

**REPORT NUMBER: NCAP-MGA-2019-012**

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

**NISSAN MOTOR CO., LTD.  
2019 Nissan Versa S 4-Door Sedan  
NHTSA No.: M20195212**

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




**Test Date: November 15, 2018**

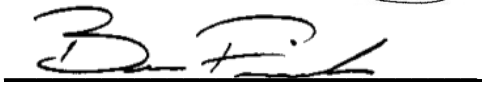
**Final Report Date: February 5, 2019**

**FINAL REPORT**

**U.S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Office of Crashworthiness Standards  
Mail Code: NRM-110  
1200 New Jersey Ave, SE  
Room W43-410  
Washington, DC 20590**

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Approval Date: February 5, 2019

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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15. Supplementary Notes																																																									
<p>16. Abstract</p> <p>A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2019 Nissan Versa S 4-Door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on November 15, 2018.</p> <p>The impact velocity of the vehicle was 56.13 km/h and the ambient temperature at the barrier face at the time of impact was 21.1°C. The target vehicle post-test maximum crush was 379 mm located to the left of the vehicle centerline. The test vehicle's performance was as follows:</p>																																																									
<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>N/A</td> <td>700</td> <td style="background-color: yellow;">293</td> <td>700</td> <td style="background-color: yellow;">396</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td style="background-color: yellow;">24</td> <td>52</td> <td style="background-color: yellow;">18</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td style="background-color: yellow;">0.38</td> <td>1</td> <td style="background-color: yellow;">0.36</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td style="background-color: yellow;">1876</td> <td>2620</td> <td style="background-color: yellow;">1063</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td style="background-color: yellow;">606</td> <td>2520</td> <td style="background-color: yellow;">472</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td style="background-color: yellow;">3395</td> <td>6805</td> <td style="background-color: yellow;">2682</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td style="background-color: yellow;">3891</td> <td>6805</td> <td style="background-color: yellow;">2594</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC <sub>15</sub> )	N/A	700	293	700	396	Maximum Chest	mm	63	24	52	18	Nij	N/A	1	0.38	1	0.36	Neck Tension	N	4170	1876	2620	1063	Neck Compression	N	4000	606	2520	472	Left Femur Force	N	10008	3395	6805	2682	Right Femur Force	N	10008	3891	6805	2594
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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 DTNH22-12-D-00258. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure.

### **SUMMARY**

A load cell barrier consisting of 176 load cells was impacted by a 2019 Nissan Versa S 4-Door Sedan at a velocity of 56.13 km/h. The test was performed at MGA Research Corporation on November 15, 2018. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

Two (2) real-time cameras and fourteen (14) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

One Part 572E 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 Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation.

The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. 138) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

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

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

The maximum static crush of the vehicle was 379 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 bolster. The passenger's visible contact points were as follows: The passenger's head contacted the airbag. The passenger's head also contacted the headrest. The passenger's knees contacted the glove box.

The occupant data is summarized below:

ATD position	HIC <sub>15</sub>	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 <sup>th</sup> )	293	0.38	1876	606	47	24	3395	3891
Passenger (5 <sup>th</sup> )	396	0.36	1063	472	48	18	2682	2594

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

### TEST NOTES

Driver Right Ankle Z recorded no valid data after 55ms.  
 Driver Shoulder Belt was not installed.  
 Driver Lap Belt was not installed.  
 Passenger Shoulder Belt was not installed.  
 Passenger Lap Belt was not installed.

Barrier C-01 Fx recorded no valid data.  
 Barrier K-15 My recorded no valid data.

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

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

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	M20195212	Traction Control System (TCS)	Yes
Model Year	2019	Power Steering	Yes
Make	Nissan	Power Window Auto-Reverse	No
Model	Versa S	Driver Frontal Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	3N1CN7AP8KL807670	Driver Head/Torso Airbag	No
Body Color	Gun Metallic	Driver Torso Airbag	No
Odometer (km/mi)	11 km / 7 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	1.6 L	Driver Pelvis Airbag	No
Type/No. Cylinders	I4	Driver Knee Airbag	No
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Manual	Front Pass. Curtain Airbag	Yes
Transmission Speeds	5	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)	Yes	Other	N/A

Does owner's manual provide instructions to turn off automatic door locks?	No
--	----

**DATA FROM CERTIFICATION LABEL**

Manufactured By	NISSAN MOTOR CO., LTD.
Date of Manufacture	08/18

GVWR (kg)	1537
GAWR Front (kg)	794
GAWR Rear (kg)	775

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

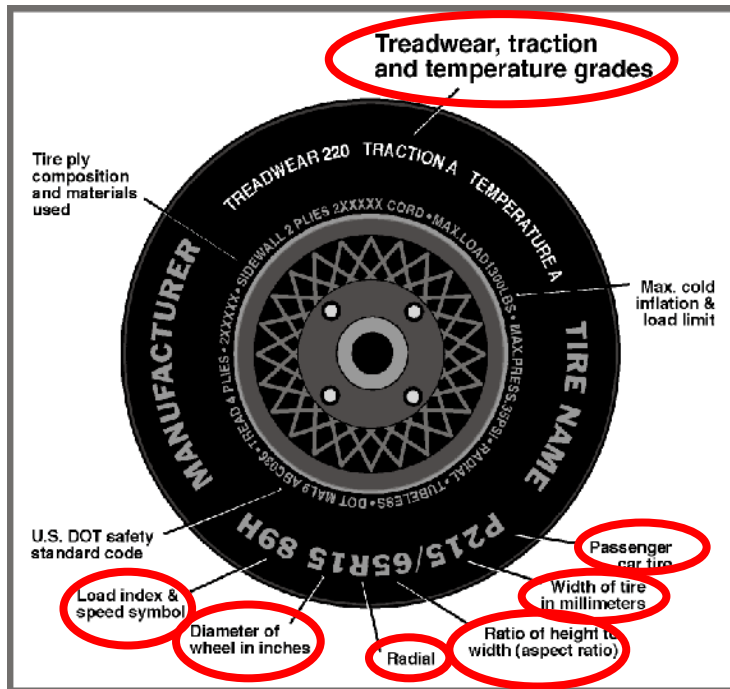
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				340
Cargo Weight (RCLW) (kg)				45

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

**VEHICLE TIRE INFORMATION**



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	185/65R15	185/65R15
Tire Size on Vehicle	185/65R15	185/65R15
Tire Manufacturer	Continental	Continental
Tire Model	ContiProContact	ContiProContact
Treadwear	500	500
Traction	AA	AA
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	86H	86H
Tire Material	Rubber	Rubber
DOT Safety Code Left	P5FP 3YP 2818	P5FP 3YP 2818
DOT Safety Code Right	P5FP 3YP 2818	P5FP 3YP 2818

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	324.0	229.5		354.5	293.5	
Right	kg	307.0	221.5		325.5	287.5	
Ratio	%	58.3%	41.7%		53.9%	46.1%	
Totals	kg	631.0	451.0	1082.0	680.0	581.0	1261.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1082.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Test Vehicle Target Weight (TVTW)	kg	1268.0

**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	692	689	668	667	1084
As Tested	mm	677	675	638	644	1198
Post Test	mm	642	635	646	630	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2600
Total Vehicle Length at Left Side	mm	4398
Total Vehicle Length at Centerline	mm	4494
Total Vehicle Length at Right Side	mm	4398
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	24
Amount of Stoddard Solvent in Fuel Tank	L	37.9

List of components removed to meet test weight: LR and RR door trim, LR and RR headrest, rear bench seat, LR and RR speakers, LR taillight, LR and RR window glass, motor, and track.

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

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	4494
2	Total Width	1696
3	Bumper Top Height	560
4	Bumper Bottom Height	445
5	Longitudinal Member Top Height	692
6	Distance between Longitudinal Members	922
7	Longitudinal Member Width	54
8	Engine Top Height	874
9	Engine Bottom Height	189
10	Engine and Gearbox Width	724
11	Front Bumper-Engine Distance	310
12	Front Shock Absorber Fixing Height	880
13	Bonnet Leading Edge Height	879
14	Front Shock Absorber Fixing Width	1124
15	Front Bumper – Front Axle Distance	870
16	Front Axle – A-Pillar Distance	470
17	A-Pillar – B-Pillar Distance	1098
18	B-Pillar – Rear Axle Distance	1046
19	B-Pillar – C-Pillar Distance	620
20	Roof Sill Bottom Height	1452
21	Roof Sill Top Height	1509
22	Floor Sill Bottom Height	228
23	Floor Sill Top Height	340

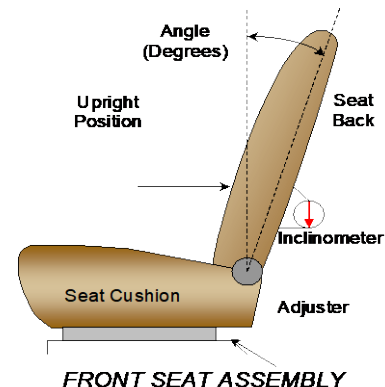
**DATA SHEET NO. 2**  
**SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

**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 October 2015.



	Degrees
Driver Seat Back Angle	-1.2° on outboard headrest post
Passenger Seat Back Angle	-2.5° on outboard headrest post

**SEAT FORE/AFT POSITIONS**

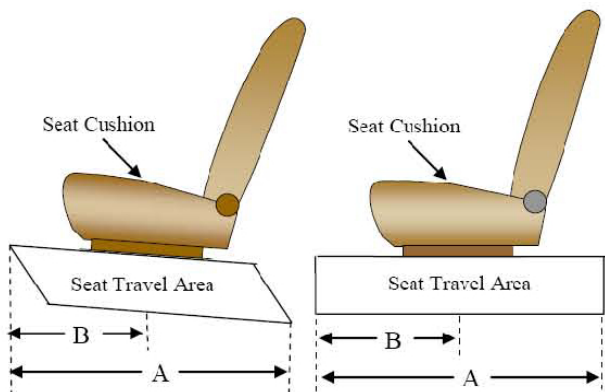
The driver and passenger seat fore/aft positions are adjusted following Appendix F, “Driver & Passenger Dummy Seating & Positioning Procedures” in the NCAP Test Procedure dated October 2015.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	240 mm / 25 detents (1 <sup>st</sup> as 1)	120 mm / 12 <sup>th</sup> detent (1 <sup>st</sup> as 0)
Passenger Seat	240 mm / 25 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 positioning 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: 2019 Nissan Versa S 4-Door Sedan  
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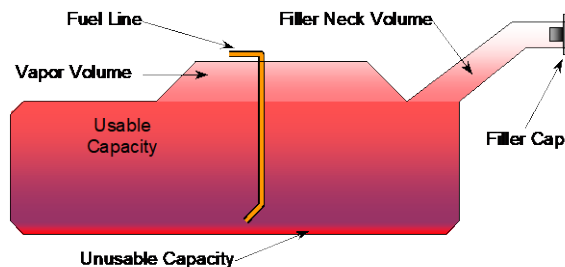
**FUEL TANK CAPACITY DATA**

	Liters
Usable Capacity of "Standard Tank"	40.9
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	37.6 to 38.4
Actual Amount of Solvent used	37.9
1/3 of Usable Capacity	13.6

**FUEL PUMP**

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

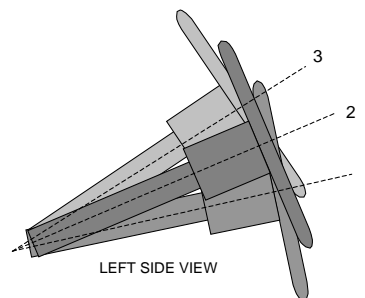
The vehicle is equipped with an electronic fuel pump.  
The fuel pump will run for 1.0 seconds after the ignition is switched to ON and while the engine is running.  
The filler neck is located on the driver's side.



VEHICLE FUEL TANK ASSEMBLY

**STEERING COLUMN ADJUSTMENT**

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



STEERING COLUMN ASSEMBLY

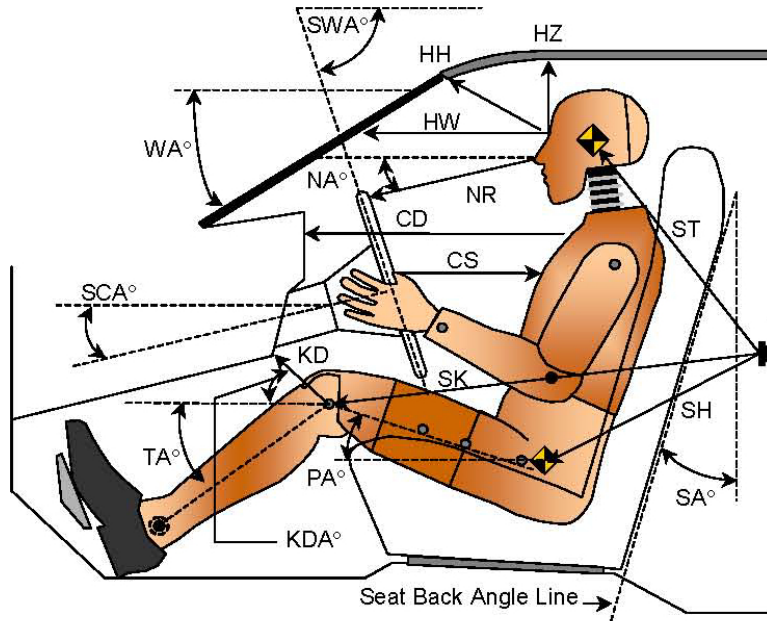
**STEERING COLUMN POSITION**

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	65.7	
Geometric Center Position 2	63.5	
Uppermost Position 3	61.2	
Telescoping Steering Wheel Travel		
Test Position	63.5	

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018



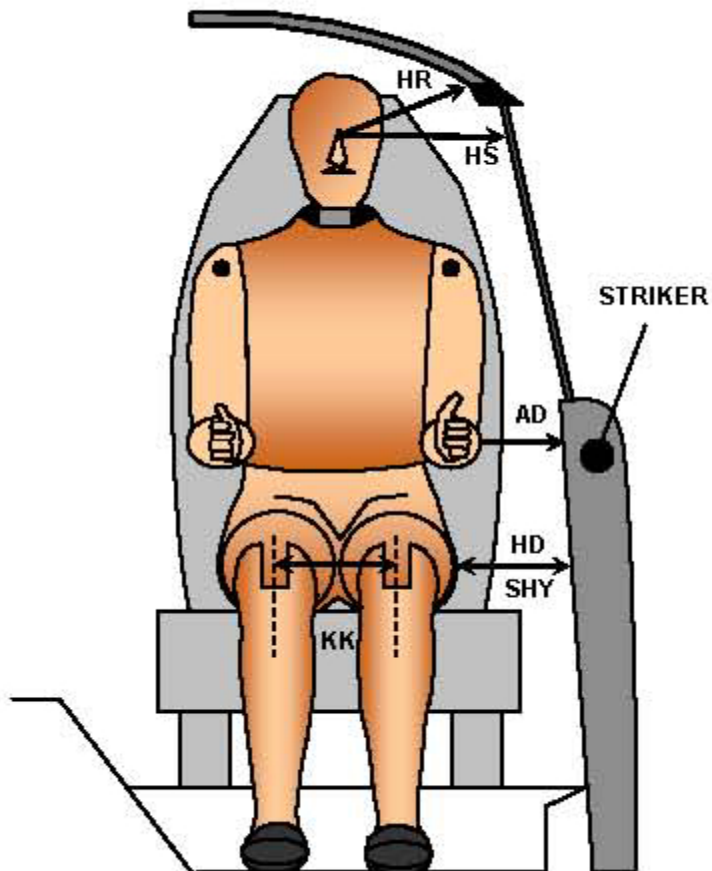
**LEFT SIDE VIEW**

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		21.5		
SWA°	Steering Wheel Angle		63.5		
SCA°	Steering Column Angle		26.5		
SA°	Seat Back Angle		-1.2		-2.5
HZ	Head to Roof (Z)	181	90	198	90
HH	Head to Header	370	19.1	283	39.2
HW	Head to Windshield	619	0	613	0
NR	Nose to Rim	425	13.8		
CD	Chest to Dash	543		398	
CS	Chest to Steering Hub	323	4.5		
RA	Rim to Abdomen	194	0		
KDL	Left Knee to Dash	134	27.6	68	30.5
KDR	Right Knee to Dash	111	29.2	82	31.3
PA°	Pelvic Angle		24.3		20.4
TA°	Tibia Angle		47.2		53.8
SK	Striker to Knee	634	87.3	694	90.8
ST	Striker to Head	577	12.4	551	29.7
SH	Striker to H-Point	266	112.4	389	100.9

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

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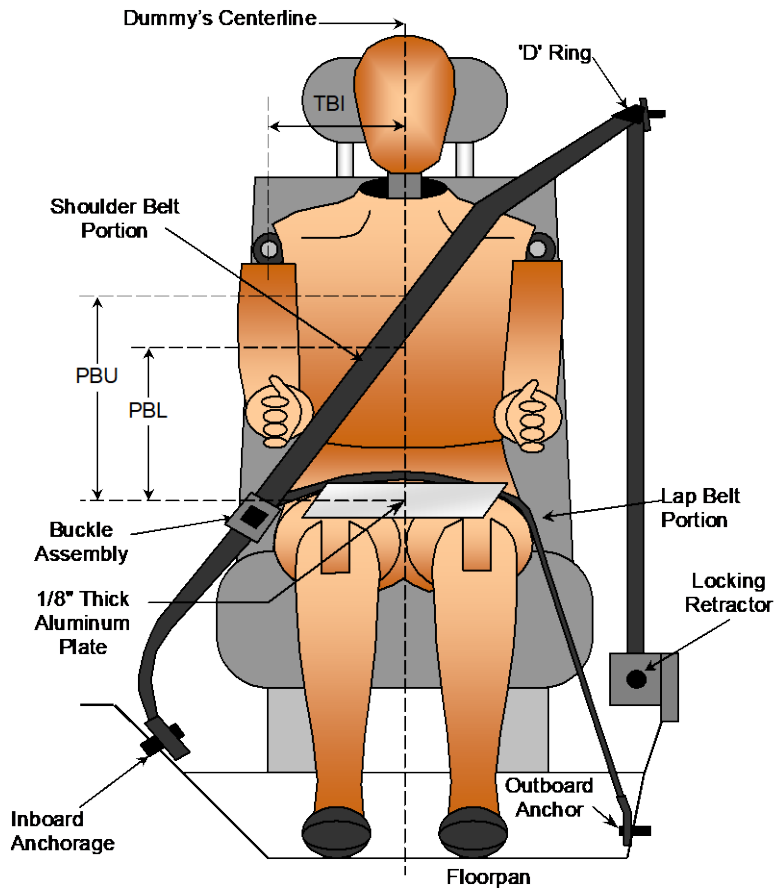
**FRONT VIEW OF DUMMY**

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	108	56
HD	H-Point to Door	106	167
HR	Head to Side Header	180	227
HS	Head to Side Window	302	327
KK	Knee to Knee	365	228
SHY	Striker to H-Point (Y Direction)	273	306
AA	Ankle to Ankle	337	172

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018



**FRONT VIEW OF DUMMY**

**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	360	330
PBL - Top surface of reference to belt lower edge	mm	285	240

**BELT LENGTH DATA**

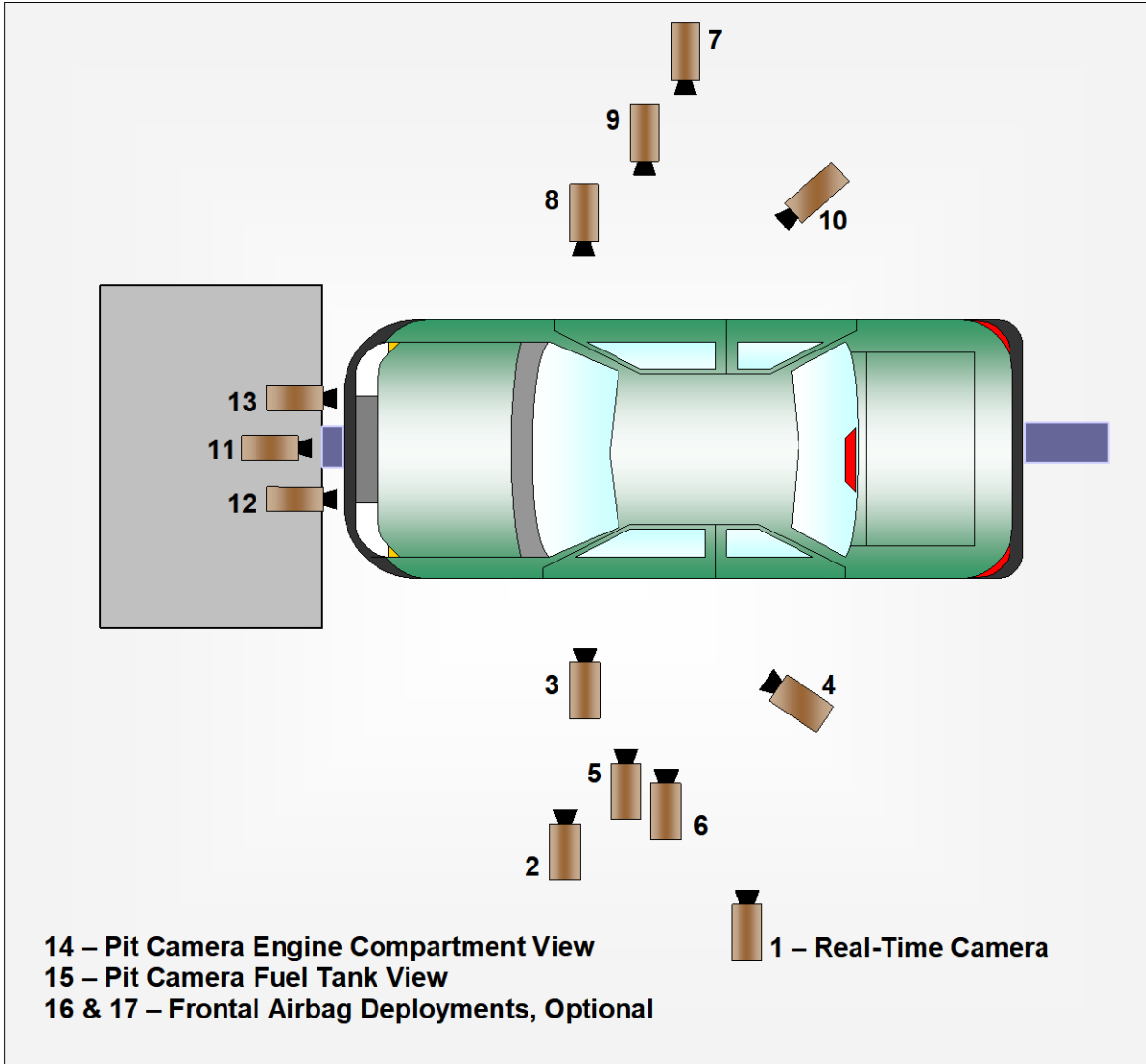
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	900	940
Lap Belt Length as measured on ATD	mm	880	980
Remainder of belt on reel	mm	1100	960
Total Belt Length for Continuous Webbing Systems	mm	3380	3380

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**CAMERA POSITIONS FOR FRONTAL IMPACTS**



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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**CAMERA LOCATIONS**

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	-1390	-6880	-2040	50	1000
3	Left Front Half	-1140	-5380	-1290	24	1000
4	Left Angle	-7070	-5940	-2010	75	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	-2000	5570	-1290	14	1000
8	Passenger Close-Up	-1540	6790	-2060	50	1000
9	Right Front Half	-1050	5300	-1490	24	1000
10	Right Angle	-6980	5640	-2050	75	1000
11	Windshield	100	0	-2310	16	1000
12	Driver Windshield	210	-370	-2230	25	1000
13	Passenger Windshield	210	370	-2230	25	1000
14	Pit Front	-970	0	3340	24	1000
15	Pit Rear	-2810	0	3340	24	1000
16	Onboard Driver Side				12	1000
17	Onboard Passenger Side				12	1000
18	Real-Time Pan View					30

**\*COORDINATES:**

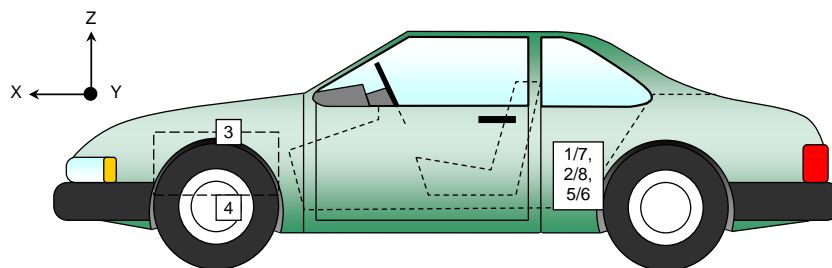
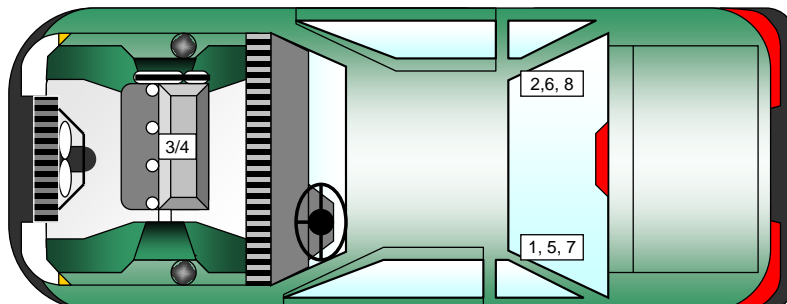
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 5 & 6 were not used for this test.

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018



**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1792	-353	-243
2	Right Rear Crossmember Accelerometer – X Direction	1792	365	-241
3	Engine Top X	3831	10	-772
4	Engine Bottom X	3730	0	-230
5	Left Rear Crossmember Accelerometer – Z Direction	1792	-353	-243
6	Right Rear Crossmember Accelerometer – Z Direction	1792	365	-241
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1851	-353	-243
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1851	365	-241

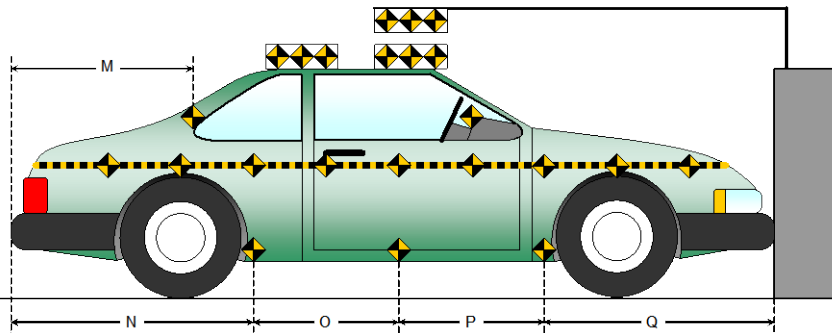
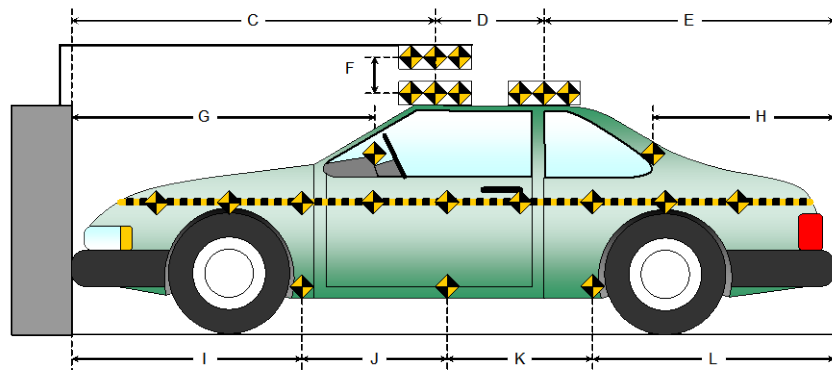
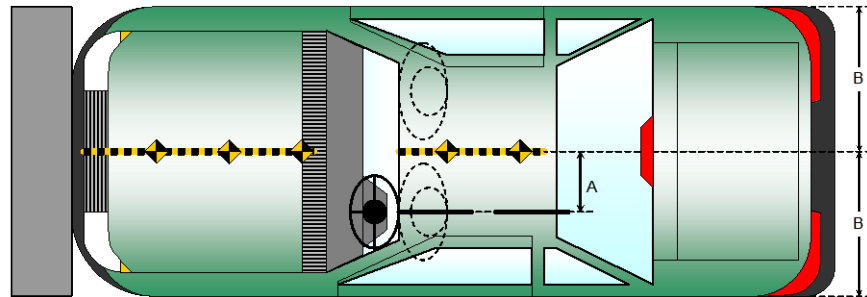
Reference Points: X - Rear Surface of Vehicle (+ forward)  
 Y - Vehicle Centerline (+ to right)  
 Z - Ground Plane (+ down)

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

Item	Value (mm)
A	325
B	848
C	2145
D	613
E	1736
F	330
G	
H	973
I	1313
J	875
K	875
L	1431
M	973
N	1431
O	875
P	875
Q	1313



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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

**Advanced Research Load Cell Barrier**

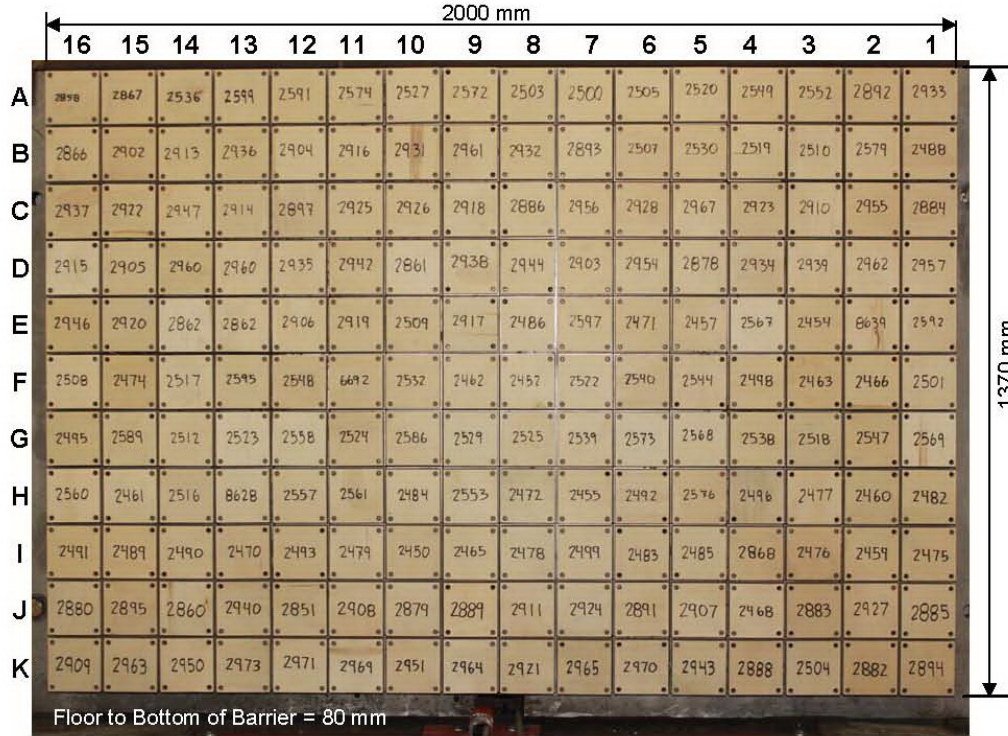


Photo for Reference Only

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: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**INSTRUMENTATION**

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

**CAMERA COVERAGE**

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

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 351	HIII 5% / 138
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

**DOOR OPENING AND SEAT TRACK INFORMATION**

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Track Shift (mm)	0	0
Seat Back Failure	None	None

**POST TEST STRUCTURAL OBSERVATIONS**

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

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	2785
Center	mm	2785
Right Side	mm	2780
Average	mm	2783

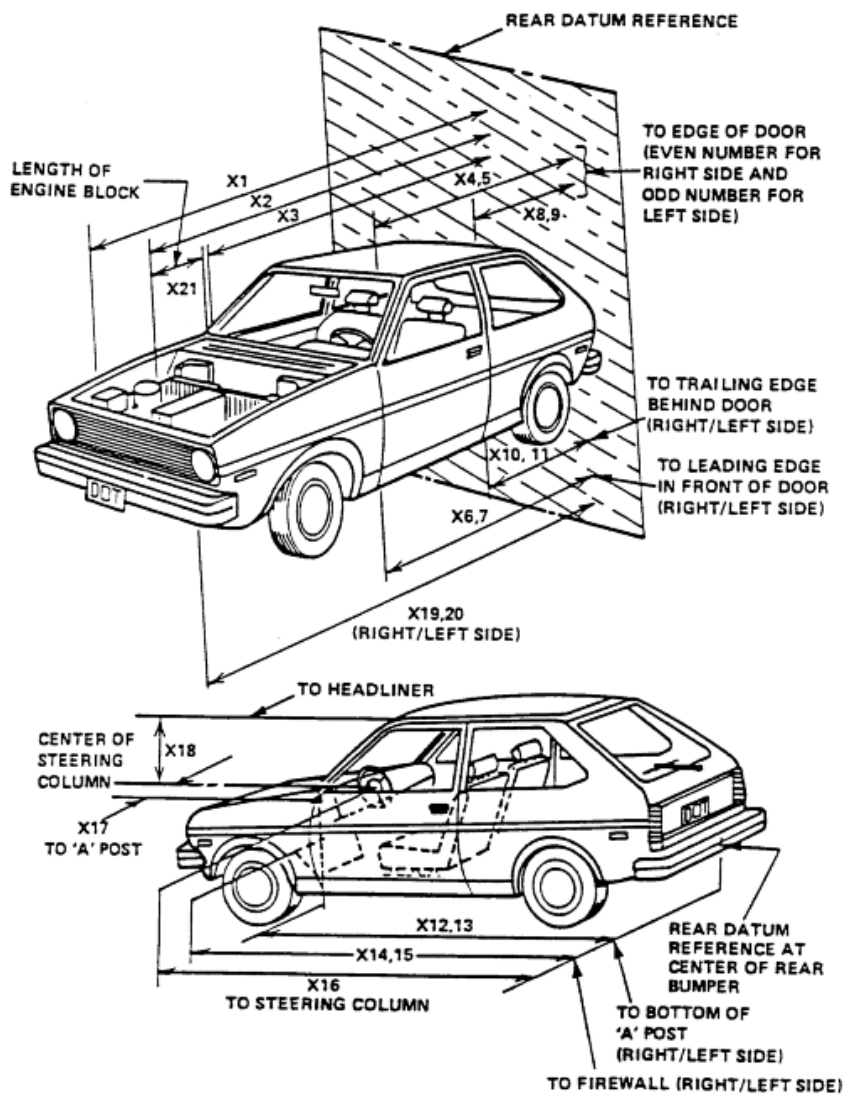
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

## DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018



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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**RSOV (Rear Surface of Vehicle)**

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4494	4189	305
2	RSOV to Front of Engine	mm	3959	3689	270
3	RSOV to Firewall	mm	3403	3384	19
4	RSOV to Upper Leading Edge of Right Door	mm	3200	3184	16
5	RSOV to Upper Leading Edge of Left Door	mm	3200	3189	11
6	RSOV to Lower Leading Edge of Right Door	mm	3149	3141	8
7	RSOV to Lower Leading Edge of Left Door	mm	3149	3130	19
8	RSOV to Upper Trailing Edge of Right Door	mm	2076	2072	4
9	RSOV to Upper Trailing Edge of Left Door	mm	2076	2070	6
10	RSOV to Lower Trailing Edge of Right Door	mm	2058	2044	14
11	RSOV to Lower Trailing Edge of Left Door	mm	2058	2043	15
12	RSOV to Bottom of "A" Post of Right Side	mm	3176	3140	36
13	RSOV to Bottom of "A" Post of Left Side	mm	3181	3145	36
14	RSOV to Firewall, Right Side	mm	3552	3427	125
15	RSOV to Firewall, Left Side	mm	3552	3455	97
16	RSOV to Steering Column	mm	2710	2763	-53
17	Center of Steering Column to "A" Post	mm	372	334	38
18	Center of Steering Column to Headliner	mm	400	374	26
19	RSOV to Right Side of Front Bumper	mm	4398	4027	371
20	RSOV to Left Side of Front Bumper	mm	4398	4019	379
21	Length of Engine Block	mm	460	N/A	N/A
RD	RSOV to Right Side of Dash Panel	mm	2986	2981	5
CD	RSOV to Center of Dash Panel	mm	3021	3010	11
LD	RSOV to Left Side of Dash Panel	mm	2996	2990	6

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**VEHICLE INFORMATION**

VIN: 3N1CN7AP8KL807670 Wheelbase (mm): 2600  
Vehicle Size Category: Passenger Car Test Weight (kg): 1261.0

**ACCELEROMETER DATA**

Accelerometer Locations: As per measurements on Page 15

Cal. Procedure/Interval: MGA procedure / 6 month

Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.13

Velocity Change (km/h): 67.9

Time of Separation (msec): 107

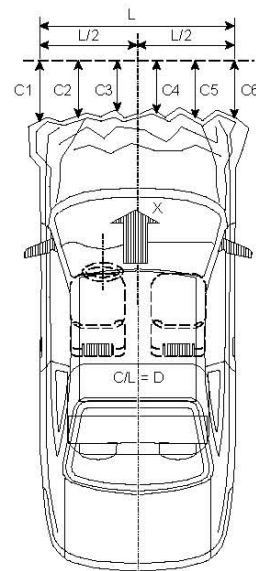
**CRUSH PROFILE**

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Centerline

Damage Region Length (mm): 1494

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4398	4019	379
C2	Crush zone 2 at left side	mm	4456	4142	314
C3	Crush zone 3 at left side	mm	4480	4161	319
C4	Crush zone 4 at right side	mm	4480	4163	317
C5	Crush zone 5 at right side	mm	4456	4150	306
C6	Crush zone 6 at right side	mm	4398	4027	371
L	C1 TO C6	mm	1494	1131	363

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

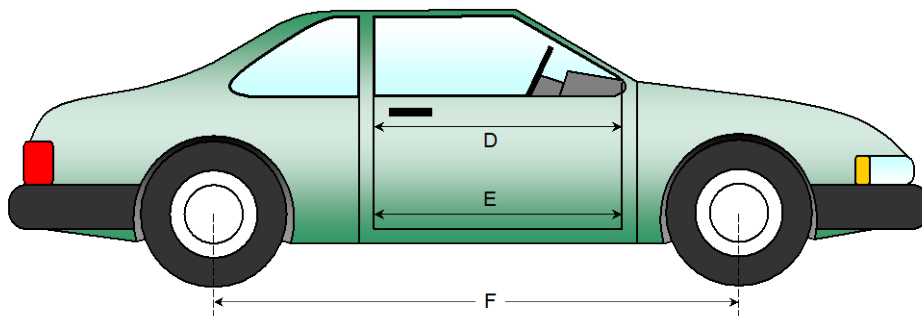
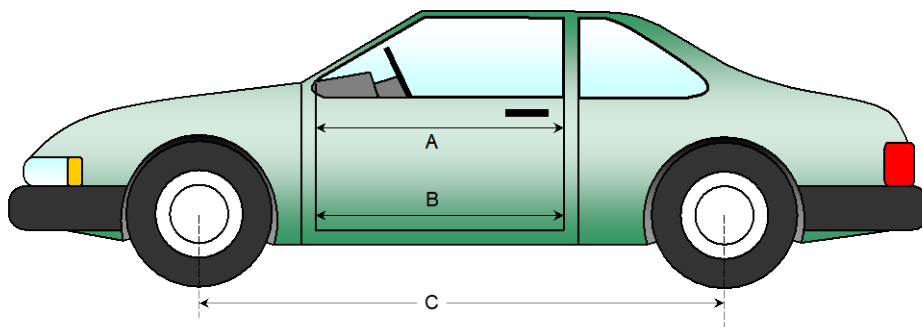
NHTSA No.: M20195212  
Test Date: 11/15/2018

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1034	1031	3
B	Left Side Lower	mm	964	960	4
D	Right Side Upper	mm	1034	1032	2
E	Right Side Lower	mm	964	962	2

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2600	2542	58
F	Right Side Wheelbase	mm	2600	2539	61



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

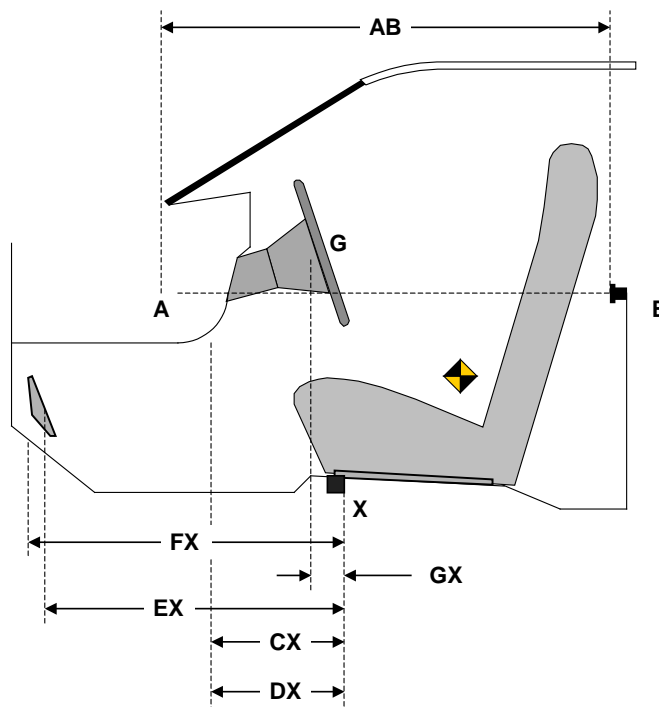
Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	842	842	0
CX	Left Knee Bolster to X	mm	232	240	-8
DX	Right Knee Bolster to X	mm	248	256	-8
EX	Brake Pedal to X	mm	532	431	101
FX	Foot Rest to X	mm	548	533	15
GX	Center of Steering Column Wheel Hub to X	mm	54	96	-42

X = Front of Seat Track (stationary)



**DRIVER COMPARTMENT**

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

**Windshield Mounting Details:**

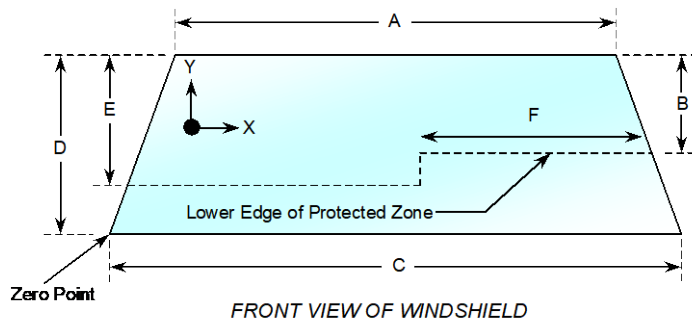
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.3° C.

**WINDSHIELD PERIPHERY MEASUREMENTS**

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	1936	1936	100.0
Right Side	1950	1950	100.0
Total	3886	3886	100.0



Item	Units	Value
A	mm	1028
B	mm	465
C	mm	1190
D	mm	834
E	mm	484
F	mm	488

**AREA OF PROTECTED ZONE FAILURES - NONE**

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

X	Y

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

X	Y

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
Test Date: 11/15/2018

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

Temperature at Time of Impact: 21.1°C

Test Time: 9:47 a.m.

