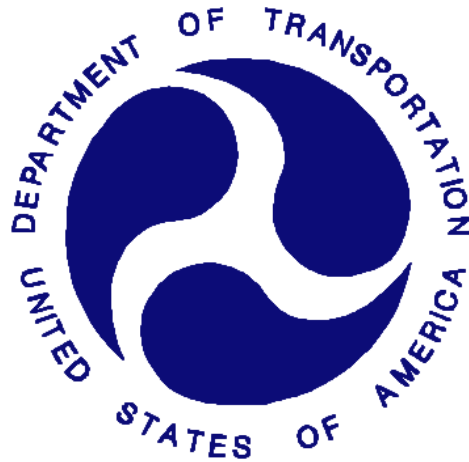


REPORT NUMBER: NCAP-MGA-2018-001

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

**HONDA MFG. OF ALABAMA, LLC
2018 Honda Odyssey EX Minivan
NHTSA No.: O20185300**

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



Test Date: August 8, 2017

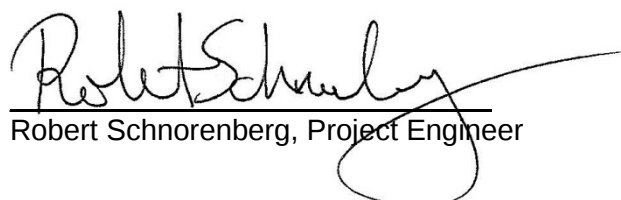
Final Report Date: September 15, 2017

FINAL REPORT

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

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Prepared by: 
Ben Fischer, Project Engineer

Approved by: 
Robert Schnorenberg, Project Engineer

Approval Date: September 15, 2017

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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15. Supplementary Notes																																																							
16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2018 Honda Odyssey EX Minivan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on August 8, 2017. The impact velocity of the vehicle was 56.39 km/h and the ambient temperature at the barrier face at the time of impact was 22.0°C. The target vehicle post-test maximum crush was 552mm located to the left of the vehicle centerline. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; 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>N/A</td> <td>700</td> <td>176</td> <td>700</td> <td>247</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td>26</td> <td>52</td> <td>17</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.27</td> <td>1</td> <td>0.32</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>820</td> <td>2620</td> <td>451</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>79</td> <td>2520</td> <td>279</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>421</td> <td>6805</td> <td>1443</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>364</td> <td>6805</td> <td>1344</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	176	700	247	Maximum Chest	mm	63	26	52	17	Nij	N/A	1	0.27	1	0.32	Neck Tension	N	4170	820	2620	451	Neck Compression	N	4000	79	2520	279	Left Femur Force	N	10008	421	6805	1443	Right Femur Force	N	10008	364	6805	1344
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SECTION 1 PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-12-D-00258. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

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

SUMMARY

A load cell barrier consisting of 176 load cells was impacted by a 2018 Honda Odyssey EX Minivan at a velocity of 56.39 km/h. The test was performed at MGA Research Corporation on August 8, 2017. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

One Part 572E 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 Frontal NCAP Laboratory Test Procedure.

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

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

The 630 channels of data were recorded on a data acquisition system. Appendix B contains the dummy response data traces.

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

The maximum static crush of the vehicle was 552mm to the left of the vehicle centerline and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee bolster trim and 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 (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th)	176	0.27	820	79	46	26	421	364
Passenger (5 th)	247	0.32	451	279	41	17	1443	1344

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

TEST NOTES

Driver Shoulder and Lap Belt load cells were not installed.
 Passenger Shoulder and Lap Belt load cells were not installed.
 Barrier K-16 My recorded no valid data.
 Barrier K-09 Fx recorded questionable data.
 Barrier K-09 My recorded questionable data.
 Barrier K-09 Mz recorded questionable data.
 Barrier F-01 Fx recorded no valid data.
 Barrier F-01 My recorded no valid data.
 Barrier F-01 Mz recorded no valid data.
 Barrier C-04 Fx recorded no valid data.
 Barrier C-04 My recorded no valid data.
 Barrier C-04 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: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20185300	Traction Control System (TCS)	Yes
Model Year	2018	Power Steering	Yes
Make	Honda	Power Window Auto-Reverse	Yes
Model	Odyssey EX	Driver Frontal Airbag	Yes
Body Style	Minivan	Driver Curtain Airbag	Yes
VIN	5FNRL6H50JB017045	Driver Head/Torso Airbag	No
Body Color	Forrest Mist Metallic	Driver Torso Airbag	No
Odometer (km/mi)	164km / 102mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	3.5 L	Driver Pelvis Airbag	No
Type/No. Cylinders	V6	Driver Knee Airbag	Yes
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	9	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	FWD	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?

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	HONDA MFG. OF ALABAMA, LLC	GVWR (kg)	2730
Date of Manufacture	06/17	GAWR Front (kg)	1310
		GAWR Rear (kg)	1465

VEHICLE SEATING AND WEIGHT CAPACITY DATA

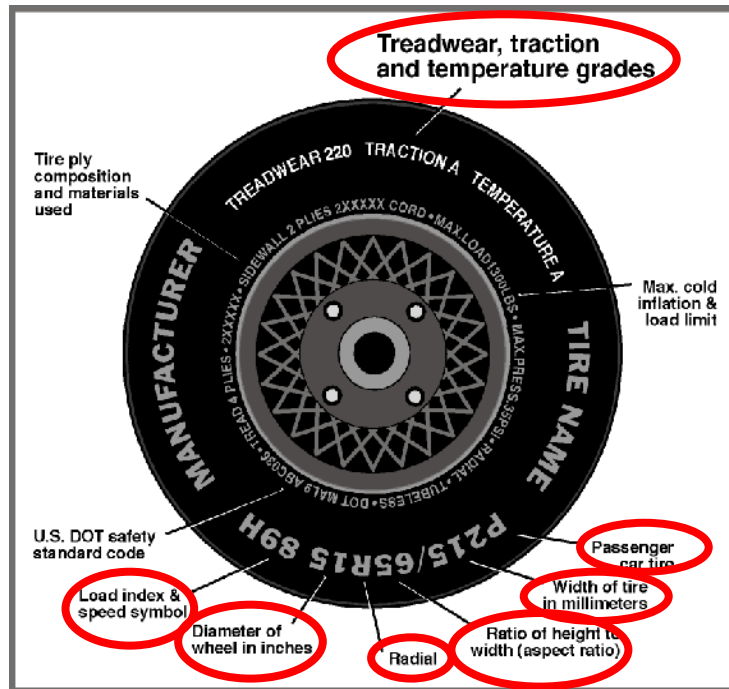
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contoured	Contoured	
Designated Seating Capacity (DSC)	2	3	3	8
Capacity Weight (VCW) (kg)				608
Cargo Weight (RCLW) (kg)				64

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	235/60R18	235/60R18
Tire Size on Vehicle	235/60R18	235/60R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Turanza	Turanza
Treadwear	480	480
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 1 Polyester, 1 Nylon	2 Steel, 1 Polyester, 1 Nylon
Load Index/Speed Symbol	103H	103H
Tire Material	Rubber	Rubber
DOT Safety Code Left	7X45 JB2 2217	7X45 JB2 2217
DOT Safety Code Right	7X45 JB2 2217	7X45 JB2 2217

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	553.5	454.0		593.0	520.0	
Right	kg	550.5	451.0		572.5	521.5	
Ratio	%	55.0%	45.0%		52.8%	47.2%	
Totals	kg	1104.0	905.0	2009.0	1165.5	1041.5	2207.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2009.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	64
Calculated Test Vehicle Target Weight (TVTW)	kg	2214

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	223	226	232	235	1351
As Tested	mm	771	778	755	763	1416
Post Test	mm	856	856	765	771	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3000
Total Vehicle Length at Left Side	mm	4985
Total Vehicle Length at Centerline	mm	5164
Total Vehicle Length at Right Side	mm	4985
Weight of Ballast in Cargo Area	kg	5
Weight of Vehicle Components Removed	kg	15
Amount of Stoddard Solvent in Fuel Tank	L	68.5

List of components removed to meet test weight: None.

List of components removed for instrumentation, data box, and equipment installation: Cargo area carpet and trim, taillights, jack/tool kit, spare tire.

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	5164
2	Total Width	1966
3	Bumper Top Height	583
4	Bumper Bottom Height	465
5	Longitudinal Member Top Height	584
6	Distance between Longitudinal Members	934
7	Longitudinal Member Width	80
8	Engine Top Height	882
9	Engine Bottom Height	168
10	Engine and Gearbox Width	830
11	Front Bumper-Engine Distance	348
12	Front Shock Absorber Fixing Height	1024
13	Bonnet Leading Edge Height	846
14	Front Shock Absorber Fixing Width	1310
15	Front Bumper – Front Axle Distance	951
16	Front Axle – A-Pillar Distance	484
17	A-Pillar – B-Pillar Distance	1075
18	B-Pillar – Rear Axle Distance	1507
19	B-Pillar – C-Pillar Distance	953
20	Roof Sill Bottom Height	1472
21	Roof Sill Top Height	1630
22	Floor Sill Bottom Height	222
23	Floor Sill Top Height	400

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

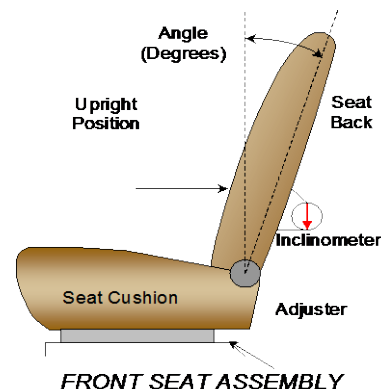
Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

NOMINAL DESIGN RIDING POSITION

The driver seat back is positioned as close as possible to the manufacturer's design angle. For the passenger seat back, seat back is adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated October 2015.

	Degrees
Driver Seat Back Angle	4.0° on headrest post guide
Passenger Seat Back Angle	-1.5° on headrest post guide



SEAT FORE/AFT POSITIONS

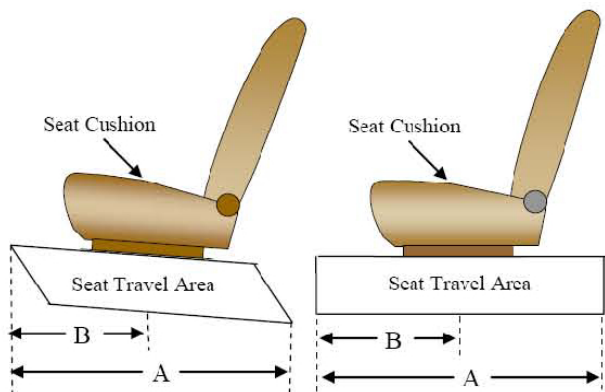
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated October 2015.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	266 mm	133 mm
Passenger Seat	198 mm	0 mm

SEAT BELT UPPER ANCHORAGES

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

	Total # of Positions	Placed in Position #
Driver Seat	4 (1 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: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

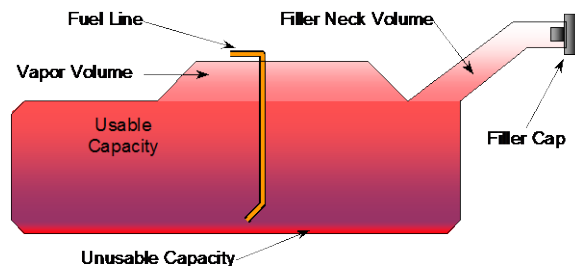
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	73.8
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	68.1 to 69.3
Actual Amount of Solvent used	68.5
1/3 of Usable Capacity	24.6

FUEL PUMP

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

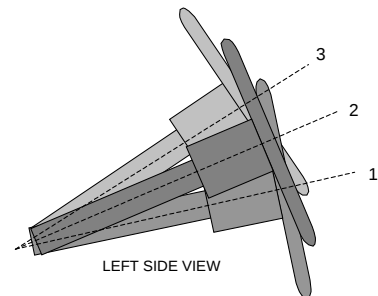
The vehicle is equipped with an electronic fuel pump. Ignition Stage 2 will activate the fuel pump to prime the system. The filler neck is located on the driver's side.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

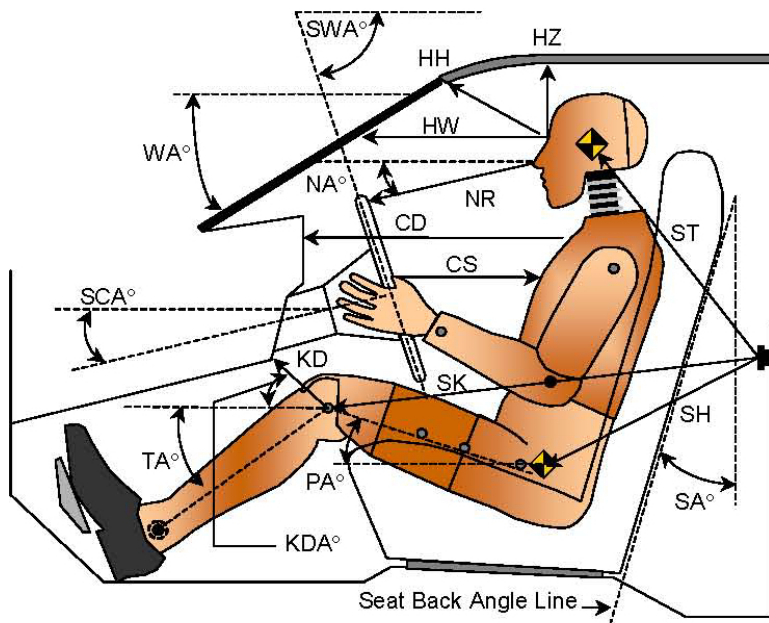
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	67.0	198
Geometric Center Position 2	64.7	218
Uppermost Position 3	62.3	238
Telescoping Steering Wheel Travel		40
Test Position	64.7	218

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017



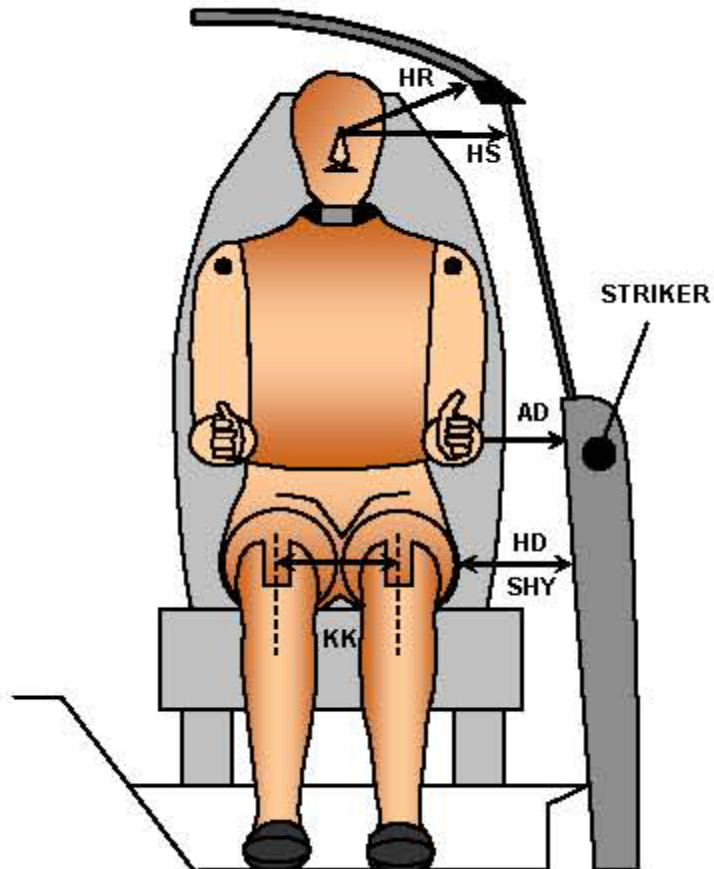
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		21.6		
SWA°	Steering Wheel Angle		64.7		
SCA°	Steering Column Angle		25.3		
SA°	Seat Back Angle		4.0		-1.5
HZ	Head to Roof (Z)	230	90	224	90
HH	Head to Header	384	33.4	335	35.2
HW	Head to Windshield	800	0	767	0
NR	Nose to Rim	405	4.2		
CD	Chest to Dash	576		381	
CS	Chest to Steering Hub	333	5.2		
RA	Rim to Abdomen	193	0		
KDL	Left Knee to Dash	168	42.6	112	37.9
KDR	Right Knee to Dash	152	42.9	118	38.0
PA°	Pelvic Angle		24.6		20.3
TA°	Tibia Angle		53.2		63.2
SK	Striker to Knee	620	94.1	699	92.2
ST	Striker to Head	494	16.4	495	26.2
SH	Striker to H-Point	306	123.6	373	105.5

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017



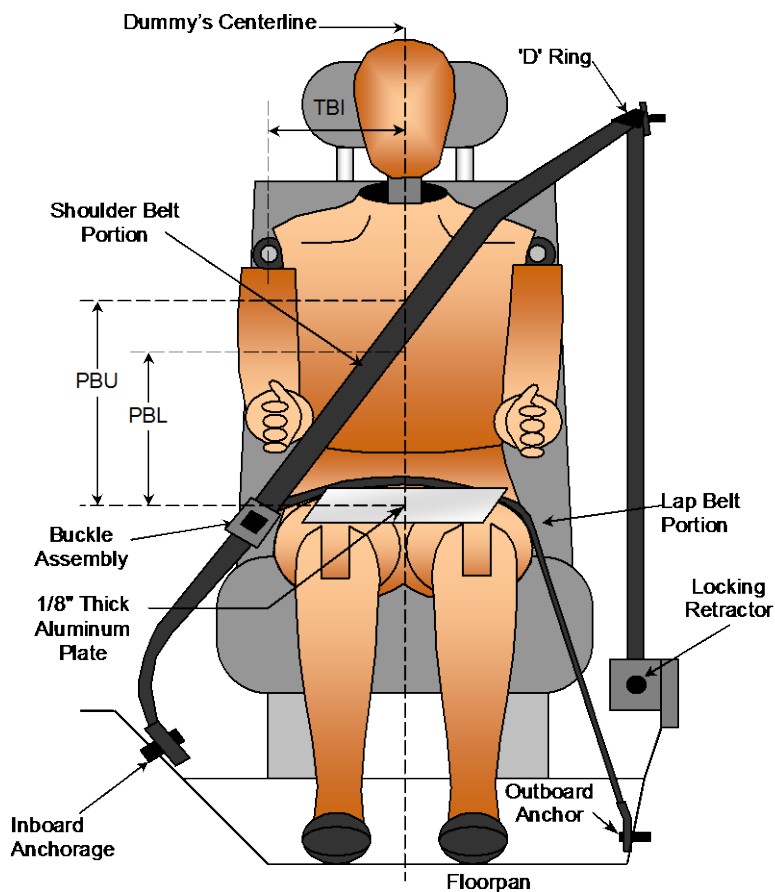
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	50	91
HD	H-Point to Door	158	181
HR	Head to Side Header	284	295
HS	Head to Side Window	383	402
KK	Knee to Knee	327	227
SHY	Striker to H-Point (Y Direction)	297	352
AA	Ankle to Ankle	286	165

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	365	320
PBL - Top surface of reference to belt lower edge	mm	280	230

BELT LENGTH DATA

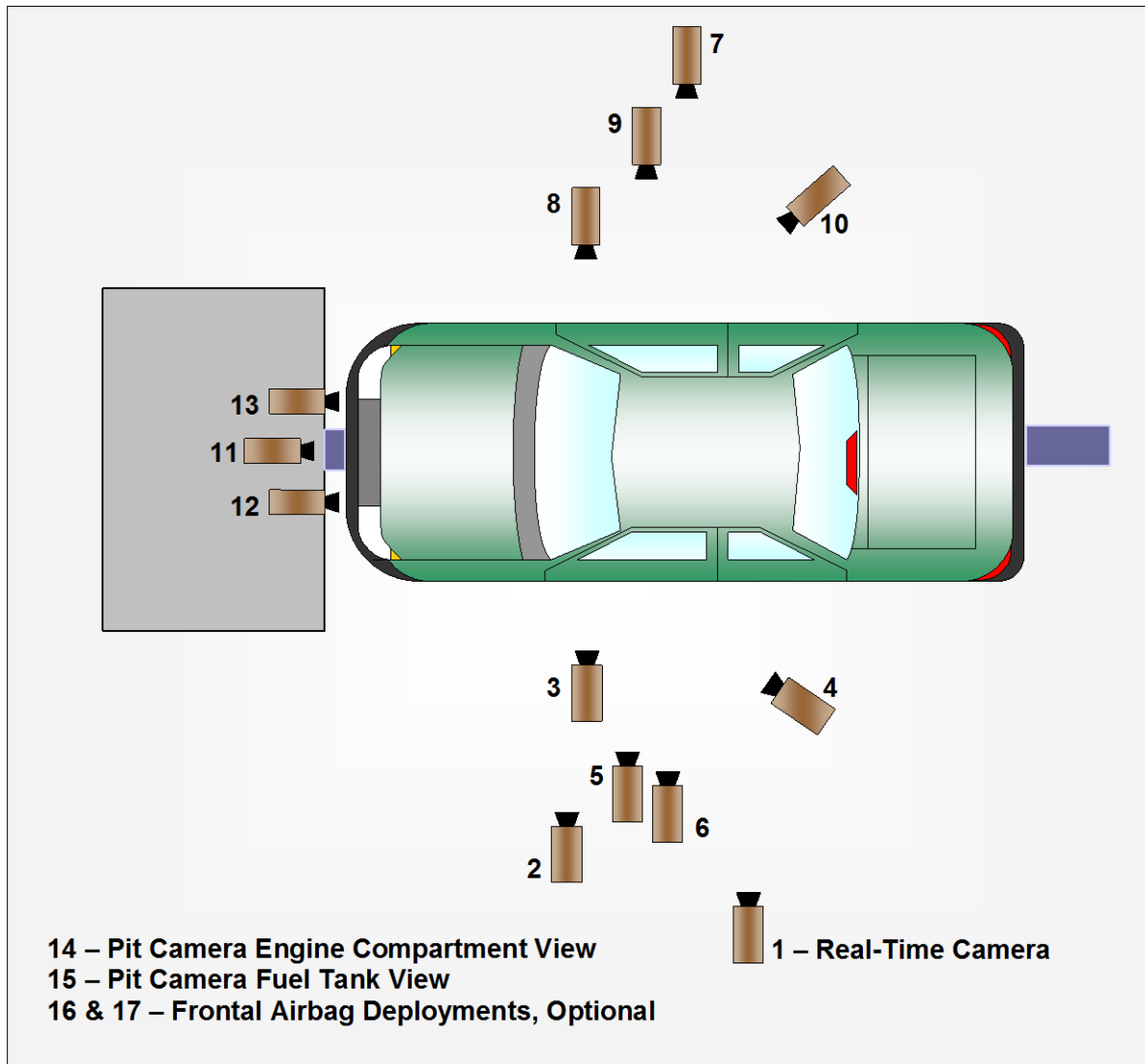
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	905	940
Lap Belt Length as measured on ATD	mm	800	875
Remainder of belt on reel	mm	865	755
Total Belt Length for Continuous Webbing Systems	mm	3170	3170

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	-1630	-6030	-2040	50	1000
3	Left Front Half	-1260	-5330	-1530	25	1000
4	Left Angle	-5560	-5770	-2120	75	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	-2230	6660	-1450	16	1000
8	Passenger Close-Up	-1480	6110	-2100	50	1000
9	Right Front Half	-1170	5570	-1540	25	1000
10	Right Angle	-5440	5880	-2110	75	1000
11	Windshield	210	0	-2310	11	1000
12	Driver Windshield	270	-370	-2230	25	1000
13	Passenger Windshield	270	370	-2230	25	1000
14	Pit Front	-810	0	3340	24	1000
15	Pit Rear	-3180	0	3340	24	1000
16	Onboard Driver Side				12	1000
17	Onboard Passenger Side				12	1000
18	Real-Time Pan View					30

***COORDINATES:**

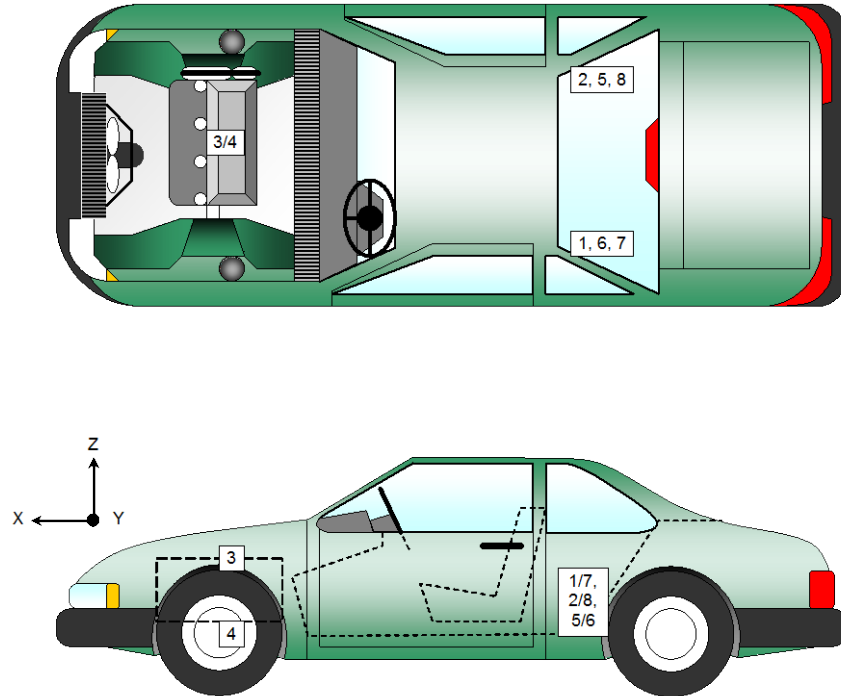
+X = forward of impact plane
 +Y = right of monorail centerline
 +Z = below ground level

Cameras 5 & 6 were not used for this test.

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	2336	-420	-396
2	Right Rear Crossmember Accelerometer – X Direction	2336	420	-391
3	Engine Top X	4427	0	-848
4	Engine Bottom X	4330	0	-250
5	Left Rear Crossmember Accelerometer – Z Direction	2336	-420	-396
6	Right Rear Crossmember Accelerometer – Z Direction	2336	420	-391
7	Left Rear Crossmember Accelerometer Redundant – X Direction	2367	-378	-396
8	Right Rear Crossmember Accelerometer Redundant – X Direction	2367	376	-391

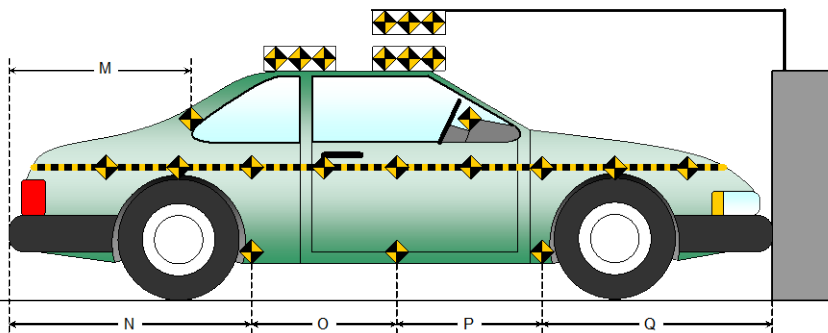
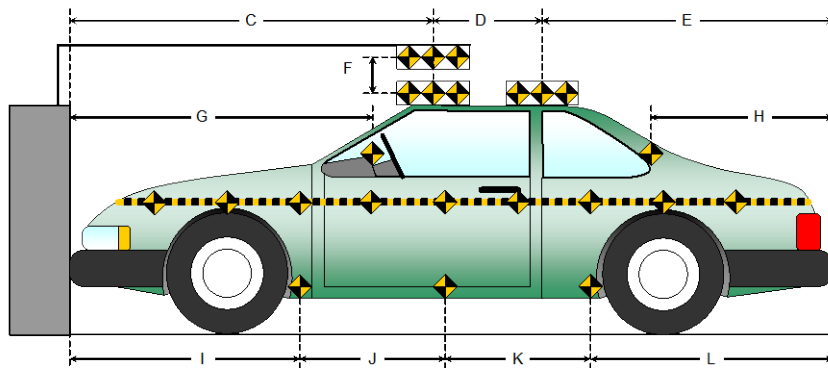
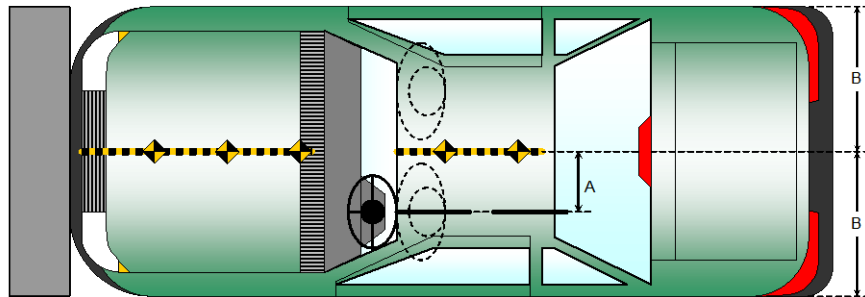
Reference Points: X - Rear Surface of Vehicle (+ forward)
Y - Vehicle Centerline(+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

Item	Value (mm)
A	428
B	983
C	2285
D	613
E	2266
F	115
G	
H	1484
I	1423
J	1014
K	1014
L	1713
M	1484
N	1713
O	1014
P	1014
Q	1423



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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

Advanced Research Load Cell Barrier

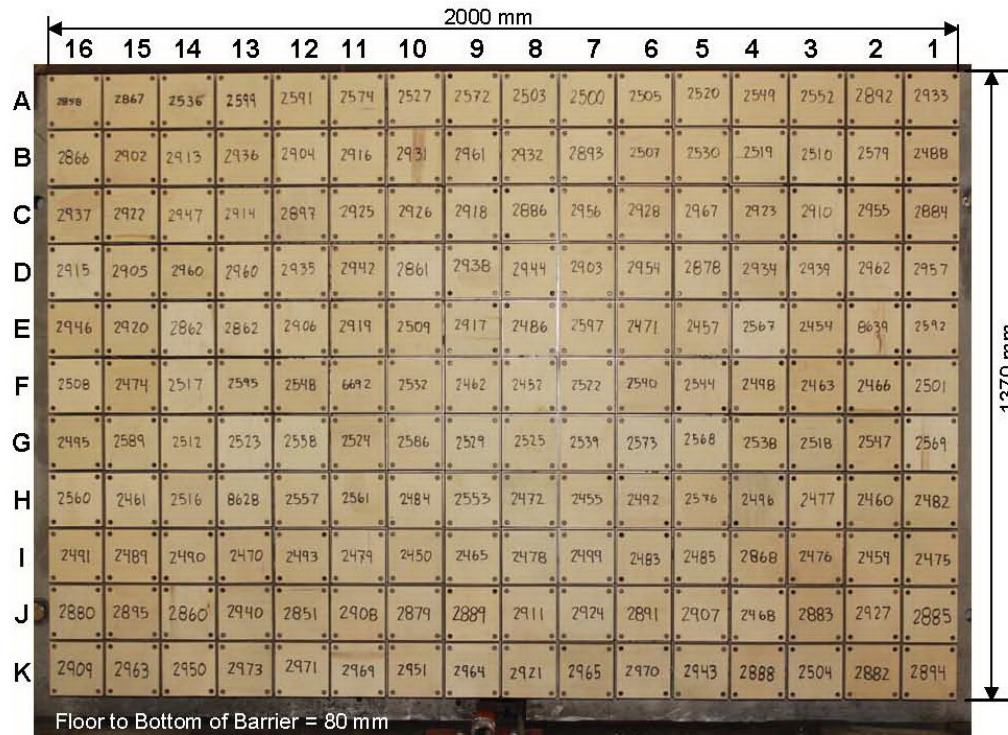


Photo for Reference Only

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: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017

INSTRUMENTATION

Driver Dummy Data Channels	47
Passenger Dummy Data Channels	47
Vehicle Structure Accelerometers	8
Barrier Channels	528
Total	630

CAMERA COVERAGE

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

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIIL 50% / 351	HIIL 5% / 634
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster Trim and Knee Airbag	Knee Airbag
Right Knee Contact	Knee Bolster Trim and Knee Airbag	Knee Airbag

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	682
Center	mm	642
Right Side	mm	664
Average	mm	663

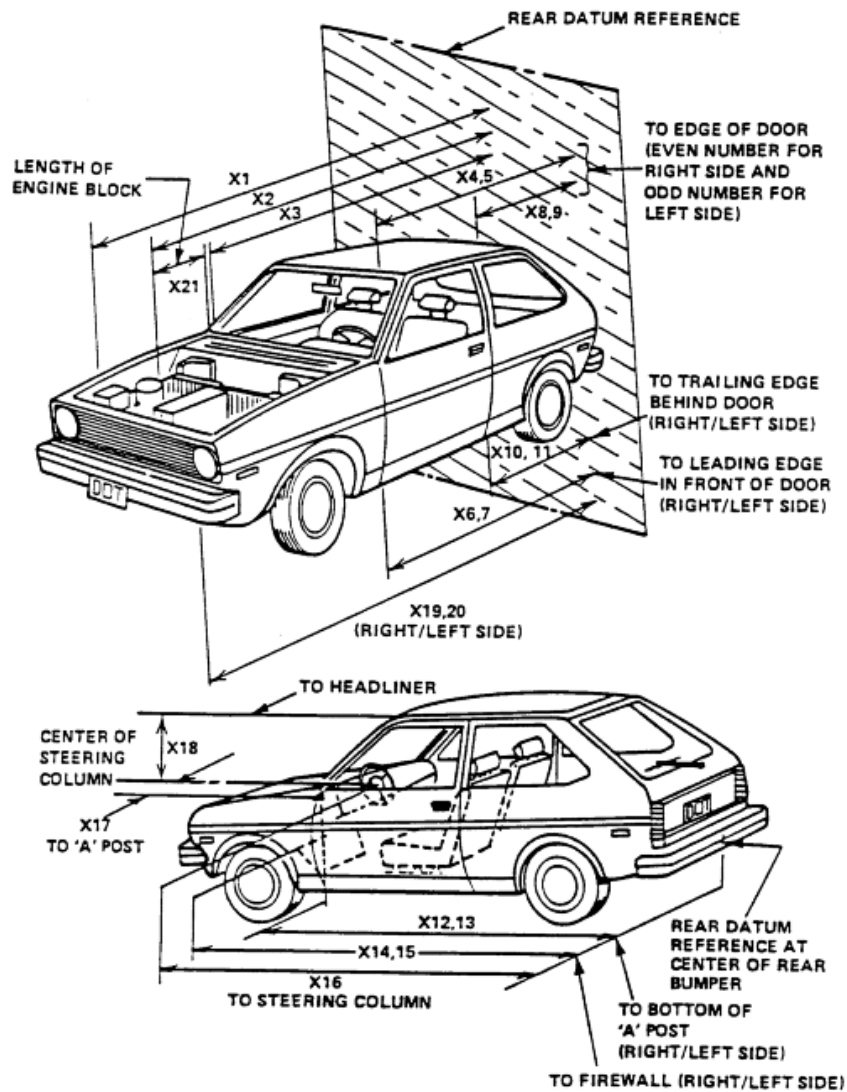
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	Yes	Yes	Yes
Torso/Pelvis Side Airbag	Yes	Yes	Yes	Yes
Knee Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	

DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	5164	4626	538
2	RSOV to Front of Engine	mm	4634	4284	350
3	RSOV to Firewall	mm	4200	4208	-8
4	RSOV to Upper Leading Edge of Right Door	mm	3728	3735	-7
5	RSOV to Upper Leading Edge of Left Door	mm	3728	3725	3
6	RSOV to Lower Leading Edge of Right Door	mm	3668	3669	-1
7	RSOV to Lower Leading Edge of Left Door	mm	3668	3692	-24
8	RSOV to Upper Trailing Edge of Right Door	mm	2624	2623	1
9	RSOV to Upper Trailing Edge of Left Door	mm	2624	2613	11
10	RSOV to Lower Trailing Edge of Right Door	mm	2638	2646	-8
11	RSOV to Lower Trailing Edge of Left Door	mm	2638	2634	4
12	RSOV to Bottom of "A" Post of Right Side	mm	3684	3688	-4
13	RSOV to Bottom of "A" Post of Left Side	mm	3679	3704	-25
14	RSOV to Firewall, Right Side	mm	4133	4137	-4
15	RSOV to Firewall, Left Side	mm	4130	4118	12
16	RSOV to Steering Column	mm	3283	3298	-15
17	Center of Steering Column to "A" Post	mm	424	388	36
18	Center of Steering Column to Headliner	mm	439	424	15
19	RSOV to Right Side of Front Bumper	mm	4985	4615	370
20	RSOV to Left Side of Front Bumper	mm	4985	4664	321
21	Length of Engine Block	mm	498	498	0
RD	RSOV to Right Side of Dash Panel	mm	3550	3553	-3
CD	RSOV to Center of Dash Panel	mm	3668	3661	7
LD	RSOV to Left Side of Dash Panel	mm	3674	3640	34

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017

VEHICLE INFORMATION

VIN: 5FNRL6H50JB017045

Wheelbase (mm): 3000

Vehicle Size Category: MPV

Test Weight (kg): 2207.0

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15

Cal. Procedure/Interval: MGA procedure / 6 month

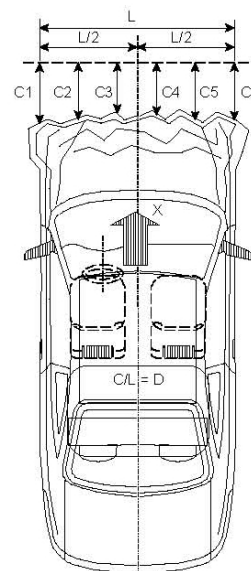
Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.39

Velocity Change (km/h): 65.2

Time of Separation (msec): 88



CRUSH PROFILE

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1496

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4985	4664	321
C2	Crush zone 2 at left side	mm	5104	4552	552
C3	Crush zone 3 at left side	mm	5135	4595	540
C4	Crush zone 4 at right side	mm	5135	4604	531
C5	Crush zone 5 at right side	mm	5104	4563	541
C6	Crush zone 6 at right side	mm	4985	4615	370
L	C1 TO C6	mm	1496	1423	73

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

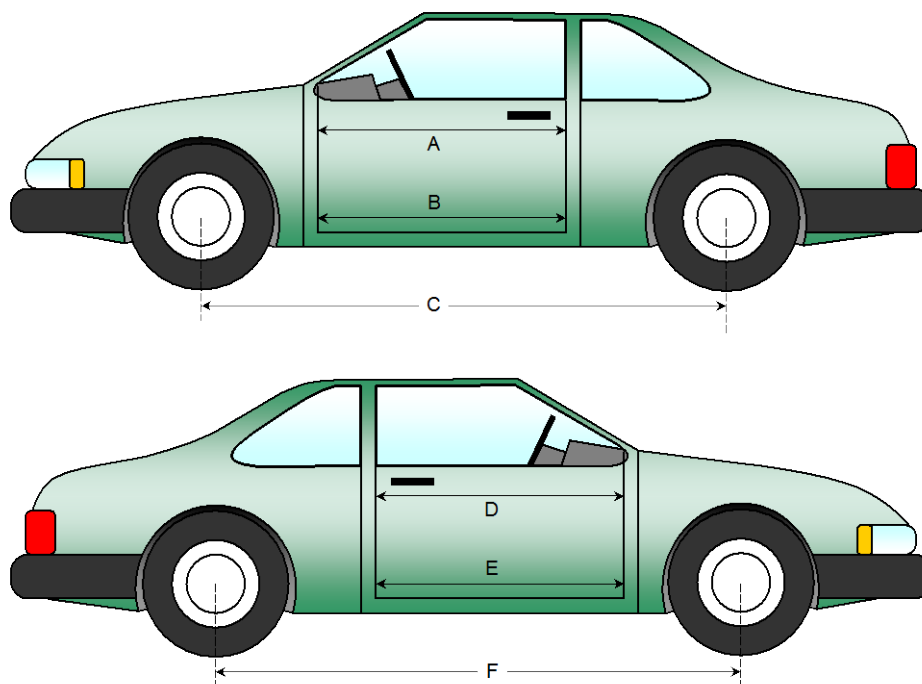
NHTSA No.: O20185300
 Test Date: 8/8/2017

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	968	968	0
B	Left Side Lower	mm	907	907	0
D	Right Side Upper	mm	968	968	0
E	Right Side Lower	mm	907	907	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3000	2888	112
F	Right Side Wheelbase	mm	3000	2892	108



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

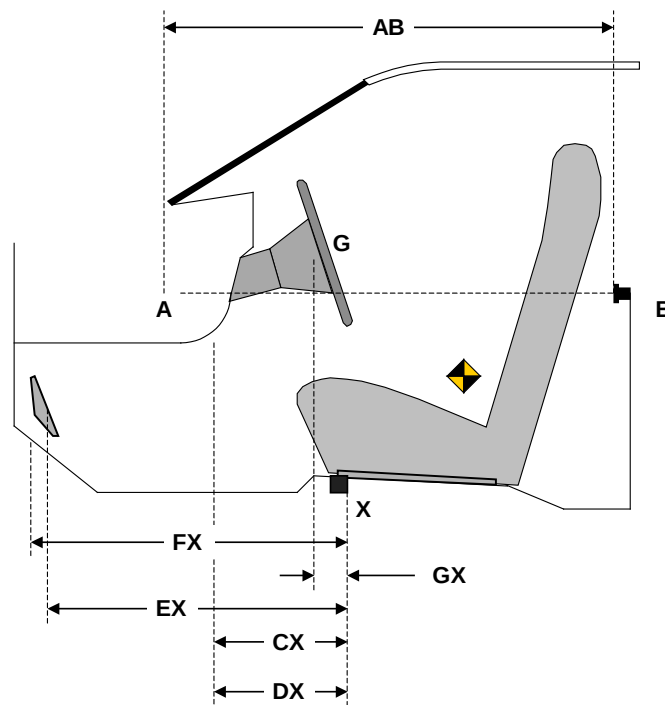
Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	798	798	0
CX	Left Knee Bolster to X	mm	234	225	9
DX	Right Knee Bolster to X	mm	210	193	17
EX	Brake Pedal to X	mm	568	497	71
FX	Foot Rest to X	mm	539	529	10
GX	Center of Steering Column Wheel Hub to X	mm	74	92	-18

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

Windshield Mounting Details:

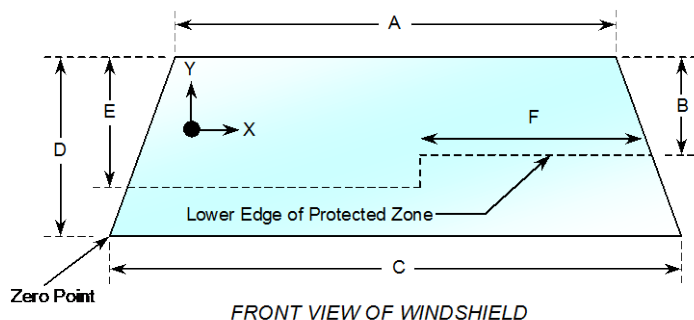
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 22.0° C.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2472	2472	100.0
Right Side	2464	2464	100.0
Total	4936	4936	100.0



Item	Units	Value
A	mm	1400
B	mm	582
C	mm	1652
D	mm	942
E	mm	572
F	mm	558

AREA OF PROTECTED ZONE FAILURES - NONE

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

X	Y

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

X	Y

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
Test Date: 8/8/2017

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 22.0°C

Test Time: 11:04 a.m.

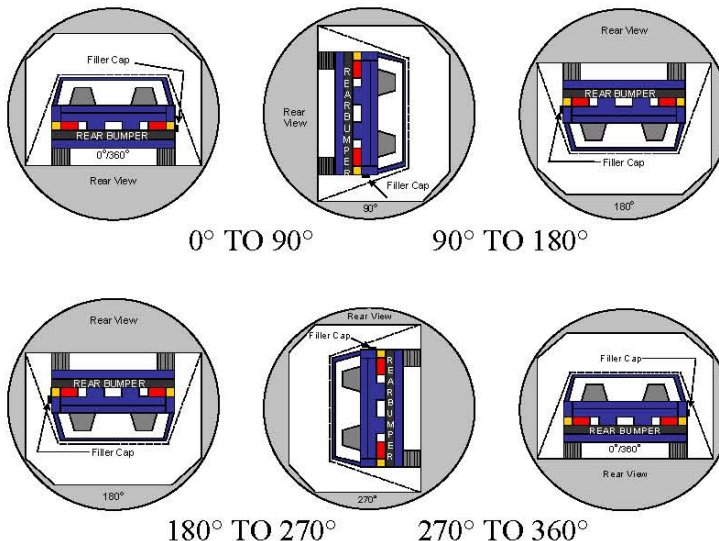
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017

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°	91	300	391
90° to 180°	90	300	390
180° to 270°	82	300	388
270° to 360°	87	300	387

FMVSS 301 SPILLAGE TABLE (units in ounces)

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

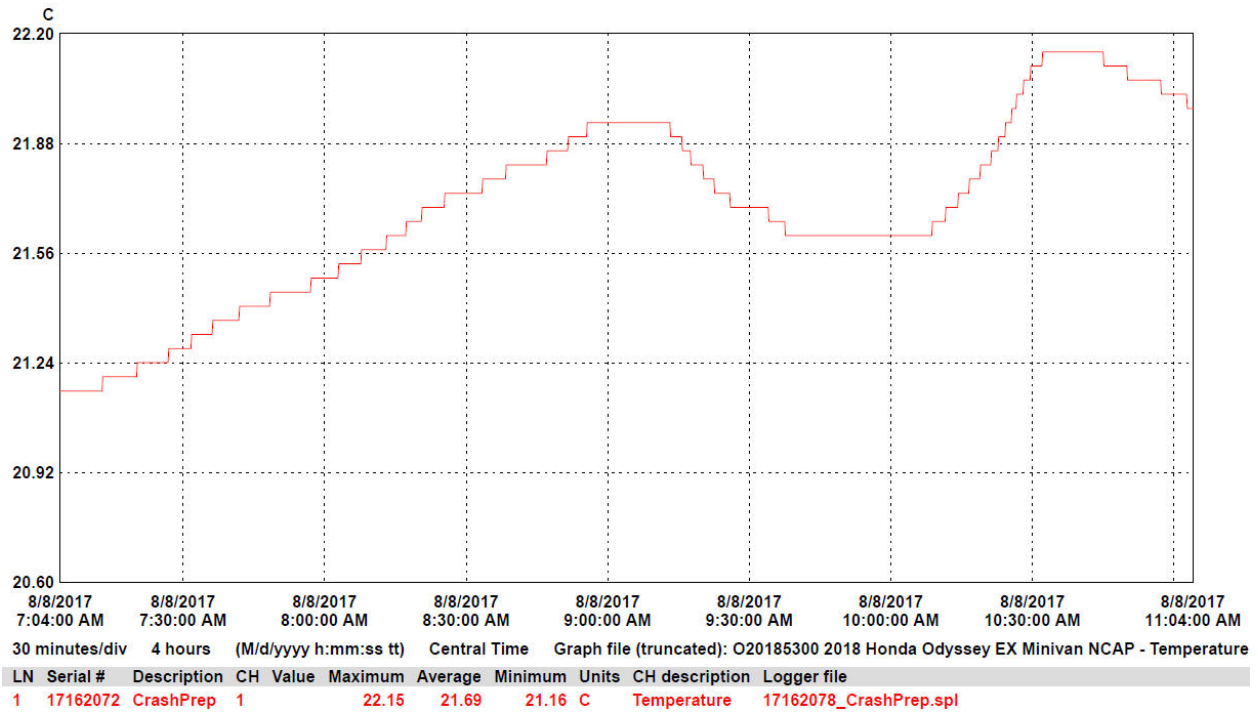
SOLVENT SPILLAGE LOCATION TABLE

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

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

Test Vehicle: 2018 Honda Odyssey EX Minivan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20185300
 Test Date: 8/8/2017



