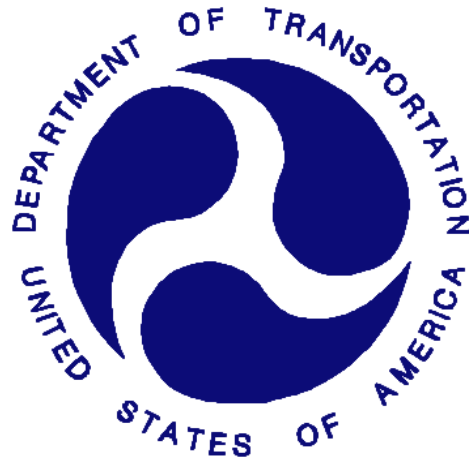


REPORT NUMBER: NCAP-MGA-2016-006

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

**HONDA OF AMERICA MFG., INC.
2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
NHTSA No.: O20165300**

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



Test Date: June 16, 2015

Final Report Date: August 13, 2015

FINAL REPORT

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

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: Nicholas Abels
Nicholas Abels, Project Engineer

Approved by: Ben Fischer
Ben Fischer, Project Engineer

Approval Date: August 13, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

1. Report No. NCAP-MGA-2016-006	2. Government Accession No.	3. Recipient's Catalog No.																																																					
4. Title and Subtitle Final Report of New Car Assessment Program Frontal Impact Testing of a 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan, NHTSA No.: O20165300		5. Report Date August 13, 2015																																																					
		6. Performing Organization Code MGA																																																					
7. Author(s) Ben Fischer, Project Engineer		8. Performing Organization Report No. NCAP-MGA-2016-006																																																					
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																																																					
		11. Contract or Grant No. DTNH22-12-D-00258																																																					
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590		13. Type of Report and Period Covered Final Test Report June 16, 2015 to August 13, 2015																																																					
		14. Sponsoring Agency Code NVS-111																																																					
15. Supplementary Notes																																																							
16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on June 16, 2015. The impact velocity of the vehicle was 56.2 km/h and the ambient temperature at the barrier face at the time of impact was 21.4°C. The target vehicle post-test maximum crush was 458 located to the right of the vehicle's centerline. The test vehicle's performance was as follows:																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>227</td> <td>700</td> <td>211</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td>25</td> <td>52</td> <td>13</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.26</td> <td>1</td> <td>0.40</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1144</td> <td>2620</td> <td>737</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>250</td> <td>2520</td> <td>177</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>254</td> <td>6805</td> <td>3415</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>1443</td> <td>6805</td> <td>2772</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	227	700	211	Maximum Chest	mm	63	25	52	13	Nij	N/A	1	0.26	1	0.40	Neck Tension	N	4170	1144	2620	737	Neck Compression	N	4000	250	2520	177	Left Femur Force	N	10008	254	6805	3415	Right Femur Force	N	10008	1443	6805	2772
Measurement Description	Units	Driver ATD				Passenger ATD																																																	
		Threshold	Result	Threshold	Result																																																		
Head Injury Criteria (HIC ₁₅)	N/A	700	227	700	211																																																		
Maximum Chest	mm	63	25	52	13																																																		
Nij	N/A	1	0.26	1	0.40																																																		
Neck Tension	N	4170	1144	2620	737																																																		
Neck Compression	N	4000	250	2520	177																																																		
Left Femur Force	N	10008	254	6805	3415																																																		
Right Femur Force	N	10008	1443	6805	2772																																																		
17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833																																																					
19. Security Classification of Report Unclassified	20. Security Classification of Page Unclassified	21. No. of Pages 166	22. Price																																																				

TABLE OF CONTENTS

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

<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat Adjustment, Fuel System, and Steering Wheel Data	8
3	Dummy Longitudinal Clearance Dimensions	10
4	Dummy Lateral Clearance Dimensions	11
5	Seat Belt Positioning Data	12
6	High-Speed Camera Locations and Data	13
7	Vehicle Accelerometer 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	25
16	FMVSS 301 Static Rollover Results	27
17	Dummy/Vehicle Temperature Stabilization Data	28

<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 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan at a velocity of 56.2 km/h. The test was performed at MGA Research Corporation on June 16, 2015. Pre-test 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.

The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. 634) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 634 channels of data were recorded on a data acquisition system. Appendix B contains the 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 458 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th)	227	0.26	1144	250	46	25	254	1443
Passenger (5 th)	211	0.40	737	177	43	13	3415	2772

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

TEST NOTES

Barrier C-04 FX has no valid data.
Barrier C-04 MY has no valid data.
Barrier C-04 MZ has no valid data.

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: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
Test Date: 6/16/2015

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20165300	Traction Control System (TCS)	Yes
Model Year	2016	Power Steering	Yes
Make	Acura	Power Window Auto-Reverse	Yes
Model	ILX AcuraWatch Plus	Driver Frontal Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	19UDE2F33GA006087	Driver Head/Torso Airbag	No
Body Color	Catalina Blue	Driver Torso Airbag	No
Odometer (km/mi)	154 / 96	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.4	Driver Pelvis Airbag	No
Type/No. Cylinders	4	Driver Knee Airbag	No
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	8	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	FWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	Yes	Front Pass. Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	N/A

Does owner's manual provide instructions to turn off automatic door locks?	Yes
--	-----

DATA FROM CERTIFICATION LABEL

Manufactured By	HONDA OF AMERICA MFG., INC.	GVWR (kg)	1815
Date of Manufacture	03/15	GAWR Front (kg)	1000
		GAWR Rear (kg)	815

VEHICLE SEATING AND WEIGHT CAPACITY DATA

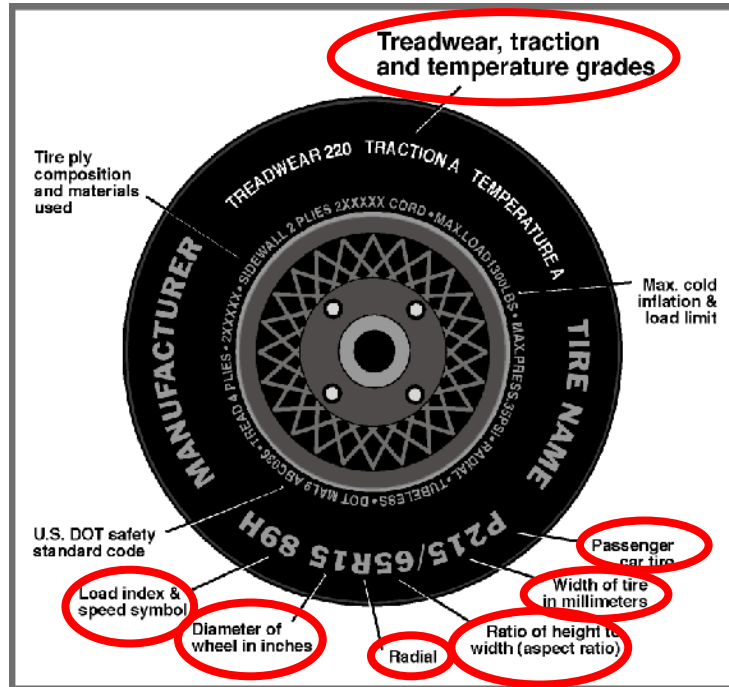
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				385
Cargo Weight (RCLW) (kg)				45

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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P215/45/R17	P215/45/R17
Tire Size on Vehicle	P215/45/R17	P215/45/R17
Tire Manufacturer	Michelin	Michelin
Tire Model	Pilot	Pilot
Treadwear	300	300
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	87V	87V
Tire Material	Rubber	Rubber
DOT Safety Code Left	B9N0 V7LX 1115	B9N0 V7LX 1115
DOT Safety Code Right	B9N0 V7LX 1115	B9N0 V7LX 1115

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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	451.5	258.5		481.0	332.0	
Right	kg	443.0	254.5		458.5	315.5	
Ratio	%	63.6	36.4		59.2	40.8	
Totals	kg	894.5	513.0	1407.5	939.5	647.5	1587.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1407.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Test Vehicle Target Weight (TVTW)	kg	1593.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	692	689	692	697	973
As Tested	mm	663	665	652	655	1090
Post Test	mm	744	742	648	656	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2670
Total Vehicle Length at Left Side	mm	4358
Total Vehicle Length at Centerline	mm	4620
Total Vehicle Length at Right Side	mm	4358
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	41
Amount of Stoddard Solvent in Fuel Tank	L	46.6

List of components removed to meet test weight: Left/right rear door trim panel, left/right rear headrest, left/right side mirror, left/right rear speaker, left/right taillight, left/right rear window glass, left/right rear window motor, left/right rear window track, rear trunk lid.

List of components removed for instrumentation, data box, and equipment installation: Cargo area cover, cargo divider, and tire repair kit.

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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4620
2	Total Width	1742
3	Bumper Top Height	535
4	Bumper Bottom Height	395
5	Longitudinal Member Top Height	508
6	Distance between Longitudinal Members	930
7	Longitudinal Member Width	100
8	Engine Top Height	859
9	Engine Bottom Height	180
10	Engine and Gearbox Width	850
11	Front Bumper-Engine Distance	654
12	Front Shock Absorber Fixing Height	858
13	Bonnet Leading Edge Height	828
14	Front Shock Absorber Fixing Width	1080
15	Front Bumper – Front Axle Distance	1486
16	Front Axle – A-Pillar Distance	472
17	A-Pillar – B-Pillar Distance	1130
18	B-Pillar – Rear Axle Distance	1068
19	B-Pillar – C-Pillar Distance	994
20	Roof Sill Bottom Height	1260
21	Roof Sill Top Height	1382
22	Floor Sill Bottom Height	200
23	Floor Sill Top Height	386

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

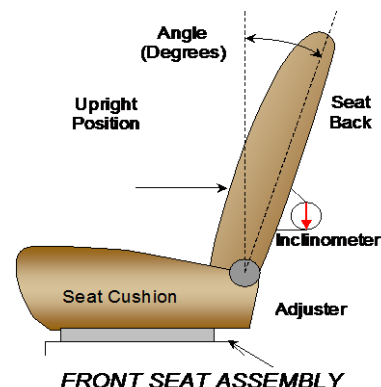
Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

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 August 2013.

	Degrees
Driver Seat Back Angle	13.6° on headrest post guide
Passenger Seat Back Angle	7.0° on headrest post guide



SEAT FORE/AFT POSITIONS

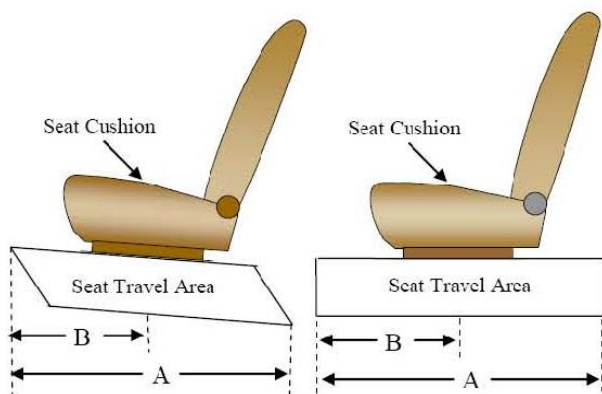
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated August 2013.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	292 mm	146 mm
Passenger Seat	240 mm / 25 detents (1 st as 1)	0 mm / 0 th detent (1 st as 0)

SEAT BELT UPPER ANCHORAGES

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

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



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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

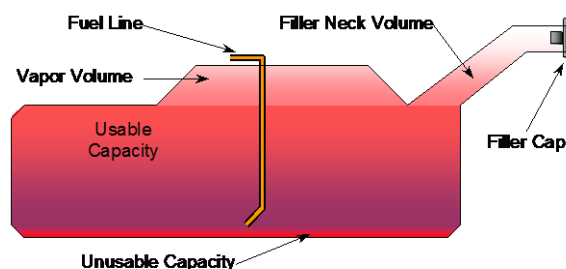
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	50.0
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	46.0 to 47.0
Actual Amount of Solvent used	46.6
1/3 of Usable Capacity	16.7

FUEL PUMP

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

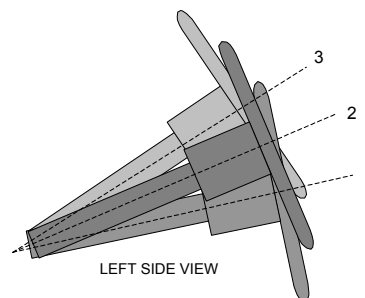
The electric fuel pump operates after the ignition key is turned from LOCK to ON position, and then the pressure is maintained. The fuel filler pipe is located on the left hand side of the vehicle.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

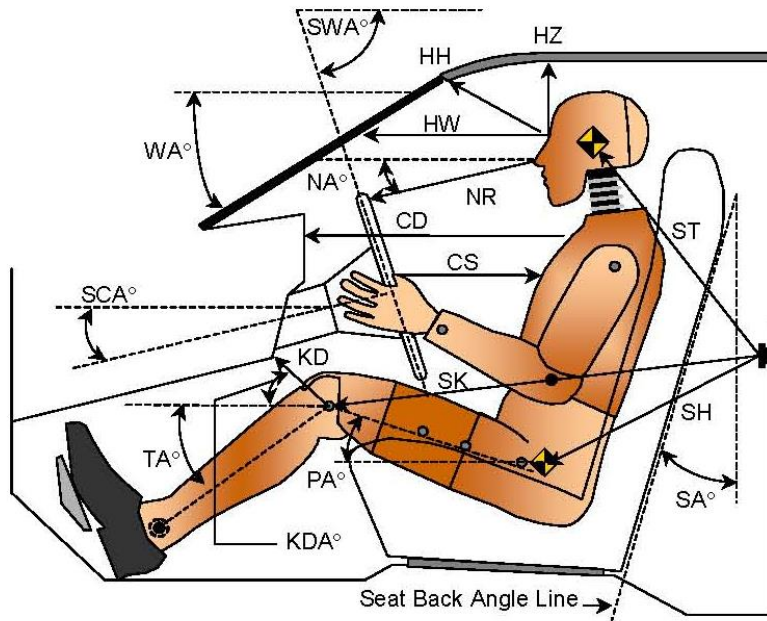
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	69.2	182
Geometric Center Position 2	66.6	204
Uppermost Position 3	64.0	226
Telescoping Steering Wheel Travel		40
Test Position	66.6	204

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
Test Date: 6/16/2015



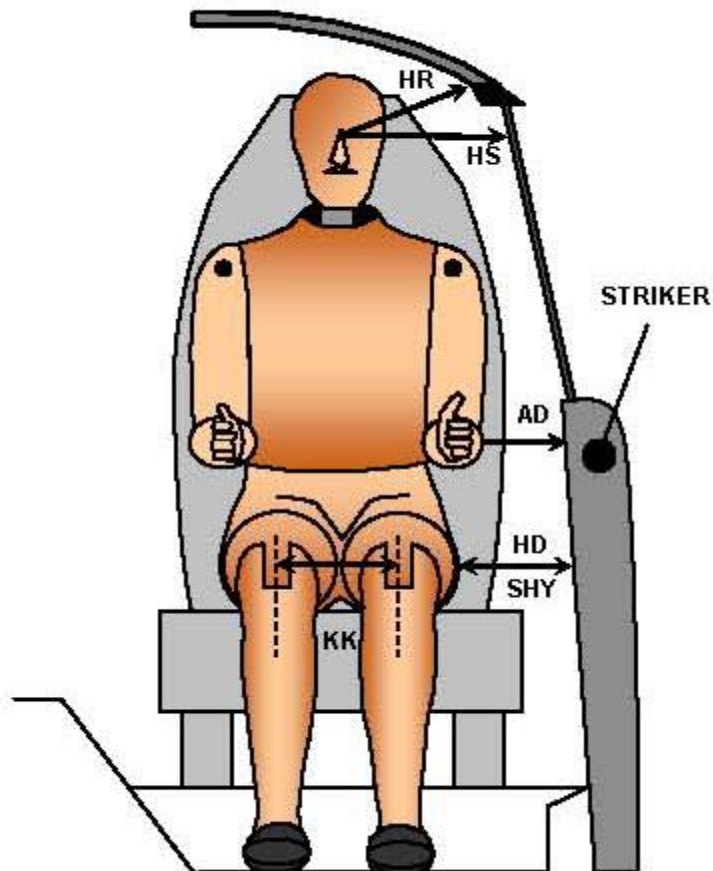
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		21.3		
SWA°	Steering Wheel Angle		66.6		
SCA°	Steering Column Angle		23.4		
SA°	Seat Back Angle (on headrest post)		13.6		7.0
HZ	Head to Roof (Z)	152	90.0	187	90.0
HH	Head to Header	337	21.7	281	44.0
HW	Head to Windshield	650	0.0	690	0.0
NR	Nose to Rim	400	7.6		
CD	Chest to Dash	520		371	
CS	Chest to Steering Hub	324	1.2		
RA	Rim to Abdomen	197	0.0		
KDL	Left Knee to Dash	139	29.8	75	34.1
KDR	Right Knee to Dash	126	30.9	77	36.9
PA°	Pelvic Angle		24.4		21.9
TA°	Tibia Angle		48.3		49.0
SK	Striker to Knee	582	94.3	684	96.6
ST	Striker to Head	411	14.2	443	28.9
SH	Striker to H-Point	311	134.0	387	115.0

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015



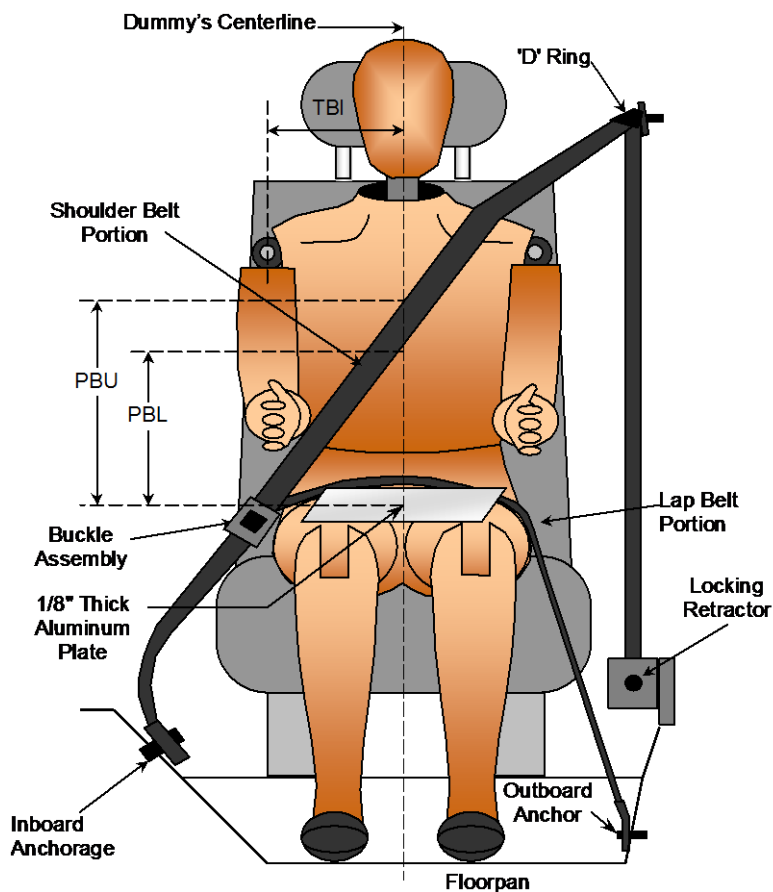
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	126	114
HD	H-Point to Door	147	182
HR	Head to Side Header	217	253
HS	Head to Side Window	329	371
KK	Knee to Knee	368	227
SHY	Striker to H-Point (Y Direction)	267	320
AA	Ankle to Ankle	361	180

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
Test Date: 6/16/2015



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	360	335
PBL - Top surface of reference to belt lower edge	mm	285	250

BELT LENGTH DATA

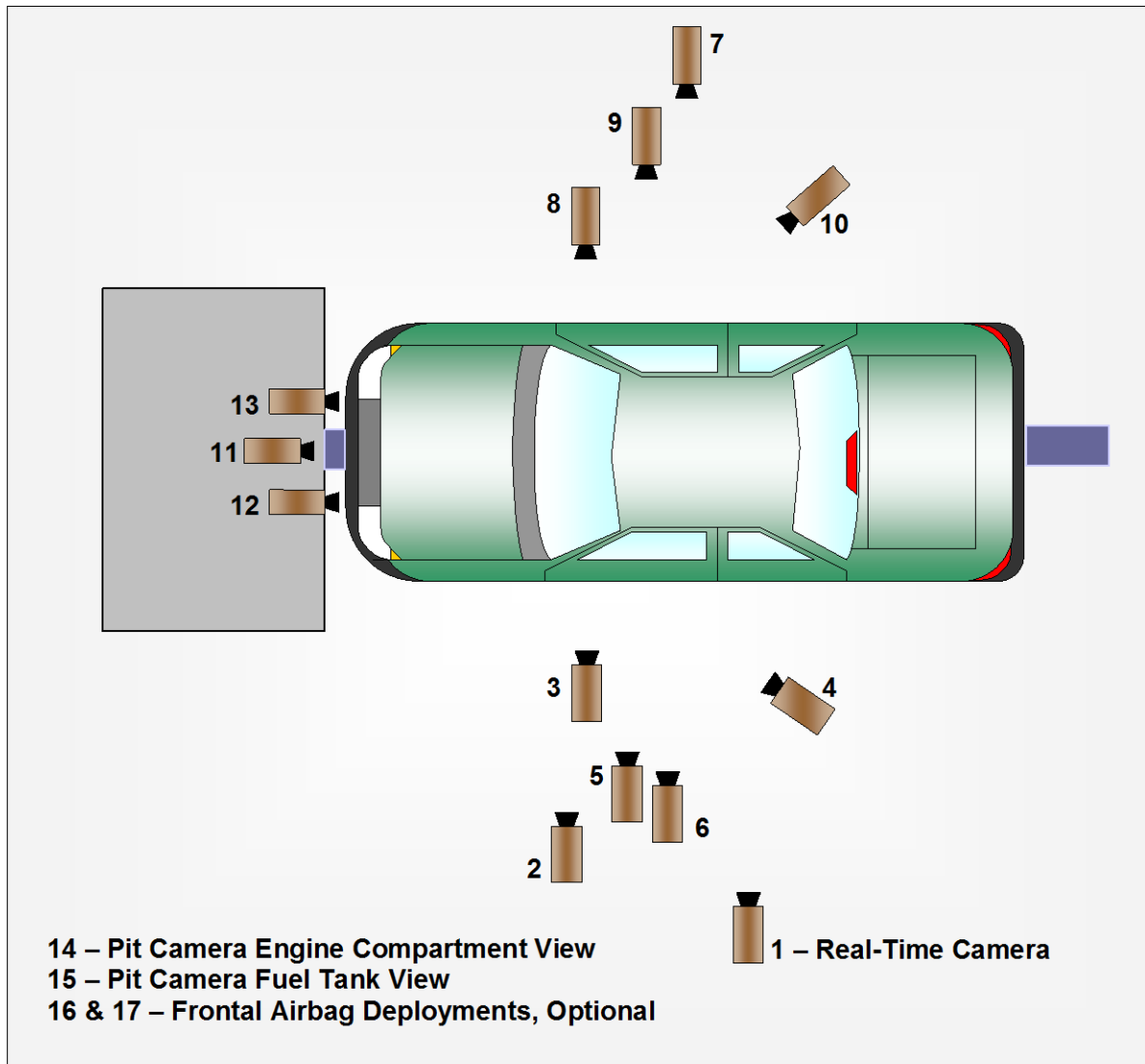
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	875	952
Lap Belt Length as measured on ATD	mm	580	490
Remainder of belt on reel	mm	995	1043
Total Belt Length for Continuous Webbing Systems	mm	3150	3185

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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
Test Date: 6/16/2015

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	-1420	-6360	-1830	35	1000
3	Left Front Half	-1130	-5070	-1130	24	1000
4	Left Angle	-5740	-5170	-1830	50	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	-2100	6500	-1220	20	1000
8	Passenger Close-Up	-1720	6720	-1810	35	1000
9	Right Front Half	-1180	5040	-1140	24	1000
10	Right Angle	-5740	5070	-1820	50	1000
11	Windshield	430	0	-2810	20	1000
12	Driver Windshield	30	-450	-2030	8.5	1000
13	Passenger Windshield	30	450	-2030	8.5	1000
14	Pit Front	-1150	0	3150	24	1000
15	Pit Rear	-2860	0	3150	24	1000
16	Onboard Driver Side				12	1000
17	Onboard Passenger Side				12	1000
18	Real-Time Pan View					30

***COORDINATES:**

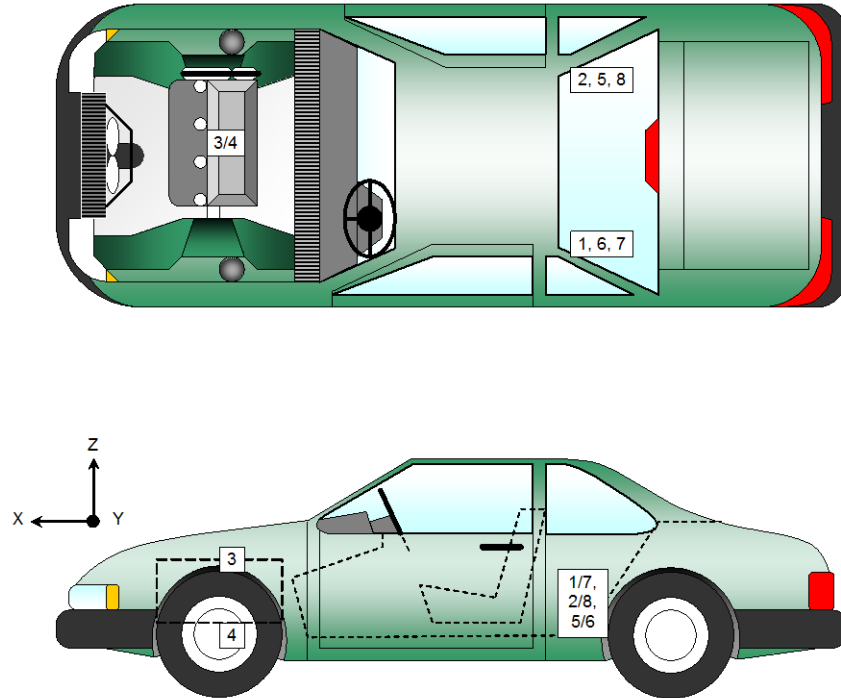
+X = forward of impact plane
 +Y = right of monorail centerline
 +Z = below ground level

Cameras 5 & 6 were not used for this test.

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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1800	-350	-216
2	Right Rear Crossmember Accelerometer – X Direction	1802	350	-225
3	Engine Top X	3762	50	-810
4	Engine Bottom X	3770	130	-180
5	Left Rear Crossmember Accelerometer – Z Direction	1800	-320	-216
6	Right Rear Crossmember Accelerometer – Z Direction	1802	320	-225
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1800	-320	-216
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1802	320	-225

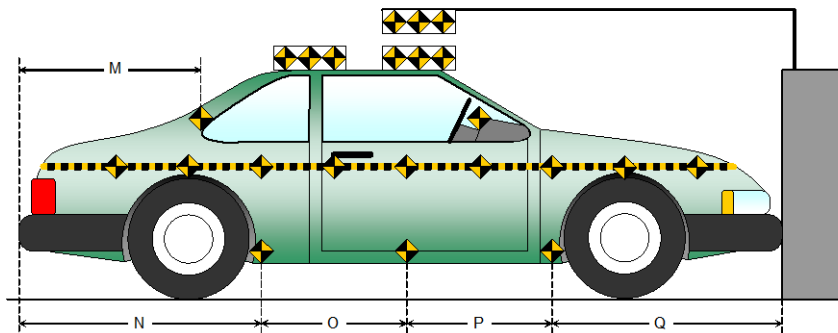
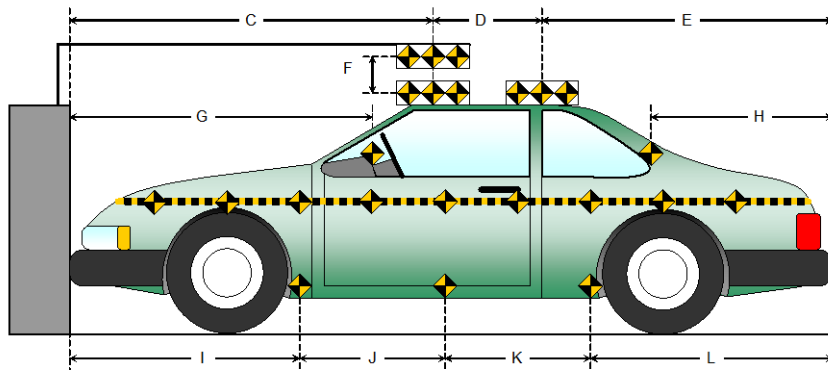
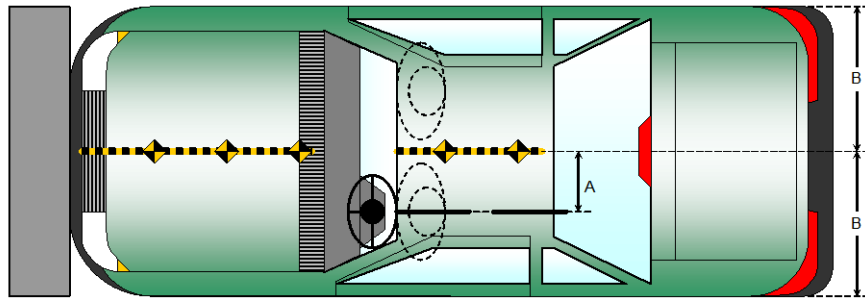
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

Item	Value (mm)
A	360
B	871
C	2387
D	615
E	1356
F	120
G	
H	1010
I	1850
J	917
K	917
L	936
M	1010
N	936
O	917
P	917
Q	1850



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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

Advanced Research Load Cell Barrier

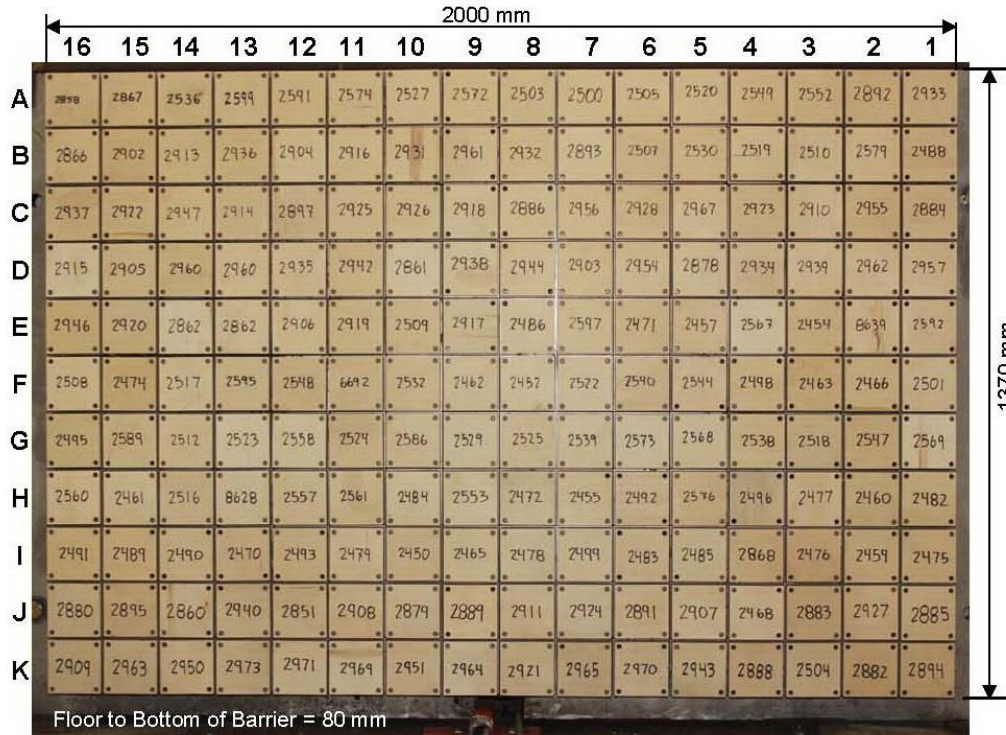


Photo for Reference Only

								Centerline															
A-16	A-15	A-14	A-13	A-12	A-11	A-10	A-09	A-08	A-07	A-06	A-05	A-04	A-03	A-02	A-01								
B-16	B-15	B-14	B-13	B-12	B-11	B-10	B-09	B-08	B-07	B-06	B-05	B-04	B-03	B-02	B-01								
C-16	C-15	C-14	C-13	C-12	C-11	C-10	C-09	C-08	C-07	C-06	C-05	C-04	C-03	C-02	C-01								
D-16	D-15	D-14	D-13	D-12	D-11	D-10	D-09	D-08	D-07	D-06	D-05	D-04	D-03	D-02	D-01								
E-16	E-15	E-14	E-13	E-12	E-11	E-10	E-09	E-08	E-07	E-06	E-05	E-04	E-03	E-02	E-01								
F-16	F-15	F-14	F-13	F-12	F-11	F-10	F-09	F-08	F-07	F-06	F-05	F-04	F-03	F-02	F-01								
G-16	G-15	G-14	G-13	G-12	G-11	G-10	G-09	G-08	G-07	G-06	G-05	G-04	G-03	G-02	G-01								
H-16	H-15	H-14	H-13	H-12	H-11	H-10	H-09	H-08	H-07	H-06	H-05	H-04	H-03	H-02	H-01								
I-16	I-15	I-14	I-13	I-12	I-11	I-10	I-09	I-08	I-07	I-06	I-05	I-04	I-03	I-02	I-01								
J-16	J-15	J-14	J-13	J-12	J-11	J-10	J-09	J-08	J-07	J-06	J-05	J-04	J-03	J-02	J-01								
K-16	K-15	K-14	K-13	K-12	K-11	K-10	K-09	K-08	K-07	K-06	K-05	K-04	K-03	K-02	K-01								

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: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
Test Date: 6/16/2015

INSTRUMENTATION

Driver Dummy Data Channels	49
Passenger Dummy Data Channels	49
Vehicle Structure Accelerometers	8
Barrier Channels	528
Total	634

CAMERA COVERAGE

High-Speed Vehicle Onboard	2
High-Speed Offboard	12
Real-Time	2
Total	16

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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
Test Date: 6/16/2015

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 351	HIII 5% / 634
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were 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	785
Center	mm	686
Right Side	mm	735
Average	mm	735

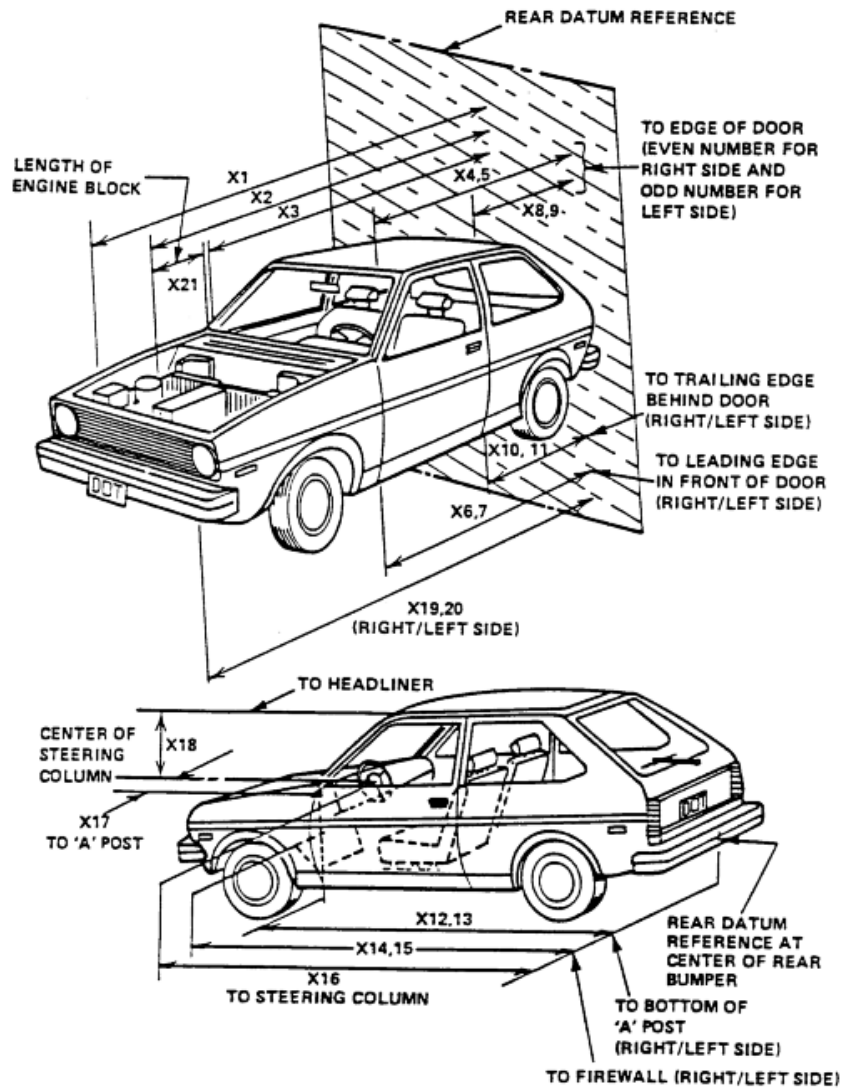
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	No	Yes	No
Torso/Pelvis Side Airbag	Yes	No	Yes	No
Knee Airbag	No		No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	

DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4620	4227	393
2	RSOV to Front of Engine	mm	3928	3669	259
3	RSOV to Firewall	mm	3547	3479	68
4	RSOV to Upper Leading Edge of Right Door	mm	3082	3072	10
5	RSOV to Upper Leading Edge of Left Door	mm	3082	3069	13
6	RSOV to Lower Leading Edge of Right Door	mm	3071	3069	2
7	RSOV to Lower Leading Edge of Left Door	mm	3071	3067	4
8	RSOV to Upper Trailing Edge of Right Door	mm	1966	1945	21
9	RSOV to Upper Trailing Edge of Left Door	mm	1966	1949	17
10	RSOV to Lower Trailing Edge of Right Door	mm	1986	1986	0
11	RSOV to Lower Trailing Edge of Left Door	mm	1986	1984	2
12	RSOV to Bottom of "A" Post of Right Side	mm	3096	3092	4
13	RSOV to Bottom of "A" Post of Left Side	mm	3096	3095	1
14	RSOV to Firewall, Right Side	mm	3222	3187	35
15	RSOV to Firewall, Left Side	mm	3222	3192	30
16	RSOV to Steering Column	mm	2622	2638	-16
17	Center of Steering Column to "A" Post	mm	400	380	20
18	Center of Steering Column to Headliner	mm	390	382	8
19	RSOV to Right Side of Front Bumper	mm	4358	4053	305
20	RSOV to Left Side of Front Bumper	mm	4358	4106	252
21	Length of Engine Block	mm	310	310	0
RD	RSOV to Right Side of Dash Panel	mm	2858	2839	19
CD	RSOV to Center of Dash Panel	mm	2897	2882	15
LD	RSOV to Left Side of Dash Panel	mm	2842	2824	18

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
Test Date: 6/16/2015

VEHICLE INFORMATION

VIN: 19UDE2F33GA006087 Wheelbase (mm): 2670
Vehicle Size Category: Passenger Car Test Weight (kg): 1587.0

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15

Cal. Procedure/Interval: MGA procedure / 6 month

Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.2

Velocity Change (km/h): 65.8

Time of Separation (msec): 111.1

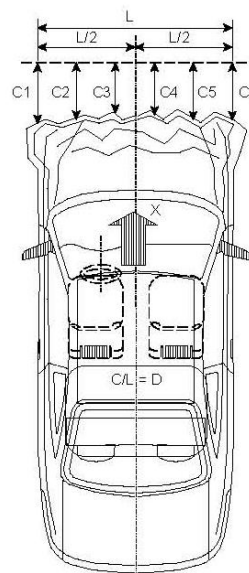
CRUSH PROFILE

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1420

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4358	4106	252
C2	Crush zone 2 at left side	mm	4454	4132	322
C3	Crush zone 3 at left side	mm	4532	4148	384
C4	Crush zone 4 at right side	mm	4532	4074	458
C5	Crush zone 5 at right side	mm	4454	4018	436
C6	Crush zone 6 at right side	mm	4358	4053	305
L	C1 TO C6	mm	1420	1393	27

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

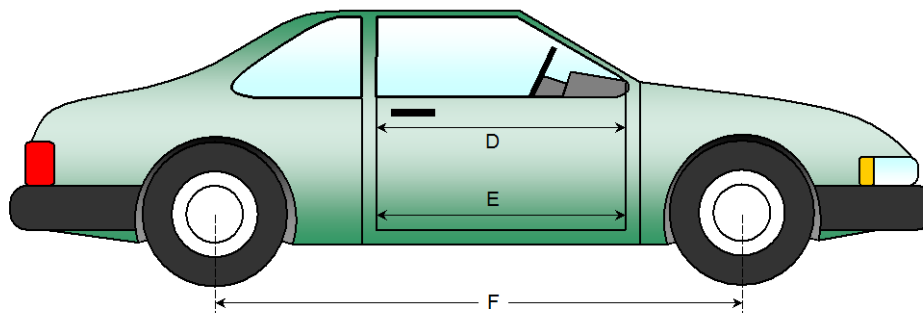
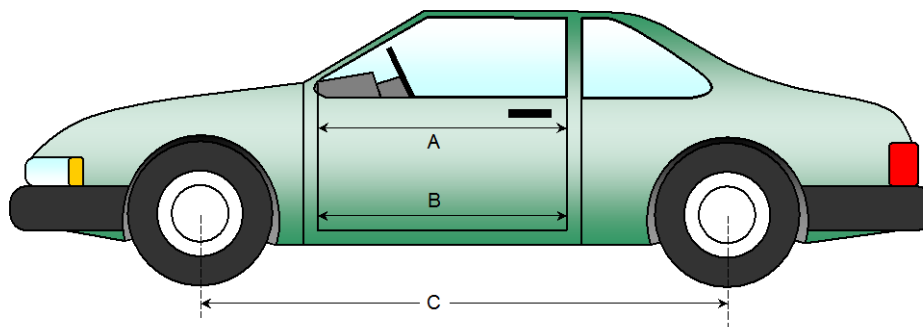
NHTSA No.: O20165300
Test Date: 6/16/2015

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1020	1020	0
B	Left Side Lower	mm	908	908	0
D	Right Side Upper	mm	1020	1020	0
E	Right Side Lower	mm	908	908	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2670	2570	100
F	Right Side Wheelbase	mm	2670	2543	127



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

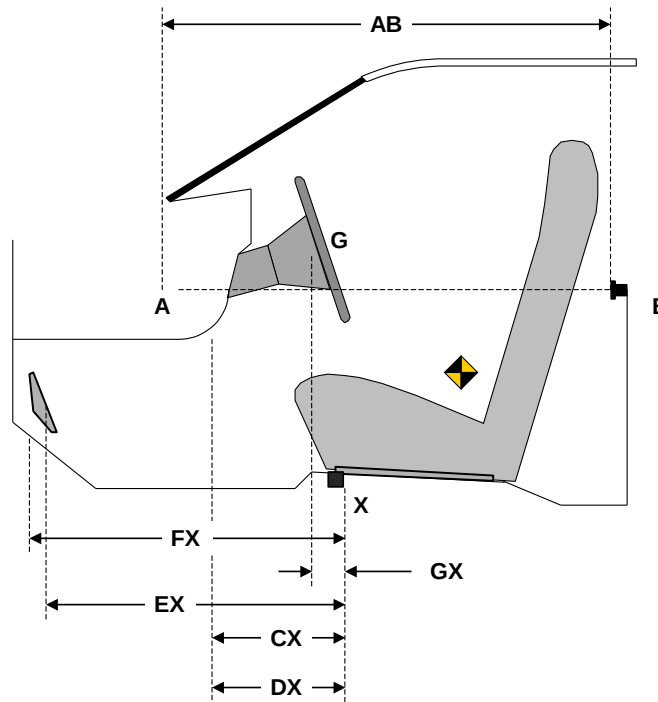
Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	742	742	0
CX	Left Knee Bolster to X	mm	258	253	5
DX	Right Knee Bolster to X	mm	252	241	11
EX	Brake Pedal to X	mm	550	546	4
FX	Foot Rest to X	mm	580	552	28
GX	Center of Steering Column Wheel Hub to X	mm	96	127	-31

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: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

Windshield Mounting Details:

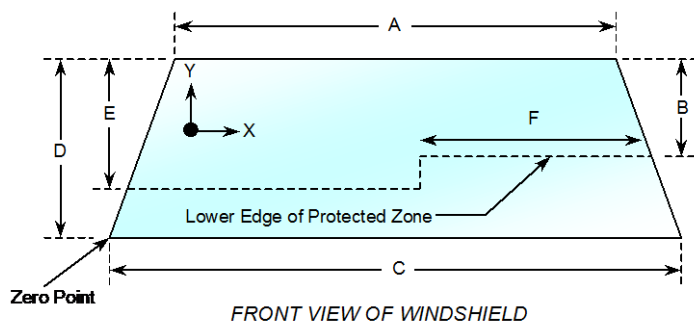
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.4° C.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2198	2198	100
Right Side	2198	2198	100
Total	4396	4396	100



Item	Units	Value
A	mm	1258
B	mm	486
C	mm	1570
D	mm	784
E	mm	506
F	mm	518

AREA OF PROTECTED ZONE FAILURES - NONE

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

X	Y

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

X	Y

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

Test Vehicle:	<u>2016 Acura ILX AcuraWatch Plus 4-Dr Sedan</u>	NHTSA No.:	<u>O20165300</u>
Test Program:	<u>NCAP Frontal Barrier Impact Test</u>	Test Date:	<u>6/16/2015</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.4°C Test Time: 10:43 a.m.

