

**REPORT NUMBER: NCAP-MGA-23-001**

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

**HONDA DEVELOPMENT & MANUFACTURING OF AMERICA, LLC  
2023 Acura Integra A-Spec Tech 5-Door Hatchback  
NHTSA No.: O20235300**

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



**Test Date: November 16, 2022**

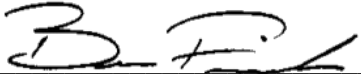
**Final Report Date: November 20, 2023**

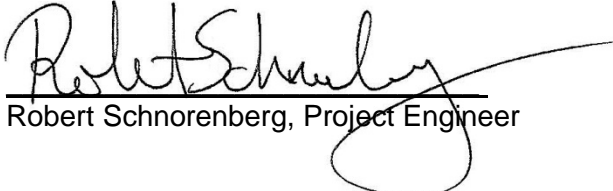
**FINAL REPORT**

**U.S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Office of Crashworthiness Standards  
1200 New Jersey Ave, SE  
Washington, DC 20590**

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Approval Date: November 20, 2023

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

<b>1. Report No.</b> NCAP-MGA-23-001	<b>2. Government Accession No.</b>	<b>3. Recipient's Catalog No.</b>																																																							
<b>4. Title and Subtitle</b> Final Report of New Car Assessment Program Frontal Impact Testing of a 2023 Acura Integra A-Spec Tech 5-Door Hatchback, NHTSA No.: O20235300		<b>5. Report Date</b> November 20, 2023																																																							
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<b>9. Performing Organization Name and Address</b> MGA Research Corporation 5000 Warren Road Burlington, WI 53105		<b>10. Work Unit No.</b>																																																							
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<b>12. Sponsoring Agency Name and Address</b> U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave, SE Washington, D.C. 20590		<b>13. Type of Report and Period Covered</b> Final Test Report November 16, 2022 to November 20, 2023																																																							
		<b>14. Sponsoring Agency Code</b> NRM-110																																																							
<b>15. Supplementary Notes</b>																																																									
<b>16. Abstract</b> A 56.3 km/h NCAP Frontal Rigid Barrier Impact Test was conducted on a 2023 Acura Integra A-Spec Tech 5-Door Hatchback in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on November 16, 2022.  The impact velocity of the vehicle was 56.06 km/h and the ambient temperature at the barrier face at the time of impact was 21.2°C. The target vehicle post-test maximum crush was 470 mm located to the right of the vehicle 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 (HIC<sub>15</sub>)</td> <td></td> <td>700</td> <td>231</td> <td>700</td> <td>328</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>20</td> <td>52</td> <td>14</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.27</td> <td>1</td> <td>0.27</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>848</td> <td>2620</td> <td>672</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>85</td> <td>2520</td> <td>323</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>1277</td> <td>6805</td> <td>1178</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>2553</td> <td>6805</td> <td>474</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC <sub>15</sub> )		700	231	700	328	Maximum Chest Compression	mm	63	20	52	14	Nij		1	0.27	1	0.27	Neck Tension	N	4170	848	2620	672	Neck Compression	N	4000	85	2520	323	Left Femur Force	N	10008	1277	6805	1178	Right Femur Force	N	10008	2553	6805	474
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<b>17. Key Words</b>  35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)			<b>18. Distribution Statement</b> Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																																																						
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## **SECTION 1 PURPOSE AND SUMMARY OF TEST**

### **PURPOSE**

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number 693JJ919D000006. 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 Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing.

### **SUMMARY**

A load cell barrier consisting of 176 load cells was impacted by a 2023 Acura Integra A-Spec Tech 5-Door Hatchback at a velocity of 56.06 km/h. The test was performed at MGA Research Corporation on November 16, 2022. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

Two (2) real-time cameras and sixteen (16) 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 50<sup>th</sup> percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5<sup>th</sup> percentile female test device (ATD) was placed in the right-front passenger seating position according to dummy placement instructions specified in the Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing.

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. 142) were qualified previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 630 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 470 mm located to the right of the vehicle centerline 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 contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee airbag.  
 The passenger's visible contact points were as follows: The passenger's head contacted the airbag. The passenger's head also contacted the headrest. The passenger's knees contacted the knee airbag.

The occupant data is summarized below:

ATD position	HIC <sub>15</sub>	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 <sup>th</sup> )	231	0.27	848	85	37.3	20	1277	2553
Passenger (5 <sup>th</sup> )	328	0.27	672	323	42.3	14	1178	474

The test data can be found on the NHTSA website at [www.nhtsa.gov](http://www.nhtsa.gov)

### TEST NOTES

- Driver Shoulder Belt load cell was not installed.
- Driver Lap Belt load cell was not installed.
- Passenger Head Angular Velocity X recorded questionable data.
- Passenger Shoulder Belt load cell was not installed.
- Passenger Lap Belt load cell was not installed.
- Barrier C-01 Fx recorded no valid data.
- Barrier C-02 Fx, My recorded no valid data.
- Barrier K-15 My recorded 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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	O20235300	Traction Control System (TCS)	Yes
Model Year	2023	Power Steering	Yes
Make	Acura	Power Window Auto-Reverse	Yes
Model	Integra A-Spec Tech	Driver Frontal Airbag	Yes
Body Style	5-Door Hatchback	Driver Curtain Airbag	Yes
VIN	19UDE4G79PA005104	Driver Head/Torso Airbag	No
Body Color	Apex Blue Pearl	Driver Torso Airbag	No
Odometer (km/mi)	135 km / 84 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	1.5 L	Driver Pelvis Airbag	No
Type/No. Cylinders	Inline 4	Driver Knee Airbag	Yes
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Manual	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6	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	Yes
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
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**DATA FROM CERTIFICATION LABEL**

Manufactured By	HONDA DEVELOPMENT & MANUFACTURING OF AMERICA, LLC	GVWR (kg)	1820
		GAWR Front (kg)	965
Date of Manufacture	08/22	GAWR Rear (kg)	860

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

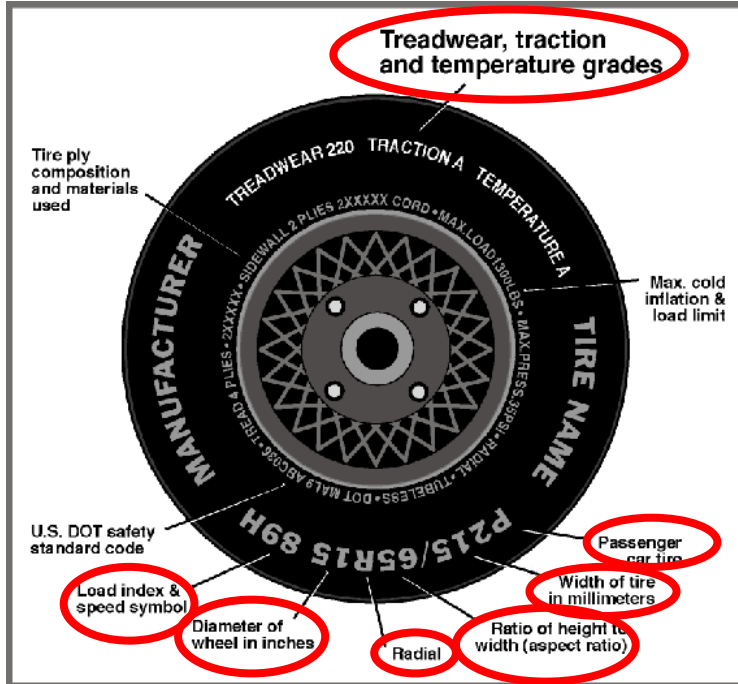
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contoured		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				385
Cargo Weight (RCLW) (kg)				45

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**VEHICLE TIRE INFORMATION**



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	235/40R18	235/40R18
Tire Size on Vehicle	235/40R18	235/40R18
Tire Manufacturer	Continental	Continental
Tire Model	Conti ProContact	Conti ProContact
Treadwear	400	400
Traction	AA	AA
Temperature Grade	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	1 Rayon, 2 Steel, 2 Polyamide	1 Rayon, 2 Steel, 2 Polyamide
Load Index/Speed Symbol	91W	91W
Tire Material	Rubber	Rubber
DOT Safety Code Left	1VYOF BEKL 1622	1VYOF BEKL 1622
DOT Safety Code Right	1VYOF BEKL 1622	1VYOF BEKL 1622

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	413.0	288.0		446.0	351.0	
Right	kg	417.0	275.0		443.0	333.5	
Ratio	%	59.6%	40.4%		56.5%	43.5%	
Totals	kg	830.0	563.0	1393.0	889.0	684.5	1573.5

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1393.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Test Vehicle Target Weight (TVTW)	kg	1579.0

**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	674	682	686	674	1106
As Tested	mm	670	665	654	662	1190
Post Test	mm	740	742	654	660	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2736
Total Vehicle Length at Left Side	mm	4459
Total Vehicle Length at Centerline	mm	4716
Total Vehicle Length at Right Side	mm	4459
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	13
Amount of Stoddard Solvent in Fuel Tank	L	43.6

List of components removed to meet test weight: Cargo area carpet/trim/divider, jack and tools.

List of components removed for instrumentation, data box, and equipment installation: Additional cargo area trim, subwoofer.

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	4716
2	Total Width	1805
3	Bumper Top Height	523
4	Bumper Bottom Height	437
5	Longitudinal Member Top Height	528
6	Distance between Longitudinal Members	965
7	Longitudinal Member Width	64
8	Engine Top Height	773
9	Engine Bottom Height	201
10	Engine and Gearbox Width	813
11	Front Bumper-Engine Distance	550
12	Front Shock Absorber Fixing Height	856
13	Bonnet Leading Edge Height	795
14	Front Shock Absorber Fixing Width	182
15	Front Bumper – Front Axle Distance	831
16	Front Axle – A-Pillar Distance	440
17	A-Pillar – B-Pillar Distance	1112
18	B-Pillar – Rear Axle Distance	1159
19	B-Pillar – C-Pillar Distance	731
20	Roof Sill Bottom Height	1356
21	Roof Sill Top Height	1427
22	Floor Sill Bottom Height	168
23	Floor Sill Top Height	309

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

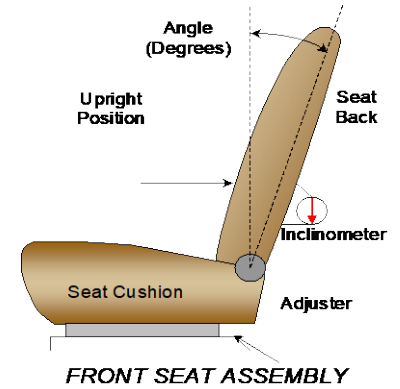
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**NOMINAL DESIGN RIDING POSITION**

The driver seat back is positioned as close as possible to the manufacturer's design angle. For the passenger seat back, seat back is adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated May 2018.

	Degrees
Driver Seat Back Angle	2.6° on outboard headrest post
Passenger Seat Back Angle	2.6° on outboard headrest post



**SEAT FORE/AFT POSITIONS**

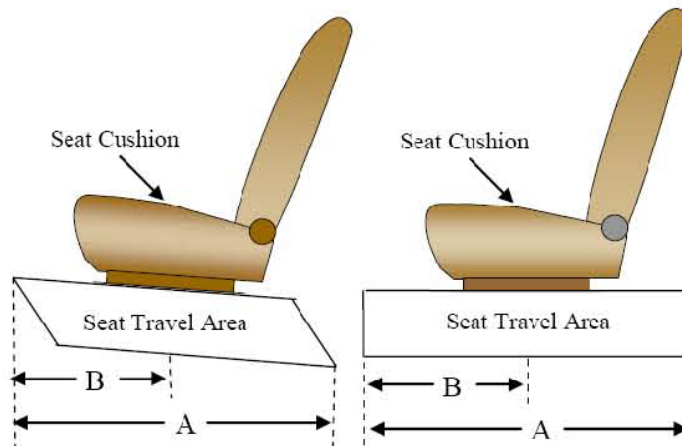
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated May 2018.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	288 mm	144 mm
Passenger Seat	210 mm	0 mm

**SEAT BELT UPPER ANCHORAGES**

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

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



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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

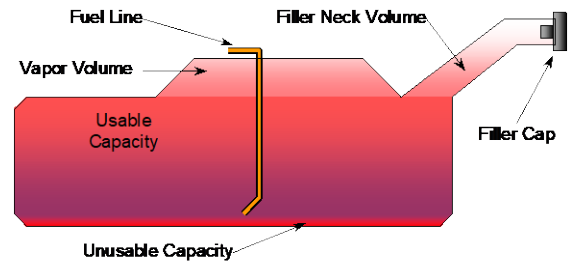
NHTSA No.: O20235300  
 Test Date: 11/16/2022

**FUEL TANK CAPACITY DATA**

	<b>Liters</b>
Usable Capacity of "Standard Tank"	46.9
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	43.1 to 44.1
Actual Amount of Solvent used	43.6
1/3 of Usable Capacity	15.6

**FUEL PUMP**

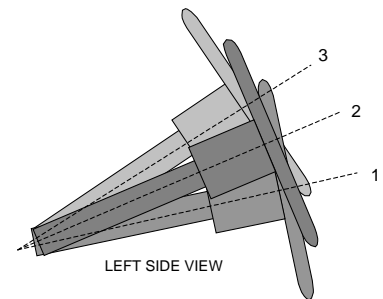
The vehicle is equipped with an electronic fuel pump. The fuel pump will run when the Engine Start/Stop Switch is pushed two times (ignition ON position). The pump will be filled for two seconds, after which pressure is maintained. The filler neck is located on the driver's side.



VEHICLE FUEL TANK ASSEMBLY

**STEERING COLUMN ADJUSTMENT**

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



STEERING COLUMN ASSEMBLY

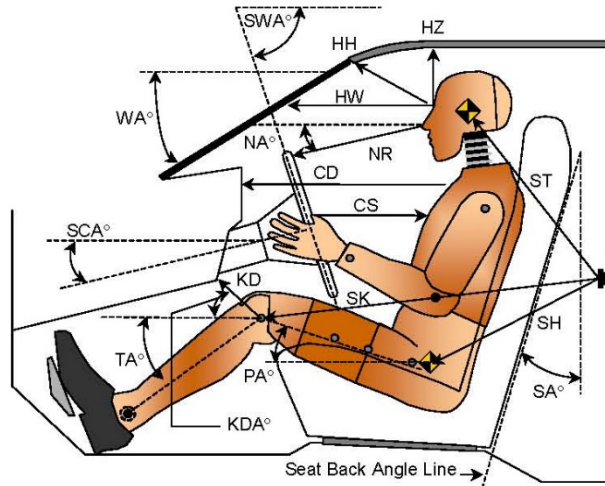
**STEERING COLUMN POSITION**

	<b>Degrees</b>	<b>Fore/Aft Position (mm)</b>
Lowermost Position 1	74.1	
Geometric Center Position 2	71.2	
Uppermost Position 3	68.3	
Telescoping Steering Wheel Travel		40
Test Position	71.2	20

**DATA SHEET NO. 3**  
**DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
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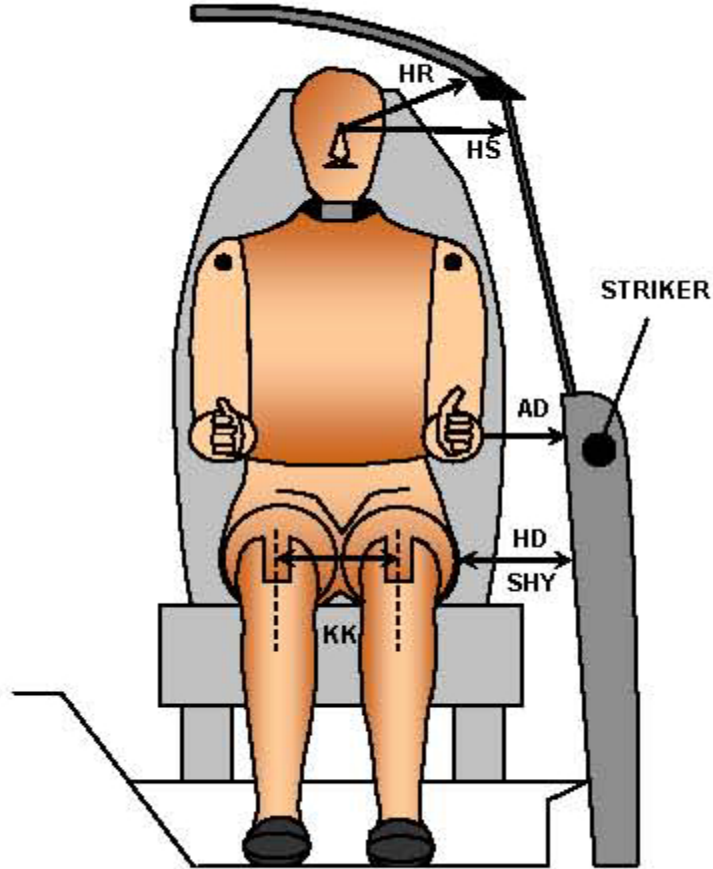
**LEFT SIDE VIEW**

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		28.0		
SWA°	Steering Wheel Angle		71.2		
SCA°	Steering Column Angle		18.8		
SA°	Seat Back Angle		2.6		2.6
HZ	Head to Roof (Z)	156	90	202	90
HH	Head to Header	340	21.1	317	39.9
HW	Head to Windshield	636	0	669	0
NR	Nose to Rim	363	14.0		
CD	Chest to Dash	509		393	
CS	Chest to Steering Hub	286	8.8		
RA	Rim to Abdomen	196	0		
KDL	Left Knee to Dash	195	40.6	177	43.5
KDR	Right Knee to Dash	170	39.1	183	43.5
PA°	Pelvic Angle		23.8		18.3
TA°	Tibia Angle		42.4		42.5
SK	Striker to Knee	592	8.4	668	102.4
ST	Striker to Head	410	75.4	403	25.6
SH	Striker to H-Point	348	46.2	404	125.0

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

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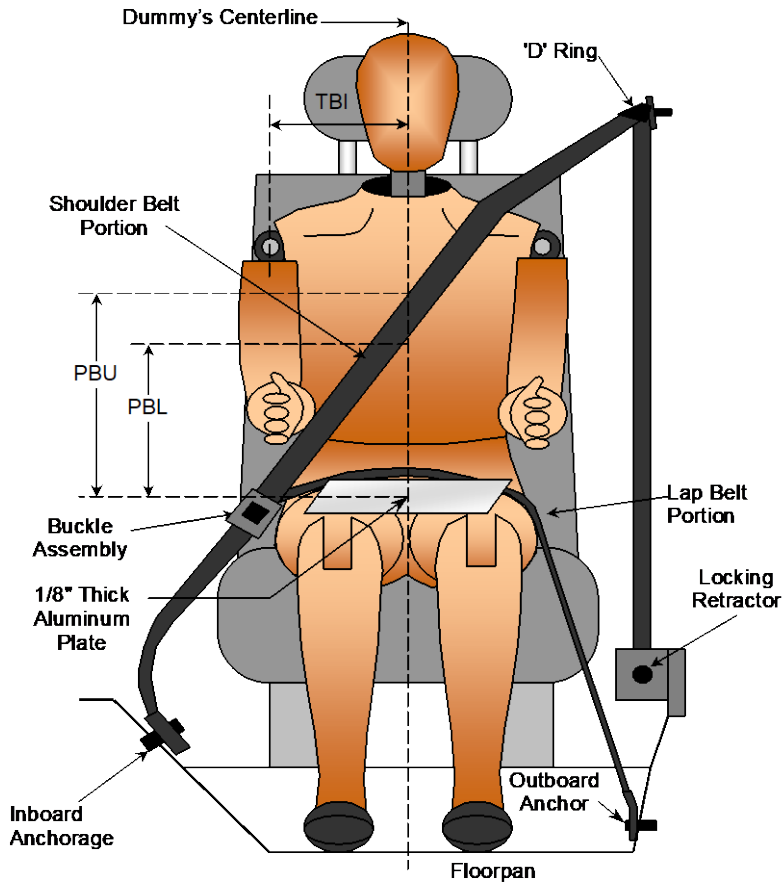
**FRONT VIEW OF DUMMY**

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	138	80
HD	H-Point to Door	139	171
HR	Head to Side Header	209	243
HS	Head to Side Window	320	360
KK	Knee to Knee	370	229
SHY	Striker to H-Point (Y Direction)	269	311
AA	Ankle to Ankle	385	164

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022



**FRONT VIEW OF DUMMY**

**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	365	320
PBL - Top surface of reference to belt lower edge	mm	285	225

**BELT LENGTH DATA**

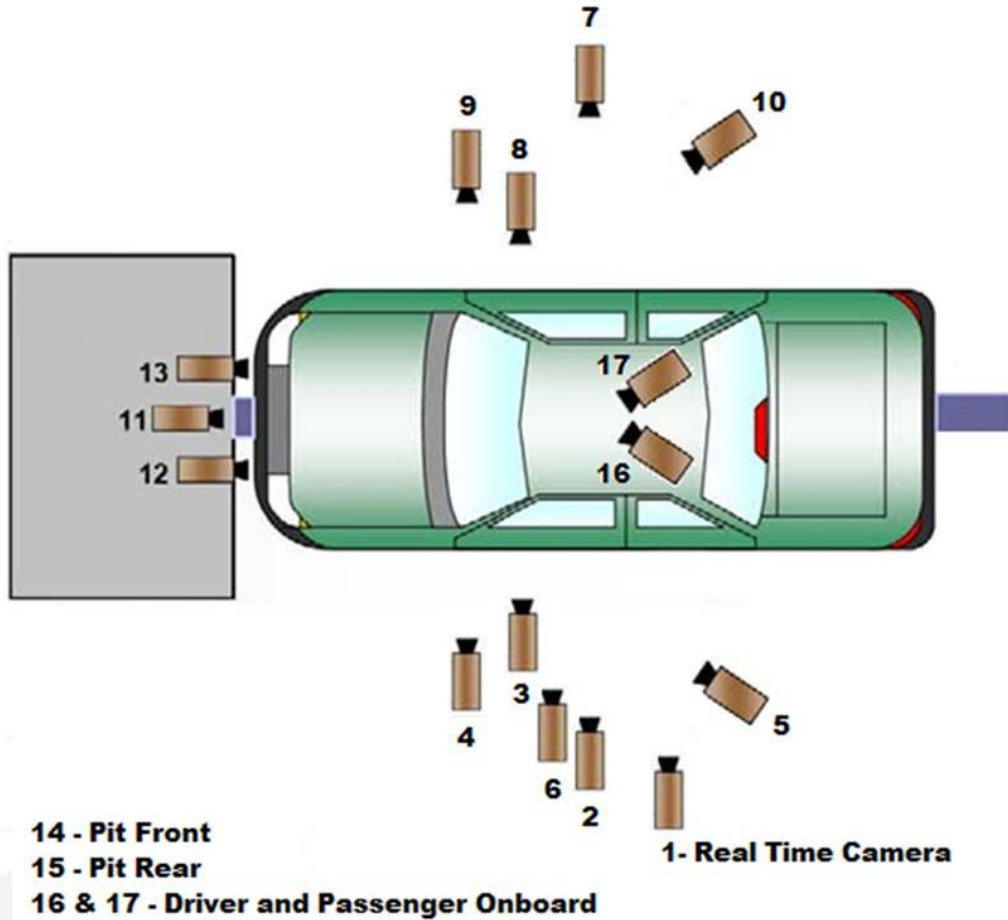
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	906	940
Lap Belt Length as measured on ATD	mm	579	620
Remainder of belt on reel	mm	1065	990
Total Belt Length for Continuous Webbing Systems	mm	3000	3000

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
Test Date: 11/16/2022

**CAMERA POSITIONS FOR FRONTAL IMPACTS**



*\*\*Camera locations are approximate and not to scale*

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**CAMERA LOCATIONS**

No.	Camera View	Coordinates* (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall					30
2	Left Overall	-2270	-5710	-1200	12	1000
3	Driver Close-Up	-2030	-6760	-1795	50	1000
4	Left Front Half	-1410	-5610	-1190	24	1000
5	Left Angle	-7320	-5780	-1800	75	1000
6	Steering Column	-1270	-5655	-1250	50	1000
7	Right Overall	-2220	5890	-1210	12	1000
8	Passenger Close-Up	-1750	6780	-1790	50	1000
9	Right Front Half	-1255	5595	-1240	24	1000
10	Right Angle	-7580	5530	-1800	75	1000
11	Windshield	130	0	-2310	12	1000
12	Driver Windshield	180	-370	-2230	25	1000
13	Passenger Windshield	180	370	-2230	25	1000
14	Pit Front	-1045	0	3340	24	1000
15	Pit Rear	-3155	0	3340	24	1000
16	Driver Onboard				12	1000
17	Passenger Onboard				12	1000
18	Real-Time Pan View					30

\*COORDINATES:

+X = forward of impact plane

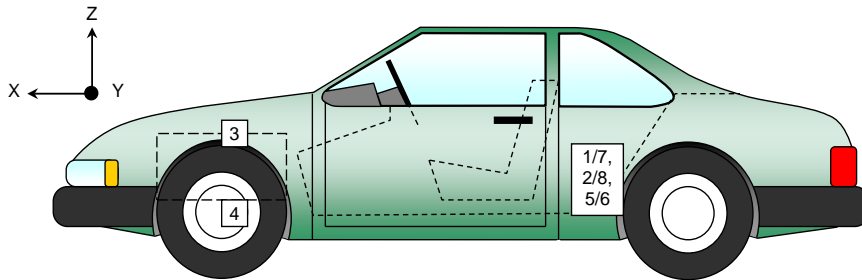
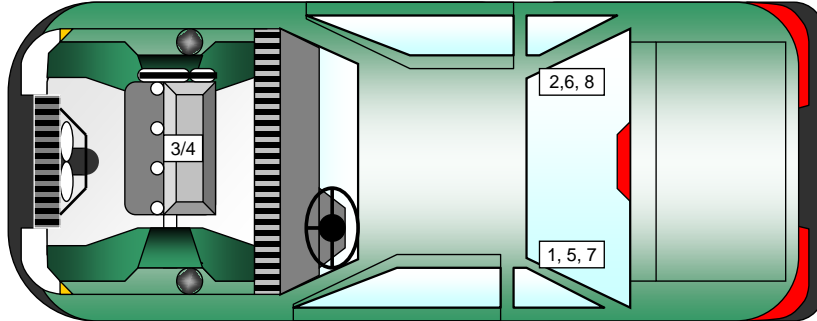
+Y = right of monorail centerline

+Z = below ground level

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022



**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1861	-344	-182
2	Right Rear Crossmember Accelerometer – X Direction	1861	344	-182
3	Engine Top X	3993	35	-773
4	Engine Bottom X	3927	220	-201
5	Left Rear Crossmember Accelerometer – Z Direction	1861	-344	-182
6	Right Rear Crossmember Accelerometer – Z Direction	1861	344	-182
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1861	-314	-182
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1861	314	-182

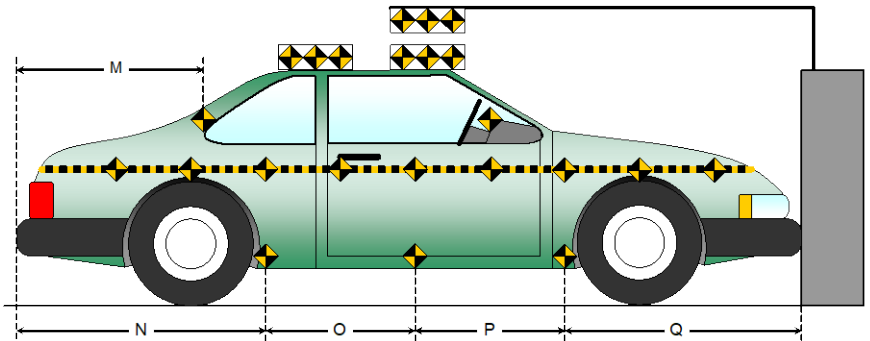
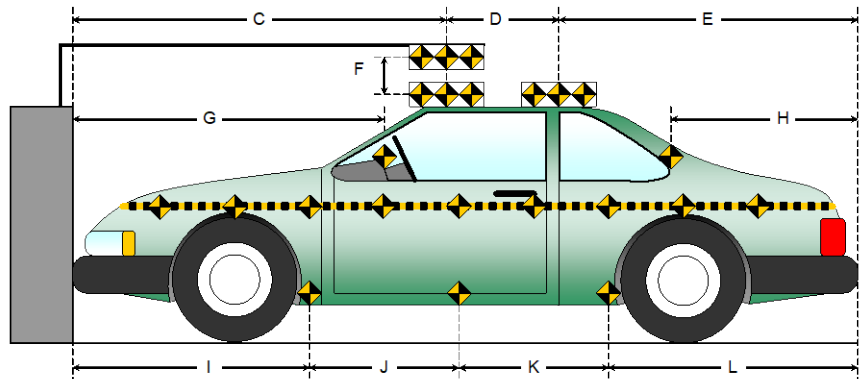
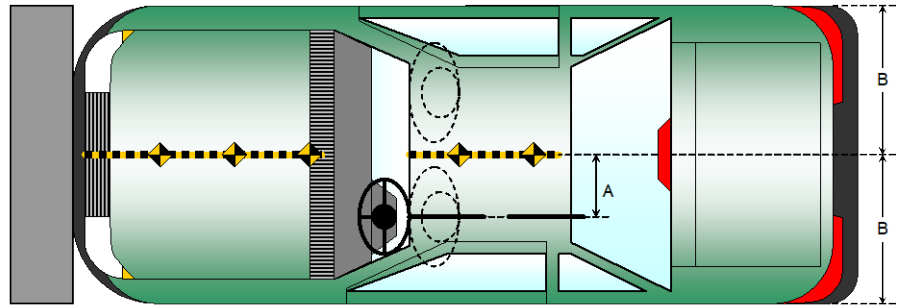
Reference Points: X - Rear Surface of Vehicle (+ forward)  
 Y - Vehicle Centerline (+ to right)  
 Z - Ground Plane (+ down)

**DATA SHEET NO. 8**  
**PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

Item	Value (mm)
A	360
B	903
C	2400
D	610
E	1706
F	185
G	
H	1259
I	1422
J	946
K	946
L	1402
M	1259
N	1402
O	946
P	946
Q	1422



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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**ADVANCED RESEARCH LOAD CELL BARRIER**

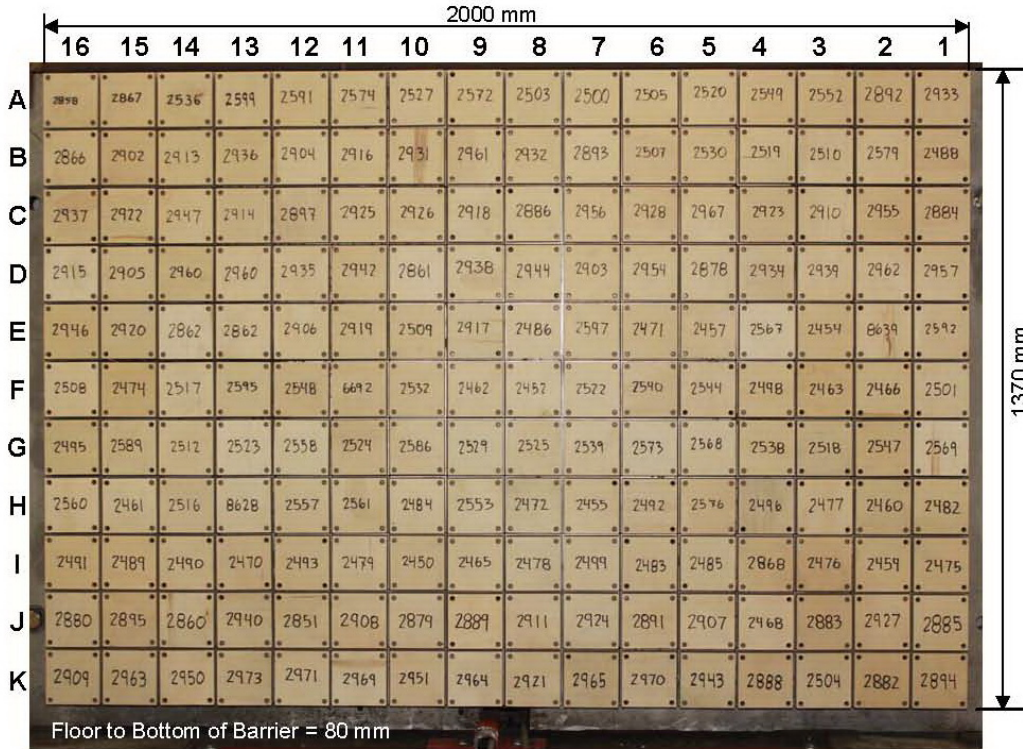


Photo for Reference Only

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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**INSTRUMENTATION**

Instrumentation	Number of Channels Collected
Driver Dummy Data Channels	47
Passenger Dummy Data Channels	47
Vehicle Structure Accelerometers	8
Barrier Channels	528
Total	630

**CAMERA COVERAGE**

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	2
High-Speed Offboard	14
Real-Time	2
Total	18

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 351	HIII 5% / 142
Head Contact	Frontal Airbag, Headrest	Frontal Airbag, Headrest
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Knee Airbag
Right Knee Contact	Knee Airbag	Knee Airbag

**DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION**

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
Front Door Opening	Remained closed and unlocked; opened without tools	Remained closed and unlocked; opened without tools
Rear Door Opening	Remained closed and unlocked; opened without tools	Remained closed and unlocked; opened without tools
Trunk/Hatch/Tailgate Opening	Remained closed; opened without tools	
Seat Track Shift (mm)	0	0
Seat Back Movement	None	None

**OTHER VEHICLE POST-TEST OBSERVATIONS**

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

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	610
Center	mm	555
Right Side	mm	590
Average	mm	585

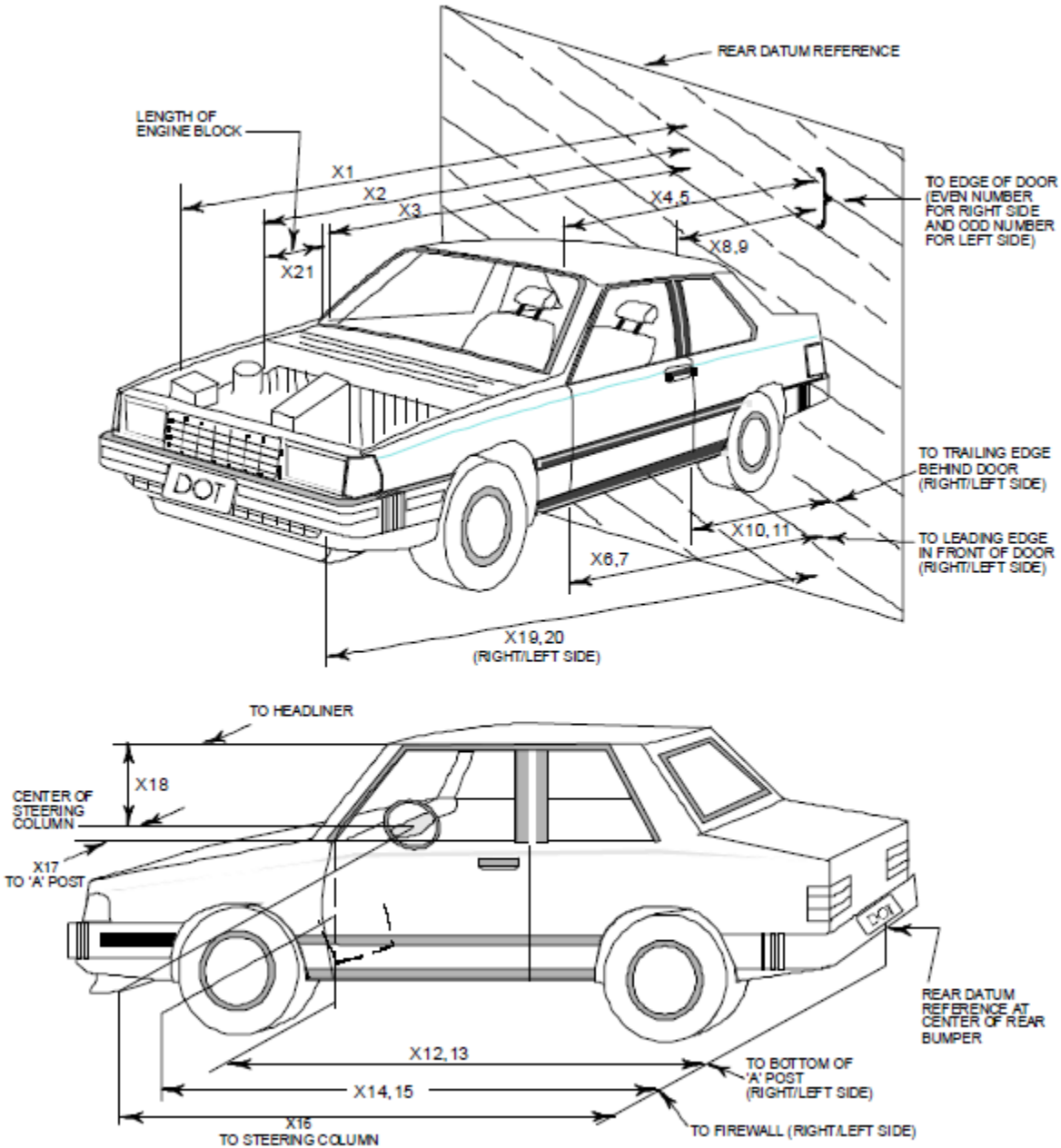
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Driver		Passenger	
	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	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	
Other				

## DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022



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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

No.	Measurement Description	Pre-Test	Post-Test	Change
1	Total Length of Vehicle at Centerline	4716	4160	-556
2	RSOV to Front of Engine	4043	4125	82
3	RSOV to Firewall	3598	3610	12
4	RSOV to Upper Leading Edge of Right Door	3155	3185	30
5	RSOV to Upper Leading Edge of Left Door	3166	3155	-11
6	RSOV to Lower Leading Edge of Right Door	3218	3242	24
7	RSOV to Lower Leading Edge of Left Door	3216	3207	-9
8	RSOV to Upper Trailing Edge of Right Door	2123	2145	22
9	RSOV to Upper Trailing Edge of Left Door	2125	2130	5
10	RSOV to Lower Trailing Edge of Right Door	2139	2174	35
11	RSOV to Lower Trailing Edge of Left Door	2133	2148	15
12	RSOV to Bottom of "A" Post of Right Side	3238	3200	-38
13	RSOV to Bottom of "A" Post of Left Side	3233	3194	-39
14	RSOV to Firewall, Right Side	3458	3498	40
15	RSOV to Firewall, Left Side	3451	3466	15
16	RSOV to Steering Column	2702	2755	53
17	Center of Steering Column to "A" Post	390	395	5
18	Center of Steering Column to Headliner	426	445	19
19	RSOV to Right Side of Front Bumper	4459	4178	-281
20	RSOV to Left Side of Front Bumper	4459	4155	-304
21	Length of Engine Block	398	433	35
RD	RSOV to Right Side of Dash Panel	3063	3055	-8
CD	RSOV to Center of Dash Panel	3104	3178	74
LD	RSOV to Left Side of Dash Panel	3099	2945	-154

All dimensions in mm

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

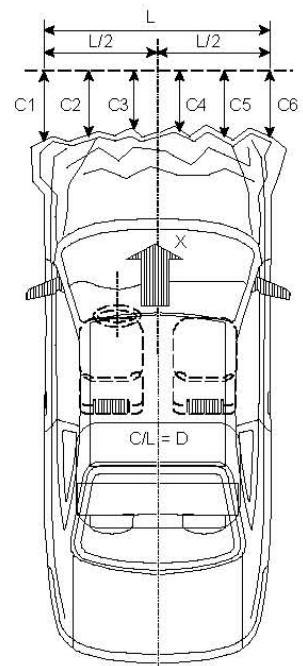
NHTSA No.: O20235300  
Test Date: 11/16/2022

**VEHICLE INFORMATION**

VIN:	<u>19UDE4G79PA005104</u>	Wheelbase (mm):	<u>2736</u>
Vehicle Size Category:	<u>Passenger Car</u>	Test Weight (kg):	<u>1573.5</u>

**ACCELEROMETER DATA**

Accelerometer Locations:	<u>As per Data Sheet No. 7</u>
Cal. Procedure/Interval:	<u>MGA Procedure / 6 month</u>
Integration Algorithm:	<u>Trapezoidal</u>
Linearity:	<u>&gt; 99%</u>
Impact Velocity (km/h):	<u>56.06</u>
Velocity Change (km/h):	<u>67.2</u>
Time of Separation (msec)	<u>105</u>



**CRUSH PROFILE**

Collision Deformation Classification:	<u>12FDEW3</u>
Midpoint of Damage:	<u>Centerline</u>
Damage Region Length (mm):	<u>1588</u>
Impact Mode:	<u>Frontal</u>

No.	Measurement Description	Units	Pre-Test	Post-Test	Exterior Crush
C1	Crush zone 1 at left side	mm	4459	4155	304
C2	Crush zone 2 at left side	mm	4632	4225	407
C3	Crush zone 3 at left side	mm	4685	4158	527
C4	Crush zone 4 at right side	mm	4685	4257	428
C5	Crush zone 5 at right side	mm	4632	4243	389
C6	Crush zone 6 at right side	mm	4459	4178	281
L	C1 TO C6	mm	1588	1561	-27

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

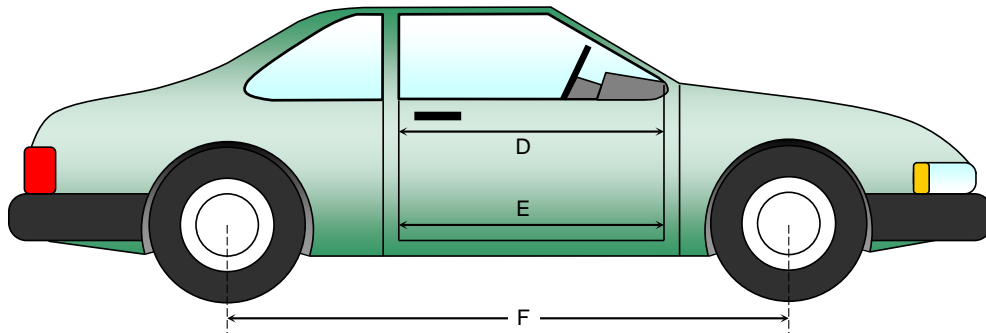
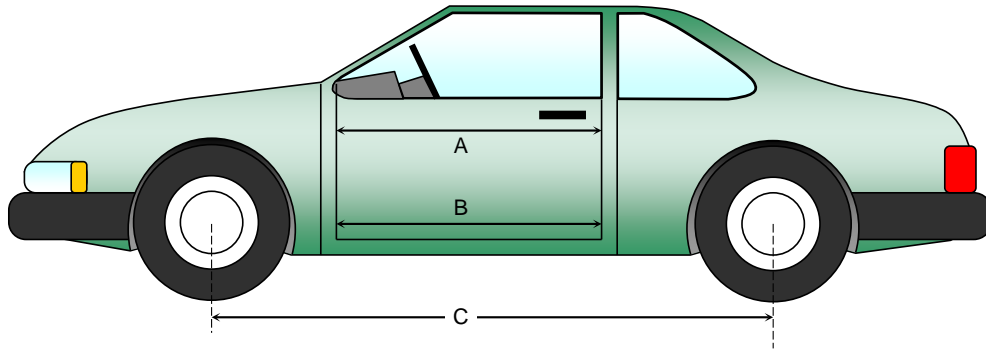
NHTSA No.: O20235300  
 Test Date: 11/16/2022

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	1016	1014	-2
B	Left Side Lower	mm	912	911	-1
D	Right Side Upper	mm	1016	1015	-1
E	Right Side Lower	mm	911	908	-3

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	2736	2639	-97
F	Right Side Wheelbase	mm	2736	2653	-83



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

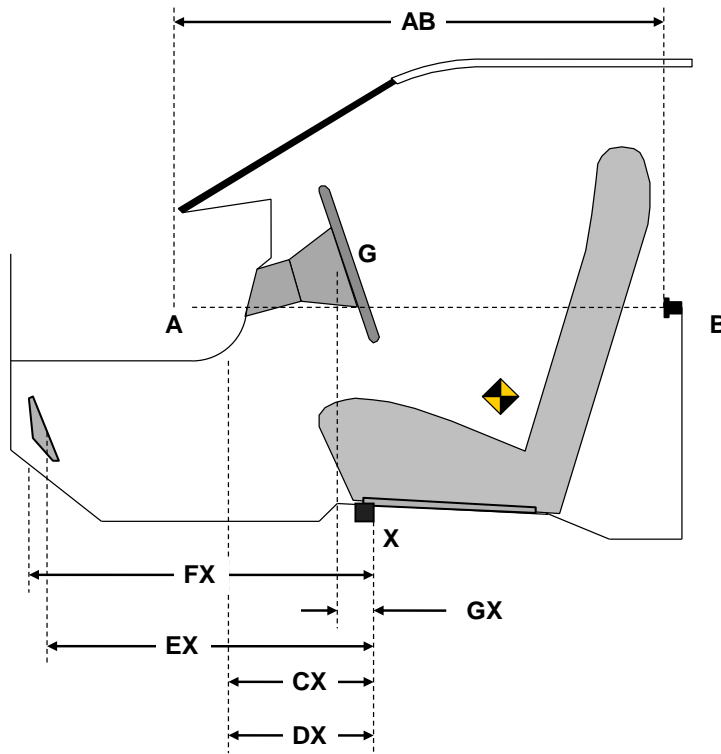
Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Change
AB	Door Opening (Inside Window Jam)	mm	805	805	0
CX	Left Knee Bolster to X	mm	341	338	-3
DX	Right Knee Bolster to X	mm	328	333	5
EX	Brake Pedal to X	mm	612	607	-5
FX	Foot Rest to X	mm	603	598	-5
GX	Center of Steering Column Wheel Hub to X	mm	28	52	24

X = Front of Seat Track (stationary)



**DRIVER COMPARTMENT**

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**WINDSHIELD MOUNTING DETAILS**

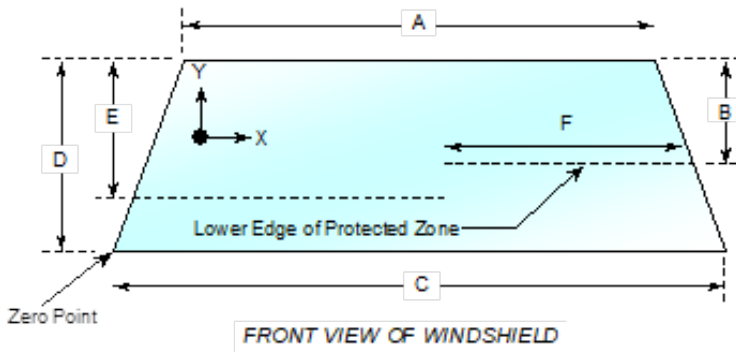
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.2°C.

**WINDSHIELD PERIPHERY MEASUREMENTS**

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2167	2167	100
Right Side	2167	2167	100
Total	4334	4334	100



Item	Units	Value
A	mm	1194
B	mm	395
C	mm	1672
D	mm	734
E	mm	502
F	mm	572

**AREA OF PROTECTED ZONE FAILURES**

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. 16**  
**FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

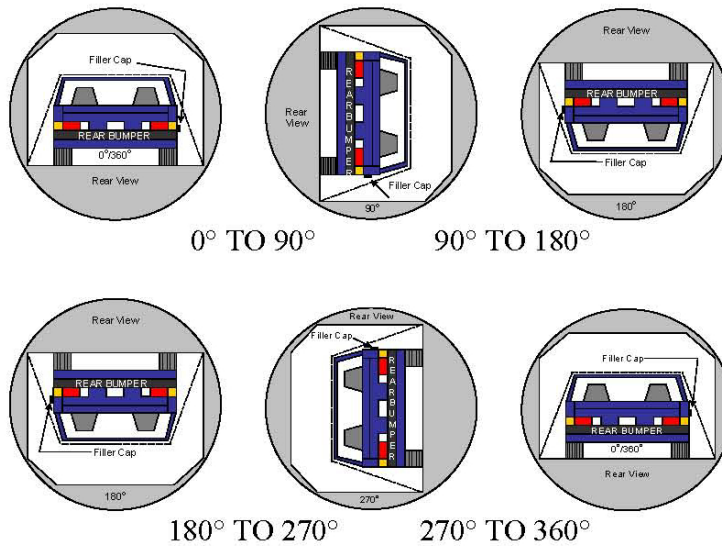
**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA**

Temperature at Time of Impact: 21.2°C

Test Time: 10:50 a.m.