**APPENDIX A
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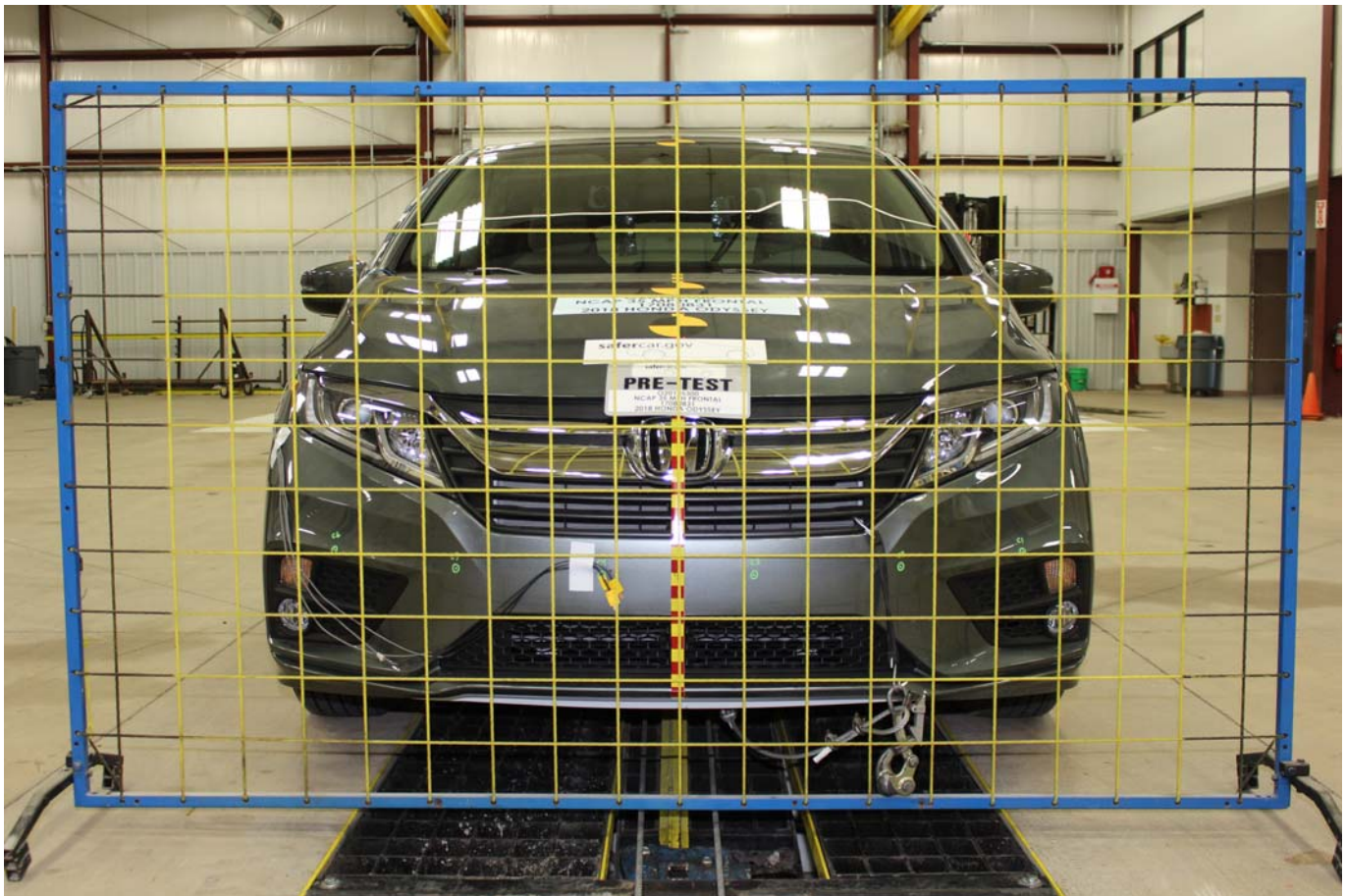


Photo No. 001 - Load Cell Location

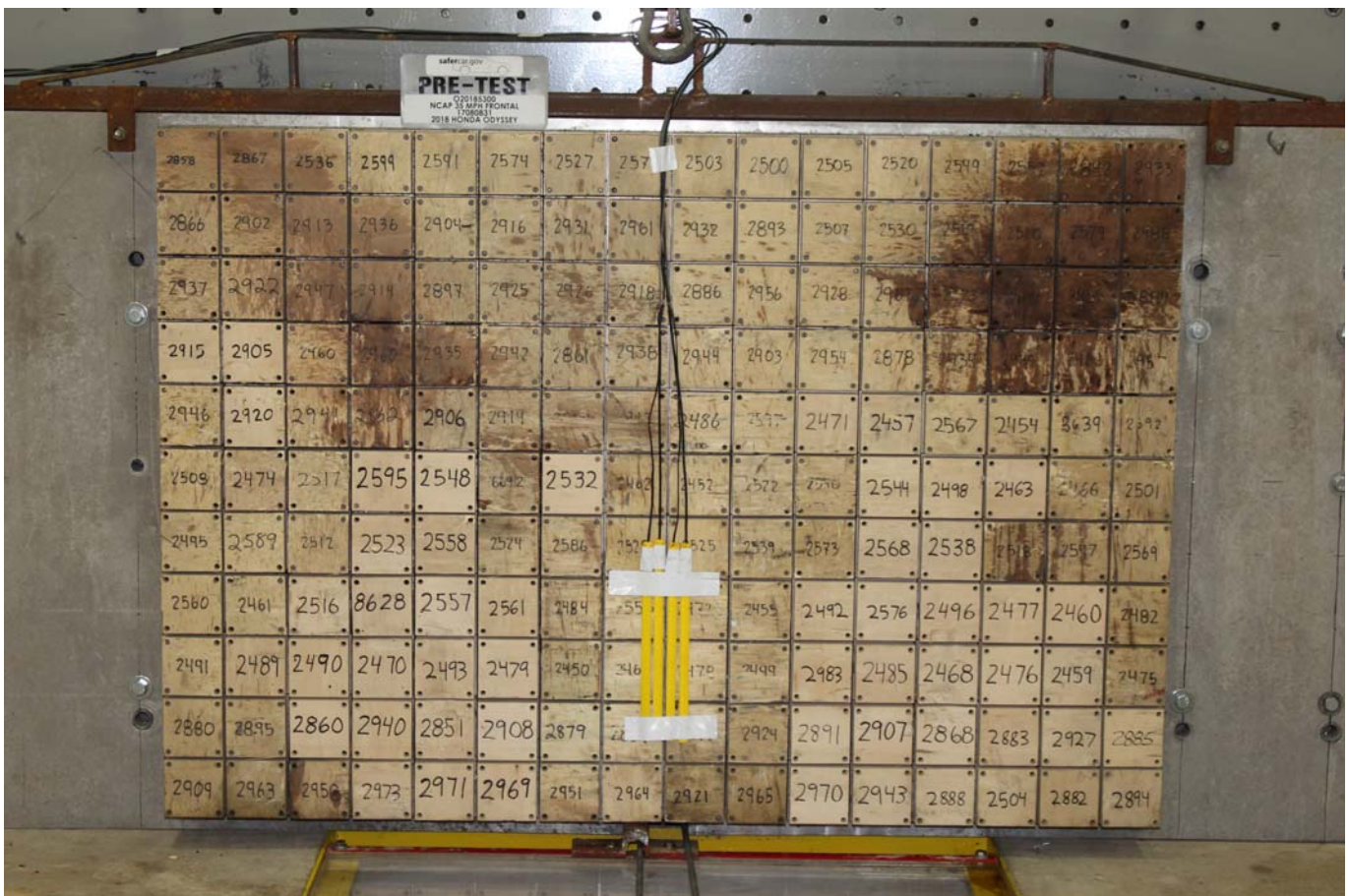


Photo No. 002 - Pre-Test Load Cell Wall

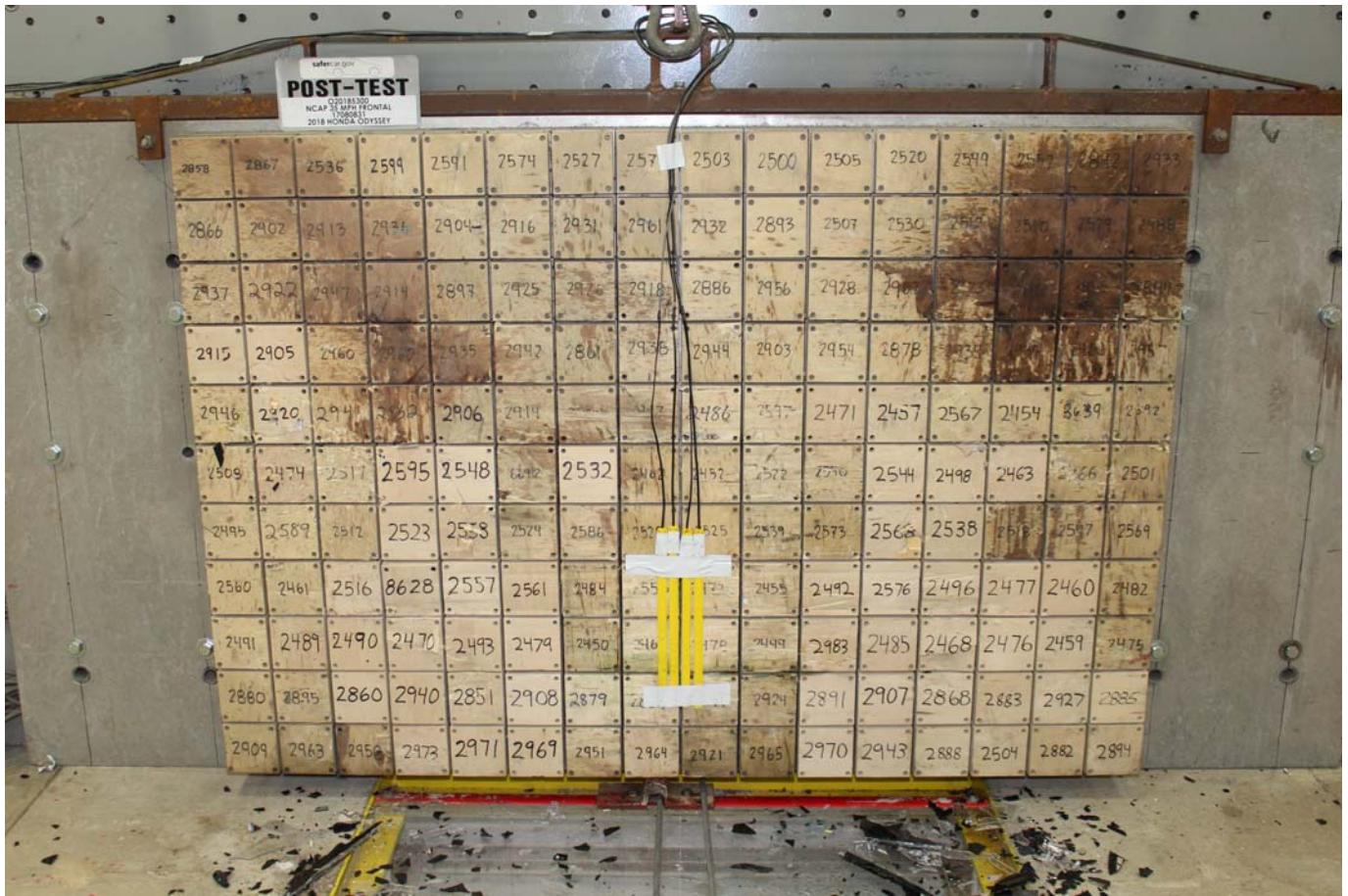


Photo No. 003 - Post-Test Load Cell Wall

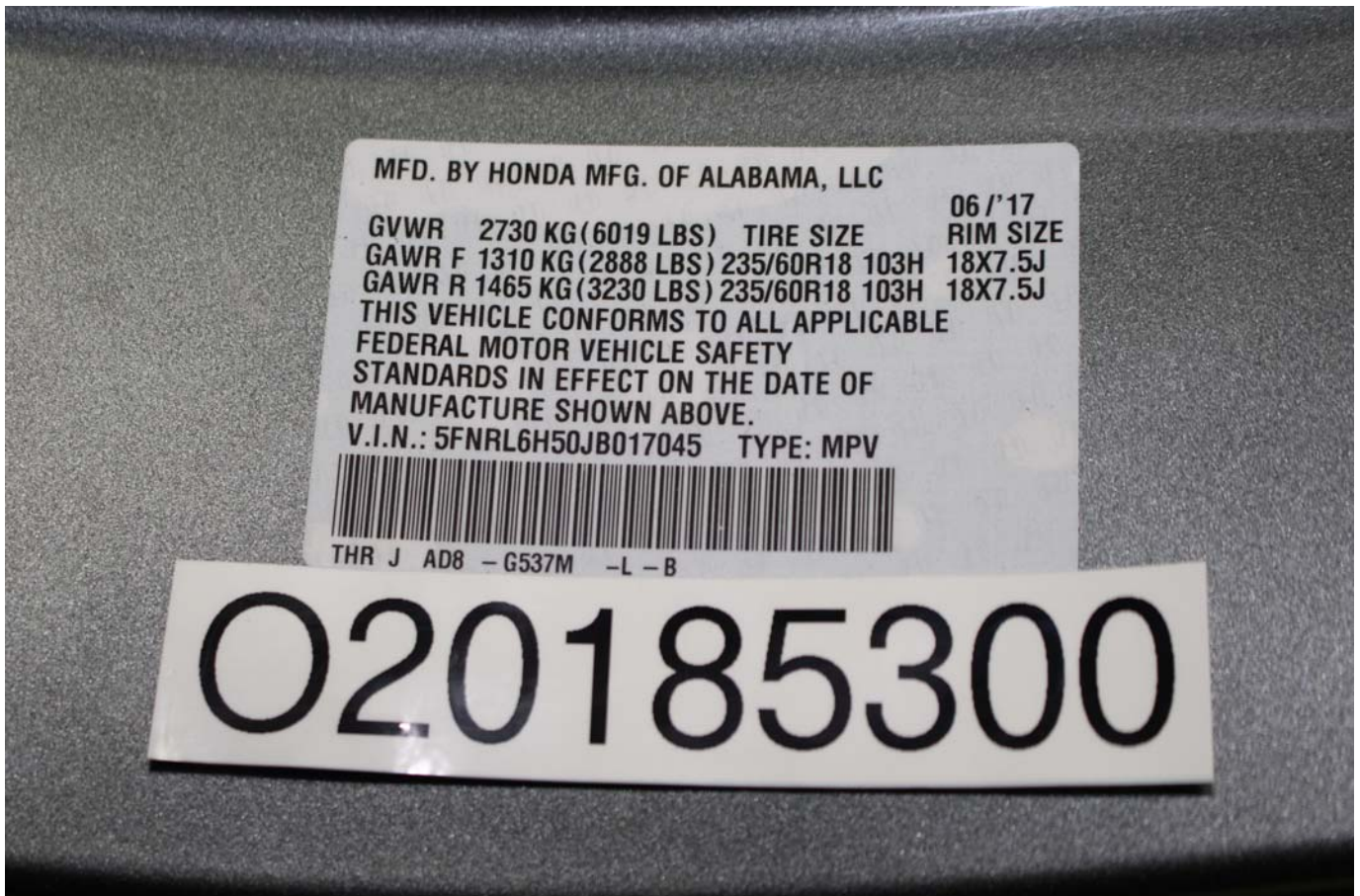


Photo No. 004 - Manufacturer Label

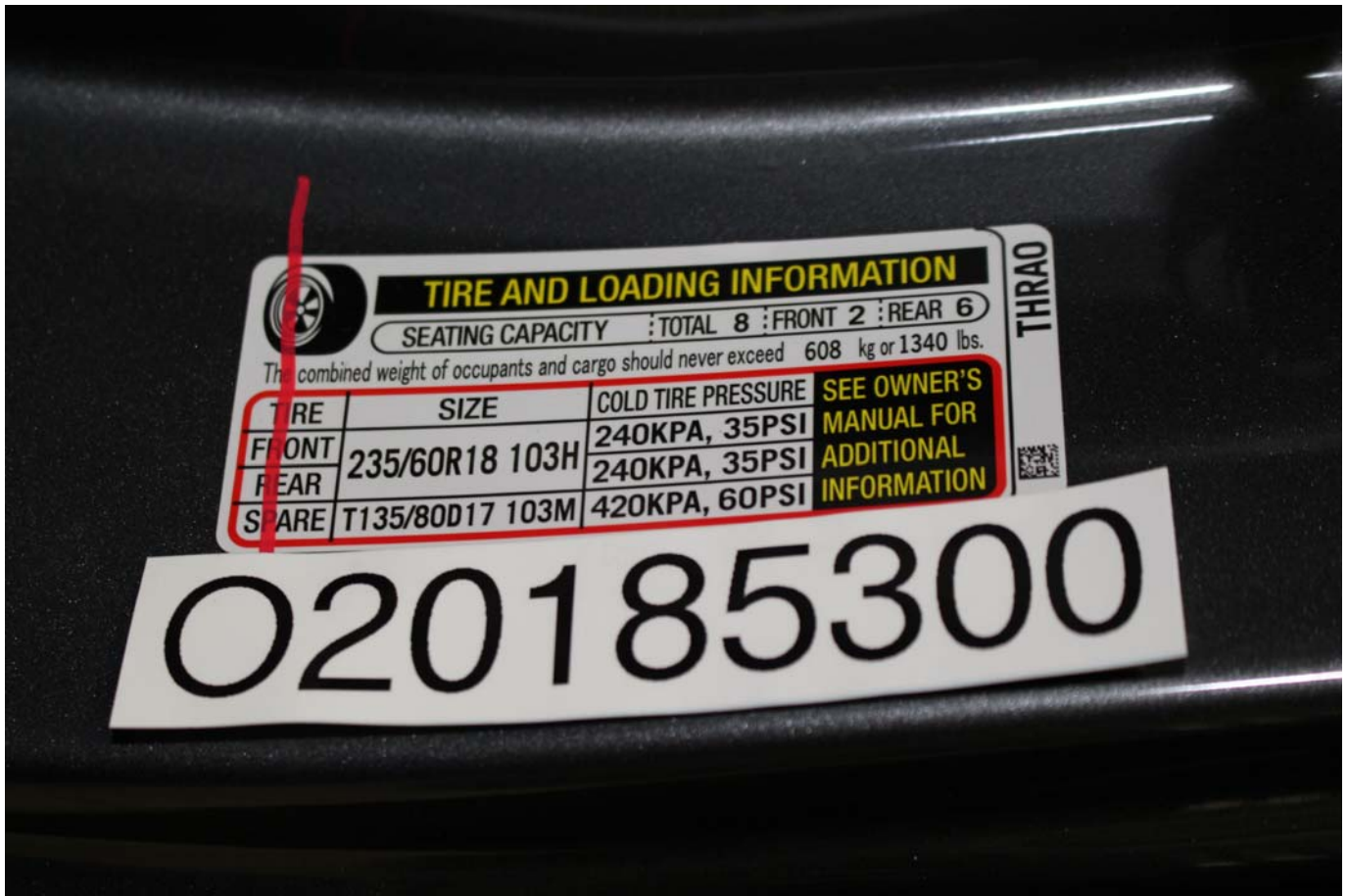


Photo No. 005 - Tire Placard



Photo No. 006 - 2018 Honda Odyssey EX Minivan Frontal As Delivered



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

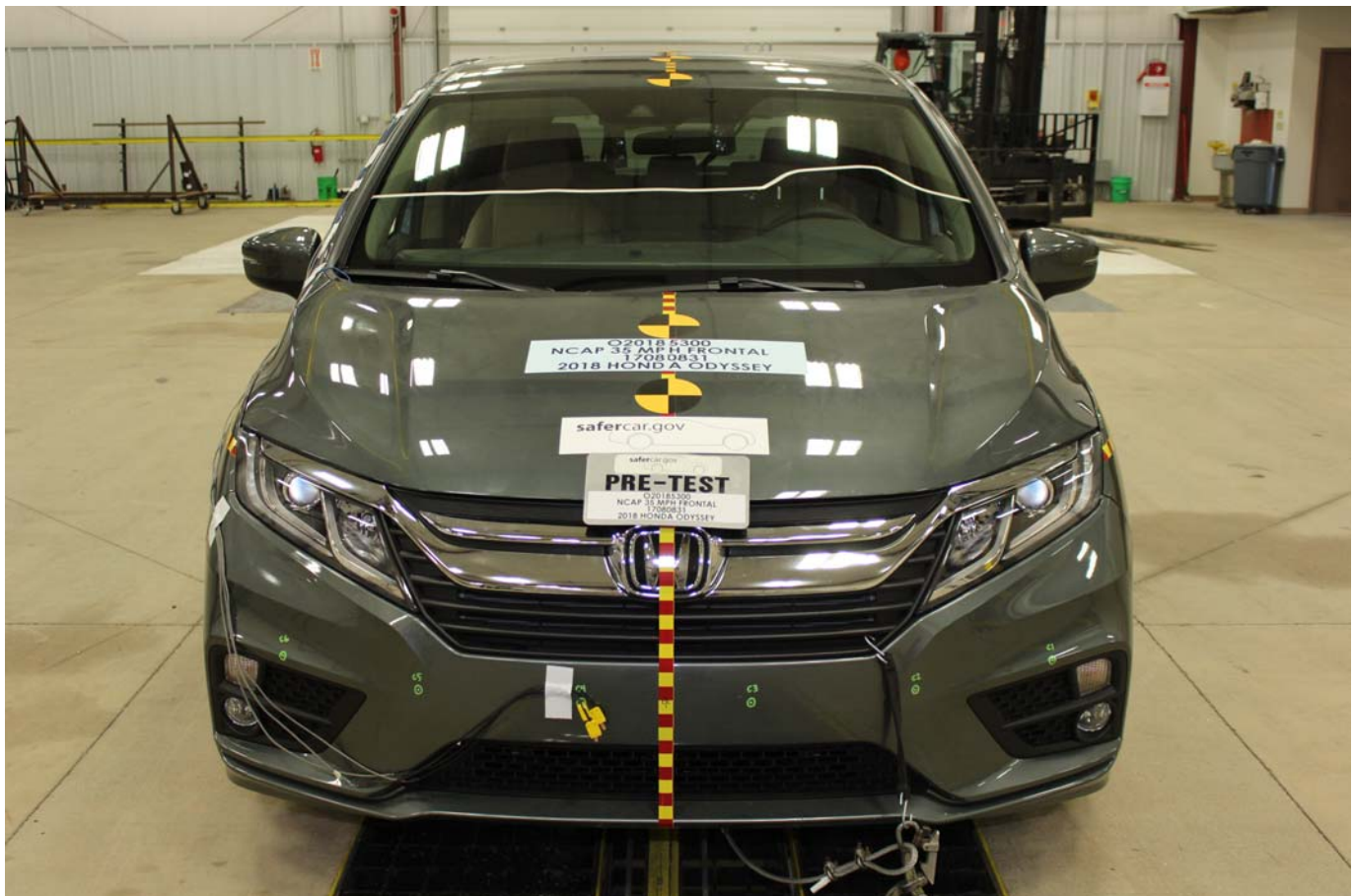


Photo No. 008 - Pre-Test Front View of Test Vehicle

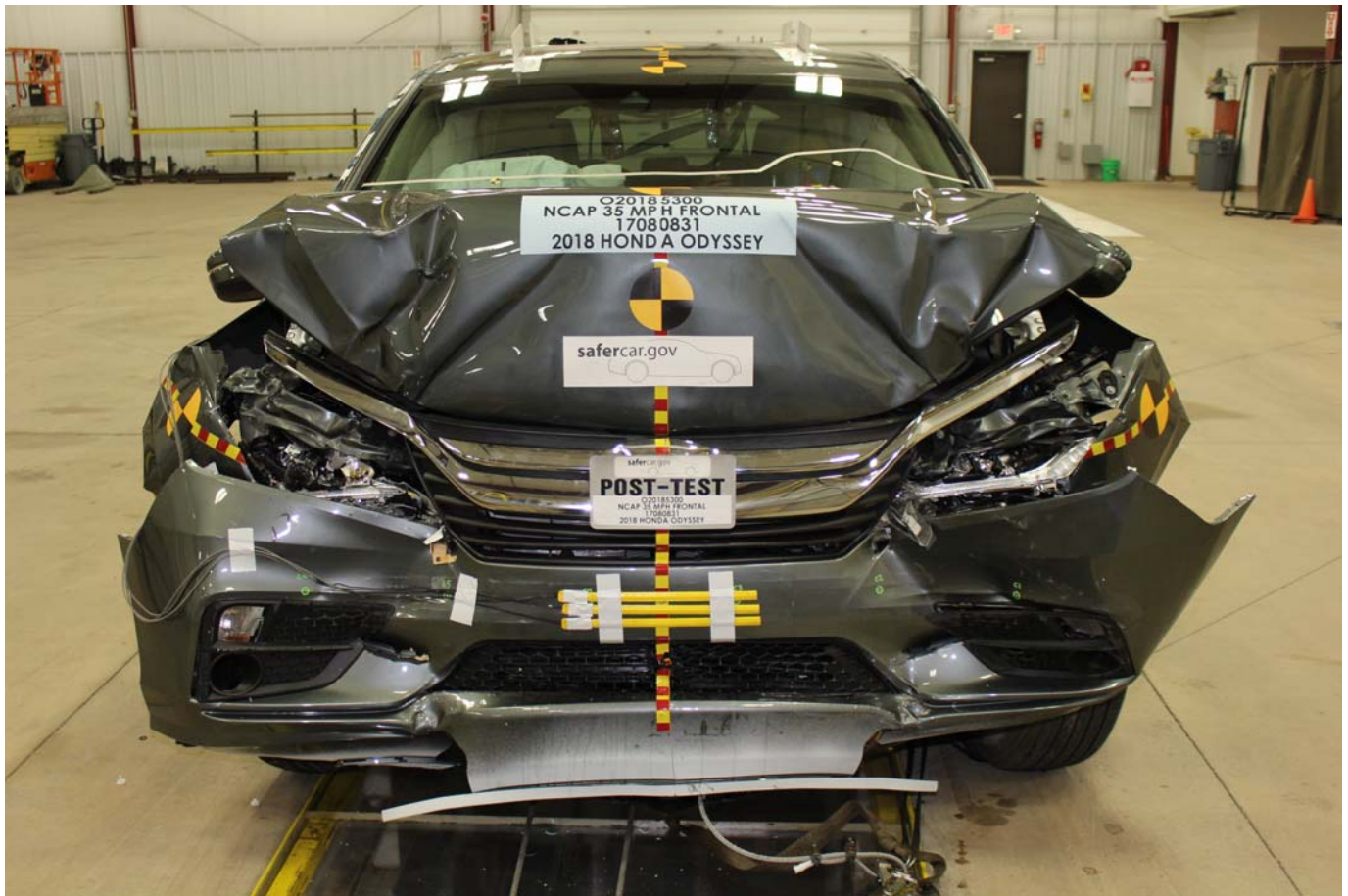


Photo No. 009 - Post-Test Front View of Test Vehicle



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

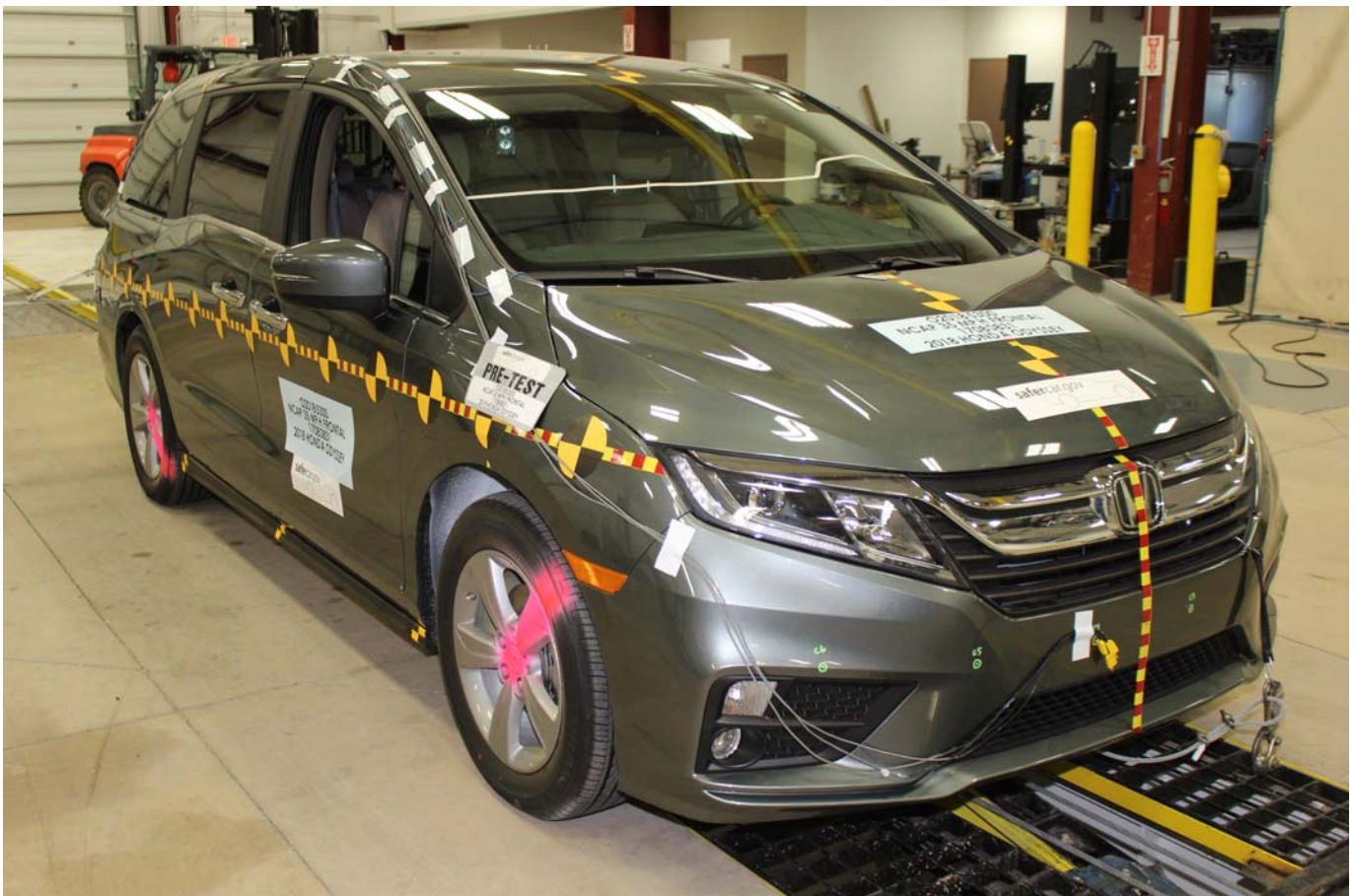


Photo No. 014 - Pre-Test Right Front 3-4 View

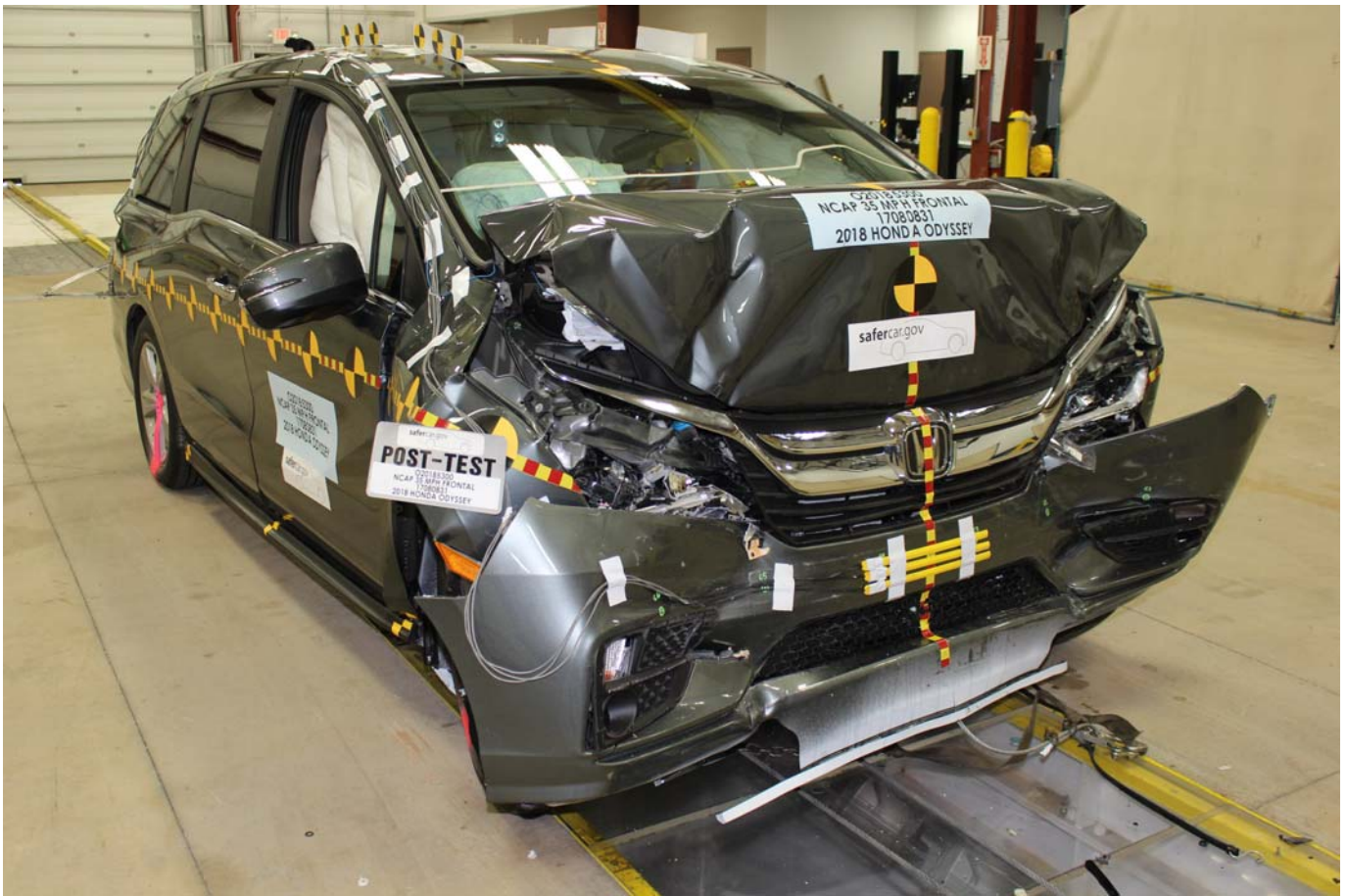


Photo No. 015 - Post-Test Right Front 3-4 View



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

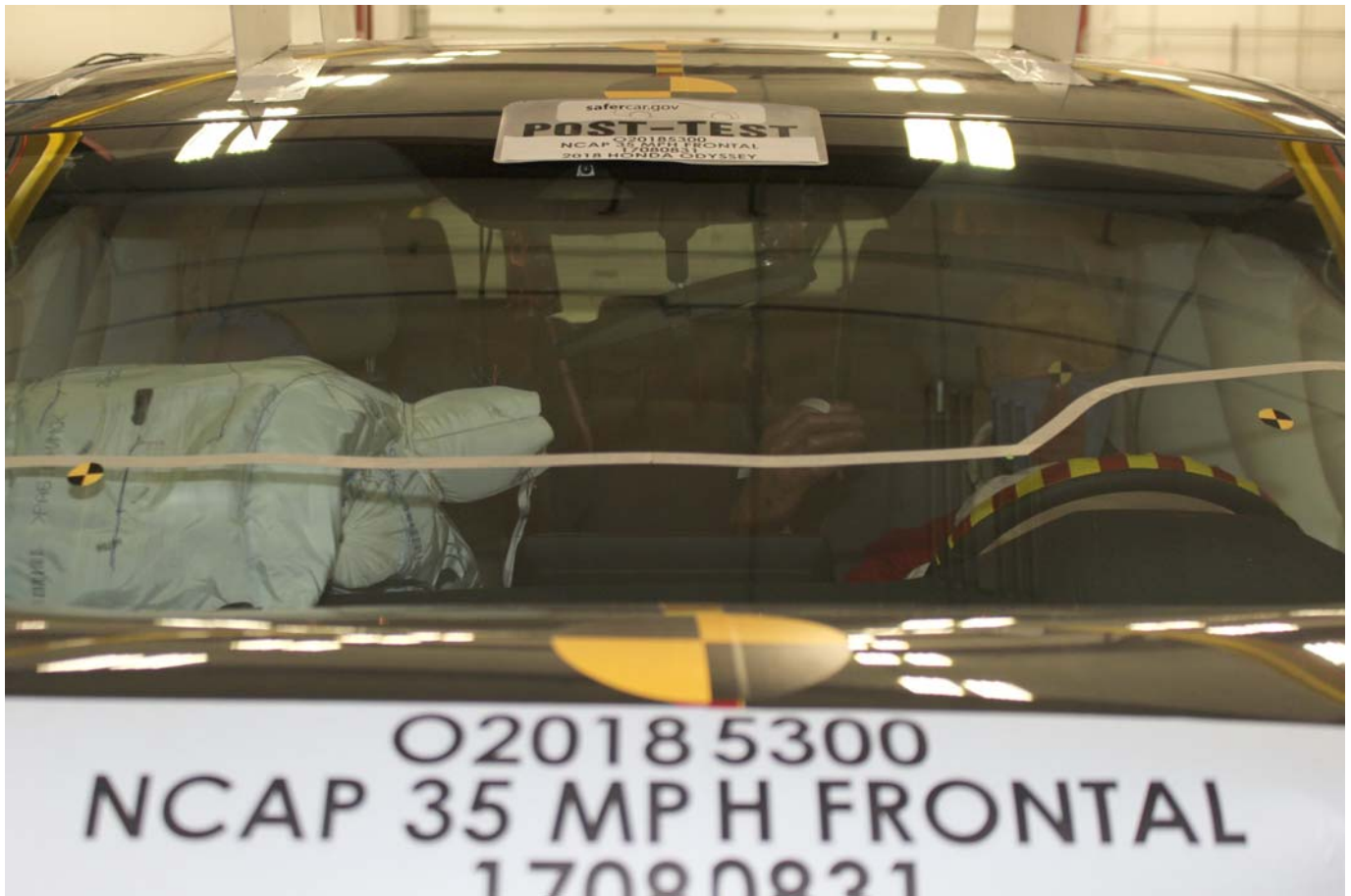


Photo No. 019 - Post-Test Windshield View

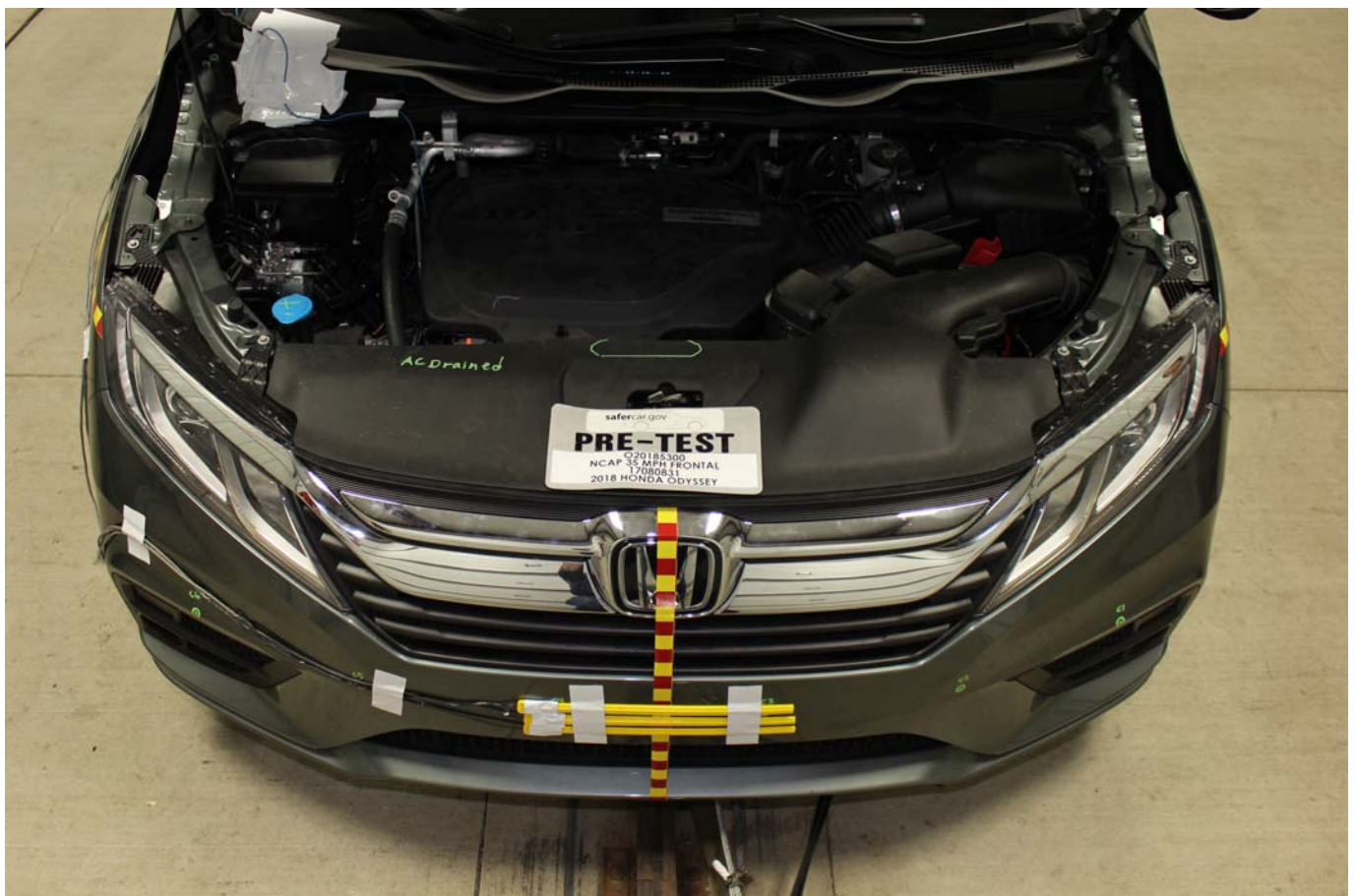


Photo No. 020 - Pre-Test Engine Compartment View

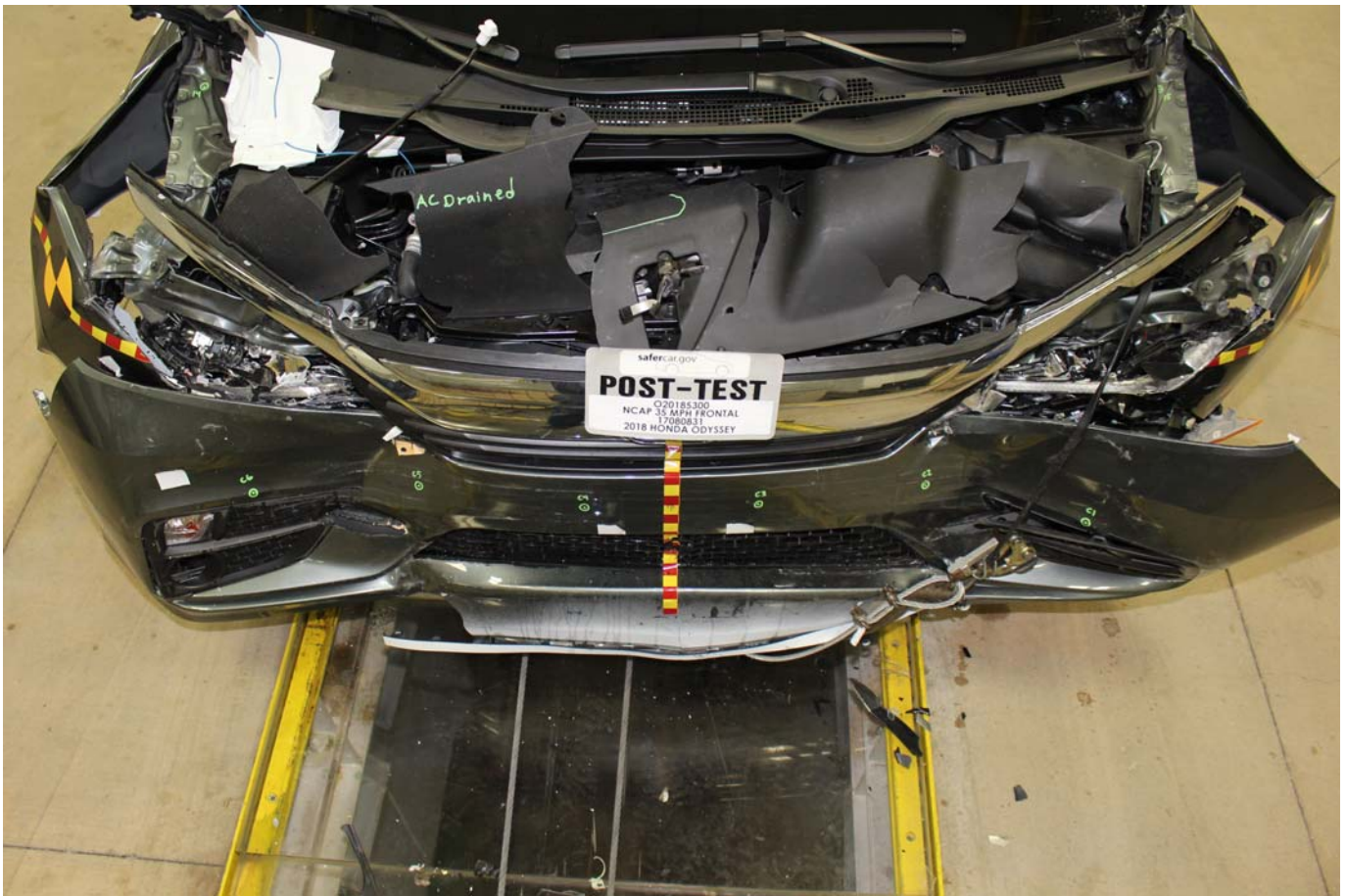


Photo No. 021 - Post-Test Engine Compartment View

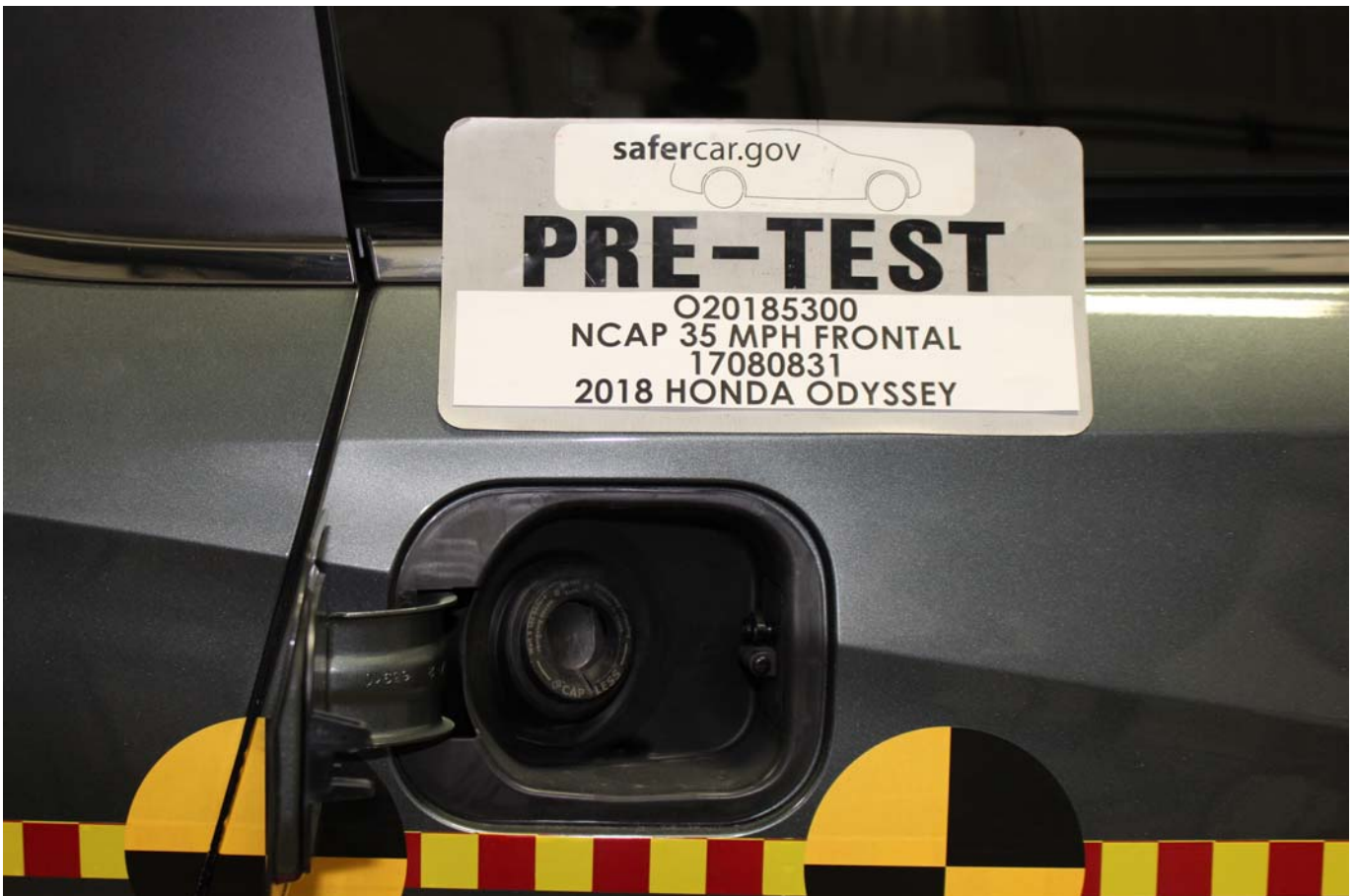


Photo No. 022 - Pre-Test Fuel Filler Cap View



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

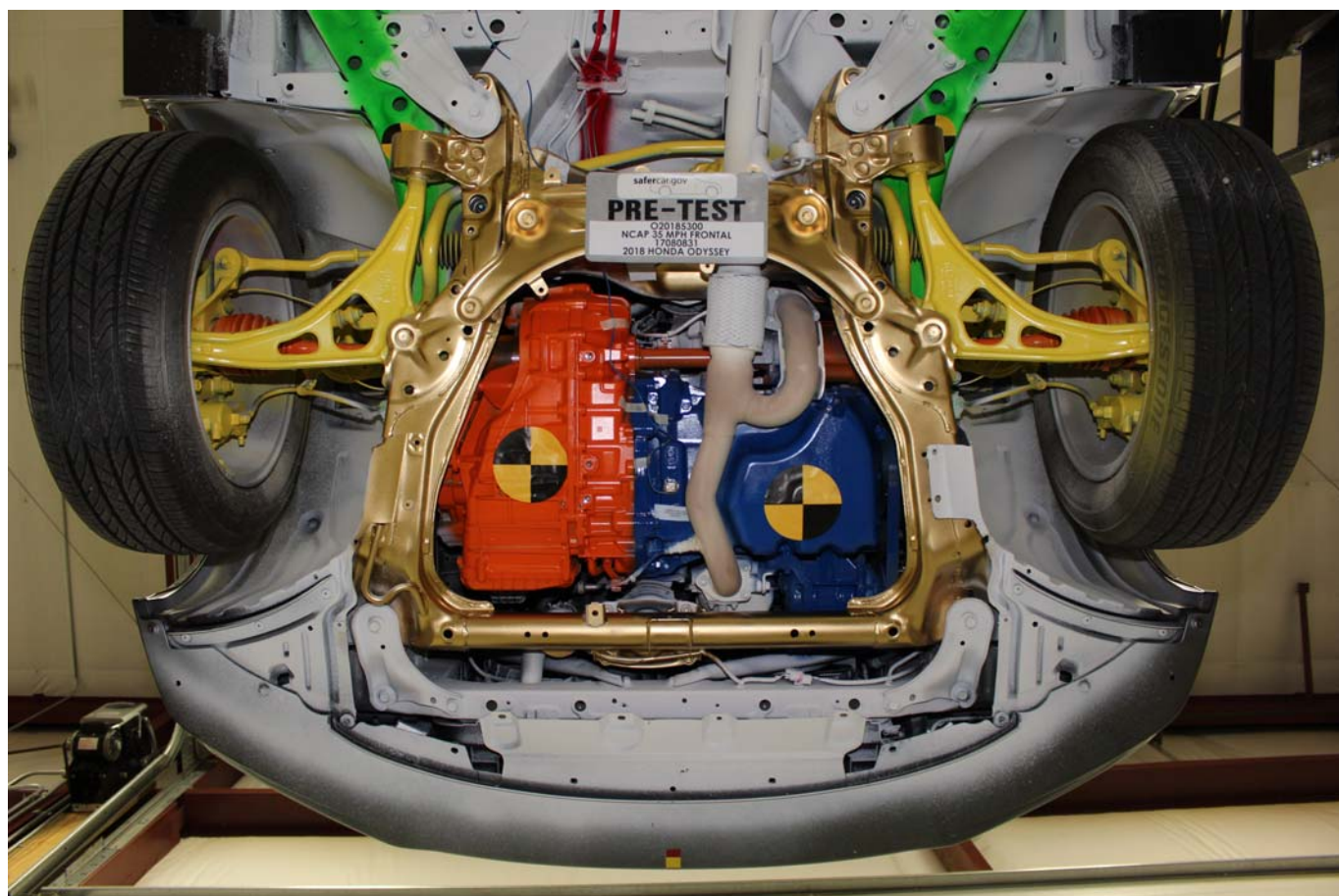


Photo No. 024 - Pre-Test Front Underbody View



Photo No. 025 - Post-Test Front Underbody View

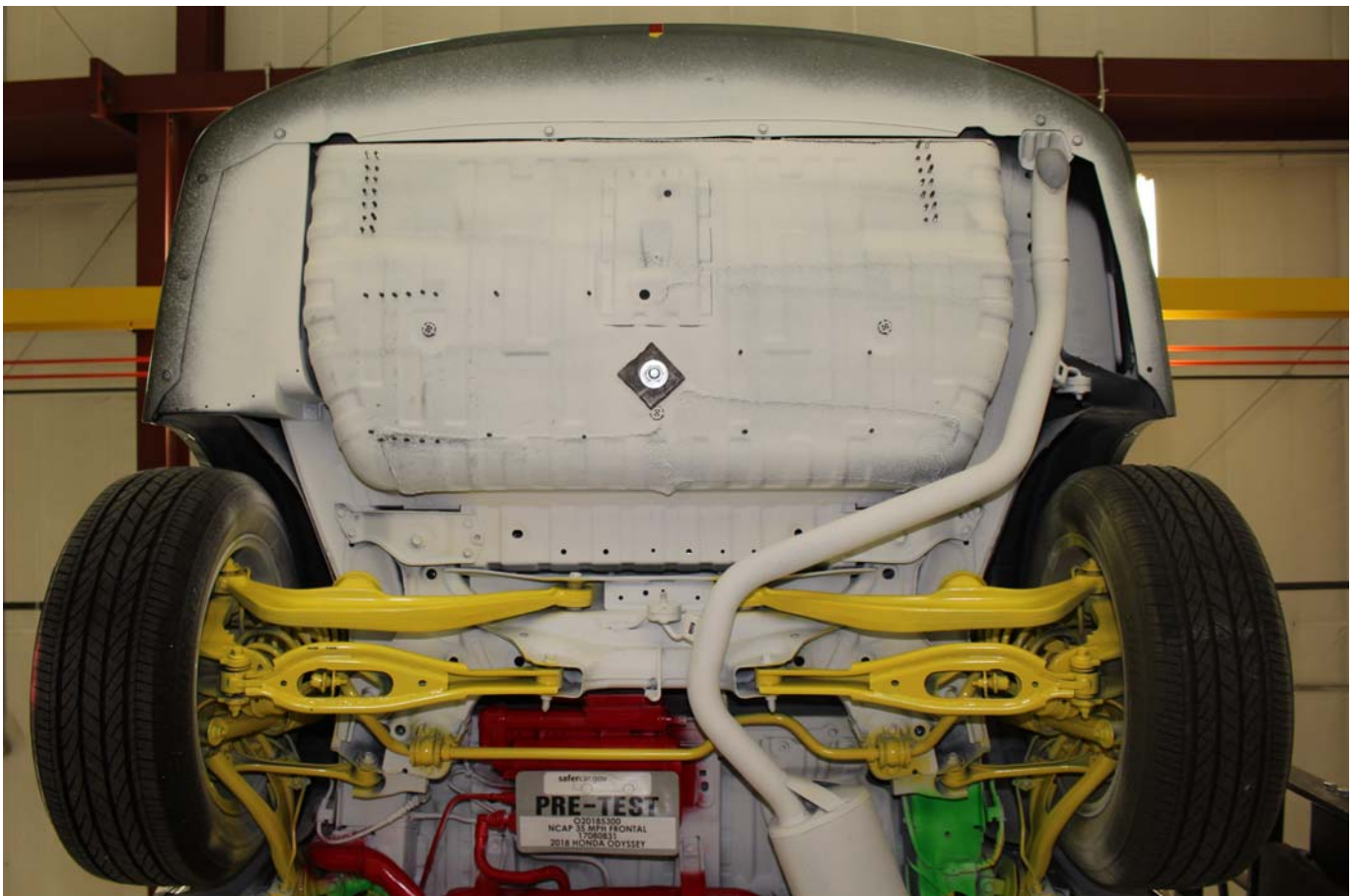


Photo No. 026 - Pre-Test Rear Underbody View

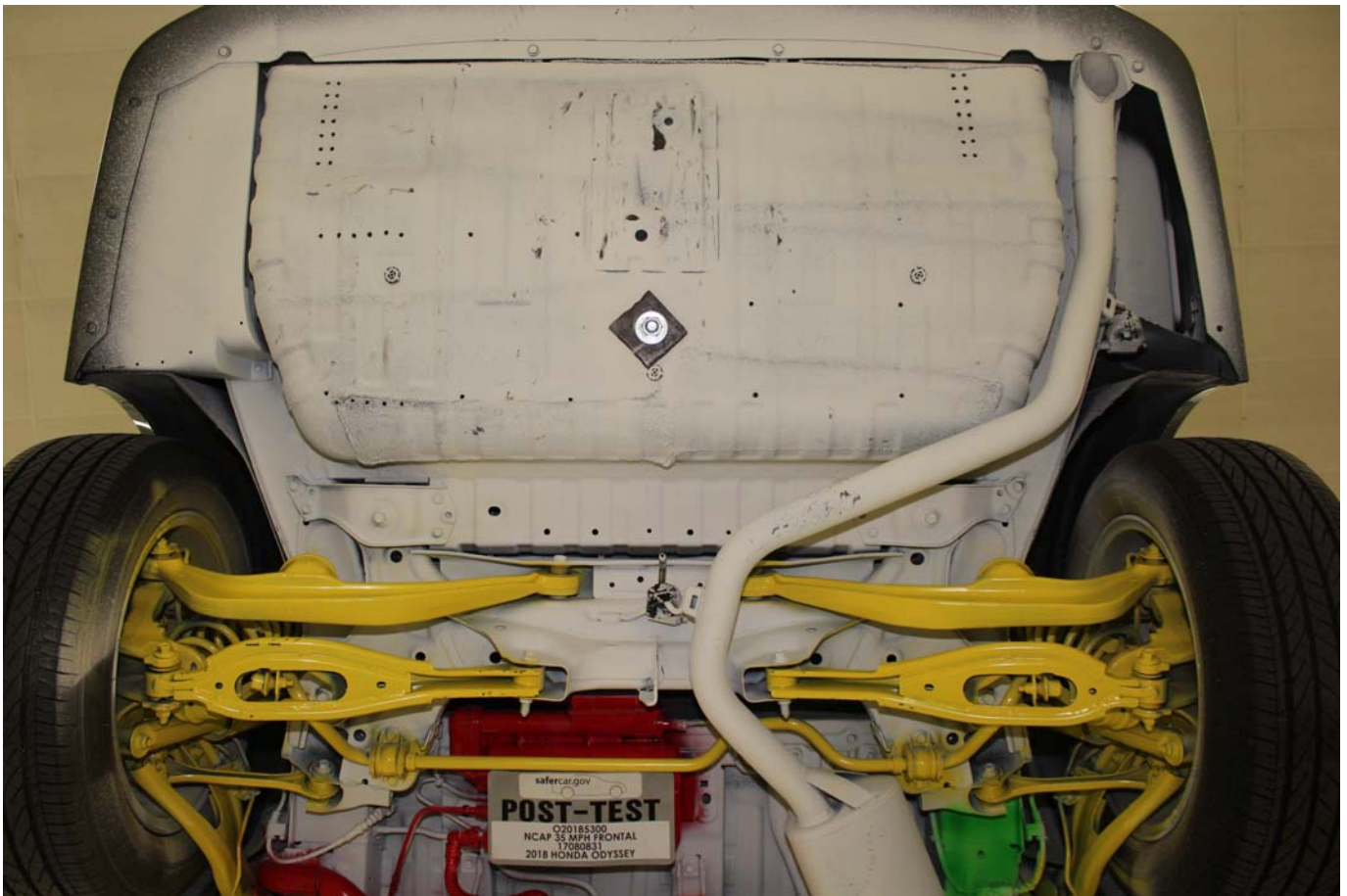


Photo No. 027 - Post-Test Rear Underbody View



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 (Door Open)



