

**REPORT NUMBER: NCAP-MGA-21-017**

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

**TOYOTA MOTOR CORPORATION  
2021 Toyota C-HR LE 5-Door Hatchback  
NHTSA No.: O20215103**

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



**Test Date: February 3, 2021**

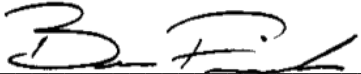
**Final Report Date: June 1, 2021**

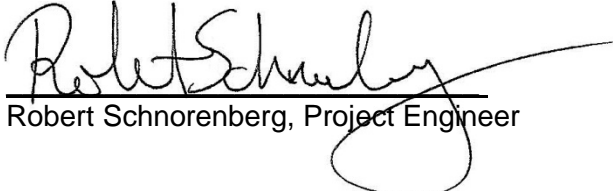
**FINAL REPORT**

**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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Prepared by:   
Ben Fischer, Program Manager

Approved by:   
Robert Schnorenberg, Project Engineer

Approval Date: June 1, 2021

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: \_\_\_\_\_

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

Date: \_\_\_\_\_

## TECHNICAL REPORT DOCUMENTATION PAGE

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<b>4. Title and Subtitle</b> Final Report of New Car Assessment Program Frontal Impact Testing of a 2021 Toyota C-HR LE 5-Door Hatchback, NHTSA No.: O20215103		<b>5. Report Date</b> June 1, 2021																																																							
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<b>9. Performing Organization Name and Address</b> MGA Research Corporation 5000 Warren Road Burlington, WI 53105		<b>10. Work Unit No.</b>																																																							
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<b>12. Sponsoring Agency Name and Address</b> U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590		<b>13. Type of Report and Period Covered</b> Final Test Report February 3, 2021 to June 1, 2021																																																							
		<b>14. Sponsoring Agency Code</b> NRM-110																																																							
<b>15. Supplementary Notes</b>																																																									
<b>16. Abstract</b> A 56.3 km/h NCAP Frontal Rigid Barrier Impact Test was conducted on a 2021 Toyota C-HR LE 5-Door Hatchback in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on February 3, 2021.  The impact velocity of the vehicle was 56.51 km/h and the ambient temperature at the barrier face at the time of impact was 21.9°C. The target vehicle post-test maximum crush was 480 mm located to the left of vehicle centerline. The test vehicle's performance was as follows:																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>15</sub>)</td> <td></td> <td>700</td> <td>165</td> <td>700</td> <td>202</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>30</td> <td>52</td> <td>18</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.31</td> <td>1</td> <td>0.60</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1223</td> <td>2620</td> <td>1251</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>210</td> <td>2520</td> <td>325</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>1417</td> <td>6805</td> <td>1010</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>1189</td> <td>6805</td> <td>969</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC <sub>15</sub> )		700	165	700	202	Maximum Chest Compression	mm	63	30	52	18	Nij		1	0.31	1	0.60	Neck Tension	N	4170	1223	2620	1251	Neck Compression	N	4000	210	2520	325	Left Femur Force	N	10008	1417	6805	1010	Right Femur Force	N	10008	1189	6805	969
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<b>17. Key Words</b>  35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)			<b>18. Distribution Statement</b> Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																																																						
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## **SECTION 1 PURPOSE AND SUMMARY OF TEST**

### **PURPOSE**

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number 693JJ919D000006. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact was conducted in accordance with the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing.

### **SUMMARY**

A load cell barrier consisting of 176 load cells was impacted by a 2021 Toyota C-HR LE 5-Door Hatchback at a velocity of 56.51 km/h. The test was performed at MGA Research Corporation on February 3, 2021. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were installed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading.

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

The 634 channels of data were recorded on a data acquisition system. Appendix B contains the dummy response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard Solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 480 mm located to the left of 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:

<b>ATD position</b>	<b>HIC<sub>15</sub></b>	<b>Nij</b>	<b>Neck Tension (N)</b>	<b>Neck Comp. (N)</b>	<b>3ms Chest Clip (g)</b>	<b>Chest Disp. (mm)</b>	<b>Left Femur (N)</b>	<b>Right Femur (N)</b>
Driver (50 <sup>th</sup> )	165	0.31	1223	210	39.8	30	1417	1189
Passenger (5 <sup>th</sup> )	202	0.60	1251	325	47.7	18	1010	969

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

### **TEST NOTES**

Driver Shoulder Belt load cell was not installed.

Driver Lap Belt load cell was not installed.

Passenger Shoulder Belt load cell was not installed.

Passenger Lap Belt load cell was not installed.

Barrier C-01 Fx recorded questionable data.

Barrier C-02 My recorded no valid data.

Barrier I-05 My recorded questionable data.

Barrier K-15 My recorded no valid data.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

**SECTION 2**  
**OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS**

**DATA SHEET NO. 1  
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	O20215103	Traction Control System (TCS)	Yes
Model Year	2021	Power Steering	Yes
Make	Toyota	Power Window Auto-Reverse	Yes
Model	C-HR LE	Driver Frontal Airbag	Yes
Body Style	5-Door Hatchback	Driver Curtain Airbag	Yes
VIN	JTNKHMBX4M1100147	Driver Head/Torso Airbag	No
Body Color	Oxide Bronze Metallic	Driver Torso Airbag	No
Odometer (km/mi)	204 km / 127 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.0 L	Driver Pelvis Airbag	No
Type/No. Cylinders	Inline 4	Driver Knee Airbag	Yes
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	CVT	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	FWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Front Pass. Knee Airbag	No
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)	No	Front Pass. Seat Cushion Airbag	Yes

Does owner's manual provide instructions to turn off automatic door locks?	N/A
--	-----

**DATA FROM CERTIFICATION LABEL**

Manufactured By	TOYOTA MOTOR CORPORATION	GVWR (kg)	1960
		GAWR Front (kg)	1050
Date of Manufacture	09/20	GAWR Rear (kg)	1075

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

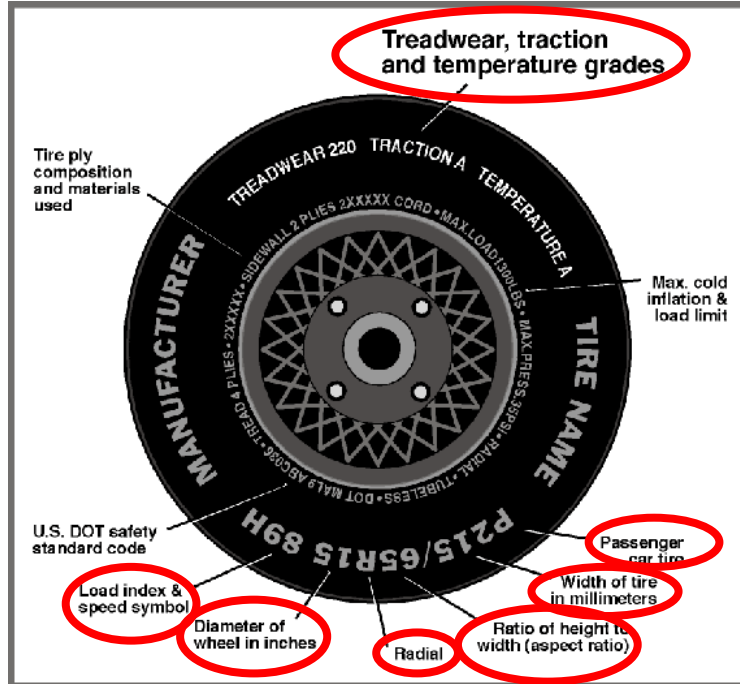
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contoured		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				375
Cargo Weight (RCLW) (kg)				33

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**VEHICLE TIRE INFORMATION**



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	215/60R17	215/60R17
Tire Size on Vehicle	215/60R17	215/60R17
Tire Manufacturer	Continental	Continental
Tire Model	ProContact	ProContact
Treadwear	500	500
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	96H	96H
Tire Material	Rubber	Rubber
DOT Safety Code Left	6YKT WCOF 0820	6YKT WCOF 0820
DOT Safety Code Right	6YKT WCOF 0820	6YKT WCOF 0820

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	446.0	302.5		483.5	356.5	
Right	kg	452.0	277.5		490.0	316.0	
Ratio	%	60.8%	39.2%		59.1%	40.9%	
Totals	kg	898.0	580.0	1478.0	973.5	672.5	1646.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1478.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	33
Calculated Test Vehicle Target Weight (TVT <sub>W</sub> )	kg	1652.0

**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	740	738	783	786	1040
As Tested	mm	725	728	727	737	1083
Post Test	mm	675	795	697	775	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2650
Total Vehicle Length at Left Side	mm	4205
Total Vehicle Length at Centerline	mm	4370
Total Vehicle Length at Right Side	mm	4205
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	30
Amount of Stoddard Solvent in Fuel Tank	L	45.8

List of components removed to meet test weight: Rear hatch trim, LR/RR headrest, LR taillight.

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

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	4370
2	Total Width	1798
3	Bumper Top Height	568
4	Bumper Bottom Height	444
5	Longitudinal Member Top Height	579
6	Distance between Longitudinal Members	920
7	Longitudinal Member Width	70
8	Engine Top Height	891
9	Engine Bottom Height	260
10	Engine and Gearbox Width	774
11	Front Bumper-Engine Distance	N/A
12	Front Shock Absorber Fixing Height	N/A
13	Bonnet Leading Edge Height	839
14	Front Shock Absorber Fixing Width	N/A
15	Front Bumper – Front Axle Distance	944
16	Front Axle – A-Pillar Distance	420
17	A-Pillar – B-Pillar Distance	1102
18	B-Pillar – Rear Axle Distance	1092
19	B-Pillar – C-Pillar Distance	641
20	Roof Sill Bottom Height	1422
21	Roof Sill Top Height	1490
22	Floor Sill Bottom Height	259
23	Floor Sill Top Height	372

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

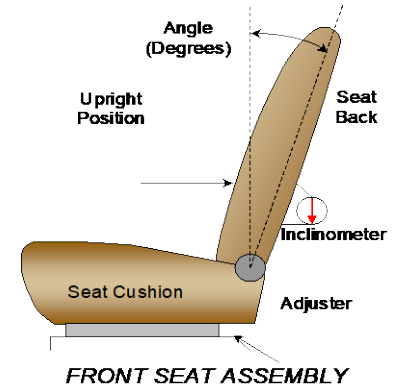
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NHTSA No.: O20215103  
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**NOMINAL DESIGN RIDING POSITION**

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

	Degrees
Driver Seat Back Angle	3.3° on outboard headrest post
Passenger Seat Back Angle	1.8° on outboard headrest post



**SEAT FORE/AFT POSITIONS**

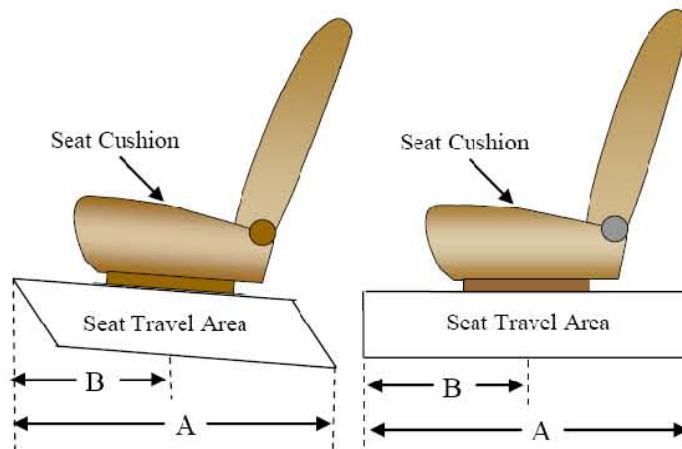
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated May 2018.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	294 mm / 27 detents (1 <sup>st</sup> as 1)	147 mm / 11 <sup>th</sup> detent (1 <sup>st</sup> as 0)
Passenger Seat	260 mm / 27 detents (1 <sup>st</sup> as 1)	0 mm / 0 <sup>th</sup> detent (1 <sup>st</sup> as 0)

**SEAT BELT UPPER ANCHORAGES**

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

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





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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

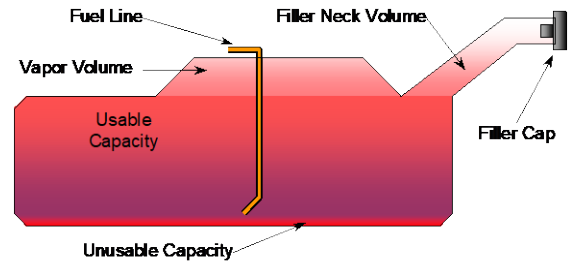
NHTSA No.: O20215103  
 Test Date: 2/3/2021

**FUEL TANK CAPACITY DATA**

	<b>Liters</b>
Usable Capacity of "Standard Tank"	49.2
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	45.3 to 46.2
Actual Amount of Solvent used	45.8
1/3 of Usable Capacity	16.4

**FUEL PUMP**

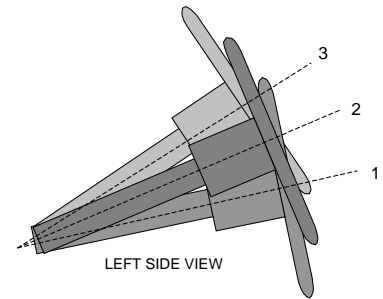
The vehicle is equipped with an electronic fuel pump. The fuel pump is activated when the ignition is turned on. The filler neck is located on the driver's side.



VEHICLE FUEL TANK ASSEMBLY

**STEERING COLUMN ADJUSTMENT**

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



STEERING COLUMN ASSEMBLY

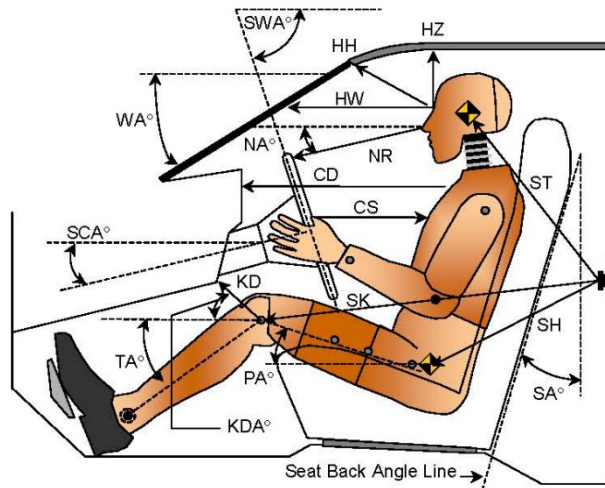
**STEERING COLUMN POSITION**

	<b>Degrees</b>	<b>Fore/Aft Position (mm)</b>
Lowermost Position 1	69.4	
Geometric Center Position 2	67.4	
Uppermost Position 3	65.4	
Telescoping Steering Wheel Travel		38
Test Position	67.4	19

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021



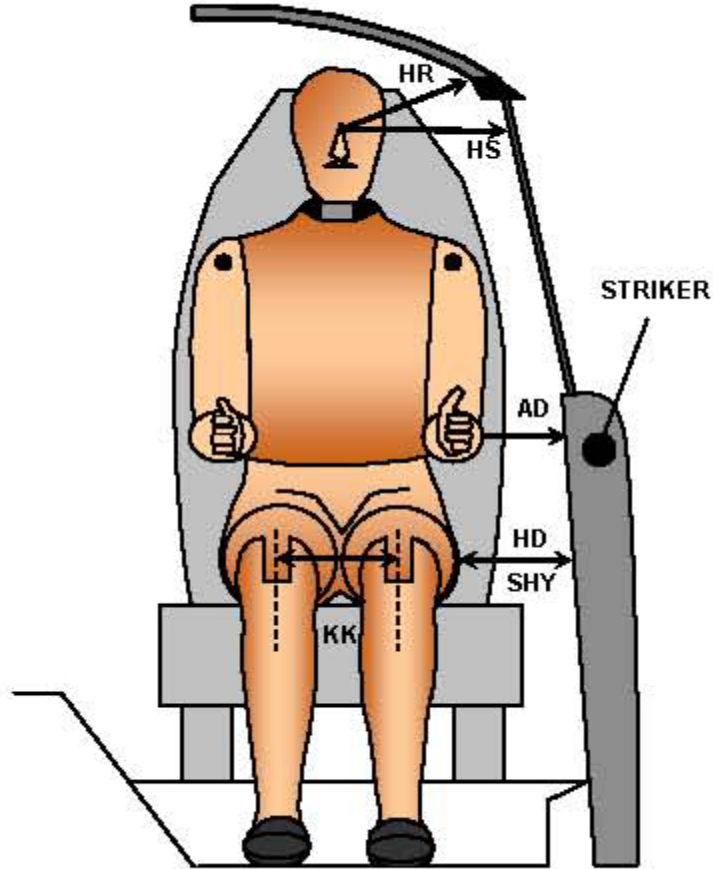
**LEFT SIDE VIEW**

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		21.4		
SWA°	Steering Wheel Angle		67.4		
SCA°	Steering Column Angle		22.6		
SA°	Seat Back Angle		3.3		1.8
HZ	Head to Roof (Z)	208	90	240	90
HH	Head to Header	385	22.3	332	38.3
HW	Head to Windshield	697	0	704	0
NR	Nose to Rim	374	11.0		
CD	Chest to Dash	490		327	
CS	Chest to Steering Hub	295	10.3		
RA	Rim to Abdomen	188	0		
KDL	Left Knee to Dash	162	28.1	77	37.0
KDR	Right Knee to Dash	158	30.2	90	36.1
PA°	Pelvic Angle		22.4		20.1
TA°	Tibia Angle		52.2		56.6
SK	Striker to Knee	585	102.8	681	102.4
ST	Striker to Head	402	18.0	402	37.2
SH	Striker to H-Point	363	142.7	400	121.9

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

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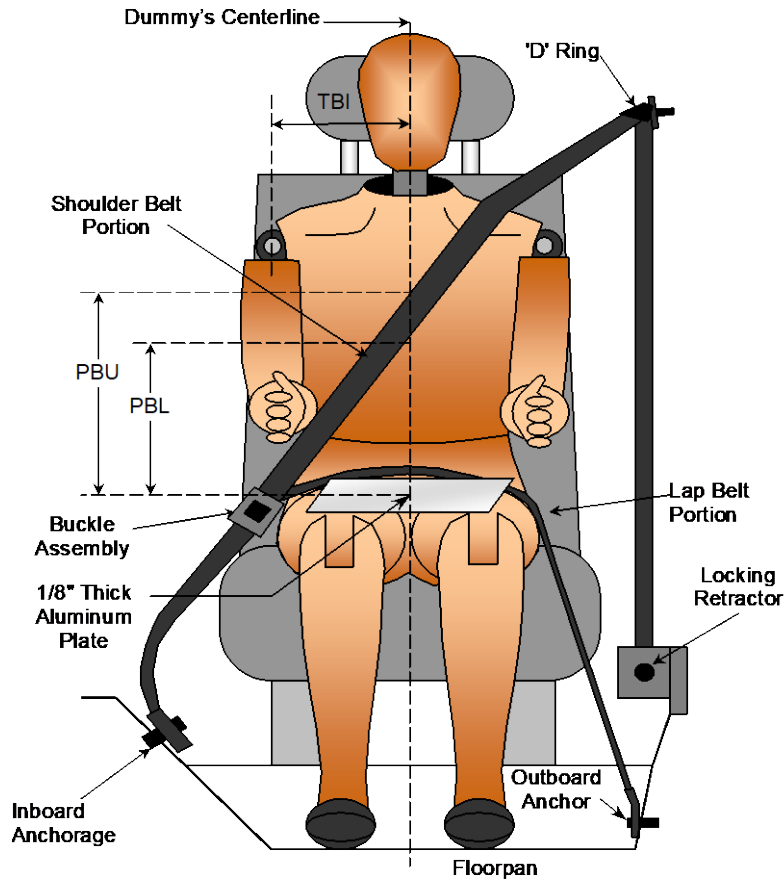
**FRONT VIEW OF DUMMY**

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	115	108
HD	H-Point to Door	139	175
HR	Head to Side Header	198	236
HS	Head to Side Window	333	340
KK	Knee to Knee	385	226
SHY	Striker to H-Point (Y Direction)	275	319
AA	Ankle to Ankle	375	161

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021



**FRONT VIEW OF DUMMY**

**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	360	335
PBL - Top surface of reference to belt lower edge	mm	290	250

**BELT LENGTH DATA**

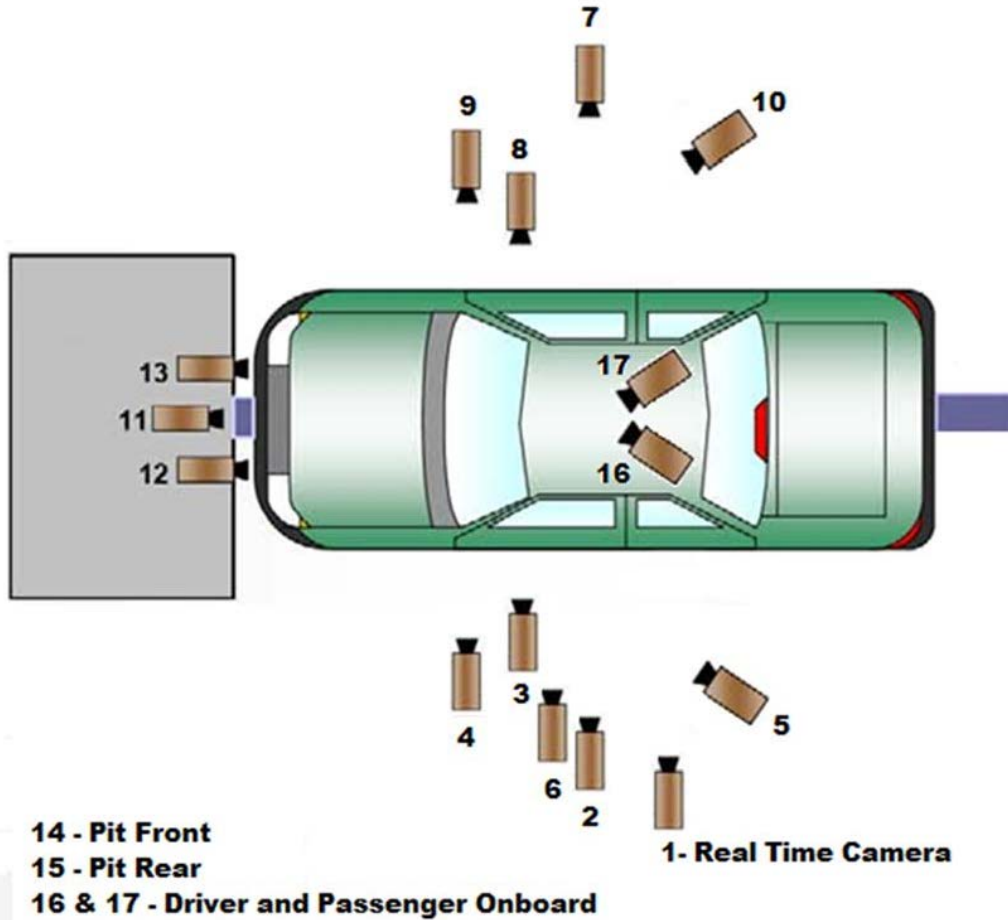
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	890	930
Lap Belt Length as measured on ATD	mm	740	840
Remainder of belt on reel	mm	980	840
Total Belt Length for Continuous Webbing Systems	mm	3410	3410

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
Test Date: 2/3/2021

**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: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**CAMERA LOCATIONS**

No.	Camera View	Coordinates* (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall					30
2	Left Overall	-2060	-5570	-1310	12	1000
3	Driver Close-Up	-1560	-6770	-1800	50	1000
4	Left Front Half	-1290	-5240	-1240	24	1000
5	Left Angle	-7270	-5870	-1990	75	1000
6	Steering Column	-1010	-5480	-1260	50	1000
7	Right Overall	-1850	5500	-1270	12	1000
8	Passenger Close-Up	-1500	6770	-1850	50	1000
9	Right Front Half	-1040	5250	-1230	24	1000
10	Right Angle	-7440	5570	-1960	75	1000
11	Windshield	130	0	-2310	12	1000
12	Driver Windshield	180	-370	-2230	25	1000
13	Passenger Windshield	180	370	-2230	25	1000
14	Pit Front	-930	0	3340	24	1000
15	Pit Rear	-3100	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

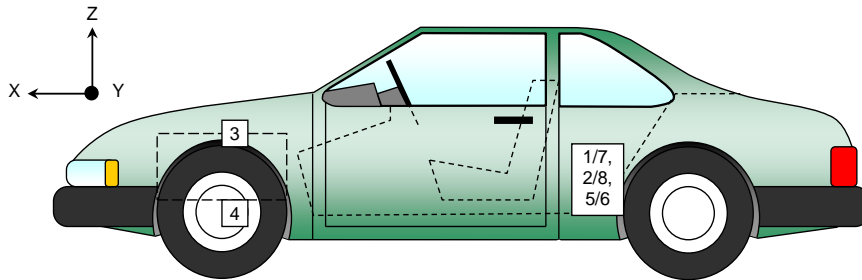
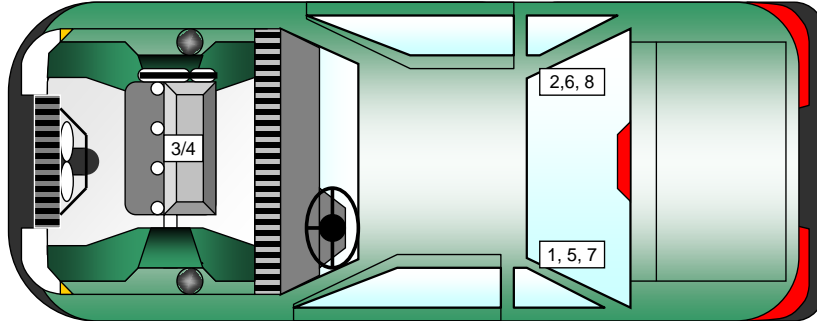
+Y = right of monorail centerline

+Z = below ground level

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021



**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1638	-360	-322
2	Right Rear Crossmember Accelerometer – X Direction	1638	360	-325
3	Engine Top X	3662	0	-891
4	Engine Bottom X	3709	0	-268
5	Left Rear Crossmember Accelerometer – Z Direction	1638	-360	-322
6	Right Rear Crossmember Accelerometer – Z Direction	1638	360	-325
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1638	-385	-322
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1638	385	-325

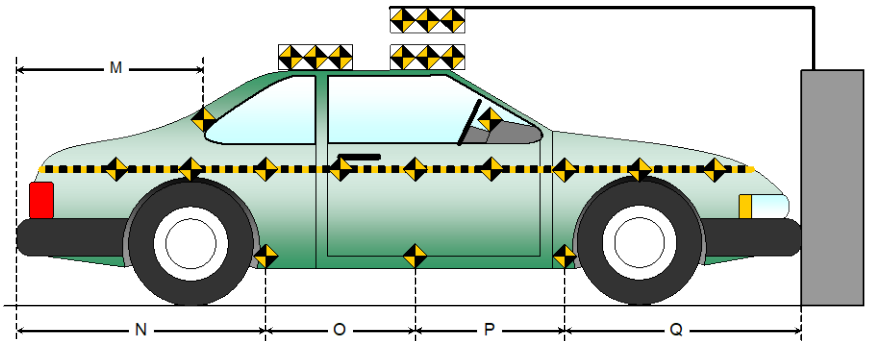
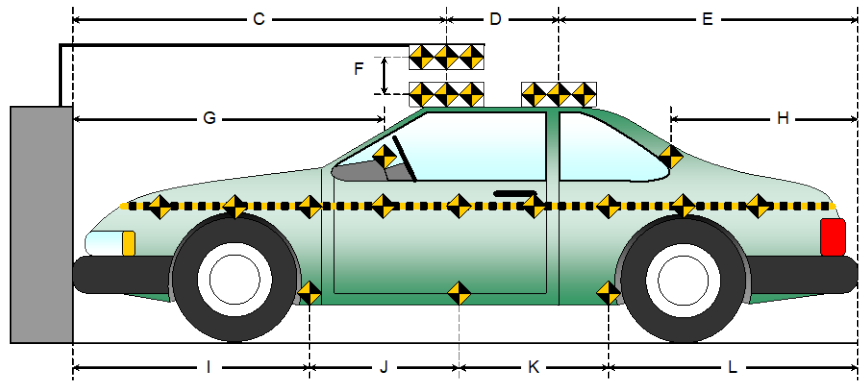
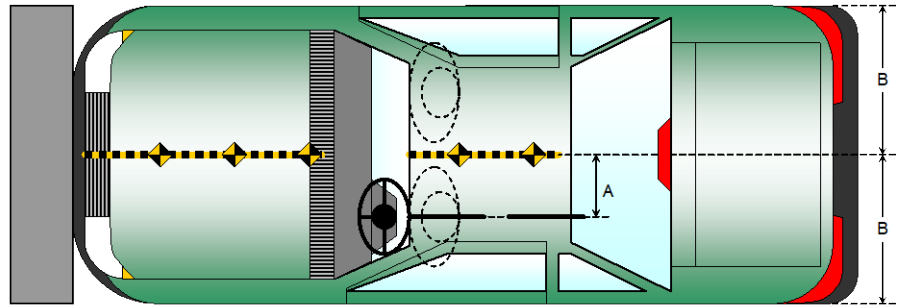
Reference Points: X - Rear Surface of Vehicle (+ forward)  
 Y - Vehicle Centerline (+ to right)  
 Z - Ground Plane (+ down)

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

Item	Value (mm)
A	355
B	899
C	2305
D	610
E	1455
F	130
G	
H	883
I	1398
J	865
K	865
L	1242
M	883
N	1242
O	865
P	865
Q	1398





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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**ADVANCED RESEARCH LOAD CELL BARRIER**

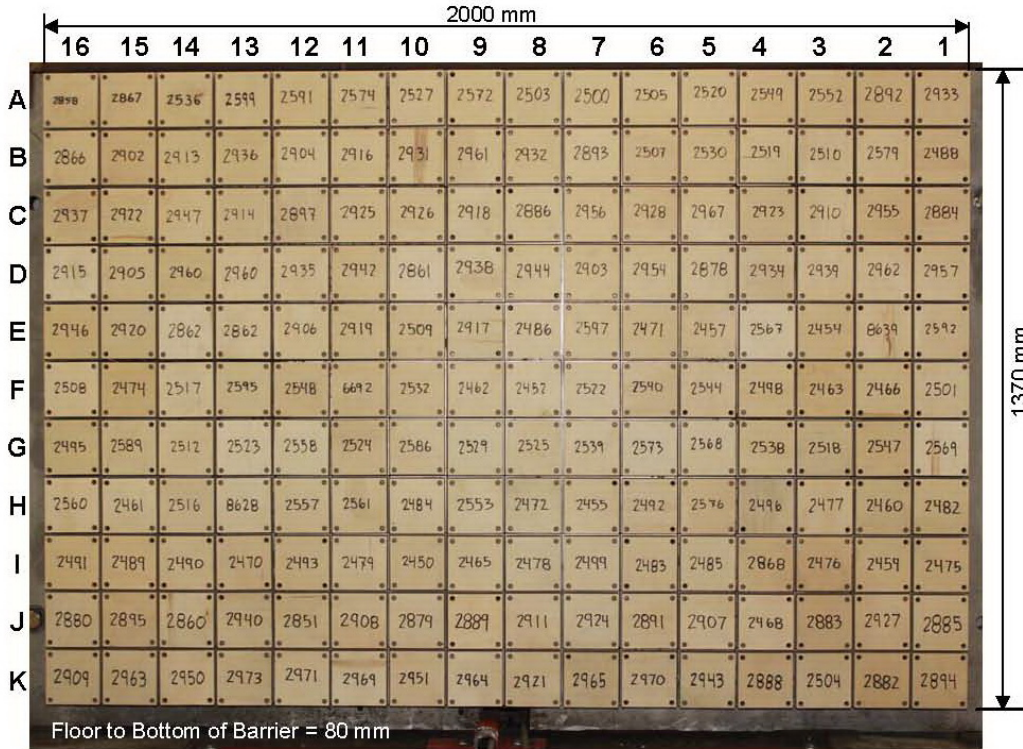


Photo for Reference Only

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: 2021 Toyota C-HR LE 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
Test Date: 2/3/2021

**INSTRUMENTATION**

<b>Instrumentation</b>	<b>Number of Channels Collected</b>
Driver Dummy Data Channels	49
Passenger Dummy Data Channels	49
Vehicle Structure Accelerometers	8
Barrier Channels	528
Total	634

**CAMERA COVERAGE**

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

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 351	HIII 5% / 634
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 unlocked	Doors were unlocked
Front Door Opening	Remained closed and unlocked; opened without tools	Remained closed and unlocked; opened without tools
Rear Door Opening	Remained closed and unlocked; opened without tools	Remained closed and unlocked; opened without tools
Trunk/Hatch/Tailgate Opening	Remained closed; opened without tools	
Seat Track Shift (mm)	0	0
Seat Back Movement	None	None

**OTHER VEHICLE POST-TEST OBSERVATIONS**

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Cracked by passenger frontal airbag deployment
Window Damage	None
Other Notable Effects	None

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	970
Center	mm	822
Right Side	mm	927
Average	mm	906

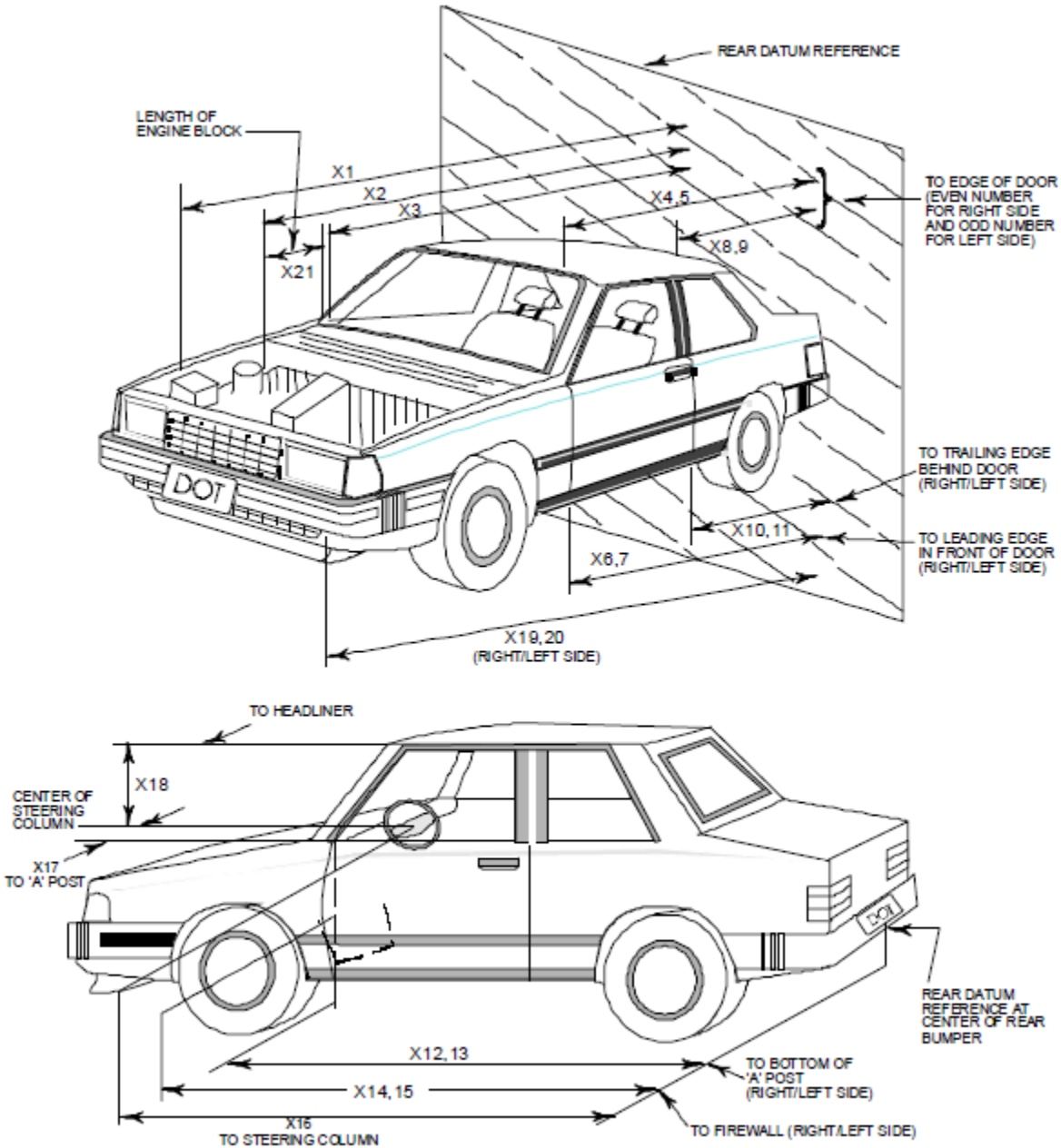
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

## DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021



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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
Test Date: 2/3/2021

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4370	3922	448
2	RSOV to Front of Engine	3876	3684	192
3	RSOV to Firewall	3405	3350	55
4	RSOV to Upper Leading Edge of Right Door	2945	2948	-3
5	RSOV to Upper Leading Edge of Left Door	2945	2952	-7
6	RSOV to Lower Leading Edge of Right Door	2936	2917	19
7	RSOV to Lower Leading Edge of Left Door	2936	2919	17
8	RSOV to Upper Trailing Edge of Right Door	1860	1857	3
9	RSOV to Upper Trailing Edge of Left Door	1860	1857	3
10	RSOV to Lower Trailing Edge of Right Door	1881	1856	25
11	RSOV to Lower Trailing Edge of Left Door	1881	1887	-6
12	RSOV to Bottom of "A" Post of Right Side	2932	2927	5
13	RSOV to Bottom of "A" Post of Left Side	2932	2925	7
14	RSOV to Firewall, Right Side	3462	3433	29
15	RSOV to Firewall, Left Side	3464	3430	34
16	RSOV to Steering Column	2470	2582	-112
17	Center of Steering Column to "A" Post	374	363	11
18	Center of Steering Column to Headliner	432	445	-13
19	RSOV to Right Side of Front Bumper	4205	3835	370
20	RSOV to Left Side of Front Bumper	4205	3788	417
21	Length of Engine Block	505	505	0
RD	RSOV to Right Side of Dash Panel	2620	2711	-91
CD	RSOV to Center of Dash Panel	2686	2704	-18
LD	RSOV to Left Side of Dash Panel	2721	2730	-9

All Dimensions in mm

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

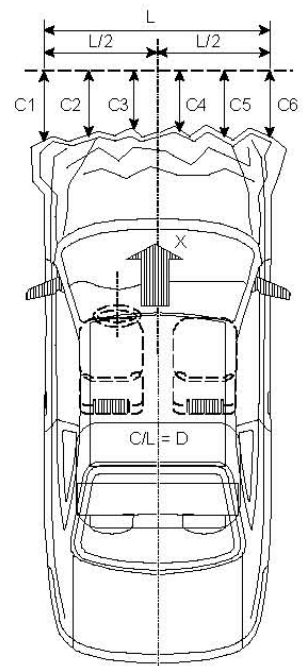
NHTSA No.: O20215103  
Test Date: 2/3/2021

**VEHICLE INFORMATION**

VIN:	<u>JTNKHMBX4M1100147</u>	Wheelbase (mm):	<u>2650</u>
Vehicle Size Category:	<u>Passenger Car</u>	Test Weight (kg):	<u>1646.0</u>

**ACCELEROMETER DATA**

Accelerometer Locations:	<u>As per Data Sheet No. 7</u>
Cal. Procedure/Interval:	<u>MGA Procedure / 6 month</u>
Integration Algorithm:	<u>Trapezoidal</u>
Linearity:	<u>&gt; 99%</u>
Impact Velocity (km/h):	<u>56.51</u>
Velocity Change (km/h):	<u>65.5</u>
Time of Separation (msec)	<u>84</u>



**CRUSH PROFILE**

Collision Deformation Classification:	<u>12FDEW3</u>
Midpoint of Damage:	<u>Centerline</u>
Damage Region Length (mm):	<u>1328</u>
Impact Mode:	<u>Frontal</u>

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4205	3788	417
C2	Crush zone 2 at left side	mm	4319	3844	475
C3	Crush zone 3 at left side	mm	4362	3882	480
C4	Crush zone 4 at right side	mm	4362	3906	456
C5	Crush zone 5 at right side	mm	4319	3886	433
C6	Crush zone 6 at right side	mm	4205	3835	370
L	C1 TO C6	mm	1328	1320	8

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
Test Program: NCAP Frontal Barrier Impact Test

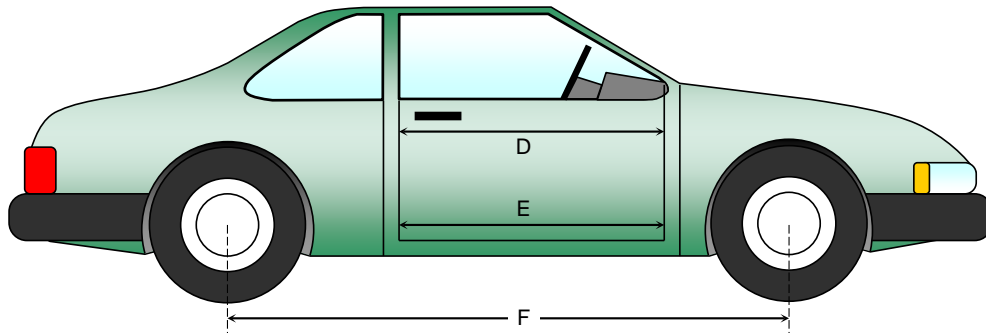
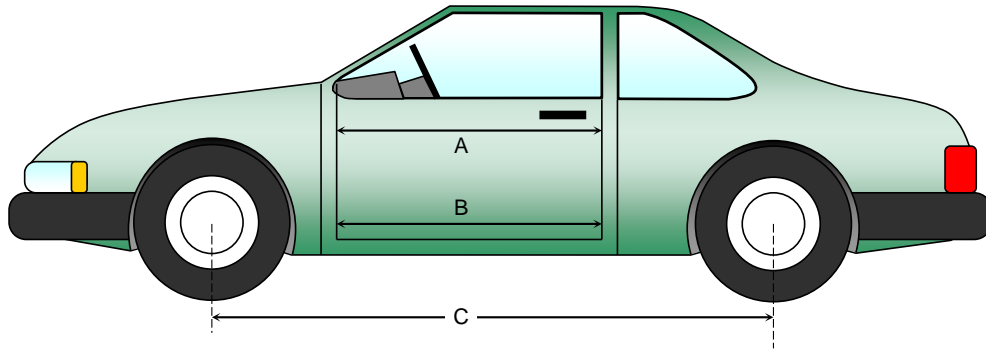
NHTSA No.: O20215103  
Test Date: 2/3/2021

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1003	1003	0
B	Left Side Lower	mm	785	785	0
D	Right Side Upper	mm	1002	1002	0
E	Right Side Lower	mm	801	801	0

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2650	2562	88
F	Right Side Wheelbase	mm	2650	2580	70



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

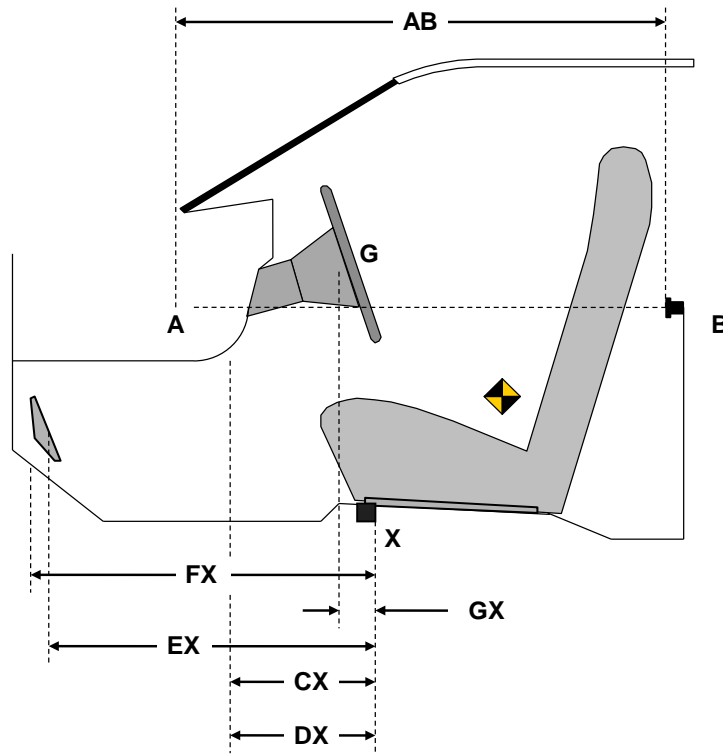
Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	762	762	0
CX	Left Knee Bolster to X	mm	322	338	-16
DX	Right Knee Bolster to X	mm	339	332	7
EX	Brake Pedal to X	mm	519	473	46
FX	Foot Rest to X	mm	549	545	4
GX	Center of Steering Column Wheel Hub to X	mm	41	109	-68

X = Front of Seat Track (stationary)



**DRIVER COMPARTMENT**



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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**WINDSHIELD MOUNTING DETAILS**

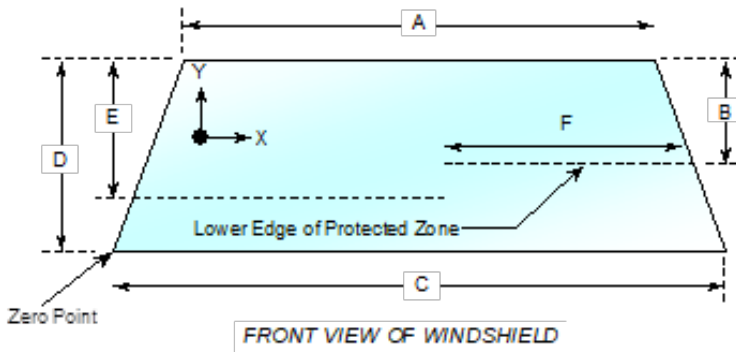
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.9°C.

**WINDSHIELD PERIPHERY MEASUREMENTS**

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	3440	3440	100
Right Side	3440	3440	100
Total	6880	6880	100



Item	Units	Value
A	mm	1132
B	mm	520
C	mm	1470
D	mm	838
E	mm	568
F	mm	488

**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: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

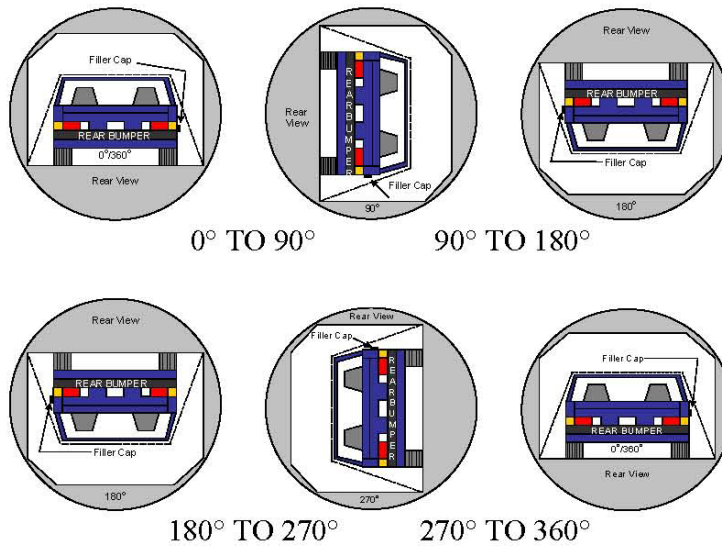
**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA**

Temperature at Time of Impact: 21.9°C

Test Time: 11:04 a.m.