- A. From impact until vehicle motion ceases: (Maximum Allowable = 1 ounce) 0.0 oz.  
 B. For the 5 minute period after motion ceases: (Maximum Allowable = 5 ounces) 0.0 oz.  
 C. For the following 25 minutes: (Maximum Allowable = 1 ounce / minute) None  
 D. Spillage Details: None

**FMVSS 301 STATIC ROLLOVER RESULTS**



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

**DATA SHEET NO. 16 (CONTINUED)**  
**FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022

**FMVSS 301 SPILLAGE TABLE (UNITS IN OUNCES)**

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

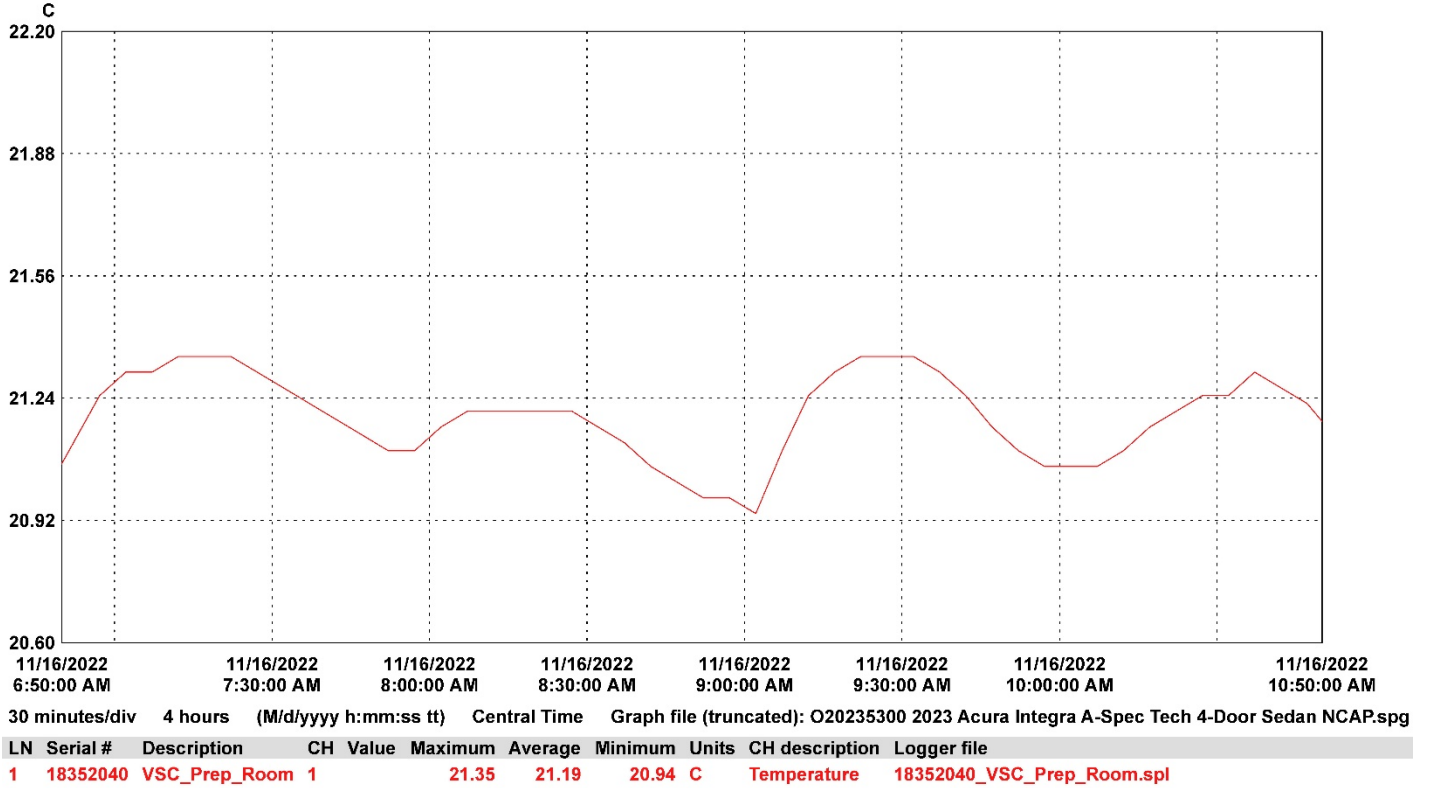
**SOLVENT SPILLAGE LOCATION TABLE**

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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235300  
 Test Date: 11/16/2022



**APPENDIX A  
PHOTOGRAPHS**

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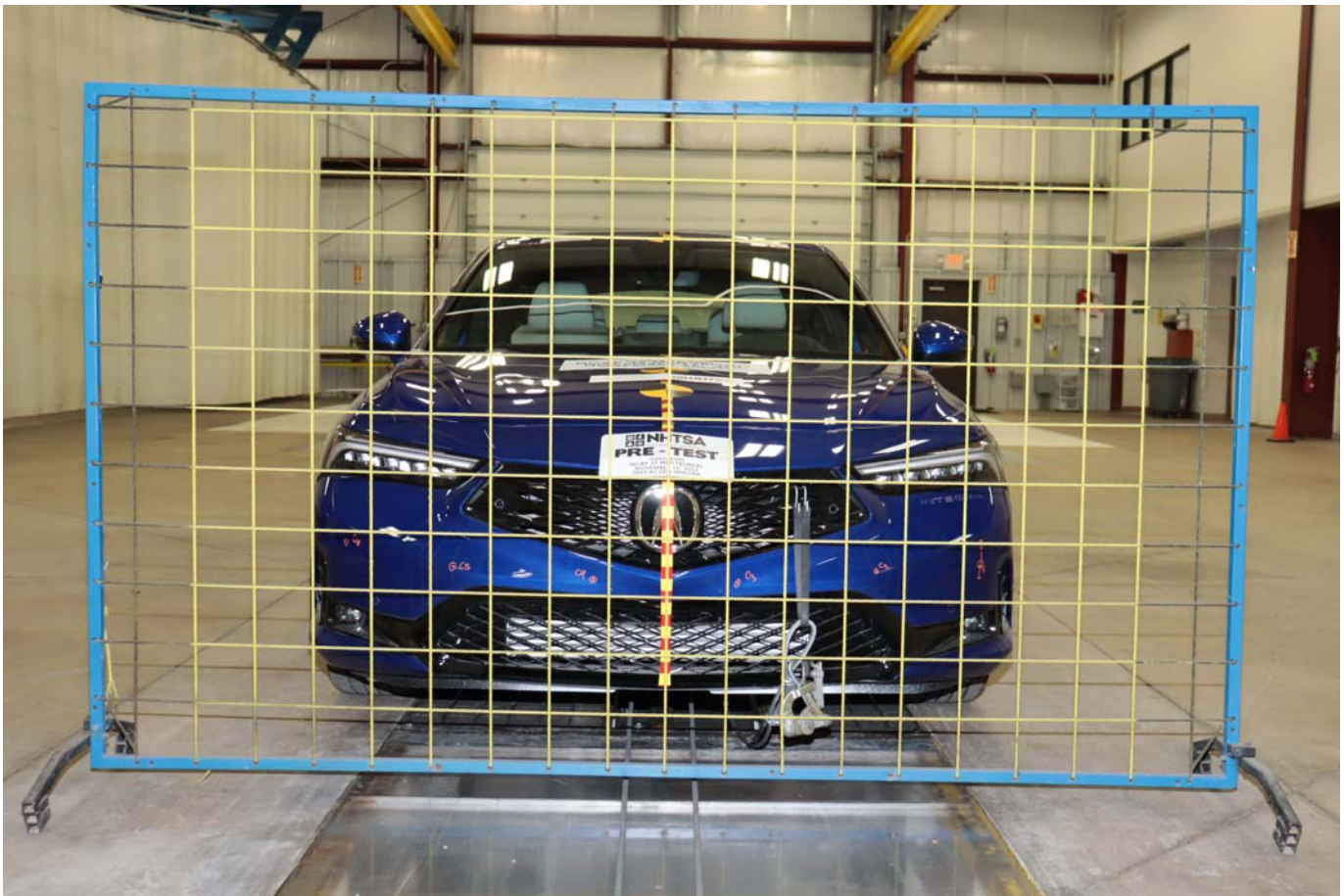


Photo No. 001 - Load Cell Location

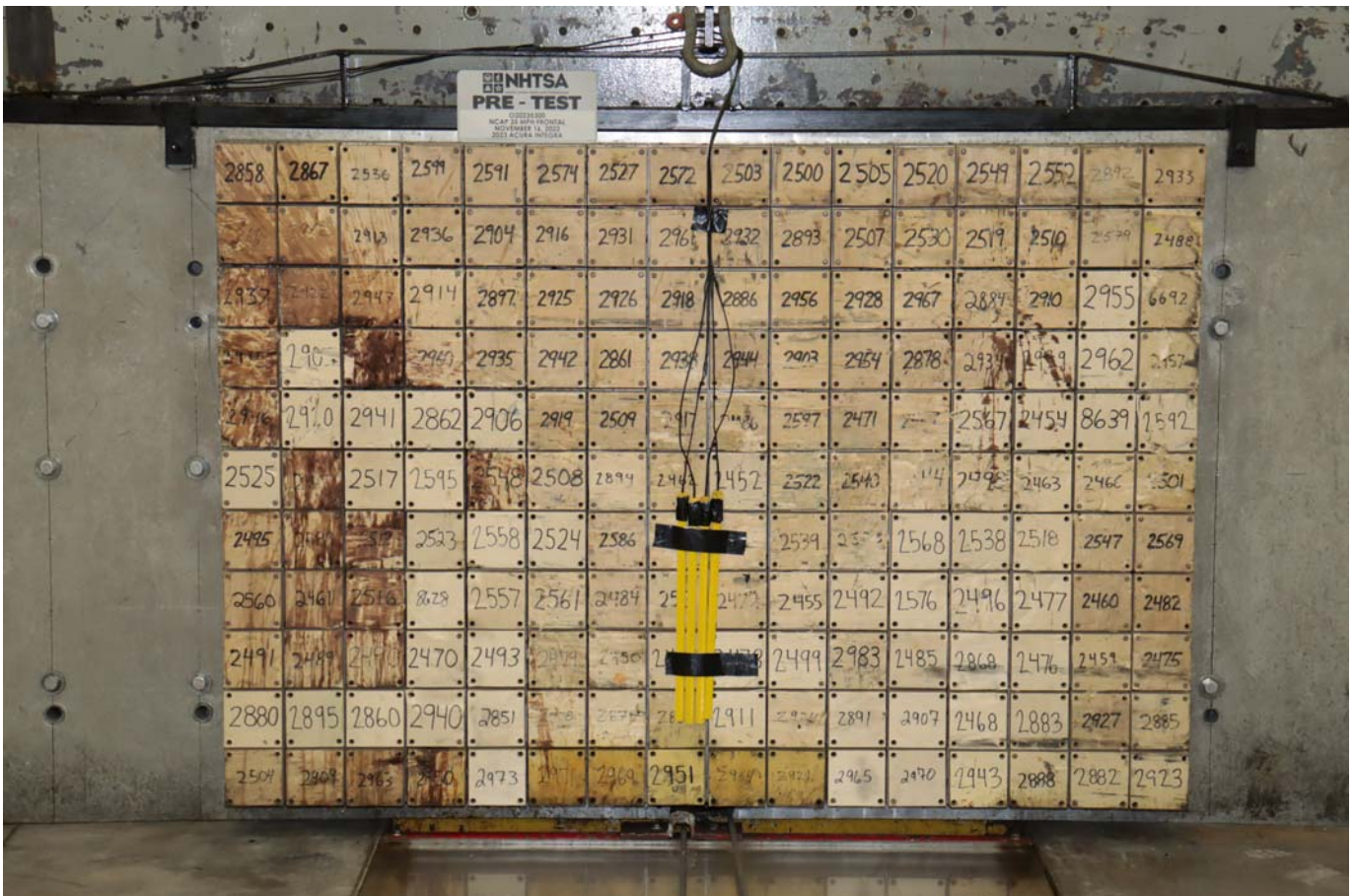


Photo No. 002 - Pre-Test Load Cell Wall



Photo No. 003 - Post-Test Load Cell Wall

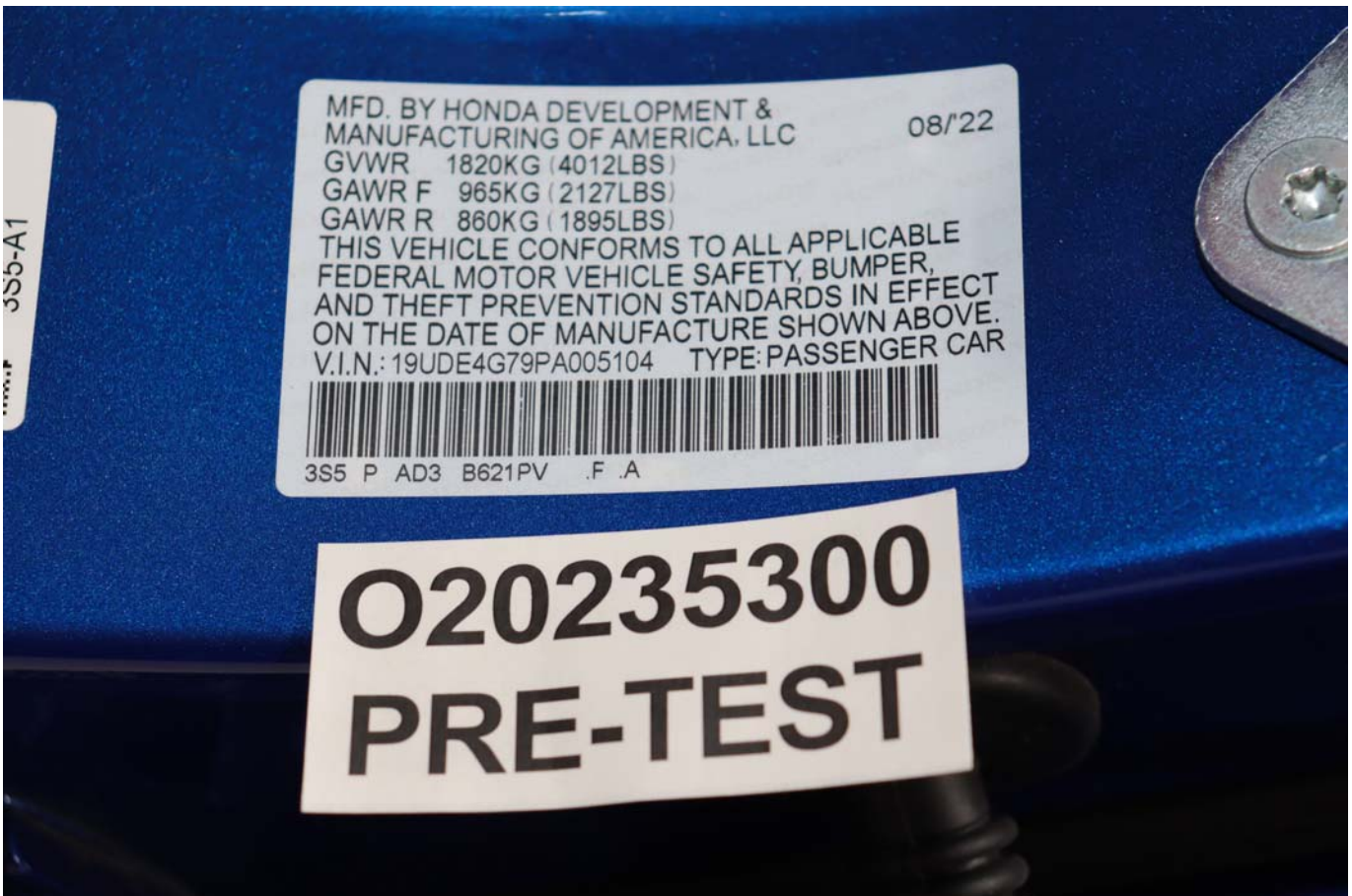


Photo No. 004 - Manufacturer's Label



Photo No. 005 - Tire Placard



Photo No. 006 - 2023 Acura Integra A-Spec Tech 5-Door Hatchback Frontal As Delivered



Photo No. 007 - Left Rear 3-4 View, As Received

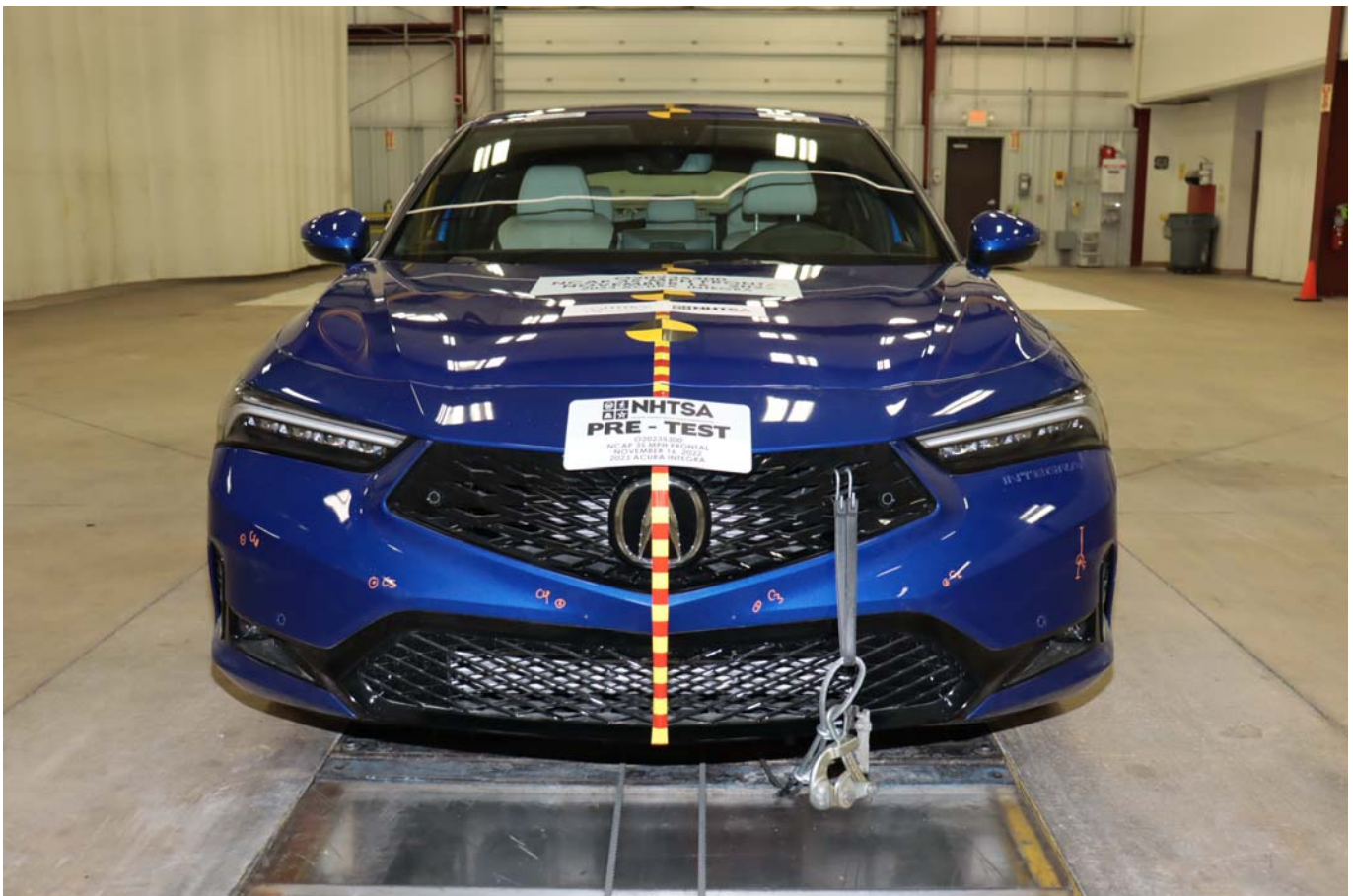


Photo No. 008 - Pre-Test Front View of Test Vehicle

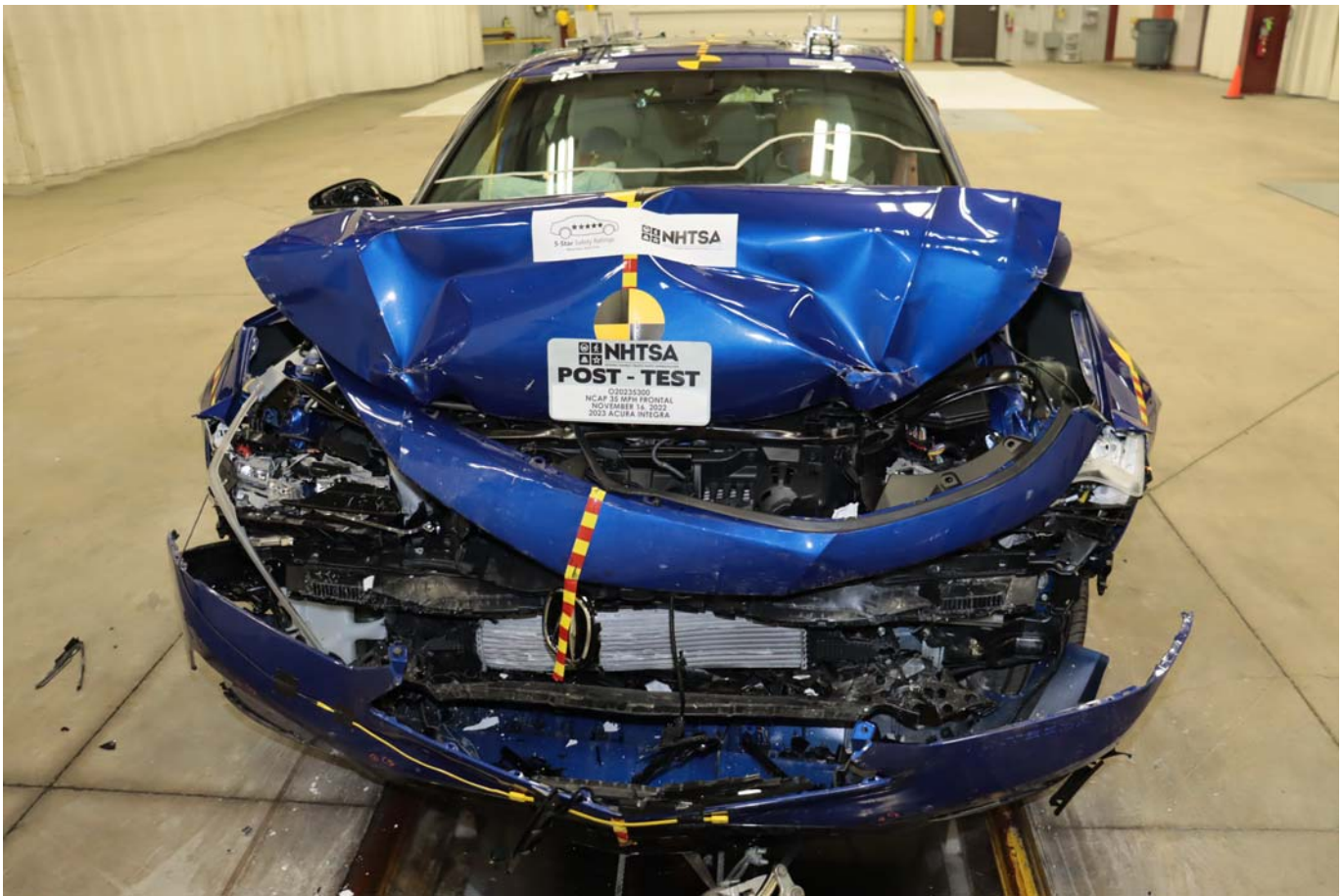


Photo No. 009 - Post-Test Front View of Test Vehicle



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



Photo No. 011 - Post-Test Left View of Test Vehicle

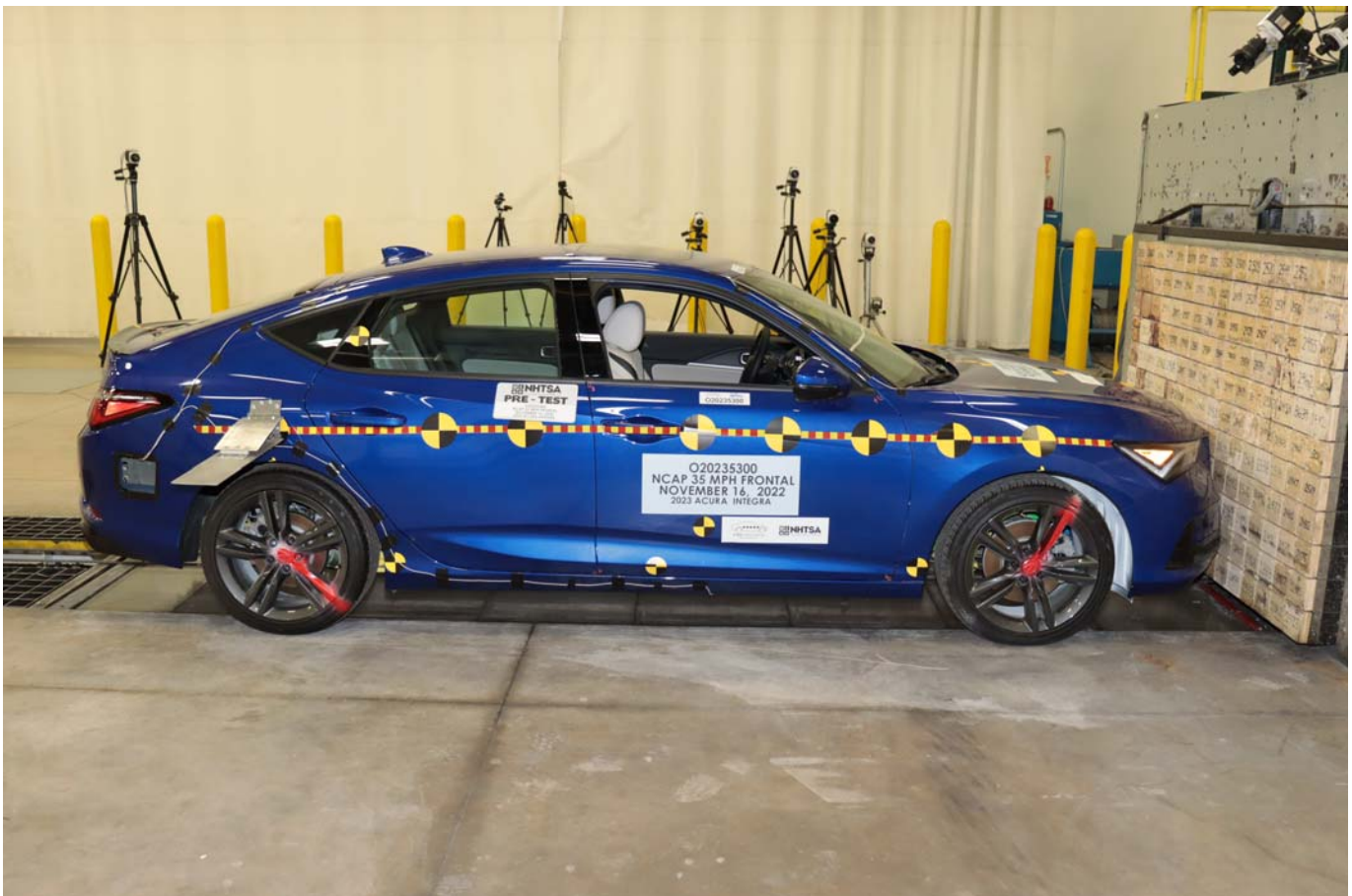


Photo No. 012 - Pre-Test Right View of Test Vehicle



Photo No. 013 - Post-Test Right View of Test Vehicle



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

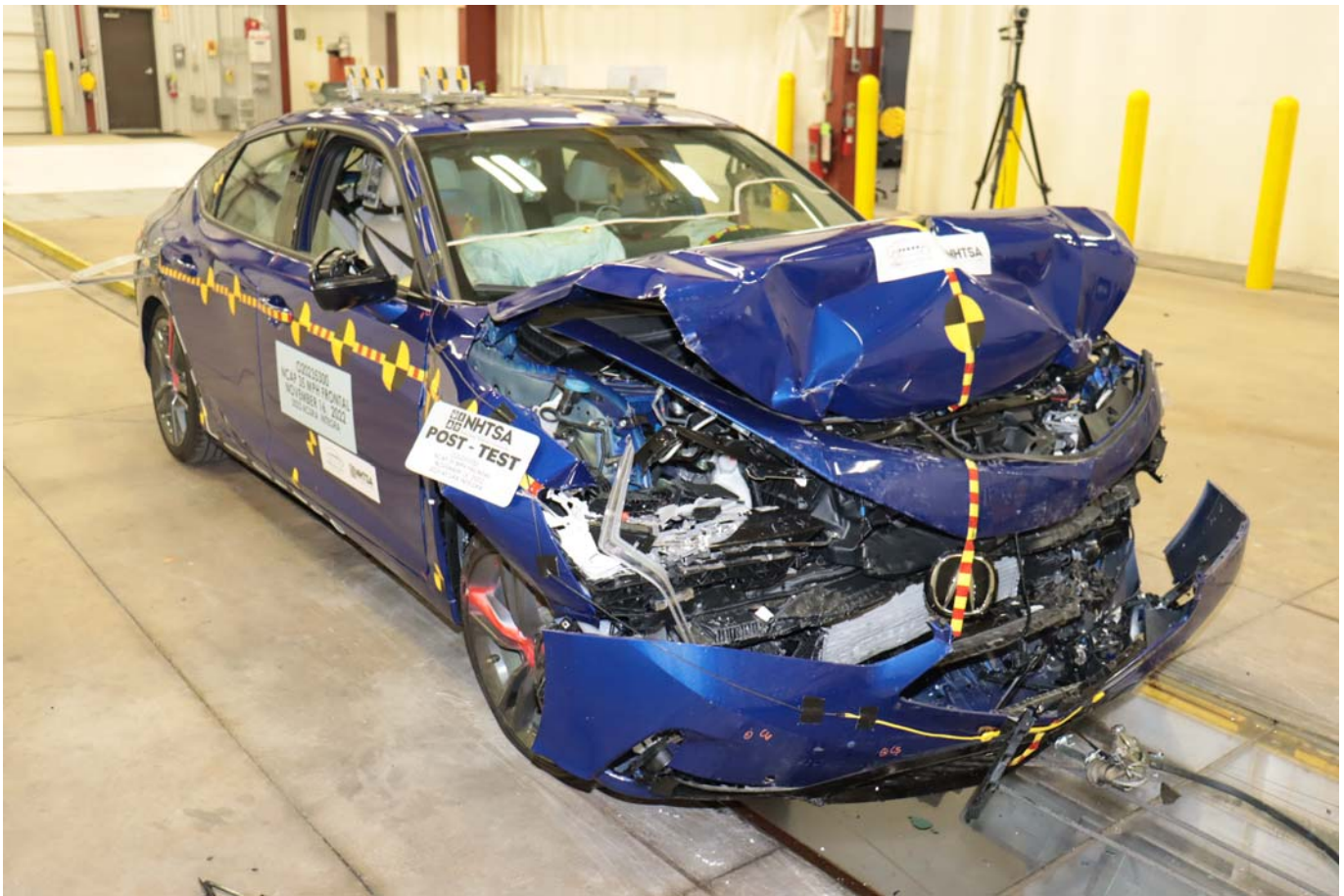


Photo No. 015 - Post-Test Right Front 3-4 View



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



Photo No. 017 - Post-Test Left Rear 3-4 View



Photo No. 018 - Pre-Test Windshield View



Photo No. 019 - Post-Test Windshield View



Photo No. 020 - Pre-Test Engine Compartment View



Photo No. 021 - Post-Test Engine Compartment View



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



Photo No. 023 - Post-Test Fuel Filler Cap View

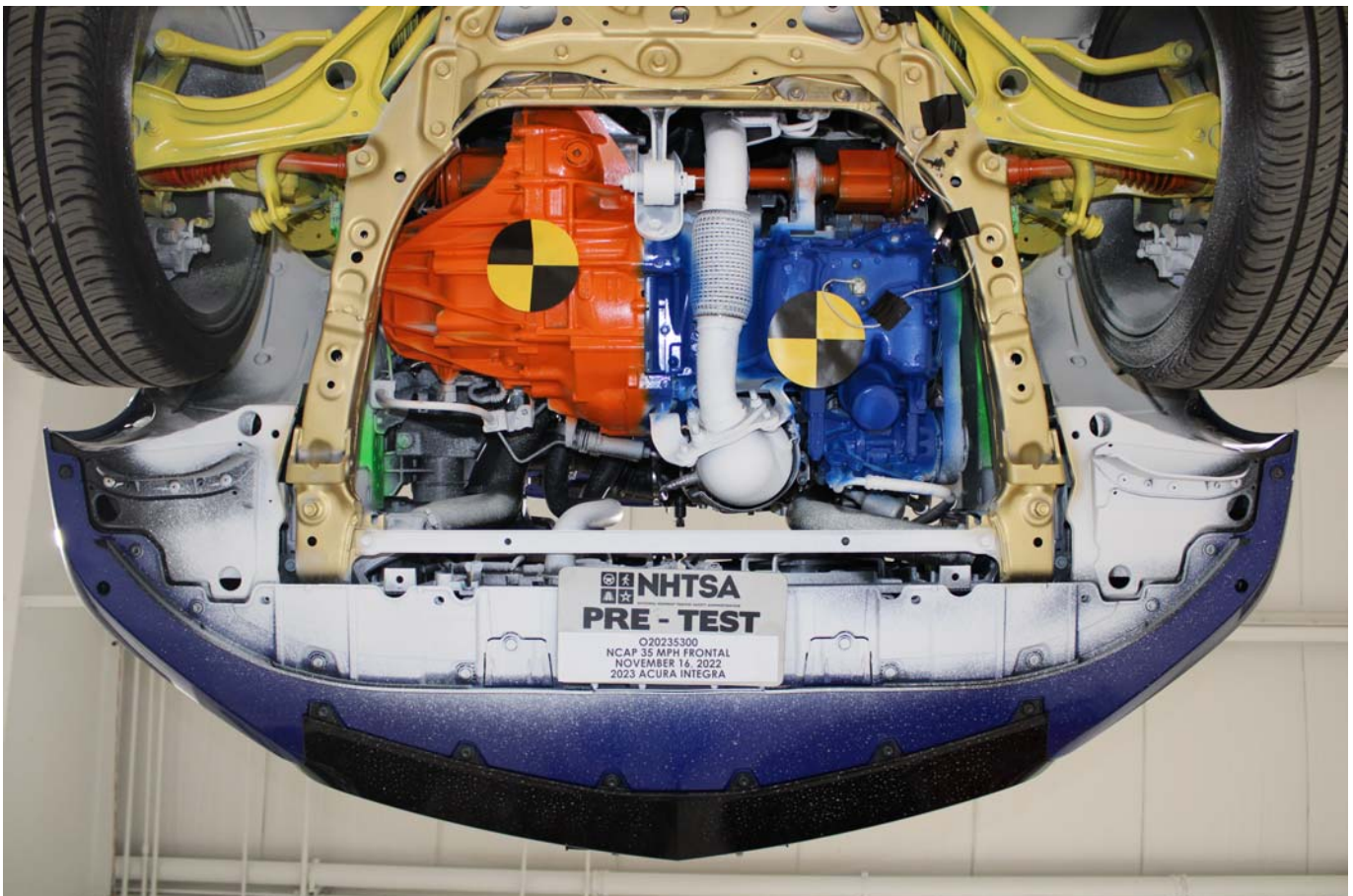


Photo No. 024 - Pre-Test Front Underbody View

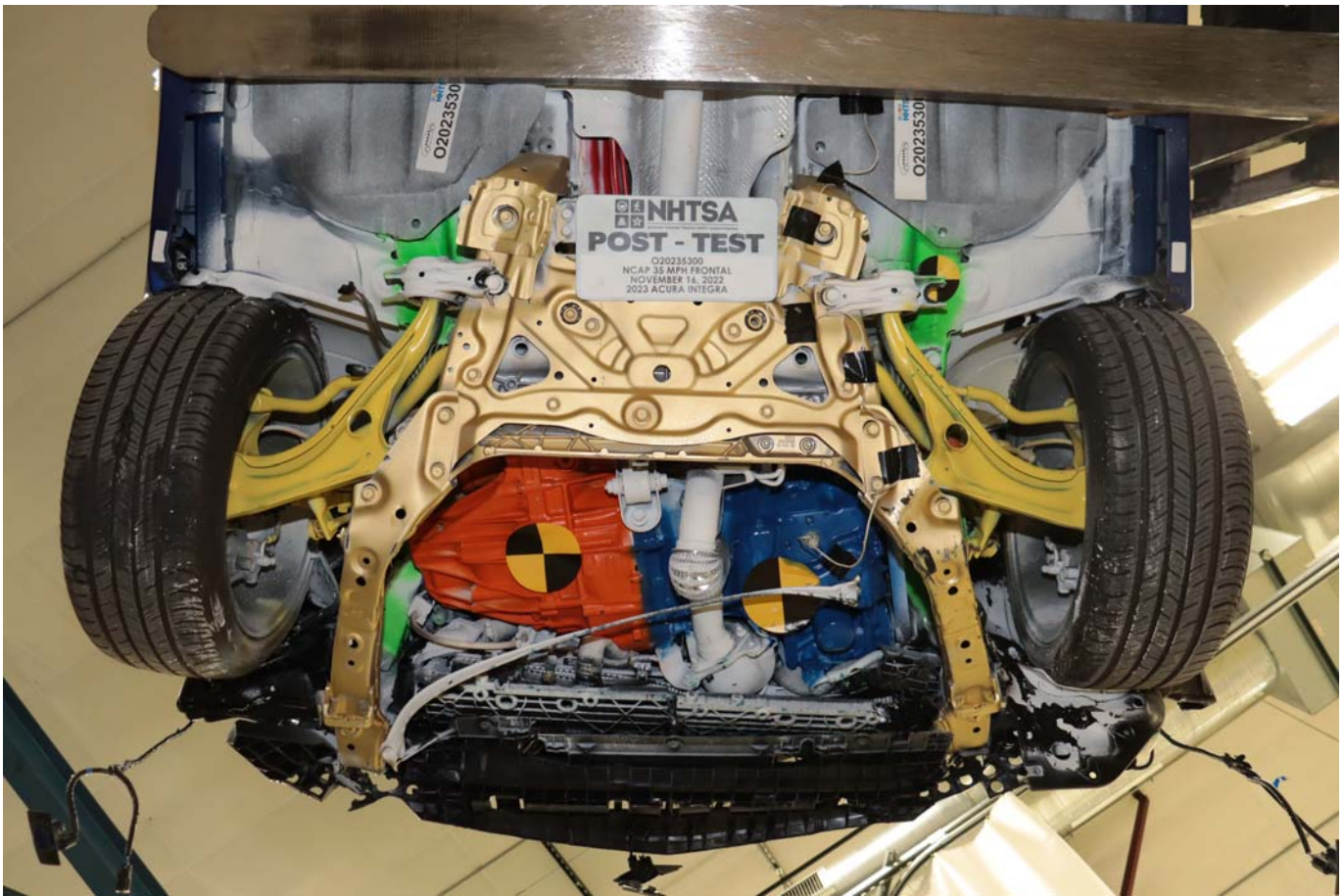


Photo No. 025 - Post-Test Front Underbody View

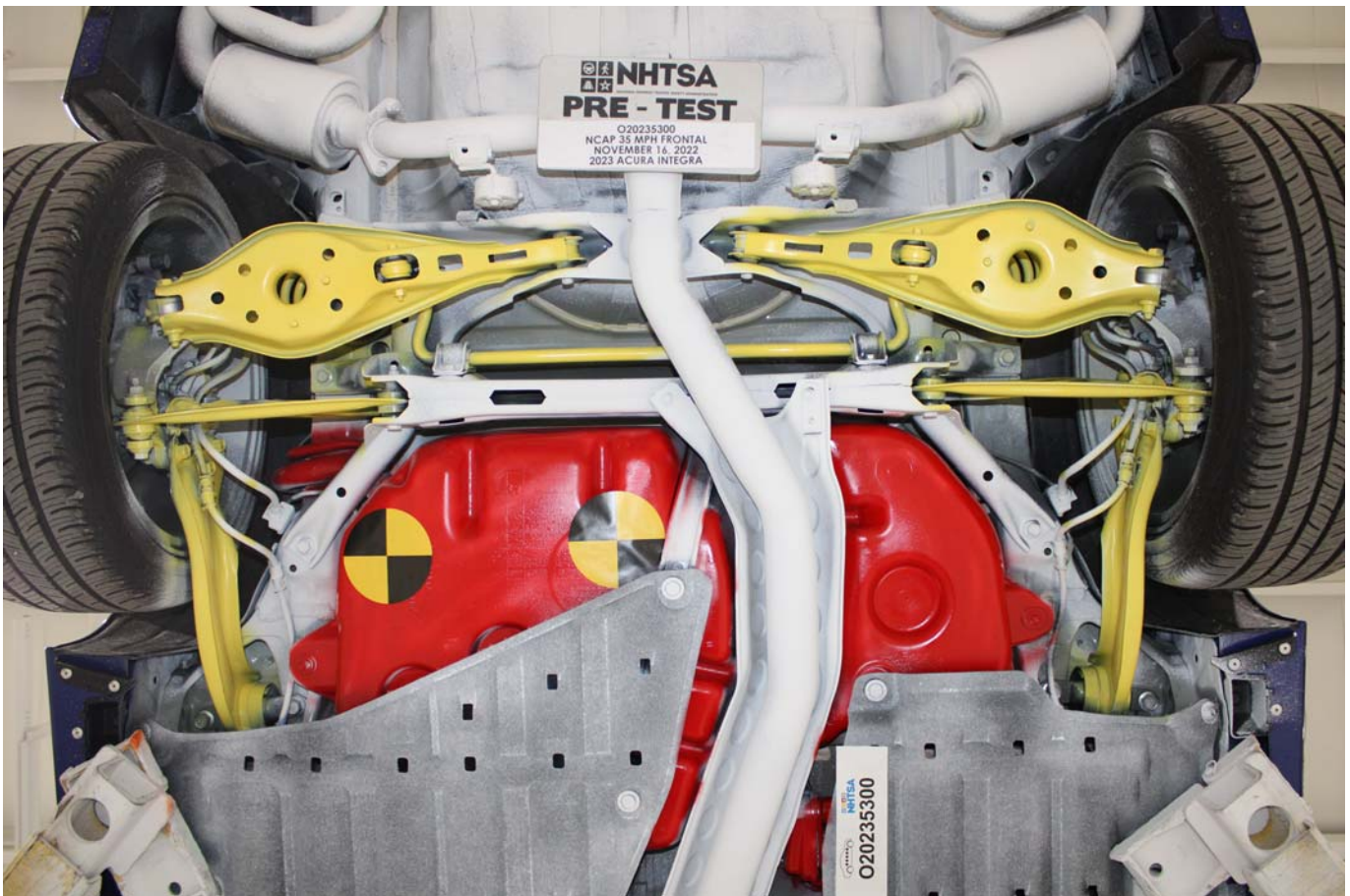


Photo No. 026 - Pre-Test Rear Underbody View

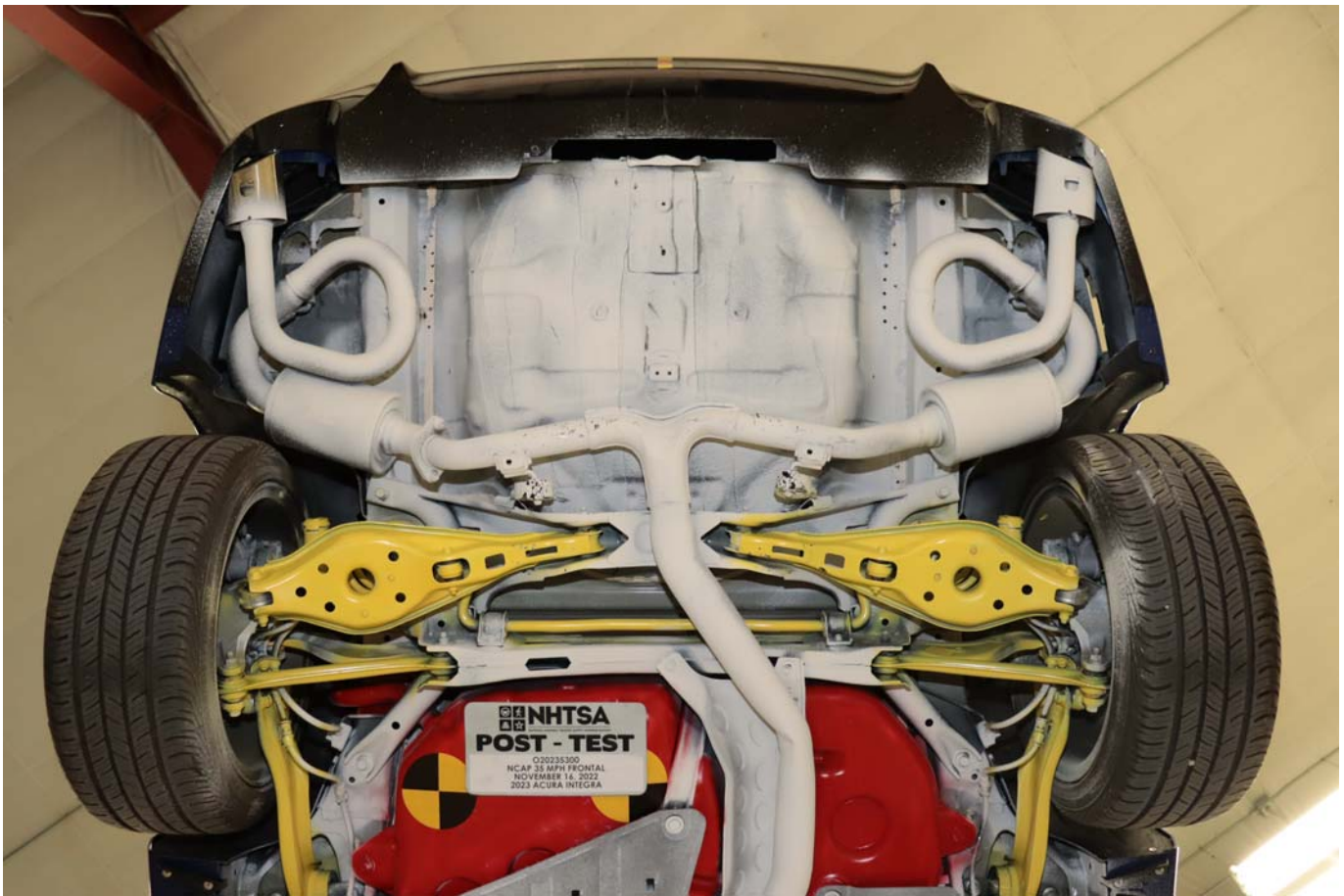


Photo No. 027 - Post-Test Rear Underbody View



Photo No. 028 - Pre-Test Dummy Cable Routing



Photo No. 029 - Post-Test Dummy Cable Routing



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



Photo No. 031 - Post-Test Driver Dummy Front View



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



Photo No. 033 - Post-Test Driver Dummy Window View



Photo No. 034 - Pre-Test Driver Dummy and Vehicle Interior View



Photo No. 035 - Post-Test Driver Dummy and Vehicle Interior View



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



Photo No. 037 - Post-Test Driver's Seat Fore-Aft Markings



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



Photo No. 039 - Post-Test View of Belt Anchorage for Driver Dummy



Photo No. 040 - Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy



Photo No. 041 - Post-Test View of Belt Buckle and Latch Plate for Driver Dummy



Photo No. 042 - Pre-Test Driver Dummy Feet



Photo No. 043 - Post-Test Driver Dummy Feet



Photo No. 044 - Pre-Test Driver's Side Knee Bolster



Photo No. 045 - Post-Test Driver's Side Knee Bolster



Photo No. 046 - Pre-Test Driver's Side Floorpan

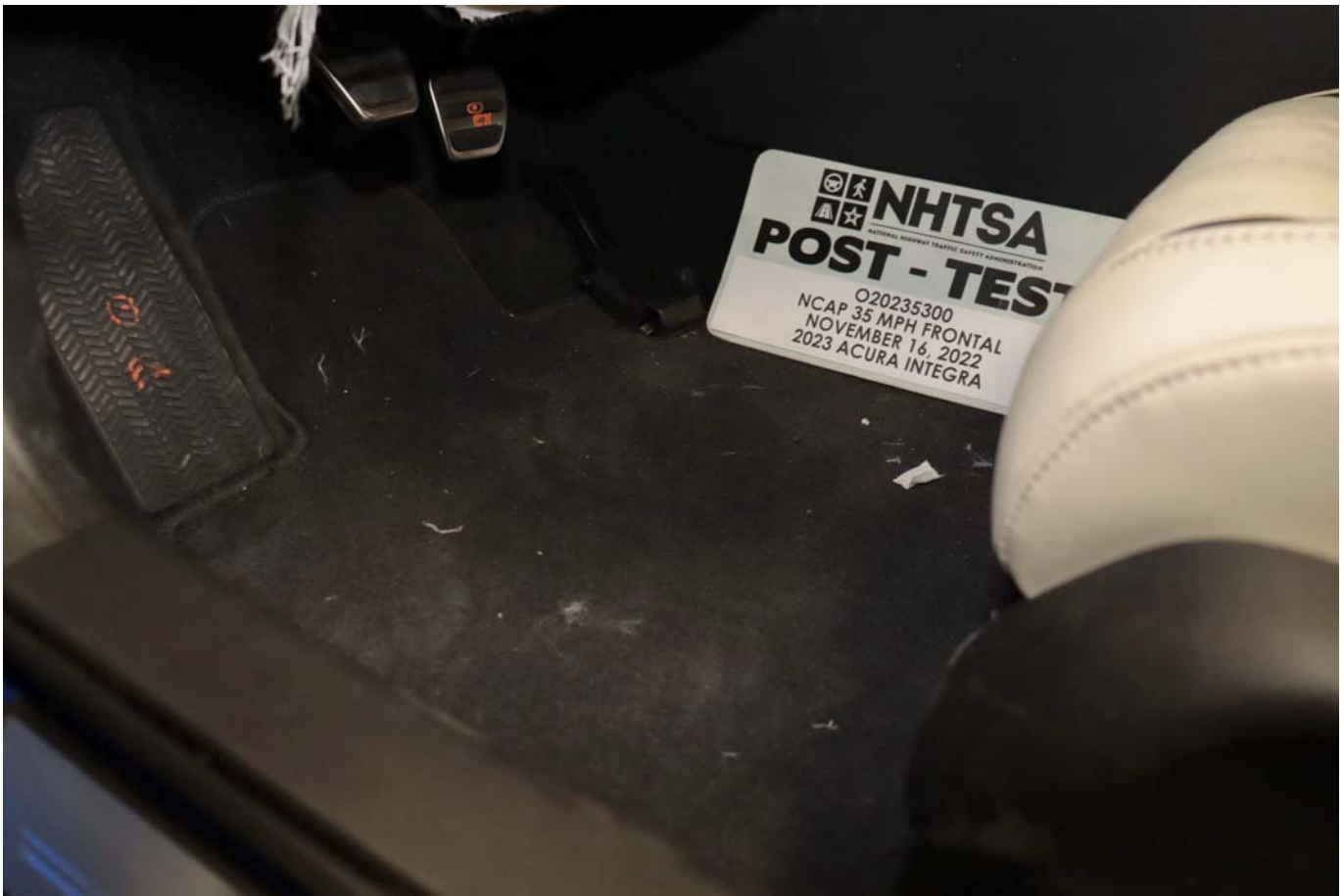


Photo No. 047 - Post-Test Driver's Side Floorpan



Photo No. 048 - Post-Test Driver Dummy Face



Photo No. 049 - Post-Test Driver Dummy Contact with Airbag



Photo No. 050 - Post-Test Driver Dummy Contact with Headrest



Photo No. 051 - Pre-Test View of the Steering Wheel



Photo No. 052 - Post-Test View of the Steering Wheel



Photo No. 053 - Pre-Test Passenger Dummy Front View



Photo No. 054 - Post-Test Passenger Dummy Front View



Photo No. 055 - Pre-Test Passenger Dummy Window View



Photo No. 056 - Post-Test Passenger Dummy Window View



Photo No. 057 - Pre-Test Passenger Dummy and Vehicle Interior View



Photo No. 058 - Post-Test Passenger Dummy and Vehicle Interior View



Photo No. 059 - Pre-Test Passenger's Seat Fore-Aft Markings

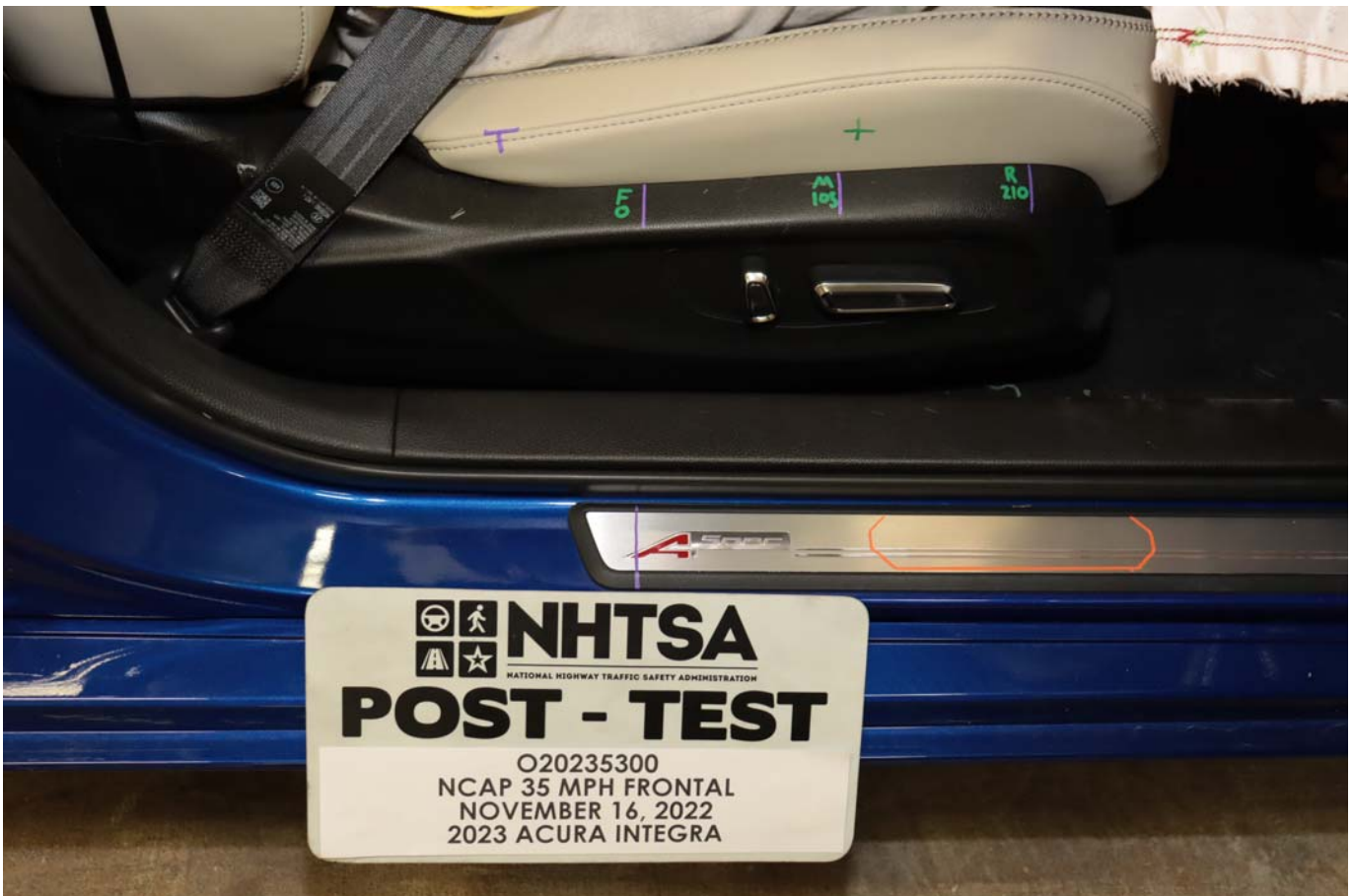


Photo No. 060 - Post-Test Passenger's Seat Fore-Aft Markings



Photo No. 061 - Pre-Test View of Belt Anchorage for Passenger Dummy



Photo No. 062 - Post-Test View of Belt Anchorage for Passenger Dummy



Photo No. 063 - Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy



Photo No. 064 - Post-Test View of Belt Buckle and Latch Plate for Passenger Dummy



