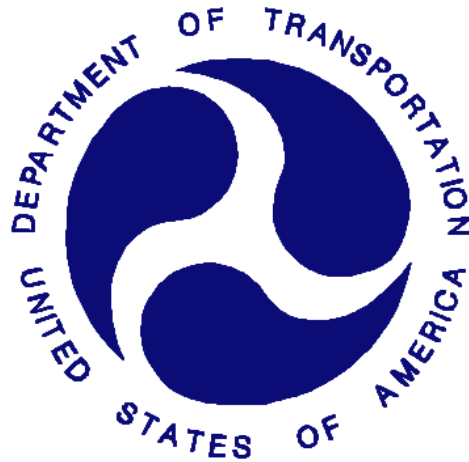


REPORT NUMBER: NCAP-MGA-2017-013

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

**AUDI AG
2017 Audi A4 2.0T Quattro 4-Door Sedan
NHTSA No.: O20175800**

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



Test Date: December 1, 2016

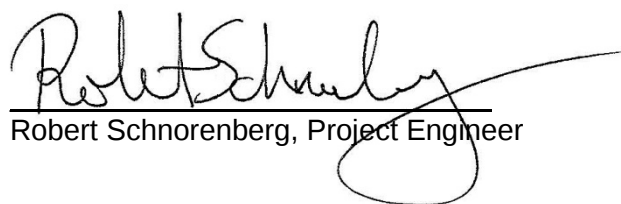
Final Report Date: January 25, 2017

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: January 25, 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 2017 Audi A4 2.0T Quattro 4-Door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on December 1, 2016. The impact velocity of the vehicle was 56.23 km/h and the ambient temperature at the barrier face at the time of impact was 21.3°C. The target vehicle post-test maximum crush was 430mm located to the left of the vehicle's centerline. The test vehicle's performance was as follows:																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>164</td> <td>700</td> <td>236</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td>33</td> <td>52</td> <td>25</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.26</td> <td>1</td> <td>0.25</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1030</td> <td>2620</td> <td>528</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>243</td> <td>2520</td> <td>211</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>1919</td> <td>6805</td> <td>1441</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>1755</td> <td>6805</td> <td>1517</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	164	700	236	Maximum Chest	mm	63	33	52	25	Nij	N/A	1	0.26	1	0.25	Neck Tension	N	4170	1030	2620	528	Neck Compression	N	4000	243	2520	211	Left Femur Force	N	10008	1919	6805	1441	Right Femur Force	N	10008	1755	6805	1517
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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 2017 Audi A4 2.0T Quattro 4-Door Sedan at a velocity of 56.23 km/h. The test was performed at MGA Research Corporation on December 1, 2016. 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. Seat belt load cells were also installed on the driver's shoulder belt, driver's lap belt, passenger's shoulder belt, and passenger's lap belt to measure dummy torso section loading.

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

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

The maximum static crush of the vehicle was 430mm to the left of the vehicle's centerline and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee airbag. The passenger's visible contact points were as follows: The passenger's head contacted the airbag. The passenger's head also contacted the headrest and side curtain airbag. 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)	164	0.26	1030	243	39	33	1919	1755
Passenger (5 th)	236	0.25	528	211	42	25	1441	1517

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

TEST NOTES

Bottom of Engine X recorded no valid data after 24ms.
 Barrier K-16 My recorded no valid data.
 Barrier F-01 Fx 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: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20175800	Traction Control System (TCS)	Yes
Model Year	2017	Power Steering	Yes
Make	Audi	Power Window Auto-Reverse	Yes
Model	A4	Driver Frontal Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	WAUANAF40HN025918	Driver Head/Torso Airbag	No
Body Color	Manhattan Gray Metallic	Driver Torso Airbag	No
Odometer (km/mi)	90km / 56mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.0 L	Driver Pelvis Airbag	No
Type/No. Cylinders	Inline 4	Driver Knee Airbag	Yes
Engine Placement	Longitudinal	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	7	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	AWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	Yes	Front Pass. Knee Airbag	Yes
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	N/A

Does owner's manual provide instructions to turn off automatic door locks?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	AUDI AG	GVWR (kg)	2175
Date of Manufacture	07/16	GAWR Front (kg)	1085
		GAWR Rear (kg)	1140

VEHICLE SEATING AND WEIGHT CAPACITY DATA

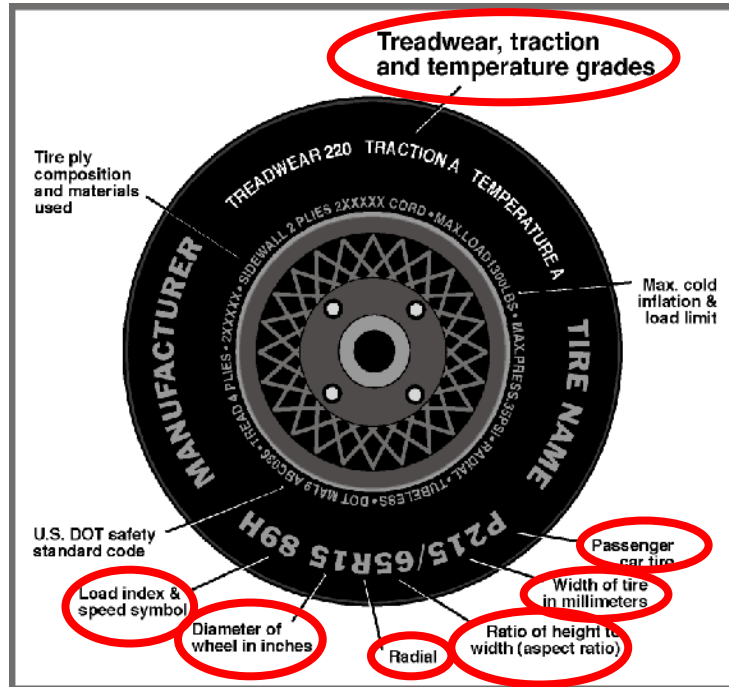
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				480
Cargo Weight (RCLW) (kg)				140

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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	225/50R17	225/50R17
Tire Size on Vehicle	225/50R17	225/50R17
Tire Manufacturer	Continental	Continental
Tire Model	ProContact	ProContact
Treadwear	500	500
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Rayon	1 Rayon
Tire Plies Body	1 Rayon, 2 Steel, 1 Polyamide	1 Rayon, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	94H	94H
Tire Material	Rubber	Rubber
DOT Safety Code Left	LM40 WCP9 1916	LM40 WCP9 1916
DOT Safety Code Right	LM40 WCP9 1916	LM40 WCP9 1916

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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	446.5	361.0		476.0	476.0	
Right	kg	461.0	360.0		477.0	473.0	
Ratio	%	55.7%	44.3%		50.1%	49.9%	
Totals	kg	907.5	721.0	1628.5	953.0	949.0	1902.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1628.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	140
Calculated Test Vehicle Target Weight (TVTW)	kg	1909.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	715	703	708	722	1249
As Tested	mm	700	700	668	670	1407
Post Test	mm	740	717	674	654	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2821
Total Vehicle Length at Left Side	mm	4577
Total Vehicle Length at Centerline	mm	4734
Total Vehicle Length at Right Side	mm	4577
Weight of Ballast in Cargo Area	kg	77
Weight of Vehicle Components Removed	kg	30
Amount of Stoddard Solvent in Fuel Tank	L	53.8

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, spare tire and cover, jack and tool kit, LR/RR floor mat.

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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4734
2	Total Width	1836
3	Bumper Top Height	560
4	Bumper Bottom Height	428
5	Longitudinal Member Top Height	590
6	Distance between Longitudinal Members	823
7	Longitudinal Member Width	80
8	Engine Top Height	890
9	Engine Bottom Height	217
10	Engine and Gearbox Width	599
11	Front Bumper-Engine Distance	407
12	Front Shock Absorber Fixing Height	887
13	Bonnet Leading Edge Height	745
14	Front Shock Absorber Fixing Width	740
15	Front Bumper – Front Axle Distance	881
16	Front Axle – A-Pillar Distance	425
17	A-Pillar – B-Pillar Distance	1236
18	B-Pillar – Rear Axle Distance	1160
19	B-Pillar – C-Pillar Distance	732
20	Roof Sill Bottom Height	1275
21	Roof Sill Top Height	1403
22	Floor Sill Bottom Height	184
23	Floor Sill Top Height	410

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

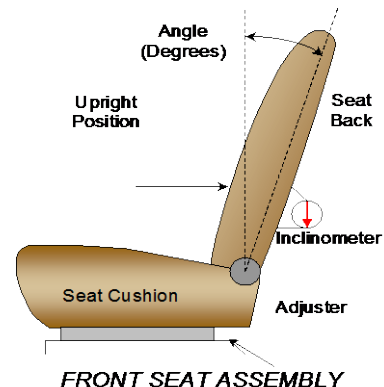
Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016

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	18.6° on seatback centerline
Passenger Seat Back Angle	15.7° on seatback centerline



SEAT FORE/AFT POSITIONS

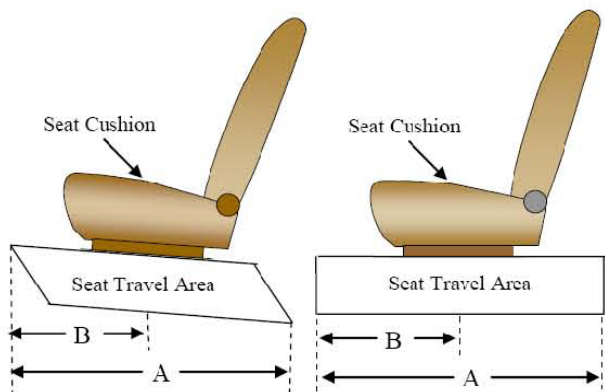
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated October 2015.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	308 mm	154 mm
Passenger Seat	248 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)	1 (1 st as 0)



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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

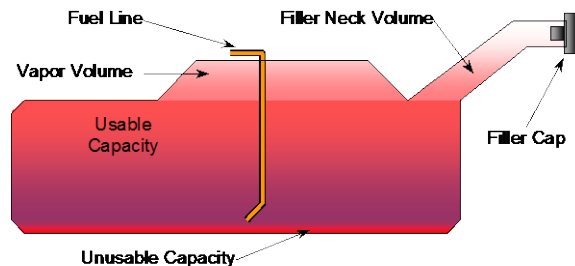
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	57.9
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	53.4 to 54.1
Actual Amount of Solvent used	53.8
1/3 of Usable Capacity	19.3

FUEL PUMP

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

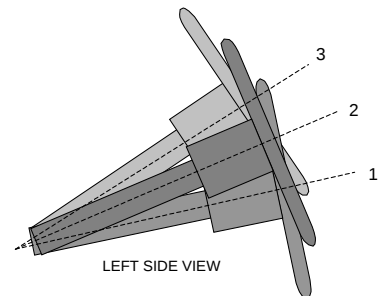
The test vehicle is equipped with an electronic fuel pump. At ignition "on" the pump will work for a short time to put pressure to the system. If the engine is started the pump works normally. The filler neck is located on the passenger's side.



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

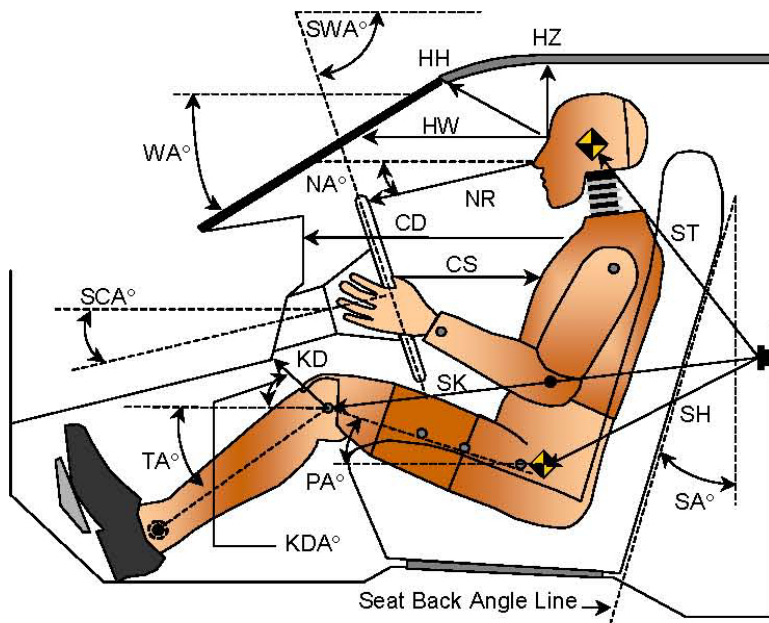
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	71.2	173
Geometric Center Position 2	68.8	203
Uppermost Position 3	66.4	232
Telescoping Steering Wheel Travel		59
Test Position	68.8	203

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016



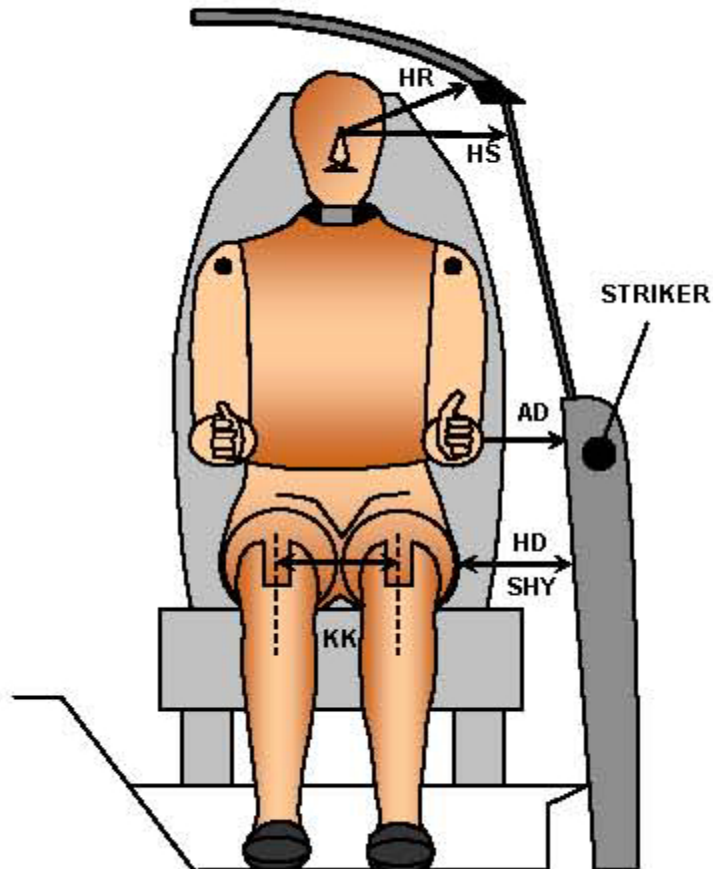
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		23.4		
SWA°	Steering Wheel Angle		68.8		
SCA°	Steering Column Angle		21.2		
SA°	Seat Back Angle		18.6		15.7
HZ	Head to Roof (Z)	173	90	287	90
HH	Head to Header	314	28.8	253	46.3
HW	Head to Windshield	624	0	599	0
NR	Nose to Rim	361	7.9		
CD	Chest to Dash	509		373	
CS	Chest to Steering Hub	302	0.8		
RA	Rim to Abdomen	197	0		
KDL	Left Knee to Dash	219	27.7	143	51.8
KDR	Right Knee to Dash	212	29.1	153	52.9
PA°	Pelvic Angle		24.3		20.2
TA°	Tibia Angle		37.4		43.0
SK	Striker to Knee	543	98.1	649	99.4
ST	Striker to Head	448	11.5	409	30.1
SH	Striker to H-Point	282	148.3	344	117.9

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016



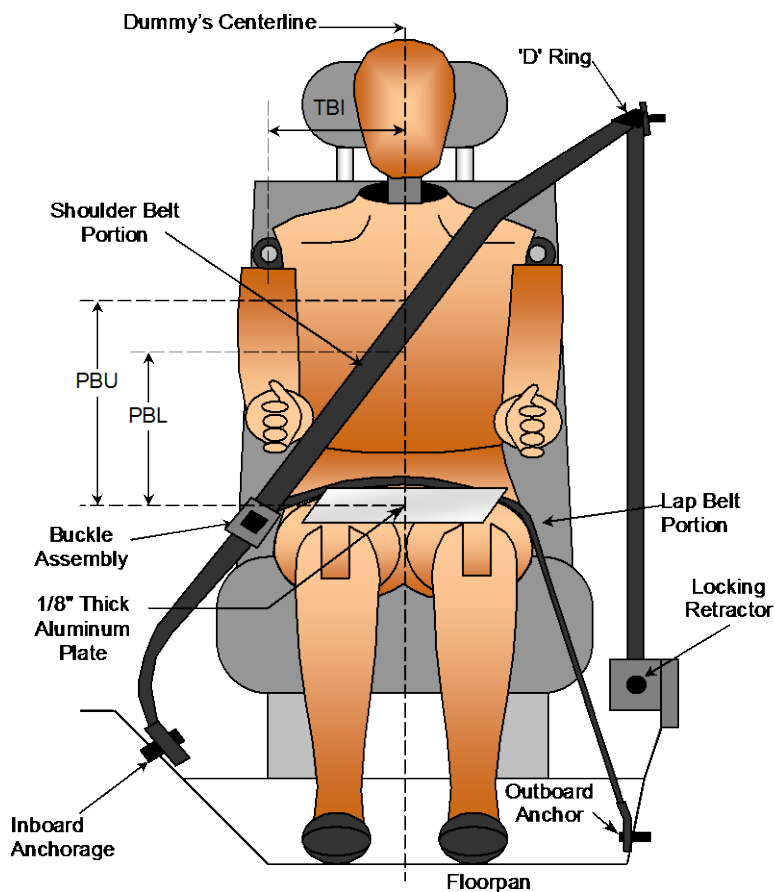
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	127	92
HD	H-Point to Door	164	173
HR	Head to Side Header	210	219
HS	Head to Side Window	329	330
KK	Knee to Knee	233	226
SHY	Striker to H-Point (Y Direction)	293	300
AA	Ankle to Ankle	318	166

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	360	300
PBL - Top surface of reference to belt lower edge	mm	270	215

BELT LENGTH DATA

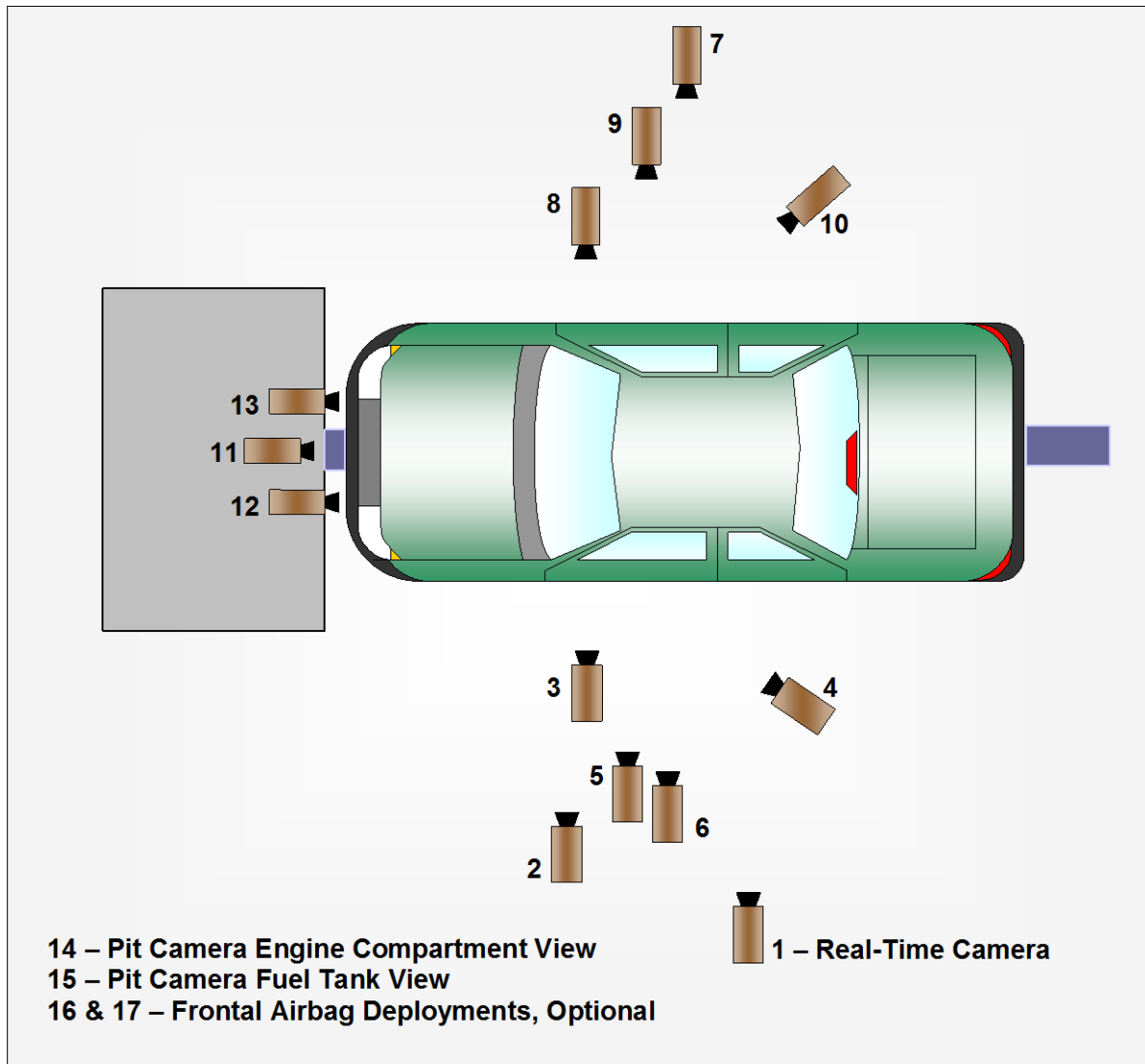
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	850	890
Lap Belt Length as measured on ATD	mm	535	600
Remainder of belt on reel	mm	1265	1175
Total Belt Length for Continuous Webbing Systems	mm	3250	3250

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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	-1650	-7420	-2100	35	1000
3	Left Front Half	-1040	-5010	-1280	24	1000
4	Left Angle	-5760	-5040	-2080	50	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	-2490	6950	-1170	20	1000
8	Passenger Close-Up	-1650	7100	-2080	35	1000
9	Right Front Half	-1220	5060	-1300	24	1000
10	Right Angle	-5790	5110	-2090	50	1000
11	Windshield	470	0	-2810	20	1000
12	Driver Windshield	-30	-450	-2030	8.5	1000
13	Passenger Windshield	-30	450	-2030	8.5	1000
14	Pit Front	-1200	0	3150	24	1000
15	Pit Rear	-2890	0	3150	24	1000
16	Onboard Driver Side				12	1000
17	Onboard Passenger Side				12	1000
18	Real-Time Pan View					30

***COORDINATES:**

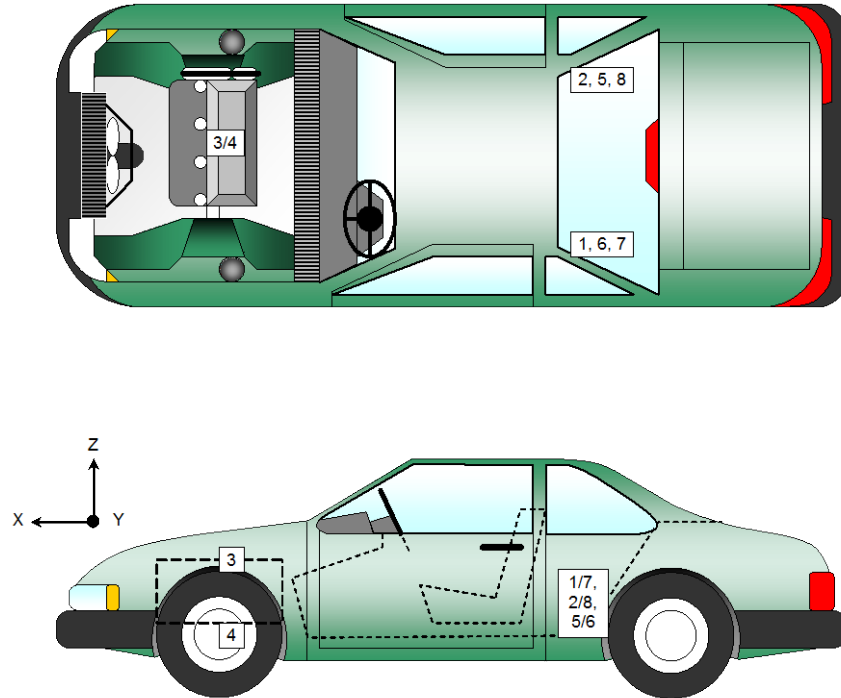
+X = forward of impact plane
 +Y = right of monorail centerline
 +Z = below ground level

Cameras 5 & 6 were not used for this test.

DATA SHEET NO. 7 VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1958	-405	-193
2	Right Rear Crossmember Accelerometer – X Direction	1960	407	-193
3	Engine Top X	4110	-10	-785
4	Engine Bottom X	4192	0	-217
5	Left Rear Crossmember Accelerometer – Z Direction	1958	-405	-193
6	Right Rear Crossmember Accelerometer – Z Direction	1960	407	-193
7	Left Rear Crossmember Accelerometer Redundant – X Direction	1920	-405	-193
8	Right Rear Crossmember Accelerometer Redundant – X Direction	1921	407	-193

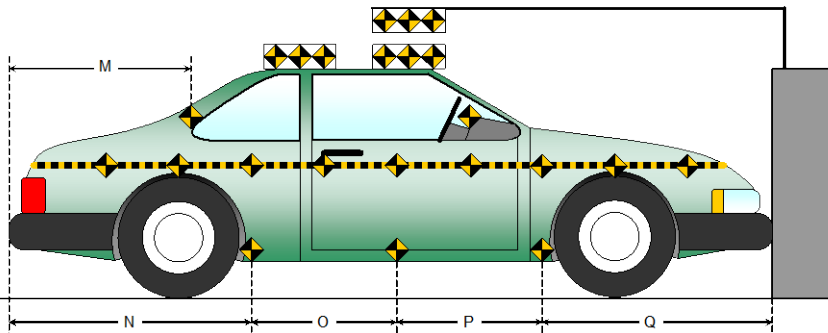
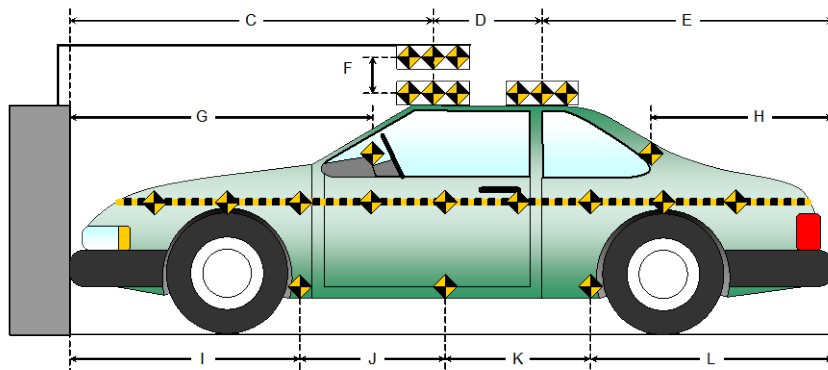
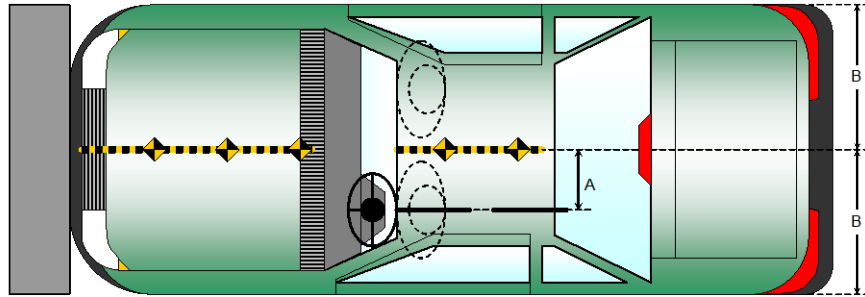
Reference Points: X - Rear Surface of Vehicle (+ forward)
Y - Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

Item	Value (mm)
A	360
B	918
C	2420
D	613
E	1701
F	200
G	
H	1300
I	1306
J	985
K	985
L	1458
M	1300
N	1458
O	985
P	985
Q	1306



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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016

Advanced Research Load Cell Barrier

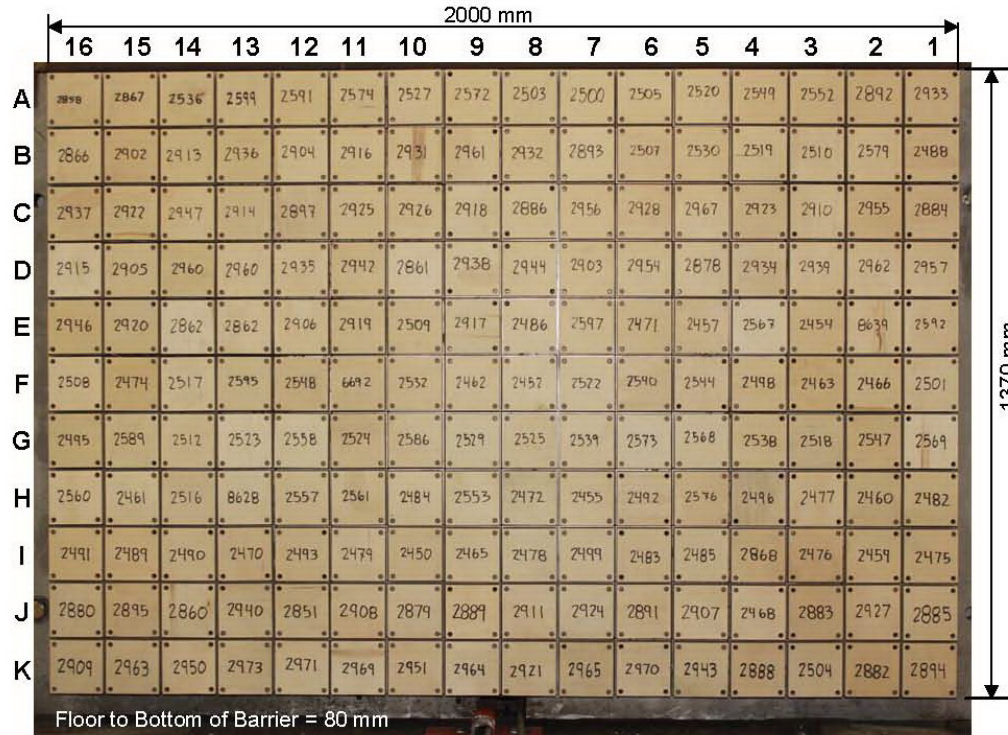


Photo for Reference Only

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: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016

INSTRUMENTATION

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

CAMERA COVERAGE

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

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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016

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, Curtain Airbag
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Knee Airbag
Right Knee Contact	Knee Airbag	Knee Airbag

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were locked	Doors were locked
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	4575
Center	mm	4600
Right Side	mm	4570
Average	mm	4582

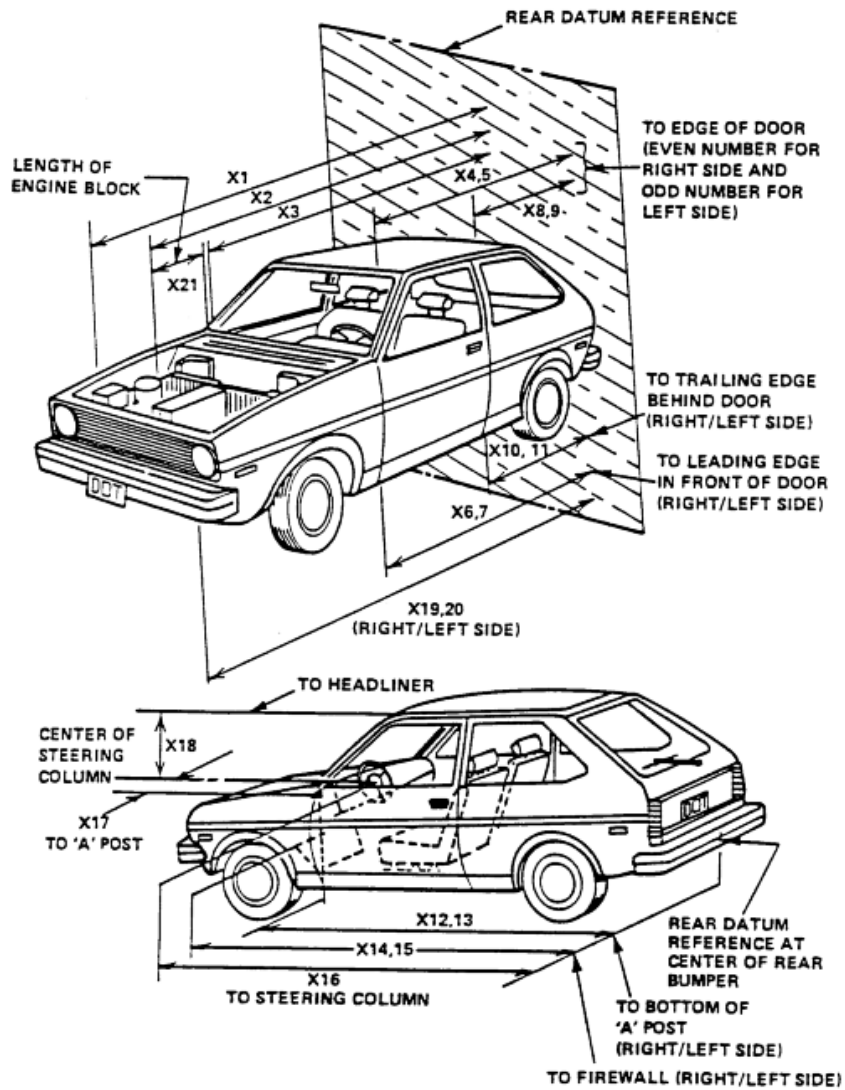
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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	No	Yes	No
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: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4734	4311	423
2	RSOV to Front of Engine	mm	4223	3990	233
3	RSOV to Firewall	mm	3664	3584	80
4	RSOV to Upper Leading Edge of Right Door	mm	3183	3190	-7
5	RSOV to Upper Leading Edge of Left Door	mm	3183	3190	-7
6	RSOV to Lower Leading Edge of Right Door	mm	3212	3209	3
7	RSOV to Lower Leading Edge of Left Door	mm	3212	3212	0
8	RSOV to Upper Trailing Edge of Right Door	mm	2107	2116	-9
9	RSOV to Upper Trailing Edge of Left Door	mm	2107	2118	-11
10	RSOV to Lower Trailing Edge of Right Door	mm	2162	2158	4
11	RSOV to Lower Trailing Edge of Left Door	mm	2162	2161	1
12	RSOV to Bottom of "A" Post of Right Side	mm	3229	3215	14
13	RSOV to Bottom of "A" Post of Left Side	mm	3229	3217	12
14	RSOV to Firewall, Right Side	mm	3709	3711	-2
15	RSOV to Firewall, Left Side	mm	3709	3708	1
16	RSOV to Steering Column	mm	2705	2783	-78
17	Center of Steering Column to "A" Post	mm	340	336	4
18	Center of Steering Column to Headliner	mm	395	431	-36
19	RSOV to Right Side of Front Bumper	mm	4577	4277	300
20	RSOV to Left Side of Front Bumper	mm	4577	4251	326
21	Length of Engine Block	mm	560	560	0
RD	RSOV to Right Side of Dash Panel	mm	2946	2942	4
CD	RSOV to Center of Dash Panel	mm	2950	2969	-19
LD	RSOV to Left Side of Dash Panel	mm	2967	2974	-7

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016

VEHICLE INFORMATION

VIN: WAUANAF40HN025918 Wheelbase (mm): 2821
Vehicle Size Category: Passenger Car Test Weight (kg): 1902.0

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): 56.23

Velocity Change (km/h): 63.9

Time of Separation (msec): 99

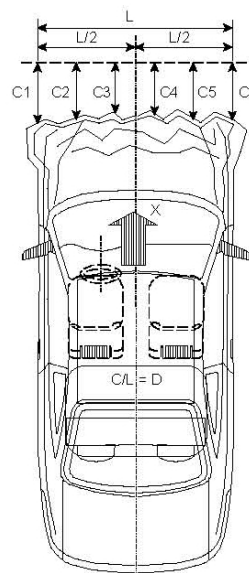
CRUSH PROFILE

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1242

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4577	4251	326
C2	Crush zone 2 at left side	mm	4668	4252	416
C3	Crush zone 3 at left side	mm	4696	4266	430
C4	Crush zone 4 at right side	mm	4696	4272	424
C5	Crush zone 5 at right side	mm	4668	4279	389
C6	Crush zone 6 at right side	mm	4577	4277	300
L	C1 TO C6	mm	1242	1239	3

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

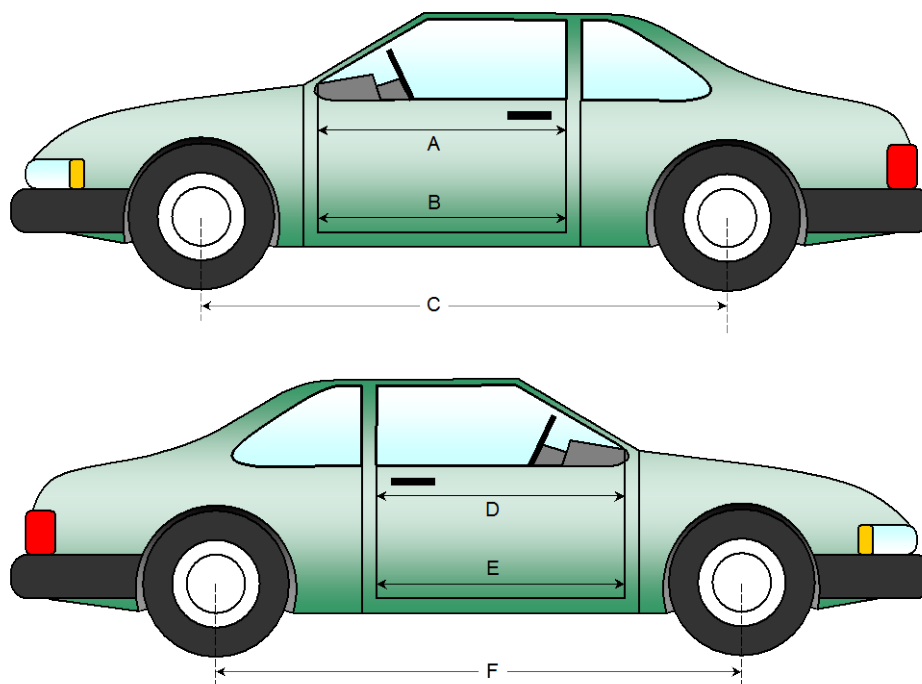
NHTSA No.: O20175800
Test Date: 12/1/2016

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	941	941	0
B	Left Side Lower	mm	852	852	0
D	Right Side Upper	mm	941	941	0
E	Right Side Lower	mm	852	852	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2821	2779	42
F	Right Side Wheelbase	mm	2821	2812	9



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

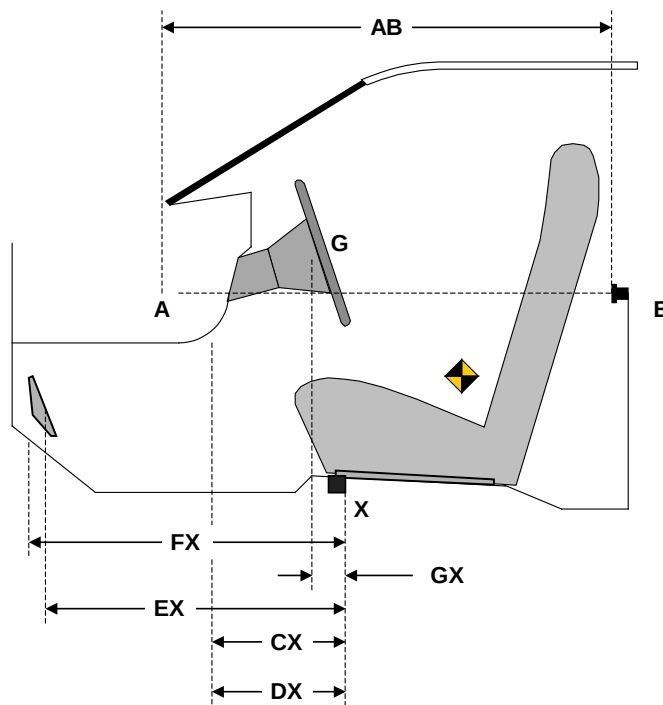
Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	799	799	0
CX	Left Knee Bolster to X	mm	282	289	-7
DX	Right Knee Bolster to X	mm	303	304	-1
EX	Brake Pedal to X	mm	575	563	12
FX	Foot Rest to X	mm	621	619	2
GX	Center of Steering Column Wheel Hub to X	mm	48	126	-78

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: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

Windshield Mounting Details:

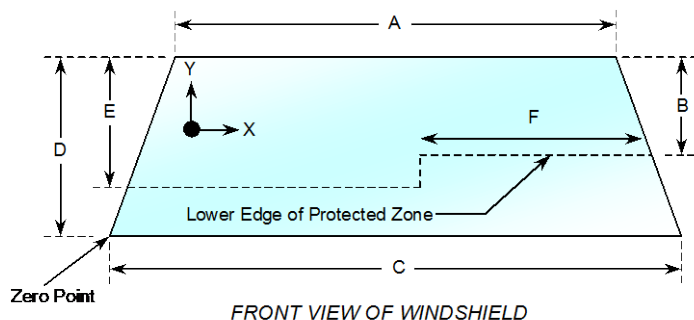
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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

Temperature of windshield molding during test: 21.3° C.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	1445	1445	100.0
Right Side	1445	1445	100.0
Total	2890	2890	100.0



Item	Units	Value
A	mm	1156
B	mm	356
C	mm	1510
D	mm	778
E	mm	470
F	mm	547

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: 2017 Audi A4 2.0T Quattro 4-Door Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
Test Date: 12/1/2016

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.3°C

Test Time: 10:10 a.m.

