

REPORT NUMBER: NCAP-MGA-20-020

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

**GENERAL MOTORS LLC
2020 Cadillac CT5 Luxury AWD 4-Door Sedan
NHTSA No.: M20200103**

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



Test Date: June 17, 2020

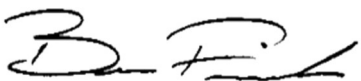
Final Report Date: September 1, 2020

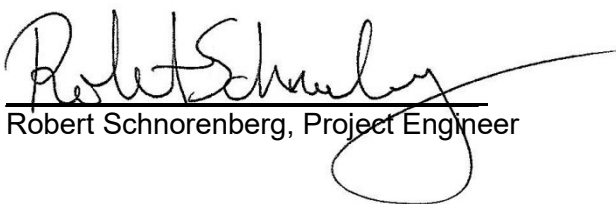
FINAL REPORT

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

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Robert Schnorenberg, Project Engineer

Approval Date: September 1, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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16. Abstract A 56.3 km/h NCAP Frontal Rigid Barrier Impact Test was conducted on a 2020 Cadillac CT5 Luxury AWD 4-Door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. 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 June 17, 2020. The impact velocity of the vehicle was 56.63 km/h and the ambient temperature at the barrier face at the time of impact was 21.7°C. The target vehicle post-test maximum crush was 505 mm located to the left of vehicle centerline. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td></td> <td>700</td> <td>155</td> <td>700</td> <td>340</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>21</td> <td>52</td> <td>15</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.24</td> <td>1</td> <td>0.25</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>964</td> <td>2620</td> <td>642</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>22</td> <td>2520</td> <td>351</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>1815</td> <td>6805</td> <td>415</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>1519</td> <td>6805</td> <td>160</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)		700	155	700	340	Maximum Chest Compression	mm	63	21	52	15	Nij		1	0.24	1	0.25	Neck Tension	N	4170	964	2620	642	Neck Compression	N	4000	22	2520	351	Left Femur Force	N	10008	1815	6805	415	Right Femur Force	N	10008	1519	6805	160
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SECTION 1 PURPOSE AND SUMMARY OF TEST

PURPOSE

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

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

SUMMARY

A load cell barrier consisting of 176 load cells was impacted by a 2020 Cadillac CT5 Luxury AWD 4-Door Sedan at a velocity of 56.63 km/h. The test was performed at MGA Research Corporation on June 17, 2020. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

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

The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. DH1659) were qualified previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

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

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

The maximum static crush of the vehicle was 505 mm located to the left of vehicle centerline and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee airbag.

The passenger's visible contact points were as follows: The passenger's head contacted the airbag. The passenger's head also contacted the headrest. The passenger's knees contacted the knee airbag.

The occupant data is summarized below:

ATD position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th)	155	0.24	964	22	37	21	1815	1519
Passenger (5 th)	340	0.25	642	351	43	15	415	160

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

TEST NOTES

Barrier K-15 My recorded no valid data

Barrier F-16 Fx recorded no valid data

Barrier C-01 Fx recorded no valid data

Barrier C-02 Fx recorded no valid data

Barrier C-02 My recorded no valid data

Barrier C-02 Mz 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: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20200103	Traction Control System (TCS)	Yes
Model Year	2020	Power Steering	Yes
Make	Cadillac	Power Window Auto-Reverse	Yes
Model	CT5 Luxury AWD	Driver Frontal Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	1G6DS5RK1L0115372	Driver Head/Torso Airbag	No
Body Color	Evergreen Metallic	Driver Torso Airbag	No
Odometer (km/mi)	7 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.0 L	Driver Pelvis Airbag	No
Type/No. Cylinders	Inline 4	Driver Knee Airbag	Yes
Engine Placement	Longitudinal	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	10	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	AWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Front Pass. Knee Airbag	Yes
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	N/A

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

DATA FROM CERTIFICATION LABEL

Manufactured By	GENERAL MOTORS LLC	GVWR (kg)	2133
Date of Manufacture	11/19	GAWR Front (kg)	1006
		GAWR Rear (kg)	1128

VEHICLE SEATING AND WEIGHT CAPACITY DATA

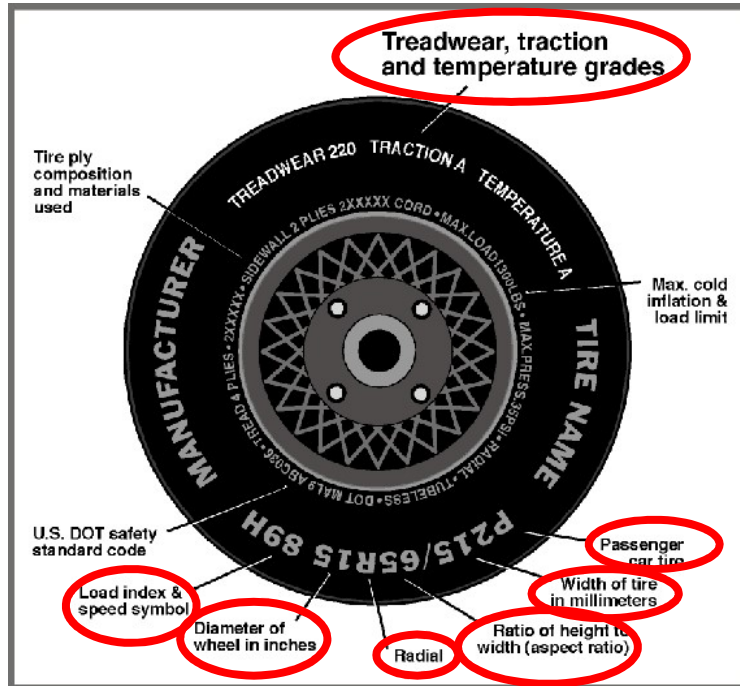
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contoured		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				396
Cargo Weight (RCLW) (kg)				56

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	210	230
Recommended Tire Size	245/45R18	245/45R18
Tire Size on Vehicle	245/45R18	245/45R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy Tour A/S	Primacy Tour A/S
Treadwear	540	540
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	96V	96V
Tire Material	Rubber	Rubber
DOT Safety Code Left	B9B7 04DX 2019	B9B7 04DX 2019
DOT Safety Code Right	B9B7 04DX 2019	B9B7 04DX 2019

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
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TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	461.0	415.5		494.0	489.0	
Right	kg	450.0	399.0		472.5	460.5	
Ratio	%	52.8%	47.2%		50.4%	49.6%	
Totals	kg	911.0	814.5	1725.5	966.5	949.5	1916.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1725.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	56
Calculated Test Vehicle Target Weight (TVTW)	kg	1922.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	716	721	725	732	1390
As Tested	mm	710	712	700	711	1459
Post Test	mm	841	749	695	717	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2945
Total Vehicle Length at Left Side	mm	4690
Total Vehicle Length at Centerline	mm	4870
Total Vehicle Length at Right Side	mm	4690
Weight of Ballast in Cargo Area	kg	5
Weight of Vehicle Components Removed	kg	10
Amount of Stoddard Solvent in Fuel Tank	L	61.3

List of components removed to meet test weight: None.

List of components removed for instrumentation, data box, and equipment installation: Cargo area cover / divider, underbody plastic.

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4870
2	Total Width	1882
3	Bumper Top Height	530
4	Bumper Bottom Height	408
5	Longitudinal Member Top Height	546
6	Distance between Longitudinal Members	750
7	Longitudinal Member Width	72
8	Engine Top Height	876
9	Engine Bottom Height	168
10	Engine and Gearbox Width	955
11	Front Bumper-Engine Distance	N/A
12	Front Shock Absorber Fixing Height	894
13	Bonnet Leading Edge Height	790
14	Front Shock Absorber Fixing Width	85
15	Front Bumper – Front Axle Distance	862
16	Front Axle – A-Pillar Distance	435
17	A-Pillar – B-Pillar Distance	1332
18	B-Pillar – Rear Axle Distance	1162
19	B-Pillar – C-Pillar Distance	690
20	Roof Sill Bottom Height	1241
21	Roof Sill Top Height	1430
22	Floor Sill Bottom Height	190
23	Floor Sill Top Height	353

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

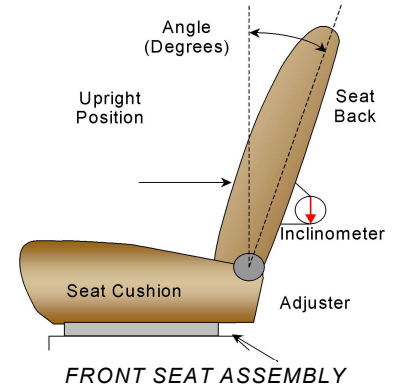
Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

NOMINAL DESIGN RIDING POSITION

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

	Degrees
Driver Seat Back Angle	-6.2° on outboard headrest post
Passenger Seat Back Angle	-16.0° on outboard headrest post



SEAT FORE/AFT POSITIONS

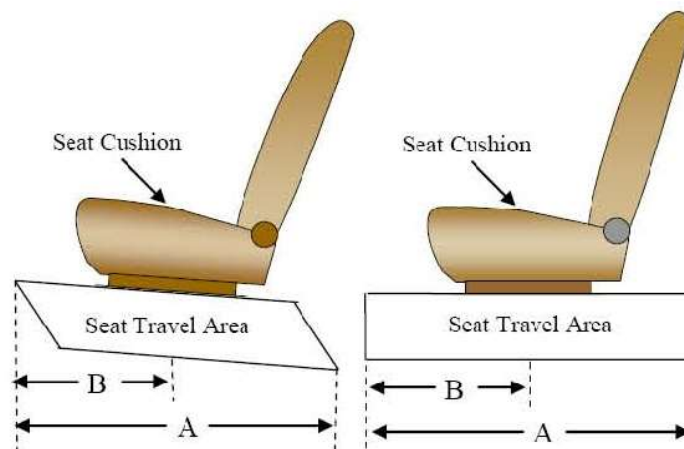
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated May 2018.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	300 mm	150 mm
Passenger Seat	240 mm	0 mm

SEAT BELT UPPER ANCHORAGES

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

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



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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

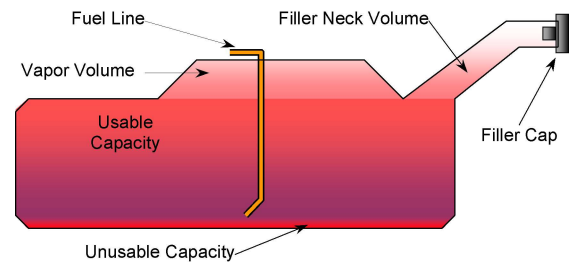
NHTSA No.: M20200103
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FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	65.9
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	60.6 to 61.9
Actual Amount of Solvent used	61.3
1/3 of Usable Capacity	22.0

FUEL PUMP

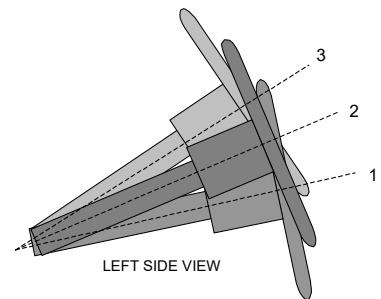
The vehicle is equipped with an electronic fuel pump. When vehicle ignition is keyed to "on" position but without engine running, the fuel pump runs for approximately 2 seconds to pressurize the system and then shuts off. The fuel filler neck is located on the passenger side.



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

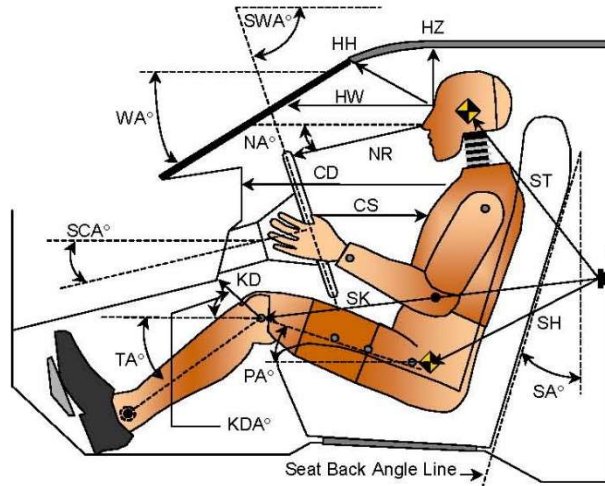
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	73.1	
Geometric Center Position 2	70.8	
Uppermost Position 3	68.4	
Telescoping Steering Wheel Travel		35
Test Position	70.8	18

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020



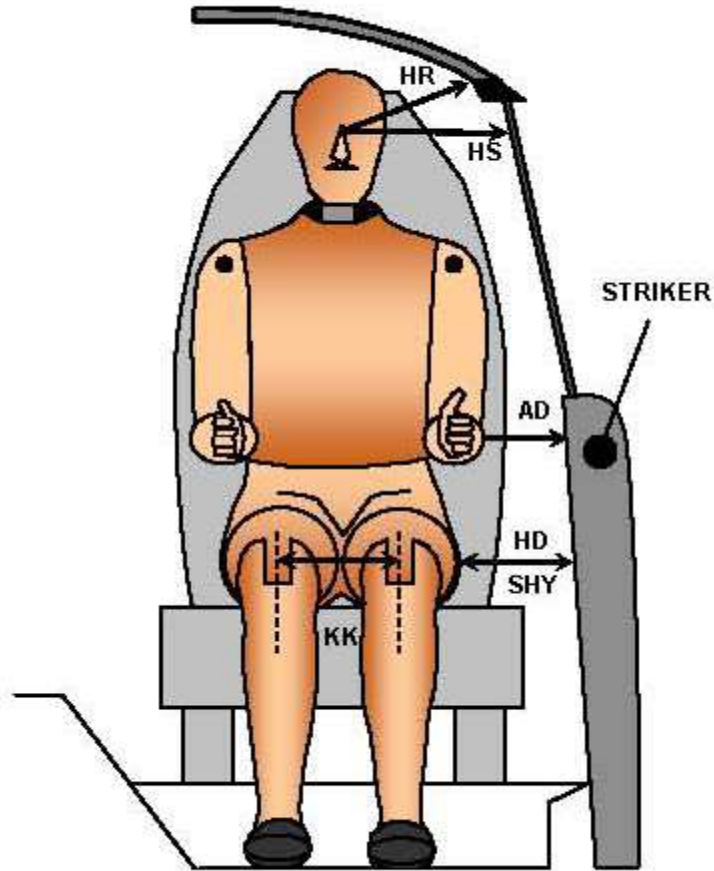
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		23.3		
SWA°	Steering Wheel Angle		70.8		
SCA°	Steering Column Angle		19.2		
SA°	Seat Back Angle		-6.2		-16.0
HZ	Head to Roof (Z)	201	90	236	90
HH	Head to Header	387	26.5	344	37.3
HW	Head to Windshield	671	0	676	0
NR	Nose to Rim	407	7.4		
CD	Chest to Dash	547		432	
CS	Chest to Steering Hub	359	3.1		
RA	Rim to Abdomen	143	0		
KDL	Left Knee to Dash	225	33.2	160	36.2
KDR	Right Knee to Dash	209	29.1	178	34.1
PA°	Pelvic Angle		24.4		22.3
TA°	Tibia Angle		33.7		38.2
SK	Striker to Knee	523	102.1	595	99.1
ST	Striker to Head	447	1.0	415	19.8
SH	Striker to H-Point	246	143.1	345	119.3

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020



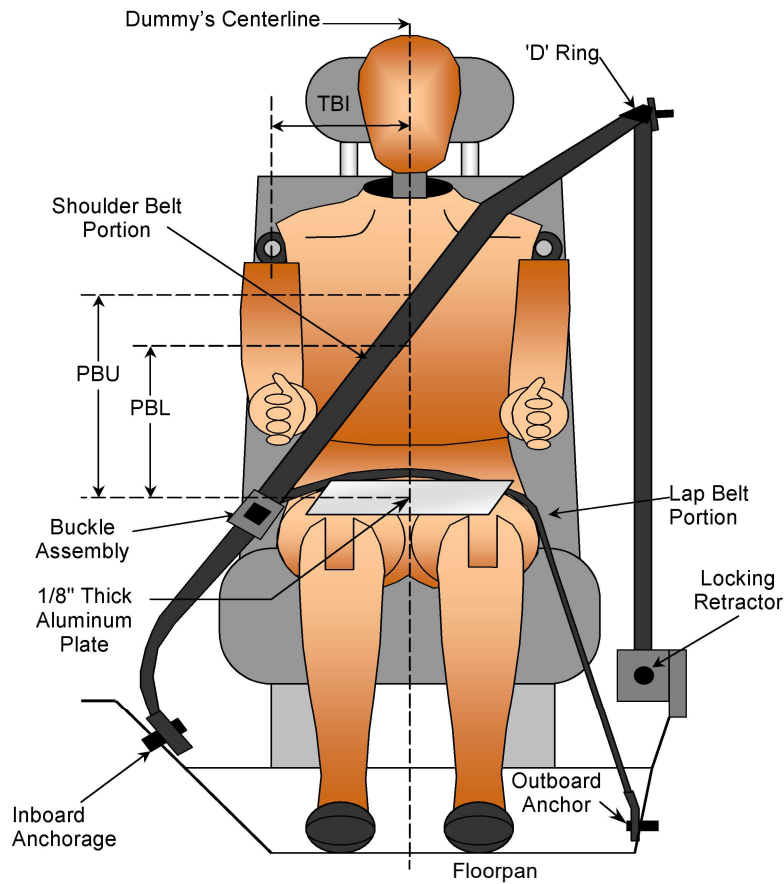
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	127	92
HD	H-Point to Door	146	172
HR	Head to Side Header	217	255
HS	Head to Side Window	353	365
KK	Knee to Knee	337	231
SHY	Striker to H-Point (Y Direction)	277	305
AA	Ankle to Ankle	315	168

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	330	290
PBL - Top surface of reference to belt lower edge	mm	250	210

BELT LENGTH DATA

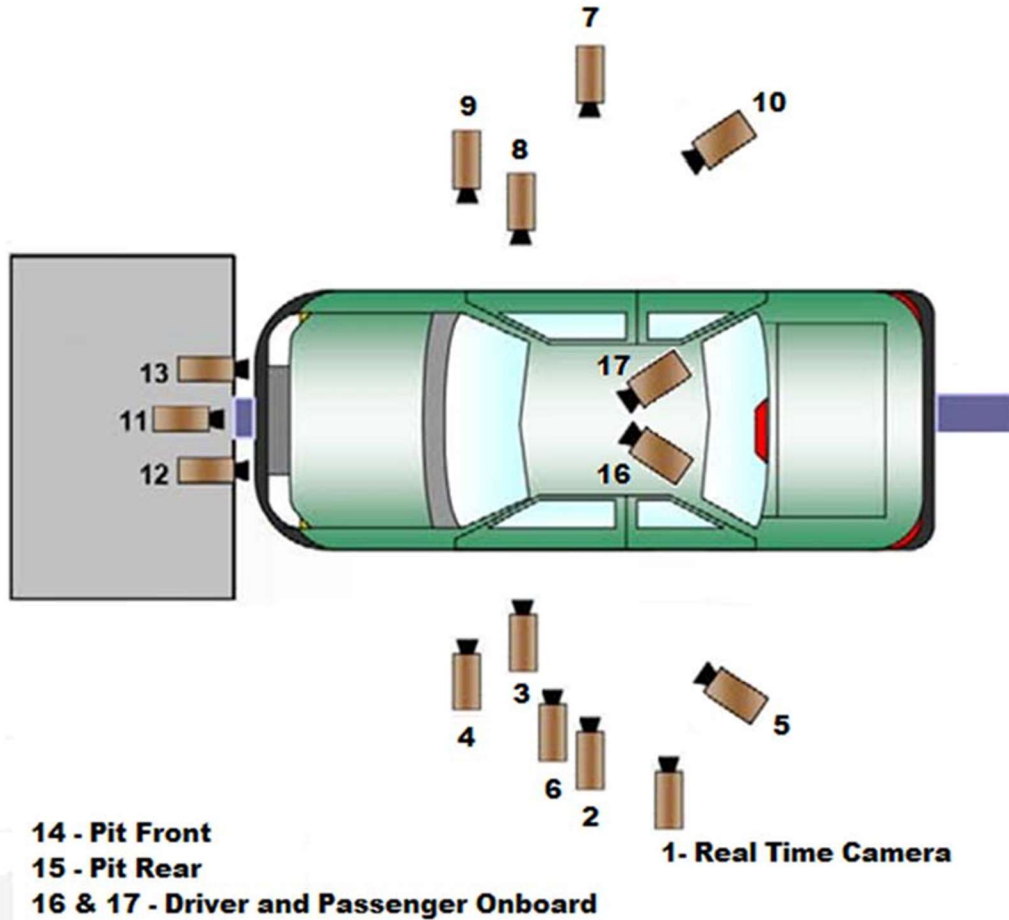
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	810	620
Lap Belt Length as measured on ATD	mm	510	590
Remainder of belt on reel	mm	1080	1170
Total Belt Length for Continuous Webbing Systems	mm	3000	2980

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
Test Date: 6/17/2020

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

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CAMERA LOCATIONS

No.	Camera View	Coordinates* (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall					30
2	Left Overall	-2155	-5470	-1370	12	1000
3	Driver Close-Up	-1310	-7095	-1795	50	1000
4	Left Front Half	-1355	-5400	-1300	24	1000
5	Left Angle	-7500	-6050	-2050	75	1000
6	Steering Column	-980	-7625	-1270	50	1000
7	Right Overall	-2140	5590	-1325	12	1000
8	Passenger Close-Up	-1300	6840	-1810	50	1000
9	Right Front Half	-1295	5305	-1320	24	1000
10	Right Angle	-7460	5595	-2030	75	1000
11	Windshield	80	0	-2310	11	1000
12	Driver Windshield	150	-370	-2230	25	1000
13	Passenger Windshield	150	370	-2230	25	1000
14	Pit Front	-680	0	3340	24	1000
15	Pit Rear	-2870	0	3340	24	1000
16	Driver Onboard				12	1000
17	Passenger Onboard				12	1000
18	Real-Time Pan View					30

*COORDINATES:

+X = forward of impact plane

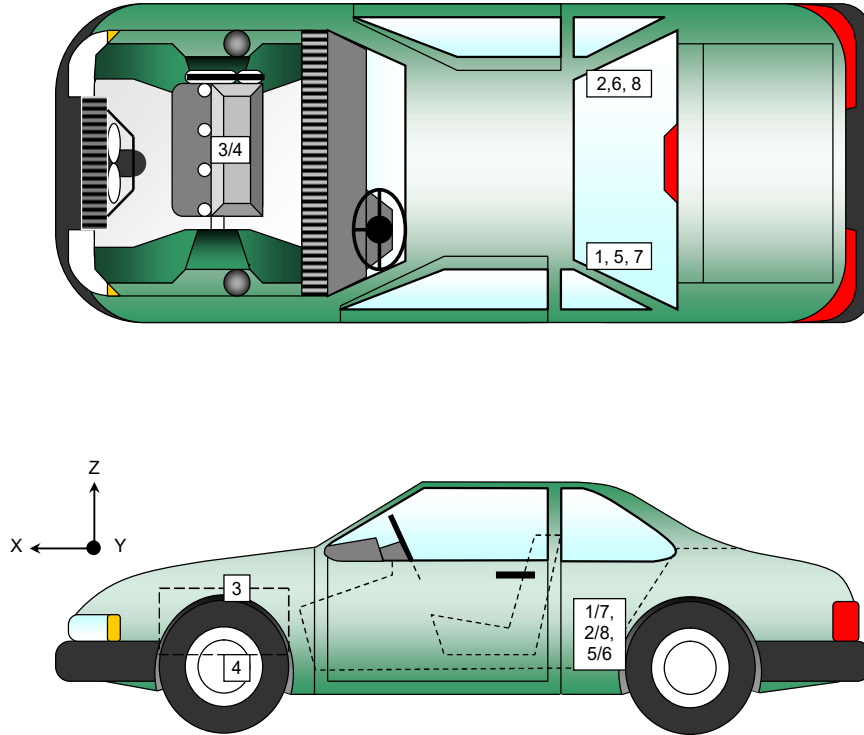
+Y = right of monorail centerline

+Z = below ground level

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
Test Date: 6/17/2020



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1912	-365	-254
2	Right Rear Crossmember Accelerometer – X Direction	1912	365	-256
3	Engine Top X	3979	40	-840
4	Engine Bottom X	3710	0	-162
5	Left Rear Crossmember Accelerometer – Z Direction	1912	-365	-254
6	Right Rear Crossmember Accelerometer – Z Direction	1912	365	-256
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1912	-425	-254
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1912	425	-250

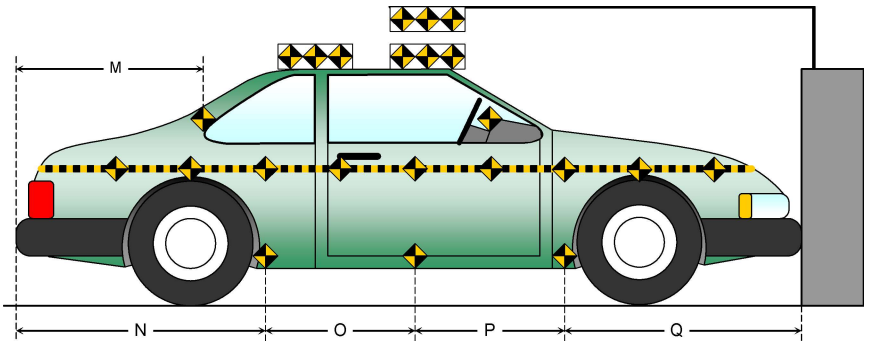
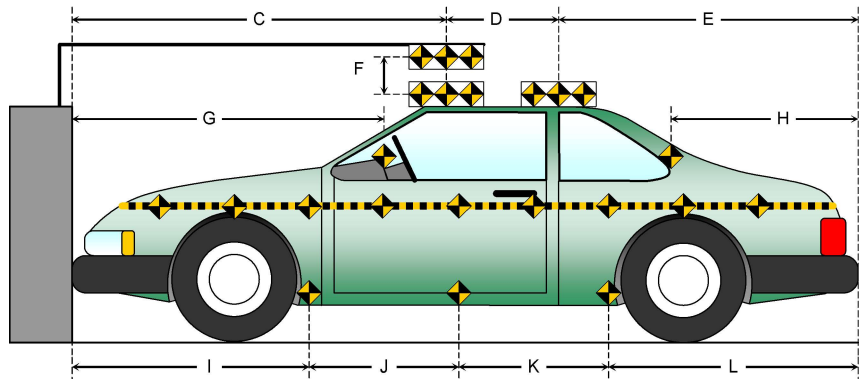
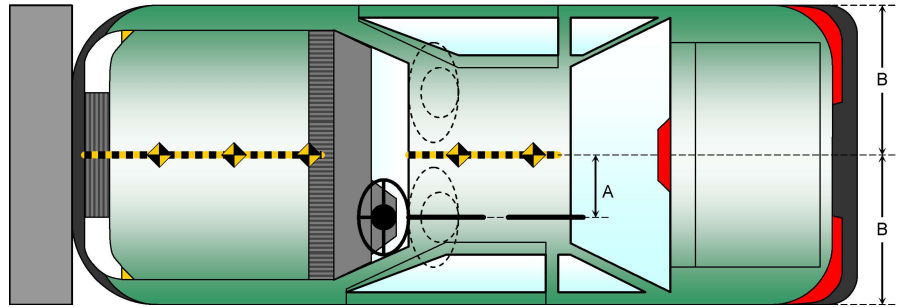
Reference Points: X - Rear Surface of Vehicle (+ forward)
Y - Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

Item	Value (mm)
A	358
B	941
C	2530
D	610
E	1730
F	1495
G	
H	1162
I	1303
J	1035
K	1035
L	1497
M	1162
N	1497
O	1035
P	1035
Q	1303



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

ADVANCED RESEARCH LOAD CELL BARRIER

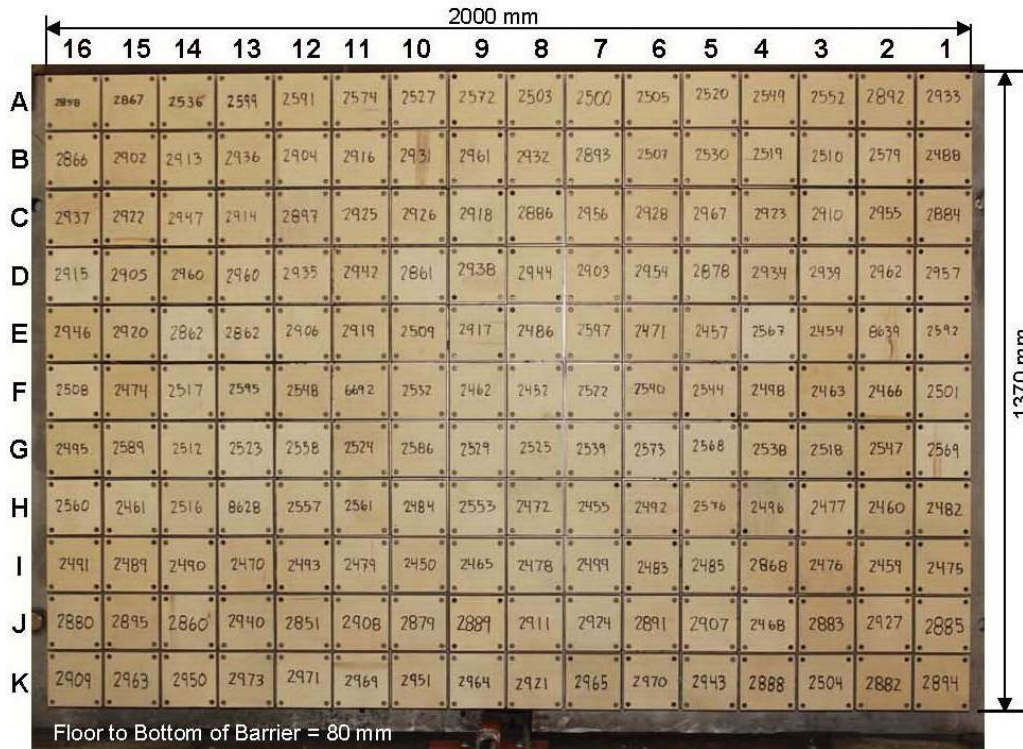


Photo for Reference Only

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: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
Test Date: 6/17/2020

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
Test Date: 6/17/2020

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIIL 50% / 351	HIIL 5% / DH1659
Head Contact	Frontal Airbag, Headrest	Frontal Airbag, Headrest
Upper Torso Contact	None	None
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Knee Airbag
Right Knee Contact	Knee Airbag	Knee Airbag

DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION

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

OTHER VEHICLE POST-TEST OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1085
Center	mm	960
Right Side	mm	1080
Average	mm	1042

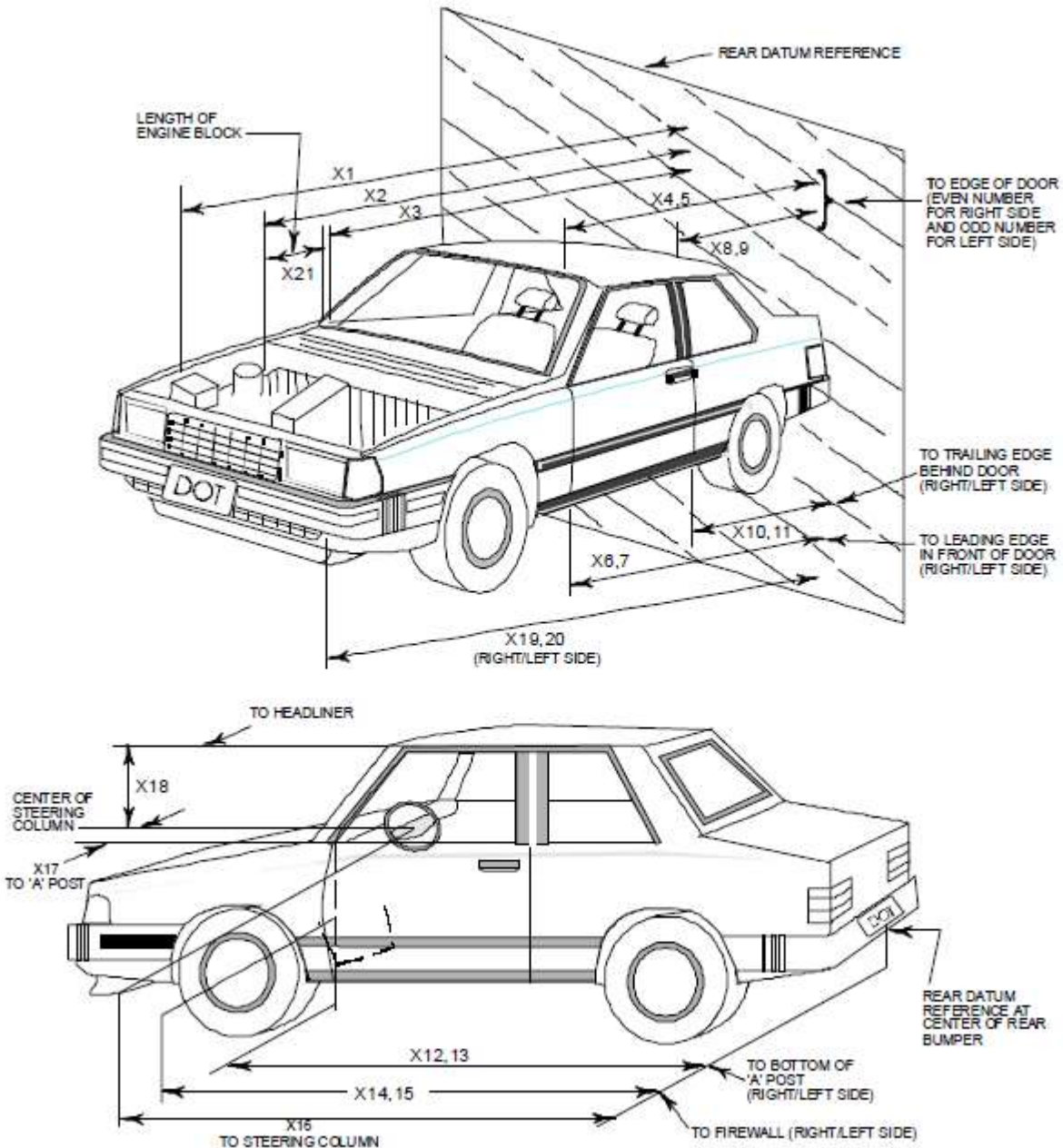
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
Test Date: 6/17/2020



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
Test Date: 6/17/2020

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4870	4418	452
2	RSOV to Front of Engine	4101	3996	105
3	RSOV to Firewall	3650	3630	20
4	RSOV to Upper Leading Edge of Right Door	3332	3332	0
5	RSOV to Upper Leading Edge of Left Door	3332	3332	0
6	RSOV to Lower Leading Edge of Right Door	3341	3341	0
7	RSOV to Lower Leading Edge of Left Door	3341	3341	0
8	RSOV to Upper Trailing Edge of Right Door	2226	2226	0
9	RSOV to Upper Trailing Edge of Left Door	2226	2226	0
10	RSOV to Lower Trailing Edge of Right Door	2232	2232	0
11	RSOV to Lower Trailing Edge of Left Door	2232	2232	0
12	RSOV to Bottom of "A" Post of Right Side	3364	3347	17
13	RSOV to Bottom of "A" Post of Left Side	3364	3342	22
14	RSOV to Firewall, Right Side	3694	3668	26
15	RSOV to Firewall, Left Side	3698	3669	29
16	RSOV to Steering Column	2842	2862	-20
17	Center of Steering Column to "A" Post	335	342	-7
18	Center of Steering Column to Headliner	400	443	-43
19	RSOV to Right Side of Front Bumper	4690	4328	362
20	RSOV to Left Side of Front Bumper	4690	4315	375
21	Length of Engine Block	568	568	0
RD	RSOV to Right Side of Dash Panel	2982	2980	2
CD	RSOV to Center of Dash Panel	2972	2969	3
LD	RSOV to Left Side of Dash Panel	3065	3058	7

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
Test Date: 6/17/2020

VEHICLE INFORMATION

VIN: 1G6DS5RK1L0115372
Vehicle Size Category: Passenger Car

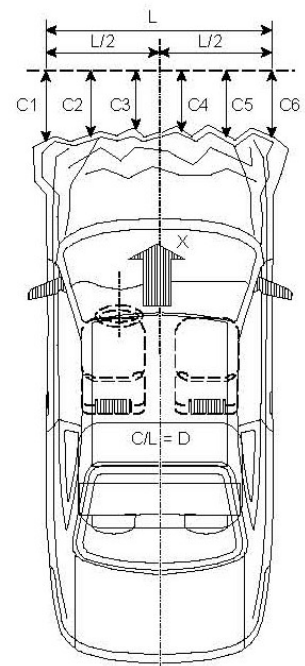
Wheelbase (mm): 2945
Test Weight (kg): 1916.0

ACCELEROMETER DATA

Accelerometer Locations: As per Data Sheet No. 7
Cal. Procedure/Interval: MGA Procedure / 6 month
Integration Algorithm: Trapezoidal
Linearity: > 99%
Impact Velocity (km/h): 56.63
Velocity Change (km/h): 65.0
Time of Separation (msec) 98

CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: Centerline
Damage Region Length (mm): 1320
Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4690	4315	375
C2	Crush zone 2 at left side	mm	4781	4295	486
C3	Crush zone 3 at left side	mm	4832	4327	505
C4	Crush zone 4 at right side	mm	4832	4352	480
C5	Crush zone 5 at right side	mm	4781	4332	449
C6	Crush zone 6 at right side	mm	4690	4328	362
L	C1 TO C6	mm	1320	1309	11

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

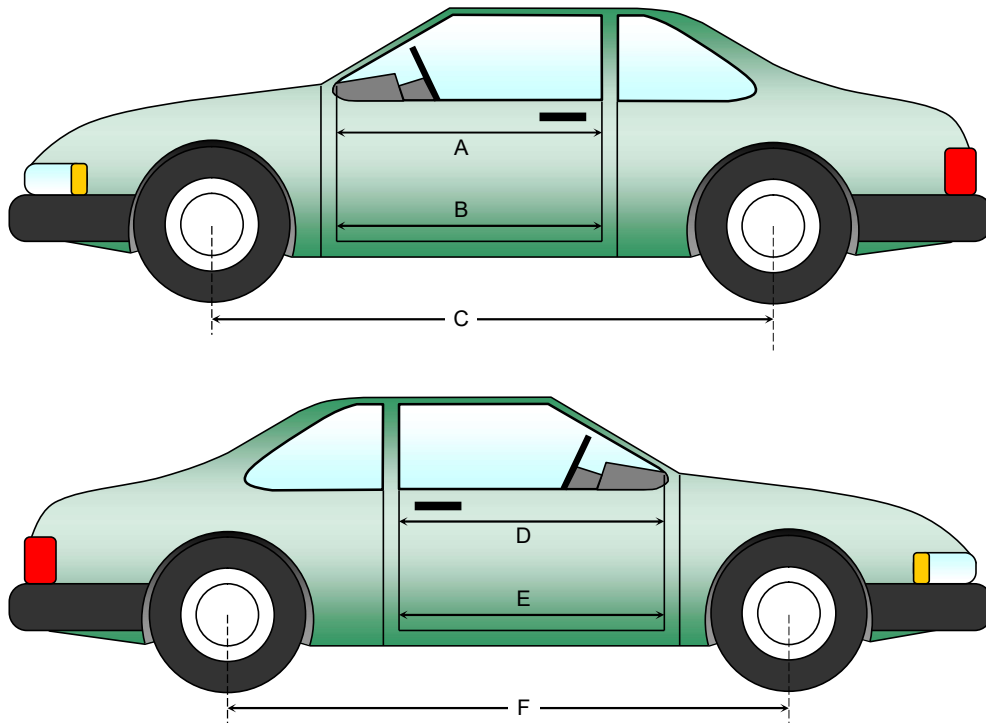
NHTSA No.: M20200103
Test Date: 6/17/2020

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1041	1041	0
B	Left Side Lower	mm	940	940	0
D	Right Side Upper	mm	1042	1042	0
E	Right Side Lower	mm	942	942	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2945	2826	119
F	Right Side Wheelbase	mm	2945	2850	95



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

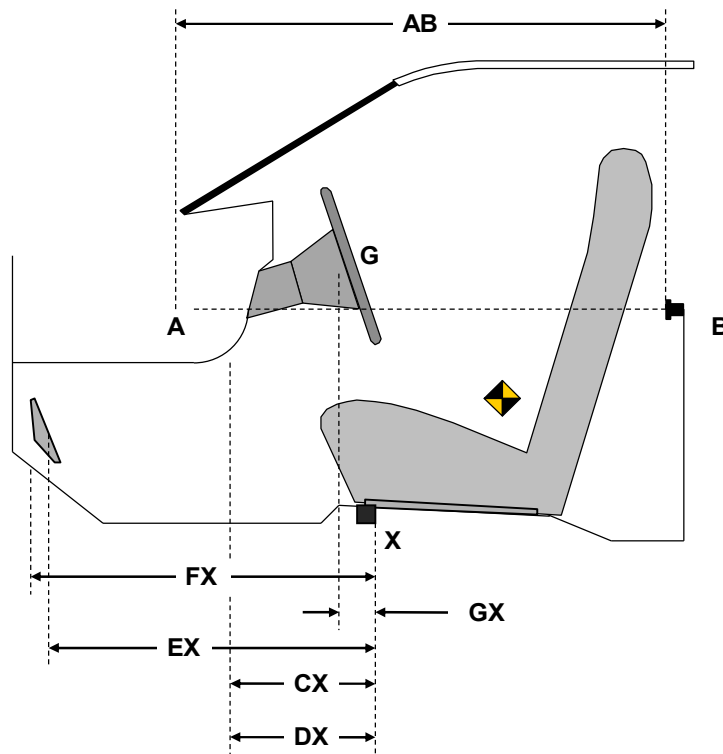
Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	730	730	0
CX	Left Knee Bolster to X	mm	320	327	-7
DX	Right Knee Bolster to X	mm	325	316	9
EX	Brake Pedal to X	mm	595	591	4
FX	Foot Rest to X	mm	662	653	9
GX	Center of Steering Column Wheel Hub to X	mm	79	156	-77

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

WINDSHIELD MOUNTING DETAILS

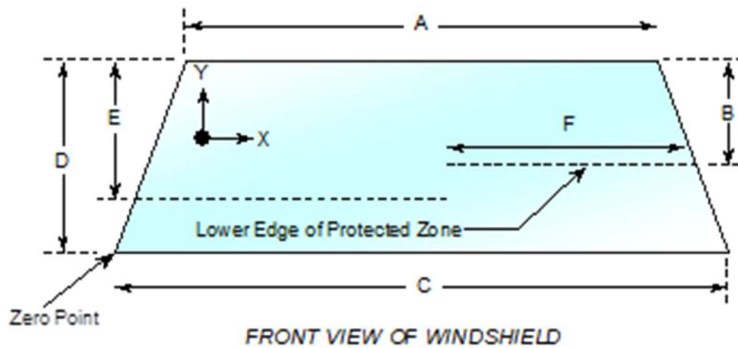
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.7°C.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2134	2134	100
Right Side	2134	2134	100
Total	4268	4268	100



Item	Units	Value
A	mm	1200
B	mm	414
C	mm	1304
D	mm	882
E	mm	494
F	mm	572

AREA OF PROTECTED ZONE FAILURES

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

X	Y

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

X	Y

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

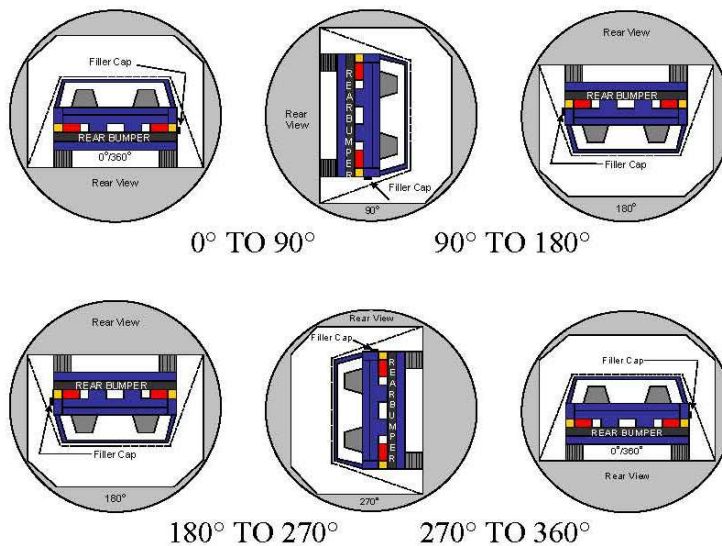
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.7°C

Test Time: 12:14 p.m.