Photo No. 035 - Post-Test Driver Dummy and Vehicle Interior (Door Open)

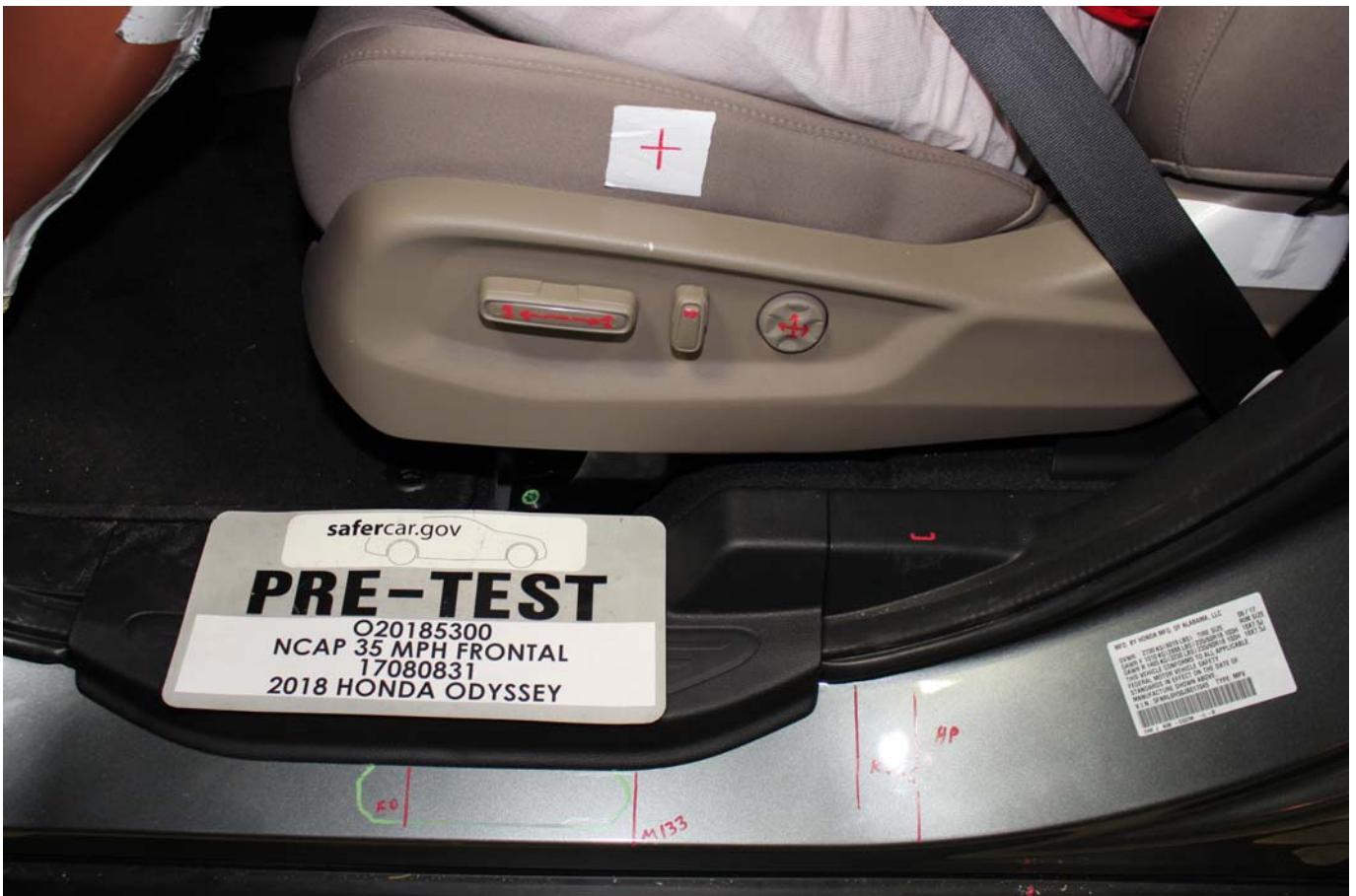


Photo No. 036 - Pre-Test Driver Seat Fore-Aft Markings

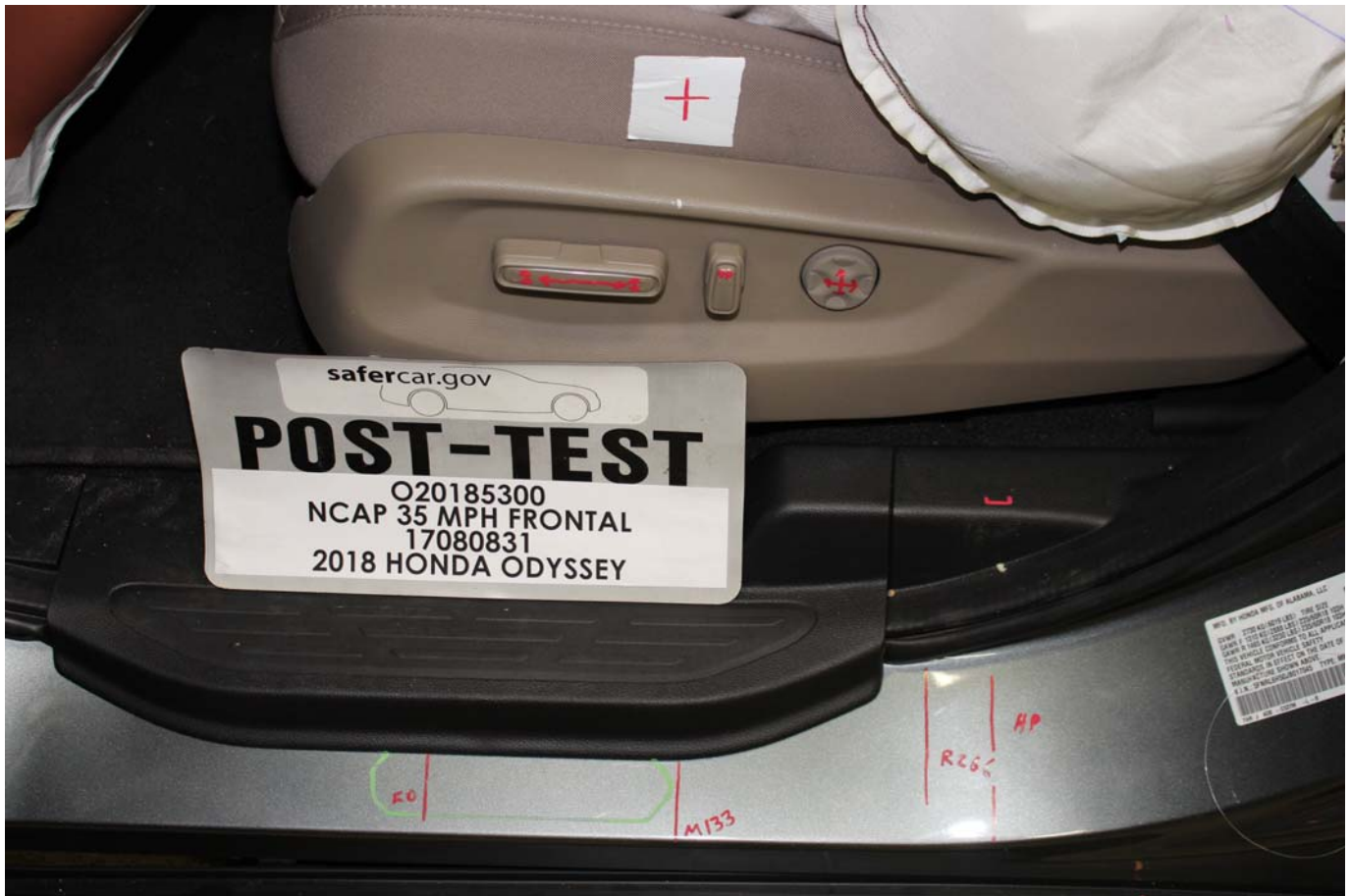


Photo No. 037 - Post-Test Driver Seat Fore-Aft Markings

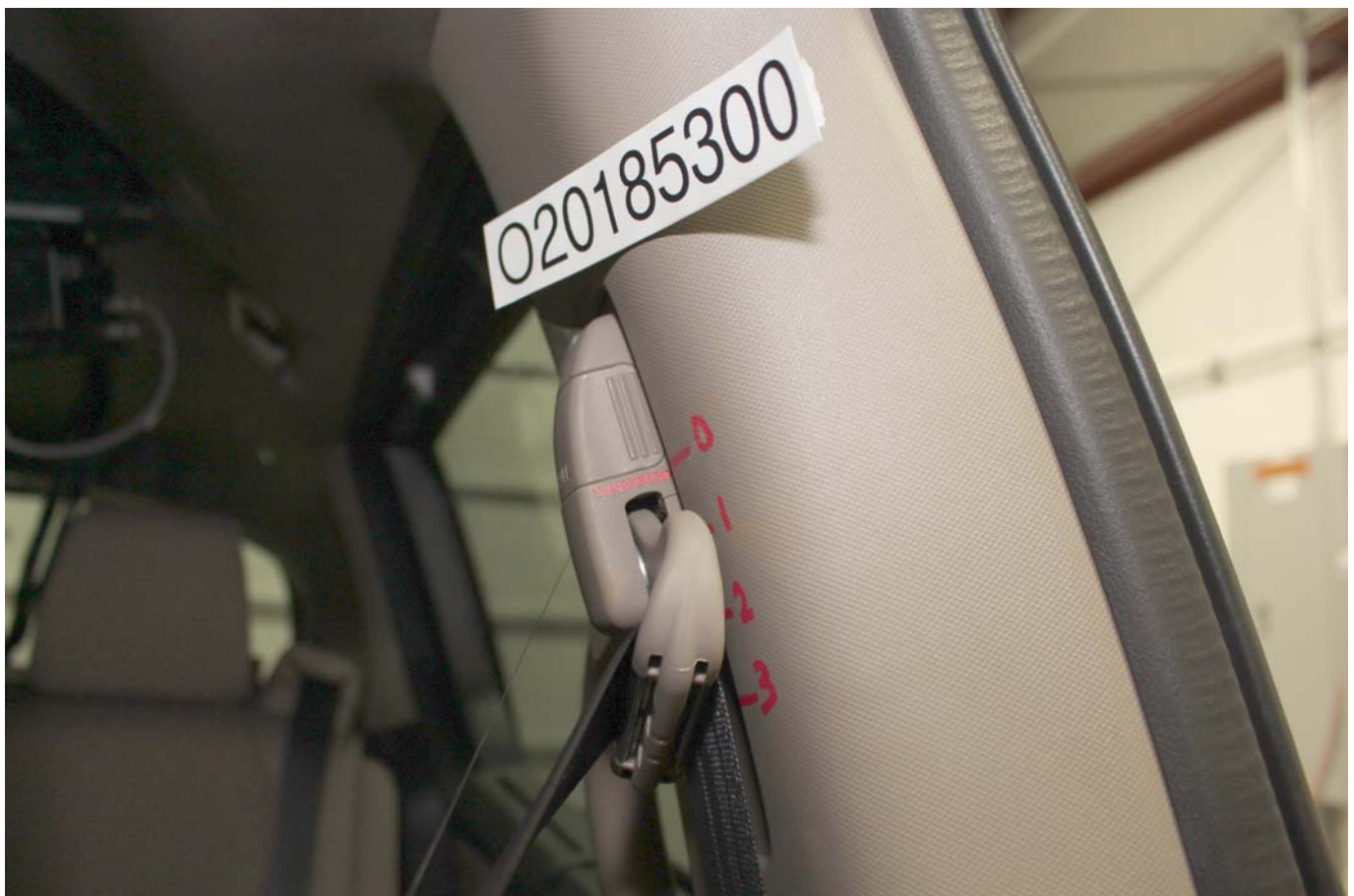


Photo No. 038 - Pre-Test View of Belt Anchorage for Driver Dummy



Photo No. 039 - Post-Test View of Belt Anchorage for Driver Dummy



Photo No. 040 - Pre-Test Driver Dummy Feet



Photo No. 041 - Post-Test Driver Dummy Feet



Photo No. 042 - Pre-Test Driver Side Knee Bolster (without dummy)



Photo No. 043 - Post-Test Driver Side Knee Bolster (without dummy)



Photo No. 044 - Pre-Test Driver Side Floorpan



Photo No. 045 - Post-Test Driver Side Floorpan



Photo No. 046 - Post-Test Driver Dummy Face



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



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



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



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



Photo No. 051 - Pre-Test Passenger Dummy Front View



Photo No. 052 - Post-Test Passenger Dummy Front View



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



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



Photo No. 055 - Pre-Test Passenger Dummy and Vehicle Interior (Door Open)



Photo No. 056 - Post-Test Passenger Dummy and Vehicle Interior (Door Open)

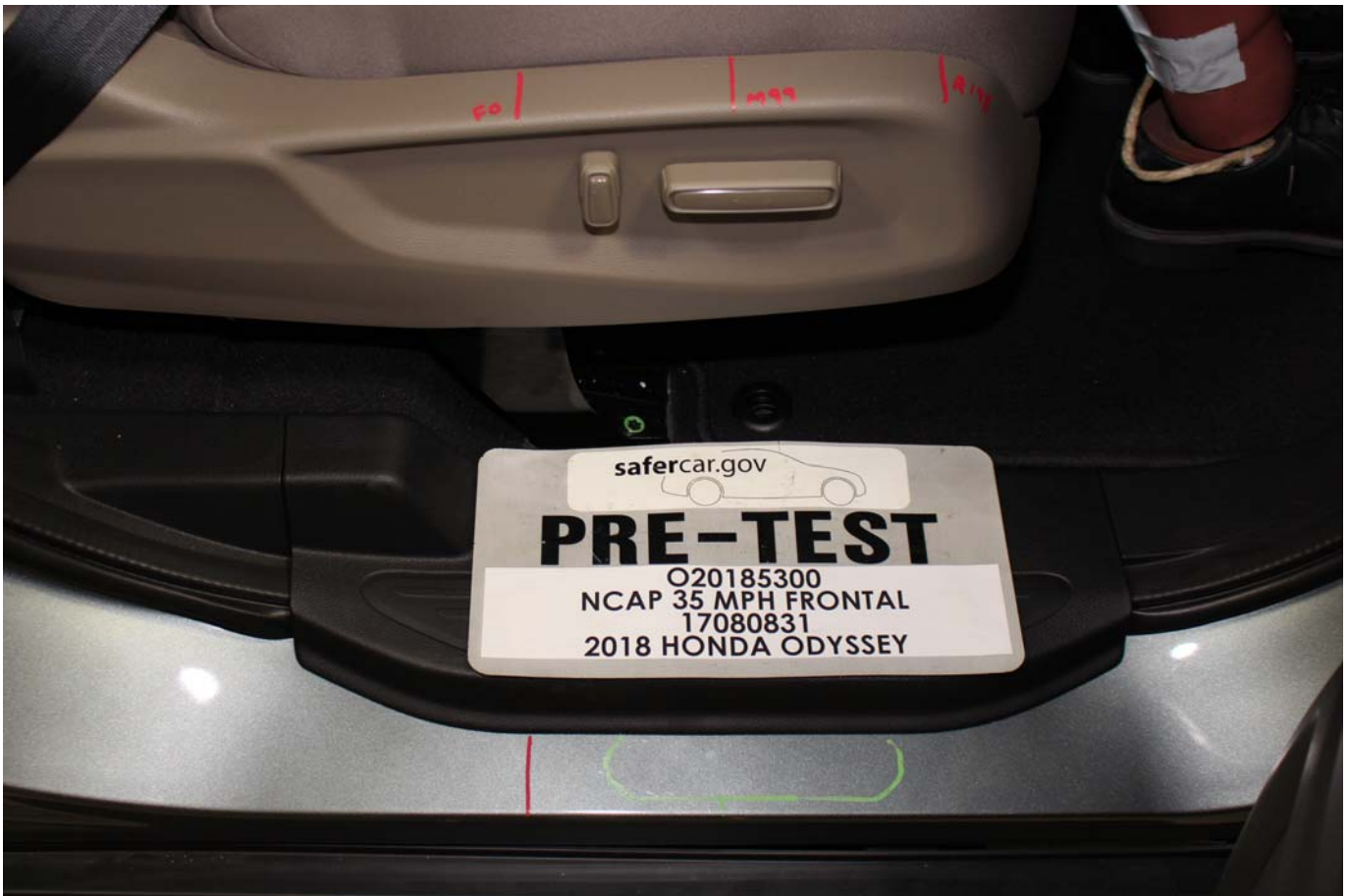


Photo No. 057 - Pre-Test Passenger Seat Fore-Aft Markings

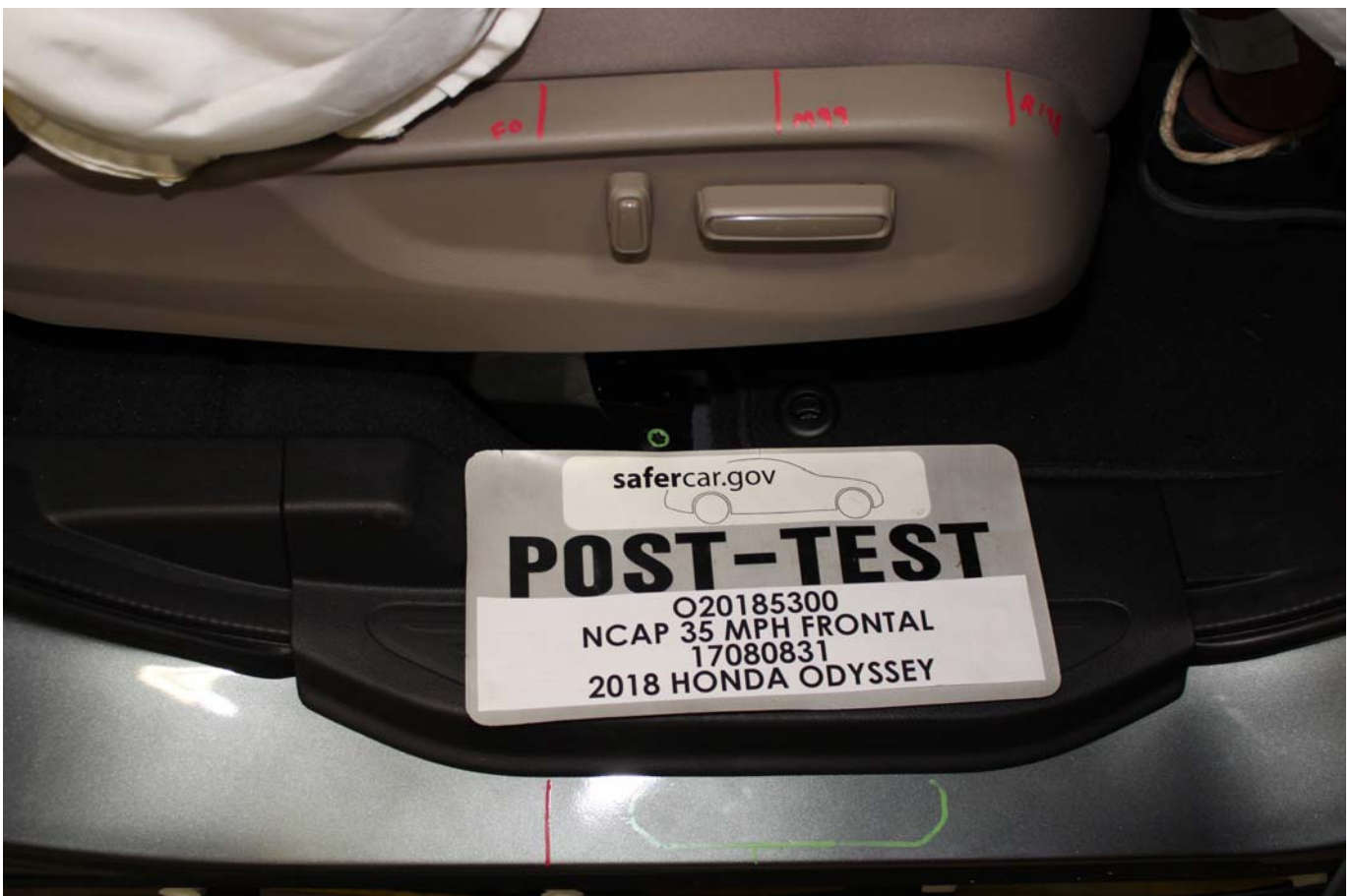


Photo No. 058 - Post-Test Passenger Seat Fore-Aft Markings



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



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



Photo No. 061 - Pre-Test Passenger Dummy Feet



Photo No. 062 - Post-Test Passenger Dummy Feet



Photo No. 063 - Pre-Test Passenger Side Knee Bolster (without dummy)



Photo No. 064 - Post-Test Passenger Side Knee Bolster (without dummy)



Photo No. 065 - Pre-Test Passenger Side Floorpan



Photo No. 066 - Post-Test Passenger Side Floorpan



Photo No. 067 - Post-Test Passenger Dummy Face



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



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



Photo No. 070 - Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

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



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



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

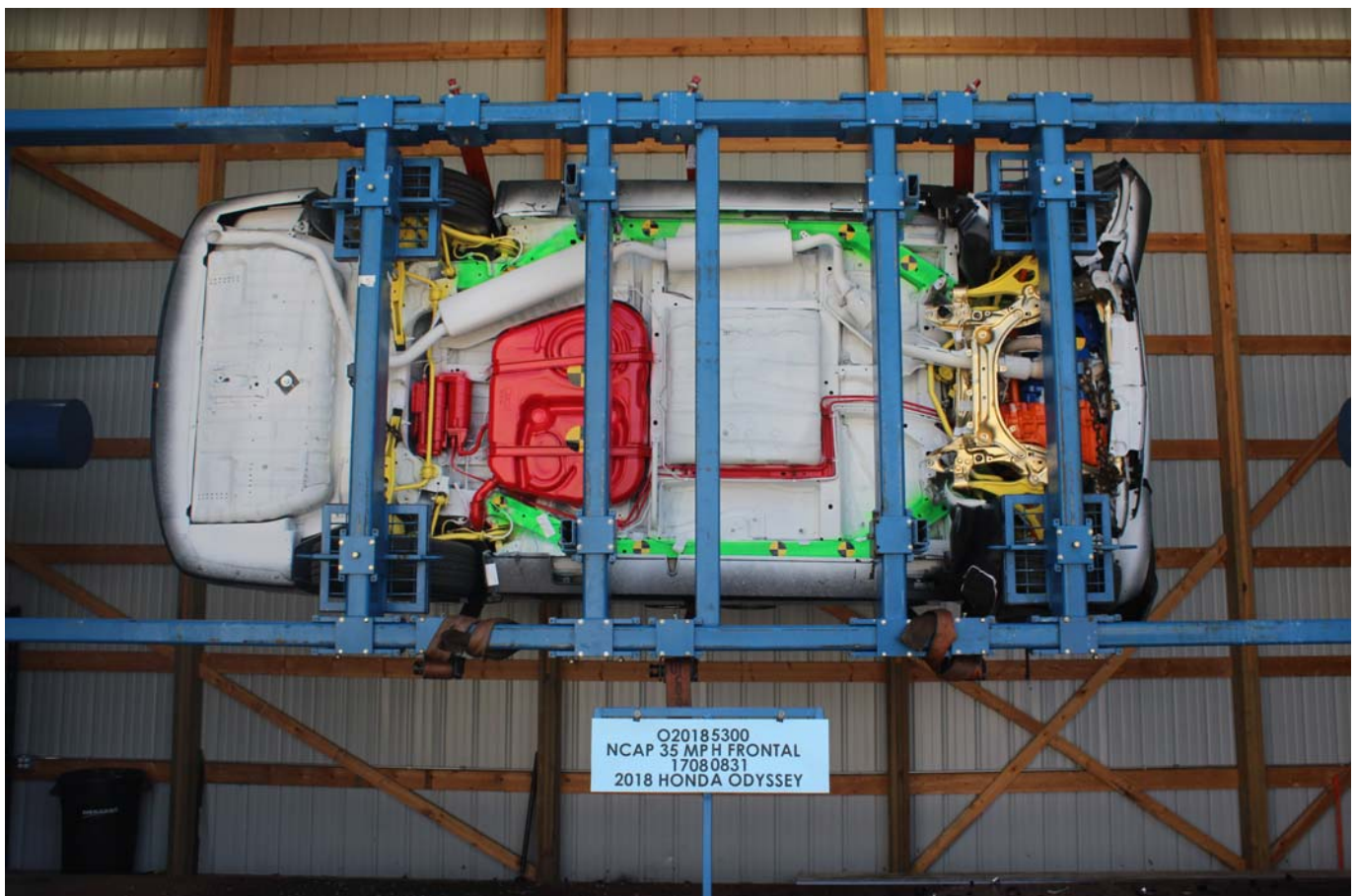


Photo No. 074 - Vehicle at 90 Degrees on Static Rollover Device



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



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



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



Photo No. 078 - 2018 Honda Odyssey EX Minivan Frontal Impact Event



2018 ODYSSEY EX

EXT: FOREST MIST M. ENGINE NUMBER: J35Y7-1024493
INT: BEIGE

STANDARD EQUIPMENT AT NO EXTRA COST

- TECHNICAL FEATURES *
- 280hp 3.5-Liter VTEC V6 Engine with Variable Cylinder Management (VCM)
- 9-Speed Automatic Transmission
- Paddle Shifters
- Intelligent Traction Management
- Electric Power Steering

SAFETY FEATURES *

- Driver's and Front Passenger's Airbags
- Driver's and Front Passenger's Side Airbags
- Three Row Side Curtain Airbags
- Driver's and Front Passenger's Knee Airbags
- Vehicle Stability Assist (VSA)
- Anti-Lock Braking System (ABS)
- Electronic Brake Distribution (EBD)
- Tire Pressure Monitoring System
- LED Daytime Running Lights
- LATCH System for Child Seats

INTERIOR FEATURES *

- Audio System with 7 Speakers
- Display Audio with Multi-View Rear Camera
- TFT Meter Display
- CarPlay/Android Auto Integration
- SiriusXM Satellite Radio
- HD Radio
- HondaLink with Smart Phone Integration
- Bluetooth HandsFreeLink
- CabinControl Capability
- USB Audio Interface

- Push-Button Start
- Trip-Zone Automatic Climate Control
- Driver's 12-Way Power Seat
- Heated Front Seats
- Front Passenger's 4-Way Power Seat
- Tilt & Telescopic Steering Column
- Illuminated Visor Vanity Mirrors
- Magic Slide 2nd Row Seats
- 60/40 Fold-Down 3rd Row
- Floor Mats
- Second-Row Sunshades

EXTERIOR FEATURES *

- Dual Power Sliding Doors
- Blind Spot Information System (BSI) w/ Cross Traffic Monitor
- 18" Alloy Wheels
- 235/60 R18 All-Season Tires
- Auto High-Beam
- Auto-On/Off Headlights
- Fog Lights
- Heated Power Door Mirrors with Turn Indicators
- Capless Fuel Filler
- LED Taillights
- Rear Privacy Glass
- Smart Entry System with Security System
- Remote Engine Start
- Walk Away Auto Lock

HONDA SENSING PACKAGE *

- Adaptive Cruise Control (ACC)
- Collision Mitigation Braking System (CMBS)
- Forward Collision Warning (FCW)
- Lane Departure Warning (LDW)
- Lane Keeping Assist System (LKAS)
- Road Departure Mitigation (RDM)

Manufacturer's Suggested Retail Price **\$33,860.00**

Full Tank of Fuel **No Charge**

SiriusXM Includes:
Free Activation and 3 Months Free Service (excl. AK & HI)

Honda Roadside Assistance
3YR/50K Mile Warranty Term

Destination and Handling **940.00**

TOTAL VEHICLE PRICE
(Includes Pre-Delivery Service)

\$34,800.00

License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

DAVID HOBBS HONDA
6100 NO. GREEN BAY AVE
GLENDALE, WI 53209

PORT OF ENTRY: ALABAMA
DELIVERY POINT: SCHAUMBURG
SHIP#:
ROW/SPACE: 783-031
TRANS.METHOD: E62 TALLADEGA
N50 ELWOOD

ORIG. DLR: 207671
REF.NO: 40832
HN CODE: HN-5195
EMISSION: 50 STATE
CONTROL NO: 269468
DEALER: 207671

VIN: 5FNRL6H5JB017045



EPA Fuel Economy and Environment

Gasoline Vehicle

Fuel Economy
22 MPG
combined city highway
4.5 gallons per 100 miles

These estimates reflect new EPA methods beginning with 2017 models.
Minivans range from 19 to 52 MPG.
The best vehicle rates 136 MPG.

You spend
\$1,500
in fuel costs
over 5 years
compared to the
average new vehicle.

Annual fuel cost
\$1,650

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **Smog Rating** (tailpipe only)
1 4 10 1 3 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 \$4,150 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.40 per gallon. MPGe is miles per gallon gasoline equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov
Calculate personalized estimates and compare vehicles

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: **75 %**

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

FOR THIS VEHICLE
Final Assembly Point:
LINCOLN, ALABAMA
USA
Country of Origin: Engine:
U.S.A.
Transmission:
U.S.A.

GOVERNMENT 5-STAR SAFETY RATING

Overall Vehicle Score **Not Rated**

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

Frontal Crash **Driver Passenger** **Not Rated**
Based on the risk of injury in a frontal impact.
Should ONLY be compared to other vehicles of similar size and weight.

Side Crash **Front seat Rear seat** **Not Rated**
Based on the risk of injury in a side impact.

Rollover **Not Rated**
Based on the risk of rollover in a single vehicle crash.

Star Ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4235

65 miles

Photo No. 079 - Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

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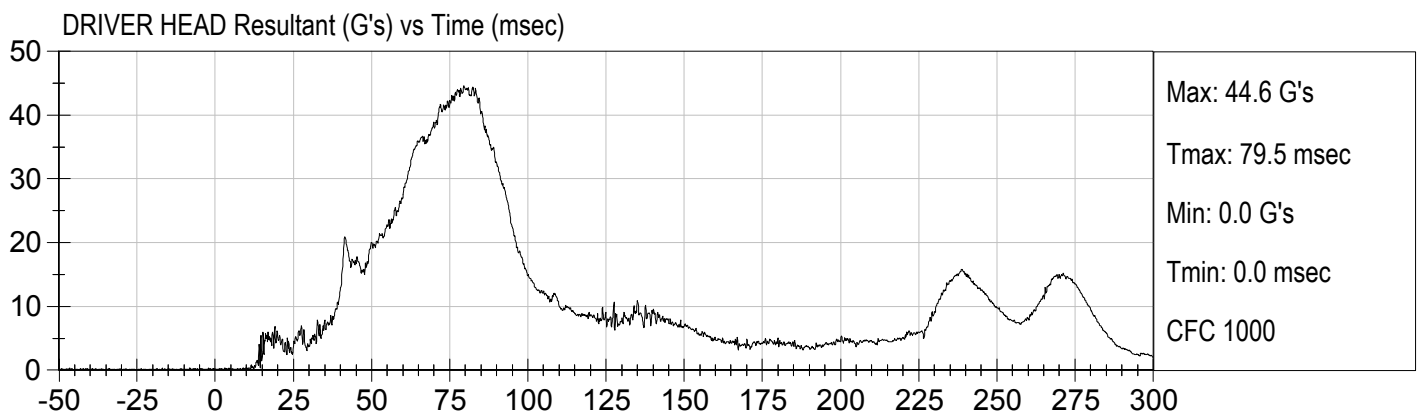
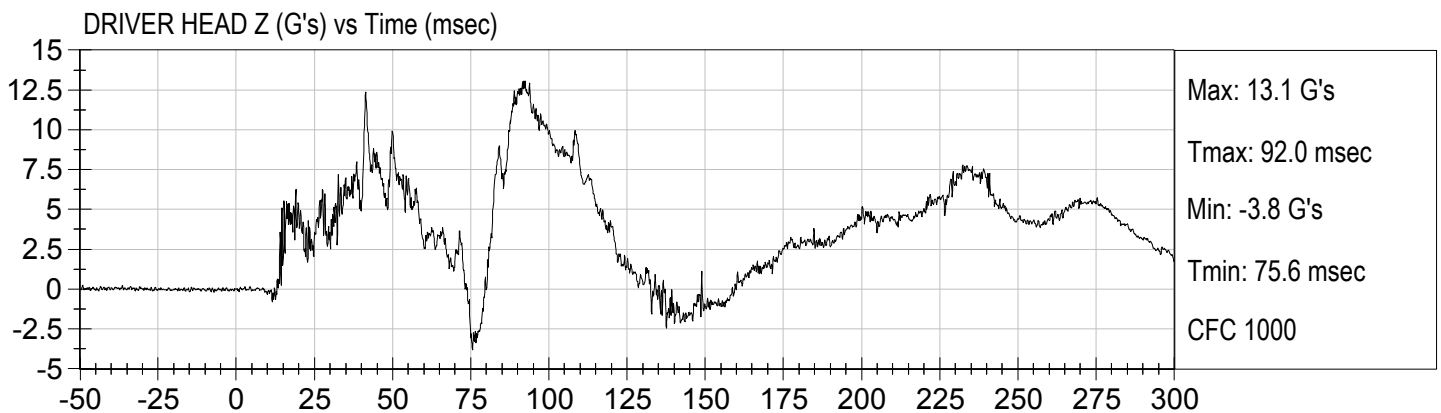
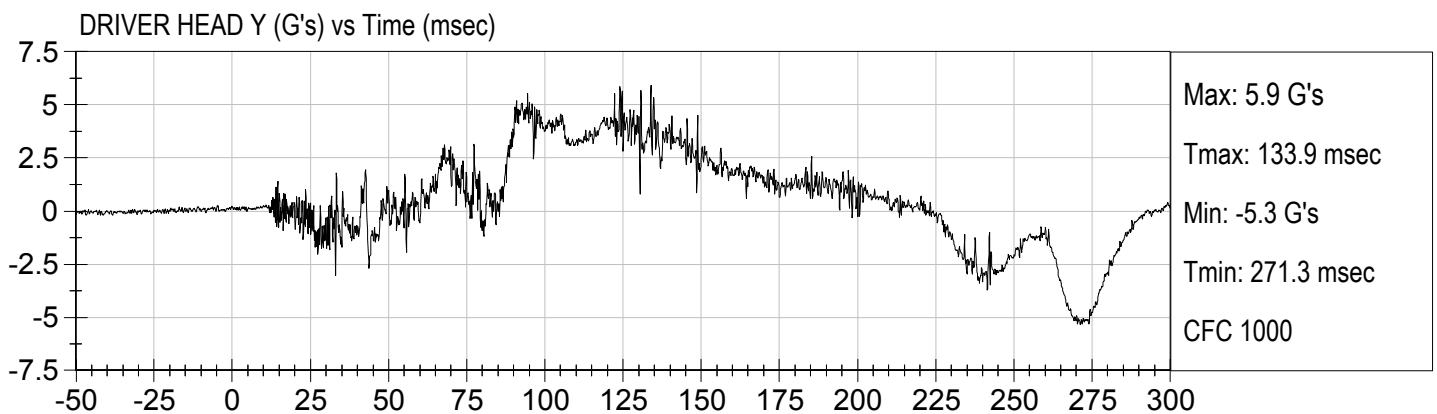
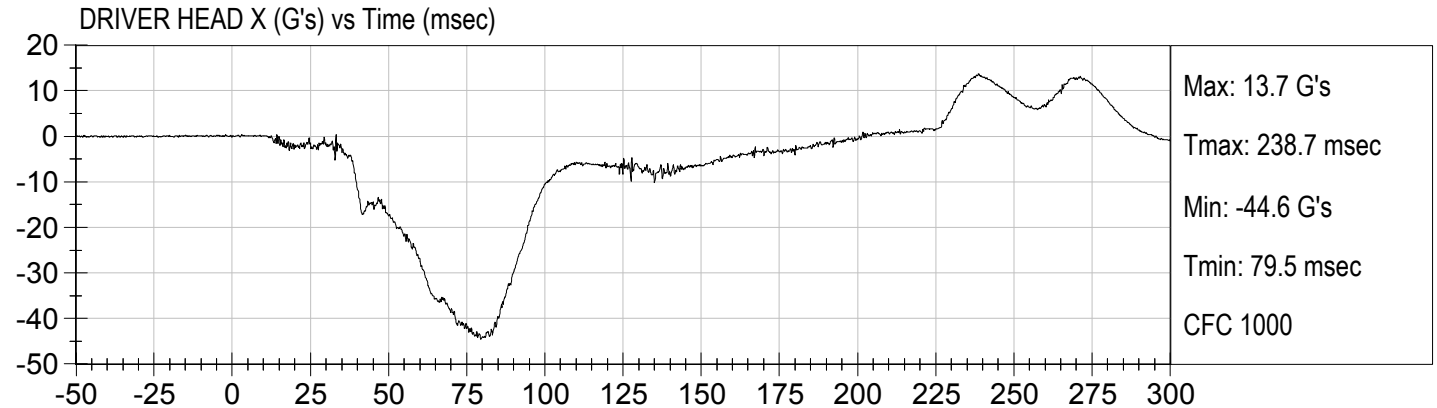
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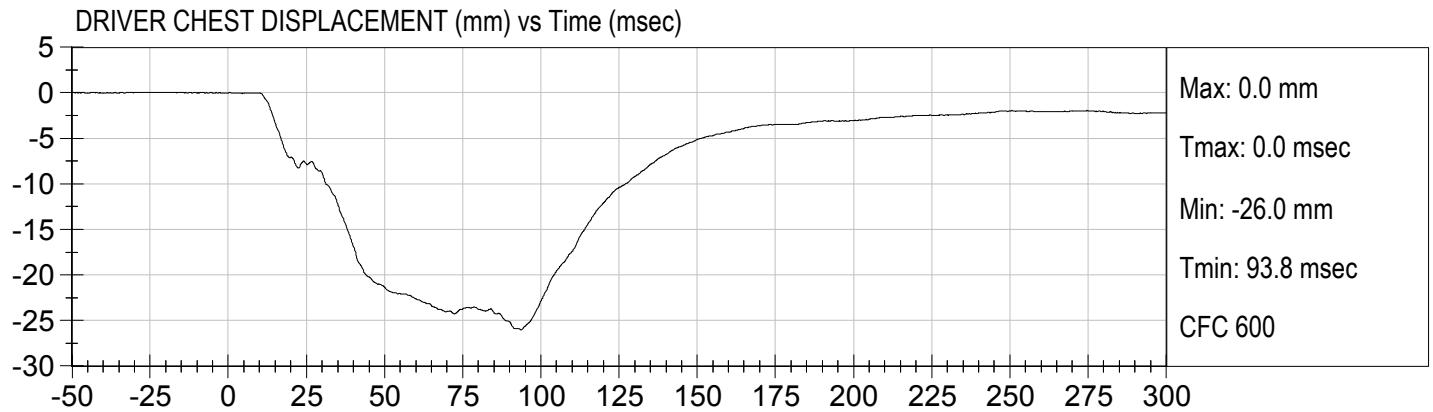
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

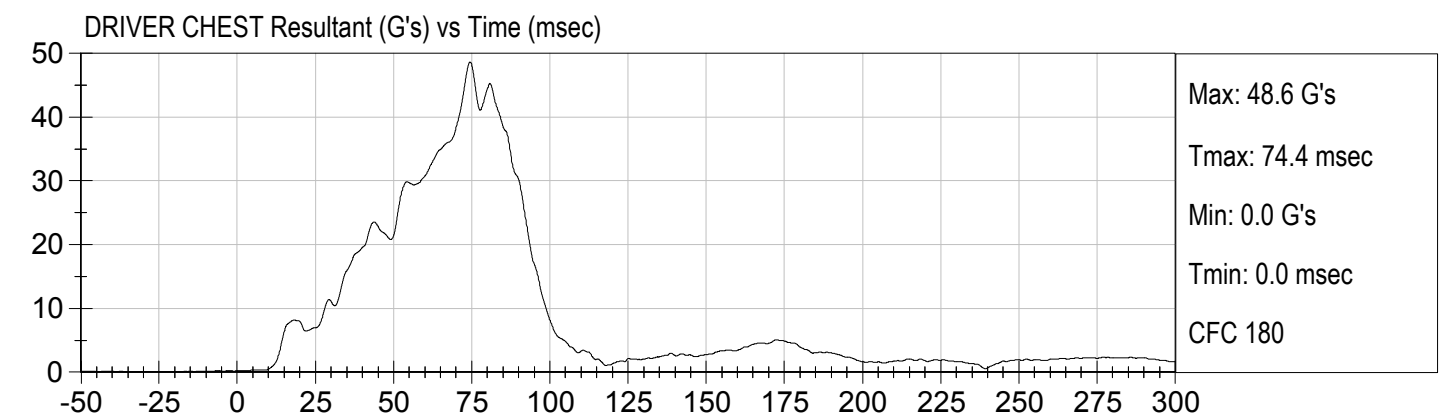
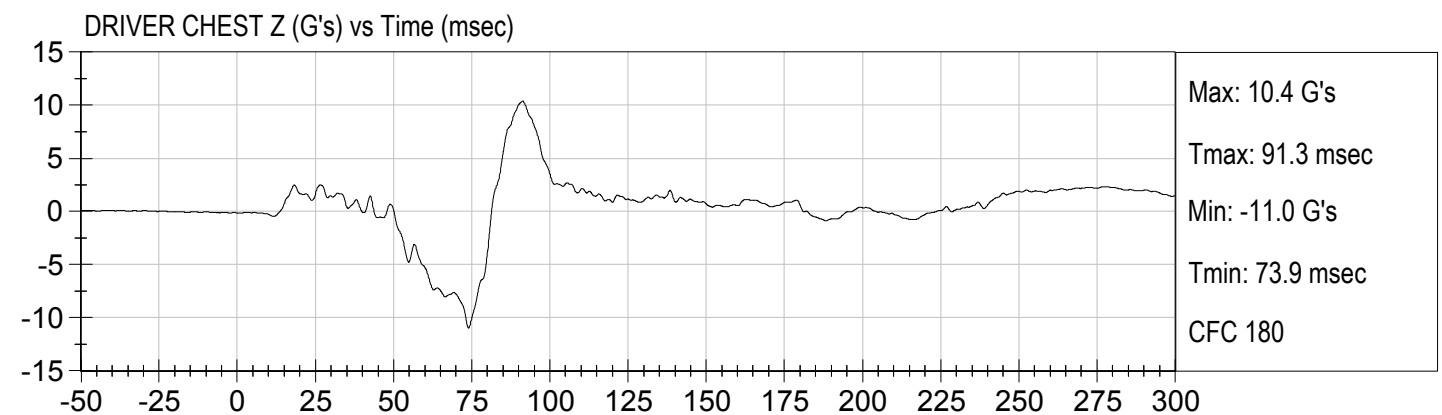
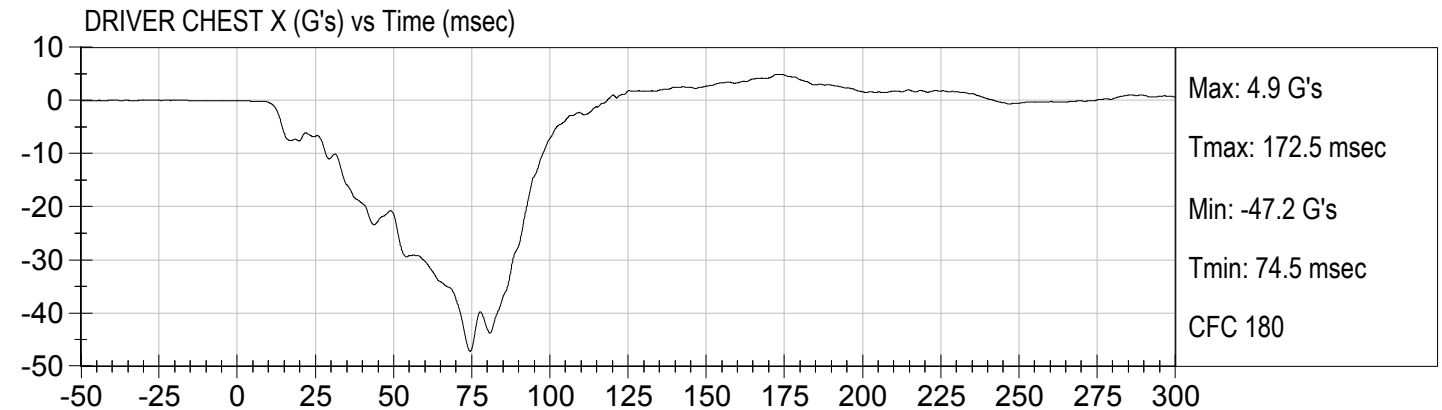
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 Driver Upper Neck Force Y
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 Driver Upper Neck Moment Z
 Driver Chest X Redundant
 Driver Chest Y Redundant
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 Driver Left Femur Redundant
 Driver Right Femur Redundant
 Driver Left Upper Tibia Moment X
 Driver Left Upper Tibia Moment Y

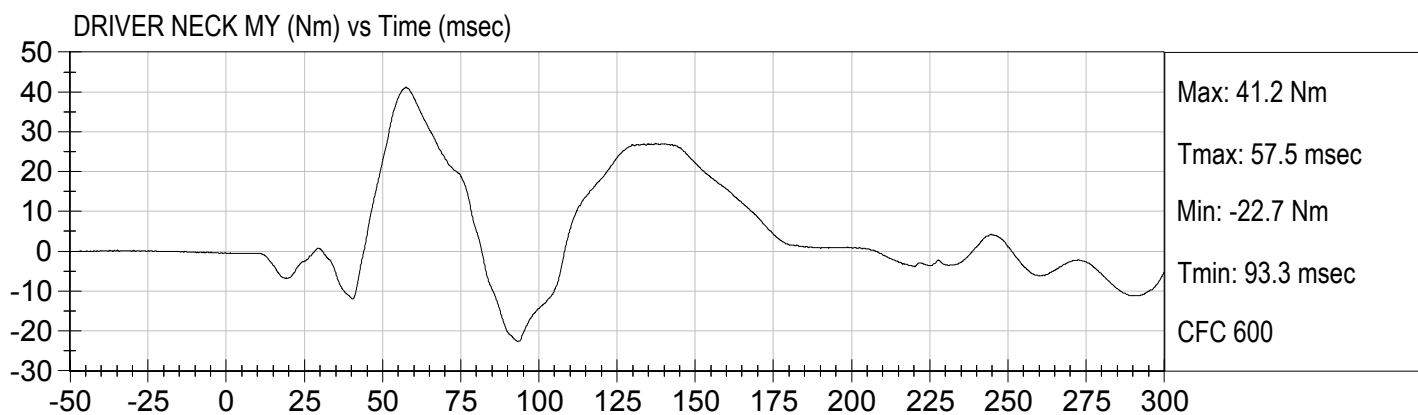
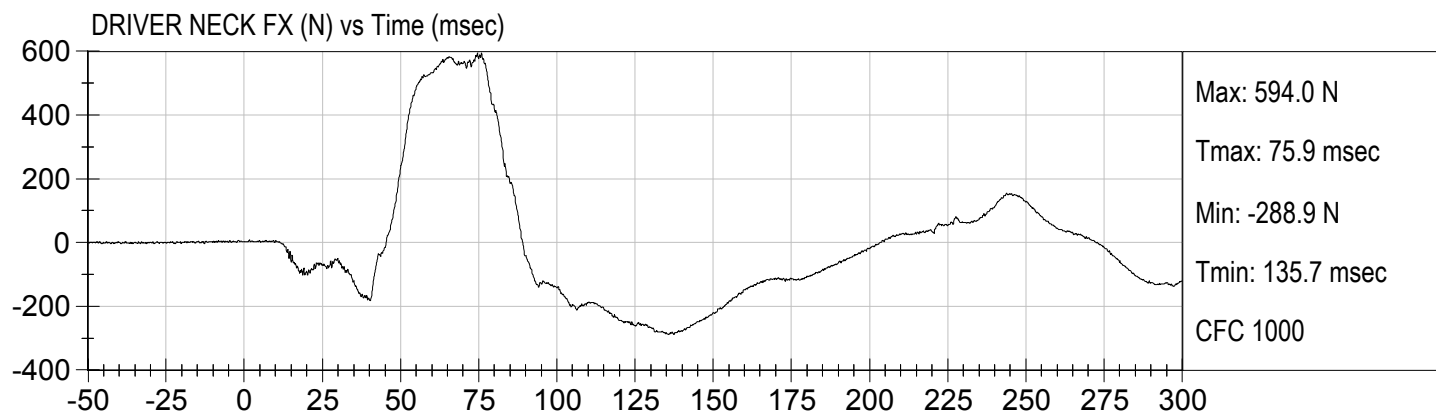
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Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower 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
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Passenger Chest Y Redundant
Passenger Chest Z Redundant
Passenger Pelvis X
Passenger Pelvis Y

