

REPORT NUMBER: NCAP-MGA-23-024

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

**HONDA OF CANADA MFG.
2023 Honda CR-V AWD EX 5-Door SUV
NHTSA No.: O20235306**

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



Test Date: June 14, 2023

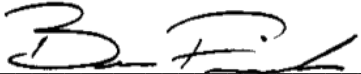
Final Report Date: February 13, 2024

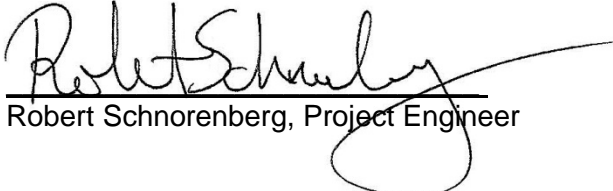
FINAL REPORT

**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: February 13, 2024

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. NCAP-MGA-23-024	2. Government Accession No.	3. Recipient's Catalog No.																																																							
4. Title and Subtitle Final Report of New Car Assessment Program Frontal Impact Testing of a 2023 Honda CR-V AWD EX 5-Door SUV, NHTSA No.: O20235306		5. Report Date February 13, 2024																																																							
		6. Performing Organization Code MGA																																																							
7. Author(s) Ben Fischer, Program Manager		8. Performing Organization Report No. NCAP-MGA-23-024																																																							
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																																																							
		11. Contract or Grant No. 693JJ919D000006																																																							
12. Sponsoring Agency Name and Address 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		13. Type of Report and Period Covered Final Test Report June 14, 2023 to February 13, 2024																																																							
		14. Sponsoring Agency Code NRM-110																																																							
15. Supplementary Notes																																																									
16. Abstract A 56.3 km/h NCAP Frontal Rigid Barrier Impact Test was conducted on a 2023 Honda CR-V AWD EX 5-Door SUV 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 June 14, 2023. The impact velocity of the vehicle was 56.53 km/h and the ambient temperature at the barrier face at the time of impact was 21.1°C. The target vehicle post-test maximum crush was 611 mm located to the left 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 (HIC₁₅)</td> <td></td> <td>700</td> <td>211.497</td> <td>700</td> <td>357.109</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>15.647</td> <td>52</td> <td>13.792</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.171</td> <td>1</td> <td>0.540</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>805.475</td> <td>2620</td> <td>936.396</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>211.641</td> <td>2520</td> <td>163.292</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>964.996</td> <td>6805</td> <td>1812.927</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>1408.307</td> <td>6805</td> <td>1519.017</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)		700	211.497	700	357.109	Maximum Chest Compression	mm	63	15.647	52	13.792	Nij		1	0.171	1	0.540	Neck Tension	N	4170	805.475	2620	936.396	Neck Compression	N	4000	211.641	2520	163.292	Left Femur Force	N	10008	964.996	6805	1812.927	Right Femur Force	N	10008	1408.307	6805	1519.017
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17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)			18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																																																						
19. Security Classification of Report Unclassified	20. Security Classification of Page Unclassified	21. No. of Pages 178	22. Price																																																						

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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 Honda CR-V AWD EX 5-Door SUV at a velocity of 56.53 km/h. The test was performed at MGA Research Corporation on June 14, 2023. 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 50th percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5th percentile female test device (ATD) was placed in the right-front passenger seating position according to dummy placement instructions specified in the 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 611 mm located to the left 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	HIC₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th)	211.497	0.171	805.475	211.641	38.792	15.647	964.996	1408.307
Passenger (5 th)	357.109	0.540	936.396	163.292	49.784	13.792	1812.927	1519.017

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

TEST NOTES

Top of Engine X 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 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20235306	Traction Control System (TCS)	Yes
Model Year	2023	Power Steering	Yes
Make	Honda	Power Window Auto-Reverse	Yes
Model	CR-V AWD EX	Driver Frontal Airbag	Yes
Body Style	5-Door SUV	Driver Curtain Airbag	Yes
VIN	2HKRS4H42PH412675	Driver Head/Torso Airbag	No
Body Color	Radiant Red Metallic	Driver Torso Airbag	No
Odometer (km/mi)	278 km / 173 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	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	CVT	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	AWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	Yes	Front Pass. Knee Airbag	Yes
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Driver Only	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	N/A

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

DATA FROM CERTIFICATION LABEL

Manufactured By	HONDA OF CANADA MFG.	GVWR (kg)	2175
Date of Manufacture	01/23	GAWR Front (kg)	1120
		GAWR Rear (kg)	1120

VEHICLE SEATING AND WEIGHT CAPACITY DATA

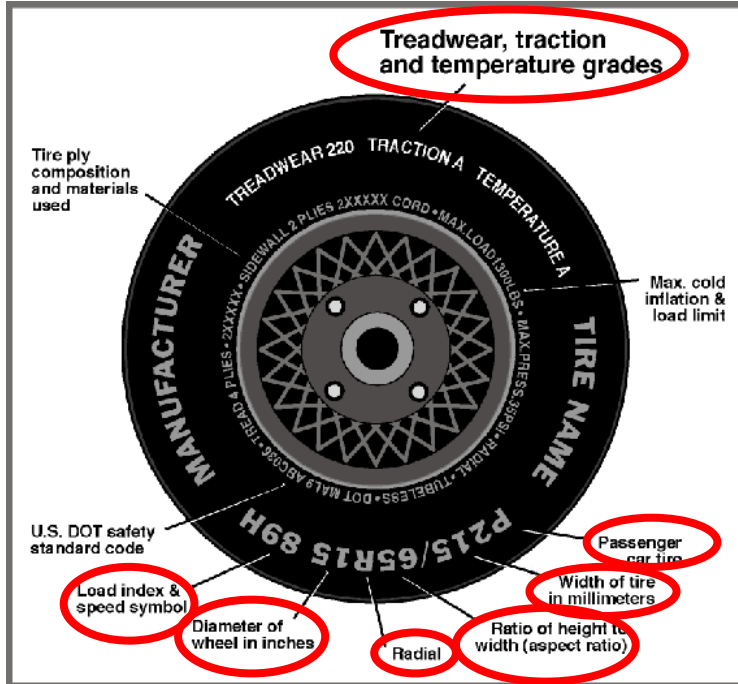
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contoured		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				385
Cargo Weight (RCLW) (kg)				45

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	220
Recommended Tire Size	235/60R18	235/60R18
Tire Size on Vehicle	235/60R18	235/60R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Ecopia	Ecopia
Treadwear	700	700
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	103H	103H
Tire Material	Rubber	Rubber
DOT Safety Code Left	7X45 EC2 4322	7X45 EC2 4322
DOT Safety Code Right	7X45 EC2 4322	7X45 EC2 4322

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	486.0	345.5		528.5	404.5	
Right	kg	445.5	348.5		474.5	398.0	
Ratio	%	57.3%	42.7%		55.6%	44.4%	
Totals	kg	931.5	694.0	1625.5	1003.0	802.5	1805.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1625.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Test Vehicle Target Weight (TVTW)	kg	1811.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	798	802	807	807	1154
As Tested	mm	787	788	782	797	1202
Post Test	mm	832	858	800	788	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2704
Total Vehicle Length at Left Side	mm	4480
Total Vehicle Length at Centerline	mm	4684
Total Vehicle Length at Right Side	mm	4480
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	25
Amount of Stoddard Solvent in Fuel Tank	L	49.2

List of components removed to meet test weight: None.

List of components removed for instrumentation, data box, and equipment installation: Cargo area carpet/trim/divider, jack and tools, spare tire and cover, RR taillight, underbody plastic.

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4684
2	Total Width	1895
3	Bumper Top Height	612
4	Bumper Bottom Height	511
5	Longitudinal Member Top Height	565
6	Distance between Longitudinal Members	930
7	Longitudinal Member Width	60
8	Engine Top Height	849
9	Engine Bottom Height	238
10	Engine and Gearbox Width	790
11	Front Bumper-Engine Distance	400
12	Front Shock Absorber Fixing Height	975
13	Bonnet Leading Edge Height	890
14	Front Shock Absorber Fixing Width	1200
15	Front Bumper – Front Axle Distance	930
16	Front Axle – A-Pillar Distance	526
17	A-Pillar – B-Pillar Distance	1048
18	B-Pillar – Rear Axle Distance	1132
19	B-Pillar – C-Pillar Distance	612
20	Roof Sill Bottom Height	1513
21	Roof Sill Top Height	1620
22	Floor Sill Bottom Height	276
23	Floor Sill Top Height	450

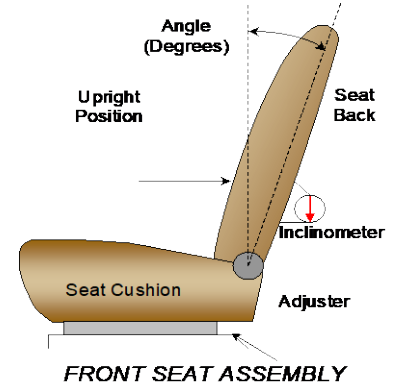
**DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

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	1.0° on outboard headrest post
Passenger Seat Back Angle	-5.2° on outboard headrest post

SEAT FORE/AFT POSITIONS

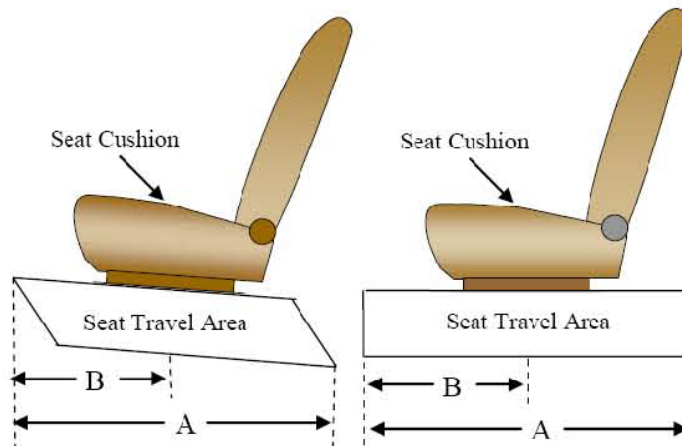
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated May 2018.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	288 mm	144 mm
Passenger Seat	220 mm / 23 detents (1 st as 1)	0 mm / 0 th detent (1 st as 0)

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 st as 1)	0 (1 st as 0)
Passenger Seat	4 (1 st as 1)	0 (1 st as 0)



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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

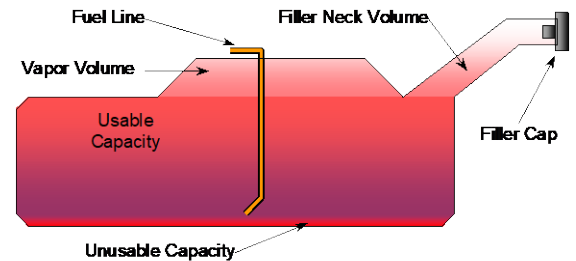
NHTSA No.: O20235306
 Test Date: 6/14/2023

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	53.0
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	48.8 to 49.8
Actual Amount of Solvent used	49.2
1/3 of Usable Capacity	17.7

FUEL PUMP

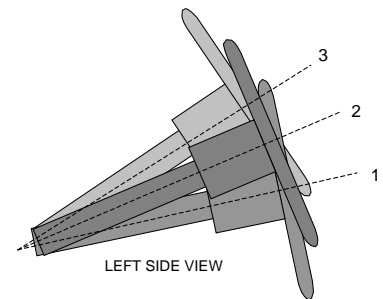
The vehicle is equipped with an electronic fuel pump. The fuel pump is active after the Engine Start/Stop Switch is pushed two times and IGN-ON (II) position is achieved. The pump will be filled for two seconds, and then the pressure is maintained. The filler neck is located on the driver's side.



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

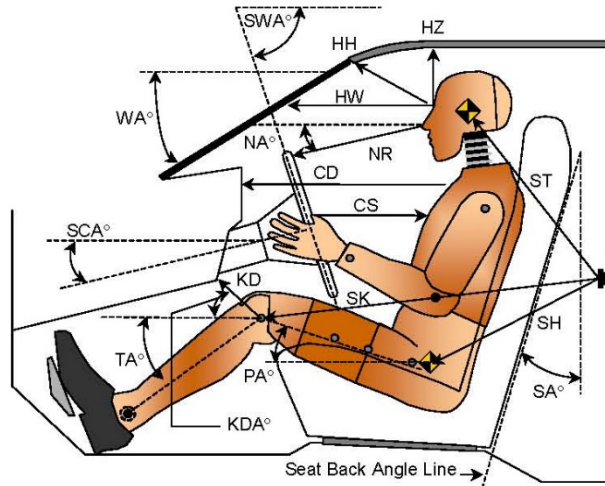
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	66.3	
Geometric Center Position 2	63.5	
Uppermost Position 3	60.7	
Telescoping Steering Wheel Travel		40
Test Position	63.5	20

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023



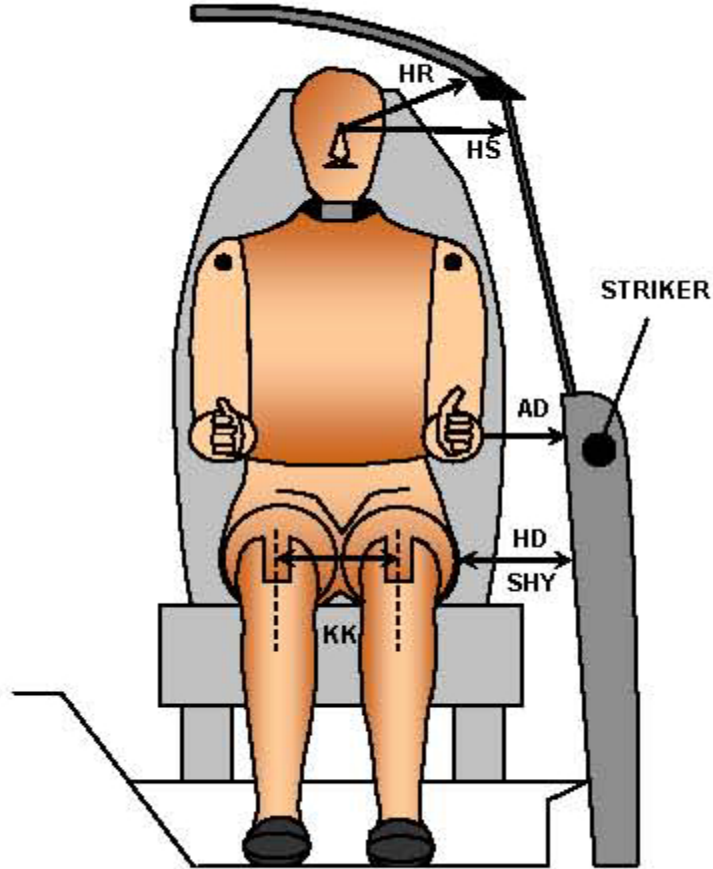
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		27.6		
SWA°	Steering Wheel Angle		63.5		
SCA°	Steering Column Angle		26.5		
SA°	Seat Back Angle		1.0		-5.2
HZ	Head to Roof (Z)	184	90	212	90
HH	Head to Header	284	22.2	315	38.9
HW	Head to Windshield	651	0	623	0
NR	Nose to Rim	400	12.8		
CD	Chest to Dash	535		421	
CS	Chest to Steering Hub	317	8.2		
RA	Rim to Abdomen	194	0		
KDL	Left Knee to Dash	225	31.1	140	30.4
KDR	Right Knee to Dash	223	29.7	143	27.7
PA°	Pelvic Angle		23.6		21.1
TA°	Tibia Angle		52.1		58.2
SK	Striker to Knee	614	99.9	746	104.5
ST	Striker to Head	455	20.4	439	36.0
SH	Striker to H-Point	327	127.5	409	111.8

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023



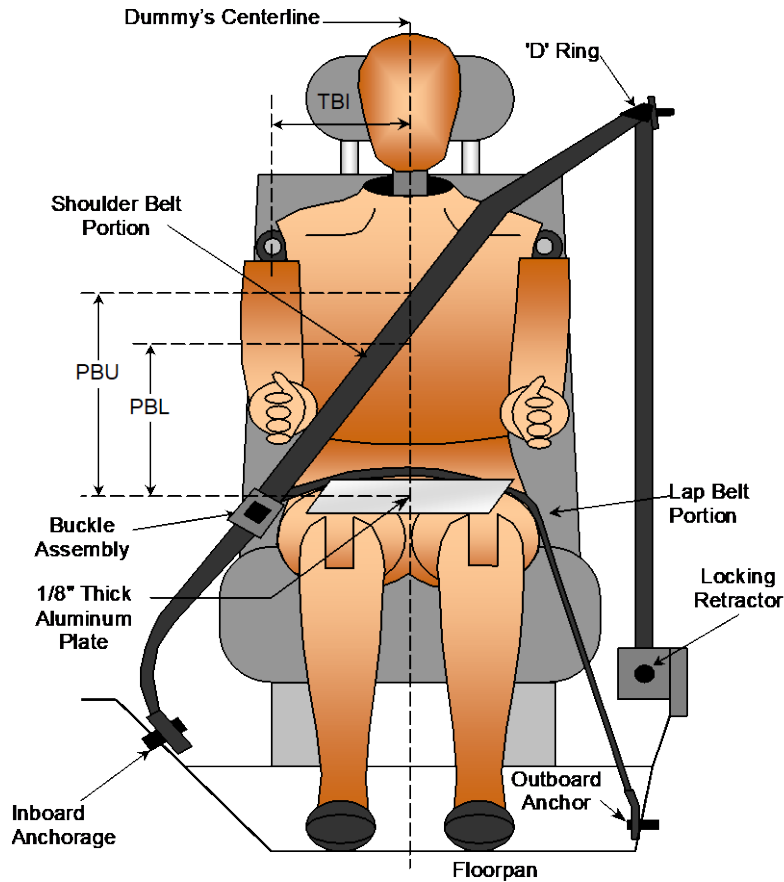
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	126	83
HD	H-Point to Door	154	257
HR	Head to Side Header	245	275
HS	Head to Side Window	365	380
KK	Knee to Knee	346	163
SHY	Striker to H-Point (Y Direction)	290	334
AA	Ankle to Ankle	355	155

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	360	310
PBL - Top surface of reference to belt lower edge	mm	275	225

BELT LENGTH DATA

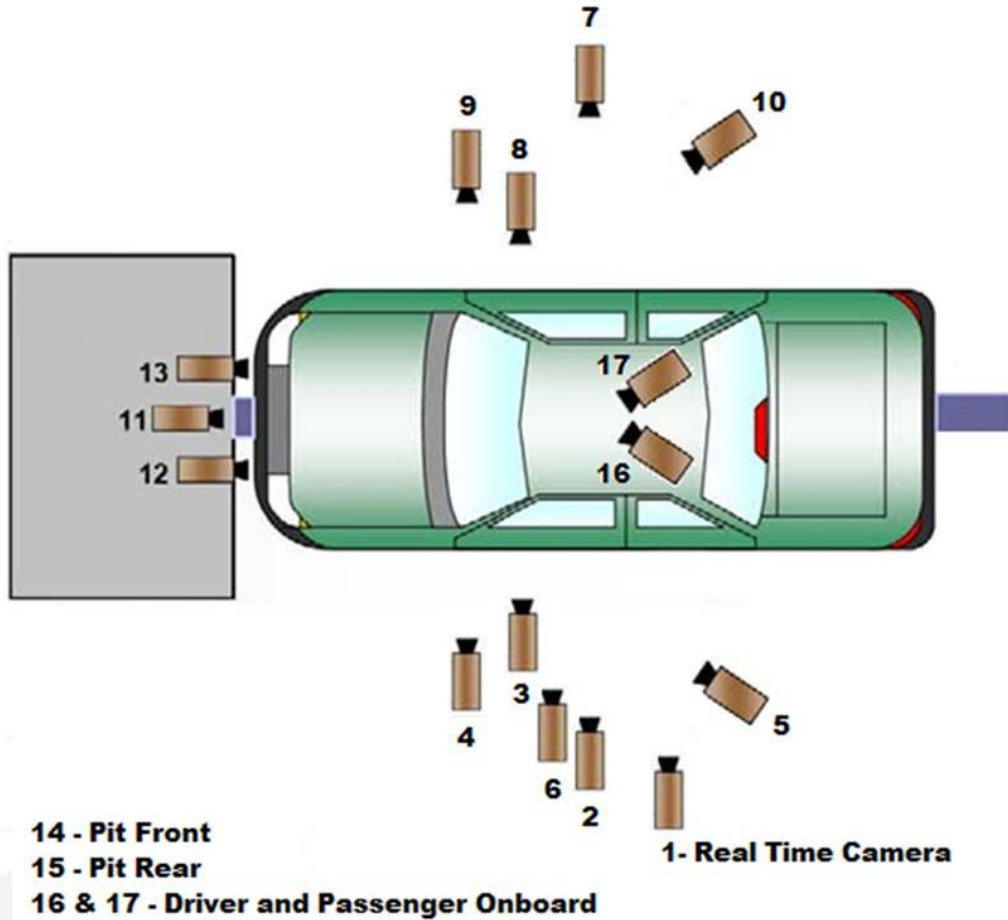
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	880	945
Lap Belt Length as measured on ATD	mm	735	810
Remainder of belt on reel	mm	305	210
Total Belt Length for Continuous Webbing Systems	mm	2450	2500

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
Test Date: 6/14/2023

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 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

CAMERA LOCATIONS

No.	Camera View	Coordinates* (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall					30
2	Left Overall	-2240	-5780	-1440	12	1000
3	Driver Close-Up	-1860	-6900	-1980	50	1000
4	Left Front Half	-1290	-5770	-1470	24	1000
5	Left Angle	-7320	-5720	-2030	75	1000
6	Steering Column	-1090	-5600	-1230	50	1000
7	Right Overall	-2090	6260	-1500	12	1000
8	Passenger Close-Up	-1660	6900	-2080	50	1000
9	Right Front Half	-1080	5720	-1480	24	1000
10	Right Angle	-7420	5490	-2090	75	1000
11	Windshield	140	0	-2310	12	1000
12	Driver Windshield	200	-370	-2230	25	1000
13	Passenger Windshield	200	370	-2230	25	1000
14	Pit Front	-940	0	3340	24	1000
15	Pit Rear	-3300	0	3340	24	1000
16	Driver Onboard				12	1000
17	Passenger Onboard				12	1000
18	Real-Time Pan View					30

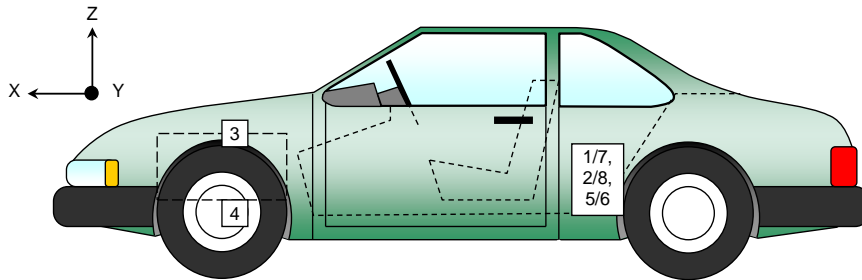
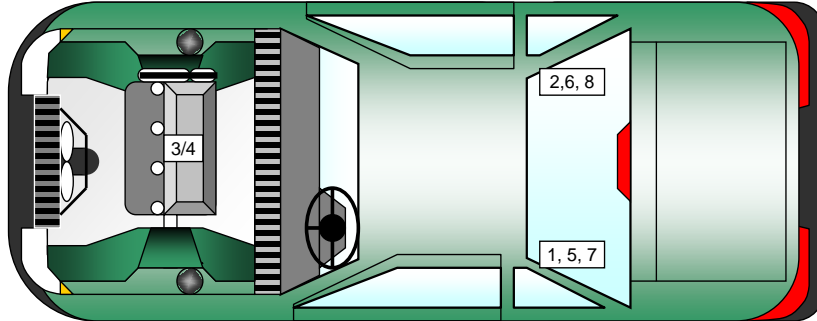
*COORDINATES:

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

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1819	-370	-387
2	Right Rear Crossmember Accelerometer – X Direction	1819	370	-387
3	Engine Top X	3944	35	-825
4	Engine Bottom X	3870	140	-230
5	Left Rear Crossmember Accelerometer – Z Direction	1819	-370	-387
6	Right Rear Crossmember Accelerometer – Z Direction	1819	370	-387
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1819	-420	-387
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1819	420	-387

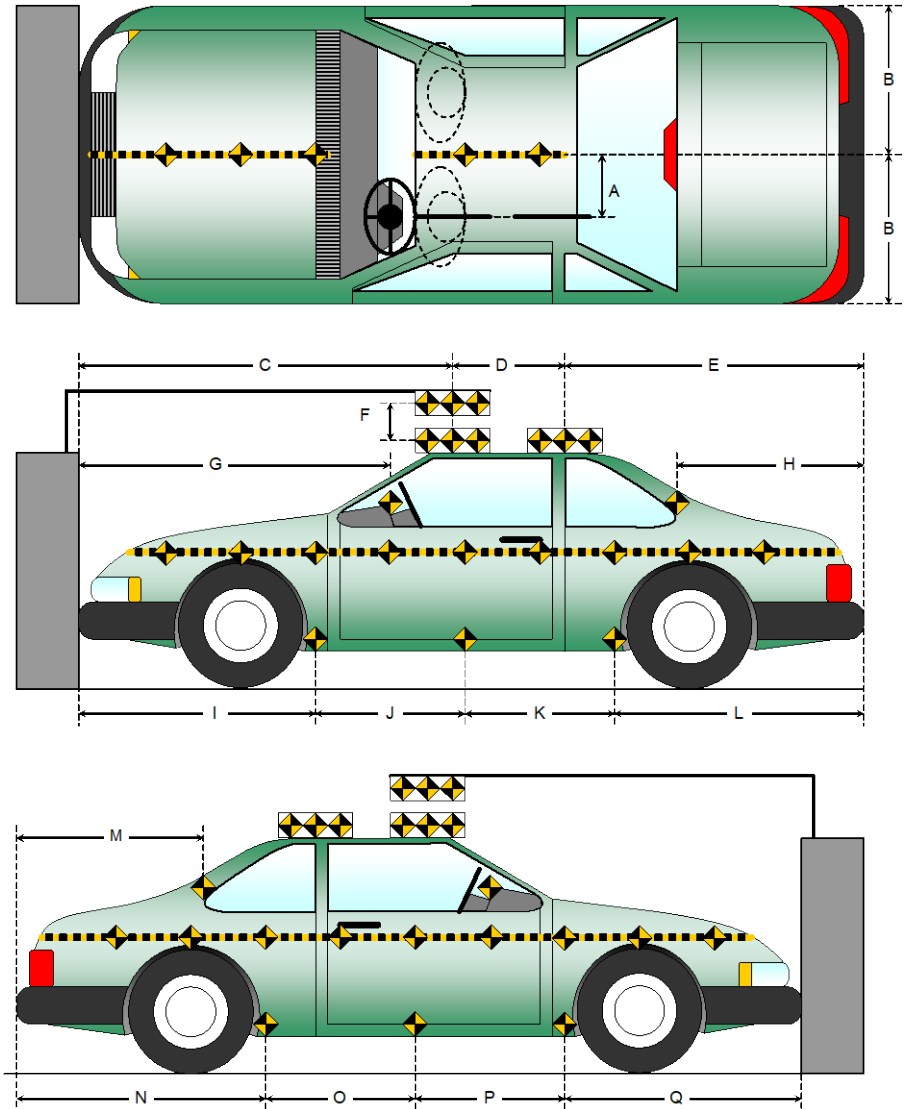
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

Item	Value (mm)
A	385
B	948
C	2350
D	610
E	1724
F	140
G	
H	576
I	1499
J	832
K	832
L	1521
M	576
N	1521
O	832
P	832
Q	1499



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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

ADVANCED RESEARCH LOAD CELL BARRIER

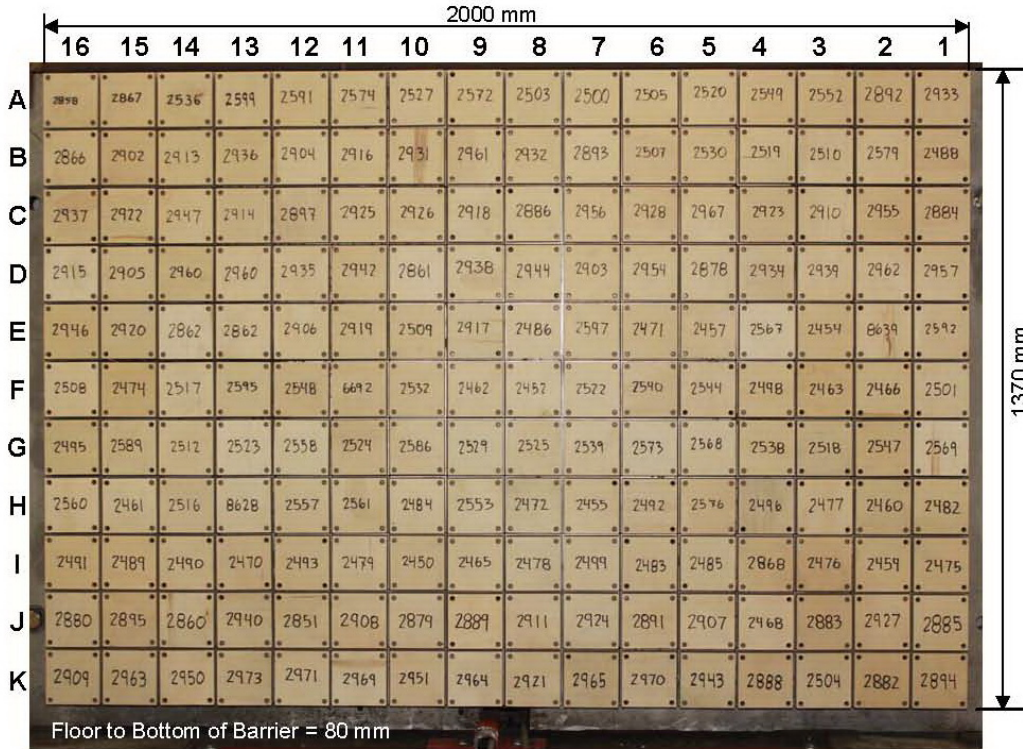


Photo for Reference Only

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 Honda CR-V AWD EX 5-Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
Test Date: 6/14/2023

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	15
Real-Time	2
Total	19

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

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 locked; 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	Small cracks from hood corners
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	655
Center	mm	670
Right Side	mm	650
Average	mm	658

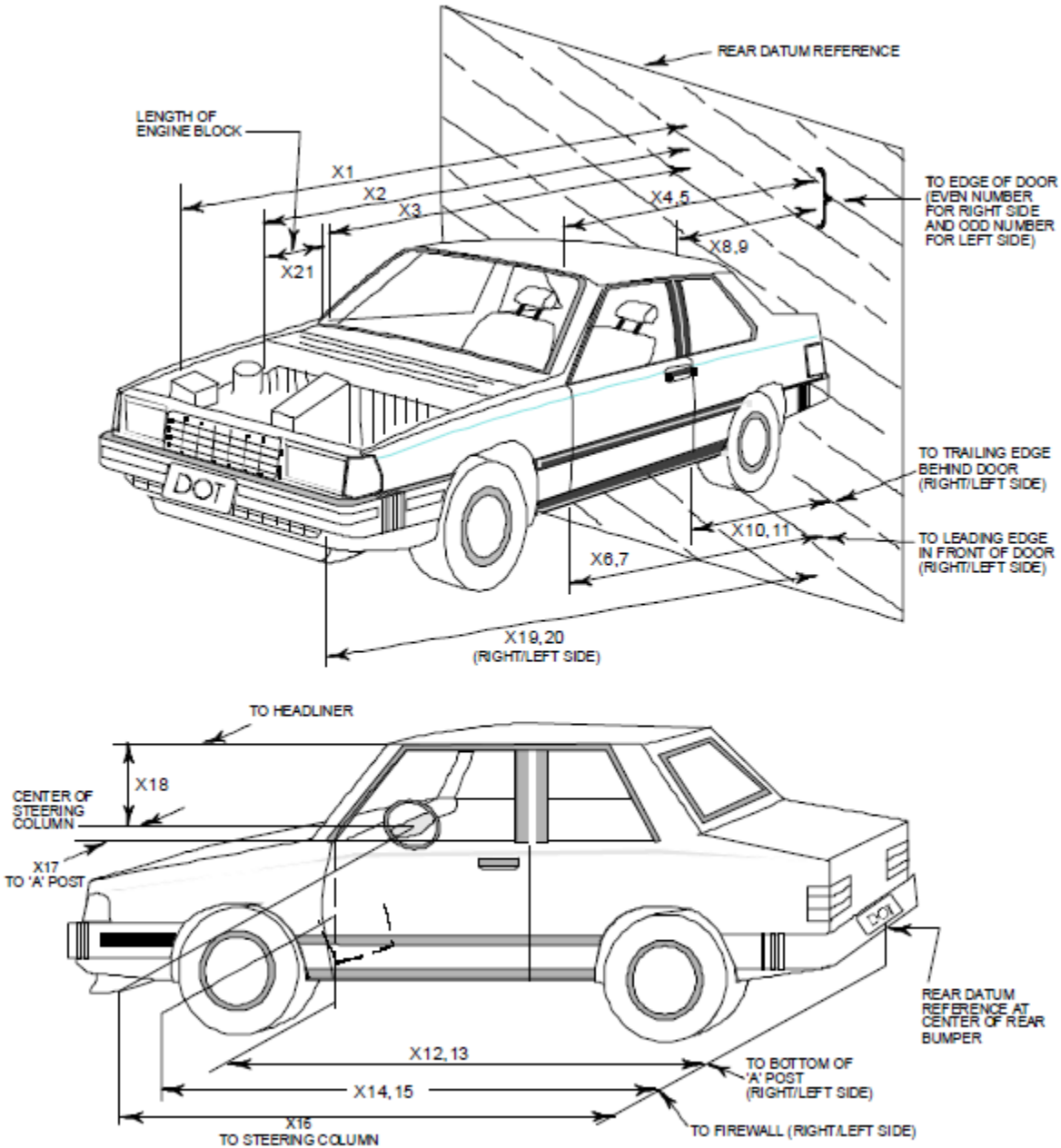
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver		Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	No	Yes	Yes
Torso/Pelvis Side Airbag	Yes	No	Yes	Yes
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 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

No.	Measurement Description	Pre-Test	Post-Test	Change
1	Total Length of Vehicle at Centerline	4684	4190	-494
2	RSOV to Front of Engine	4035	3674	-361
3	RSOV to Firewall	3514	3436	-78
4	RSOV to Upper Leading Edge of Right Door	3186	3164	-22
5	RSOV to Upper Leading Edge of Left Door	3186	3167	-19
6	RSOV to Lower Leading Edge of Right Door	3170	3148	-22
7	RSOV to Lower Leading Edge of Left Door	3170	3150	-20
8	RSOV to Upper Trailing Edge of Right Door	2084	2059	-25
9	RSOV to Upper Trailing Edge of Left Door	2084	2058	-26
10	RSOV to Lower Trailing Edge of Right Door	2120	2097	-23
11	RSOV to Lower Trailing Edge of Left Door	2120	2101	-19
12	RSOV to Bottom of "A" Post of Right Side	3161	3129	-32
13	RSOV to Bottom of "A" Post of Left Side	3160	3132	-28
14	RSOV to Firewall, Right Side	3461	3440	-21
15	RSOV to Firewall, Left Side	3471	3445	-26
16	RSOV to Steering Column	2731	2729	-2
17	Center of Steering Column to "A" Post	373	359	-14
18	Center of Steering Column to Headliner	418	391	-27
19	RSOV to Right Side of Front Bumper	4480	4046	-434
20	RSOV to Left Side of Front Bumper	4480	3993	-487
21	Length of Engine Block	405	405	0
RD	RSOV to Right Side of Dash Panel	2991	2981	-10
CD	RSOV to Center of Dash Panel	3152	3164	12
LD	RSOV to Left Side of Dash Panel	2991	2985	-6

All dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
Test Program: NCAP Frontal Barrier Impact Test

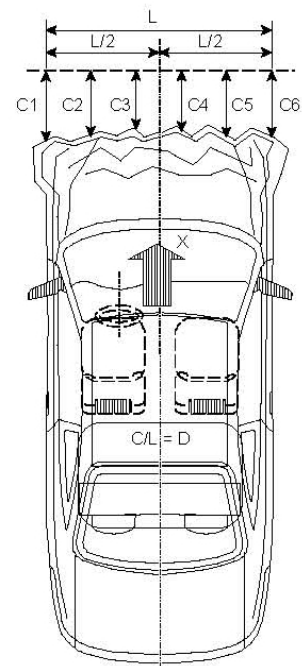
NHTSA No.: O20235306
Test Date: 6/14/2023

VEHICLE INFORMATION

VIN:	<u>2HKRS4H42PH412675</u>	Wheelbase (mm):	<u>2704</u>
Vehicle Size Category:	<u>MPV</u>	Test Weight (kg):	<u>1805.5</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>> 99%</u>
Impact Velocity (km/h):	<u>56.53</u>
Velocity Change (km/h):	<u>67.2</u>
Time of Separation (msec)	<u>92</u>



CRUSH PROFILE

Collision Deformation Classification:	<u>12FDEW3</u>
Midpoint of Damage:	<u>Centerline</u>
Damage Region Length (mm):	<u>1612</u>
Impact Mode:	<u>Frontal</u>

No.	Measurement Description	Units	Pre-Test	Post-Test	Exterior Crush
C1	Crush zone 1 at left side	mm	4480	3993	487
C2	Crush zone 2 at left side	mm	4631	4020	611
C3	Crush zone 3 at left side	mm	4659	4059	600
C4	Crush zone 4 at right side	mm	4659	4050	609
C5	Crush zone 5 at right side	mm	4631	4034	597
C6	Crush zone 6 at right side	mm	4480	4045	435
L	C1 TO C6	mm	1612	1563	49

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

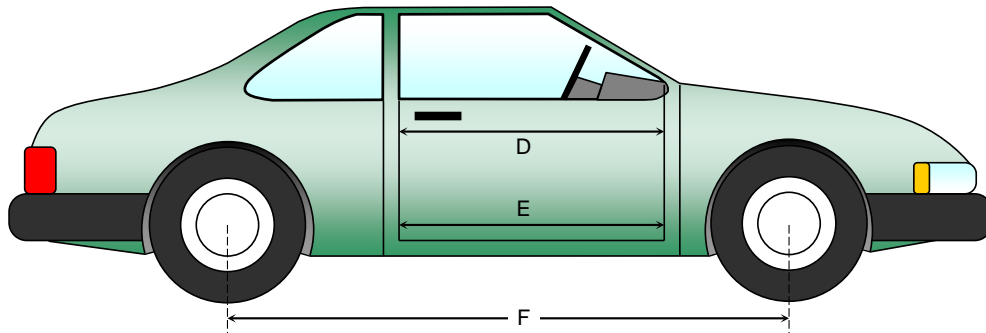
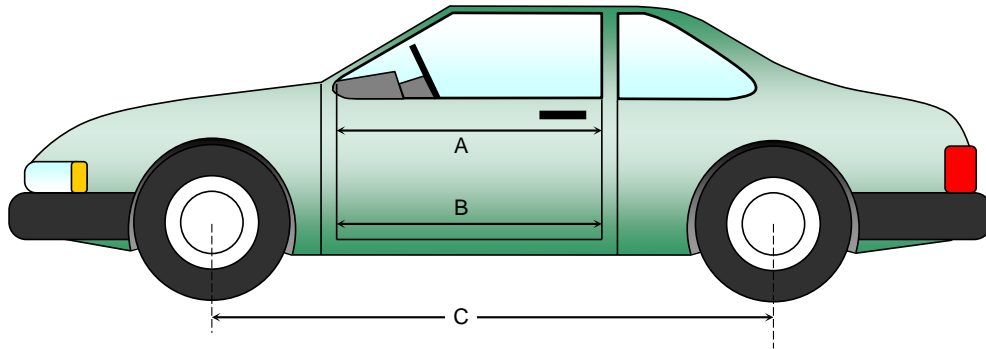
NHTSA No.: O20235306
 Test Date: 6/14/2023

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	1030	1030	0
B	Left Side Lower	mm	886	886	0
D	Right Side Upper	mm	1030	1030	0
E	Right Side Lower	mm	884	884	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	2704	2584	-120
F	Right Side Wheelbase	mm	2704	2581	-123



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

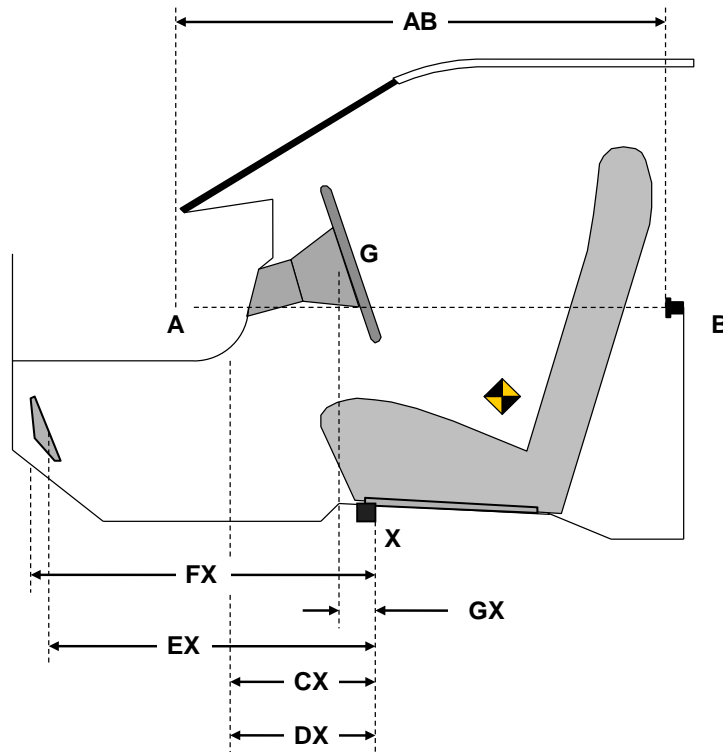
Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Change
AB	Door Opening (Inside Window Jam)	mm	856	856	0
CX	Left Knee Bolster to X	mm	350	384	34
DX	Right Knee Bolster to X	mm	361	379	18
EX	Brake Pedal to X	mm	530	559	29
FX	Foot Rest to X	mm	538	528	-10
GX	Center of Steering Column Wheel Hub to X	mm	54	47	-7

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

WINDSHIELD MOUNTING DETAILS

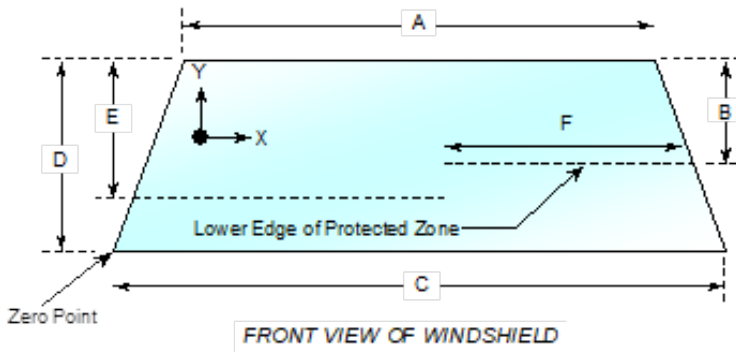
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.1°C.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2199	2199	100
Right Side	2199	2199	100
Total	4398	4398	100



Item	Units	Value
A	mm	1236
B	mm	459
C	mm	1600
D	mm	781
E	mm	508
F	mm	545

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 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

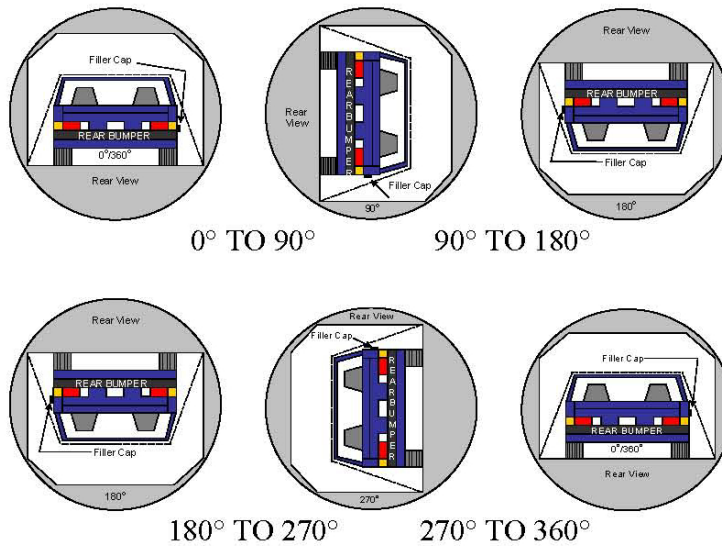
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.1°C

Test Time: 10:53 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°	109	300	409
90° to 180°	111	300	411
180° to 270°	107	300	407
270° to 360°	112	300	412

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

Test Vehicle: 2023 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023

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	

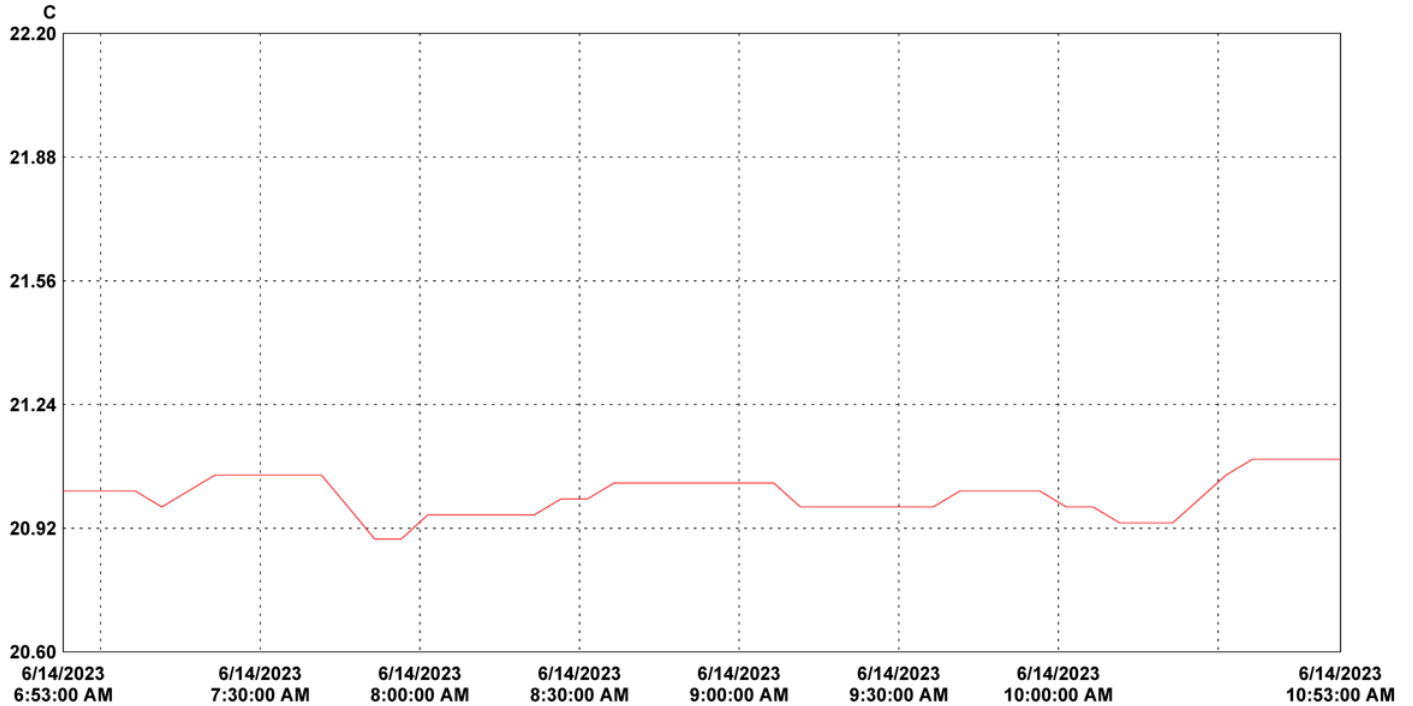
SOLVENT SPILLAGE LOCATION TABLE

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 Honda CR-V AWD EX 5-Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20235306
 Test Date: 6/14/2023