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

**FMVSS 301 STATIC ROLLOVER RESULTS**



1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage: **None**

**SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	111	300	411
90° to 180°	110	300	410
180° to 270°	107	300	407
270° to 360°	110	300	410

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

Test Vehicle: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021

**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	

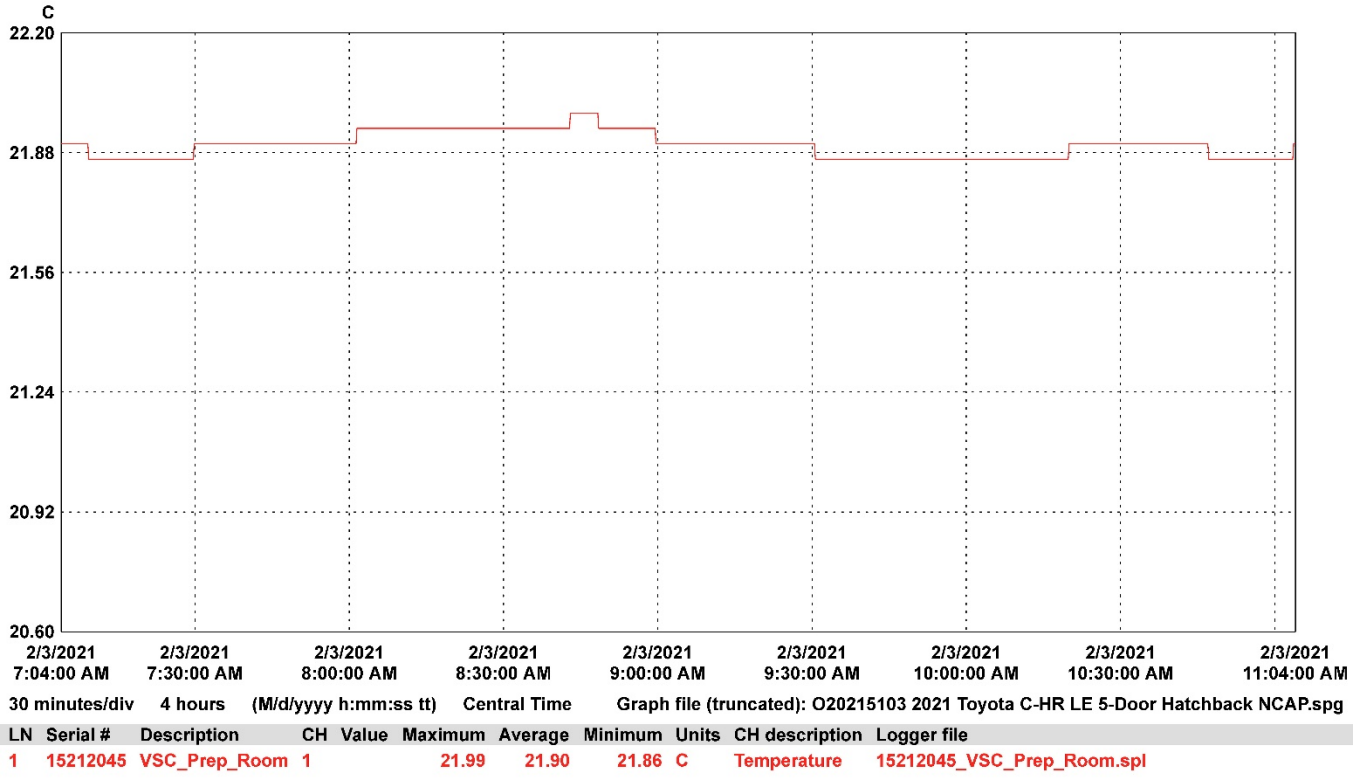
**SOLVENT SPILLAGE LOCATION TABLE**

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: 2021 Toyota C-HR LE 5-Door Hatchback  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20215103  
 Test Date: 2/3/2021



**APPENDIX A  
PHOTOGRAPHS**

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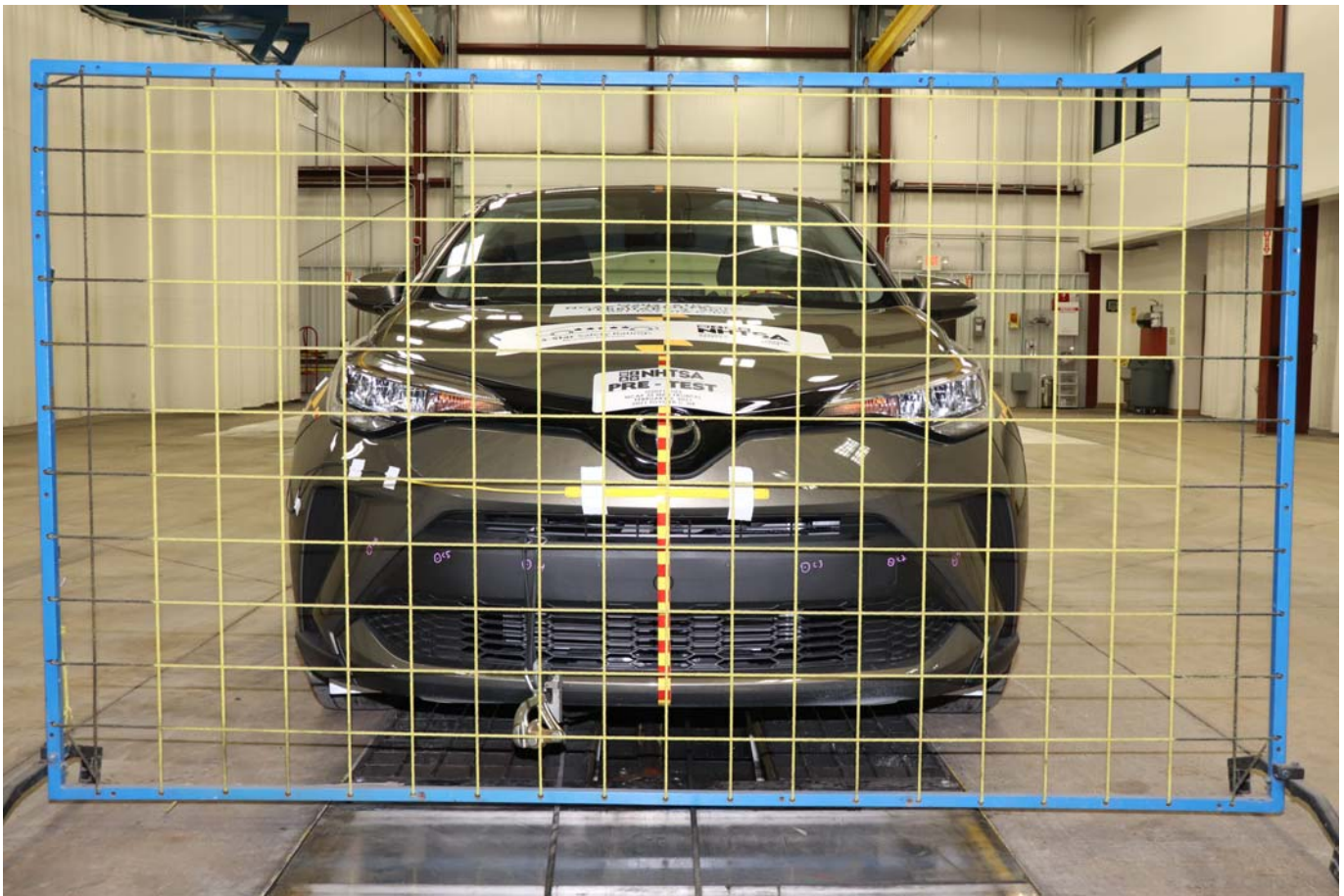


Photo No. 001 - Load Cell Location



Photo No. 002 - Pre-Test Load Cell Wall





Photo No. 003 - Post-Test Load Cell Wall



Photo No. 004 - Manufacturer Label



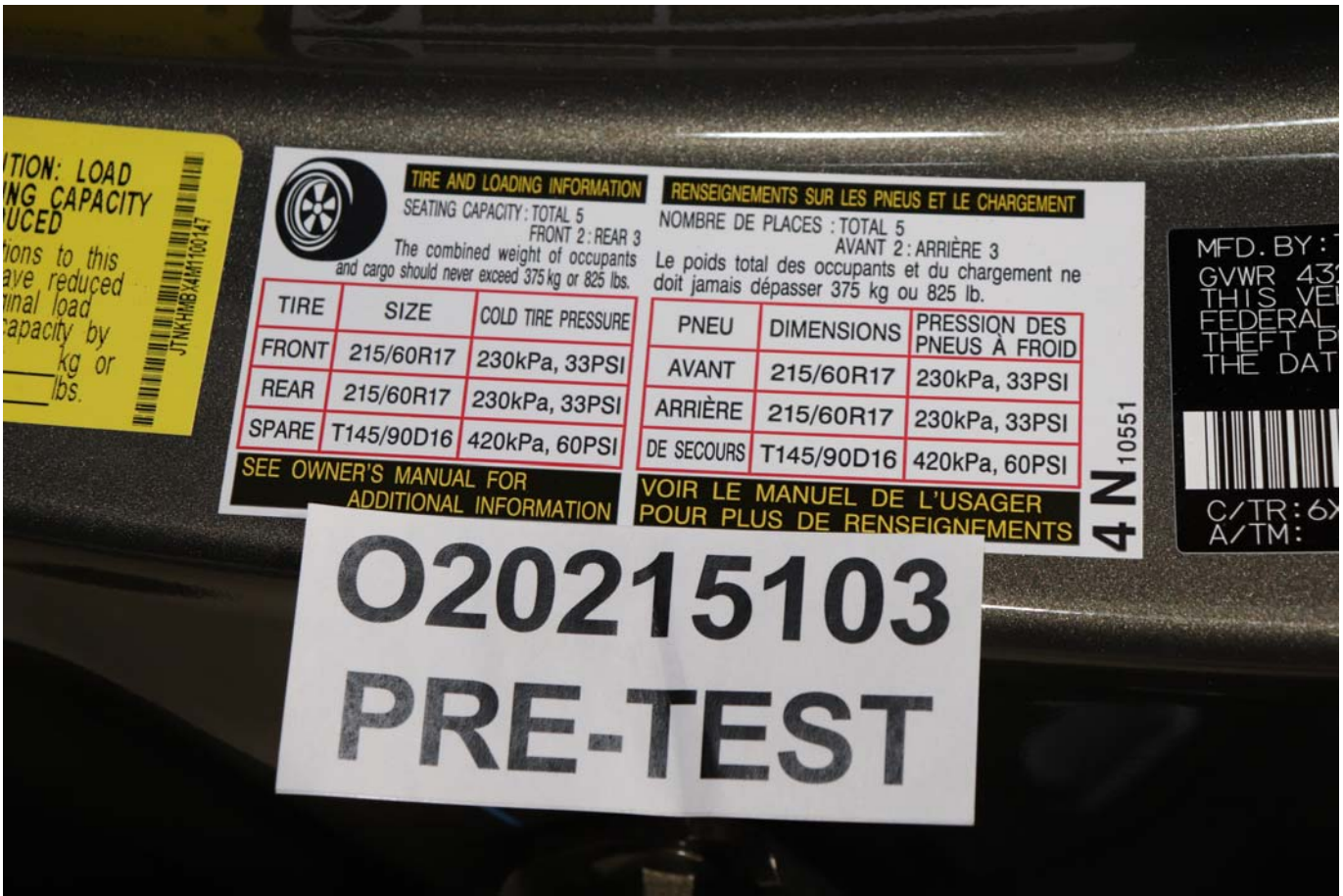


Photo No. 005 - Tire Placard

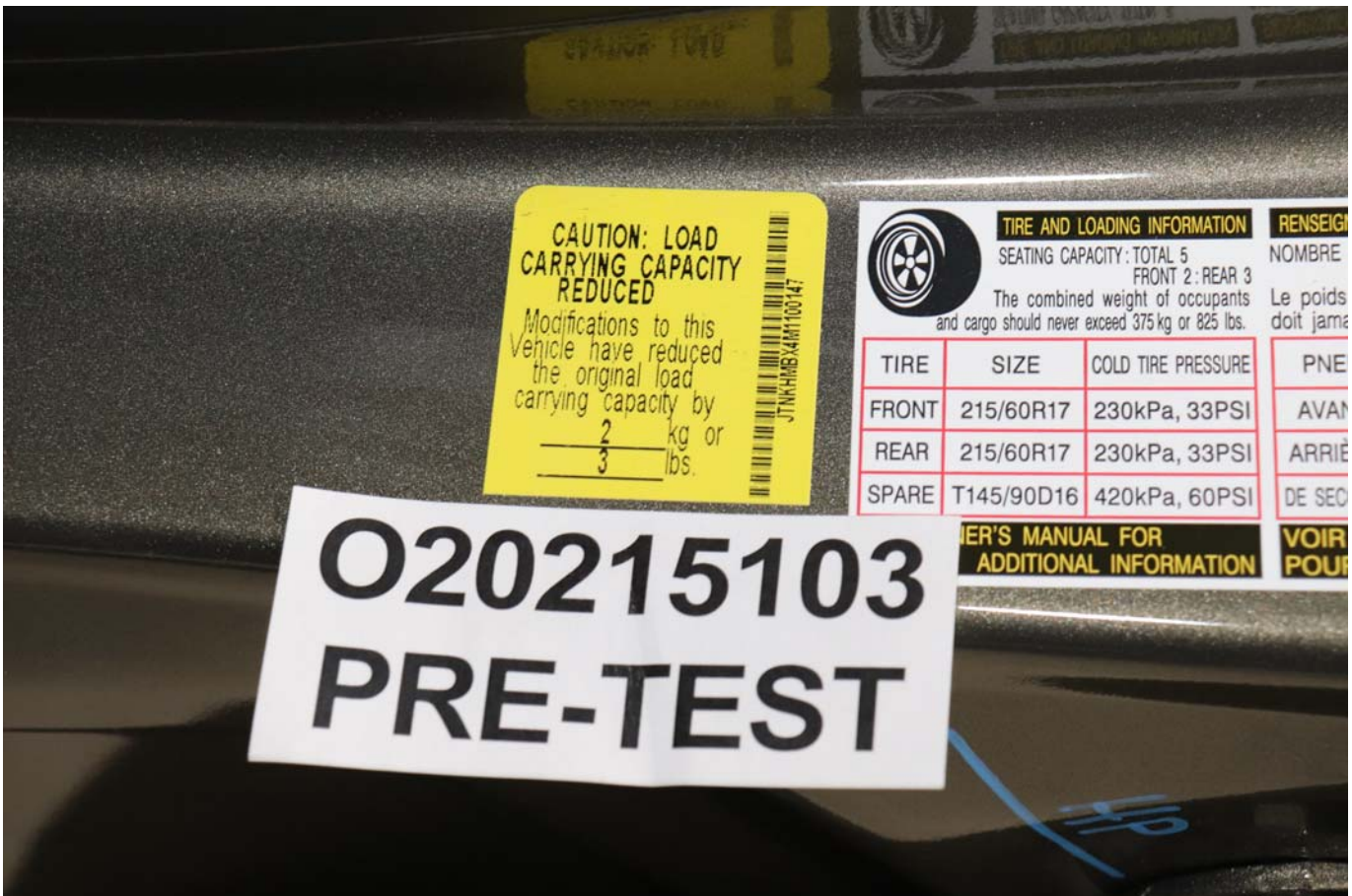


Photo No. 005a - Vehicle Load Carrying Capacity Reduction Label





Photo No. 006 - 2021 Toyota C-HR LE 5-Door Hatchback Frontal As Delivered



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



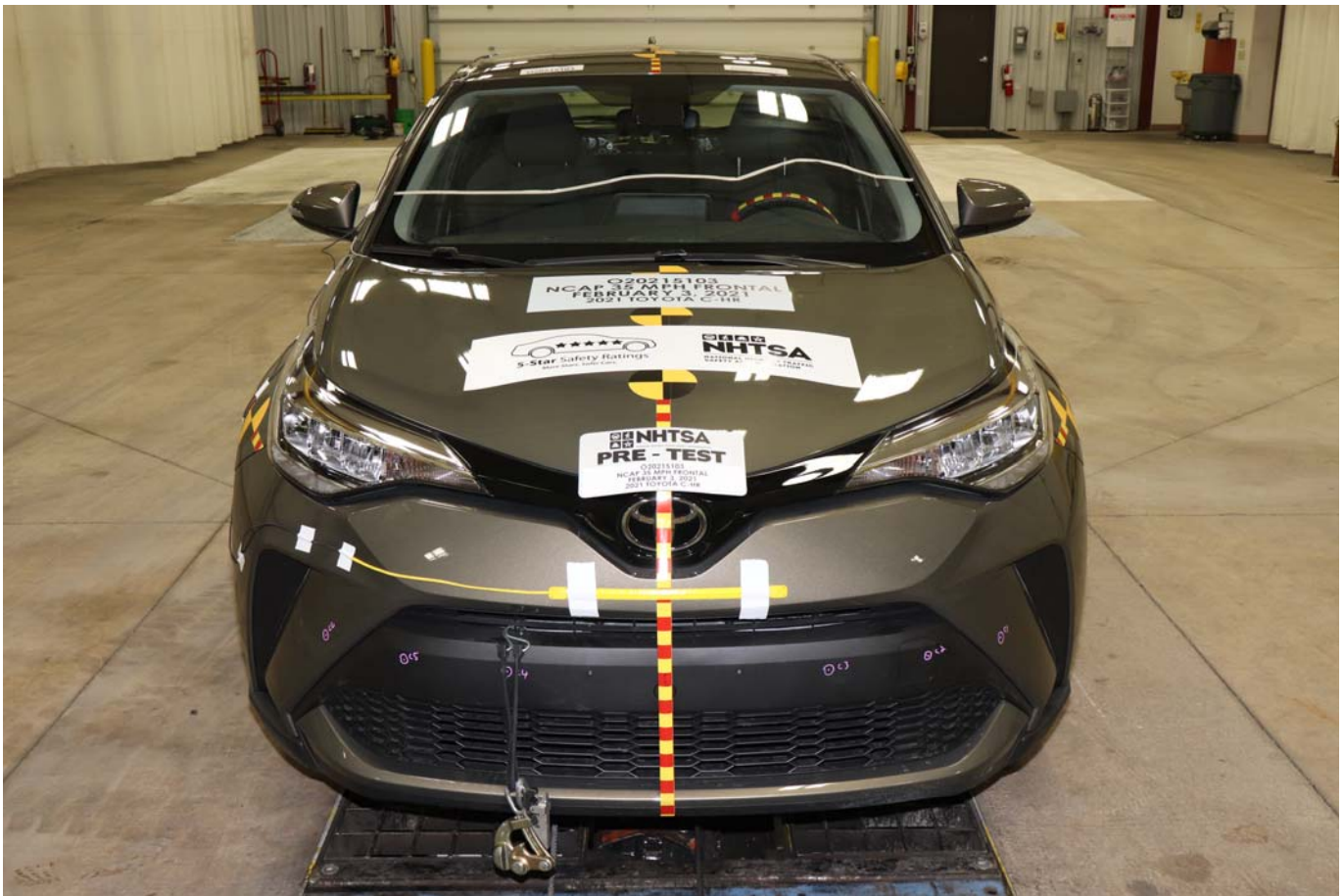


Photo No. 008 - Pre-Test Front View of Test Vehicle

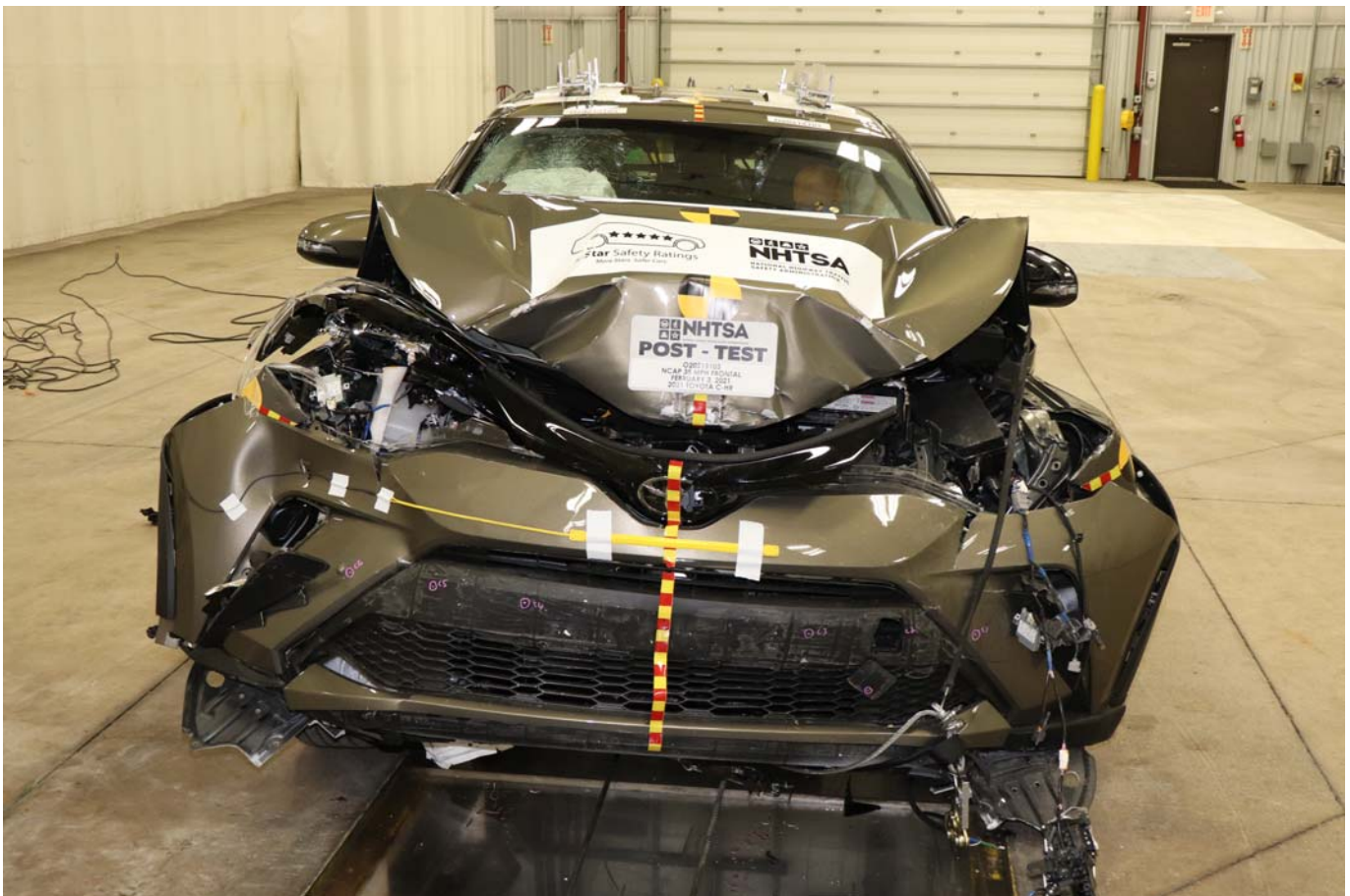


Photo No. 009 - Post-Test Front View of Test Vehicle





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



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





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



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



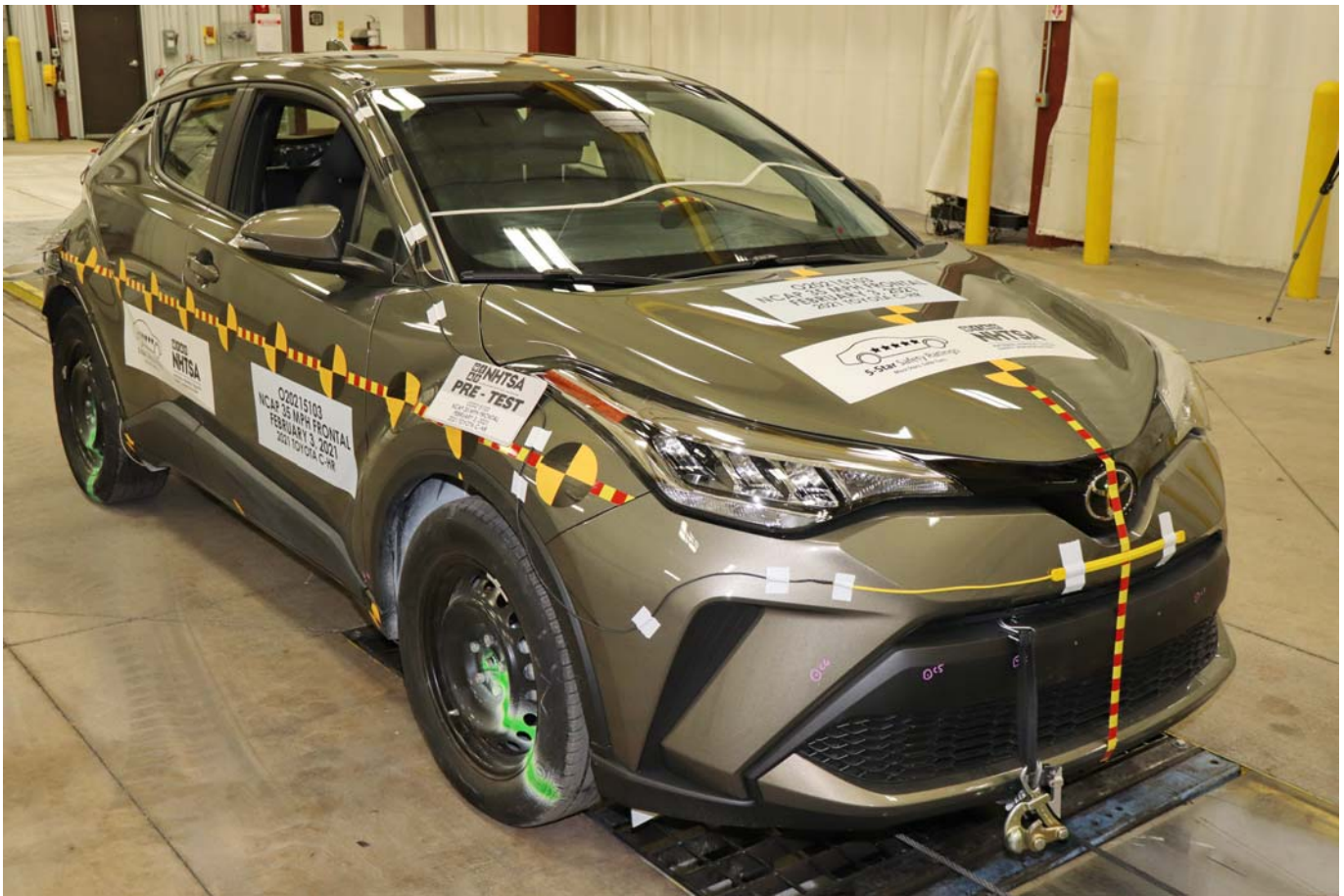


Photo No. 014 - Pre-Test Right Front 3-4 View

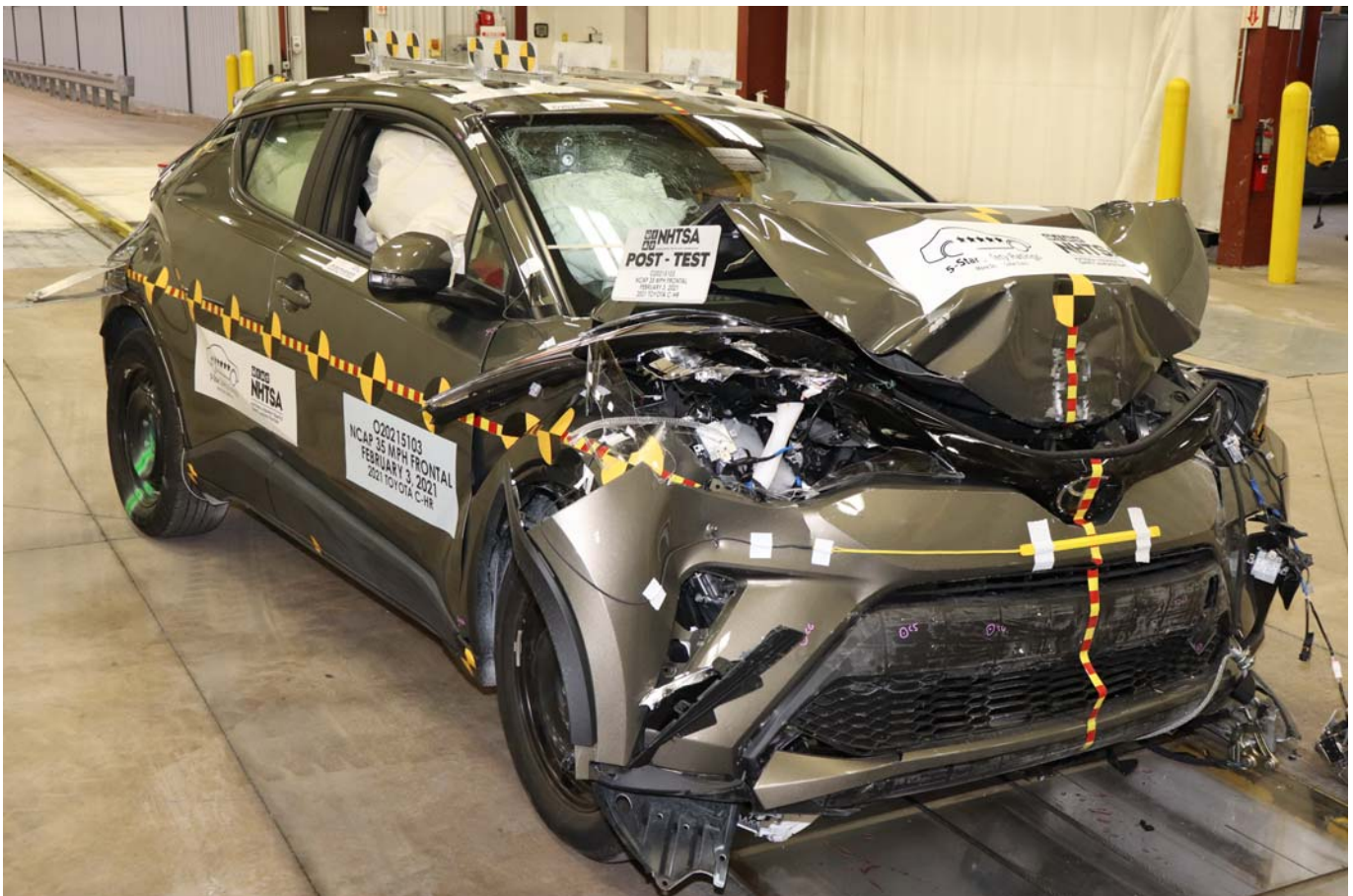


Photo No. 015 - Post-Test Right Front 3-4 View





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



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





Photo No. 018 - Pre-Test Windshield View



Photo No. 019 - Post-Test Windshield View





Photo No. 020 - Pre-Test Engine Compartment View

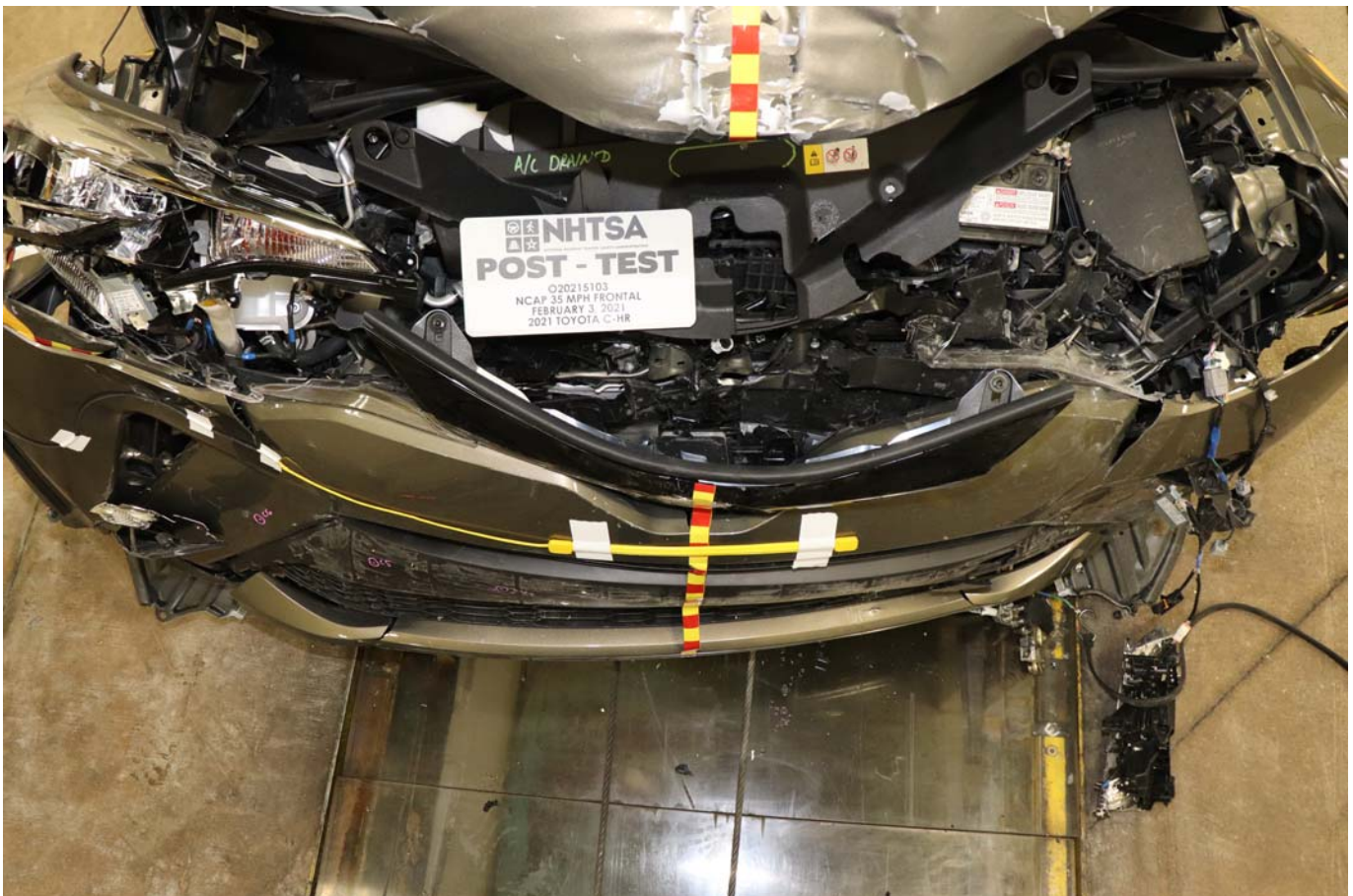


Photo No. 021 - Post-Test Engine Compartment View





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

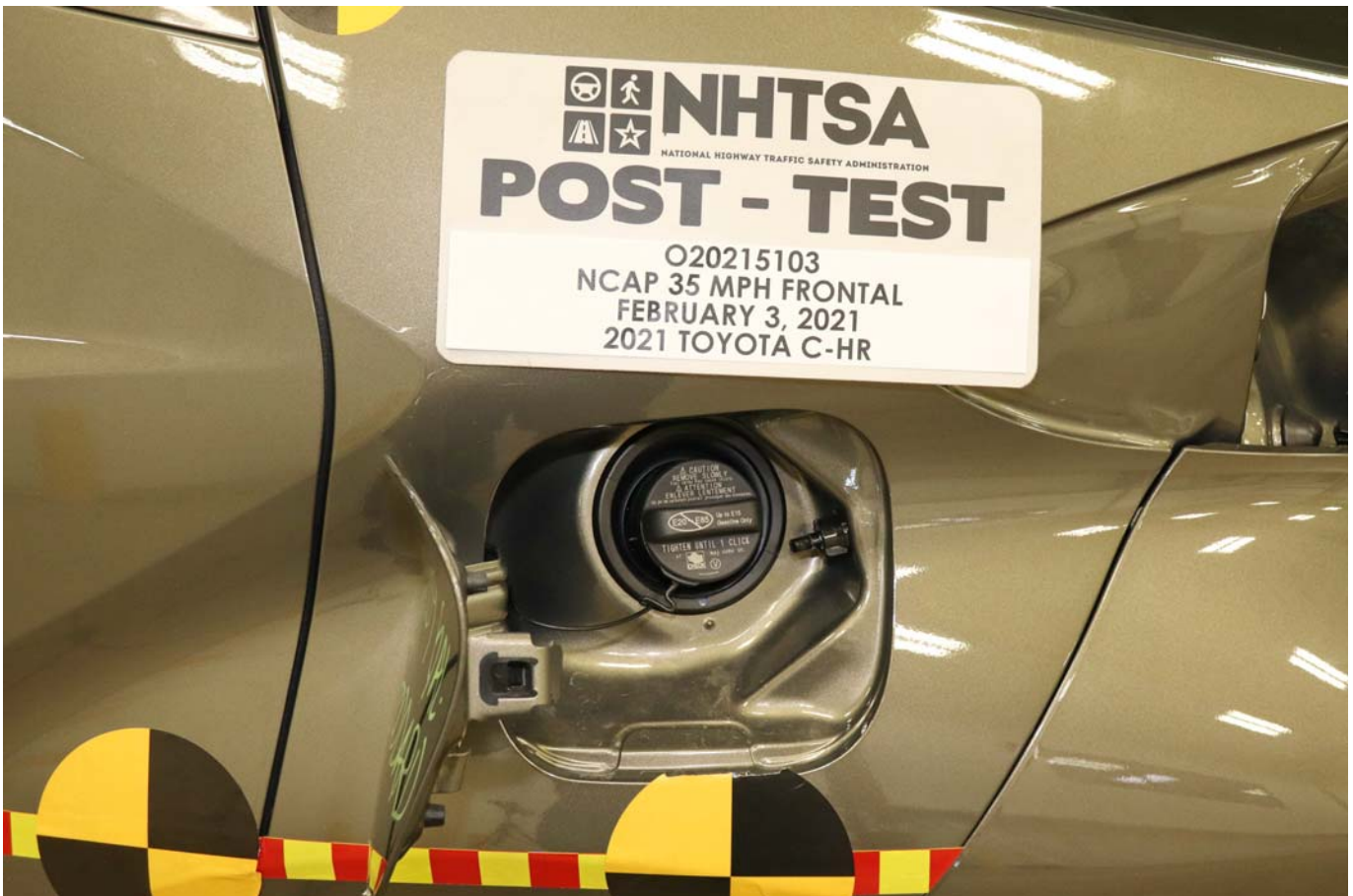


Photo No. 023 - Post-Test Fuel Filler Cap View



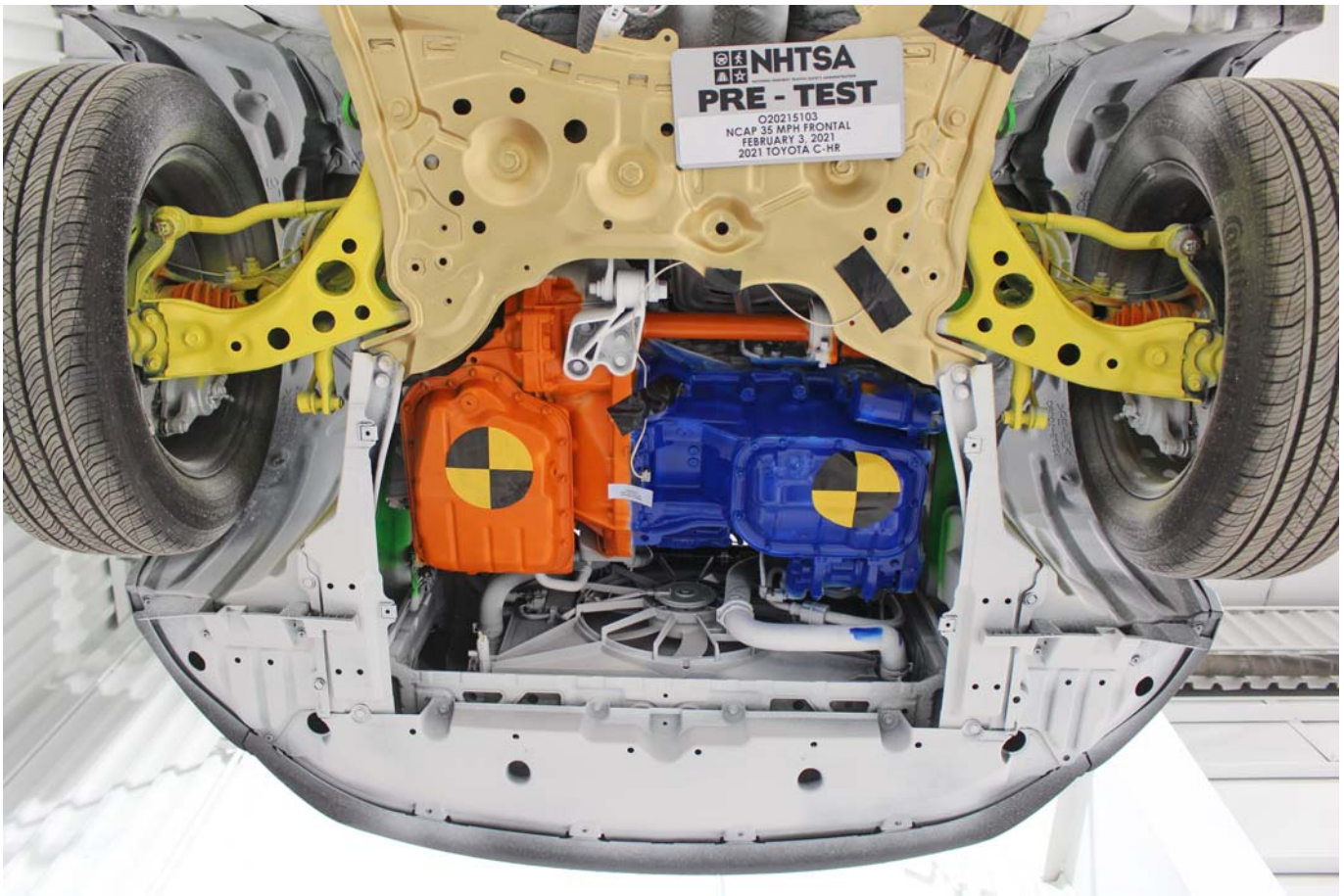


Photo No. 024 - Pre-Test Front Underbody View

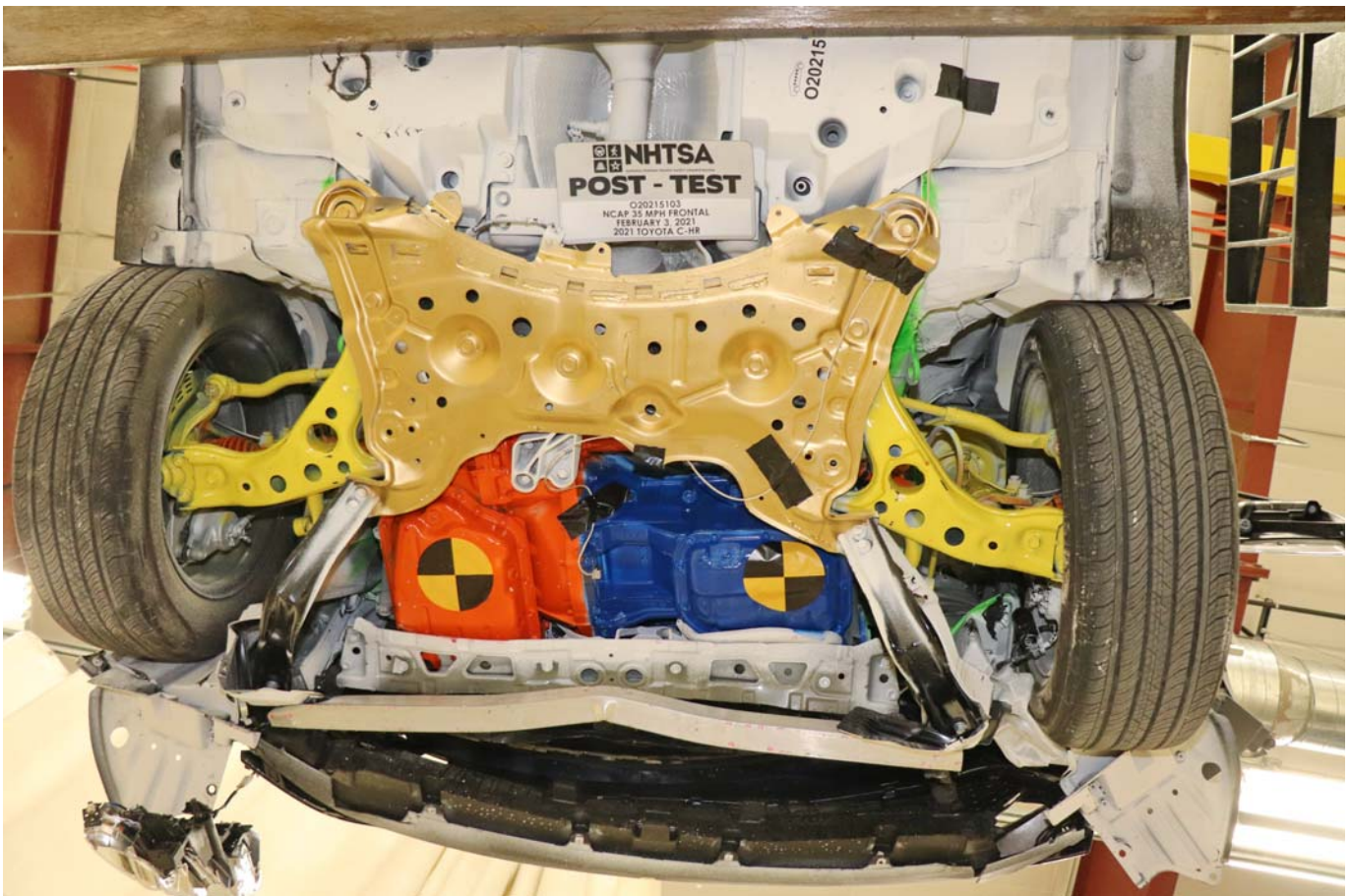


Photo No. 025 - Post-Test Front Underbody View



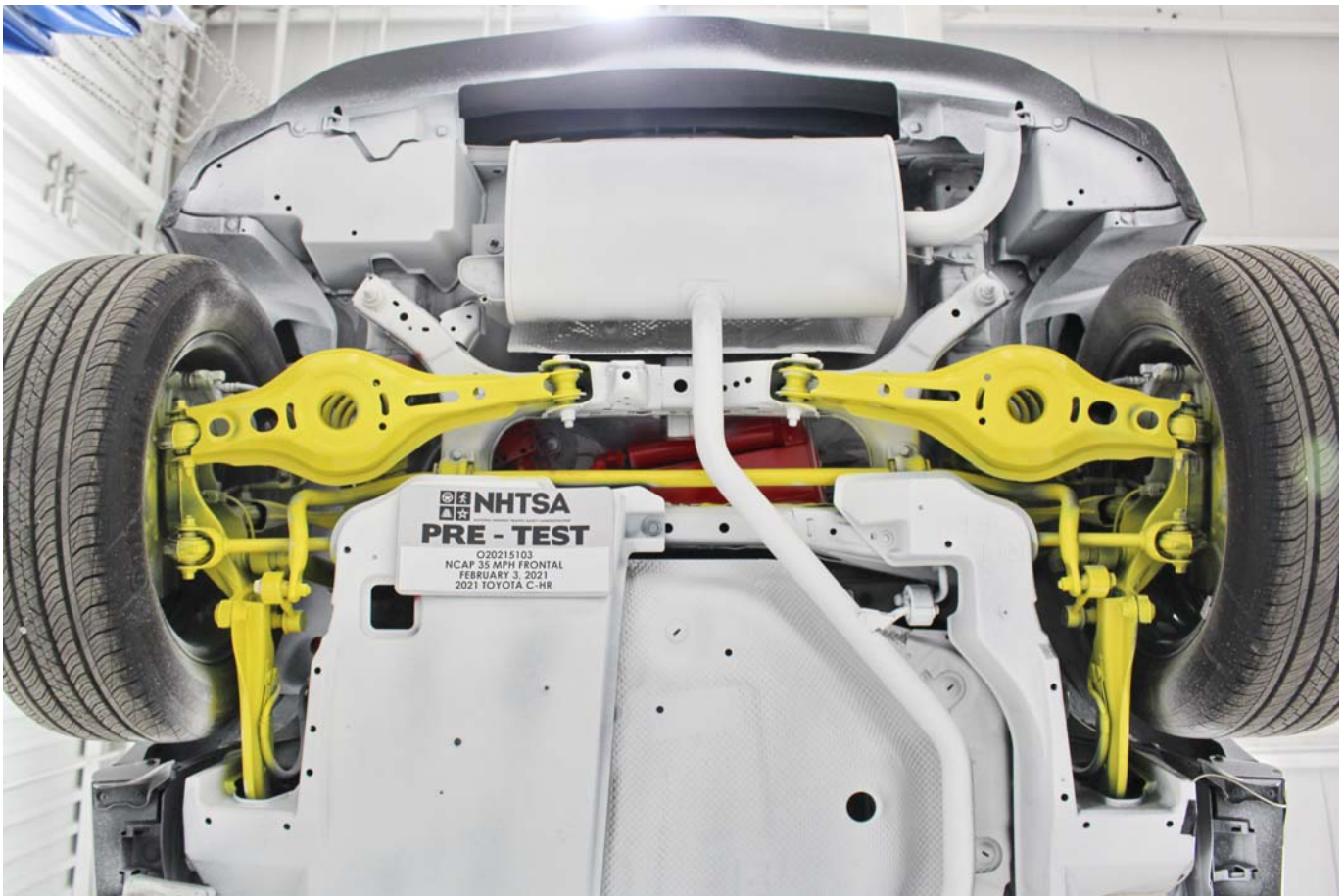


Photo No. 026 - Pre-Test Rear Underbody View

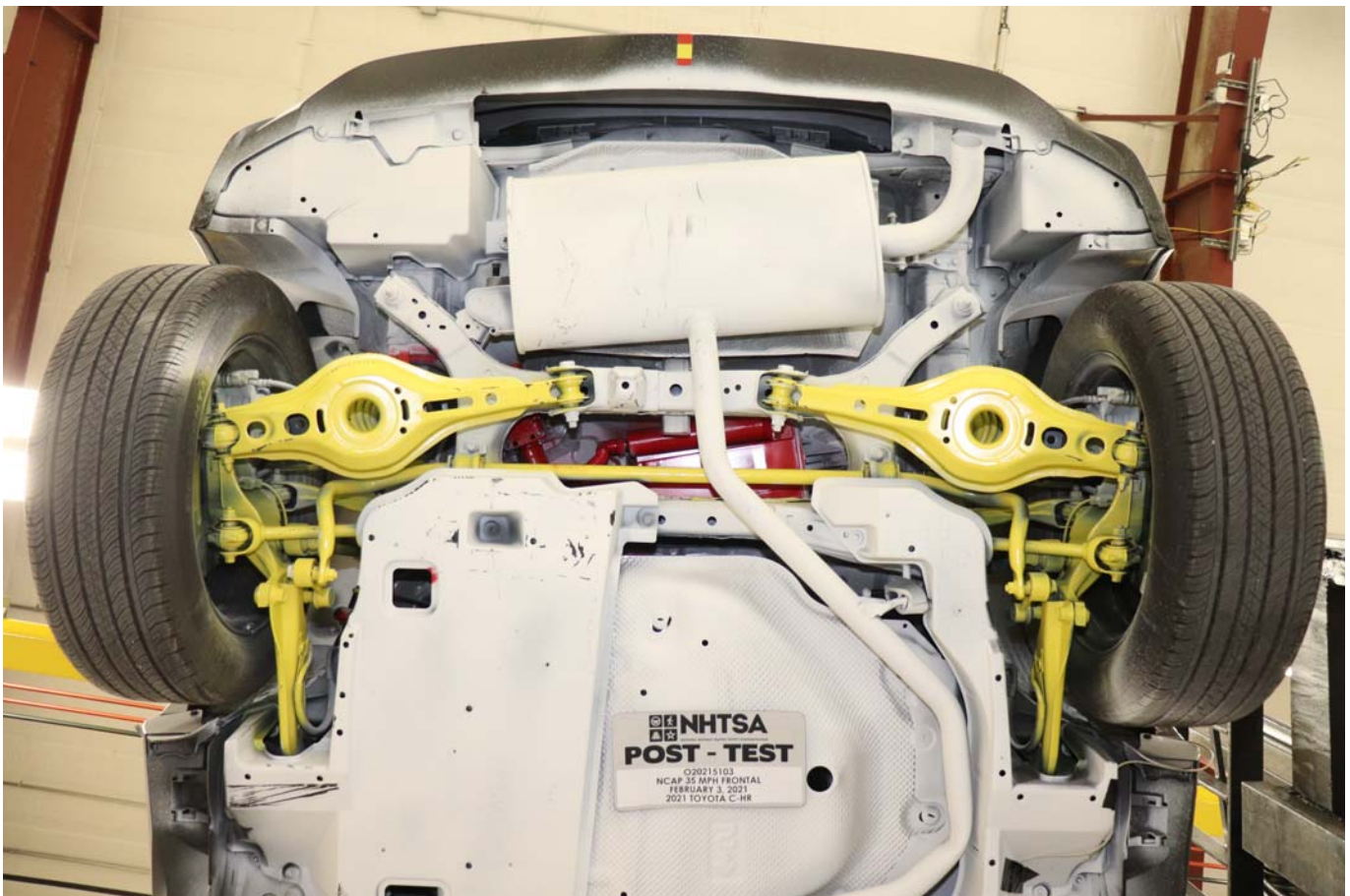


Photo No. 027 - Post-Test Rear Underbody View





Photo No. 028 - Pre-Test Dummy Cable Routing



Photo No. 029 - Post-Test Dummy Cable Routing



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



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





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



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





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



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





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

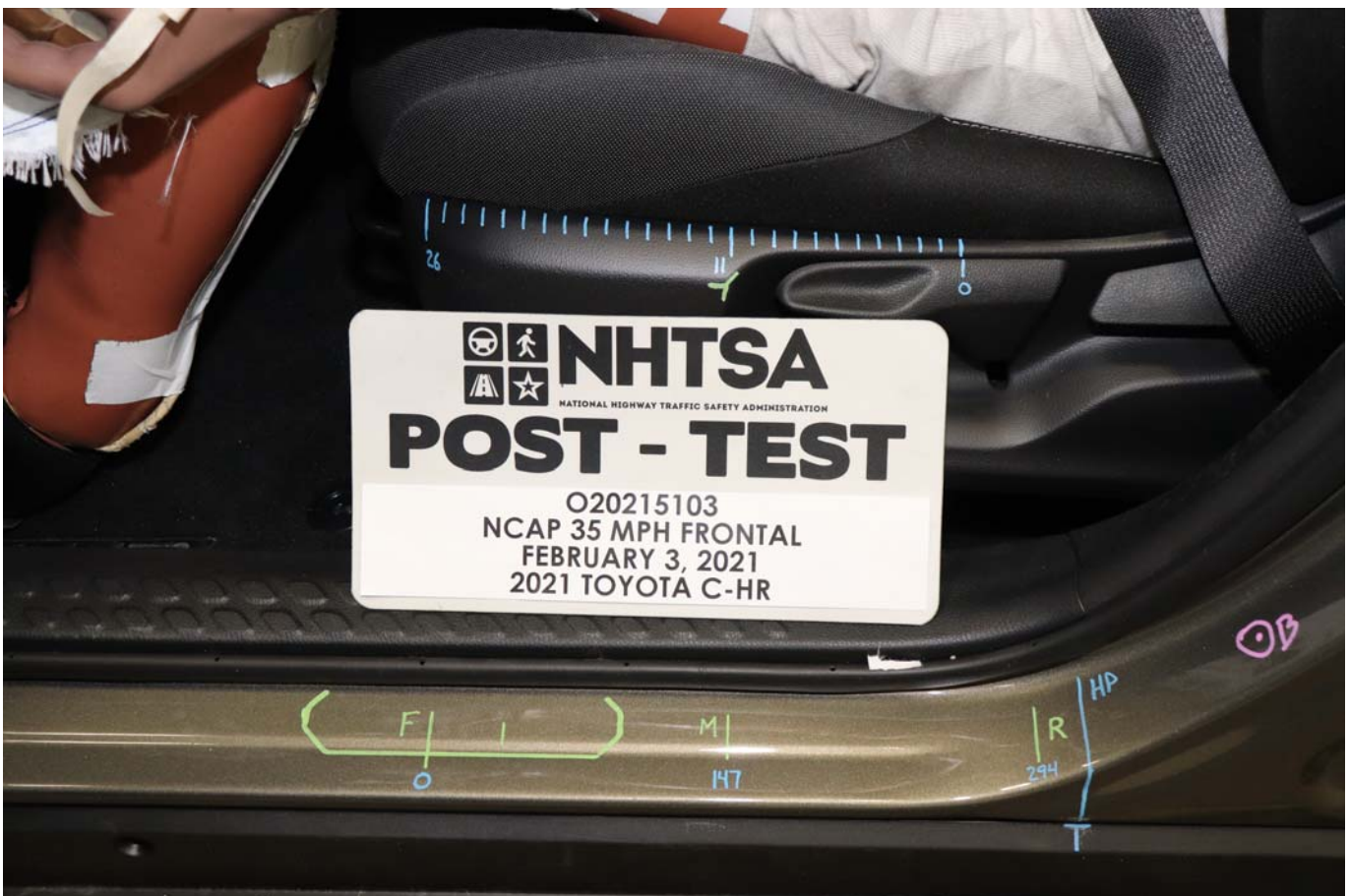


Photo No. 037 - Post-Test Driver Seat Fore-Aft Markings



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 Side Knee Bolster



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



Photo No. 046 - Pre-Test Driver Side Floorpan



Photo No. 047 - Post-Test Driver 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





