REPORT NUMBER: NCAP-MGA-22-015

NEW CAR ASSESSMENT PROGRAM (NCAP)
Frontal Barrier Impact Test

NISSAN MOTOR CO., LTD.
2022 Nissan Frontier S 4x4 Crew Cab
NHTSA No.: M20225202

MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105

Test Date: February 9, 2022

Final Report Date: June 9, 2022

FINAL REPORT

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

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Approval Date: June 9, 2022

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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15. Supplementary Notes	

16. Abstract

A 56.3 km/h NCAP Frontal Rigid Barrier Impact Test was conducted on a 2022 Nissan Frontier S 4x4 Crew Cab 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 February 9, 2022.

The impact velocity of the vehicle was 56.10 km/h and the ambient temperature at the barrier face at the time of impact was 21.5°C. The target vehicle post-test maximum crush was 715 mm located to the left of the vehicle centerline. The test vehicle's performance was as follows:

Measurement Description	Units	Driver ATD		Passenger ATD	
		Threshold	Result	Threshold	Result
Head Injury Criteria (HIC_{15})		700	371	700	407
Maximum Chest Compression	mm	63	34	52	17
Nij		1	0.29	1	0.32
Neck Tension	N	4170	1601	2620	1149
Neck Compression	N	4000	658	2520	621
Left Femur Force	N	10008	2573	6805	1705
Right Femur Force	N	10008	3520	6805	1156

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35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)	Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590

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TABLE OF CONTENTS

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 2022 Nissan Frontier S 4x4 Crew Cab at a velocity of 56.10 km/h. The test was performed at MGA Research Corporation on February 9, 2022. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

Two (2) real-time cameras and sixteen (16) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

One Part 572E 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 715 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 glove box.

The occupant data is summarized below:

ATD position	HIC_{15}	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50^{th})	371	0.29	1601	658	42.3	34	2573	3520
Passenger (5^{th})	407	0.32	1149	621	46.4	17	1705	1156

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

TEST NOTES

Passenger Head Angular Velocity Z recorded no valid data after 18 ms.
Passenger Left Femur Red. recorded a data spike at 19 ms.
Driver Shoulder Belt load cell was not installed.
Driver Lap Belt load cell was not installed.
Passenger Shoulder Belt load cell was not installed.
Passenger Lap Belt load cell was not installed.
Barrier C-01 Fx recorded no valid data.
Barrier C-02 Fx, My, Mz recorded no valid data.
Barrier I-05 My recorded no valid data.
Barrier K-03 Fx recorded questionable data.
Barrier K-15 My recorded no valid data.

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20225202	Traction Control System (TCS)	Yes
Model Year	2022	Power Steering	Yes
Make	Nissan	Power Window Auto-Reverse	Yes
Model	Frontier S 4x4 Crew Cab	Driver Frontal Airbag	Yes
Body Style	4-Door Pickup Truck	Driver Curtain Airbag	Yes
VIN	1N6ED1EK8NN623187	Driver Head/Torso Airbag	No
Body Color	Gun Metallic	Driver Torso Airbag	No
Odometer (km/mi)	95 km / 59 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	3.8 L	Driver Pelvis Airbag	No
Type/No. Cylinders	V6	Driver Knee Airbag	Yes
Engine Placement	Longitudinal	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	9	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	4WD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Front Pass. Knee Airbag	Yes
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	No	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?	No

DATA FROM CERTIFICATION LABEL

Manufactured By	NISSAN MOTOR CO., LTD.
Date of Manufacture	10/21

GVWR (kg)	2727
GAWR Front (kg)	1495
GAWR Rear (kg)	1558

VEHICLE SEATING AND WEIGHT CAPACITY DATA

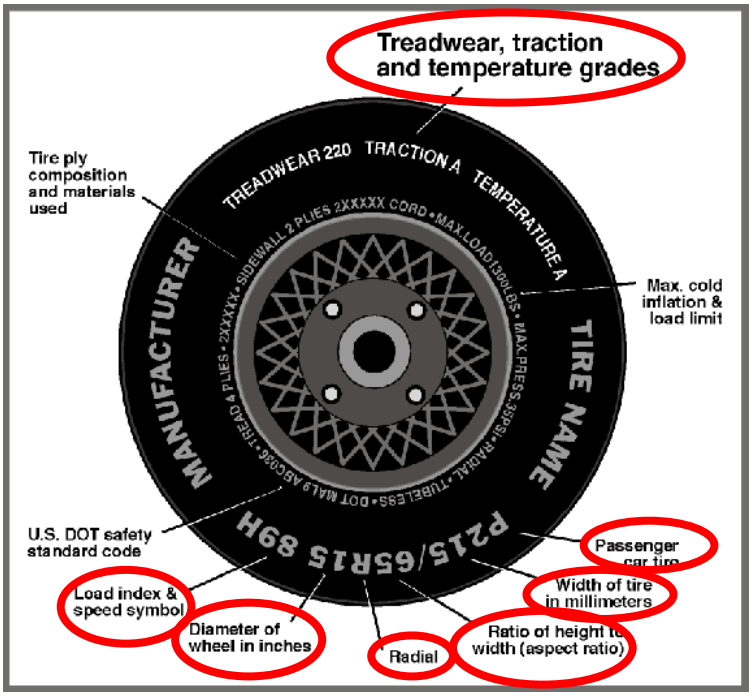
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				572
Cargo Weight (RCLW) (kg)				136*

* Rated Cargo and Luggage Weight (RCLW) limited to maximum of 300 lbs (136 kg).

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

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	265/70R16	265/70R16
Tire Size on Vehicle	265/70R16	265/70R16
Tire Manufacturer	Hankook	Hankook
Tire Model	Dynapro HT	Dynapro HT
Treadwear	700	700
Traction	B	B
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 2 Nylon	2 Steel, 2 Polyester, 2 Nylon
Load Index/Speed Symbol	111T	111T
Tire Material	Rubber	Rubber
DOT Safety Code Left	00T79V CHHA 3821	00T79V CHHA 3821
DOT Safety Code Right	00T79V CHHA 3821	00T79V CHHA 3821

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

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab NHTSA No.: M20225202
Test Program: NCAP Frontal Barrier Impact Test Test Date: 2/9/2022

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	606.0	464.5		633.5	581.0	
Right	kg	588.5	458.5		601.0	573.5	
Ratio	%	56.4%	43.6%		51.7%	48.3%	
Totals	kg	1194.5	923.0	2117.5	1234.5	1154.5	2389.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2117.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	136
Calculated Test Vehicle Target Weight (TVTW)	kg	2394.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	878	881	901	904	1399
As Tested	mm	872	871	869	875	1551
Post Test	mm	787	831	854	872	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3210
Total Vehicle Length at Left Side	mm	5238
Total Vehicle Length at Centerline	mm	5331
Total Vehicle Length at Right Side	mm	5238
Weight of Ballast in Cargo Area	kg	71
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	74.2

List of components removed to meet test weight: None.

List of components removed for instrumentation, data box, and equipment installation: None.

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

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab NHTSA No.: M20225202
Test Program: NCAP Frontal Barrier Impact Test Test Date: 2/9/2022

TARGET VEHICLE STRUCTURAL MEASUREMENT

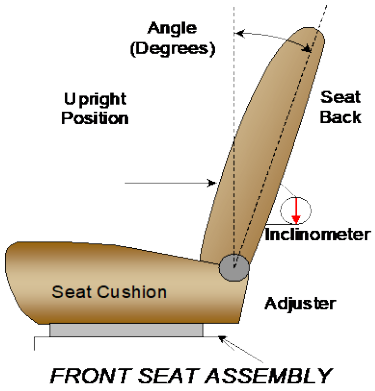
	Elements	Pre-Test (mm)
1	Total Length	5331
2	Total Width	1846
3	Bumper Top Height	530
4	Bumper Bottom Height	463
5	Longitudinal Member Top Height	560
6	Distance between Longitudinal Members	848
7	Longitudinal Member Width	65
8	Engine Top Height	1139
9	Engine Bottom Height	254
10	Engine and Gearbox Width	1126
11	Front Bumper-Engine Distance	480
12	Front Shock Absorber Fixing Height	692
13	Bonnet Leading Edge Height	1153
14	Front Shock Absorber Fixing Width	218
15	Front Bumper – Front Axle Distance	735
16	Front Axle – A-Pillar Distance	623
17	A-Pillar – B-Pillar Distance	1132
18	B-Pillar – Rear Axle Distance	1482
19	B-Pillar – C-Pillar Distance	860
20	Roof Sill Bottom Height	1620
21	Roof Sill Top Height	1682
22	Floor Sill Bottom Height	377
23	Floor Sill Top Height	483

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

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

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	6.0° on outboard headrest post
Passenger Seat Back Angle	4.7° on outboard headrest post

SEAT FORE/AFT POSITIONS

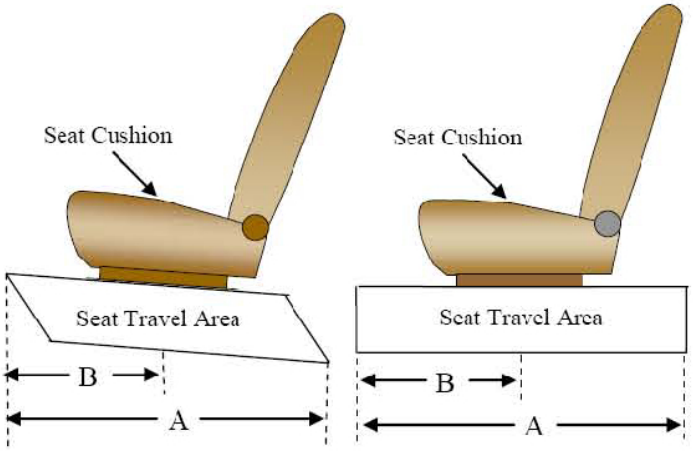
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated May 2018.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	226 mm / 22 detents (1st as 1)	116 mm / 10th detent (1st as 0)
Passenger Seat	210 mm / 22 detents (1st as 1)	0 mm / 0th detent (1st 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 (1st as 1)	0 (1st as 0)
Passenger Seat	4 (1st as 1)	0 (1st as 0)



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

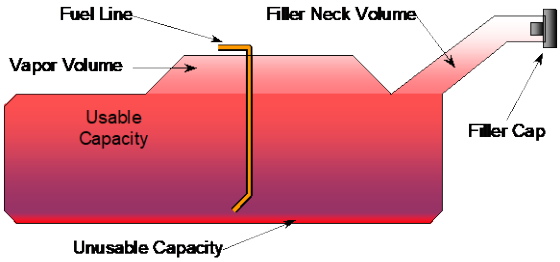
Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	79.9
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	73.5 to 75.1
Actual Amount of Solvent used	74.2
1/3 of Usable Capacity	26.6

FUEL PUMP

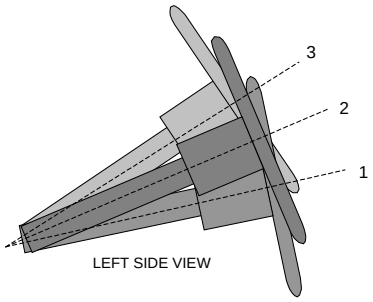
The vehicle is equipped with an electronic fuel pump. The fuel pump will run for approximately 1 second after the ignition is switched on; when the engine is running; and for 1.5 seconds after the engine stops running. The filler neck is located on the driver's side.



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.



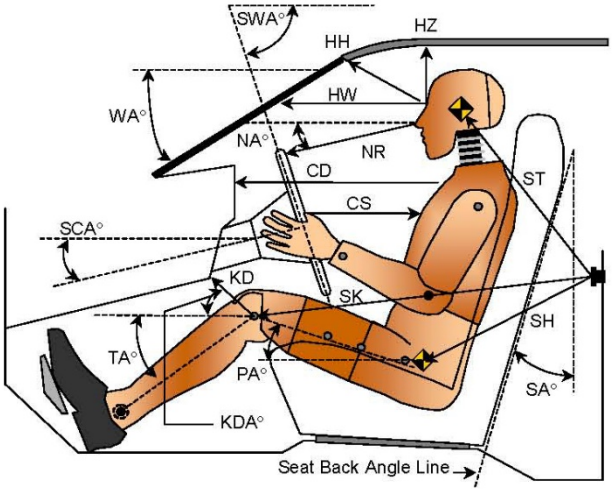
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	74.0	
Geometric Center Position 2	66.5	
Uppermost Position 3	58.9	
Telescoping Steering Wheel Travel		
Test Position	68.0	

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

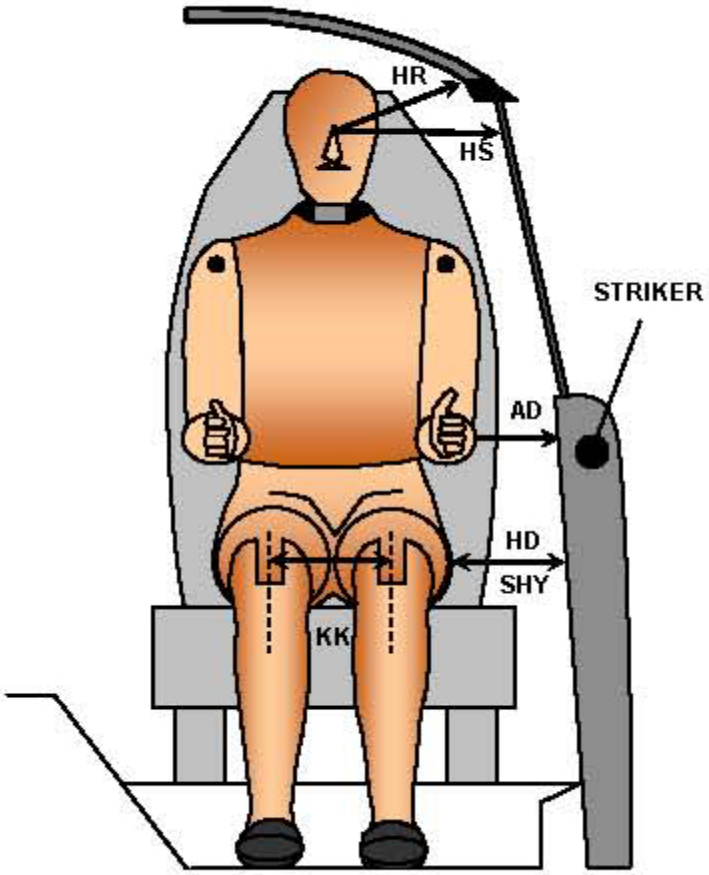


LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		28.7		
SWA°	Steering Wheel Angle		68.0		
SCA°	Steering Column Angle		22.0		
SA°	Seat Back Angle		6.0		4.7
HZ	Head to Roof (Z)	172	90	220	90
HH	Head to Header	370	19.4	332	31.6
HW	Head to Windshield	609	0	626	0
NR	Nose to Rim	382	17.4		
CD	Chest to Dash	510		404	
CS	Chest to Steering Hub	302	9.7		
RA	Rim to Abdomen	192	0		
KDL	Left Knee to Dash	164	34.4	82	37.0
KDR	Right Knee to Dash	127	36.1	100	37.7
PA°	Pelvic Angle		22.0		18.8
TA°	Tibia Angle		43.6		60.6
SK	Striker to Knee	582	87.5	674	75.2
ST	Striker to Head	607	7.6	582	14.8
SH	Striker to H-Point	212	102.7	383	84.7

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

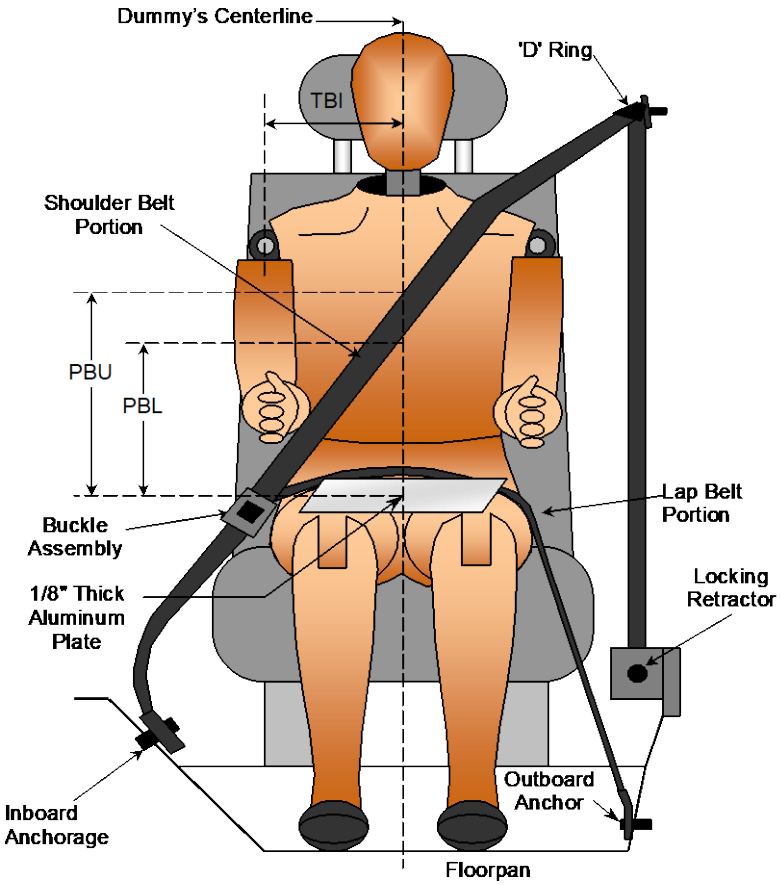


FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	121	55
HD	H-Point to Door	125	154
HR	Head to Side Header	215	249
HS	Head to Side Window	336	340
KK	Knee to Knee	355	230
SHY	Striker to H-Point (Y Direction)	247	270
AA	Ankle to Ankle	335	160

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle:	2022 Nissan Frontier S 4x4 Crew Cab	NHTSA No.:	M20225202
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	2/9/2022



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	355	310
PBL - Top surface of reference to belt lower edge	mm	285	225

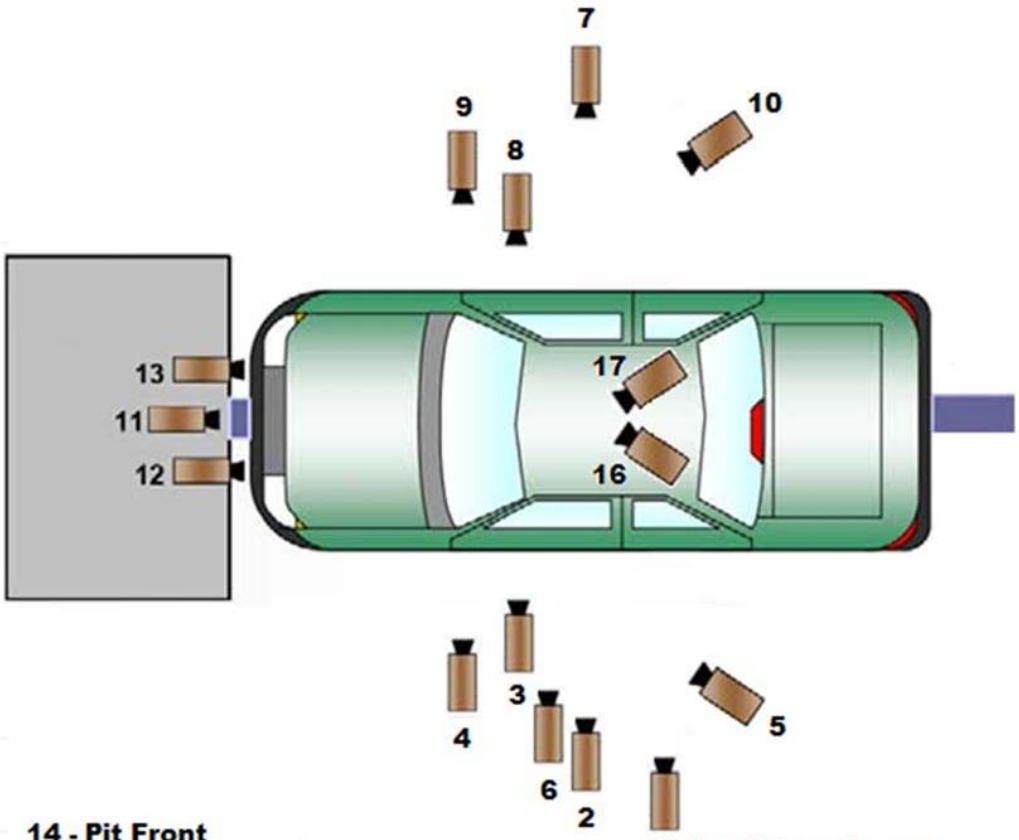
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	820	840
Lap Belt Length as measured on ATD	mm	660	720
Remainder of belt on reel	mm	1070	990
Total Belt Length for Continuous Webbing Systems	mm	3200	3200

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

Test Vehicle:	2022 Nissan Frontier S 4x4 Crew Cab	NHTSA No.:	M20225202
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	2/9/2022

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

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

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

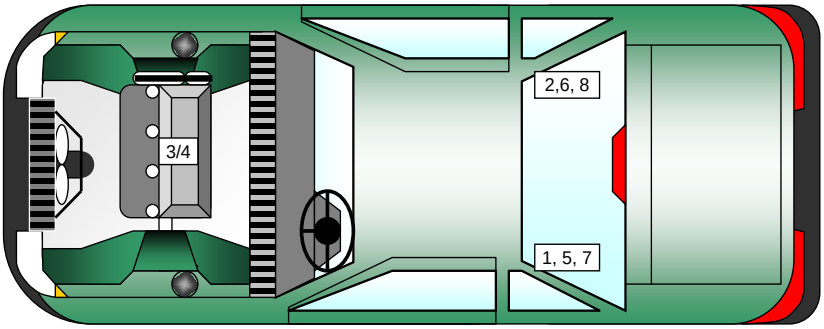
CAMERA LOCATIONS

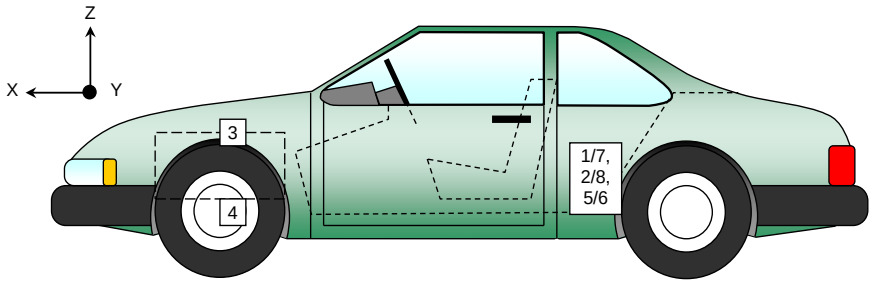
No.	Camera View	Coordinates* (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall					30
2	Left Overall	-2540	-5590	-1440	12	1000
3	Driver Close-Up	-1690	-7100	-1980	50	1000
4	Left Front Half	-1310	-5680	-1420	24	1000
5	Left Angle	-7240	-5870	-1980	75	1000
6	Steering Column	-920	-5350	-1240	50	1000
7	Right Overall	-2400	5660	-1340	12	1000
8	Passenger Close-Up	-1650	7160	-1980	50	1000
9	Right Front Half	-1210	5420	-1430	24	1000
10	Right Angle	-7430	5500	-2000	75	1000
11	Windshield	180	0	-2310	12	1000
12	Driver Windshield	230	-370	-2230	25	1000
13	Passenger Windshield	230	370	-2230	25	1000
14	Pit Front	-1020	0	3340	24	1000
15	Pit Rear	-3060	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: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022





VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1948	-390	-680
2	Right Rear Crossmember Accelerometer – X Direction	1948	-390	-680
3	Engine Top X	4359	-45	-1009
4	Engine Bottom X	4335	0	-254
5	Left Rear Crossmember Accelerometer – Z Direction	1948	-390	-680
6	Right Rear Crossmember Accelerometer – Z Direction	1948	-390	-680
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1948	-360	-680
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1948	-360	-680

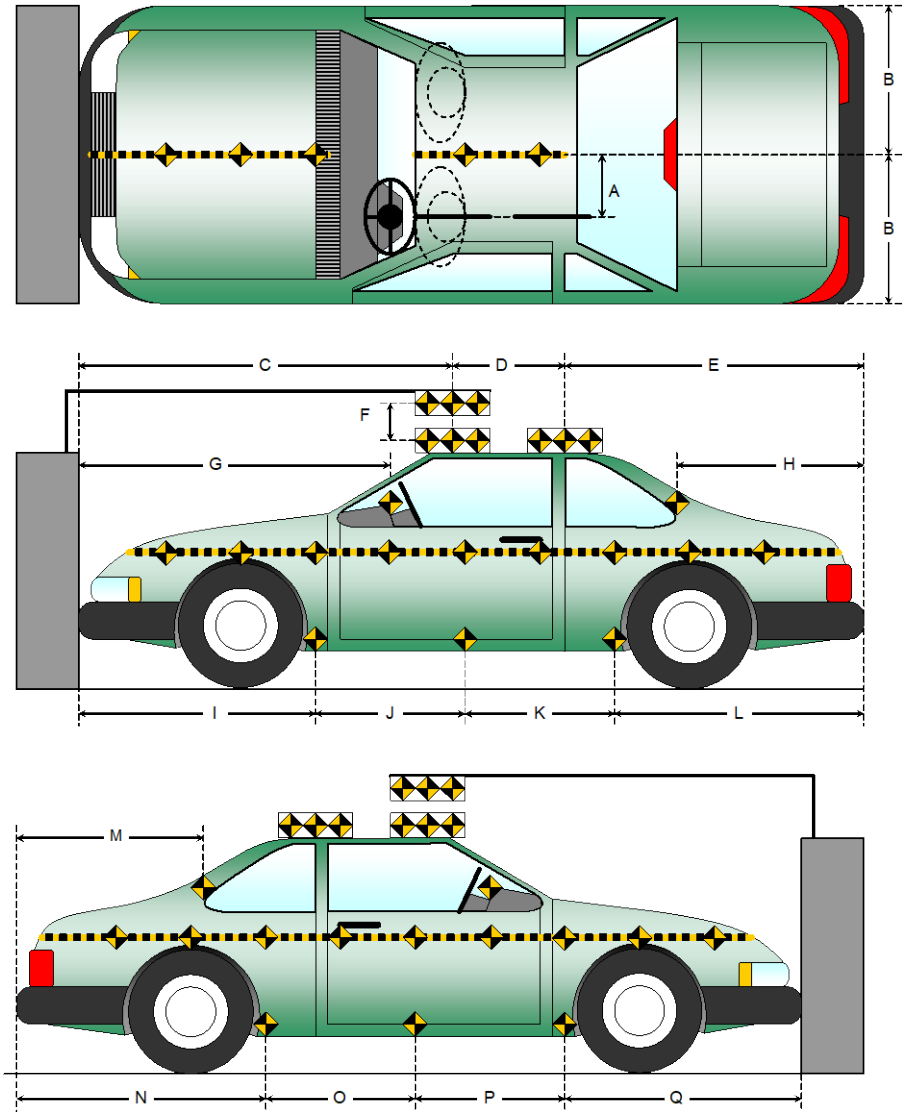
Reference Points: X - Rear Surface of Vehicle (+ forward)
Y - Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20225202
Test Date: 2/9/2022

Item	Value (mm)
A	390
B	923
C	2385
D	610
E	2336
F	70
G	
H	1812
I	1385
J	1102
K	1101
L	1743
M	1823
N	1743
O	1102
P	1101
Q	1385



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

ADVANCED RESEARCH LOAD CELL BARRIER

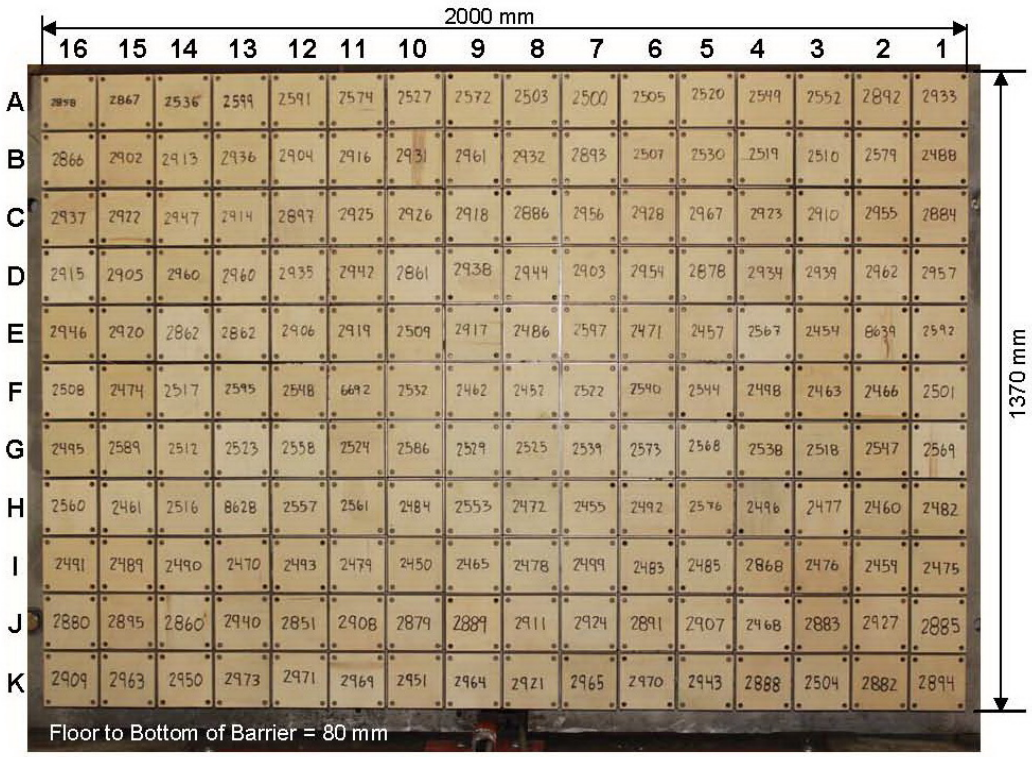


Photo for Reference Only

Centerline

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

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

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

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

DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were locked	Doors were locked
Front Door Opening	Remained closed and locked; opened without tools	Remained closed and locked; opened without tools
Rear Door Opening	Remained closed and locked; opened without tools	Remained closed and locked; 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	Cracked
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	910
Center	mm	900
Right Side	mm	922
Average	mm	911

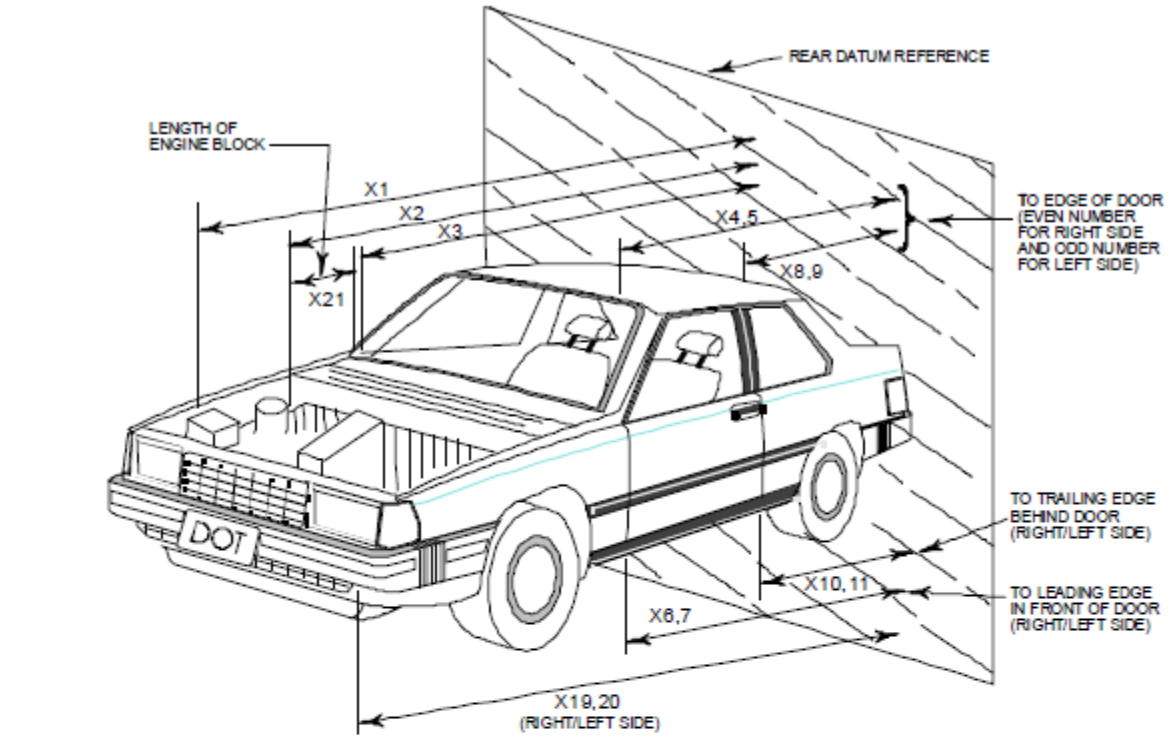
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

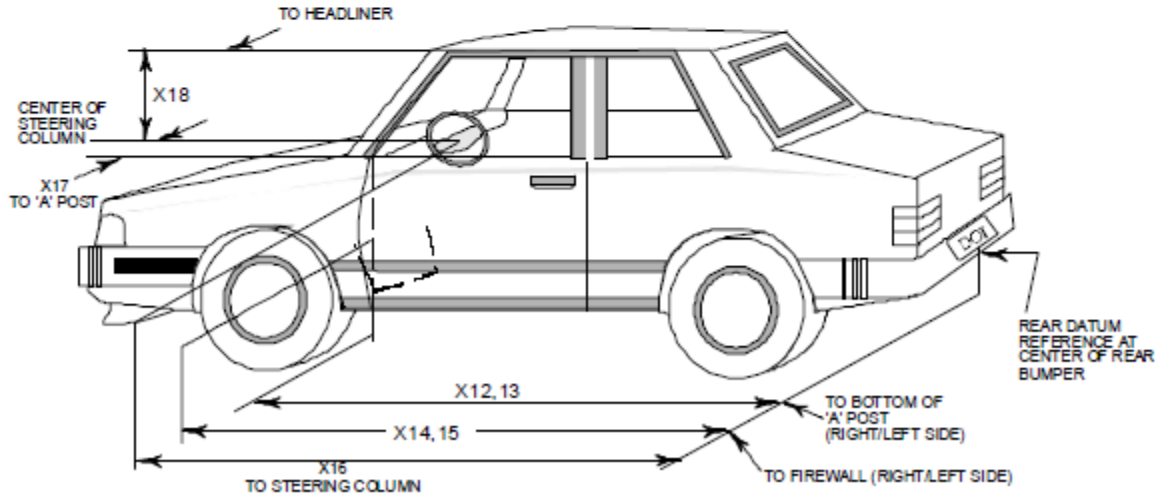
Restraint Type	Driver		Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	No	Yes	No
Torso/Pelvis Side Airbag	Yes	No	Yes	No
Knee Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	
Other				

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20225202
Test Date: 2/9/2022





DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

No.	Measurement Description	Pre-Test	Post-Test	Change
1	Total Length of Vehicle at Centerline	5331	4860	-471
2	RSOV to Front of Engine	4514	4397	-117
3	RSOV to Firewall	4207	4108	-99
4	RSOV to Upper Leading Edge of Right Door	3861	3860	-1
5	RSOV to Upper Leading Edge of Left Door	3863	3864	1
6	RSOV to Lower Leading Edge of Right Door	3735	3731	-4
7	RSOV to Lower Leading Edge of Left Door	3718	3724	6
8	RSOV to Upper Trailing Edge of Right Door	2734	2730	-4
9	RSOV to Upper Trailing Edge of Left Door	2731	2739	8
10	RSOV to Lower Trailing Edge of Right Door	2689	2696	7
11	RSOV to Lower Trailing Edge of Left Door	2682	2687	5
12	RSOV to Bottom of “A” Post of Right Side	3841	3759	-82
13	RSOV to Bottom of “A” Post of Left Side	3821	3756	-65
14	RSOV to Firewall, Right Side	4248	4221	-27
15	RSOV to Firewall, Left Side	4227	4211	-16
16	RSOV to Steering Column	3331	3382	51
17	Center of Steering Column to “A” Post	374	350	-24
18	Center of Steering Column to Headliner	448	420	-28
19	RSOV to Right Side of Front Bumper	5238	4808	-430
20	RSOV to Left Side of Front Bumper	5238	4869	-369
21	Length of Engine Block	632	652	20
RD	RSOV to Right Side of Dash Panel	3580	3565	-15
CD	RSOV to Center of Dash Panel	3538	3593	55
LD	RSOV to Left Side of Dash Panel	3558	3603	45

All dimensions in mm

* The post-test measurements presented in this table were revised on 12/27/2023 due to the original values being affected by a measurement setup error.

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

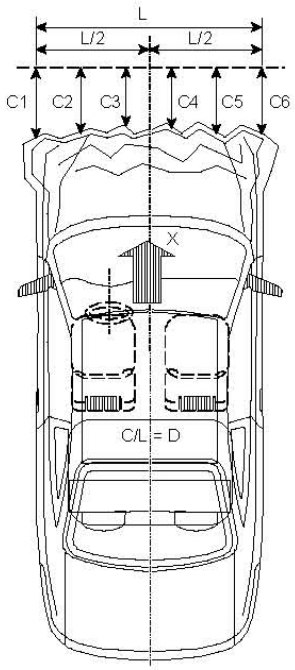
Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

VEHICLE INFORMATION

VIN:	1N6ED1EK8NN623187	Wheelbase (mm):	3210
Vehicle Size Category:	Truck	Test Weight (kg):	2389.0

ACCELEROMETER DATA

Accelerometer Locations:	As per Data Sheet No. 7
Cal. Procedure/Interval:	MGA Procedure / 6 month
Integration Algorithm:	Trapezoidal
Linearity:	> 99%
Impact Velocity (km/h):	56.10
Velocity Change (km/h):	63.0
Time of Separation (msec)	118



CRUSH PROFILE

Collision Deformation Classification:	12FDEW4
Midpoint of Damage:	Centerline
Damage Region Length (mm):	1217
Impact Mode:	Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Exterior Crush
C1	Crush zone 1 at left side	mm	5238	4869	369
C2	Crush zone 2 at left side	mm	5298	4879	419
C3	Crush zone 3 at left side	mm	5316	4841	475
C4	Crush zone 4 at right side	mm	5316	4851	465
C5	Crush zone 5 at right side	mm	5298	4817	481
C6	Crush zone 6 at right side	mm	5238	4808	430
L	C1 TO C6	mm	1217	1207	10

* The post-test measurements presented in this table were revised on 12/27/2023 due to the original values being affected by a measurement setup error.

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

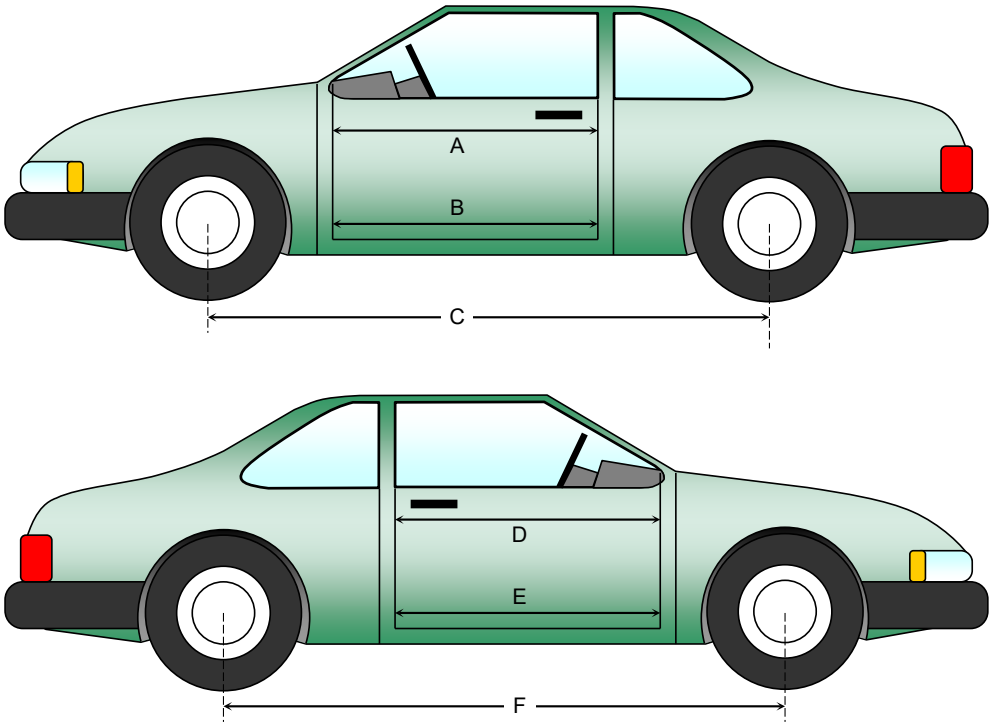
Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	992	994	2
B	Left Side Lower	mm	937	932	-5
D	Right Side Upper	mm	992	991	-1
E	Right Side Lower	mm	937	929	-8

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	3210	3109	-101
F	Right Side Wheelbase	mm	3210	3127	-83



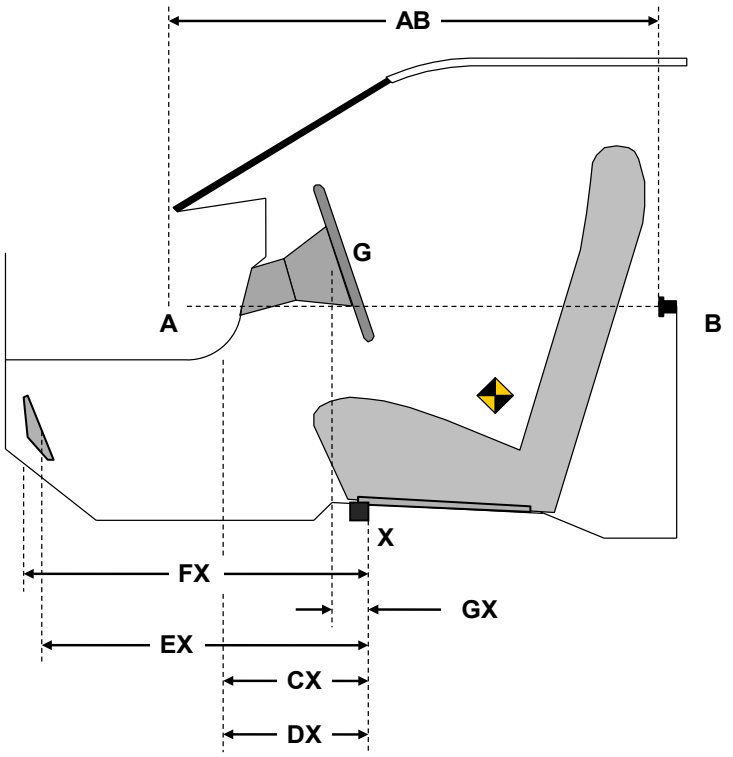
DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Change
AB	Door Opening (Inside Window Jam)	mm	760	767	7
CX	Left Knee Bolster to X	mm	331	324	-7
DX	Right Knee Bolster to X	mm	315	309	-6
EX	Brake Pedal to X	mm	519	516	-3
FX	Foot Rest to X	mm	564	547	-17
GX	Center of Steering Column Wheel Hub to X	mm	24	21	-3

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

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

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022

WINDSHIELD MOUNTING DETAILS

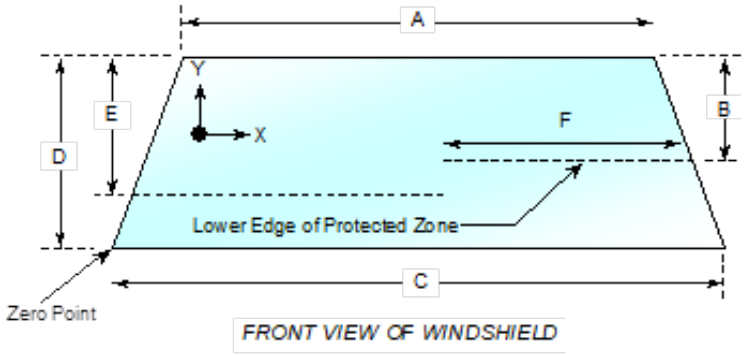
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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

Temperature of windshield molding during test: 21.5°C.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2104	2104	100
Right Side	2104	2104	100
Total	4208	4208	100



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1188
B	mm	354
C	mm	1474
D	mm	773
E	mm	445
F	mm	454

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: 2022 Nissan Frontier S 4x4 Crew Cab NHTSA No.: M20225202
Test Program: NCAP Frontal Barrier Impact Test Test Date: 2/9/2022

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.5°C Test Time: 11:14 a.m.

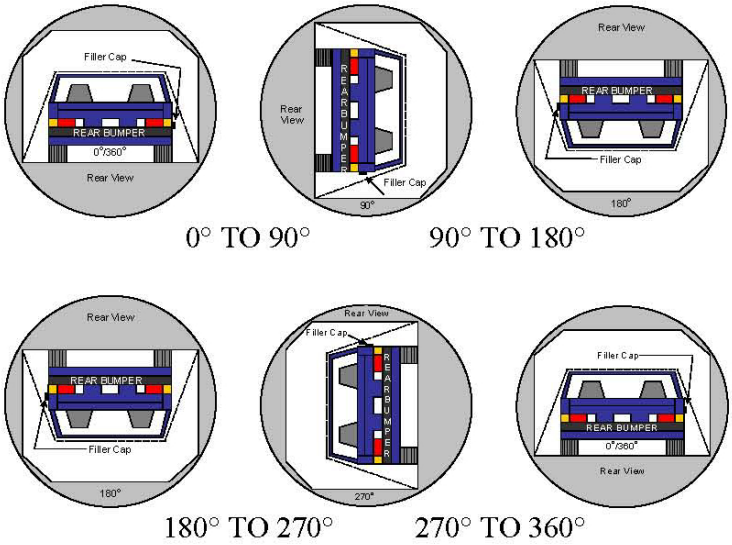
A. From impact until vehicle motion ceases: (Maximum Allowable = 1 ounce) 0.0 oz.