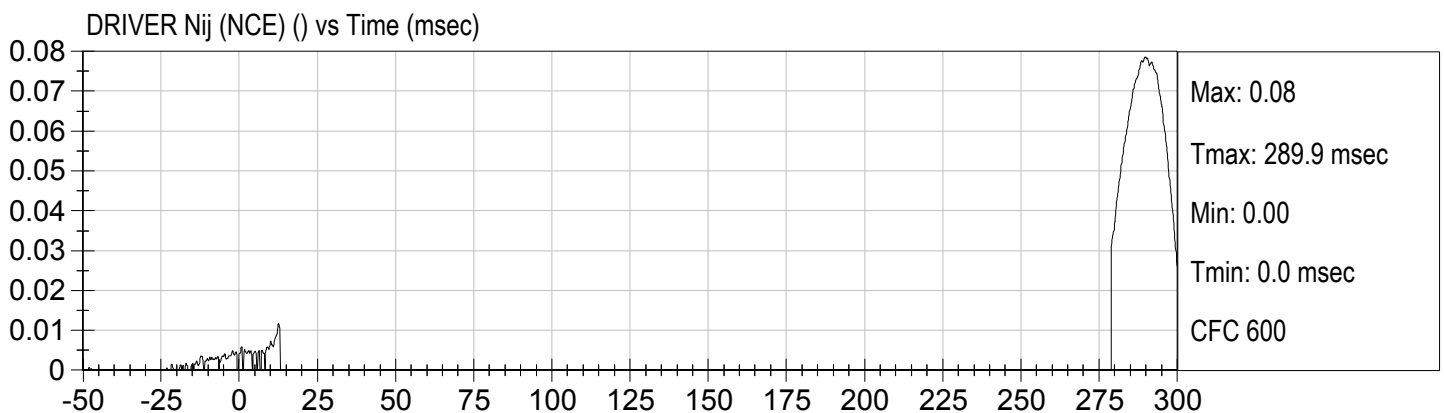
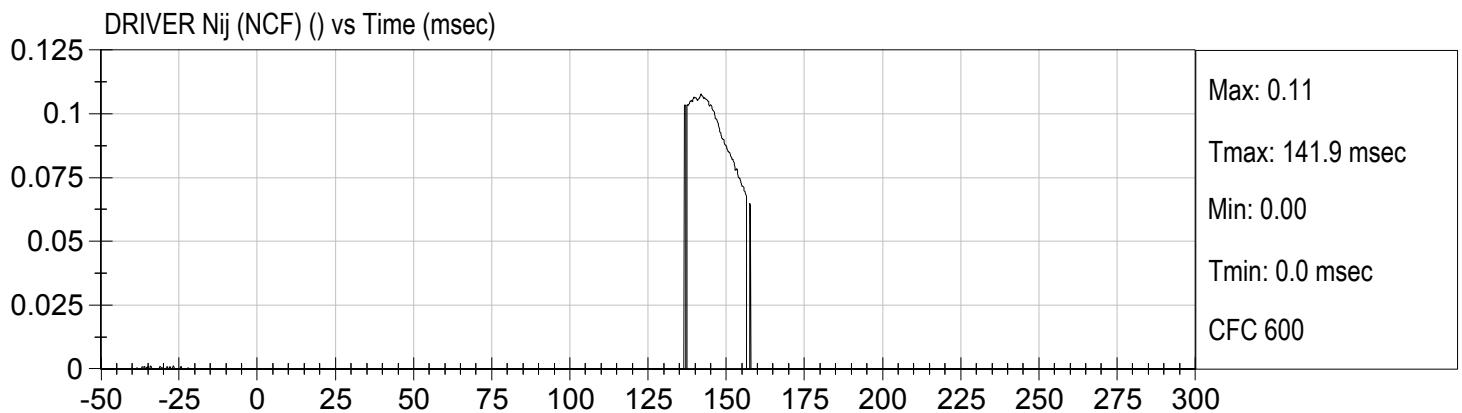
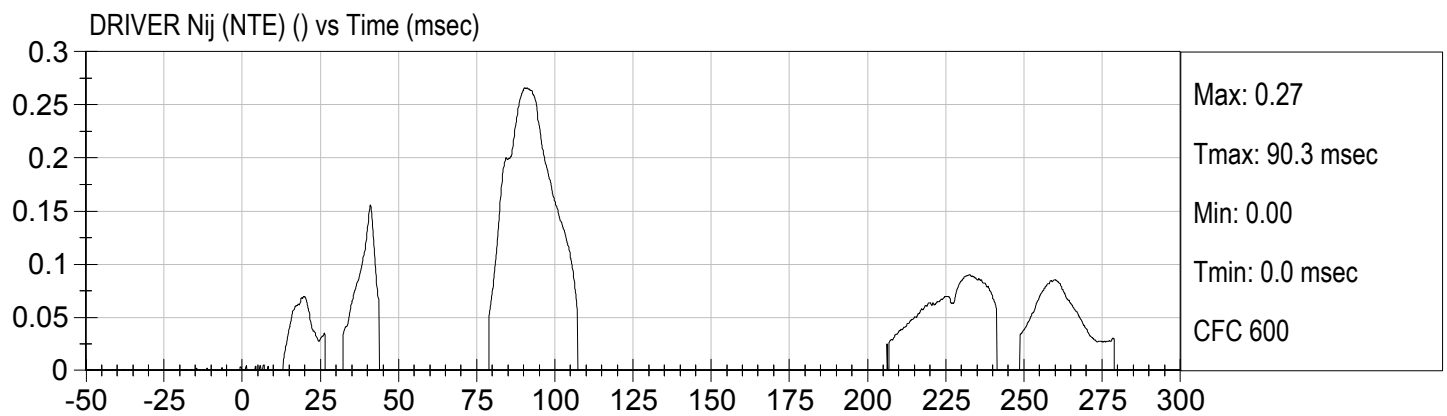
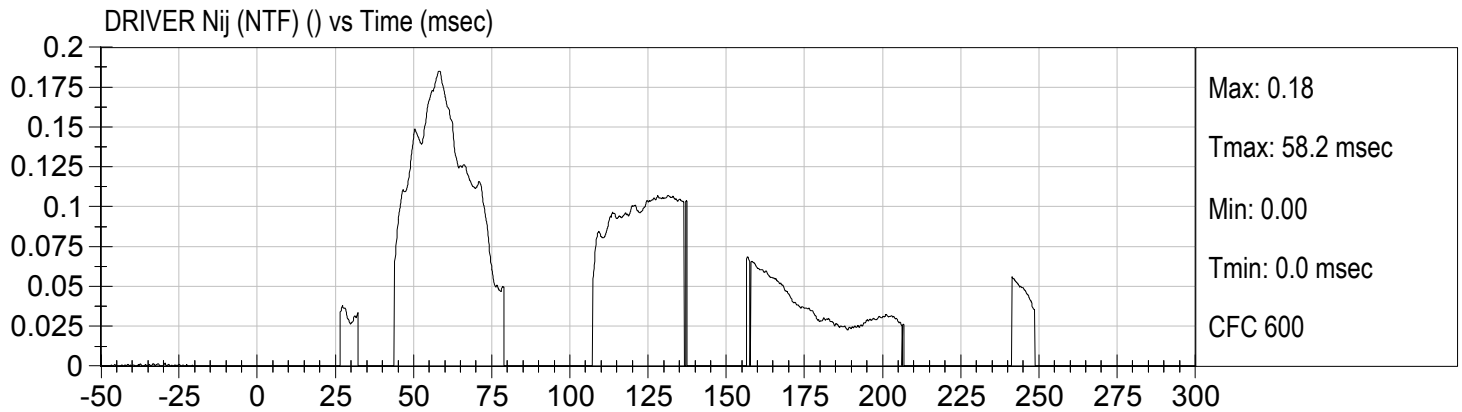
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Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Lap Belt Force
Passenger Shoulder Belt Force
Left Rear Seat Crossmember X
Right Rear Seat Crossmember X
Vehicle Engine Top X
Vehicle Engine Bottom X
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

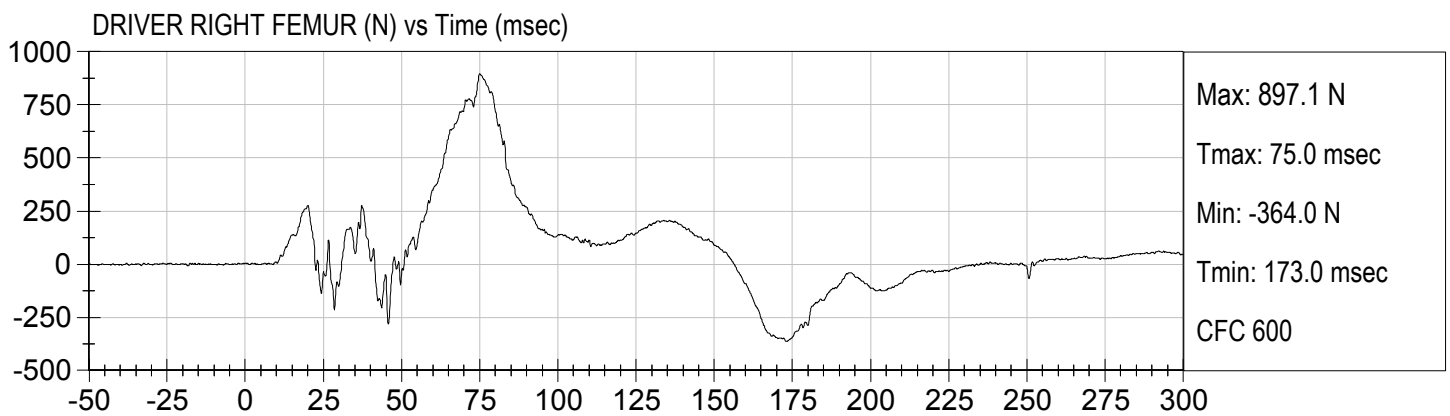
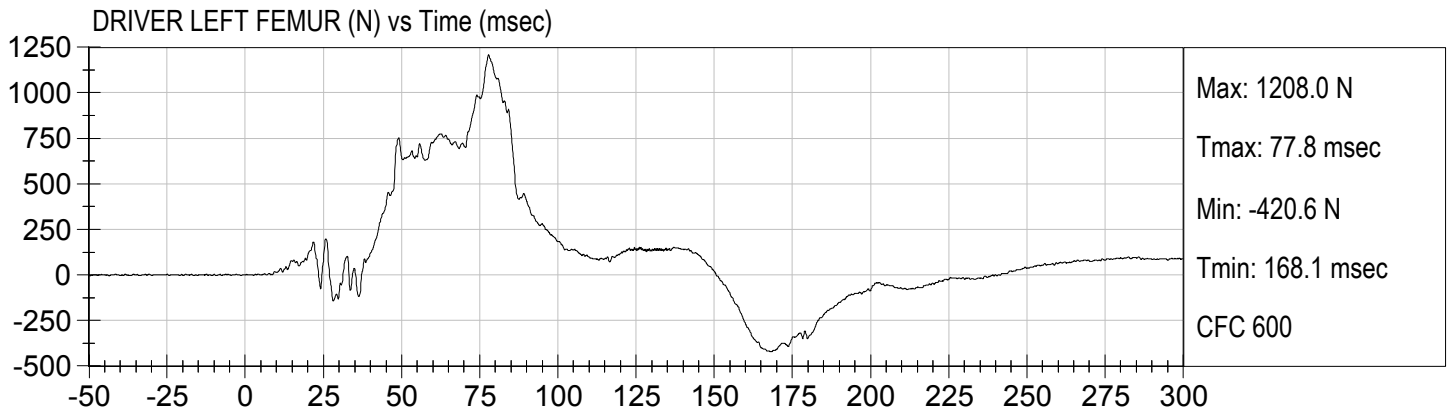


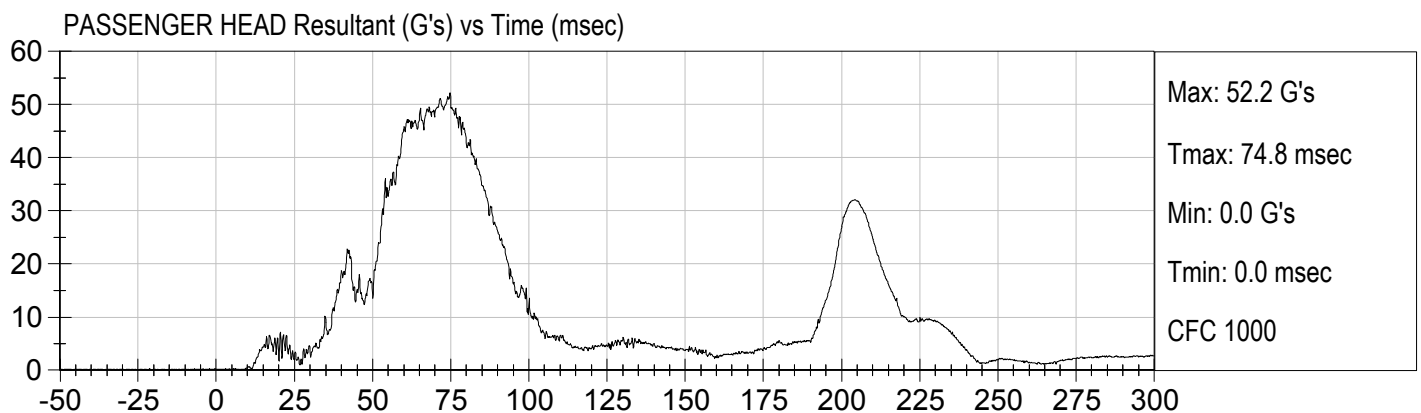
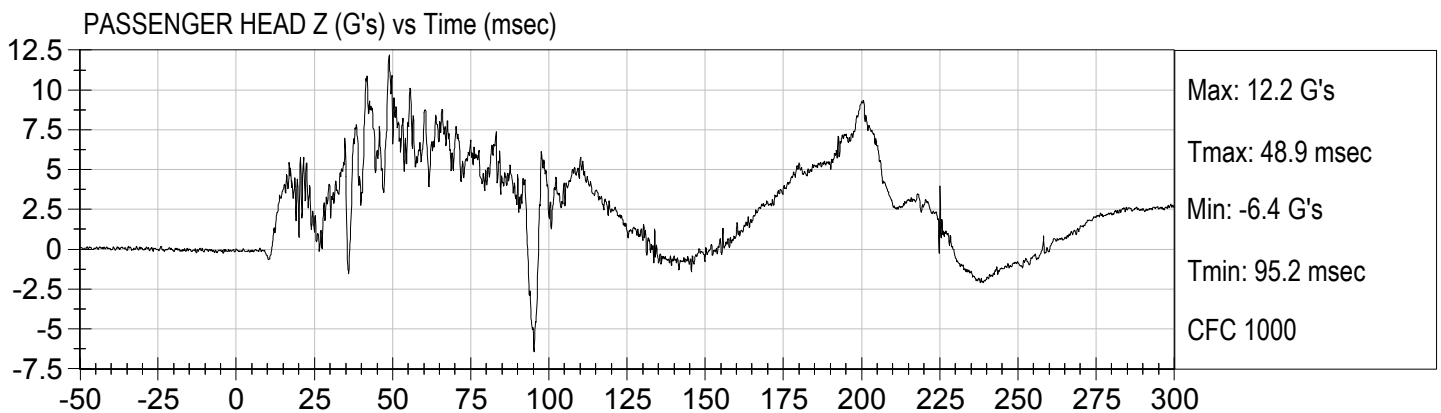
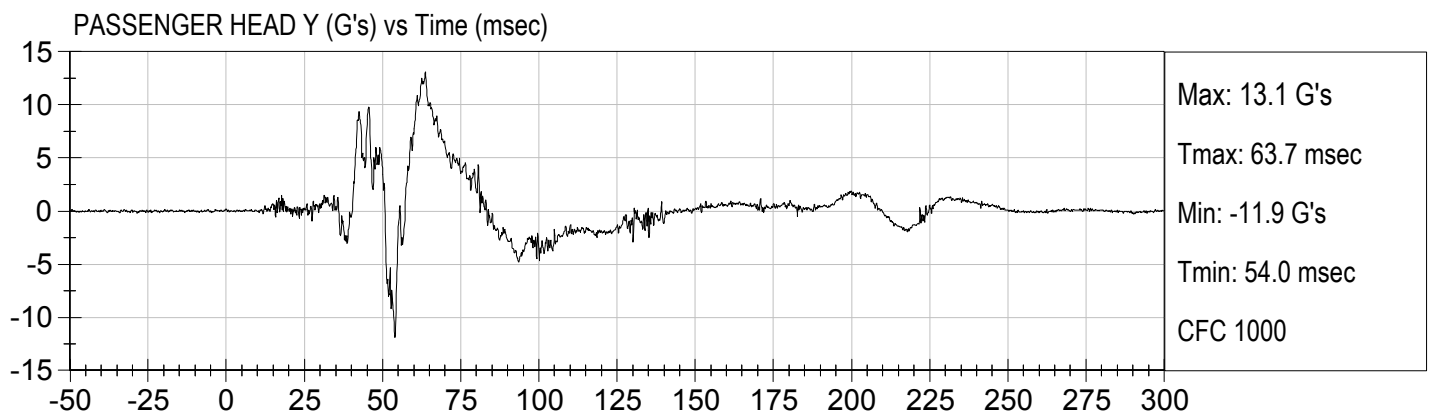
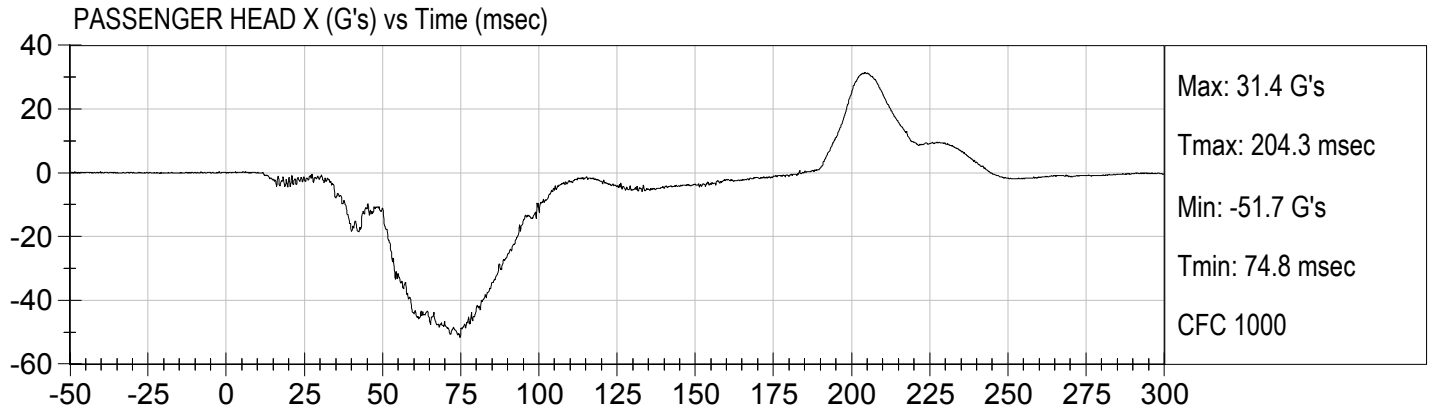


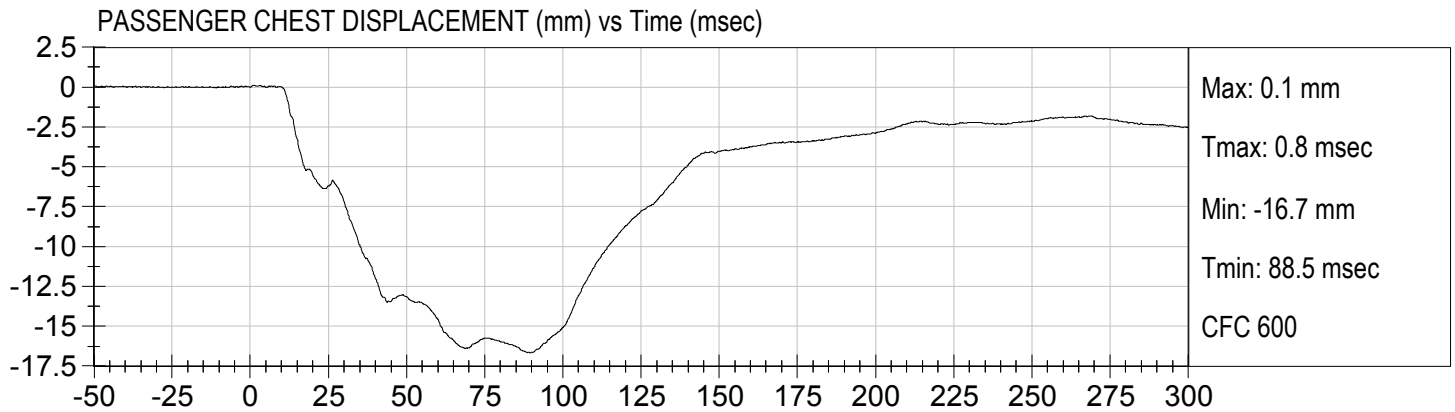


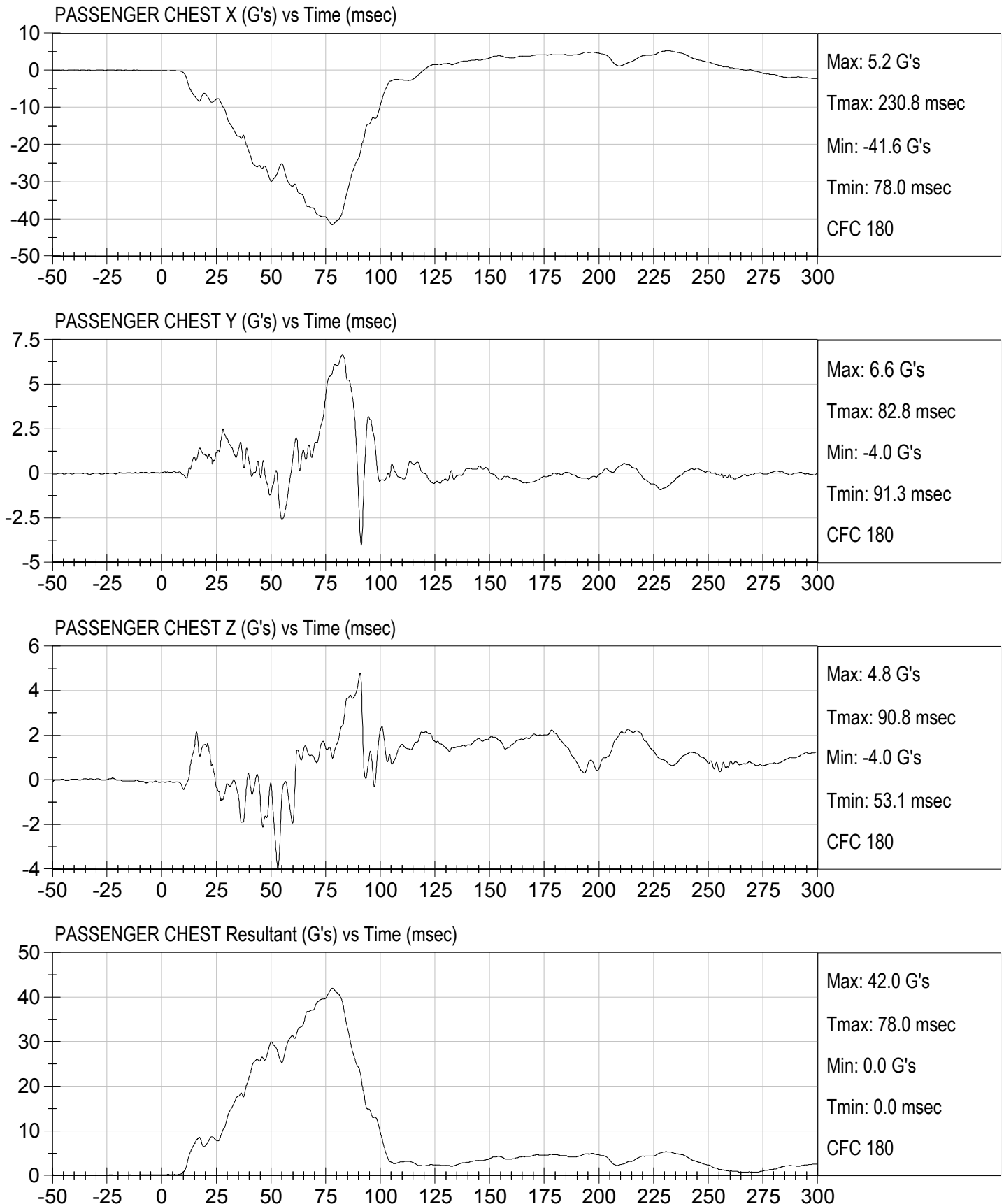


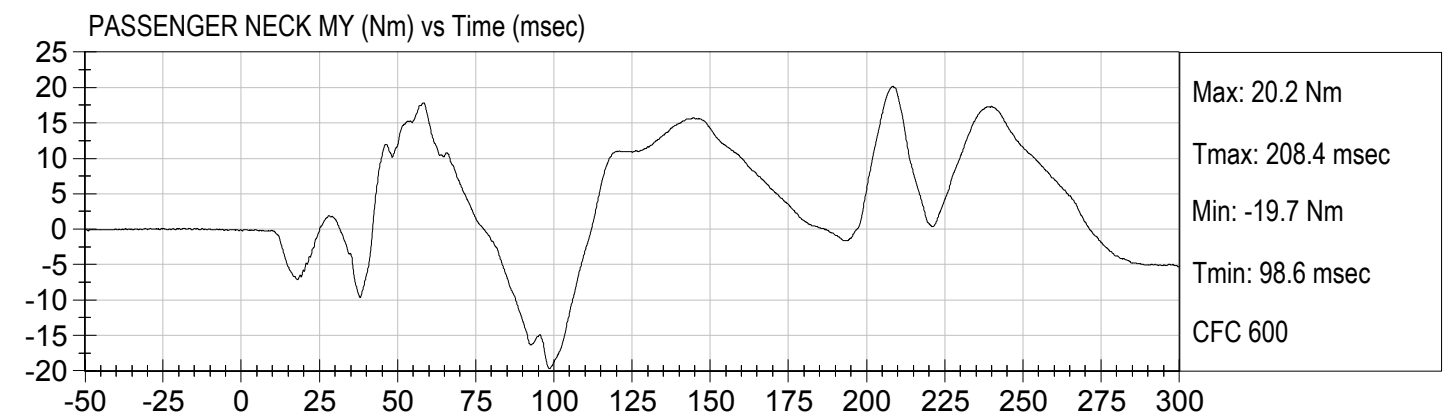
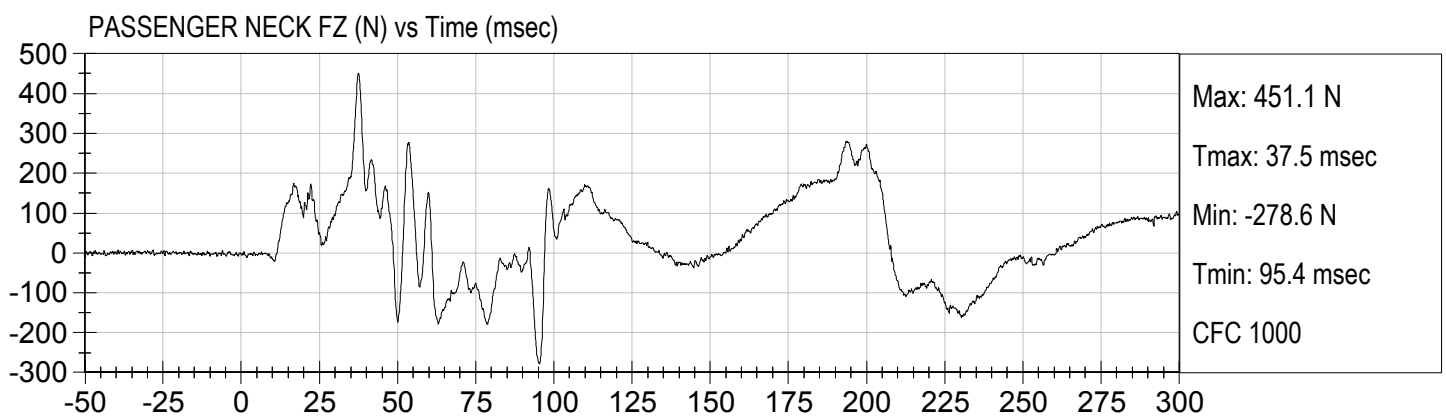
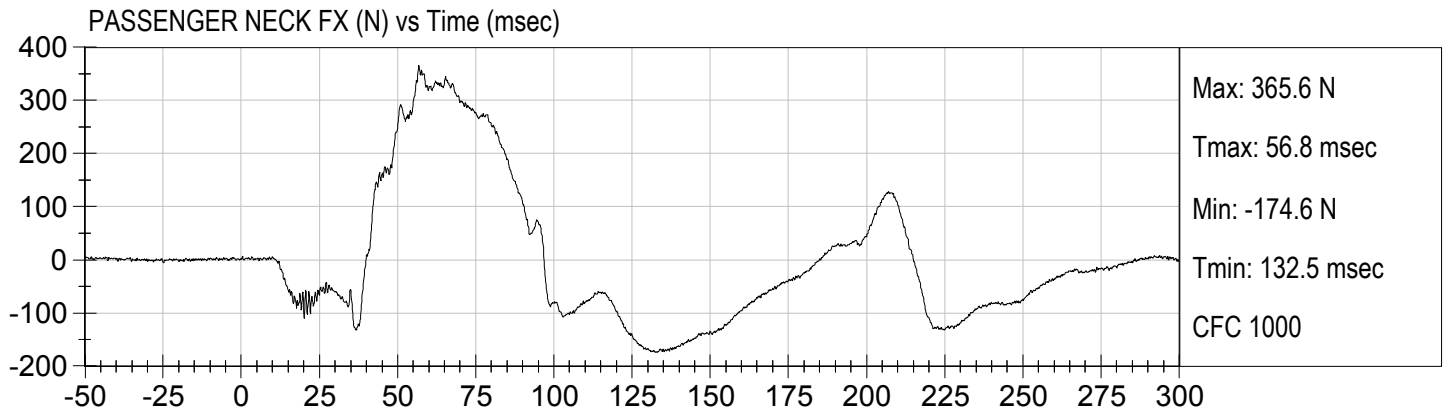


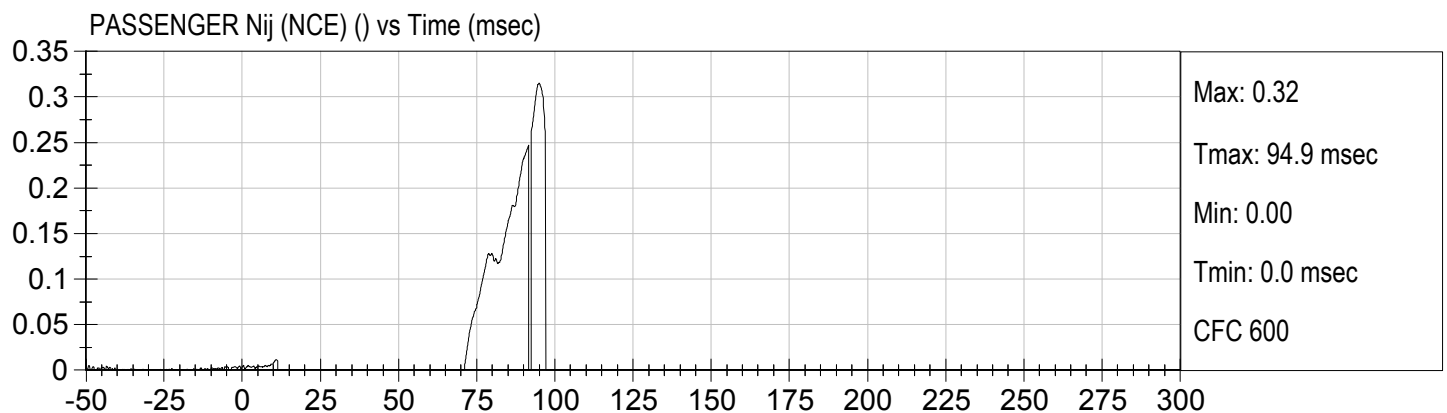
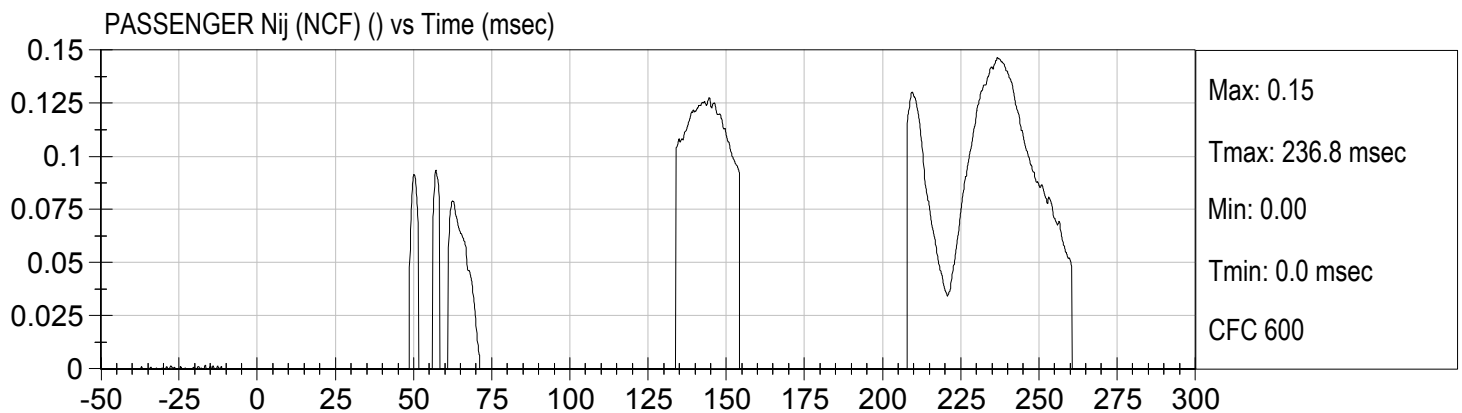
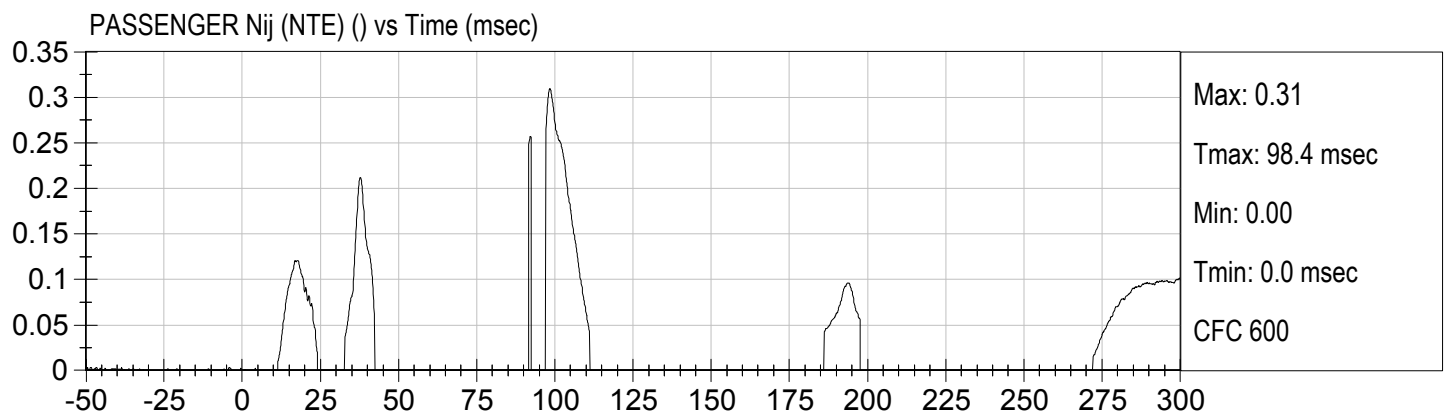
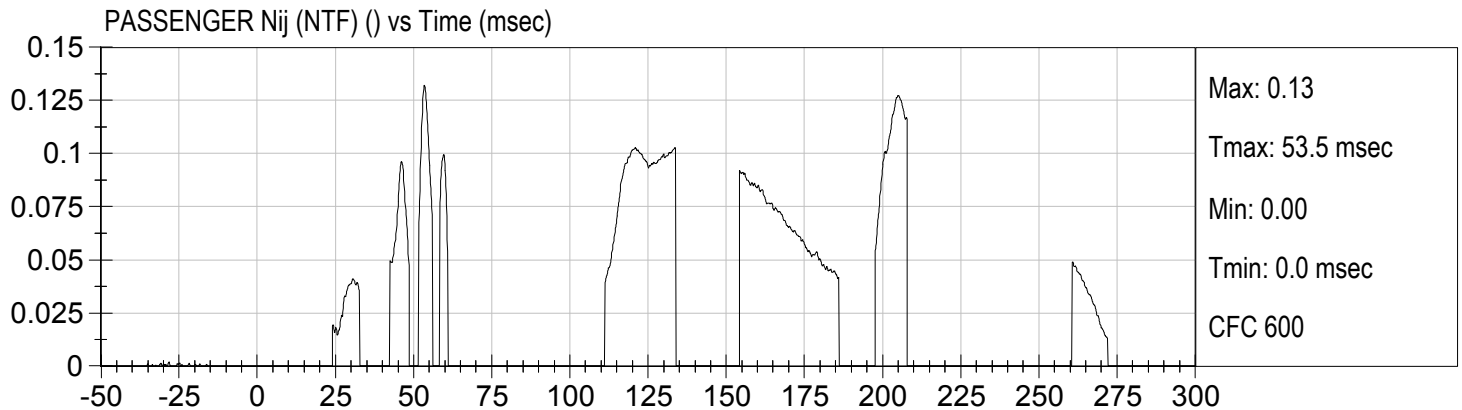


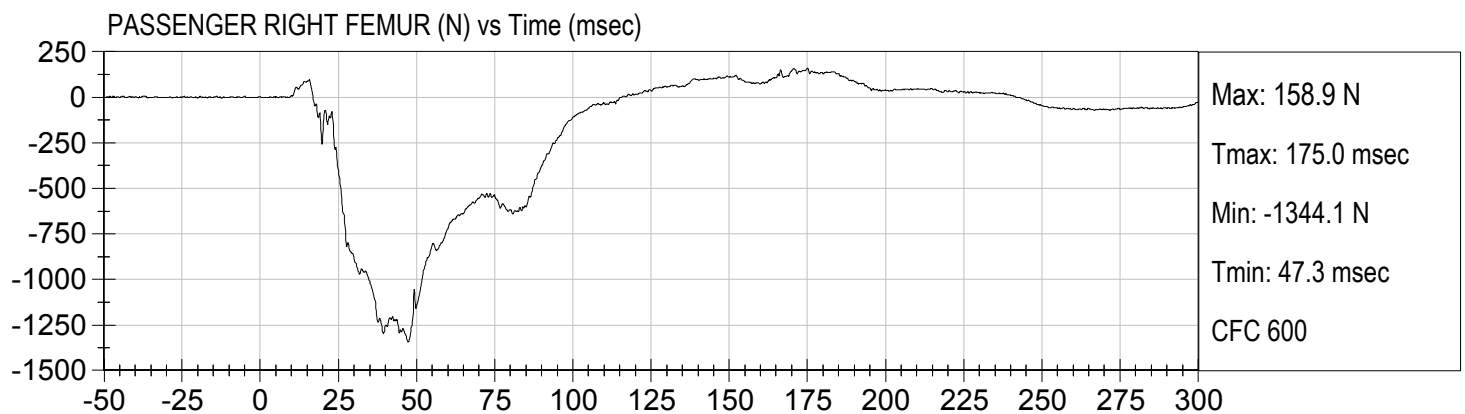
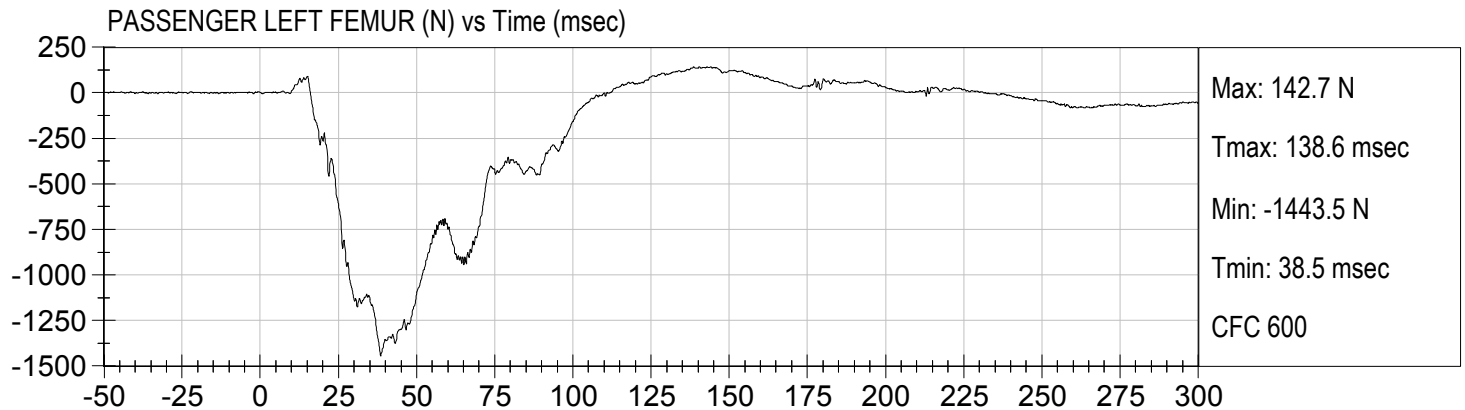












APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

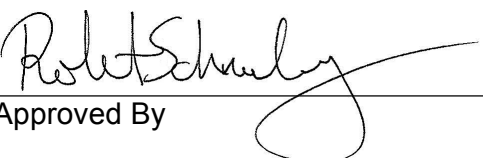
Test ID: D171681

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Peak Resultant Acceleration	G's	225 to 275	249	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	5.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

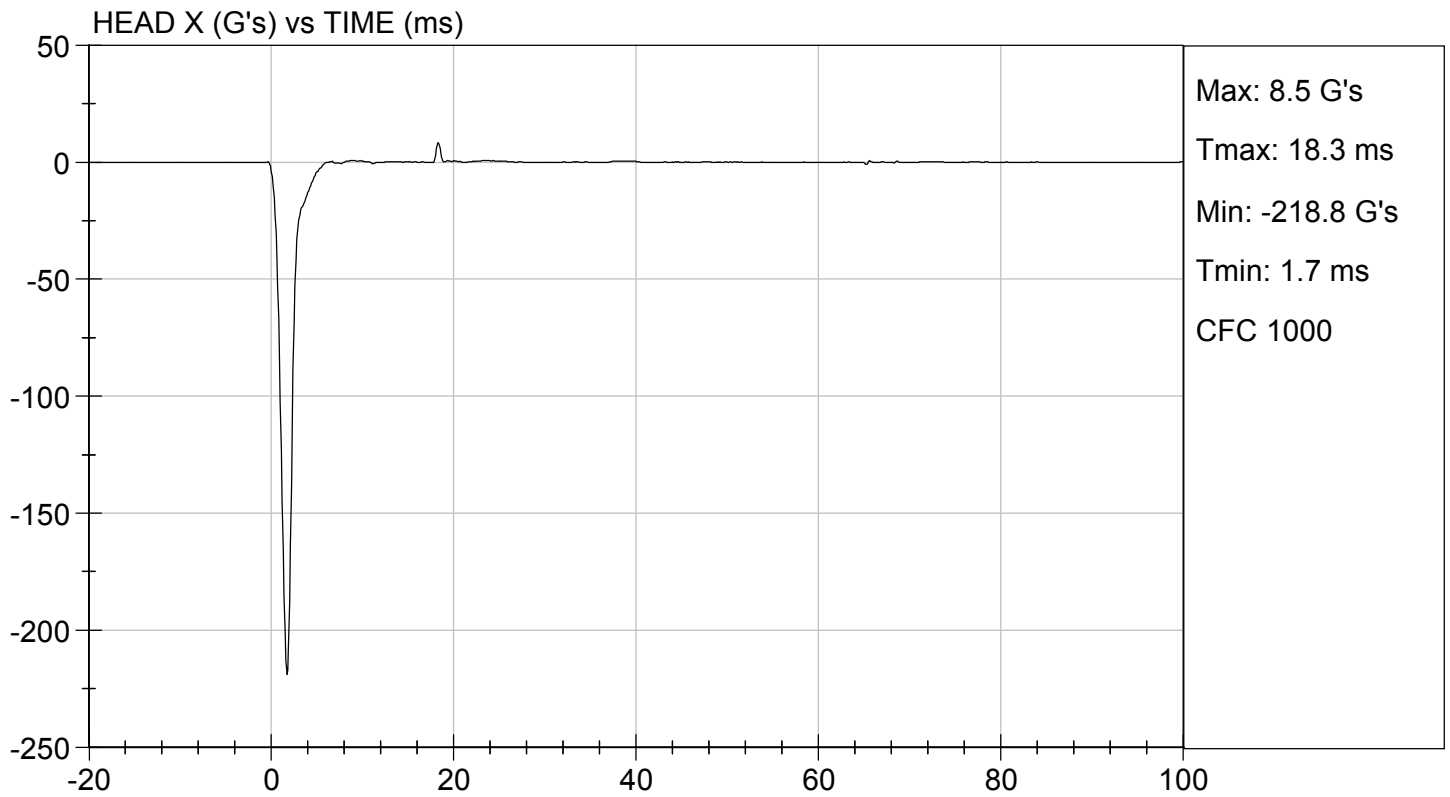
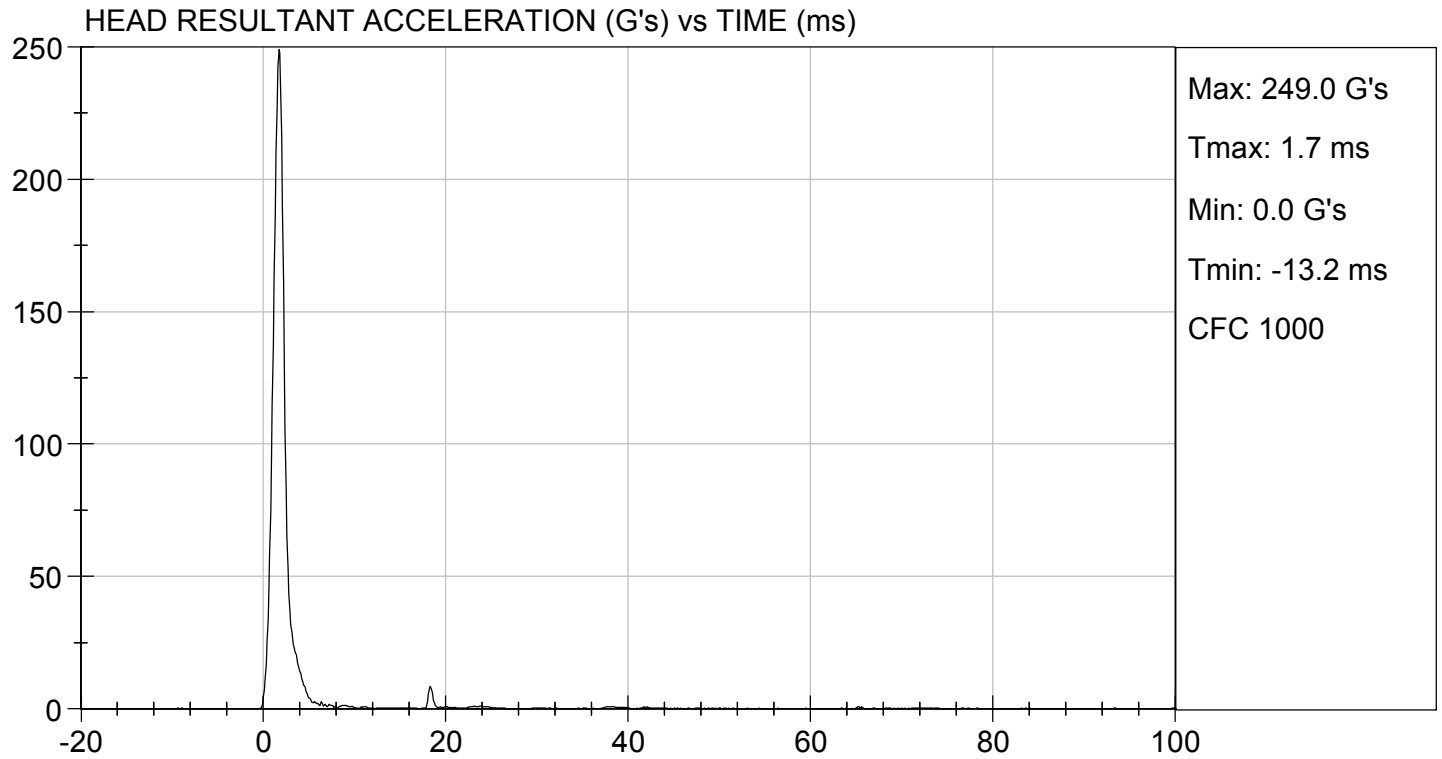