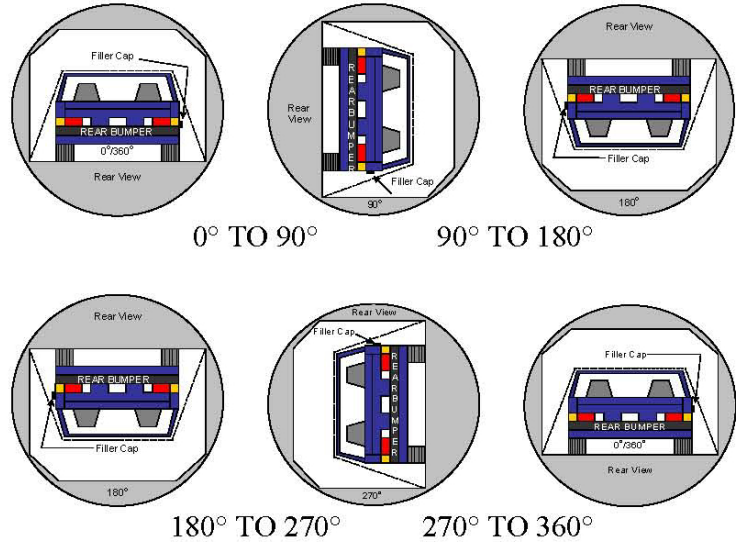
- A. From impact until vehicle motion ceases:   0   oz.  
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases:   0   oz.  
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes:   0   oz.  
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

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

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018

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

**FMVSS 301 SPILLAGE TABLE (units in ounces)**

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

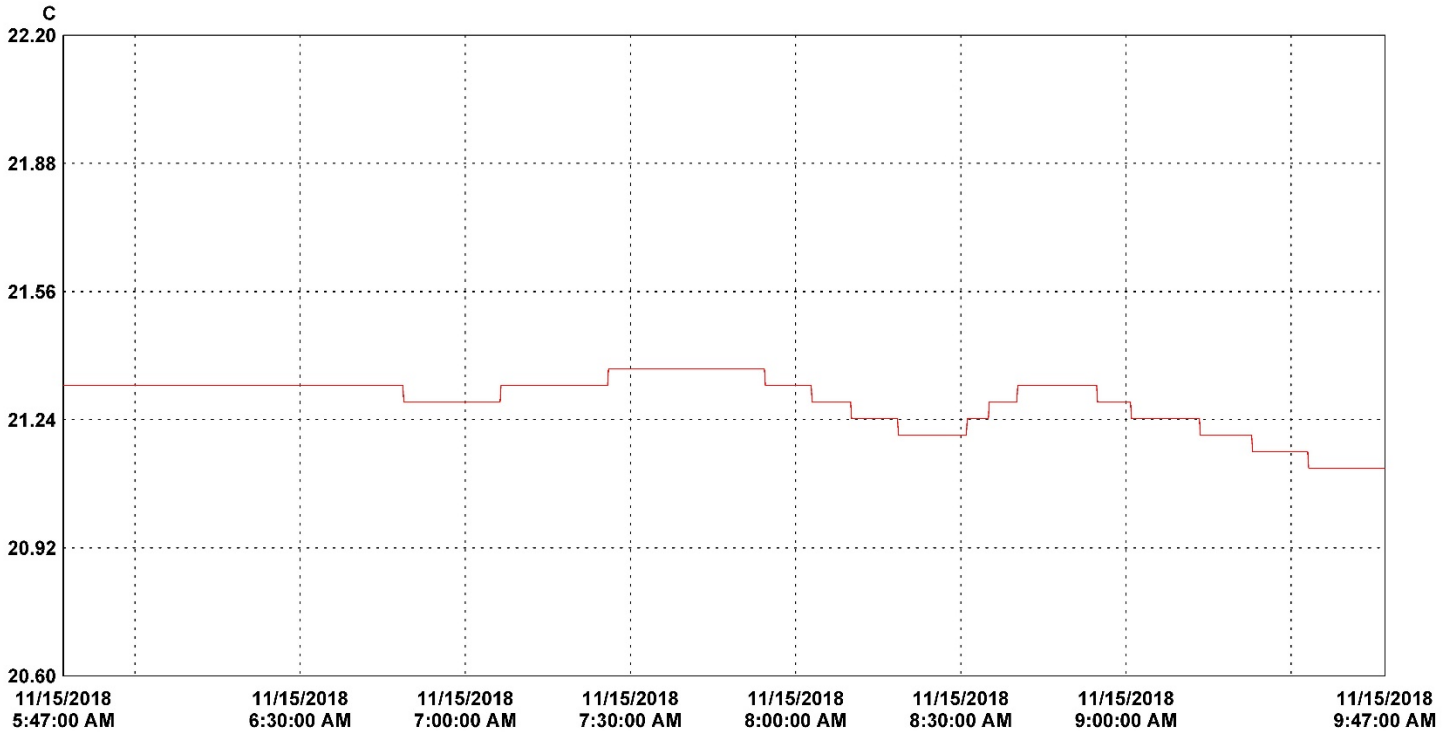
**SOLVENT SPILLAGE LOCATION TABLE**

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

**DATA SHEET NO. 17  
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA**

Test Vehicle: 2019 Nissan Versa S 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20195212  
 Test Date: 11/15/2018



30 minutes/div 4 hours (M/d/yyyy h:mm:ss tt) Central Time Graph file (truncated): M20195212 2019 Nissan Versa S 4-Door Sedan NCAP.spg

LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	12032257	VSC_Prep_Room	1	21.37	21.28	21.12	C	Temperature	12032257_VSC_Prep_Room.spl	

**APPENDIX A  
PHOTOGRAPHS**

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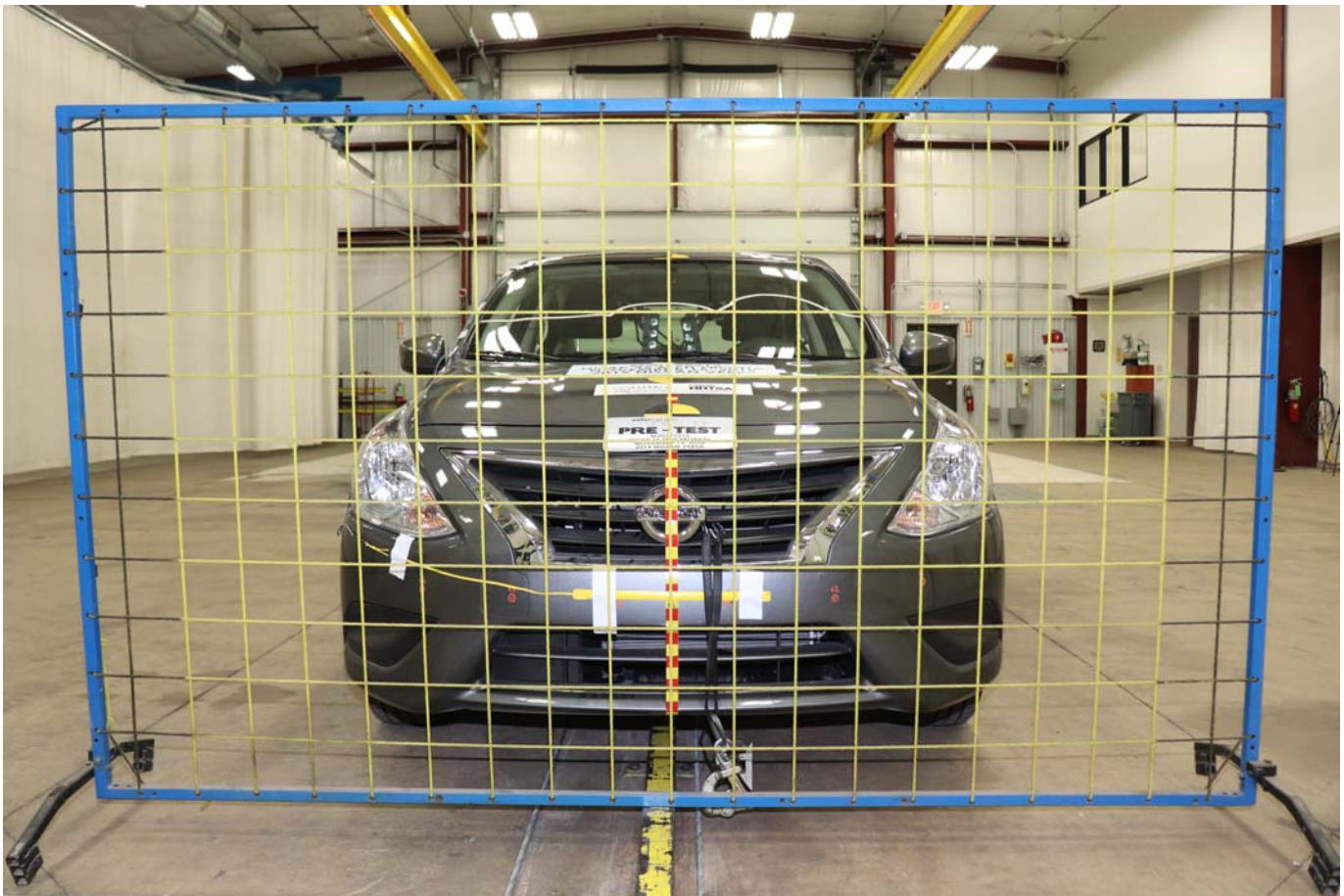


Photo No. 001 - Load Cell Location



Photo No. 002 - Pre-Test Load Cell Wall



Photo No. 003 - Post-Test Load Cell Wall

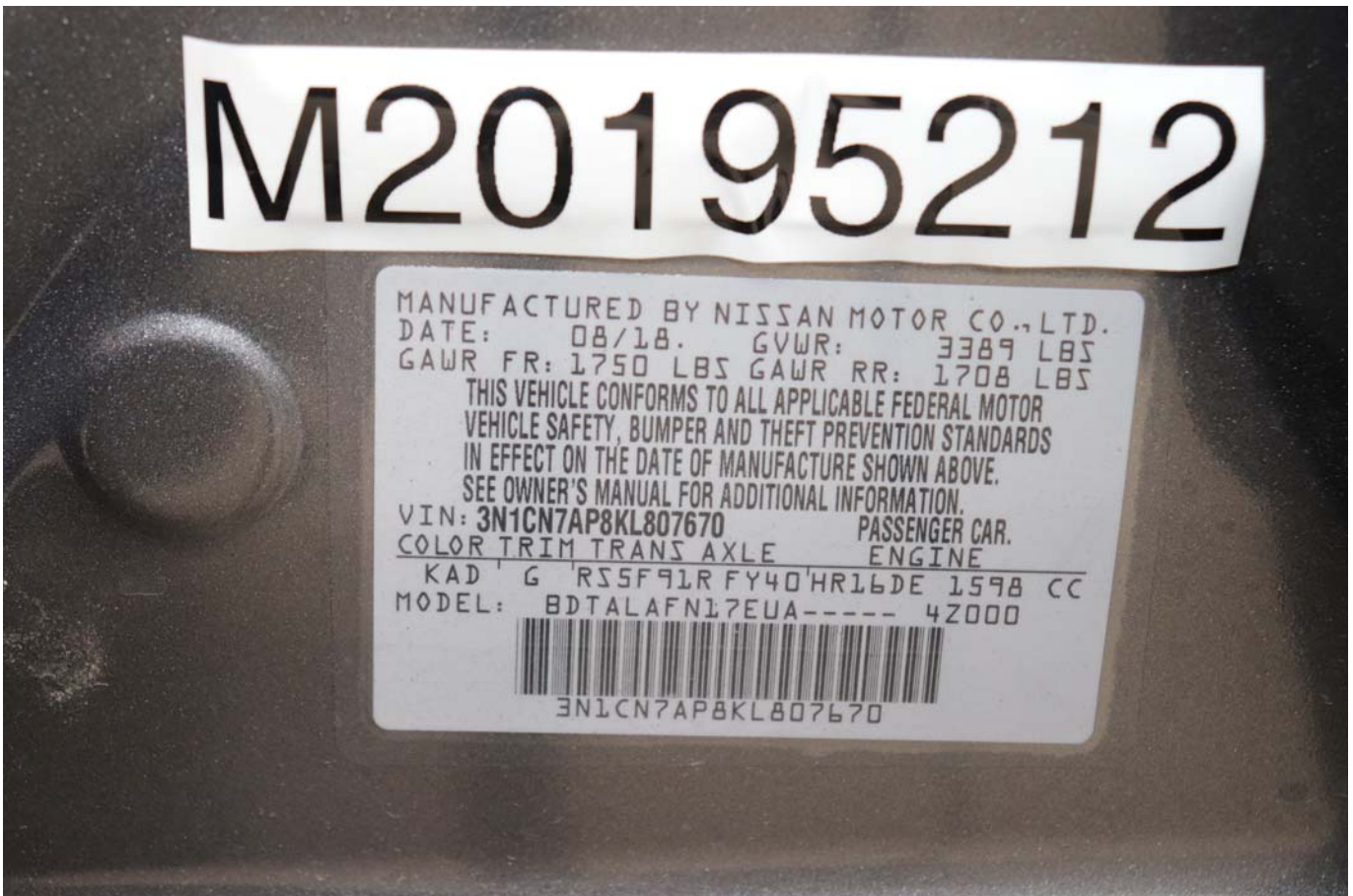


Photo No. 004 - Manufacturer Label



Photo No. 005 - Tire Placard



Photo No. 006 - 2019 Nissan Versa S 4-Door Sedan Frontal As Delivered



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



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

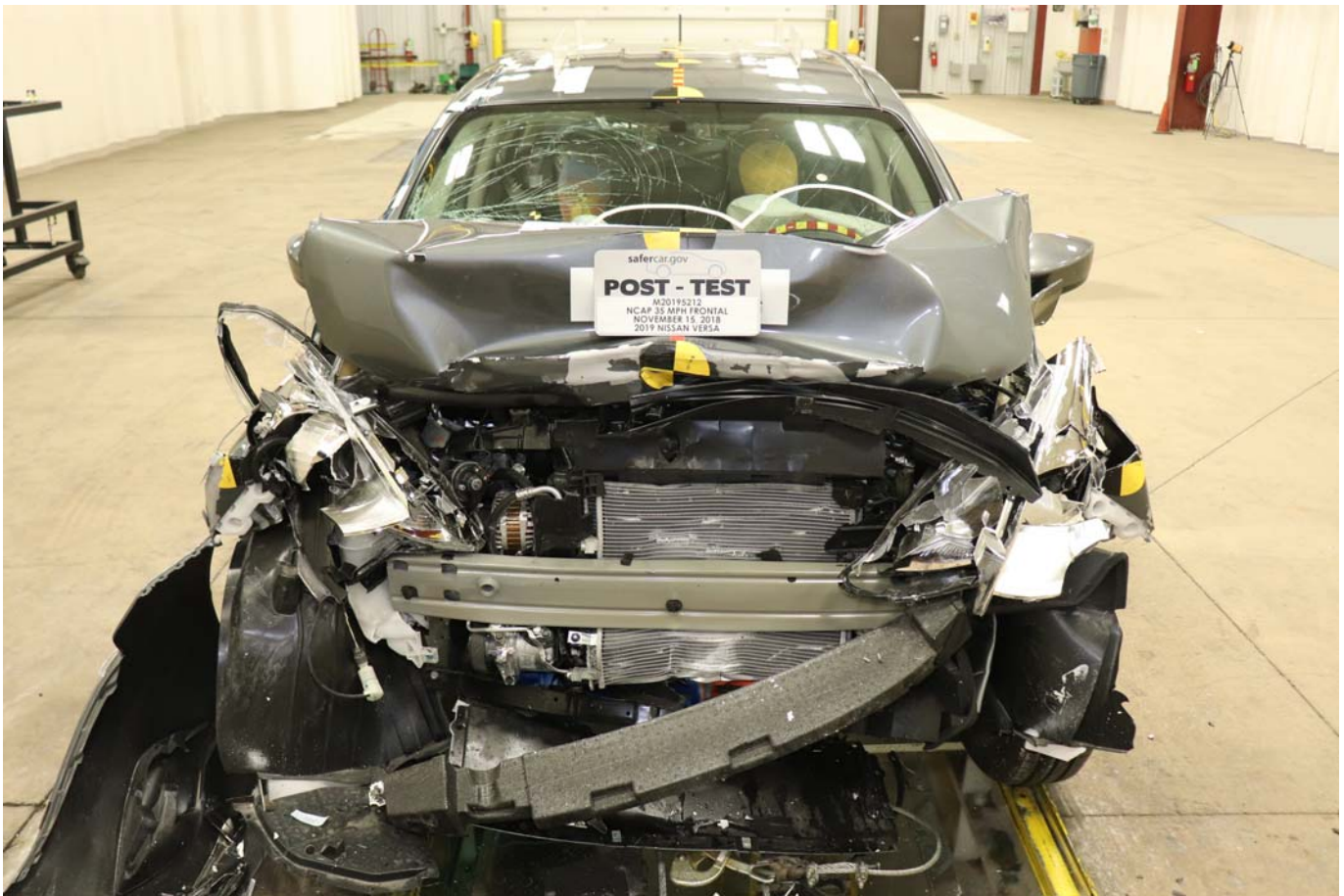


Photo No. 009 - Post-Test Front View of Test Vehicle



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

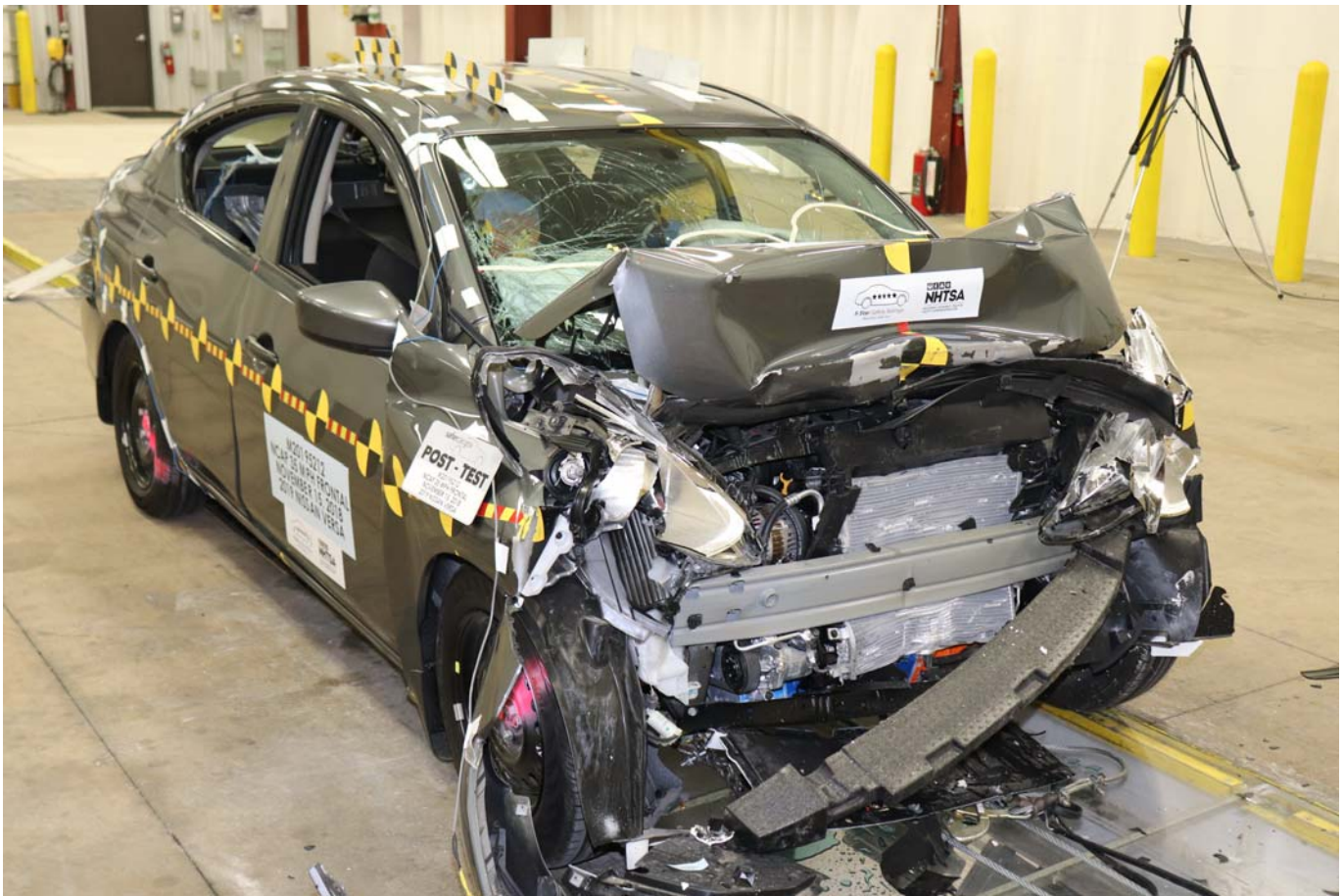


Photo No. 015 - Post-Test Right Front 3-4 View



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

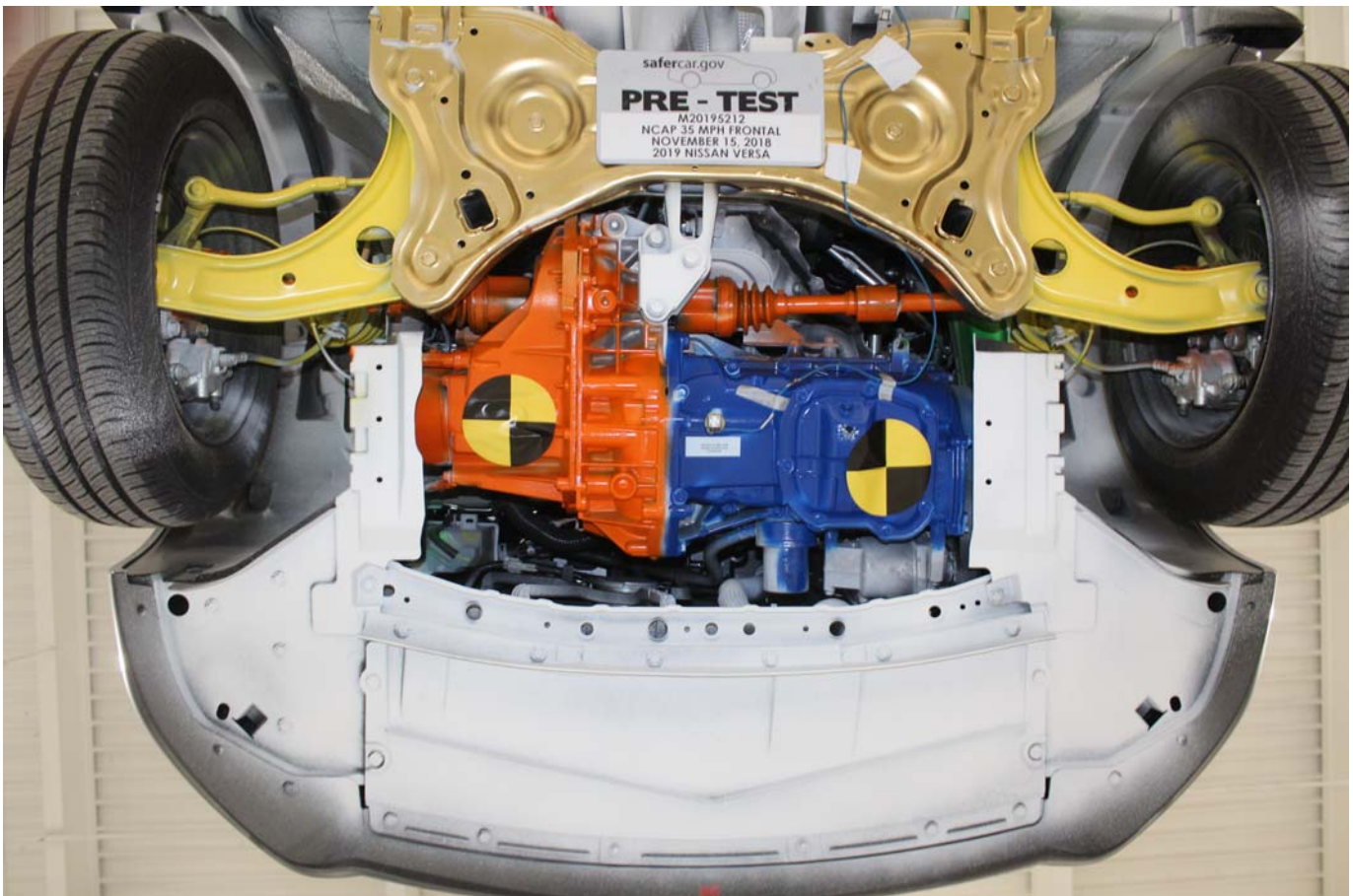


Photo No. 024 - Pre-Test Front Underbody View

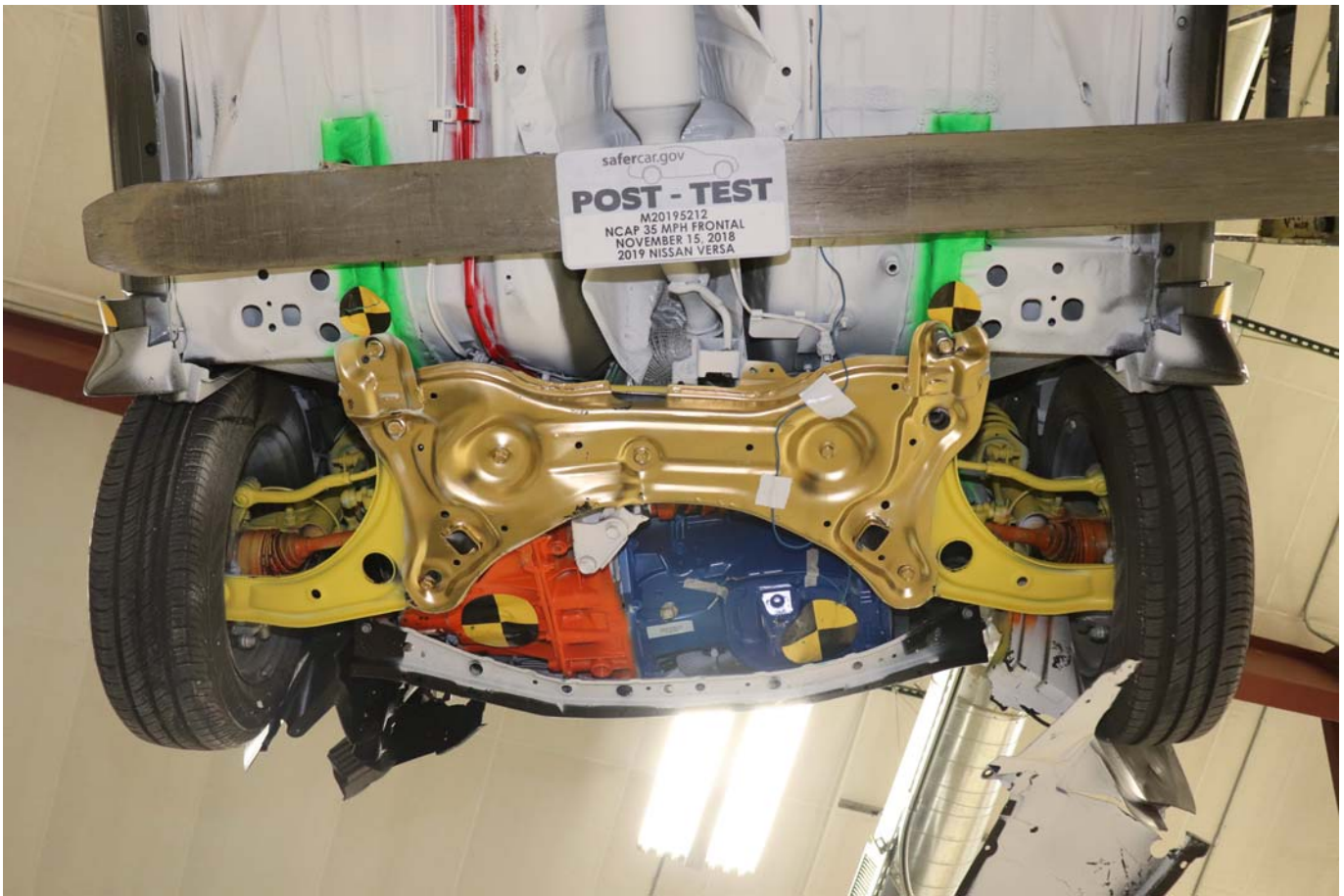


Photo No. 025 - Post-Test Front Underbody View



Photo No. 026 - Pre-Test Rear Underbody View

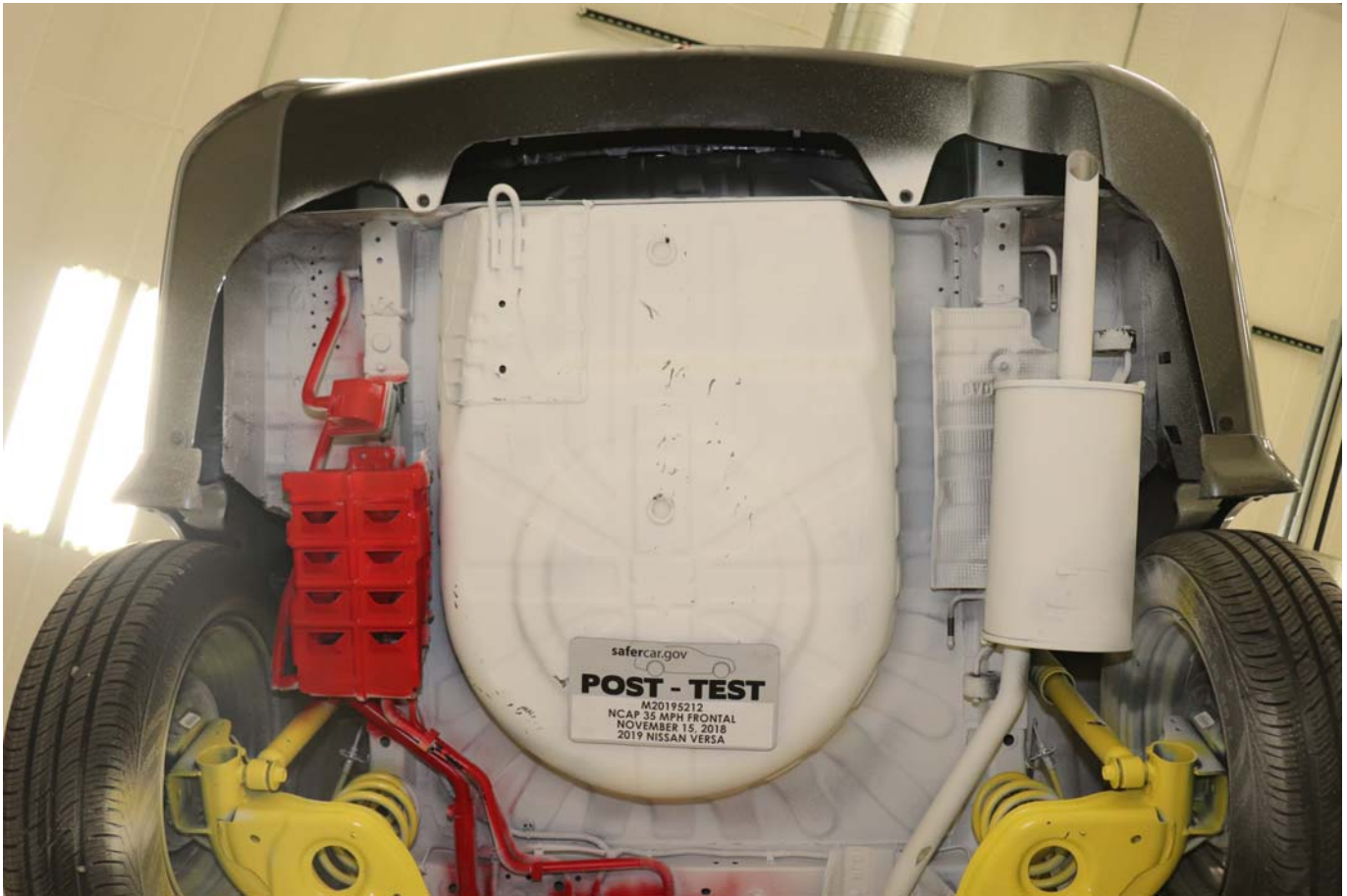


Photo No. 027 - Post-Test Rear Underbody View



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 Driver Dummy Feet



Photo No. 041 - Post-Test Driver Dummy Feet



Photo No. 042 - Pre-Test Driver Side Knee Bolster



Photo No. 043 - Post-Test Driver Side Knee Bolster



Photo No. 044 - Pre-Test Driver Side Floorpan



Photo No. 045 - Post-Test Driver Side Floorpan



Photo No. 046 - Post-Test Driver Dummy Face

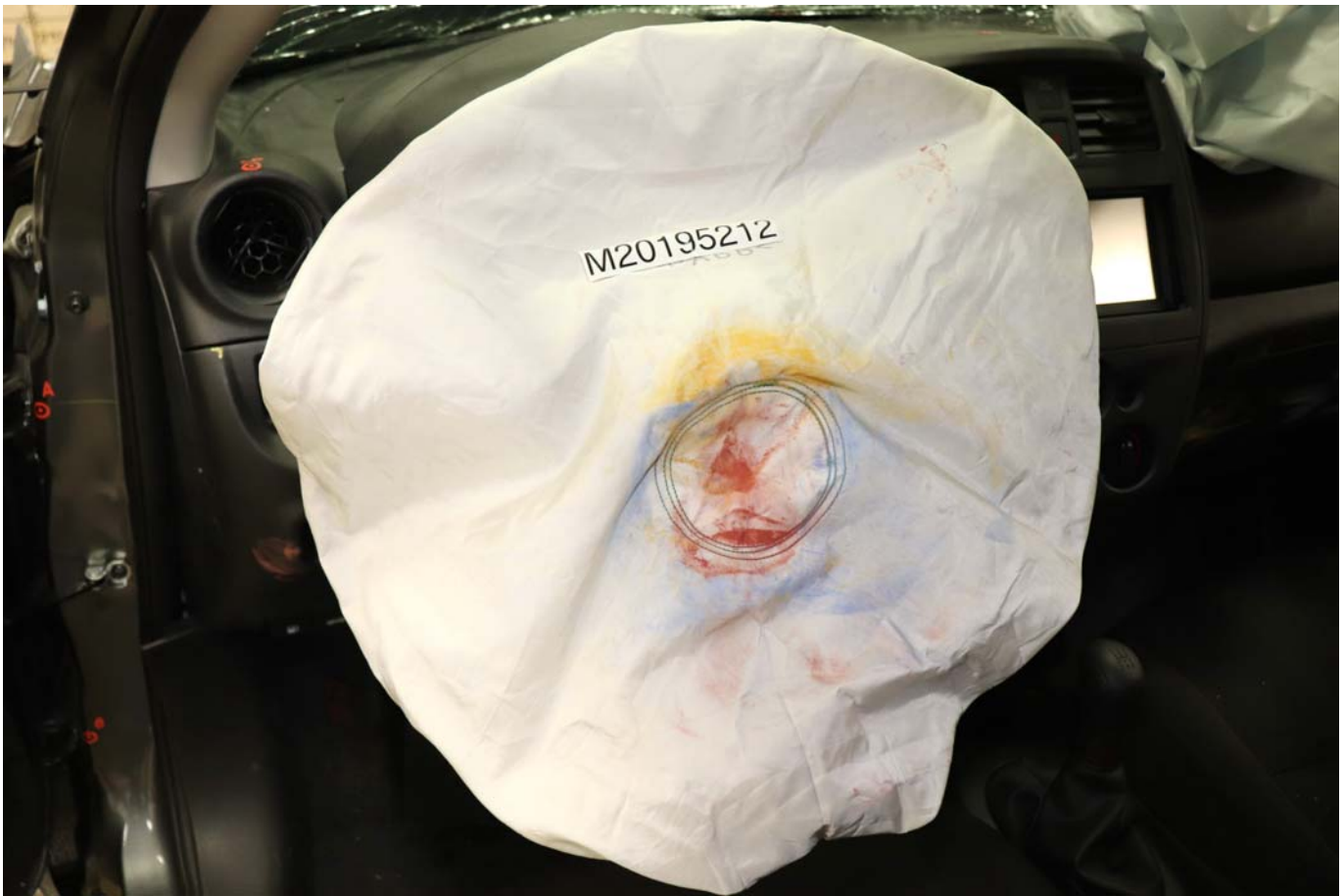


Photo No. 047 - Post-Test Driver Dummy Contact with Airbag



Photo No. 048 - Post-Test Driver Dummy Contact with Headrest



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



Photo No. 050 - Post-Test View of the Steering Wheel



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



Photo No. 055 - Pre-Test Passenger Dummy and Vehicle Interior



Photo No. 056 - Post-Test Passenger Dummy and Vehicle Interior



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Photo No. 058 - Post-Test Passenger Seat Fore-Aft Markings



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



Photo No. 060 - Post-Test View of Belt Anchorage for Passenger Dummy



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Photo No. 062 - Post-Test Passenger Dummy Feet



Photo No. 063 - Pre-Test Passenger Side Knee Bolster



Photo No. 064 - Post-Test Passenger Side Knee Bolster



Photo No. 065 - Pre-Test Passenger Side Floorpan



Photo No. 066 - Post-Test Passenger Side Floorpan



Photo No. 067 - Post-Test Passenger Dummy Face



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



Photo No. 069 - Post-Test Passenger Dummy Contact with Headrest

**PHOTOGRAPH NOT APPLICABLE**

Photo No. 070 - Ballast Installed in Vehicle

# PHOTOGRAPH NOT APPLICABLE

Photo No. 071 - Post-Test Stoddard Solvent Spillage Location View



Photo No. 072 - Post-Test Speed Trap Read-Out



Photo No. 073 - Vehicle at 0 Degree on Static Rollover Device

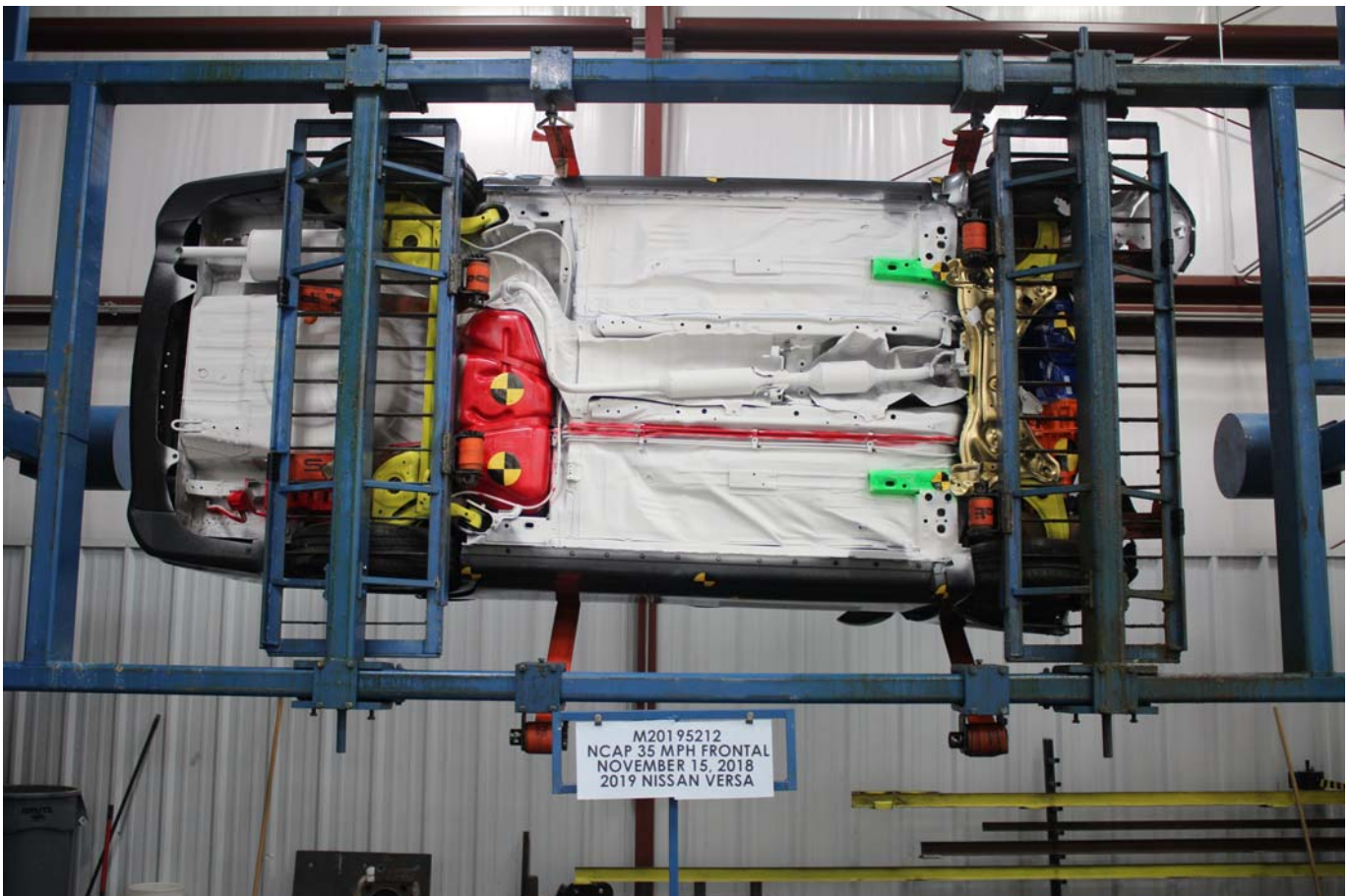


Photo No. 074 - Vehicle at 90 Degrees on Static Rollover Device



Photo No. 075 - Vehicle at 180 Degrees on Static Rollover Device



Photo No. 076 - Vehicle at 270 Degrees on Static Rollover Device



Photo No. 077 - Vehicle at 360 Degrees on Static Rollover Device



Photo No. 078 - 2019 Nissan Versa S 4-Door Sedan Frontal Impact Event



**2019 NISSAN VERSA  
S 5 SPEED MANUAL**



Scan QR code for general model information & options

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

**Fuel Economy** COMPACT CARS range from 14 to 107 MPG. The best vehicle rates 138 MPG.

**30** MPG  
combined city/hwy

**27** city

**36** highway

**3.3** gallons per 100 miles

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

**Annual fuel cost \$1,300**

**Fuel Economy & Greenhouse Gas Rating** (tailpipe only) **7**

**Smog Rating** (tailpipe only) **3**

This vehicle emits 296 grams CO<sub>2</sub> per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions. Learn more at [fuelconomy.gov](http://fuelconomy.gov).

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$7,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.55 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

**fuelconomy.gov**  
Calculate personalized estimates and compare vehicles

Smartphone QR Code

**GOVERNMENT 5-STAR SAFETY RATINGS** DELIVERY

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

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

**VEHICLE COLORS:**  
EXT: GUN METALLIC  
INT: CHARCOAL

**FINAL ASSEMBLY POINT:**  
AGUAS(ABV),MEX

**TRANSPORT METHOD:**  
TRUCK

**DEALER:**  
GEORGESVILLE NISSAN, LLC  
1260 AUTOMALL DR  
COLUMBUS OH  
43228

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

This Vehicle qualifies for Nissan's

**Security+Plus Extended Protection Plan**

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

VIN: 3N1CN7AP8KL807670  
EMS: 50 STATE EMISSIONS  
MDL: 10059-807670 KAD-G  
OPT: B-892C03L92

20180821225531AS5640

**Standard Equipment Included at No Extra Charge**

**Mechanical & Performance**

- 1.6 L Dohc 16-Valve 4-Cylinder Engine
- 5-Speed Manual Transmission
- Front And Rear Stabilizer Bars
- Power-Assisted Ventilated Front Disc / Rear Drum Brakes
- 15" Steel Wheels W/ Full Wheel Covers

**Safety & Security**

- Rear View Monitor
- Driver And Front Passenger, Side-Impact, And Curtain Airbags
- Lower Anchors And Tethers For Children (LATCH)
- Anti-Lock Braking System (ABS)
- Traction Control System (TCS)
- Vehicle Dynamic Control (VDC)
- Electronic Brake Force Distribution (EBD) And Brake Assist
- Tire Pressure Monitoring System (TPMS)

**Comfort & Convenience**

- 4-Way Adjustable Cloth Front Bucket Seats
- 7" Color Touchscreen
- Streaming Audio Via Bluetooth®
- Bluetooth® Hands-Free Phones System
- Hands-Free Text Messaging Assistant
- Siri® Eyes-Free
- AM/FM Audio System W/ 4 Speakers
- USB Connection Port For Ipad® Interface And Other Compatible Devices + Aux-In Port
- Aux-In Port
- Adjustable Front Headrests
- Map Light

**Exterior**

- Chrome-Accented Multi-Reflector Halogen Headlights
- Body-Color Power Outside Mirrors
- Variable Intermittent Windshield Wipers

**Manufacturer's Suggested Retail Base Price:** \$12,360.00

**Options Included by Manufacturer**

SPLASH GUARDS	200.00
CARPETED FLOOR MATS & TRUNK MAT	200.00

**DESTINATION CHARGES** 895.00

**Total\*** \$13,655.00

\*\*REPLACES STANDARD EQUIPMENT

For more information, see dealer, owner's manual, or [www.NissanUSA.com/connect/important-information](http://www.NissanUSA.com/connect/important-information).