Photo No. 065 - Pre-Test Passenger Dummy Feet



Photo No. 066 - Post-Test Passenger Dummy Feet



Photo No. 067 - Pre-Test Passenger's Side Knee Bolster



Photo No. 068 - Post-Test Passenger's Side Knee Bolster



Photo No. 069 - Pre-Test Passenger's Side Floorpan

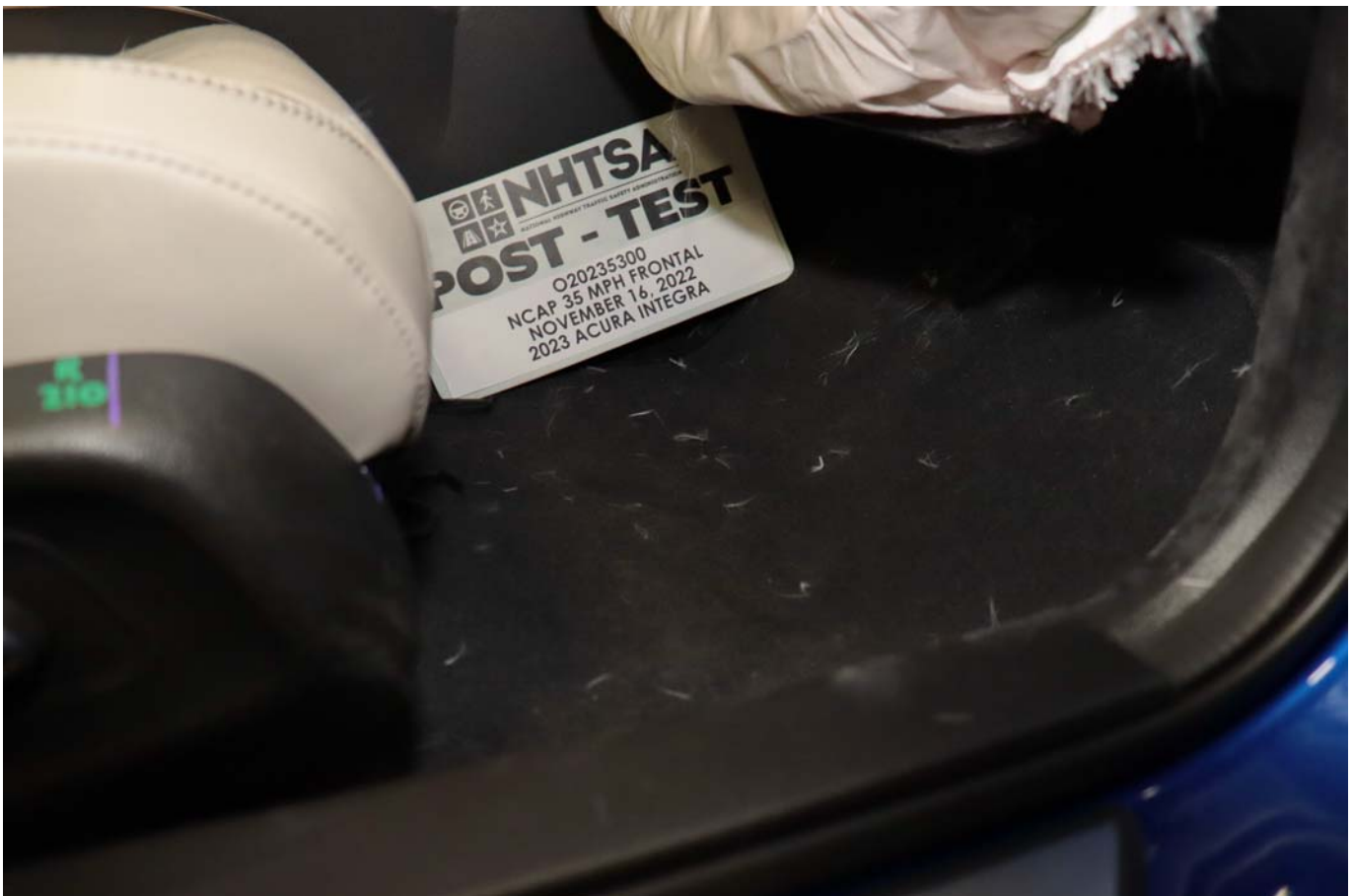


Photo No. 070 - Post-Test Passenger's Side Floorpan



Photo No. 071 - Post-Test Passenger Dummy Face



Photo No. 072 - Post-Test Passenger Dummy Contact with Airbag



Photo No. 073 - Post-Test Passenger Dummy Contact with Headrest

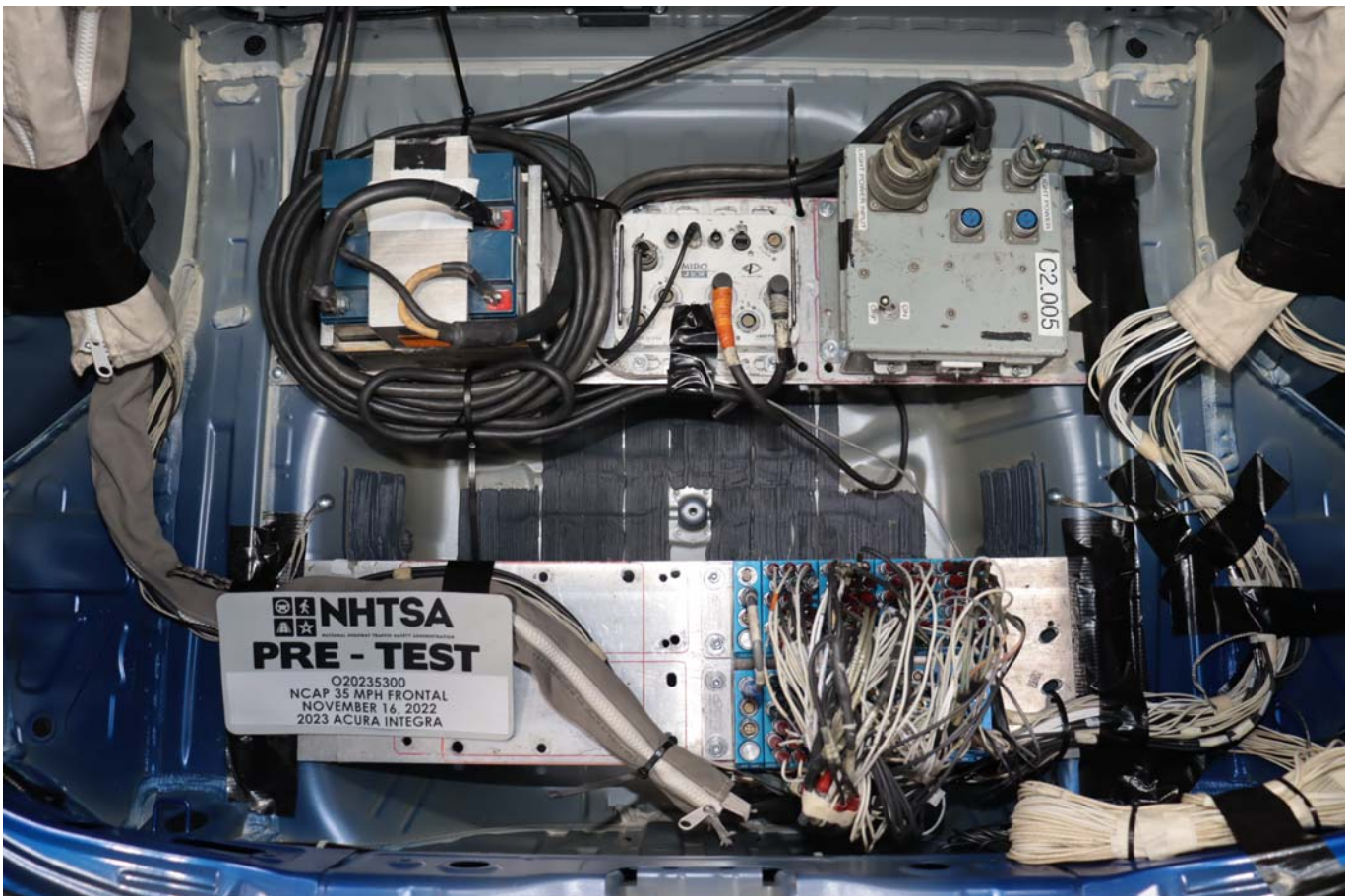


Photo No. 074 - Photograph of Ballast Installed in Vehicle

# PHOTOGRAPH NOT APPLICABLE

Photo No. 075 - Post-Test Stoddard Solvent Spillage Location View



Photo No. 076 - Post-Test Speed Trap Read-Out



Photo No. 077 - Vehicle at 0 Degrees on Static Rollover Device

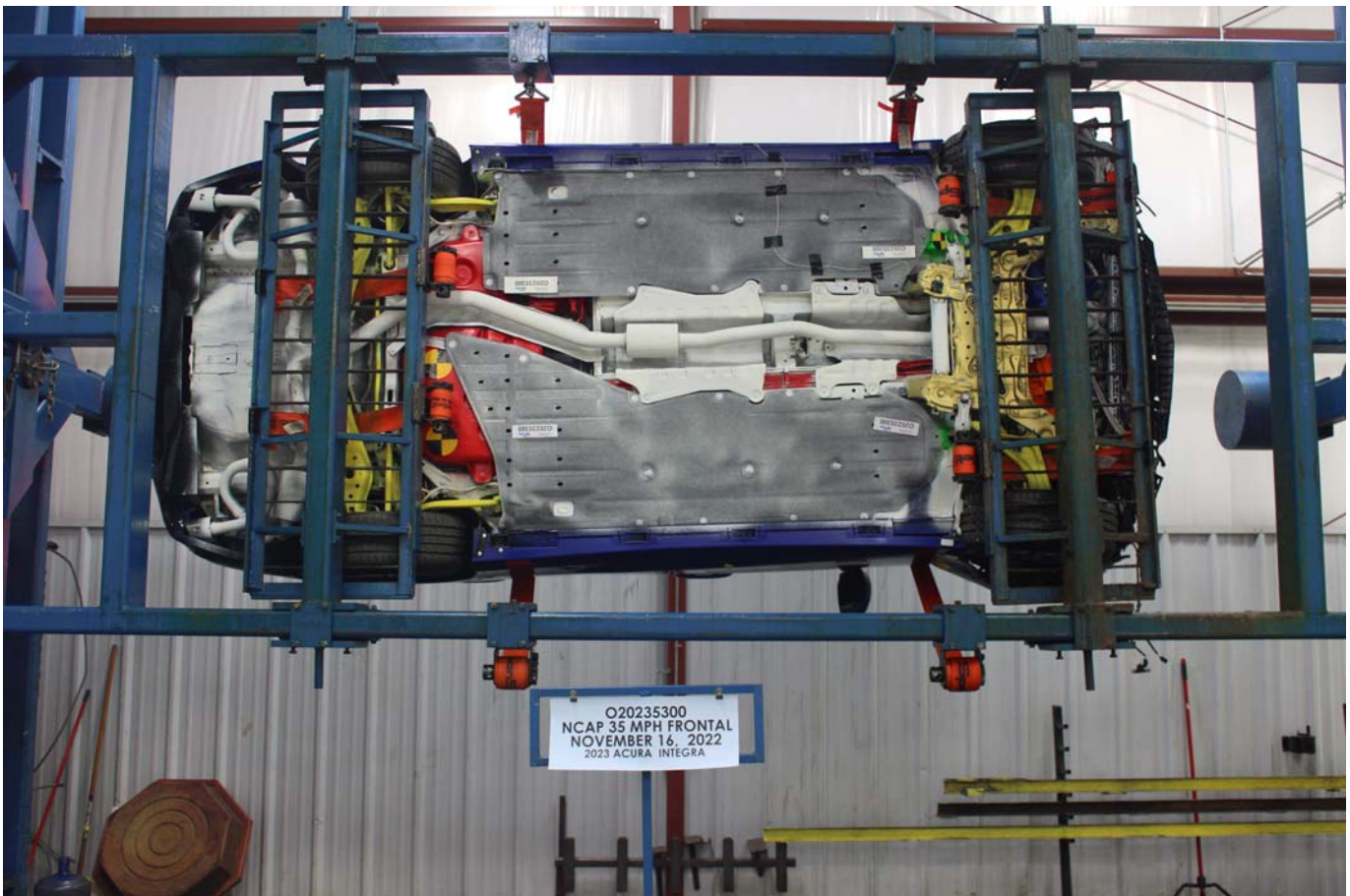


Photo No. 078 - Vehicle at 90 Degrees on Static Rollover Device



Photo No. 079 - Vehicle at 180 Degrees on Static Rollover Device



Photo No. 080 - Vehicle at 270 Degrees on Static Rollover Device



Photo No. 081 - Vehicle at 360 Degrees on Static Rollover Device

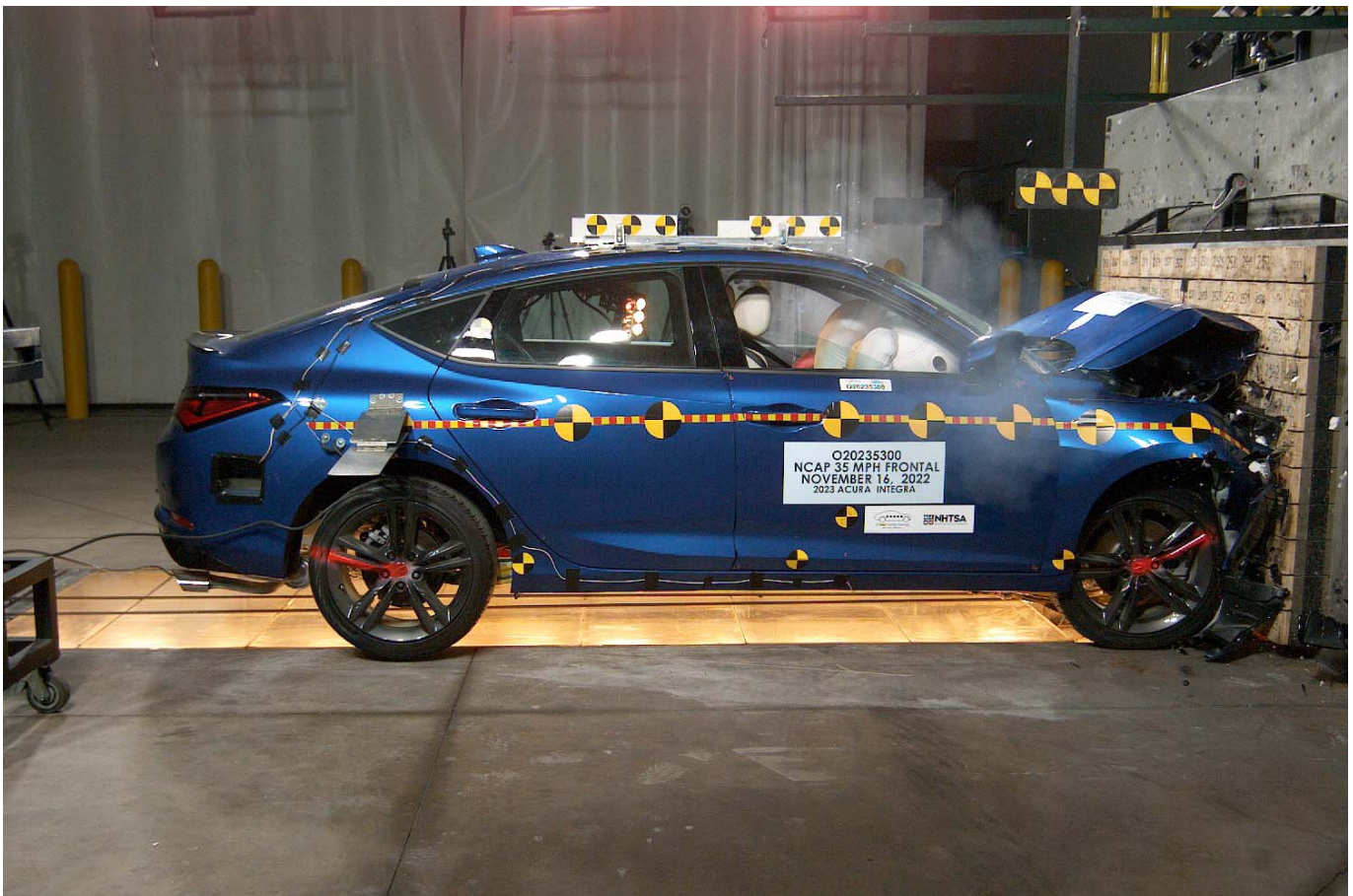


Photo No. 082 - 2023 Acura Integra A-Spec Tech 5-Door Hatchback Frontal Impact Event



### 2023 INTEGRA A-SPEC TECH

EXT: APEX BLUE PEARL ENGINE NUMBER: L15CA-1105694  
INT: ORCHID

### EPA DOT Fuel Economy and Environment

Gasoline Vehicle

**Fuel Economy**  
**30** MPG  
combined city/hwy  
26 city  
36 highway  
3.3 gallons per 100 miles

Large Cars range from 14 to 131 MPG.  
The best vehicle rates 132 MPG.

**You spend \$1,000**  
in fuel costs over 5 years compared to the average new vehicle.

#### STANDARD EQUIPMENT AT NO EXTRA COST

- TECHNICAL FEATURES \***
  - 200hp 1.5-Liter Direct Injection VTEC Turbo 4-Cylinder Engine
  - 6-Speed Manual Transmission
  - Limited Slip Differential
  - Integrated Dynamics System (IDS) w/ Individual Mode
  - Adaptive Damper System (ADS)
  - 4-Wheel Disc Brakes
  - Front MacPherson Strut Suspension
  - Rear Multi-Link Suspension
  - Electric Power Steering
- SAFETY FEATURES \***
  - Driver's and Front Passenger's Airbags
  - Driver's and Front Passenger's Side Airbags
  - Driver's and Front Passenger's Knee Airbags
  - Side Curtain Airbags with Rollover Sensor
  - Rear Side Airbags
  - Anti-Lock Braking System (ABS) with Rollover Sensor
  - Vehicle Stability Assist (VSA)
  - Electronic Brake Distribution (EBD)
  - Tire Pressure Monitoring System
  - LATCH System for Child Seats
  - LED Day Time Running Lights
- INTERIOR FEATURES \***
  - Driver's 12-Way Power Seat
  - Driver Recognition Memory System
  - Front Passenger's 4-Way Power Seat
  - Heated Front Seats
  - 9" Color Touchscreen with Multi-View Rear Camera
  - Precision Cockpit - Digital Instrument Panel
  - Wireless Apple Carplay / Android Auto Integration
  - Bluetooth HandsFreeLink
  - WiFi Hotspot
  - Alexa Built-In
  - HD Radio
  - SiriusXM Satellite Radio
  - Blind Spot Information (BSI) w/ Rear Cross Traffic Monitor
  - Driver Attention Monitor
  - Traffic Sign Recognition
  - Dual-Zone Automatic Climate Control with Air Filtration System

- Push-Button Ignition
- Auto Dimming Rearview Mirror
- Cargo Area Cover
- EXTERIOR FEATURES \***
  - Power Moonroof with Tilt Feature
  - Jewel Eye LED Headlights
  - Heated Power Door Mirrors with Turn Indicators
  - Keyless Access System with Smart Entry
  - Tire Sealant and Inflator Kit (in place of spare tire)

- TECH PACKAGE \***
  - Acura ELS Studio Premium Audio System with 16 Speakers
  - Sport Seats with Microsuede Inserts
  - AcuraLink Communication System
  - Head-Up Display
  - Wireless Phone Charger
  - Front and Rear Parking Sensors
  - Low Speed Braking Control
  - Rain Sensing Wipers

- A-SPEC PACKAGE \***
  - A-Spec Exclusive Styling
  - 18" Alloy Wheels
  - 235/40 R18 All-Season Tires
  - LED Fog Lights
  - Rear Decklid Spoiler
  - Sport Pedals

- ACURAWATCH FEATURES \***
  - Adaptive Cruise Control
  - Collision Mitigation Braking
  - Forward Collision Warning
  - Lane Departure Warning
  - Lane Keeping Assist System
  - Road Departure Mitigation

Manufacturer's Suggested Retail Price **\$35,800.00**

MSRP Includes:  
-5Y/70K Mile Powertrain Warranty  
-4Y/50K Mile Ltd Vehicle Warranty  
-Full Tank of Fuel  
-SiriusXM Includes:  
Free Activation and 3 Months Free Service (excl. AK & HI)

APEX BLUE PEARL 500.00

Destination and Handling 1,095.00

**TOTAL VEHICLE PRICE**  
(includes Pre-Delivery Service)  
**\$37,395.00**

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

**Annual fuel cost \$1,800**



Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs \$8,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

[fuelconomy.gov](http://fuelconomy.gov)  
Calculate personalized estimates, and compare vehicles



#### PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE  
U.S./Canadian Parts Content: **65 %**

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

FOR THIS VEHICLE  
Final Assembly Point:  
**MARYSVILLE, OHIO USA**

Country of Origin: Engine:  
**U.S.A.**  
Transmission:  
**INDIA**

#### 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** ★★★★★  
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](http://www.safercar.gov) or 1-888-327-4236

This vehicle is equipped with bumpers that can withstand an impact of 2.5 miles per hour with no damage to the vehicle's body and safety systems, although the bumper and related components may sustain damage. The bumper system on this vehicle conforms to the current federal bumper standard of 2.5 miles per hour.

MULLER'S WOODFIELD ACURA  
1099 W. HIGGINS ROAD  
HOFFMAN ESTATES, IL 60195

PORT OF ENTRY: MARYSVILLE  
DELIVERY POINT: CHICAGO  
SHIP#: 515-019  
ROWSPACE: 515-019  
TRANS.METHOD: TRUCK

ORIG. DLR: 251115  
REF.NO: 41168  
VIN CODE: AL-2736  
EMISSION: 50 STATE  
CONTROL NO: 061576  
DEALER: 251115

VIN: 19UDE4G79PA005104



Photo No. 083 - Monroney Label Photograph

**APPENDIX B**  
**DUMMY RESPONSE DATA TRACES**

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Figure No. 34. Passenger Nij (NCE) vs. Time	B-11
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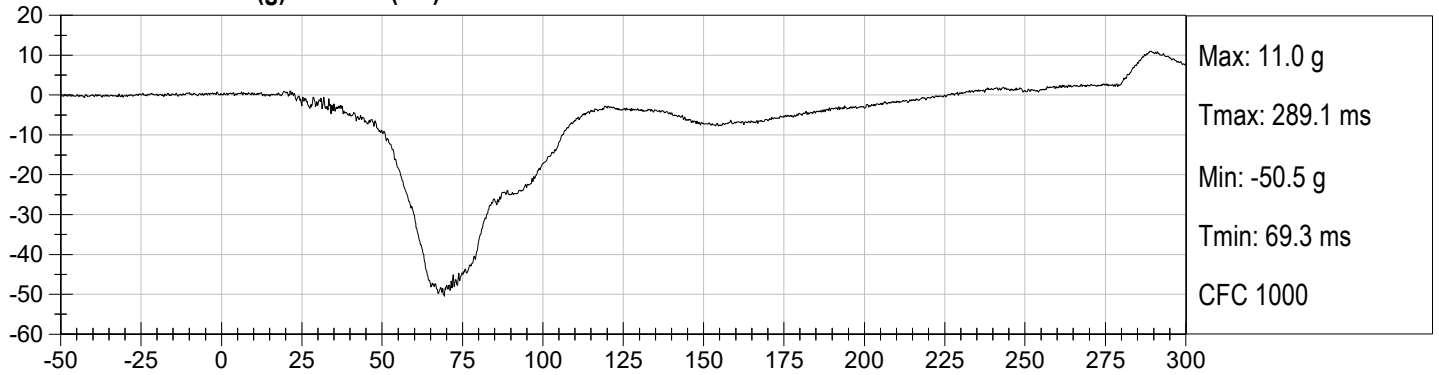
**The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at [www.nhtsa.gov](http://www.nhtsa.gov)**

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

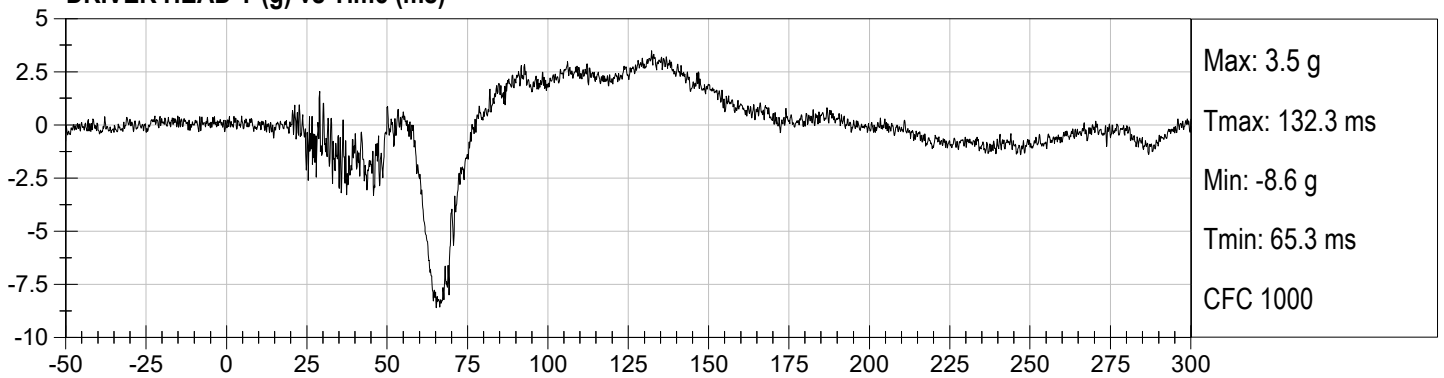
Driver Left Upper Tibia Force Z  
Driver Left Lower Tibia Moment X  
Driver Left Lower Tibia Moment Y  
Driver Left Lower Tibia Force Z  
Driver Right Upper Tibia Moment X  
Driver Right Upper Tibia Moment Y  
Driver Right Upper Tibia Force Z  
Driver Right Lower Tibia Moment X  
Driver Right Lower Tibia 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

**DRIVER HEAD X (g) vs Time (ms)**



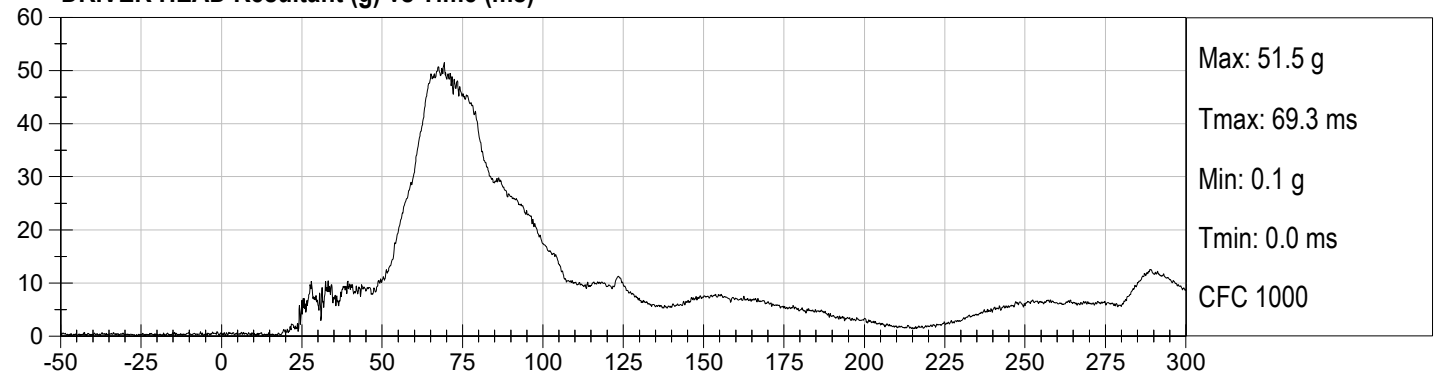
**DRIVER HEAD Y (g) vs Time (ms)**

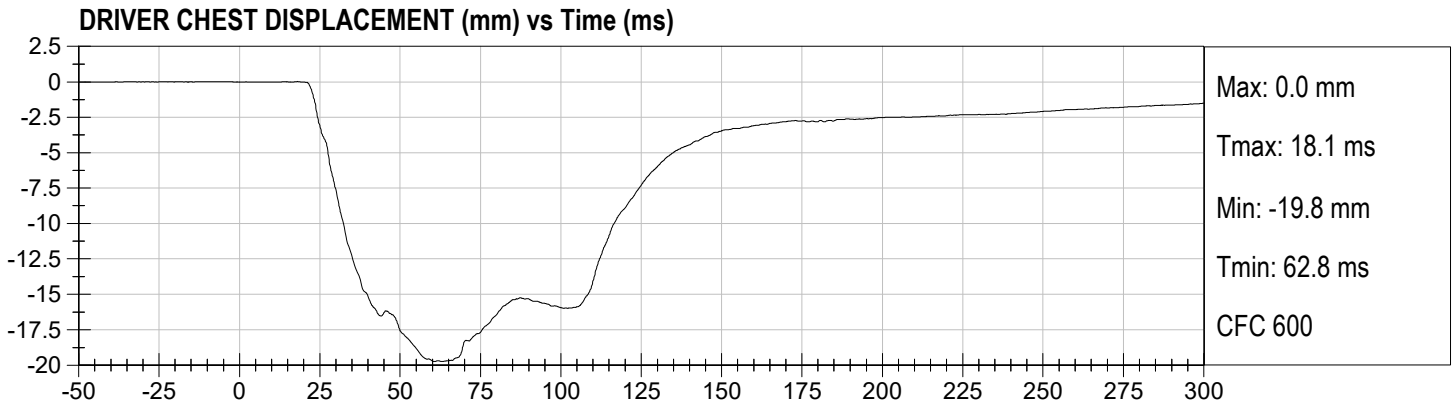


**DRIVER HEAD Z (g) vs Time (ms)**

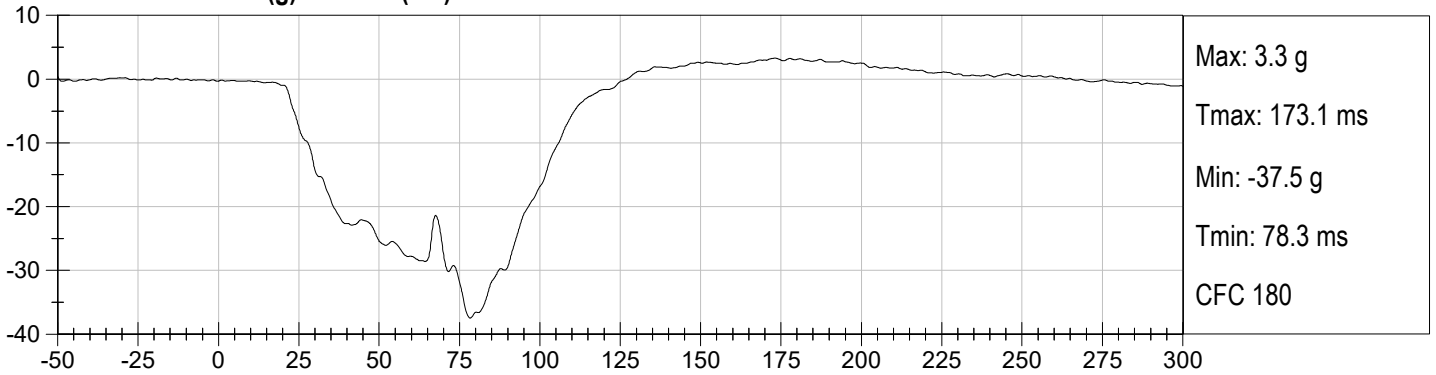


**DRIVER HEAD Resultant (g) vs Time (ms)**

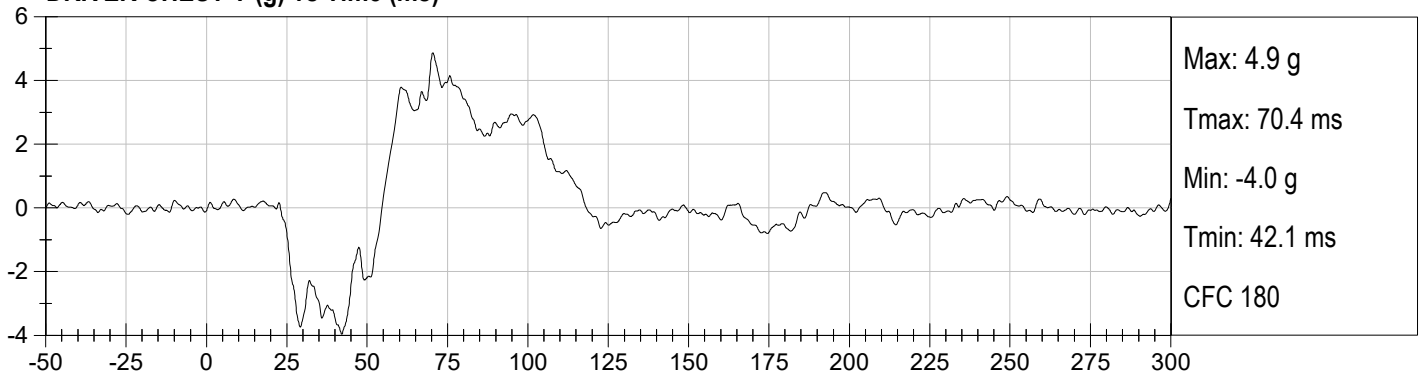




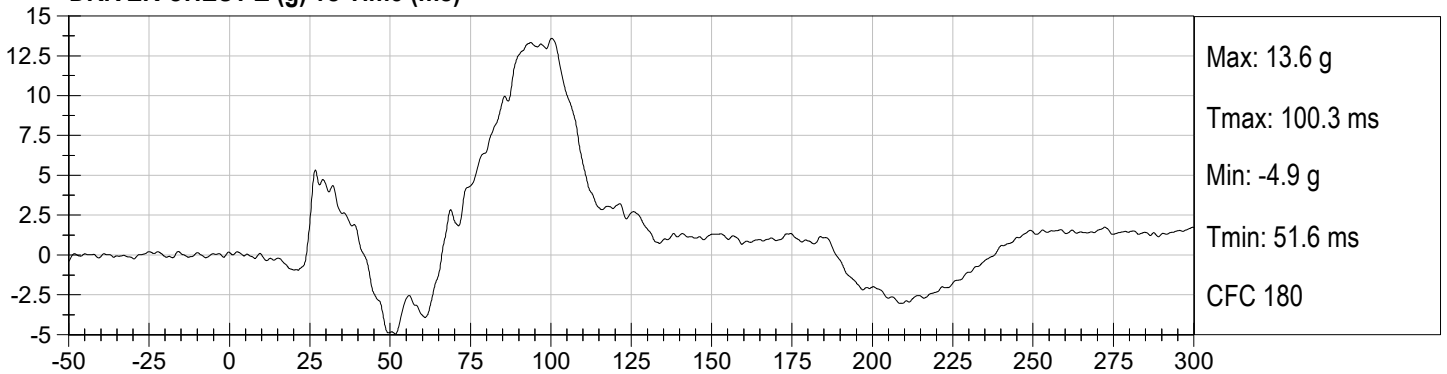
**DRIVER CHEST X (g) vs Time (ms)**



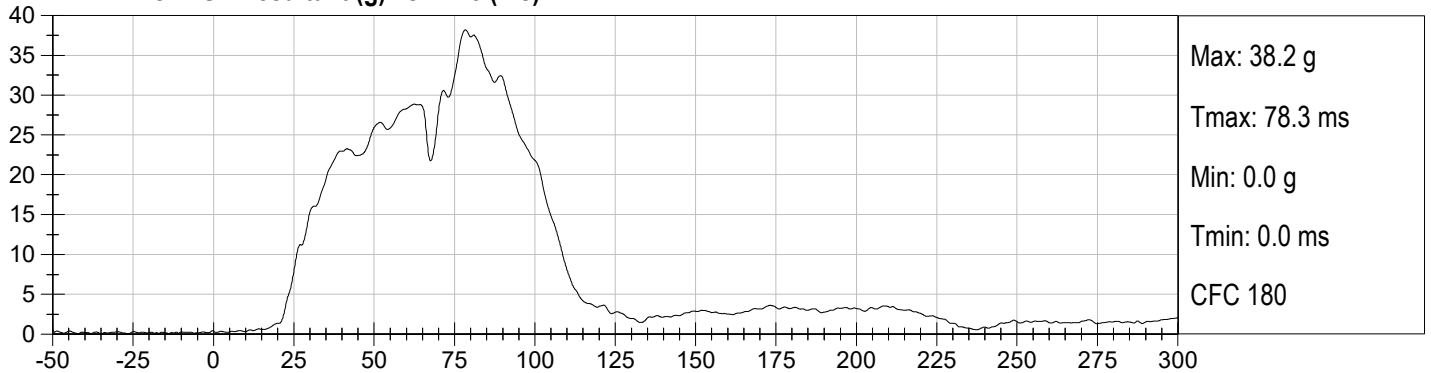
**DRIVER CHEST Y (g) vs Time (ms)**



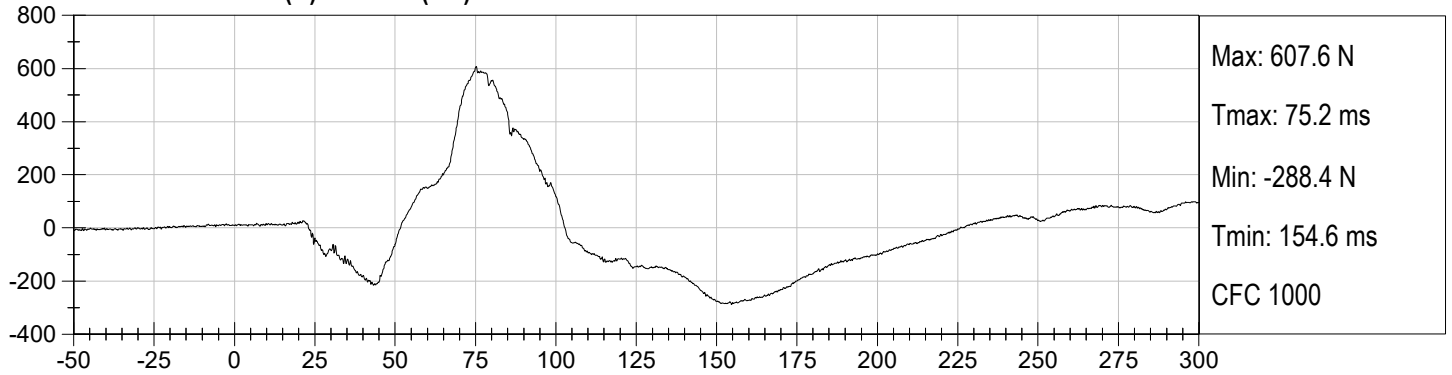
**DRIVER CHEST Z (g) vs Time (ms)**



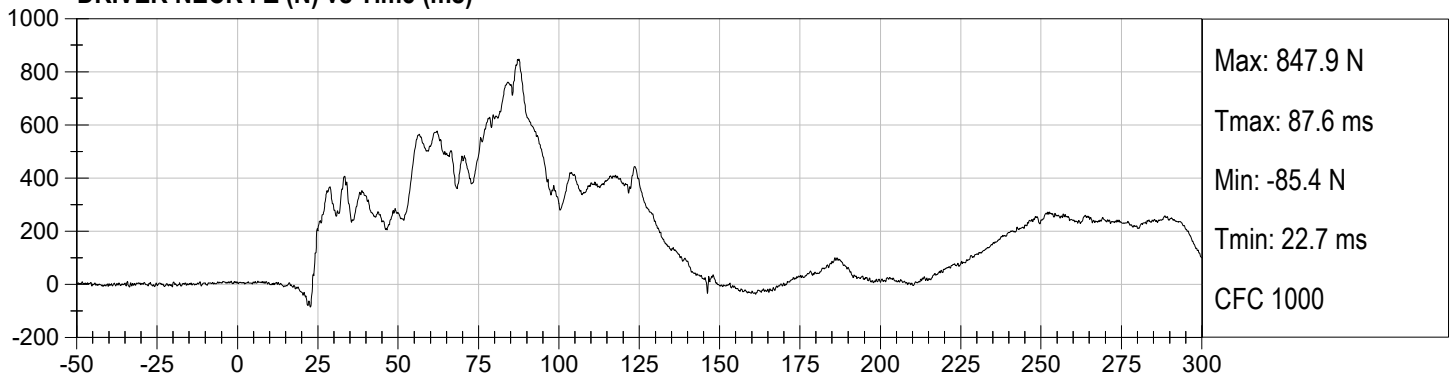
**DRIVER CHEST Resultant (g) vs Time (ms)**



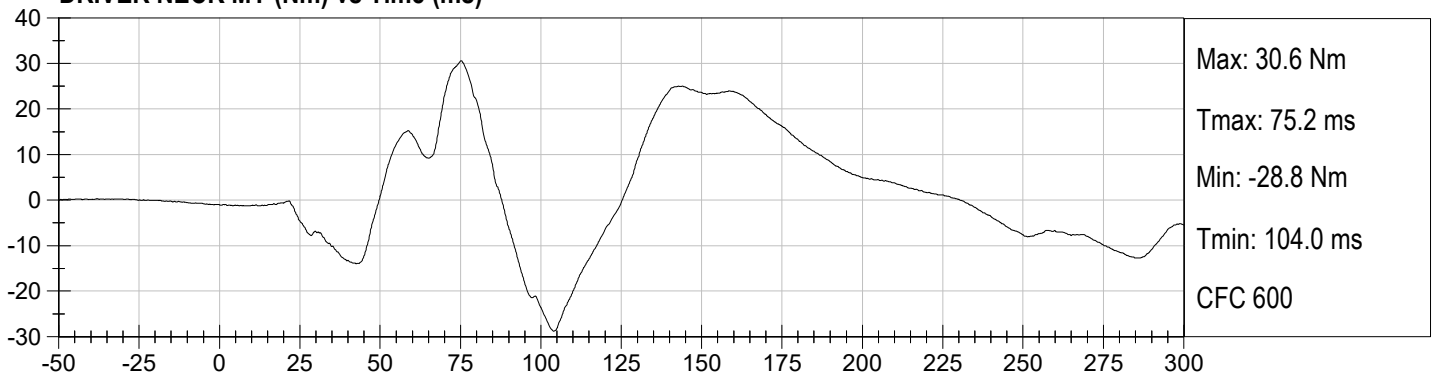
**DRIVER NECK FX (N) vs Time (ms)**

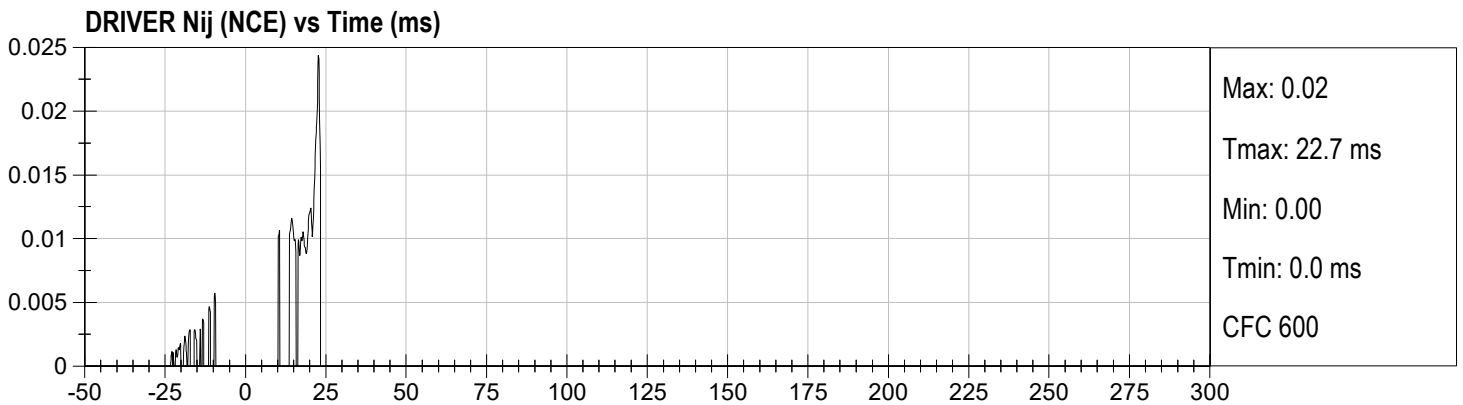
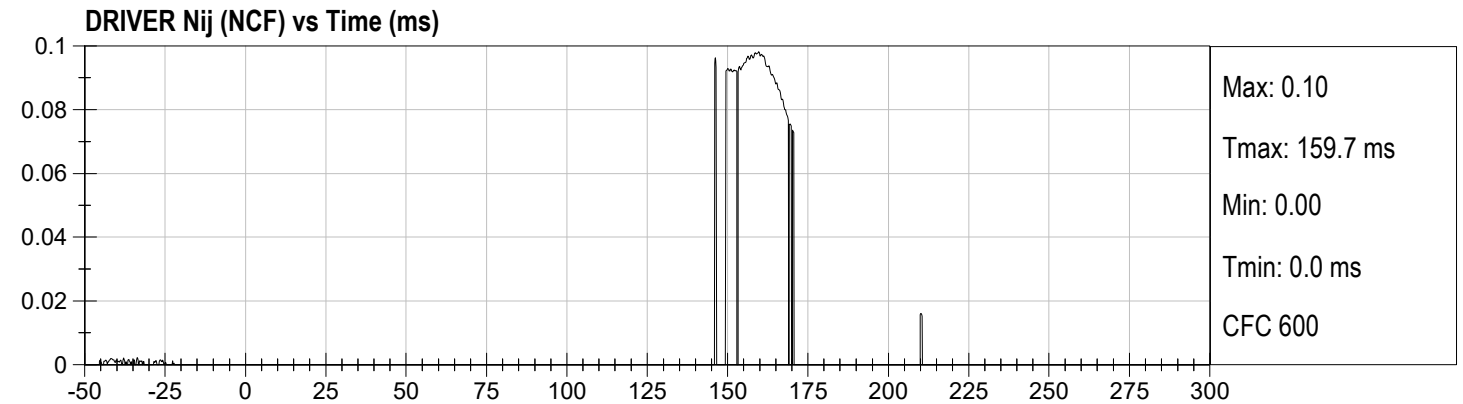
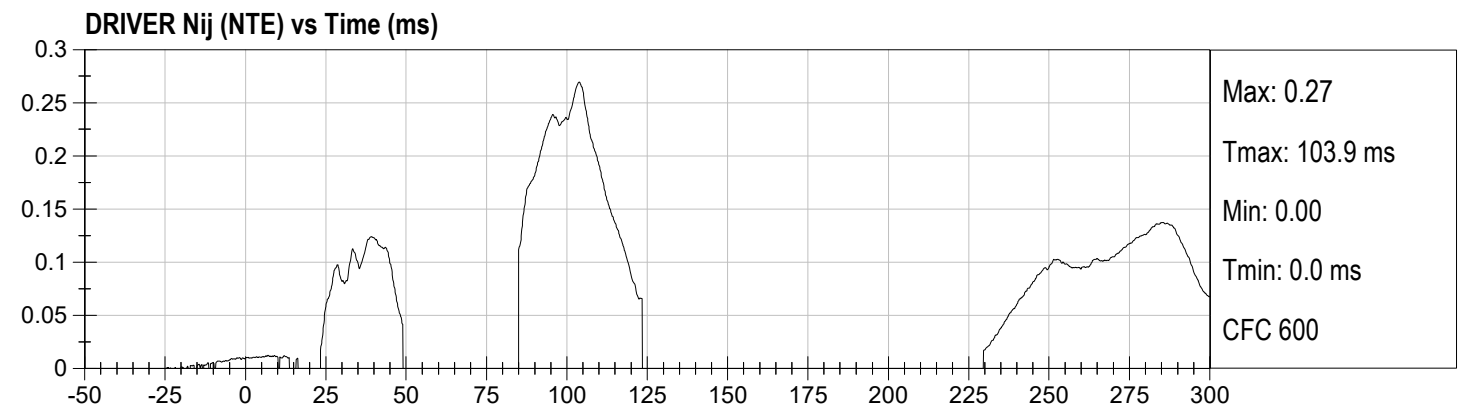
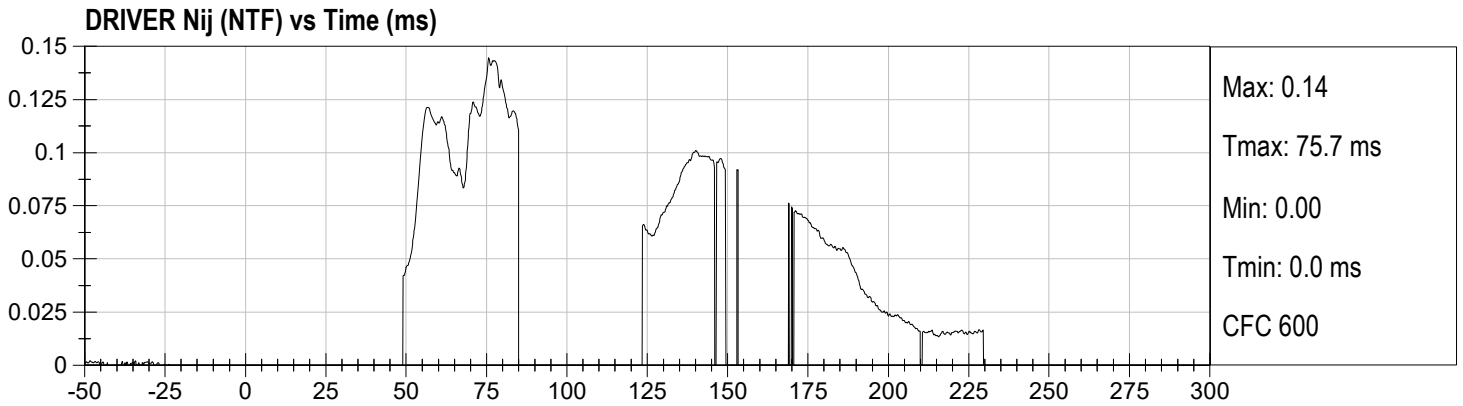