30 minutes/div 4 hours (M/d/yyyy h:mm:ss tt) Central Time Graph file (truncated): O20235306 2023 Honda CR-V AWD EX 5-Door SUV NCAP.spg

LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	21282027	VSC_Prep_Room	1	21.10	21.00	20.89	C	Temperature	21282027_VSC_Prep_Room.spl	

**APPENDIX A
PHOTOGRAPHS**

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Photo No. 082	2023 Honda CR-V AWD EX 5-Door SUV Frontal Impact Event	A-41
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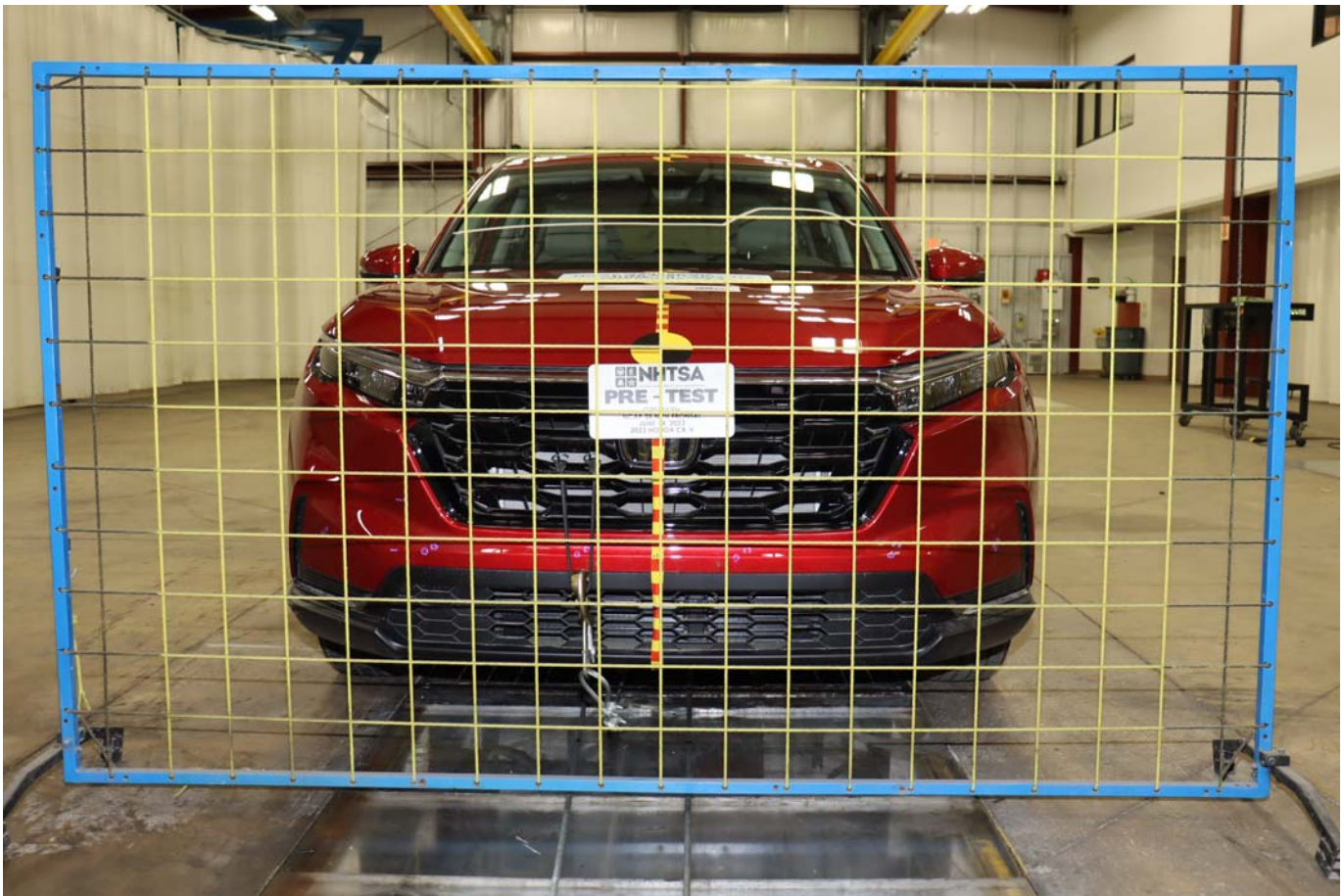


Photo No. 001 - Load Cell Location



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 Honda CR-V AWD EX 5-Door SUV Frontal As Delivered



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

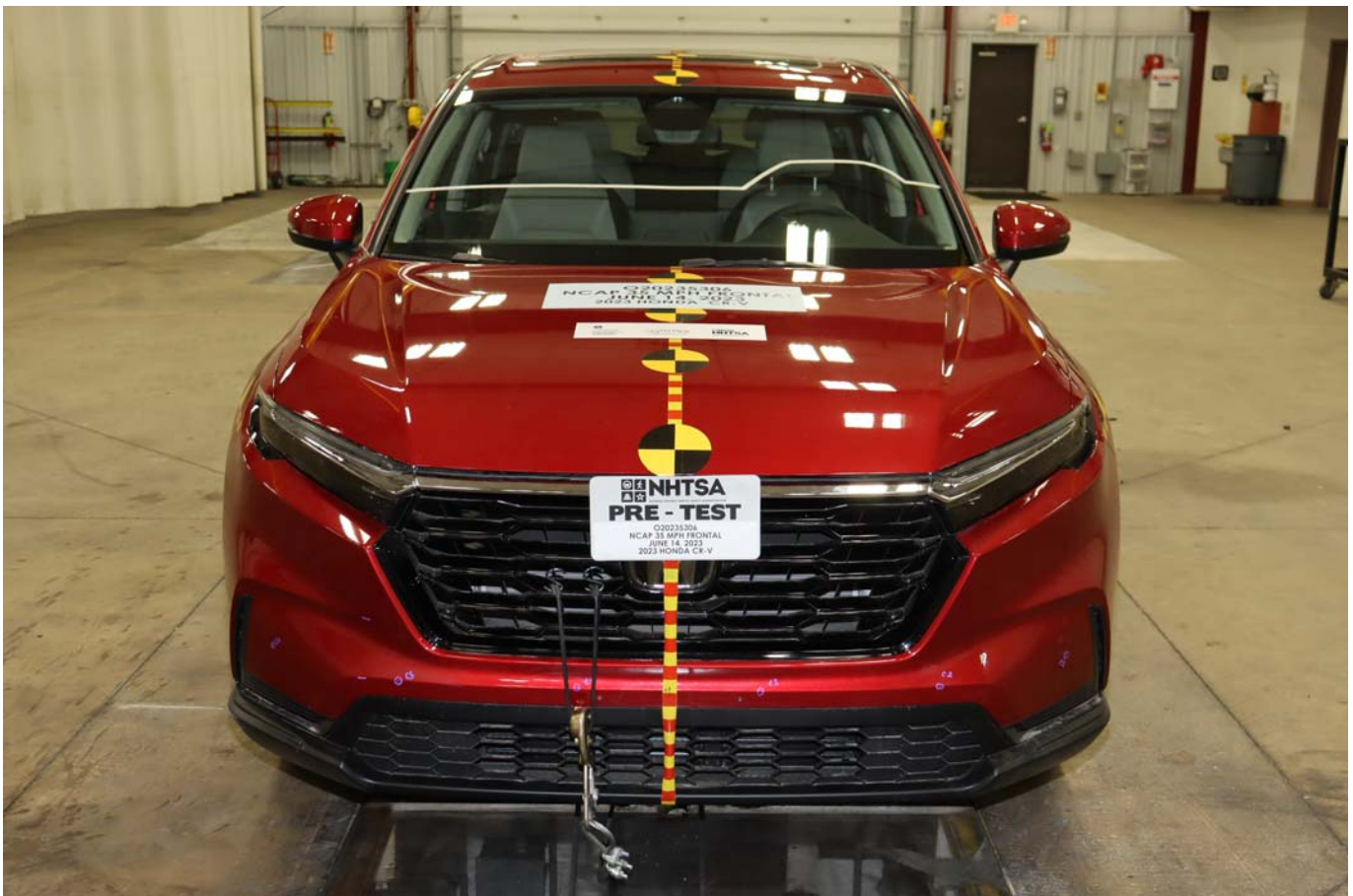


Photo No. 008 - Pre-Test Front View of Test Vehicle

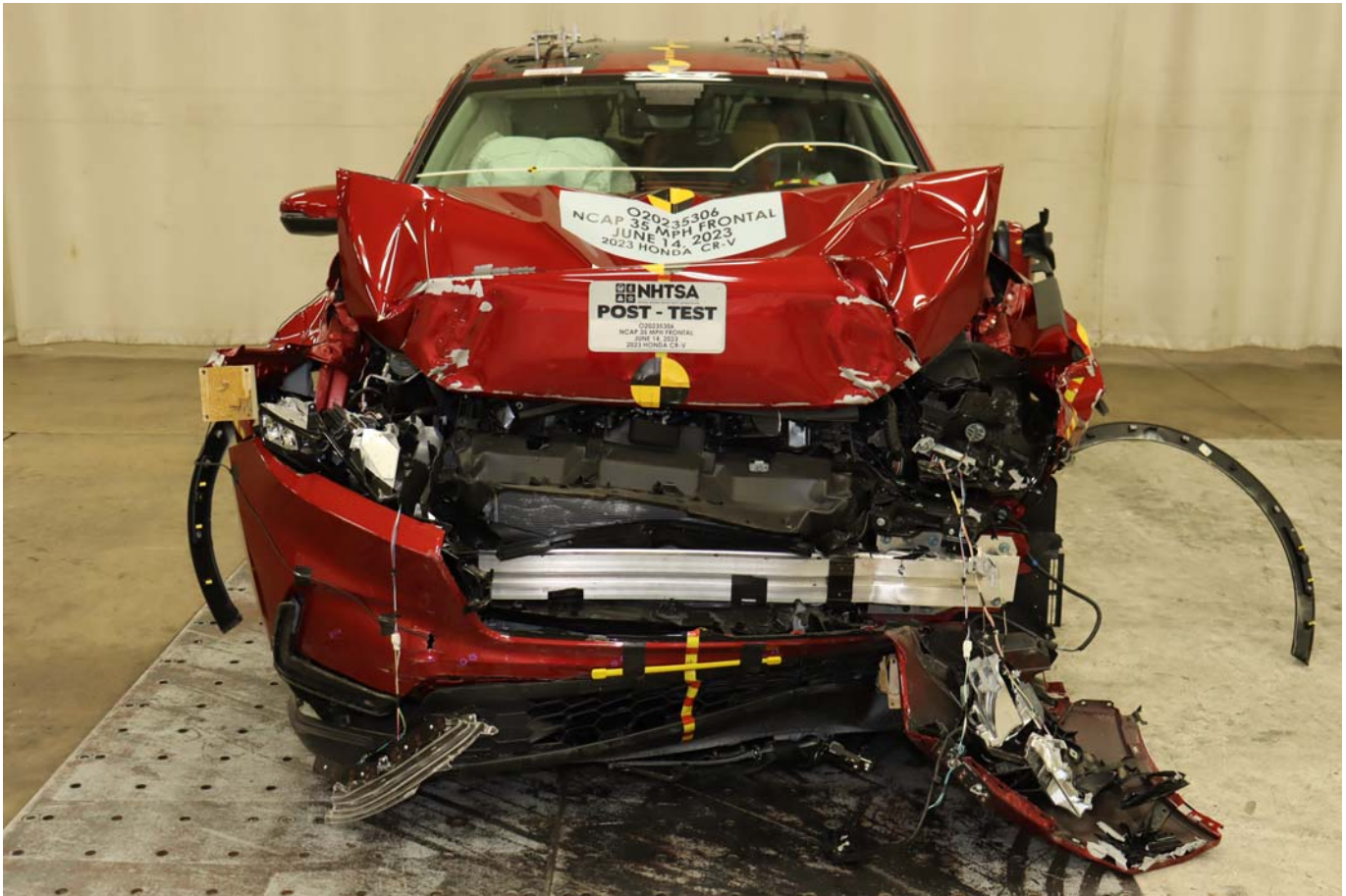


Photo No. 009 - Post-Test Front View of Test Vehicle



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

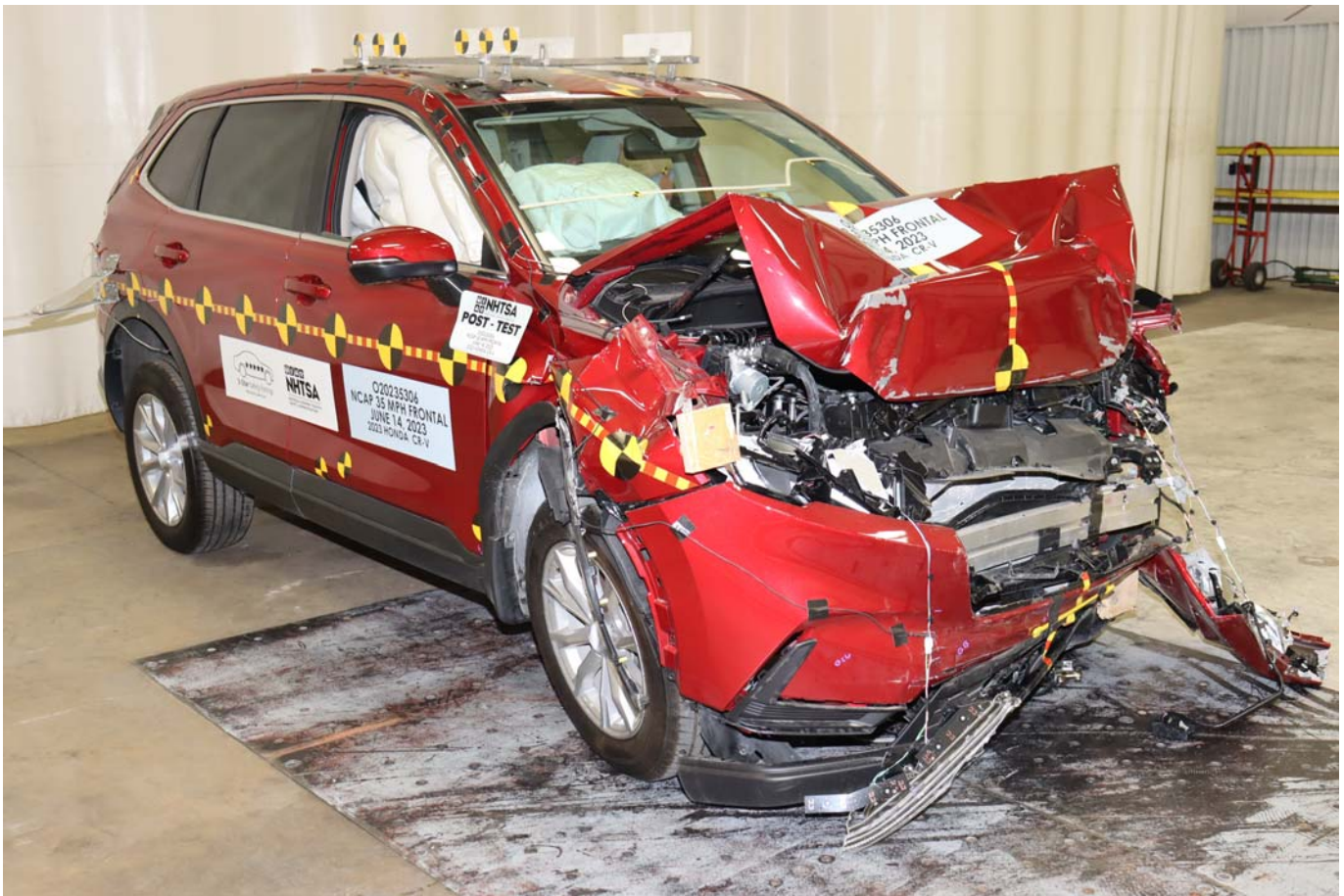


Photo No. 015 - Post-Test Right Front 3-4 View



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

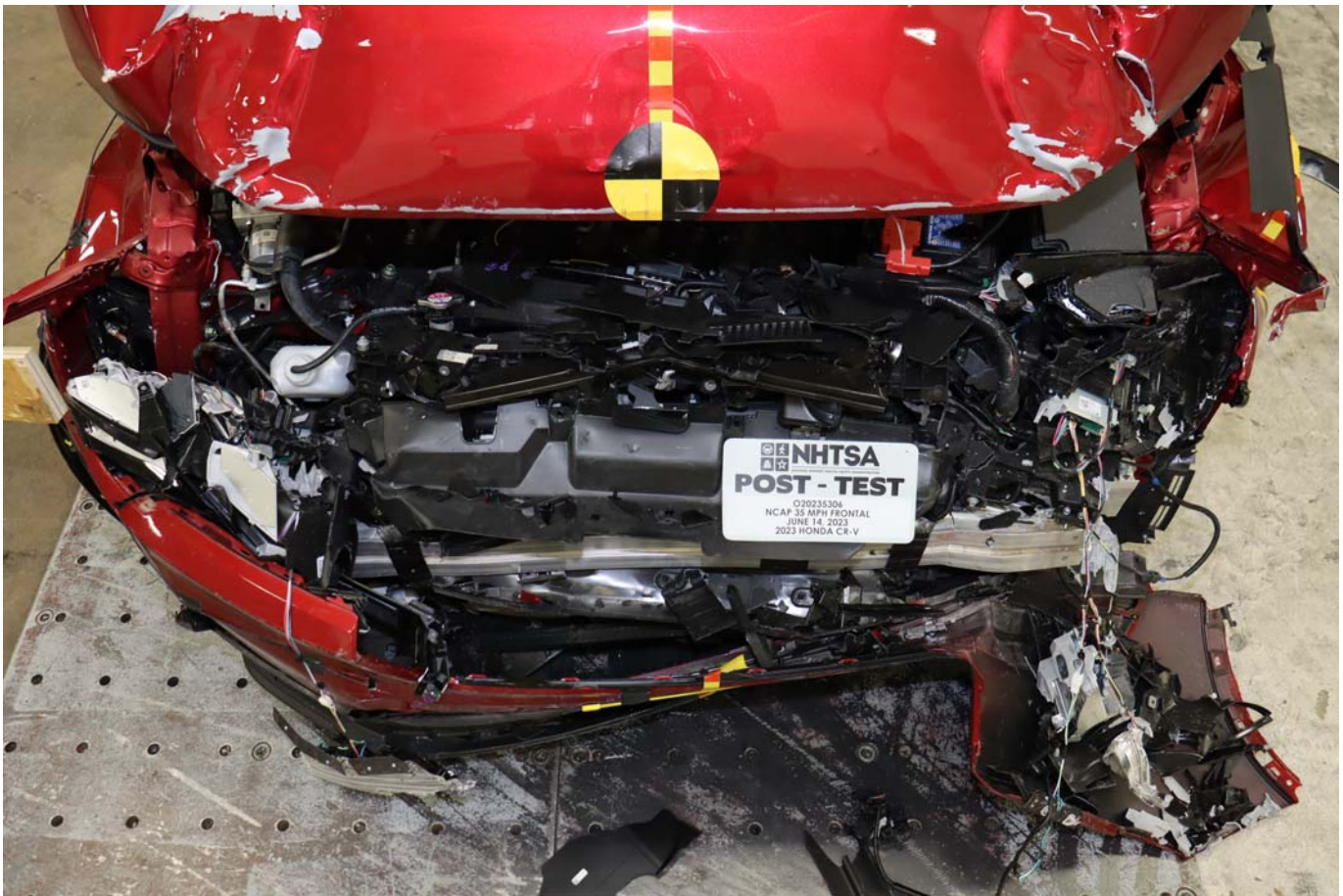


Photo No. 021 - Post-Test Engine Compartment View



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



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

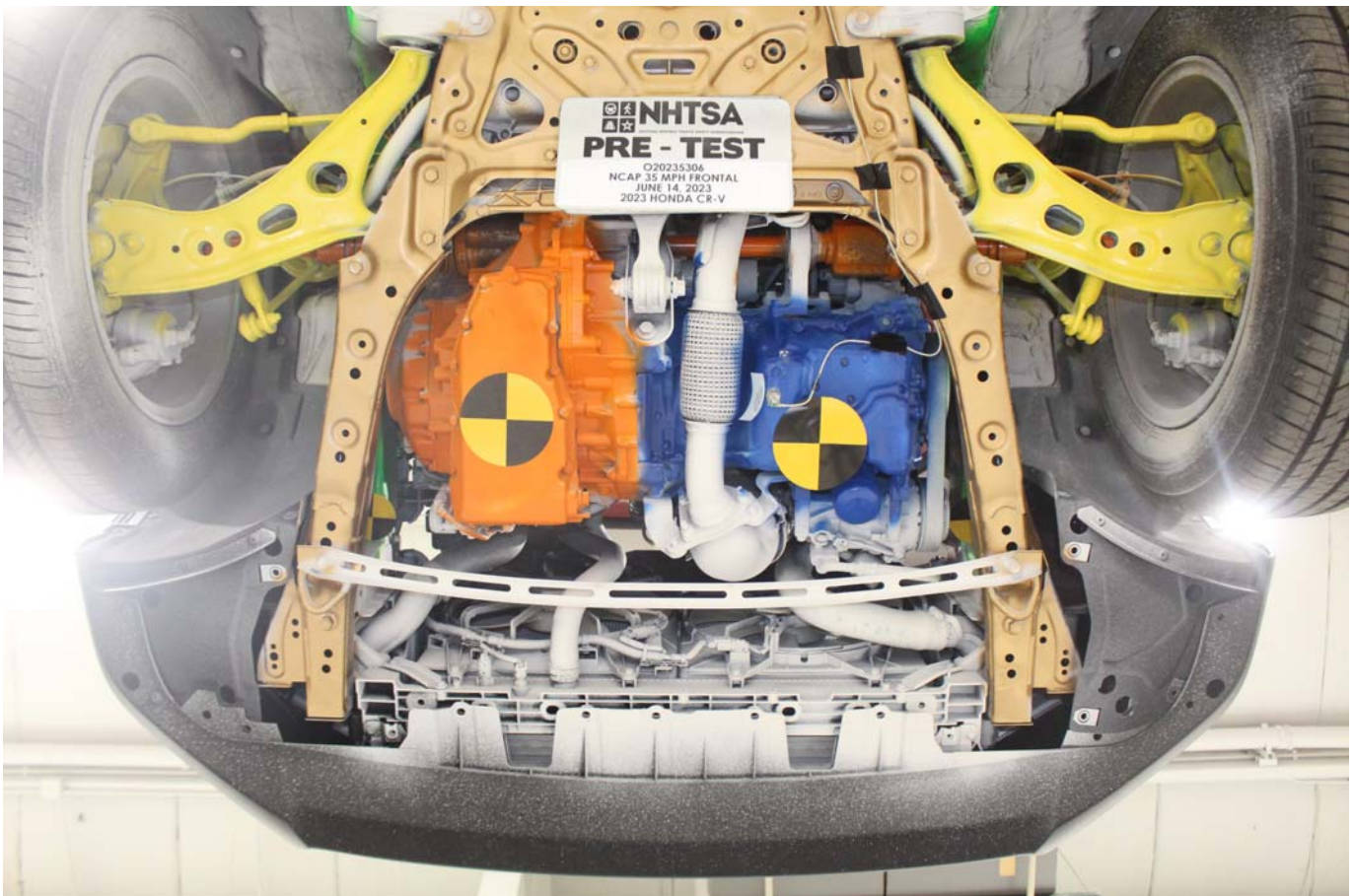


Photo No. 024 - Pre-Test Front Underbody View

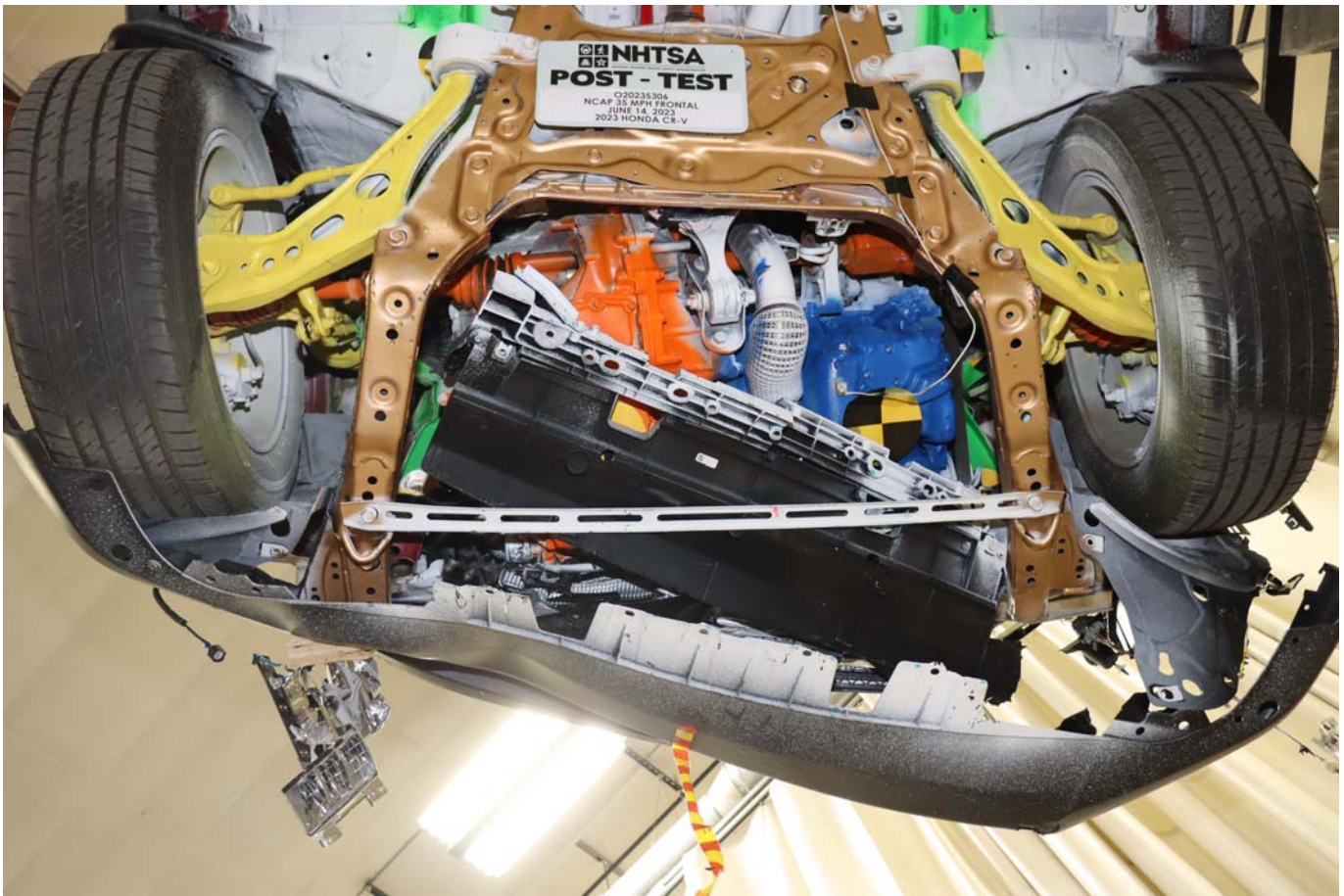


Photo No. 025 - Post-Test Front Underbody View

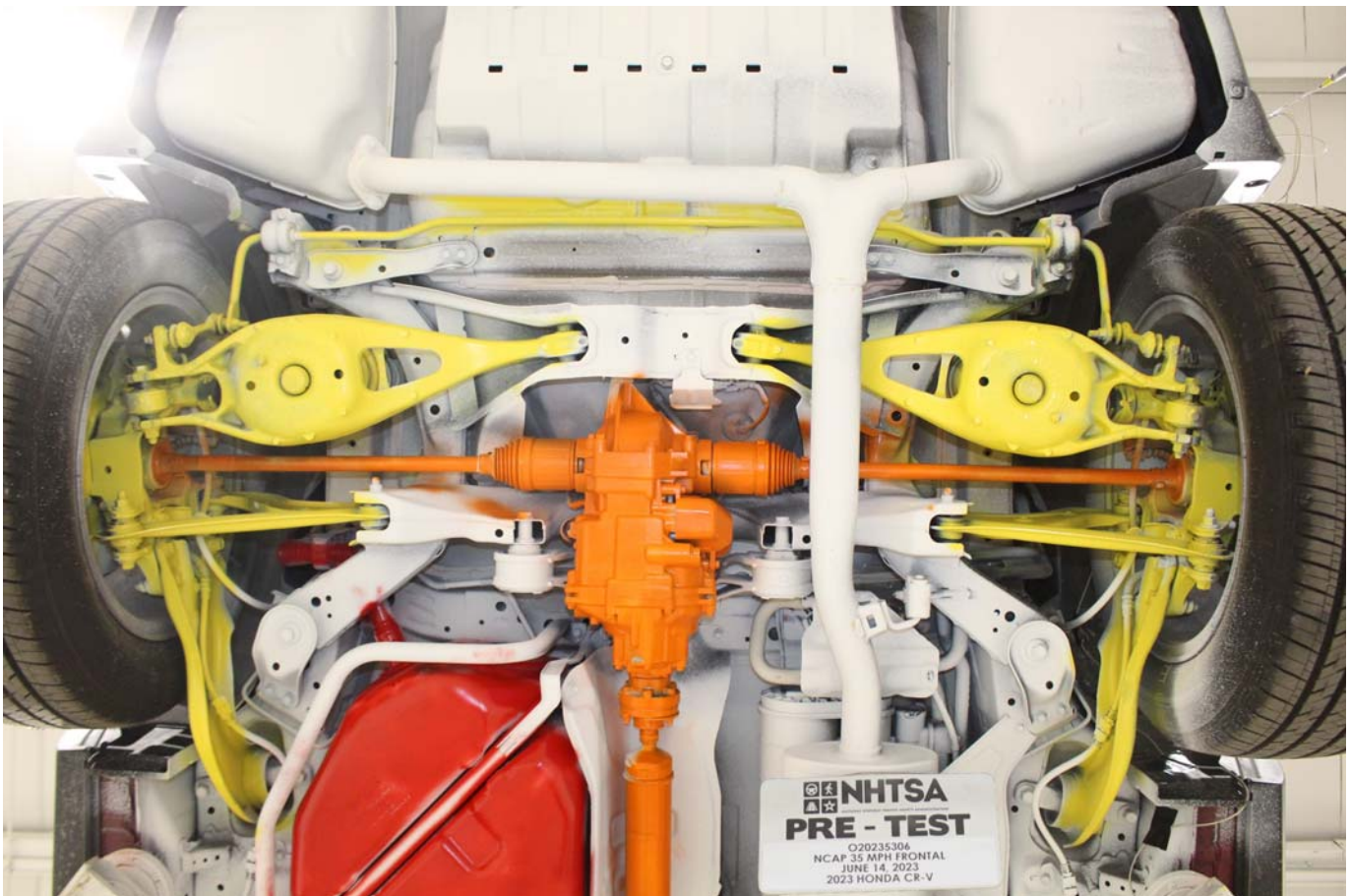


Photo No. 026 - Pre-Test Rear Underbody View



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

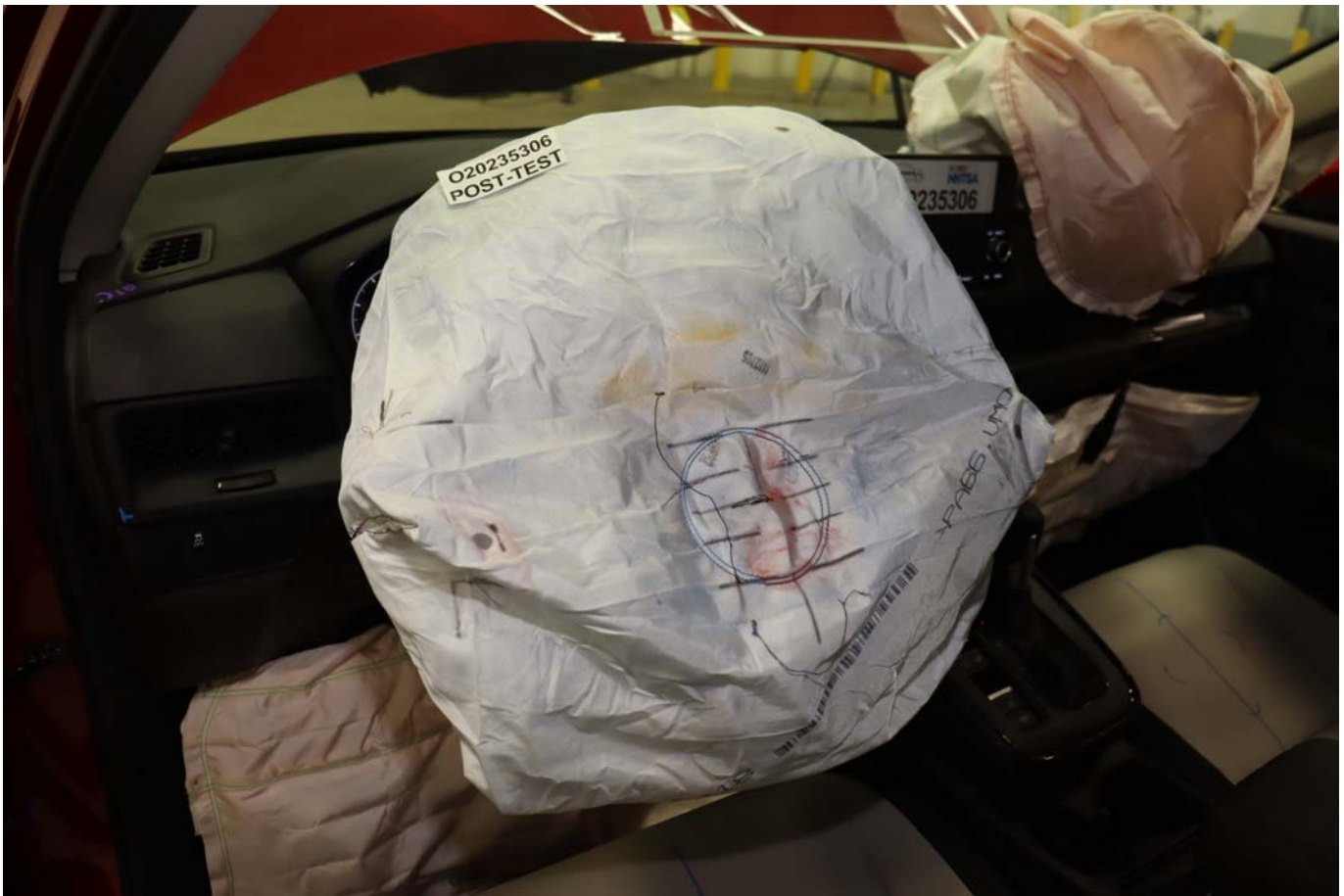


Photo No. 049 - Post-Test Driver Dummy Contact with Airbag



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

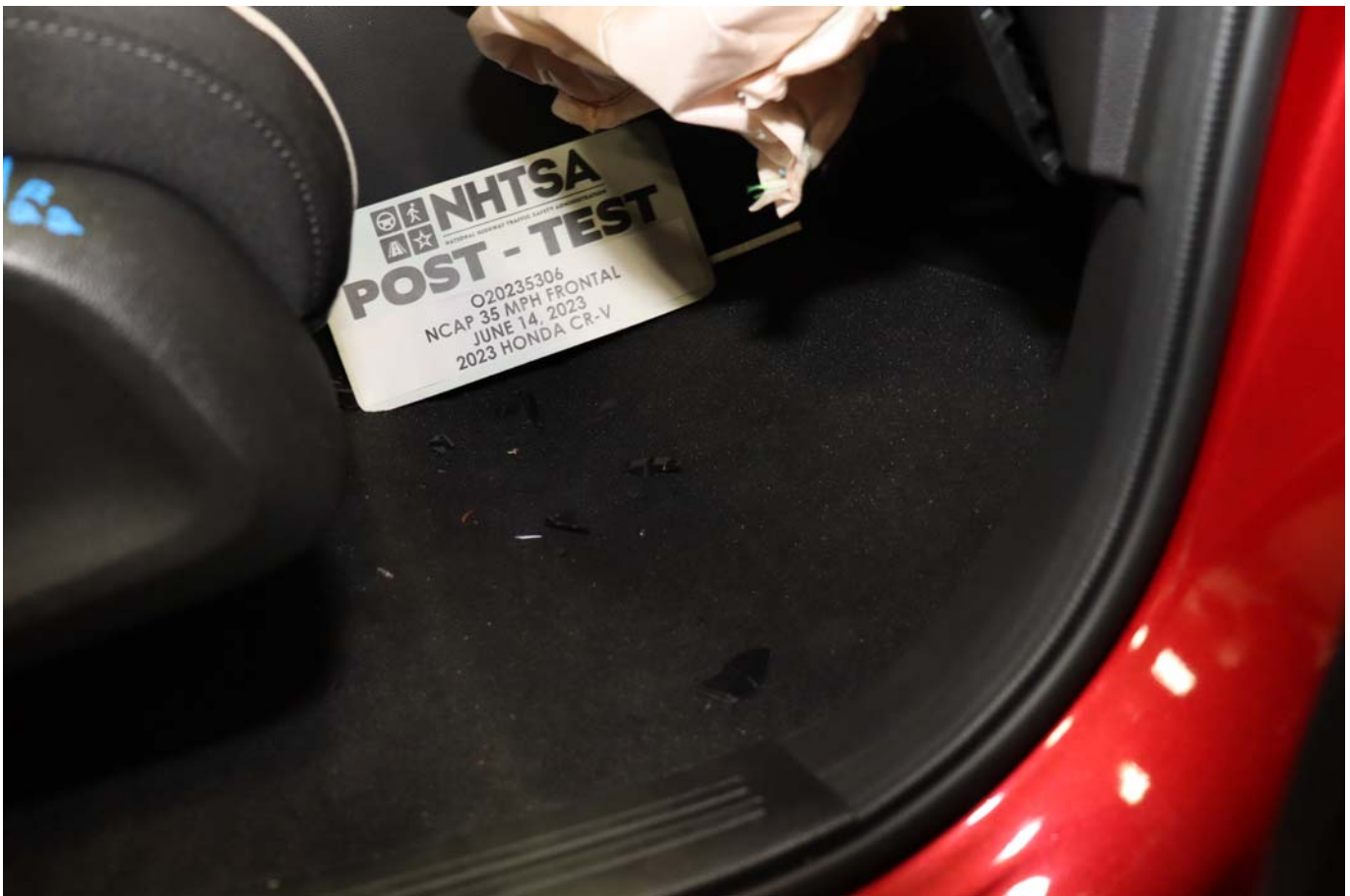


Photo No. 070 - Post-Test Passenger's Side Floorpan



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

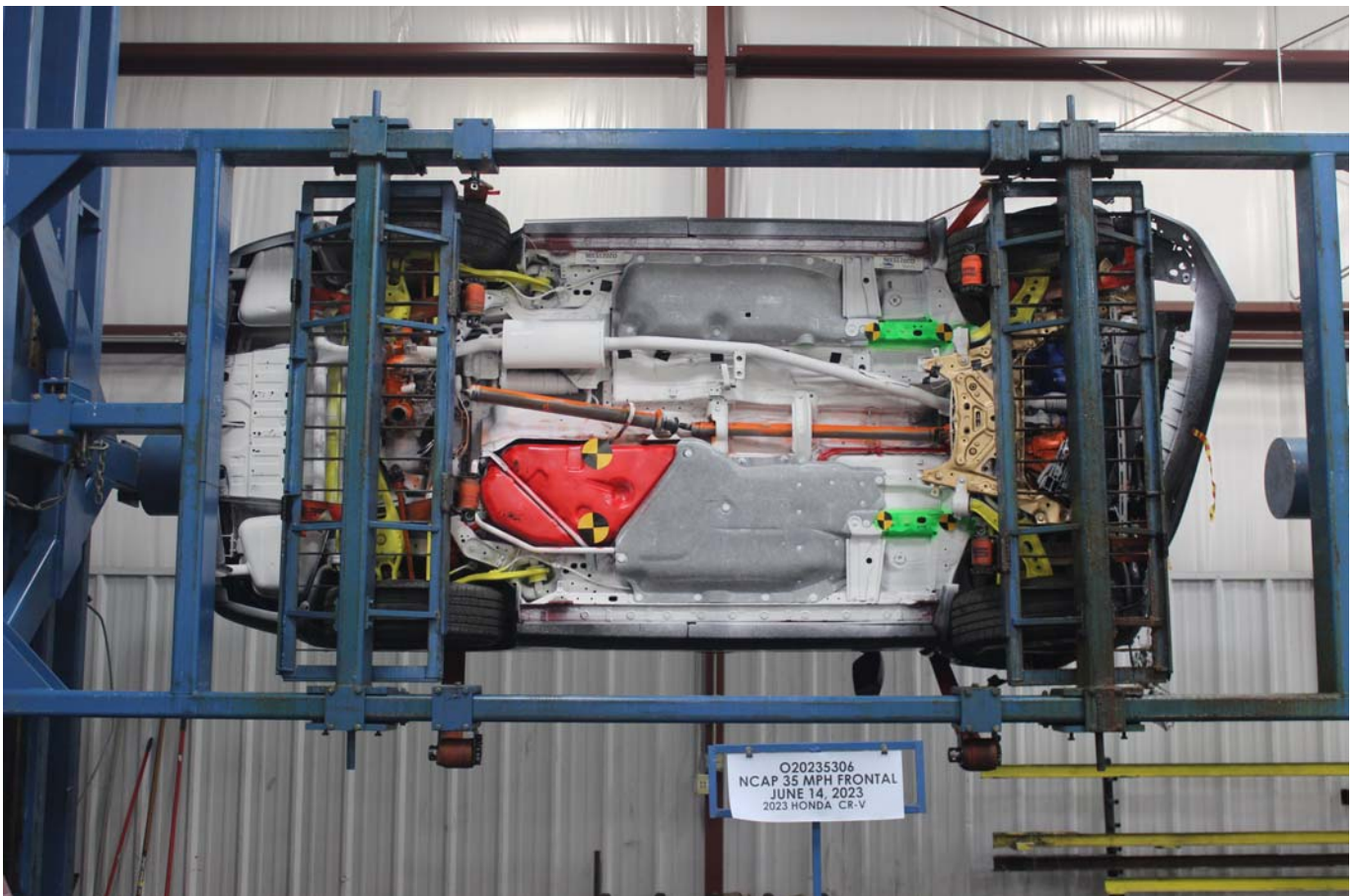


Photo No. 078 - Vehicle at 90 Degrees on Static Rollover Device



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



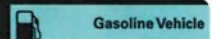
Photo No. 082 - 2023 Honda CR-V AWD EX 5-Door SUV Frontal Impact Event



2023 CR-V 1.5T AWD EX

EXT: RADIANT RED M ENGINE NUMBER: L15BE-7003054
INT: GRAY

EPA DOT Fuel Economy and Environment



Fuel Economy

29 MPG
combined city/hwy

27 city
32 highway

Small SUVs range from 14 to 123 MPG. The best vehicle rates 132 MPG.

You Save \$250
in fuel costs over 5 years compared to the average new vehicle.

3.4 gallons per 100 miles

STANDARD EQUIPMENT AT NO EXTRA COST

- TECHNICAL FEATURES ***
 - 190hp 1.5-Liter Direct Injection Turbo-Charged 4-Cylinder Engine
 - All-Wheel Drive System
 - Continuously Variable Transmission (CVT)
 - 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 Airbag
 - Vehicle Stability Assist (VSA)
 - Anti-Lock Braking System (ABS)
 - Electronic Brake Distribution (EBD)
 - Brake Assist
 - Tire Pressure Monitoring System
 - LED Daytime Running Lights
 - LATCH System for Child Seats
- INTERIOR FEATURES ***
 - Audio System with 6 Speakers
 - 7" Color Touchscreen with Multi-View Rear Camera
 - Apple CarPlay/Android Auto Integration
 - Rear Cross Traffic Monitor
 - TFT Meter Display
 - Push-Button Start
 - Driver Attention Monitor
 - Bluetooth HandsFreeLink
 - USB Audio Interface
- EXTERIOR FEATURES ***
 - Power Moonroof with Tilt Feature
 - Blind Spot Information System (BSI)
 - 18" Alloy Wheels
 - 235/60 R18 All-Season Tires
 - LED Headlights & Taillights
 - Auto-On/Off Headlights
 - Variable Intermittent Windshield Wipers
 - Heated Power Door Mirrors with Turn Indicators
 - Tailgate Spoiler
 - Smart Entry System with Security System
 - Remote Engine Start
 - Capless Fuel Filler
- HONDA SENSING ***
 - Adaptive Cruise Control (ACC)
 - Collision Mitigation Braking System (CMBS)
 - Lane Keeping Assist System (LKAS)
 - Road Departure Mitigation (RDM)
 - Traffic Jam Assist

Manufacturer's Suggested Retail Price **\$33,110.00**

Full Tank of Fuel **No Charge**

-Honda Roadside Assistance
3YR/50K Mile Warranty Term

Premium Exterior Color **455.00**

Destination and Handling **1,295.00**

TOTAL VEHICLE PRICE
(includes Pre-Delivery Service)

\$34,860.00

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 \$1,550

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

1 6 10 Best

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

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs \$8,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.29 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: **55 %**

Major Sources of Foreign Parts Content:
JAPAN 20 %

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

FOR THIS VEHICLE
Final Assembly Point:
ALLISTON, ONTARIO CANADA

Country of Origin: Engine:
U.S.A

Transmission:
U.S.A

GOVERNMENT 5-STAR SAFETY RATING

Overall Vehicle Score To Be Rated

Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver	To Be Rated
	Passenger	To Be Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
Side Crash	Front seat	To Be Rated
	Rear seat	To Be Rated
Based on the risk of injury in a side impact.		
Rollover		To Be Rated
Based on the risk of rollover in a single vehicle crash.		