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°	113	300	413
90° to 180°	111	300	411
180° to 270°	108	300	408
270° to 360°	111	300	411

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

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab NHTSA No.: M20225202
Test Program: NCAP Frontal Barrier Impact Test Test Date: 2/9/2022

FMVSS 301 SPILLAGE TABLE (UNITS IN OUNCES)

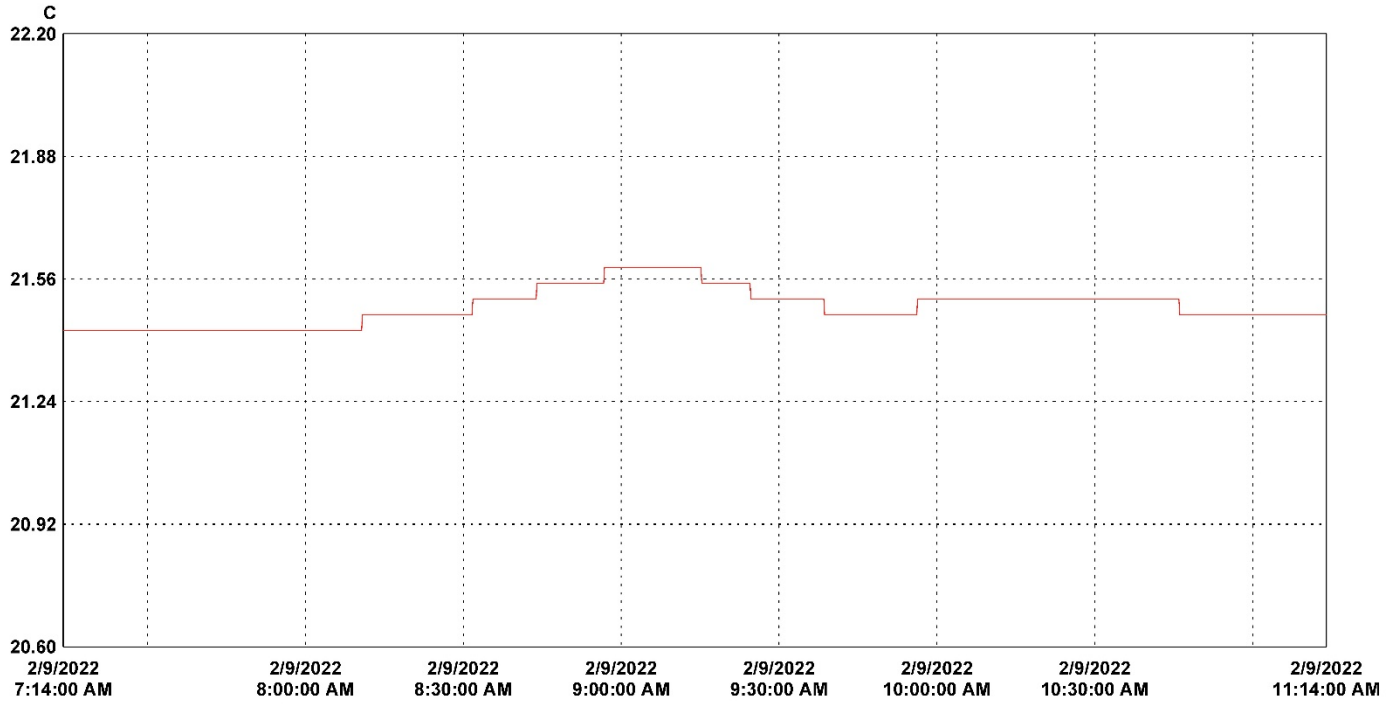
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 17
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2022 Nissan Frontier S 4x4 Crew Cab
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225202
Test Date: 2/9/2022



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	18352041	VSC_Prep_Room	1		21.59	21.49	21.42	C	Temperature	18352041_VSC_Prep_Room.spl

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

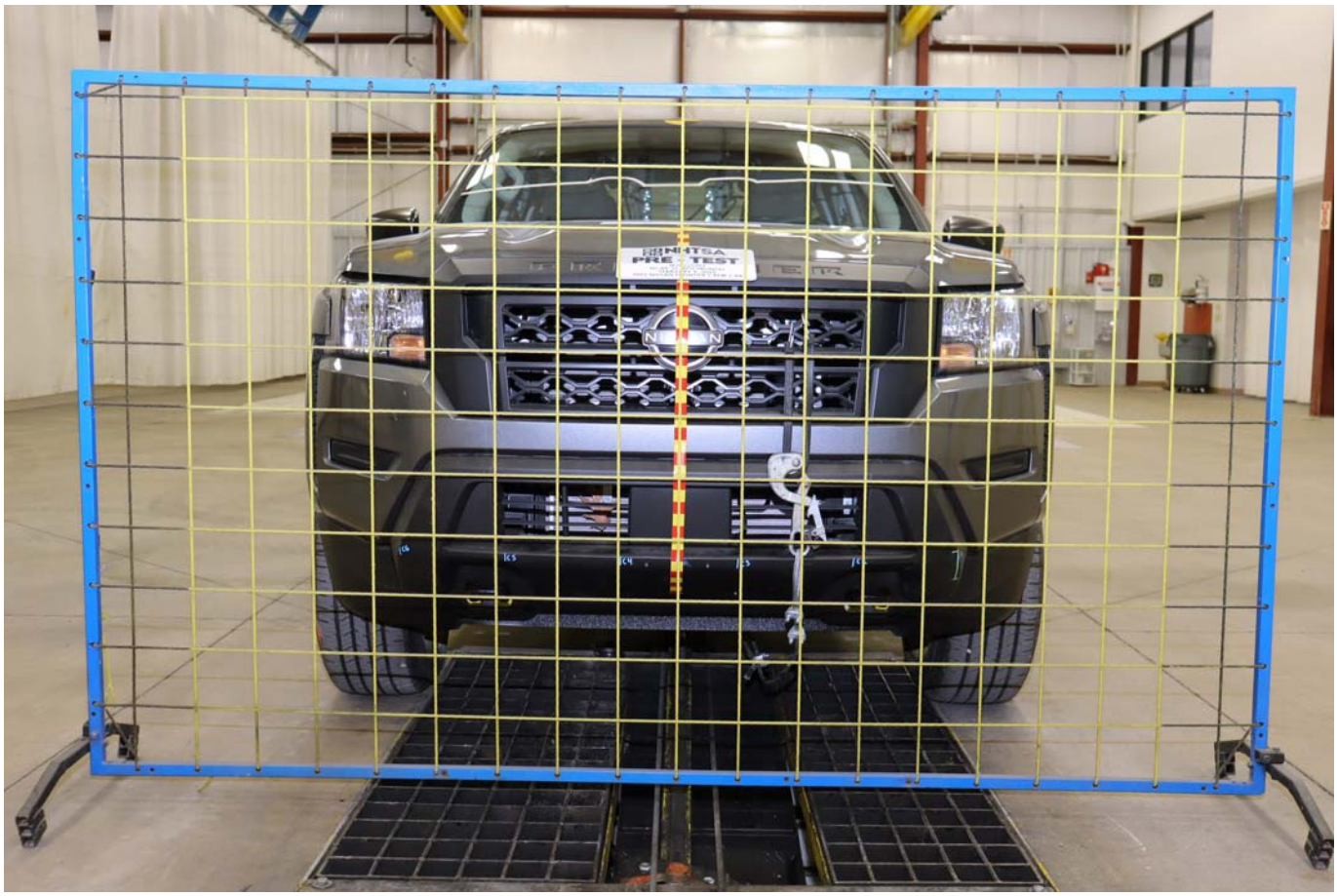


Photo No. 001 - Load Cell Location

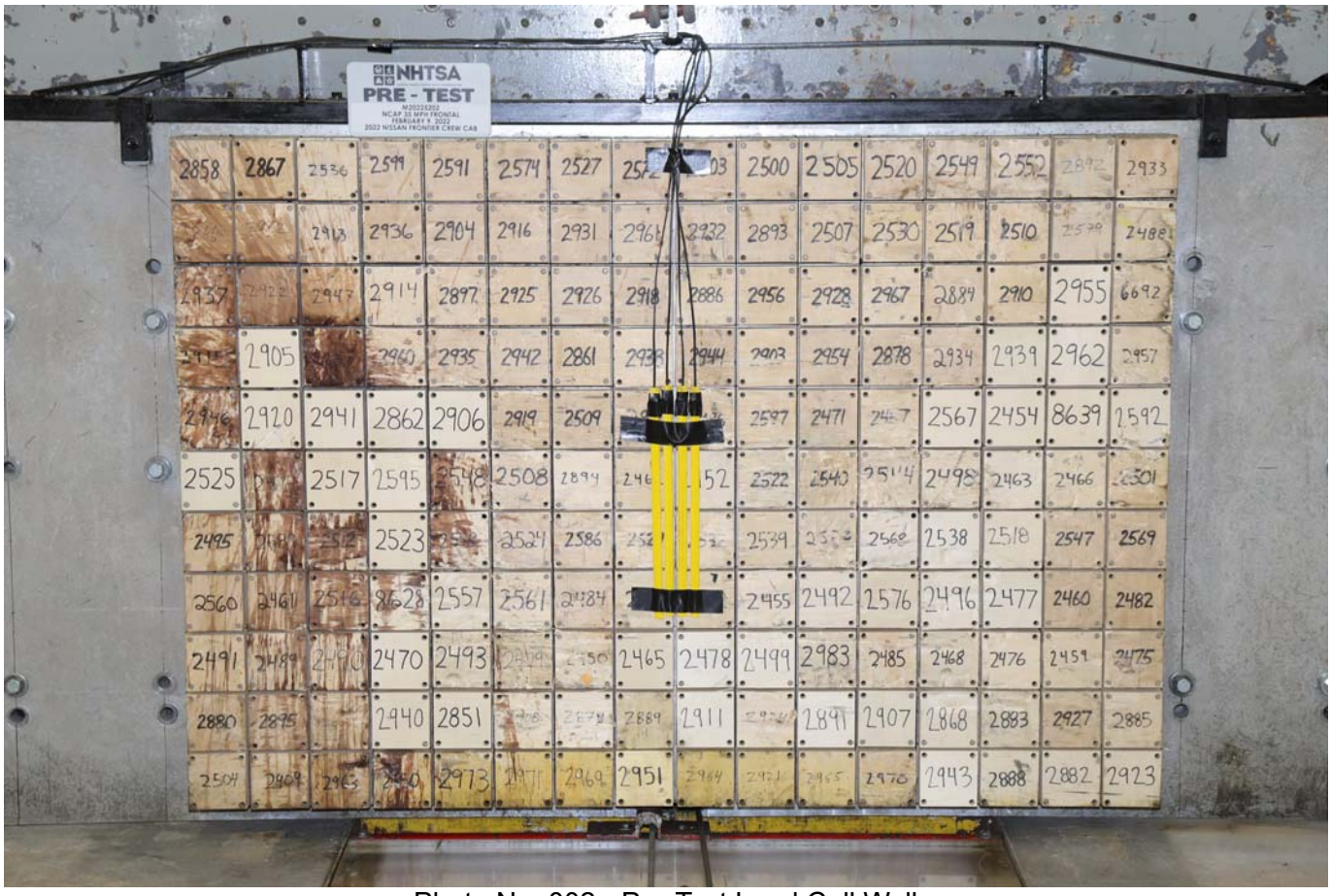


Photo No. 002 - Pre-Test Load Cell Wall

Photo No. 003 - Post-Test Load Cell Wall

Photo No. 004 - Manufacturer's Label

Photo No. 005 - Tire Placard

Photo No. 006 - 2022 Nissan Frontier S 4x4 Crew Cab Frontal As Delivered

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

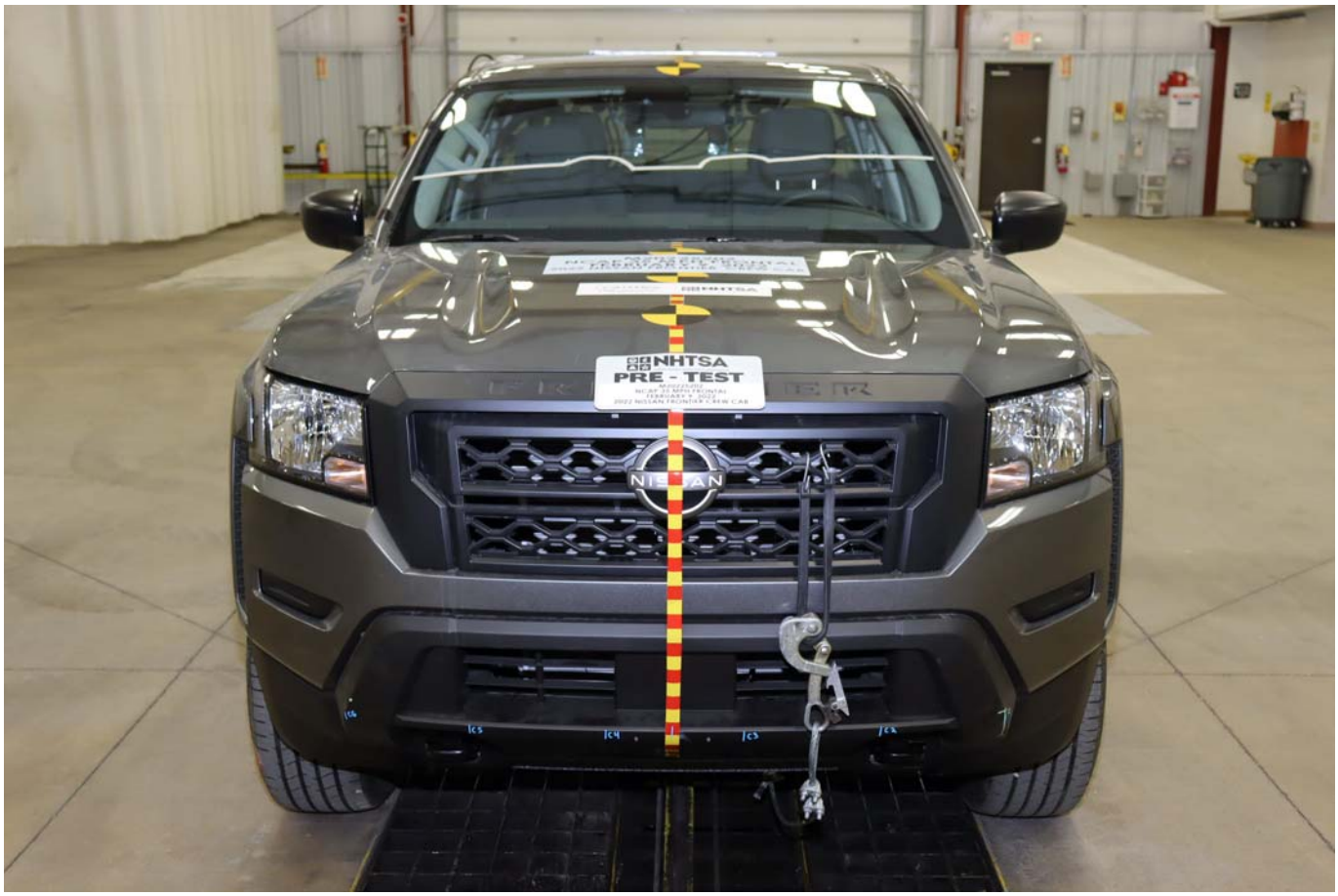


Photo No. 008 - Pre-Test Front View of Test Vehicle

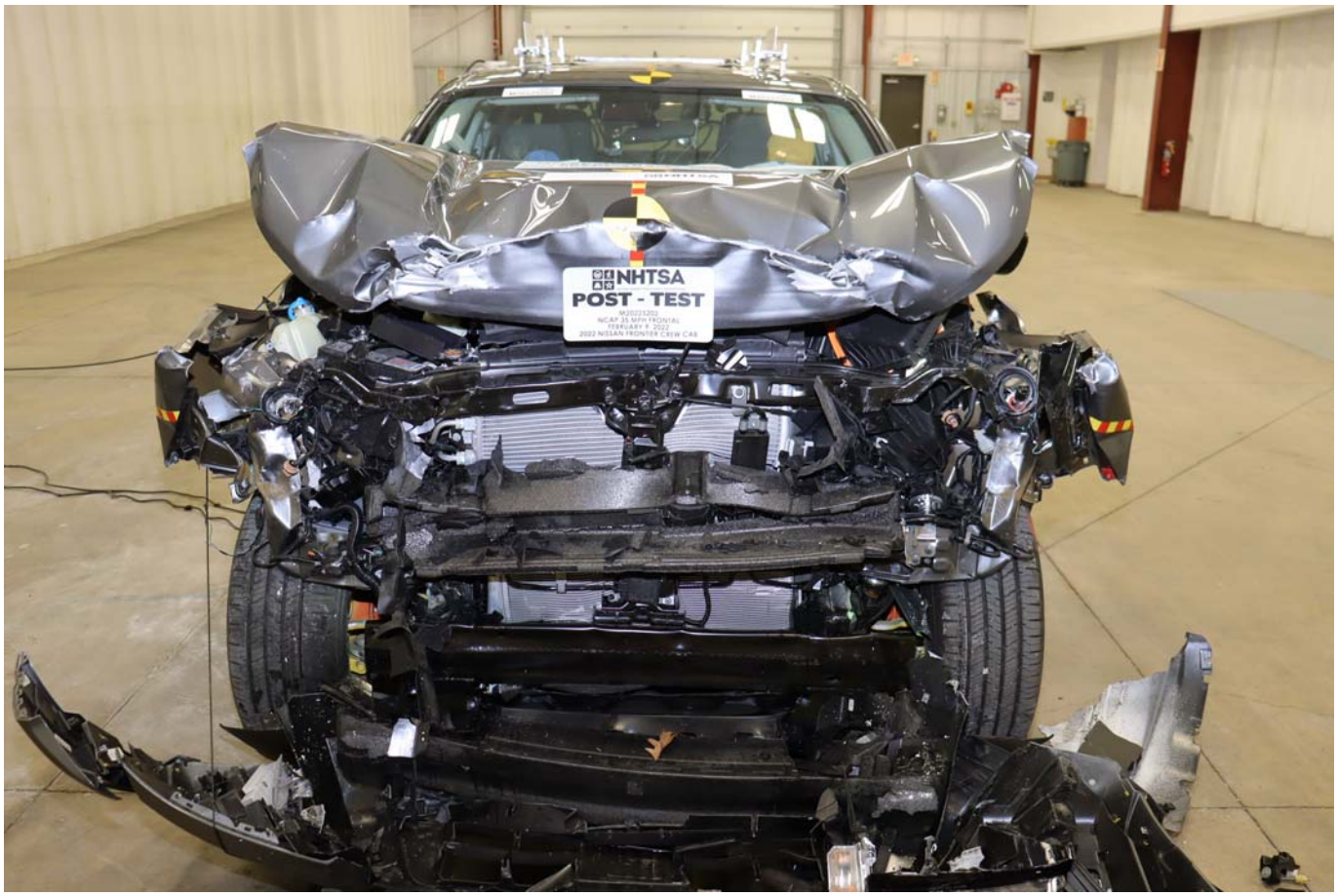


Photo No. 009 - Post-Test Front View of Test Vehicle

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

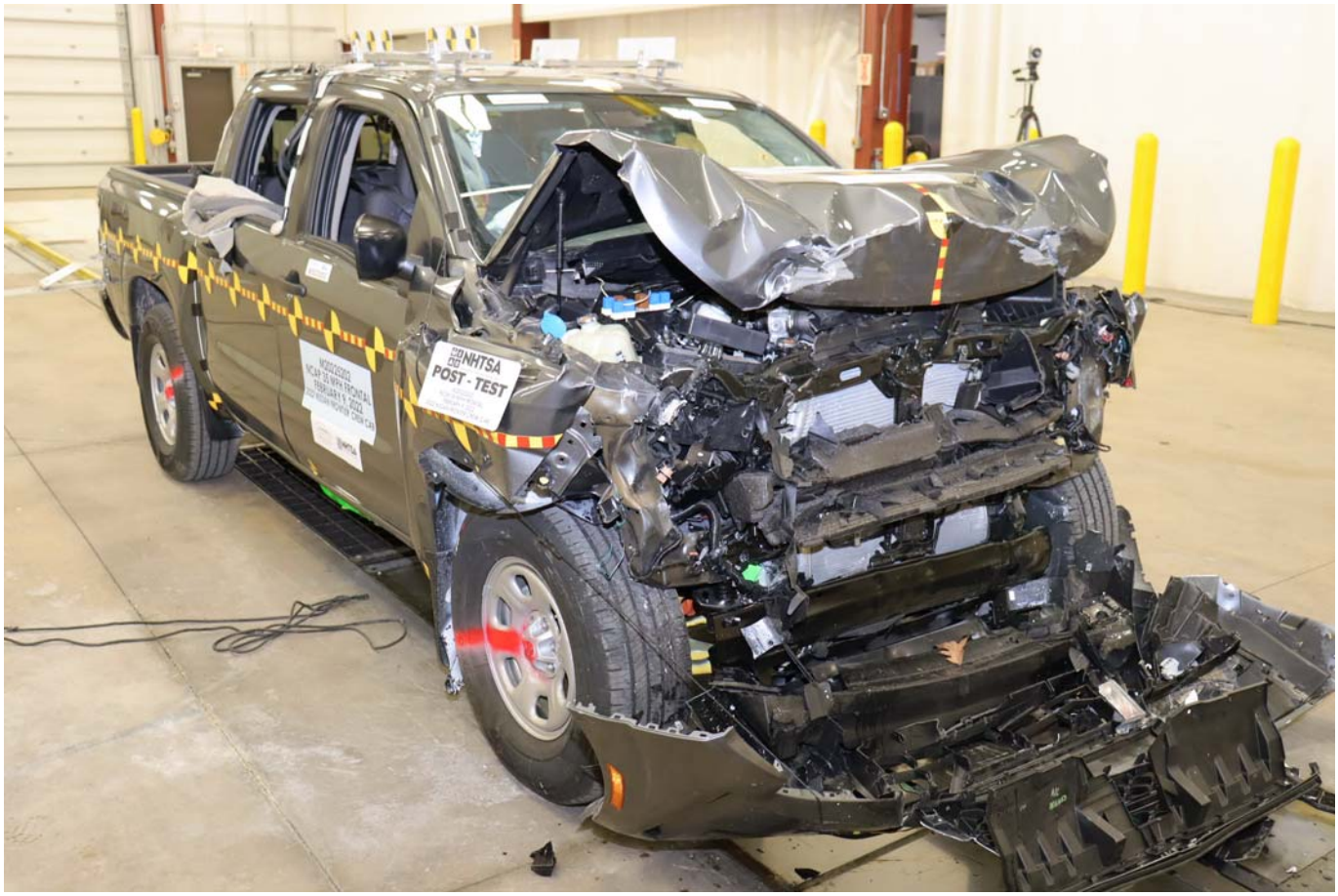


Photo No. 015 - Post-Test Right Front 3-4 View

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

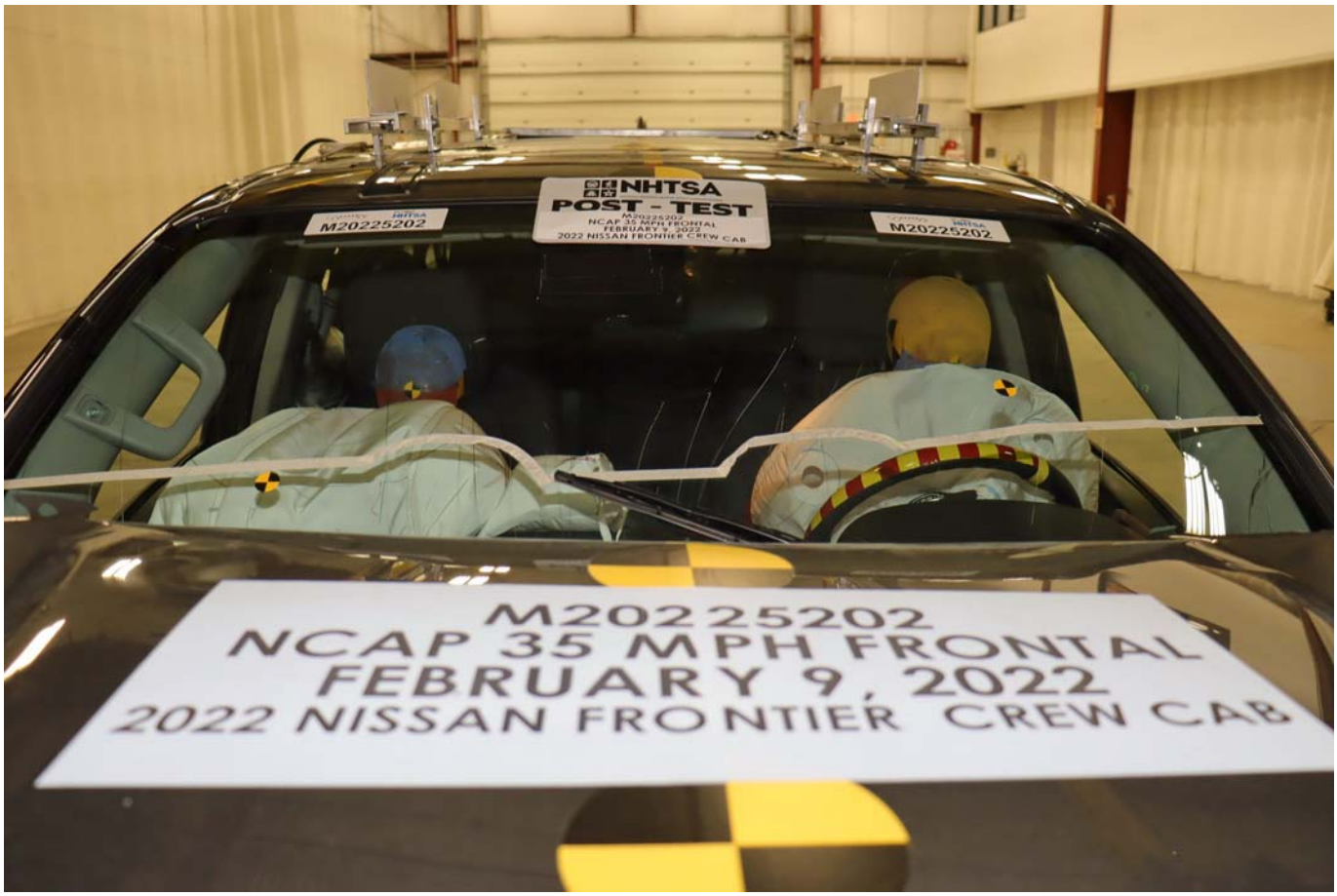


Photo No. 019 - Post-Test Windshield View

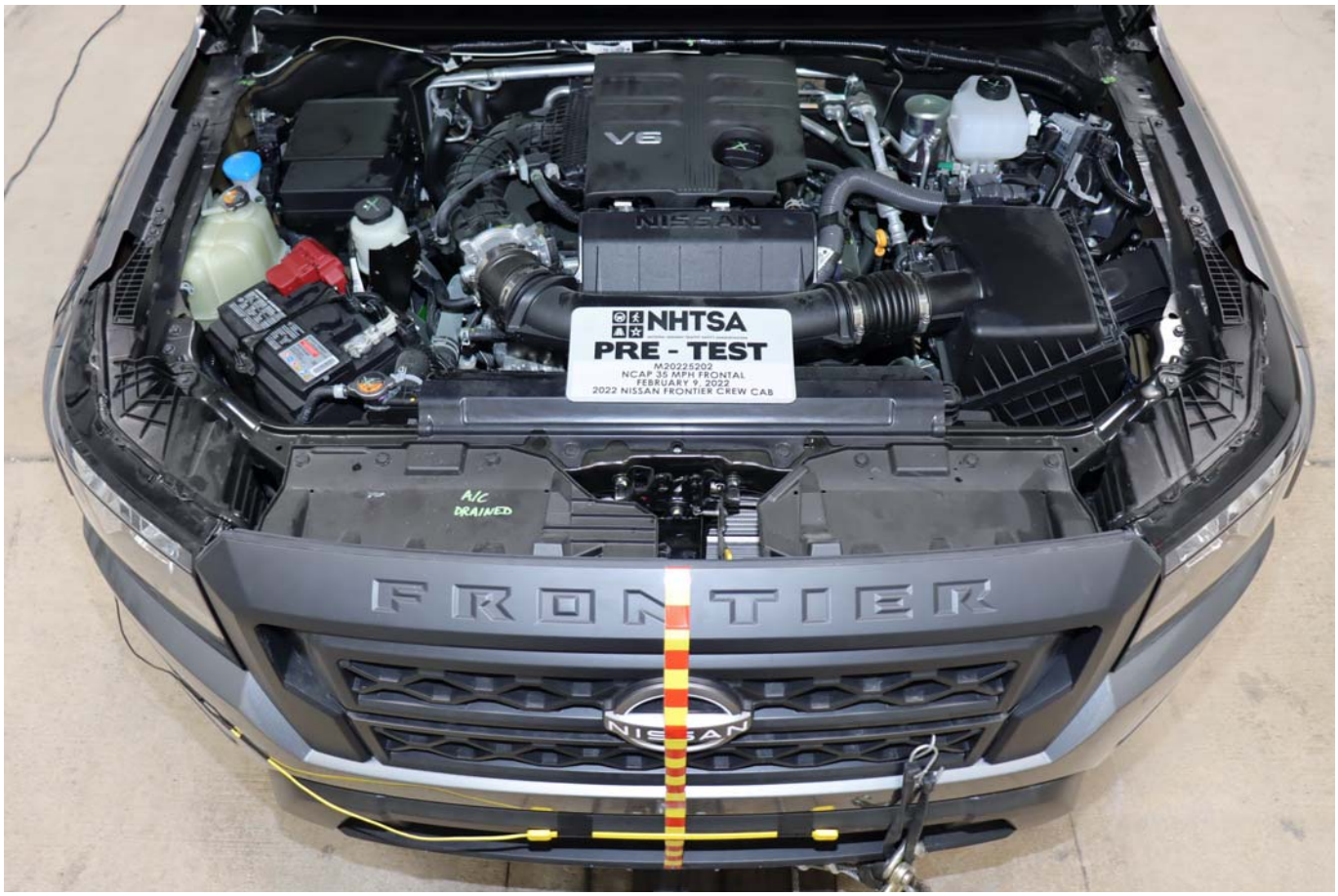


Photo No. 020 - Pre-Test Engine Compartment View

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

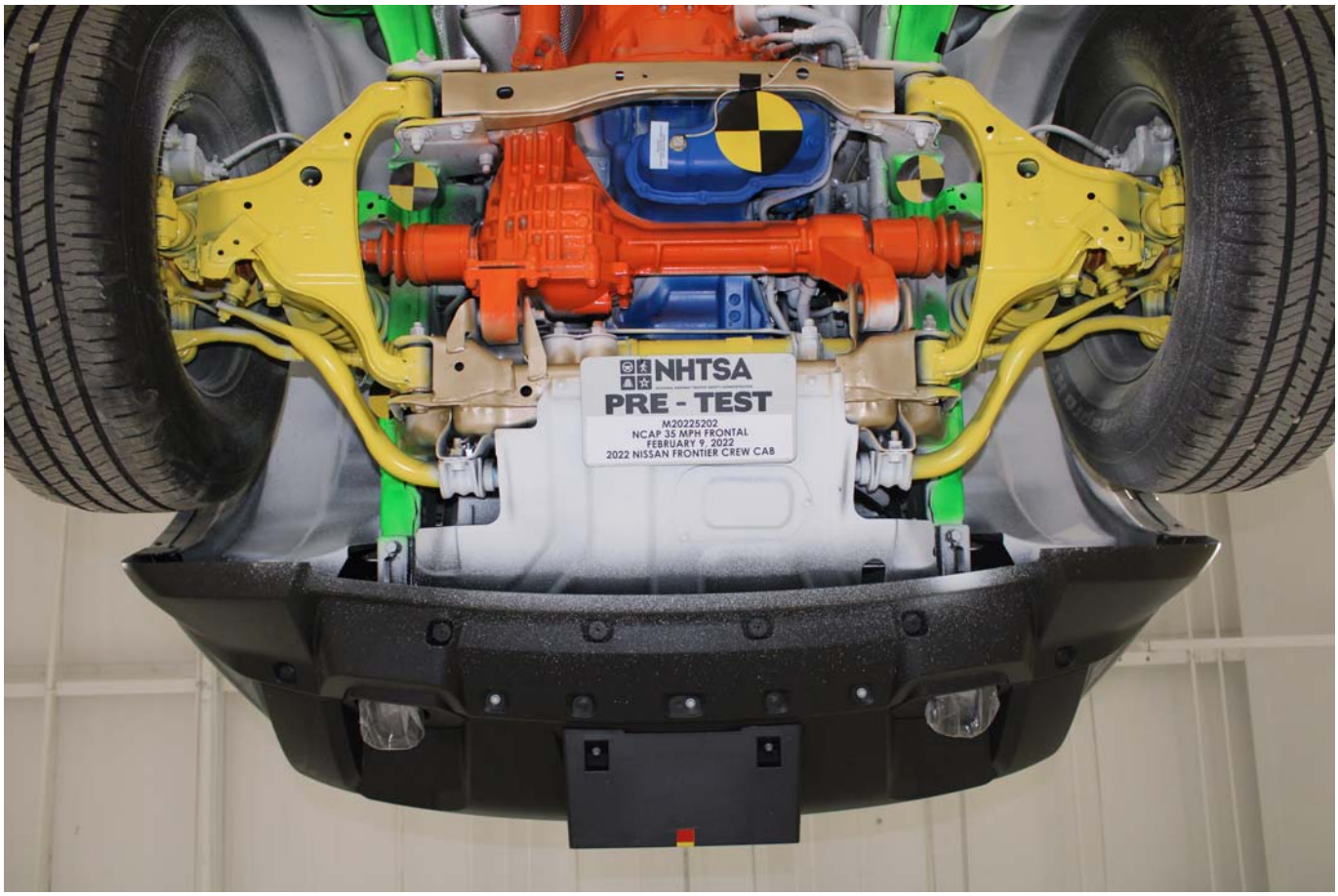


Photo No. 024 - Pre-Test Front Underbody View

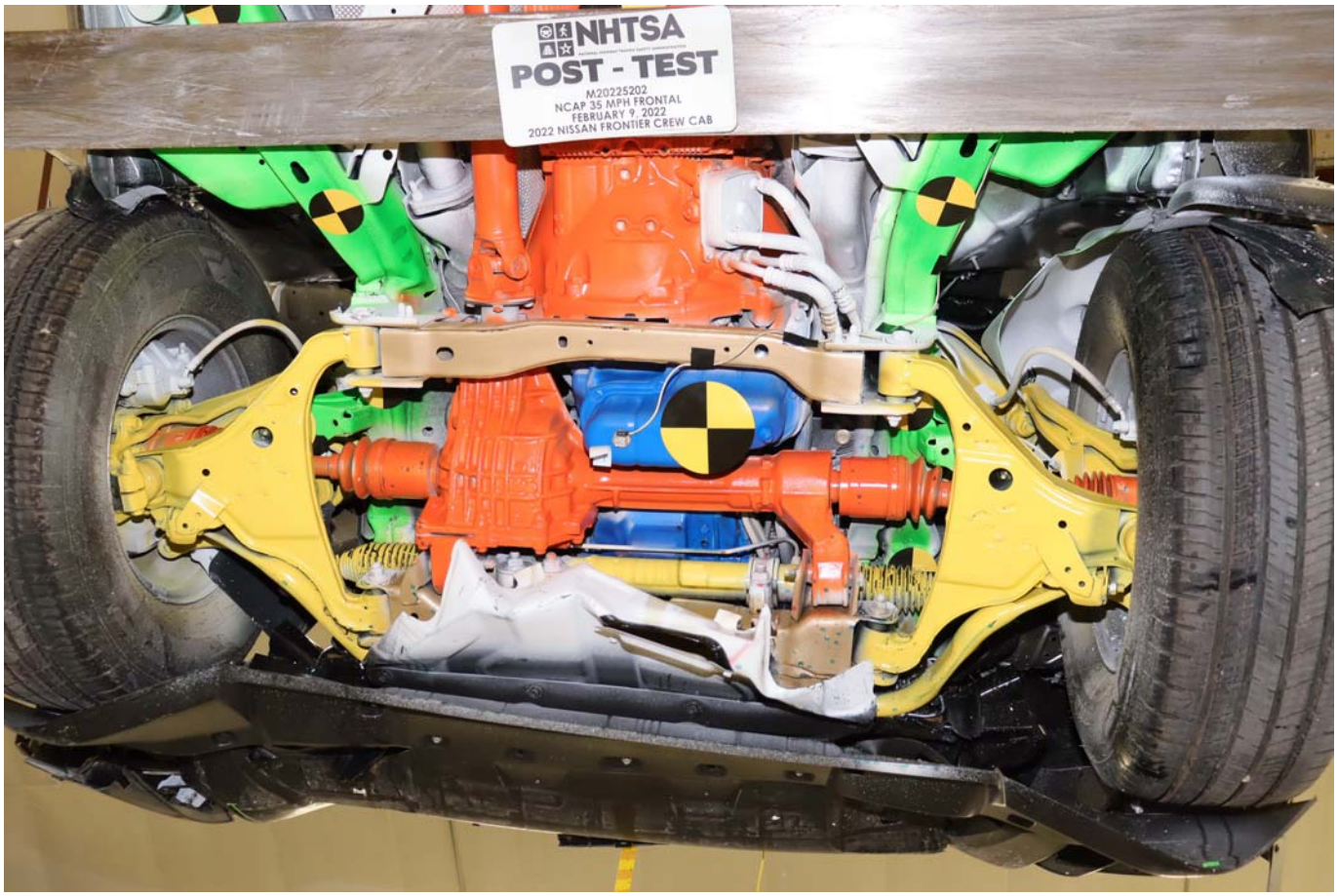


Photo No. 025 - Post-Test Front Underbody View

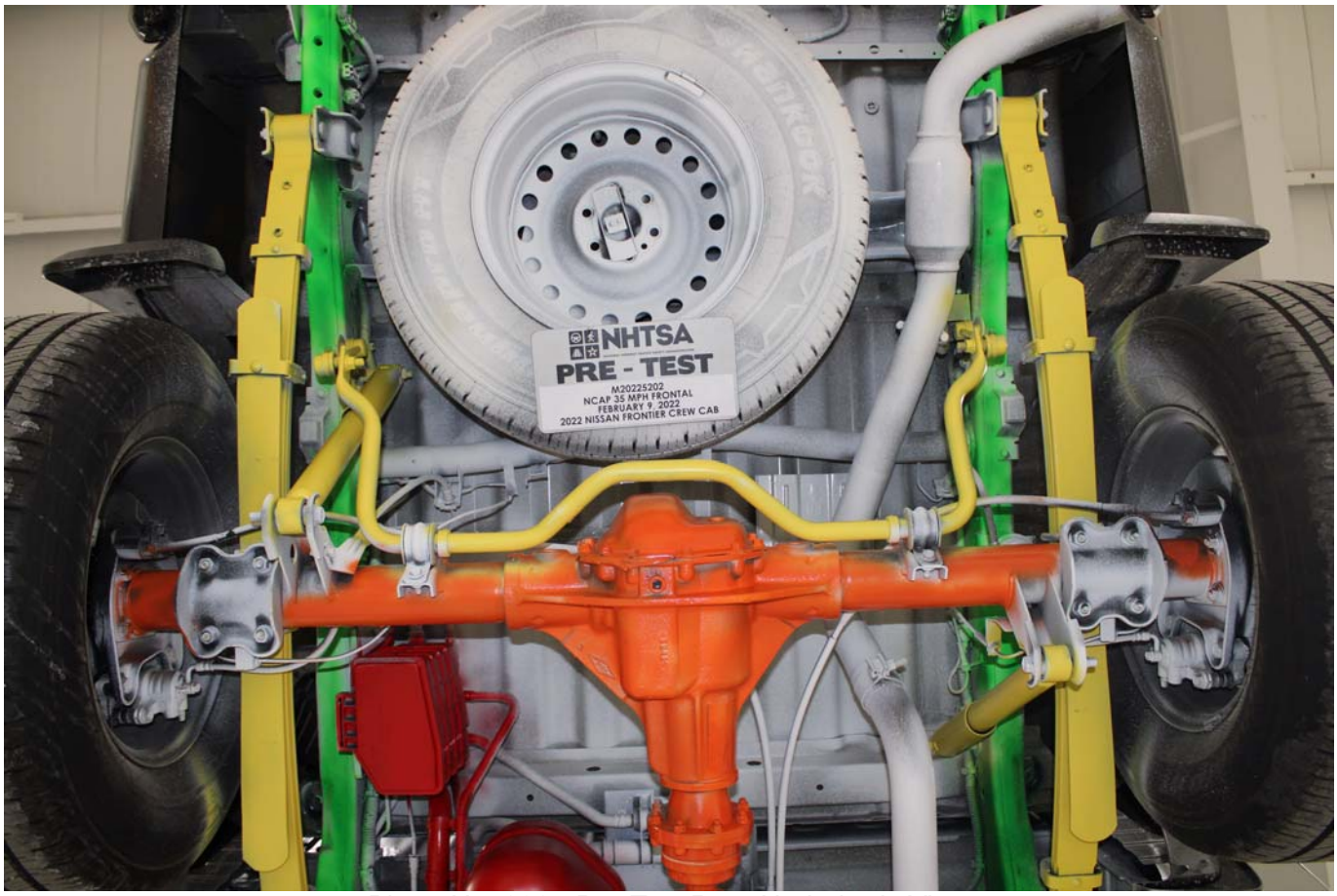


Photo No. 026 - Pre-Test Rear Underbody View

Photo No. 027 - Post-Test Rear Underbody View

Photo No. 028 - Pre-Test Dummy Cable Routing

PHOTOGRAPH NOT AVAILABLE

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

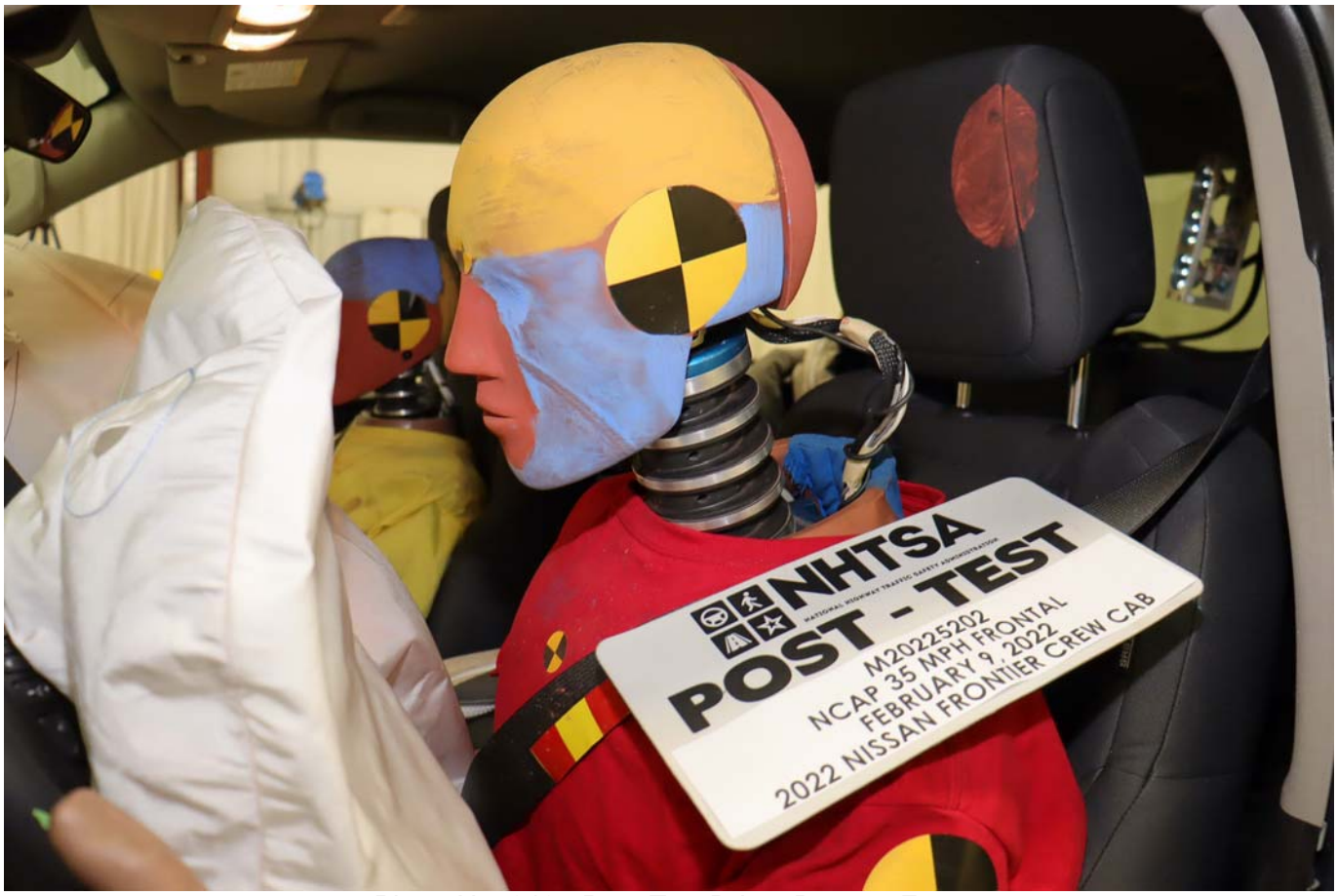


Photo No. 048 - Post-Test Driver Dummy Face

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

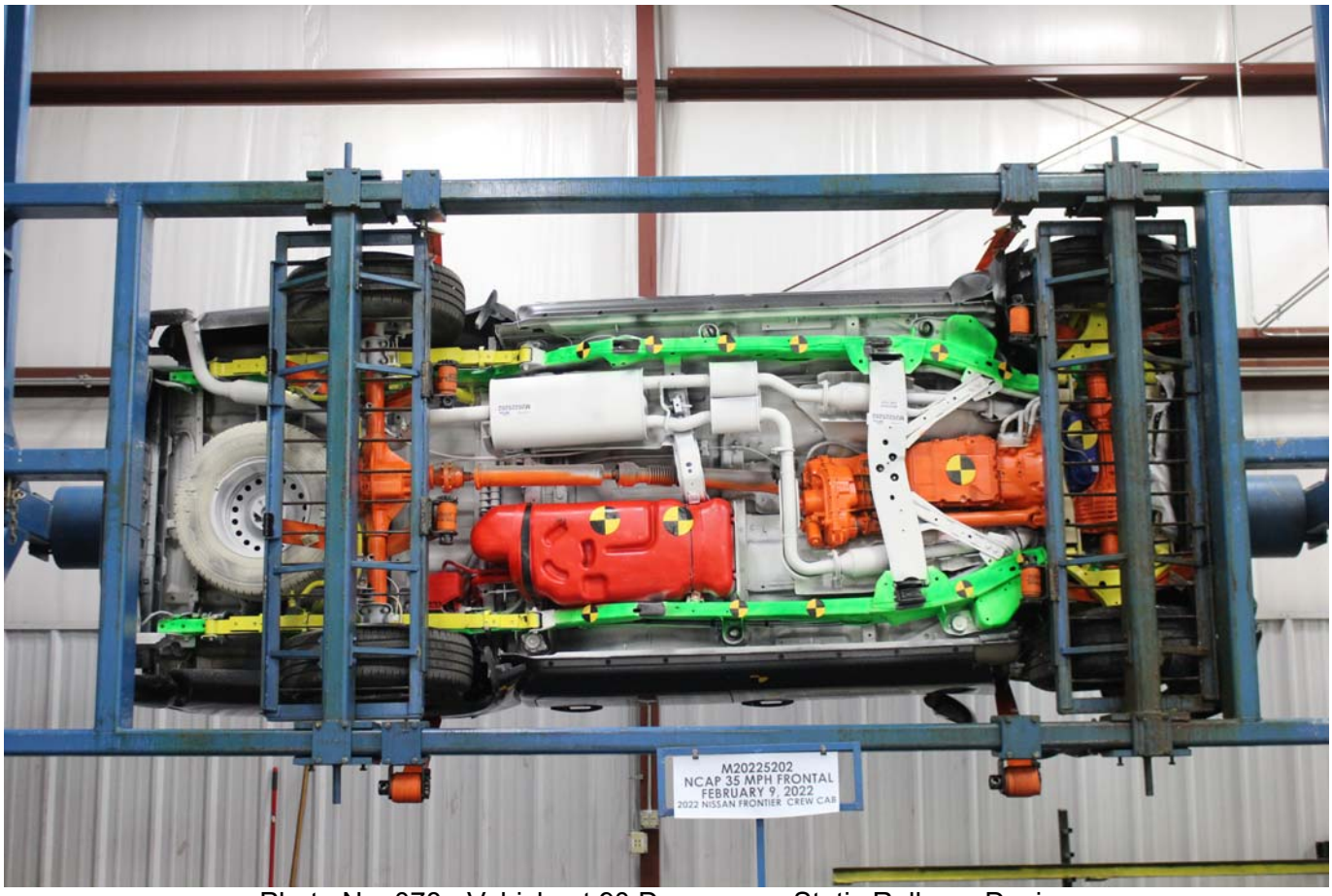


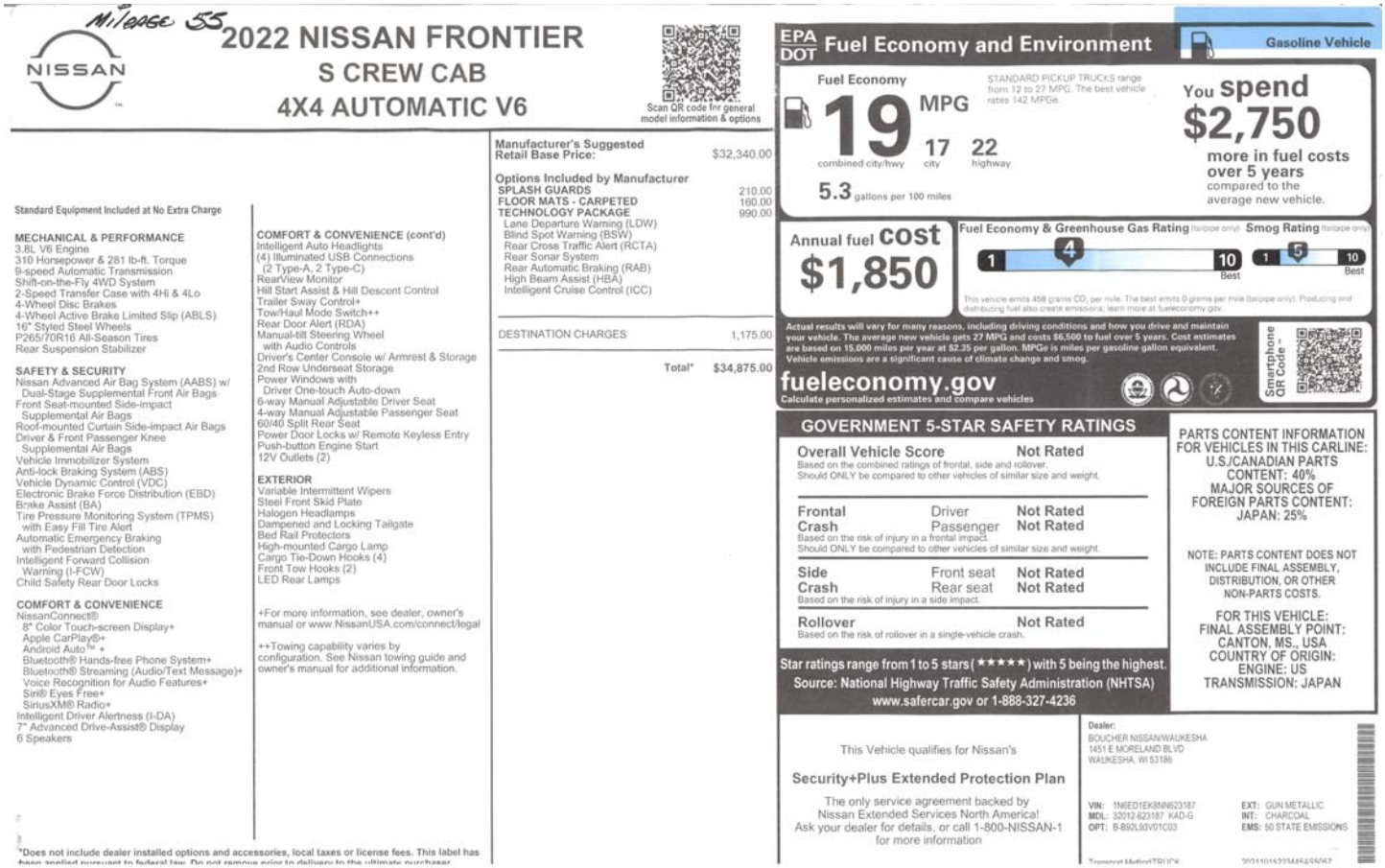
Photo No. 078 - Vehicle at 90 Degrees on Static Rollover Device

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 - 2022 Nissan Frontier S 4x4 Crew Cab Frontal Impact Event


Mileage 55

NISSAN

2022 NISSAN FRONTIER
S CREW CAB
4X4 AUTOMATIC V6

Scan QR code for general model information & options

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
3.8L V6 Engine
310 Horsepower & 281 lb-ft. Torque
9-speed Automatic Transmission
Shift-on-the-Fly 4WD System
2-Speed Transfer Case with 4Hi & 4Lo
4-Wheel Disc Brakes
4-Wheel Active Brake Limited Slip (ABLS)
16" Styled Steel Wheels
P265/70R16 All-Season Tires
Rear Suspension Stabilizer

SAFETY & SECURITY
Nissan Advanced Air Bag System (AABS) w/ Dual-Stage Supplemental Front Air Bags
Front Seat-mounted Side-impact Supplemental Air Bags
Roof-mounted Curtain Side-impact Air Bags
Driver & Front Passenger Knee Supplemental Air Bags
Vehicle Immobilizer System
Anti-lock Braking System (ABS)
Vehicle Dynamic Control (VDC)
Electronic Brake Force Distribution (EBD)
Brake Assist (BA)
Tire Pressure Monitoring System (TPMS) with Easy Fill Tire Alert
Automatic Emergency Braking with Pedestrian Detection
Intelligent Forward Collision Warning (I-FCW)
Child Safety Rear Door Locks

COMFORT & CONVENIENCE
NissanConnect®
8" Color Touch-screen Display+
Apple CarPlay®+
Android Auto™ +
Bluetooth® Hands-free Phone System+
Bluetooth® Streaming (Audio/Text Message)+
Voice Recognition for Audio Features+
Siri® Eyes Free+
SiriusXM® Radio+
Intelligent Driver Alertness (I-DA)
7" Advanced Drive-Assist® Display
6 Speakers

COMFORT & CONVENIENCE (cont'd)
Intelligent Auto Headlights
(4) Illuminated USB Connections (2 Type-A, 2 Type-C)
RearView Monitor
Hill Start Assist & Hill Descent Control
Trailer Sway Control+
Tow/Haul Mode Switch++
Rear Door Alert (RDA)
Manual-tilt Steering Wheel with Audio Controls
Driver's Center Console w/ Armrest & Storage
2nd Row Underseat Storage
Power Windows with Driver One-touch Auto-down
6-way Manual Adjustable Driver Seat
4-way Manual Adjustable Passenger Seat
60/40 Split Rear Seat
Power Door Locks w/ Remote Keyless Entry
Push-button Engine Start
12V Outlets (2)

EXTERIOR
Variable Intermittent Wipers
Steel Front Skid Plate
Halogen Headlamps
Dampened and Locking Tailgate
Bed Rail Protectors
High-mounted Cargo Lamp
Cargo Tie-Down Hooks (4)
Front Tow Hooks (2)
LED Rear Lamps

+For more information, see dealer, owner's manual or www.NissanUSA.com/connect/legal

++Towing capability varies by configuration. See Nissan towing guide and owner's manual for additional information.