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



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



Photo No. 060 - Post-Test Passenger 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 Side Knee Bolster





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



Photo No. 069 - Pre-Test Passenger Side Floorpan





Photo No. 070 - Post-Test Passenger Side Floorpan



Photo No. 071 - Post-Test Passenger Dummy Face



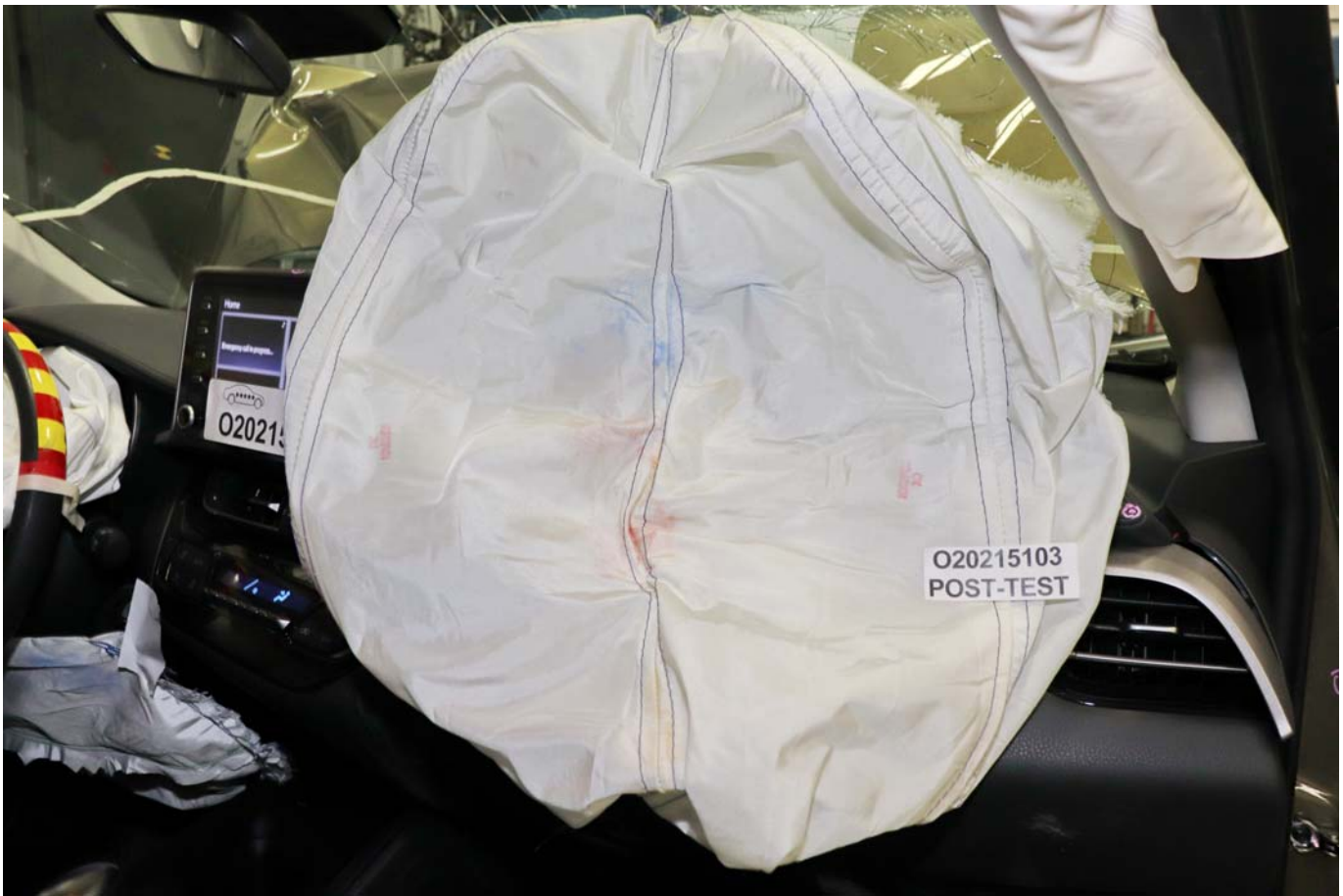


Photo No. 072 - Post-Test Passenger Dummy Contact with Airbag



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



Photo No. 074 - 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 - 2021 Toyota C-HR LE 5-Door Hatchback Frontal Impact Event



**TOYOTA**  
Let's Go Places

DESC: **C-HR** LE  
VIN: **JTNKHMBX4M1100147**  
YR/MDL: 2021/2402A  
CLR: OXIDE BRONZE MET./FH21 (06X1/21)  
FINAL ASSEMBLY POINT: ISAWA, IWATE, JAPAN

**STANDARD EQUIPMENT**

**MECHANICAL AND PERFORMANCE**

- 2.0L 4-Cyl DOHC Engine
- CVT w/ Shift Mode
- Front Wheel Drive
- Ventilated Front/Solid Rear Disc Brakes
- Independent Front & Rear Suspension w/ Stabilizer Bar & Dampers
- 17-in Steel Wheels w/ All-Season Tires
- Temporary Spare

**SAFETY AND CONVENIENCE**

- Toyota Safety Sense 2.5: Pre-Collision System w/ Pedestrian Detection, Lane Departure Alert w/ Steering Assist, Automatic High Beams, Full-Speed Range Dynamic Radar Cruise Control, Lane Tracing Assist, Road Sign Assist
- Star Safety System: 10 Standard Airbags
- Tire Pressure Monitoring System
- LATCH-Lower Anchor & Tether for Children
- Safety Connect w/ 1-Year Trial

**EXTERIOR**

- LED Headlights
- LED Daytime Running Lights
- Heated Power Mirrors w/ Signal Indicator

**INTERIOR**

- Audio - 8-in Touchscreen, 6 Speakers, HandsFree Bluetooth Phone/Music, USB Media/Charge-Port
- SiriusXM w/ 3-Month All Access Trial
- Android Auto & Apple CarPlay Compatible
- Dual-Zone Auto Climate Control System
- Remote Keyless Entry w/ Panic Function
- One-Touch Automatic Windows
- Sport Fabric-Trimmed Seats
- Tilt/Telescope Steering Wheel w/ Voice Command Audio & Multi-Information Display Controls
- For full product details, please visit: Toyota.com/C-HR

**MANUFACTURER'S SUGGESTED RETAIL PRICE \$21,445.00**

**OPTIONAL EQUIPMENT**

FE	50 State Emissions	
SJ	Black Out Emblems	89.00
OK	Preferred Owner's Portfolio	
CF	Carpeted Floor Mats/Cargo Mat	269.00

**GOVERNMENT 5-STAR SAFETY RATINGS**

<b>Overall Vehicle Score</b>	<b>Not Rated</b>
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.	
<b>Frontal Crash</b>	<b>Not Rated</b>
Driver Passenger	<b>Not Rated</b>
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.	
<b>Side Crash</b>	<b>★★★★★</b>
Front seat	<b>★★★★★</b>
Rear seat	<b>★★★★★</b>
Based on the risk of injury in a side impact.	
<b>Rollover</b>	<b>★★★★</b>
Based on the risk of rollover in a single-vehicle crash.	

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA) [www.safercar.gov](http://www.safercar.gov) or 1-888-327-4236

**EPA DOT Fuel Economy and Environment** Gasoline Vehicle

<b>Fuel Economy</b>	<b>You save \$500</b>
<b>29 MPG</b> combined city/hwy	<b>in fuel costs over 5 years</b>
27 city 31 highway	<b>compared to the average new vehicle.</b>
3.4 gallons per 100 miles	

**Annual fuel COST \$1,400**

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

1 6 10 3 10

Best Best

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 \$2,500 for fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.70 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

[fuelconomy.gov](http://fuelconomy.gov)

Calculate personalized estimates and compare vehicles

**DELIVERY PROCESSING AND HANDLING FEE 1,175.00**

**TOTAL \$22,976.00**

The New Vehicle Limited Warranty provides 3-year/36,000 mile basic coverage, 5-year/60,000 mile powertrain coverage, plus 5-year/unlimited mile corrosion perforation coverage. See Warranty and Maintenance Guide for details. An extended service contract may be available for the vehicle.

Ask dealer for details. Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Gasoline, license and title fees, applicable federal, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price.

ToyotaCare, which covers normal factory scheduled maintenance for two years or 25,000 miles, whichever occurs first, is included as part of the sales price of the vehicle for qualifying buyers. See participating dealer for eligibility and coverage details.

Delivered by Truck for 46007  
5801 ODANA ROAD  
MADISON WIS53719

Photo No. 083 - Monroney Label Photograph

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

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**The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at [www.nhtsa.gov](http://www.nhtsa.gov)**

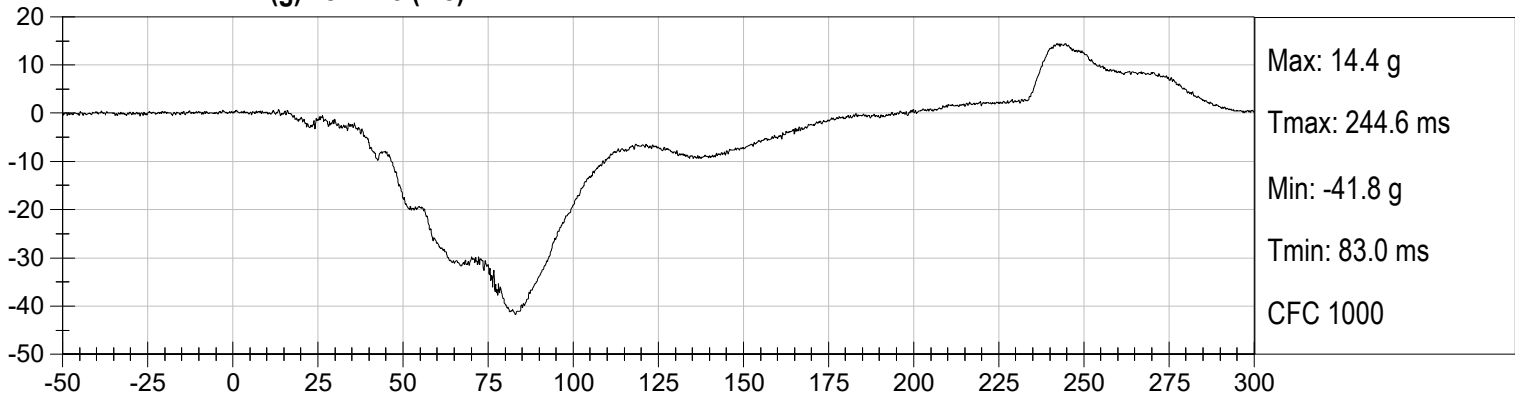
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 Driver Head Y Redundant  
 Driver Head Z Redundant  
 Driver Head Angular Velocity X  
 Driver Head Angular Velocity Y  
 Driver Head Angular Velocity Z  
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 Driver Upper Neck Moment X  
 Driver Upper 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  
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Passenger Chest Y Redundant  
Passenger Chest Z Redundant  
Passenger Pelvis X  
Passenger Pelvis Y

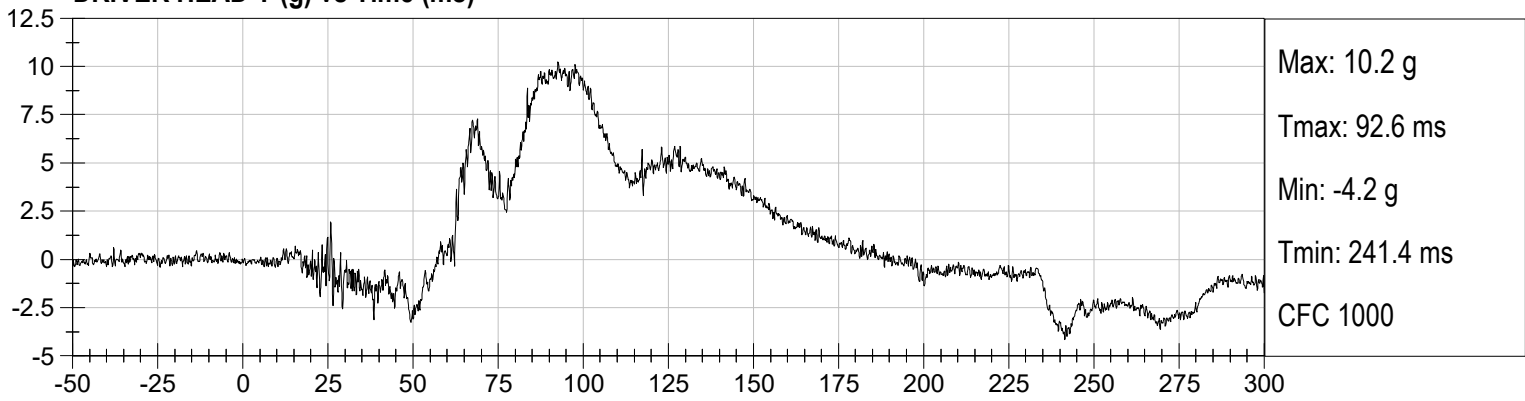
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Passenger Left Lower Tibia Moment X  
Passenger Left Lower Tibia Moment Y  
Passenger Left Lower Tibia Force Z  
Passenger Right Upper Tibia Moment X  
Passenger Right Upper Tibia Moment Y  
Passenger Right Upper Tibia Force Z  
Passenger Right Lower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



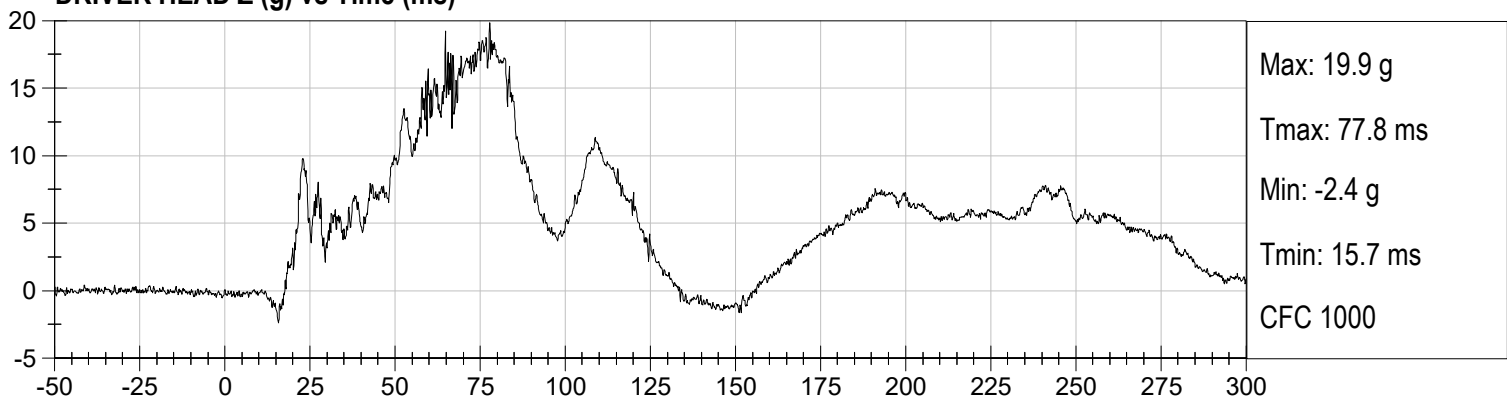
**DRIVER HEAD X (g) vs Time (ms)**



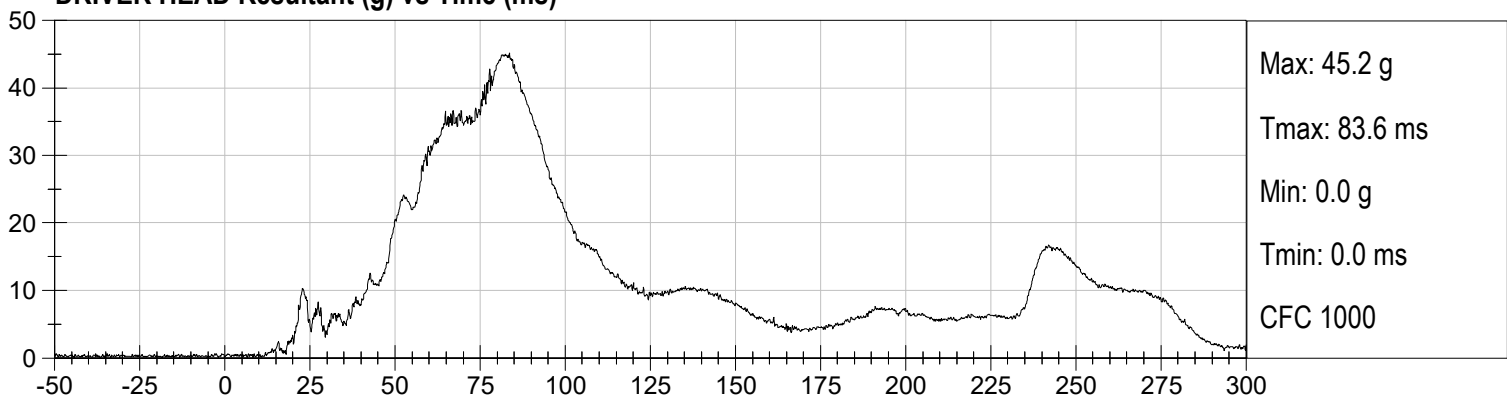
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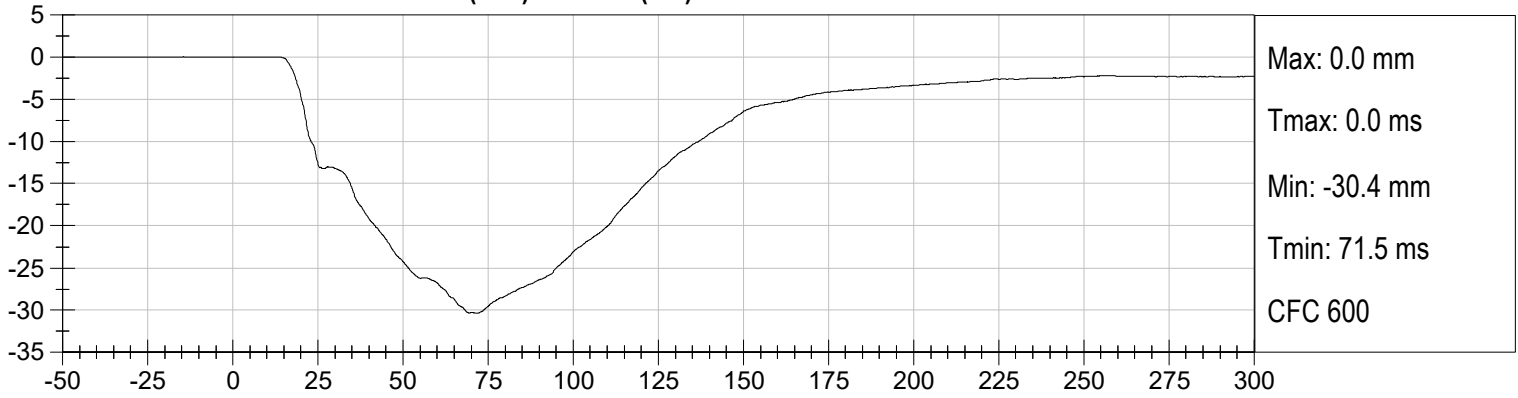
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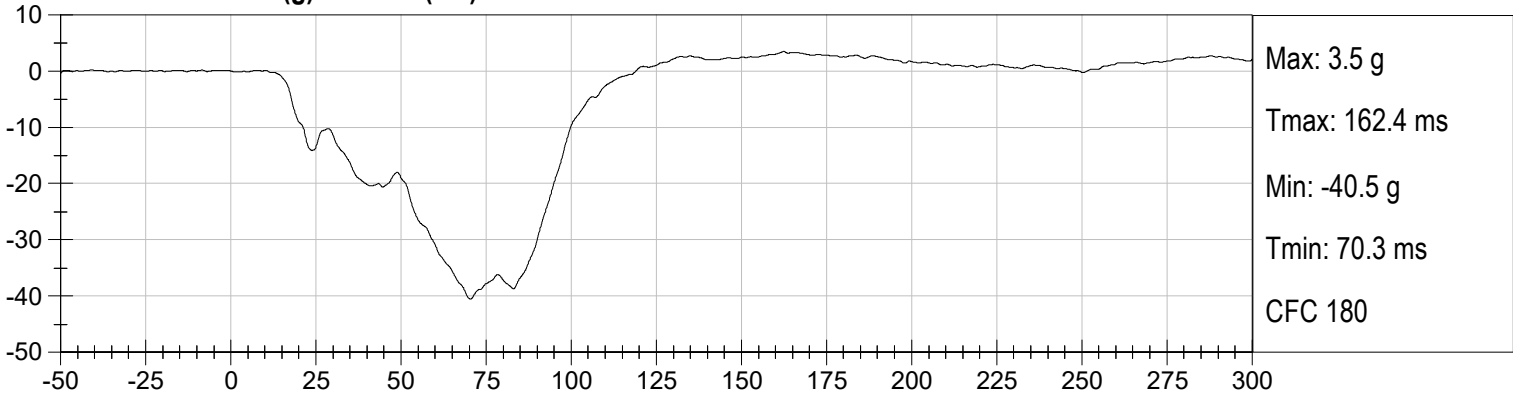
**DRIVER HEAD Resultant (g) vs Time (ms)**



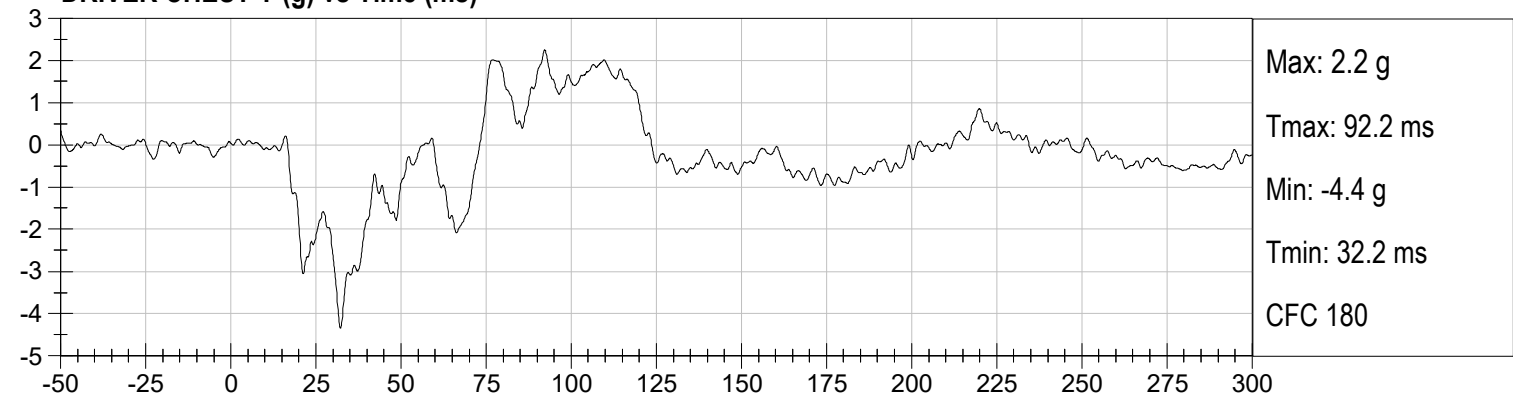
**DRIVER CHEST DISPLACEMENT (mm) vs Time (ms)**



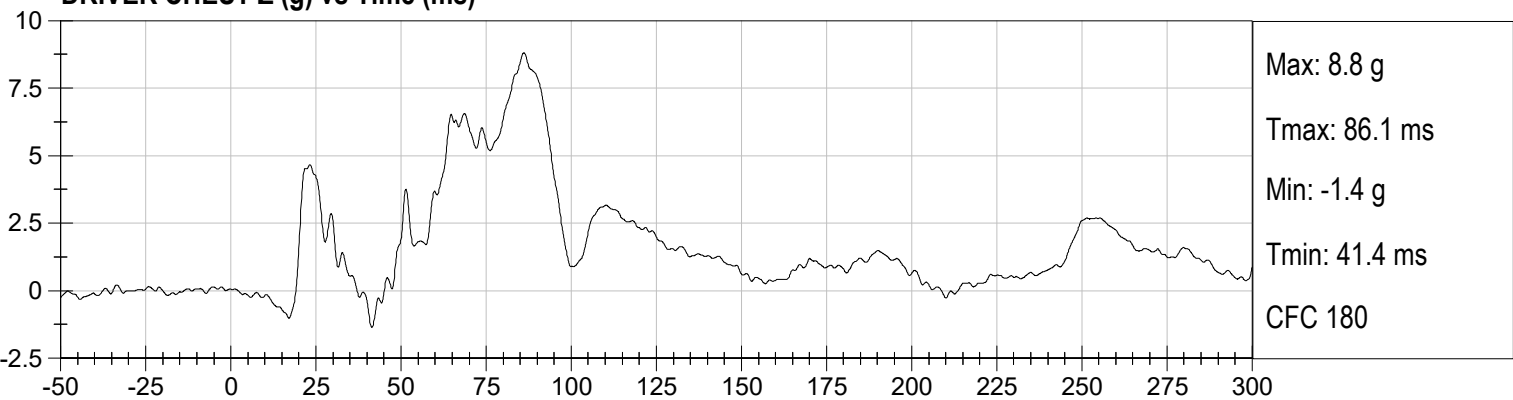
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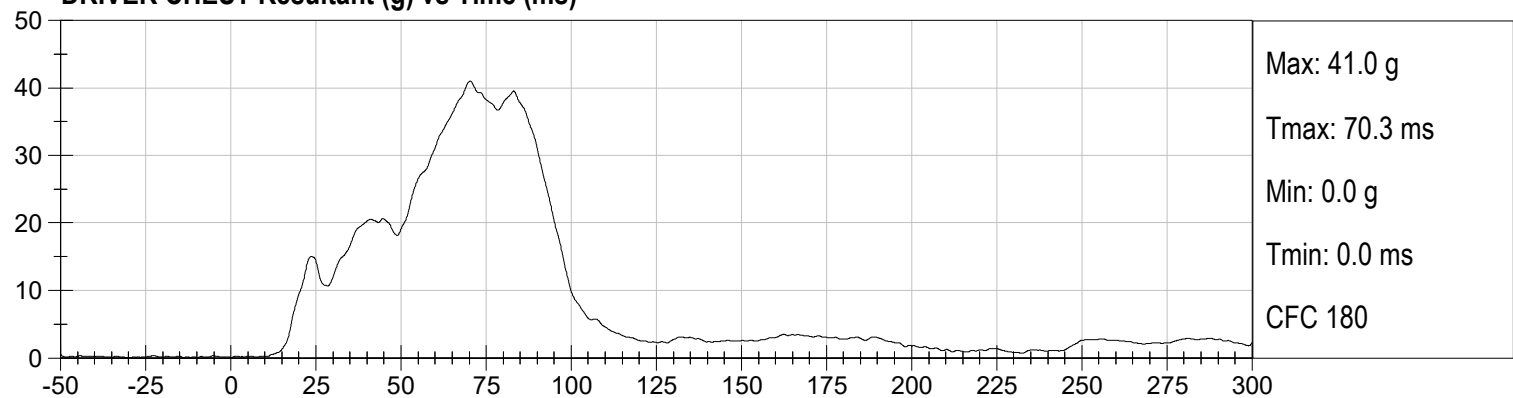
**DRIVER CHEST Y (g) vs Time (ms)**



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

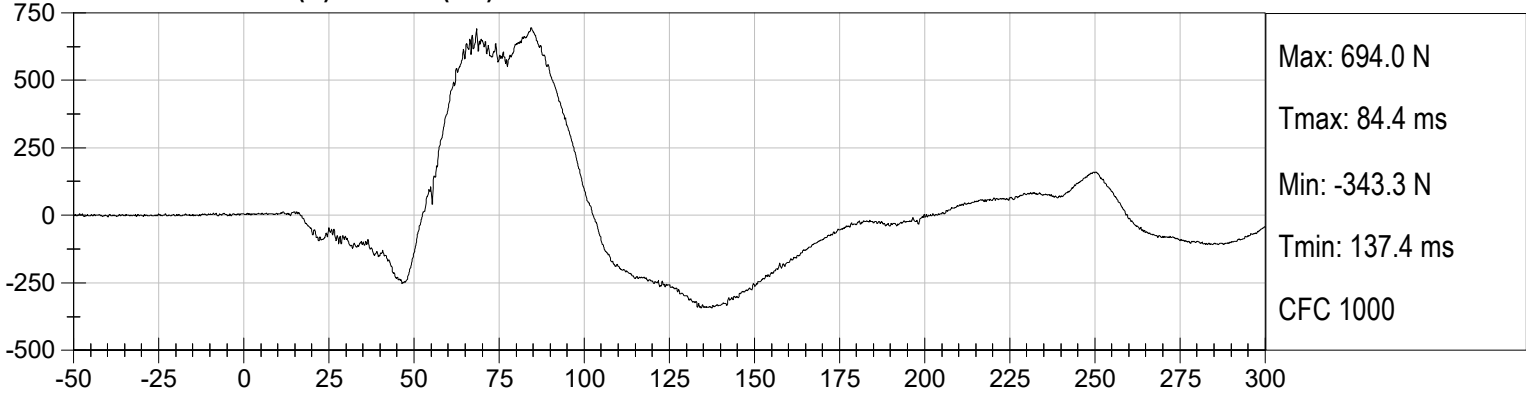


**DRIVER CHEST Resultant (g) vs Time (ms)**

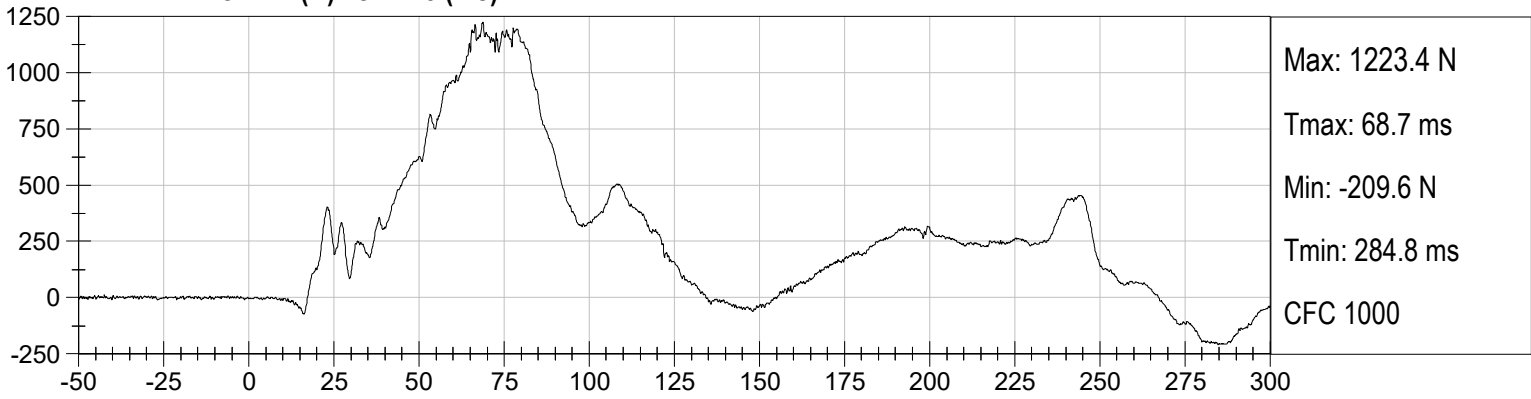




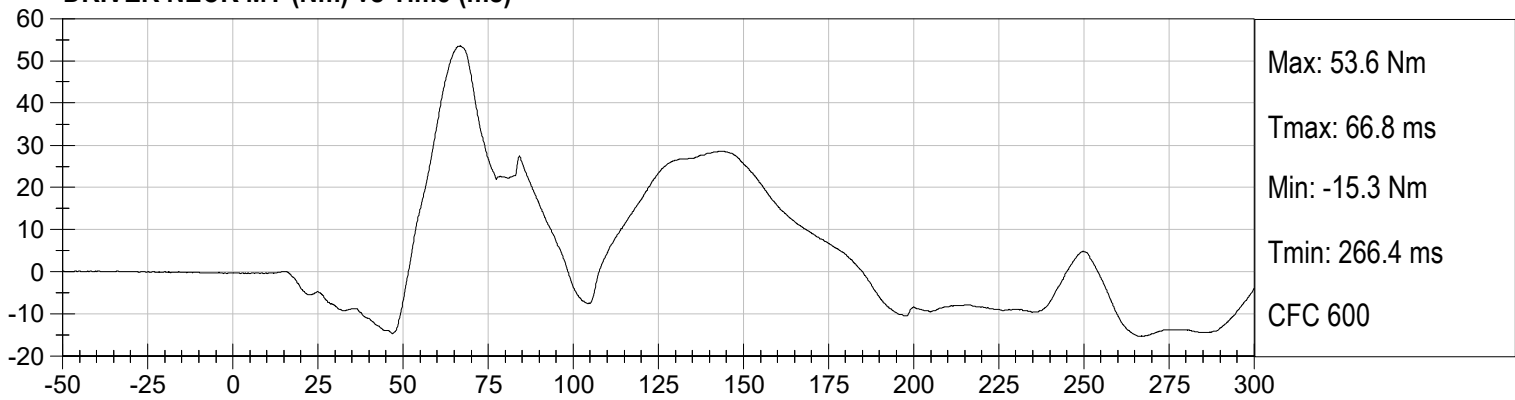
**DRIVER NECK FX (N) vs Time (ms)**



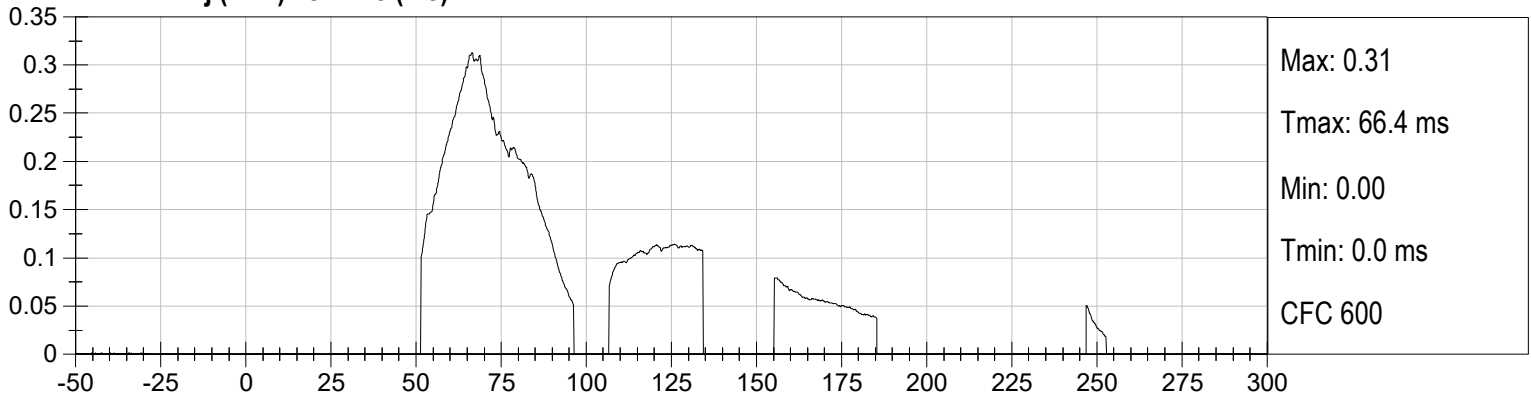
**DRIVER NECK FZ (N) vs Time (ms)**



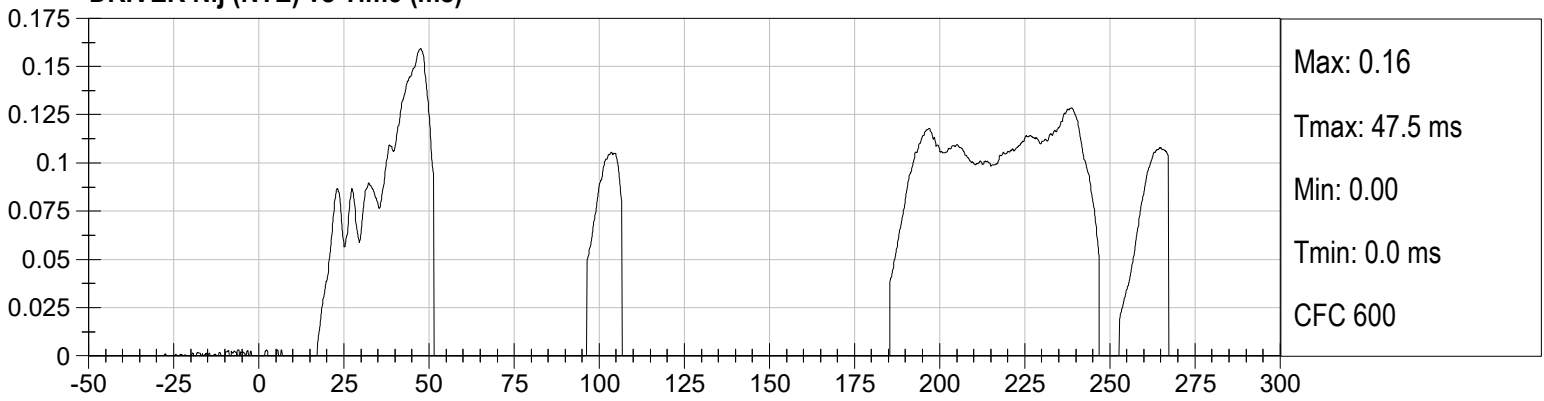
**DRIVER NECK MY (Nm) vs Time (ms)**



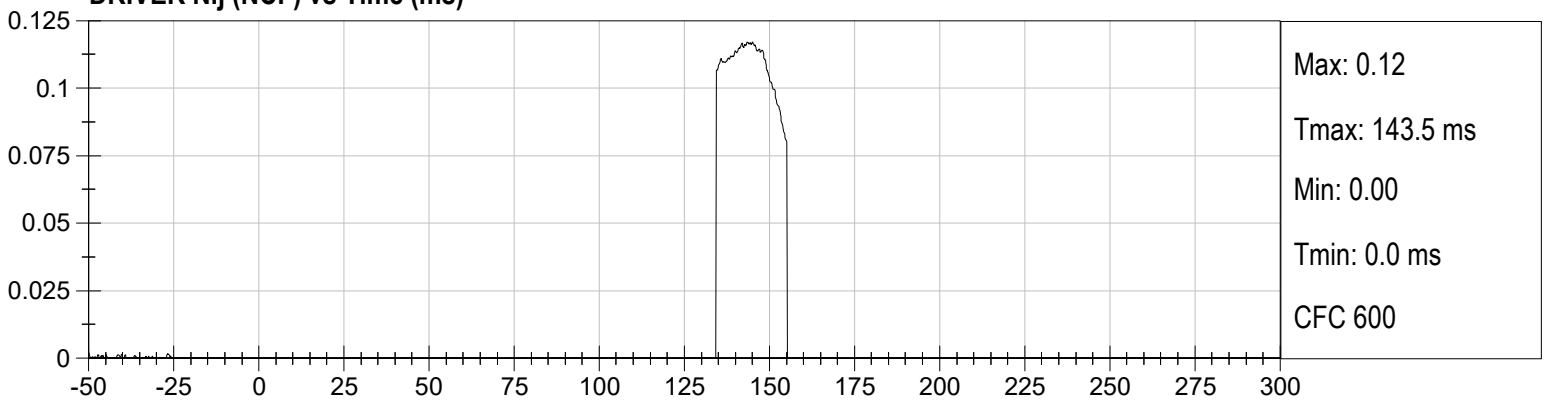
**DRIVER Nij (NTF) vs Time (ms)**



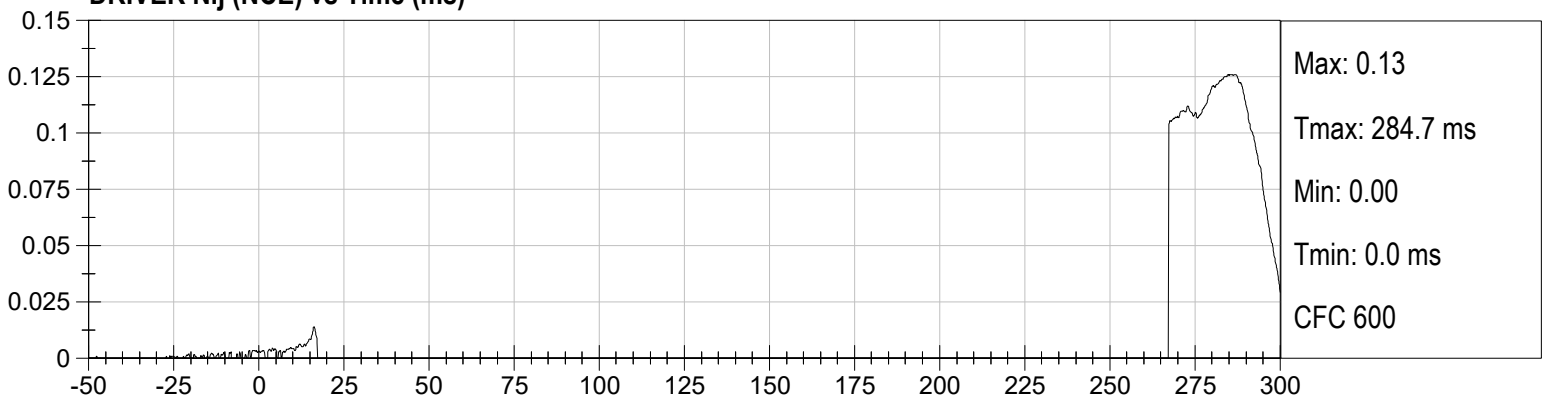
**DRIVER Nij (NTE) vs Time (ms)**

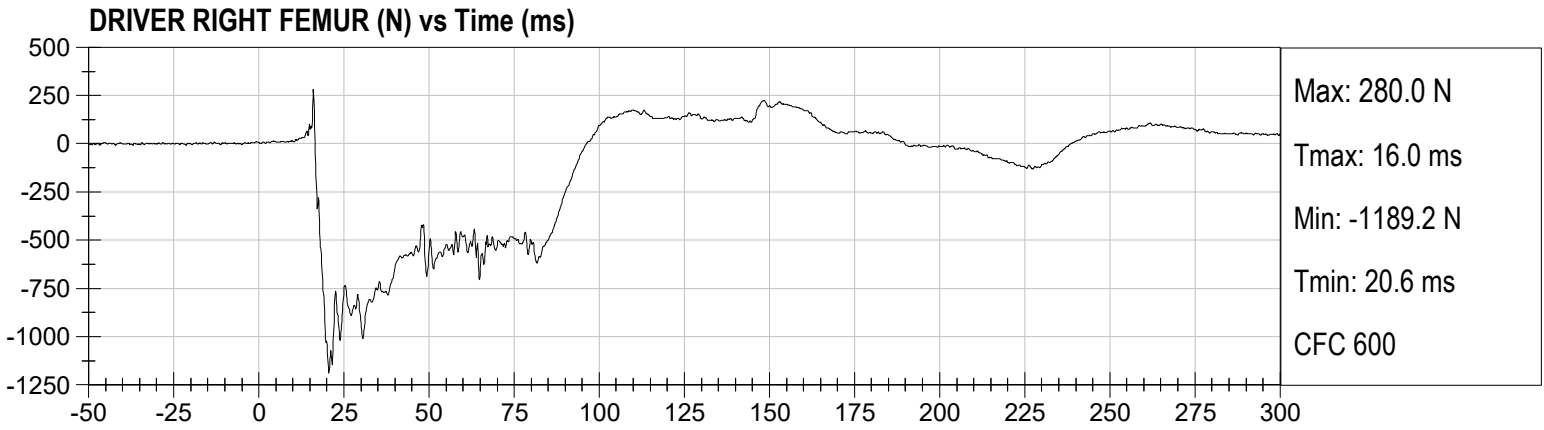
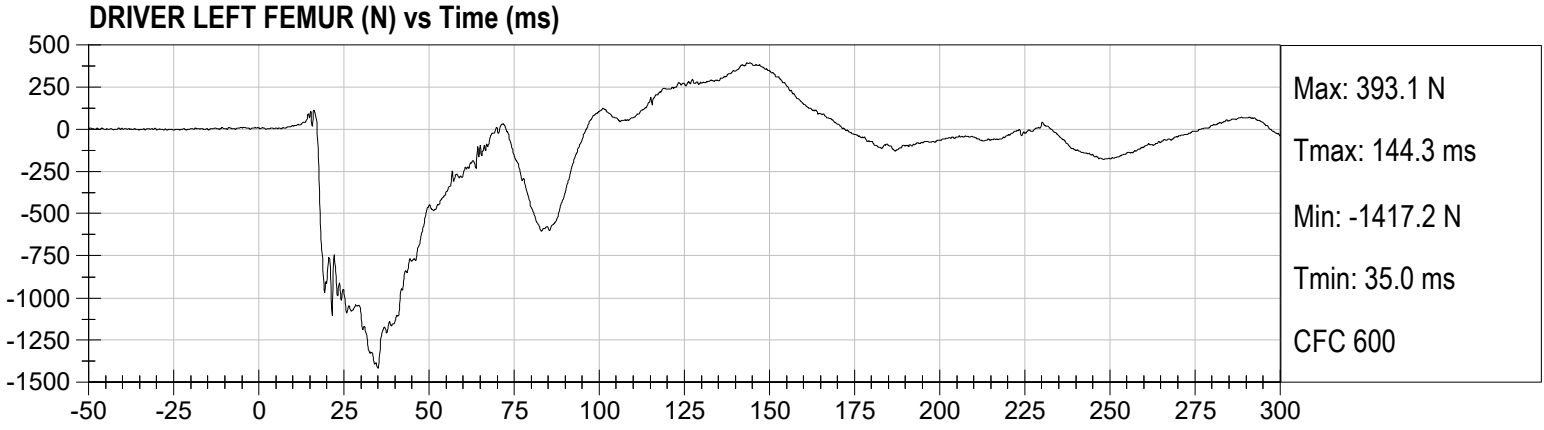