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

MCGRATH HONDA OF ST. CHAR
4075 E. MAIN STREET
ST. CHARLES, IL 60174

PORT OF ENTRY: BUFFALO
DELIVERY POINT: CHICAGO
SHIP#: ROW/SPACE: 109-044
TRANS.METHOD: N50 ELWOOD

ORIG. DLR: 207854
REF. NO.: 41290
HN CODE: HN-1970
EMISSION: 50 STATE
CONTROL NO.: 136593
DEALER: 207854



Photo No. 083 - Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

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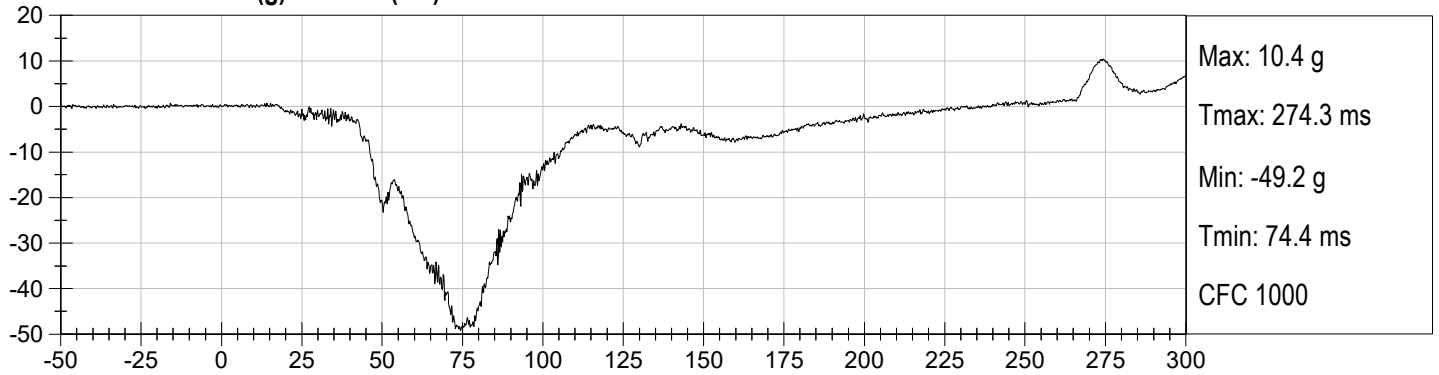
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.gov

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

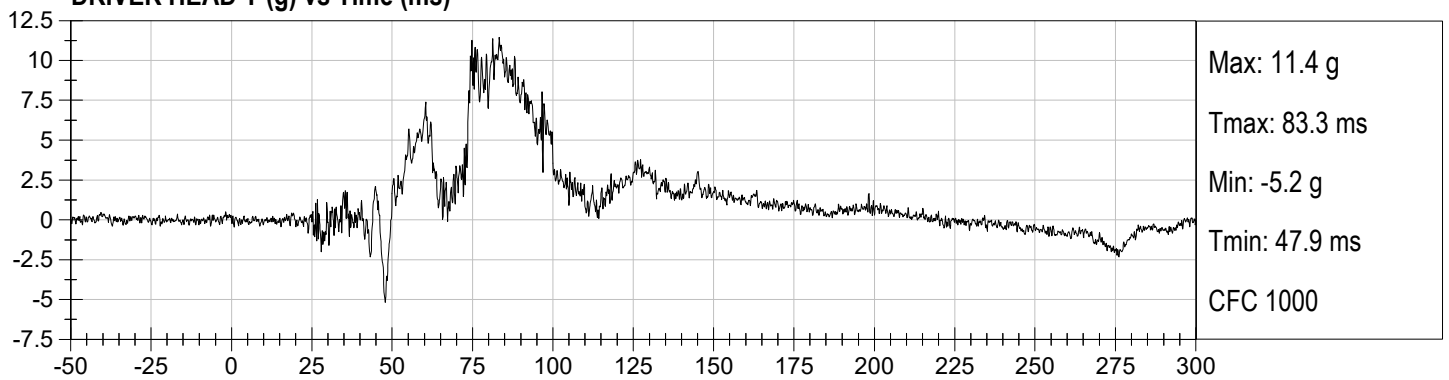
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver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

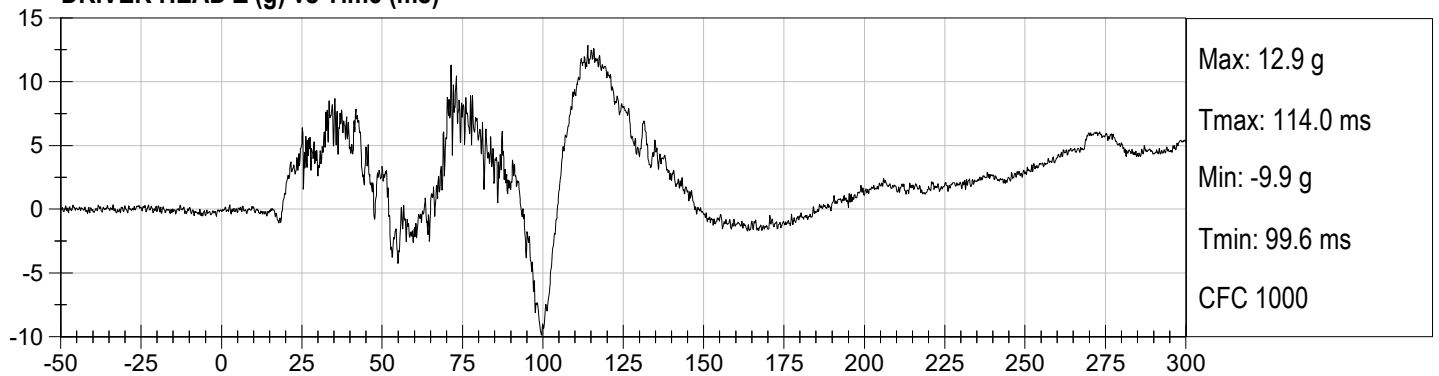
DRIVER HEAD X (g) vs Time (ms)



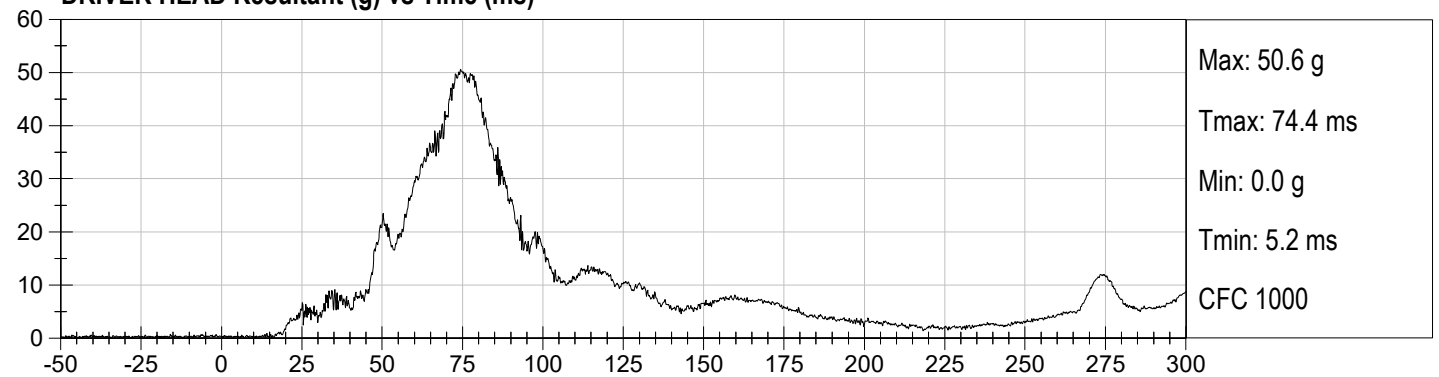
DRIVER HEAD Y (g) vs Time (ms)

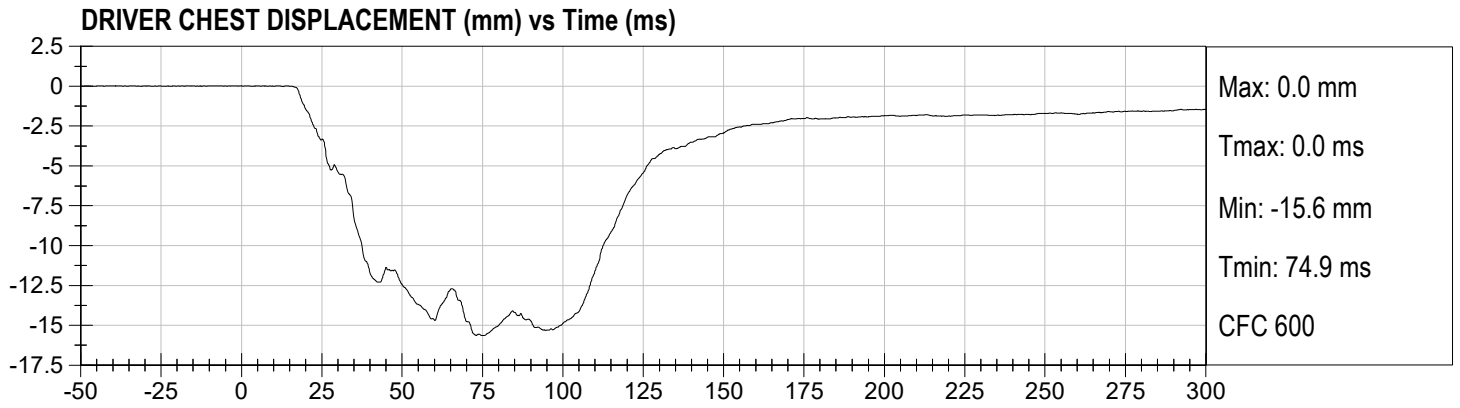


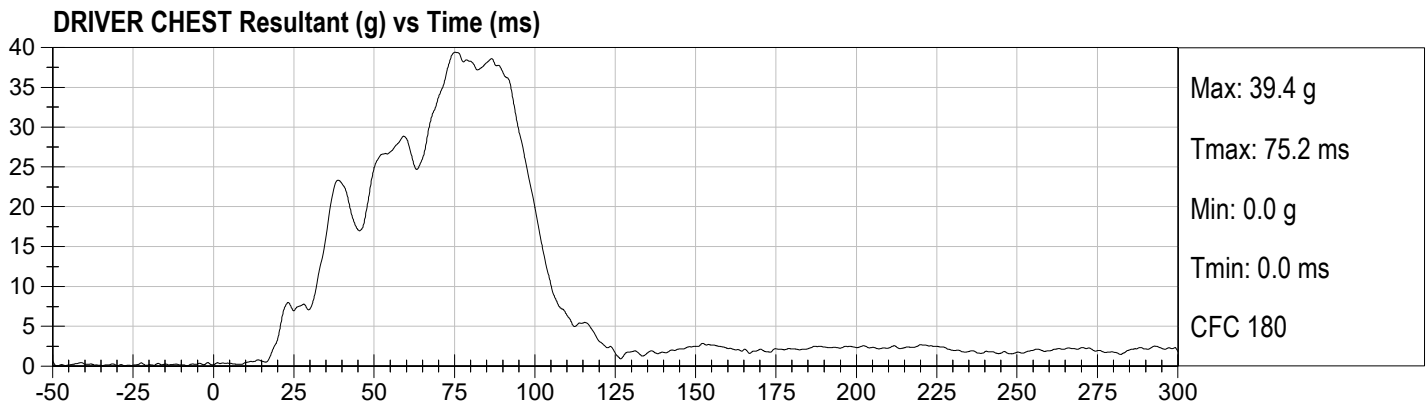
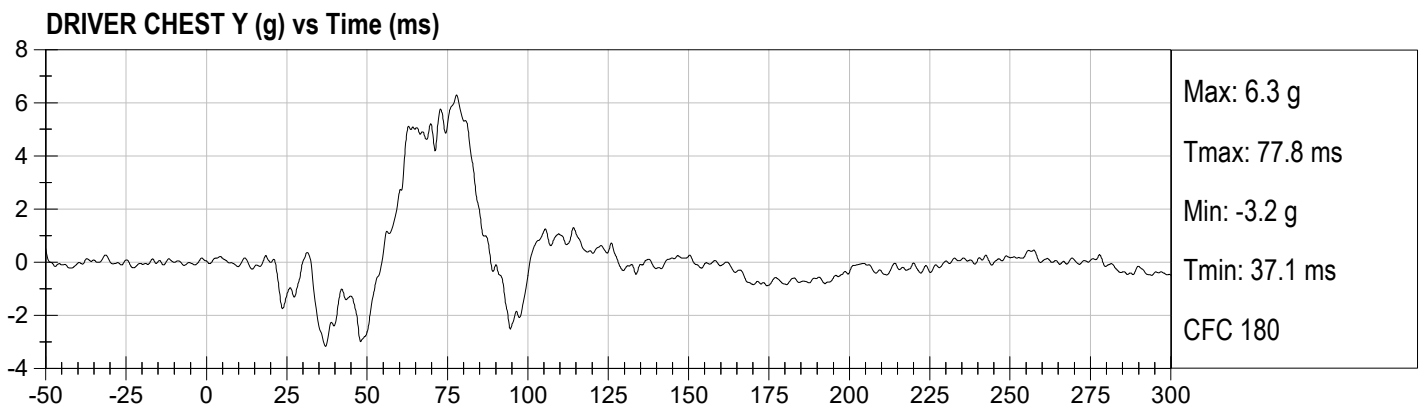
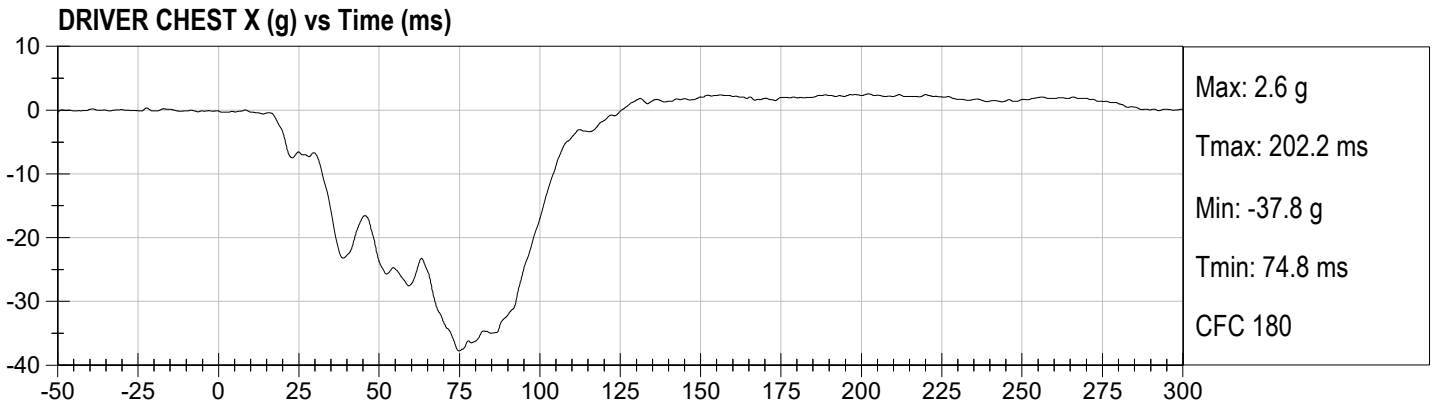
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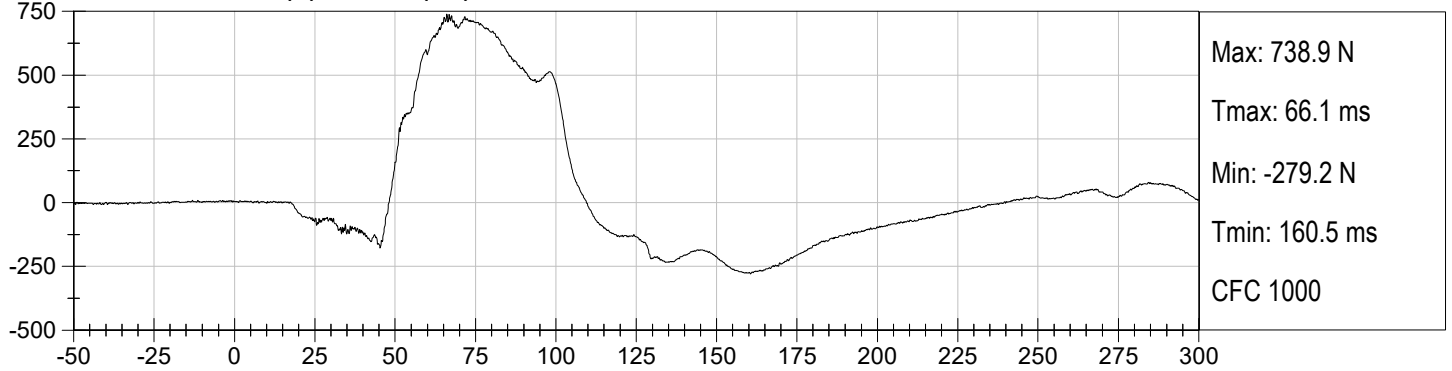
DRIVER HEAD Resultant (g) vs Time (ms)



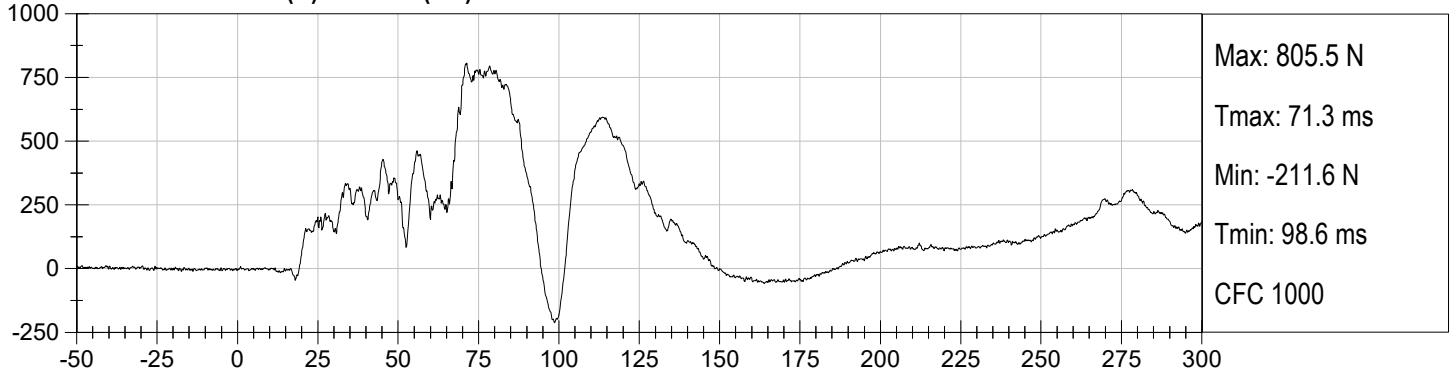




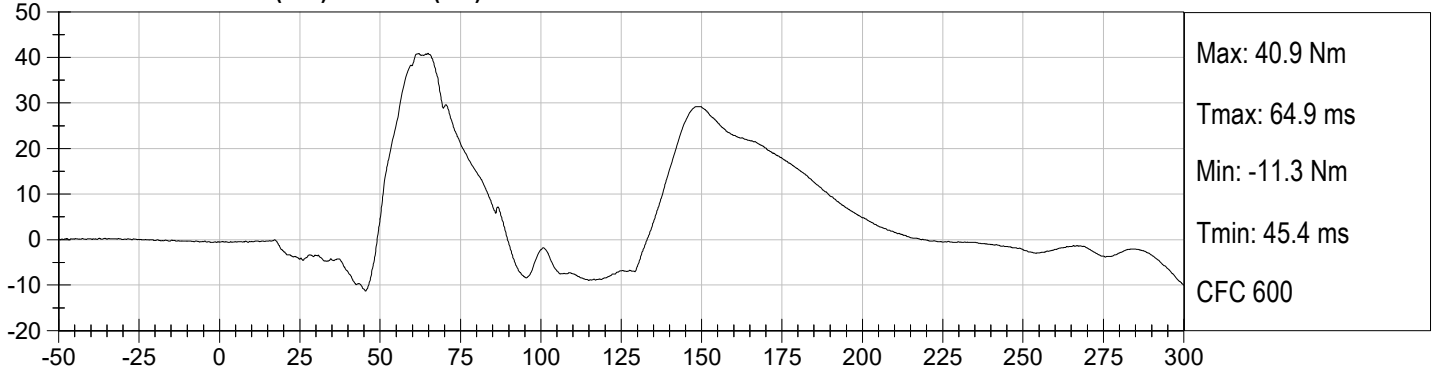
DRIVER NECK FX (N) vs Time (ms)

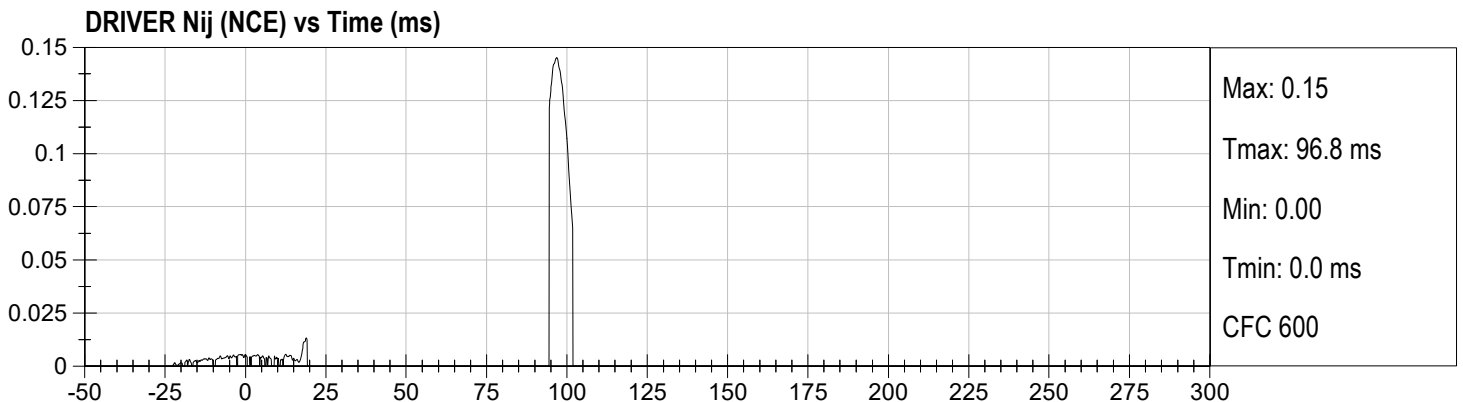
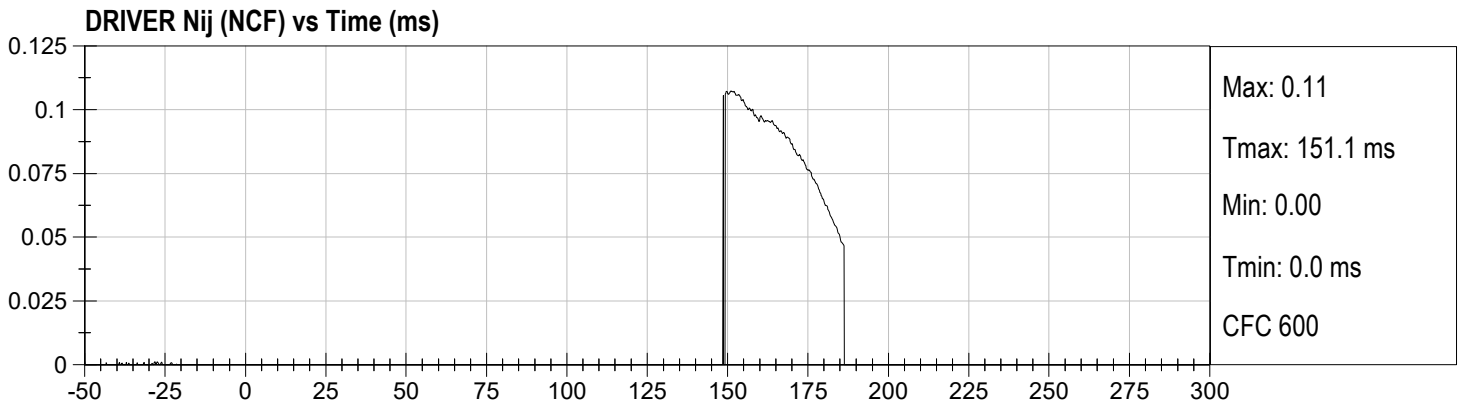
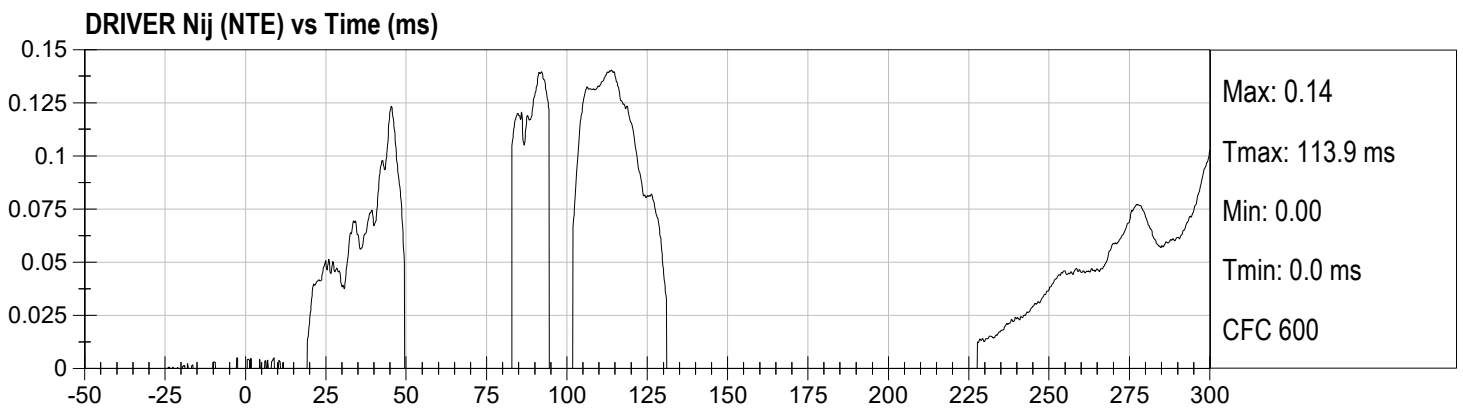
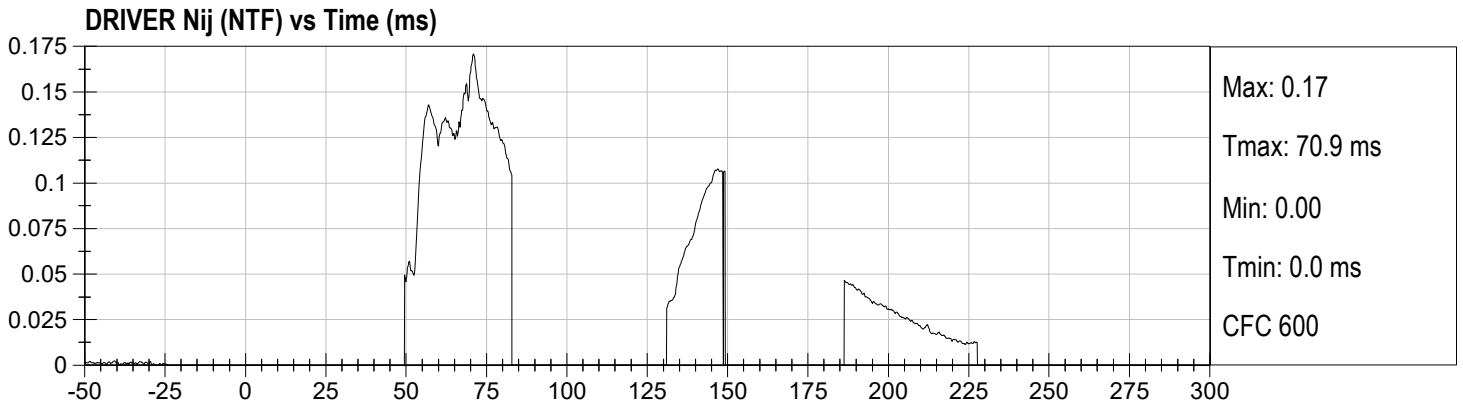


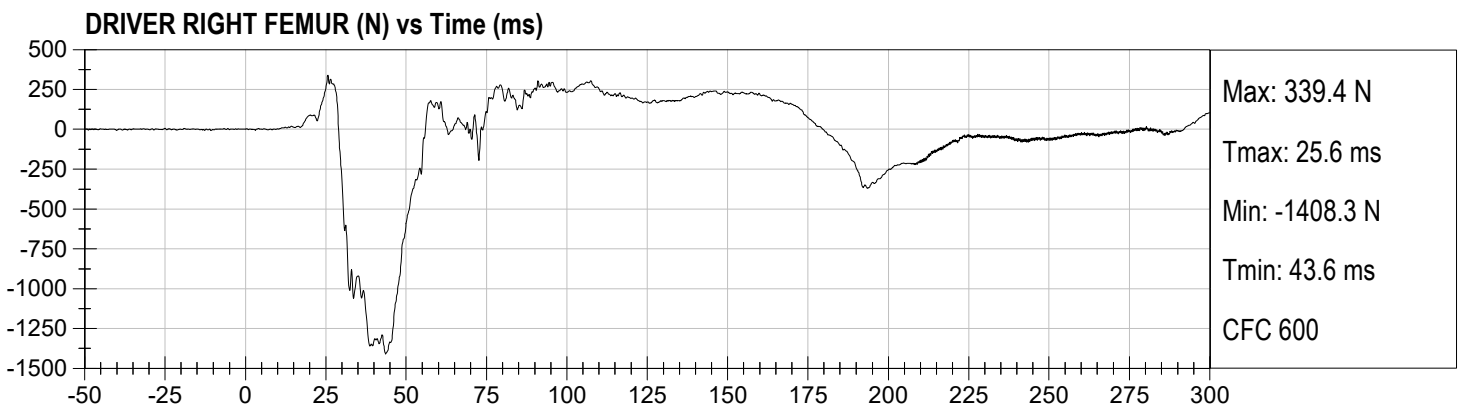
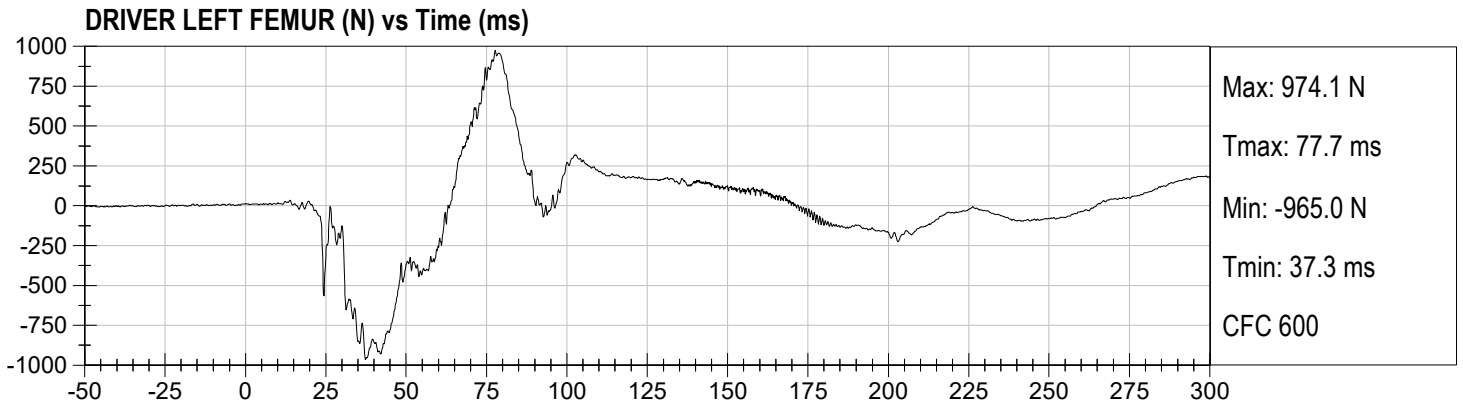
DRIVER NECK FZ (N) vs Time (ms)

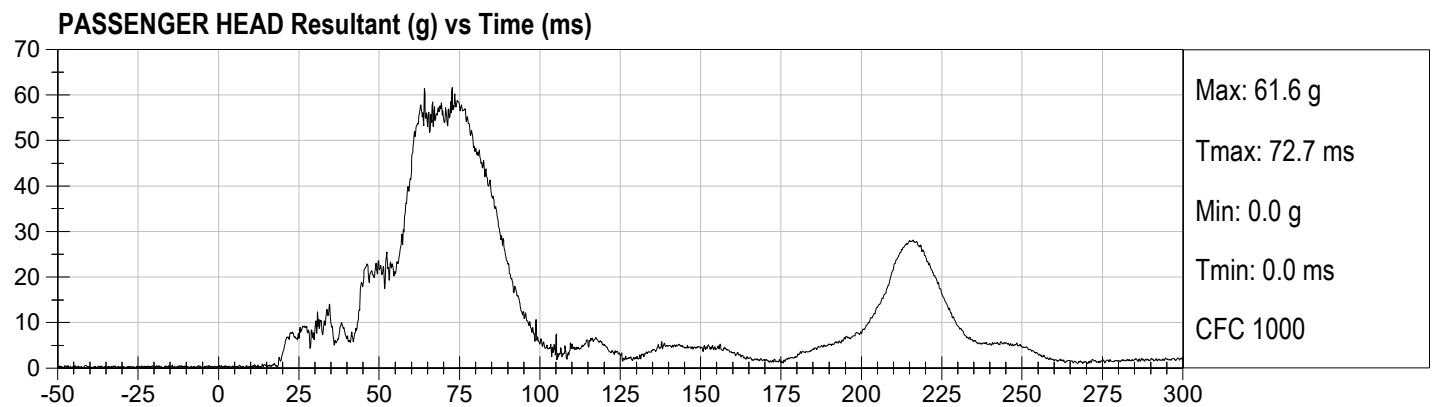
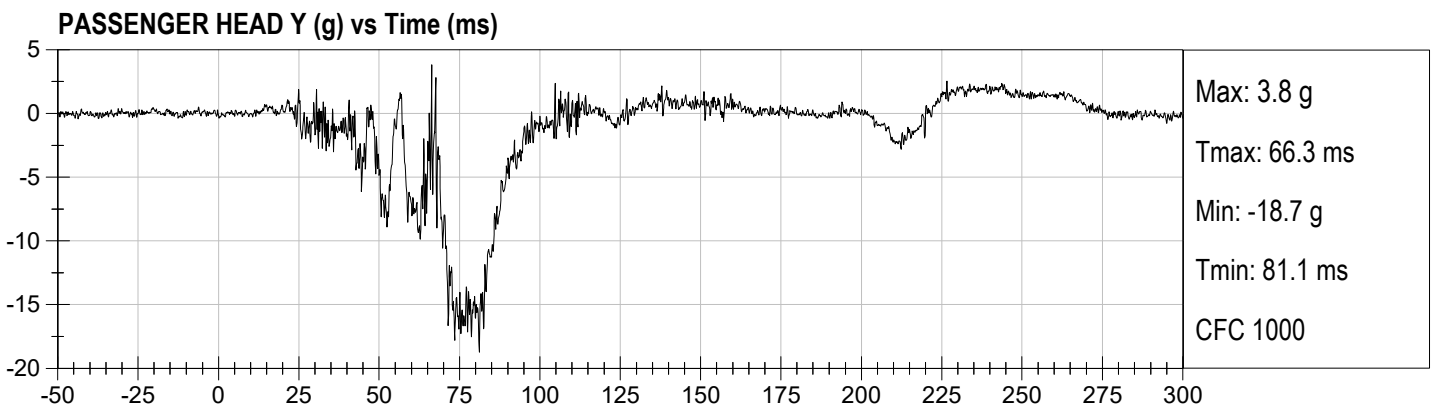
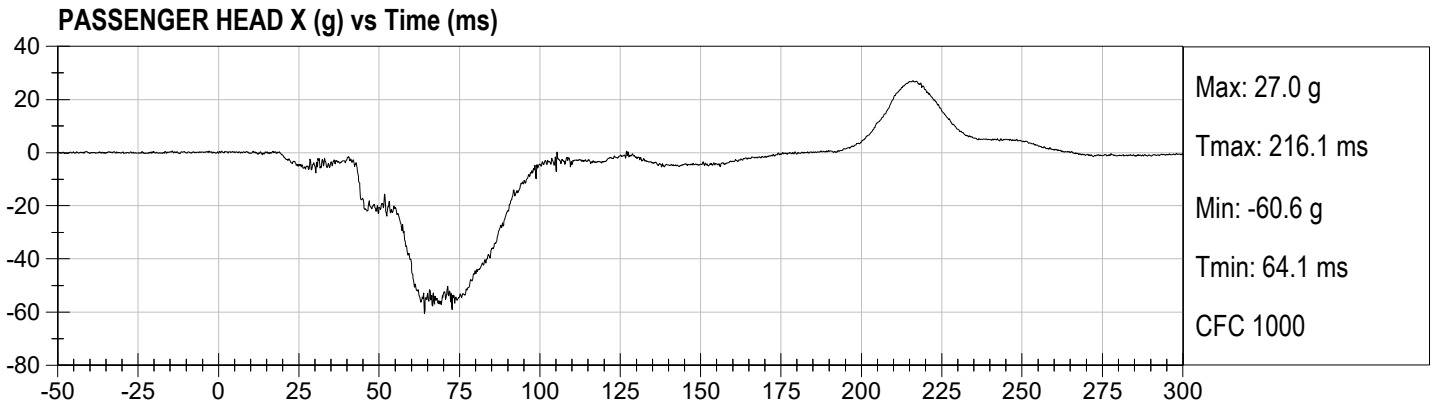


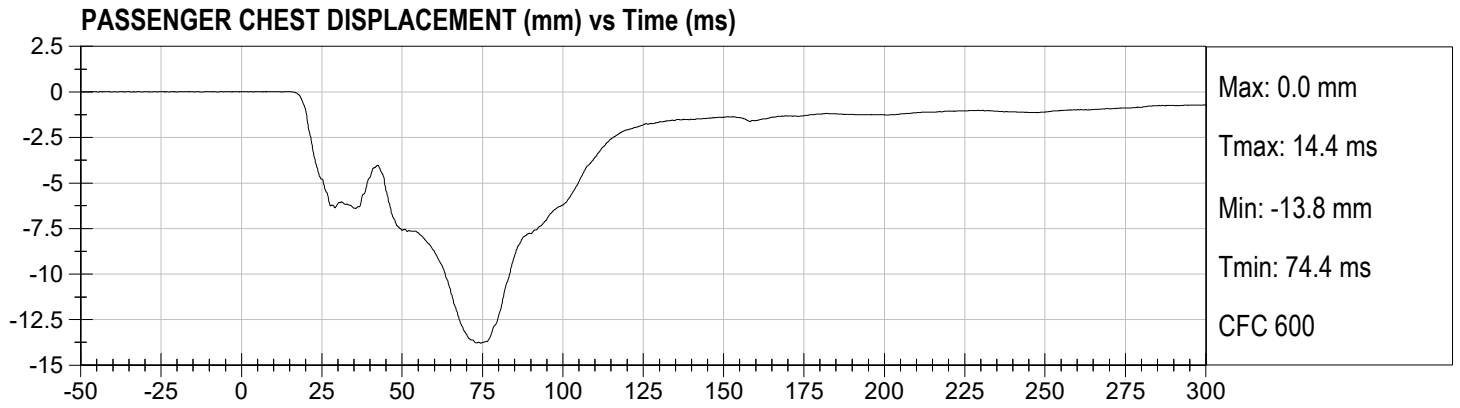
DRIVER NECK MY (Nm) vs Time (ms)



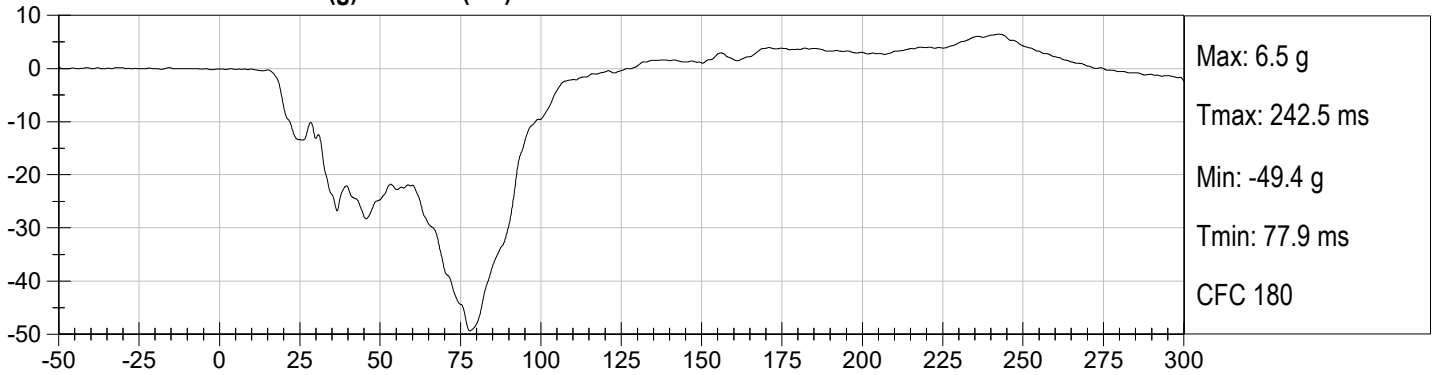




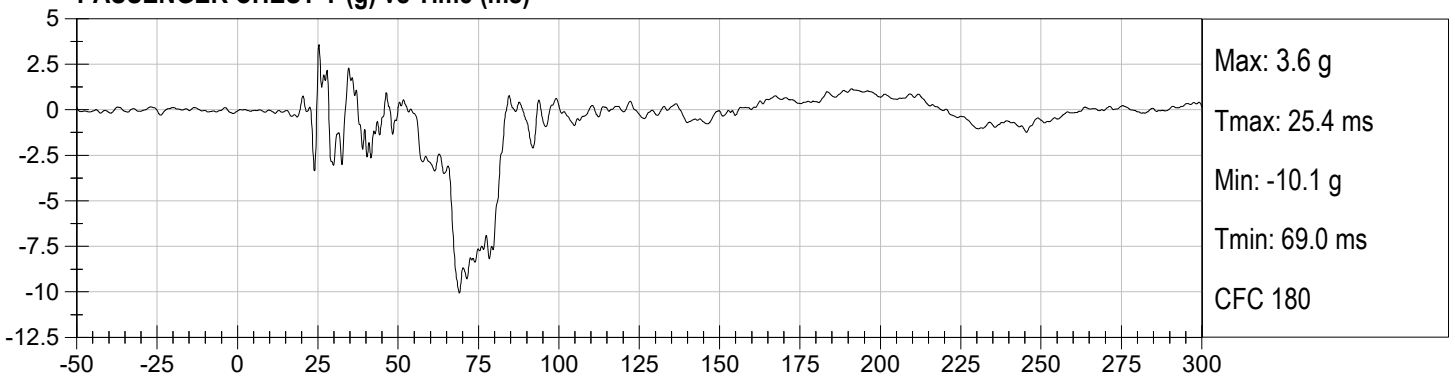




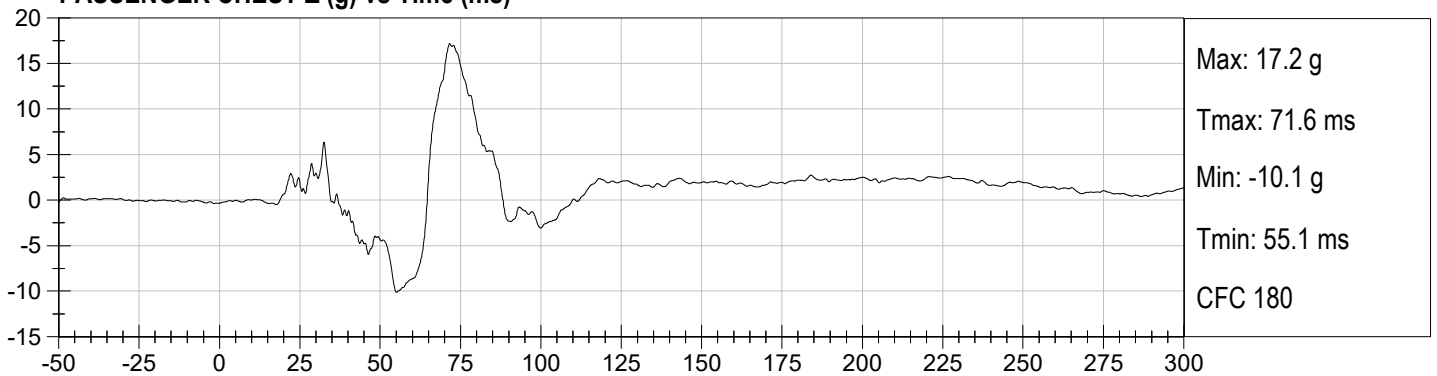
PASSENGER CHEST X (g) vs Time (ms)



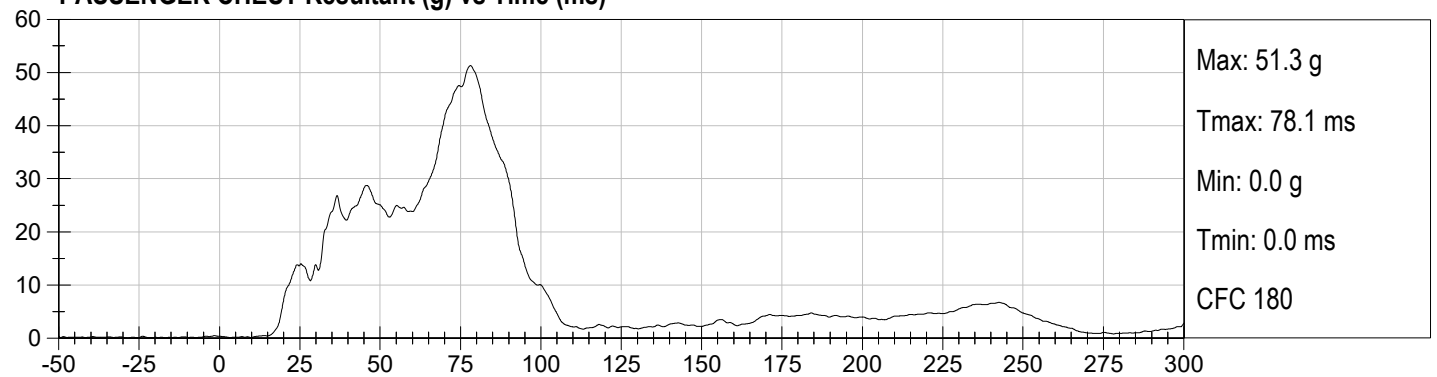
PASSENGER CHEST Y (g) vs Time (ms)



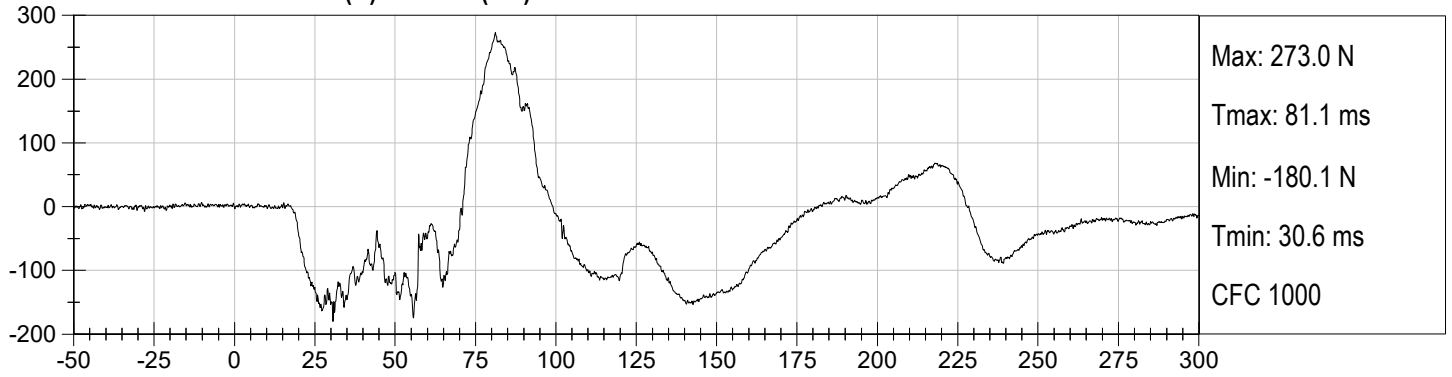
PASSENGER CHEST Z (g) vs Time (ms)