Manufacturer's Suggested Retail Base Price: $32,340.00

Options Included by Manufacturer

SPLASH GUARDS	210.00
FLOOR MATS - CARPETED	160.00
TECHNOLOGY PACKAGE	990.00
Lane Departure Warning (LDW)	
Blind Spot Warning (BSW)	
Rear Cross Traffic Alert (RCTA)	
Rear Sonar System	
Rear Automatic Braking (RAB)	
High Beam Assist (HBA)	
Intelligent Cruise Control (ICC)	

DESTINATION CHARGES 1,175.00

Total* $34,875.00

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy
19 MPG
combined city/hwy — 17 city — 22 highway
5.3 gallons per 100 miles

STANDARD PICKUP TRUCKS range from 12 to 27 MPG. The best vehicle rates 142 MPGe.

You spend **$2,750** more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $1,850

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 1 — 4 — 10 Best
Smog Rating (tailpipe only) 1 — 5 — 10 Best

This vehicle emits 458 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $6,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.35 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score — Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver	Not Rated
	Passenger	Not Rated
Side Crash	Front seat	Not Rated
	Rear seat	Not Rated
Rollover		Not Rated

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.
Based on the risk of injury in a side impact.
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

PARTS CONTENT INFORMATION FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 40%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: JAPAN: 25%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: CANTON, MS., USA
COUNTRY OF ORIGIN:
ENGINE: US
TRANSMISSION: JAPAN

This Vehicle qualifies for Nissan's

Security+Plus Extended Protection Plan

The only service agreement backed by Nissan Extended Services North America! Ask your dealer for details, or call 1-800-NISSAN-1 for more information

Dealer:
BOUCHER NISSAN/WAUKESHA
1451 E MORELAND BLVD
WAUKESHA, WI 53186

VIN: 1N6ED1EK8NN623187
MDL: 32012-623187 KAD-G
OPT: B-B92L93V01C03
EXT: GUN METALLIC
INT: CHARCOAL
EMS: 50 STATE EMISSIONS

Photo No. 083 - Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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

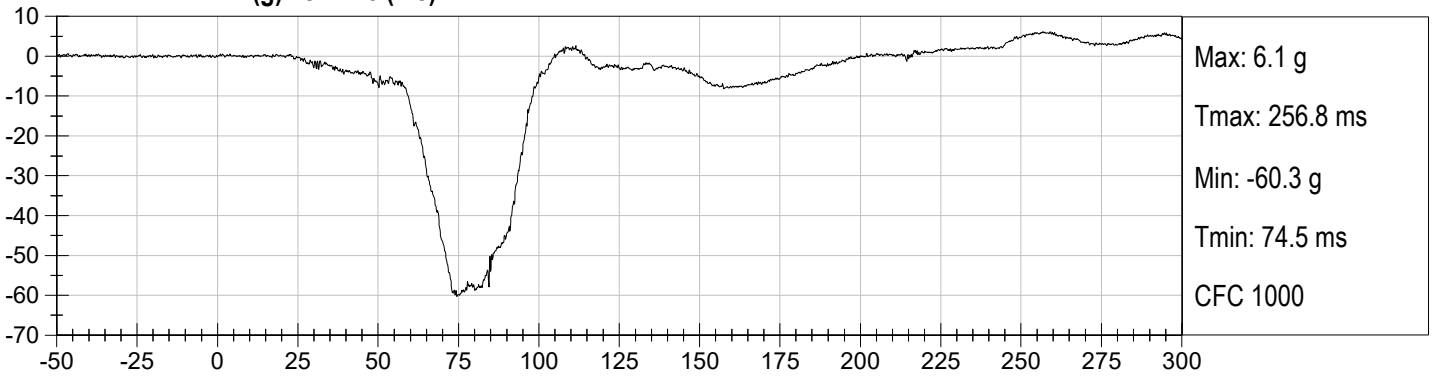
Right Rear Seat Crossmember Z

Left Rear Seat Crossmember Xr

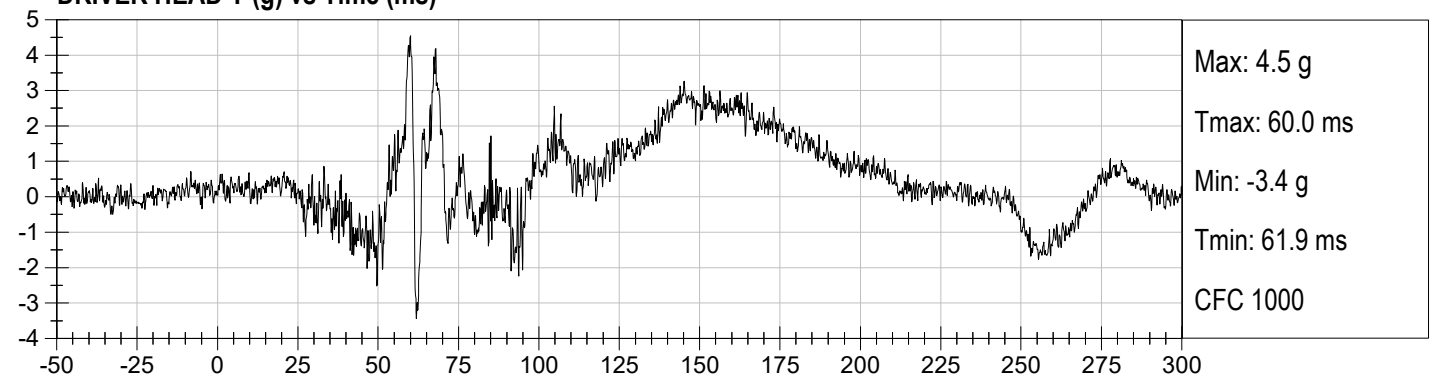
Right Rear Seat Crossmember Xr

Advanced Research Load Cell Barrier – 528 channels

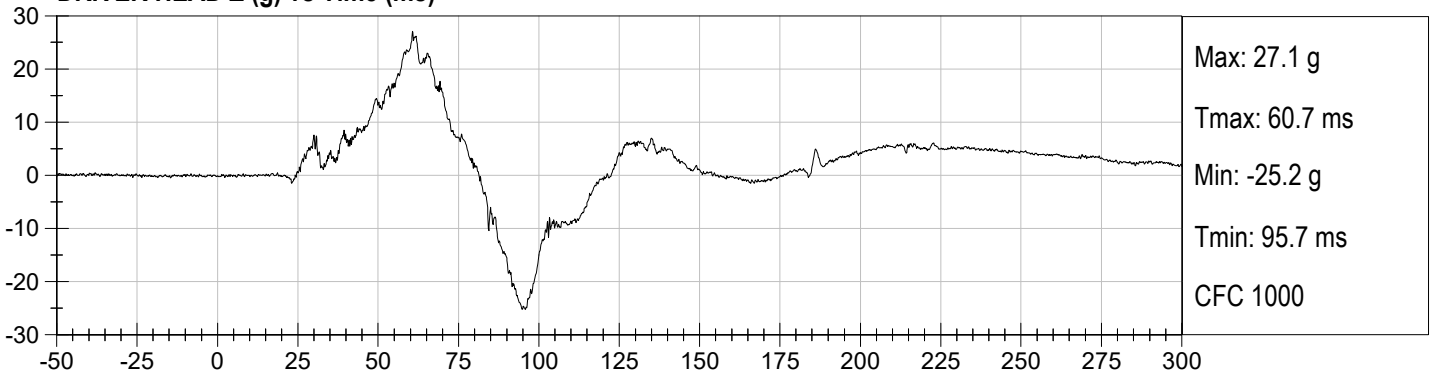
DRIVER HEAD X (g) vs Time (ms)



DRIVER HEAD Y (g) vs Time (ms)

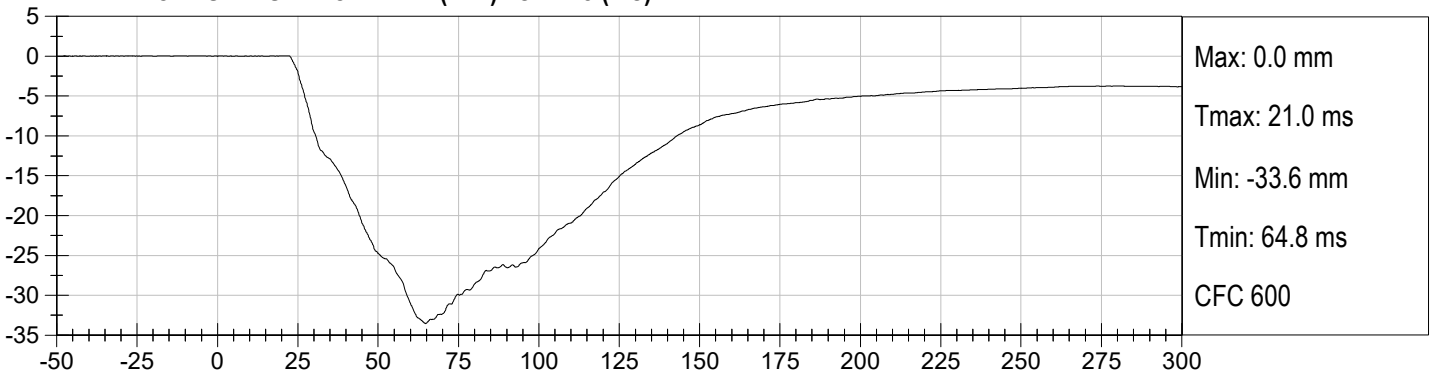


DRIVER HEAD Z (g) vs Time (ms)

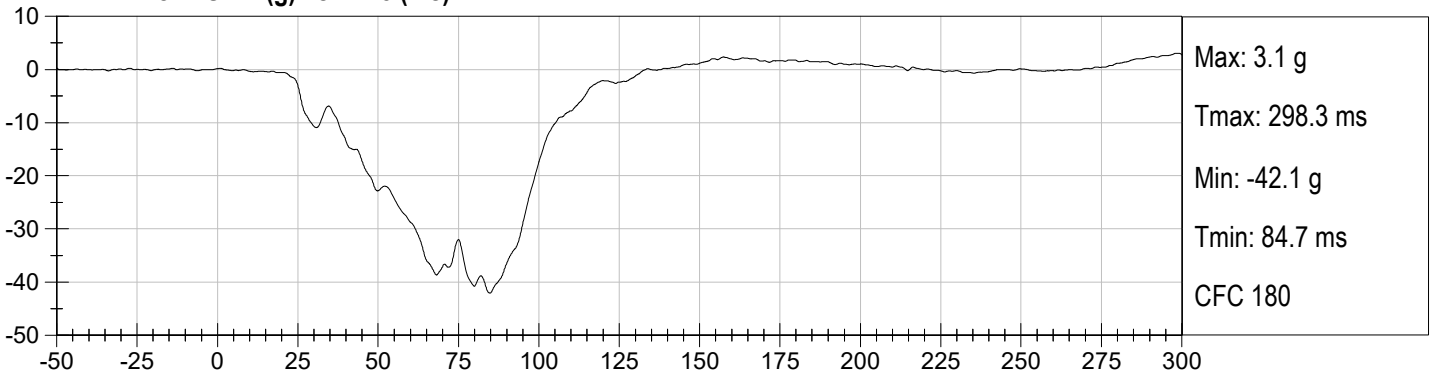


DRIVER HEAD Resultant (g) vs Time (ms)

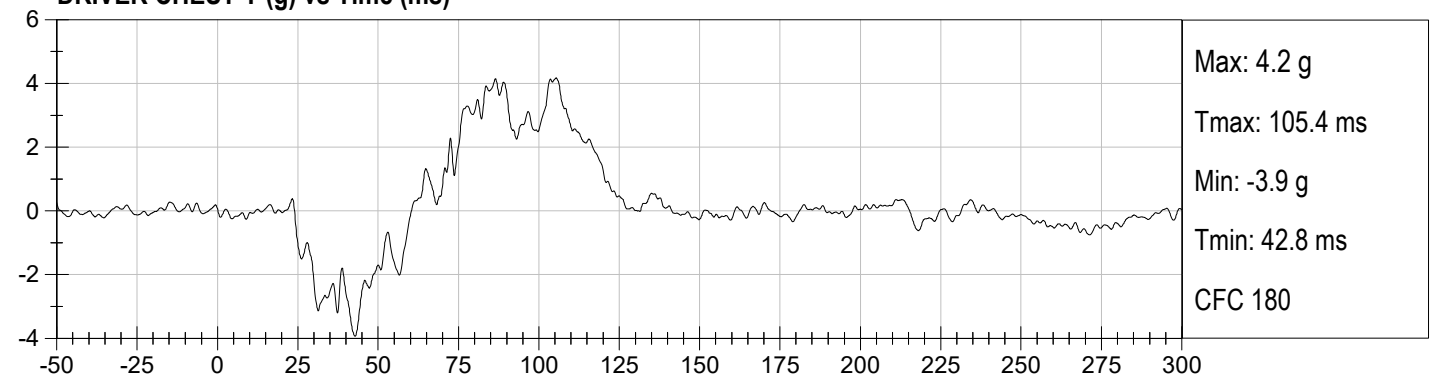
DRIVER CHEST DISPLACEMENT (mm) vs Time (ms)



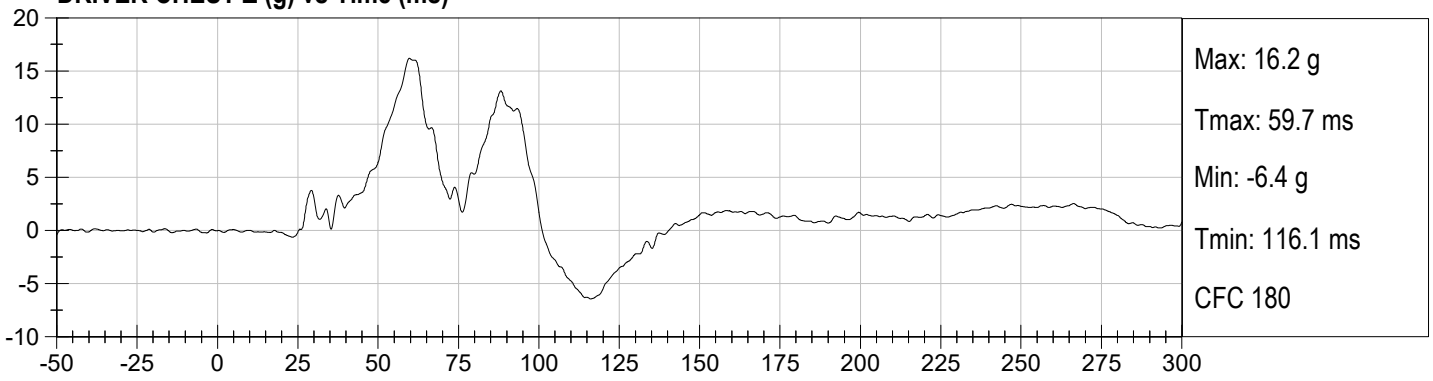
DRIVER CHEST X (g) vs Time (ms)



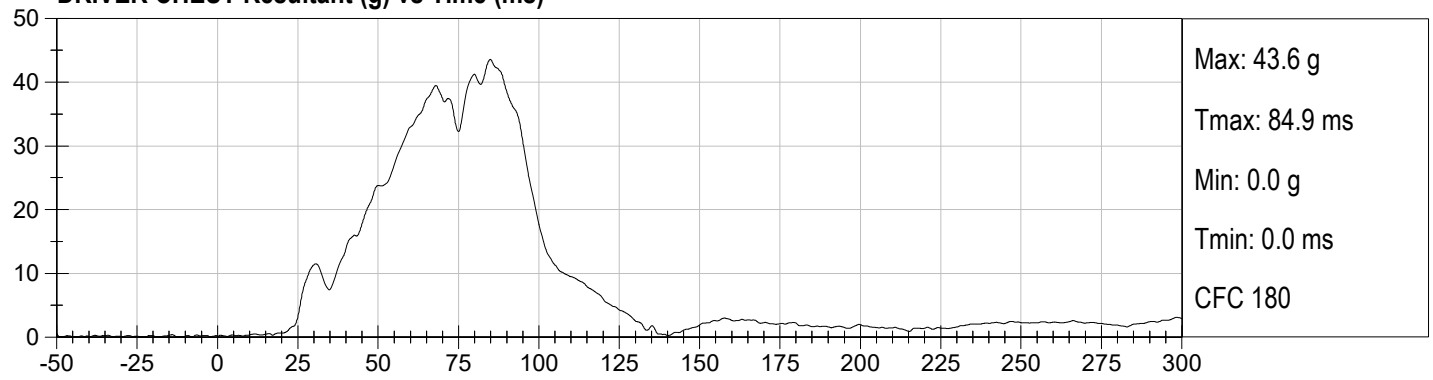
DRIVER CHEST Y (g) vs Time (ms)



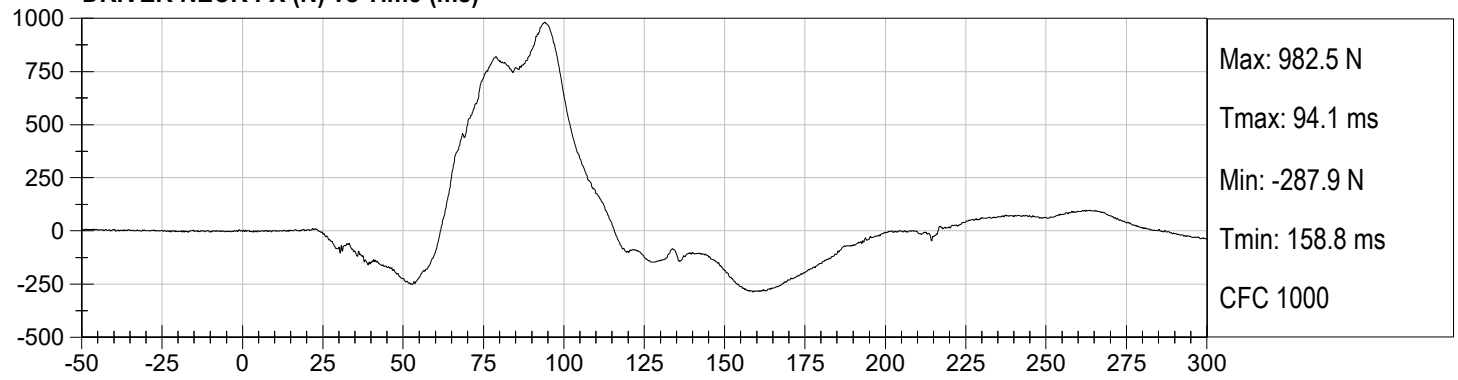
DRIVER CHEST Z (g) vs Time (ms)



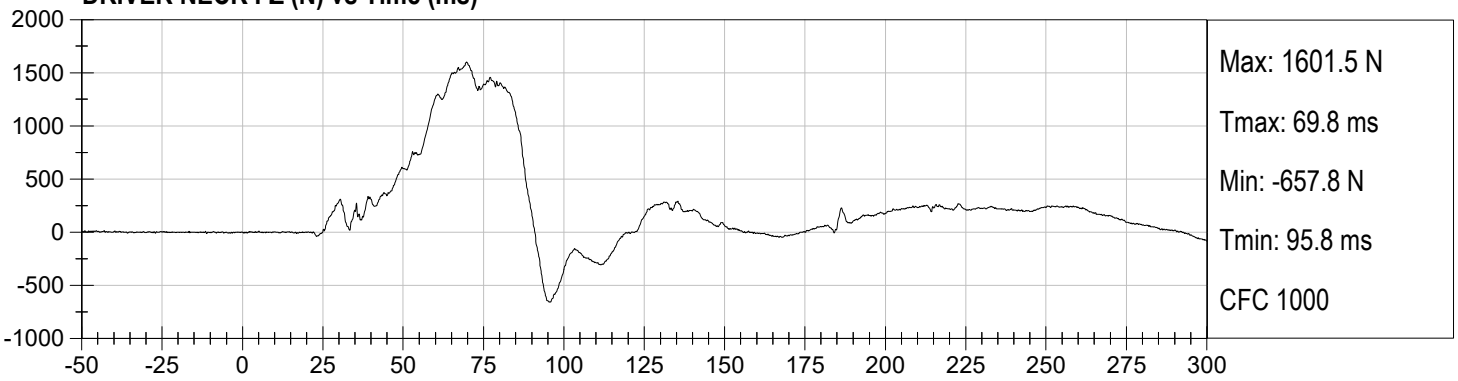
DRIVER CHEST Resultant (g) vs Time (ms)



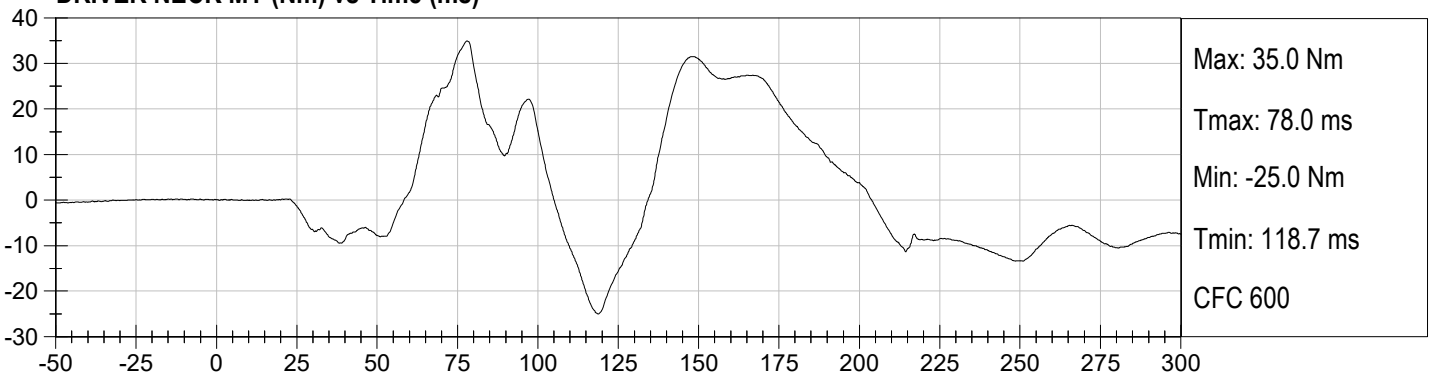
DRIVER NECK FX (N) vs Time (ms)



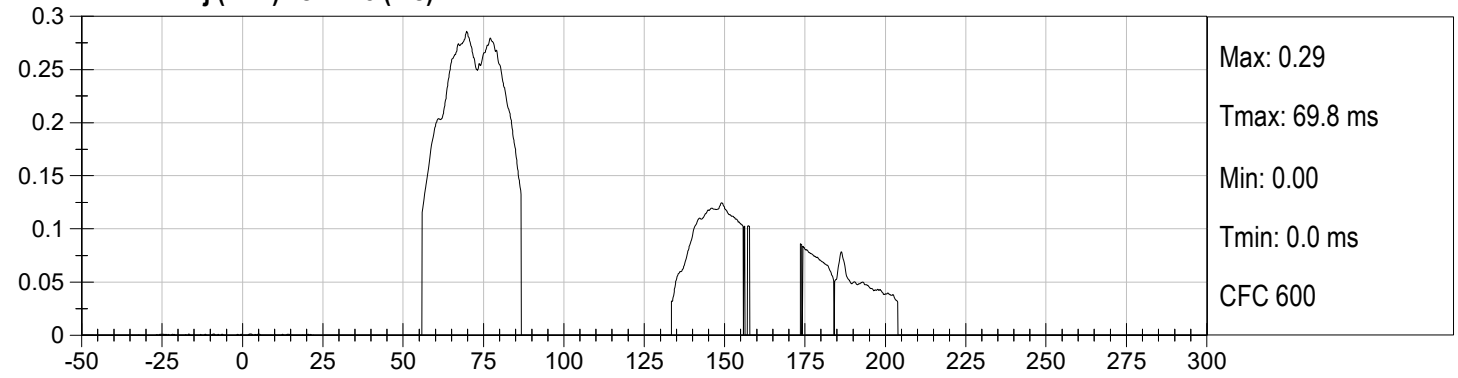
DRIVER NECK FZ (N) vs Time (ms)



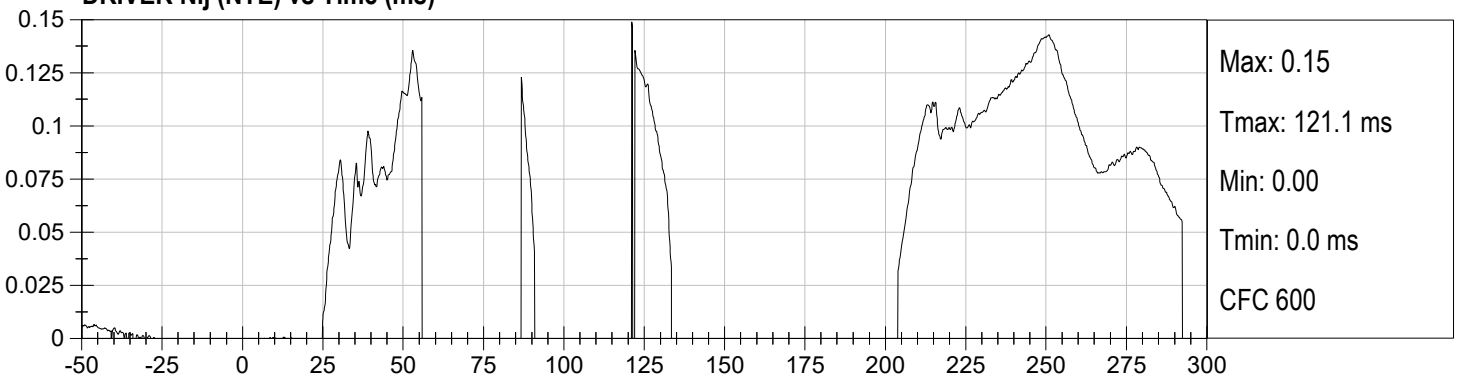
DRIVER NECK MY (Nm) vs Time (ms)



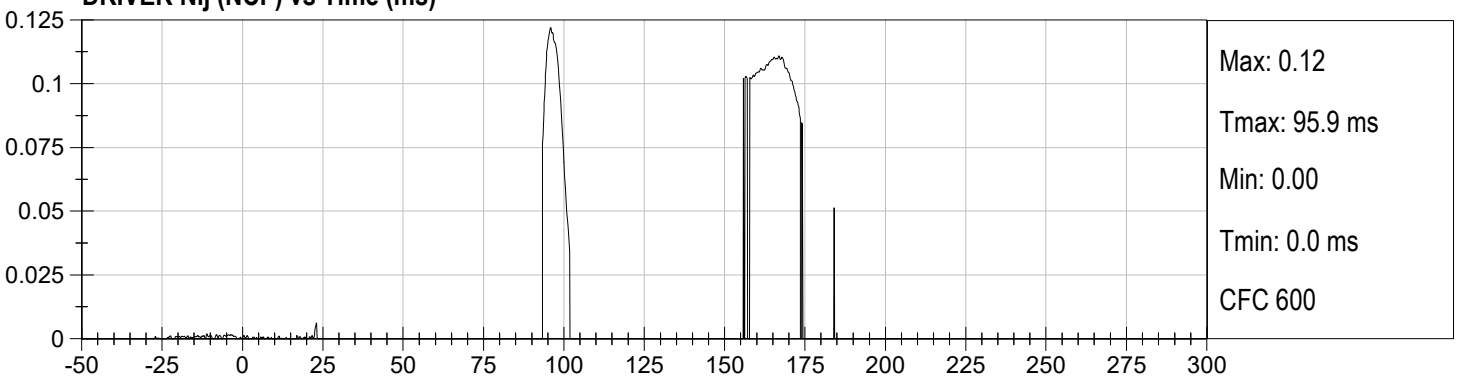
DRIVER Nij (NTF) vs Time (ms)



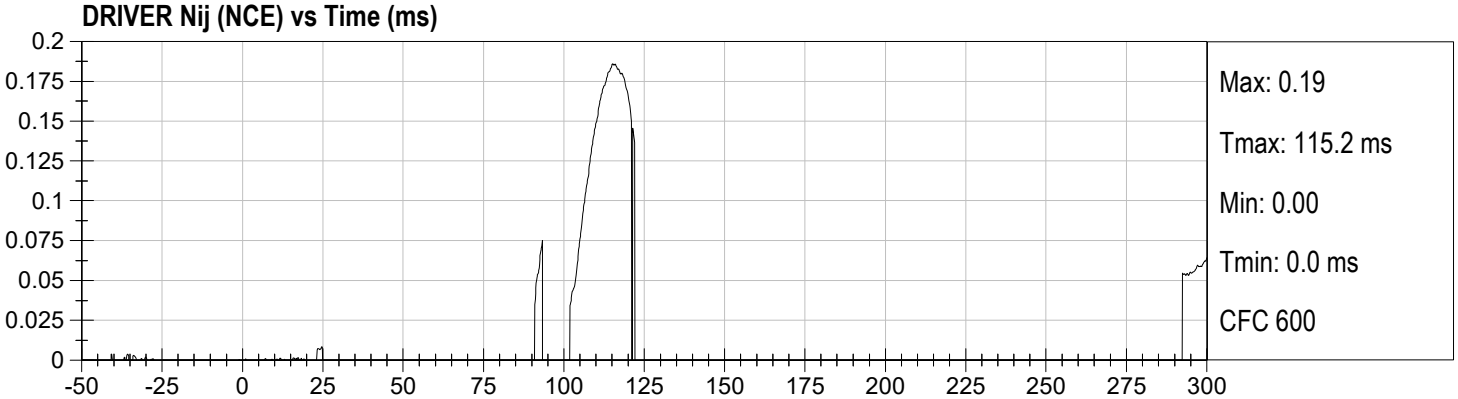
DRIVER Nij (NTE) vs Time (ms)



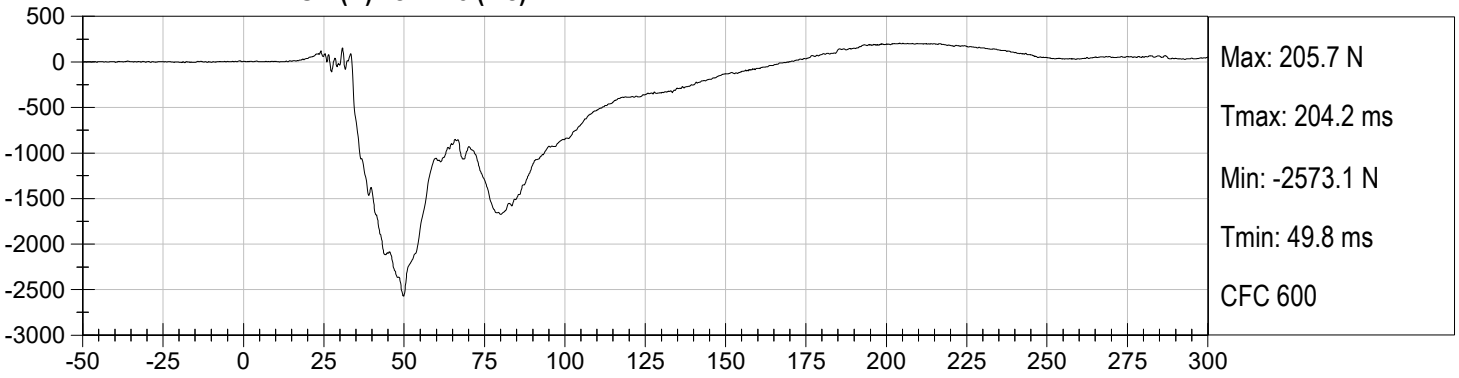
DRIVER Nij (NCF) vs Time (ms)



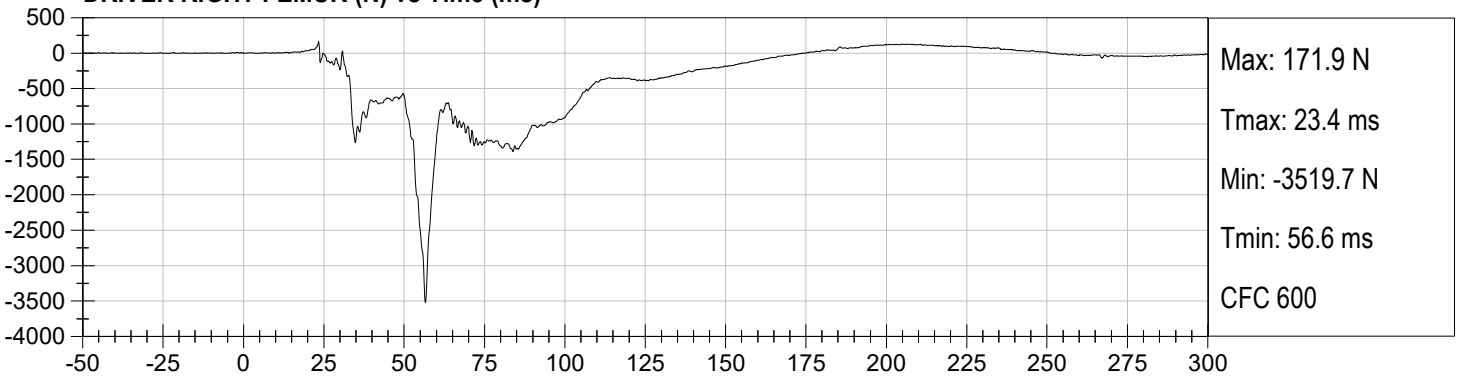
DRIVER Nij (NCE) vs Time (ms)



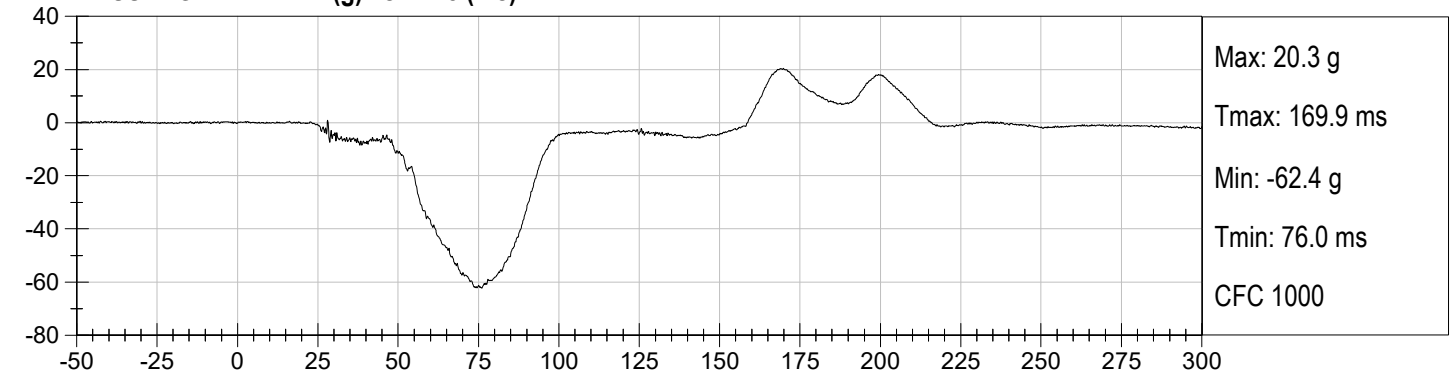
DRIVER LEFT FEMUR (N) vs Time (ms)



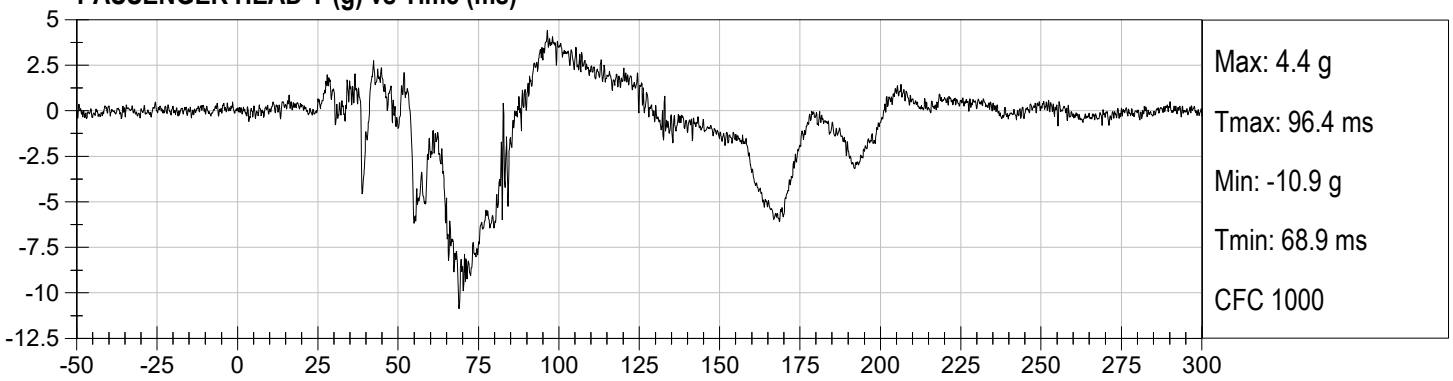
DRIVER RIGHT FEMUR (N) vs Time (ms)



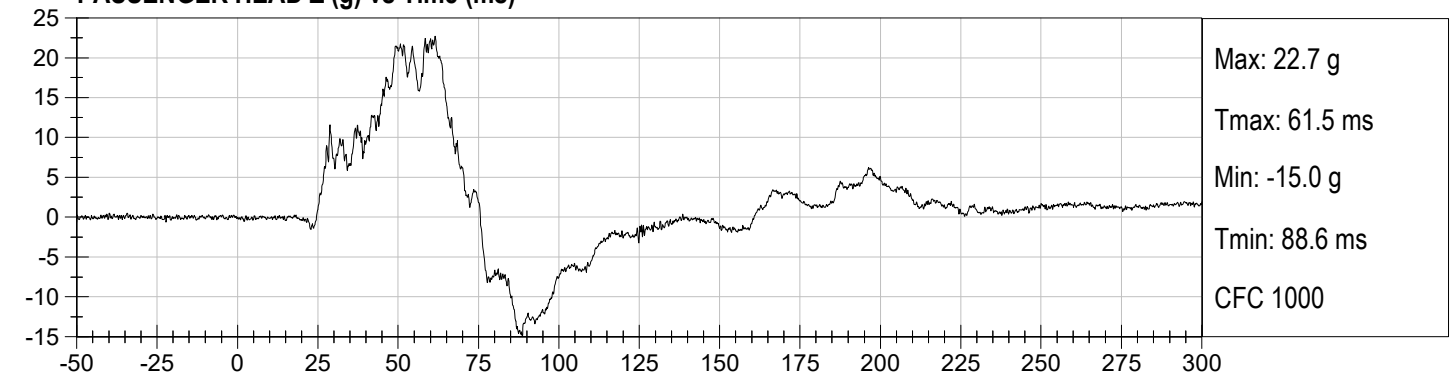
PASSENGER HEAD X (g) vs Time (ms)



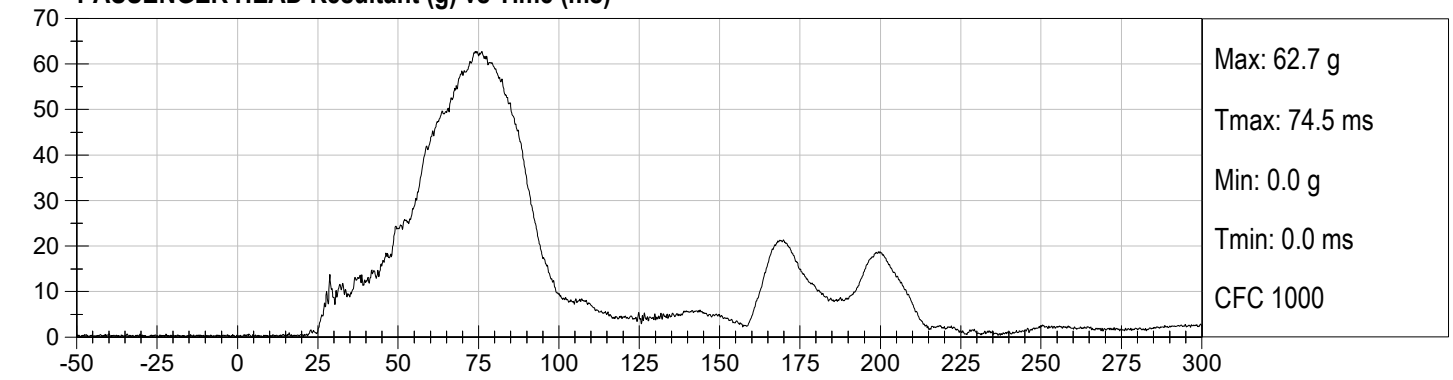
PASSENGER HEAD Y (g) vs Time (ms)



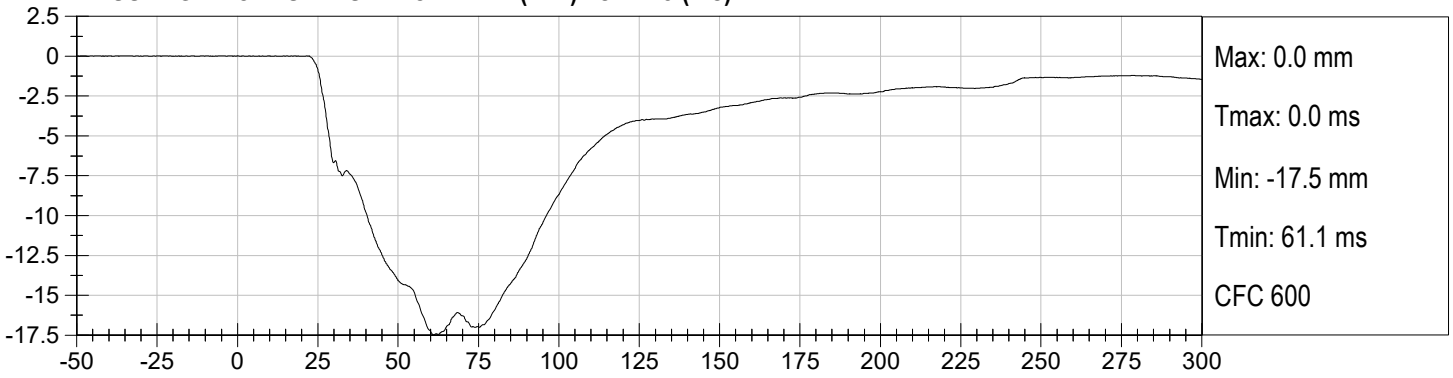
PASSENGER HEAD Z (g) vs Time (ms)



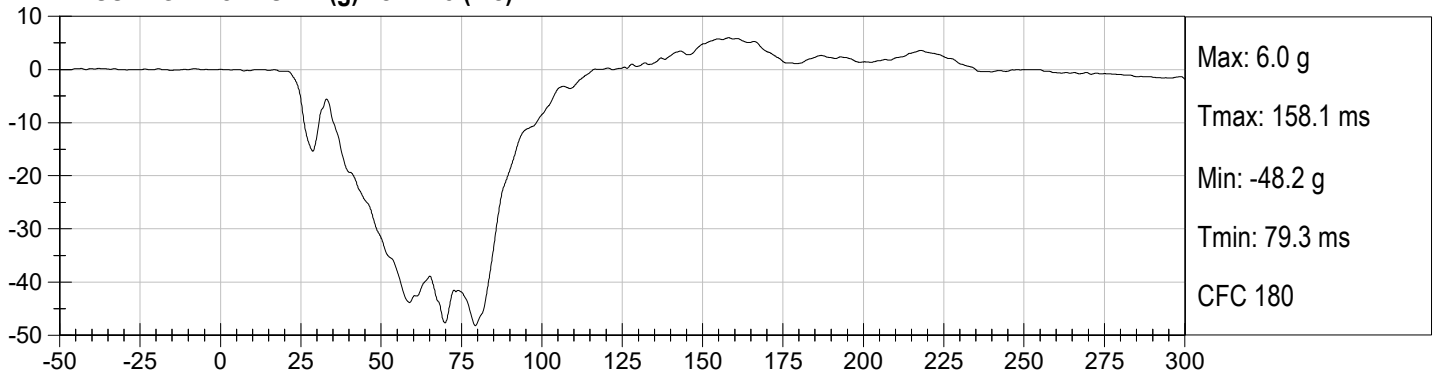
PASSENGER HEAD Resultant (g) vs Time (ms)