**DRIVER Nij (NCF) vs Time (ms)**



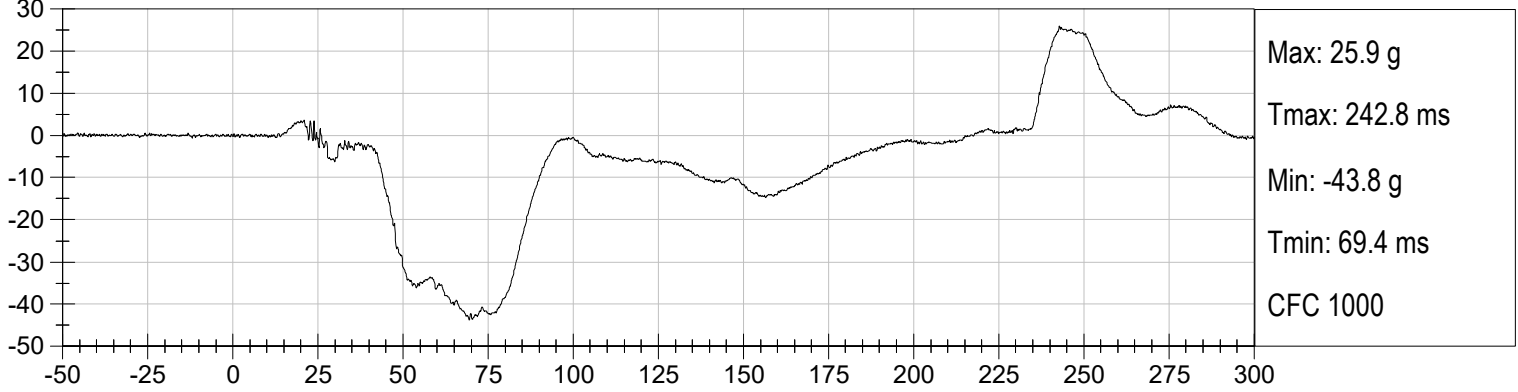
**DRIVER Nij (NCE) vs Time (ms)**



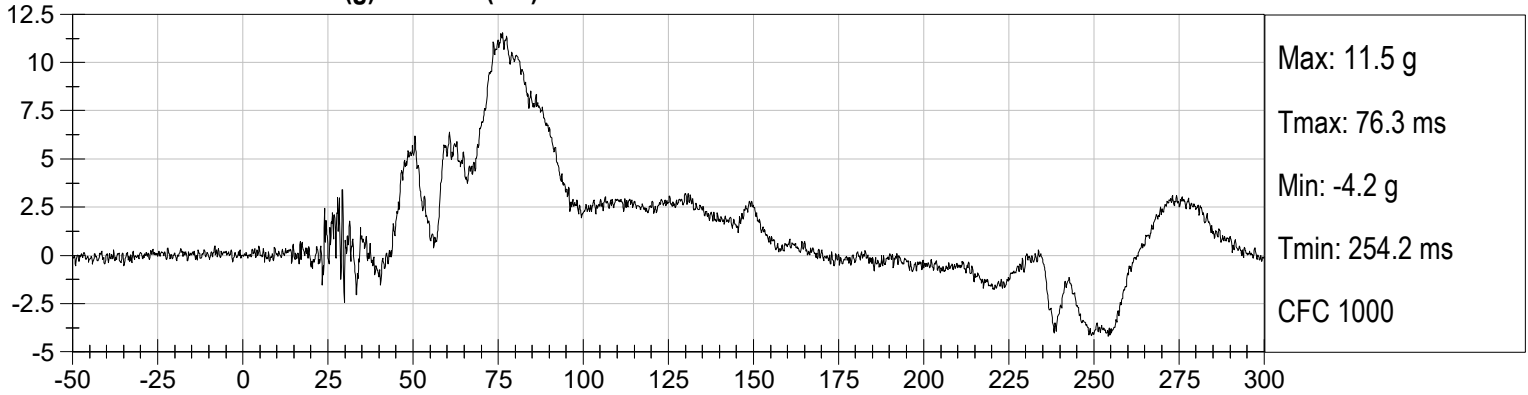




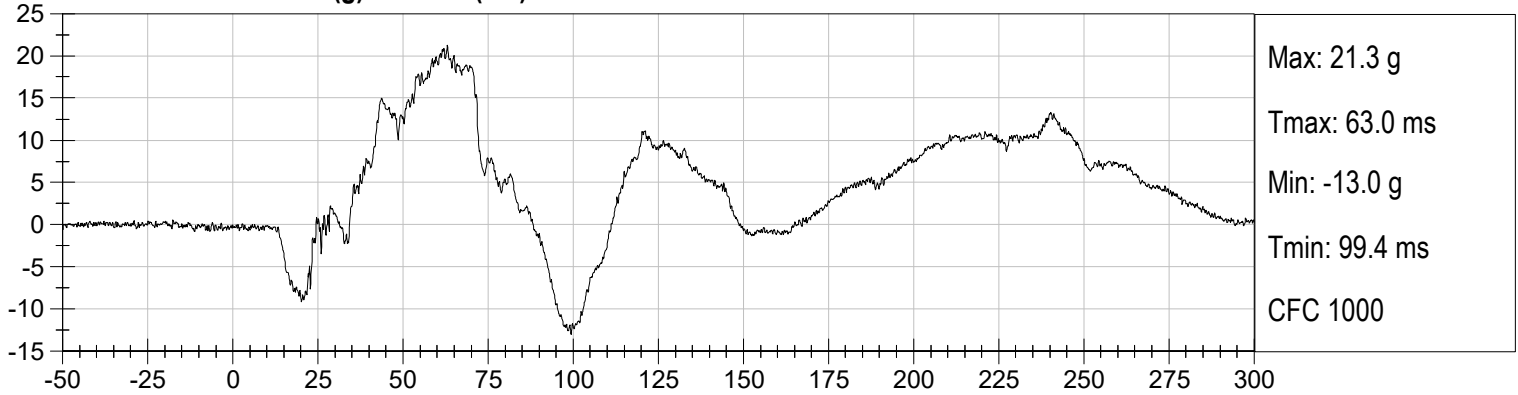
**PASSENGER HEAD X (g) vs Time (ms)**



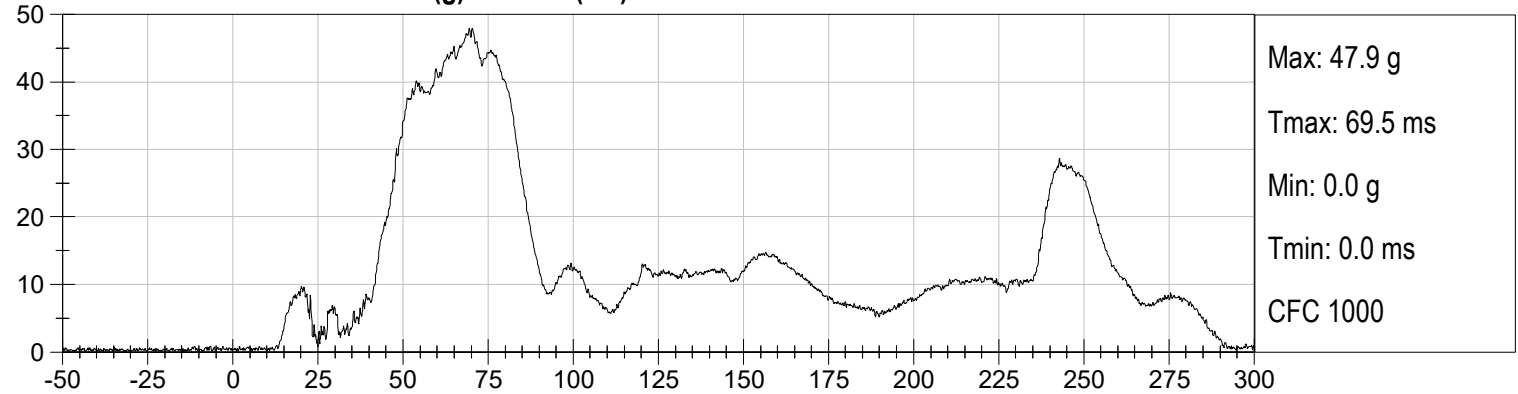
**PASSENGER HEAD Y (g) vs Time (ms)**



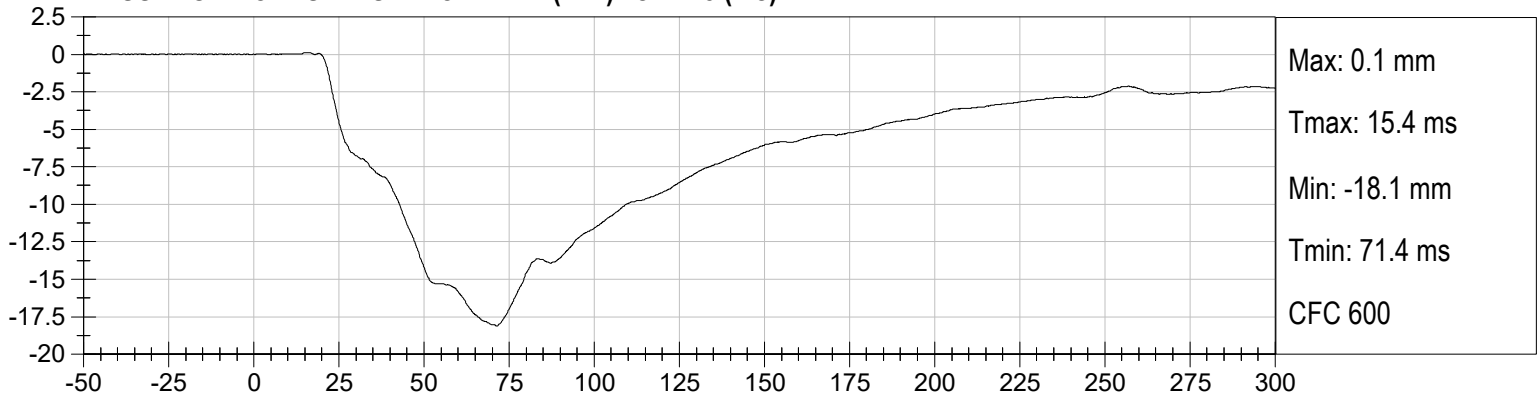
**PASSENGER HEAD Z (g) vs Time (ms)**



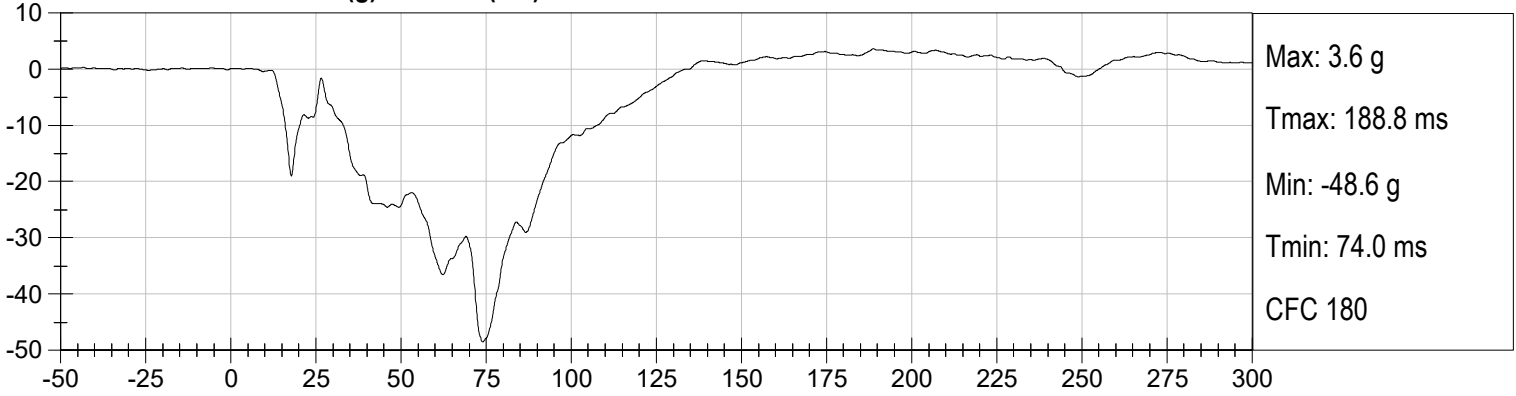
**PASSENGER HEAD Resultant (g) vs Time (ms)**



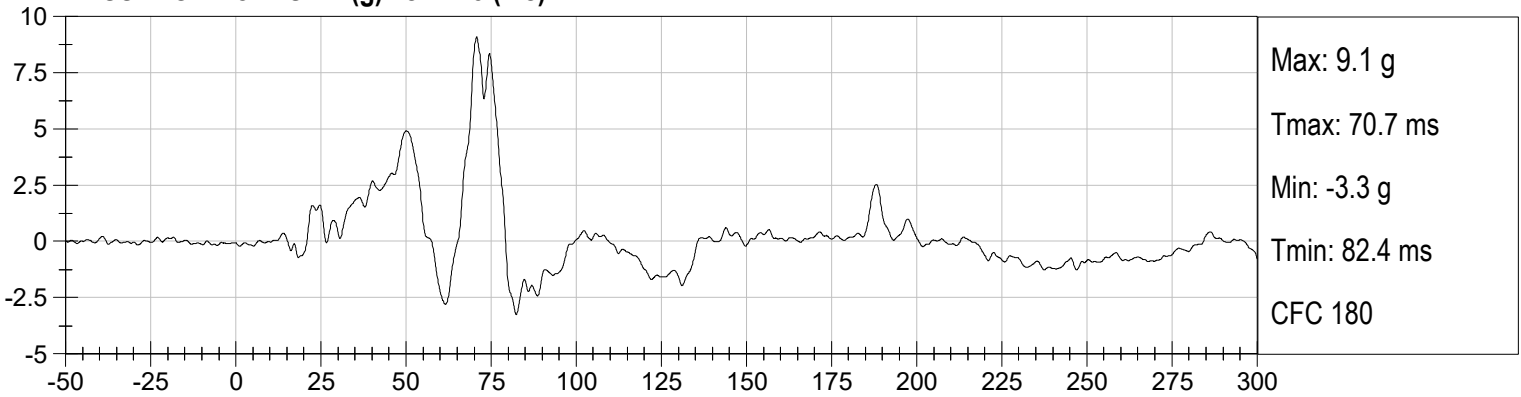
**PASSENGER CHEST DISPLACEMENT (mm) vs Time (ms)**



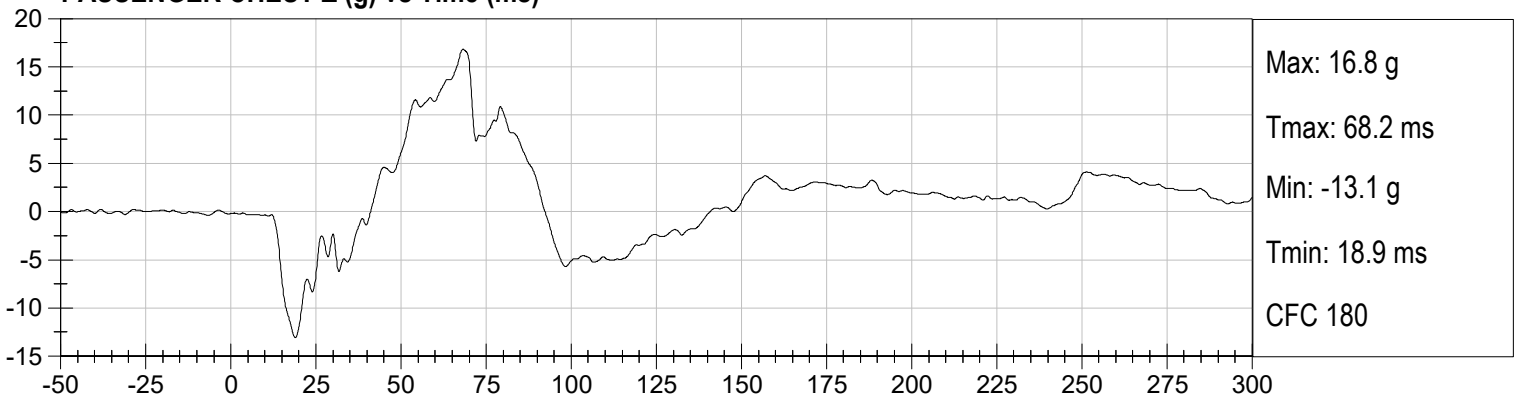
**PASSENGER CHEST X (g) vs Time (ms)**



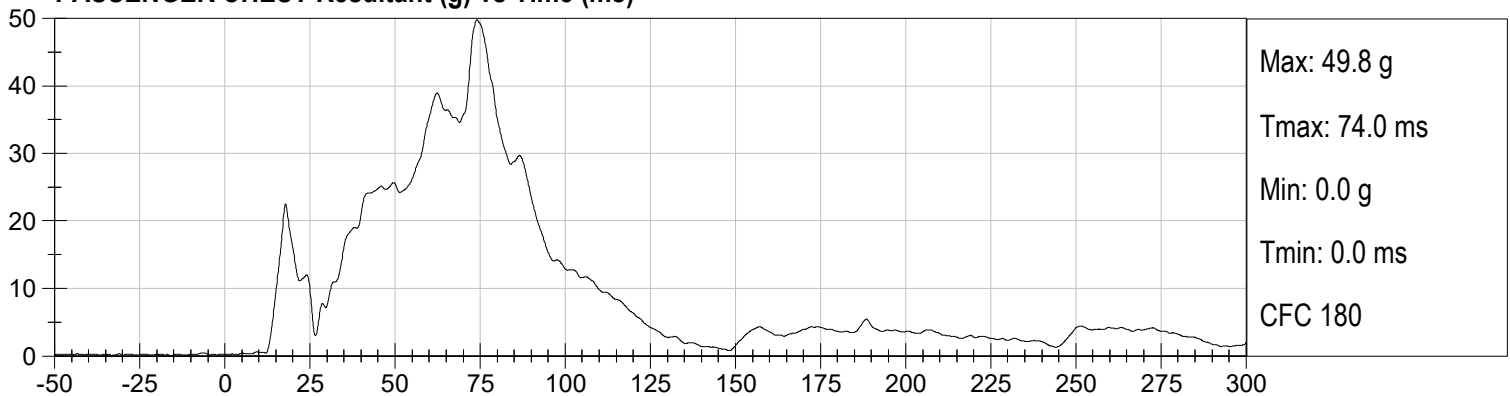
**PASSENGER CHEST Y (g) vs Time (ms)**



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

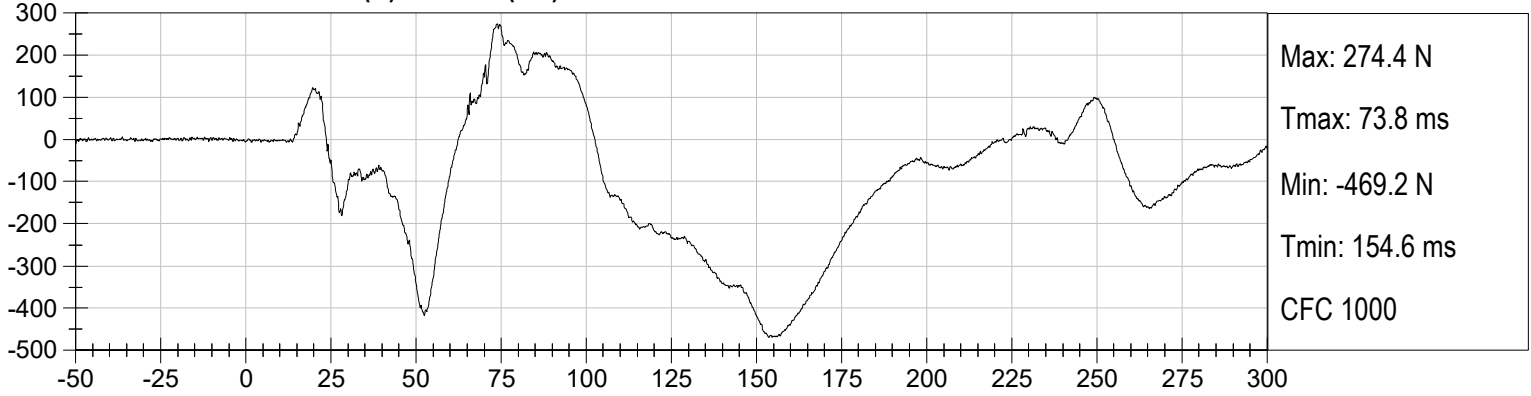


**PASSENGER CHEST Resultant (g) vs Time (ms)**

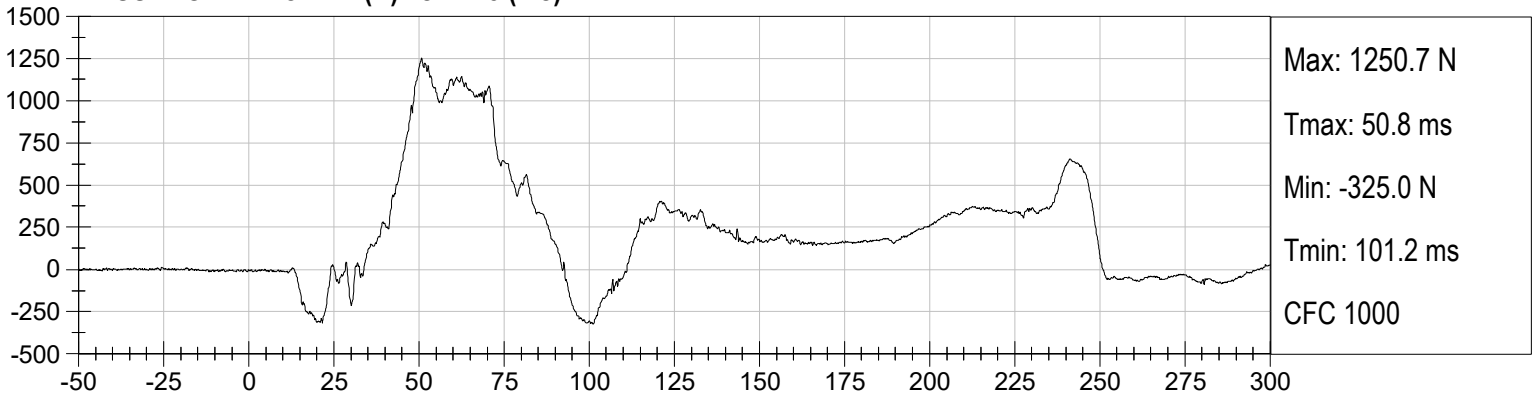




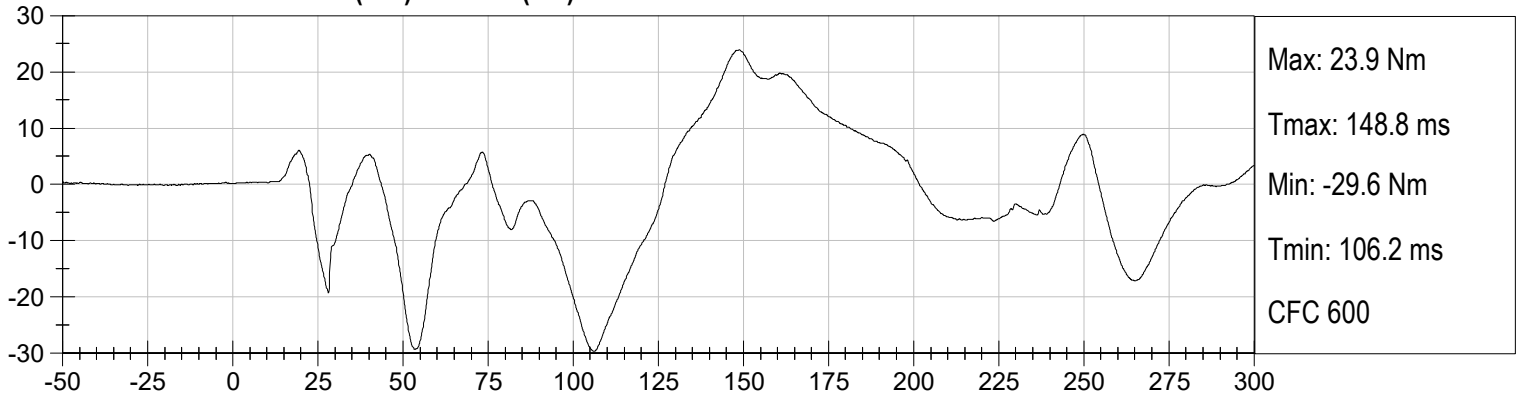
**PASSENGER NECK FX (N) vs Time (ms)**



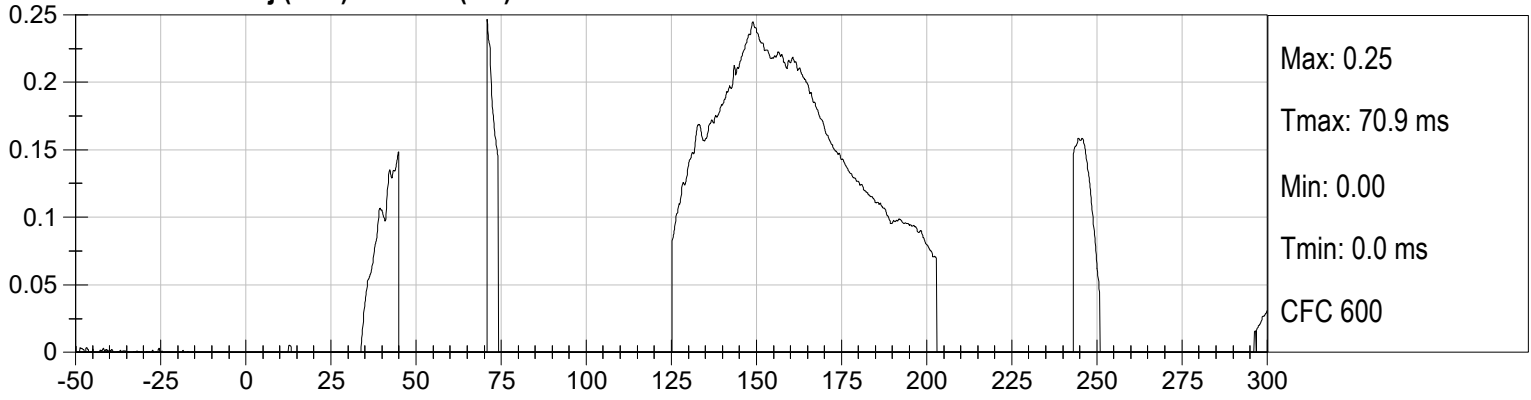
**PASSENGER NECK FZ (N) vs Time (ms)**



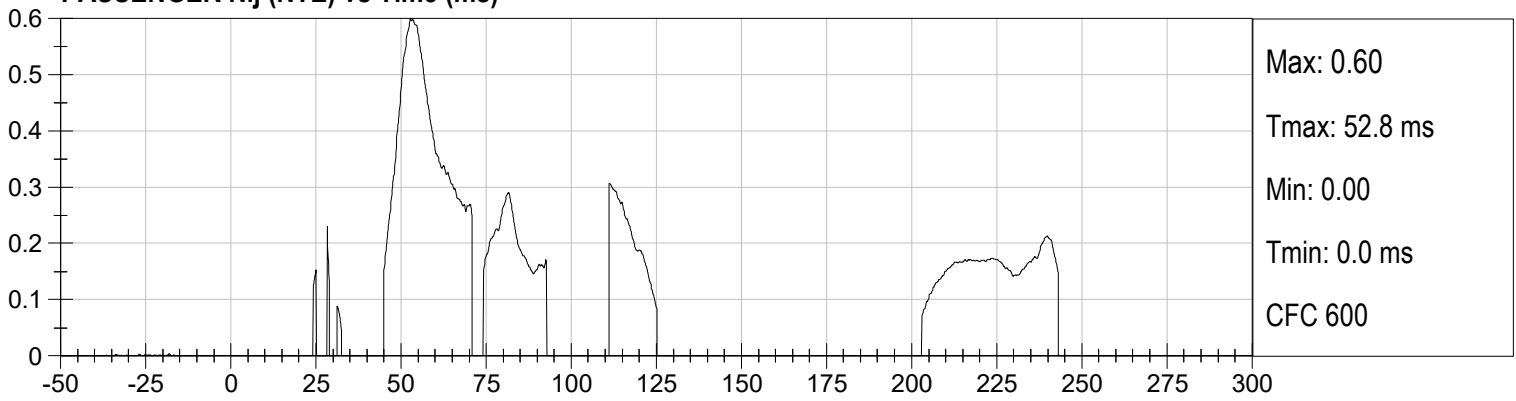
**PASSENGER NECK MY (Nm) vs Time (ms)**



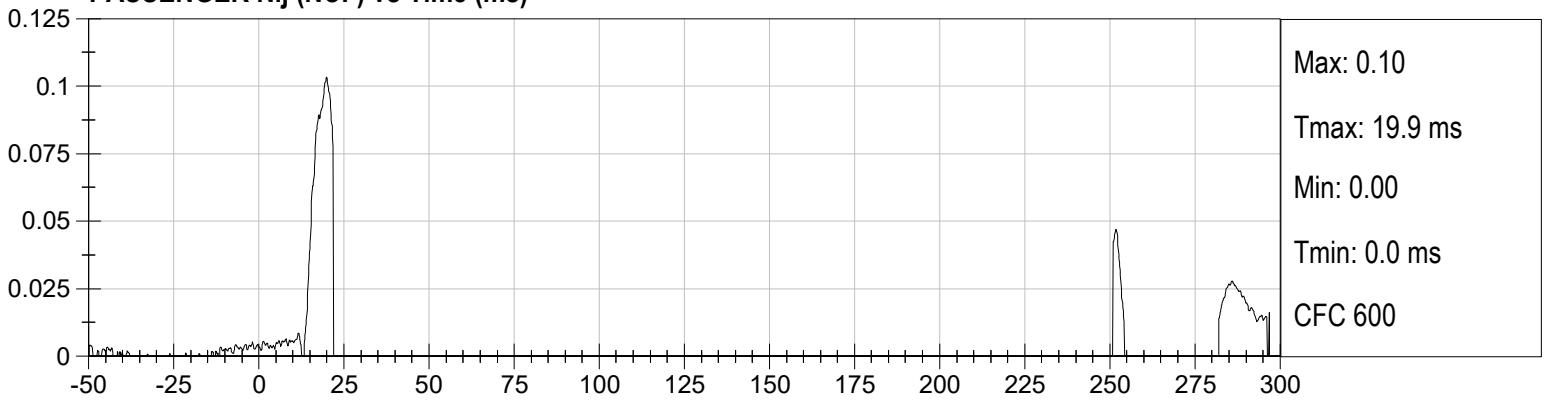
**PASSENGER Nij (NTF) vs Time (ms)**



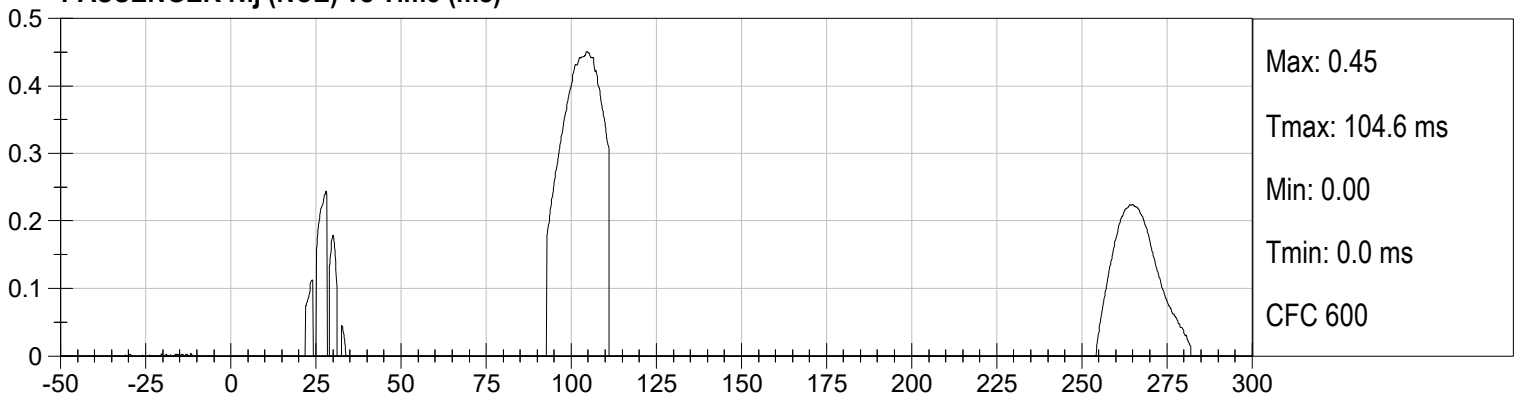
**PASSENGER Nij (NTE) vs Time (ms)**



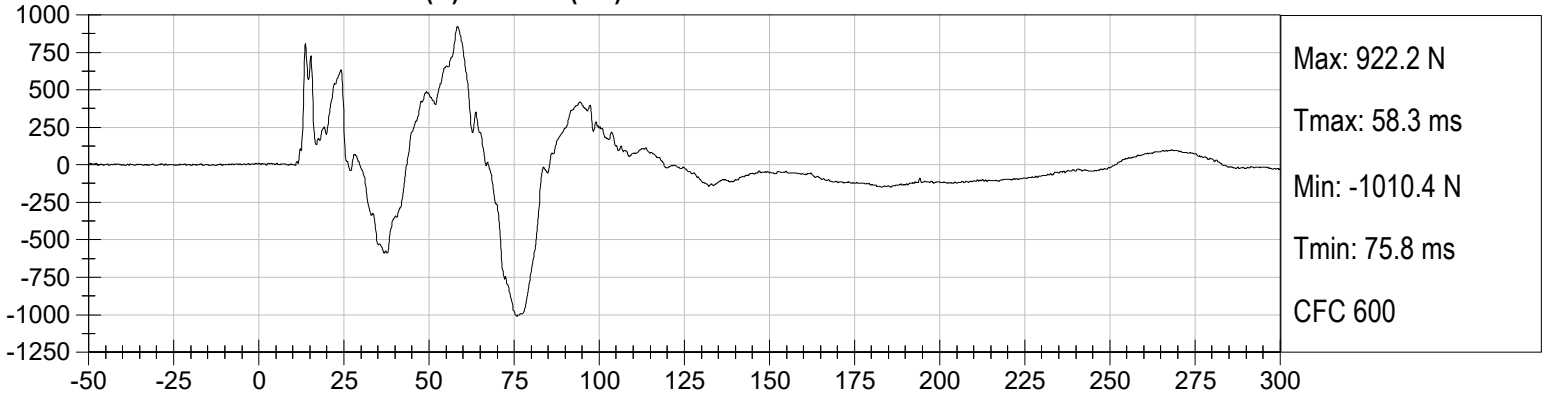
**PASSENGER Nij (NCF) vs Time (ms)**



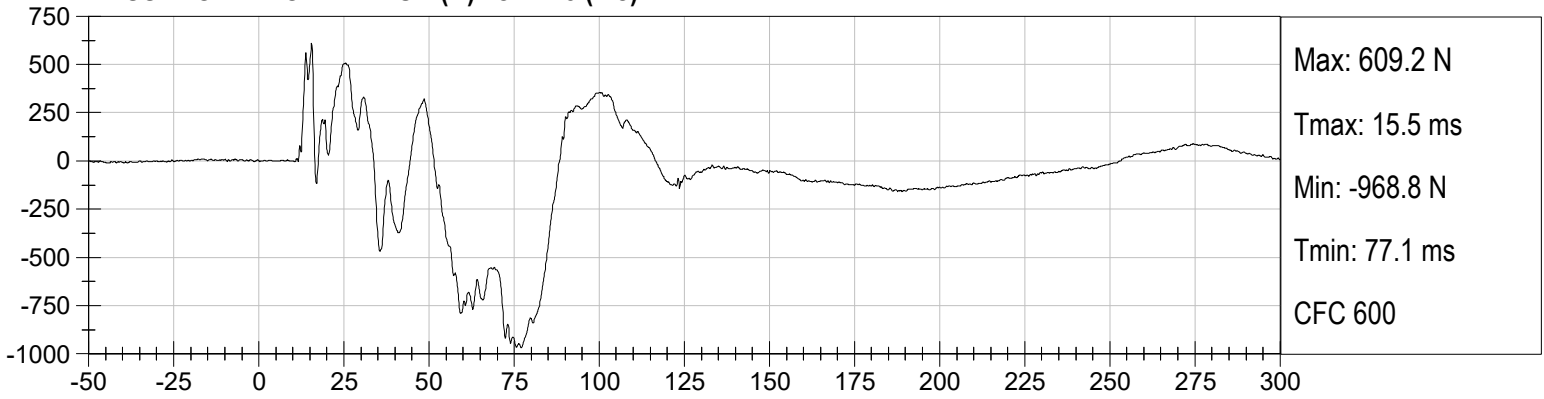
**PASSENGER Nij (NCE) vs Time (ms)**



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

**Hybrid III, 50th External Measurements  
SN: 351**

HYBRID III, PART 572, SUBPART E EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (inches)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	34.6-35.0	34.8
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	19.9-20.5	20.0
C	H-POINT HEIGHT	Reference	3.3-3.5	3.4
D	H-POINT LOCATION FROM BACKLINE	Reference	5.3-5.5	5.5
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	3.3-3.7	3.5
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	5.5-6.1	6.0
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	11.4-12.0	11.8
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	1.6-1.8	1.7
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	13.0-13.6	13.3
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	7.5-8.3	7.8
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	22.8-23.8	23.8
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	16.9-17.9	17.0
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	19.1-19.7	19.5
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. "K".	17.8-18.8	18.8



HYBRID III, SUBPART E EXTERIOR DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS		ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 16.9-17.1 in. above seat surface	8.4-9.0	8.5
P	FOOT LENGTH	Tip of toe to rear of heel	9.9-10.5	10.3
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	16.3-17.2	16.5
W	FOOT BREADTH	The widest part of the foot	3.6-4.2	4.0
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 16.9-17.1 in. above seat surface	38.2-39.4	39.2
Z	WAIST CIRCUMFERENCE	Measured 8.9-9.1 in. above seat surface	32.9-34.1	33.7
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	16.9-17.1	17.0
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	8.9-9.1	9.0

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

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

**ATD Serial No:** 351

**Test ID:** D210081

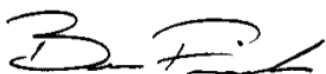
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Peak Resultant Acceleration	G's	225 to 275	256	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	1.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>



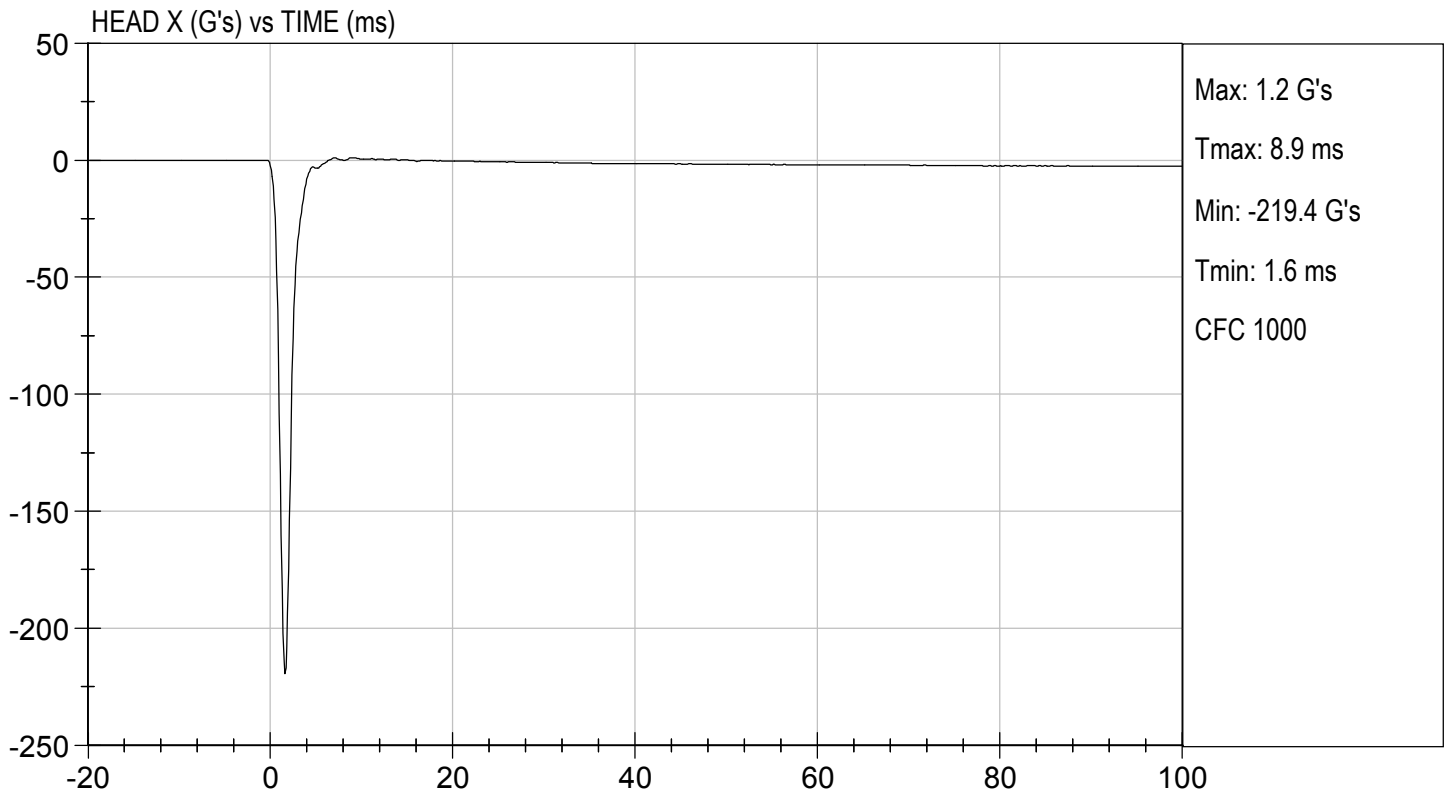
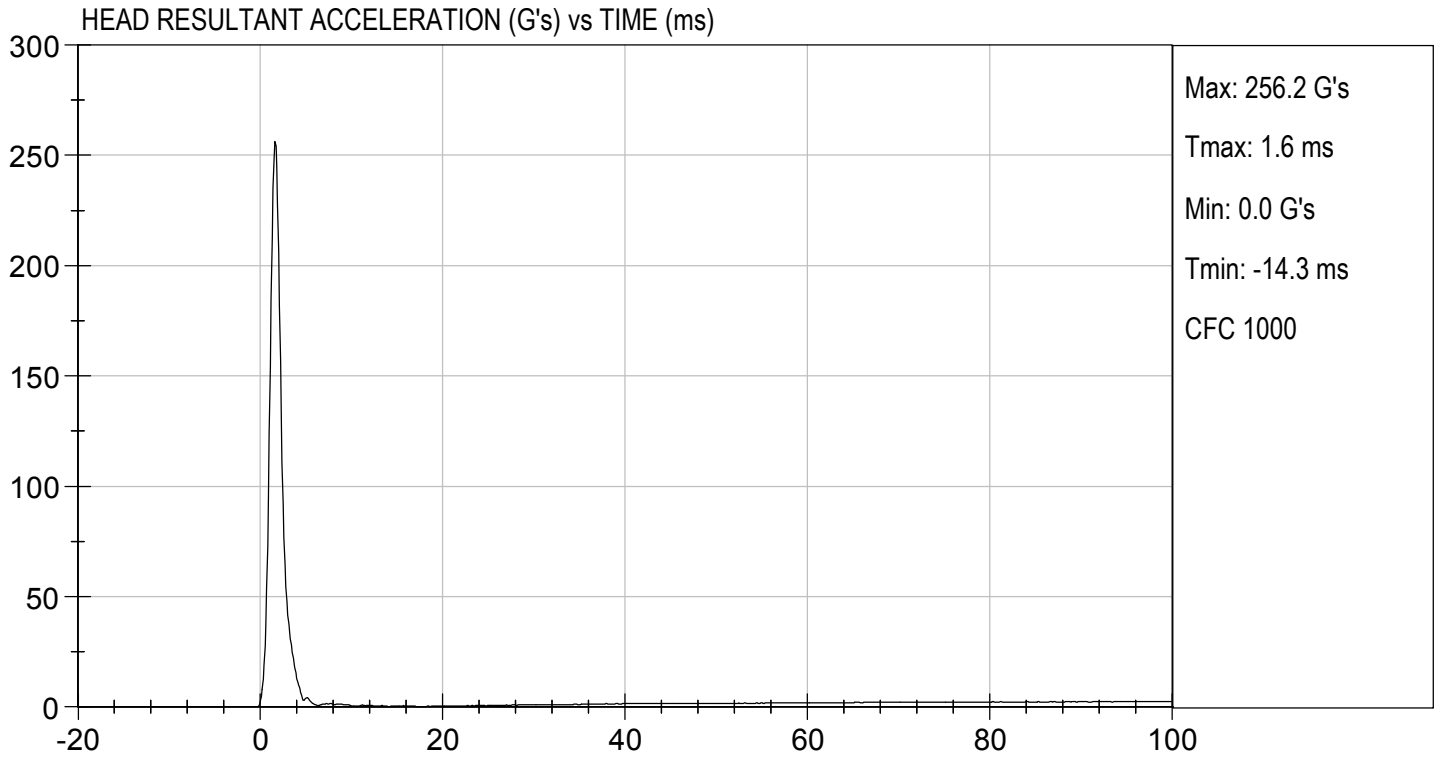
Laboratory Technician

01/07/2021

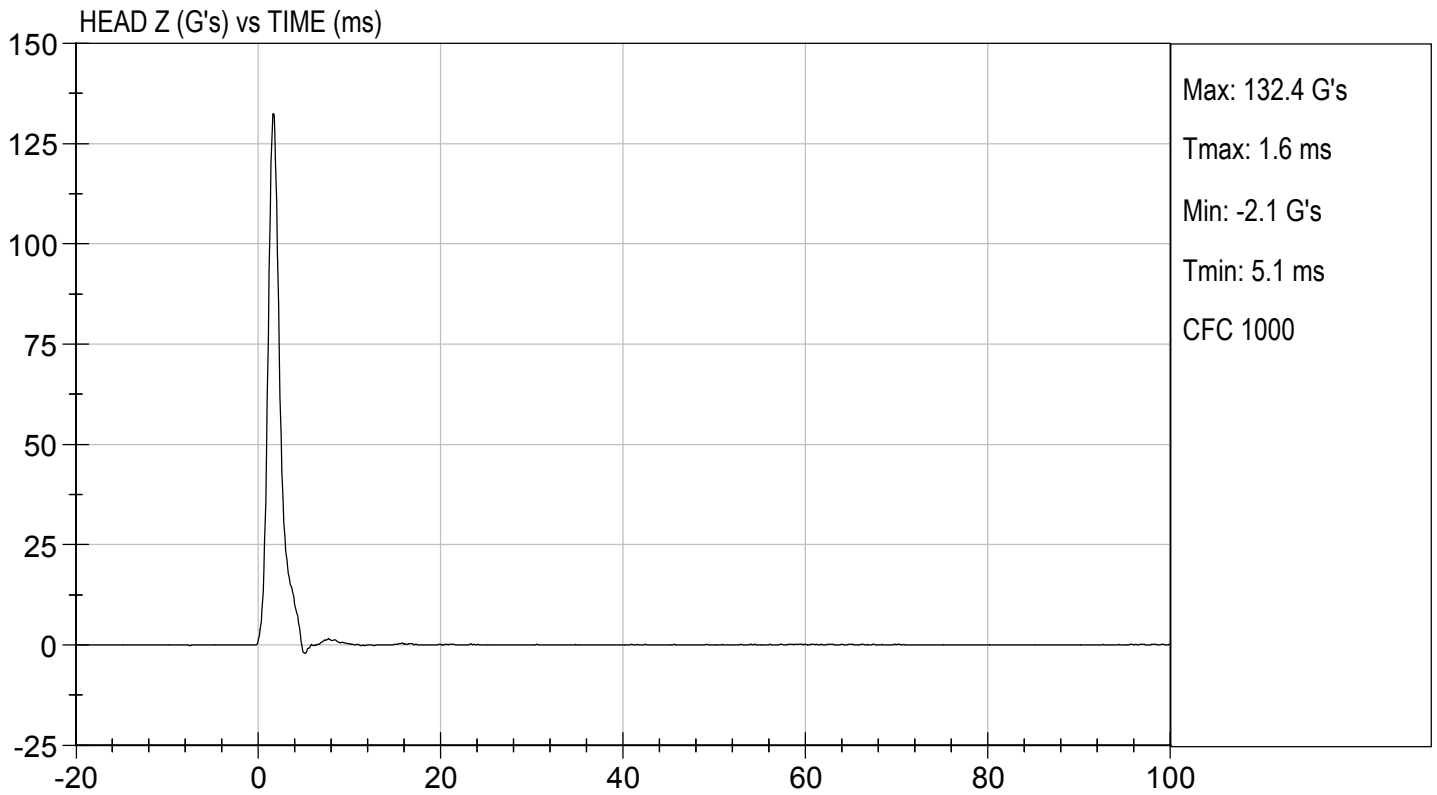
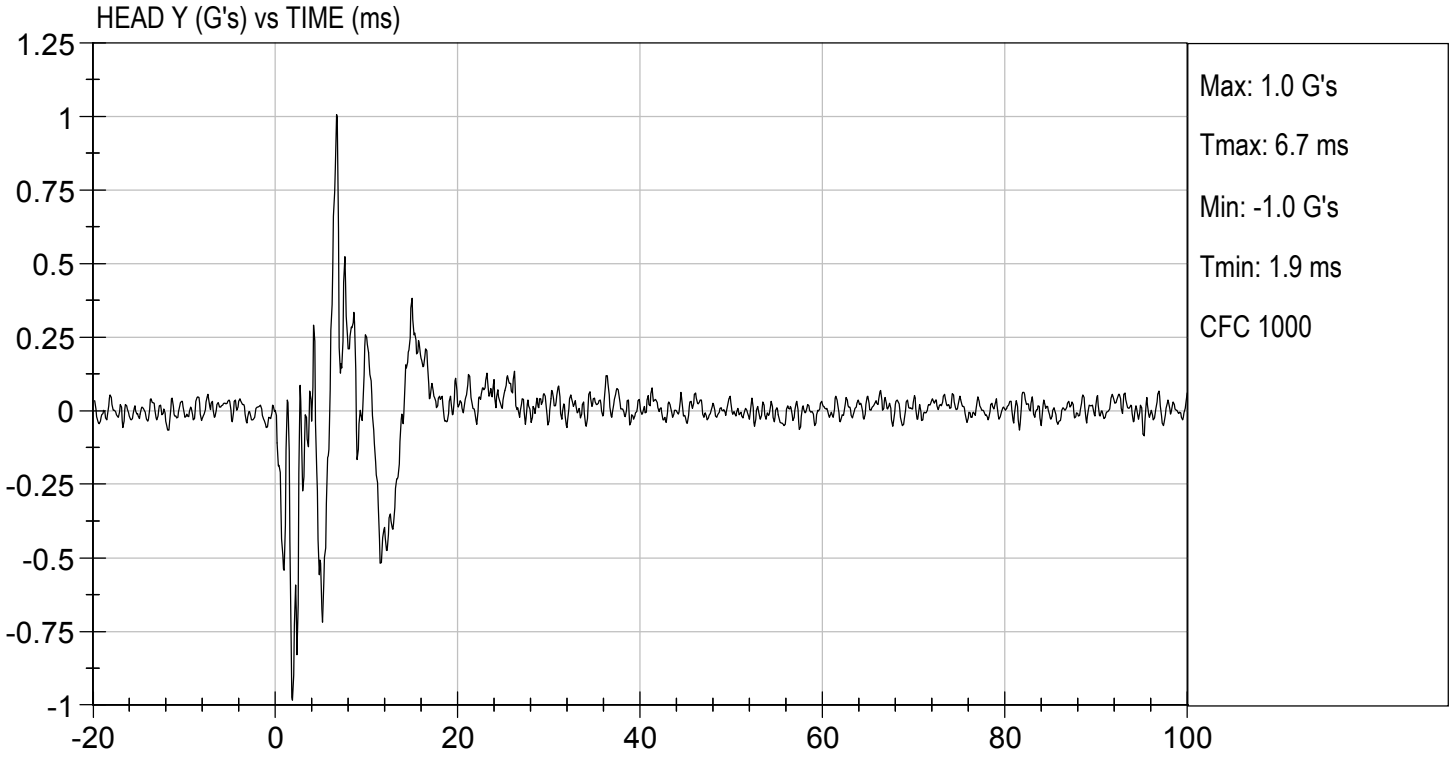
Test Date