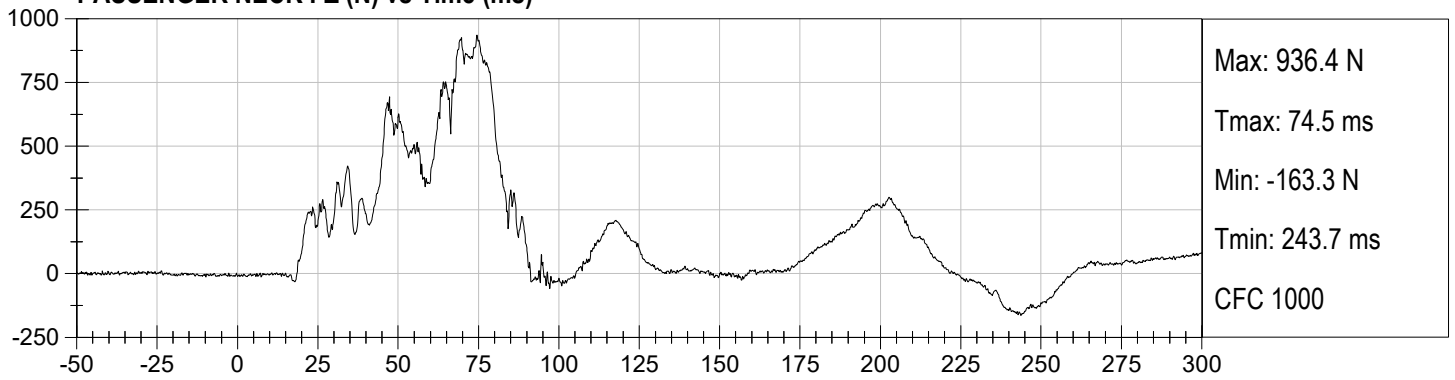
PASSENGER CHEST Resultant (g) vs Time (ms)



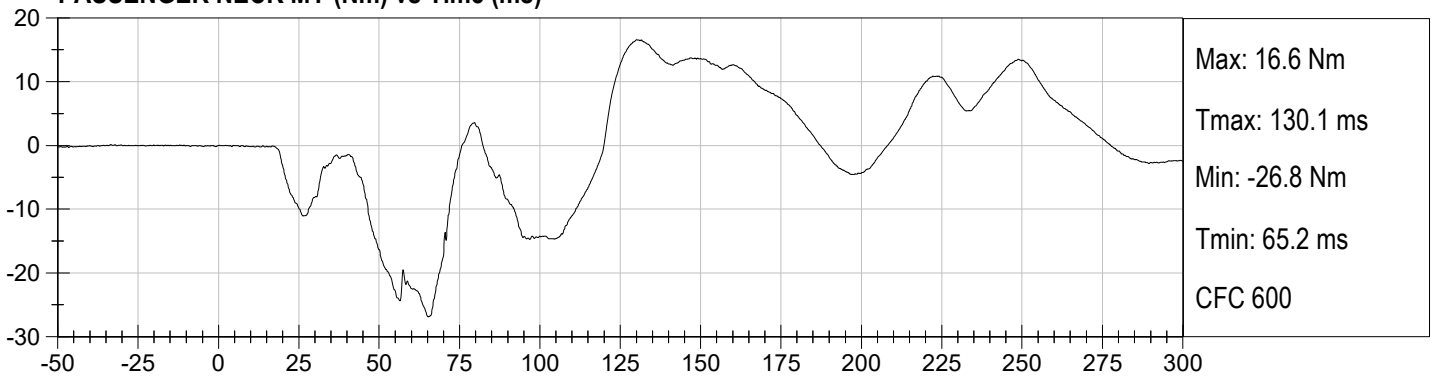
PASSENGER NECK FX (N) vs Time (ms)

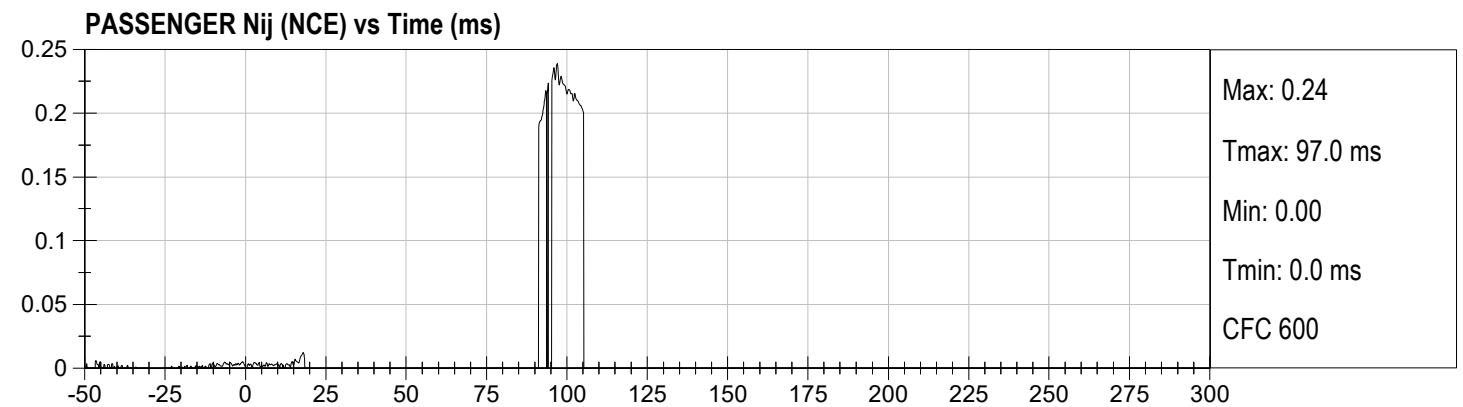
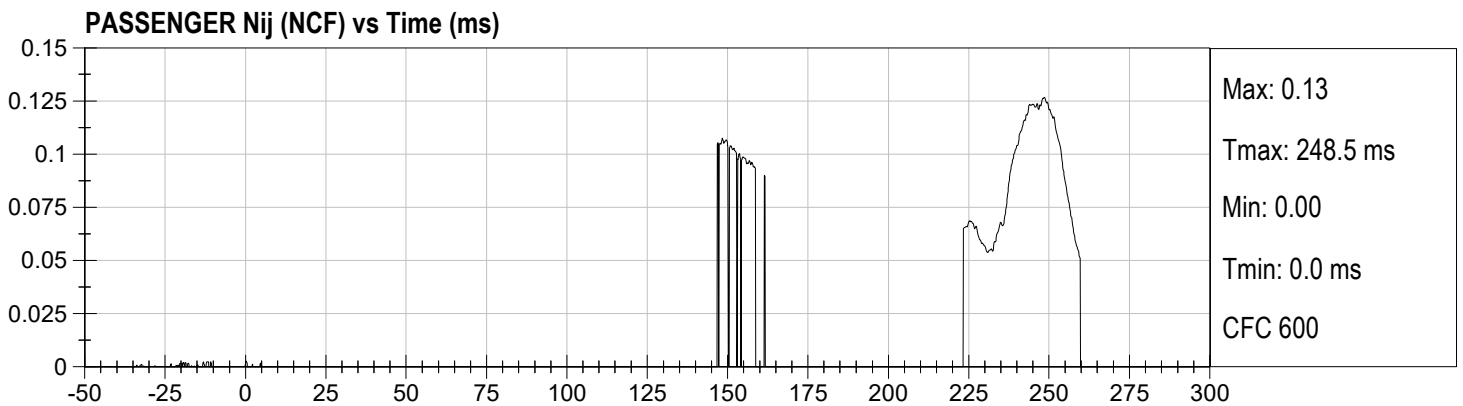
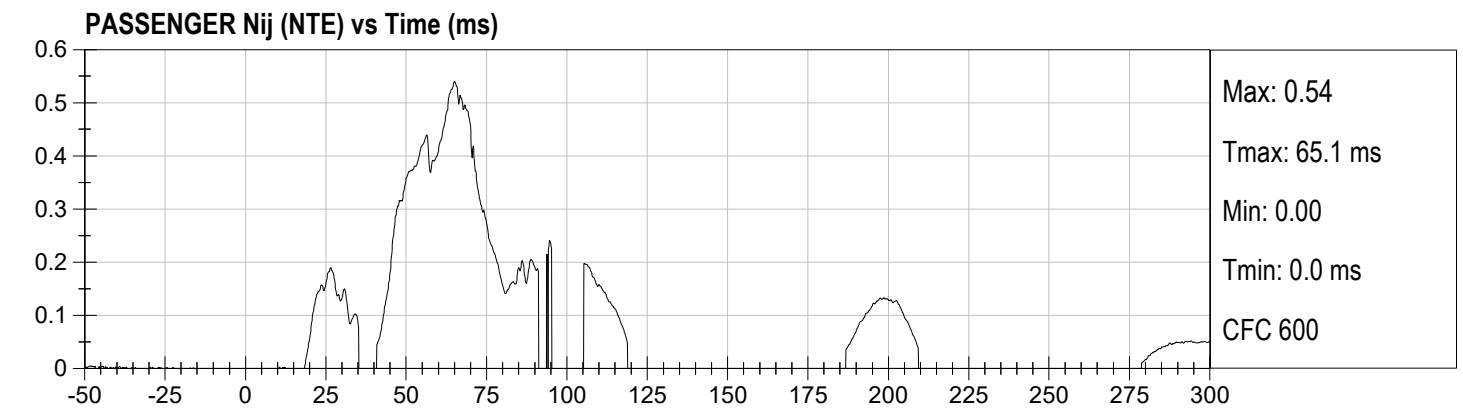
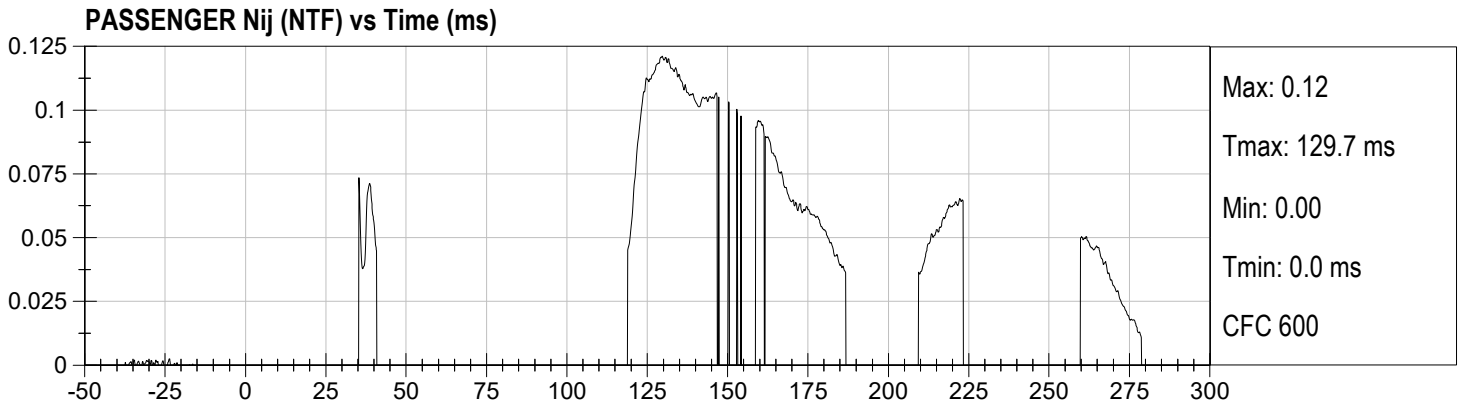


PASSENGER NECK FZ (N) vs Time (ms)

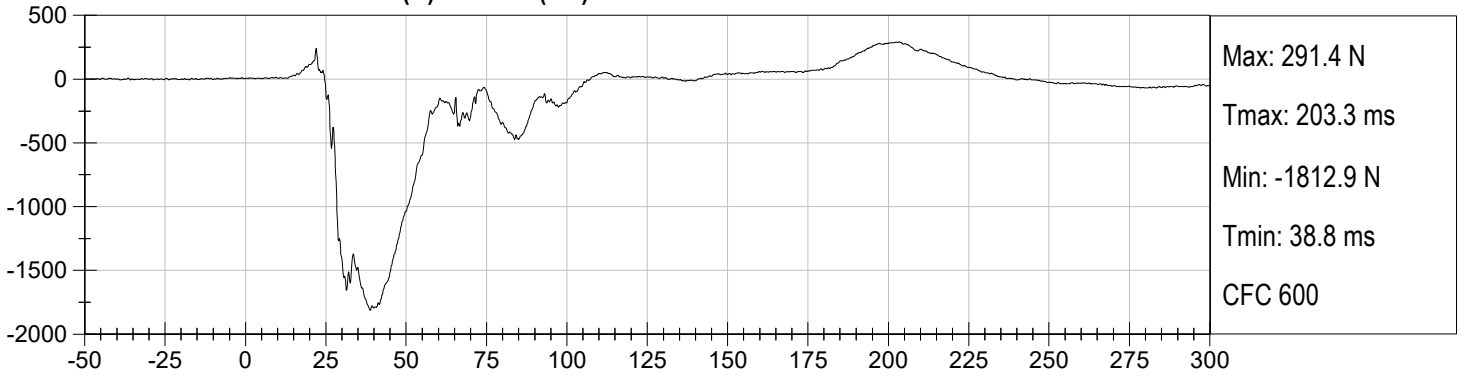


PASSENGER NECK MY (Nm) vs Time (ms)

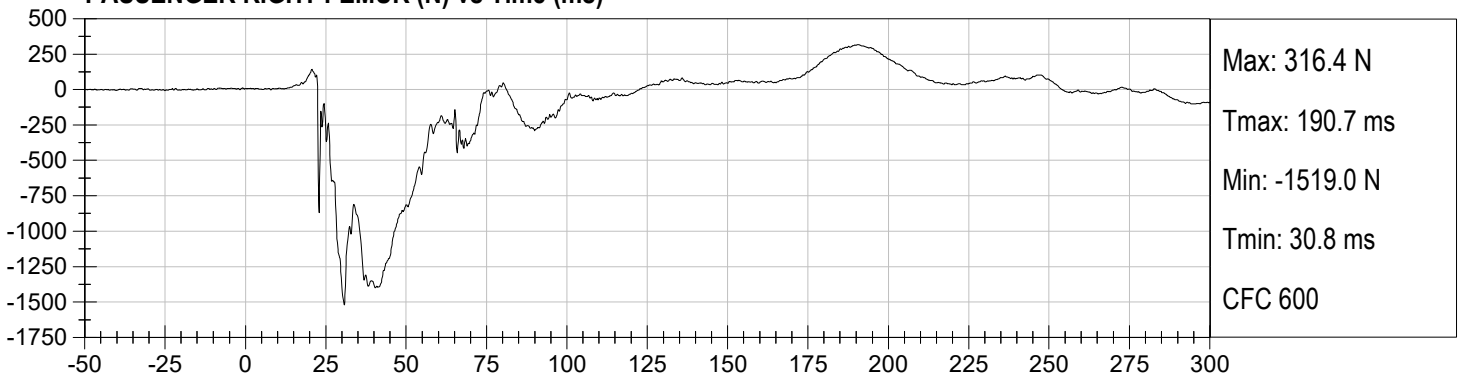




PASSENGER LEFT FEMUR (N) vs Time (ms)



PASSENGER RIGHT FEMUR (N) vs Time (ms)



APPENDIX C
DUMMY QUALIFICATION AND PERFORMANCE VERIFICATION

QUALIFICATION TEST RESULTS

PRE-TEST

HYBRID III 50TH 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

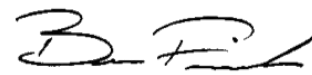
ATD Serial No: 351

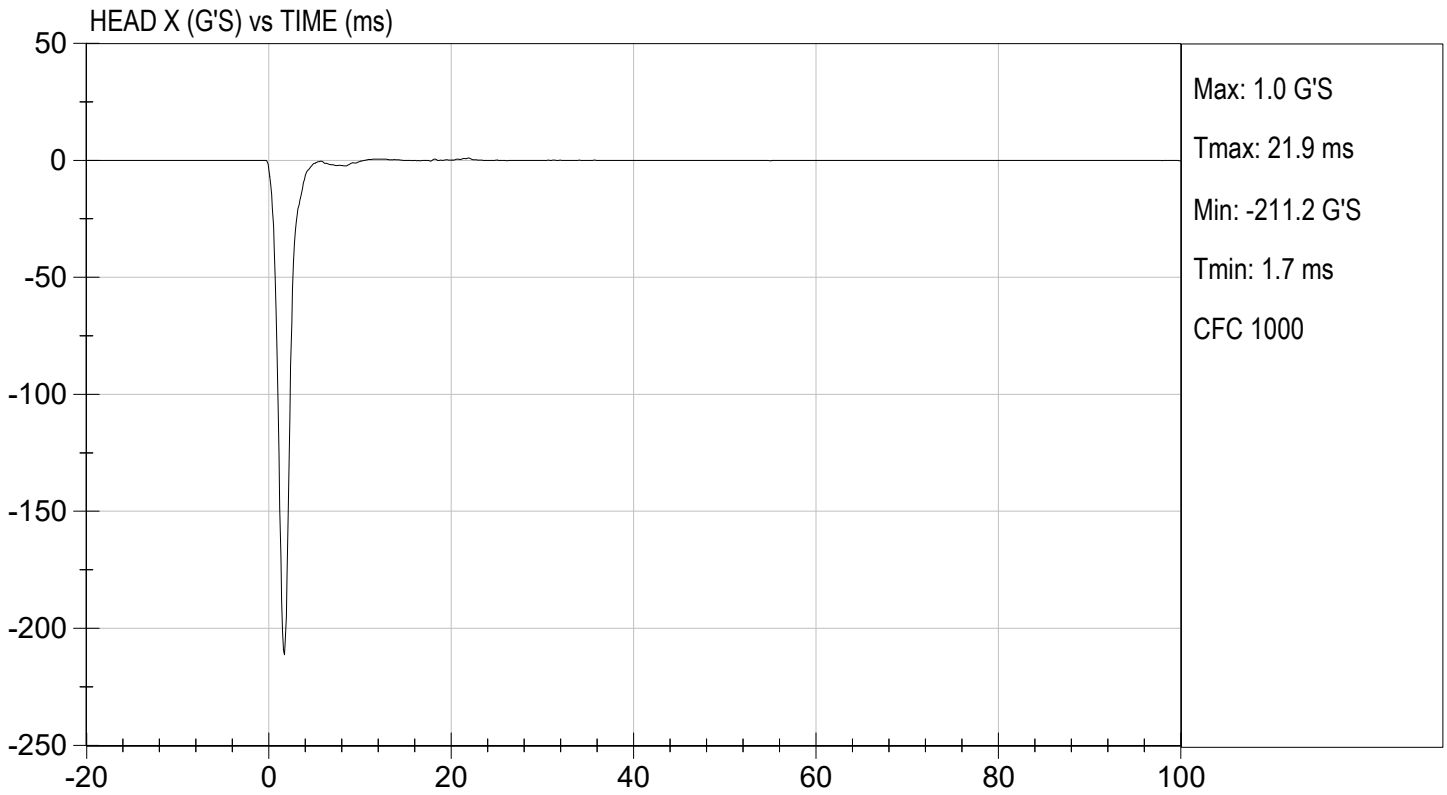
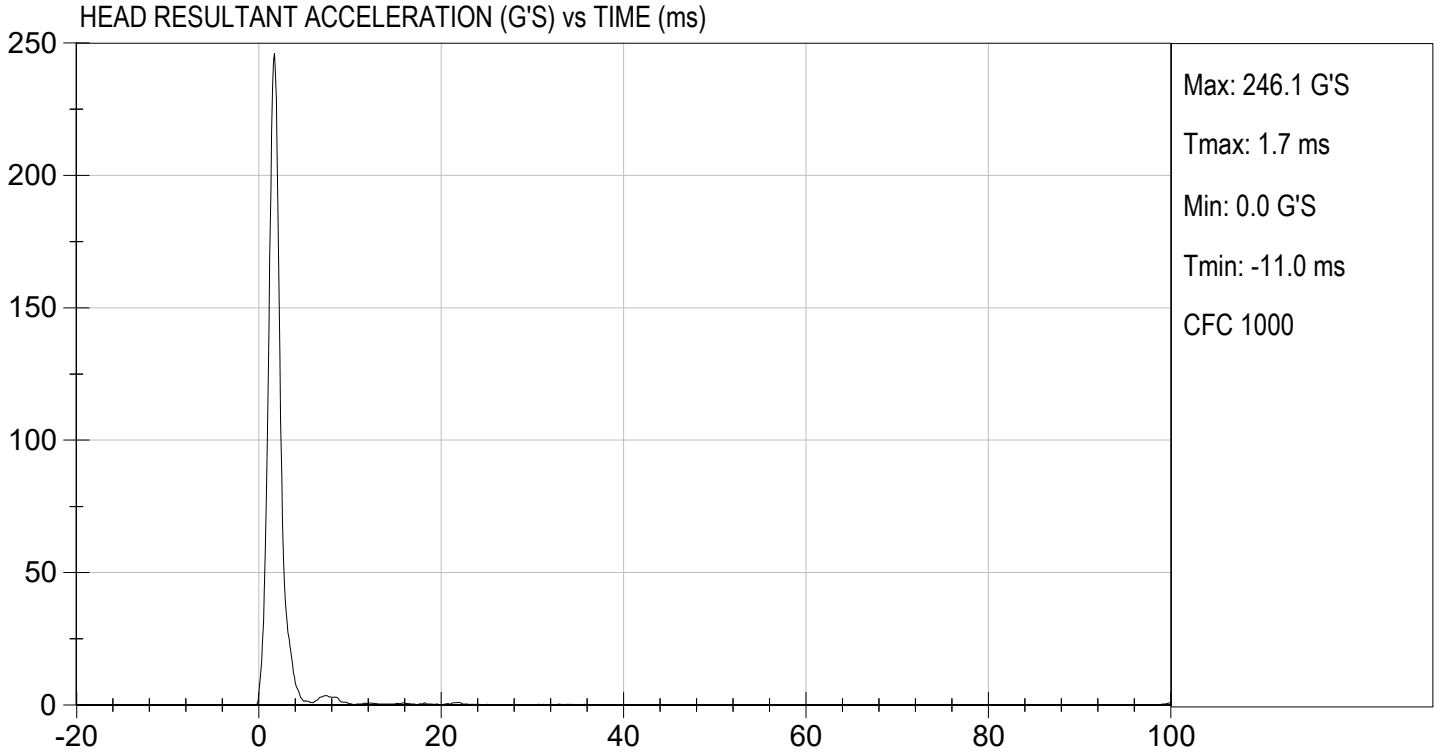
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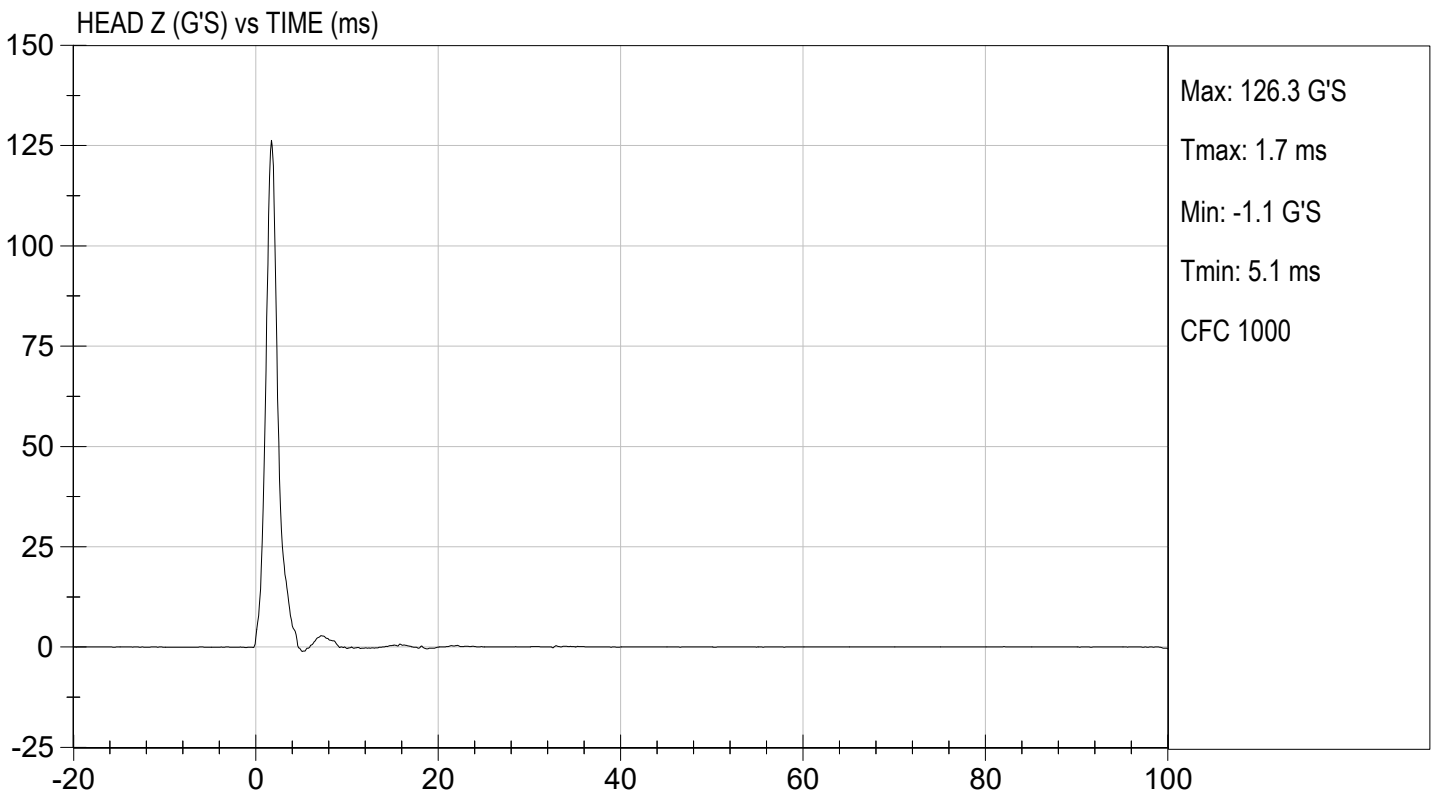
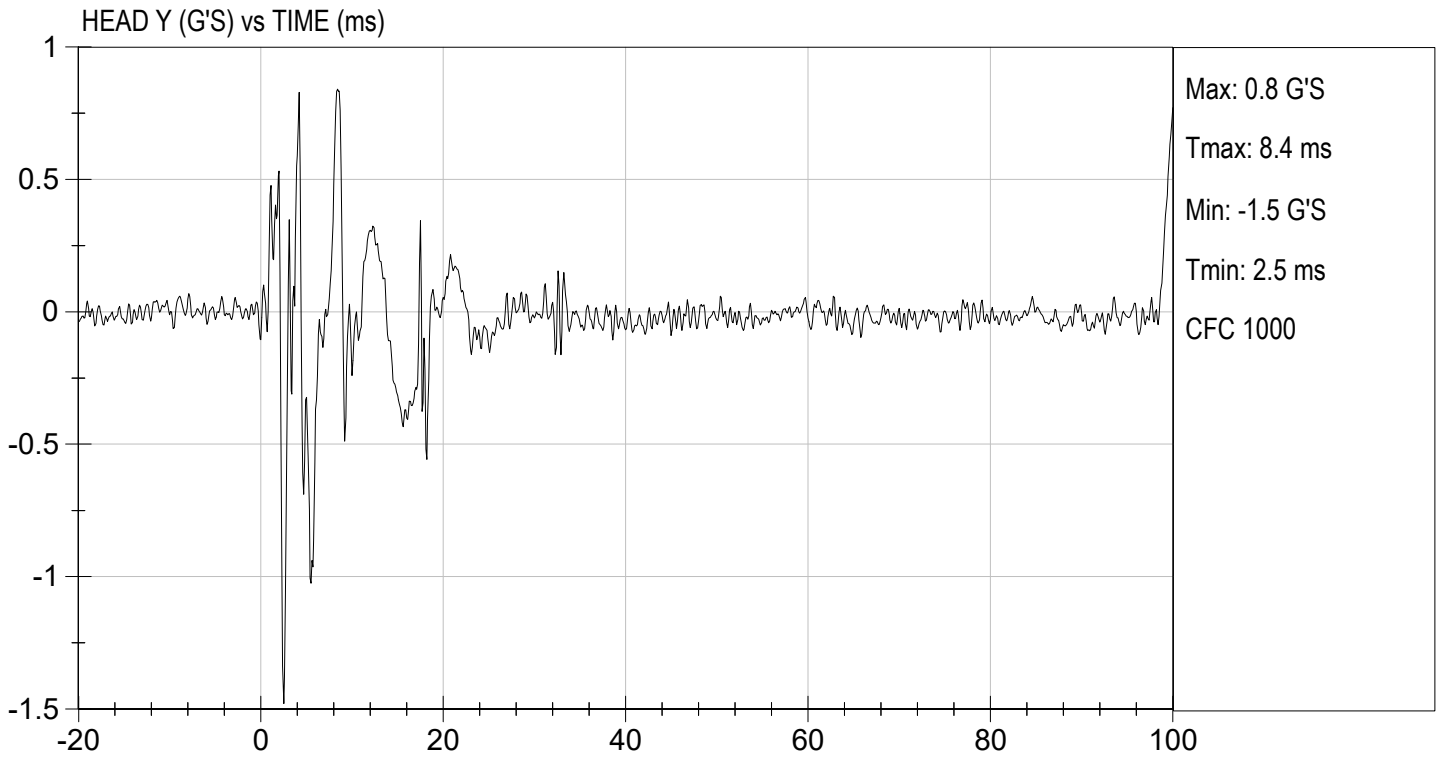
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	225 to 275	246	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-1.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

05/19/2023
 Test Date


 Approved By





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

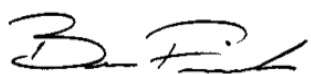
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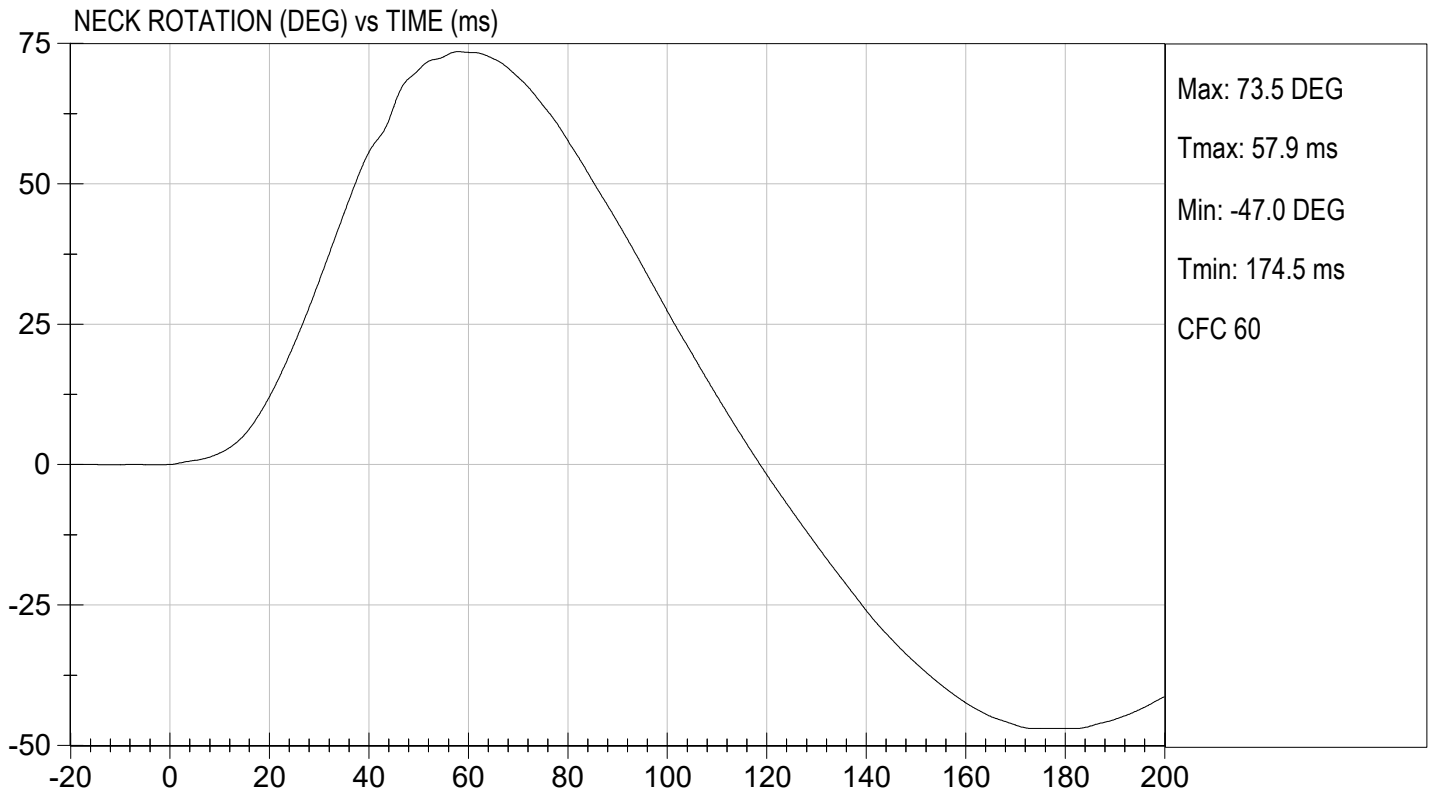
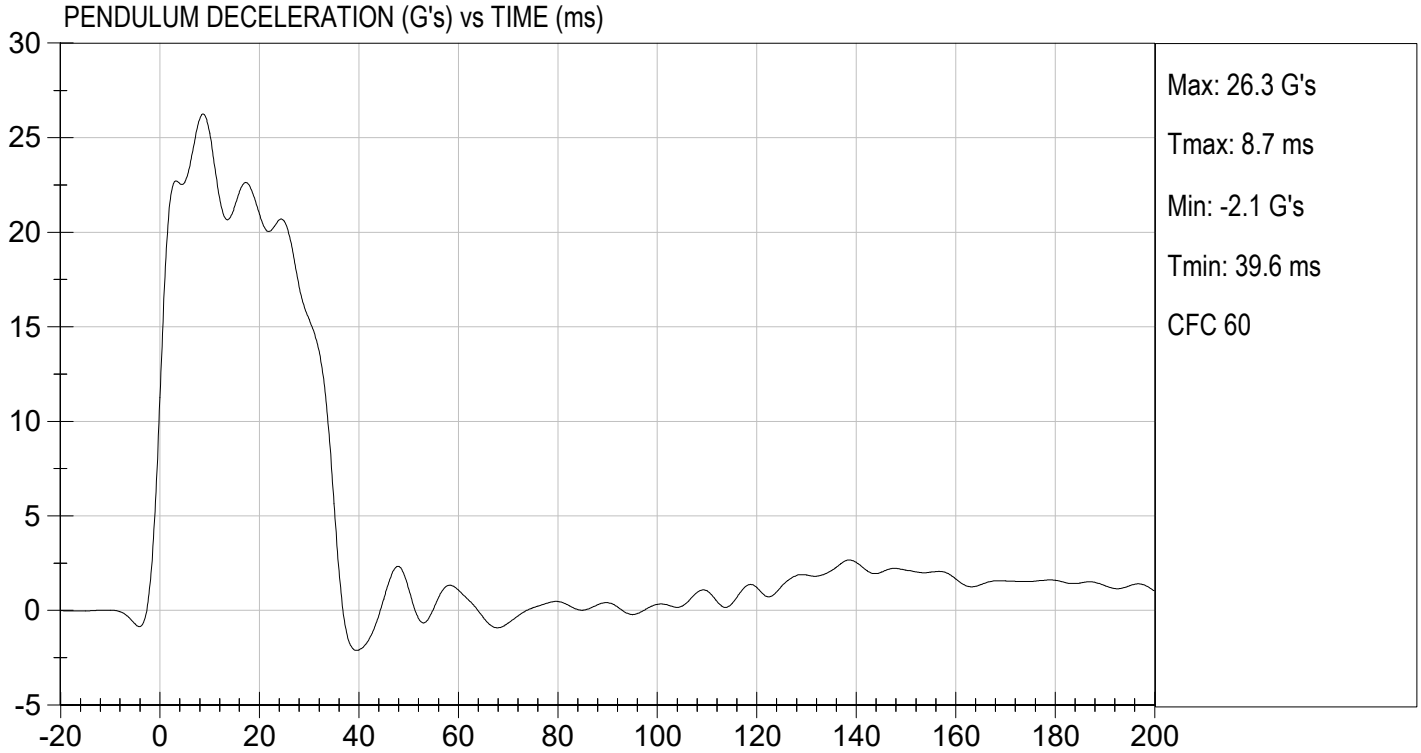
Test I.D.: D231252

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	41	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	25.23	Pass
	20 ms	G's	17.60 to 22.60	20.96	Pass
	30 ms	G's	12.50 to 18.50	15.38	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	35.2	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	73.5	Pass
	Time	ms	57.0 to 64.0	57.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	118.8	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	94.4	Pass
	Time	ms	47.0 to 58.0	47.2	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.9	Pass
Overall Test Results					Pass


 Laboratory Technician

05/19/2023
 Test Date

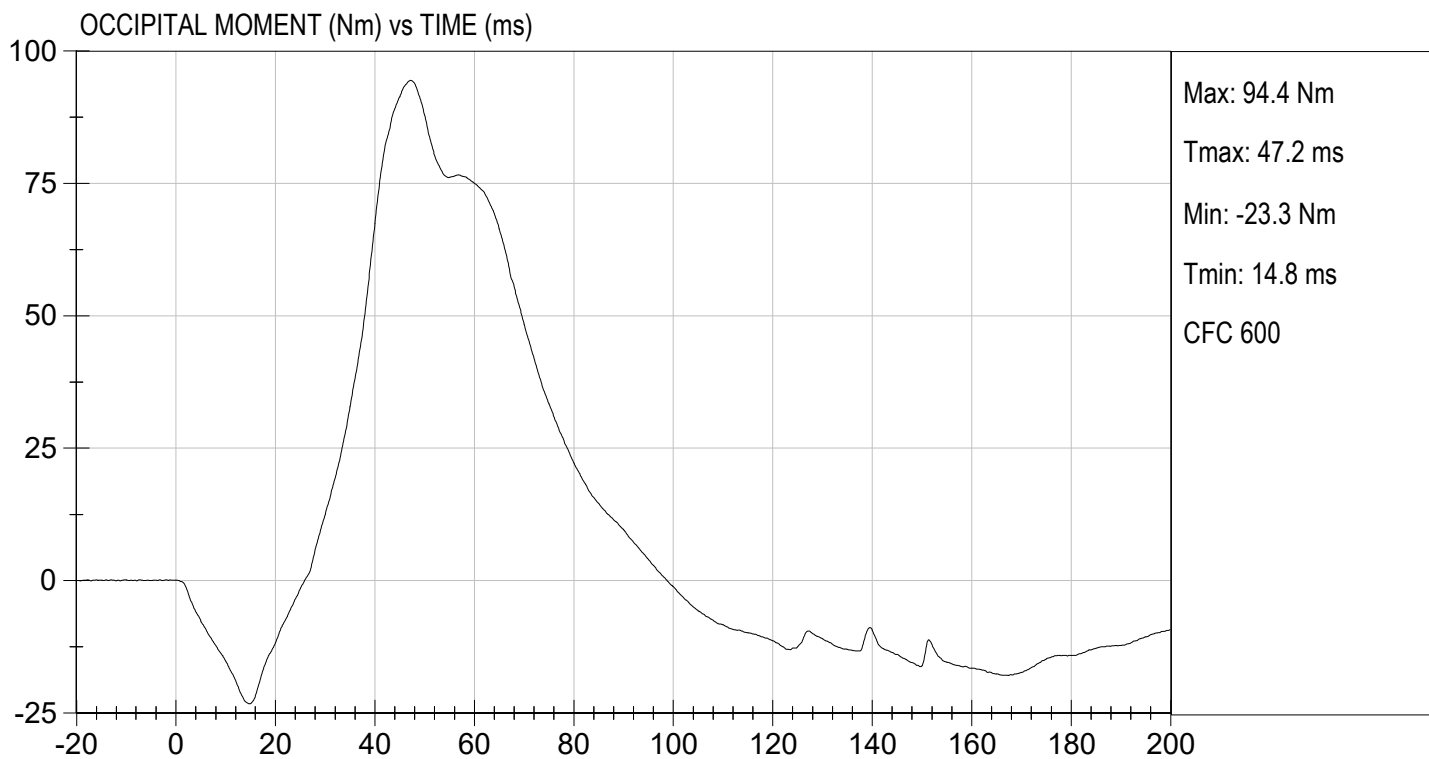

 Approved By





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

TEST DATE: 05/19/2023
TEST #: D231252



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

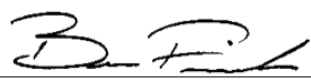
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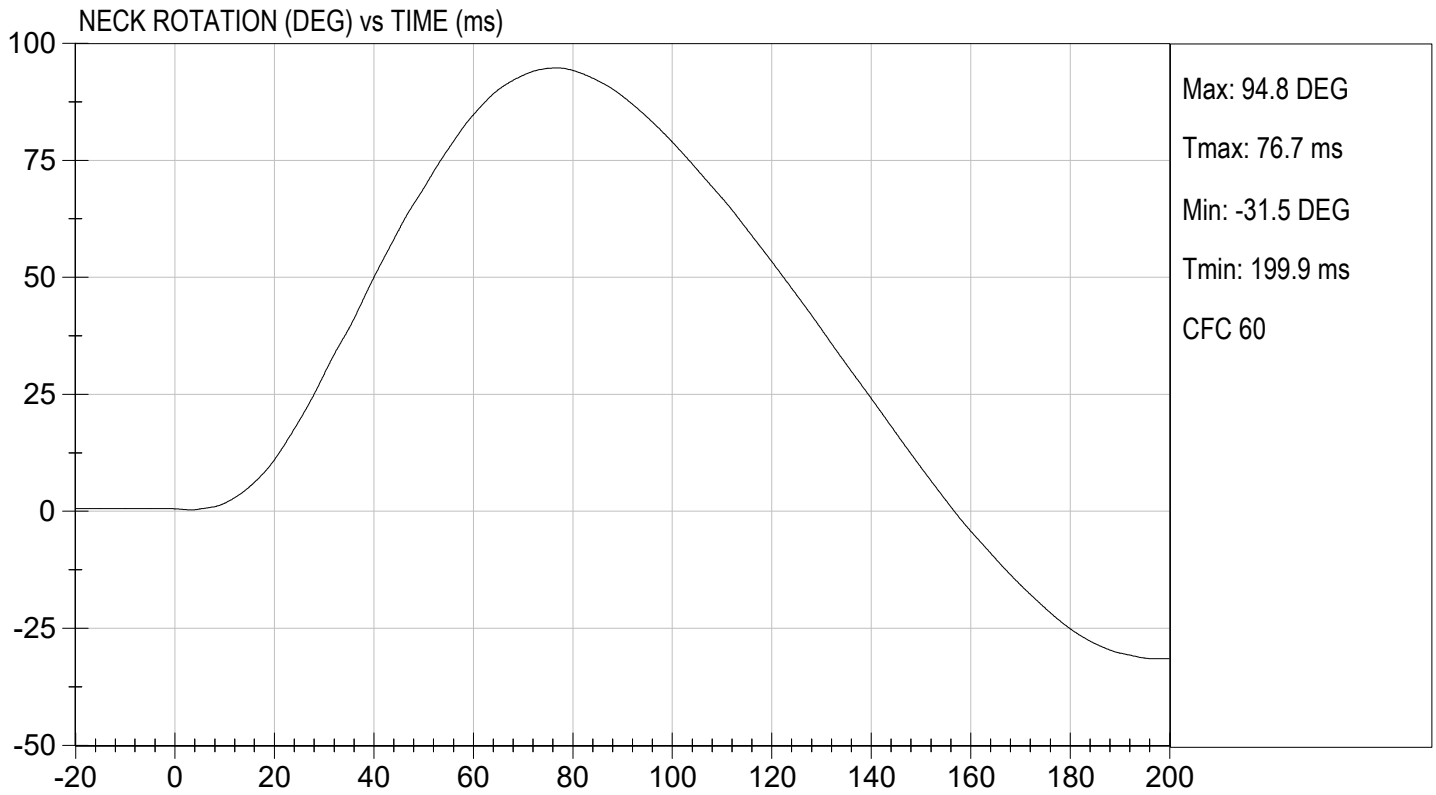
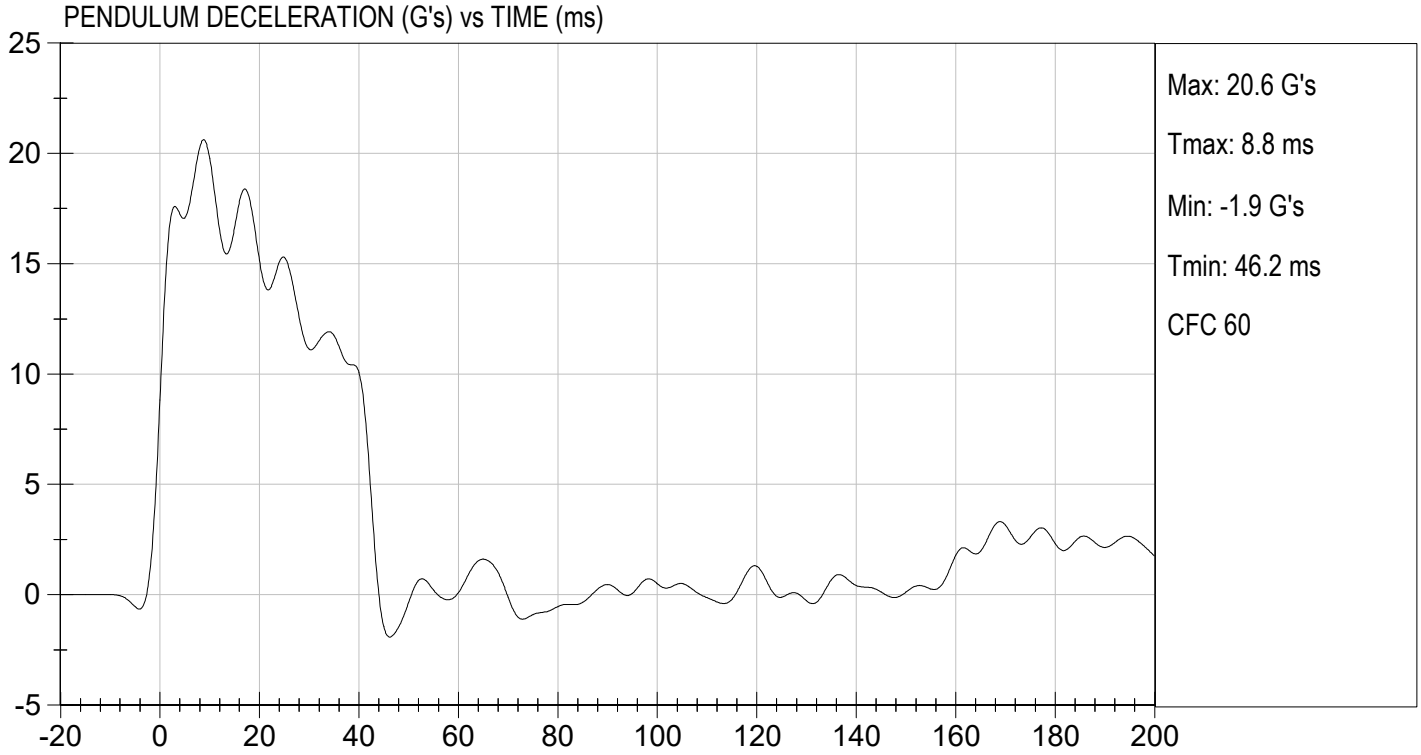
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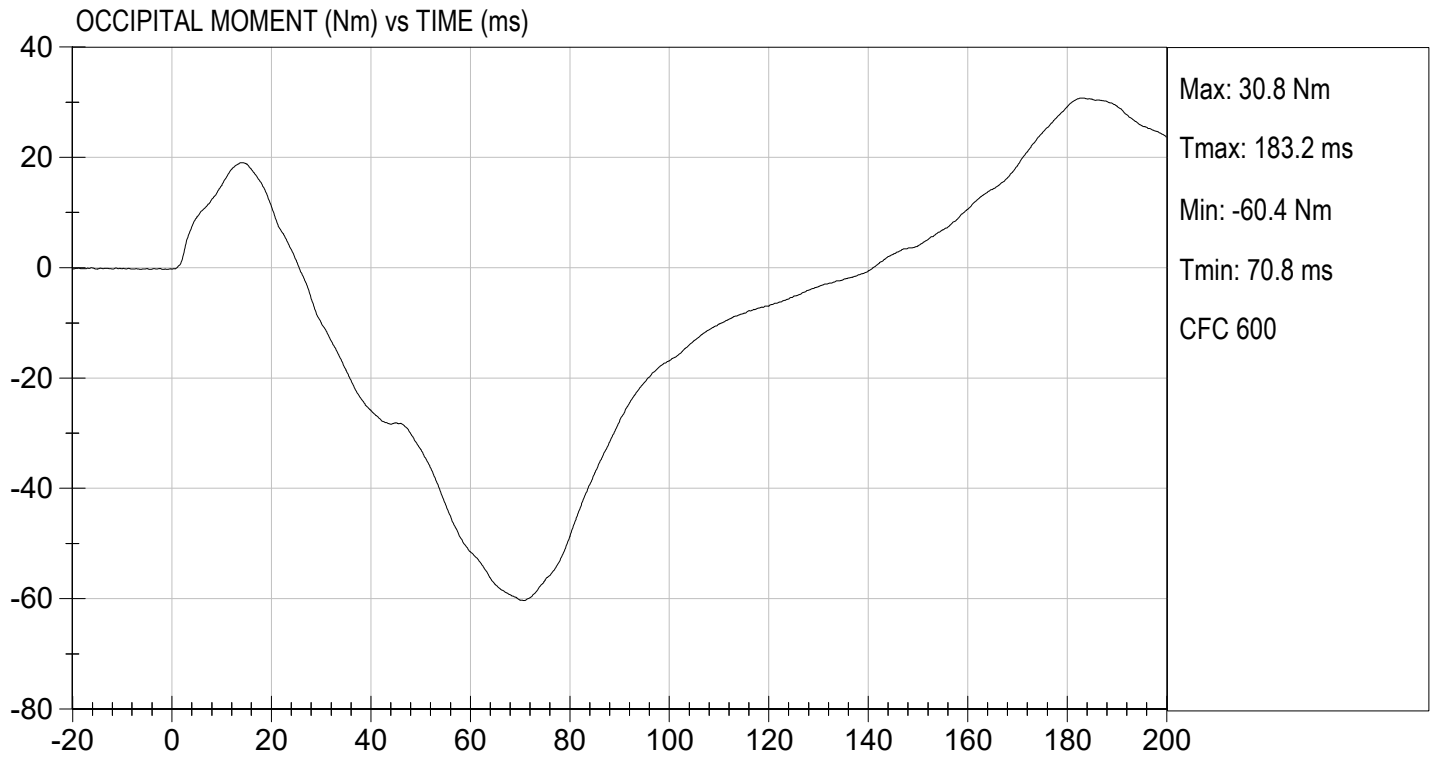
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	41	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.78	Pass
	20 ms	G's	14.00 to 19.00	15.16	Pass
	30 ms	G's	11.00 to 16.00	11.12	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	11.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	42.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.8	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	156.9	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-60.4	Pass
	Time	ms	65.0 to 79.0	70.8	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	141.1	Pass
Overall Test Results					Pass