**DRIVER NECK FZ (N) vs Time (ms)**

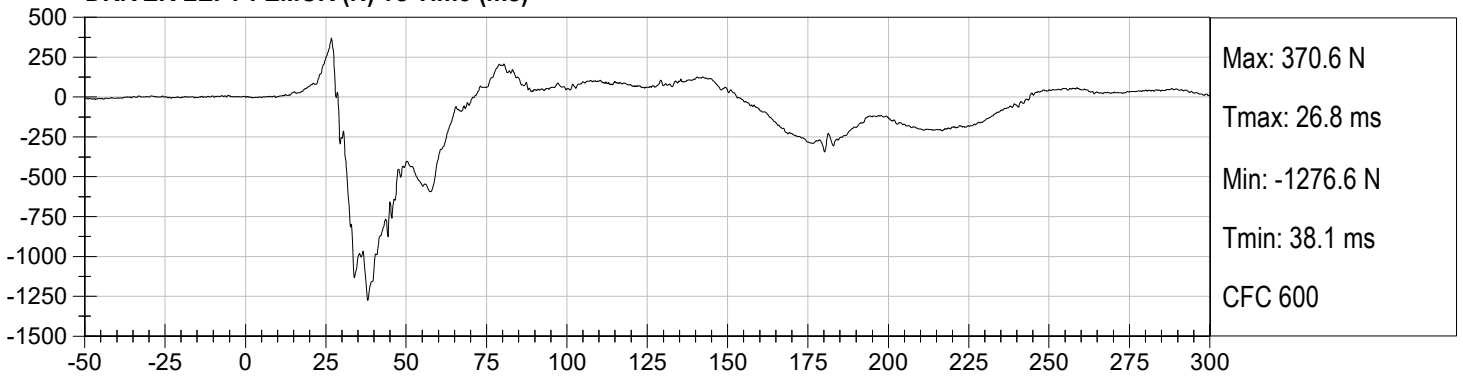


**DRIVER NECK MY (Nm) vs Time (ms)**

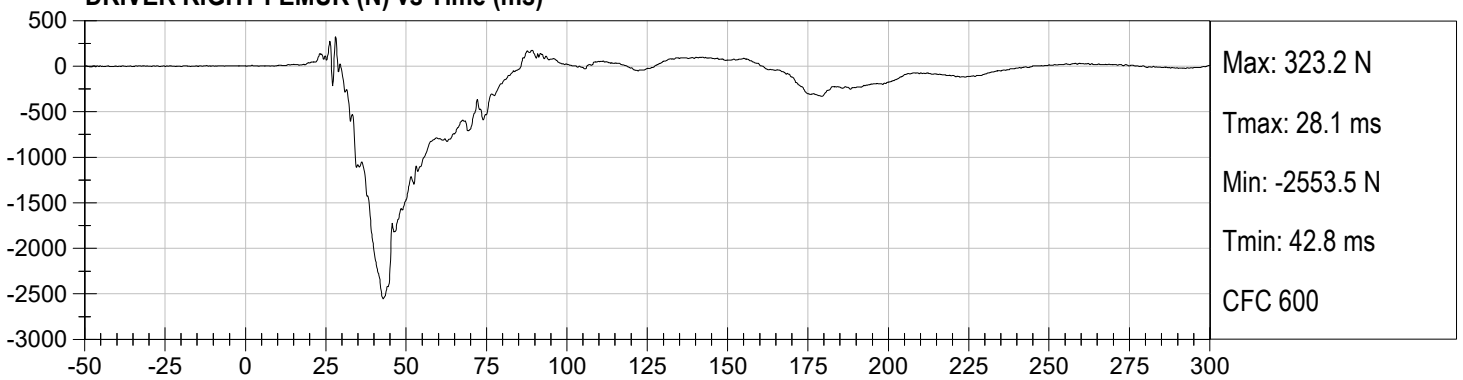


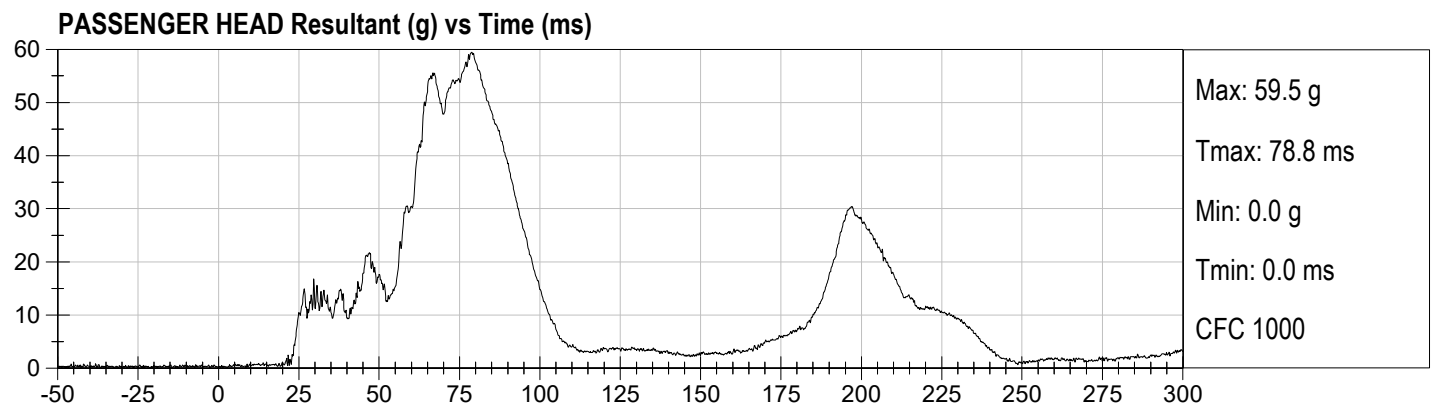
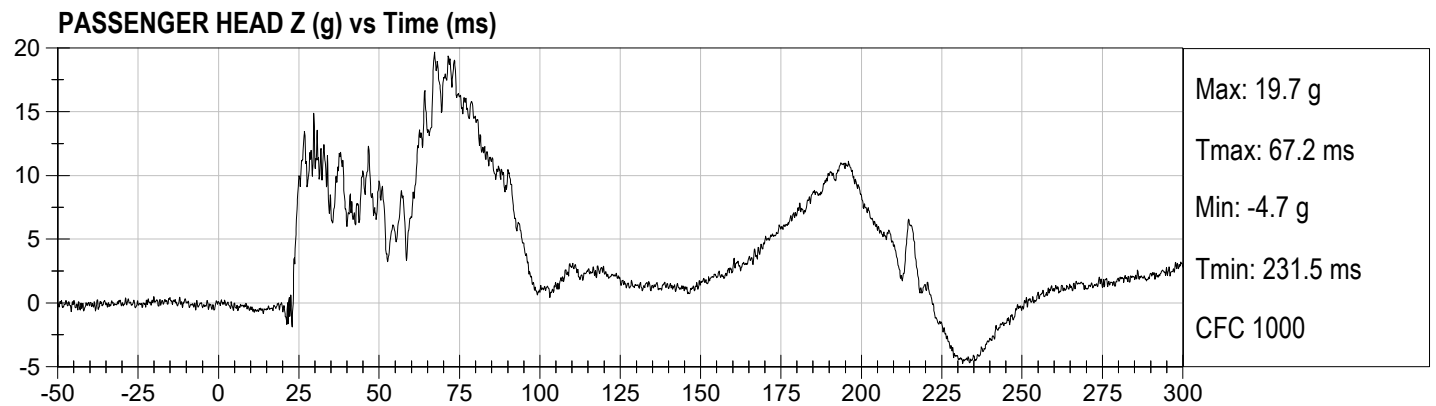
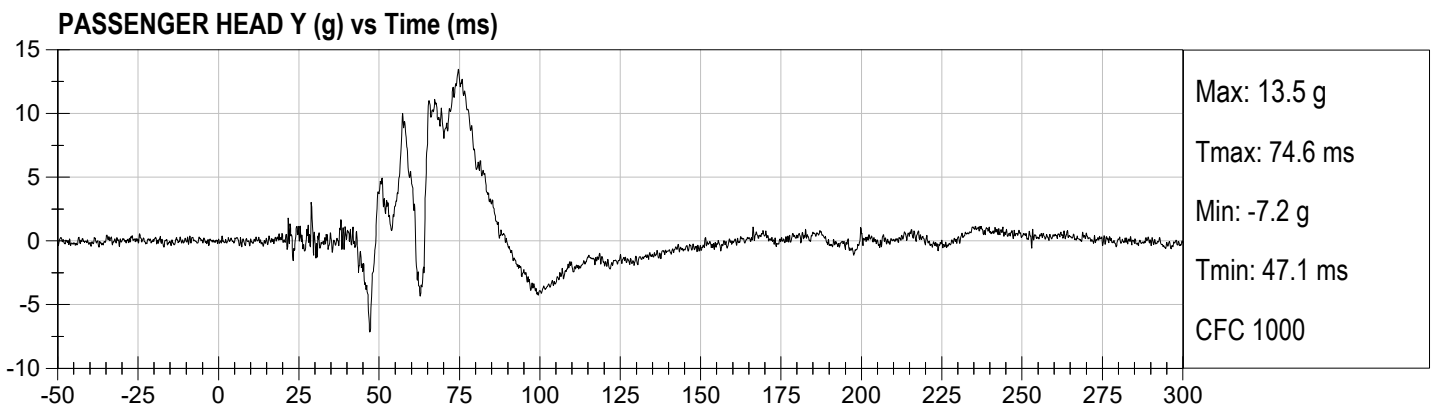
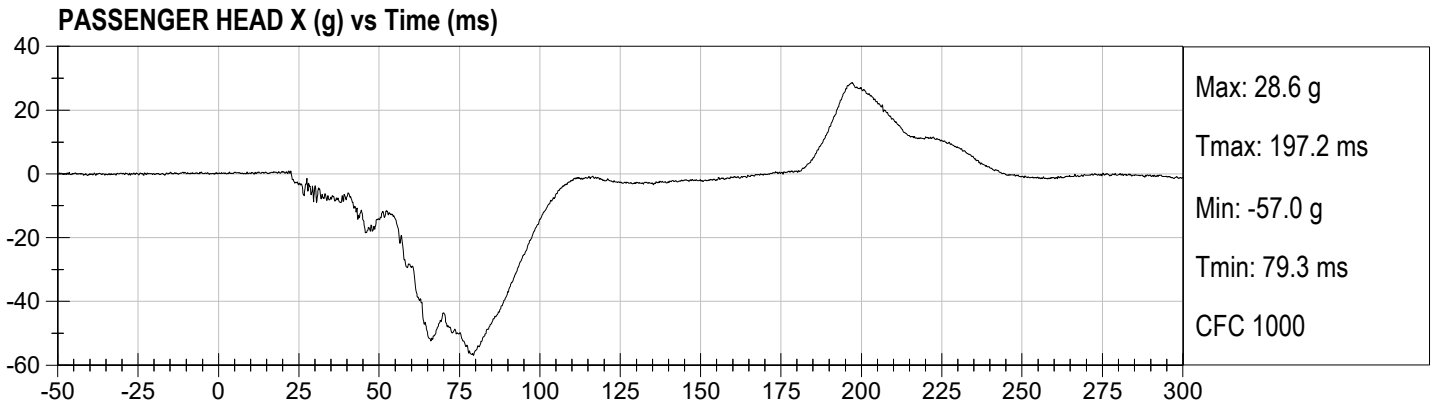


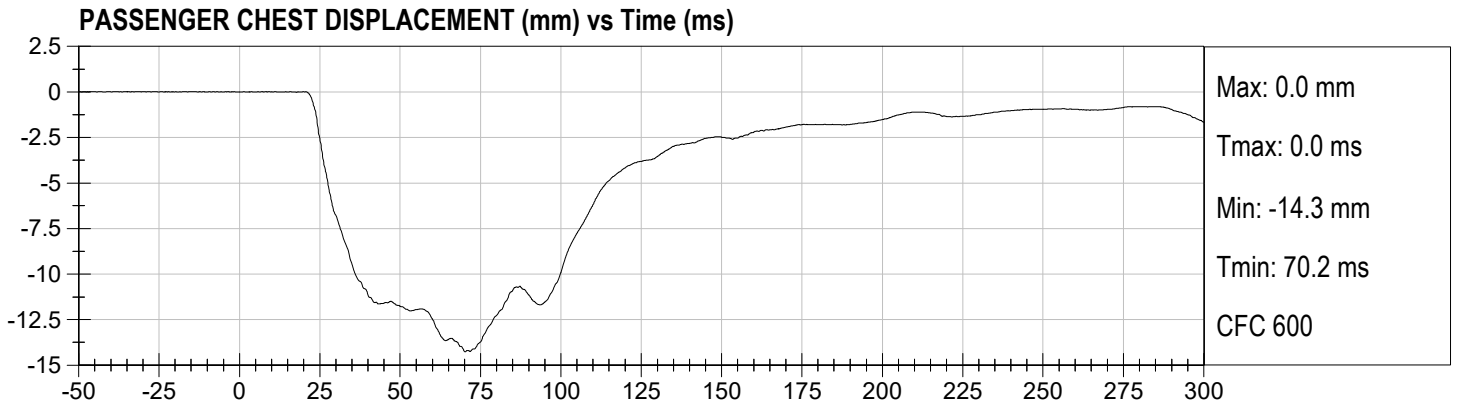
**DRIVER LEFT FEMUR (N) vs Time (ms)**



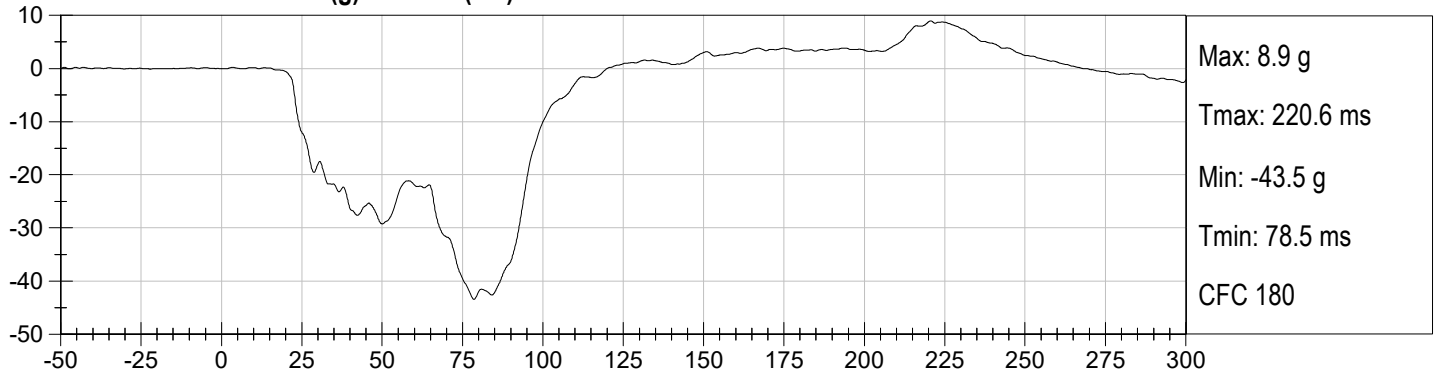
**DRIVER RIGHT FEMUR (N) vs Time (ms)**



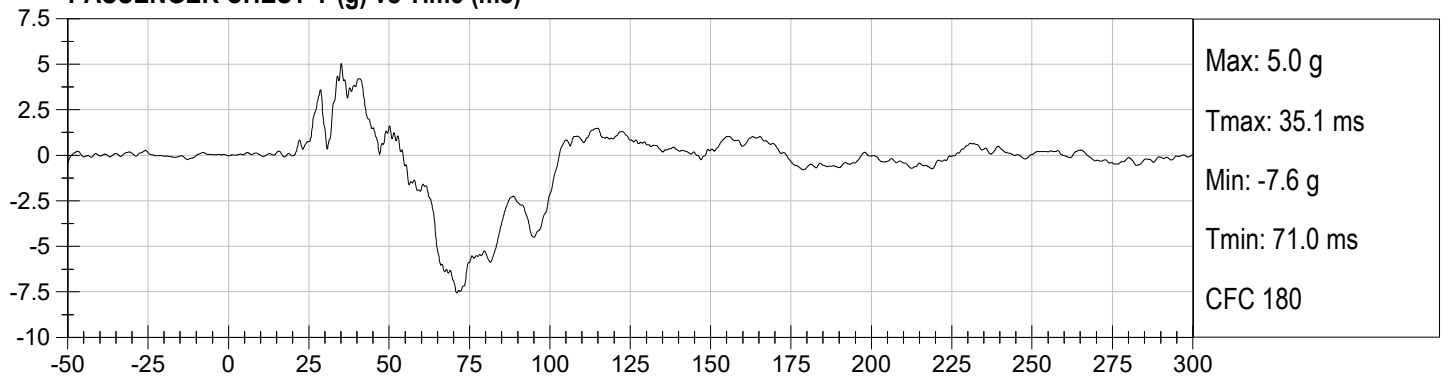




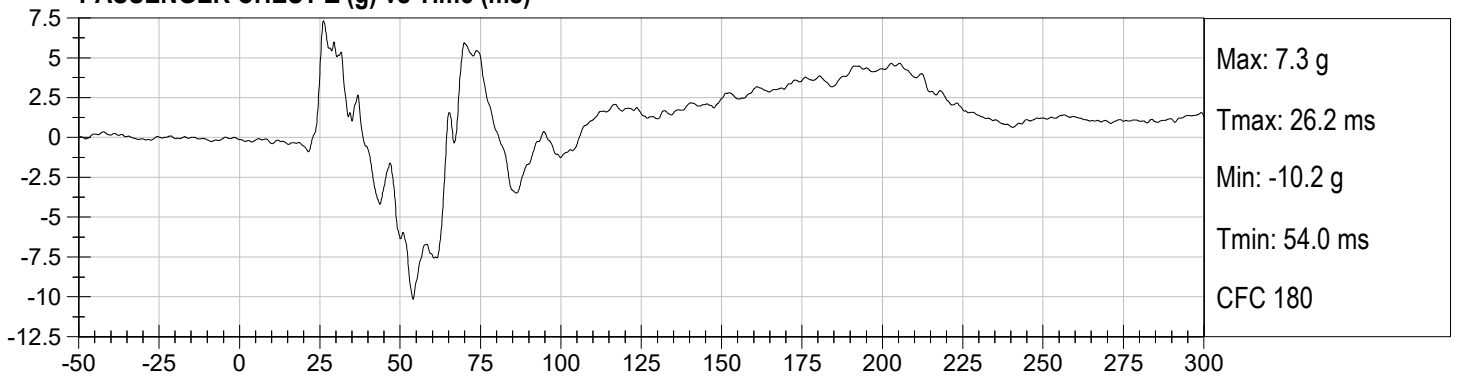
**PASSENGER CHEST X (g) vs Time (ms)**



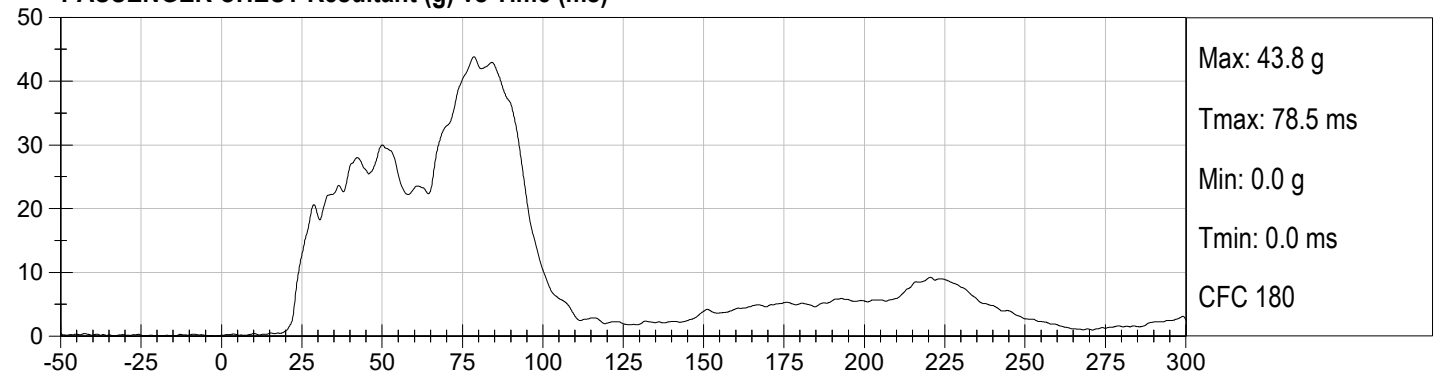
**PASSENGER CHEST Y (g) vs Time (ms)**

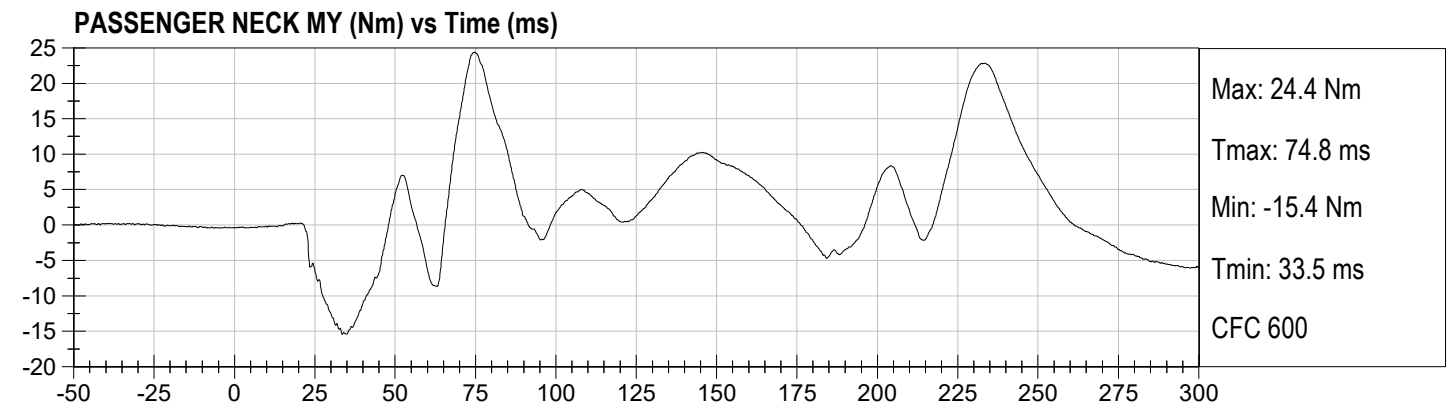
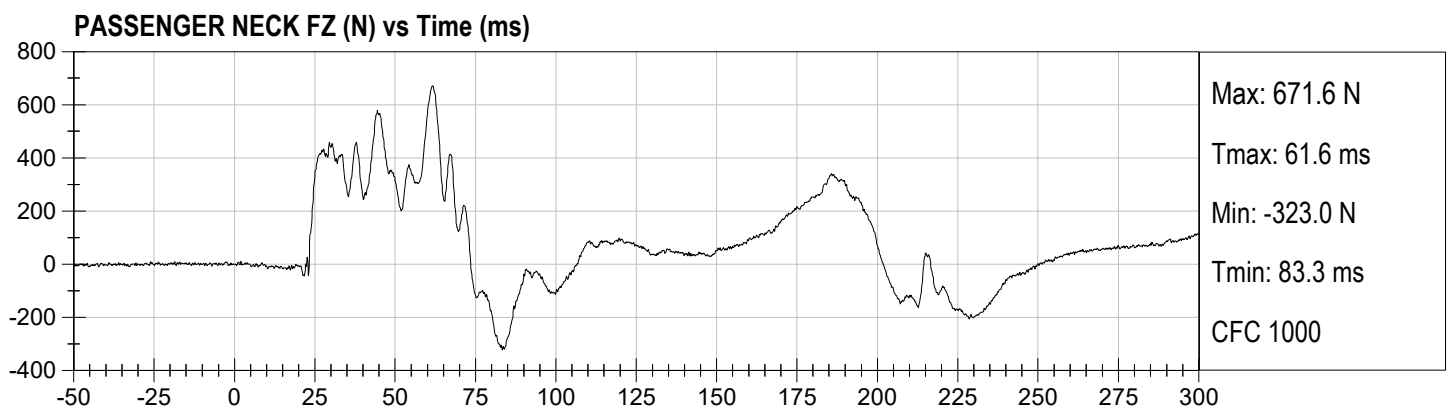
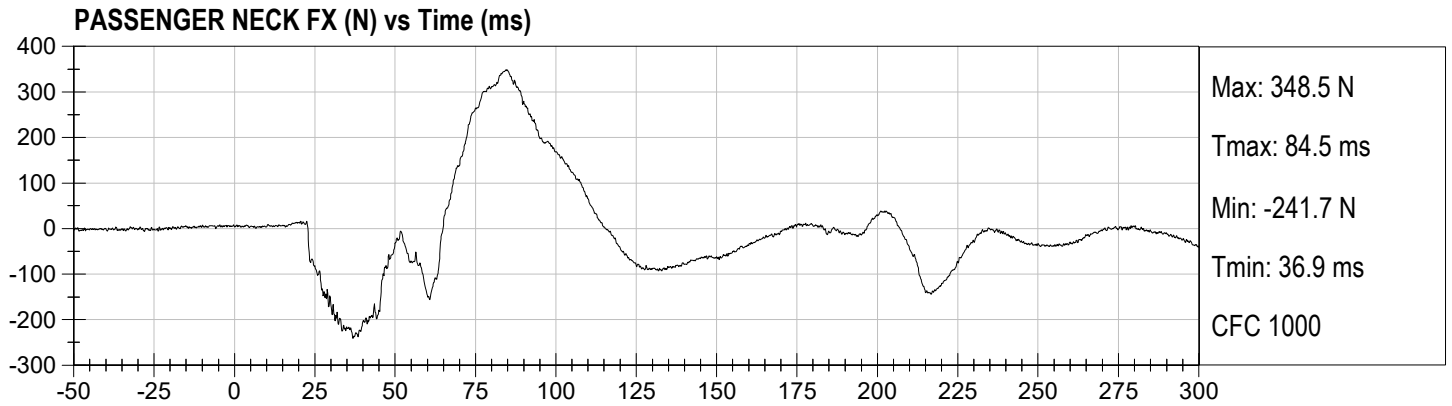


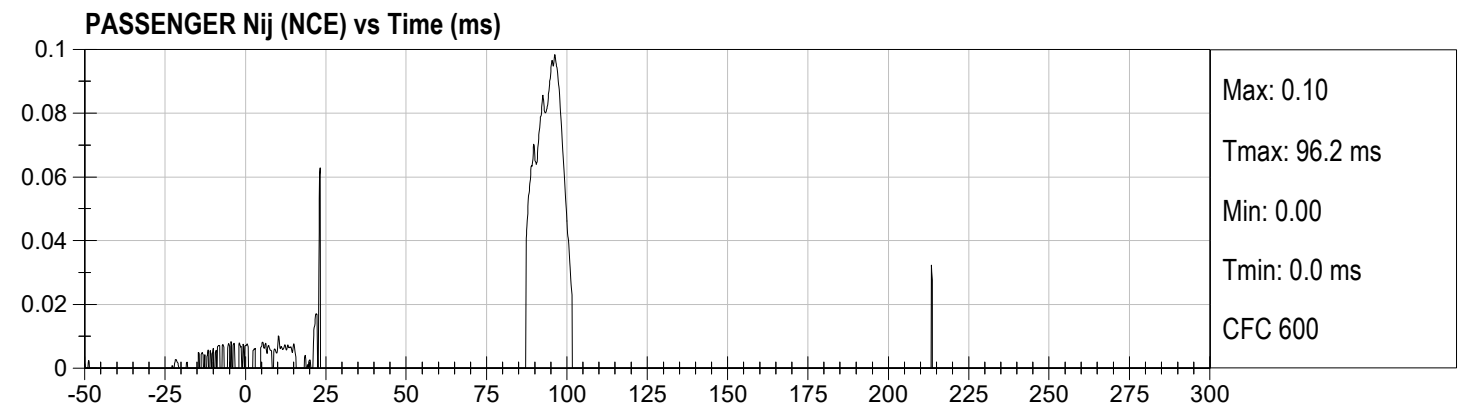
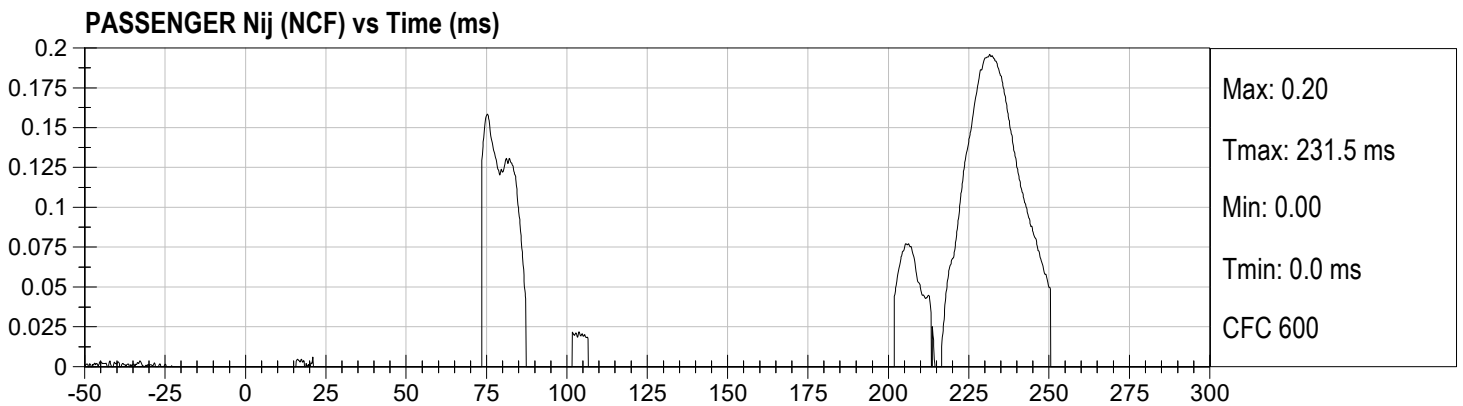
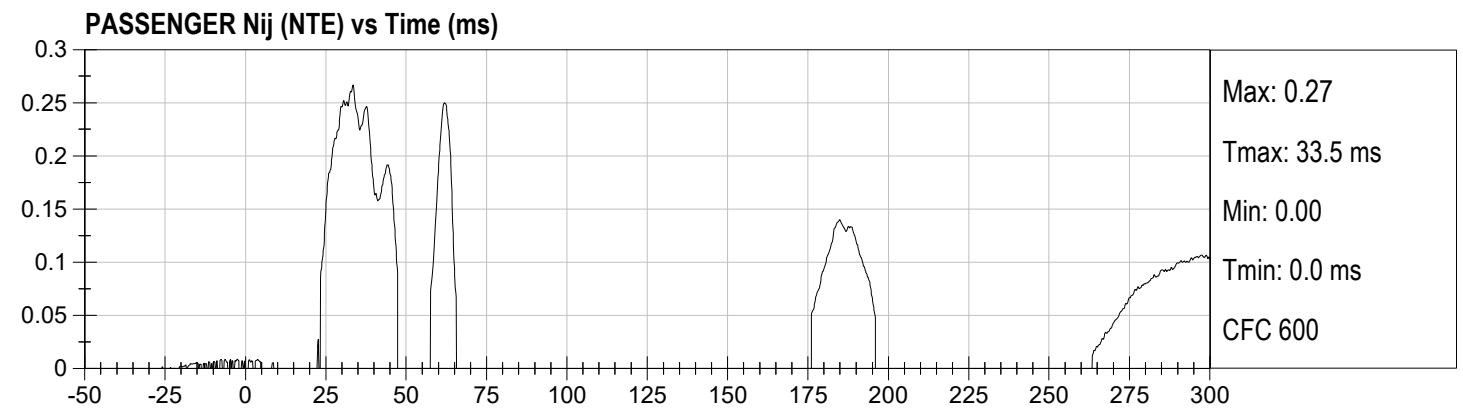
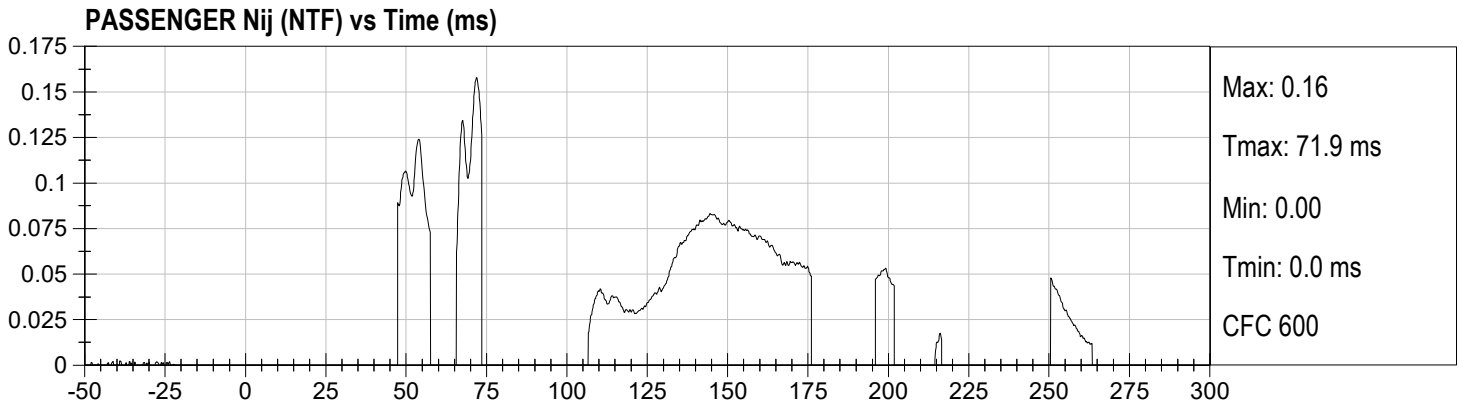
**PASSENGER CHEST Z (g) vs Time (ms)**

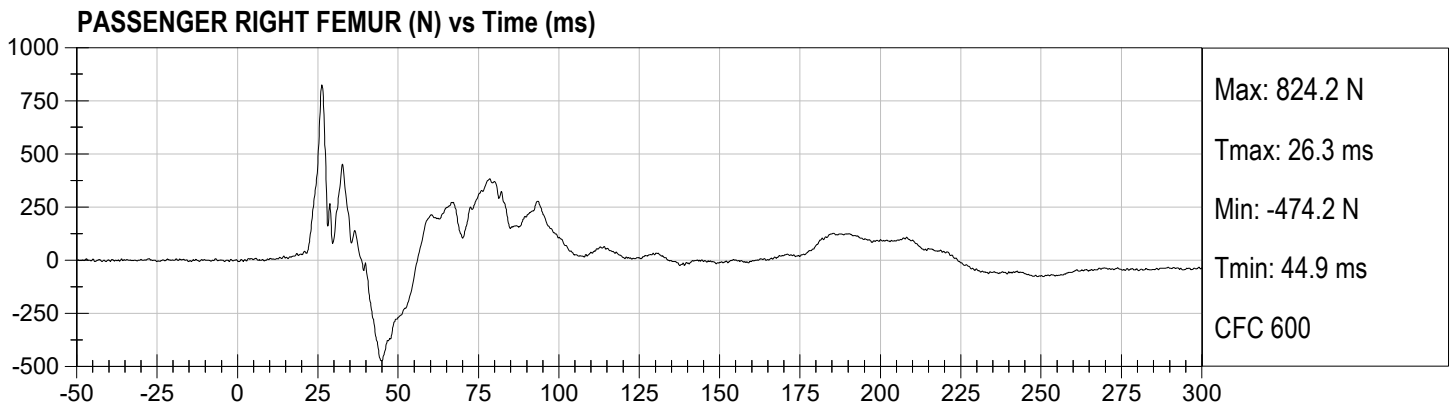
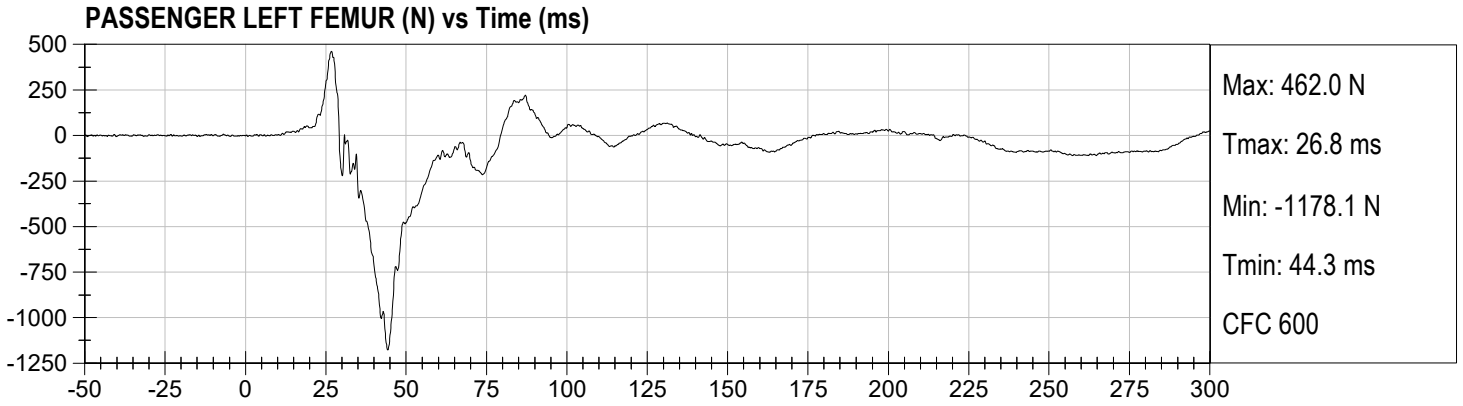


**PASSENGER CHEST Resultant (g) vs Time (ms)**









**APPENDIX C**  
**DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA**

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**HYBRID III 50<sup>TH</sup> PERCENTILE MALE - DRIVER ATD**

**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**

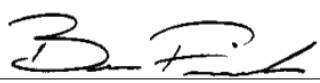
ATD Serial No: 351

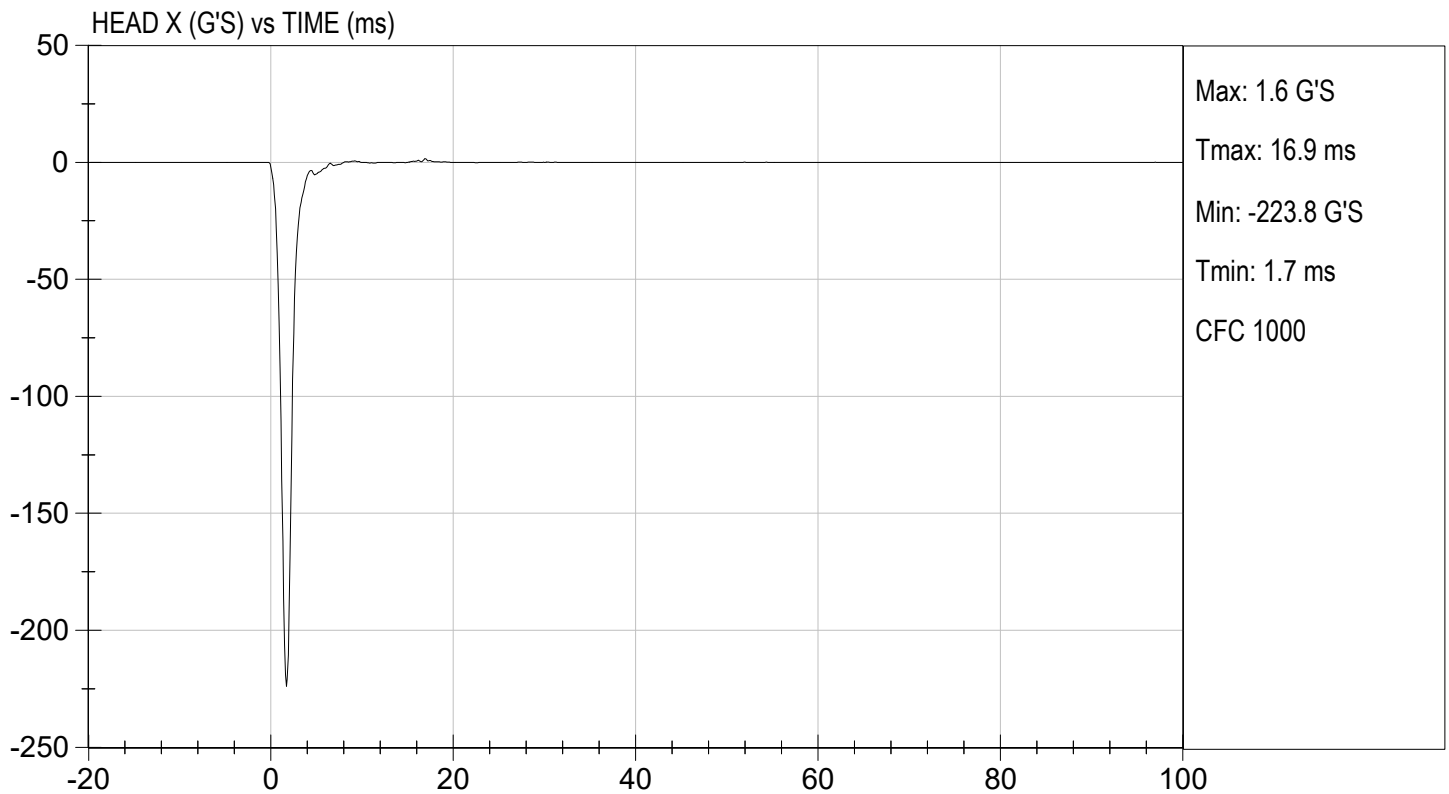
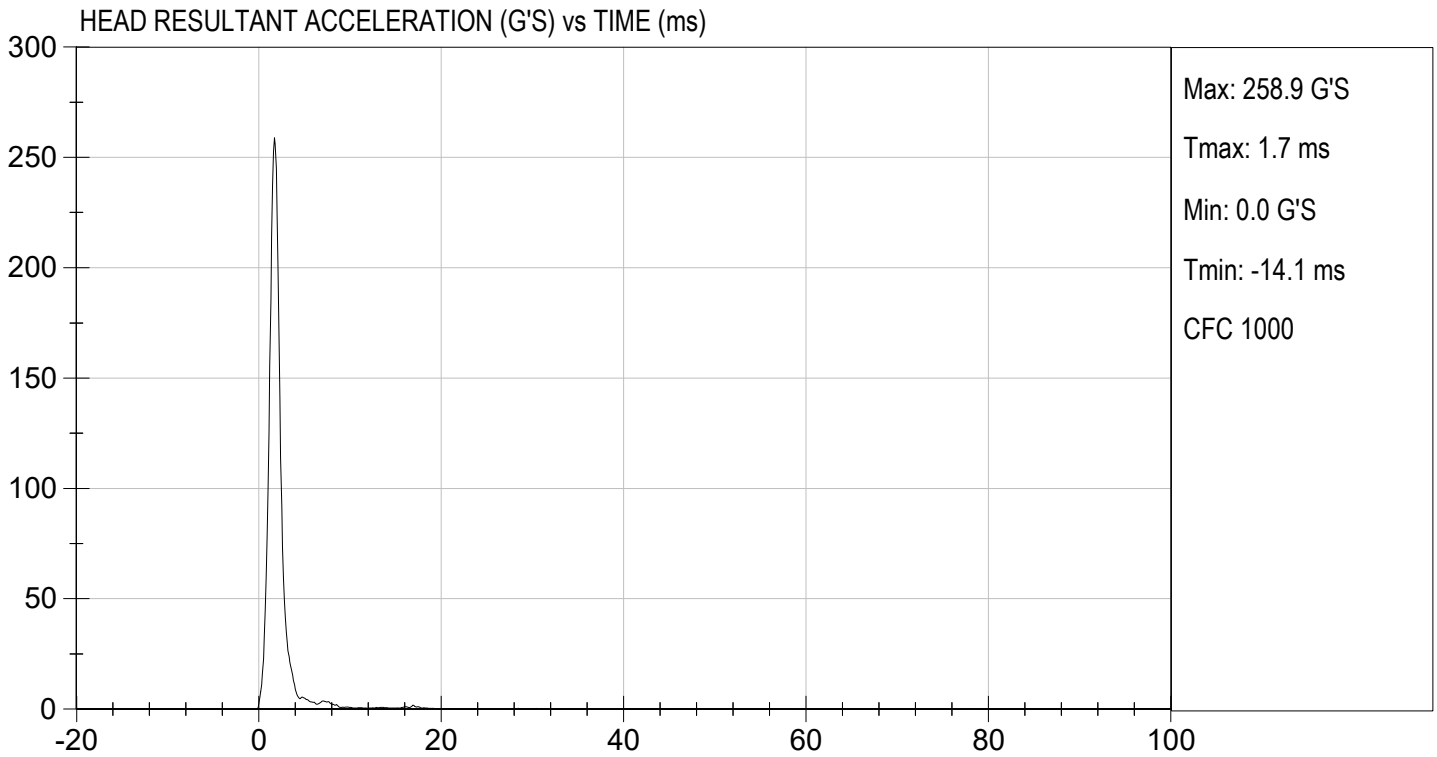
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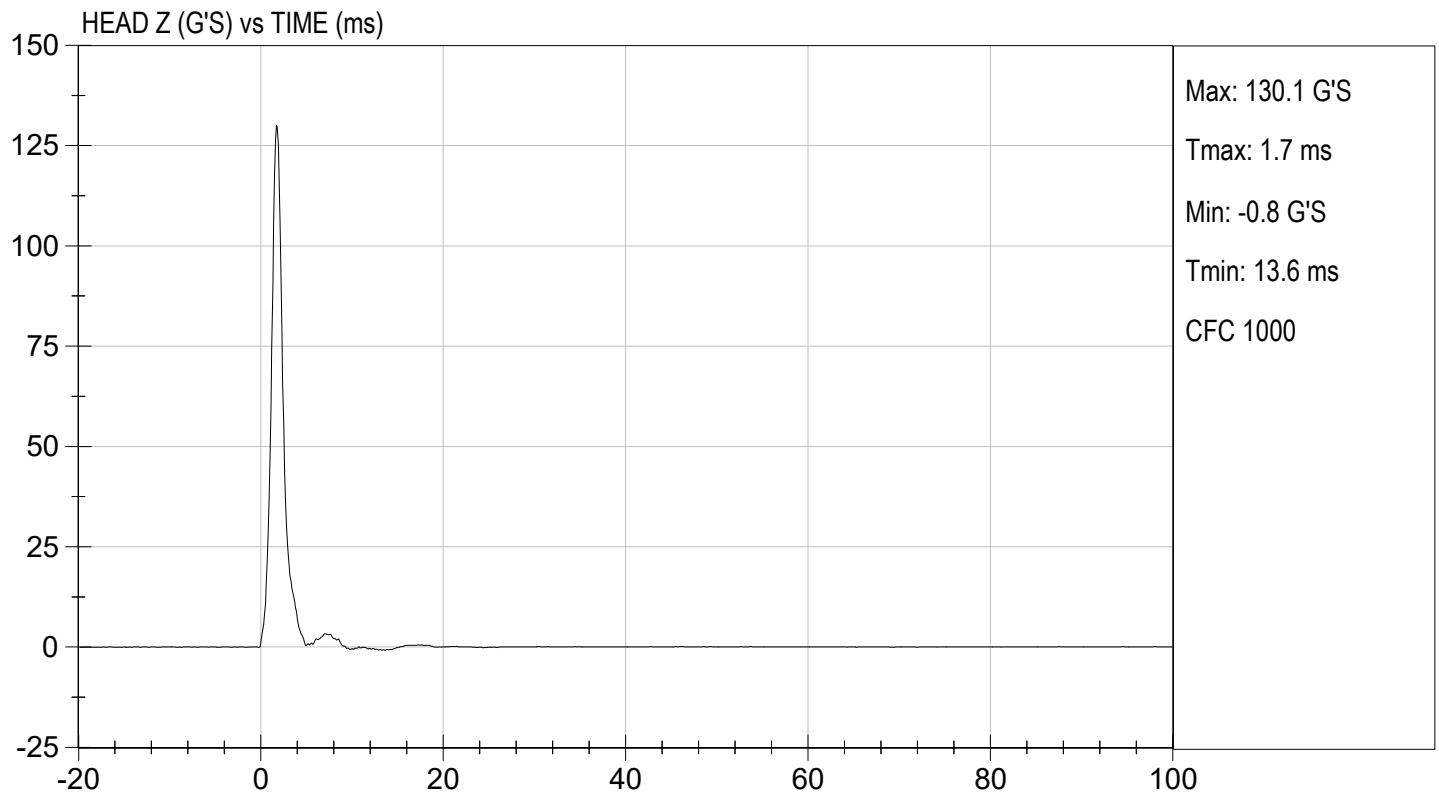
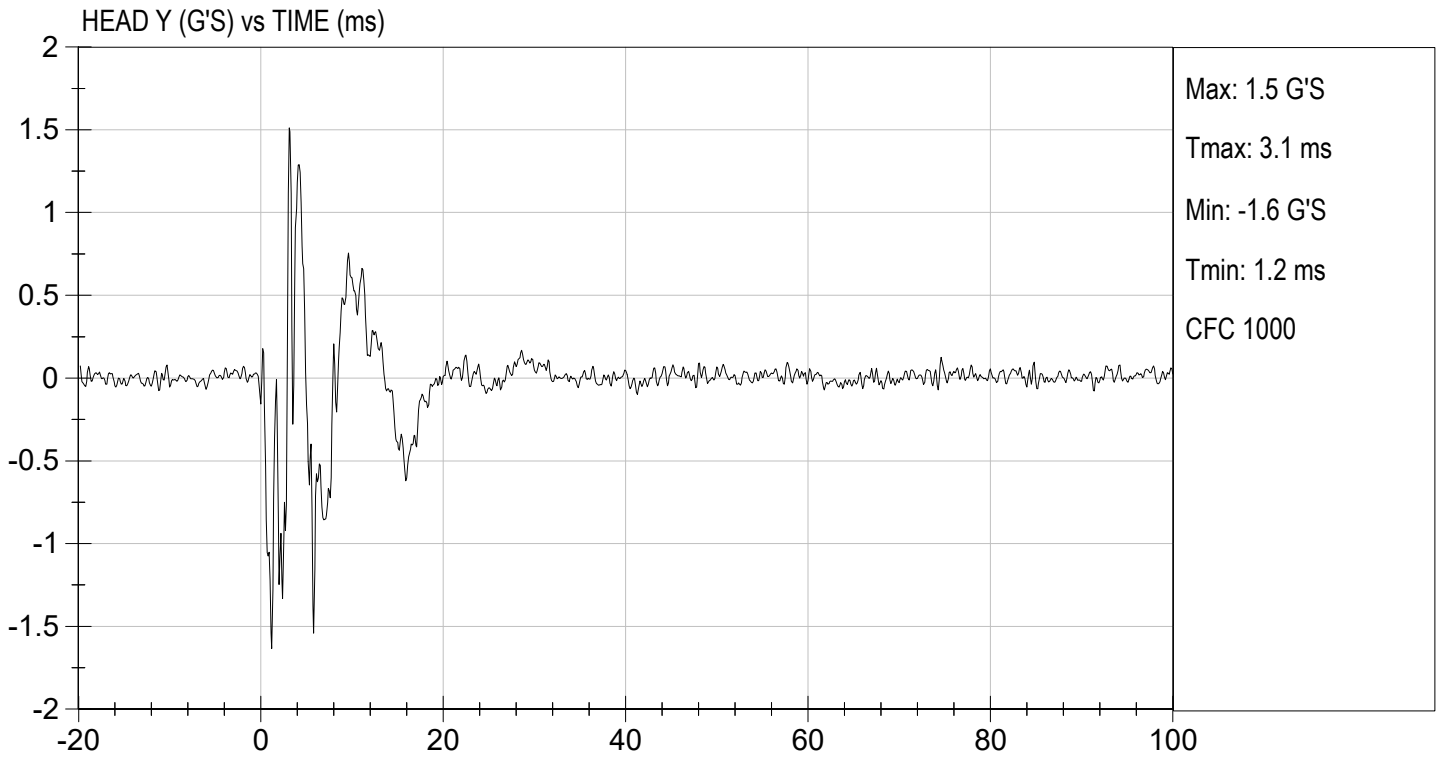
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Peak Resultant Acceleration	G's	225 to 275	259	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-1.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/07/2022  
 Test Date