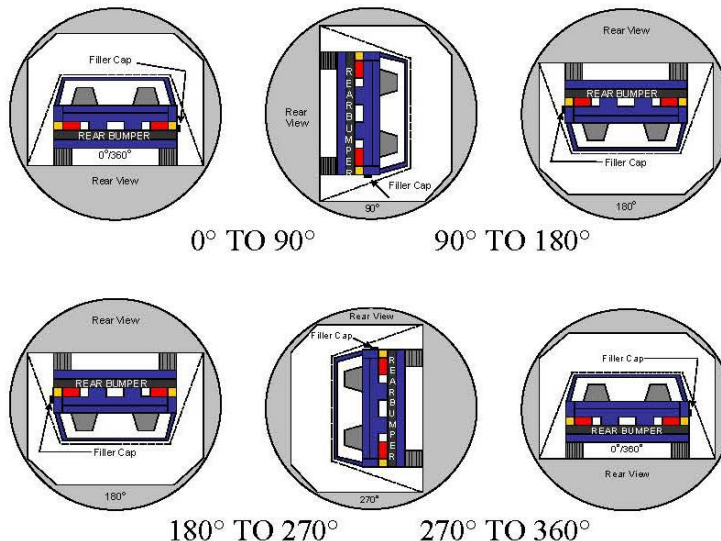
- | | |
|--|--------------|
| A. From impact until vehicle motion ceases:
(Maximum allowable = 1 oz.) | <u>0</u> oz. |
| B. For the 5 minute period after motion ceases:
(Maximum allowable = 5 oz.) | <u>0</u> oz. |
| C. For the following 25 minutes:
(Maximum allowable = 1 oz./minute) | <u>0</u> oz. |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

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

Test Vehicle: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015

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°	115	300	415
90° to 180°	112	300	412
180° to 270°	106	300	406
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

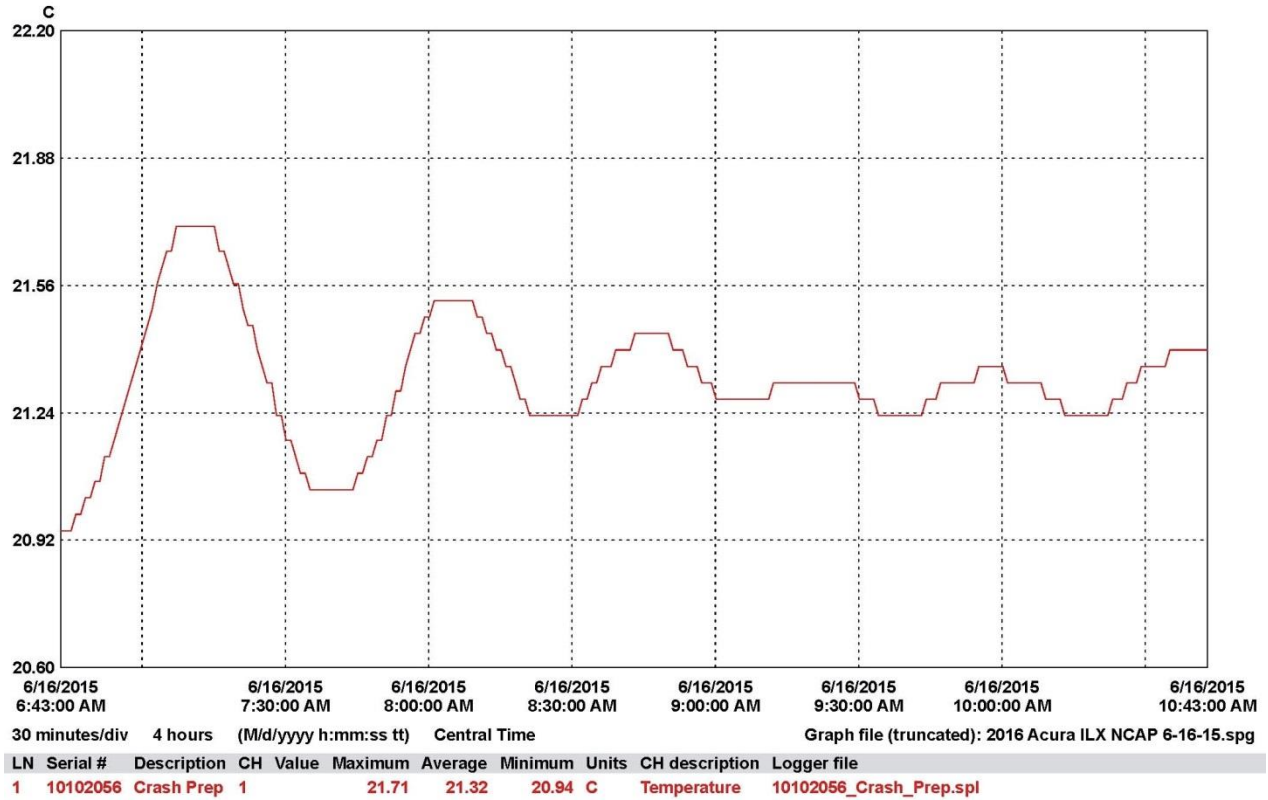
SOLVENT SPILLAGE LOCATION TABLE

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: 2016 Acura ILX AcuraWatch Plus 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20165300
 Test Date: 6/16/2015



**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS

		<u>Page No.</u>
Photo No. 1.	Load Cell Location	A-1
Photo No. 2.	Load Cell Wall	A-1
Photo No. 3.	Manufacturer's Label	A-2
Photo No. 4.	Tire Placard	A-2
Photo No. 5.	2016 Acura ILX Frontal As Delivered	A-3
Photo No. 6.	Left Rear 3-4 View, As Received	A-3
Photo No. 7.	Pre-Test Front View of Test Vehicle	A-4
Photo No. 8.	Post-Test Front View of Test Vehicle	A-4
Photo No. 9.	Pre-Test Left View of Test Vehicle	A-5
Photo No. 10.	Post-Test Left View of Test Vehicle	A-5
Photo No. 11.	Pre-Test Right View of Test Vehicle	A-6
Photo No. 12.	Post-Test Right View of Test Vehicle	A-6
Photo No. 13.	Pre-Test Right Front 3-4 View	A-7
Photo No. 14.	Post-Test Right Front 3-4 View	A-7
Photo No. 15.	Pre-Test Left Rear 3-4 View	A-8
Photo No. 16.	Post-Test Left Rear 3-4 View	A-8
Photo No. 17.	Pre-Test Windshield View	A-9
Photo No. 18.	Post-Test Windshield View	A-9
Photo No. 19.	Pre-Test Engine Compartment View	A-10
Photo No. 20.	Post-Test Engine Compartment View	A-10
Photo No. 21.	Pre-Test Fuel Filler Cap View	A-11
Photo No. 22.	Post-Test Fuel Filler Cap View	A-11
Photo No. 23.	Pre-Test Front Underbody View	A-12
Photo No. 24.	Post-Test Front Underbody View	A-12
Photo No. 25.	Pre-Test Rear Underbody View	A-13
Photo No. 26.	Post-Test Rear Underbody View	A-13
Photo No. 27.	Pre-Test Dummy Cable Routing	A-14
Photo No. 28.	Post-Test Dummy Cable Routing	A-14
Photo No. 29.	Pre-Test Driver Dummy Front View	A-15
Photo No. 30.	Post-Test Driver Dummy Front View	A-15

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

		<u>Page No.</u>
Photo No. 60.	Pre-Test Passenger Dummy Feet	A-31
Photo No. 61.	Post-Test Passenger Dummy Feet	A-31
Photo No. 62.	Pre-Test Passenger's Side Knee Bolster (without dummy)	A-32
Photo No. 63.	Post-Test Passenger's Side Knee Bolster (without dummy)	A-32
Photo No. 64.	Pre-Test Passenger's Side Floorpan	A-33
Photo No. 65.	Post-Test Passenger's Side Floorpan	A-33
Photo No. 66.	Post-Test Passenger Dummy Face	A-34
Photo No. 67.	Post-Test Passenger Dummy Contact with Airbag	A-34
Photo No. 68.	Post-Test Passenger Dummy Contact with Headrest	A-35
Photo No. 68a.	Post-Test Passenger Dummy Contact with Glovebox	A-35
Photo No. 69.	Ballast Installed in Vehicle	A-36
Photo No. 70.	Post-Test Stoddard Solvent Spillage Location View	A-36
Photo No. 71.	Post-Test Speed Trap Read-Out	A-37
Photo No. 72.	Vehicle at 0 Degree on Static Rollover Device	A-37
Photo No. 73.	Vehicle at 90 Degrees on Static Rollover Device	A-38
Photo No. 74.	Vehicle at 180 Degrees on Static Rollover Device	A-38
Photo No. 75.	Vehicle at 270 Degrees on Static Rollover Device	A-39
Photo No. 76.	Vehicle at 360 Degrees on Static Rollover Device	A-39
Photo No. 77.	2016 Acura ILX Frontal Impact Event	A-40
Photo No. 78.	Monroney Label Photograph	A-40



Photo No. 001 - Load Cell Location

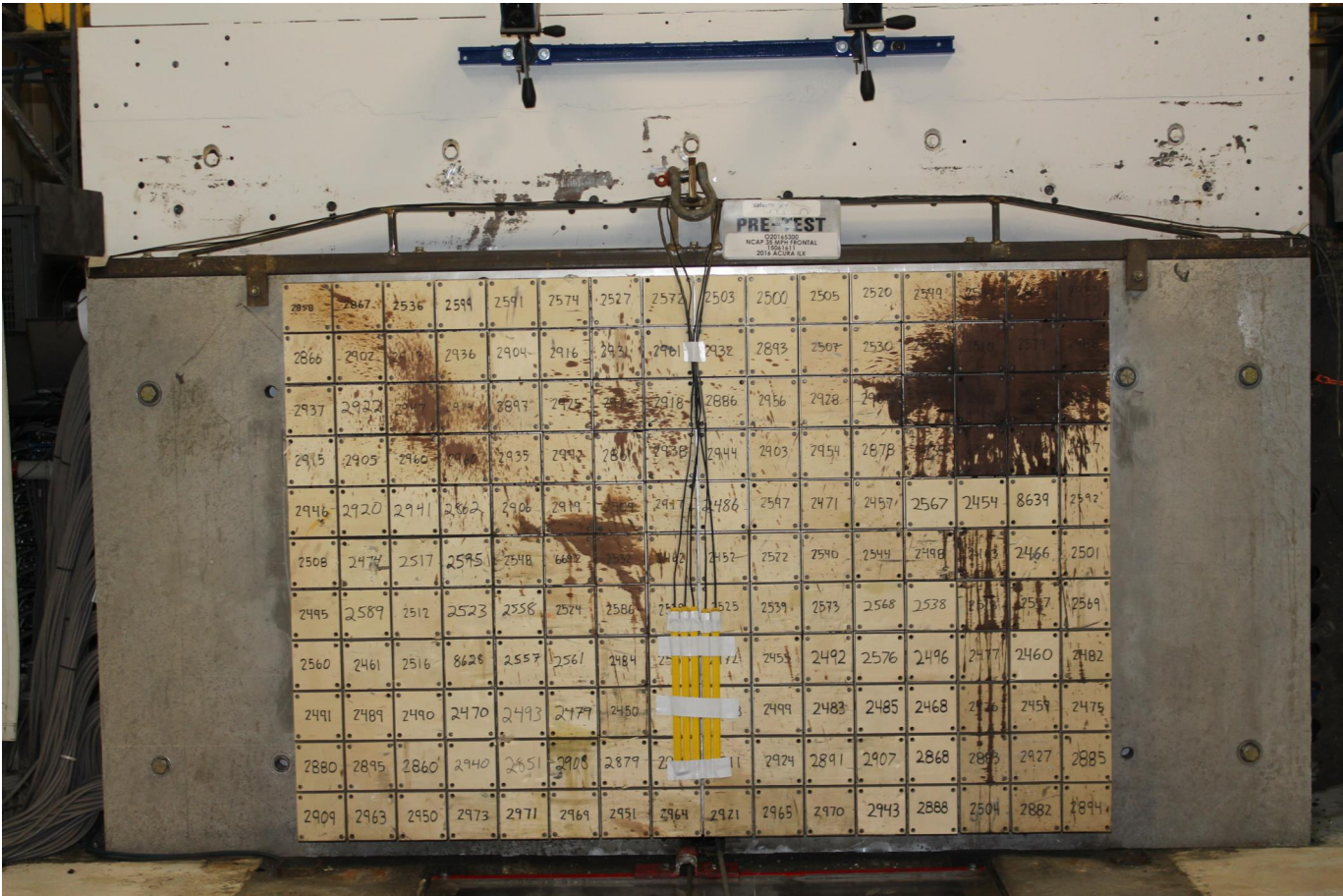


Photo No. 002 - Load Cell Wall



Photo No. 003 - Manufacturer's Label



Photo No. 004 - Tire Placard



Photo No. 005 - 2016 Acura ILX Frontal As Delivered



Photo No. 006 - Left Rear 3-4 View, As Received



Photo No. 007 - Pre-Test Front View of Test Vehicle



Photo No. 008 - Post-Test Front View of Test Vehicle



Photo No. 009 - Pre-Test Left View of Test Vehicle



Photo No. 010 - Post-Test Left View of Test Vehicle



Photo No. 011 - Pre-Test Right View of Test Vehicle



Photo No. 012 - Post-Test Right View of Test Vehicle



Photo No. 013 - Pre-Test Right Front 3-4 View



Photo No. 014 - Post-Test Right Front 3-4 View



Photo No. 015 - Pre-Test Left Rear 3-4 View



Photo No. 016 - Post-Test Left Rear 3-4 View



Photo No. 017 - Pre-Test Windshield View



Photo No. 018 - Post-Test Windshield View



Photo No. 019 - Pre-Test Engine Compartment View



Photo No. 020 - Post-Test Engine Compartment View



Photo No. 021 - Pre-Test Fuel Filler Cap View



Photo No. 022 - Post-Test Fuel Filler Cap View

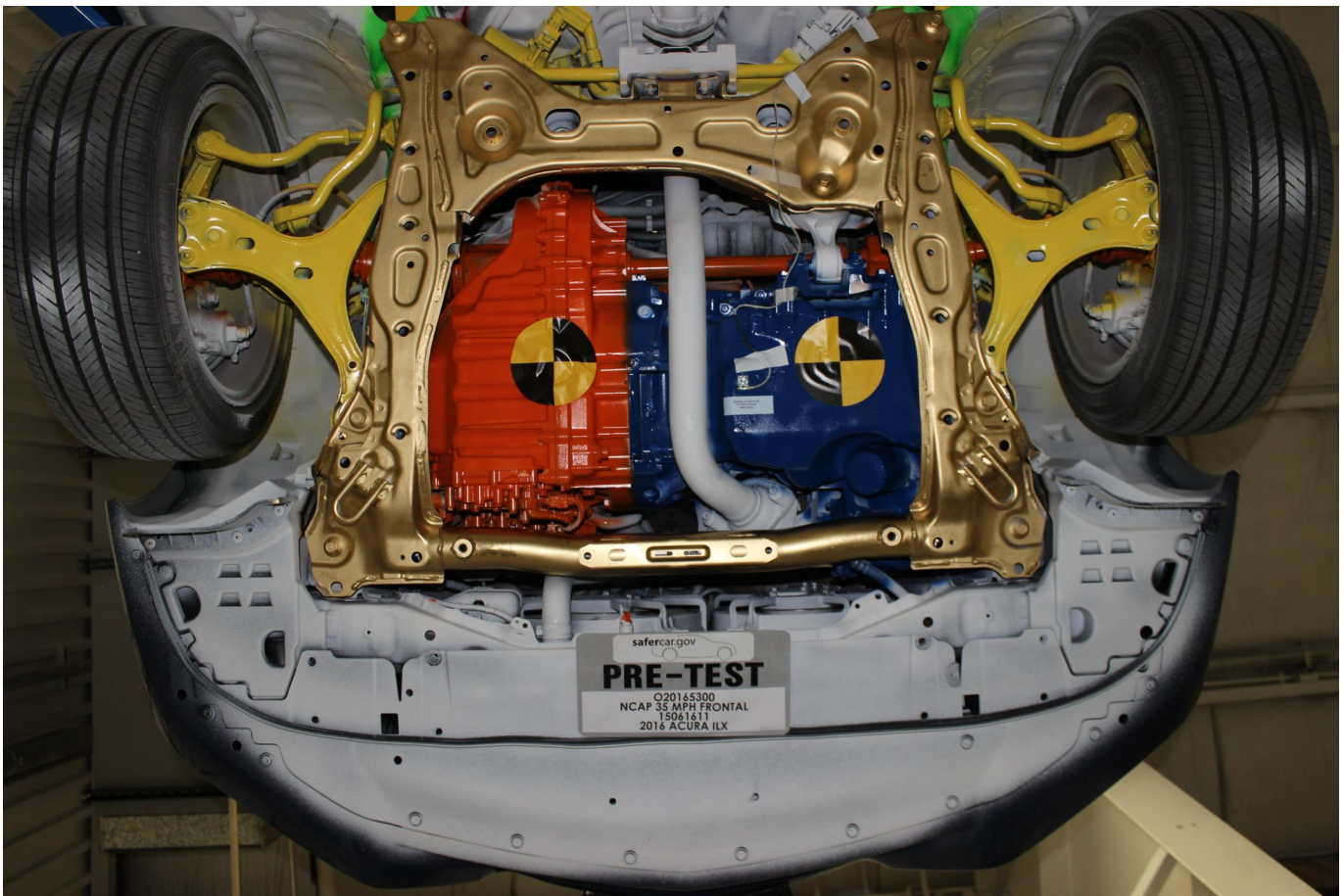


Photo No. 023 - Pre-Test Front Underbody View

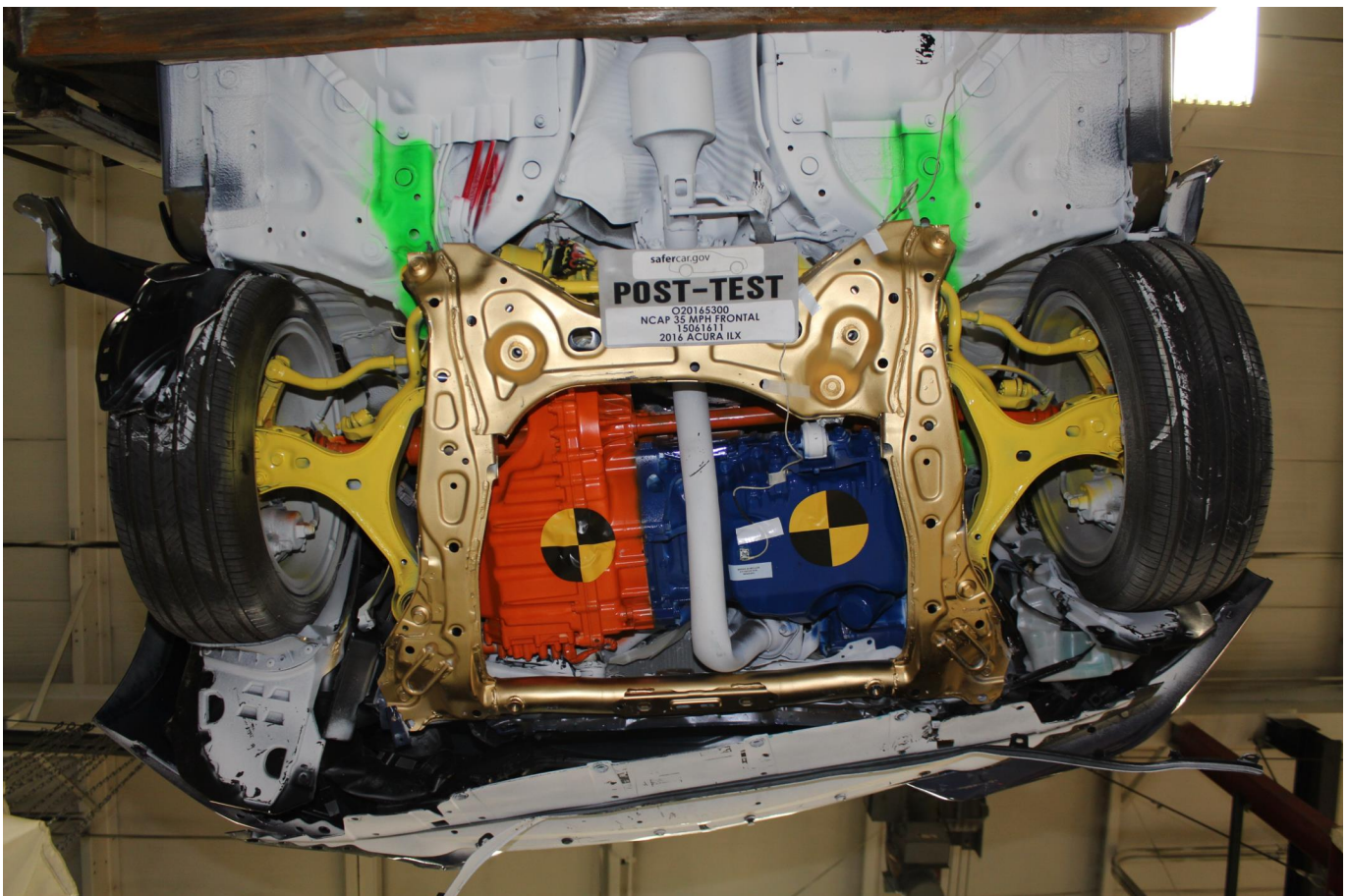


Photo No. 024 - Post-Test Front Underbody View



Photo No. 025 - Pre-Test Rear Underbody View

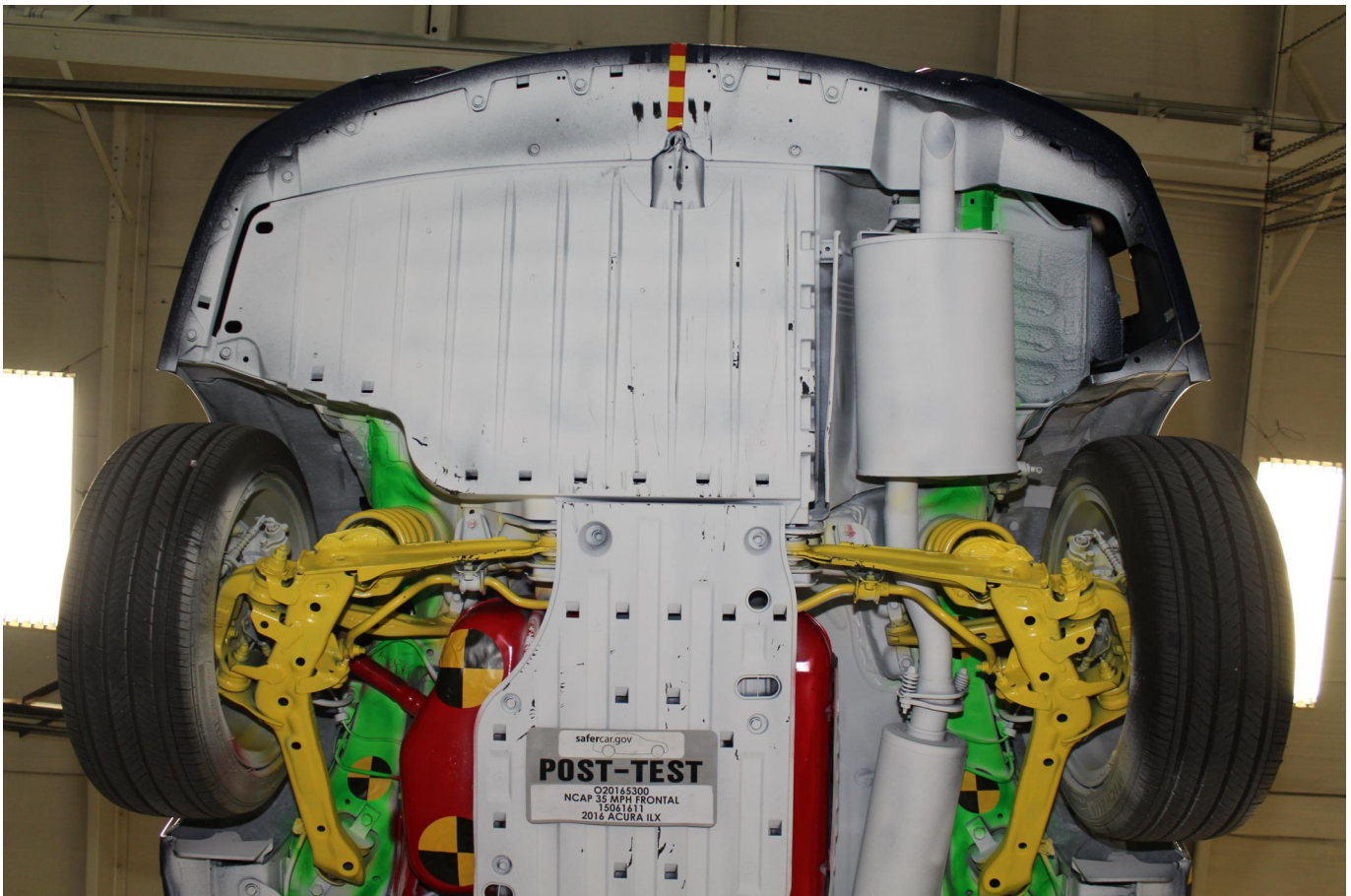


Photo No. 026 - Post-Test Rear Underbody View



Photo No. 027 - Pre-Test Dummy Cable Routing

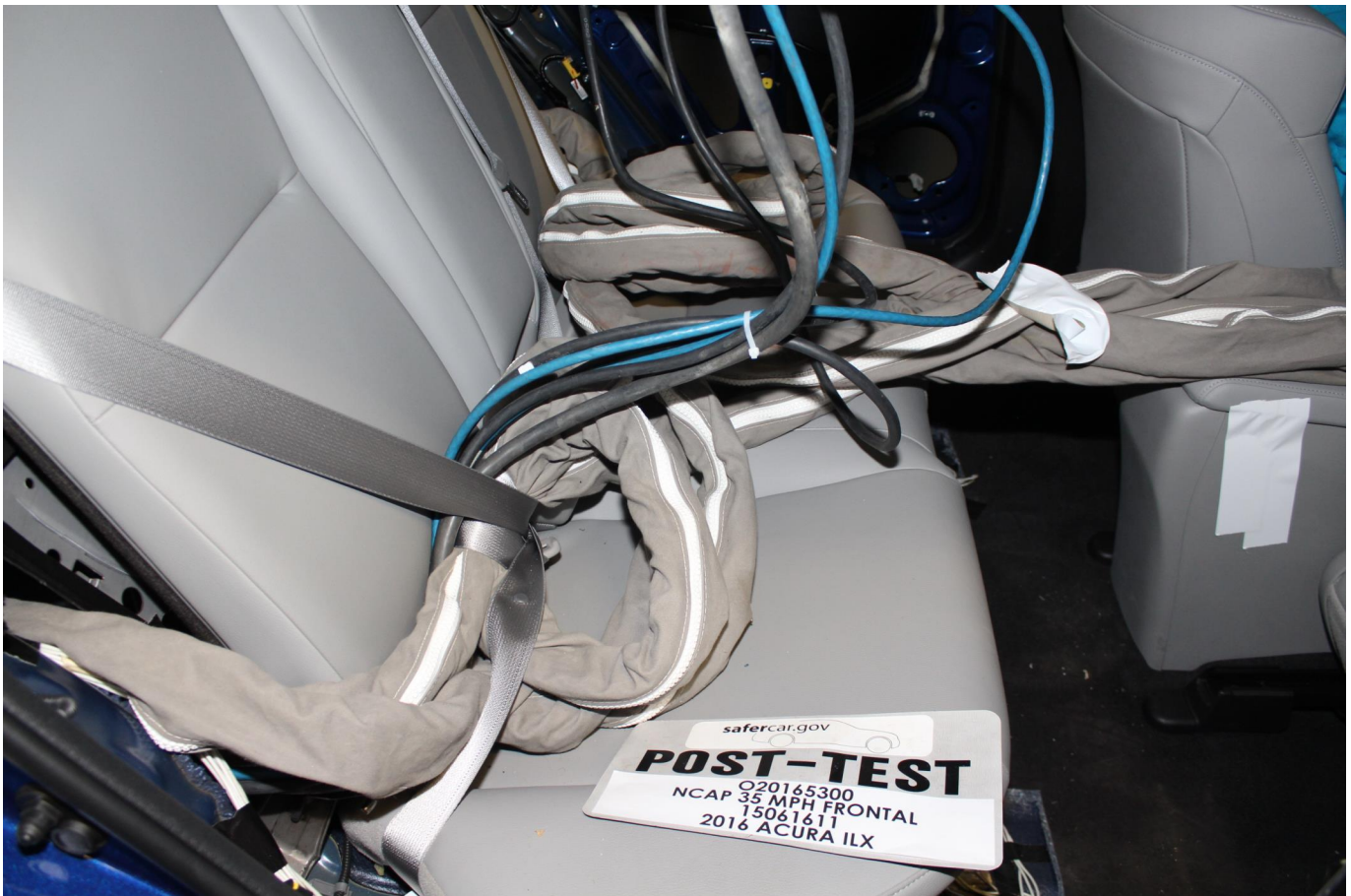


Photo No. 028 - Post-Test Dummy Cable Routing



Photo No. 029 - Pre-Test Driver Dummy Front View



Photo No. 030 - Post-Test Driver Dummy Front View



Photo No. 031 - Pre-Test Driver Dummy Window View



Photo No. 032 - Post-Test Driver Dummy Window View



Photo No. 033 - Pre-Test Driver Dummy and Vehicle Interior (Door Open)



Photo No. 034 - Post-Test Driver Dummy and Vehicle Interior (Door Open)



Photo No. 035 - Pre-Test Driver's Seat Fore-Aft Markings



Photo No. 036 - Post-Test Driver's Seat Fore-Aft Markings



Photo No. 037 - Pre-Test View of Belt Anchorage for Driver Dummy

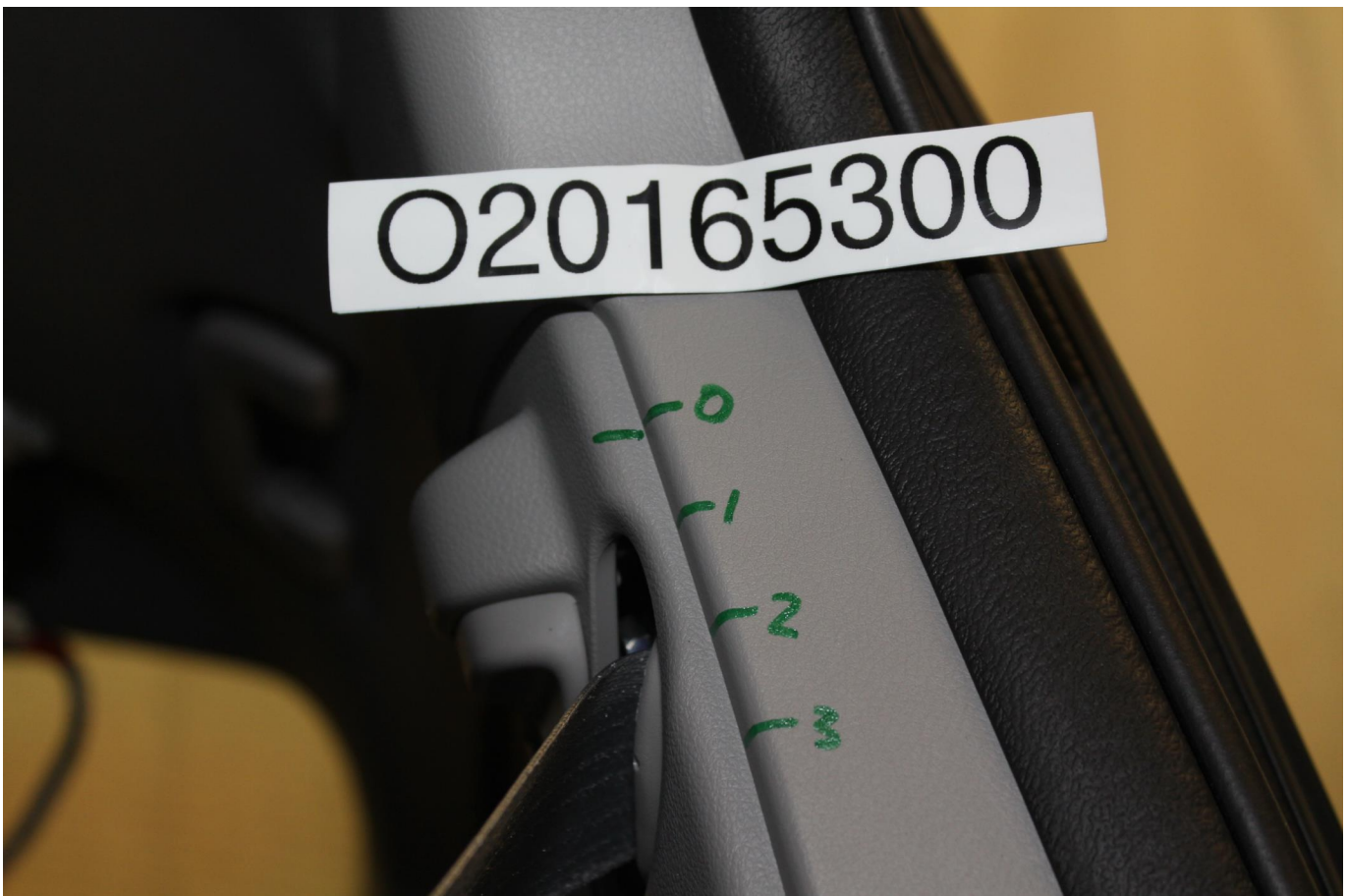


Photo No. 038 - Post-Test View of Belt Anchorage for Driver Dummy



Photo No. 039 - Pre-Test Driver Dummy Feet



Photo No. 040 - Post-Test Driver Dummy Feet



Photo No. 041 - Pre-Test Driver's Side Knee Bolster (without dummy)



Photo No. 042 - Post-Test Driver's Side Knee Bolster (without dummy)



Photo No. 043 - Pre-Test Driver's Side Floorpan



Photo No. 044 - Post-Test Driver's Side Floorpan



Photo No. 045 - Post-Test Driver Dummy Face



Photo No. 046 - Post-Test Driver Dummy Contact with Airbag



Photo No. 047 - Post-Test Driver Dummy Contact with Headrest



Photo No. 047a - Post-Test Driver Dummy Contact with Knee Bolster



Photo No. 048 - Pre-Test View of the Steering Wheel

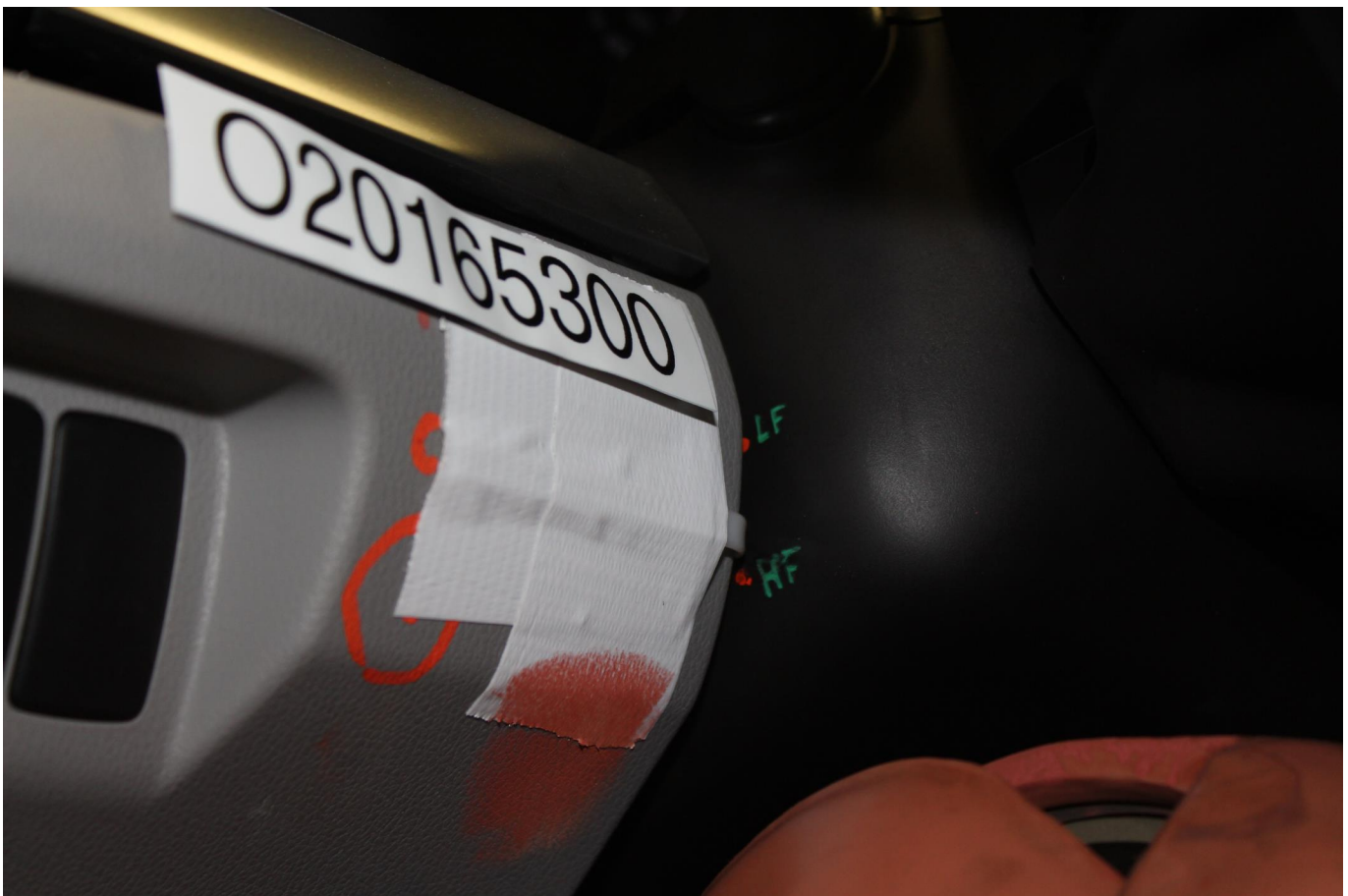


Photo No. 049 - Post-Test View of the Steering Wheel



Photo No. 050 - Pre-Test Passenger Dummy Front View



Photo No. 051 - Post-Test Passenger Dummy Front View



Photo No. 052 - Pre-Test Passenger Dummy Window View

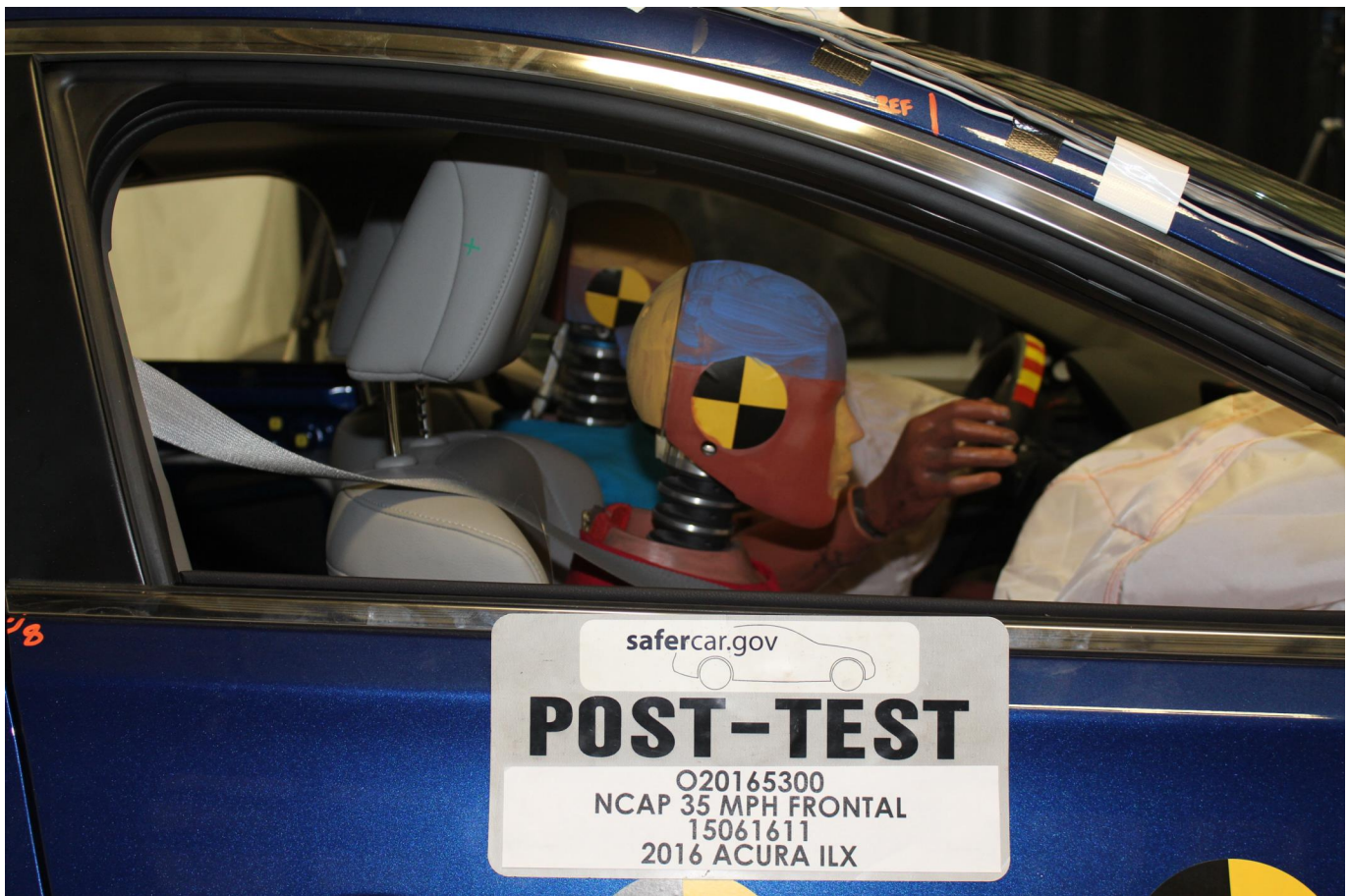


Photo No. 053 - Post-Test Passenger Dummy Window View



Photo No. 054 - Pre-Test Passenger Dummy and Vehicle Interior (Door Open)



Photo No. 055 - Post-Test Passenger Dummy and Vehicle Interior (Door Open)

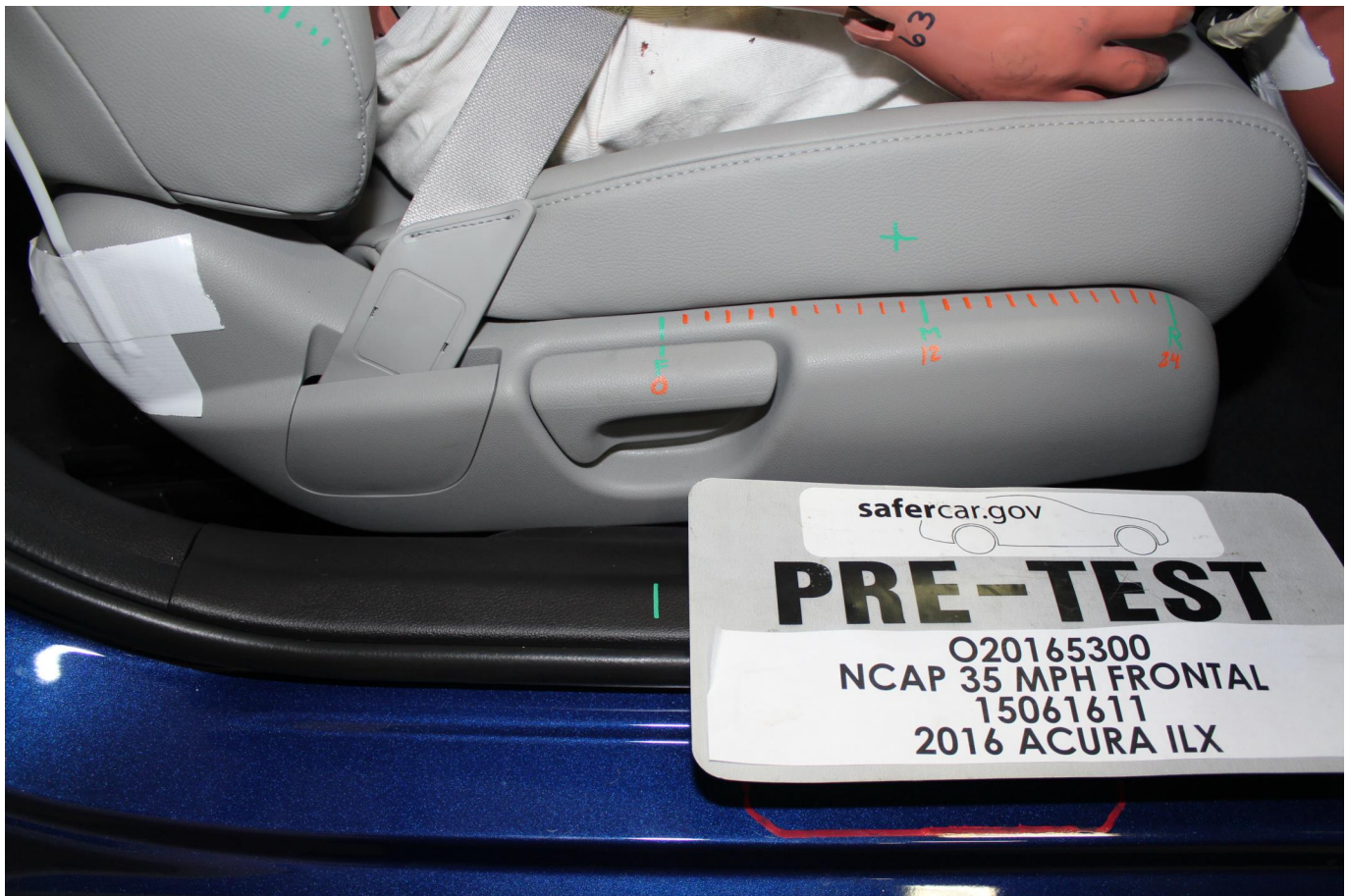


Photo No. 056 - Pre-Test Passenger's Seat Fore-Aft Markings

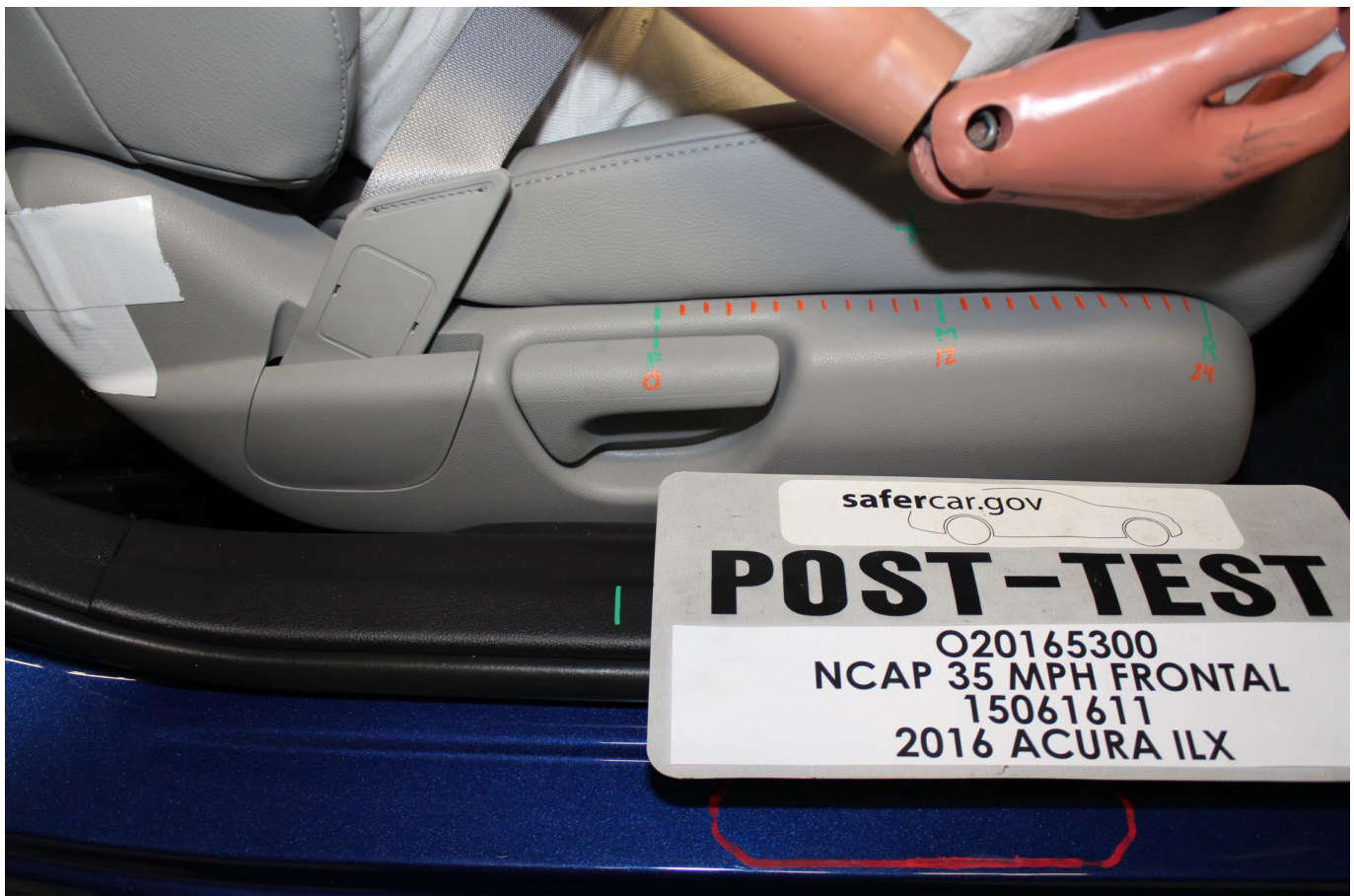


Photo No. 057 - Post-Test Passenger's Seat Fore-Aft Markings

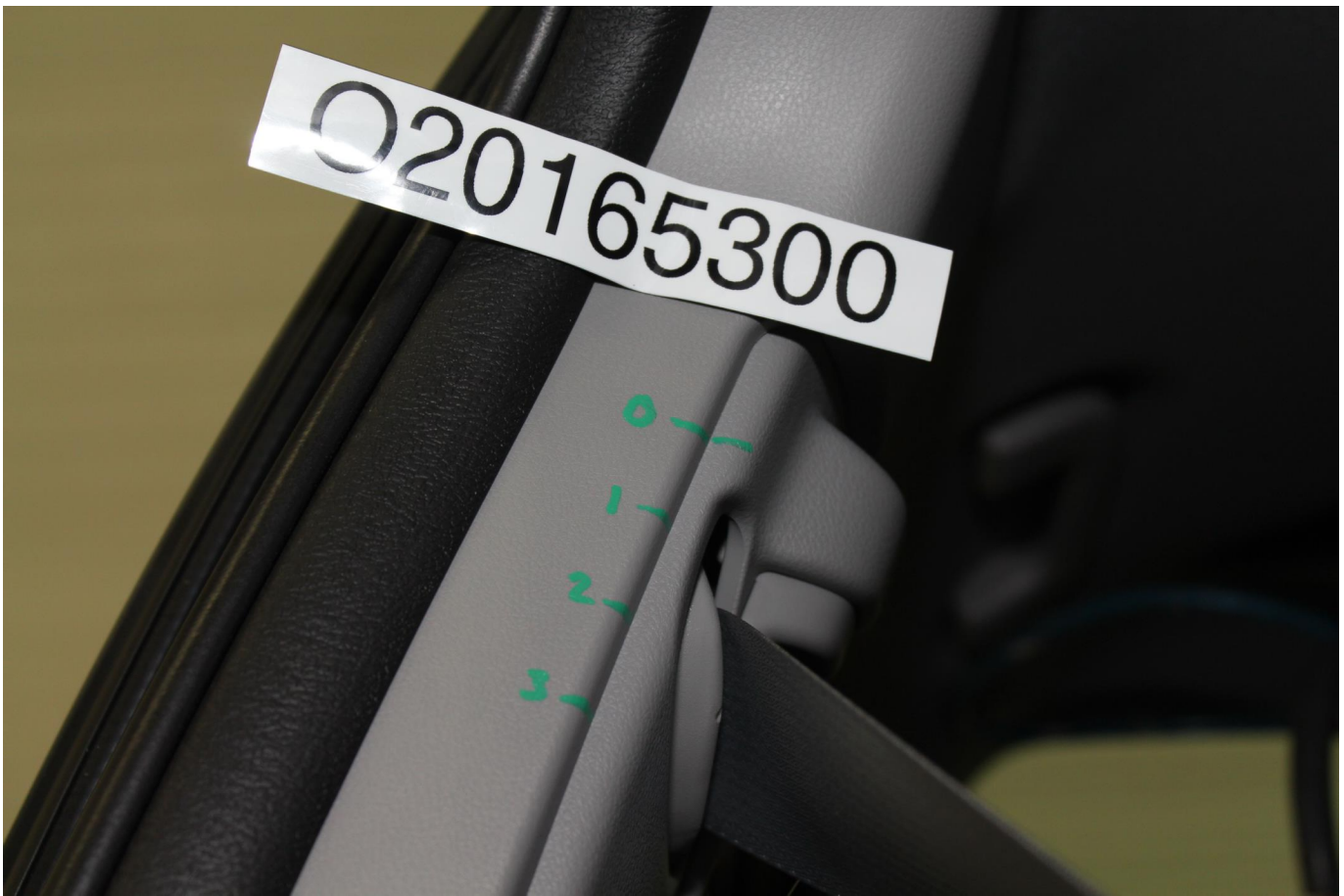


Photo No. 058 - Pre-Test View of Belt Anchorage for Passenger Dummy



Photo No. 059 - Post-Test View of Belt Anchorage for Passenger Dummy



Photo No. 060 - Pre-Test Passenger Dummy Feet



Photo No. 061 - Post-Test Passenger Dummy Feet



Photo No. 062 - Pre-Test Passenger's Side Knee Bolster (without dummy)