Approved By







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

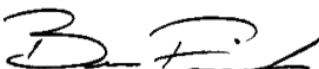
**ATD Serial No:** 351

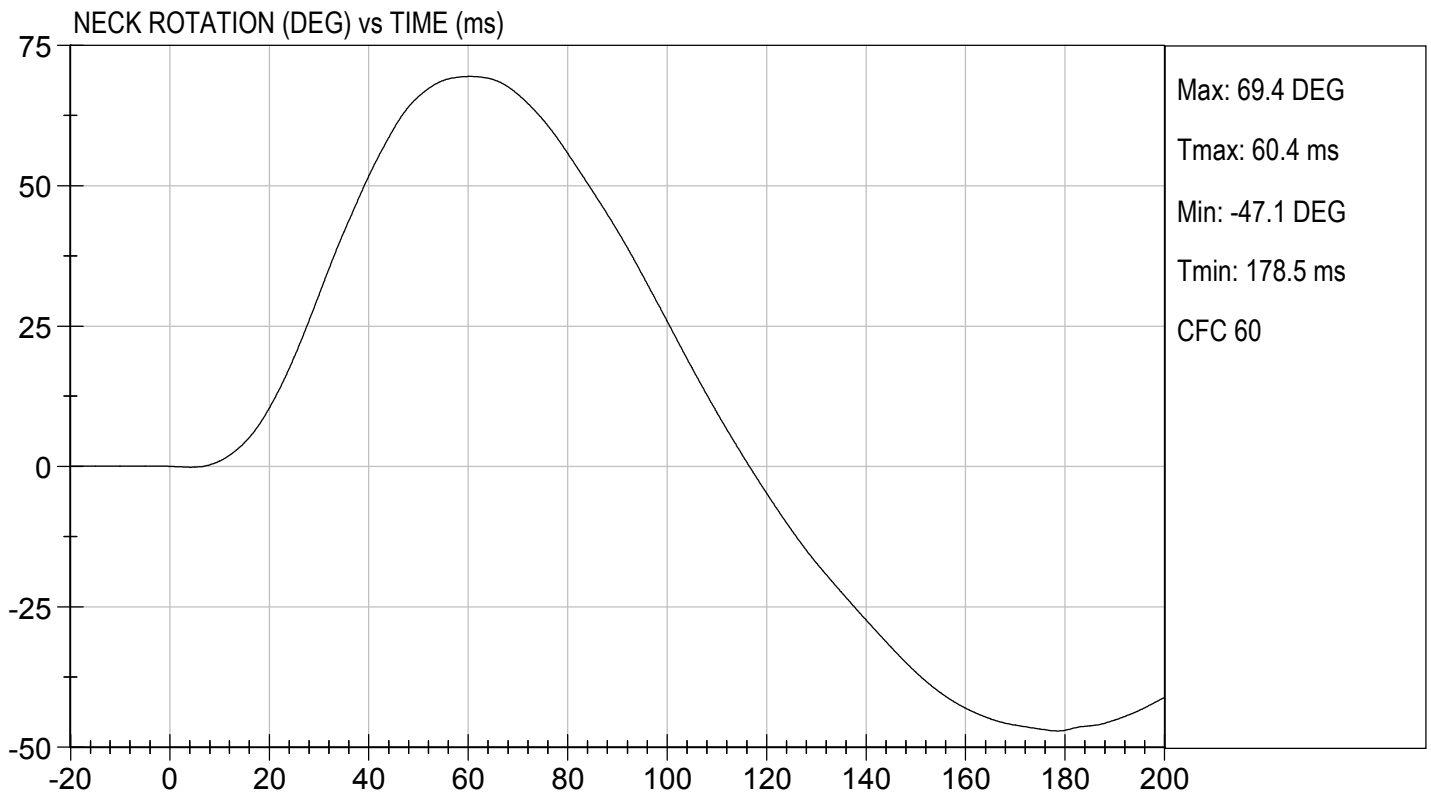
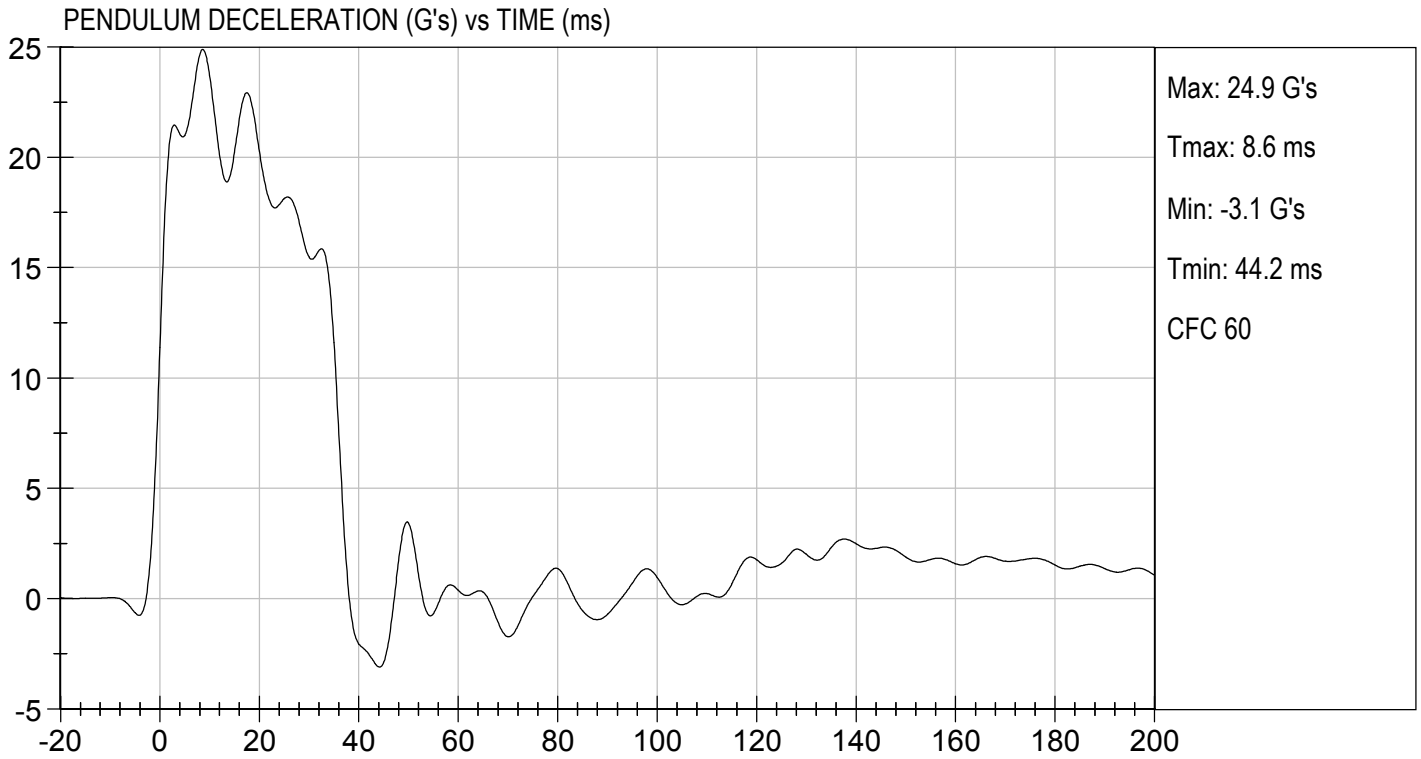
**Test I.D:** D210082

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.71	Pass
	20 ms	G's	17.60 to 22.60	20.27	Pass
	30 ms	G's	12.50 to 18.50	15.47	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.6	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	69.4	Pass
	Time	ms	57.0 to 64.0	60.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	116.7	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	89.3	Pass
	Time	ms	47.0 to 58.0	49.3	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	100.2	Pass
<b>Overall Test Results</b>					<b>Pass</b>

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

01/07/2021  
 \_\_\_\_\_  
 Test Date

  
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 Approved By

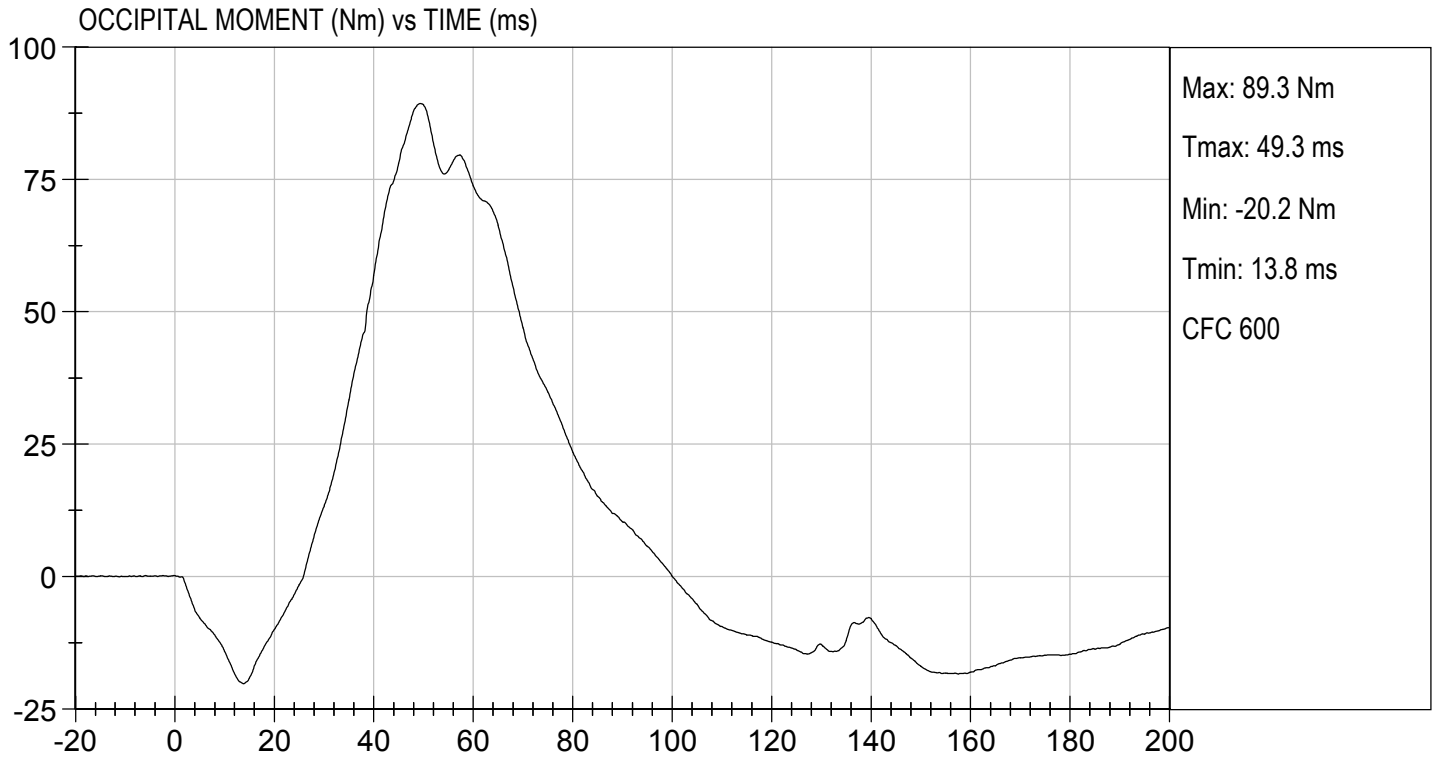






TEST DESC: NECK FLEXION  
VELOCITY: 22.83 ft/s, 6.96 m/s

TEST DATE: 01/07/2021  
TEST #: D210082



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

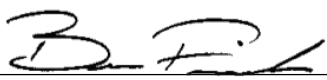
**ATD Serial No:** 351

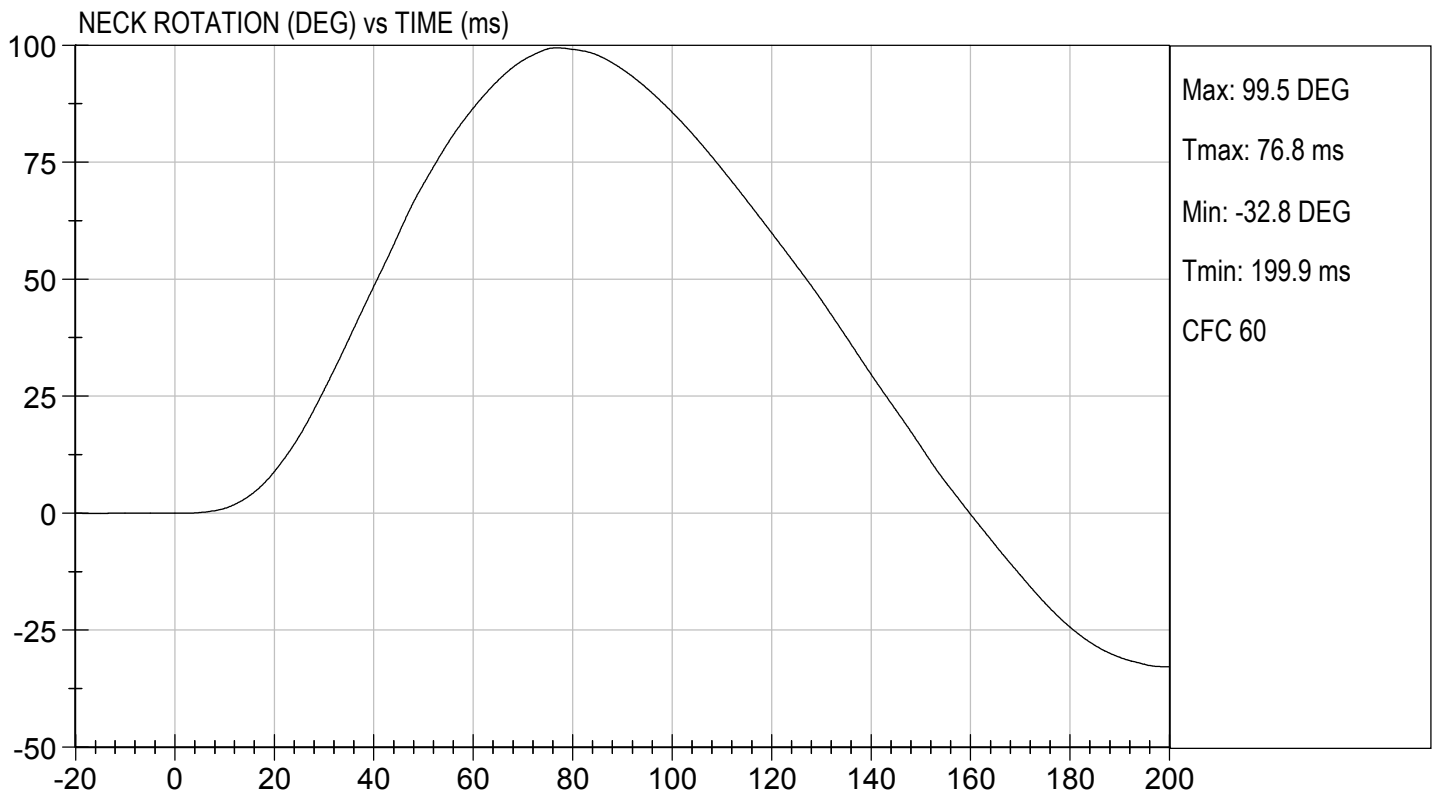
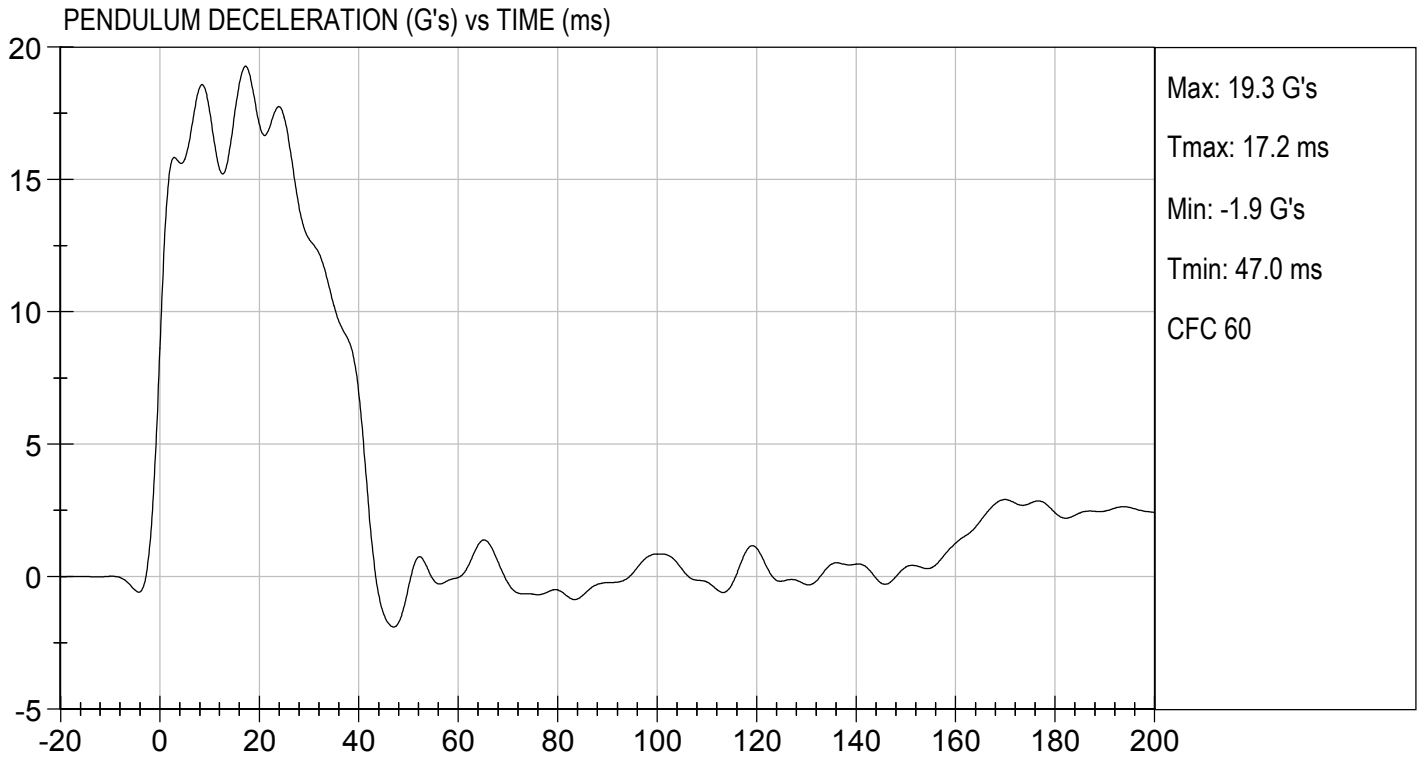
**Test I.D.:** D210083

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.58	Pass
	20 ms	G's	14.00 to 19.00	17.08	Pass
	30 ms	G's	11.00 to 16.00	12.75	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.7	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.5	Pass
	Time	ms	72.0 to 82.0	76.8	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	160.0	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-64.8	Pass
	Time	ms	65.0 to 79.0	72.0	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	142.8	Pass
Overall Test Results					Pass

  
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 Laboratory Technician

01/07/2021  
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 Test Date

  
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 Approved By







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

**ATD Serial No:** 351

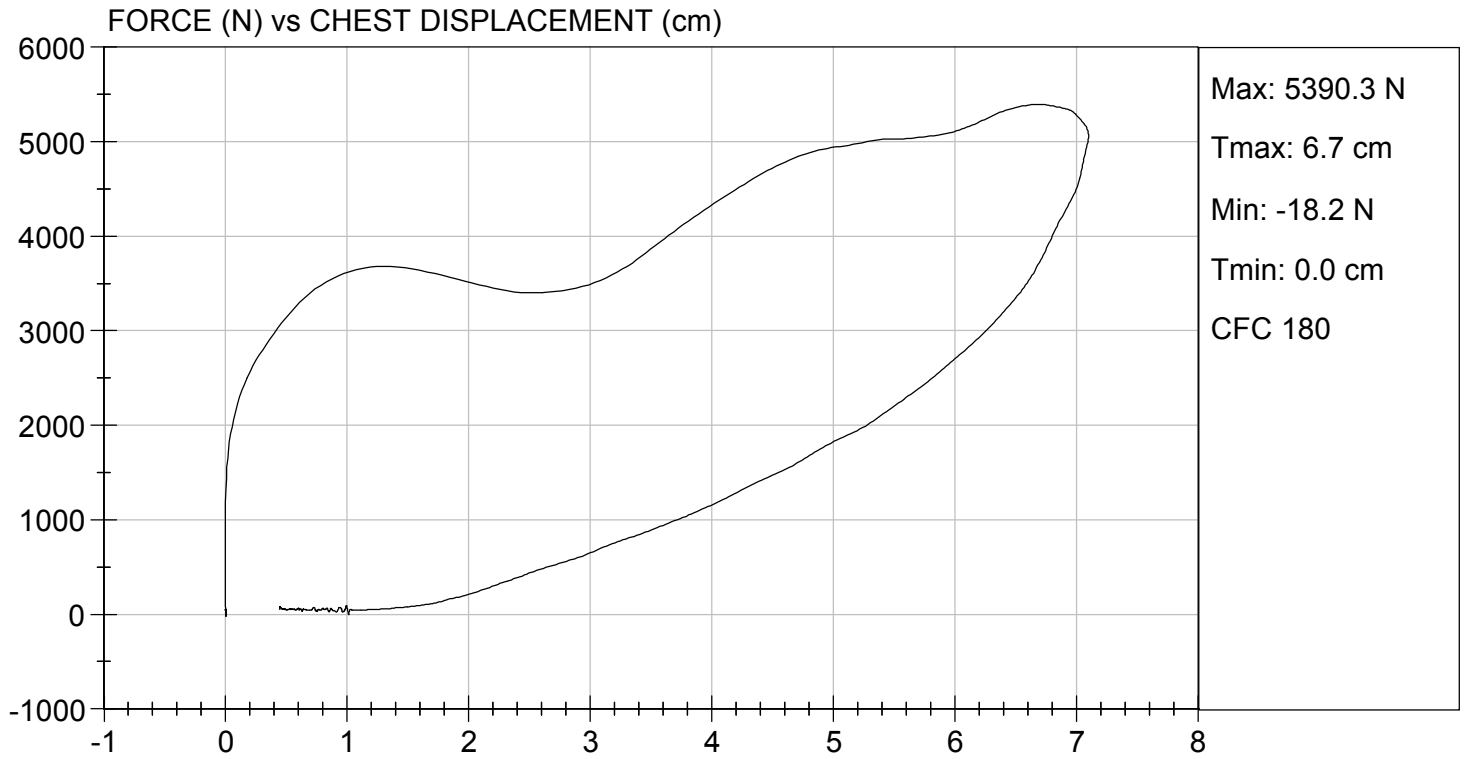
**Test I.D:** D210084

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,390	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.10	Pass
Internal Hysteresis	%	69 to 85	69	Pass
			<b>Overall Test Results</b>	<b>Pass</b>

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

01/08/2021  
 \_\_\_\_\_  
 Test Date

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





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

**ATD Serial No:** 351

**Test I.D:** D210085

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	N	4715 to 5782	5,475	Pass
Overall Test Results				Pass

  
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 Laboratory Technician

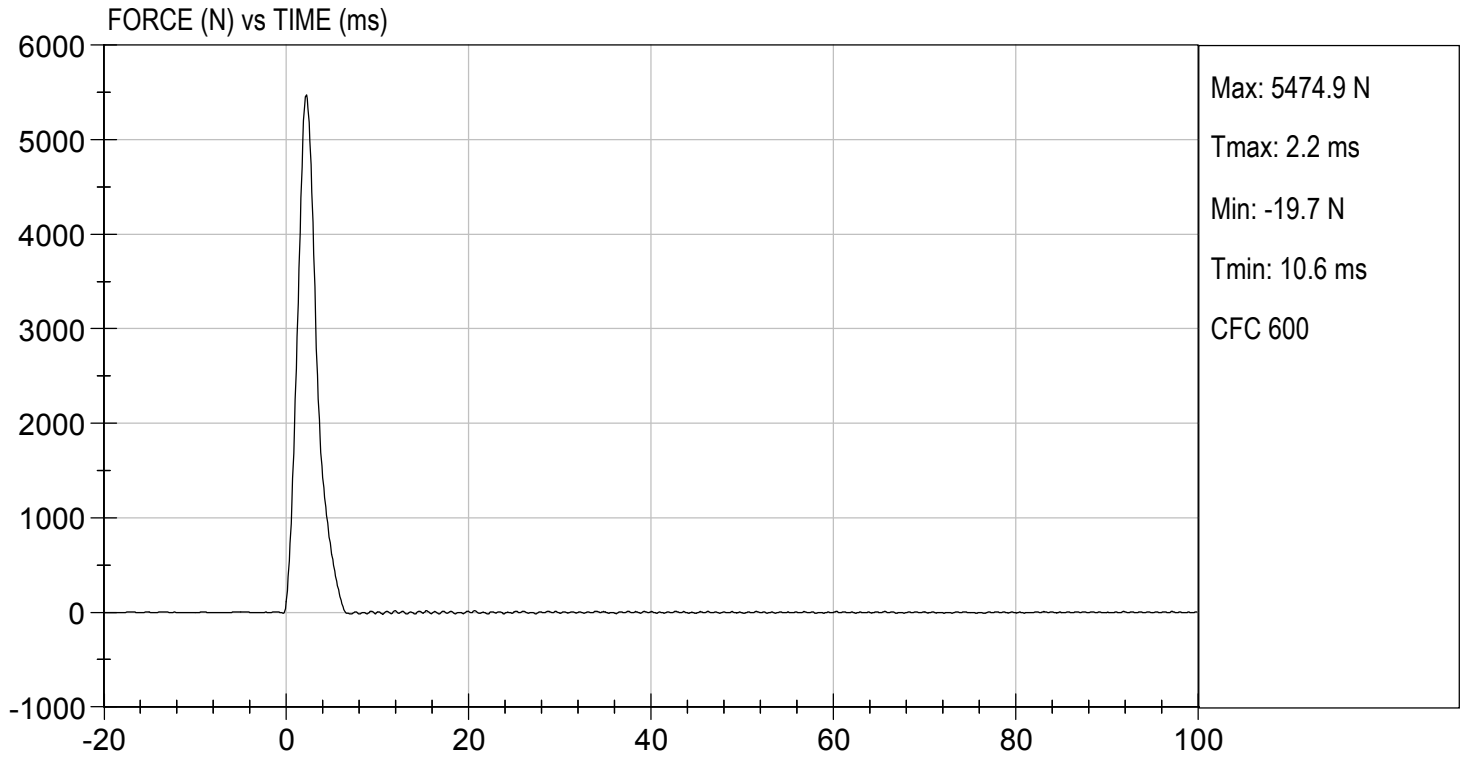
01/07/2021  
 \_\_\_\_\_  
 Test Date

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



TEST DESC: RIGHT KNEE  
VELOCITY: 6.80 ft/s, 2.07 m/s

TEST DATE: 01/07/2021  
TEST #: D210085



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

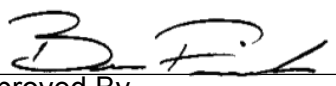
**ATD Serial No:** 351

**Test I.D:** D210086

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	N	4715 to 5782	5,327	Pass
Overall Test Results				Pass

  
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 Laboratory Technician

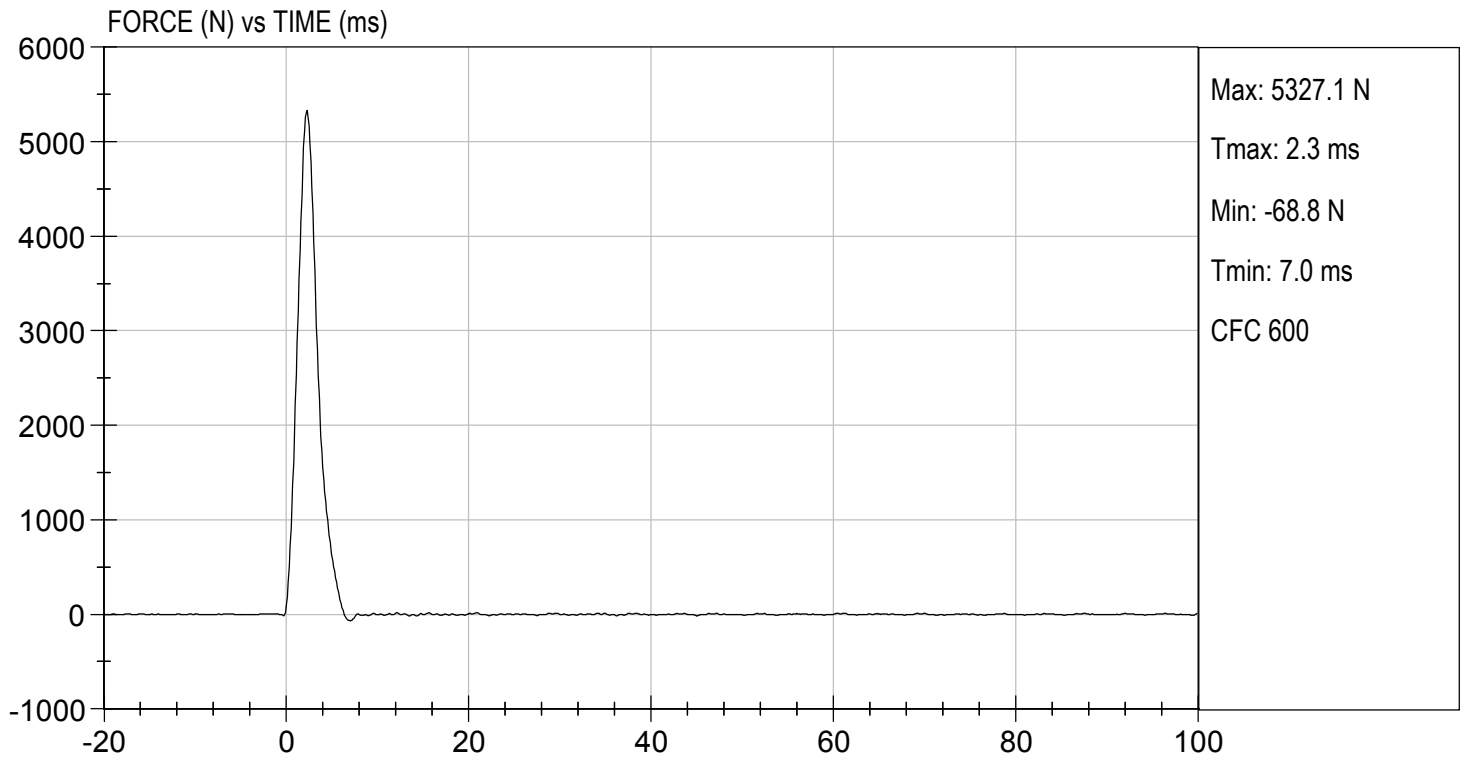
01/07/2021  
 \_\_\_\_\_  
 Test Date

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



TEST DESC: LEFT KNEE  
VELOCITY: 6.80 ft/s, 2.07 m/s

TEST DATE: 01/07/2021  
TEST #: D210086





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

**ATD Serial No:** 351

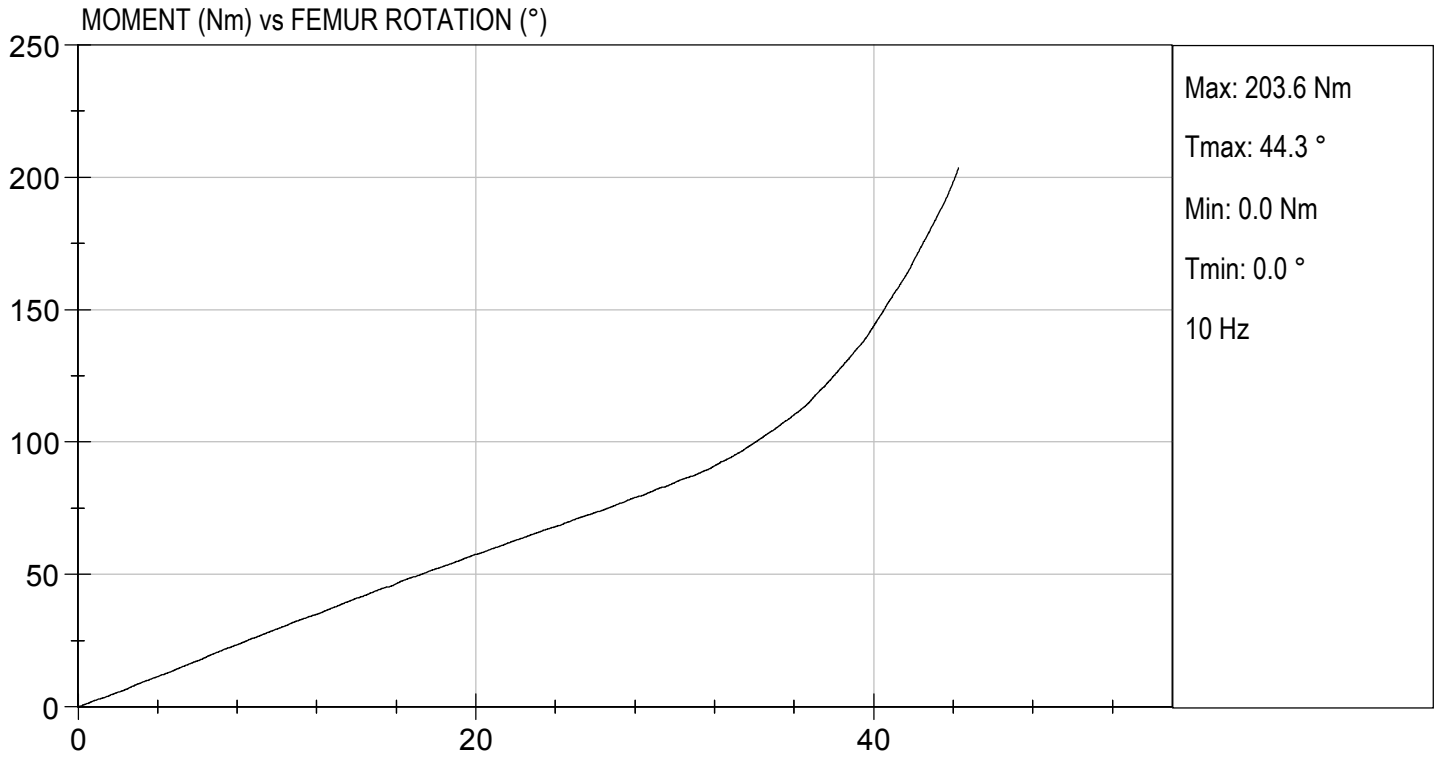
**Test I.D:** D210080

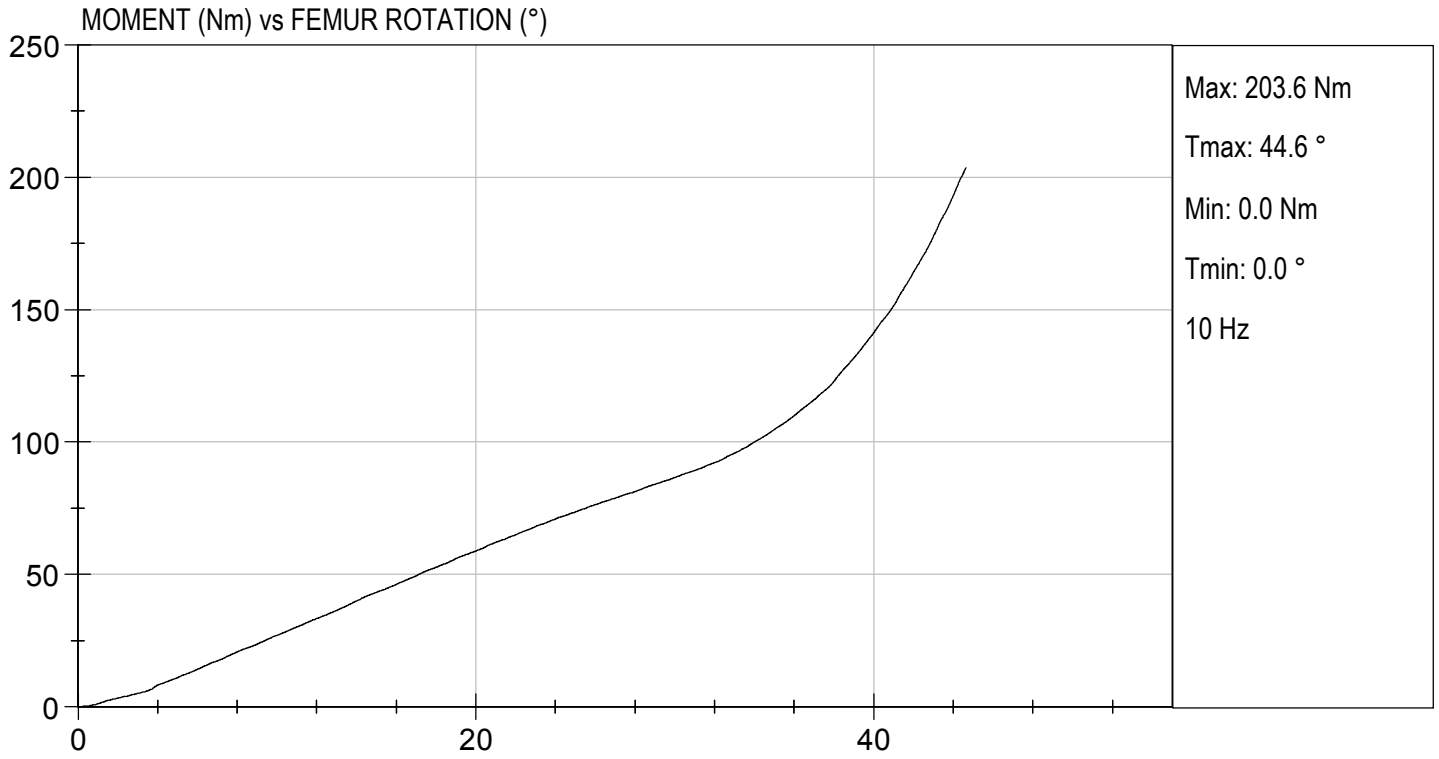
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21	21	Pass
Laboratory Relative Humidity	%	10 to 70	22	22	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.4	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	84.7	86.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.3	44.6	Pass
Overall Test Results					Pass

  
 Laboratory Technician

01/08/2021  
 Test Date

  
 Approved By





**CALIBRATION TEST RESULTS**

**POST-TEST**

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




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

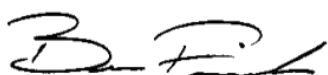
ATD Serial No: 351

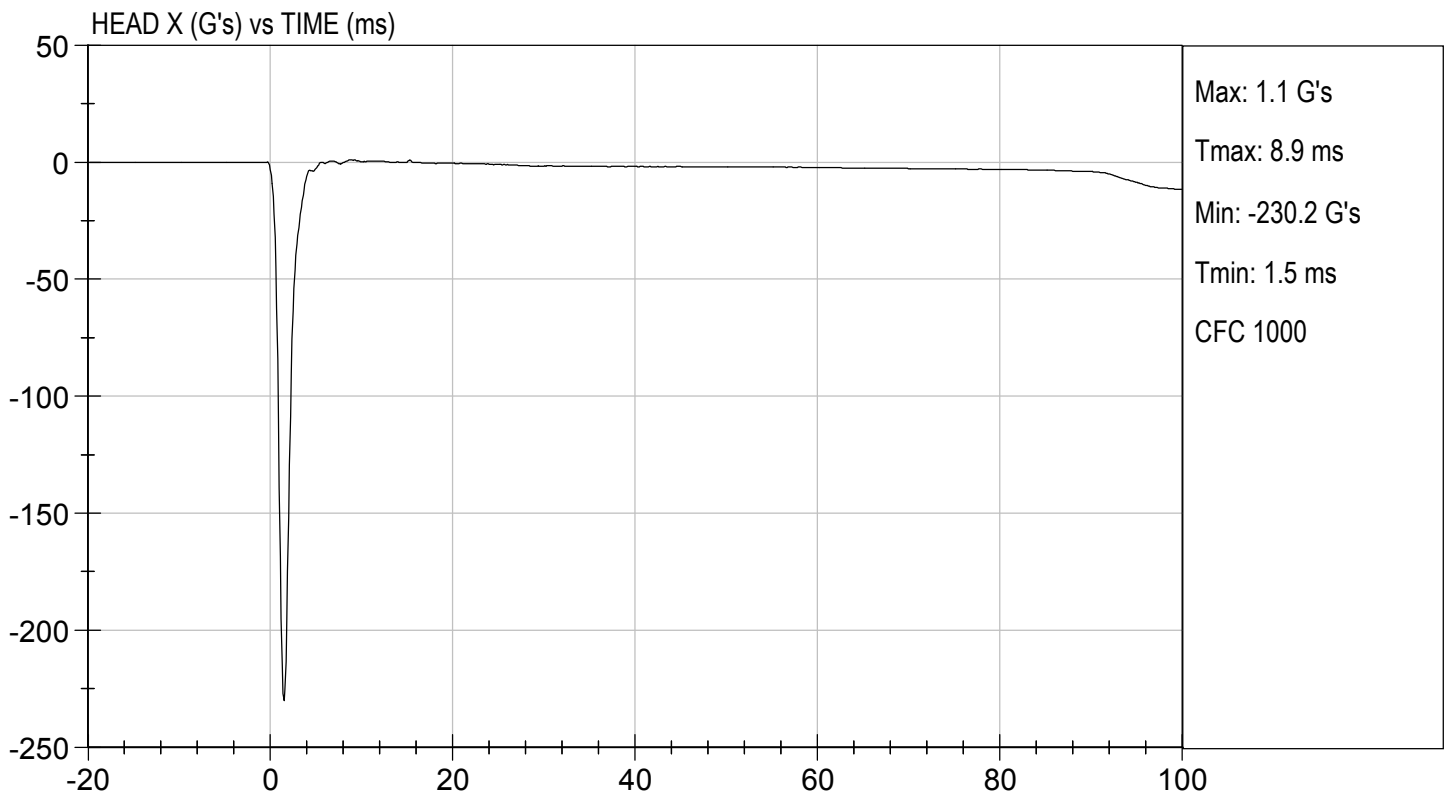
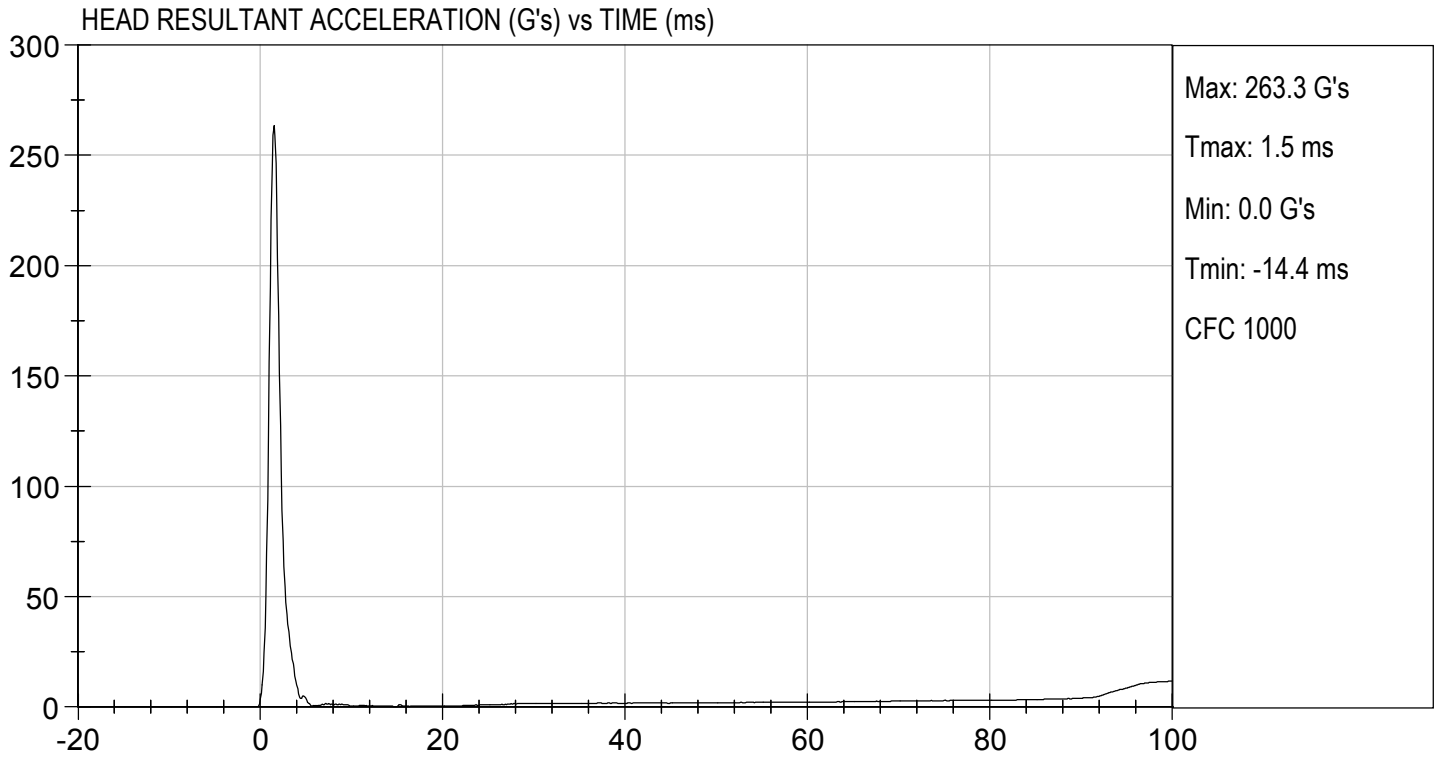
Test ID: D210281

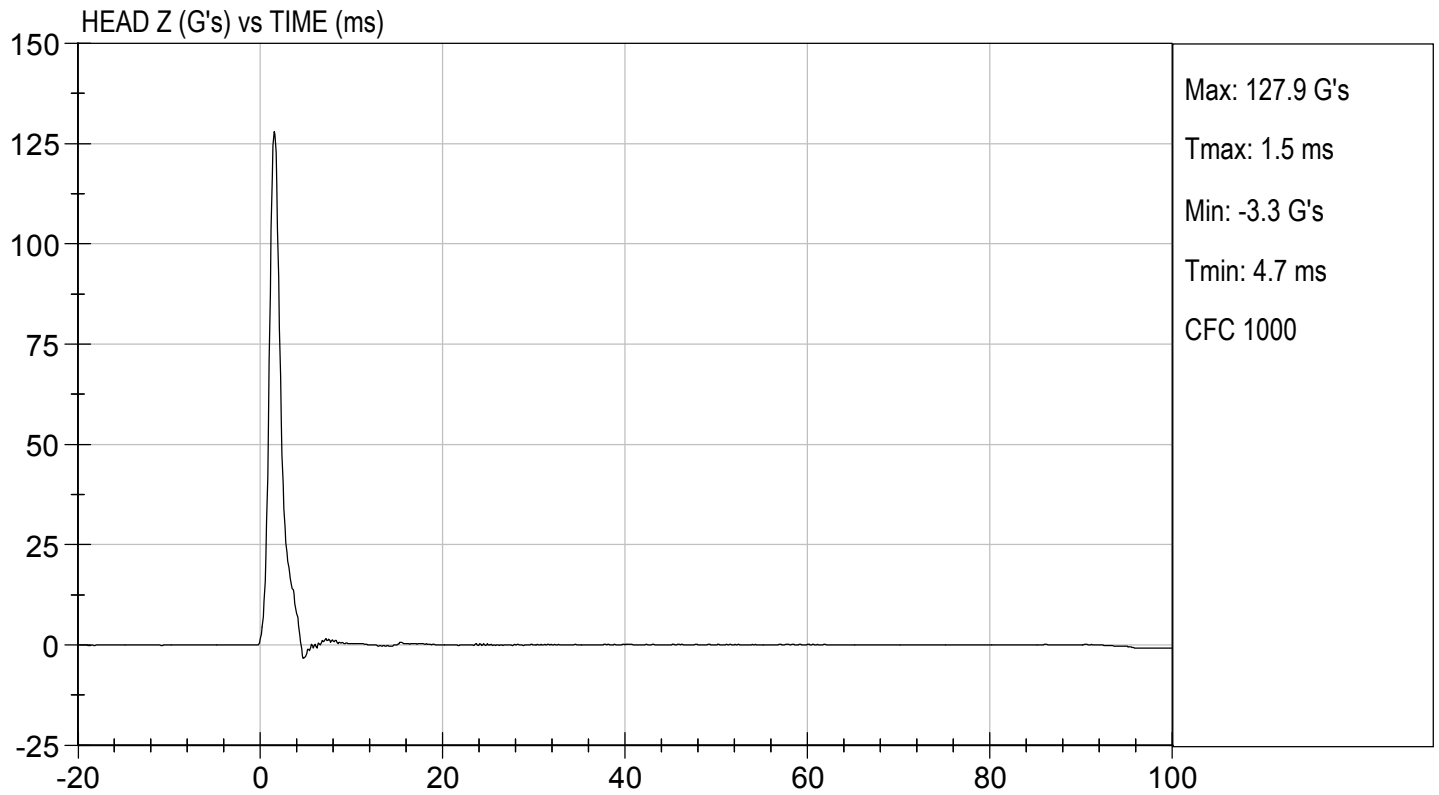
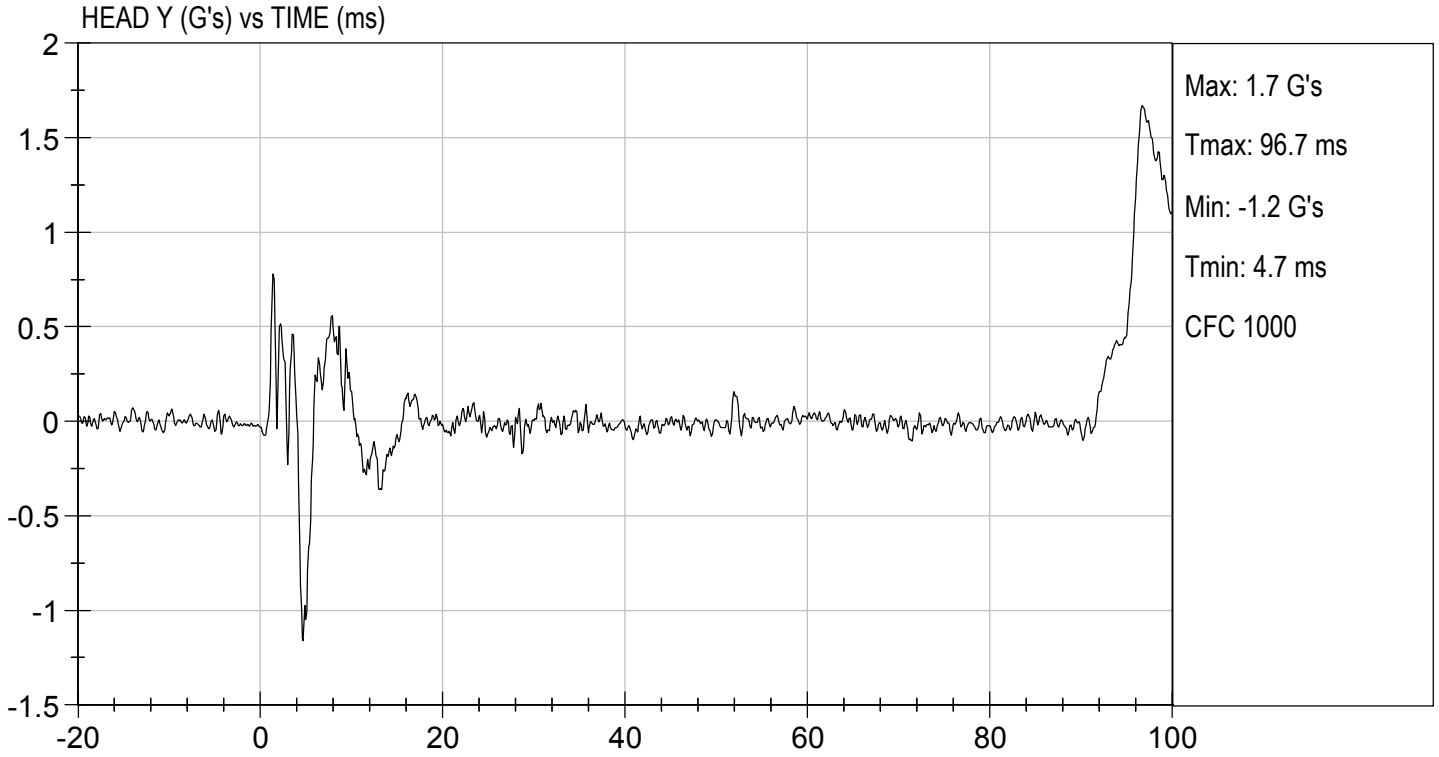
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Peak Resultant Acceleration	G's	225 to 275	263	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	1.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

02/04/2021  
 Test Date

  
 Approved By





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

**ATD Serial No:** 351

**Test I.D:** D210282

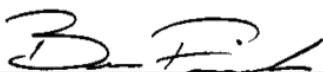
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.67	Pass
	20 ms	G's	17.60 to 22.60	20.47	Pass
	30 ms	G's	12.50 to 18.50	14.71	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	37.2	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	70.1	Pass
	Time	ms	57.0 to 64.0	58.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	117.1	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	94.4	Pass
	Time	ms	47.0 to 58.0	49.0	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.8	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Laboratory Technician