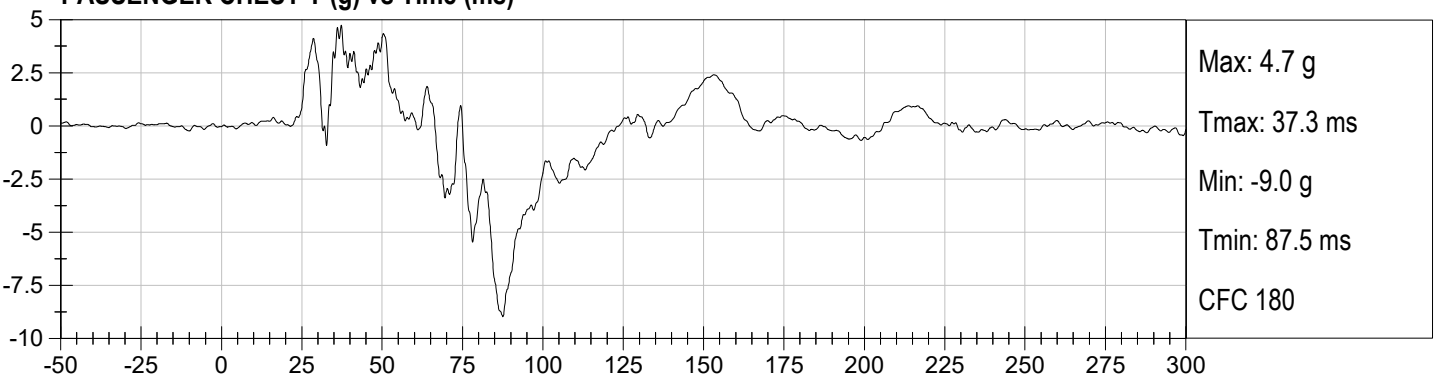
PASSENGER CHEST DISPLACEMENT (mm) vs Time (ms)



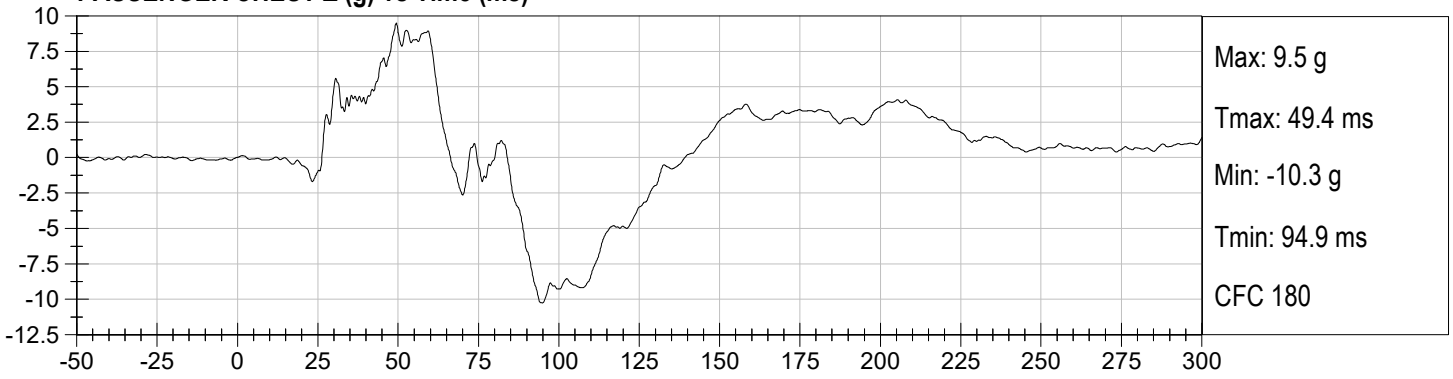
PASSENGER CHEST X (g) vs Time (ms)



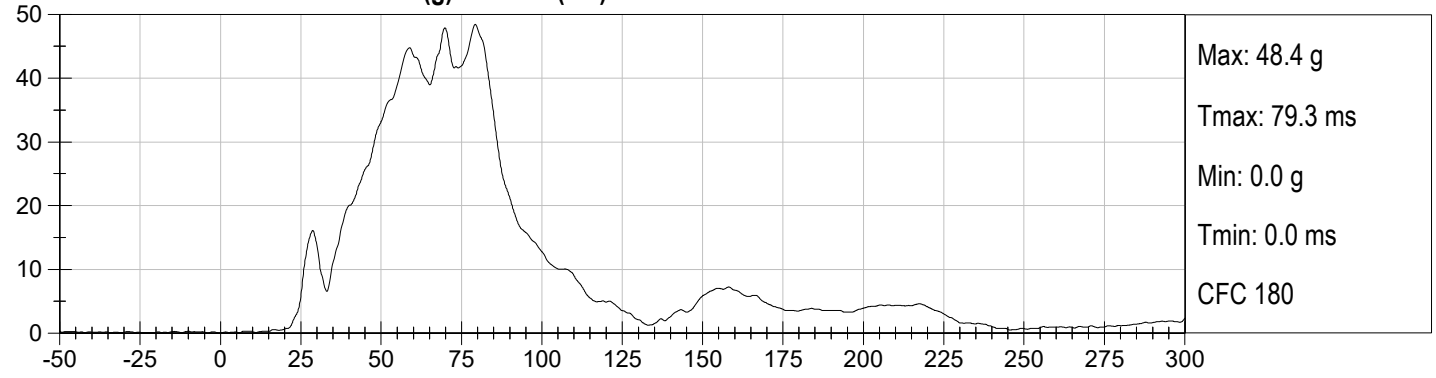
PASSENGER CHEST Y (g) vs Time (ms)



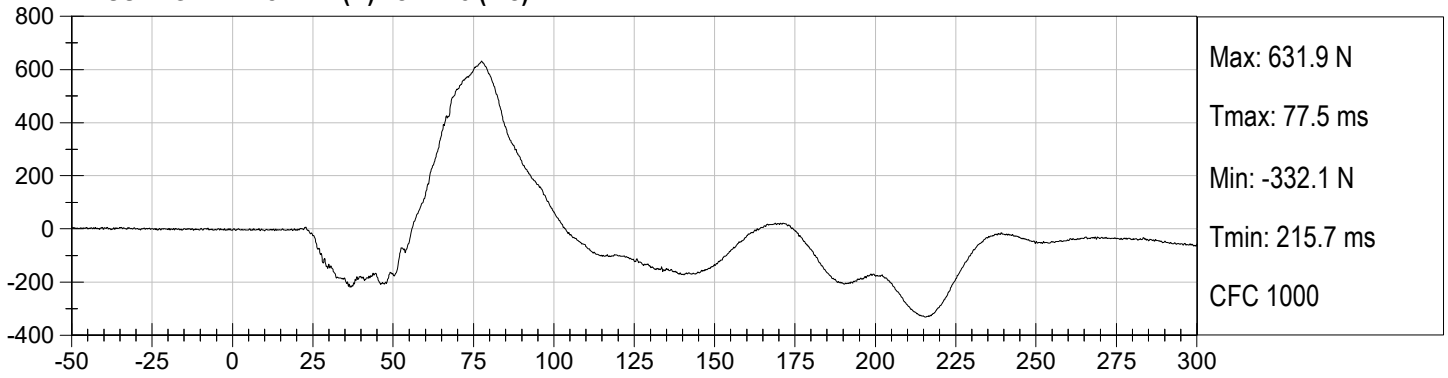
PASSENGER CHEST Z (g) vs Time (ms)



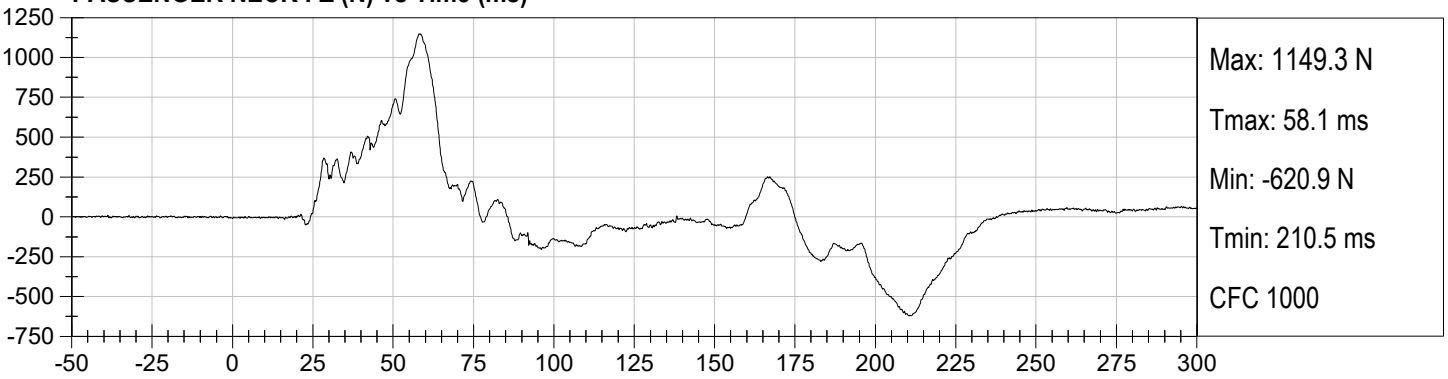
PASSENGER CHEST Resultant (g) vs Time (ms)



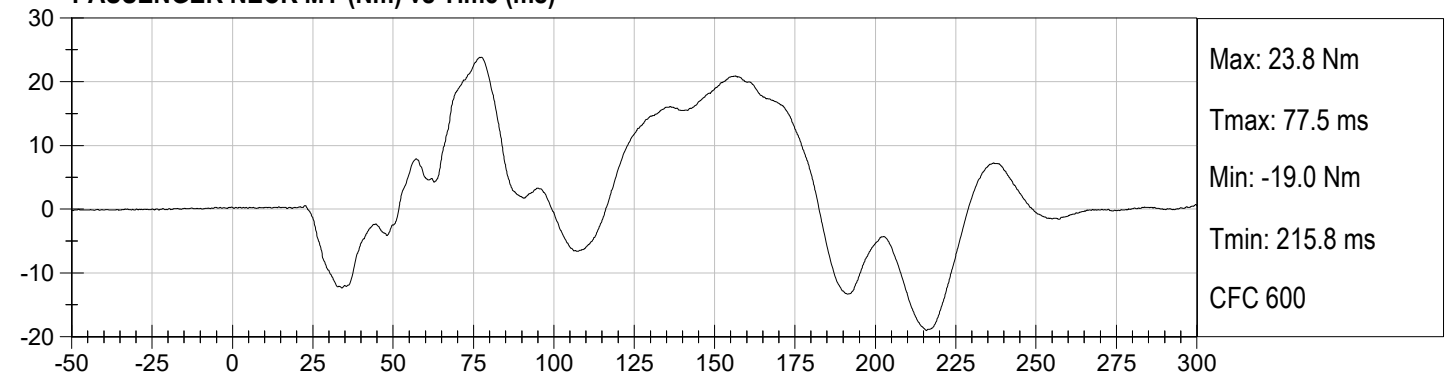
PASSENGER NECK FX (N) vs Time (ms)



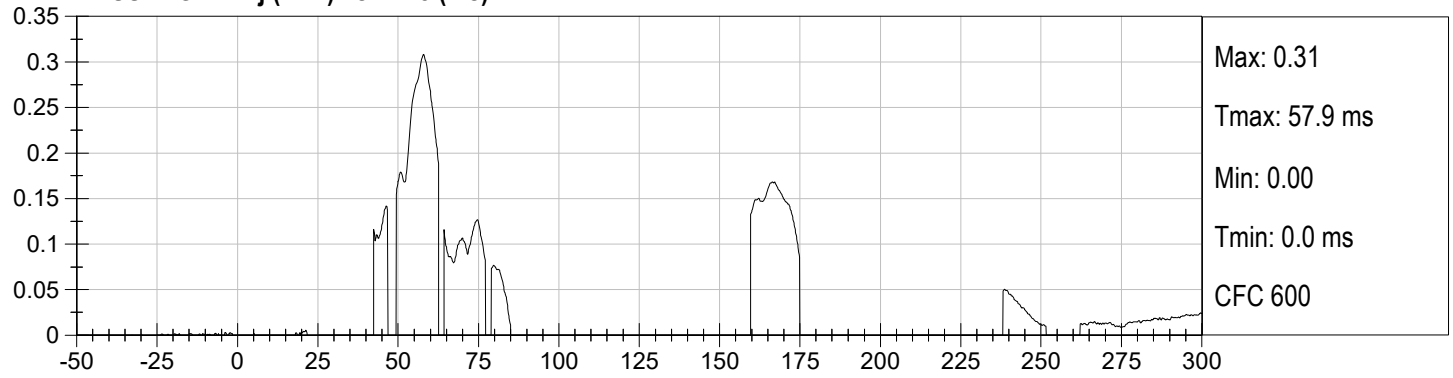
PASSENGER NECK FZ (N) vs Time (ms)



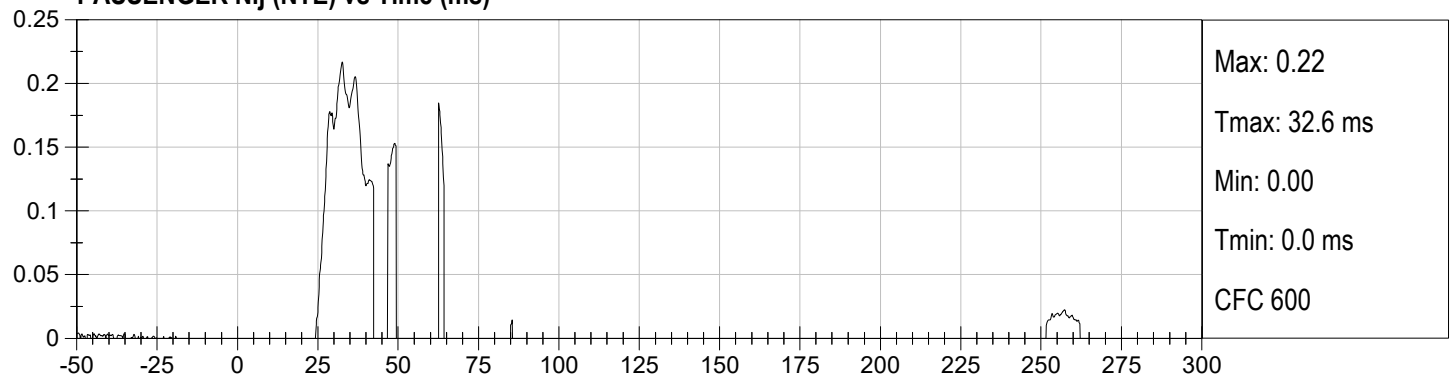
PASSENGER NECK MY (Nm) vs Time (ms)



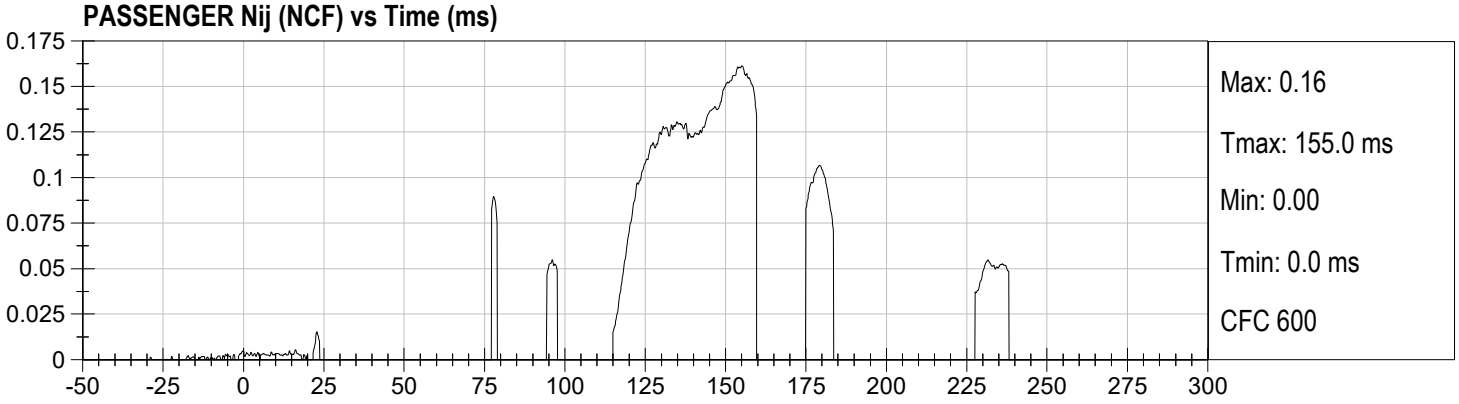
PASSENGER Nij (NTF) vs Time (ms)



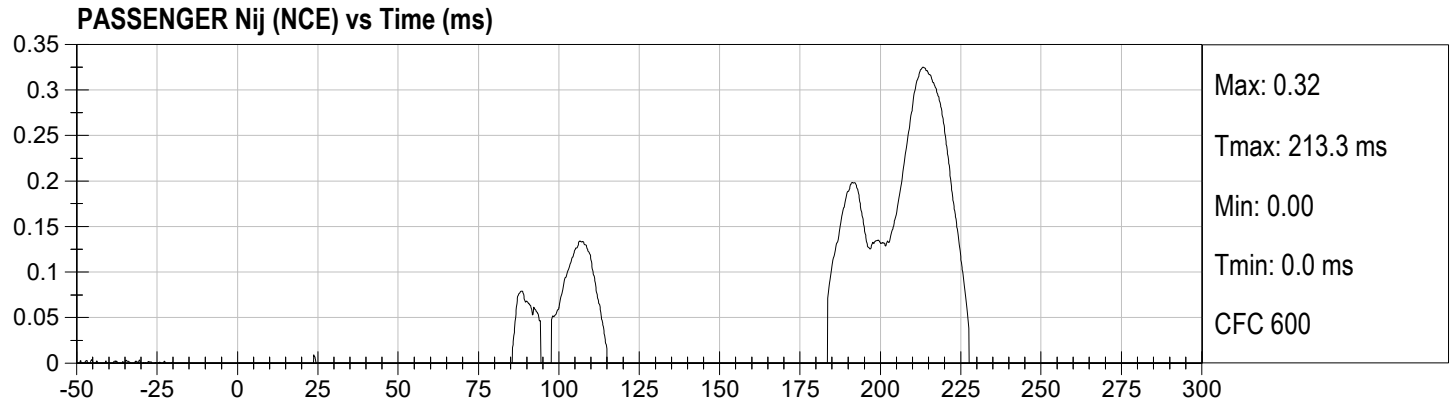
PASSENGER Nij (NTE) vs Time (ms)



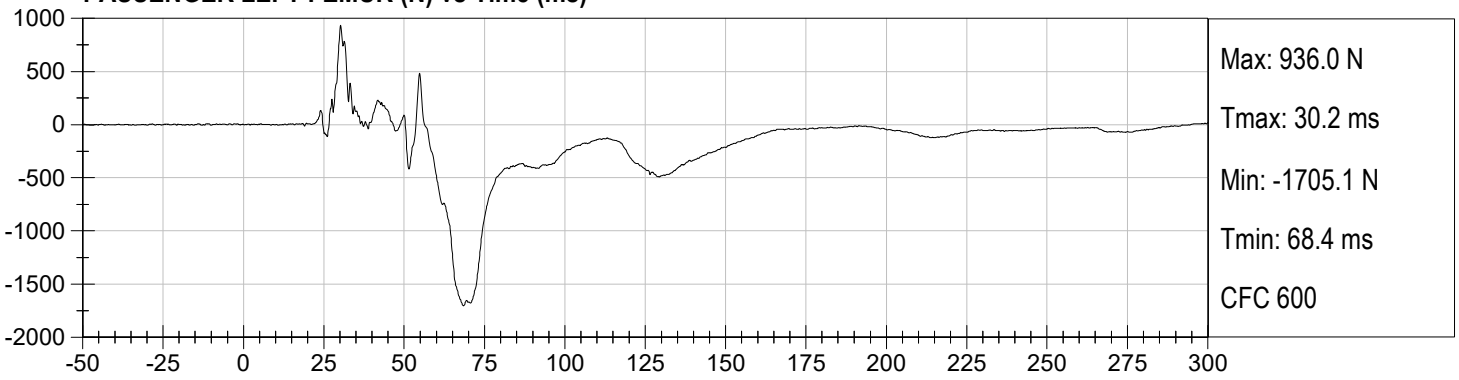
PASSENGER Nij (NCF) vs Time (ms)



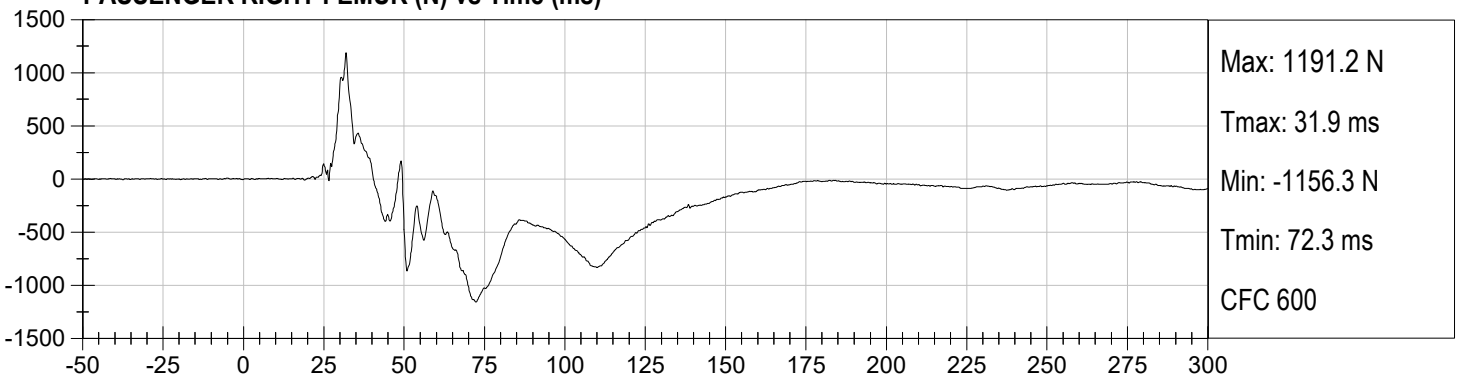
PASSENGER Nij (NCE) vs Time (ms)



PASSENGER LEFT FEMUR (N) vs Time (ms)



PASSENGER RIGHT FEMUR (N) vs Time (ms)



APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION 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 **Test ID:** D220181

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Peak Resultant Acceleration	G's	225 to 275	261	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

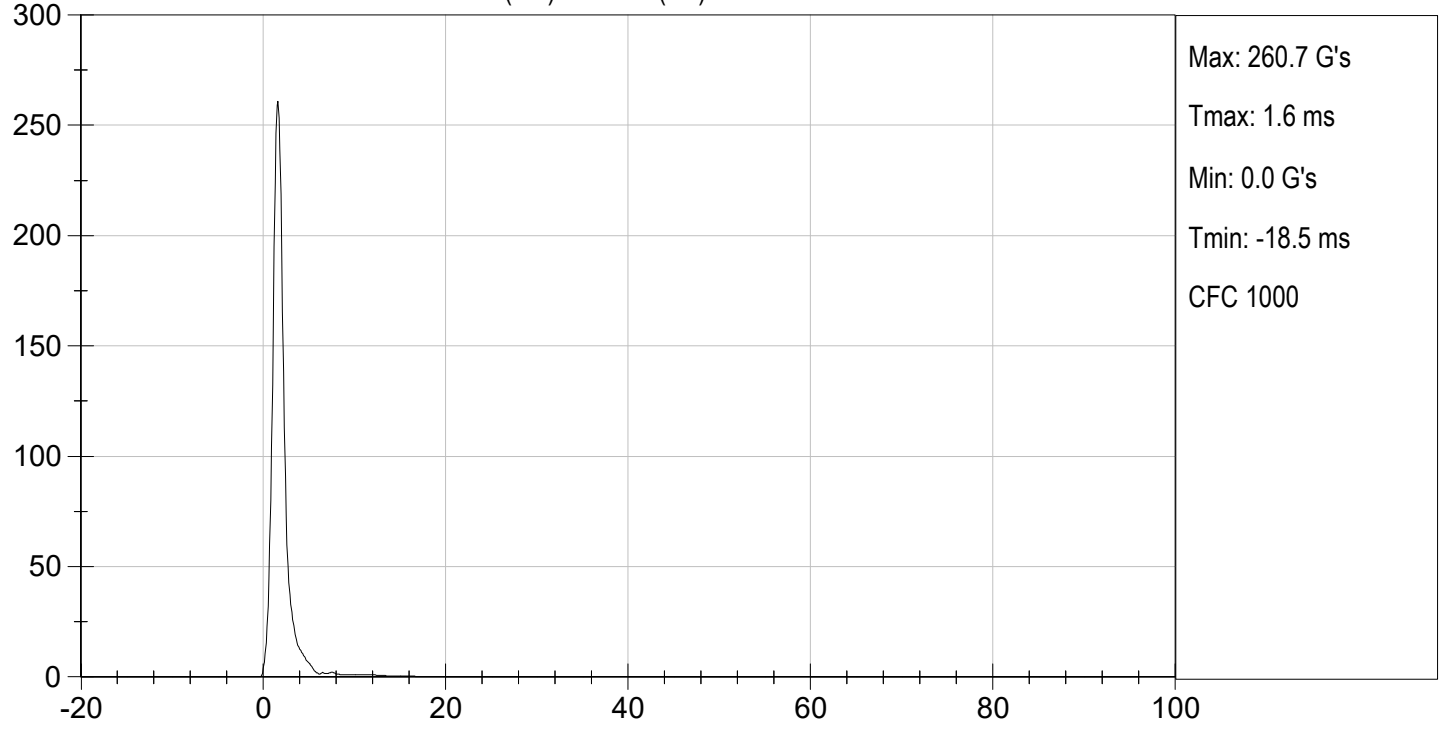
01/25/2022
Test Date

Approved By

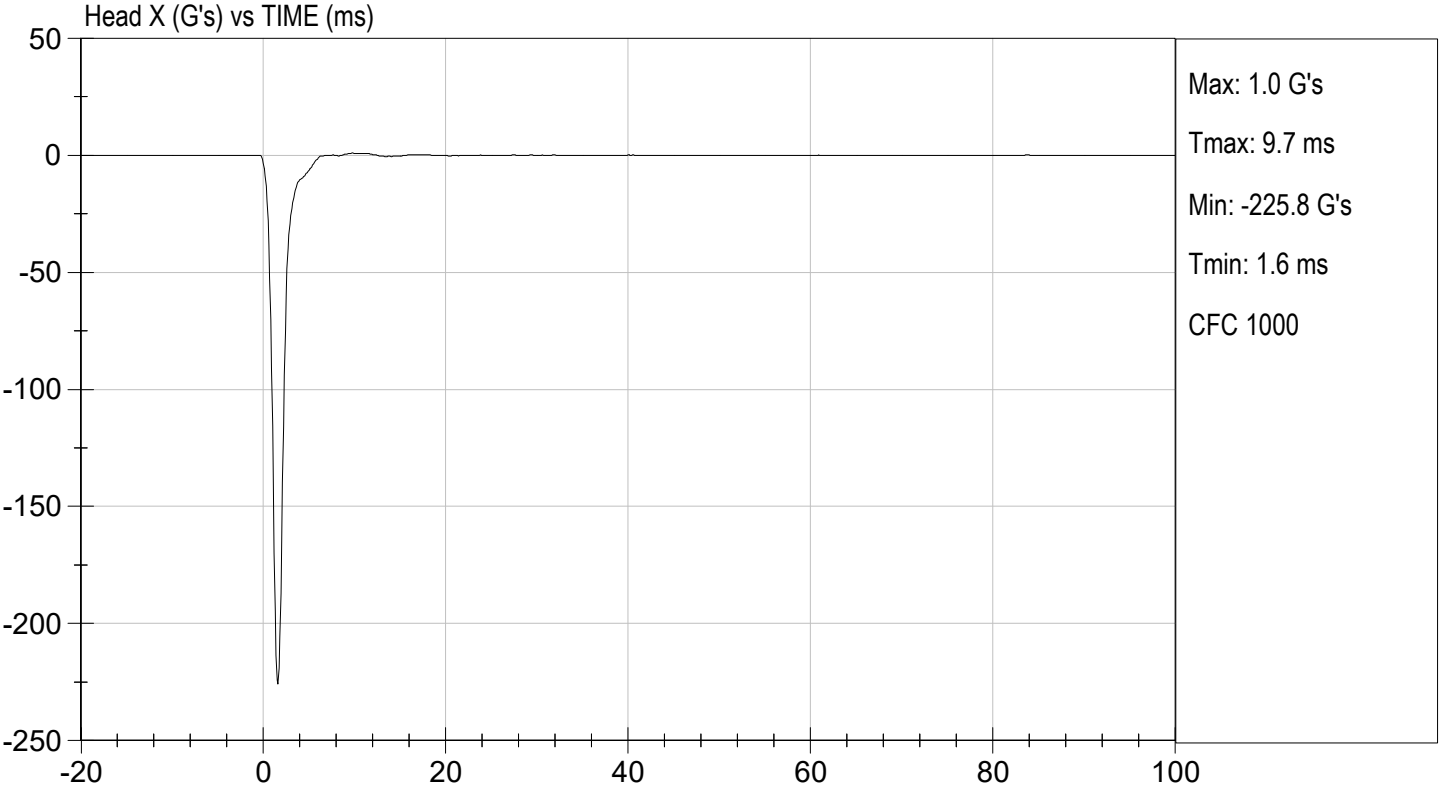
TEST DESC: HEAD DROP

TEST DATE: 01/25/2022
TEST #: D220181

HEAD RESULTANT ACCELERATION (G's) vs TIME (ms)

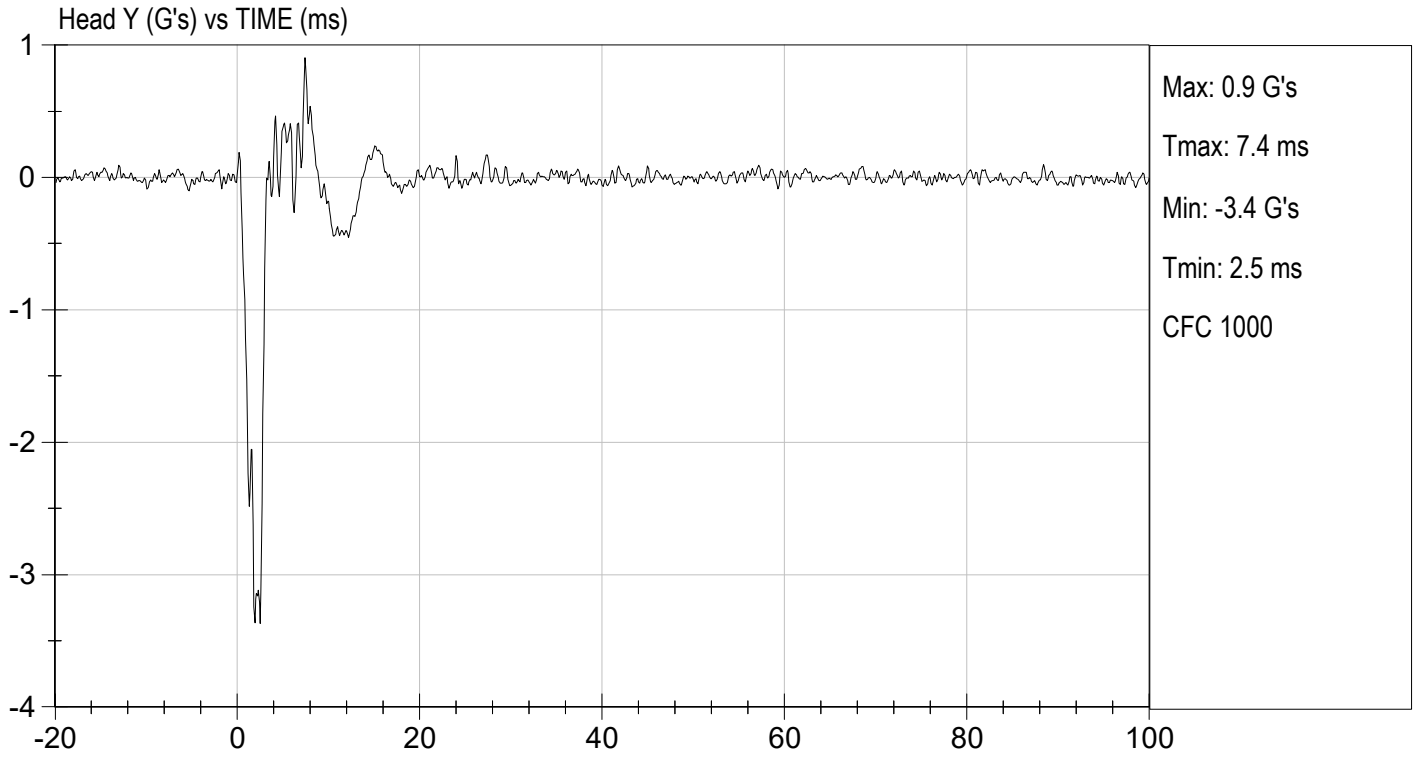


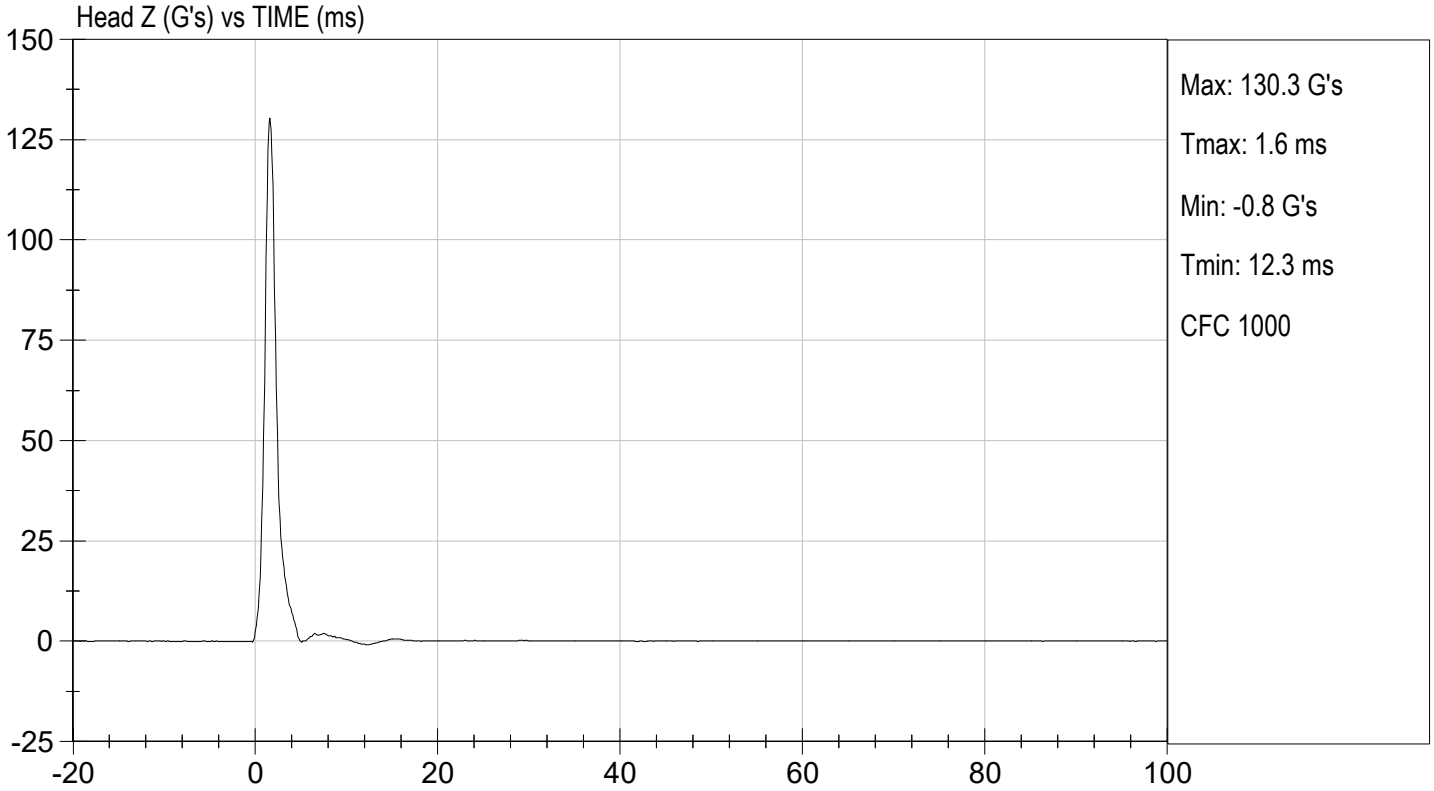
Head X (G's) vs TIME (ms)



TEST DESC: HEAD DROP

TEST DATE: 01/25/2022
TEST #: D220181





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220182

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.92	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.64	Pass
	20 ms	G's	17.60 to 22.60	19.70	Pass
	30 ms	G's	12.50 to 18.50	13.32	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	40.1	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	70.2	Pass
	Time	ms	57.0 to 64.0	62.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	121.6	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	95.6	Pass
	Time	ms	47.0 to 58.0	51.8	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	102.1	Pass
			Overall Test Results		Pass

Laboratory Technician

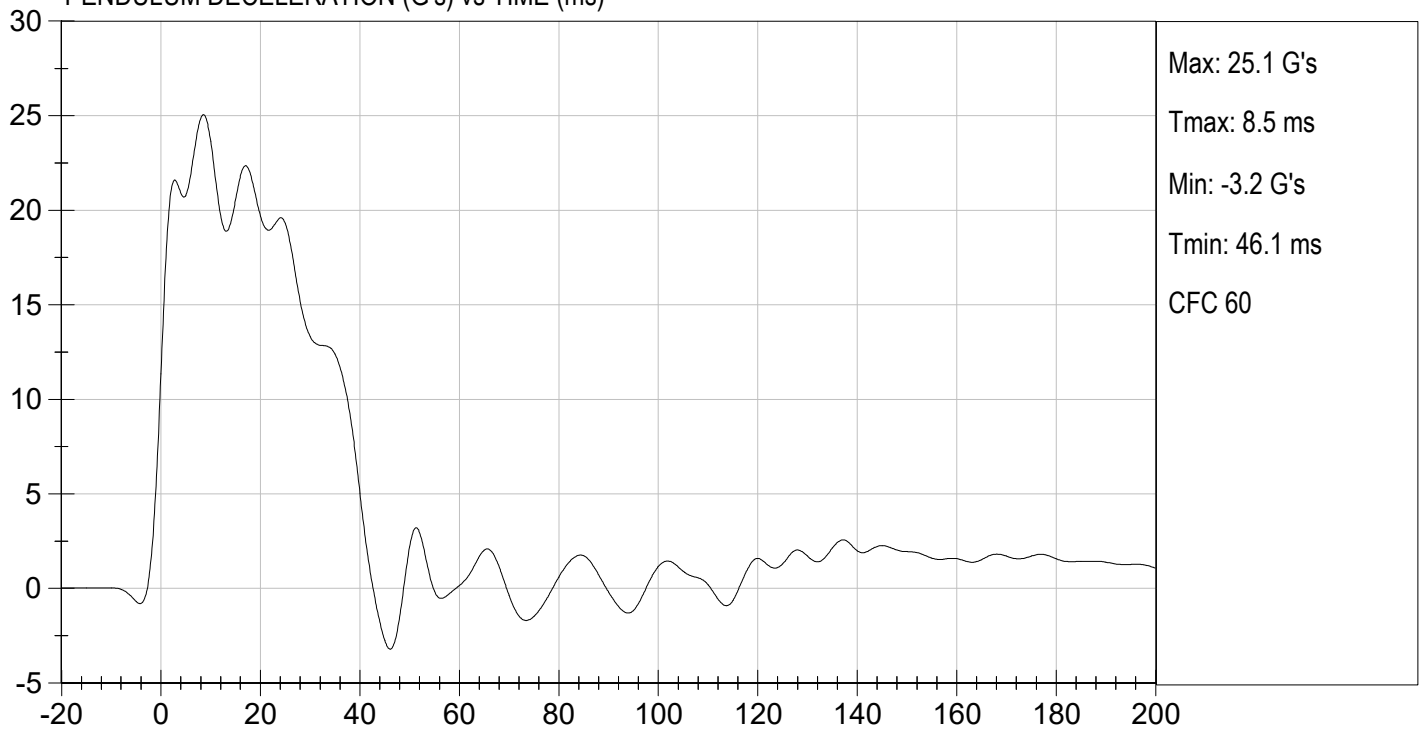
01/25/2022
Test Date

Approved By

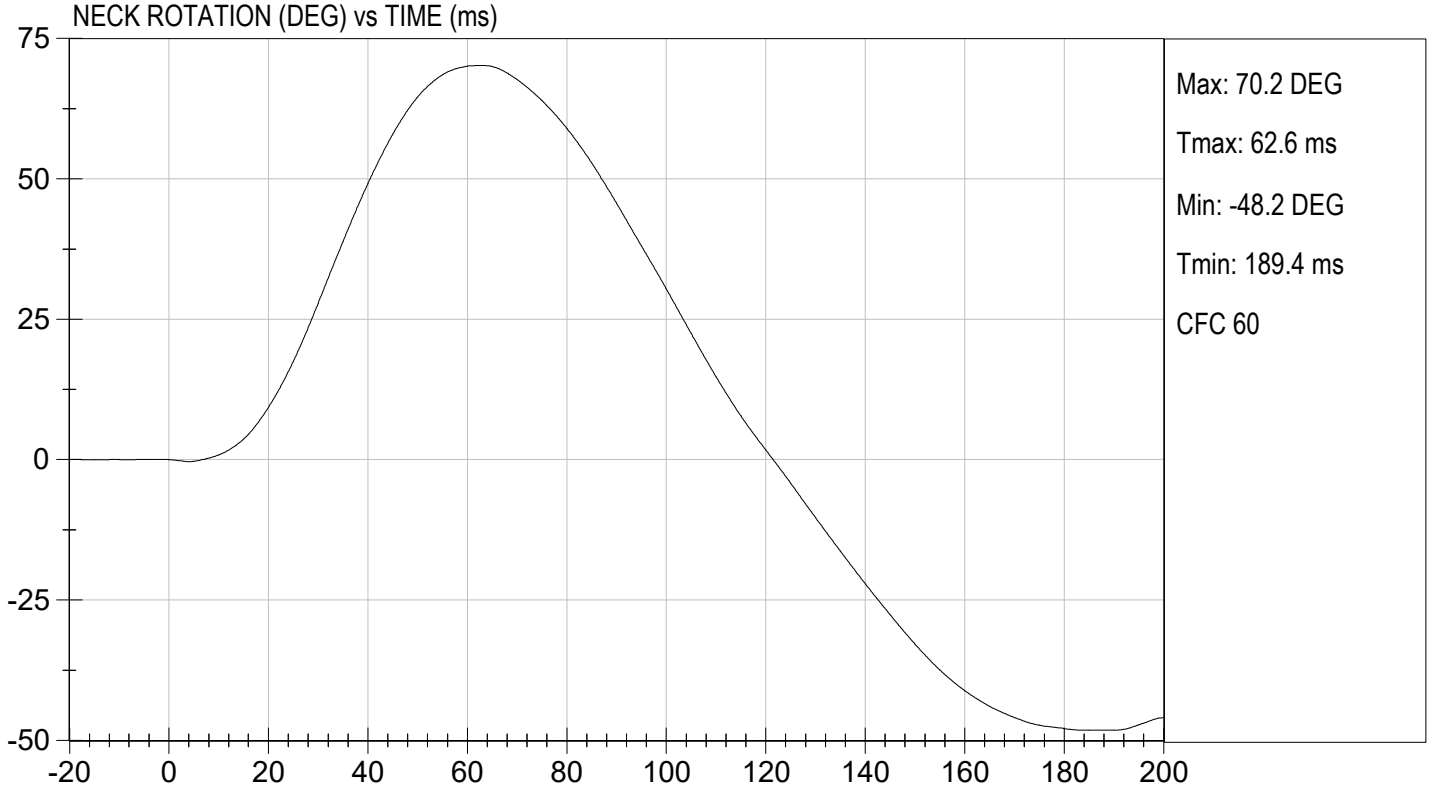
TEST DESC: NECK FLEXION
VELOCITY: 22.70 ft/s, 6.92 m/s

TEST DATE: 01/25/2022
TEST #: D220182

PENDULUM DECELERATION (G's) vs TIME (ms)

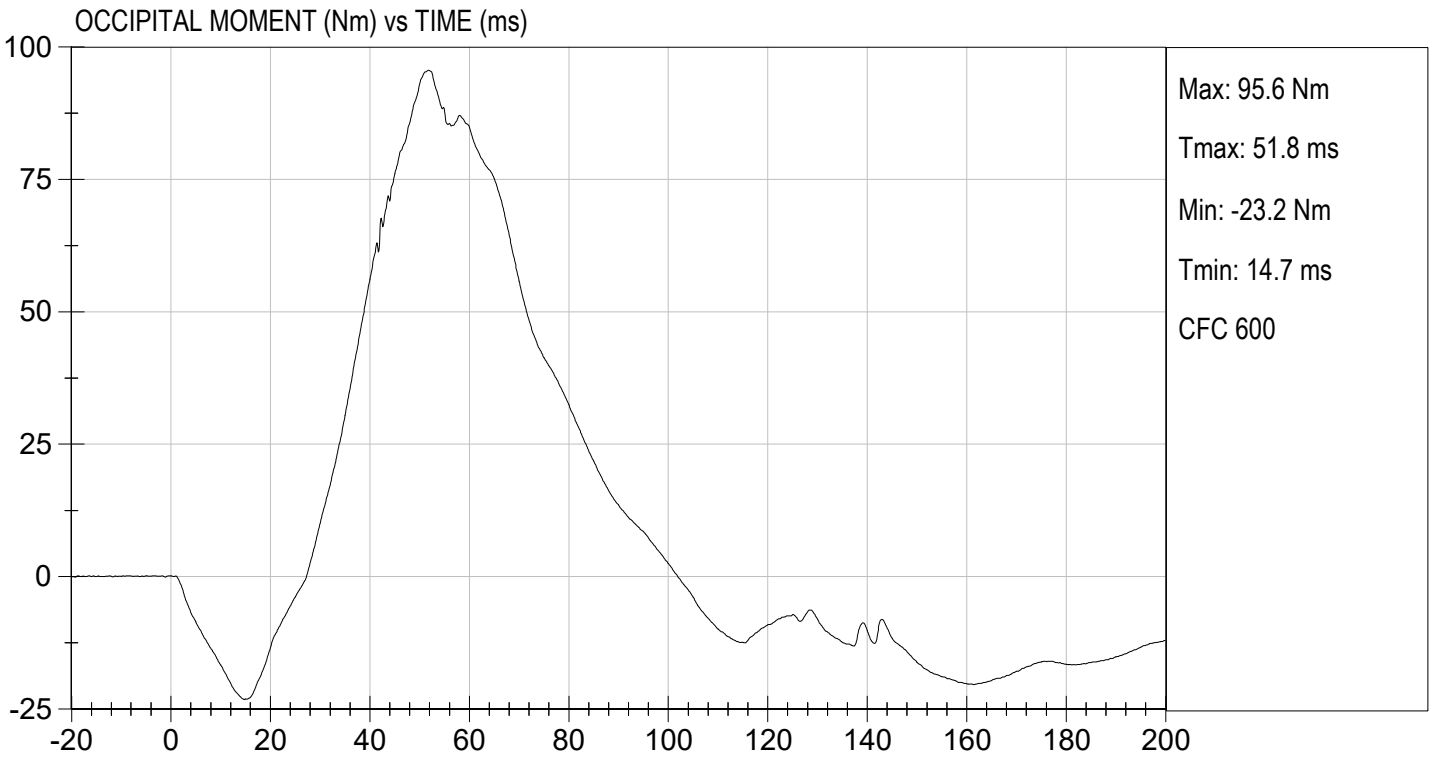


NECK ROTATION (DEG) vs TIME (ms)