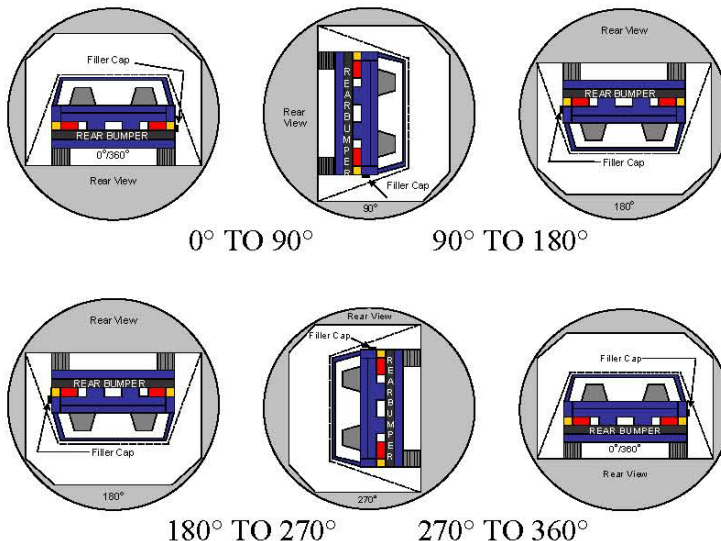
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

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

Test Vehicle: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	112	300	412
90° to 180°	110	300	410
180° to 270°	112	300	412
270° to 360°	113	300	413

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

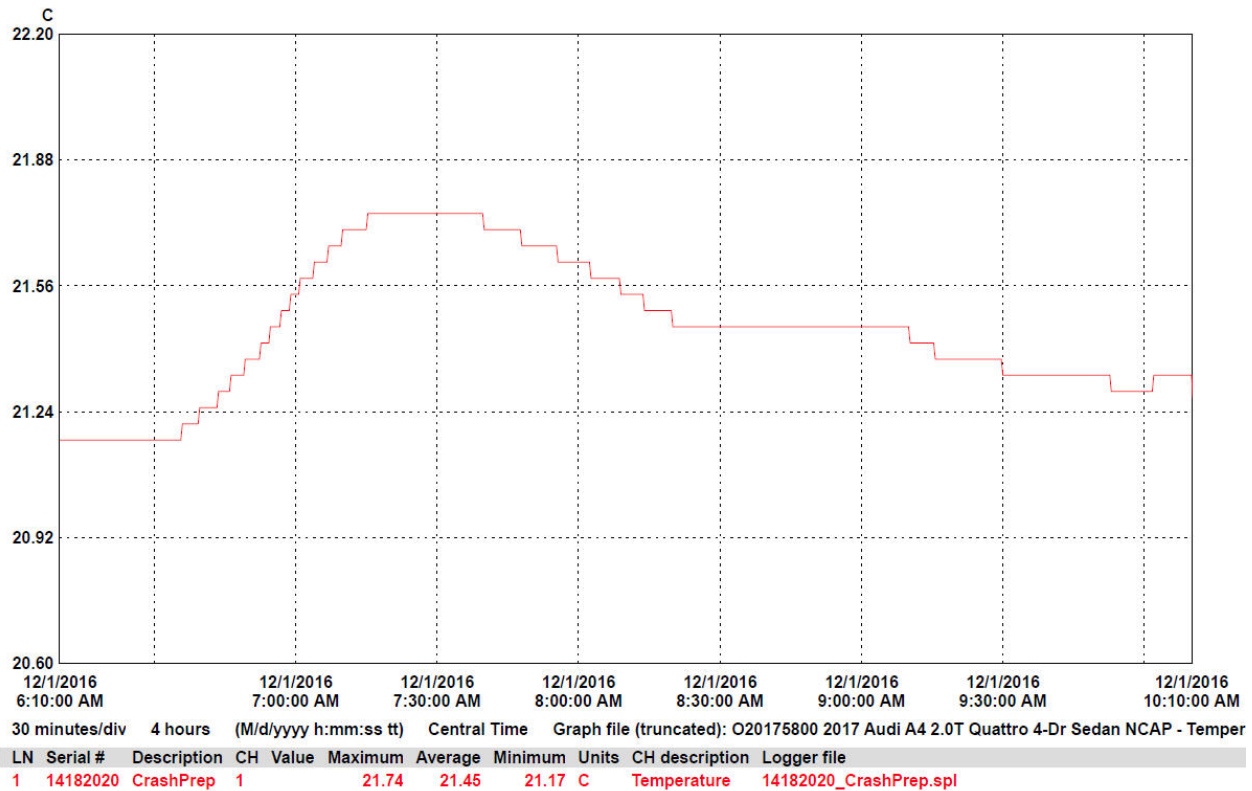
SOLVENT SPILLAGE LOCATION TABLE

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: 2017 Audi A4 2.0T Quattro 4-Door Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20175800
 Test Date: 12/1/2016



APPENDIX A
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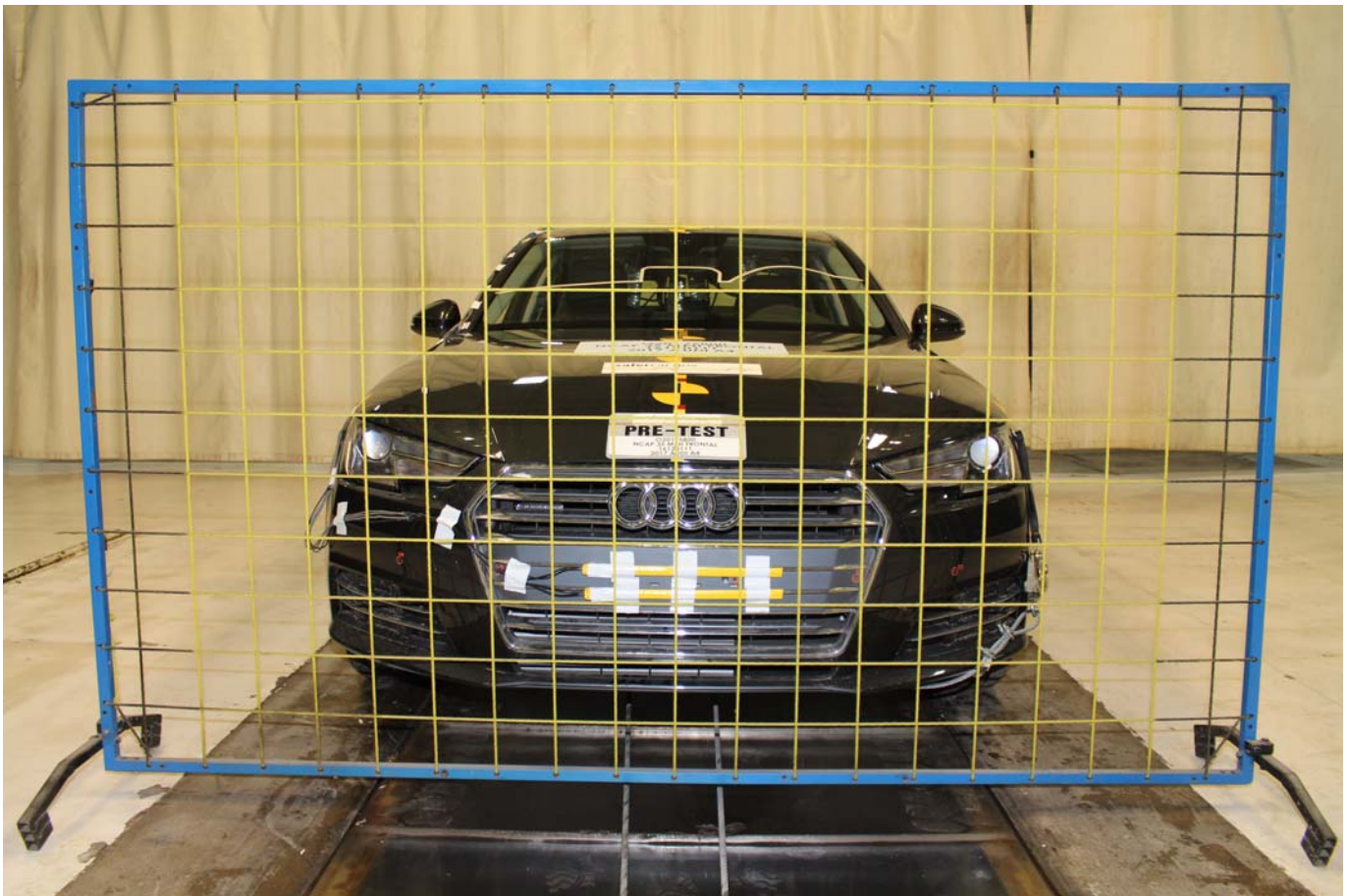