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

Photo No. 079 - Monroney Label Photograph

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

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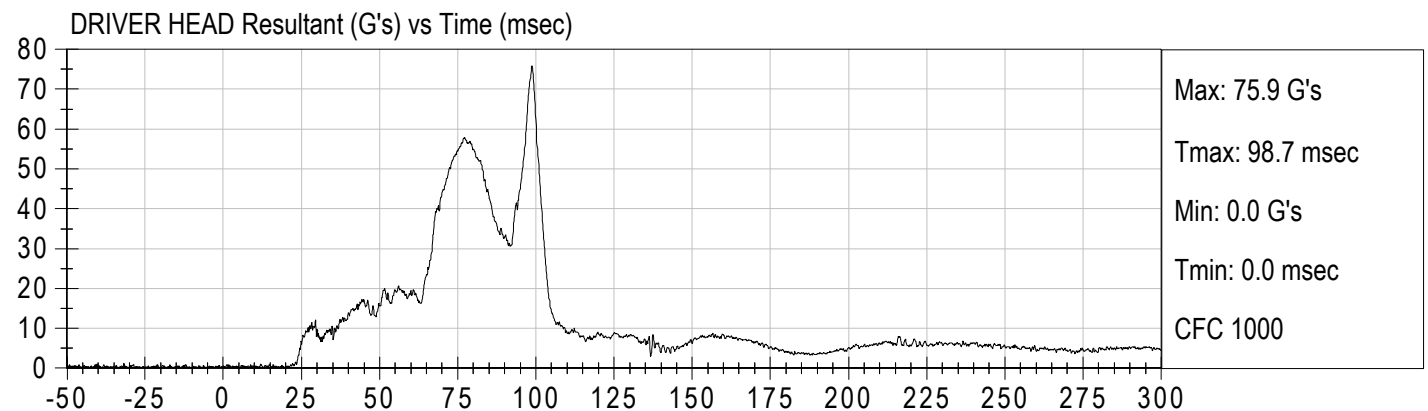
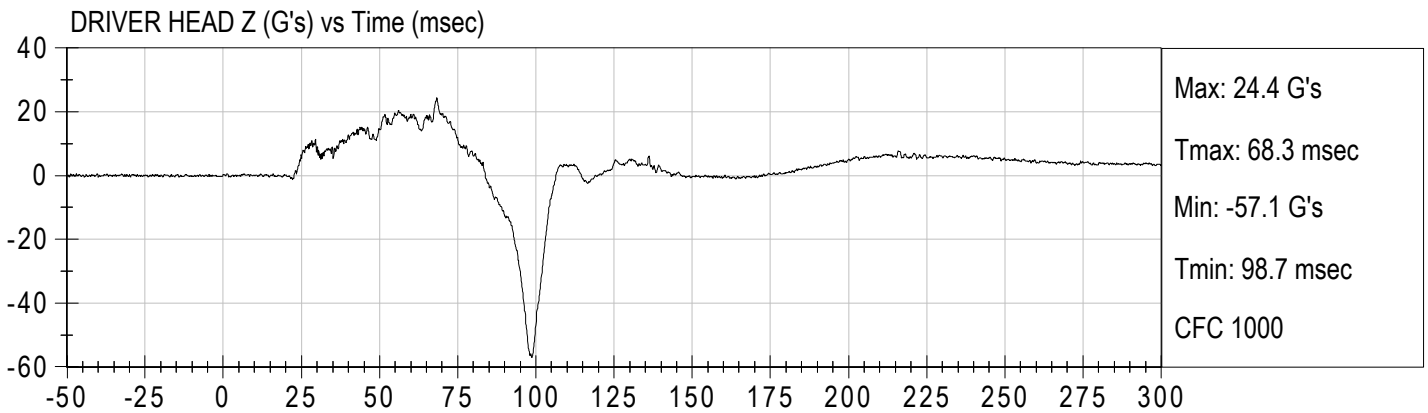
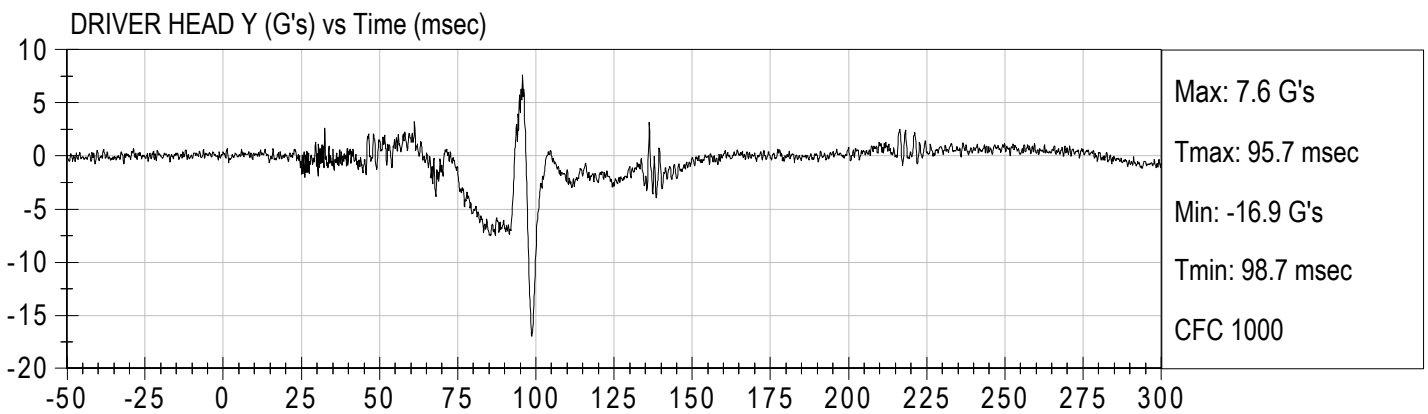
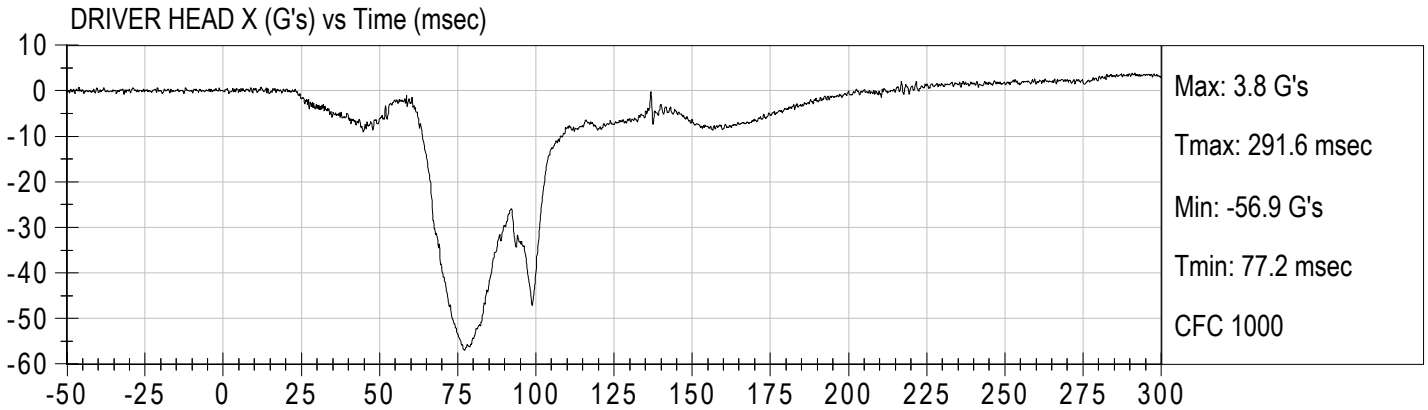
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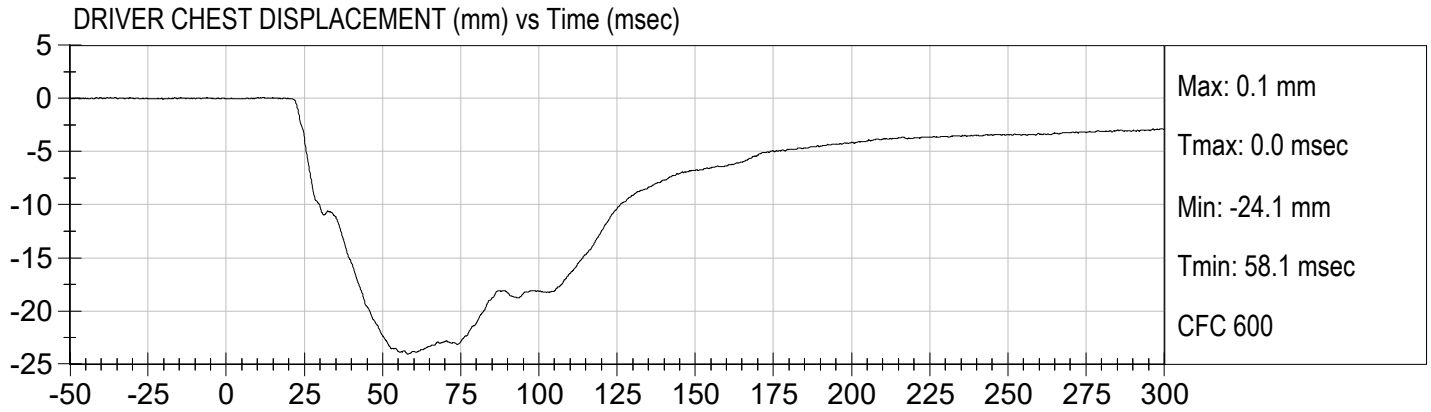
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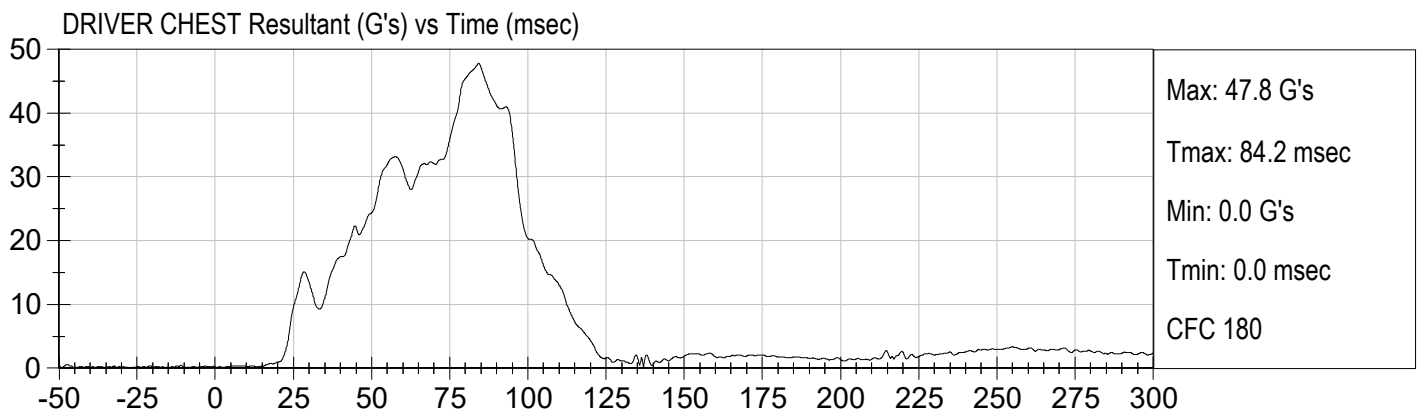
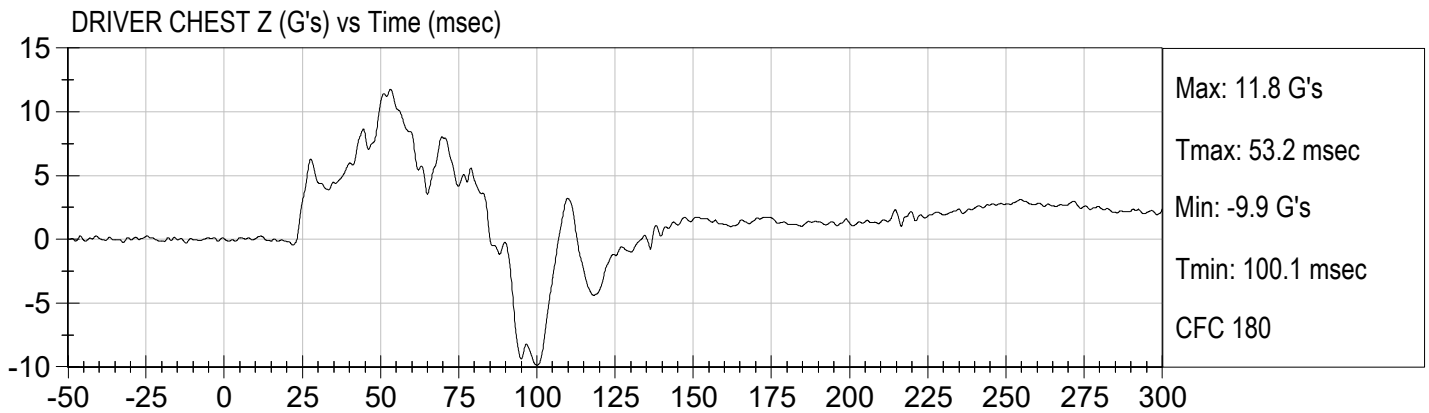
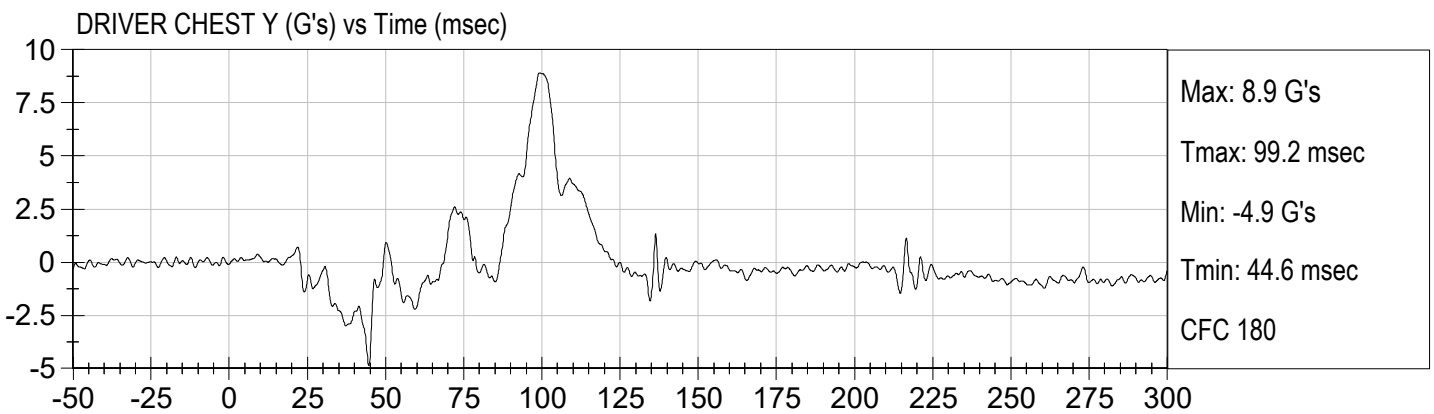
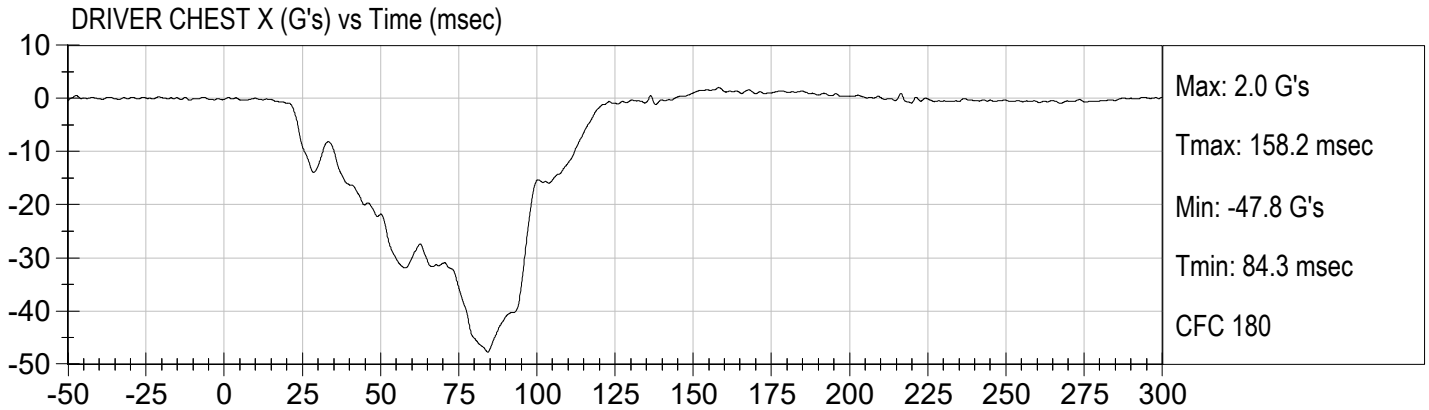
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 Driver Upper Neck Moment Z  
 Driver Chest X Redundant  
 Driver Chest Y Redundant  
 Driver Chest Z Redundant  
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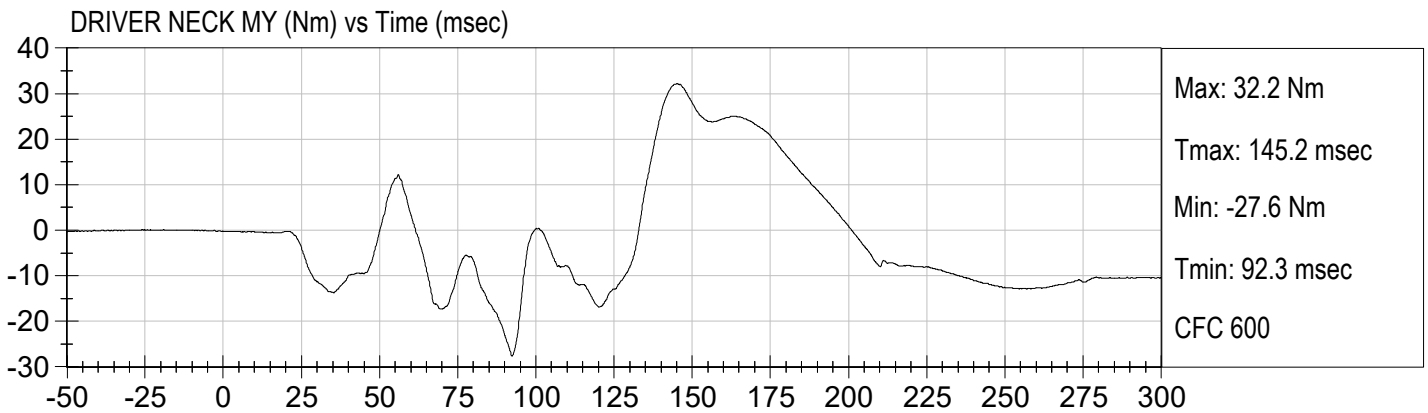
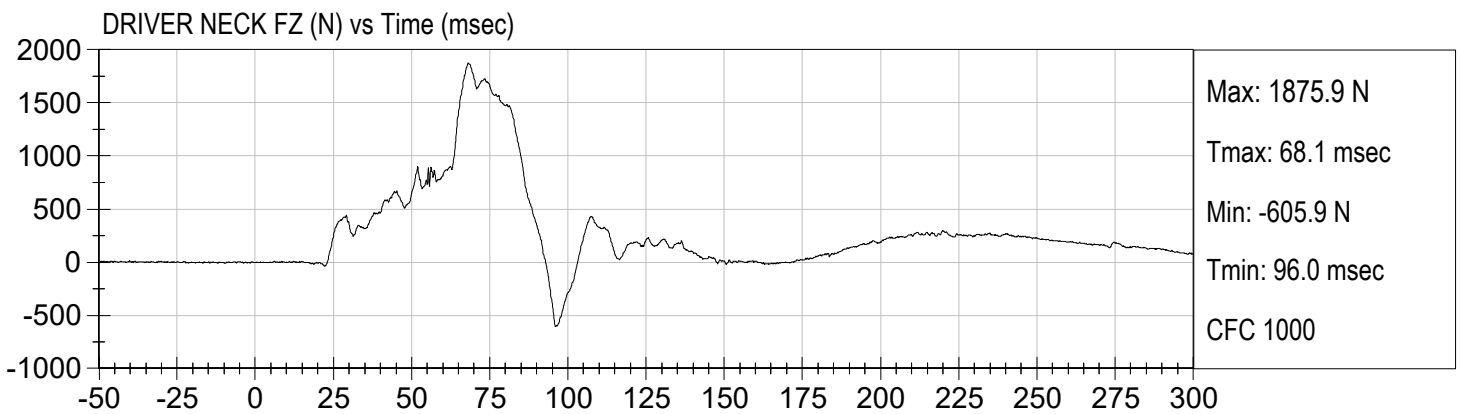
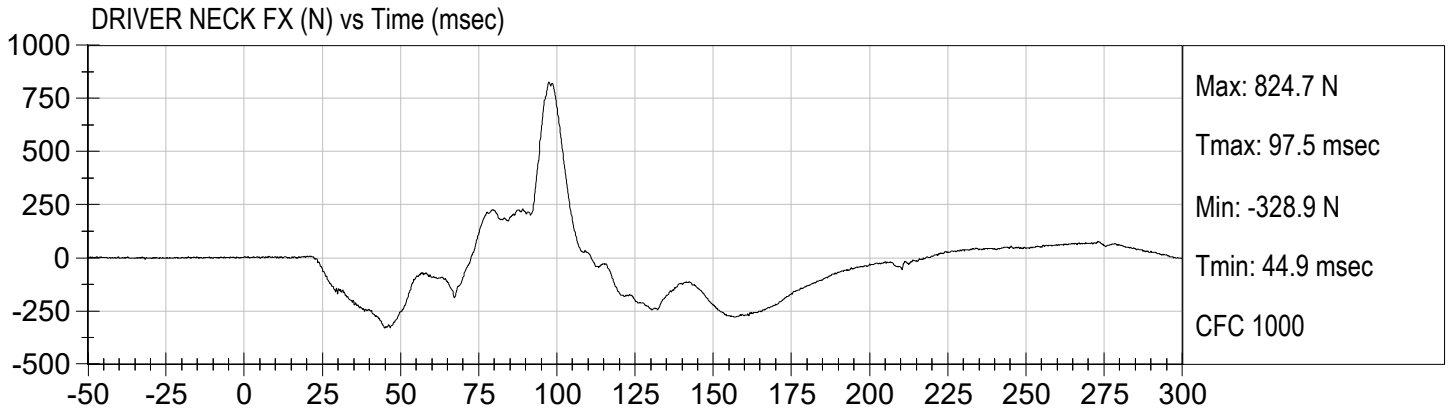
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Driver Right Lower Tibia Moment Y  
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Driver Left Foot Aft X  
Driver Left Foot Aft Z  
Driver Right Foot Fore Z  
Driver Right Foot Aft X  
Driver Right Foot Aft Z  
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Driver Shoulder Belt Force  
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Passenger Head Y Redundant  
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Passenger Head Angular Velocity X  
Passenger Head Angular Velocity Y  
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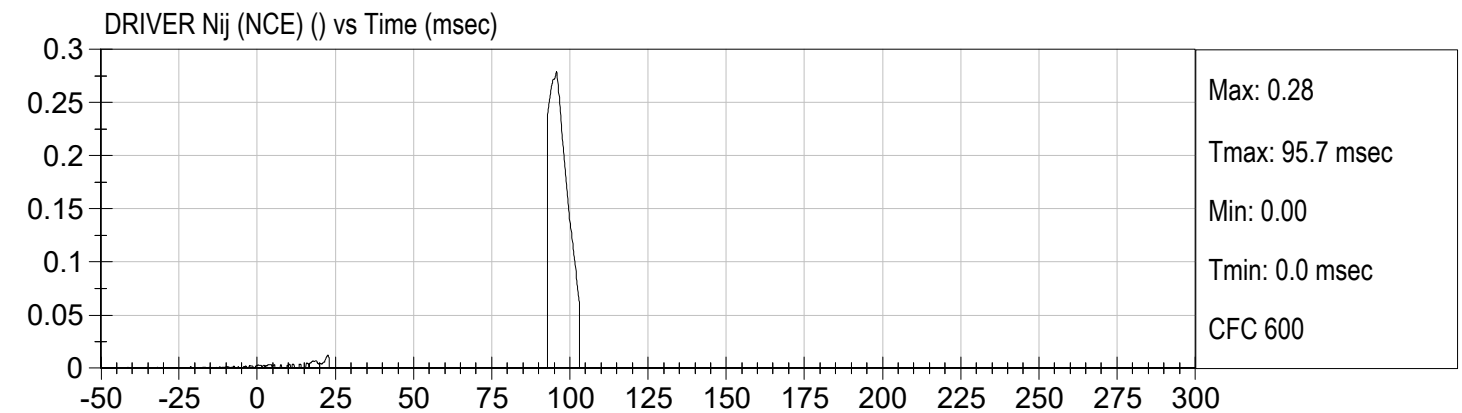
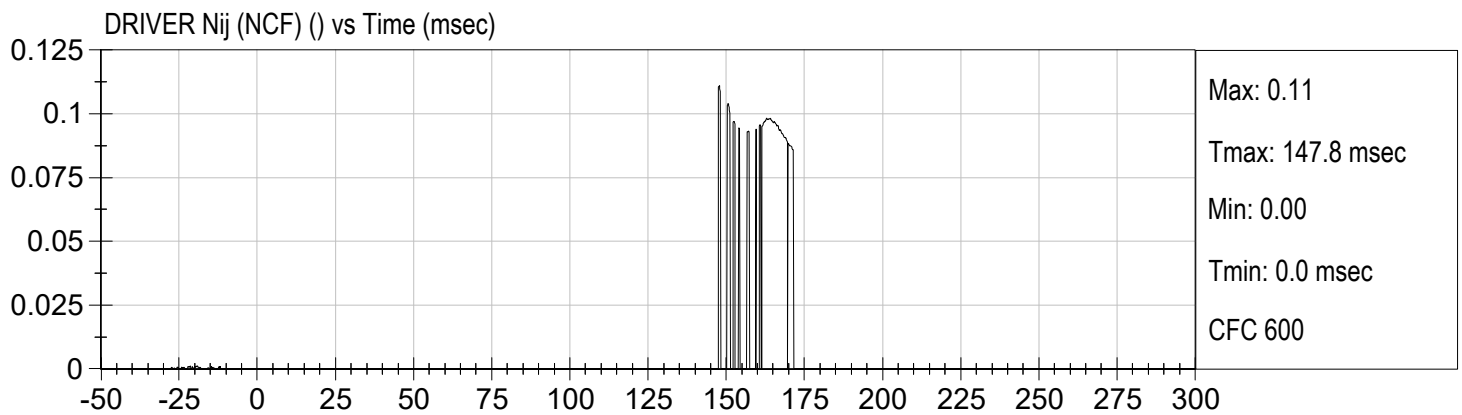
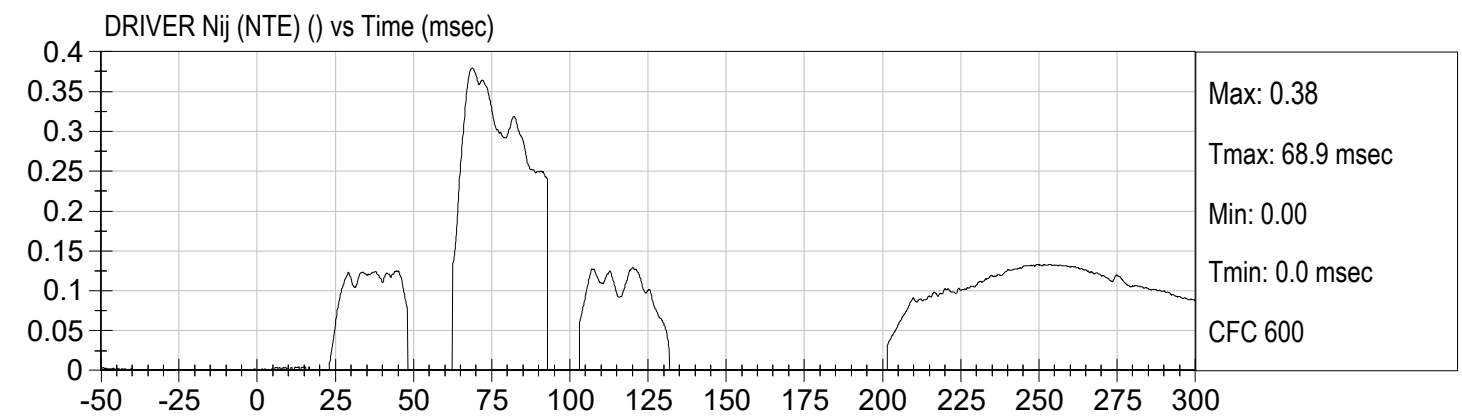
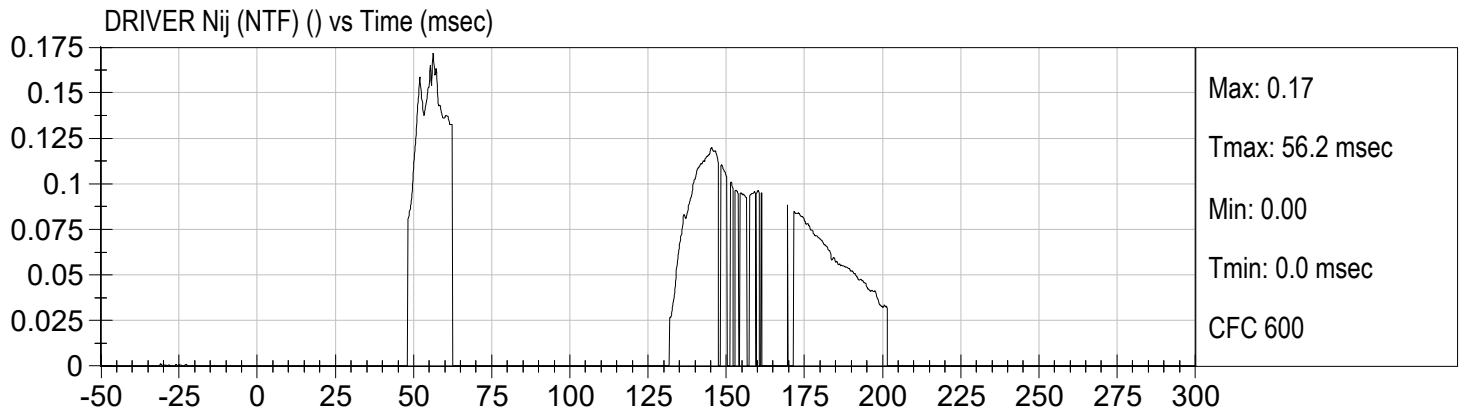
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Passenger Left Lower Tibia Force Z  
Passenger Right Upper Tibia Moment X  
Passenger Right Upper Tibia Moment Y  
Passenger Right Upper Tibia Force Z  
Passenger Right Lower Tibia Moment X  
Passenger Right Lower Tibia Moment Y  
Passenger Right Lower Tibia Force Z  
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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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Advanced Research Load Cell Barrier – 528 channels

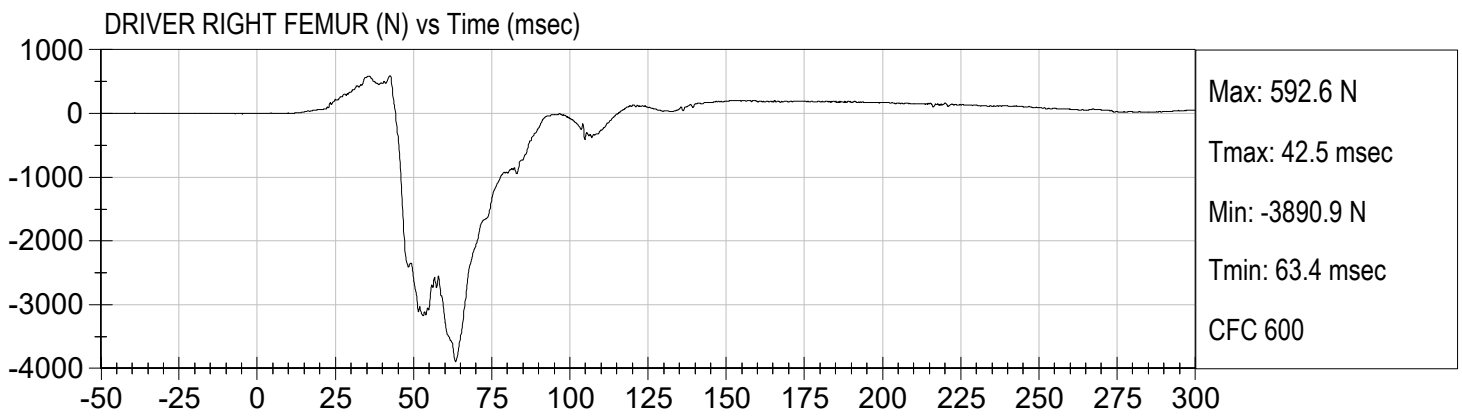
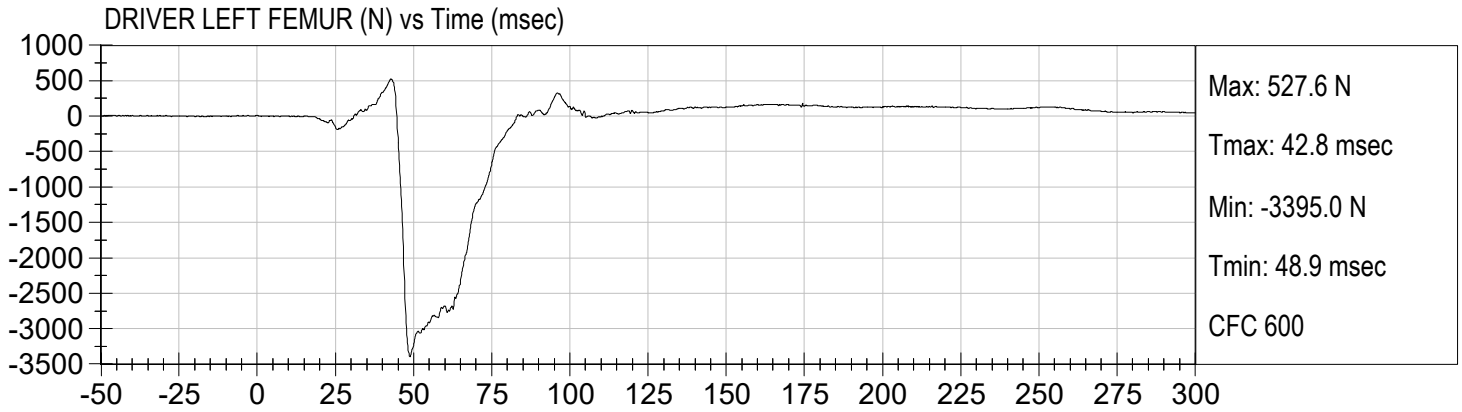


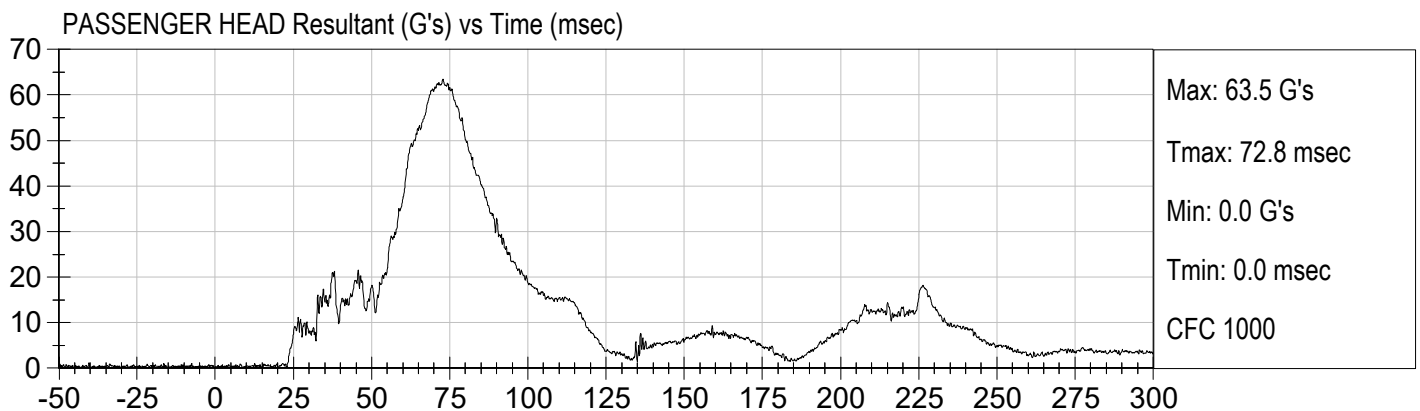
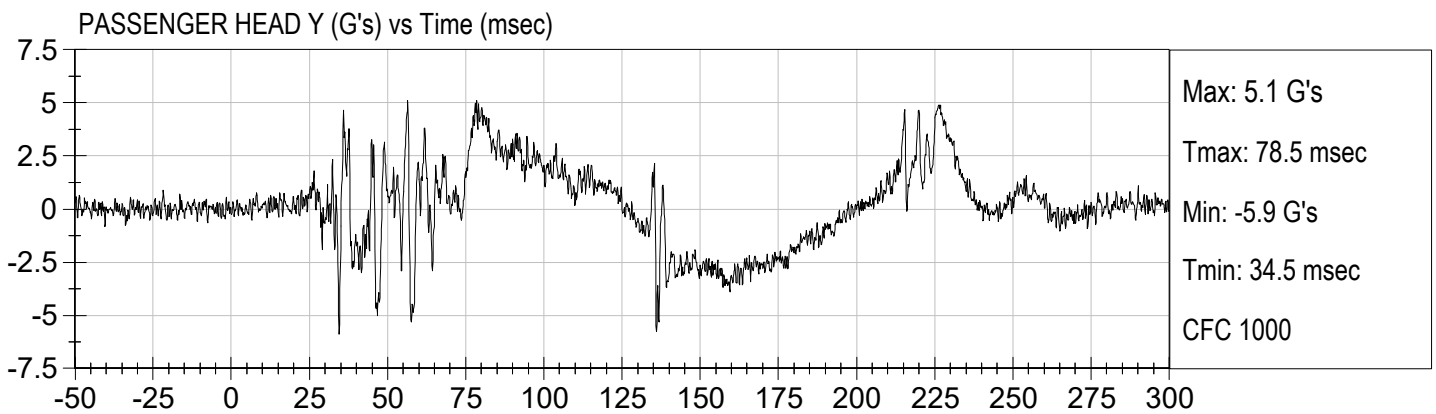
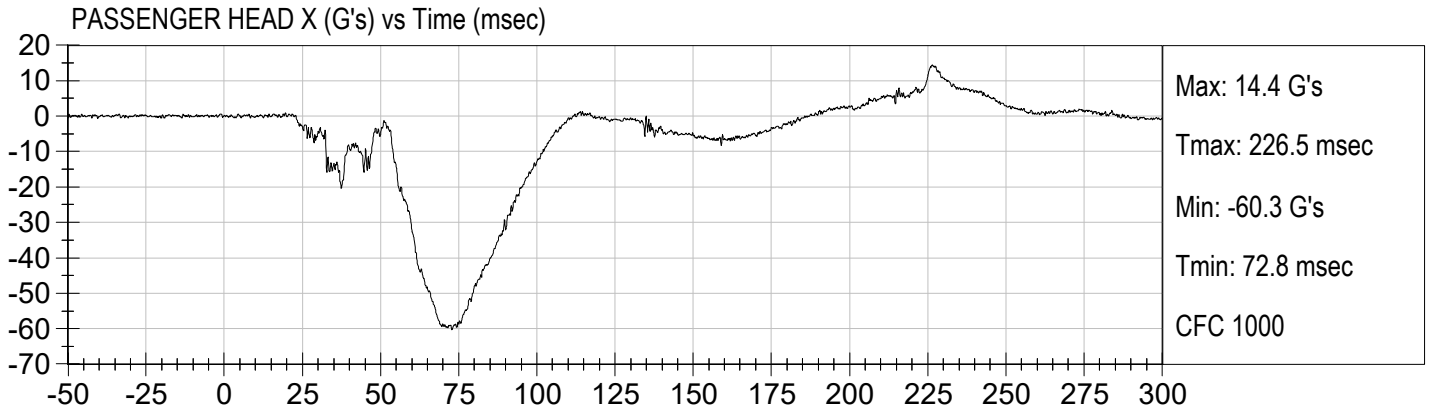


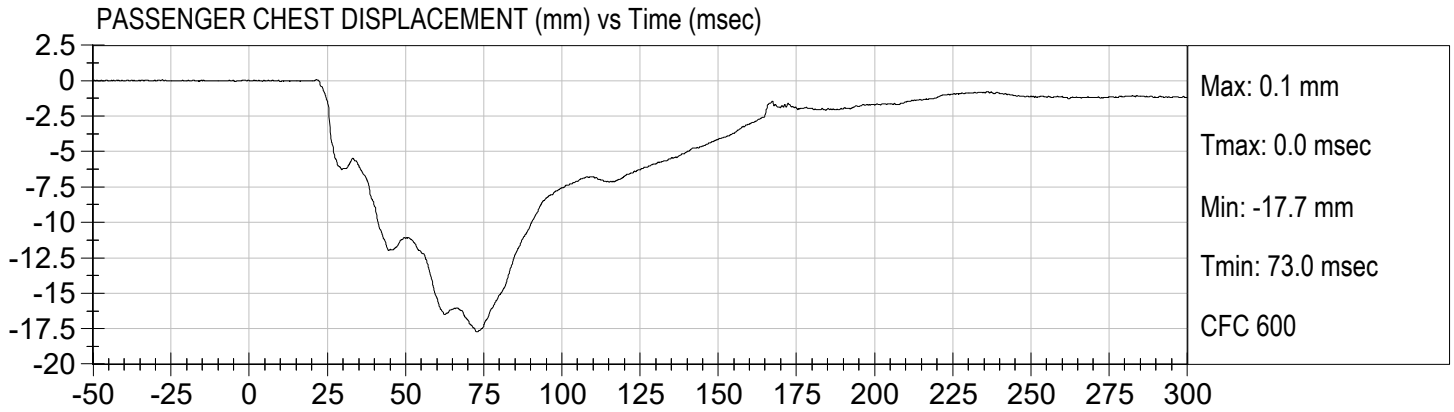


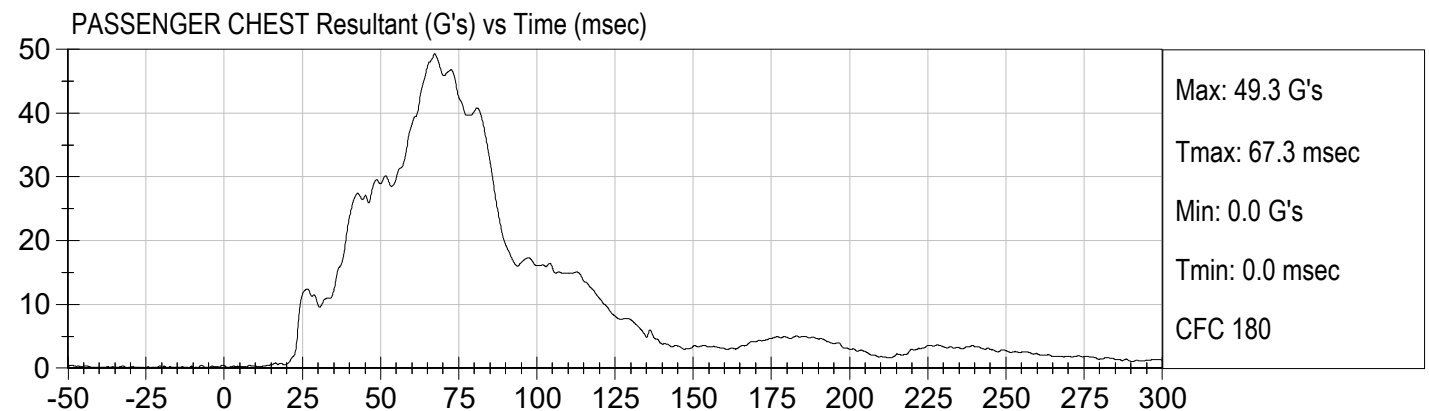
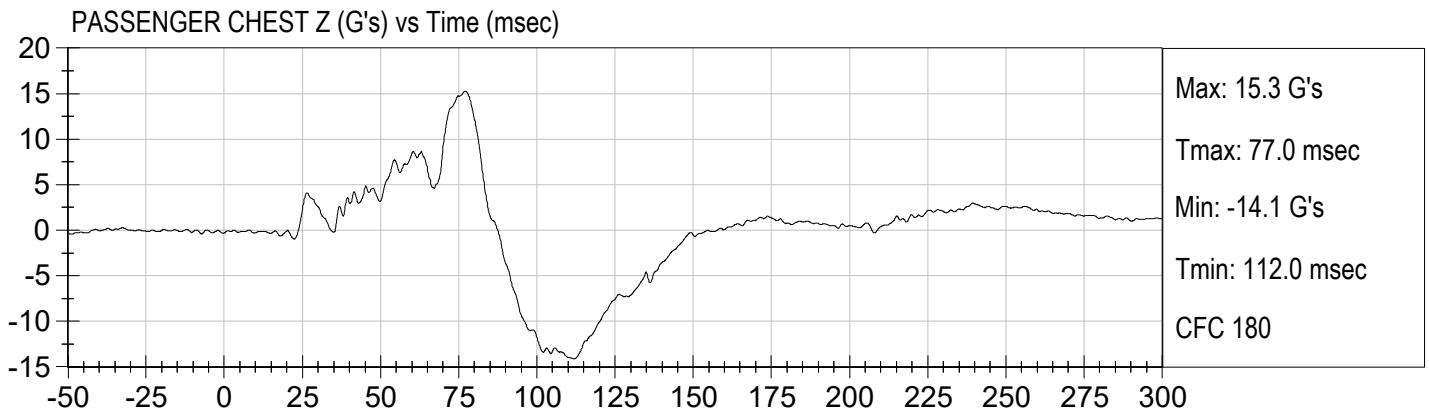
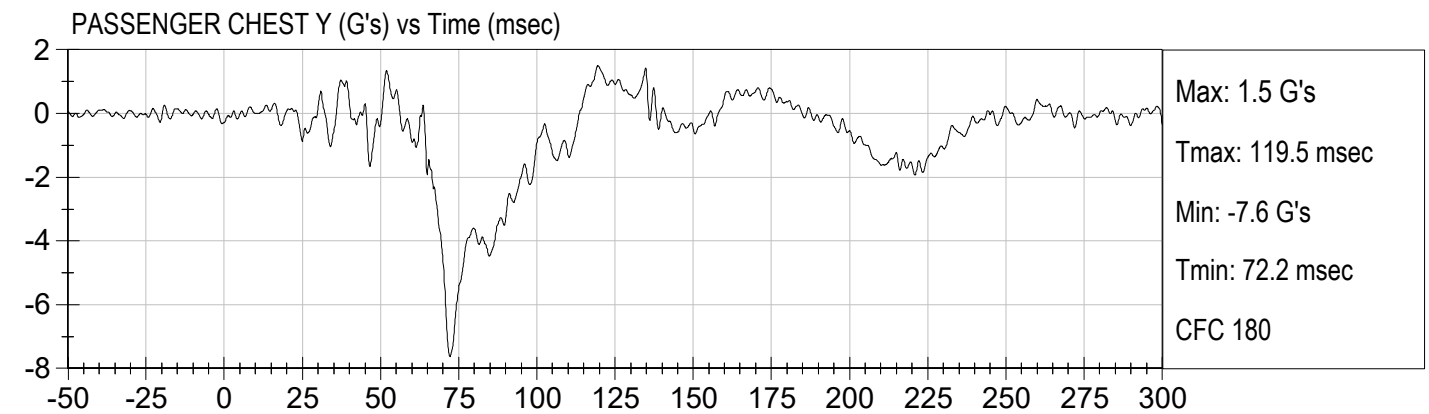
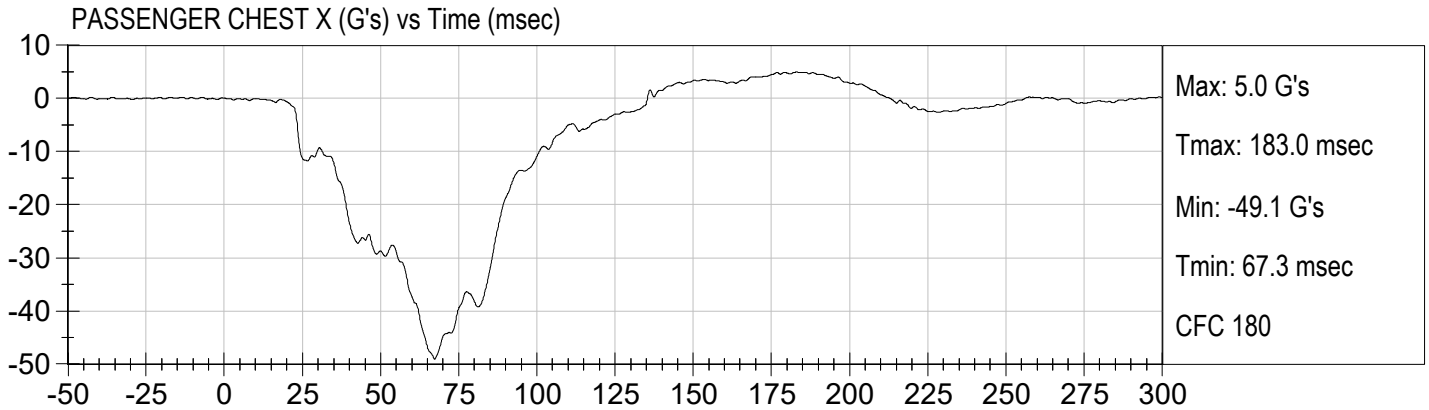