TEST DESC: NECK FLEXION
VELOCITY: 22.70 ft/s, 6.92 m/s

TEST DATE: 01/25/2022
TEST #: D220182



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220183

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	5.95 to 6.19	5.98	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.47	Pass
	20 ms	G's	14.00 to 19.00	17.36	Pass
	30 ms	G's	11.00 to 16.00	15.32	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	15.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	100.0	Pass
	Time	ms	72.0 to 82.0	75.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	161.1	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-65.0	Pass
	Time	ms	65.0 to 79.0	72.7	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	142.5	Pass
			Overall Test Results		Pass

Laboratory Technician

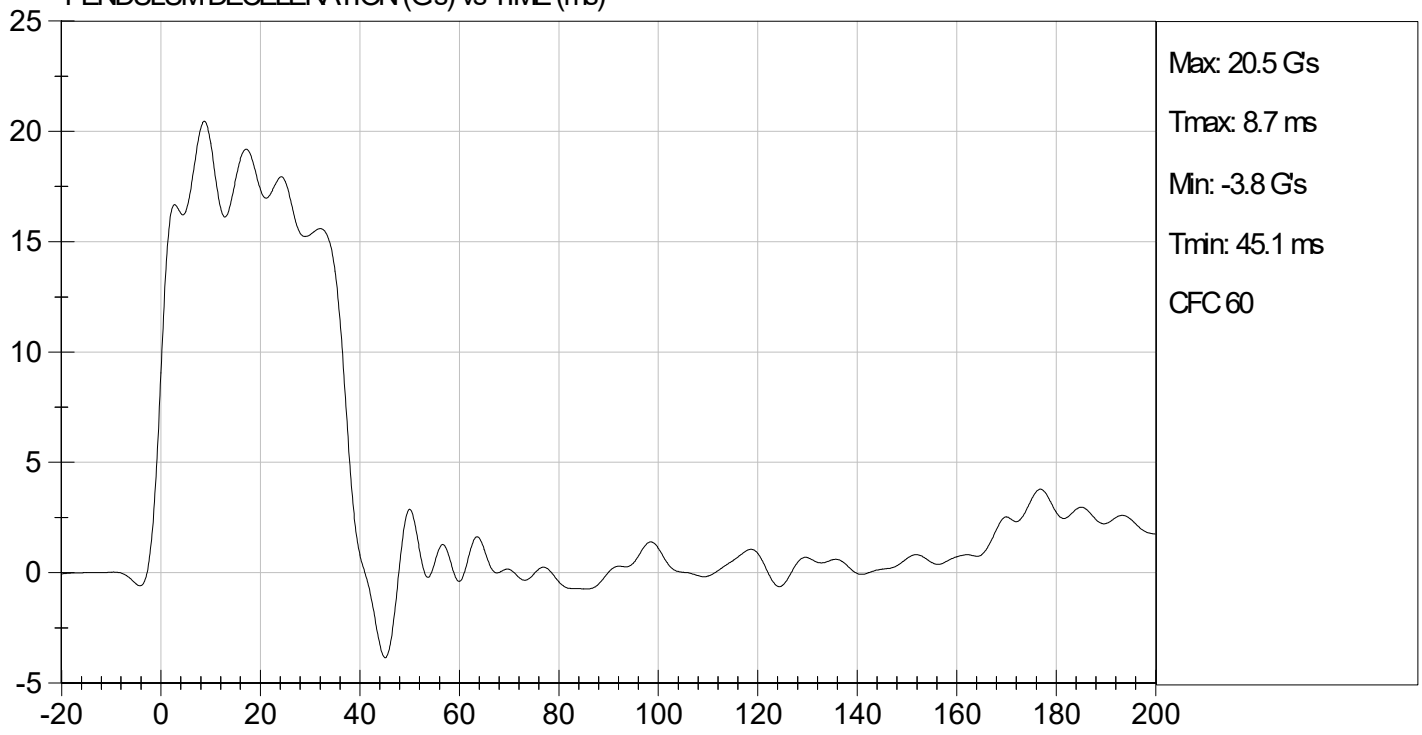
01/25/2022
Test Date

Approved By

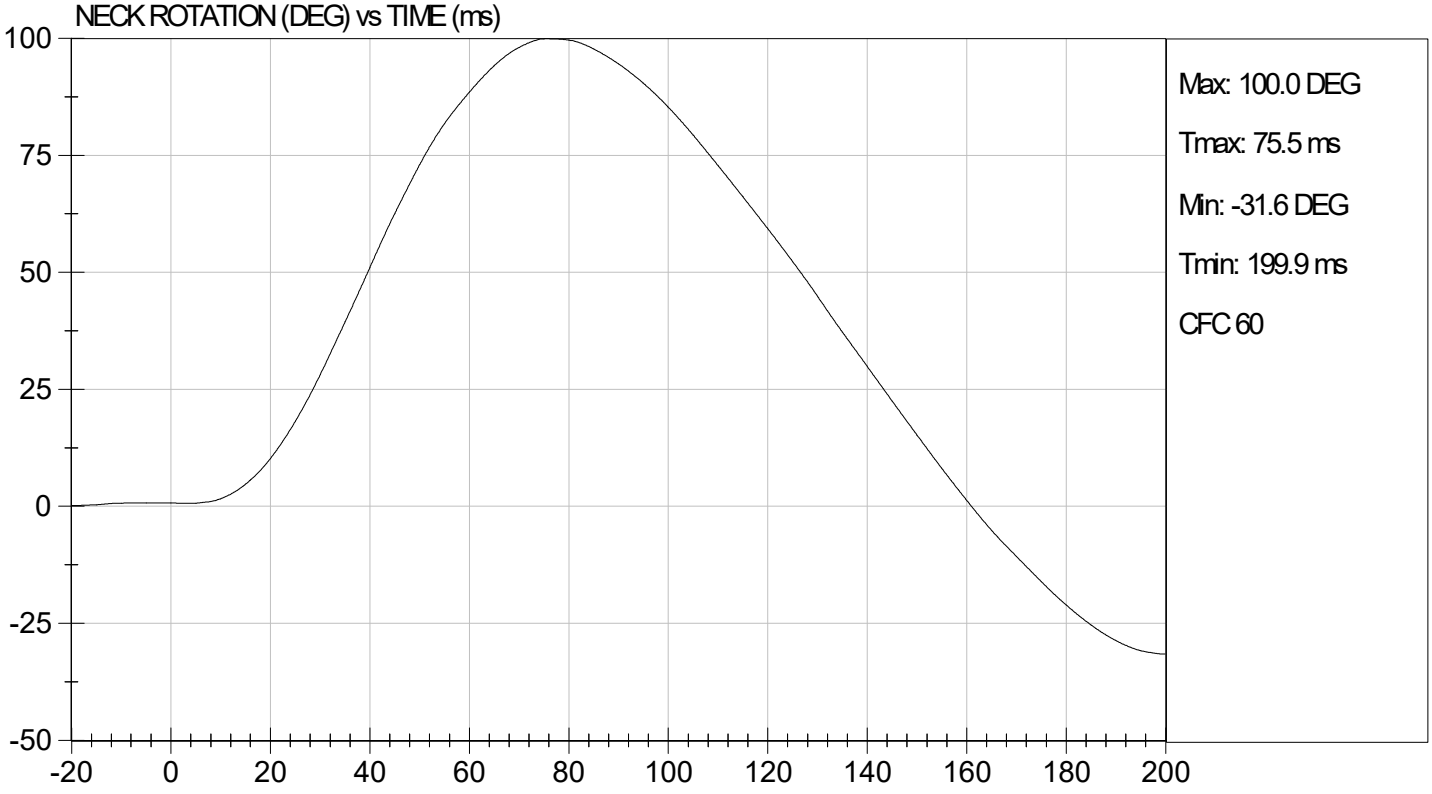
TEST DESC: NECK EXTENSION
VELOCITY: 19.61 ft/s, 5.98 m/s

TEST DATE: 01/25/2022
TEST #: D220183

PENDULUM DECELERATION (G's) vs TIME (ms)

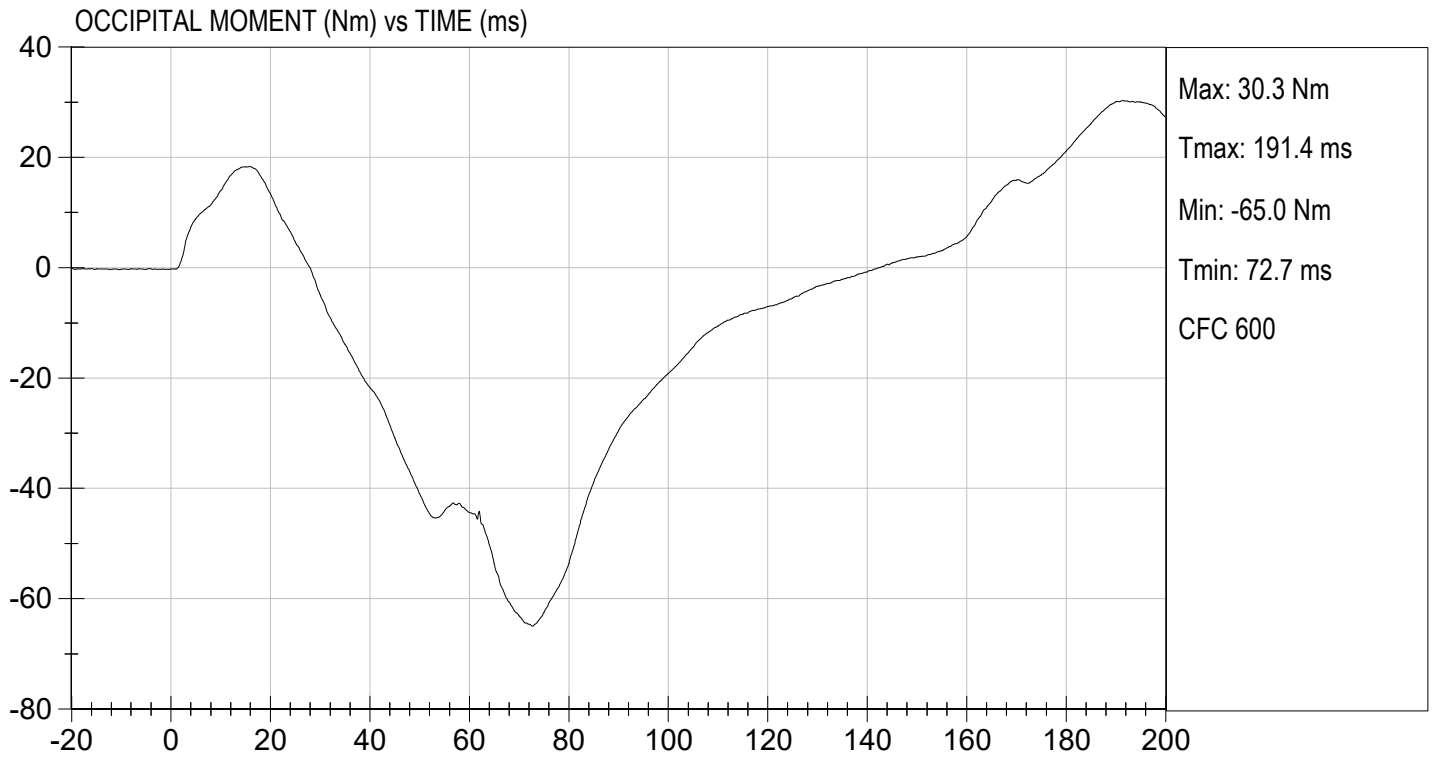


NECK ROTATION (DEG) vs TIME (ms)



TEST DESC: NECK EXTENSION
VELOCITY: 19.61 ft/s, 5.98 m/s

TEST DATE: 01/25/2022
TEST #: D220183



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220184

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,566	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.91	Pass
Internal Hysteresis	%	69 to 85	73	Pass
		Overall Test Results		Pass

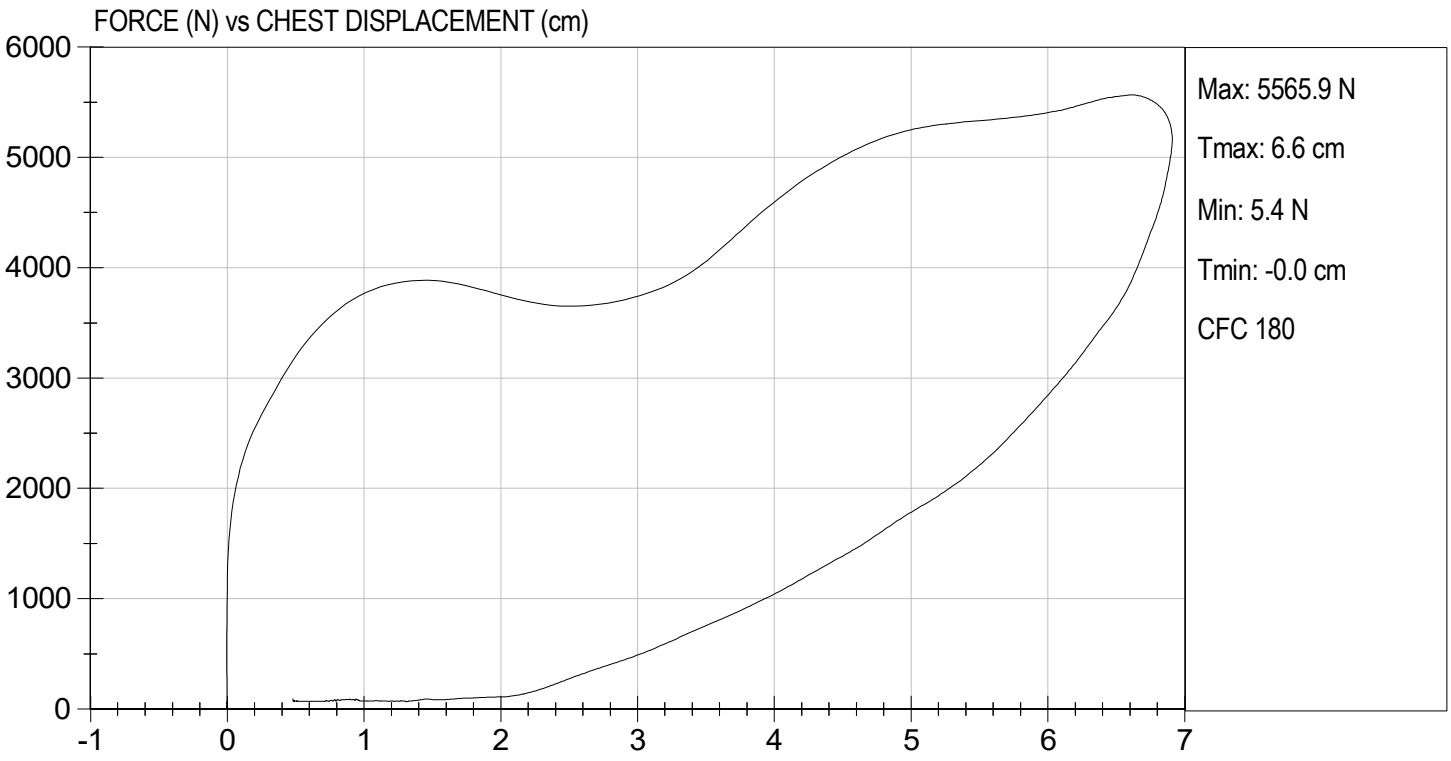
Laboratory Technician

01/25/2022
Test Date

Approved By

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

TEST DATE: 01/25/2022
TEST #: D220184



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220185

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	5,252	Pass
		Overall Test Results		Pass

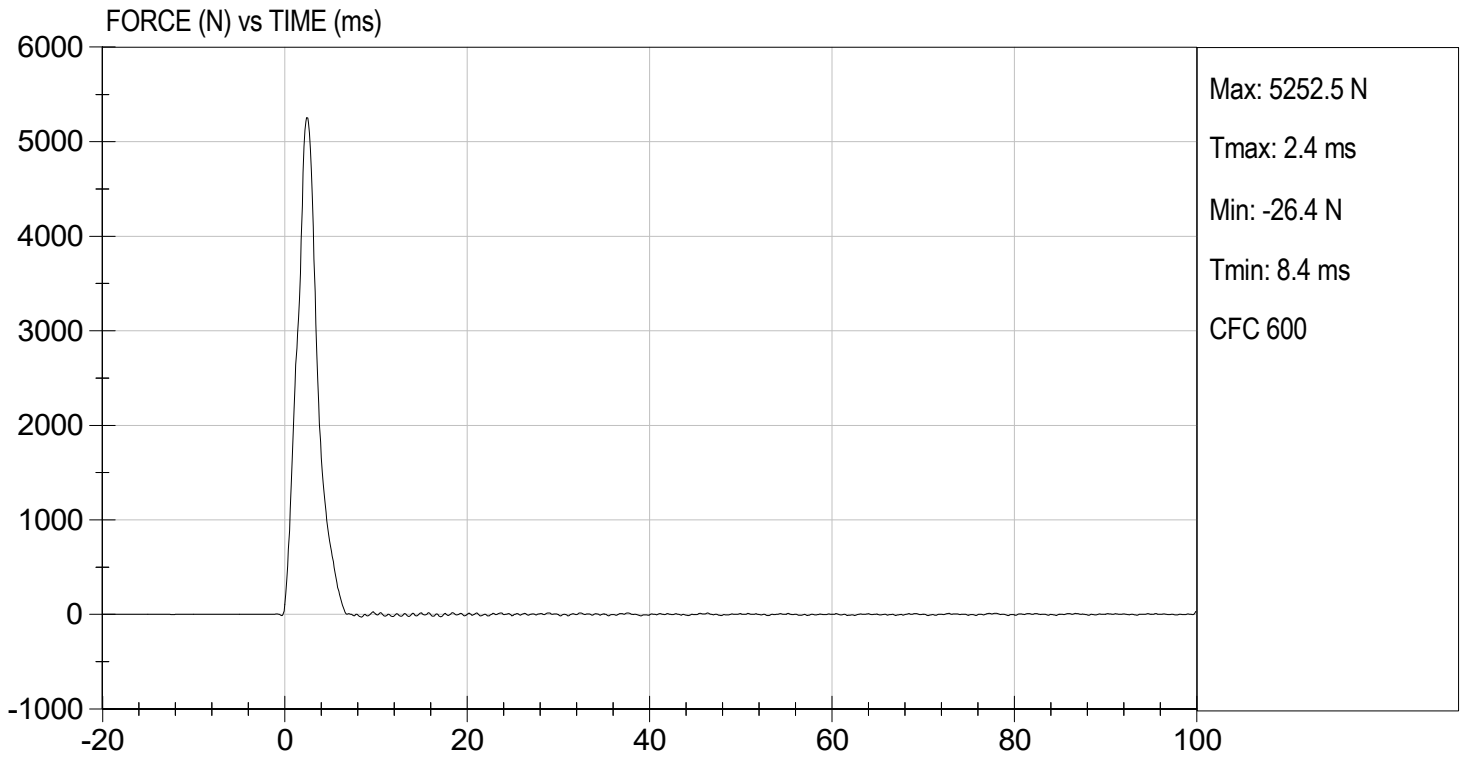
Laboratory Technician

01/25/2022
Test Date

Approved By

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

TEST DATE: 01/25/2022
TEST #: D220185



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220186

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	N	4715 to 5782	5,432	Pass
		Overall Test Results		Pass

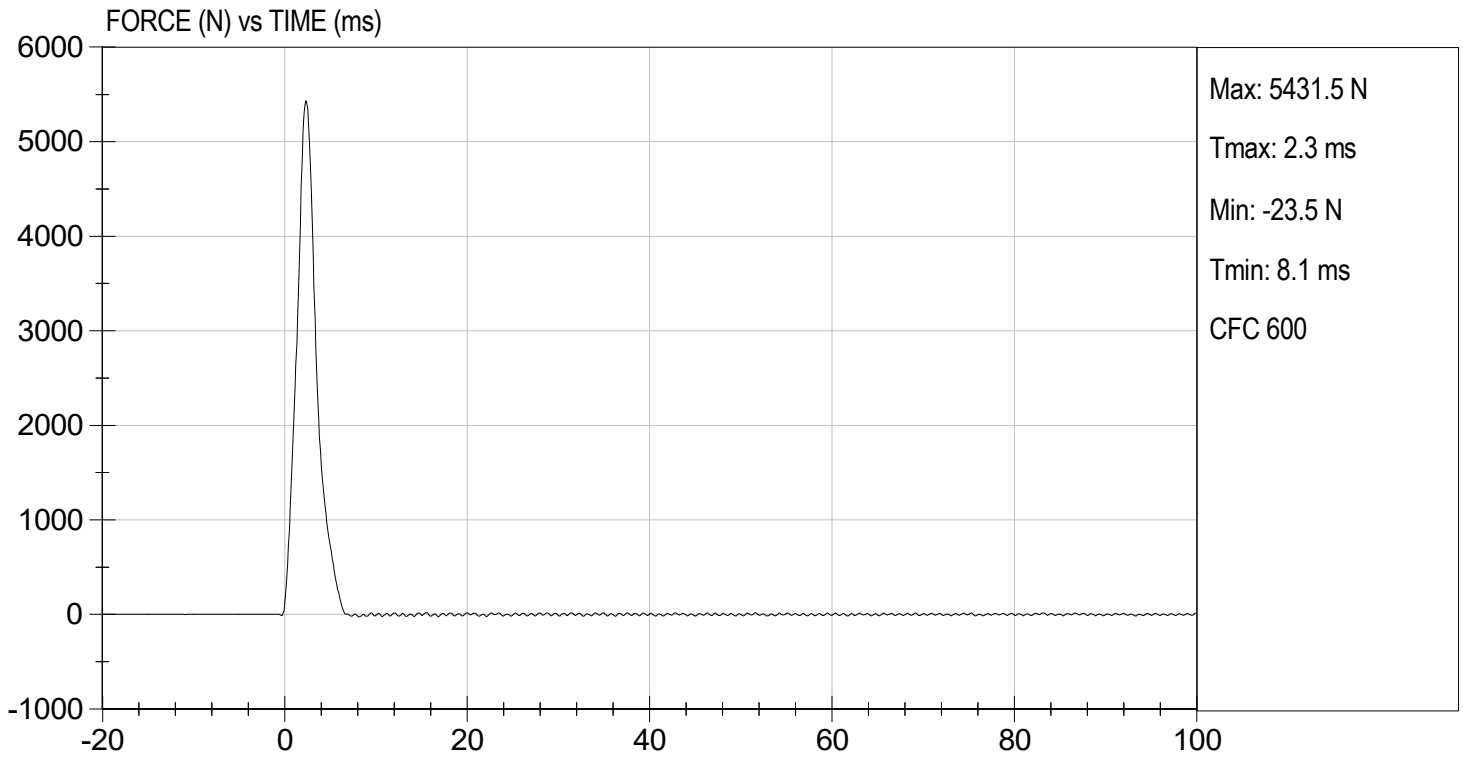
Laboratory Technician

01/25/2022
Test Date

Approved By

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

TEST DATE: 01/25/2022
TEST #: D220186



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220180

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	19	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.4	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	82.8	89.0	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.6	44.0	Pass
		Overall Test Results			Pass

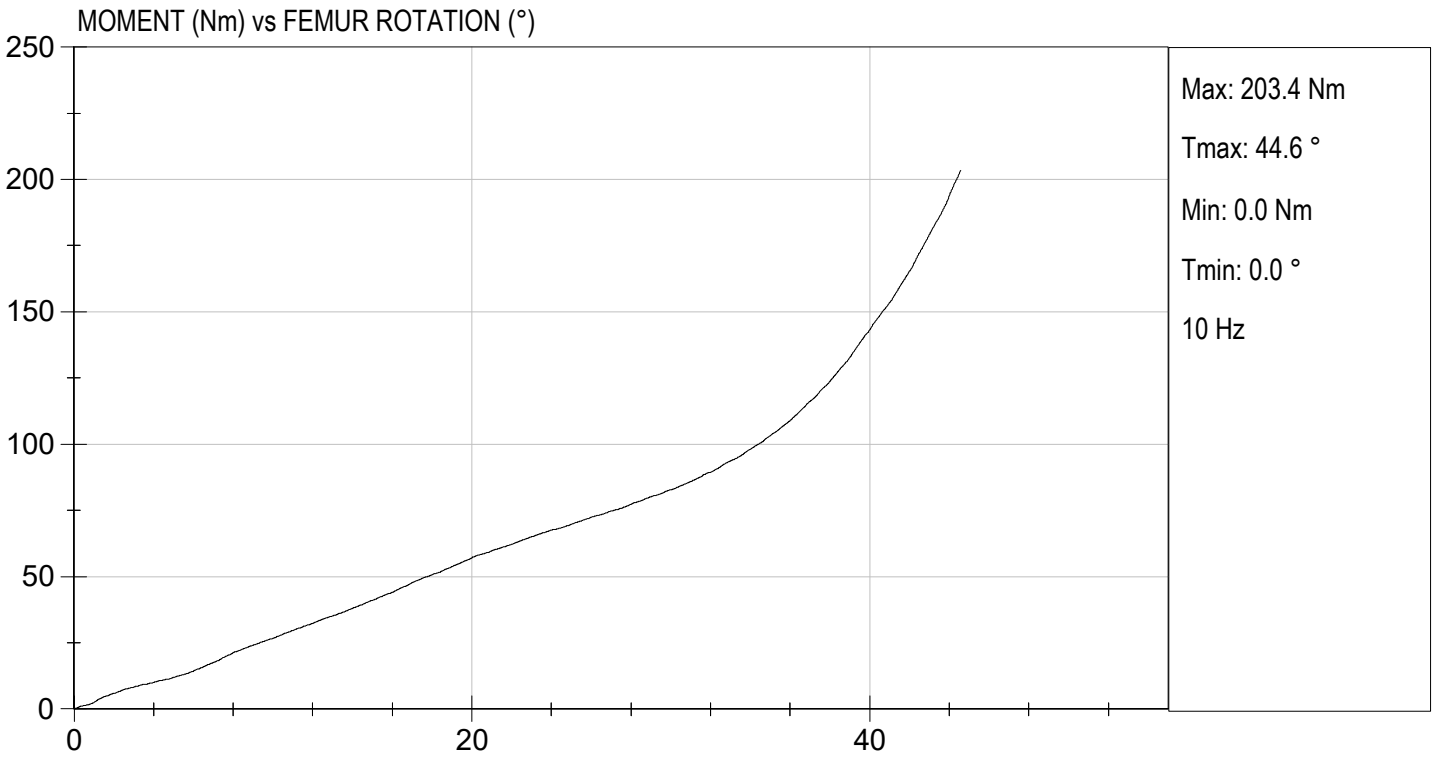
Laboratory Technician

01/25/2022
Test Date

Approved By

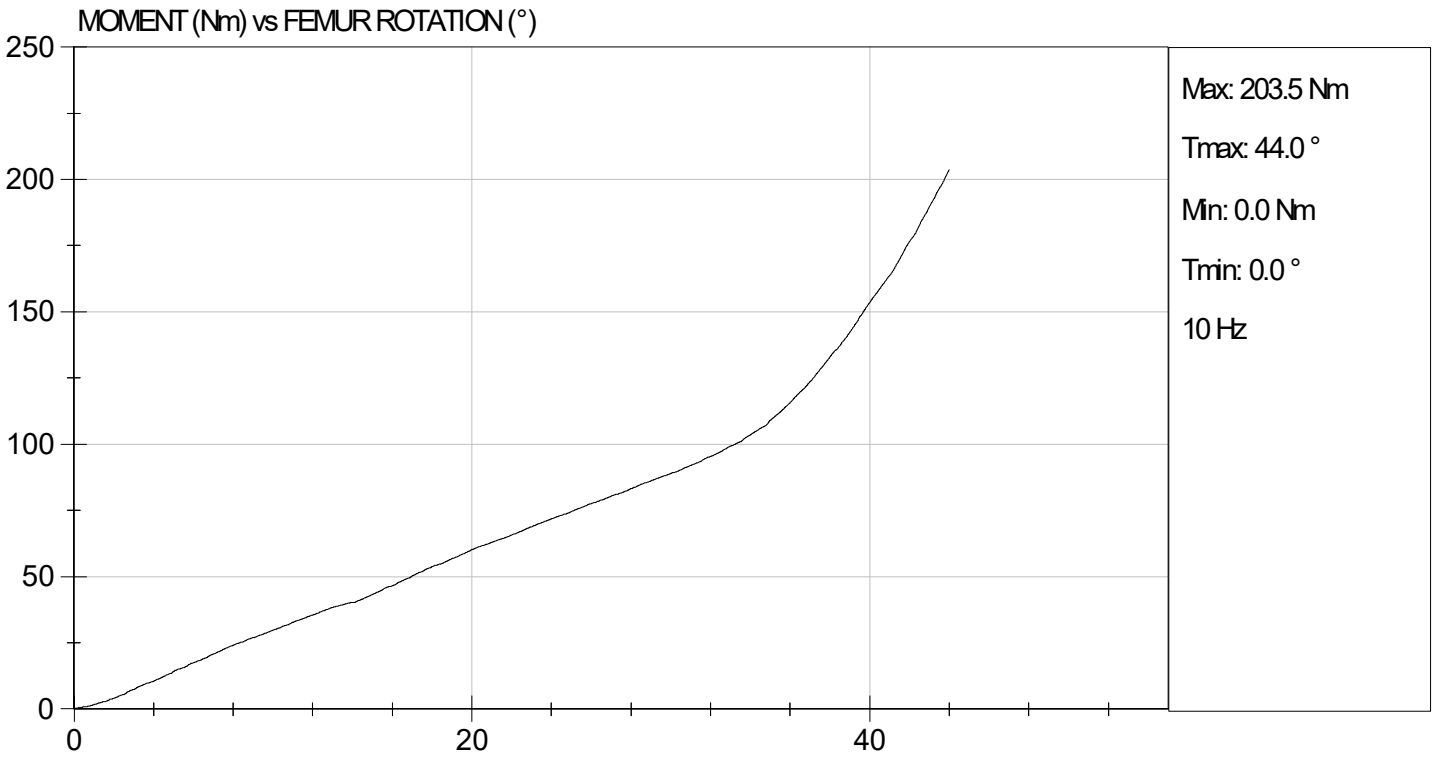
TEST DESC: RIGHT HIP FEMUR FLEXION

TEST DATE: 01/25/2022
TEST #: D220189



TEST DESC: LEFT HIP FEMUR FLEXION

TEST DATE: 01/25/2022
TEST #: D220180



CALIBRATION 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:** D220391

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	26	Pass
Peak Resultant Acceleration	G's	225 to 275	255	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

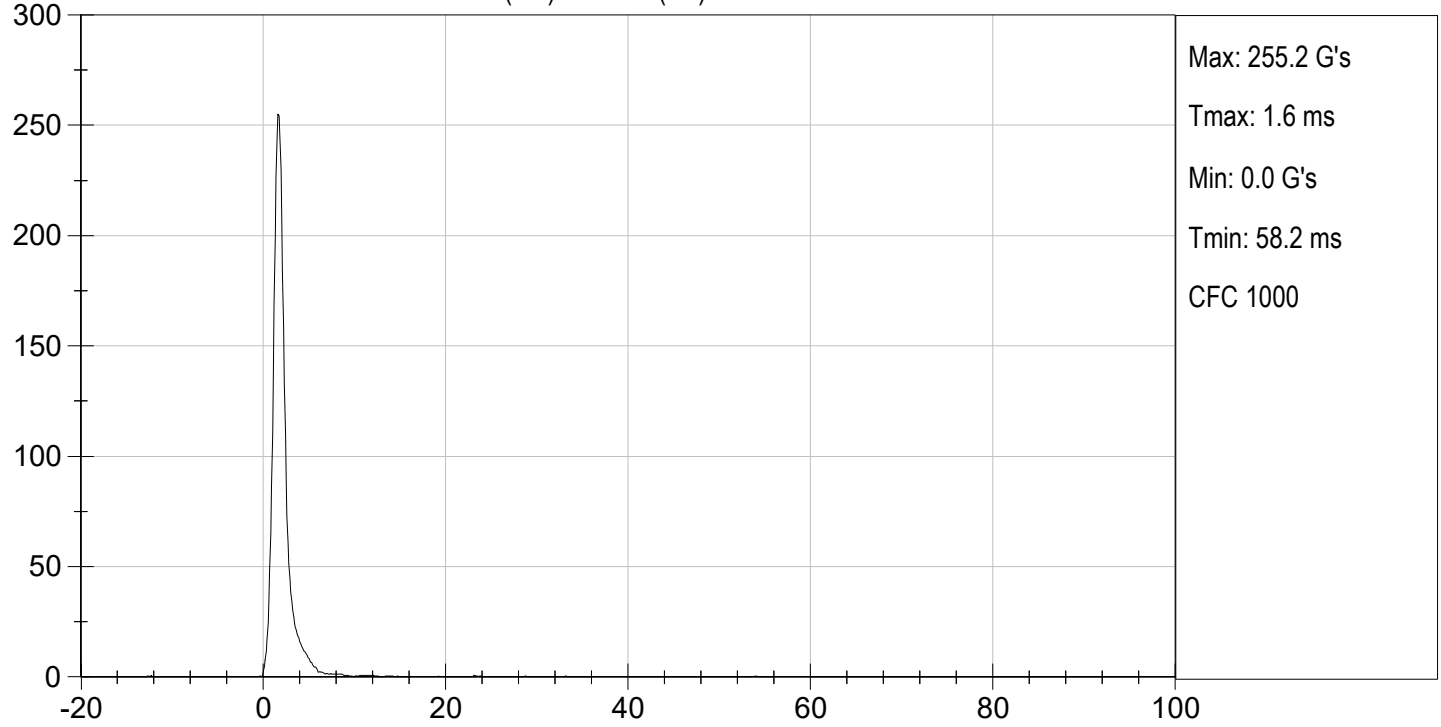
02/10/2022
Test Date

Approved By

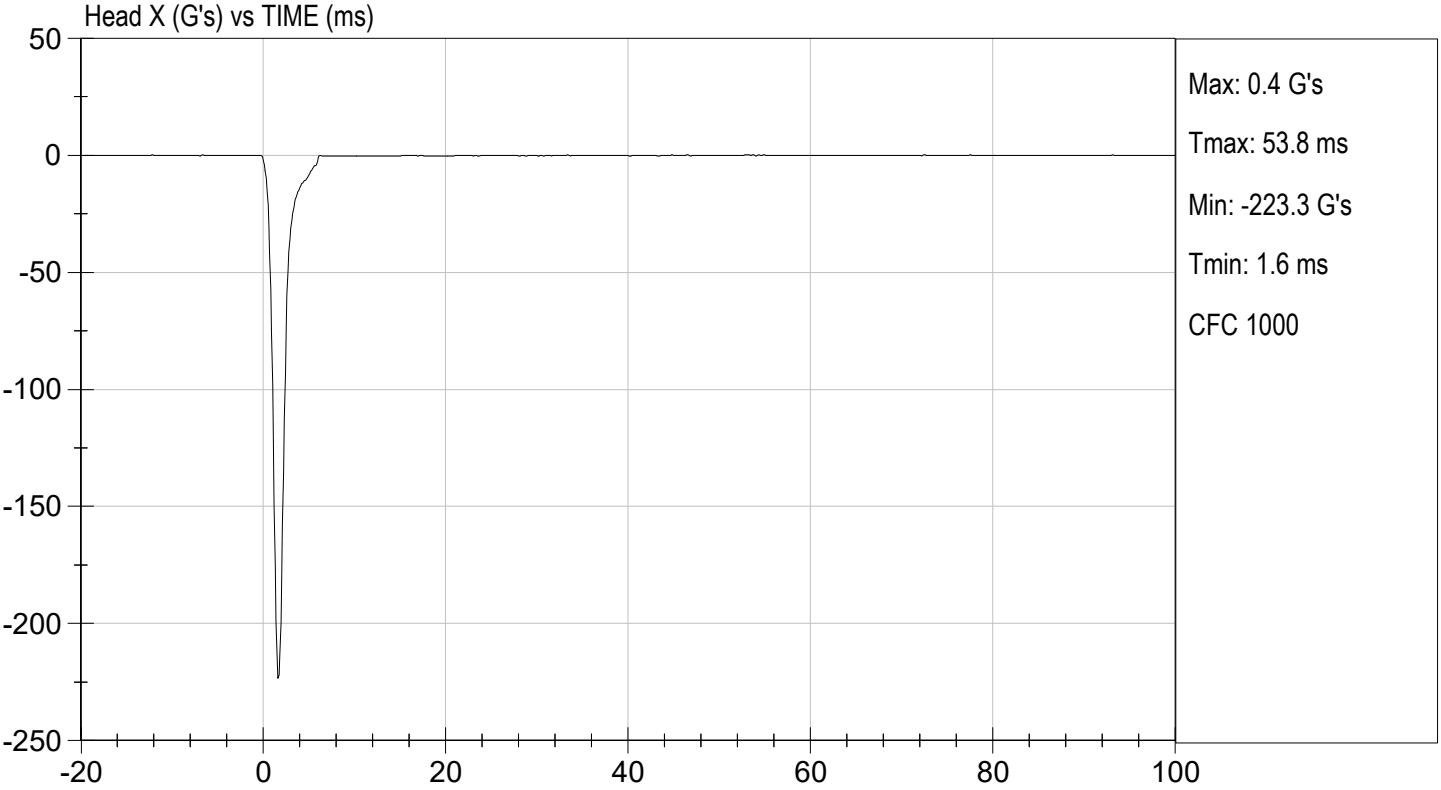
TEST DESC: HEAD DROP

TEST DATE: 02/10/2022
TEST #: D220391

HEAD RESULTANT ACCELERATION (G's) vs TIME (ms)

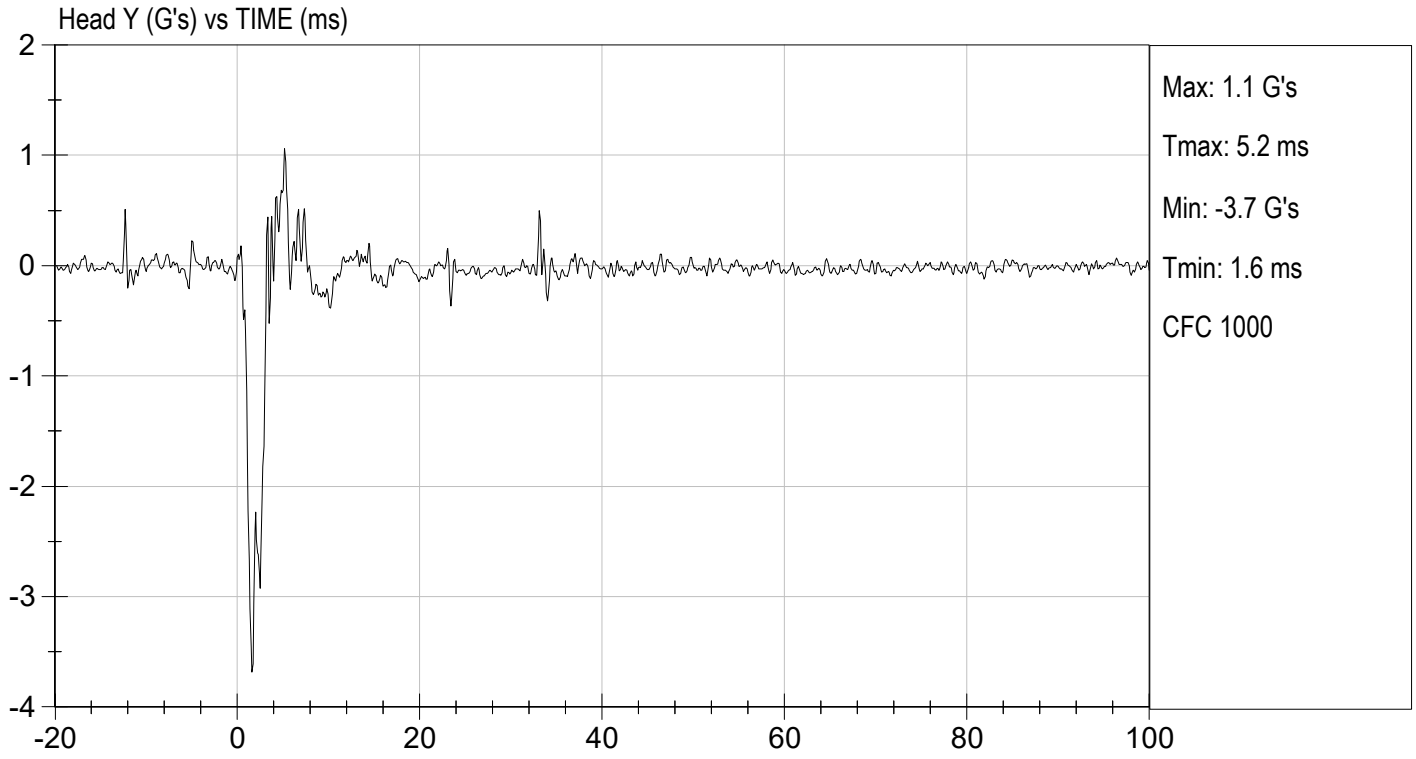


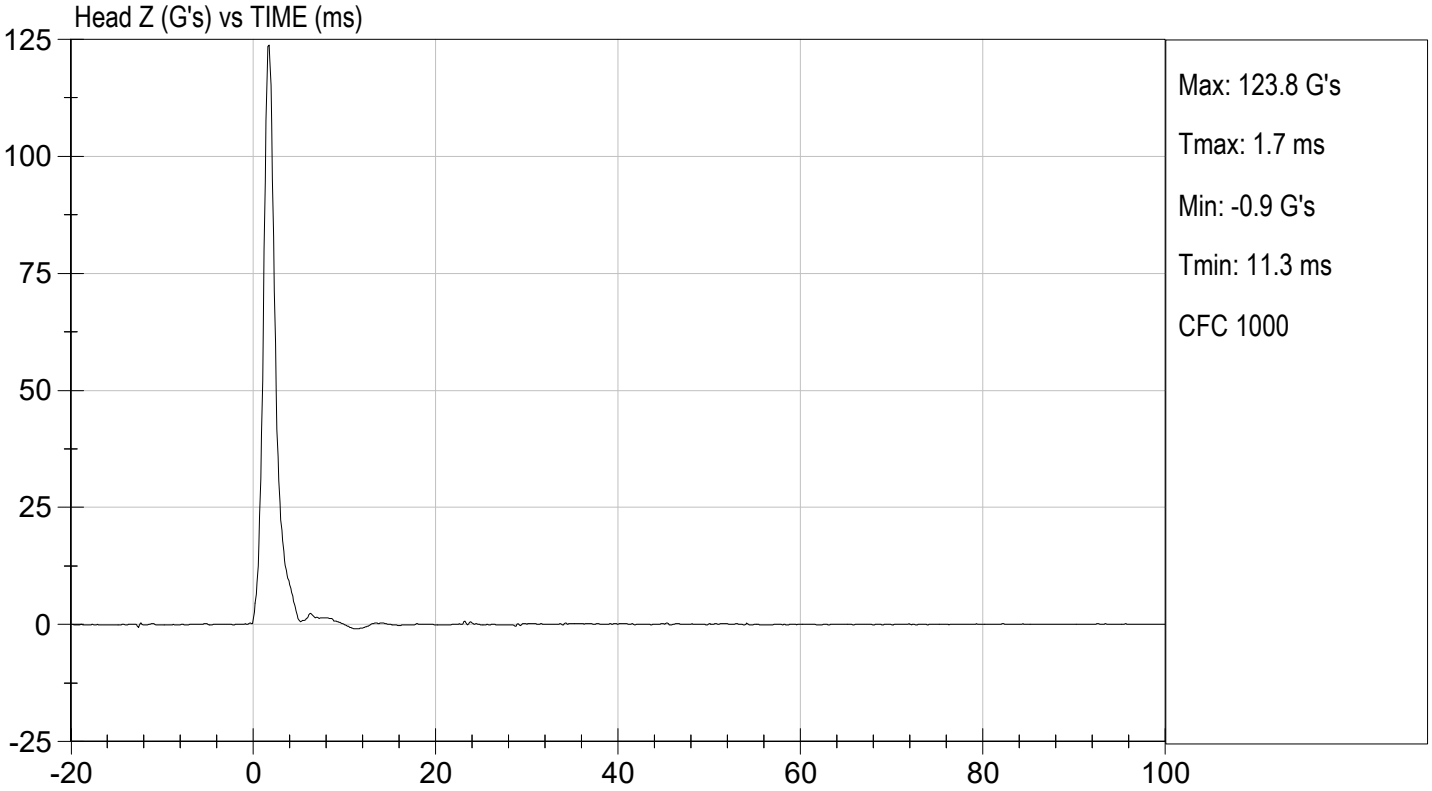
Head X (G's) vs TIME (ms)



TEST DESC: HEAD DROP

TEST DATE: 02/10/2022
TEST #: D220391





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220392

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	25	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.89	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.49	Pass
	20 ms	G's	17.60 to 22.60	20.08	Pass
	30 ms	G's	12.50 to 18.50	16.29	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	16.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.7	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	70.7	Pass
	Time	ms	57.0 to 64.0	59.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	118.0	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	94.3	Pass
	Time	ms	47.0 to 58.0	48.8	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	100.0	Pass
			Overall Test Results		Pass