Photo No. 001 - Load Cell Location



Photo No. 002 - Pre-Test Load Cell Wall



Photo No. 003 - Post-Test Load Cell Wall



Photo No. 004 - Manufacturer Label

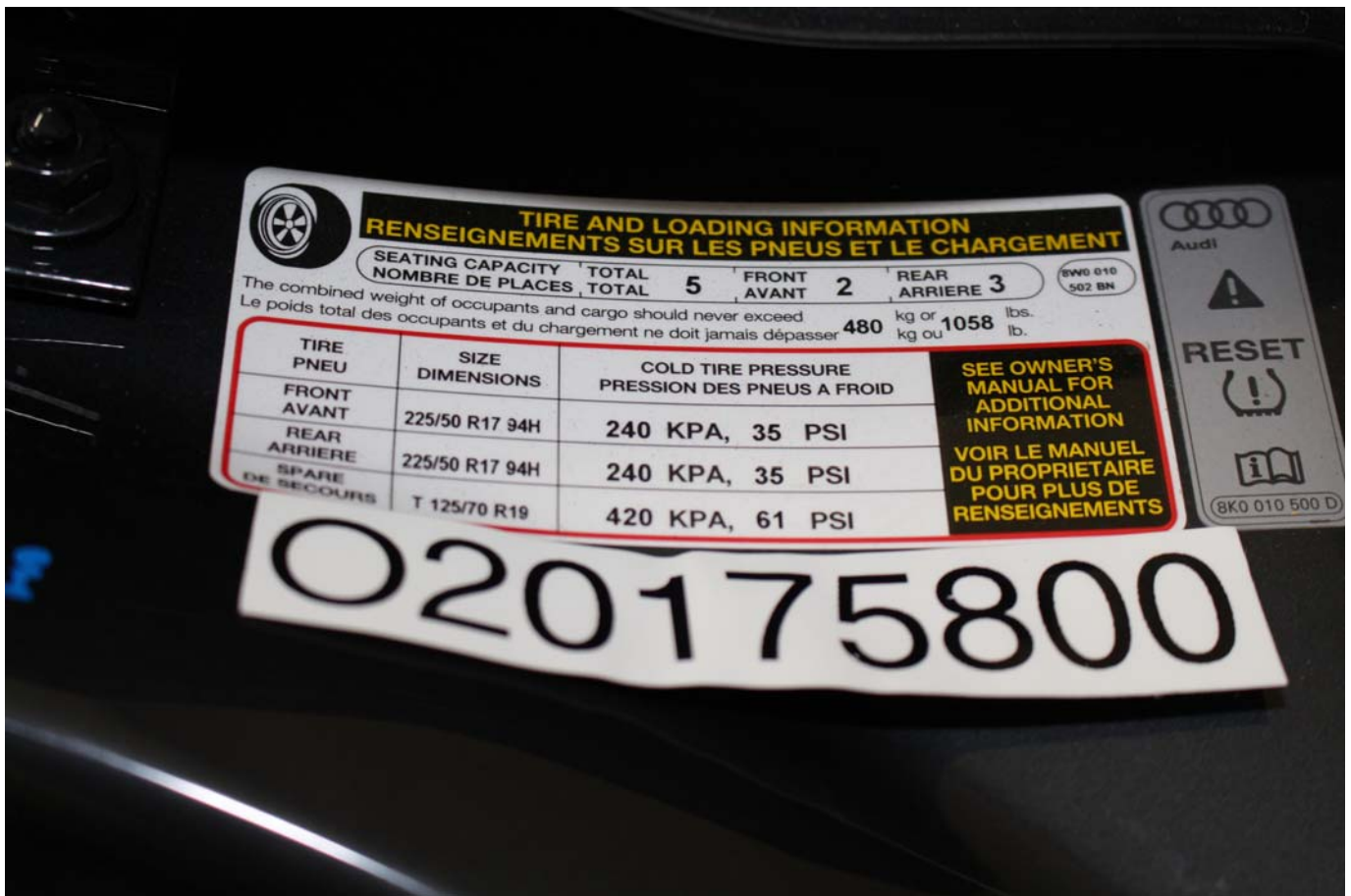


Photo No. 005 - Tire Placard



Photo No. 006 - 2016 Audi A4 Frontal As Delivered



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



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

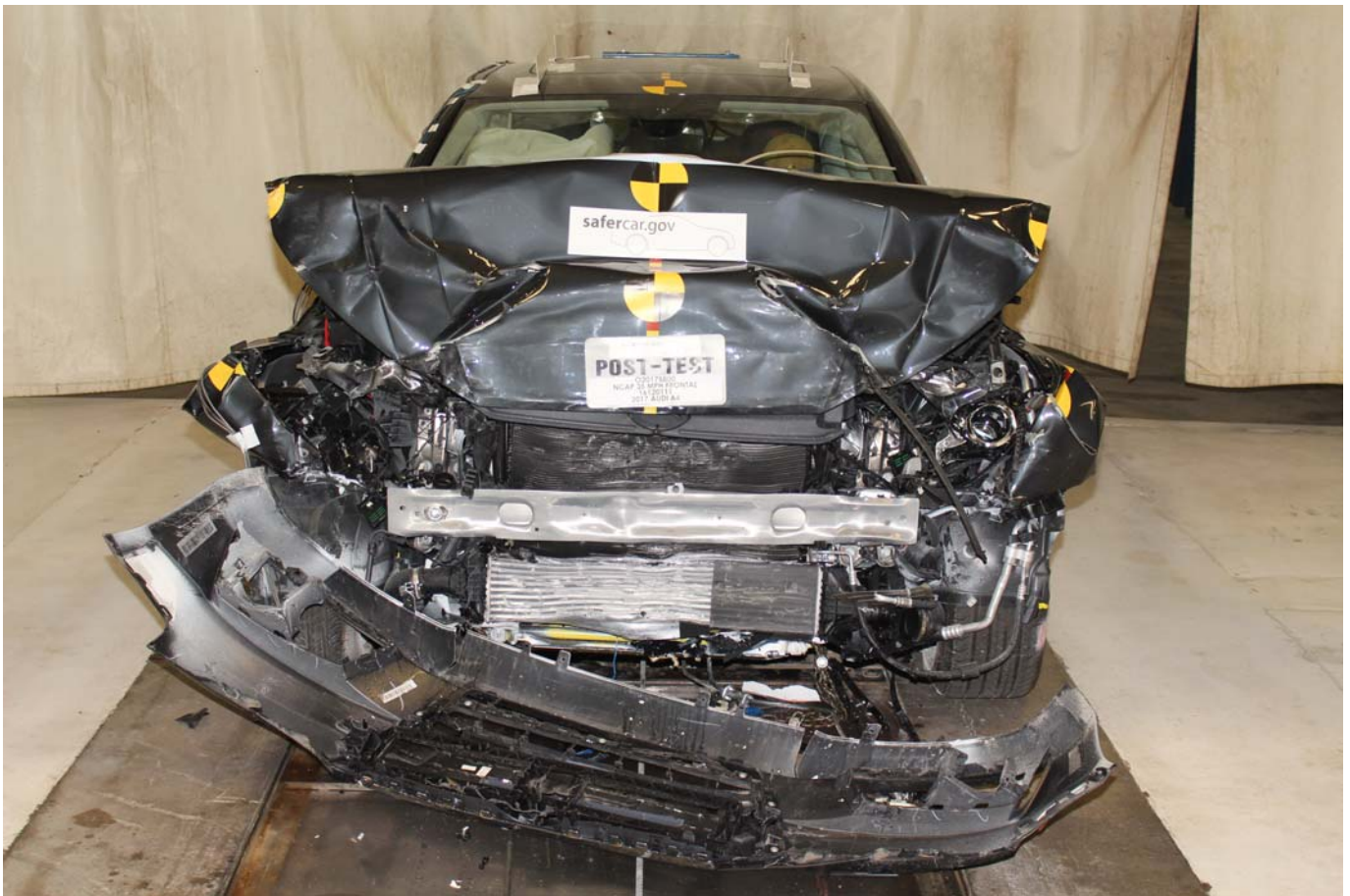


Photo No. 009 - Post-Test Front View of Test Vehicle



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

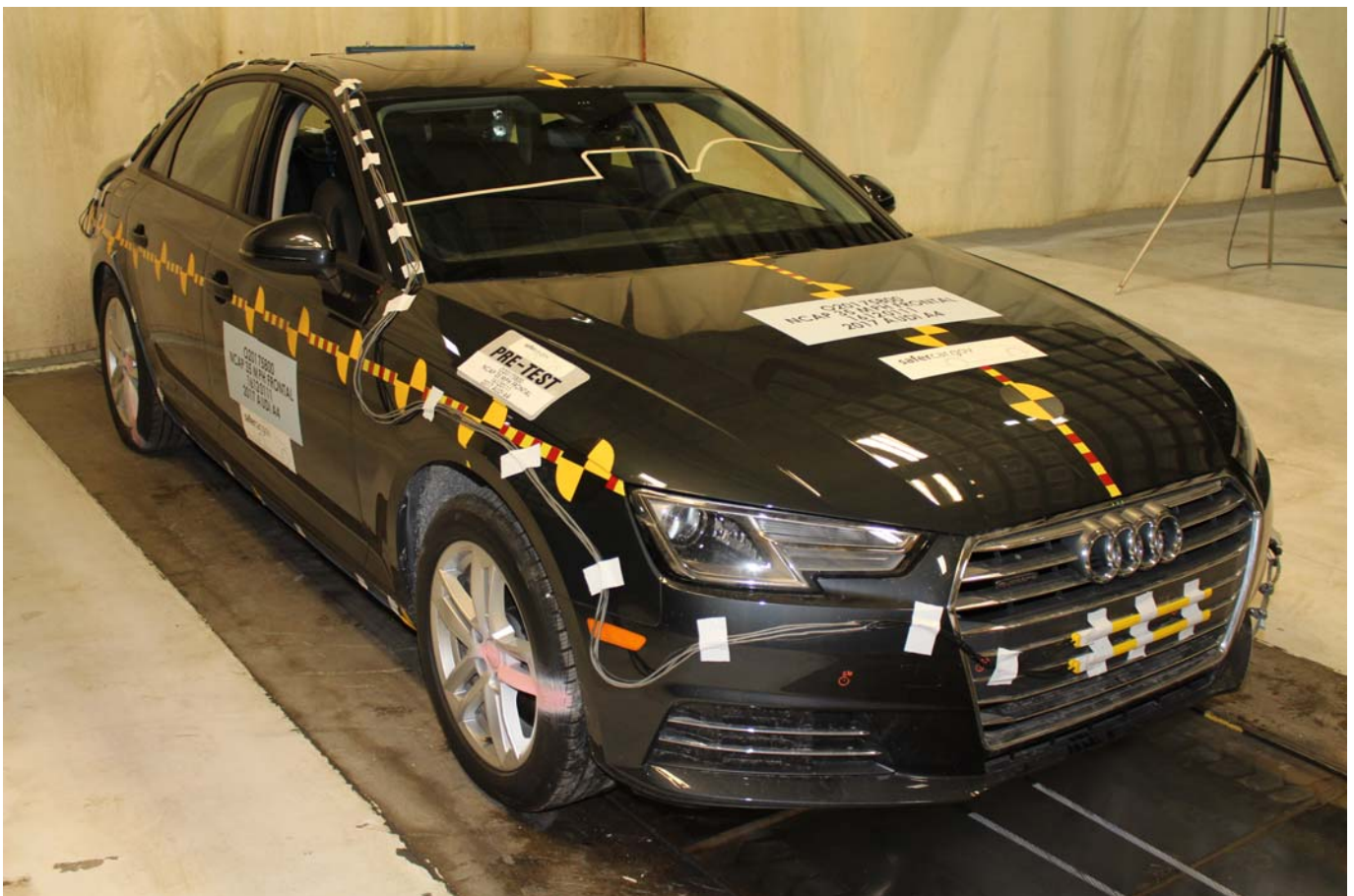


Photo No. 014 - Pre-Test Right Front 3-4 View

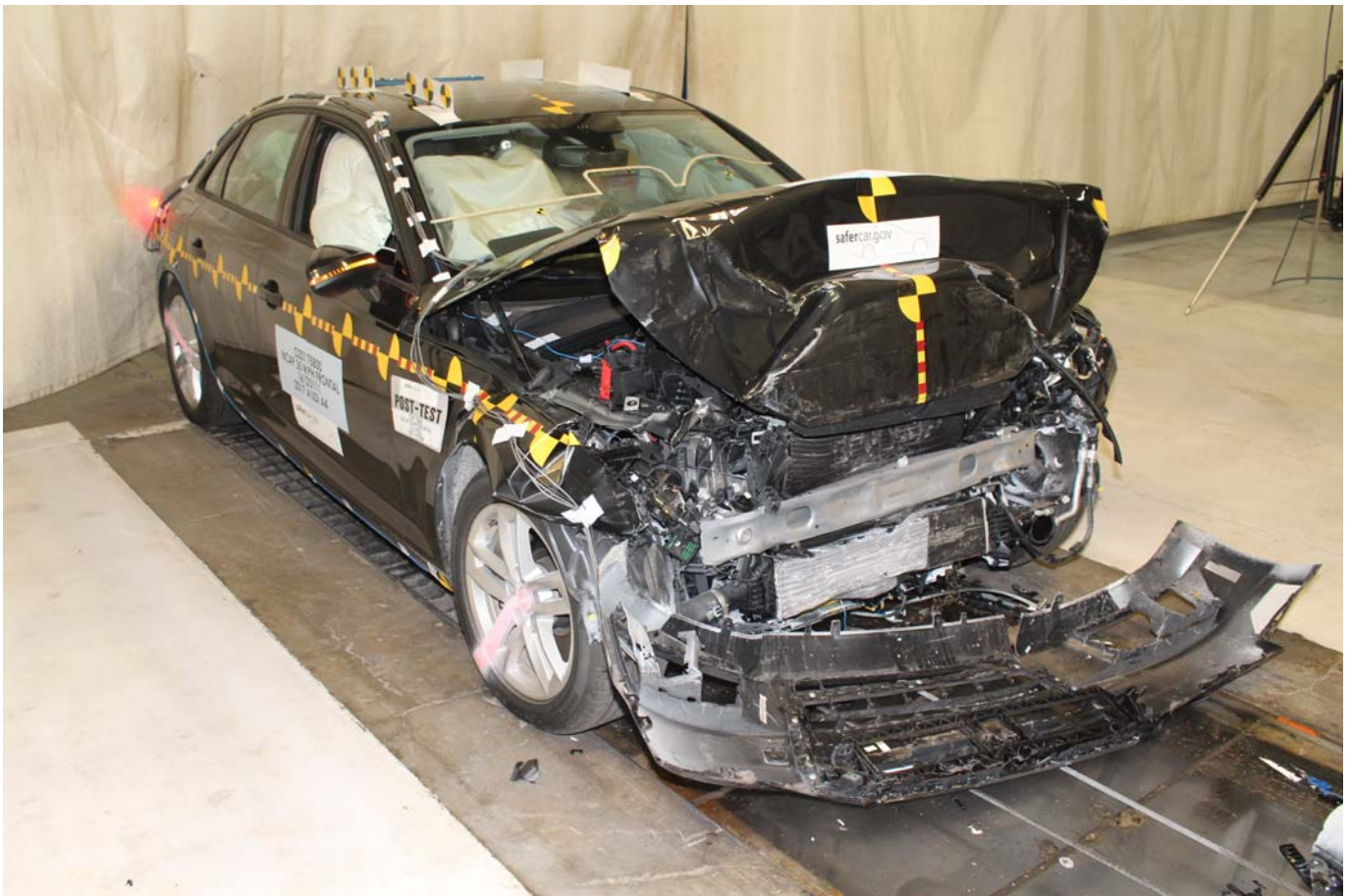


Photo No. 015 - Post-Test Right Front 3-4 View



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

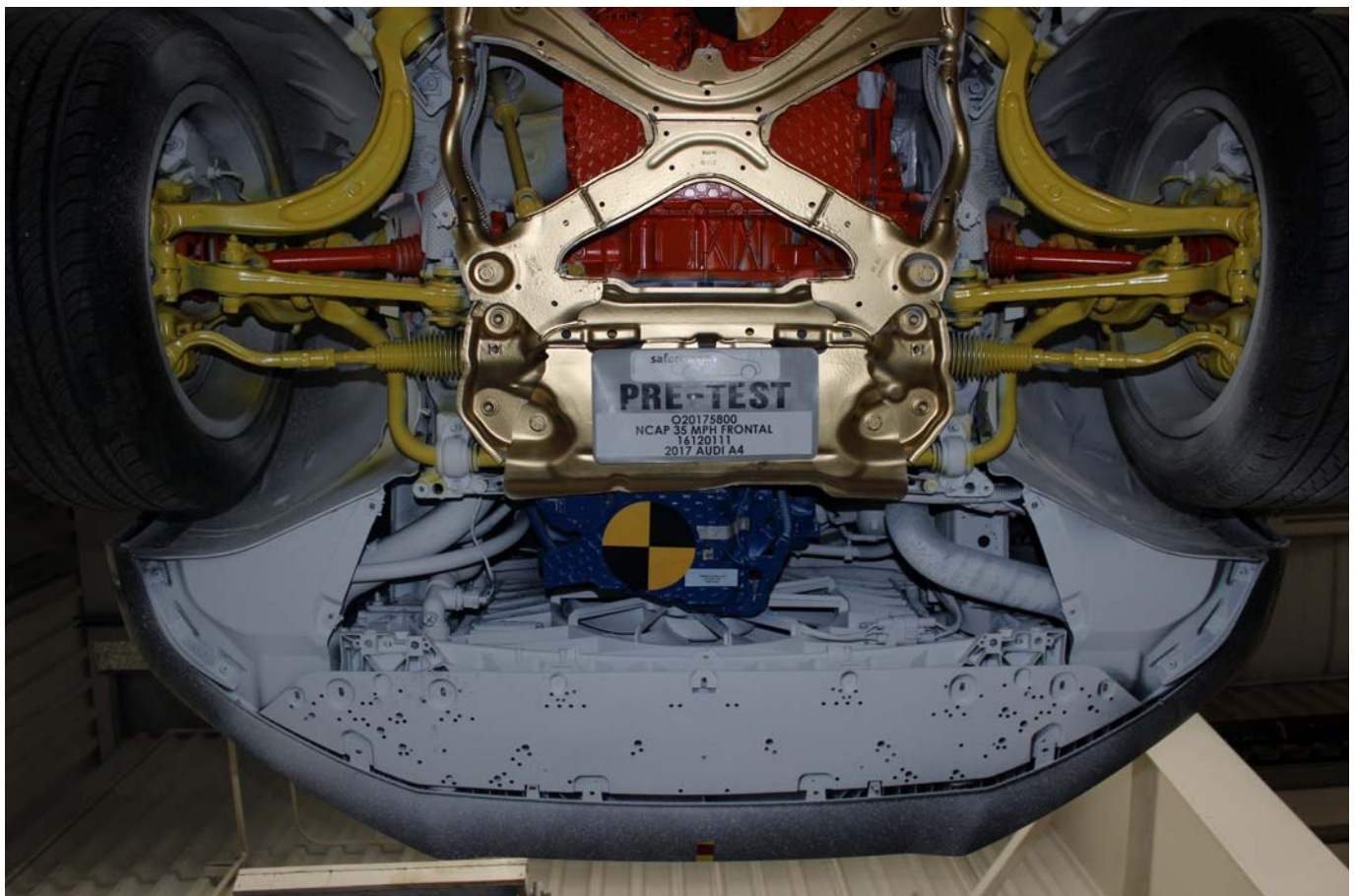


Photo No. 024 - Pre-Test Front Underbody View

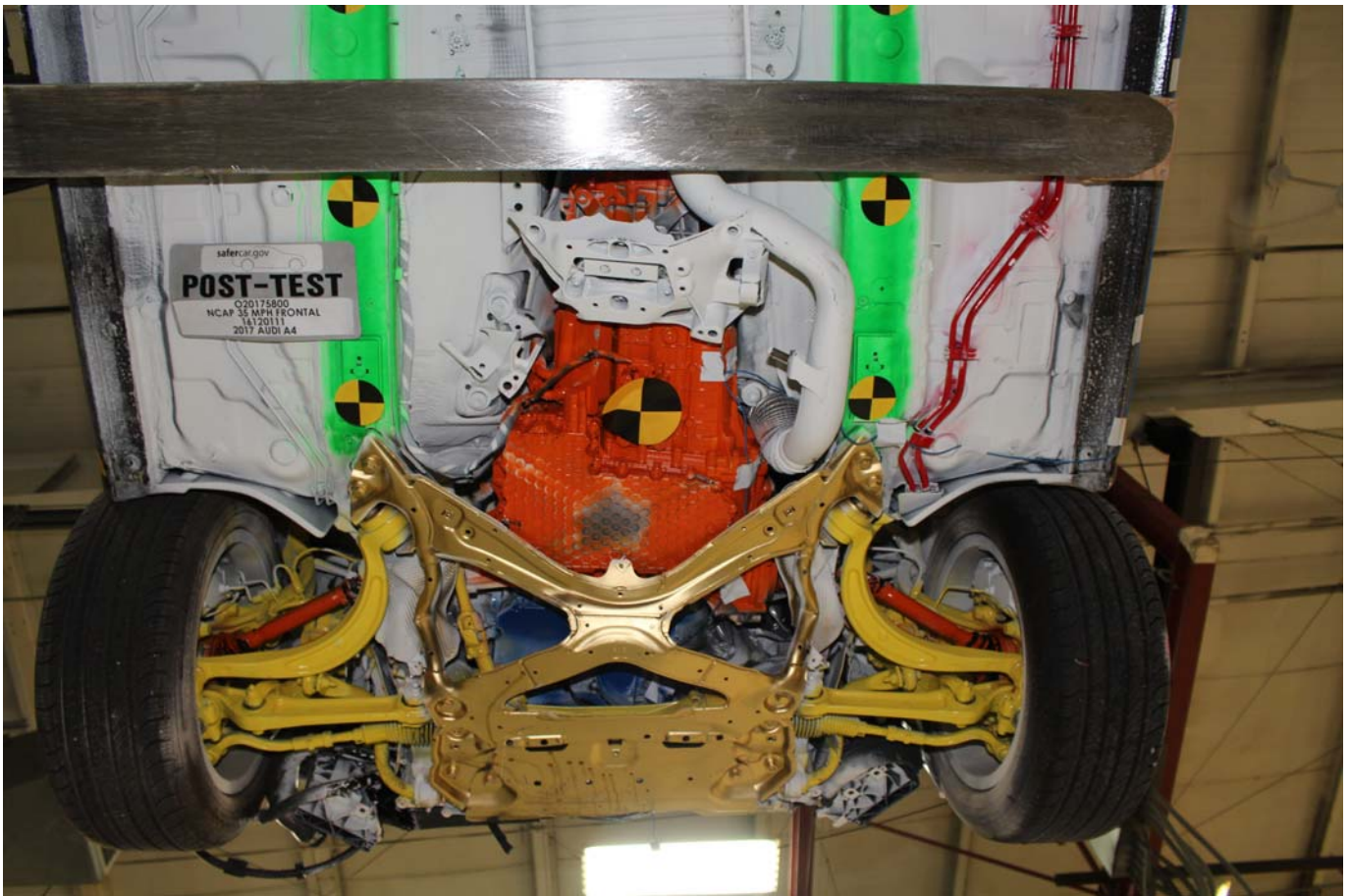


Photo No. 025 - Post-Test Front Underbody View

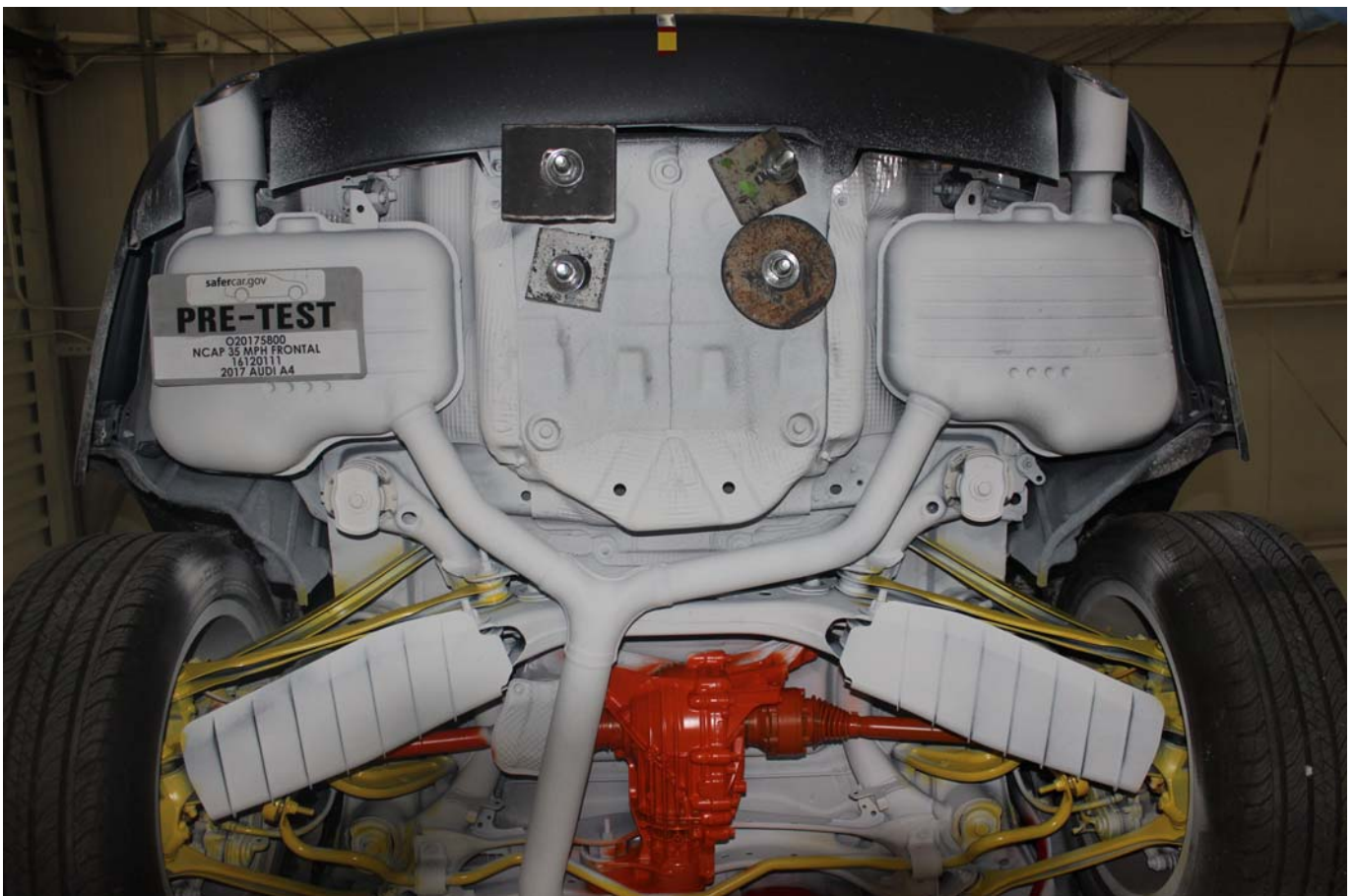


Photo No. 026 - Pre-Test Rear Underbody View

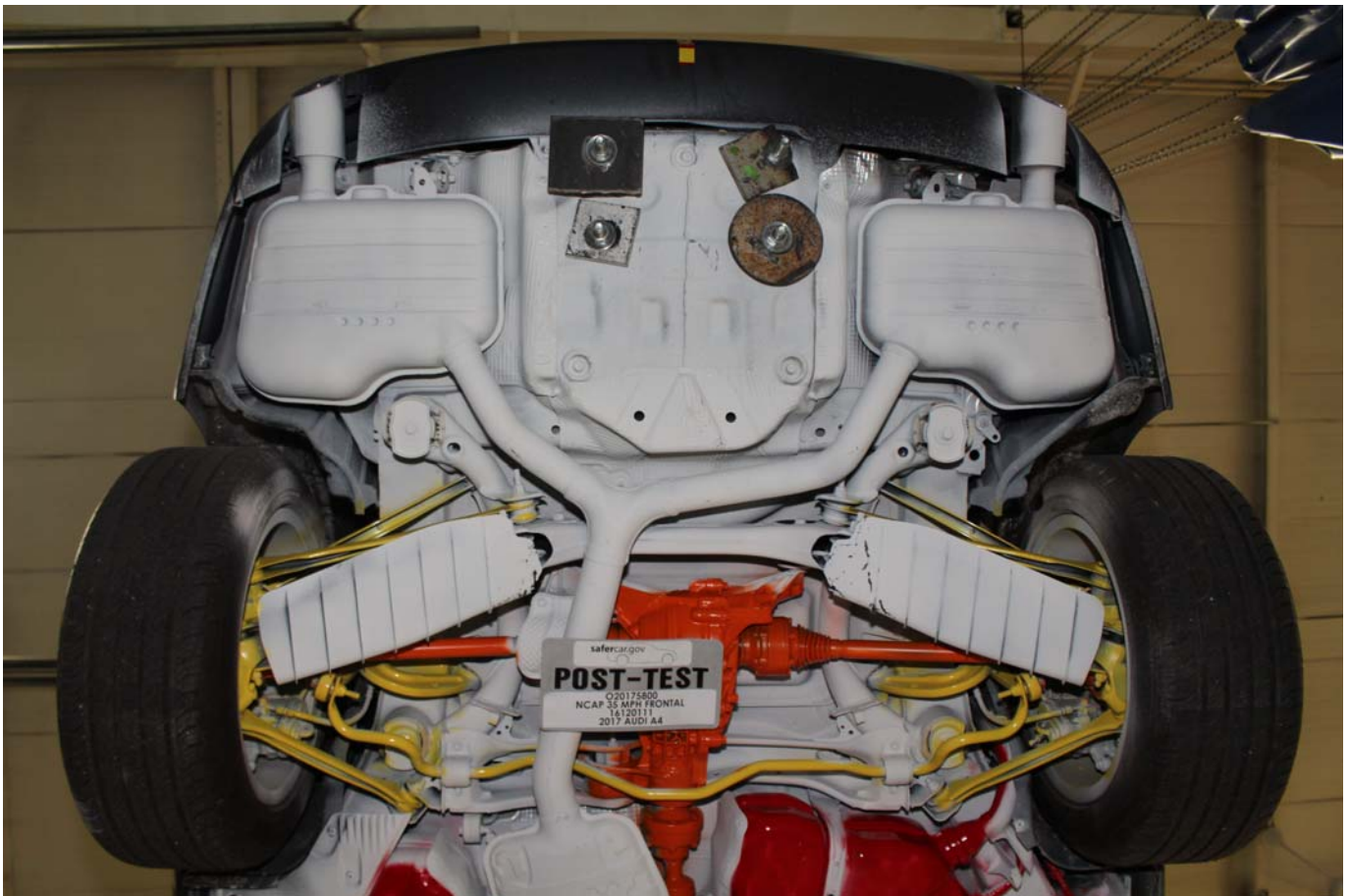


Photo No. 027 - Post-Test Rear Underbody View



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

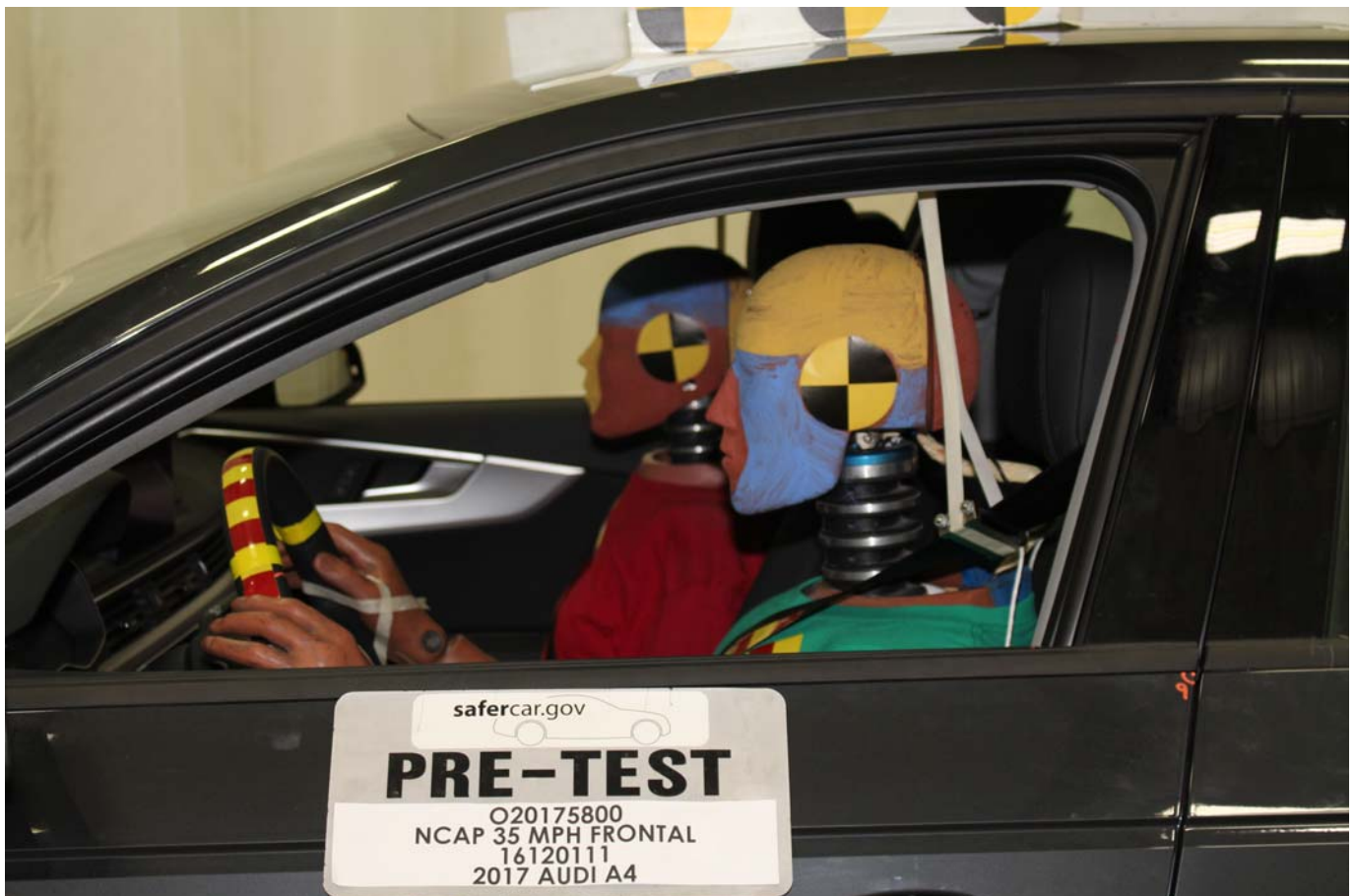


Photo No. 032 - Pre-Test Driver Dummy Window View



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

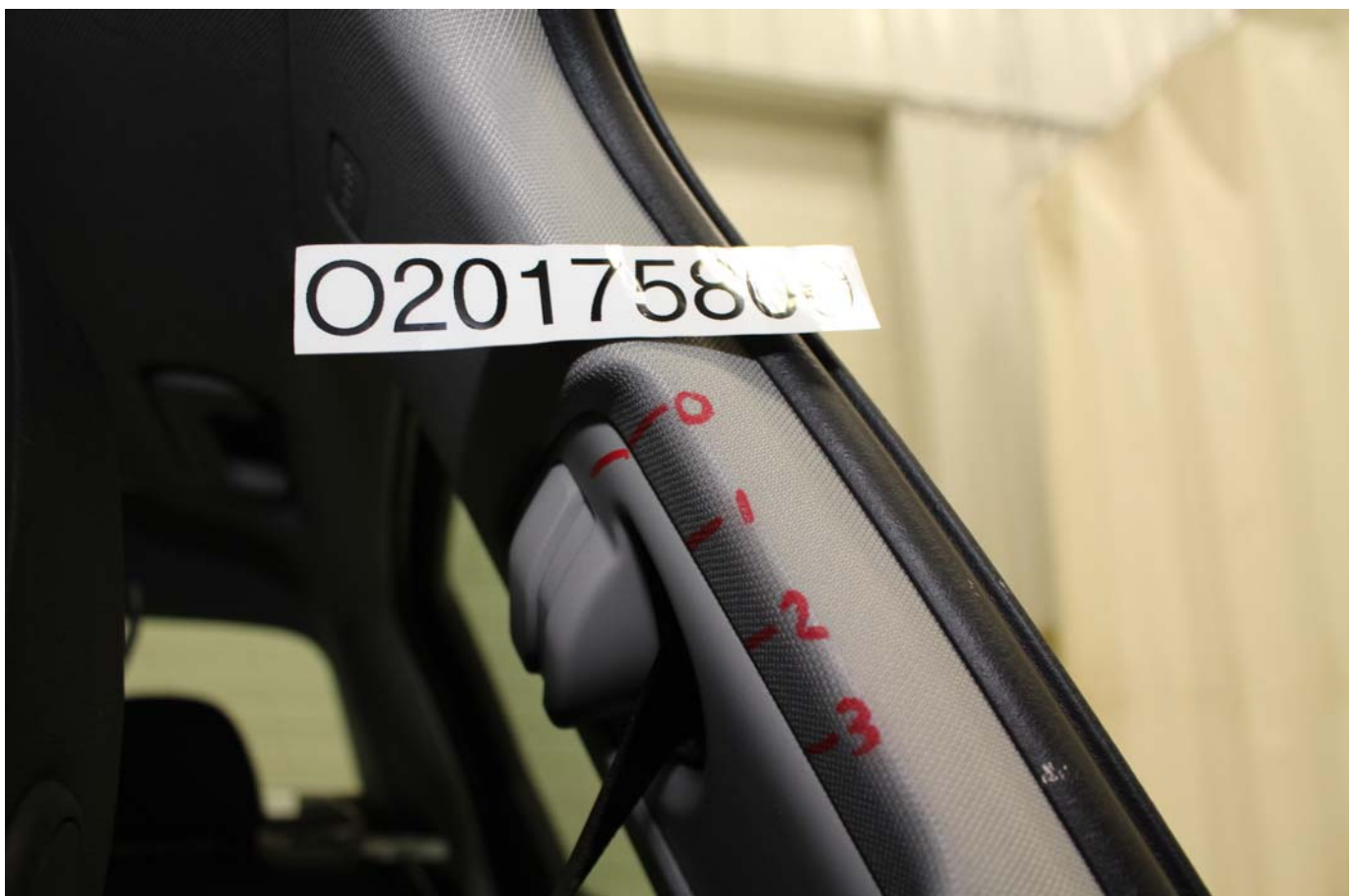


Photo No. 038 - Pre-Test View of Belt Anchorage for Driver Dummy



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

PHOTOGRAPH NOT AVAILABLE

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



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

PHOTOGRAPH NOT AVAILABLE

Photo No. 044 - Pre-Test Driver Side Floorpan



Photo No. 045 - Post-Test Driver Side Floorpan



Photo No. 046 - Post-Test Driver Dummy Face

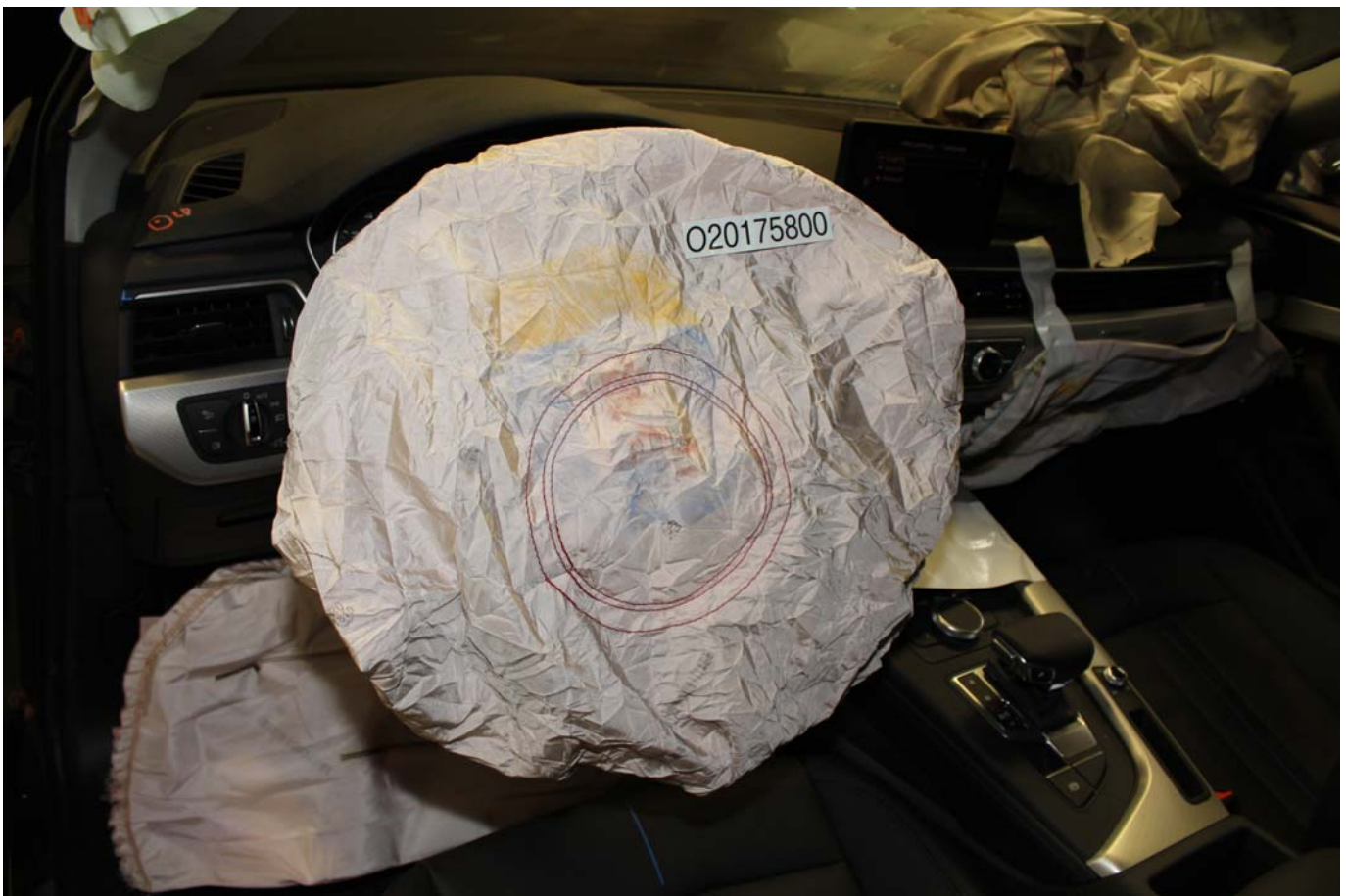


Photo No. 047 - Post-Test Driver Dummy Contact with Airbag



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

PHOTOGRAPH NOT AVAILABLE

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



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

PHOTOGRAPH NOT AVAILABLE

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

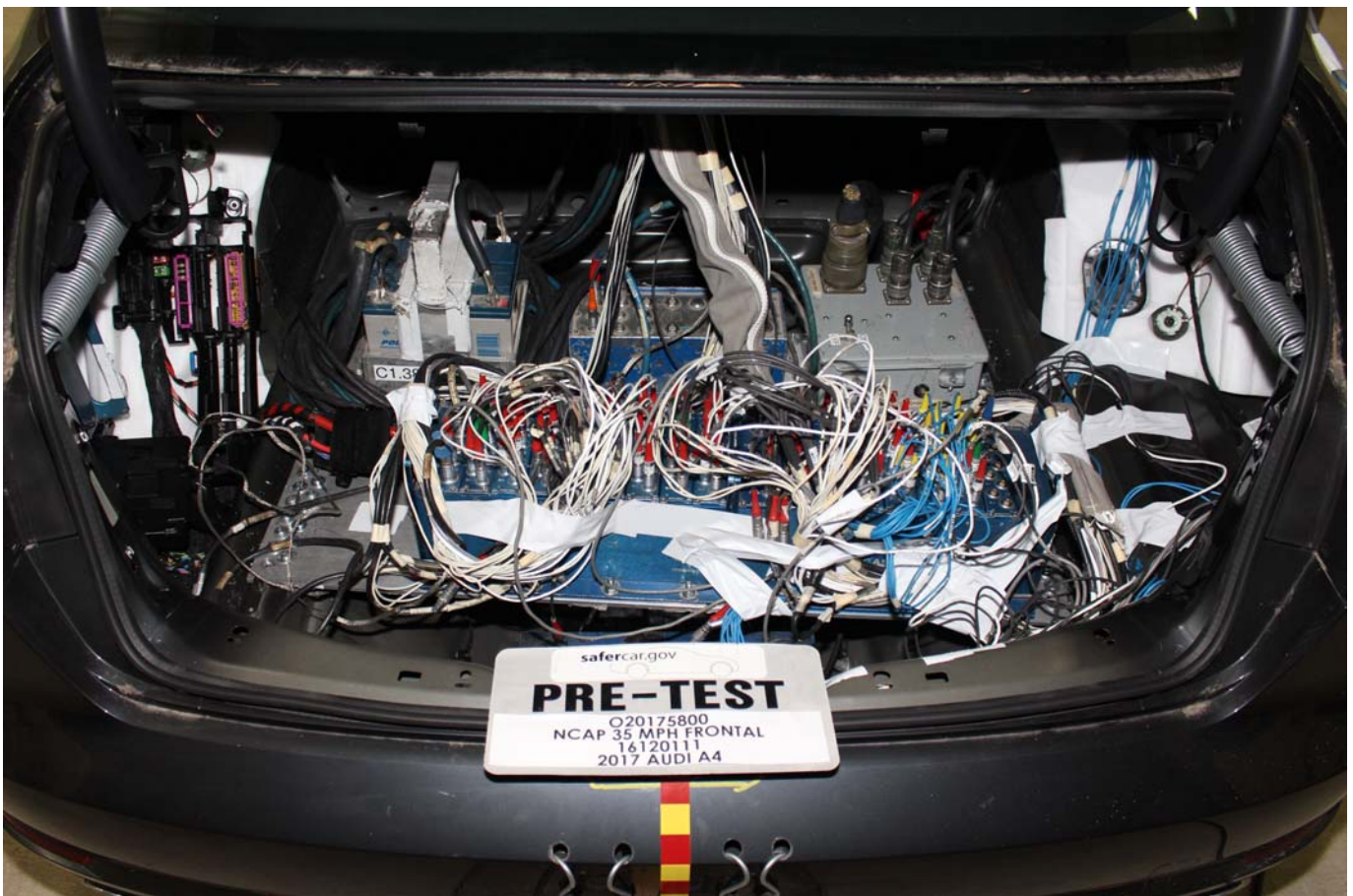


Photo No. 070 - Ballast Installed in Vehicle

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

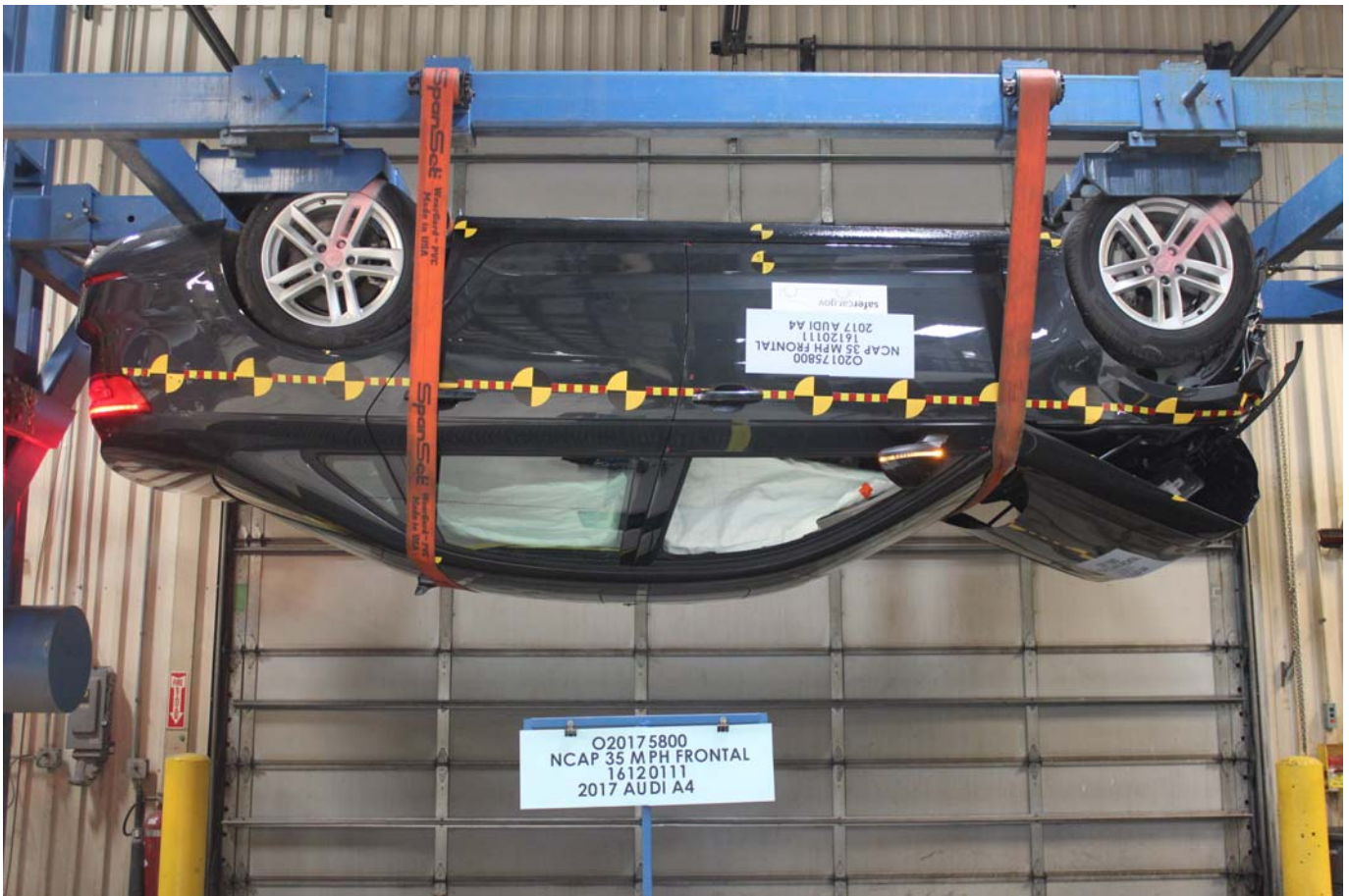


Photo No. 075 - Vehicle at 180 Degrees on Static Rollover Device

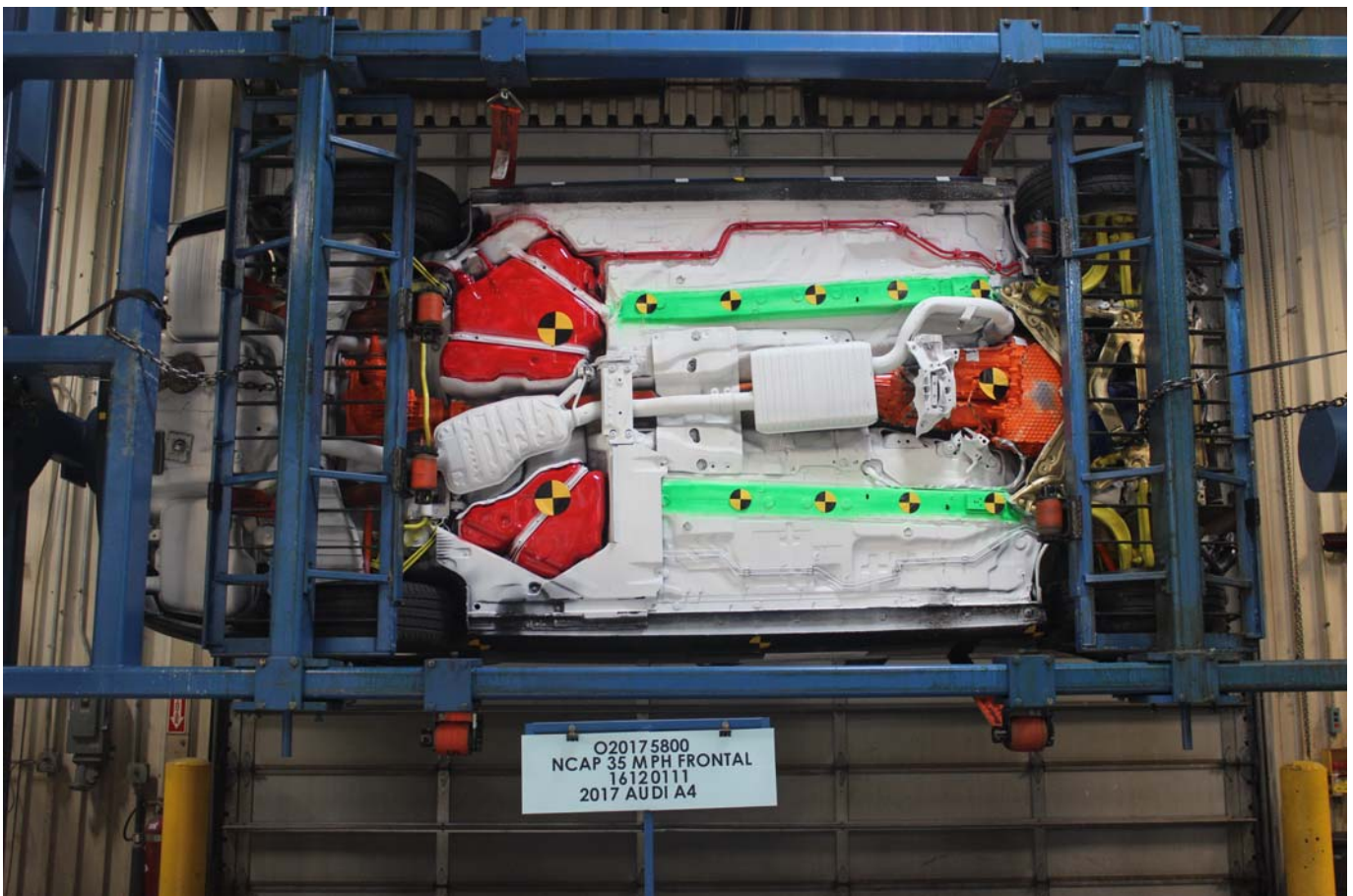


Photo No. 076 - Vehicle at 270 Degrees on Static Rollover Device



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

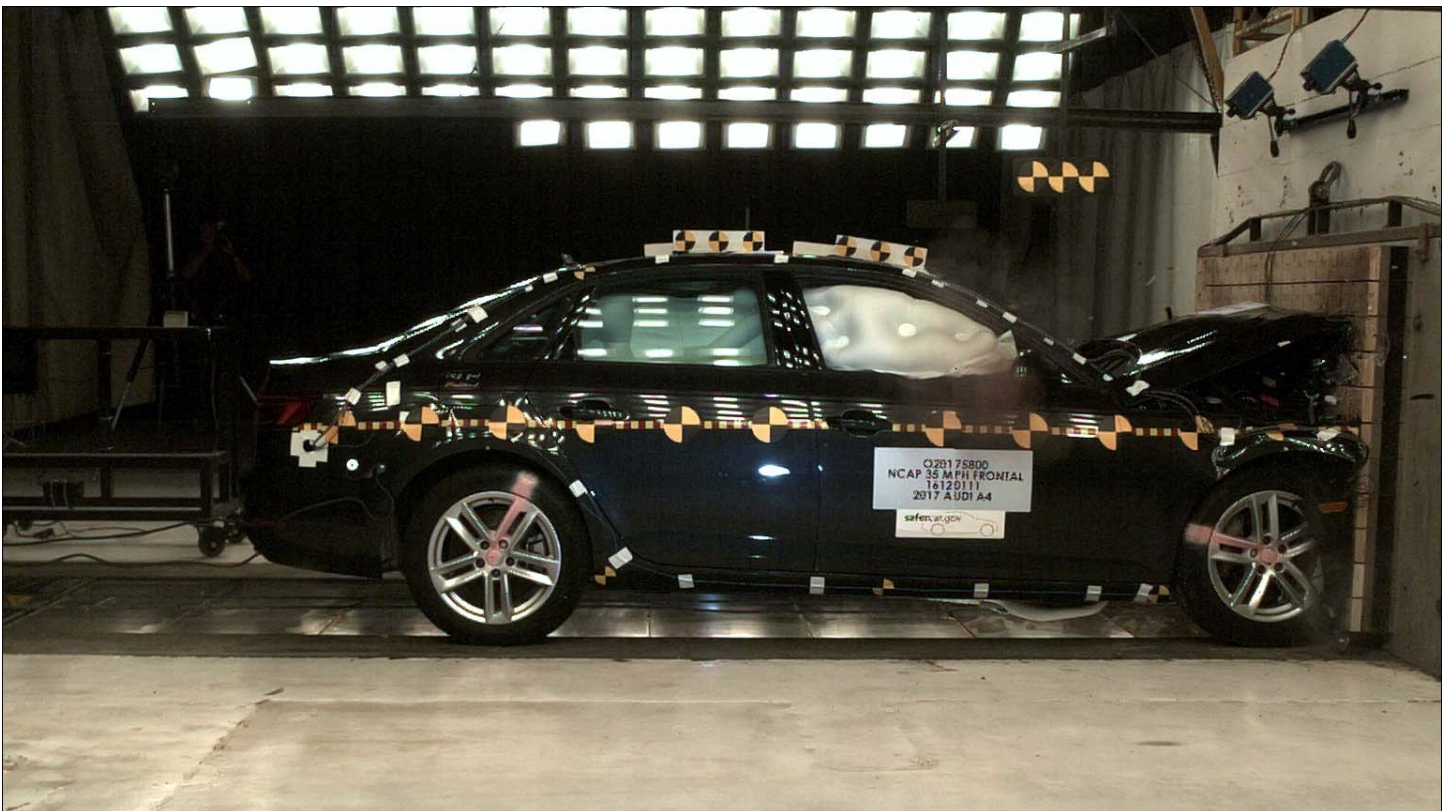


Photo No. 078 - 2016 Audi A4 Frontal Impact Event

2017 Audi A4 Sedan 2.0T quattro S tronic



STANDARD EQUIPMENT (unless replaced by options)

TECHNICAL

- 2.0L TFSI® 252hp / 273lb-ft I4 engine
- 7-speed S tronic® transmission
- quattro® all-wheel drive system
- 17" 5-spoke design wheels, all-season tires
- ESC (Electronic Stability Control)
- TPMS (tire pressure monitoring system)

COMFORT/CONVENIENCE

- Audi xenon plus headlights w/ LED DRLs
- LED taillights with dynamic turn signals
- Heated, power-adjustable exterior mirrors
- 8-way power adjustable front seats w/ 4-way driver lumbar adjustment
- LED ambient interior lighting
- Power Sunroof
- Leather seating surfaces
- Rearview camera
- Keyless engine start/stop
- Three-zone digital automatic climate control
- Audi smartphone interface
- Audi music interface with two USB ports and a 3.5mm aux-in
- Audi pre sense basic & city
- Audi drive select
- Audi sound system
- 3-spoke leather-wrapped multifunction steering wheel w/ shift paddles
- Garage door opener (HomeLink®)
- Rain & light sensor
- Preparation for mobile phone (Bluetooth®) with audio streaming
- Split-folding rear seatback (40/20/40)

SAFETY/SECURITY

- Driver & front passenger advanced airbag supplemental restraint system
- Driver & front passenger knee airbags
- Driver & front passenger seat-mounted torso side airbags
- SIDE GUARD® curtain airbags
- Front 3-point safety belts with automatic pretensioners and load limiters
- Rear outboard 3-point safety belts with pretensioners and Automatic Locking Retractor (ALR)
- Lower Anchors and Tethers for Children (LATCH)

WARRANTY/MAINTENANCE

- 4 Year/50,000 mile (whichever occurs first) New Vehicle Limited Warranty*
 - 12 Year/Unlimited Mileage Powertrain Limited Warranty
 - 1 Year/10,000 mile (whichever occurs first) First Scheduled Maintenance Service FREE OF CHARGE
 - 4 Year Roadside Assistance coverage provided by a third party supplier
- *Please refer to the 2017 Audi Warranty and Maintenance Booklet for complete coverage information.

MANUFACTURER'S SUGGESTED RETAIL PRICE

2017 Audi A4 Sedan 2.0T quattro S tronic **\$39,400.00**

PACKAGES / OPTIONS

Manhattan Gray metallic	\$575.00
Black interior	\$900.00
Convenience package	
8-way power front seats w/ driver memory	
Heated, auto-dim exterior mirrors w/ memory	
Alarm system	
SiriusXM® All Access service w/3-month trial subscription	
Audi advanced key	
Audi Guard protection kit	\$325.00
Destination Charge	\$950.00

Total Price: \$42,150.00
Fuel, license, title fees, taxes and dealer-installed accessories are not included.

MODEL: 8W25NY

VIN: WAUJANAF40HN025918

DEALER: 408A76
SCHMITT'S AUDI
5255 GENESEE ST
BOWMANVILLE, NY 14026
Port of Entry: DAVISVILLE

SHIP TO: 408A76
SCHMITT'S AUDI
5255 GENESEE ST
BOWMANVILLE, NY 14026
COMM NUM: KF6285
Transportation Method: TRUCK

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score **Not Rated**

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

Frontal Crash	Driver 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 1-888-327-4236



Fuel Economy and Environment



Gasoline Vehicle

Fuel Economy
27 MPG
combined city/hwy
3.7 gallons per 100 miles

Compact Cars range from 14 to 116 MPG. The best vehicle rates 119 MPG.

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

Annual fuel cost \$1,550

Fuel Economy & Greenhouse Gas Rating (tailpipe only)



This vehicle emits 330 grams of CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov.

Smog Rating (tailpipe only)



Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 26 MPG and costs \$7,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.80 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov

Calculate personalized estimates and compare vehicles



PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:

U.S./CANADIAN PARTS CONTENT: 1%

MAJOR SOURCES OF FOREIGN

PARTS CONTENT: GERMANY: 59%

HUNGARY: 15%

FOR THIS VEHICLE:

1% FINAL ASSEMBLY POINT: NECKARSULM, GERMANY

COUNTRY OF ORIGIN: ENGINE: HUNGARY

TRANSMISSION: GERMANY

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

Photo No. 079 - Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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List of Data Plots Provided in the Test Report

Figure No. 1.	Driver Head X Acceleration vs. Time	B-1
Figure No. 2.	Driver Head Y Acceleration vs. Time	B-1
Figure No. 3.	Driver Head Z Acceleration vs. Time	B-1
Figure No. 4.	Driver Head Resultant Acceleration vs. Time	B-1
Figure No. 5.	Driver Chest Displacement vs. Time	B-2
Figure No. 6.	Driver Chest X Acceleration vs. Time	B-3
Figure No. 7.	Driver Chest Y Acceleration vs. Time	B-3
Figure No. 8.	Driver Chest Z Acceleration vs. Time	B-3
Figure No. 9.	Driver Chest Resultant Acceleration vs. Time	B-3
Figure No. 10.	Driver Neck Force X vs. Time	B-4
Figure No. 11.	Driver Neck Force Z vs. Time	B-4
Figure No. 12.	Driver Neck Moment Y vs. Time	B-4
Figure No. 13.	Driver Nij (NTF) vs. Time	B-5
Figure No. 14.	Driver Nij (NTE) vs. Time	B-5
Figure No. 15.	Driver Nij (NCF) vs. Time	B-5
Figure No. 16.	Driver Nij (NCE) vs. Time	B-5
Figure No. 17.	Driver Left Femur Force vs. Time	B-6
Figure No. 18.	Driver Right Femur Force vs. Time	B-6
Figure No. 19.	Passenger Head X Acceleration vs. Time	B-7
Figure No. 20.	Passenger Head Y Acceleration vs. Time	B-7
Figure No. 21.	Passenger Head Z Acceleration vs. Time	B-7
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Figure No. 23.	Passenger Chest Displacement vs. Time	B-8
Figure No. 24.	Passenger Chest X Acceleration vs. Time	B-9
Figure No. 25.	Passenger Chest Y Acceleration vs. Time	B-9
Figure No. 26.	Passenger Chest Z Acceleration vs. Time	B-9
Figure No. 27.	Passenger Chest Resultant Z Acceleration vs. Time	B-9

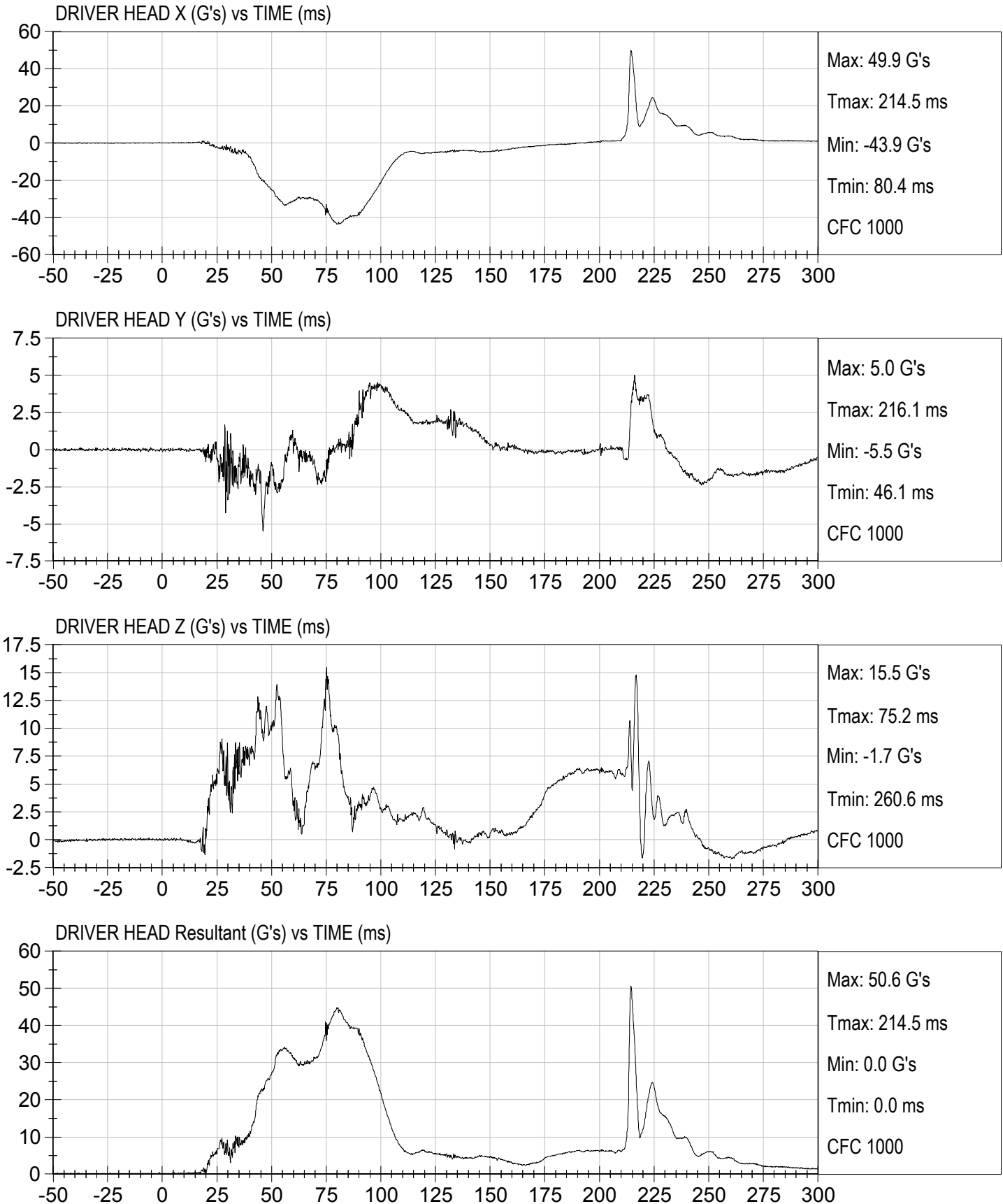
	<u>Page No.</u>
Figure No. 28. Passenger Neck Force X vs. Time	B-10
Figure No. 29. Passenger Neck Force Z vs. Time	B-10
Figure No. 30. Passenger Neck Moment Y vs. Time	B-10
Figure No. 31. Passenger Nij (NTF) vs. Time	B-11
Figure No. 32. Passenger Nij (NTE) vs. Time	B-11
Figure No. 33. Passenger Nij (NCF) vs. Time	B-11
Figure No. 34. Passenger Nij (NCE) vs. Time	B-11
Figure No. 35. Passenger Left Femur Force vs. Time	B-12
Figure No. 36. Passenger Right Femur Force vs. Time	B-12

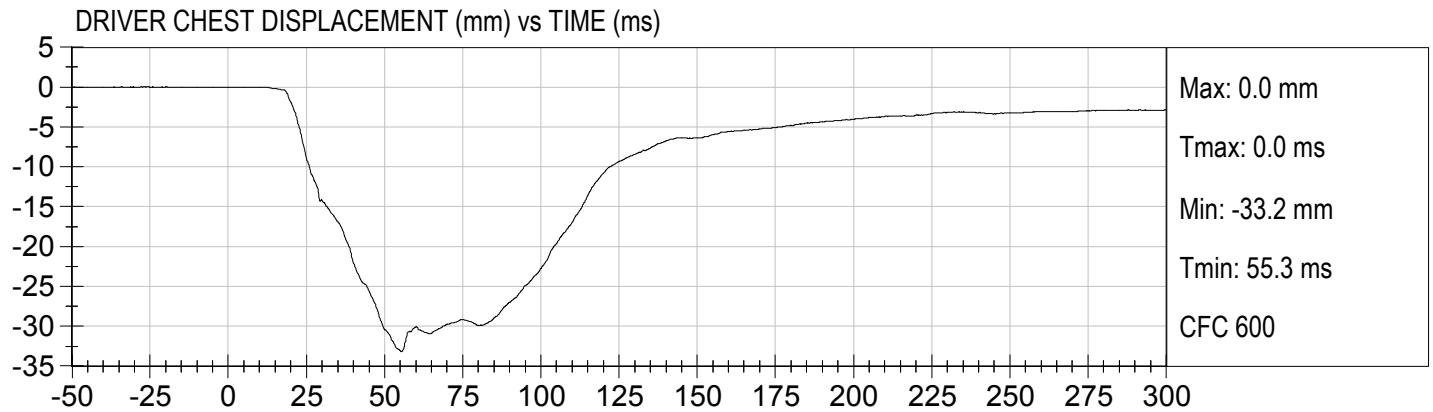
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

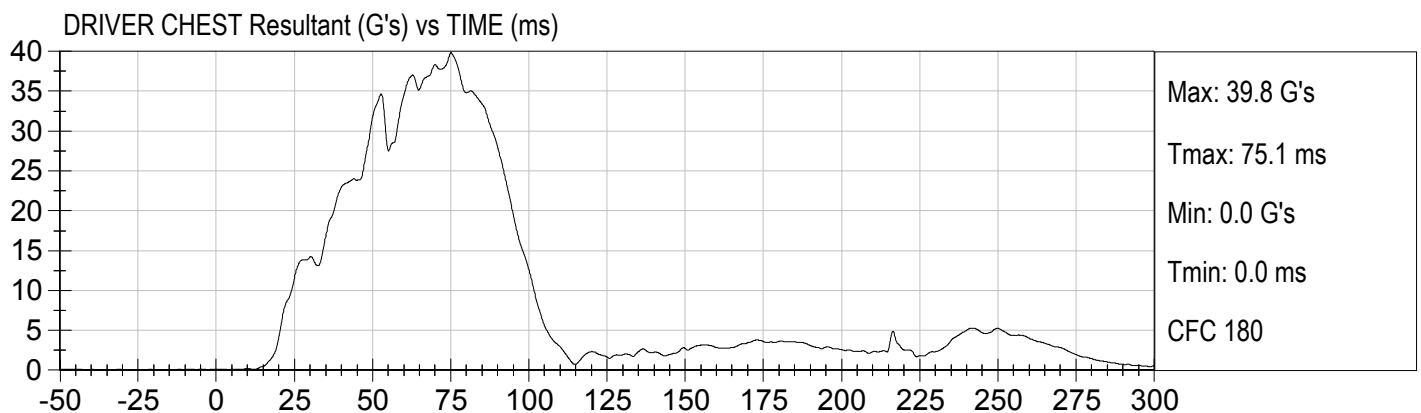
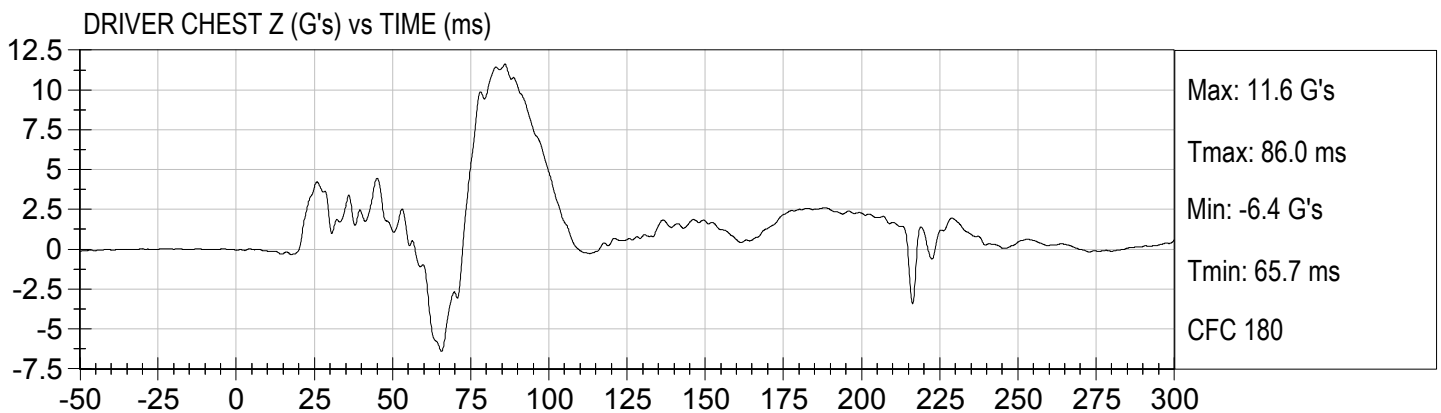
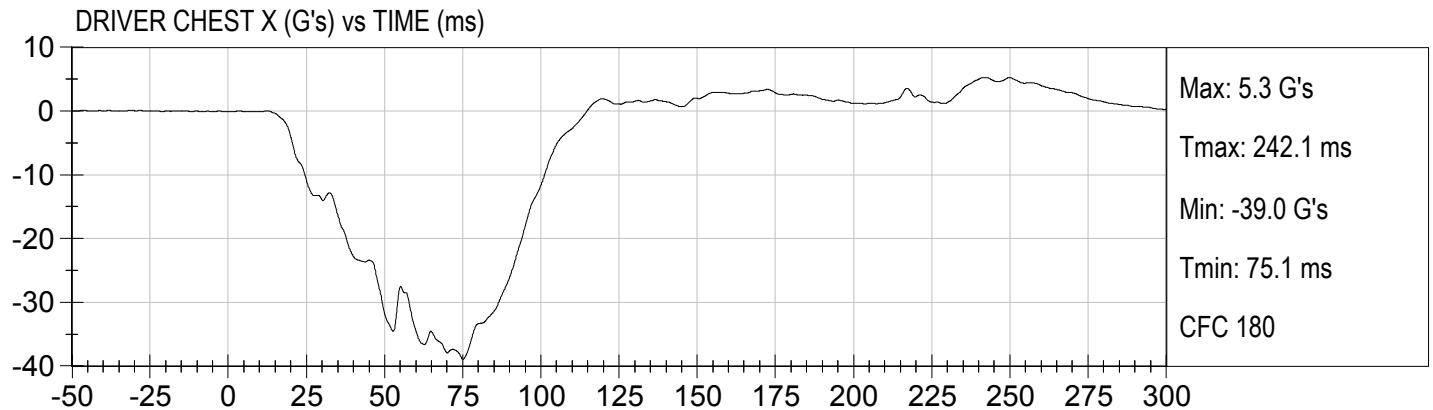
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 Driver Head Y Redundant
 Driver Head Z Redundant
 Driver Head Angular Velocity X
 Driver Head Angular Velocity Y
 Driver Head Angular Velocity Z
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant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