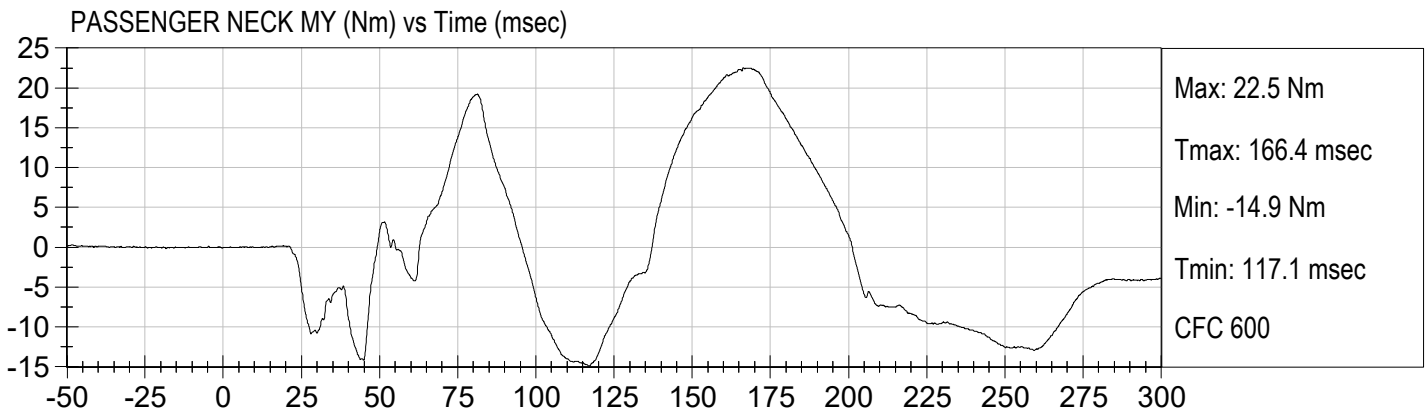
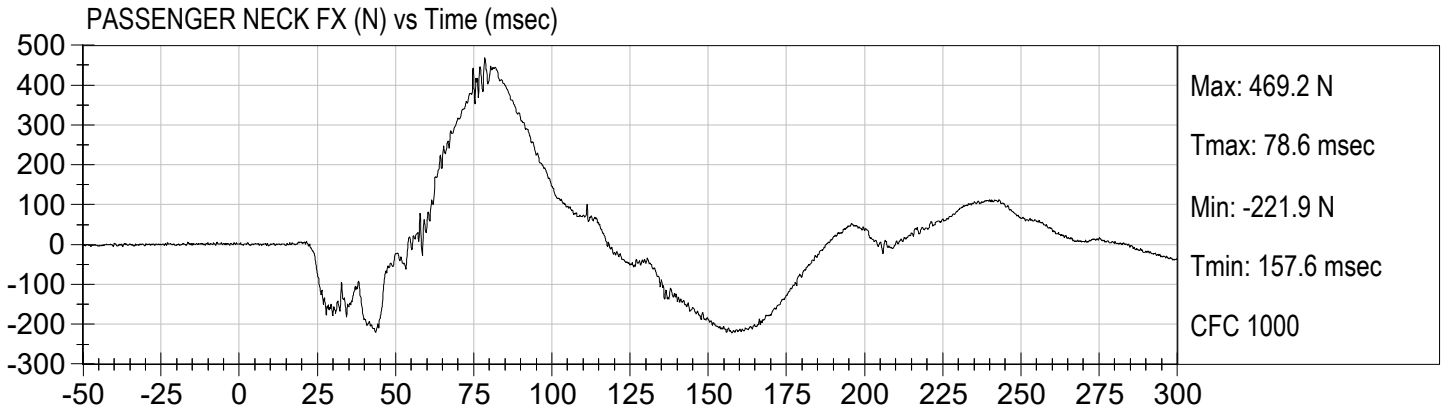


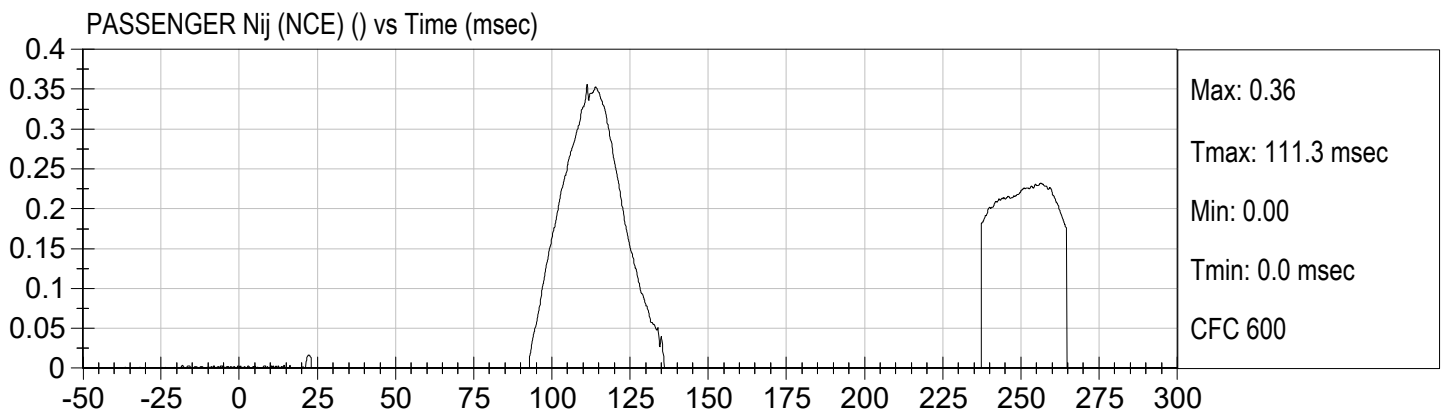
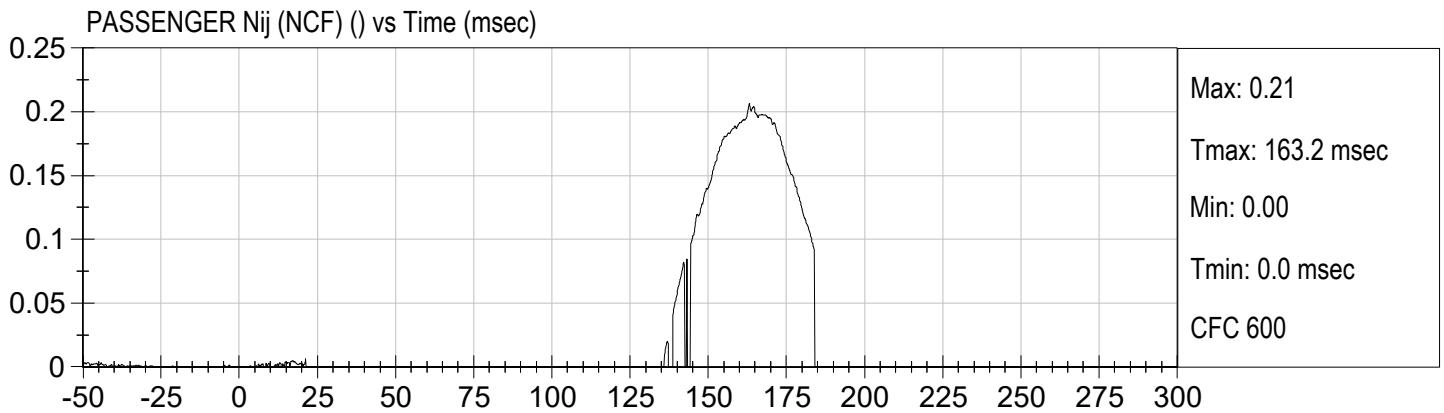
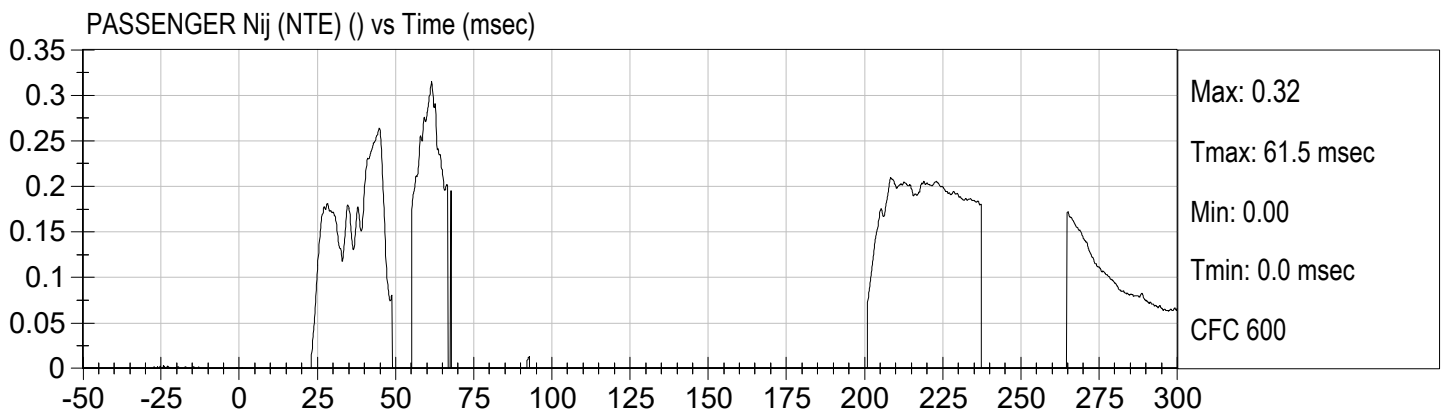
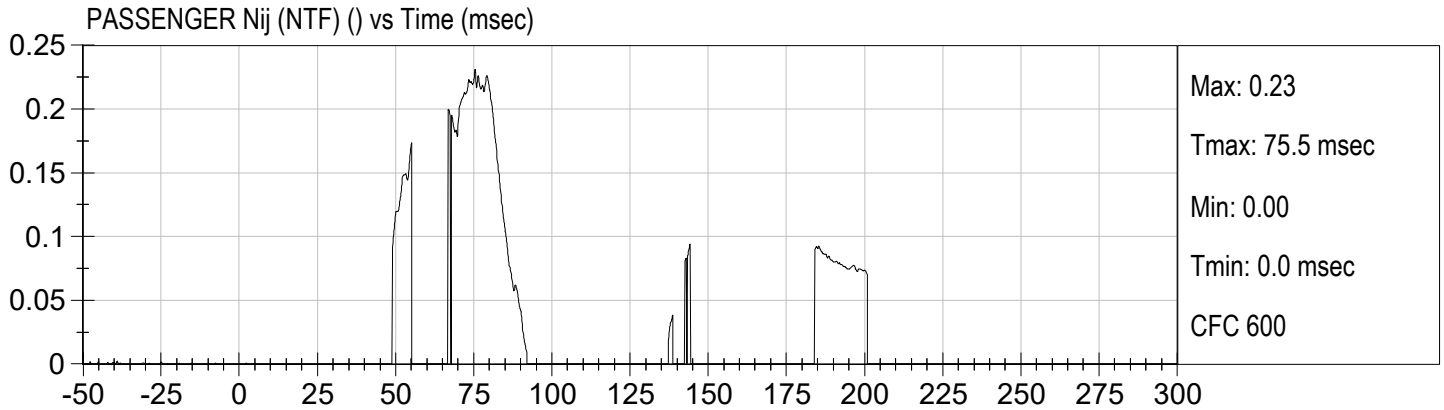


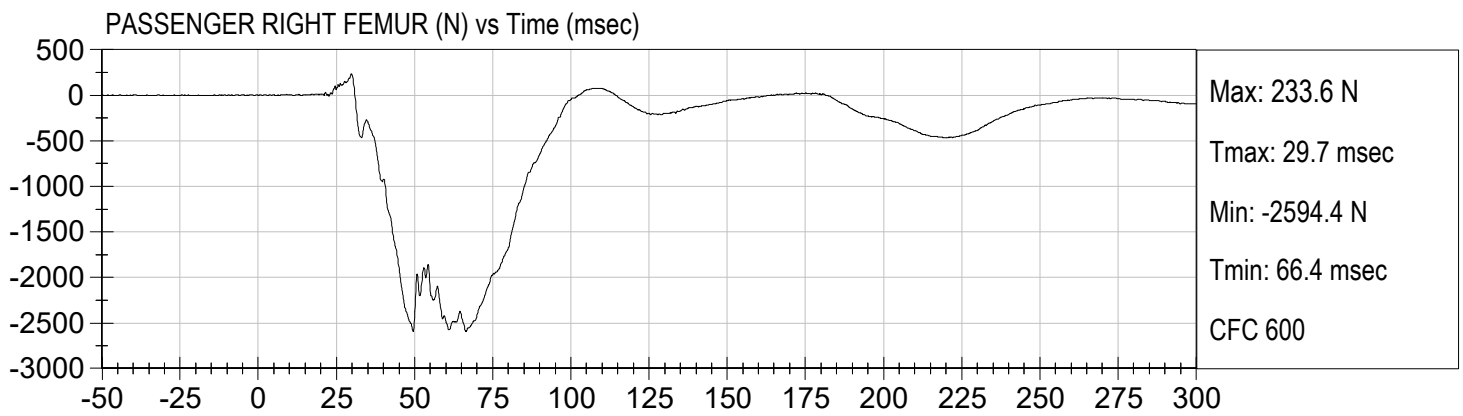
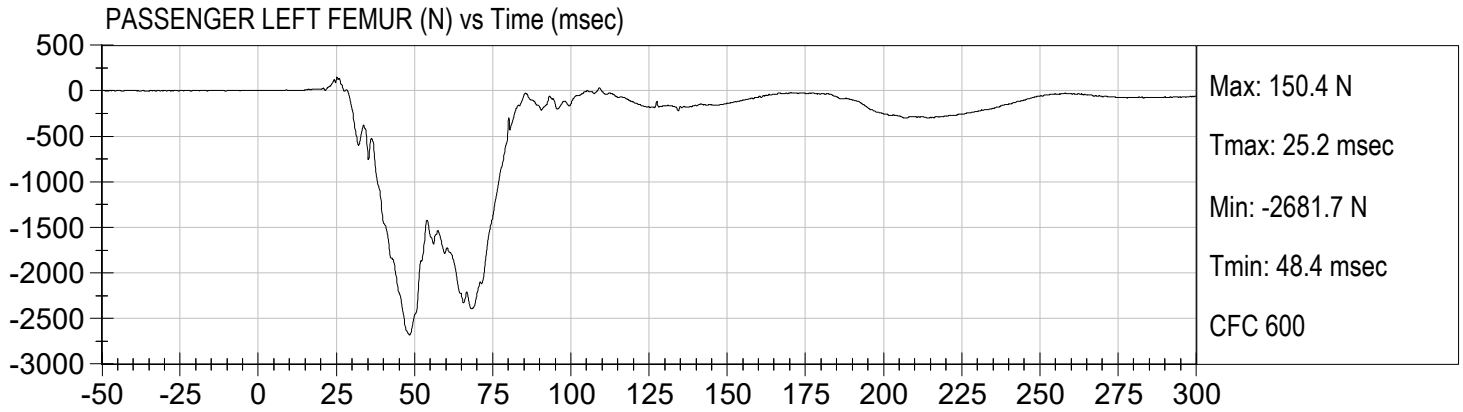












**APPENDIX C**  
**DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA**

**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

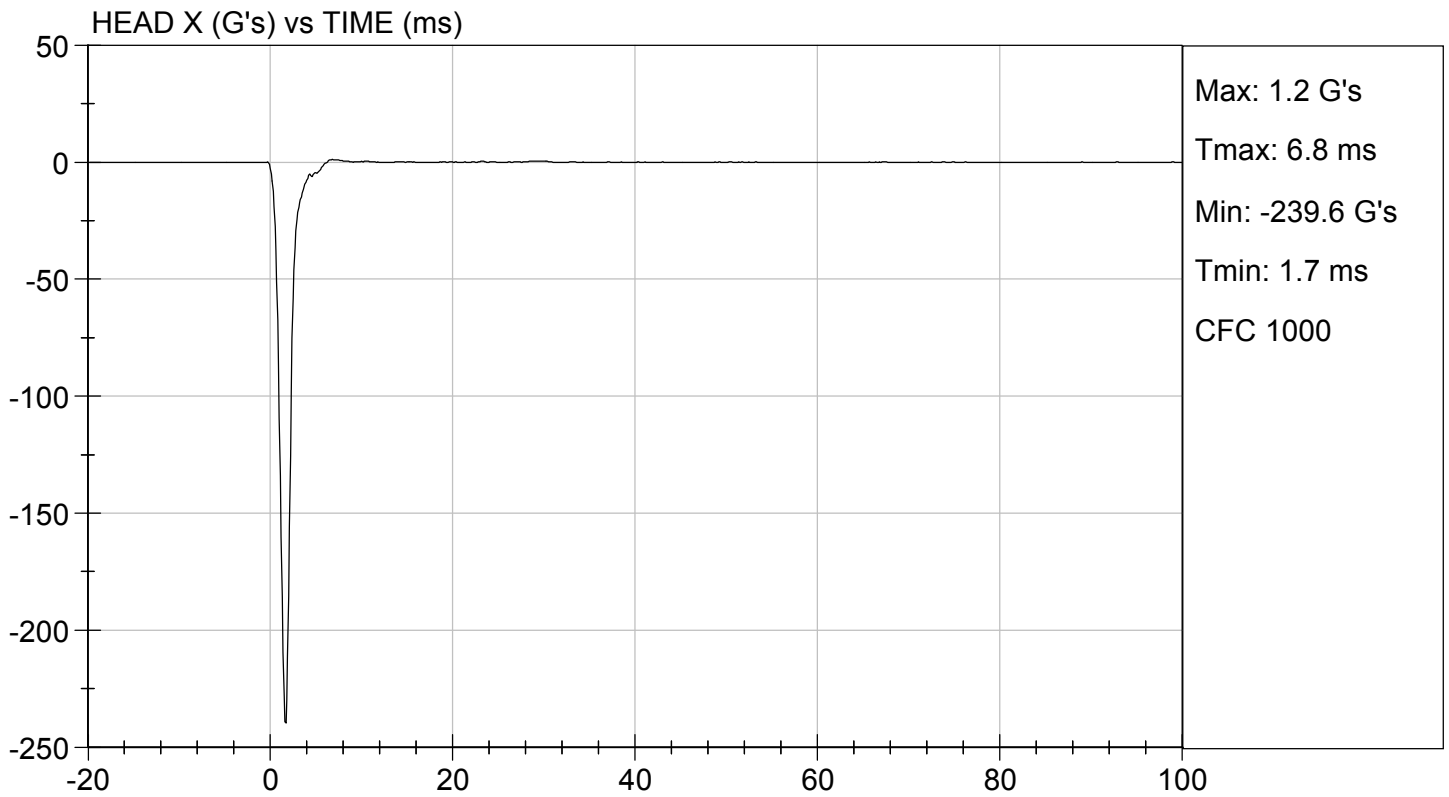
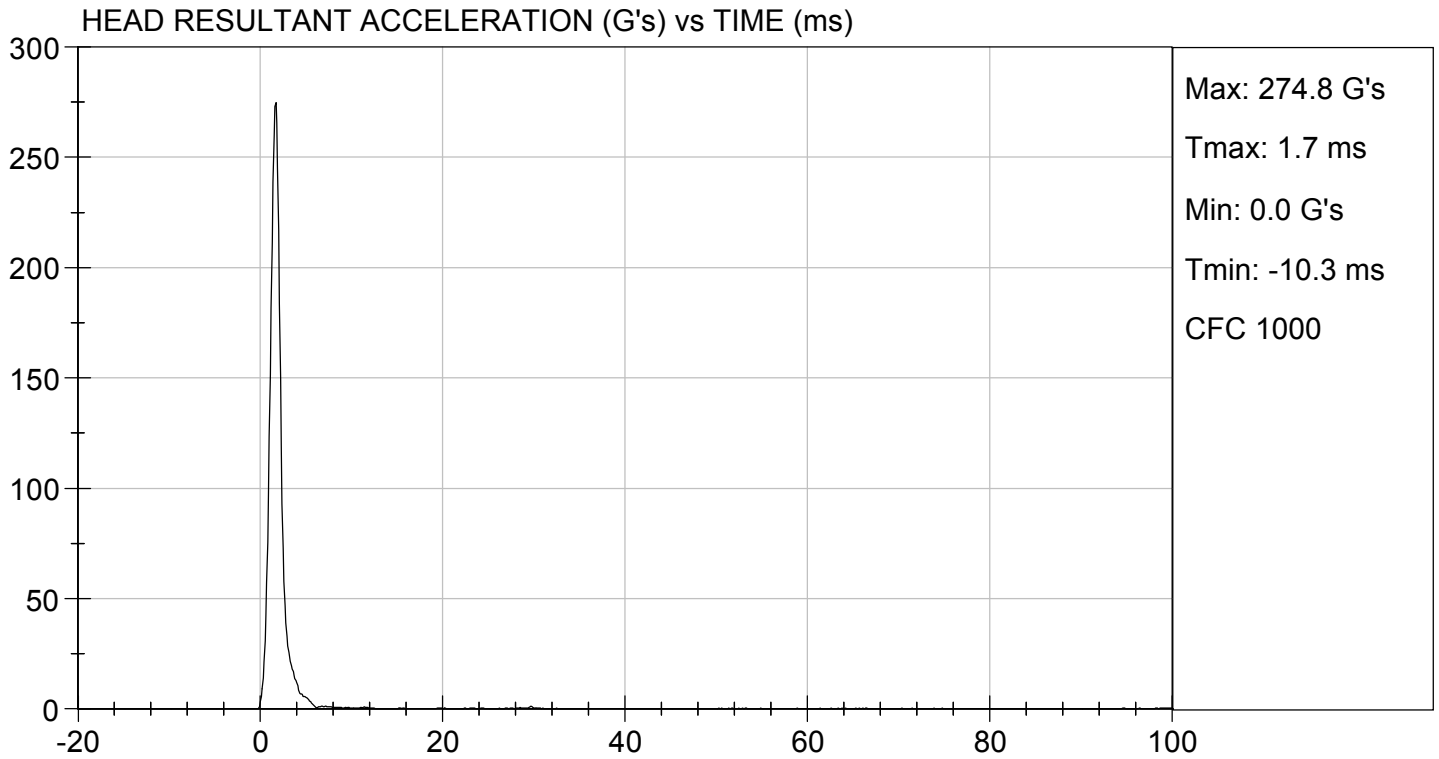
**Test ID:** D183311

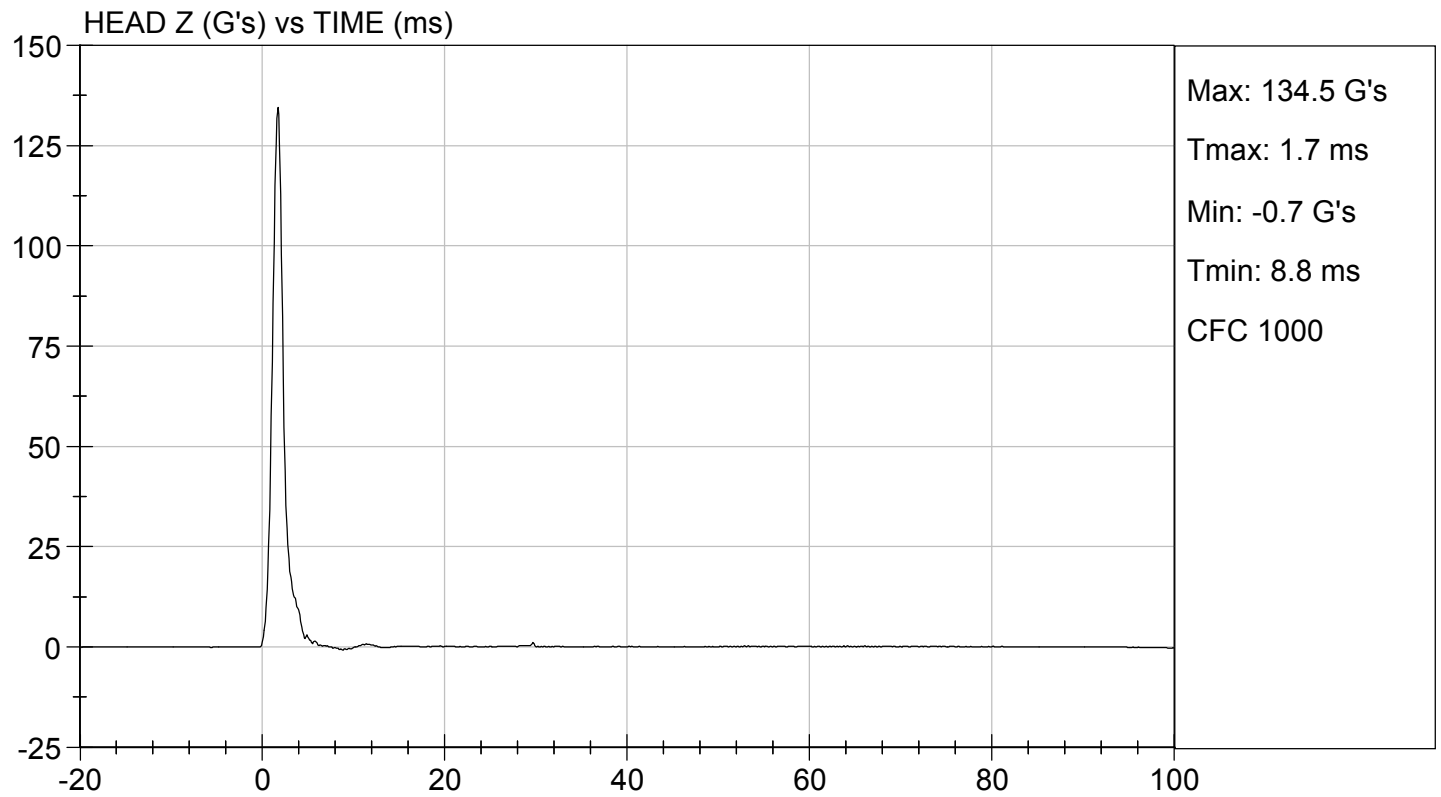
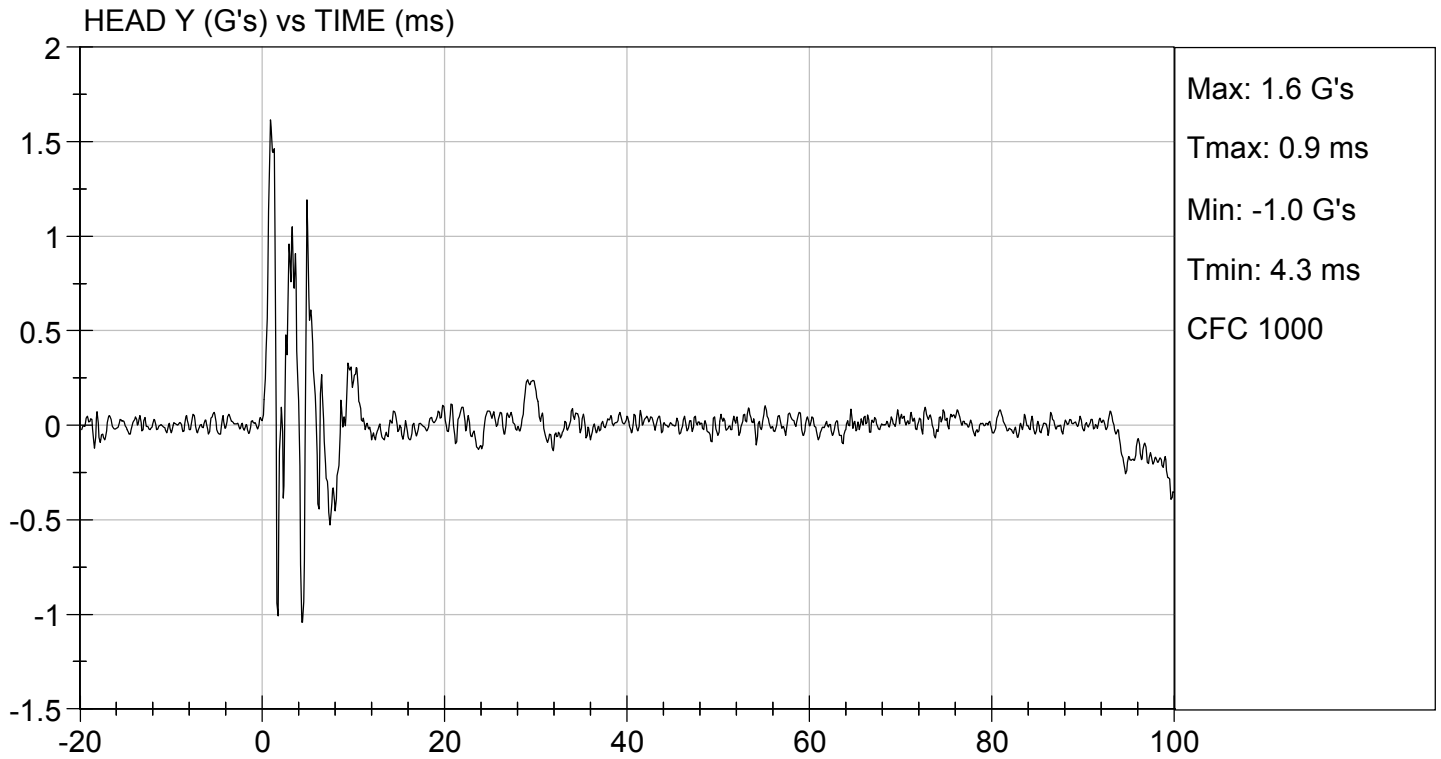
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Peak Resultant Acceleration	G's	225 to 275	275	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	1.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>

*Danielle Redinlaugh*  
Laboratory Technician

11/01/2018  
Test Date

*B. F.*  
Approved By





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

ATD Serial No: 351

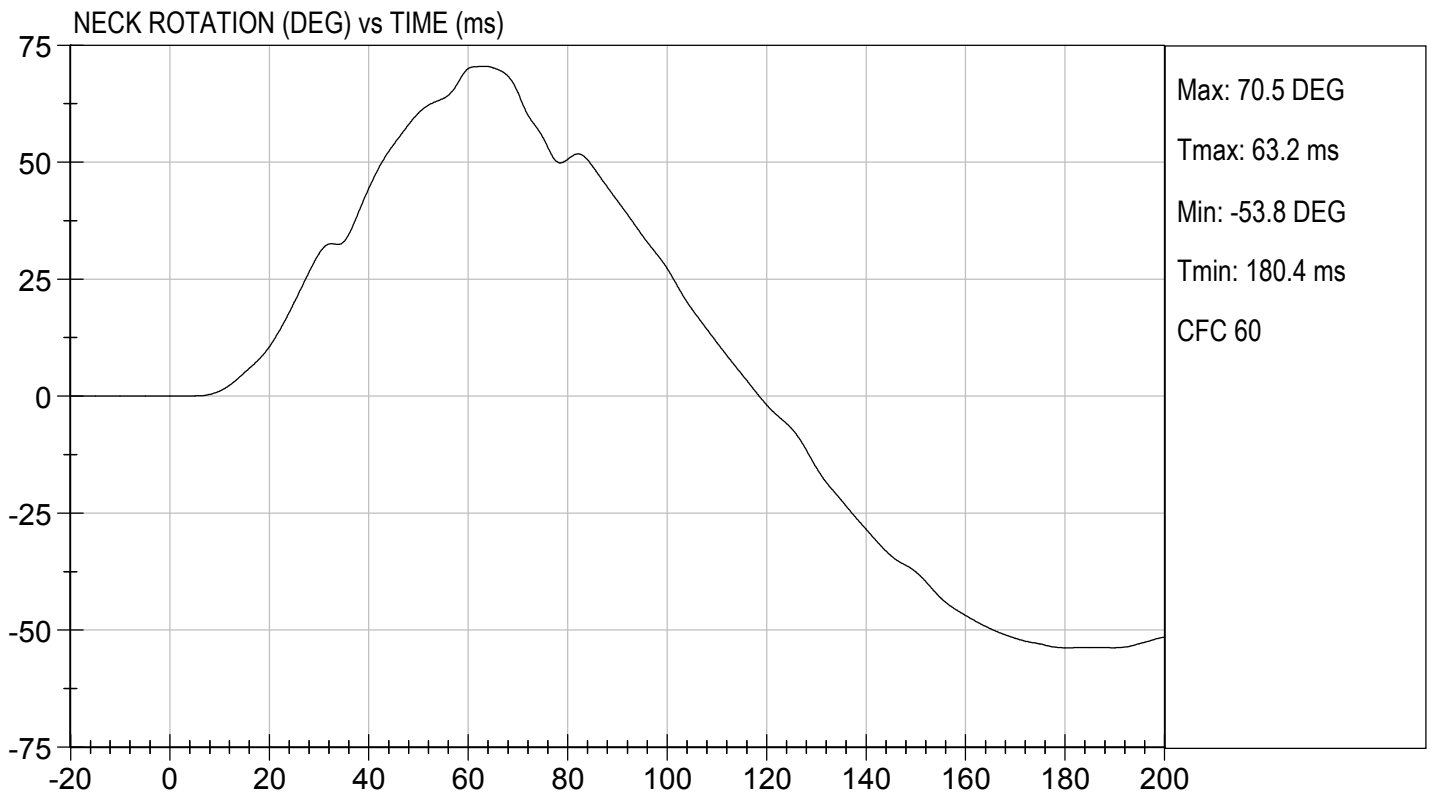
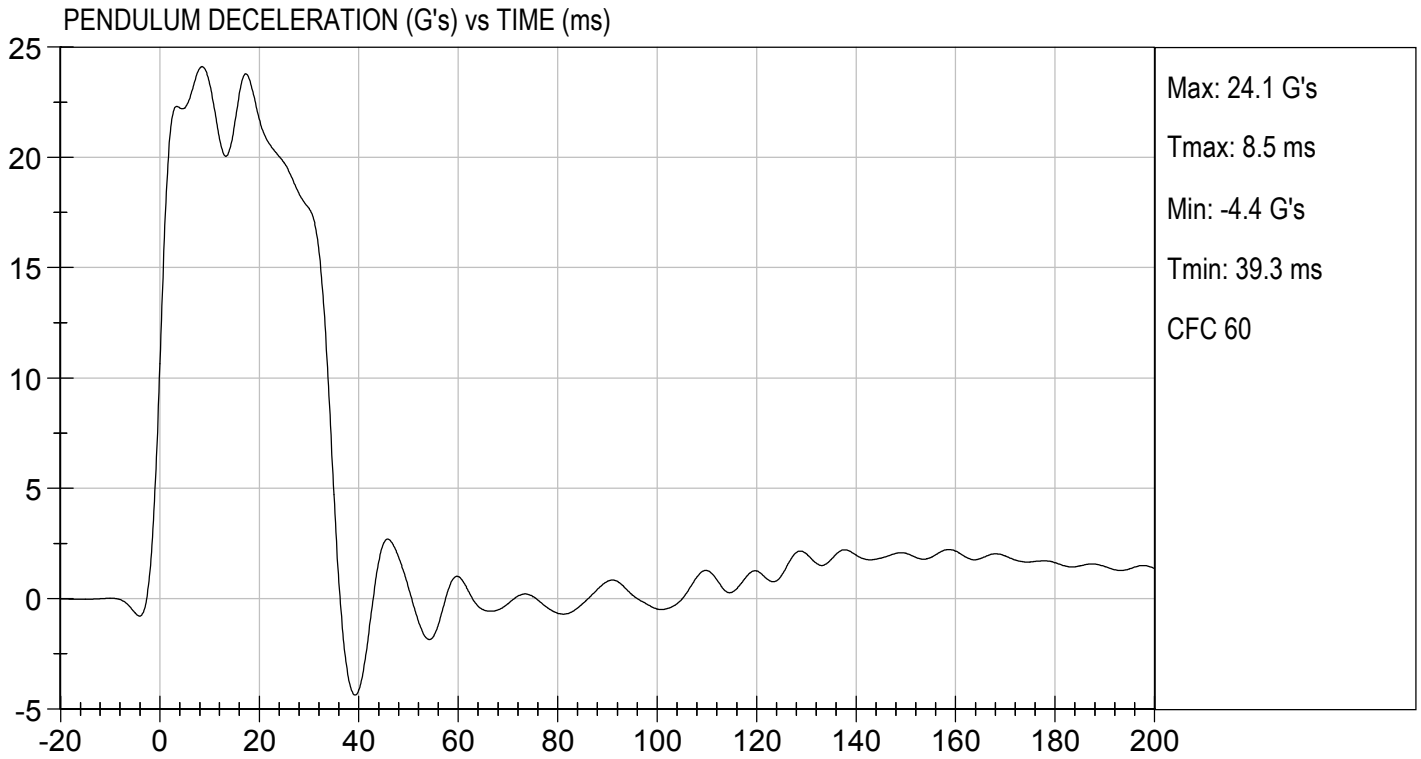
Test I.D.: D183312

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	37	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.34	Pass
	20 ms	G's	17.60 to 22.60	21.71	Pass
	30 ms	G's	12.50 to 18.50	17.68	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	17.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	35.0	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	70.5	Pass
	Time	ms	57.0 to 64.0	63.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	118.7	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	93.9	Pass
	Time	ms	47.0 to 58.0	48.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.4	Pass
Overall Test Results					Pass

*Danielle Redinlaugh*  
Laboratory Technician

11/01/2018  
Test Date

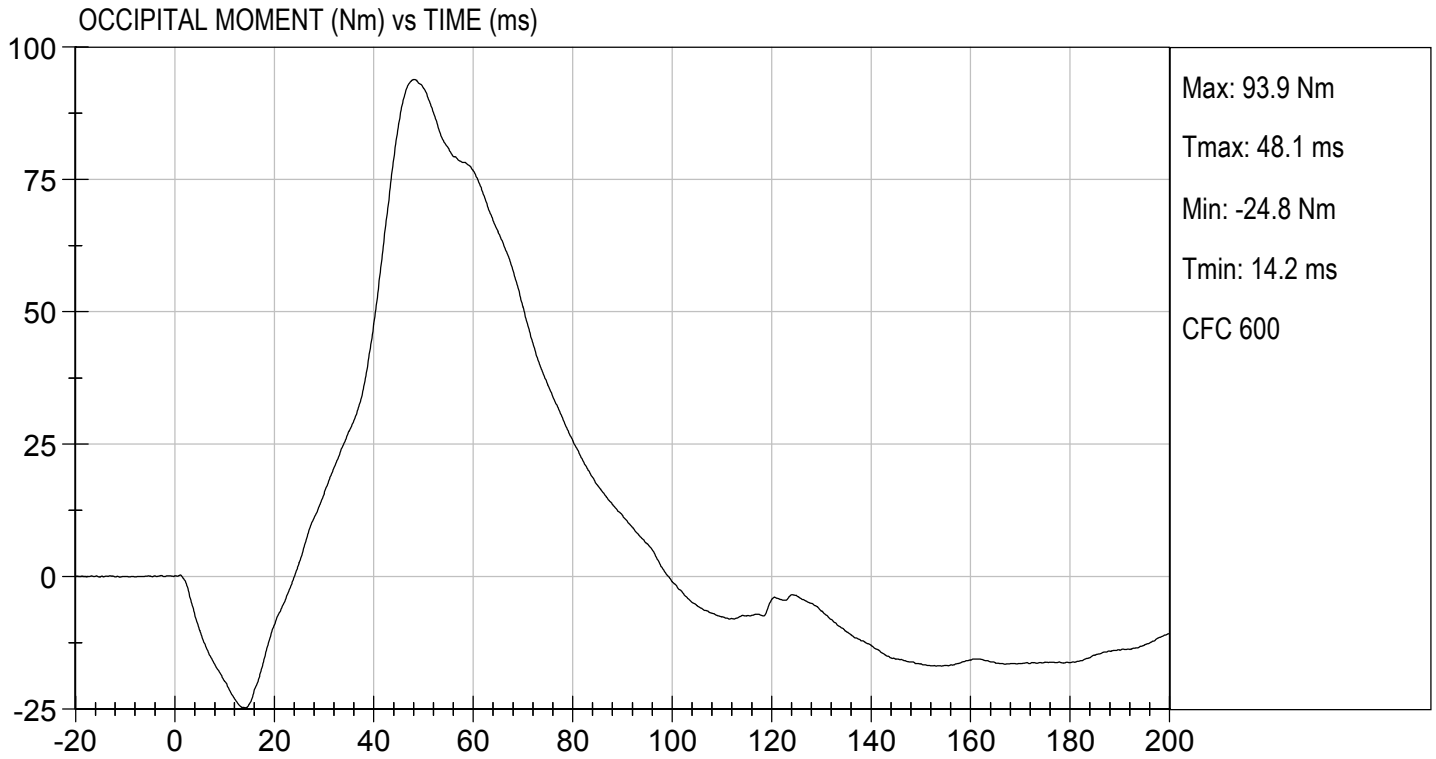
*B. F.*  
Approved By





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

TEST DATE: 11/01/2018  
TEST #: D183312



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

ATD Serial No: 351

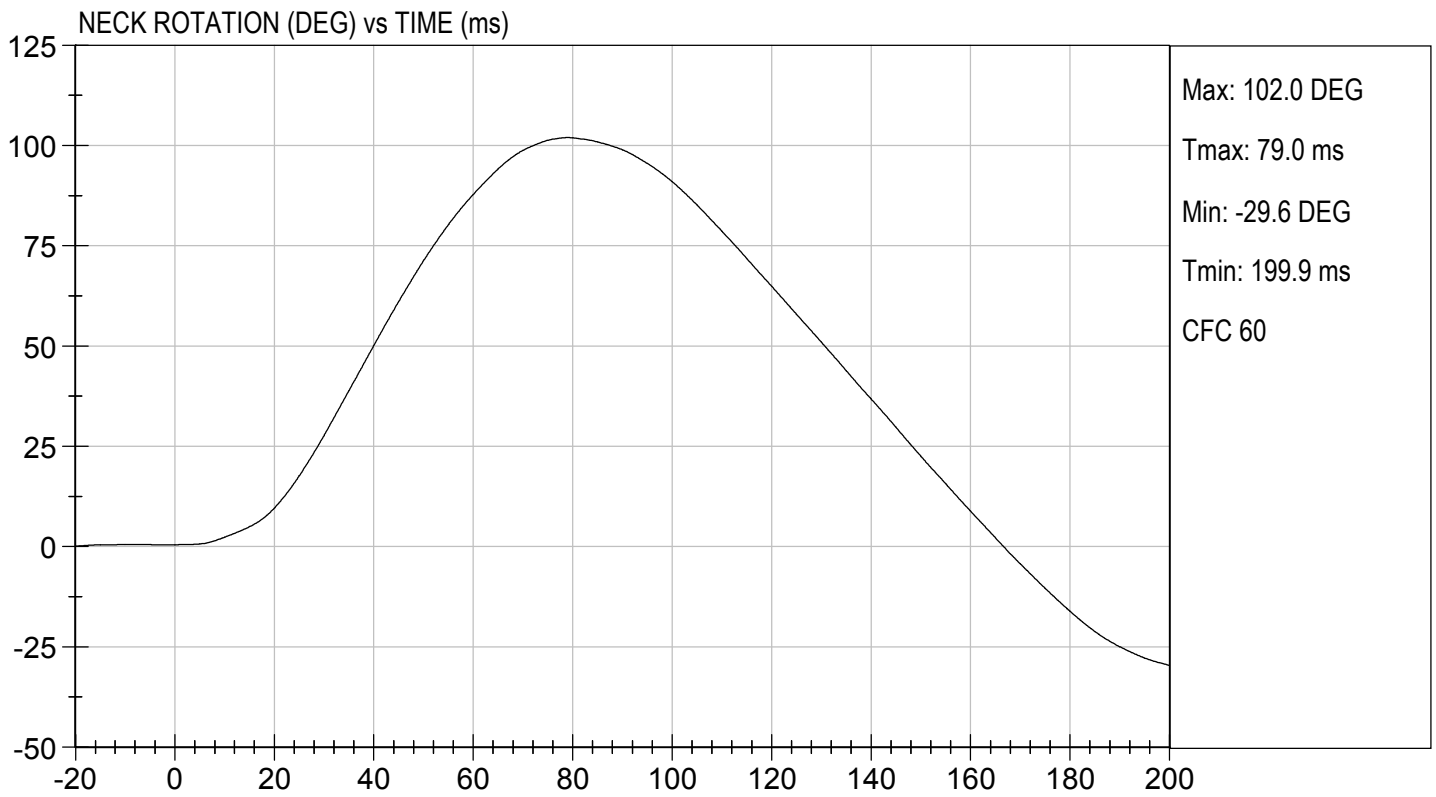
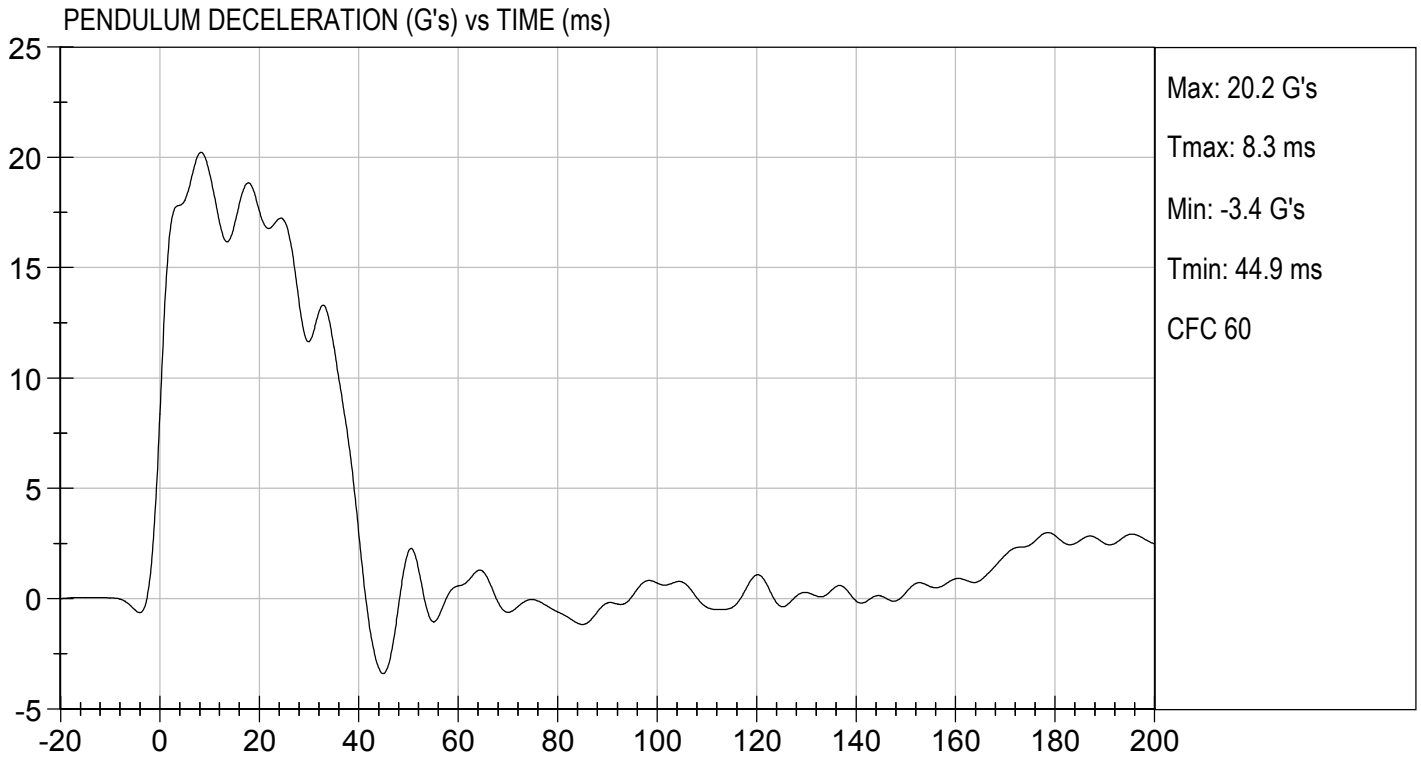
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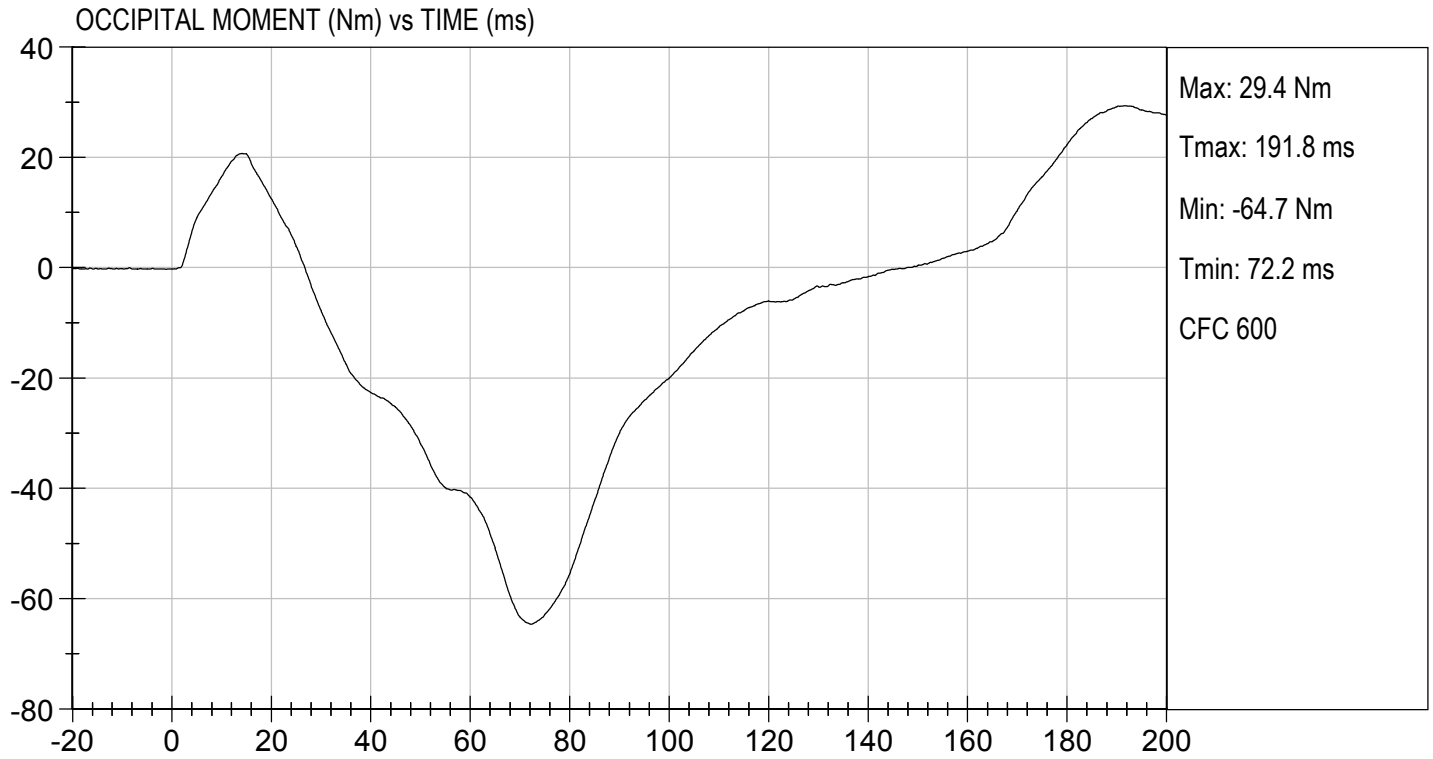
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	37	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.27	Pass
	20 ms	G's	14.00 to 19.00	17.56	Pass
	30 ms	G's	11.00 to 16.00	11.65	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	102.0	Pass
	Time	ms	72.0 to 82.0	79.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	166.8	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-64.7	Pass
	Time	ms	65.0 to 79.0	72.2	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	148.0	Pass
Overall Test Results					Pass