Alex Thomas

Laboratory Technician

02/09/2022

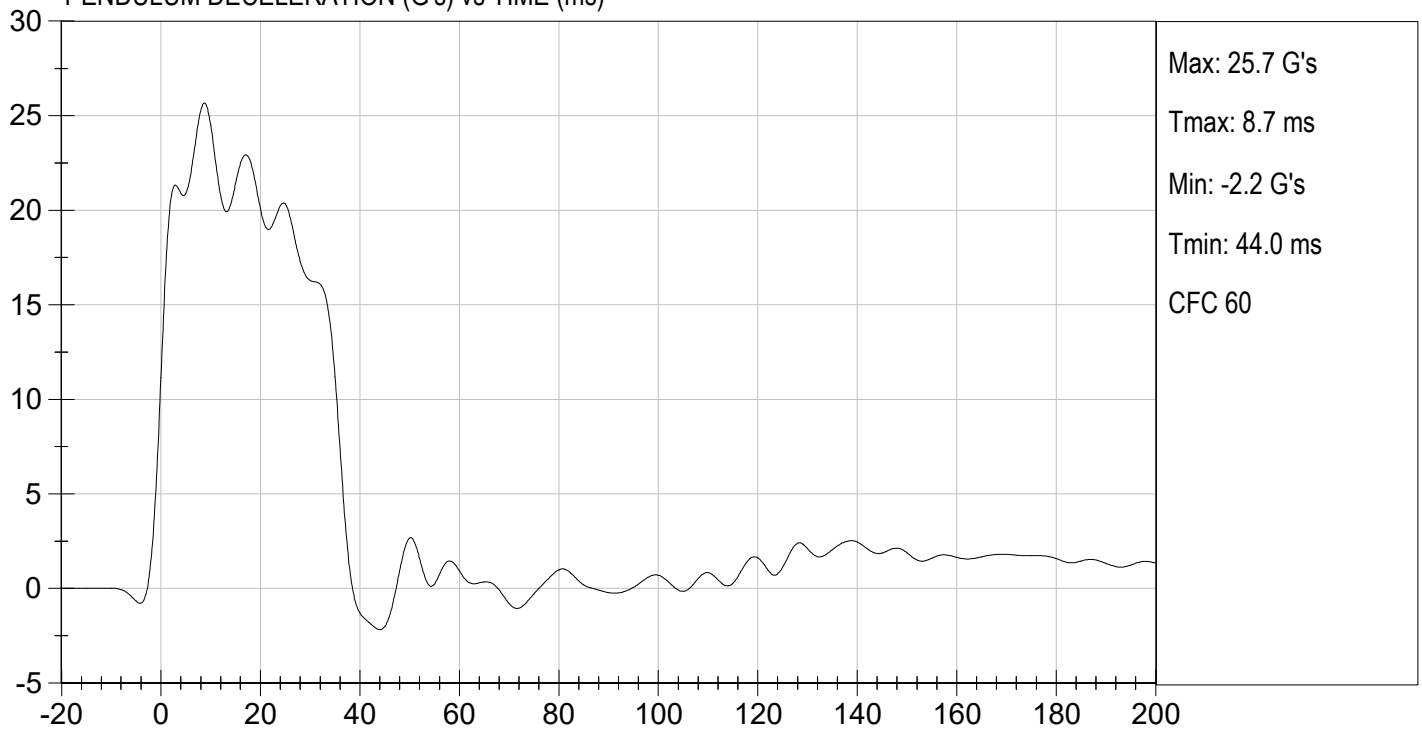
Test Date

Approved By

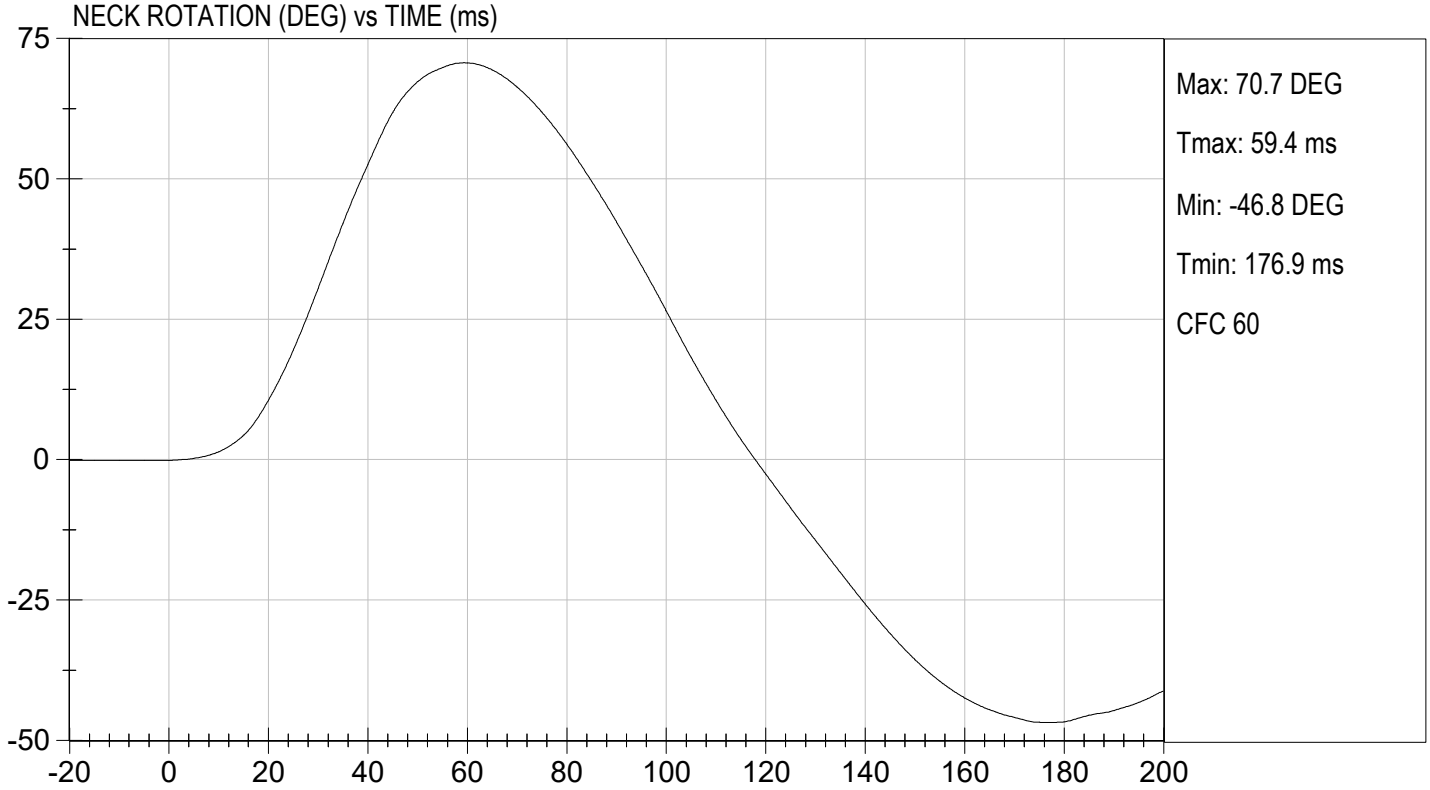
TEST DESC: NECK FLEXION
VELOCITY: 22.62 ft/s, 6.89 m/s

TEST DATE: 02/09/2022
TEST #: D220392

PENDULUM DECELERATION (G's) vs TIME (ms)

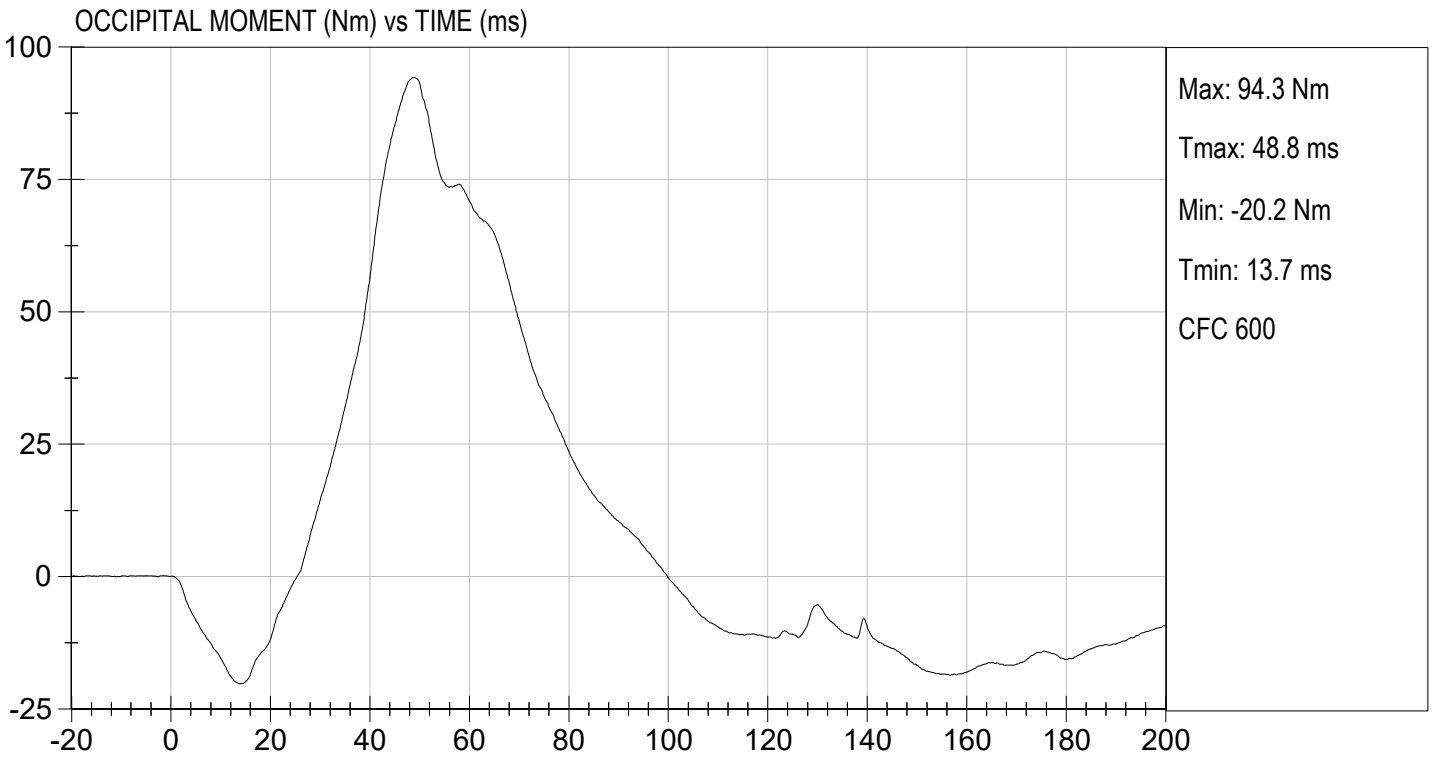


NECK ROTATION (DEG) vs TIME (ms)



TEST DESC: NECK FLEXION
VELOCITY: 22.62 ft/s, 6.89 m/s

TEST DATE: 02/09/2022
TEST #: D220392



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220393

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	25	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.93	Pass
	20 ms	G's	14.00 to 19.00	16.29	Pass
	30 ms	G's	11.00 to 16.00	15.53	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	15.7	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	100.5	Pass
	Time	ms	72.0 to 82.0	77.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	161.2	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-65.4	Pass
	Time	ms	65.0 to 79.0	71.8	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.4	Pass
			Overall Test Results		Pass

Laboratory Technician

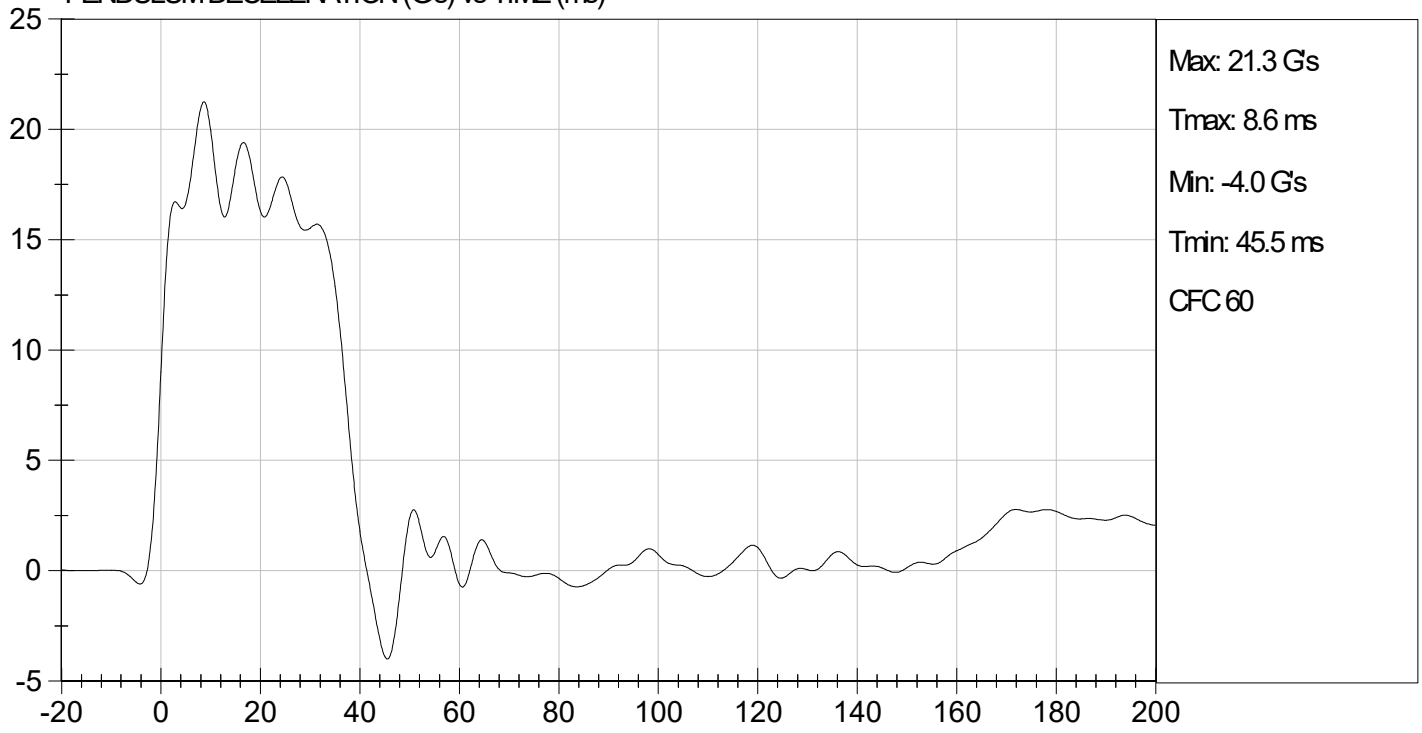
02/09/2022
Test Date

Approved By

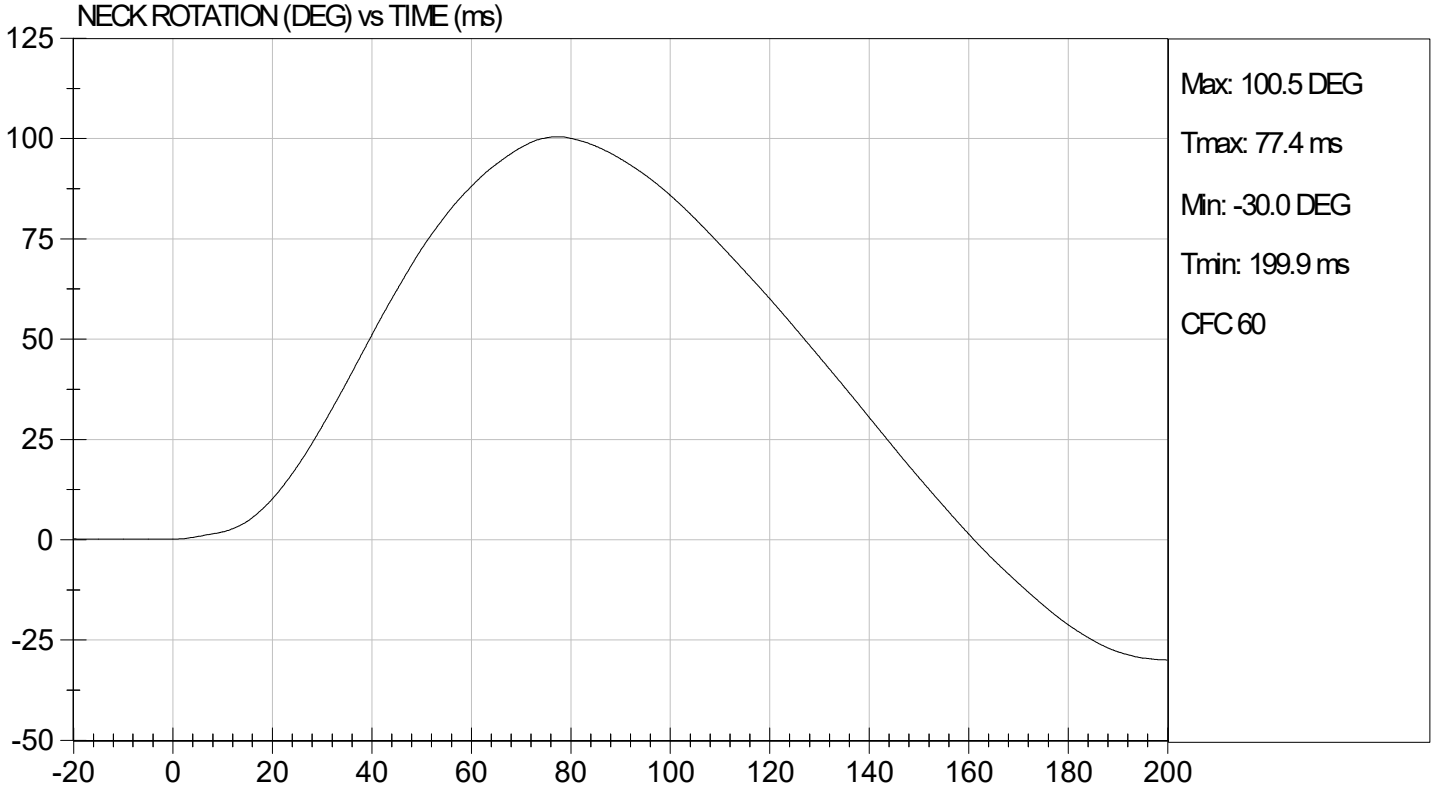
TEST DESC: NECK EXTENSION
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 02/09/2022
TEST #: D220393

PENDULUM DECELERATION (G's) vs TIME (ms)

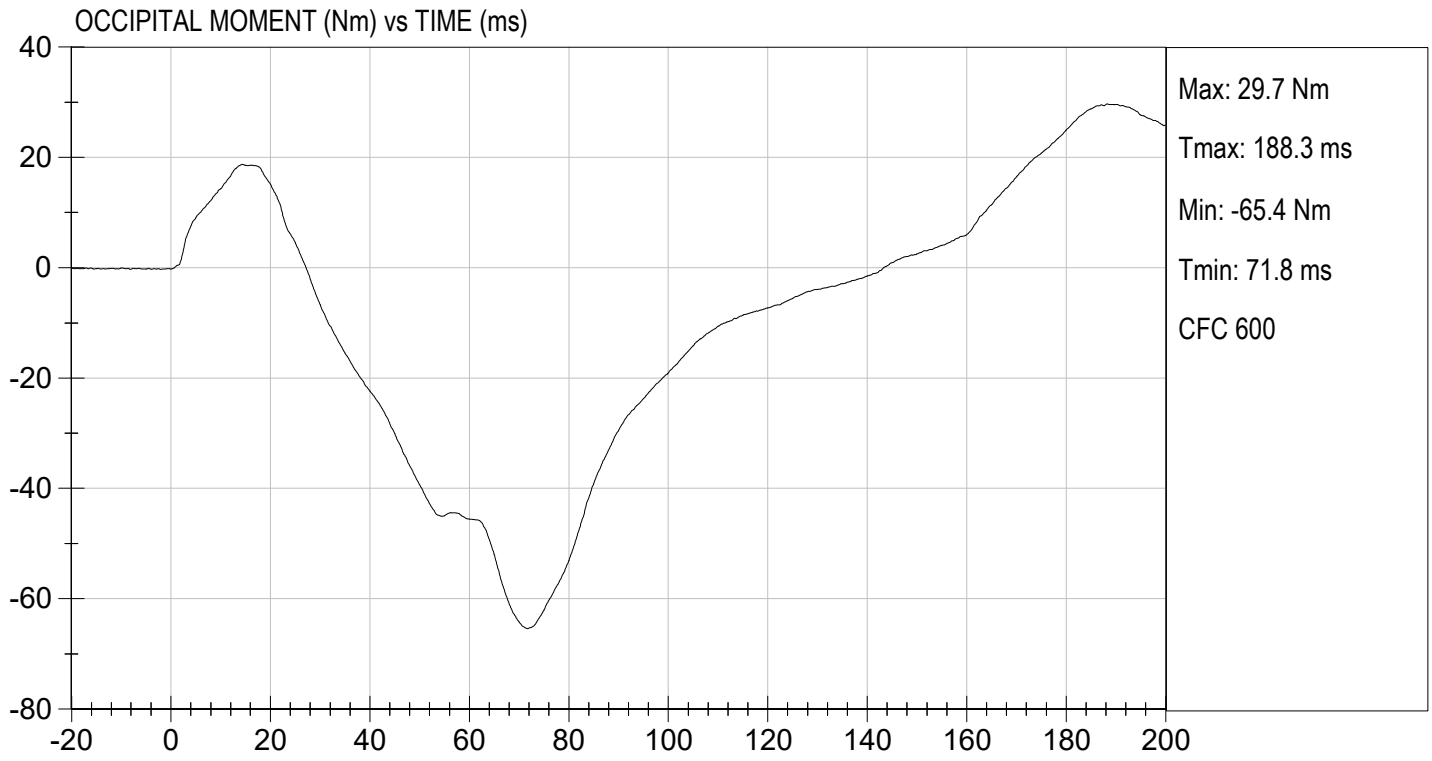


NECK ROTATION (DEG) vs TIME (ms)



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

TEST DATE: 02/09/2022
TEST #: D220393



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220394

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	26	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,376	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.24	Pass
Internal Hysteresis	%	69 to 85	71	Pass
		Overall Test Results		Pass

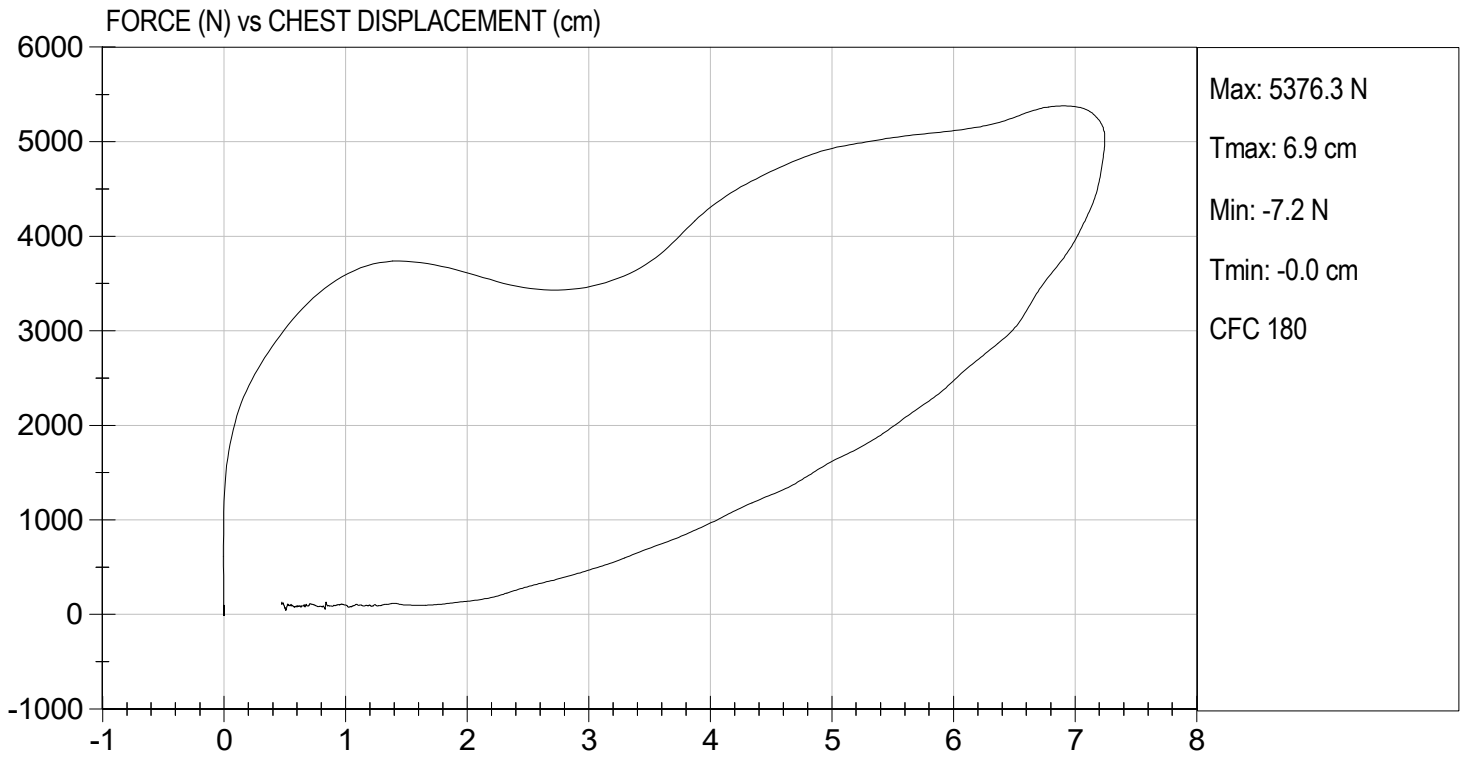
Laboratory Technician

02/09/2022
Test Date

Approved By

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

TEST DATE: 02/09/2022
TEST #: D220394



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220395

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	N	4715 to 5782	5,102	Pass
		Overall Test Results		Pass

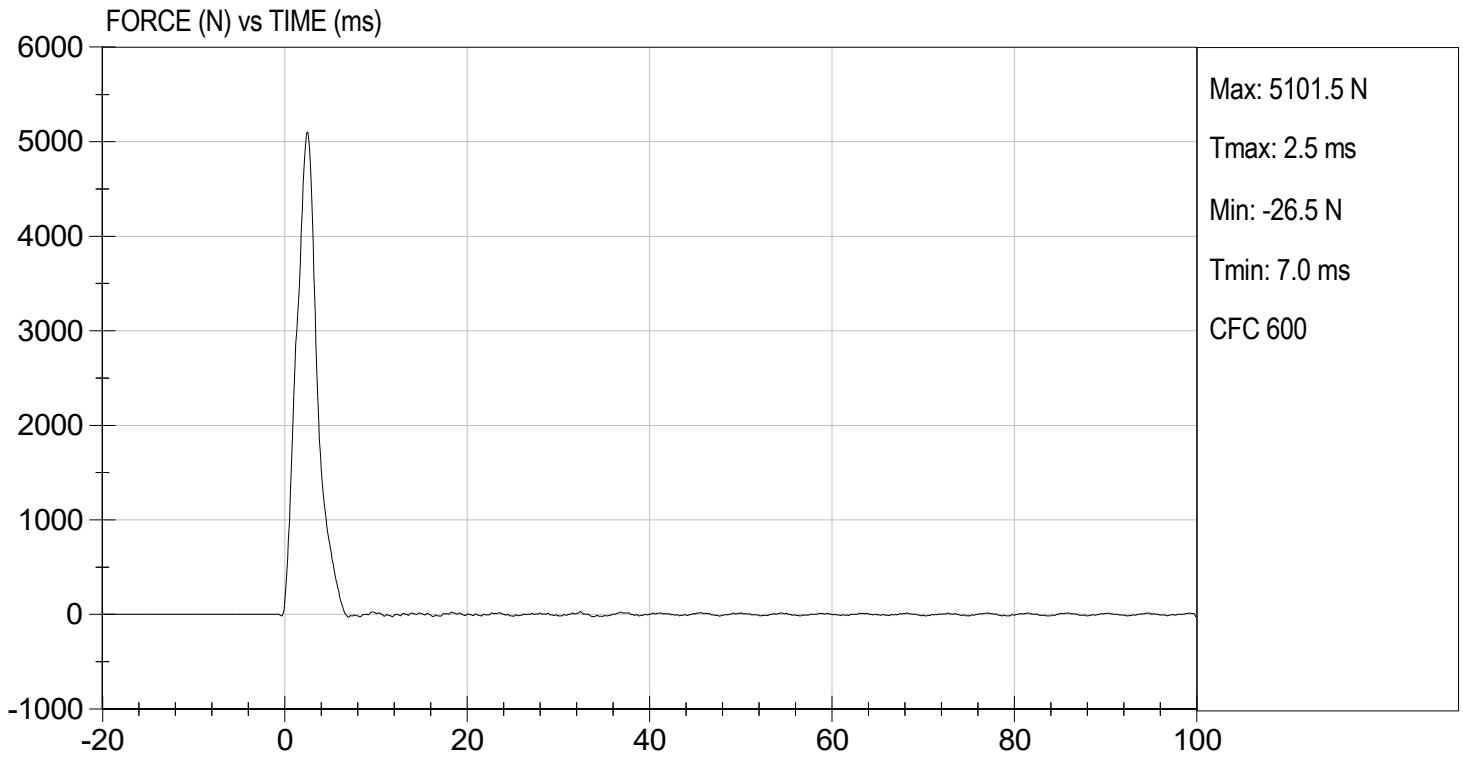
Laboratory Technician

02/10/2022
Test Date

Approved By

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

TEST DATE: 02/10/2022
TEST #: D220395



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220396

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	N	4715 to 5782	5,070	Pass
		Overall Test Results		Pass

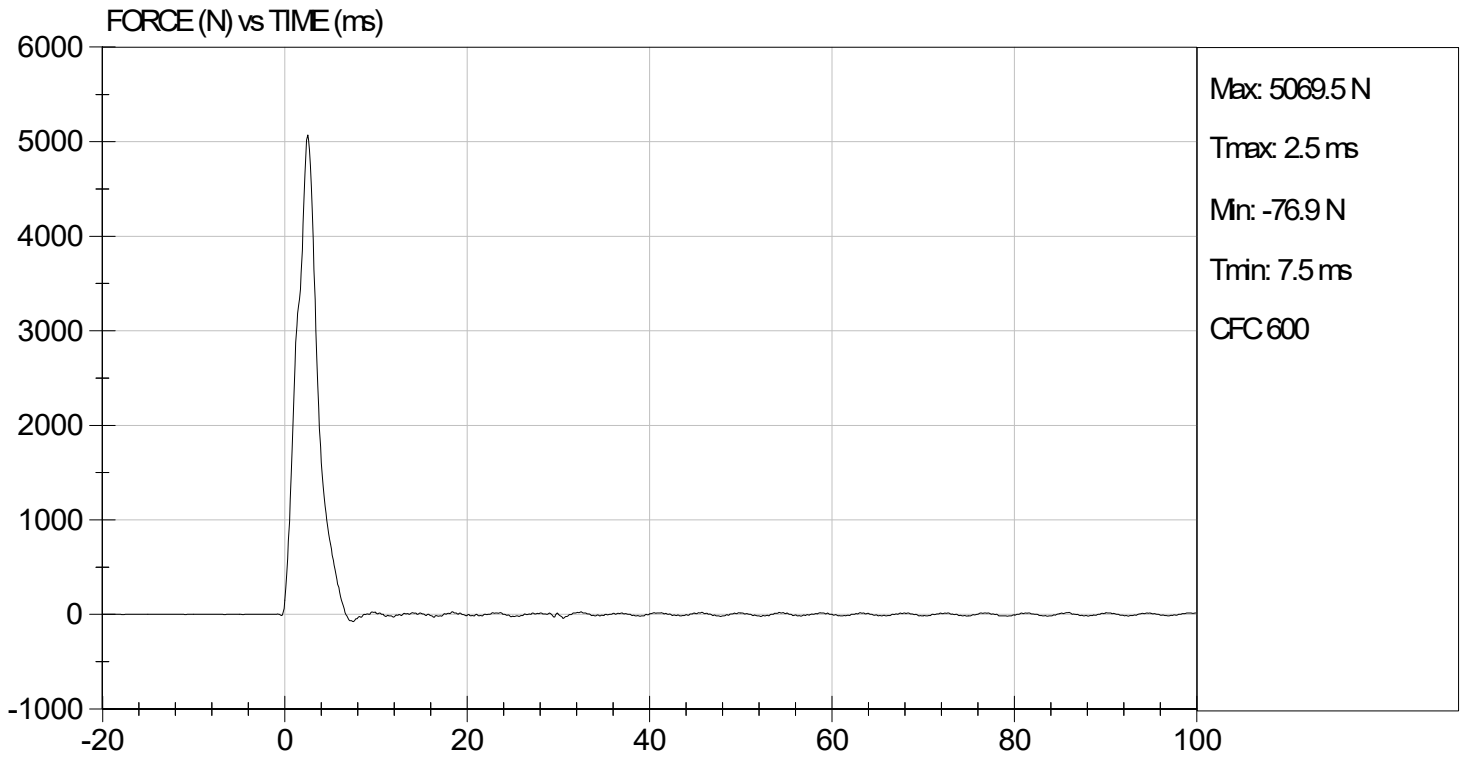
Laboratory Technician

02/10/2022
Test Date

Approved By

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

TEST DATE: 02/10/2022
TEST #: D220396



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D220390

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.9	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	28	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.4	6.3	Pass
30 Degrees	Nm	94.9 Nm Max	87.6	90.3	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.3	44.3	Pass
		Overall Test Results			Pass

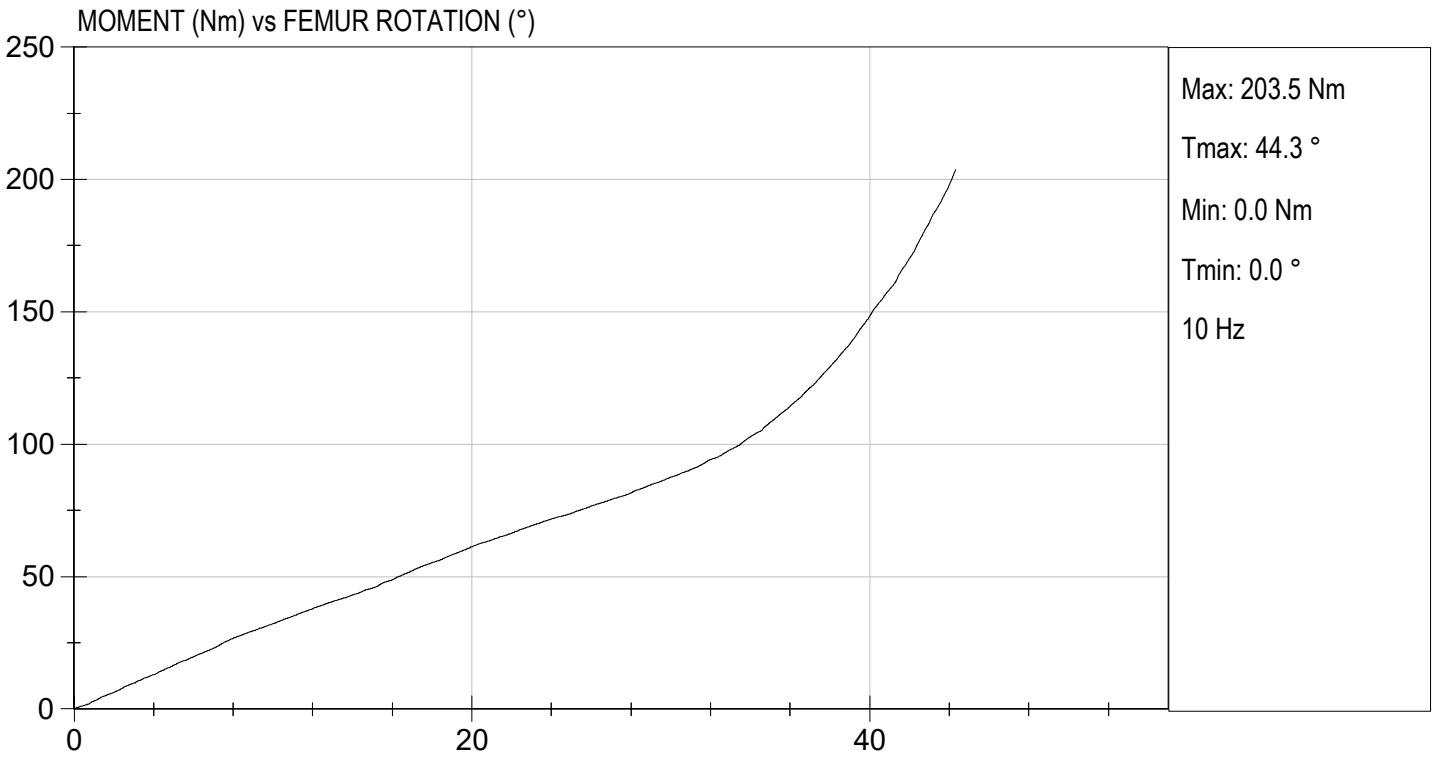
Laboratory Technician

02/10/2022
Test Date

Approved By

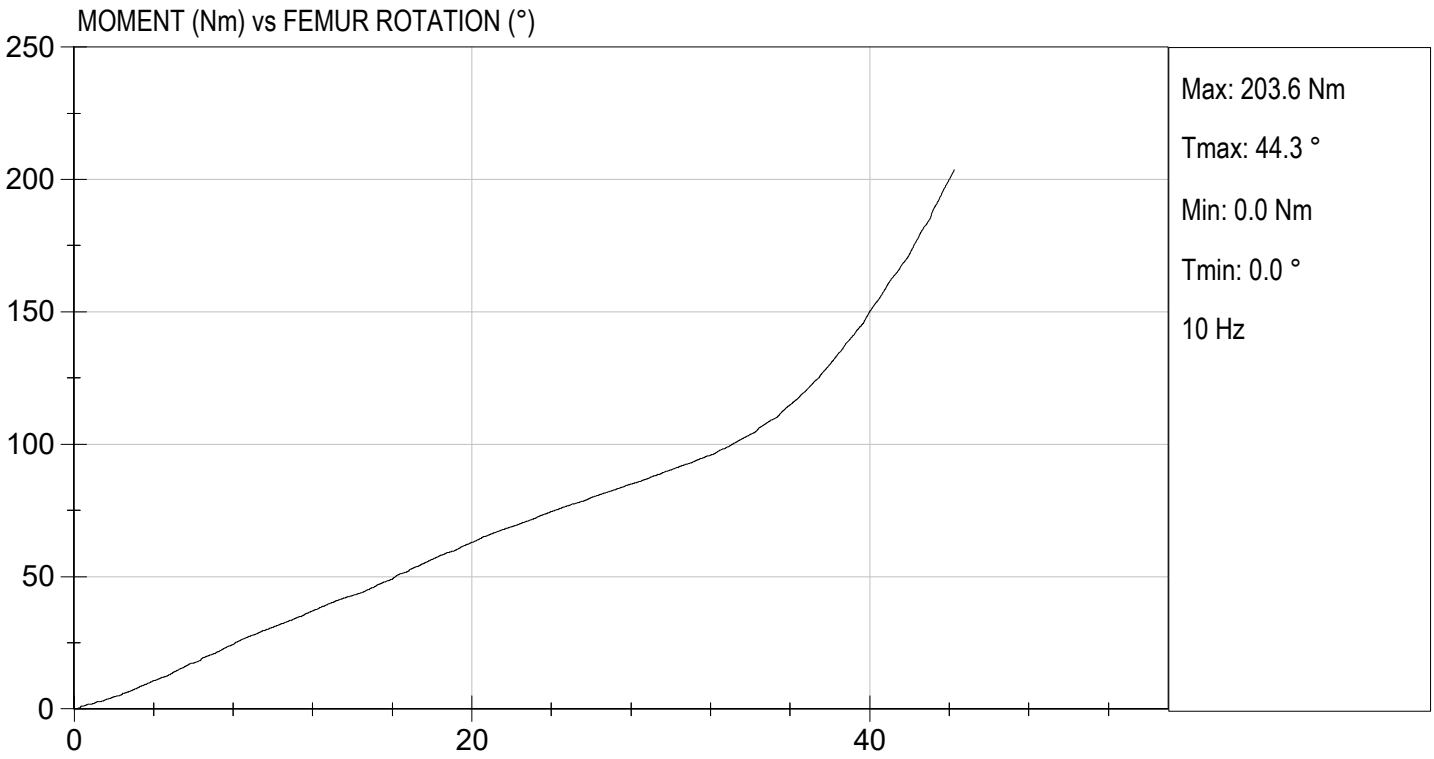
TEST DESC: RIGHT HIP FEMUR FLEXION

TEST DATE: 02/10/2022
TEST #: D220399



TEST DESC: LEFT HIP FEMUR FLEXION

TEST DATE: 02/10/2022
TEST #: D220390



CALIBRATION 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 heal	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:** D220191

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Peak Resultant Acceleration	G's	250 to 300	297	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

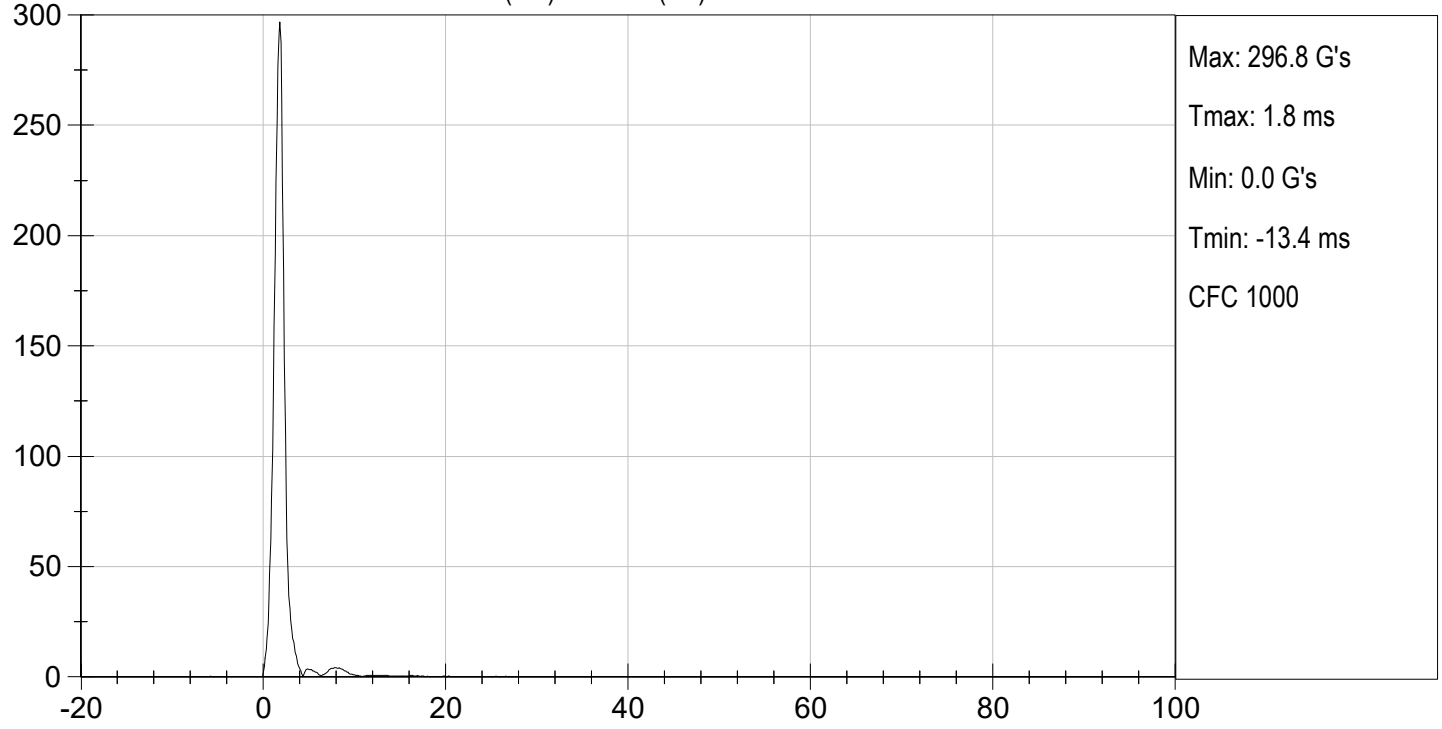
01/24/2022
Test Date

Approved By

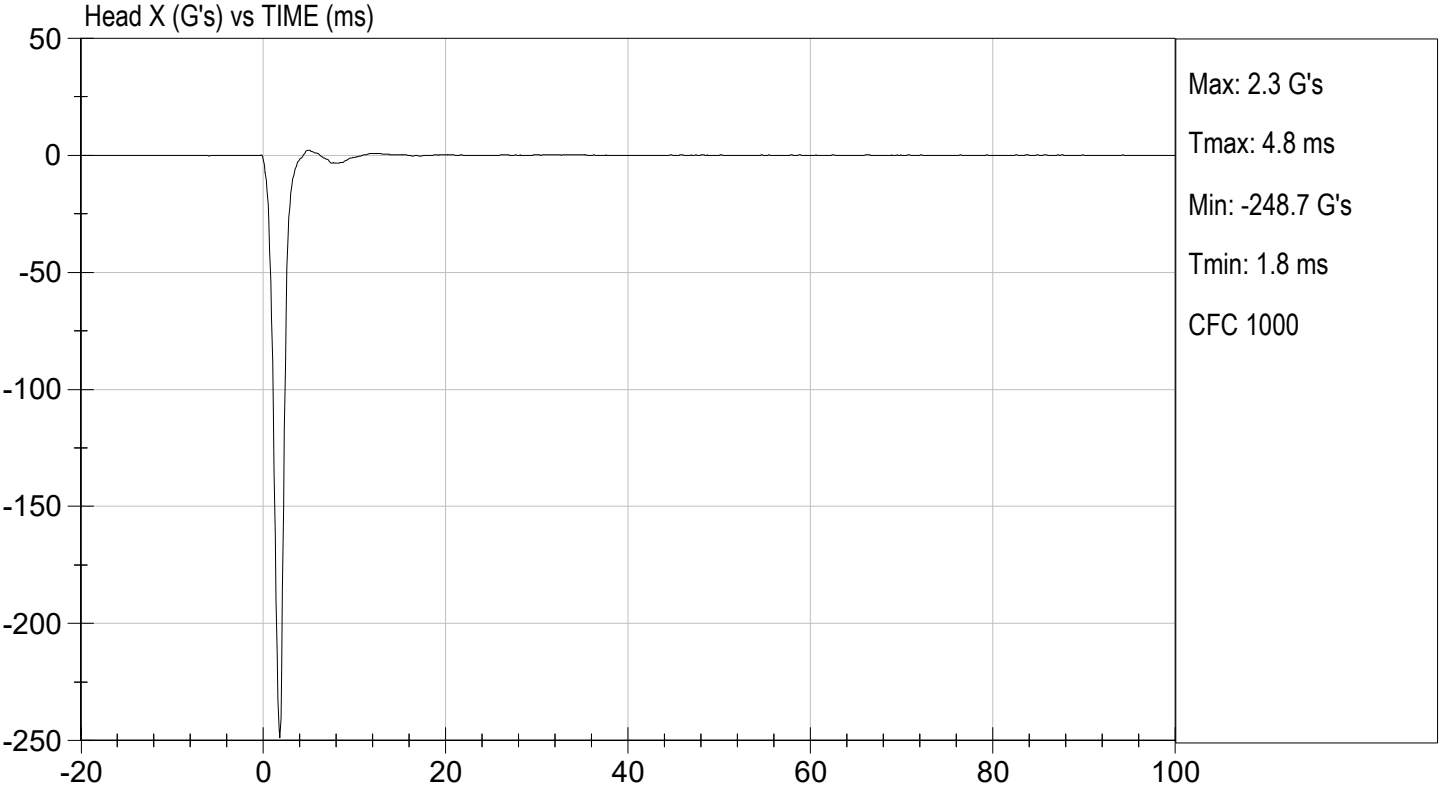
TEST DESC: HEAD DROP

TEST DATE: 01/24/2022
TEST #: D220191

HEAD RESULTANT ACCELERATION (G's) vs TIME (ms)