Photo No. 063 - Post-Test Passenger's Side Knee Bolster (without dummy)



Photo No. 064 - Pre-Test Passenger's Side Floorpan



Photo No. 065 - Post-Test Passenger's Side Floorpan



Photo No. 066 - Post-Test Passenger Dummy Face



Photo No. 067 - Post-Test Passenger Dummy Contact with Airbag



Photo No. 068 - Post-Test Passenger Dummy Contact with Headrest



Photo No. 068a - Post-Test Passenger Dummy Contact with Glovebox

PHOTOGRAPH NOT APPLICABLE

Photo No. 069 - Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

Photo No. 070 - Post-Test Stoddard Solvent Spillage Location View



Photo No. 071 - Post-Test Speed Trap Read-Out



Photo No. 072 - Vehicle at 0 Degree on Static Rollover Device

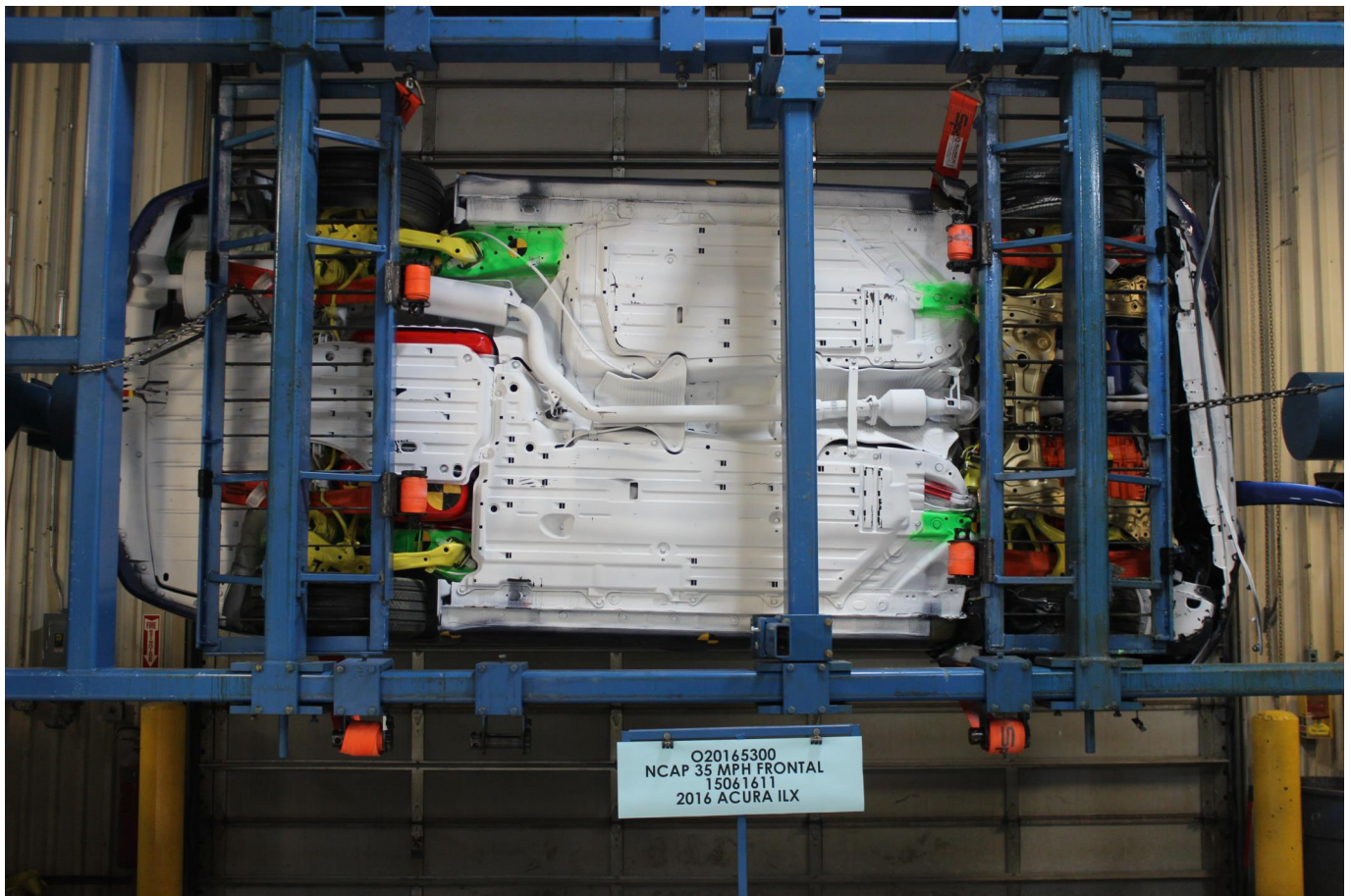


Photo No. 073 - Vehicle at 90 Degrees on Static Rollover Device

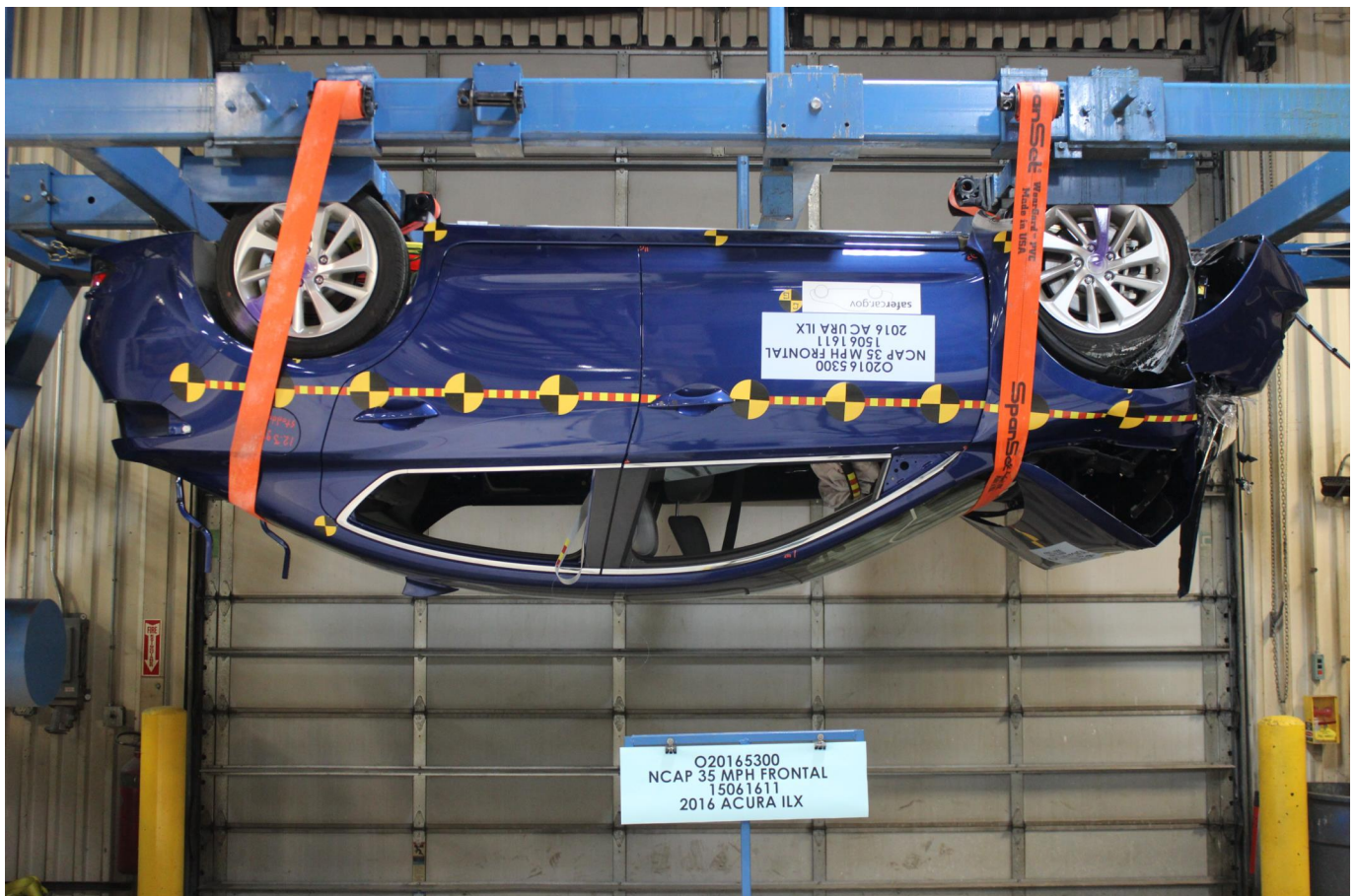


Photo No. 074 - Vehicle at 180 Degrees on Static Rollover Device

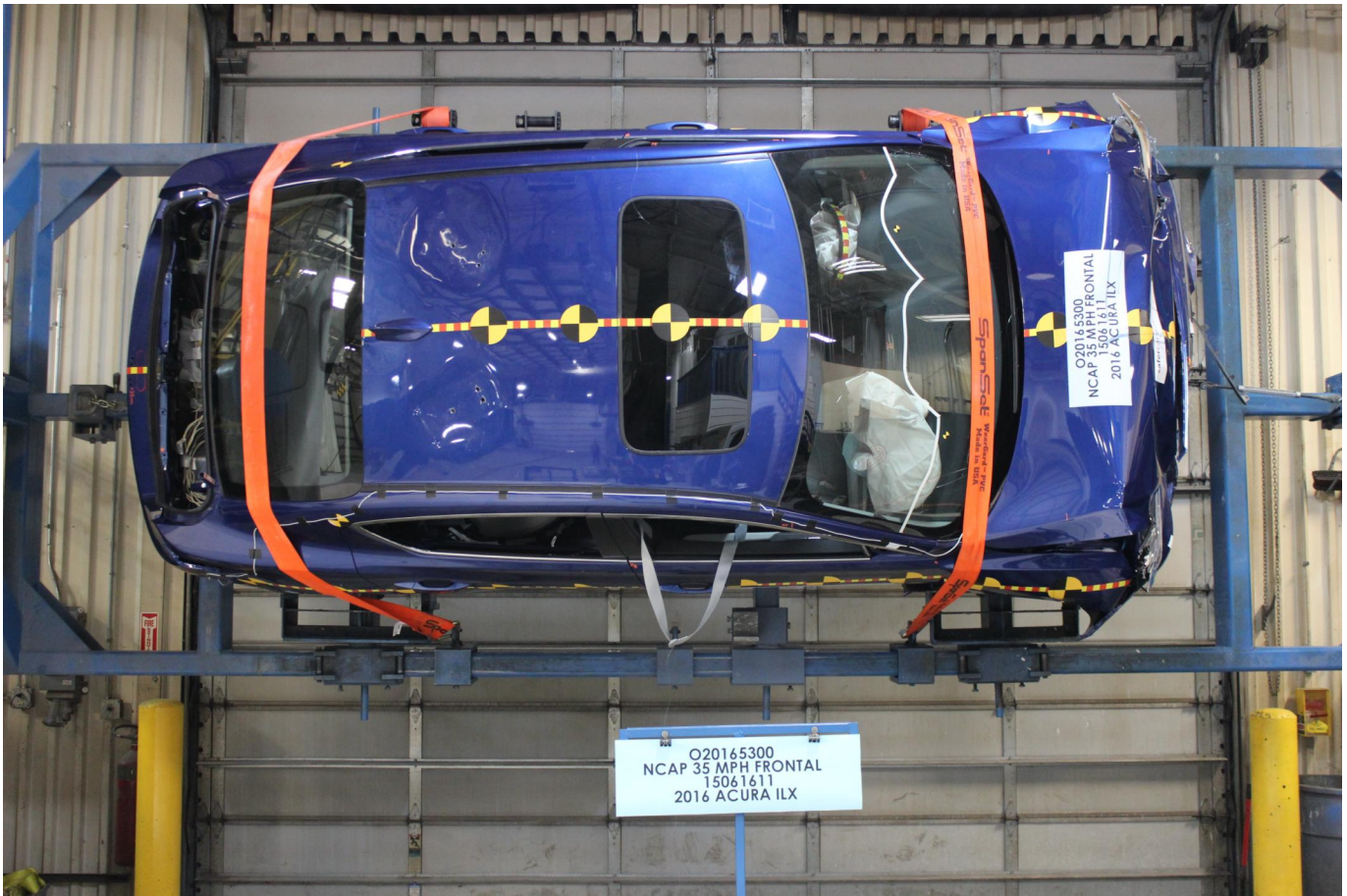


Photo No. 075 - Vehicle at 270 Degrees on Static Rollover Device



Photo No. 076 - Vehicle at 360 Degrees on Static Rollover Device



Photo No. 077 - 2016 Acura ILX Frontal Impact Event

ACURA

2016 ILX ACURAWATCH PLUS
 EXT: CATALINA BLUE P ENGINE NUMBER: K24V7-1007096
 INT: GRAYSTONE

STANDARD EQUIPMENT AT NO EXTRA COST

- TECHNICAL FEATURES ***
 - 201hp 2.4-Liter DOHC 16-Valve i-VTEC 4-Cylinder Engine
 - 8-Speed Dual-Clutch Transmission
 - 4-Wheel Disc Brakes
 - 4-Wheel Independent Suspension
 - Electric Power-Assisted Rack-and-Pinion Steering
 - Immobilizer Theft-Deterrent System
- SAFETY FEATURES ***
 - Driver's and Front Passenger's Dual-Stage Airbags (SRS)
 - Driver's and Front Passenger's Side Airbags
 - Side Curtain Airbags
 - Vehicle Stability Assist (VSA)
 - Anti-Lock Braking System (ABS)
 - Electronic Brake Distribution (EBD)
 - Brake Assist
 - Tire Pressure Monitoring System
 - LED Day Time Running Lights
 - ACE Body Structure
 - LATCH System for Child Seats
- INTERIOR FEATURES ***
 - Acura Sound System with 6 Speakers and AM/FM/in-Dash CD
 - USB Audio Interface
 - Driver's 8-Way Power Seat
 - Heated Front Seats
 - Multi-View Rear Camera Display
 - Dual-Zone Auto Climate Control with Air Filtration System
 - Push-Button Ignition
 - Bluetooth Hands-FreeLink
 - Steering Wheel-Mounted Controls
 - Power Windows and Door Locks
- EXTERIOR FEATURES ***
 - Power Moonroof with Tilt Feature
 - 17" x 7.0" Alloy Wheels
 - P215/45 R17 All-Season Tires
 - Jewel Eye LED Headlights
 - LED Illuminated Tail Lights
 - Heated Power Door Mirrors
 - Tire Sealant and Inflator Kit (in place of spare tire)
 - Keyless Access System with Smart Entry
- ACURAWATCH PLUS PACKAGE ***
 - Adaptive Cruise Control
 - Collision Mitigation Braking
 - Road Departure Mitigation
 - Forward Collision Warning
 - Lane Keeping Assist System
 - Lane Departure Warning
 - Color Meter Display Screen

Manufacturer's Suggested Retail Price
\$29,200.00

MSRP Includes:
 -6YR/70K Mile Powertrain Warranty
 -4YR/50K Mile Lid Vehicle Warranty
 -Full Tank of Fuel

Destination and Handling **920.00**

TOTAL VEHICLE PRICE
 (Includes Pre-Delivery Service)
\$30,120.00

License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

ZIMBRICK ACURA
 7525 CENTURY AVENUE
 MIDDLETON, WI 53562

PORT OF ENTRY: MARYSVILLE
 DELIVERY POINT: CHICAGO

94HP
 ROW/SPACE: 604-011
 TRANS.METHOD: TRUCK

VIN: 19UDE2F3GGA006087

ORIG. DLR: 251347
 REF.NO: 40490
 HN CODE: AL-2738
 EMISSION: 50 STATE
 CONTROL NO: 932195
 DEALER: 251347

EPA DOT Fuel Economy and Environment

Fuel Economy
29 MPG
 combined city/hwy
25 city
36 highway
3.4 gallons per 100 miles

Compact cars range from 14 to 116 MPG. The best vehicle rates 119 MPG.

You Save \$500
 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,700

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

1 **7** **10** **1** **5** **10**
 Best Best

This vehicle emits 305 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fuelconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 29 MPG and emits 335 g/mi for full-year 1 year. CO₂ estimates are based on 15,000 miles per year at \$3.10 per gallon. EPA's is miles per gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
 Calculate personalized estimates and compare vehicles.

Scan QR Code

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
 U.S./Canadian Parts Content: **60 %**

Major Sources of Foreign Parts Content:
JAPAN 25 %

NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

GOVERNMENT 5-STAR SAFETY RATING

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.

Frontal Crash	Driver Passenger	Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
Side Crash	Front seat Rear seat	Not Rated
Based on the risk of injury in a side impact.		
Rollover		Not Rated
Based on the risk of rollover in a single vehicle crash.		

Star Ratings range from 1 to 5 stars ("****") with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4236

FOR THIS VEHICLE
 Final Assembly Point:
MARYSVILLE, OHIO USA

Country of Origin: Engine:
U.S.

Transmission:
JAPAN

This vehicle is equipped with a front bumper of a type that has been tested at an impact speed of 5 miles per hour, and a rear bumper of a type that has been tested at an impact speed of 2.5 miles per hour, resulting in no damage to the vehicle's body and safety systems and minimal damage to the bumper and attachment hardware. "Minimal damage to the bumper" means minor cosmetic damage that can be repaired with the use of common repair materials and without replacing any parts. The stronger the bumper, the less likely the vehicle will require repair after a low-speed collision. This vehicle exceeds the current federal bumper standard of 2.5 miles per hour.

Photo No. 078 - Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Page No.

List of Data Plots Provided in the Test Report

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

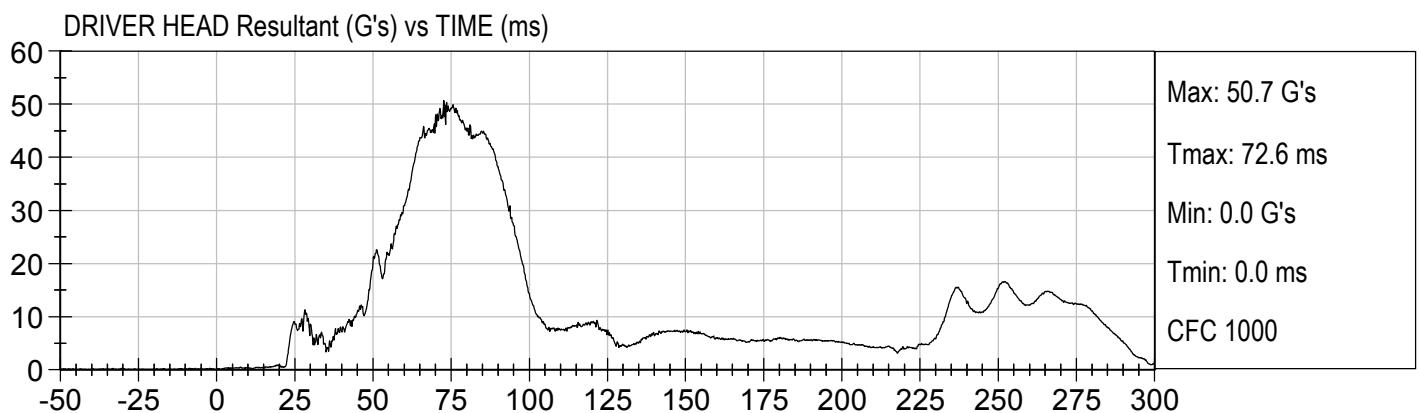
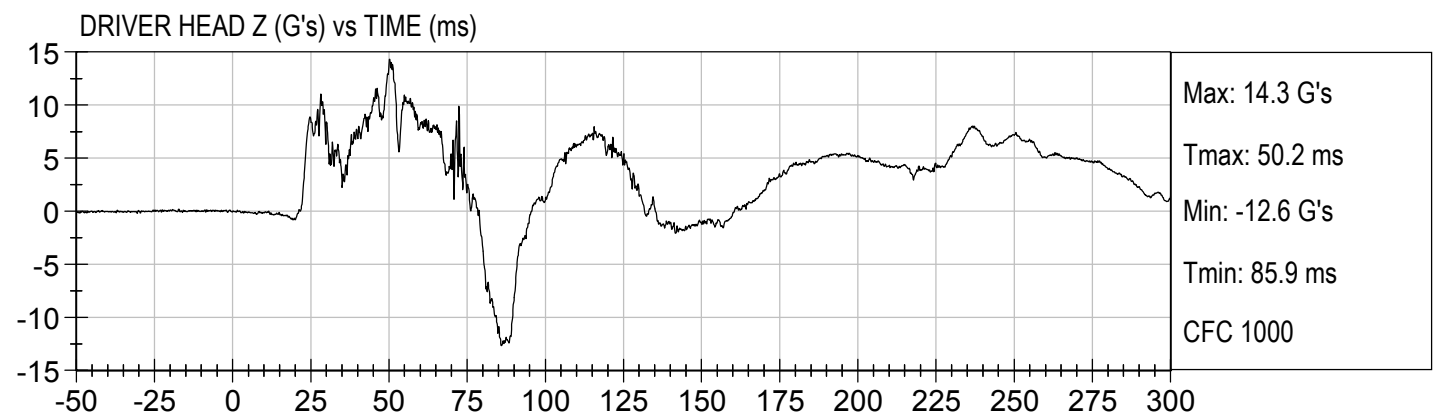
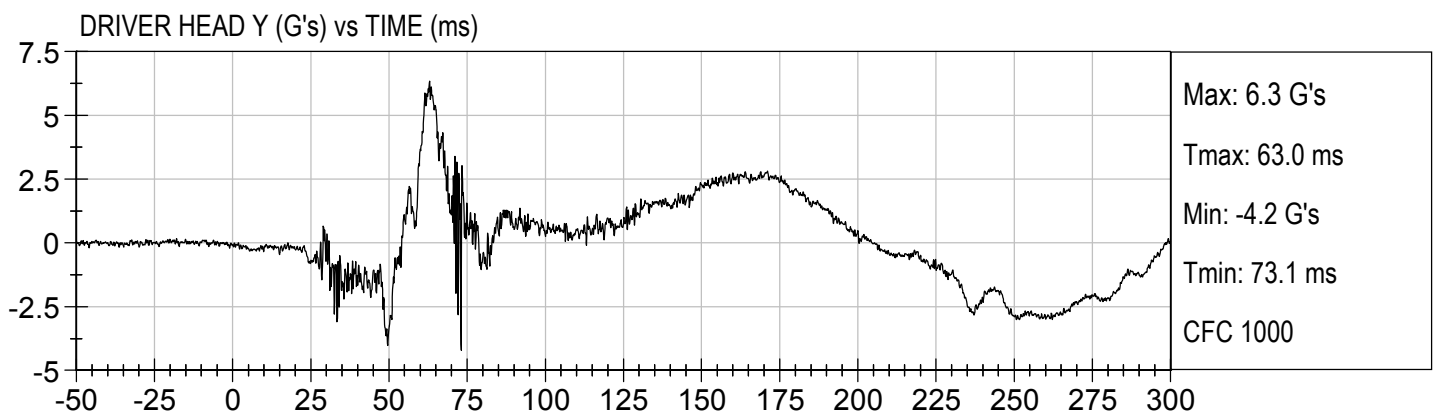
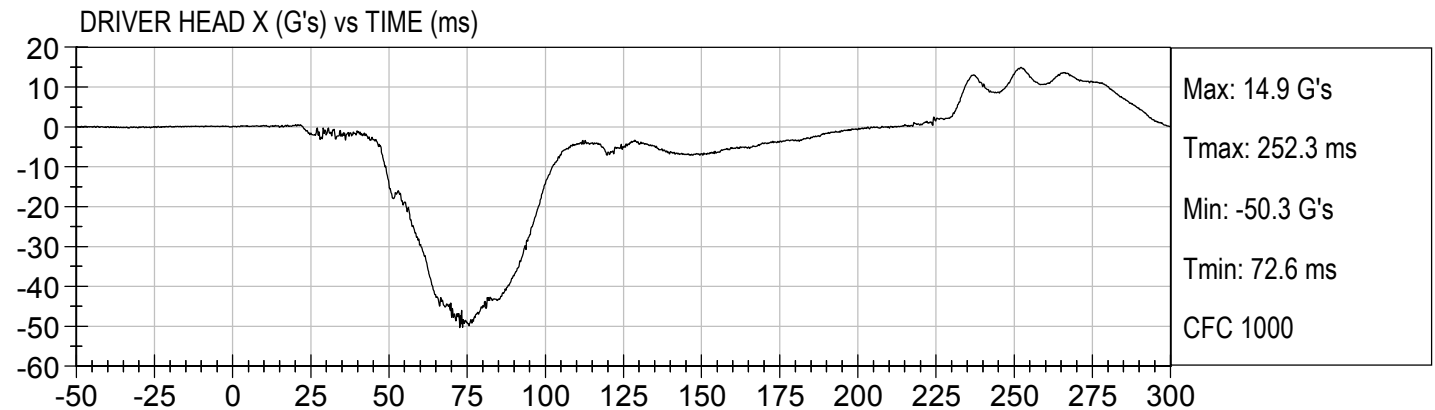
		<u>Page No.</u>
Figure No. 28.	Passenger Neck Force X vs. Time	B-10
Figure No. 29.	Passenger Neck Force Z vs. Time	B-10
Figure No. 30.	Passenger Neck Moment Y vs. Time	B-10
Figure No. 31.	Passenger Nij (NTF) vs. Time	B-11
Figure No. 32.	Passenger Nij (NTE) vs. Time	B-11
Figure No. 33.	Passenger Nij (NCF)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

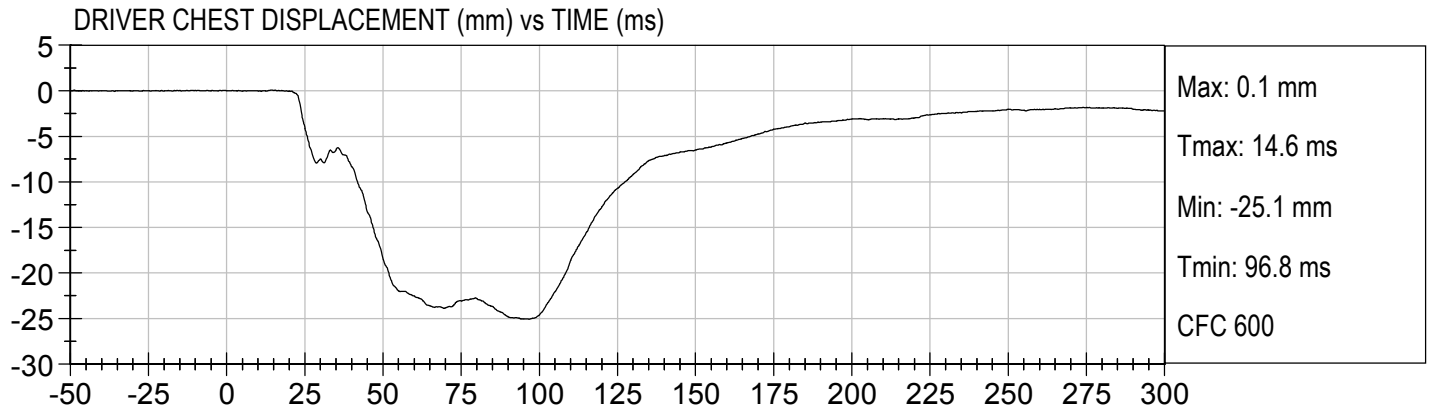
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

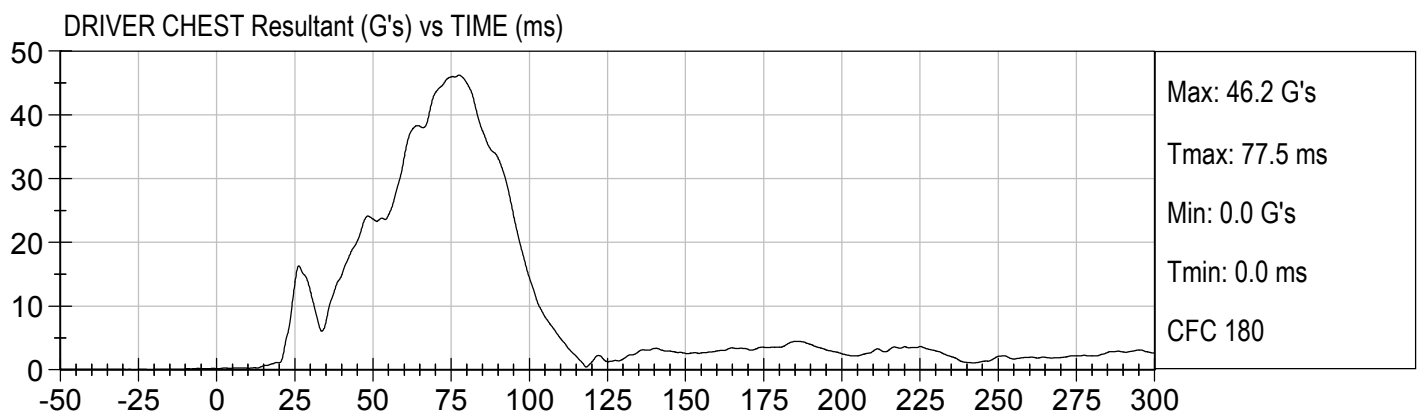
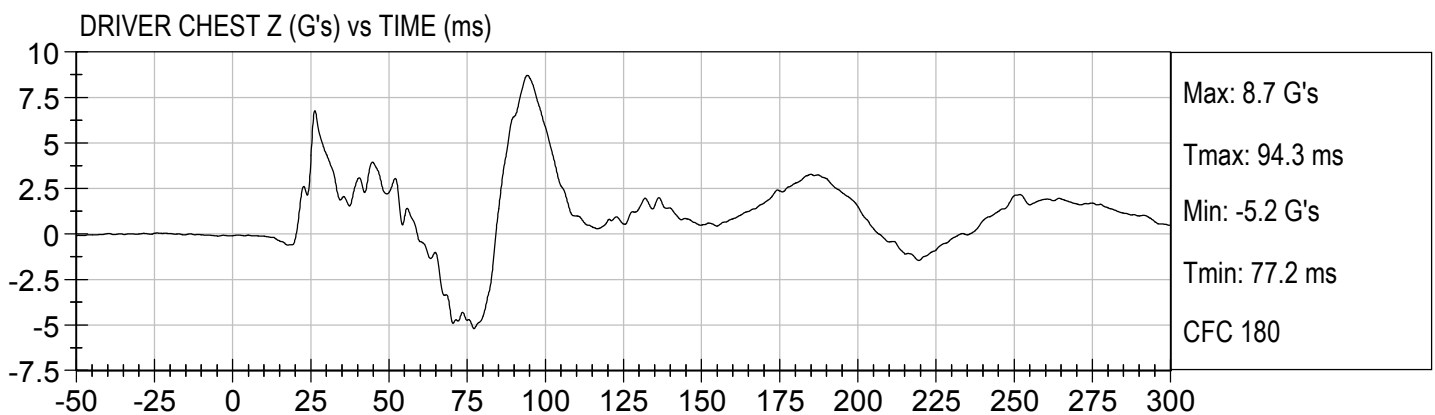
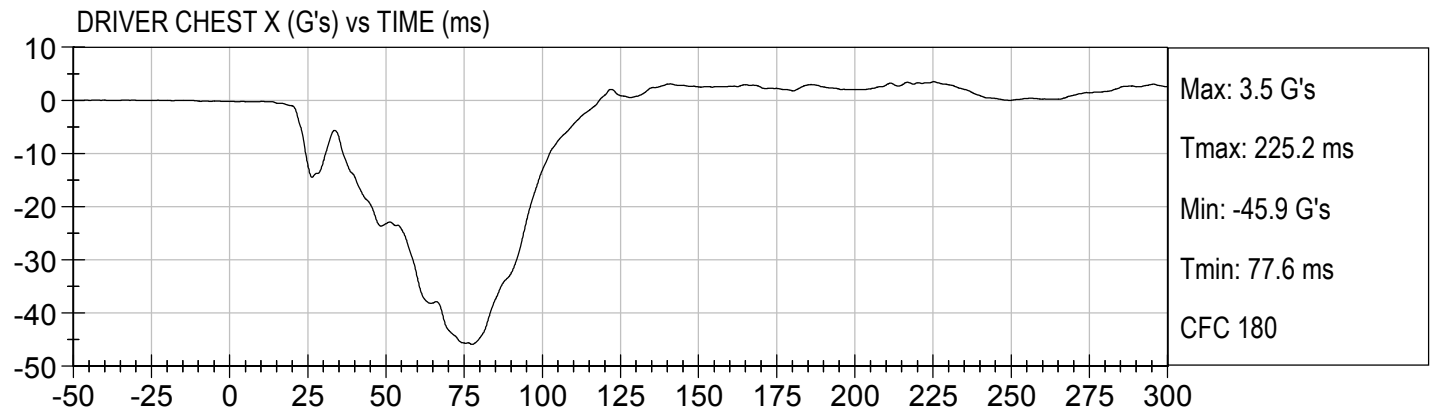
Driver Head X Redundant
 Driver Head Y Redundant
 Driver Head Z Redundant
 Driver Head Angular Velocity X
 Driver Head Angular Velocity Y
 Driver Head Angular Velocity Z
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant
 Driver Chest Y Redundant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

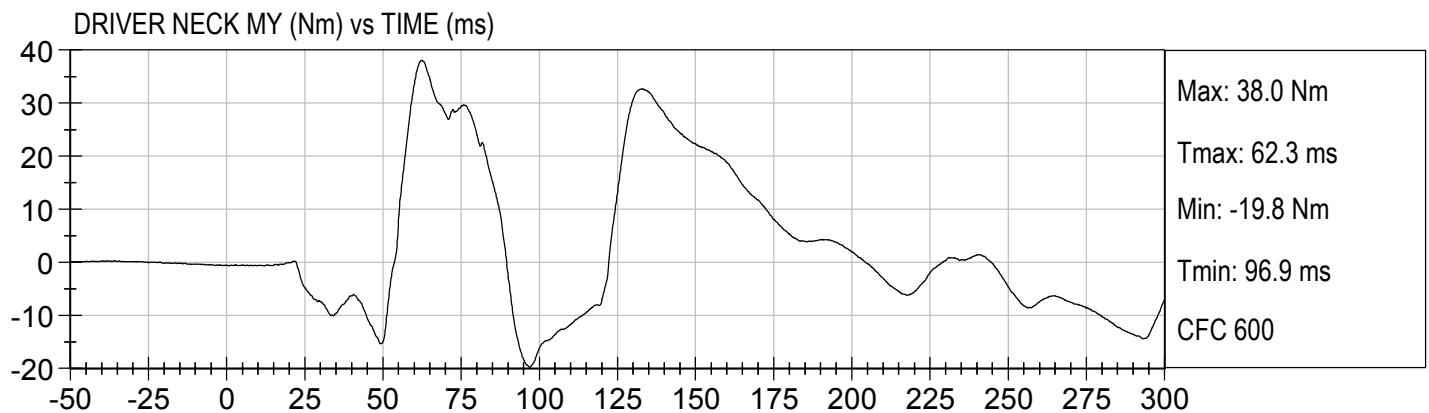
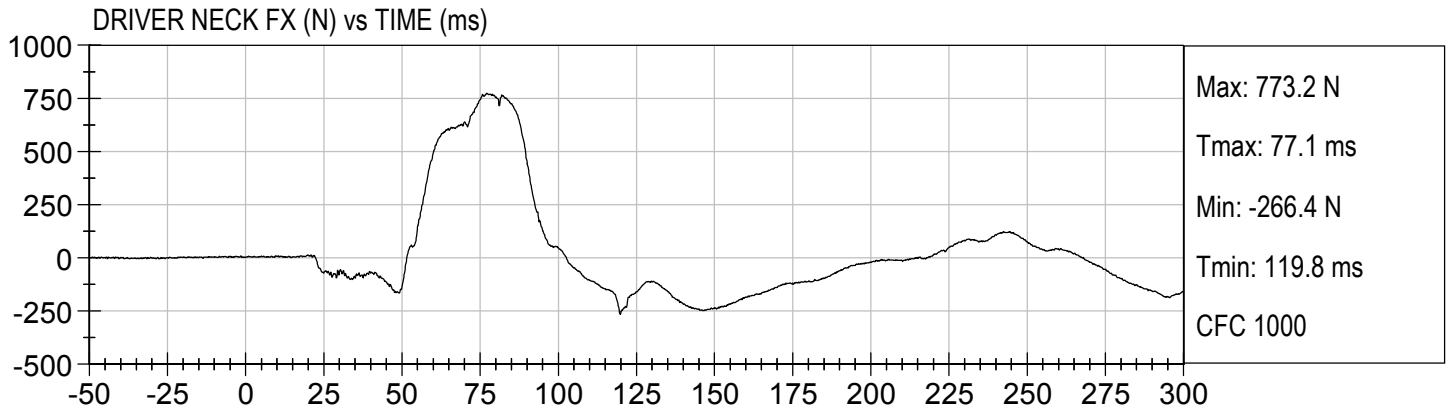
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver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

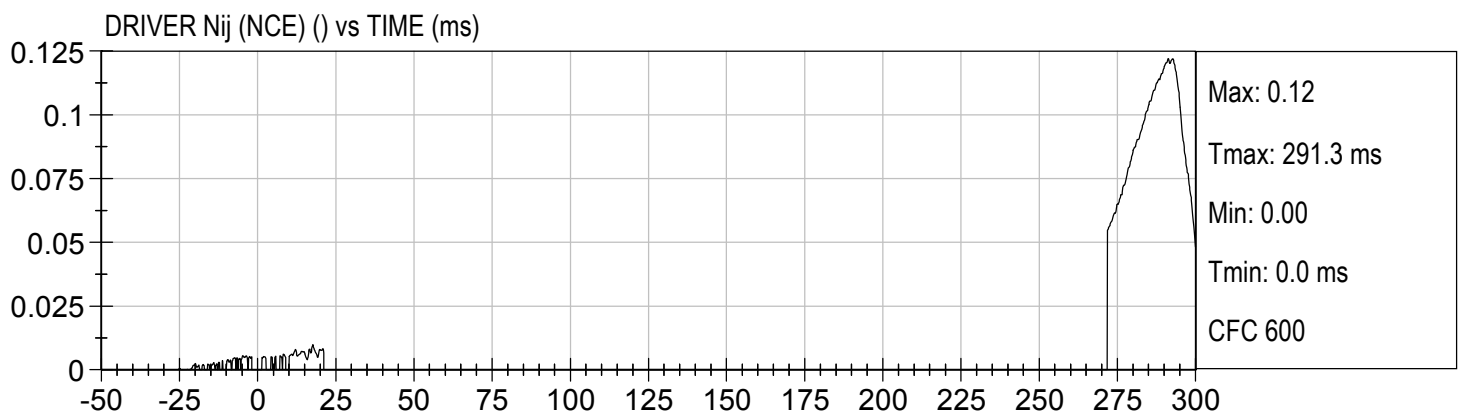
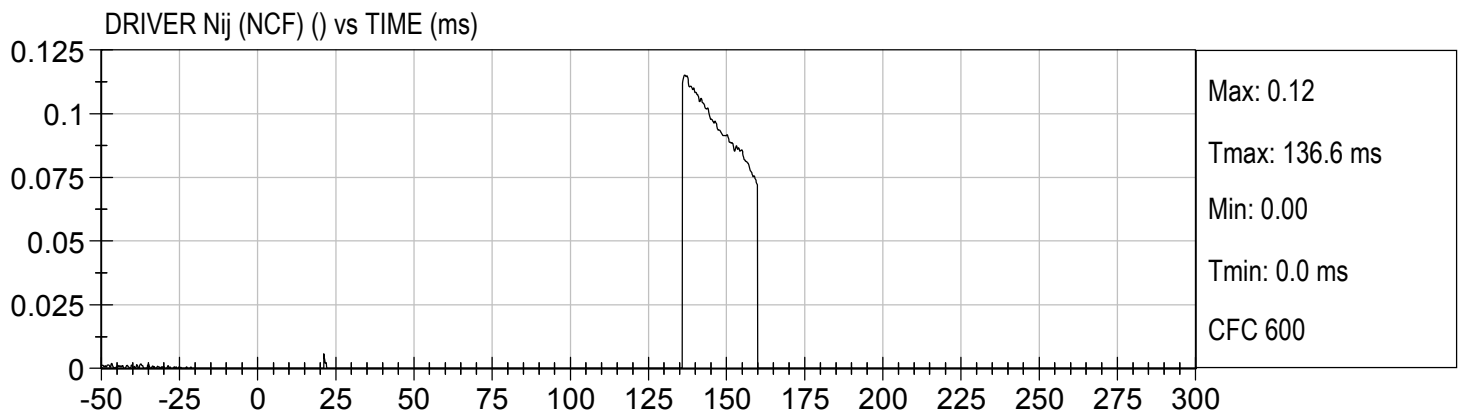
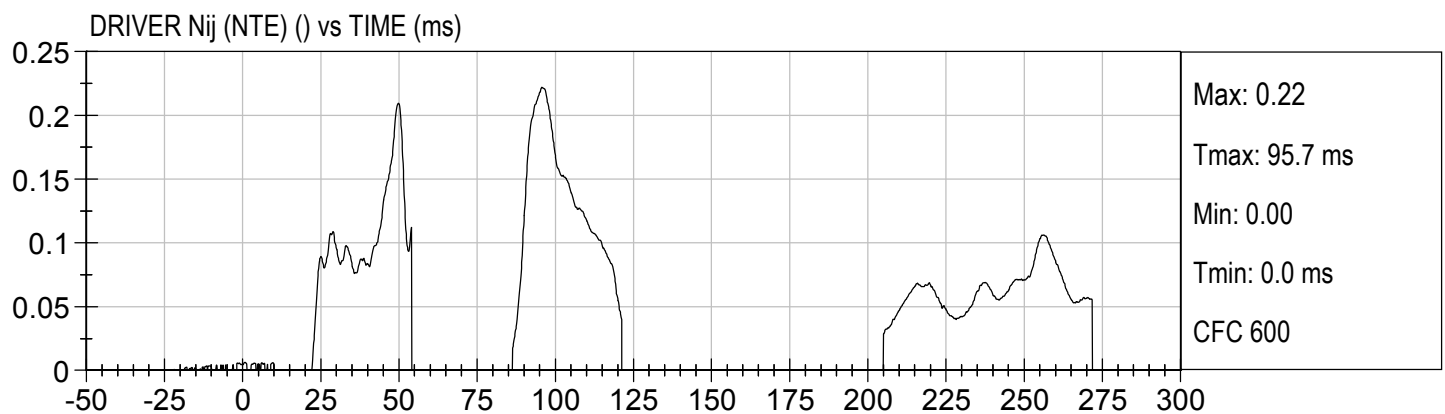
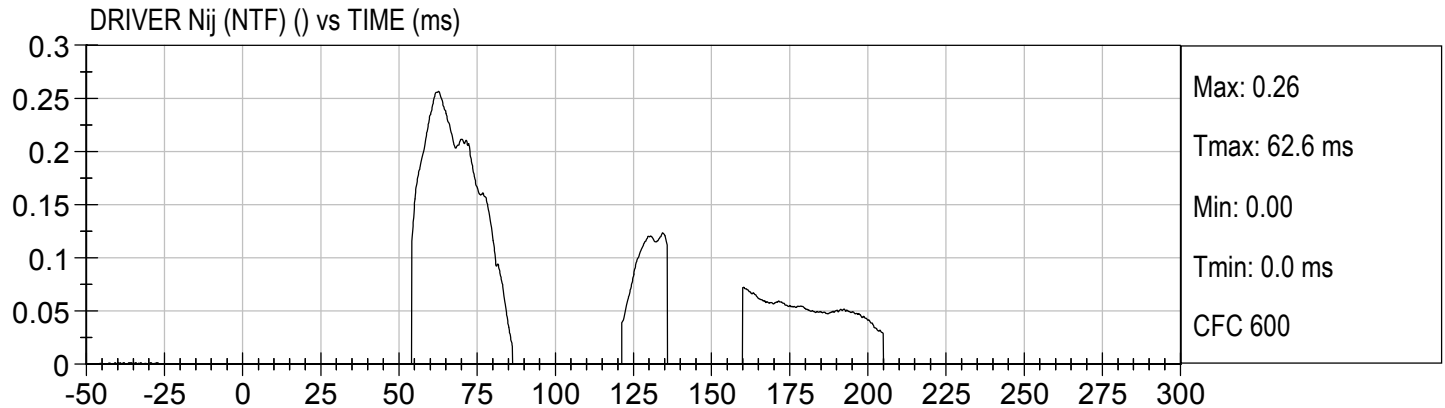
Passenger Pelvis Z
Passenger Left Femur Redundant
Passenger Right Femur Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Lap Belt Force
Passenger Shoulder Belt Force
Left Rear Seat Crossmember X
Right Rear Seat Crossmember X
Vehicle Engine Top X
Vehicle Engine Bottom X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember Xr
Right Rear Seat Crossmember Xr
Advanced Research Load Cell Barrier – 528 channels