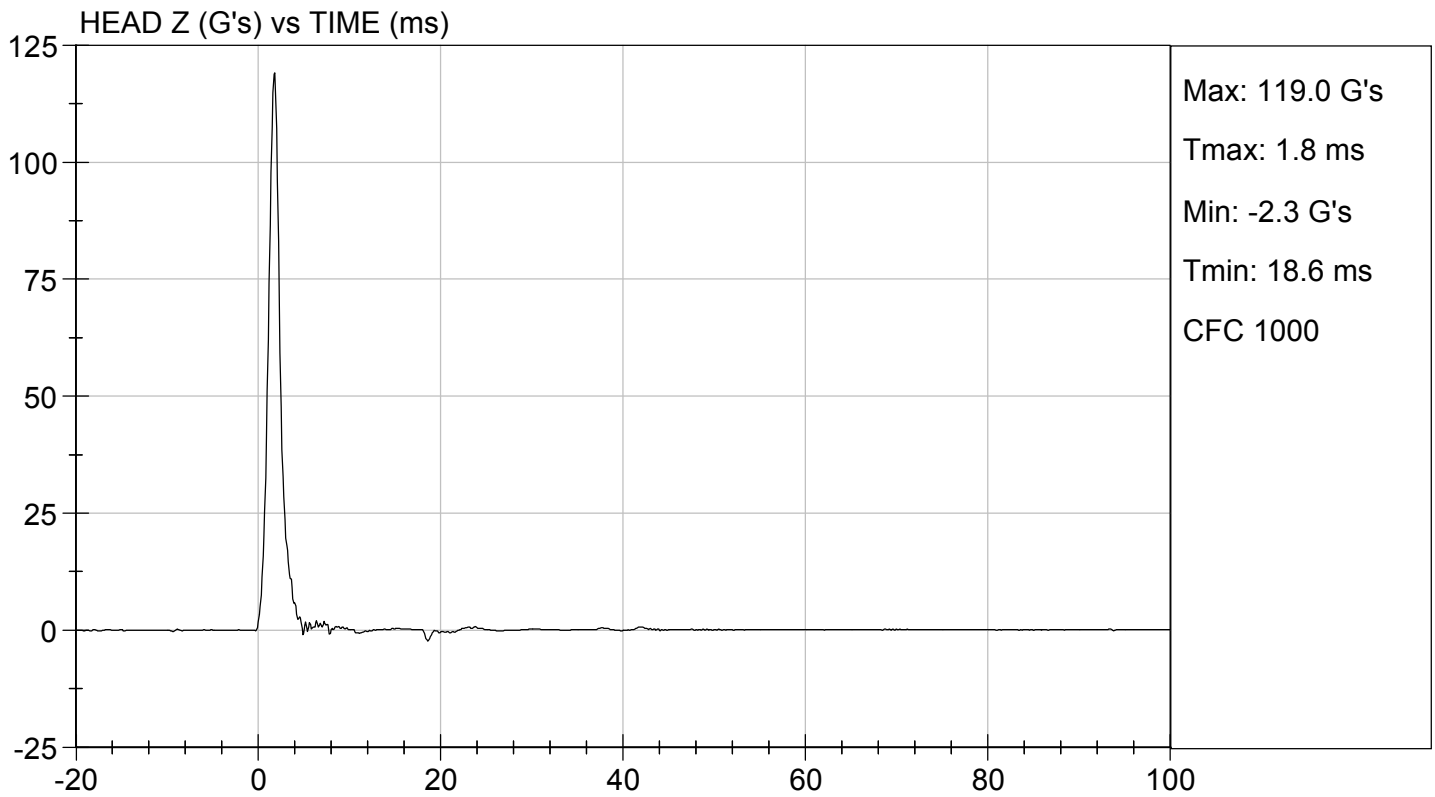
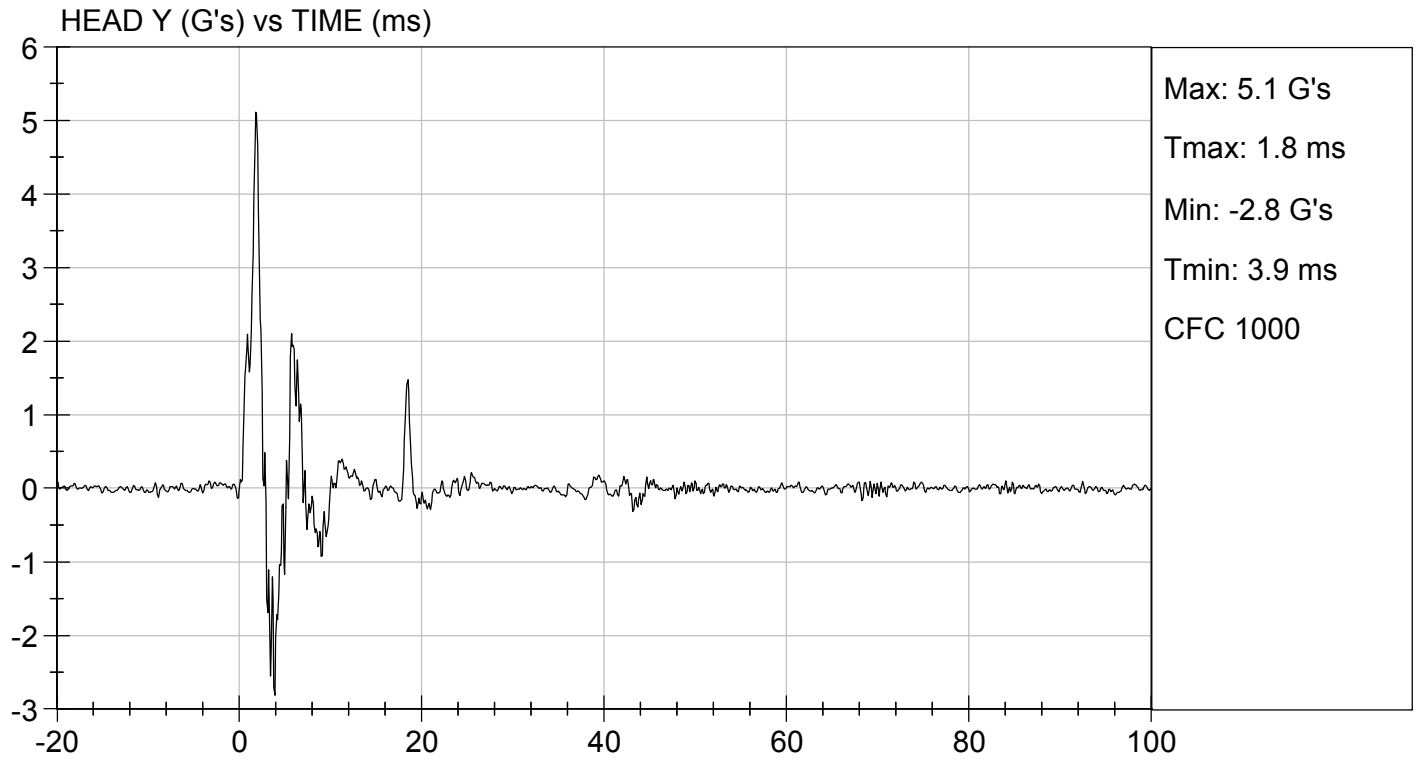
Laboratory Technician

06/14/2017
Test Date



Approved By





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

ATD Serial No: 351

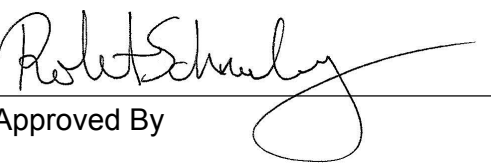
Test I.D: D171682

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.36	Pass
	20 ms	G's	17.60 to 22.60	20.66	Pass
	30 ms	G's	12.50 to 18.50	15.64	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.5	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.5	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	71.4	Pass
	Time	ms	57.0 to 64.0	60.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	120.6	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	88.5	Pass
	Time	ms	47.0 to 58.0	50.3	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.7	Pass
Overall Test Results					Pass


 Laboratory Technician

06/14/2017

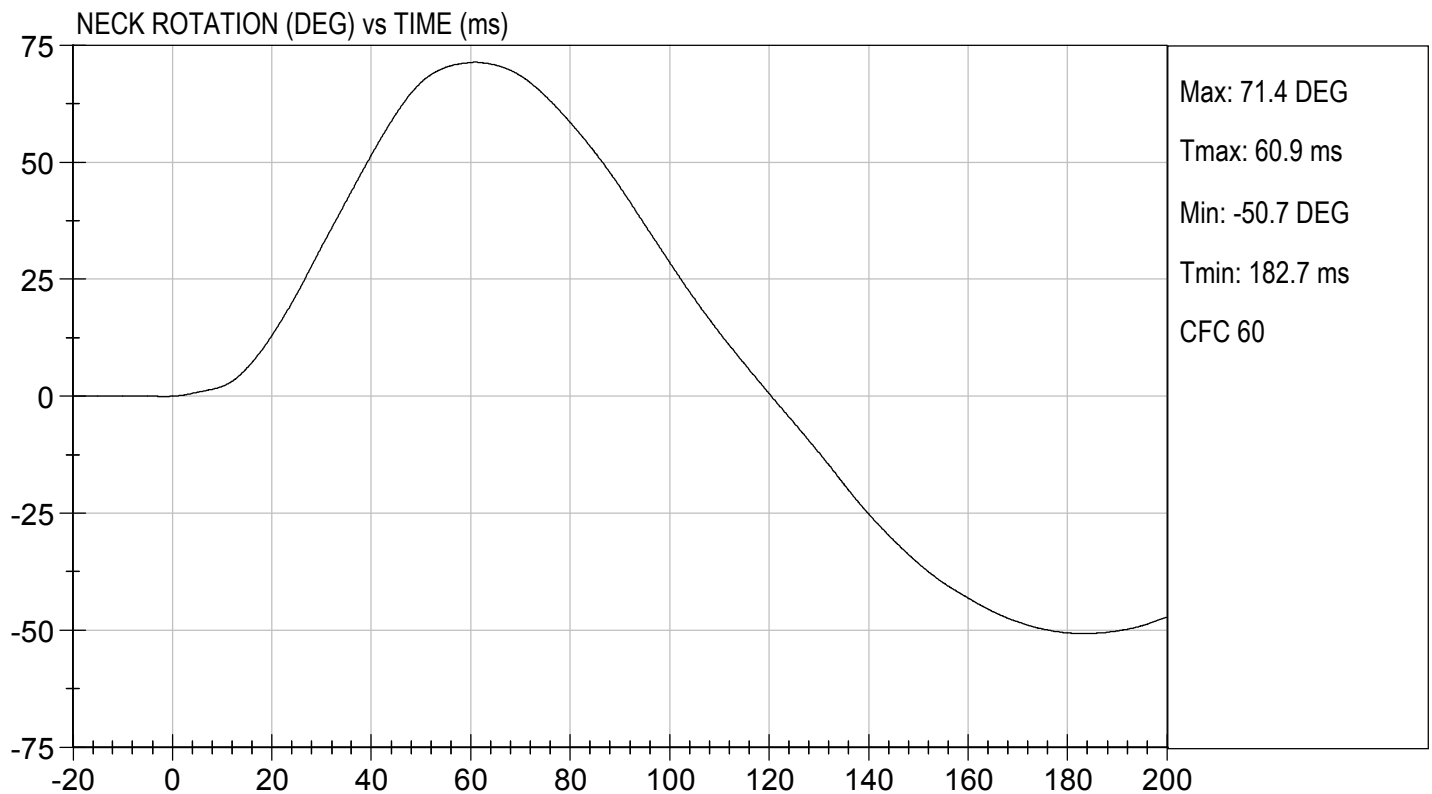
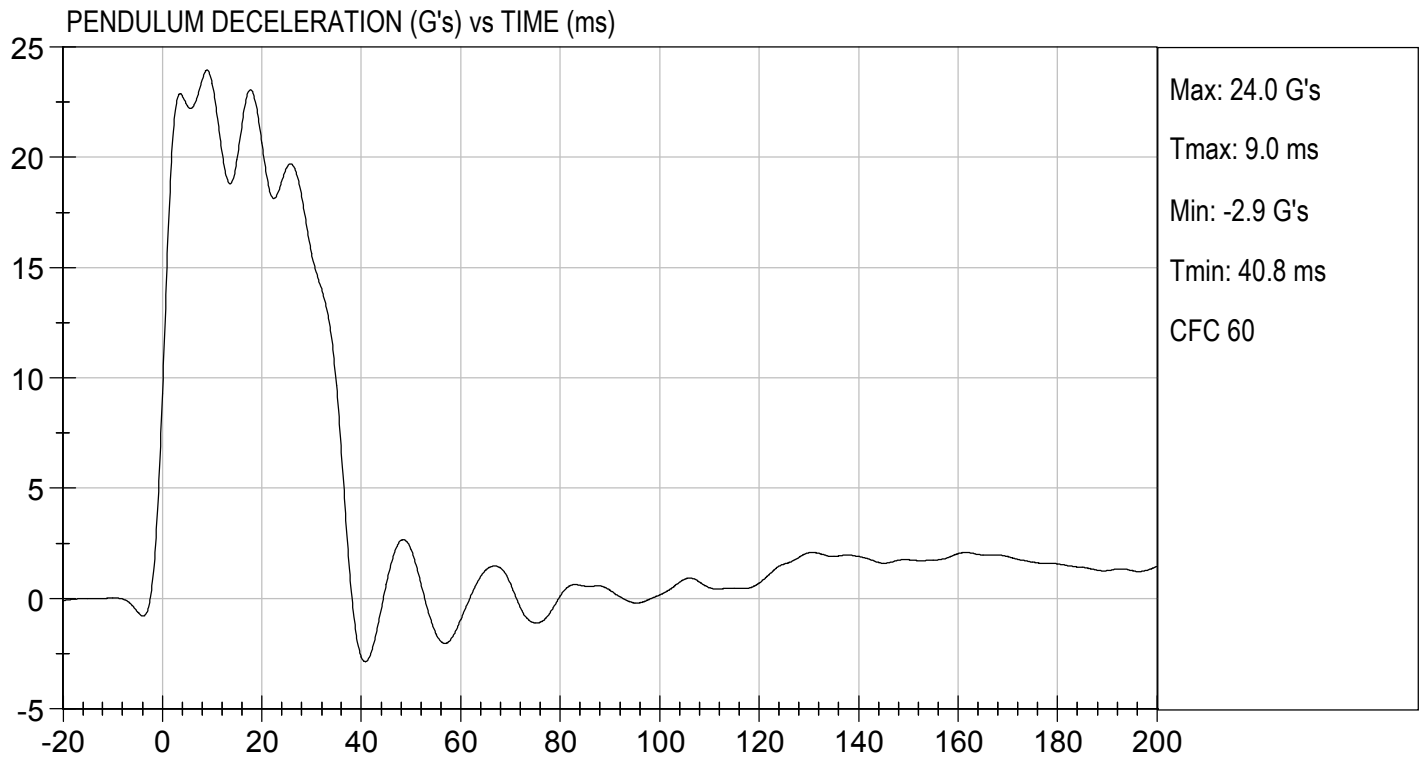
Test Date


 Approved By



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

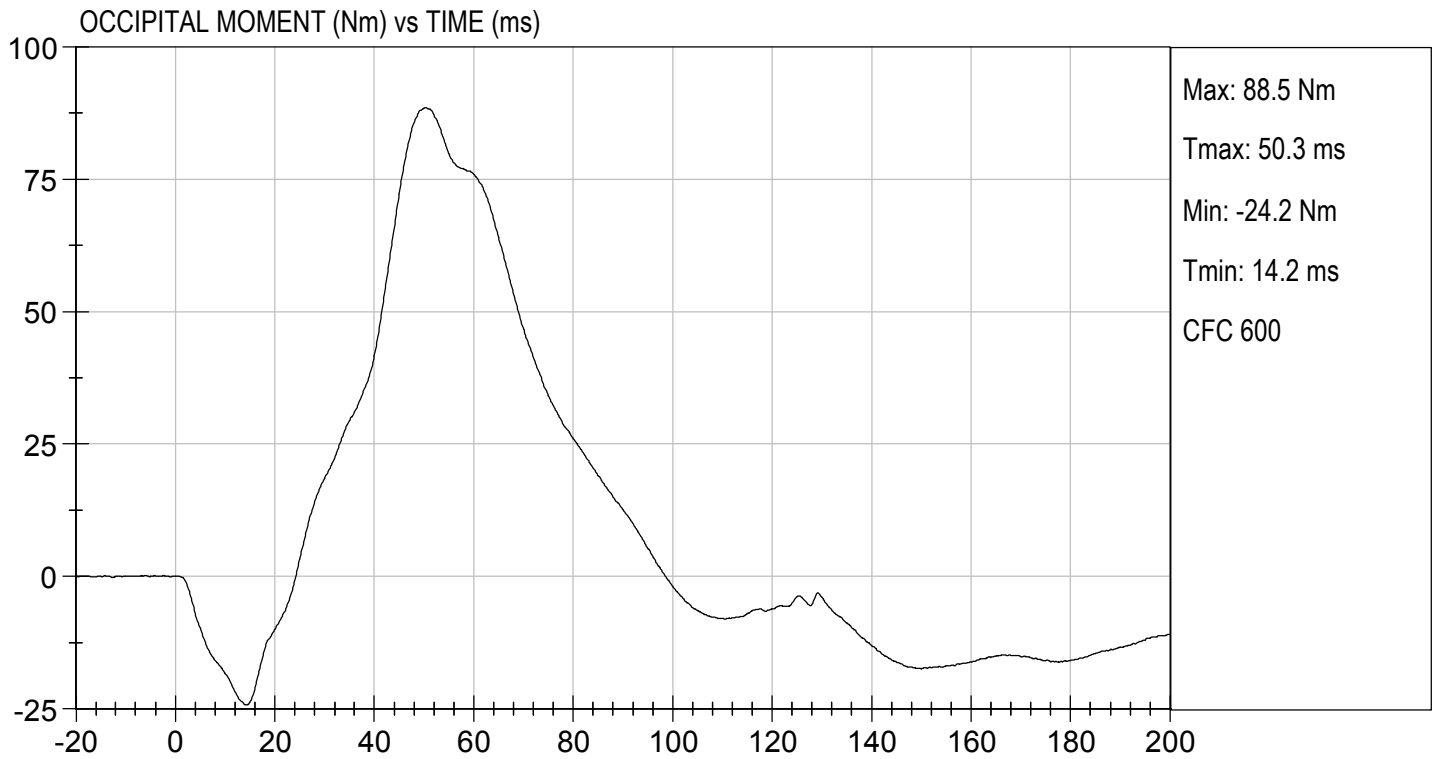
TEST DATE: 06/14/2017
TEST #: D171682





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

TEST DATE: 06/14/2017
TEST #: D171682



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

ATD Serial No: 351

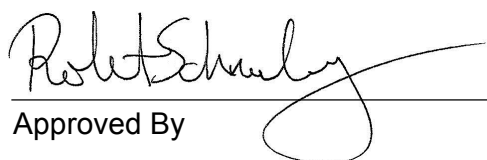
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Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	5.95 to 6.19	5.97	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.13	Pass
	20 ms	G's	14.00 to 19.00	14.81	Pass
	30 ms	G's	11.00 to 16.00	12.96	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	101.9	Pass
	Time	ms	72.0 to 82.0	80.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	166.8	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-60.7	Pass
	Time	ms	65.0 to 79.0	73.4	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	147.4	Pass
Overall Test Results					Pass


 Laboratory Technician

06/14/2017

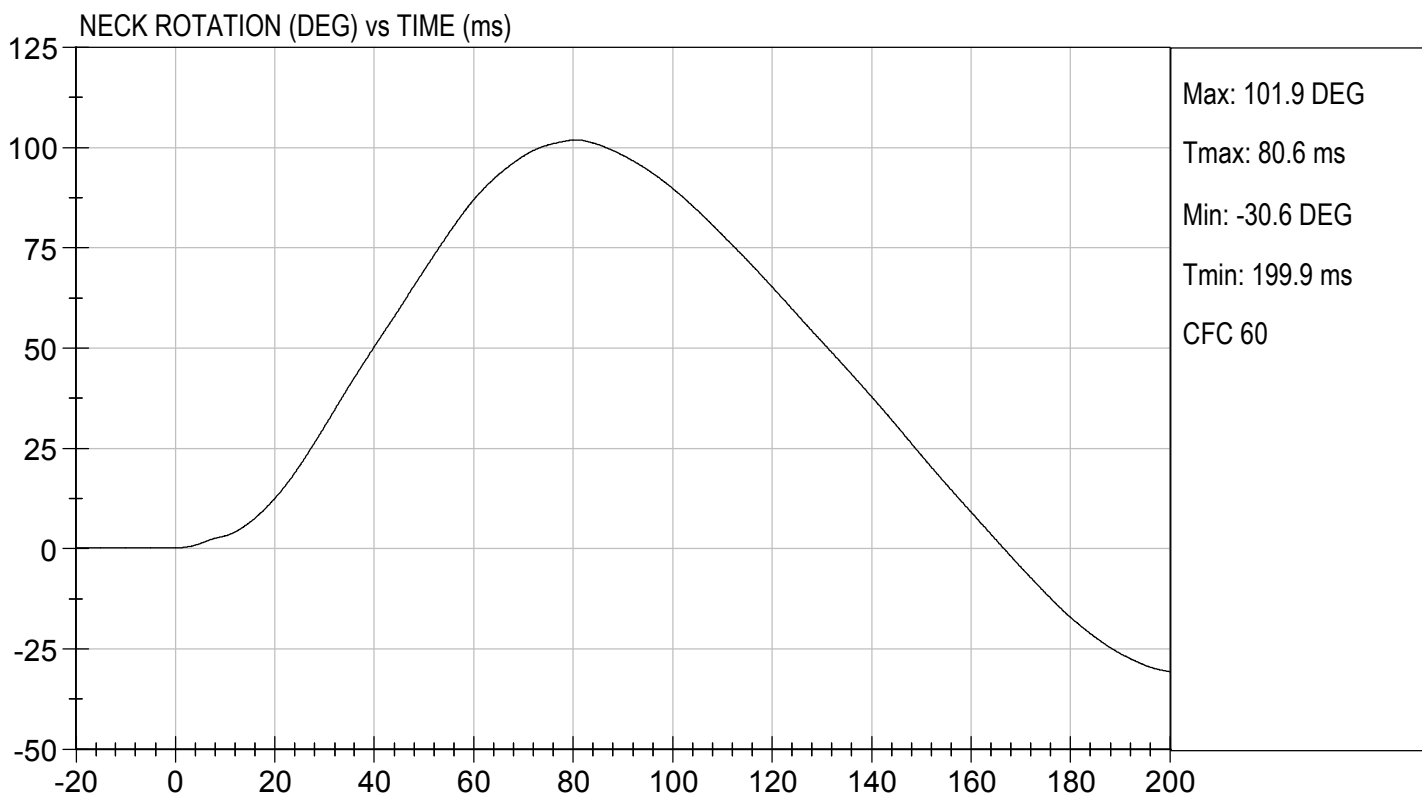
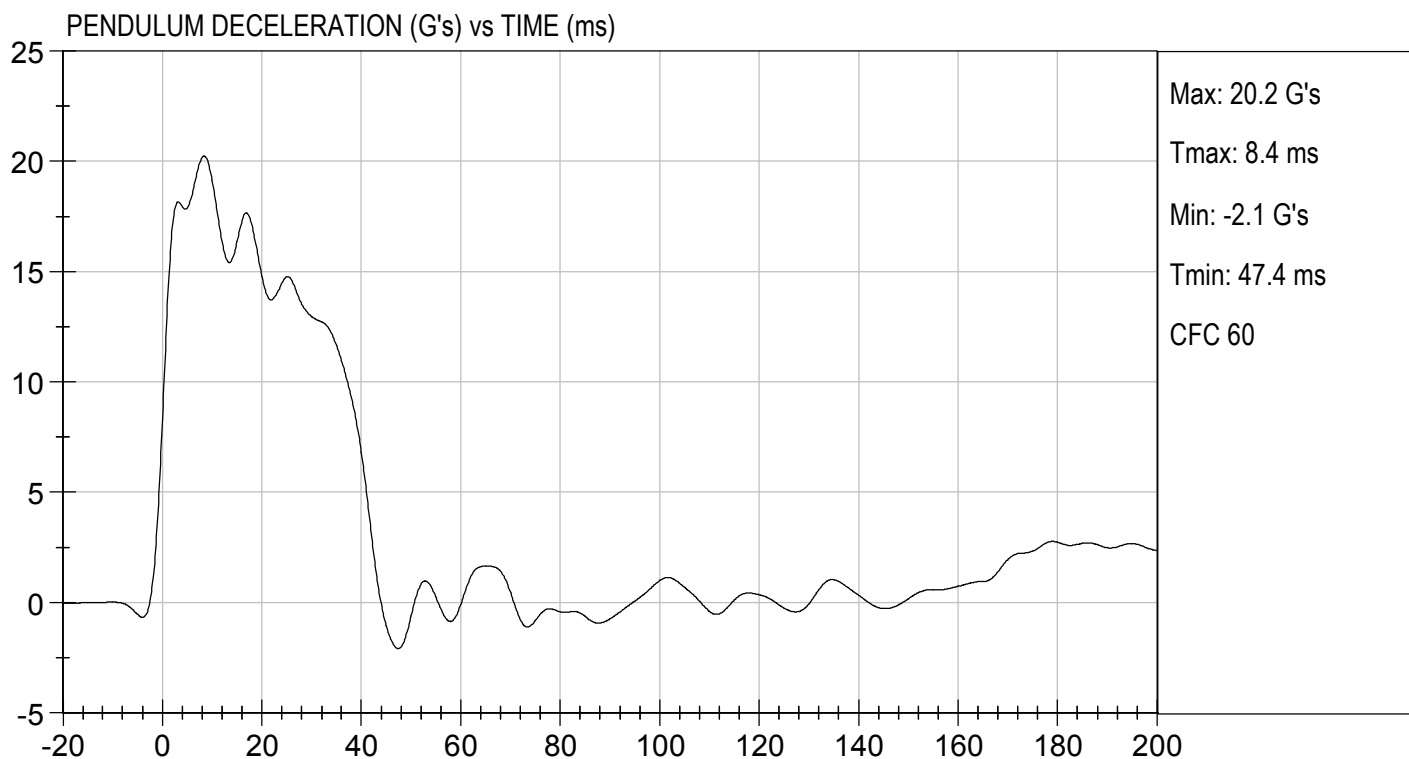
Test Date


 Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 19.60 ft/s, 5.97 m/s

TEST DATE: 06/14/2017
TEST #: D171683





TEST DESC: NECK EXTENSION
VELOCITY: 19.60 ft/s, 5.97 m/s

TEST DATE: 06/14/2017
TEST #: D171683



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

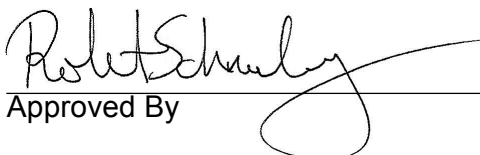
Test I.D: D171684

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,778	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.65	Pass
Internal Hysteresis	%	69 to 85	72	Pass
			Overall Test Results	Pass



Laboratory Technician

06/14/2017
Test Date

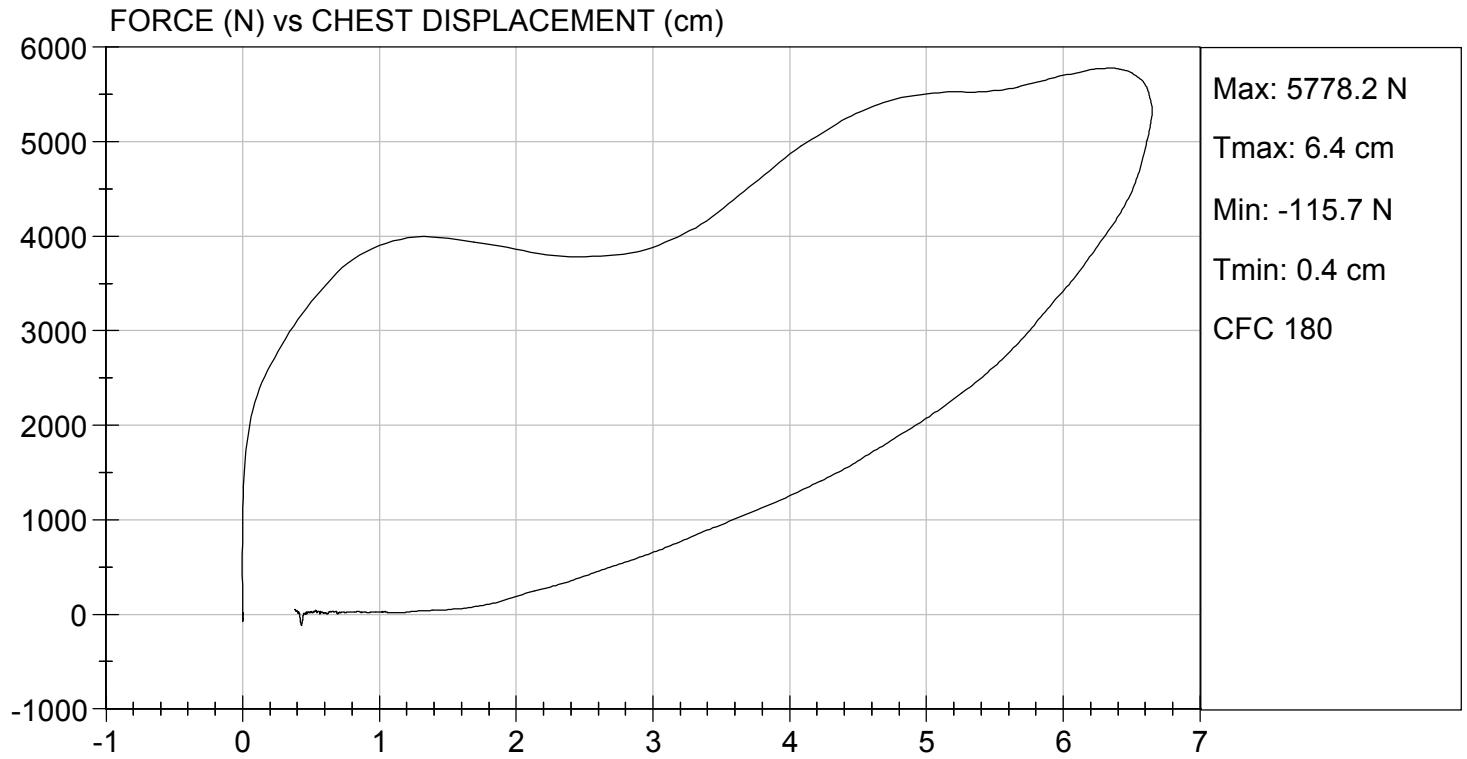


Approved By



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

TEST DATE: 06/14/2017
TEST #: D171684



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

ATD Serial No: 351

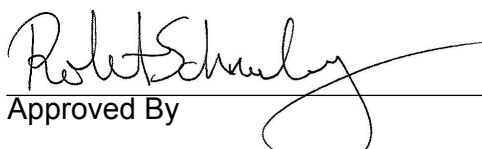
Test I.D: D171685

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,216	Pass
Overall Test Results				Pass



Laboratory Technician

06/14/2017
Test Date

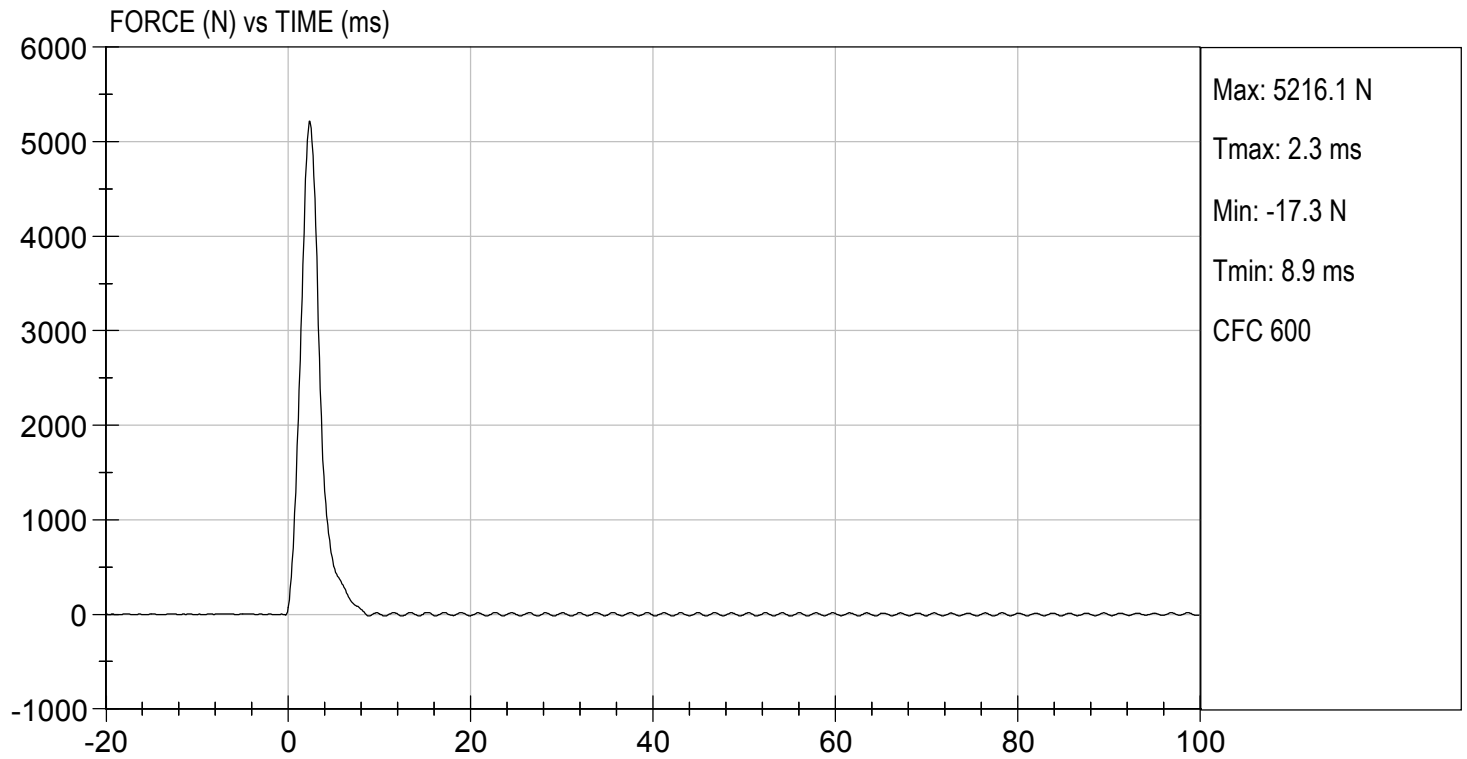


Approved By



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

TEST DATE: 06/14/2017
TEST #: D171685



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

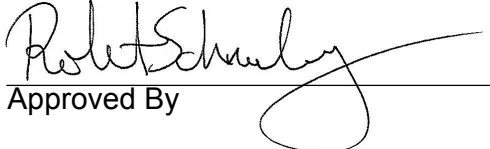
ATD Serial No: 351

Test I.D: D171686

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	4,948	Pass
Overall Test Results				Pass


Laboratory Technician

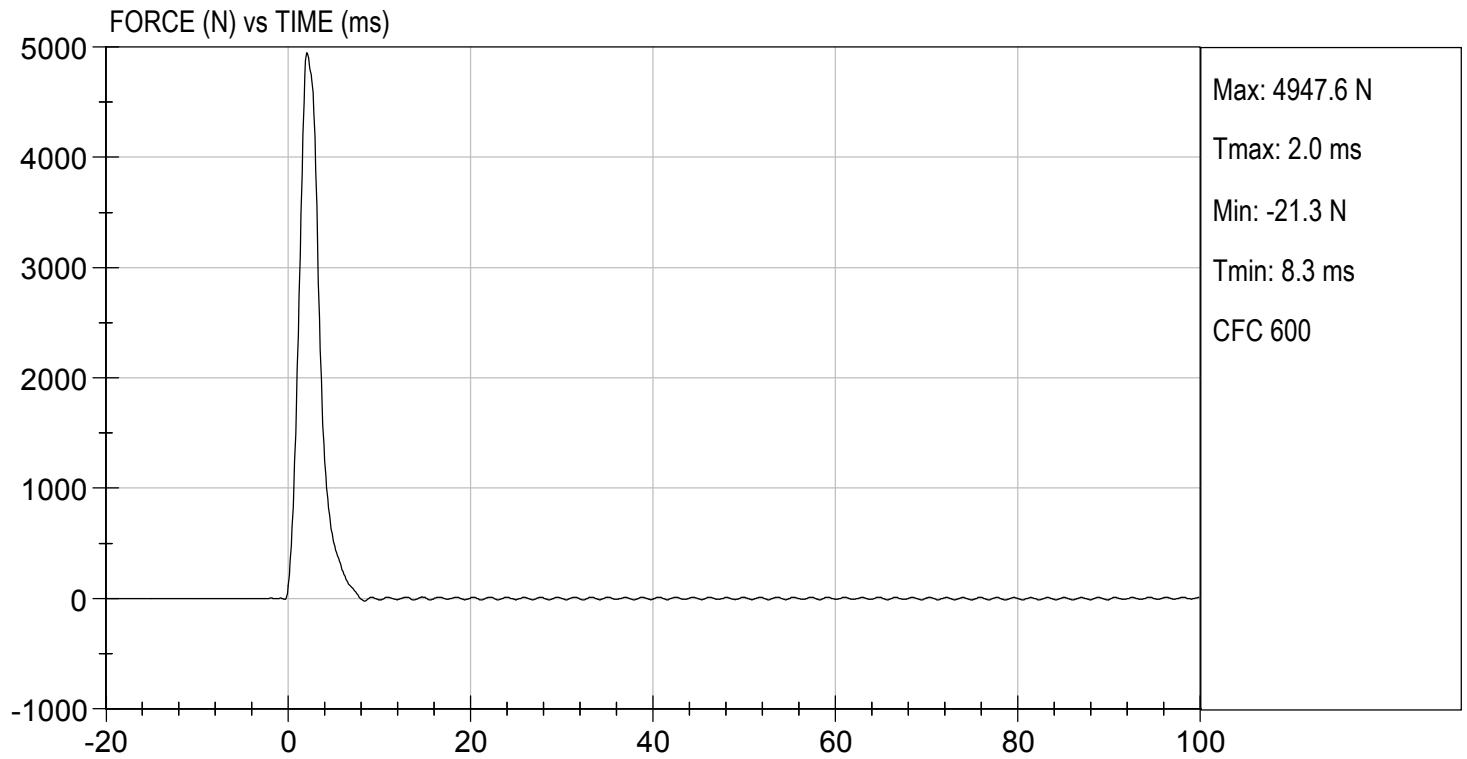
06/14/2017
Test Date


Approved By



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

TEST DATE: 06/14/2017
TEST #: D171686



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

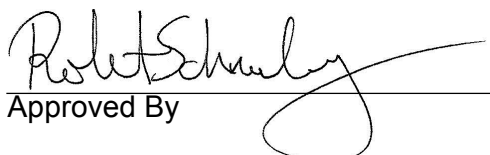
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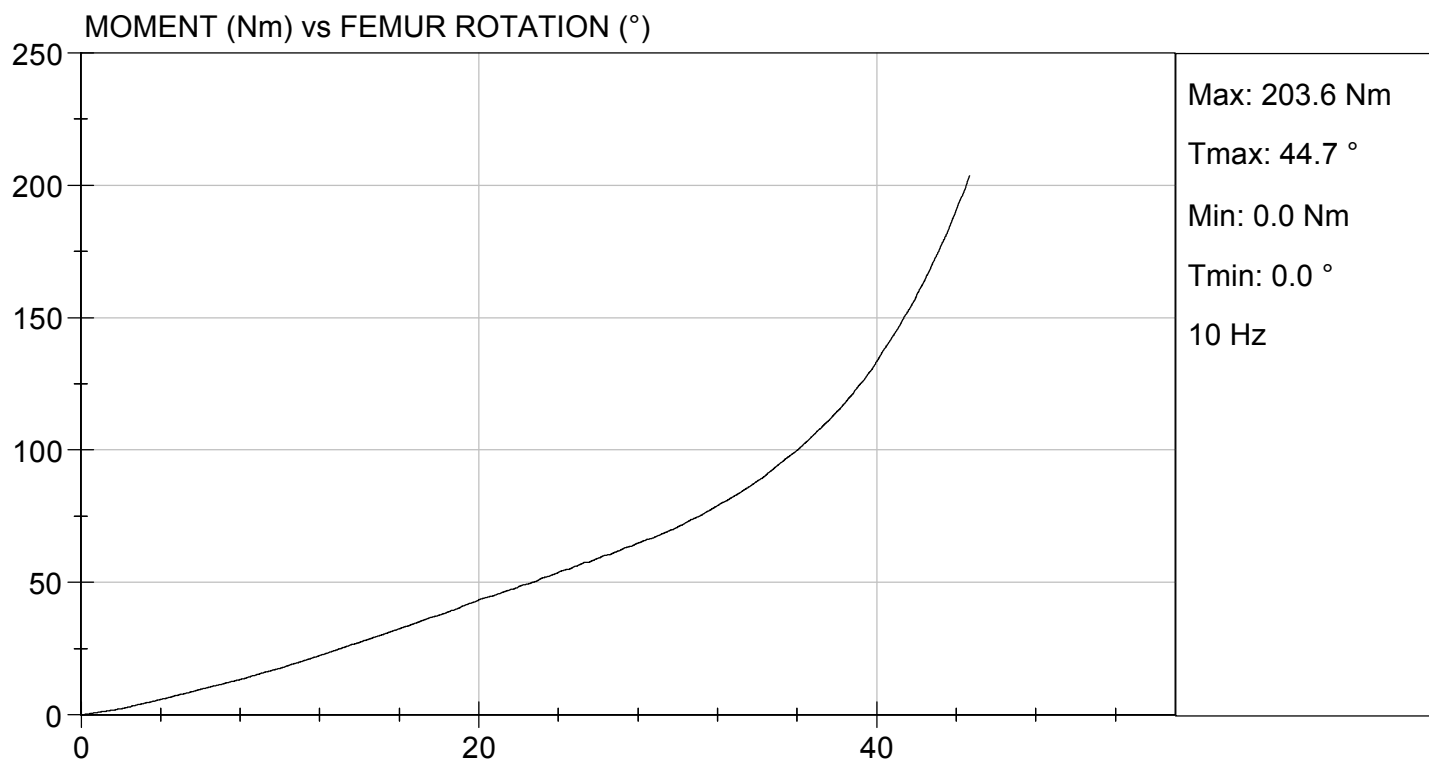
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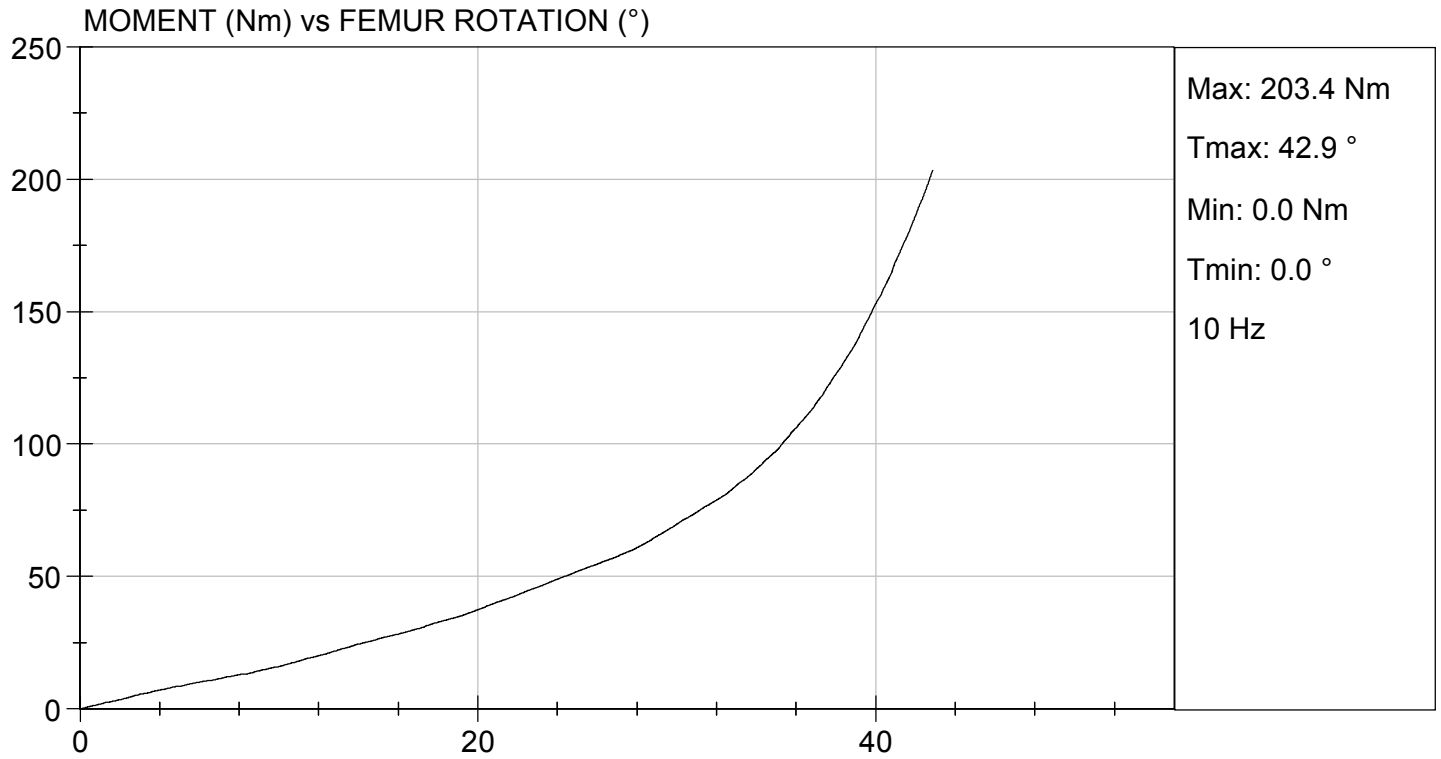
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.0	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	51	51	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.5	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	71.0	69.8	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.7	42.9	Pass
Overall Test Results					Pass


 Laboratory Technician

06/14/2017
 Test Date


 Approved By



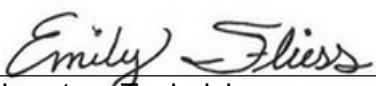


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 50TH PERCENTILE MALE

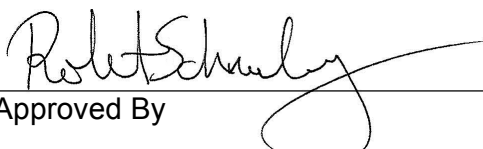
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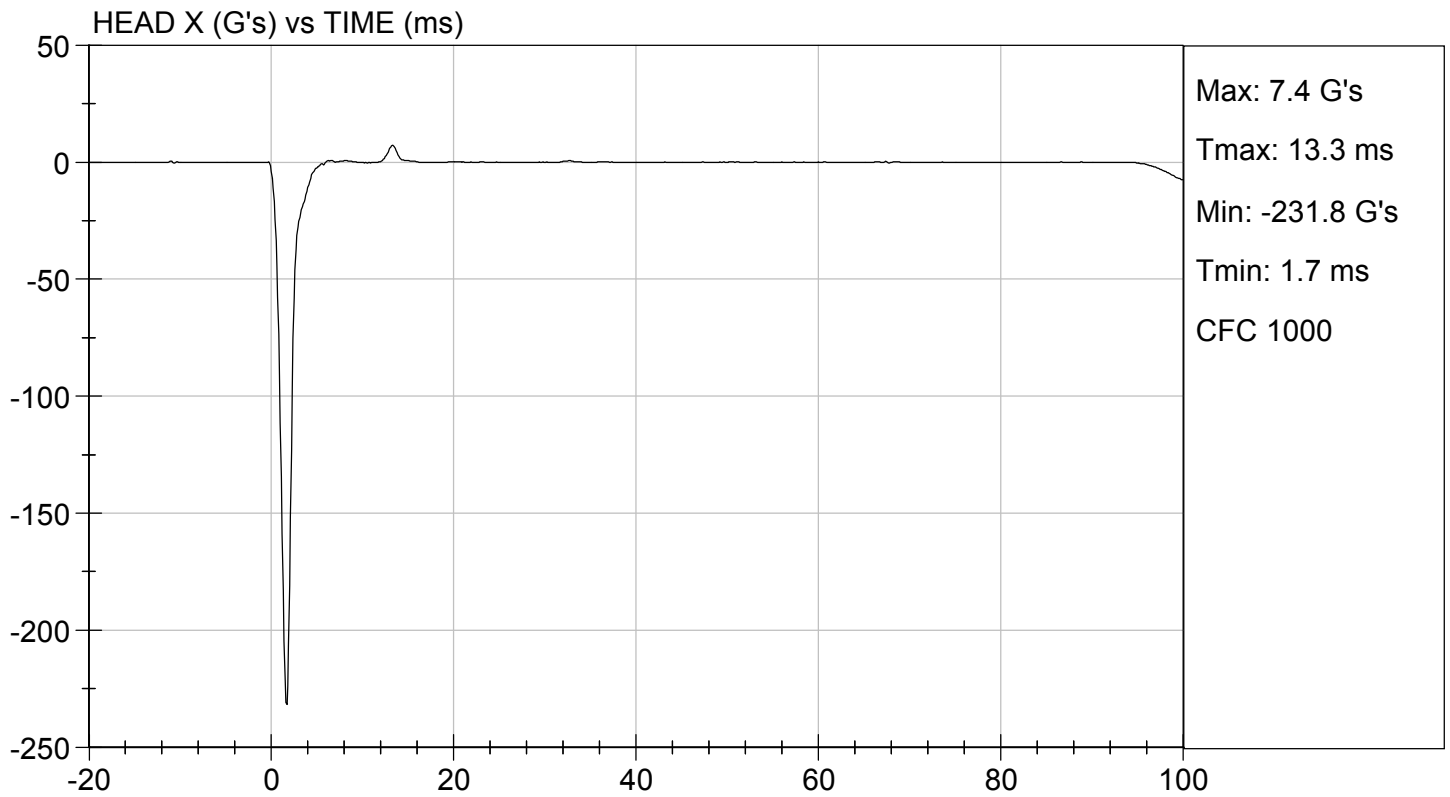
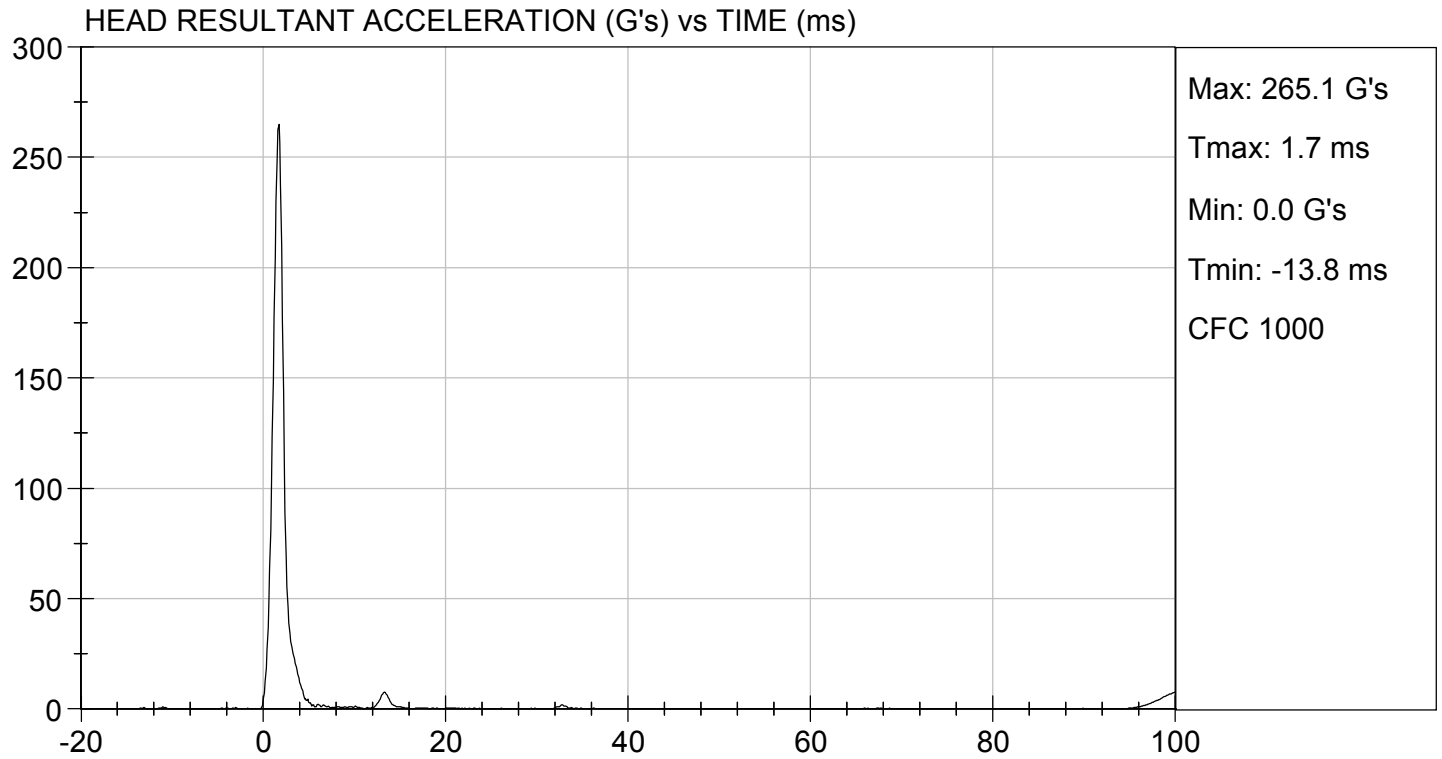
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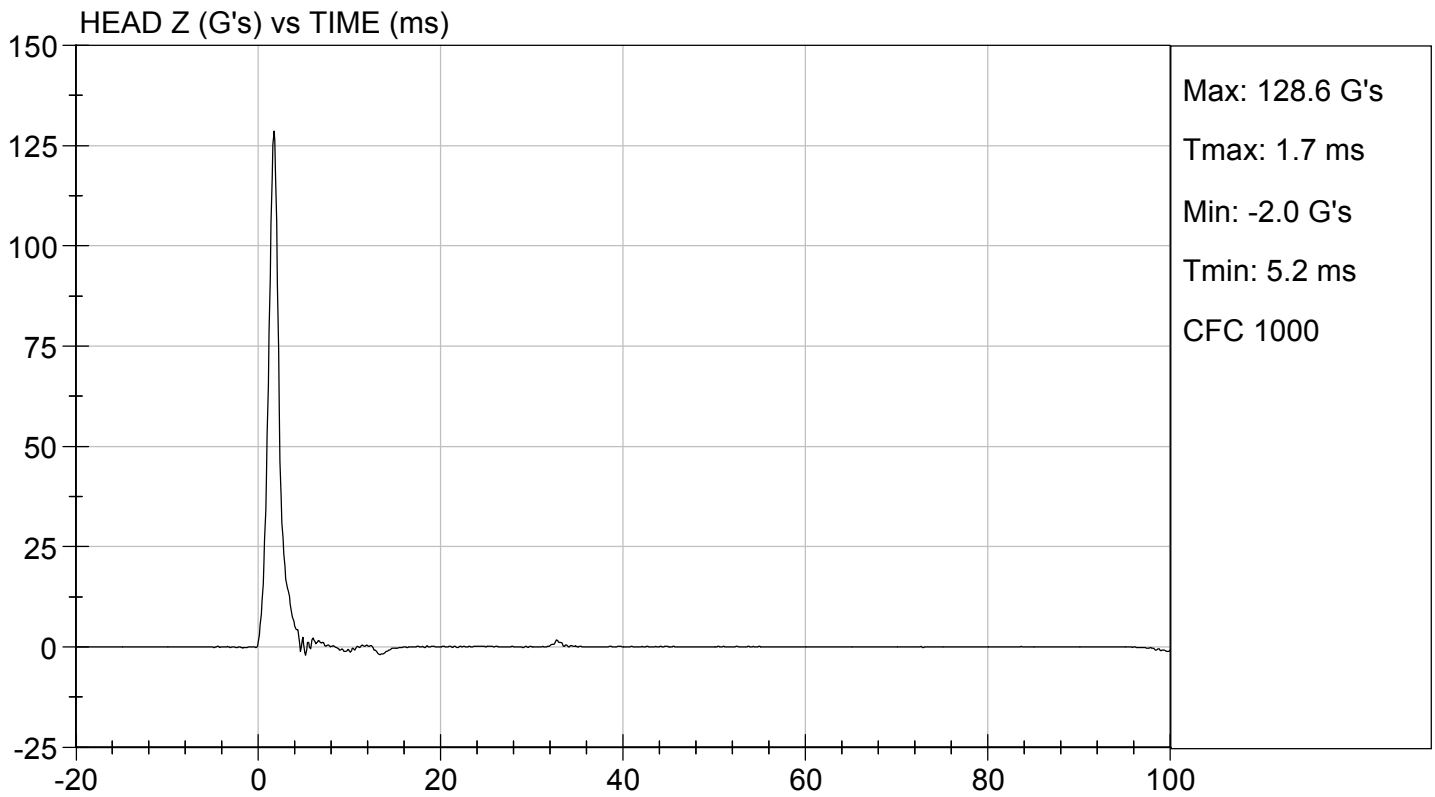
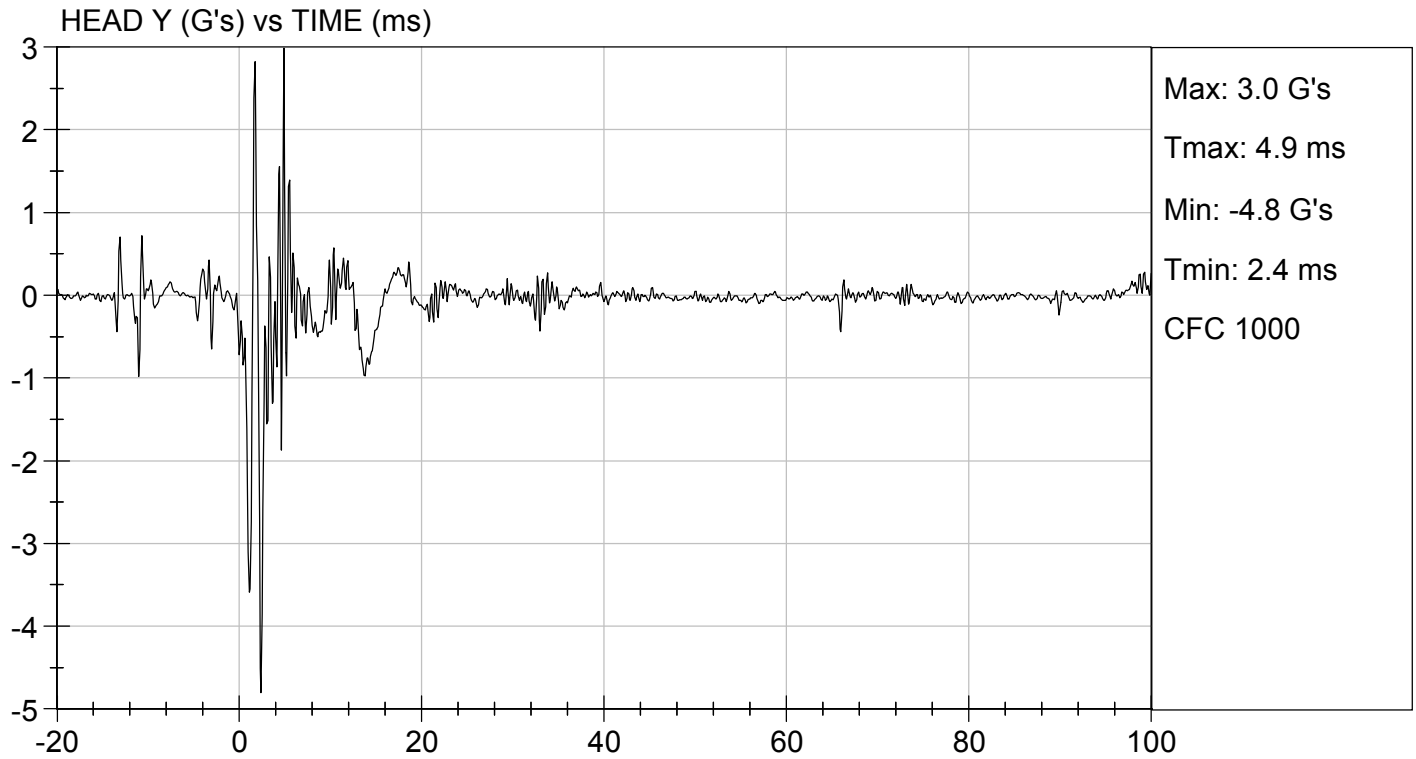
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	225 to 275	265	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-4.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