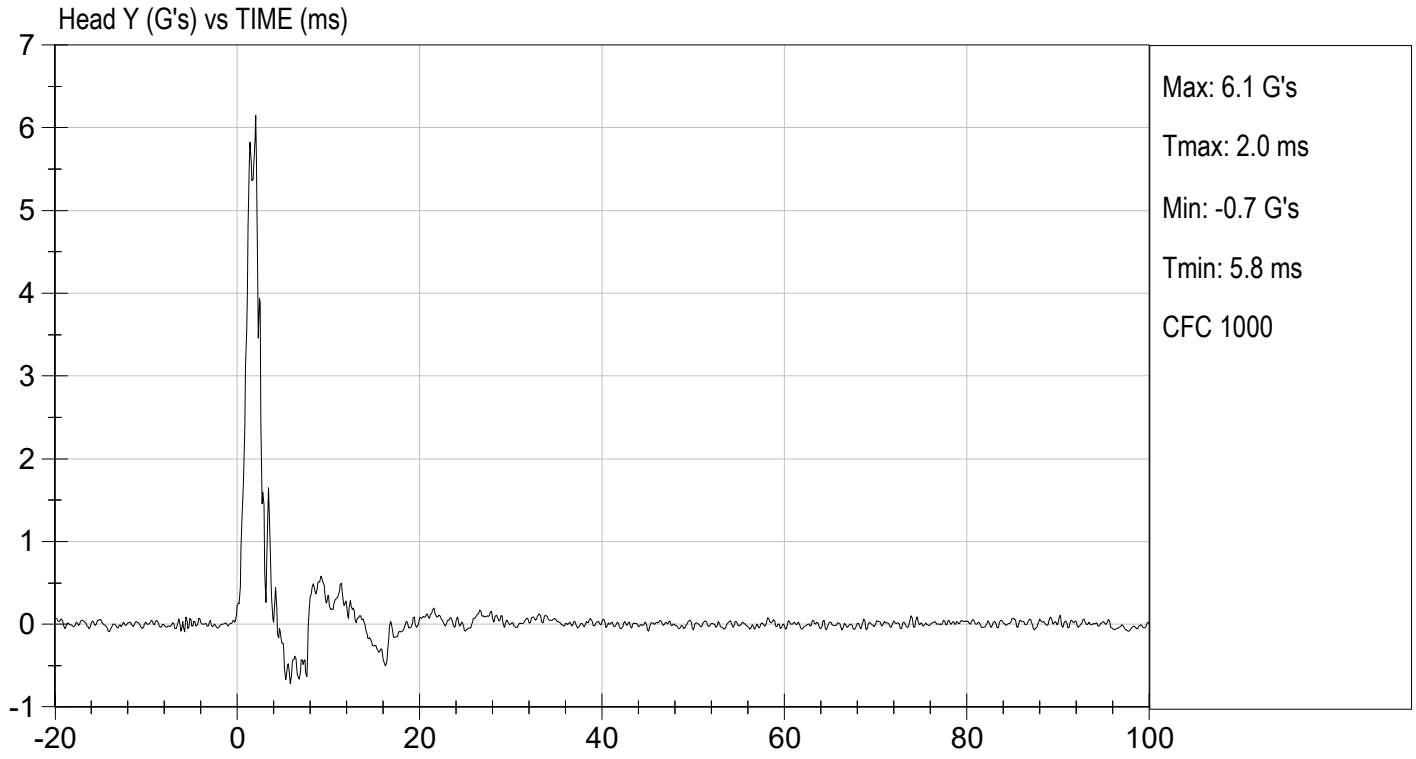


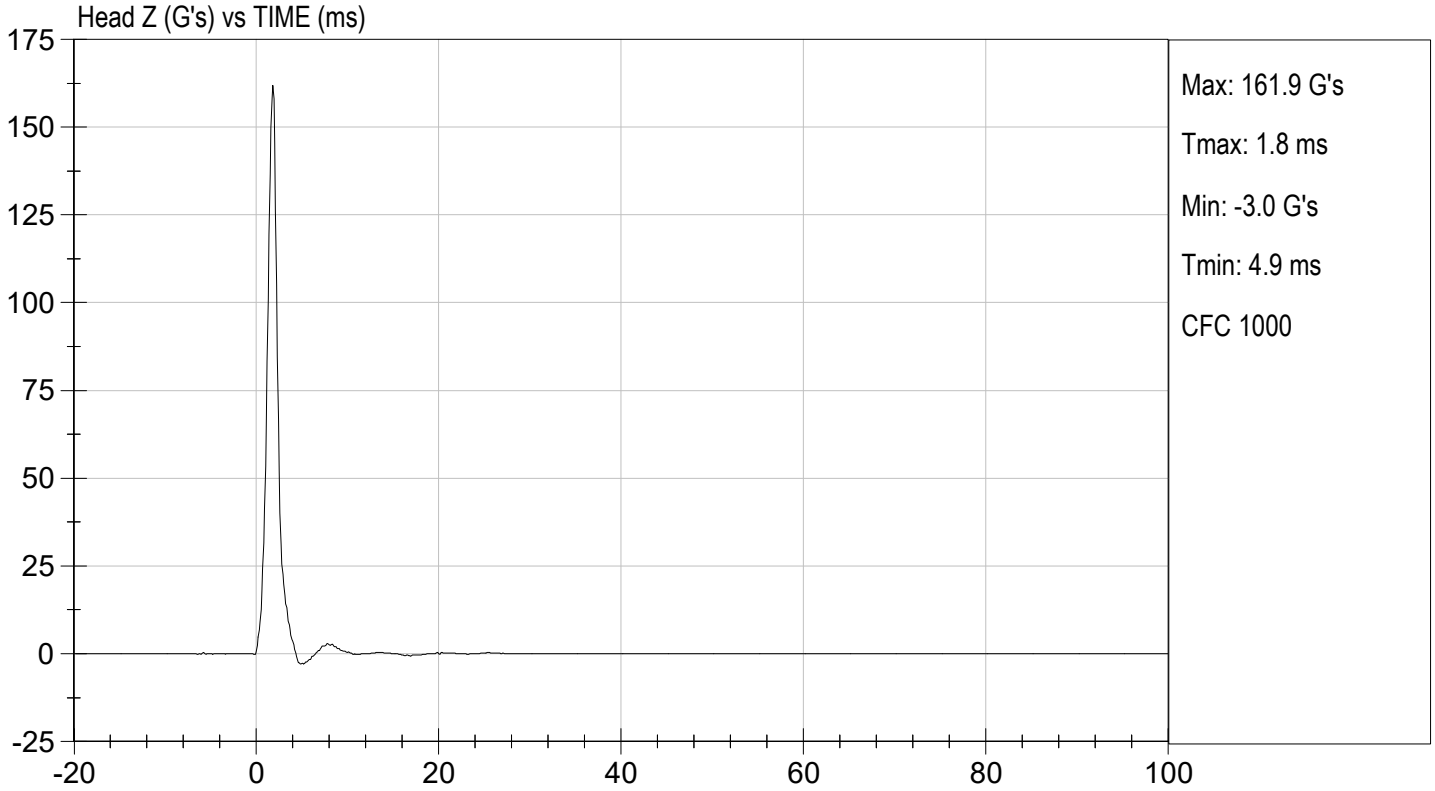
Head X (G's) vs TIME (ms)



TEST DESC: HEAD DROP

TEST DATE: 01/24/2022
TEST #: D220191





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220192

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	18	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.8	Pass
	30 ms	m/s	5.8 to 7.0	6.9	Pass
D Plane Rotation	Max	deg	77 to 91	85	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	72	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
			Overall Results		Pass

Laboratory Technician

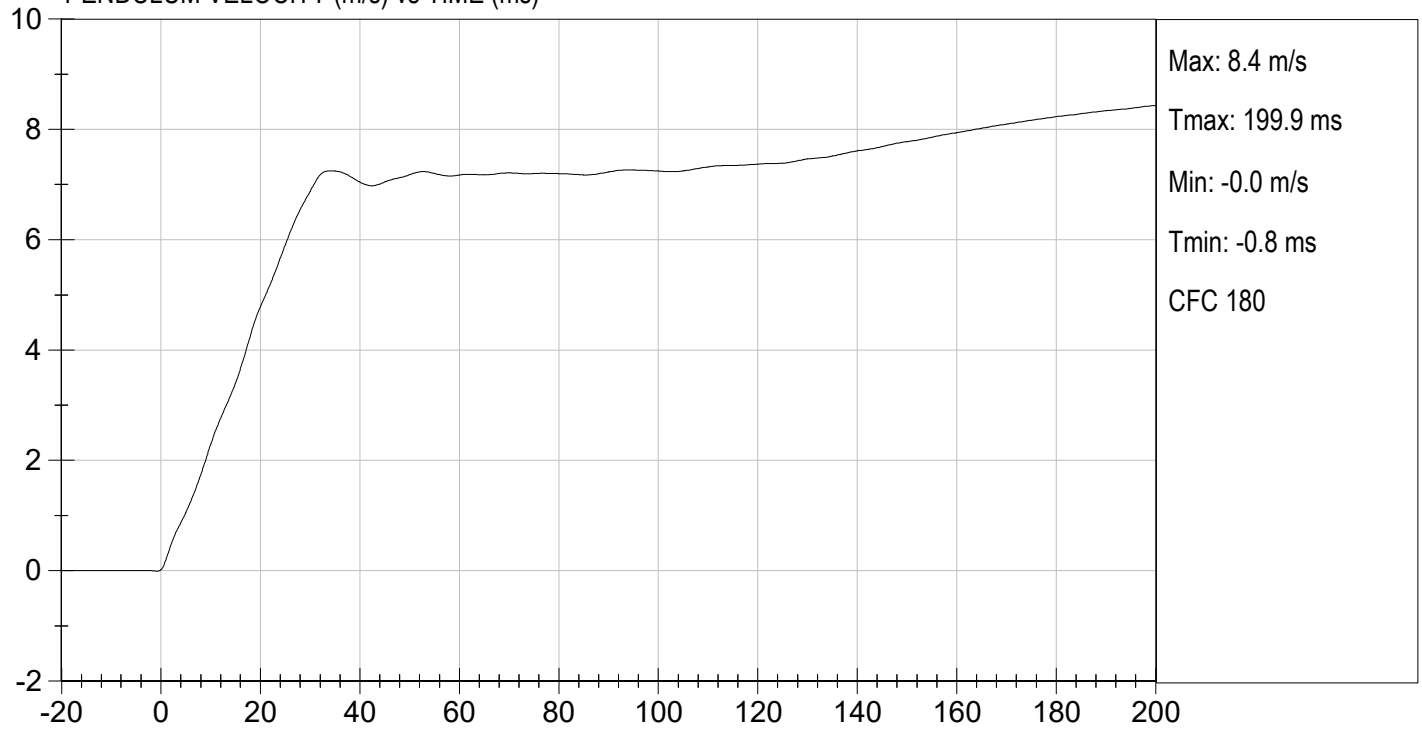
01/25/2022
Test Date

Approved By

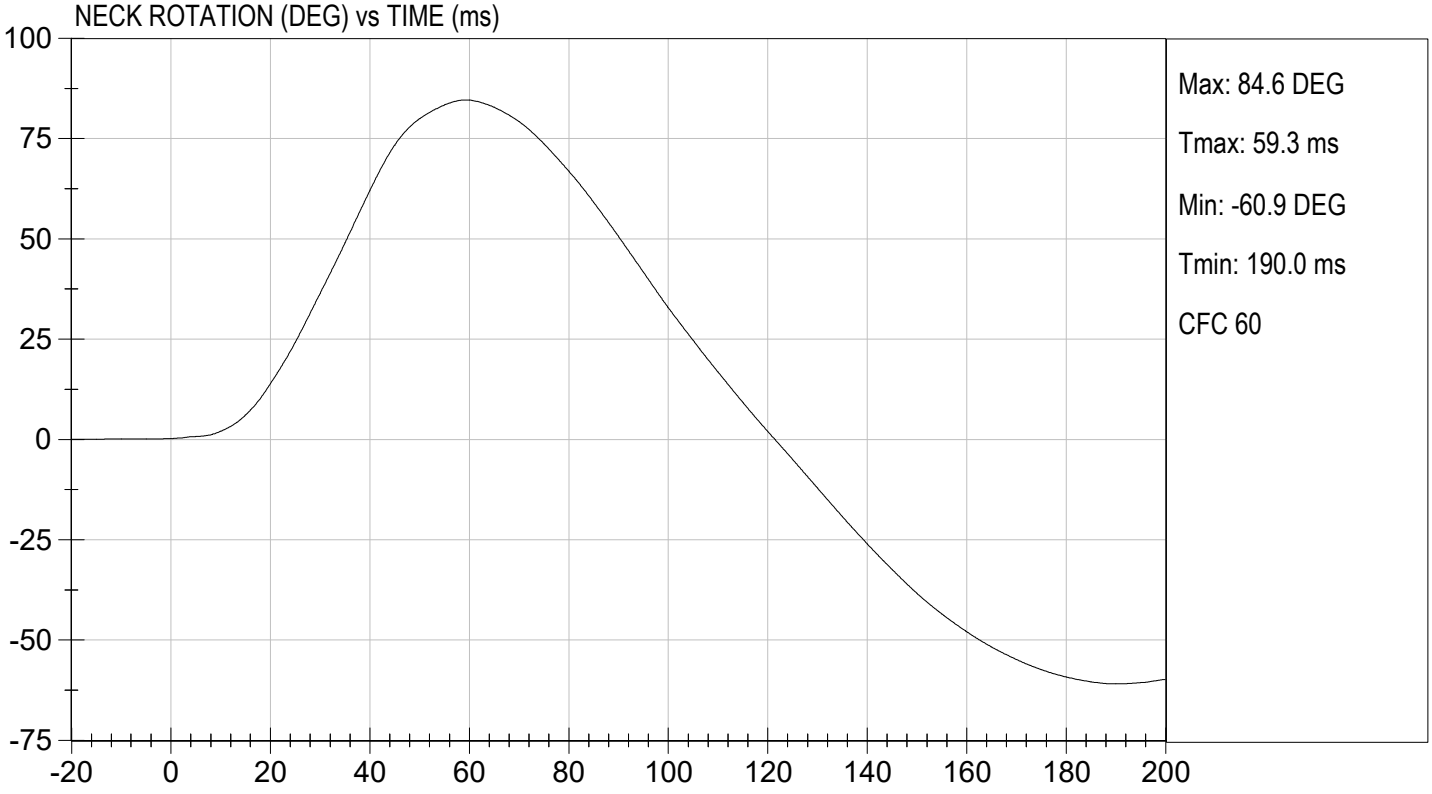
TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 01/25/2022
TEST #: D220192

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

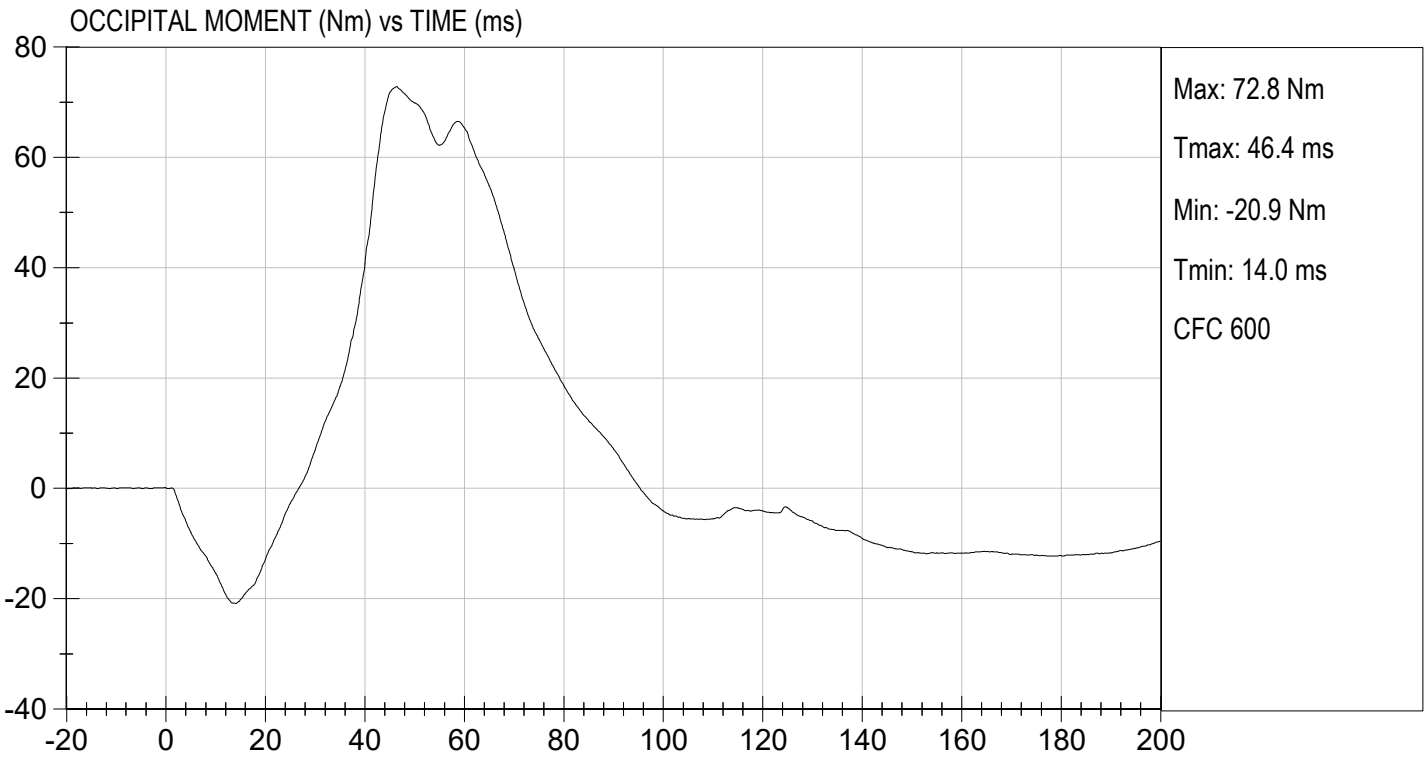


NECK ROTATION (DEG) vs TIME (ms)



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

TEST DATE: 01/25/2022
TEST #: D220192



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220193

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	18	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.05	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	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	113	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-56	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	106	Pass
			Overall Results		Pass

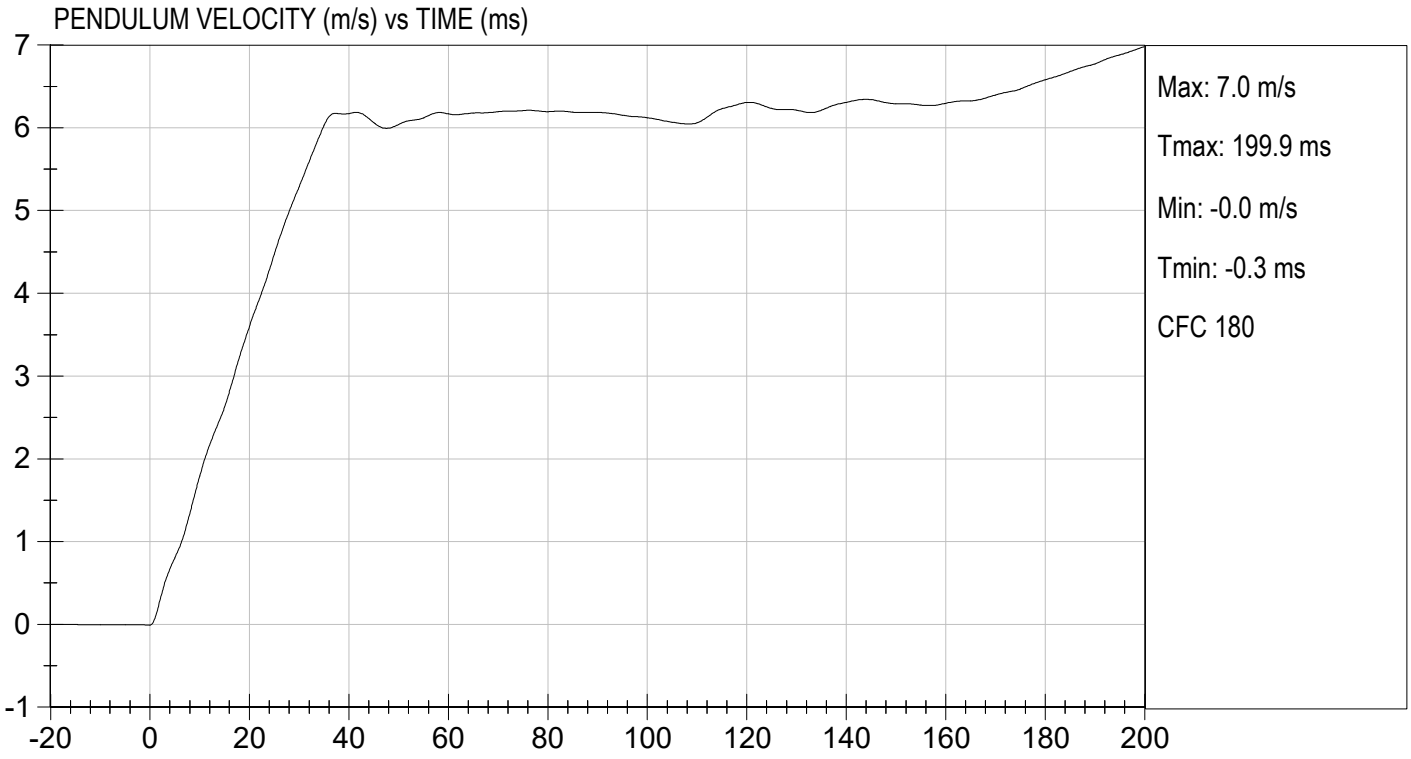
Laboratory Technician

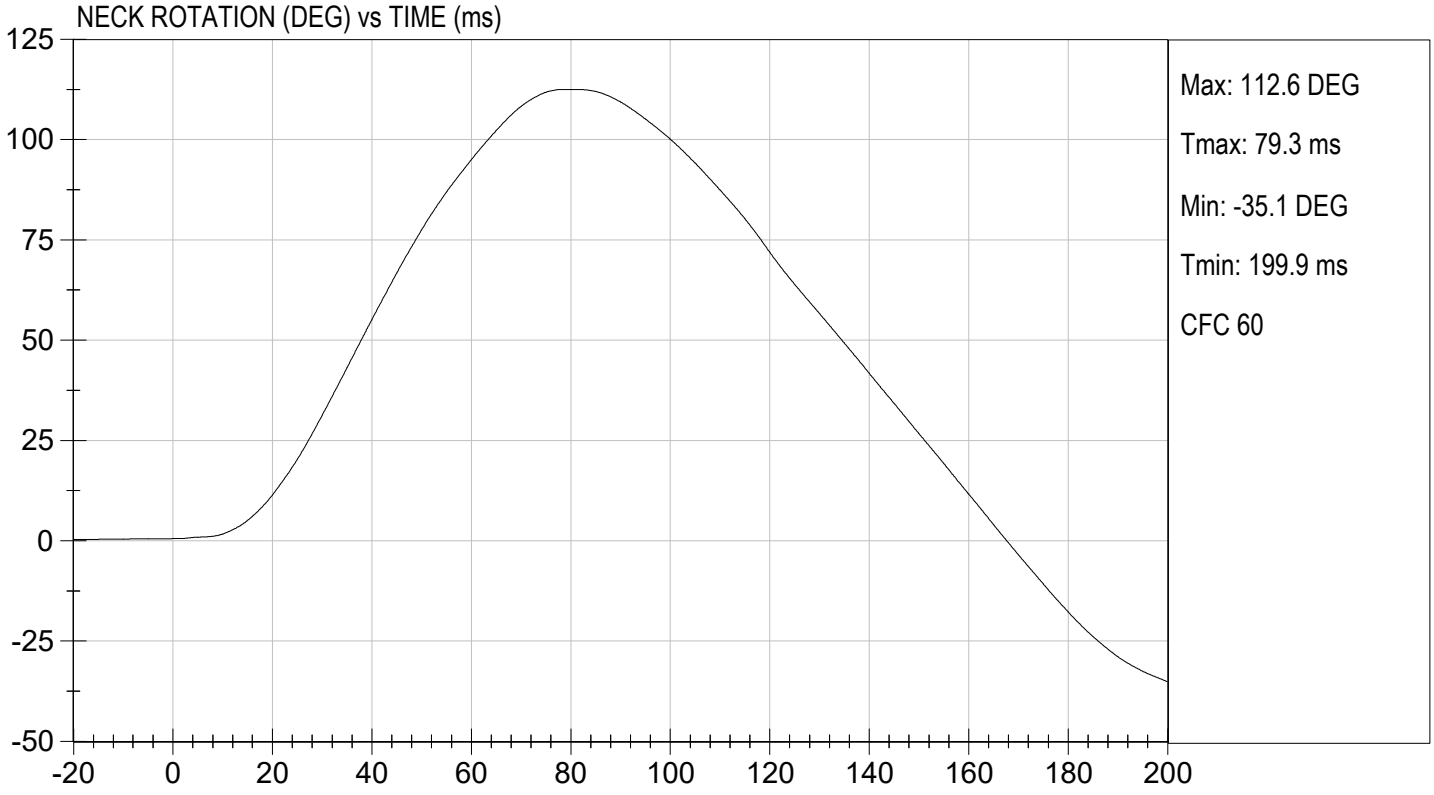
01/25/2022
Test Date

Approved By

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

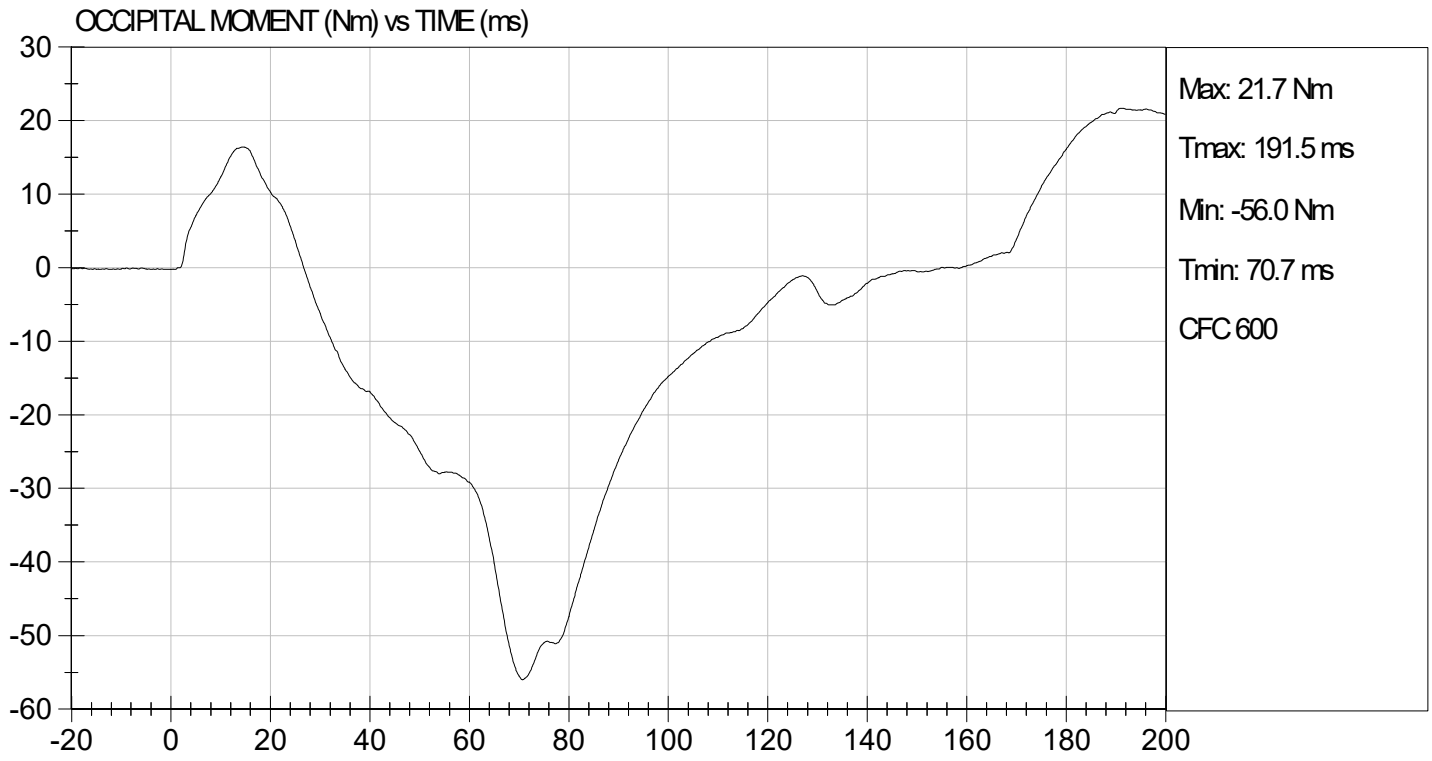
TEST DATE: 01/25/2022
TEST #: D220193





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

TEST DATE: 01/25/2022
TEST #: D220193



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220194

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Relative Humidity	%	10 to 70	24	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	50	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4141	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4397	Pass
		Overall Test Results		Pass

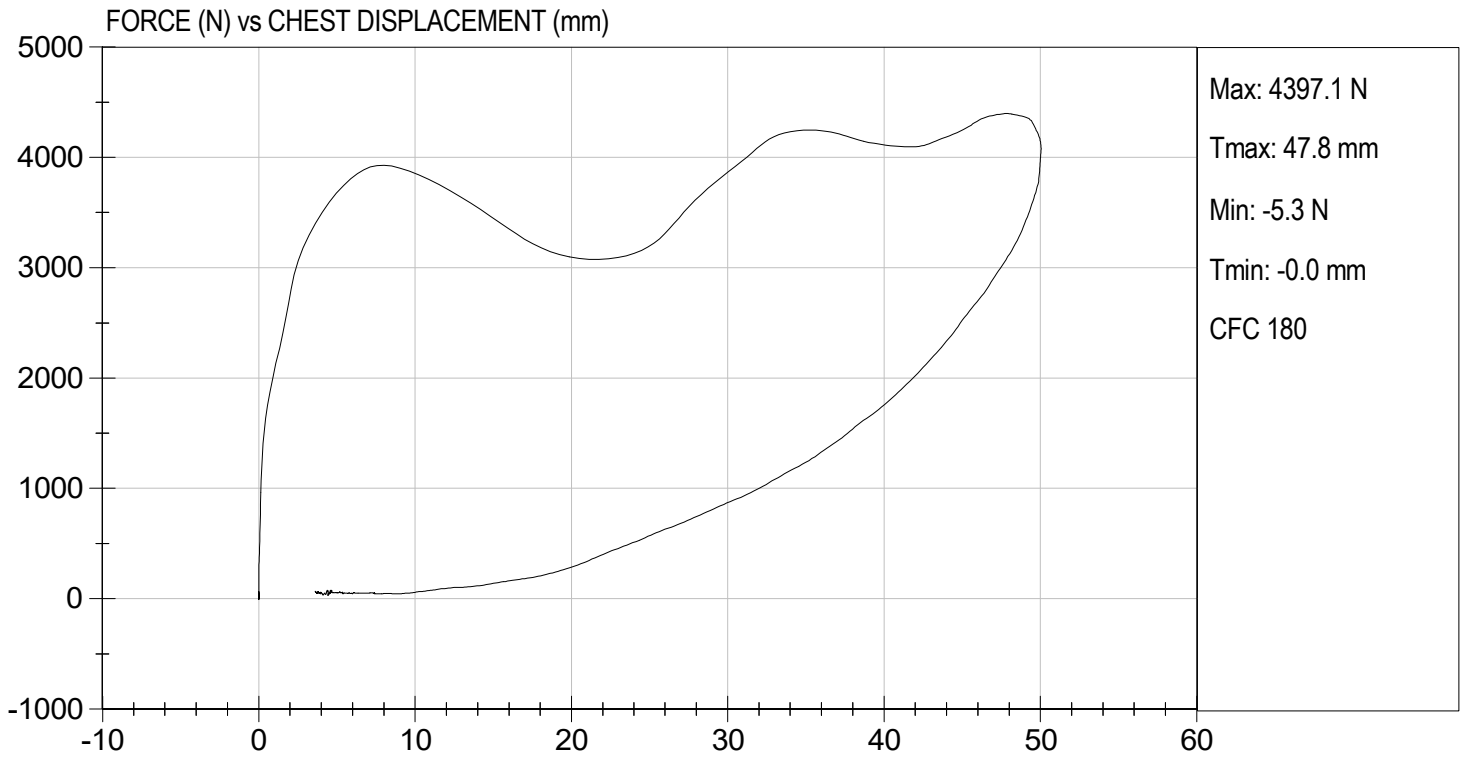
Laboratory Technician

01/24/2022
Test Date

Approved By

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

TEST DATE: 01/24/2022
TEST #: D220194



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220195

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	4018	Pass
		Overall Test Results		Pass

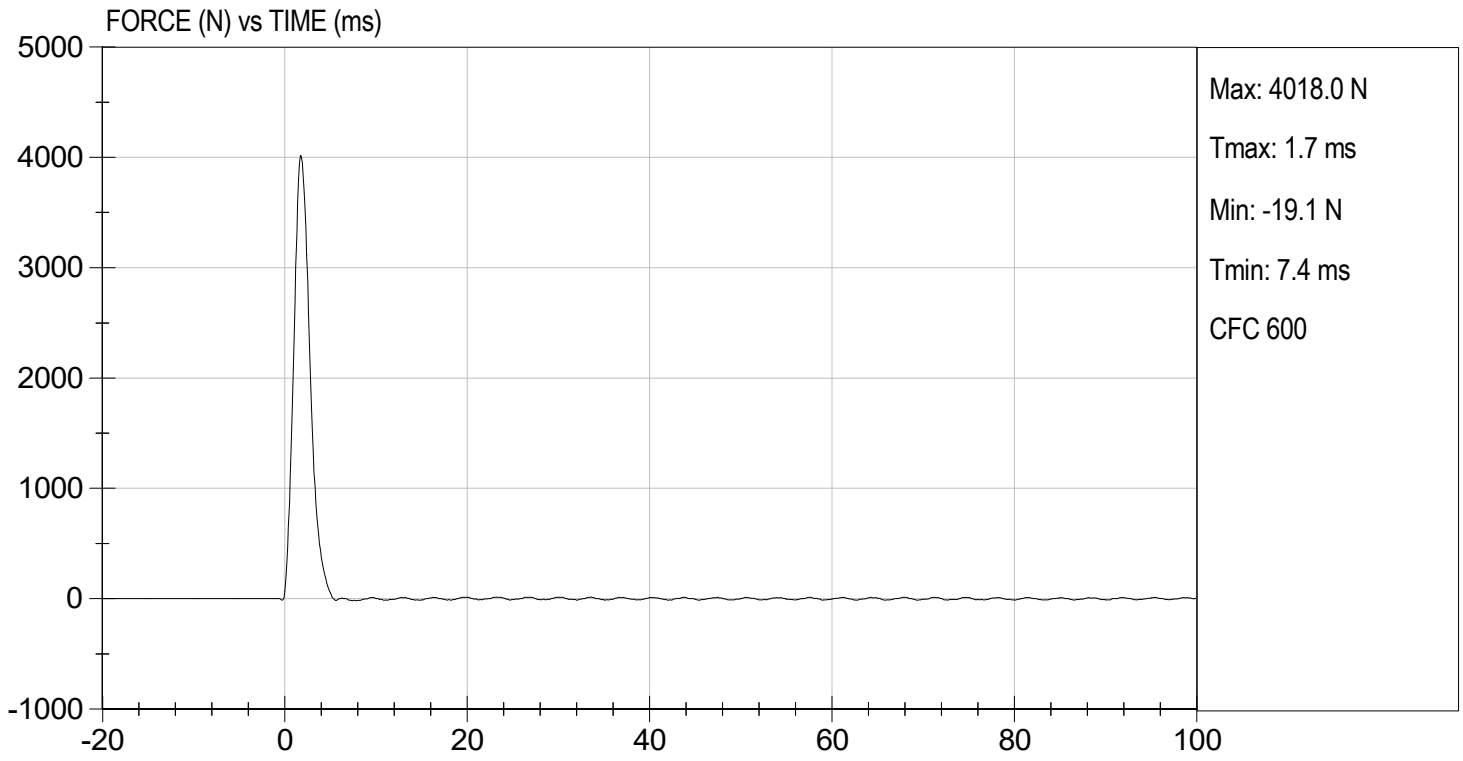
Laboratory Technician

01/24/2022
Test Date

Approved By

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

TEST DATE: 01/24/2022
TEST #: D220195



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220196

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3972	Pass
		Overall Test Results		Pass

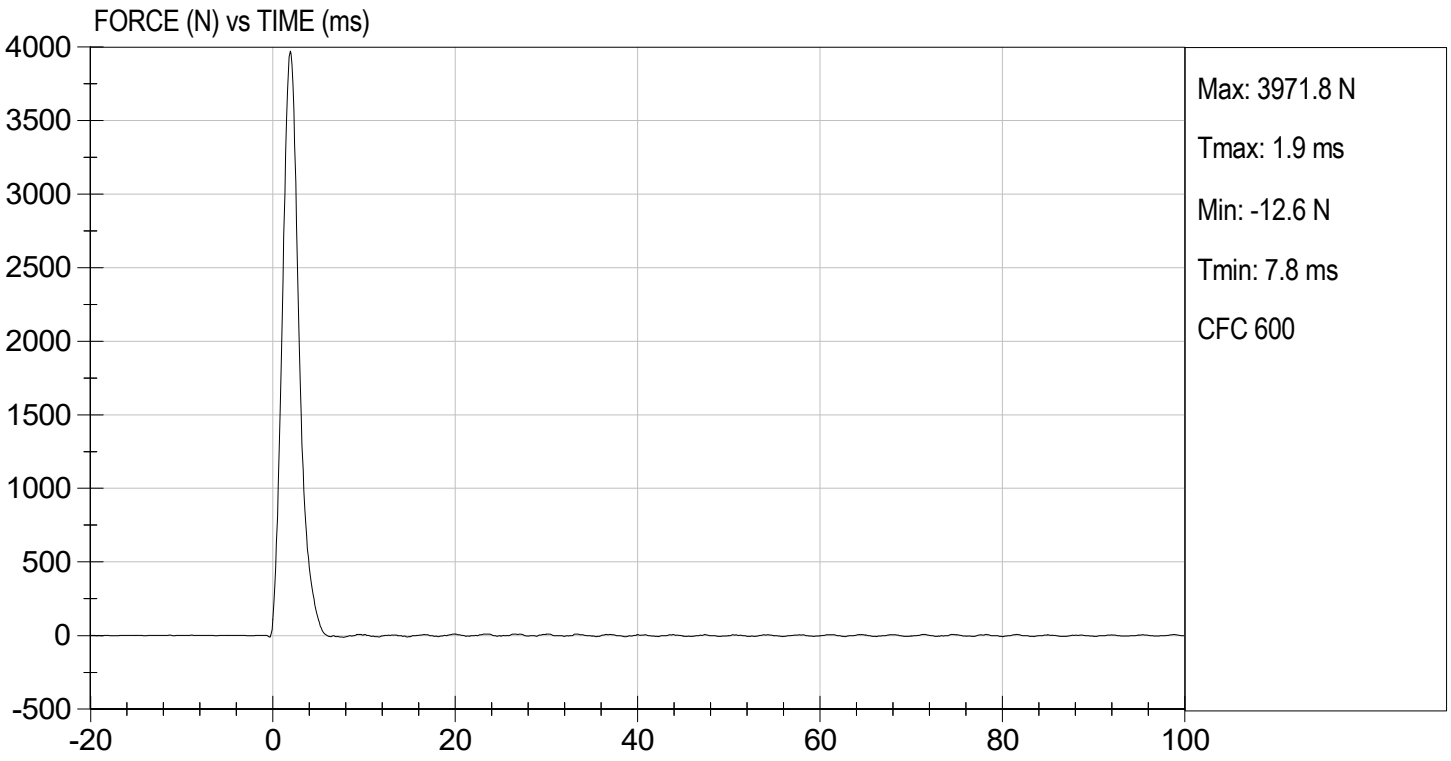
Laboratory Technician

01/24/2022
Test Date

Approved By

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

TEST DATE: 01/24/2022
TEST #: D220196



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220197

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	377	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.7	Pass
		Overall Result		Pass

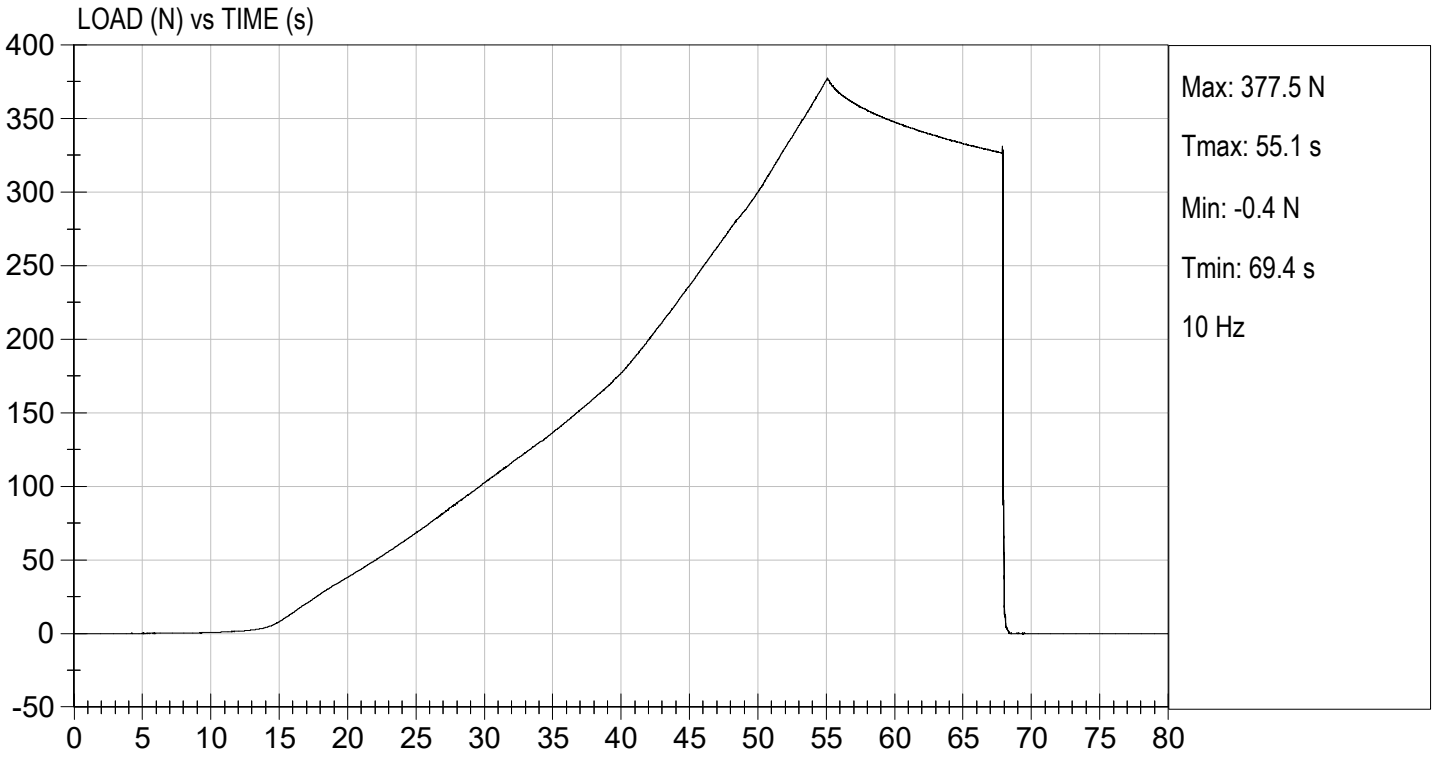
Laboratory Technician

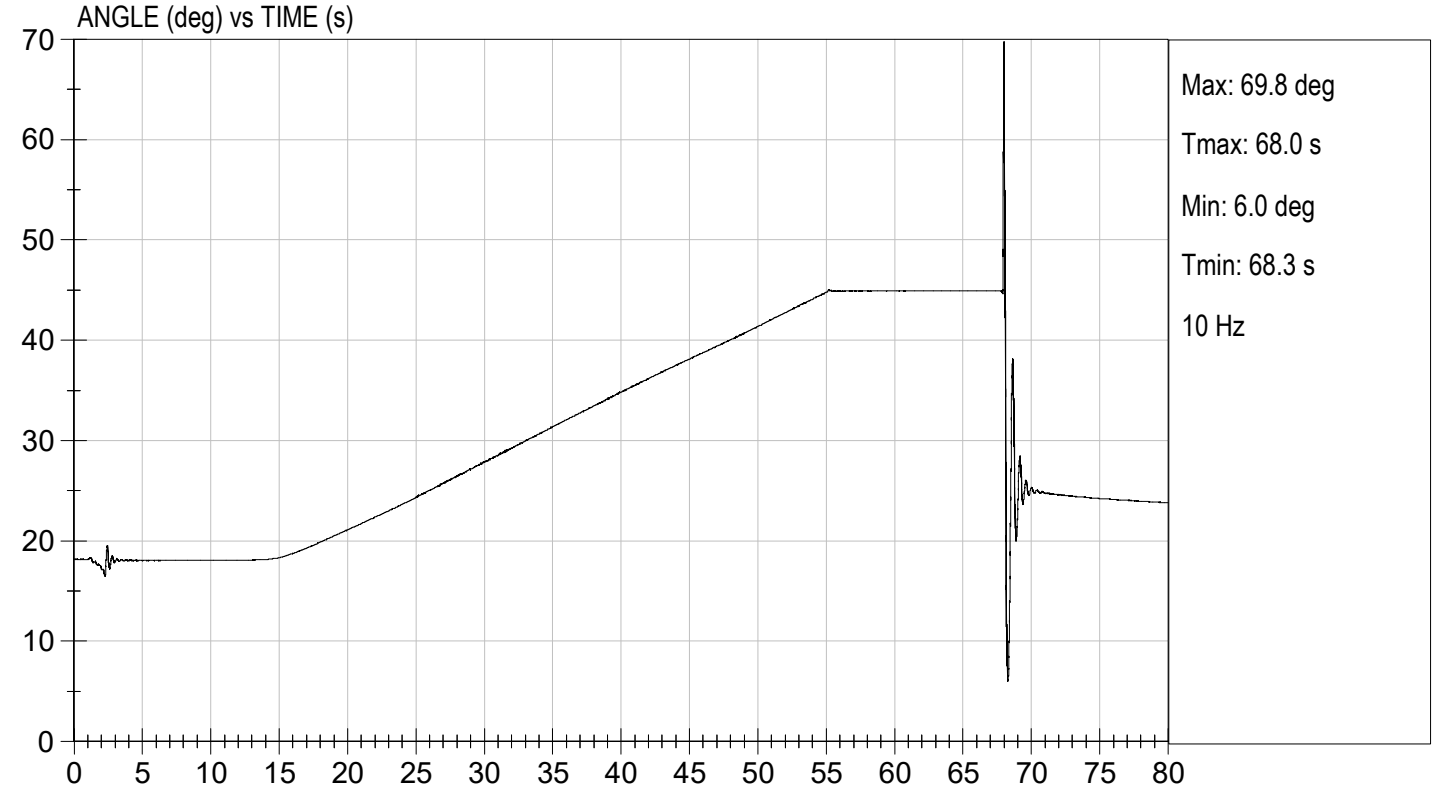
01/24/2022
Test Date

Approved By

TEST DESC: LUMBAR FLEXION

TEST DATE: 01/24/2022
TEST #: D220197





CALIBRATION 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:** D220401

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	250 to 300	252	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	3.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

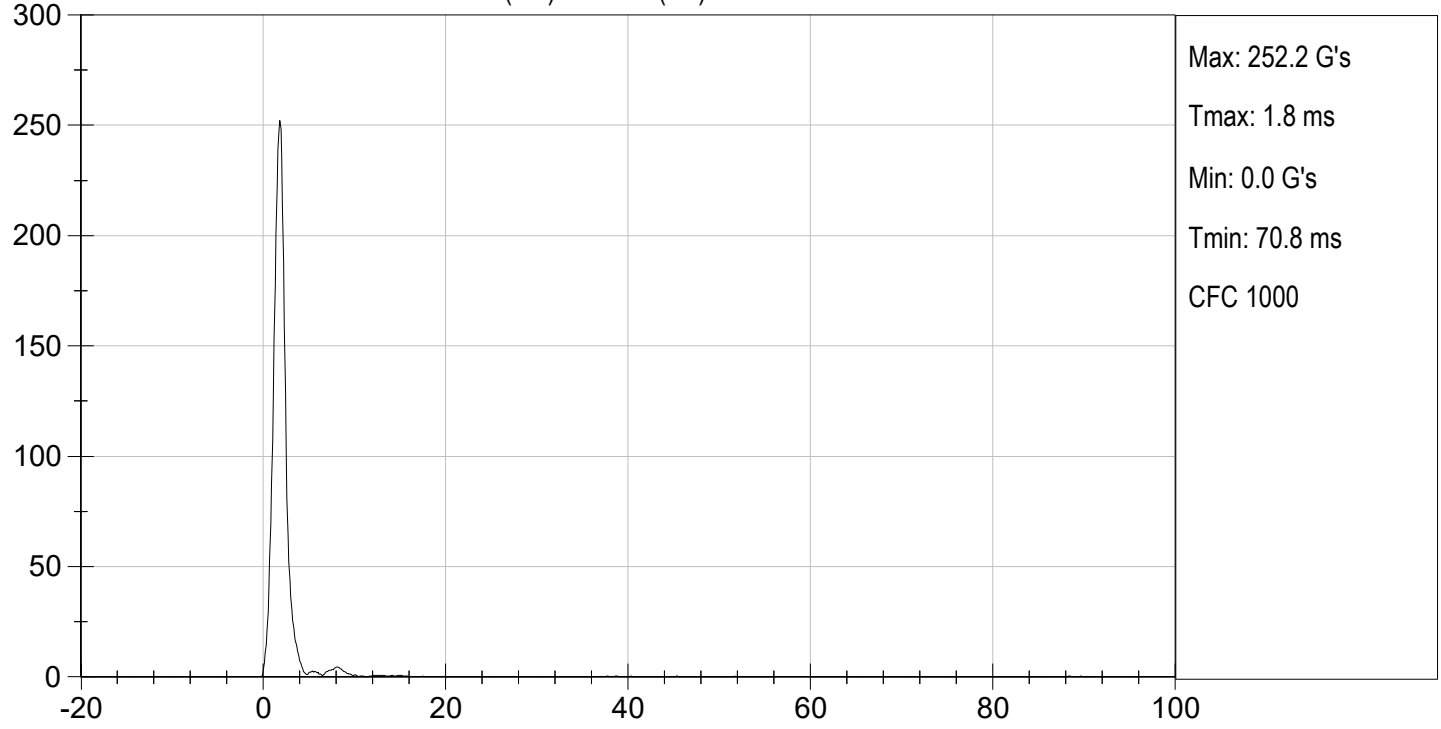
02/10/2022
Test Date

Approved By

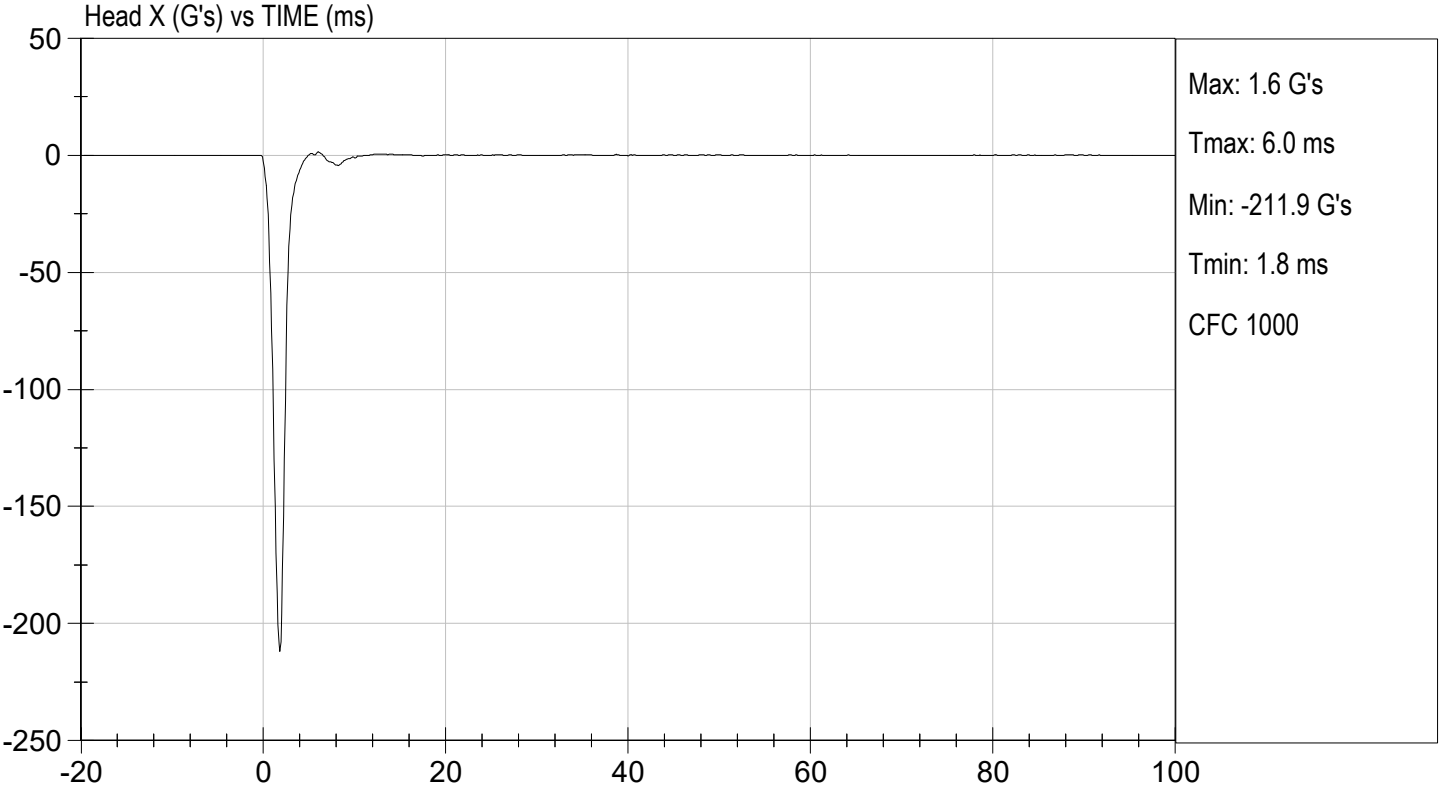
TEST DESC: HEAD DROP

TEST DATE: 02/10/2022
TEST #: D220401

HEAD RESULTANT ACCELERATION (G's) vs TIME (ms)