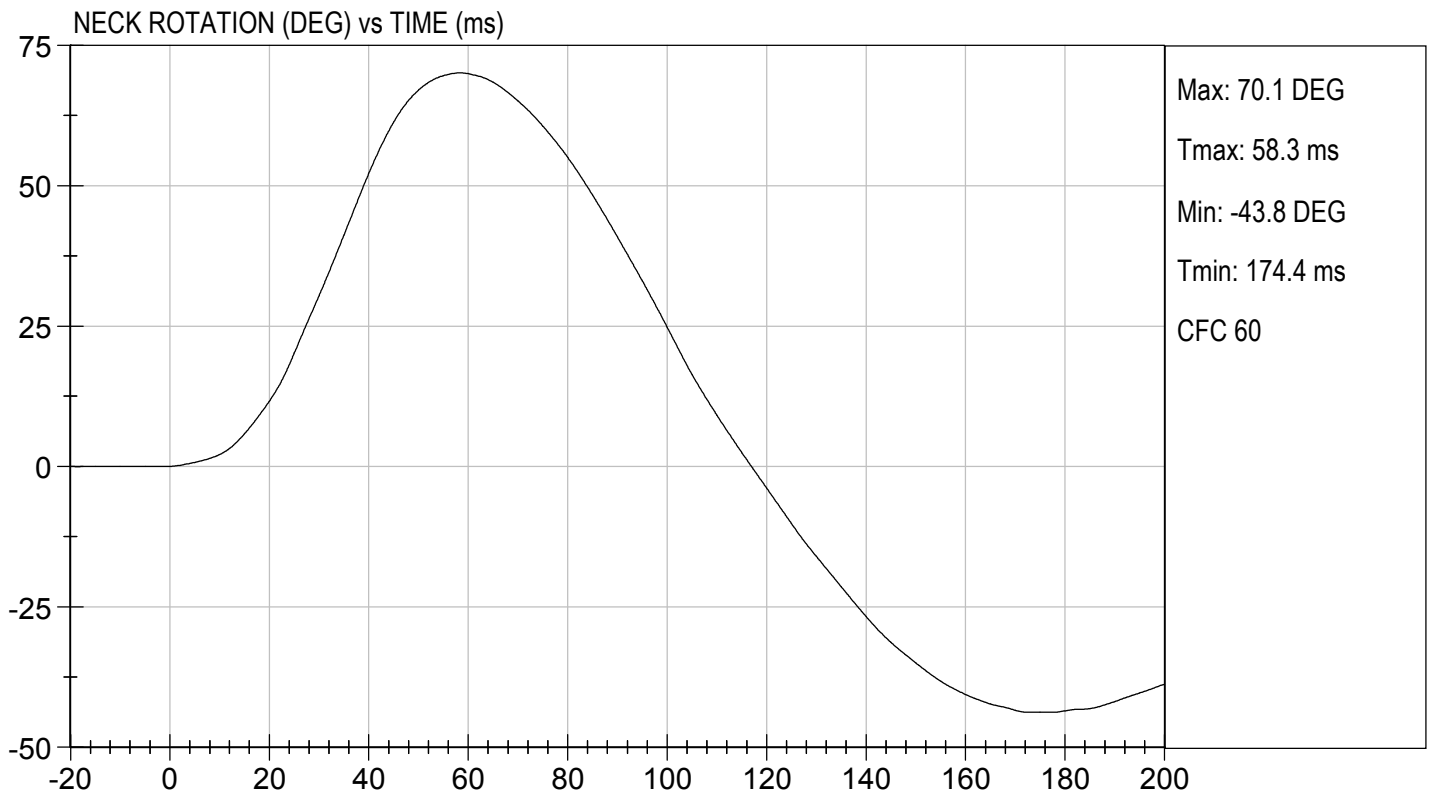
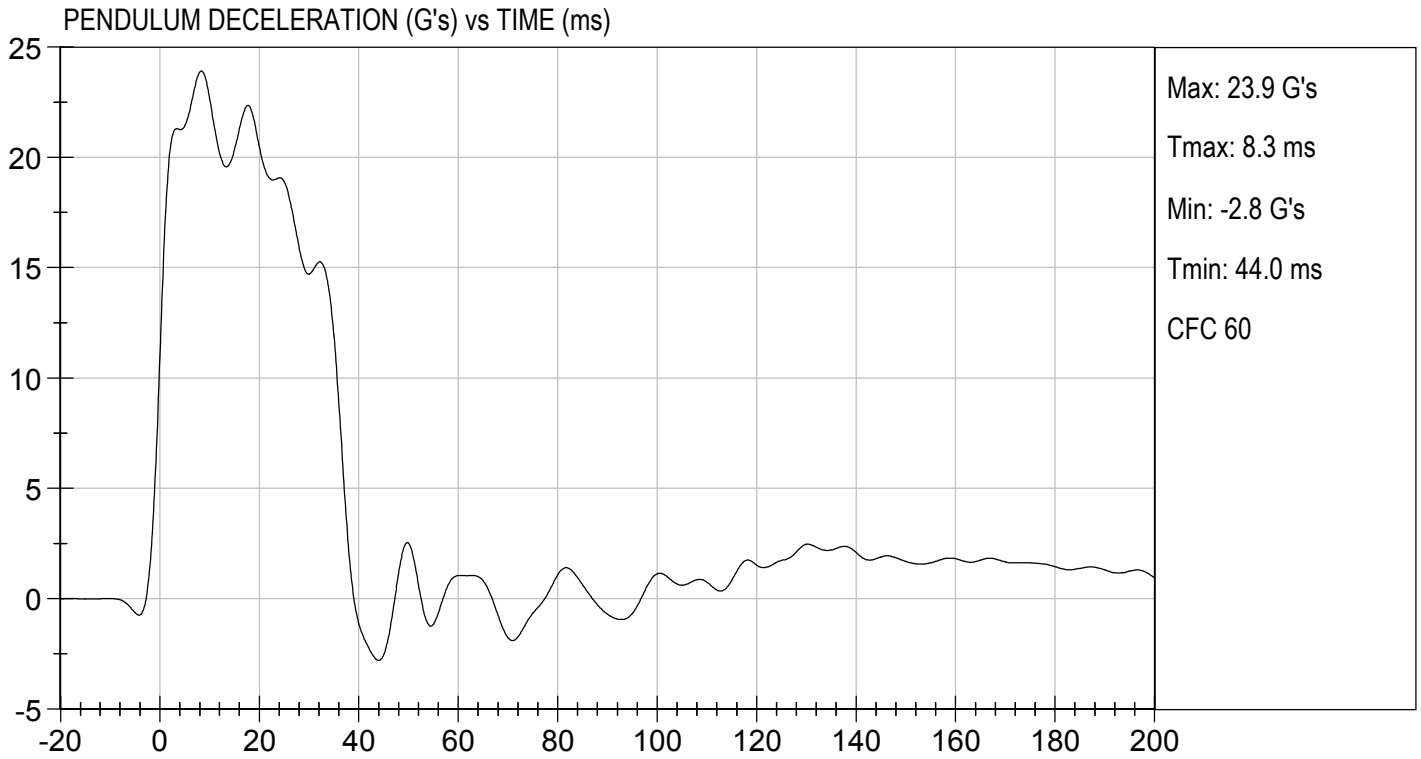
02/05/2021

Test Date



Approved By

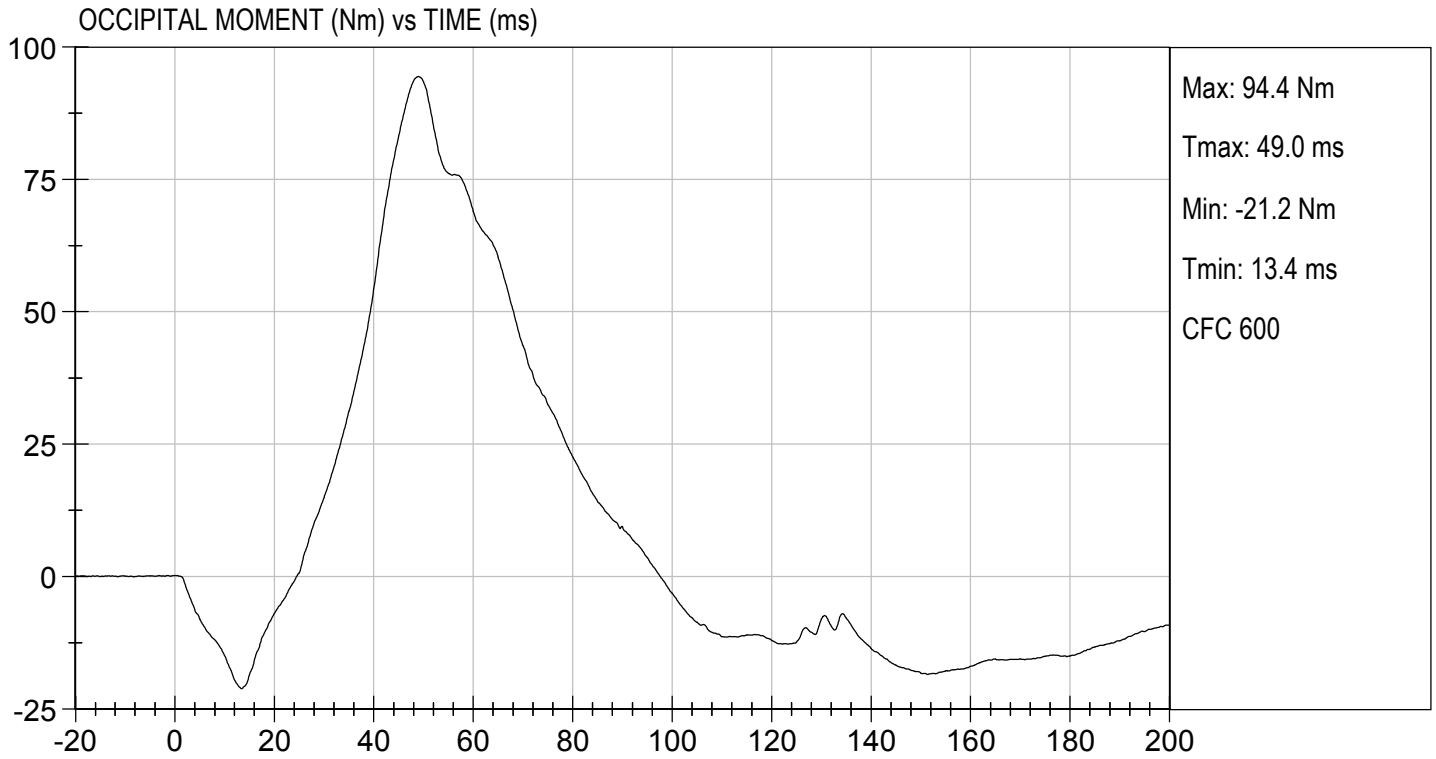






TEST DESC: NECK FLEXION  
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 02/05/2021  
TEST #: D210282




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

ATD Serial No: 351

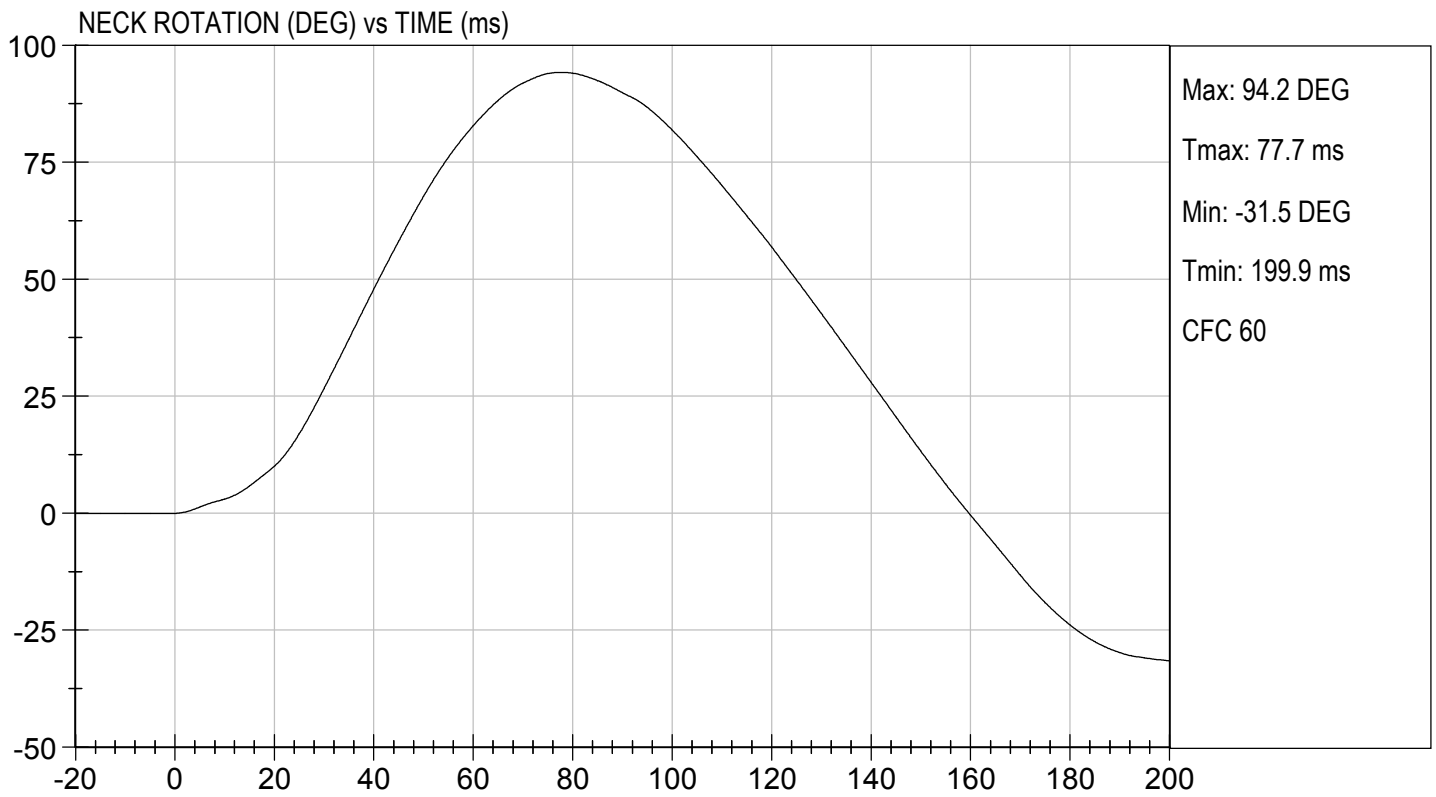
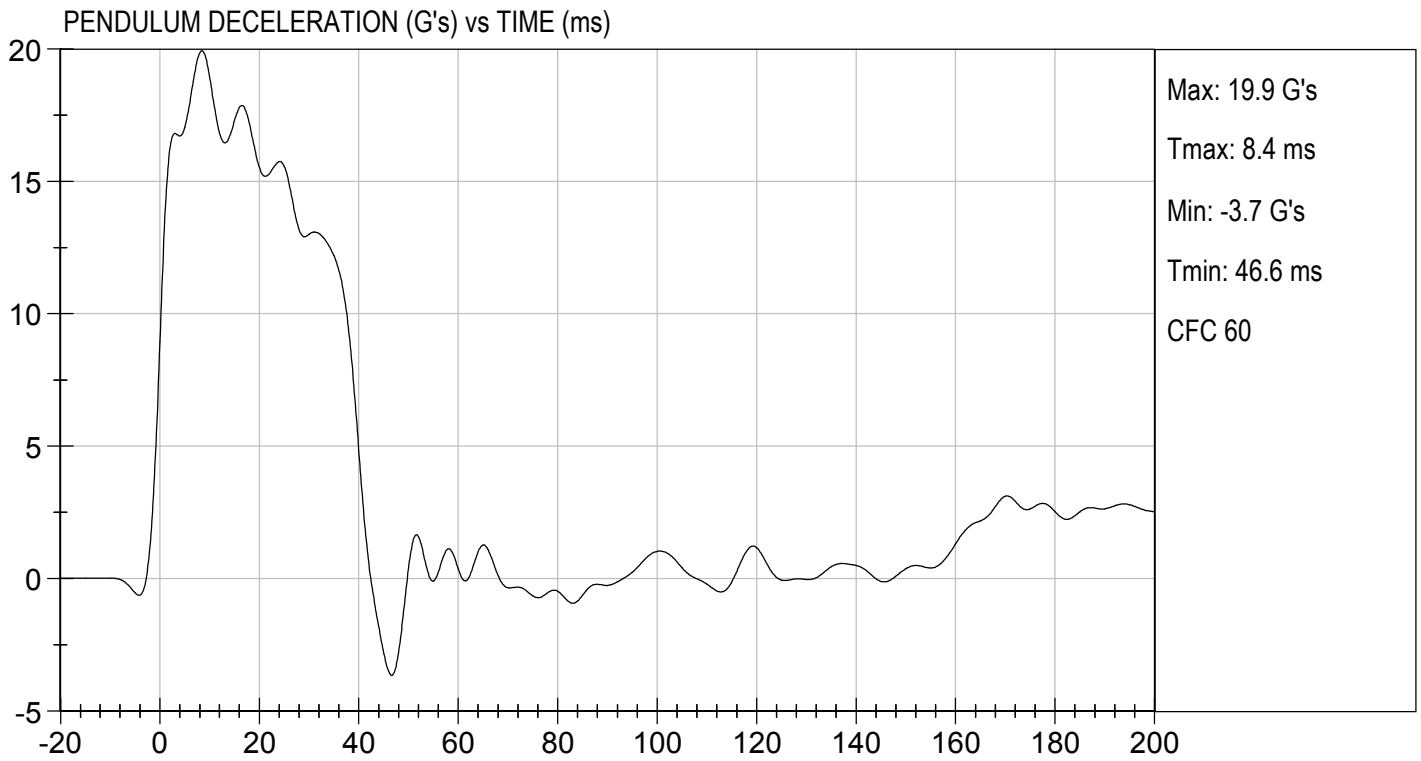
Test I.D.: D210283

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.94	Pass
	20 ms	G's	14.00 to 19.00	15.53	Pass
	30 ms	G's	11.00 to 16.00	13.01	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.1	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	40.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.2	Pass
	Time	ms	72.0 to 82.0	77.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	159.8	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.5	Pass
	Time	ms	65.0 to 79.0	72.1	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.2	Pass
Overall Test Results					Pass

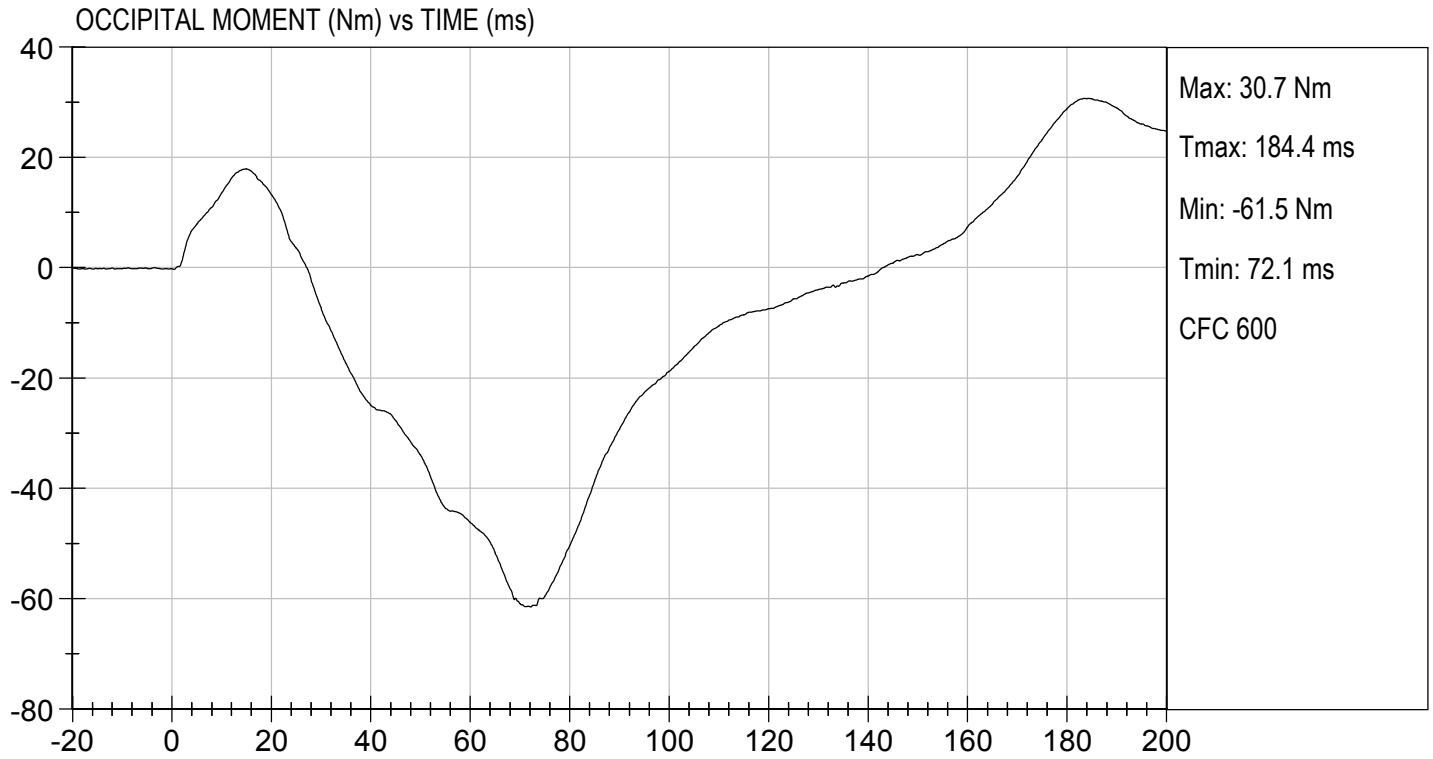
  
 Laboratory Technician

02/05/2021  
 Test Date

  
 Approved By








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

ATD Serial No: 351

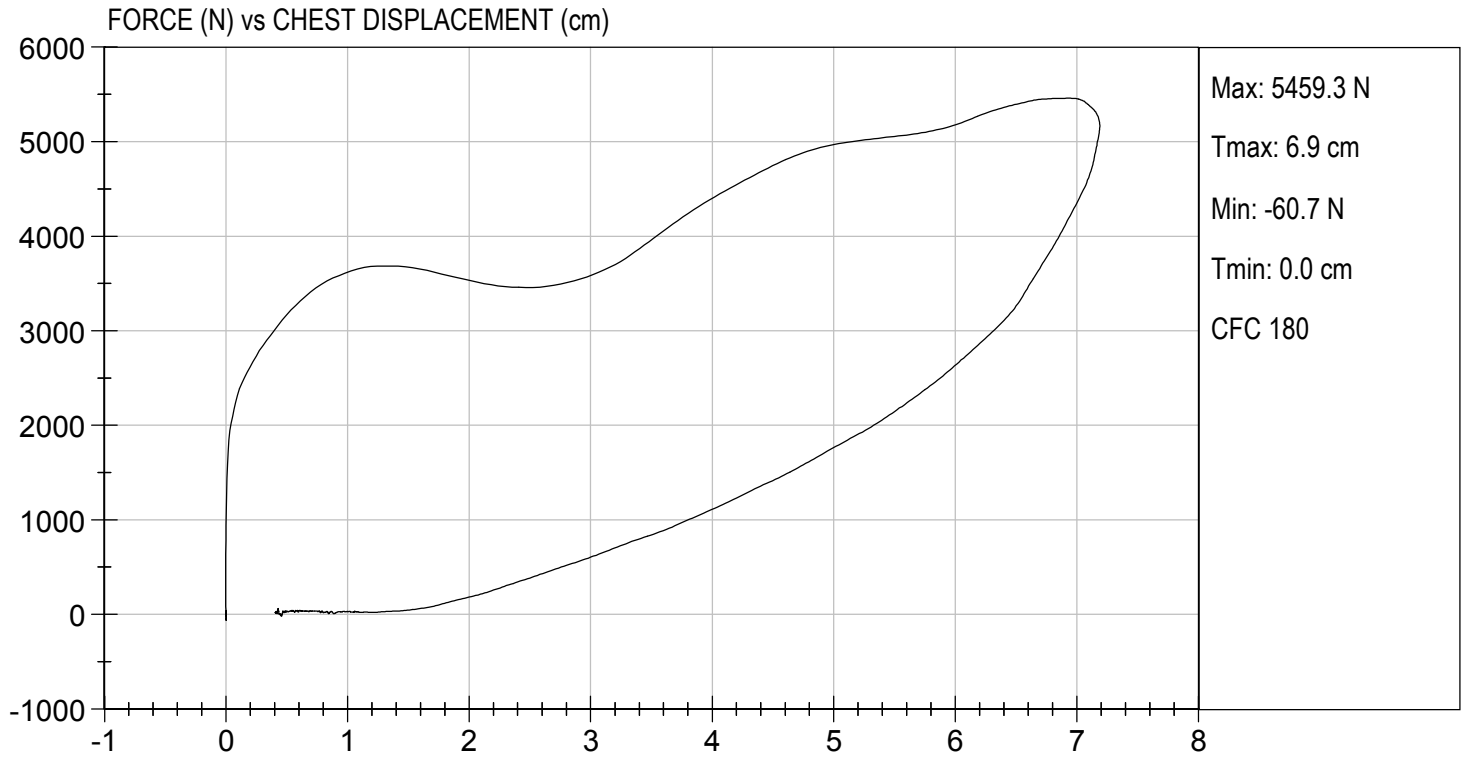
Test I.D: D210284

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,459	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.19	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results				Pass

  
 Laboratory Technician

02/04/2021  
 Test Date

  
 Approved By




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

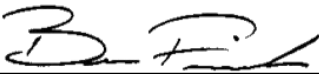
**ATD Serial No:** 351

**Test I.D:** D210285

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,194	Pass
Overall Test Results				Pass

  
 Laboratory Technician

02/05/2021  
 Test Date

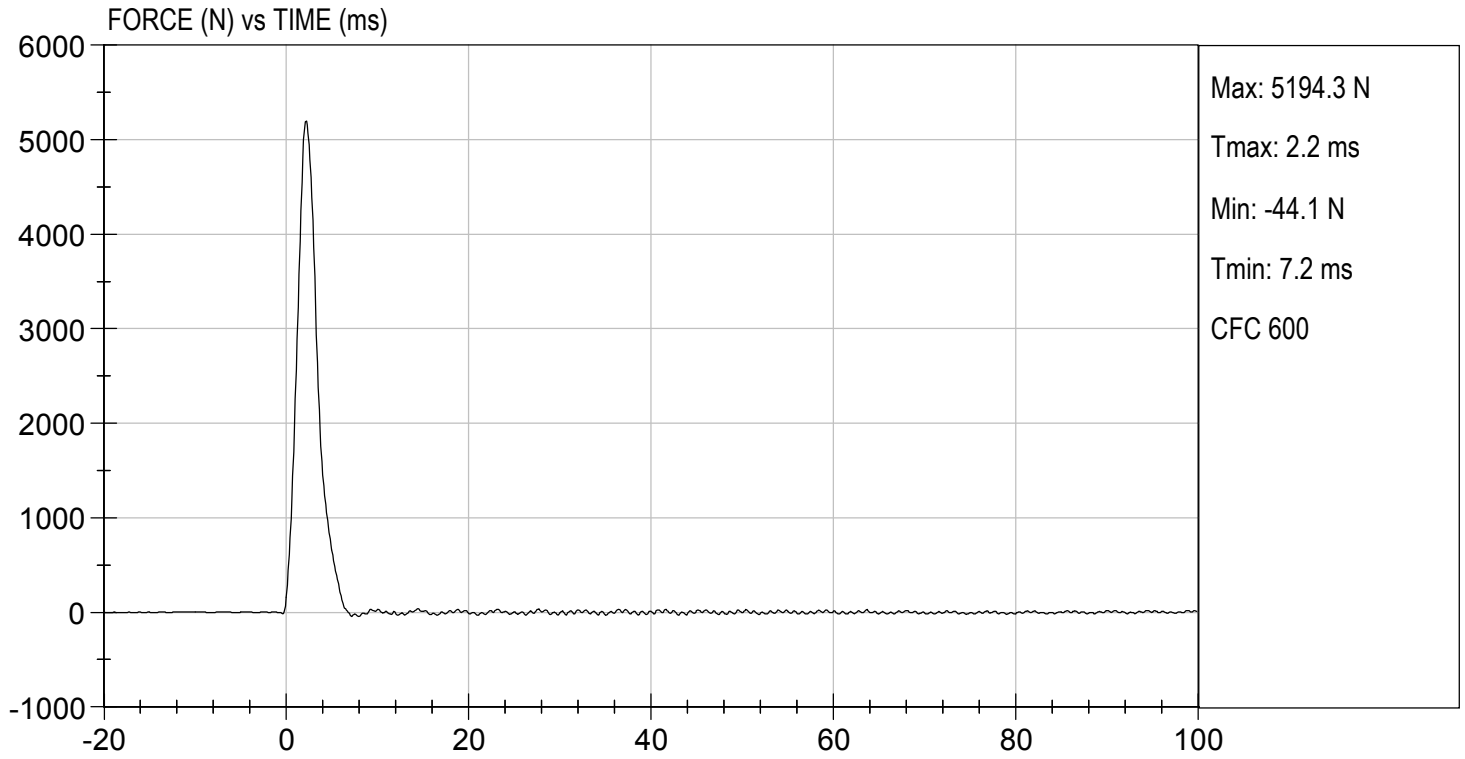
  
 Approved By





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

TEST DATE: 02/05/2021  
TEST #: D210285



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

ATD Serial No: 351

Test I.D: D210286

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,300	Pass
Overall Test Results				Pass

  
 Laboratory Technician

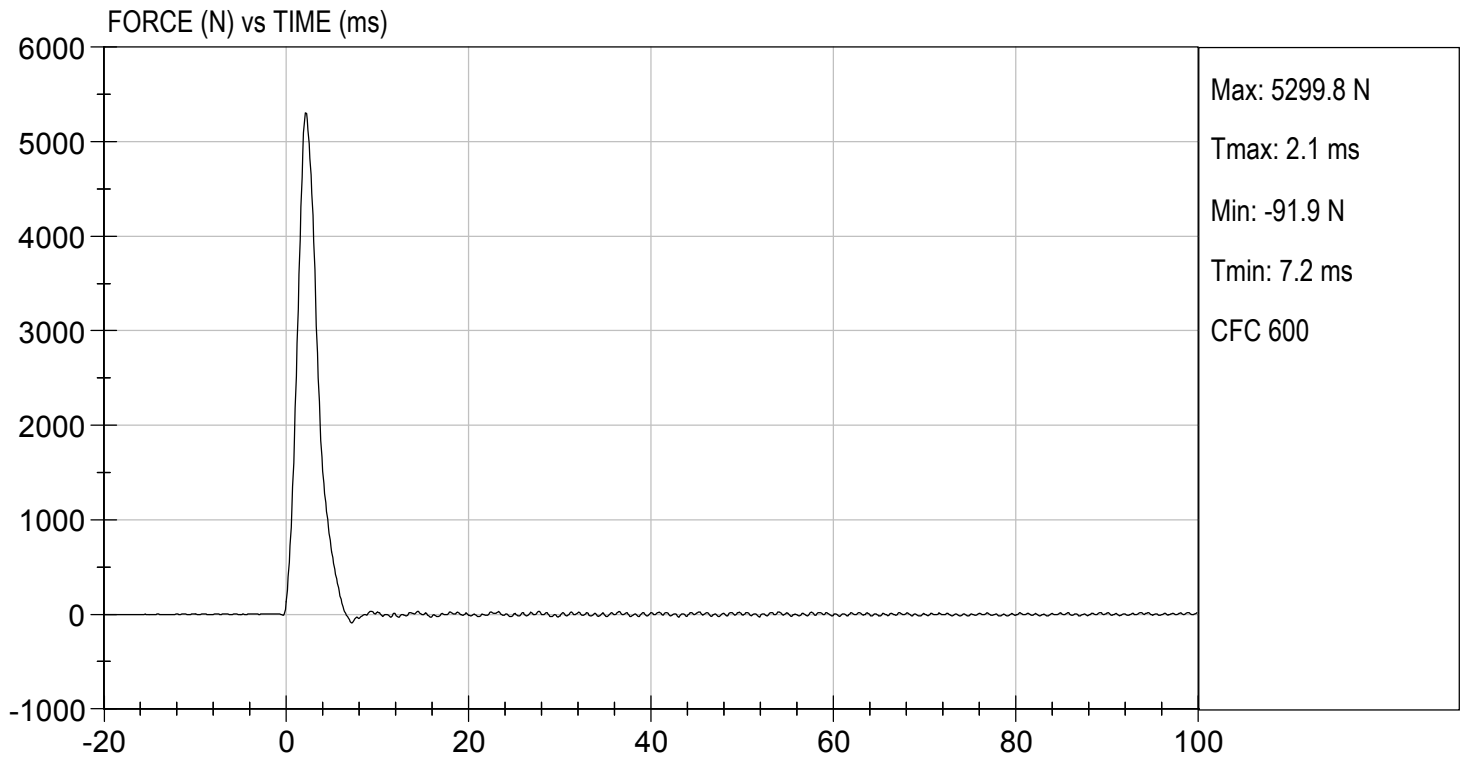
02/05/2021  
 Test Date

  
 Approved By



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

TEST DATE: 02/05/2021  
TEST #: D210286

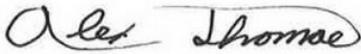


**MGA RESEARCH CORPORATION**  
**HIP-FEMUR FLEXION TEST**  
**HYBRID III 50TH PERCENTILE MALE**

ATD Serial No: 351

Test I.D: D210280

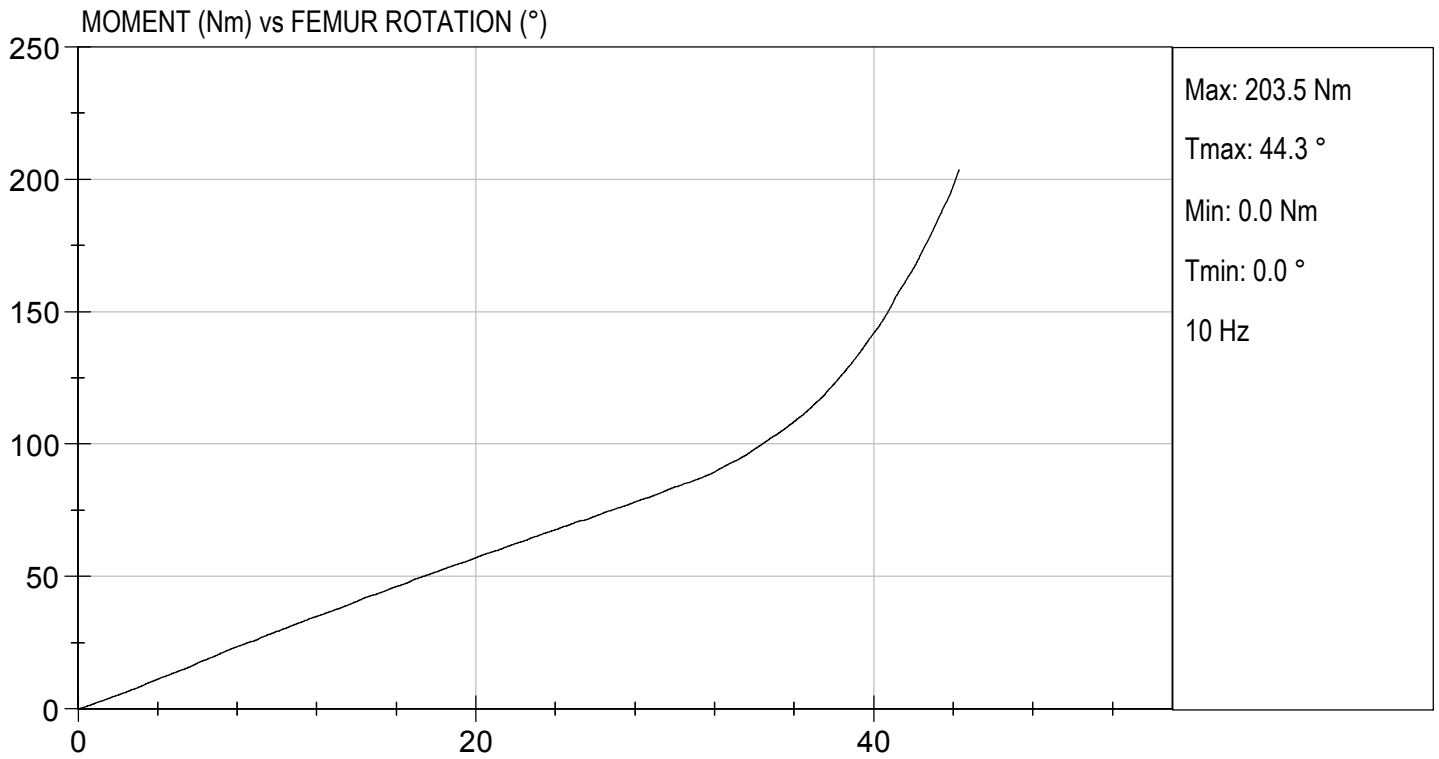
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	19	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.4	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	83.8	86.2	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.3	44.2	Pass
Overall Test Results					Pass

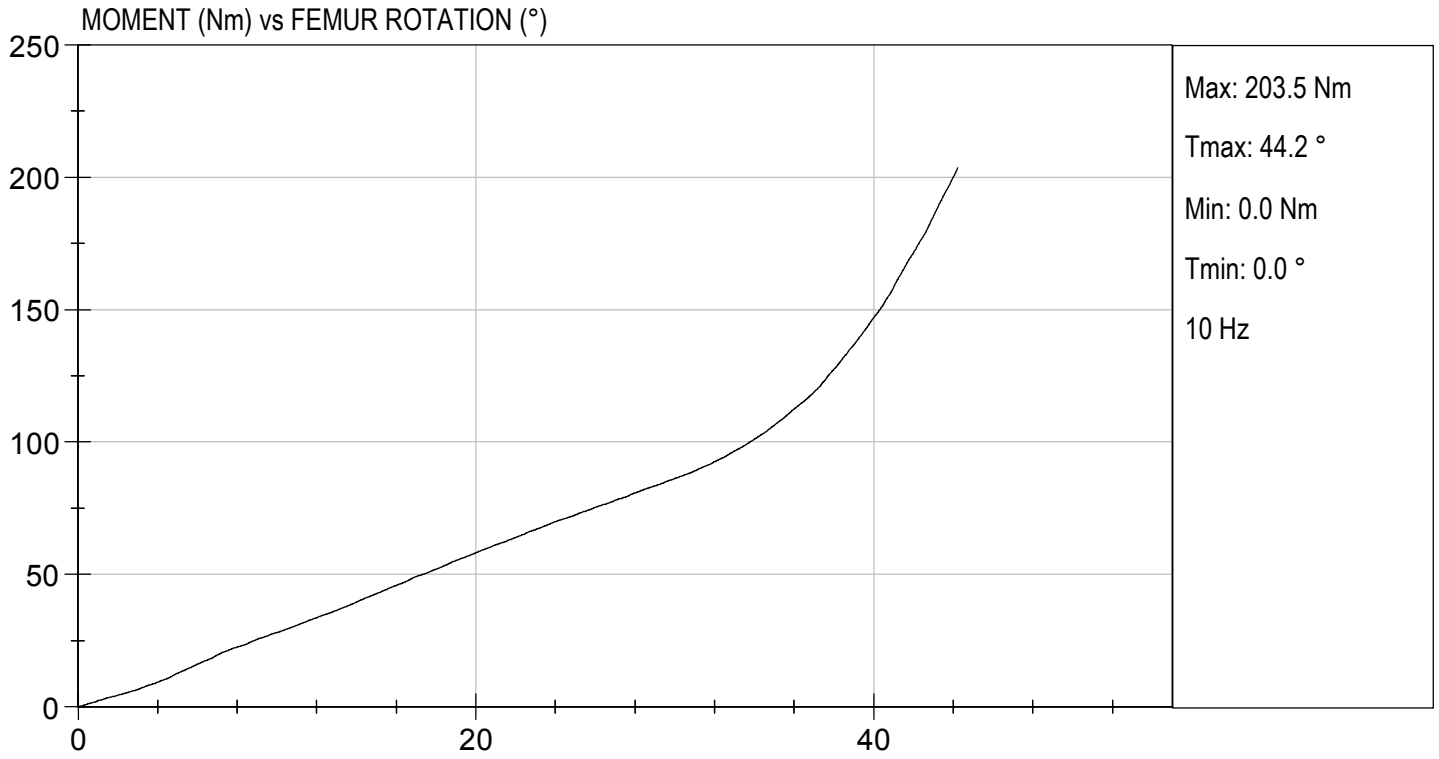
  
 Laboratory Technician

02/05/2021  
 Test Date

  
 Approved By







**CALIBRATION TEST RESULTS**

**PRE-TEST**

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

**Hybrid III, 5th External Measurements  
SN: 634**

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



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

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

**ATD Serial No:** 634

**Test ID:** D210071

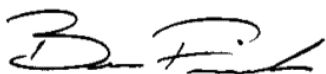
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Peak Resultant Acceleration	G's	250 to 300	276	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	6.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>



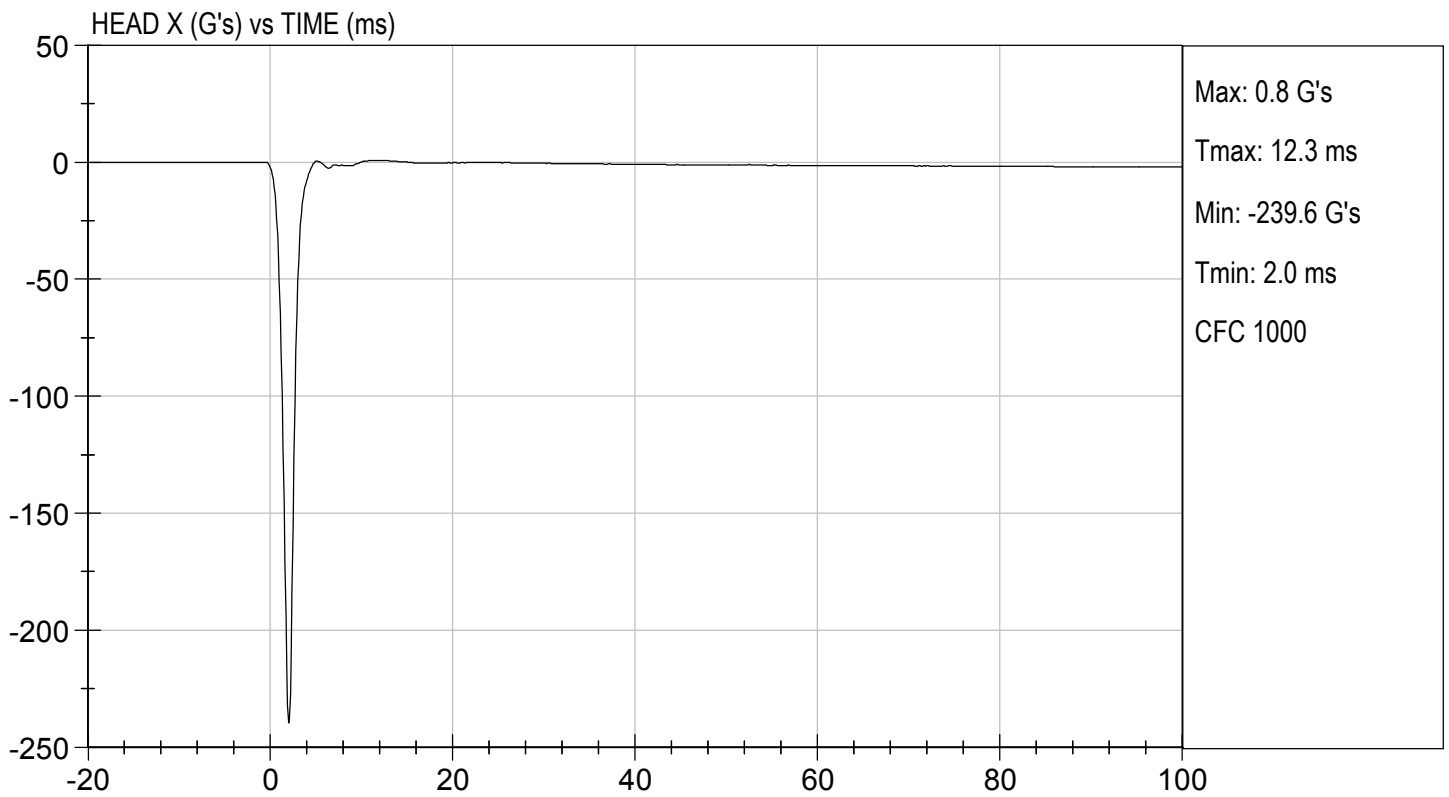
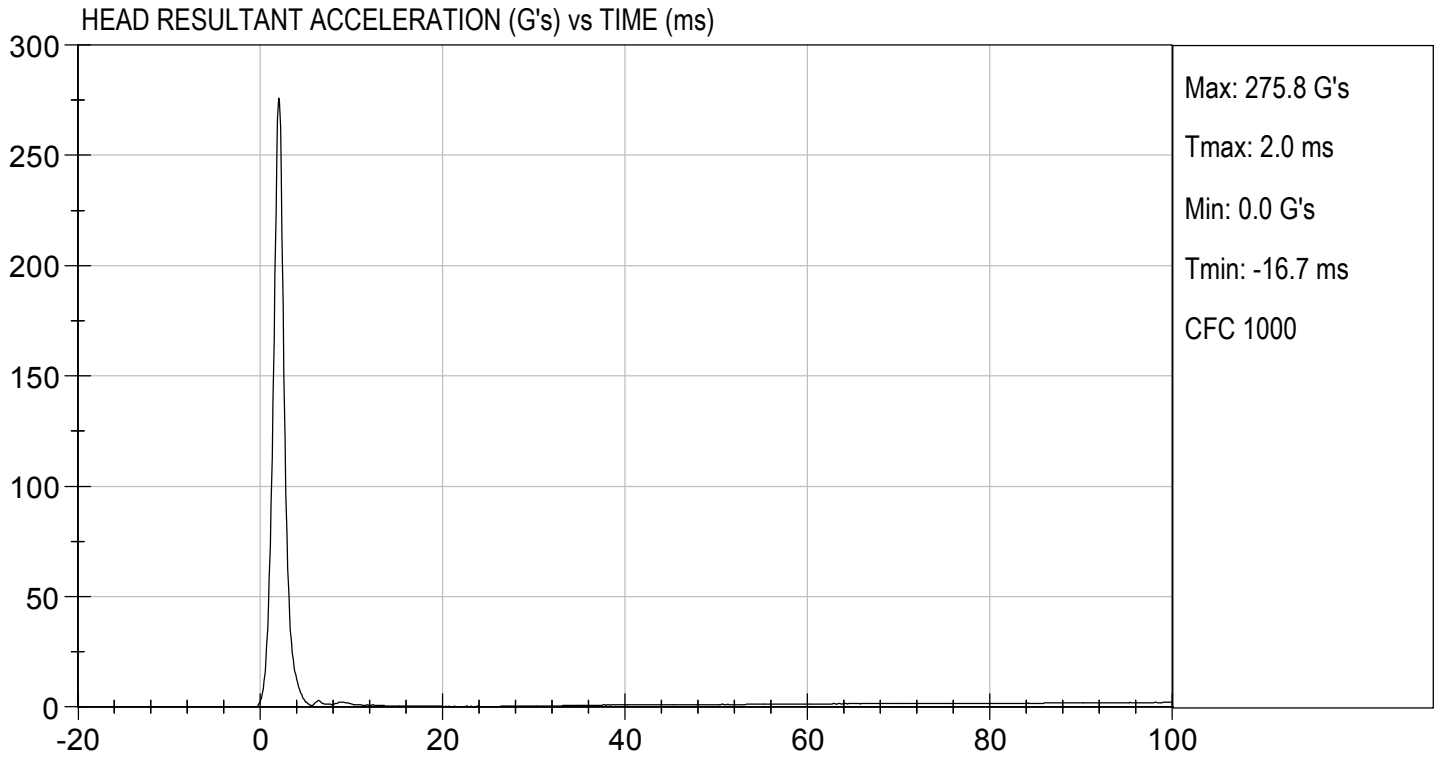
Laboratory Technician

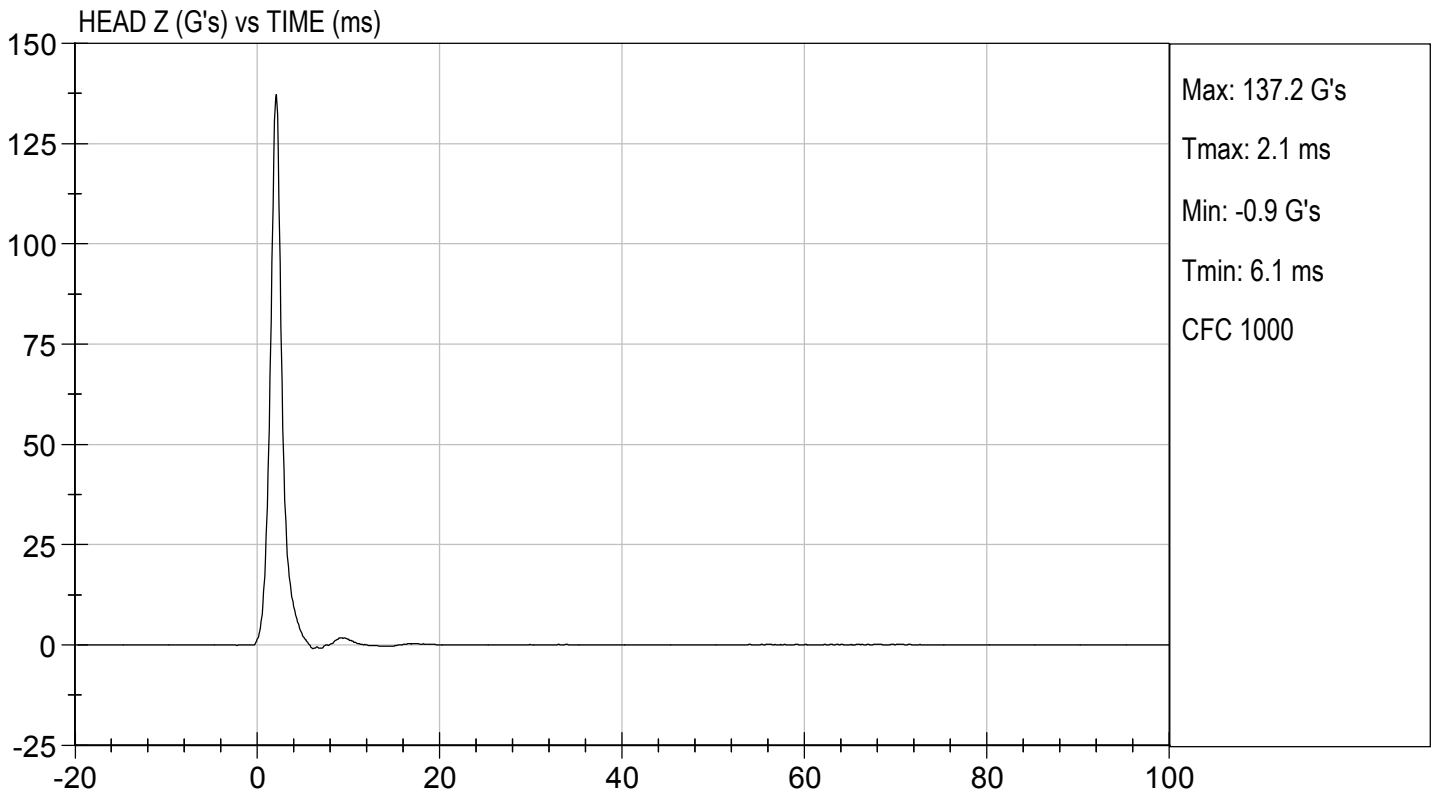
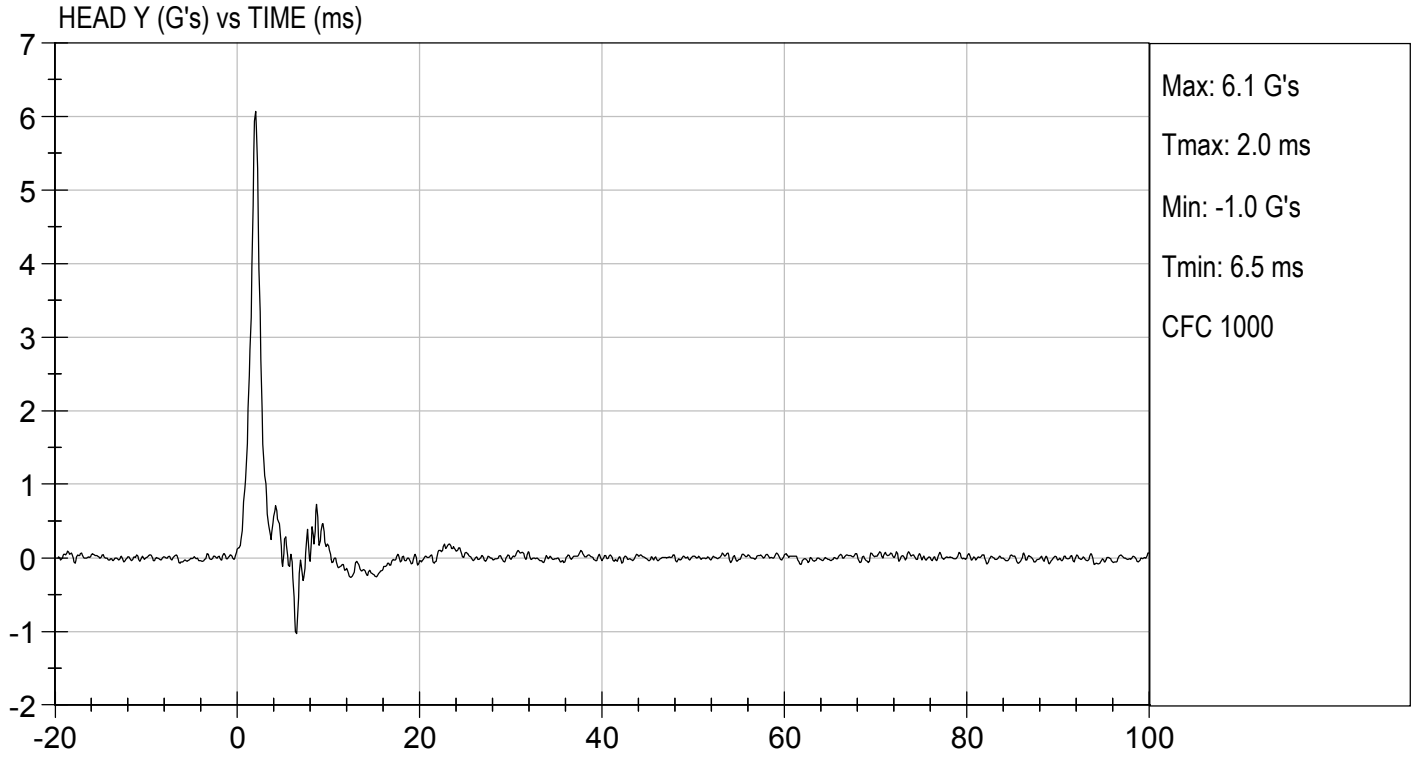
01/07/2021