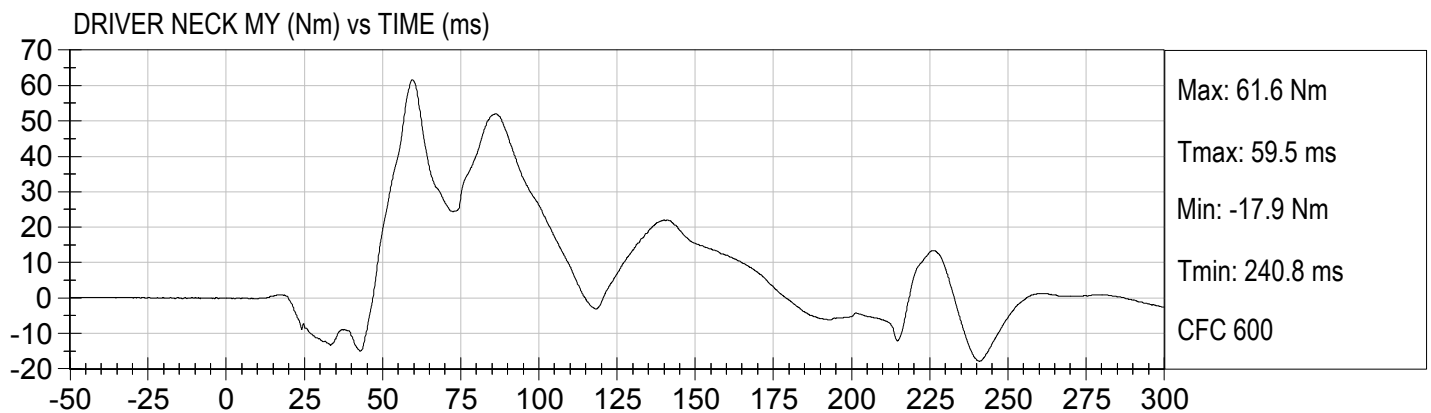
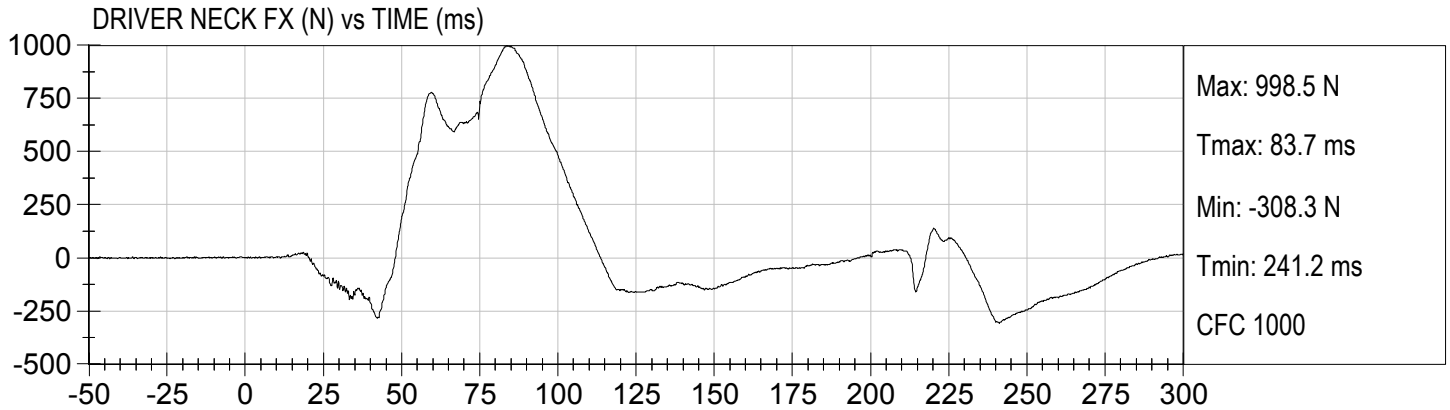
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Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower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

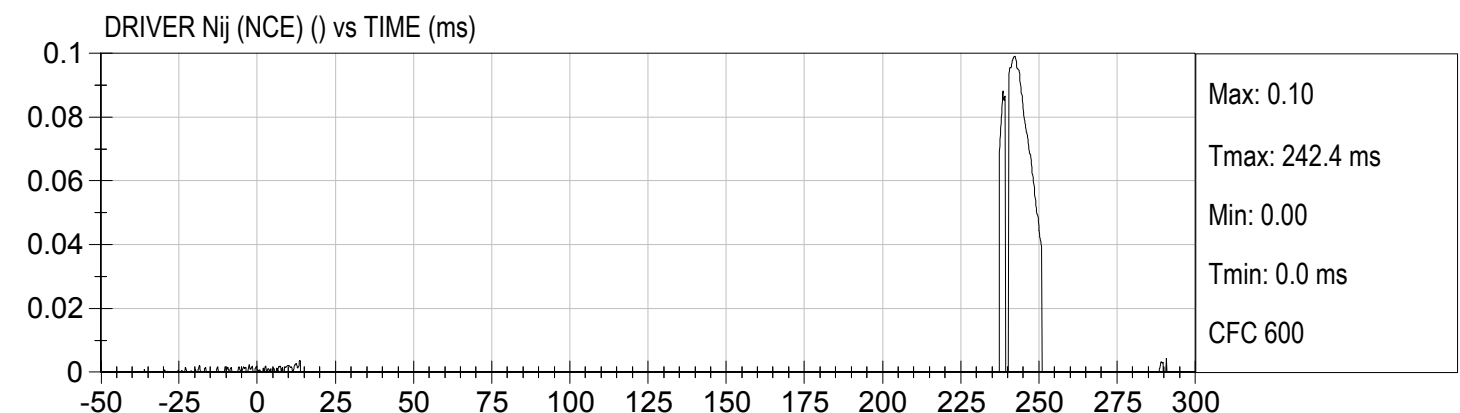
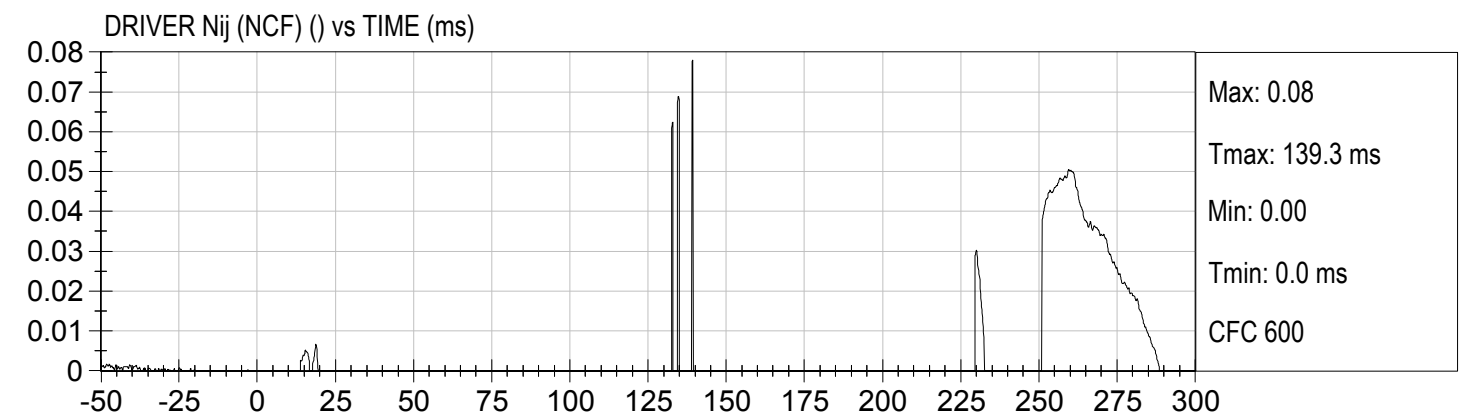
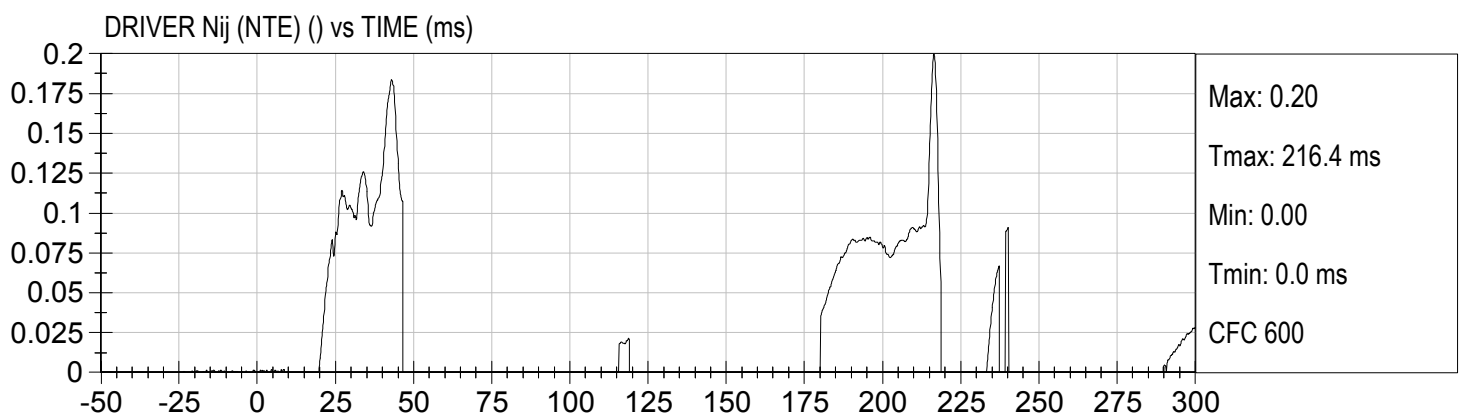
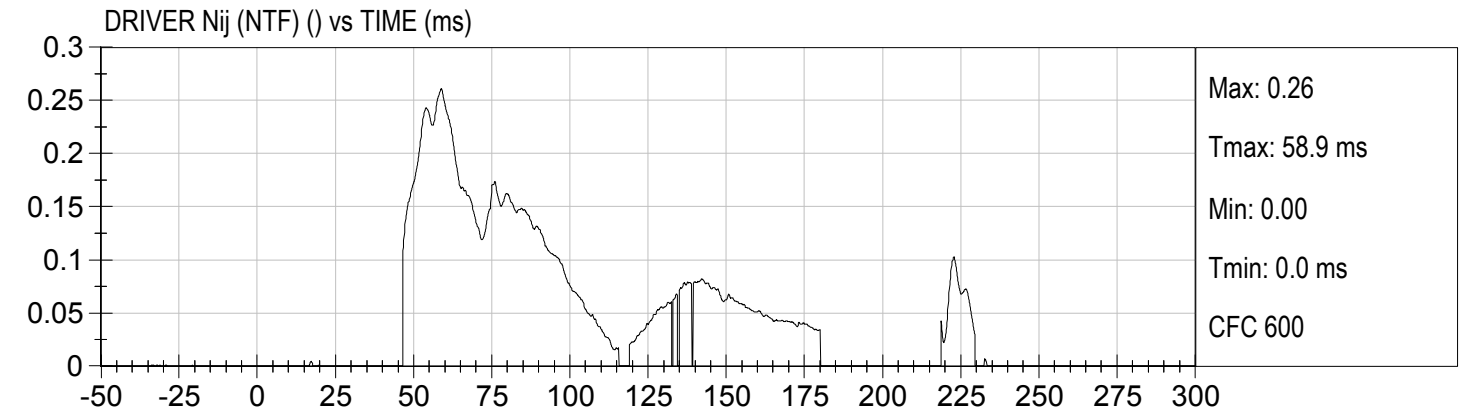
Passenger Pelvis Z
Passenger Left Femur Redundant
Passenger Right Femur Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger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

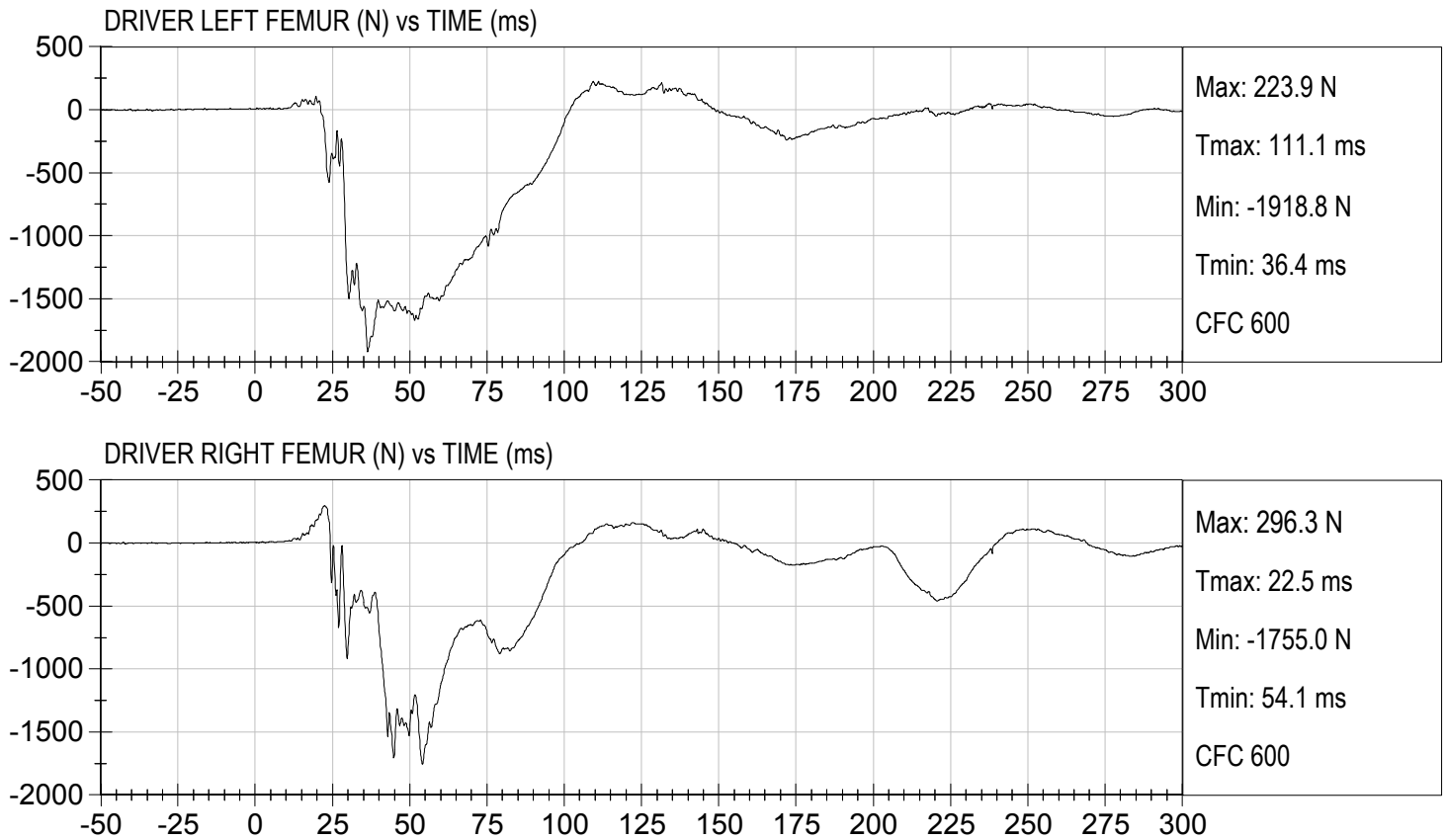


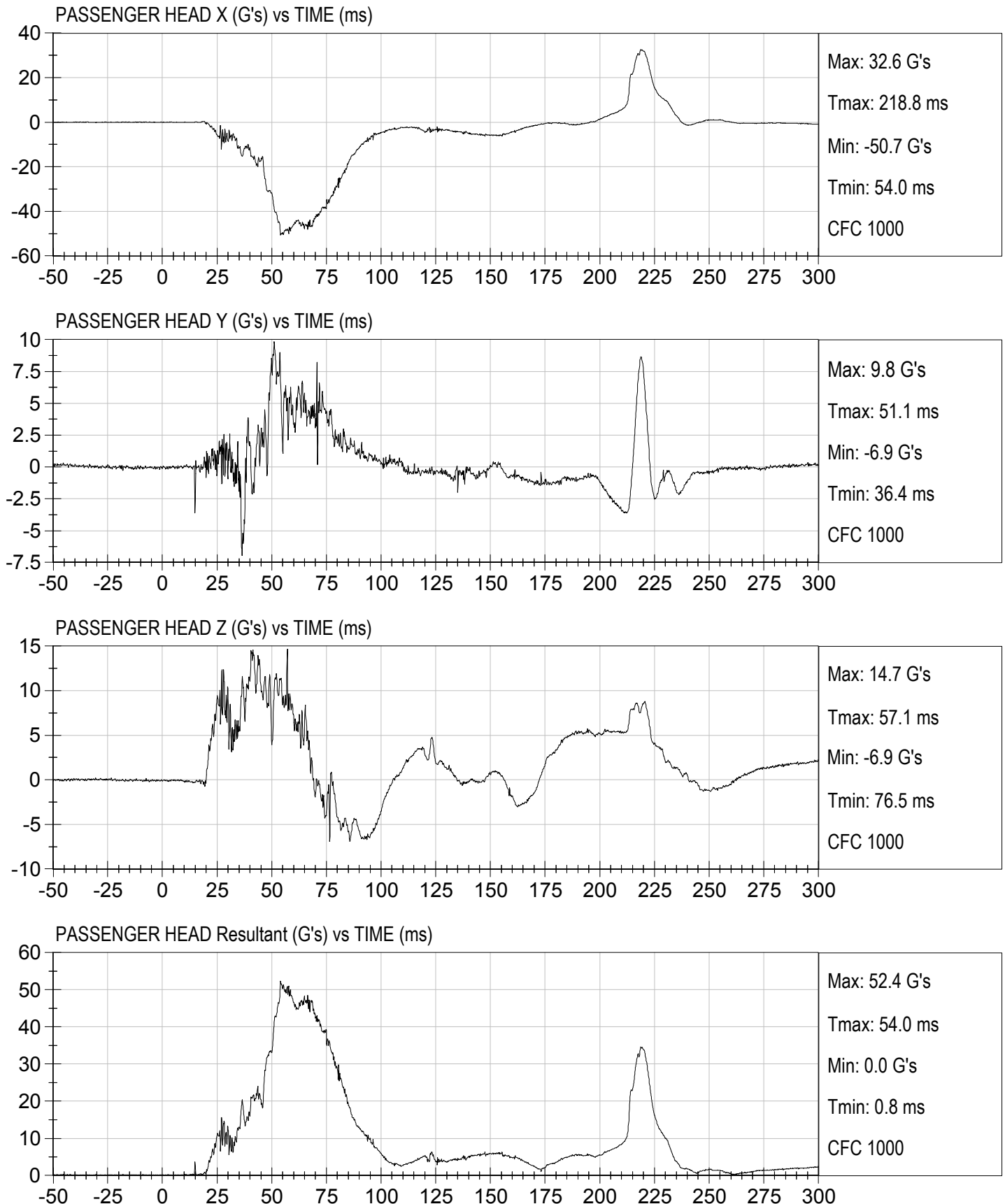


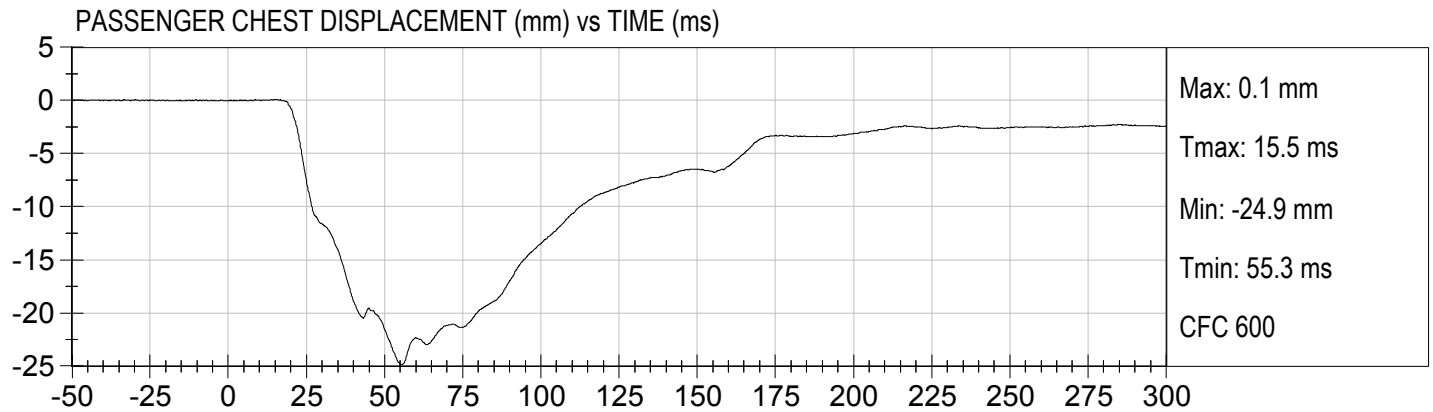


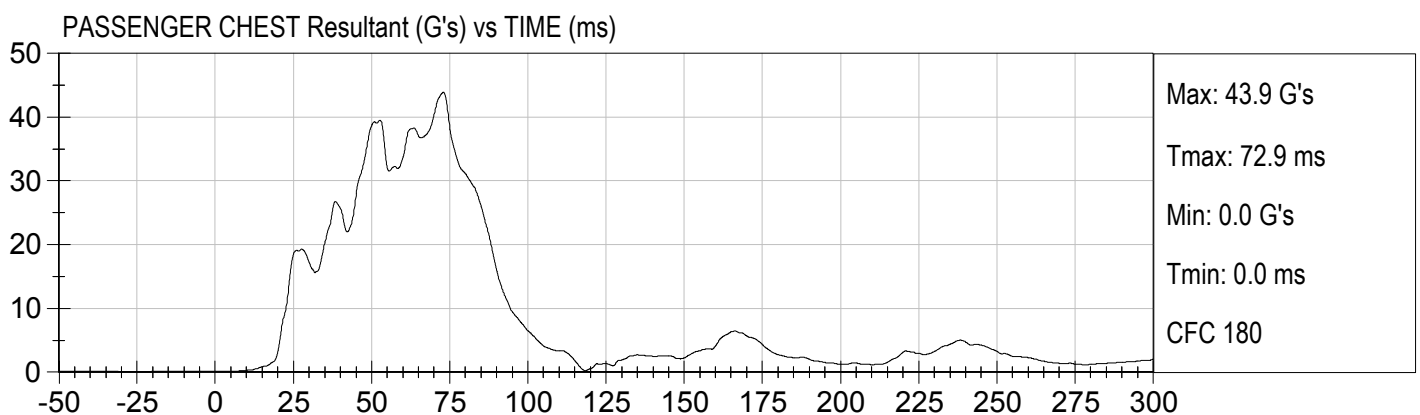
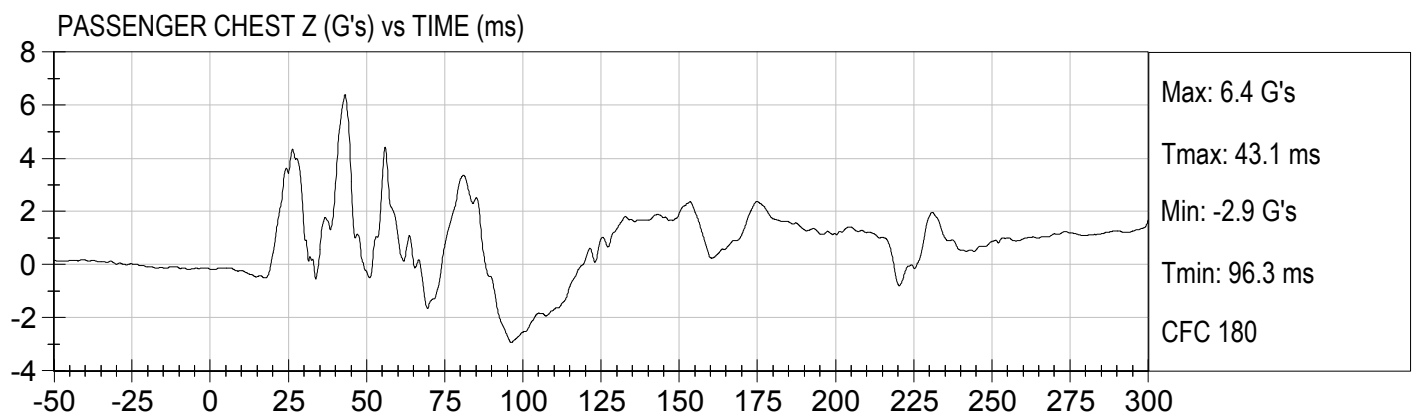
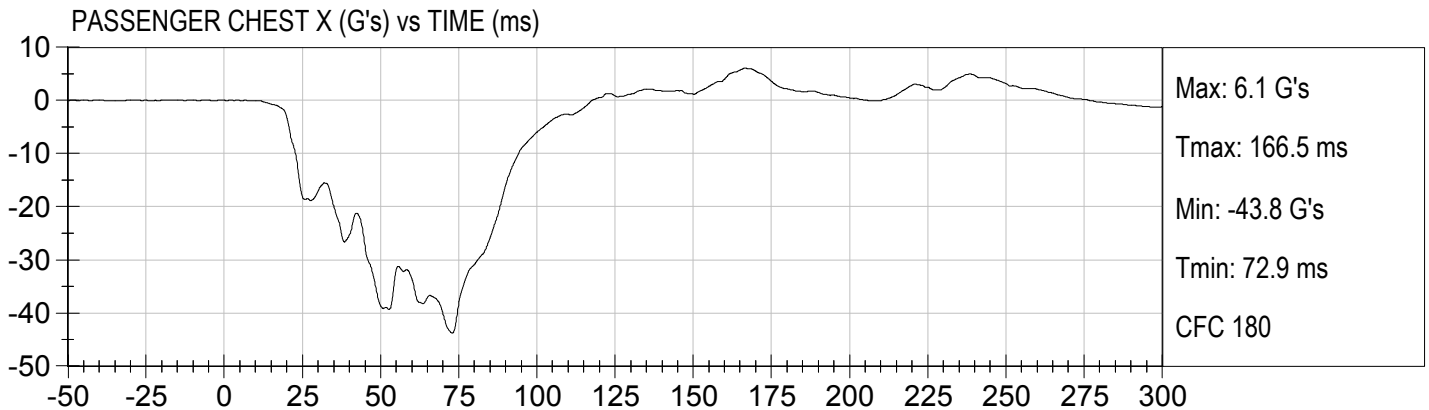


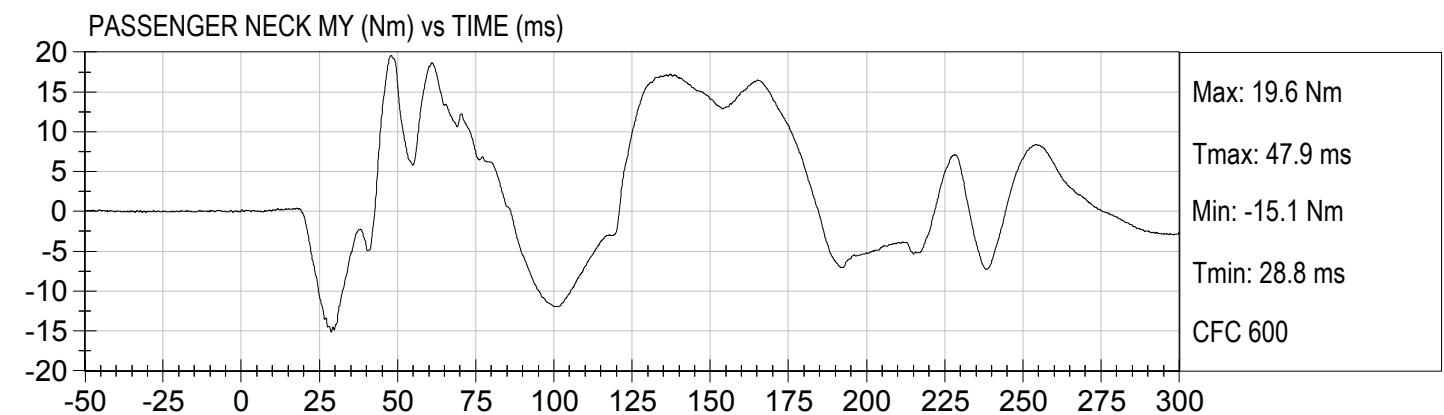
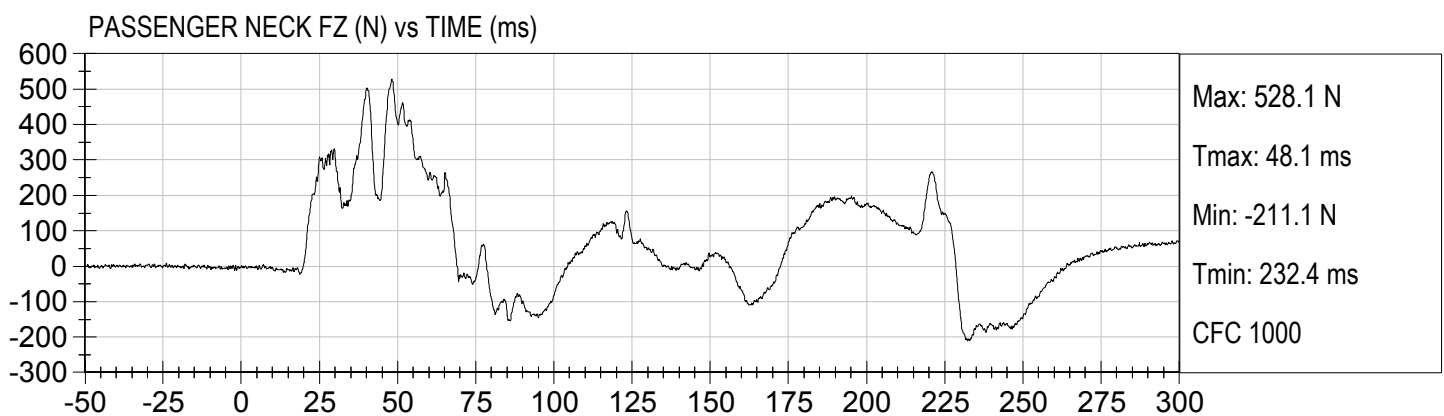
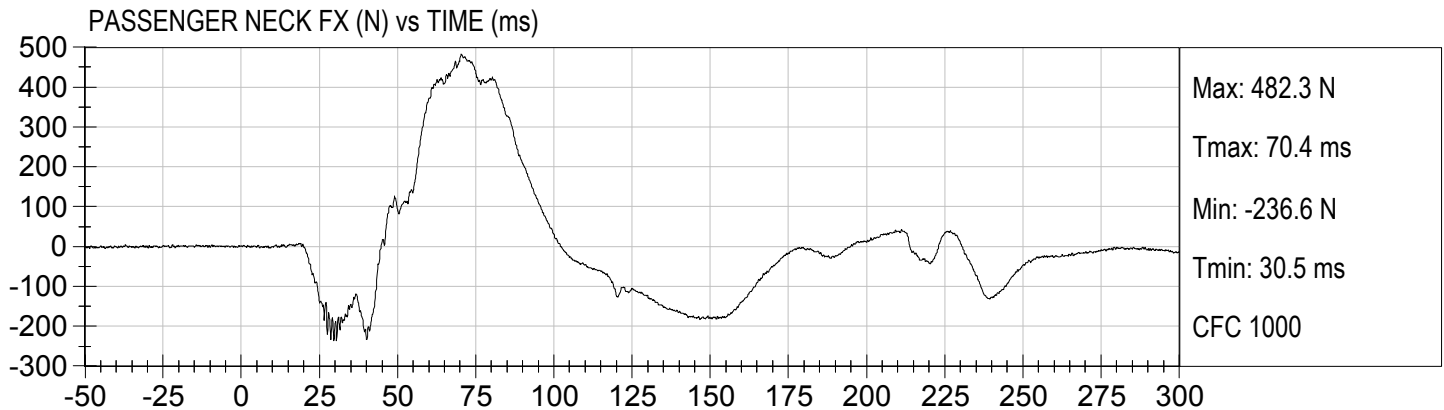


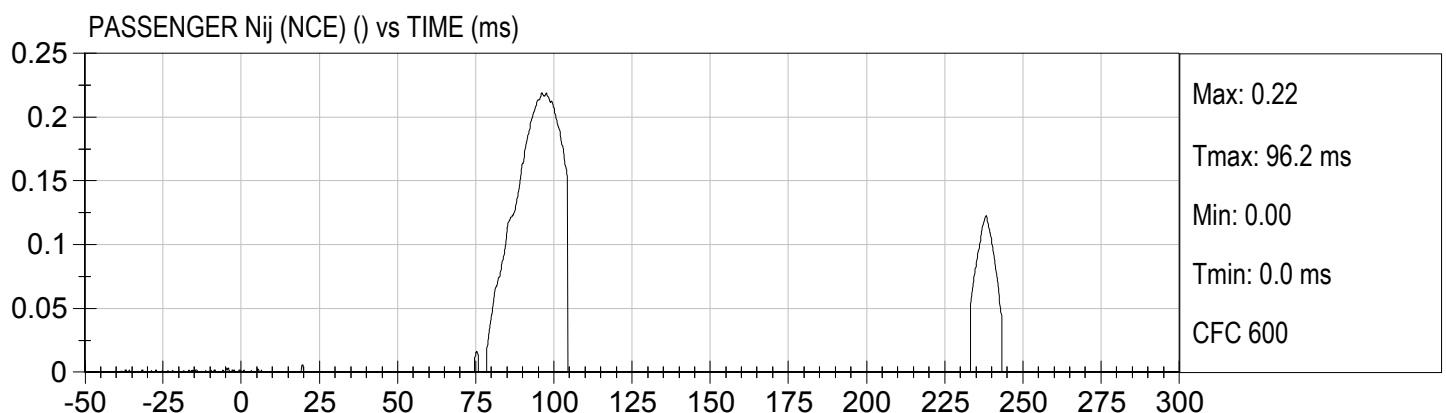
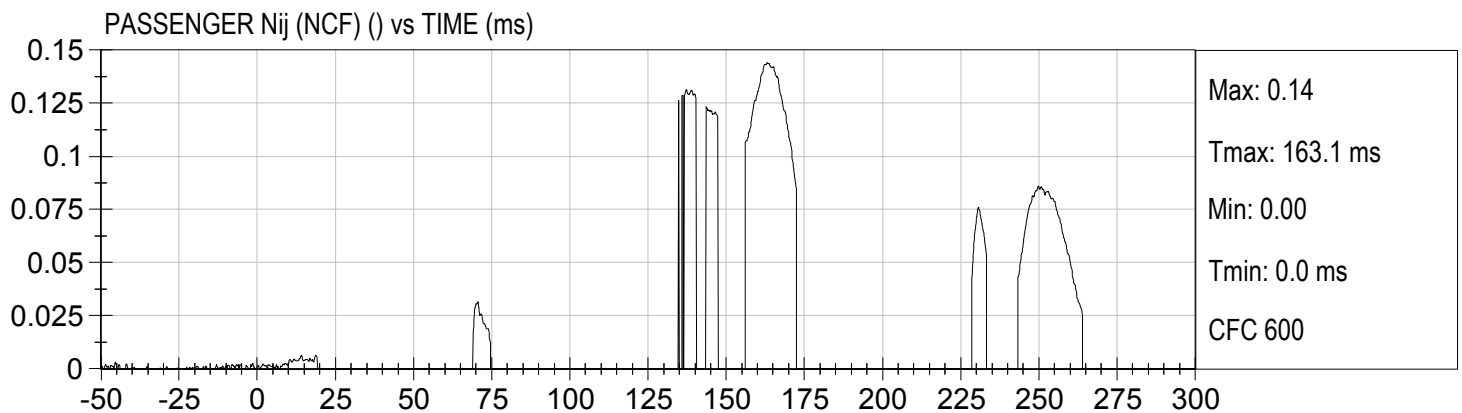
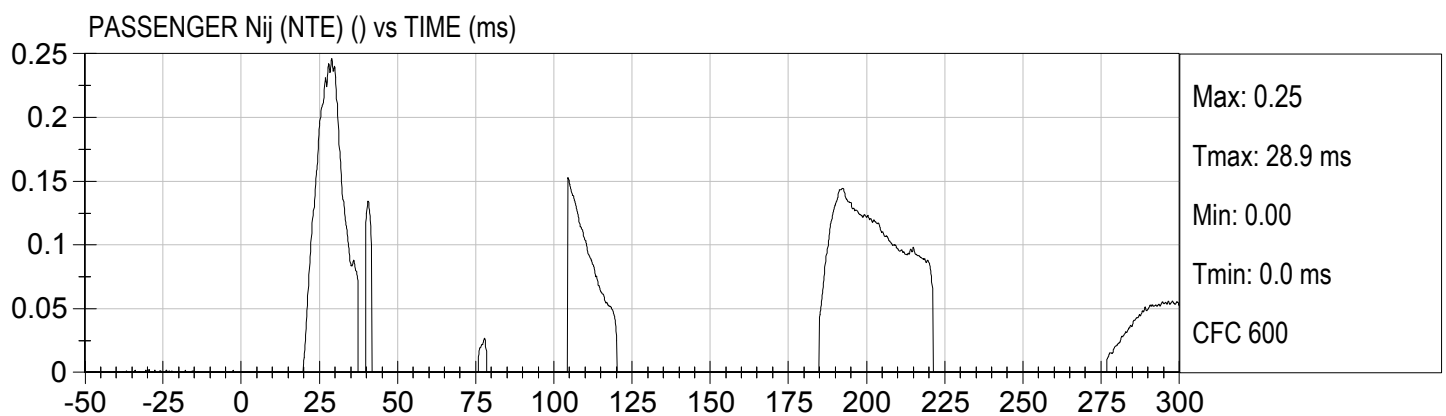
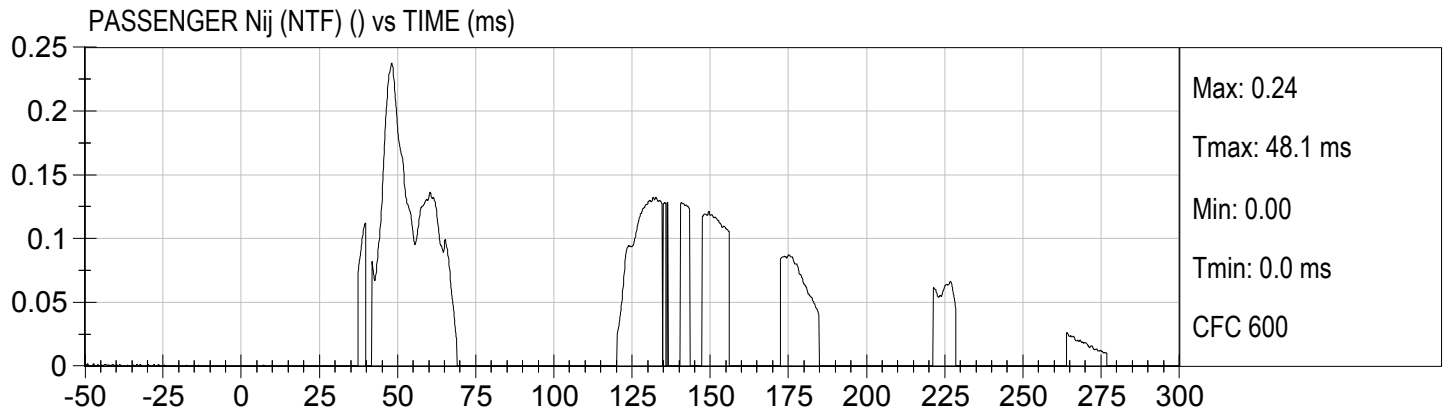