08/09/2017
Test Date


Approved By



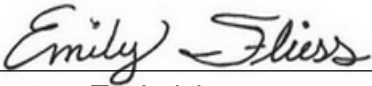


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

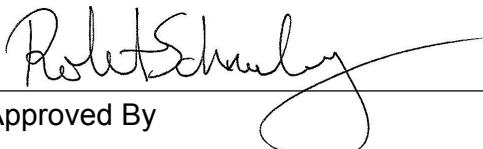
ATD Serial No: 351

Test I.D: D172122

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	46	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.31	Pass
	20 ms	G's	17.60 to 22.60	18.77	Pass
	30 ms	G's	12.50 to 18.50	14.89	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	40.6	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	71.4	Pass
	Time	ms	57.0 to 64.0	62.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	123.5	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	90.5	Pass
	Time	ms	47.0 to 58.0	53.6	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	101.2	Pass
Overall Test Results					Pass


 Laboratory Technician

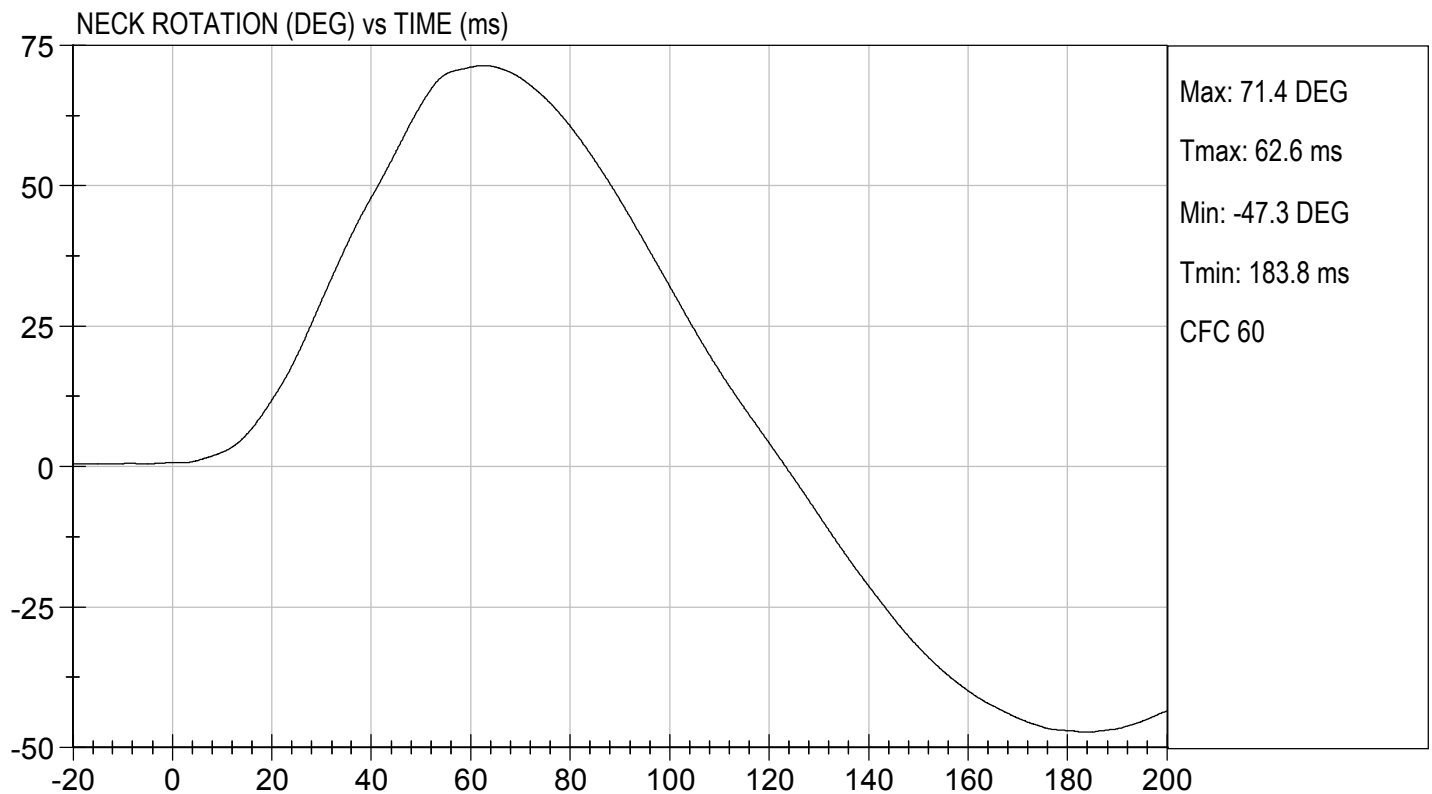
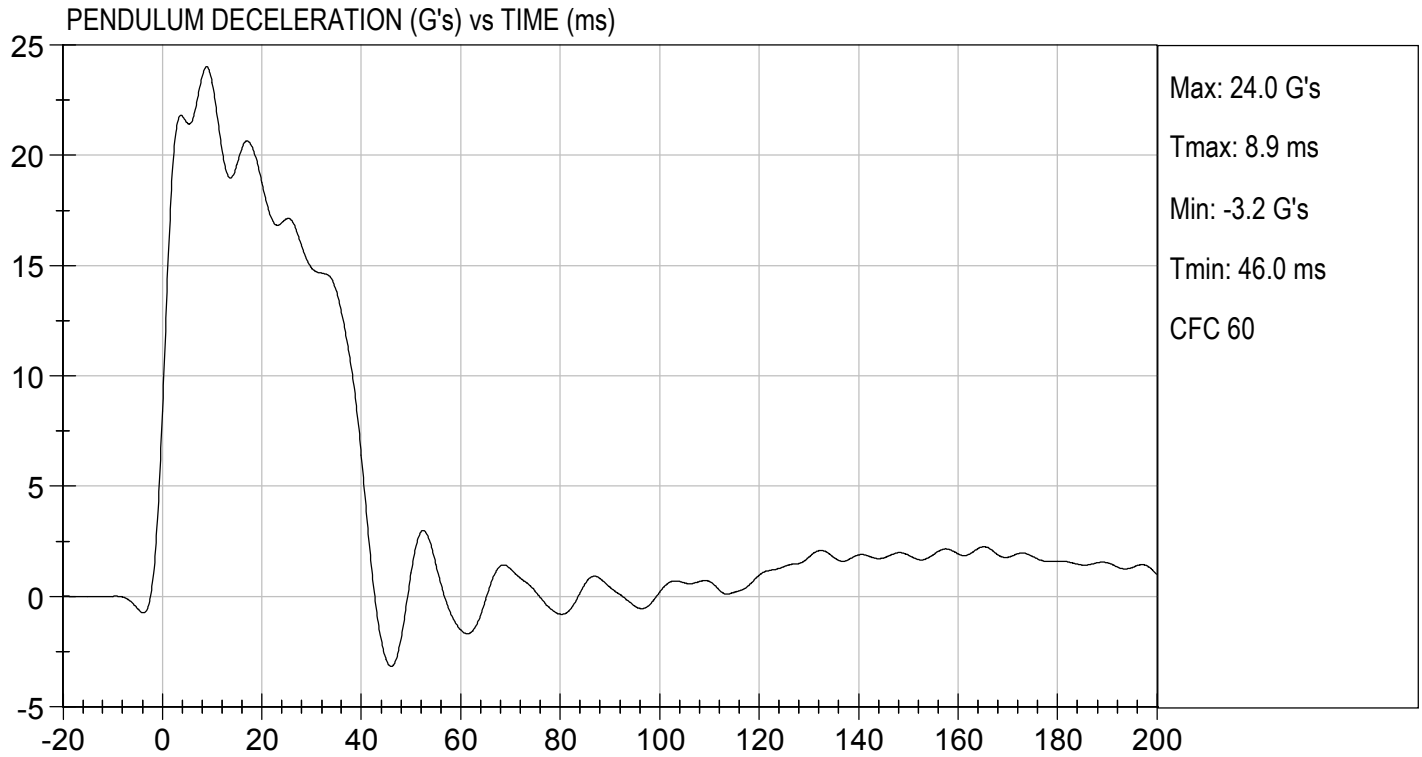
08/09/2017
 Test Date


 Approved By



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

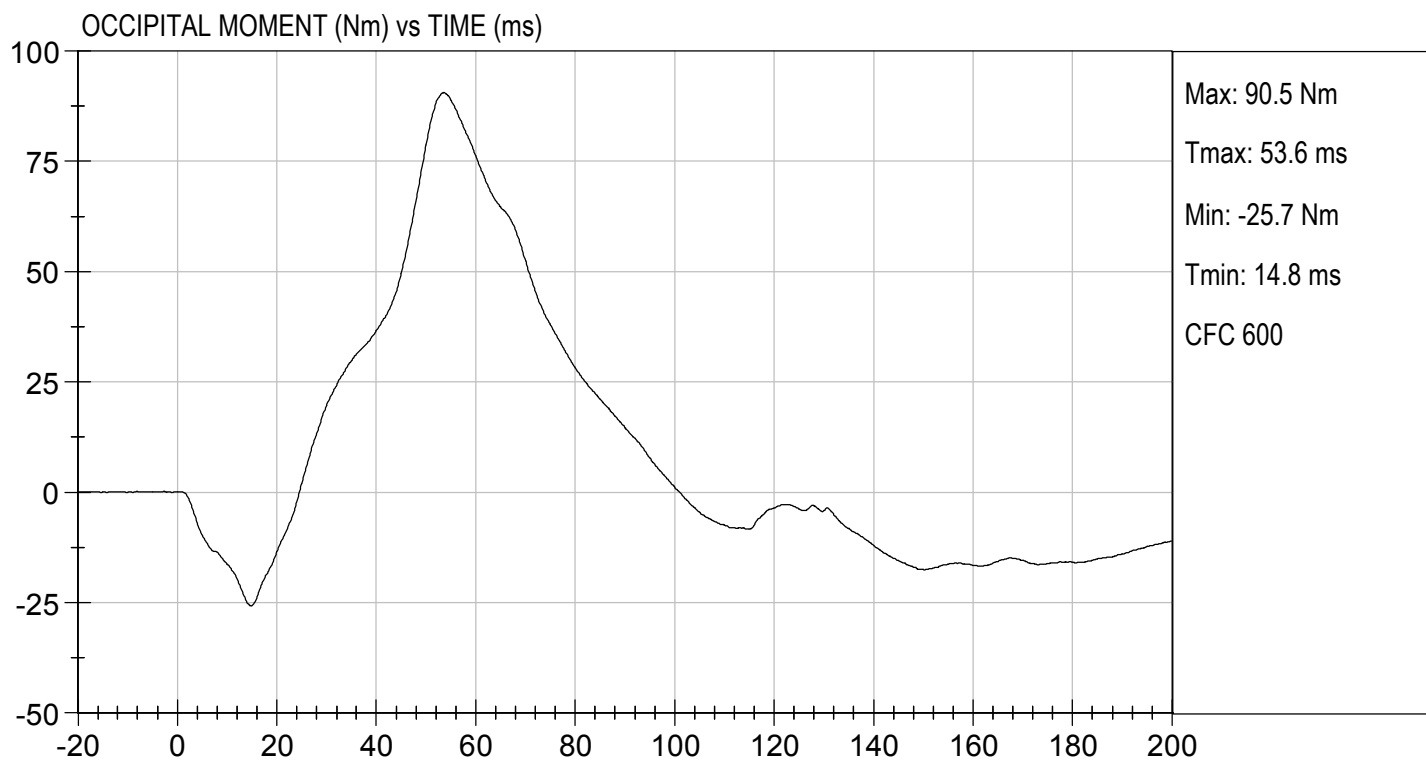
TEST DATE: 08/09/2017
TEST #: D172122





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

TEST DATE: 08/09/2017
TEST #: D172122

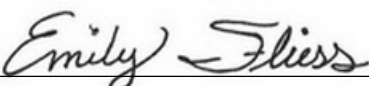


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

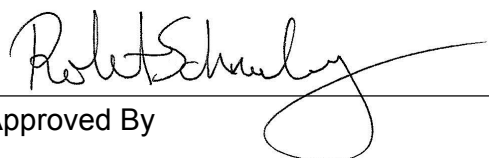
ATD Serial No: 351

Test I.D: D172123

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	46	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.11	Pass
	20 ms	G's	14.00 to 19.00	16.15	Pass
	30 ms	G's	11.00 to 16.00	12.60	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.5	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	43.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	95.9	Pass
	Time	ms	72.0 to 82.0	79.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	164.6	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-57.6	Pass
	Time	ms	65.0 to 79.0	74.4	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	147.0	Pass
Overall Test Results					Pass


 Laboratory Technician

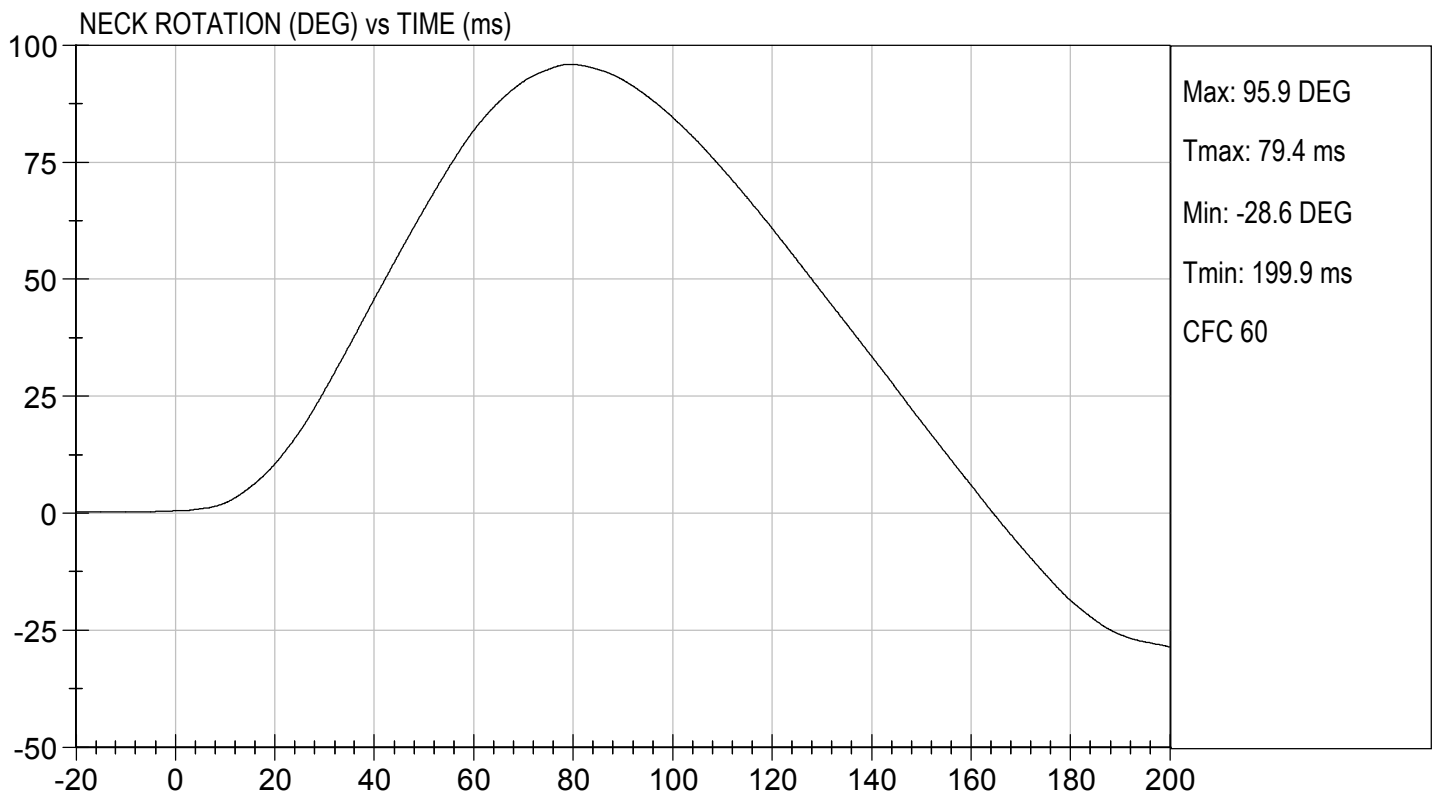
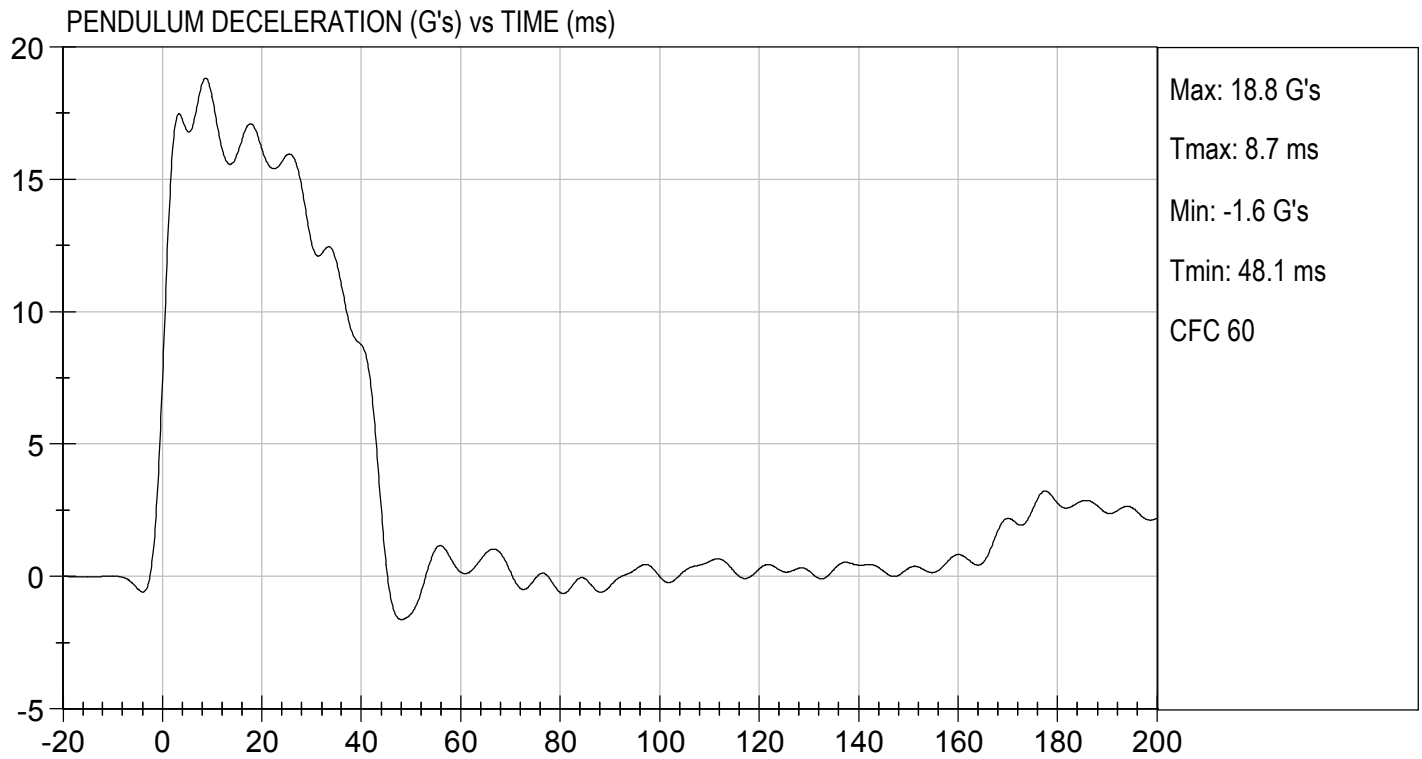
08/09/2017
 Test Date


 Approved By



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

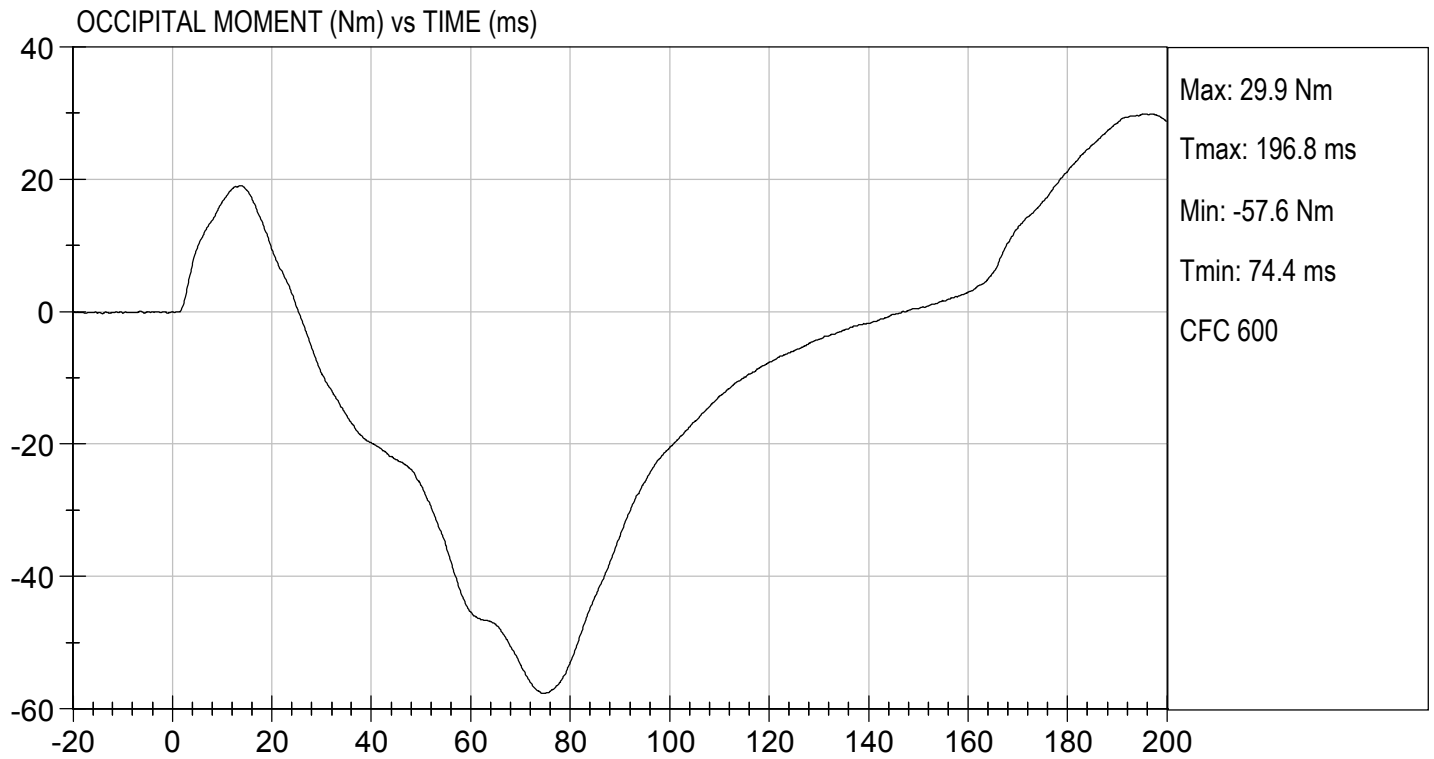
TEST DATE: 08/09/2017
TEST #: D172123





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

TEST DATE: 08/09/2017
TEST #: D172123

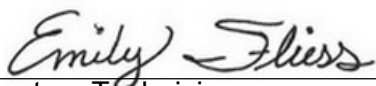


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

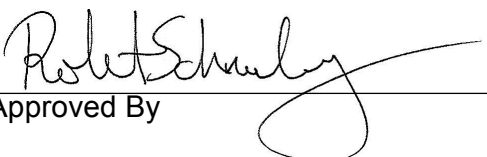
ATD Serial No: 351

Test I.D: D172124

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,549	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.58	Pass
Internal Hysteresis	%	69 to 85	72	Pass
			Overall Test Results	Pass


Laboratory Technician

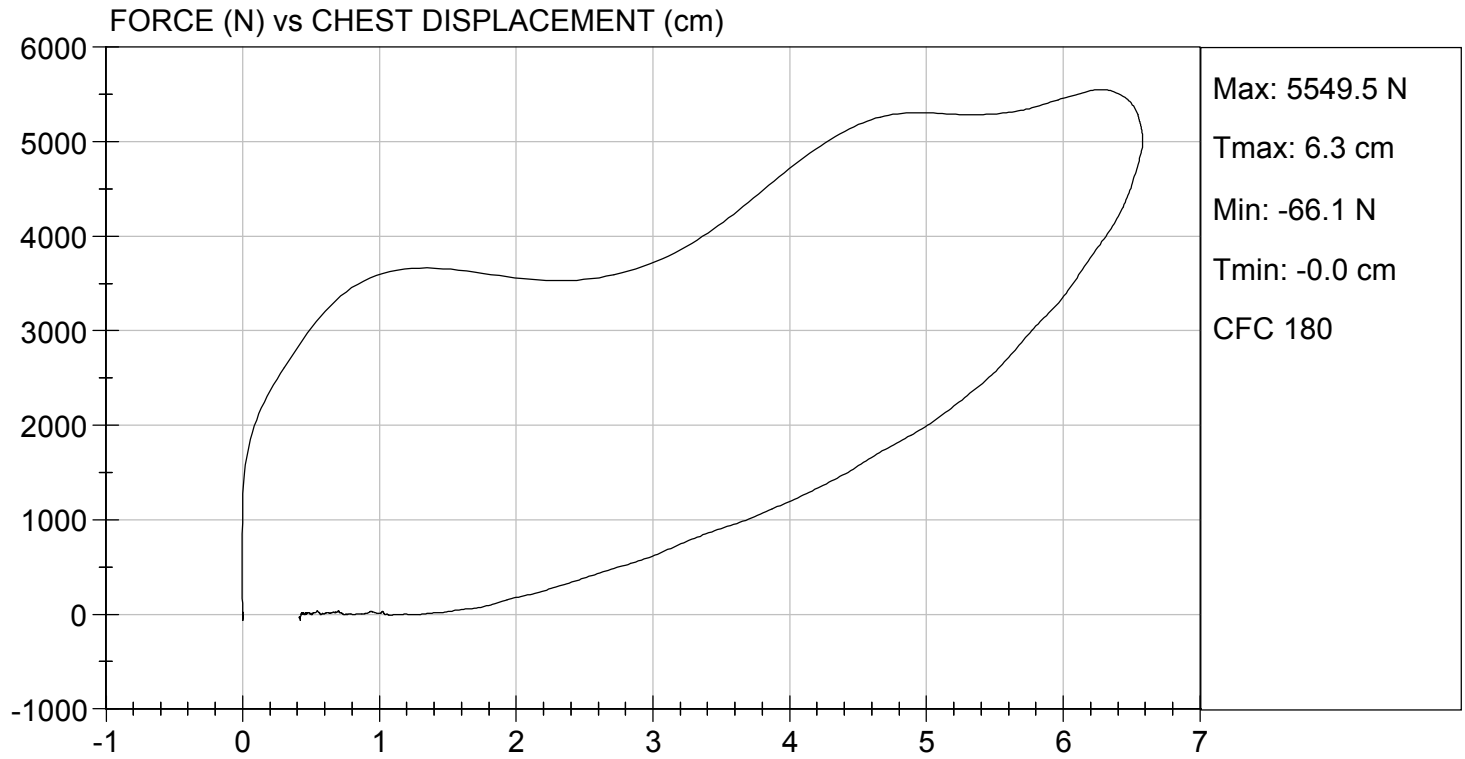
08/09/2017
Test Date


Approved By



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

TEST DATE: 08/09/2017
TEST #: D172124

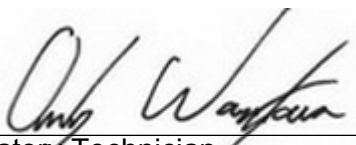


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D172125

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,187	Pass
Overall Test Results				Pass


Laboratory Technician

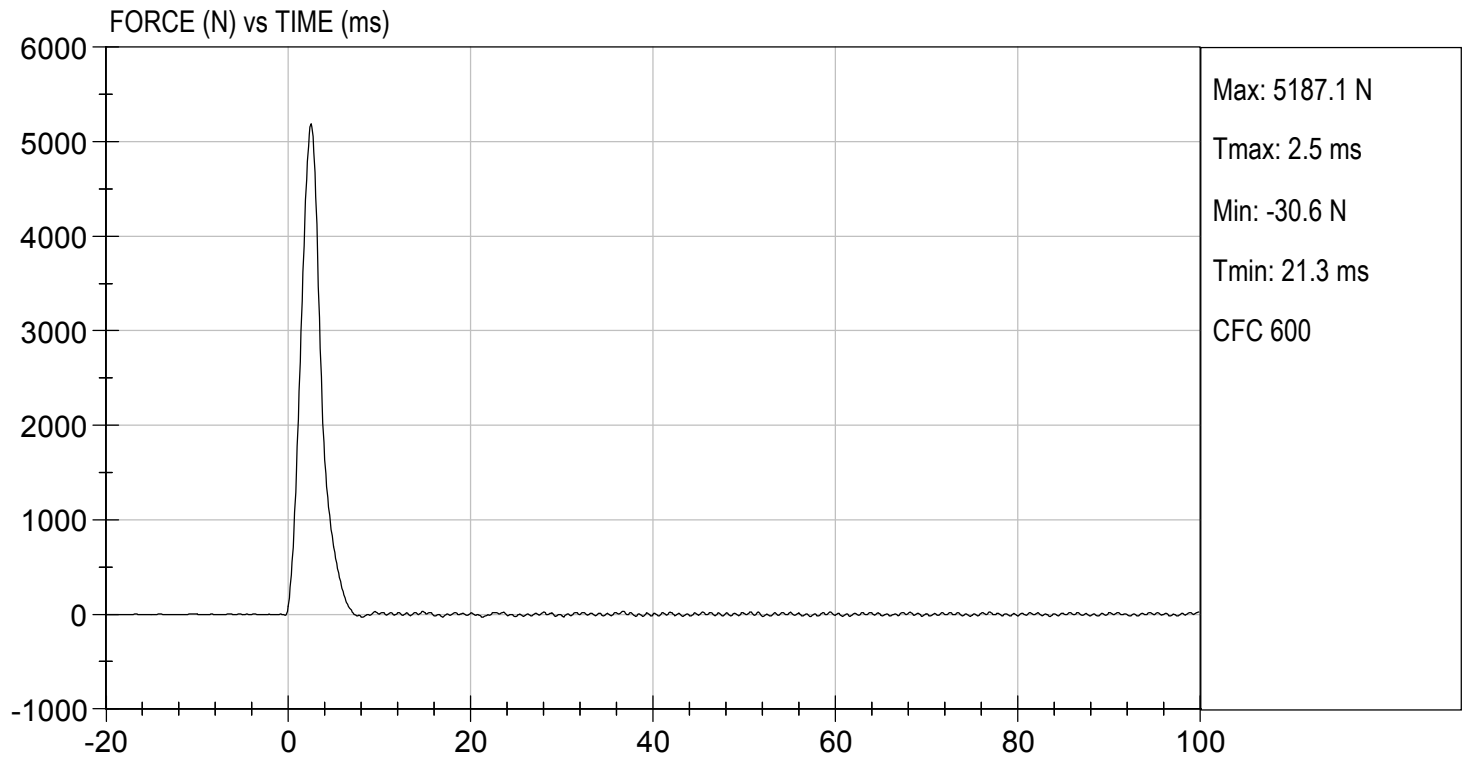
08/09/2017
Test Date


Approved By



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

TEST DATE: 08/09/2017
TEST #: D172125

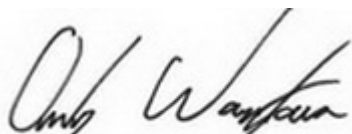


MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D172126

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,224	Pass
Overall Test Results				Pass



Laboratory Technician

08/09/2017
Test Date

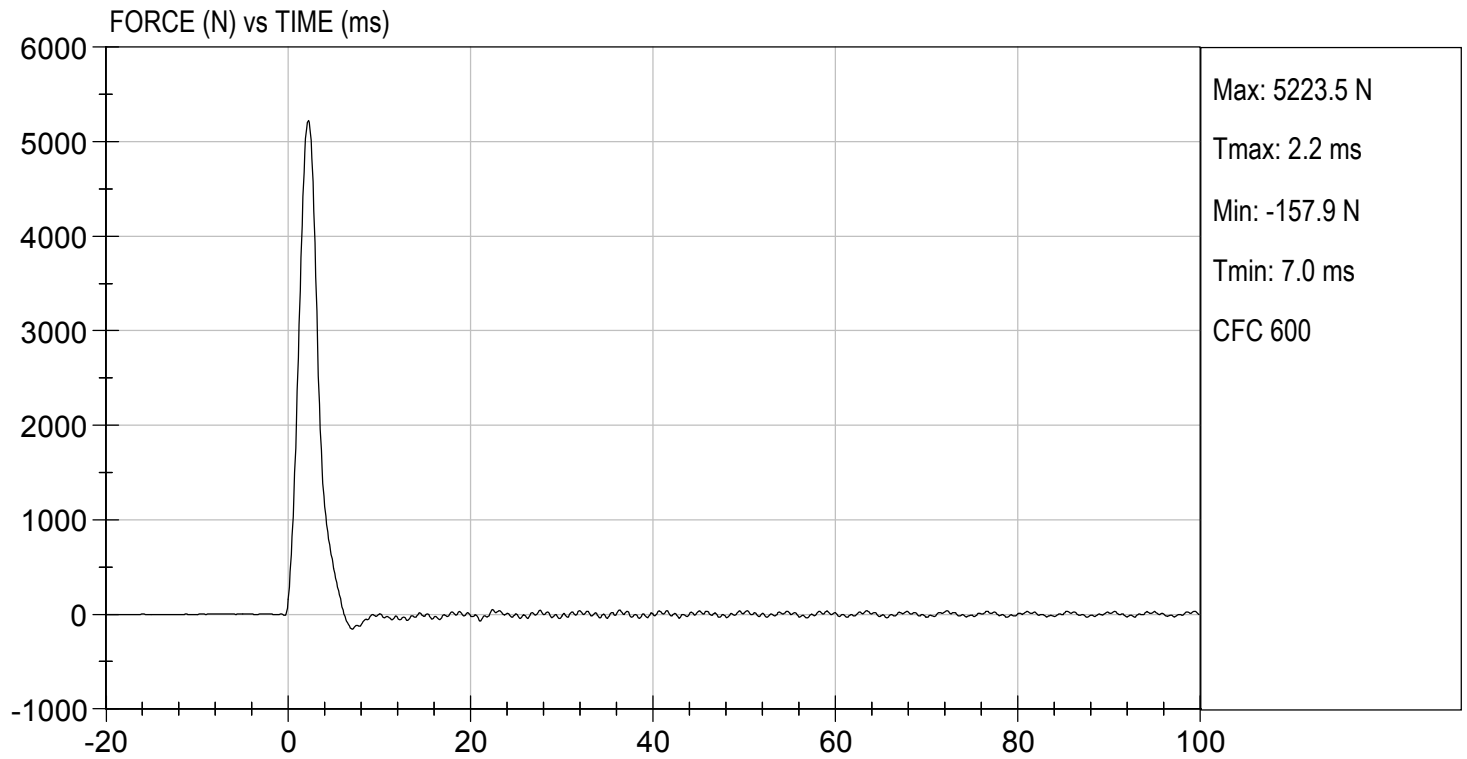


Approved By



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

TEST DATE: 08/09/2017
TEST #: D172126

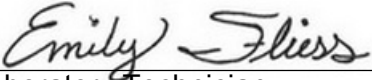


MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

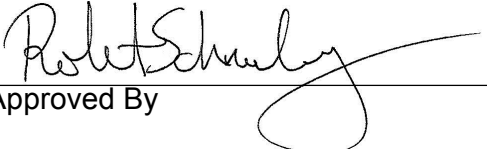
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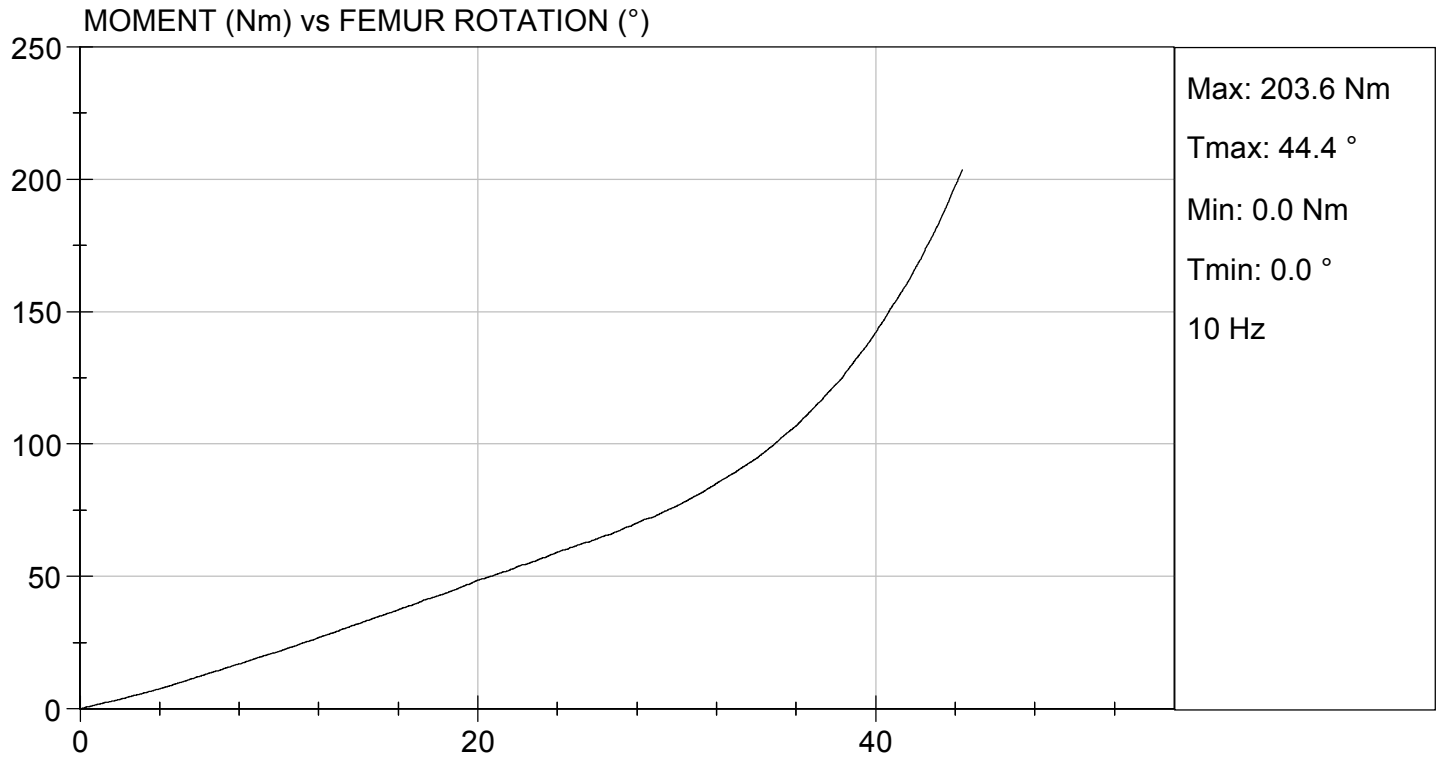
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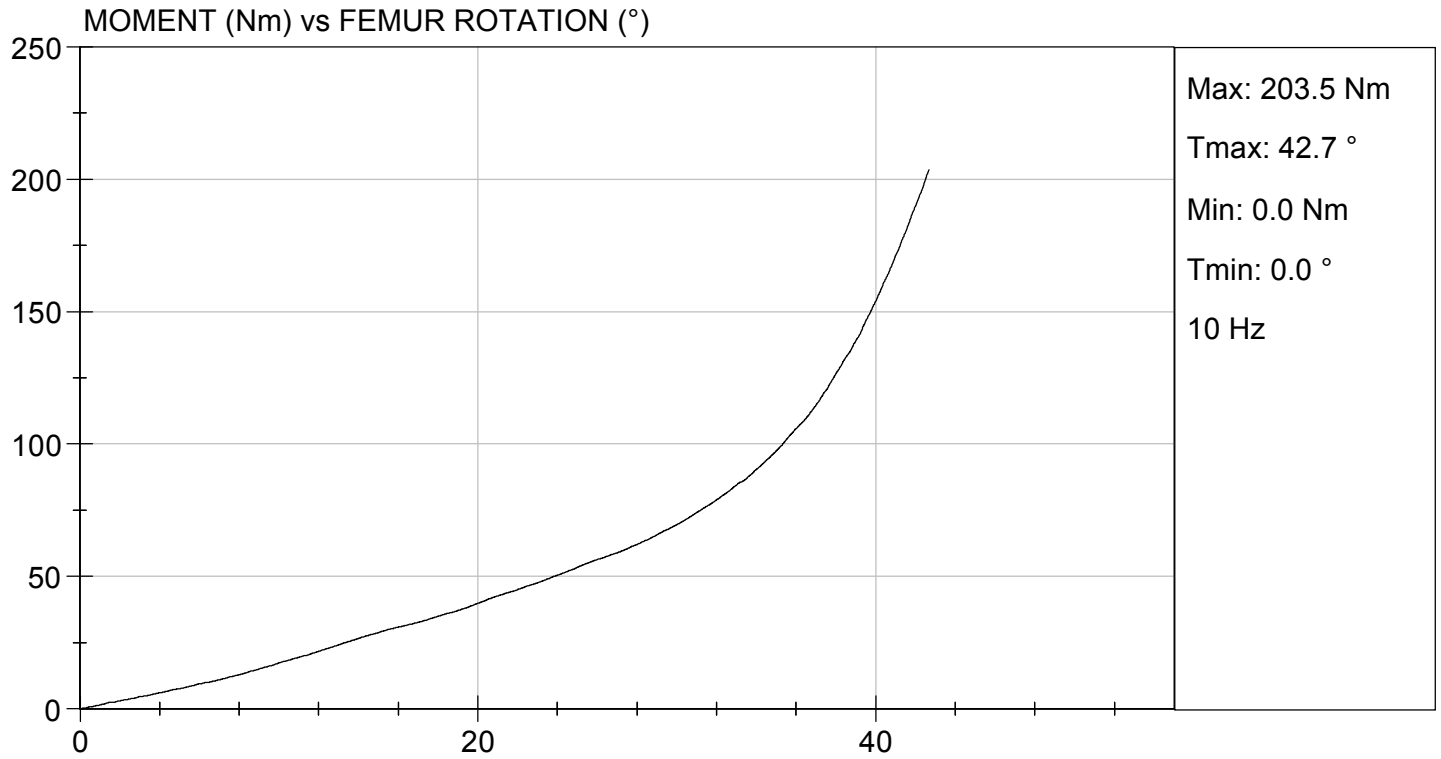
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	20.9	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	46	46	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.5	6.4	Pass
30 Degrees	Nm	94.9 Nm Max	76.7	69.6	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.4	42.7	Pass
Overall Test Results					Pass


 Laboratory Technician

08/08/2017
 Test Date


 Approved By





Hybrid III, 5th External Measurements
SN: 634

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

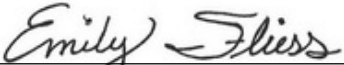
HYBRID III, SUBPART O EXTERNAL DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 304.8 ± 5.1 mm above seat surface	175.3-190.5	181.6
P	FOOT LENGTH	Tip of toe to rear of heel	218.5-233.7	224.7
Q	STANDING HEIGHT	(THEORETICAL)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