*Danielle Redinlaugh*  
 Laboratory Technician

11/01/2018  
 Test Date

*B. F.*  
 Approved By






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

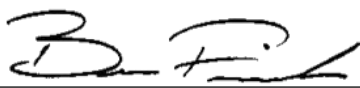
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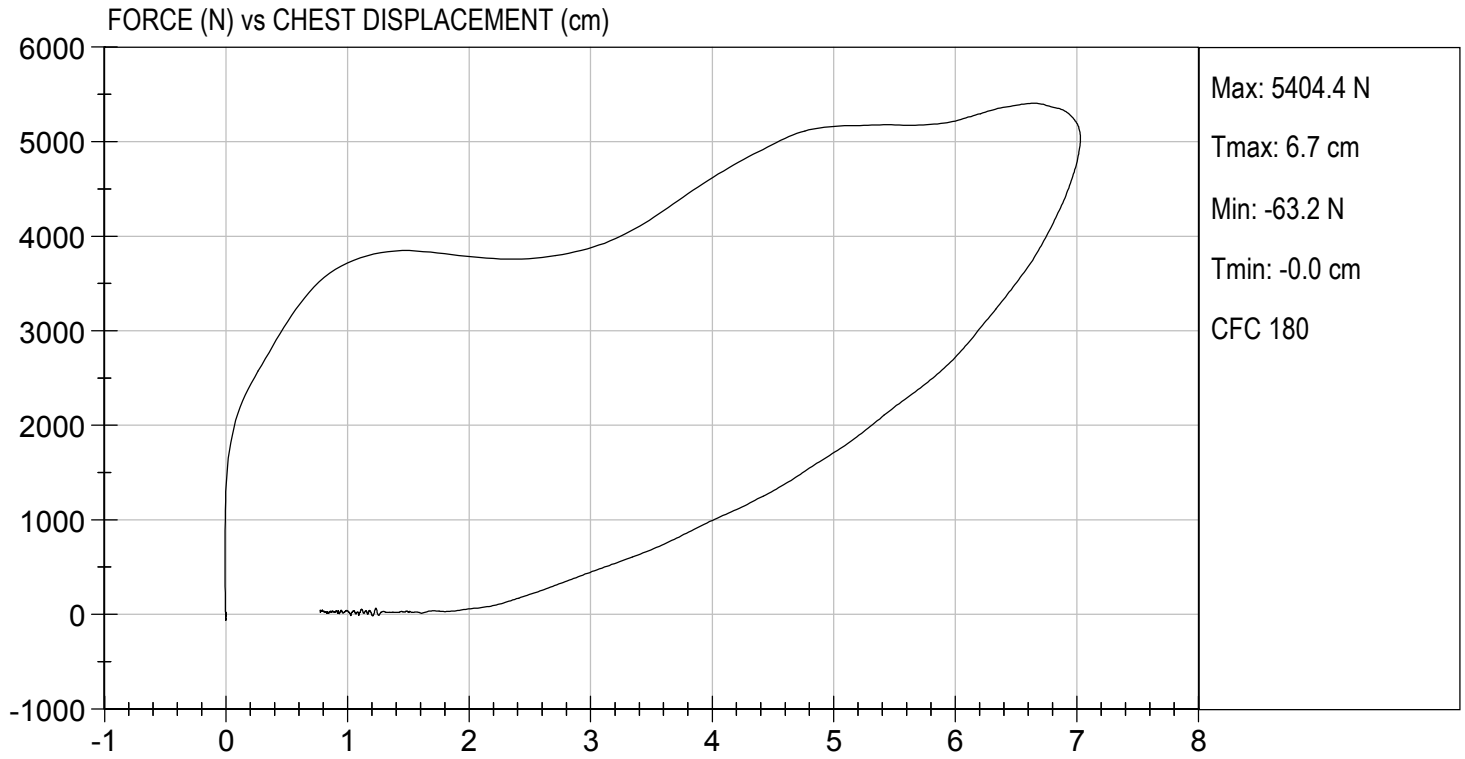
Test I.D: D18AX4

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,404	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.03	Pass
Internal Hysteresis	%	69 to 85	73	Pass
			Overall Test Results	Pass

  
 Laboratory Technician

11/02/2018  
 Test Date

  
 Approved By



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

ATD Serial No: 351

Test I.D: D183315

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	5,415	Pass
Overall Test Results				Pass

*Danielle Redinlaugh*  
 Laboratory Technician

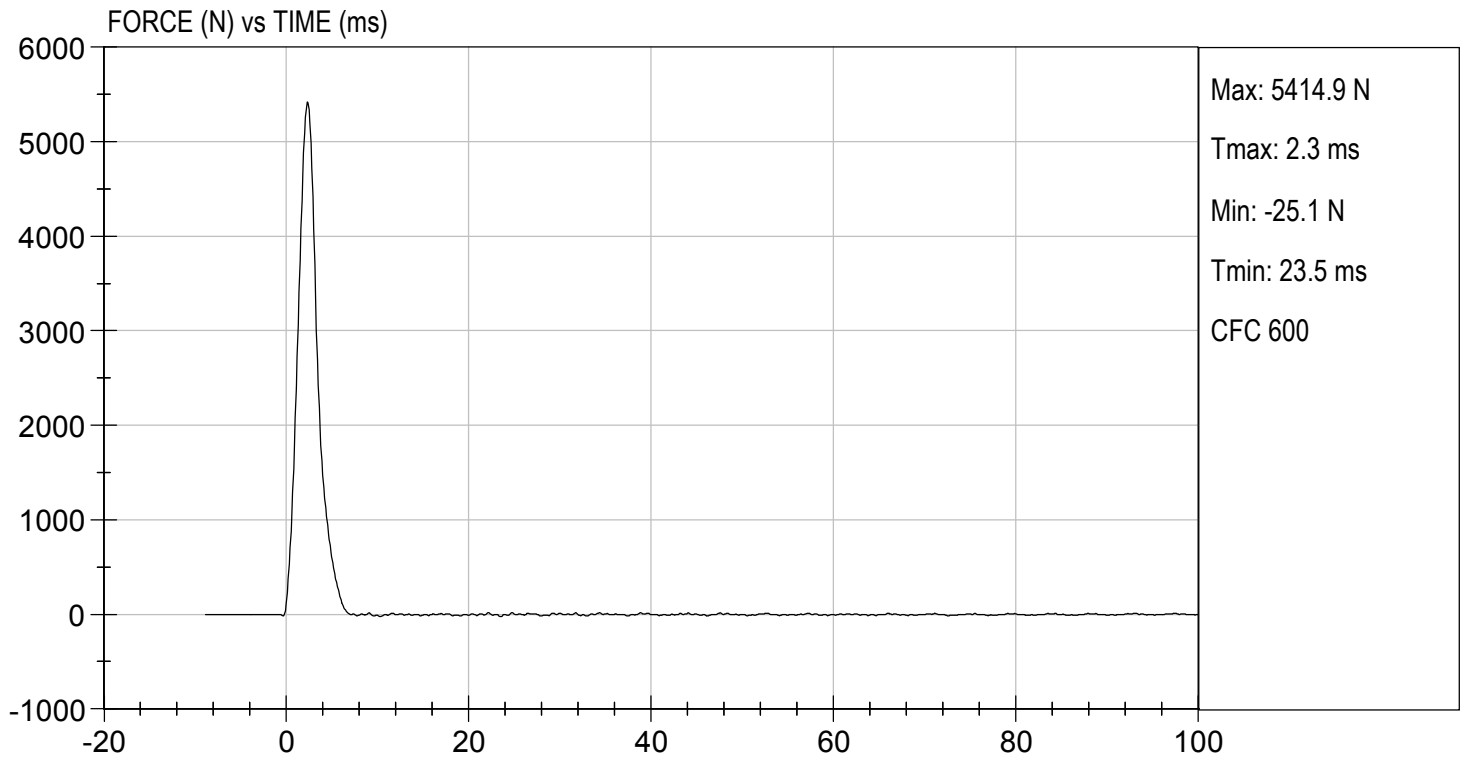
11/01/2018  
 Test Date

*B. F. H.*  
 Approved By



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

TEST DATE: 11/01/2018  
TEST #: D183315



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

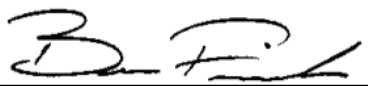
ATD Serial No: 351

Test I.D: D183316

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Probe Velocity	m/s	2.07 to 2.13	2.13	Pass
Peak Probe Force	N	4715 to 5782	4,774	Pass
Overall Test Results				Pass

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

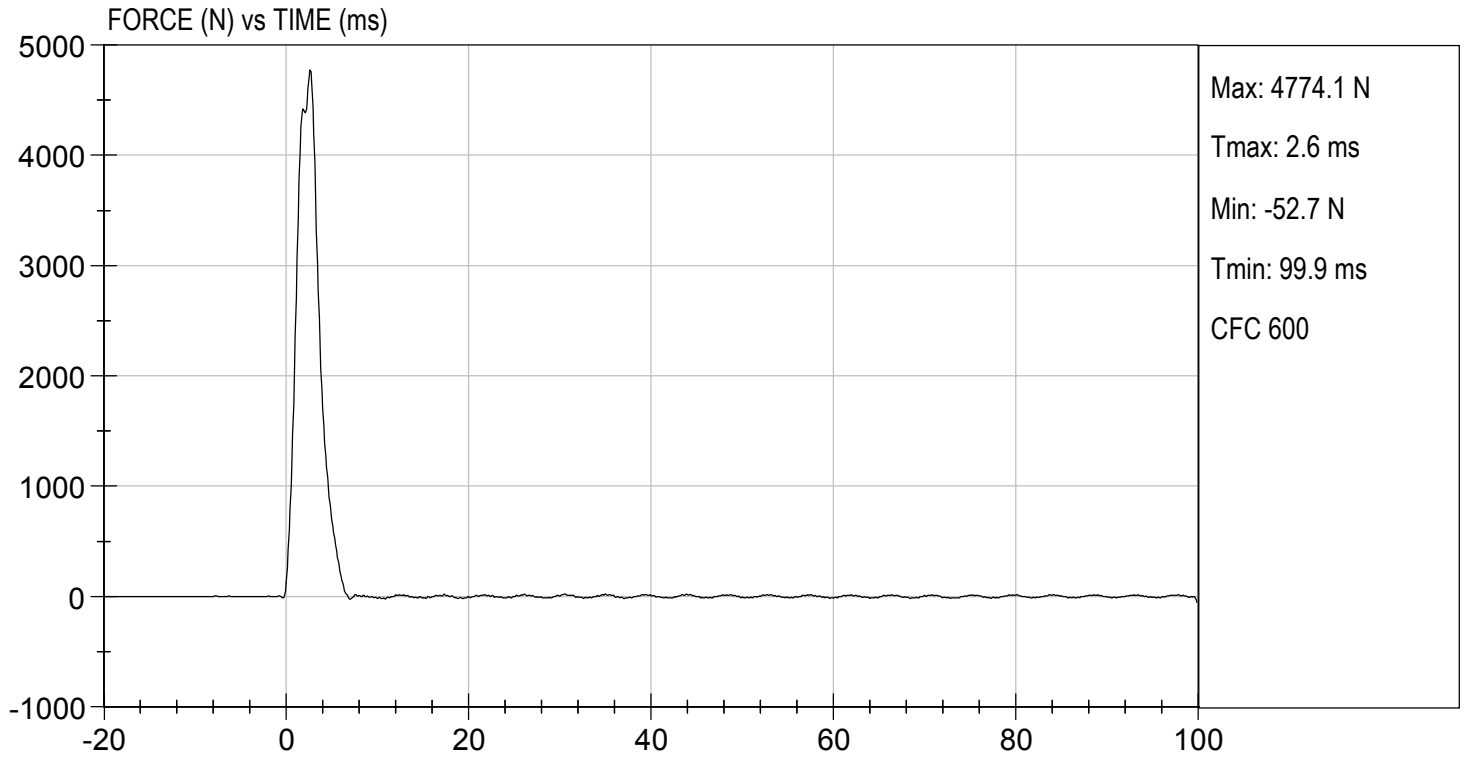
11/01/2018  
 \_\_\_\_\_  
 Test Date

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



TEST DESC: LEFT KNEE  
VELOCITY: 7.00 ft/s, 2.13 m/s

TEST DATE: 11/01/2018  
TEST #: D183316

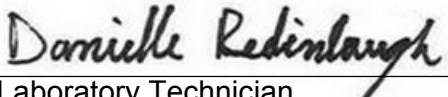


**MGA RESEARCH CORPORATION**  
**HIP-FEMUR FLEXION TEST**  
**HYBRID III 50TH PERCENTILE MALE**

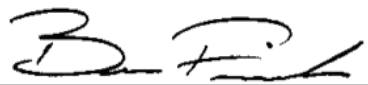
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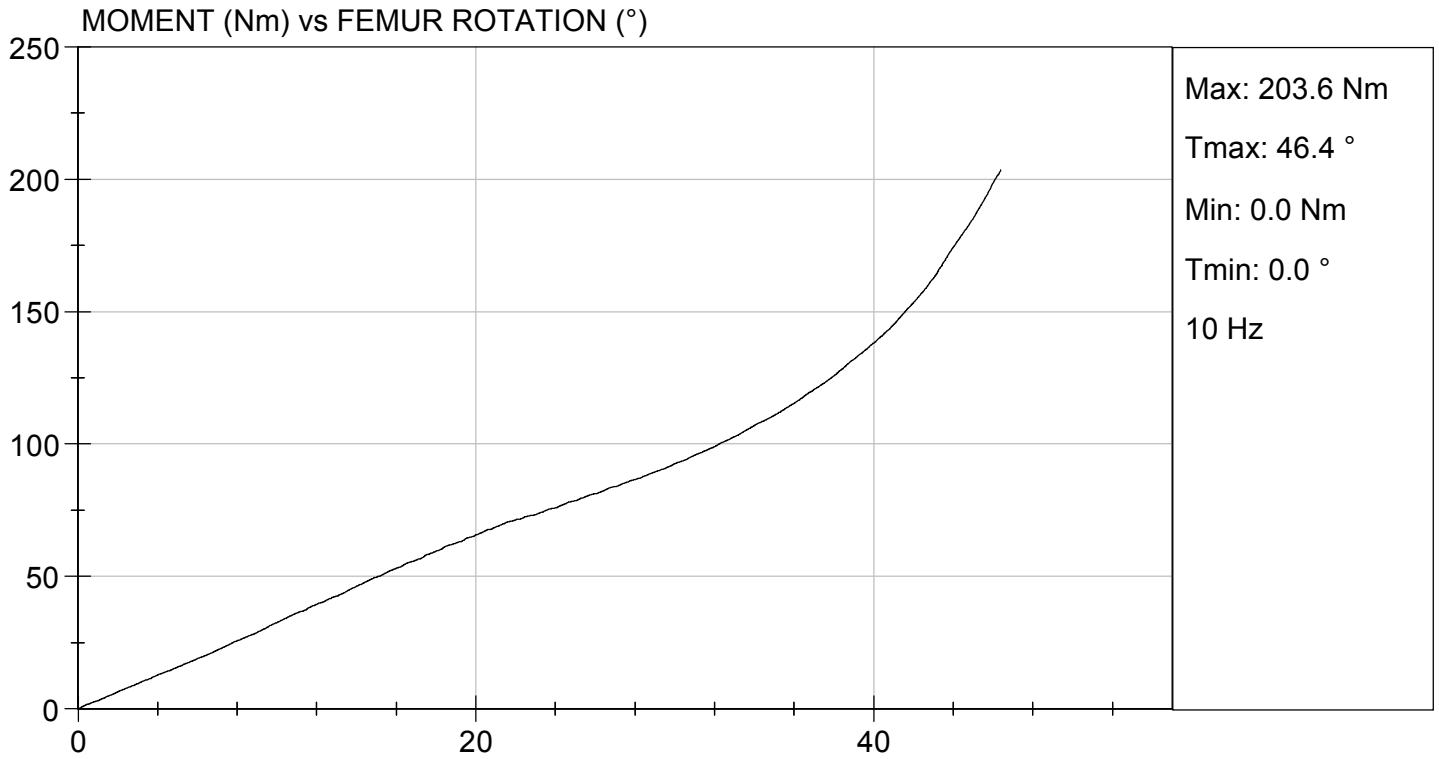
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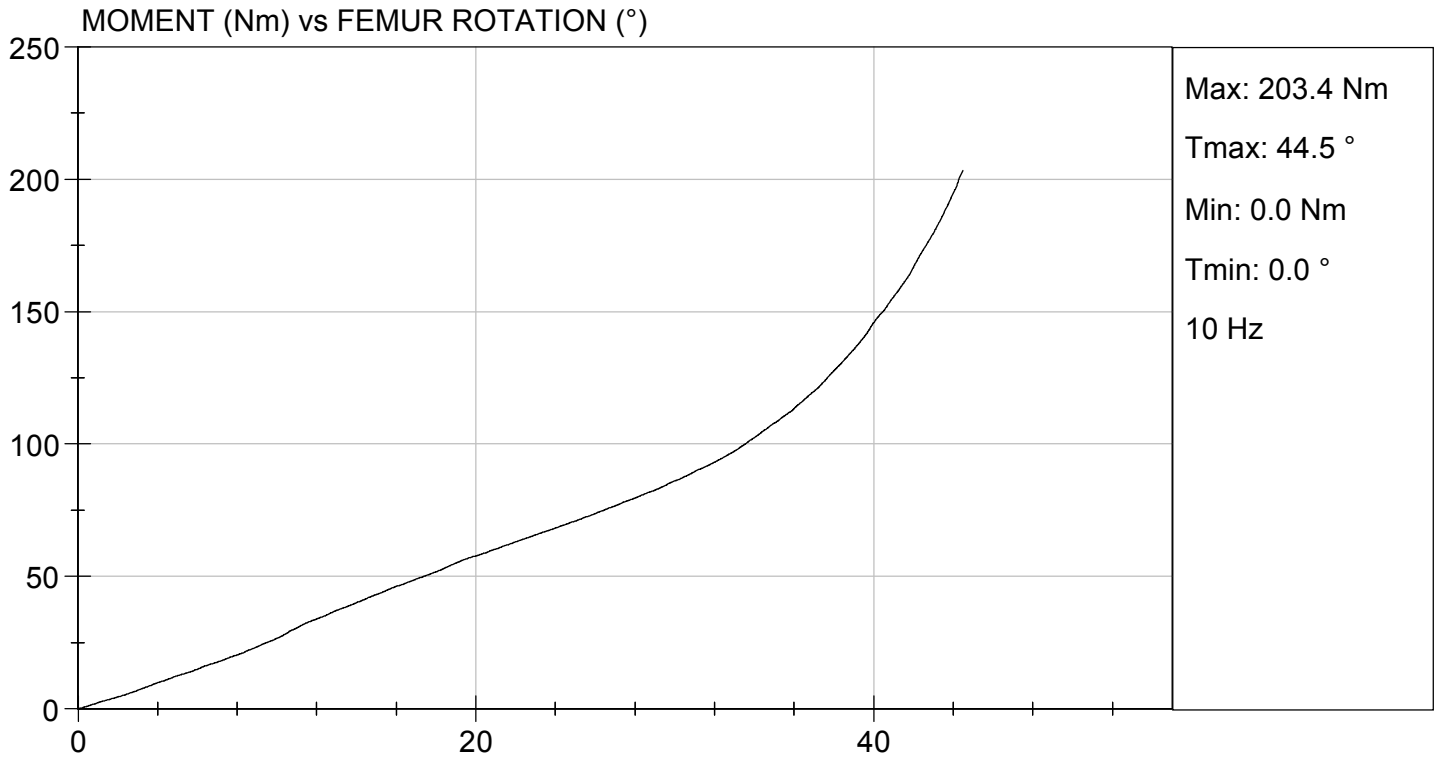
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	20.7	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	36	36	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.4	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	92.6	86.1	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	46.4	44.5	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/01/2018  
 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: D183471

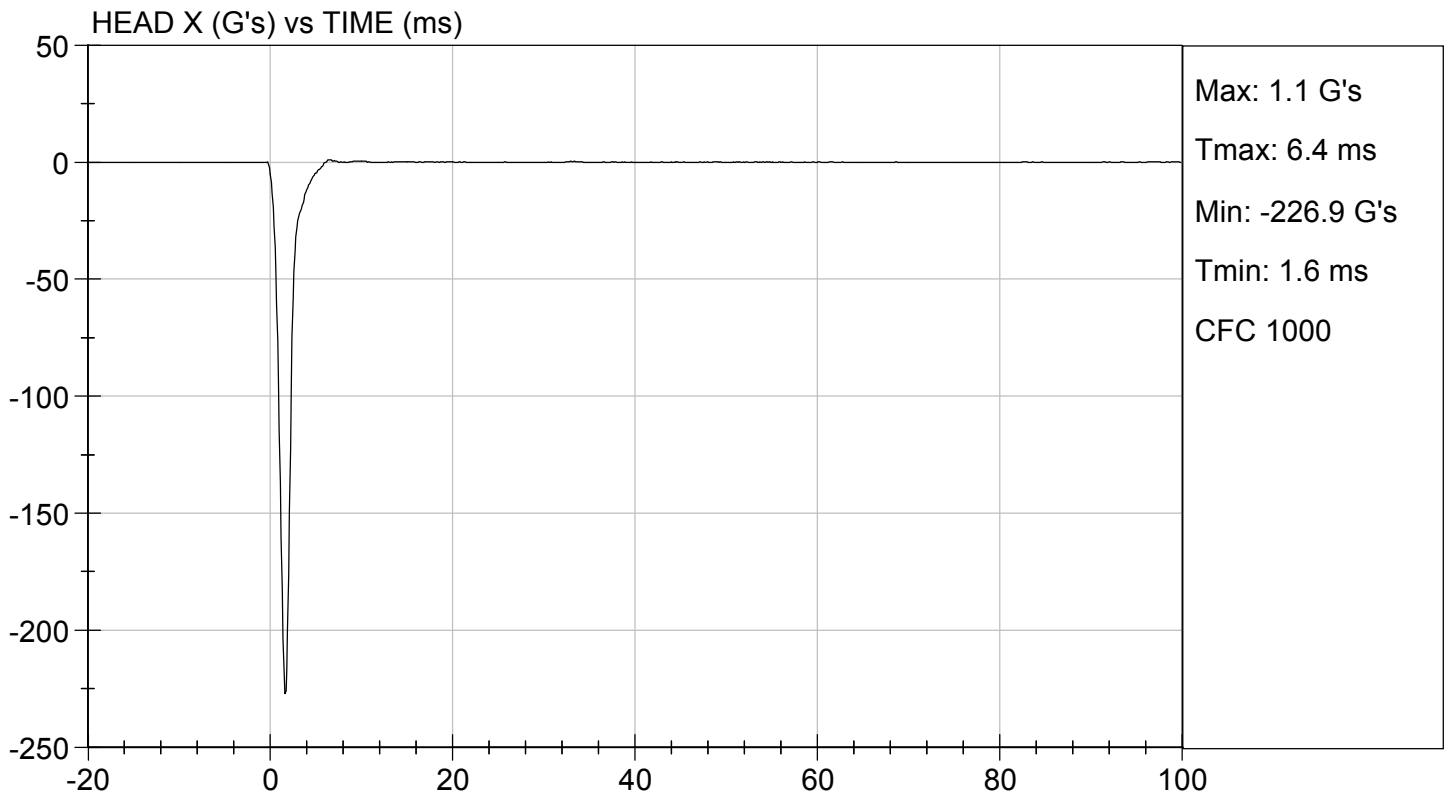
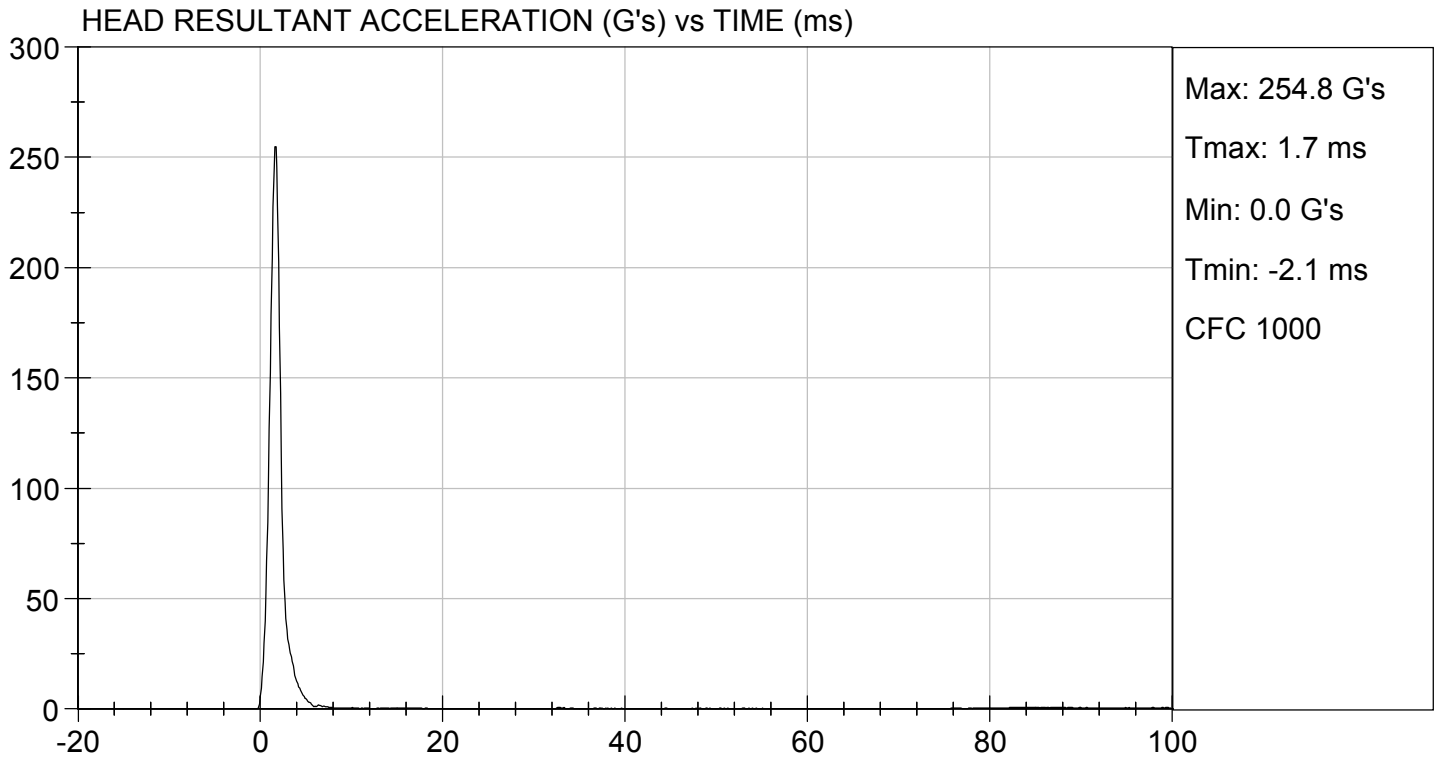
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Peak Resultant Acceleration	G's	225 to 275	255	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-4.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

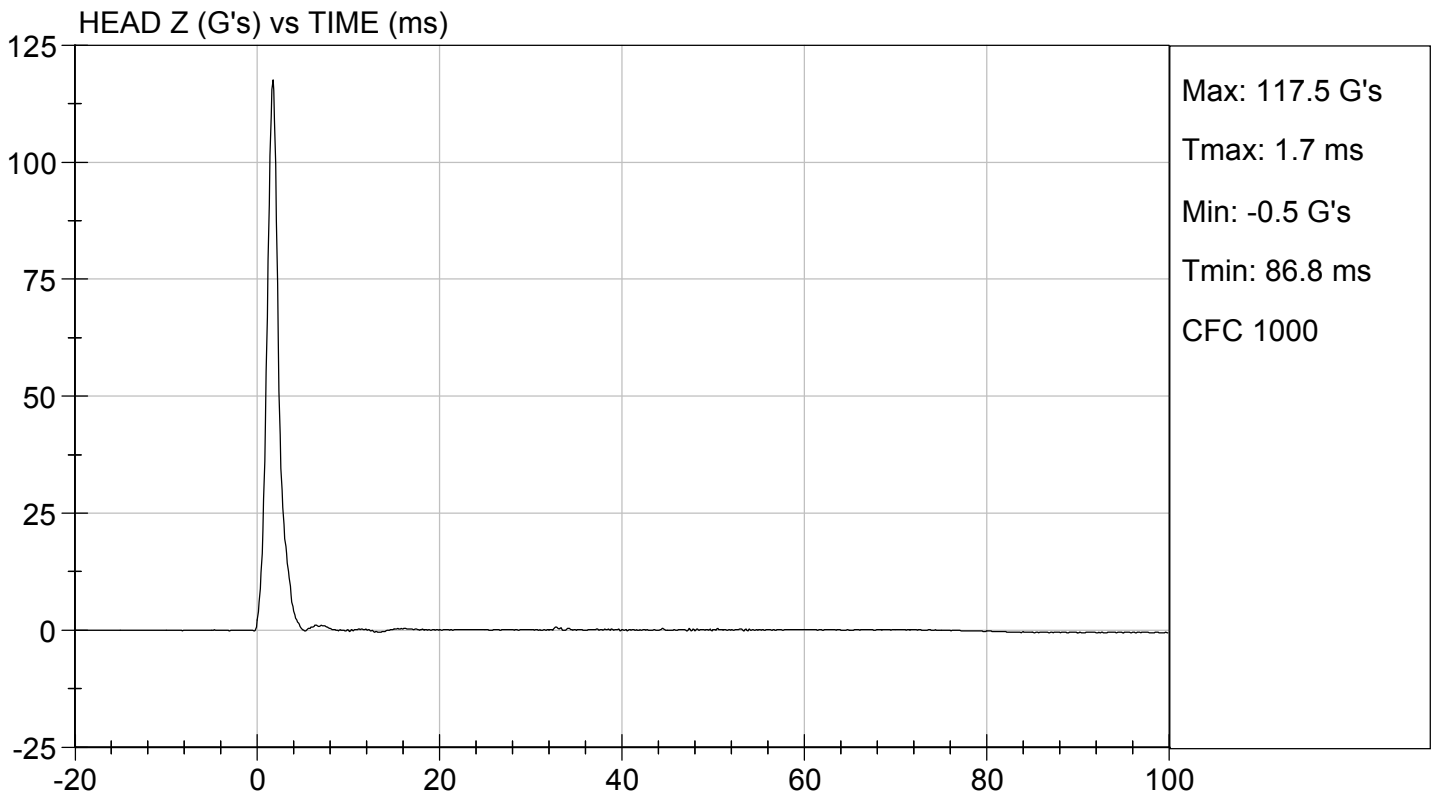
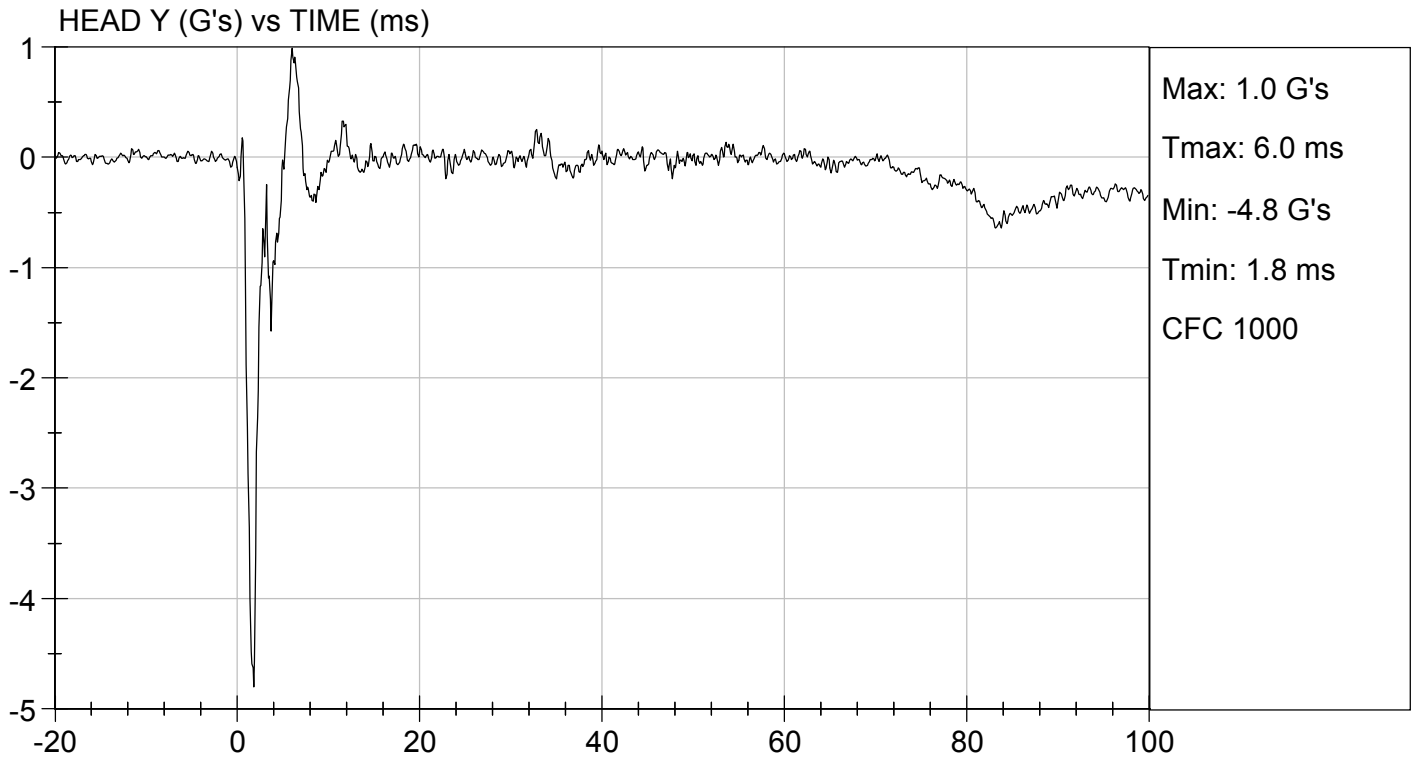
*Jacob D Taylor*  
 Laboratory Technician

11/19/2018

Test Date

*B. F. H.*  
 Approved By



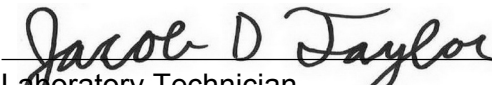


**MGA RESEARCH CORPORATION**  
**NECK FLEXION TEST**  
**HYBRID III 50TH PERCENTILE MALE**

ATD Serial No: 351


Test I.D.: D183472

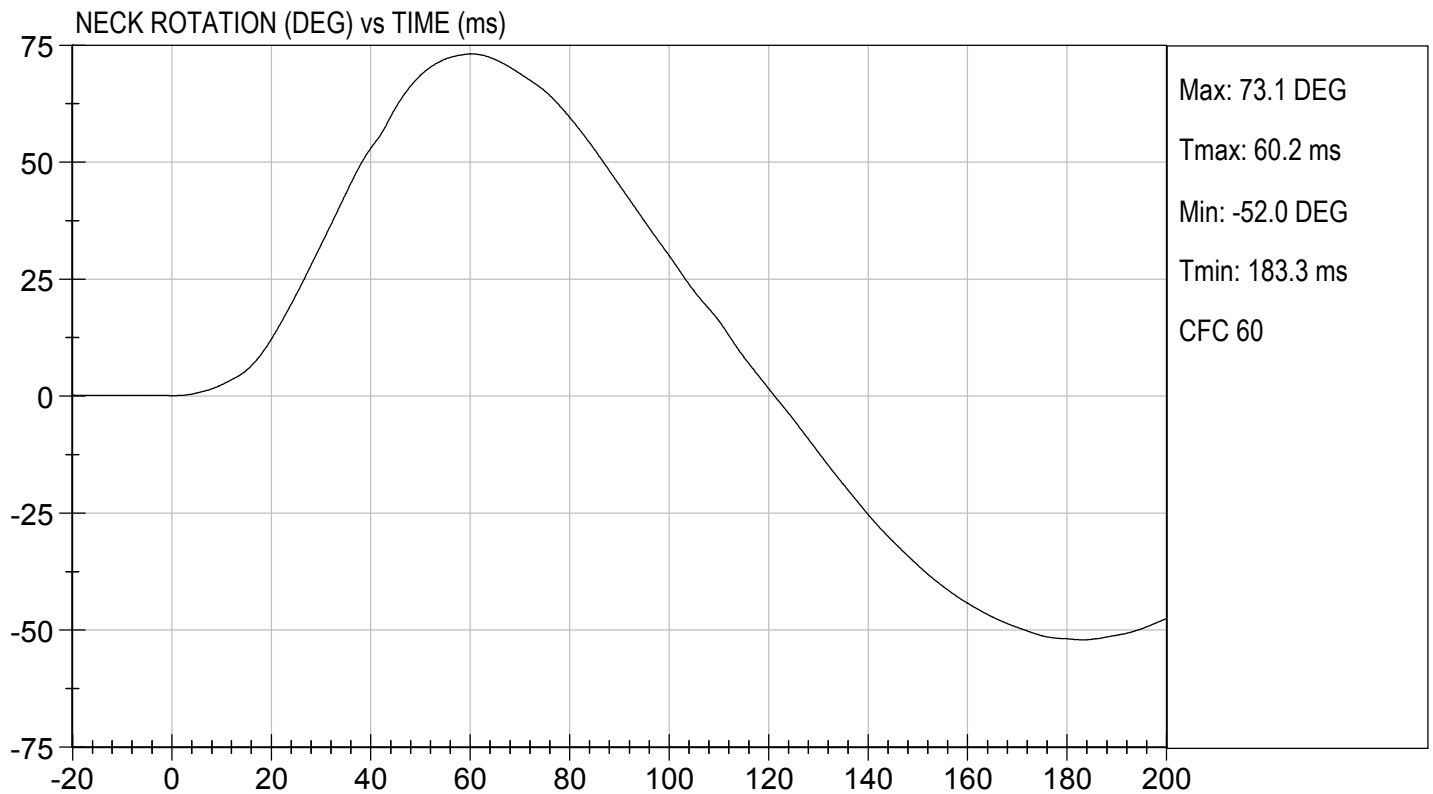
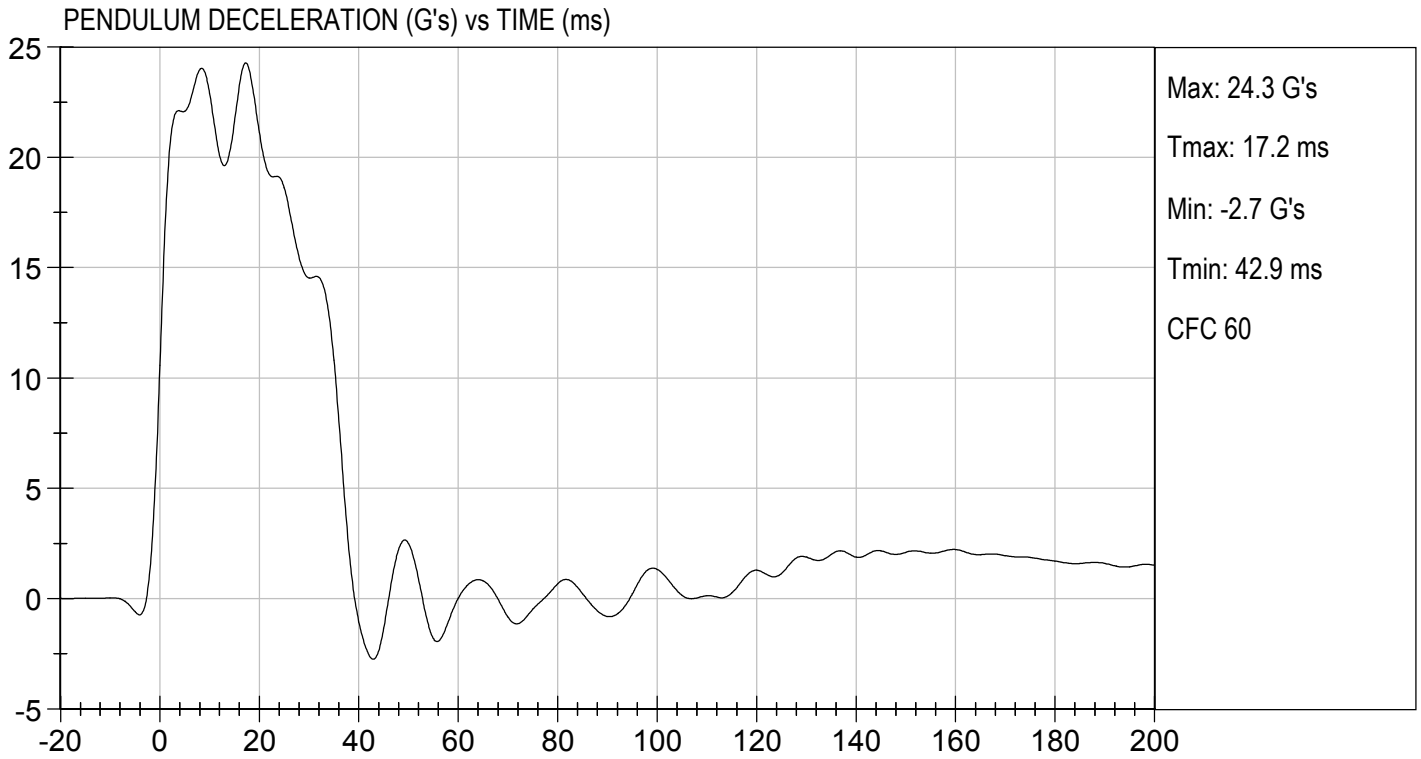
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	17	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.90	Pass
	20 ms	G's	17.60 to 22.60	21.13	Pass
	30 ms	G's	12.50 to 18.50	14.53	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	37.1	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	73.1	Pass
	Time	ms	57.0 to 64.0	60.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	121.4	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	89.1	Pass
	Time	ms	47.0 to 58.0	49.9	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.7	Pass
Overall Test Results					Pass

