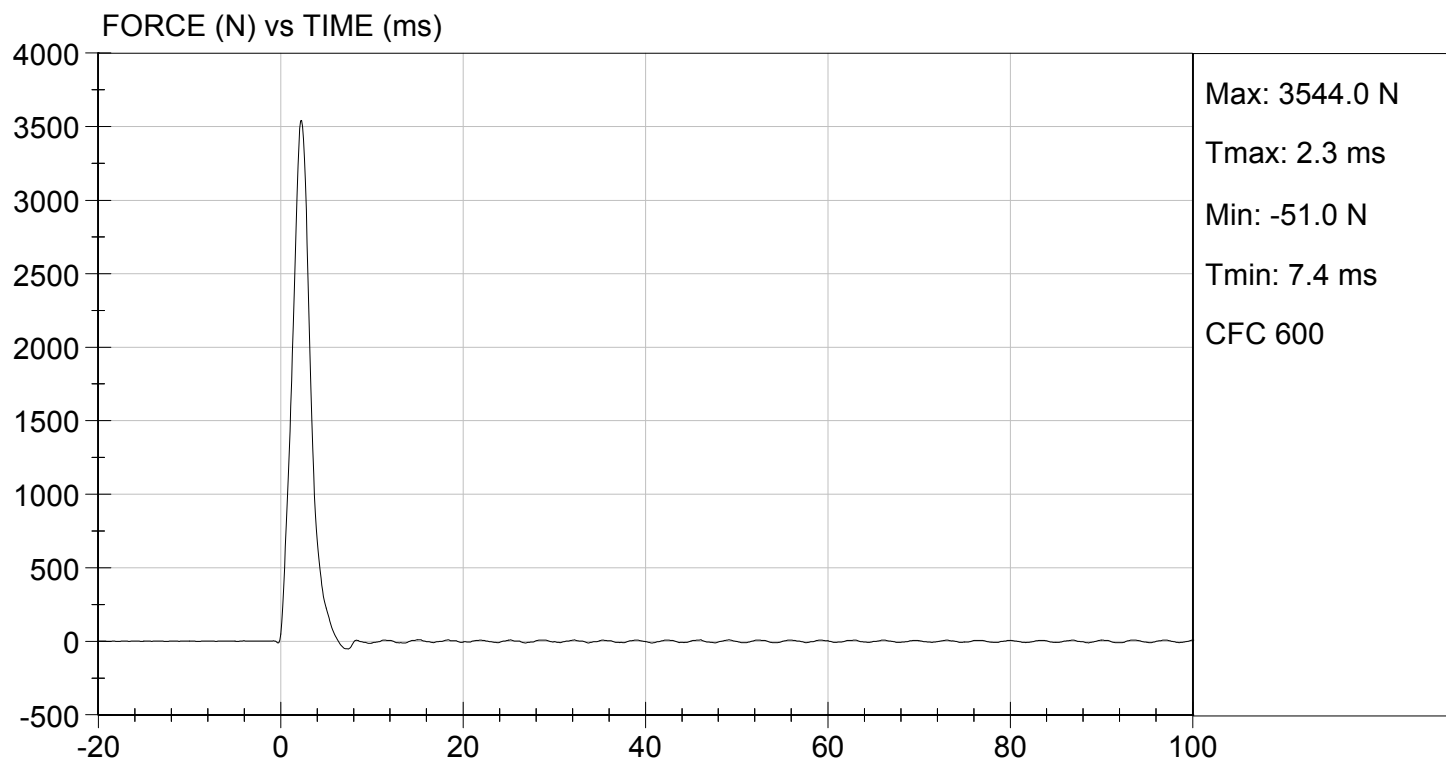
09/06/2012
Test Date

David Winkelbauer
Approved By



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

TEST DATE: 09/06/2012
TEST #: D123265



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D123266

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	42	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3487	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