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D171991

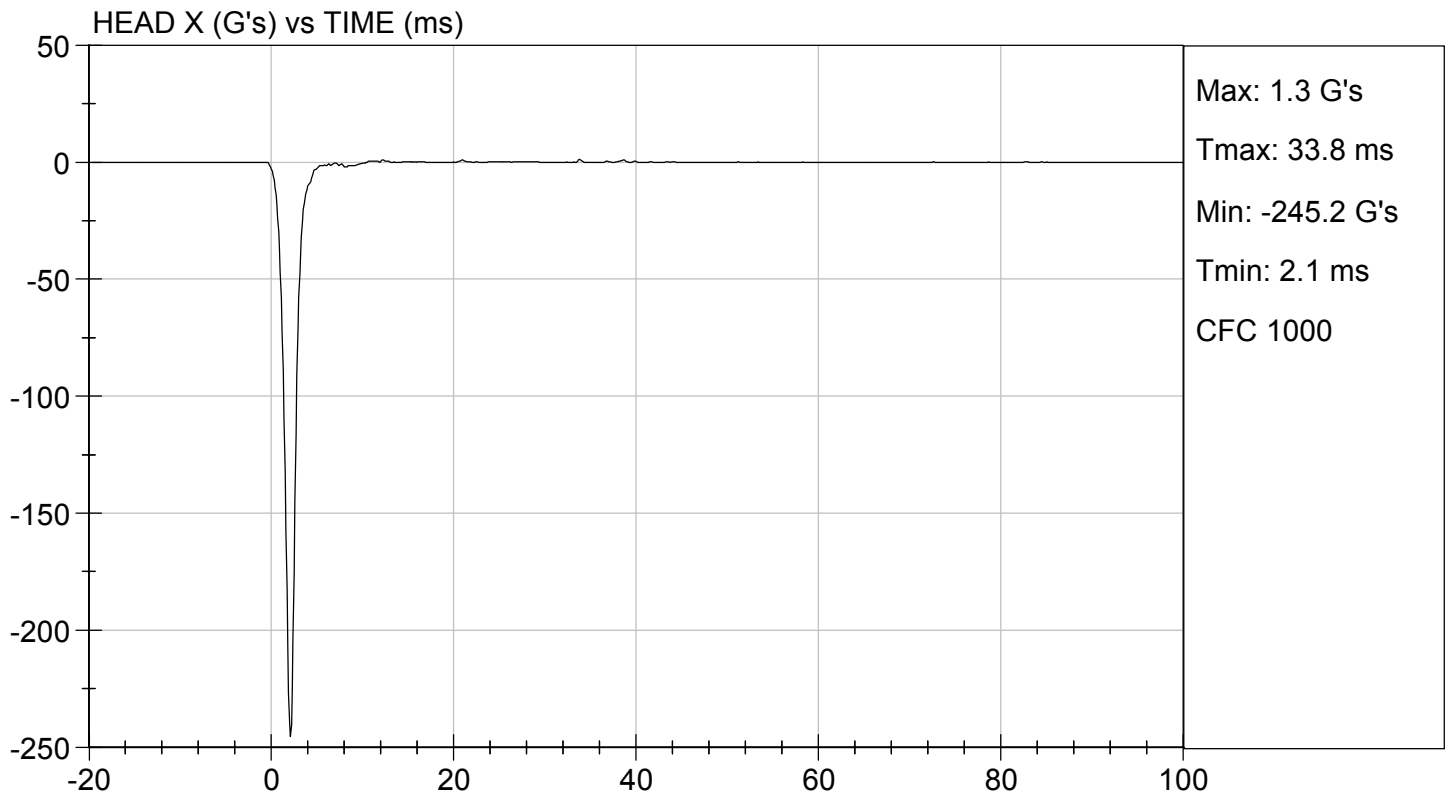
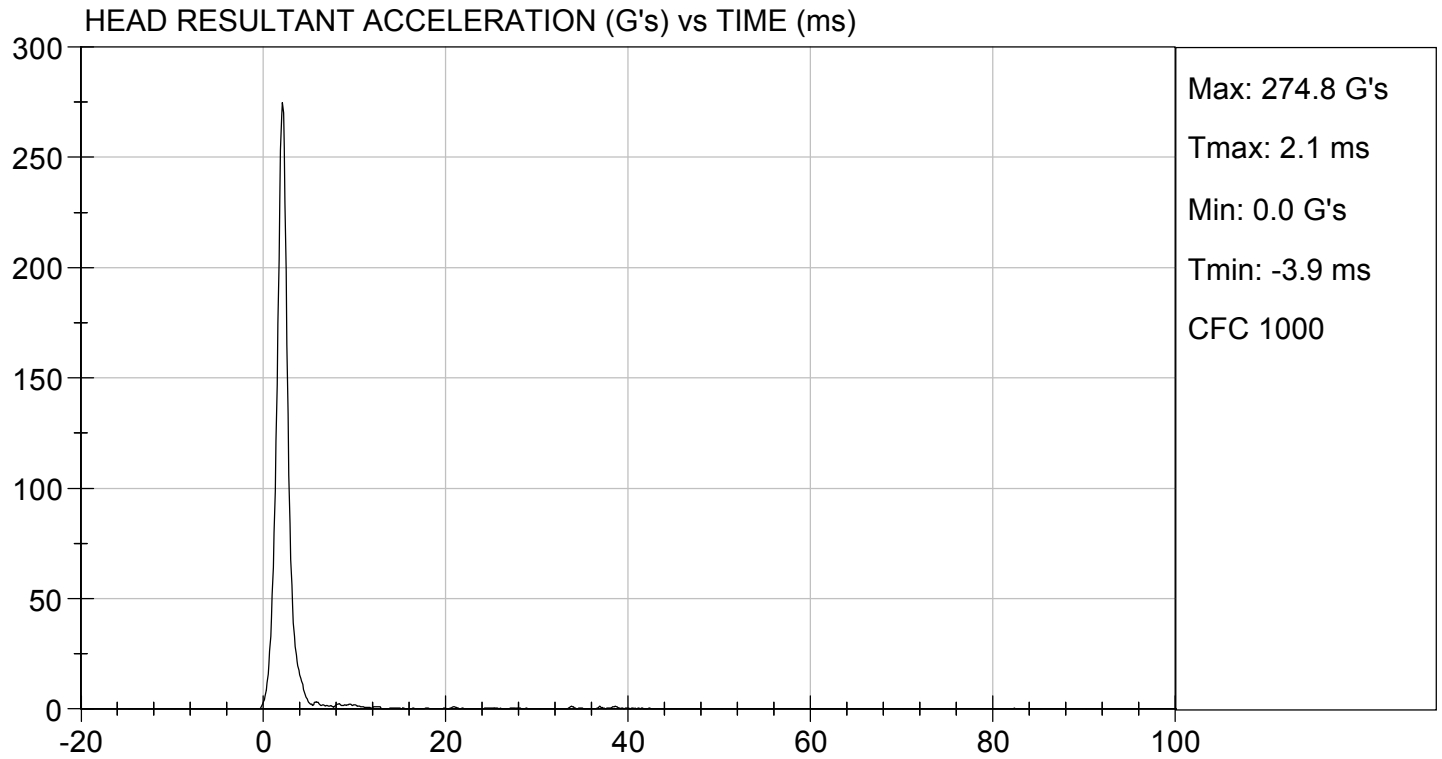
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	47.1	Pass
Peak Resultant Acceleration	G's	250 to 300	275	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-4.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

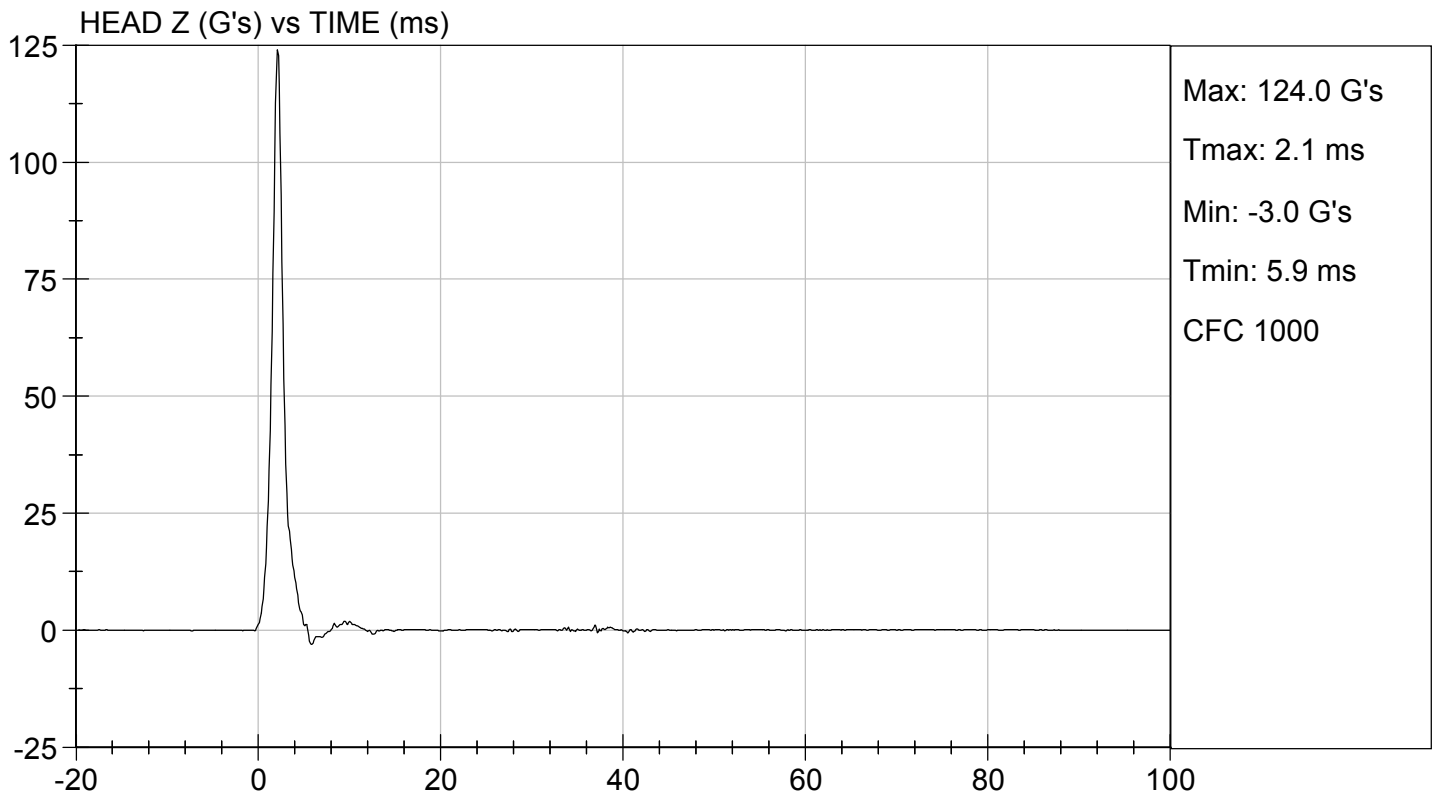
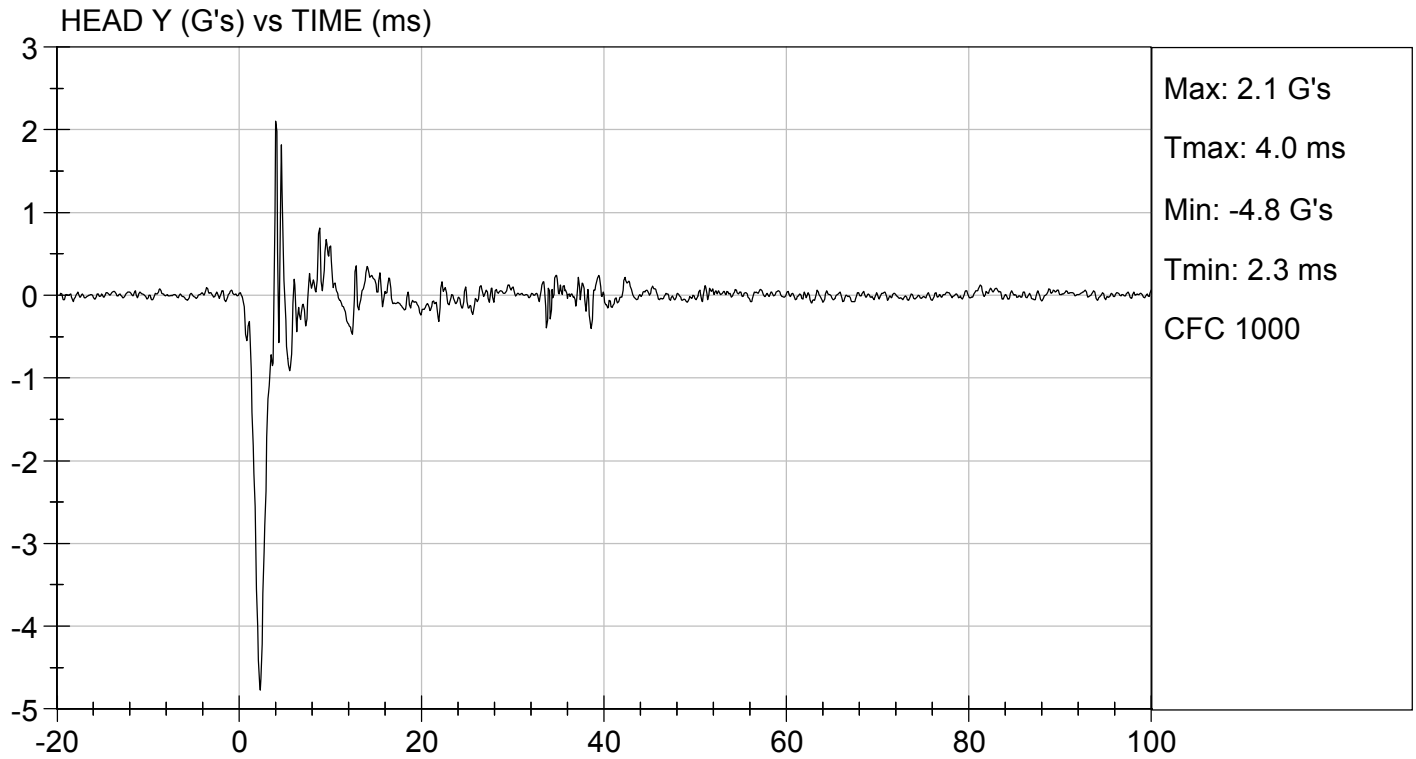

Laboratory Technician

07/25/2017

Test Date


Approved By





MGA RESEARCH CORPORATION

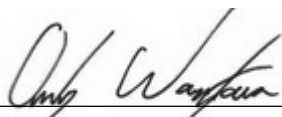
NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

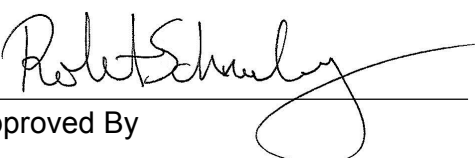
ATD Serial No: 634

Test I.D: D171992

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21	Pass
Laboratory Relative Humidity		%	10 to 70	47.7	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	6.8	Pass
D Plane Rotation	Max	deg	77 to 91	82	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results					Pass


 Laboratory Technician

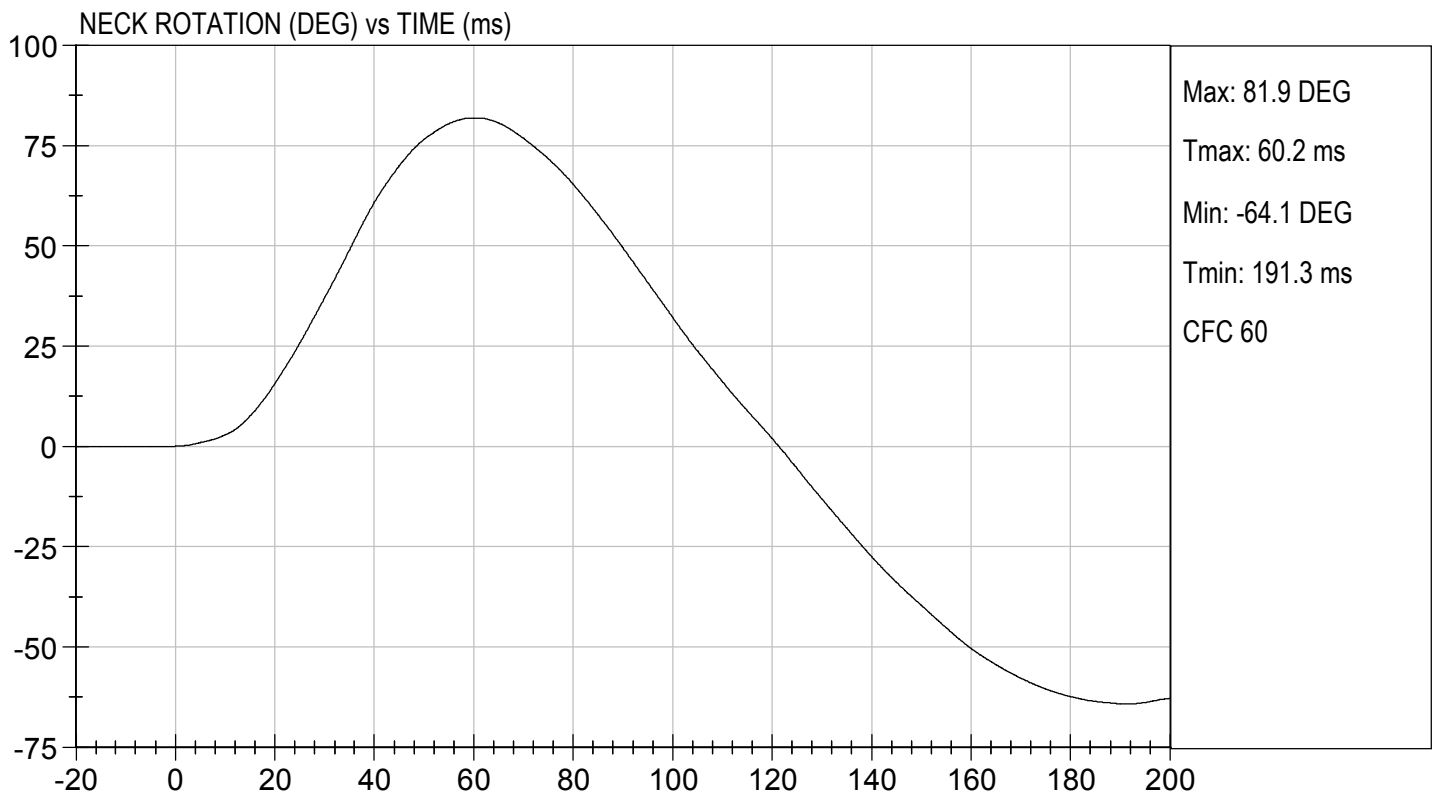
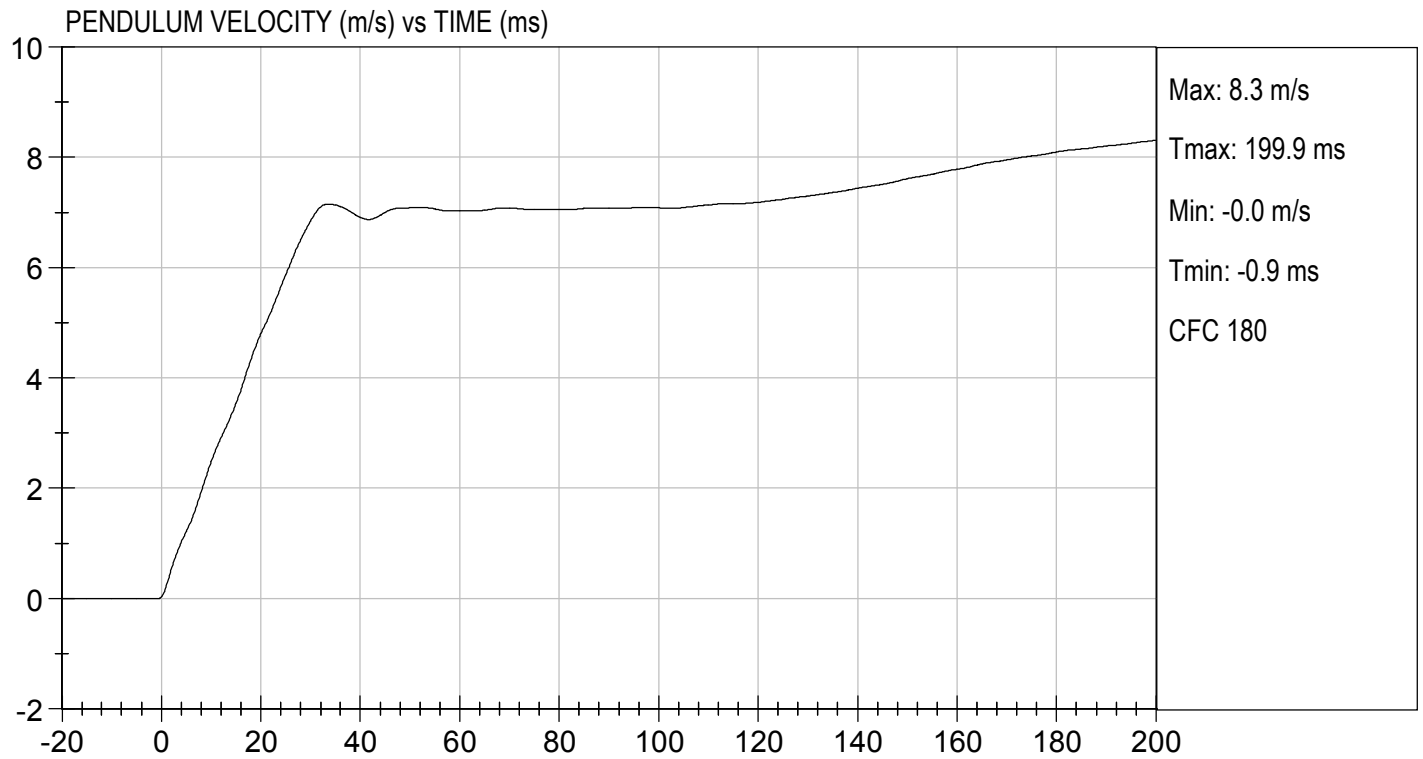
07/26/2017
 Test Date


 Approved By



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

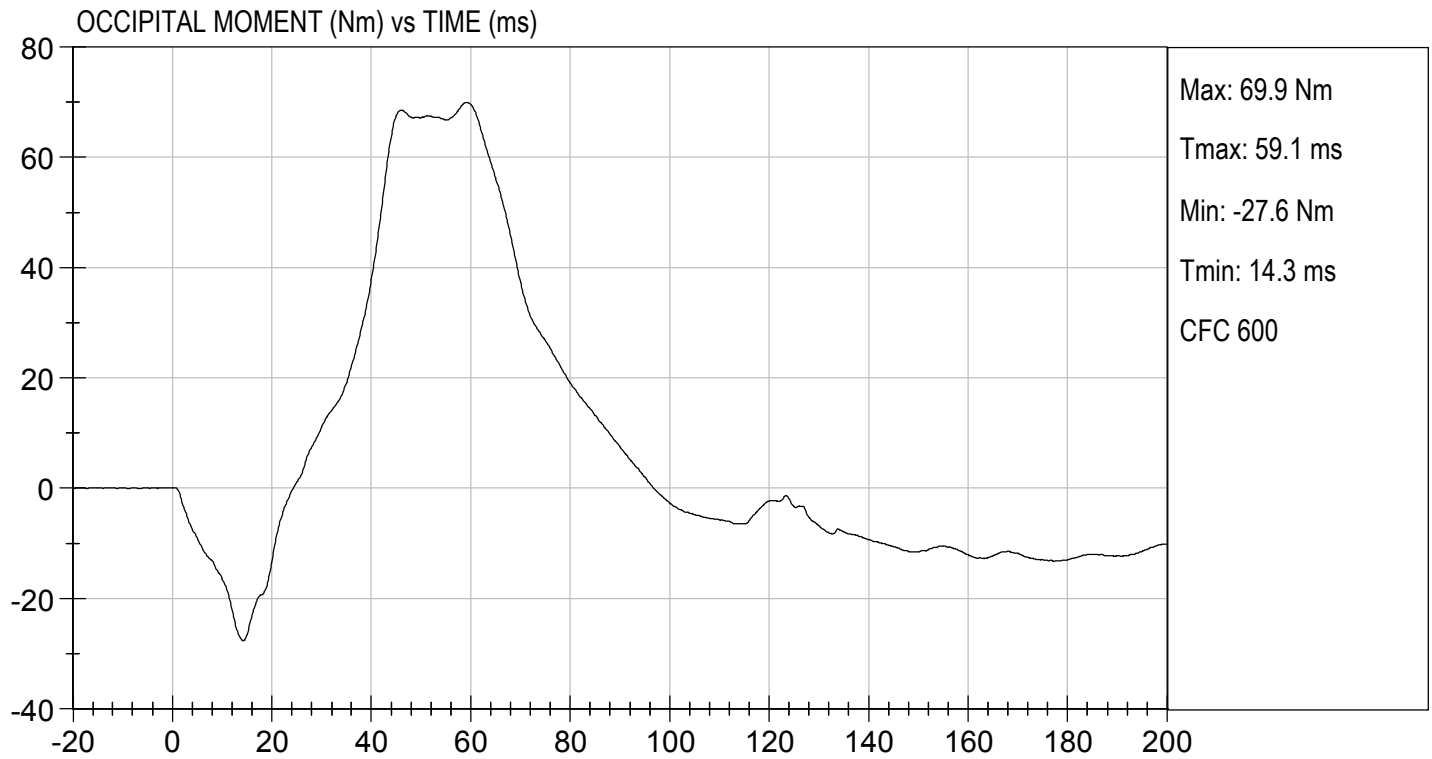
TEST DATE: 07/26/2017
TEST #: D171992





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

TEST DATE: 07/26/2017
TEST #: D171992

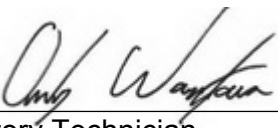


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

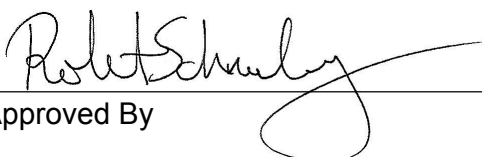
ATD Serial No: 634

Test I.D: D171993

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	44.9	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.3	Pass
D Plane Rotation	Max	deg	99 to 114	107	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-56	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	105	Pass
Overall Results					Pass


 Laboratory Technician

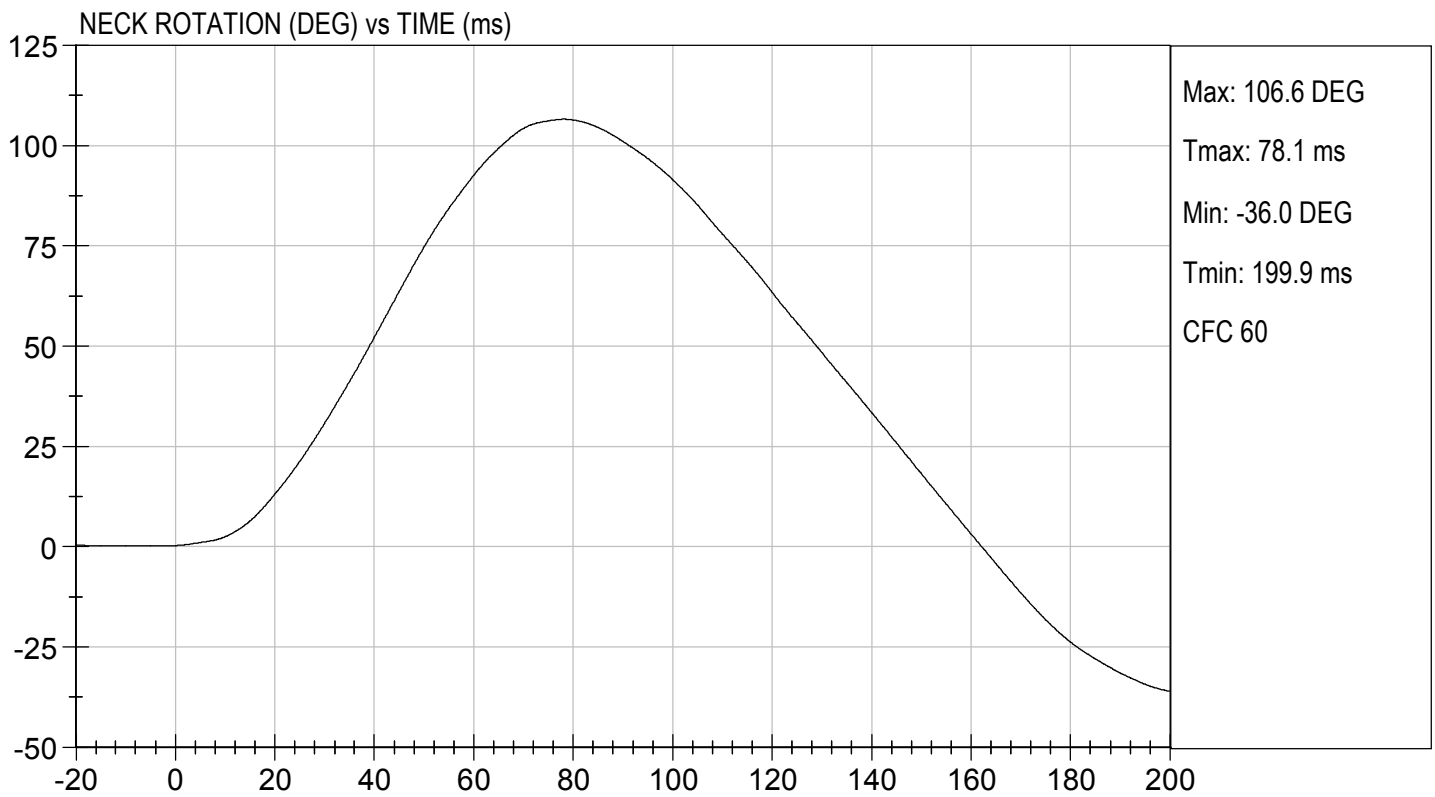
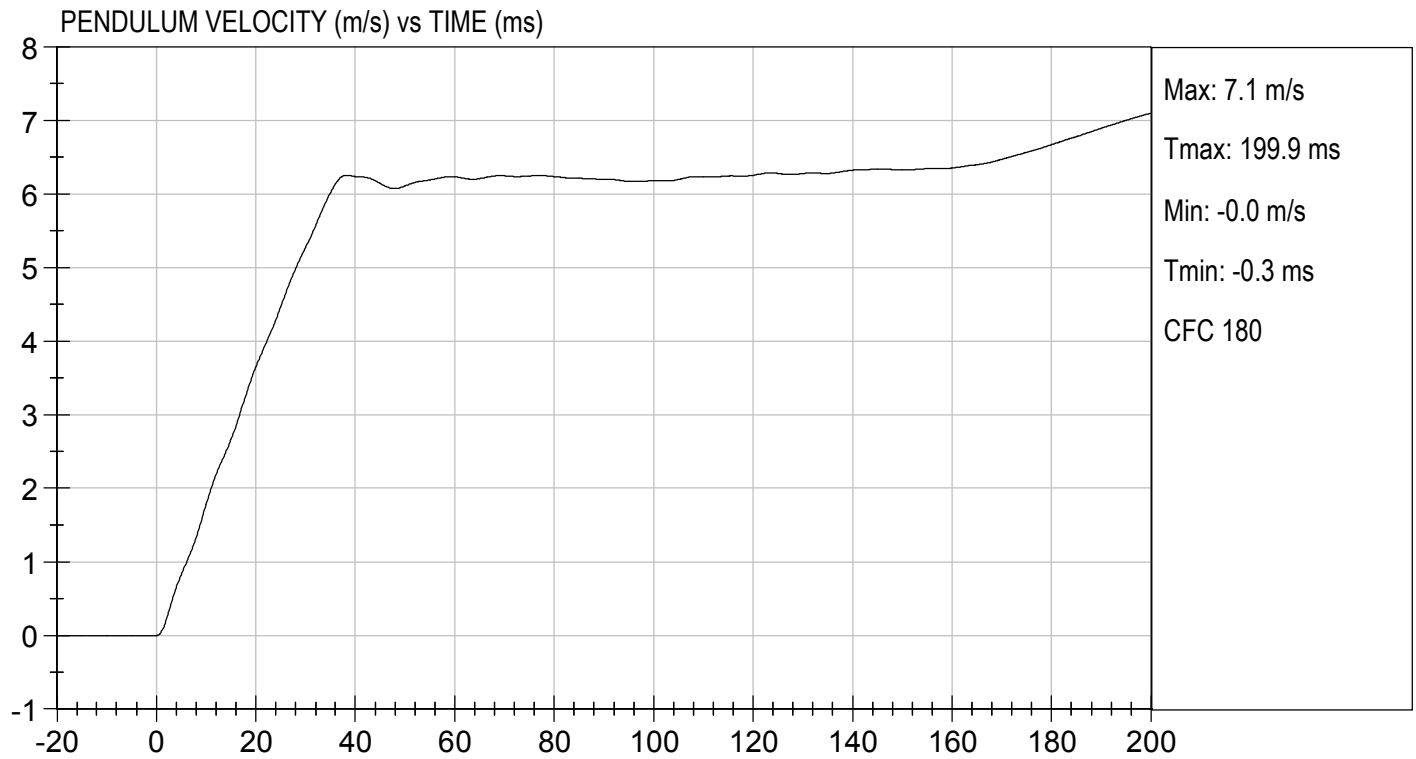
07/26/2017
 Test Date


 Approved By



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

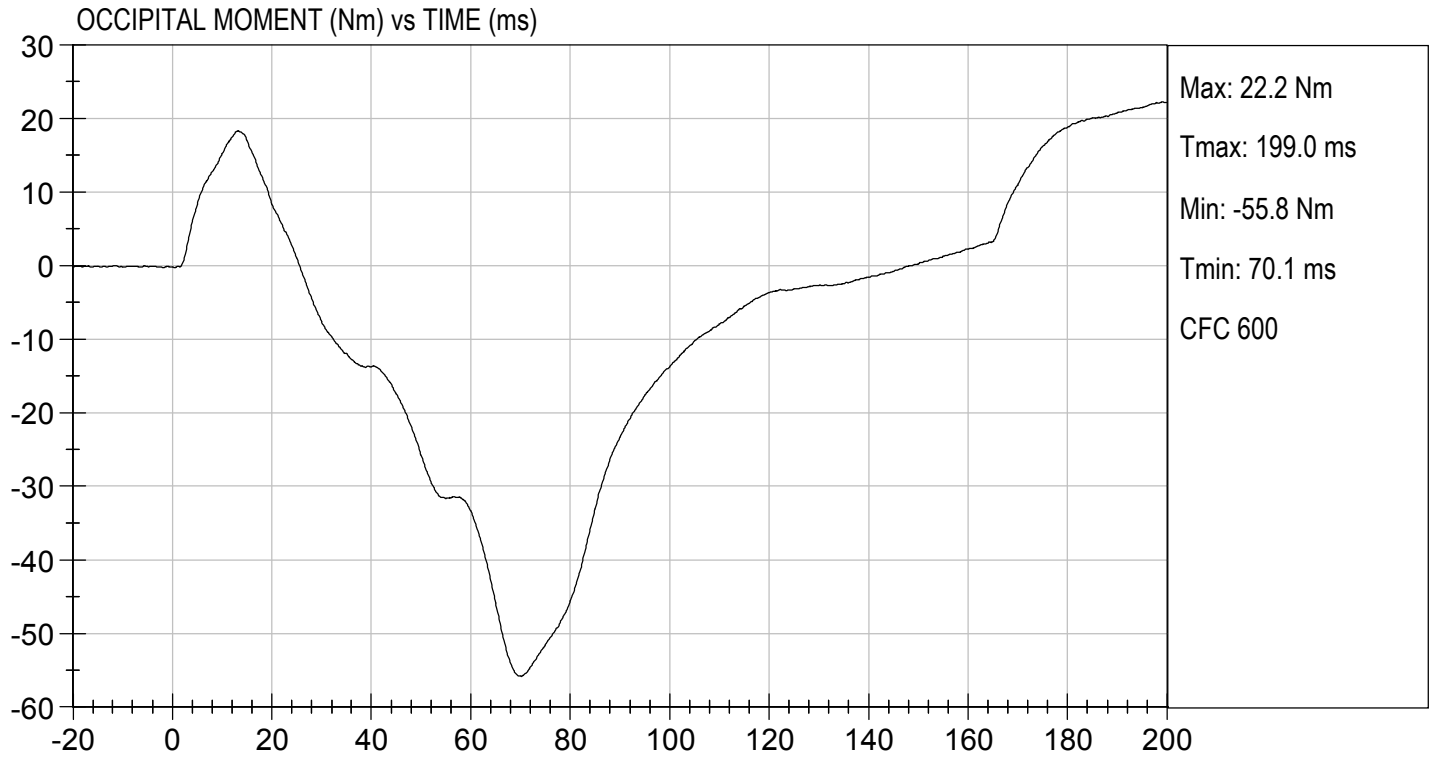
TEST DATE: 07/26/2017
TEST #: D171993





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

TEST DATE: 07/26/2017
TEST #: D171993

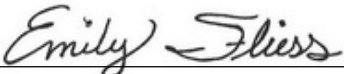


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

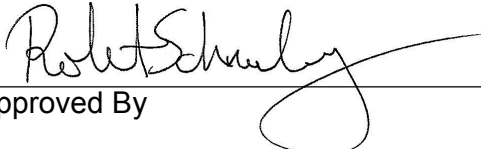
Test I.D: D171994F

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.6	Pass
Relative Humidity	%	10 to 70	53	Pass
Probe Speed	m/s	6.59 to 6.83	6.60	Pass
Peak Deflection	mm	50 to 58	50	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4281	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4466	Pass
			Overall Test Results	Pass


Laboratory Technician

07/27/2017

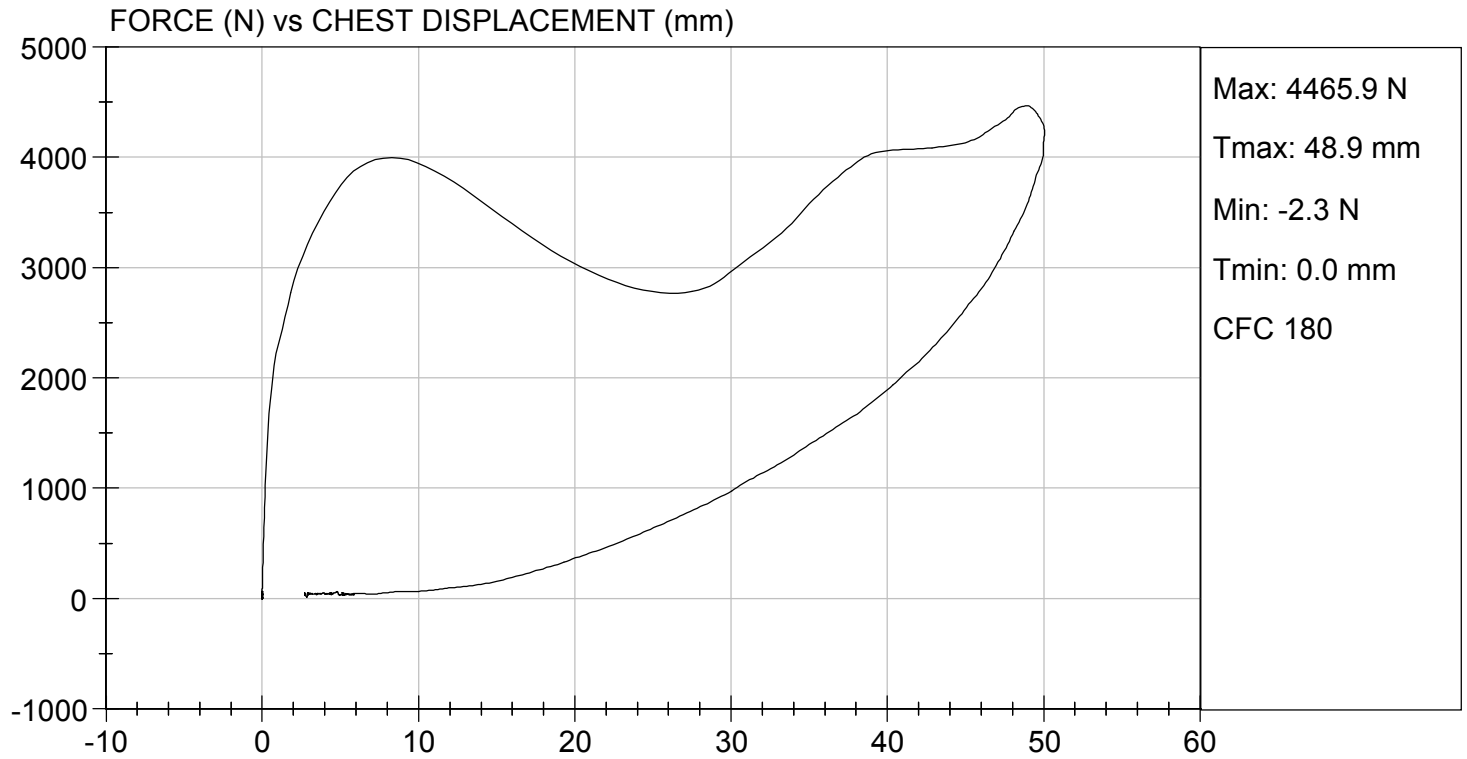
Test Date


Approved By



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

TEST DATE: 07/27/2017
TEST #: D171994F



MGA RESEARCH CORPORATION

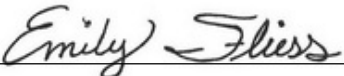
RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

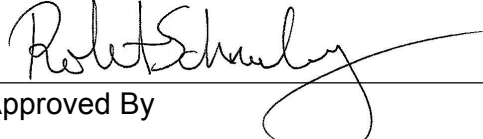
Test I.D: D171995

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	47.5	Pass
Probe Speed	m/s	2.07 to 2.13	2.09	Pass
Maximum Force	N	3450 to 4060	3950	Pass
Overall Test Results				Pass


Laboratory Technician

07/25/2017

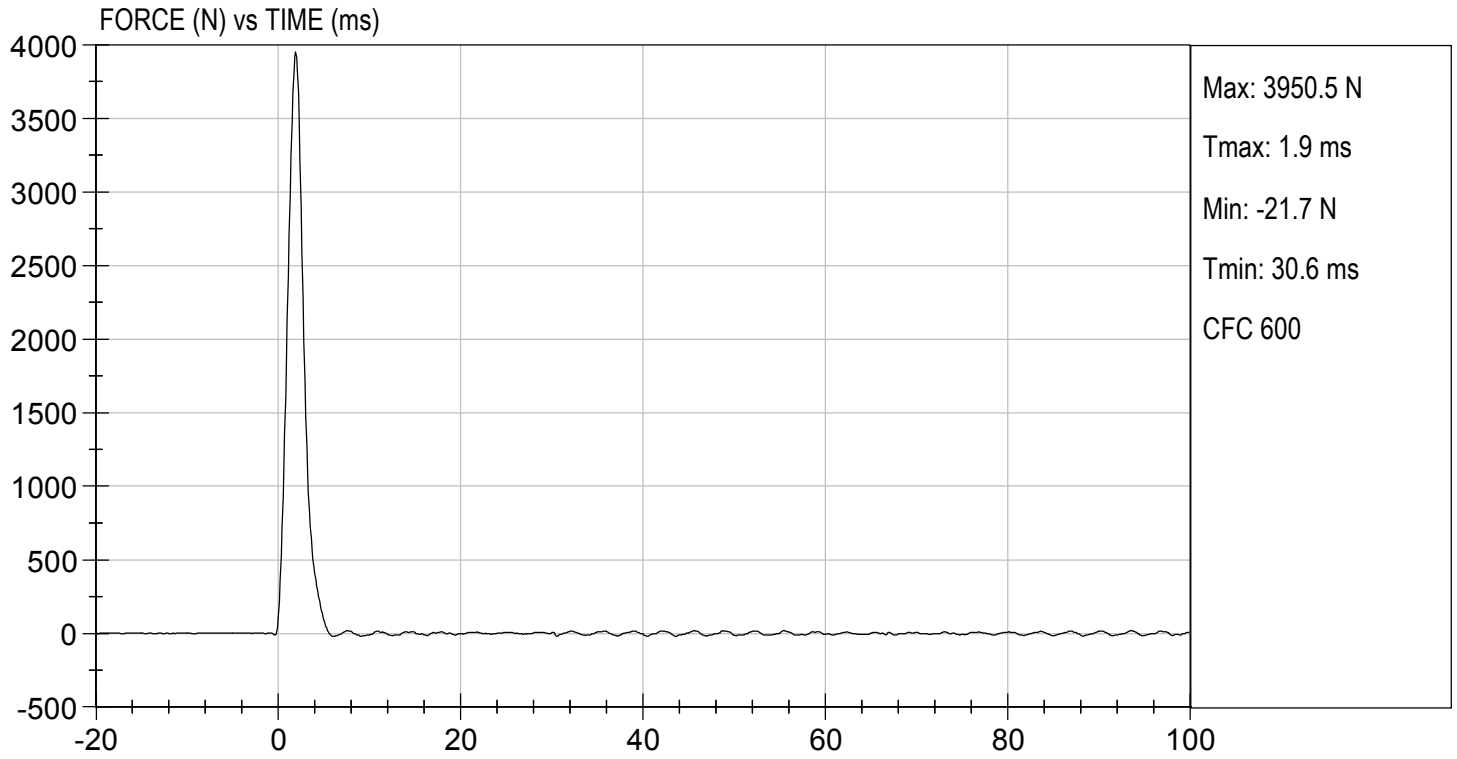
Test Date


Approved By



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

TEST DATE: 07/25/2017
TEST #: D171995



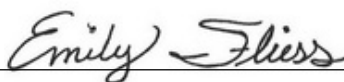
MGA RESEARCH CORPORATION

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

ATD Serial No: 634

Test I.D: D171996

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	47.5	Pass
Probe Speed	m/s	2.07 to 2.13	2.09	Pass
Maximum Force	N	3450 to 4060	3566	Pass
Overall Test Results				Pass


Laboratory Technician

07/25/2017

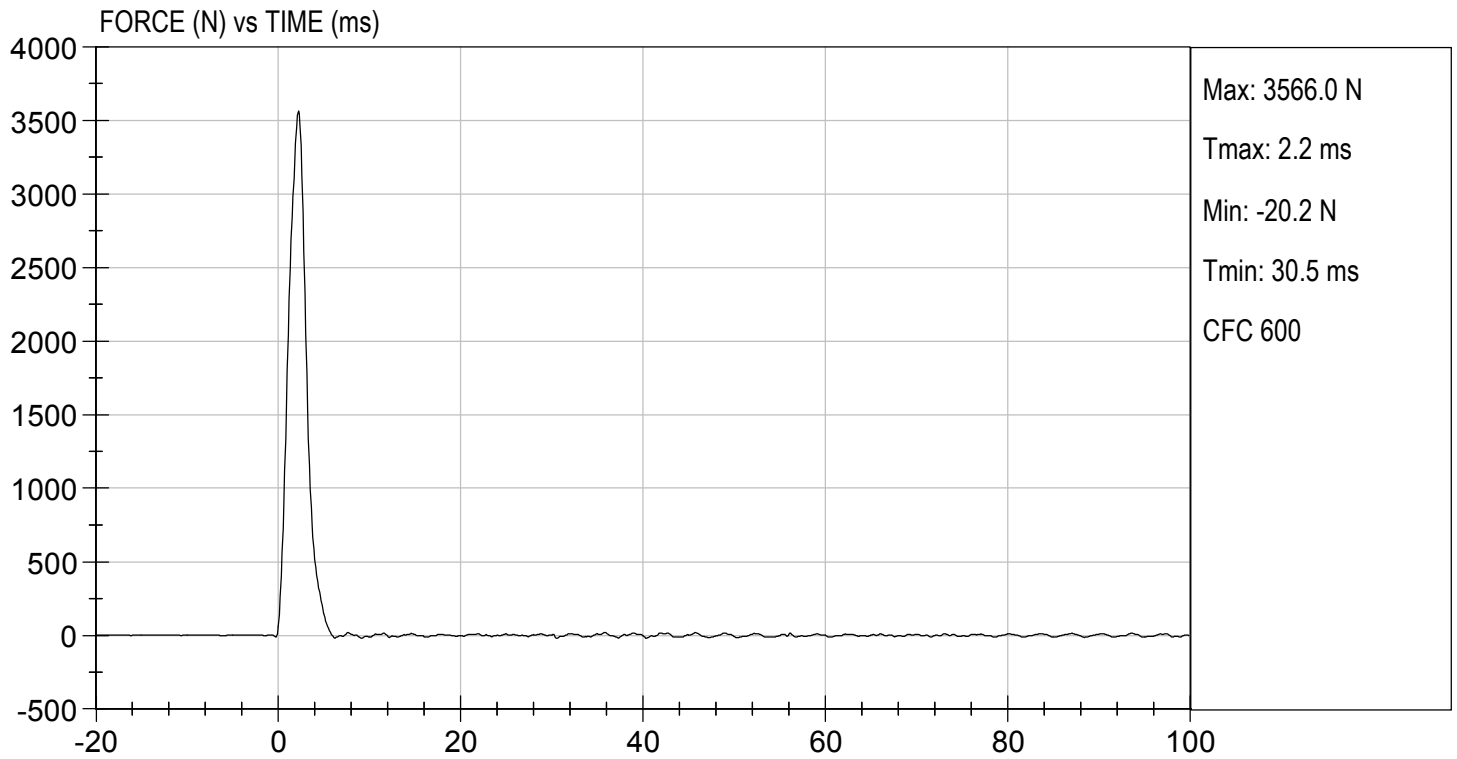
Test Date


Approved By



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

TEST DATE: 07/25/2017
TEST #: D171996



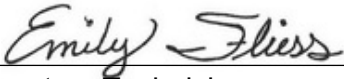
MGA RESEARCH CORPORATION

**TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE**

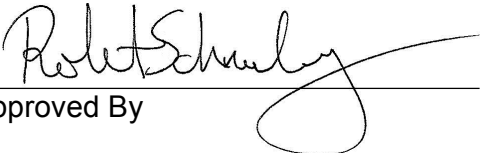
ATD Serial No: 634

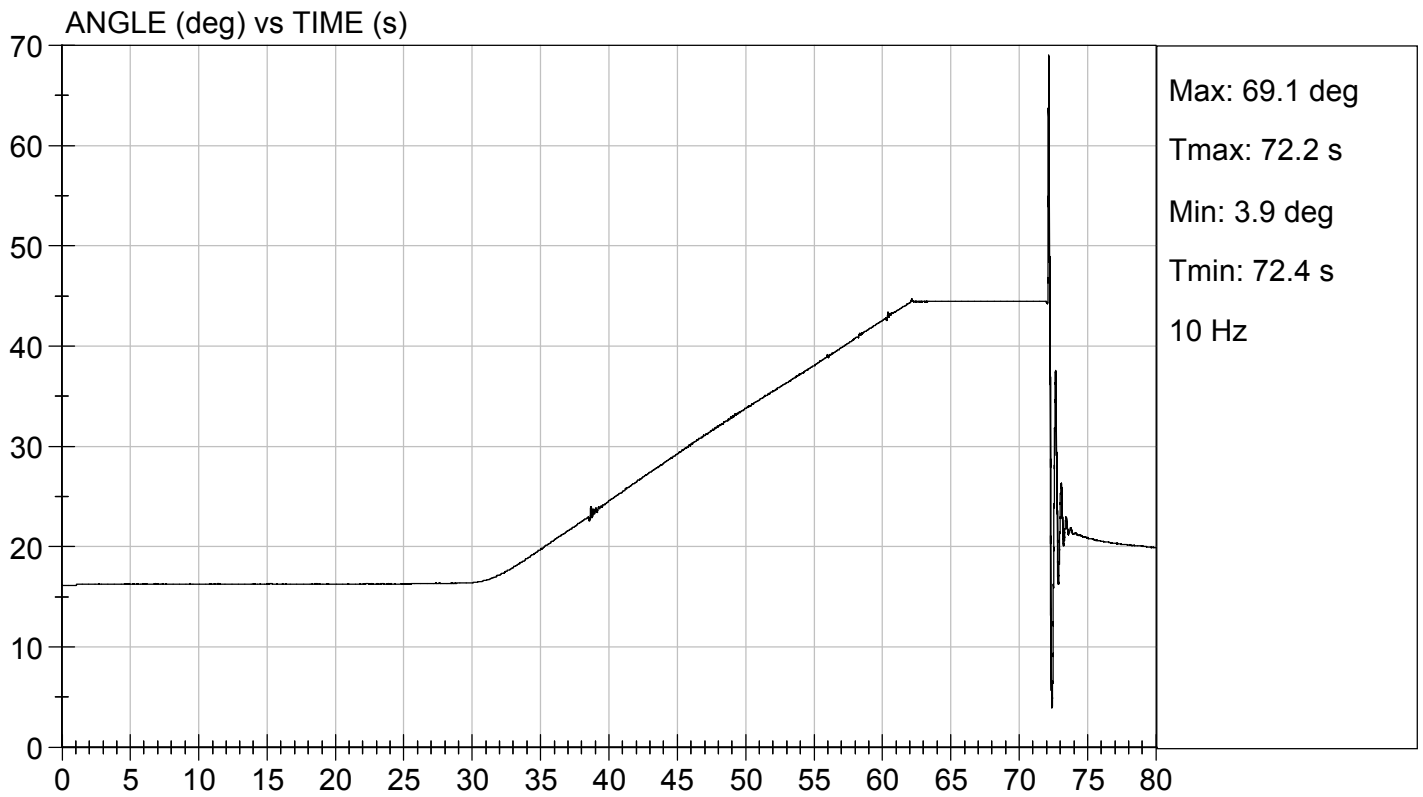
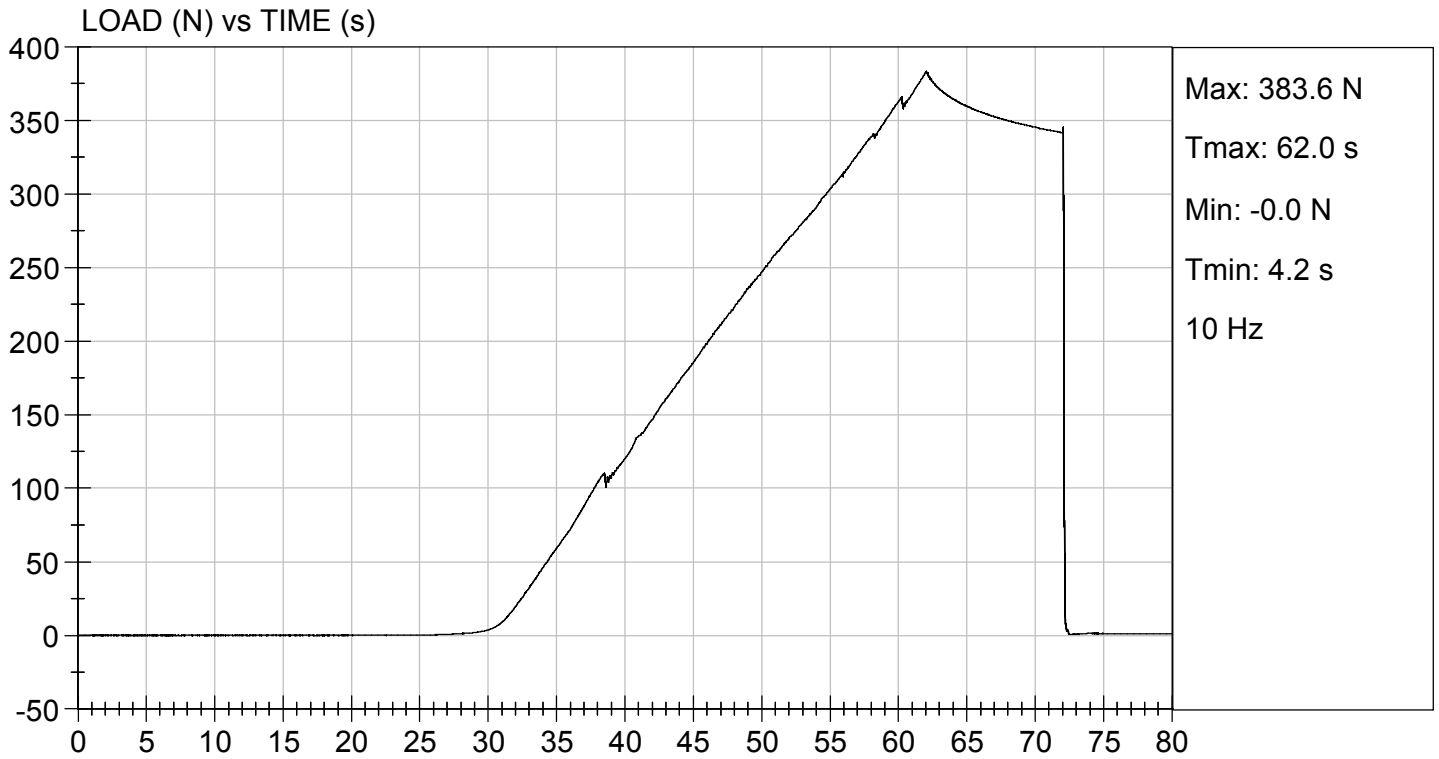
Test I.D: D171997