 Laboratory Technician

05/19/2023
 Test Date


 Approved By





MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D231254

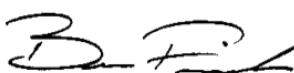
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,737	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.57	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Overall Test Results				Pass



 Laboratory Technician

05/19/2023

 Test Date

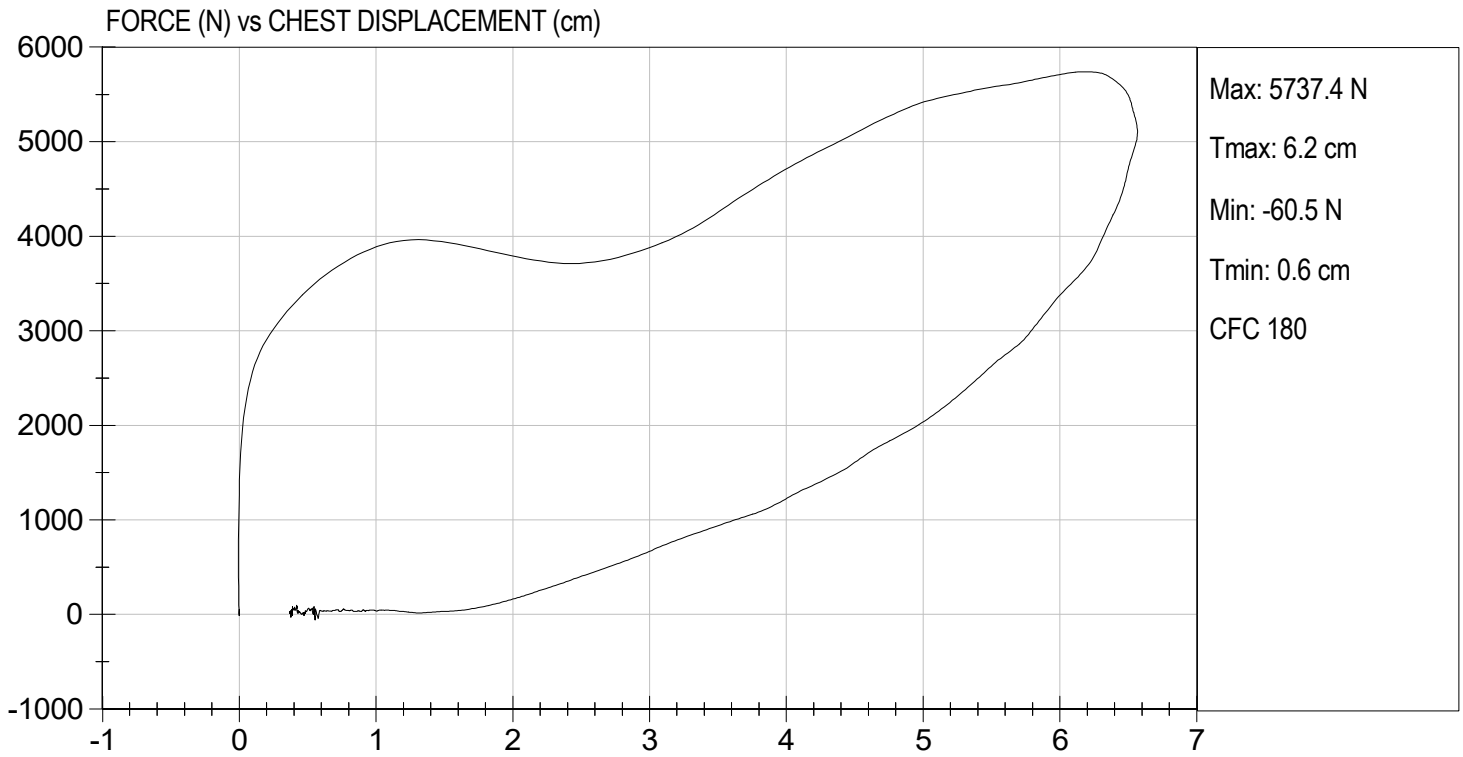


 Approved By



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

TEST DATE: 05/19/2023
TEST #: D231254



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

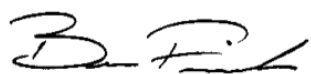
ATD Serial No: 351

Test I.D: D231255

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,133	Pass
Overall Test Results				Pass


 Laboratory Technician

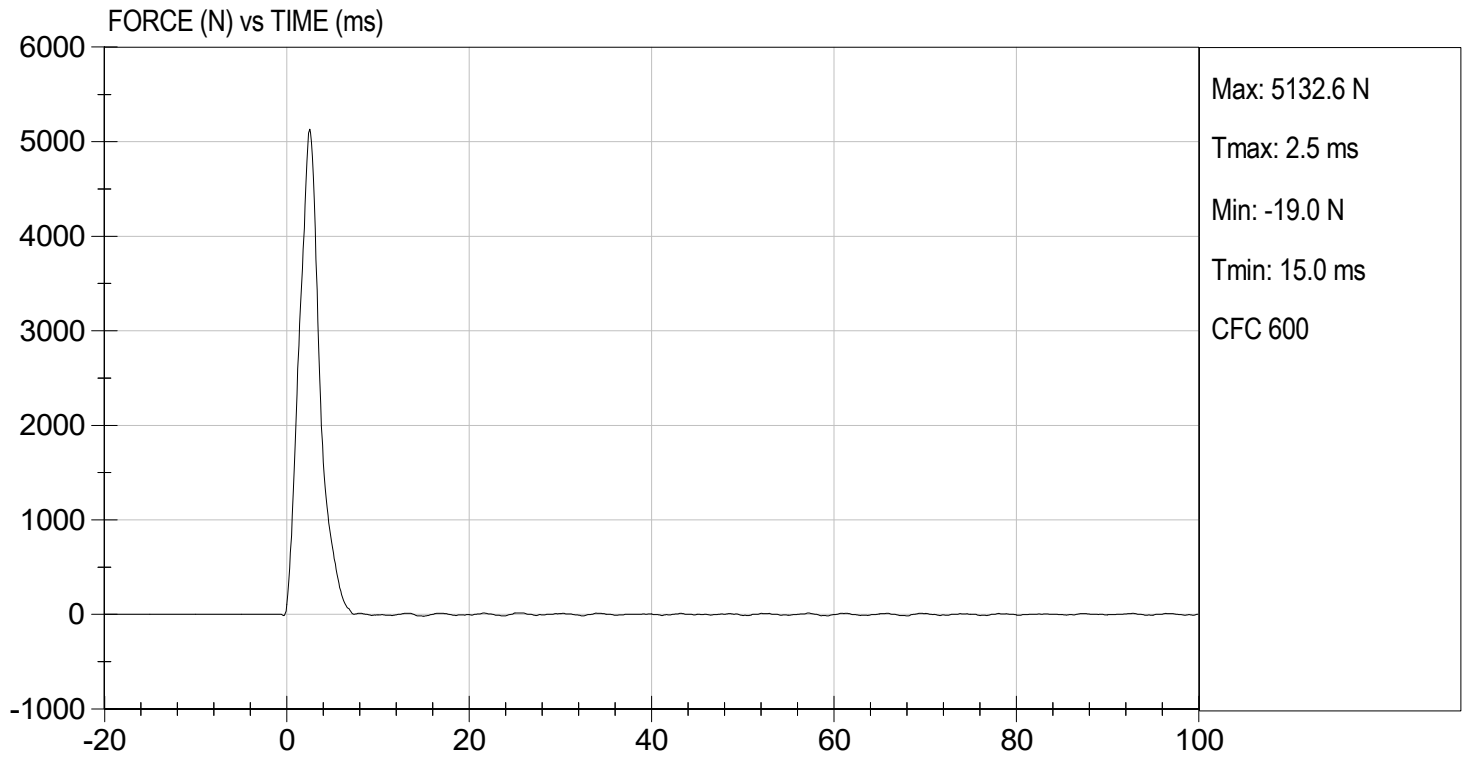
05/19/2023
 Test Date


 Approved By



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

TEST DATE: 05/19/2023
TEST #: D231255



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

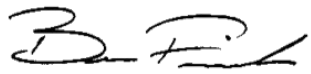
ATD Serial No: 351

Test I.D: D231256

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	N	4715 to 5782	5,386	Pass
Overall Test Results				Pass


 Laboratory Technician

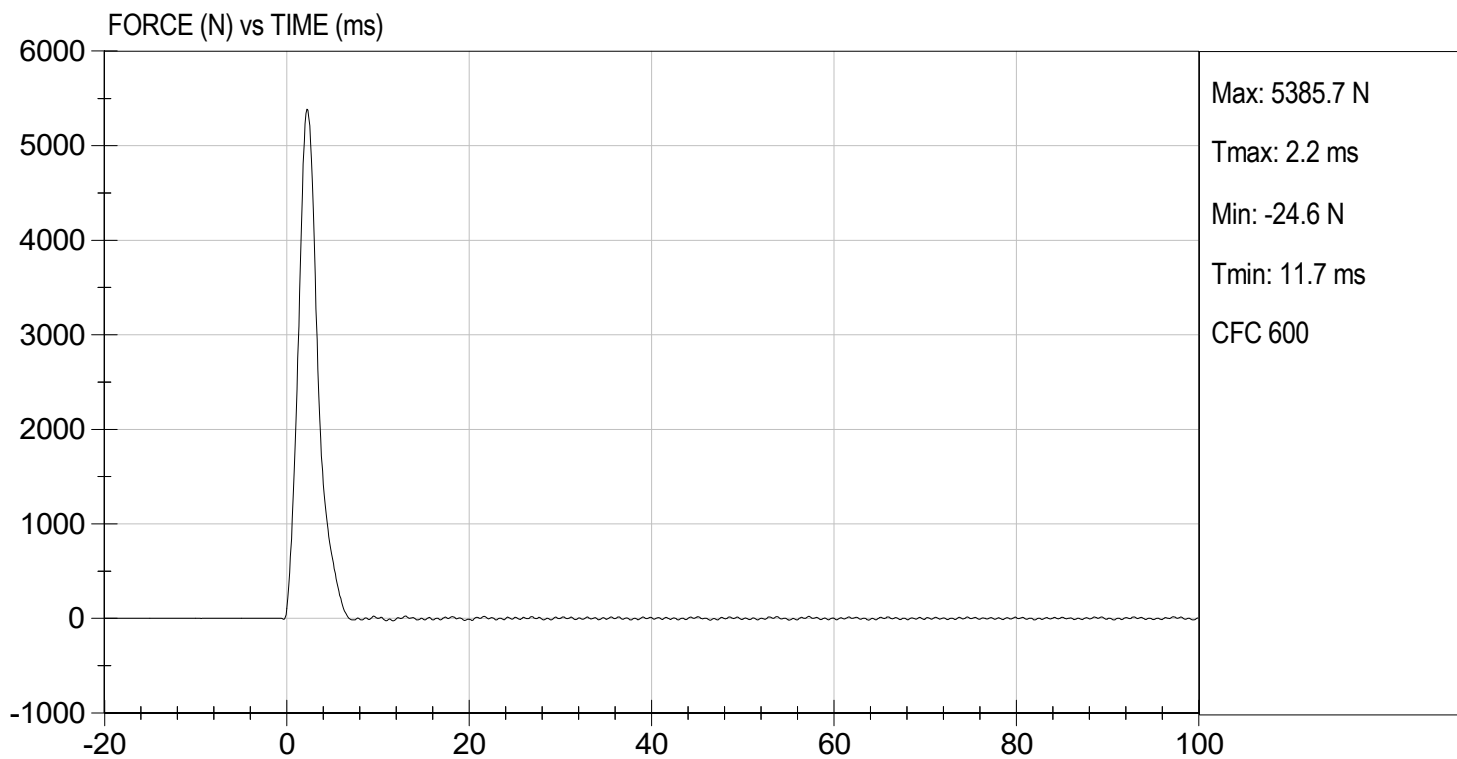
05/19/2023
 Test Date


 Approved By



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

TEST DATE: 05/19/2023
TEST #: D231256



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

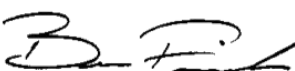
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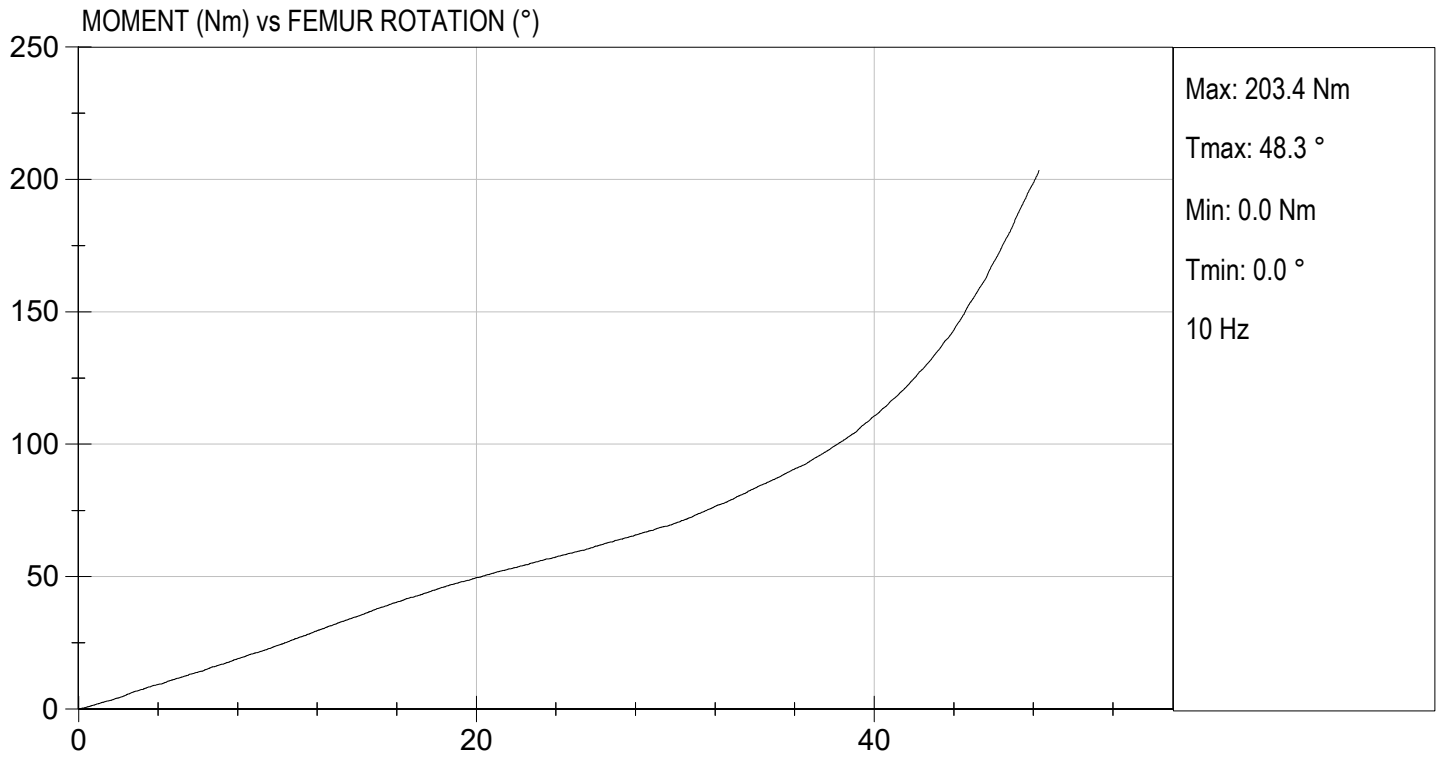
Test I.D.: D231250

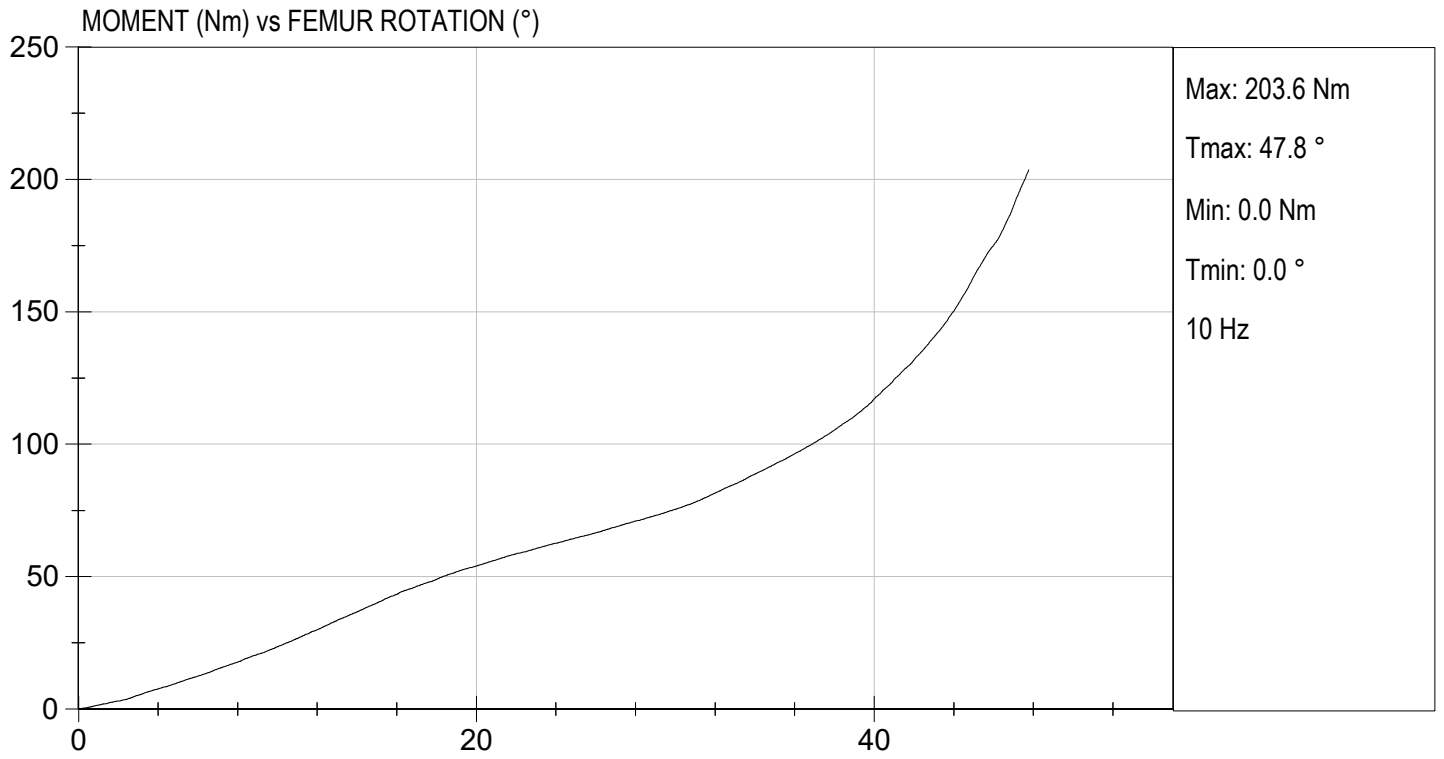
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.4	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	43	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.5	6.5	Pass
30 Degrees	Nm	94.9 Nm Max	70.2	75.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	48.3	47.8	Pass
Overall Test Results					Pass


 Laboratory Technician

05/19/2023
 Test Date


 Approved By





QUALIFICATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

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

ATD Serial No: 351

Test ID: D231511

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Peak Resultant Acceleration	G's	225 to 275	267	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-1.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass



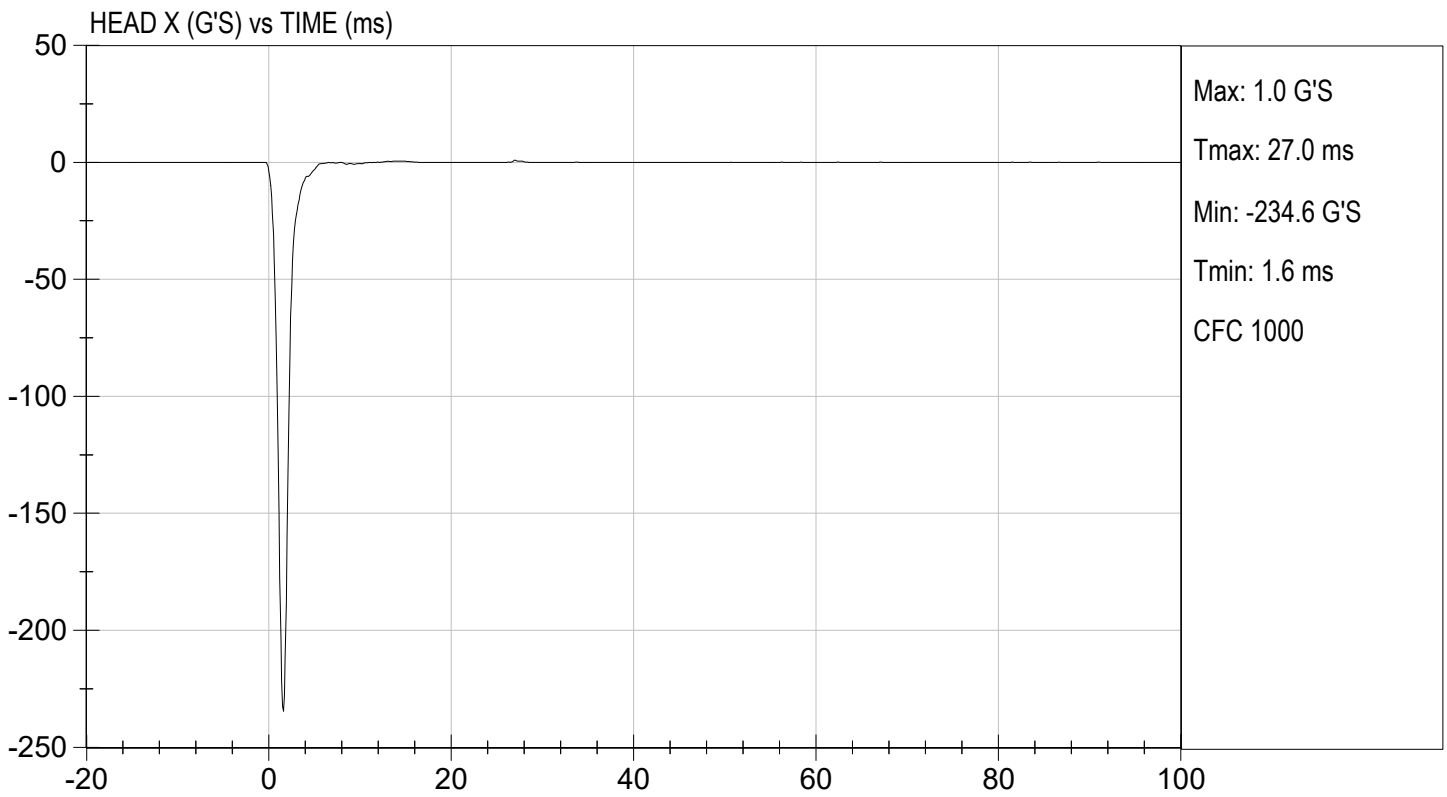
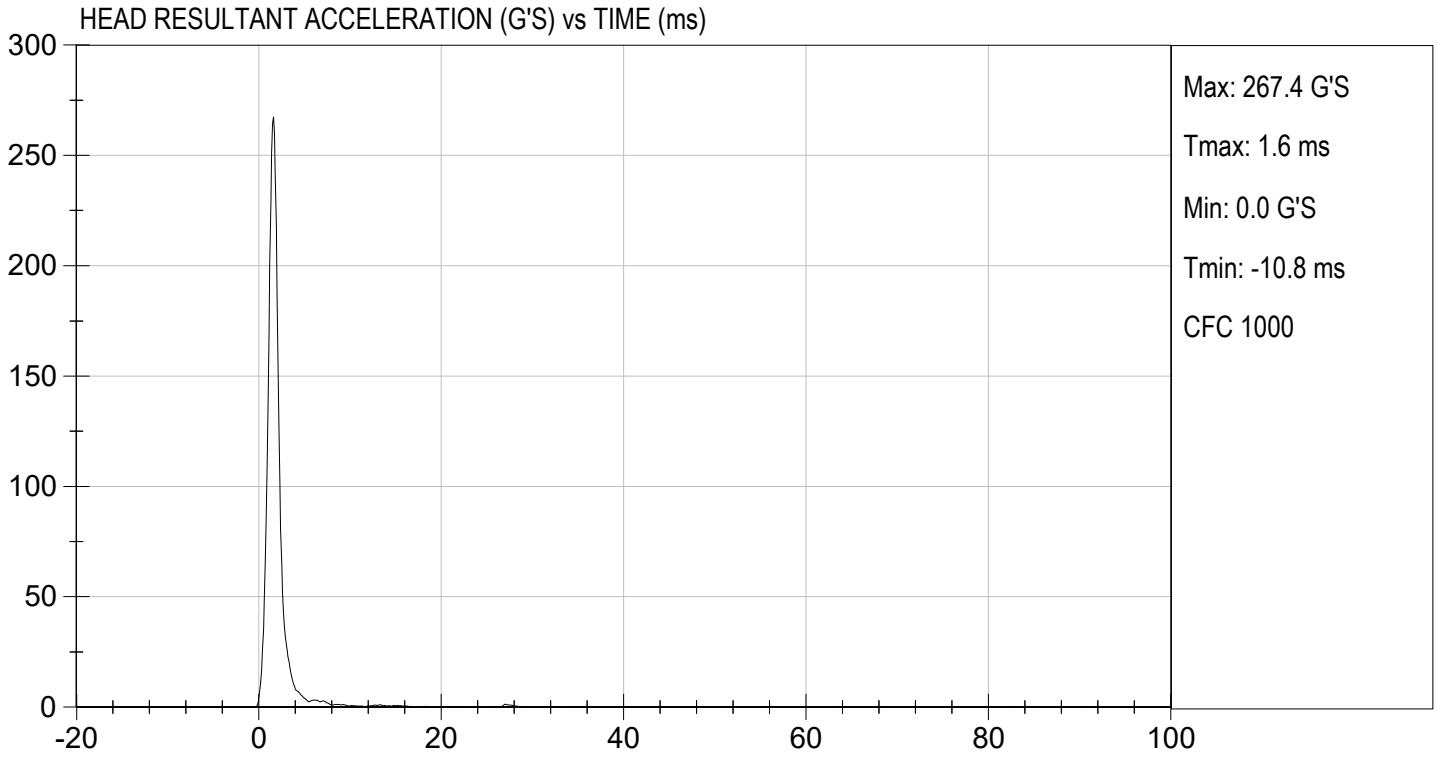
 Laboratory Technician

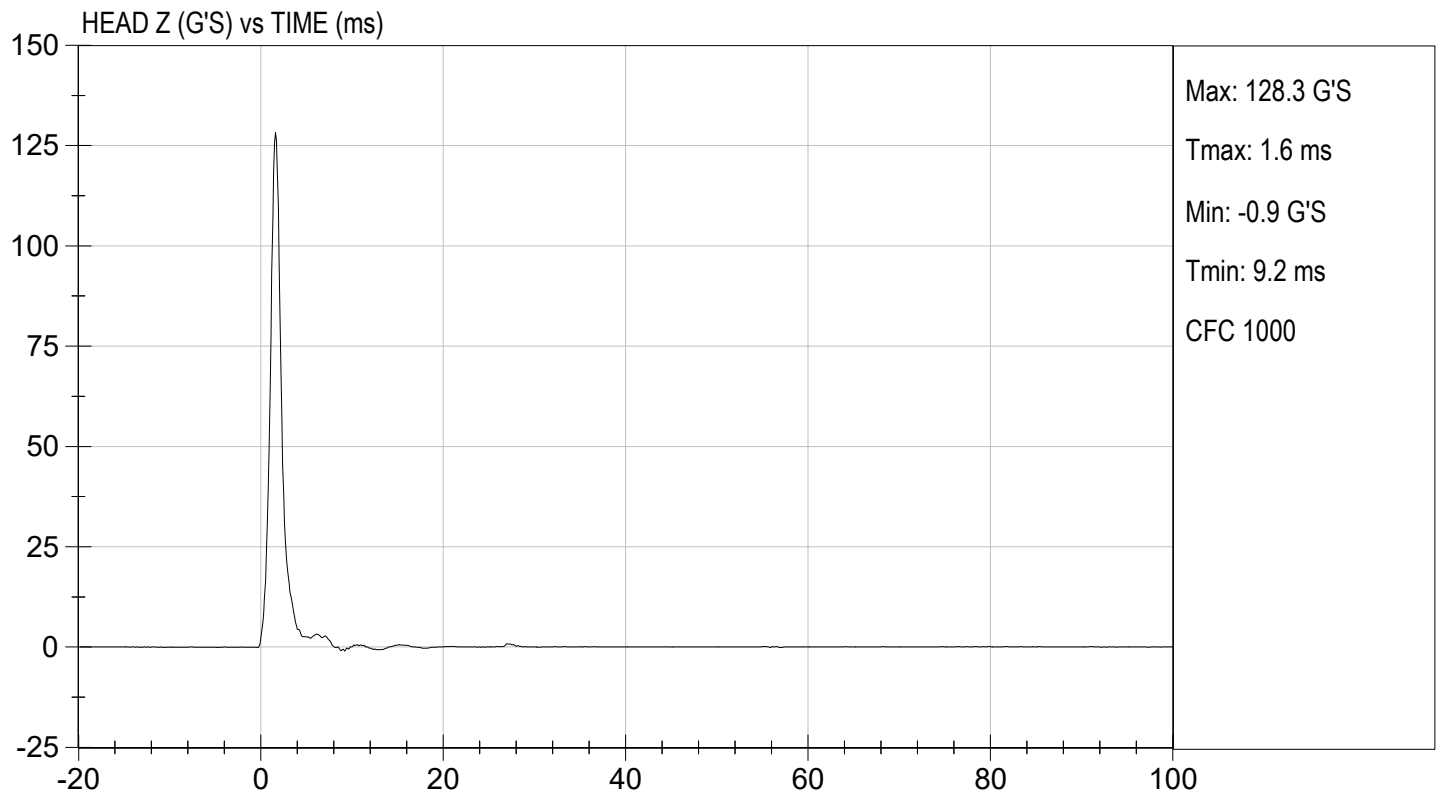
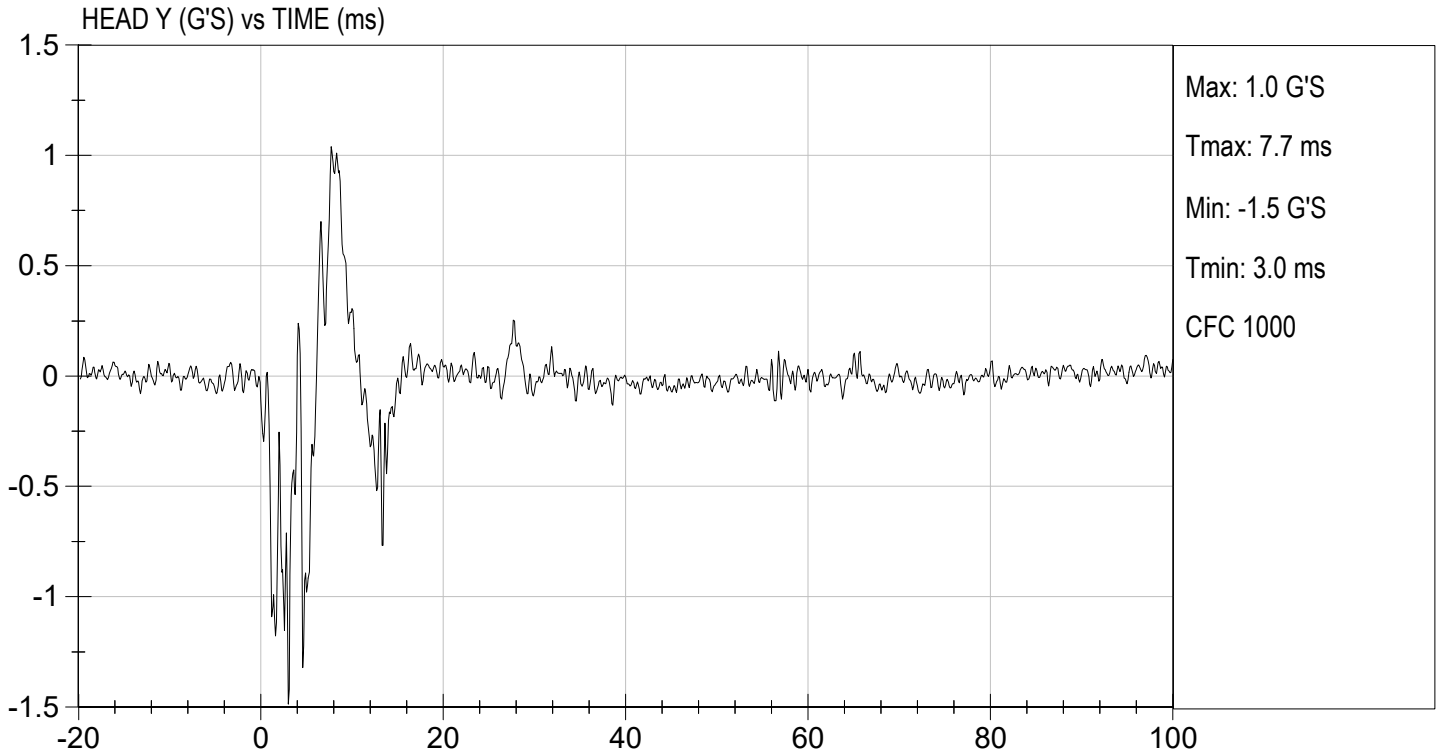
06/15/2023

 Test Date



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

ATD Serial No: 351

Test I.D.: D231512

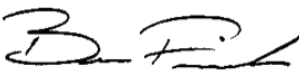
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.97	Pass
	20 ms	G's	17.60 to 22.60	20.07	Pass
	30 ms	G's	12.50 to 18.50	15.13	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.2	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.6	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	72.6	Pass
	Time	ms	57.0 to 64.0	59.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	117.9	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	95.7	Pass
	Time	ms	47.0 to 58.0	49.0	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.2	Pass
Overall Test Results					Pass



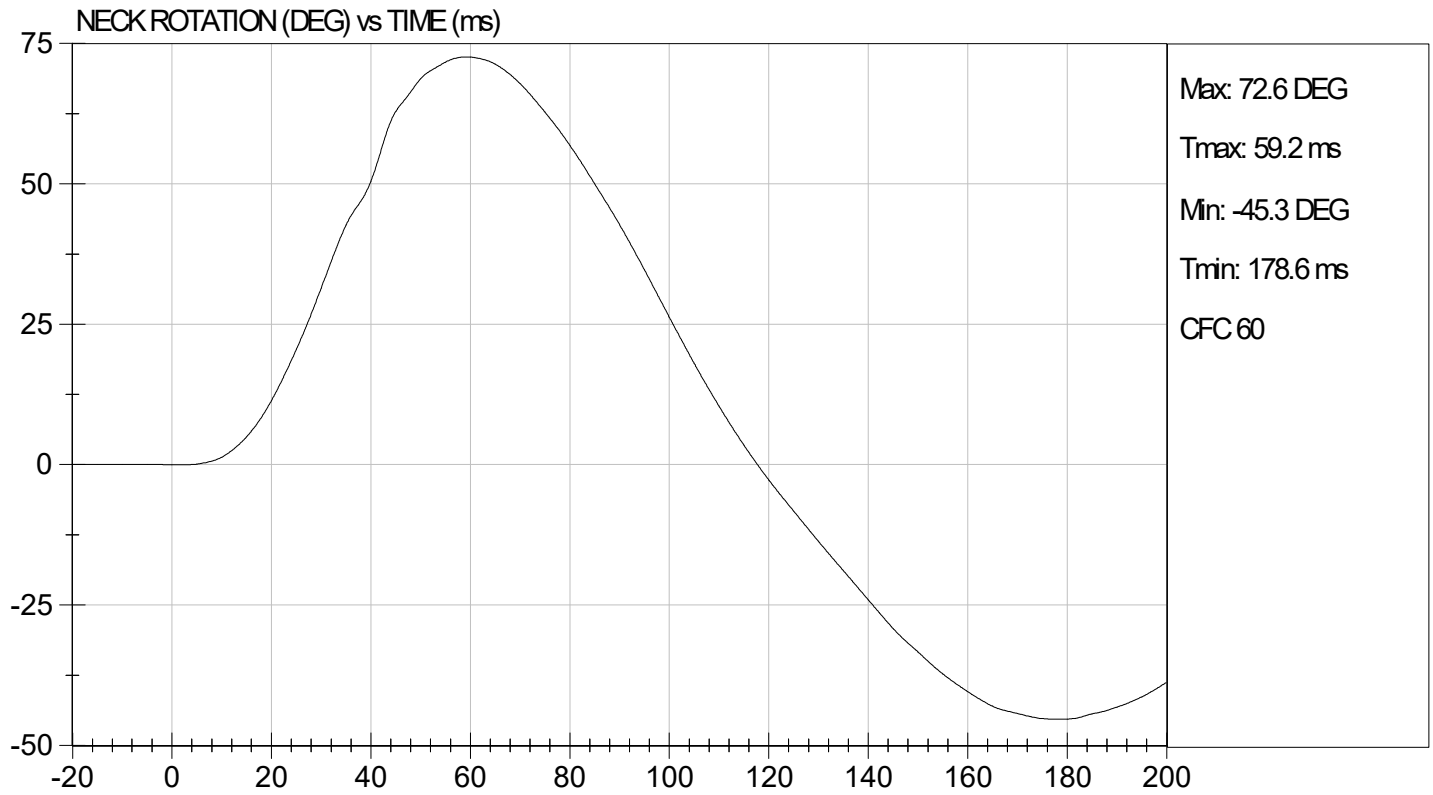
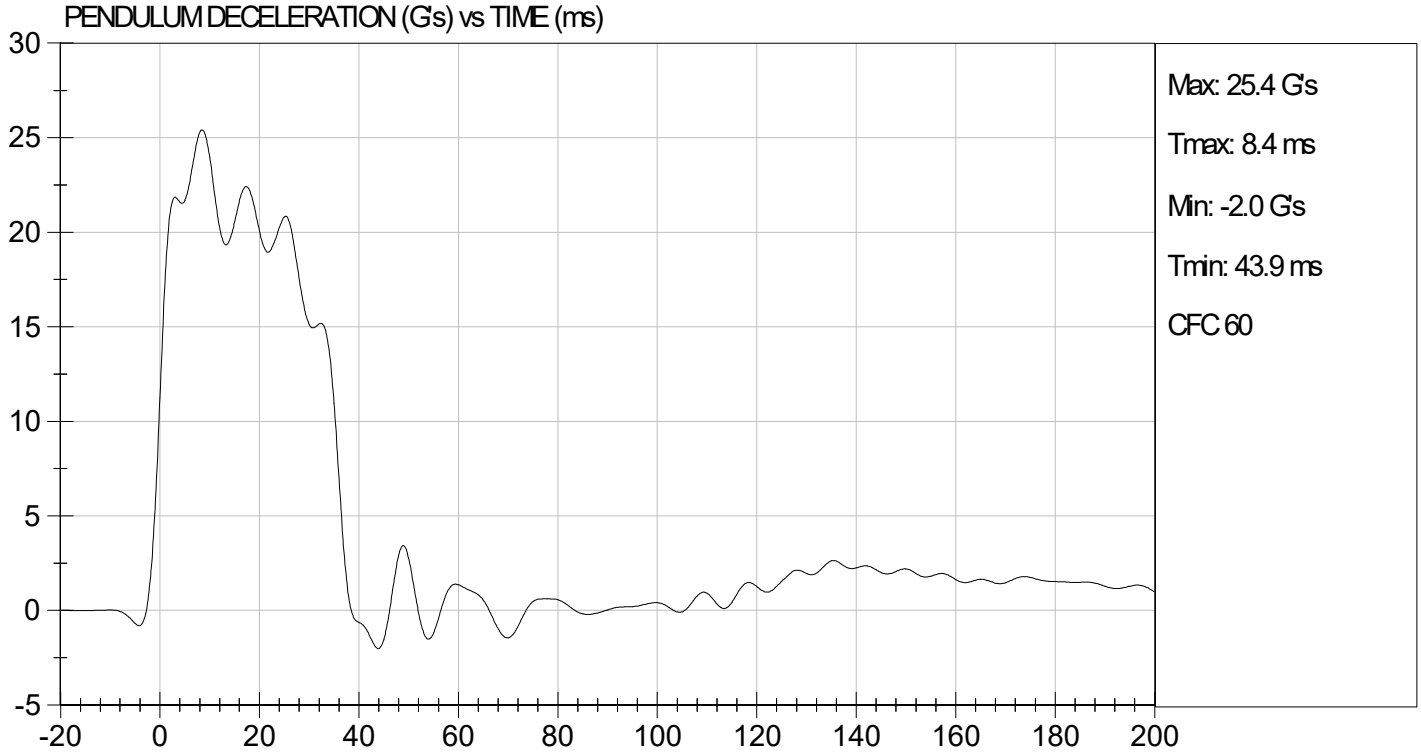
 Laboratory Technician