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

FMVSS 301 STATIC ROLLOVER RESULTS



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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	112	300	412
90° to 180°	111	300	411
180° to 270°	107	300	407
270° to 360°	112	300	412

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

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020

FMVSS 301 SPILLAGE TABLE (UNITS IN OUNCES)

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

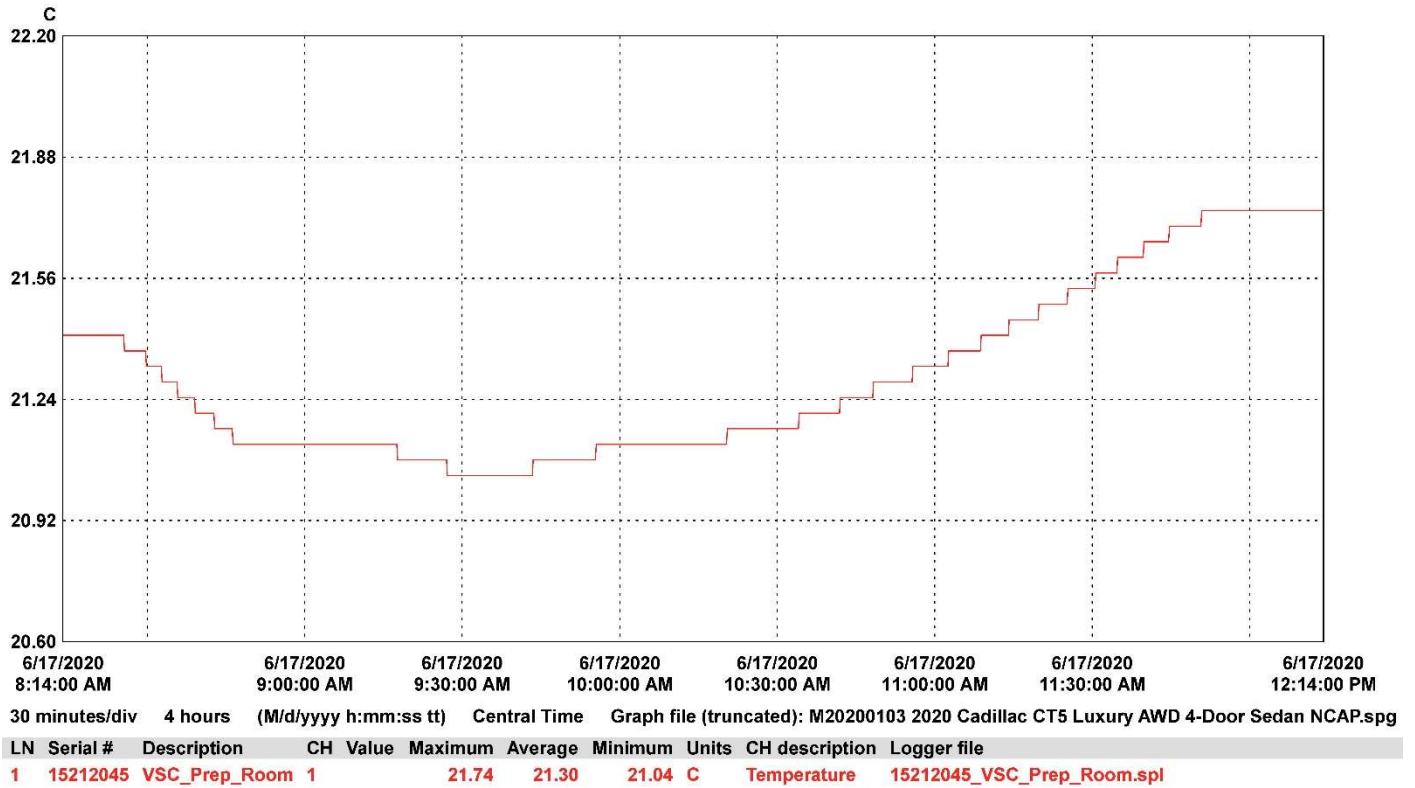
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2020 Cadillac CT5 Luxury AWD 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20200103
 Test Date: 6/17/2020



**APPENDIX A
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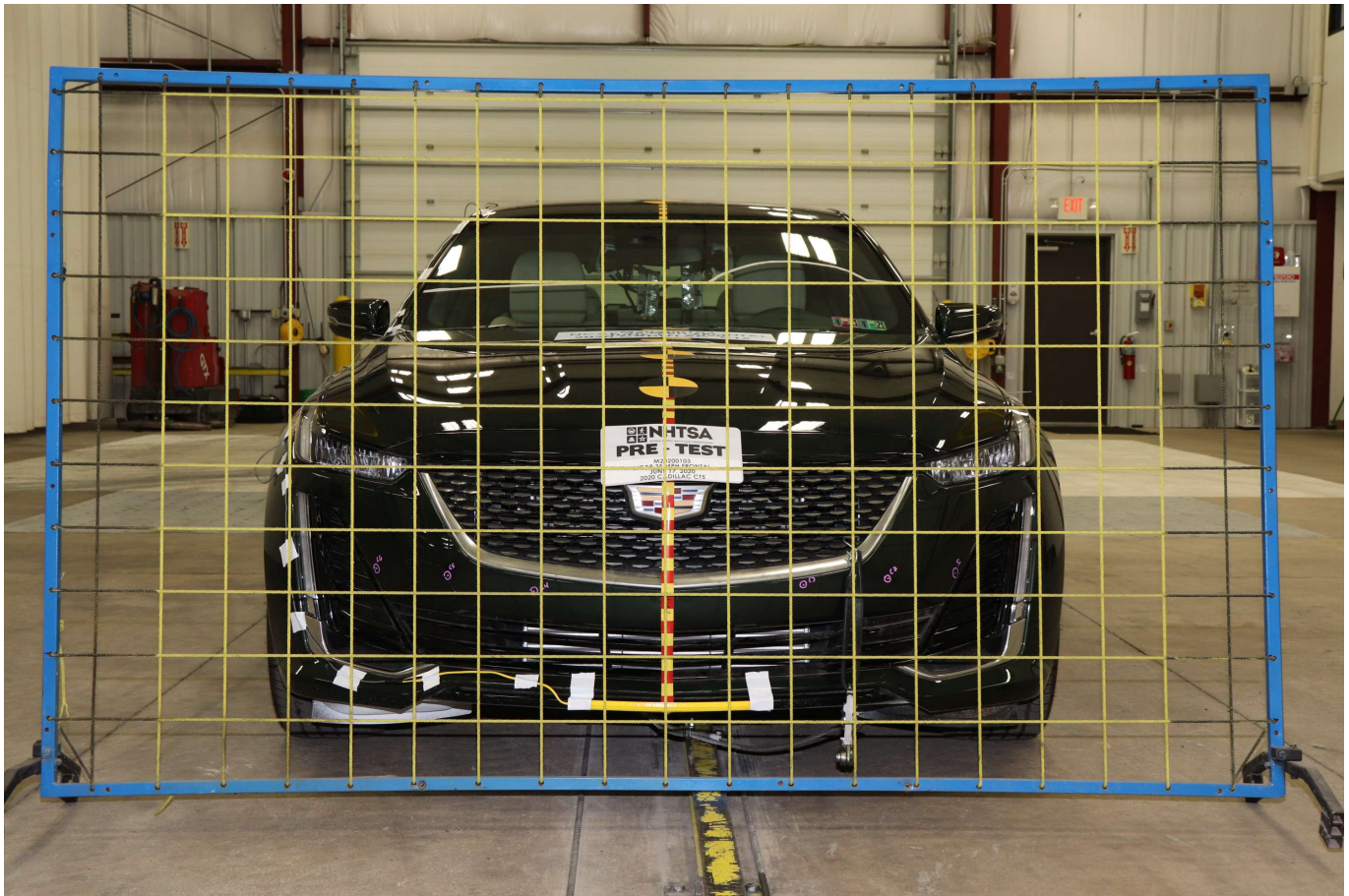


Photo No. 001 - Load Cell Location



Photo No. 002 - Pre-Test Load Cell Wall



Photo No. 003 - Post-Test Load Cell Wall

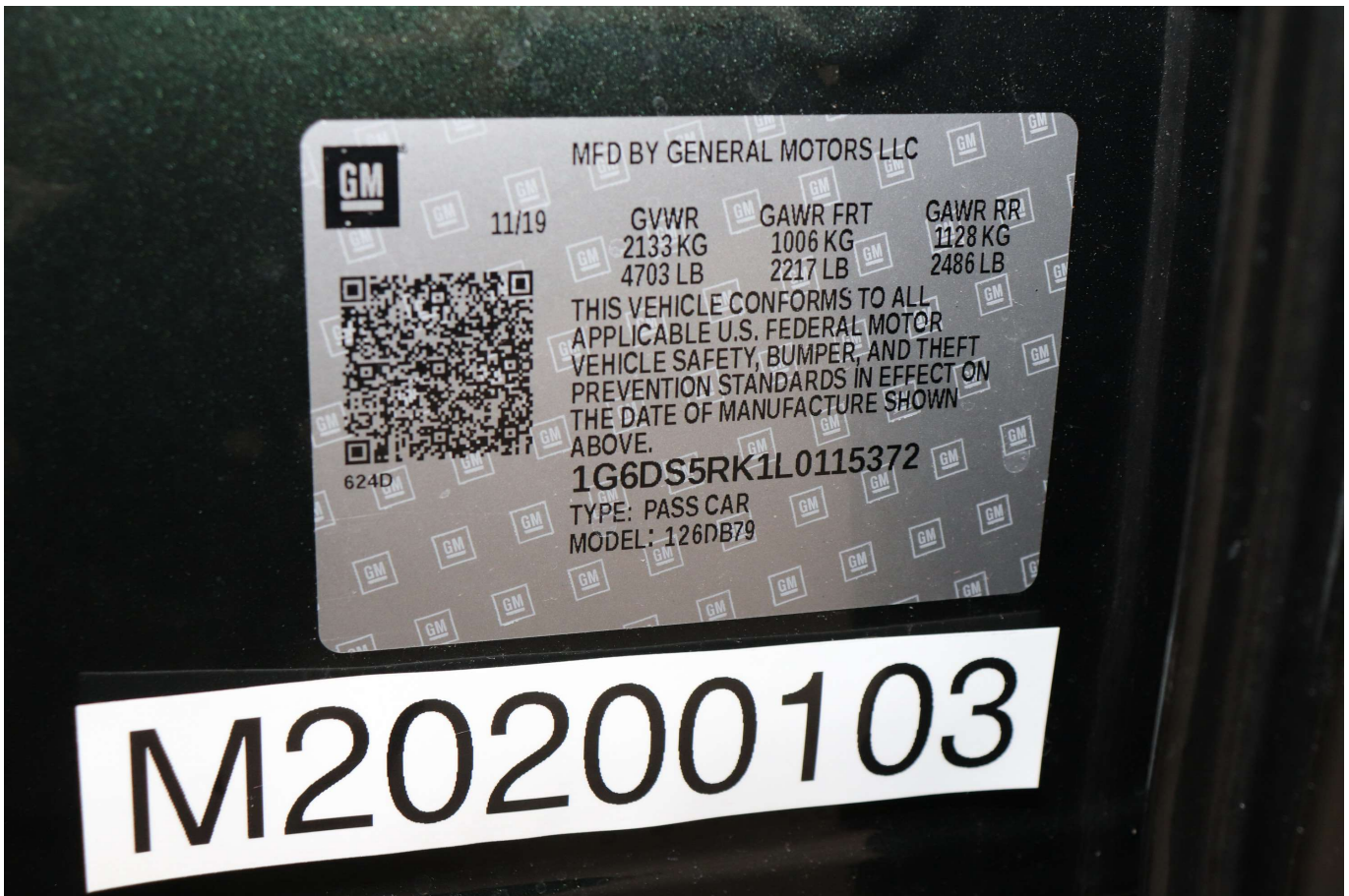


Photo No. 004 - Manufacturer Label



Photo No. 005 - Tire Placard



Photo No. 006 - 2020 Cadillac CT5 Luxury AWD 4-Door Sedan Frontal As Delivered



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

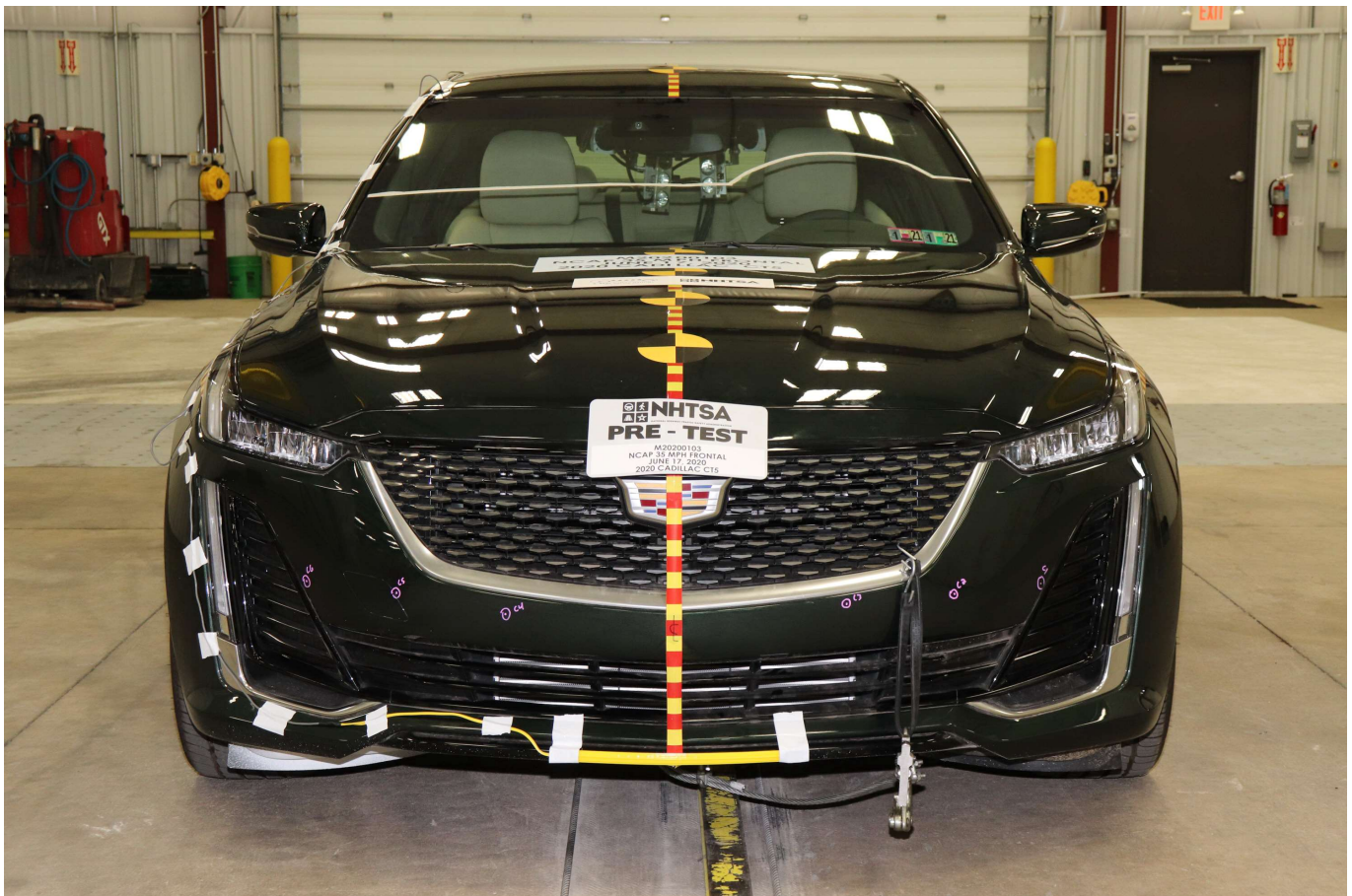


Photo No. 008 - Pre-Test Front View of Test Vehicle



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

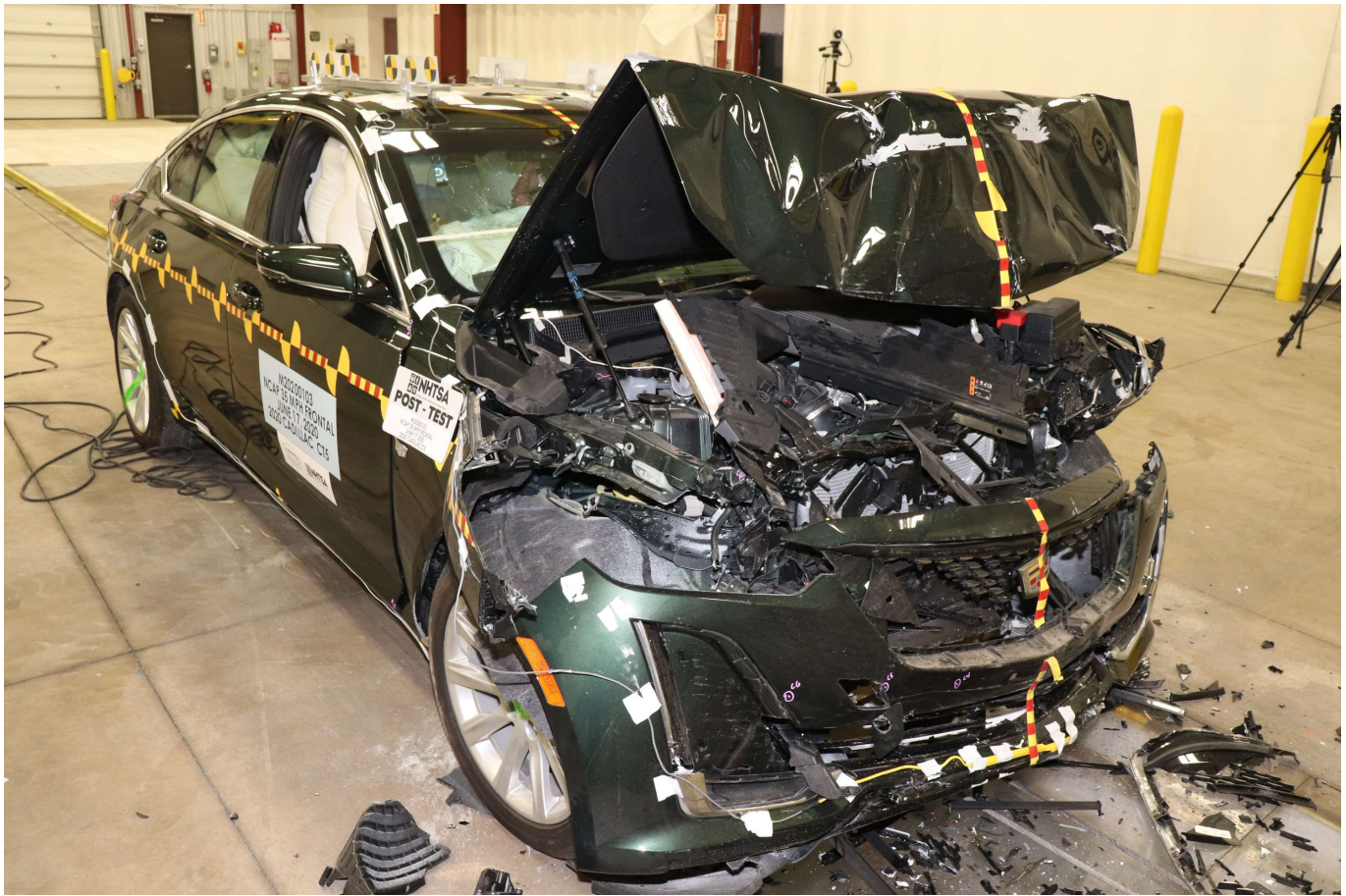


Photo No. 015 - Post-Test Right Front 3-4 View



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

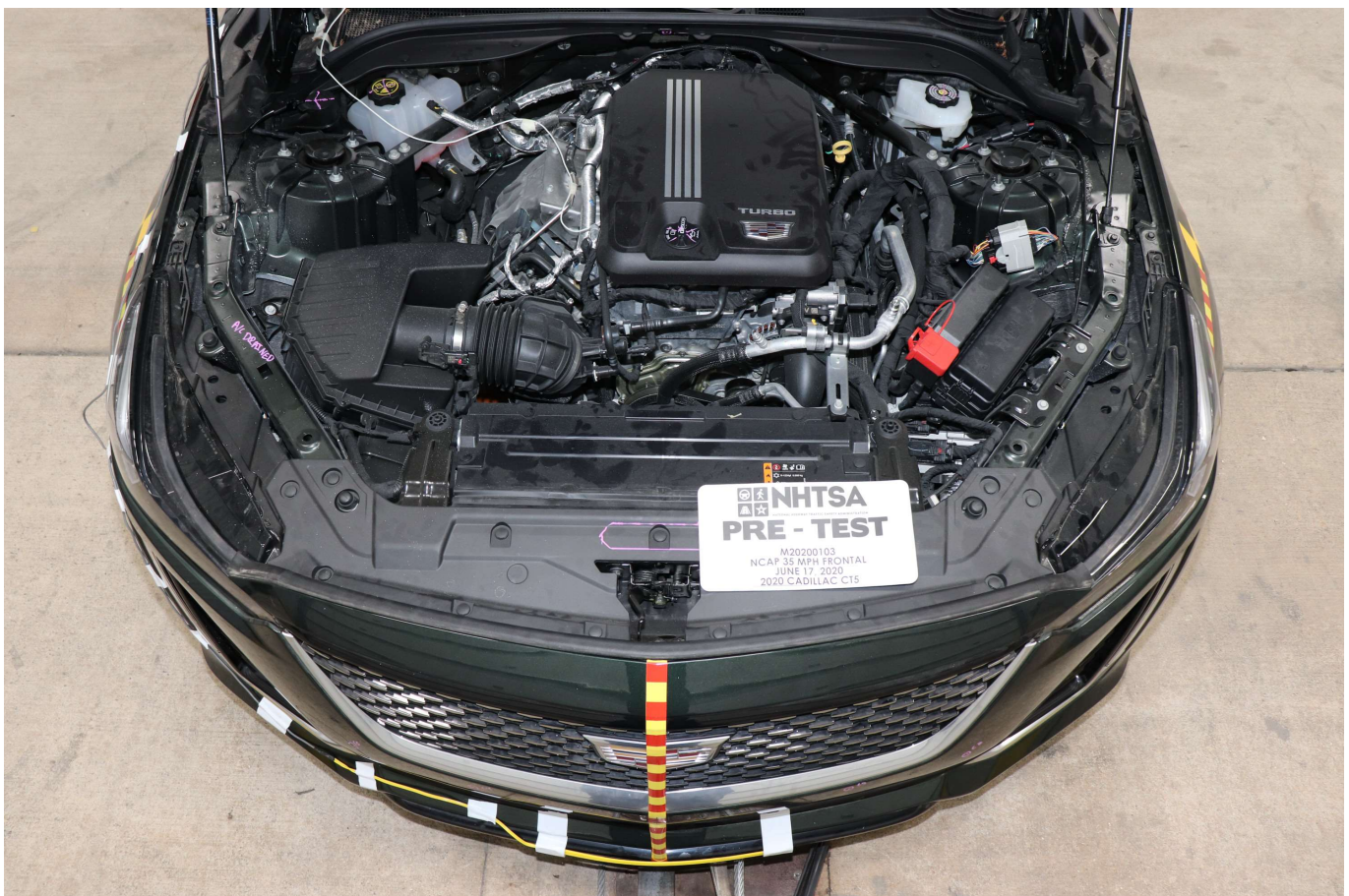


Photo No. 020 - Pre-Test Engine Compartment View



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

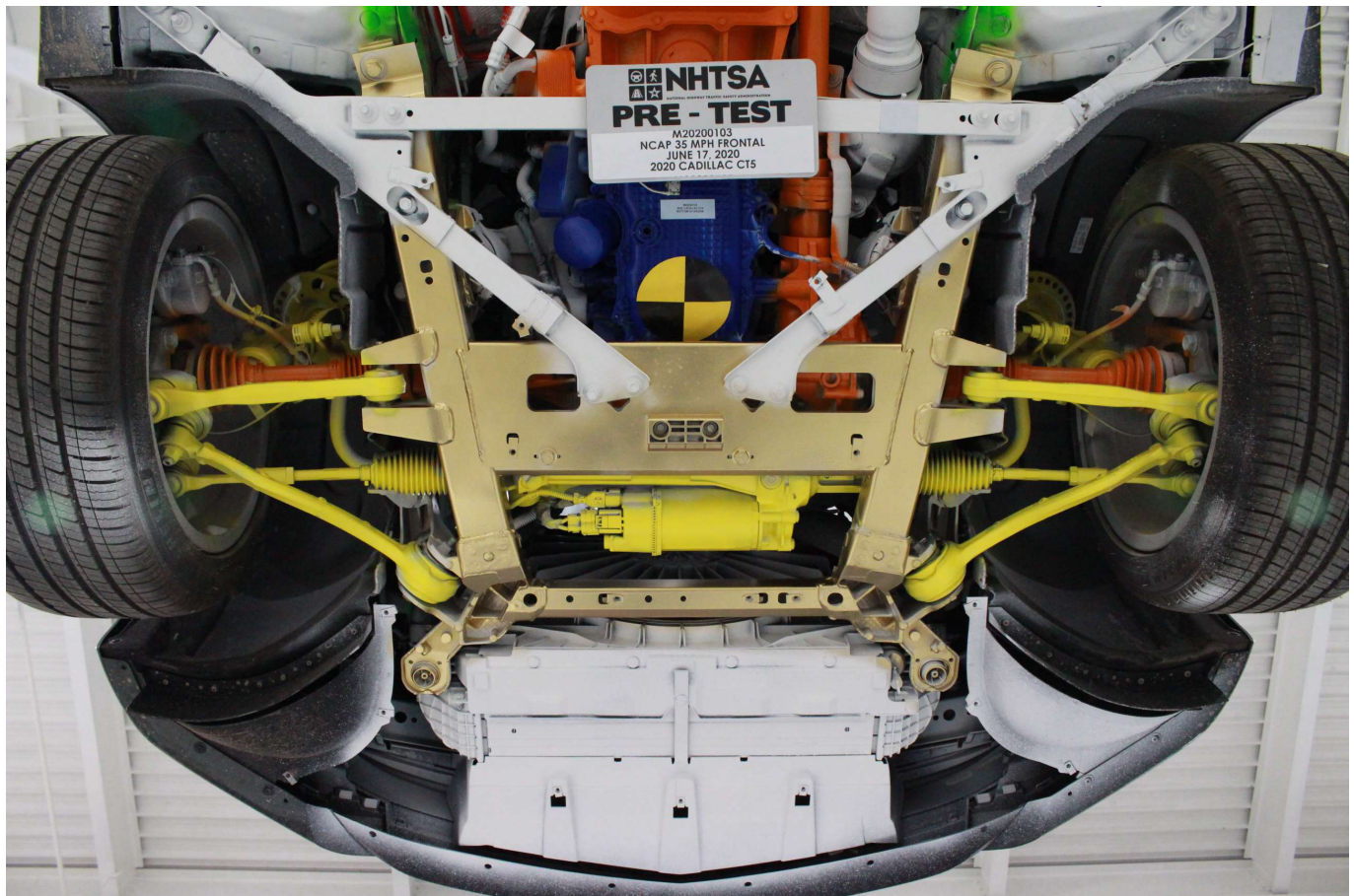


Photo No. 024 - Pre-Test Front Underbody View

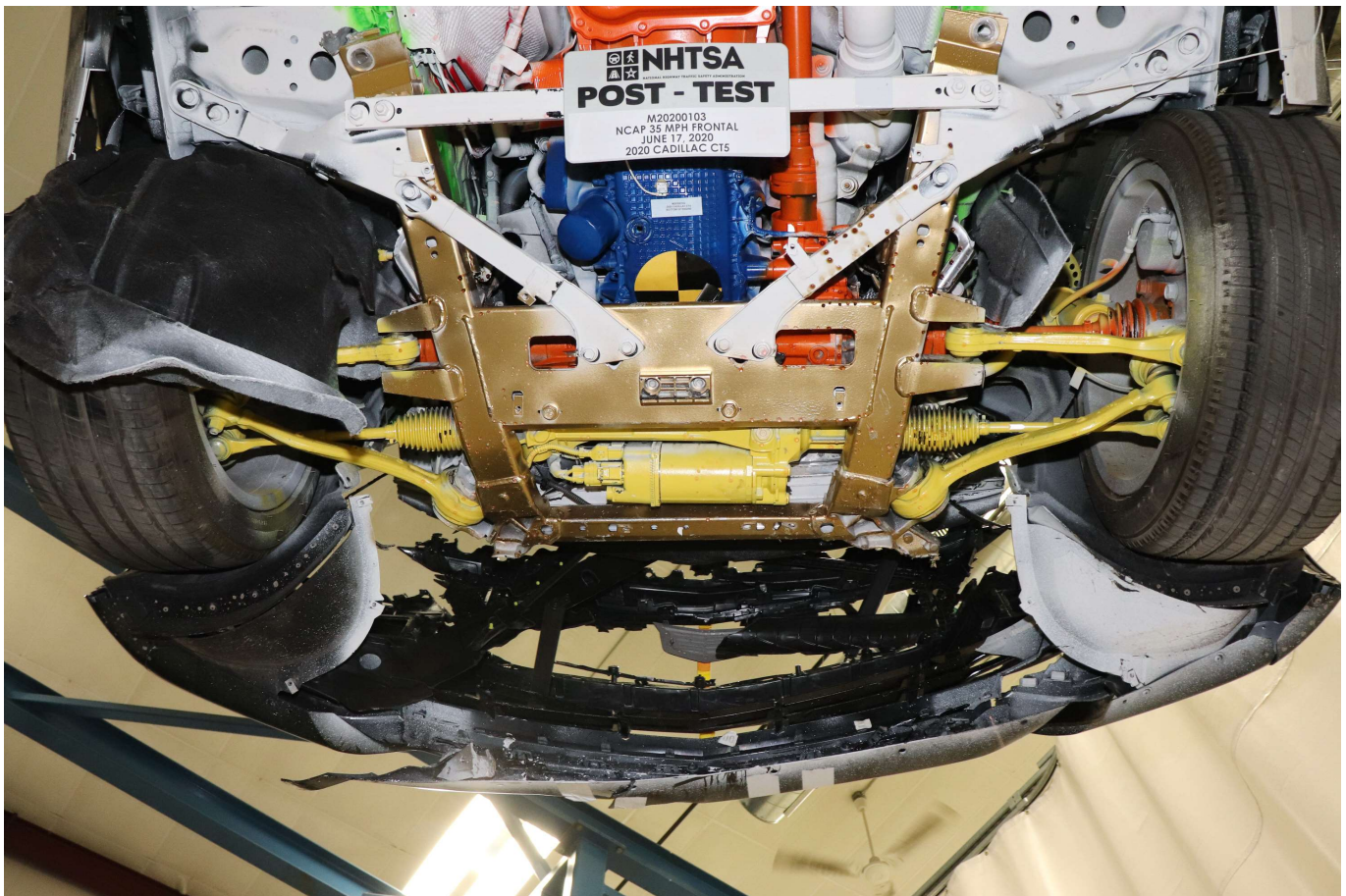


Photo No. 025 - Post-Test Front Underbody View

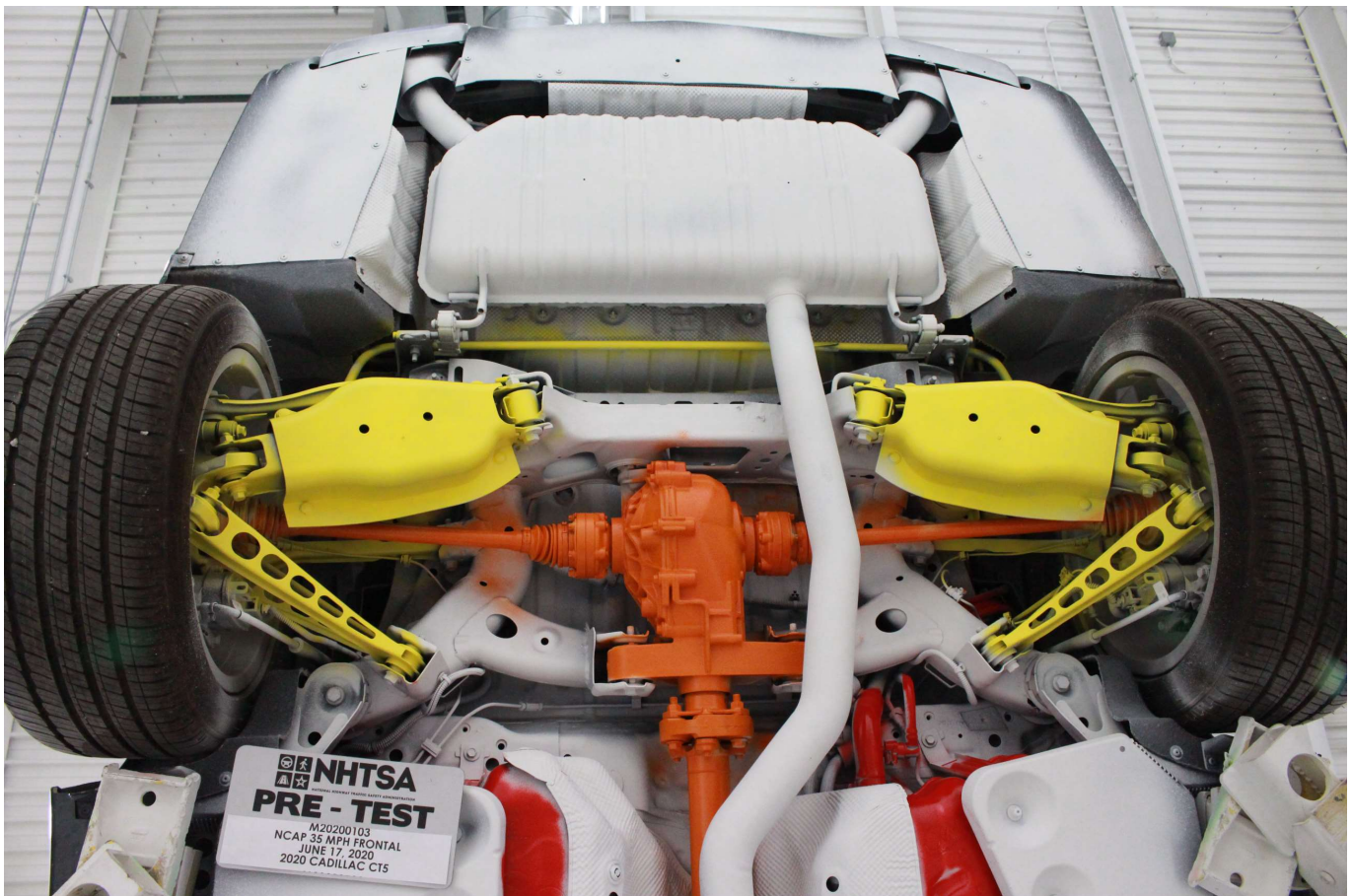


Photo No. 026 - Pre-Test Rear Underbody View

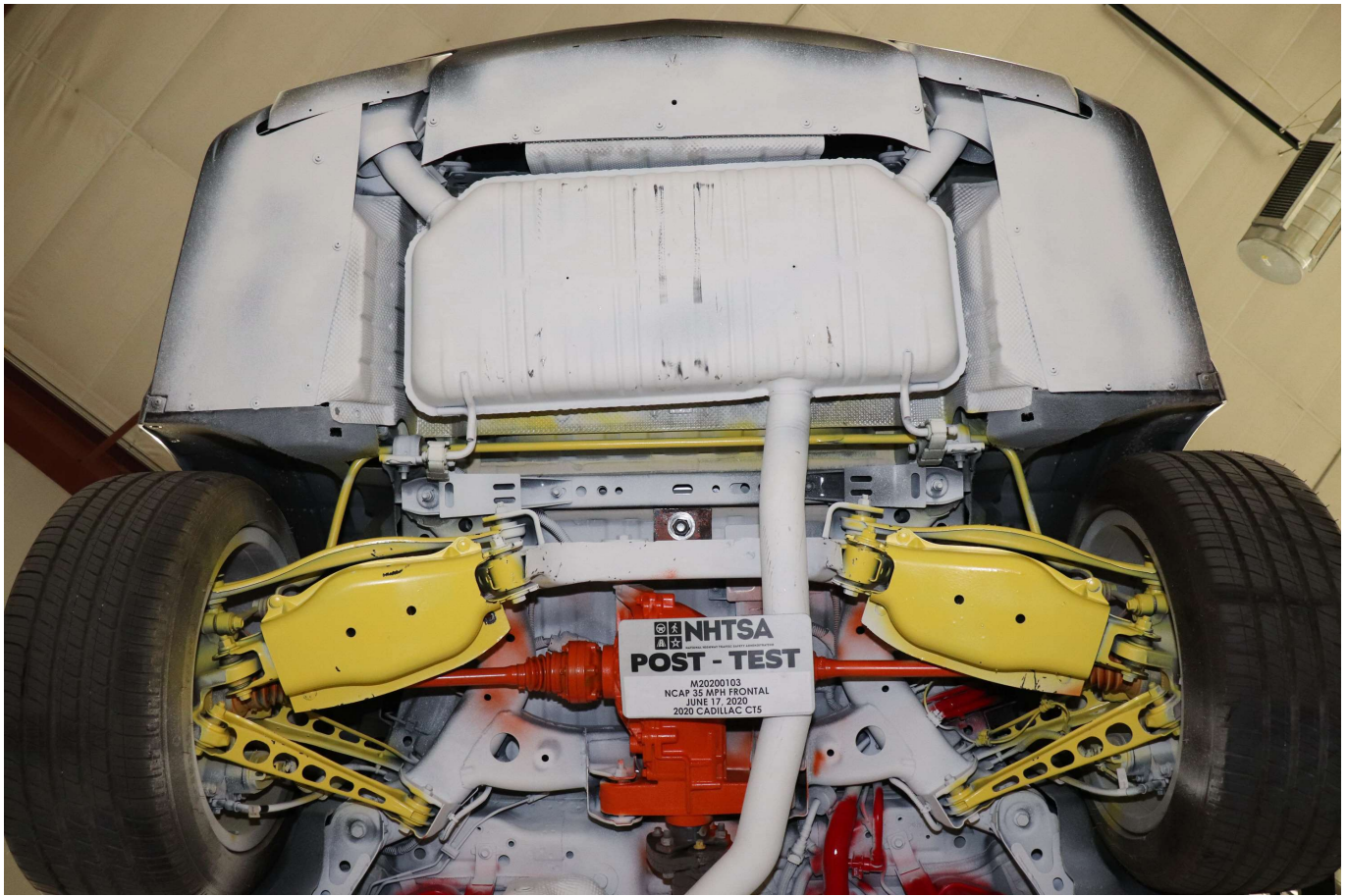


Photo No. 027 - Post-Test Rear Underbody View



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

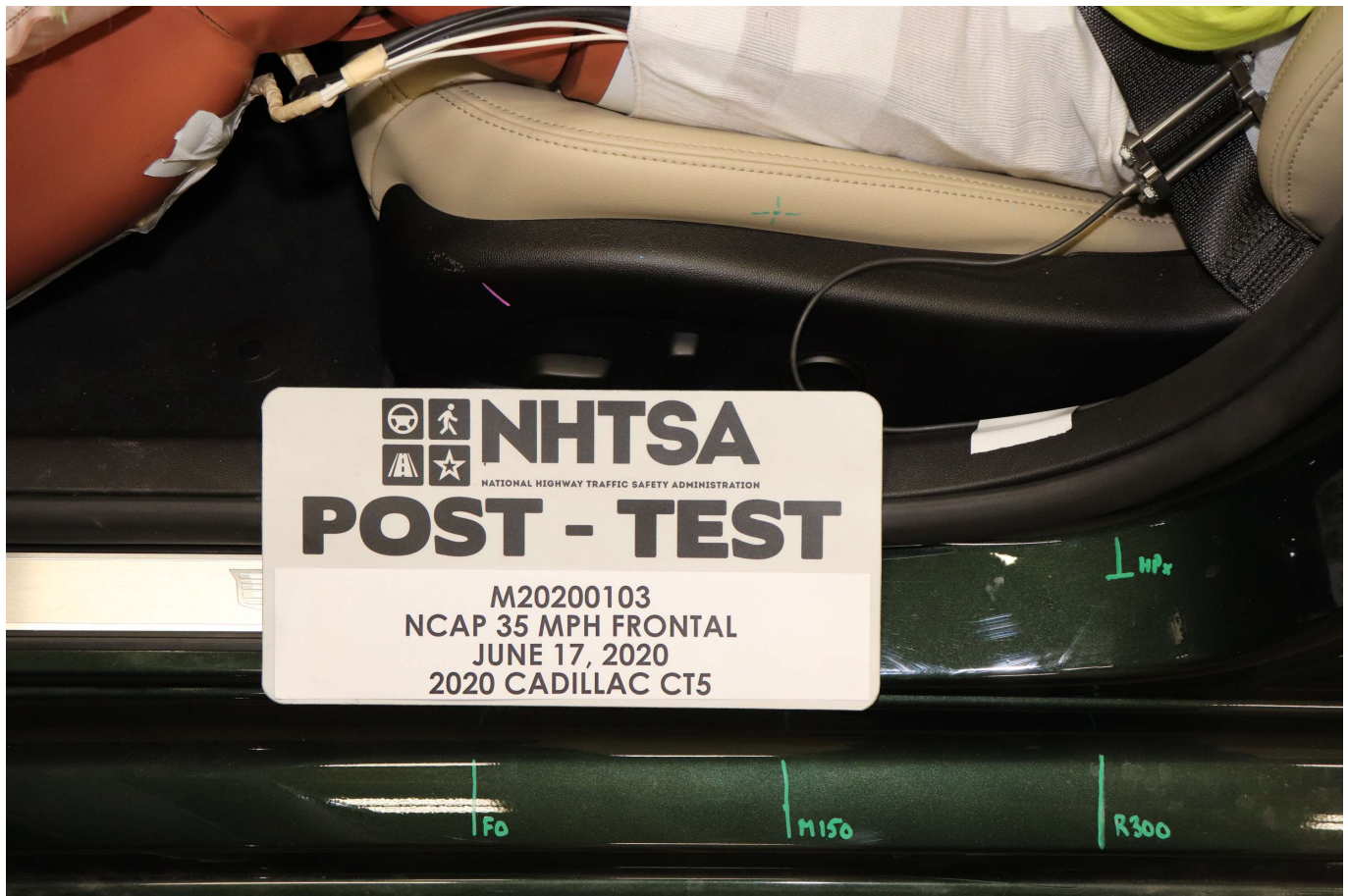


Photo No. 037 - Post-Test Driver Seat Fore-Aft Markings



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 View of Belt Buckle and Latch Plate for Driver Dummy



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

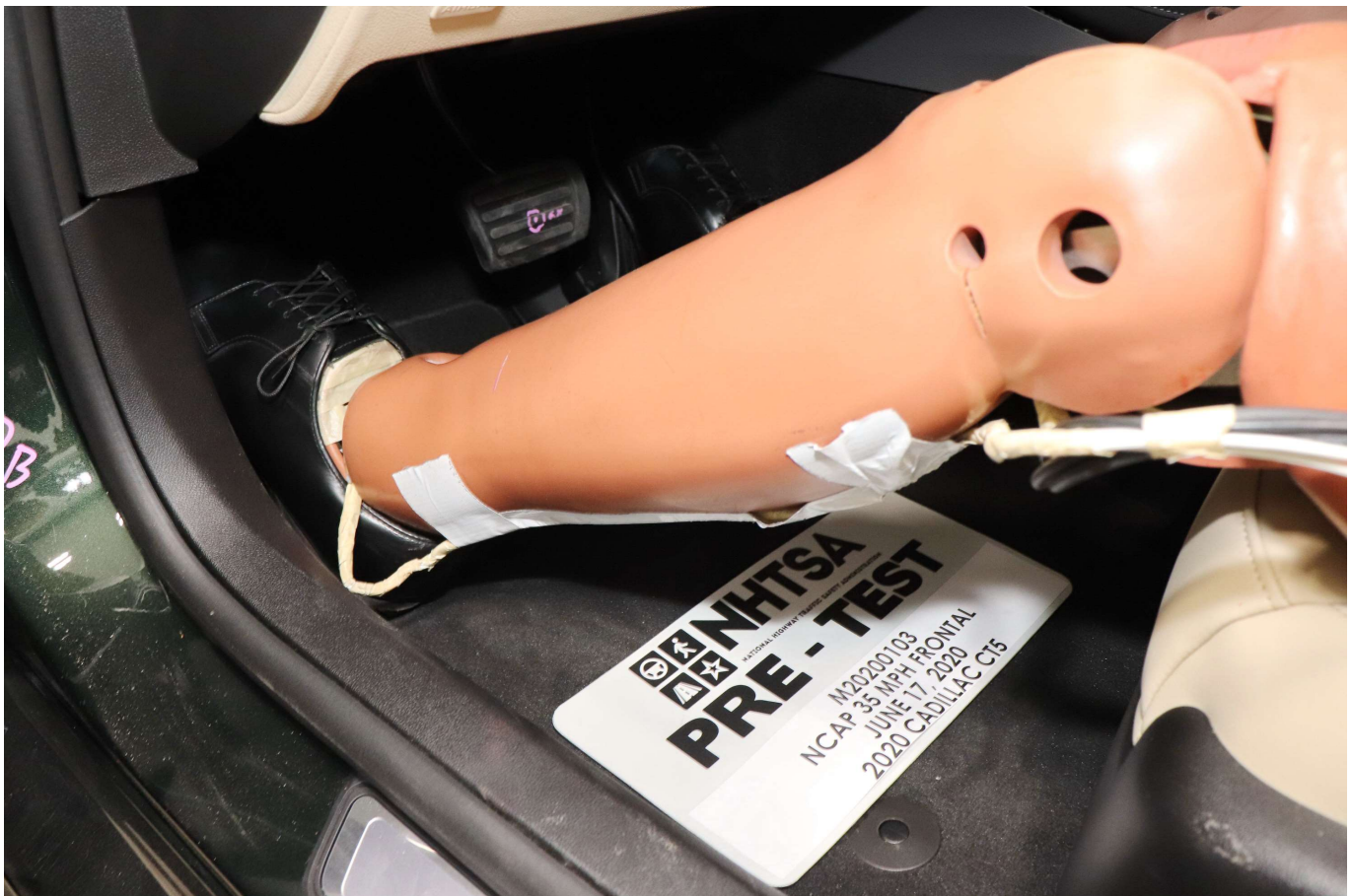


Photo No. 042 - Pre-Test Driver Dummy Feet



Photo No. 043 - Post-Test Driver Dummy Feet



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



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



Photo No. 046 - Pre-Test Driver Side Floorpan



Photo No. 047 - Post-Test Driver Side Floorpan



Photo No. 048 - Post-Test Driver Dummy Face



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



Photo No. 065 - Pre-Test Passenger Dummy Feet

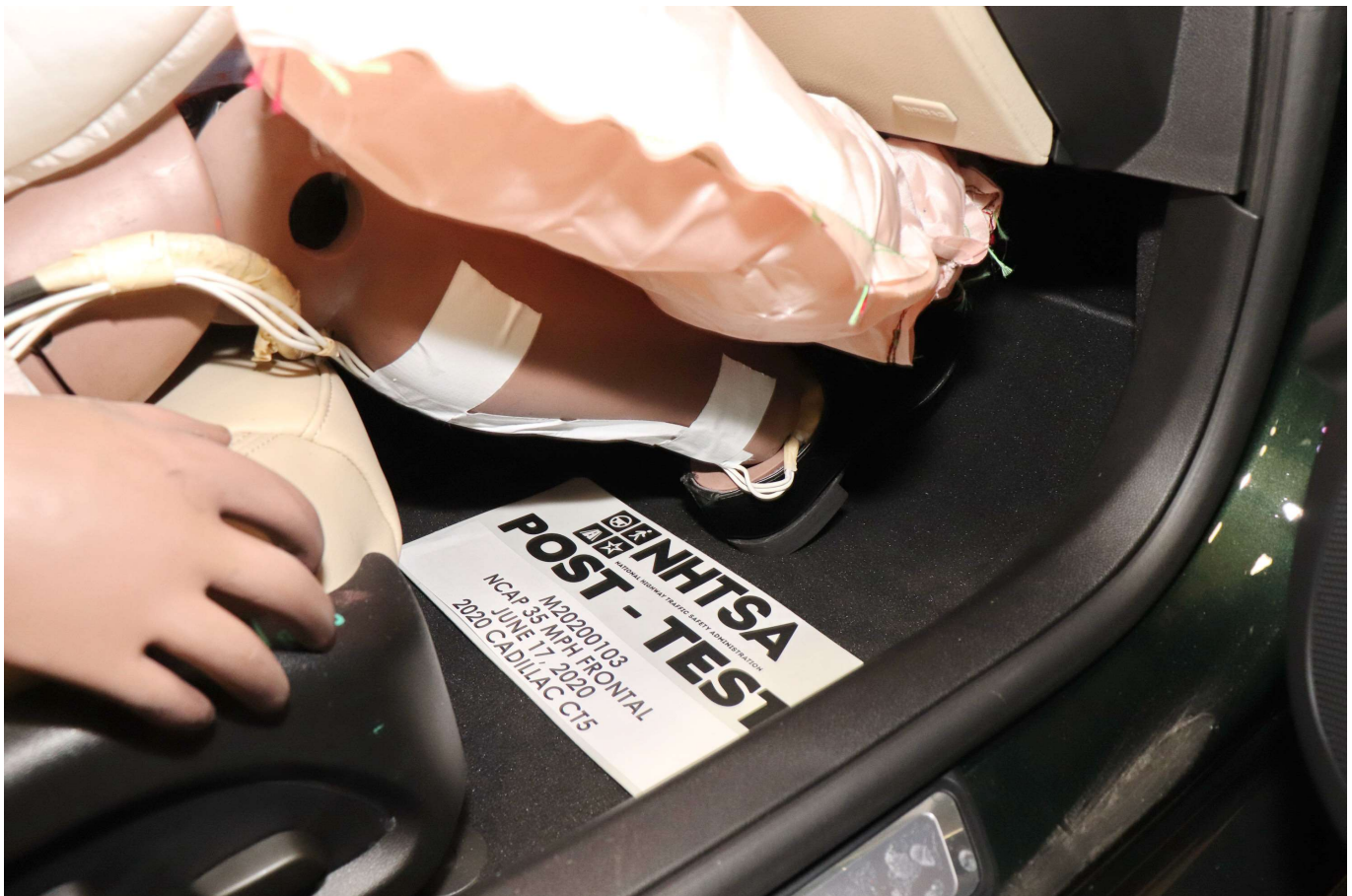


Photo No. 066 - Post-Test Passenger Dummy Feet



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



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

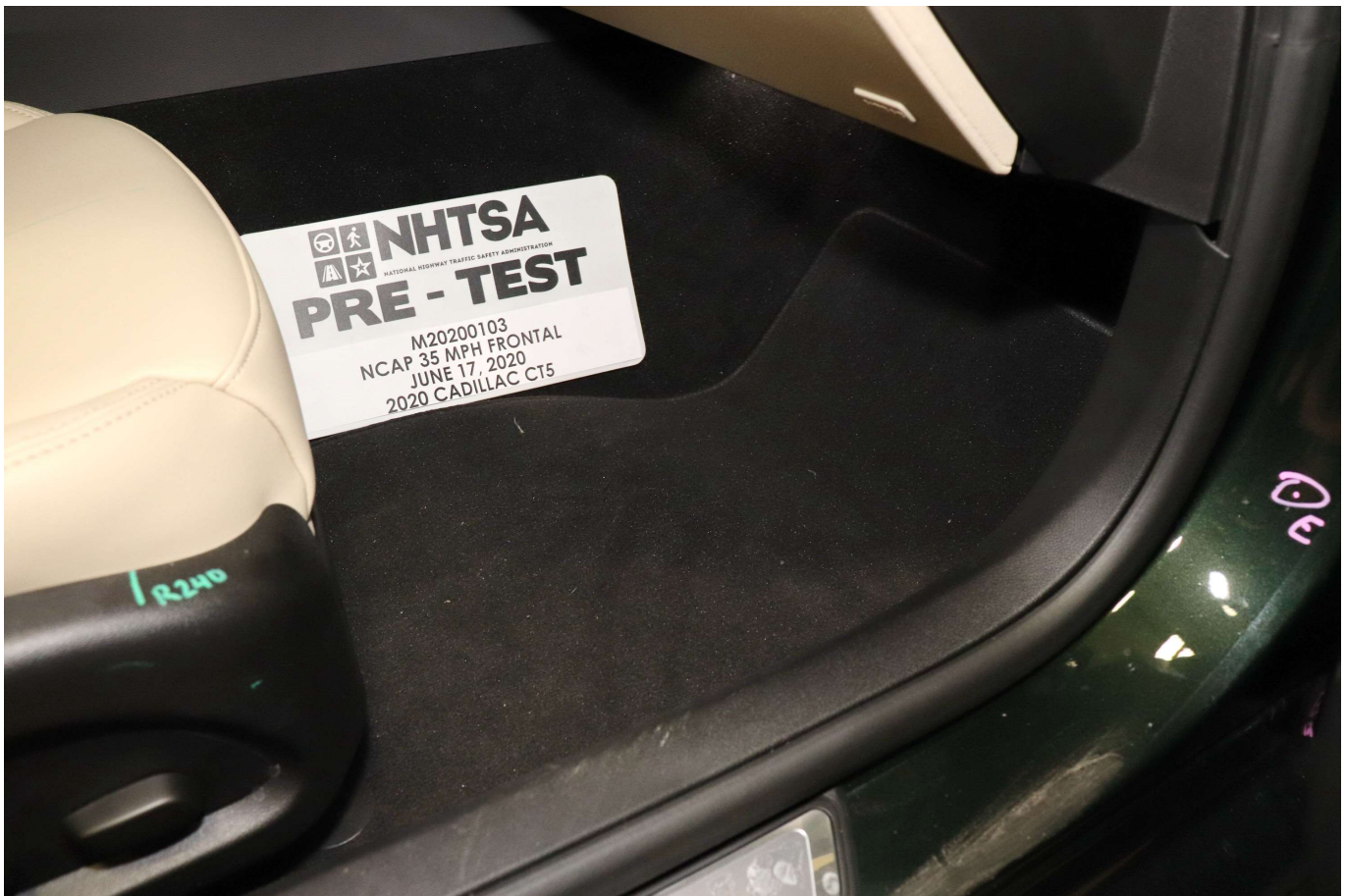


Photo No. 069 - Pre-Test Passenger Side Floorpan

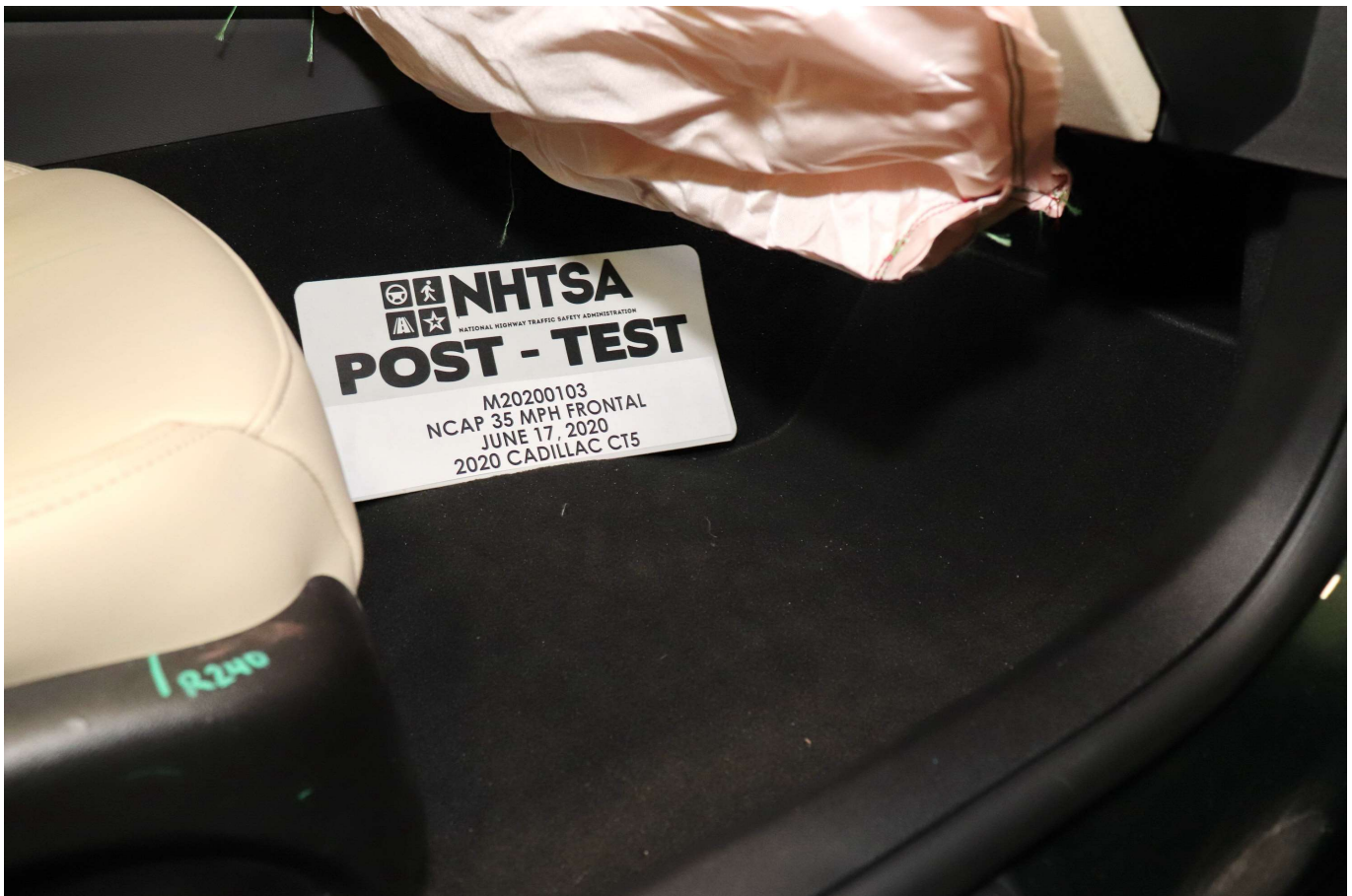


Photo No. 070 - Post-Test Passenger Side Floorpan

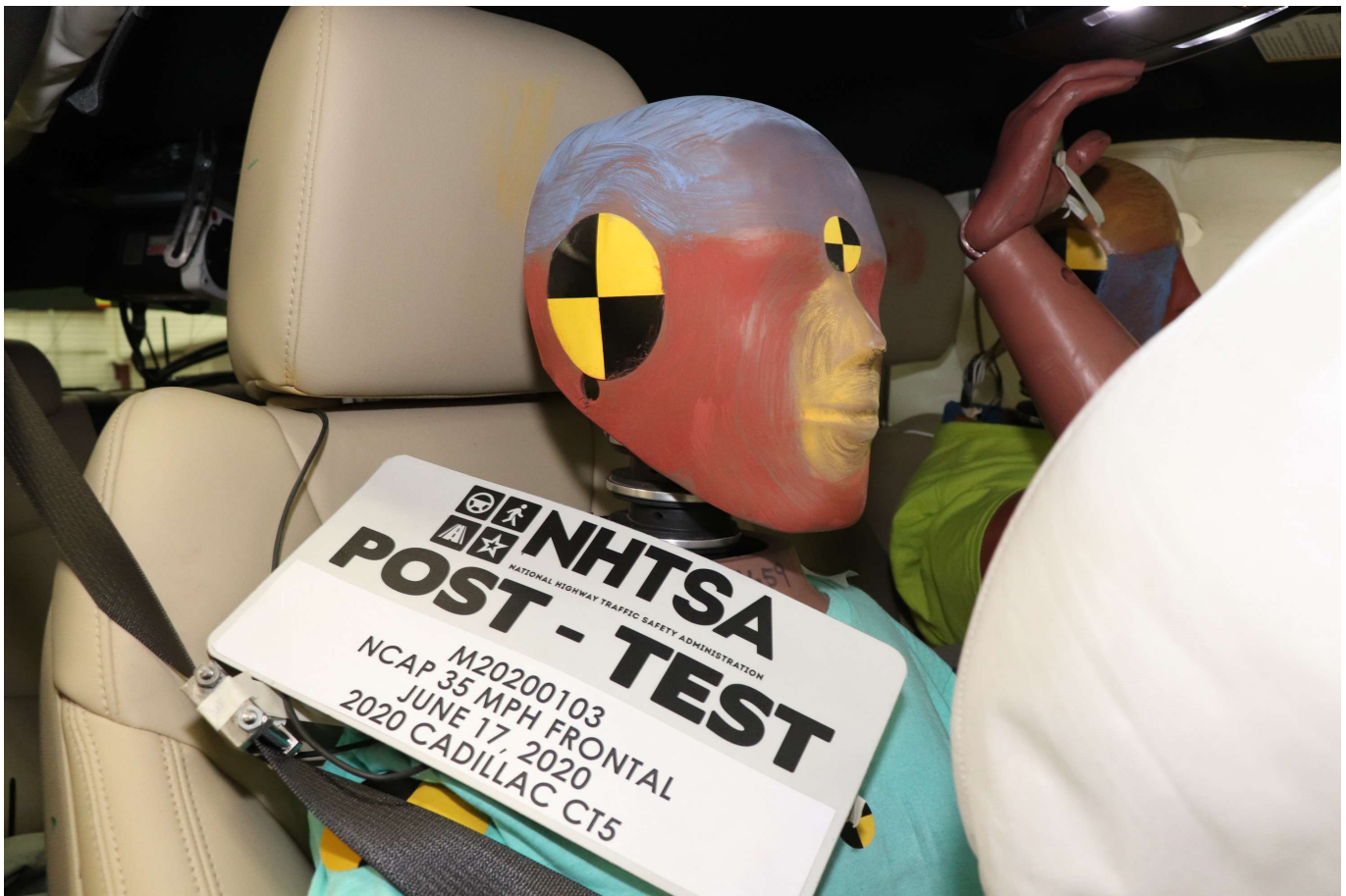


Photo No. 071 - Post-Test Passenger Dummy Face



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



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



Photo No. 074 - Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

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



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



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



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



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

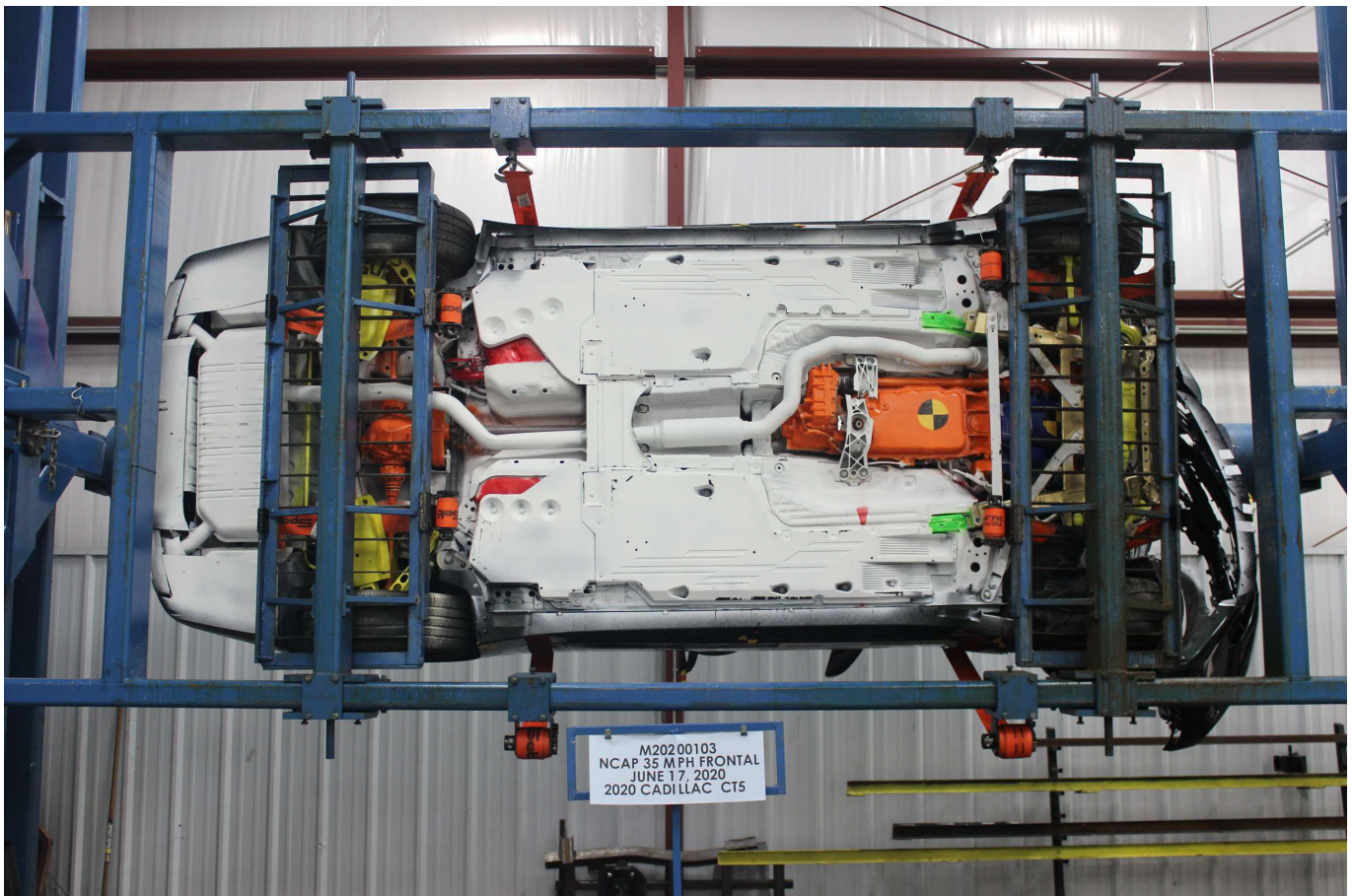


Photo No. 080 - Vehicle at 270 Degrees on Static Rollover Device



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



Photo No. 082 - 2020 Cadillac CT5 Luxury AWD 4-Door Sedan Frontal Impact Event



2020 CT5 LUXURY

EXTERIOR: EVERGREEN METALLIC
INTERIOR: SAHARA BEIGE/JET BLACK
ACCENTS

ENGINE, 2.0L TURBO,
TRANSMISSION, 10-SPEED AUTO

Visit us at www.cadillac.com

STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN

OWNER BENEFITS

- 4 YEAR / 50,000 MILE* BUMPER-TO-BUMPER LIMITED WARRANTY
- 6 YEAR / 70,000 MILE* POWERTRAIN LIMITED WARRANTY, ROADSIDE ASSISTANCE & COURTESY TRANSPORTATION
- FIRST MAINTENANCE VISIT
- *WHICHEVER COMES FIRST SEE CADILLAC.COM OR DEALER FOR TERMS, DETAILS & LIMITS
- ONSTAR (R) SERVICES & 4G LTE WI-FI (R) AVAILABLE; SEE ONSTAR.COM FOR TERMS