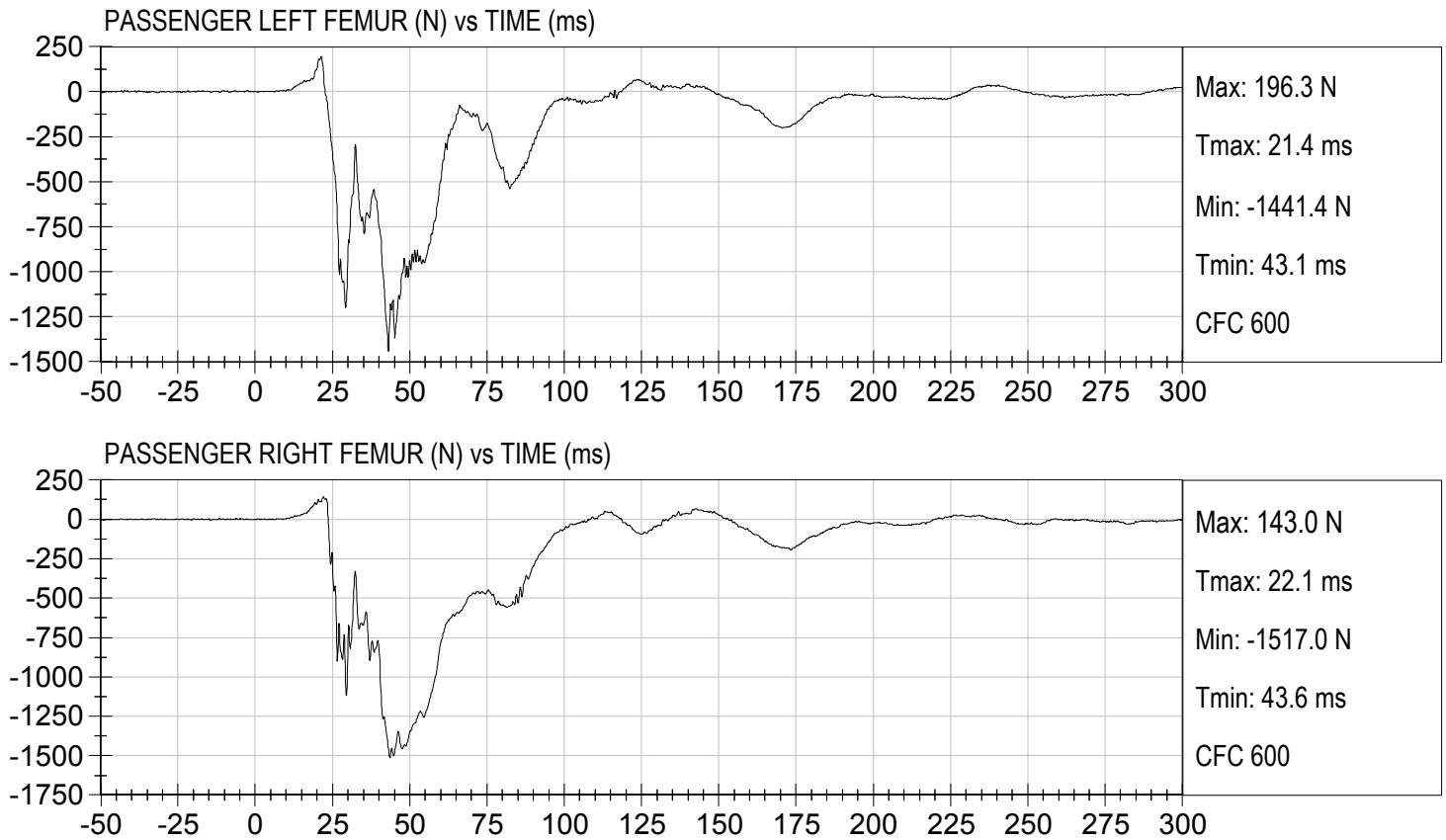












APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

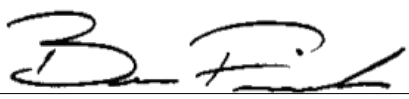
Test ID: D163751

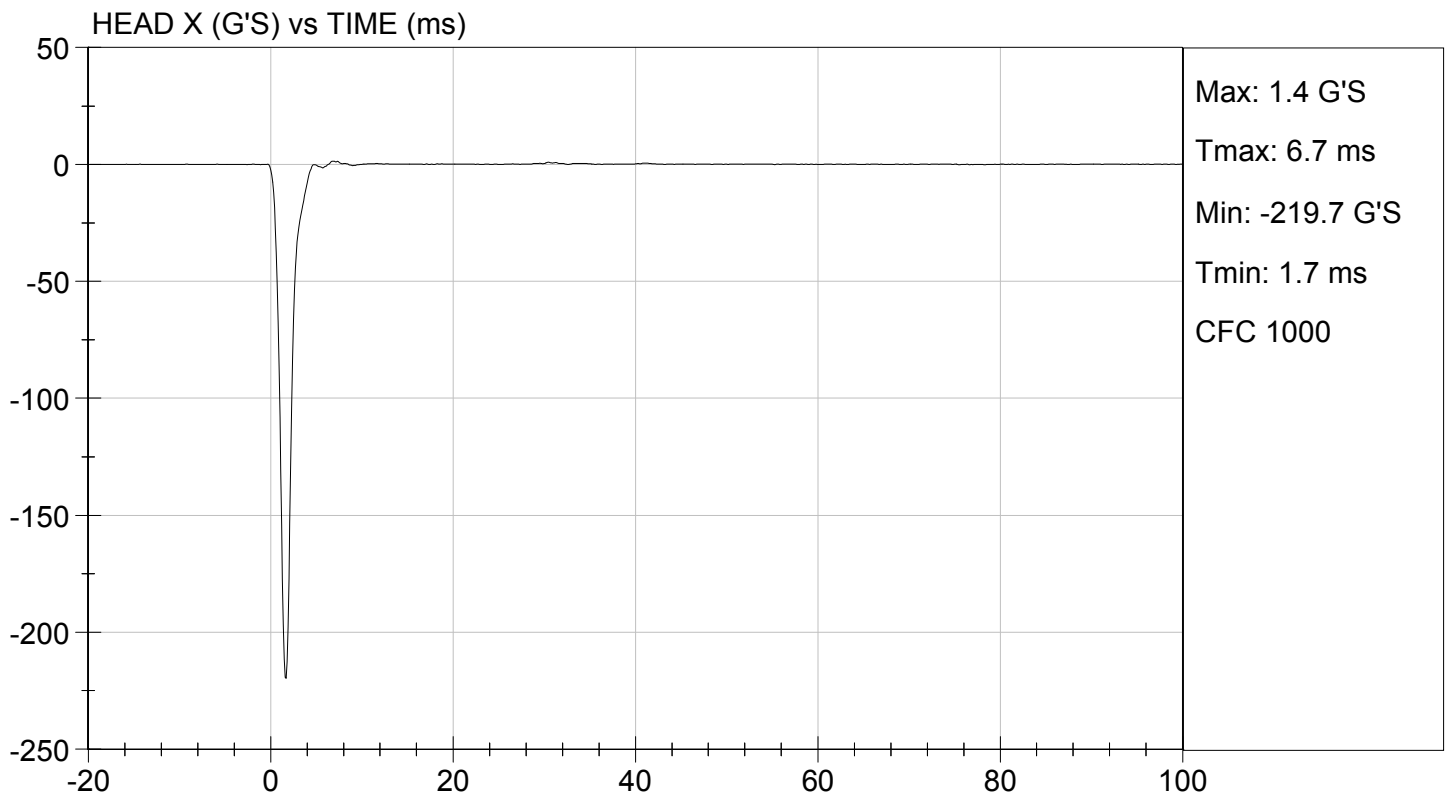
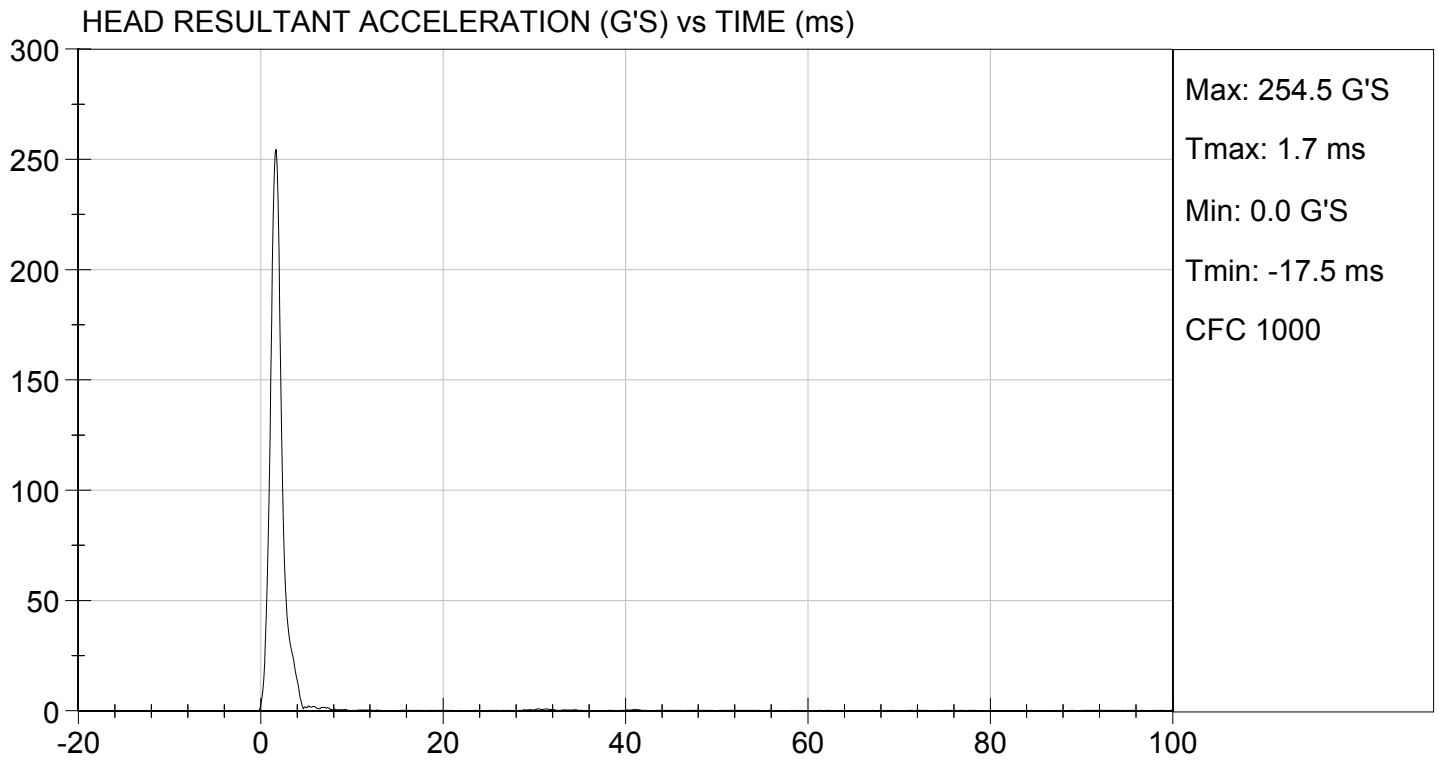
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	225 to 275	255	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	11.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

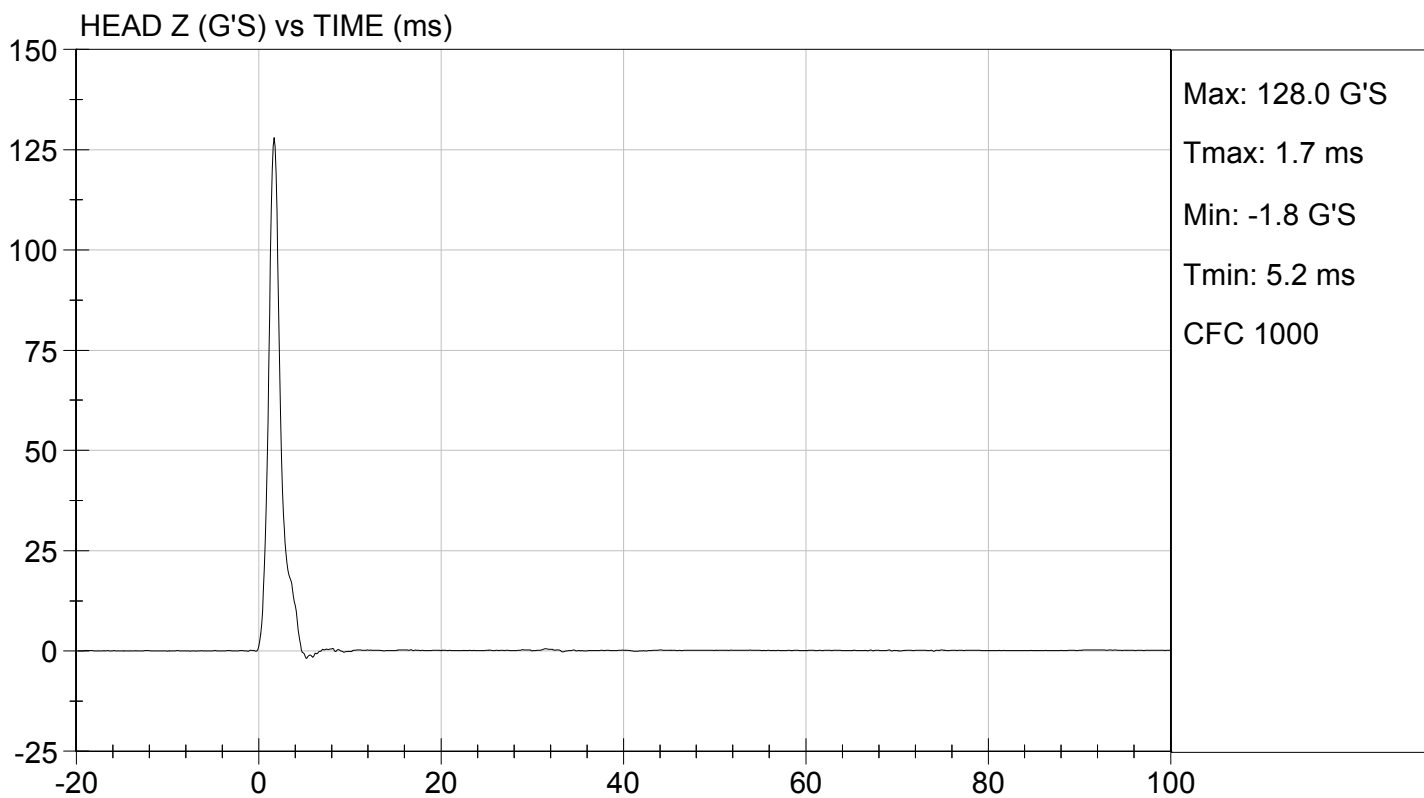
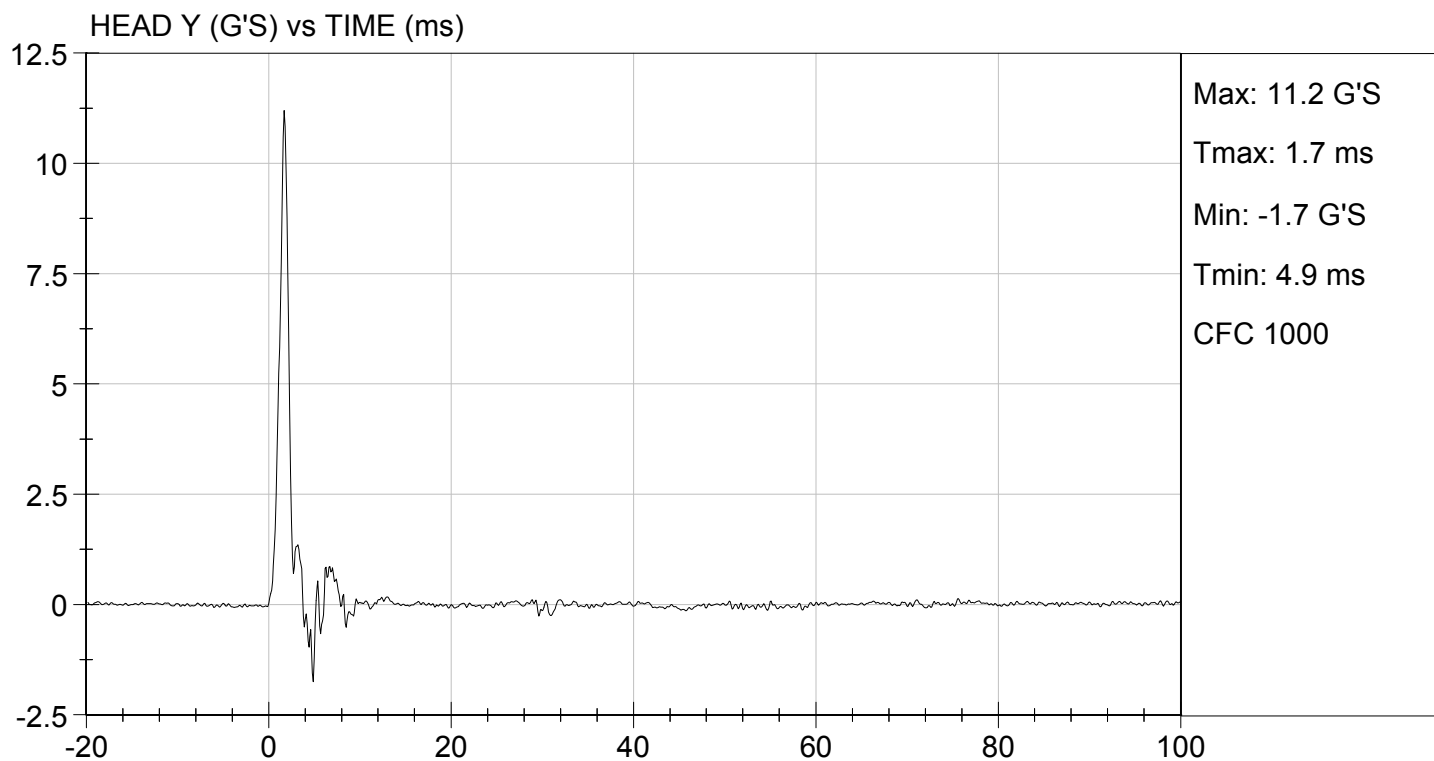

Laboratory Technician

11/07/2016

Test Date


Approved By





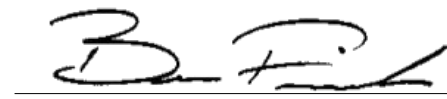
MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D163752

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	39	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.51	Pass
	20 ms	G's	17.60 to 22.60	19.75	Pass
	30 ms	G's	12.50 to 18.50	15.99	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	35.9	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	72.7	Pass
	Time	ms	57.0 to 64.0	59.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	119.4	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	91.2	Pass
	Time	ms	47.0 to 58.0	49.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.7	Pass
Overall Test Results					Pass


 Laboratory Technician

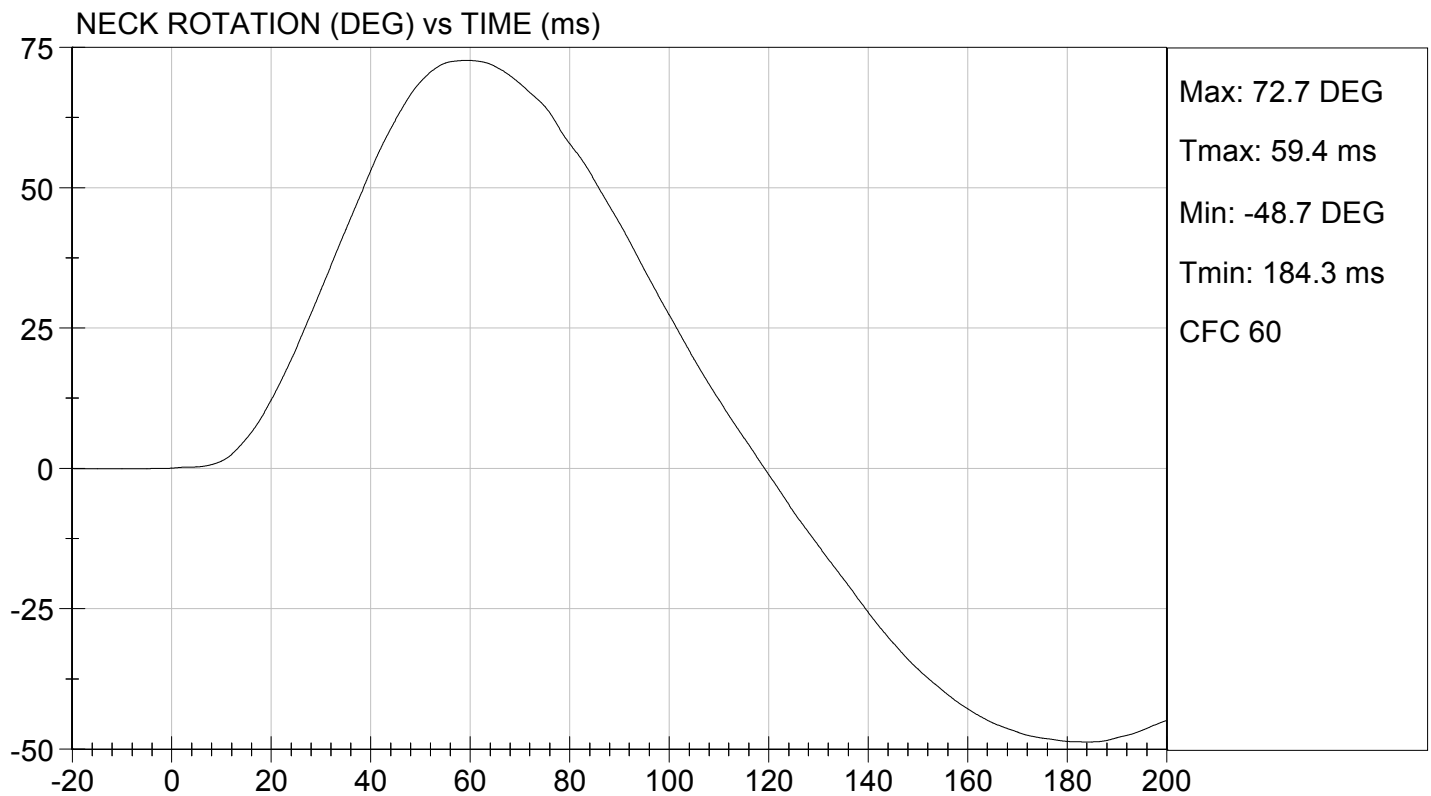
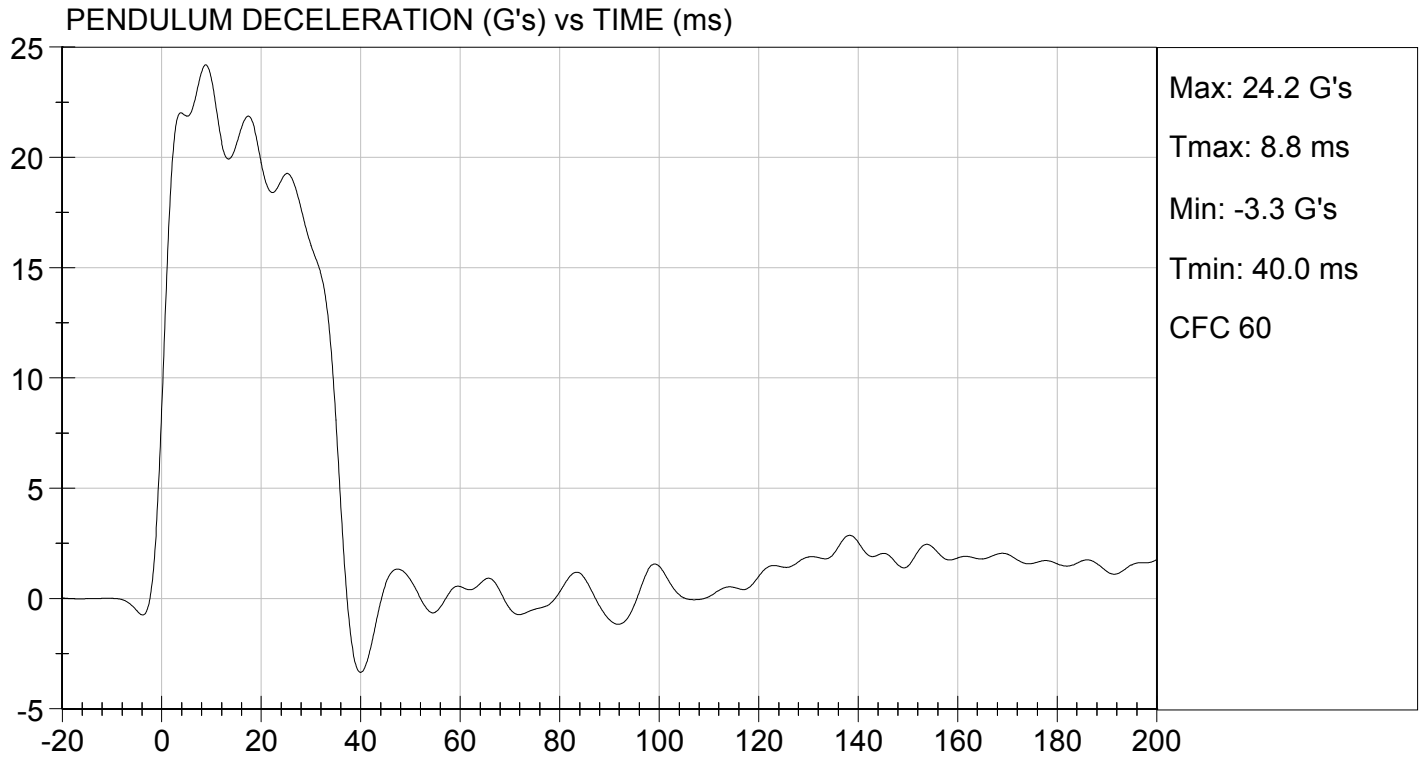

 Approved By

11/07/2016
 Test Date



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

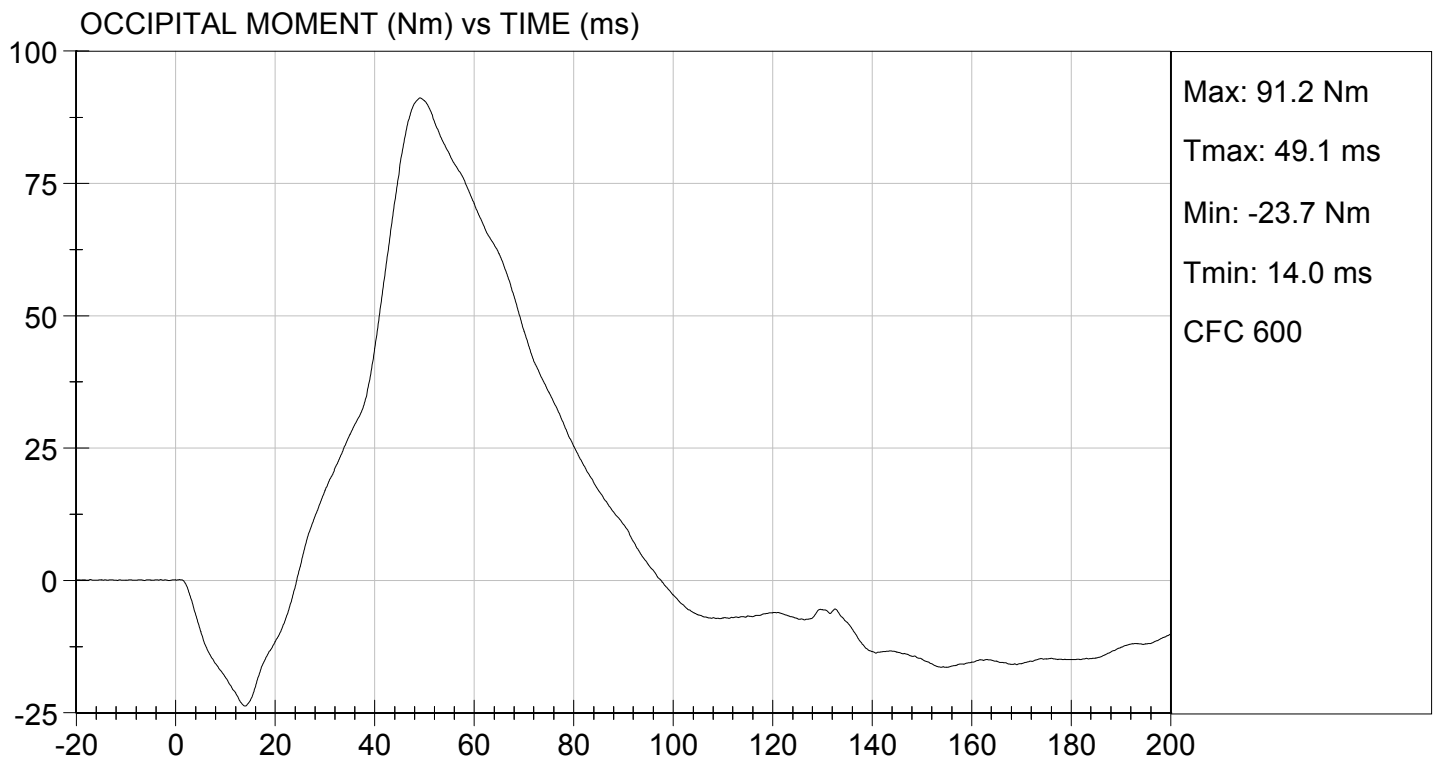
TEST DATE: 11/07/2016
TEST #: D163752





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

TEST DATE: 11/07/2016
TEST #: D163752



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

ATD Serial No: 351

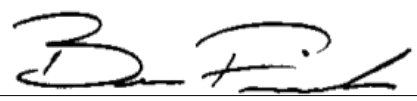
Test I.D: D163753

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	39	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.49	Pass
	20 ms	G's	14.00 to 19.00	15.44	Pass
	30 ms	G's	11.00 to 16.00	12.17	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.8	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	98.1	Pass
	Time	ms	72.0 to 82.0	78.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	165.1	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-58.8	Pass
	Time	ms	65.0 to 79.0	73.0	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	147.2	Pass
Overall Test Results					Pass


 Laboratory Technician

11/07/2016

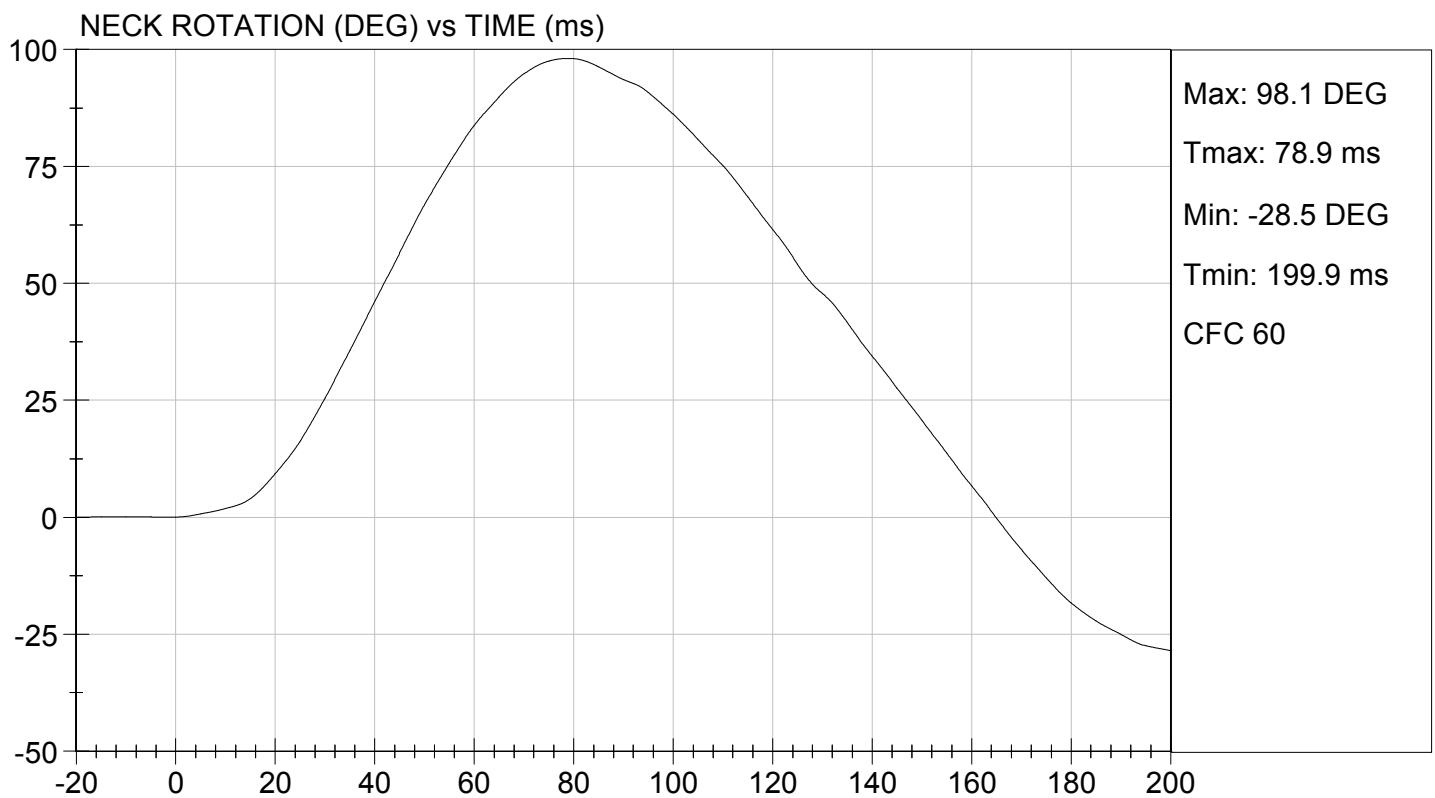
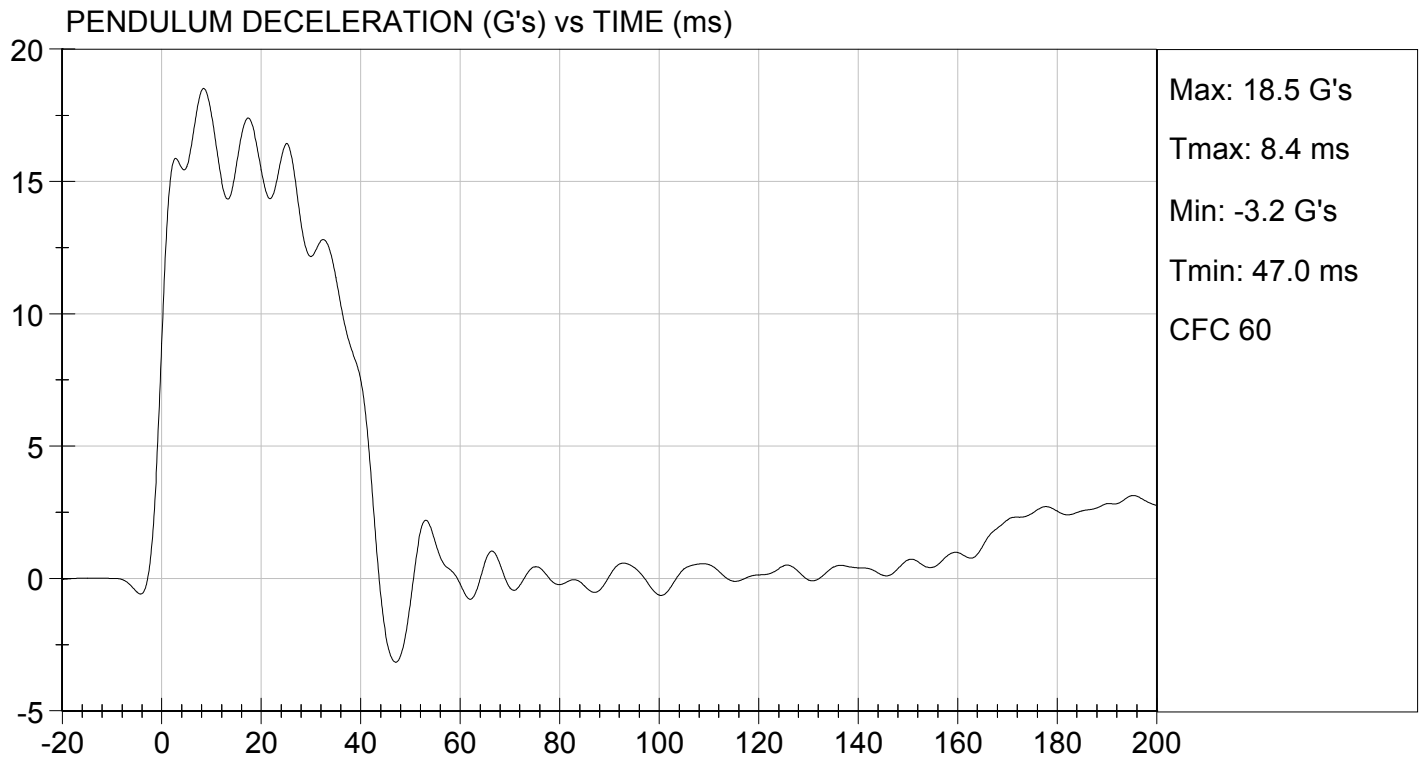
Test Date


 Approved By



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

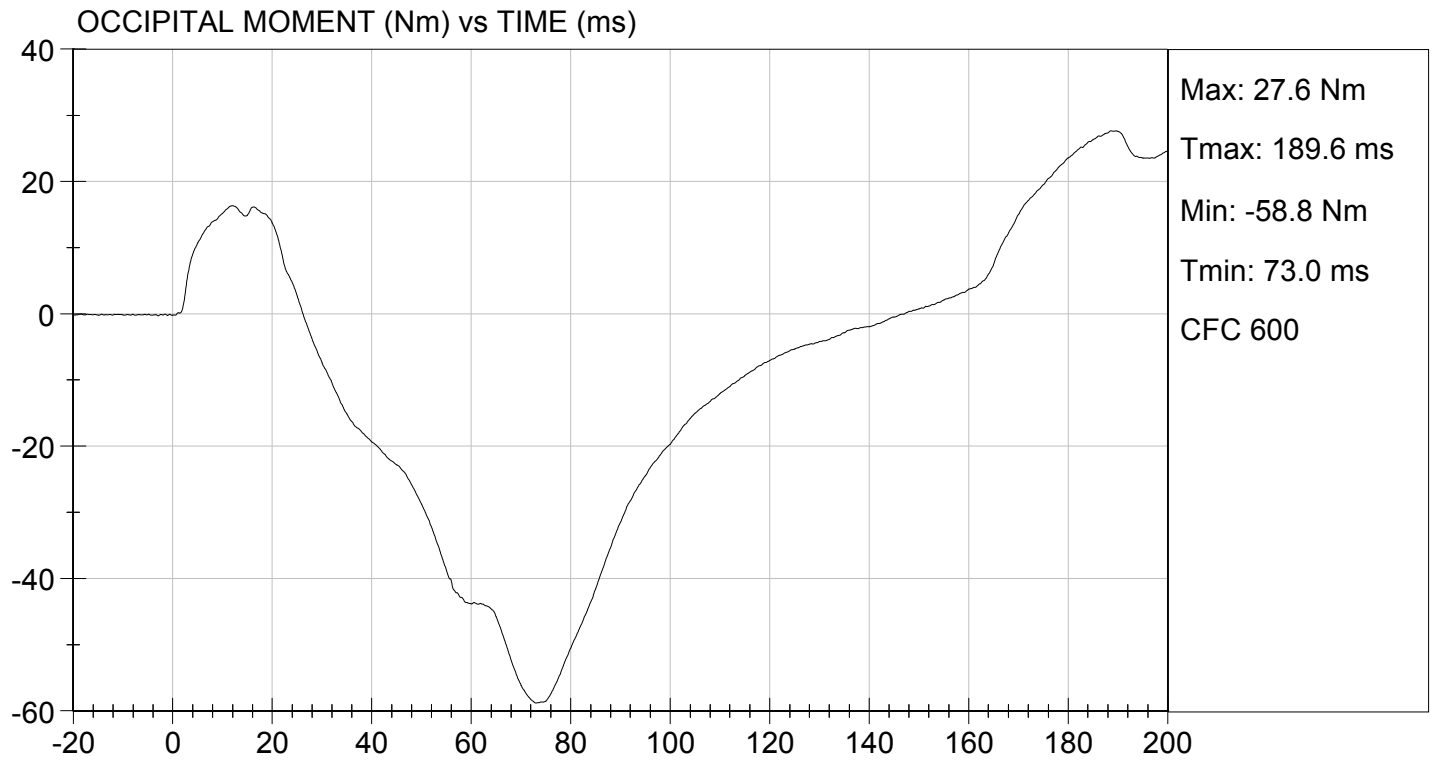
TEST DATE: 11/07/2016
TEST #: D163753





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

TEST DATE: 11/07/2016
TEST #: D163753



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

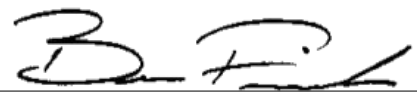
ATD Serial No: 351

Test I.D: D163754

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,552	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.51	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Overall Test Results			Pass	