06/15/2023

 Test Date



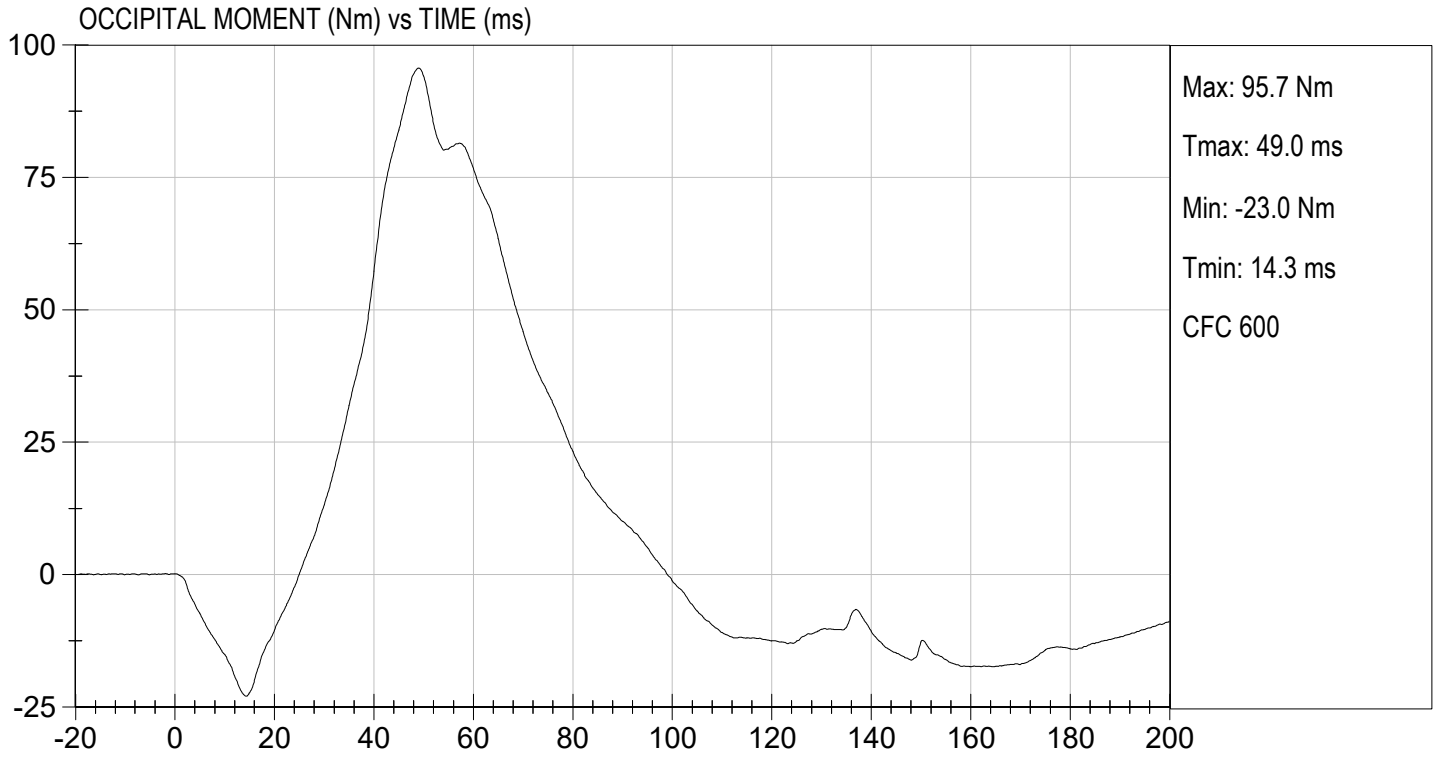
 Approved By





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

TEST DATE: 06/15/2023
TEST #: D231512



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

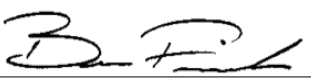
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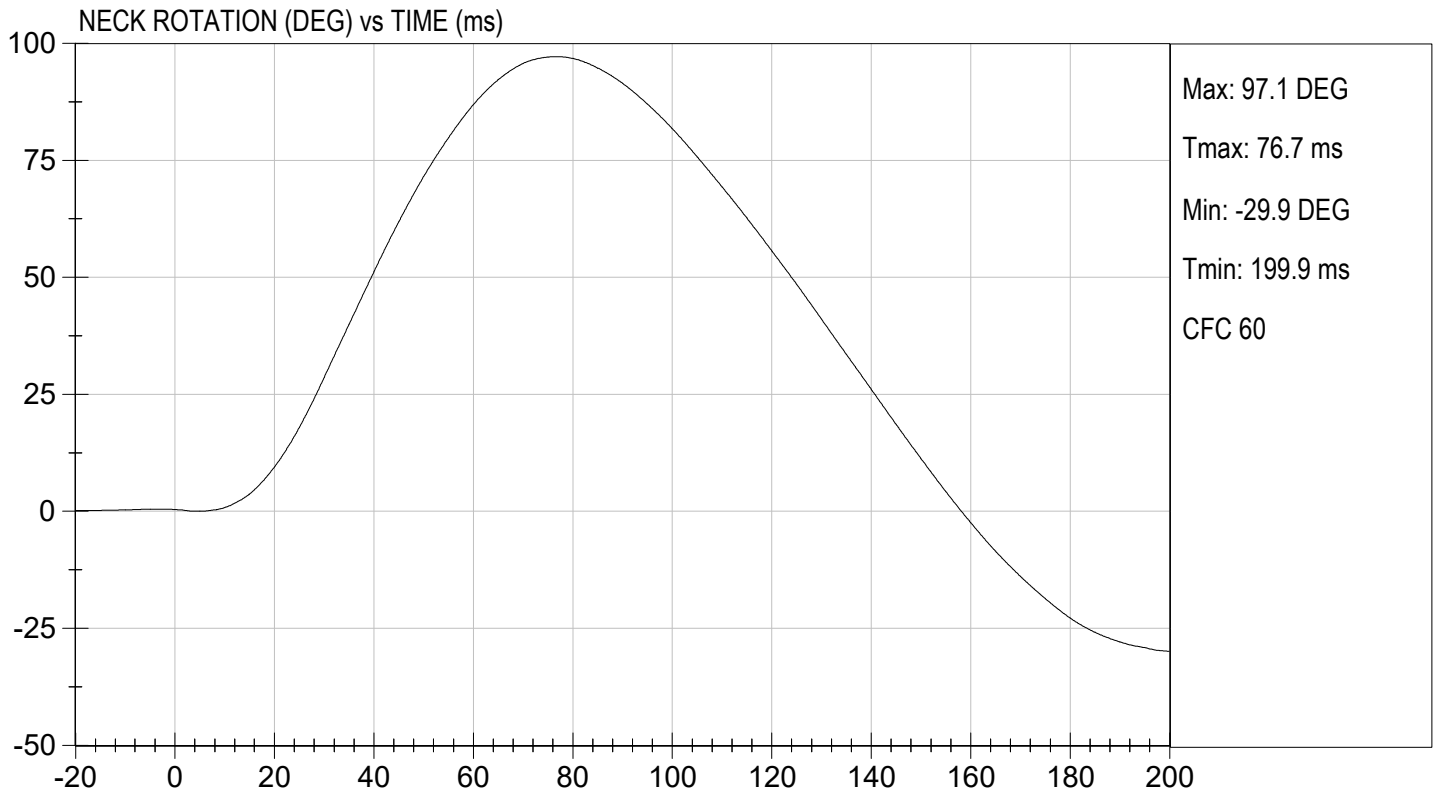
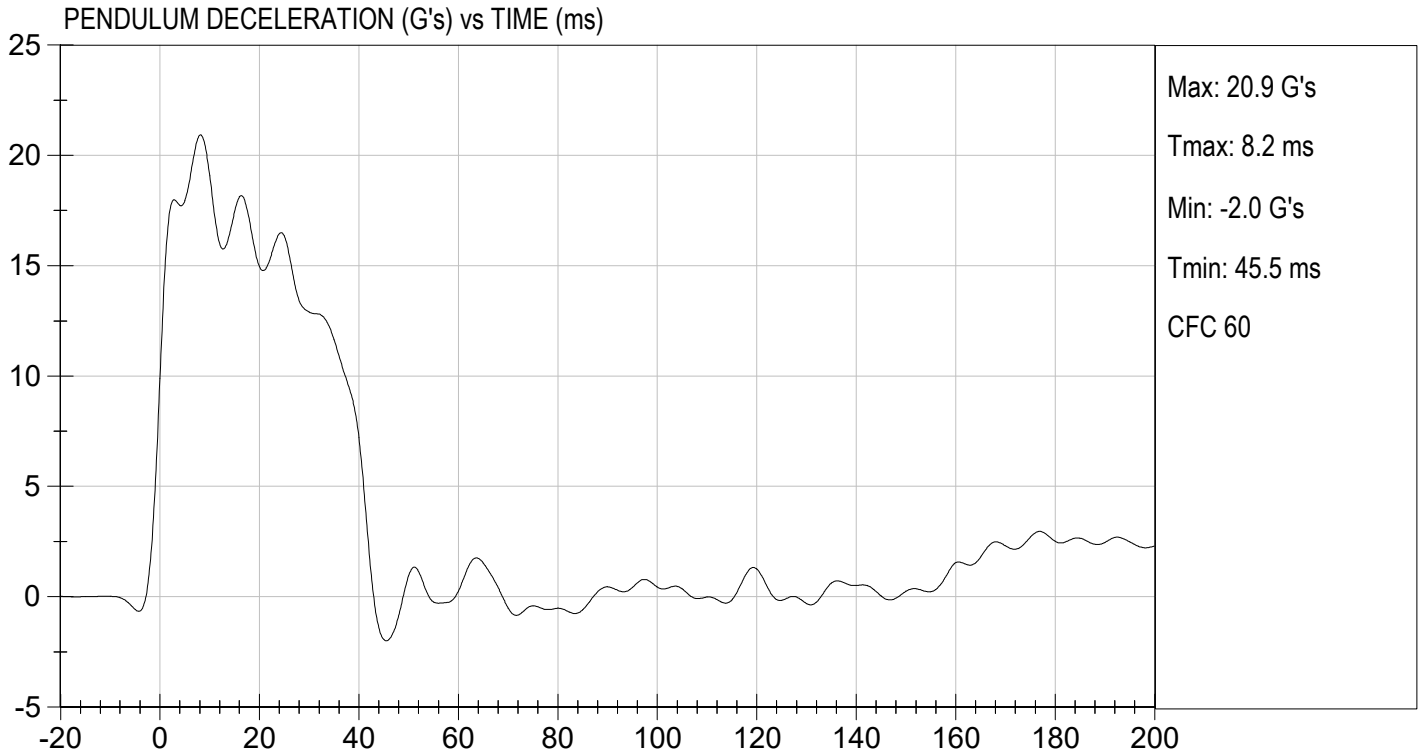
Test I.D.: D231513

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.08	Pass
	20 ms	G's	14.00 to 19.00	14.96	Pass
	30 ms	G's	11.00 to 16.00	12.90	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	41.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	97.1	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	158.3	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-62.9	Pass
	Time	ms	65.0 to 79.0	70.3	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	141.6	Pass
Overall Test Results					Pass


 Laboratory Technician

06/15/2023
 Test Date


 Approved By





MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

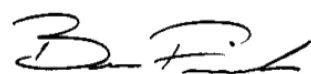
ATD Serial No: 351

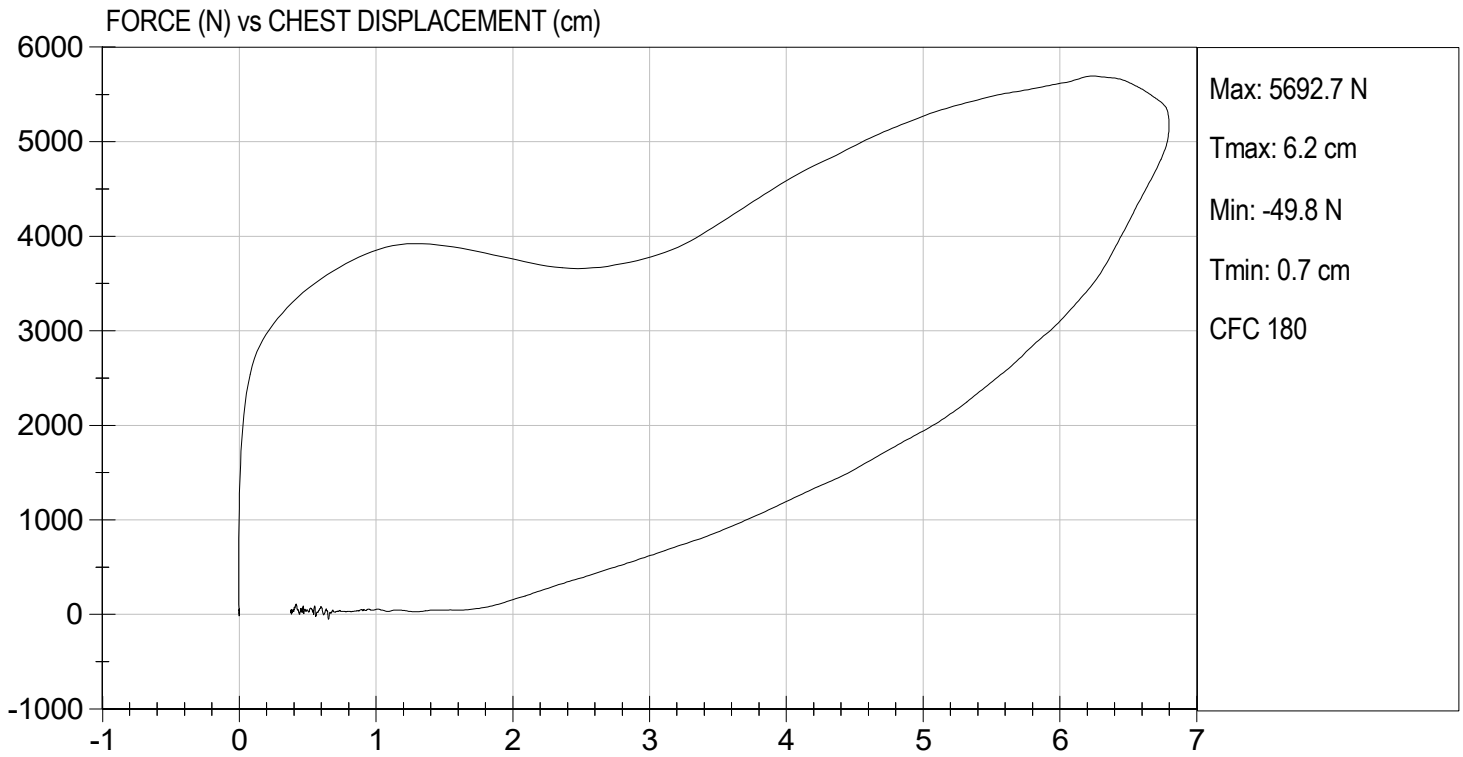
Test I.D: D231514

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,693	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.80	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Overall Test Results				Pass


 Laboratory Technician

06/15/2023
 Test Date


 Approved By



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

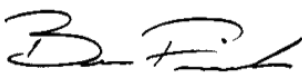
ATD Serial No: 351

Test I.D: D231515

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	N	4715 to 5782	5,091	Pass
Overall Test Results				Pass


 Laboratory Technician

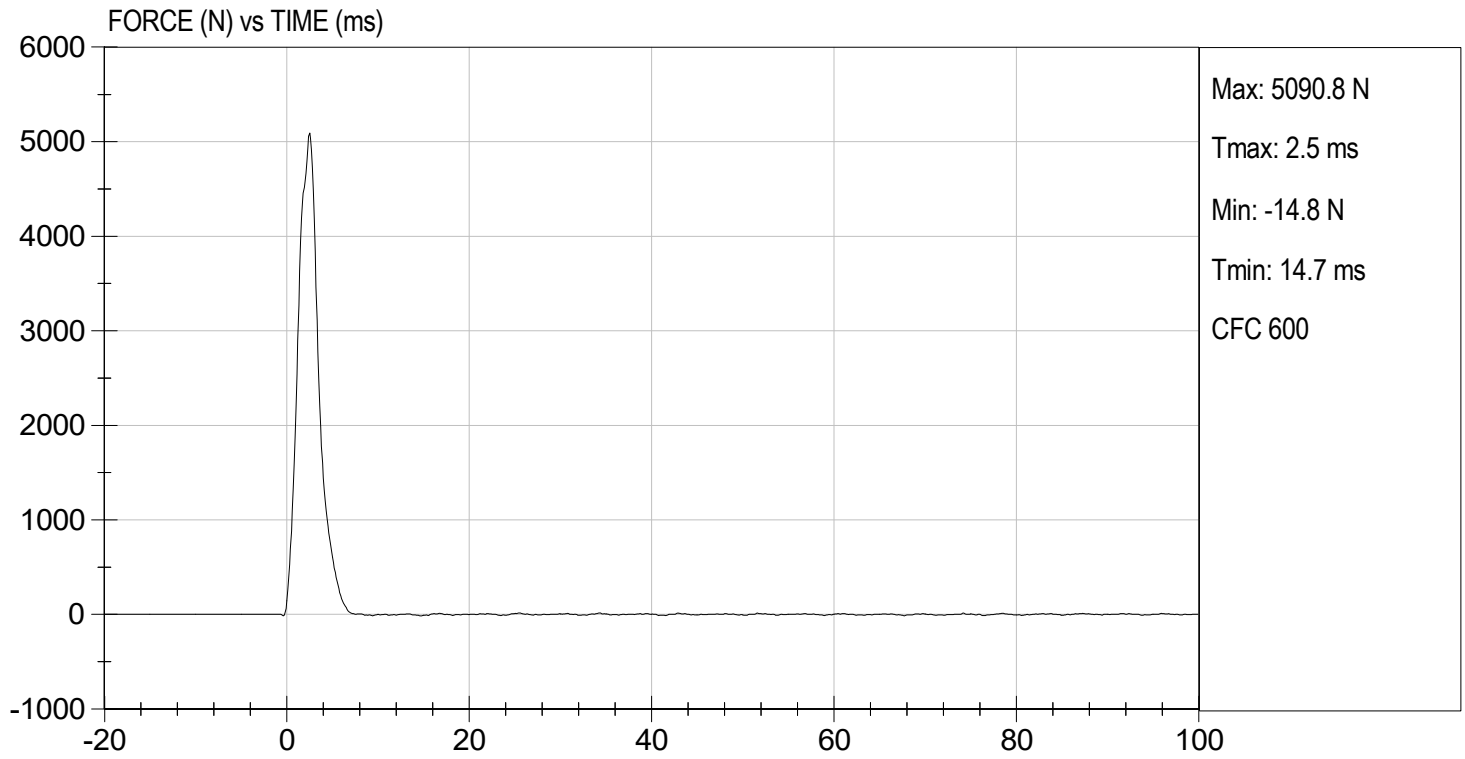
06/15/2023
 Test Date


 Approved By



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

TEST DATE: 06/15/2023
TEST #: D231515



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

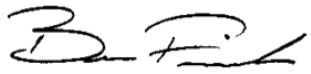
ATD Serial No: 351

Test I.D: D231516

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	N	4715 to 5782	5,076	Pass
Overall Test Results				Pass


 Laboratory Technician

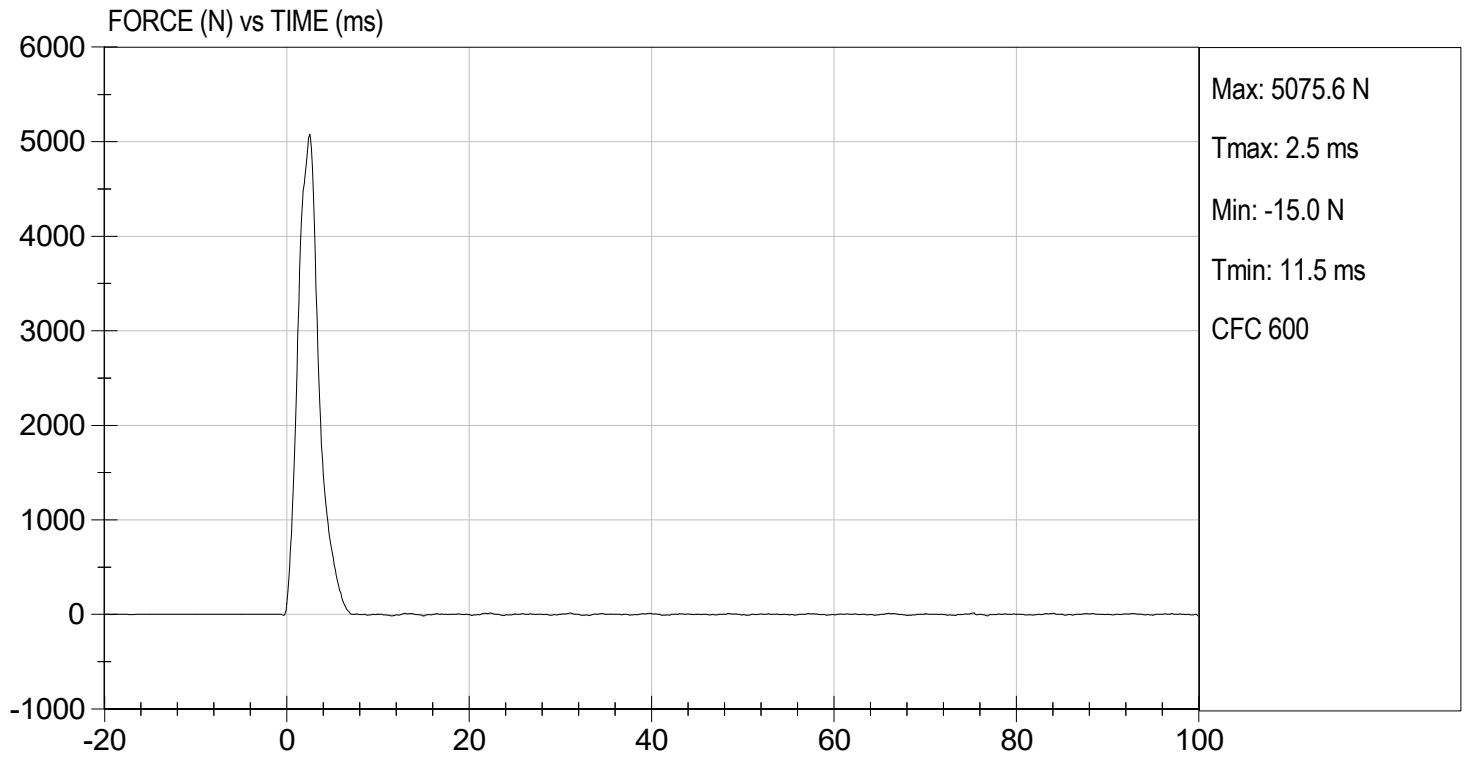
06/15/2023
 Test Date


 Approved By



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

TEST DATE: 06/15/2023
TEST #: D231516



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

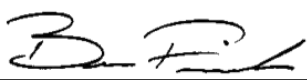
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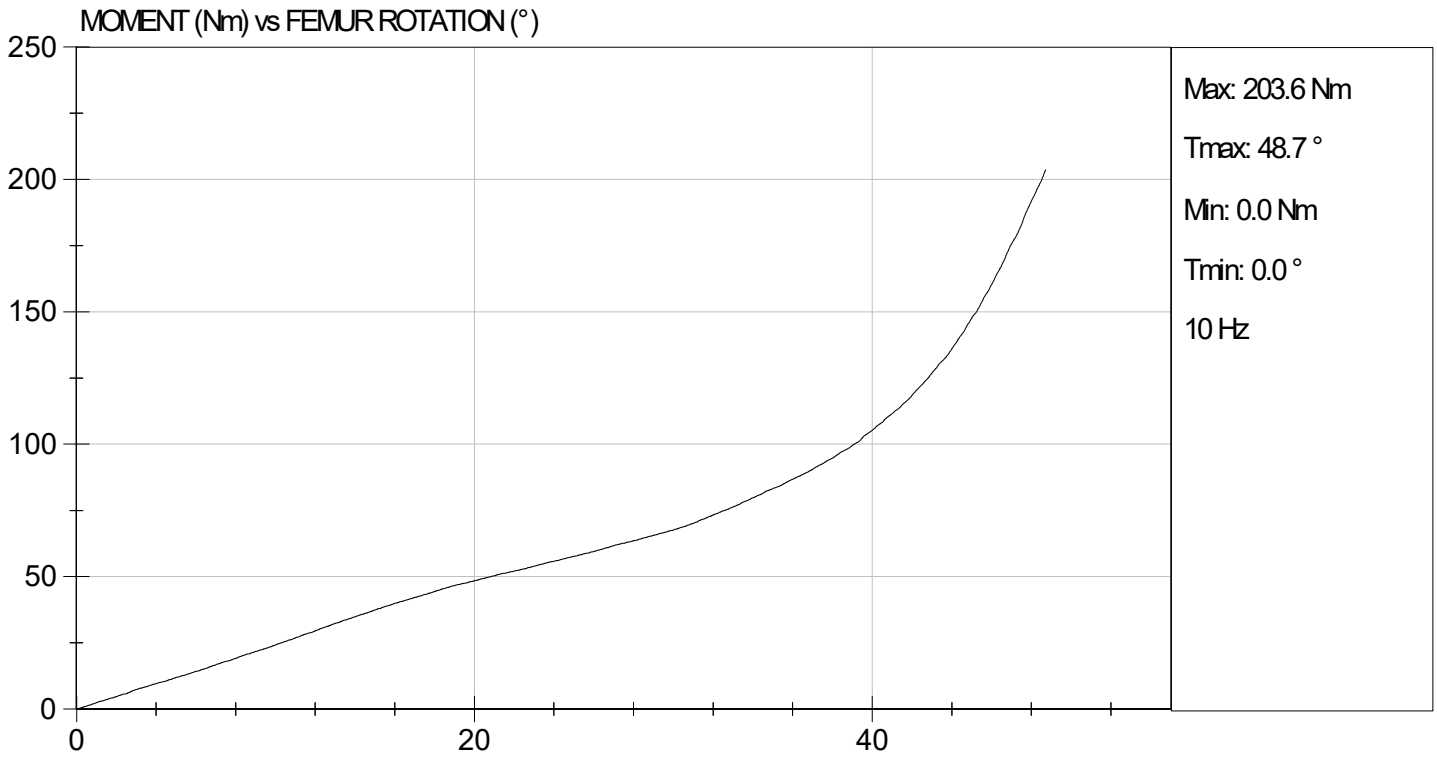
Test I.D.: D231510

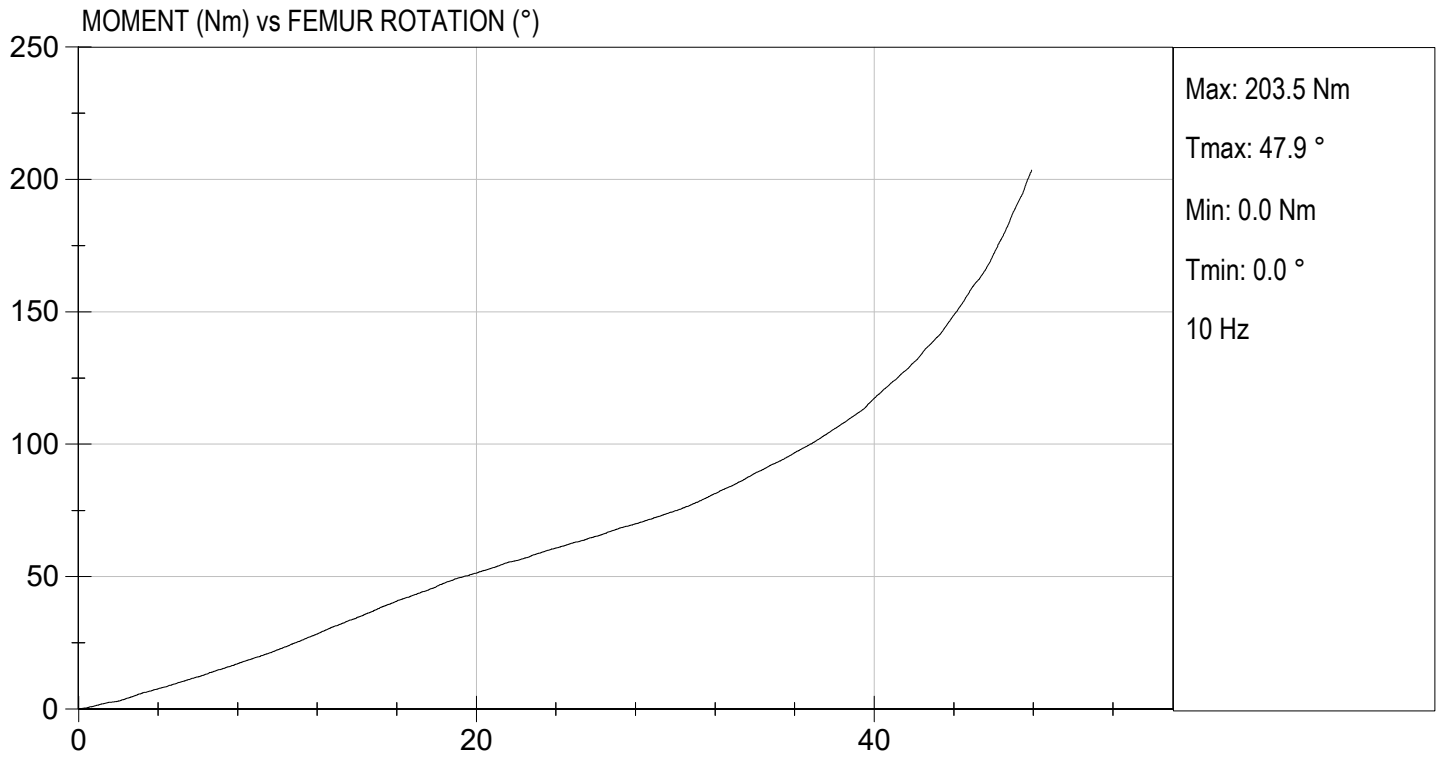
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.3	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	45	45	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.5	6.5	Pass
30 Degrees	Nm	94.9 Nm Max	67.6	74.9	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	48.7	47.9	Pass
Overall Test Results					Pass


 Laboratory Technician

06/15/2023
 Test Date


 Approved By





QUALIFICATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

**Hybrid III, 5th External Measurements
SN: 142**

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: D231241

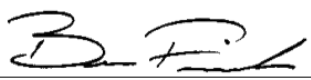
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	250 to 300	263	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-2.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass



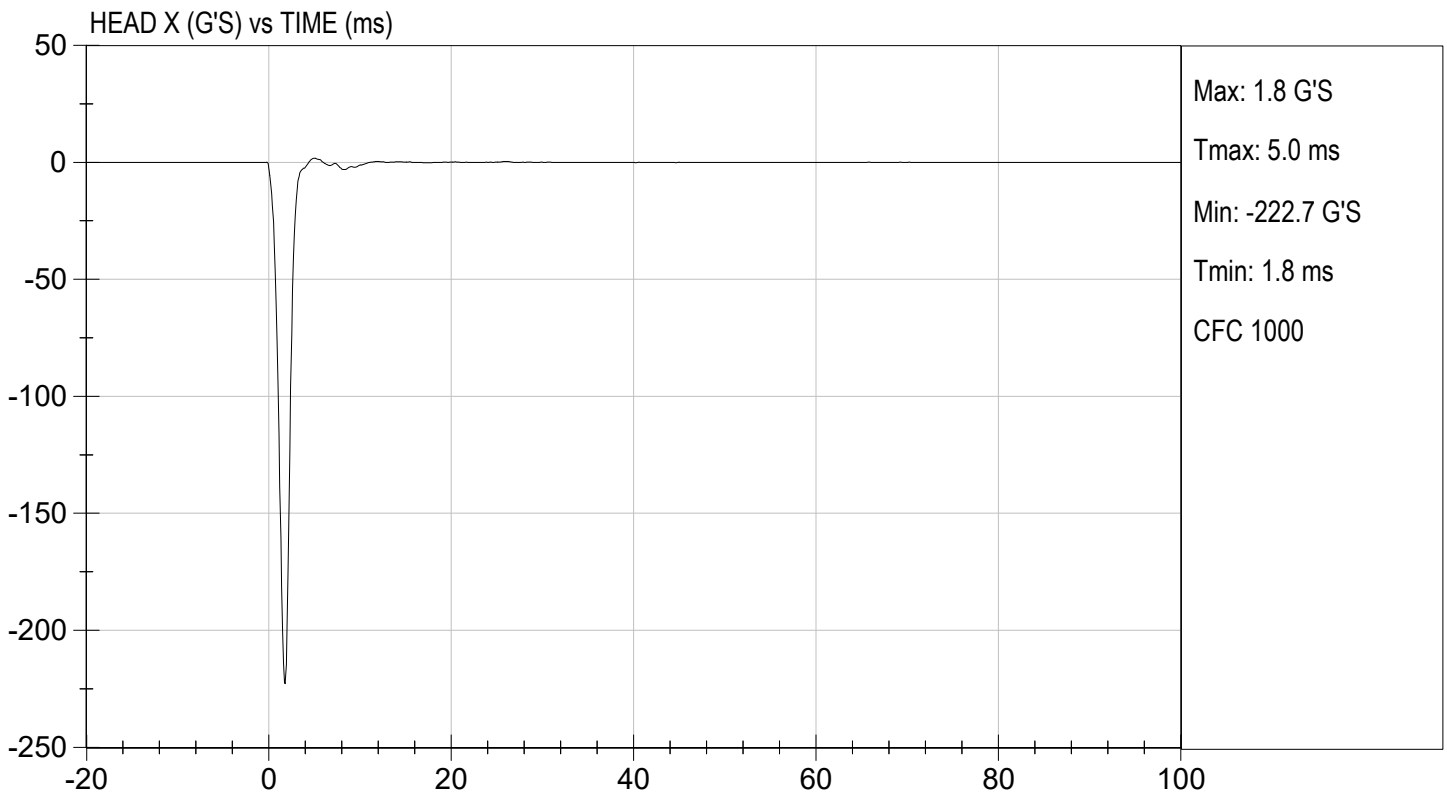
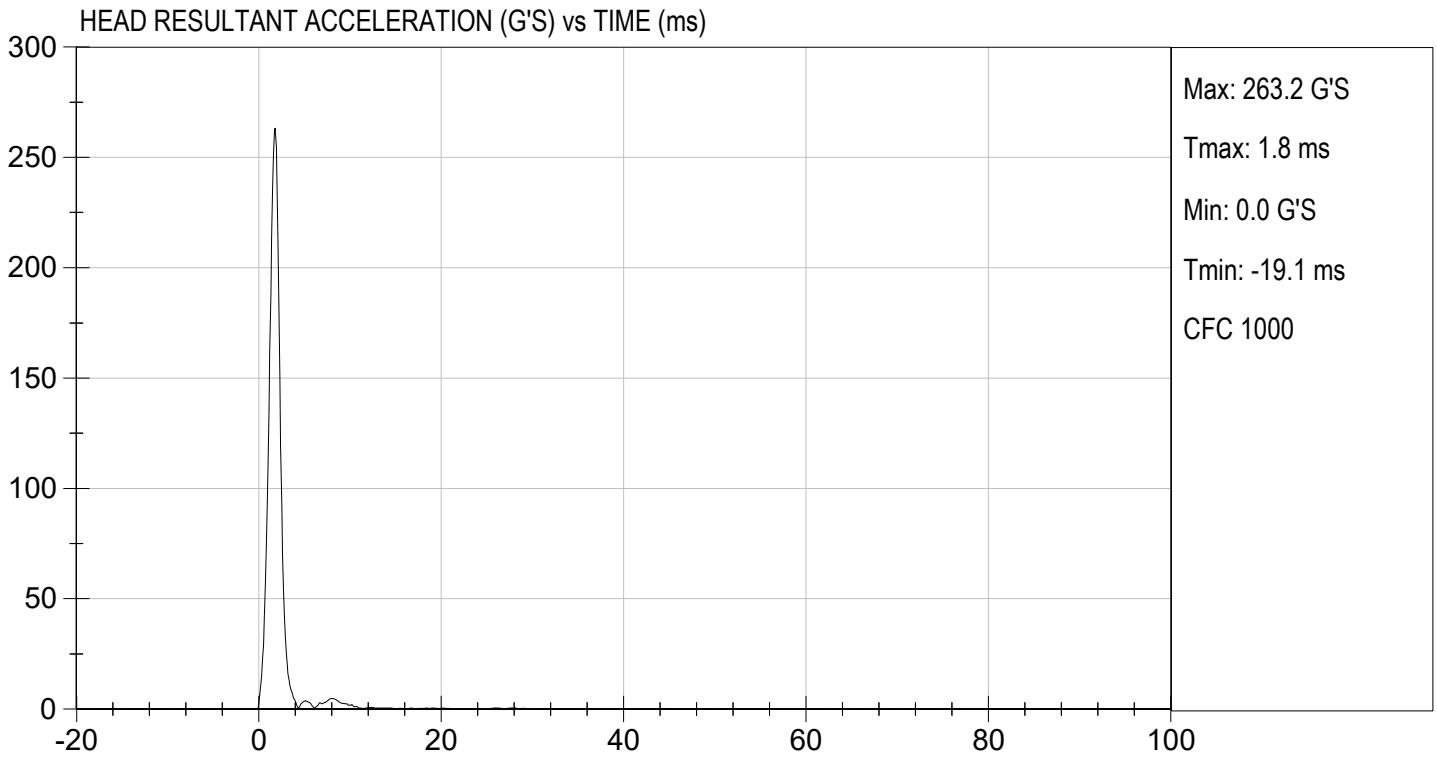
 Laboratory Technician

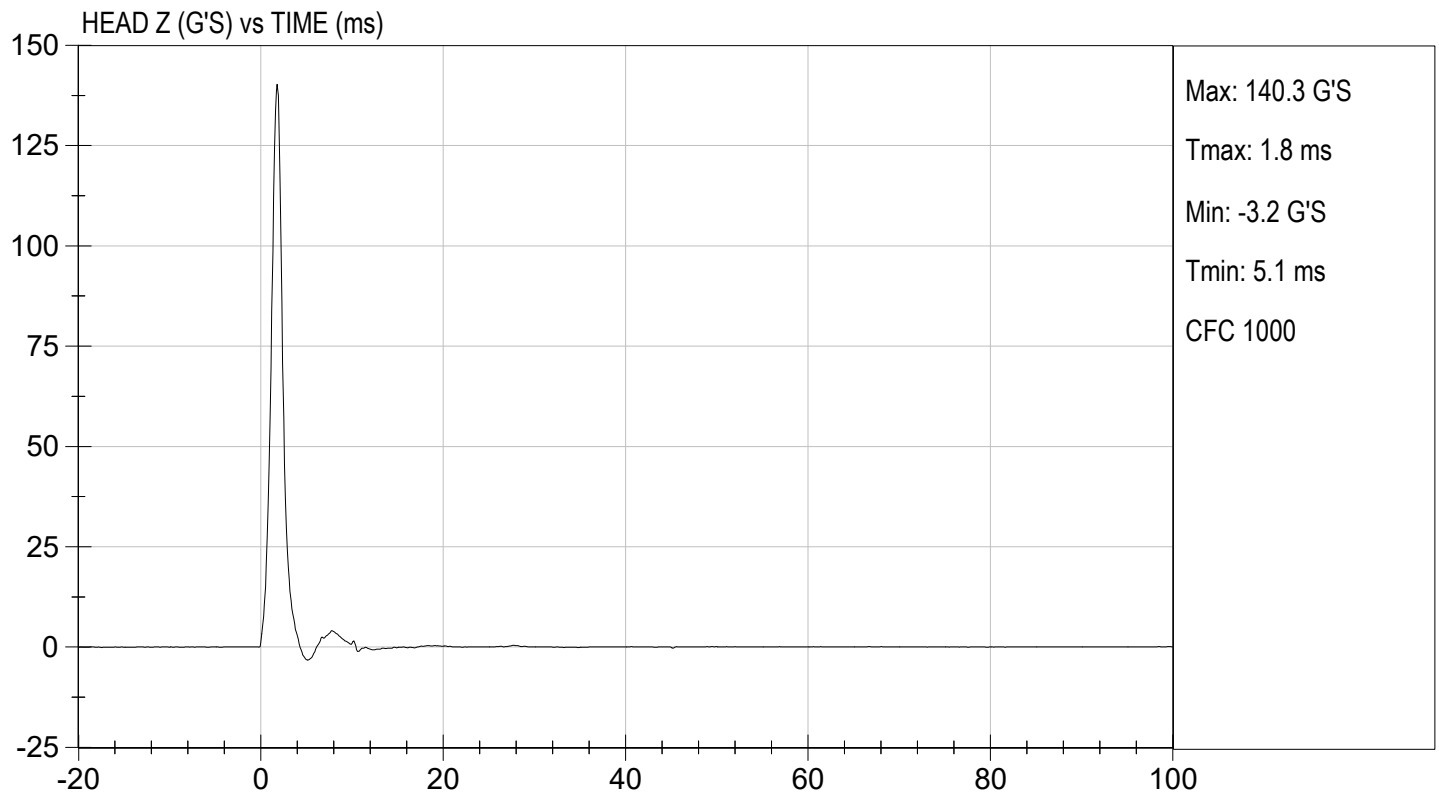
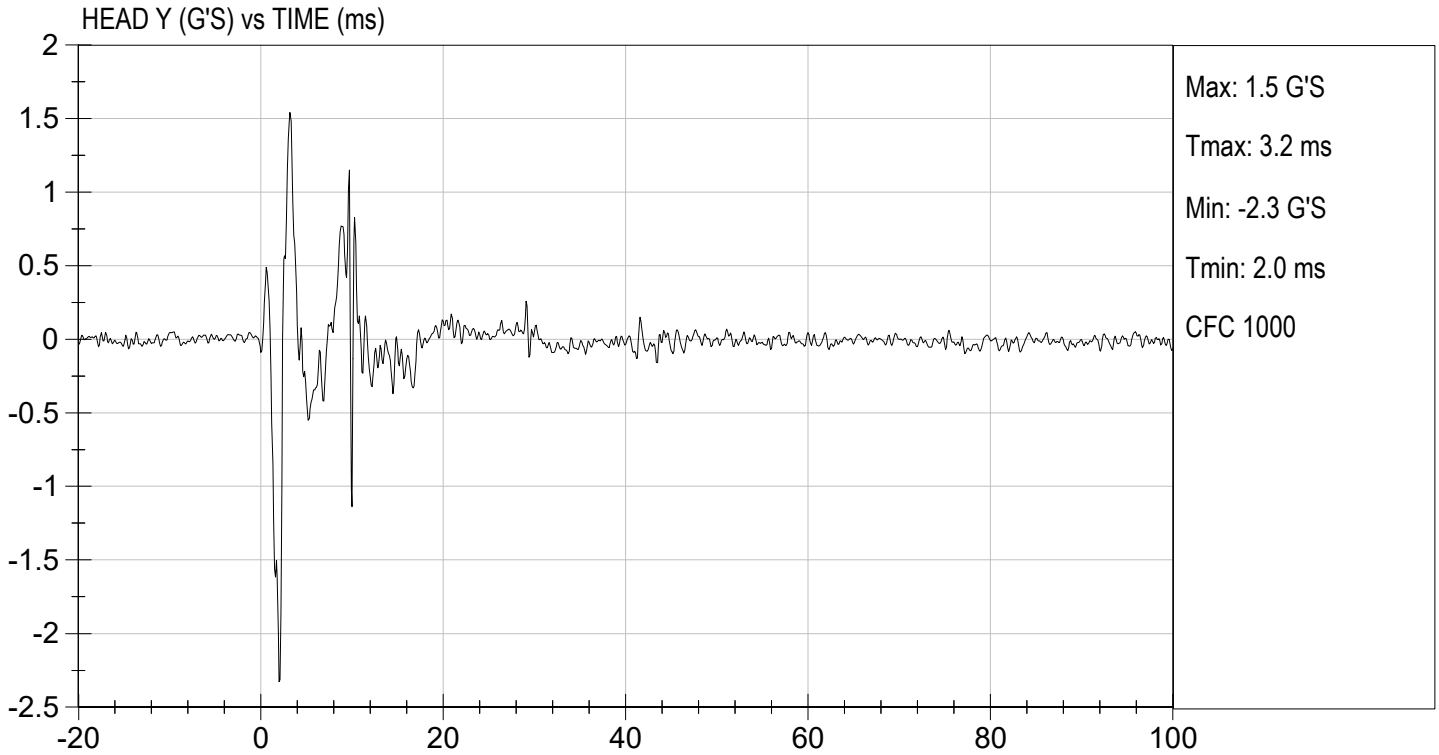
05/19/2023

 Test Date



 Approved By





MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 142

Test I.D: D231242

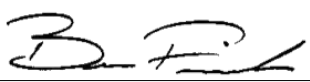
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Pendulum Speed		m/s	6.89 to 7.13	6.96	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	82	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	85	Pass
Overall Results					Pass



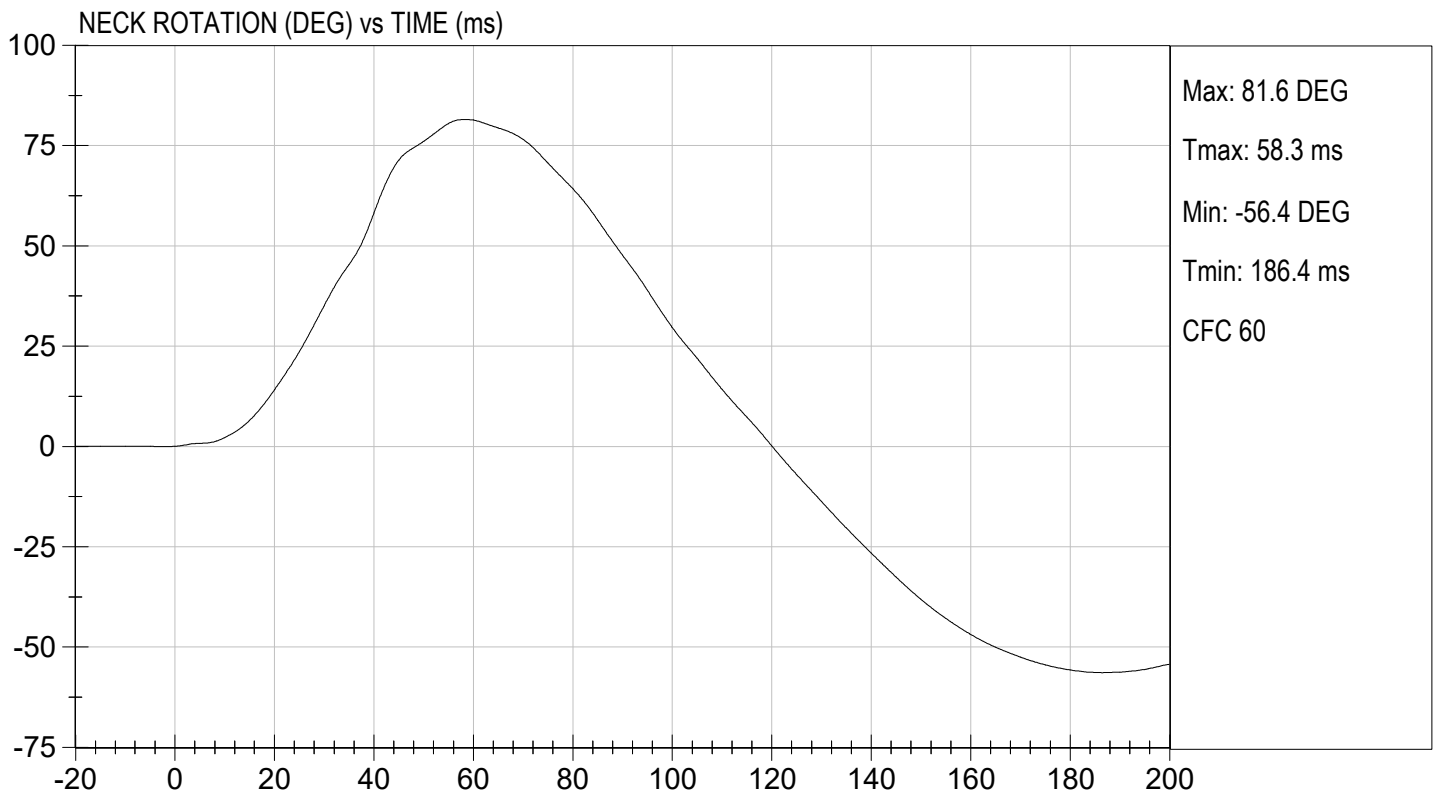
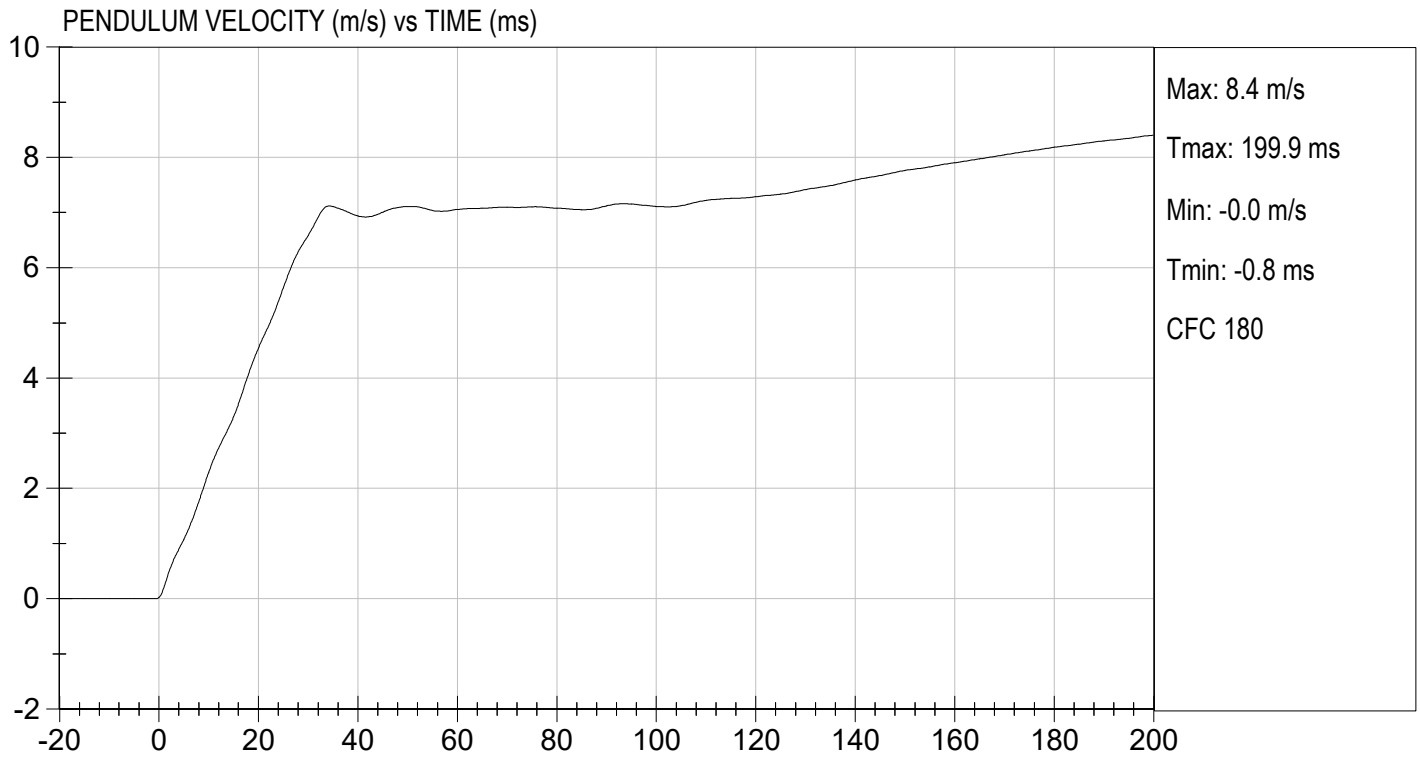
 Laboratory Technician