PERFORMANCE

- ELECTRONIC PRECISION SHIFT
- WHEELS, 18" PAINTED ALLOY WITH BRIGHT SILVER FINISH

- TIRES, ALL-SEASON, SELF-SEALING

LUXURY & CONVENIENCE

- DRIVER 8-WAY POWER SEAT W/ 2-WAY POWER LUMBAR
- PASSENGER 6-WAY POWER SEAT W/ 2-WAY POWER LUMBAR
- SEAT, REAR SPLIT FOLDING
- LEATHERETTE SEATING SURFACES
- LEATHER WRAP STEERING WHEEL W/ PADDLE SHIFTERS
- LIGHTING, LED HEADLAMPS & TAIL LAMPS
- WIPERS, RAINSENSE
- DUAL-ZONE CLIMATE CONTROL
- MIRRORS, OUTSIDE HEATED, POWER ADJUSTABLE
- W/ INTEGRATED TURN SIGNAL INDICATORS
- KEYLESS ACCESS AND START
- ADAPTIVE REMOTE START
- BLUETOOTH FOR SELECT PHONES

- & STREAMING AUDIO DEVICES
- PREMIUM AUDIO, 9-SPEAKER
- SIRIUSXM RADIO CAPABLE, ALL ACCESS TRIAL W/ SUBSCRIPTION SOLD SEPARATELY
- HD RADIO
- COLOR DRIVER INFORMATION CENTER
- CADILLAC USER EXPERIENCE 10" DISPLAY, APPLE CARPLAY(R) & ANDROID AUTO(R) CAPABILITY AVAILABLE W/ COMPATIBLE PHONES, CONNECTED APPS, ROTARY INFOTAINMENT CONTROL

SAFETY & SECURITY

- HD REAR VISION CAMERA
- SAFETY ALERT SEAT
- TEEN DRIVER
- FORWARD COLLISION ALERT
- AUTOMATIC EMERGENCY BRAKING
- FRONT PEDESTRIAN BRAKING
- TIRE PRESSURE MONITOR SYSTEM

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE \$36,895.00

OPTIONS & PRICING

OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

DRIVETRAIN, ALL WHEEL DRIVE	2,000.00
EVERGREEN METALLIC	625.00
COLD WEATHER PACKAGE:	600.00
• DRIVER & FRONT PASSENGER HEATED SEATS	
• STEERING WHEEL, HEATED, AUTOMATIC	

TOTAL OPTIONS \$3,225.00

TOTAL VEHICLE & OPTIONS \$40,120.00

DESTINATION CHARGE 995.00

TOTAL VEHICLE PRICE* \$41,115.00

EPA DOT Fuel Economy and Environment

Fuel Economy

25 MPG
combined city/hwy

21 city
31 highway

4.0 gallons per 100 miles

Mid-size cars range from 12 to 136 MPG. The best vehicle rates 136 MPG.

You spend \$2,250
more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,950

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

5

1 10 Best

This vehicle emits 356 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fuelconomy.gov.

Smog Rating (tailpipe only)

6

1 10 Best

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.25 per gallon. MPGe 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

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 55%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: CHINA 19%

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

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
LANSING, MI U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

ORDER NO XDR6ZM SALES CODE E
SALES MODEL CODE 60979
DEALER NO 29406
FINAL ASSEMBLY: U.S.A.
VIN 1G6D5SRK1L0115372
DEALER TO WHOM DELIVERED
R.J. BURNE CADILLAC
1205 WYOMING AVE
SCRANTON, PA 18509-2716

1GA1500128

Photo No. 083 - Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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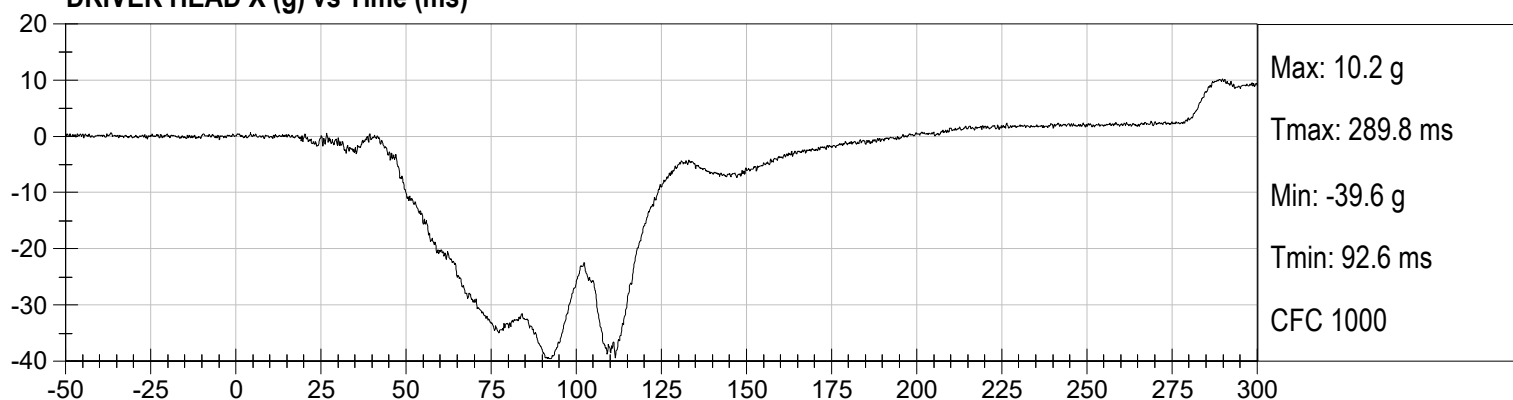
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.gov

Driver Head X Redundant
 Driver Head Y Redundant
 Driver Head Z Redundant
 Driver Head Angular Velocity X
 Driver Head Angular Velocity Y
 Driver Head Angular Velocity Z
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant
 Driver Chest Y Redundant
 Driver Chest Z Redundant
 Driver Pelvis X
 Driver Pelvis Y
 Driver Pelvis Z
 Driver Left Femur Redundant
 Driver Right Femur Redundant
 Driver Left Upper Tibia Moment X
 Driver Left Upper Tibia Moment Y

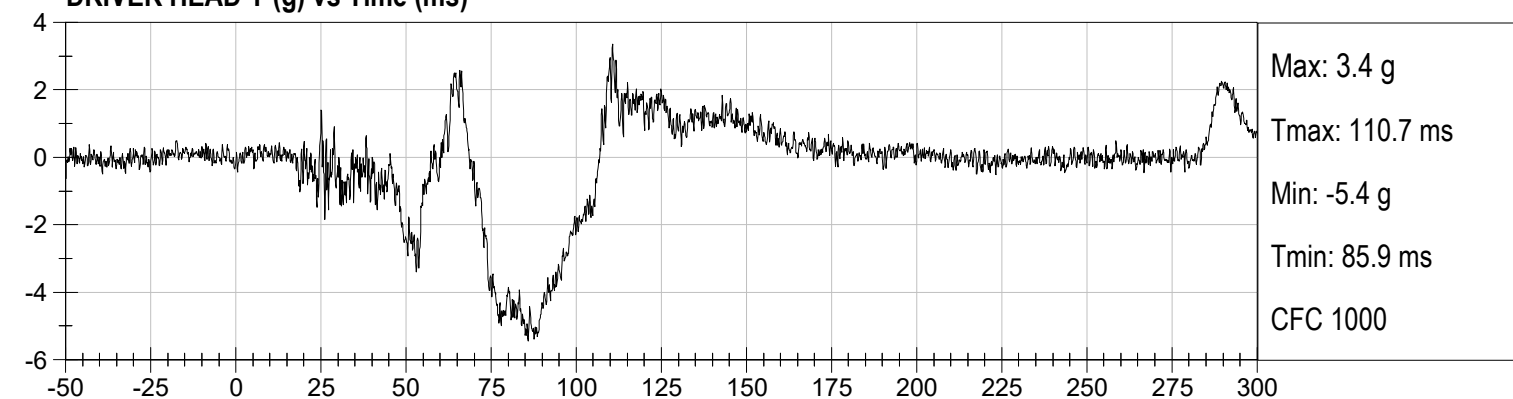
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Lap Belt Force
Driver Shoulder Belt Force
Passenger Head X Redundant
Passenger Head Y Redundant
Passenger Head Z Redundant
Passenger Head Angular Velocity X
Passenger Head Angular Velocity Y
Passenger Head Angular Velocity Z
Passenger Upper Neck Force Y
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Z
Passenger Chest X Redundant
Passenger Chest Y Redundant
Passenger Chest Z Redundant
Passenger Pelvis X
Passenger Pelvis Y

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

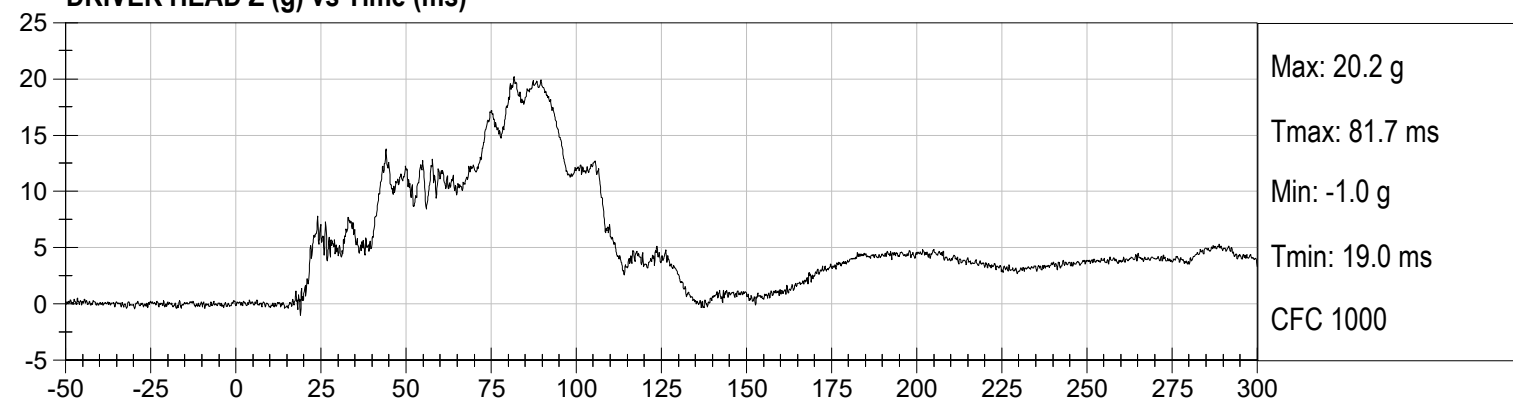
DRIVER HEAD X (g) vs Time (ms)



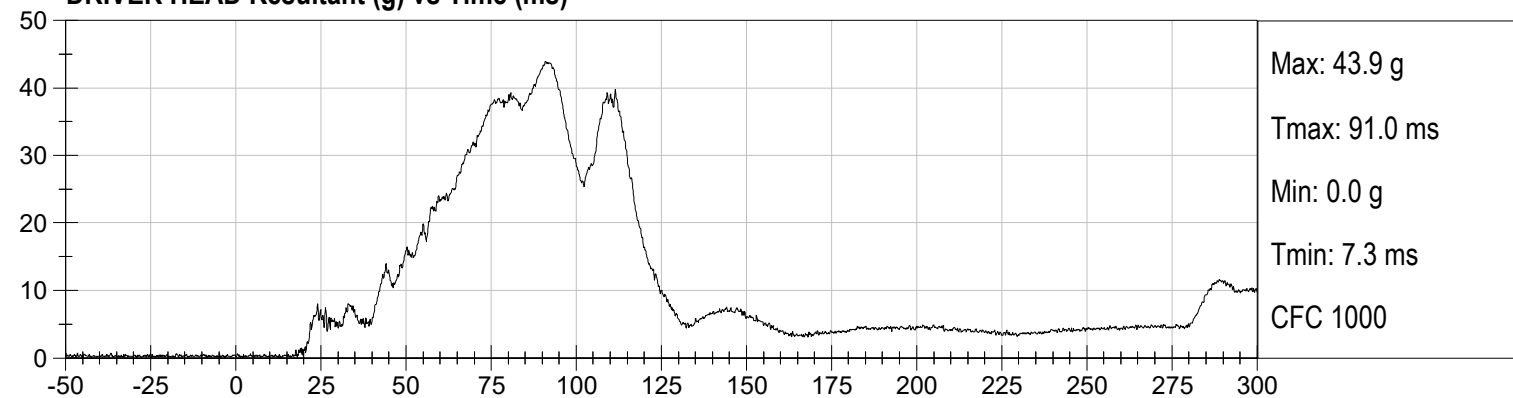
DRIVER HEAD Y (g) vs Time (ms)

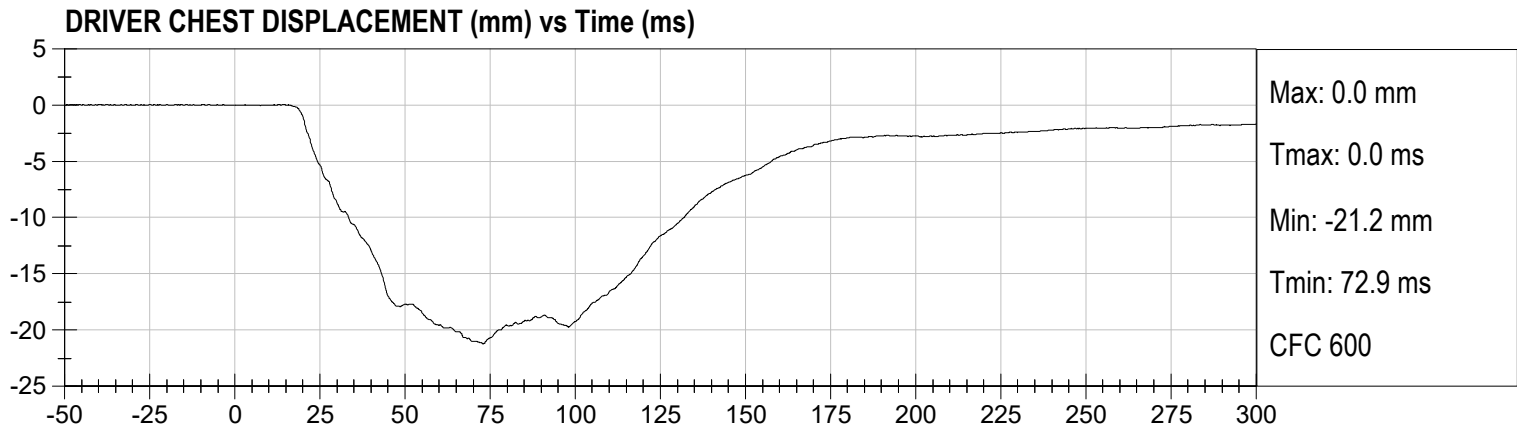


DRIVER HEAD Z (g) vs Time (ms)

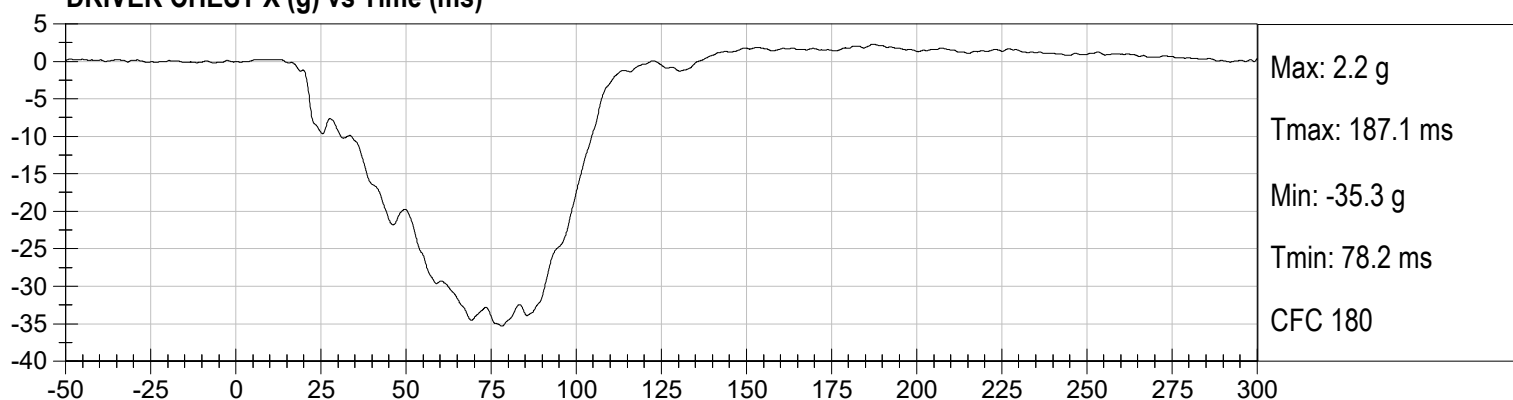


DRIVER HEAD Resultant (g) vs Time (ms)

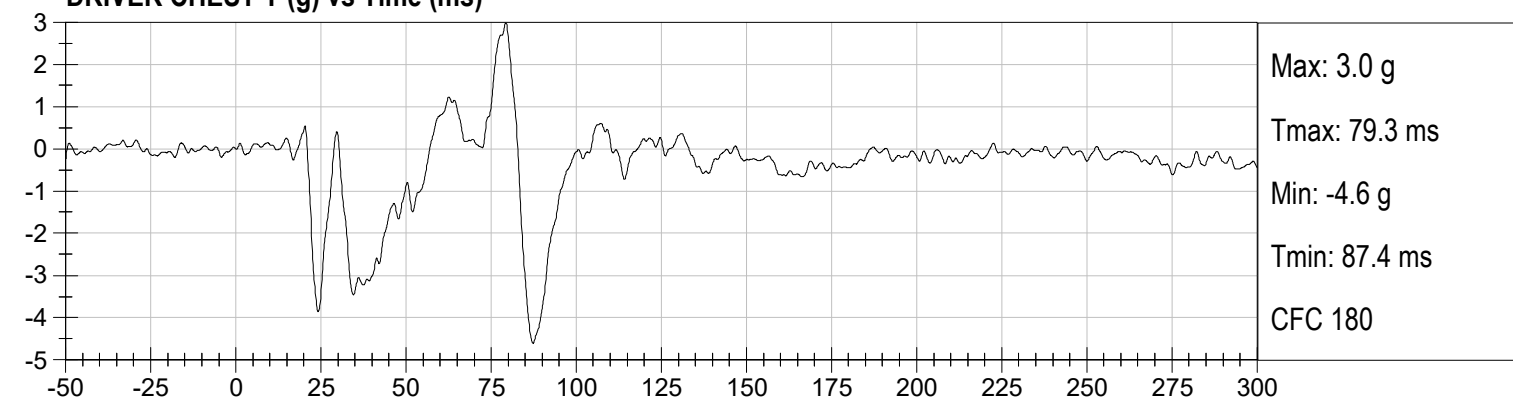




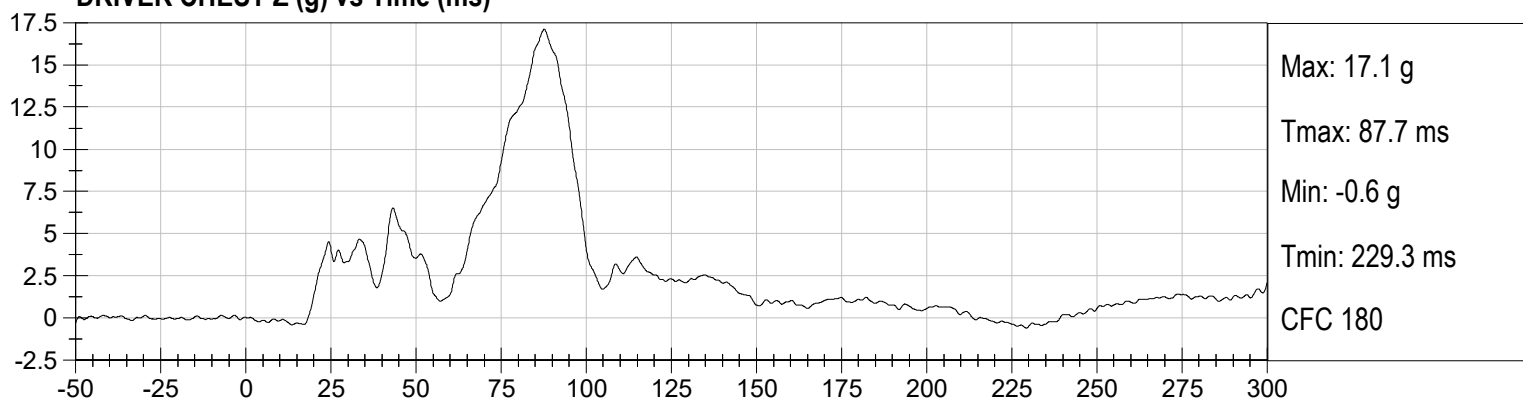
DRIVER CHEST X (g) vs Time (ms)



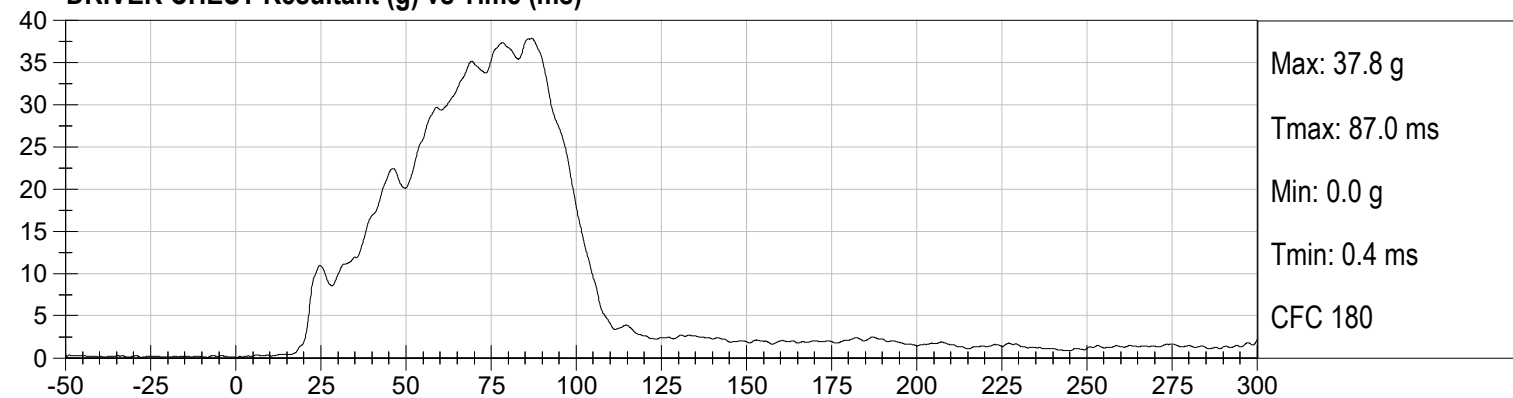
DRIVER CHEST Y (g) vs Time (ms)



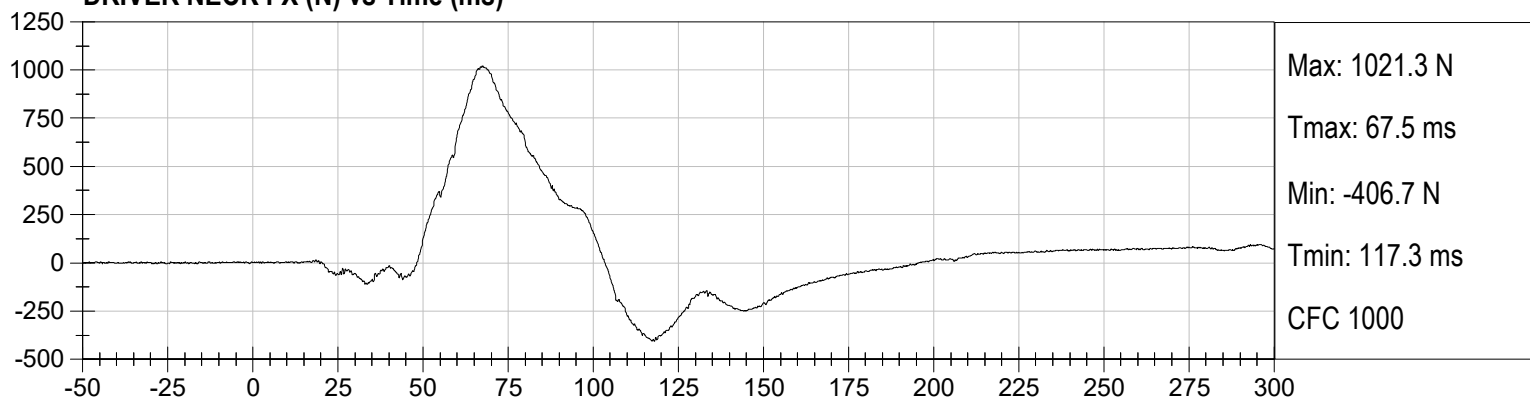
DRIVER CHEST Z (g) vs Time (ms)



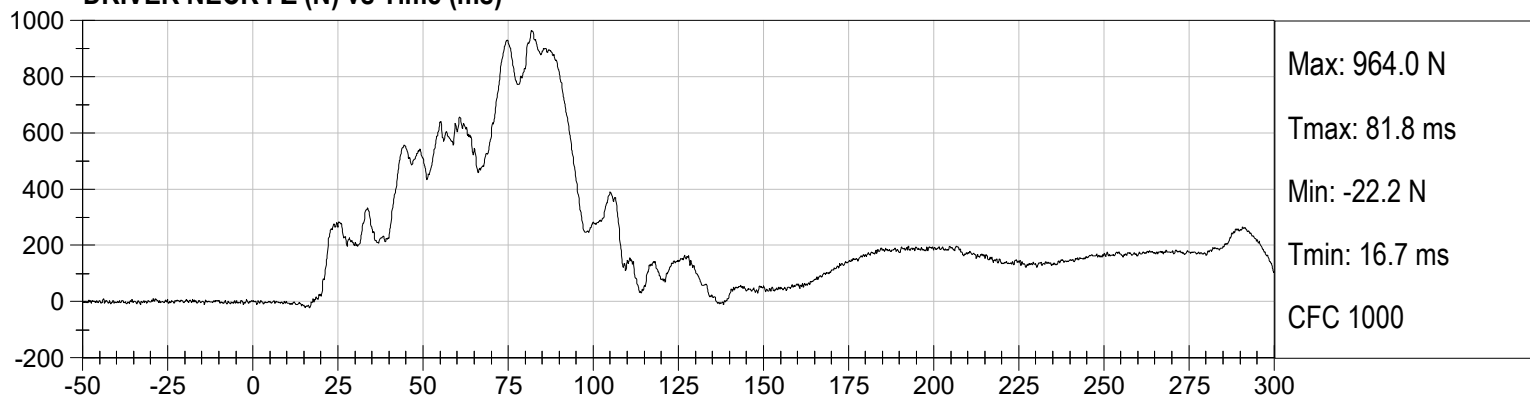
DRIVER CHEST Resultant (g) vs Time (ms)



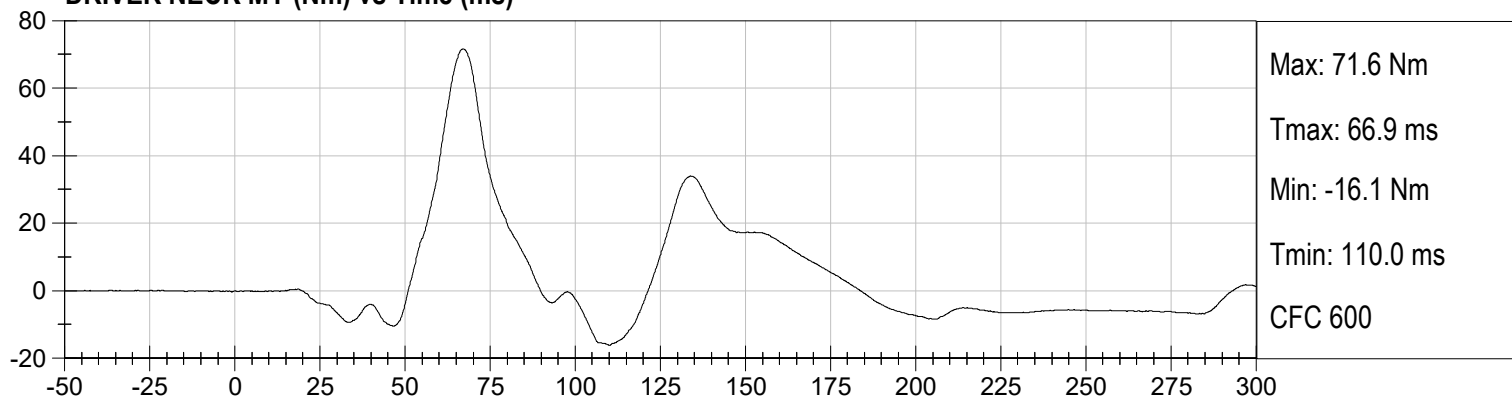
DRIVER NECK FX (N) vs Time (ms)



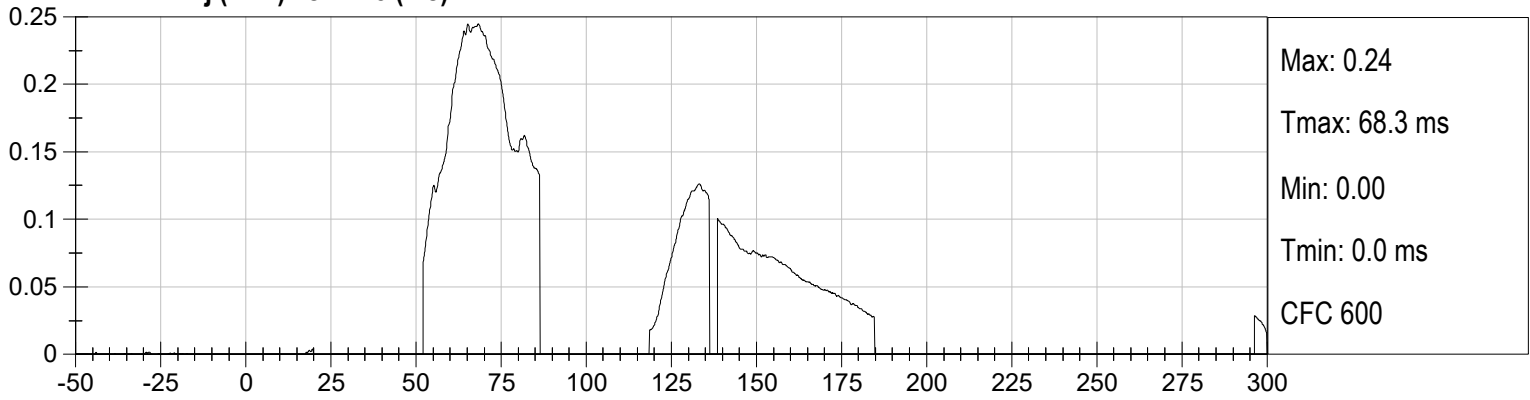
DRIVER NECK FZ (N) vs Time (ms)



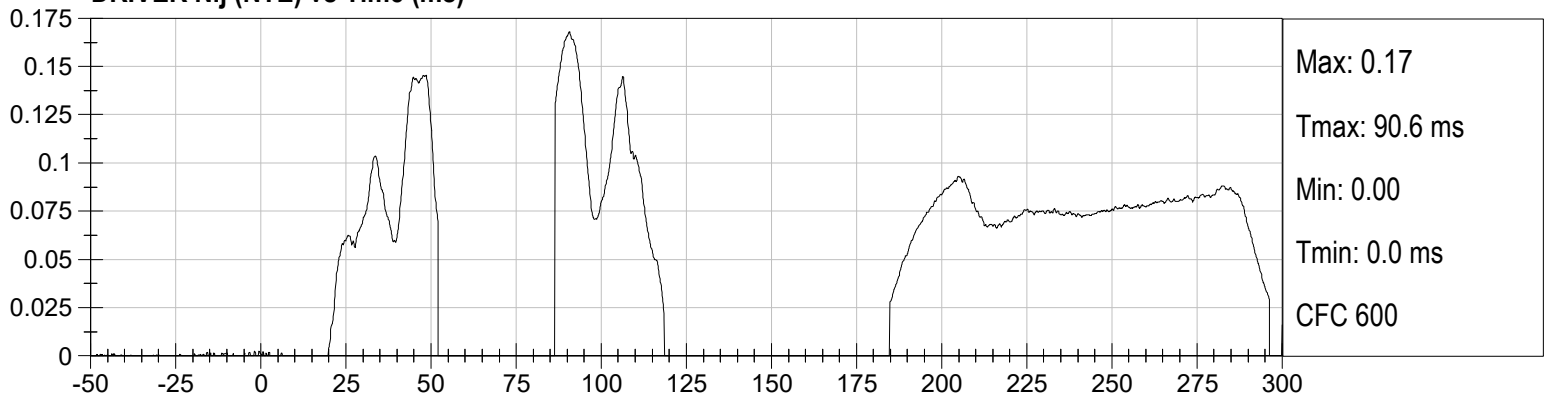
DRIVER NECK MY (Nm) vs Time (ms)



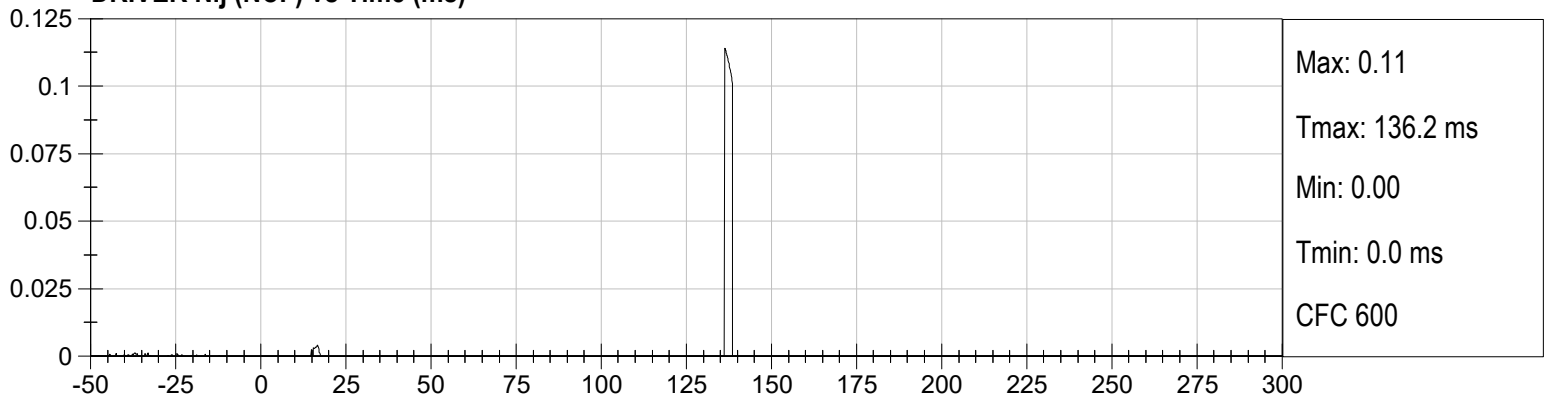
DRIVER Nij (NTF) vs Time (ms)



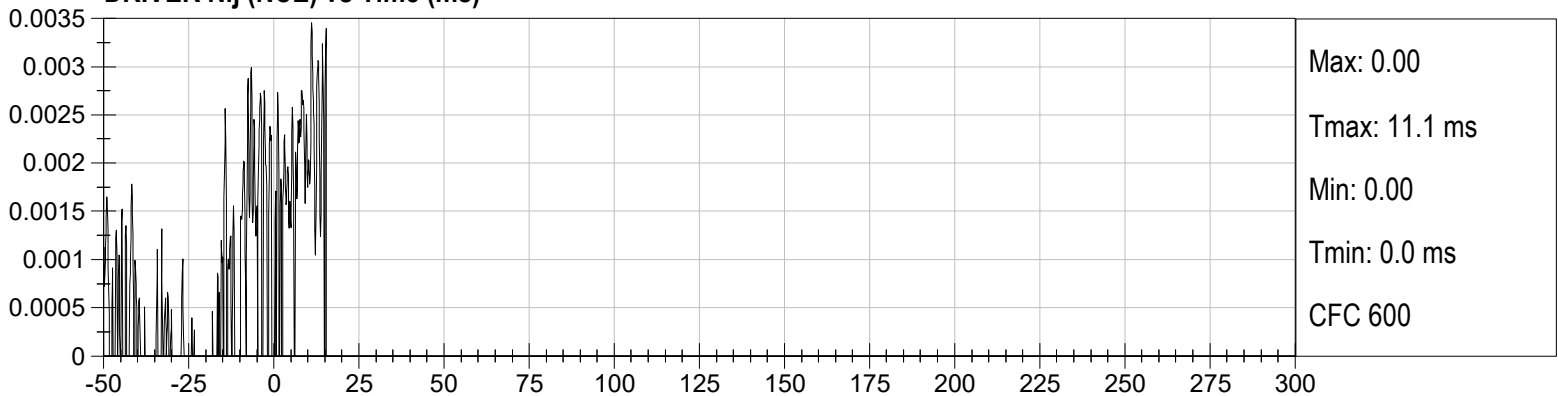
DRIVER Nij (NTE) vs Time (ms)



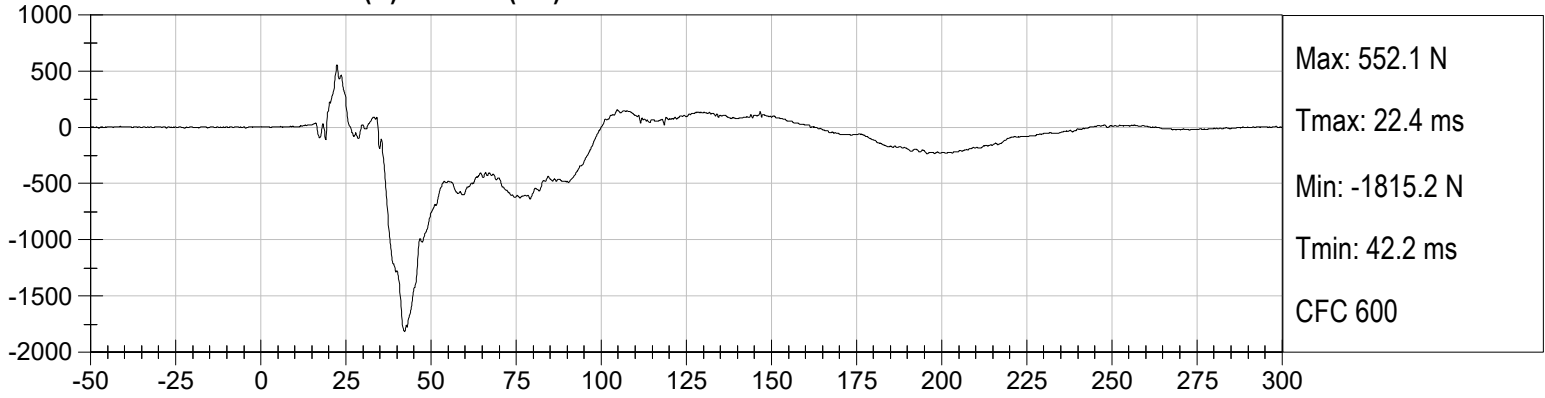
DRIVER Nij (NCF) vs Time (ms)



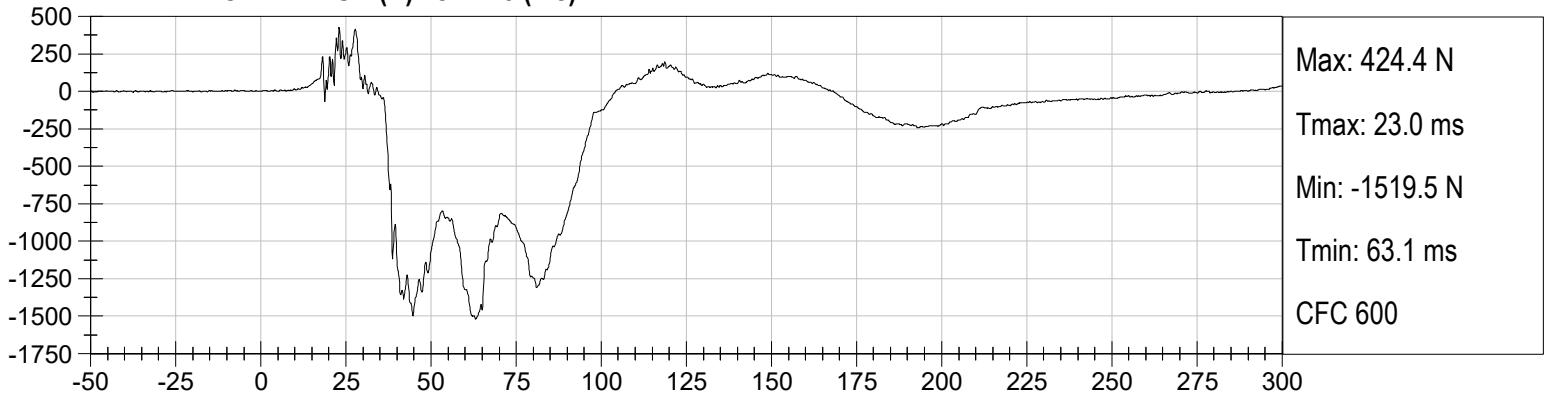
DRIVER Nij (NCE) vs Time (ms)



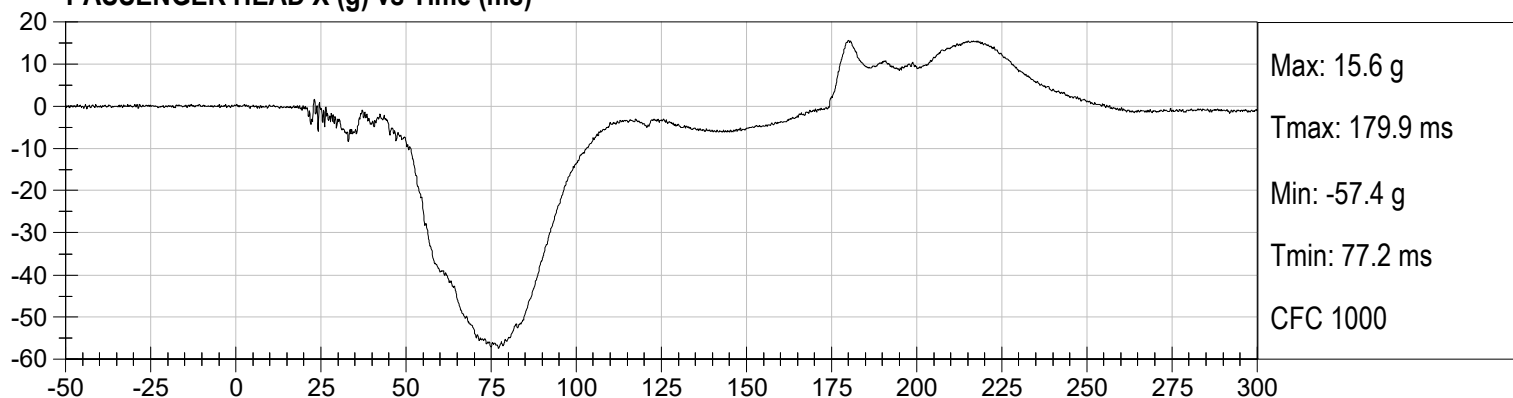
DRIVER LEFT FEMUR (N) vs Time (ms)



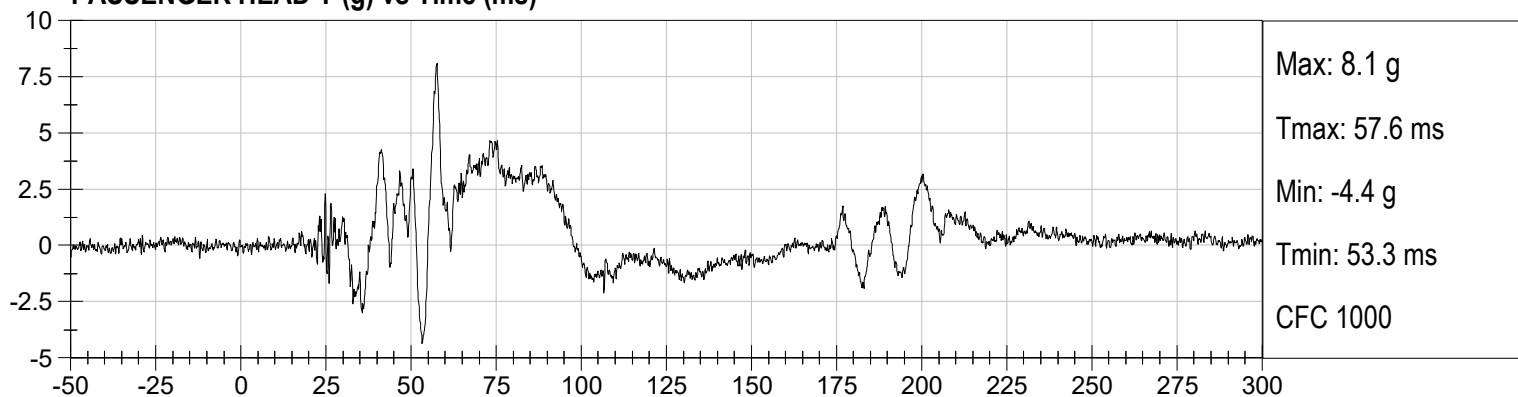
DRIVER RIGHT FEMUR (N) vs Time (ms)