Laboratory Technician

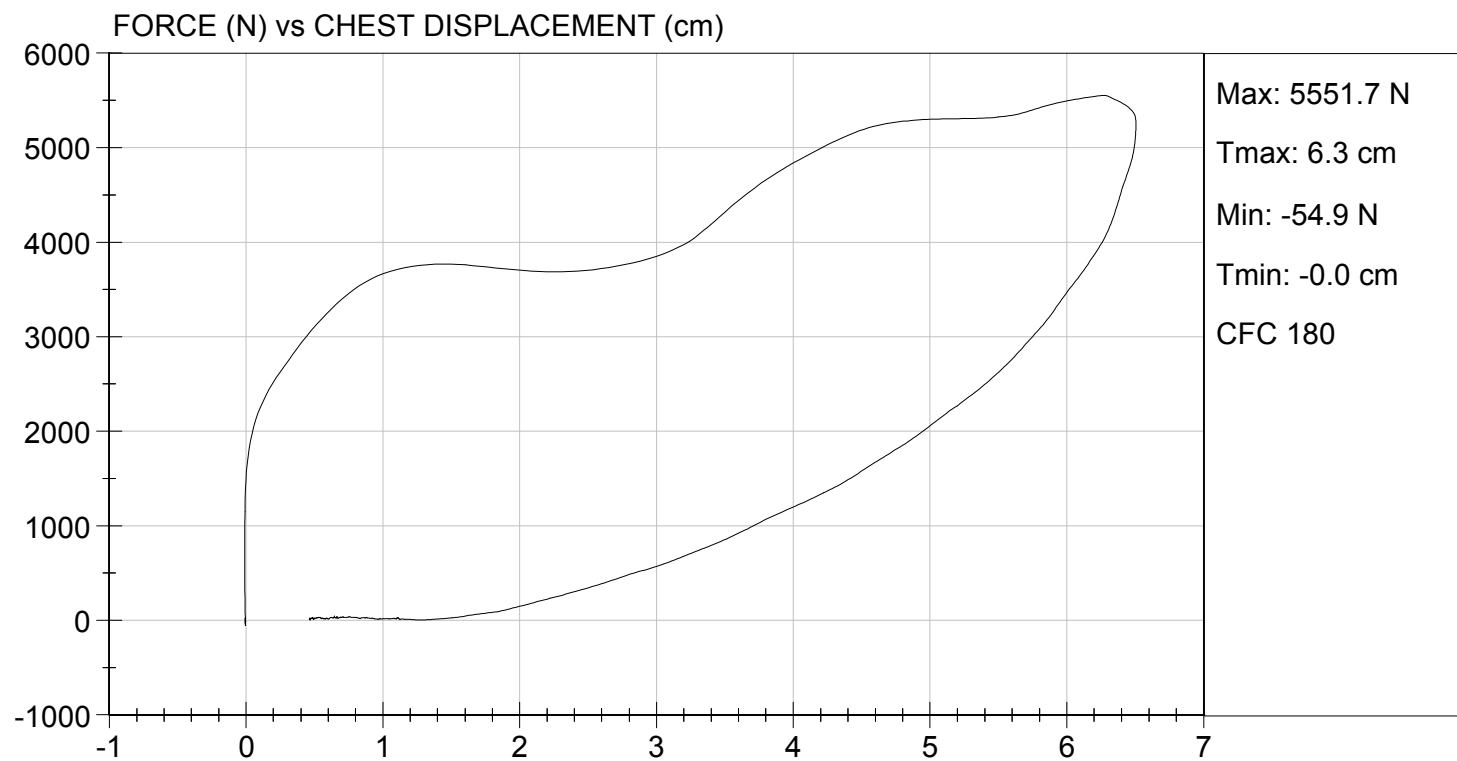
11/07/2016
Test Date


Approved By



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

TEST DATE: 11/07/2016
TEST #: D163754



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

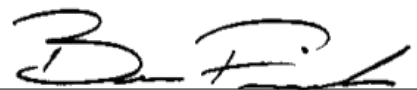
ATD Serial No: 351

Test I.D: D163755

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	N	4715 to 5782	4,769	Pass
Overall Test Results				Pass


Laboratory Technician

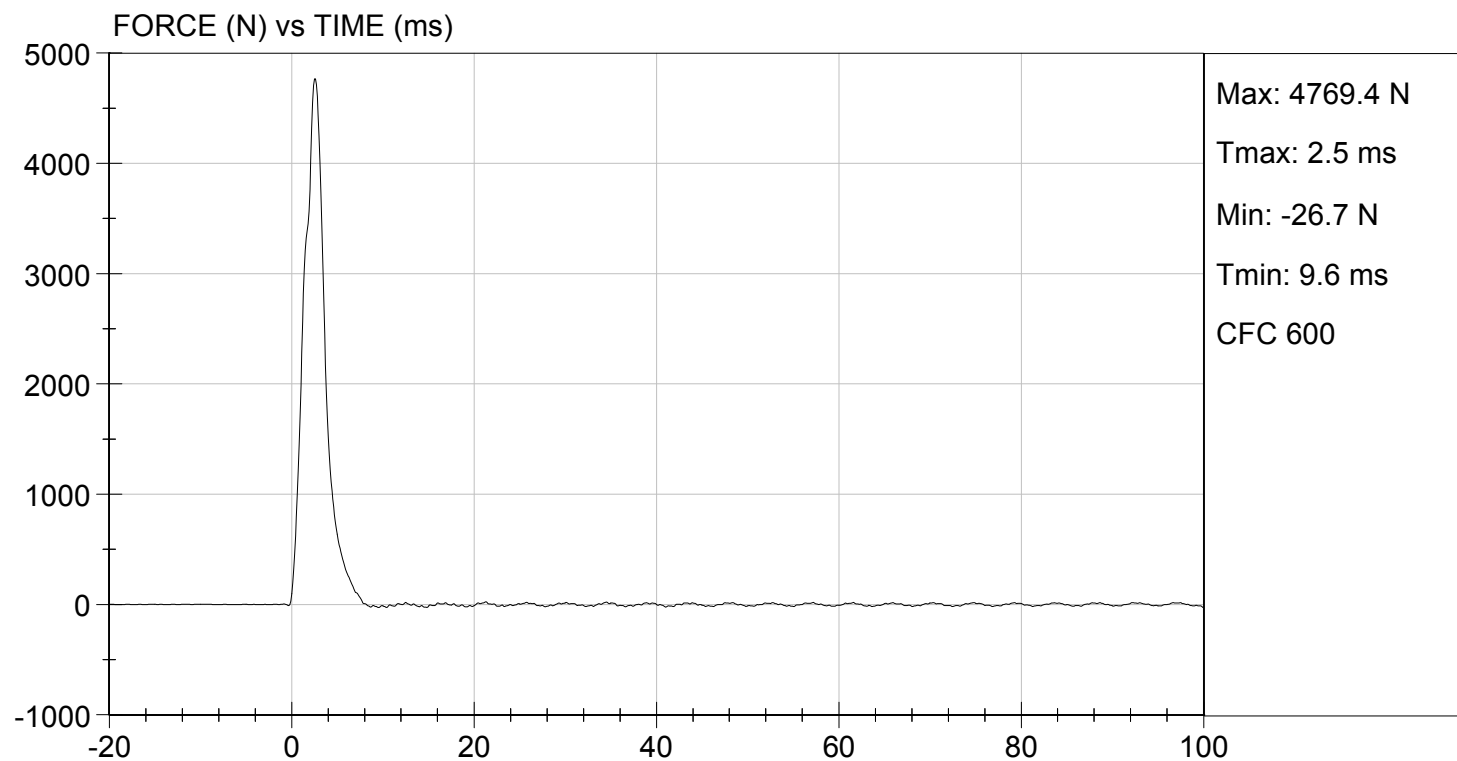
11/07/2016
Test Date


Approved By



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

TEST DATE: 11/07/2016
TEST #: D163755



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

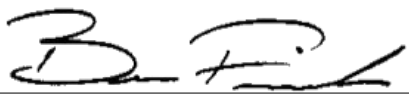
ATD Serial No: 351

Test I.D: D163756

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,406	Pass
Overall Test Results				Pass


Laboratory Technician

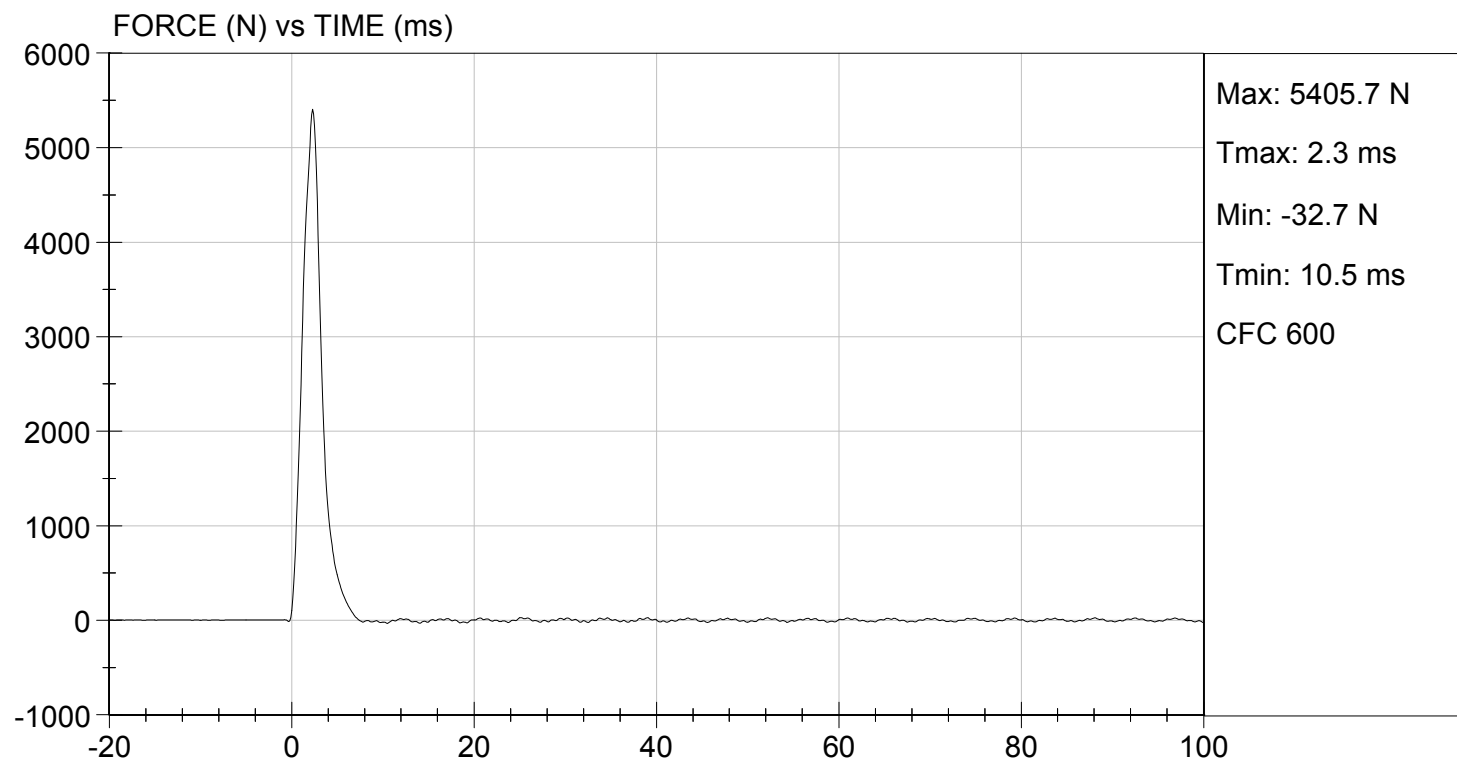
11/07/2016
Test Date


Approved By



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

TEST DATE: 11/07/2016
TEST #: D163756



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

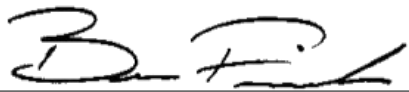
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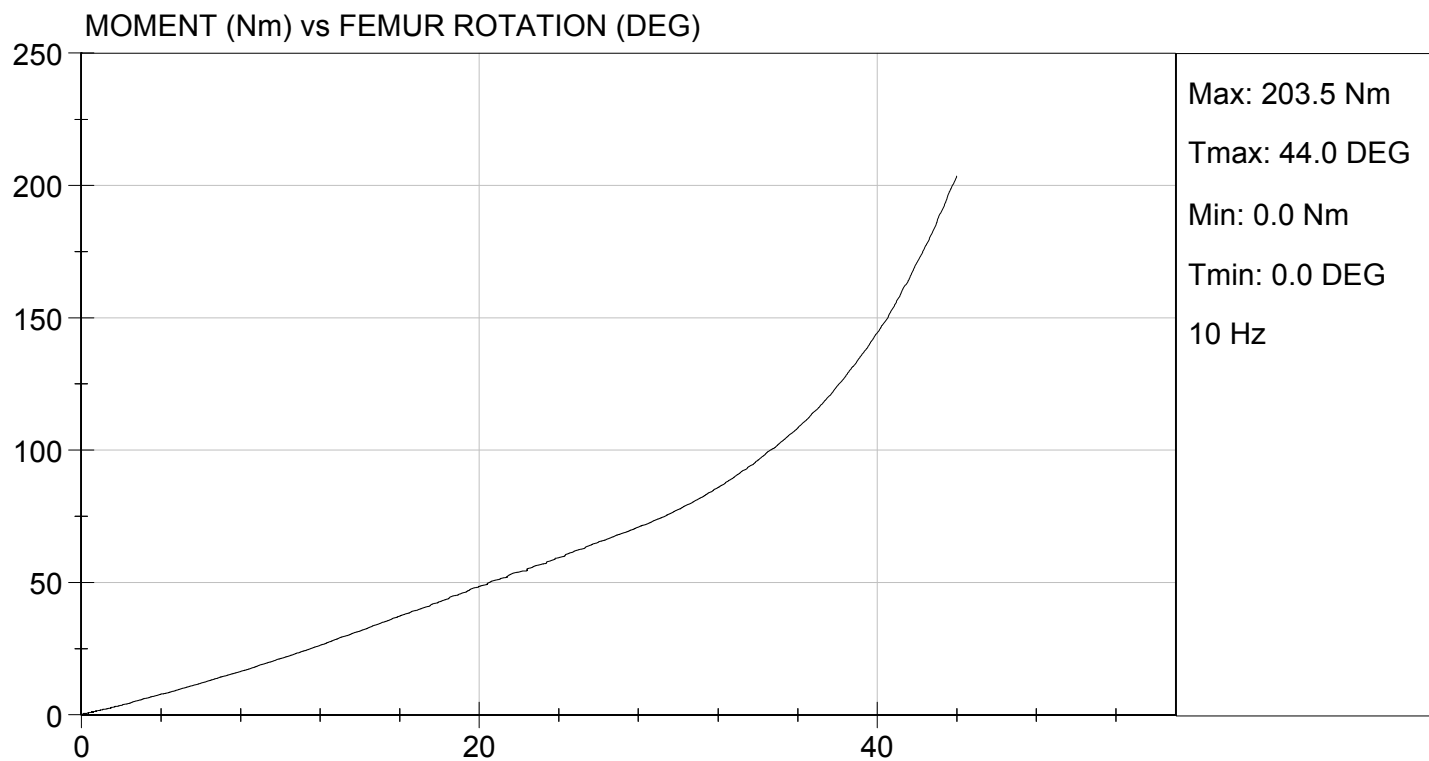
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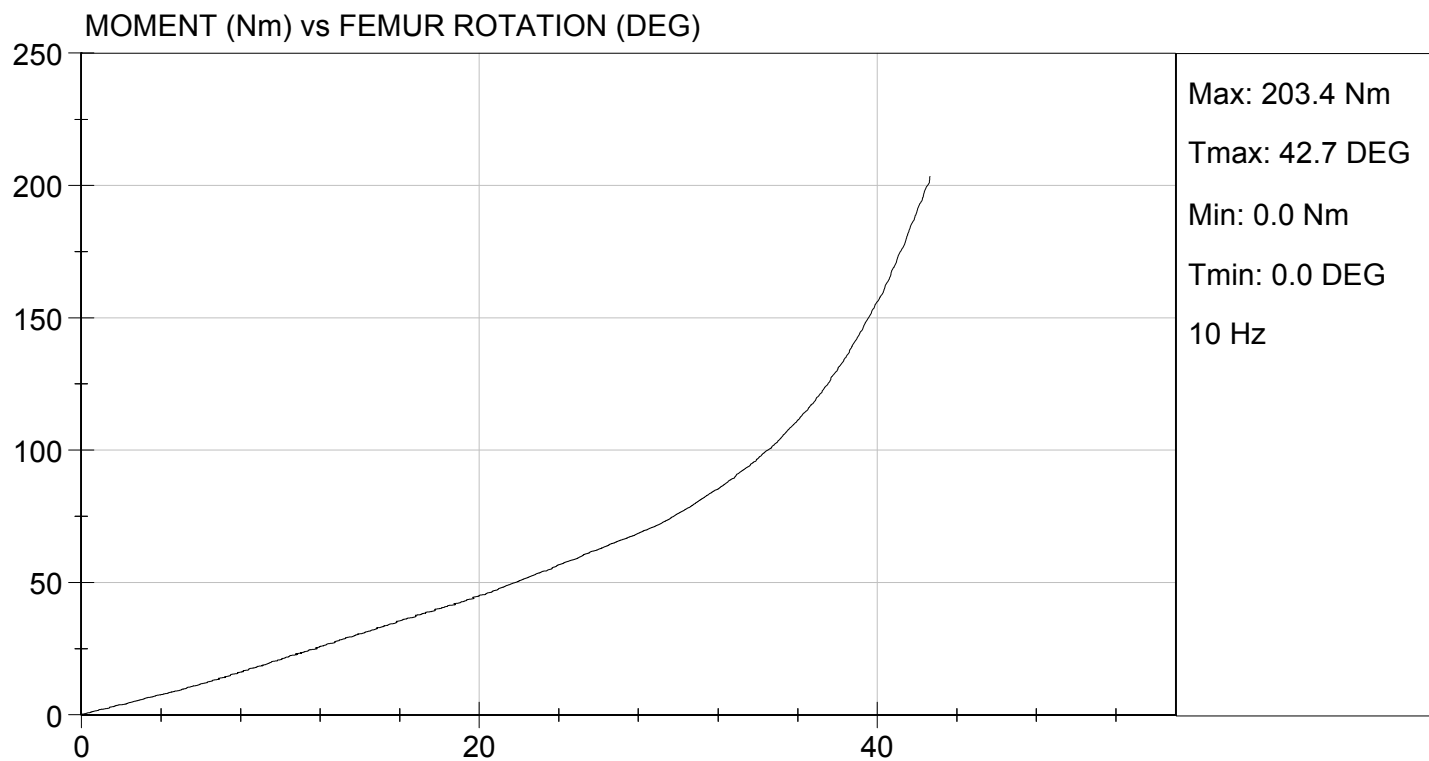
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	42	42	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	77.6	76.1	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.0	42.7	Pass
Overall Test Results					Pass


 Laboratory Technician

11/07/2016
 Test Date


 Approved By



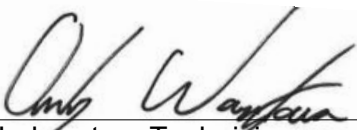


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 50TH PERCENTILE MALE

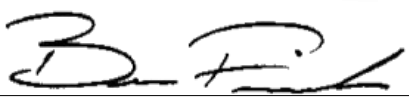
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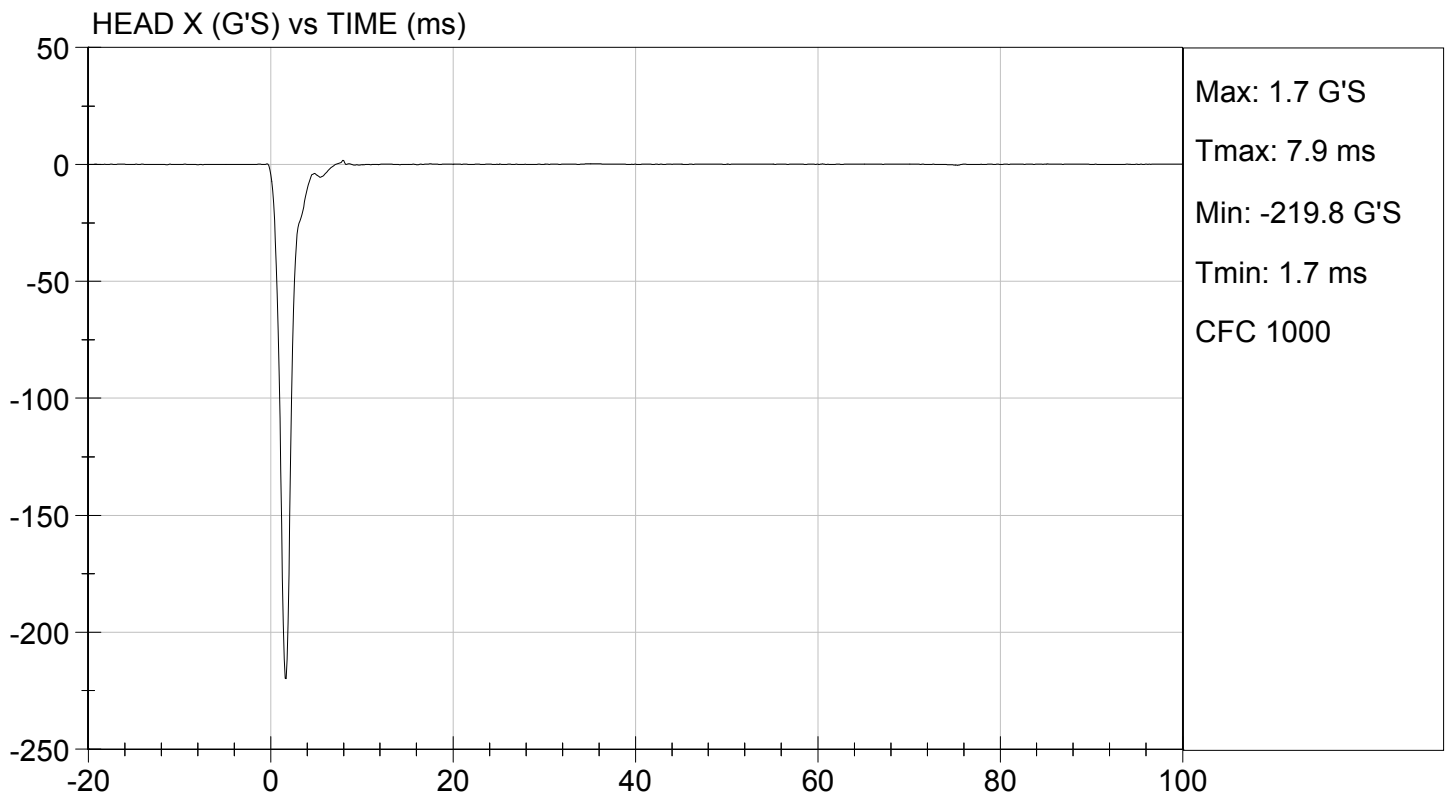
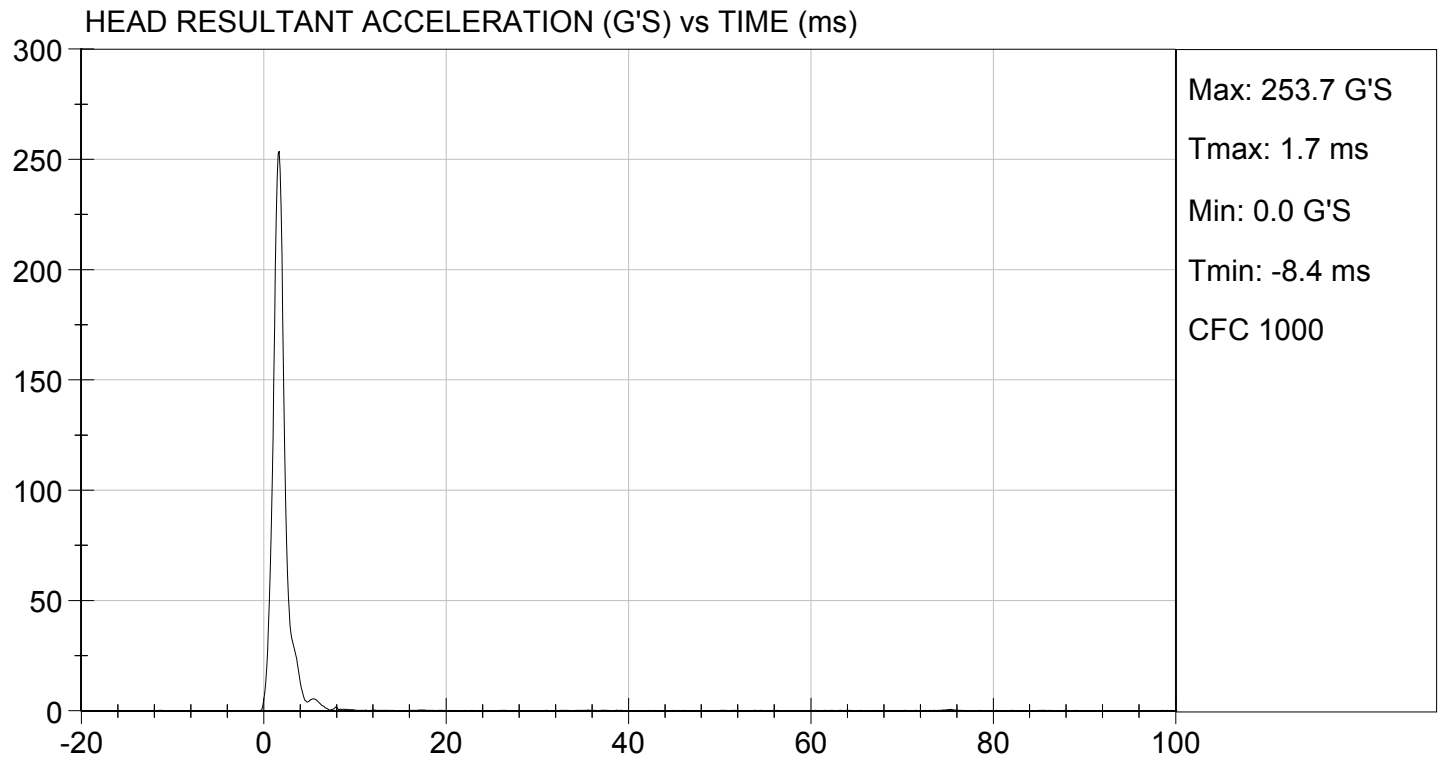
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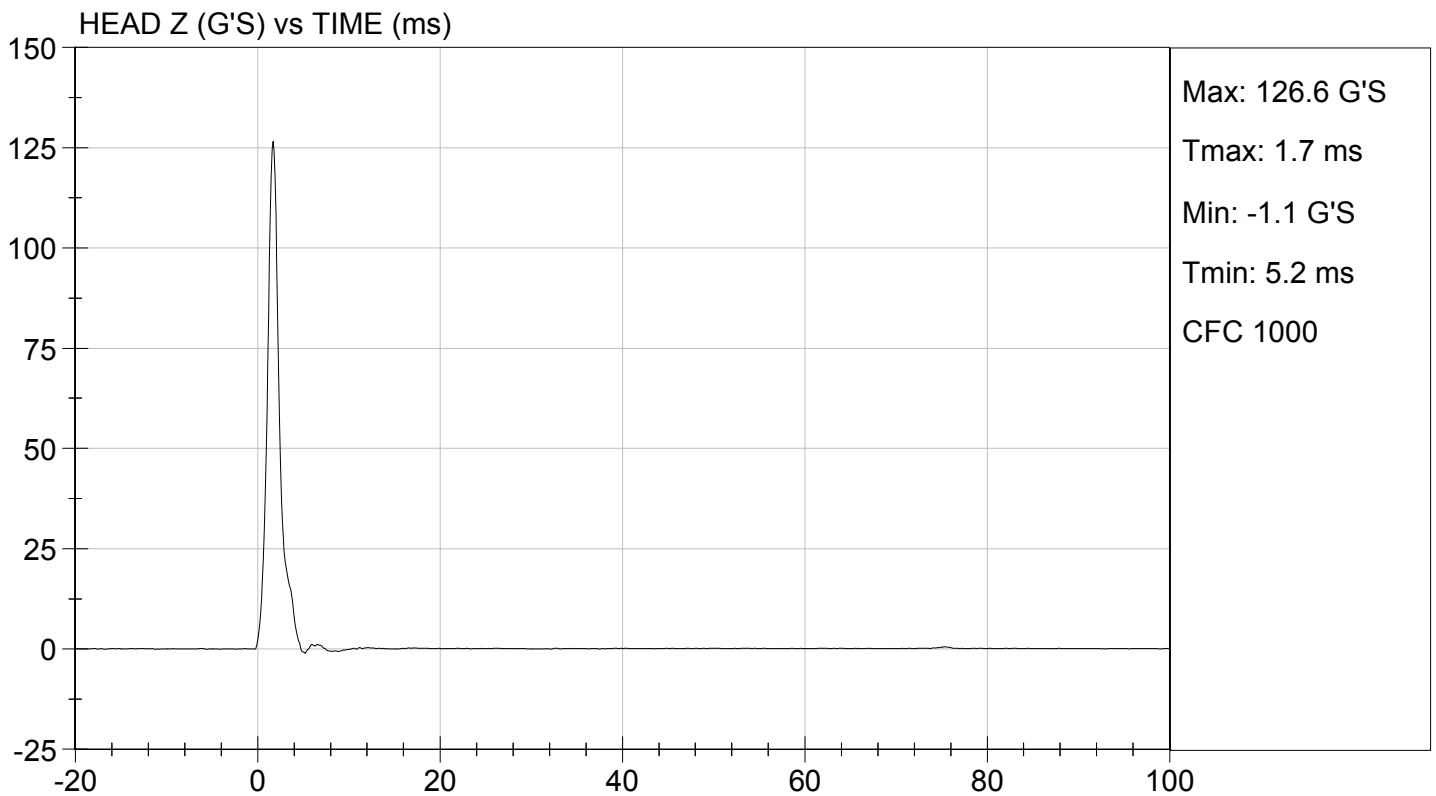
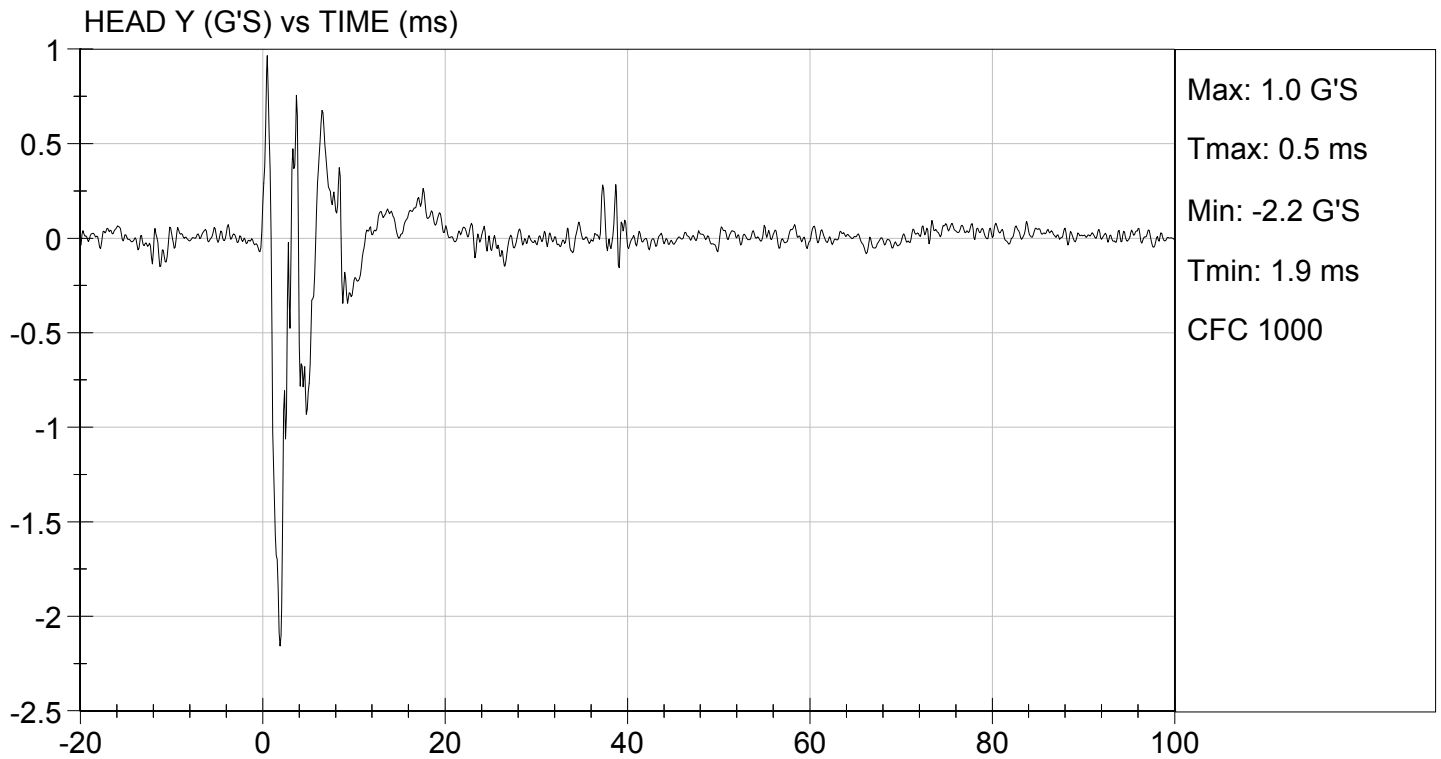
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Peak Resultant Acceleration	G's	225 to 275	254	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-2.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

12/01/2016
Test Date


Approved By





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

ATD Serial No: 351

Test I.D: D164062

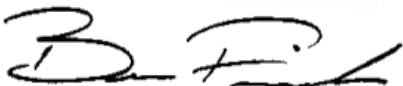
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	32	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.00	Pass
	20 ms	G's	17.60 to 22.60	18.88	Pass
	30 ms	G's	12.50 to 18.50	13.32	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.2	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	39.6	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	66.8	Pass
	Time	ms	57.0 to 64.0	60.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	120.1	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	89.4	Pass
	Time	ms	47.0 to 58.0	51.9	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.0	Pass
Overall Test Results					Pass



Laboratory Technician

12/01/2016

Test Date

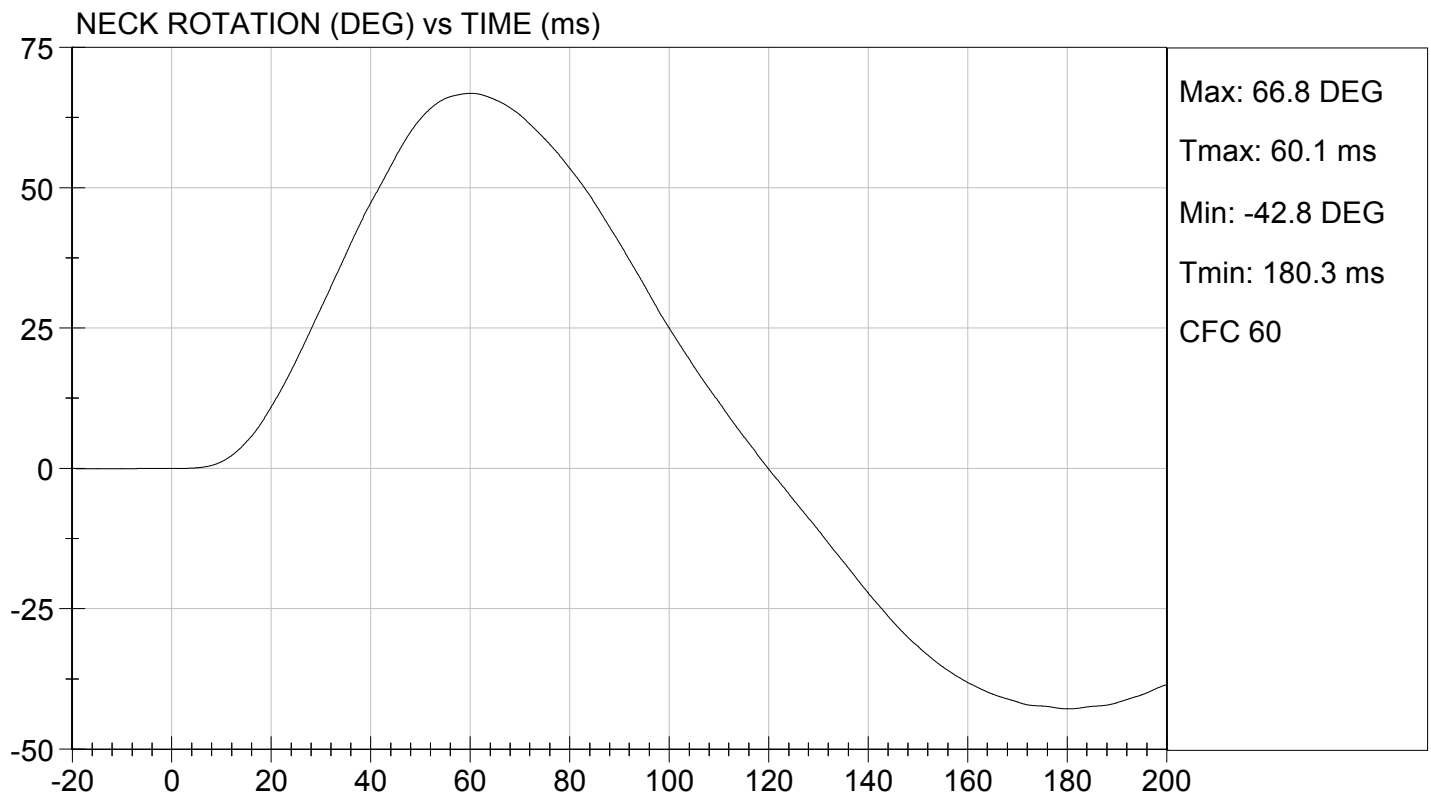
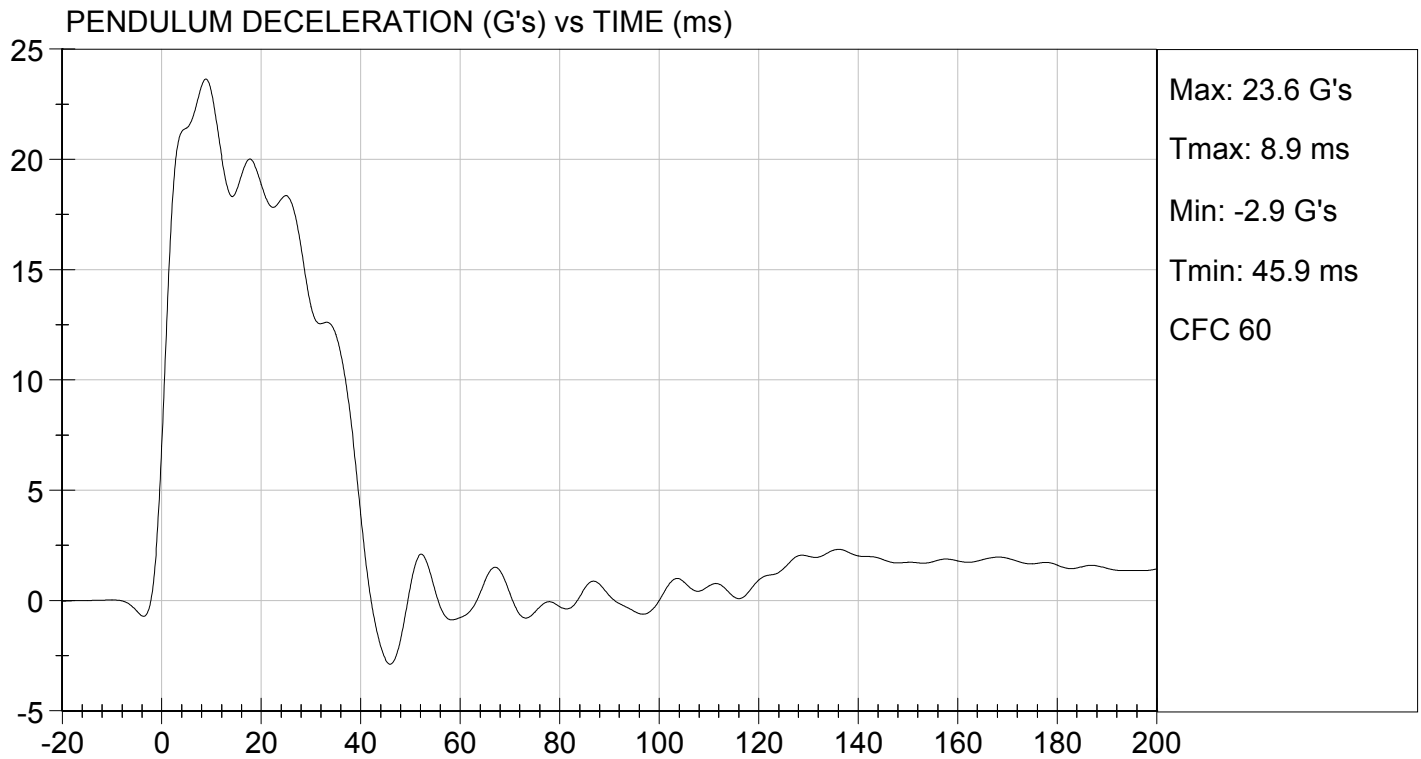