Test Date



Approved By







**MGA RESEARCH CORPORATION**

**NECK FLEXION TEST**

**HYBRID III 5TH PERCENTILE**

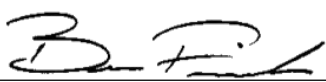
ATD Serial No: 634

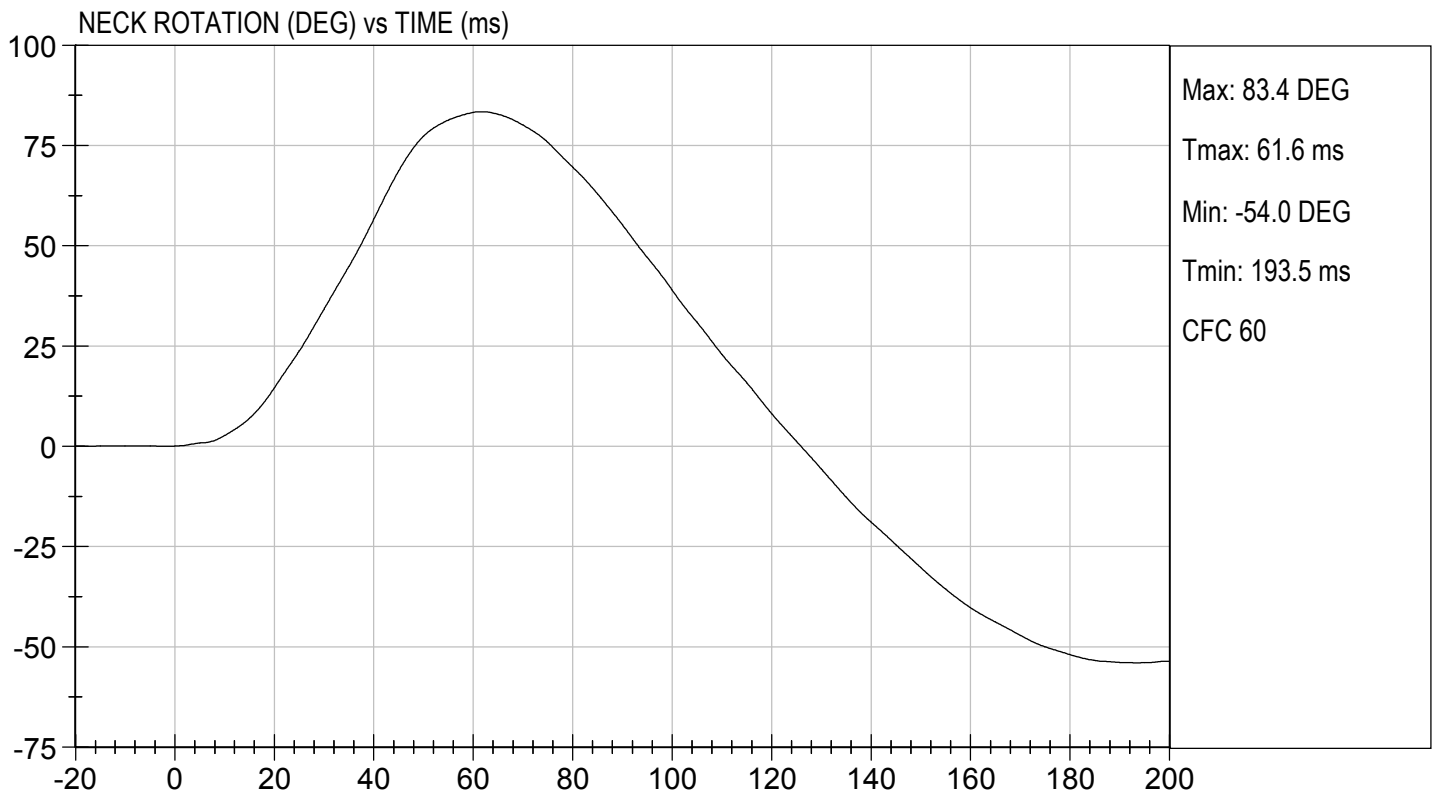
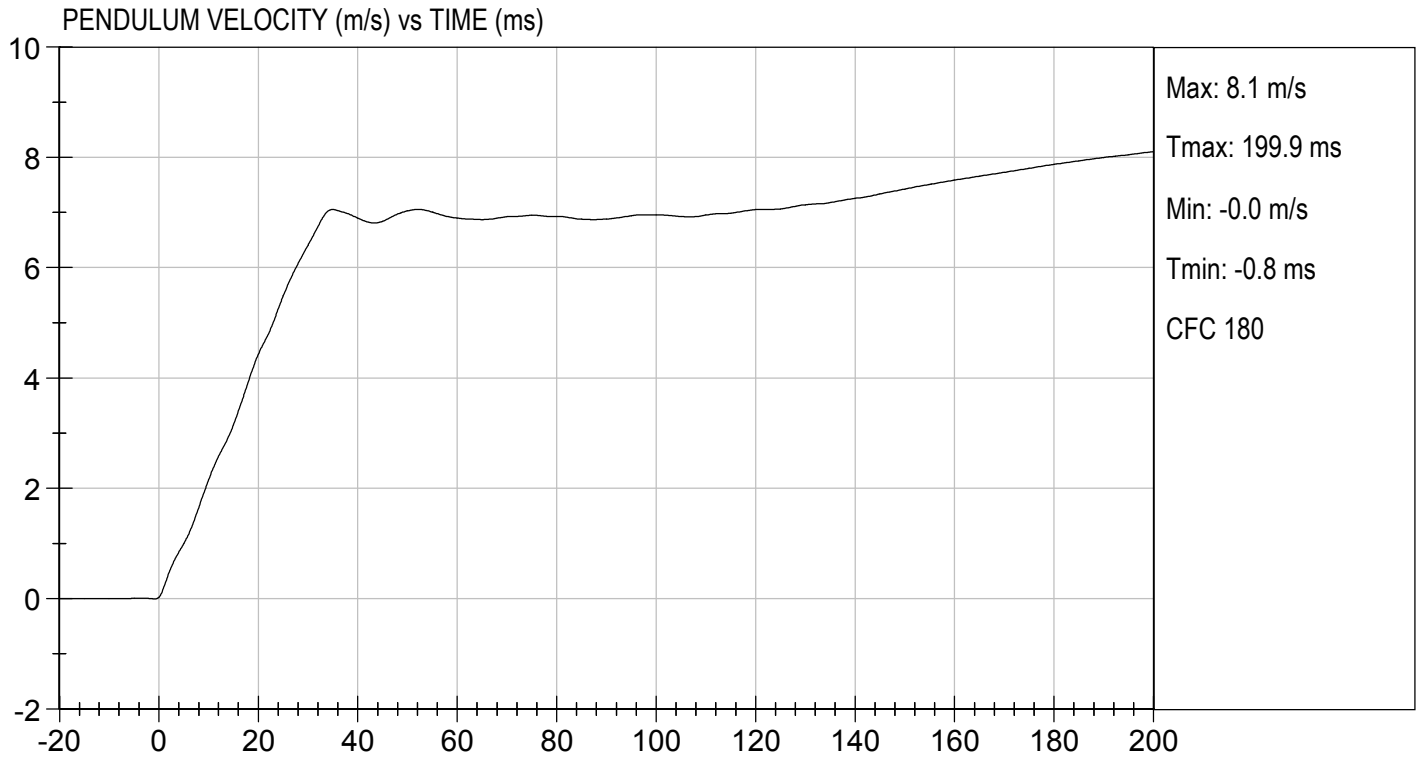
Test I.D.: D210072

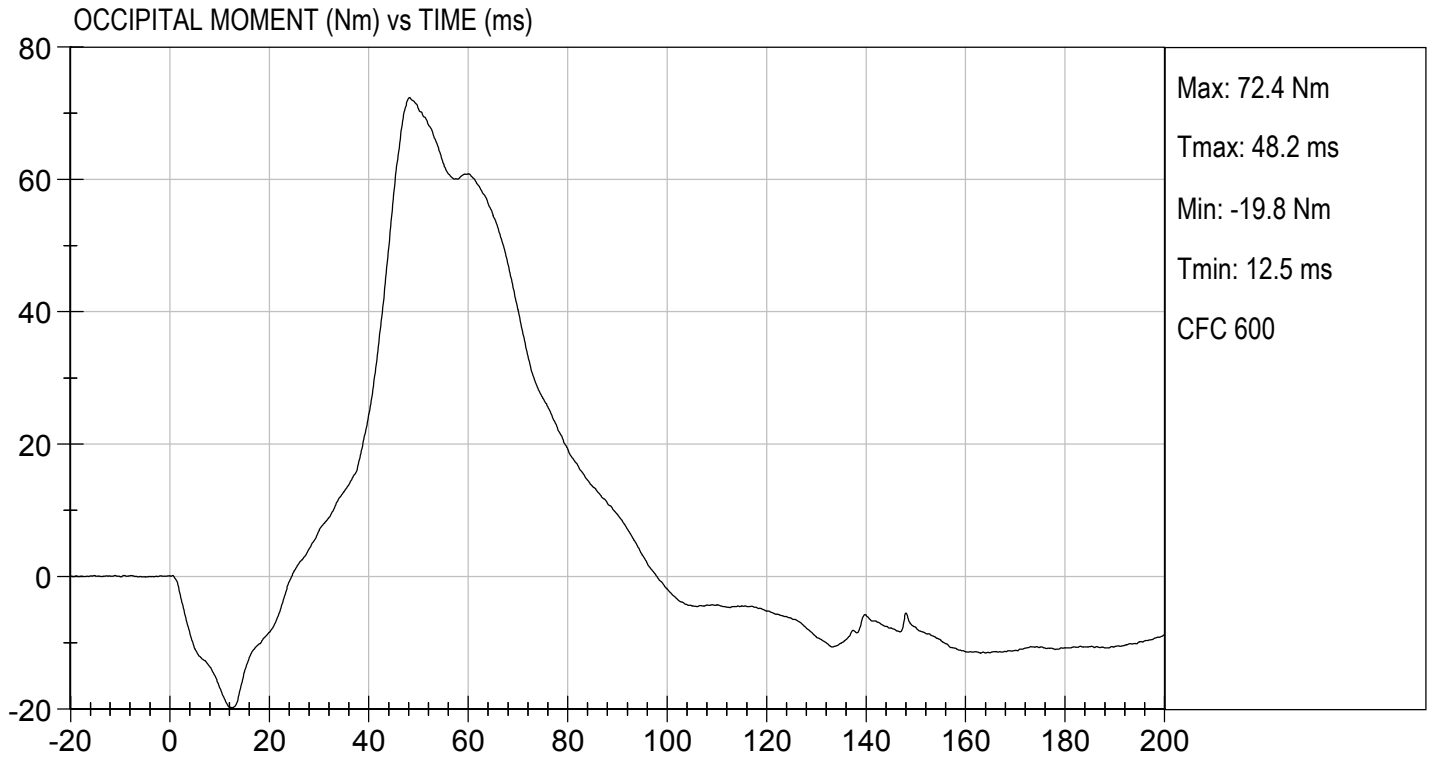
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.2	Pass
	20 ms	m/s	4.0 to 5.0	4.4	Pass
	30 ms	m/s	5.8 to 7.0	6.4	Pass
D Plane Rotation	Max	deg	77 to 91	83	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	88	Pass
Overall Results					Pass

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

01/07/2021  
 \_\_\_\_\_  
 Test Date

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





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

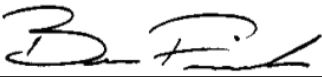
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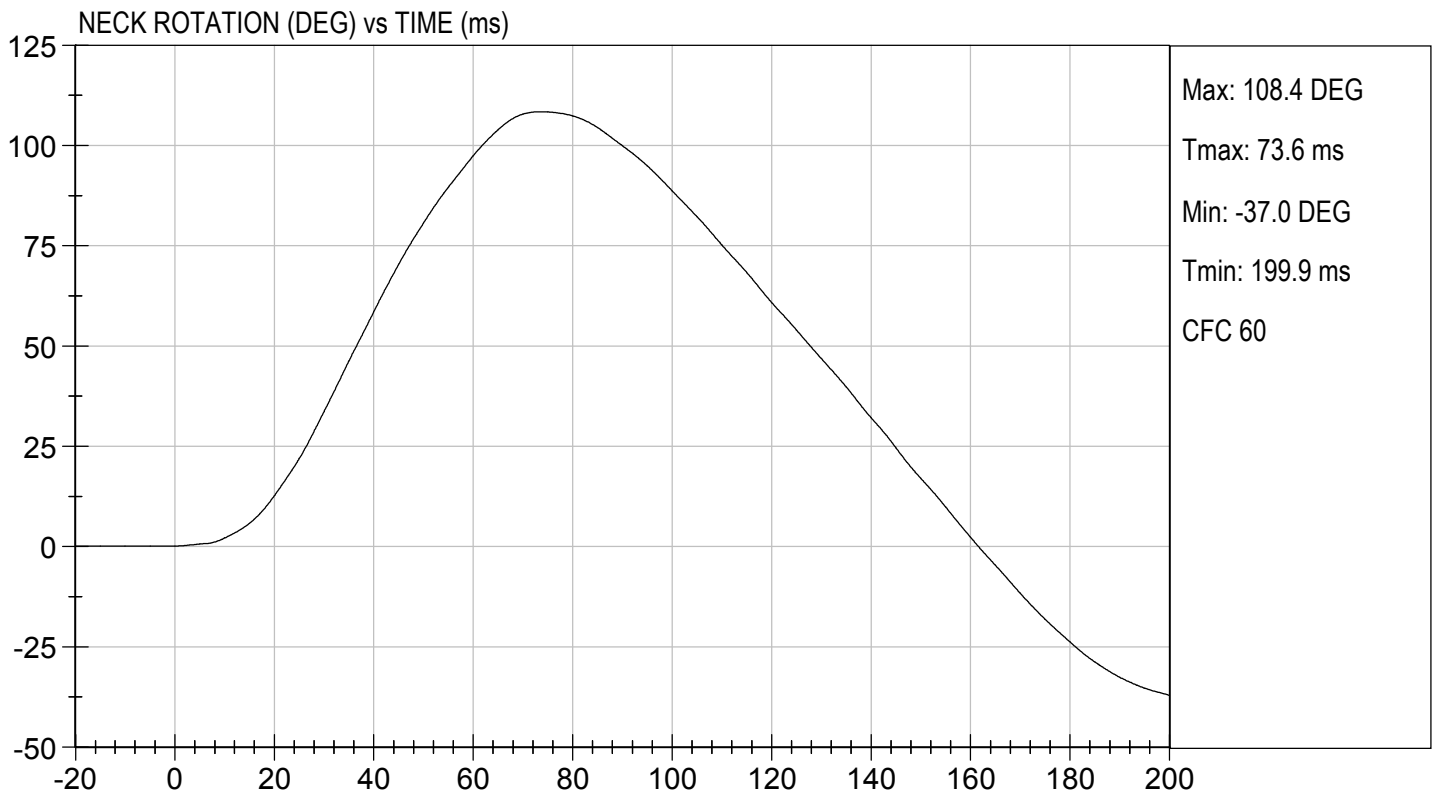
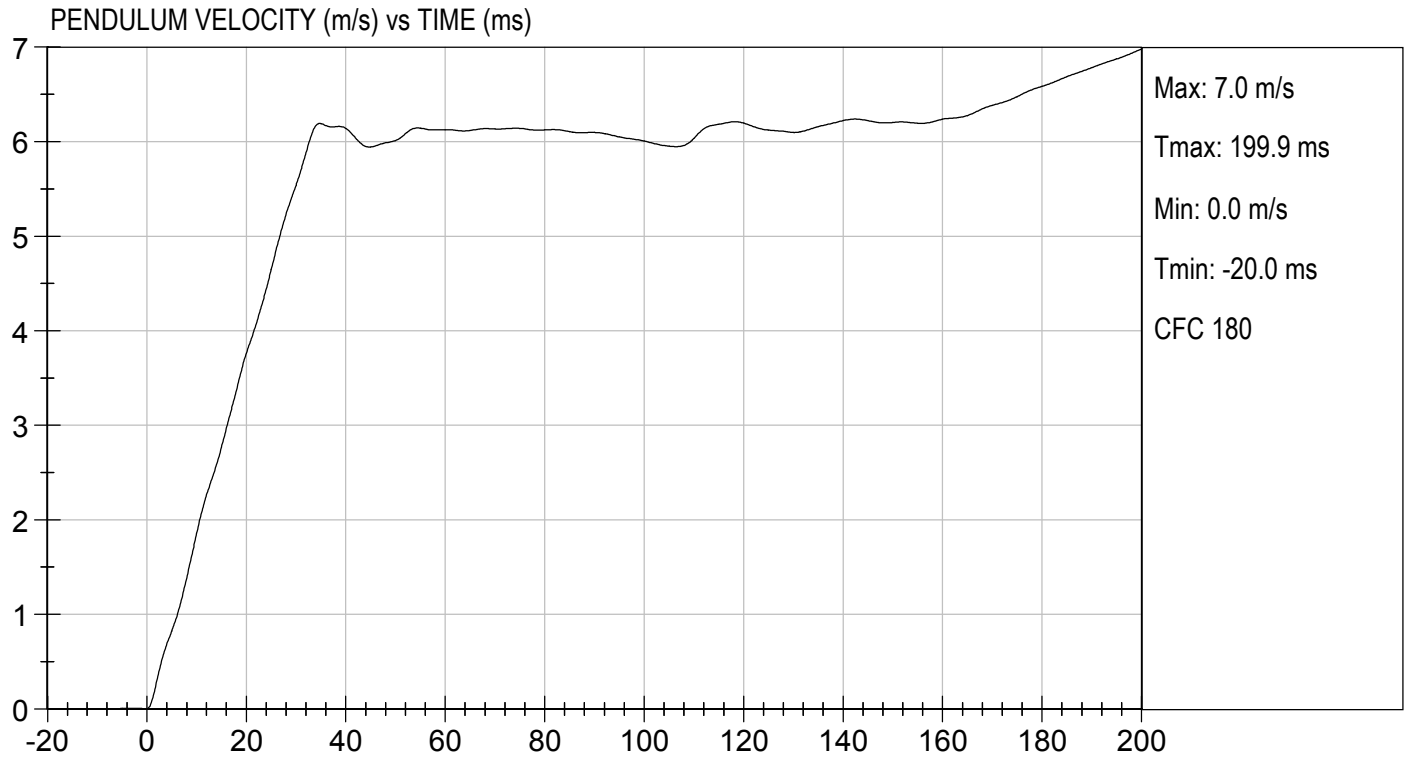
Test I.D.: D210073

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.9	Pass
	20 ms	m/s	3.1 to 3.9	3.8	Pass
	30 ms	m/s	4.6 to 5.6	5.5	Pass
D Plane Rotation	Max	deg	99 to 114	108	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-61	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	99	Pass
Overall Results					Pass

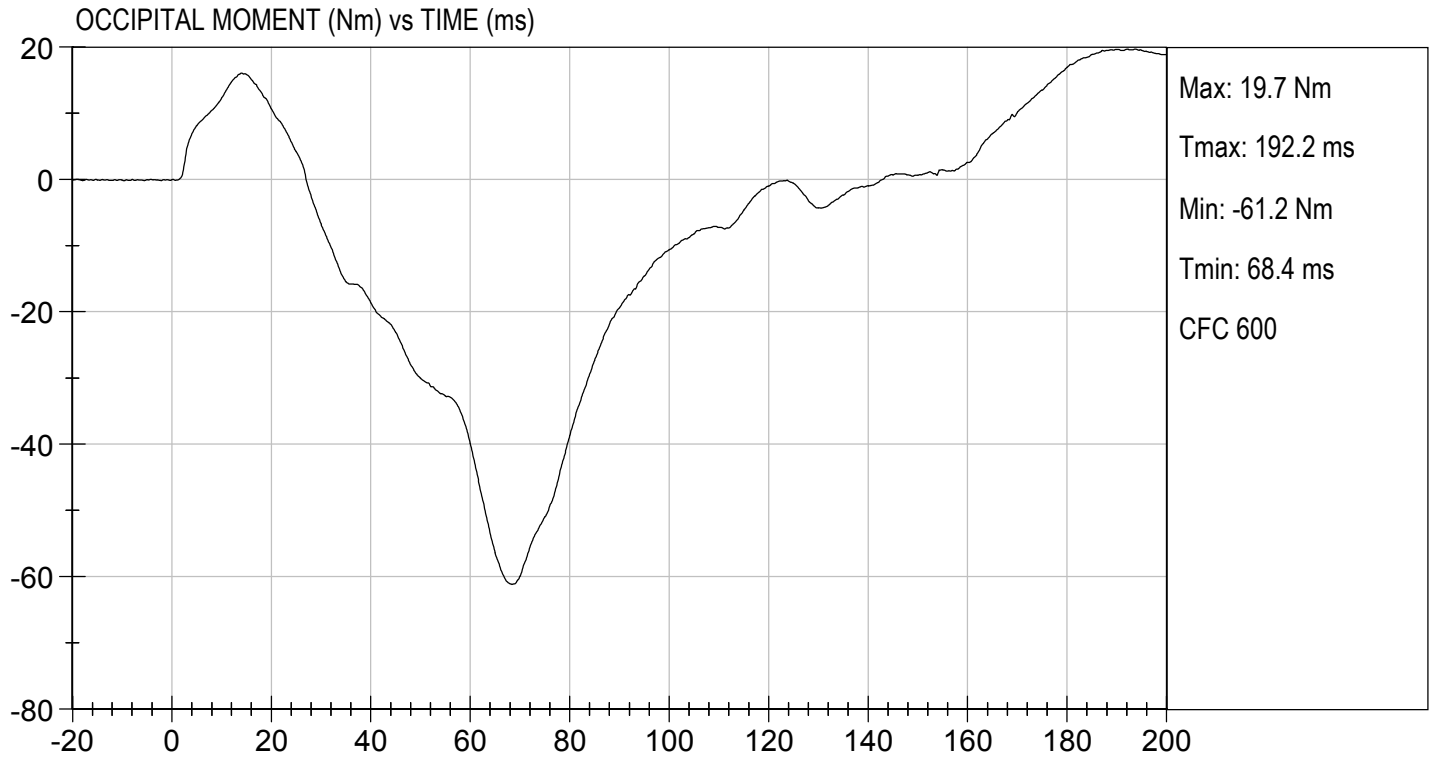
  
 \_\_\_\_\_  
 Laboratory Technician

01/07/2021  
 \_\_\_\_\_  
 Test Date

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







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

ATD Serial No: 634

Test I.D: D210074

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Relative Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	52	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4370	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4366	Pass
<b>Overall Test Results</b>				<b>Pass</b>

*Gerald Guerrero*

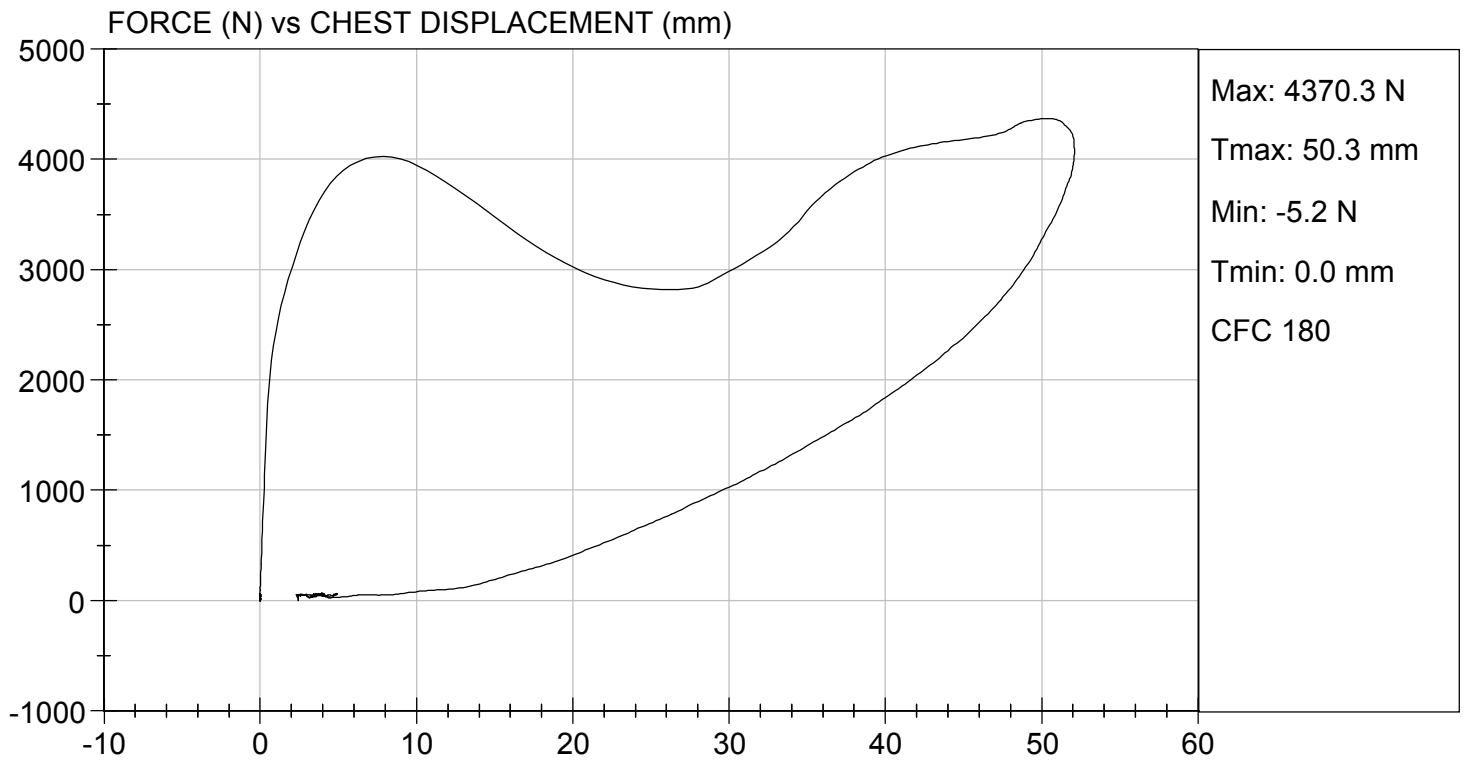
\_\_\_\_\_  
 Laboratory Technician

01/08/2021

\_\_\_\_\_  
 Test Date

*B. F. K.*

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



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

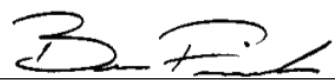
**ATD Serial No:** 634

**Test I.D:** D210075

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3753	Pass
Overall Test Results				Pass

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

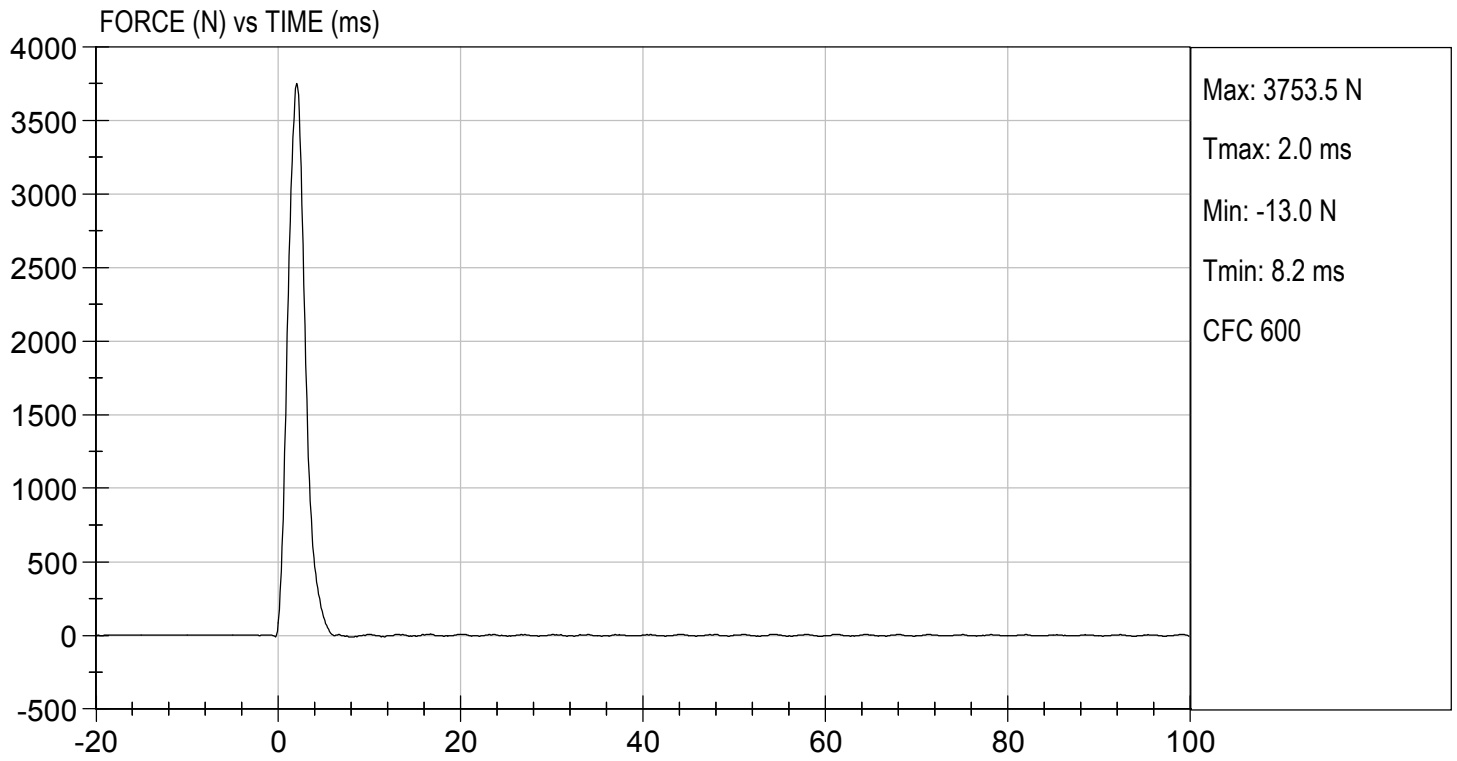
01/07/2021  
Test Date

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



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

TEST DATE: 01/07/2021  
TEST #: D210075





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

ATD Serial No: 634

Test I.D: D210076

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3878	Pass
Overall Test Results				Pass

*Gerald Cuervo*

Laboratory Technician

01/07/2021

Test Date

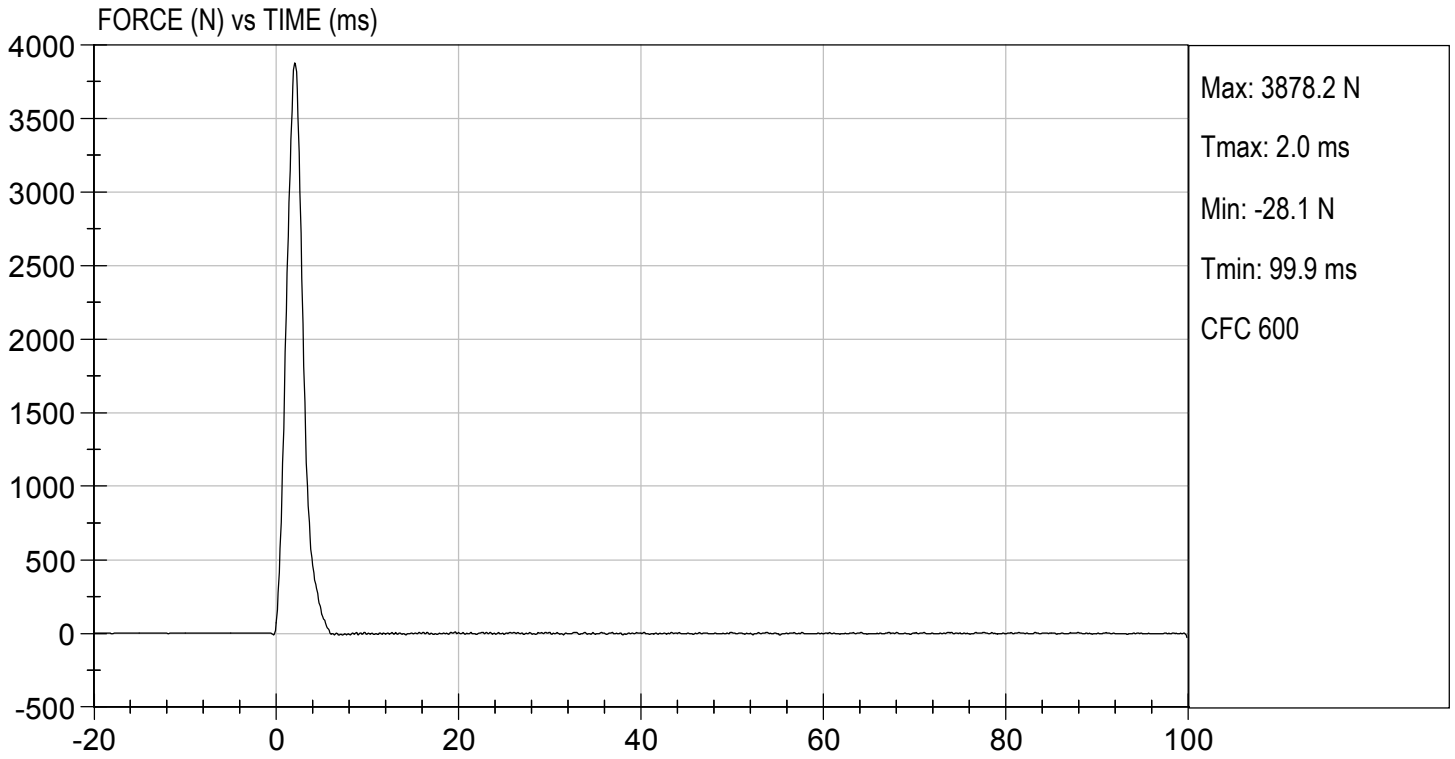
*B. F. H.*

Approved By



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

TEST DATE: 01/07/2021  
TEST #: D210076



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

ATD Serial No: 634

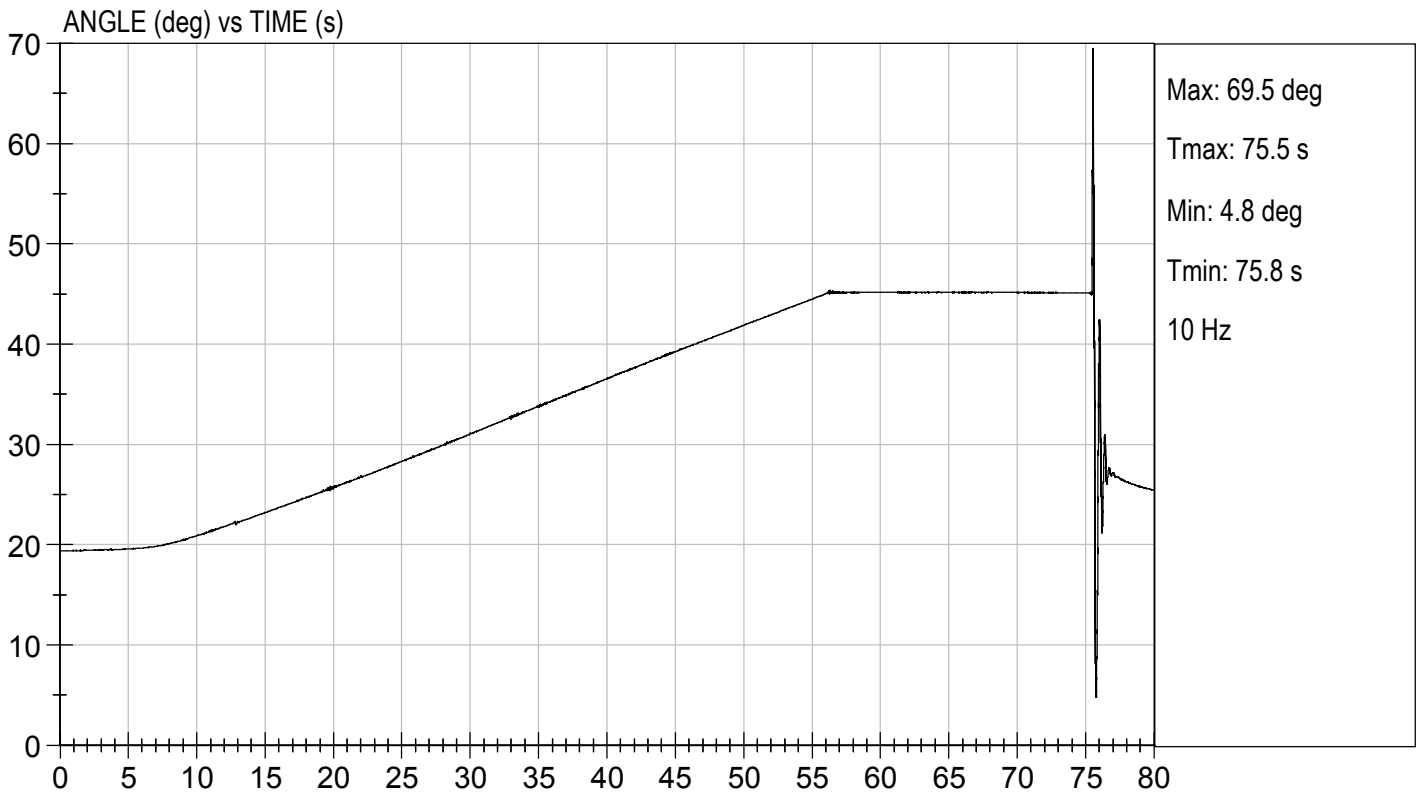
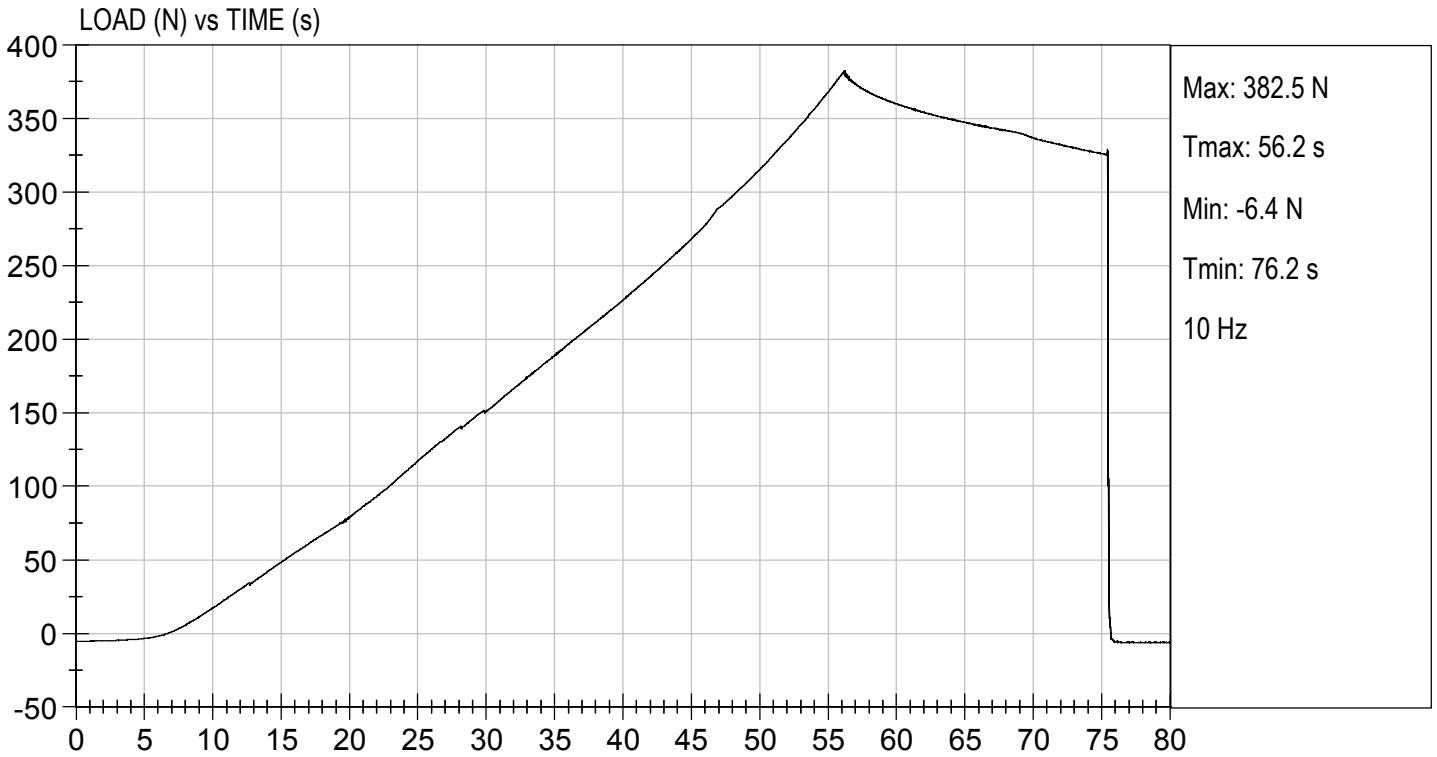
Test I.D: D210077

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	383	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.5	Pass
Overall Result				Pass

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

01/08/2021  
 \_\_\_\_\_  
 Test Date

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



**CALIBRATION TEST RESULTS**

**POST-TEST**

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



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

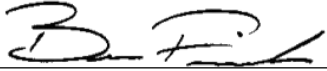
**ATD Serial No:** 634

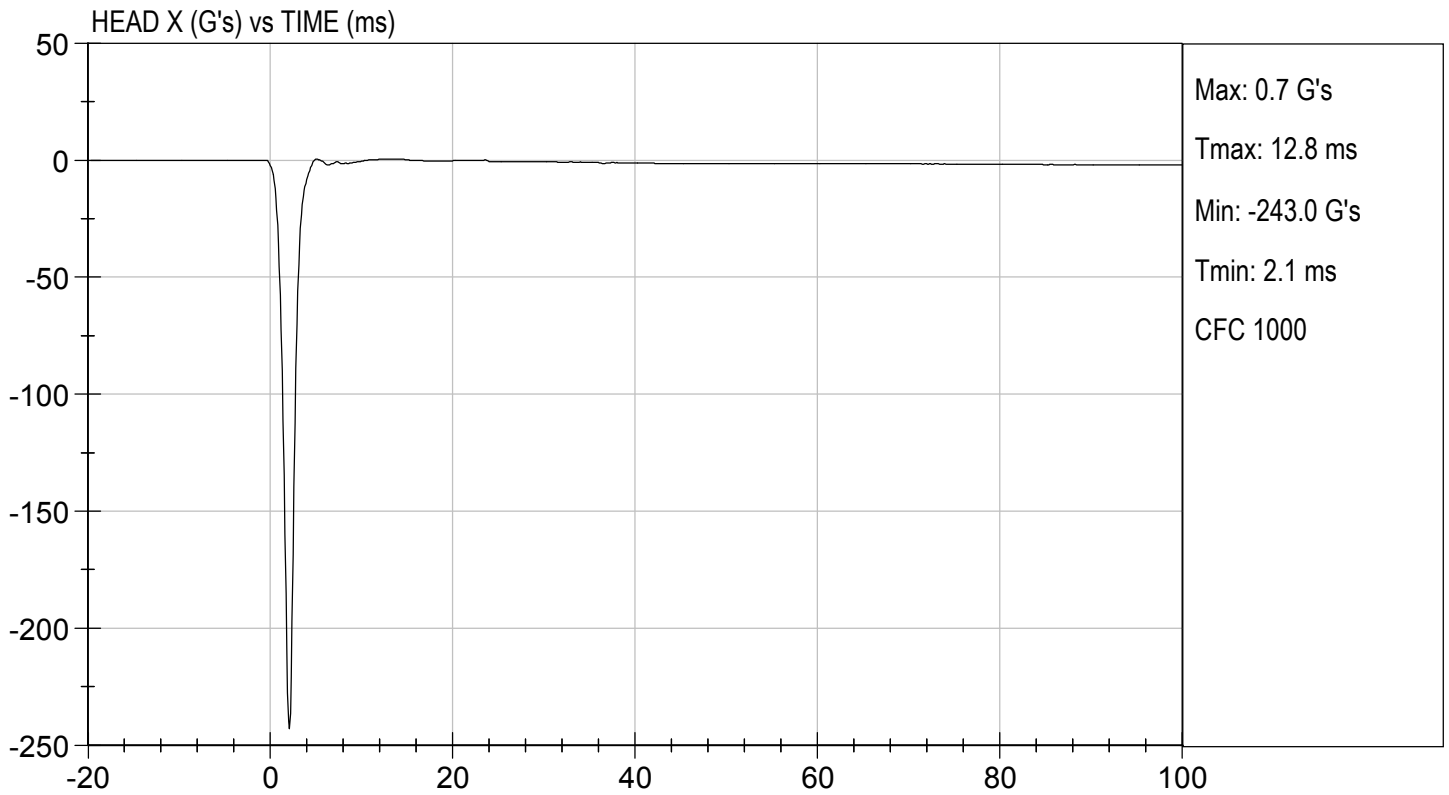
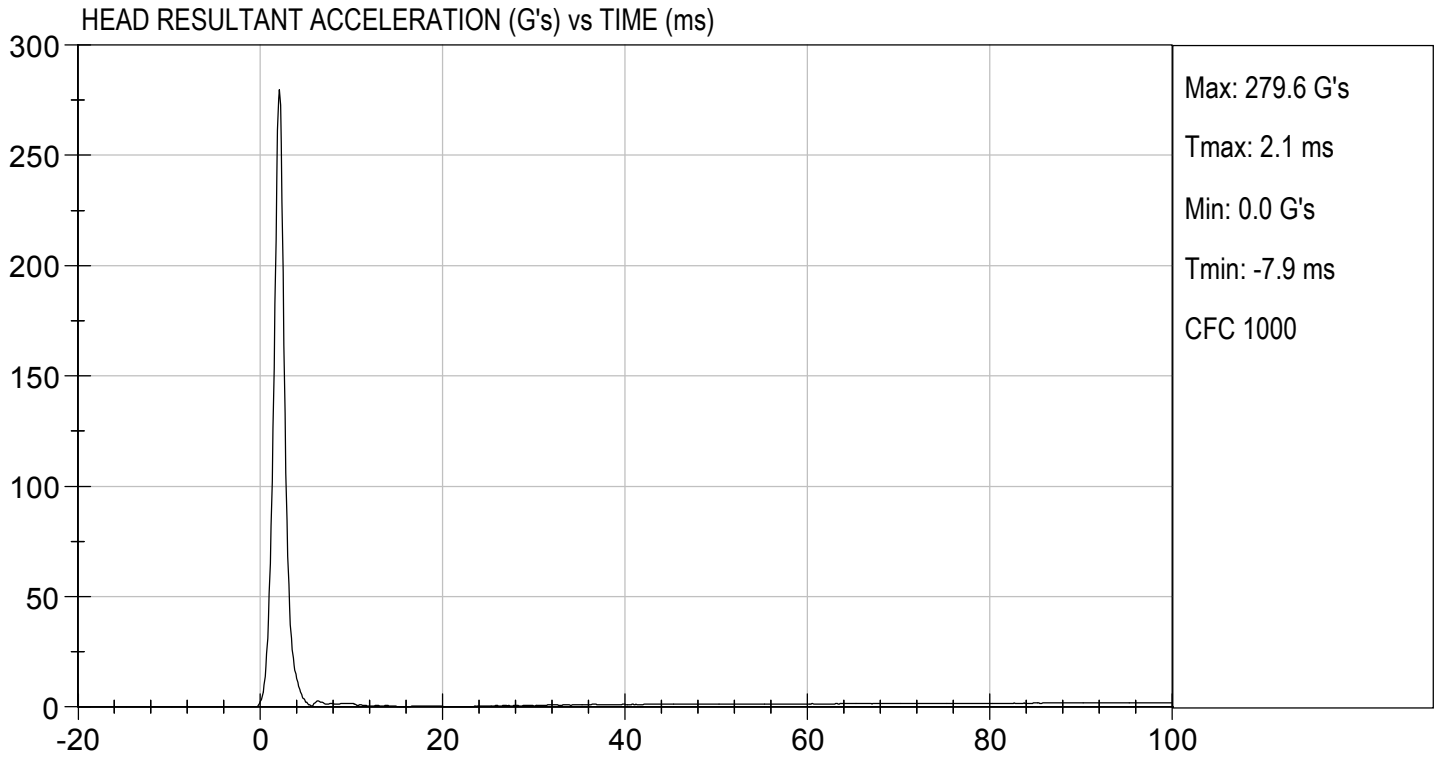
**Test ID:** D210271