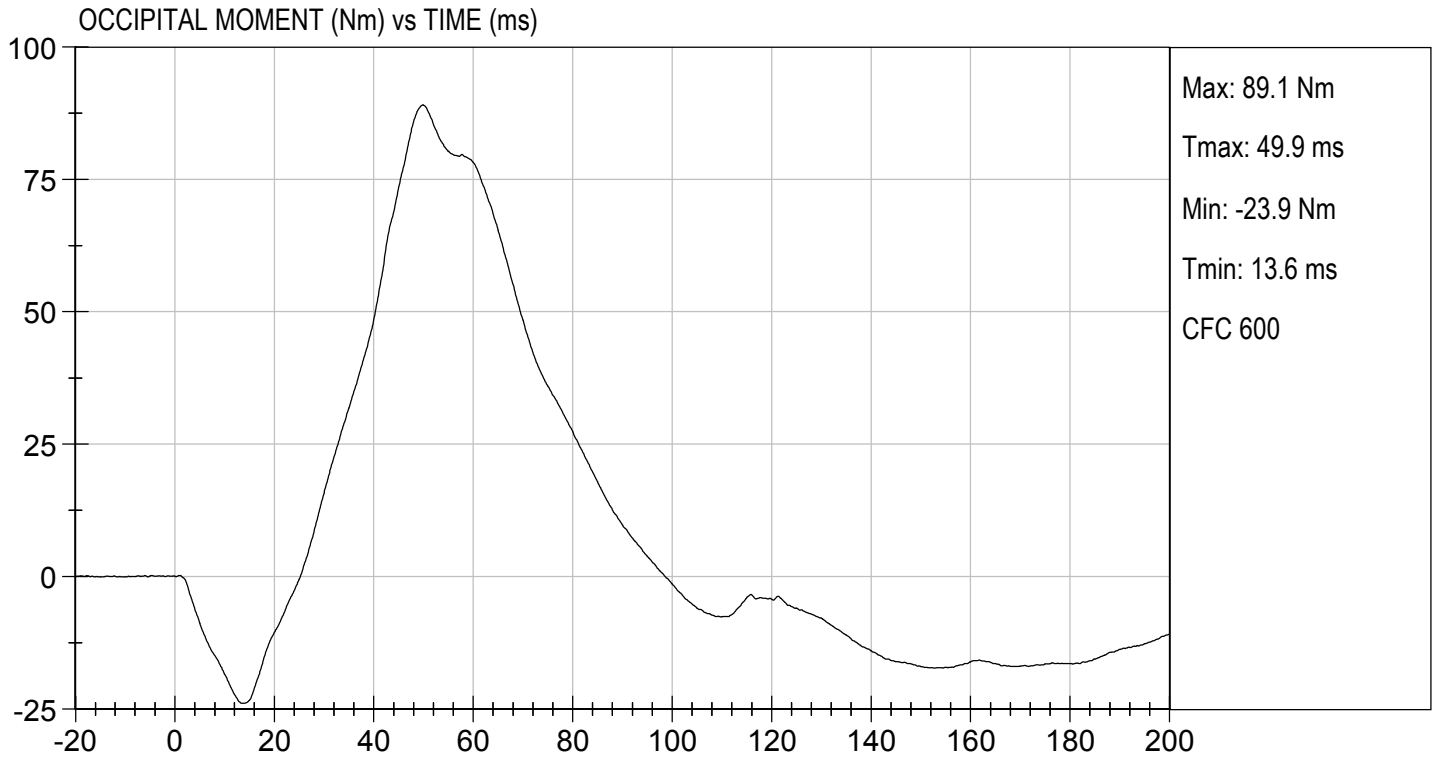
  
 Laboratory Technician

11/19/2018

Test Date

  
 Approved By






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

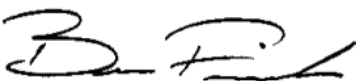
ATD Serial No: 351

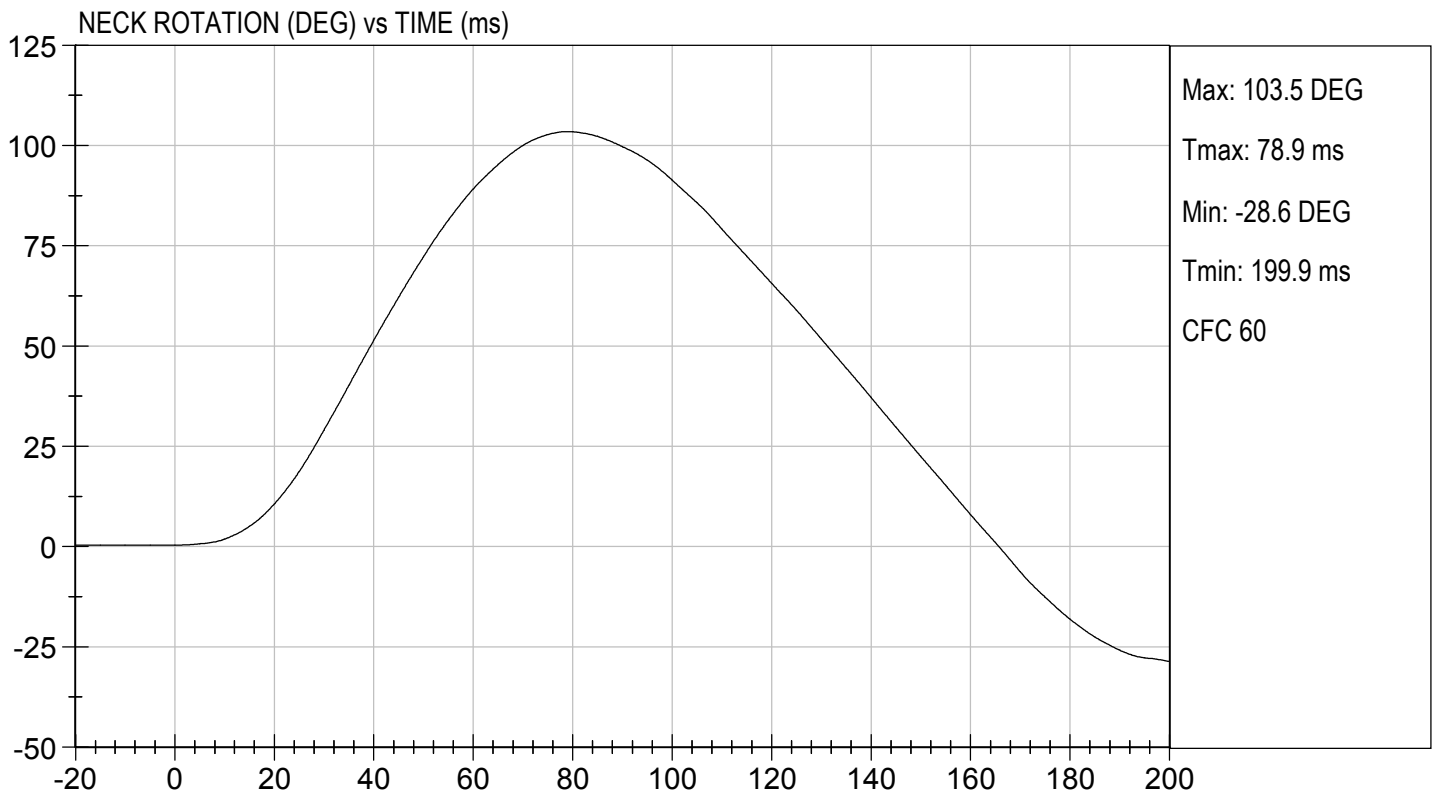
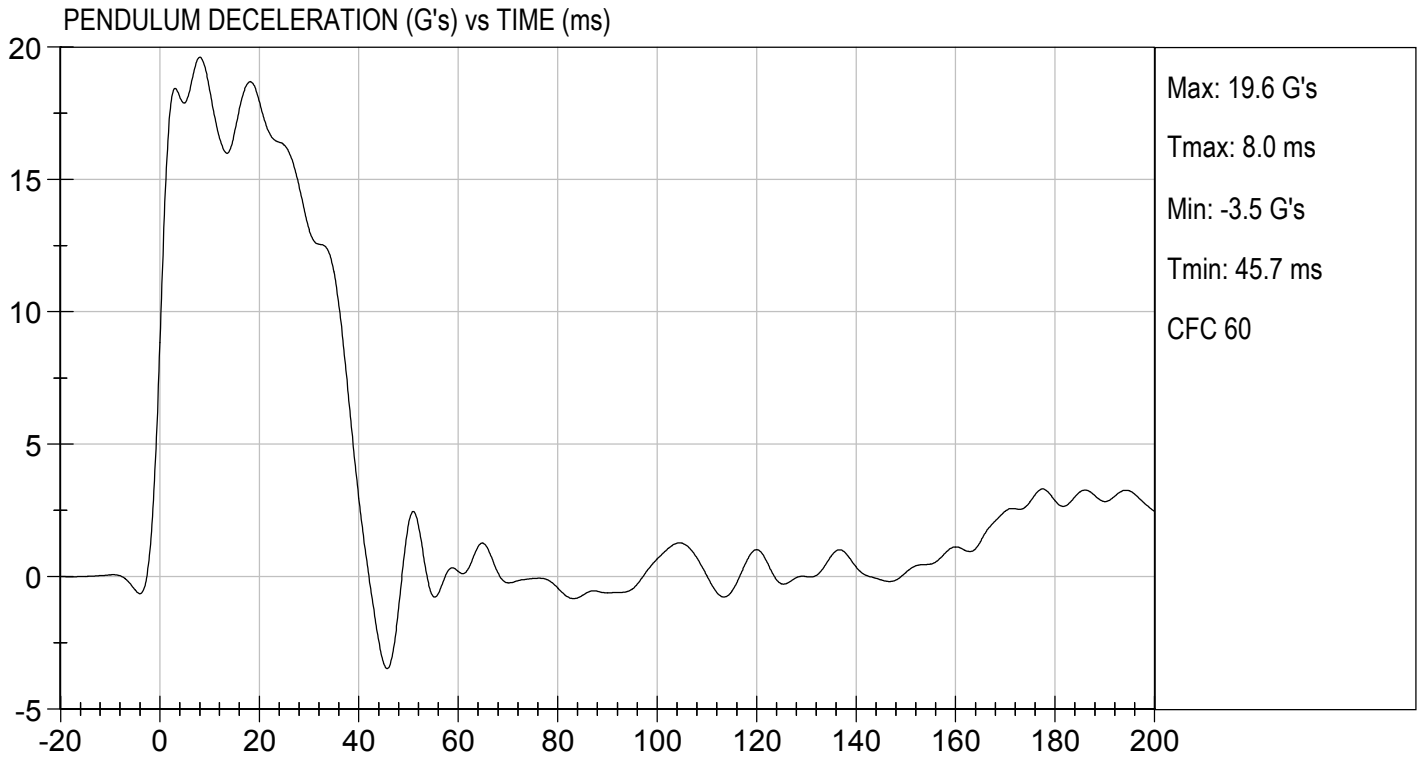
Test I.D.: D183473

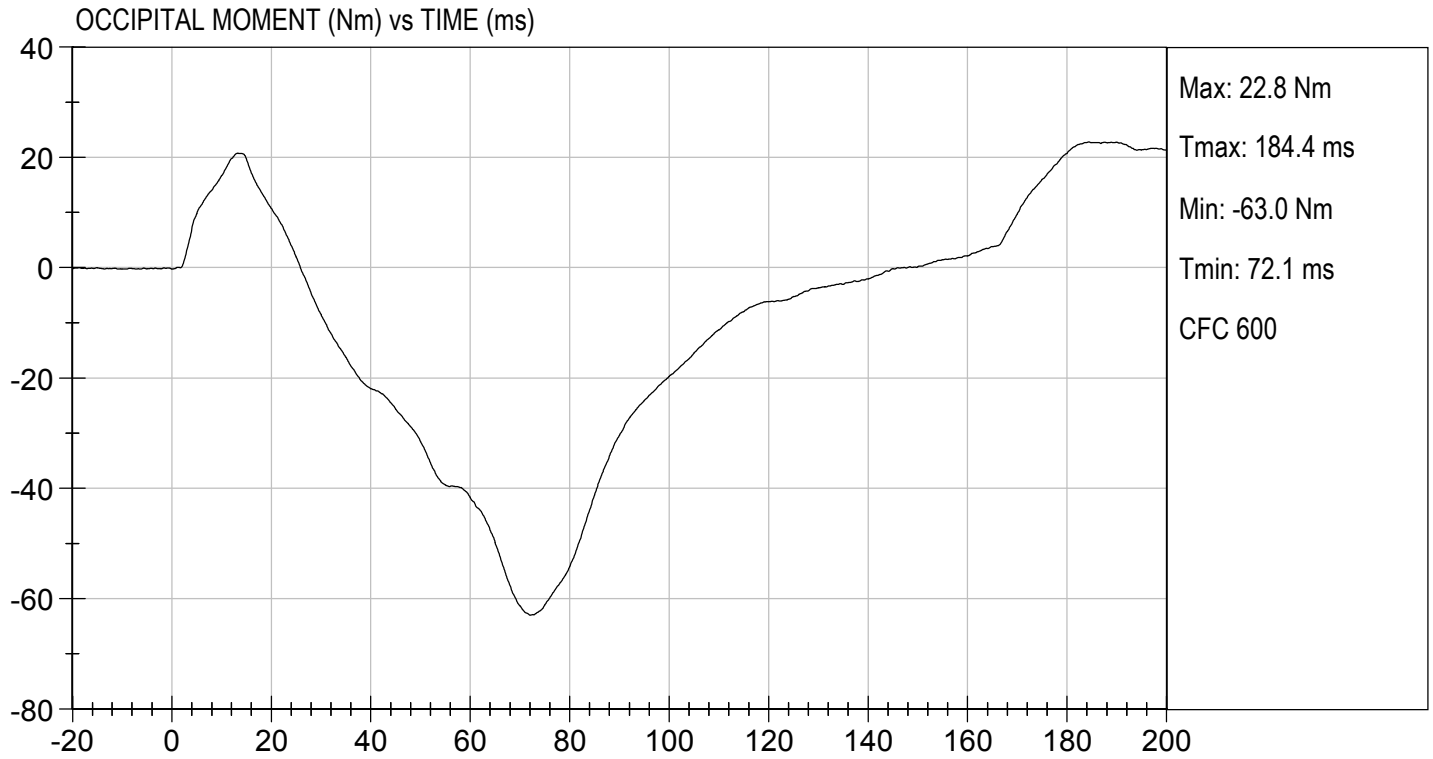
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	17	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.39	Pass
	20 ms	G's	14.00 to 19.00	17.94	Pass
	30 ms	G's	11.00 to 16.00	13.10	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.0	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	103.5	Pass
	Time	ms	72.0 to 82.0	78.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	165.9	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-63.0	Pass
	Time	ms	65.0 to 79.0	72.1	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	147.3	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/19/2018  
 Test Date

  
 Approved By





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

ATD Serial No: 351

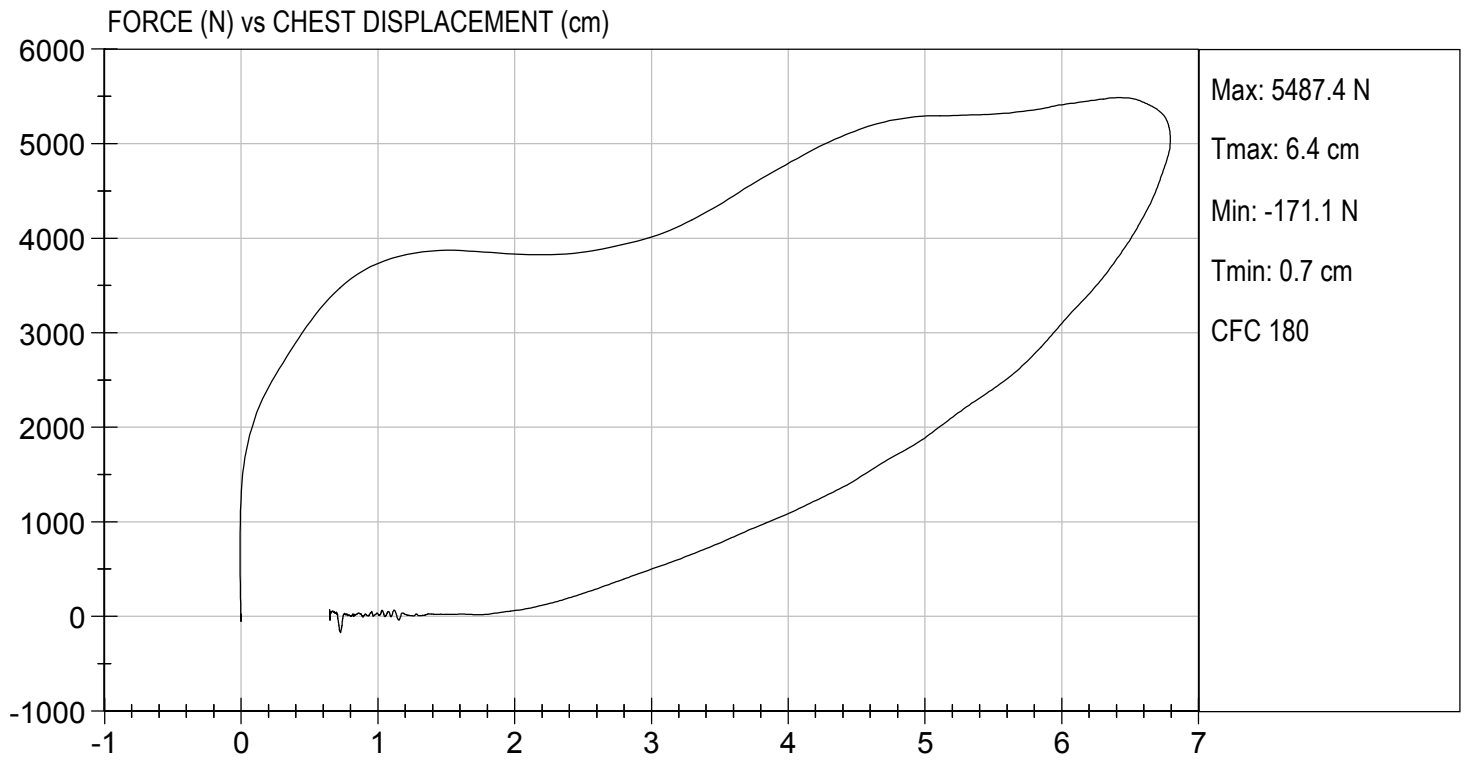
Test I.D: D183474

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,487	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.80	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Overall Test Results				Pass

Jacob D Taylor  
Laboratory Technician

11/19/2018  
Test Date

B. F. K.  
Approved By




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


**ATD Serial No:** 351

**Test I.D:** D183475

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	2.07 to 2.13	2.13	Pass
Peak Probe Force	N	4715 to 5782	4,783	Pass
Overall Test Results				Pass

  
 Laboratory Technician

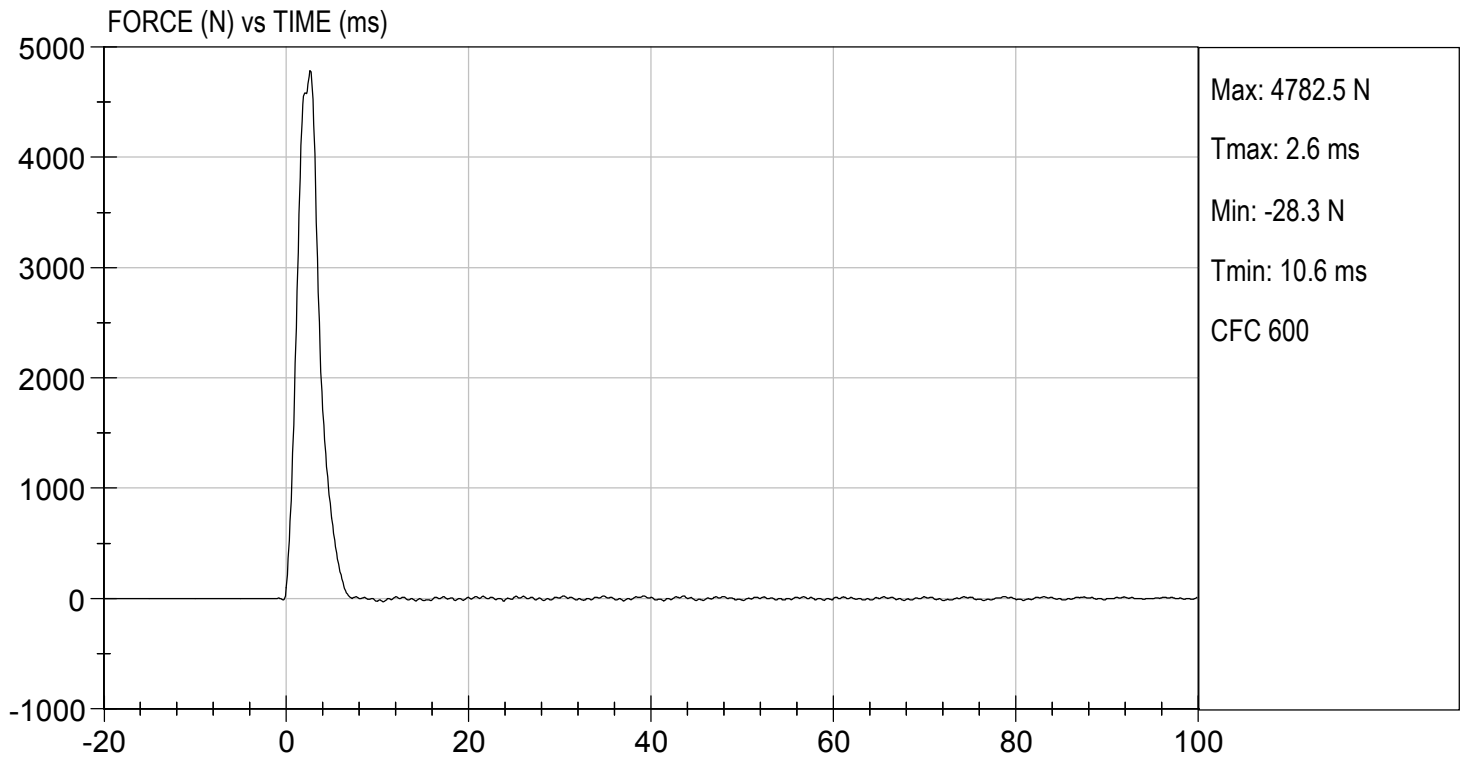
11/19/2018  
 Test Date

  
 Approved By



TEST DESC: RIGHT KNEE  
VELOCITY: 7.00 ft/s, 2.13 m/s

TEST DATE: 11/19/2018  
TEST #: D183475



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

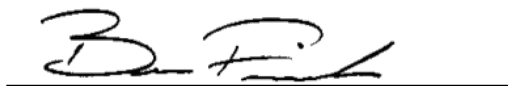
**ATD Serial No:** 351

**Test I.D:** D183476

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	4,939	Pass
Overall Test Results				Pass

  
 Laboratory Technician

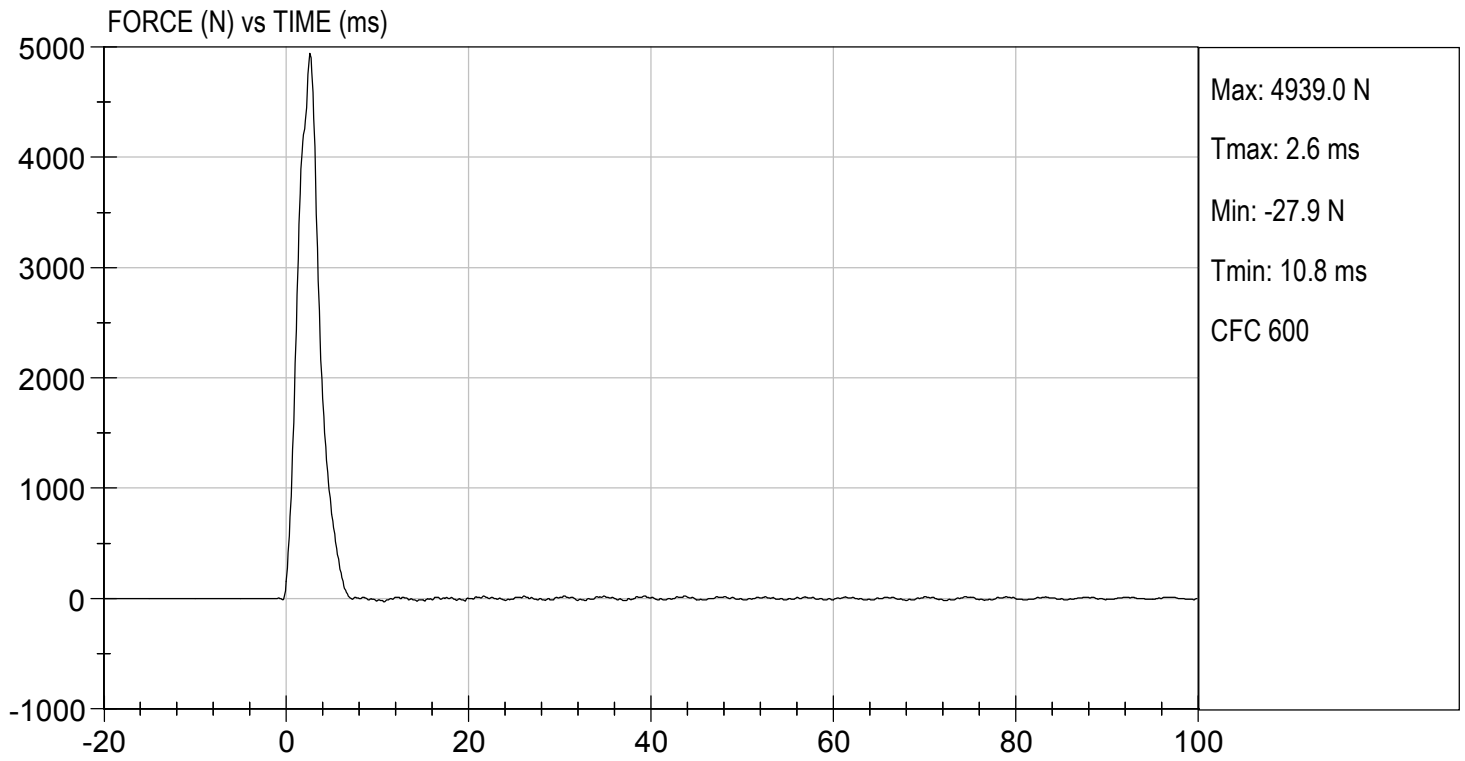
11/19/2018  
 Test Date

  
 Approved By



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

TEST DATE: 11/19/2018  
TEST #: D183476



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

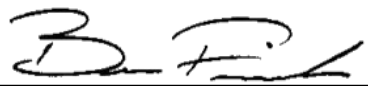
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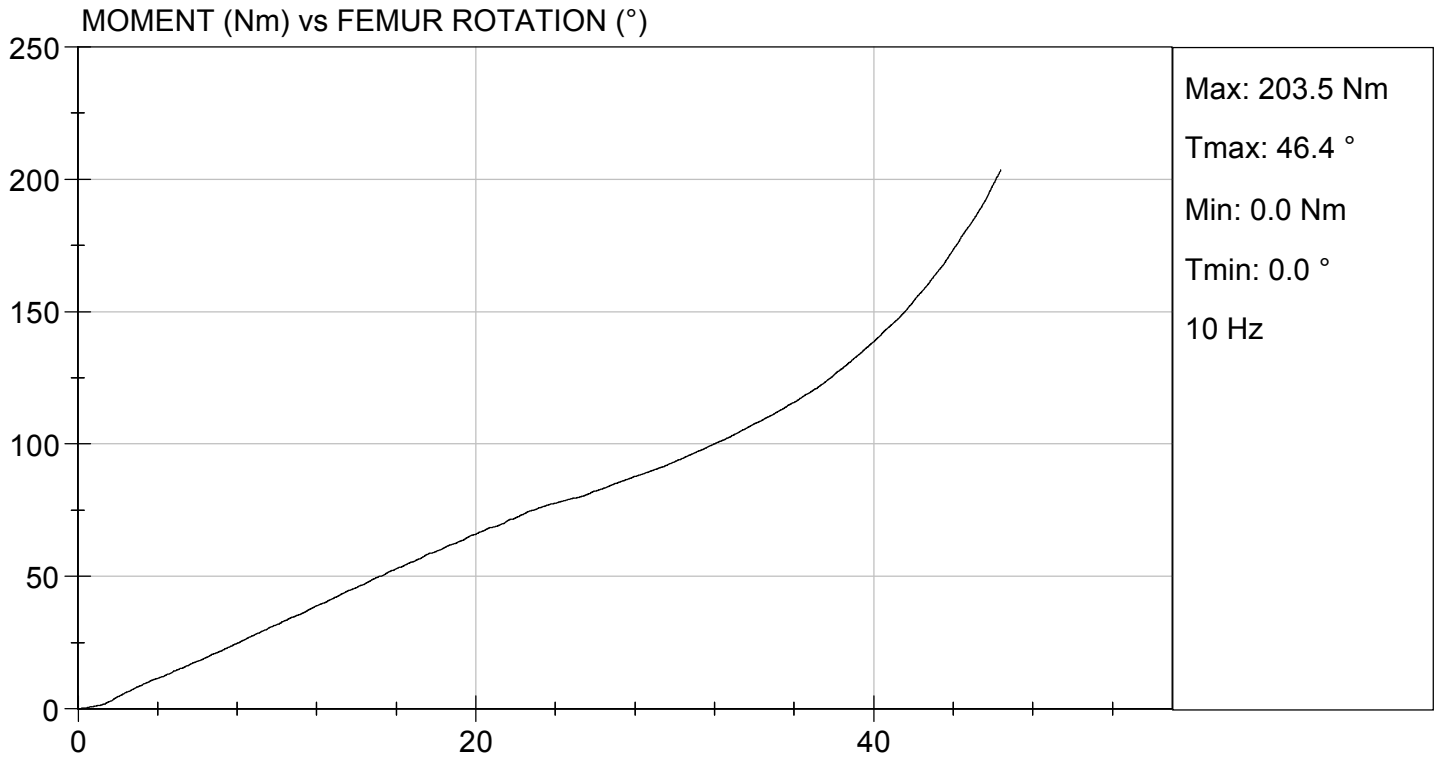
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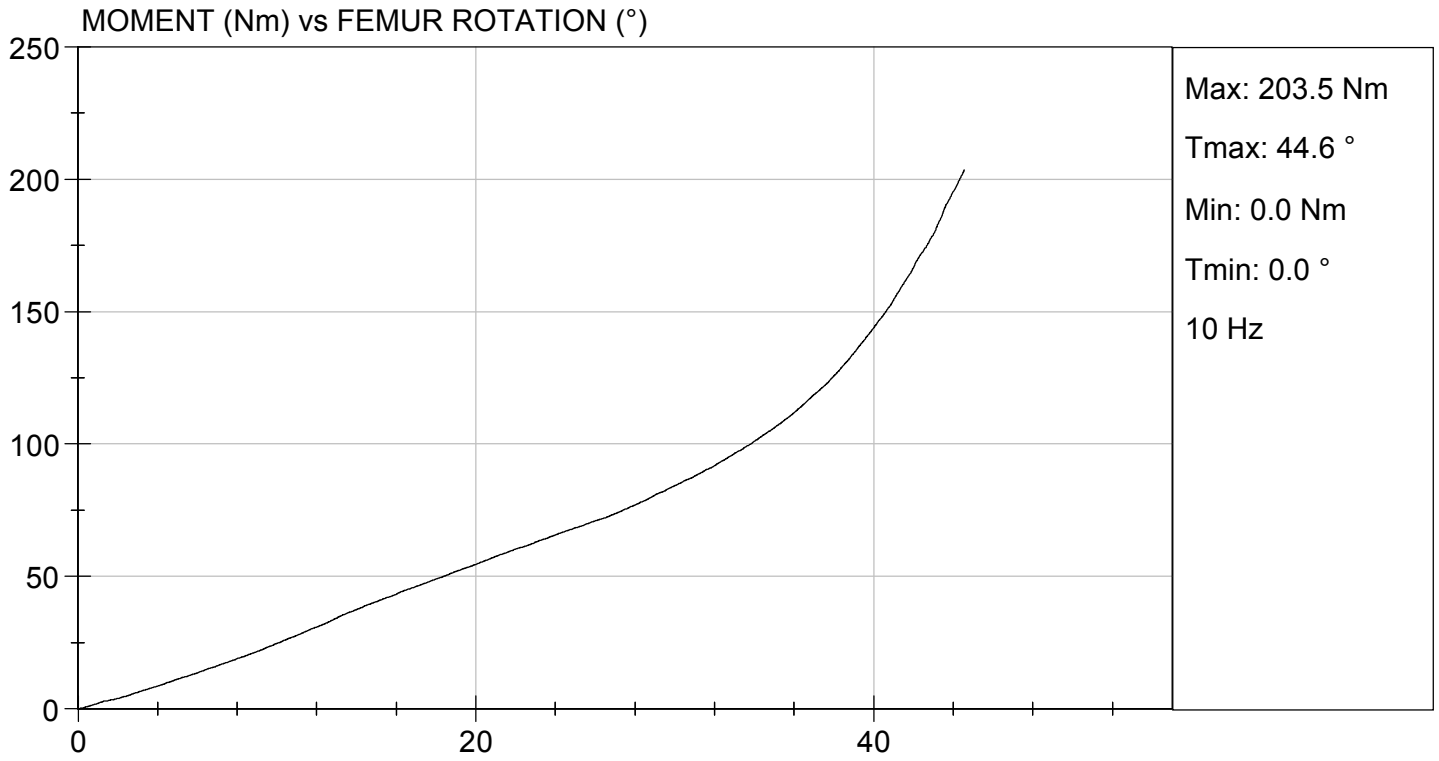
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	17	17	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.5	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	93.3	84.3	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	46.4	44.6	Pass
Overall Test Results					Pass

  
 Laboratory Technician

11/19/2018  
 Test Date

  
 Approved By





**CALIBRATION TEST RESULTS**

**PRE-TEST**

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

**Hybrid III, 5<sup>th</sup> External Measurements**  
**SN: 138**

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	785.1
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	456.8
C	H-POINT HEIGHT	Reference	81.3-86.3	84.0
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	146.2
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	78.0
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	127.5
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	249.6
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	280.2
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	201.9
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	526.7
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376.0	362.3
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	398.0

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	430.5
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	184.6
P	FOOT LENGTH	Tip of toe to rear of heel	218.5-233.7	221.0
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	472.6
S	HEAD BREADTH	The widest part of the head	137.1-147.3	141.9
T	HEAD DEPTH	Back of the head to the forehead	177.8-188.0	184.2
U	HIP BREADTH	The widest part of the hip	299.7-314.9	307.4
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	350.5-365.7	360.5
W	FOOT BREADTH	The widest part of the foot	78.8-94.0	85.0
X	HEAD CIRCUMFERENCE	Measured at the point as in dim. "T"	528.3-548.7	546.2
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 345.4 ± 12.7 mm above seat surface	850.9-881.3	875.1
Z	WAIST CIRCUMFERENCE	Measured 165.1 ± 5.1 mm above seat surface	759.5-789.9	785.4
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:** 138

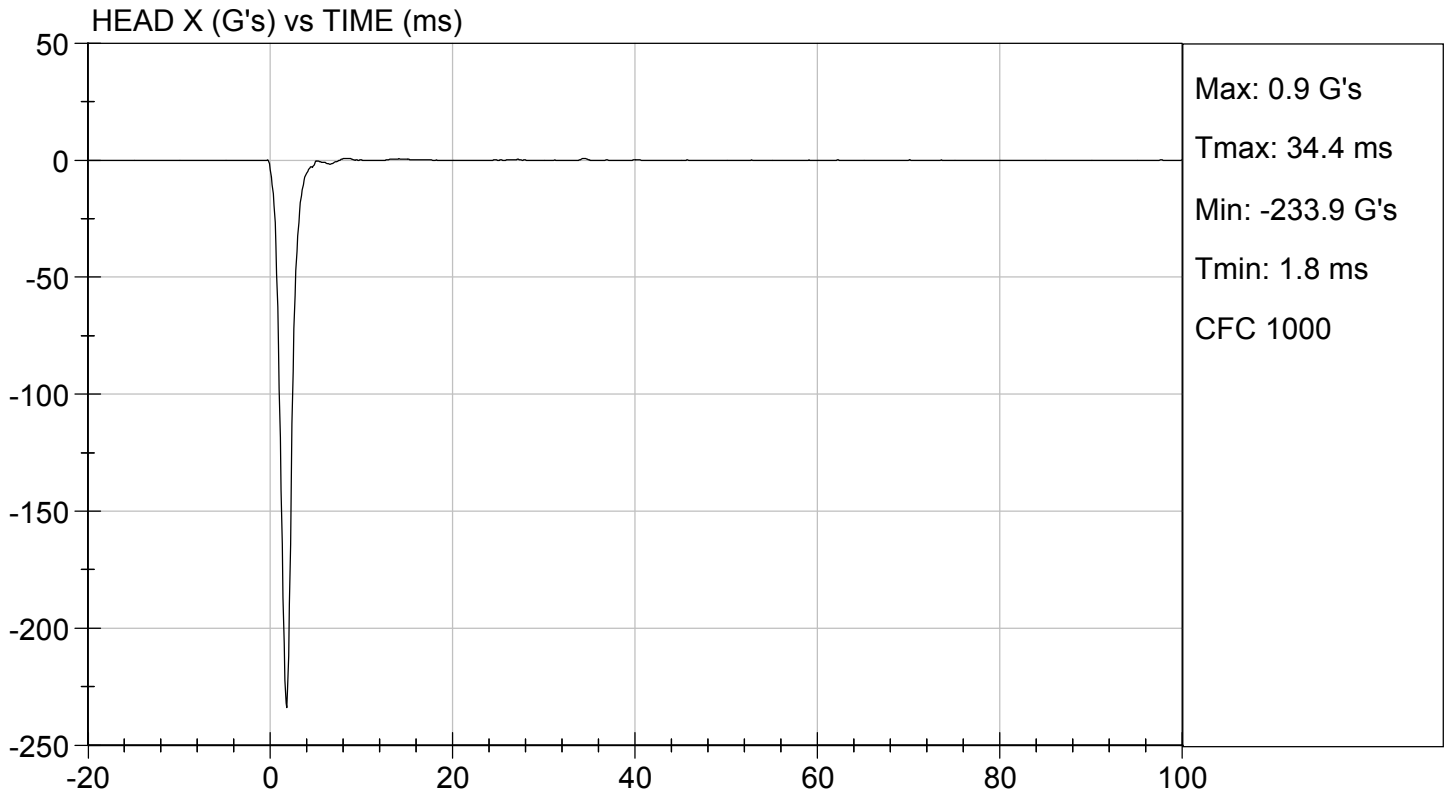
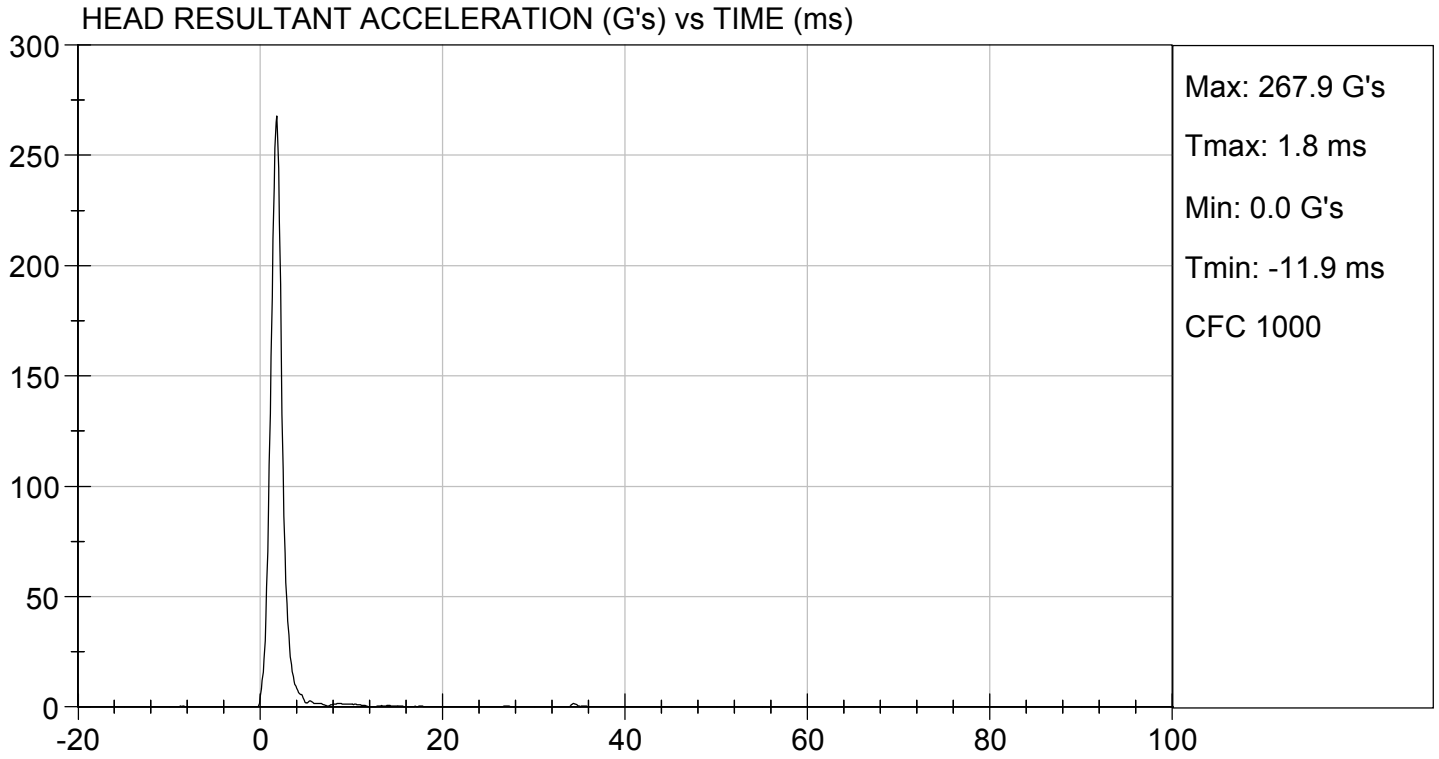
**Test ID:** D183051

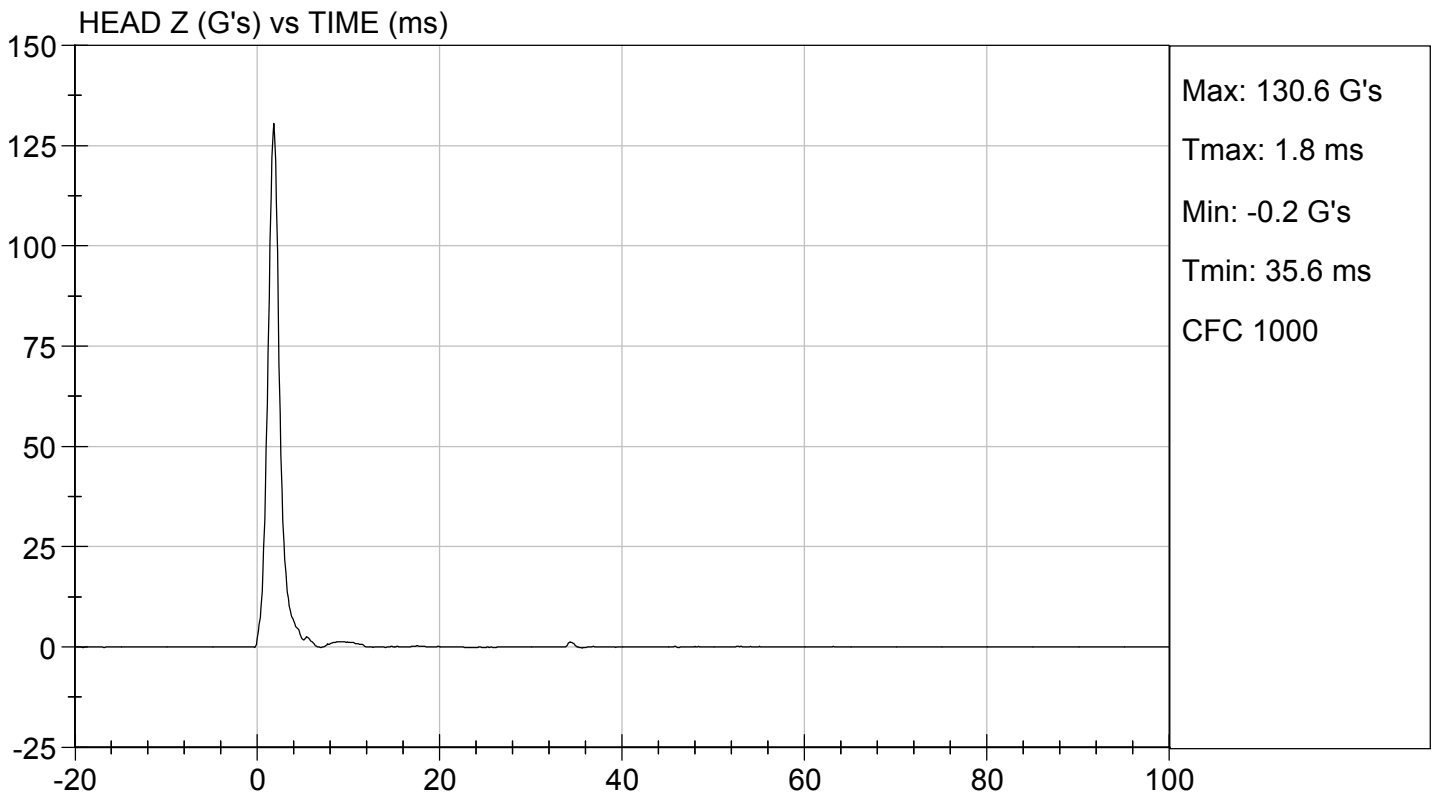
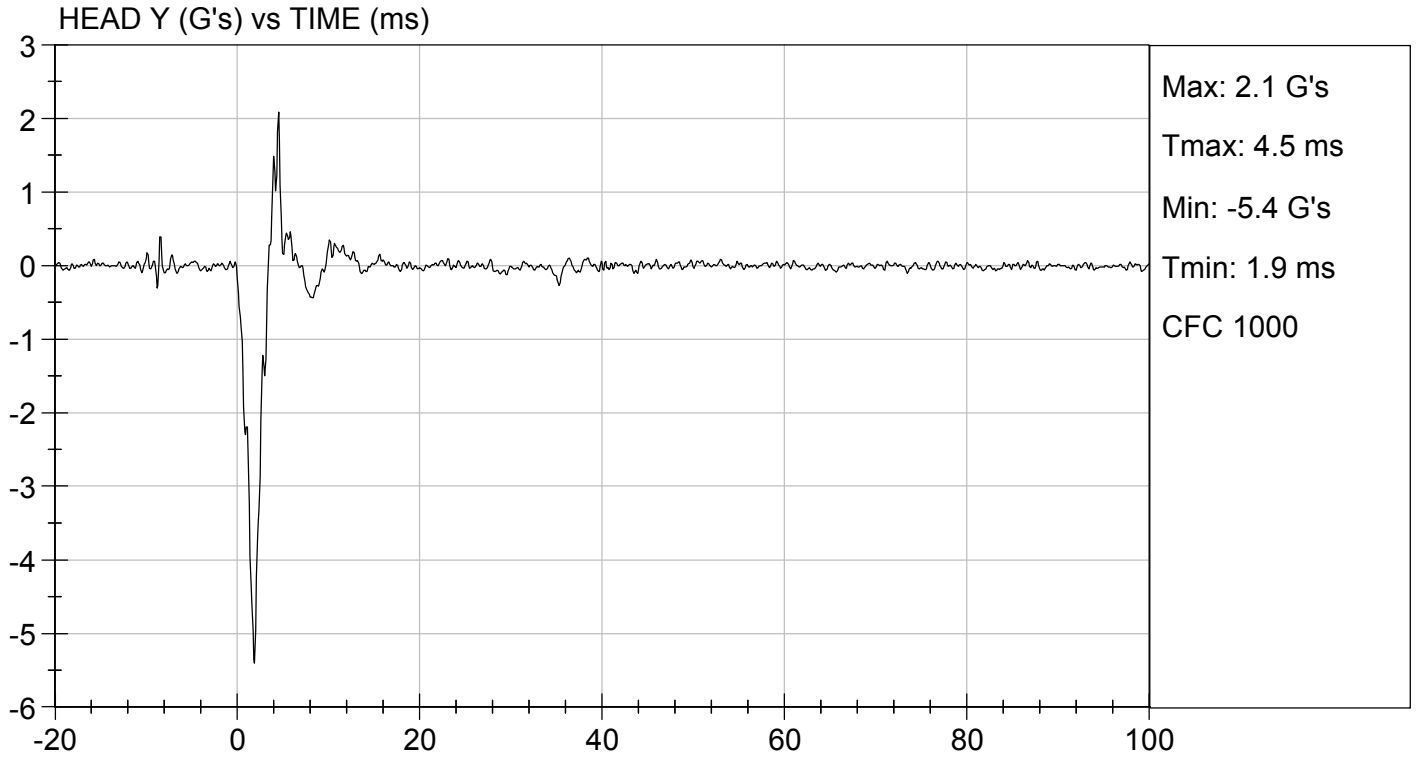
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Peak Resultant Acceleration	G's	250 to 300	268	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-5.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>