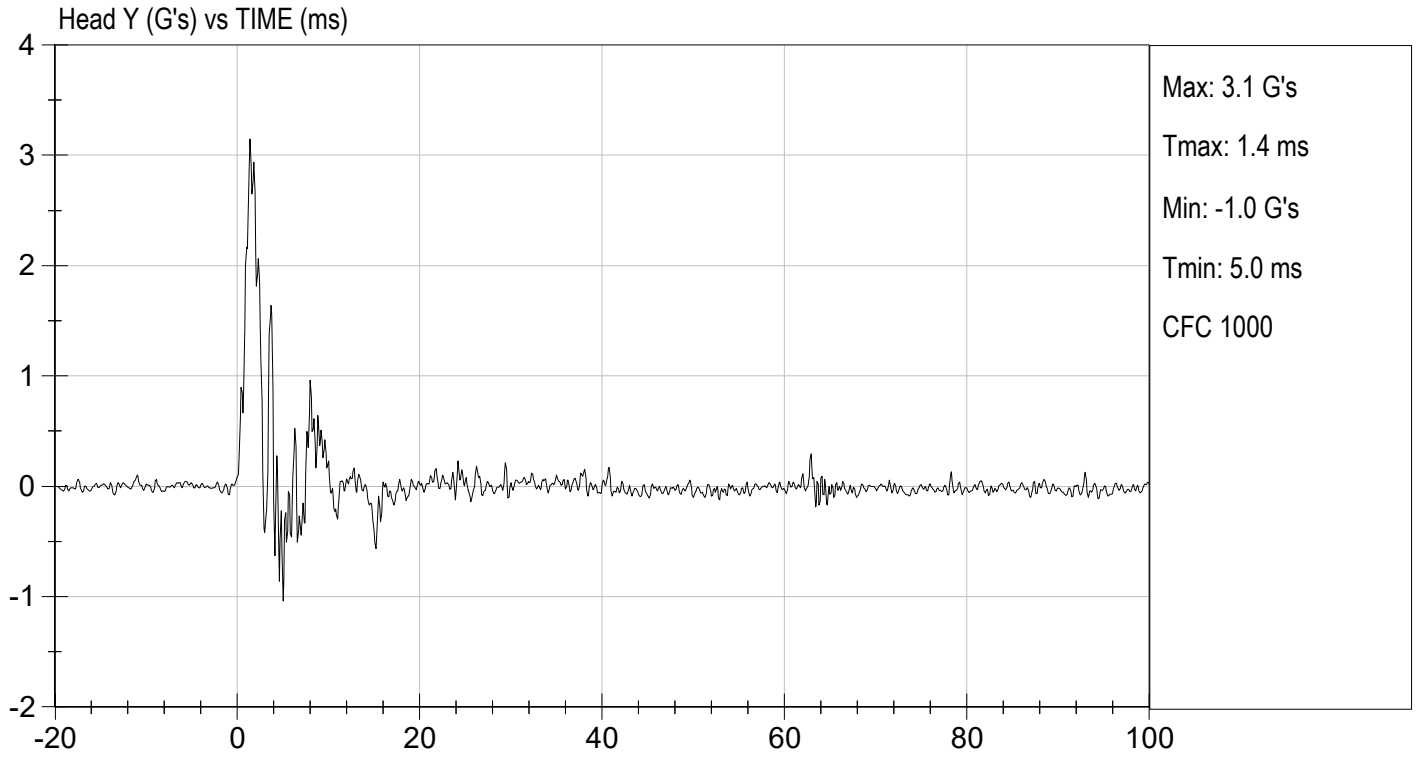


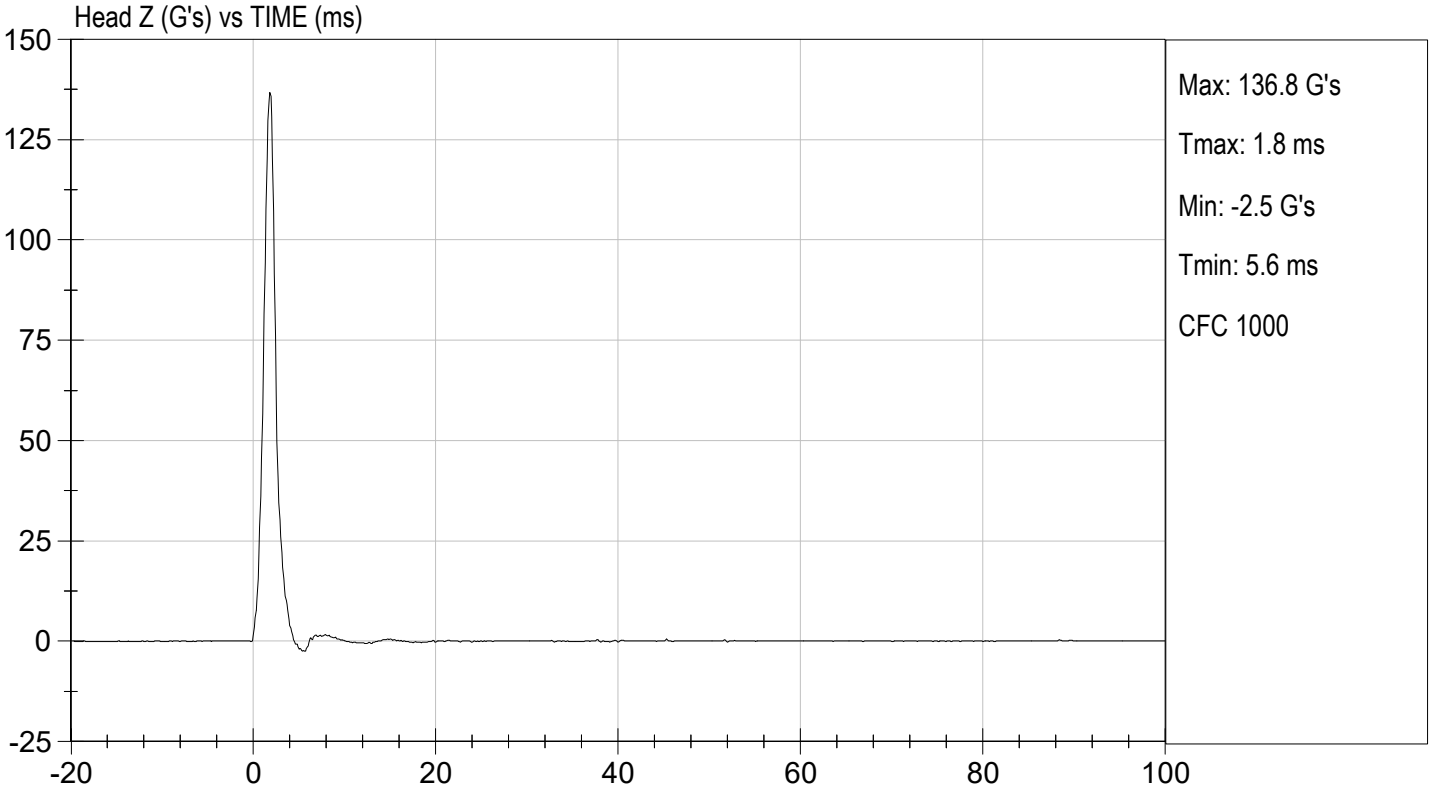
Head X (G's) vs TIME (ms)



TEST DESC: HEAD DROP

TEST DATE: 02/10/2022
TEST #: D220401





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220402

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.7	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	72	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
			Overall Results		Pass

Laboratory Technician

02/10/2022

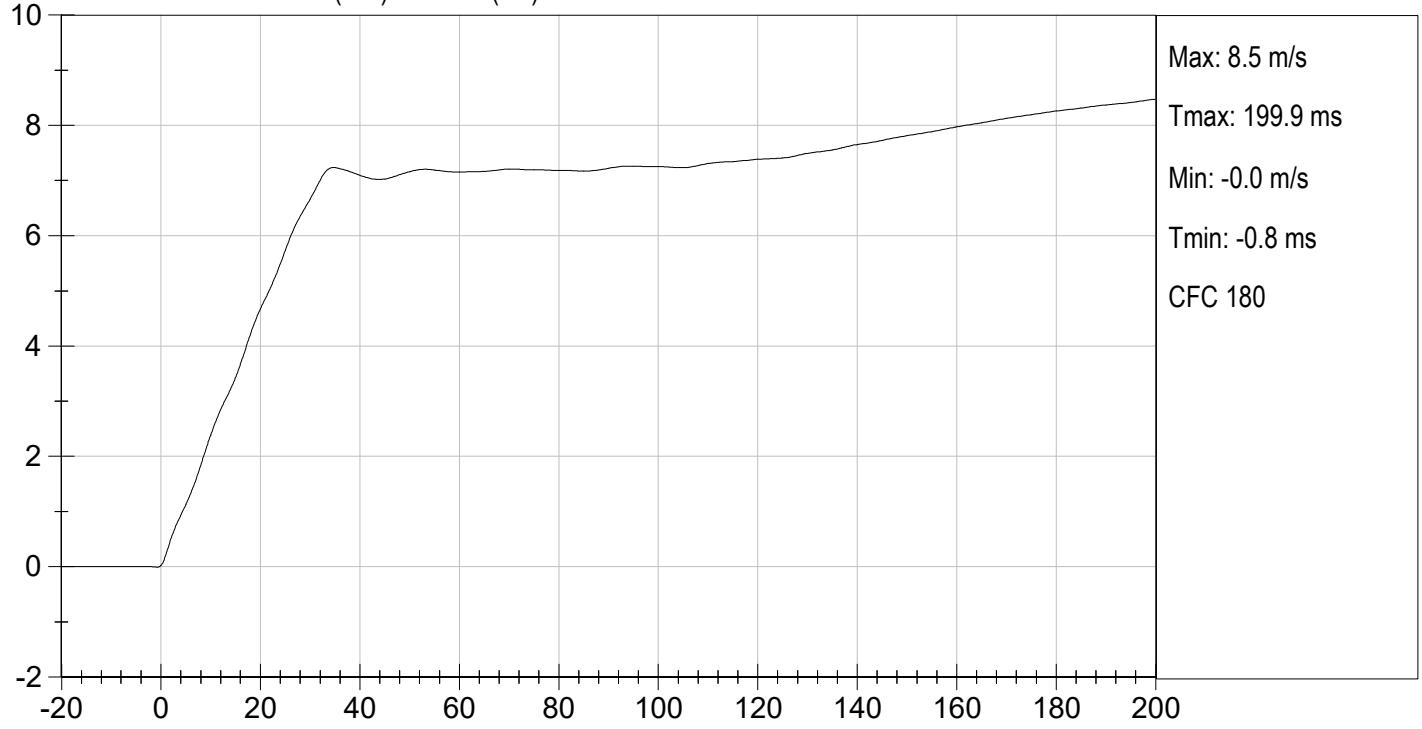
Test Date

Approved By

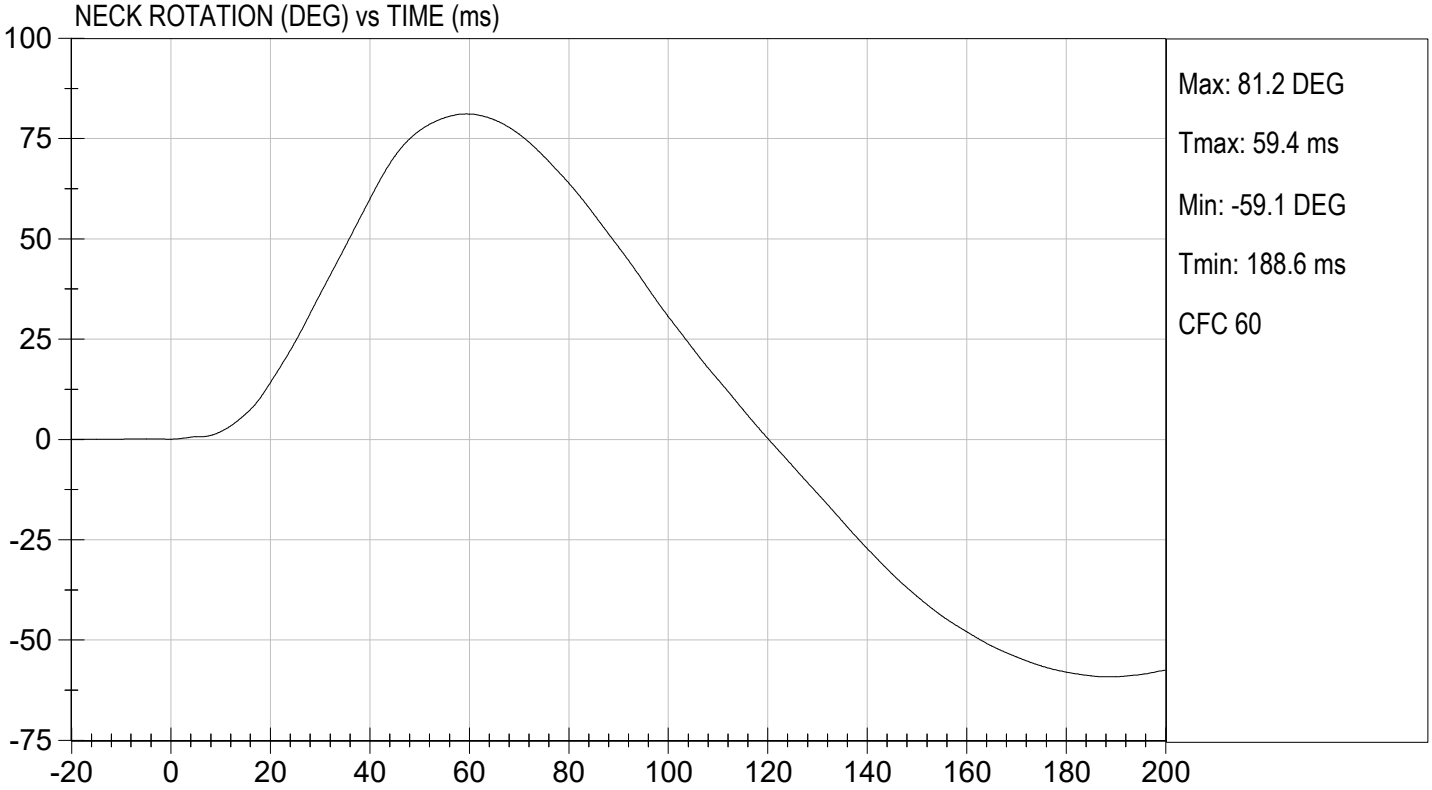
TEST DESC: NECK FLEXION
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 02/10/2022
TEST #: D220402

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



NECK ROTATION (DEG) vs TIME (ms)



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

TEST DATE: 02/10/2022
TEST #: D220402

MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220403

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	28	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	111	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-58	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	105	Pass
			Overall Results		Pass

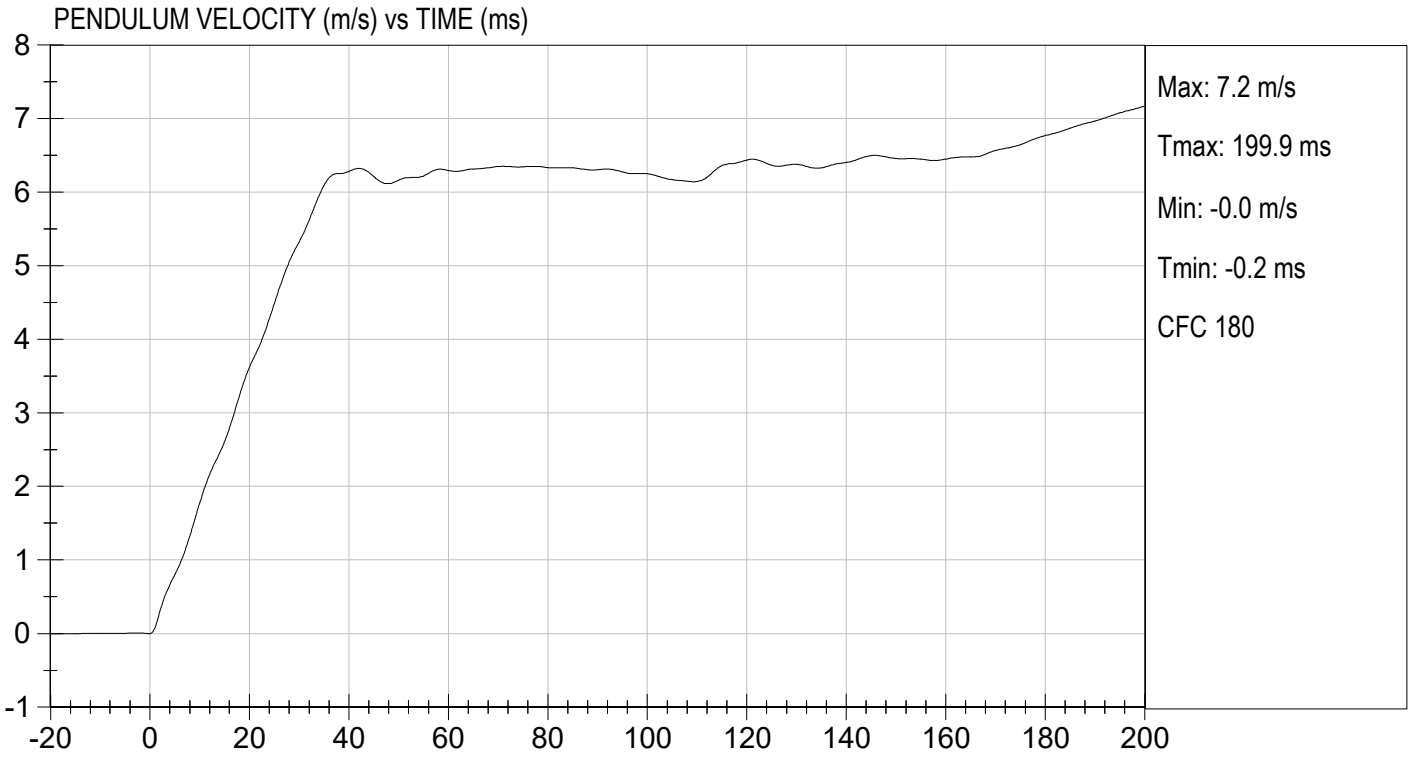
Laboratory Technician

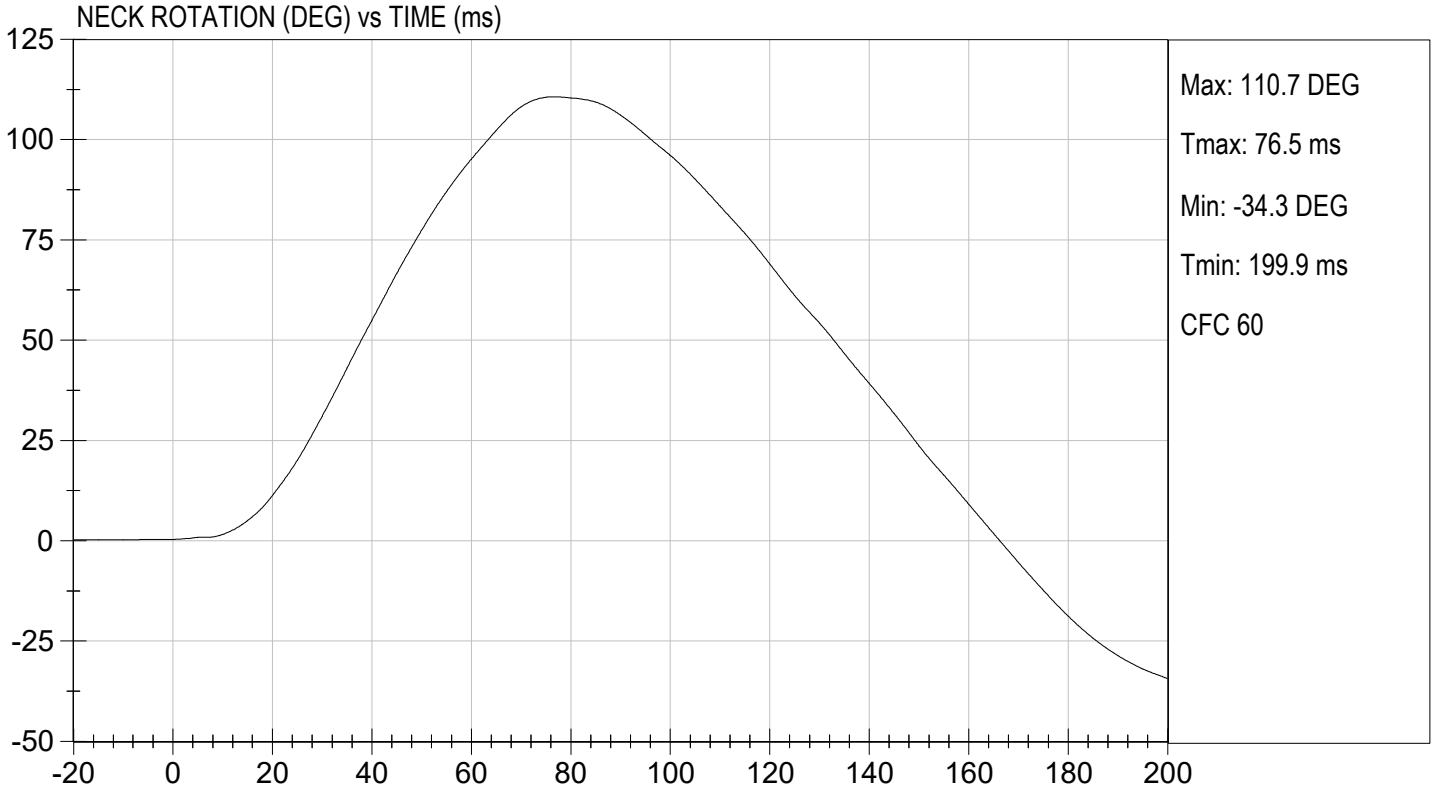
02/10/2022
Test Date

Approved By

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

TEST DATE: 02/10/2022
TEST #: D220403





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

TEST DATE: 02/10/2022
TEST #: D220403

MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220404

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Relative Humidity	%	10 to 70	20	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4320	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4348	Pass
		Overall Test Results		Pass

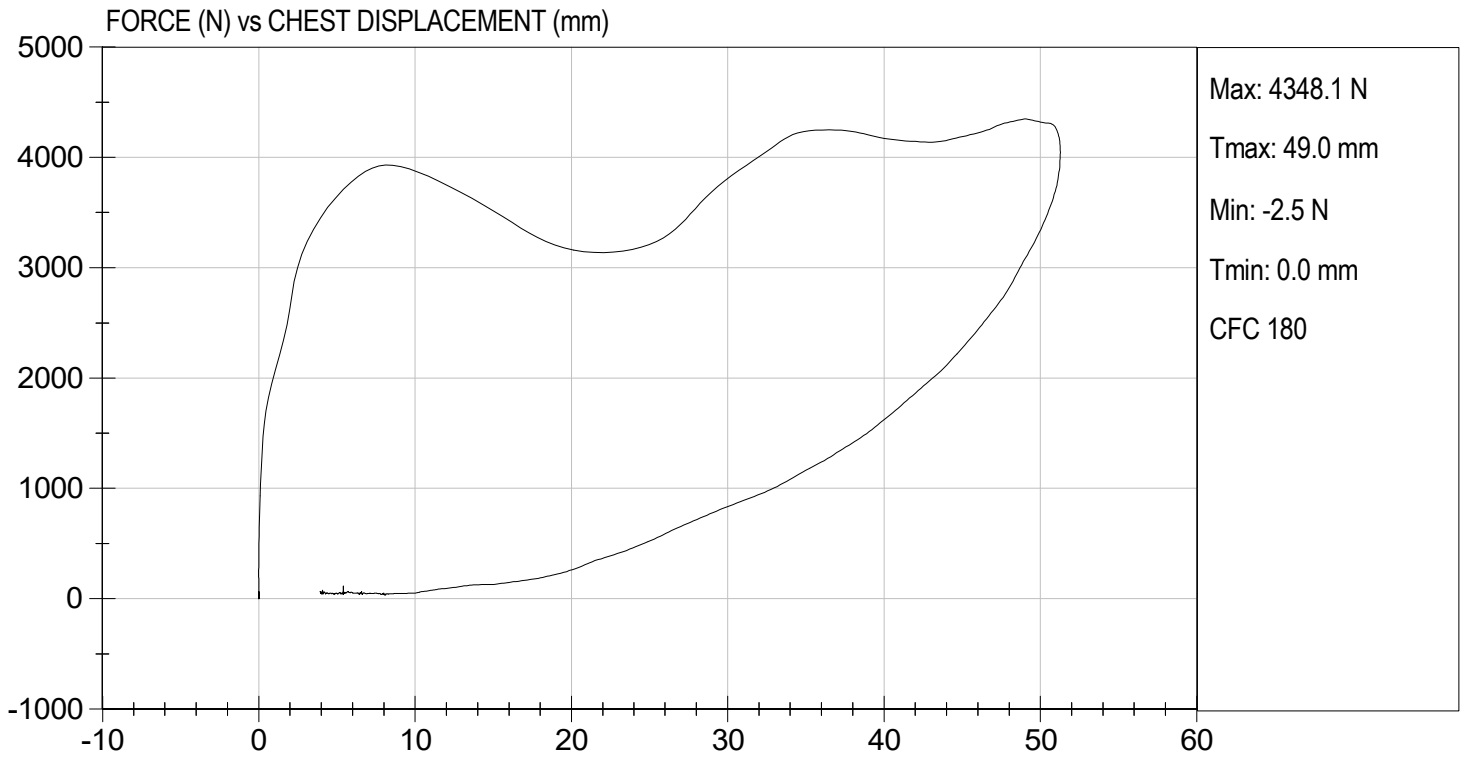
Laboratory Technician

02/11/2022
Test Date

Approved By

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

TEST DATE: 02/11/2022
TEST #: D220404



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220405

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	N	3450 to 4060	3845	Pass
		Overall Test Results		Pass

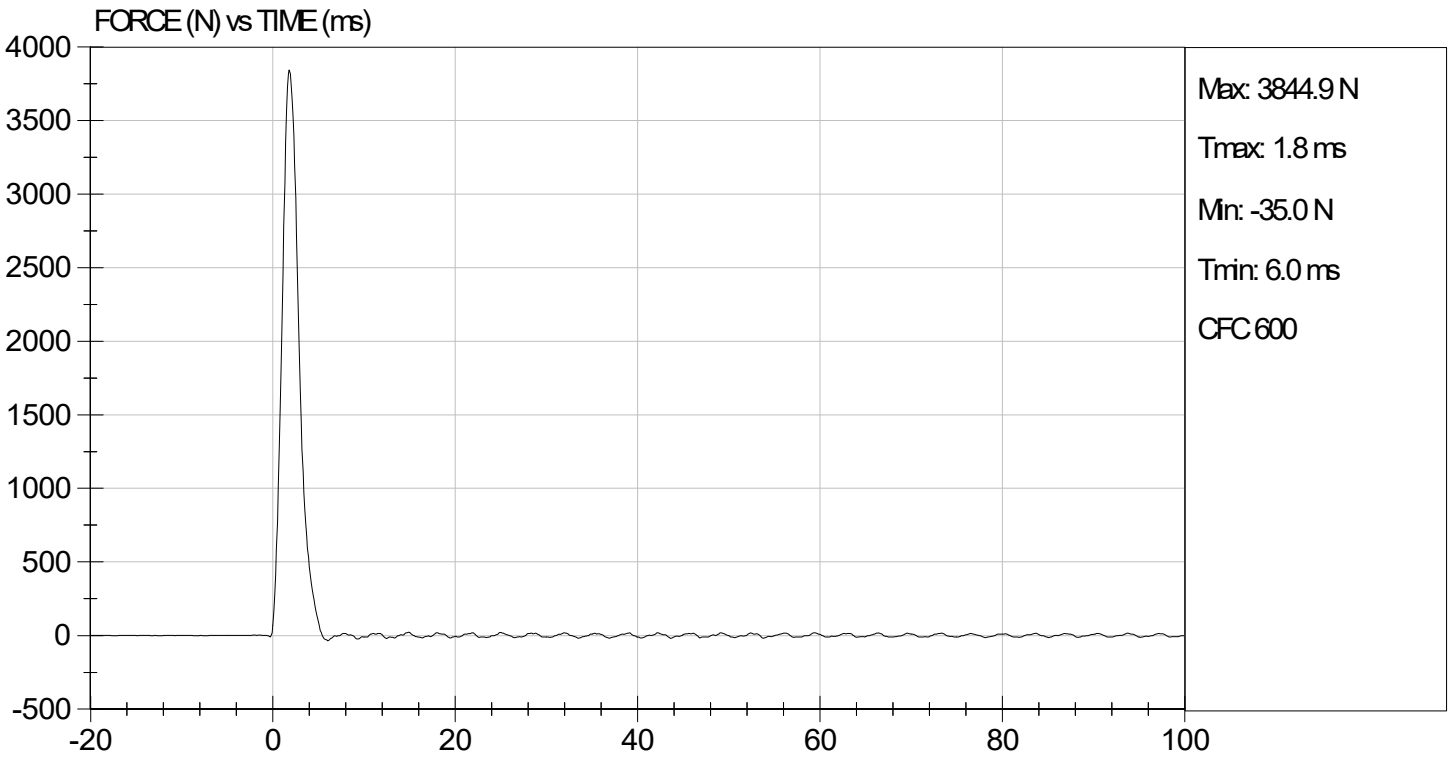
Laboratory Technician

02/09/2022
Test Date

Approved By

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

TEST DATE: 02/09/2022
TEST #: D220405



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220406

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	N	3450 to 4060	3915	Pass
		Overall Test Results		Pass

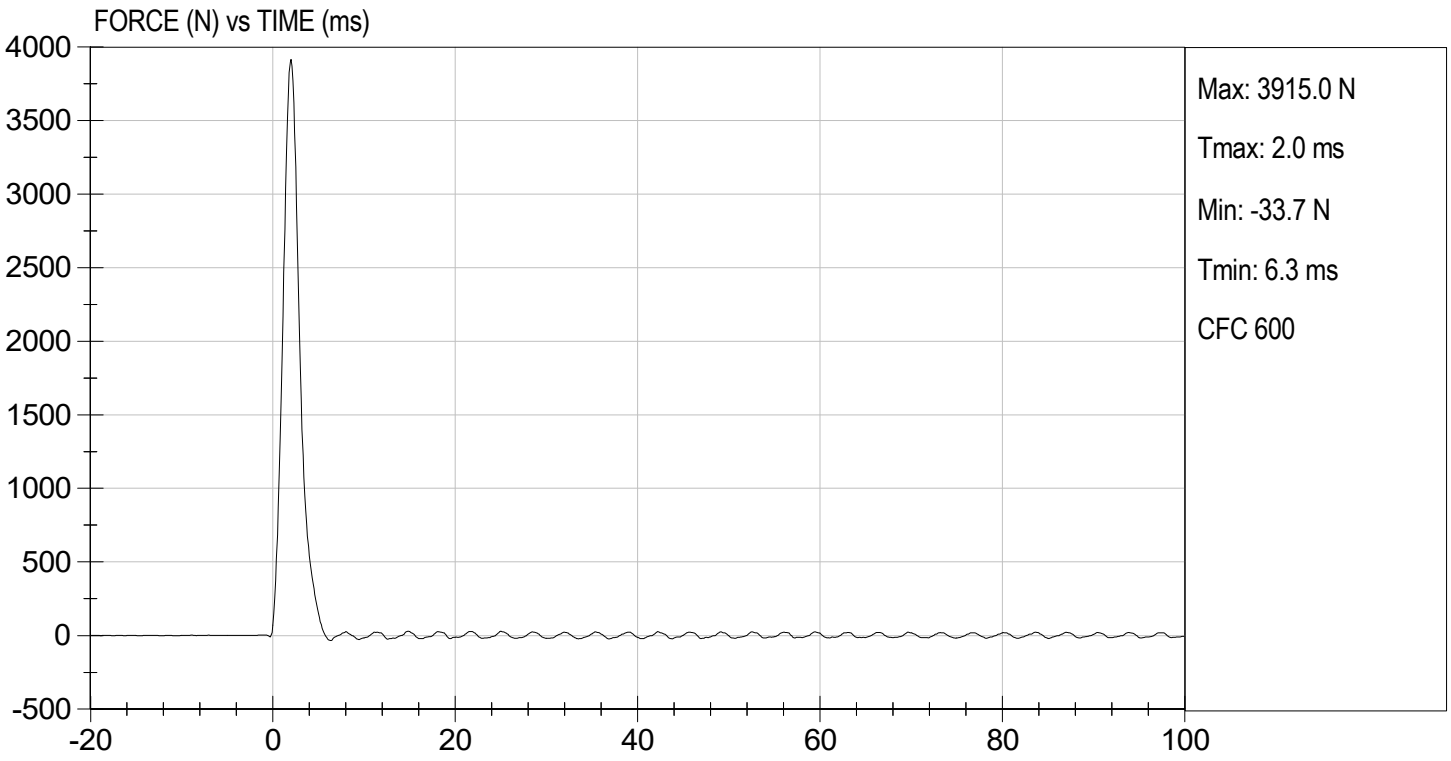
Laboratory Technician

02/09/2022
Test Date

Approved By

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

TEST DATE: 02/09/2022
TEST #: D220406



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 142 **Test I.D:** D220407

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Initial Angle	deg	0 to 20	14	Pass
Return Angle	deg	+/- 8	7	Pass
Force at 45 deg	N	320 to 390	381	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.7	Pass
		Overall Result		Pass

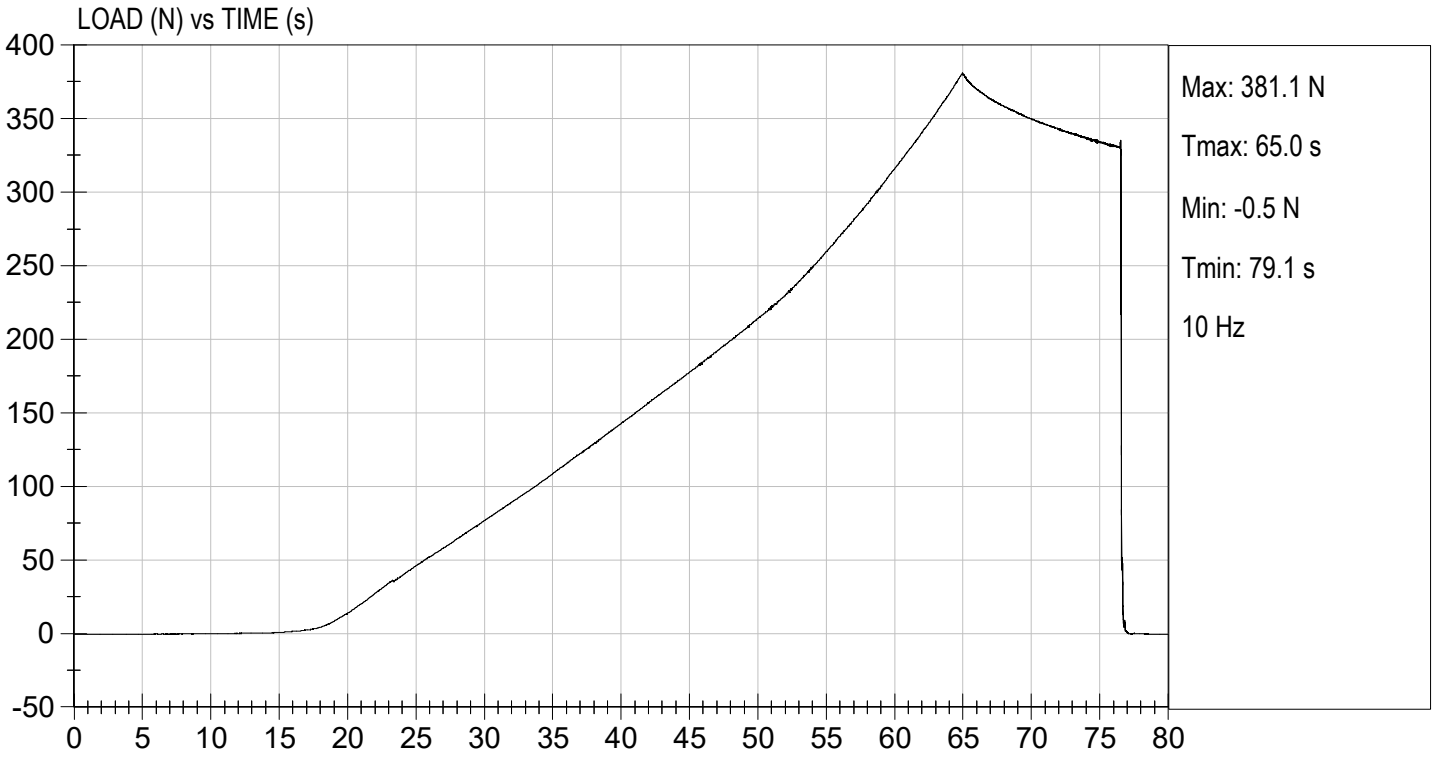
Alex Thomas
Laboratory Technician

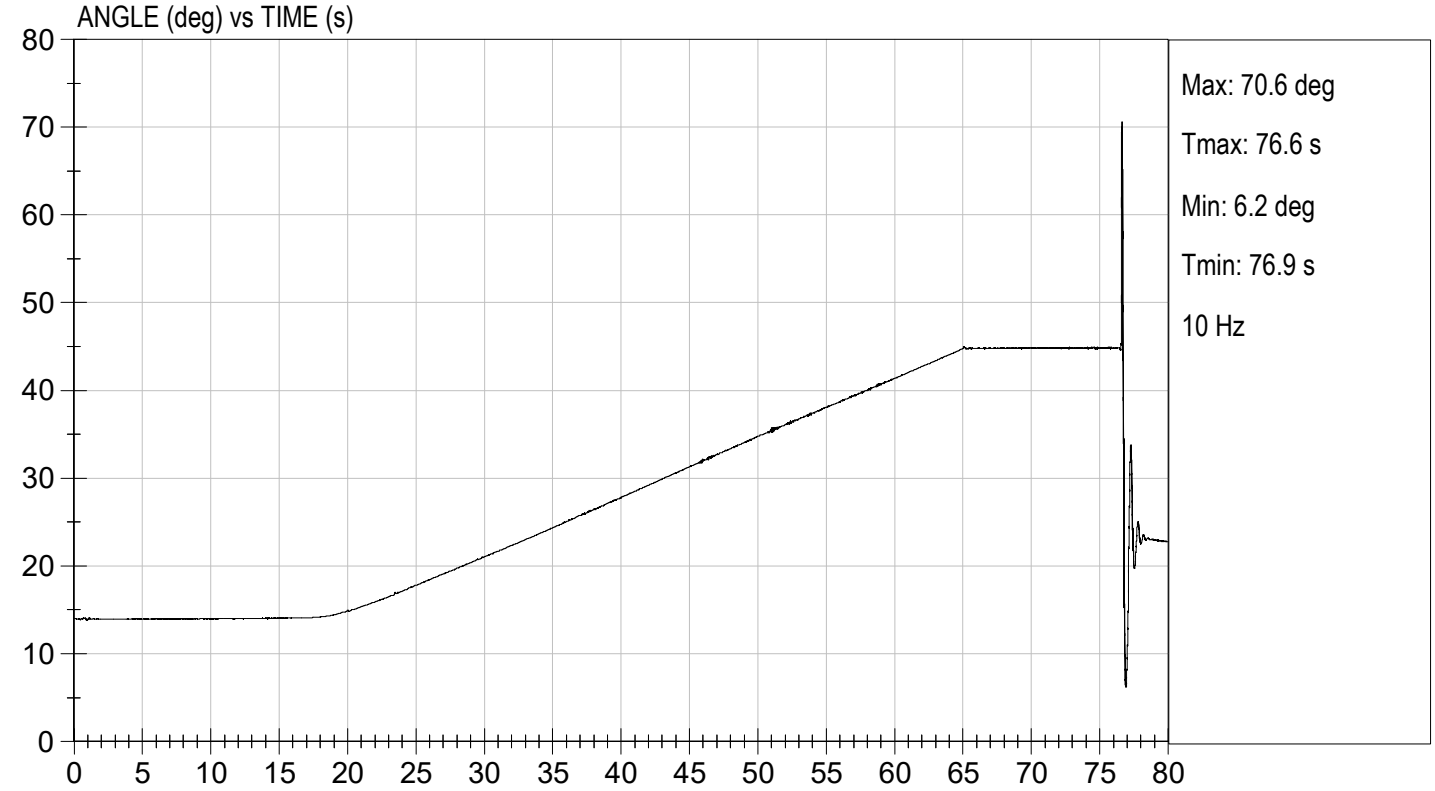
02/09/2022
Test Date

Approved By

TEST DESC: LUMBAR FLEXION

TEST DATE: 02/09/2022
TEST #: D220407





APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – DRIVER DUMMY INSTRUMENTATION

Instrument Location			Axis	Hybrid III 50th S/N 351		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers		Primary	X	P79741	Endevco	01/25/2022
			Y	P79743	Endevco	01/25/2022
			Z	P79744	Endevco	01/25/2022
		Redundant	X	P94834	Endevco	01/25/2022
			Y	P94856	Endevco	01/25/2022
			Z	P97412	Endevco	01/25/2022
Head Angular Rate Sensors			X	ARS7325	DTS	08/09/2021
			Y	ARS7340	DTS	08/09/2021
			Z	ARS7354	DTS	08/09/2021
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG1915	Denton	03/22/2021
Chest Accelerometers		Primary	X	P86792	Endevco	01/25/2022
			Y	P86793	Endevco	01/25/2022
			Z	P88348	Endevco	01/25/2022
		Redundant	X	P88666	Endevco	01/25/2022
			Y	P88667	Endevco	01/25/2022
			Z	P94109	Endevco	01/25/2022
Chest Potentiometer			X	351	Humanetics	01/25/2022
Pelvis Accelerometers			X	P95526	Endevco	01/25/2022
			Y	P96038	Endevco	01/25/2022
			Z	P97742	Endevco	01/25/2022
Femur Load Cells	Right	Primary	Z	FG121P	Denton	01/25/2022
		Redundant	Z	FG121R	Denton	01/25/2022
	Left	Primary	Z	FG122P	Denton	01/25/2022
		Redundant	Z	FG122R	Denton	01/25/2022
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG404	Denton	05/11/2021
		Lower	Mx, My, Fz	AG368	Denton	05/11/2021
	Left	Upper	Mx, My, Fz	TG475	Denton	05/11/2021
		Lower	Mx, My, Fz	AG504	Denton	05/11/2021
Foot Accelerometers	Right	Rear	X	T22486	Endevco	01/25/2022
			Z	P97382	Endevco	01/25/2022
		Front	Z	P82120	Endevco	01/25/2022
	Left	Rear	X	T16468	Endevco	01/25/2022
			Z	T16496	Endevco	01/25/2022
		Front	Z	T16501	Endevco	01/25/2022
Seat Belt Load Cells		Lap		SBG161	FTSS	11/13/2019
		Shoulder		SBG157	FTSS	11/13/2019

TABLE 2 – FRONT PASSENGER DUMMY INSTRUMENTATION

Instrument Location			Axis	Hybrid III 5th S/N 142		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers		Primary	X	P97377	Endevco	10/04/2021
			Y	P94800	Endevco	10/04/2021
			Z	P94802	Endevco	10/04/2021
		Redundant	X	P94799	Endevco	10/04/2021
			Y	P94801	Endevco	10/04/2021
			Z	P94803	Endevco	10/04/2021
Head Angular Rate Sensors			X	ARS7516	DTS	08/09/2021
			Y	ARS7357	DTS	08/09/2021
			Z	ARS7391	DTS	08/09/2021
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG2256	Denton	04/27/2021
Chest Accelerometers		Primary	X	P94793	Endevco	10/04/2021
			Y	P95322	Endevco	10/04/2021
			Z	P88719	Endevco	10/04/2021
		Redundant	X	P94794	Endevco	10/04/2021
			Y	P95370	Endevco	10/04/2021
			Z	P94785	Endevco	10/04/2021
Chest Potentiometer			X	142	Humanetics	10/18/2021
Pelvis Accelerometers			X	P94798	Endevco	10/04/2021
			Y	P97705	Endevco	10/04/2021
			Z	P82646	Endevco	10/04/2021
Femur Load Cells	Right	Primary	Z	FG126P	Denton	10/04/2021
		Redundant	Z	FG126R	Denton	10/04/2021
	Left	Primary	Z	FG127P	Denton	10/04/2021
		Redundant	Z	FG127R	Denton	10/04/2021
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG467	Denton	04/28/2021
		Lower	Mx, My, Fz	AG491	Denton	04/28/2021
	Left	Upper	Mx, My, Fz	TG478	Denton	04/28/2021
		Lower	Mx, My, Fz	AG500	Denton	04/28/2021
Foot Accelerometers	Right	Rear	X	P94795	Endevco	10/04/2021
			Z	P94796	Endevco	10/04/2021
		Front	Z	P94797	Endevco	10/04/2021
	Left	Rear	X	P83167	Endevco	10/04/2021
			Z	P83168	Endevco	10/04/2021
		Front	Z	P83169	Endevco	10/04/2021
Seat Belt Load Cells		Lap		SBG273	FTSS	11/13/2019
		Shoulder		SBG272	FTSS	11/13/2019

TABLE 3 – VEHICLE INSTRUMENTATION

Instrument Location			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember / Rear Seat Accelerometers	Left	Primary	X	A340766	MSI	09/29/2021
			Z	A340734	MSI	09/27/2021
		Redundant	X	A337171	MSI	08/24/2021
	Right	Primary	X	A383086	MSI	12/03/2021
			Z	A391172	MSI	10/20/2021
		Redundant	X	A383090	MSI	12/03/2021
Engine Accelerometers		Top	X	A383088	MSI	01/05/2022
		Bottom	X	A356220	MSI	09/28/2021