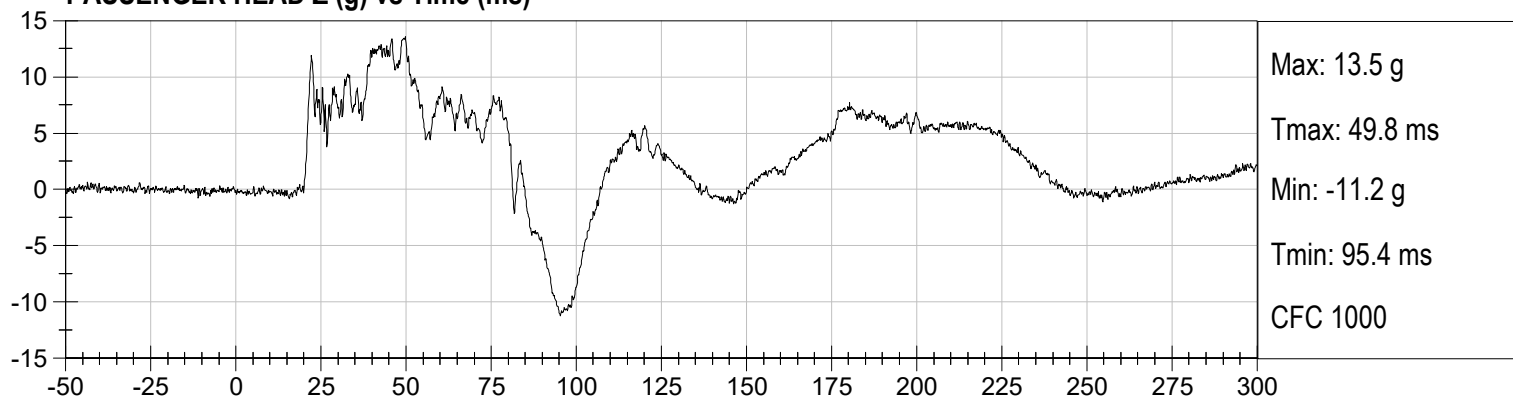
PASSENGER HEAD X (g) vs Time (ms)



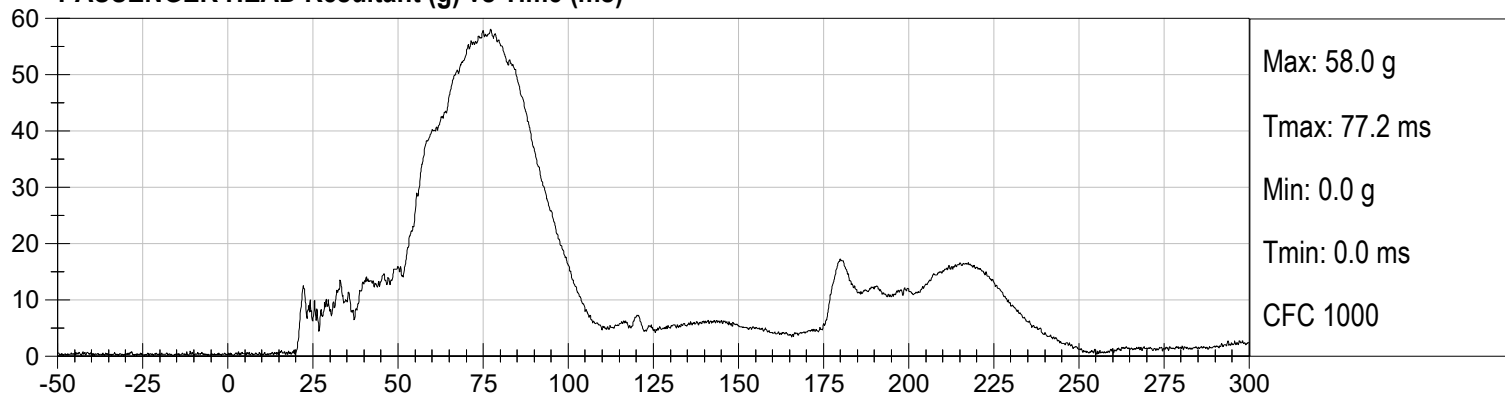
PASSENGER HEAD Y (g) vs Time (ms)

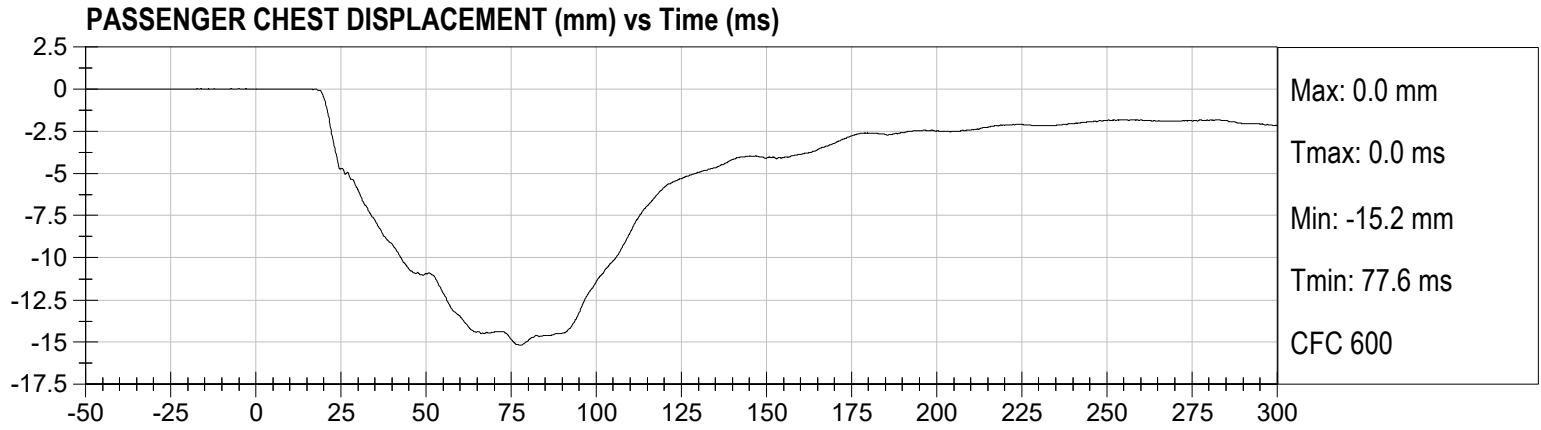


PASSENGER HEAD Z (g) vs Time (ms)

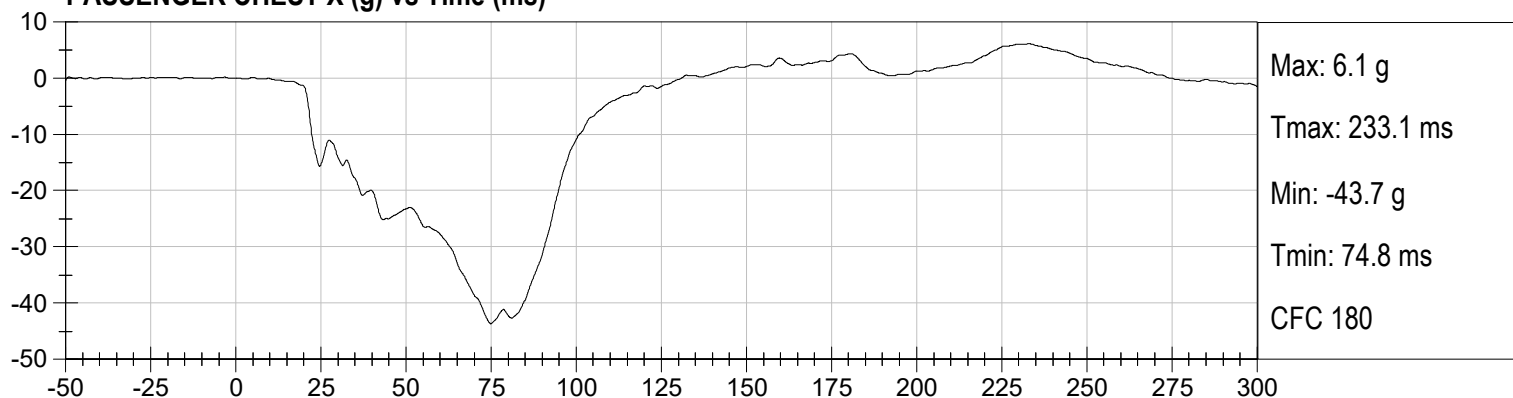


PASSENGER HEAD Resultant (g) vs Time (ms)

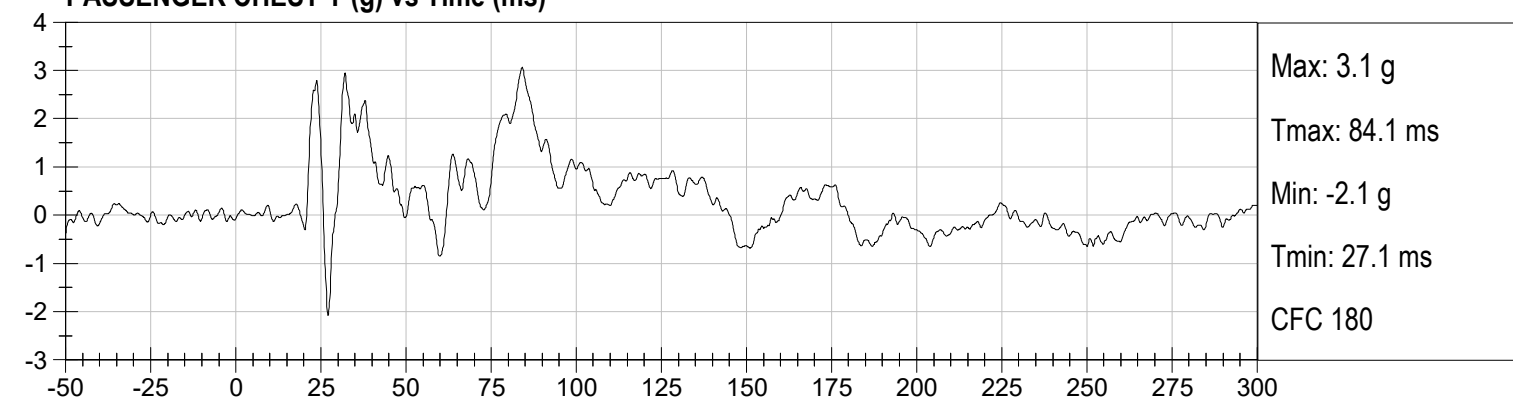




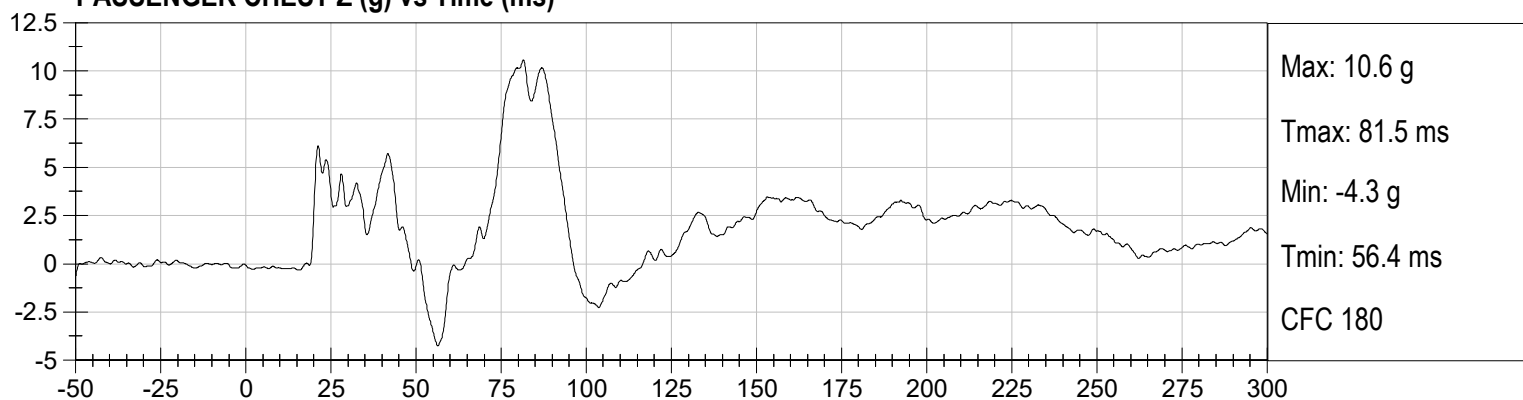
PASSENGER CHEST X (g) vs Time (ms)



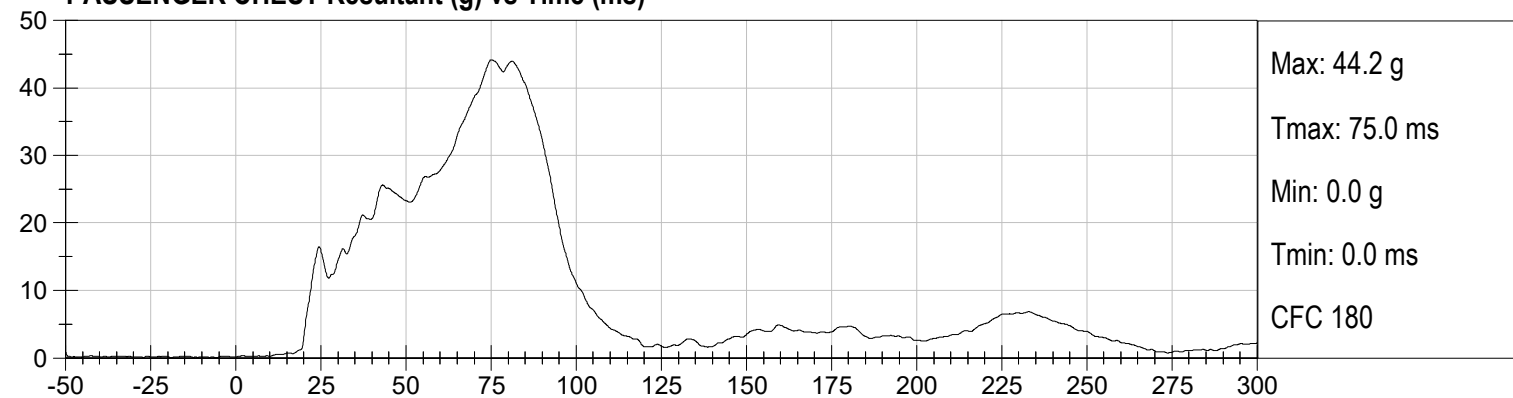
PASSENGER CHEST Y (g) vs Time (ms)



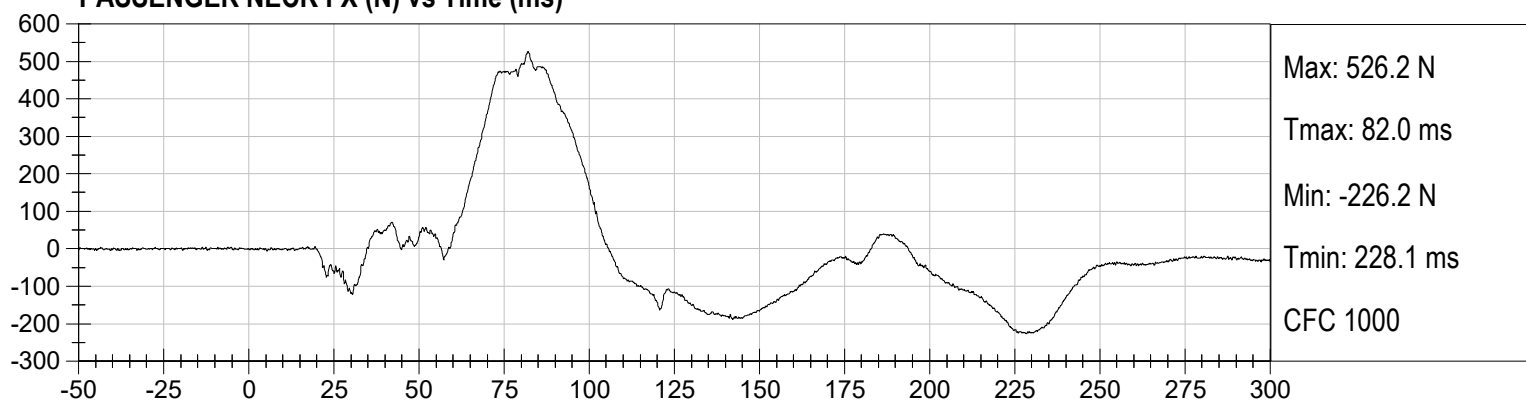
PASSENGER CHEST Z (g) vs Time (ms)



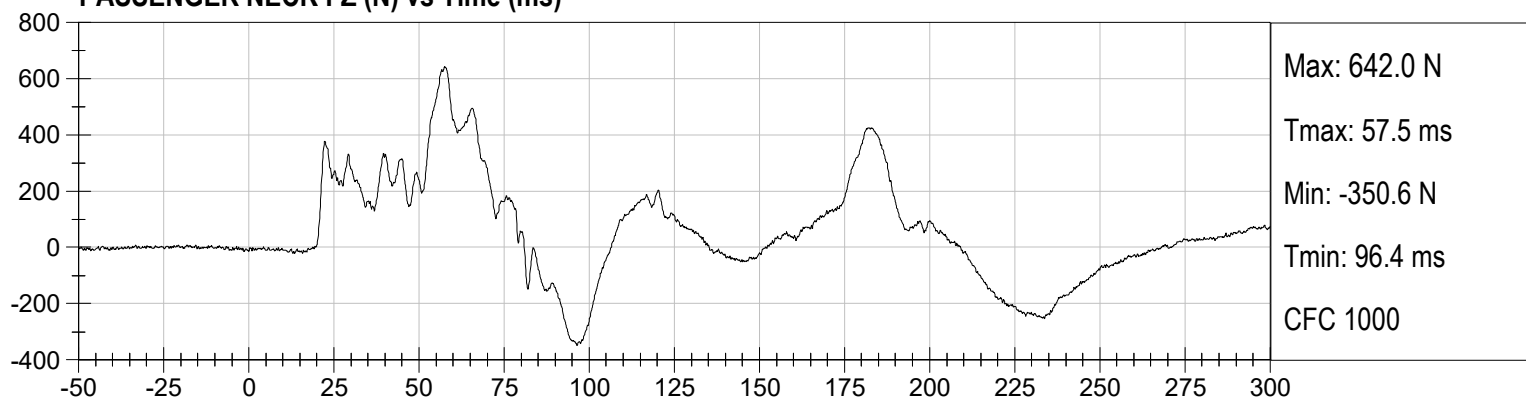
PASSENGER CHEST Resultant (g) vs Time (ms)



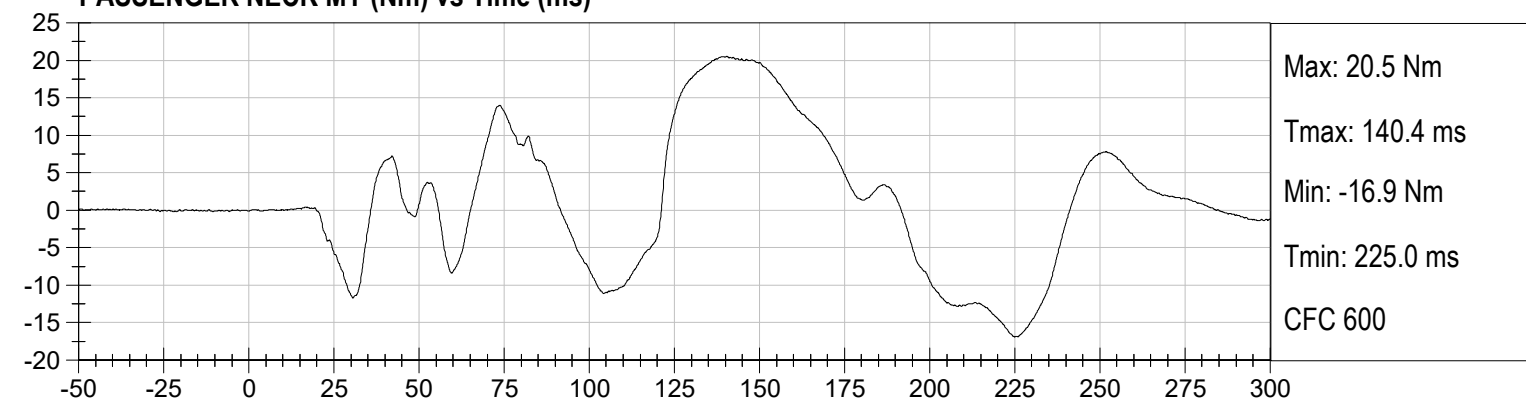
PASSENGER NECK FX (N) vs Time (ms)



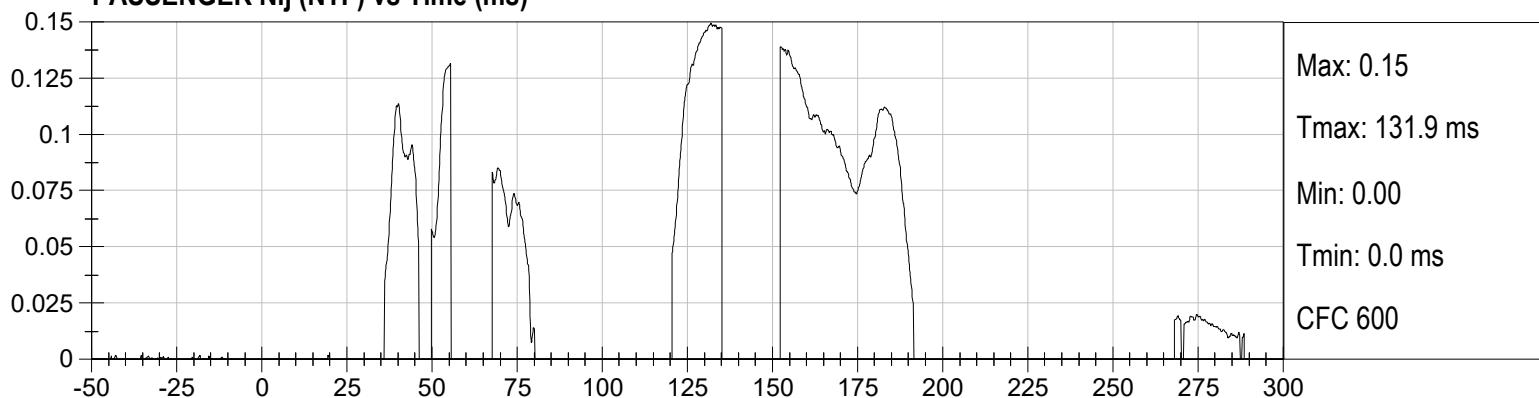
PASSENGER NECK FZ (N) vs Time (ms)



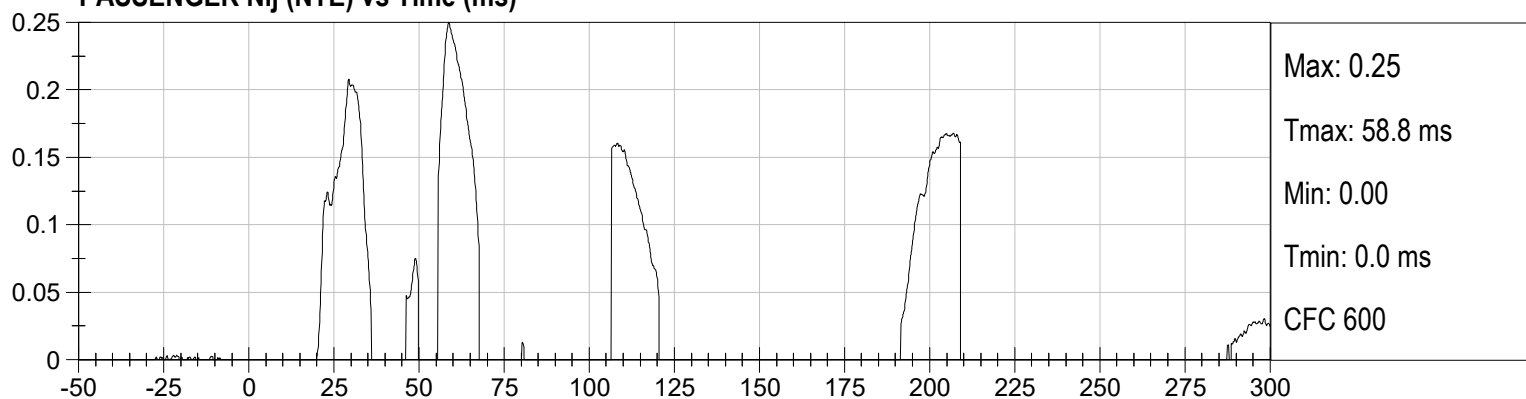
PASSENGER NECK MY (Nm) vs Time (ms)



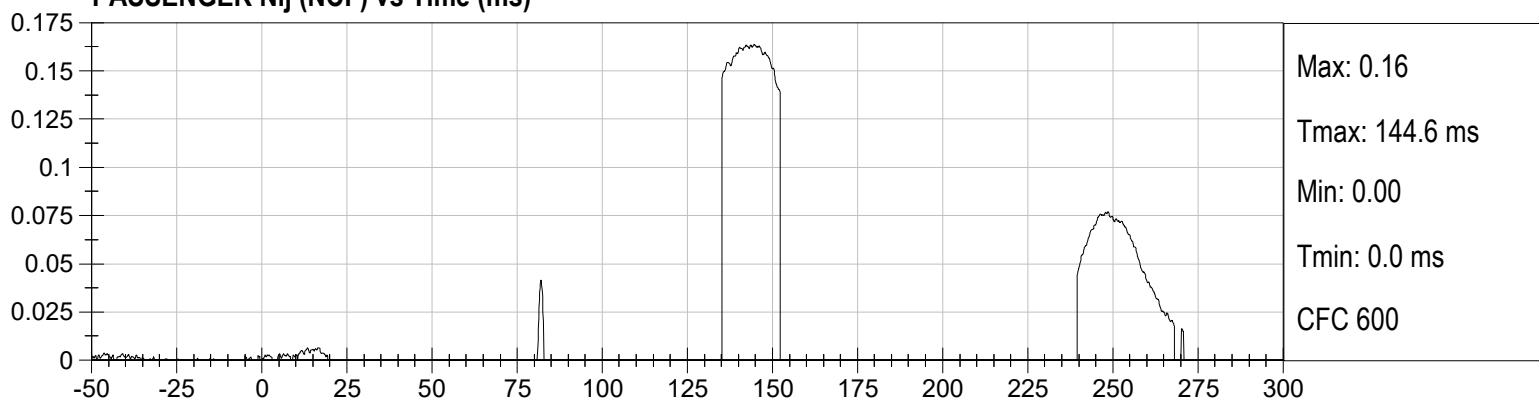
PASSENGER Nij (NTF) vs Time (ms)



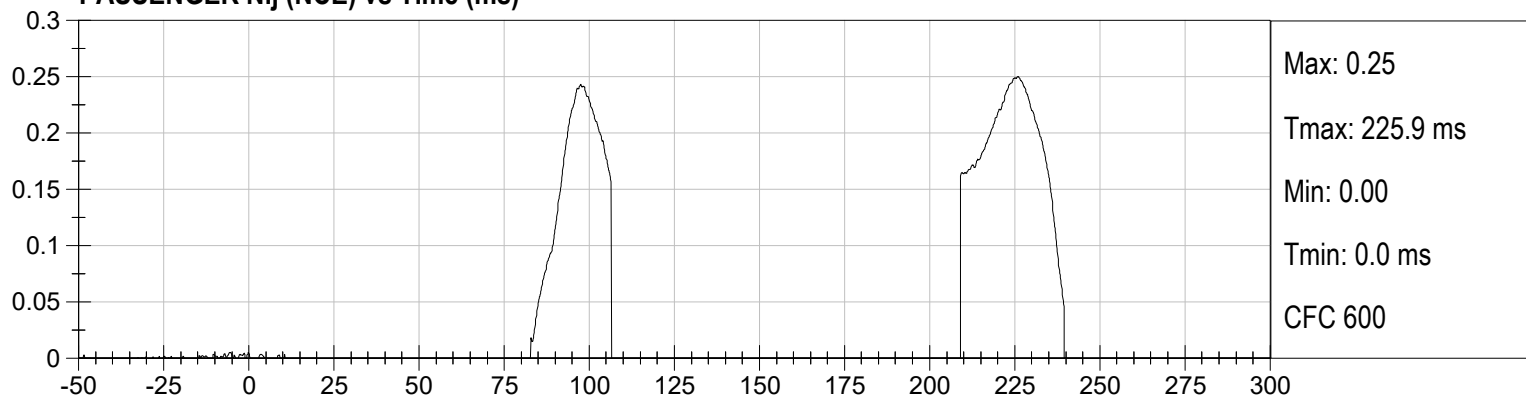
PASSENGER Nij (NTE) vs Time (ms)



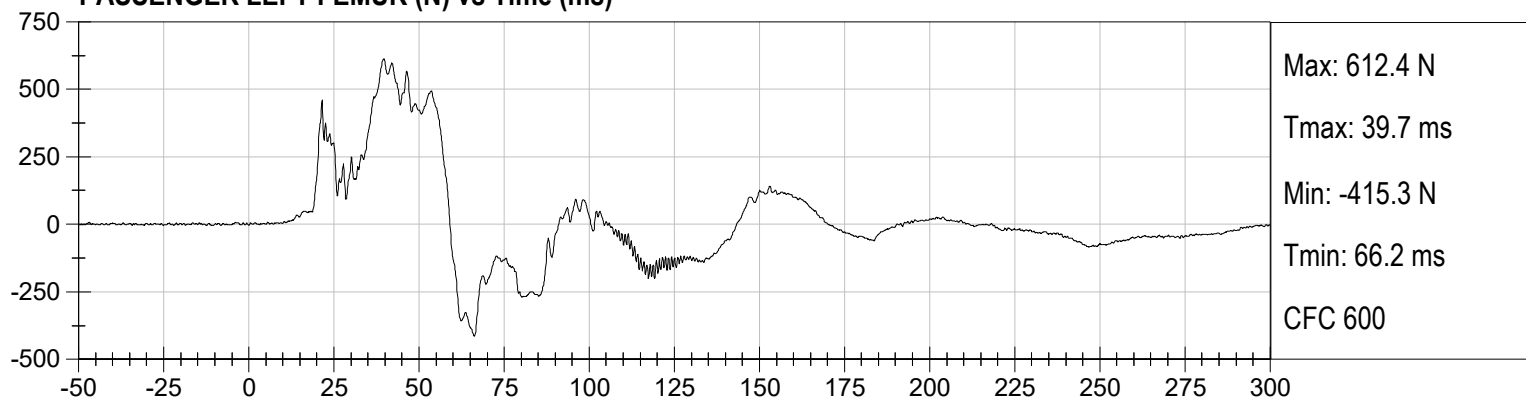
PASSENGER Nij (NCF) vs Time (ms)



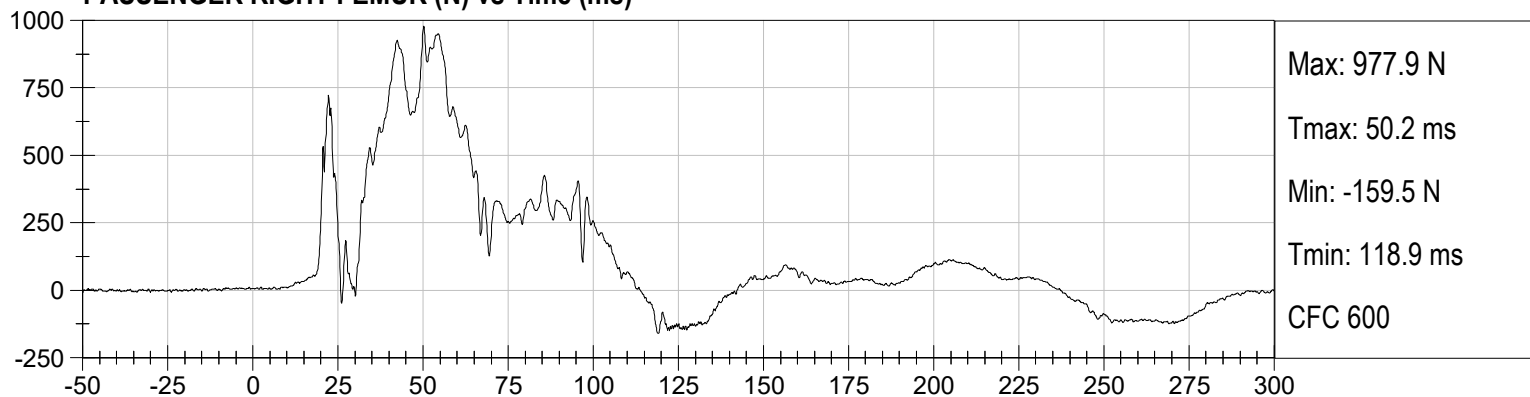
PASSENGER Nij (NCE) vs Time (ms)



PASSENGER LEFT FEMUR (N) vs Time (ms)



PASSENGER RIGHT FEMUR (N) vs Time (ms)



APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

Hybrid III, 50th External Measurements
SN: 351

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

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

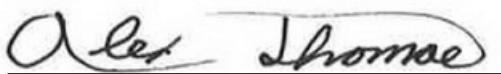
NOTE: THE H-POINT IS LOCATED 1.83 INCHES FORWARD AND 2.57 INCHES DOWN FROM THE CENTER OF THE PELVIS ANGLE REFERENCE HOLE.

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

ATD Serial No: 351

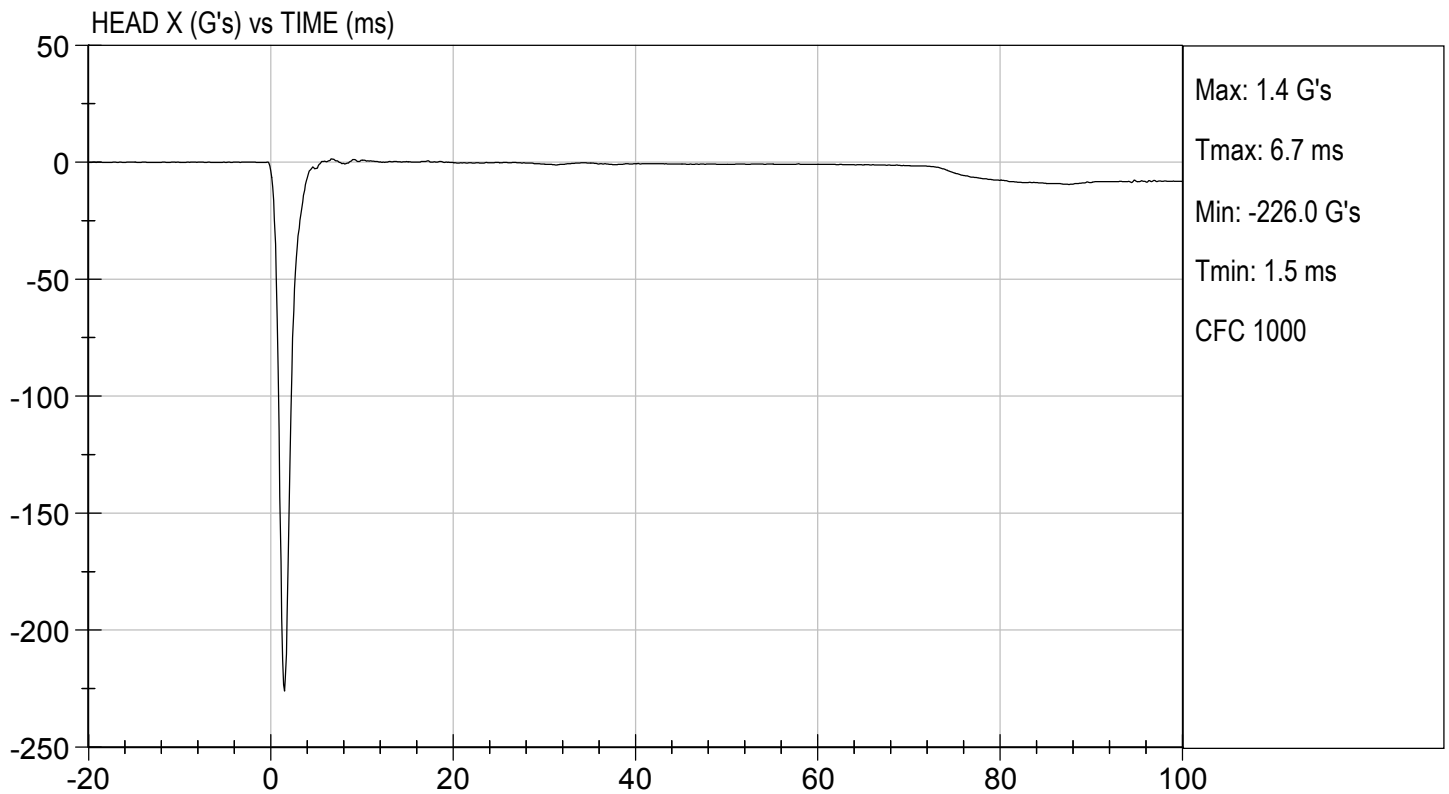
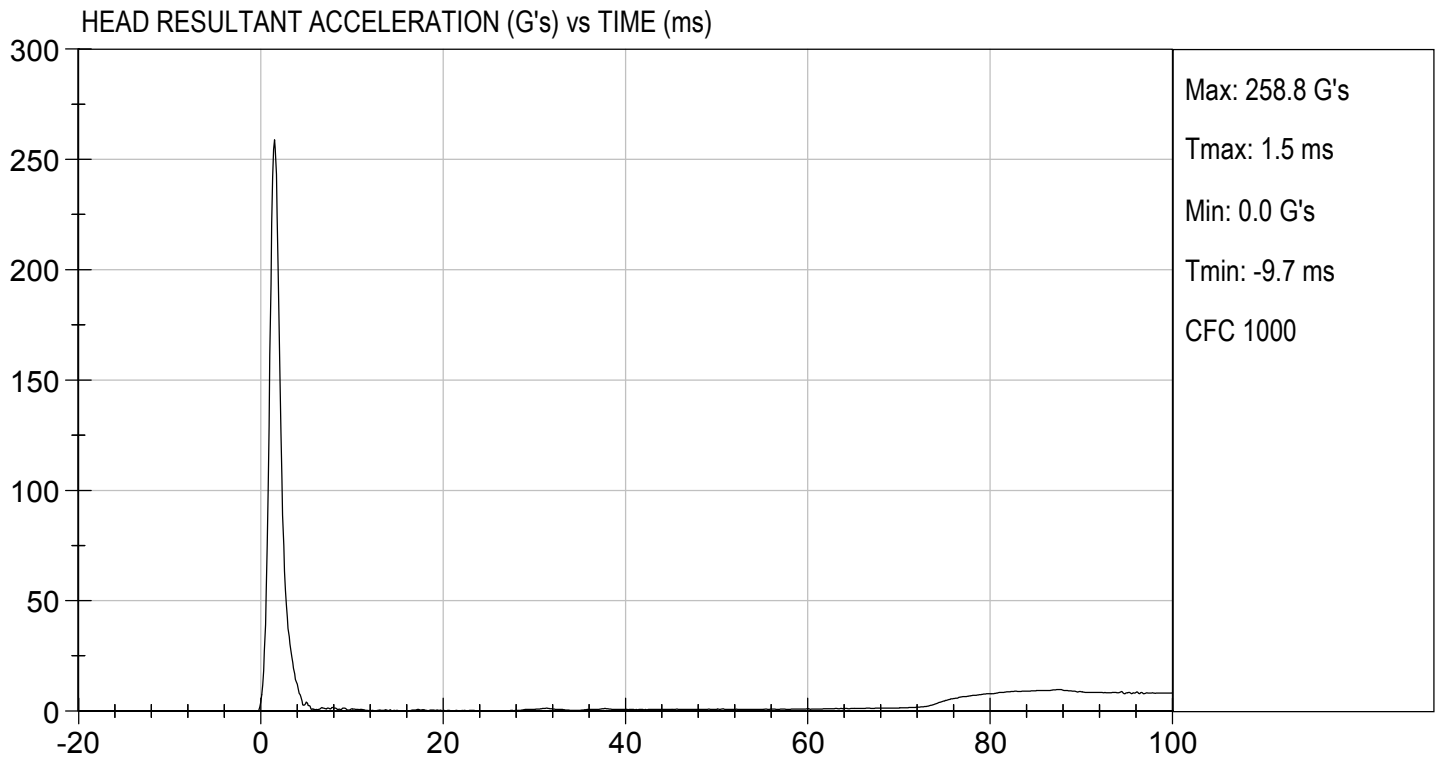
Test ID: D201431

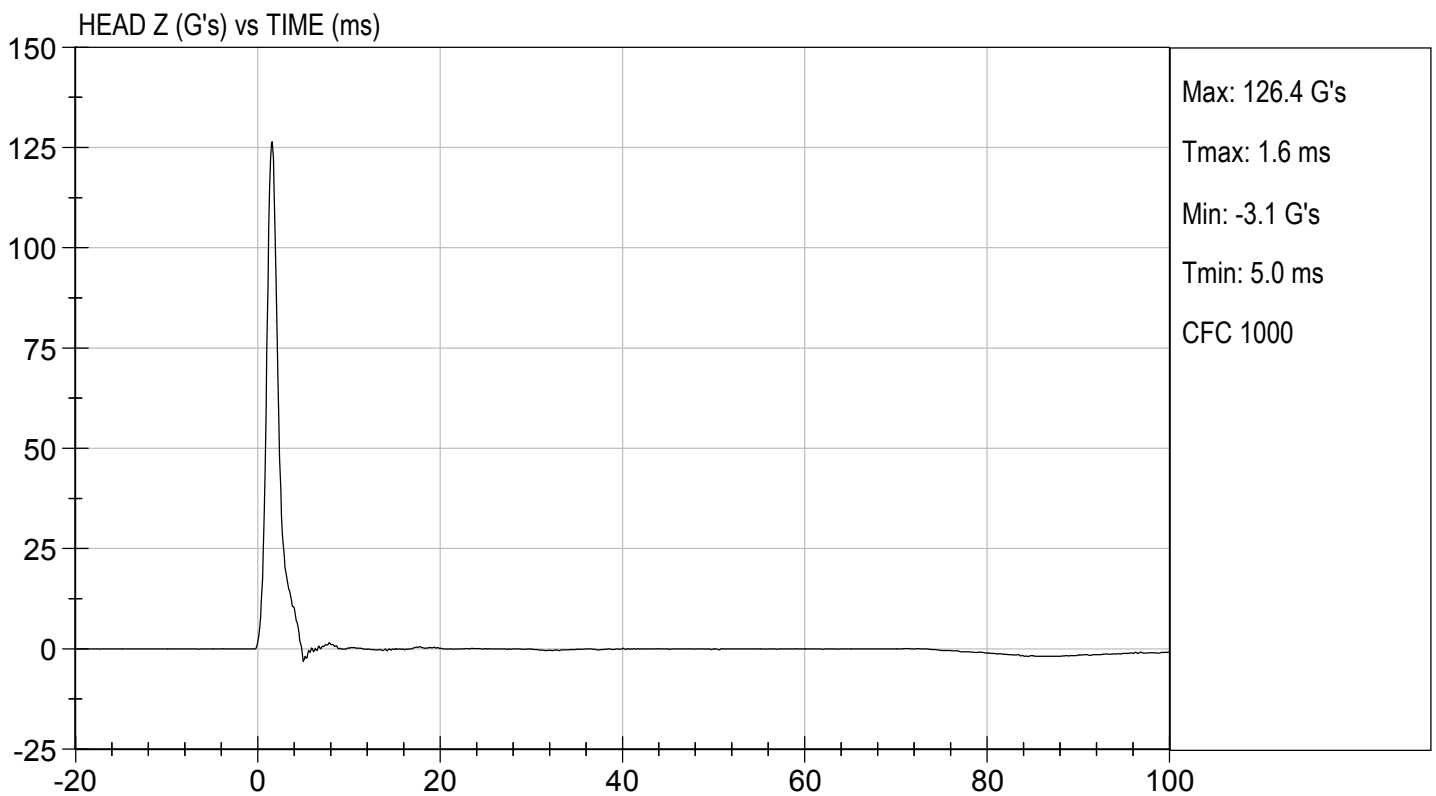
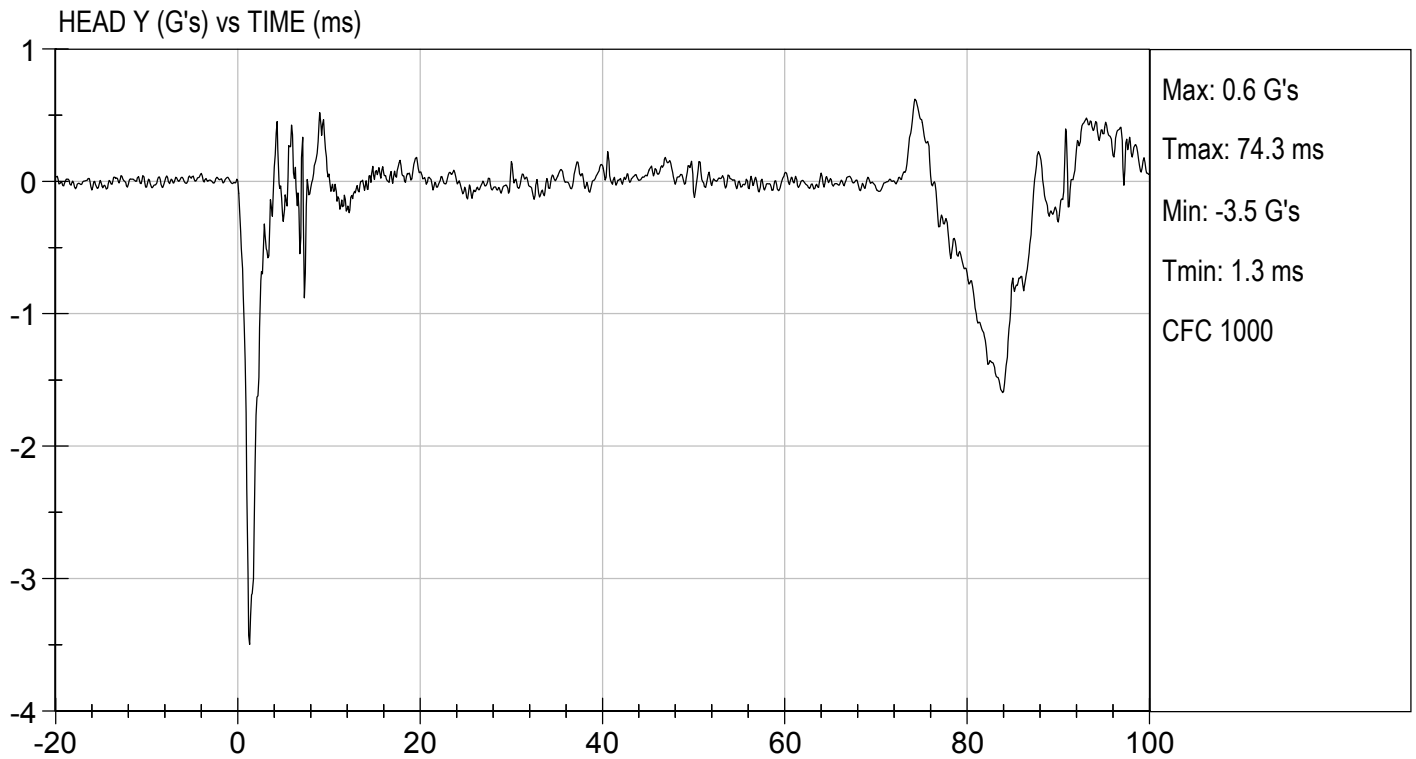
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Peak Resultant Acceleration	G's	225 to 275	259	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

06/10/2020
Test Date


Approved By





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

ATD Serial No: 351

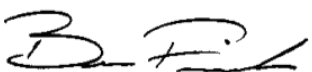
Test I.D: D201432

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.07	Pass
	20 ms	G's	17.60 to 22.60	21.63	Pass
	30 ms	G's	12.50 to 18.50	17.11	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	17.0	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	35.3	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	71.6	Pass
	Time	ms	57.0 to 64.0	61.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	119.9	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	92.1	Pass
	Time	ms	47.0 to 58.0	48.2	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	100.6	Pass
Overall Test Results					Pass


Laboratory Technician

06/11/2020

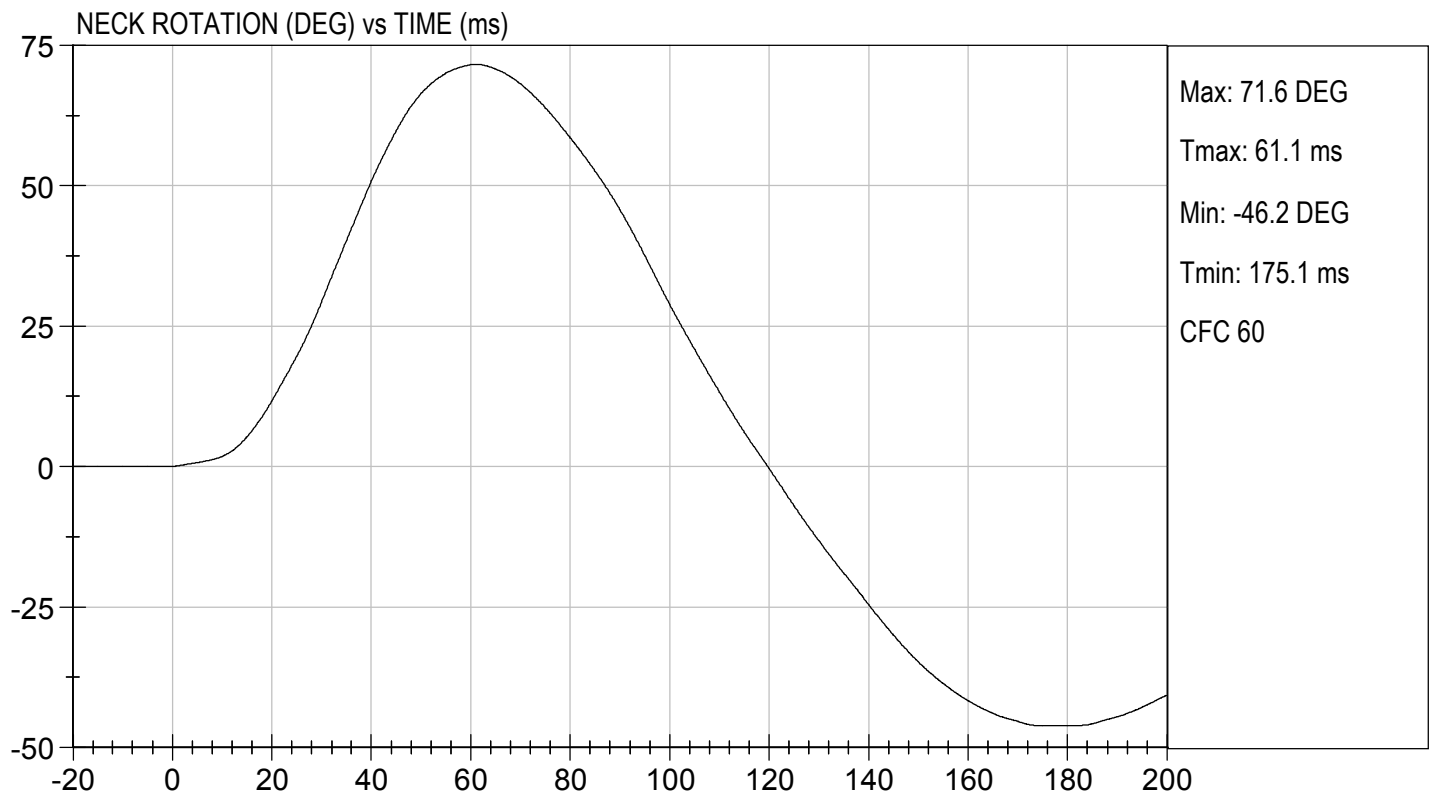
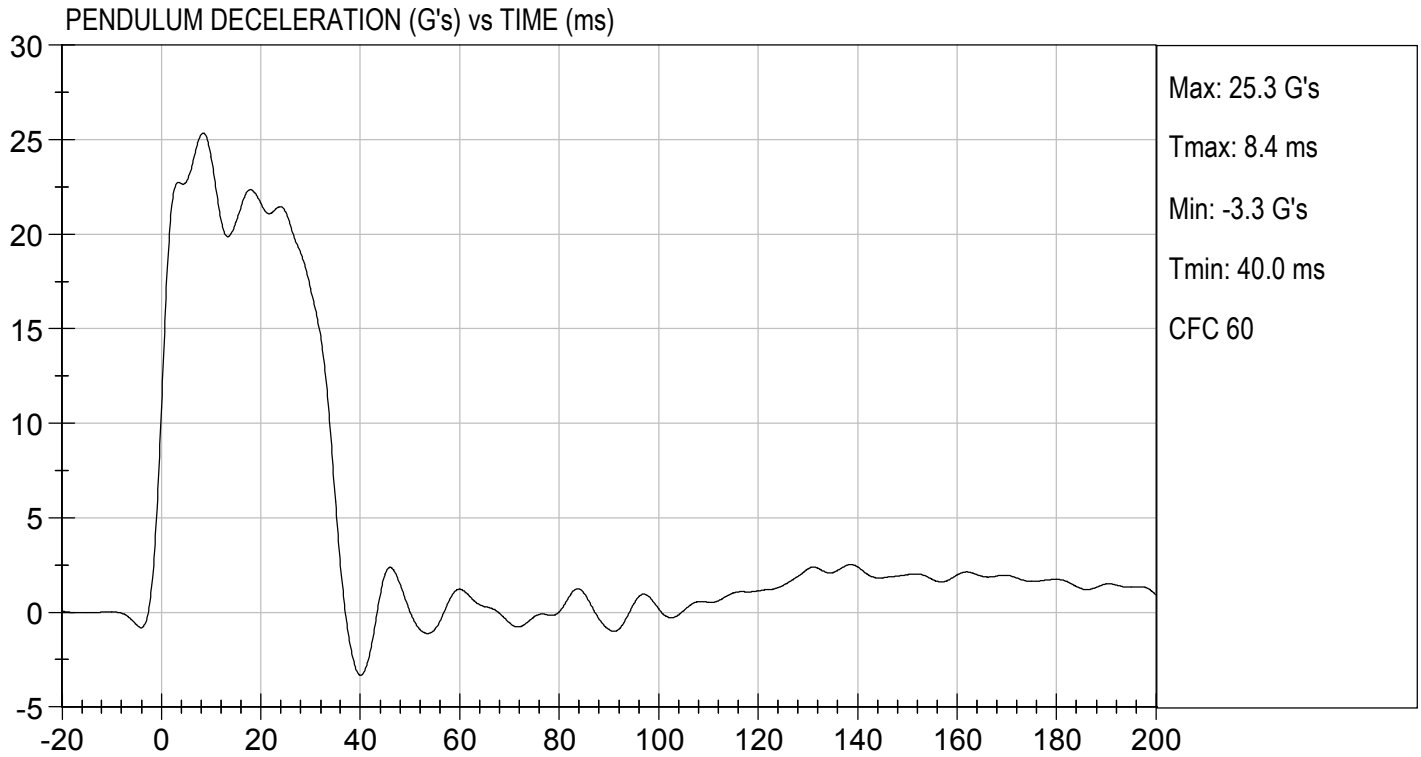
Test Date