*Jacob D Taylor*  
Laboratory Technician

10/10/2018  
Test Date

*B. F. K.*  
Approved By





**MGA RESEARCH CORPORATION**

**NECK FLEXION TEST**

**HYBRID III 5TH PERCENTILE**

ATD Serial No: 138

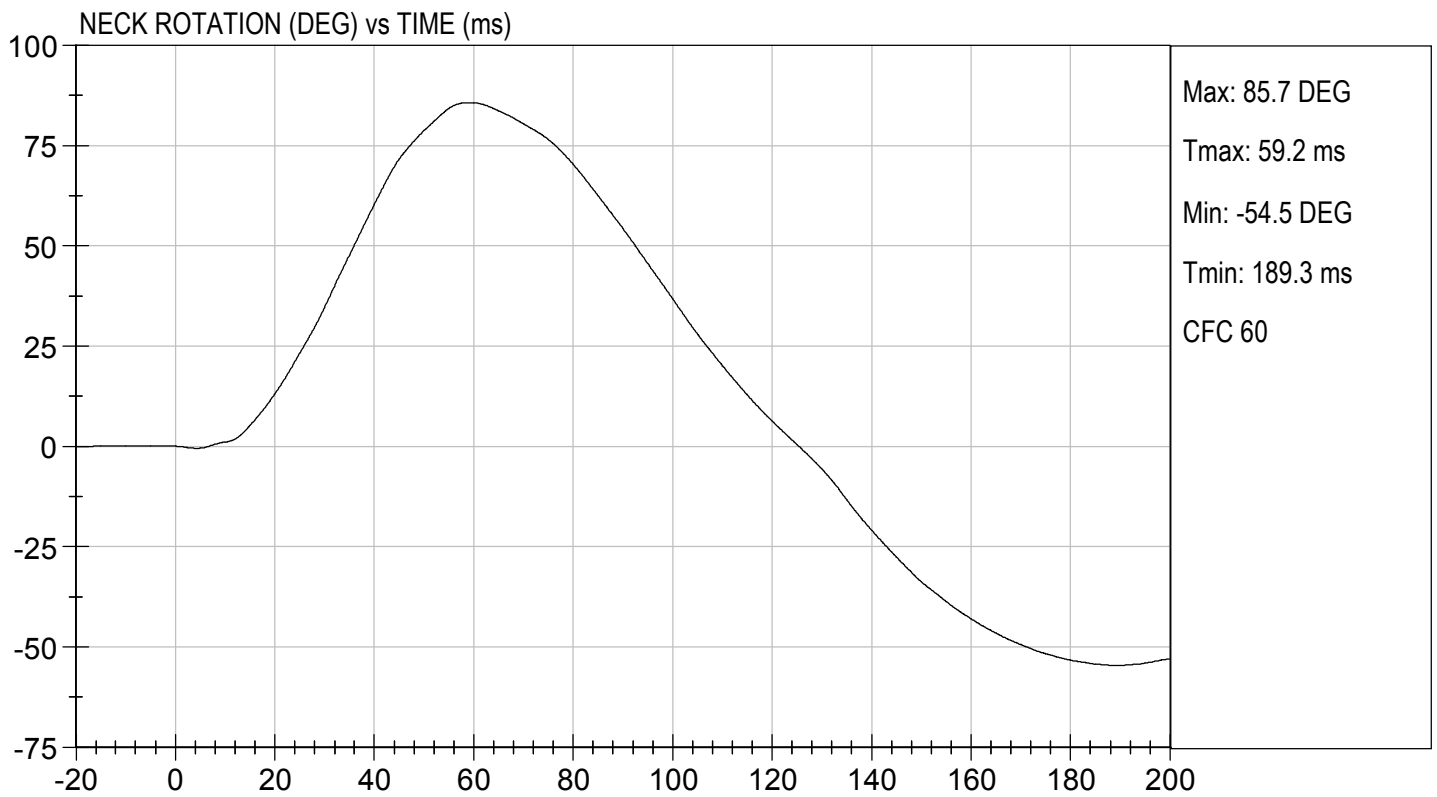
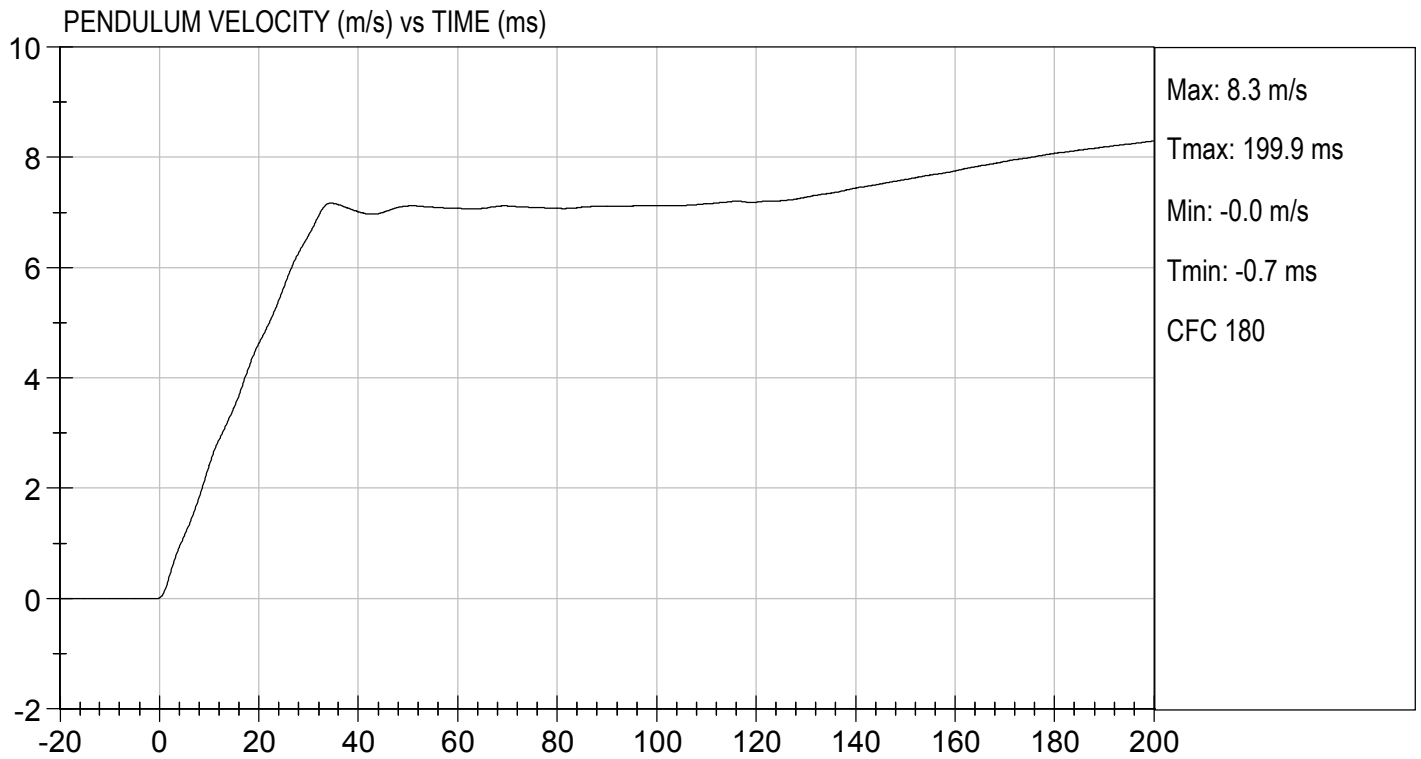
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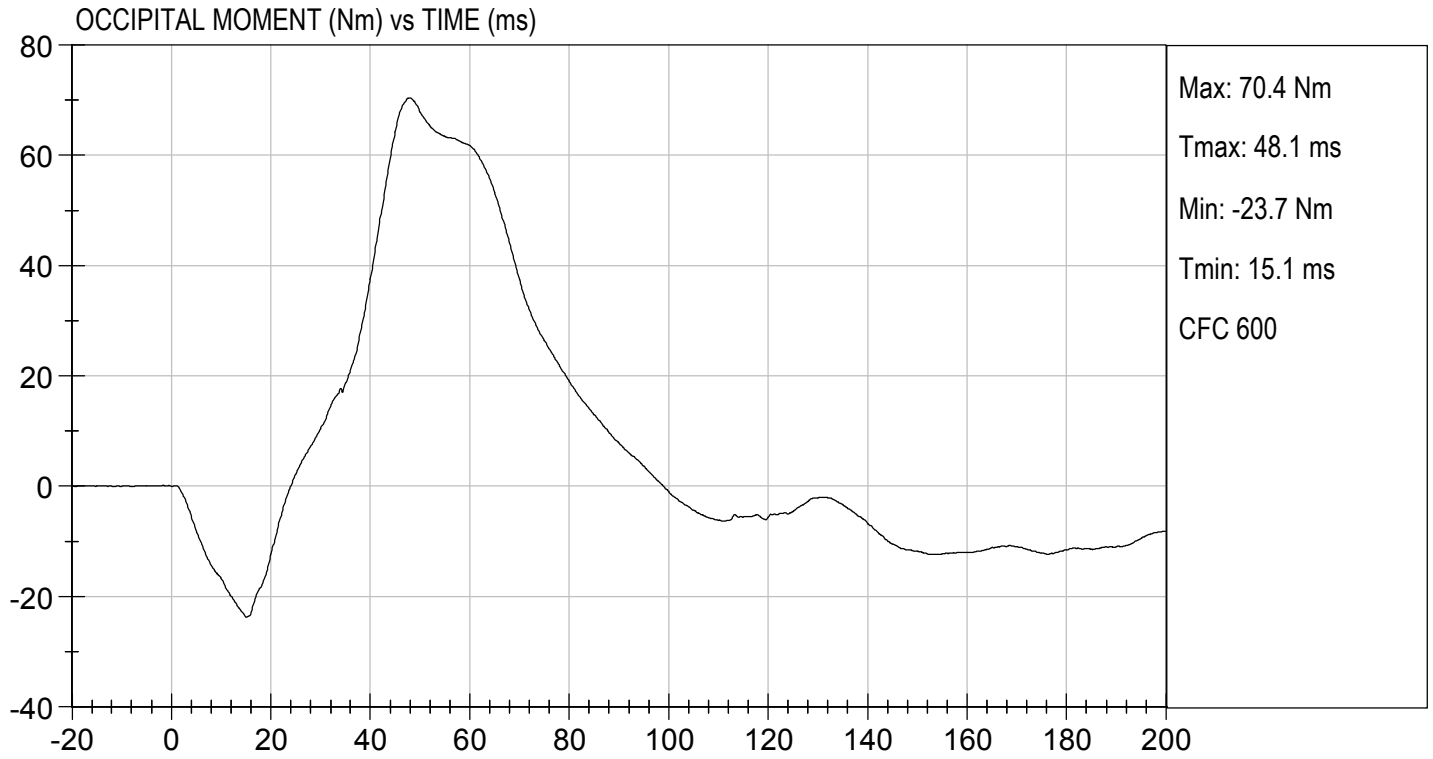
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	52	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.6	Pass
	30 ms	m/s	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	86	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results					Pass

Jacob D Taylor  
Laboratory Technician

10/10/2018  
Test Date

B. F. L.  
Approved By





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

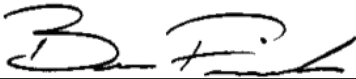
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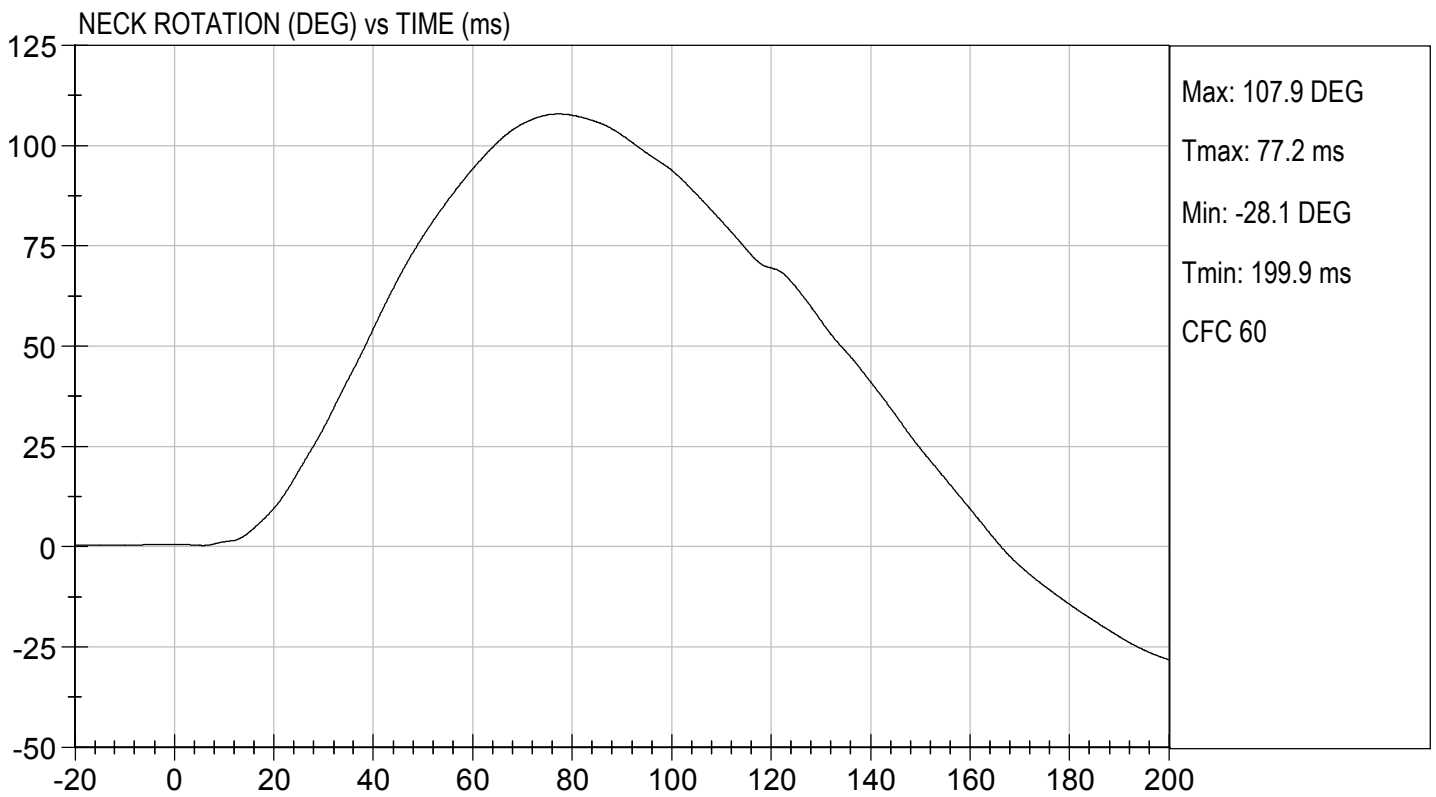
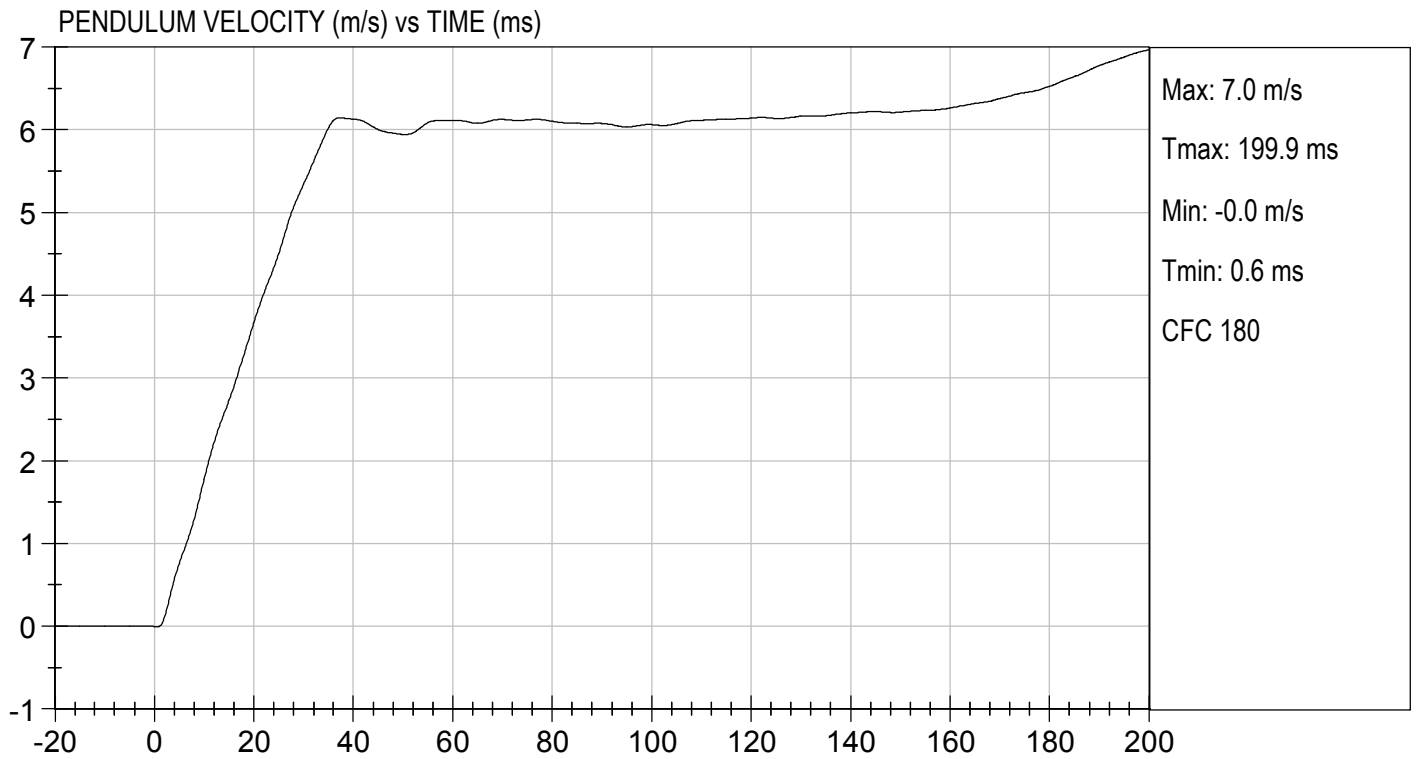
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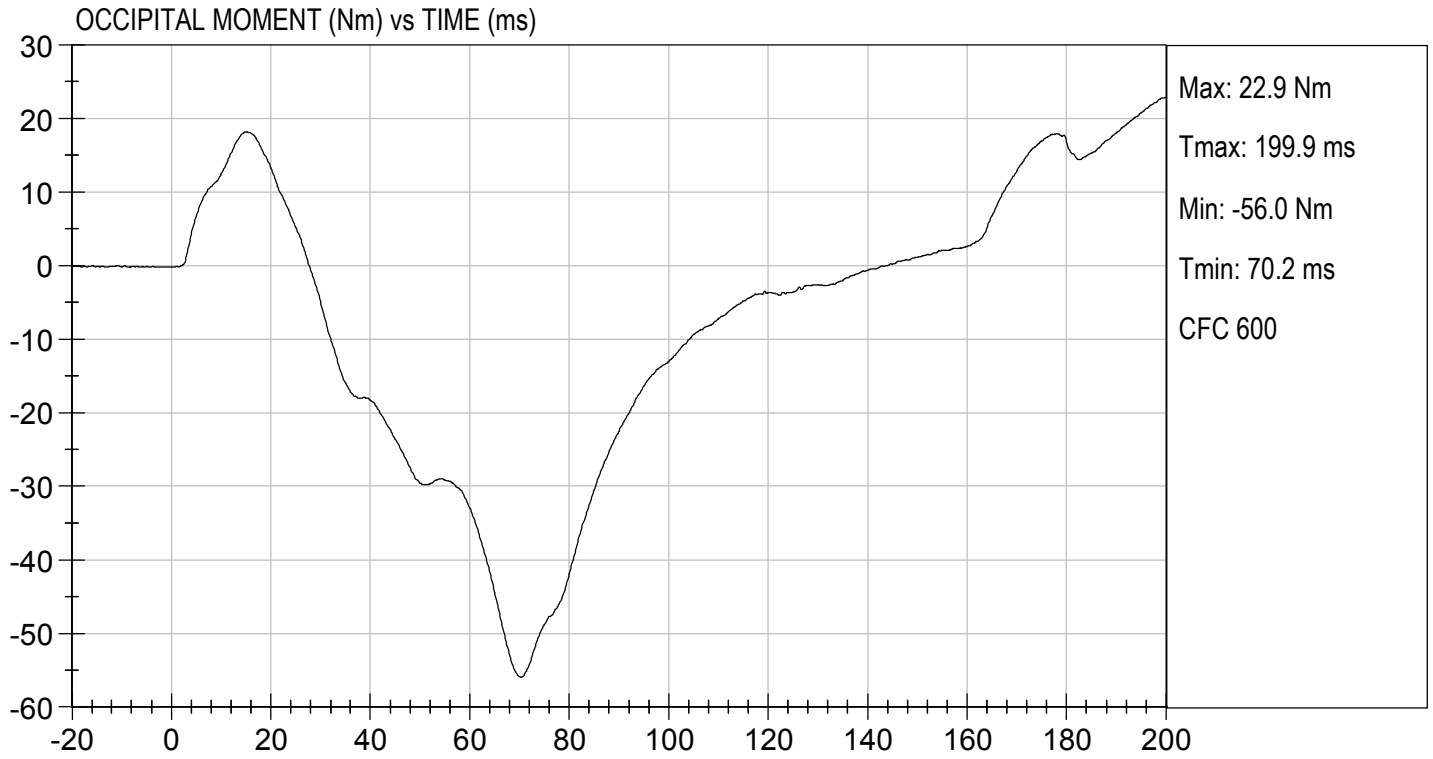
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	52	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.3	Pass
D Plane Rotation	Max	deg	99 to 114	108	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-56	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	103	Pass
Overall Results					Pass

  
 Laboratory Technician

10/10/2018  
 Test Date

  
 Approved By





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

ATD Serial No: 138

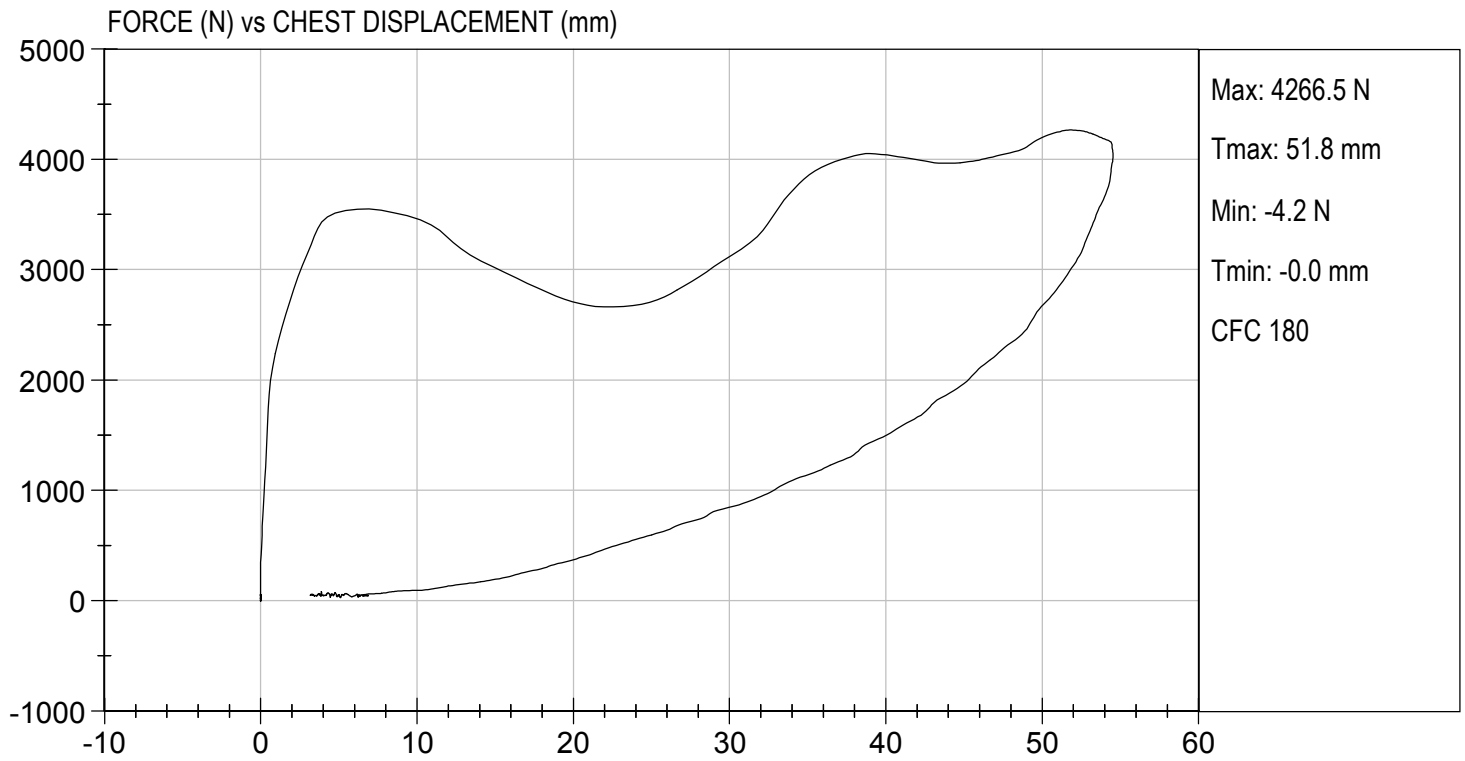
Test I.D: D183054

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Relative Humidity	%	10 to 70	51	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	55	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4266	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4199	Pass
Overall Test Results				Pass

*Jacob D Taylor*  
 Laboratory Technician

10/10/2018  
 Test Date

*B. F. H.*  
 Approved By



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

**ATD Serial No:** 138

**Test I.D:** D183055

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Probe Speed	m/s	2.07 to 2.13	2.08	Pass
Maximum Force	N	3450 to 4060	3603	Pass
Overall Test Results				Pass

Jacob D Taylor  
Laboratory Technician

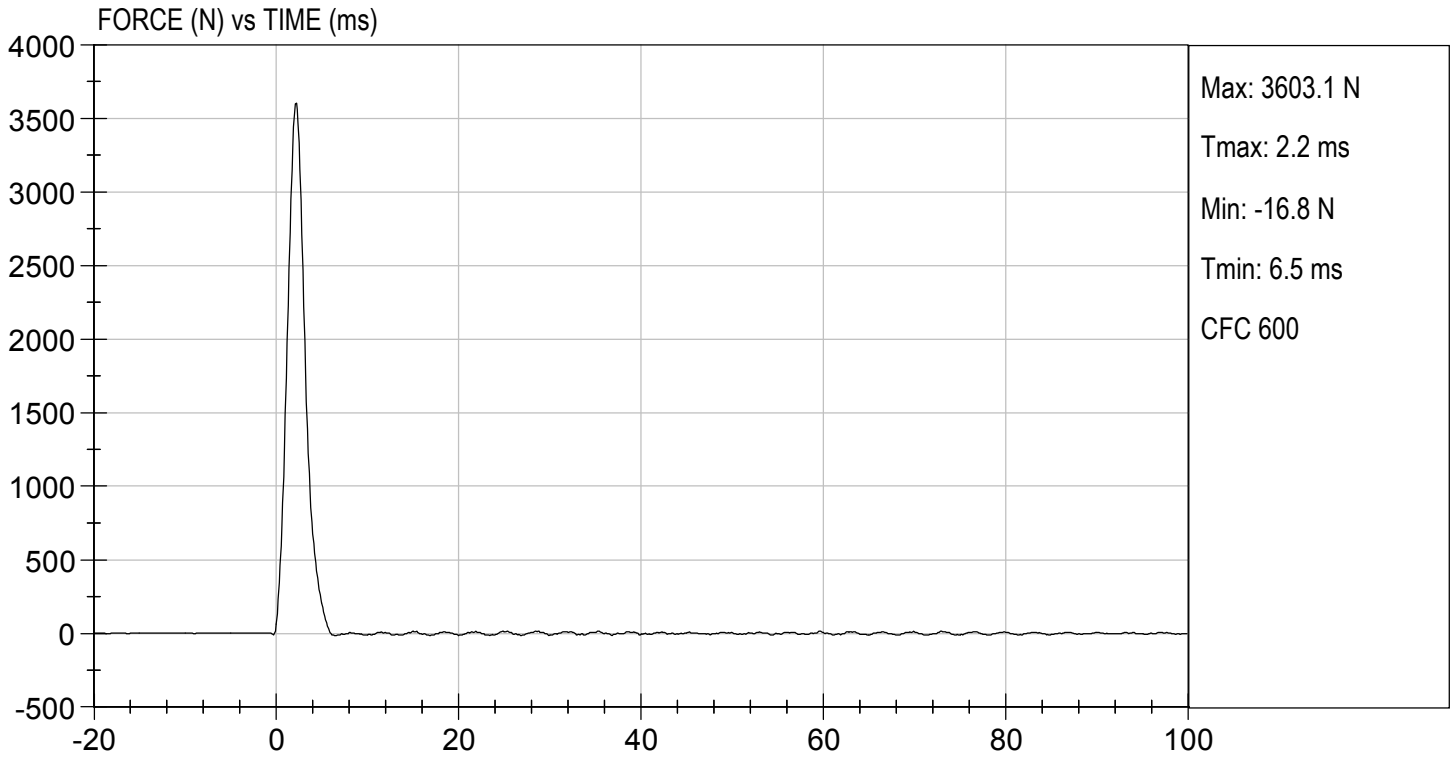
10/10/2018  
Test Date

B. F. K.  
Approved By



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

TEST DATE: 10/10/2018  
TEST #: D183055



**MGA RESEARCH CORPORATION**

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

**ATD Serial No:** 138

**Test I.D:** D183056

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	N	3450 to 4060	3829	Pass
Overall Test Results				Pass

Jacob D Taylor  
Laboratory Technician

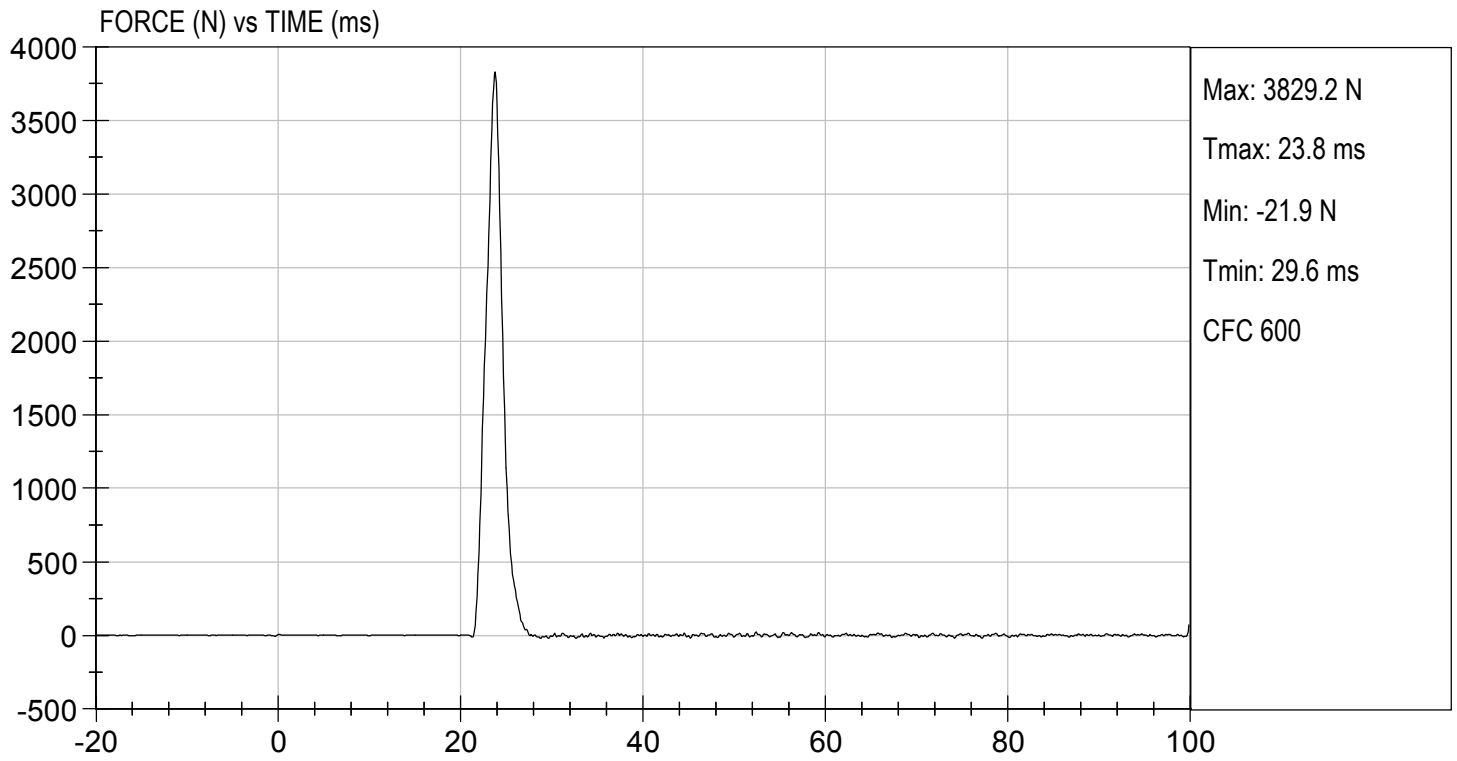
10/10/2018  
Test Date

B. F. K.  
Approved By



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

TEST DATE: 10/10/2018  
TEST #: D183056



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

ATD Serial No: 138

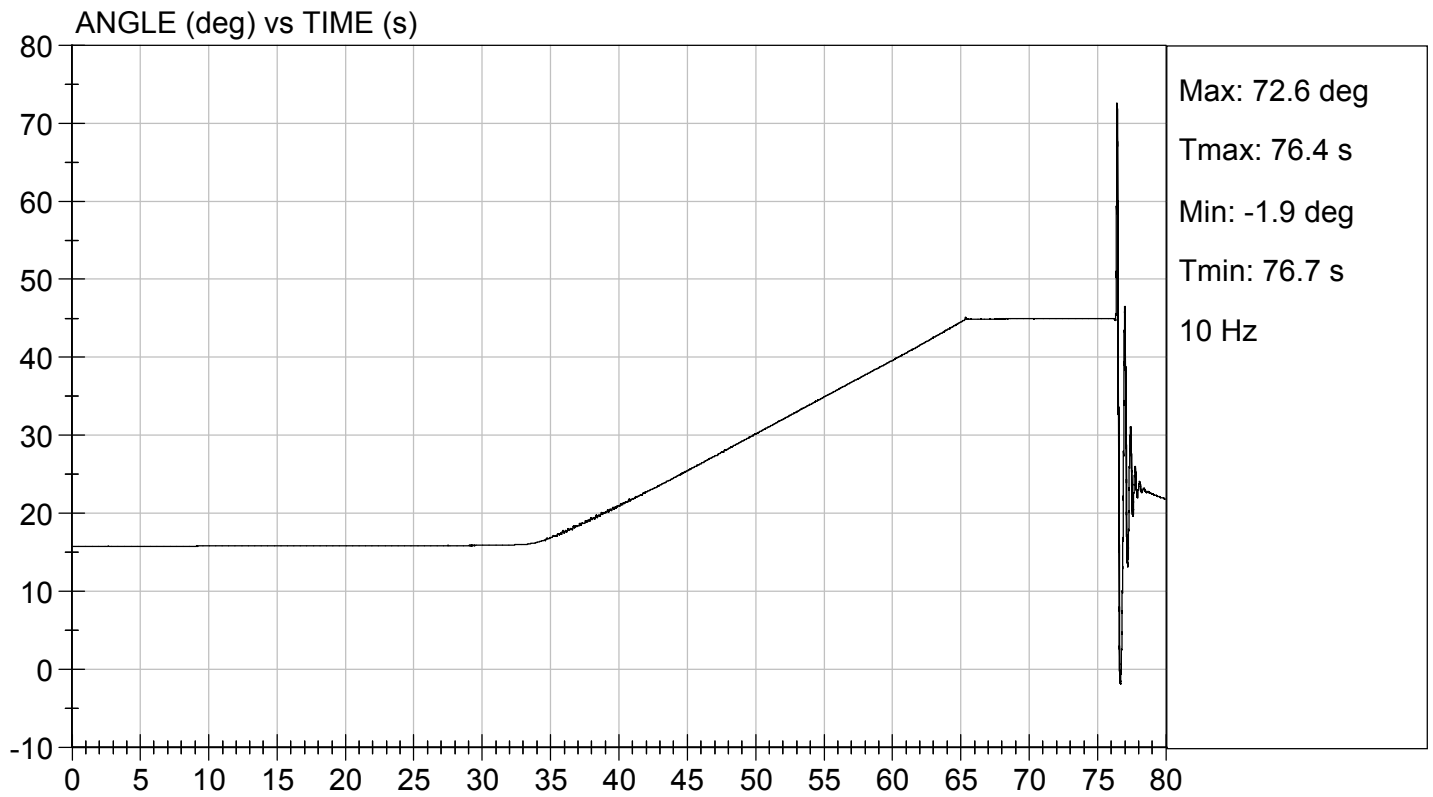
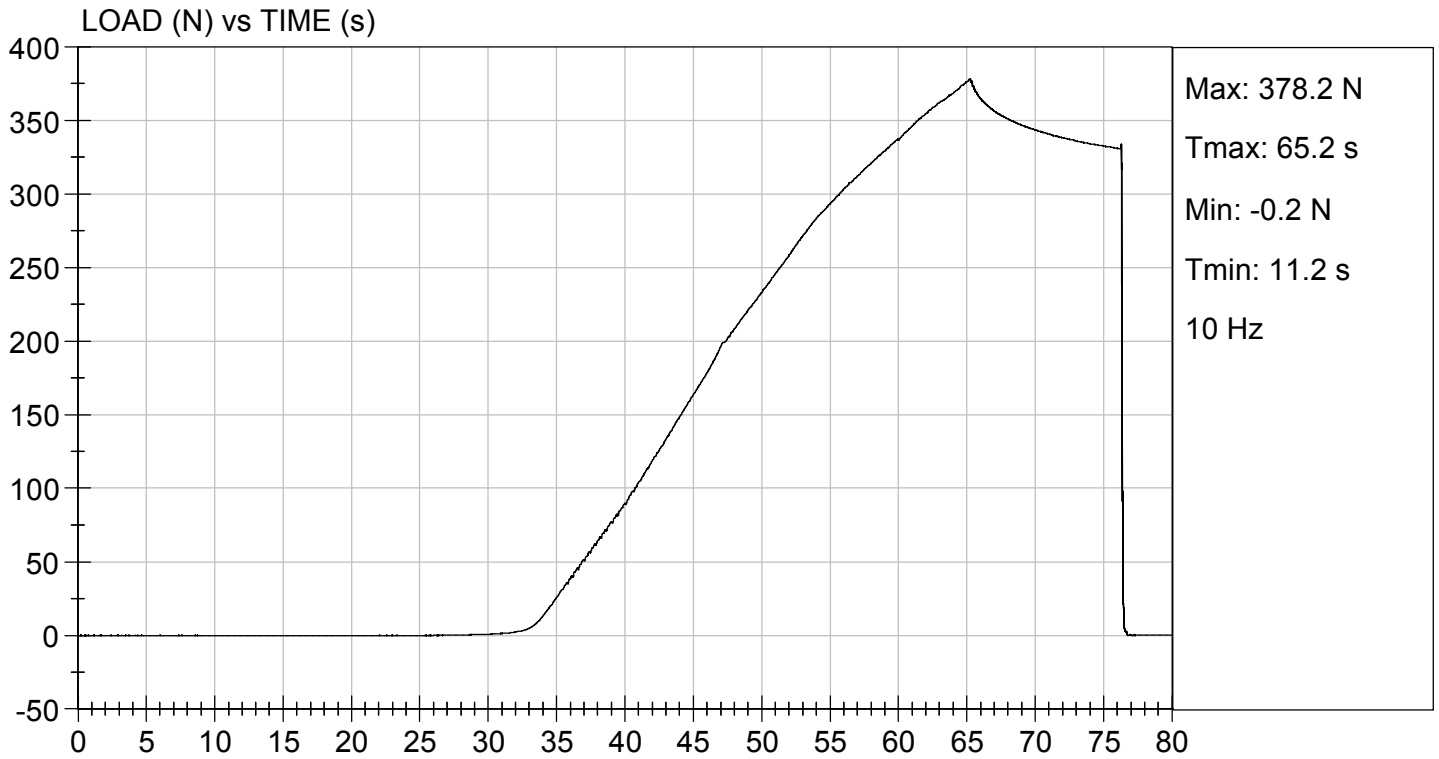
Test I.D: D183057

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	52	Pass
Initial Angle	deg	0 to 20	16	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	378	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
<b>Overall Result</b>				<b>Pass</b>

Jacob D Taylor  
 Laboratory Technician

10/10/2018  
 Test Date

B. F. H.  
 Approved By



**CALIBRATION TEST RESULTS**

**POST-TEST**

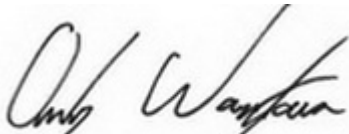
**HYBRID III 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

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

**ATD Serial No:** 138

**Test ID:** D183441

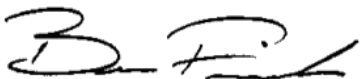
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	250 to 300	258	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>