  
 Approved By





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

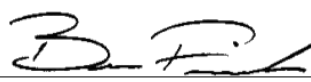
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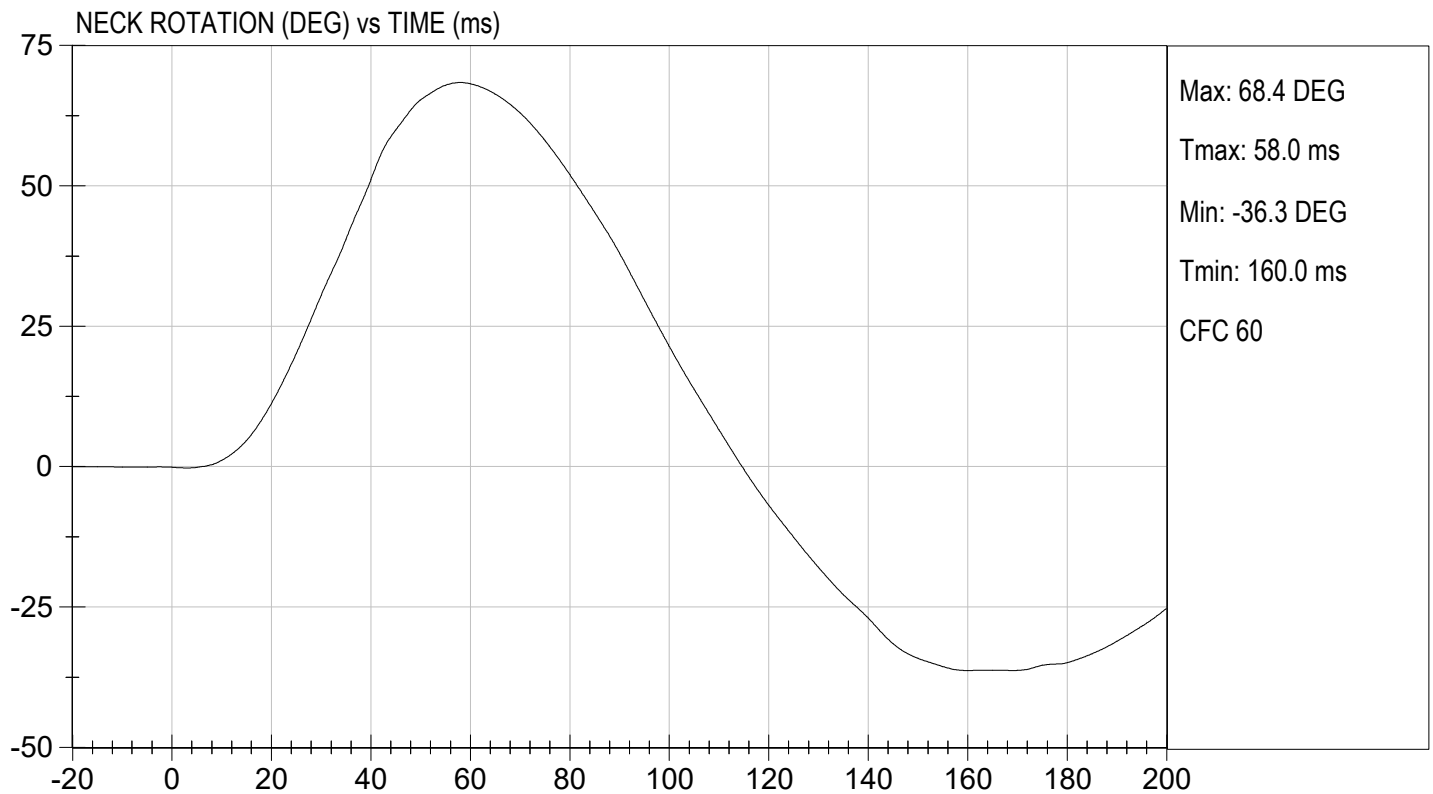
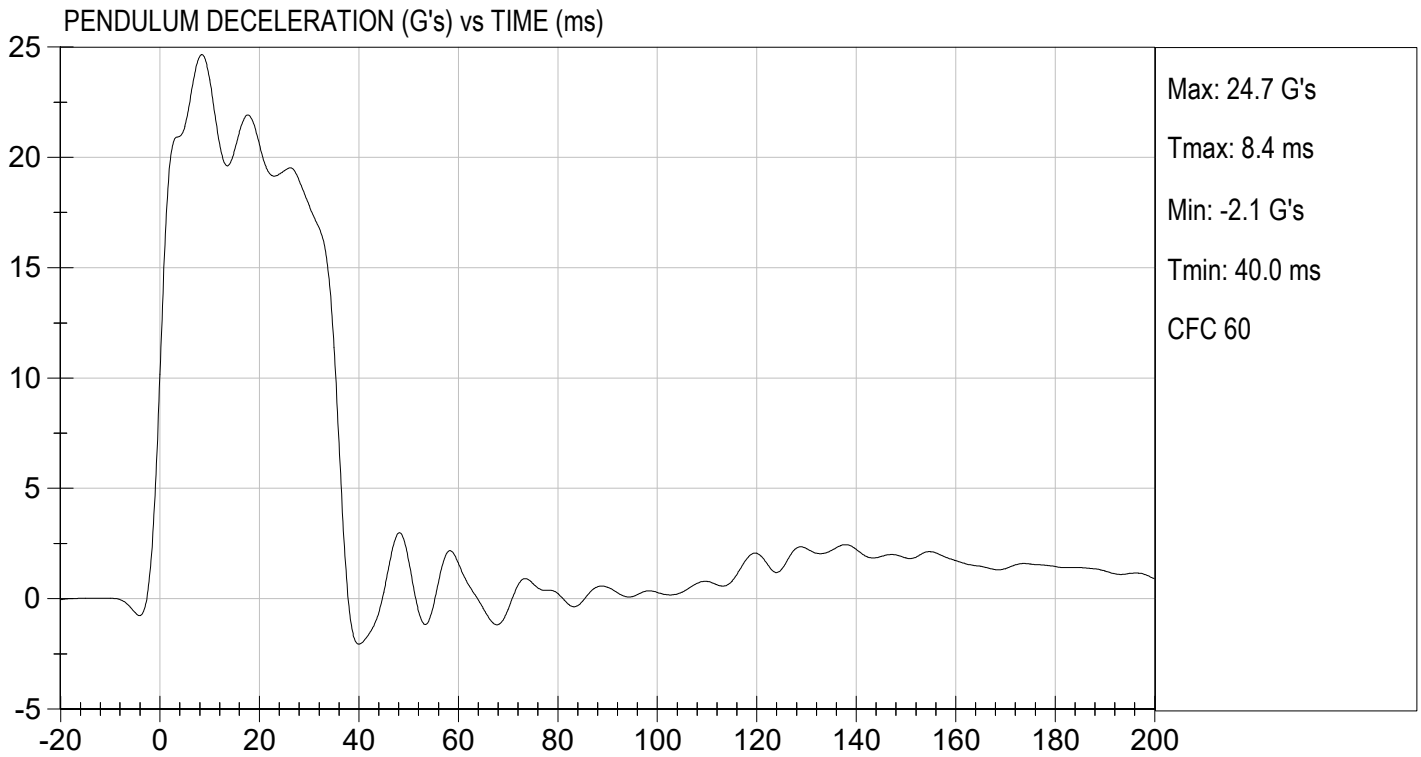
Test I.D.: D222602

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	31	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.01	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.52	Pass
	20 ms	G's	17.60 to 22.60	20.58	Pass
	30 ms	G's	12.50 to 18.50	17.82	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	17.8	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.5	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	68.4	Pass
	Time	ms	57.0 to 64.0	58.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	114.8	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	97.2	Pass
	Time	ms	47.0 to 58.0	48.0	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.7	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/07/2022  
 Test Date

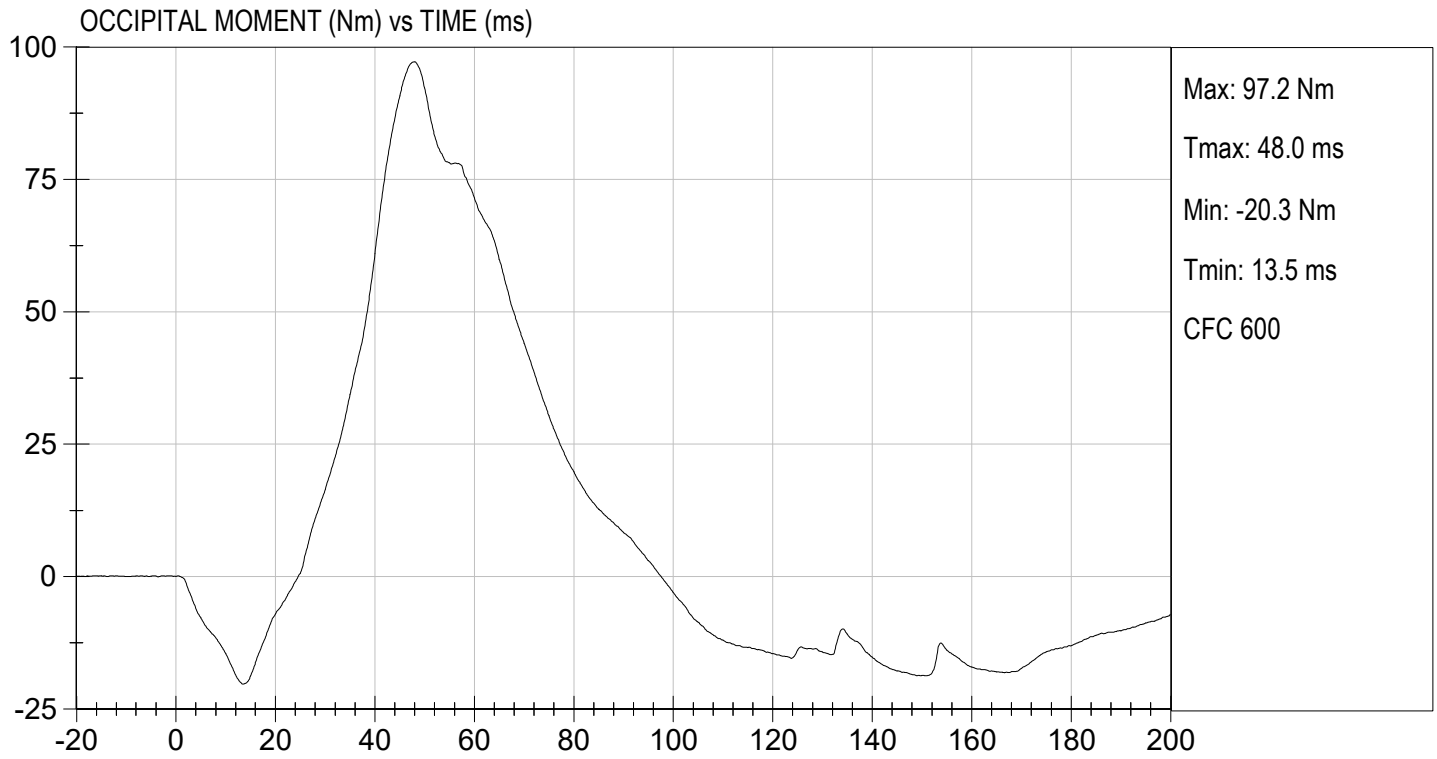
  
 Approved By





TEST DESC: NECK FLEXION  
VELOCITY: 23.00 ft/s, 7.01 m/s

TEST DATE: 11/07/2022  
TEST #: D222602



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

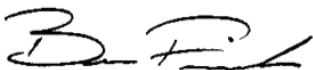
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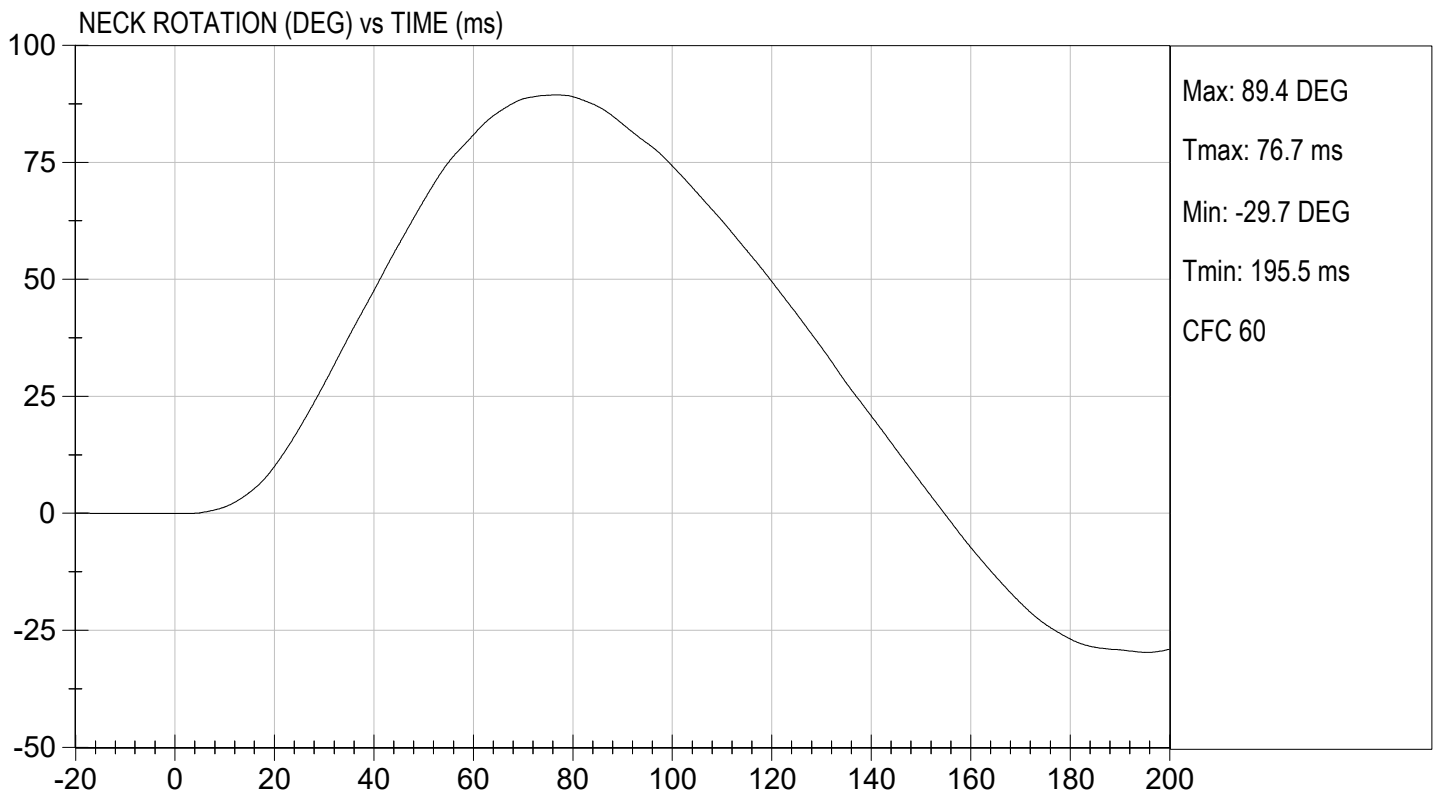
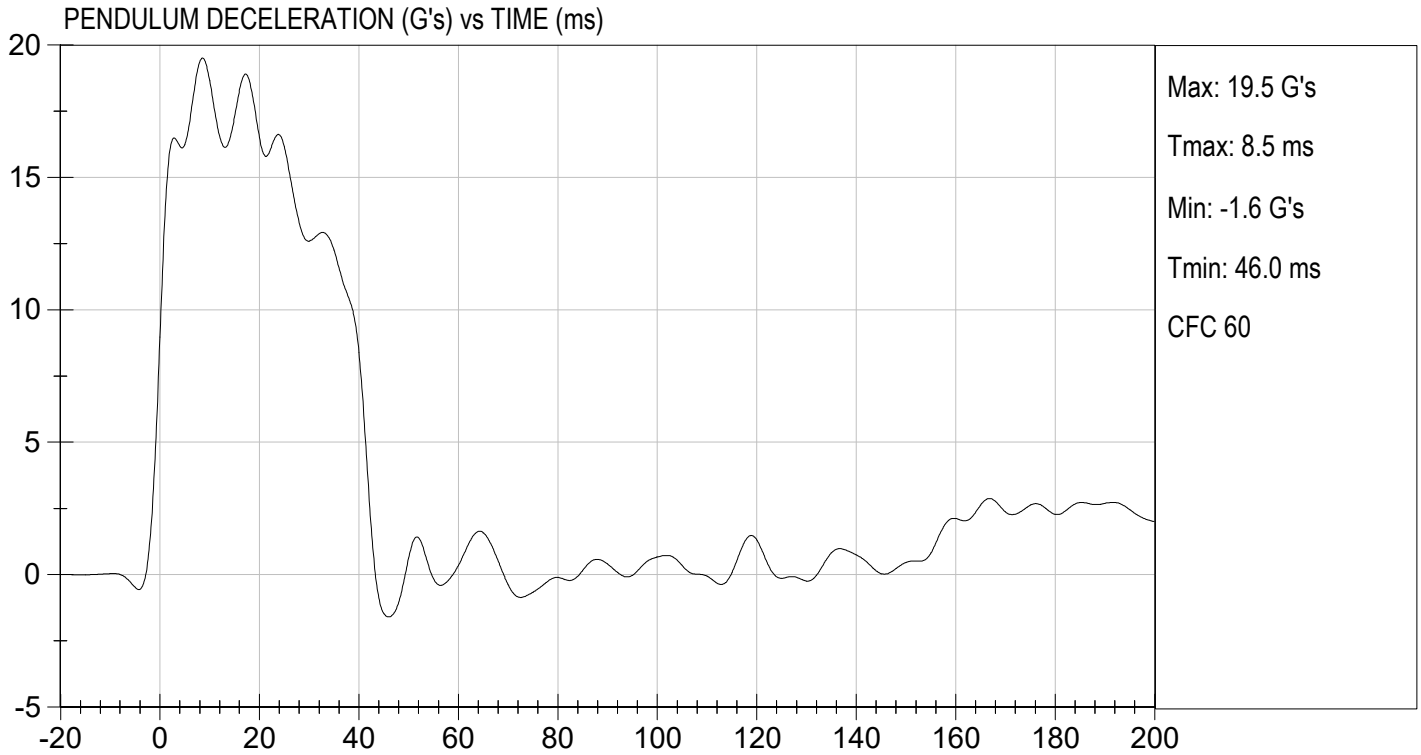
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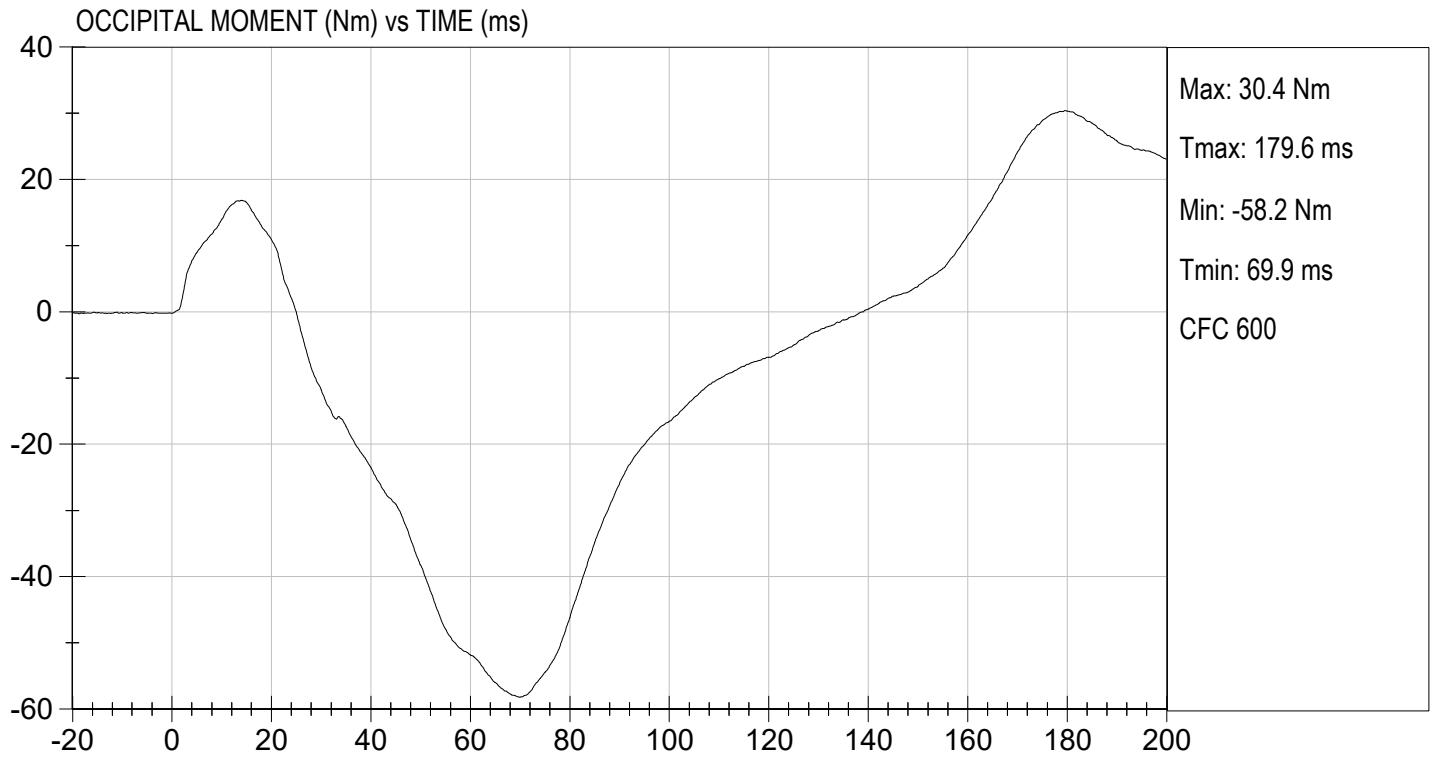
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.65	Pass
	20 ms	G's	14.00 to 19.00	16.51	Pass
	30 ms	G's	11.00 to 16.00	12.59	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	89.4	Pass
	Time	ms	72.0 to 82.0	76.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	154.9	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-58.2	Pass
	Time	ms	65.0 to 79.0	69.9	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	139.1	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/07/2022  
 Test Date

  
 Approved By





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

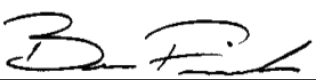
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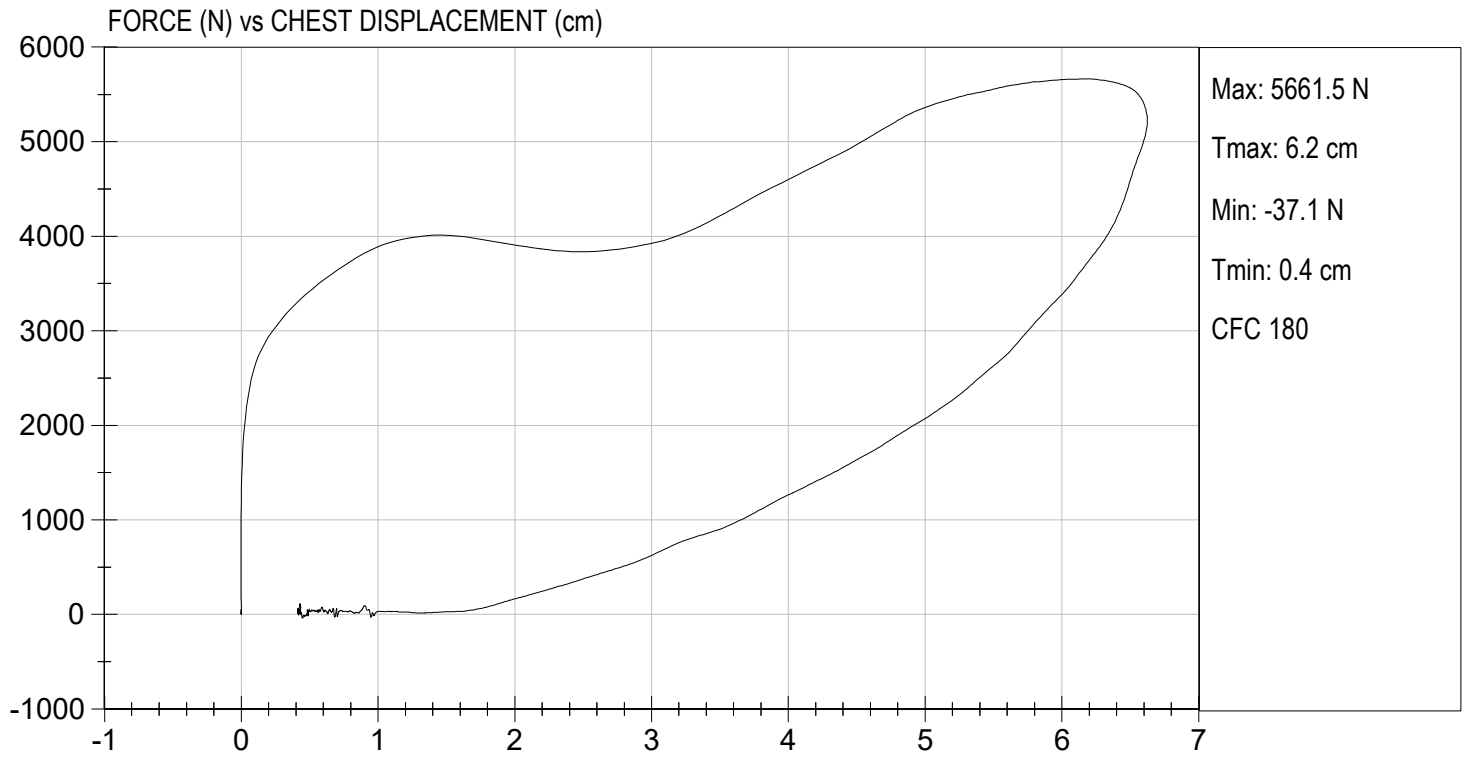
Test I.D: D222604

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,662	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.62	Pass
Internal Hysteresis	%	69 to 85	72	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

11/07/2022  
 Test Date

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

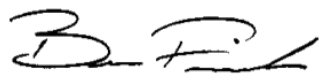
ATD Serial No: 351

Test I.D: D222605

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	30	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,115	Pass
Overall Test Results				Pass

  
 Laboratory Technician

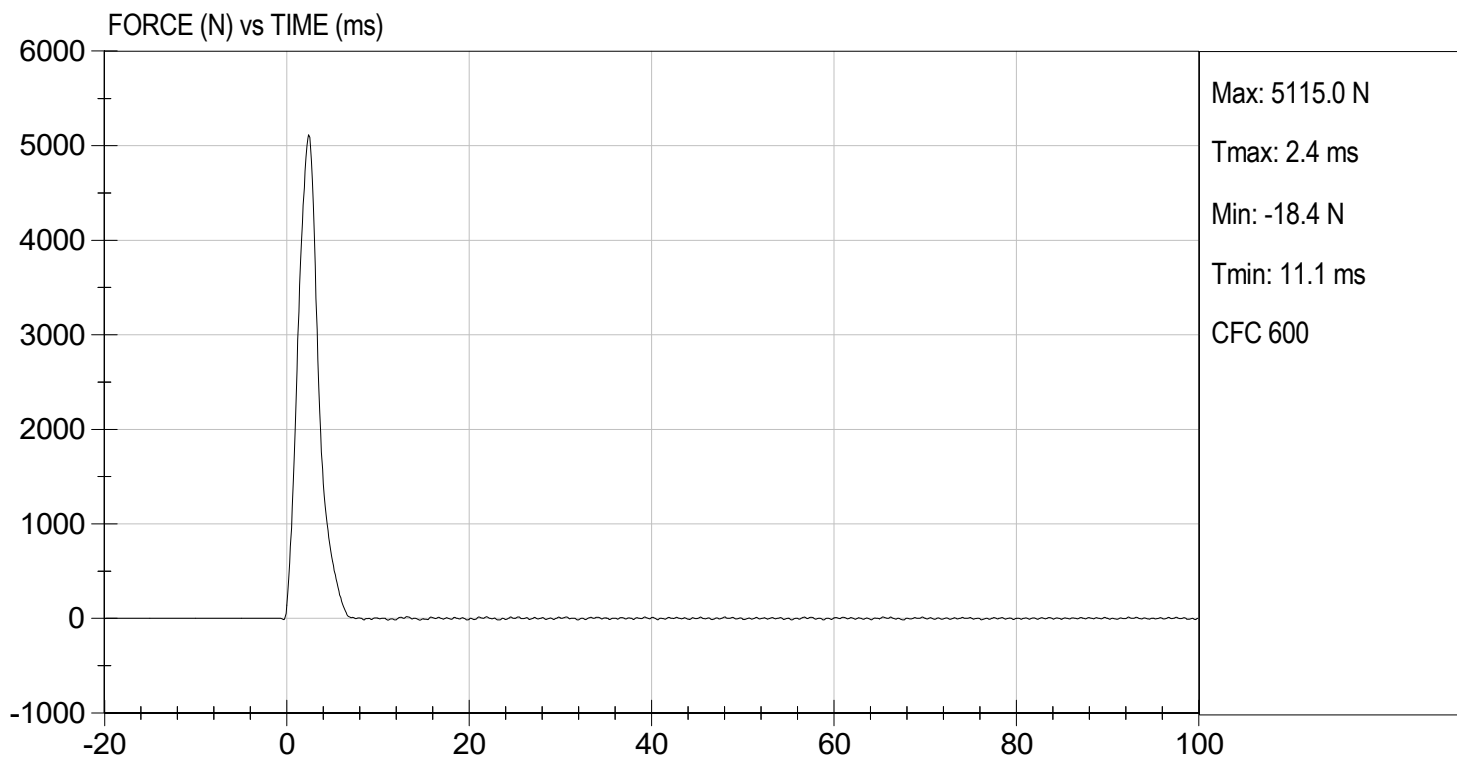
11/07/2022  
 Test Date

  
 Approved By



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

TEST DATE: 11/07/2022  
TEST #: D222605



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

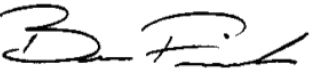
ATD Serial No: 351

Test I.D: D222606

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	30	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	N	4715 to 5782	4,961	Pass
Overall Test Results				Pass

  
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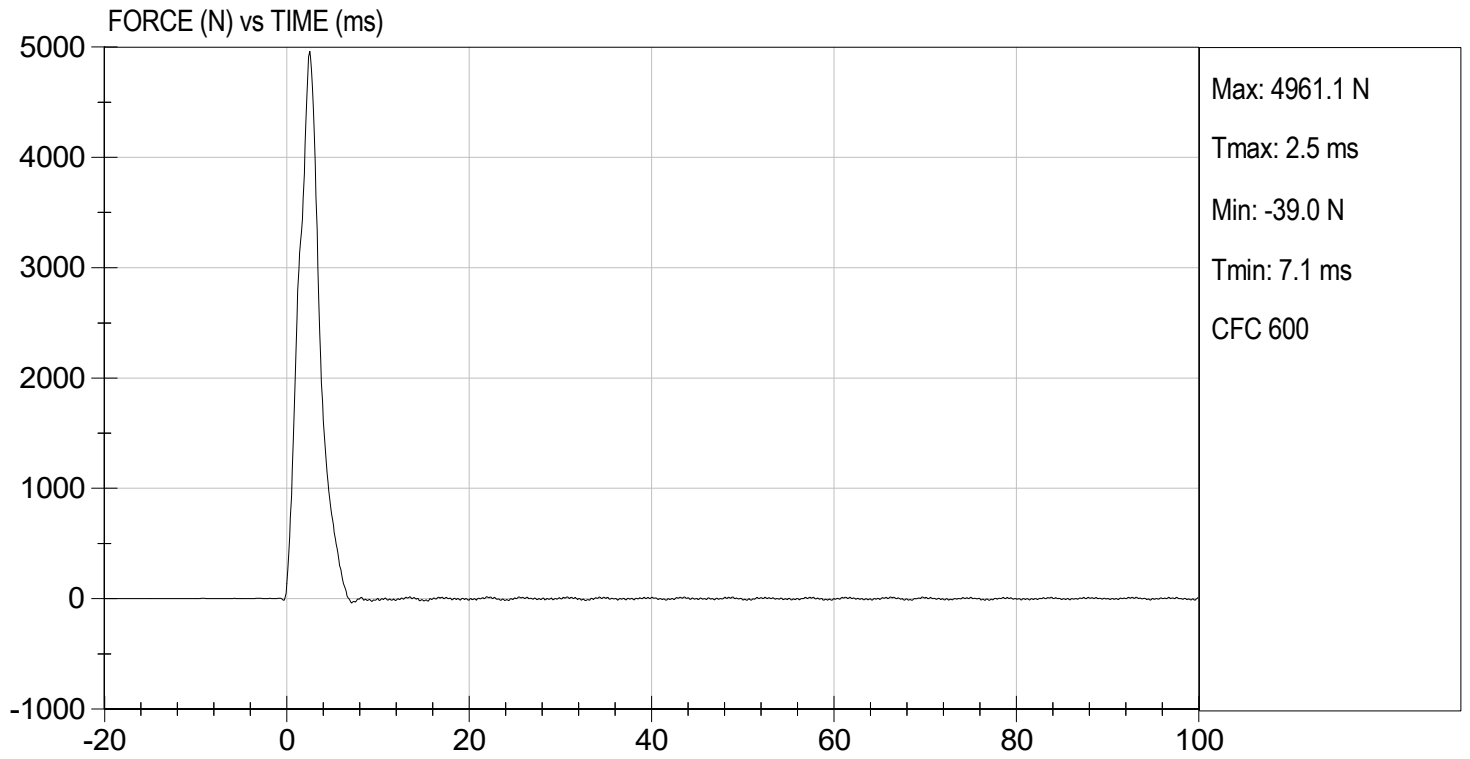
11/07/2022  
 Test Date

  
 Approved By



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

TEST DATE: 11/07/2022  
TEST #: D222606



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

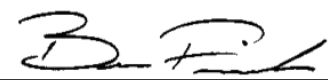
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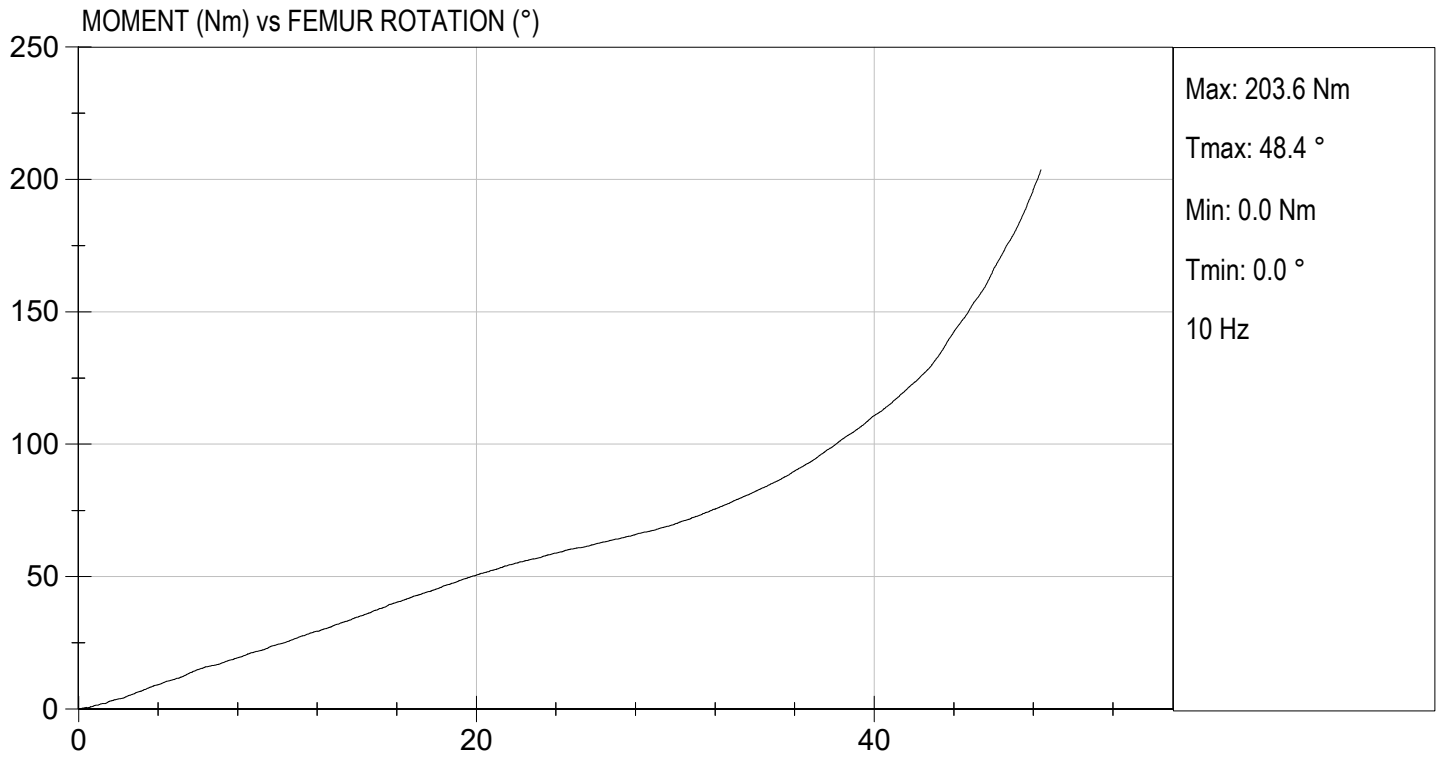
**Test I.D:** D222600

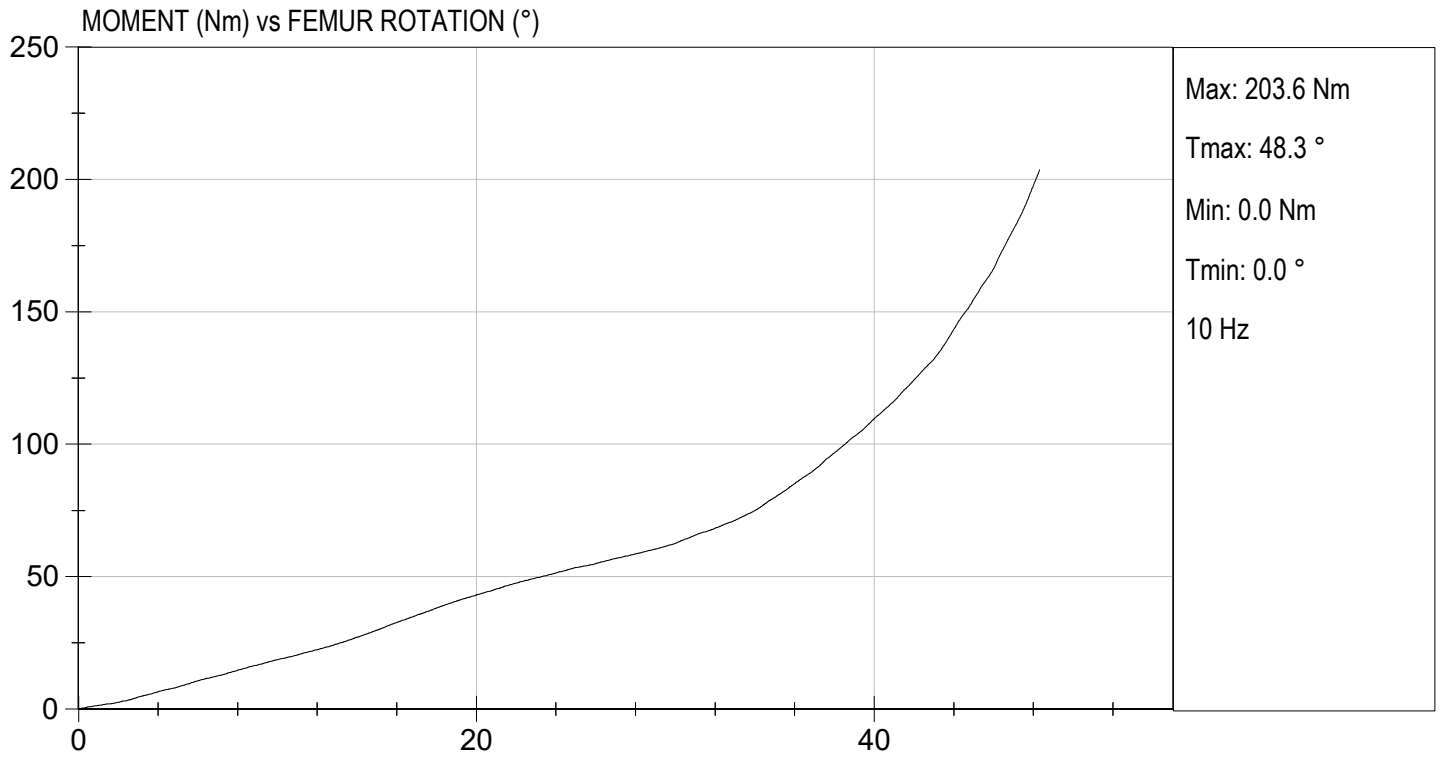
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	30	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.5	6.6	Pass
30 Degrees	Nm	94.9 Nm Max	70.0	62.6	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	48.4	48.3	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/07/2022  
 Test Date

  
 Approved By





**CALIBRATION TEST RESULTS**

**POST-TEST**

**HYBRID III 50<sup>TH</sup> PERCENTILE MALE - DRIVER ATD**

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

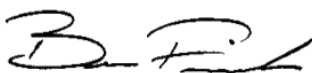
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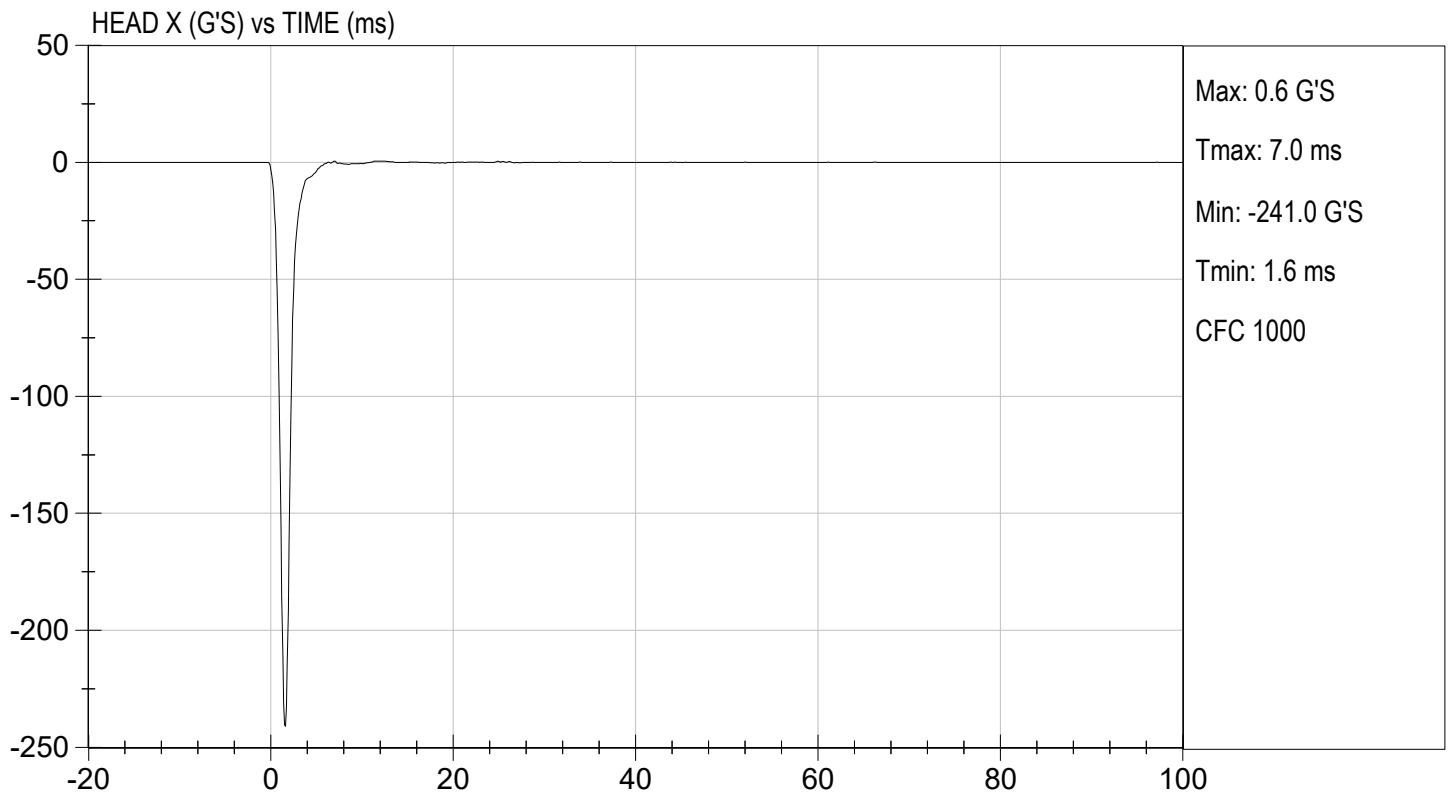
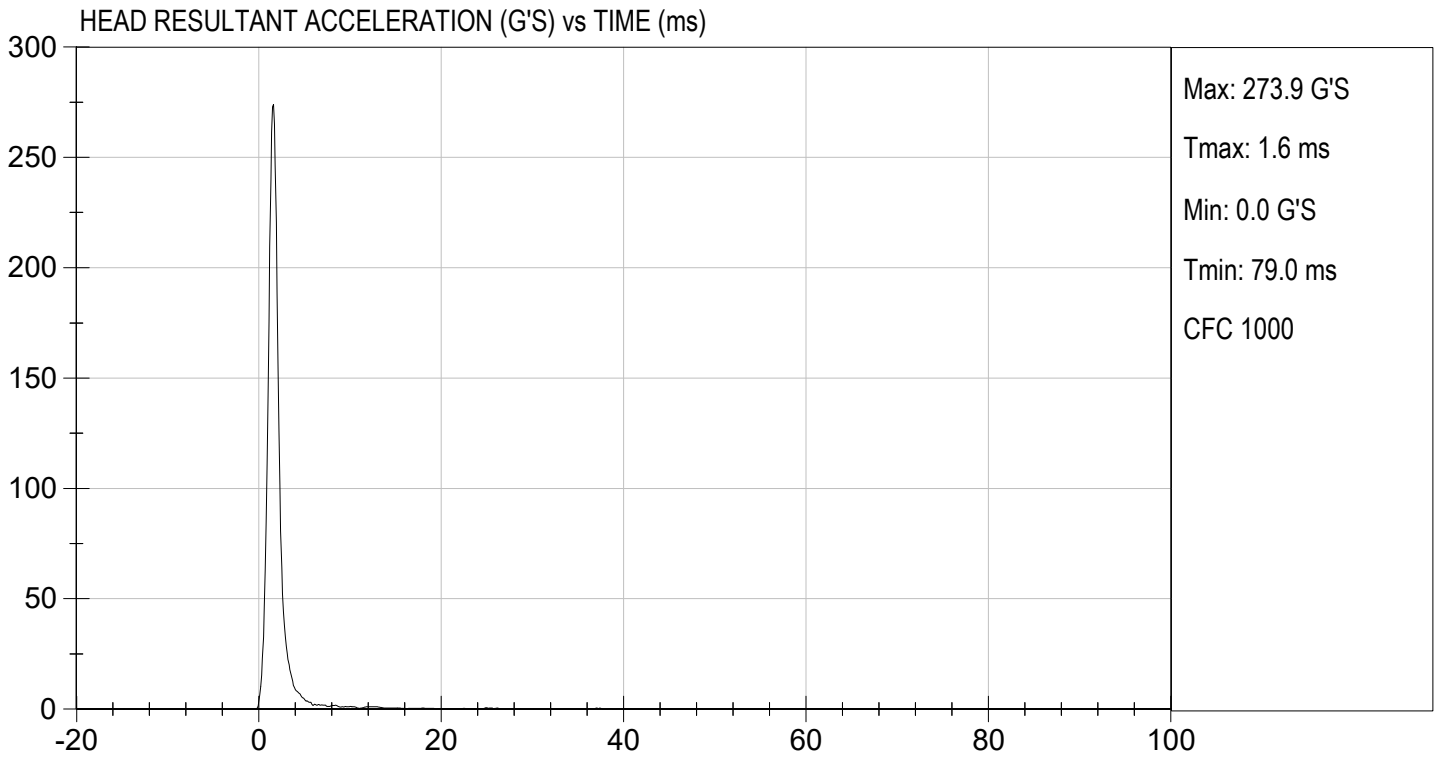
Test ID: D222651

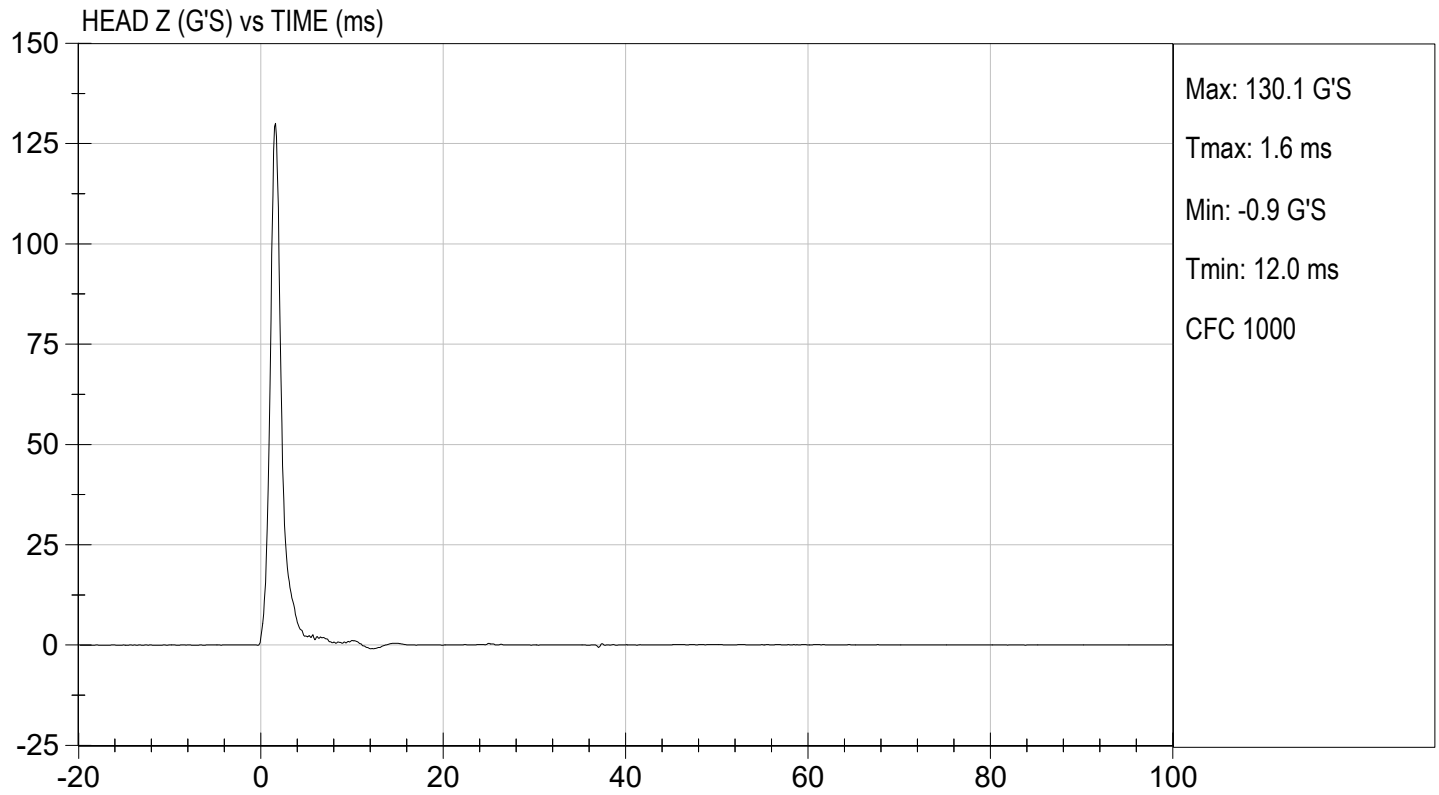
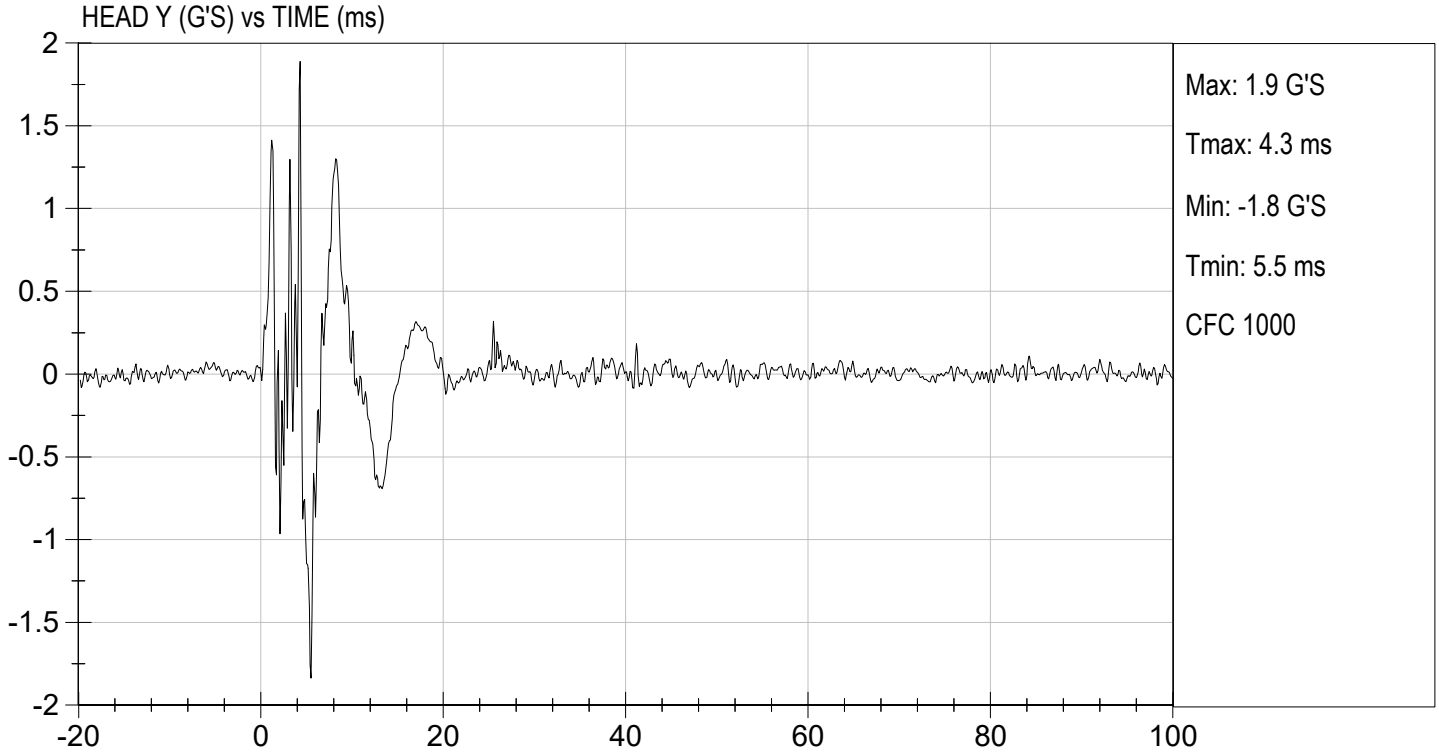
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	225 to 275	274	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	1.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/17/2022  
 Test Date