Approved By



TEST DESC: NECK FLEXION
VELOCITY: 22.64 ft/s, 6.90 m/s

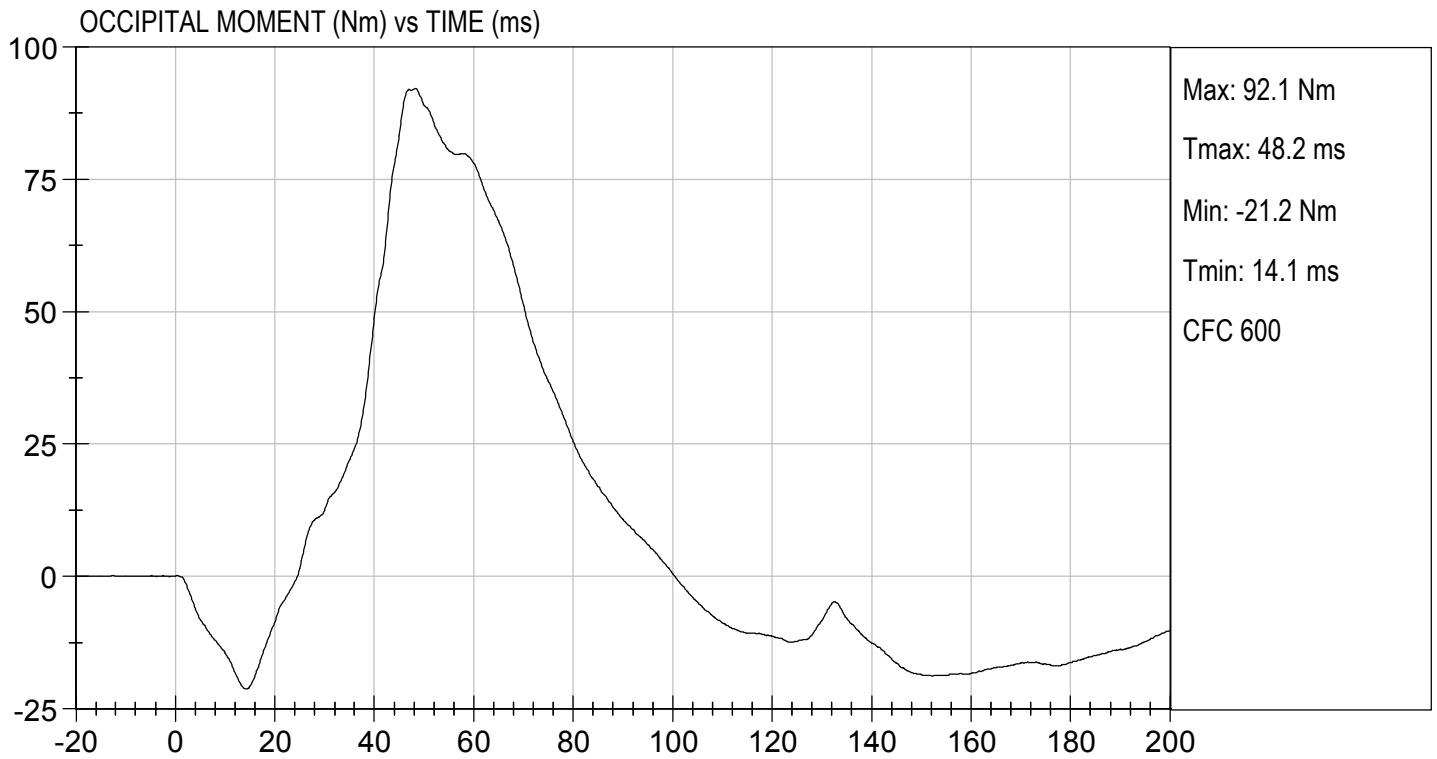
TEST DATE: 06/11/2020
TEST #: D201432





TEST DESC: NECK FLEXION
VELOCITY: 22.64 ft/s, 6.90 m/s

TEST DATE: 06/11/2020
TEST #: D201432



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

ATD Serial No: 351

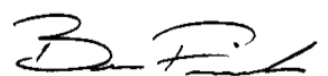
Test I.D: D201433

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Velocity		m/s	5.95 to 6.19	5.98	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	20.28	Pass
	20 ms	G's	14.00 to 19.00	15.60	Pass
	30 ms	G's	11.00 to 16.00	12.97	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.1	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	97.1	Pass
	Time	ms	72.0 to 82.0	75.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	158.1	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-67.1	Pass
	Time	ms	65.0 to 79.0	70.1	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	141.4	Pass
Overall Test Results					Pass


 Laboratory Technician

06/11/2020

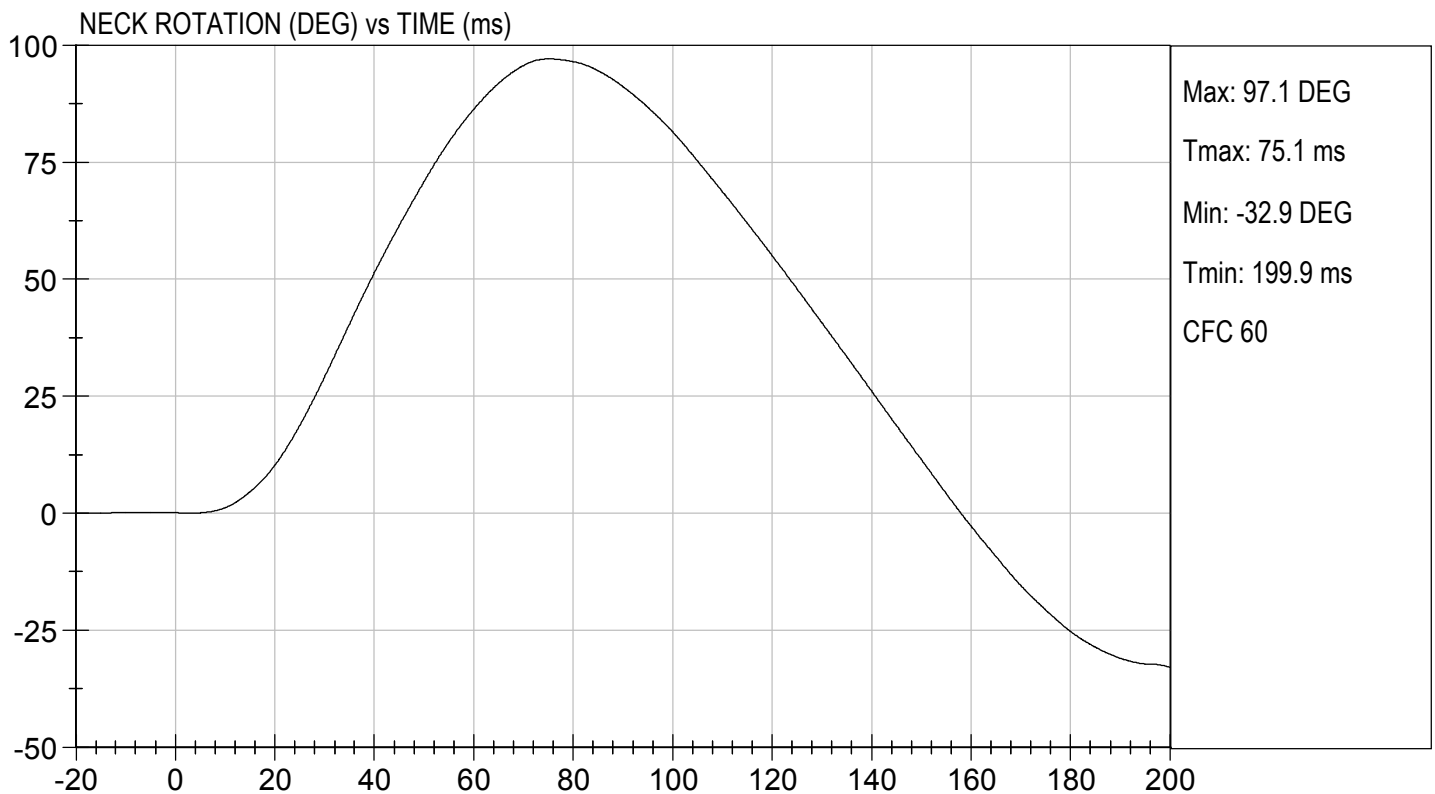
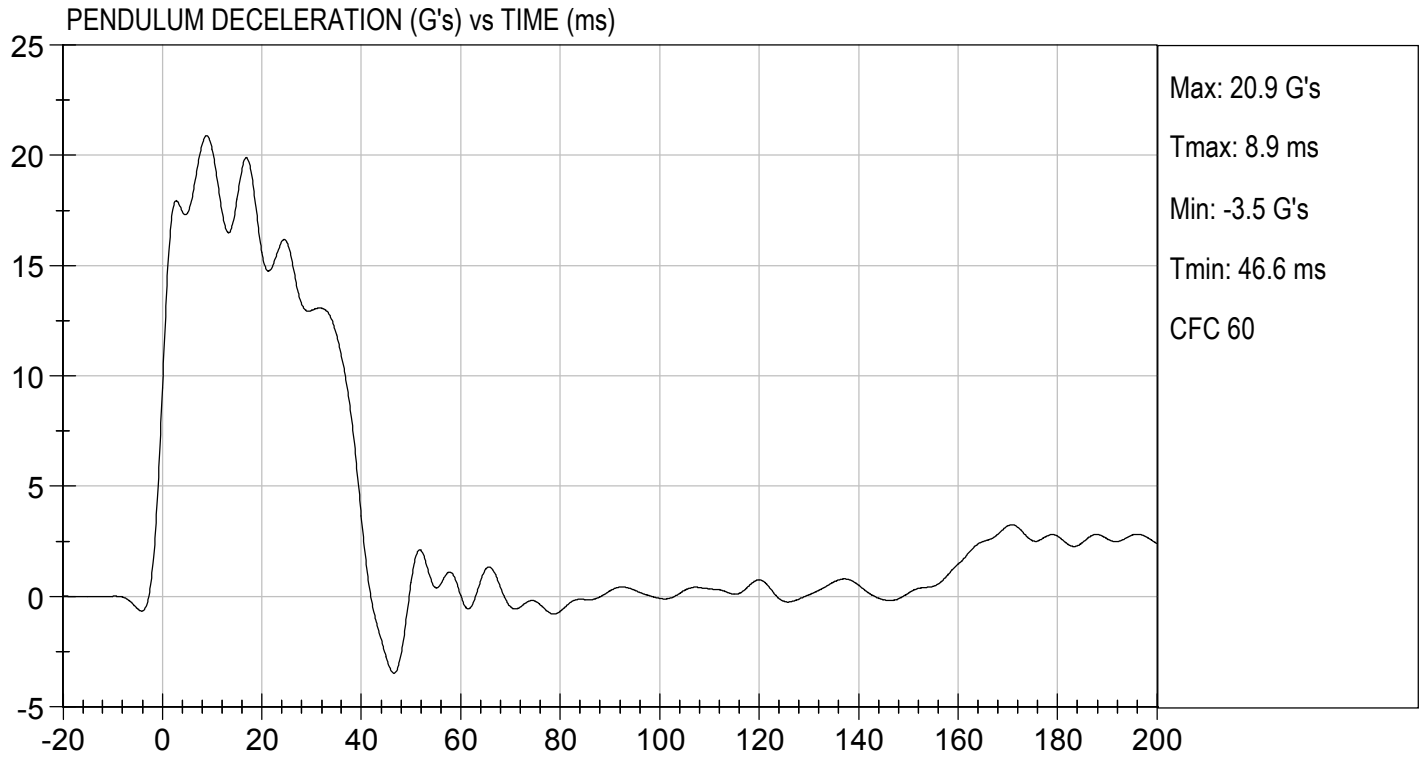
Test Date


 Approved By



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

TEST DATE: 06/11/2020
TEST #: D201433





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

TEST DATE: 06/11/2020
TEST #: D201433

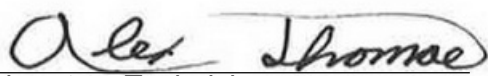


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

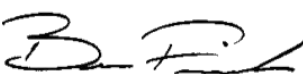
ATD Serial No: 351

Test I.D: D201434

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,461	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.97	Pass
Internal Hysteresis	%	69 to 85	71	Pass
			Overall Test Results	Pass


Laboratory Technician

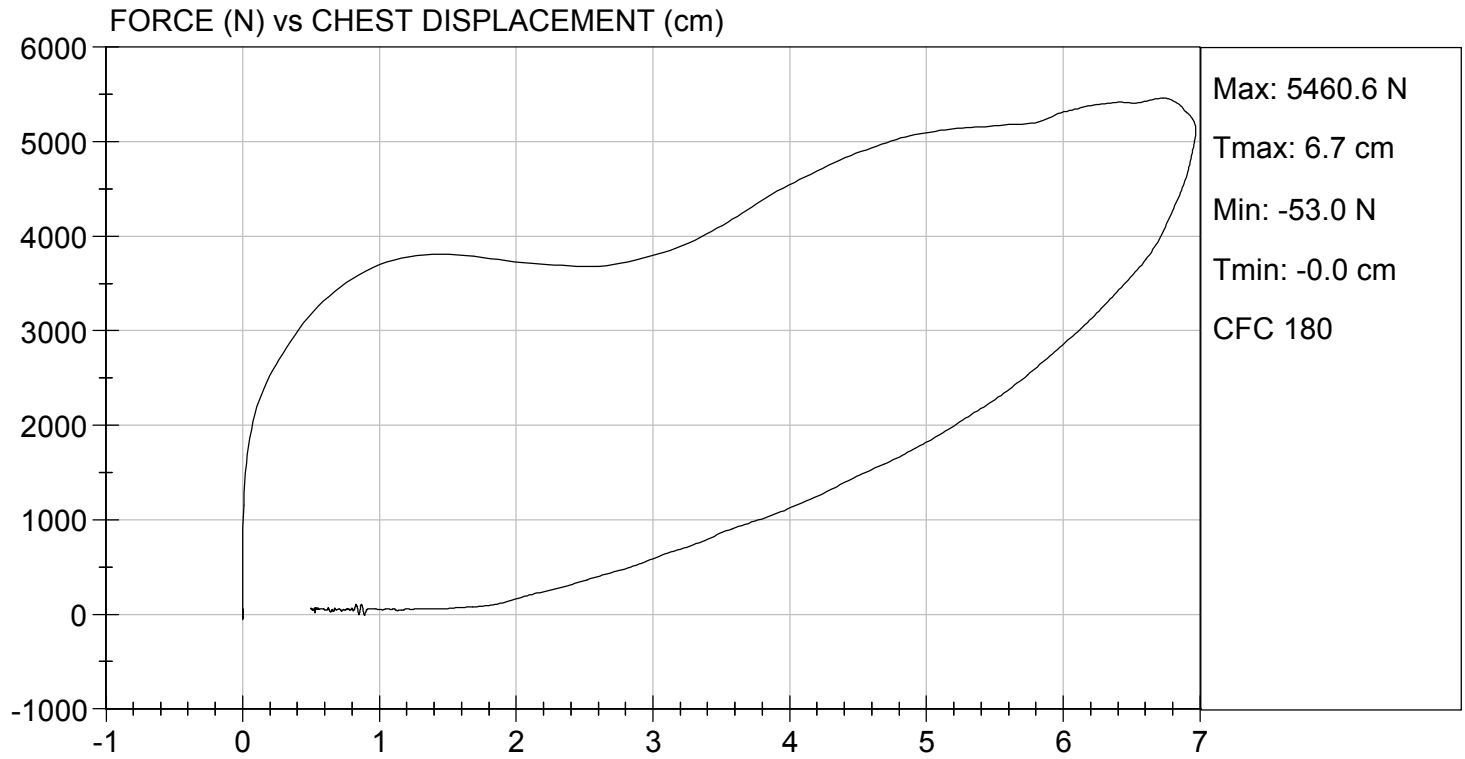
06/10/2020
Test Date


Approved By



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

TEST DATE: 06/10/2020
TEST #: D201434



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

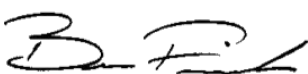
ATD Serial No: 351

Test I.D: D201435

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,085	Pass
Overall Test Results				Pass


Laboratory Technician

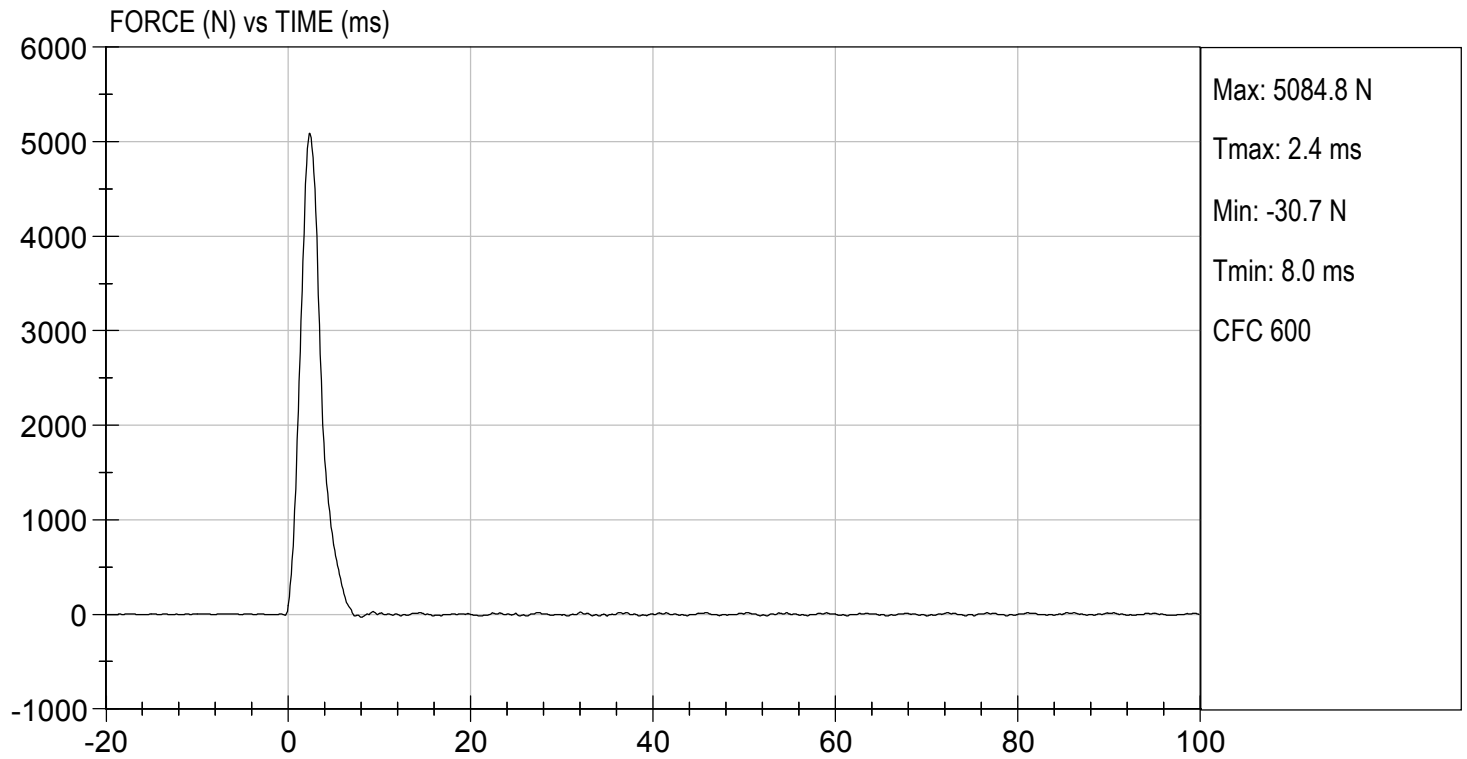
06/10/2020
Test Date


Approved By



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

TEST DATE: 06/10/2020
TEST #: D201435



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

ATD Serial No: 351

Test I.D: D201436

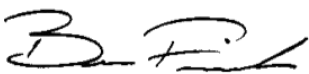
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	4,930	Pass
Overall Test Results				Pass



Laboratory Technician

06/10/2020

Test Date

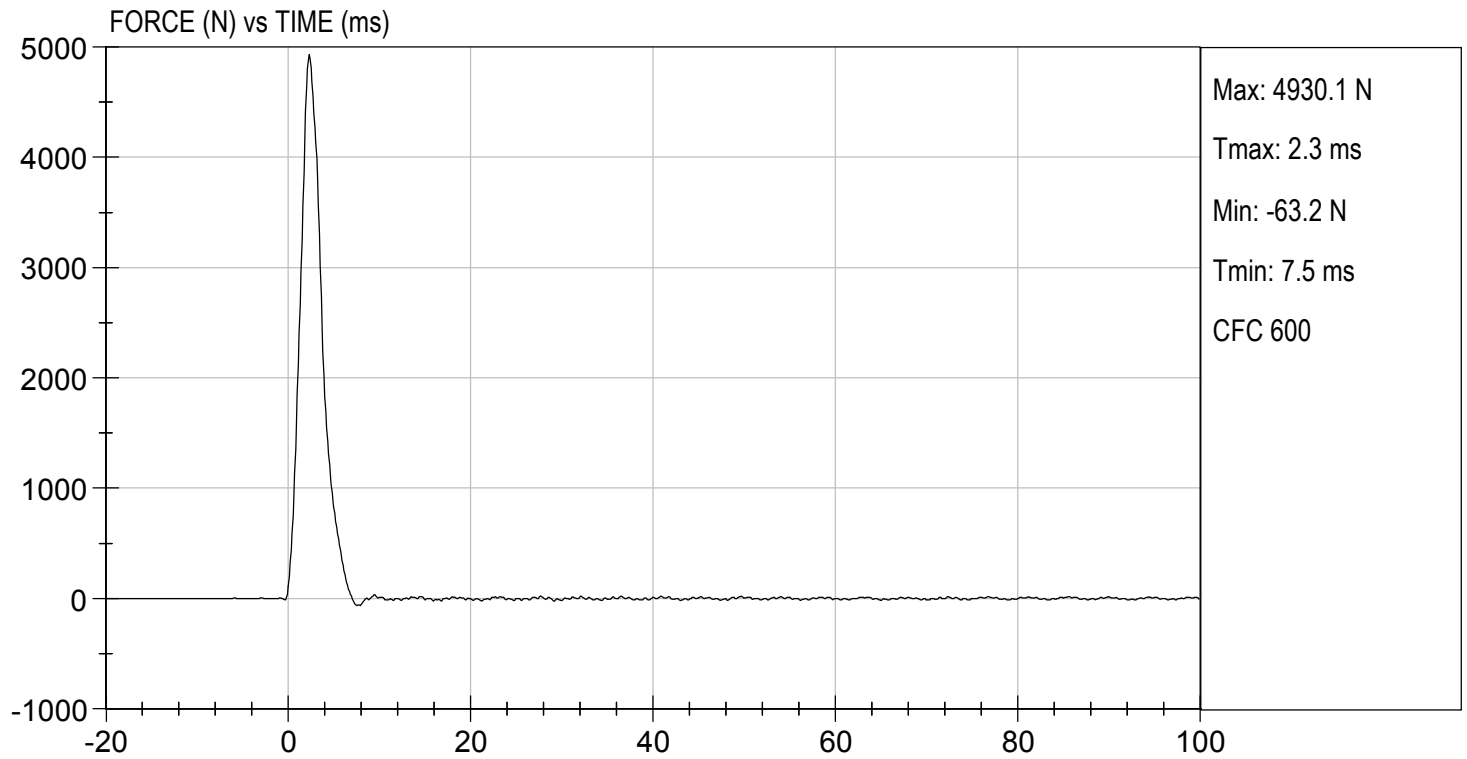


Approved By



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

TEST DATE: 06/10/2020
TEST #: D201436

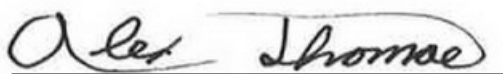


MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

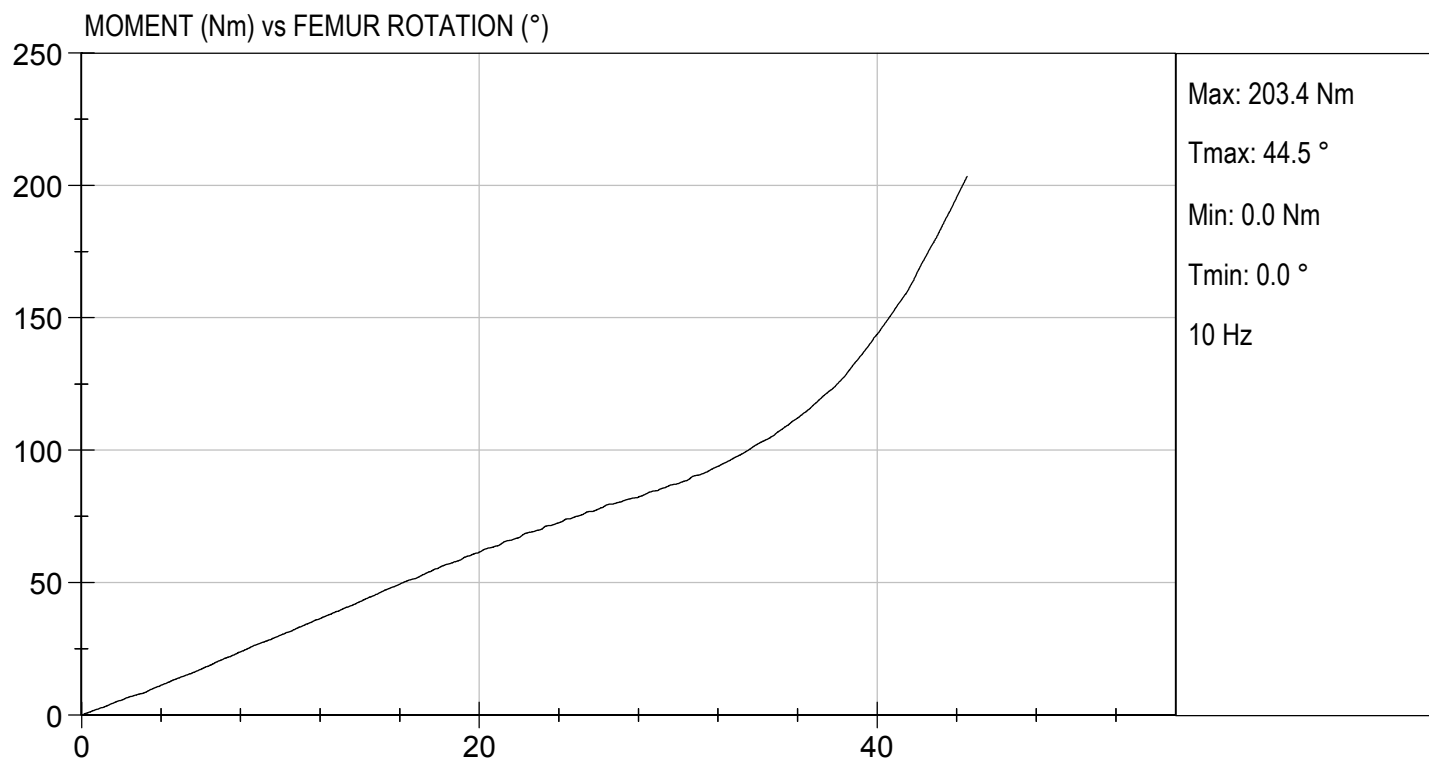
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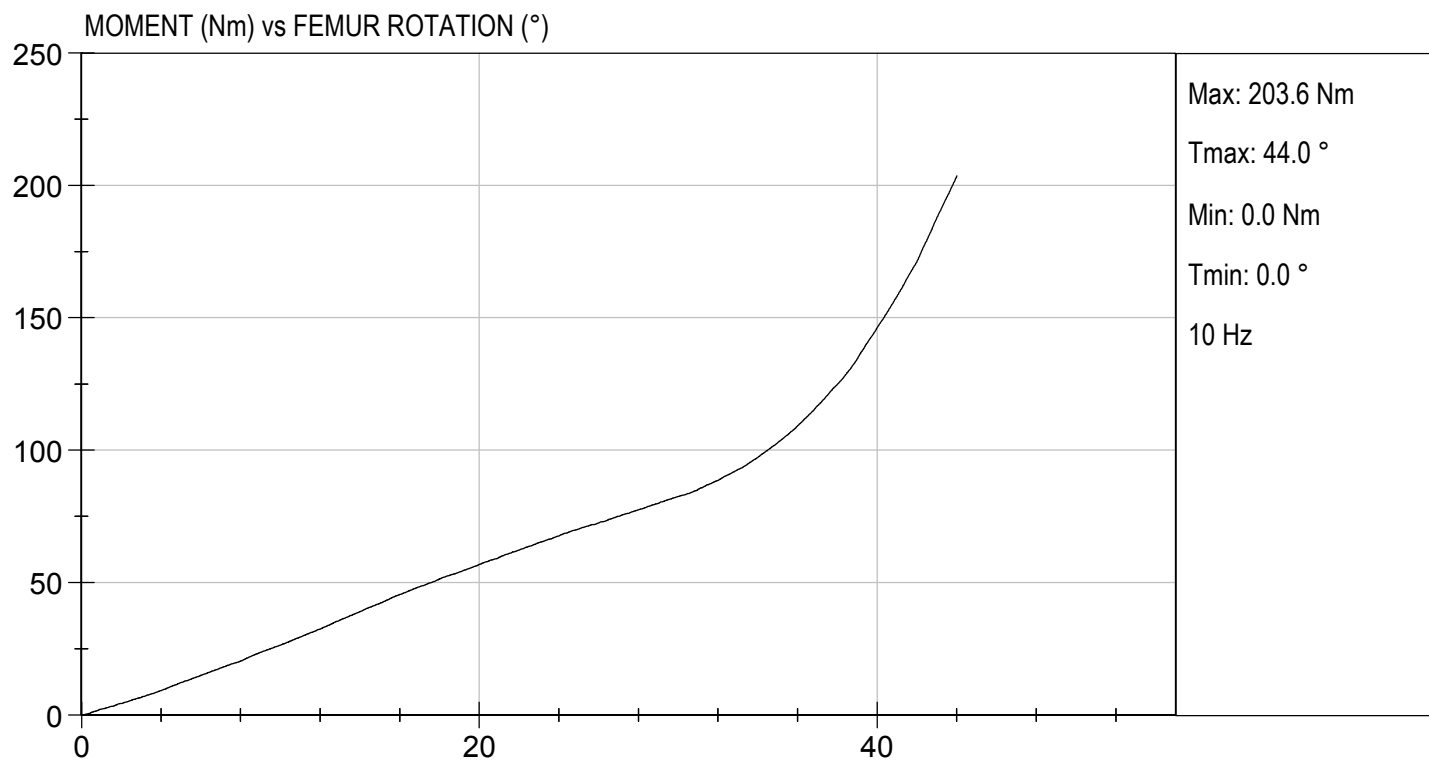
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.8	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	51	51	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.4	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	87.4	82.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.5	44.0	Pass
Overall Test Results					Pass


 Laboratory Technician

06/10/2020
 Test Date


 Approved By





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

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

ATD Serial No: 351

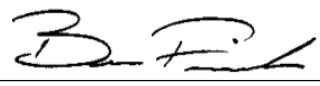
Test ID: D201521

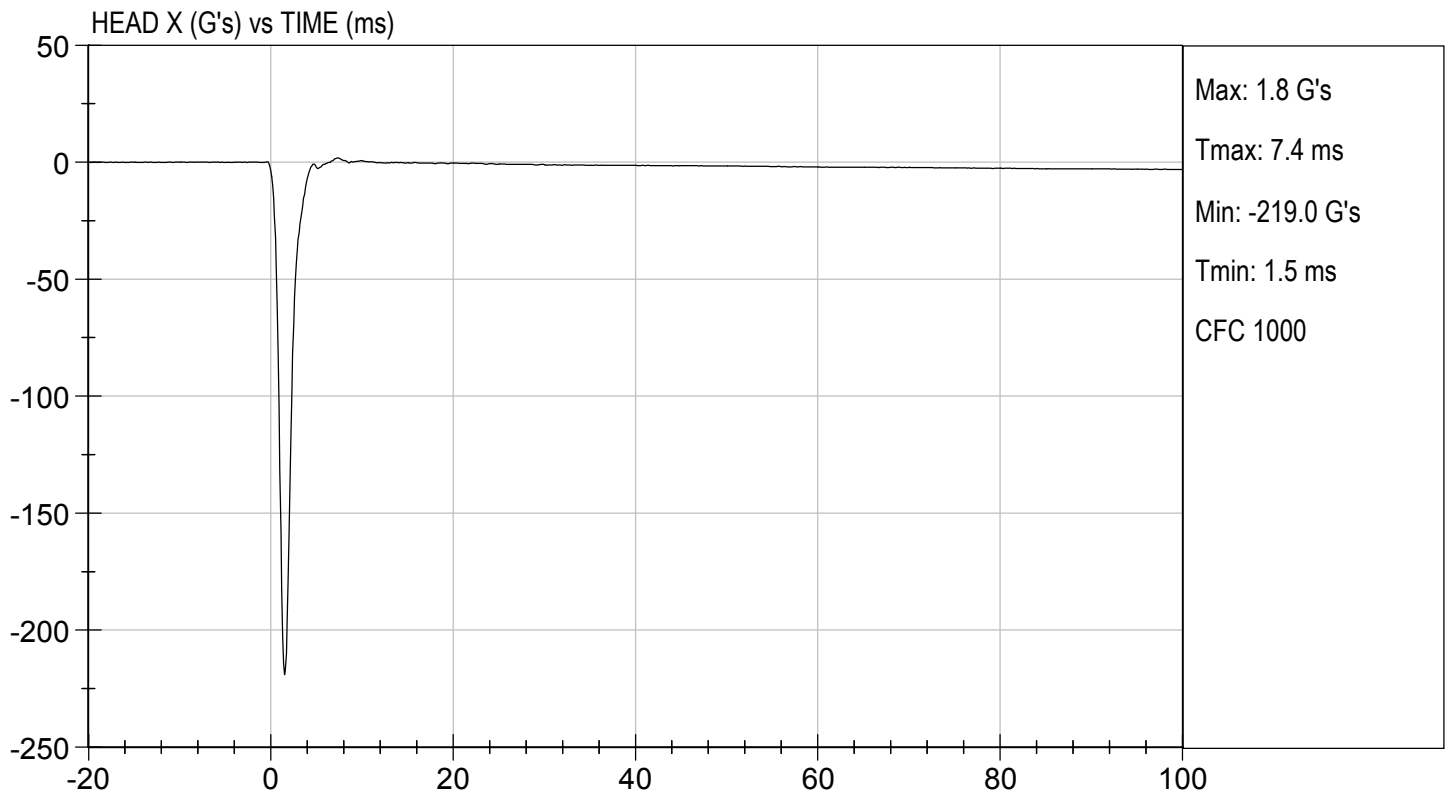
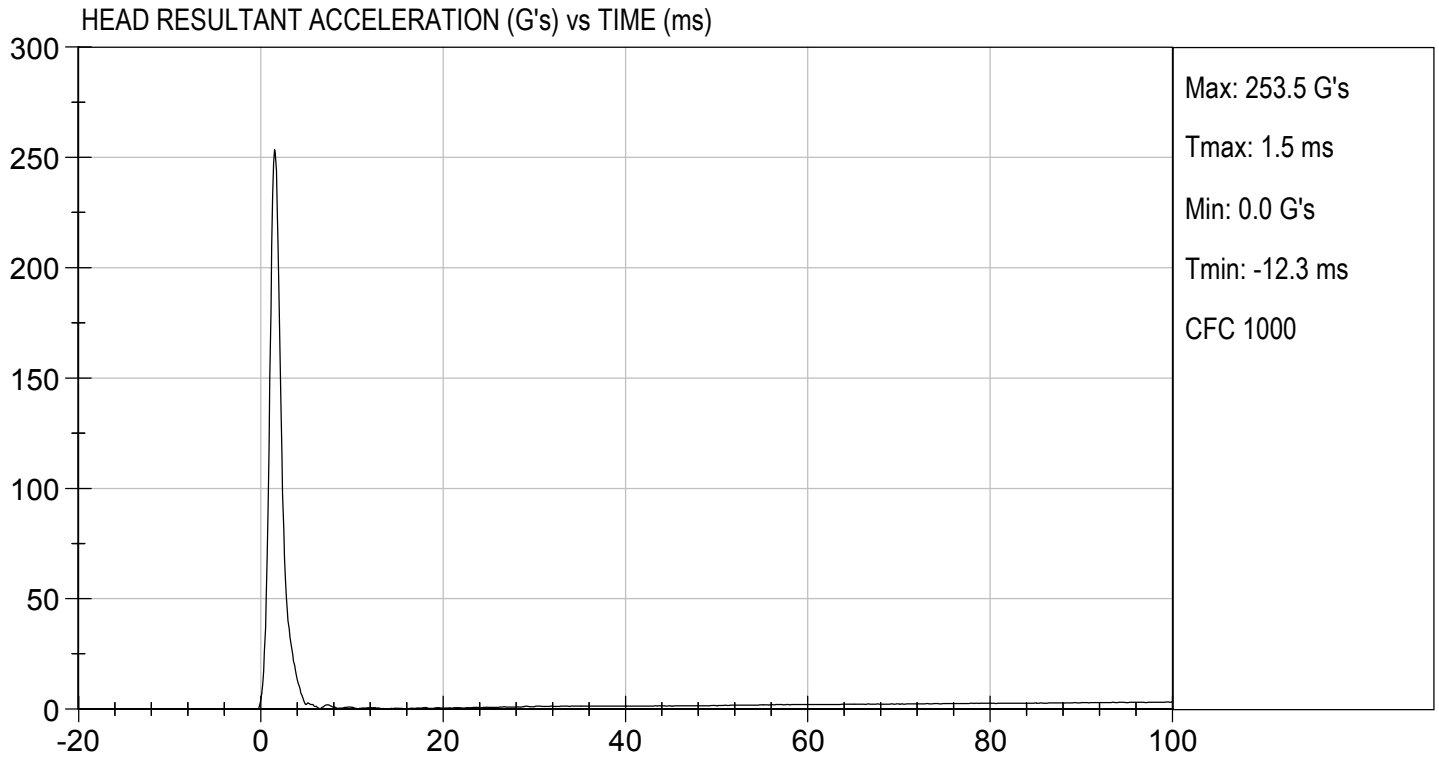
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	225 to 275	253	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

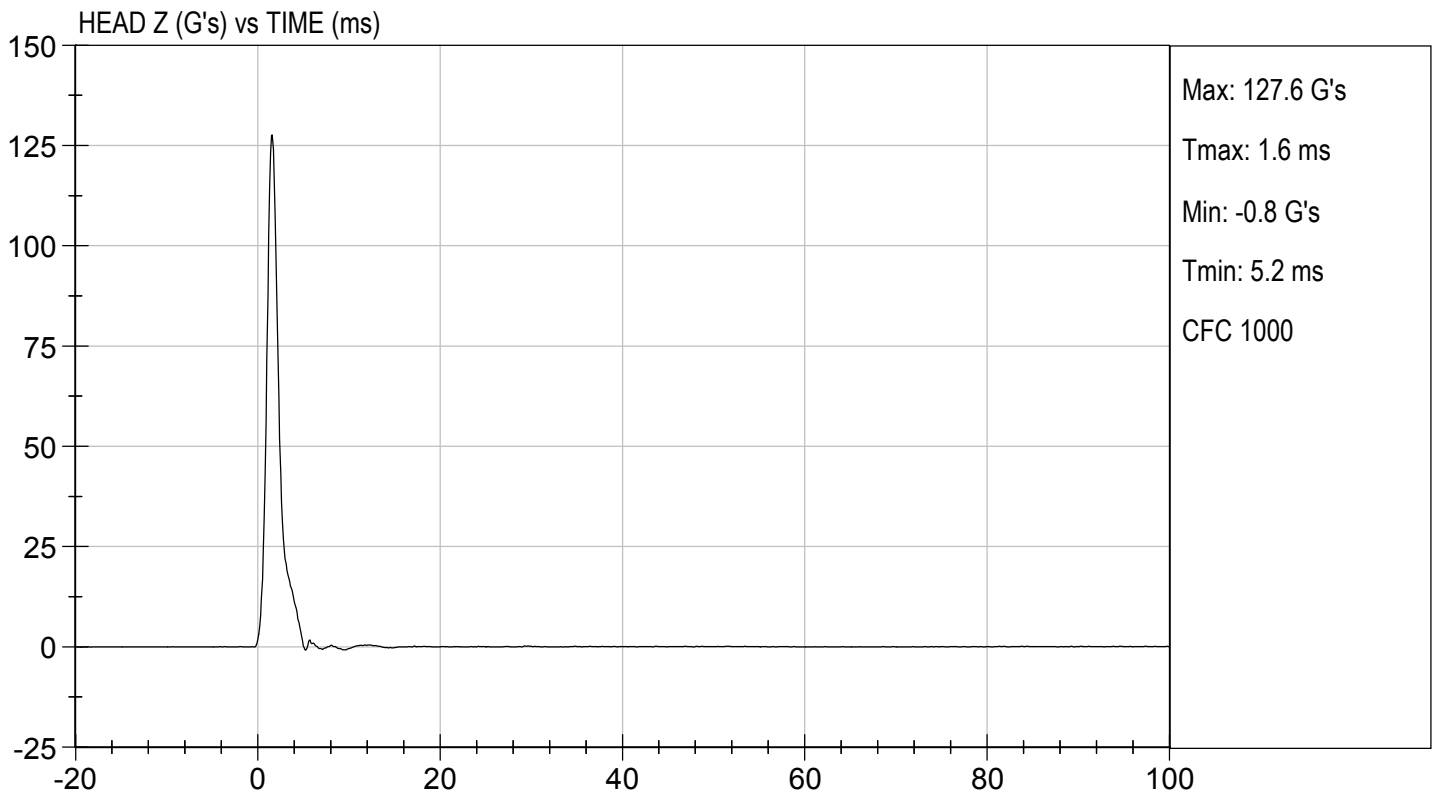
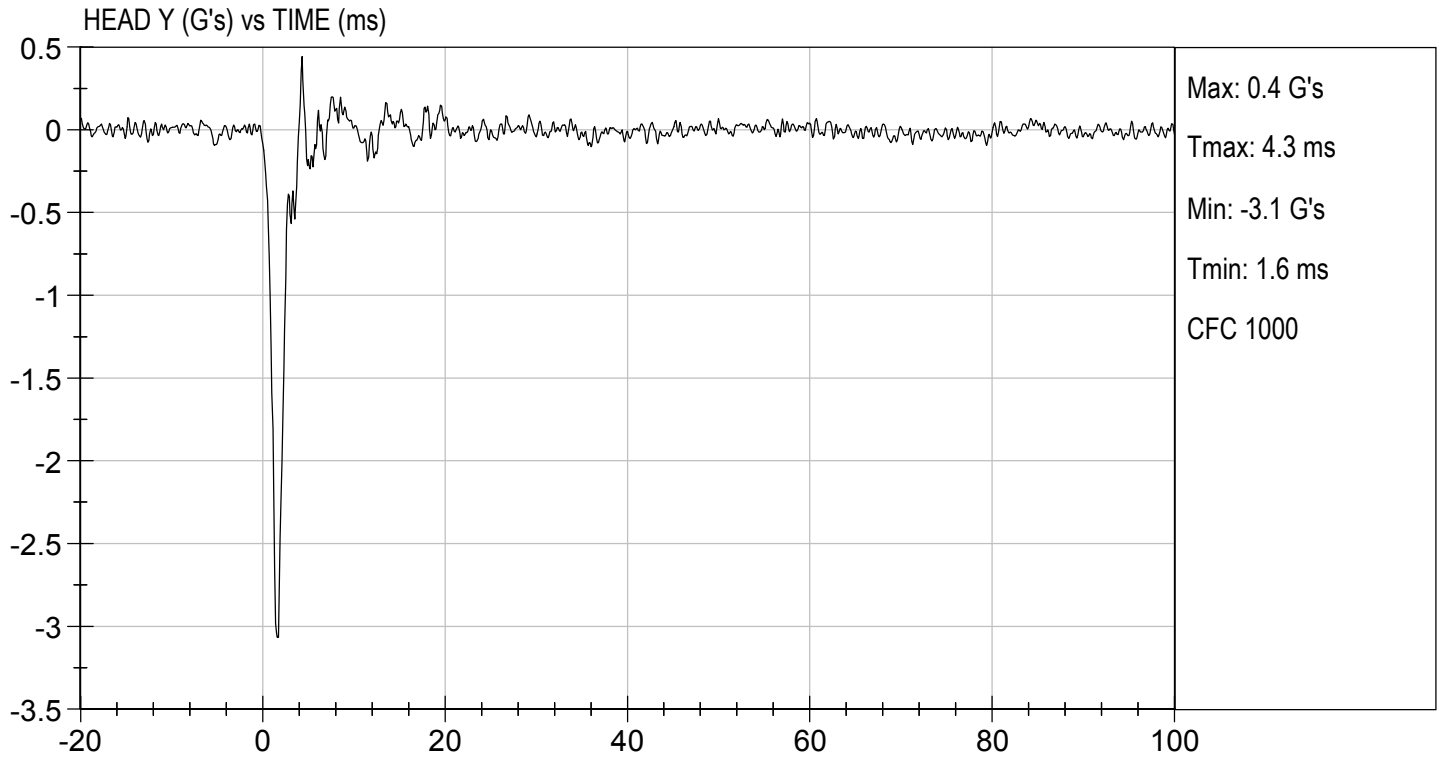

Laboratory Technician

06/17/2020

Test Date


Approved By





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

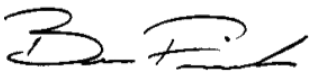
ATD Serial No: 351

Test I.D: D201522

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	39	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	25.60	Pass
	20 ms	G's	17.60 to 22.60	18.49	Pass
	30 ms	G's	12.50 to 18.50	15.61	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	16.0	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.4	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	75.4	Pass
	Time	ms	57.0 to 64.0	60.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	118.9	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	90.9	Pass
	Time	ms	47.0 to 58.0	49.0	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.3	Pass
Overall Test Results					Pass