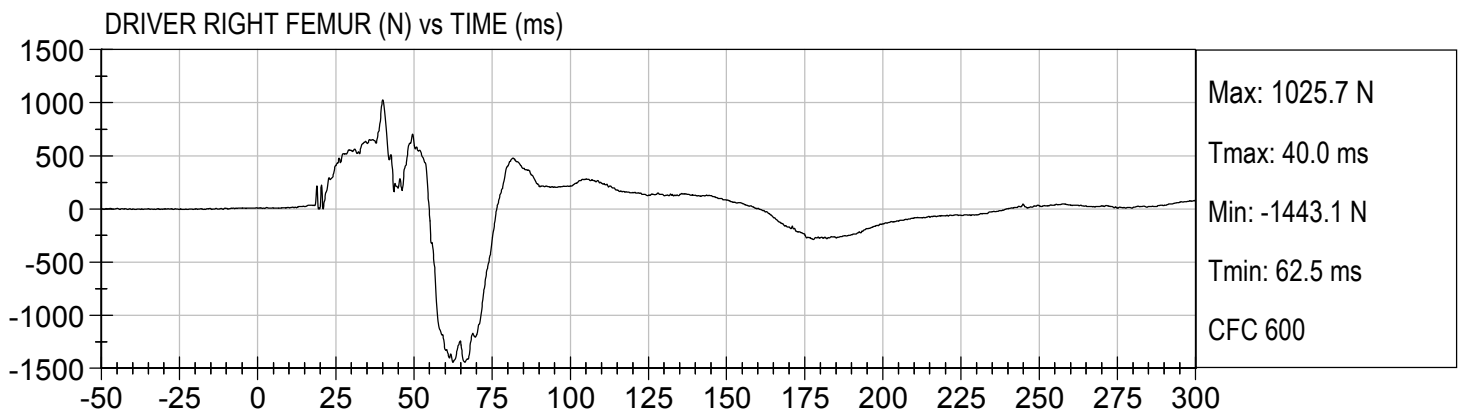
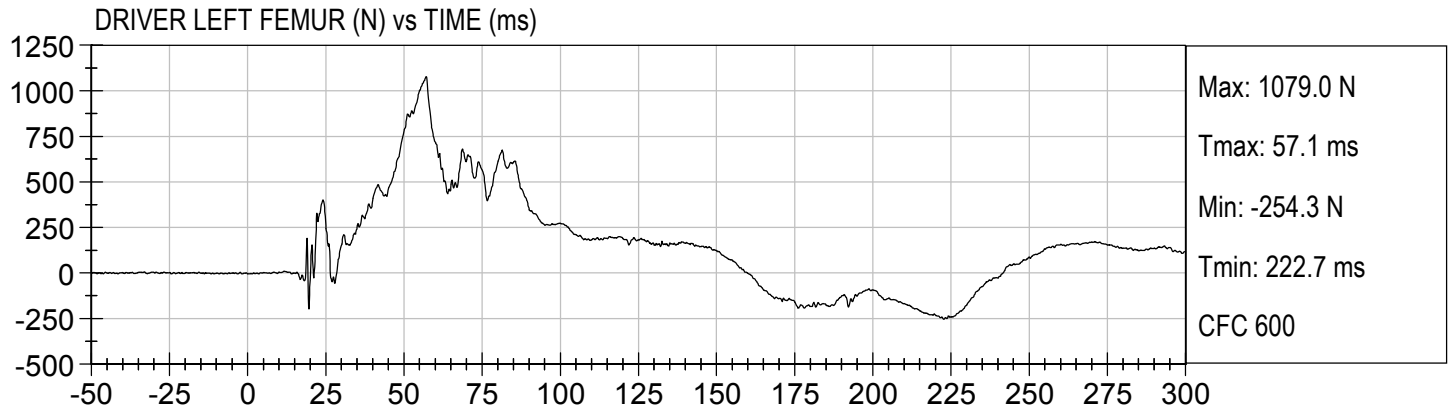


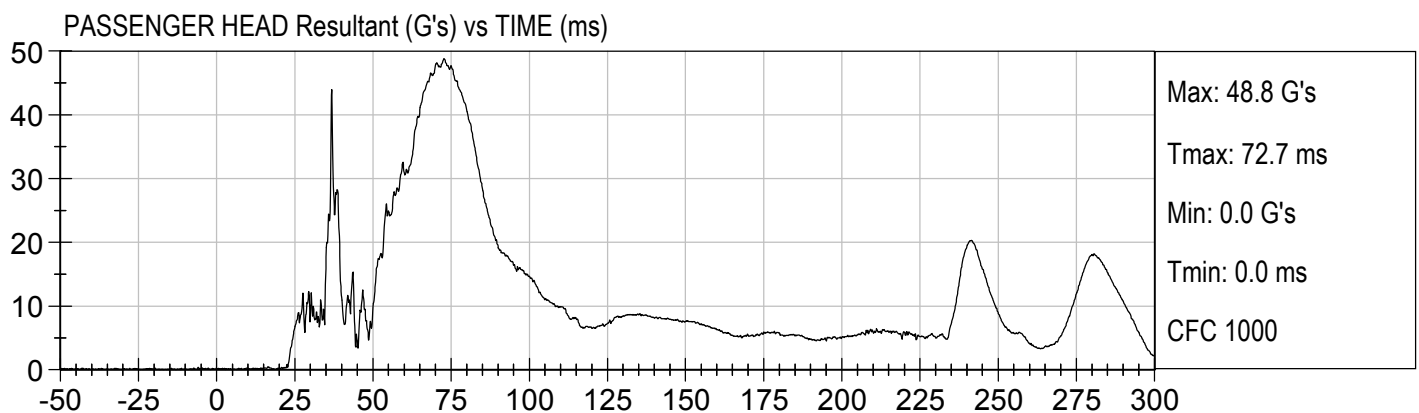
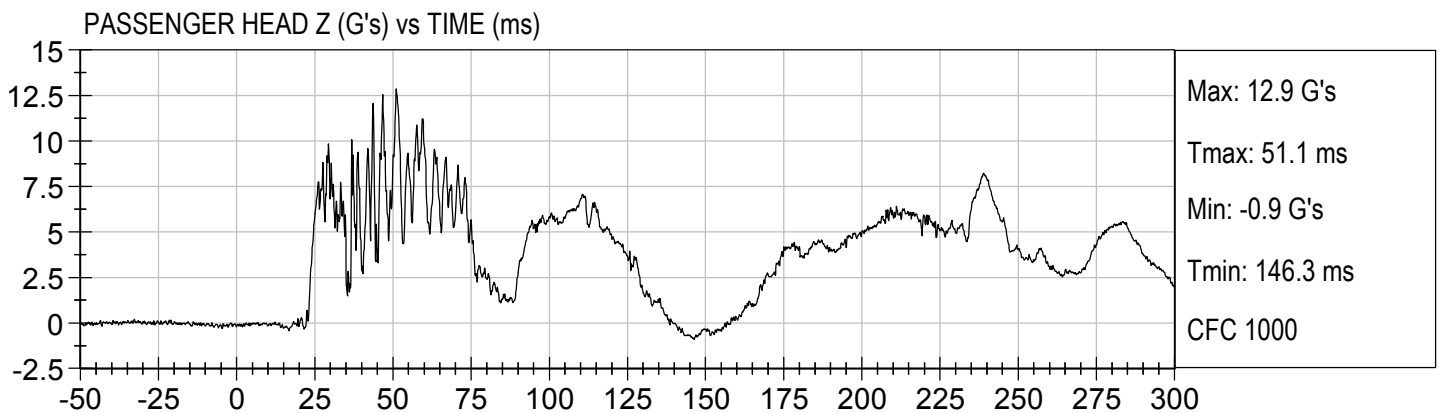
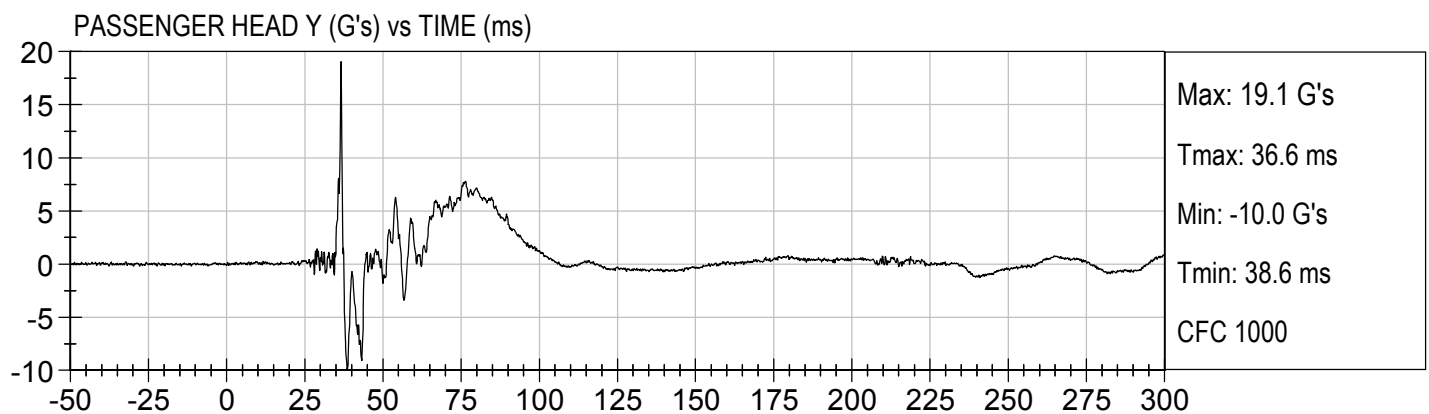
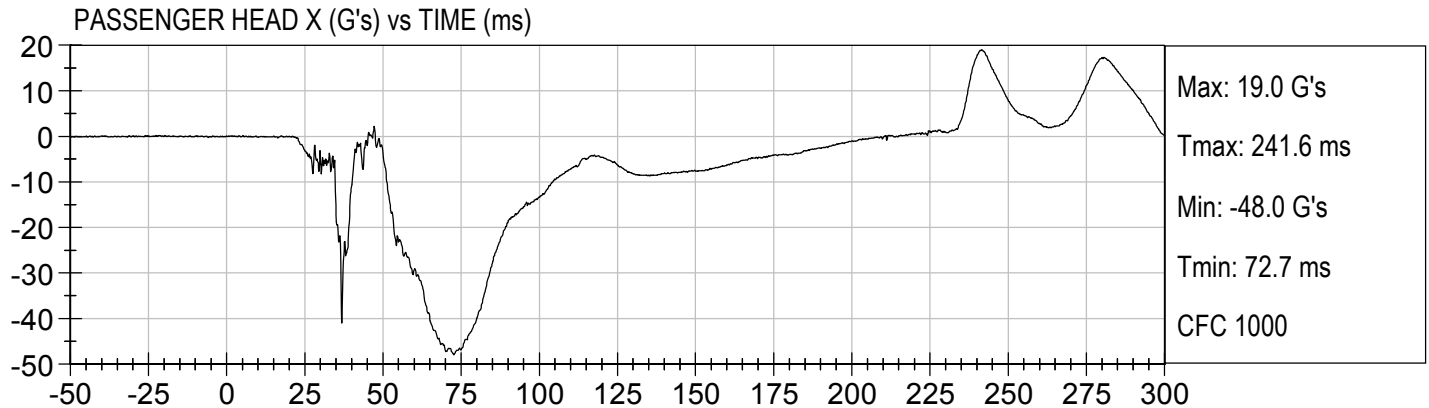


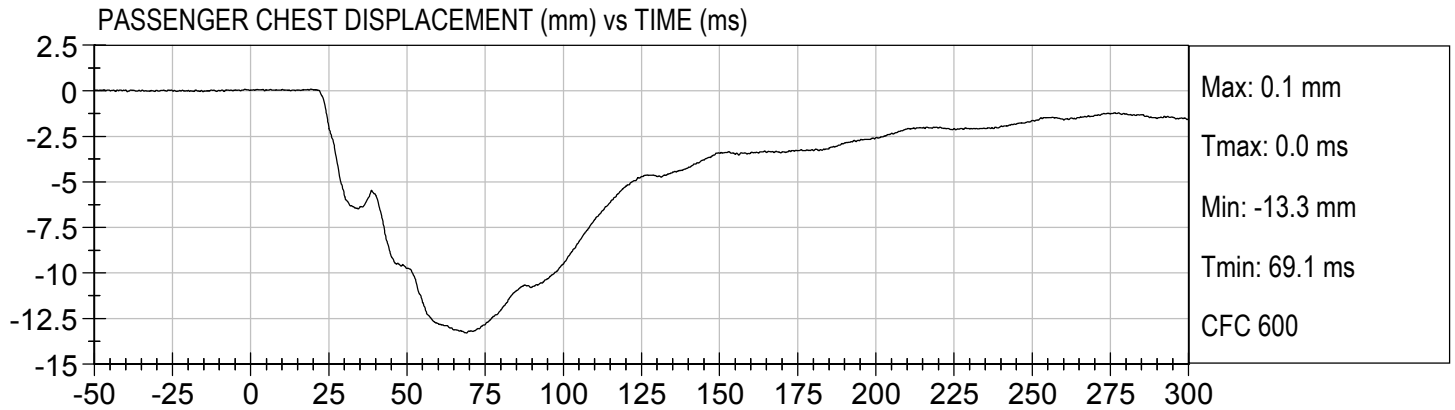


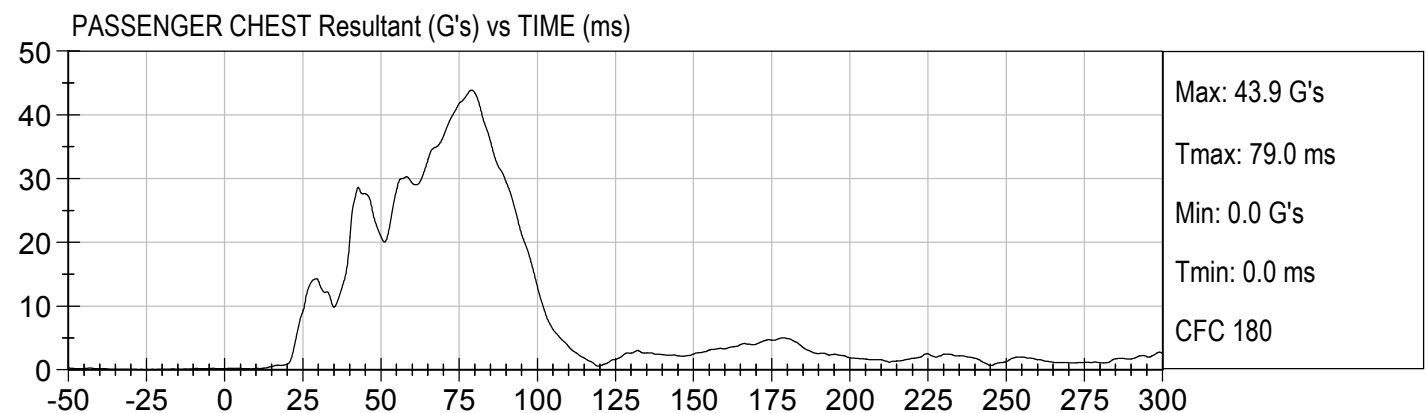
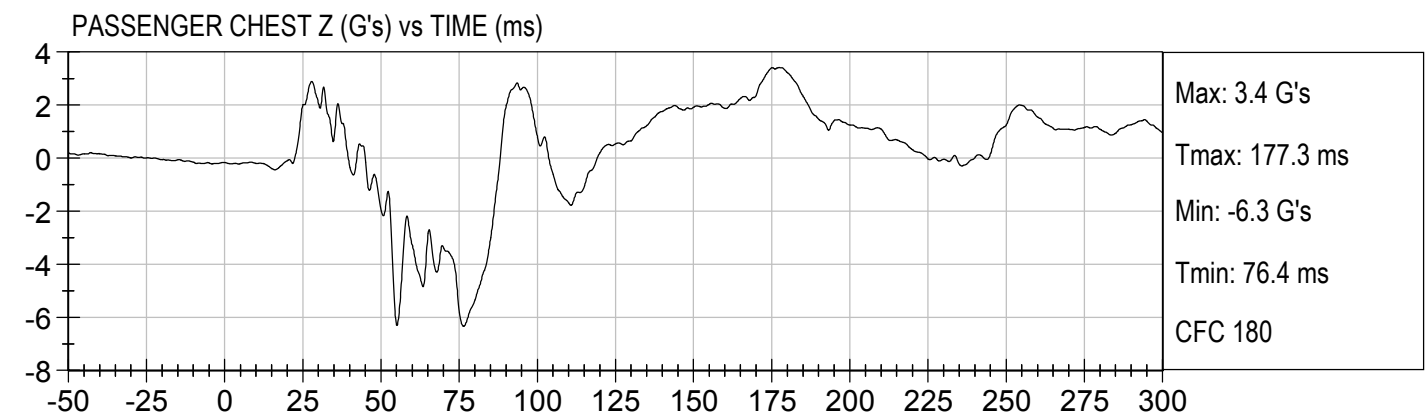
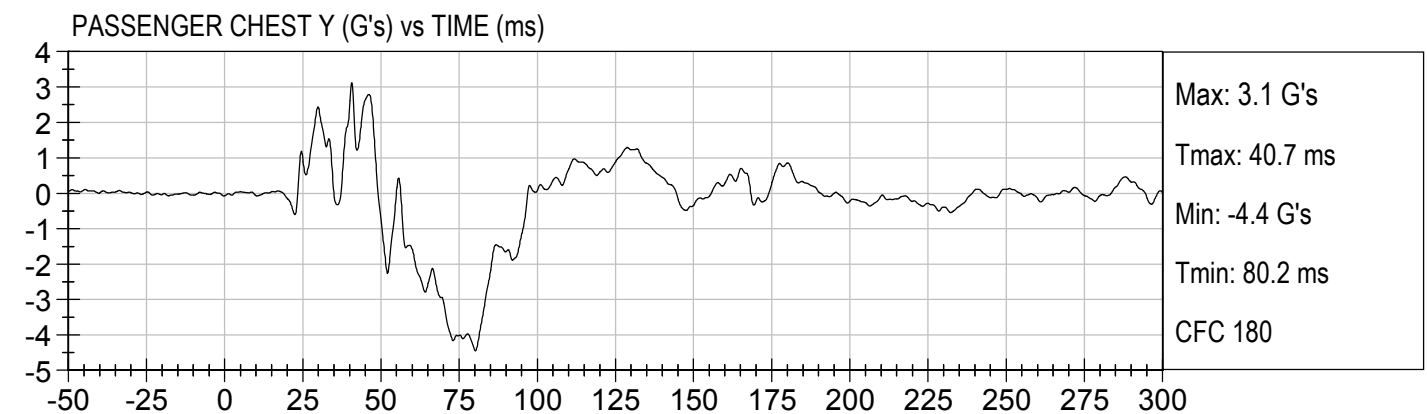
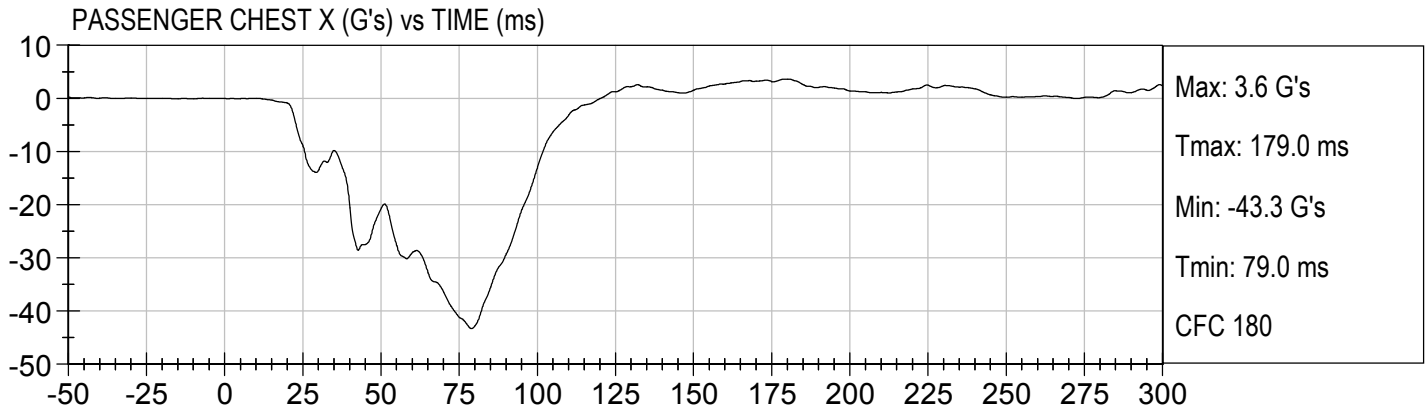


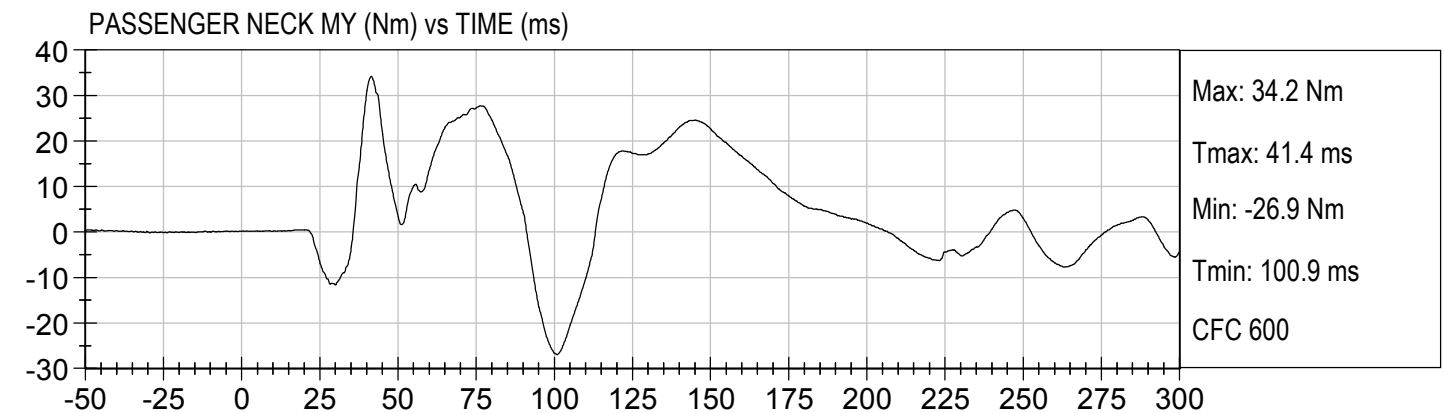
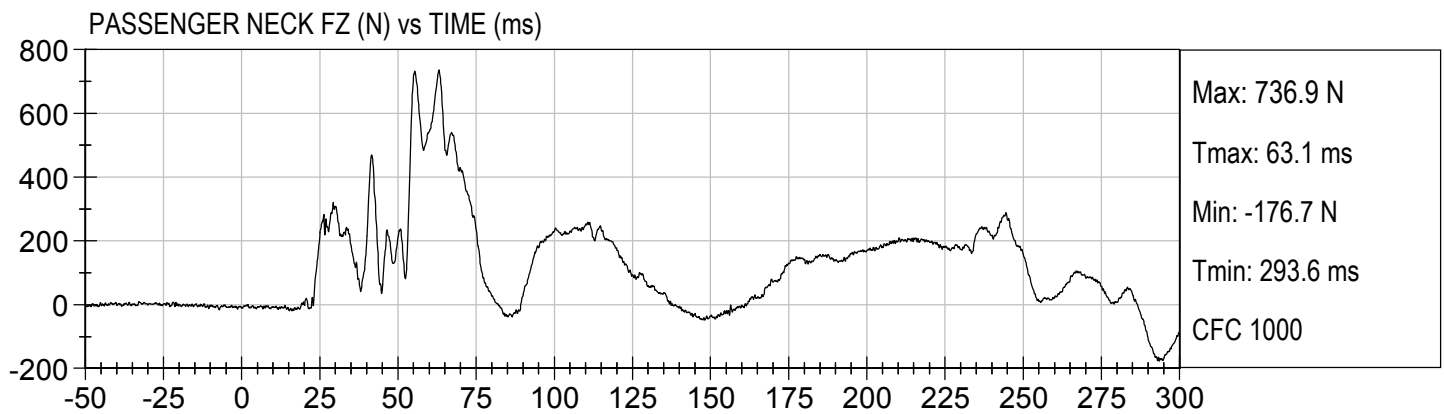
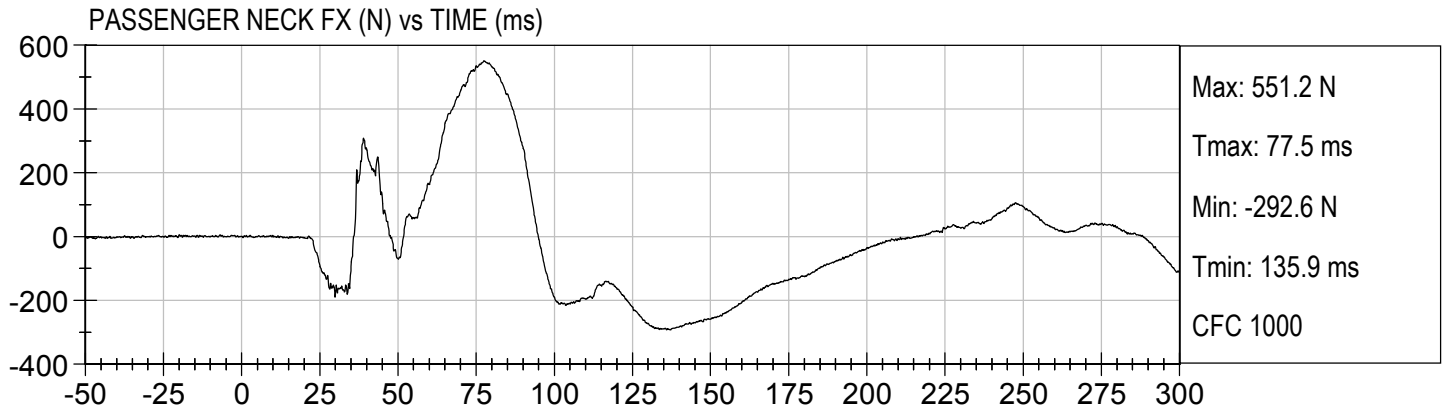


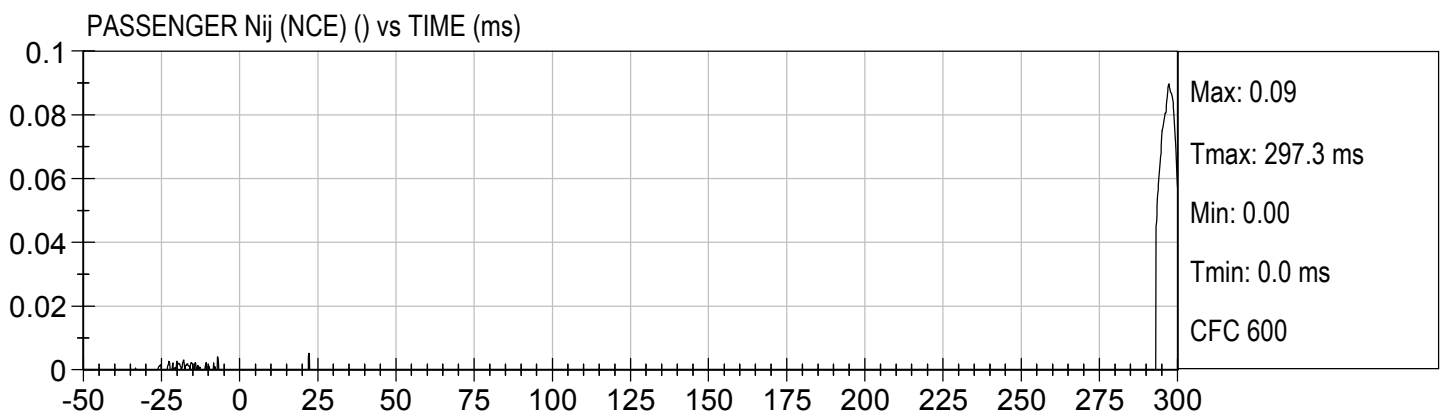
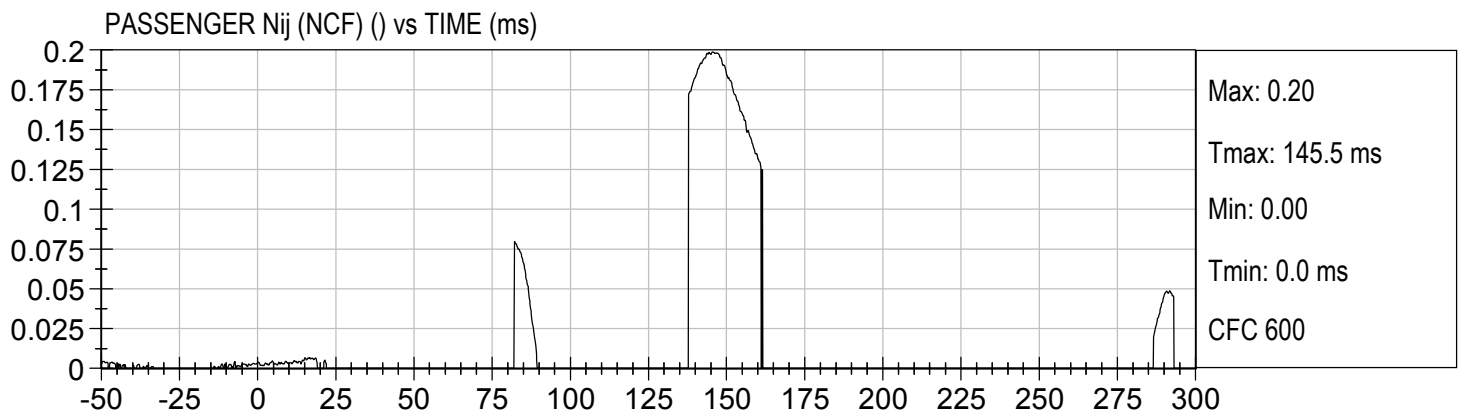
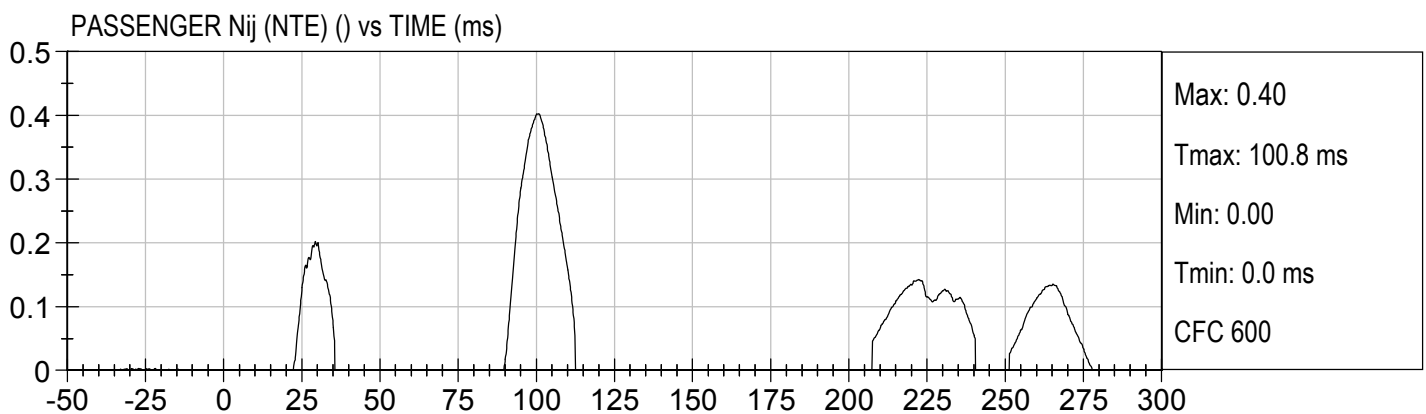
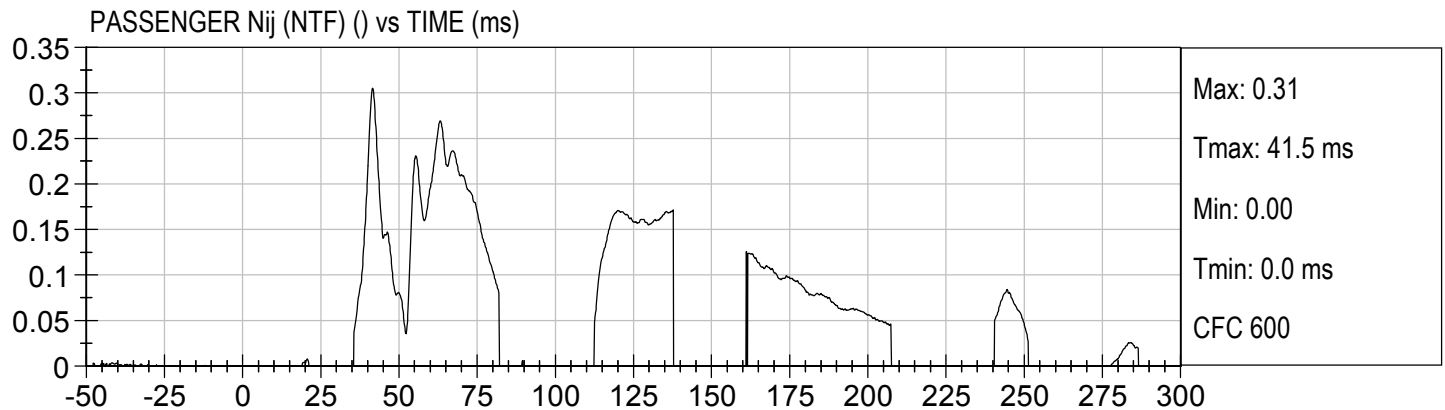


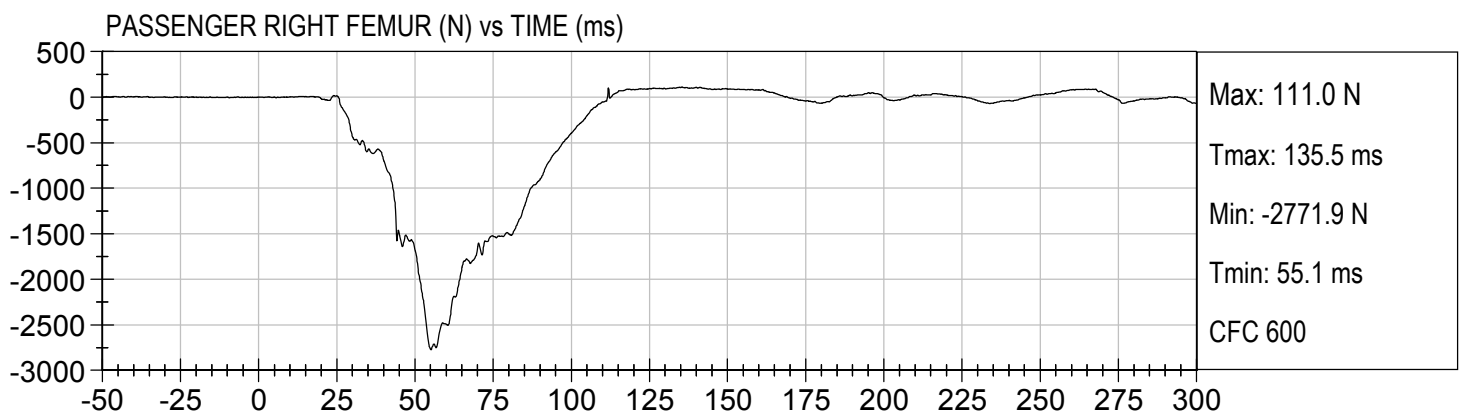
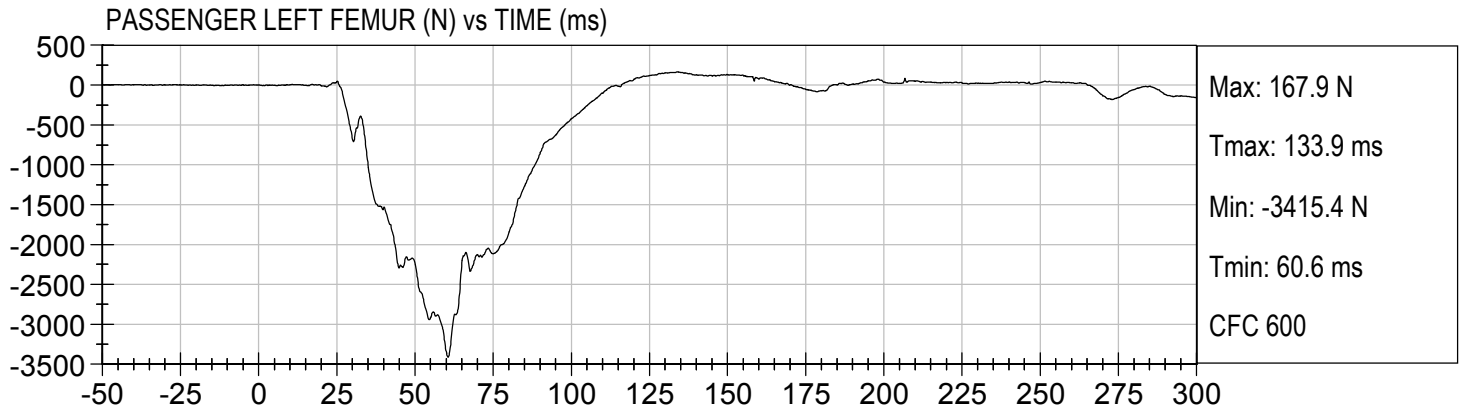












APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

Hybrid III, 50th External Measurements
SN: 351

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	34.8
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	5.5
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	3.3-3.7	3.5
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	5.5-6.1	6.0
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	11.8
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	13.3
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	7.5-8.3	7.8
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	17.0
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	18.8

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	8.5
P	FOOT LENGTH	Tip of toe to rear of heel	9.9-10.5	10.3
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	16.3-17.2	16.5
W	FOOT BREADTH	The widest part of the foot	3.6-4.2	4.0
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 16.9-17.1 in. above seat surface	38.2-39.4	39.2
Z	WAIST CIRCUMFERENCE	Measured 8.9-9.1 in. above seat surface	32.9-34.1	33.7
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

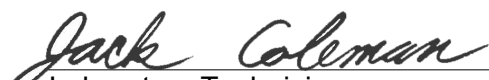
NOTE: THE H-POINT IS LOCATED 1.83 INCHES FORWARD AND 2.57 INCHES DOWN FROM THE CENTER OF THE PELVIS ANGLE REFERENCE HOLE.

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

ATD Serial No: 351

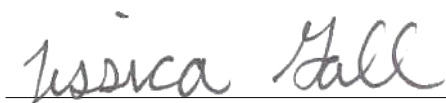
Test ID: D151601

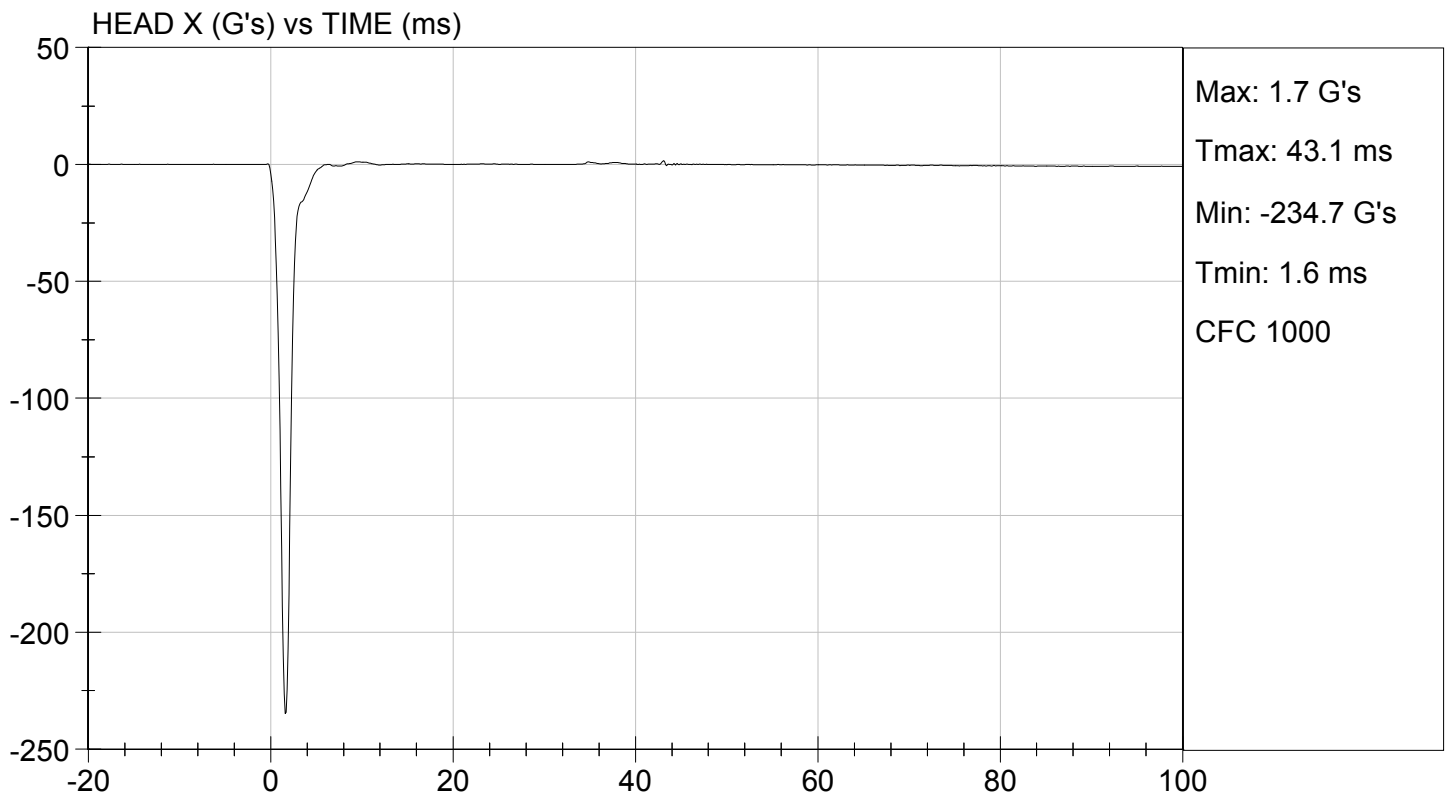
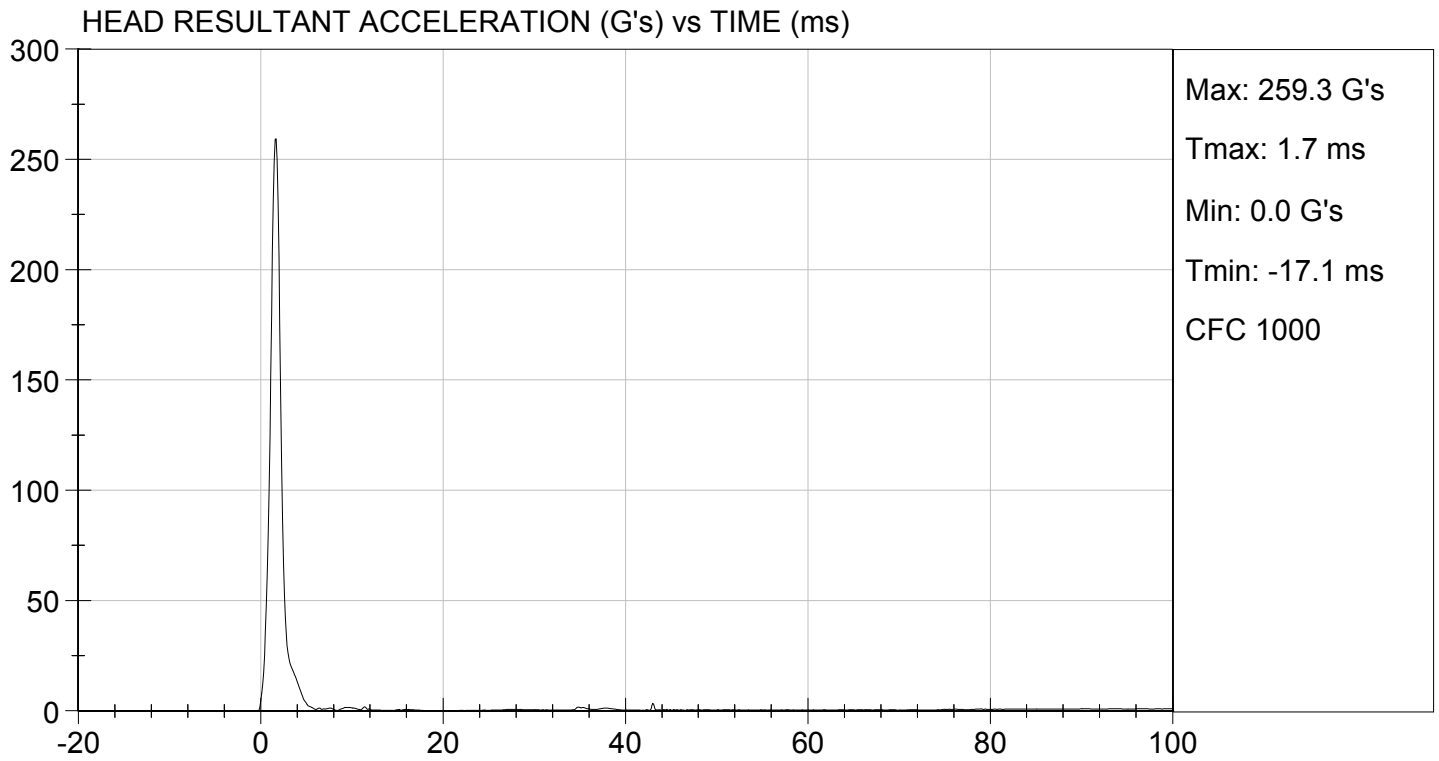
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Peak Resultant Acceleration	G's	225 to 275	259	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	6.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

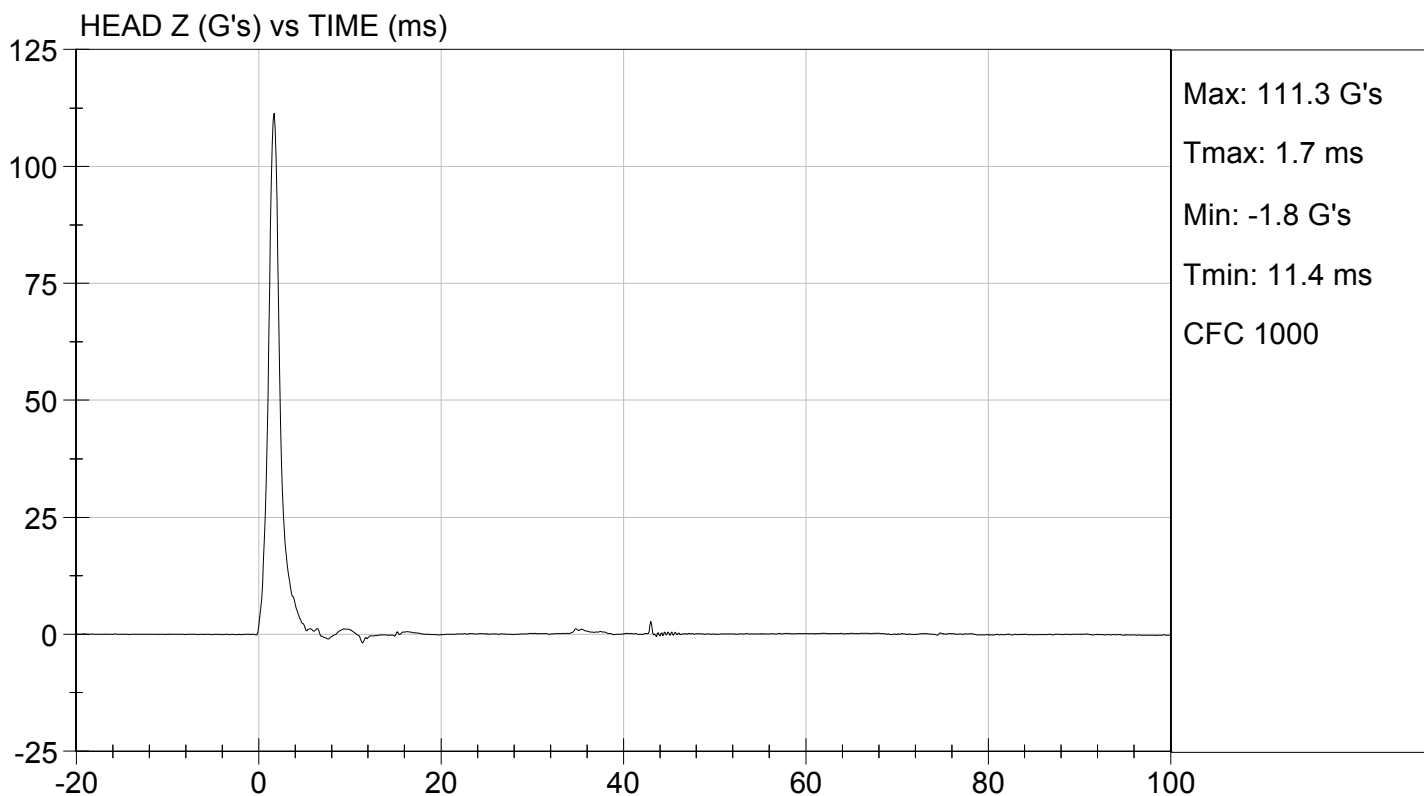
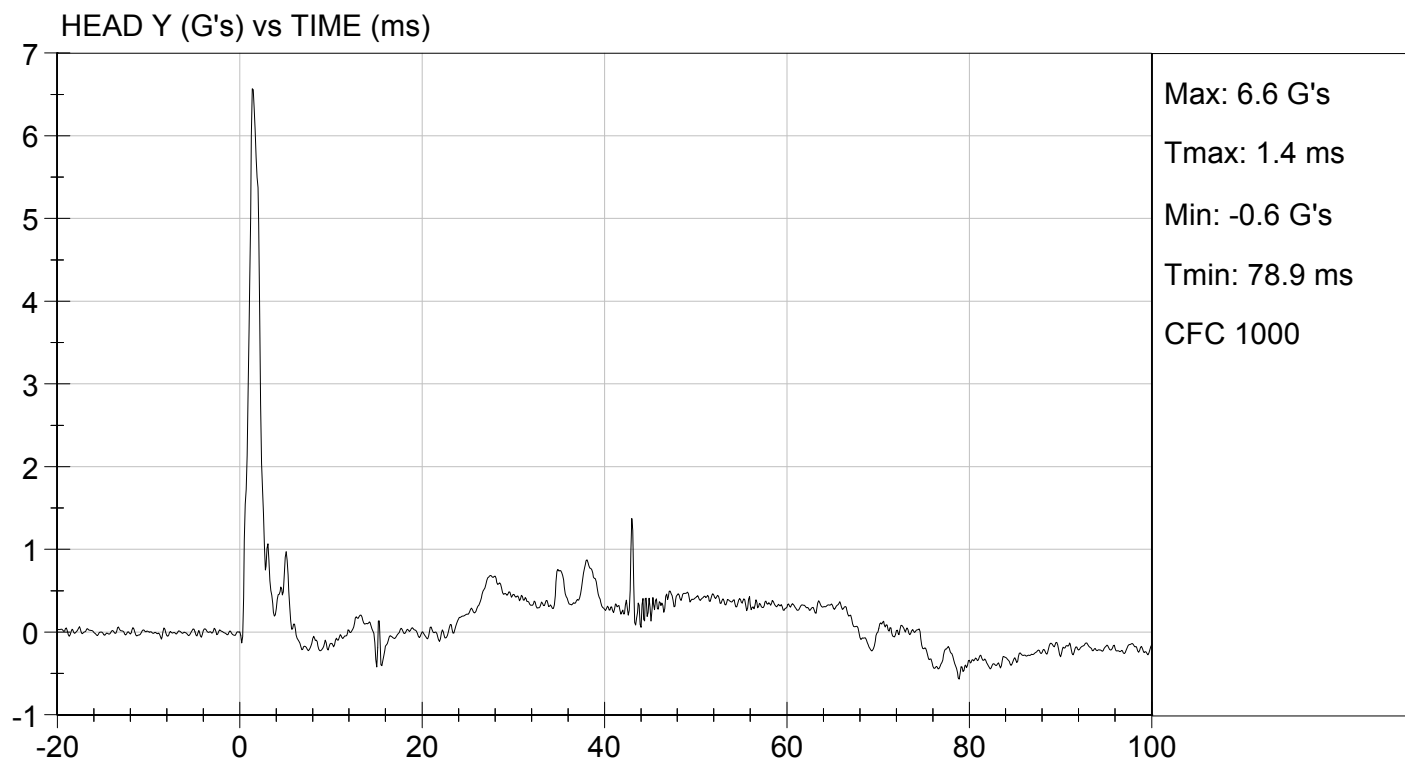