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	56.4	Pass
Initial Angle	deg	0 to 20	16	Pass
Return Angle	deg	+/- 8	3	Pass
Force at 45 deg	N	320 to 390	383	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass


Laboratory Technician

07/26/2017
Test Date


Approved By

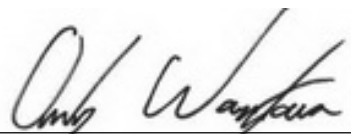


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D172111

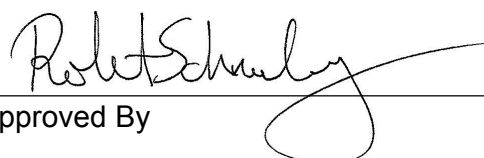
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Peak Resultant Acceleration	G's	250 to 300	274	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	4.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass



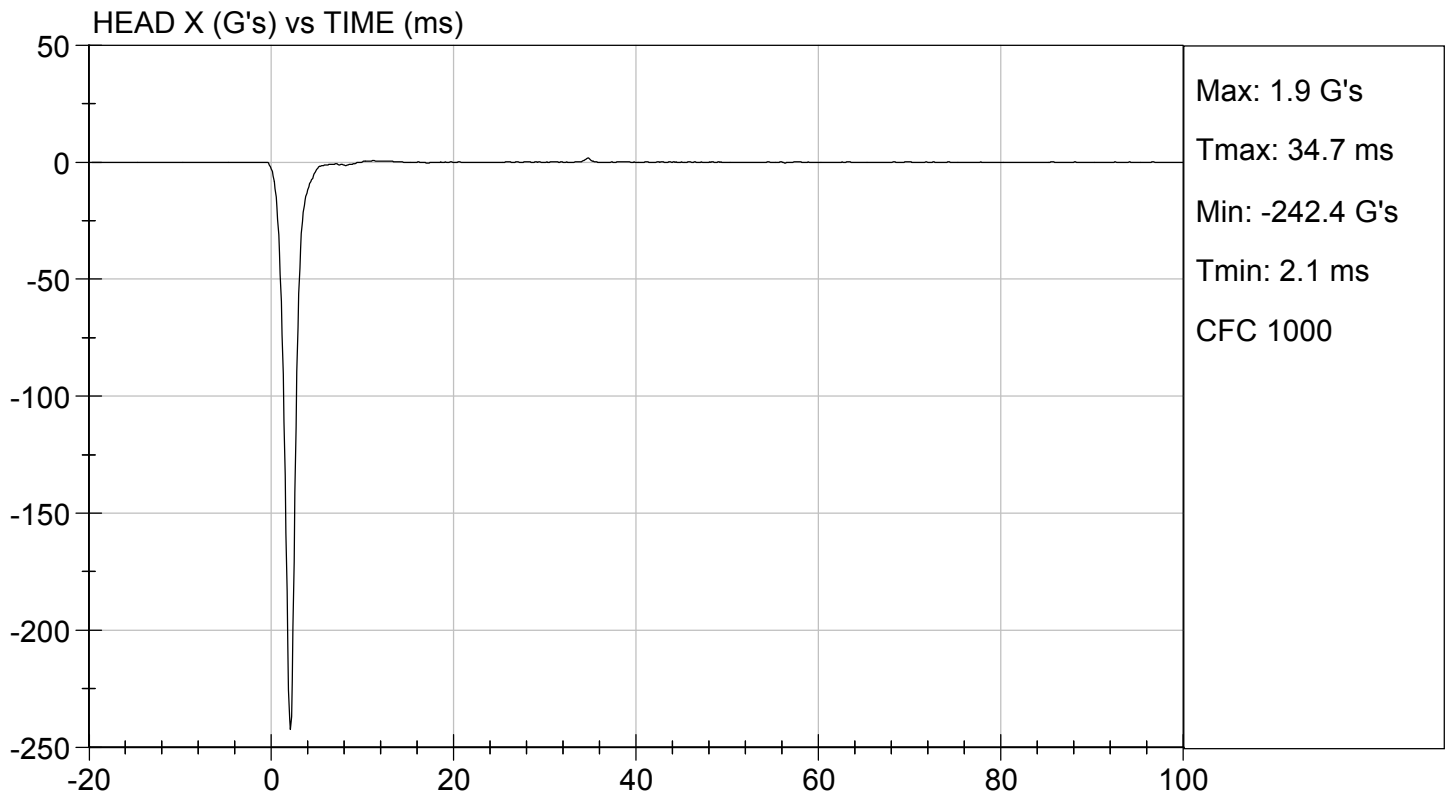
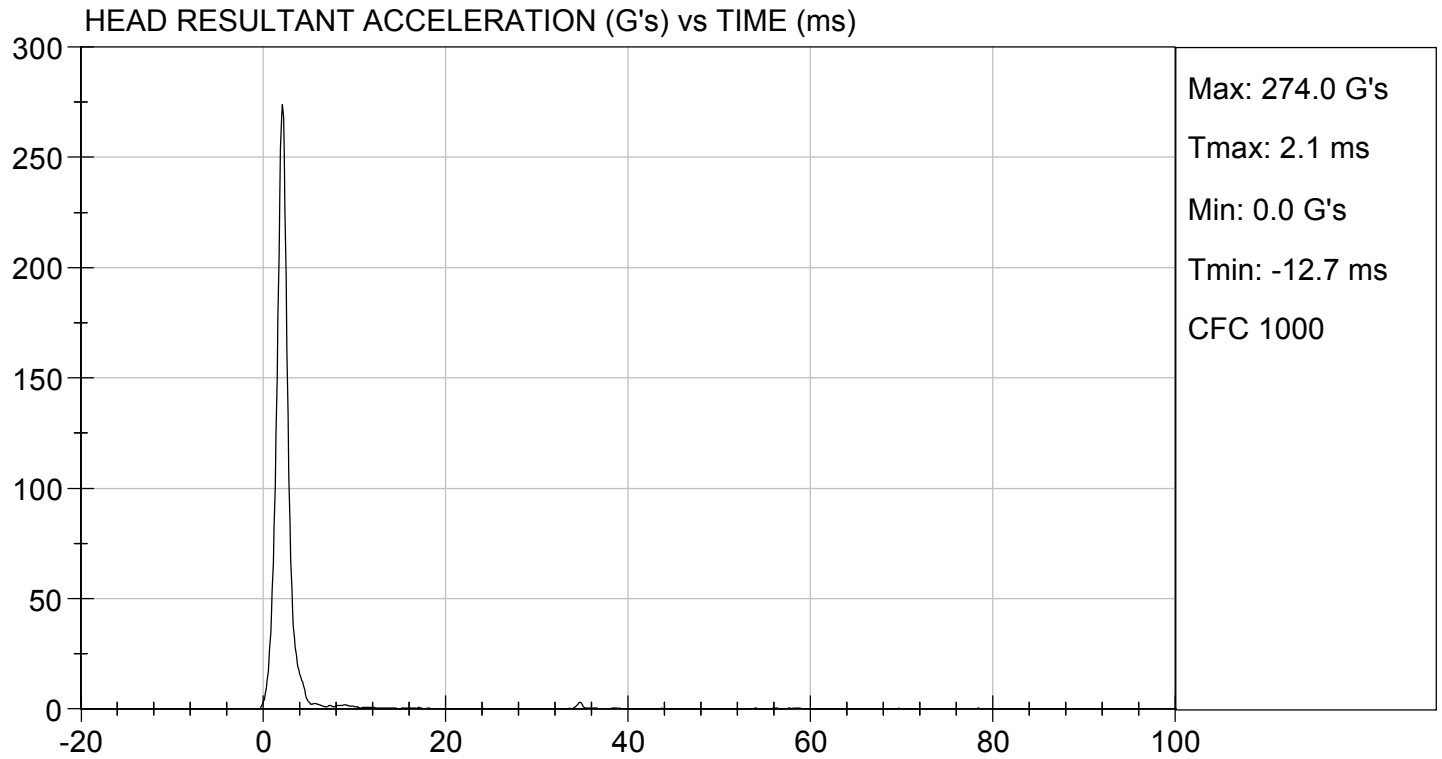
Laboratory Technician

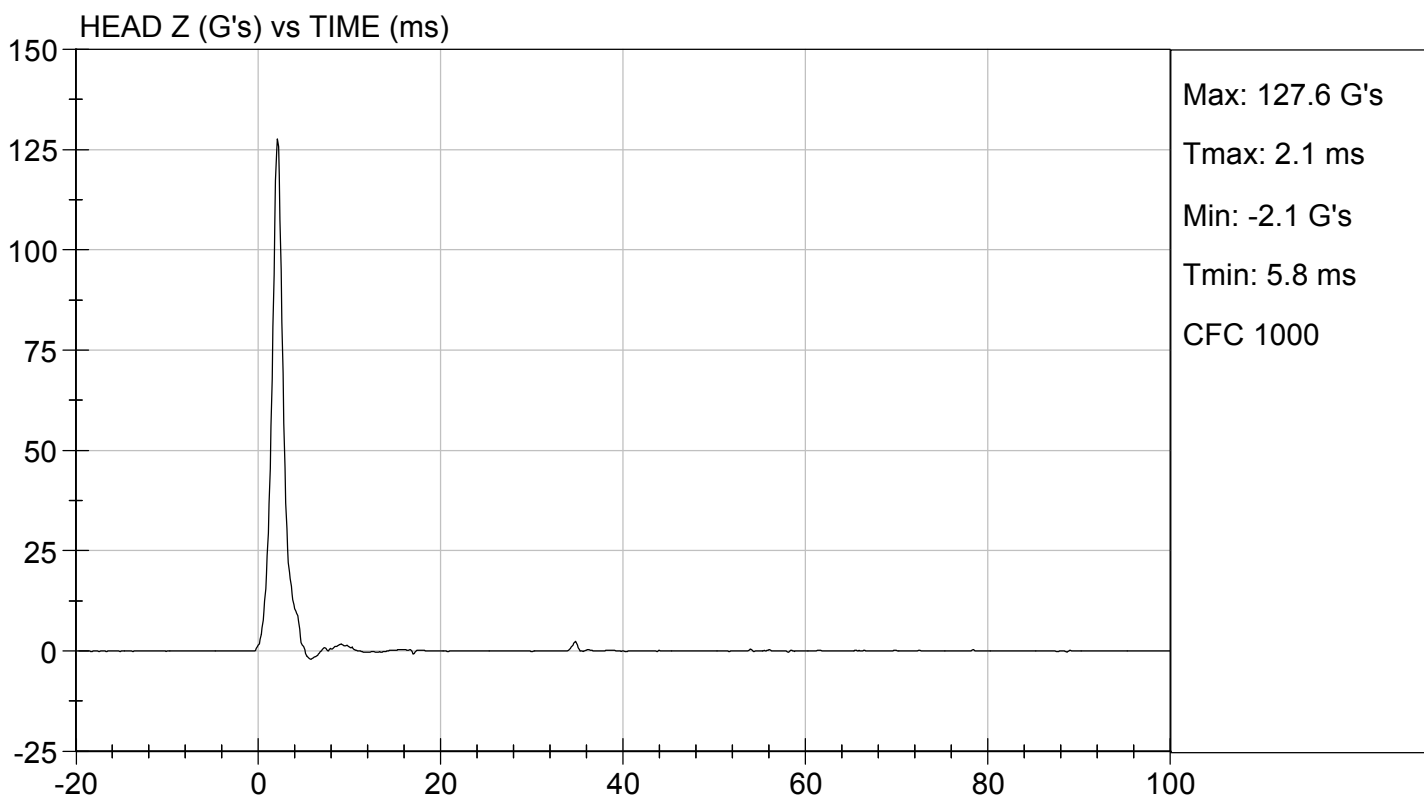
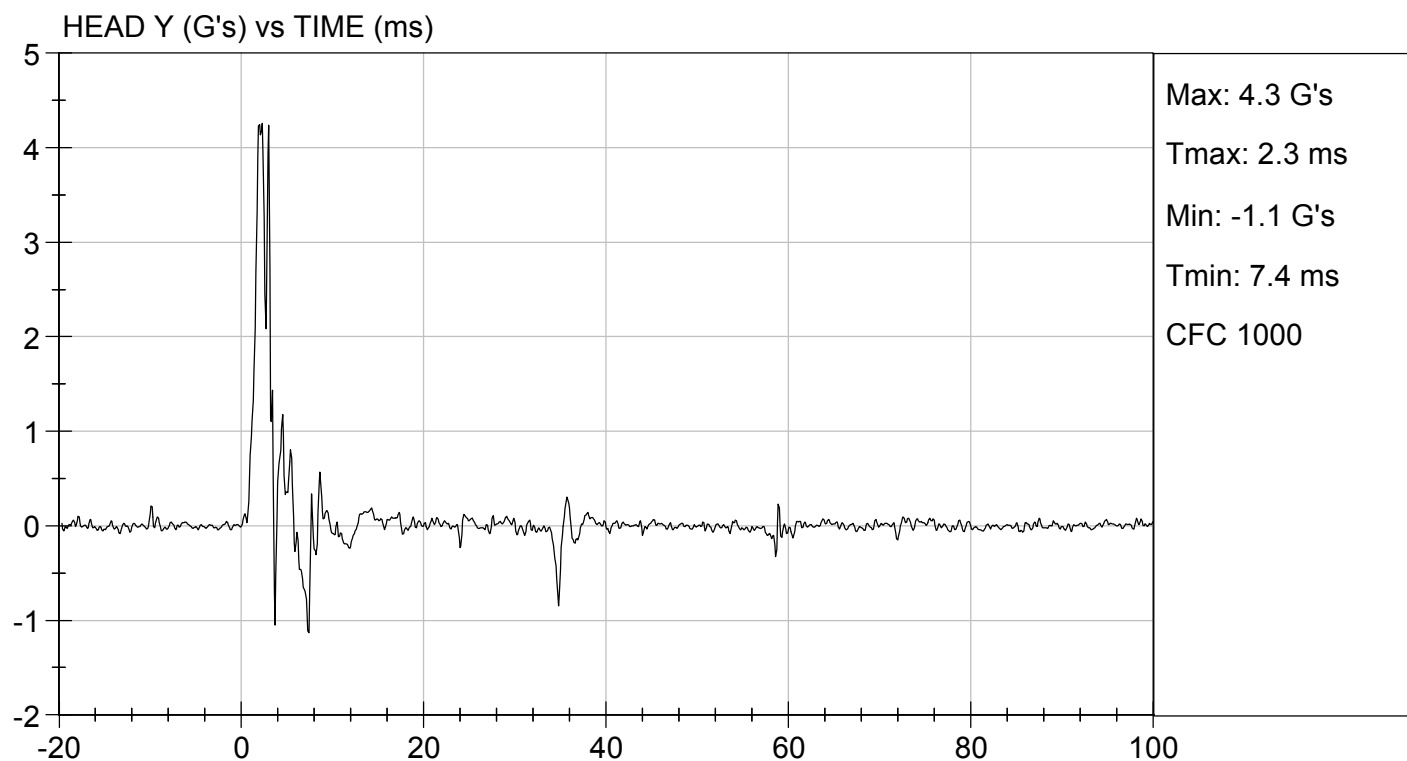
08/08/2017

Test Date



Approved By





MGA RESEARCH CORPORATION**NECK FLEXION TEST****HYBRID III 5TH PERCENTILE**ATD Serial No: 634Test I.D.: D172112

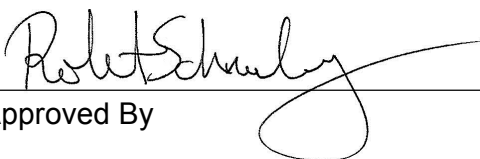
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	41.6	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.8	Pass
	30 ms	m/s	5.8 to 7.0	6.8	Pass
D Plane Rotation	Max	deg	77 to 91	83	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	69	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	88	Pass
Overall Results				Pass	



Laboratory Technician

08/09/2017

Test Date

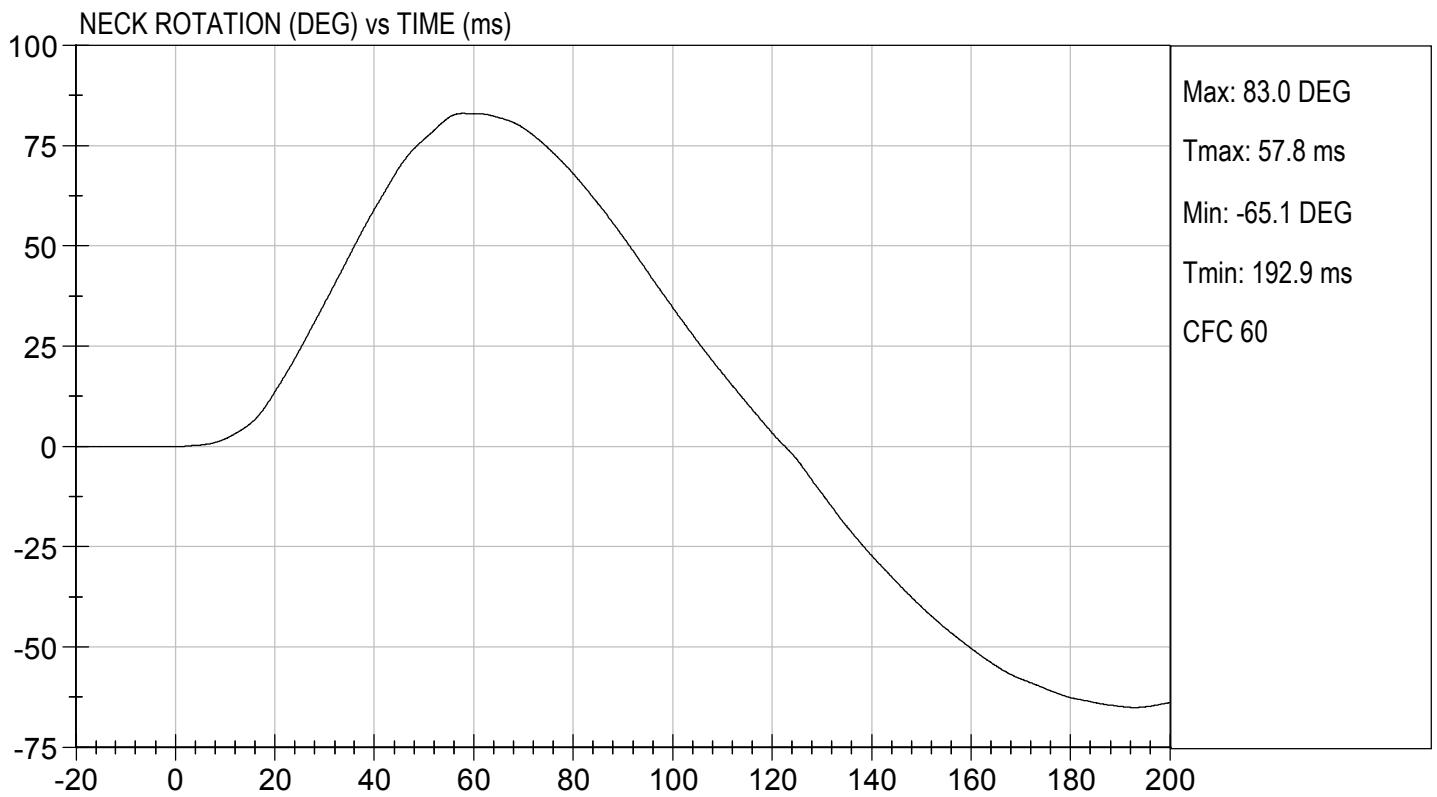
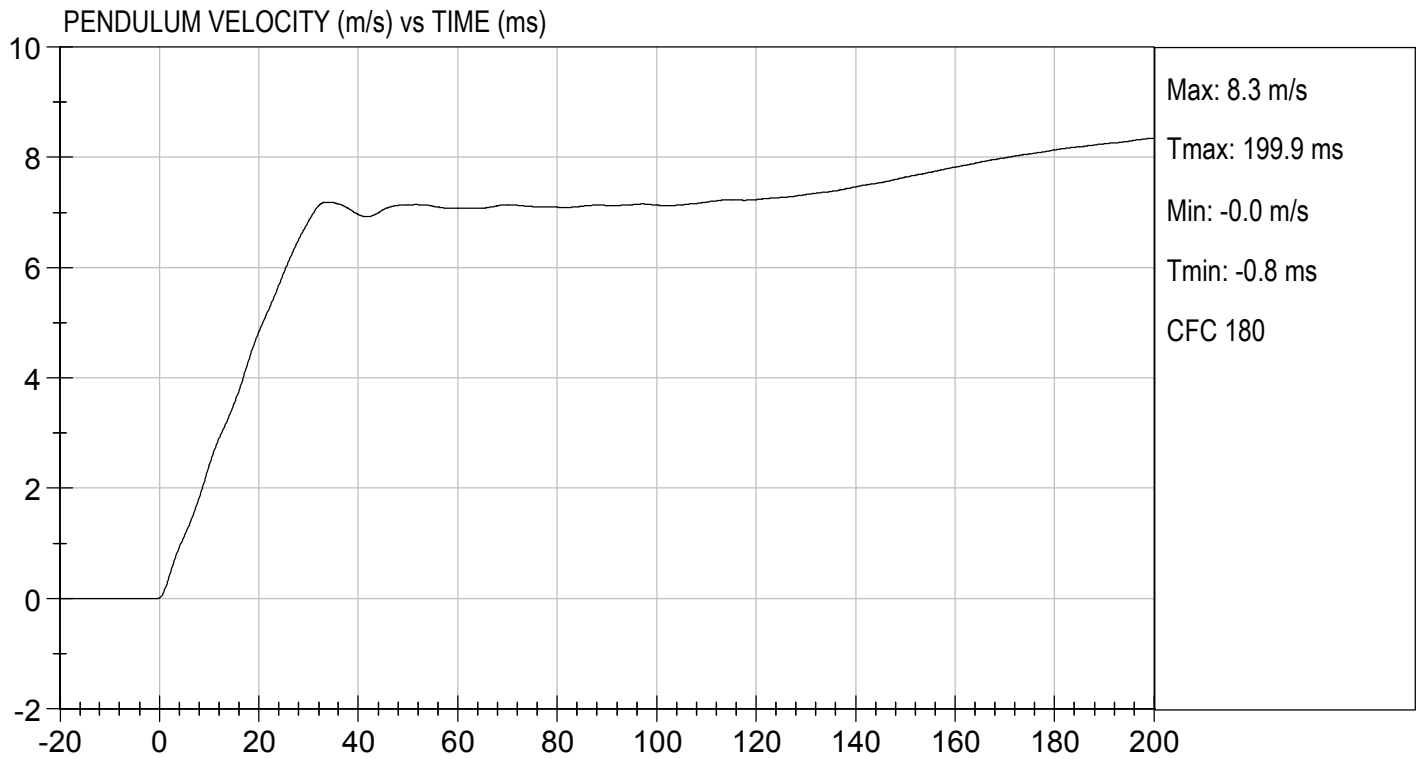


Approved By



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

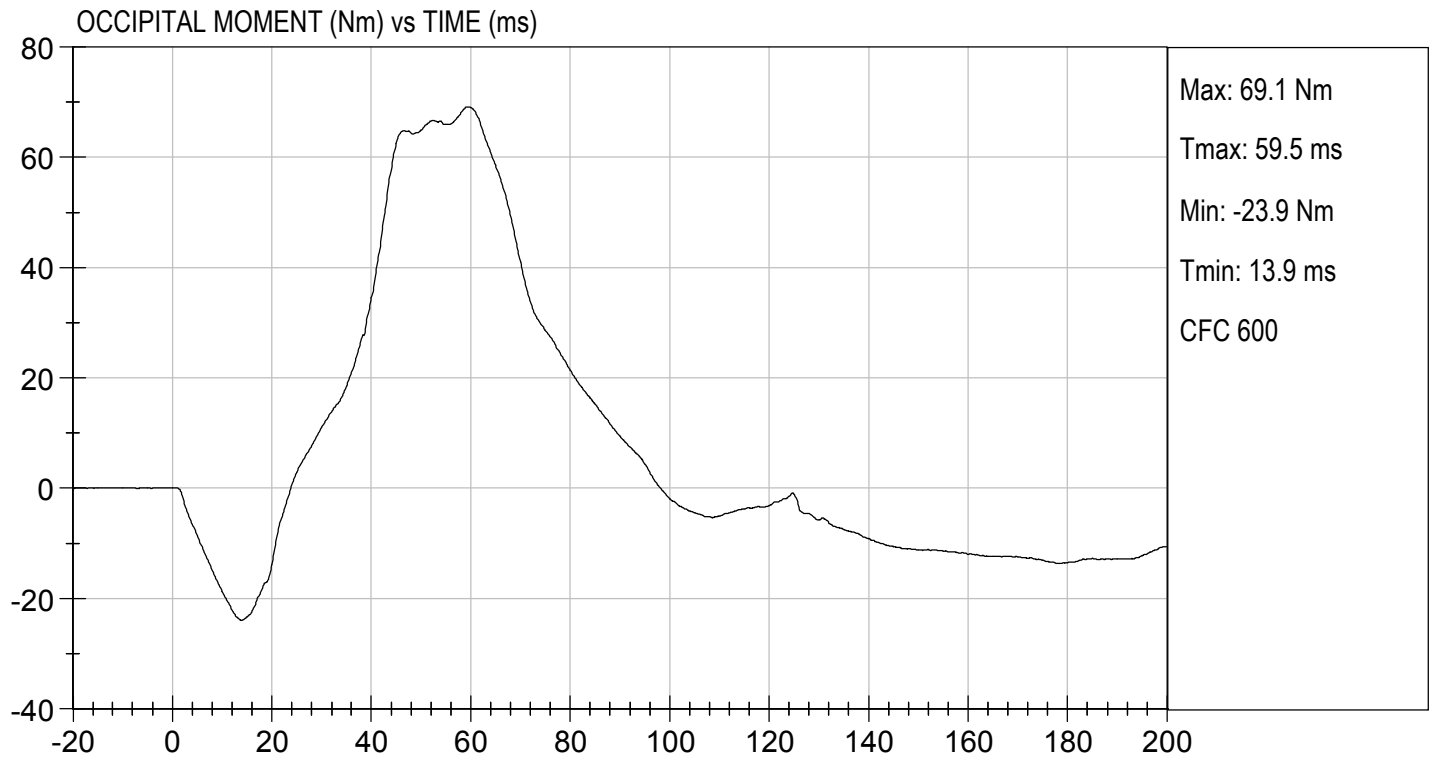
TEST DATE: 08/09/2017
TEST #: D172112





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

TEST DATE: 08/09/2017
TEST #: D172112



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

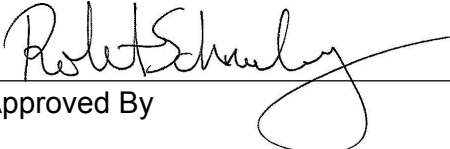
ATD Serial No: 634

Test I.D: D172113

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.2	Pass
D Plane Rotation	Max	deg	99 to 114	109	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-54	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	105	Pass
Overall Results					Pass


Laboratory Technician

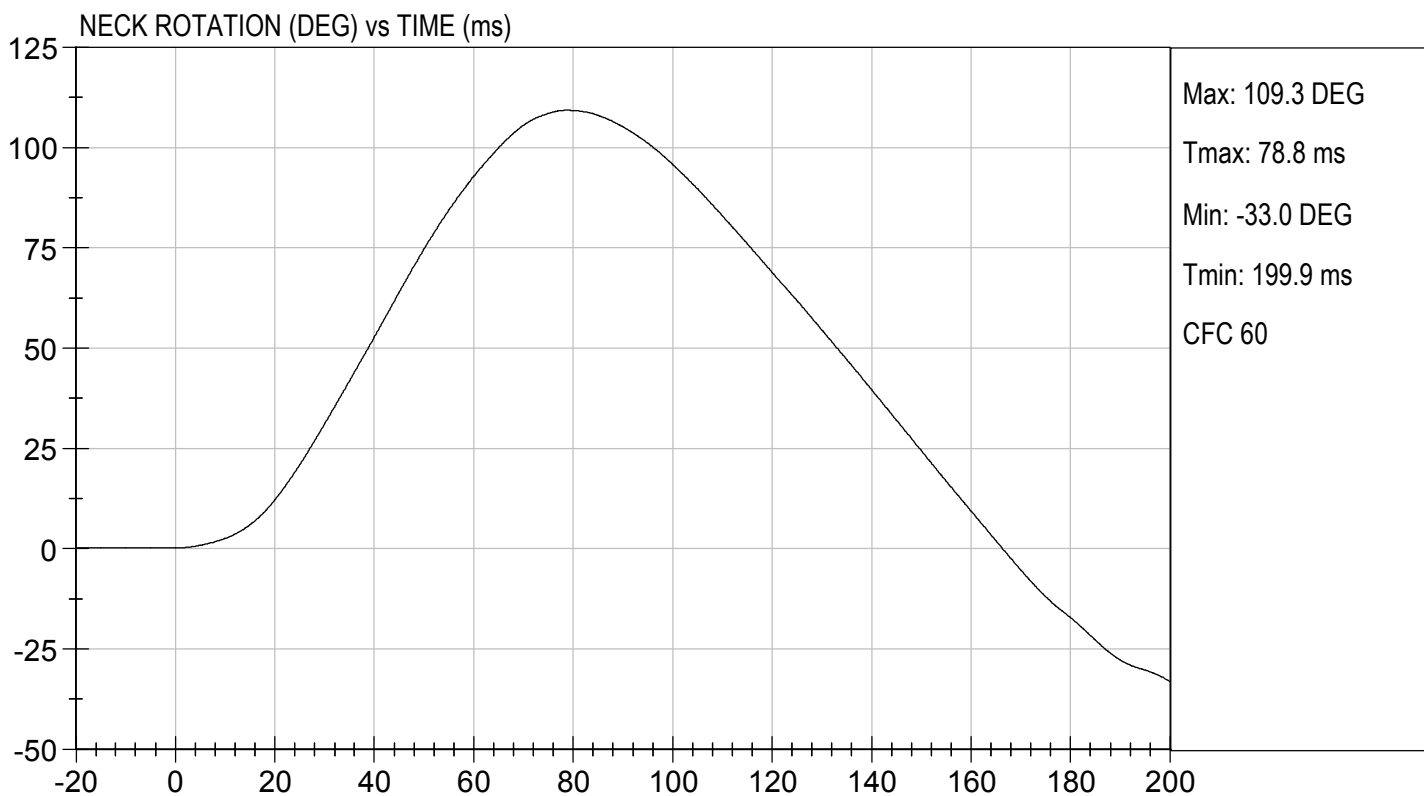
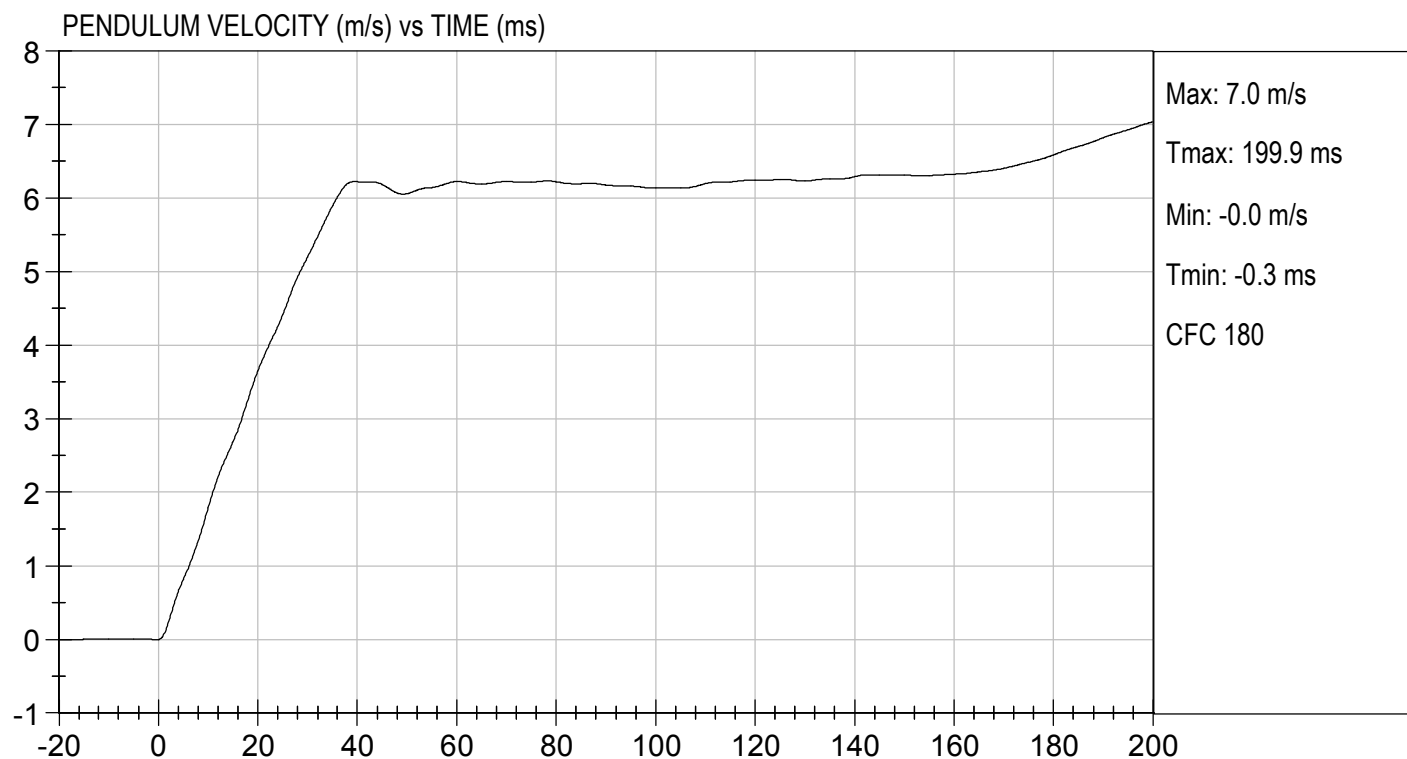
08/09/2017
Test Date


Approved By



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

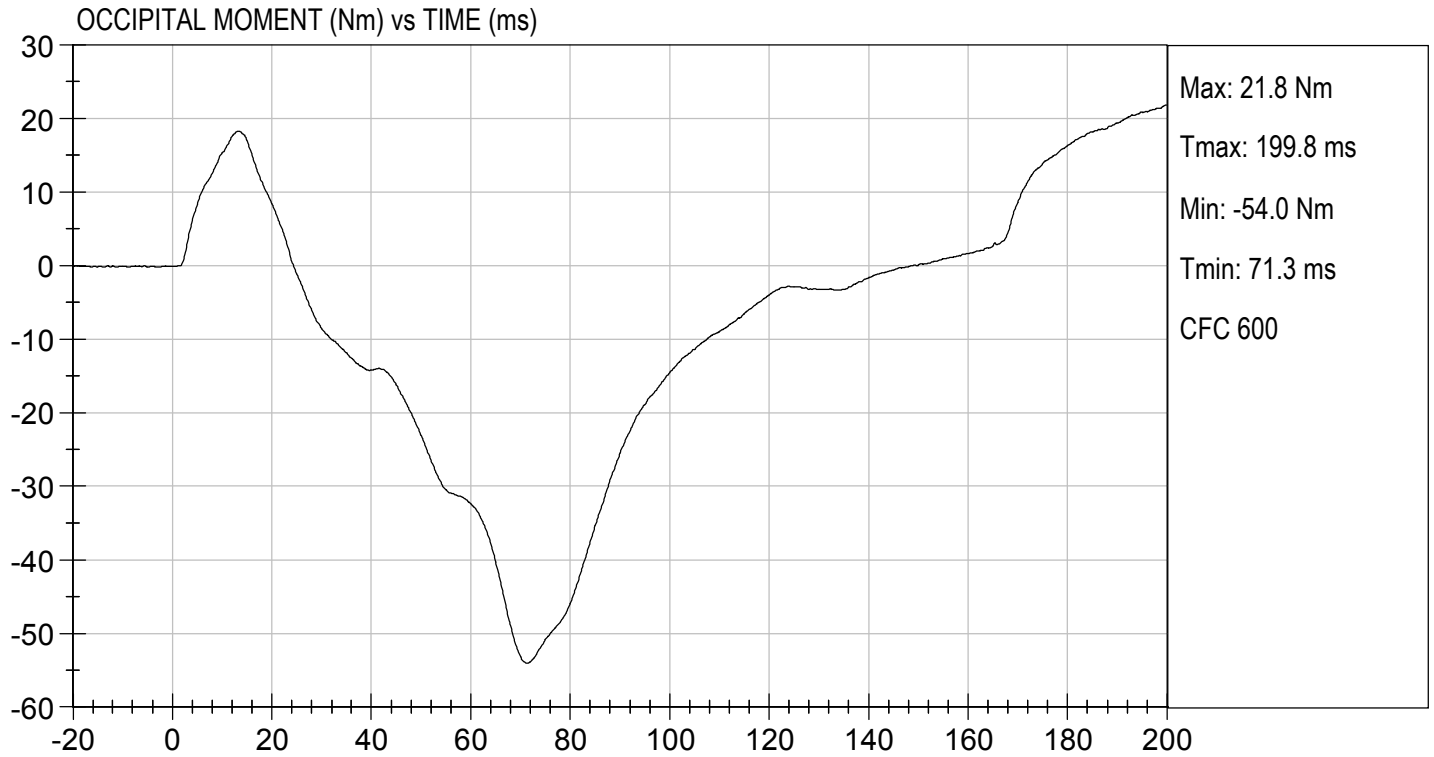
TEST DATE: 08/09/2017
TEST #: D172113





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

TEST DATE: 08/09/2017
TEST #: D172113

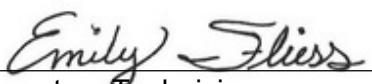


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

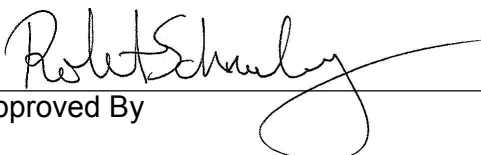
Test I.D: D172114

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	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	52	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4373	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4351	Pass
Overall Test Results				Pass


Laboratory Technician

08/10/2017

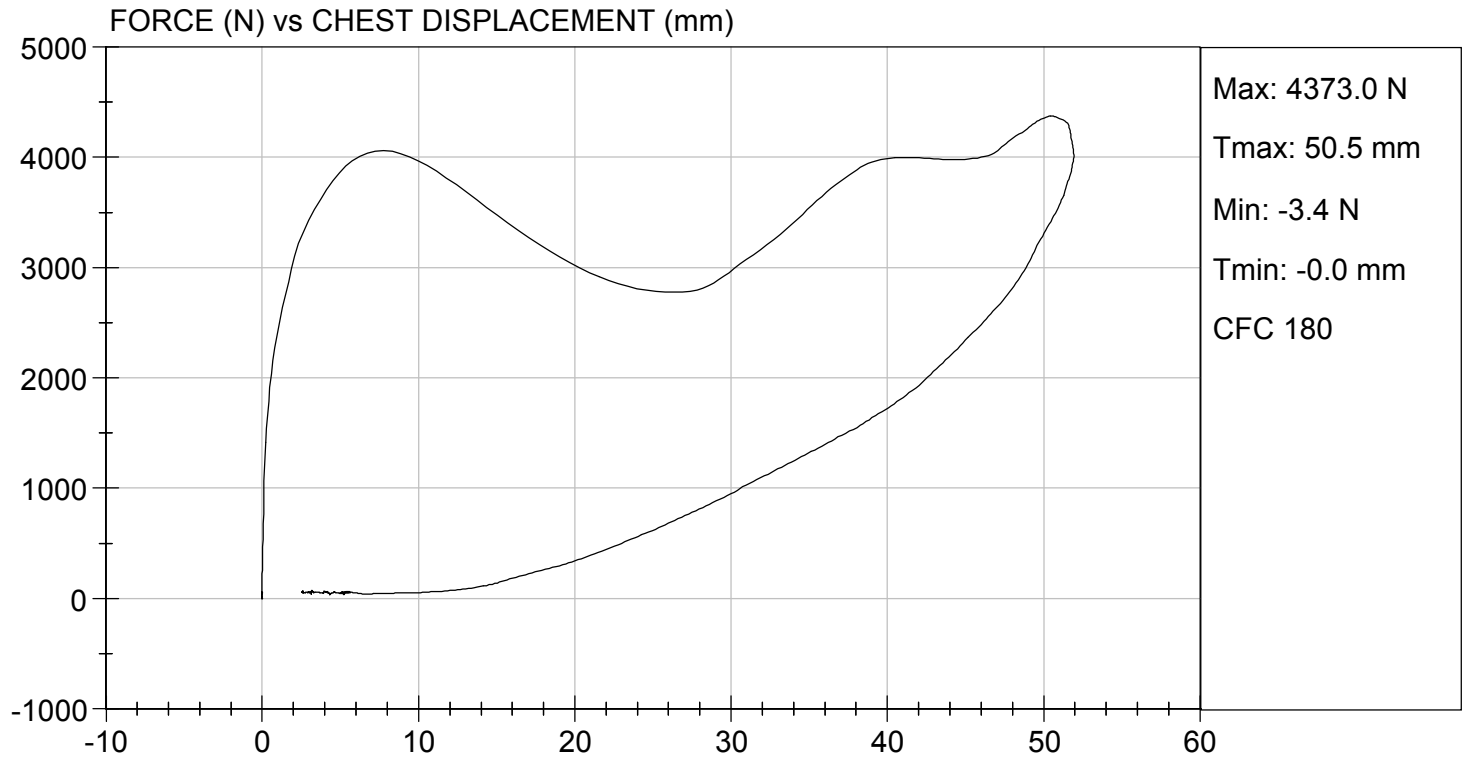
Test Date


Approved By



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

TEST DATE: 08/10/2017
TEST #: D172114



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D172115

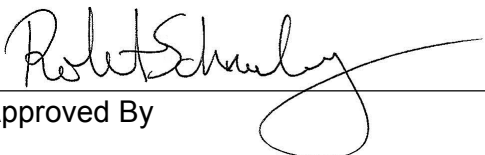
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	N	3450 to 4060	4041	Pass
Overall Test Results				Pass



Laboratory Technician

08/09/2017

Test Date

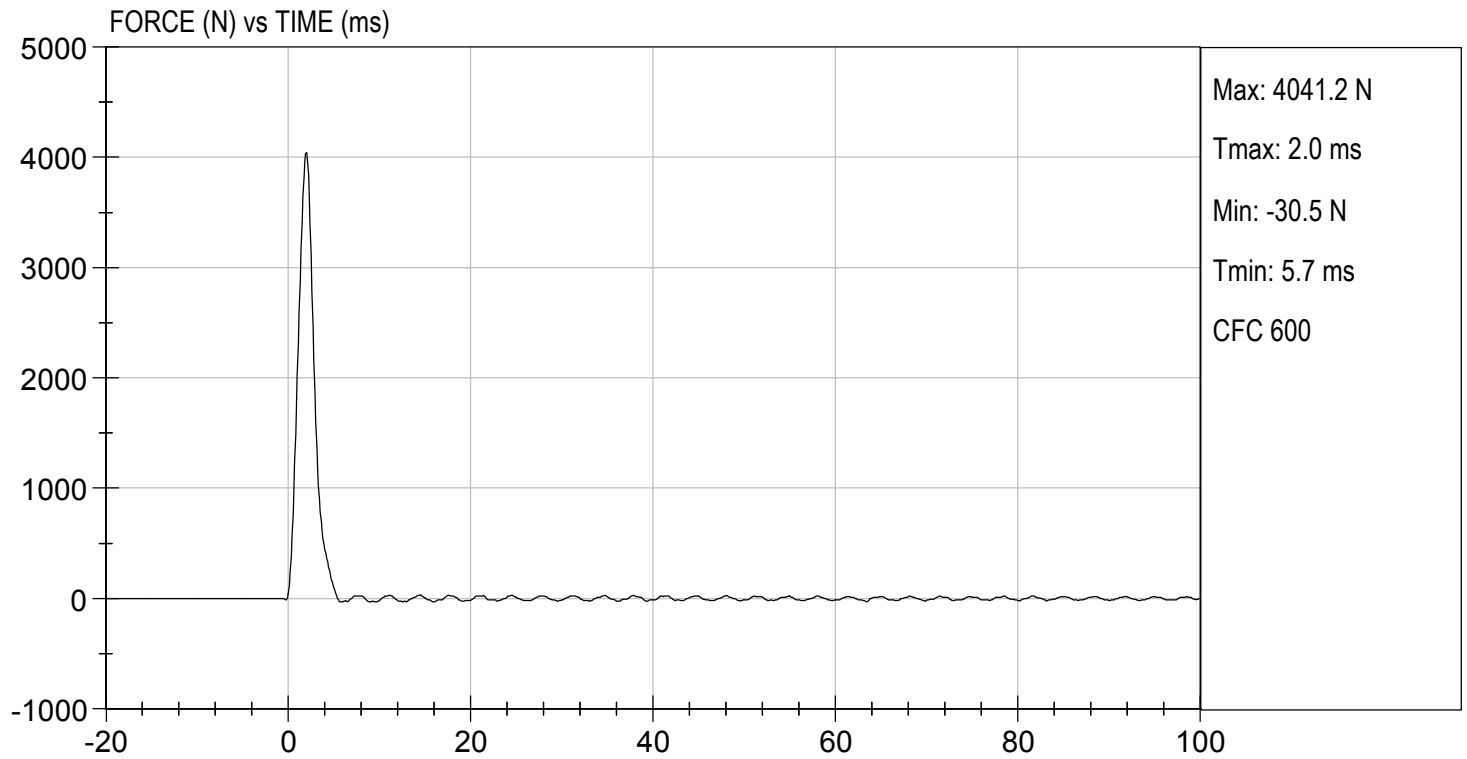


Approved By



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

TEST DATE: 08/09/2017
TEST #: D172115



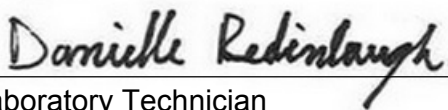
MGA RESEARCH CORPORATION

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

ATD Serial No: 634

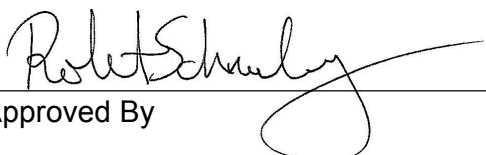
Test I.D: D172116

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Probe Speed	m/s	2.07 to 2.13	2.07	Pass
Maximum Force	N	3450 to 4060	3694	Pass
Overall Test Results				Pass


Laboratory Technician

08/09/2017

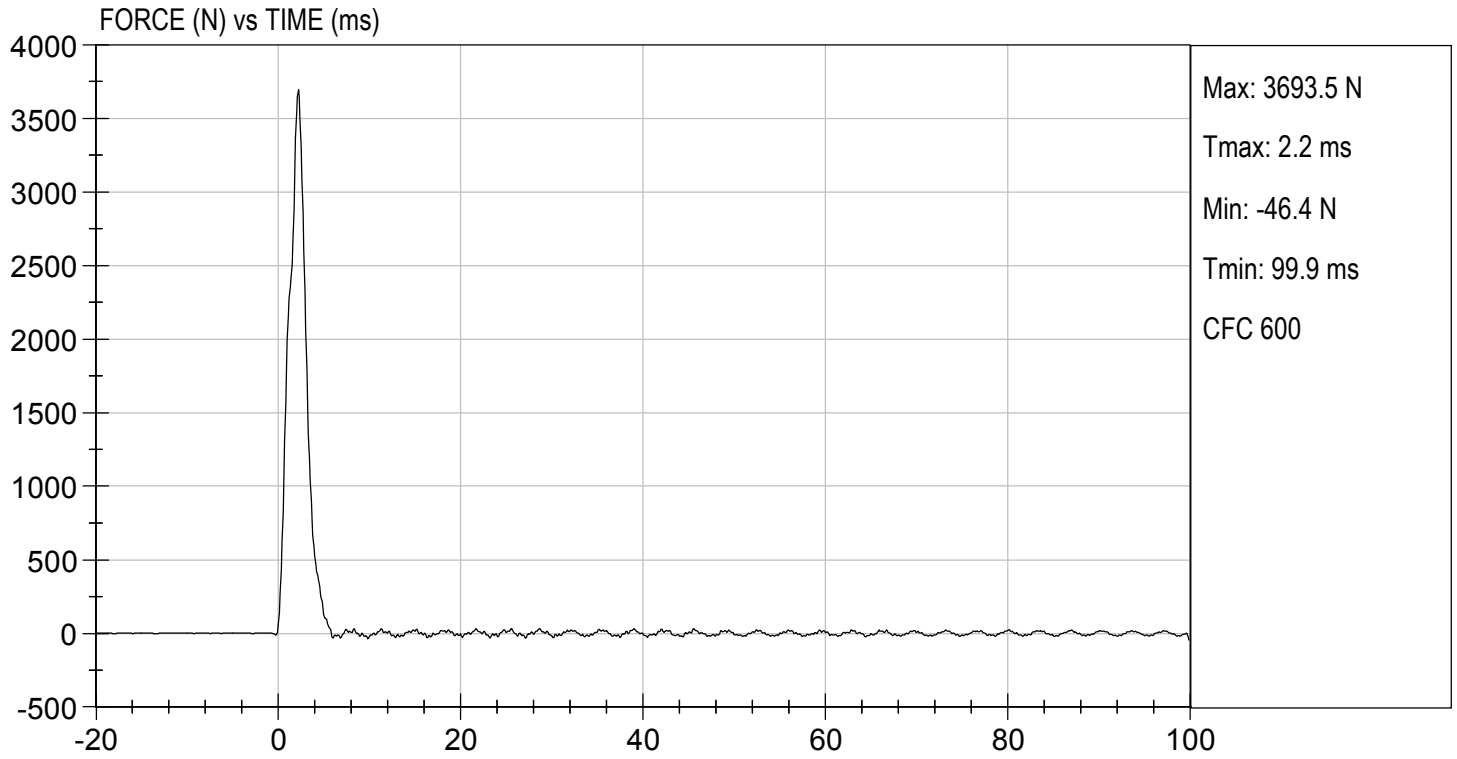
Test Date


Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.78 ft/s, 2.07 m/s

TEST DATE: 08/09/2017
TEST #: D172116



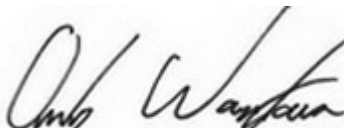
MGA RESEARCH CORPORATION

**TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE**

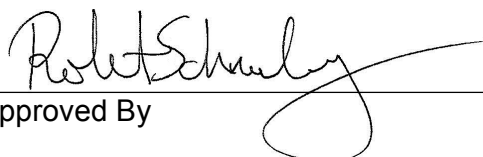
ATD Serial No: 634

Test I.D: D172117

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Initial Angle	deg	0 to 20	16	Pass
Return Angle	deg	+/- 8	3	Pass
Force at 45 deg	N	320 to 390	389	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass


Laboratory Technician

08/10/2017
Test Date


Approved By