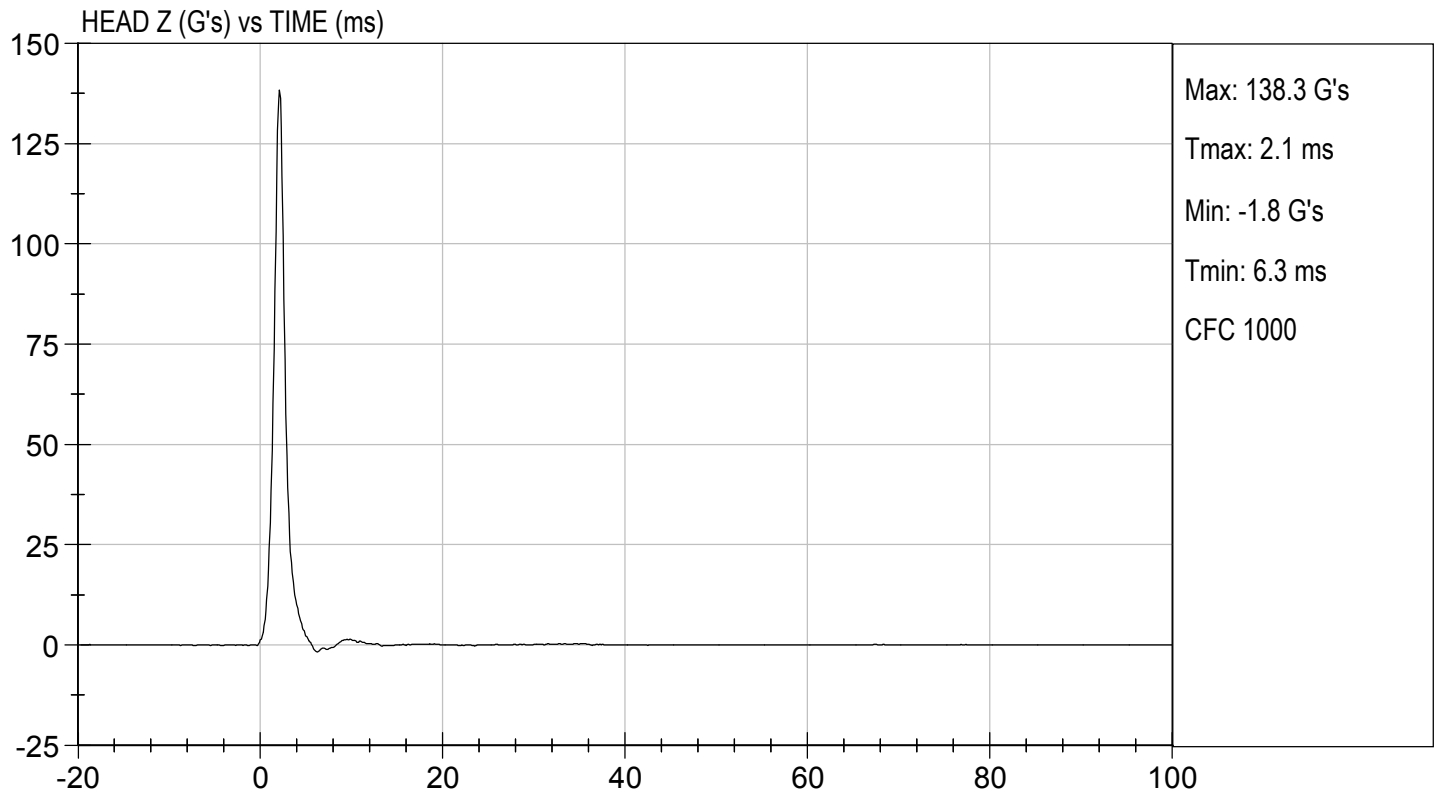
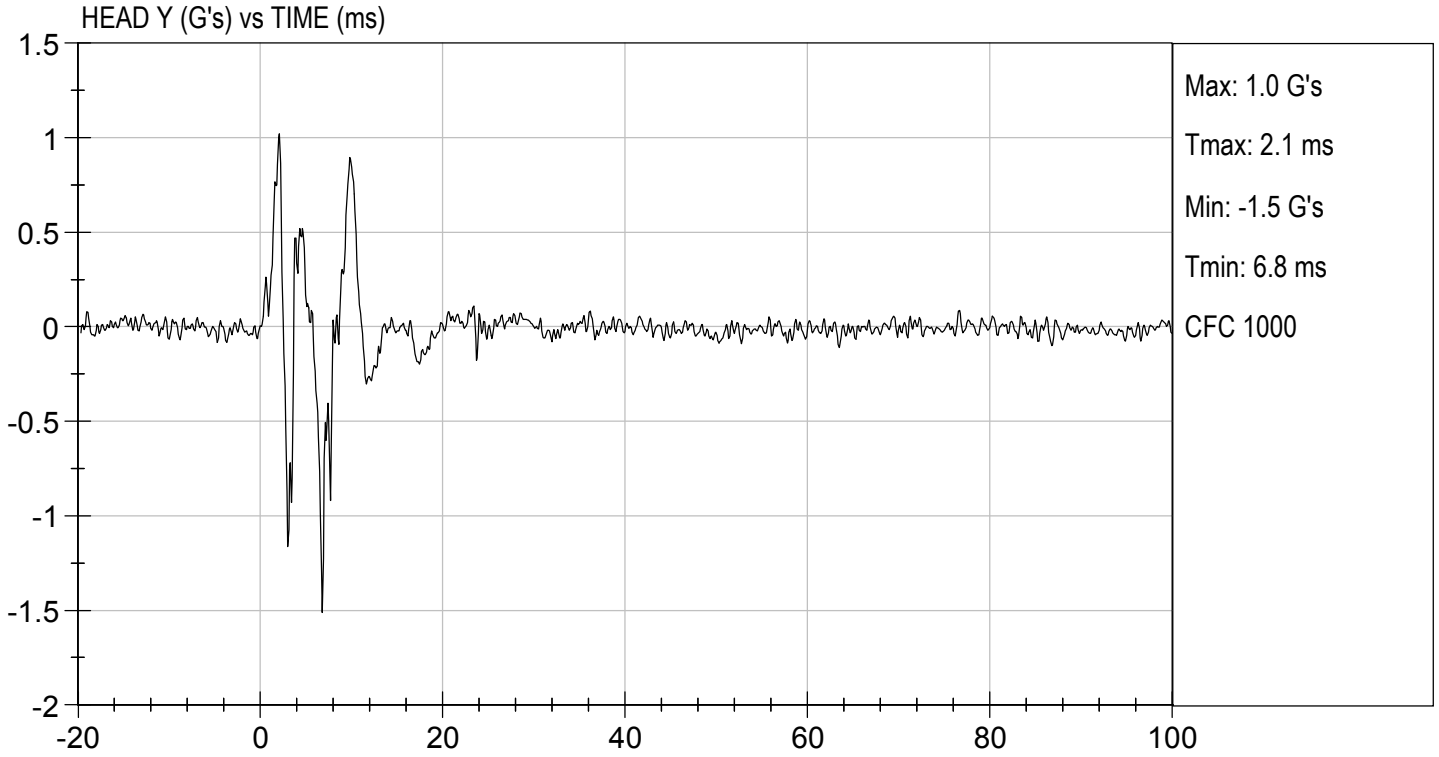
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Peak Resultant Acceleration	G's	250 to 300	280	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-1.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>

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

02/03/2021  
 \_\_\_\_\_  
 Test Date

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





**MGA RESEARCH CORPORATION**

**NECK FLEXION TEST**

**HYBRID III 5TH PERCENTILE**

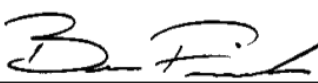
ATD Serial No: 634

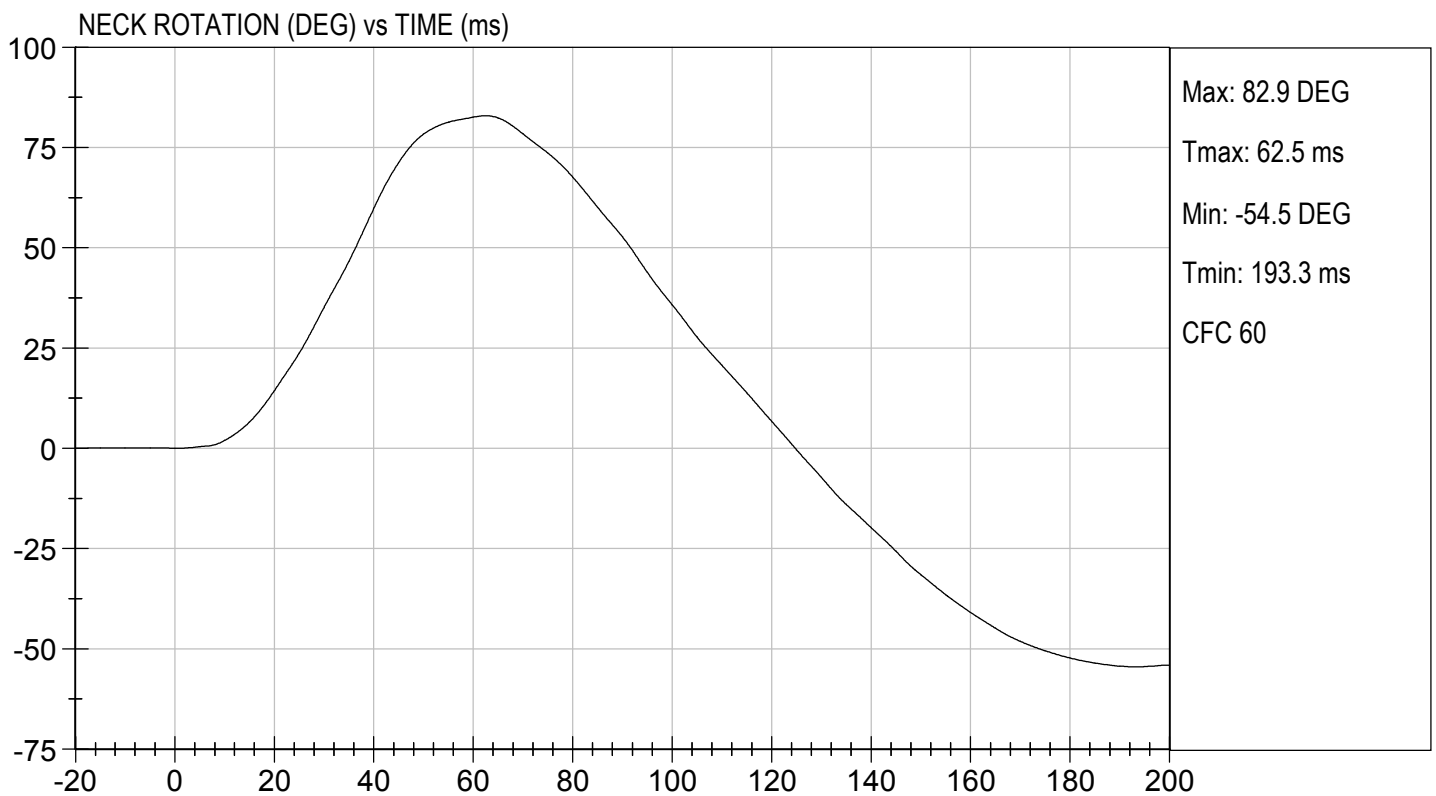
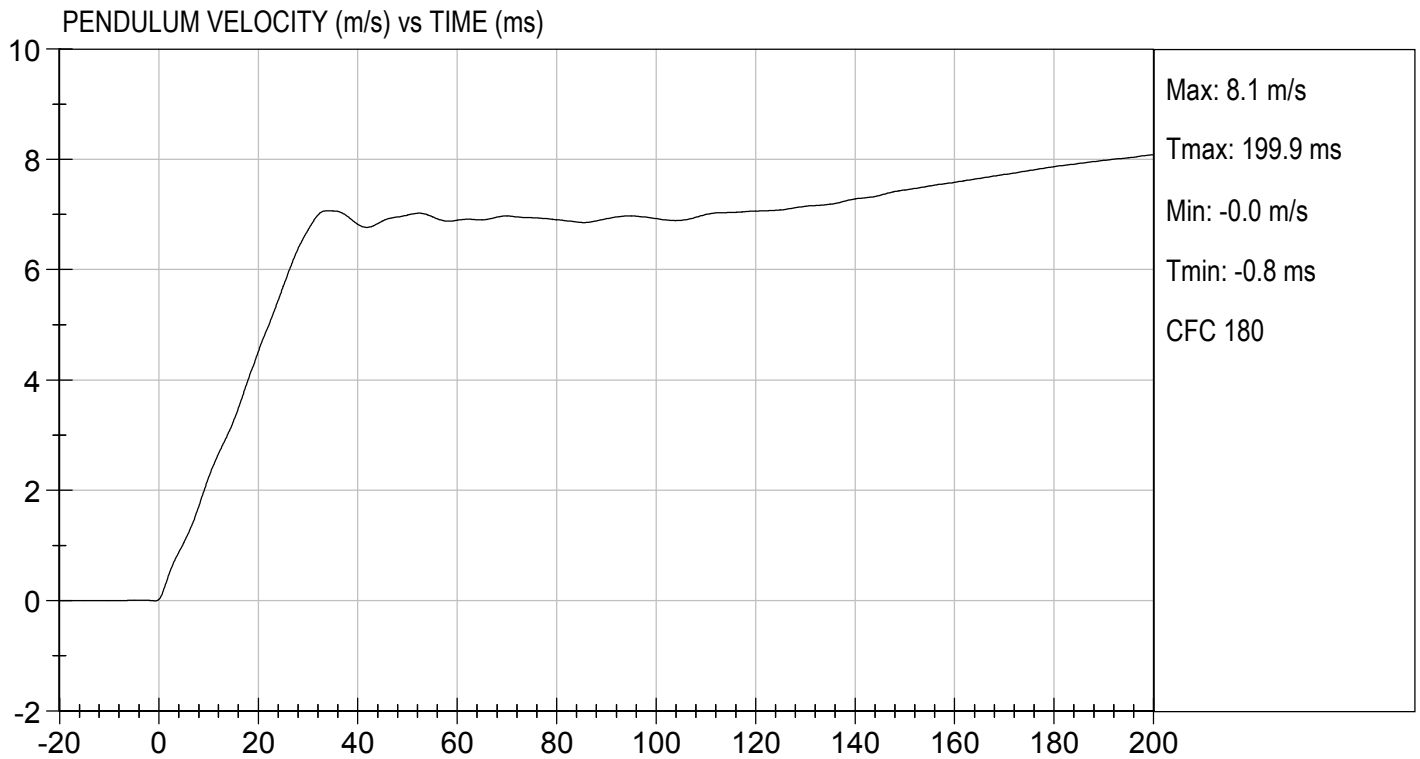
Test I.D.: D210272

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.2	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.7	Pass
D Plane Rotation	Max	deg	77 to 91	83	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	88	Pass
Overall Results					Pass

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

02/04/2021  
 \_\_\_\_\_  
 Test Date

  
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 Approved By

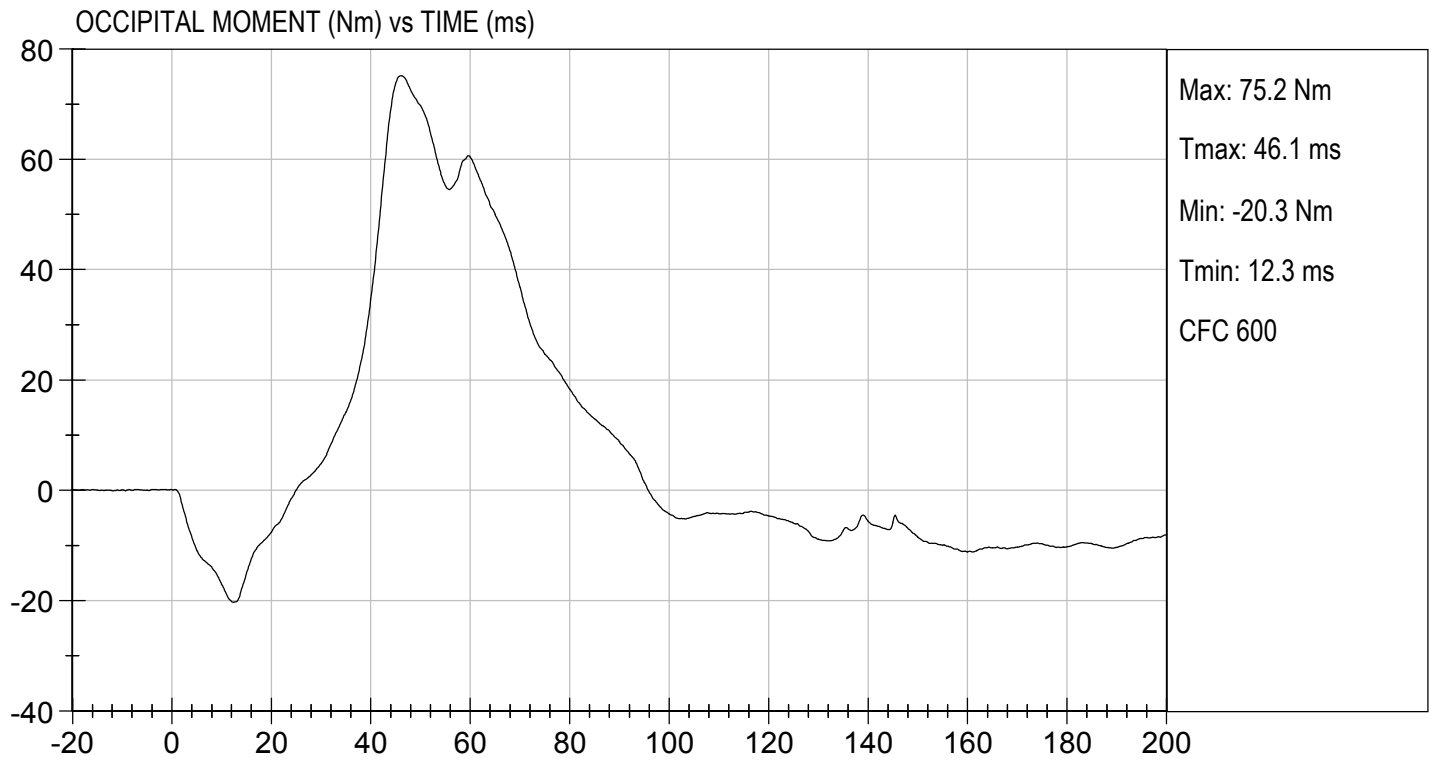






TEST DESC: NECK FLEXION  
VELOCITY: 23.15 ft/s, 7.06 m/s

TEST DATE: 02/04/2021  
TEST #: D210272



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

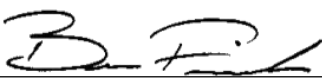
ATD Serial No: 634

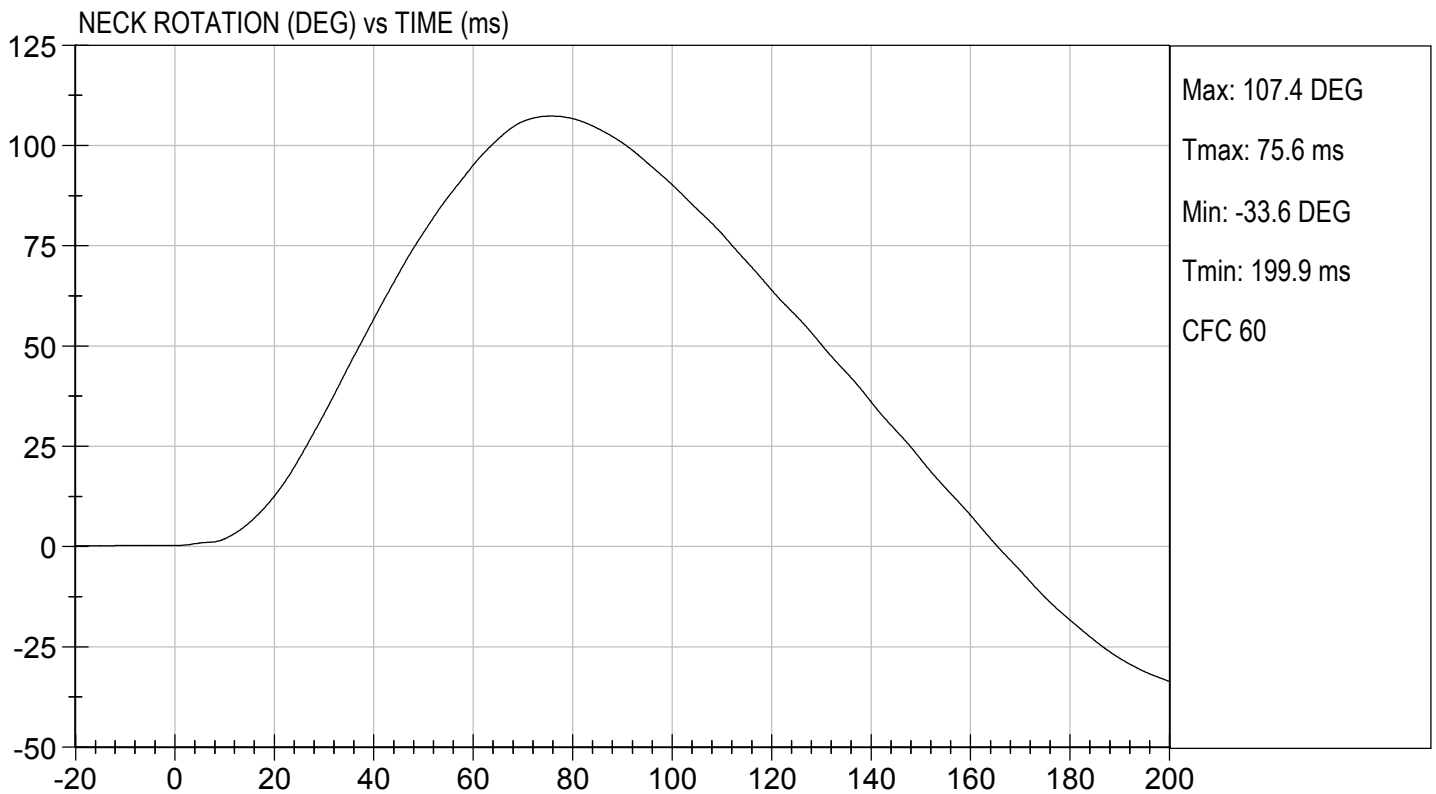
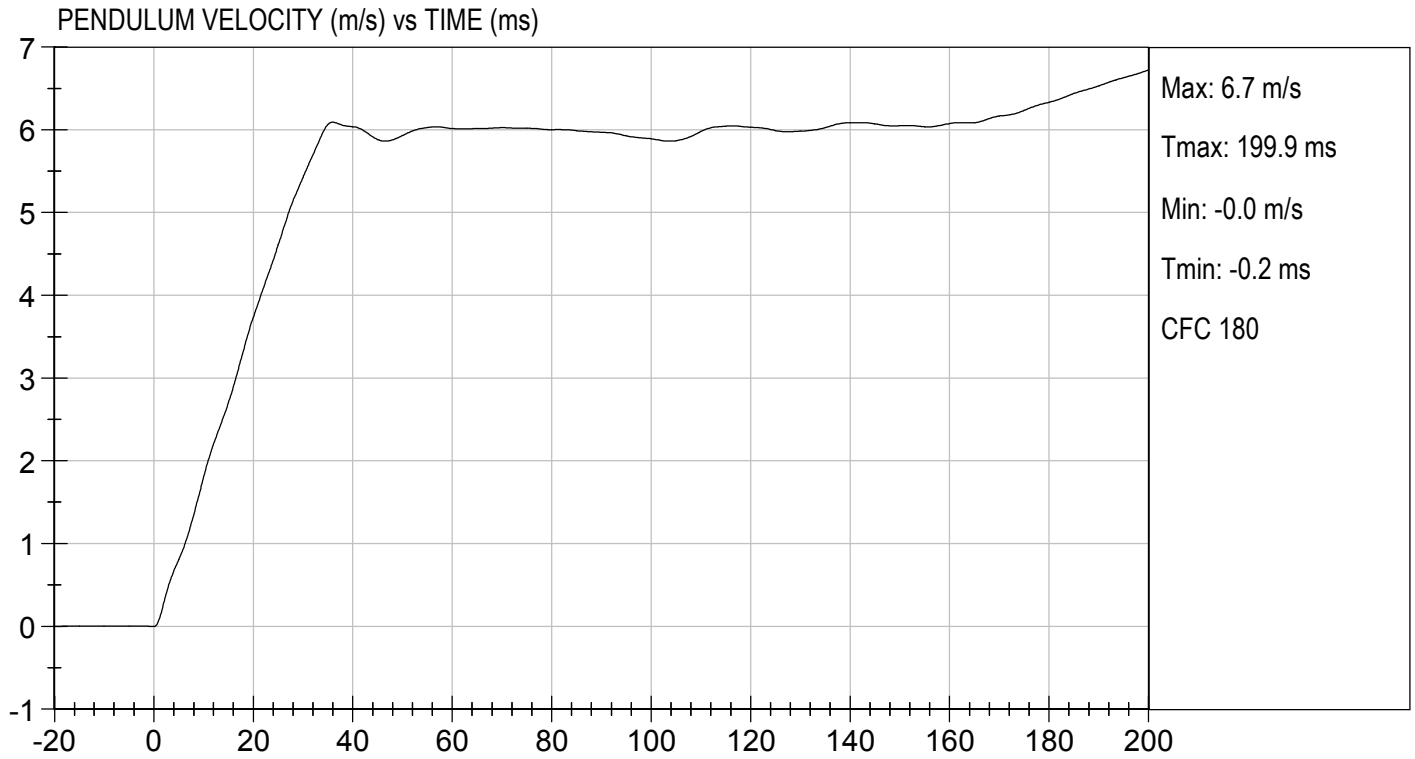
Test I.D: D210273

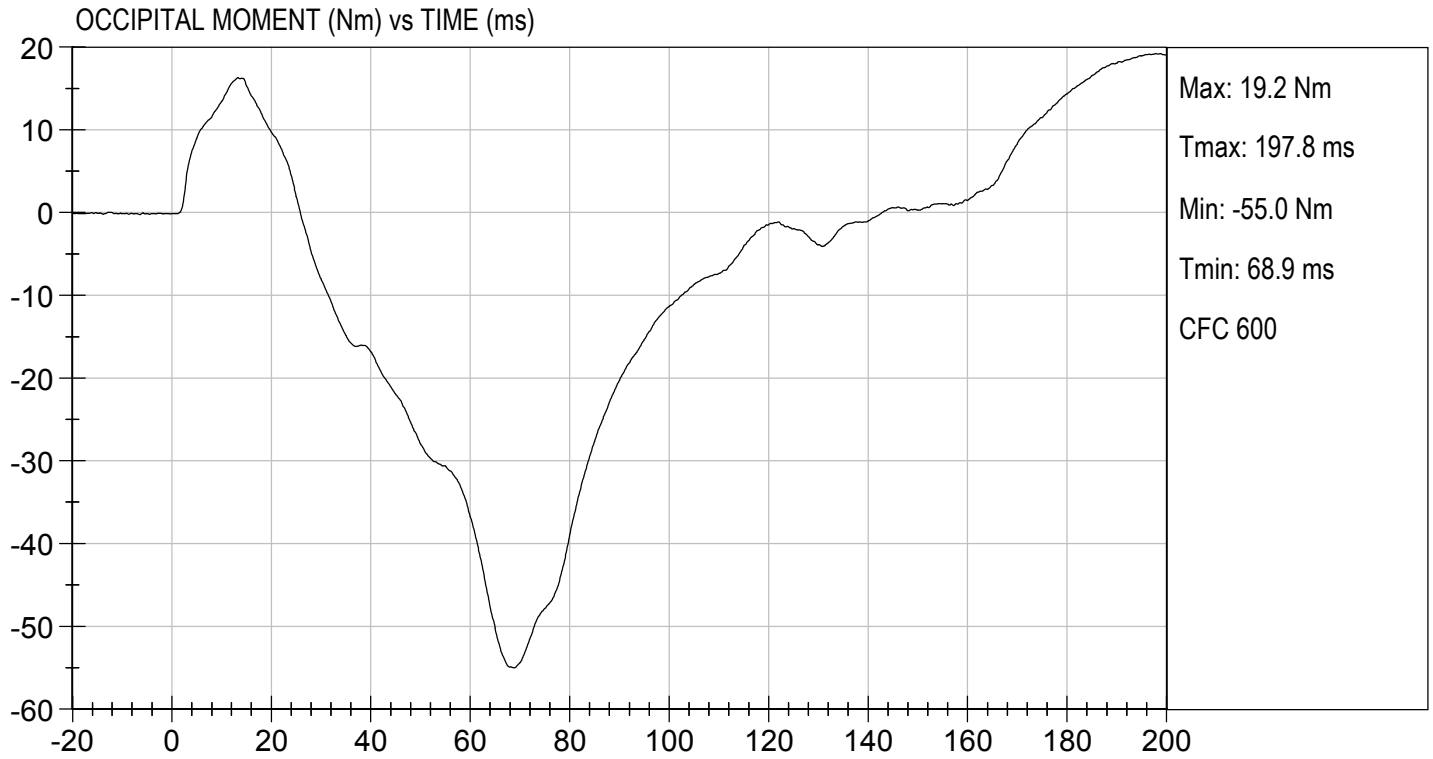
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	107	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-55	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	100	Pass
Overall Results					Pass

  
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 Laboratory Technician

02/04/2021  
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 Test Date

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

ATD Serial No: 634

Test I.D: D210274

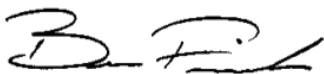
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Relative Humidity	%	10 to 70	26	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4367	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4424	Pass
Overall Test Results				Pass



Laboratory Technician

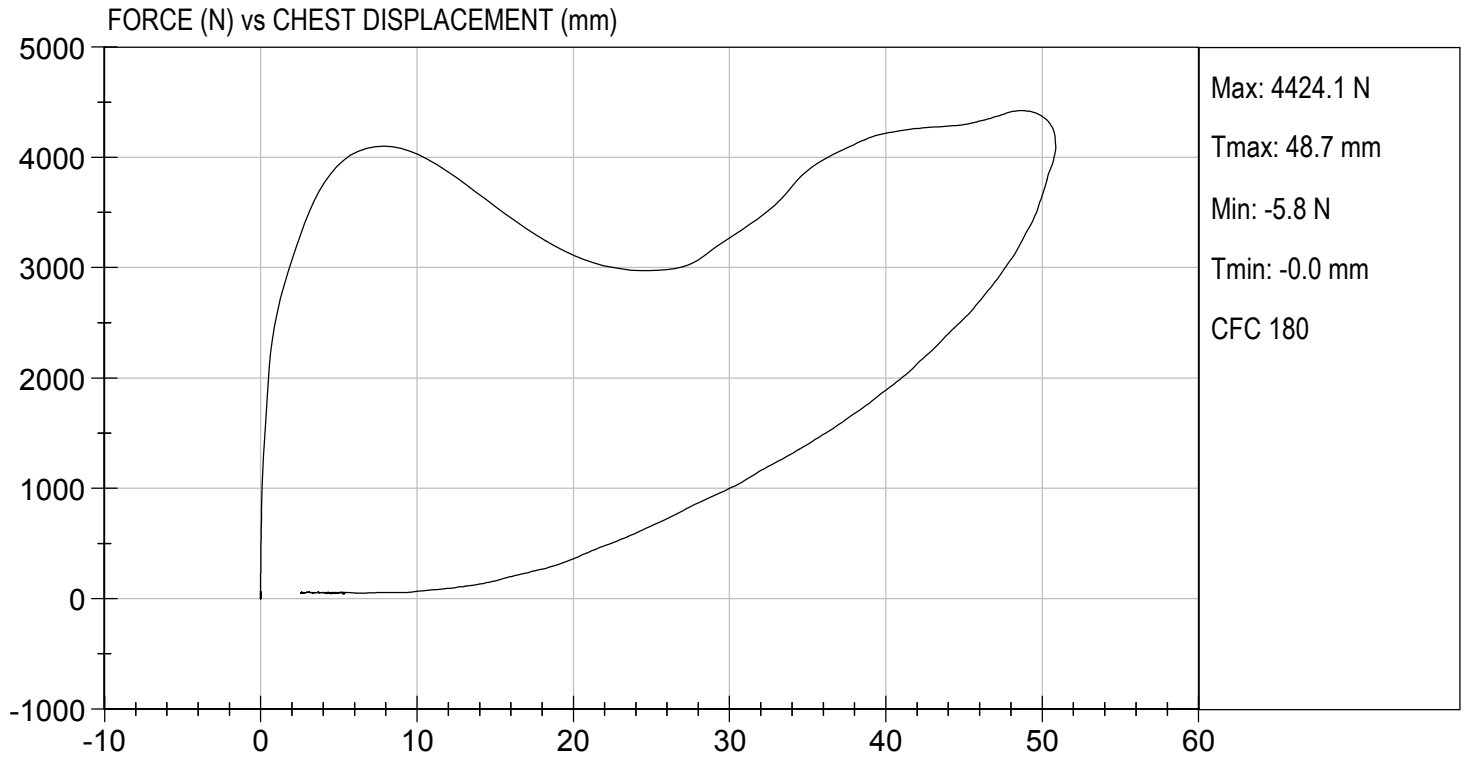
02/04/2021

Test Date



Approved By





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

ATD Serial No: 634

Test I.D: D210275

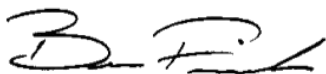
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3951	Pass
Overall Test Results				Pass



Laboratory Technician

02/03/2021

Test Date

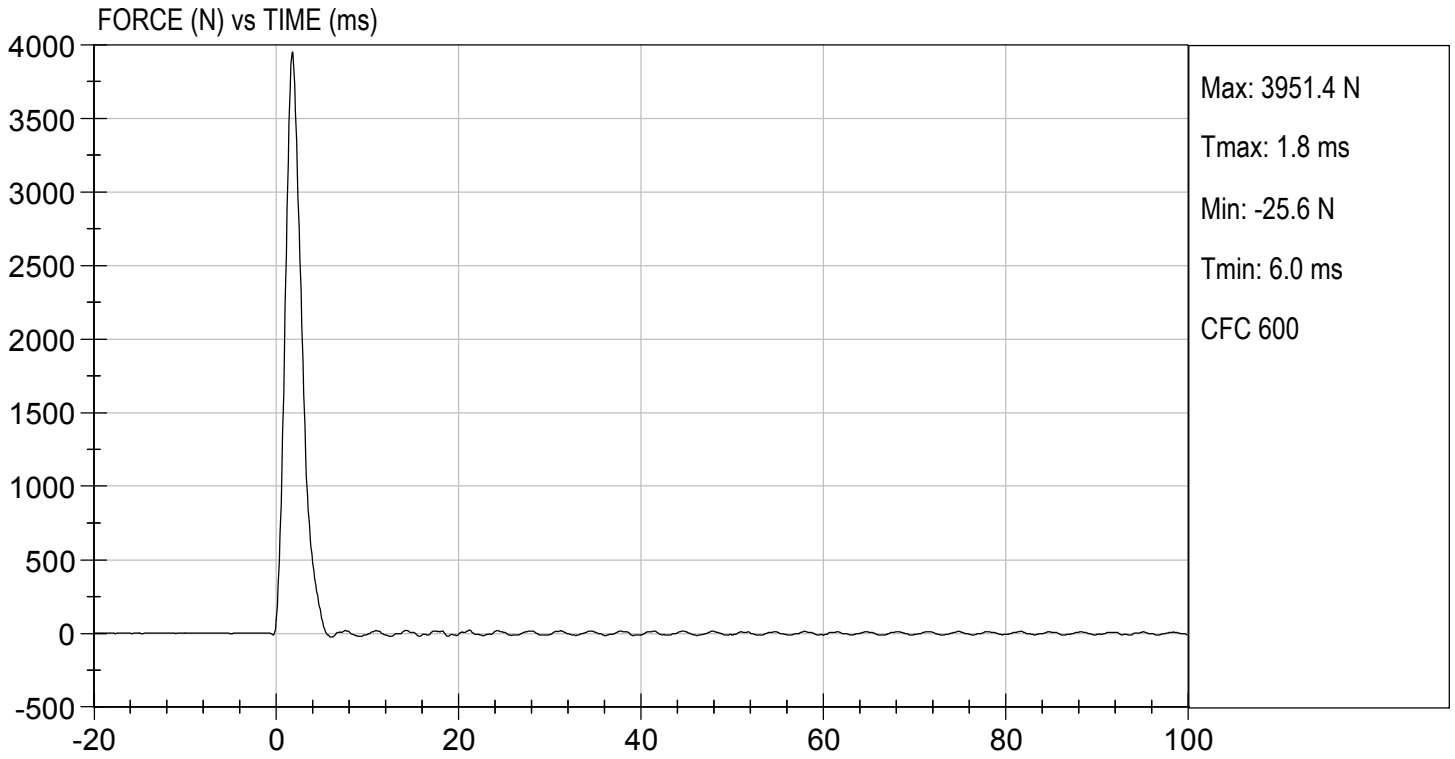


Approved By



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

TEST DATE: 02/03/2021  
TEST #: D210275



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

**ATD Serial No:** 634

**Test I.D:** D210276

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	25	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3900	Pass
Overall Test Results				Pass

  
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Laboratory Technician

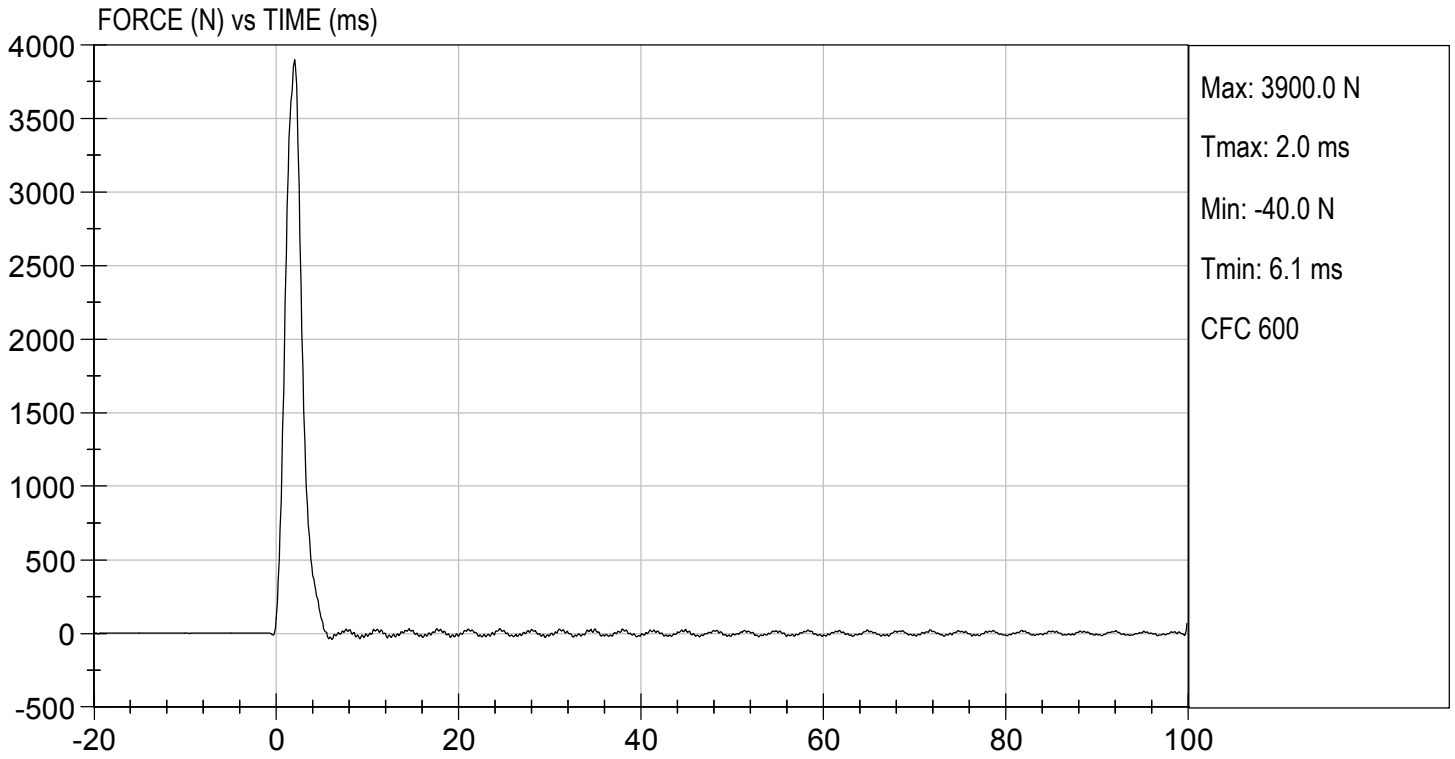
02/03/2021  
Test Date

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



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

TEST DATE: 02/03/2021  
TEST #: D210276





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

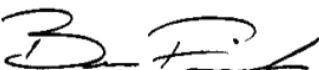
ATD Serial No: 634

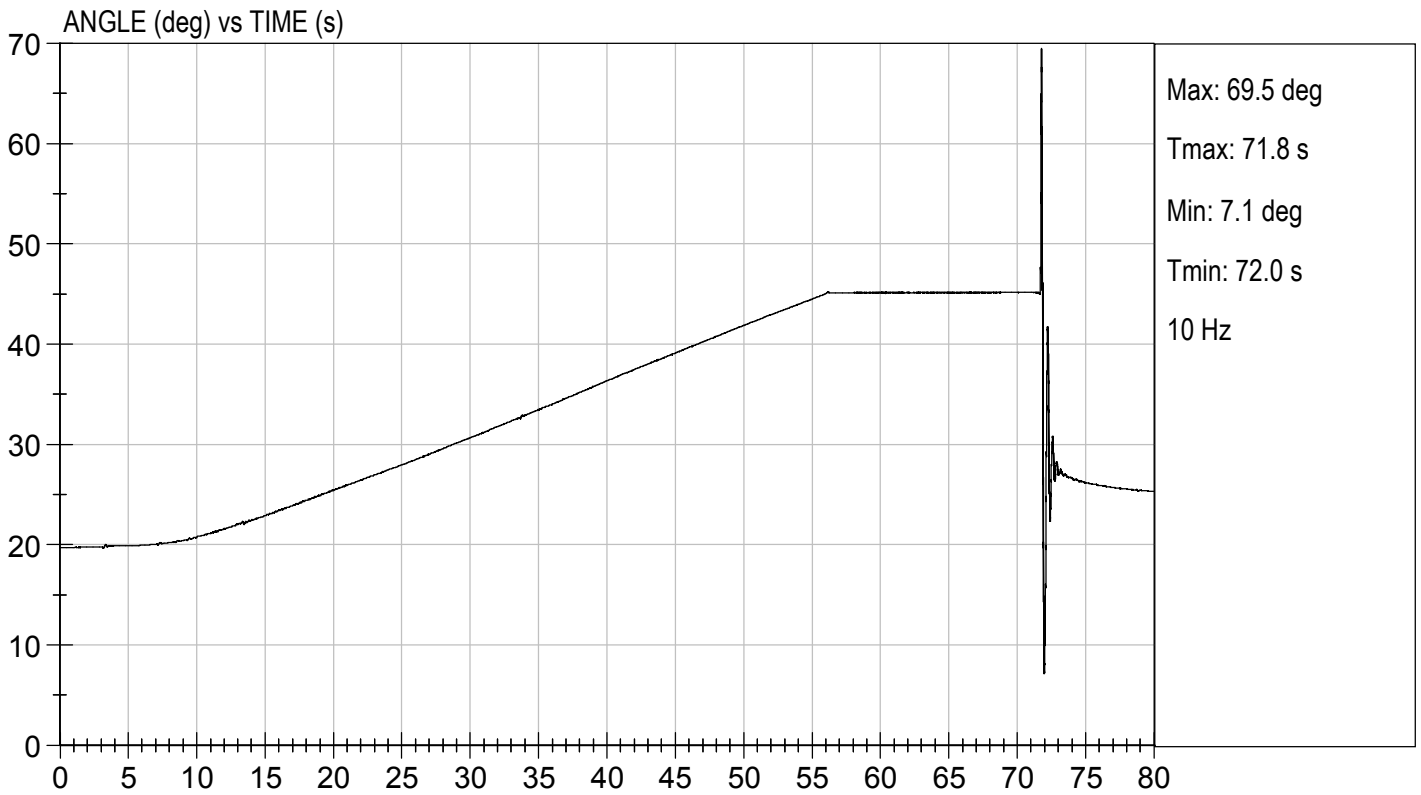
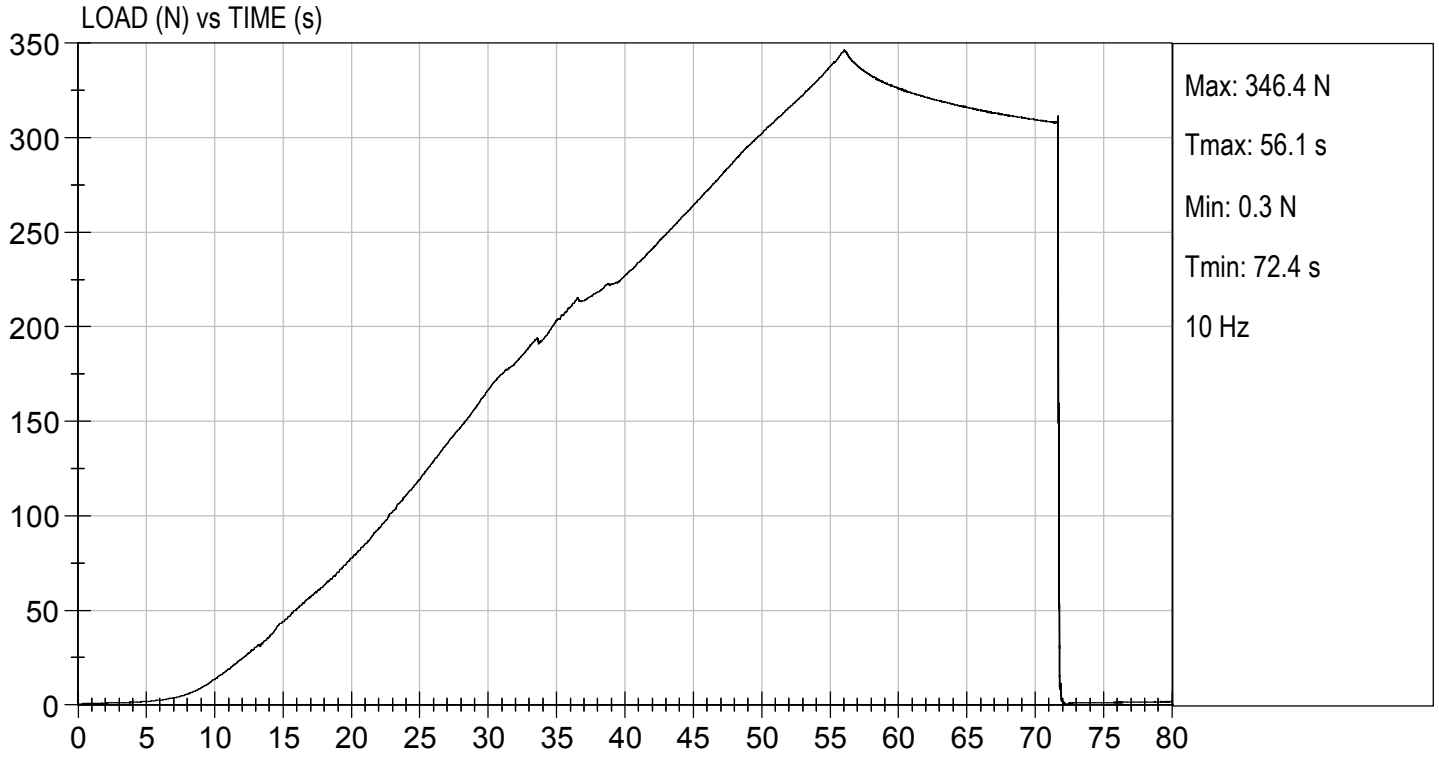
Test I.D: D210277

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Initial Angle	deg	0 to 20	20	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	346	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.5	Pass
Overall Result				Pass

  
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 Laboratory Technician

02/04/2021  
 \_\_\_\_\_  
 Test Date

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



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

**TABLE 1 – DRIVER DUMMY INSTRUMENTATION**

Instrument Location			Axis	Hybrid III 50 <sup>th</sup> S/N 351		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X		P79741	Endevco	09/02/2020
		Y		P79743	Endevco	09/02/2020
		Z		P79744	Endevco	09/02/2020
	Redundant	X		P94834	Endevco	09/02/2020
		Y		P94856	Endevco	09/02/2020
		Z		P97412	Endevco	09/02/2020
Head Angular Rate Sensors			X	ARS7402	DTS	08/04/2020
			Y	ARS7416	DTS	08/04/2020
			Z	ARS7366	DTS	08/04/2020
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG1915	Denton	03/05/2020
Chest Accelerometers	Primary	X		P86792	Endevco	09/02/2020
		Y		P86793	Endevco	09/02/2020
		Z		P88348	Endevco	09/02/2020
	Redundant	X		P88666	Endevco	09/02/2020
		Y		P88667	Endevco	09/02/2020
		Z		P94109	Endevco	09/02/2020
Chest Potentiometer			X	351	Servo	09/02/2020
Pelvis Accelerometers			X	P95526	Endevco	09/01/2020
			Y	P96038	Endevco	09/01/2020
			Z	P97742	Endevco	09/01/2020
Femur Load Cells	Right	Primary	Z	FG121P	Denton	09/02/2020
		Redundant	Z	FG121R	Denton	09/02/2020
	Left	Primary	Z	FG122P	Denton	09/02/2020
		Redundant	Z	FG122R	Denton	09/02/2020
Tibia Load Cells	Right	Upper	Mx, My, Fz	TGDH3308	FTSS	03/05/2020
		Lower	Mx, My, Fz	AGDI4208	FTSS	03/05/2020
	Left	Upper	Mx, My, Fz	TGDG6744	FTSS	03/05/2020
		Lower	Mx, My, Fz	AGDI4273	FTSS	03/05/2020
Foot Accelerometers	Right	Rear	X	T22486	Endevco	10/06/2020
			Z	P97382	Endevco	10/01/2020
		Front	Z	P82120	Endevco	09/02/2020
	Left	Rear	X	T16468	Endevco	09/01/2020
			Z	T16496	Endevco	09/01/2020
		Front	Z	T16501	Endevco	09/01/2020
Seat Belt Load Cells			Lap			
			Shoulder			

**TABLE 2 – FRONT PASSENGER DUMMY INSTRUMENTATION**

Instrument Location			Axis	Hybrid III 5 <sup>th</sup> S/N 634		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P82304	Endevco	08/11/2020	
		Y	P88172	Endevco	08/11/2020	
		Z	T16400	Endevco	08/12/2020	
	Redundant	X	T16403	Endevco	08/11/2020	
		Y	T16406	Endevco	08/11/2020	
		Z	T16413	Endevco	08/12/2020	
Head Angular Rate Sensors			X	ARS7340	DTS	08/04/2020
			Y	ARS7357	DTS	08/04/2020
			Z	ARS7442	DTS	08/04/2020
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG174	Denton	05/04/2020
Chest Accelerometers	Primary	X	T24796	Endevco	08/12/2020	
		Y	T16416	Endevco	08/12/2020	
		Z	T16420	Endevco	08/12/2020	
	Redundant	X	T16423	Endevco	08/12/2020	
		Y	T24766	Endevco	08/12/2020	
		Z	T22499	Endevco	08/12/2020	
Chest Potentiometer			X	634	Servo	12/28/2020
Pelvis Accelerometers			X	T16434	Endevco	08/11/2020
			Y	T16435	Endevco	08/11/2020
			Z	T16436	Endevco	08/11/2020
Femur Load Cells	Right	Primary	Z	FG139P	Denton	12/28/2020
		Redundant	Z	FG139R	Denton	12/28/2020
	Left	Primary	Z	FG141P	Denton	12/28/2020
		Redundant	Z	FG141R	Denton	12/28/2020
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG405	Denton	05/05/2020
		Lower	Mx, My, Fz	AG368	Denton	05/04/2020
	Left	Upper	Mx, My, Fz	TG475	Denton	05/05/2020
		Lower	Mx, My, Fz	AG504	Denton	05/04/2020
Foot Accelerometers	Right	Rear	X	T16437	Endevco	08/11/2020
			Z	T16438	Endevco	08/11/2020
		Front	Z	T22258	Endevco	08/11/2020
	Left	Rear	X	T16441	Endevco	08/11/2020
			Z	T16444	Endevco	08/11/2020
		Front	Z	T16445	Endevco	08/11/2020
Seat Belt Load Cells			Lap			
			Shoulder			



**TABLE 3 – VEHICLE INSTRUMENTATION**

Instrument Location			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember / Rear Seat Accelerometers	Left	Primary	X	A360996	MSI	12/05/2020
			Z	A337214	MSI	11/12/2020
		Redundant	X	A356216	MSI	12/14/2020
	Right	Primary	X	A337226	MSI	12/03/2020
			Z	A337223	MSI	12/03/2020
		Redundant	X	A337183	MSI	12/03/2020
Engine Accelerometers		Top	X	A356247	MSI	12/14/2020
		Bottom	X	A361005	MSI	12/12/2020