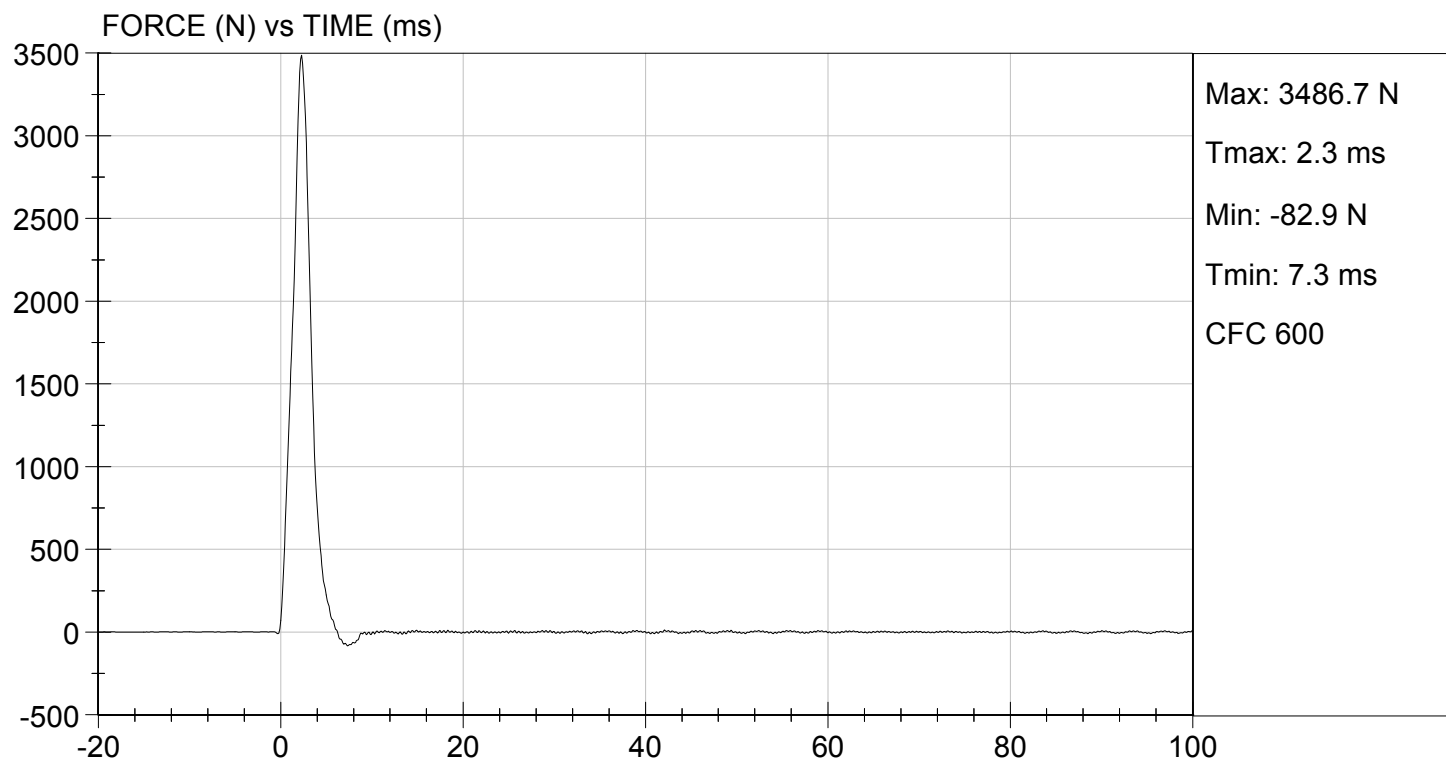
09/06/2012
Test Date

David Winkelbauer
Approved By



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

TEST DATE: 09/06/2012
TEST #: D123266



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D123267

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	42	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	2	Pass
Force at 45 deg	N	320 to 390	371	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

09/06/2012

Test Date

David Winkelbauer
Approved By