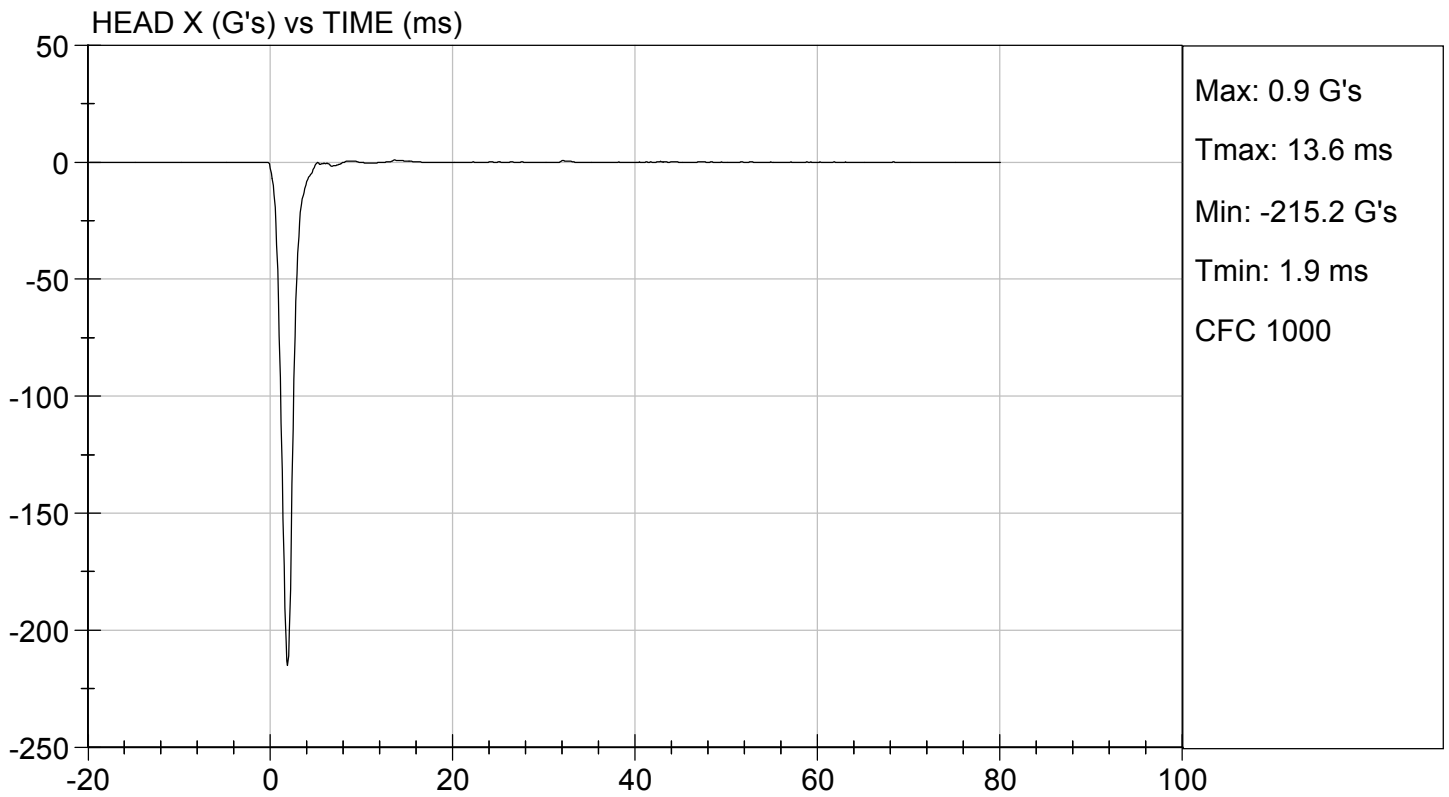
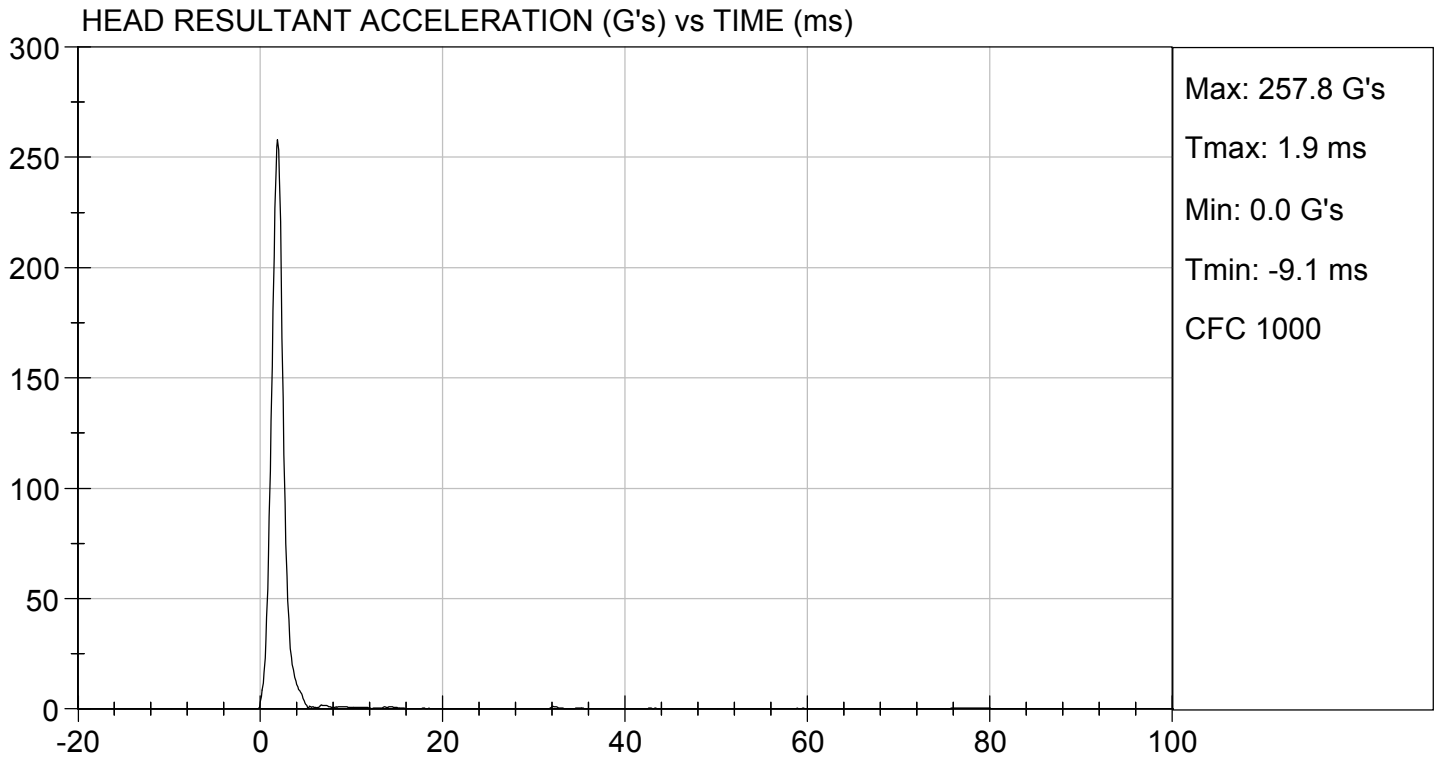
\_\_\_\_\_  
Laboratory Technician

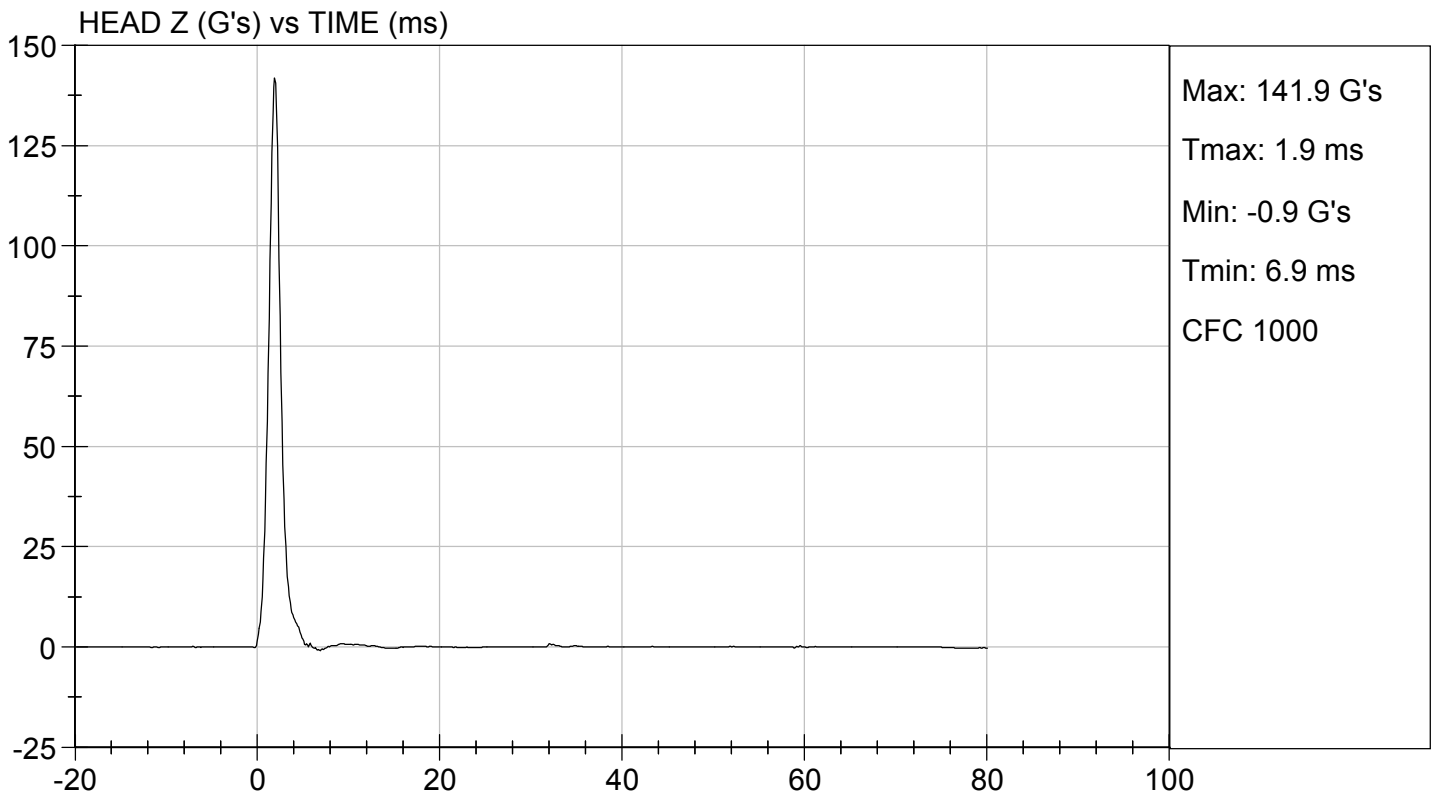
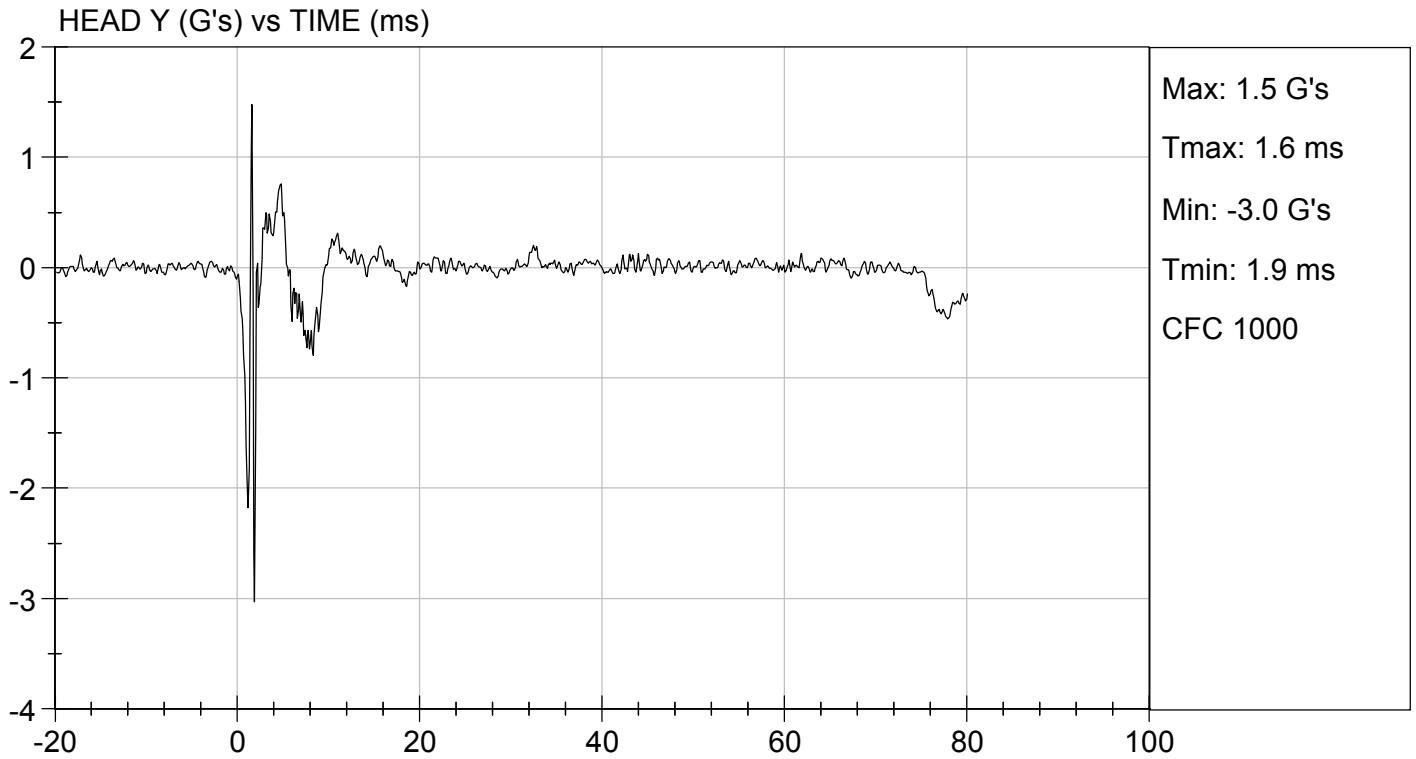
11/15/2018

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Test Date



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Approved By





**MGA RESEARCH CORPORATION**

**NECK FLEXION TEST**

**HYBRID III 5TH PERCENTILE**

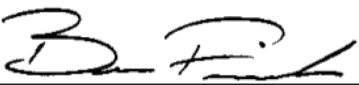
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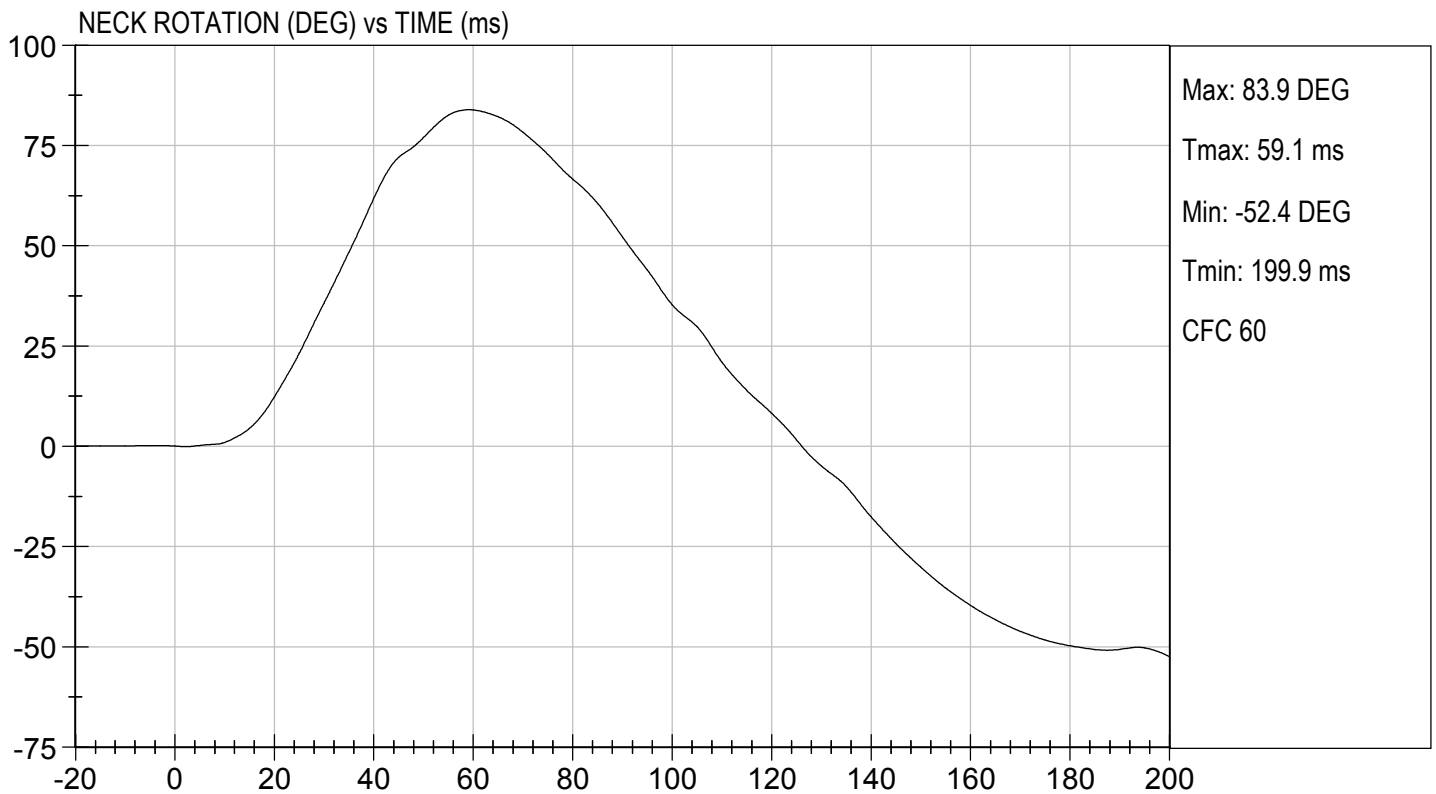
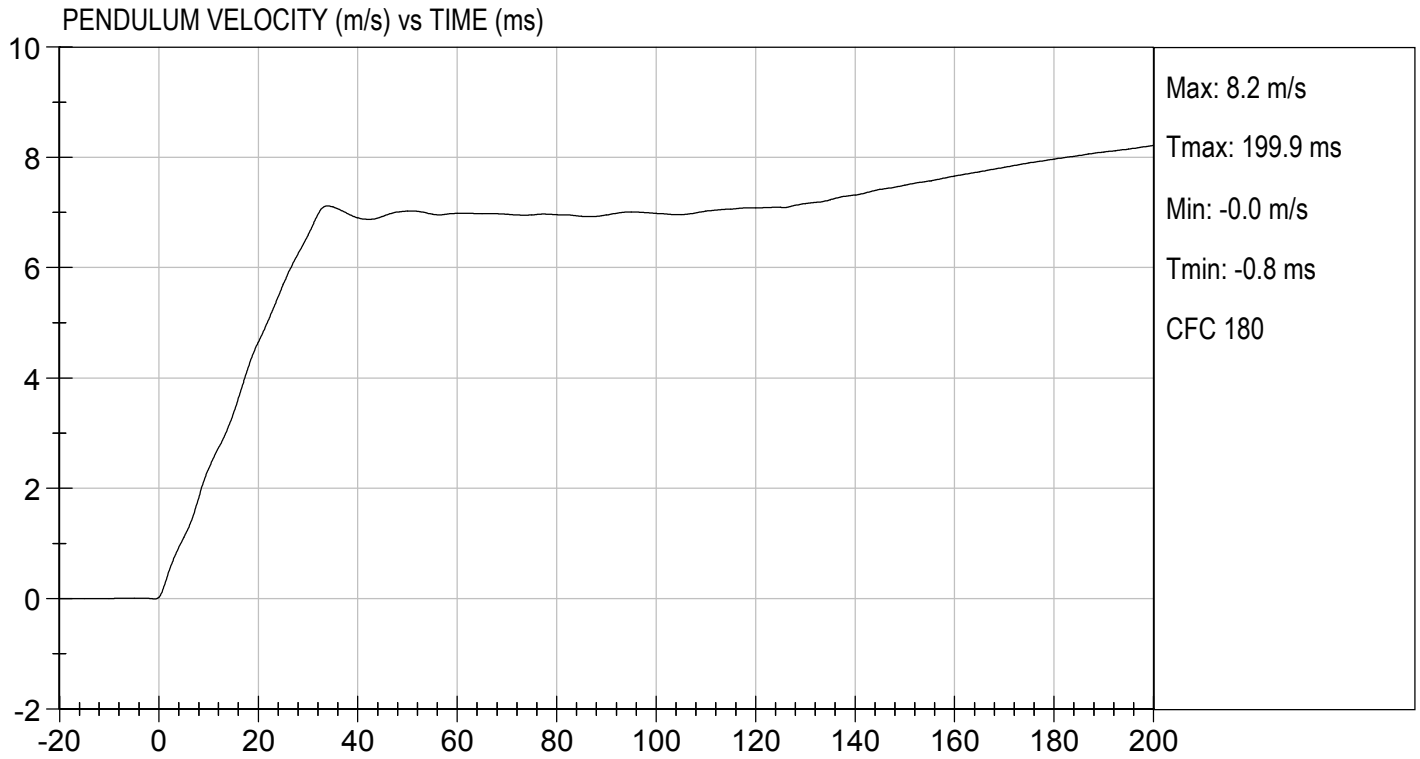
Test I.D.: D183442

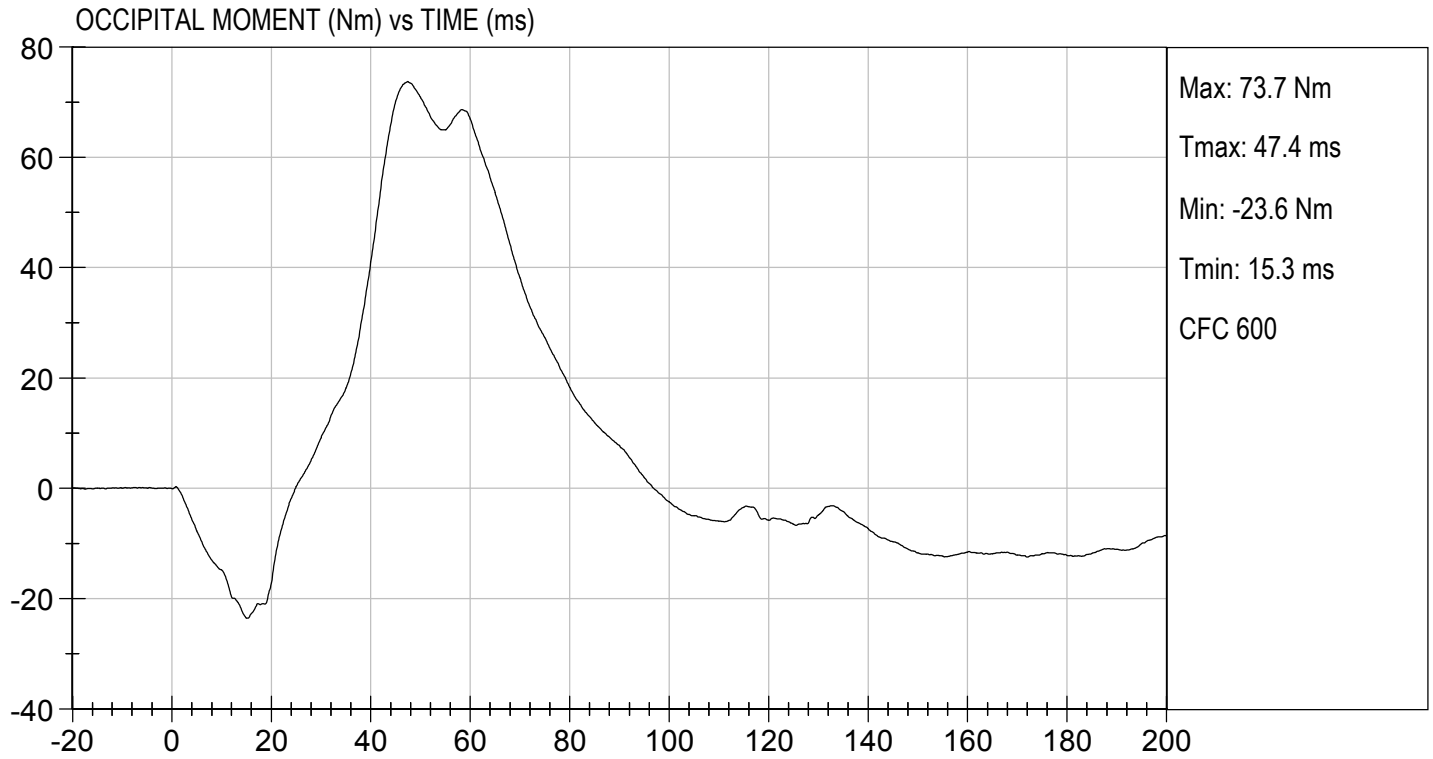
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	84	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	85	Pass
Overall Results					Pass

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

11/15/2018  
 \_\_\_\_\_  
 Test Date

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



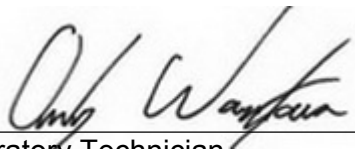


**MGA RESEARCH CORPORATION**  
**NECK EXTENSION TEST**  
**HYBRID III 5TH PERCENTILE**

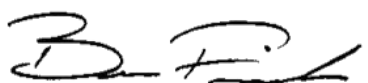
ATD Serial No: 138

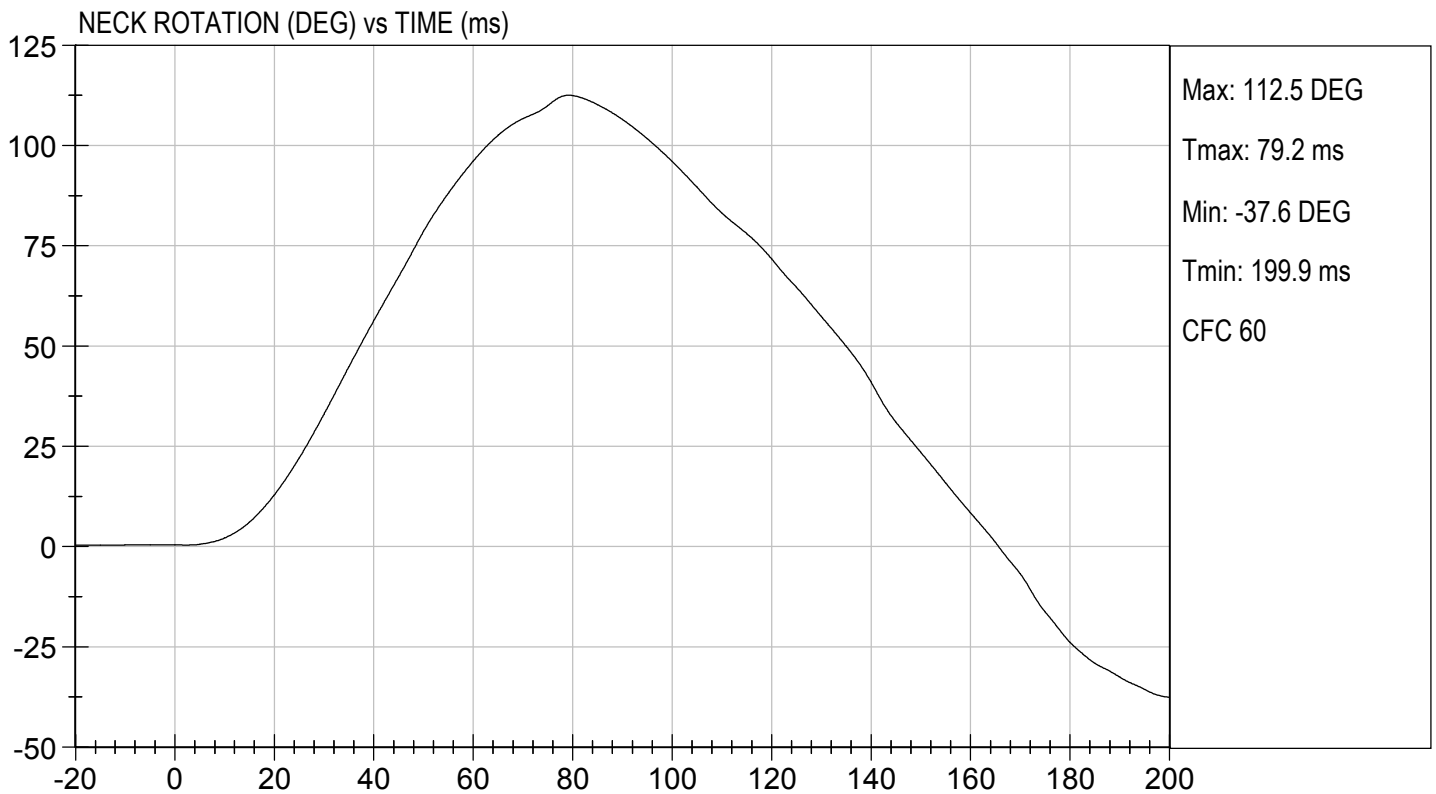
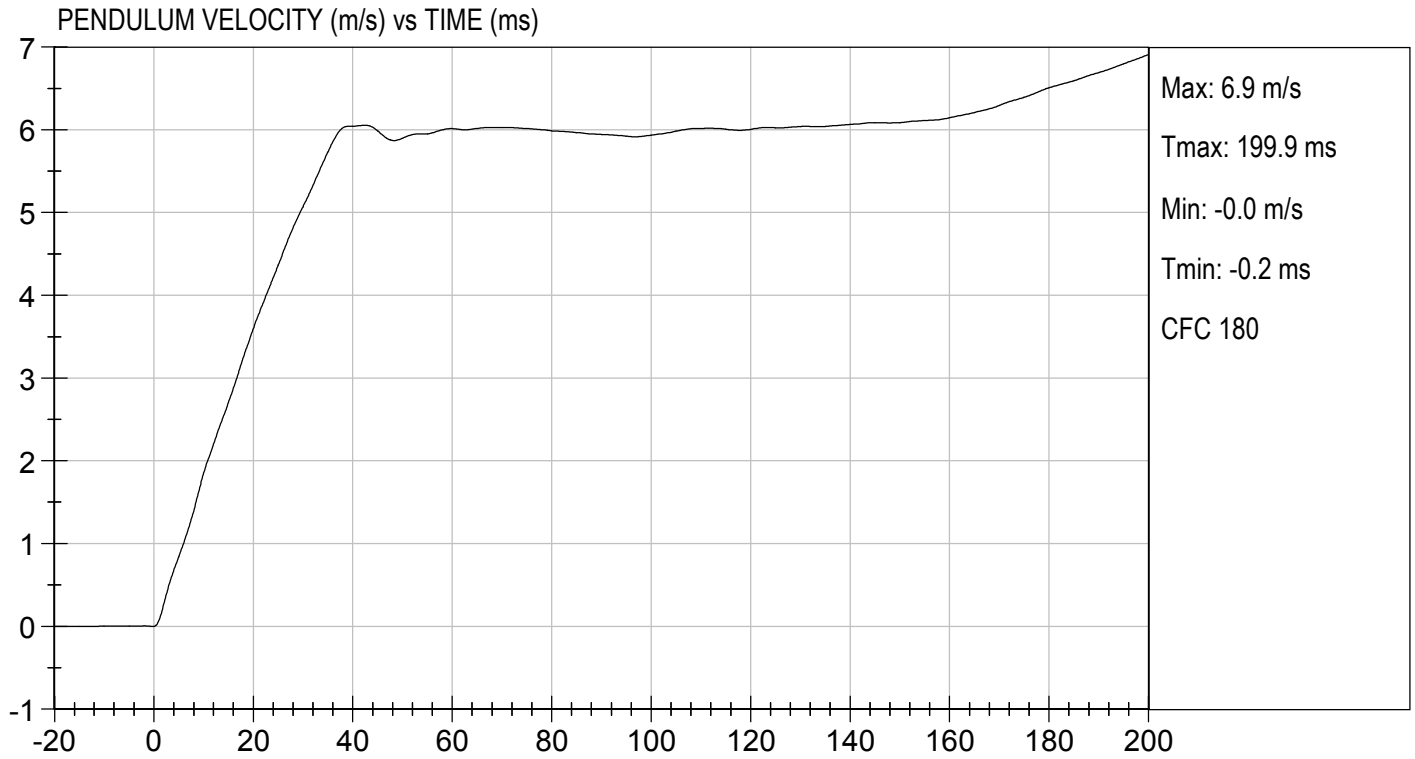
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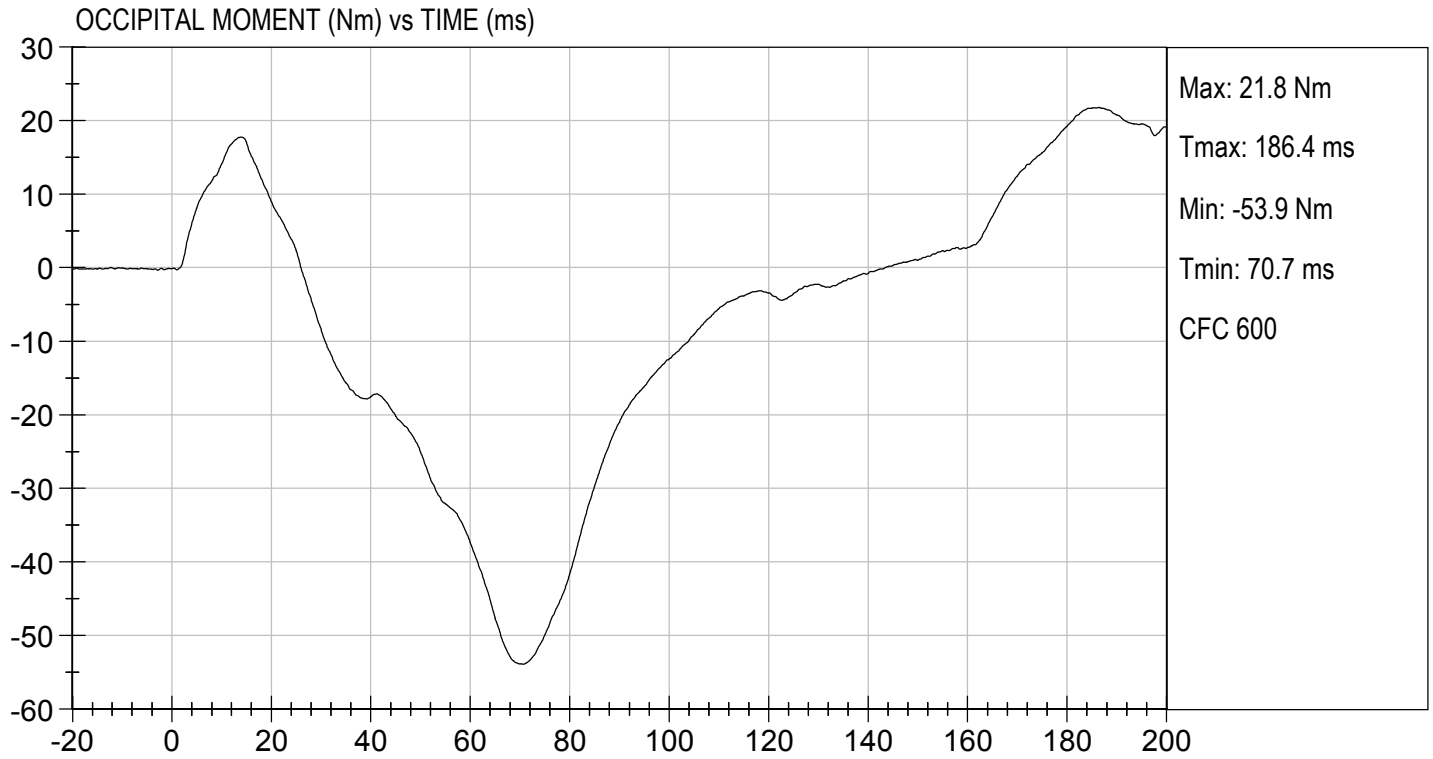
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Speed		m/s	5.95 to 6.19	5.98	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.9	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.1	Pass
D Plane Rotation	Max	deg	99 to 114	113	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-54	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	104	Pass
Overall Results					Pass

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

11/15/2018  
 \_\_\_\_\_  
 Test Date

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



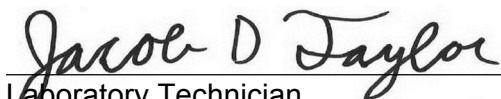


**MGA RESEARCH CORPORATION**  
**THORAX IMPACT**  
**HYBRID III 5TH PERCENTILE**

ATD Serial No: 138

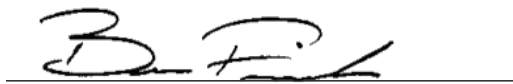
Test I.D: D183444

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Relative Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	6.59 to 6.83	6.60	Pass
Peak Deflection	mm	50 to 58	52	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4398	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4405	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/16/2018

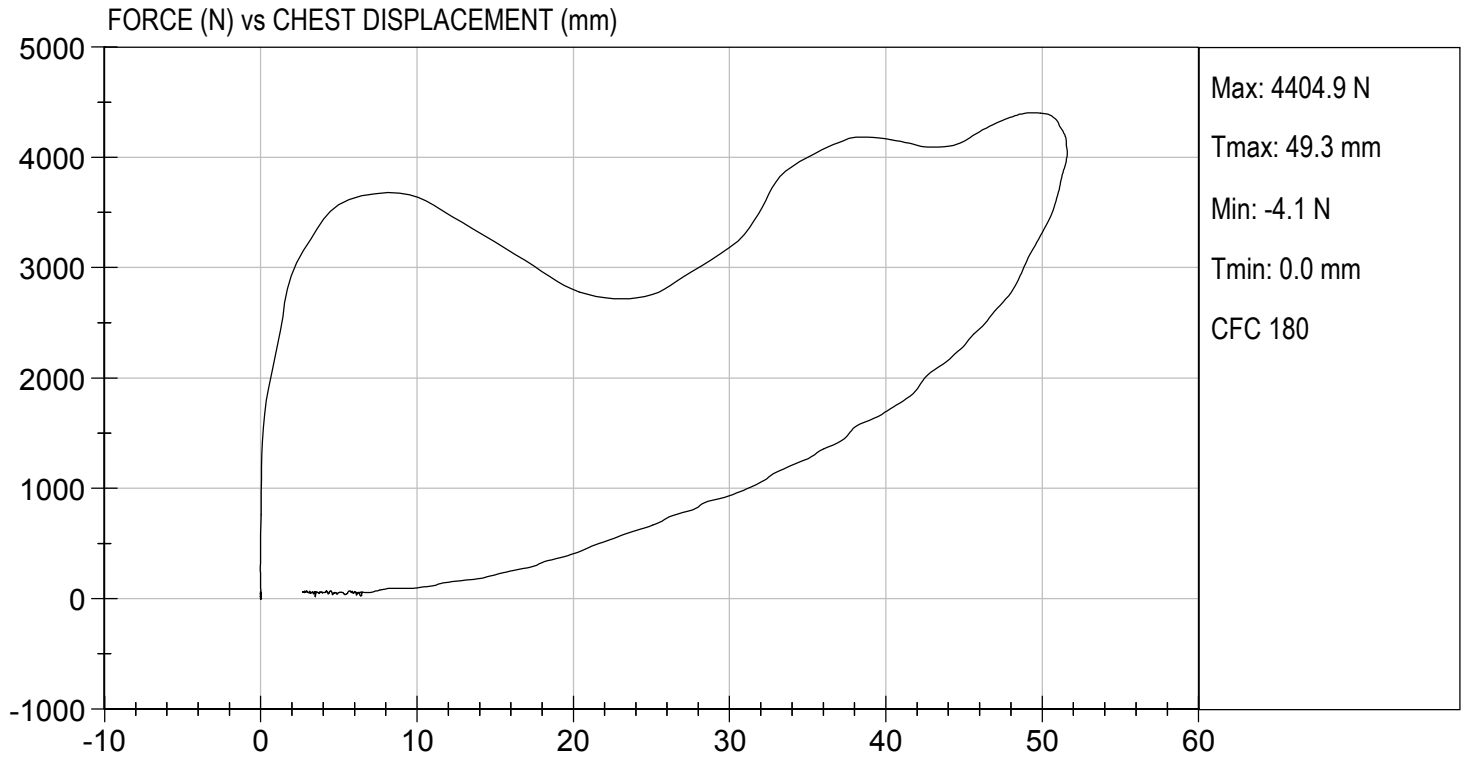
Test Date

  
 Approved By



TEST DESC: THORAX IMPACT  
VELOCITY: 21.65 ft/s, 6.60 m/s

TEST DATE: 11/16/2018  
TEST #: D183444

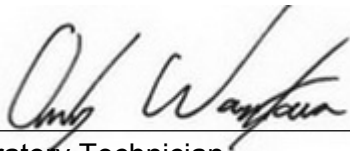


**MGA RESEARCH CORPORATION**  
**RIGHT KNEE IMPACT TEST**  
**HYBRID III 5TH PERCENTILE**

**ATD Serial No:** 138

**Test I.D:** D183445

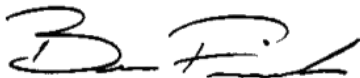
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	N	3450 to 4060	3677	Pass
Overall Test Results				Pass



Laboratory Technician

11/15/2018

Test Date

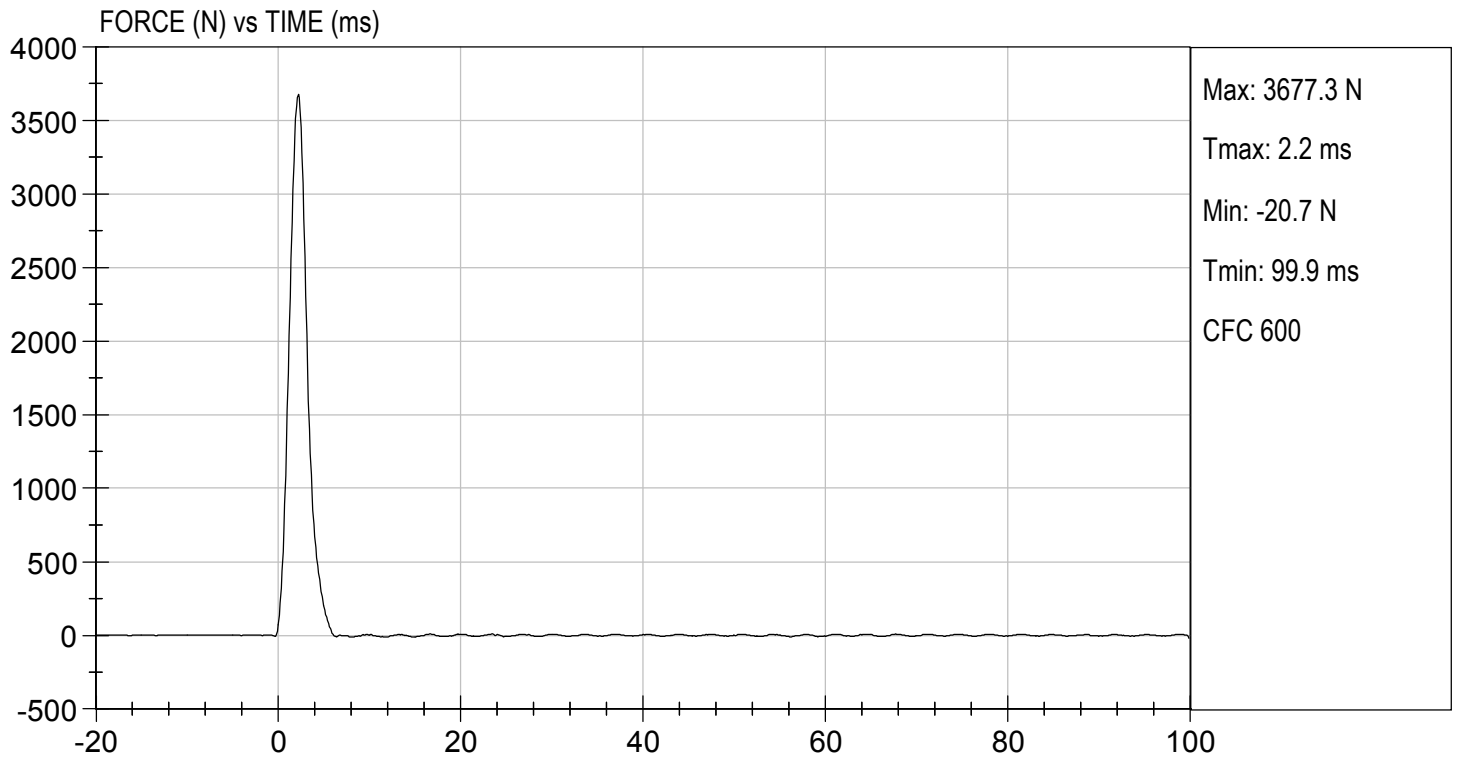


Approved By



TEST DESC: RIGHT KNEE  
VELOCITY: 7.00 ft/s, 2.13 m/s

TEST DATE: 11/15/2018  
TEST #: D183445

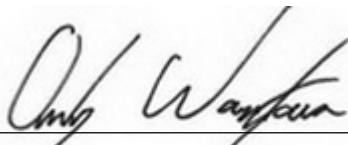


**MGA RESEARCH CORPORATION**  
**LEFT KNEE IMPACT TEST**  
**HYBRID III 5TH PERCENTILE**

**ATD Serial No:** 138

**Test I.D:** D183446

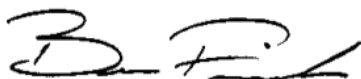
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Speed	m/s	2.07 to 2.13	2.09	Pass
Maximum Force	N	3450 to 4060	3605	Pass
<b>Overall Test Results</b>				<b>Pass</b>



Laboratory Technician

11/15/2018

Test Date

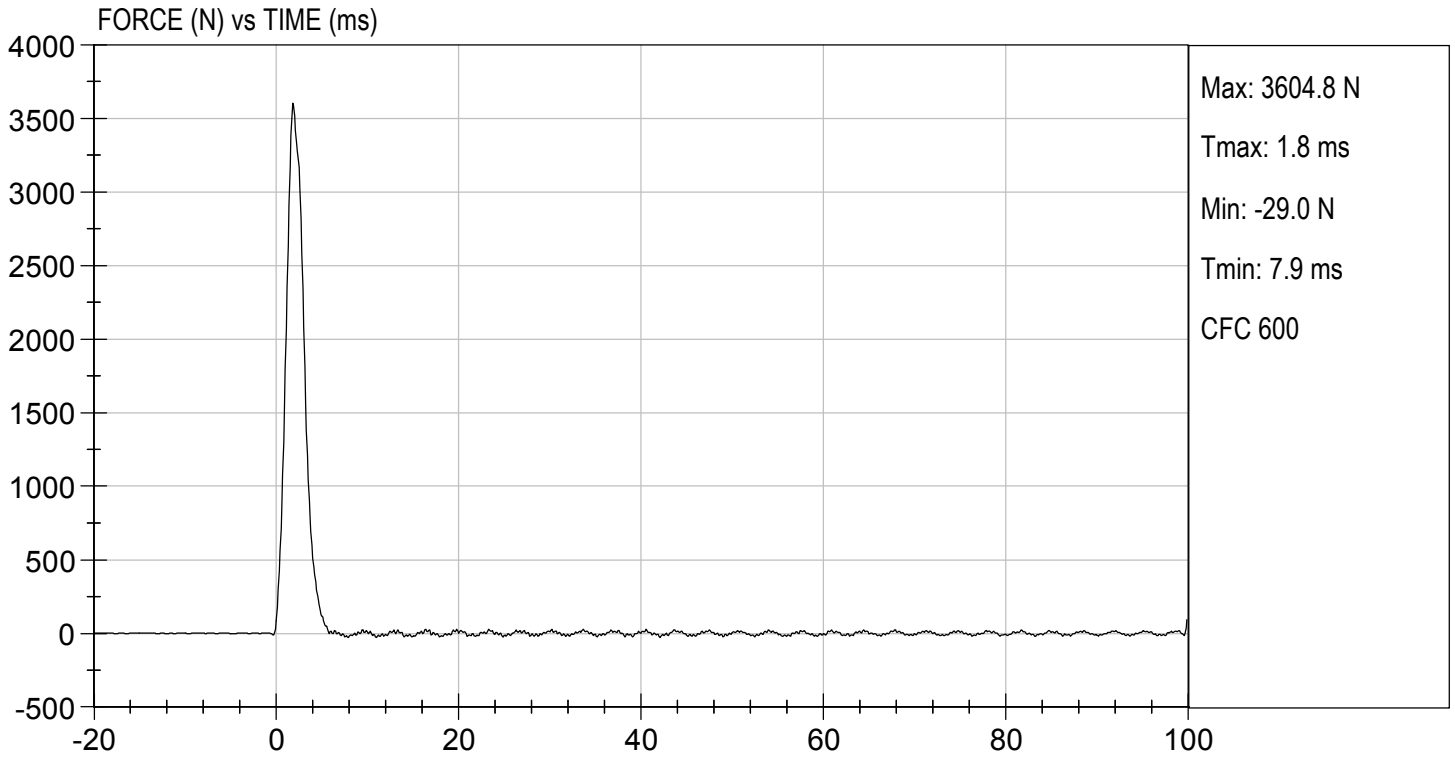


Approved By



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

TEST DATE: 11/15/2018  
TEST #: D183446

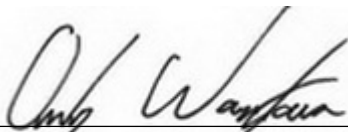


**MGA RESEARCH CORPORATION**  
**TORSO FLEXION TEST**  
**HYBRID III 5TH PERCENTILE**

ATD Serial No: 138

Test I.D: D183447

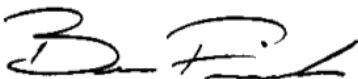
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	374	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.7	Pass
Overall Result				Pass



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

11/15/2018

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



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 Approved By