 Laboratory Technician

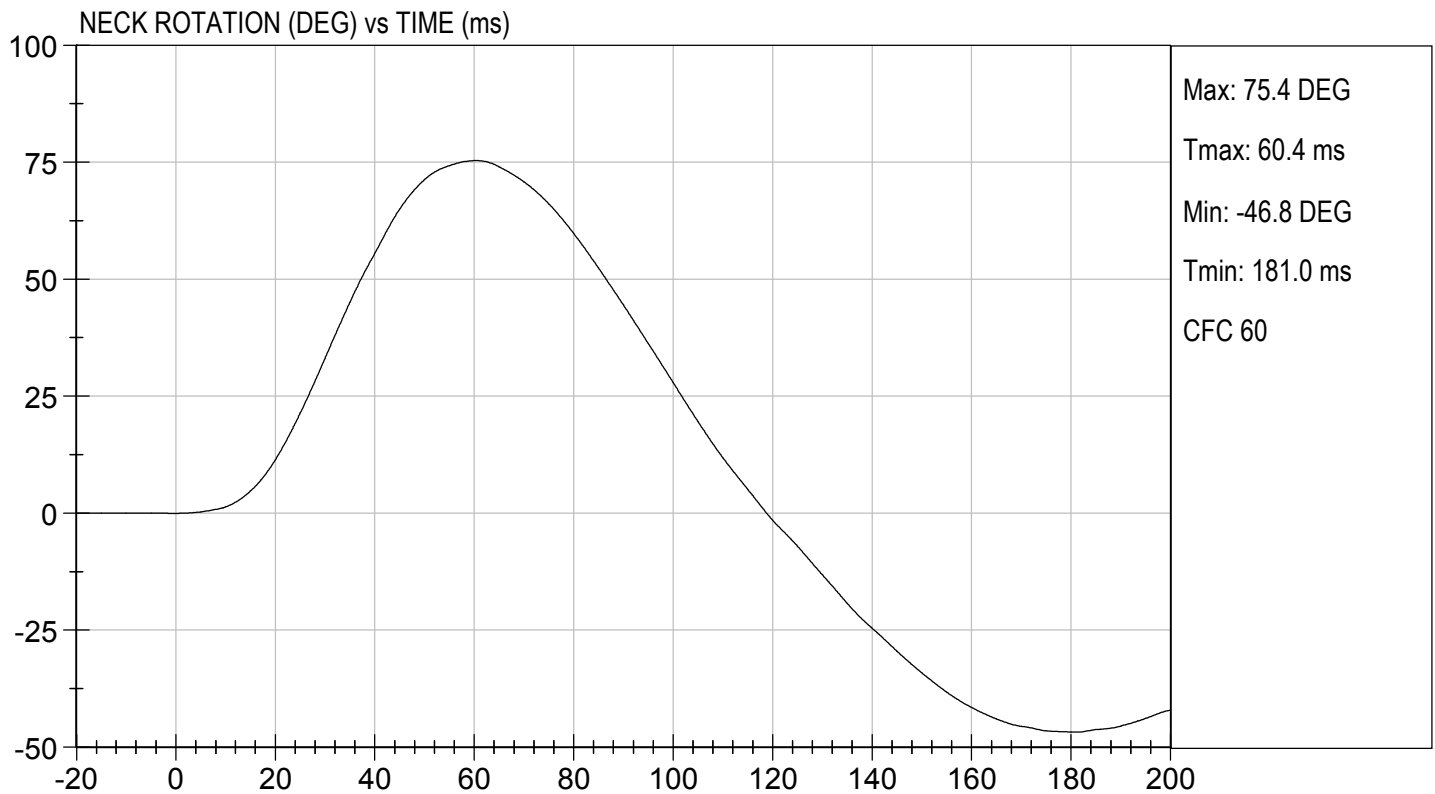
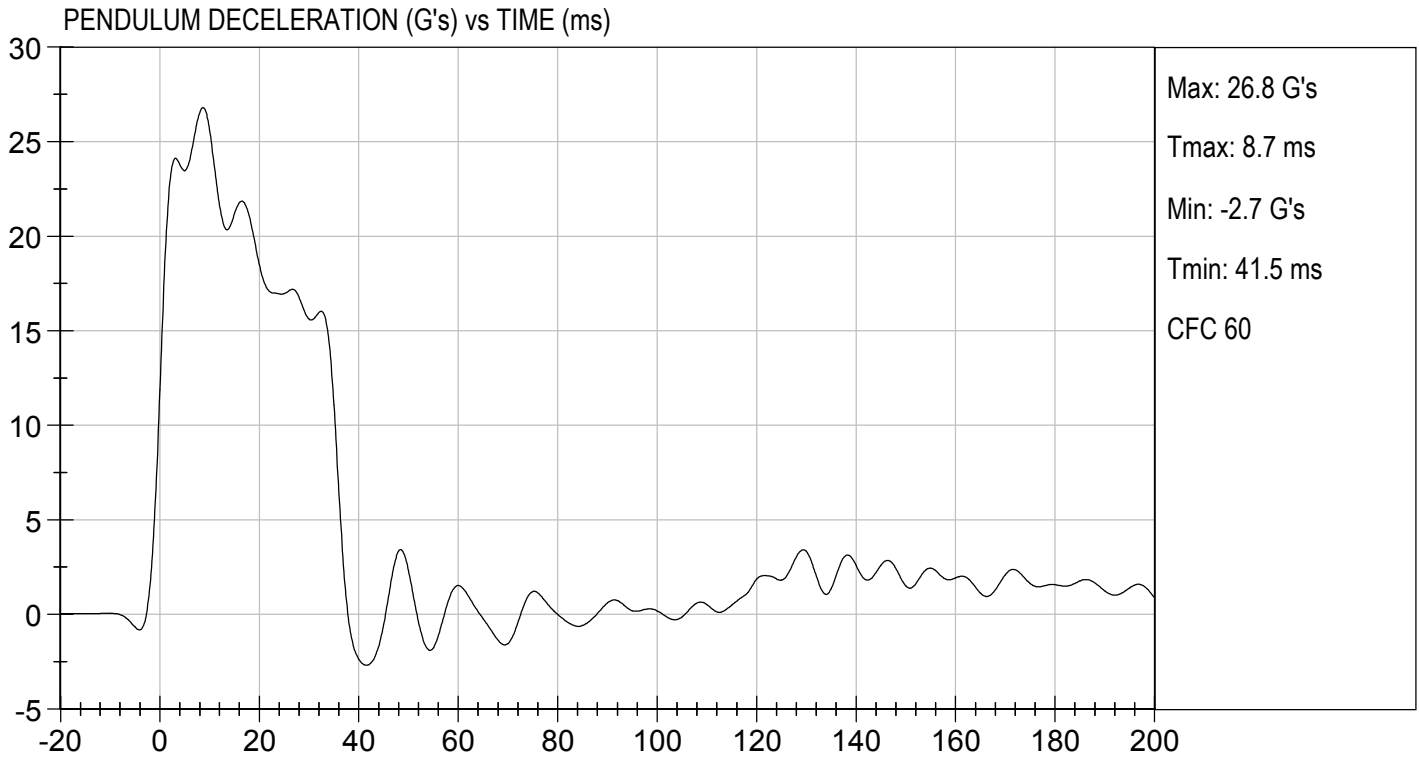
06/17/2020
 Test Date


 Approved By



TEST DESC: NECK FLEXION
VELOCITY: 23.14 ft/s, 7.05 m/s

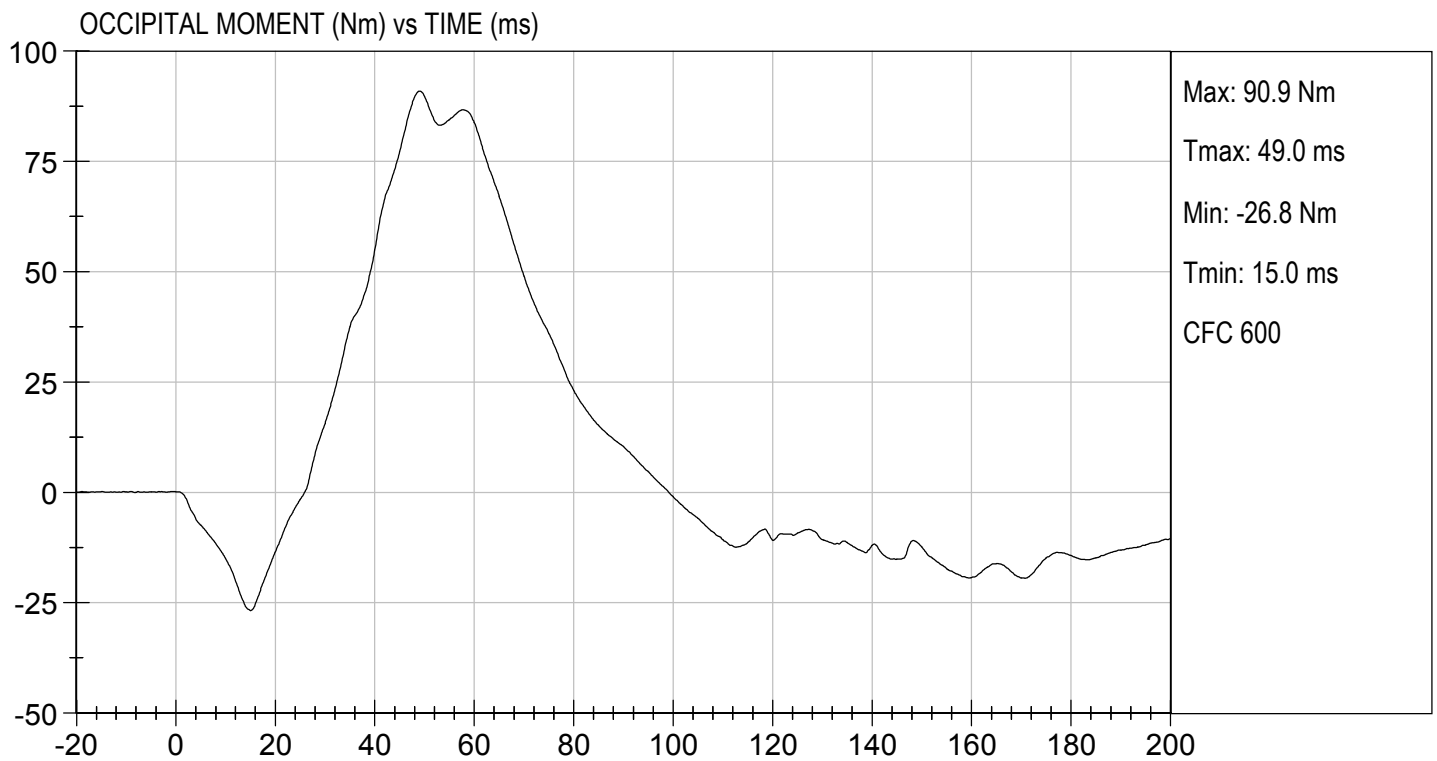
TEST DATE: 06/17/2020
TEST #: D201522





TEST DESC: NECK FLEXION
VELOCITY: 23.14 ft/s, 7.05 m/s

TEST DATE: 06/17/2020
TEST #: D201522



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

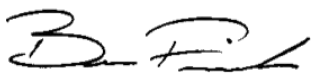
ATD Serial No: 351

Test I.D: D201523

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	39	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.35	Pass
	20 ms	G's	14.00 to 19.00	15.62	Pass
	30 ms	G's	11.00 to 16.00	12.64	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.7	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	95.9	Pass
	Time	ms	72.0 to 82.0	76.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	155.7	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-65.3	Pass
	Time	ms	65.0 to 79.0	69.8	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	140.0	Pass
Overall Test Results					Pass


 Laboratory Technician

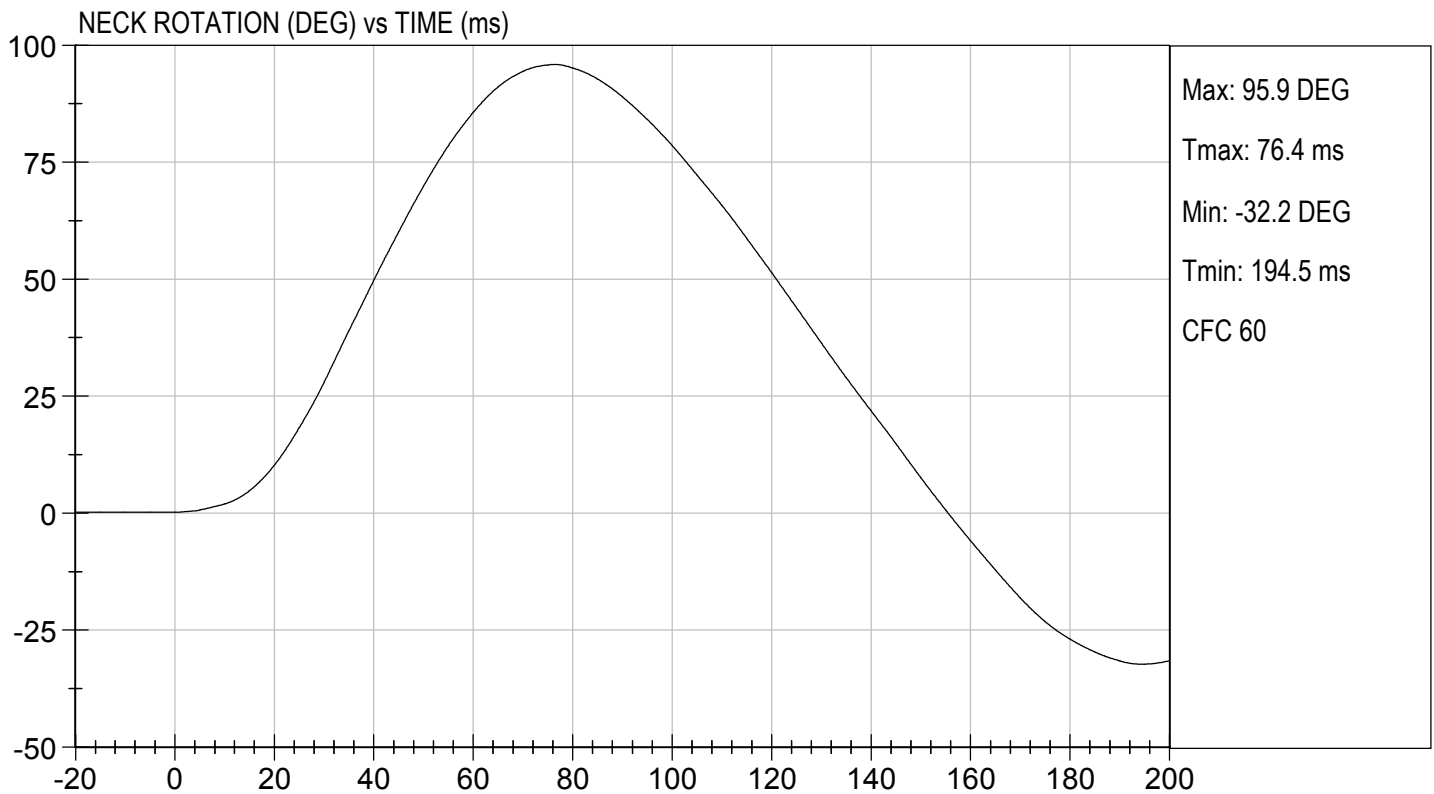
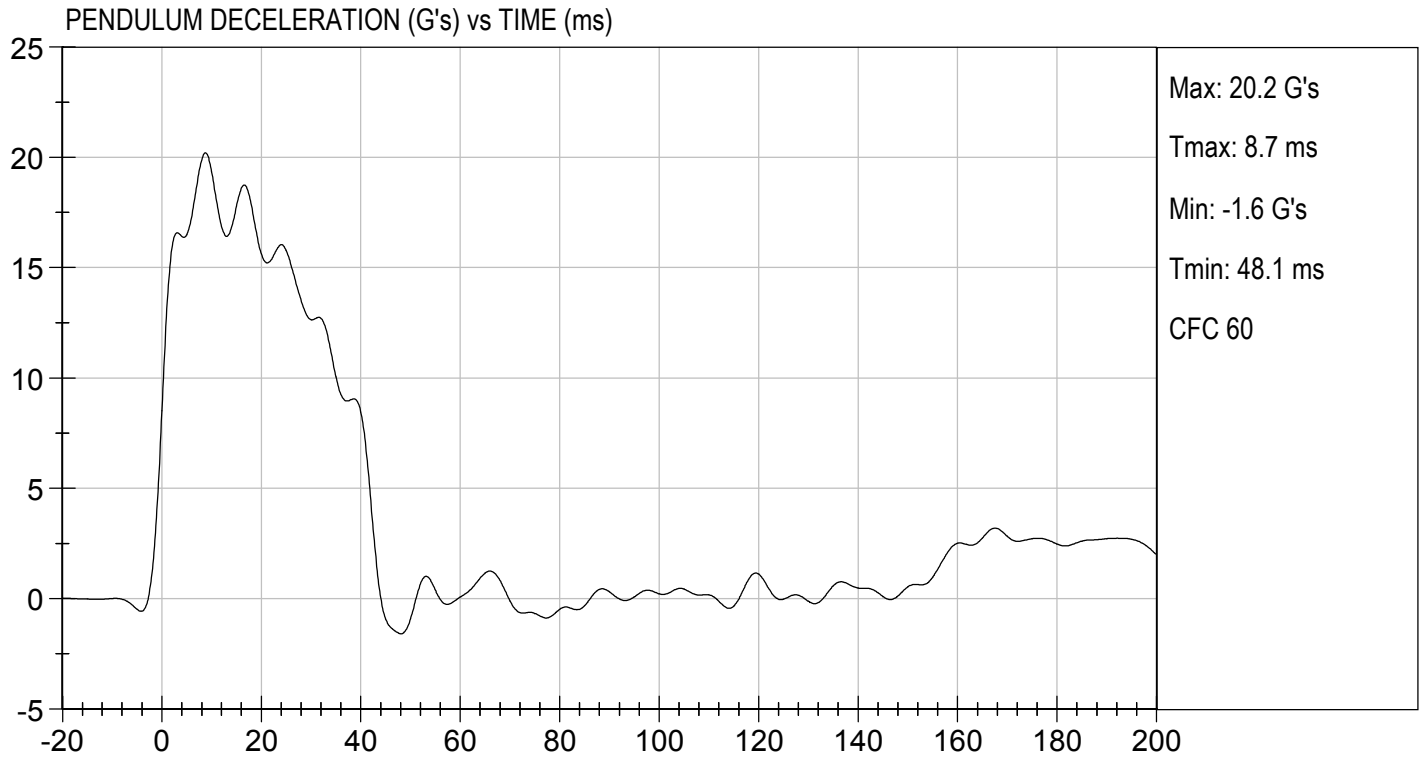
06/17/2020
 Test Date


 Approved By



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

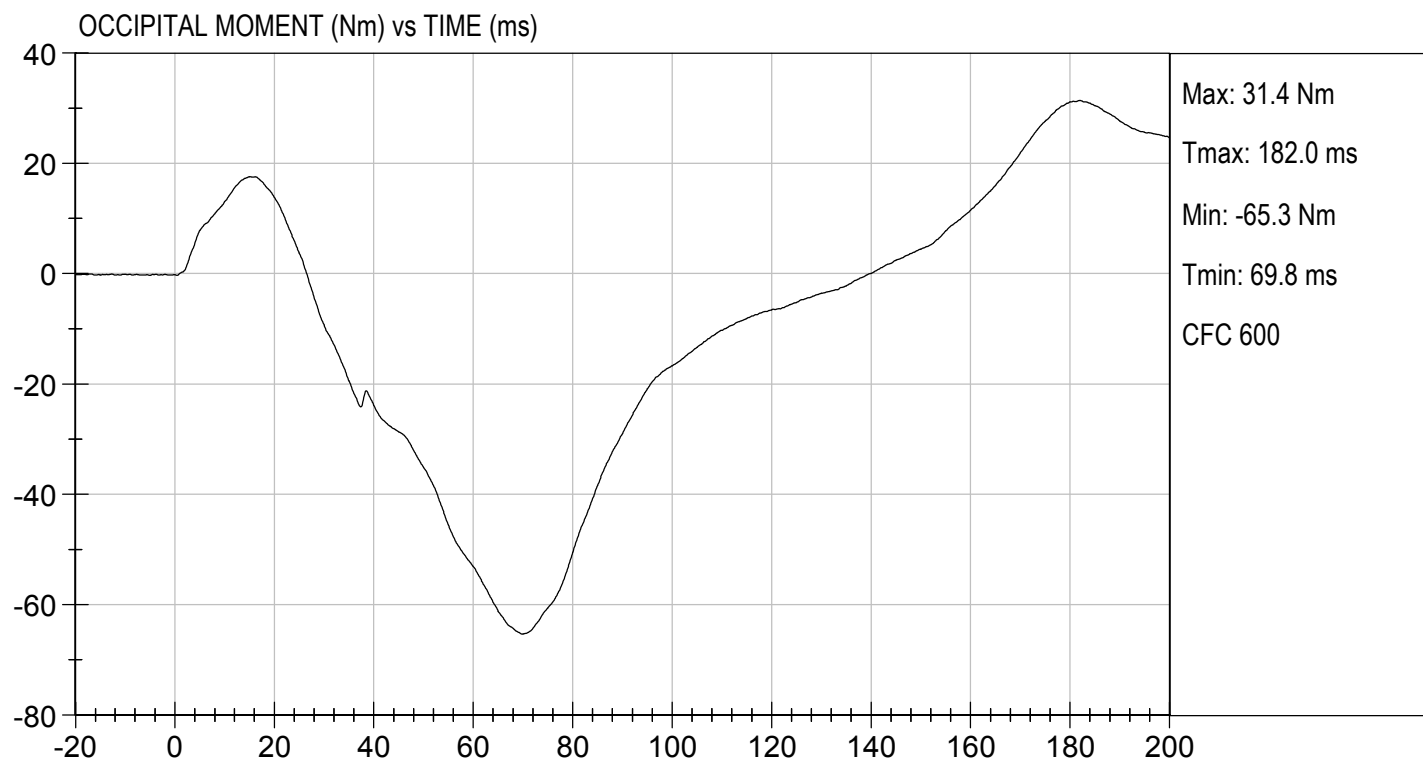
TEST DATE: 06/17/2020
TEST #: D201523





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

TEST DATE: 06/17/2020
TEST #: D201523

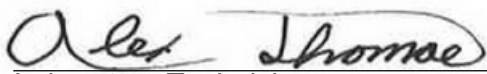


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

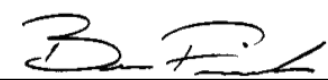
ATD Serial No: 351

Test I.D: D201524

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,493	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.09	Pass
Internal Hysteresis	%	69 to 85	70	Pass
			Overall Test Results	Pass


Laboratory Technician

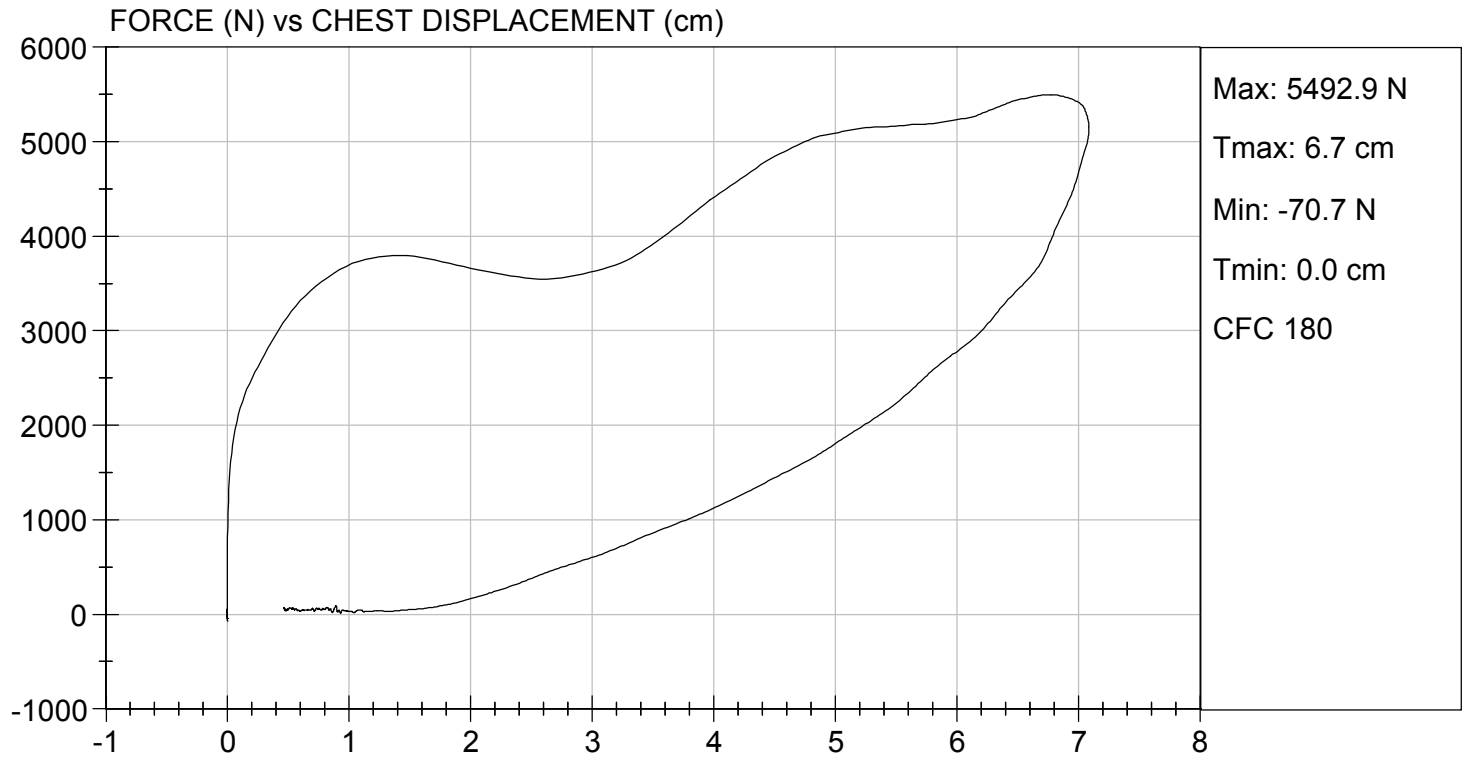
06/17/2020
Test Date


Approved By



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

TEST DATE: 06/17/2020
TEST #: D201524



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

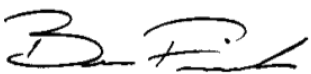
ATD Serial No: 351

Test I.D: D201525

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	4,875	Pass
Overall Test Results				Pass


Laboratory Technician

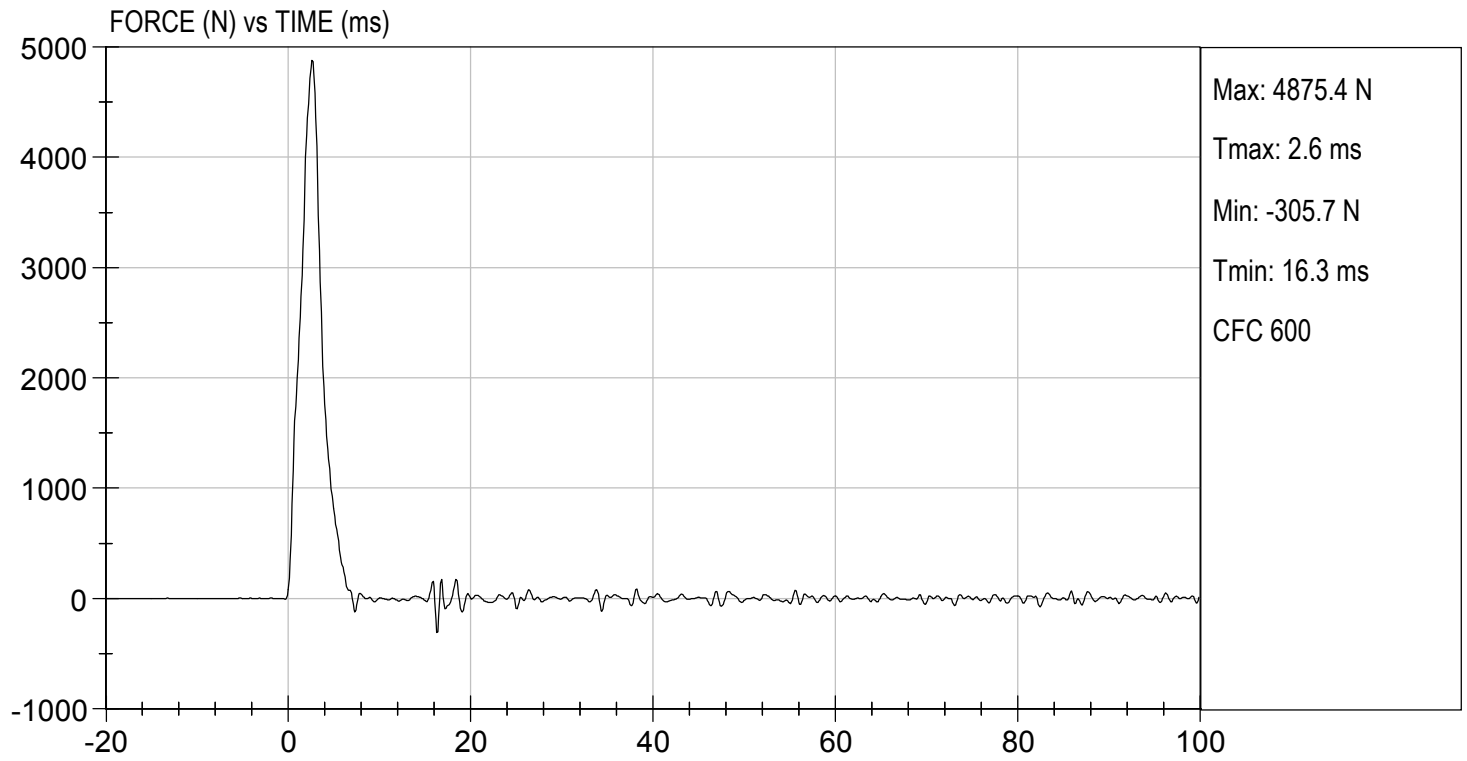
06/17/2020
Test Date


Approved By



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

TEST DATE: 06/17/2020
TEST #: D201525



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

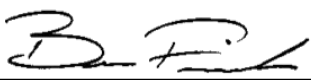
ATD Serial No: 351

Test I.D: D201526

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,072	Pass
Overall Test Results				Pass


Laboratory Technician

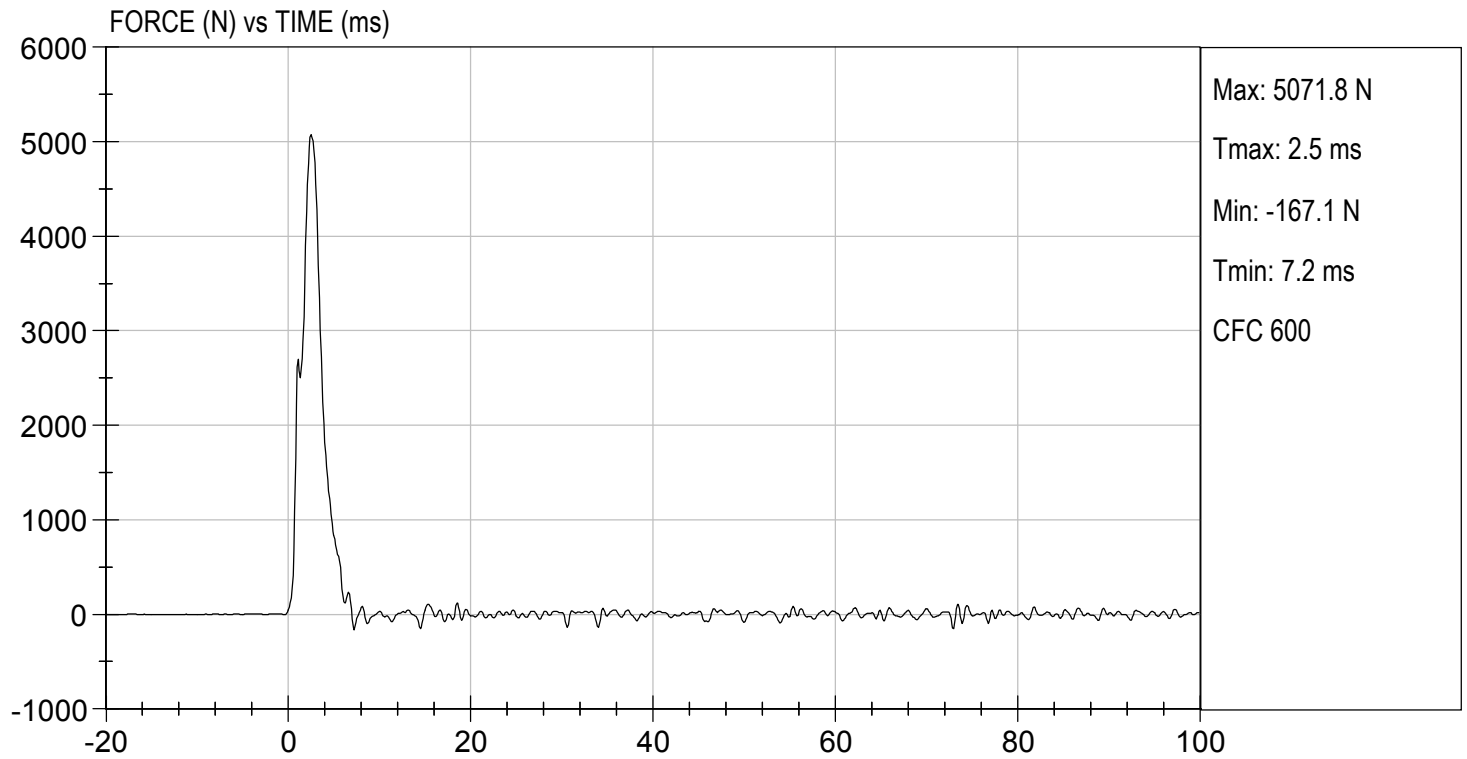
06/17/2020
Test Date


Approved By



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

TEST DATE: 06/17/2020
TEST #: D201526



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

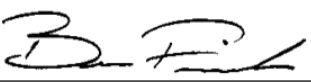
ATD Serial No: 351

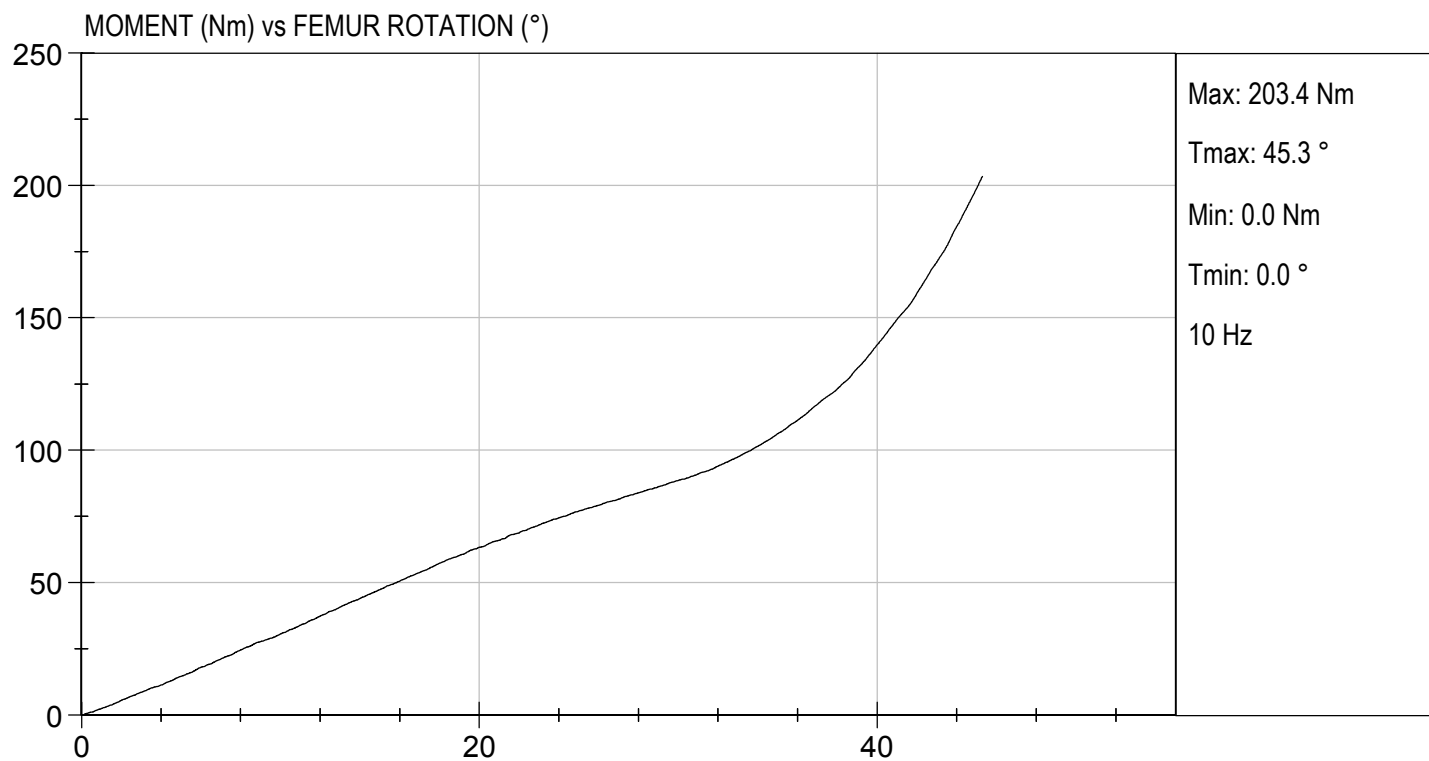
Test I.D: D201520

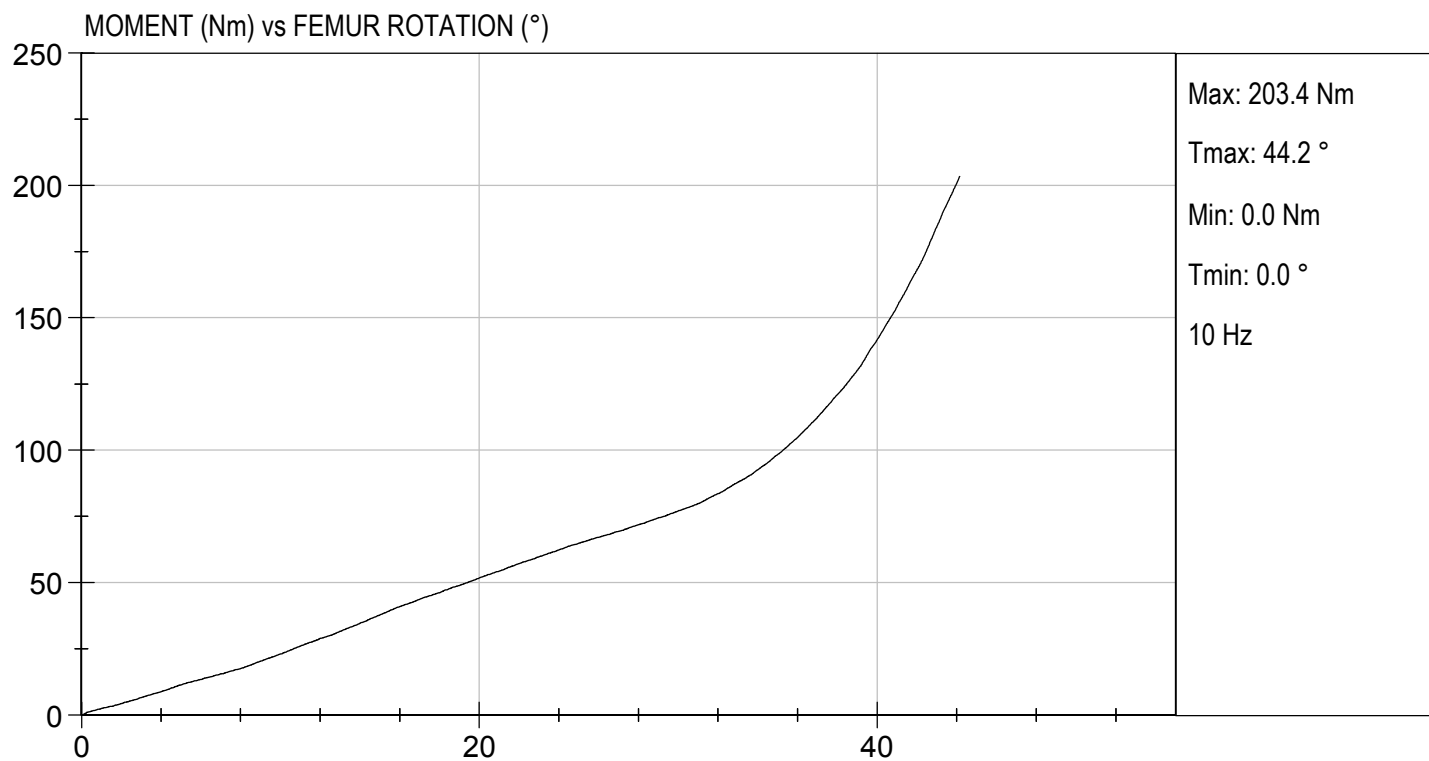
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22	22	Pass
Laboratory Relative Humidity	%	10 to 70	38	38	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.5	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	88.6	77.0	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	45.3	44.2	Pass
Overall Test Results					Pass


 Laboratory Technician

06/18/2020
 Test Date


 Approved By





CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

Hybrid III, 5th External Measurements
SN: DH1659

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	778
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	440
C	H-POINT HEIGHT	Reference	81.3-86.3	85
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	147
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	82
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	130
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	251
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	43.2-48.2	45
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	285
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	189
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	543
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376	357
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	398

N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. "K".	414-439.4	435
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	182
P	FOOT LENGTH	Tip of toe to rear of heal	218.5-233.7	221
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	469
S	HEAD BREADTH	The widest part of the head	137.1-147.3	141
T	HEAD DEPTH	Back of the head to the forehead	177.8-188	182
U	HIP BREADTH	The widest part of the hip	299.7-314.9	306
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	350.5-365.7	357
W	FOOT BREADTH	The widest part of the foot	78.8-94	83
X	HEAD CIRCUMFERENCE	Measured at the point as in dim. "T"	528.3-548.7	542
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 345.4 ± 12.7 mm above seat surface	850.9-881.3	865
Z	WAIST CIRCUMFERENCE	Measured 165.1 ± 5.1 mm above seat surface	759.5-789.9	785
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	332.7-358.1	345
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	160.1-170.2	165

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

Test ID: D201281

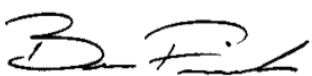
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Peak Resultant Acceleration	G's	250 to 300	294	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-5.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass



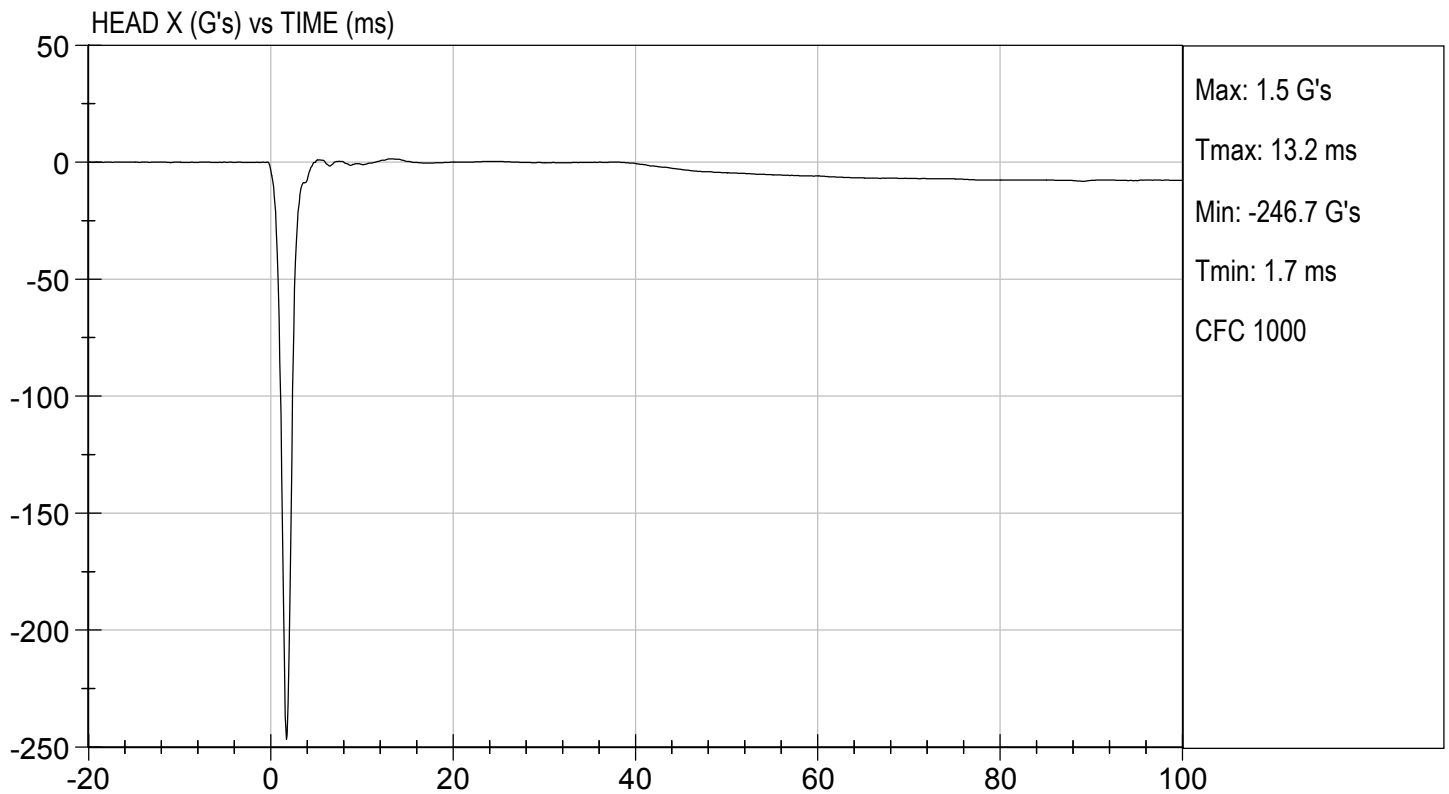
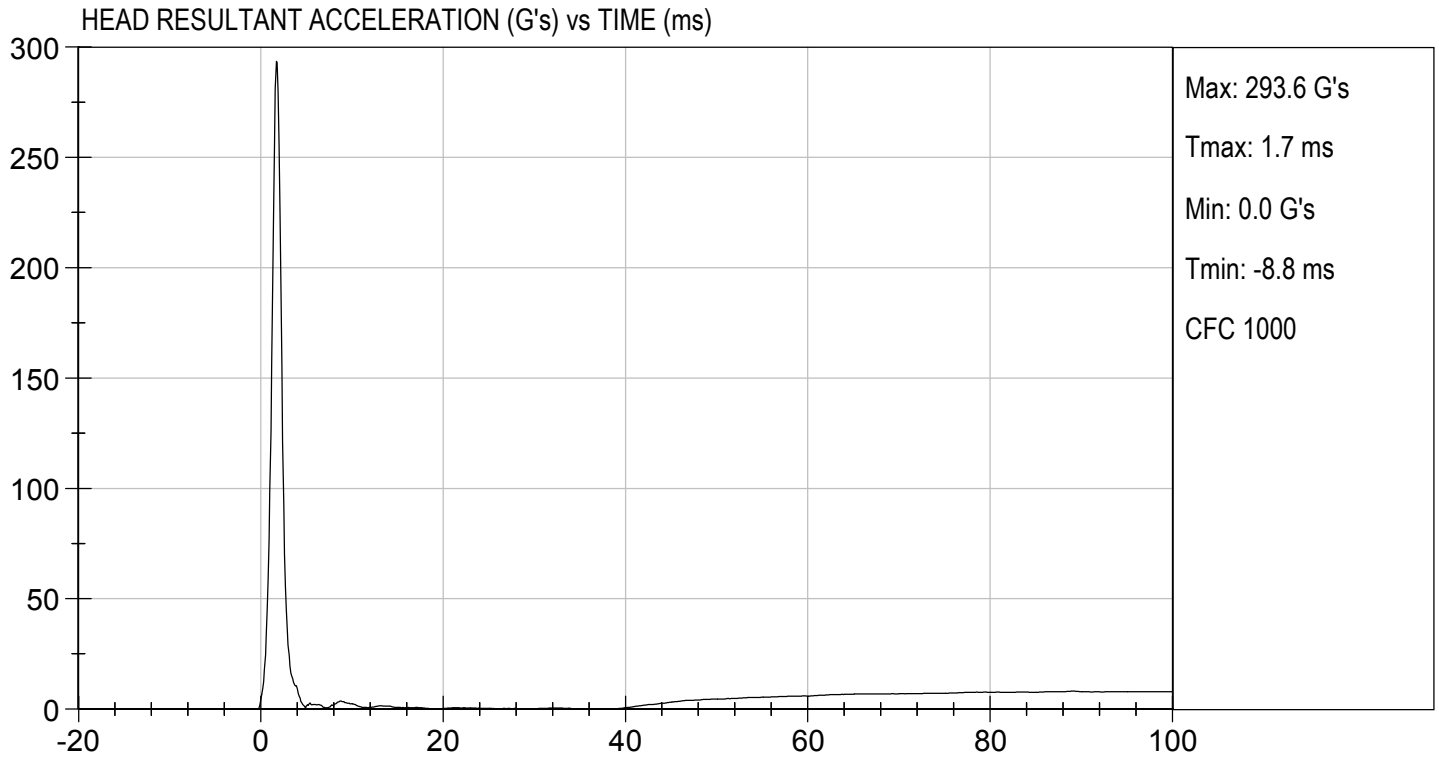
Laboratory Technician

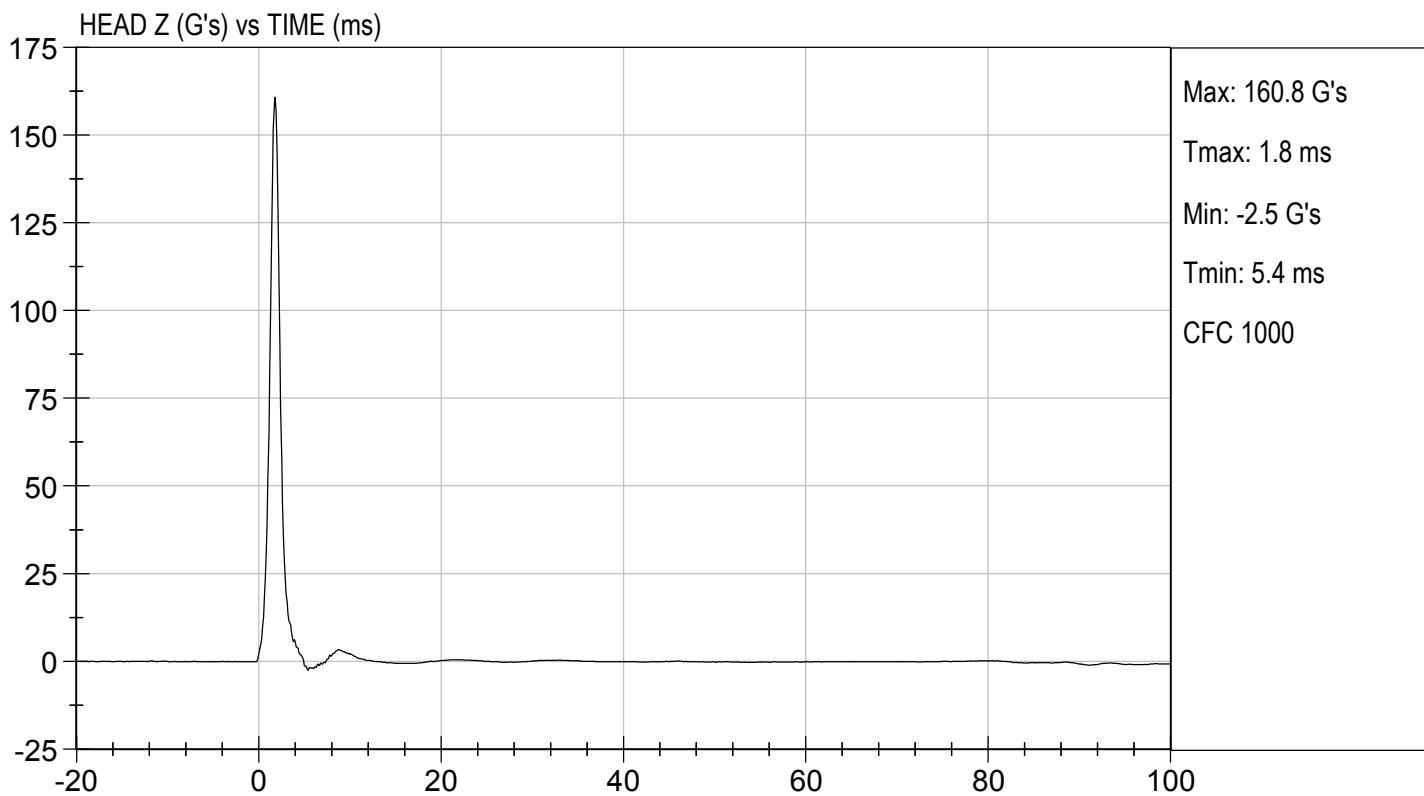
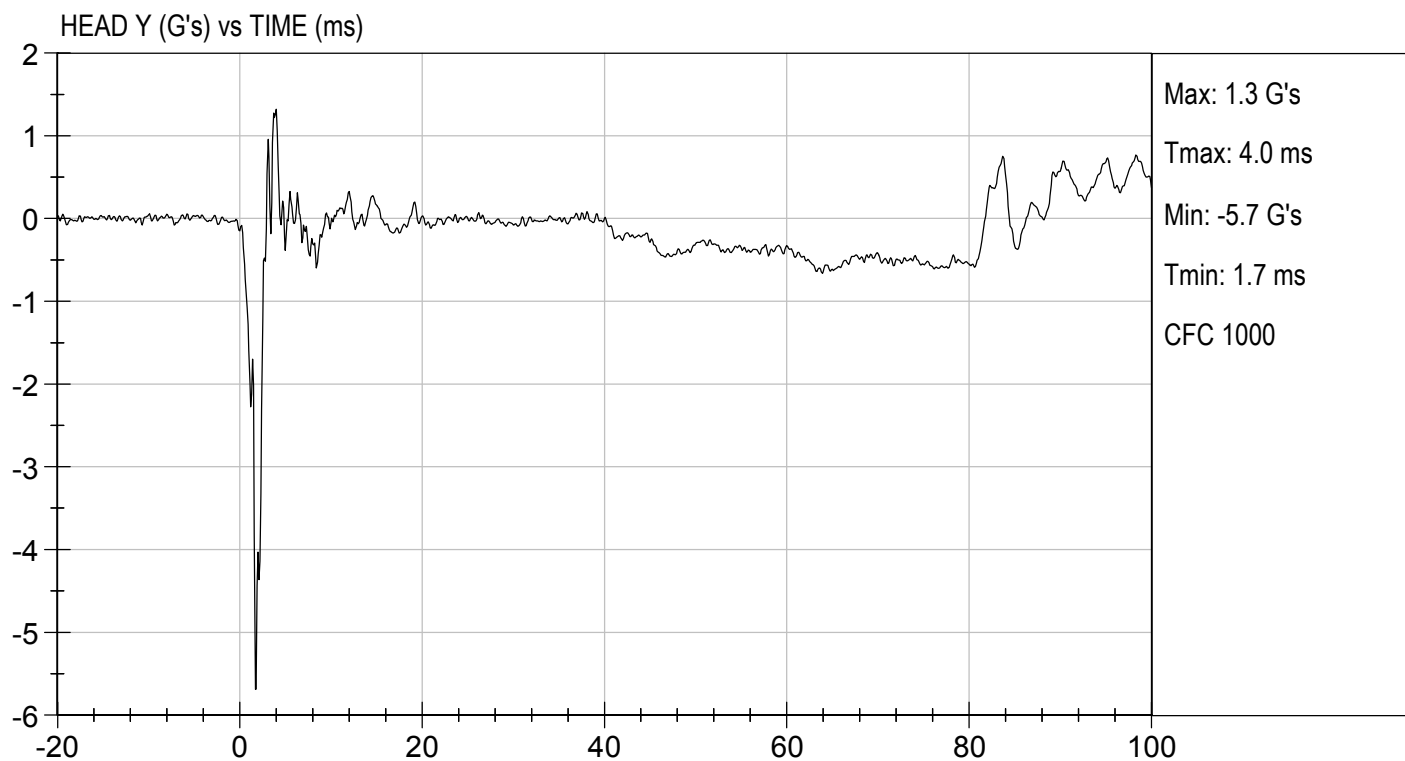
05/26/2020