Laboratory Technician

06/08/2015

Test Date


Approved By



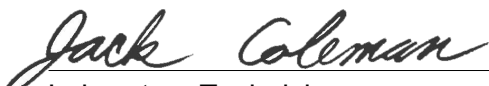


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

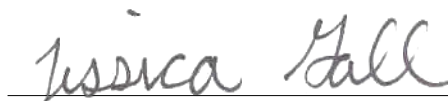
ATD Serial No: 351

Test I.D: D151602

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.72	Pass
	20 ms	G's	17.60 to 22.60	19.92	Pass
	30 ms	G's	12.50 to 18.50	14.55	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.4	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	37.9	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	71.0	Pass
	Time	ms	57.0 to 64.0	59.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	116.4	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	90.3	Pass
	Time	ms	47.0 to 58.0	51.0	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	103.9	Pass
Overall Test Results					Pass


 Laboratory Technician

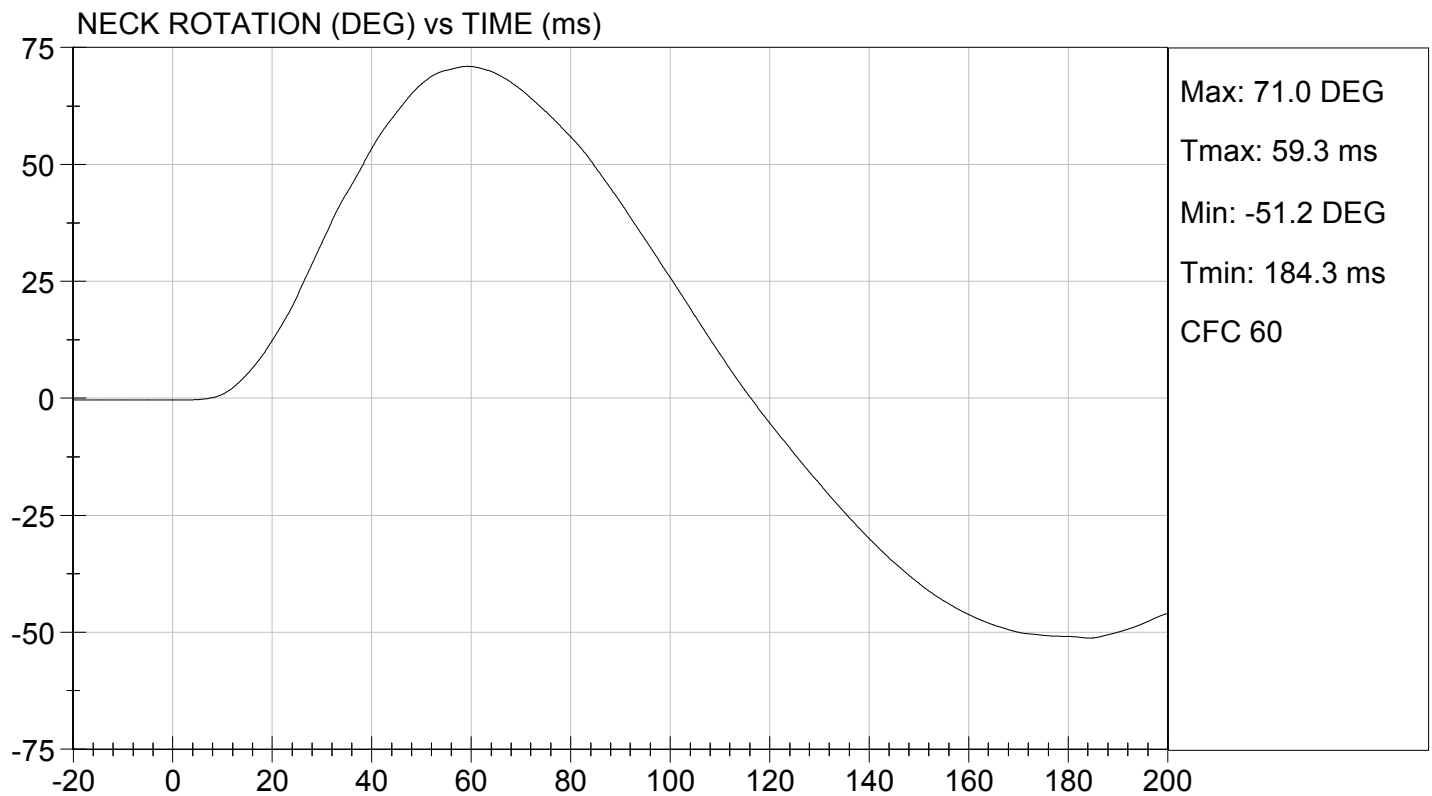
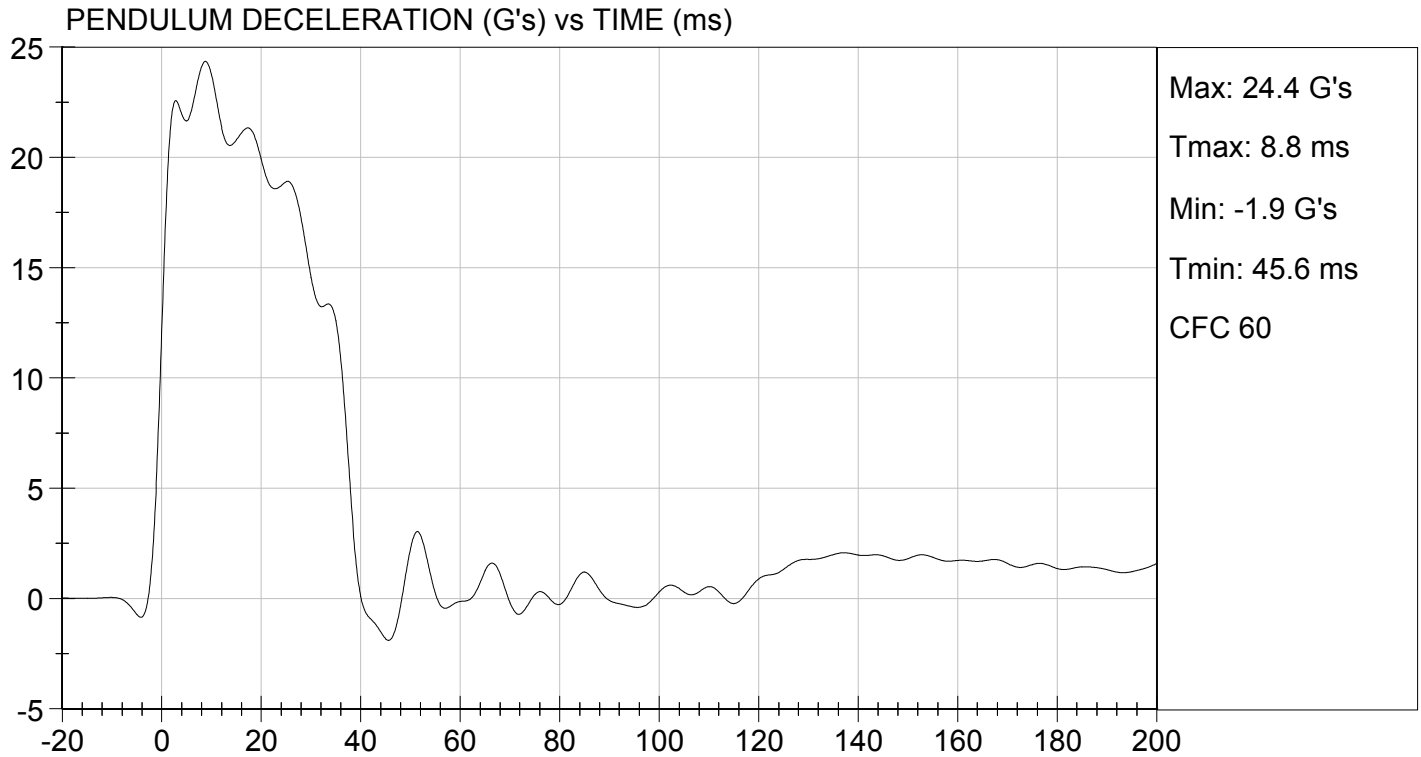
06/09/2015
 Test Date


 Approved By



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

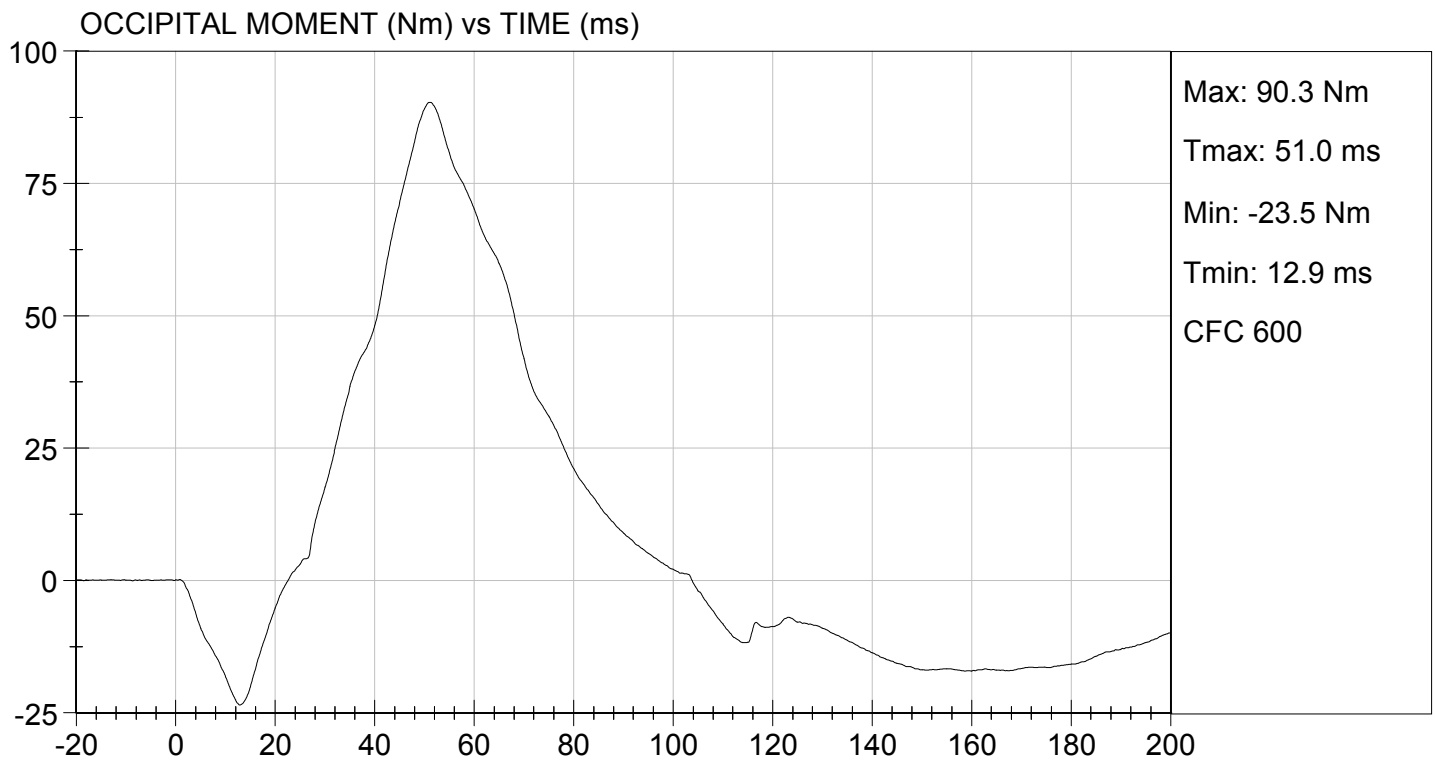
TEST DATE: 06/09/2015
TEST #: D151602





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

TEST DATE: 06/09/2015
TEST #: D151602



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

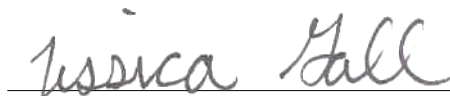
ATD Serial No: 351

Test I.D: D151603

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.06	Pass
	20 ms	G's	14.00 to 19.00	16.07	Pass
	30 ms	G's	11.00 to 16.00	12.01	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.2	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	98.7	Pass
	Time	ms	72.0 to 82.0	77.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	162.2	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-60.3	Pass
	Time	ms	65.0 to 79.0	71.9	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	148.0	Pass
Overall Test Results					Pass


 Laboratory Technician

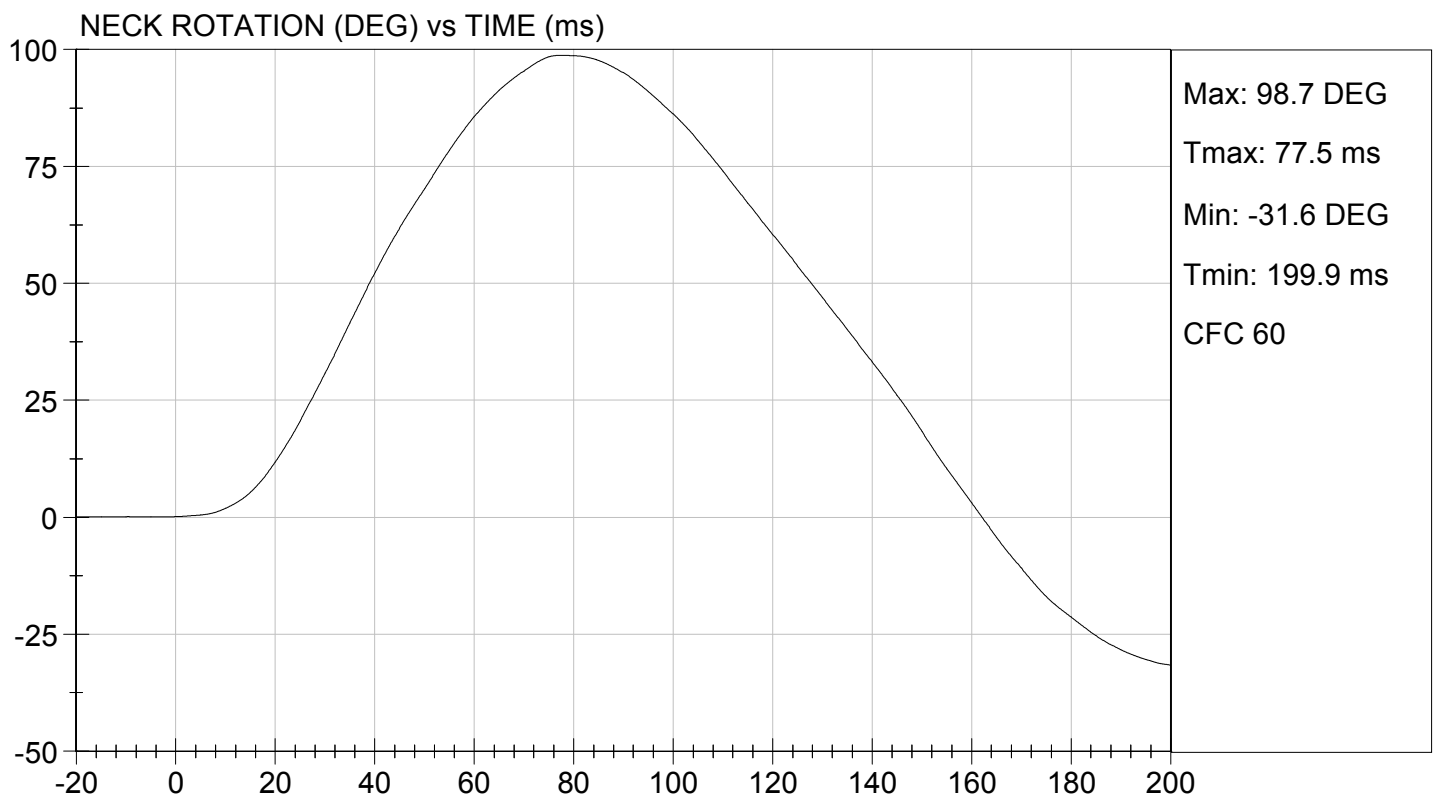
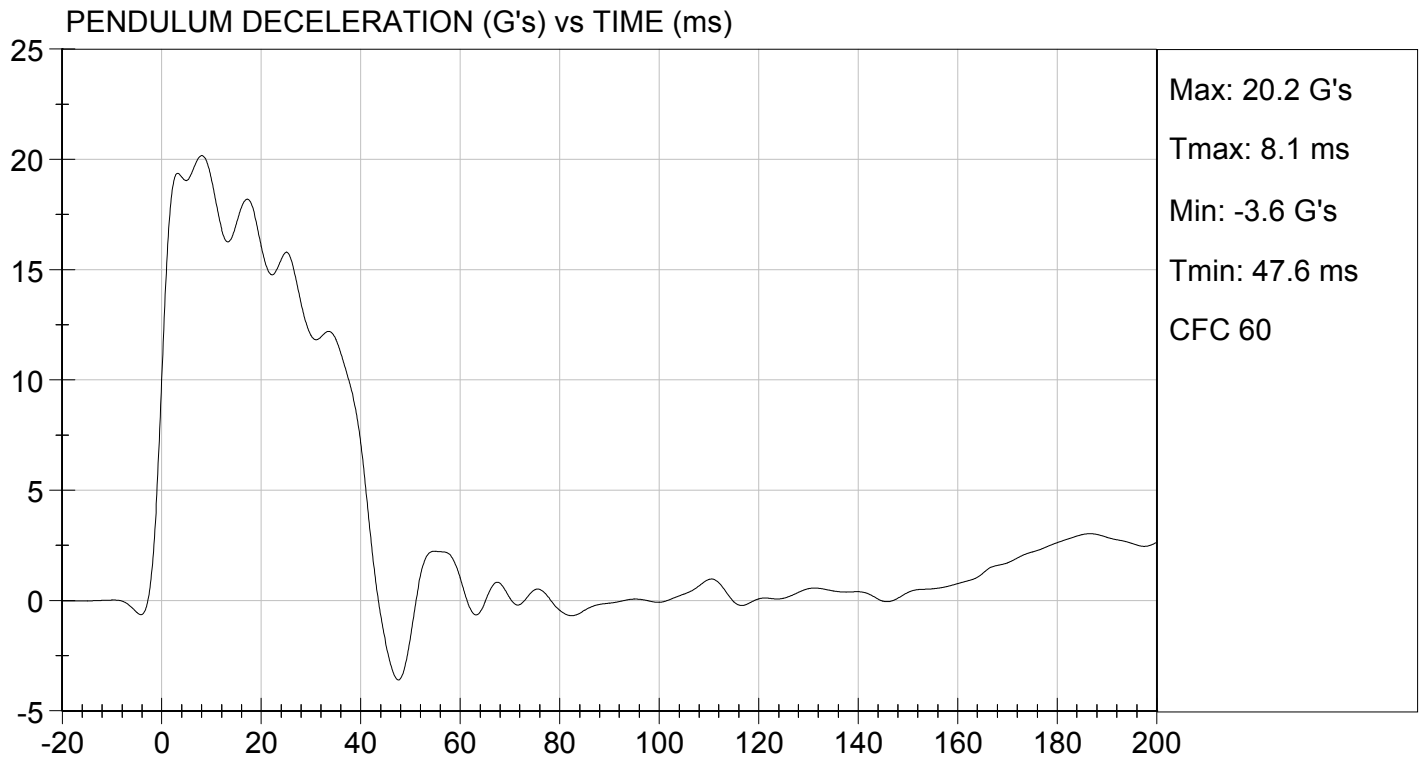
06/09/2015
 Test Date


 Approved By



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

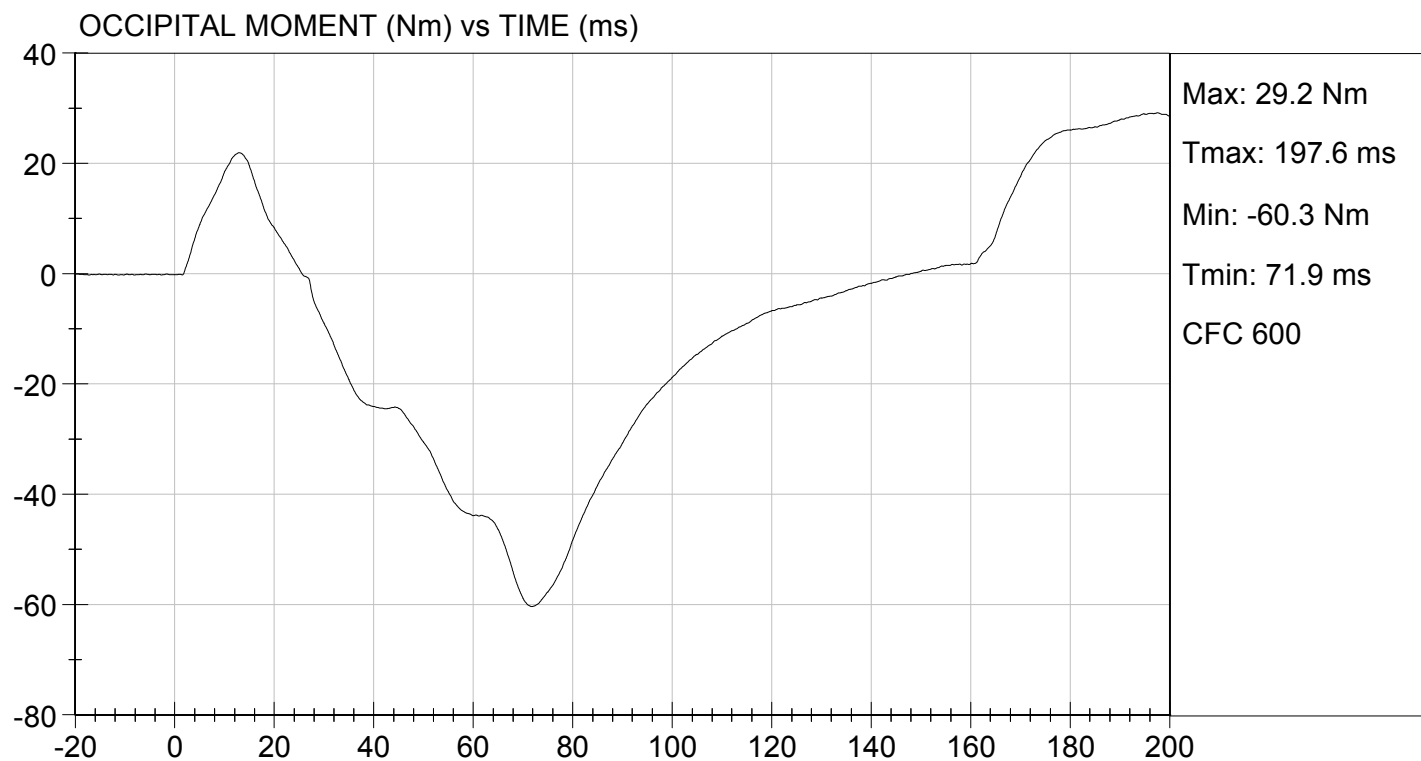
TEST DATE: 06/09/2015
TEST #: D151603





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

TEST DATE: 06/09/2015
TEST #: D151603



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D151604

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,414	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.95	Pass
Internal Hysteresis	%	69 to 85	69	Pass
			Overall Test Results	Pass

David Schoedel
Laboratory Technician

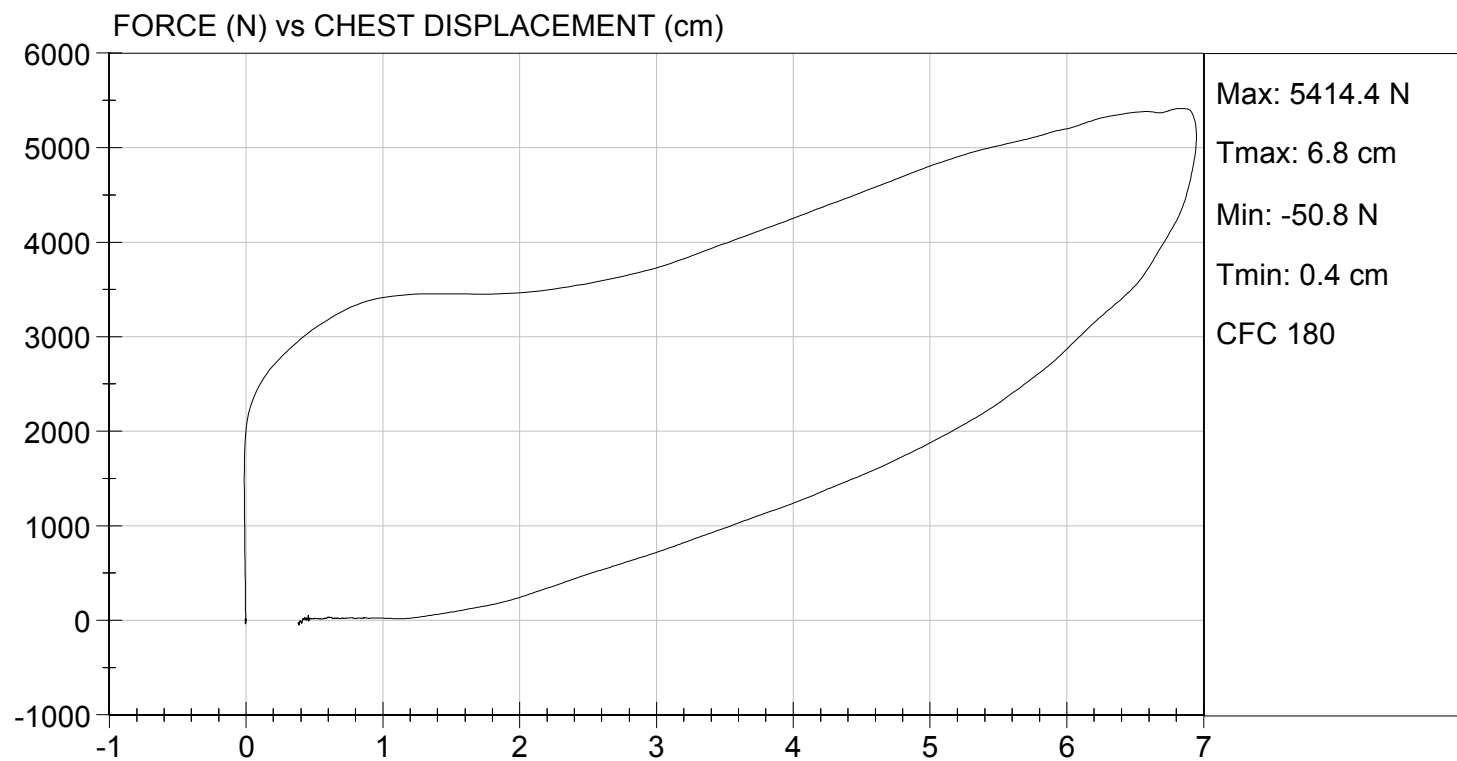
06/09/2015
Test Date

Jessica Hall
Approved By



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

TEST DATE: 06/09/2015
TEST #: D151604



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

ATD Serial No: 351

Test I.D: D151605

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	N	4715 to 5782	5,238	Pass
Overall Test Results				Pass

Maxime Chamberland
Laboratory Technician

06/09/2015

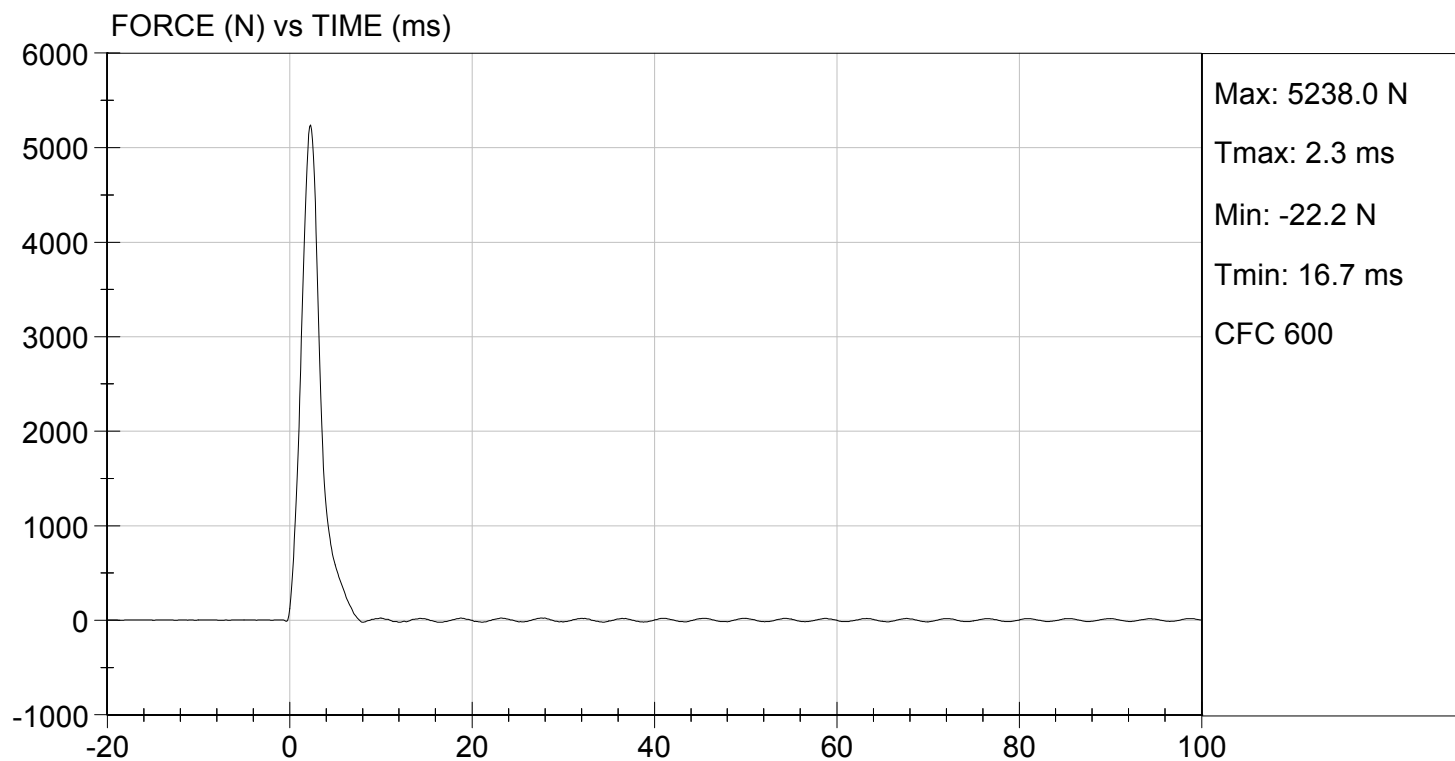
Test Date

Jessica Hall
Approved By



TEST DESC: RIGHT KNEE
VELOCITY: 6.83 ft/s, 2.08 m/s

TEST DATE: 06/09/2015
TEST #: D151605



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

ATD Serial No: 351

Test I.D: D151606

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,477	Pass
Overall Test Results				Pass

Maxime Chamberland
Laboratory Technician

06/09/2015

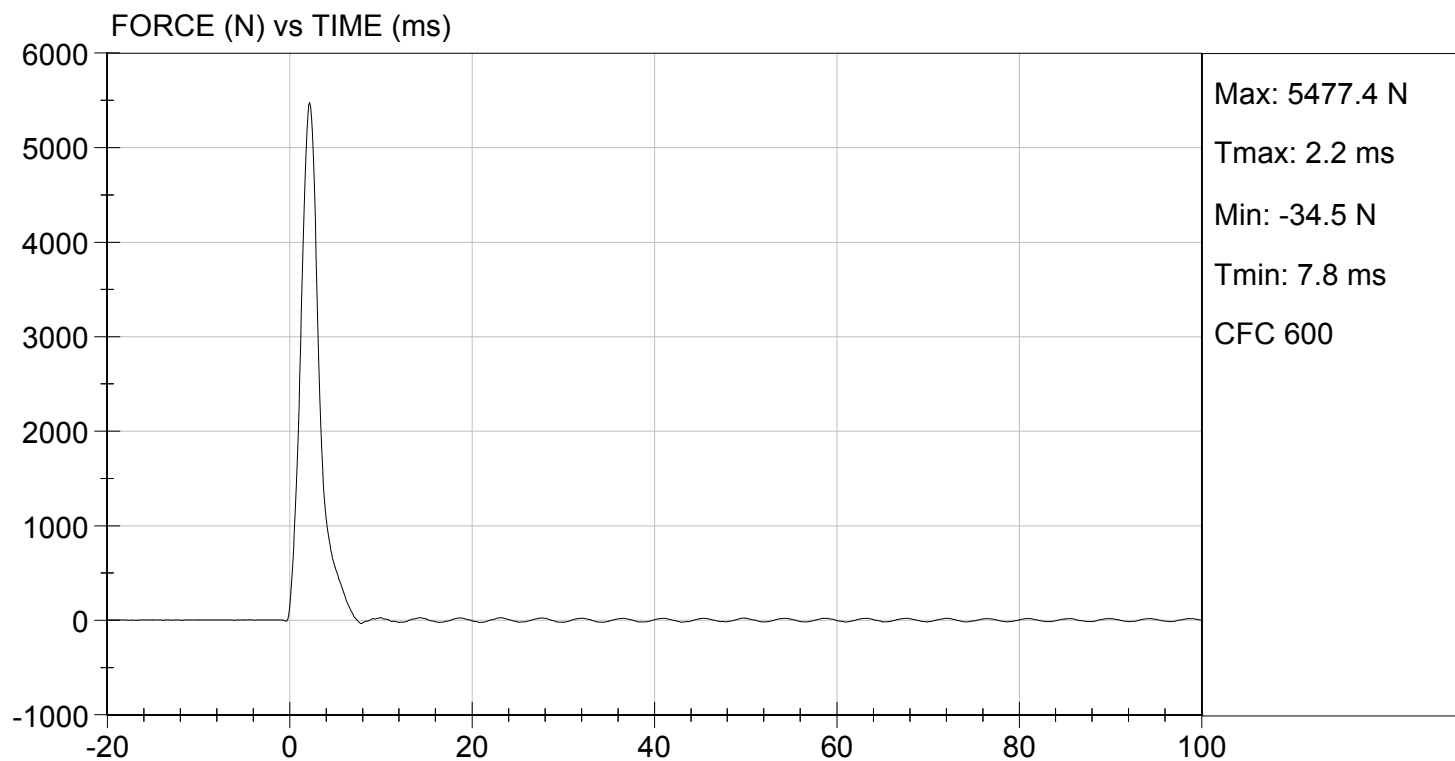
Test Date

Jessica Hall
Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.89 ft/s, 2.10 m/s

TEST DATE: 06/09/2015
TEST #: D151606



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

ATD Serial No: 351

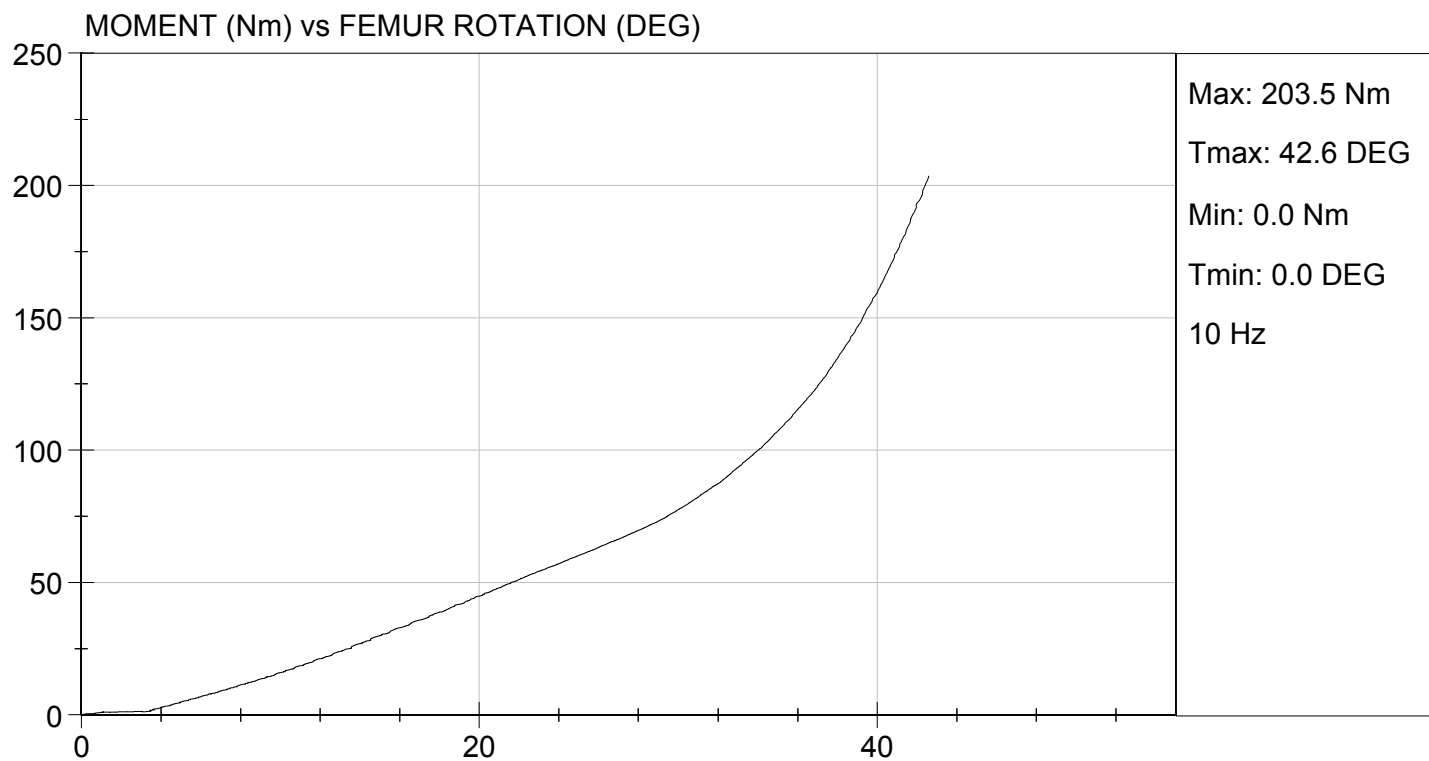
Test I.D: D151600

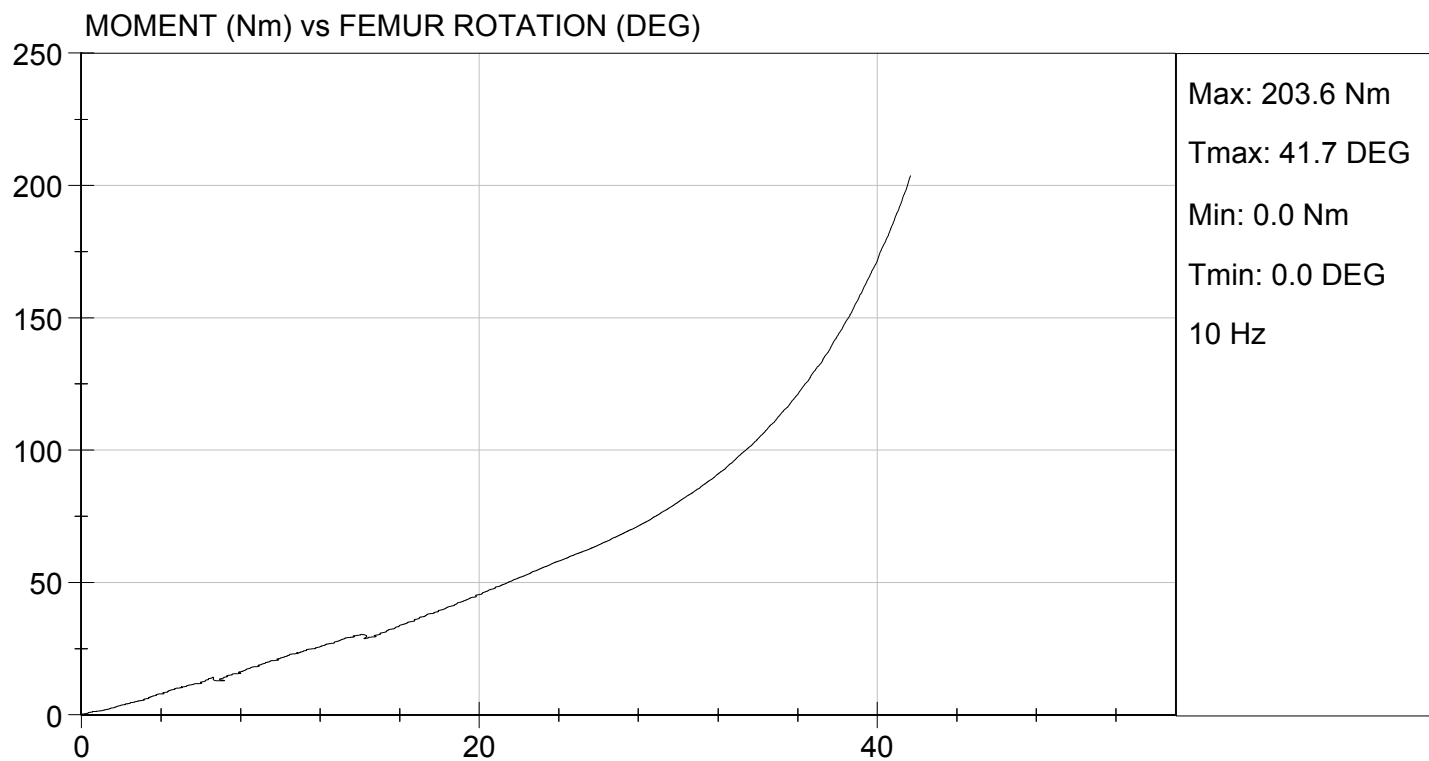
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.4	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	50	50	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.1	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	77.5	80.4	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	42.6	41.7	Pass
Overall Test Results					Pass

David Schoedel
Laboratory Technician

06/09/2015
Test Date

Jessica Hall
Approved By



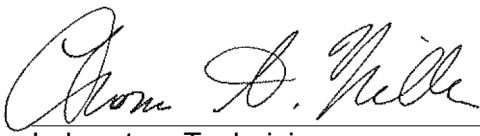


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 50TH PERCENTILE MALE

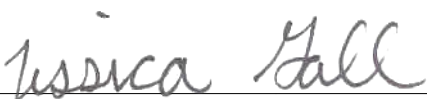
ATD Serial No: 351

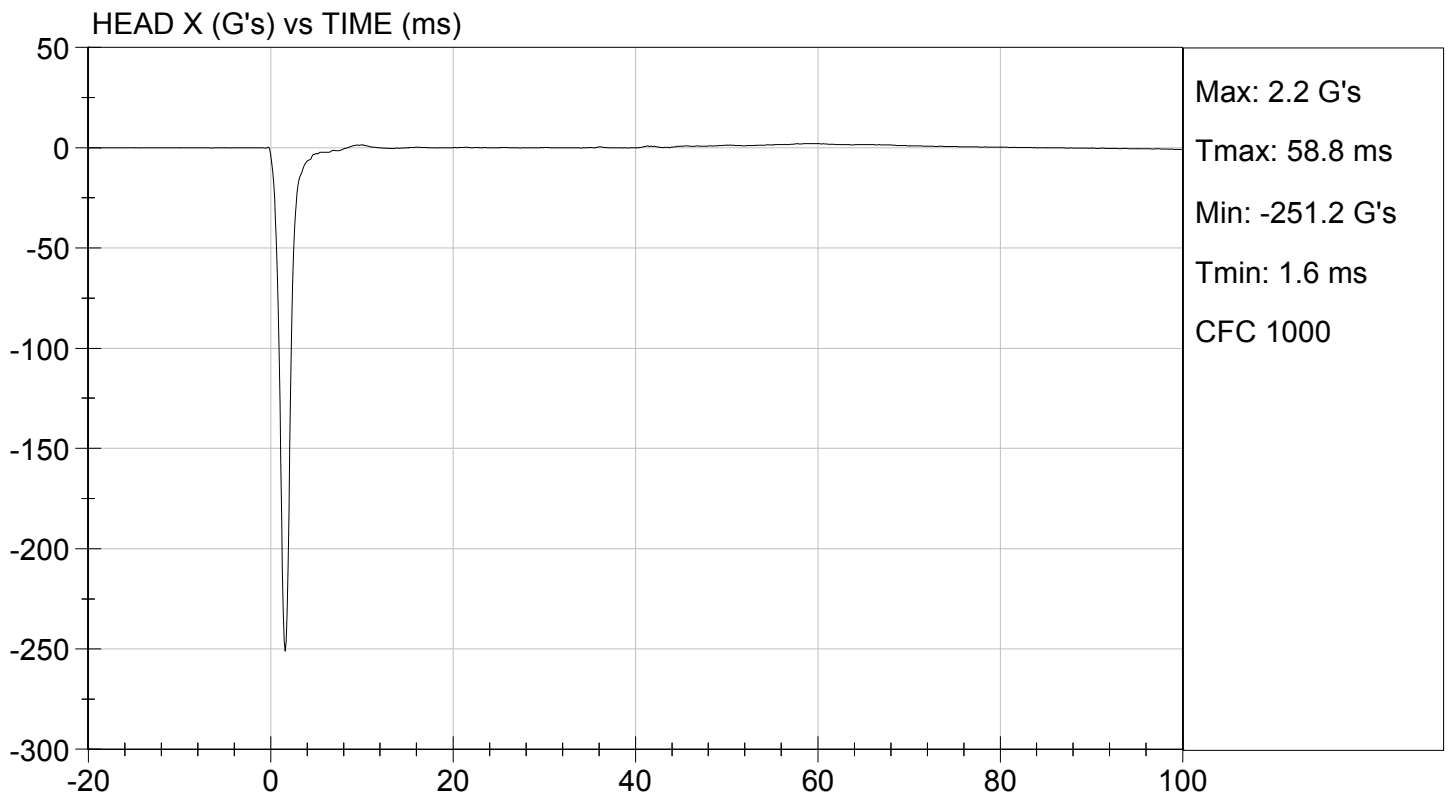
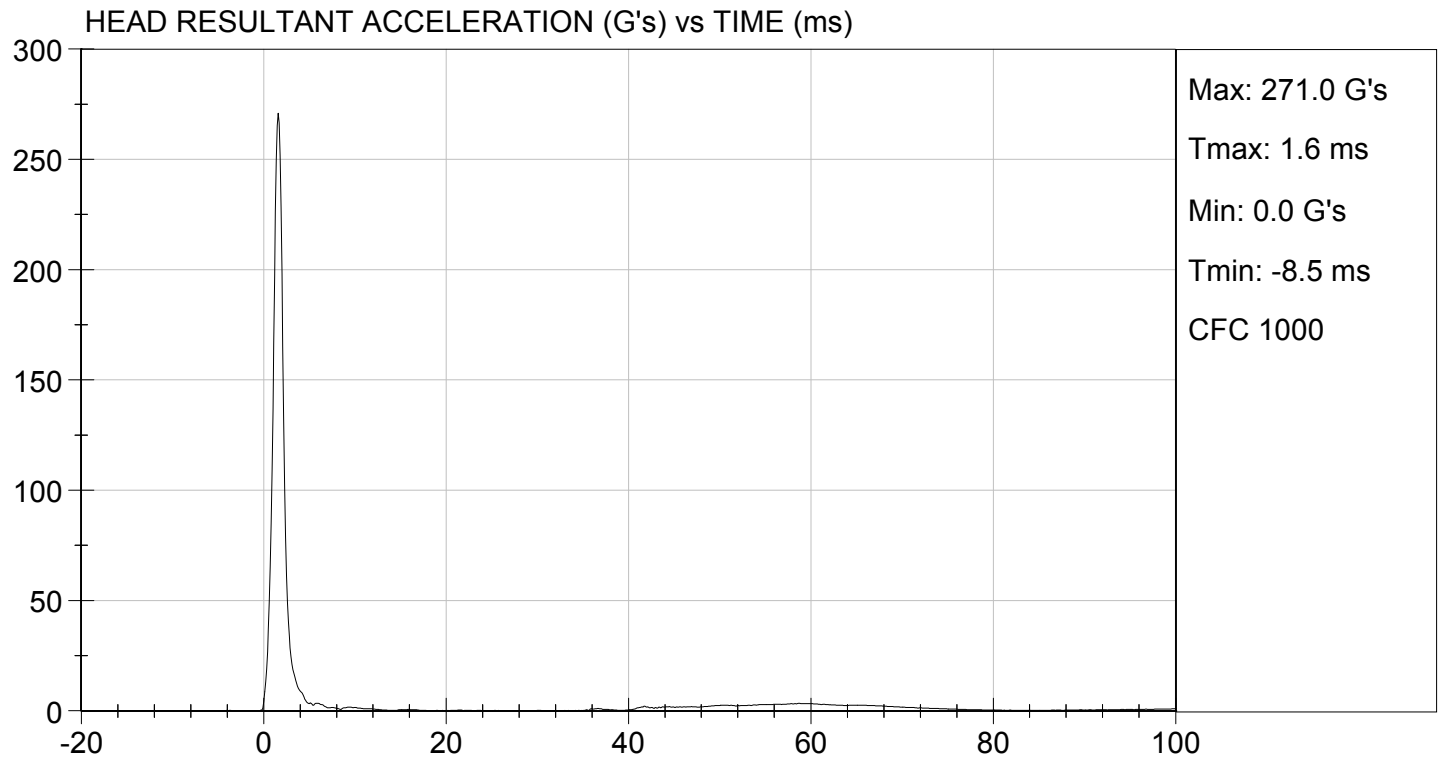
Test ID: D151731