Approved By



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

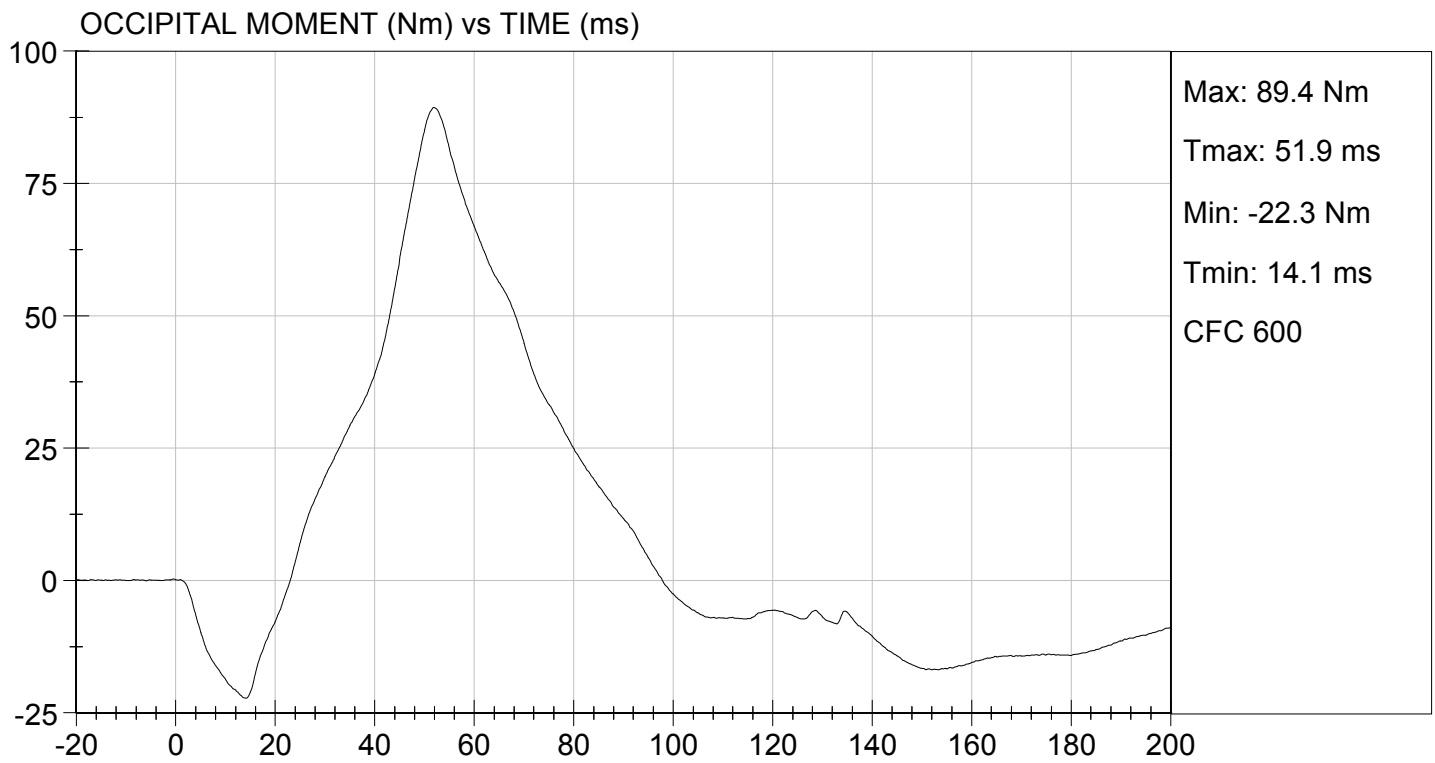
TEST DATE: 12/01/2016
TEST #: D164062





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

TEST DATE: 12/01/2016
TEST #: D164062

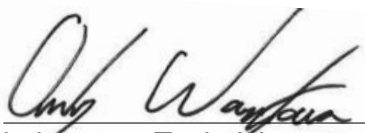


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

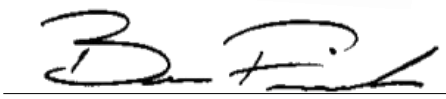
Test I.D: D164063

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	32	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.75	Pass
	20 ms	G's	14.00 to 19.00	15.68	Pass
	30 ms	G's	11.00 to 16.00	12.44	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.4	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.9	Pass
	Time	ms	72.0 to 82.0	79.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	164.5	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-55.8	Pass
	Time	ms	65.0 to 79.0	72.7	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	146.8	Pass
Overall Test Results					Pass


 Laboratory Technician

12/02/2016

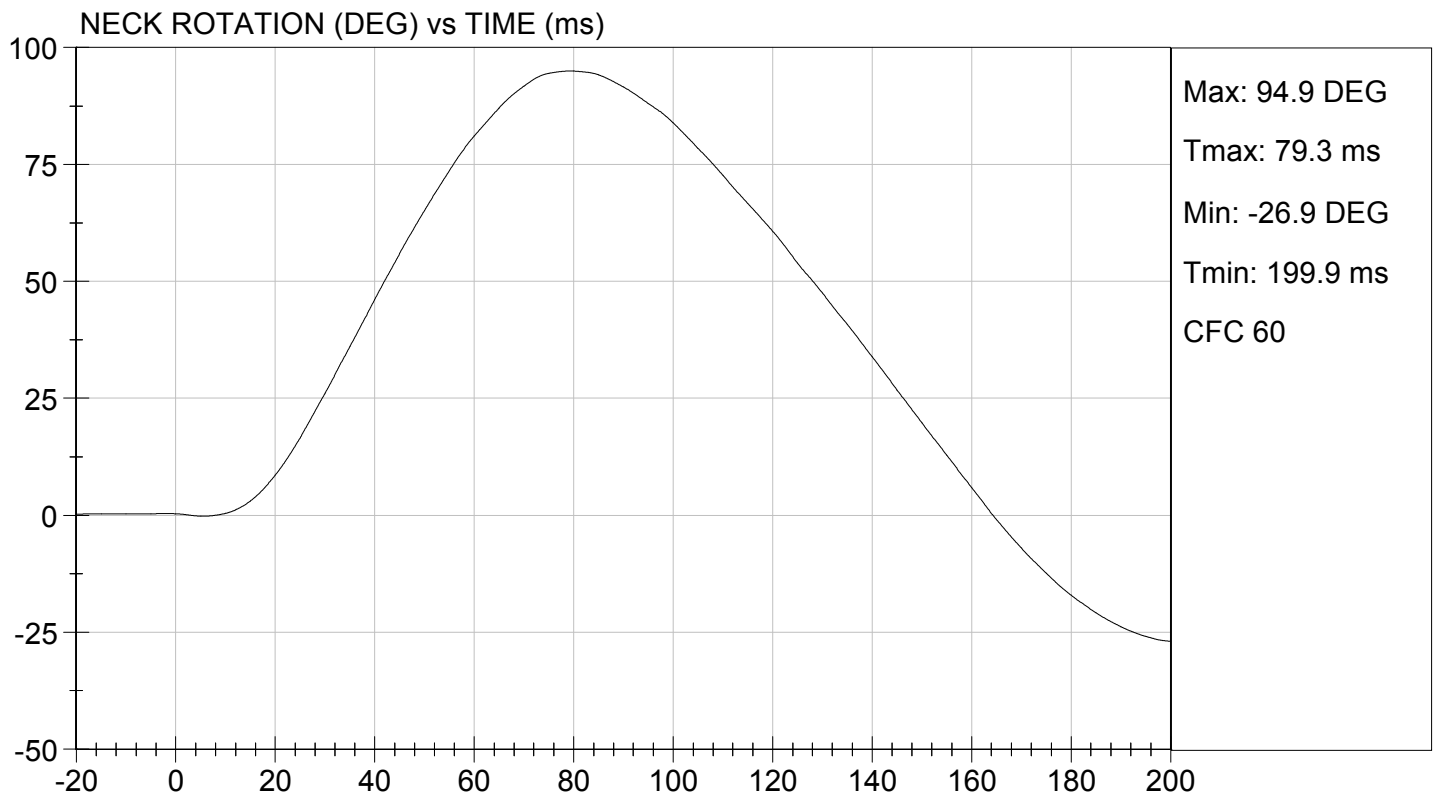
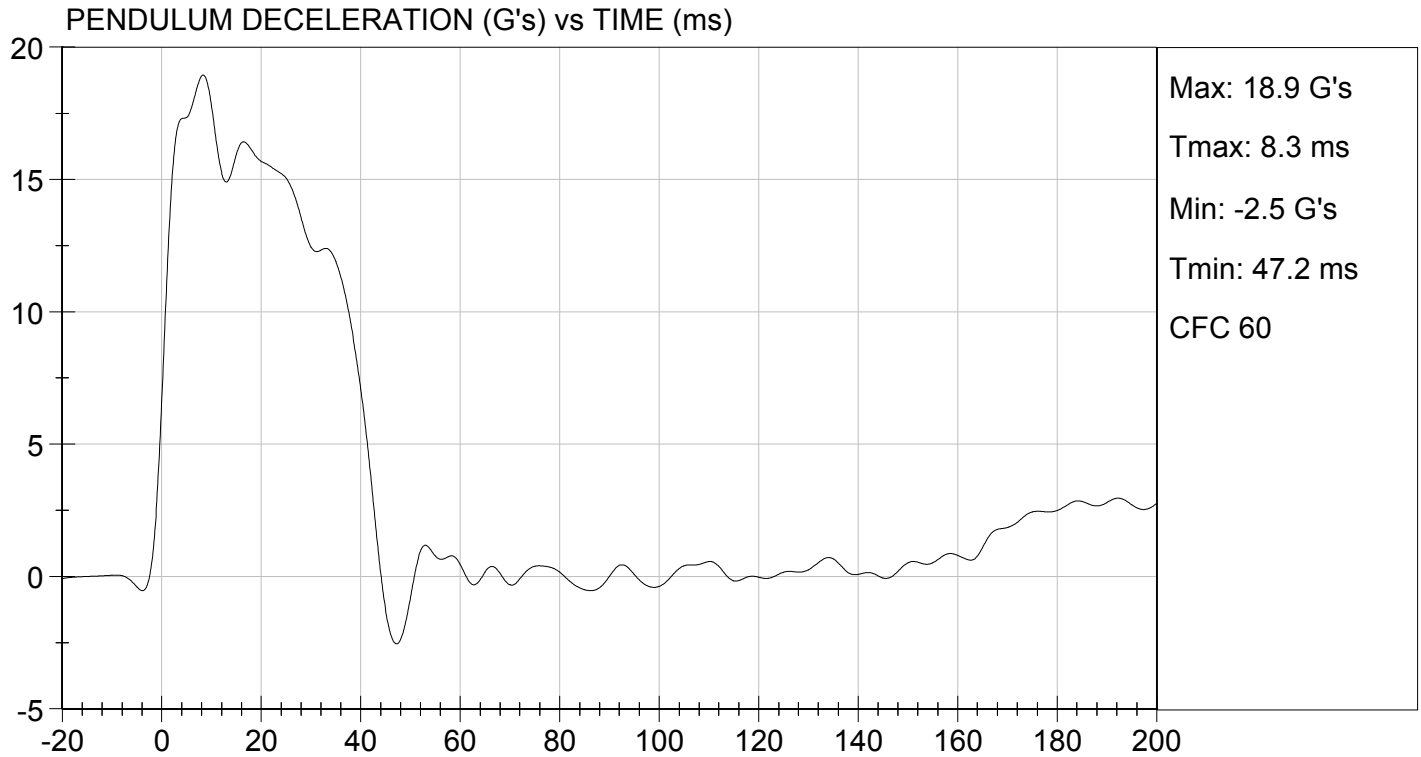
Test Date


 Approved By



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

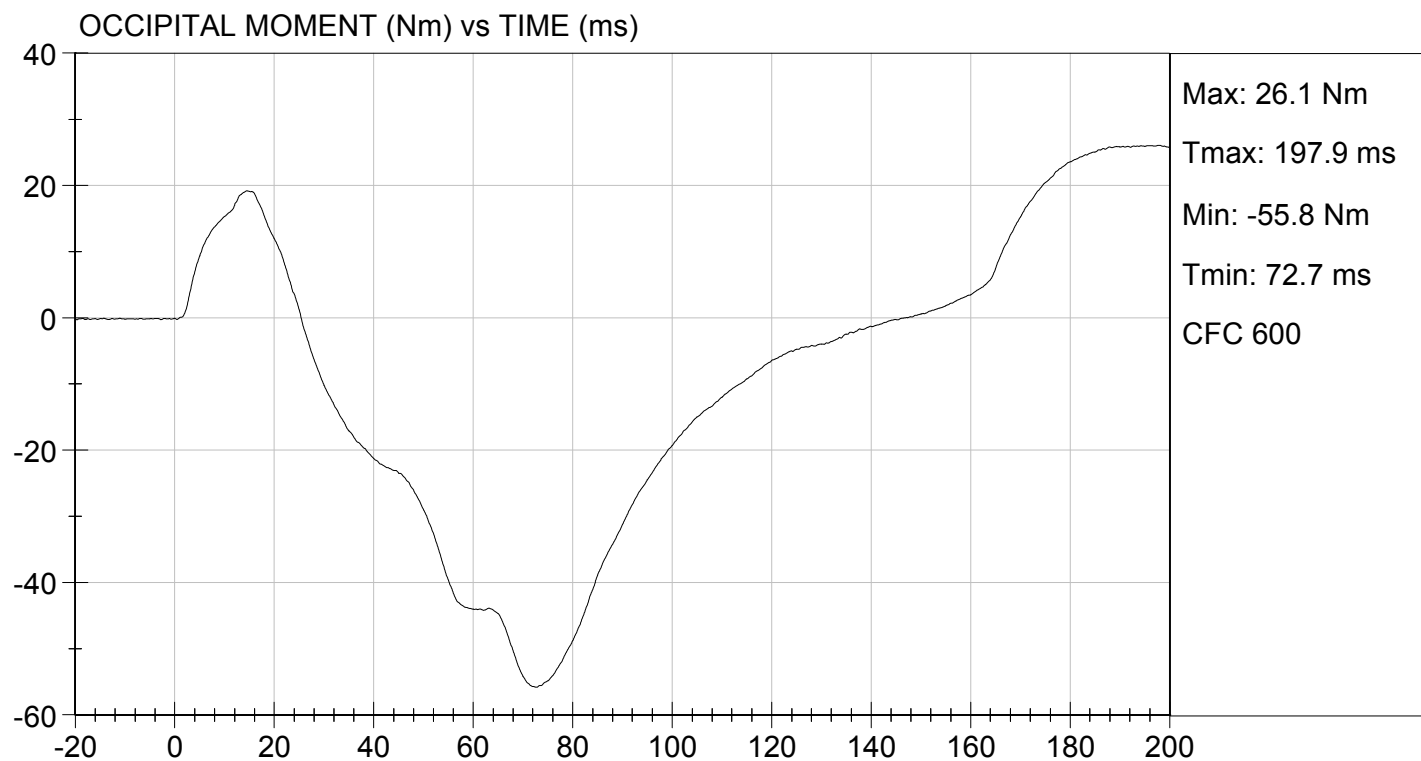
TEST DATE: 12/02/2016
TEST #: D164063





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

TEST DATE: 12/02/2016
TEST #: D164063



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

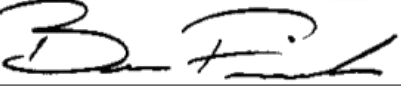
Test I.D: D164064

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	32	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,550	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.48	Pass
Internal Hysteresis	%	69 to 85	73	Pass
			Overall Test Results	Pass



Laboratory Technician

12/02/2016
Test Date

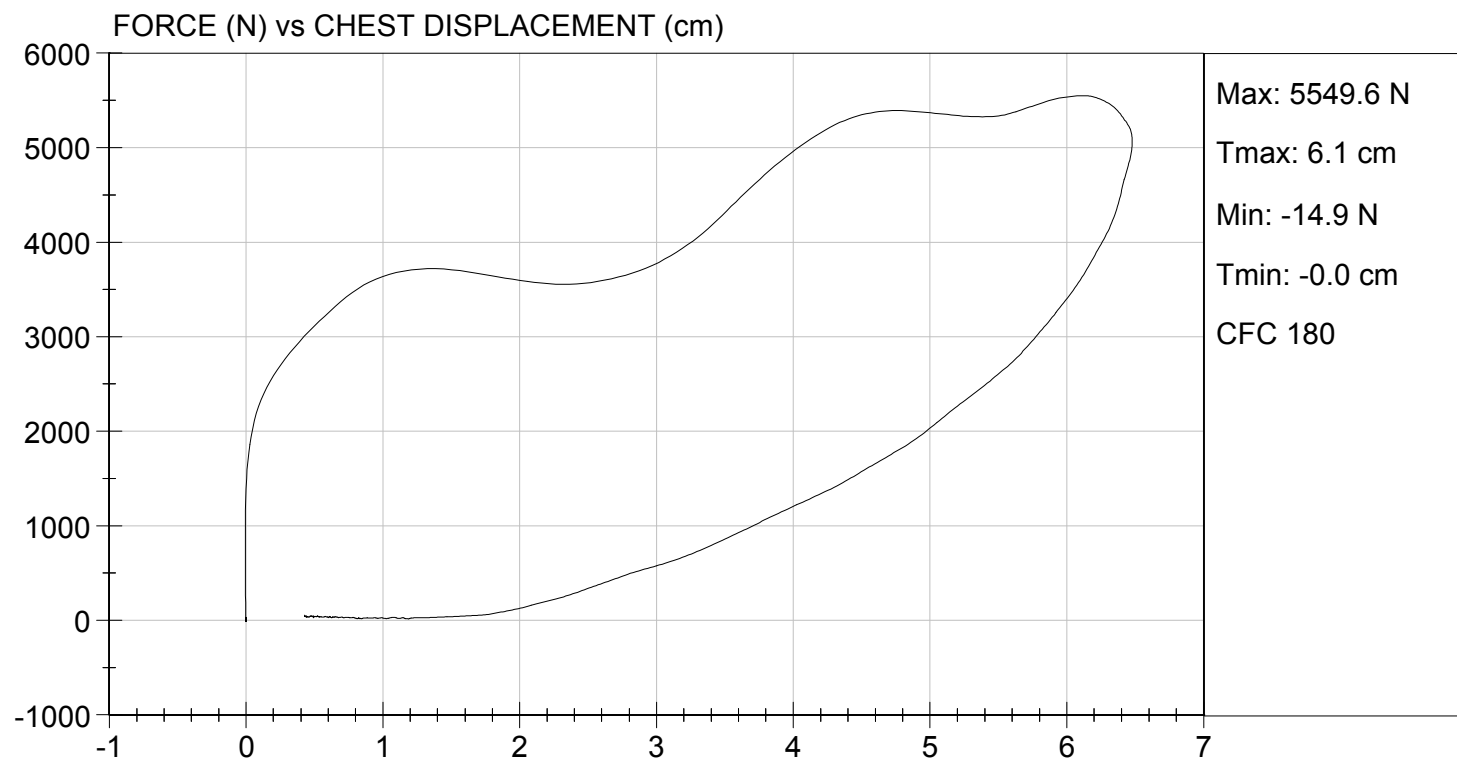


Approved By



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

TEST DATE: 12/02/2016
TEST #: D164064



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

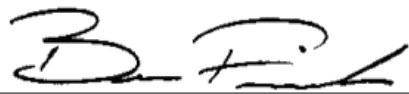
ATD Serial No: 351

Test I.D: D164065

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Velocity	m/s	2.07 to 2.13	2.13	Pass
Peak Probe Force	N	4715 to 5782	5,384	Pass
Overall Test Results				Pass


Laboratory Technician

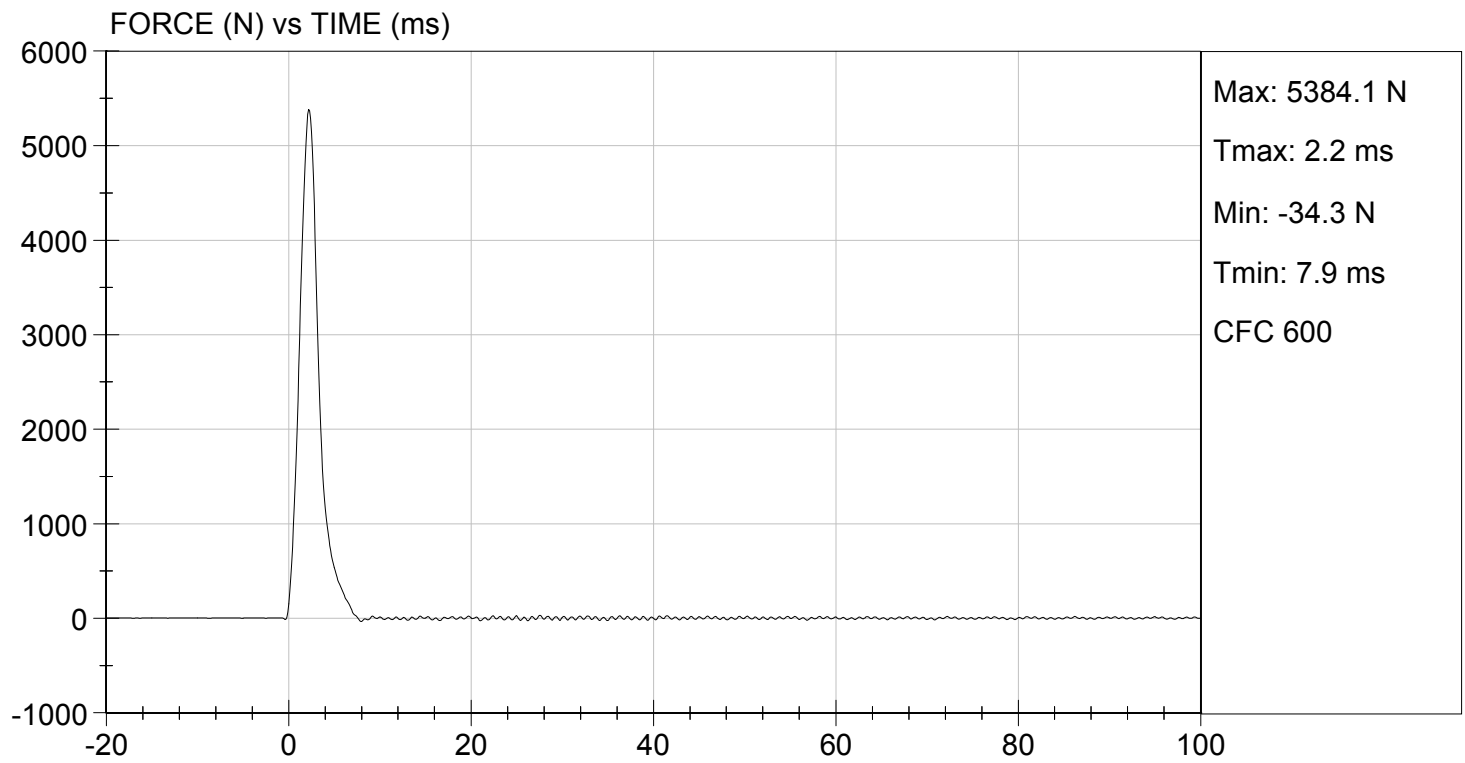
12/01/2016
Test Date


Approved By



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

TEST DATE: 12/01/2016
TEST #: D164065



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

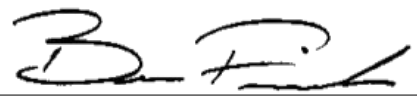
ATD Serial No: 351

Test I.D: D164066

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	5,561	Pass
Overall Test Results				Pass


Laboratory Technician

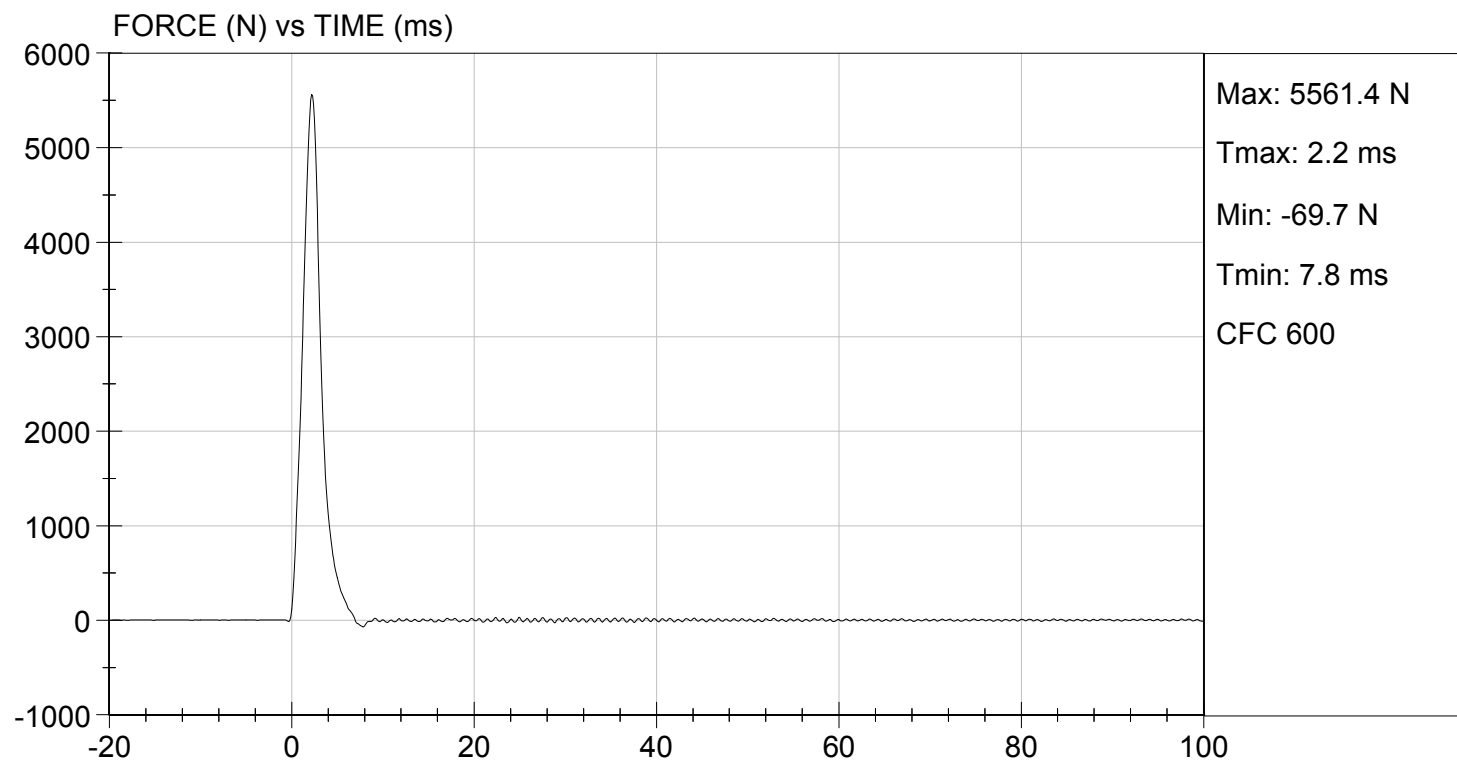
12/01/2016
Test Date


Approved By



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

TEST DATE: 12/01/2016
TEST #: D164066



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

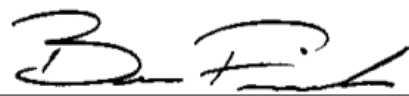
ATD Serial No: 351

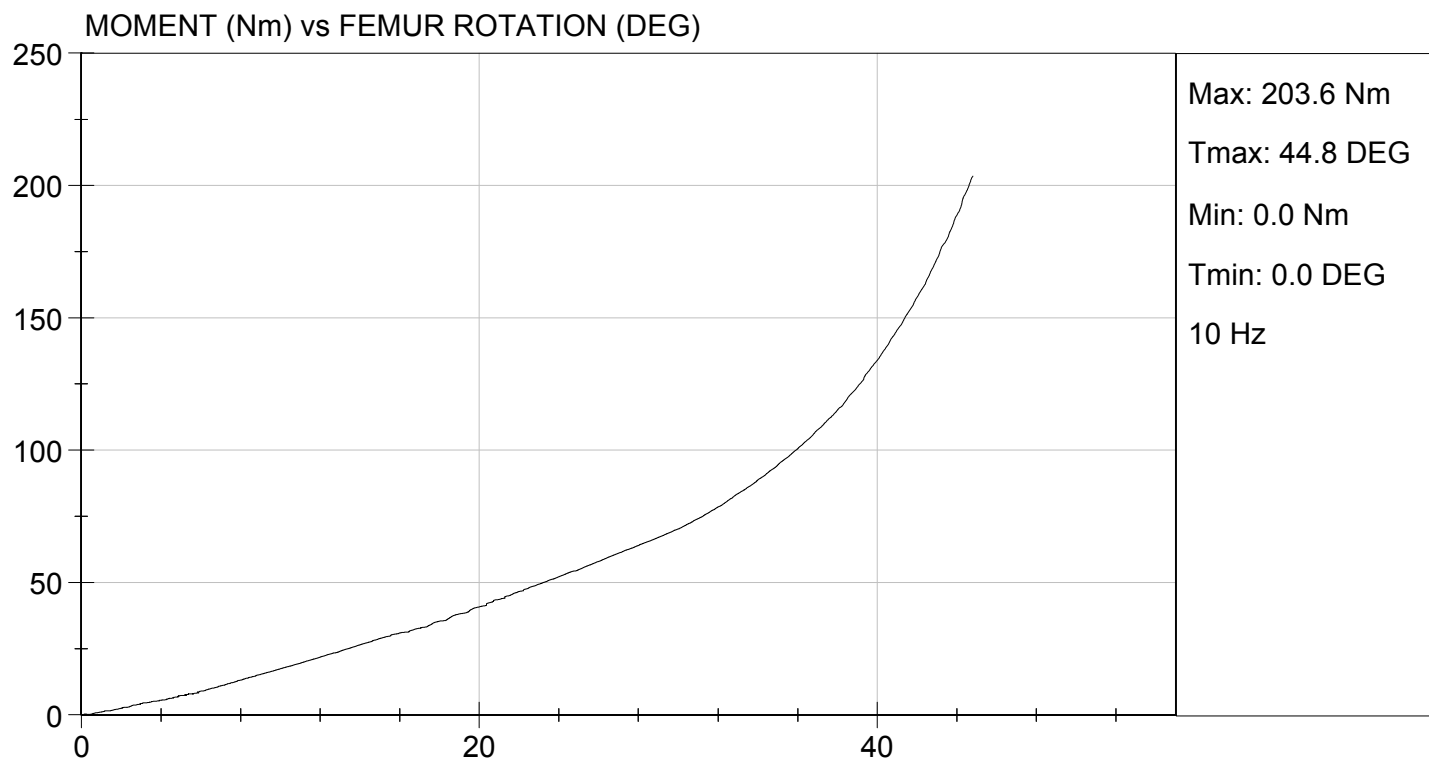
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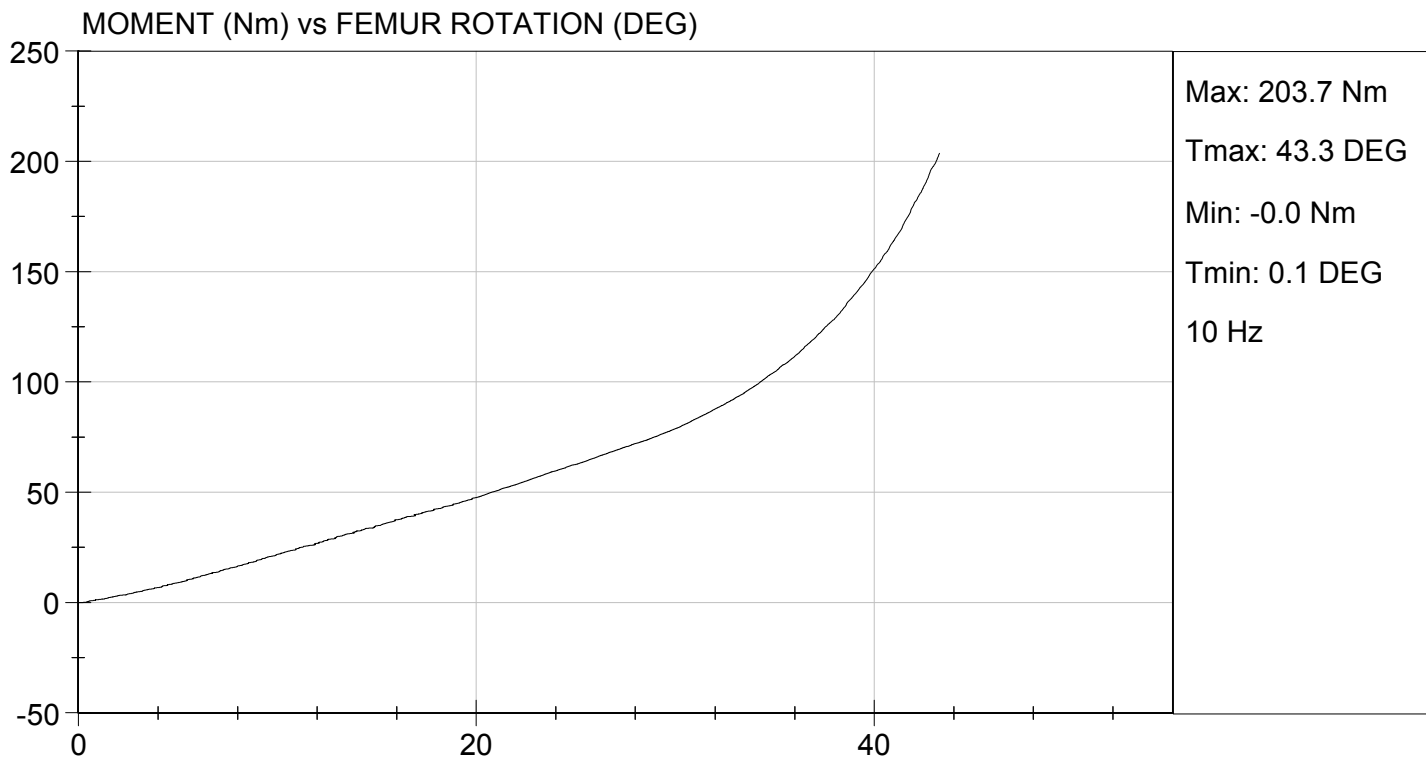
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	32	32	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.3	6.3	Pass
30 Degrees	Nm	94.9 Nm Max	70.3	78.8	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.8	43.3	Pass
Overall Test Results					Pass


 Laboratory Technician

12/01/2016
 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

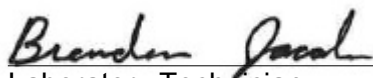
HYBRID III, SUBPART O EXTERNAL DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 304.8 ± 5.1 mm above seat surface	175.3-190.5	181.6
P	FOOT LENGTH	Tip of toe to rear of heal	218.5-233.7	224.7
Q	STANDING HEIGHT	(THEORETICAL)	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

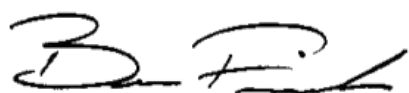
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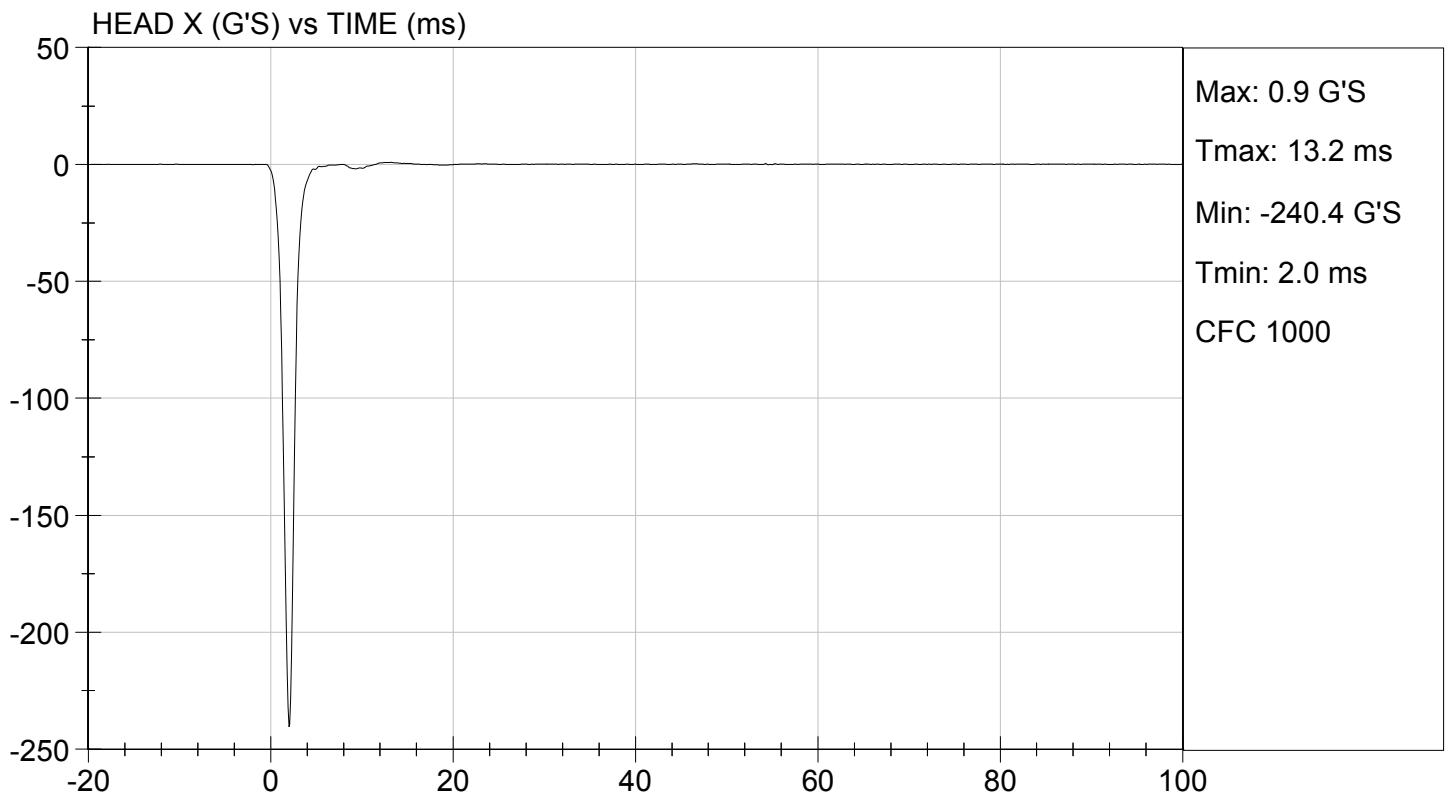
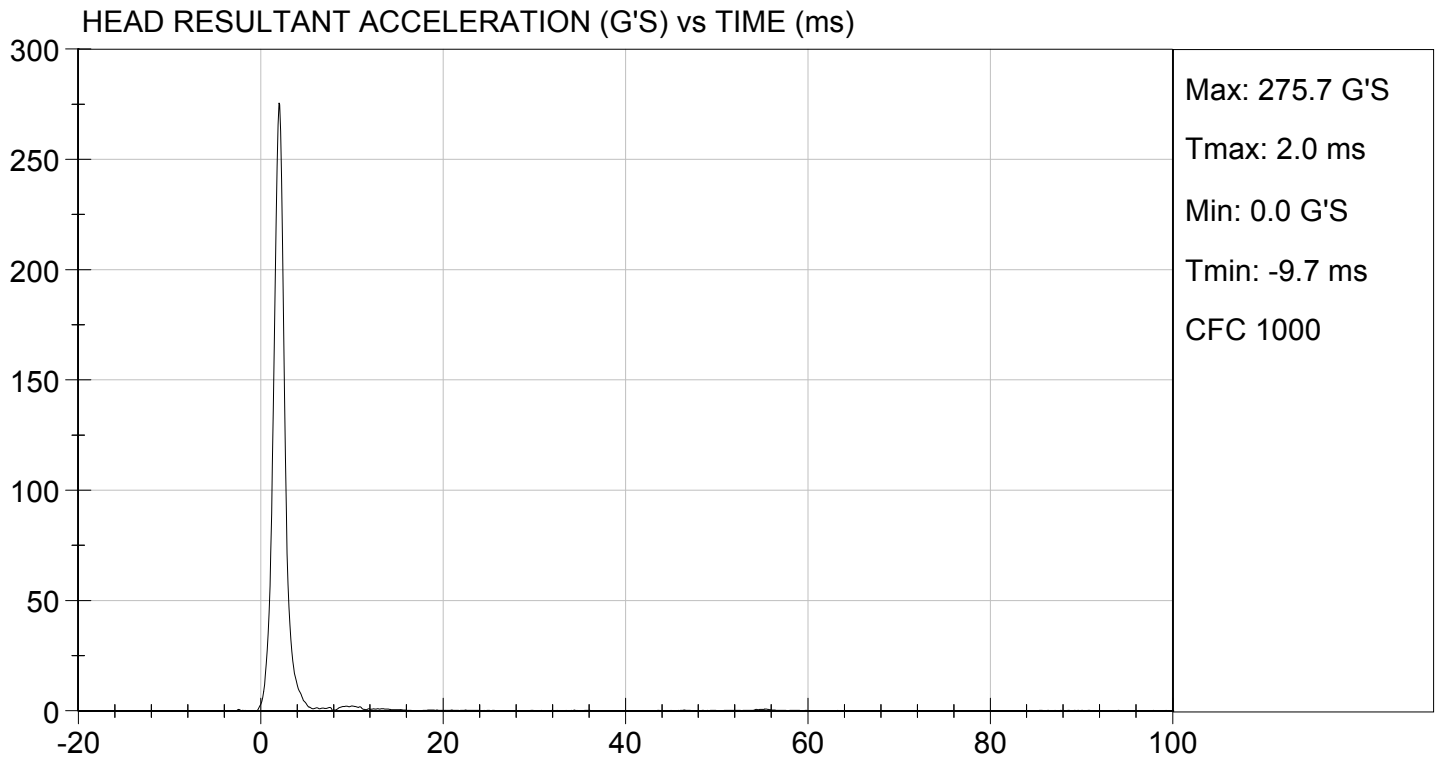
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	250 to 300	276	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	1.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
			Overall Test Results	Pass