05/19/2023

 Test Date



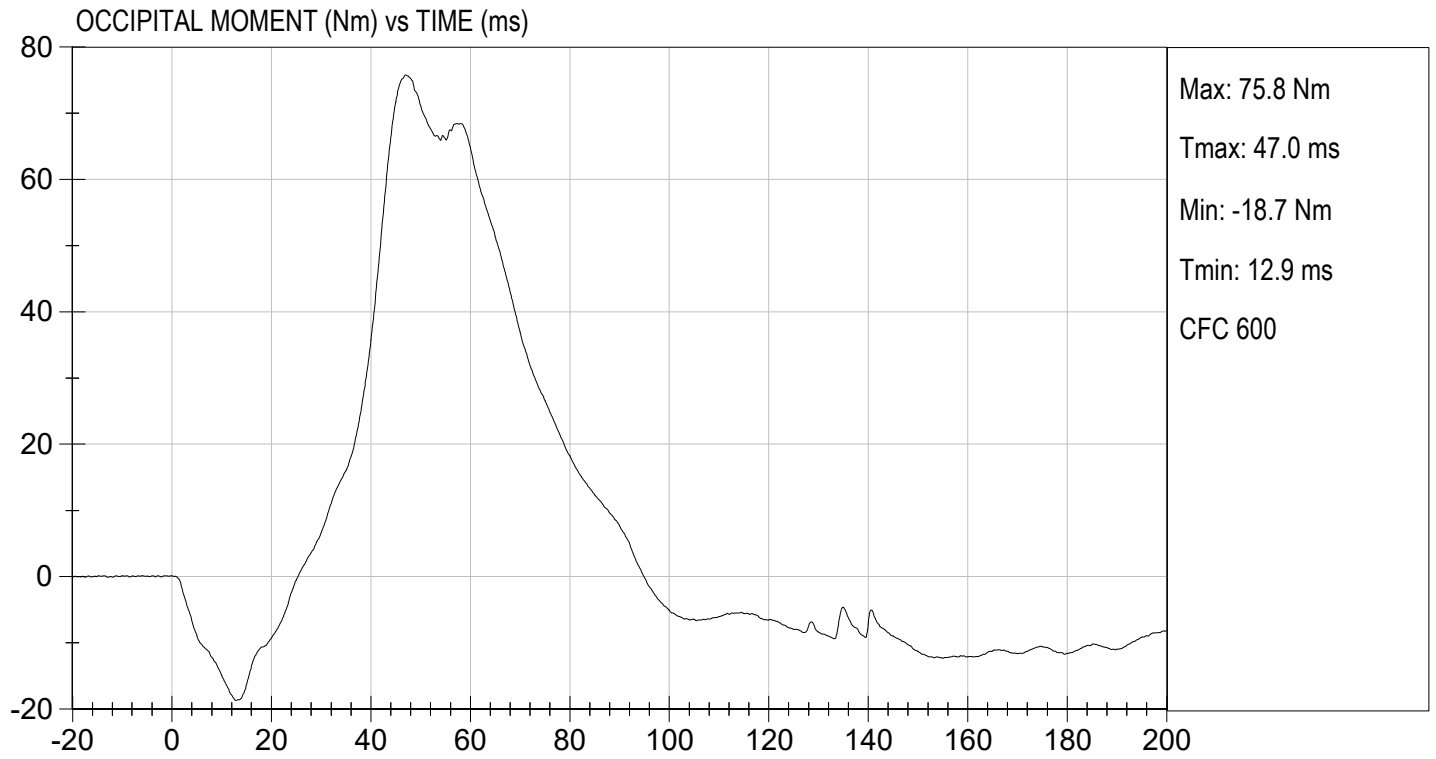
 Approved By





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

TEST DATE: 05/19/2023
TEST #: D231242



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

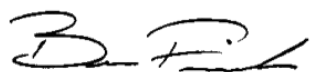
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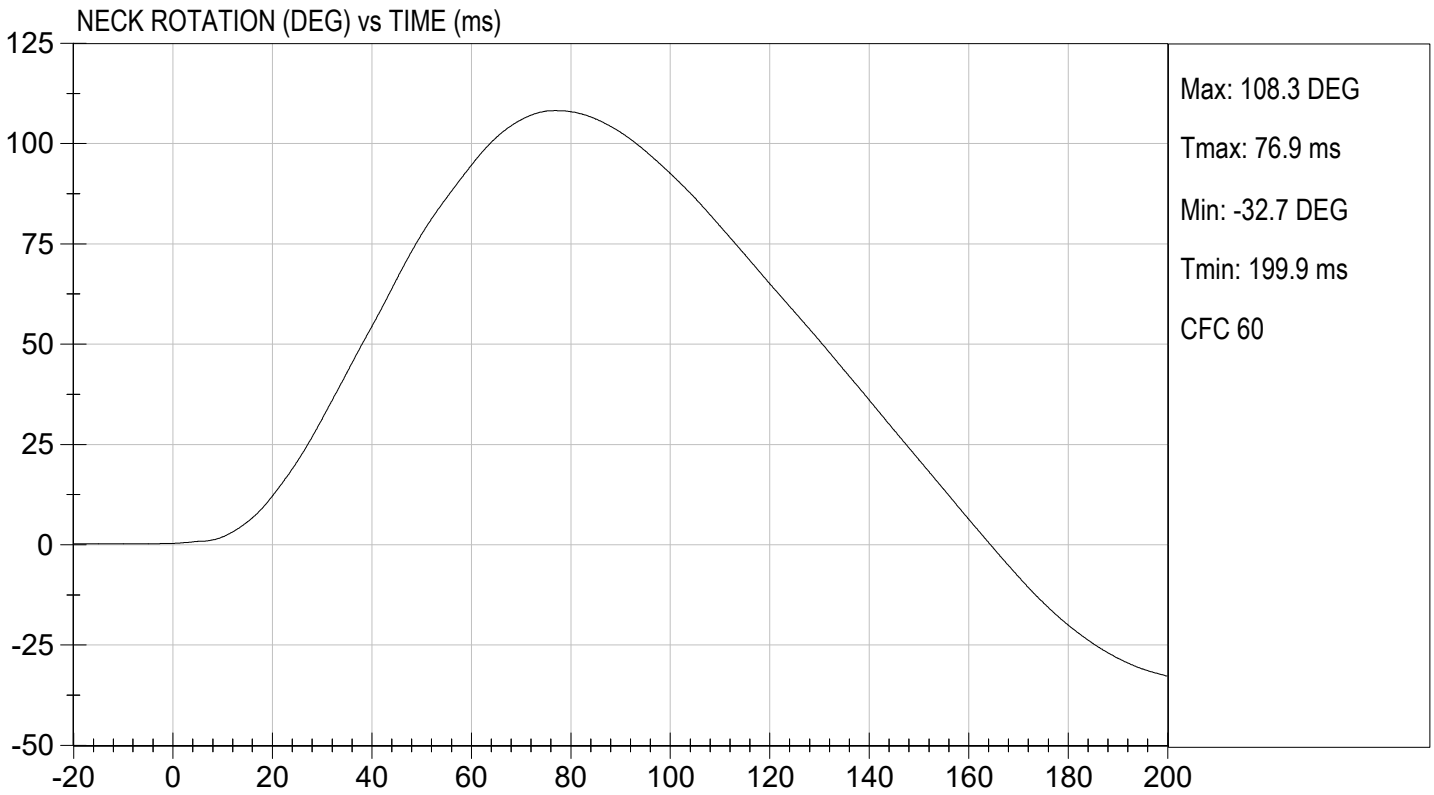
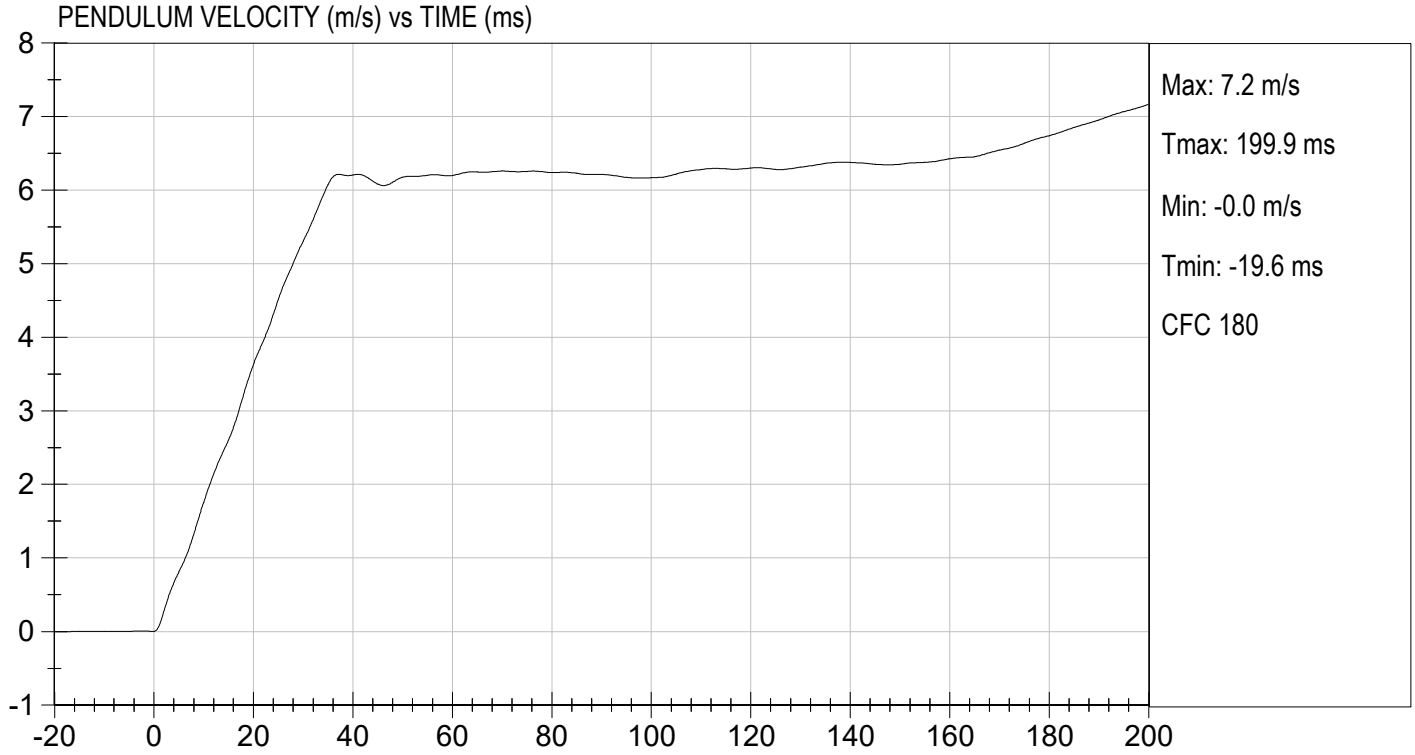
Test I.D.: D231243

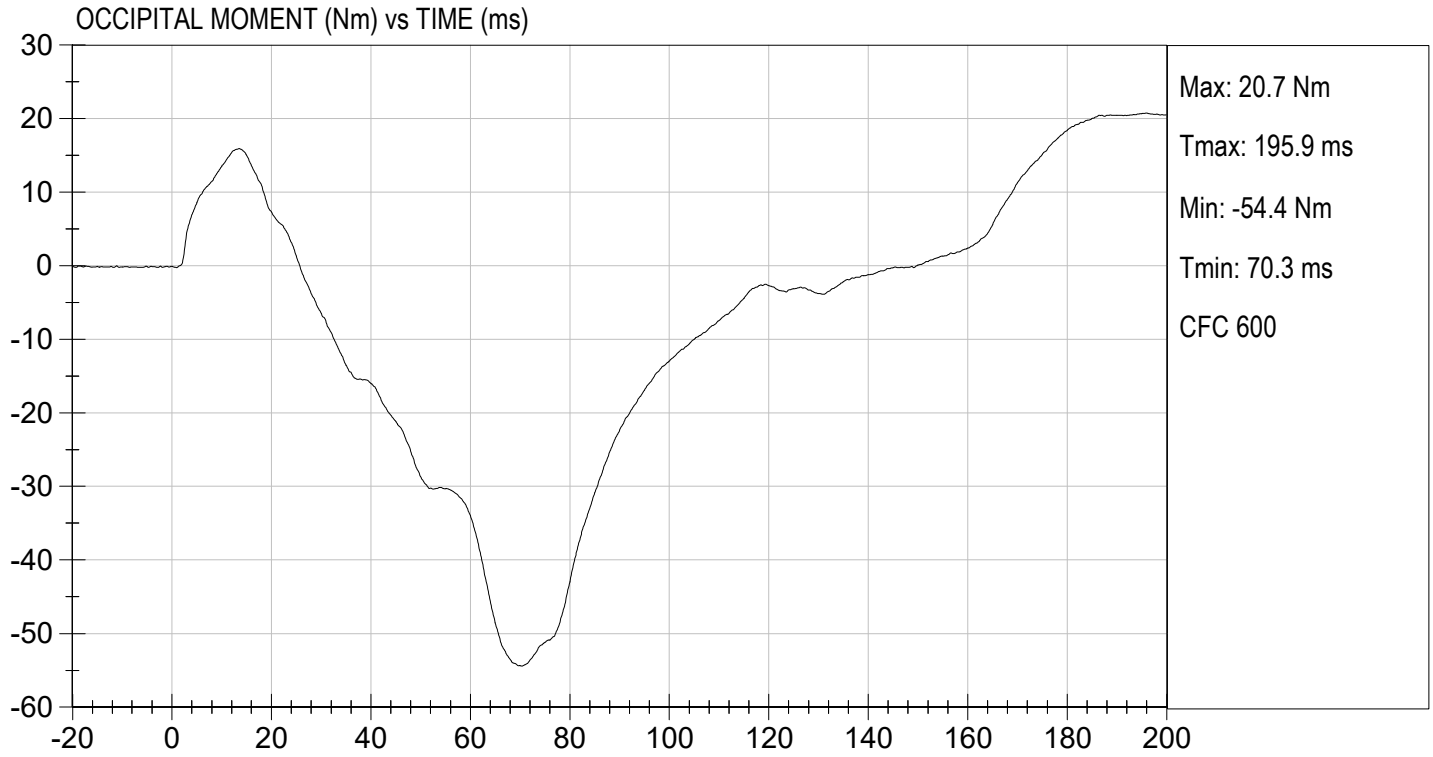
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.3	Pass
D Plane Rotation	Max	deg	99 to 114	108	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

05/19/2023
Test Date


Approved By





MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

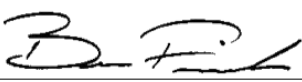
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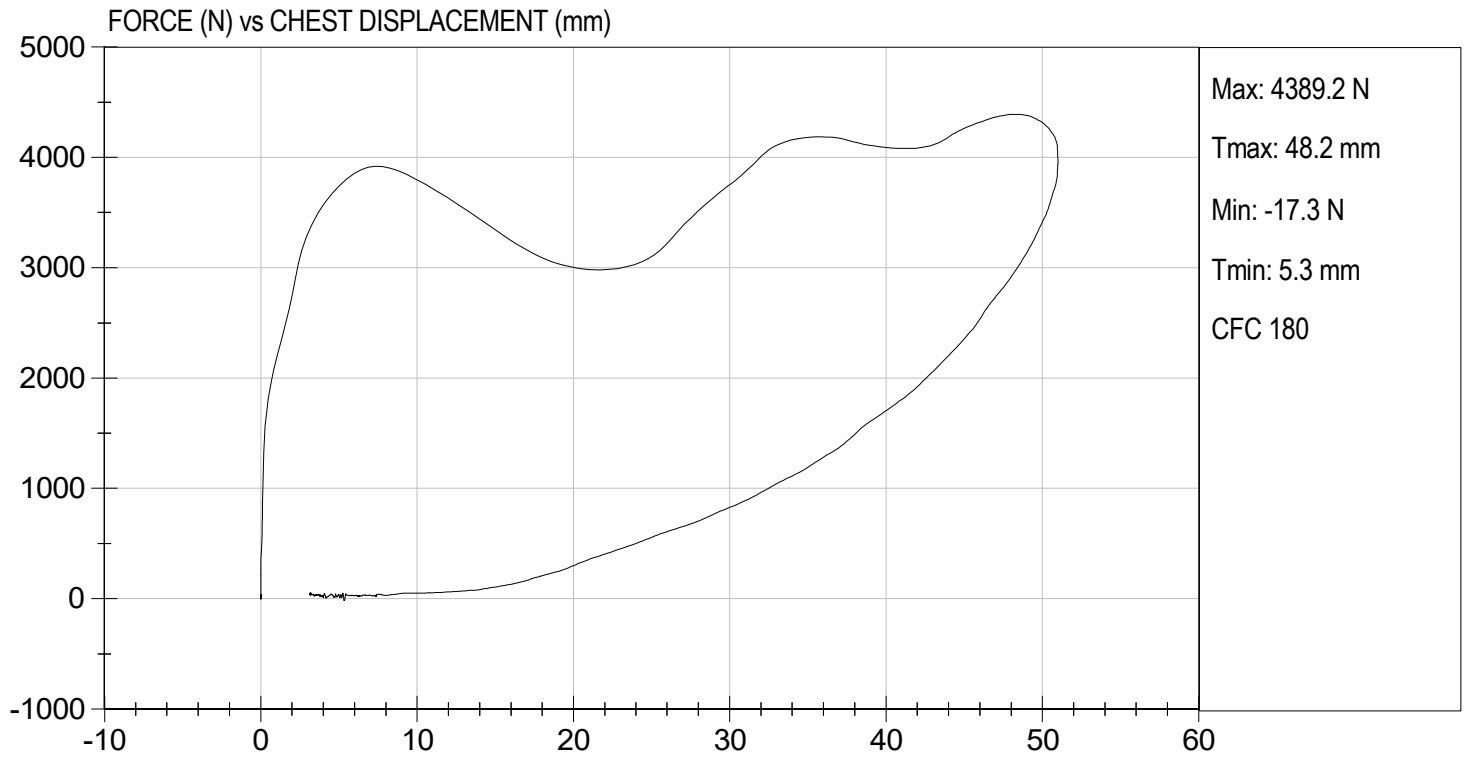
Test I.D: D231244

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Relative Humidity	%	10 to 70	38	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4314	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4389	Pass
Overall Test Results				Pass


 Laboratory Technician

05/19/2023
 Test Date


 Approved By

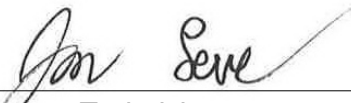


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 142

Test I.D.: D231245

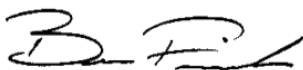
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3482	Pass
Overall Test Results				Pass



Laboratory Technician

05/19/2023

Test Date

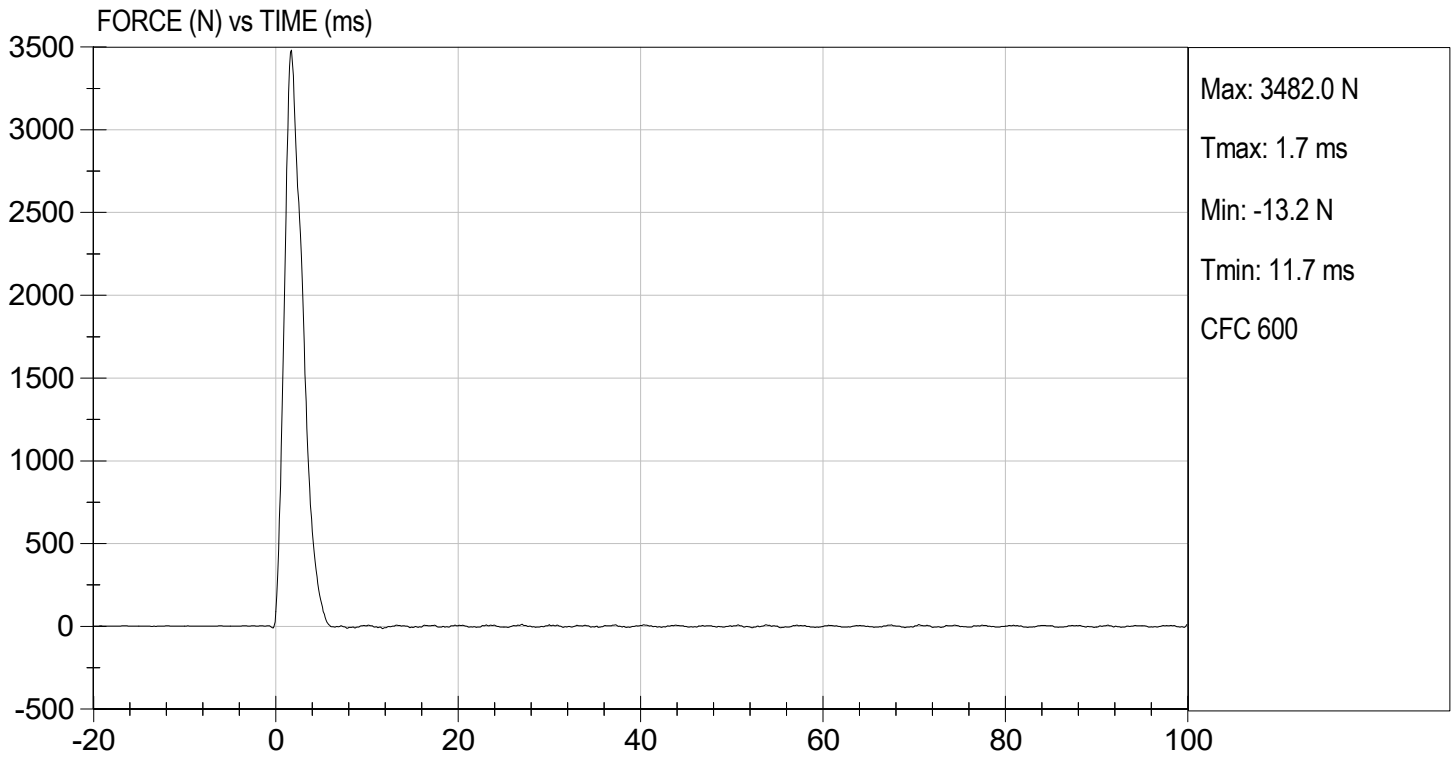


Approved By



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

TEST DATE: 05/19/2023
TEST #: D231245



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

ATD Serial No: 142

Test I.D.: D231246

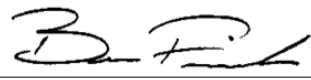
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3907	Pass
Overall Test Results				Pass



Laboratory Technician

05/19/2023

Test Date

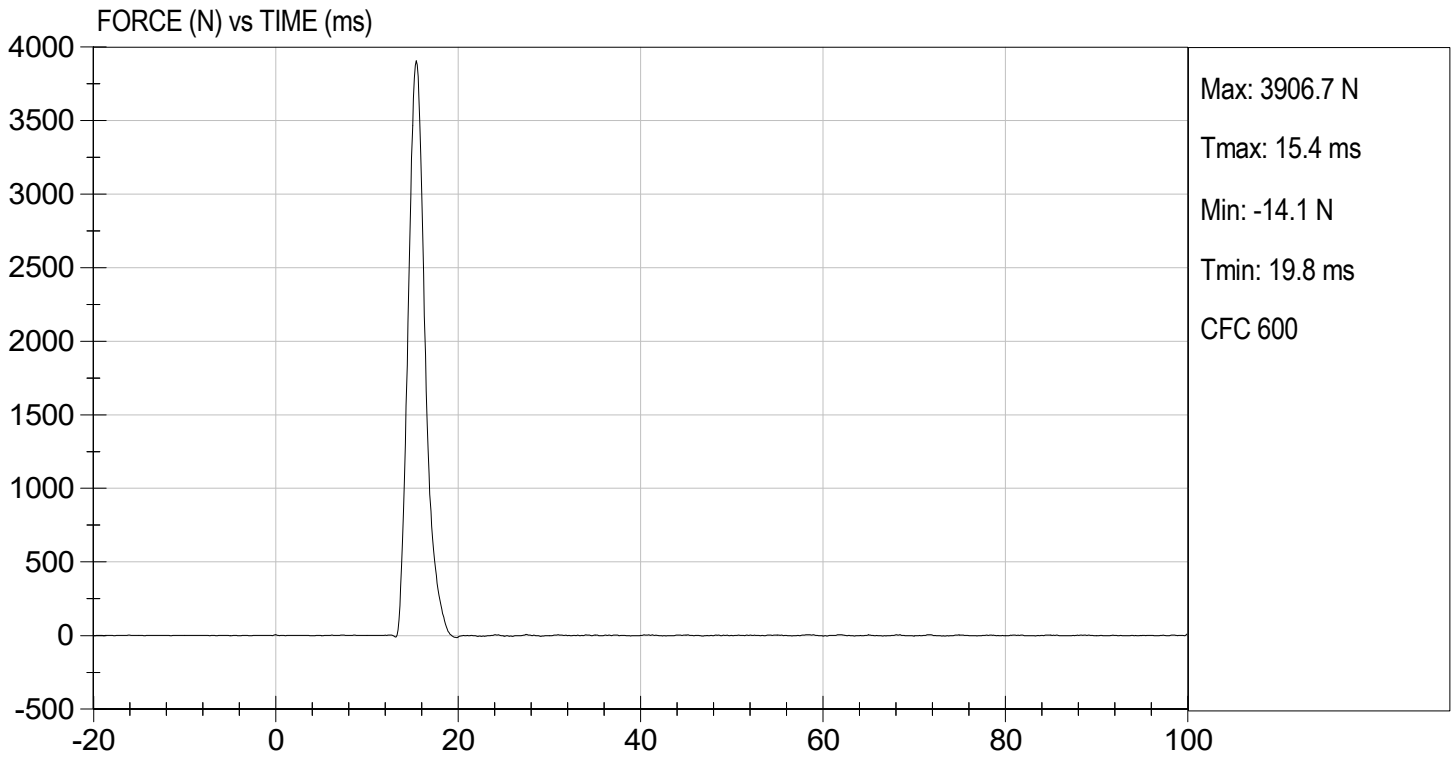


Approved By



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

TEST DATE: 05/19/2023
TEST #: D231246



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 142

Test I.D: D231247

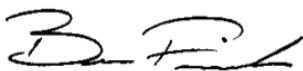
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Initial Angle	deg	0 to 20	16	Pass
Return Angle	deg	+/- 8	1	Pass
Force at 45 deg	N	320 to 390	390	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.5	Pass
Overall Result				Pass



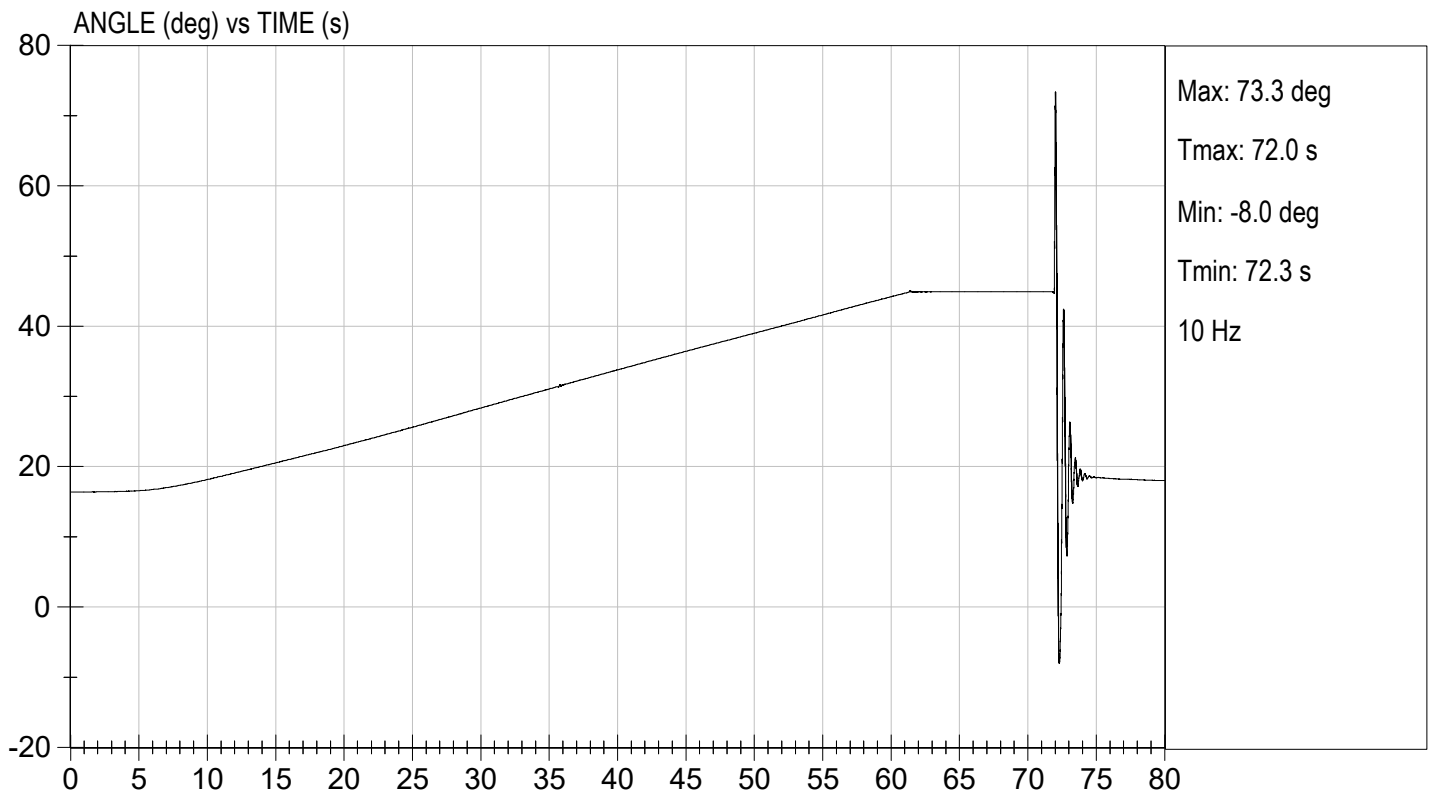
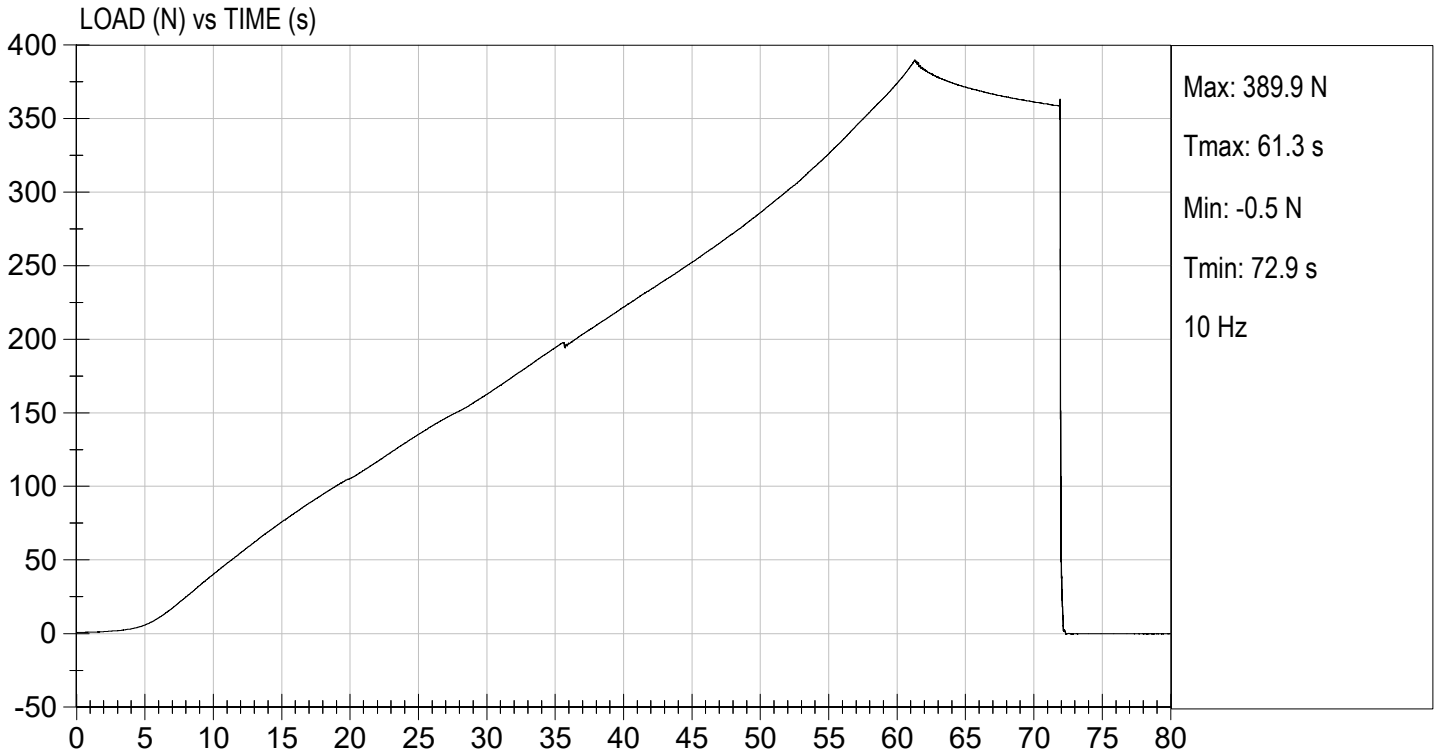
 Laboratory Technician

05/19/2023

 Test Date



 Approved By



QUALIFICATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

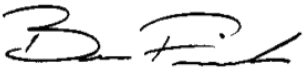
ATD Serial No: 142

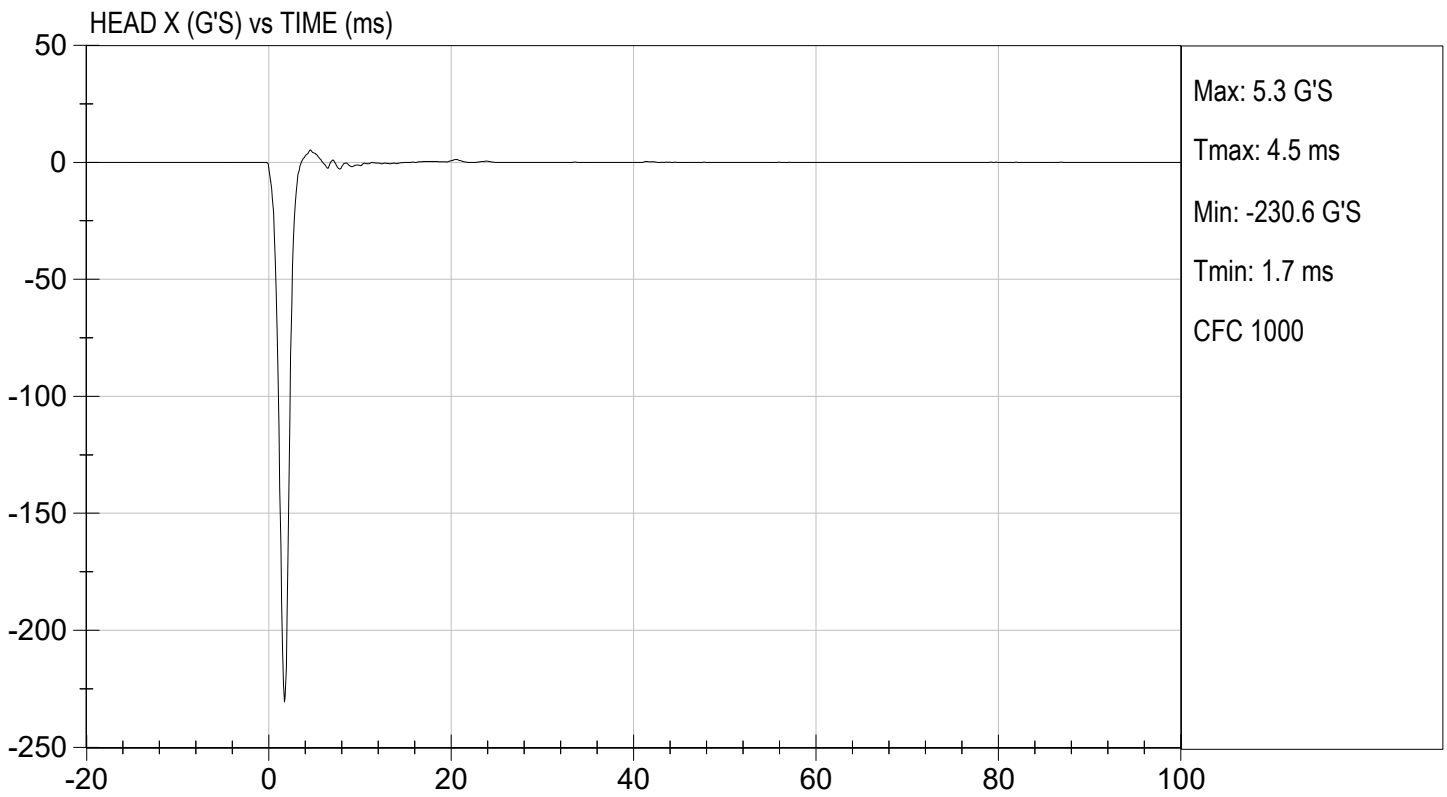
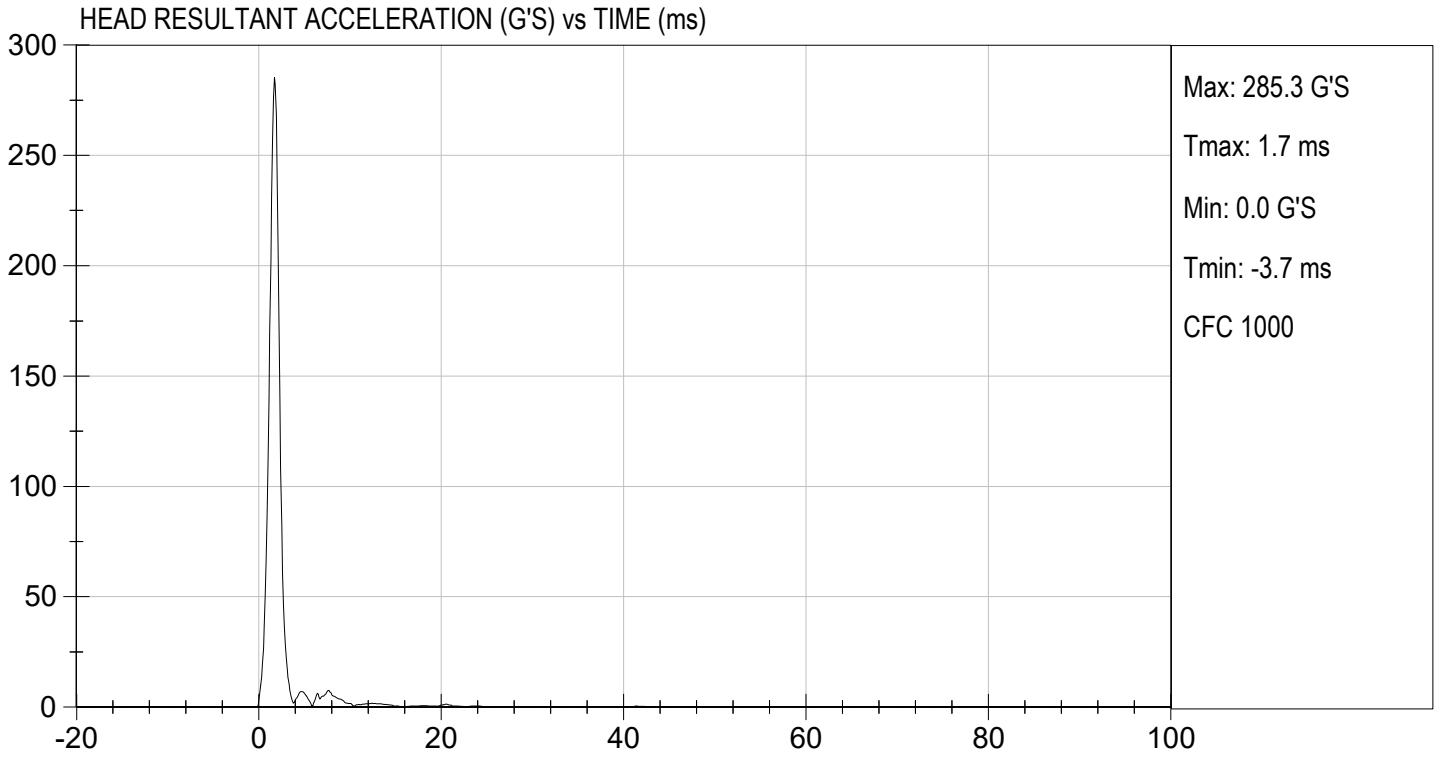
Test ID: D231501

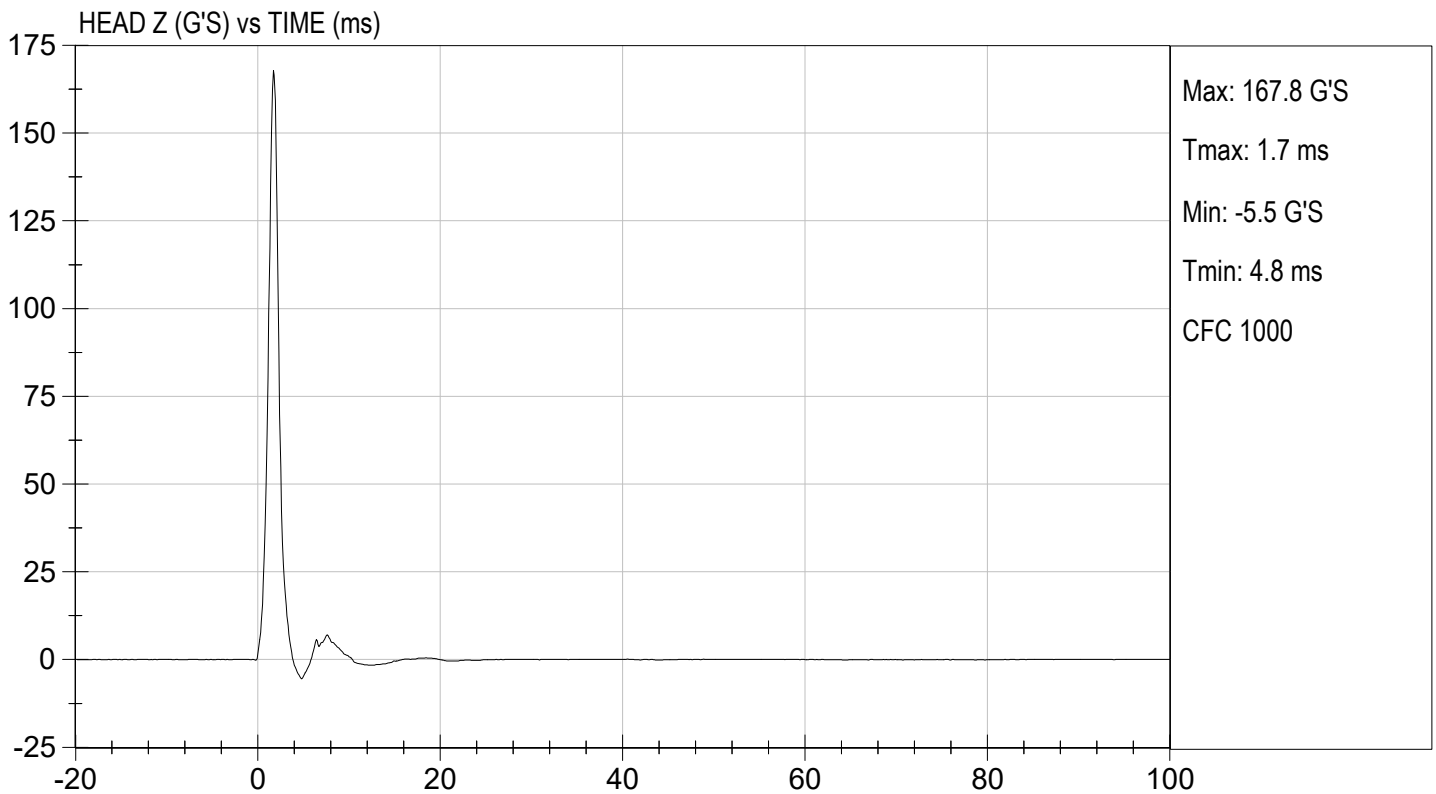
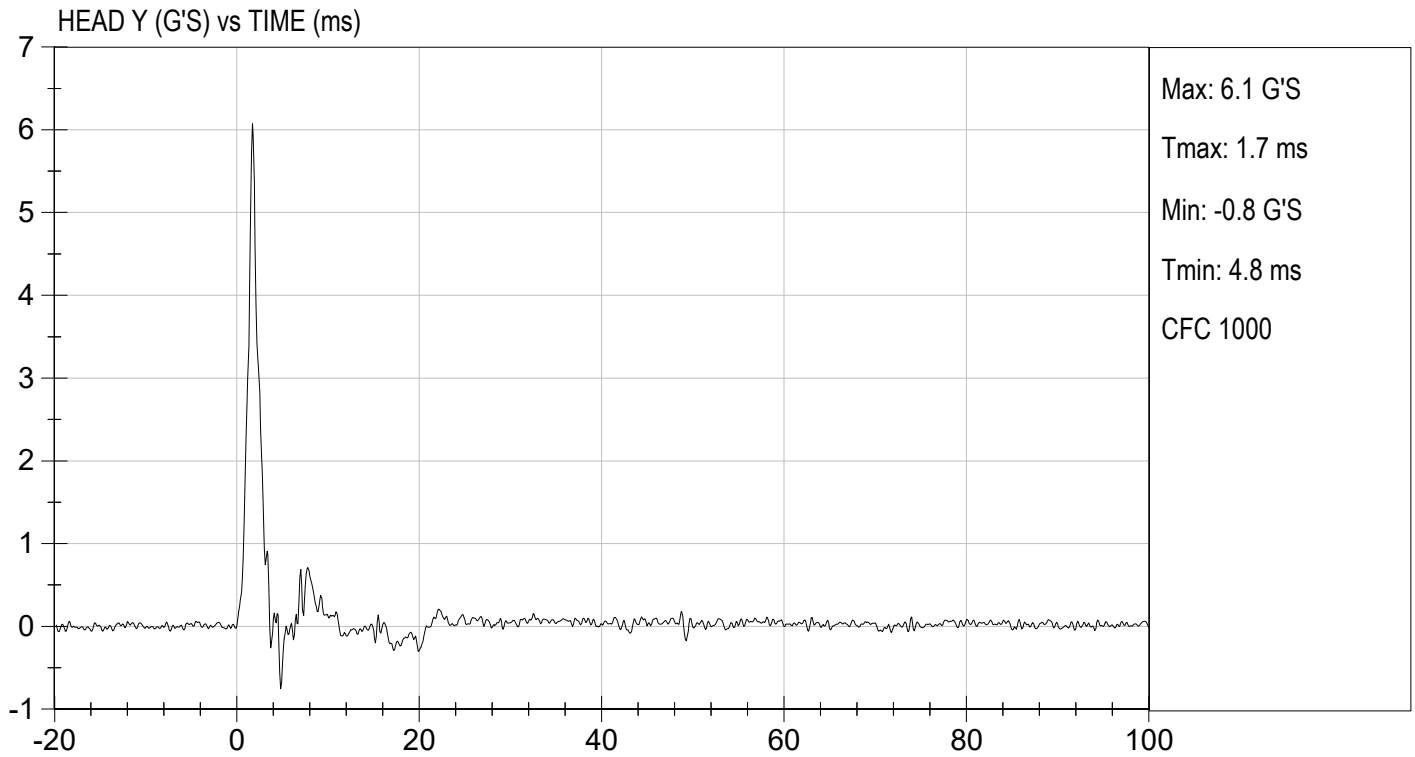
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	250 to 300	285	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	6.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