  
 Approved By





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

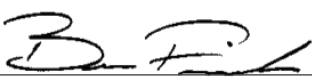
ATD Serial No: 351

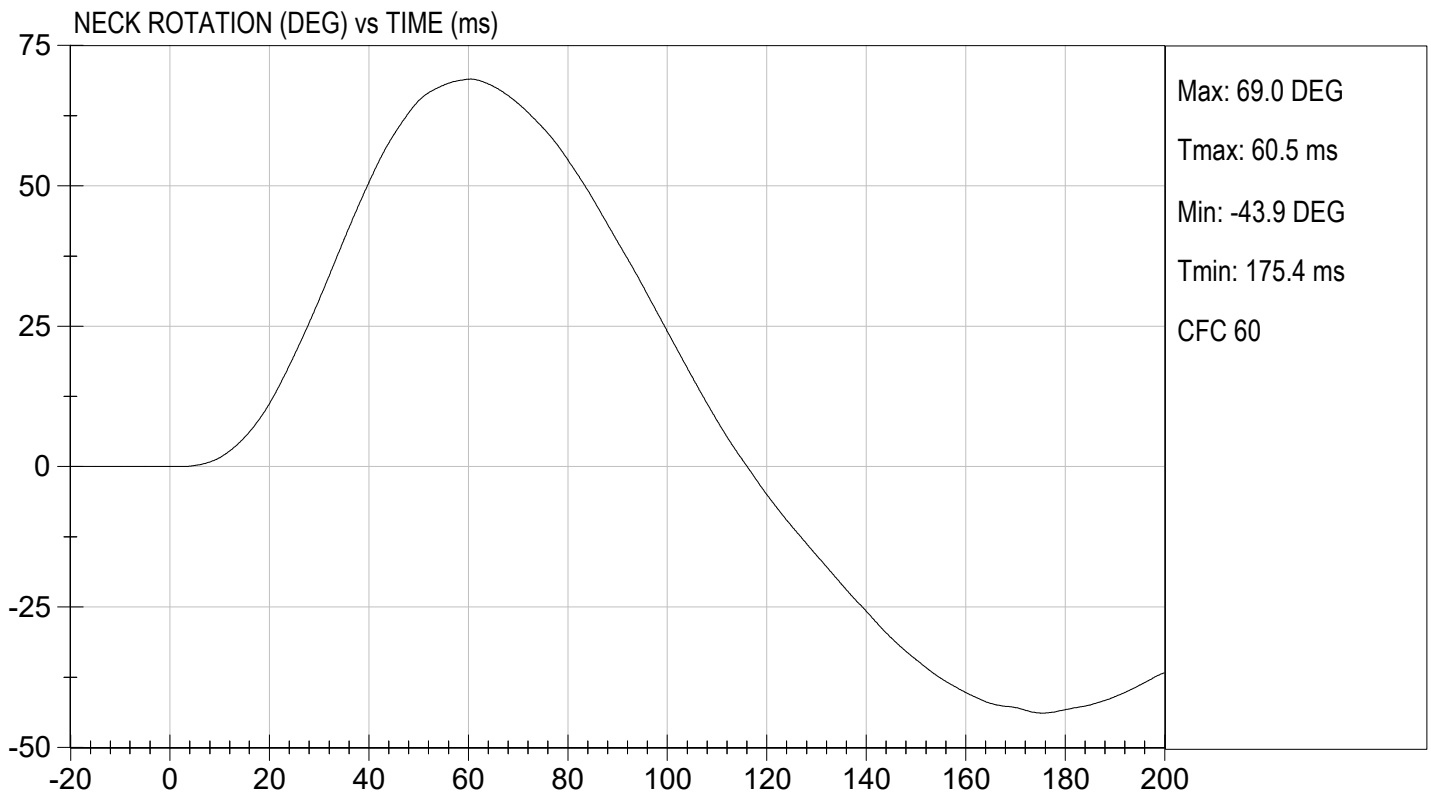
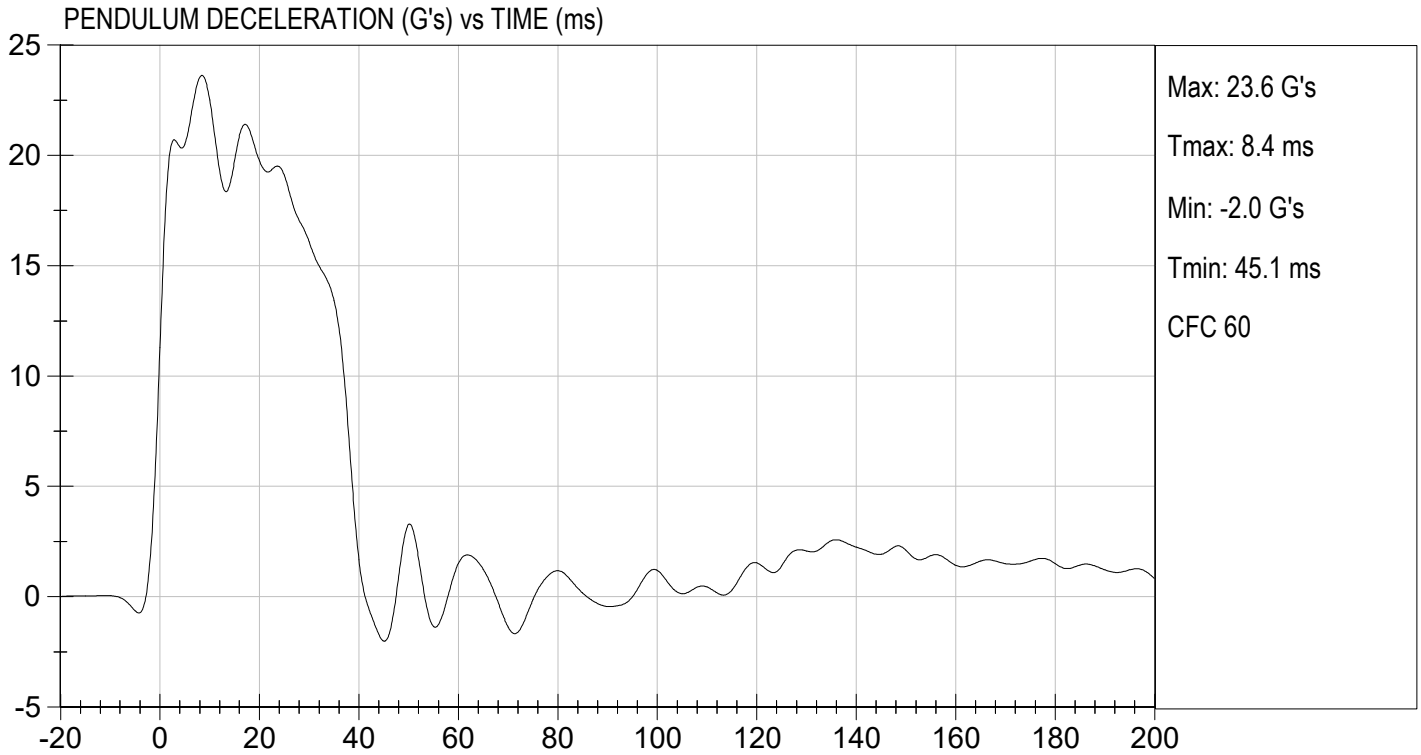
Test I.D.: D222652

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	27	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.51	Pass
	20 ms	G's	17.60 to 22.60	19.75	Pass
	30 ms	G's	12.50 to 18.50	16.07	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	16.0	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	38.8	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	69.0	Pass
	Time	ms	57.0 to 64.0	60.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	116.2	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	93.9	Pass
	Time	ms	47.0 to 58.0	50.3	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.2	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/17/2022  
 Test Date

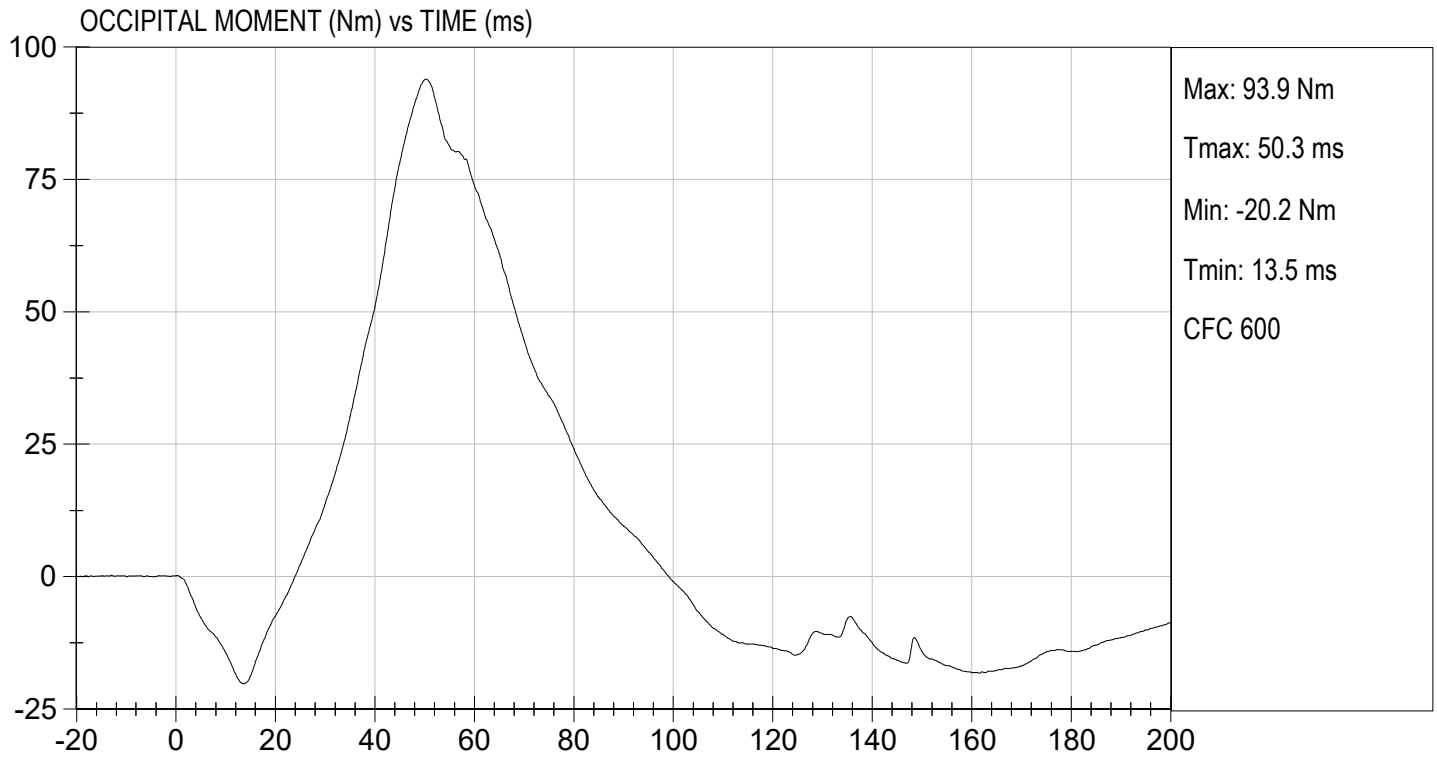
  
 Approved By





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

TEST DATE: 11/17/2022  
TEST #: D222652



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

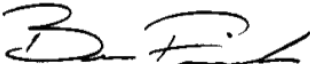
ATD Serial No: 351

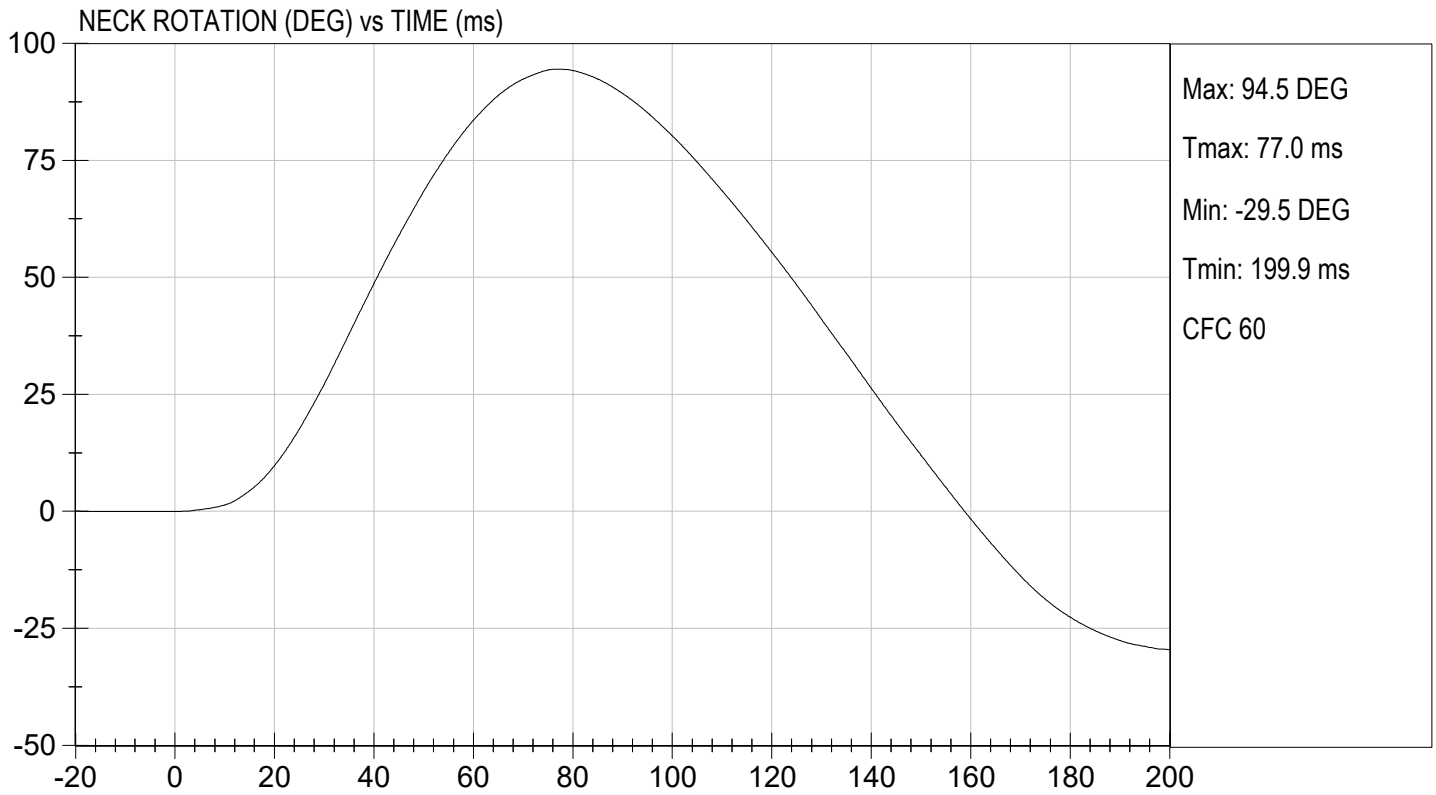
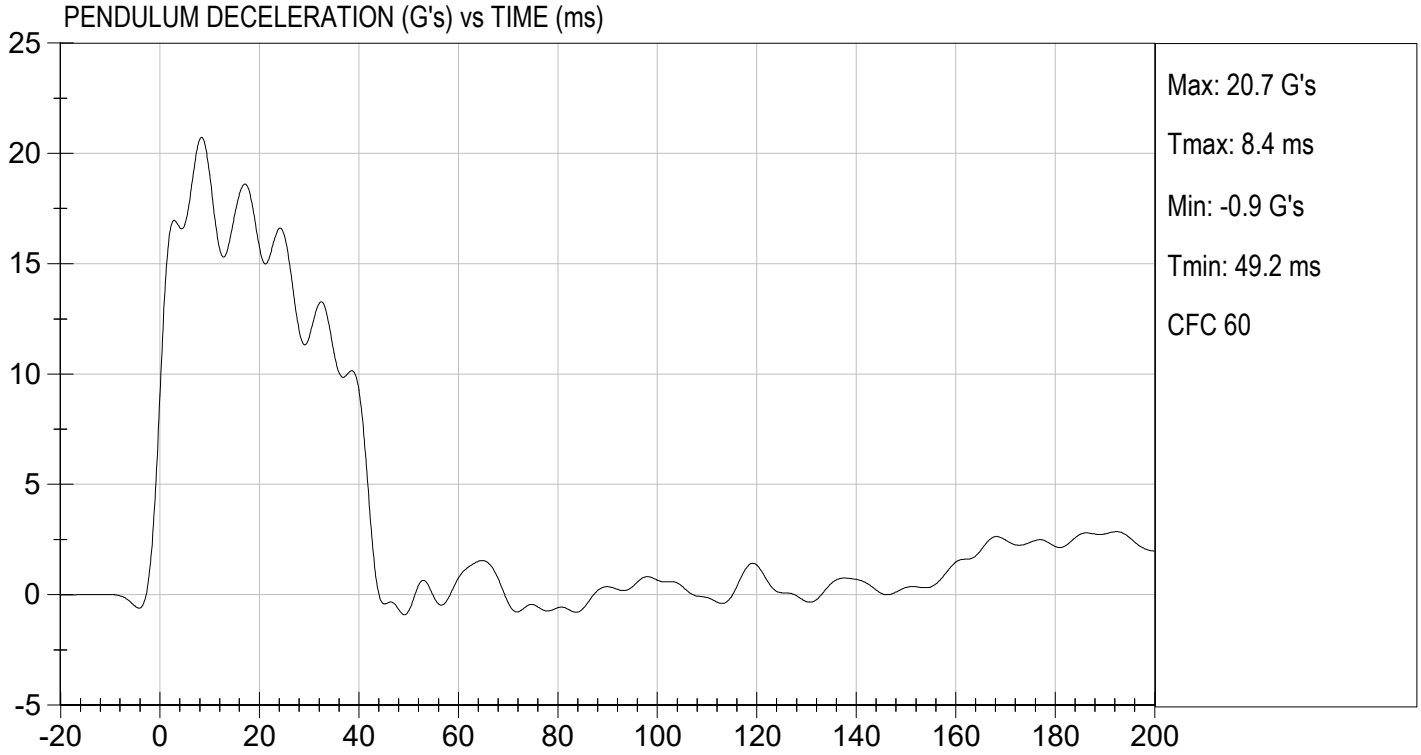
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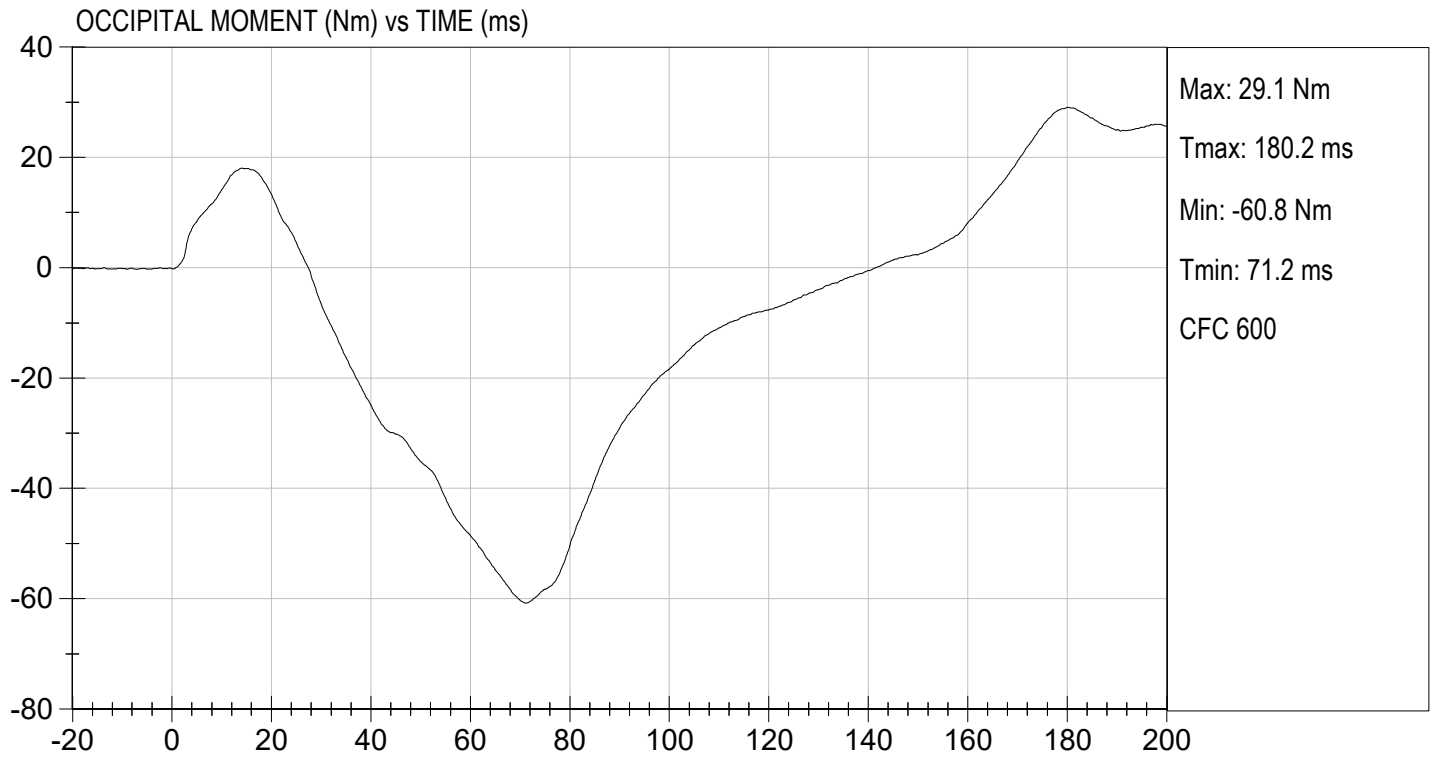
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	27	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.02	Pass
	20 ms	G's	14.00 to 19.00	15.75	Pass
	30 ms	G's	11.00 to 16.00	11.68	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.5	Pass
	Time	ms	72.0 to 82.0	77.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	158.9	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-60.8	Pass
	Time	ms	65.0 to 79.0	71.2	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	141.7	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/17/2022  
 Test Date

  
 Approved By





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

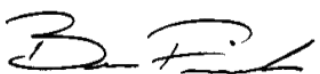
ATD Serial No: 351

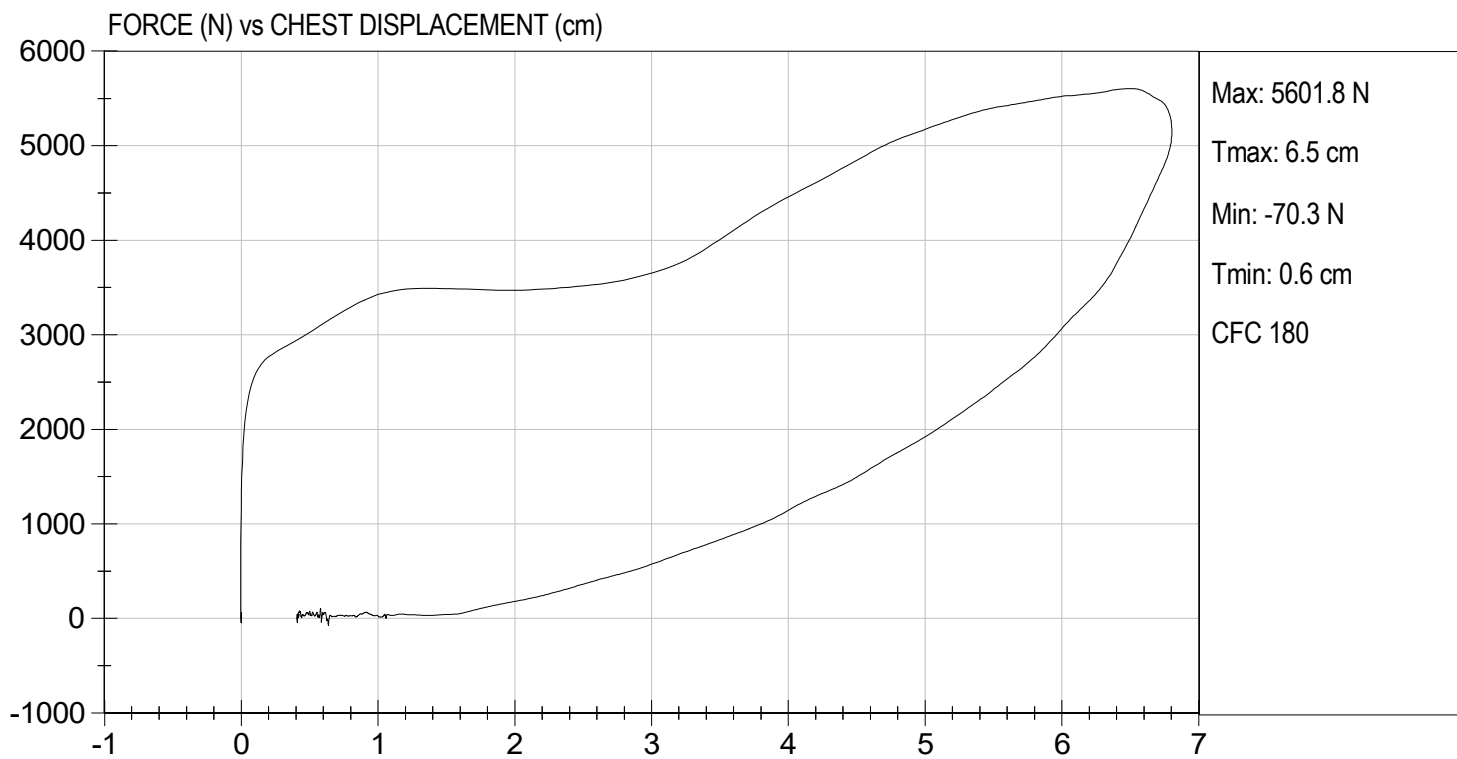
Test I.D: D222654

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,602	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.80	Pass
Internal Hysteresis	%	69 to 85	71	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

11/16/2022  
 Test Date

  
 Approved By



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

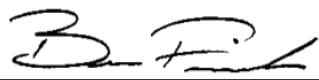
ATD Serial No: 351

Test I.D: D222655

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	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	N	4715 to 5782	4,734	Pass
Overall Test Results				Pass

  
 Laboratory Technician

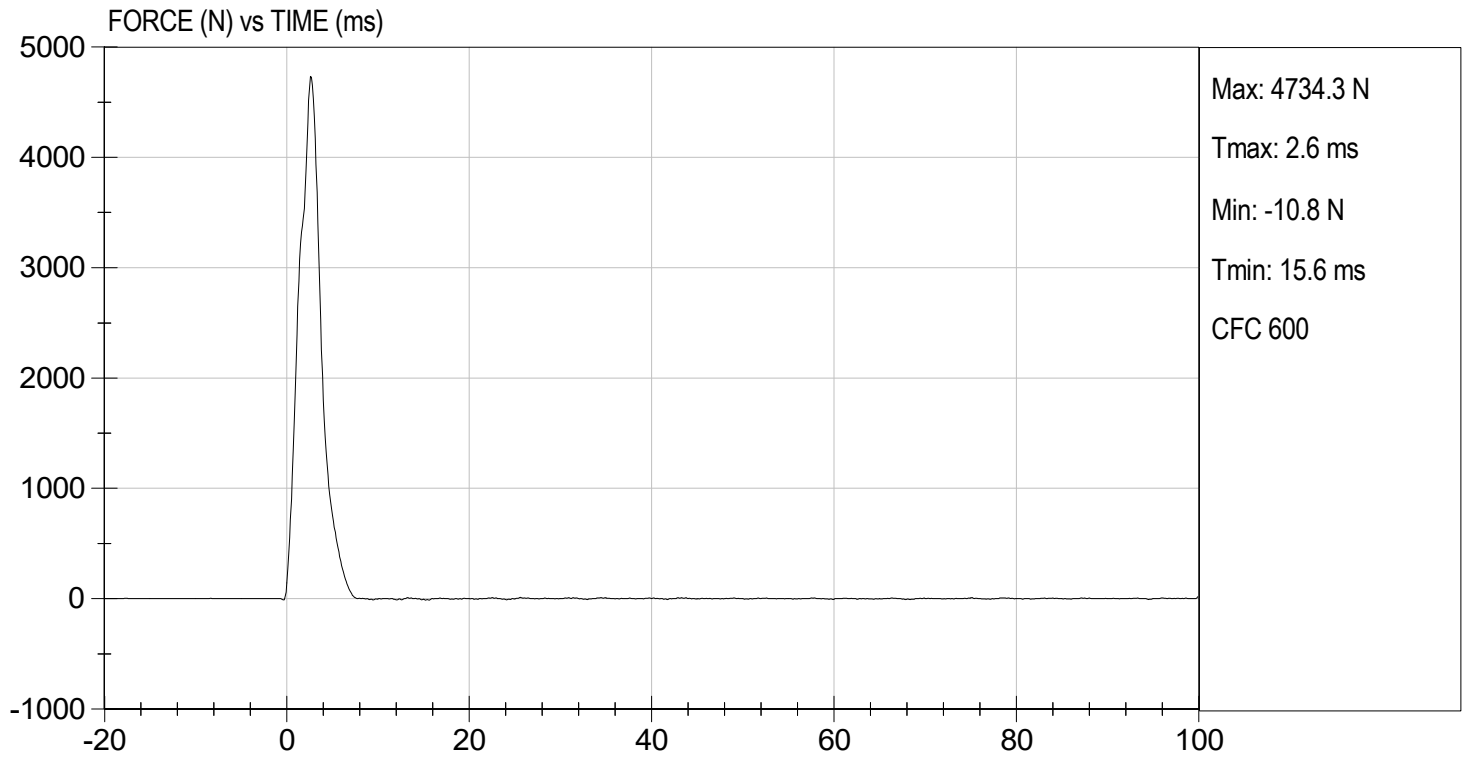
11/17/2022  
 Test Date

  
 Approved By



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

TEST DATE: 11/17/2022  
TEST #: D222655



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

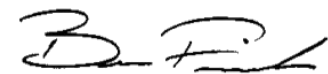
ATD Serial No: 351

Test I.D: D222656

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	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	N	4715 to 5782	5,007	Pass
Overall Test Results				Pass

  
 Laboratory Technician

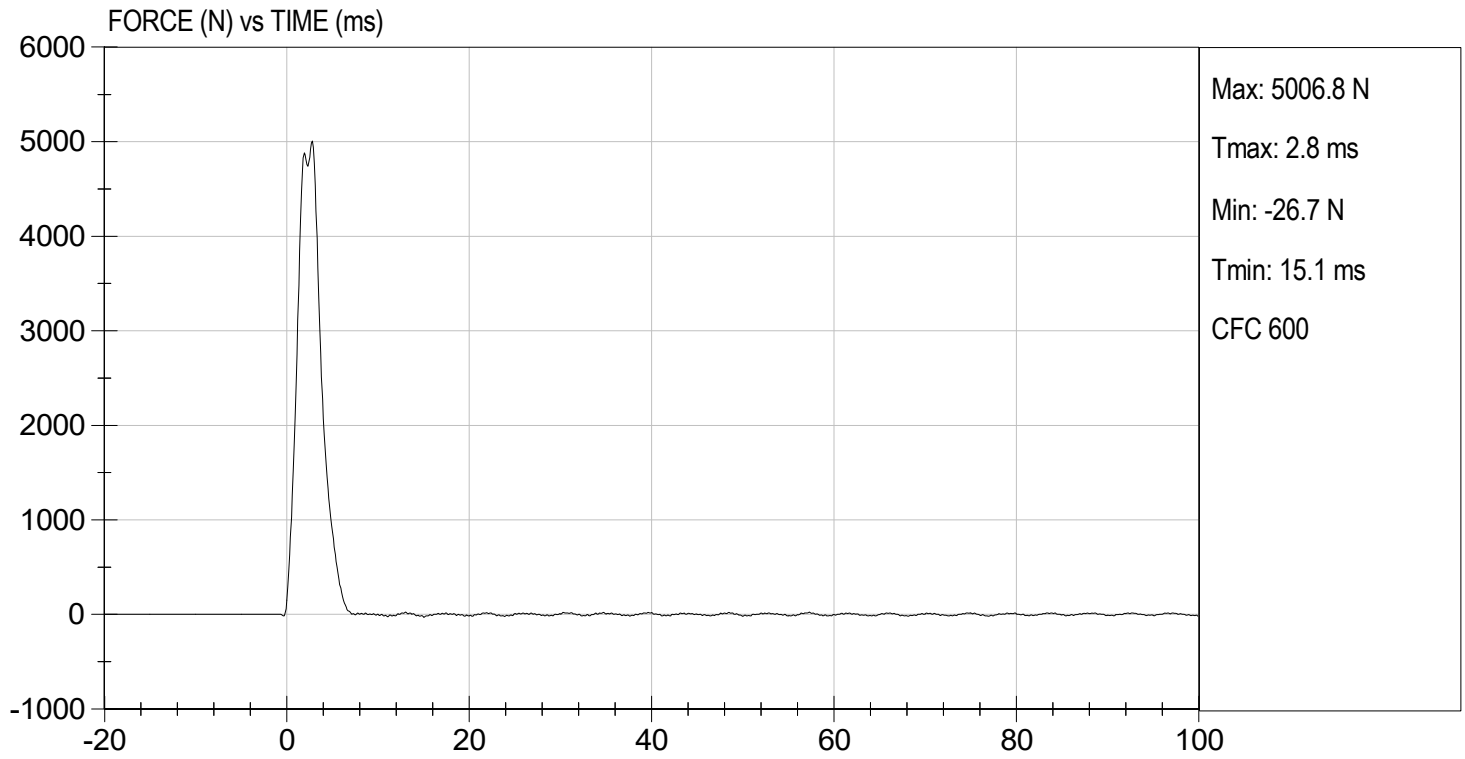
11/17/2022  
 Test Date

  
 Approved By



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

TEST DATE: 11/17/2022  
TEST #: D222656



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

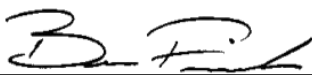
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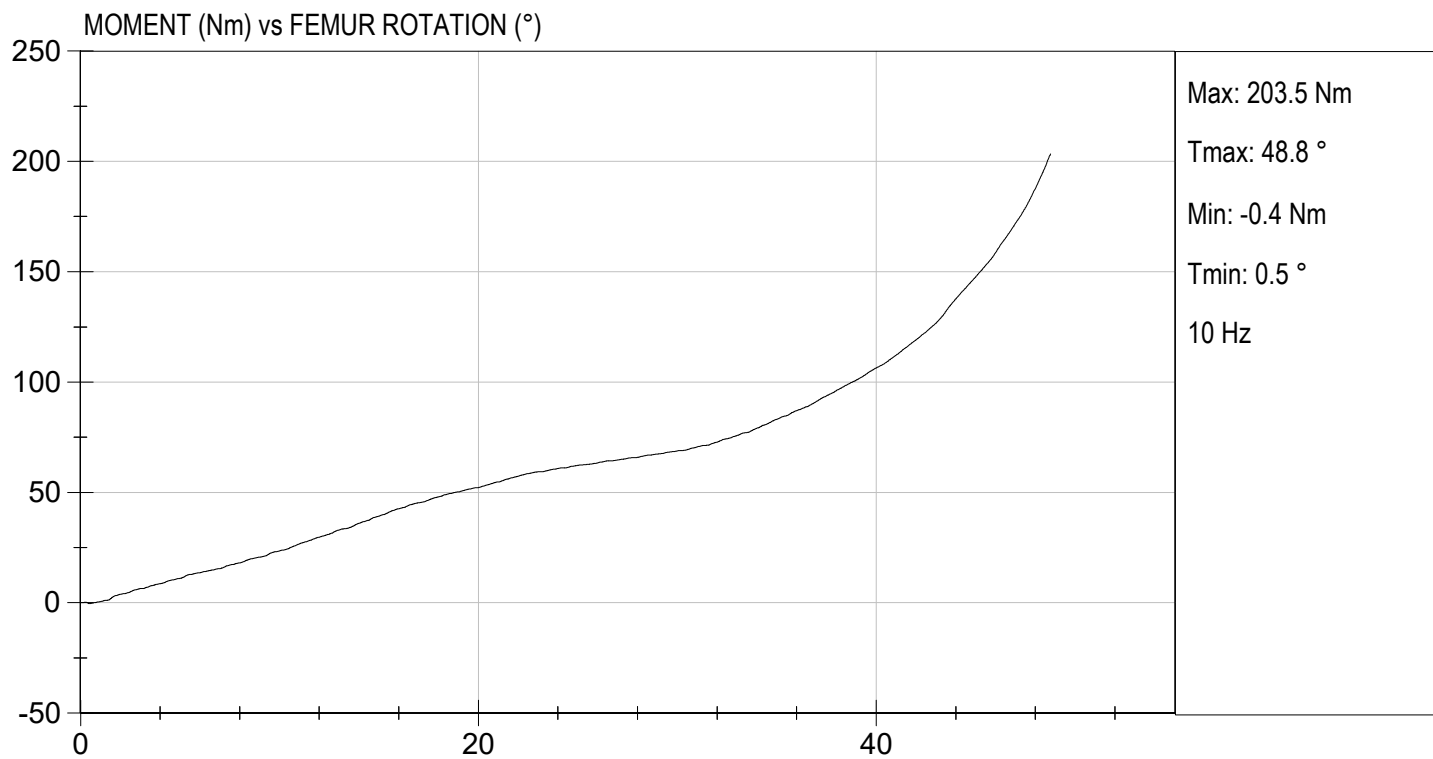
**Test I.D.:** D222650

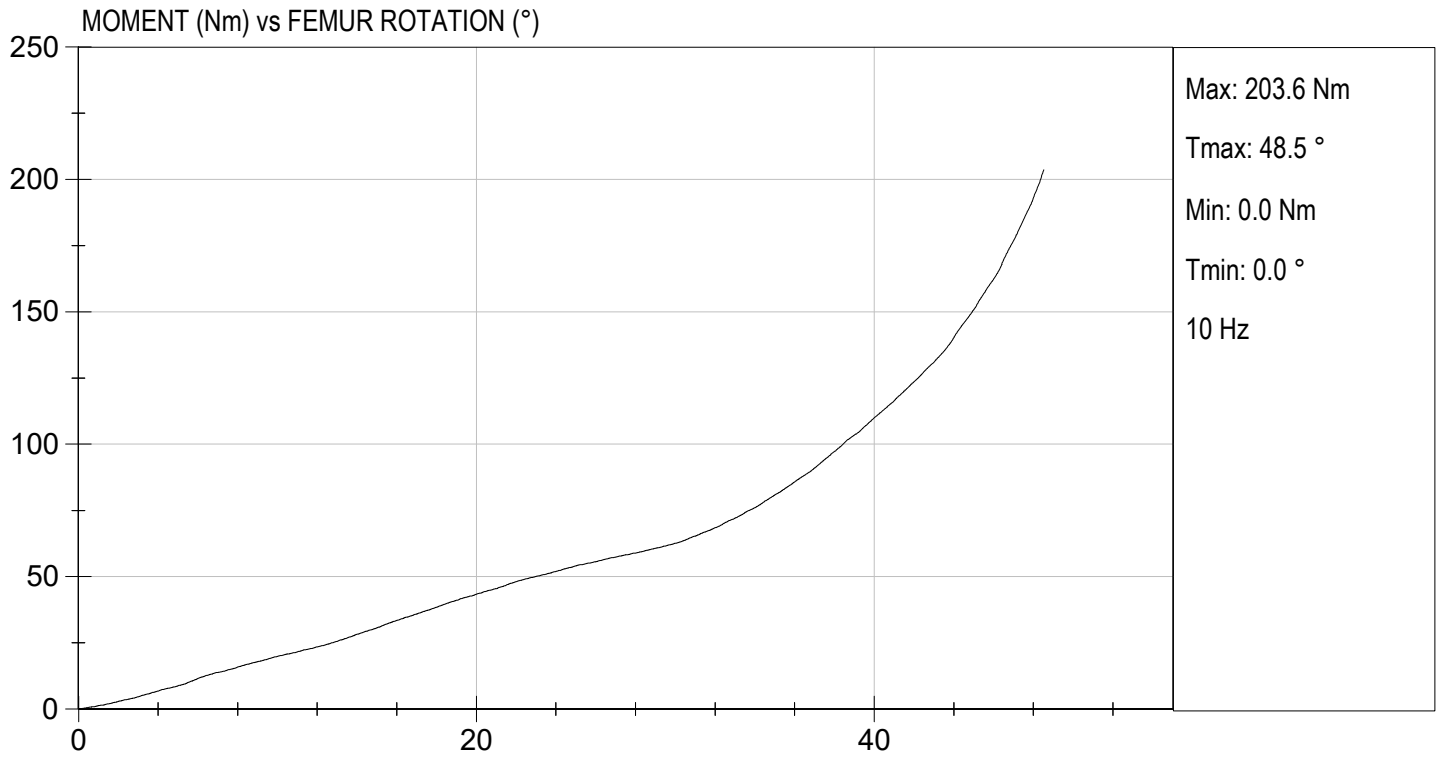
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	26	26	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.6	6.6	Pass
30 Degrees	Nm	94.9 Nm Max	68.8	62.6	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	48.8	48.5	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/17/2022  
 Test Date

  
 Approved By





**CALIBRATION TEST RESULTS**

**PRE-TEST**

**HYBRID III 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

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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	775.0
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	438.2
C	H-POINT HEIGHT	Reference	81.3-86.3	81.8
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	148.3
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	83.0
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	124.4
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	245.2
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	43.2-48.2	43.4
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	281.1
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	197.2
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	537.2
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376	358.8
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	403.1
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	435.2

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	181.2
P	FOOT LENGTH	Tip of toe to rear of heel	218.5-233.7	227.3
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	475.0
S	HEAD BREADTH	The widest part of the head	137.1-147.3	138.6
T	HEAD DEPTH	Back of the head to the forehead	177.8-188	181.0
U	HIP BREADTH	The widest part of the hip	299.7-314.9	308.4
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	350.5-365.7	362.1
W	FOOT BREADTH	The widest part of the foot	78.8-94	82.8
X	HEAD CIRCUMFERENCE	Measured at the point as in dim. "T"	528.3-548.7	545.2
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 345.4 ± 12.7 mm above seat surface	850.9-881.3	870.7
Z	WAIST CIRCUMFERENCE	Measured 165.1 ± 5.1 mm above seat surface	759.5-789.9	779.9
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	332.7-358.1	350.1
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	160.1-170.2	170.0

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

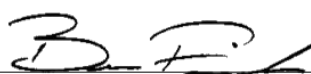
ATD Serial No: 142

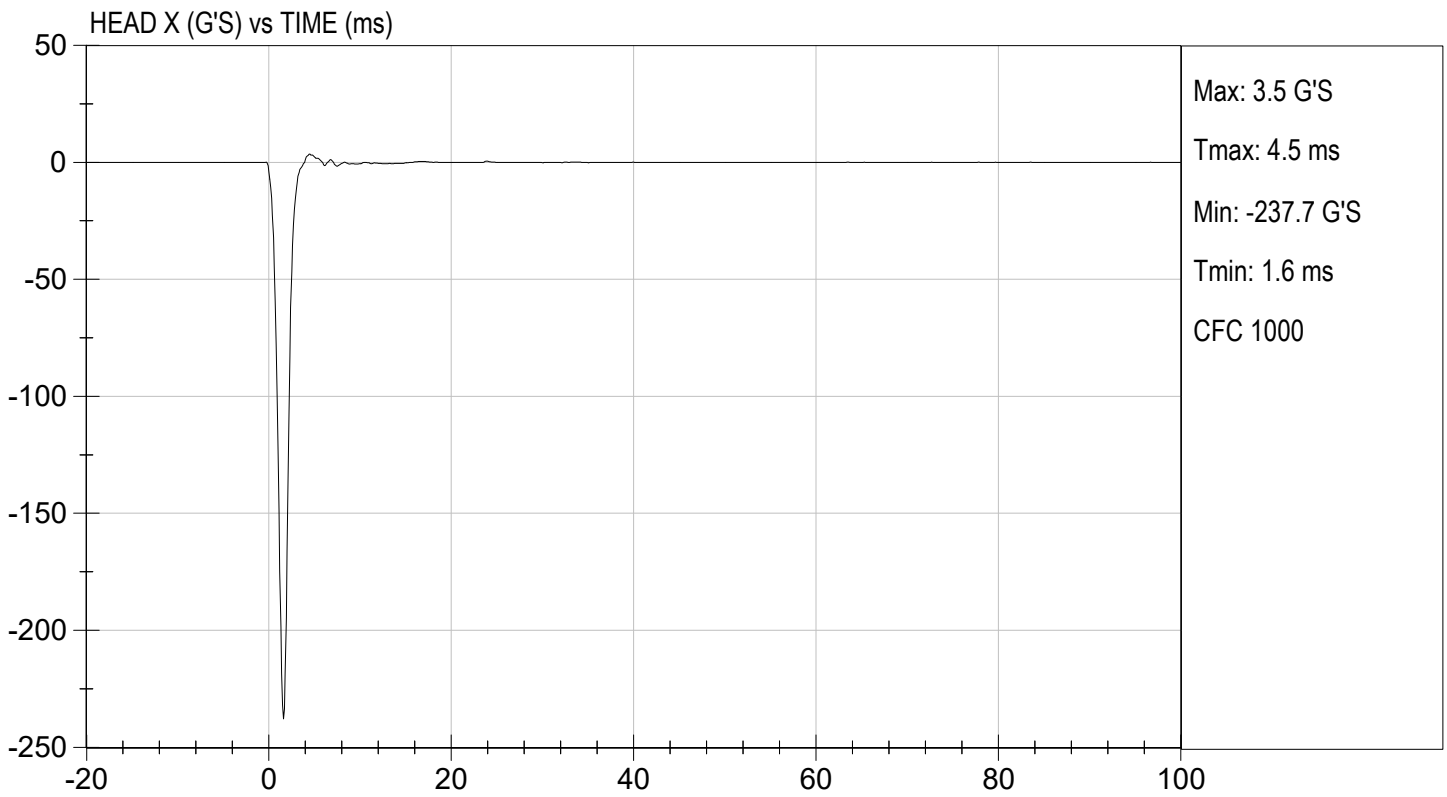
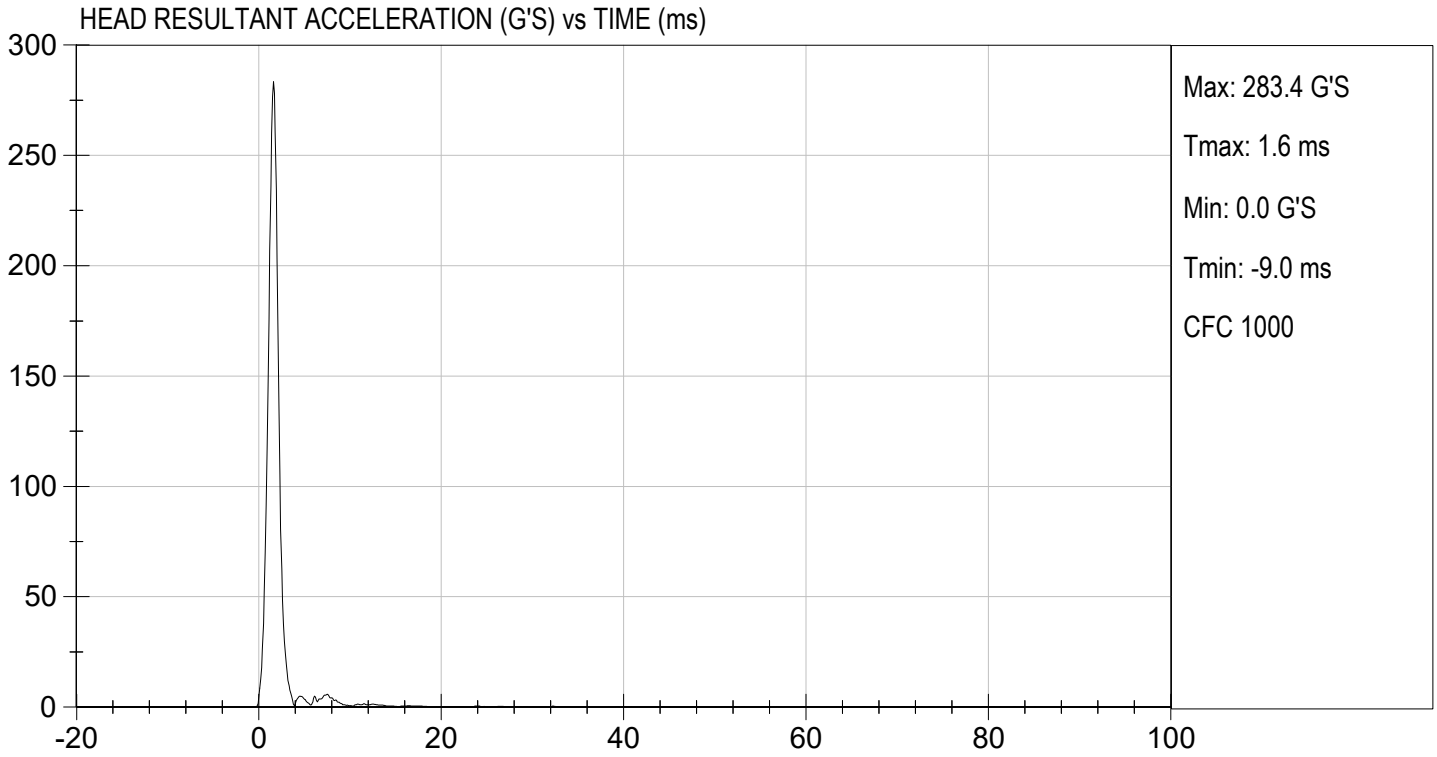
Test ID: D222591

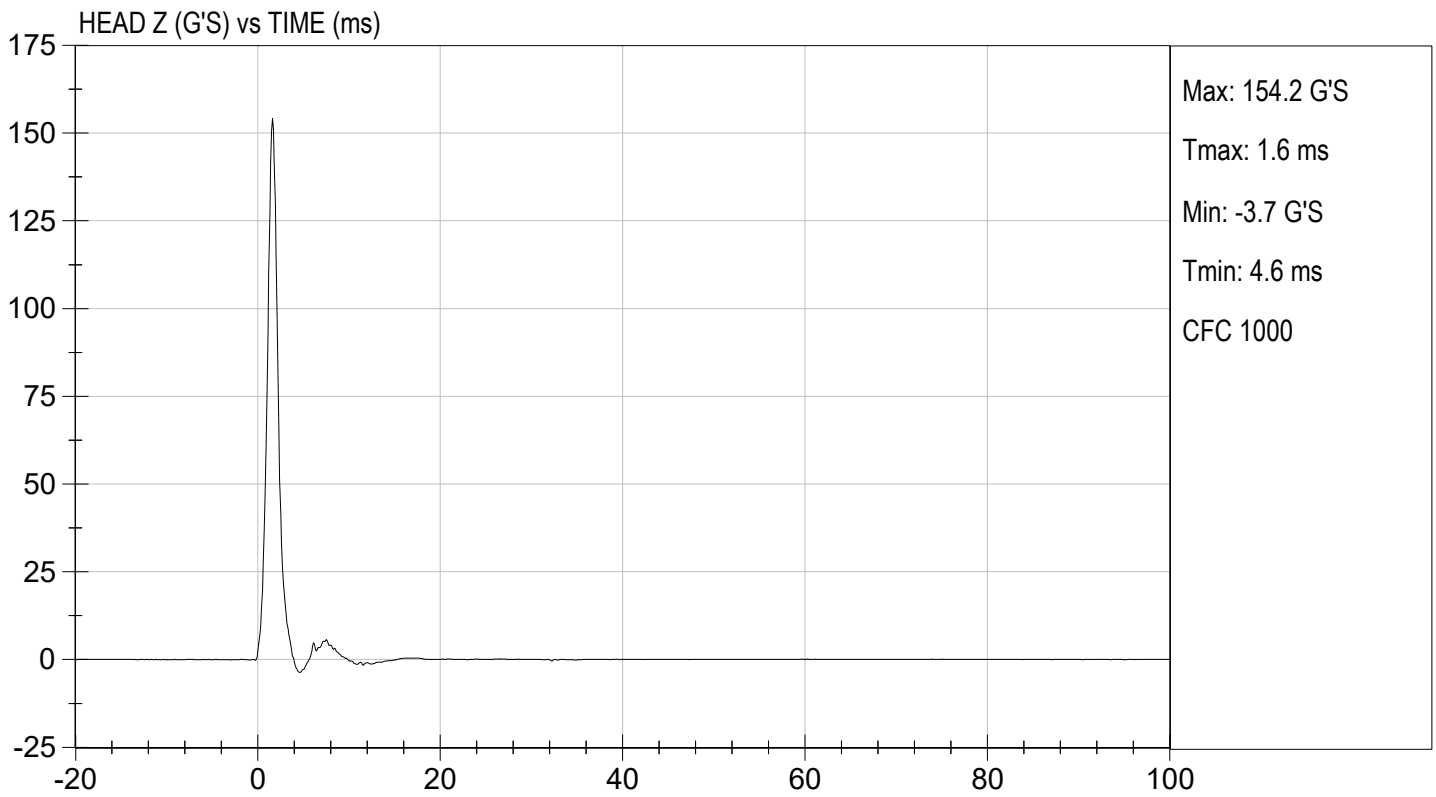
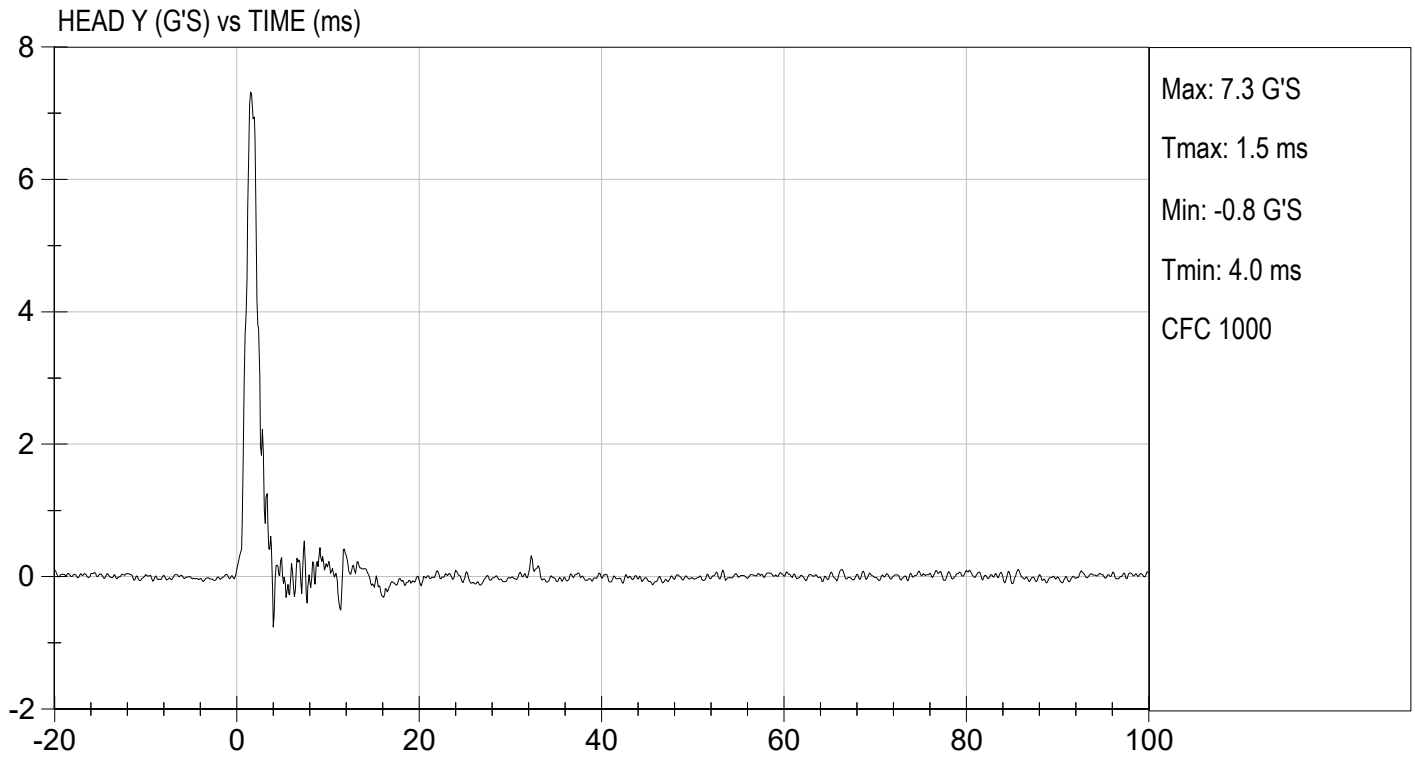
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Peak Resultant Acceleration	G's	250 to 300	283	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	7.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/08/2022  
 Test Date