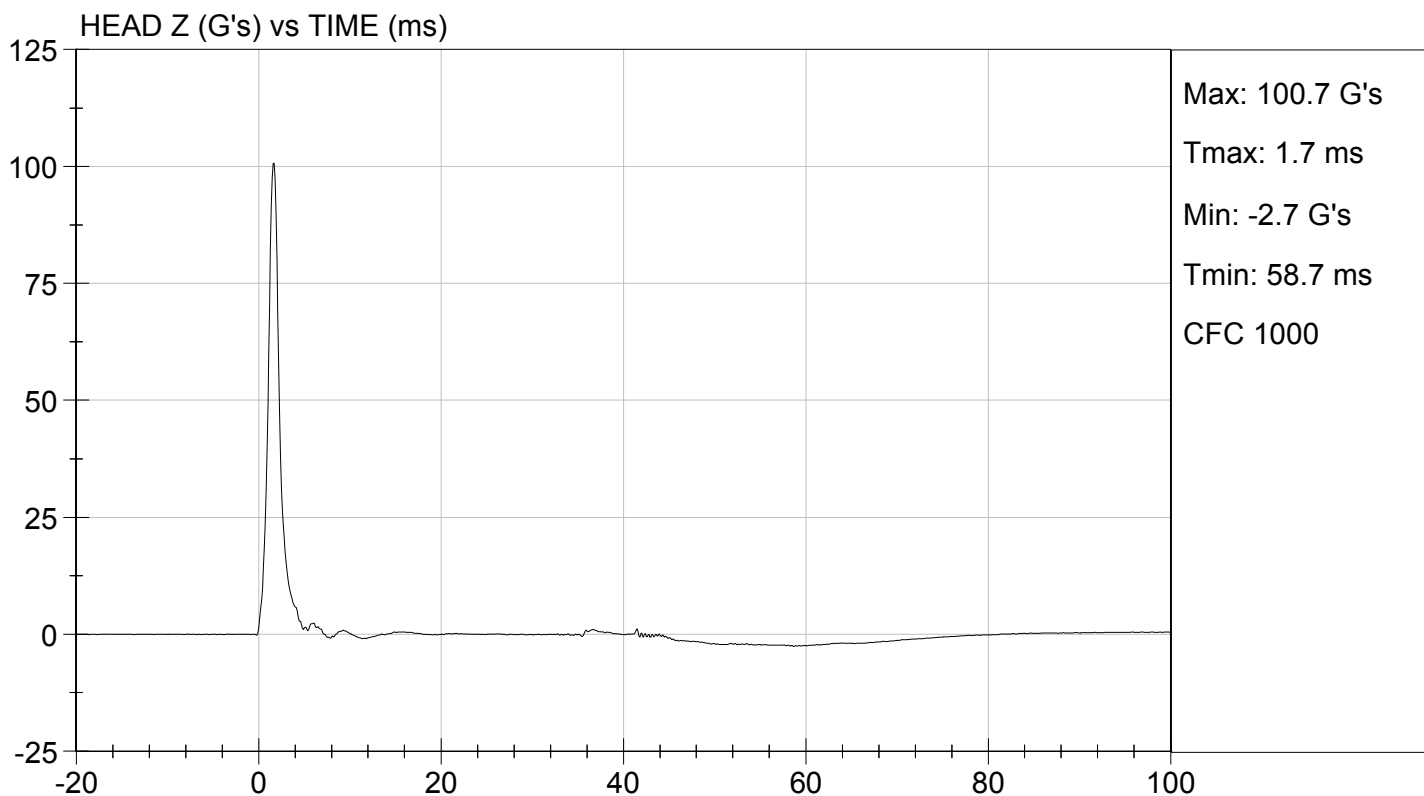
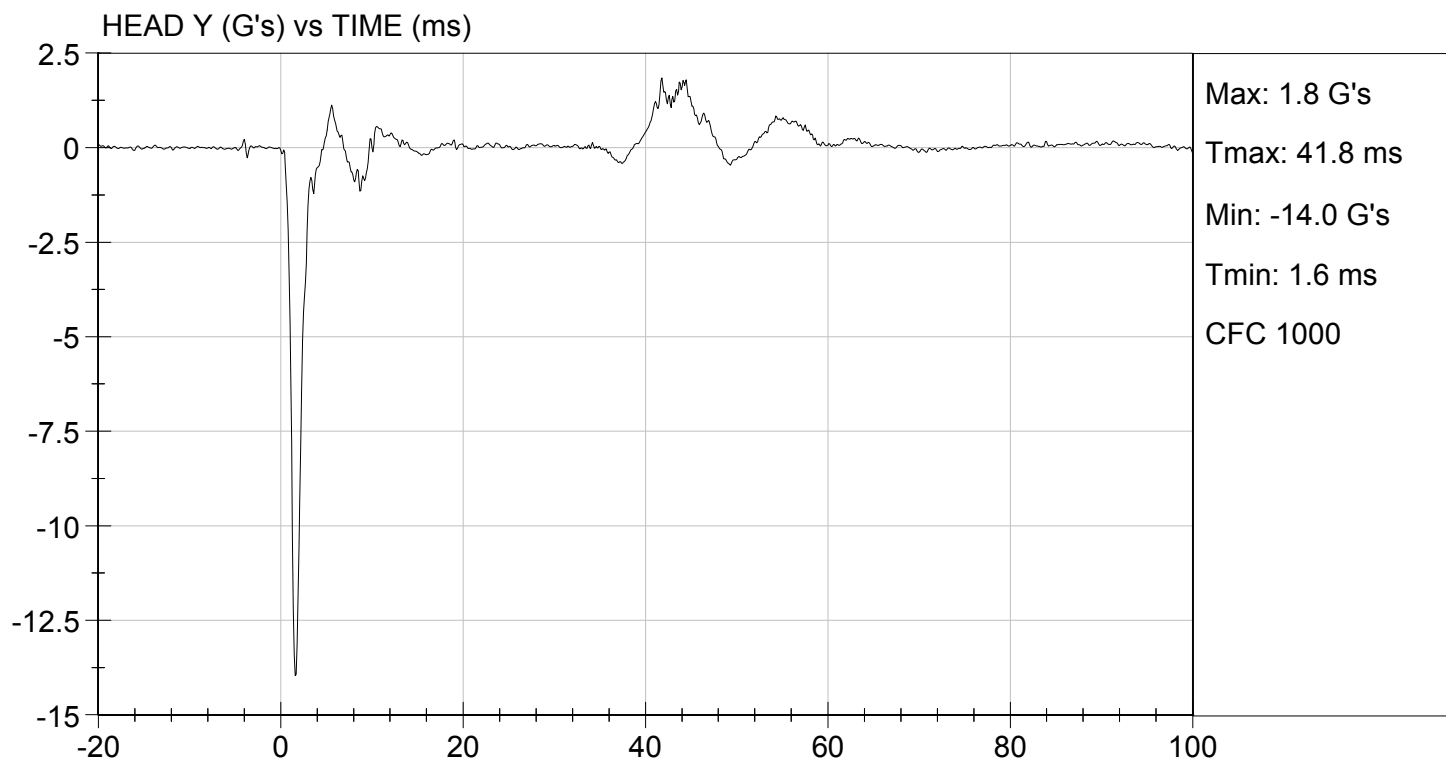
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Peak Resultant Acceleration	G's	225 to 275	271	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-14.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

06/16/2015
Test Date


Approved By





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

ATD Serial No: 351

Test I.D: D151732

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.96	Pass
	20 ms	G's	17.60 to 22.60	19.80	Pass
	30 ms	G's	12.50 to 18.50	12.63	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	39.5	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	70.3	Pass
	Time	ms	57.0 to 64.0	59.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	118.4	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	89.9	Pass
	Time	ms	47.0 to 58.0	52.3	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	104.8	Pass
Overall Test Results					Pass


 Laboratory Technician

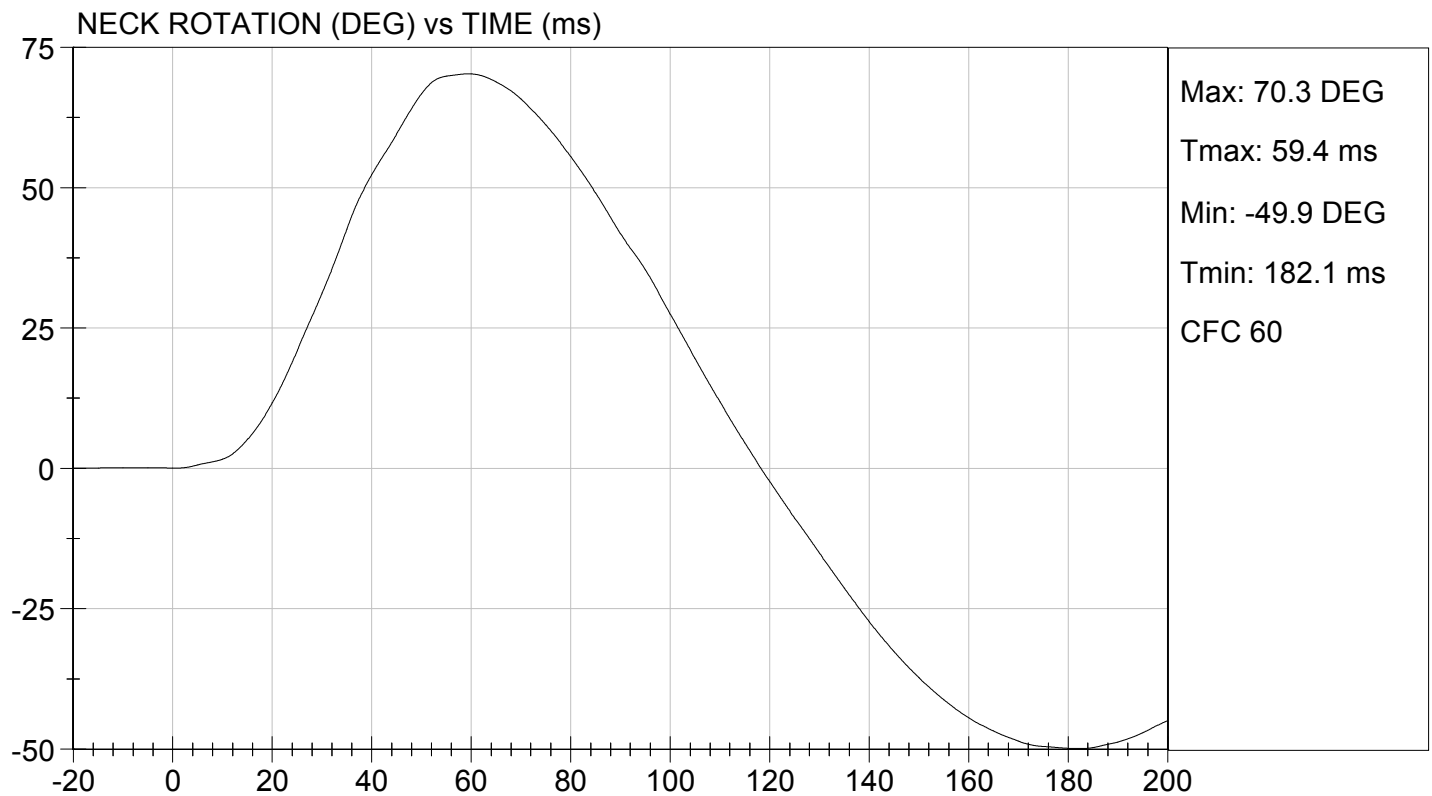
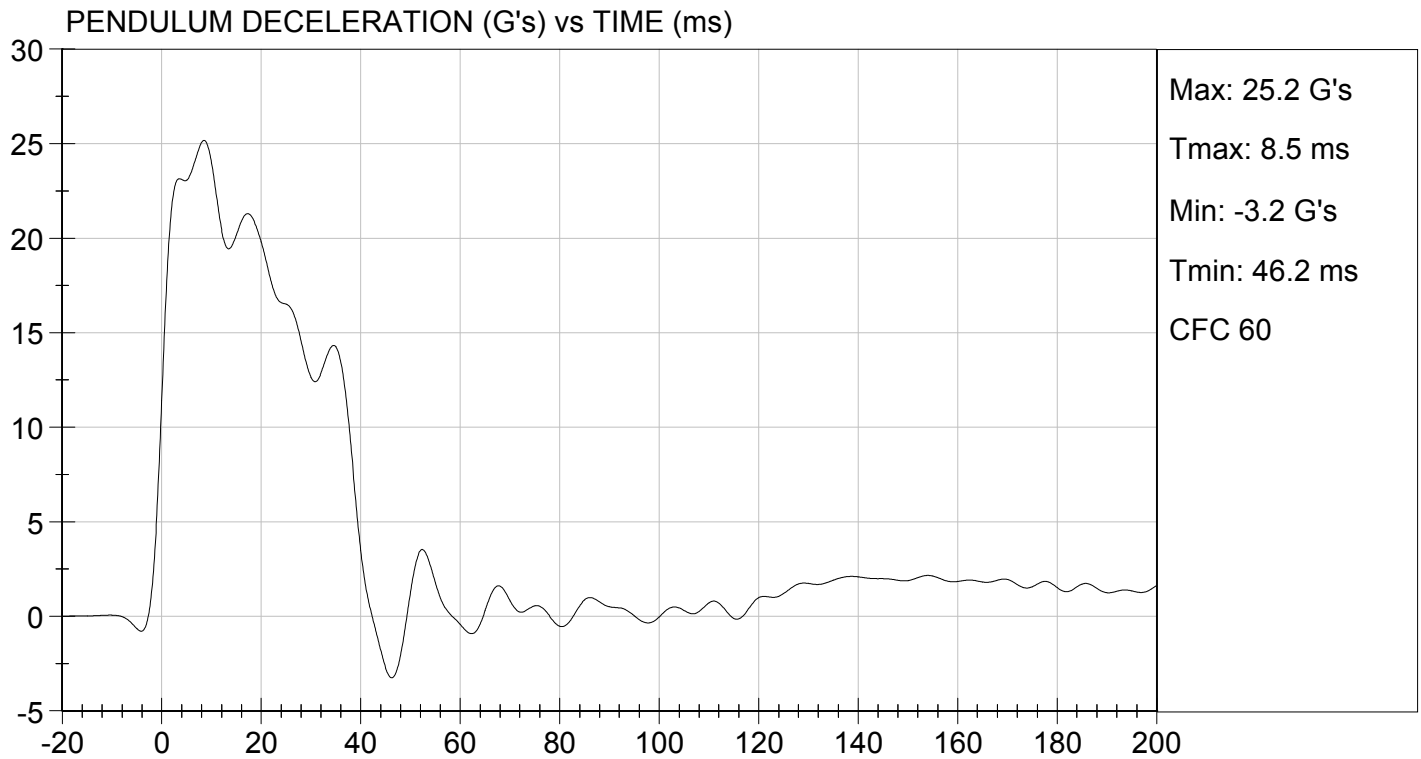
06/16/2015
 Test Date


 Approved By



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

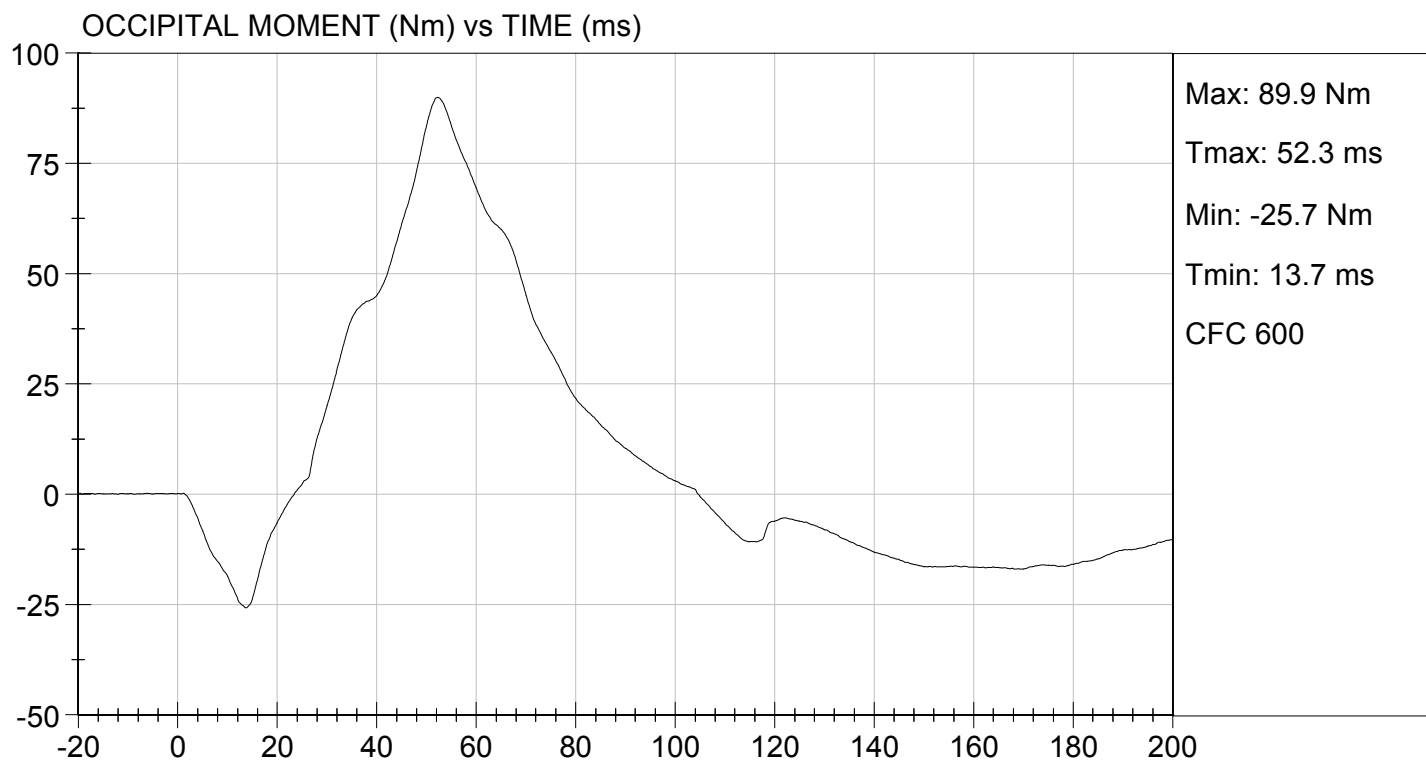
TEST DATE: 06/16/2015
TEST #: D151732





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

TEST DATE: 06/16/2015
TEST #: D151732



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

ATD Serial No: 351

Test I.D: D151733

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.17	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.94	Pass
	20 ms	G's	14.00 to 19.00	17.73	Pass
	30 ms	G's	11.00 to 16.00	12.67	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.1	Pass
	Time	ms	72.0 to 82.0	78.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	161.0	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-64.2	Pass
	Time	ms	65.0 to 79.0	71.1	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	147.0	Pass
Overall Test Results					Pass


 Laboratory Technician

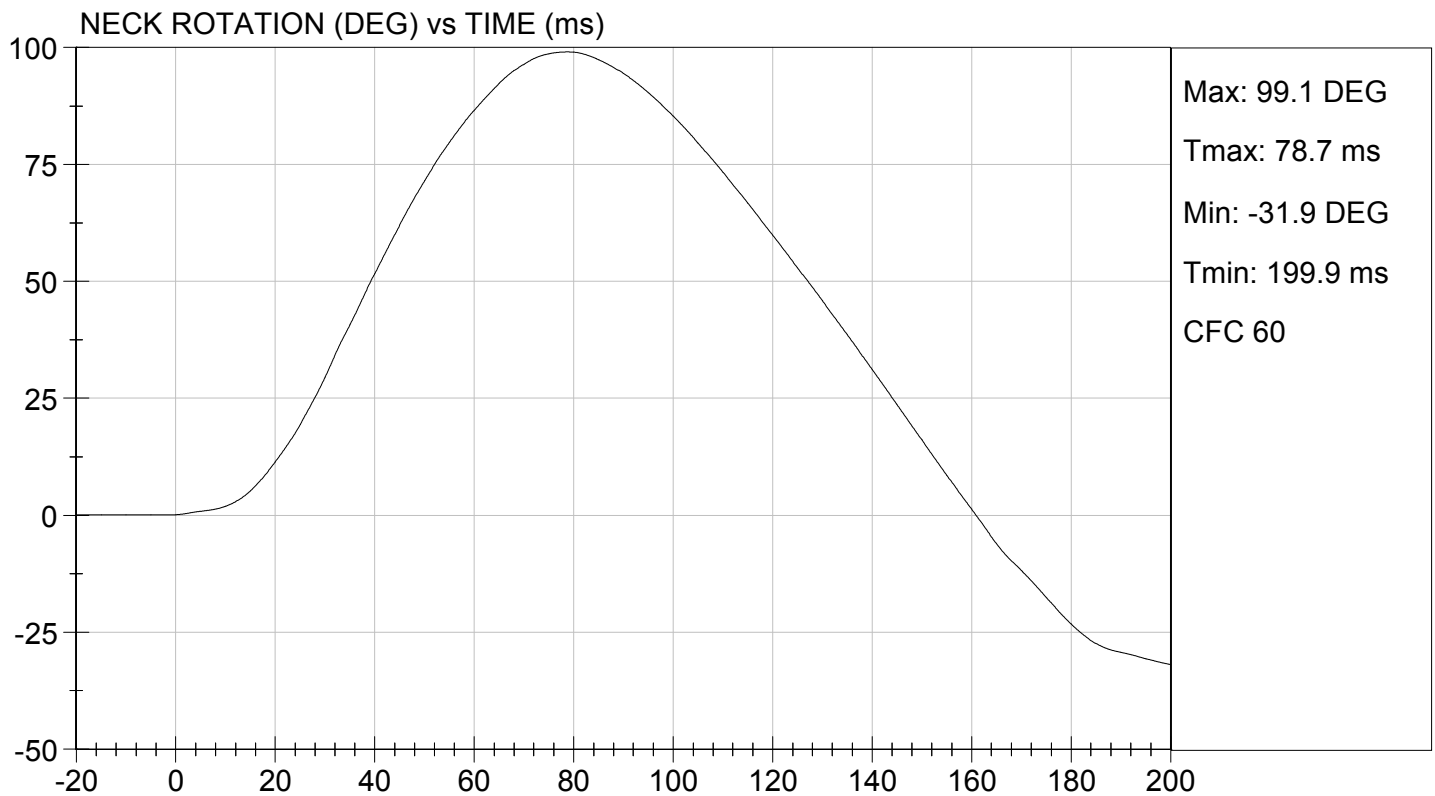
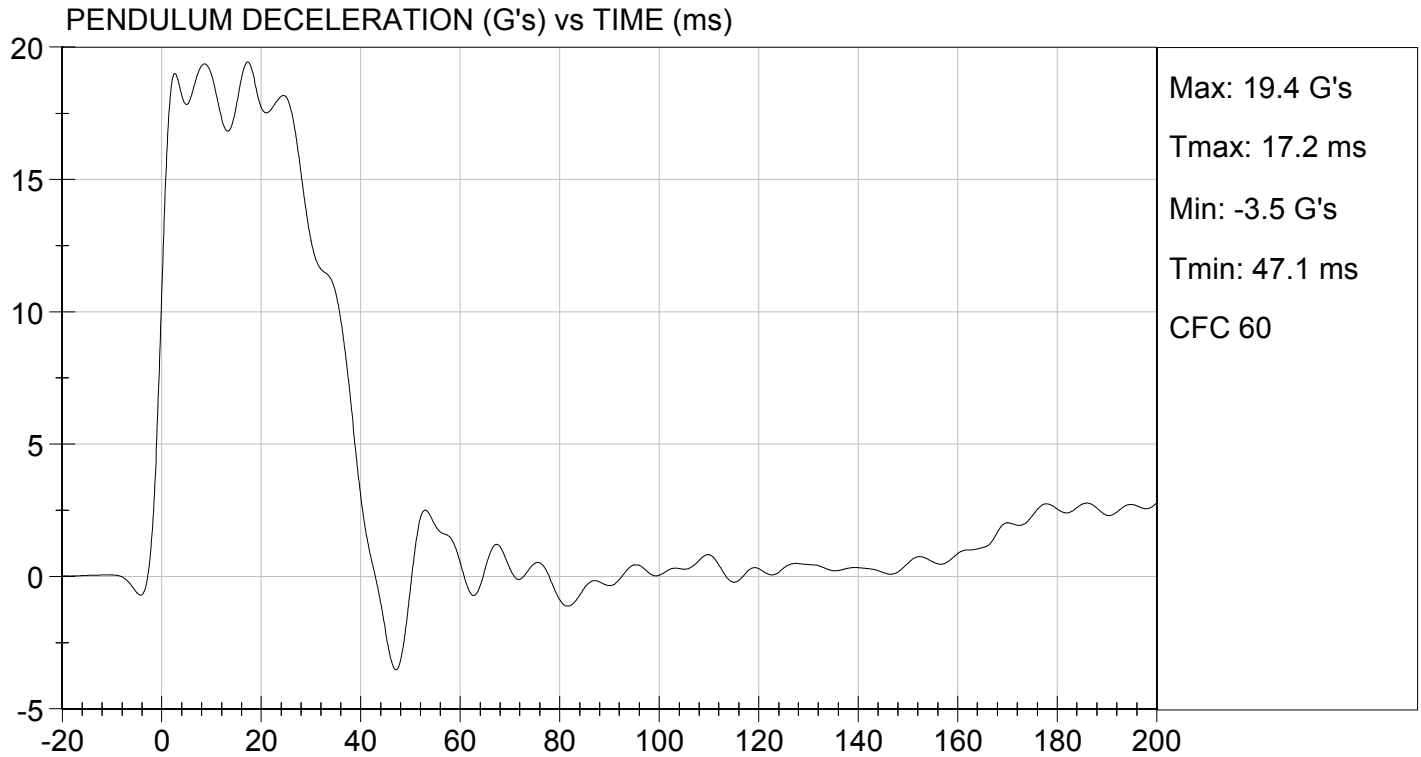
06/16/2015
 Test Date


 Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 20.23 ft/s, 6.17 m/s

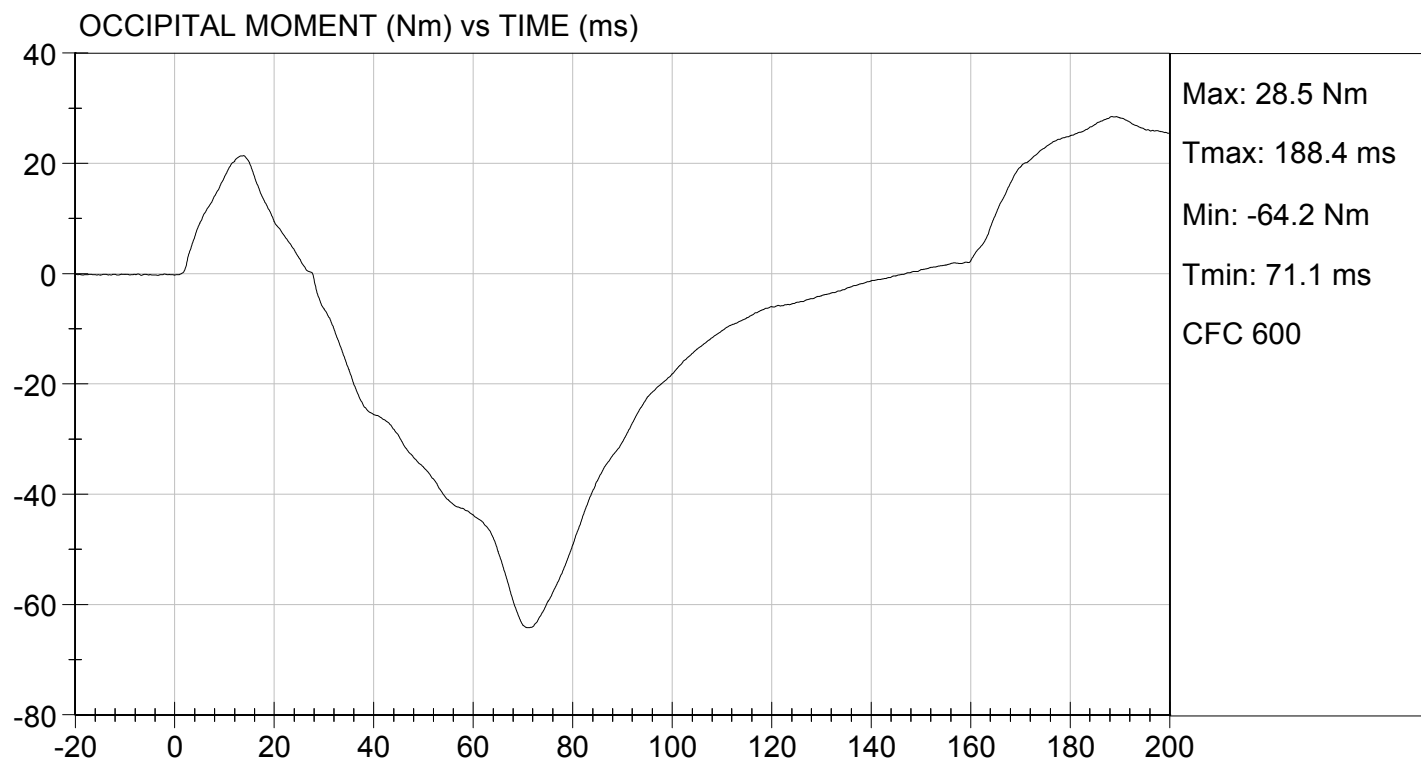
TEST DATE: 06/16/2015
TEST #: D151733





TEST DESC: NECK EXTENSION
VELOCITY: 20.23 ft/s, 6.17 m/s

TEST DATE: 06/16/2015
TEST #: D151733



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D151734

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,270	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.10	Pass
Internal Hysteresis	%	69 to 85	70	Pass
			Overall Test Results	Pass


Laboratory Technician

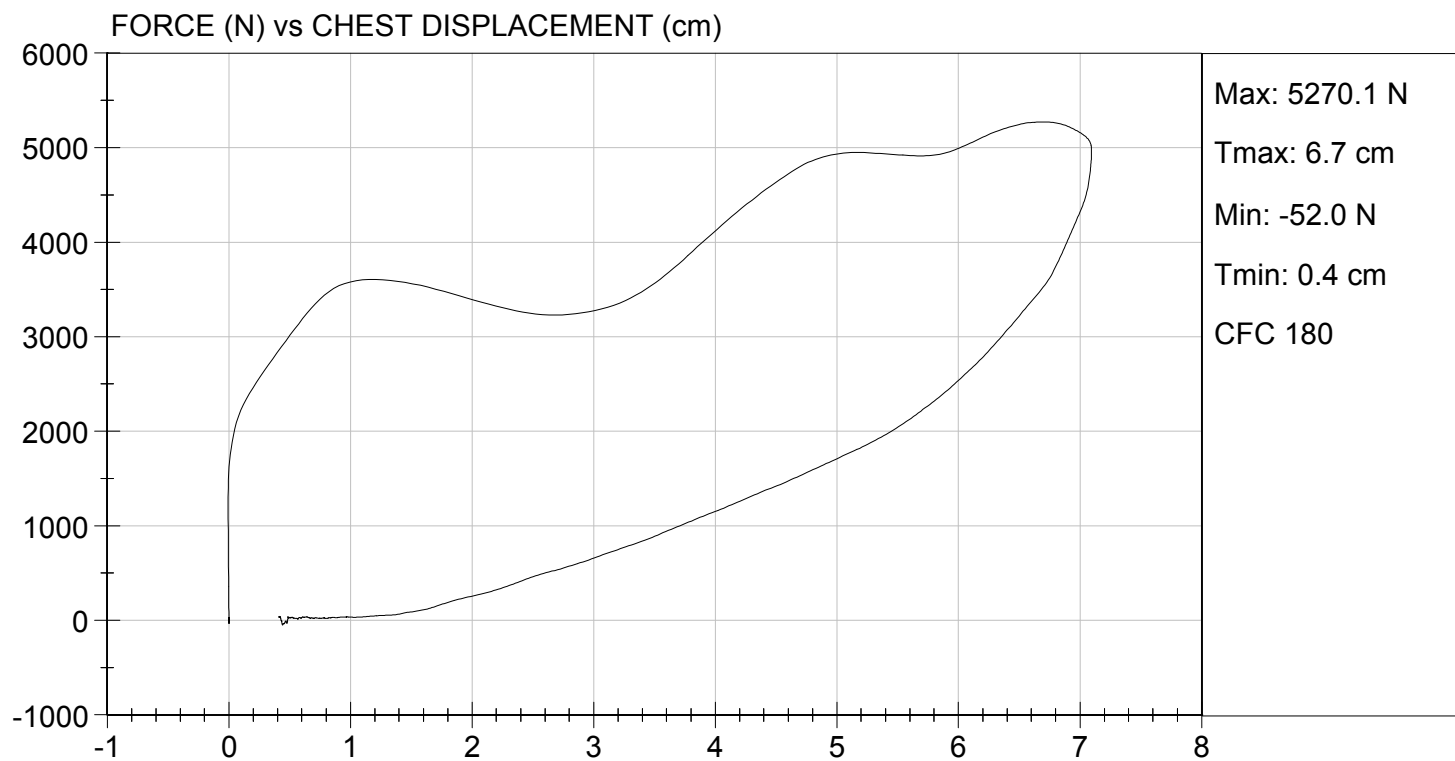
06/17/2015
Test Date


Approved By



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

TEST DATE: 06/17/2015
TEST #: D151734



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

ATD Serial No: 351

Test I.D: D151735

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,639	Pass
Overall Test Results				Pass


Laboratory Technician

06/17/2015

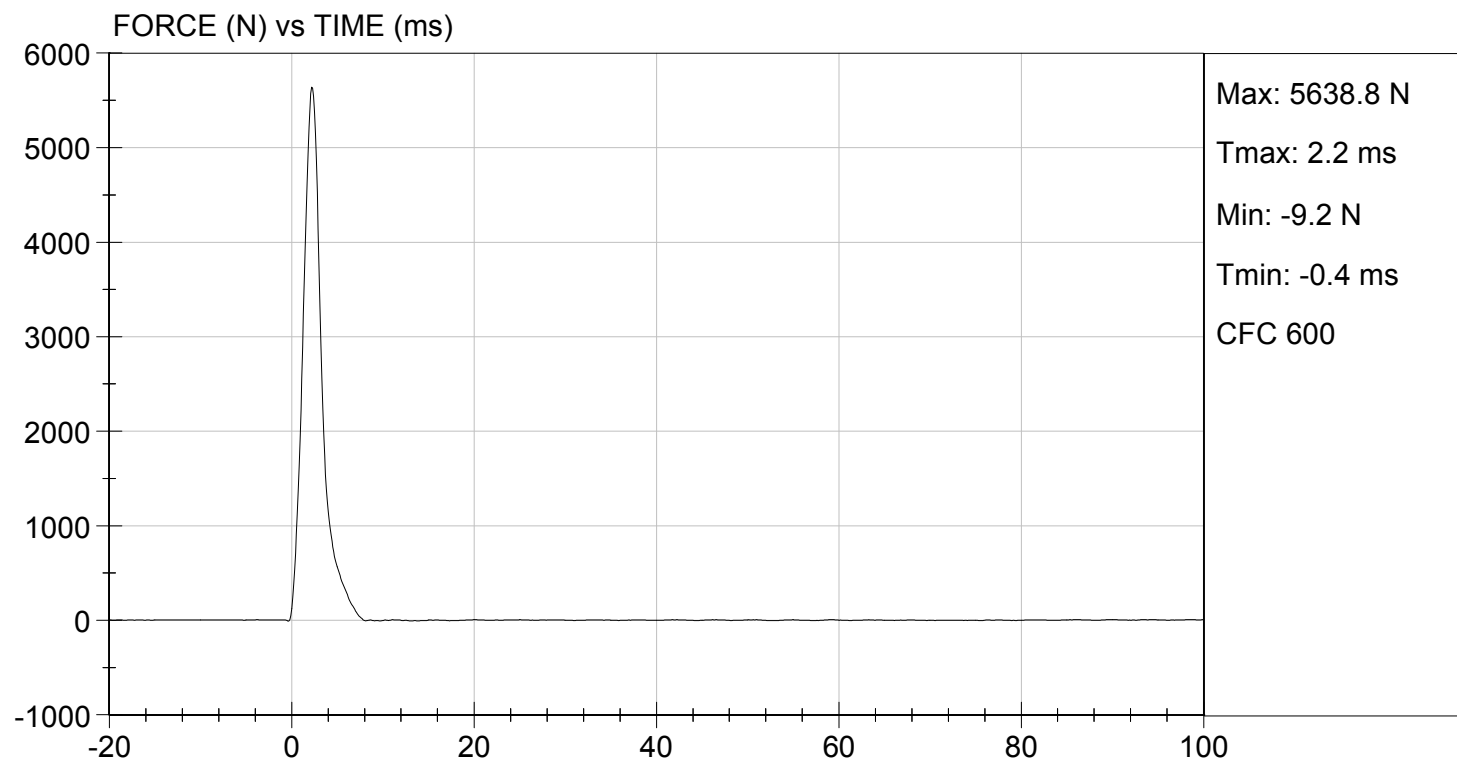
Test Date


Approved By



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

TEST DATE: 06/17/2015
TEST #: D151735



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

ATD Serial No: 351

Test I.D: D151736

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,361	Pass
Overall Test Results				Pass


Laboratory Technician

06/17/2015

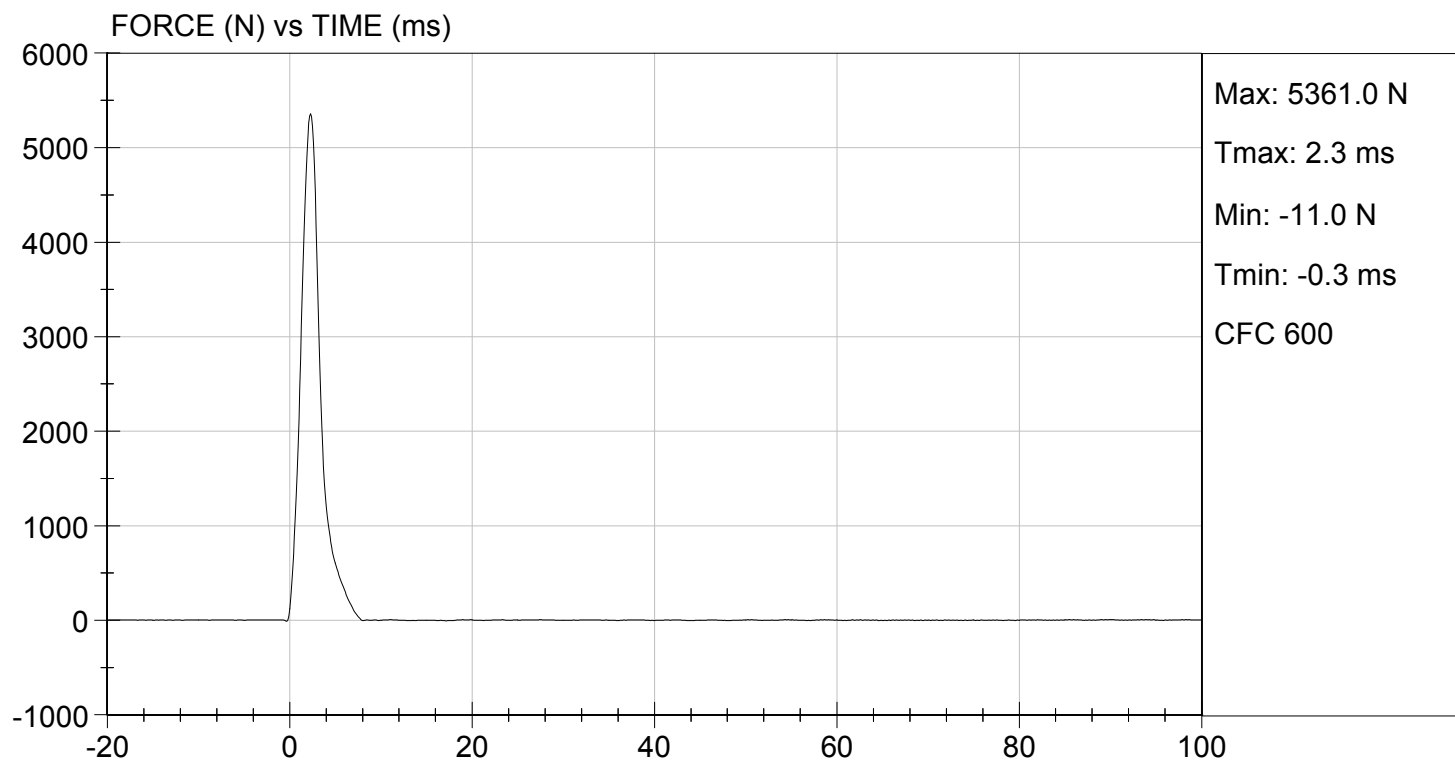
Test Date


Approved By



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

TEST DATE: 06/17/2015
TEST #: D151736



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

ATD Serial No: 351

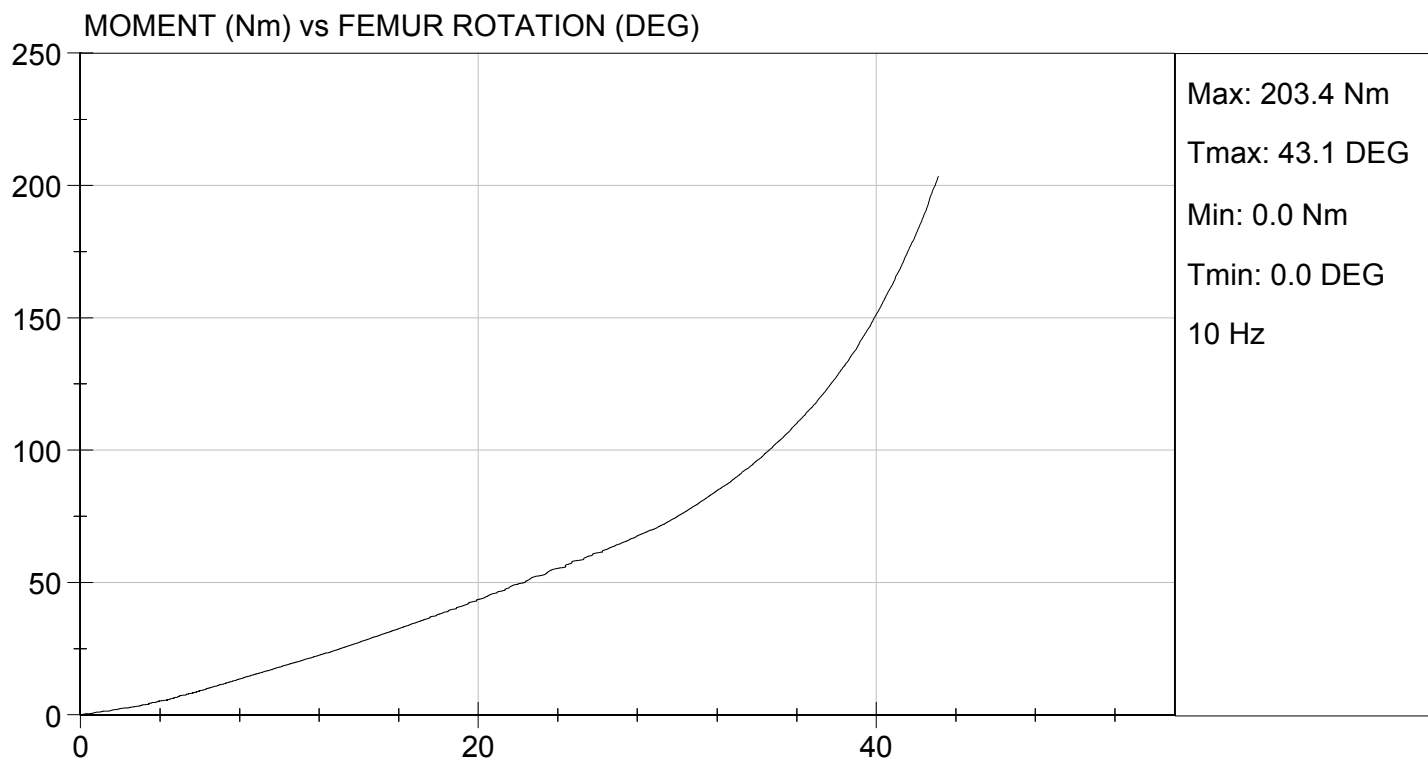
Test I.D: D151730

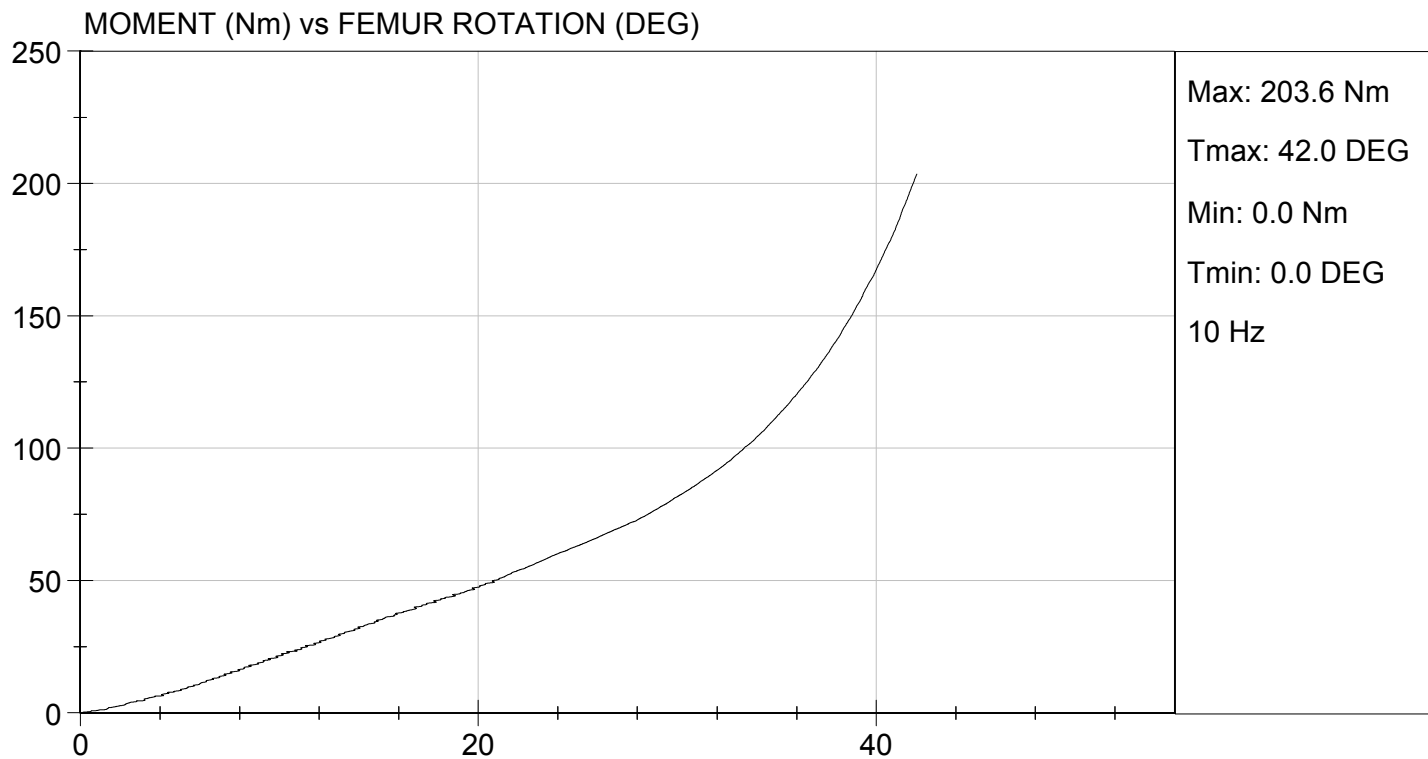
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.4	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	48	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	74.9	81.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	43.1	42.0	Pass
Overall Test Results					Pass