Test Date



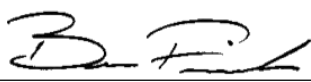
Approved By





MGA RESEARCH CORPORATION**NECK FLEXION TEST****HYBRID III 5TH PERCENTILE**ATD Serial No: DH1659Test I.D: D201282

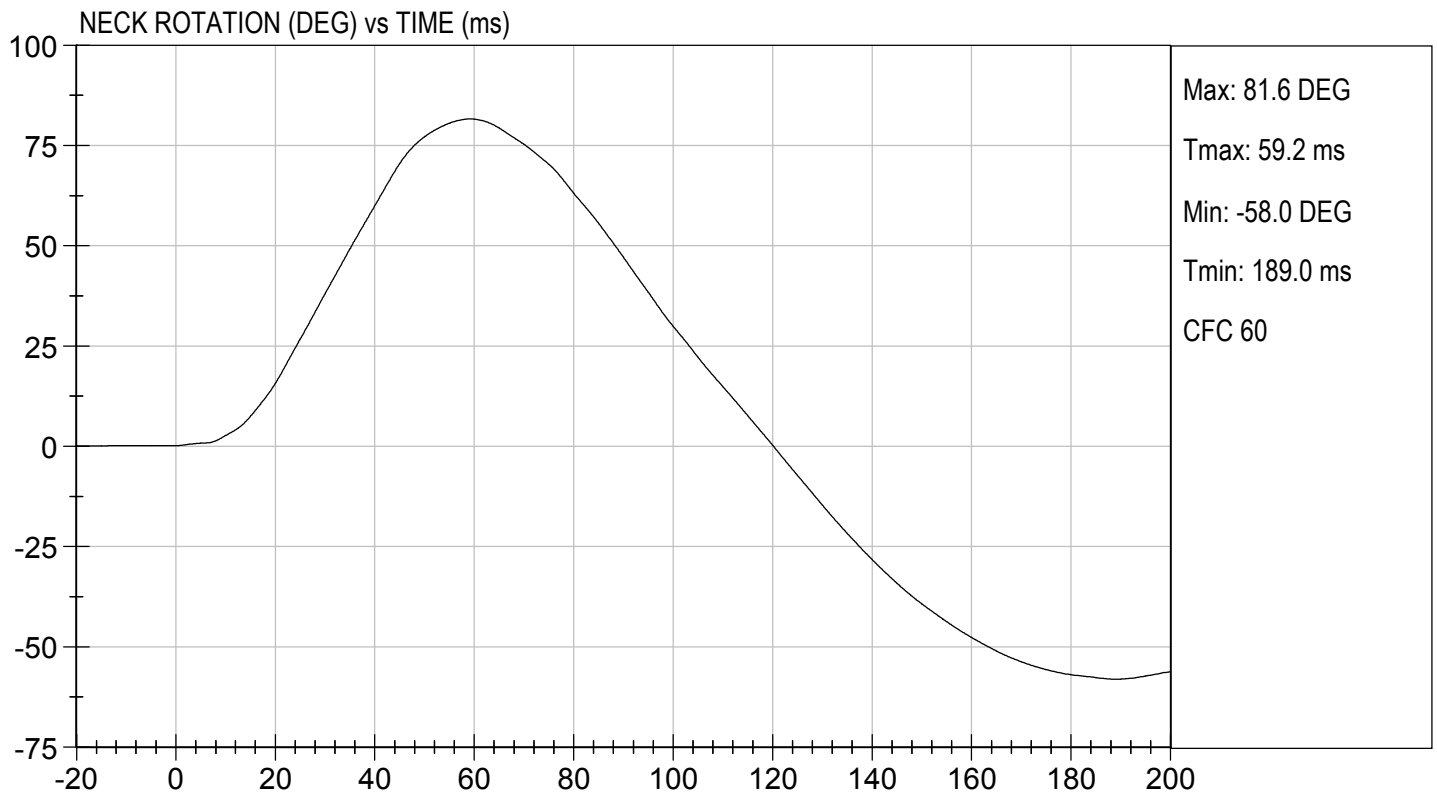
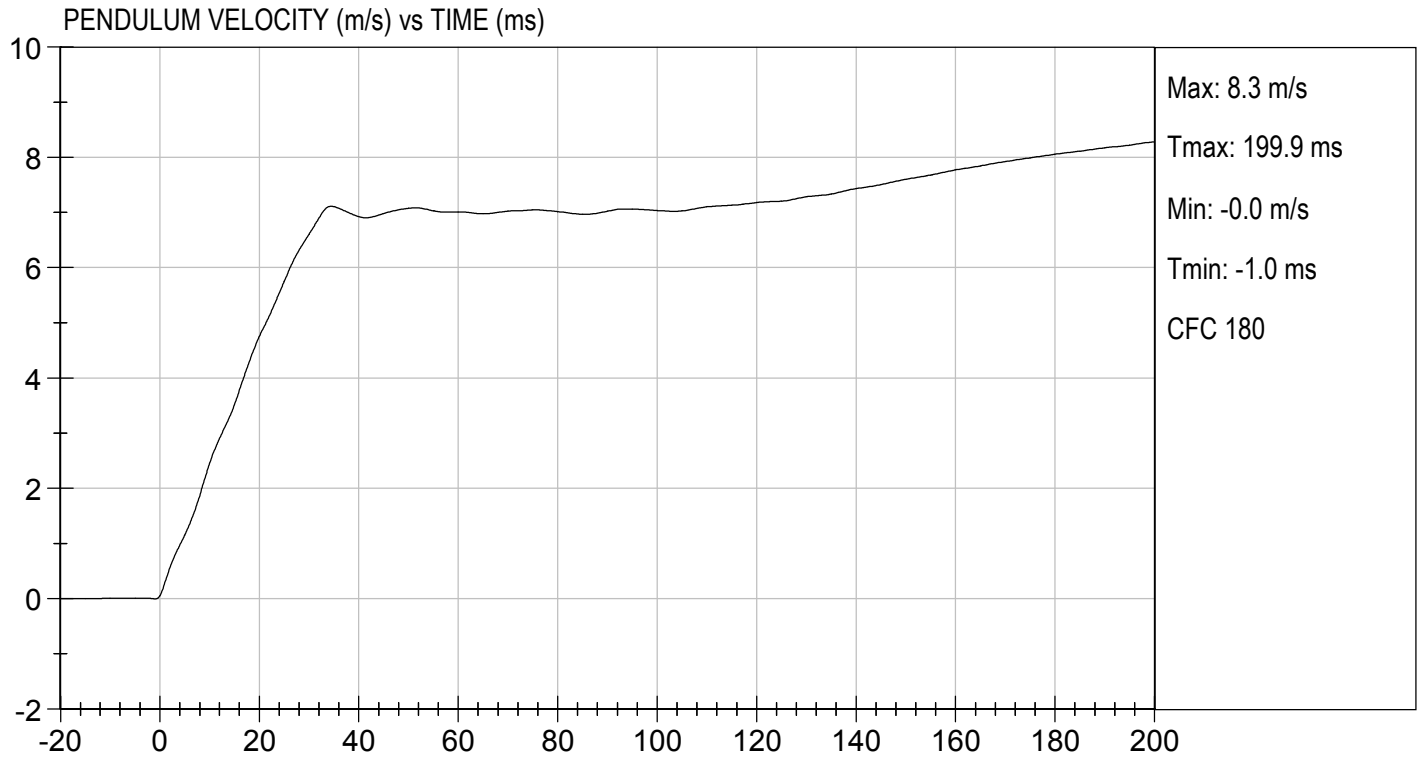
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	56	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.8	Pass
	30 ms	m/s	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	82	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	72	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	84	Pass
Overall Results					Pass


Laboratory Technician05/26/2020
Test Date
Approved By



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

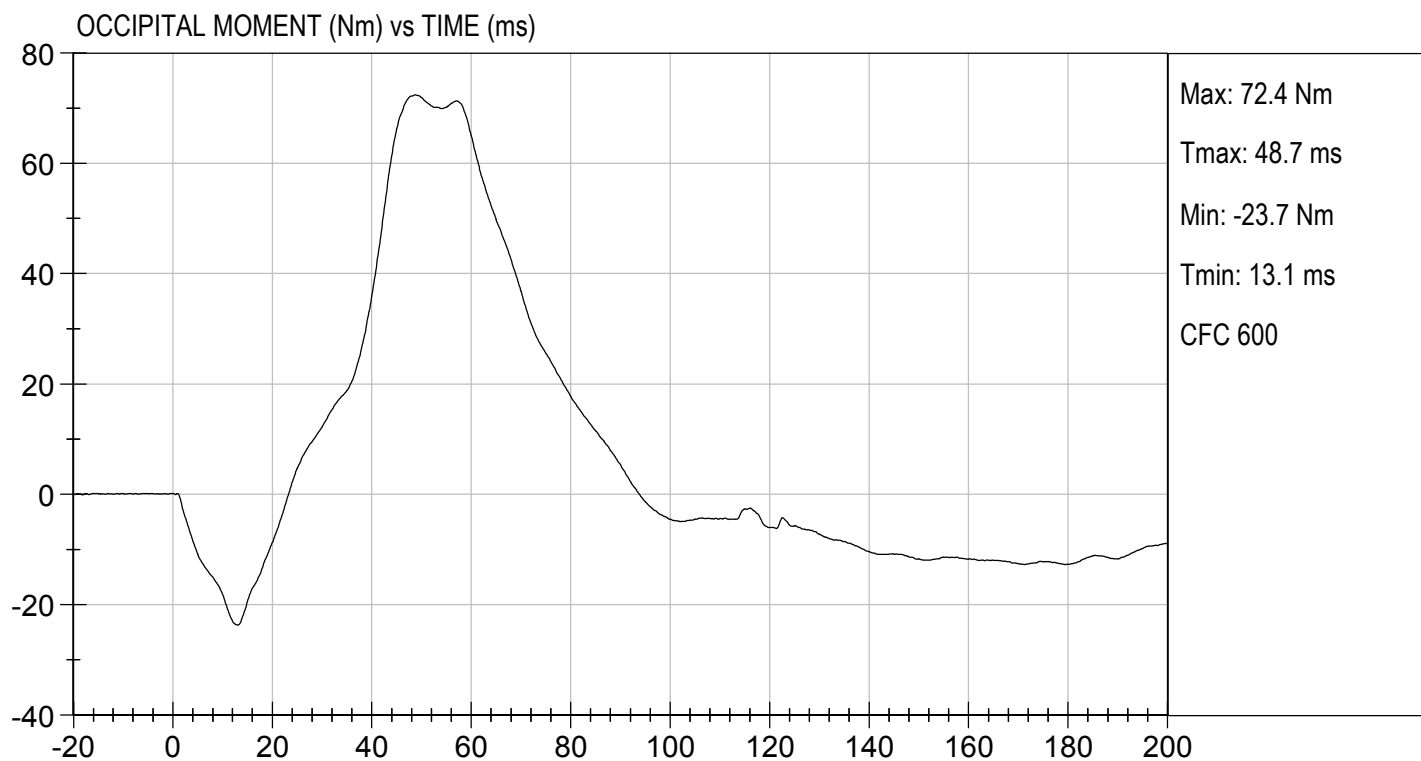
TEST DATE: 05/26/2020
TEST #: D201282





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

TEST DATE: 05/26/2020
TEST #: D201282



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

Test I.D: D201283

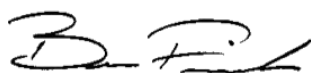
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	56	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	103	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-58	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	104	Pass
Overall Results					Pass



Laboratory Technician

05/26/2020

Test Date

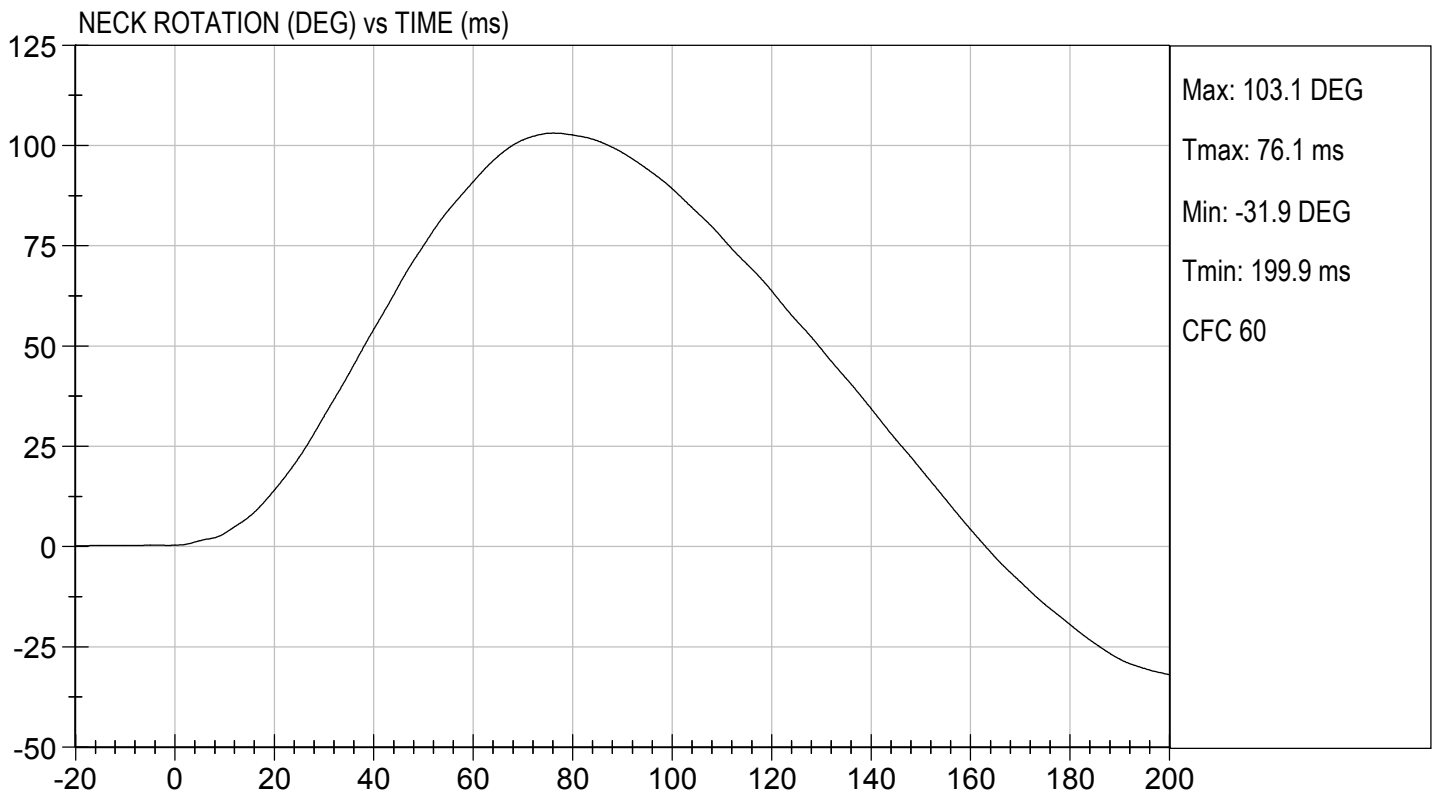
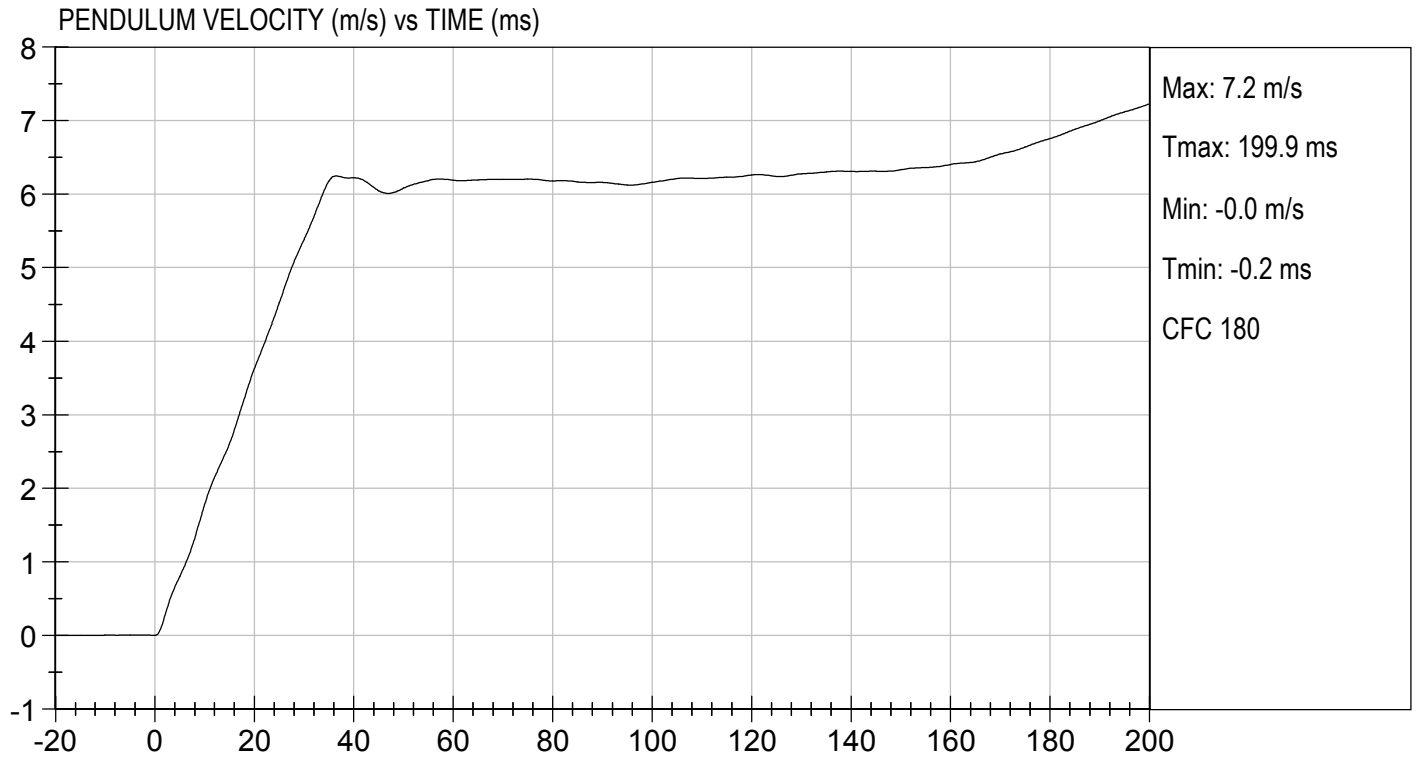


Approved By



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

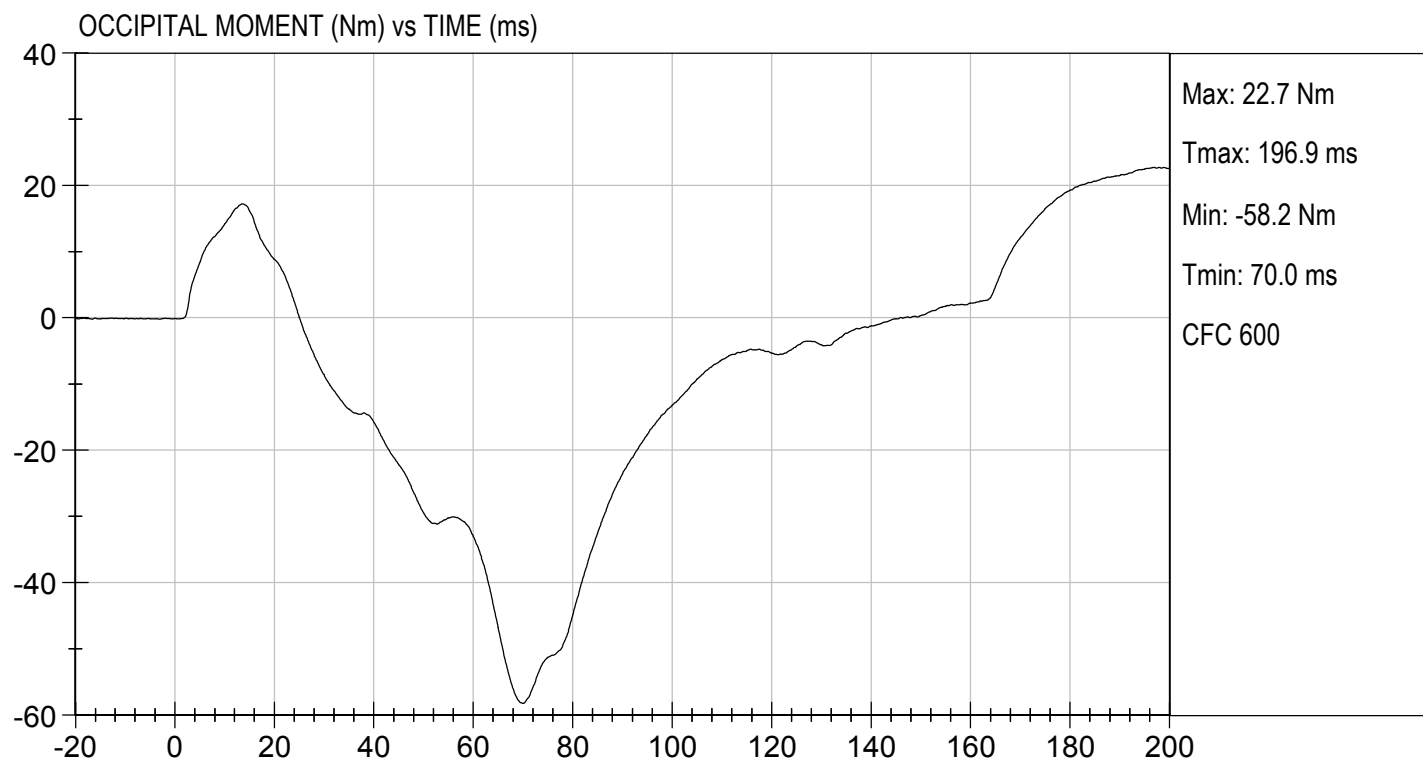
TEST DATE: 05/26/2020
TEST #: D201283





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

TEST DATE: 05/26/2020
TEST #: D201283



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

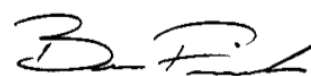
ATD Serial No: DH1659

Test I.D: D201284

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Relative Humidity	%	10 to 70	49	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	50	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4222	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4403	Pass
			Overall Test Results	Pass


 Laboratory Technician

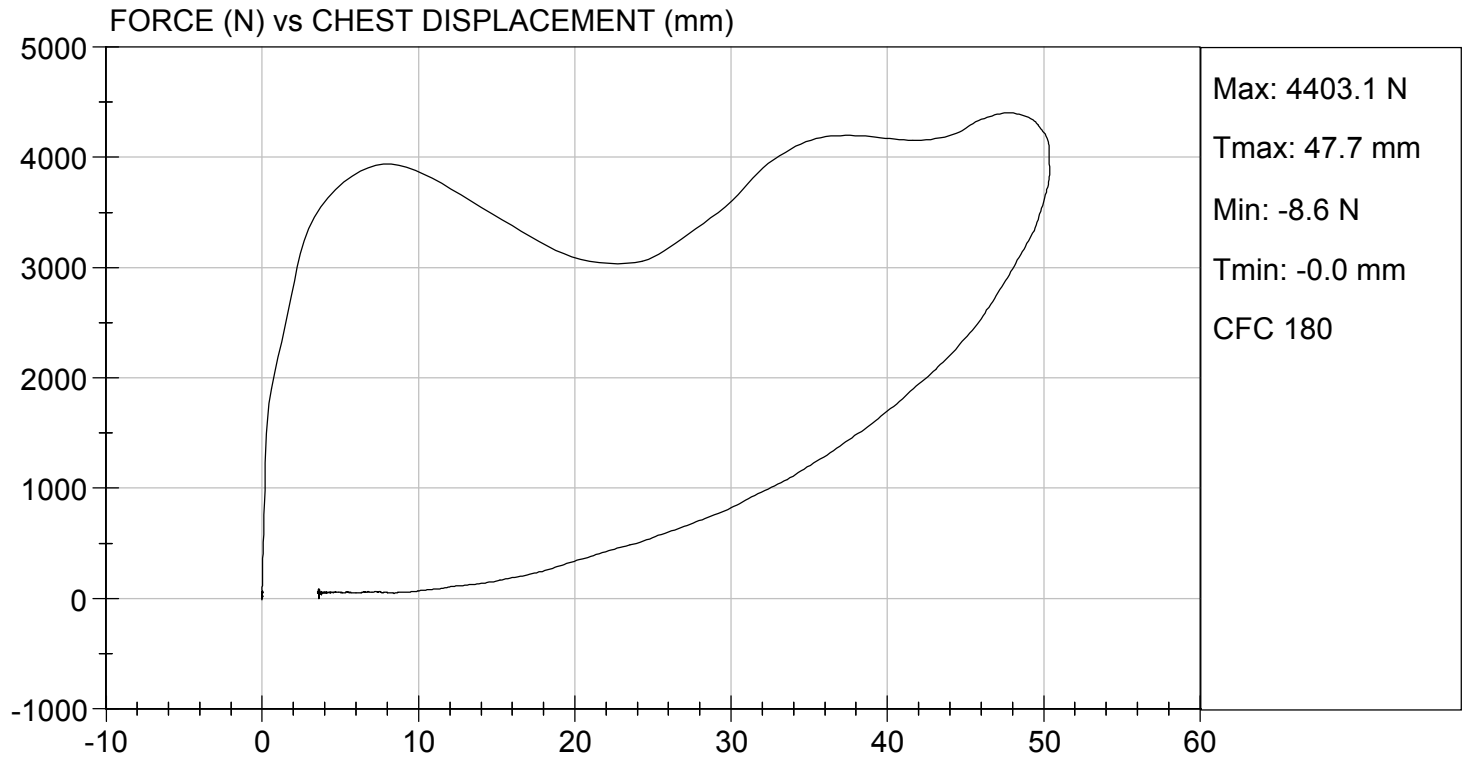
05/22/2020
 Test Date


 Approved By



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

TEST DATE: 05/22/2020
TEST #: D201284



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

Test I.D: D201285

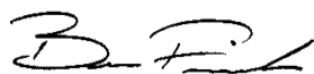
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	60	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3862	Pass
Overall Test Results				Pass



Laboratory Technician

05/26/2020

Test Date

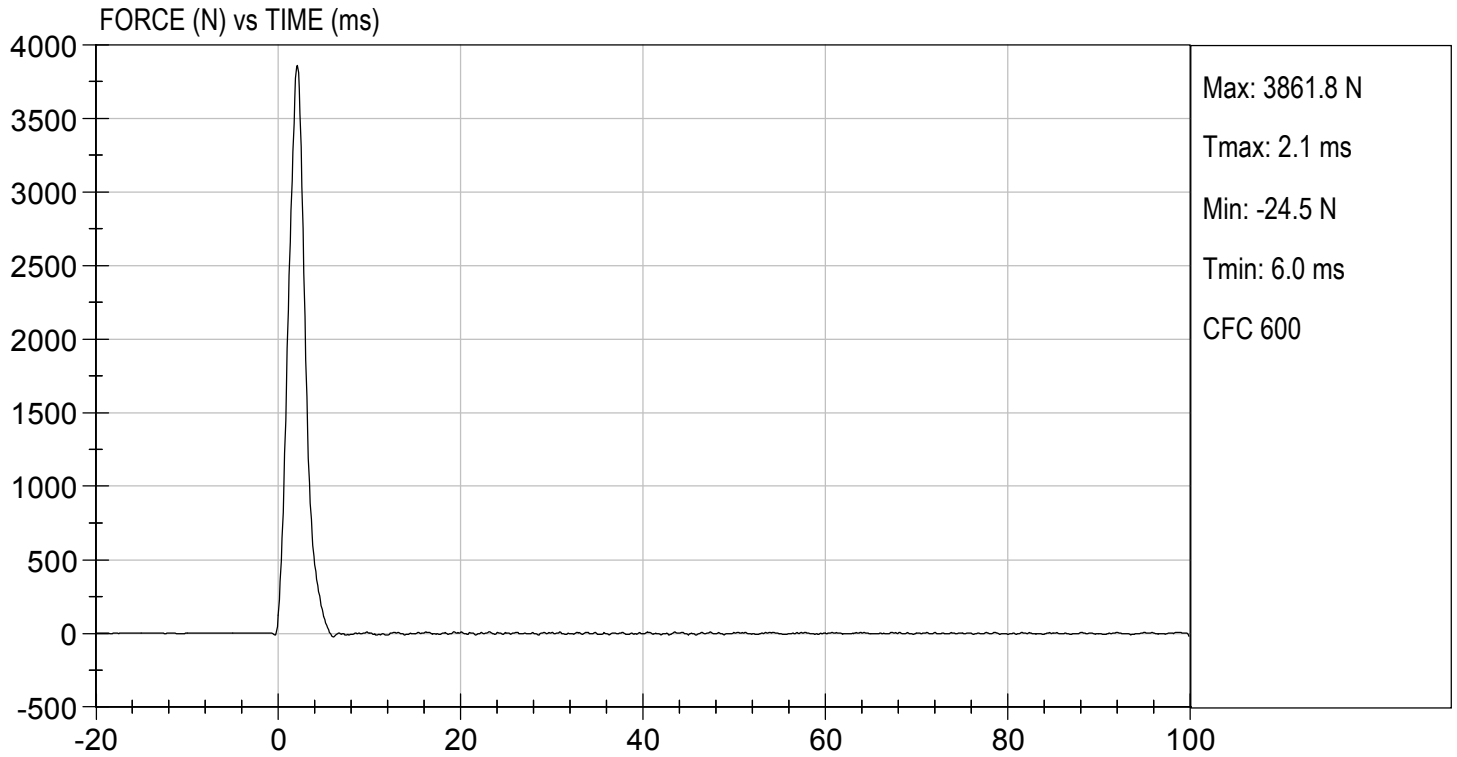


Approved By



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

TEST DATE: 05/26/2020
TEST #: D201285



MGA RESEARCH CORPORATION

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

ATD Serial No: DH1659

Test I.D: D201286

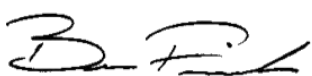
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	60	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	N	3450 to 4060	3845	Pass
Overall Test Results				Pass



Laboratory Technician

05/26/2020

Test Date

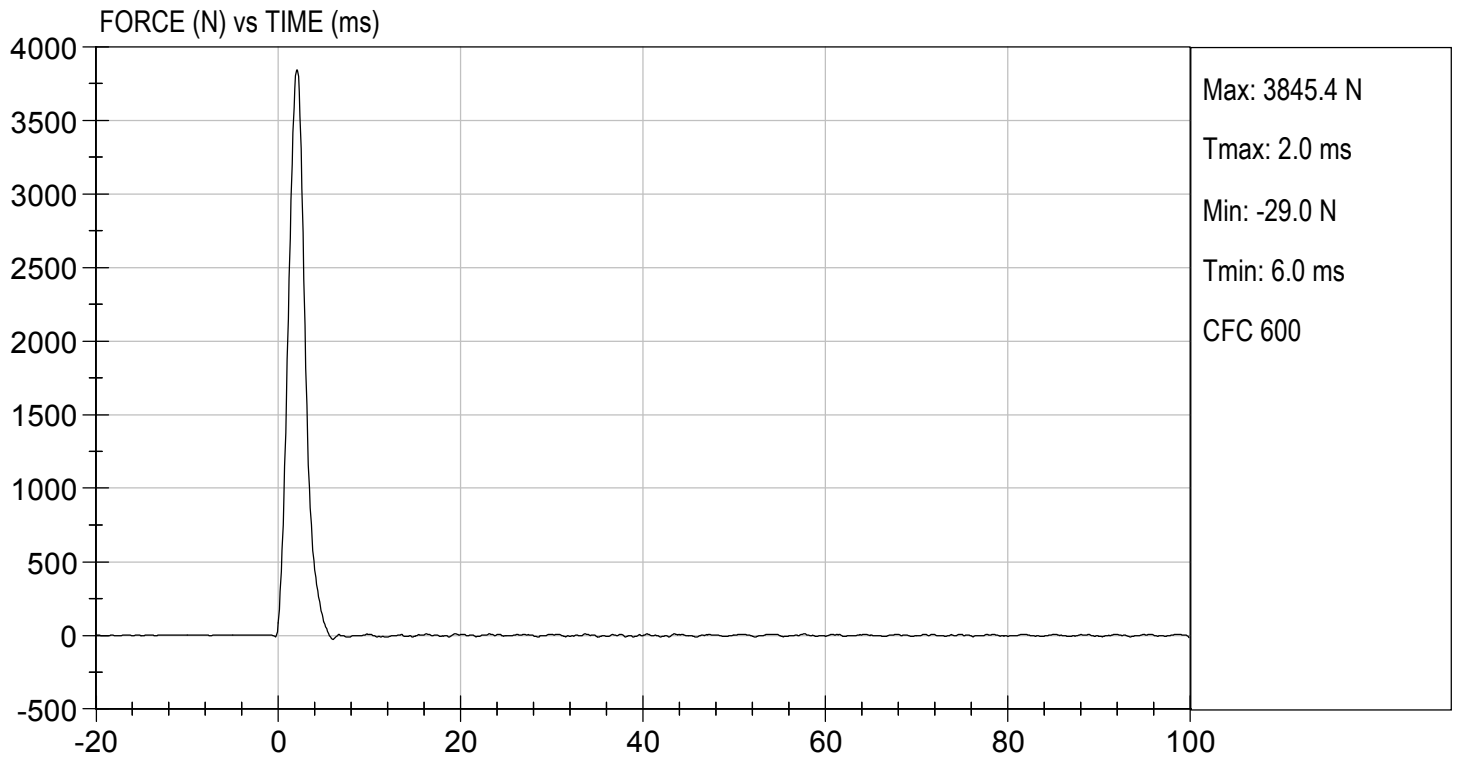


Approved By



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

TEST DATE: 05/26/2020
TEST #: D201286



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

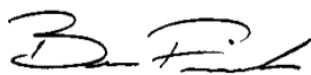
Test I.D: D201287

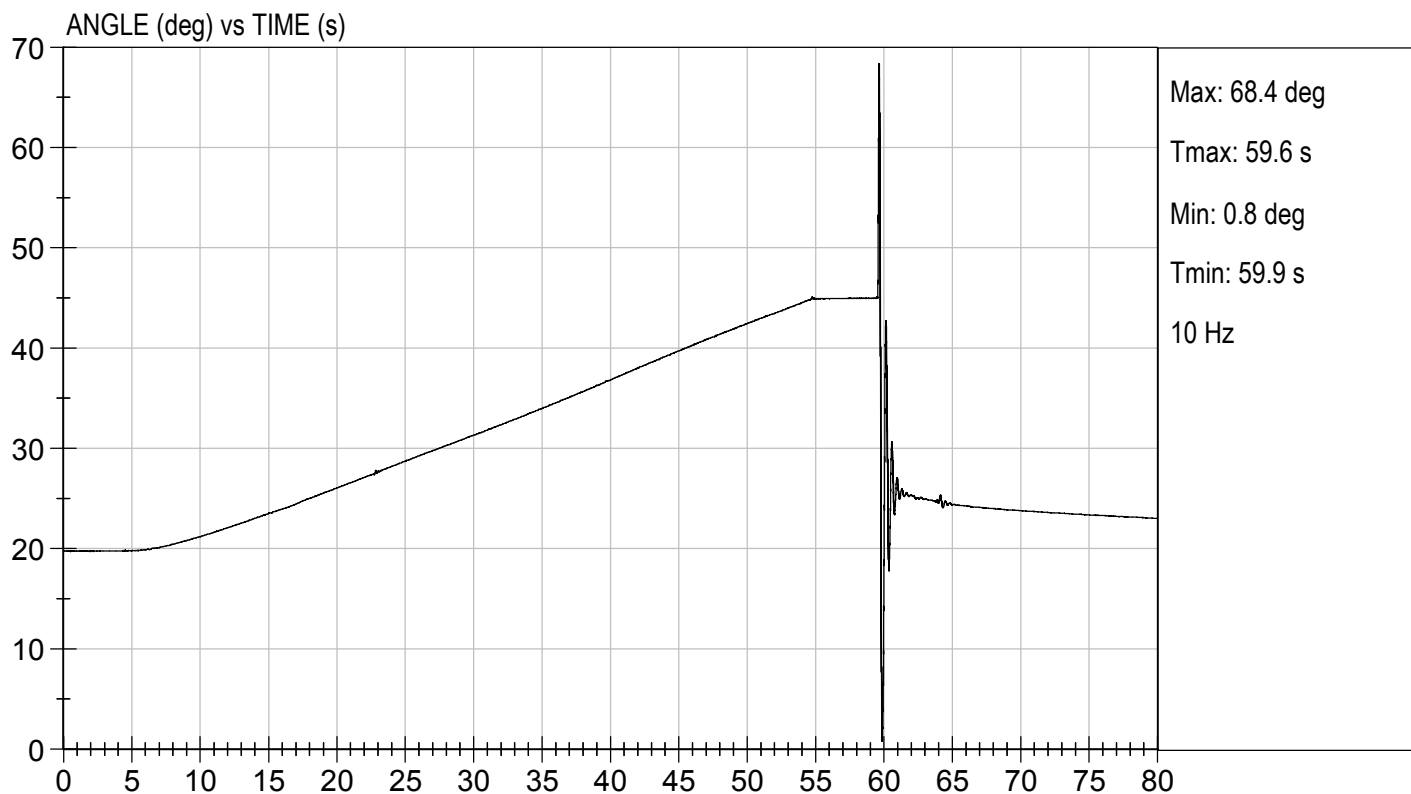
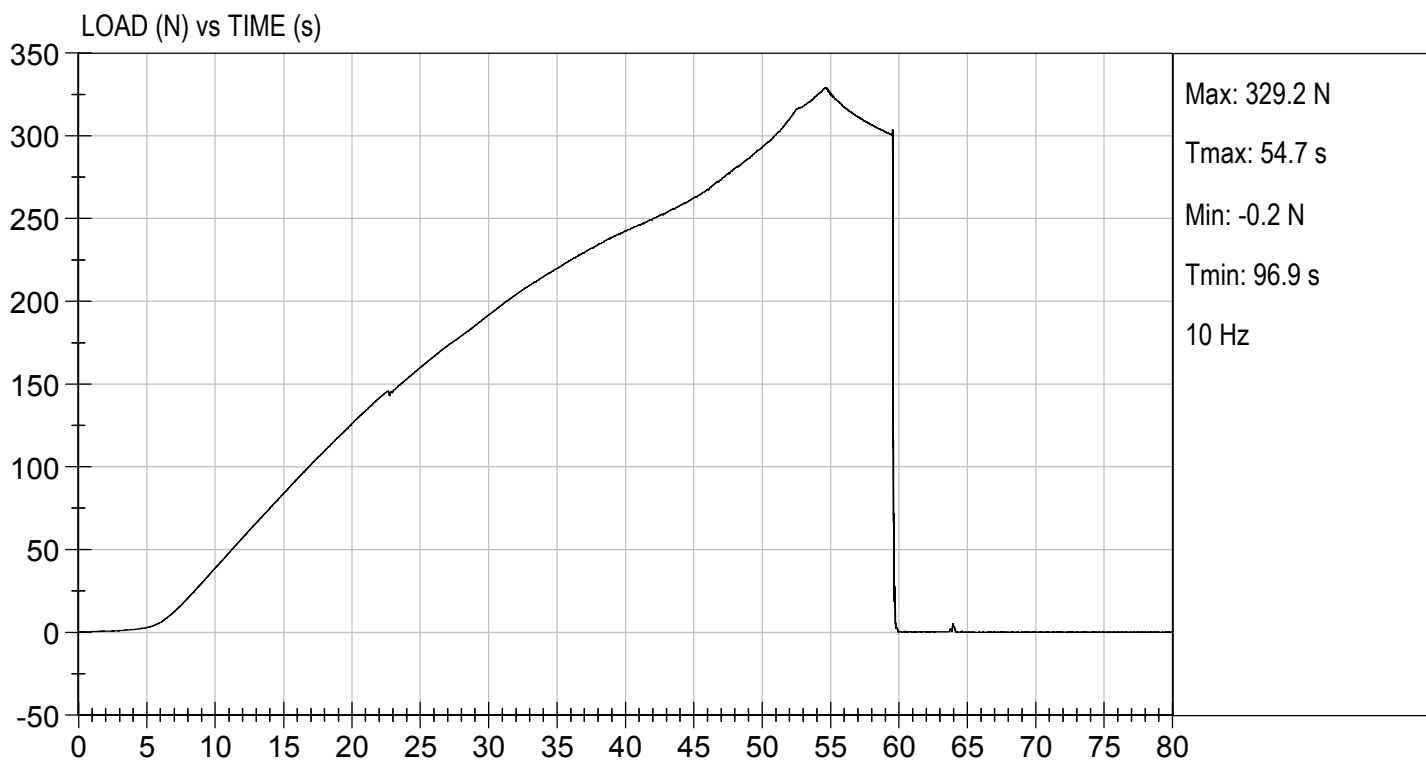
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Initial Angle	deg	0 to 20	20	Pass
Return Angle	deg	+/- 8	2	Pass
Force at 45 deg	N	320 to 390	329	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.5	Pass
Overall Result			Pass	


Laboratory Technician

05/26/2020

Test Date


Approved By



CALIBRATION TEST RESULTS

POST-TEST

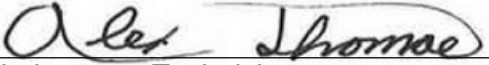
HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

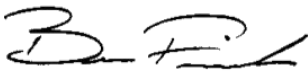
Test ID: D201531

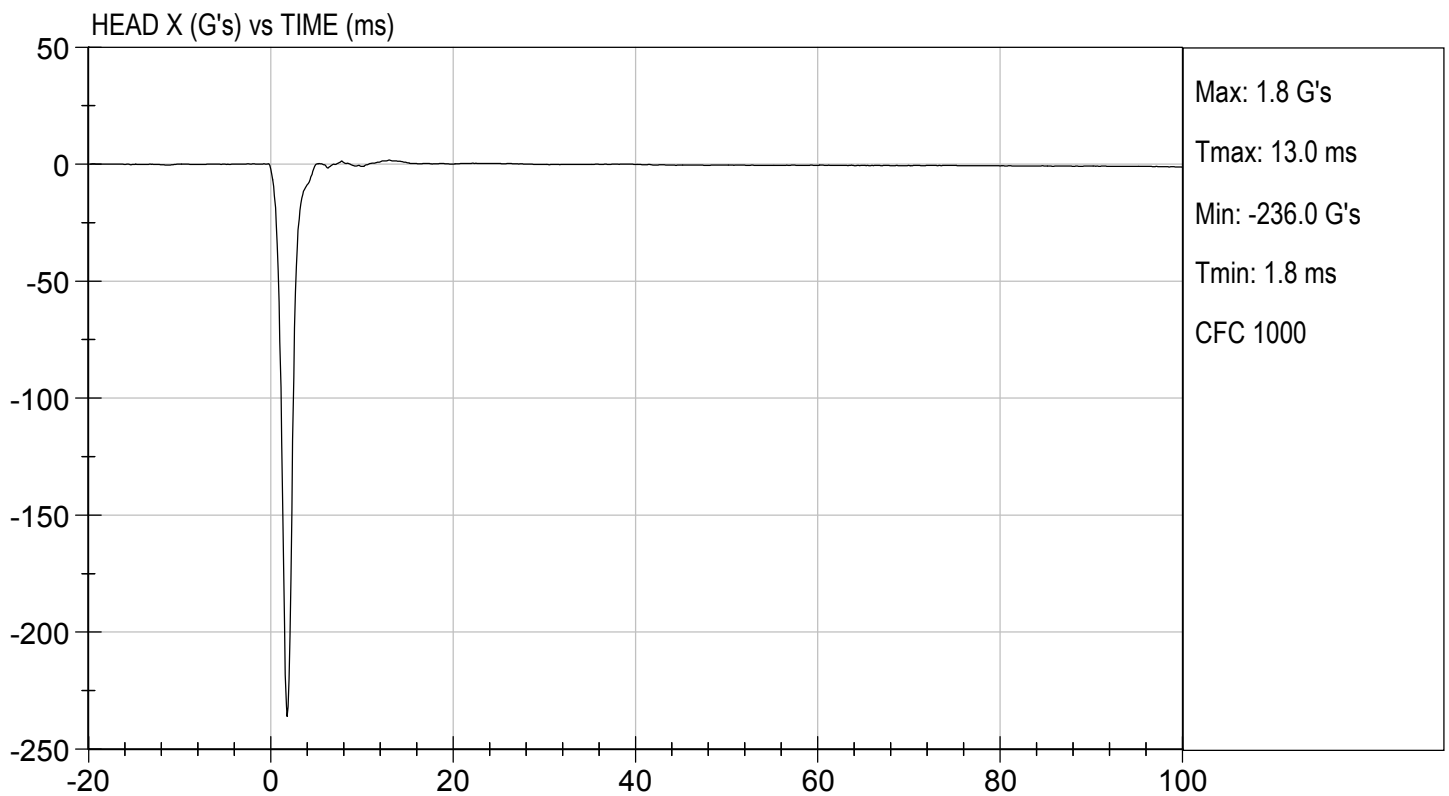
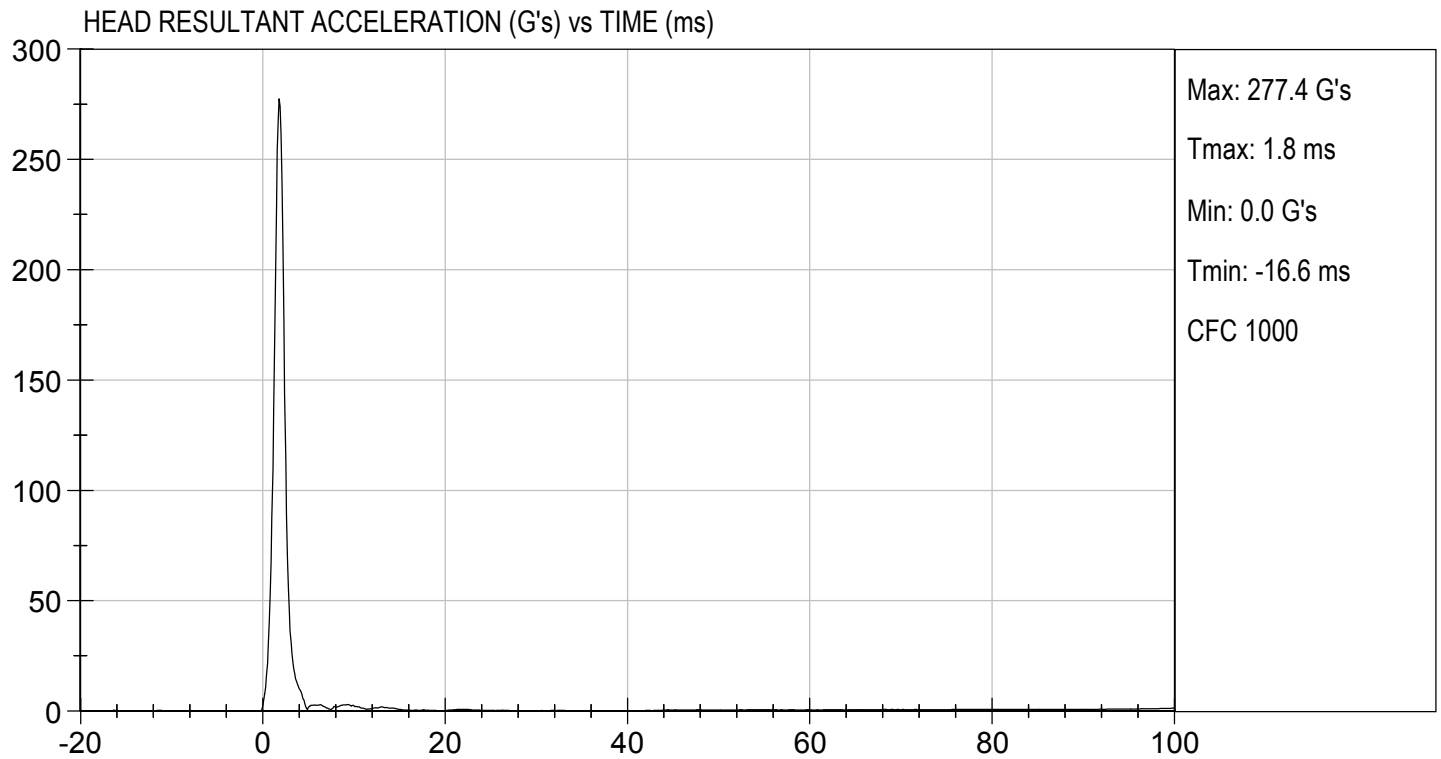
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Peak Resultant Acceleration	G's	250 to 300	277	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-2.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