  
 Approved By





**MGA RESEARCH CORPORATION**  
**NECK FLEXION TEST**  
**HYBRID III 5TH PERCENTILE**

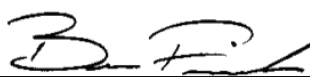
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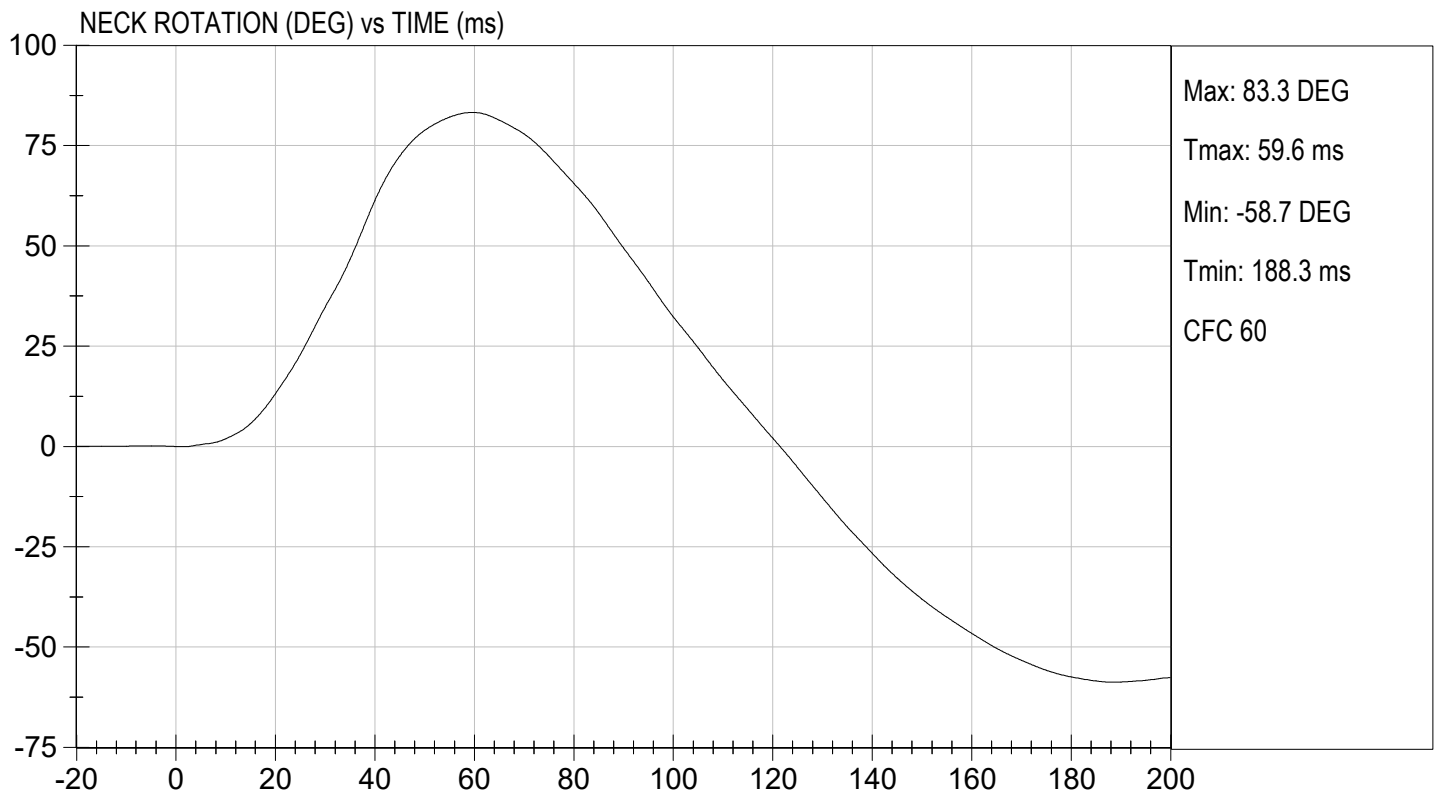
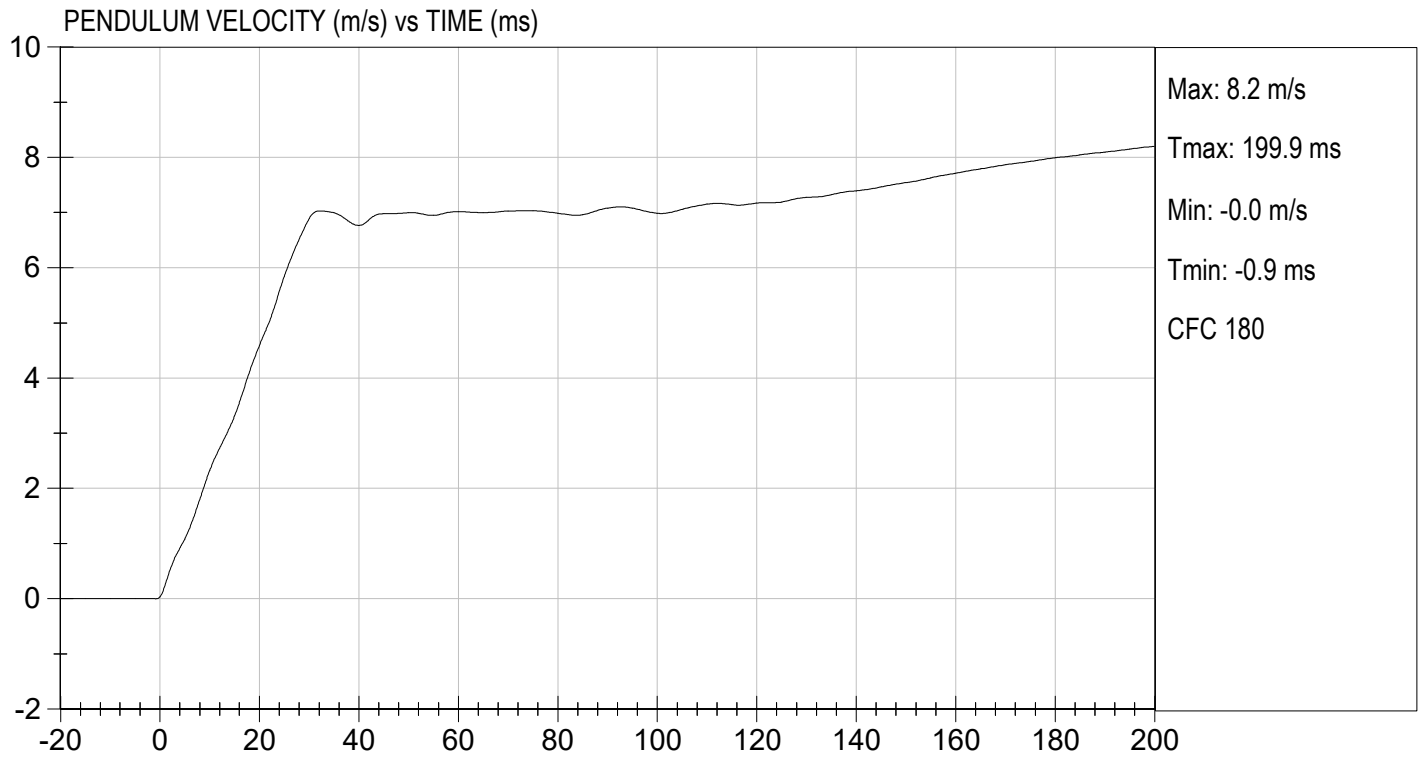
Test I.D: D222592

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	34	Pass
Pendulum Speed		m/s	6.89 to 7.13	6.96	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.6	Pass
	30 ms	m/s	5.8 to 7.0	6.9	Pass
D Plane Rotation	Max	deg	77 to 91	83	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	72	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
Overall Results					Pass

  
 \_\_\_\_\_  
 Laboratory Technician

11/08/2022  
 \_\_\_\_\_  
 Test Date

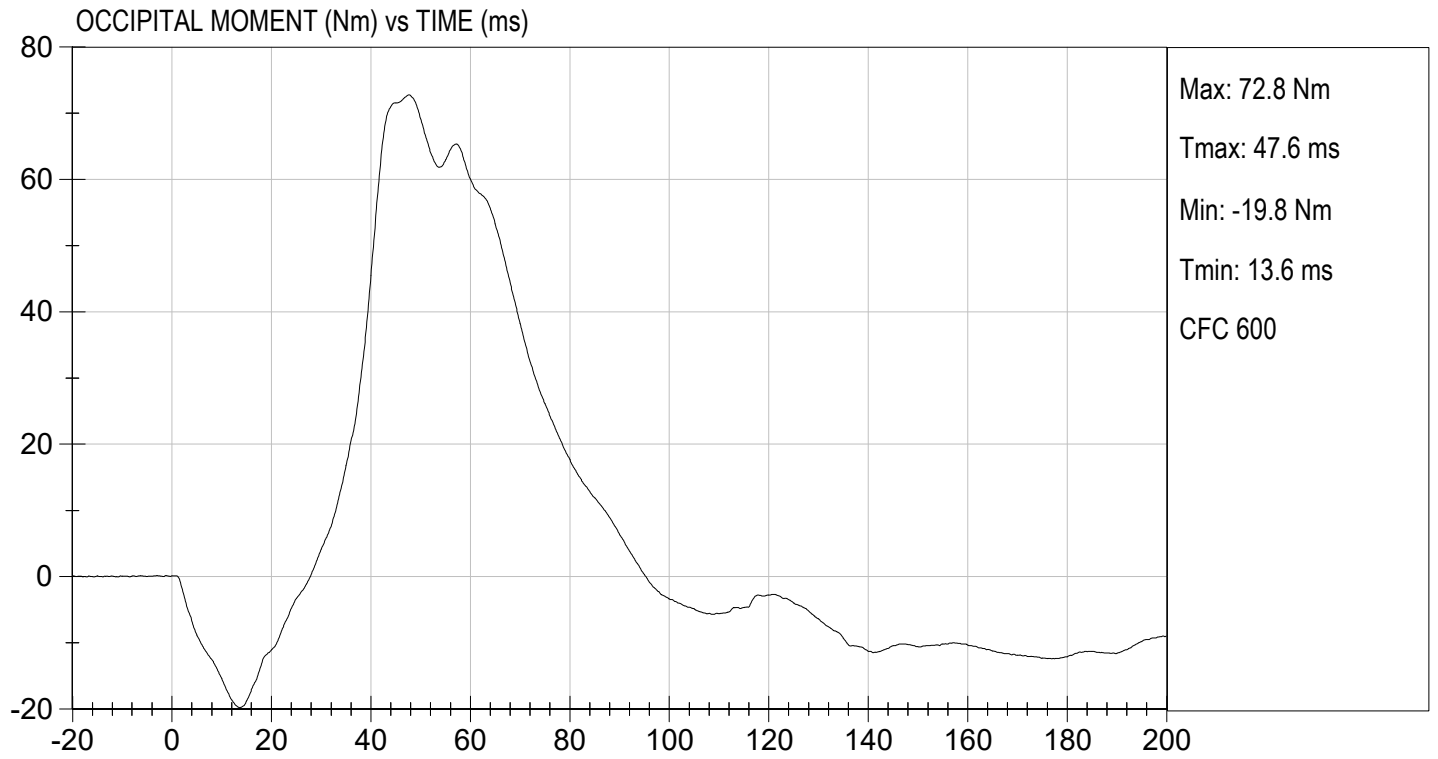
  
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 Approved By





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

TEST DATE: 11/08/2022  
TEST #: D222592



**MGA RESEARCH CORPORATION  
NECK EXTENSION TEST  
HYBRID III 5TH PERCENTILE**

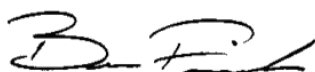
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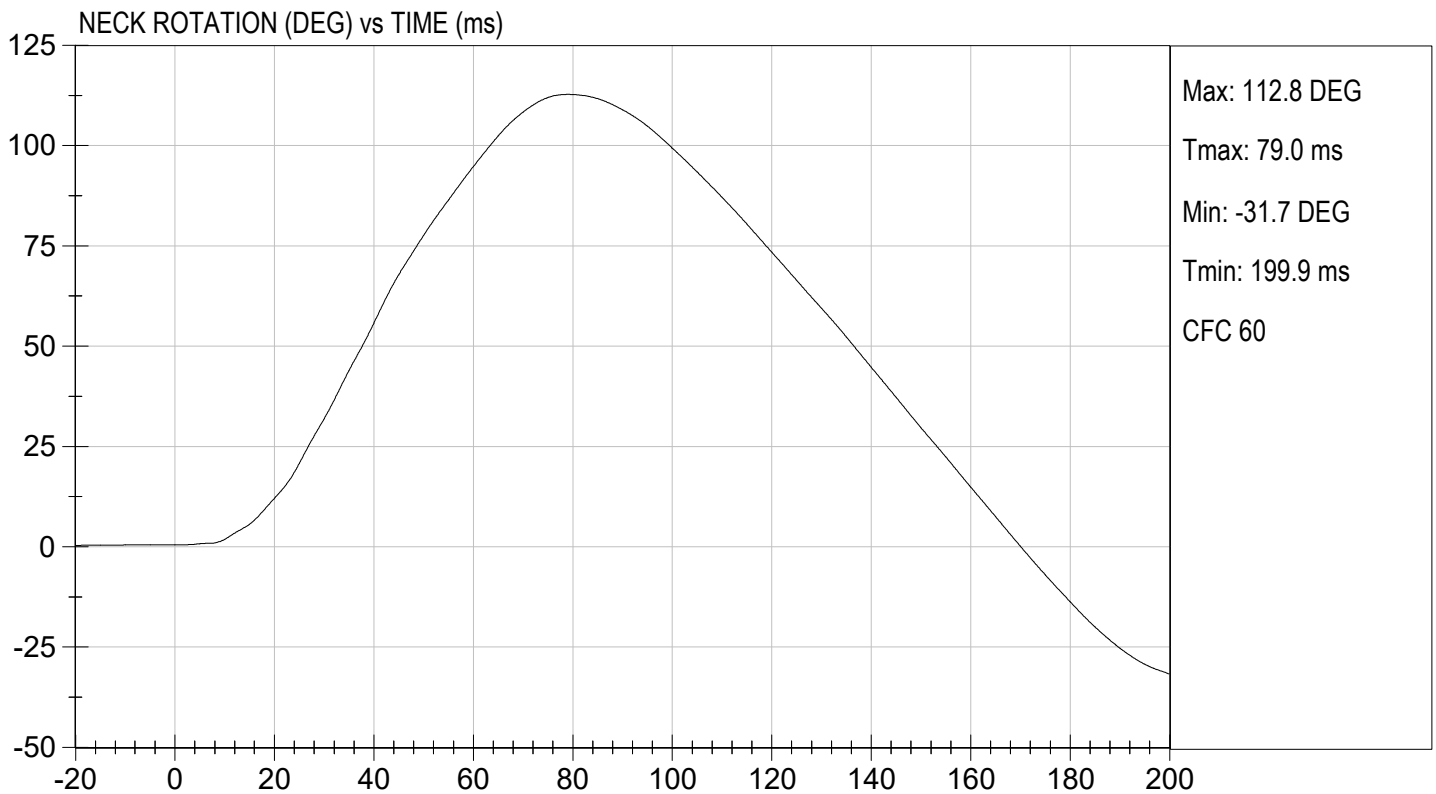
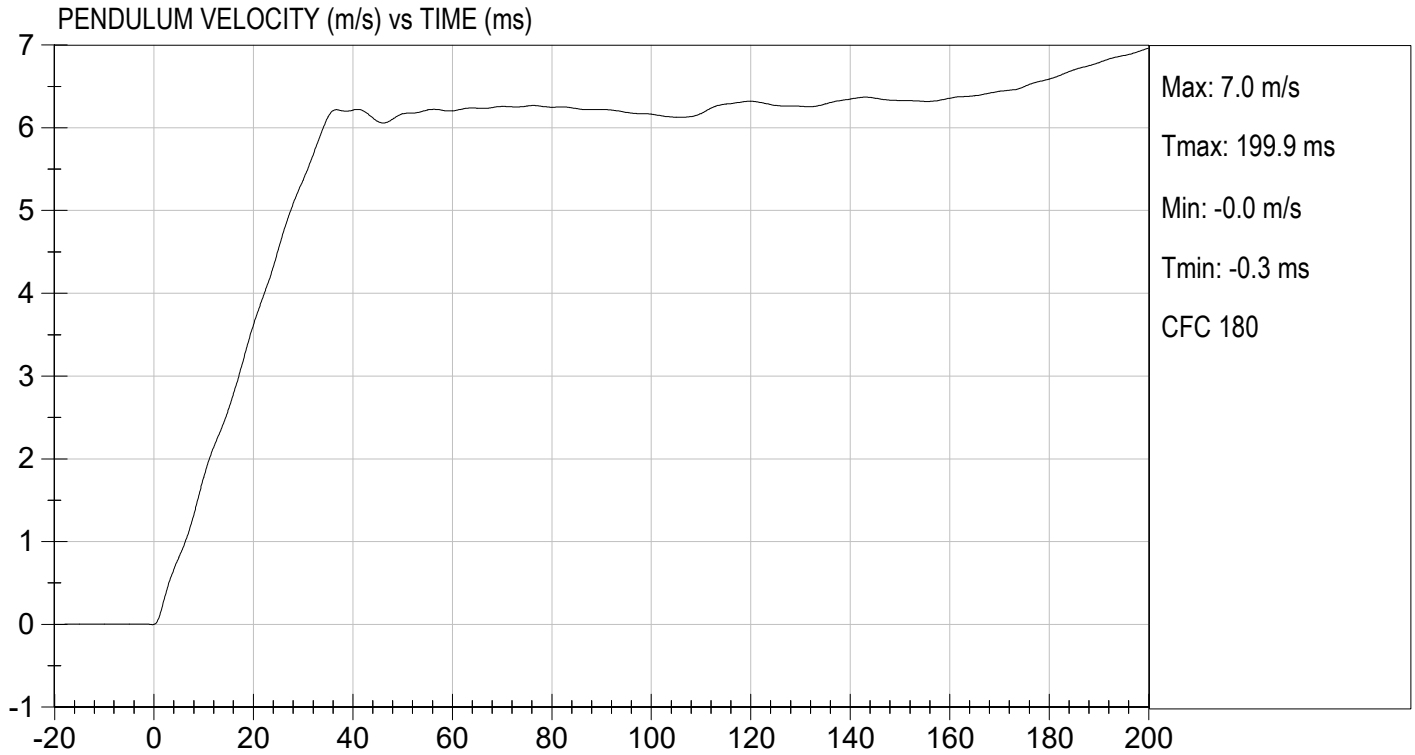
Test I.D.: D222593

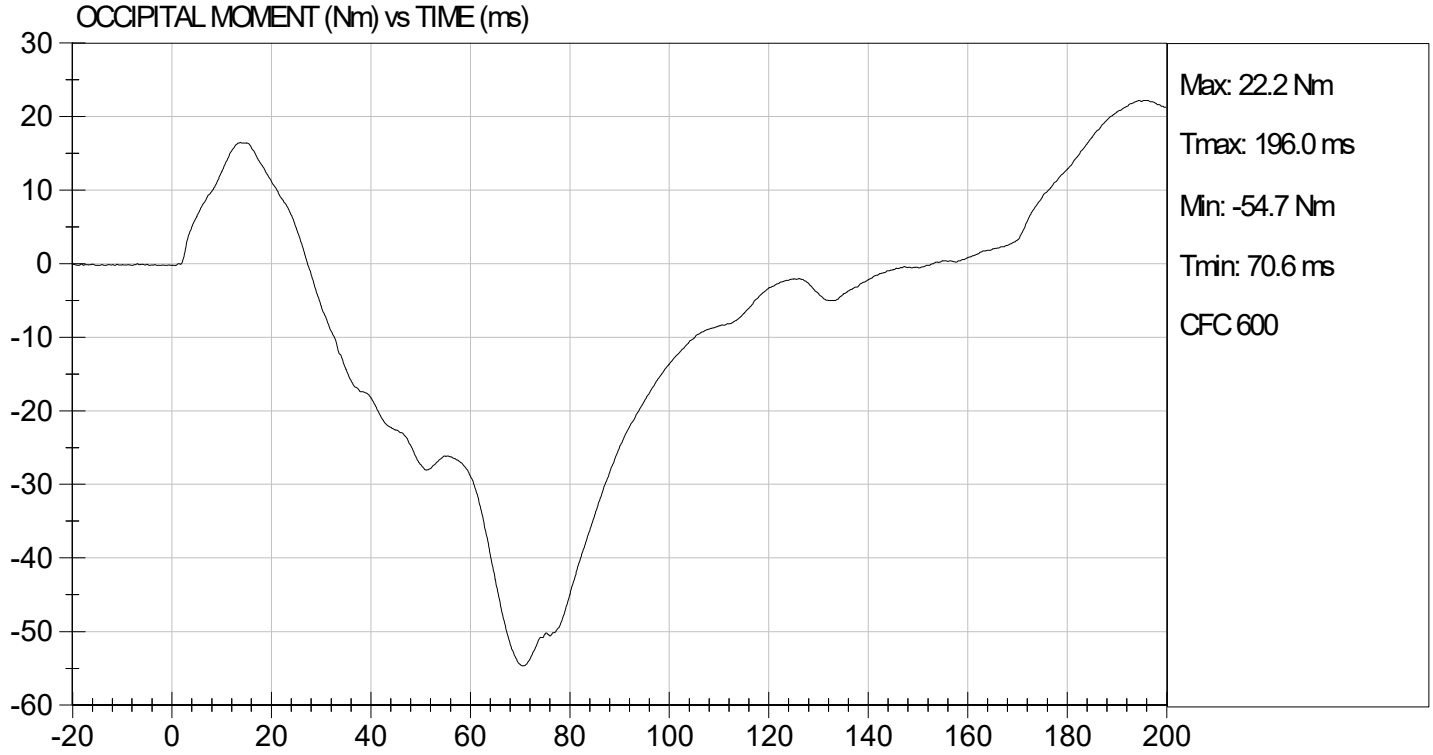
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	34	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	113	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	103	Pass
Overall Results					Pass

  
Laboratory Technician

11/08/2022  
Test Date

  
Approved By





**MGA RESEARCH CORPORATION**  
**THORAX IMPACT**  
**HYBRID III 5TH PERCENTILE**

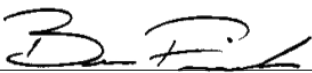
ATD Serial No: 142

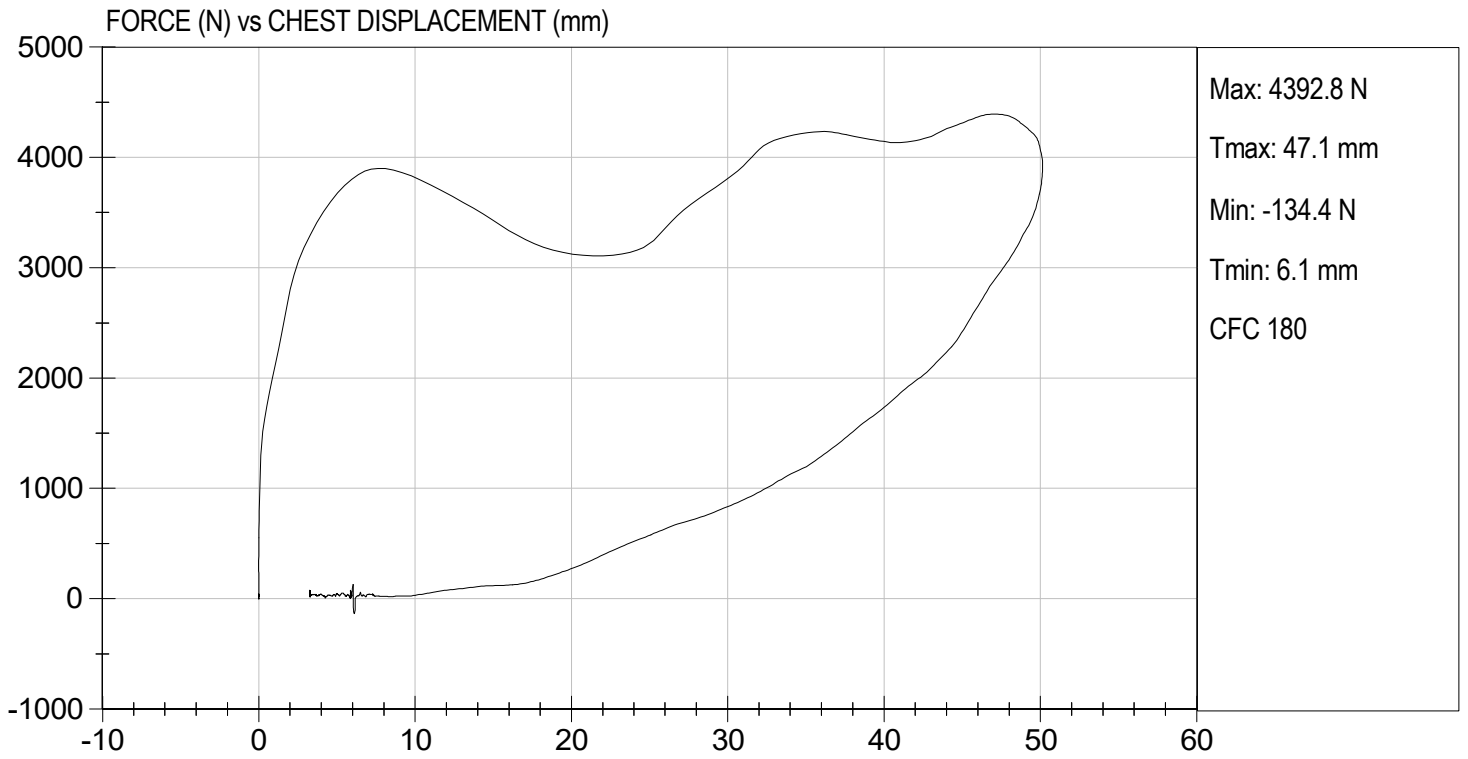
Test I.D: D222594

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Relative Humidity	%	10 to 70	31	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	50	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4071	Pass
Internal Hysteresis	%	69 to 85	76	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4393	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/07/2022  
 Test Date

  
 Approved By



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

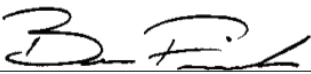
ATD Serial No: 142

Test I.D: D222595

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	4041	Pass
Overall Test Results				Pass

  
\_\_\_\_\_  
Laboratory Technician

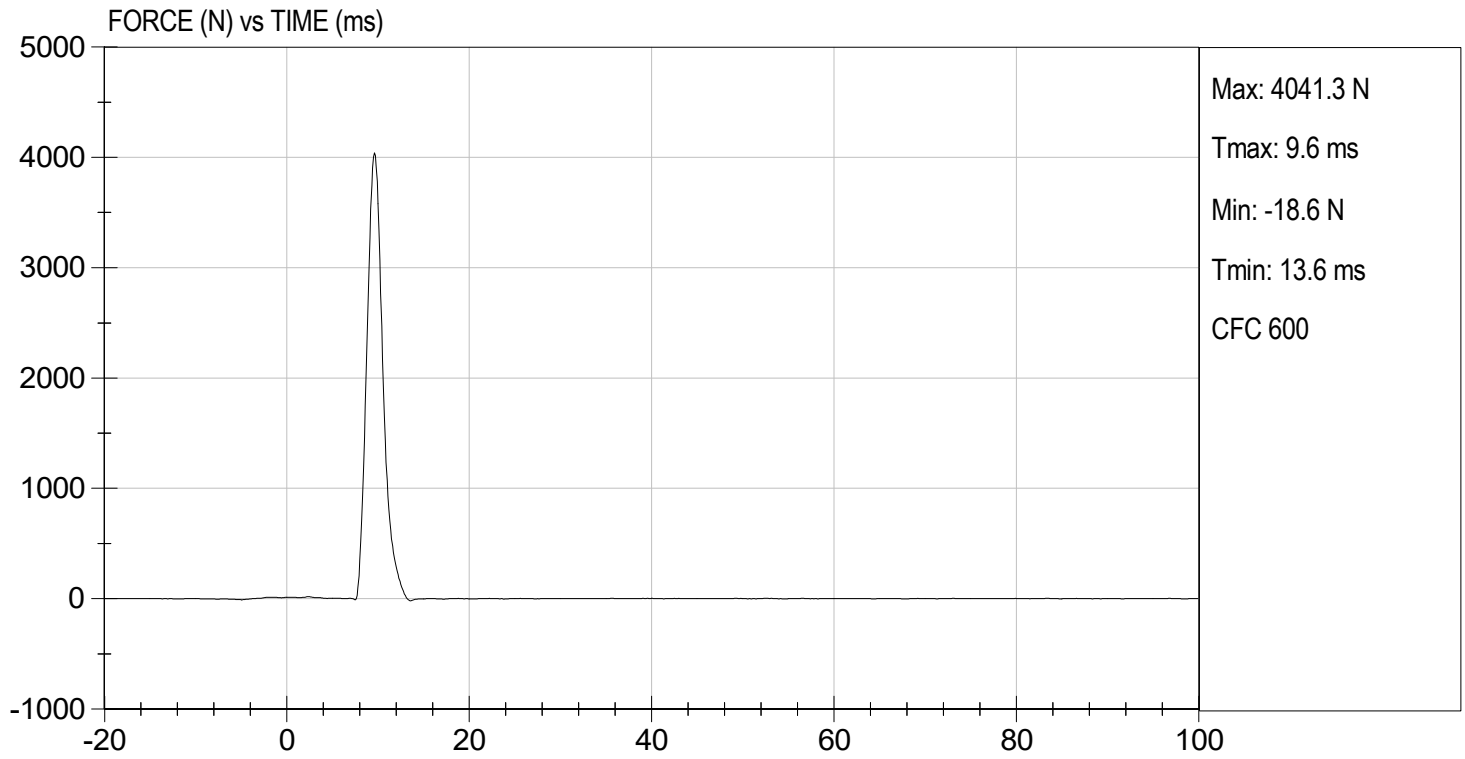
11/08/2022  
\_\_\_\_\_  
Test Date

  
\_\_\_\_\_  
Approved By



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

TEST DATE: 11/08/2022  
TEST #: D222595



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

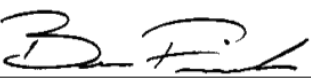
ATD Serial No: 142

Test I.D.: D222596

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3622	Pass
Overall Test Results				Pass

  
\_\_\_\_\_  
Laboratory Technician

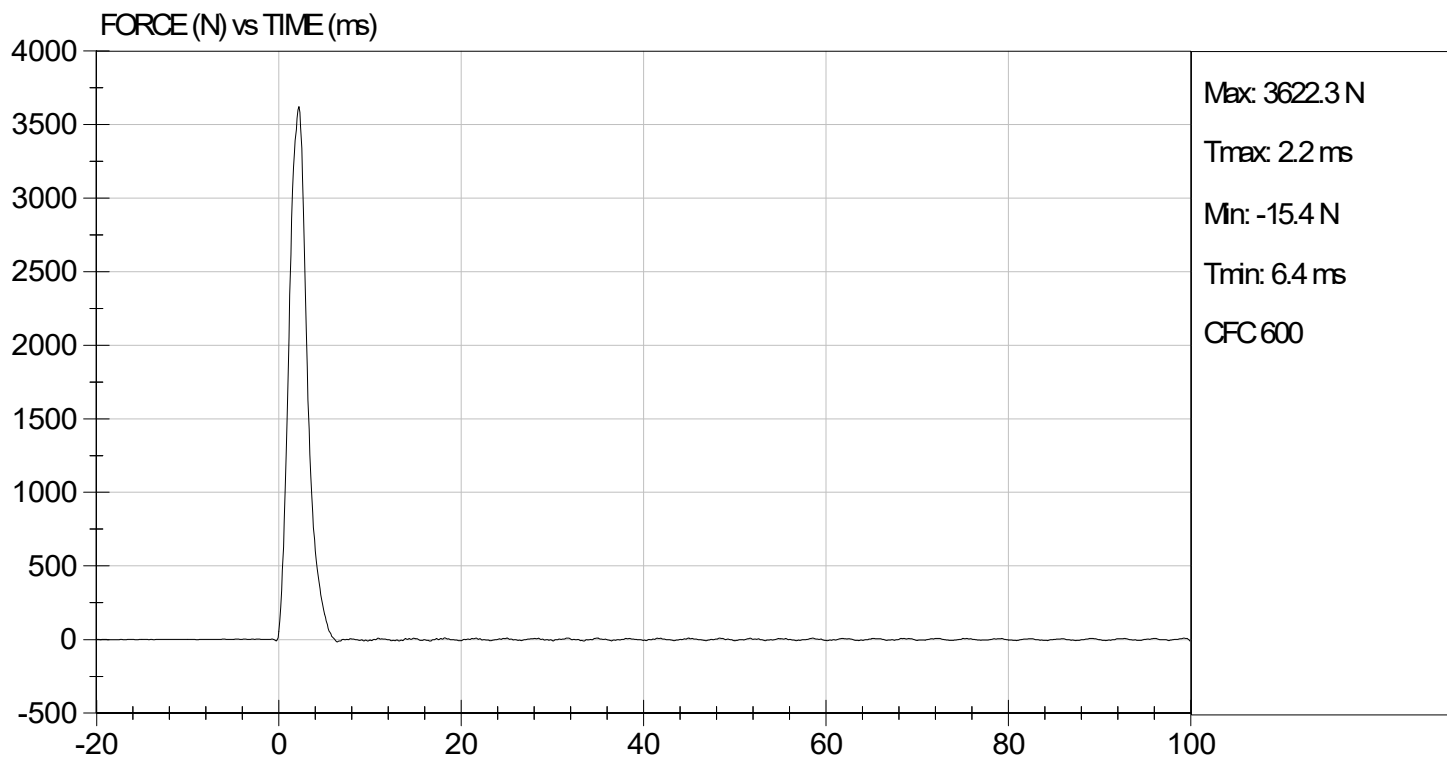
11/08/2022  
\_\_\_\_\_  
Test Date

  
\_\_\_\_\_  
Approved By



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

TEST DATE: 11/08/2022  
TEST #: D222596



**MGA RESEARCH CORPORATION**  
**TORSO FLEXION TEST**  
**HYBRID III 5TH PERCENTILE**

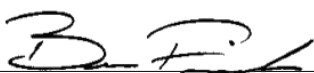
ATD Serial No: 142

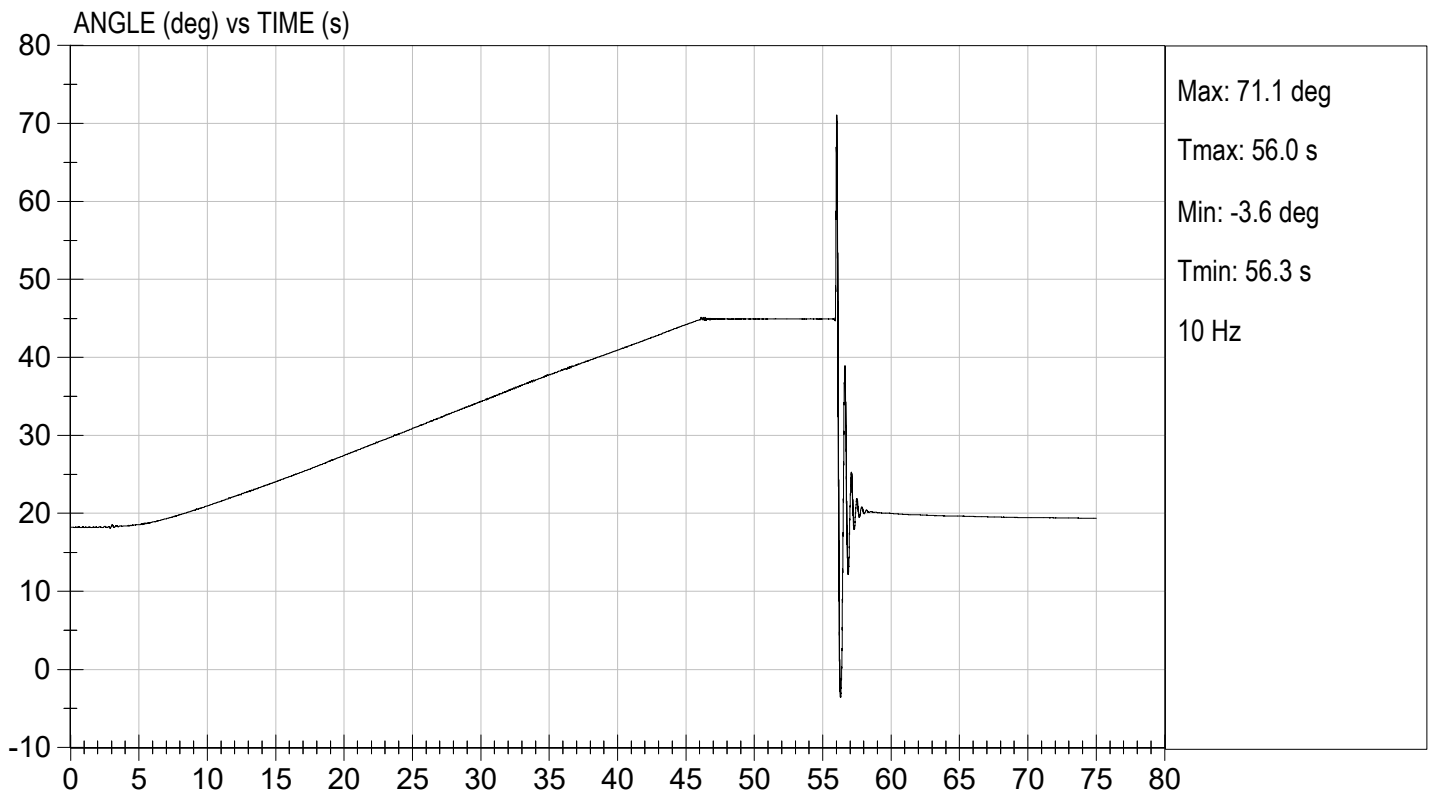
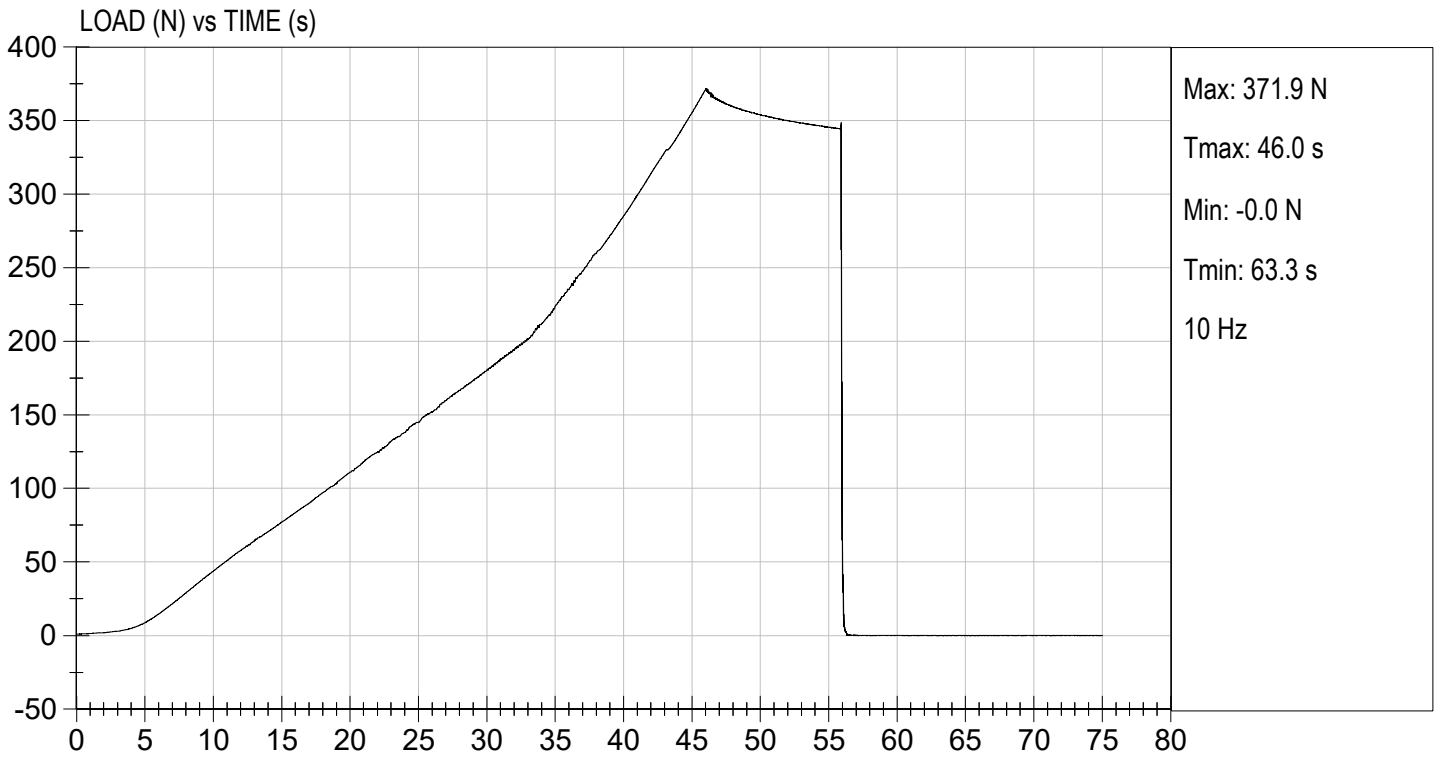
Test I.D: D222597

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	1	Pass
Force at 45 deg	N	320 to 390	372	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.7	Pass
<b>Overall Result</b>				<b>Pass</b>

  
 Laboratory Technician

11/08/2022  
 Test Date

  
 Approved By



**CALIBRATION TEST RESULTS**

**POST-TEST**

**HYBRID III 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

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

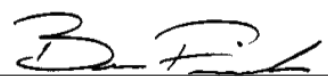
ATD Serial No: 142

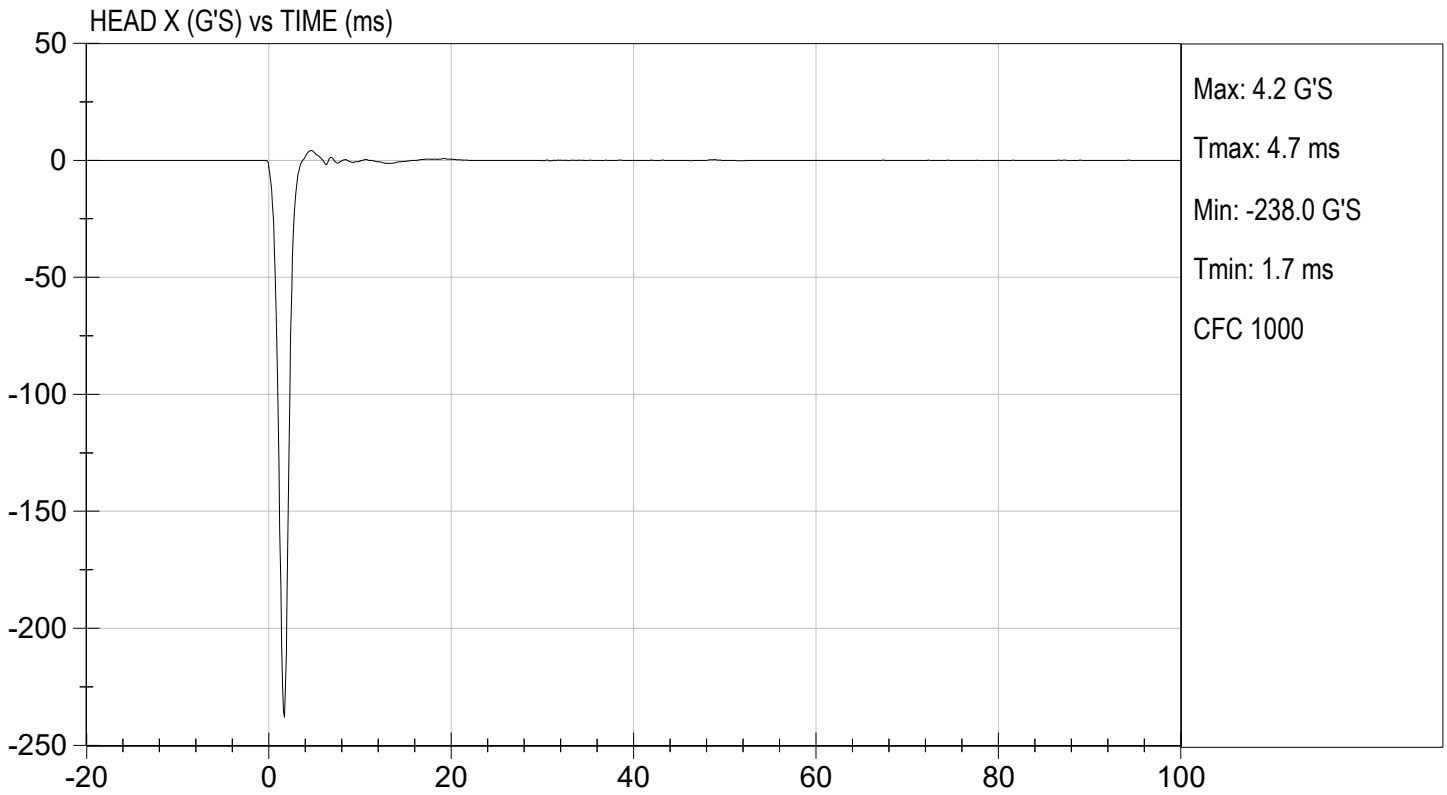
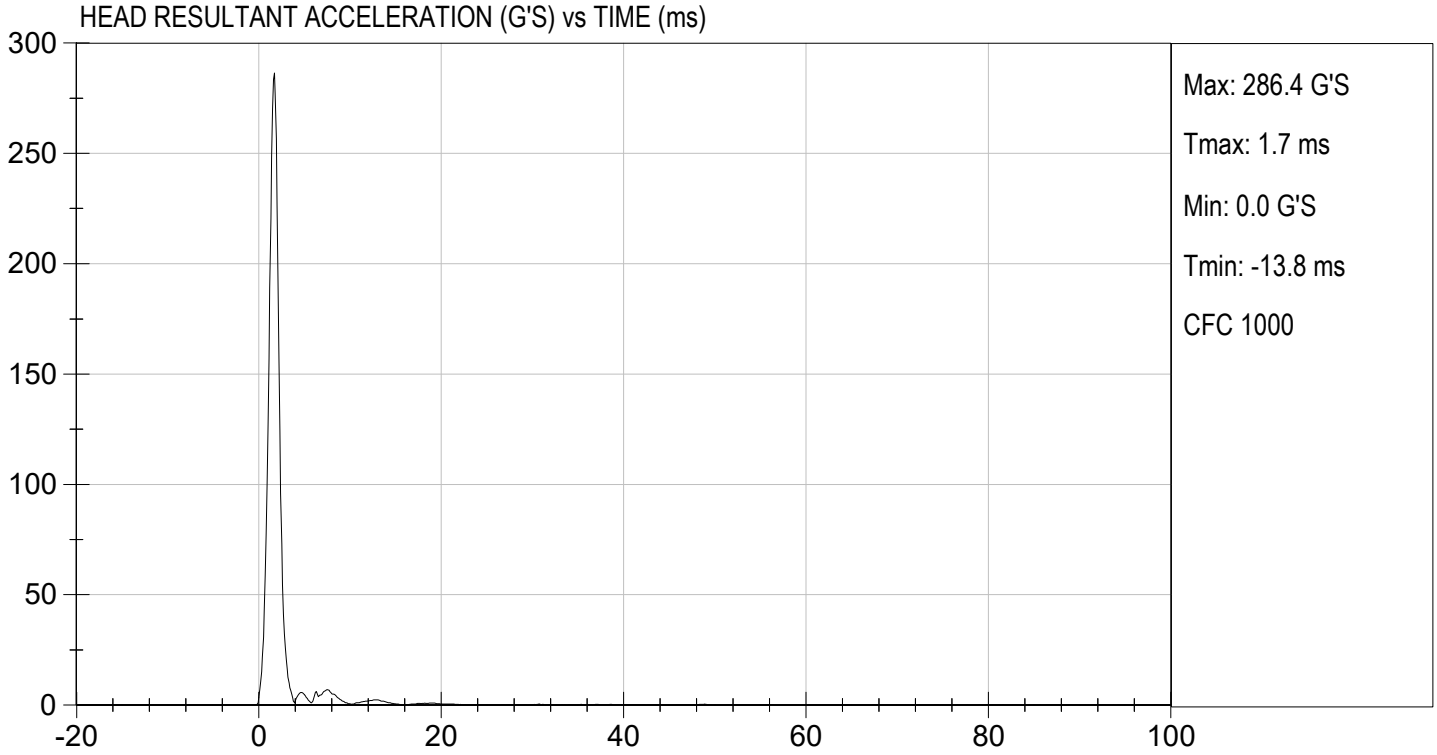
Test ID: D222641