06/15/2023
 Test Date


 Approved By





MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

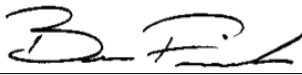
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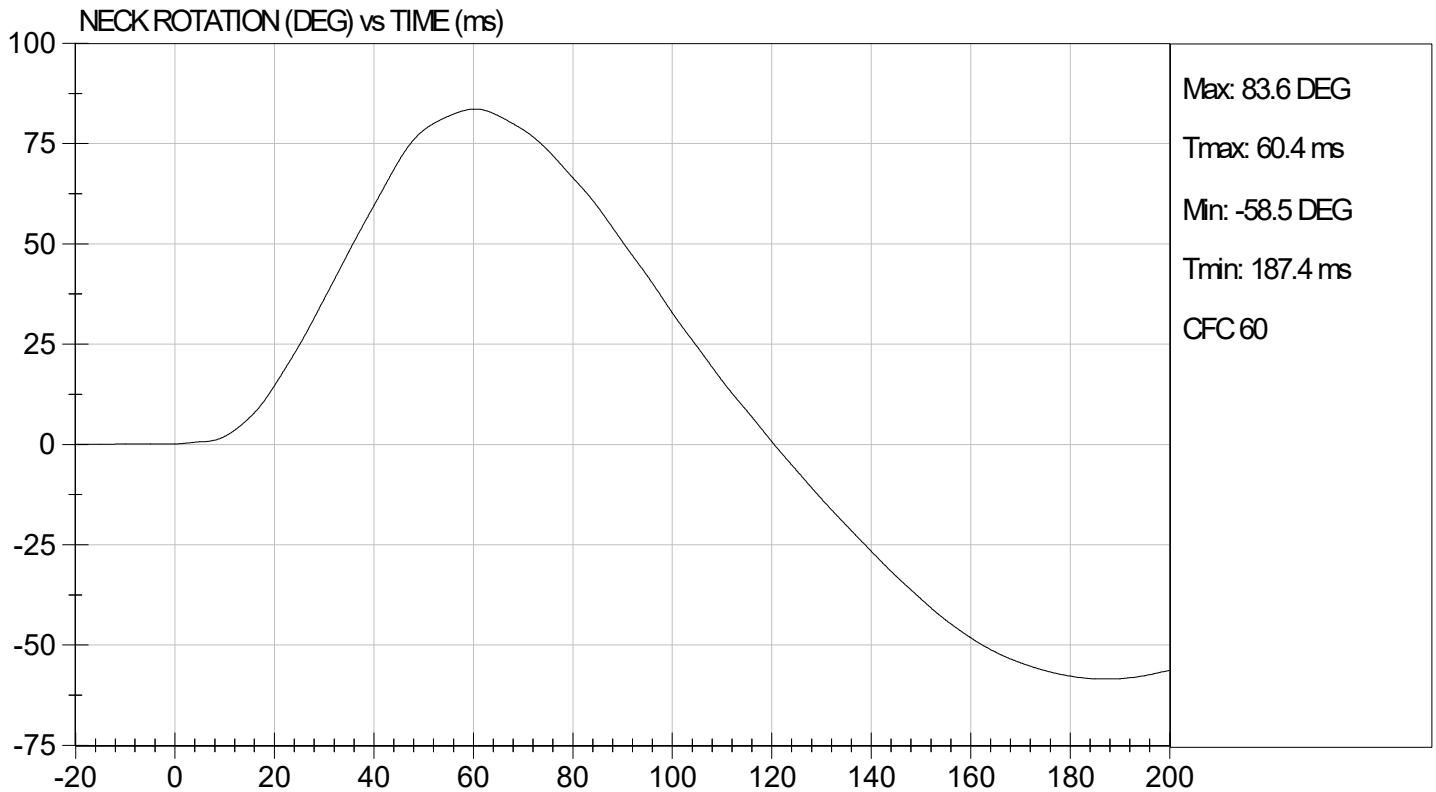
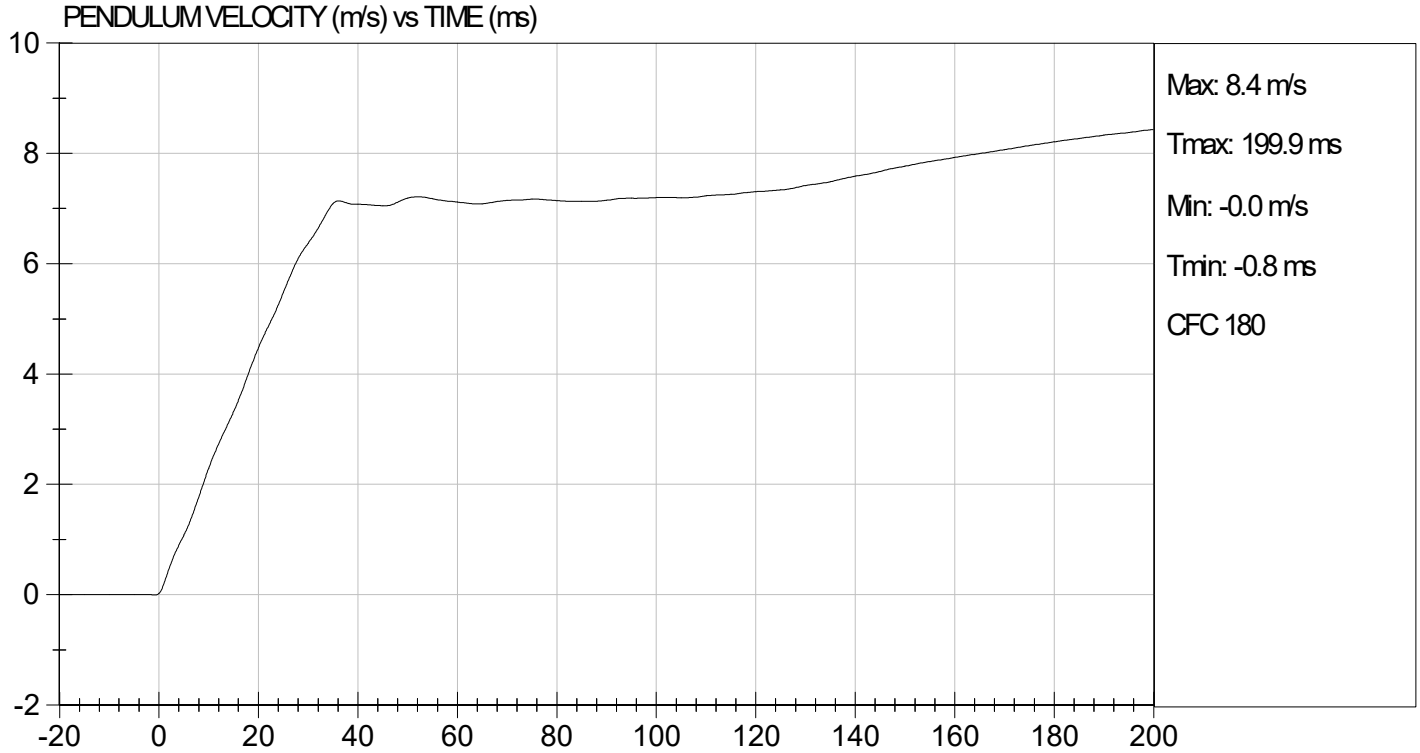
Test I.D: D231502

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	42	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	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.4	Pass
D Plane Rotation	Max	deg	77 to 91	84	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	75	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results					Pass


 Laboratory Technician

06/15/2023
 Test Date

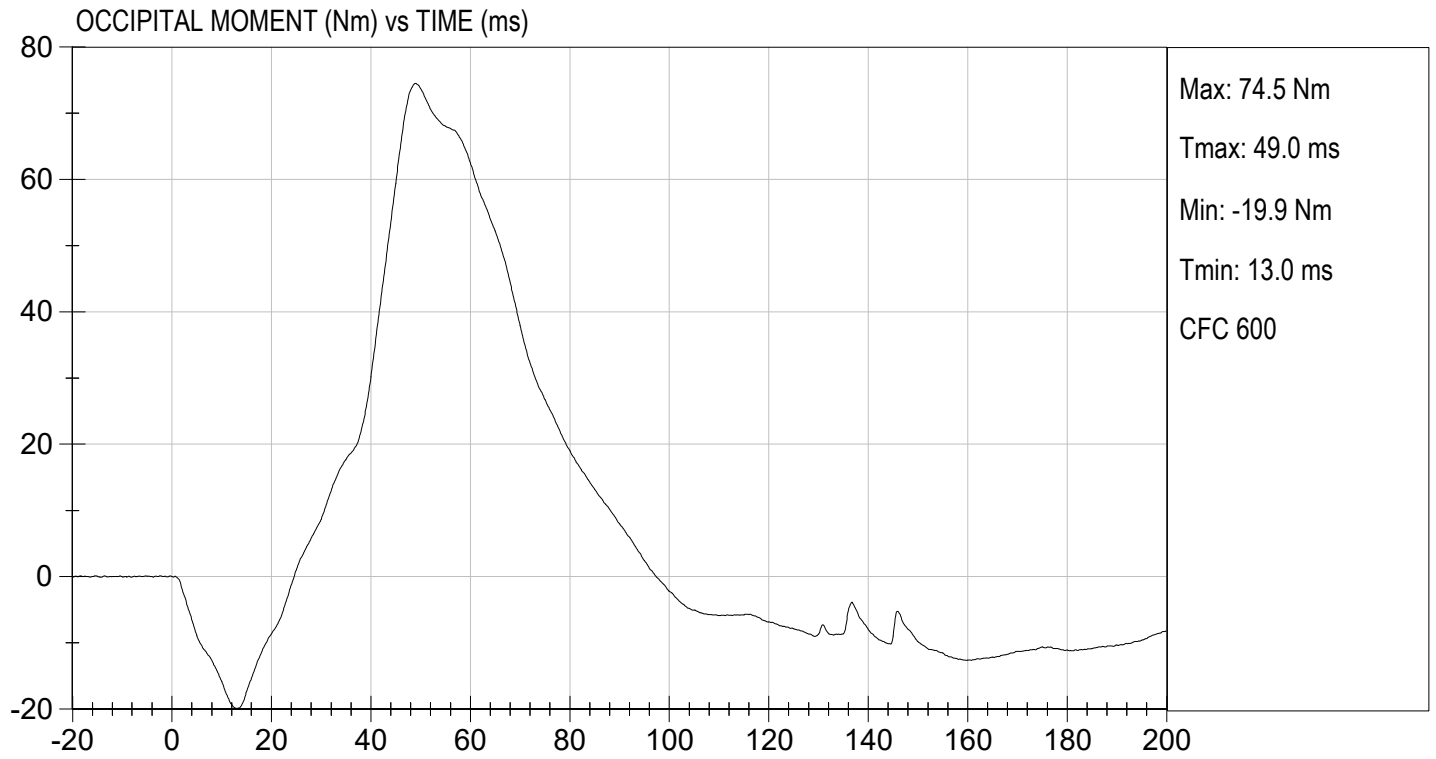

 Approved By





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

TEST DATE: 06/15/2023
TEST #: D231502



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

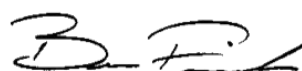
ATD Serial No: 142

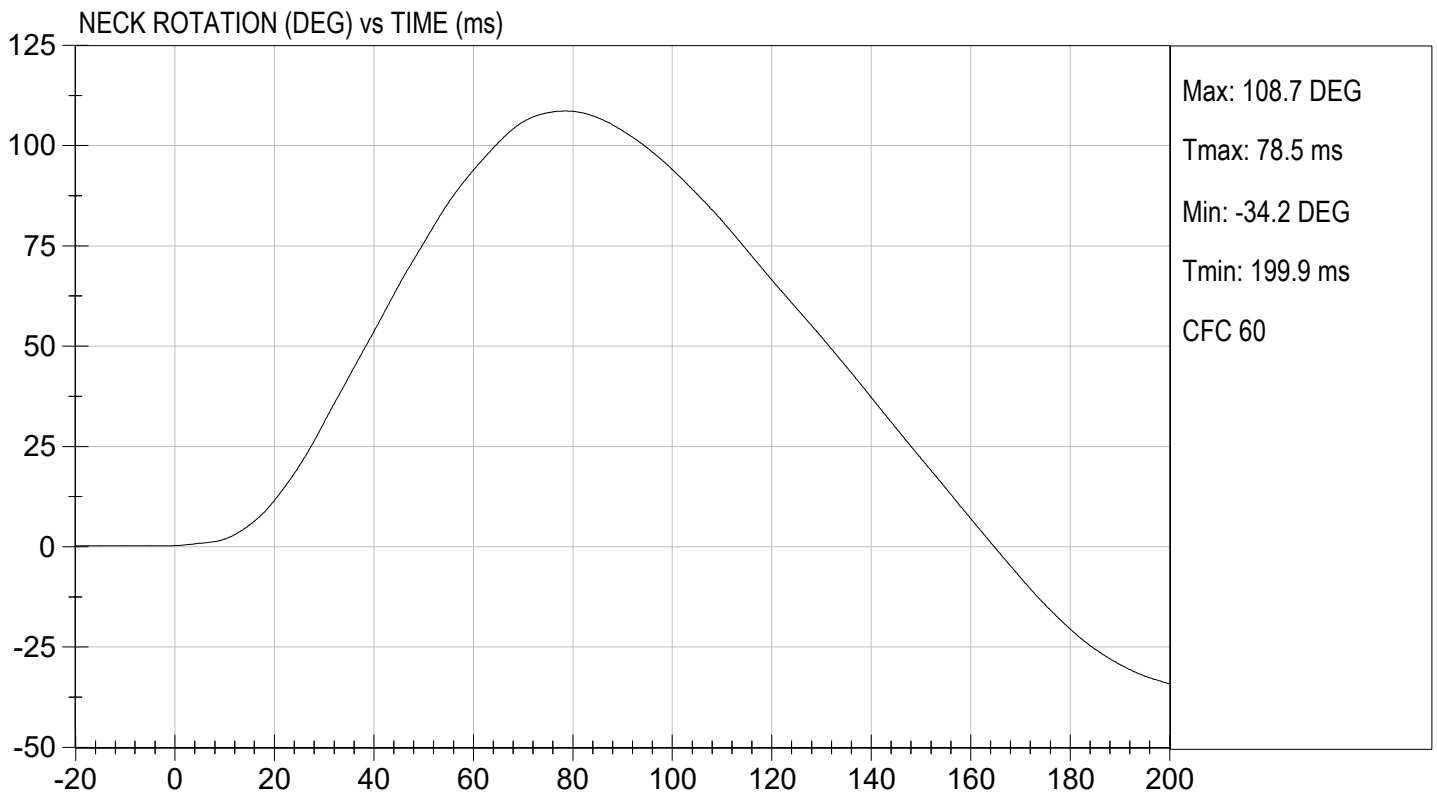
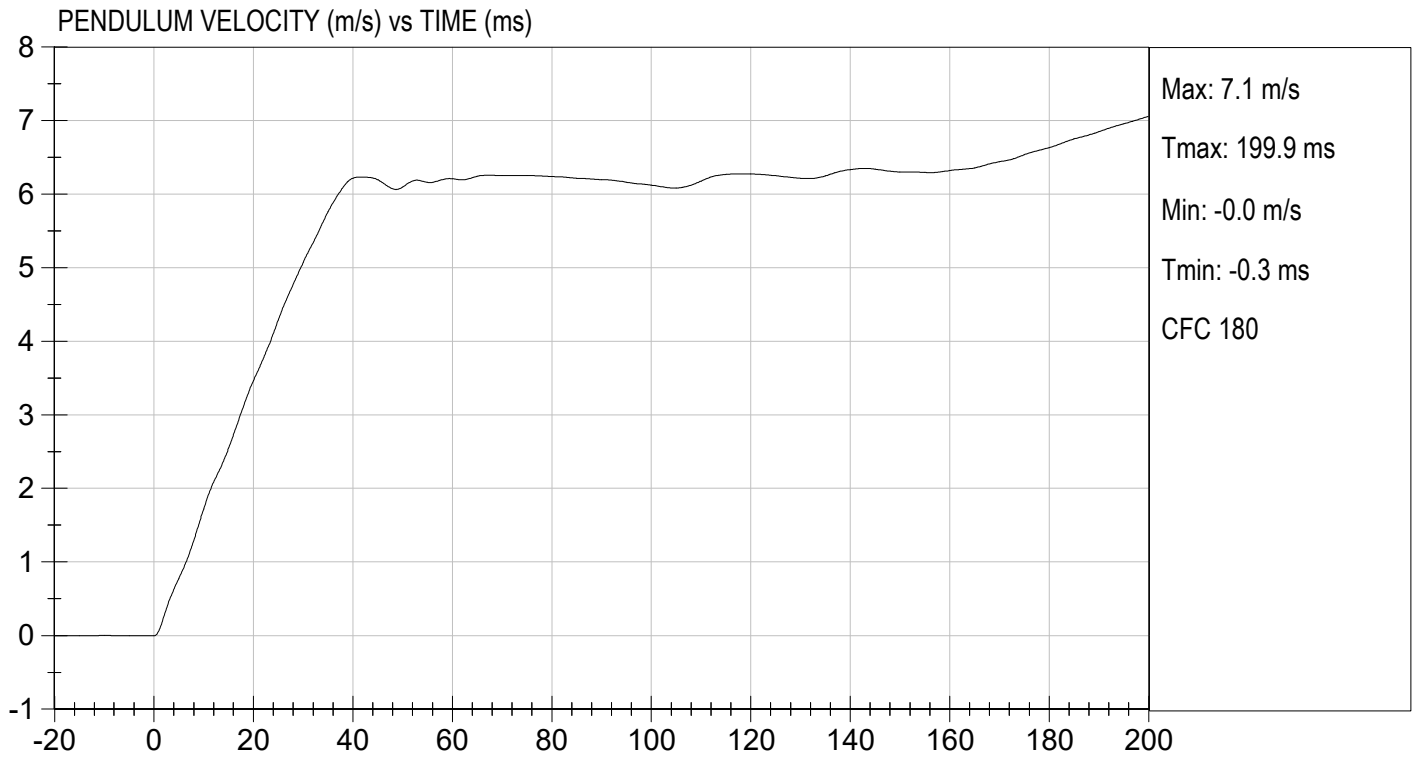
Test I.D.: D231503

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	44	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.05	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.7	Pass
	20 ms	m/s	3.1 to 3.9	3.5	Pass
	30 ms	m/s	4.6 to 5.6	5.1	Pass
D Plane Rotation	Max	deg	99 to 114	109	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	105	Pass
Overall Results					Pass


 Laboratory Technician

06/15/2023
 Test Date

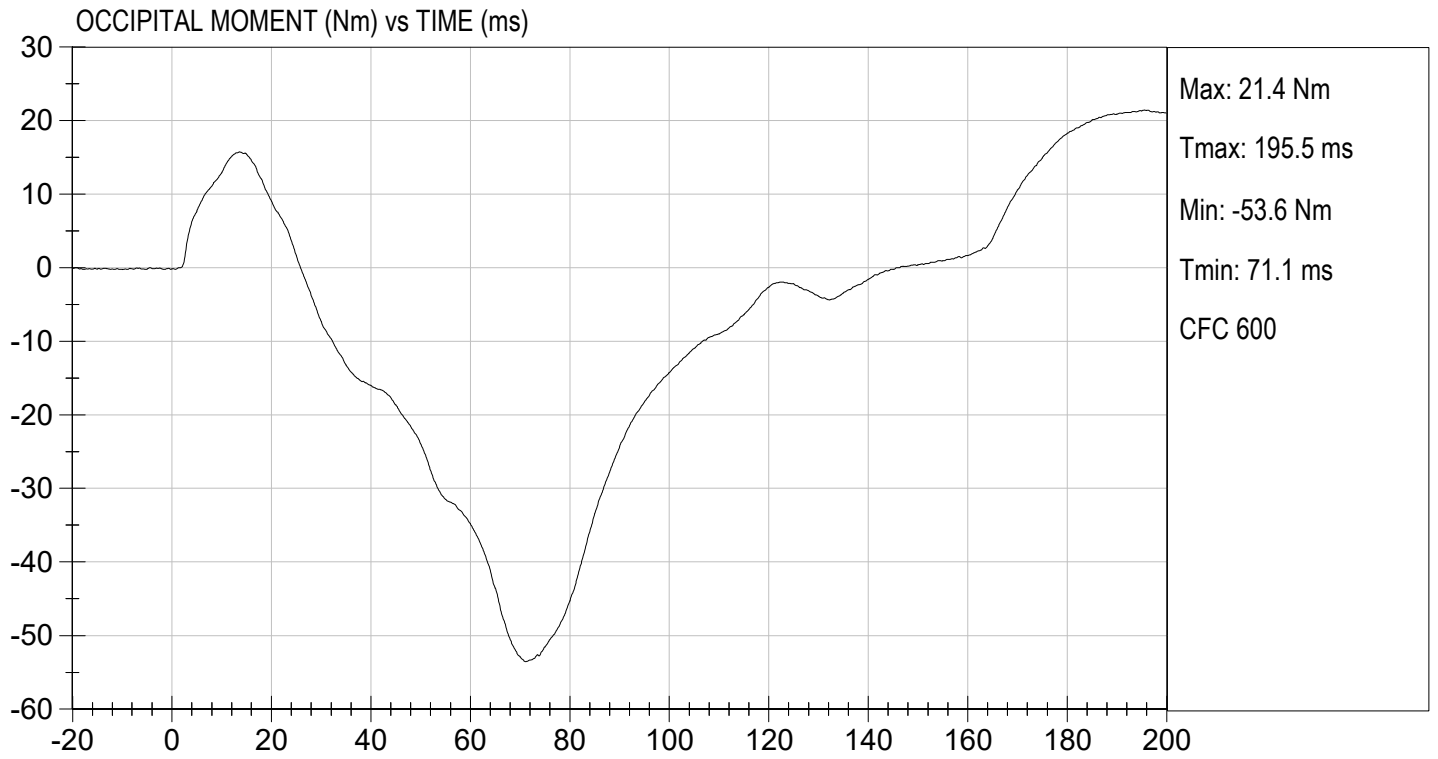

 Approved By





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

TEST DATE: 06/15/2023
TEST #: D231503



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

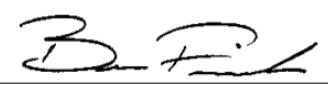
ATD Serial No: 142

Test I.D: D231504

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Relative Humidity	%	10 to 70	42	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4345	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4387	Pass
Overall Test Results				Pass


 Laboratory Technician

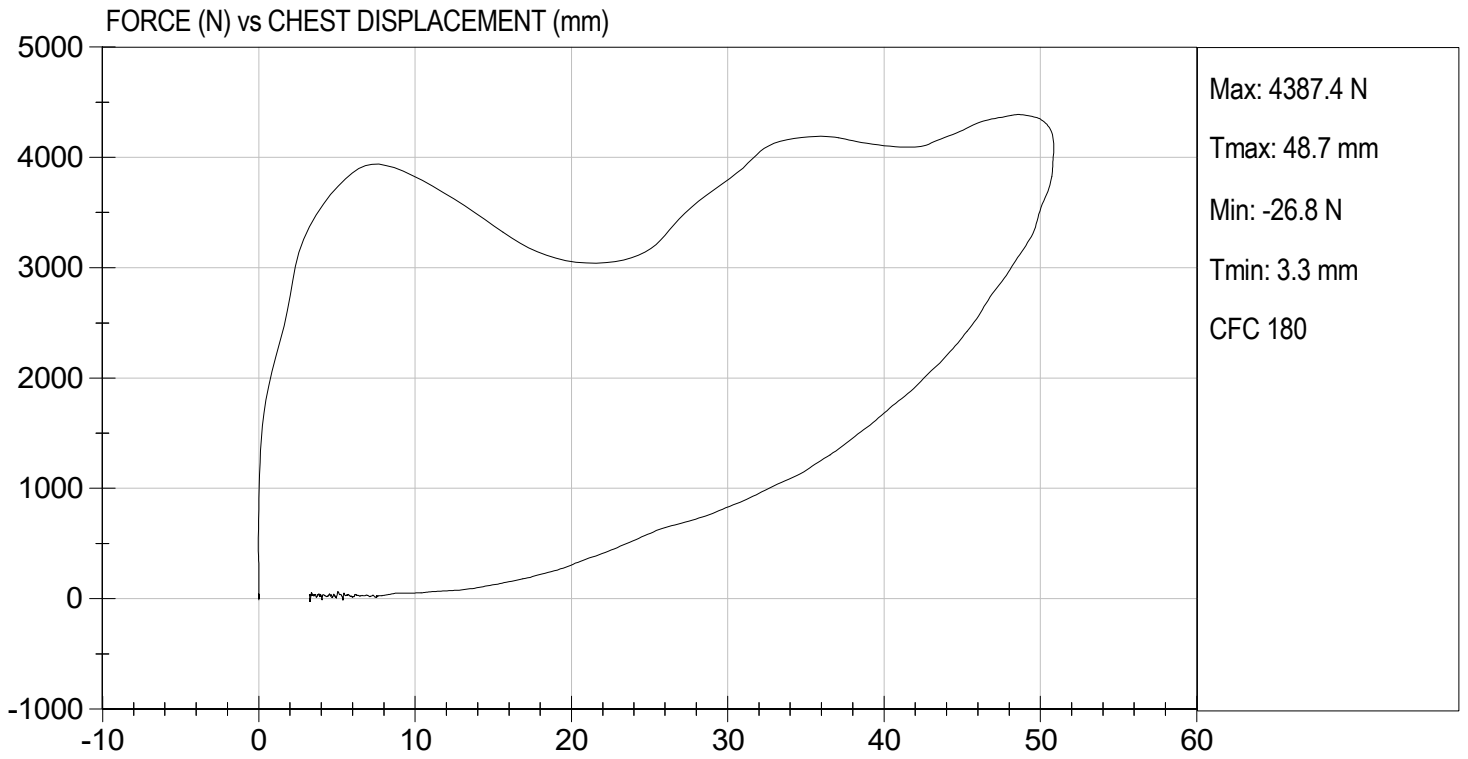
06/15/2023
 Test Date


 Approved By



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

TEST DATE: 06/15/2023
TEST #: D231504



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

ATD Serial No: 142

Test I.D.: D231505

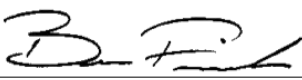
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3724	Pass
Overall Test Results				Pass



 Laboratory Technician

06/15/2023

 Test Date

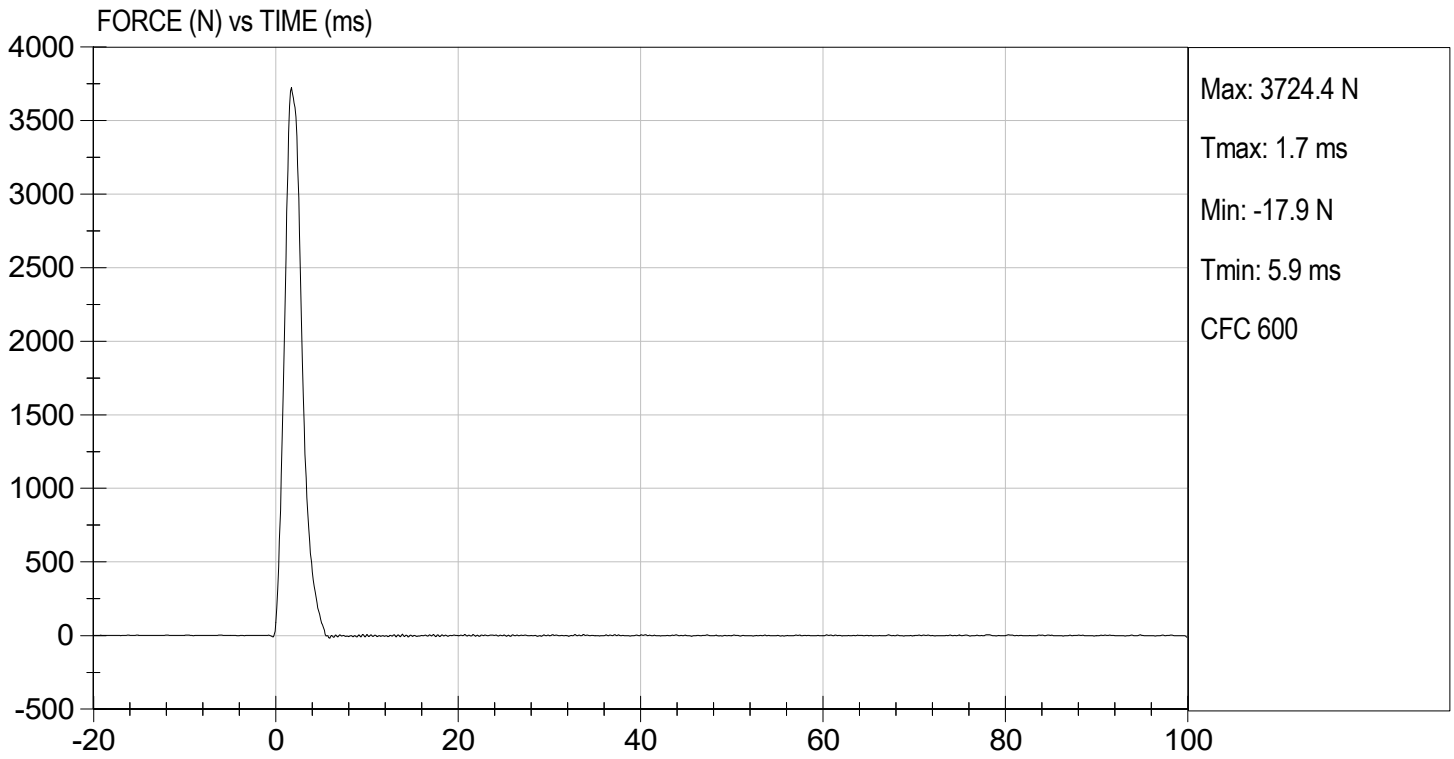


 Approved By



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

TEST DATE: 06/15/2023
TEST #: D231505



MGA RESEARCH CORPORATION

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

ATD Serial No: 142

Test I.D.: D231506

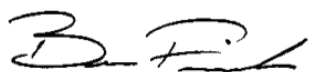
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3939	Pass
Overall Test Results				Pass



Laboratory Technician

06/15/2023

Test Date

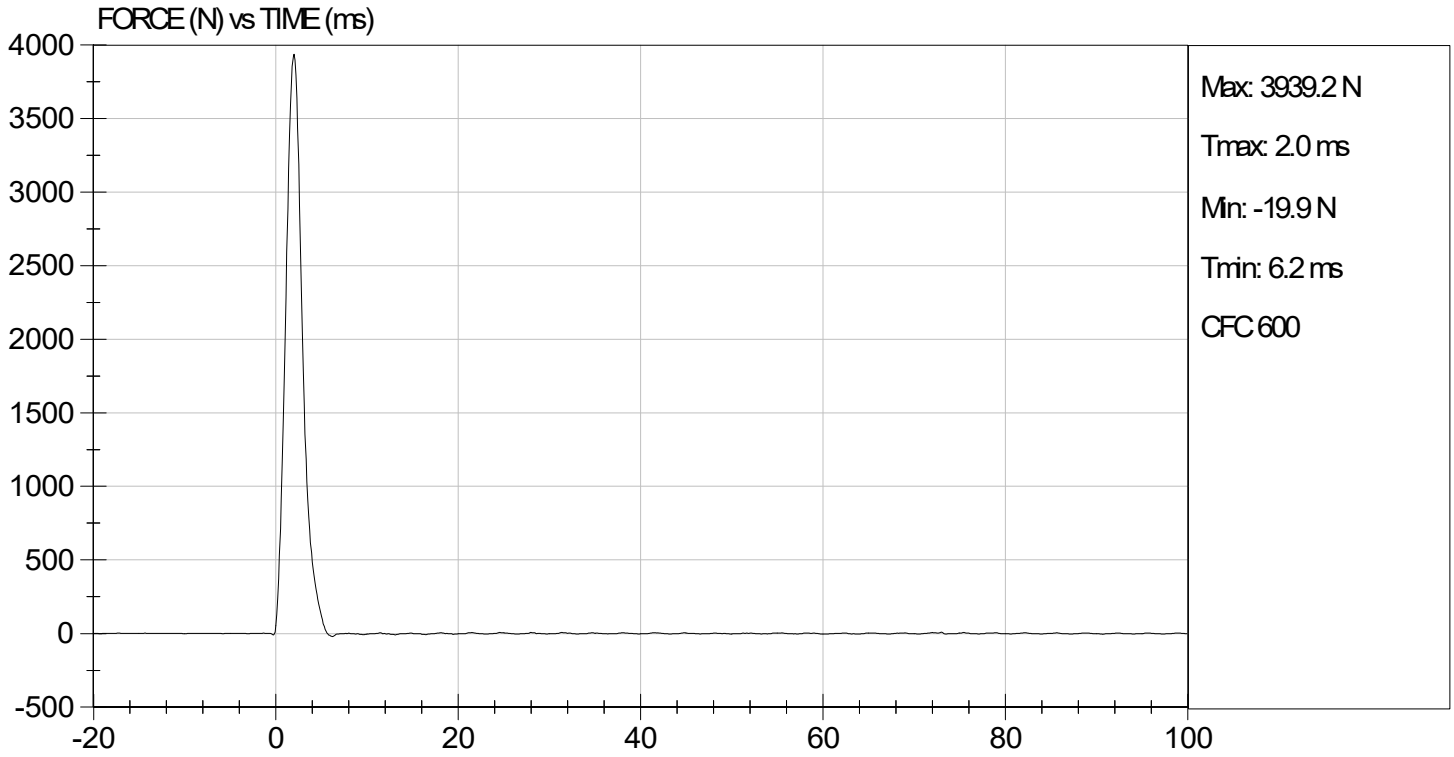


Approved By



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

TEST DATE: 06/15/2023
TEST #: D231506



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

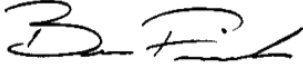
ATD Serial No: 142

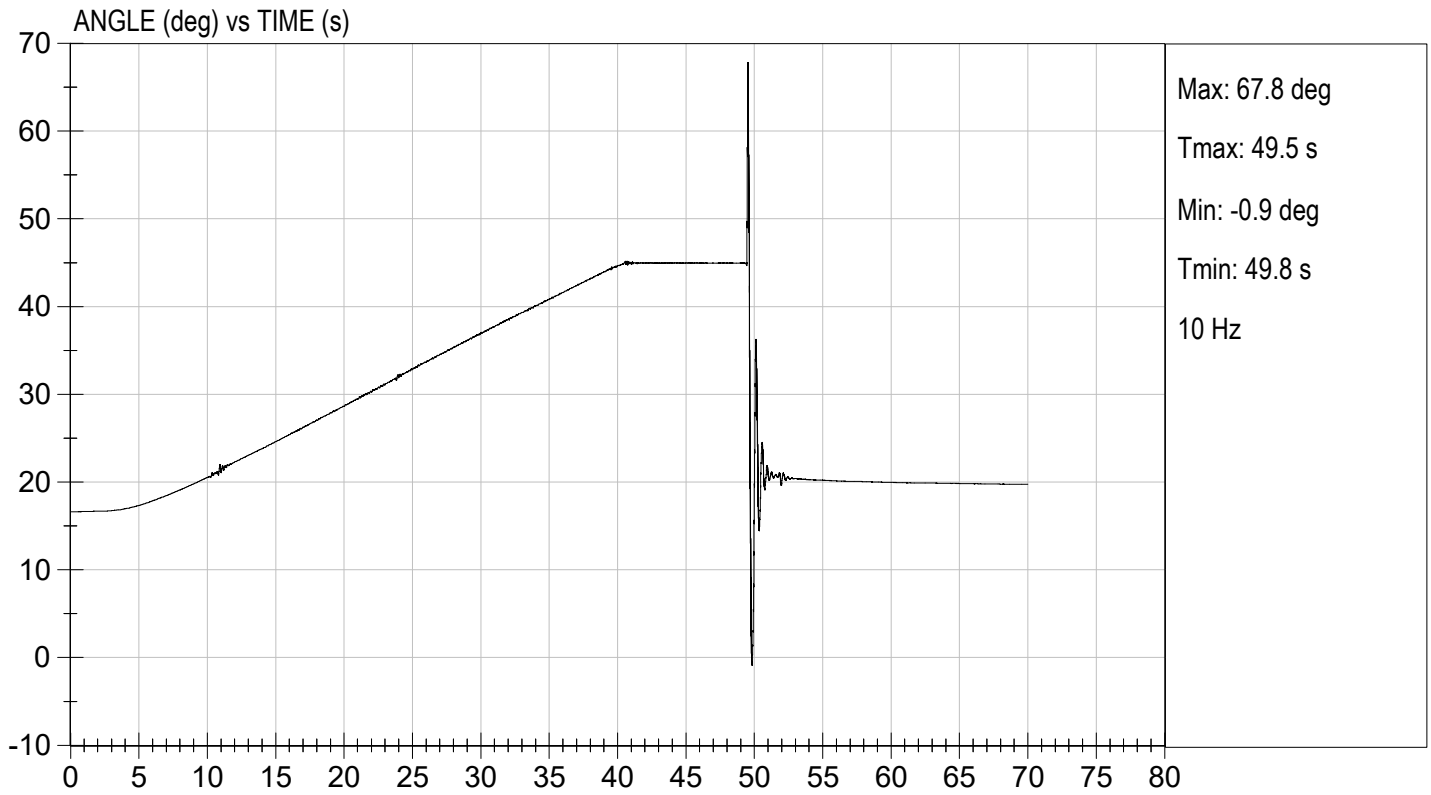
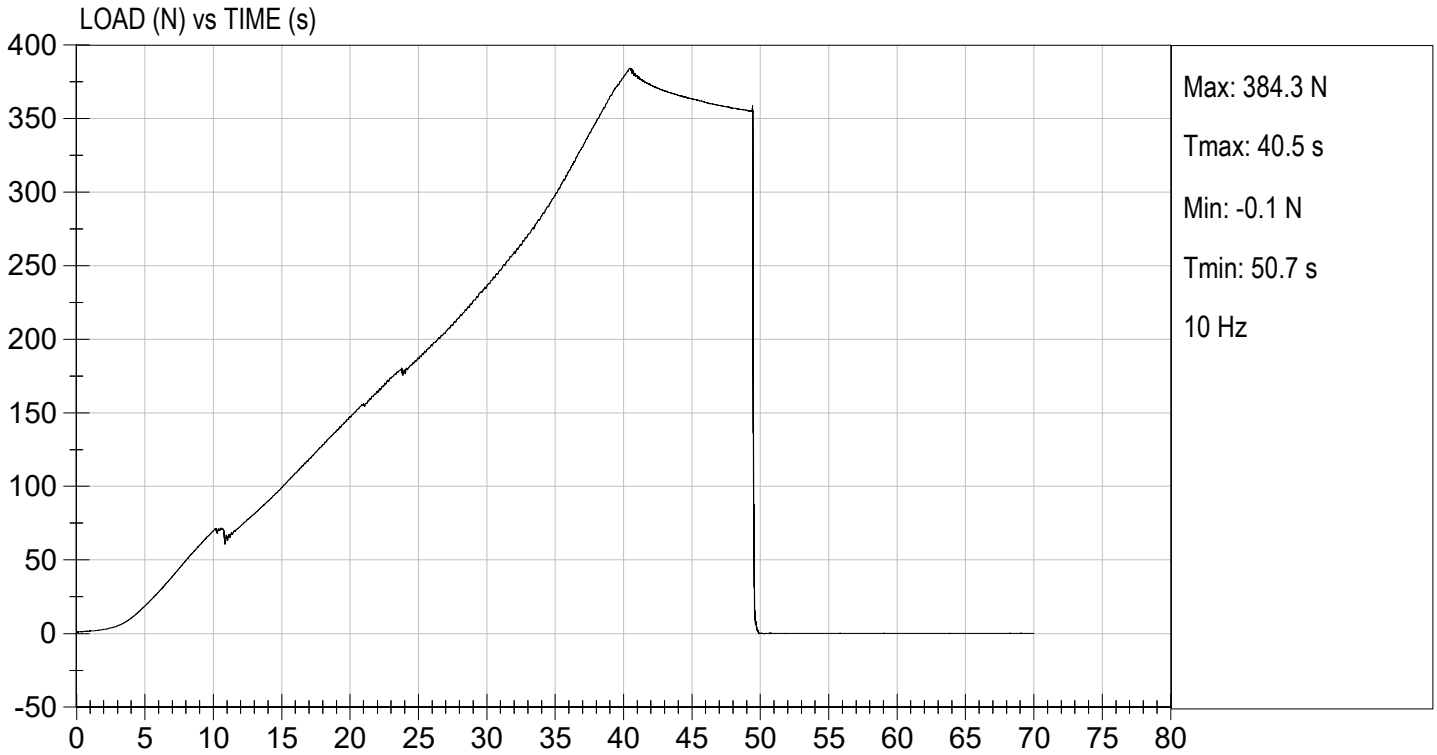
Test I.D: D231507

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	3	Pass
Force at 45 deg	N	320 to 390	384	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.8	Pass
Overall Result				Pass


 Laboratory Technician

06/15/2023
 Test Date


 Approved By



APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

TABLE 1 – DRIVER DUMMY INSTRUMENTATION

Instrument Location			Axis	Hybrid III 50 th S/N 351		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P79741	Endevco	12/29/2022	
		Y	P79743	Endevco	12/29/2022	
		Z	P79744	Endevco	12/29/2022	
	Redundant	X	P94834	Endevco	12/29/2022	
		Y	P94856	Endevco	12/29/2022	
		Z	P97412	Endevco	12/29/2022	
Head Angular Rate Sensors			X	ARS7442	DTS	09/06/2022
			Y	ARS7475	DTS	09/06/2022
			Z	ARS7516	DTS	09/06/2022
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG2022	Denton	09/21/2022
Chest Accelerometers	Primary	X	P86792	Endevco	12/29/2022	
		Y	P88348	Endevco	12/29/2022	
		Z	P86793	Endevco	12/29/2022	
	Redundant	X	P88666	Endevco	12/29/2022	
		Y	P94109	Endevco	12/29/2022	
		Z	P88667	Endevco	12/29/2022	
Chest Potentiometer			X	351	Humanetics	12/29/2022
Pelvis Accelerometers			X	P95526	Endevco	12/29/2022
			Y	P96038	Endevco	12/29/2022
			Z	P97742	Endevco	12/29/2022
Femur Load Cells	Right	Primary	Z	FG121P	Denton	12/29/2022
		Redundant	Z	FG121R	Denton	12/29/2022
	Left	Primary	Z	FG122P	Denton	12/29/2022
		Redundant	Z	FG122R	Denton	12/29/2022
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG467	Denton	12/21/2022
		Lower	Mx, My, Fz	AG491	Denton	12/21/2022
	Left	Upper	Mx, My, Fz	TG478	Denton	12/21/2022
		Lower	Mx, My, Fz	AG500	Denton	12/21/2022
Foot Accelerometers	Right	Rear	X	T22486	Endevco	12/29/2022
		Front	Z	P97382	Endevco	12/29/2022
			Z	P82120	Endevco	12/29/2022
	Left	Rear	X	T16468	Endevco	12/29/2022
		Front	Z	T16496	Endevco	12/29/2022
			Z	T16501	Endevco	12/29/2022
Seat Belt Load Cells			Lap			
			Shoulder			

TABLE 2 – FRONT PASSENGER DUMMY INSTRUMENTATION

Instrument Location			Axis	Hybrid III 5 th S/N 142		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary		X	P94799	Endevco	04/26/2023
			Y	P94800	Endevco	04/26/2023
			Z	P94801	Endevco	04/26/2023
	Redundant		X	P94802	Endevco	04/26/2023
			Y	P94803	Endevco	04/26/2023
			Z	P97377	Endevco	04/26/2023
Head Angular Rate Sensors			X	ARS7325	DTS	09/06/2022
			Y	ARS7340	DTS	09/06/2022
			Z	ARS7354	DTS	09/06/2022
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG1915	Denton	02/22/2023
Chest Accelerometers	Primary		X	P88719	Endevco	04/26/2023
			Y	P94785	Endevco	04/26/2023
			Z	P94793	Endevco	04/26/2023
	Redundant		X	P95322	Endevco	04/26/2023
			Y	P95370	Endevco	04/26/2023
			Z	T30901	Endevco	04/26/2023
Chest Potentiometer			X	142	Humanetics	04/25/2023
Pelvis Accelerometers			X	P82646	Endevco	04/25/2023
			Y	P94798	Endevco	04/25/2023
			Z	P97705	Endevco	04/25/2023
Femur Load Cells	Right	Primary	Z	FG126P	Denton	04/25/2023
		Redundant	Z	FG126R	Denton	04/25/2023
	Left	Primary	Z	FG127P	Denton	04/25/2023
		Redundant	Z	FG127R	Denton	04/25/2023
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG405	Denton	02/22/2023
		Lower	Mx, My, Fz	AG368	Denton	02/22/2023
	Left	Upper	Mx, My, Fz	TG475	Denton	02/22/2023
		Lower	Mx, My, Fz	AG504	Denton	02/22/2023
Foot Accelerometers	Right	Rear	X	P94795	Endevco	04/25/2023
			Z	P94796	Endevco	04/25/2023
		Front	Z	P94797	Endevco	04/25/2023
	Left	Rear	X	P83167	Endevco	04/26/2023
			Z	P83168	Endevco	04/26/2023
		Front	Z	P83169	Endevco	04/26/2023
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	A424075	MSI	06/08/2023
			Z	T30613	Endevco	06/08/2023
		Redundant	X	A340806	MSI	06/08/2023
	Right	Primary	X	T25668	Endevco	06/08/2023
			Z	A395070	MSI	06/08/2023
		Redundant	X	A395081	MSI	06/08/2023
Engine Accelerometers		Top	X	A370347	MSI	03/08/2023
		Bottom	X	T32176	Endevco	06/08/2023