 Laboratory Technician

06/16/2015
 Test Date


 Approved By





Hybrid III, 5th External Measurements
SN: 634

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

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

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D151621

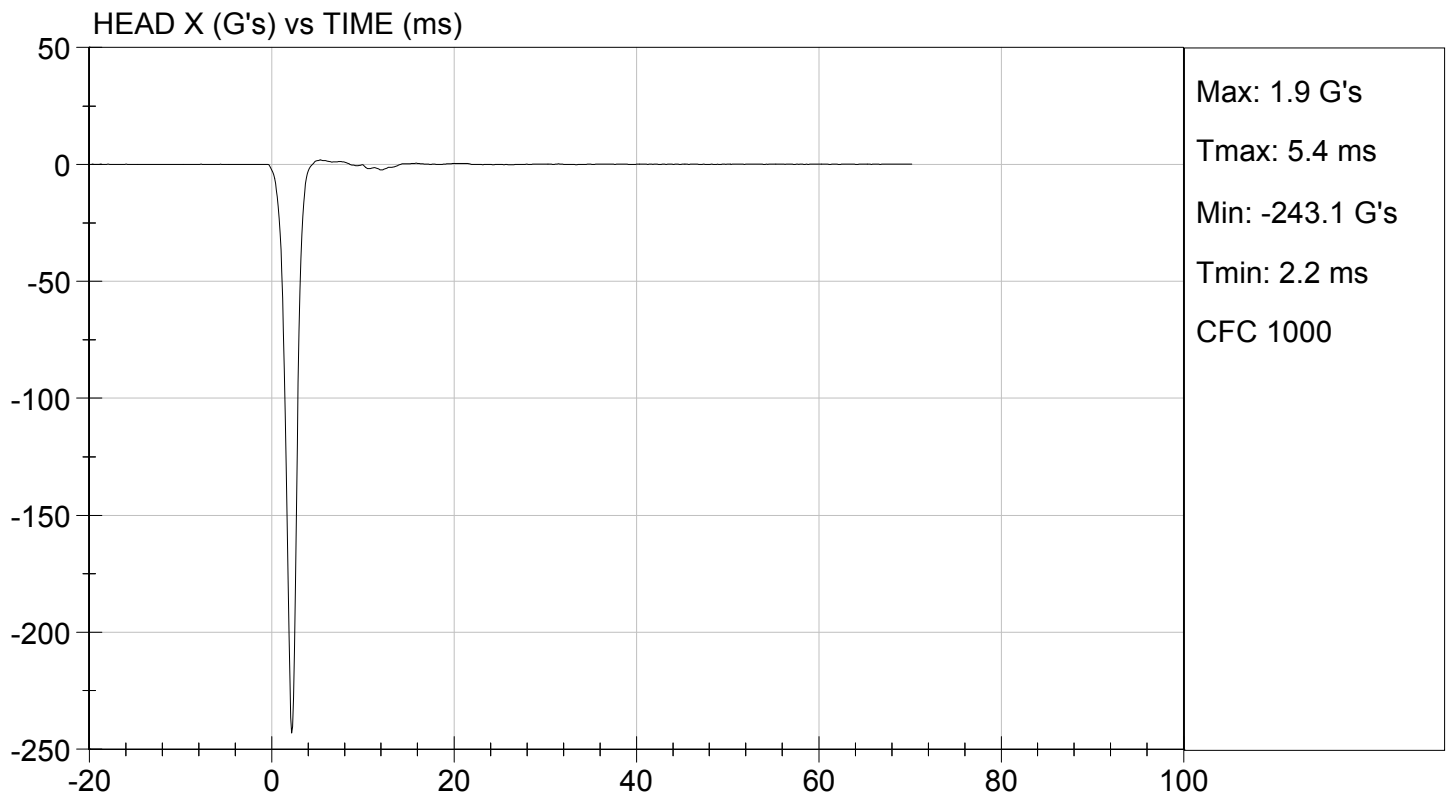
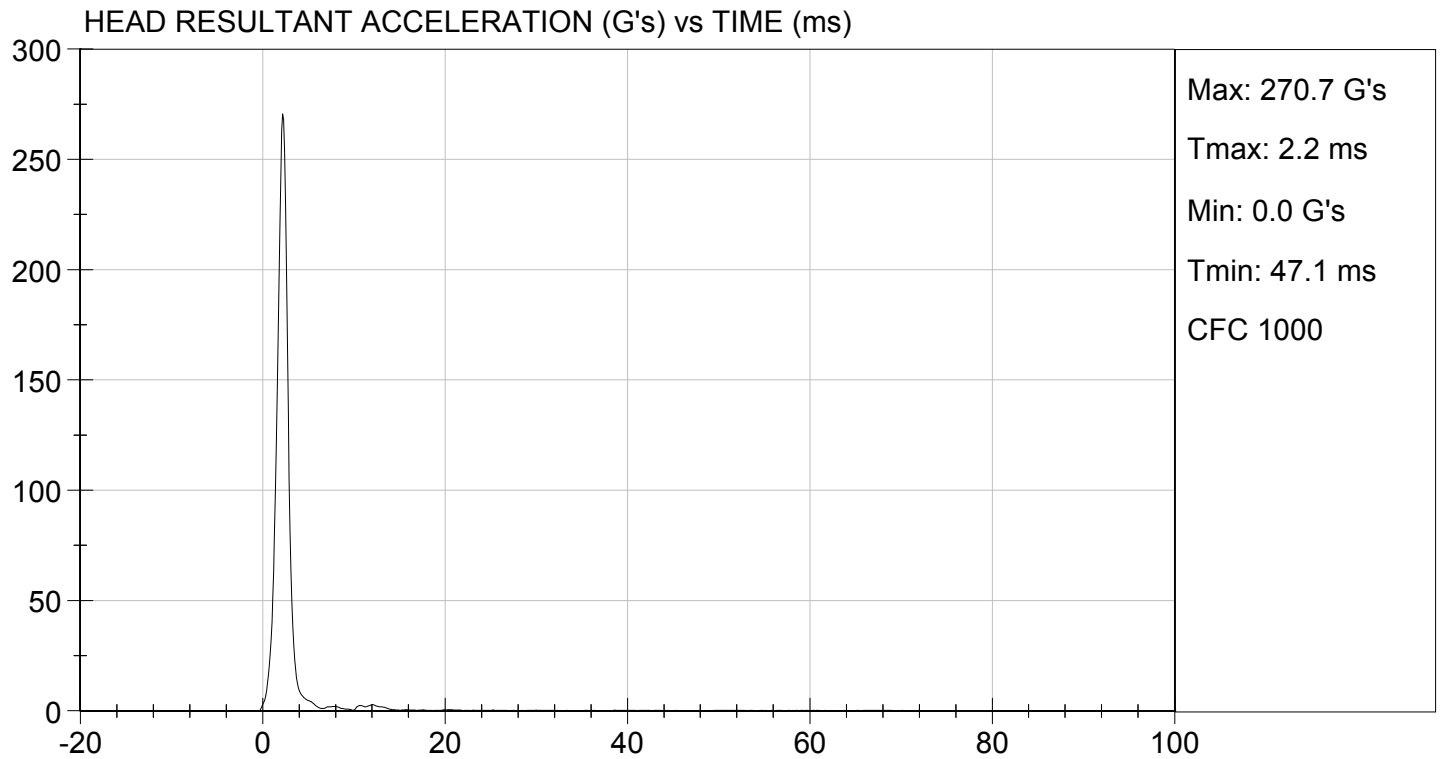
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Peak Resultant Acceleration	G's	250 to 300	271	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-5.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

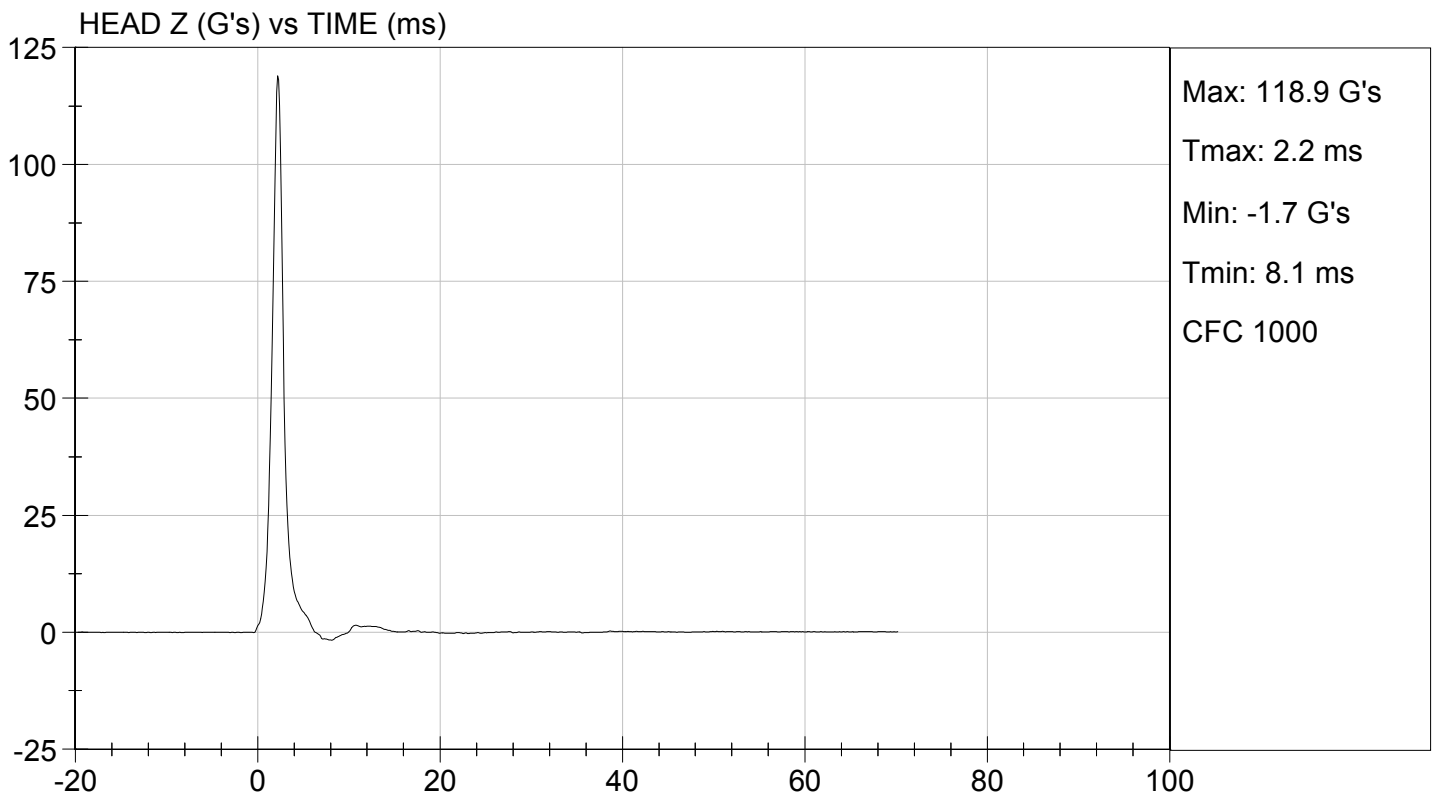
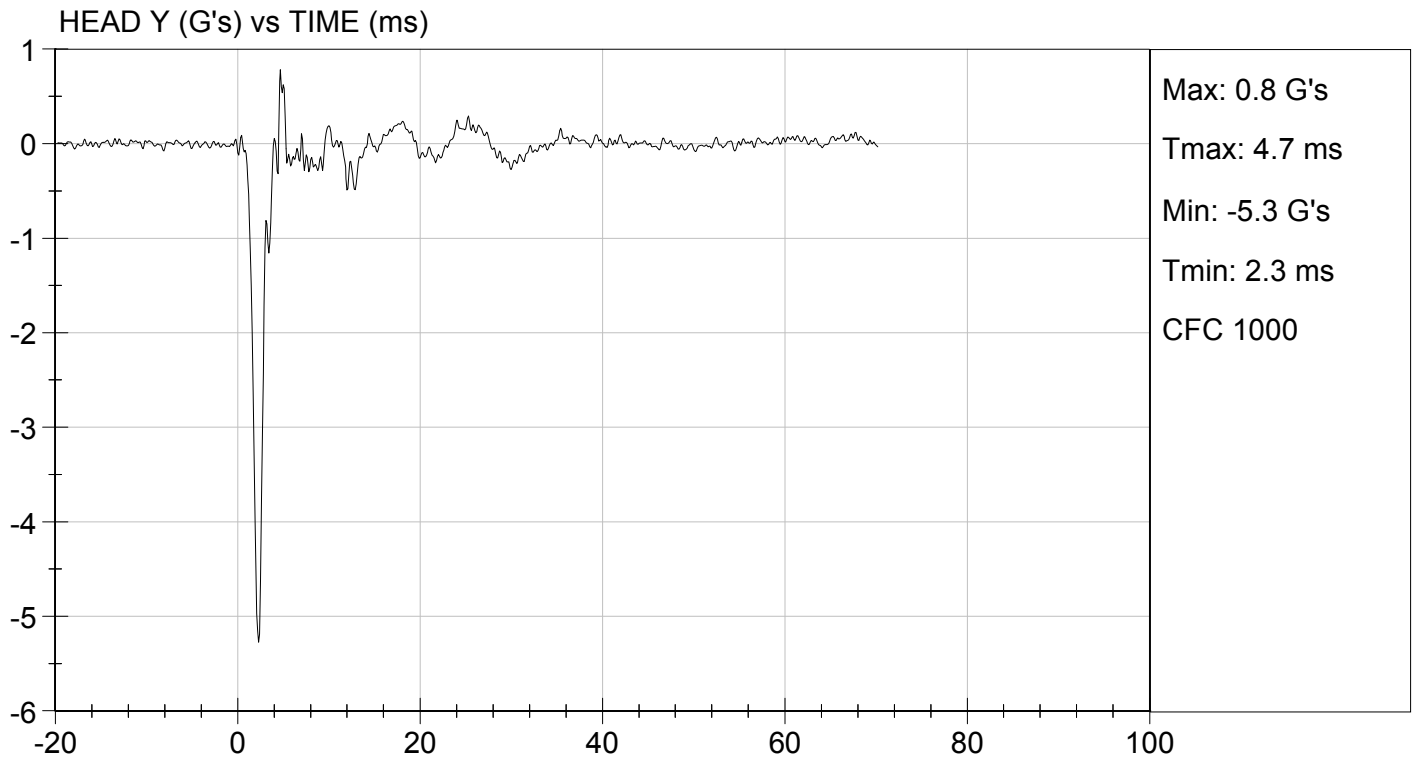
Maxime Chamberland
Laboratory Technician

06/09/2015

Test Date

Jessica Hall
Approved By





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

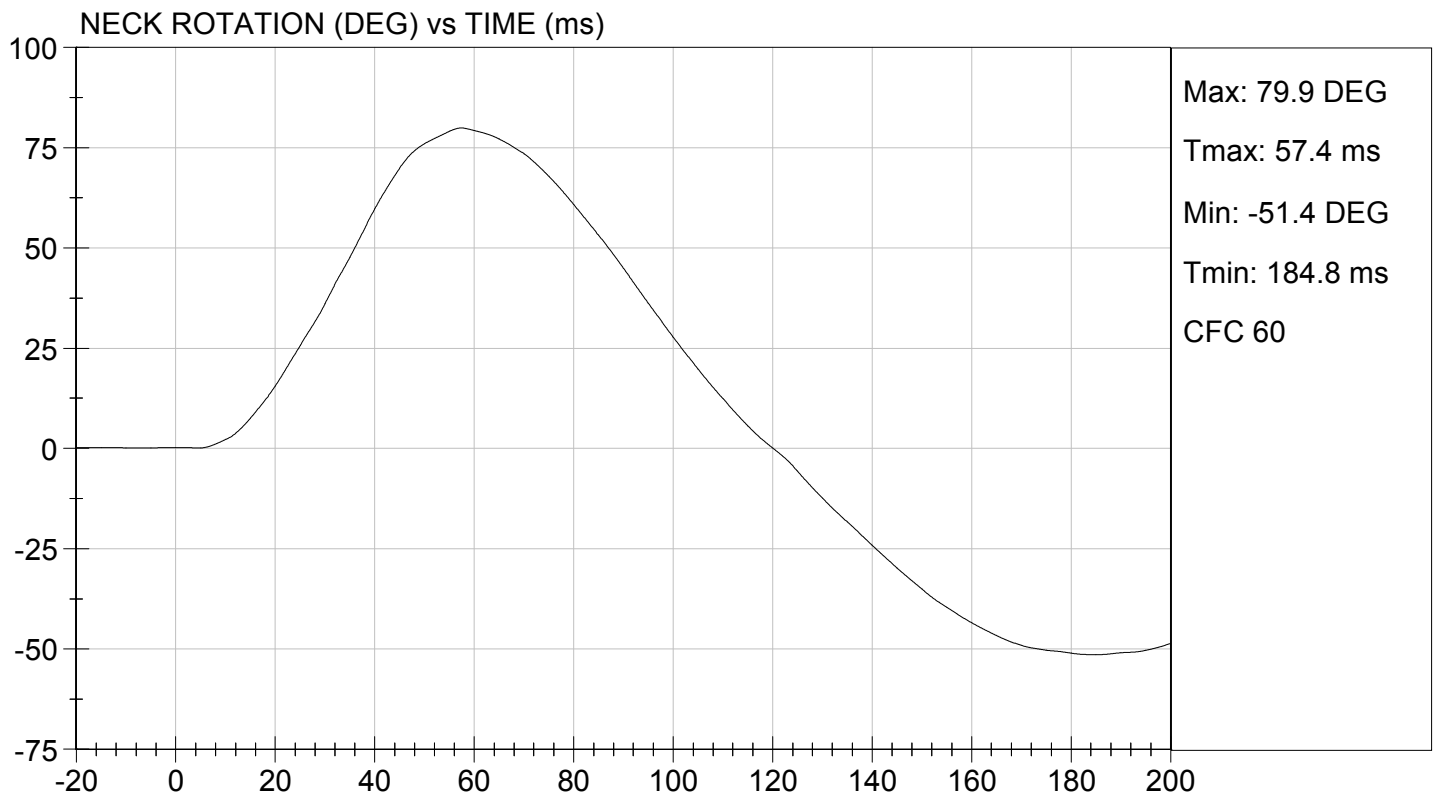
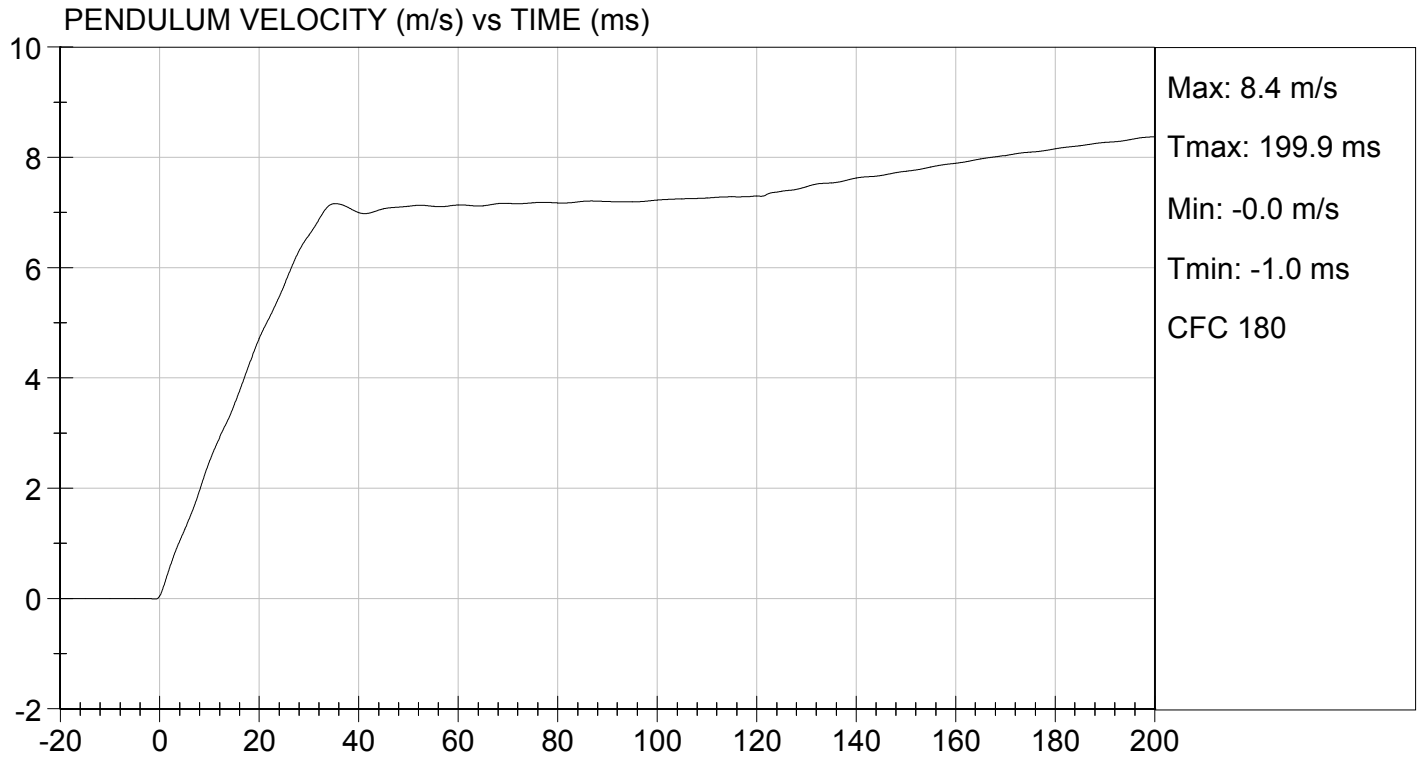
Test I.D: D151622

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	80	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	84	Pass
Overall Results					Pass

Maxime Chamberland
Laboratory Technician

06/09/2015
Test Date

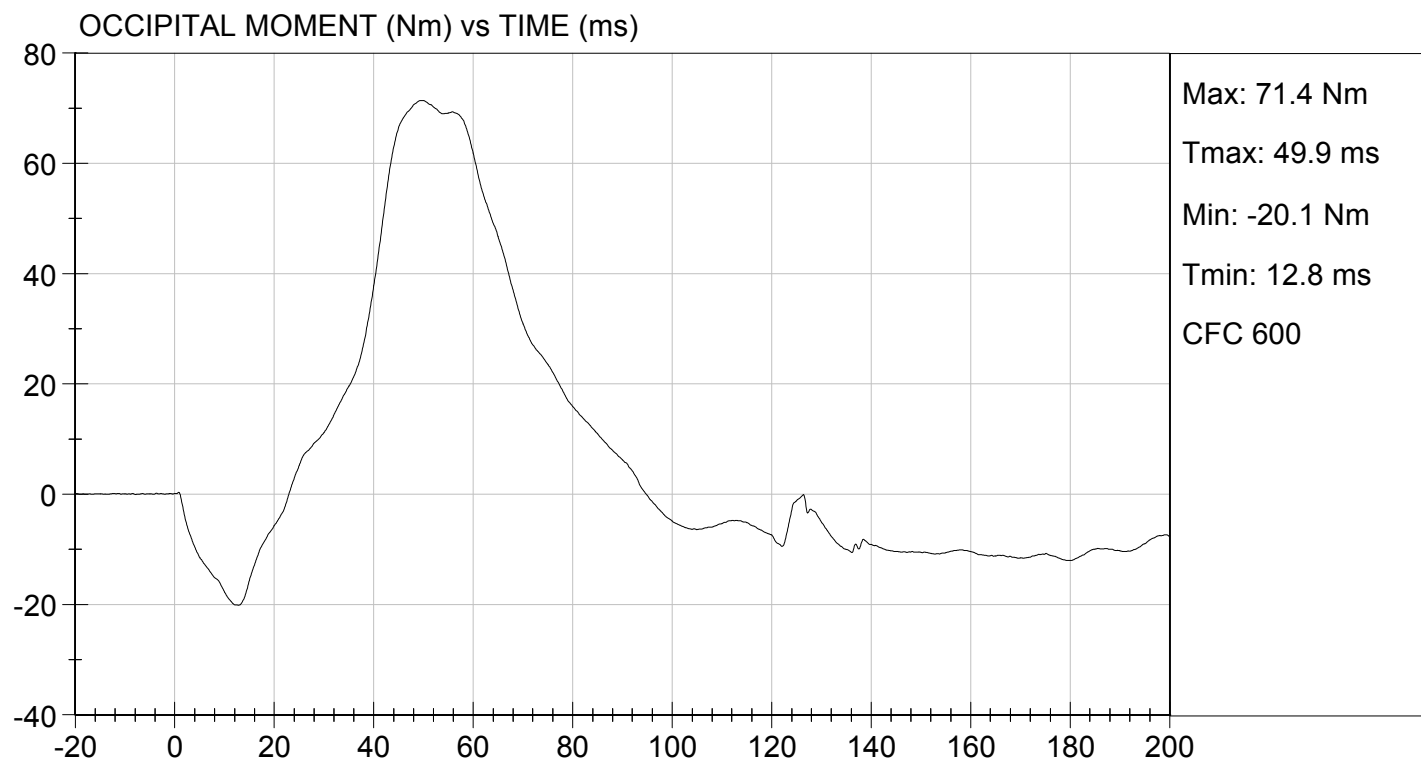
Jessica Hall
Approved By





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

TEST DATE: 06/09/2015
TEST #: D151622



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

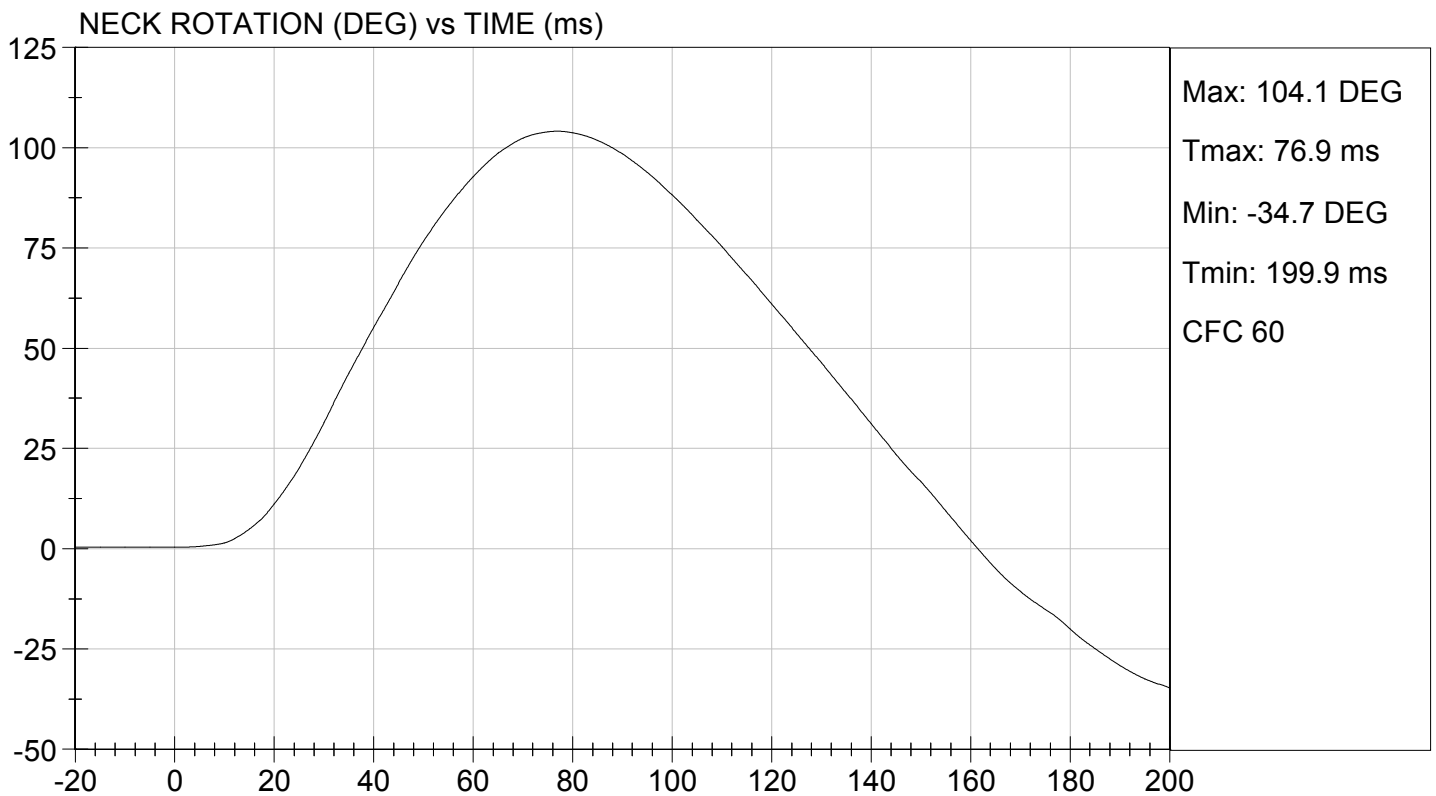
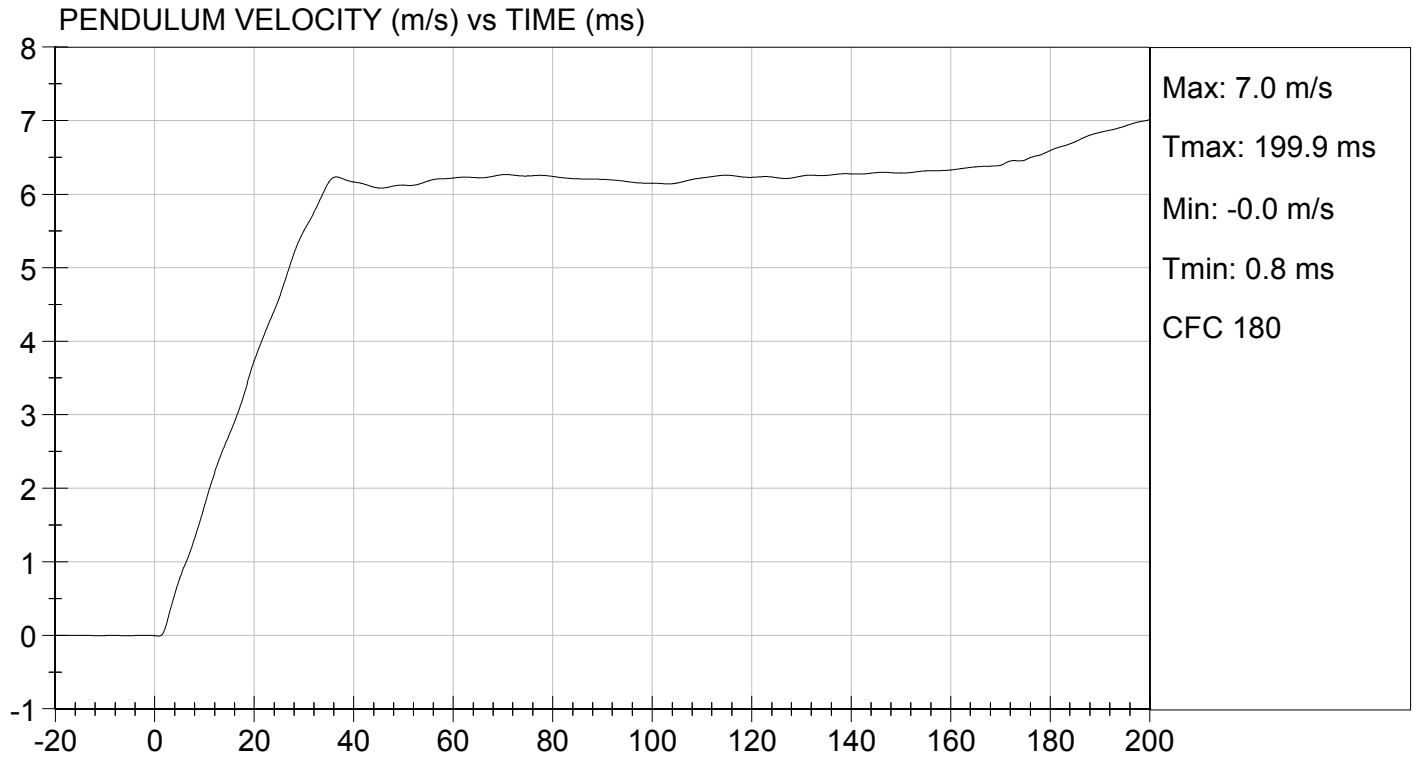
Test I.D: D151623

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.5	Pass
D Plane Rotation	Max	deg	99 to 114	104	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

Maxime Chamberland
Laboratory Technician

06/09/2015
Test Date

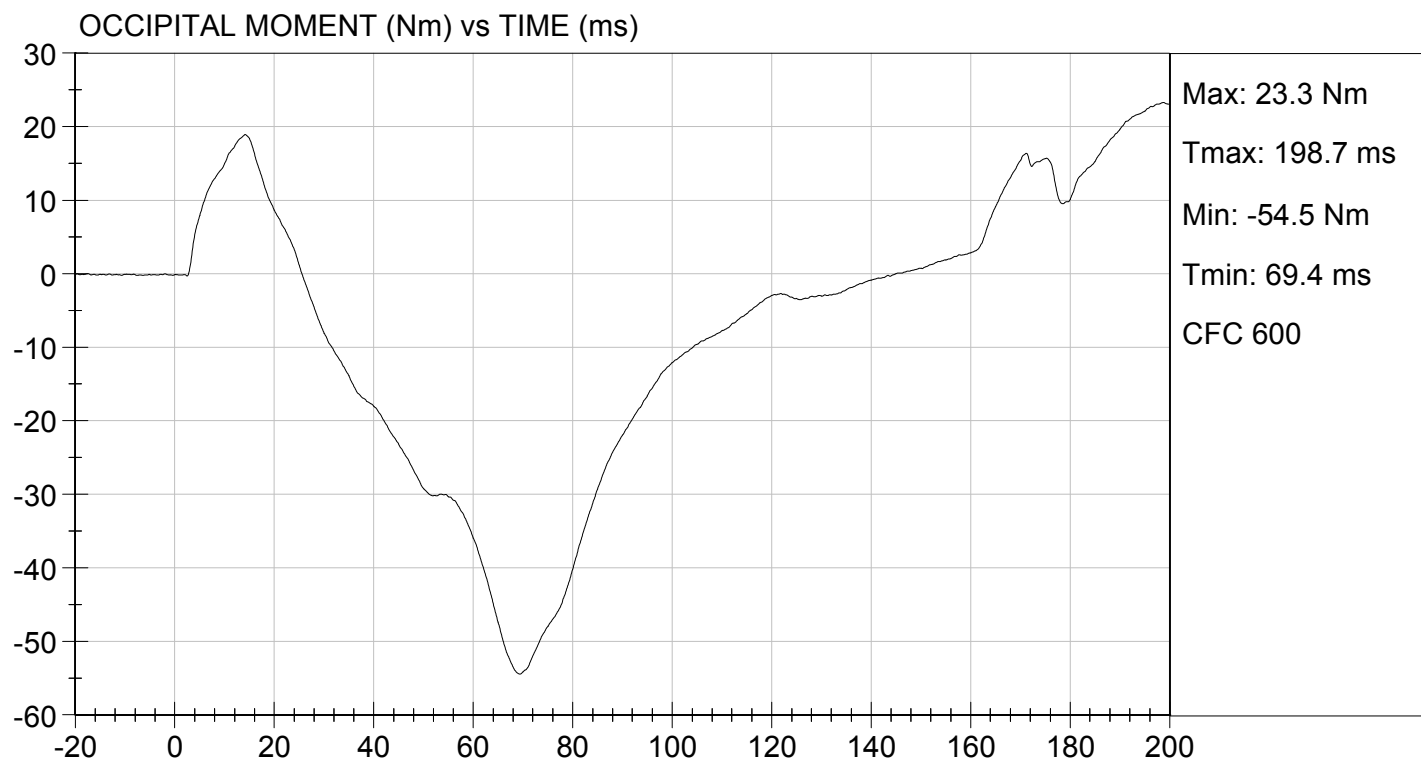
Jessica Hall
Approved By





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

TEST DATE: 06/09/2015
TEST #: D151623



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151624

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4188	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4300	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

06/10/2015

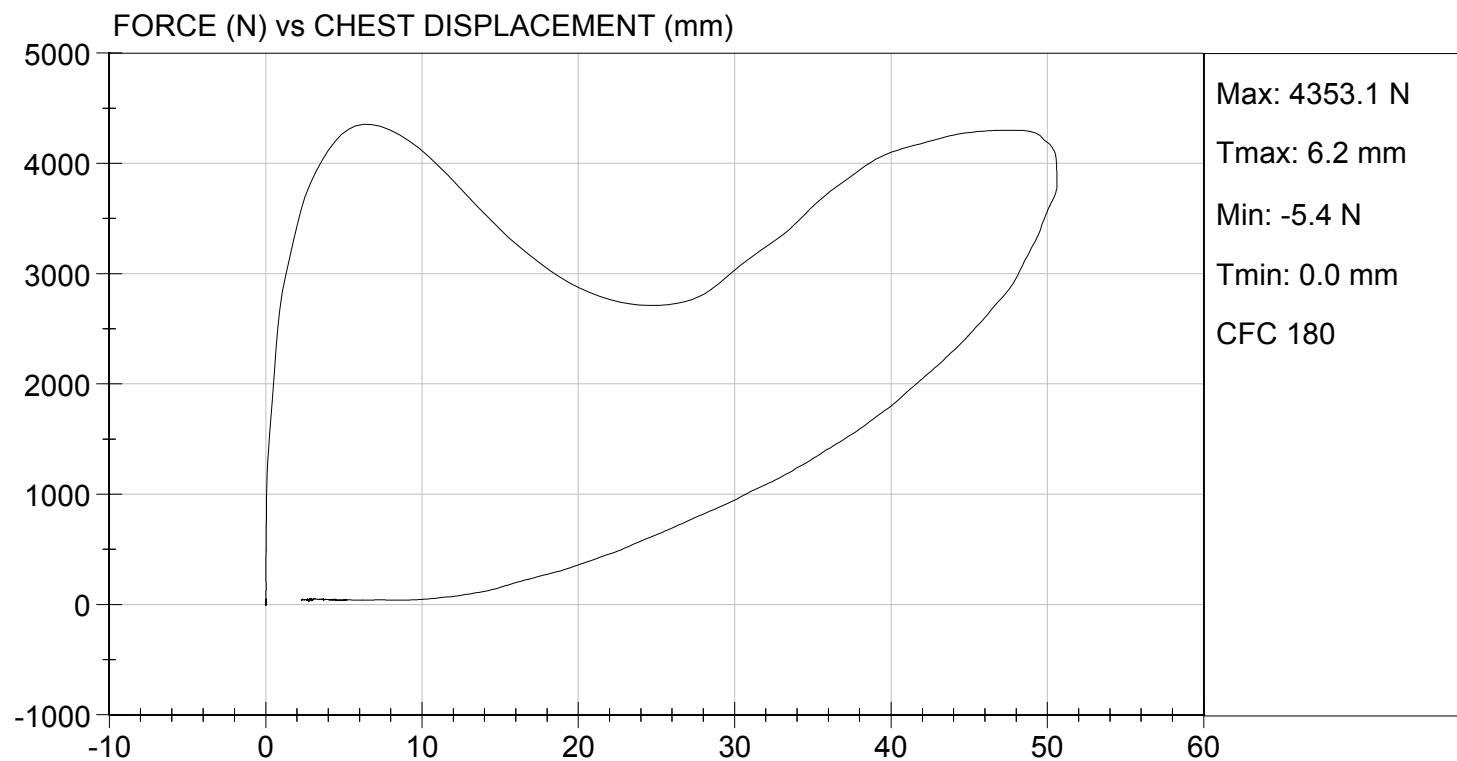
Test Date

Jessica Hall
Approved By



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

TEST DATE: 06/10/2015
TEST #: D151624



MGA RESEARCH CORPORATION

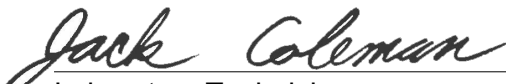
RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151625

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3881	Pass
Overall Test Results				Pass


Laboratory Technician

06/09/2015

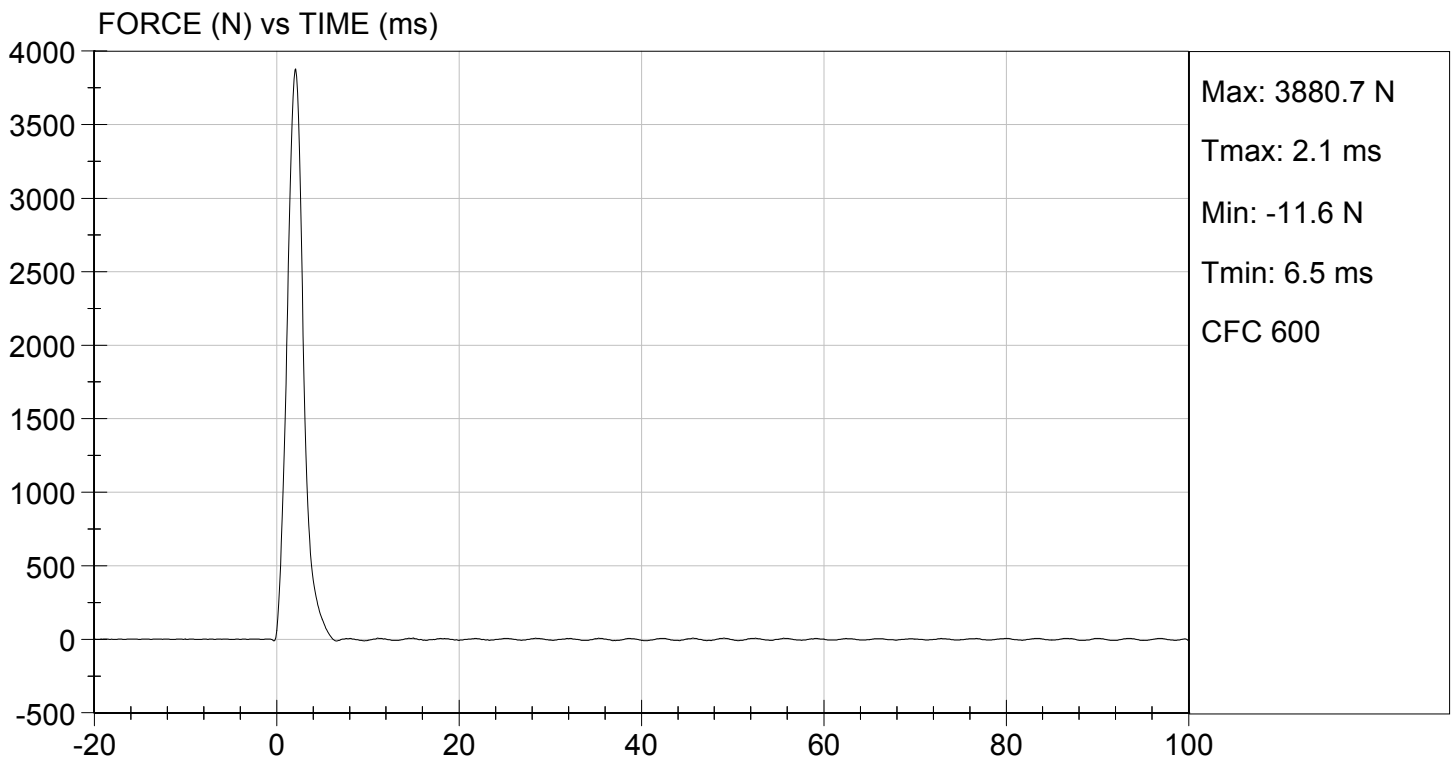
Test Date


Approved By



TEST DESC: RIGHT KNEE
VELOCITY: 6.92 ft/s, 2.11 m/s

TEST DATE: 06/09/2015
TEST #: D151625



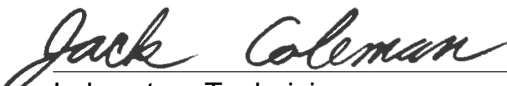
MGA RESEARCH CORPORATION

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

ATD Serial No: 634

Test I.D: D151626

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3681	Pass
Overall Test Results				Pass


Laboratory Technician

06/09/2015

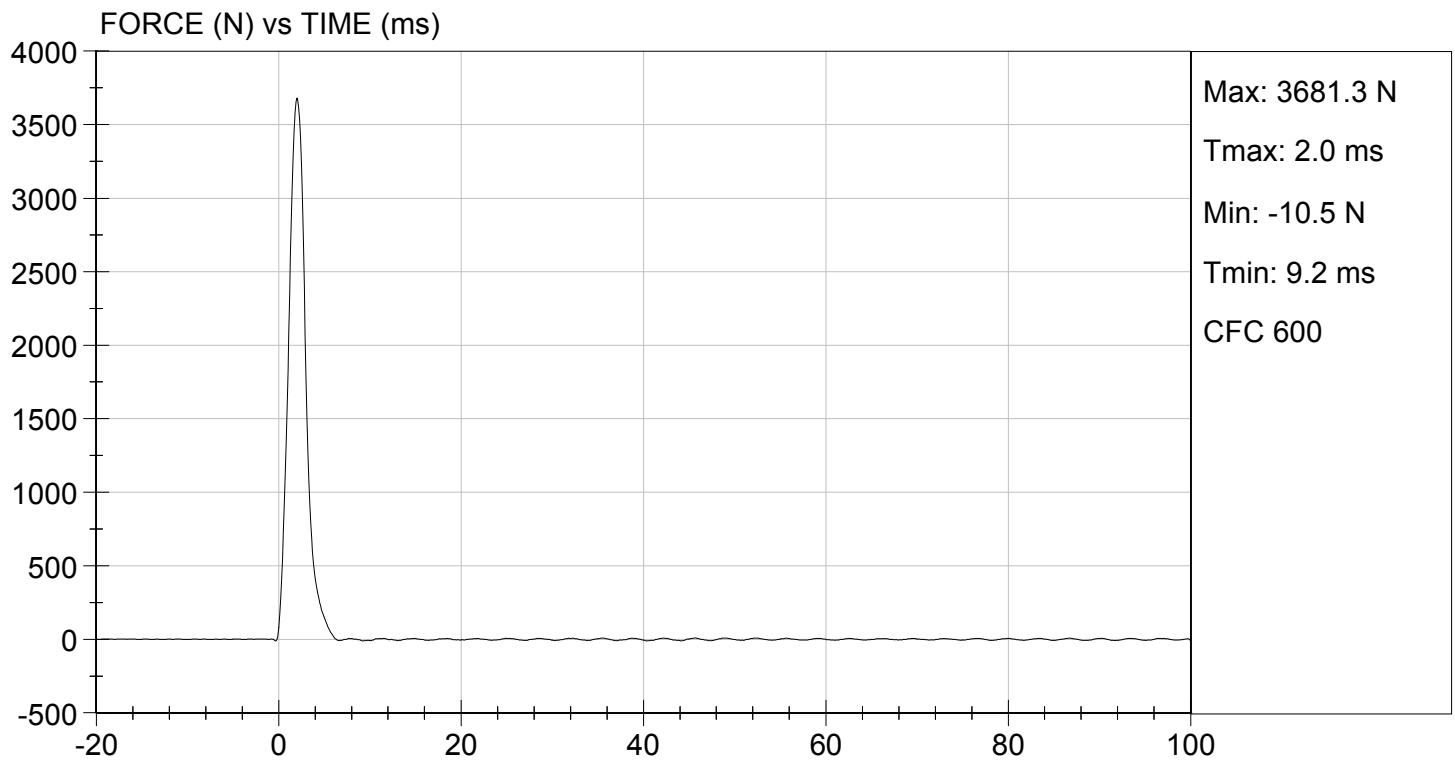
Test Date


Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.92 ft/s, 2.11 m/s

TEST DATE: 06/09/2015
TEST #: D151626



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151627

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	45	Pass
Initial Angle	deg	0 to 20	11	Pass
Return Angle	deg	+/- 8	8	Pass
Force at 45 deg	N	320 to 390	340	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass

David Schoedel
Laboratory Technician

06/10/2015

Test Date

Jessica Hall
Approved By

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D151741

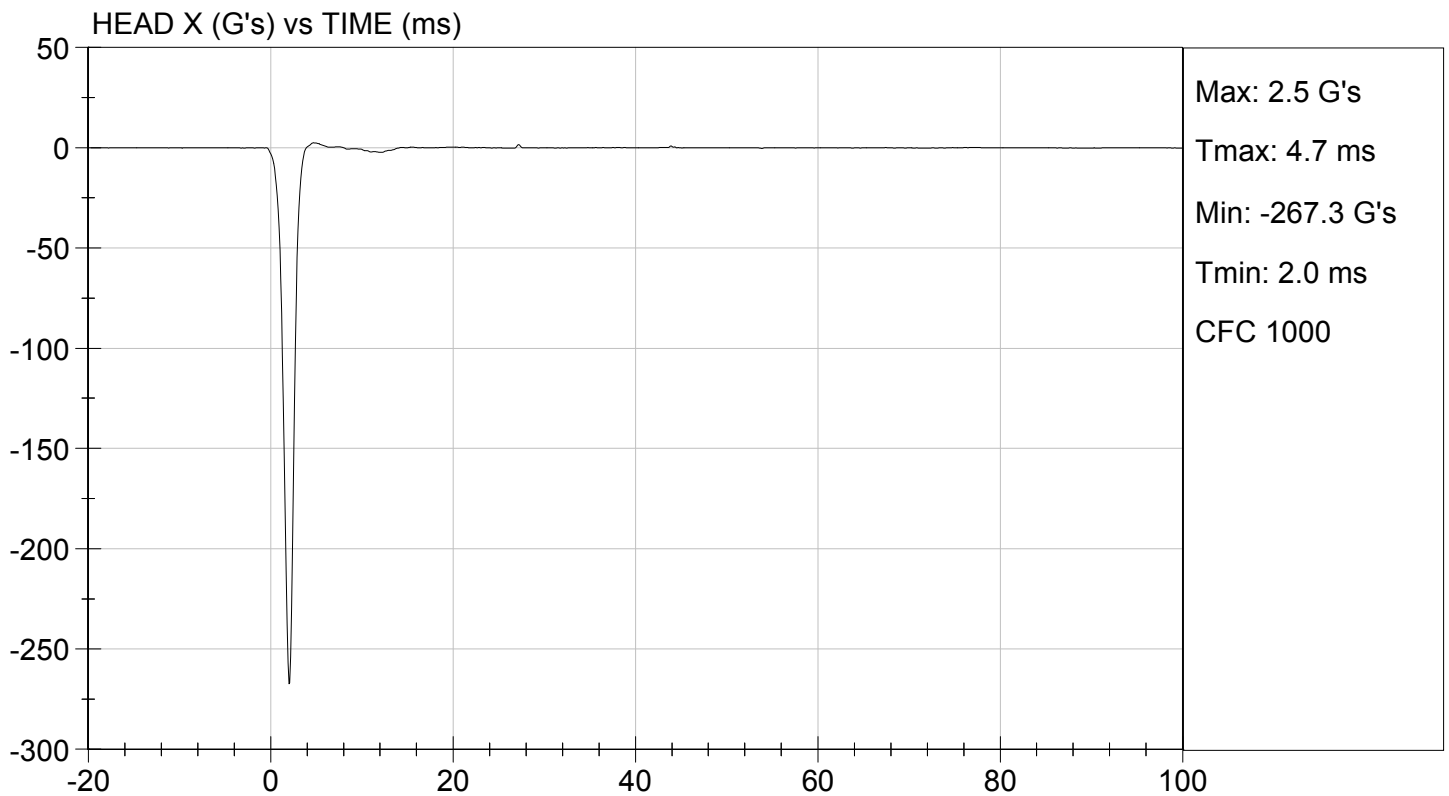
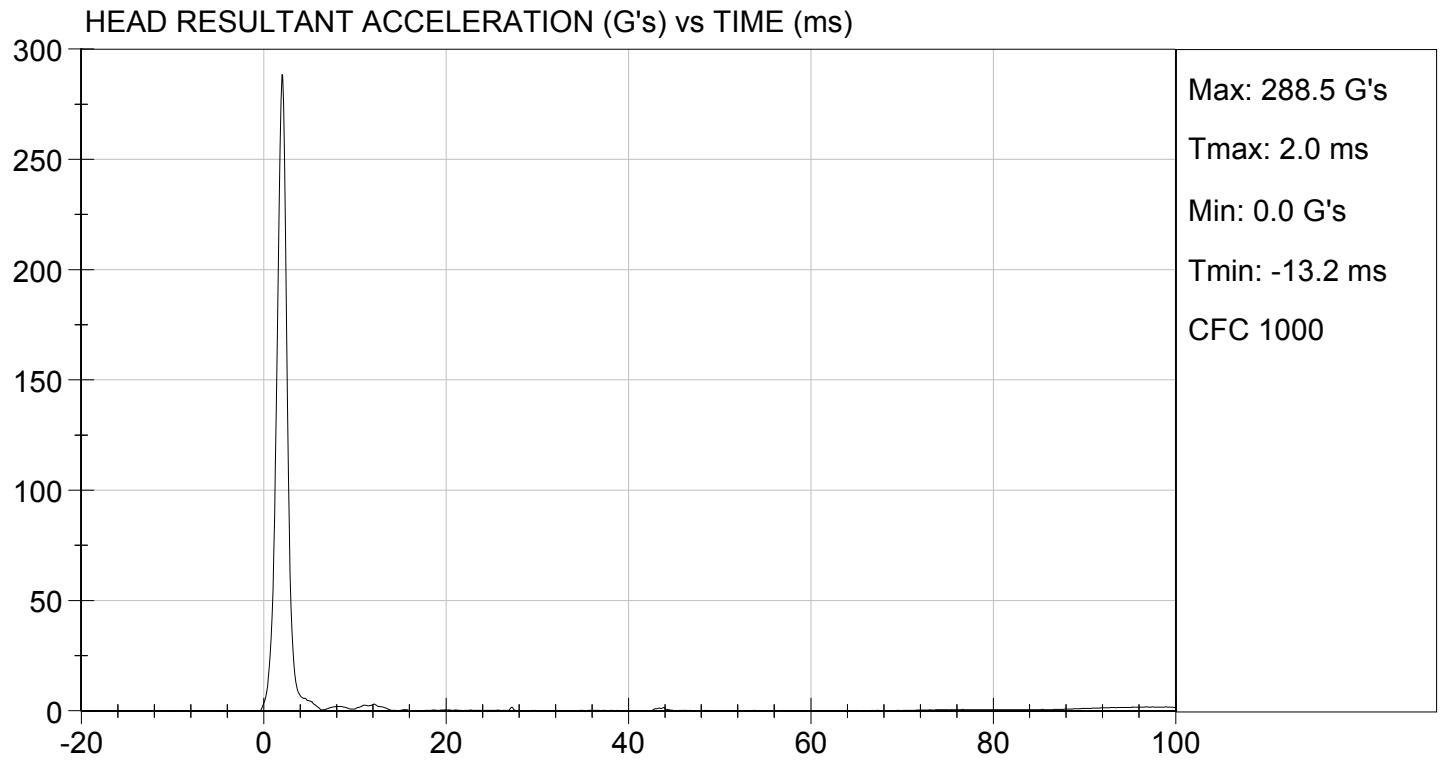
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Peak Resultant Acceleration	G's	250 to 300	289	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-6.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
			Overall Test Results	Pass

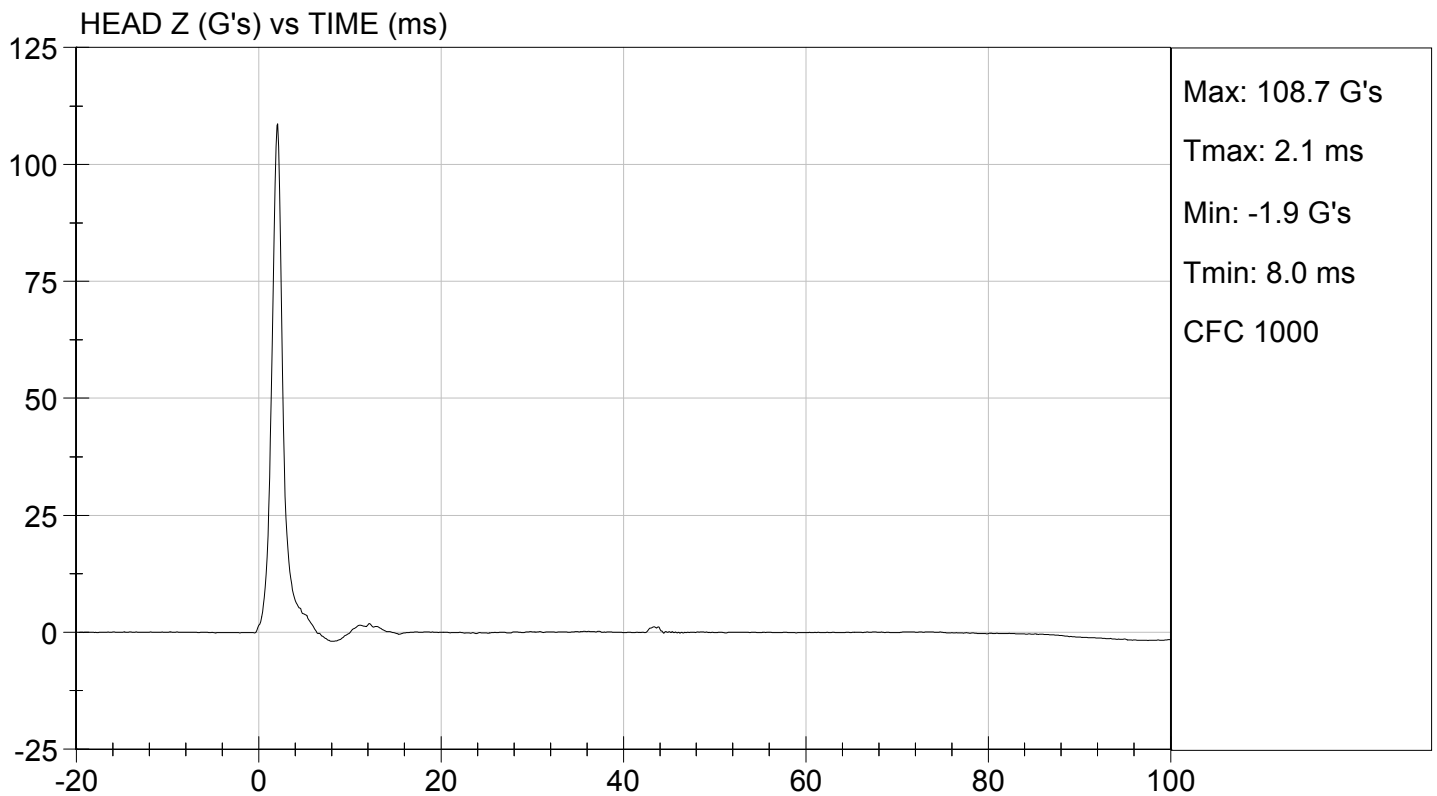
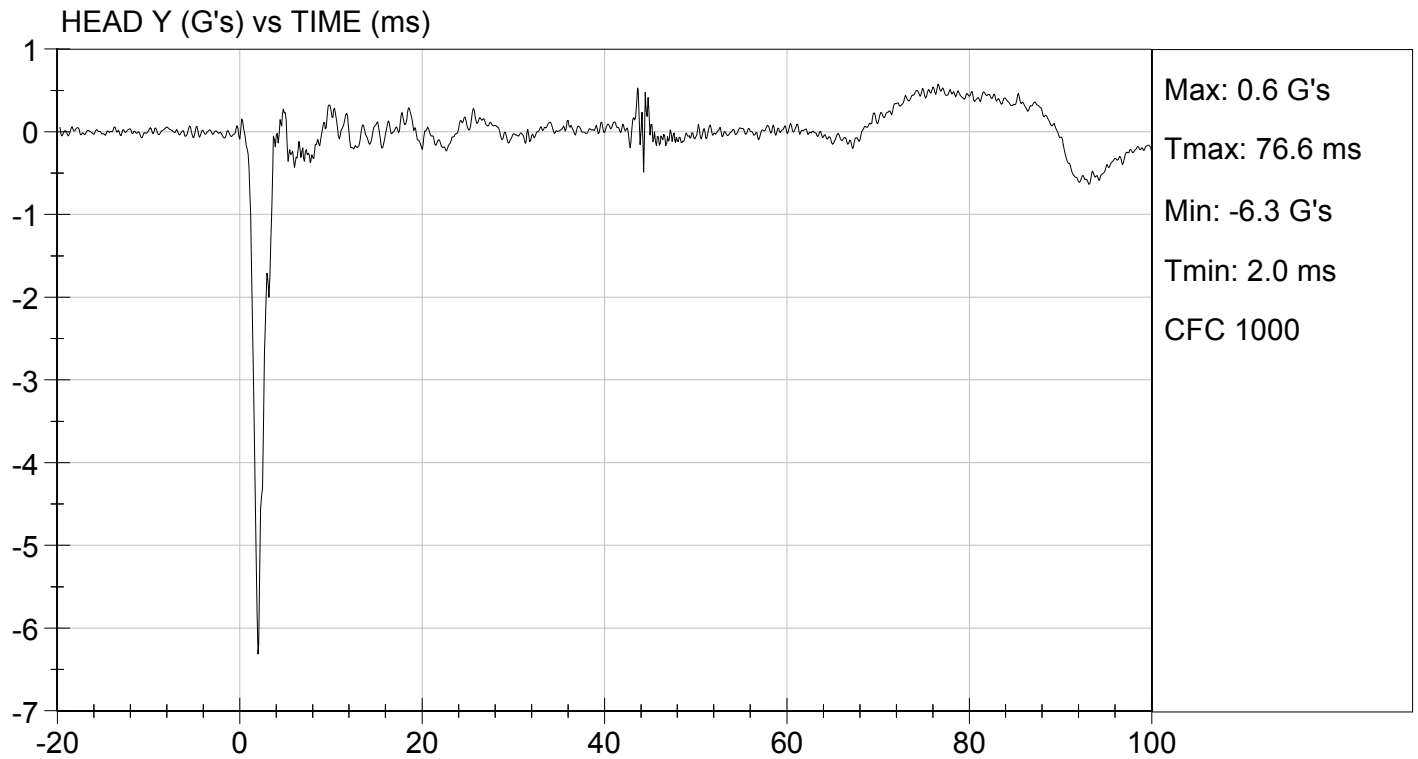
David Schoedel
Laboratory Technician

06/16/2015

Test Date

Jessica Hall
Approved By





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151742

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	48	Pass
Pendulum Speed		m/s	6.89 to 7.13	6.96	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.5	Pass
D Plane Rotation	Max	deg	77 to 91	79	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	84	Pass
Overall Results				Pass	



Laboratory Technician

06/16/2015

Test Date

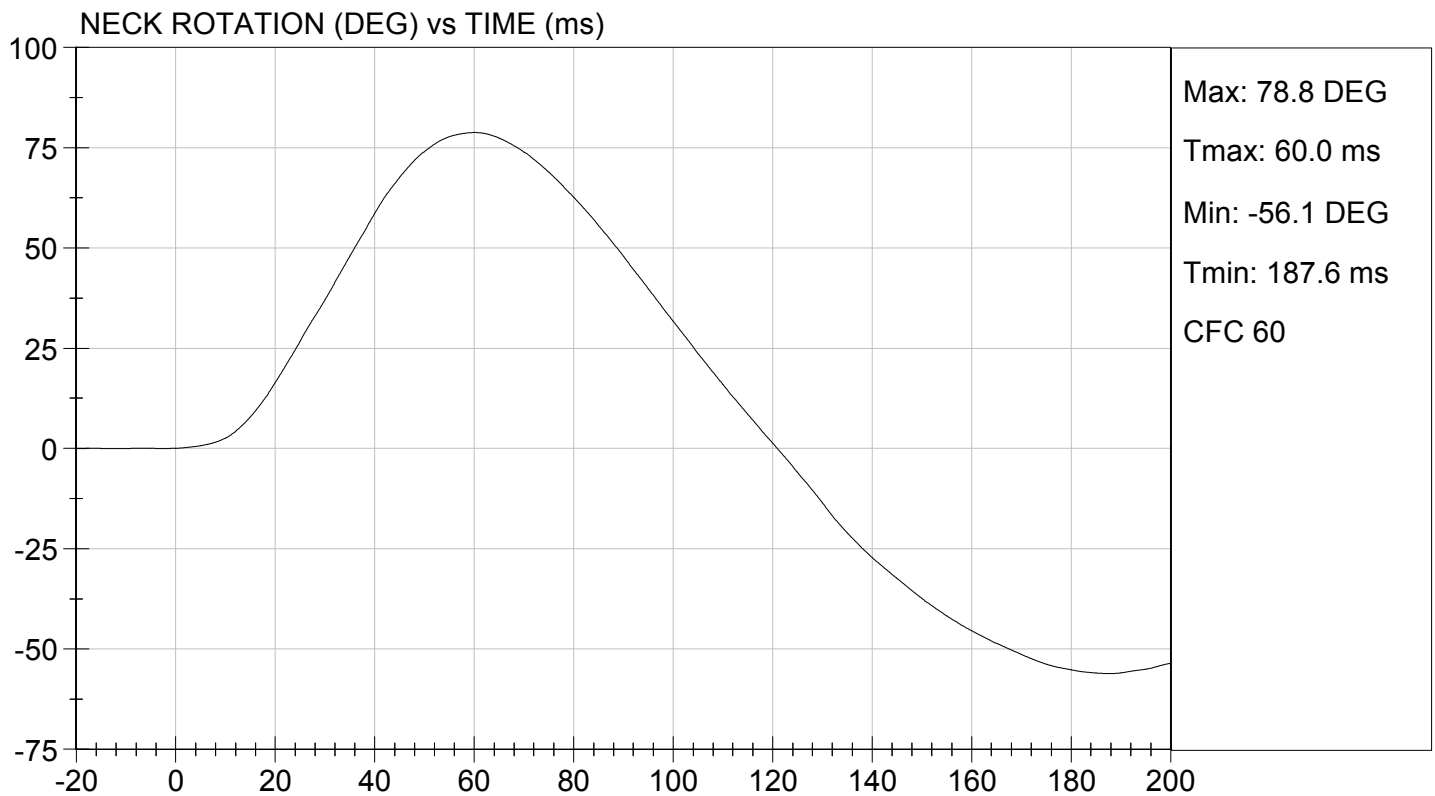
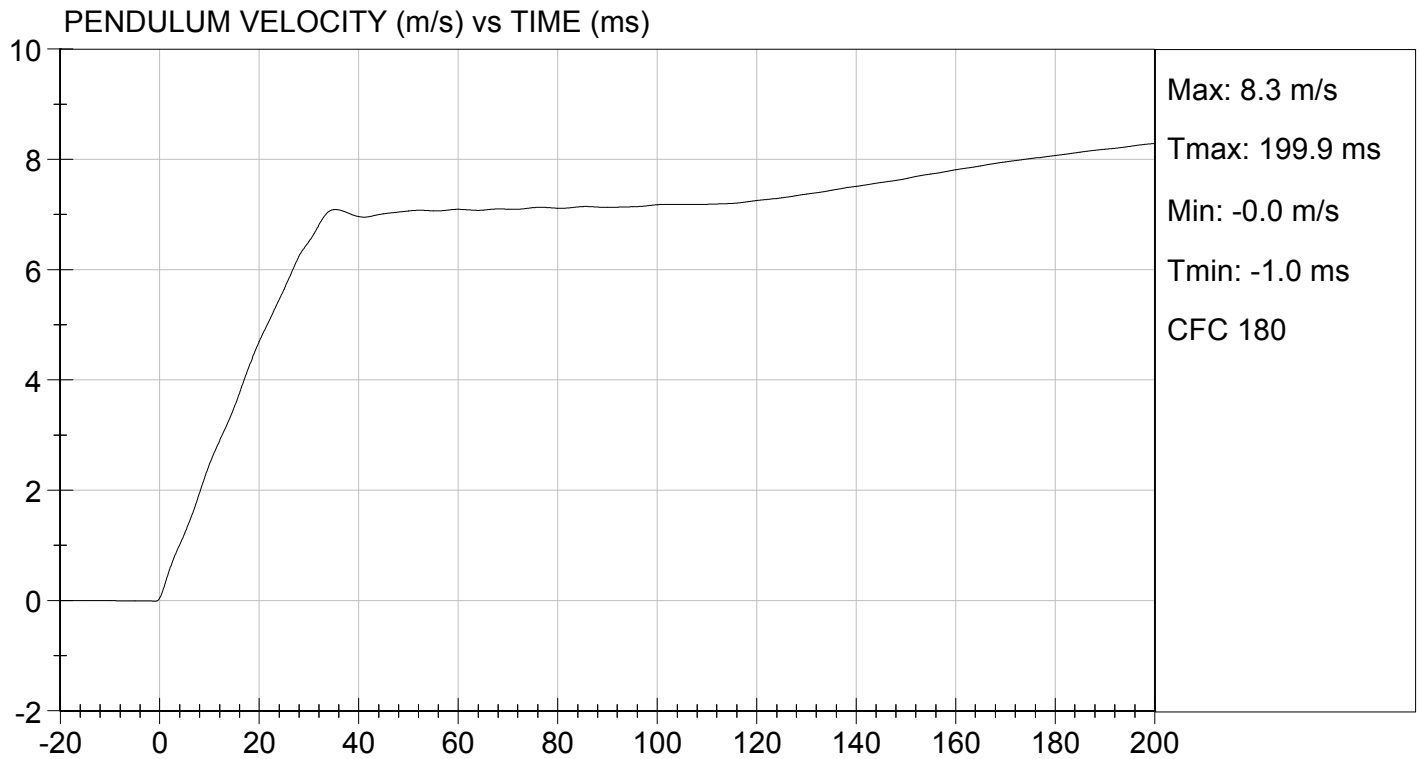


Approved By



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

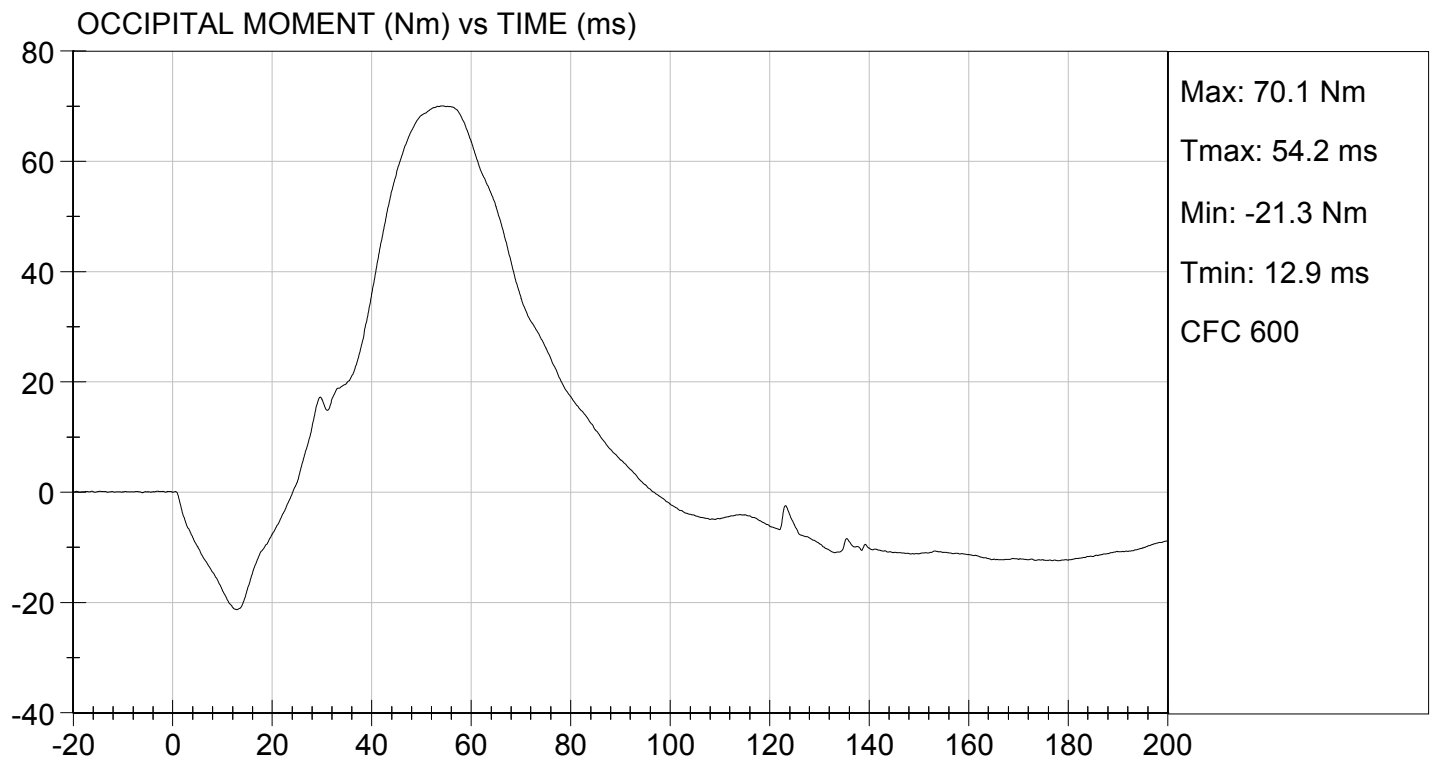
TEST DATE: 06/16/2015
TEST #: D151742





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

TEST DATE: 06/16/2015
TEST #: D151742



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151743

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	48	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.9	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	111	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-55	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	102	Pass
Overall Results					Pass

David Schoedel
Laboratory Technician

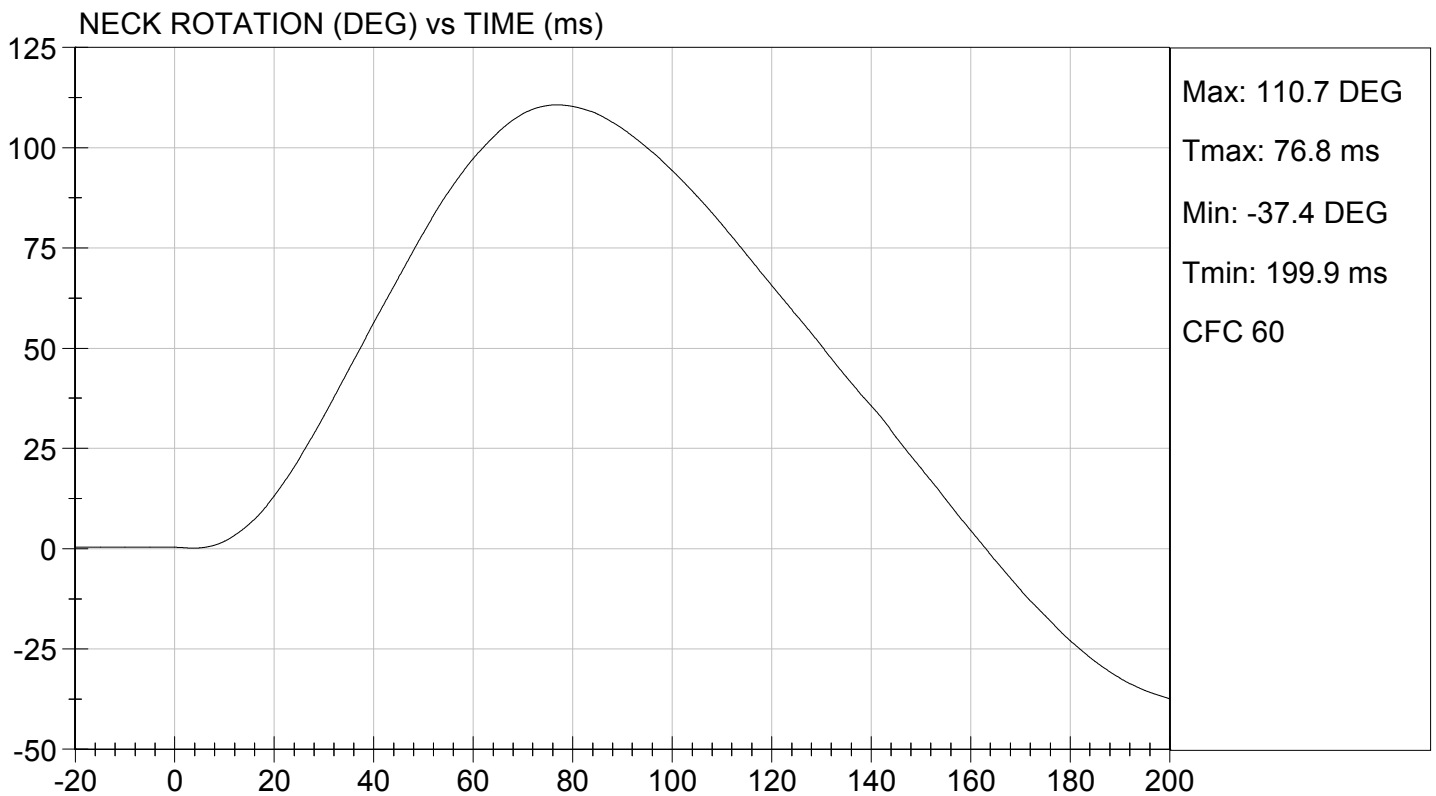
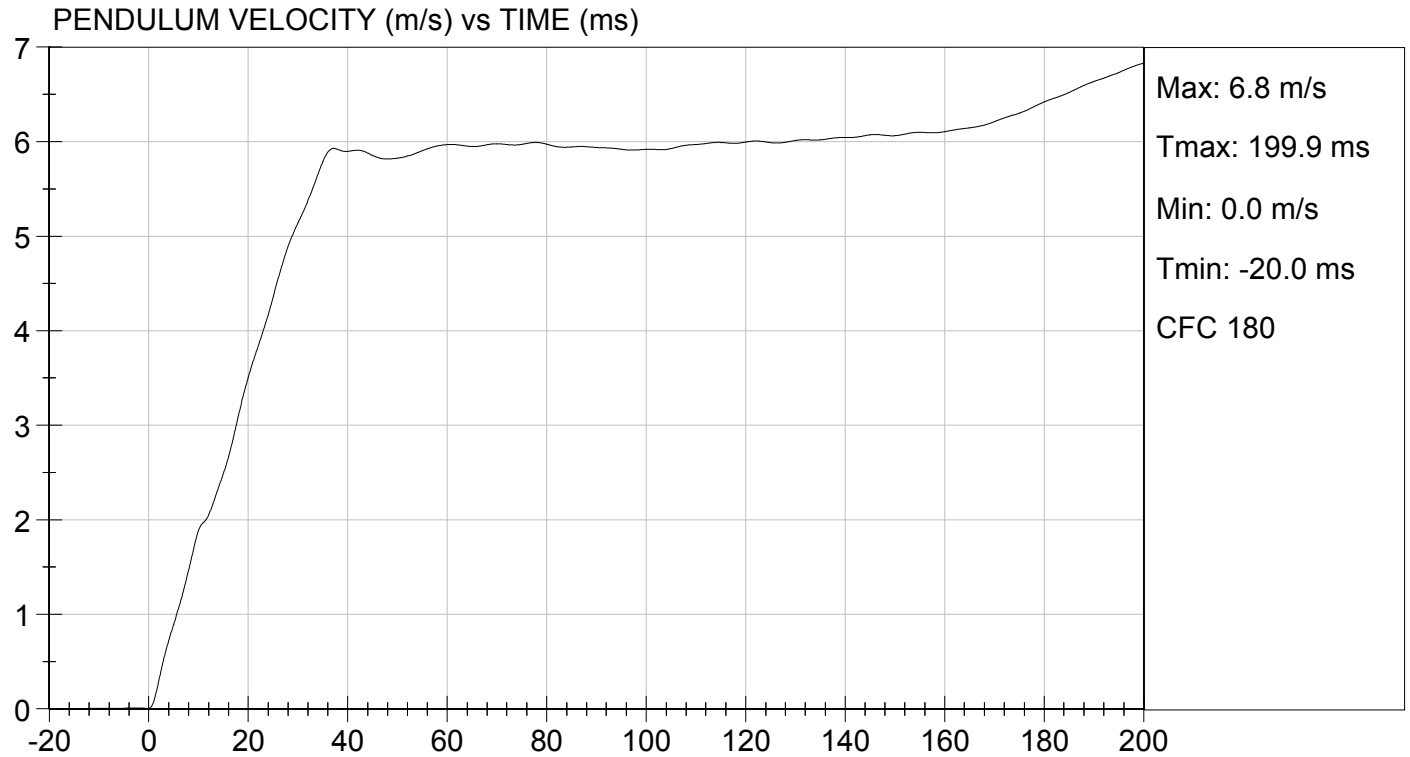
06/16/2015
Test Date

Jessica Hall
Approved By



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

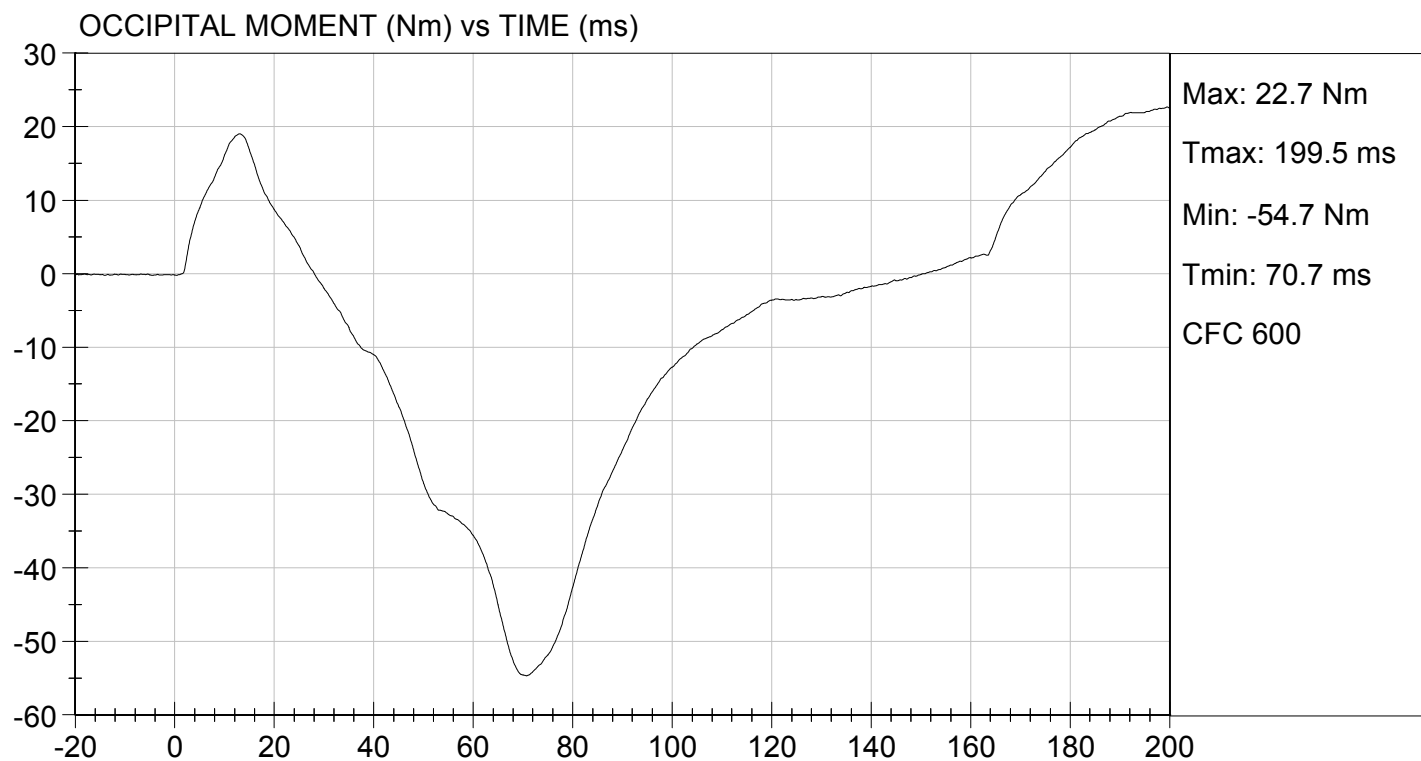
TEST DATE: 06/16/2015
TEST #: D151743





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

TEST DATE: 06/16/2015
TEST #: D151743



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151744

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	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	53	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4212	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4214	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

06/16/2015

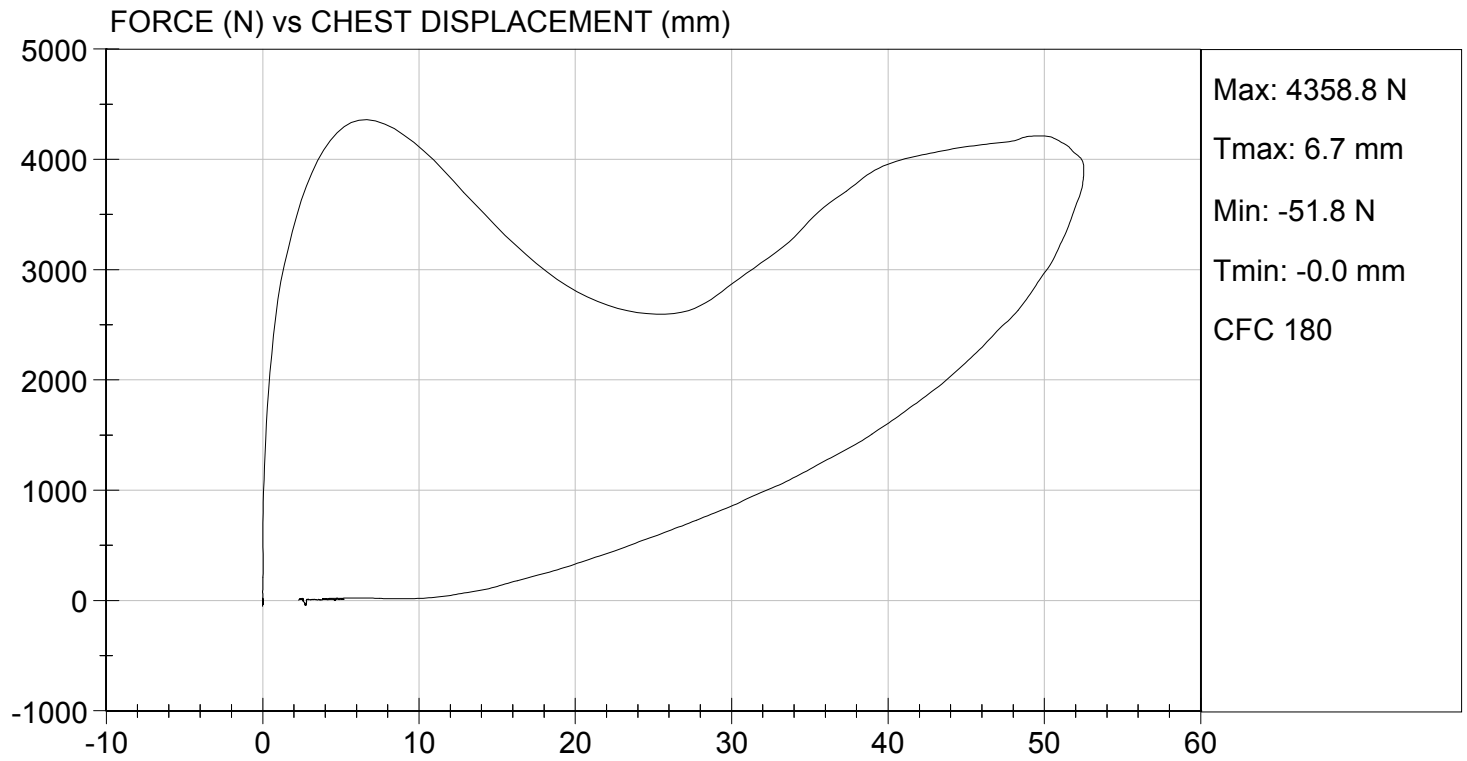
Test Date

Jessica Hall
Approved By



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

TEST DATE: 06/16/2015
TEST #: D151744



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151745

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3949	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

06/16/2015

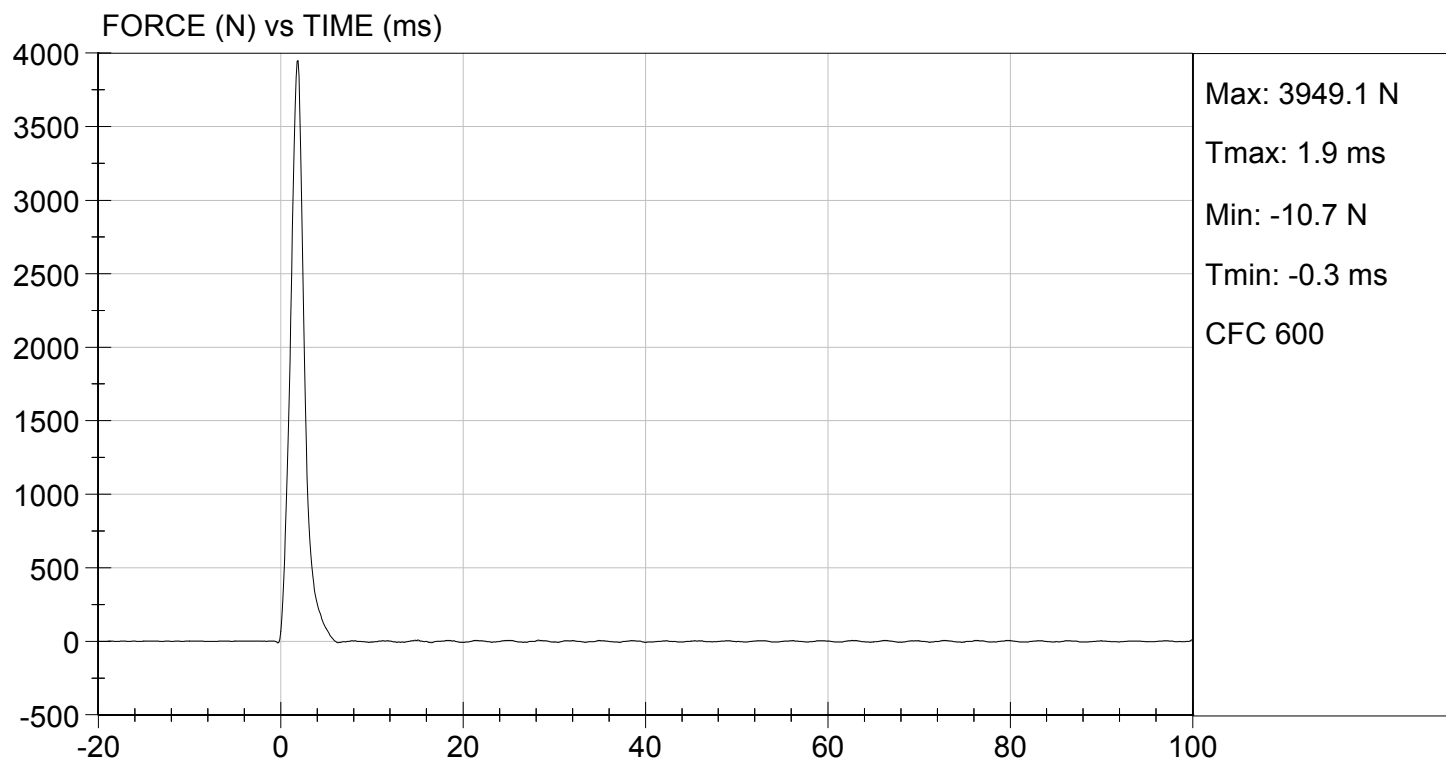
Test Date

Jessica Hall
Approved By



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

TEST DATE: 06/16/2015
TEST #: D151745



MGA RESEARCH CORPORATION

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

ATD Serial No: 634

Test I.D: D151746

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.09	Pass
Maximum Force	N	3450 to 4060	3822	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

06/16/2015

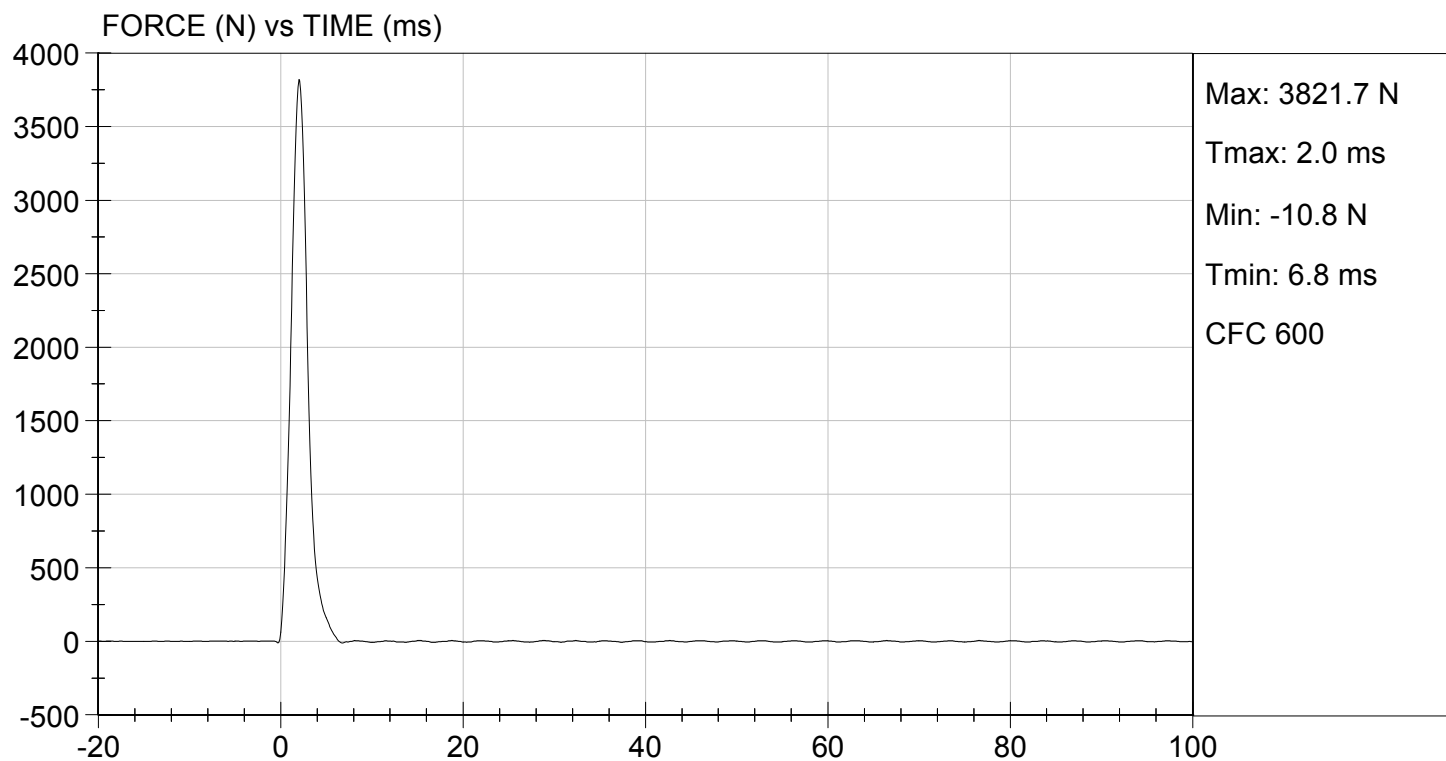
Test Date

Jessica Hall
Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.86 ft/s, 2.09 m/s

TEST DATE: 06/16/2015
TEST #: D151746



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D151747

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	6	Pass
Force at 45 deg	N	320 to 390	336	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass

David Schoedel
Laboratory Technician

06/16/2015

Test Date

Jessica Hall
Approved By