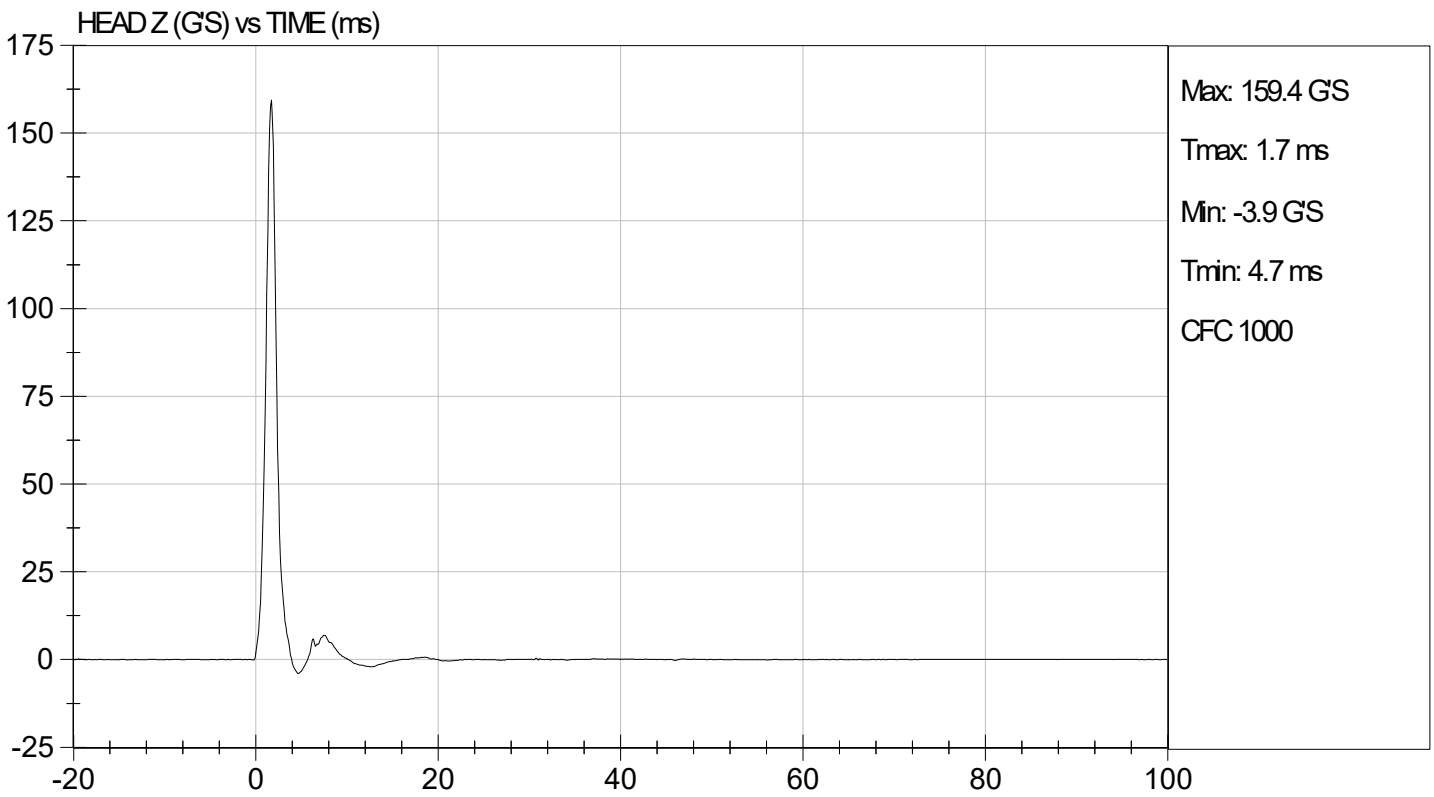
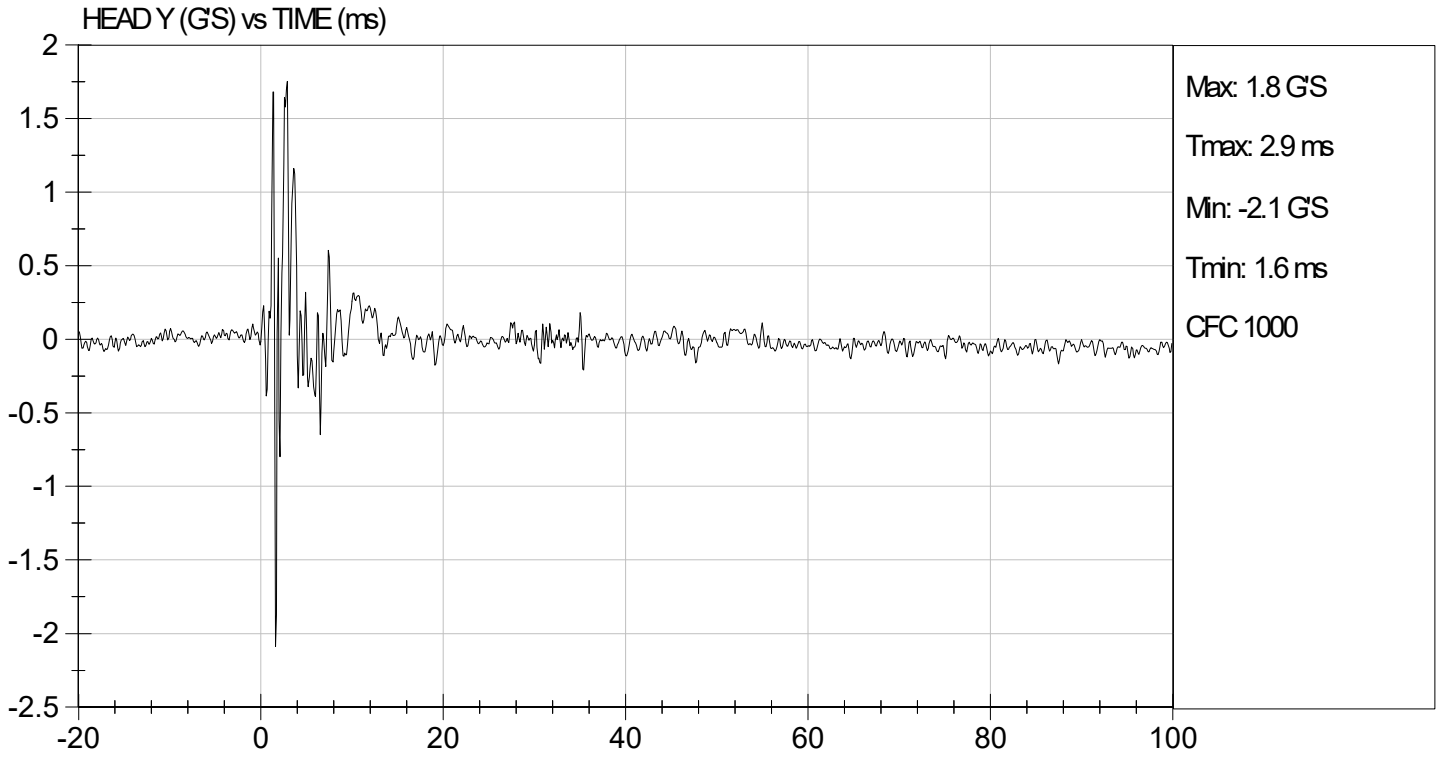
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	250 to 300	286	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-2.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/17/2022  
 Test Date

  
 Approved By





**MGA RESEARCH CORPORATION**  
**NECK FLEXION TEST**  
**HYBRID III 5TH PERCENTILE**

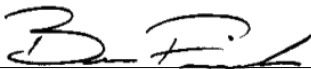
ATD Serial No: 142

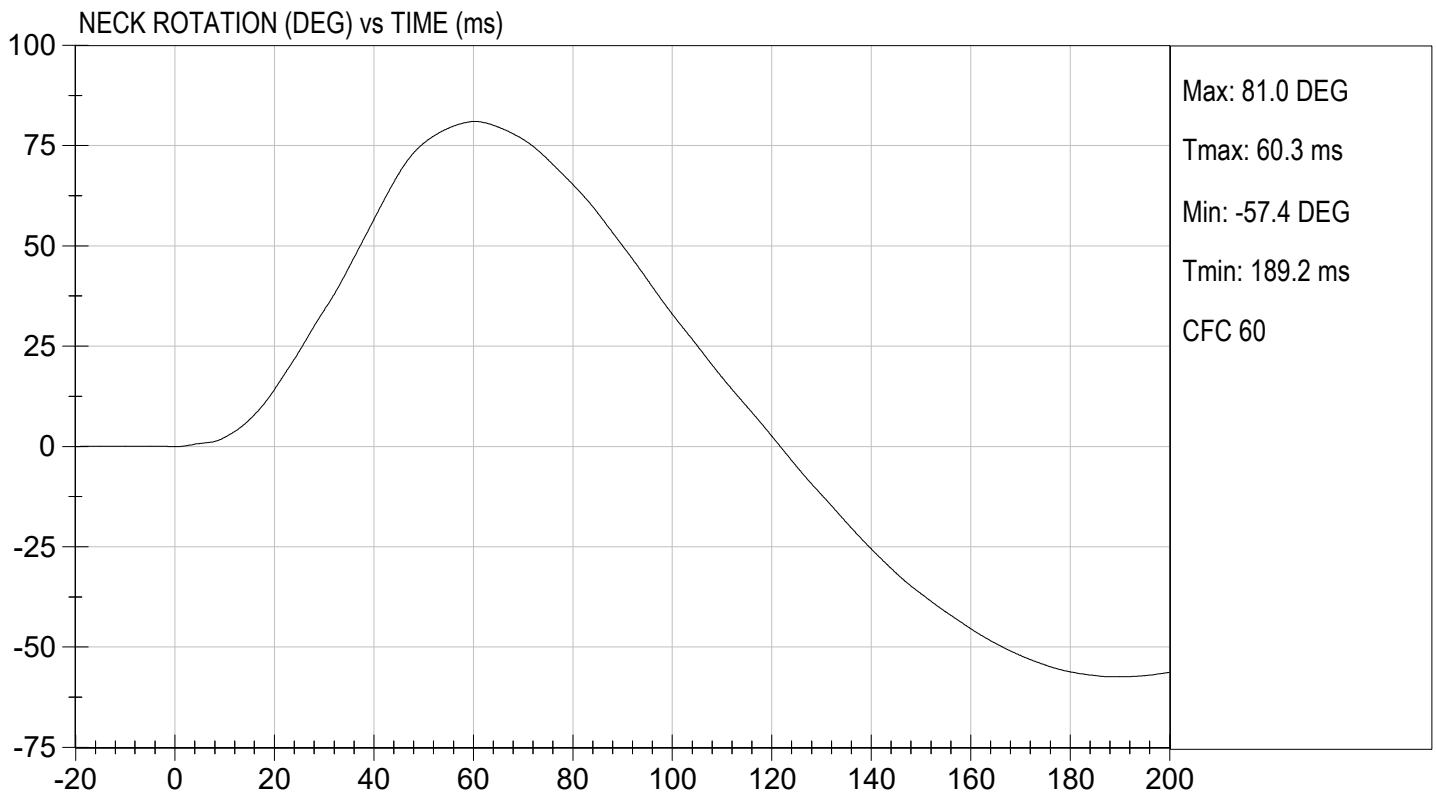
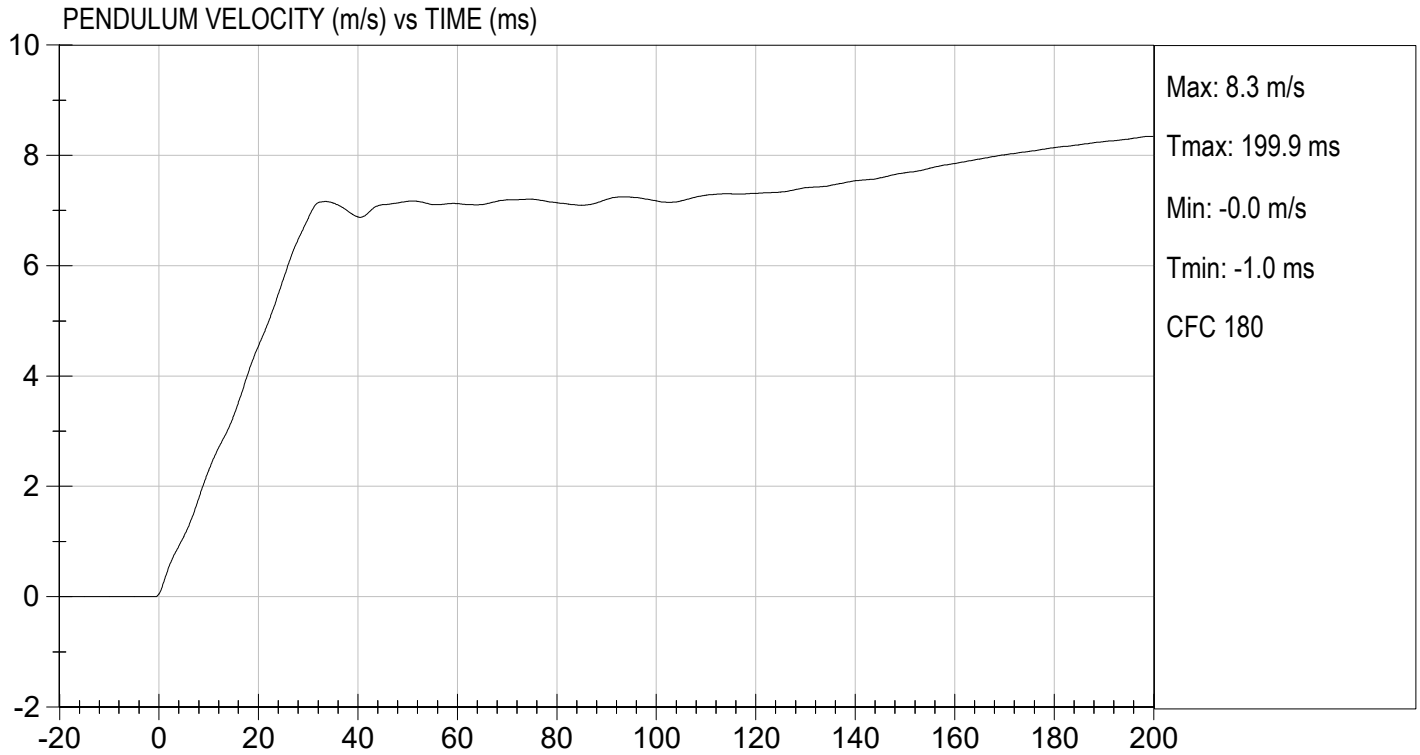
Test I.D: D222642

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	24	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.9	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	69	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	87	Pass
Overall Results					Pass

  
 Laboratory Technician

11/18/2022  
 Test Date

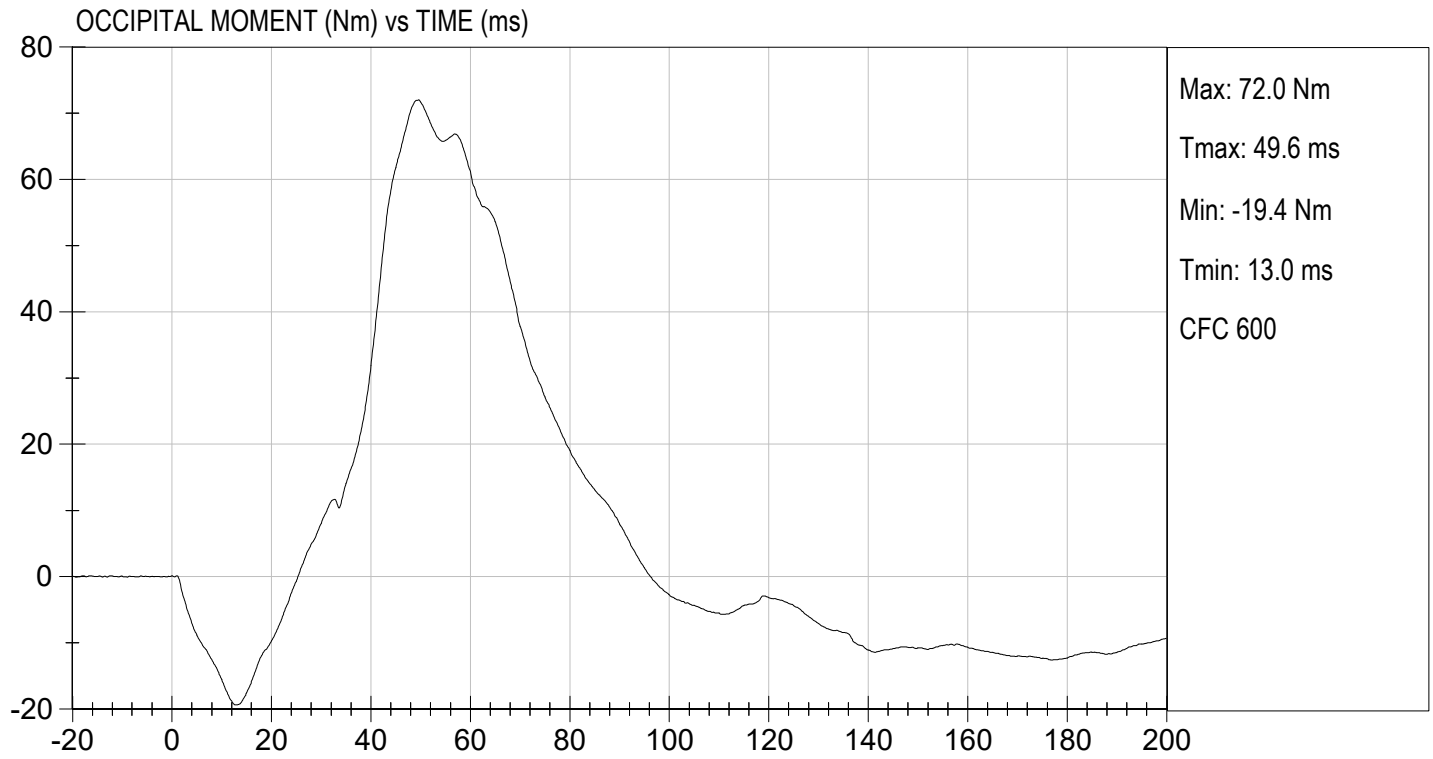
  
 Approved By





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

TEST DATE: 11/18/2022  
TEST #: D222642



**MGA RESEARCH CORPORATION**  
**NECK EXTENSION TEST**  
**HYBRID III 5TH PERCENTILE**

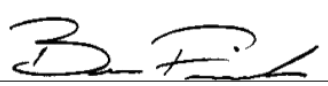
ATD Serial No: 142

Test I.D.: D222643

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	24	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.18	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.7	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.2	Pass
D Plane Rotation	Max	deg	99 to 114	111	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	104	Pass
Overall Results					Pass

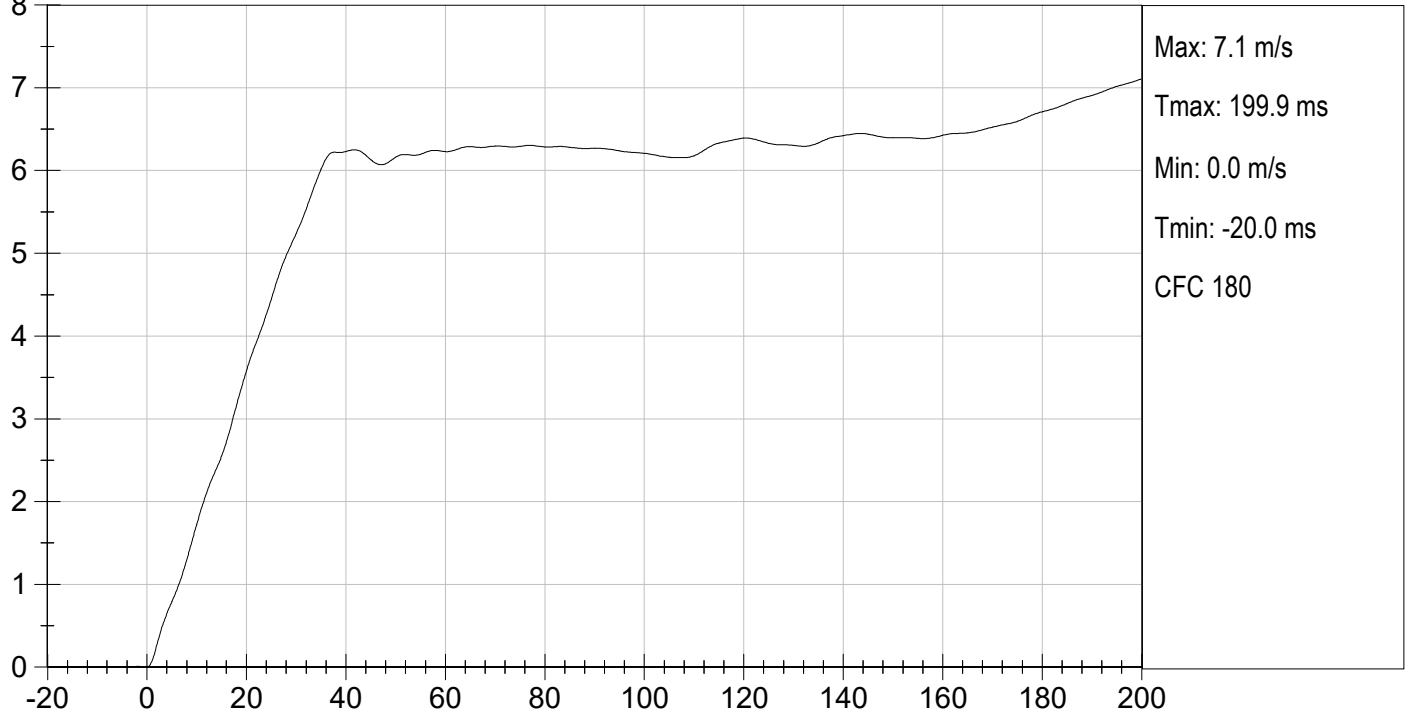
  
 Laboratory Technician

11/18/2022  
 Test Date

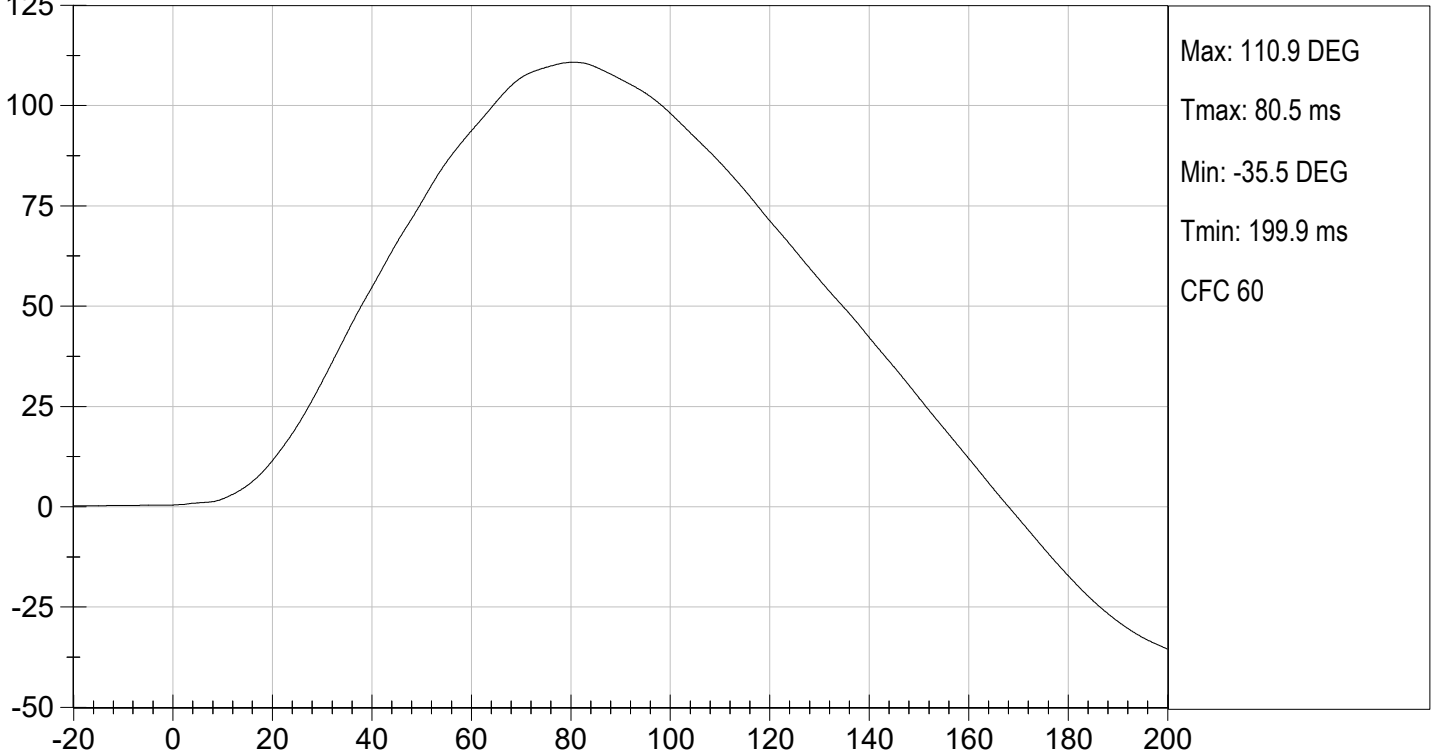
  
 Approved By



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



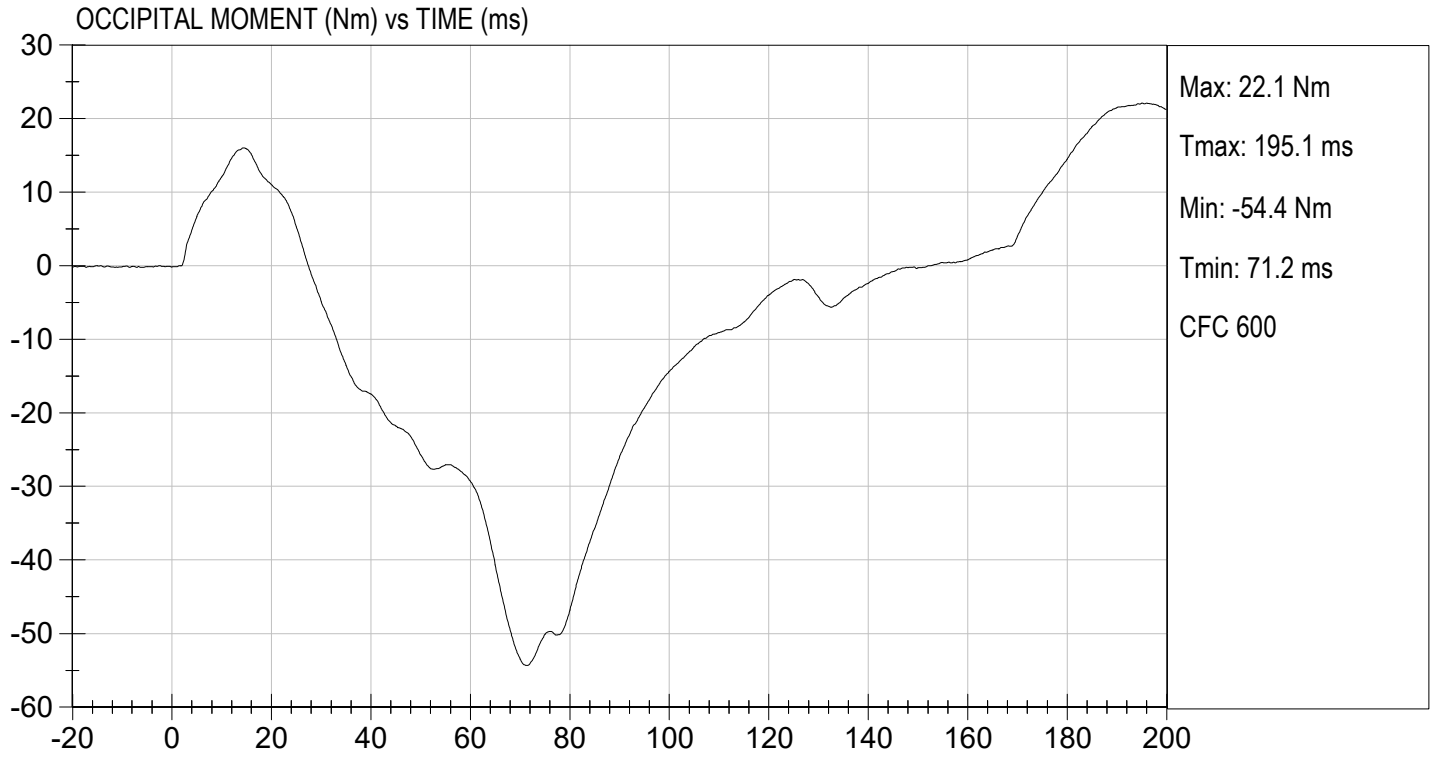
NECK ROTATION (DEG) vs TIME (ms)





TEST DESC: NECK EXTENSION  
VELOCITY: 20.28 ft/s, 6.18 m/s

TEST DATE: 11/18/2022  
TEST #: D222643



**MGA RESEARCH CORPORATION**  
**THORAX IMPACT**  
**HYBRID III 5TH PERCENTILE**

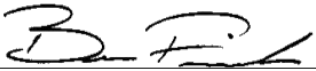
ATD Serial No: 142

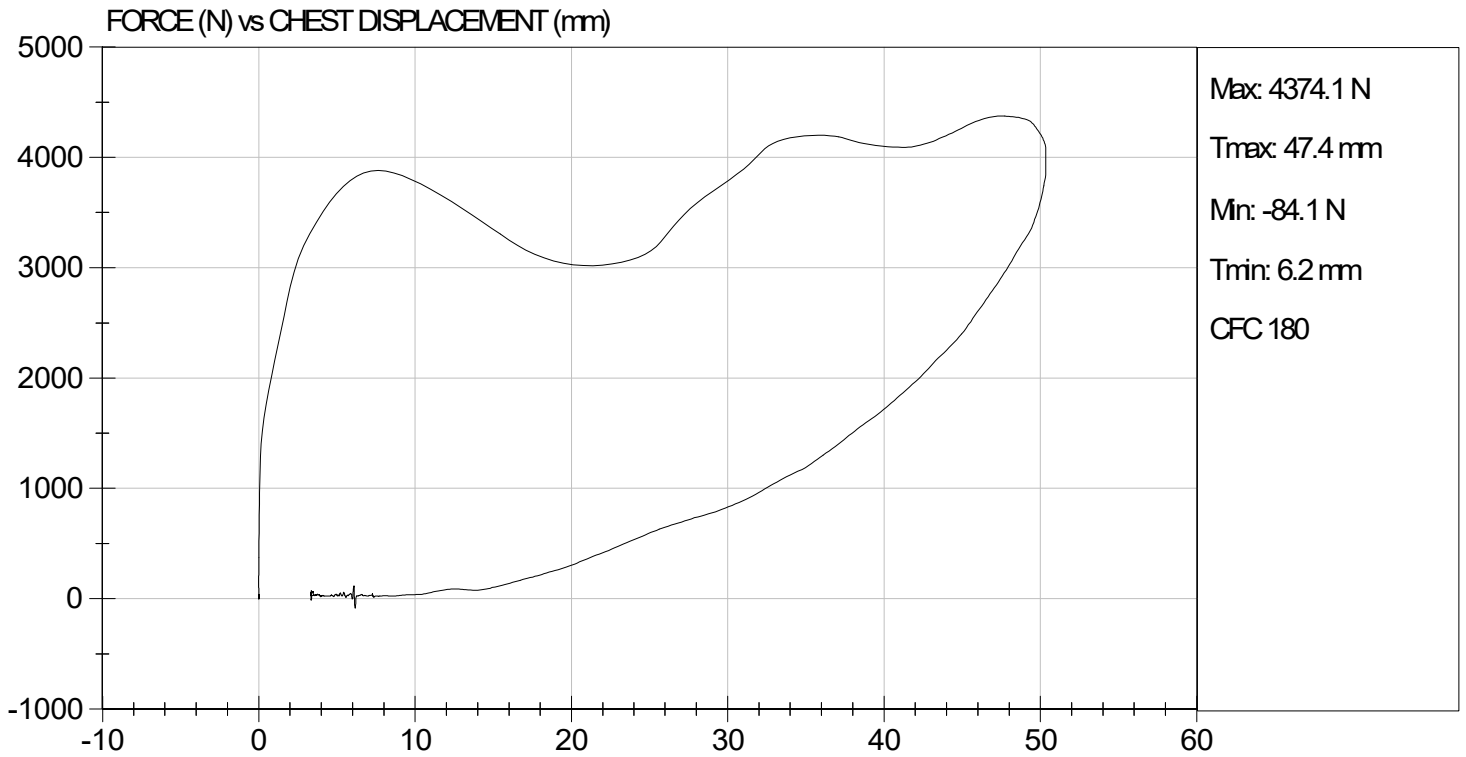
Test I.D: D222644

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Relative Humidity	%	10 to 70	27	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	50	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4200	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4374	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/17/2022  
 Test Date

  
 Approved By



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

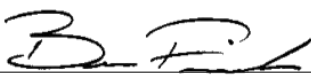
ATD Serial No: 142

Test I.D: D222645

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	26	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	N	3450 to 4060	3559	Pass
Overall Test Results				Pass

  
 \_\_\_\_\_  
 Laboratory Technician

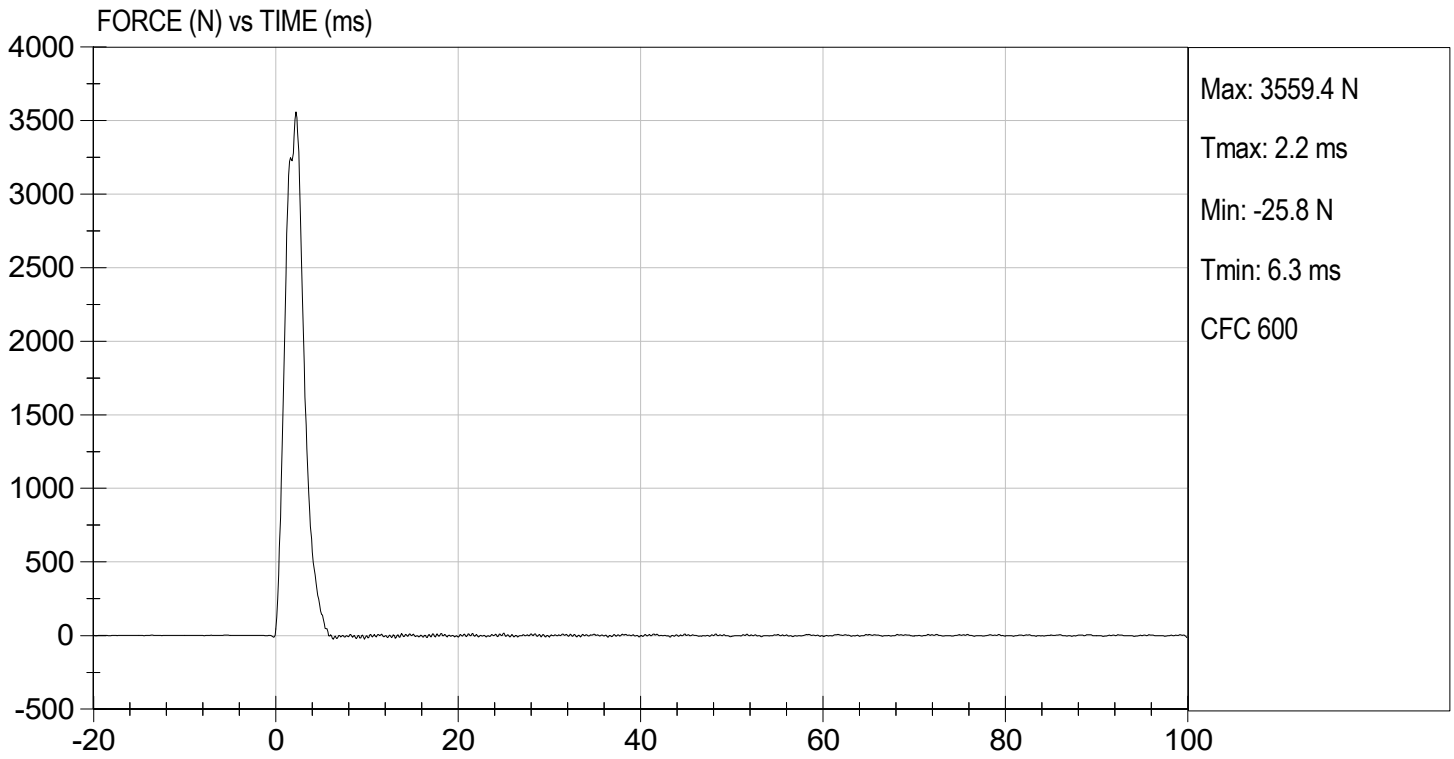
11/17/2022  
 \_\_\_\_\_  
 Test Date

  
 \_\_\_\_\_  
 Approved By



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

TEST DATE: 11/17/2022  
TEST #: D222645



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

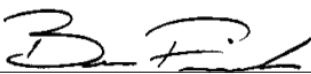
ATD Serial No: 142

Test I.D: D222646

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	26	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3871	Pass
Overall Test Results				Pass

  
\_\_\_\_\_  
Laboratory Technician

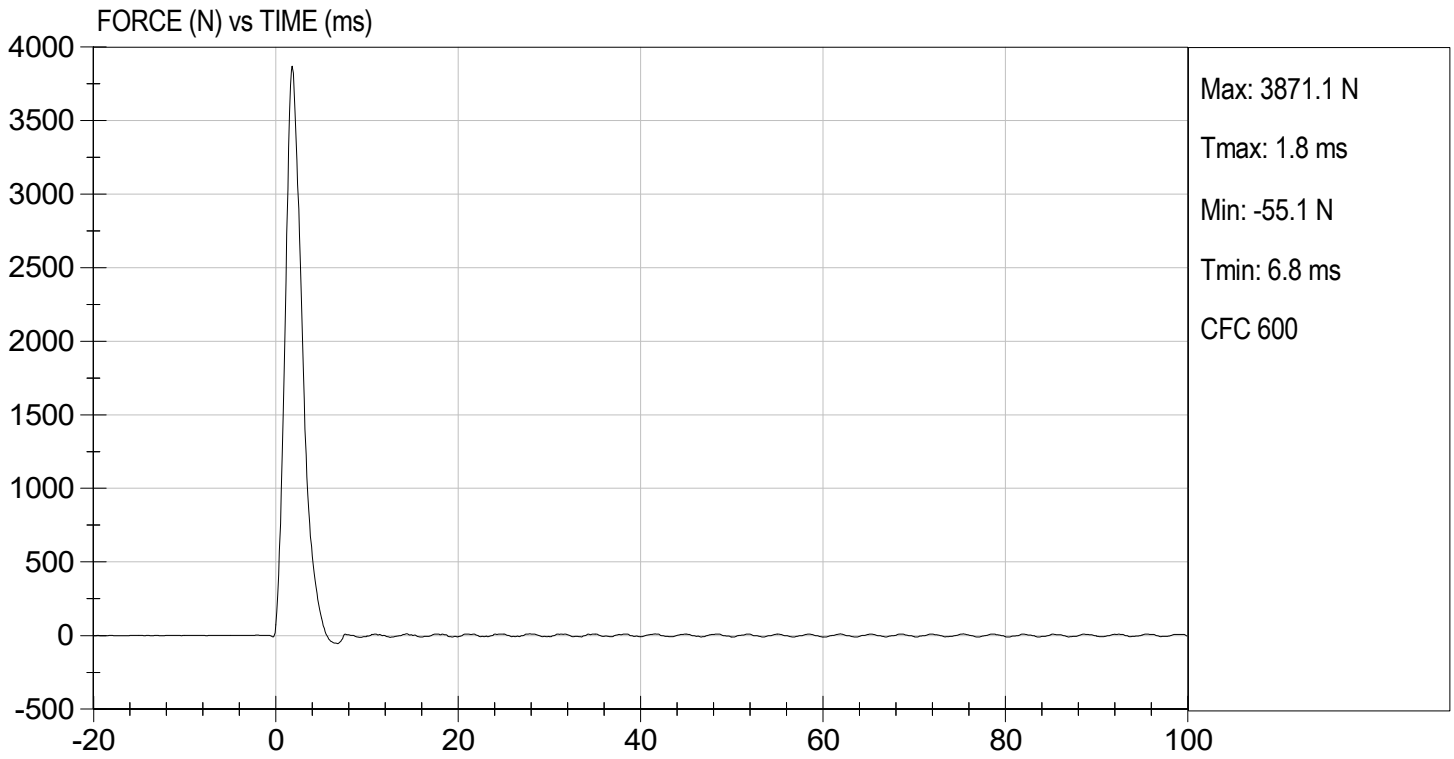
11/17/2022  
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Test Date

  
\_\_\_\_\_  
Approved By



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

TEST DATE: 11/17/2022  
TEST #: D222646



**MGA RESEARCH CORPORATION**  
**TORSO FLEXION TEST**  
**HYBRID III 5TH PERCENTILE**


ATD Serial No: 142

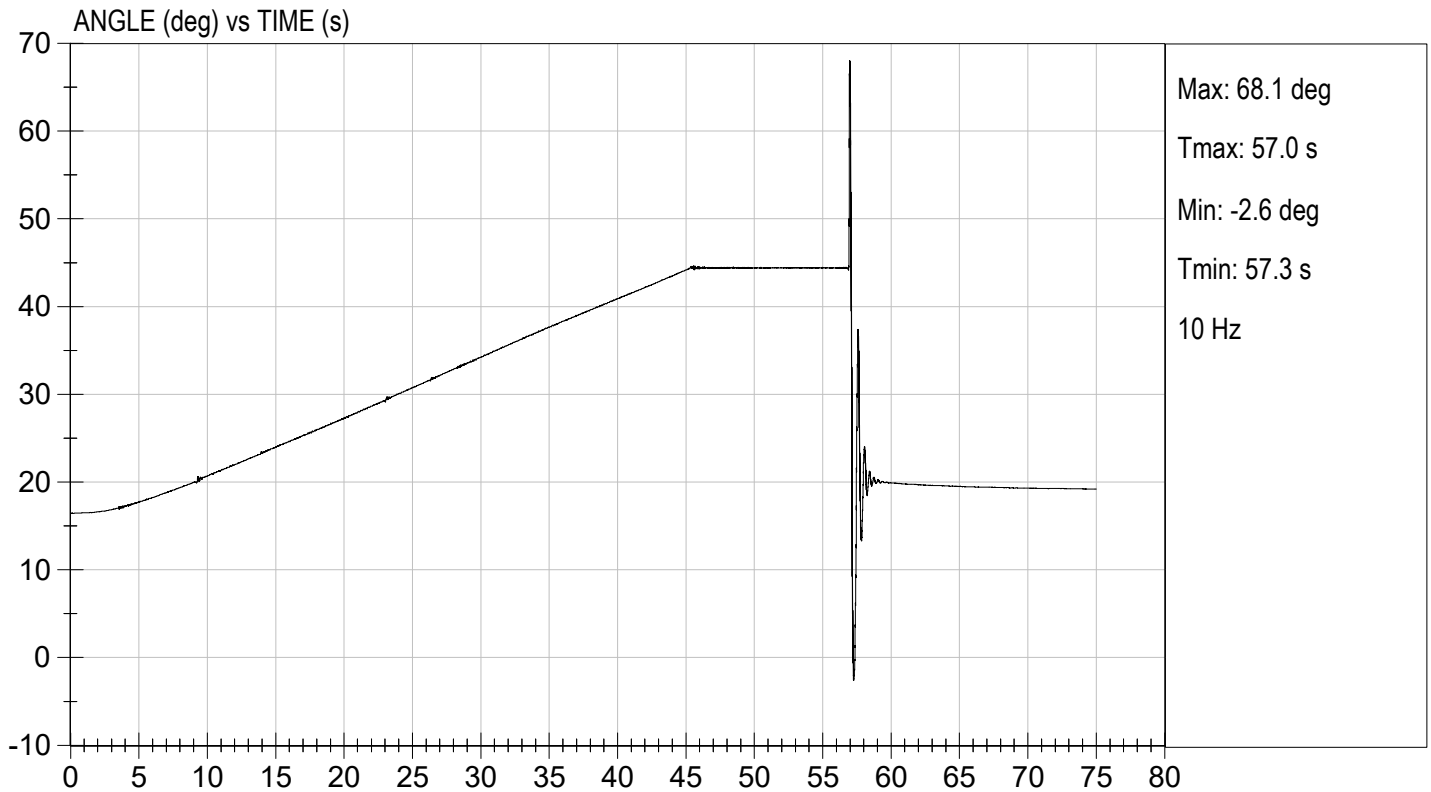
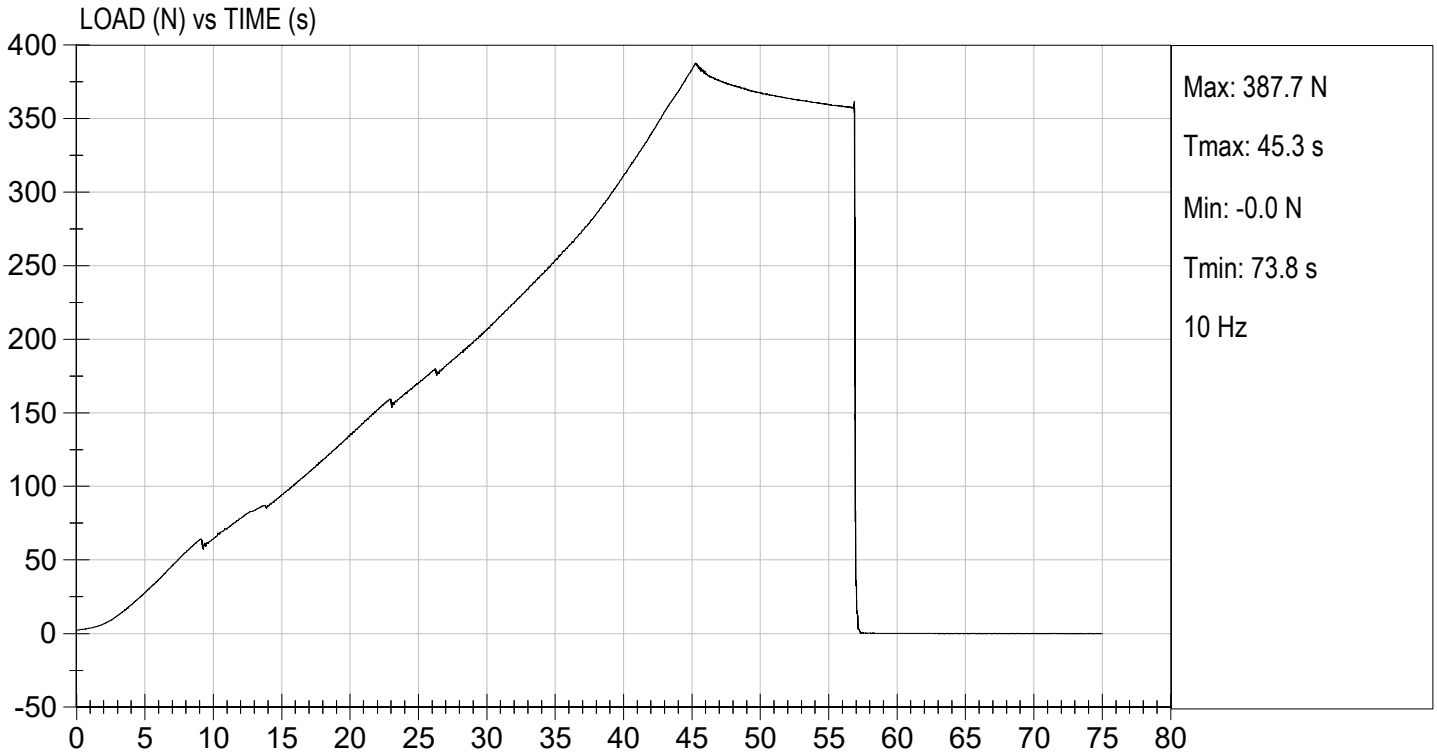
Test I.D: D222647

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Initial Angle	deg	0 to 20	16	Pass
Return Angle	deg	+/- 8	3	Pass
Force at 45 deg	N	320 to 390	387	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.7	Pass
<b>Overall Result</b>				<b>Pass</b>

  
 Laboratory Technician

11/17/2022  
 Test Date

  
 Approved By



**APPENDIX D**  
**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA**

**TABLE 1 – DRIVER DUMMY INSTRUMENTATION**

Instrument Location			Axis	Hybrid III 50 <sup>th</sup> S/N 351		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X		P79741	Endevco	06/30/2022
		Y		P79743	Endevco	06/30/2022
		Z		P79744	Endevco	06/30/2022
	Redundant	X		P94834	Endevco	06/30/2022
		Y		P94856	Endevco	06/30/2022
		Z		P97412	Endevco	06/30/2022
Head Angular Rate Sensors			X	ARS15213	DTS	03/15/2022
			Y	ARS7421	DTS	03/15/2022
			Z	ARS7524	DTS	03/14/2022
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG1915	Denton	01/18/2022
Chest Accelerometers	Primary	X		P86792	Endevco	06/30/2022
		Y		P88348	Endevco	06/30/2022
		Z		P86793	Endevco	06/30/2022
	Redundant	X		P88666	Endevco	06/30/2022
		Y		P94109	Endevco	06/30/2022
		Z		P88667	Endevco	06/30/2022
Chest Potentiometer			X	351	Humanetics	07/01/2022
Pelvis Accelerometers			X	P95526	Endevco	06/30/2022
			Y	P96038	Endevco	06/30/2022
			Z	P97742	Endevco	06/30/2022
Femur Load Cells	Right	Primary	Z	FG121P	Denton	07/01/2022
		Redundant	Z	FG121R	Denton	07/01/2022
	Left	Primary	Z	FG122P	Denton	07/01/2022
		Redundant	Z	FG122R	Denton	07/01/2022
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG405	Denton	01/18/2022
		Lower	Mx, My, Fz	AG368	Denton	01/18/2022
	Left	Upper	Mx, My, Fz	TG475	Denton	01/18/2022
		Lower	Mx, My, Fz	AG504	Denton	01/18/2022
Foot Accelerometers	Right	Rear	X	T22486	Endevco	07/01/2022
			Z	P97382	Endevco	06/30/2022
		Front	Z	P82120	Endevco	07/01/2022
	Left	Rear	X	T16468	Endevco	07/01/2022
			Z	T16496	Endevco	07/01/2022
		Front	Z	T16501	Endevco	07/01/2022
Seat Belt Load Cells		Lap				
		Shoulder				

**TABLE 2 – FRONT PASSENGER DUMMY INSTRUMENTATION**

Instrument Location			Axis	Hybrid III 5 <sup>th</sup> S/N 142		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary		X	P94799	Endevco	10/10/2022
			Y	P94800	Endevco	10/10/2022
			Z	P94801	Endevco	10/10/2022
	Redundant		X	P94802	Endevco	10/10/2022
			Y	P94803	Endevco	10/10/2022
			Z	P97377	Endevco	10/10/2022
Head Angular Rate Sensors			X	ARS7413	DTS	03/14/2022
			Y	ARS7602	DTS	03/14/2022
			Z	ARS15229	DTS	03/15/2022
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG2203	Denton	03/23/2022
Chest Accelerometers	Primary		X	P88719	Endevco	10/10/2022
			Y	P94785	Endevco	10/10/2022
			Z	P94793	Endevco	10/10/2022
	Redundant		X	P95322	Endevco	10/10/2022
			Y	P95370	Endevco	10/10/2022
			Z	T30901	Endevco	10/10/2022
Chest Potentiometer			X	142	Humanetics	10/11/2022
Pelvis Accelerometers			X	P82646	Endevco	10/10/2022
			Y	P94798	Endevco	10/10/2022
			Z	P97705	Endevco	10/10/2022
Femur Load Cells	Right	Primary	Z	FG126P	Denton	10/11/2022
		Redundant	Z	FG126R	Denton	10/11/2022
	Left	Primary	Z	FG127P	Denton	10/11/2022
		Redundant	Z	FG127R	Denton	10/11/2022
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG408	Denton	03/23/2022
		Lower	Mx, My, Fz	AG116	Denton	03/23/2022
	Left	Upper	Mx, My, Fz	TG480	Denton	03/23/2022
		Lower	Mx, My, Fz	AG502	Denton	03/23/2022
Foot Accelerometers	Right	Rear	X	P94795	Endevco	10/10/2022
			Z	P94796	Endevco	10/10/2022
		Front	Z	P94797	Endevco	10/10/2022
	Left	Rear	X	P83167	Endevco	10/10/2022
			Z	P83168	Endevco	10/10/2022
		Front	Z	P83169	Endevco	10/10/2022
Seat Belt Load Cells			Lap			
			Shoulder			

**TABLE 3 – VEHICLE INSTRUMENTATION**

Instrument Location			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember / Rear Seat Accelerometers	Left	Primary	X	A383101	MSI	08/08/2022
			Z	A383789	MSI	08/08/2022
		Redundant	X	A337227	MSI	08/08/2022
	Right	Primary	X	P33124	Endevco	09/08/2022
			Z	P32978	Endevco	09/08/2022
		Redundant	X	P68289	Endevco	09/08/2022
Engine Accelerometers		Top	X	A310677	MSI	10/26/2022
		Bottom	X	P68311	Endevco	09/08/2022