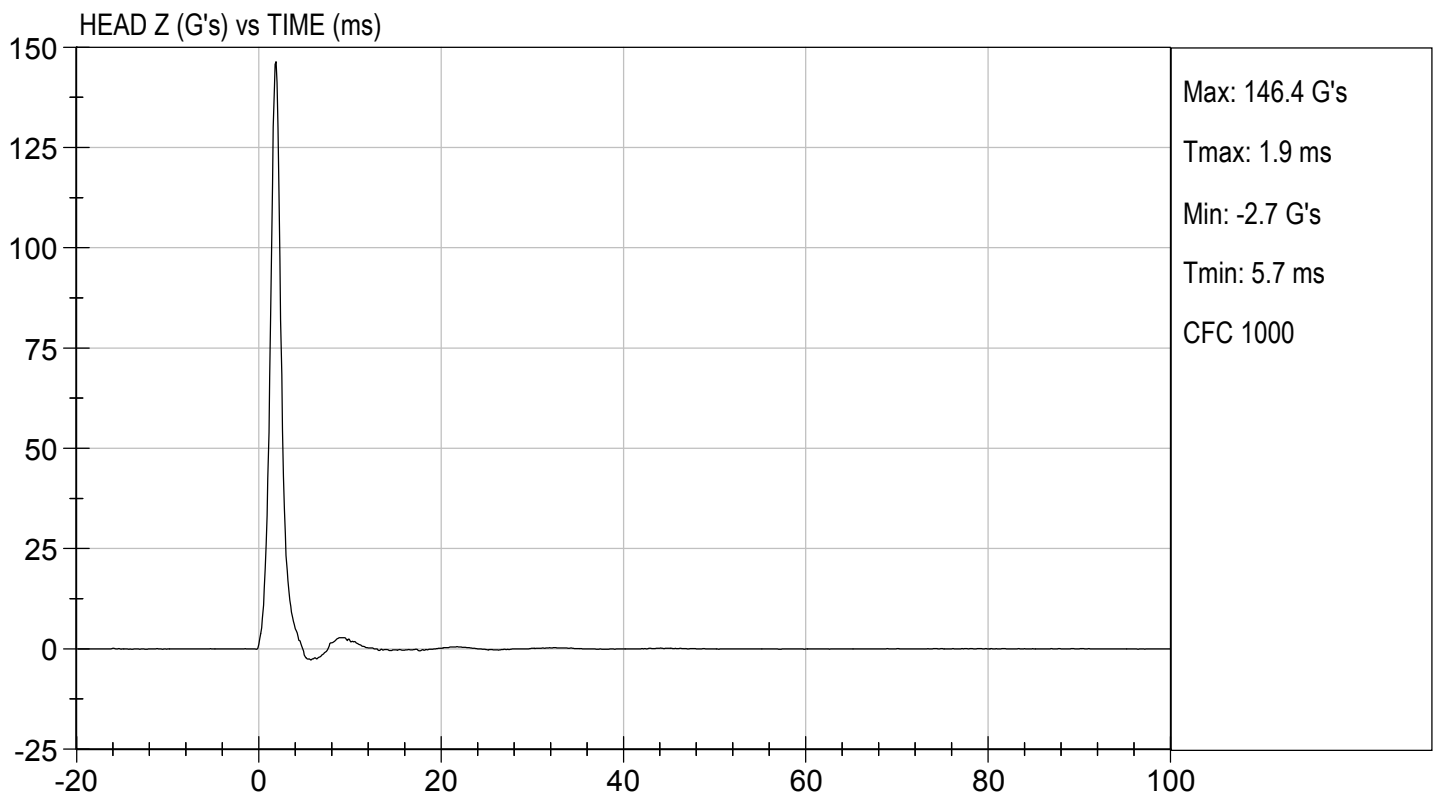
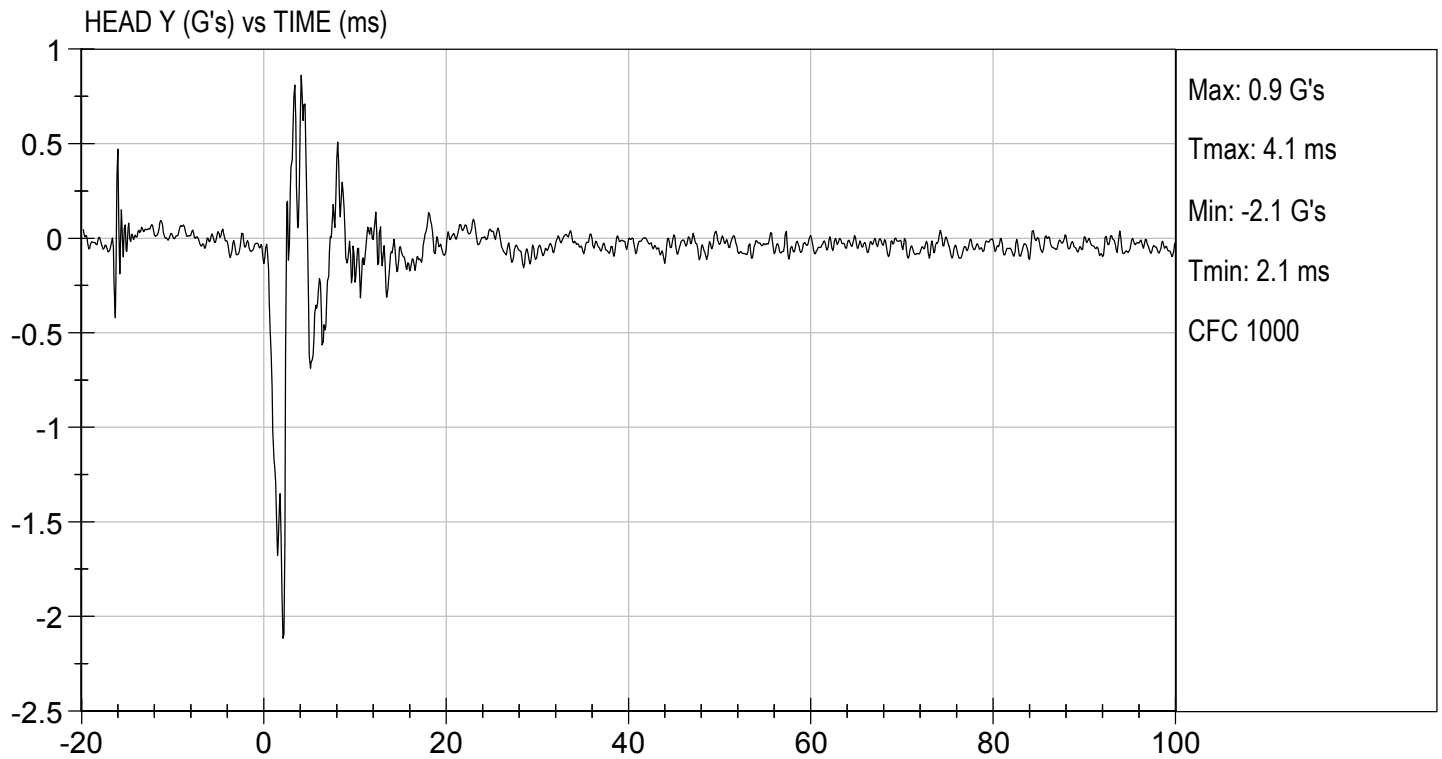

Laboratory Technician

06/18/2020

Test Date


Approved By





MGA RESEARCH CORPORATION**NECK FLEXION TEST****HYBRID III 5TH PERCENTILE**ATD Serial No: DH1659Test I.D: D201532

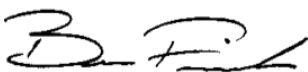
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	39	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.13	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.8	Pass
	30 ms	m/s	5.8 to 7.0	7.0	Pass
D Plane Rotation	Max	deg	77 to 91	80	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	73	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	83	Pass
Overall Results					Pass



Laboratory Technician

06/18/2020

Test Date

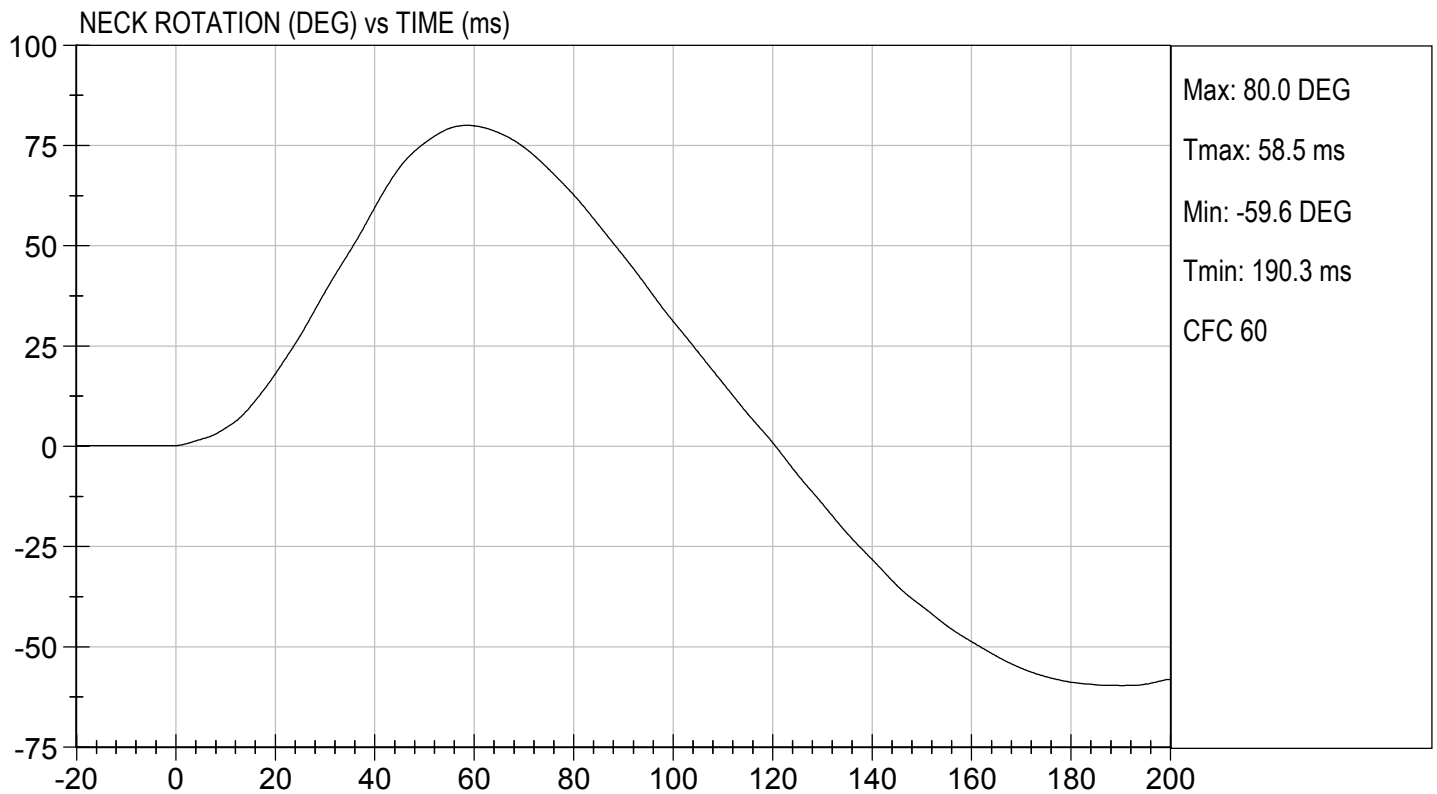
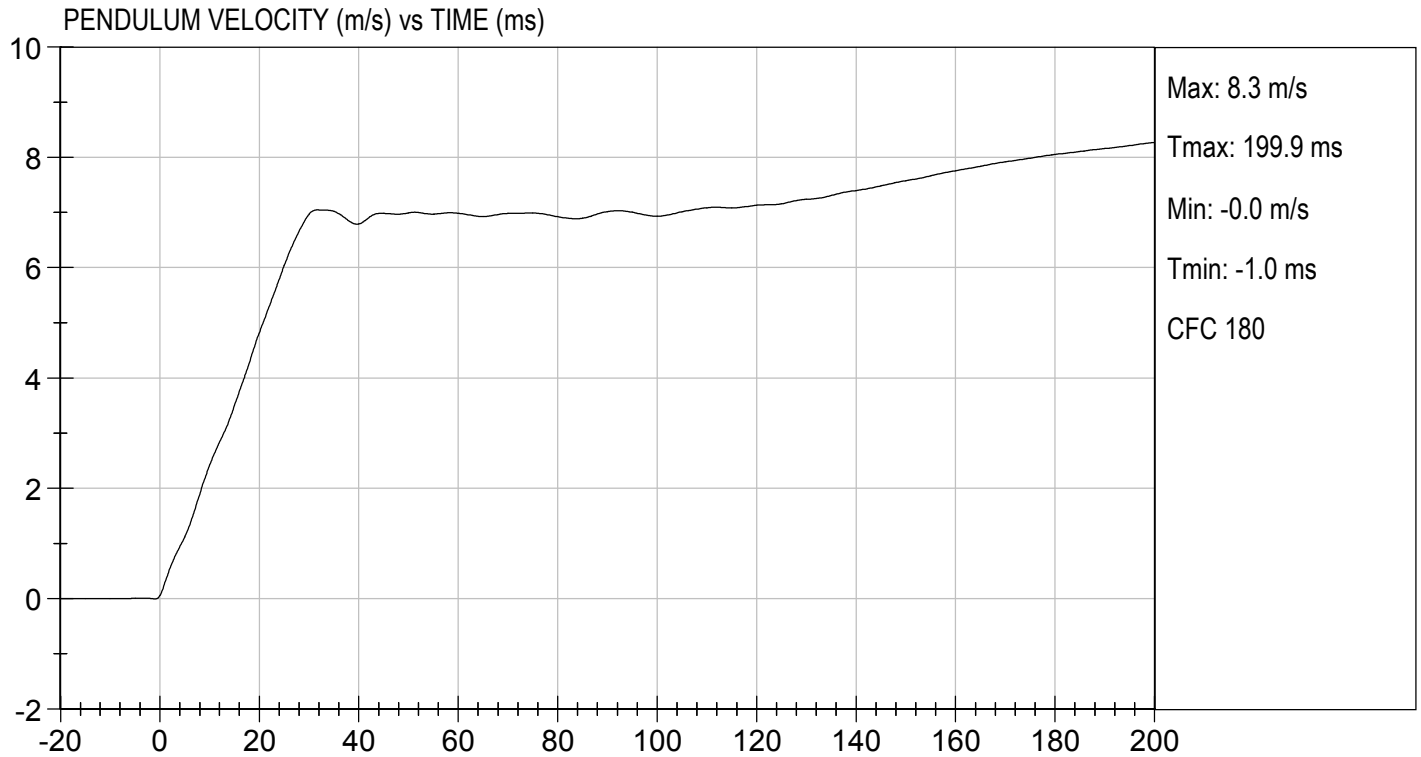


Approved By



TEST DESC: NECK FLEXION
VELOCITY: 23.40 ft/s, 7.13 m/s

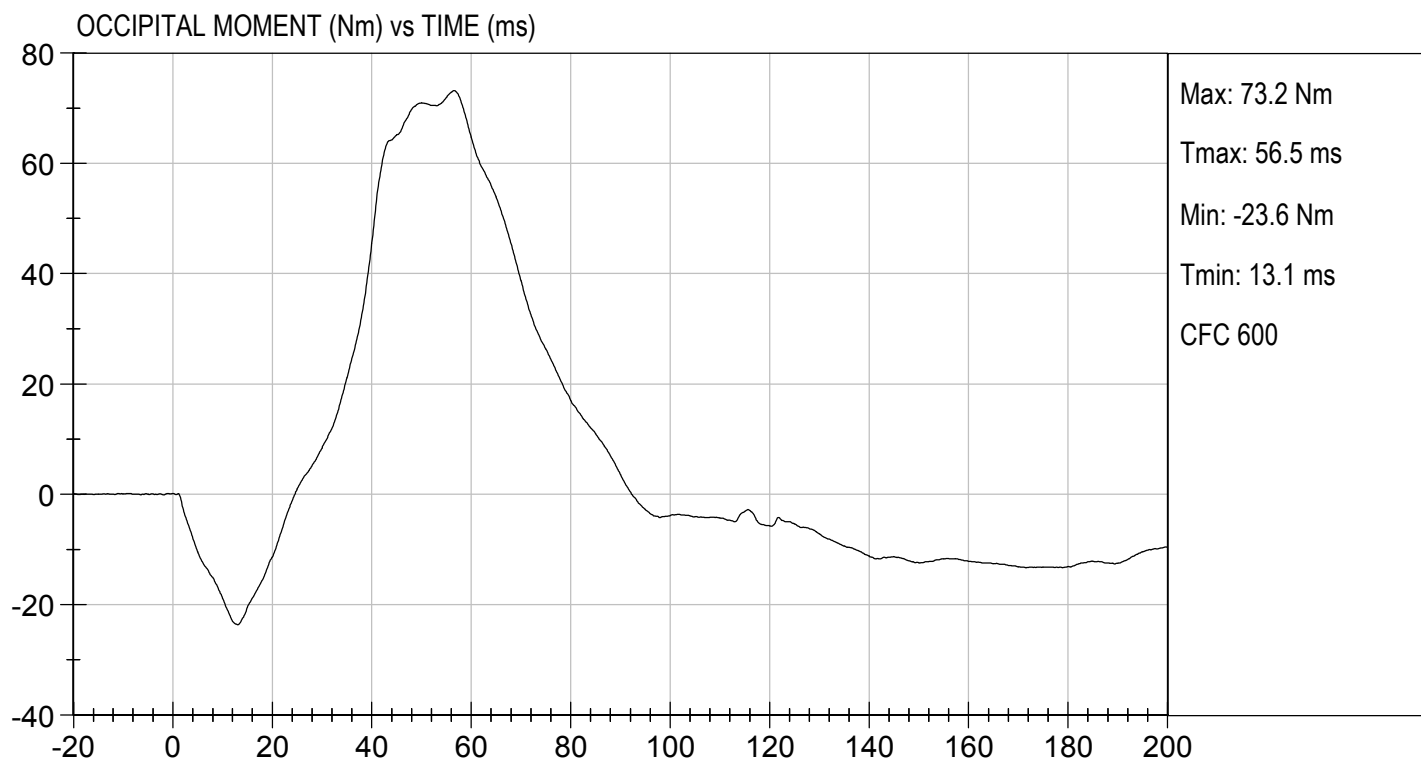
TEST DATE: 06/18/2020
TEST #: D201532





TEST DESC: NECK FLEXION
VELOCITY: 23.40 ft/s, 7.13 m/s

TEST DATE: 06/18/2020
TEST #: D201532



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

Test I.D: D201533

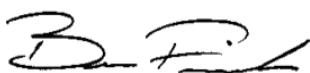
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	39	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.19	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.8	Pass
	30 ms	m/s	4.6 to 5.6	5.6	Pass
D Plane Rotation	Max	deg	99 to 114	104	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	97	Pass
Overall Results					Pass



Laboratory Technician

06/18/2020

Test Date

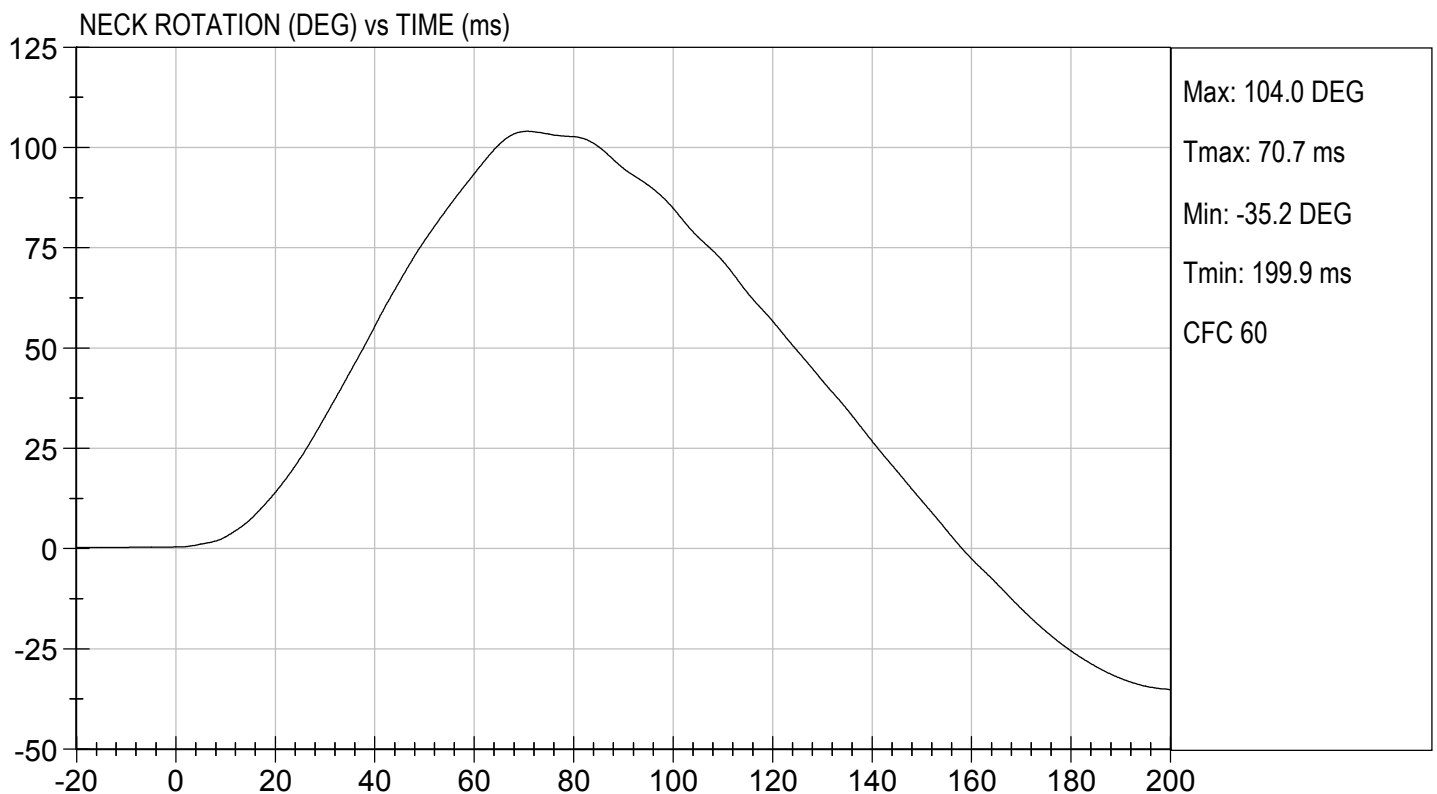
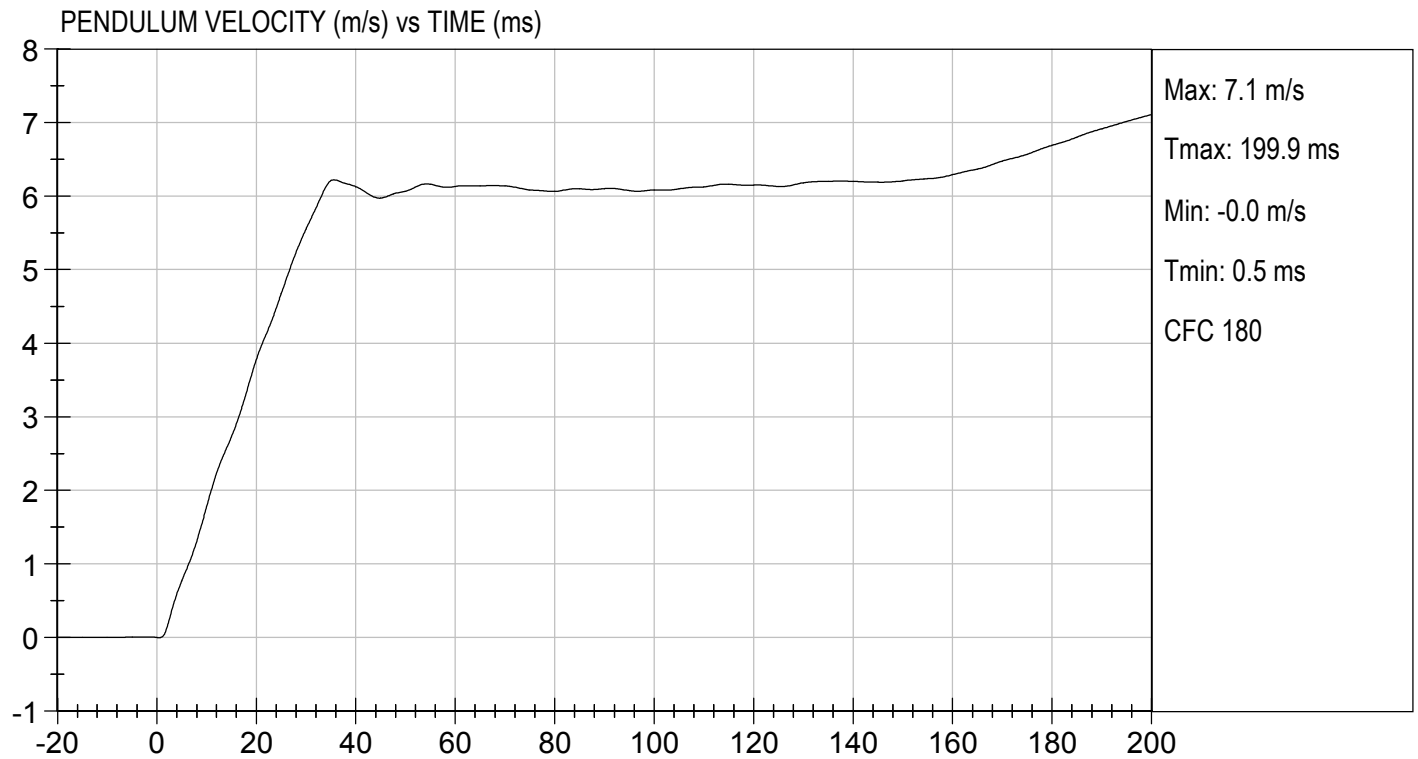


Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 20.30 ft/s, 6.19 m/s

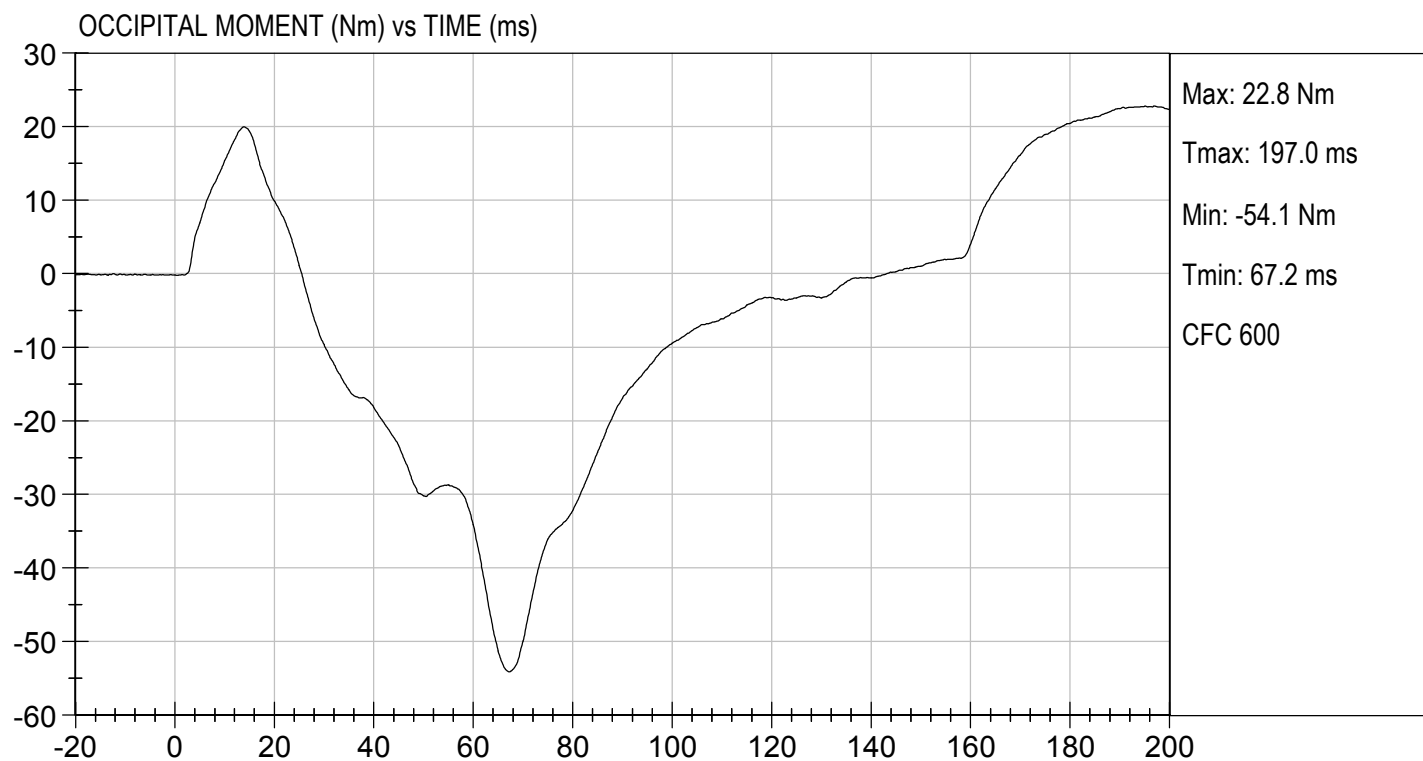
TEST DATE: 06/18/2020
TEST #: D201533





TEST DESC: NECK EXTENSION
VELOCITY: 20.30 ft/s, 6.19 m/s

TEST DATE: 06/18/2020
TEST #: D201533

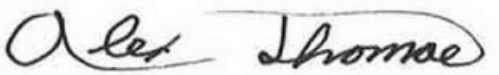


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

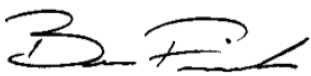
Test I.D: D201534

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Relative Humidity	%	10 to 70	39	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	50	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4215	Pass
Internal Hysteresis	%	69 to 85	75	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4456	Pass
			Overall Test Results	Pass


Laboratory Technician

06/17/2020

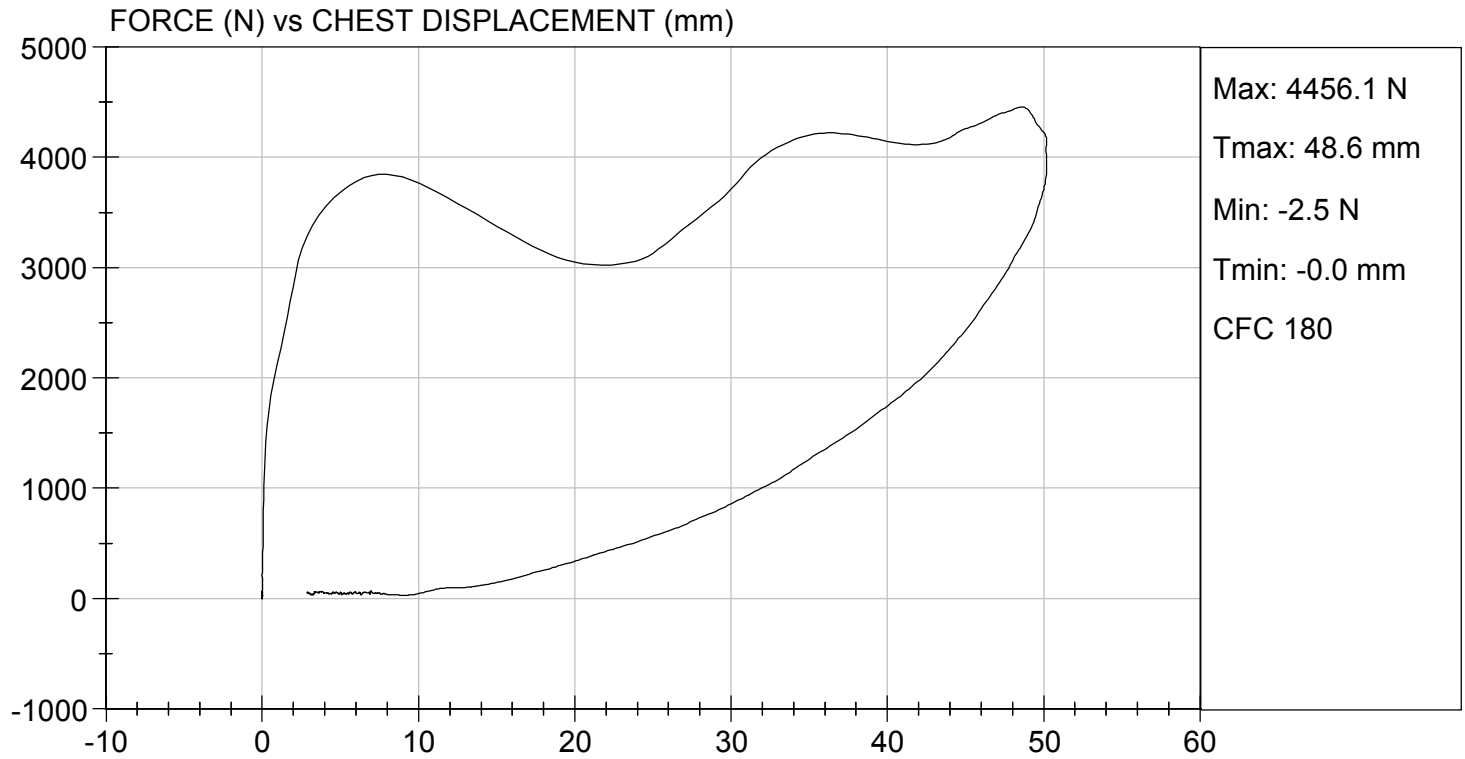
Test Date


Approved By



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

TEST DATE: 06/17/2020
TEST #: D201534



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

ATD Serial No: DH1659

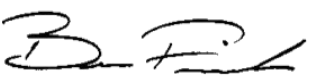
Test I.D: D201535

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	N	4715 to 5782	5,504	Pass
Overall Test Results				Pass


Laboratory Technician

06/18/2020

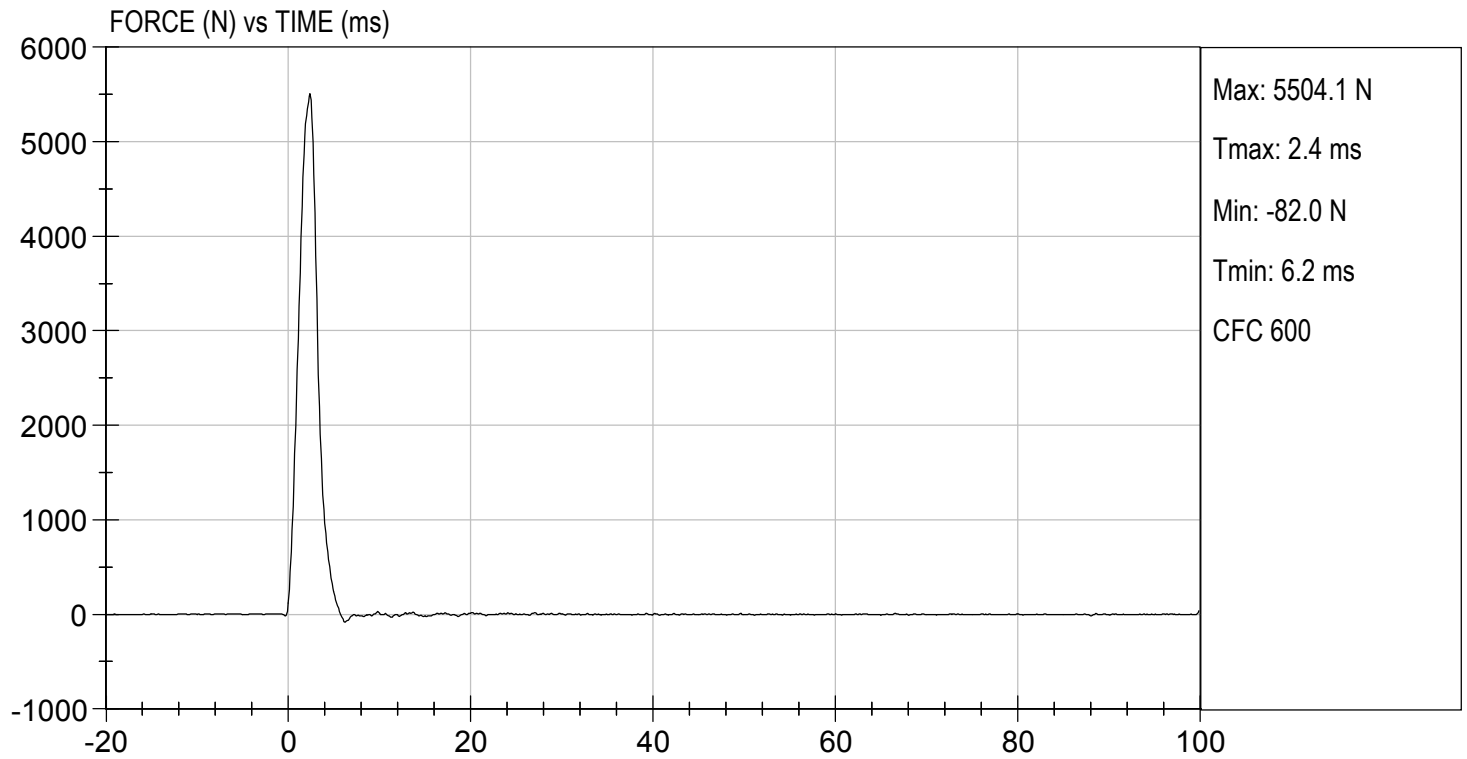
Test Date


Approved By



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

TEST DATE: 06/18/2020
TEST #: D201535



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

ATD Serial No: DH1659

Test I.D: D201536

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	N	4715 to 5782	4,718	Pass
Overall Test Results				Pass


Laboratory Technician

06/18/2020

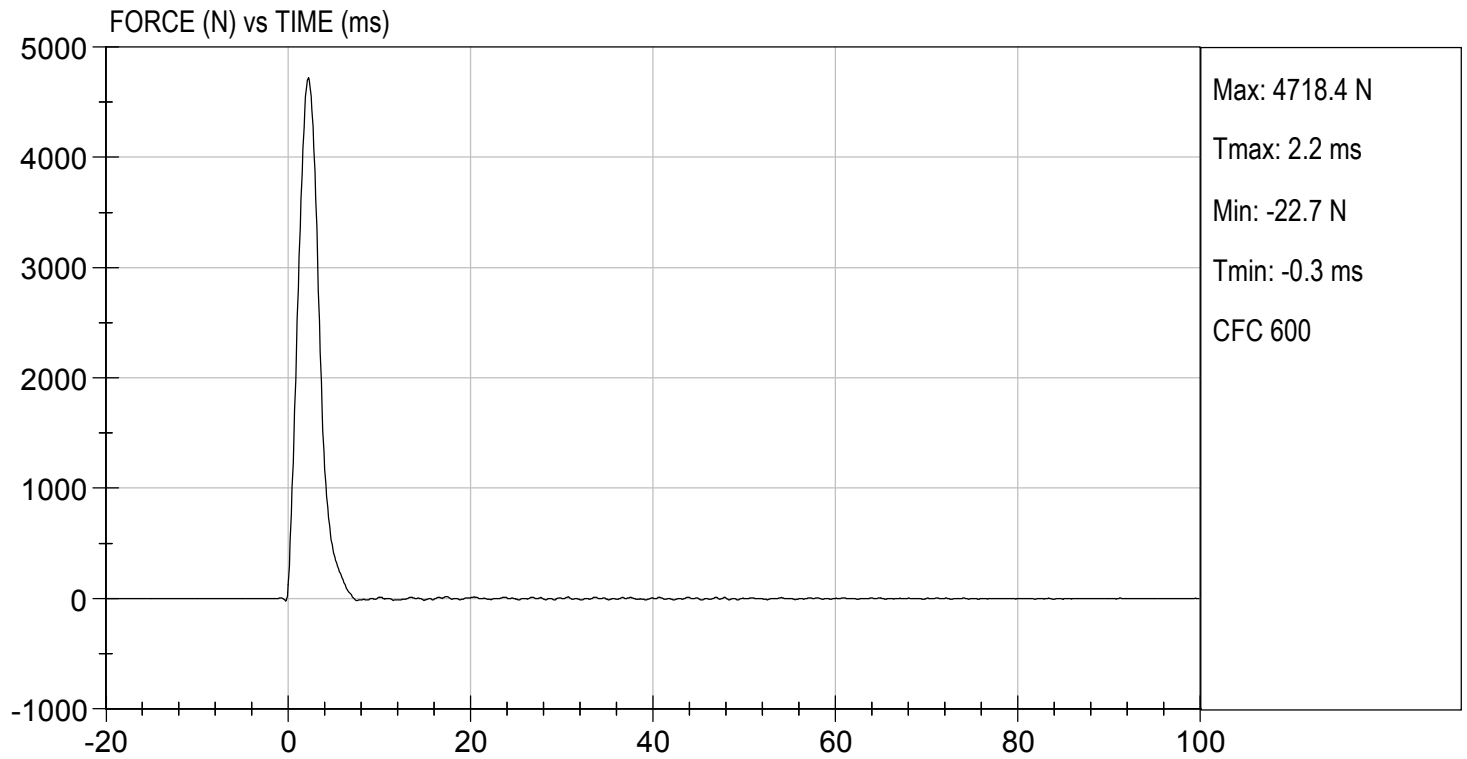
Test Date


Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.79 ft/s, 2.07 m/s

TEST DATE: 06/18/2020
TEST #: D201536



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: DH1659

Test I.D: D201537

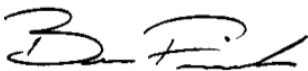
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	3	Pass
Force at 45 deg	N	320 to 390	334	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.8	Pass
Overall Result			Pass	



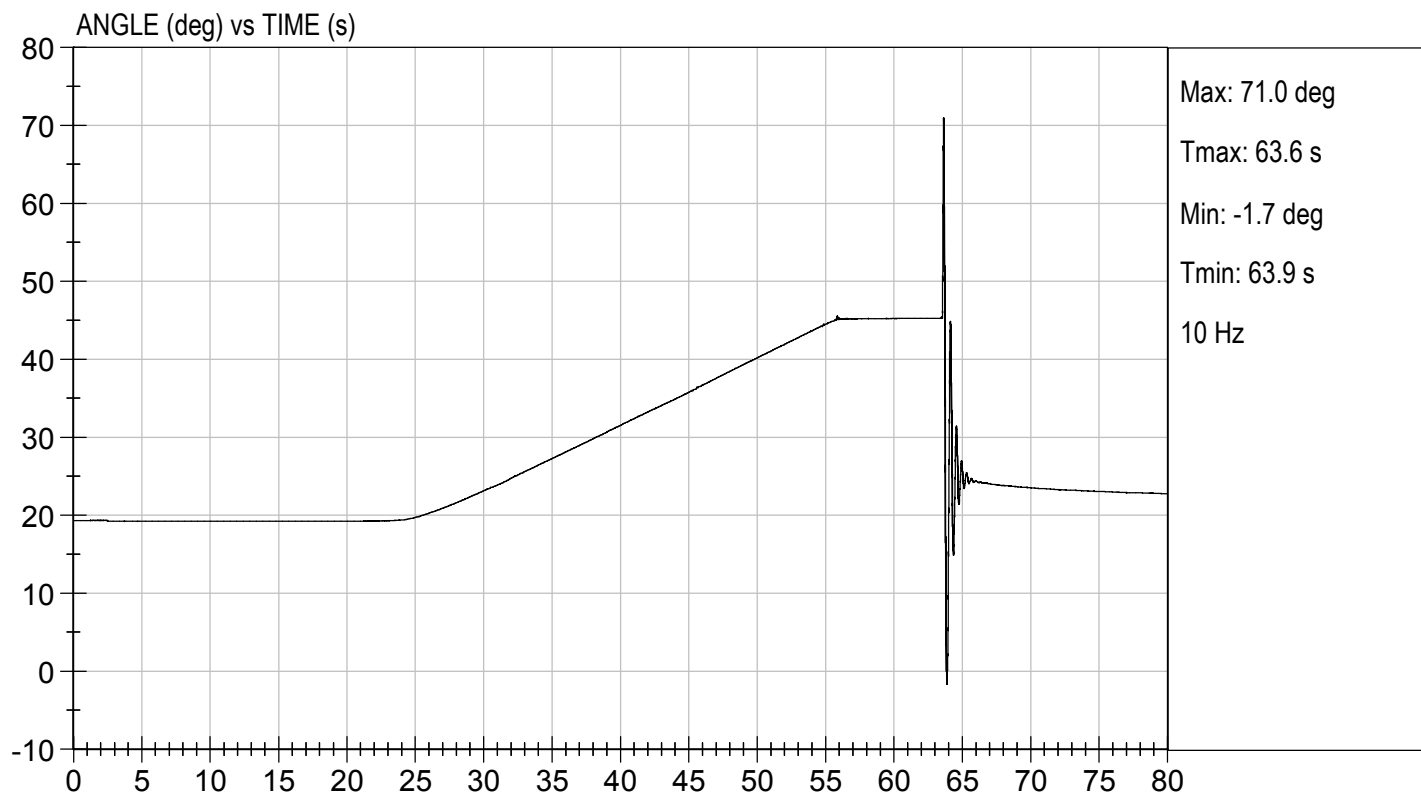
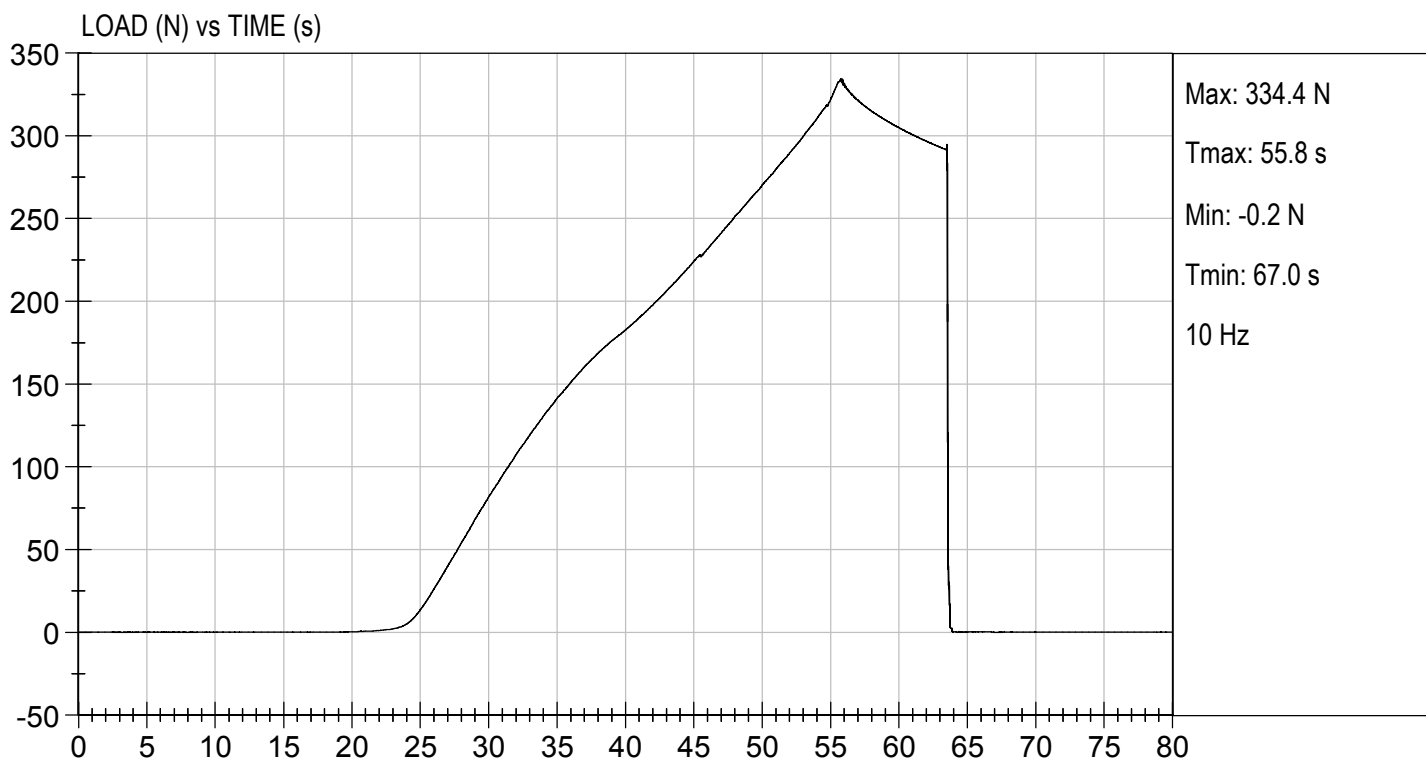
Laboratory Technician

06/17/2020

Test Date



Approved By



APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – DRIVER DUMMY INSTRUMENTATION

Instrument Location			Axis	Hybrid III 50 th S/N 351		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary		X	P79741	Endevco	03/09/2020
			Y	P79743	Endevco	03/09/2020
			Z	P79744	Endevco	03/09/2020
	Redundant		X	P94834	Endevco	03/09/2020
			Y	P94856	Endevco	03/09/2020
			Z	P97412	Endevco	03/09/2020
Head Angular Rate Sensors			X	ARS7325	DTS	07/08/2019
			Y	ARS7371	DTS	07/08/2019
			Z	ARS7391	DTS	07/08/2019
Upper Neck Load Cell			Fx, Fy, Fz Mx, My, Mz	NG1915	Denton	03/05/2020
Chest Accelerometers	Primary		X	P86792	Endevco	03/09/2020
			Y	P86793	Endevco	03/10/2020
			Z	P88348	Endevco	03/09/2020
	Redundant		X	P88666	Endevco	03/09/2020
			Y	P88667	Endevco	03/09/2020
			Z	P94109	Endevco	03/09/2020
Chest Potentiometer			X	351	Servo	03/05/2020
Pelvis Accelerometers			X	P95526	Endevco	03/09/2020
			Y	P96038	Endevco	03/09/2020
			Z	P97742	Endevco	03/09/2020
Femur Load Cells	Right	Primary	Z	FG121PFZ	Denton	03/06/2020
		Redundant	Z	FG121RFZ	Denton	03/06/2020
	Left	Primary	Z	FG122PFZ	Denton	03/06/2020
		Redundant	Z	FG122RFZ	Denton	03/06/2020
Tibia Load Cells	Right	Upper	Mx, My, Fz	TGDH3308	FTSS	03/05/2020
		Lower	Mx, My, Fz	AGDI4208	FTSS	03/05/2020
	Left	Upper	Mx, My, Fz	TGDG6744	FTSS	03/05/2020
		Lower	Mx, My, Fz	AGDI4273	FTSS	03/05/2020
Foot Accelerometers	Right	Rear	X	P82120	Endevco	03/06/2020
			Z	T22255	Endevco	03/06/2020
		Front	Z	T16447	Endevco	03/06/2020
	Left	Rear	X	T16468	Endevco	03/06/2020
			Z	T16496	Endevco	03/06/2020
		Front	Z	T16501	Endevco	03/06/2020
Seat Belt Load Cells		Lap		SBG157	FTSS	11/13/2019
		Shoulder		SBG161	FTSS	11/13/2019

TABLE 2 – FRONT PASSENGER DUMMY INSTRUMENTATION

Instrument Location			Axis	Hybrid III 5 th S/N 1659		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary		X	P82304	Endevco	02/13/2020
			Y	P88172	Endevco	02/13/2020
			Z	T16400	Endevco	02/13/2020
	Redundant		X	T16403	Endevco	02/13/2020
			Y	T16406	Endevco	02/13/2020
			Z	T16413	Endevco	02/13/2020
Head Angular Rate Sensors			X	ARS7340	DTS	07/08/2019
			Y	ARS7354	DTS	07/08/2019
			Z	ARS7357	DTS	07/08/2019
Upper Neck Load Cell		Fx, Fy, Fz Mx, My, Mz		NG2256	Denton	05/04/2020
Chest Accelerometers	Primary		X	T16415	Endevco	02/13/2020
			Y	T16416	Endevco	02/13/2020
			Z	T16420	Endevco	02/13/2020
	Redundant		X	T16423	Endevco	02/13/2020
			Y	T16426	Endevco	02/13/2020
			Z	T22499	Endevco	02/13/2020
Chest Potentiometer			X	DH1659	Servo	02/13/2020
Pelvis Accelerometers			X	T16434	Endevco	02/13/2020
			Y	T16435	Endevco	02/13/2020
			Z	T16436	Endevco	02/13/2020
Femur Load Cells	Right	Primary	Z	FG126PFZ	Denton	02/13/2020
		Redundant	Z	FG126RFZ	Denton	02/13/2020
	Left	Primary	Z	FG127PFZ	Denton	02/13/2020
		Redundant	Z	FG127RFZ	Denton	02/13/2020
Tibia Load Cells	Right	Upper	Mx, My, Fz	TG467	Denton	05/04/2020
		Lower	Mx, My, Fz	AG491	Denton	05/04/2020
	Left	Upper	Mx, My, Fz	TG478	Denton	05/04/2020
		Lower	Mx, My, Fz	AG500	Denton	05/04/2020
Foot Accelerometers	Right	Rear	X	T16437	Endevco	02/13/2020
			Z	T16438	Endevco	02/13/2020
		Front	Z	T22258	Endevco	02/13/2020
	Left	Rear	X	T16441	Endevco	02/13/2020
			Z	T16444	Endevco	02/13/2020
		Front	Z	T16445	Endevco	02/13/2020
Seat Belt Load Cells		Lap		SBG272	FTSS	11/13/2019
		Shoulder		SBG273	FTSS	11/13/2019

TABLE 3 – VEHICLE INSTRUMENTATION

Instrument Location			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember / Rear Seat Accelerometers	Left	Primary	X	T22870	Endevco	03/13/2020
			Z	T22763	Endevco	03/13/2020
		Redundant	X	T22738	Endevco	03/13/2020
	Right	Primary	X	T22615	Endevco	03/06/2020
			Z	T22667	Endevco	02/20/2020
		Redundant	X	T22853	Endevco	03/06/2020
Engine Accelerometers		Top	X	T22872	Endevco	03/19/2020
		Bottom	X	T22784	Endevco	03/20/2020