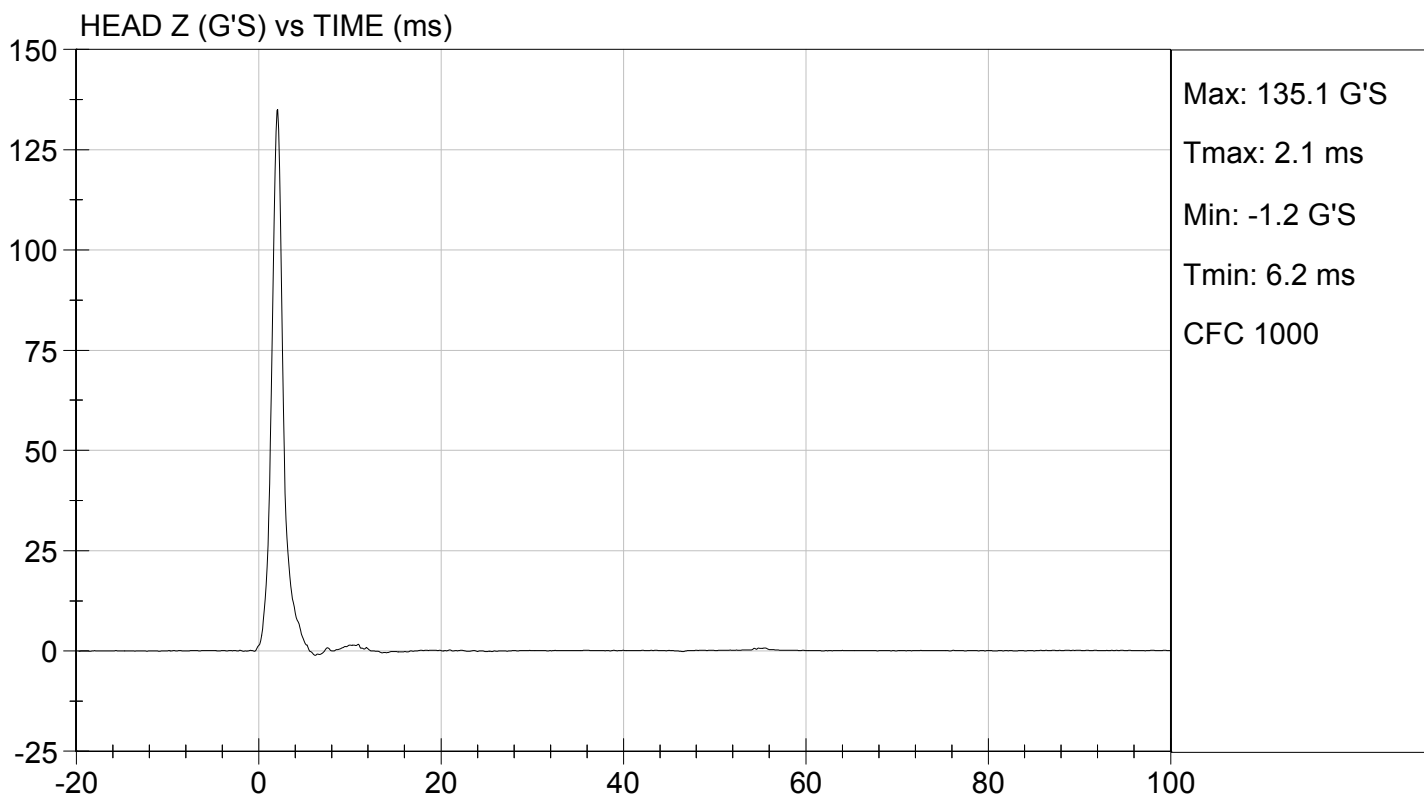
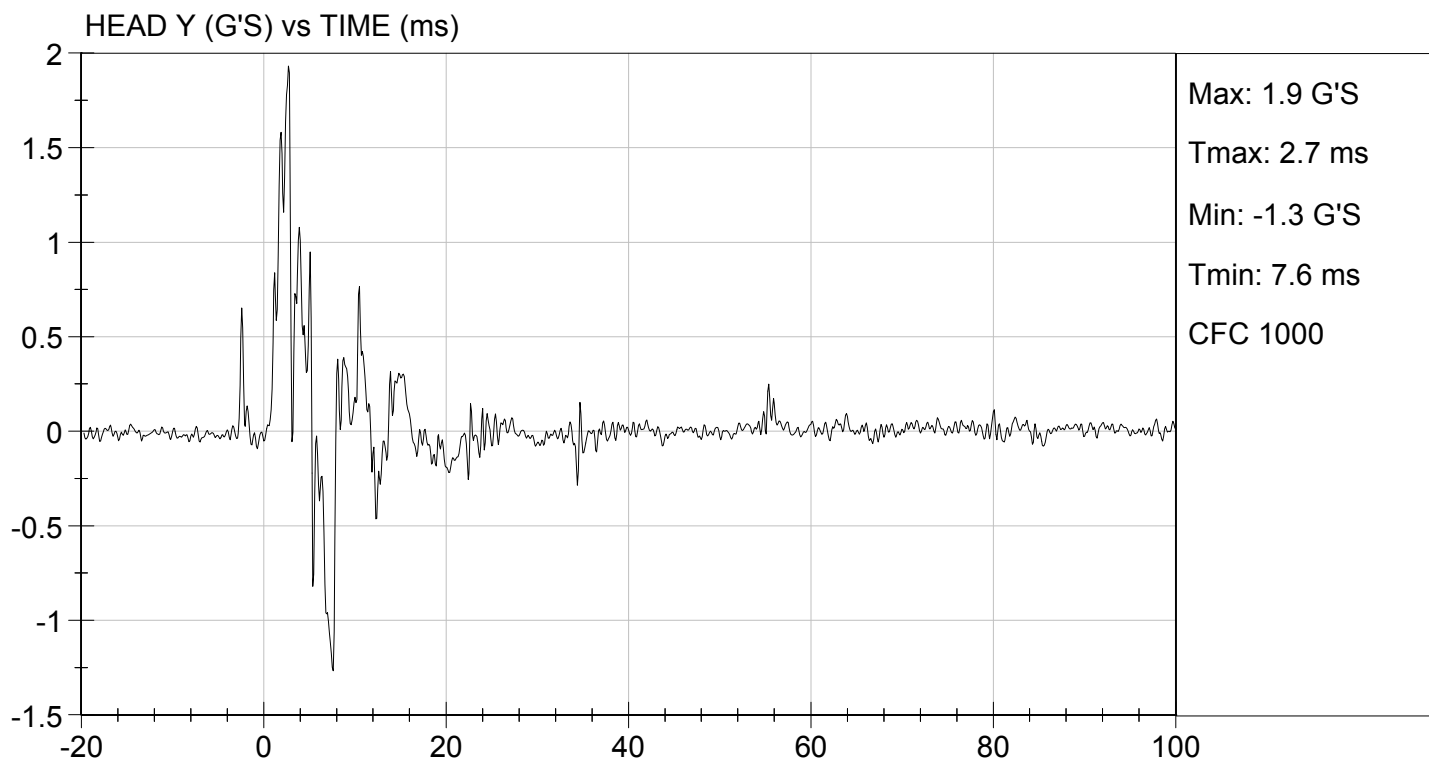

Laboratory Technician

11/07/2016

Test Date


Approved By





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D16BB2

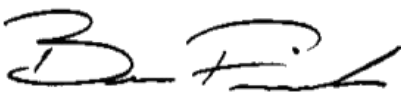
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	38	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.8	Pass
	30 ms	m/s	5.8 to 7.0	6.9	Pass
D Plane Rotation	Max	deg	77 to 91	82	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	82	Pass
Overall Results					Pass



Laboratory Technician

11/18/2016

Test Date

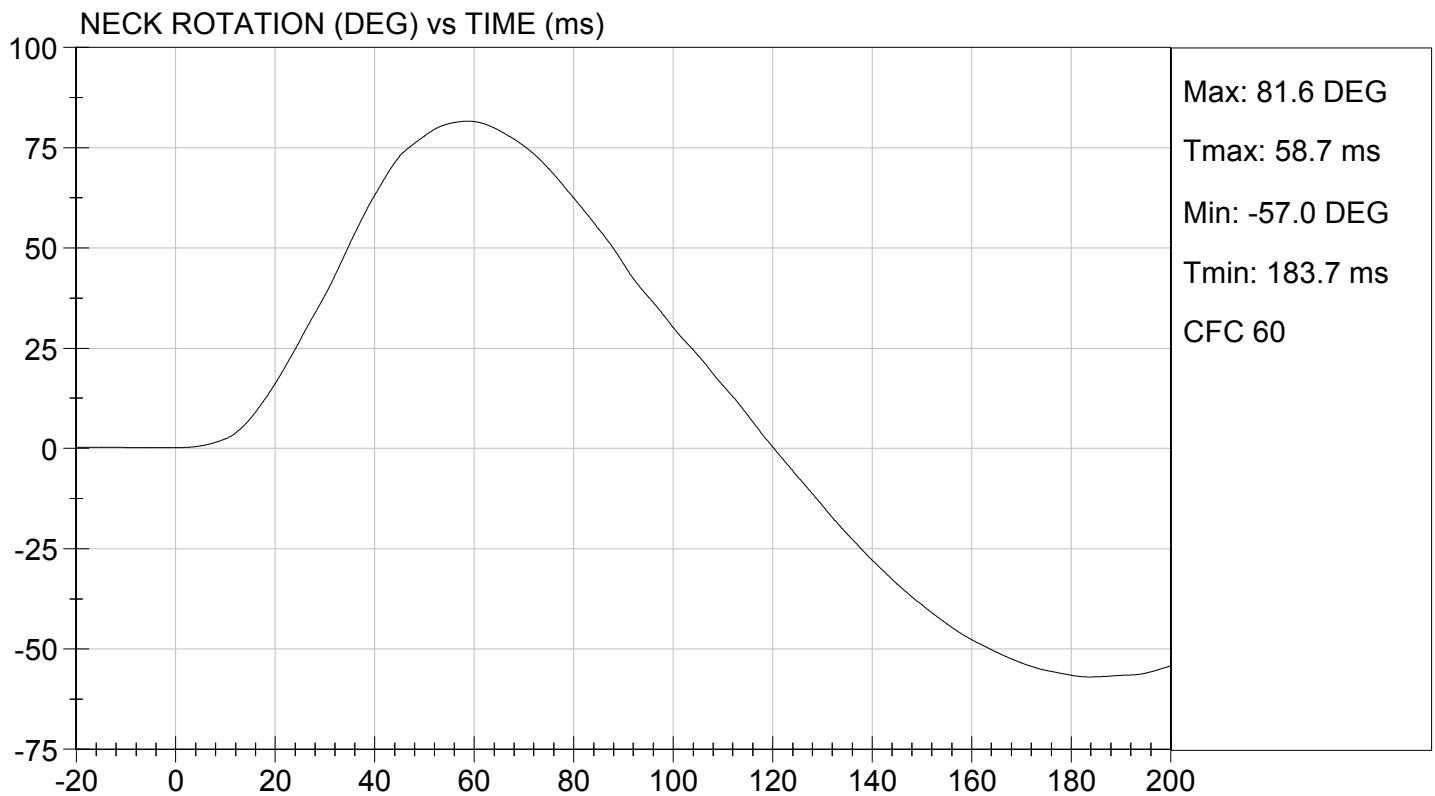
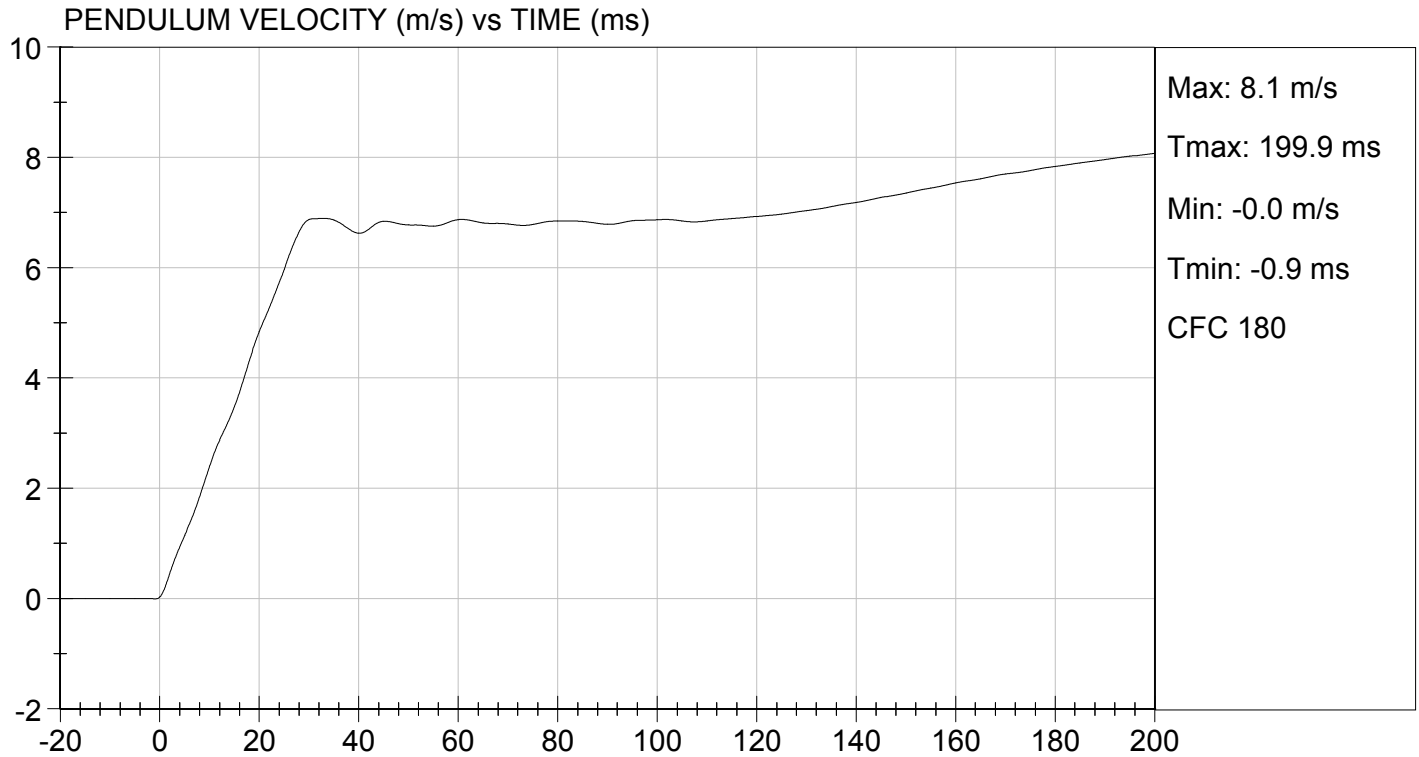


Approved By



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

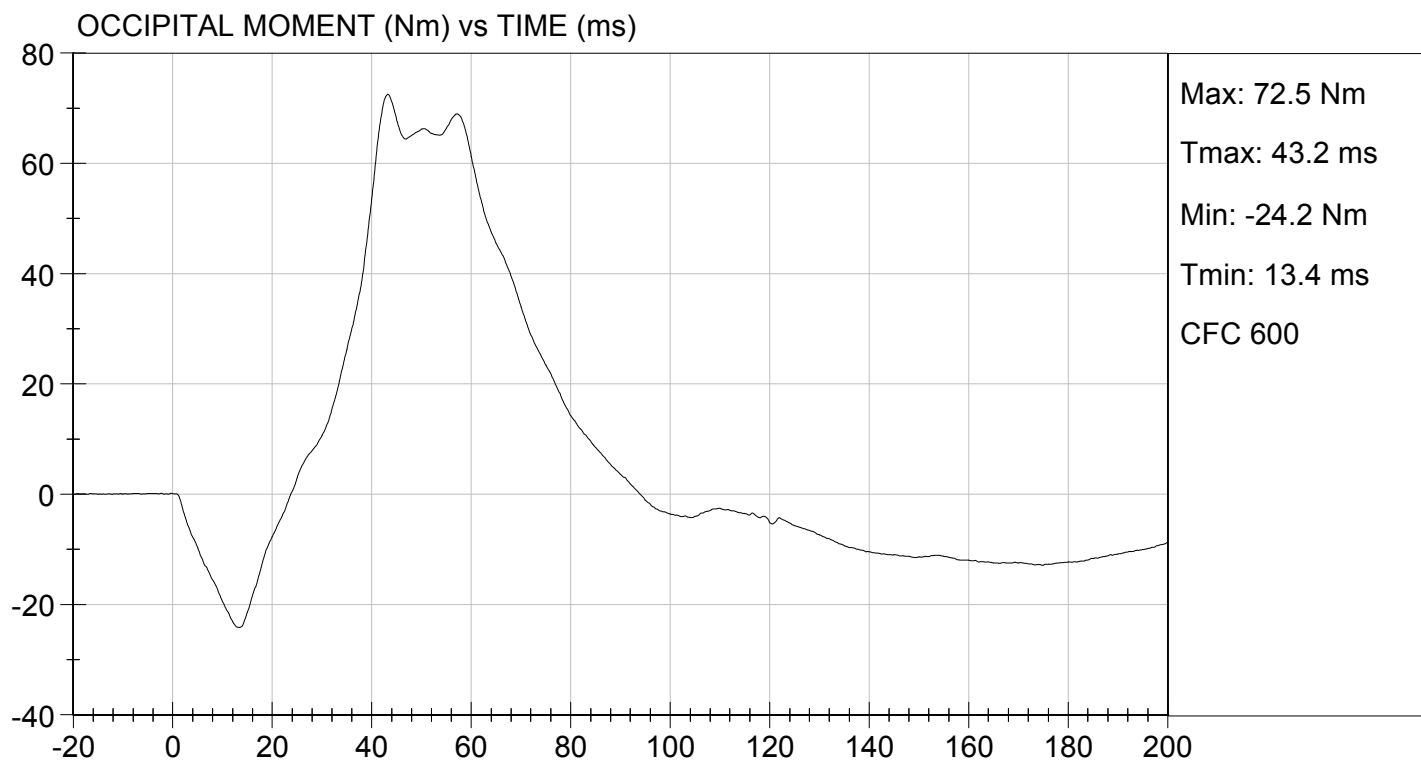
TEST DATE: 11/18/2016
TEST #: D16BB2





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

TEST DATE: 11/18/2016
TEST #: D16BB2



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

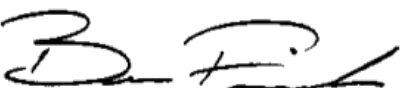
ATD Serial No: 634

Test I.D: D16BB3

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	38	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	5.5	Pass
D Plane Rotation	Max	deg	99 to 114	105	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-53	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	98	Pass
Overall Results					Pass


Laboratory Technician

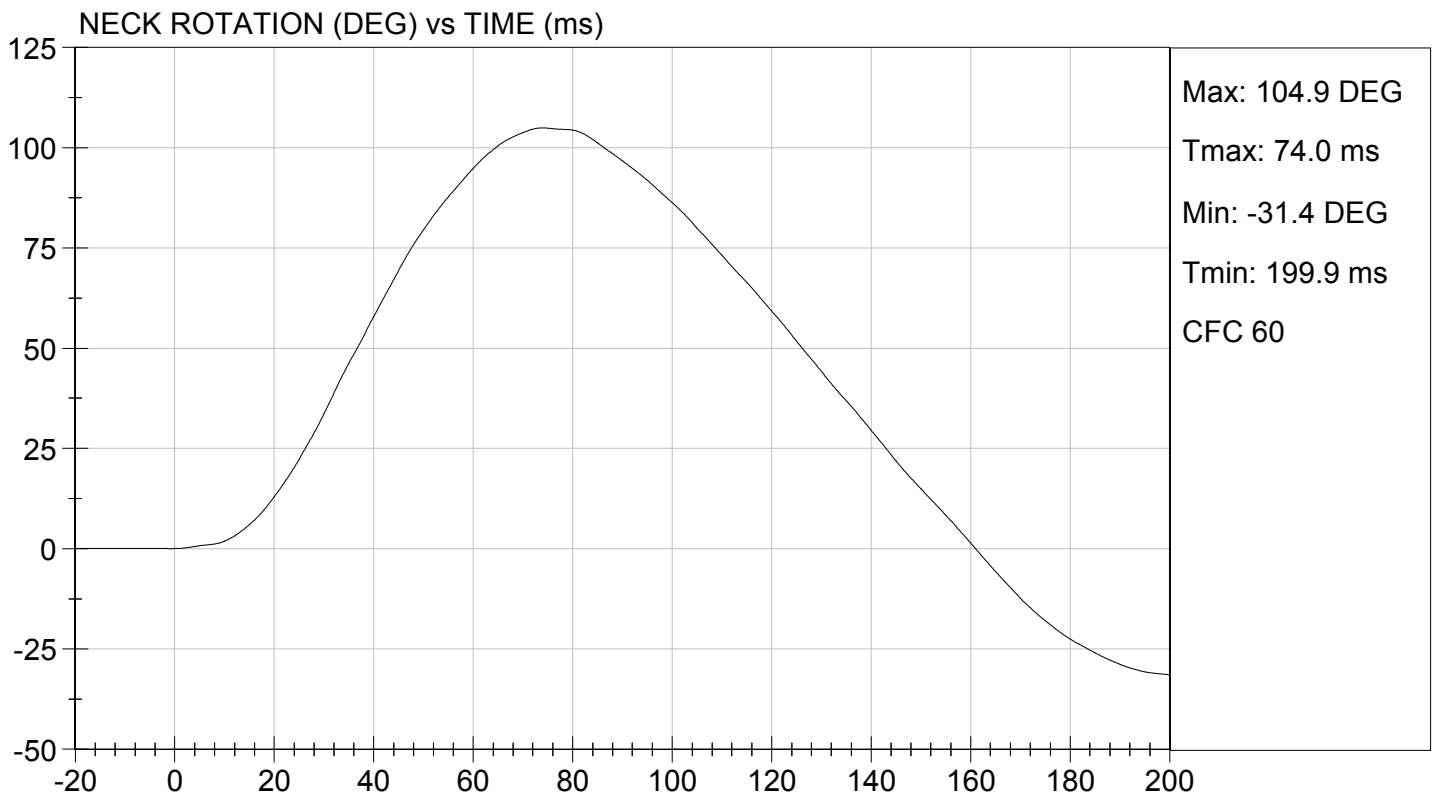
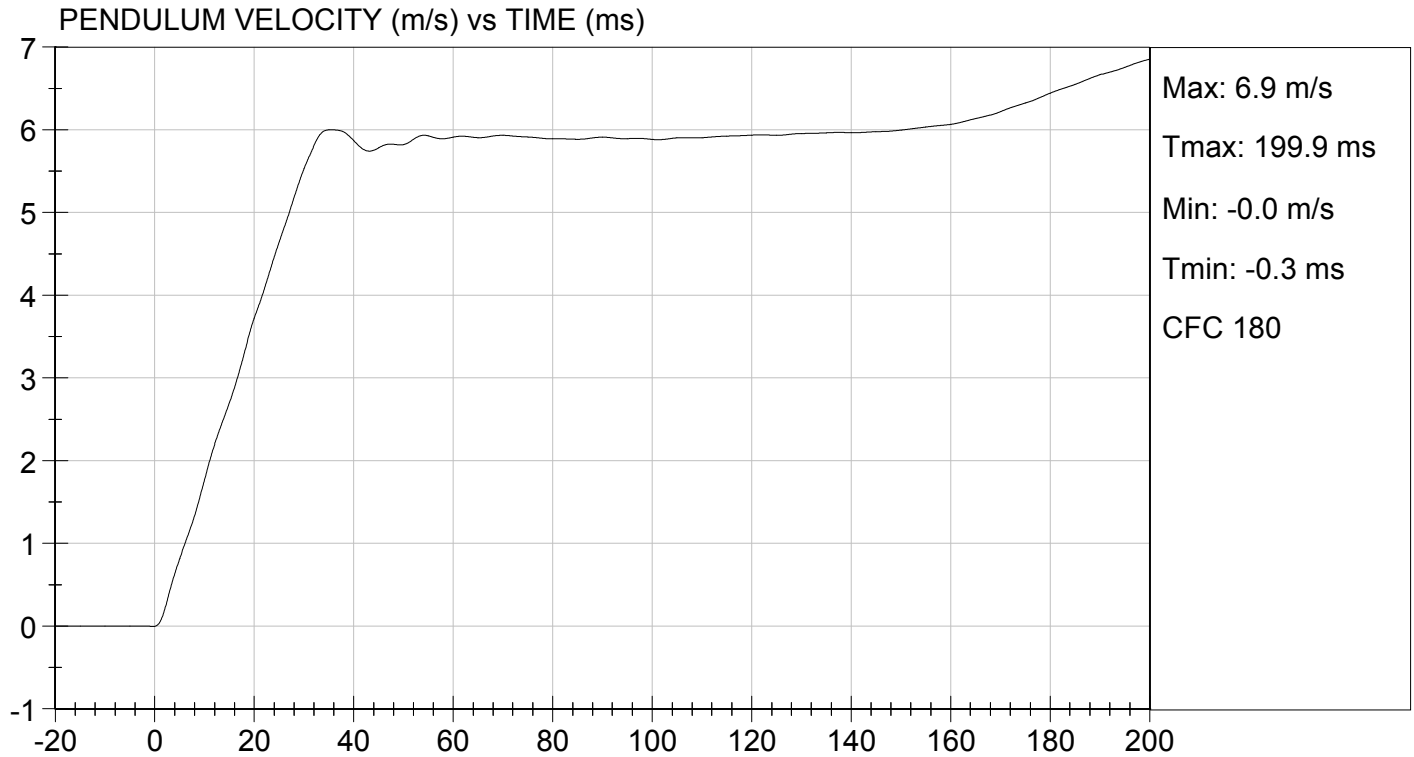
11/18/2016
Test Date


Approved By



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

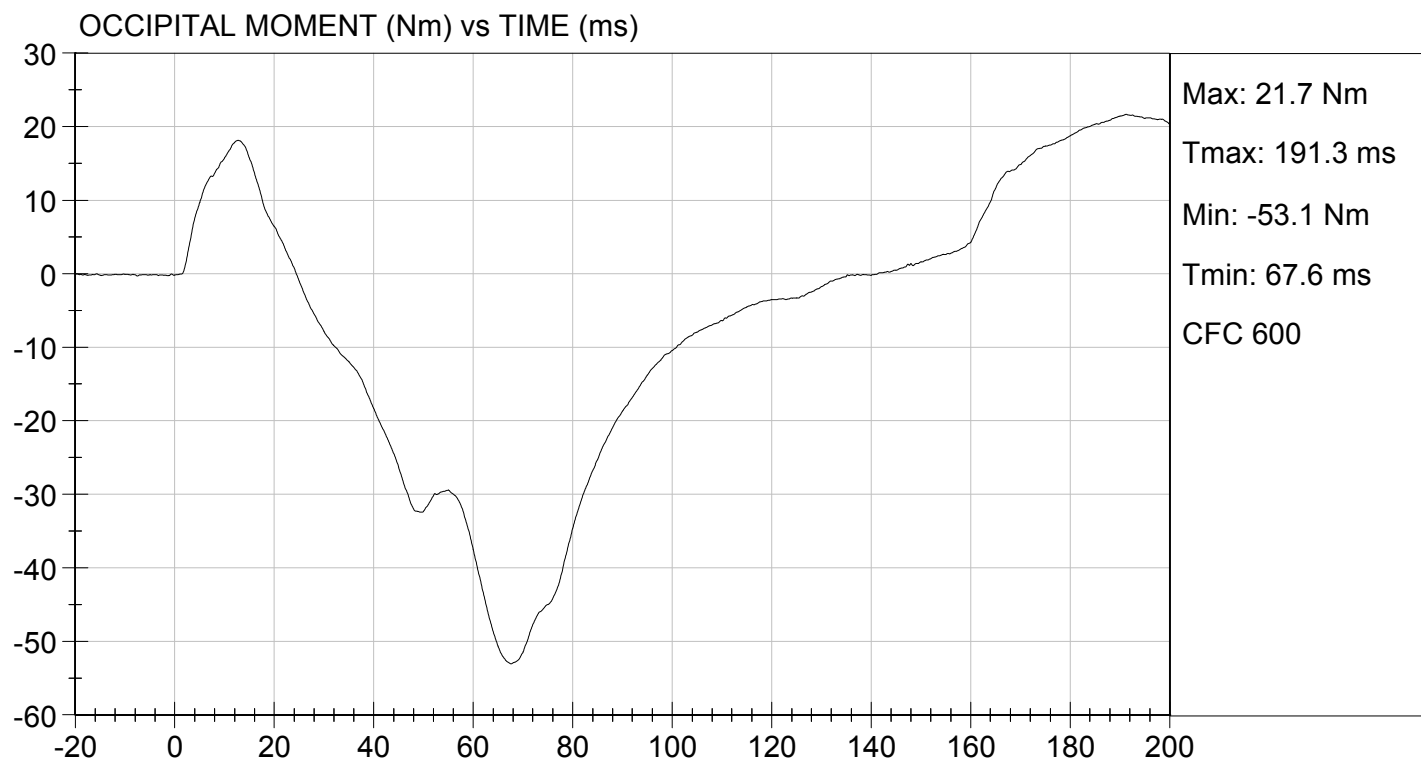
TEST DATE: 11/18/2016
TEST #: D16BB3





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

TEST DATE: 11/18/2016
TEST #: D16BB3

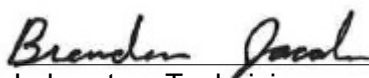


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

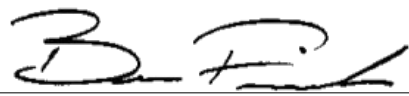
Test I.D: D163744

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Relative Humidity	%	10 to 70	39	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4305	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4331	Pass
Overall Test Results				Pass


Laboratory Technician

11/07/2016

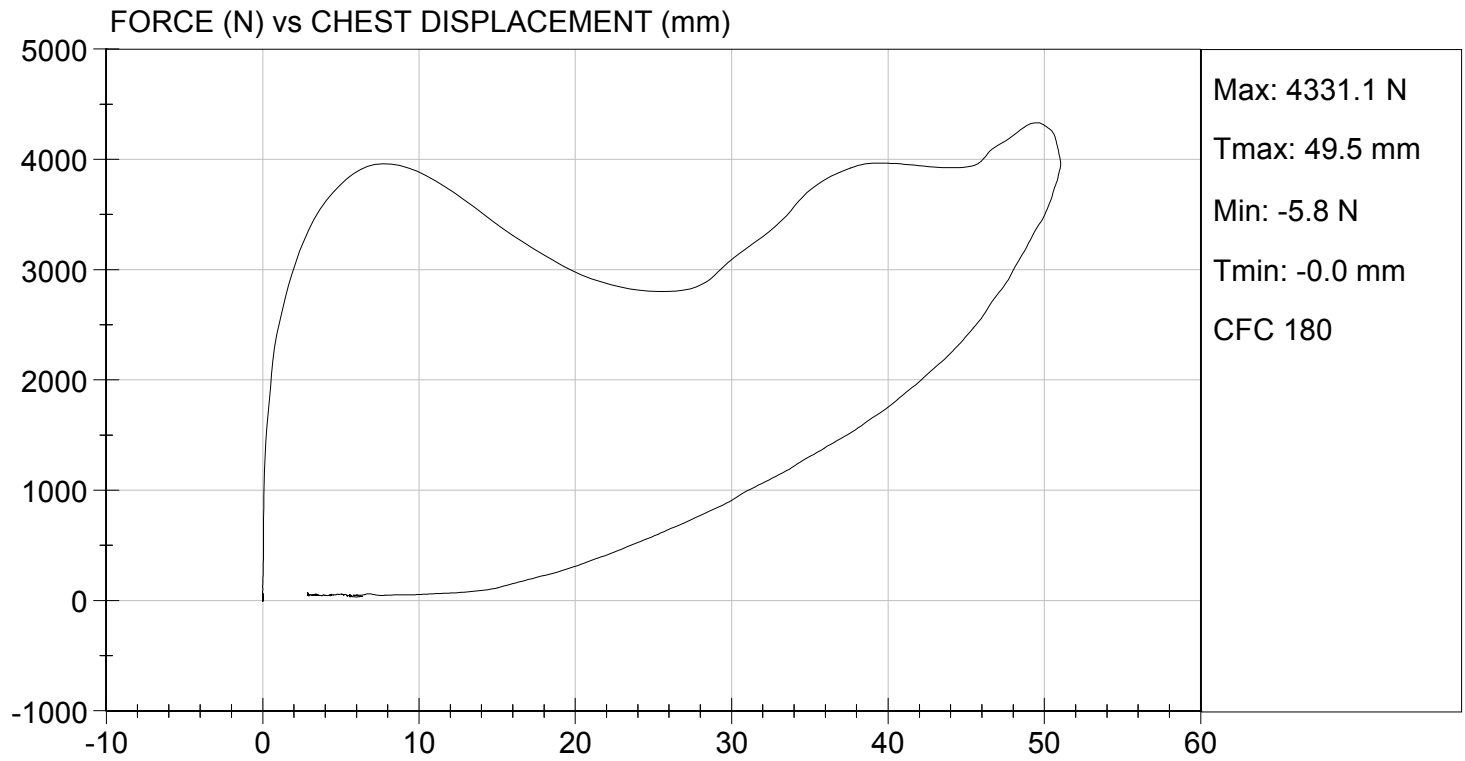
Test Date


Approved By



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

TEST DATE: 11/07/2016
TEST #: D163744



MGA RESEARCH CORPORATION

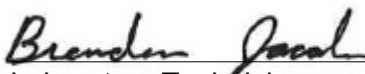
RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

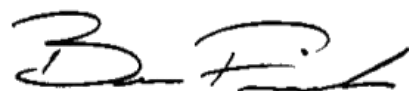
Test I.D: D163745

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	42	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	N	3450 to 4060	3691	Pass
Overall Test Results				Pass


Laboratory Technician

11/07/2016

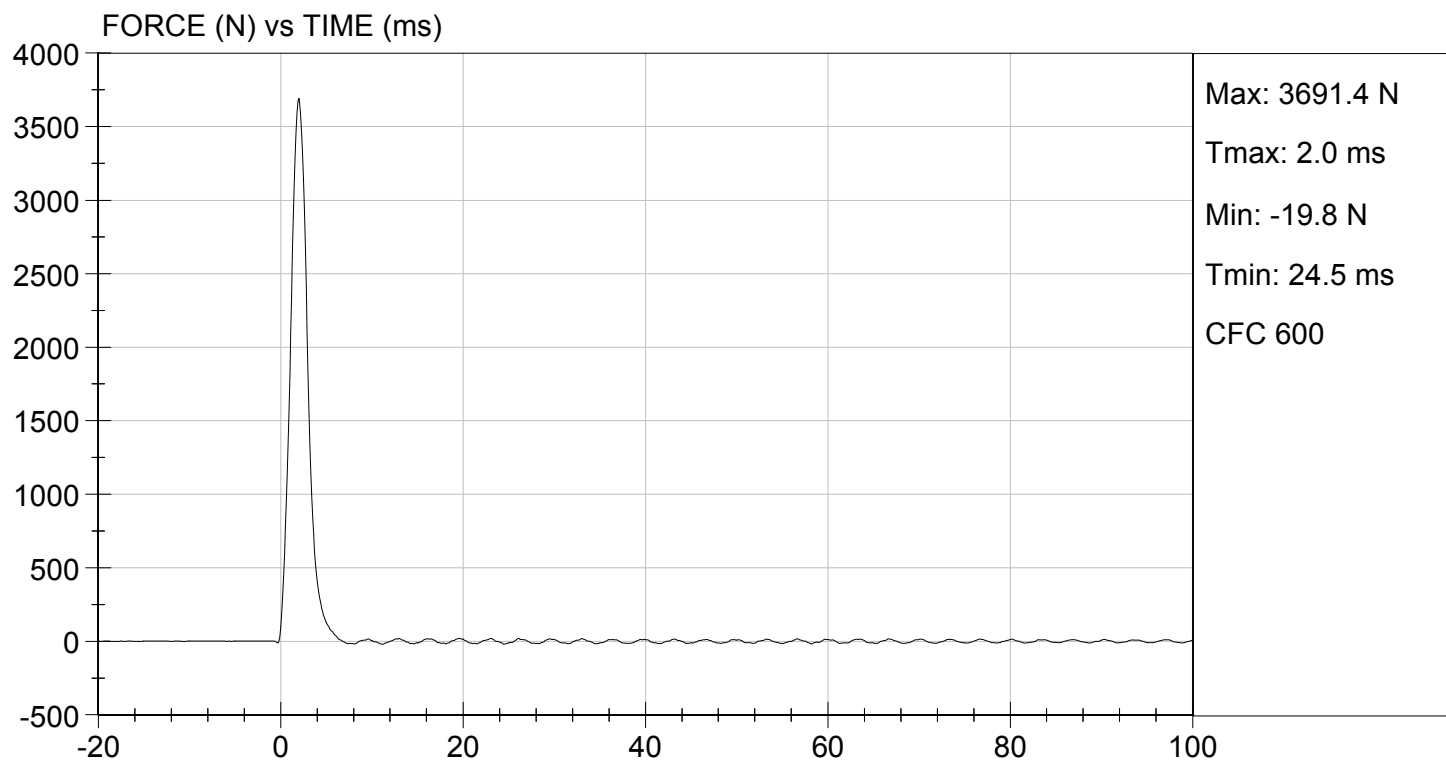
Test Date


Approved By



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

TEST DATE: 11/07/2016
TEST #: D163745



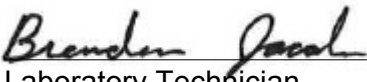
MGA RESEARCH CORPORATION

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

ATD Serial No: 634

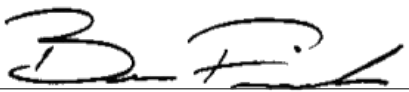
Test I.D: D163746

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	42	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3626	Pass
Overall Test Results				Pass


Laboratory Technician

11/07/2016

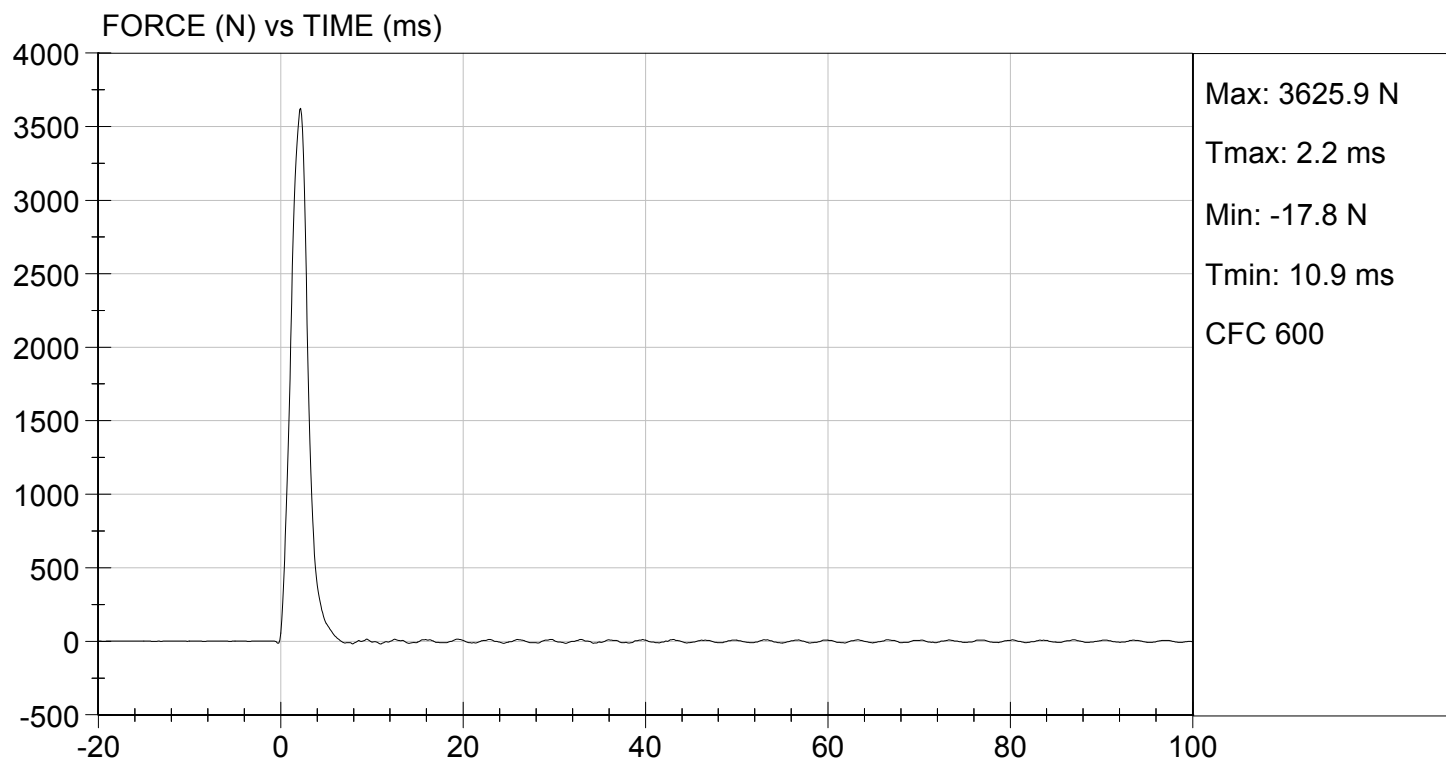
Test Date


Approved By



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

TEST DATE: 11/07/2016
TEST #: D163746



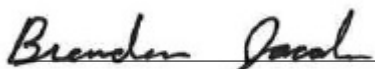
MGA RESEARCH CORPORATION

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

ATD Serial No: 634

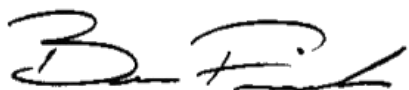
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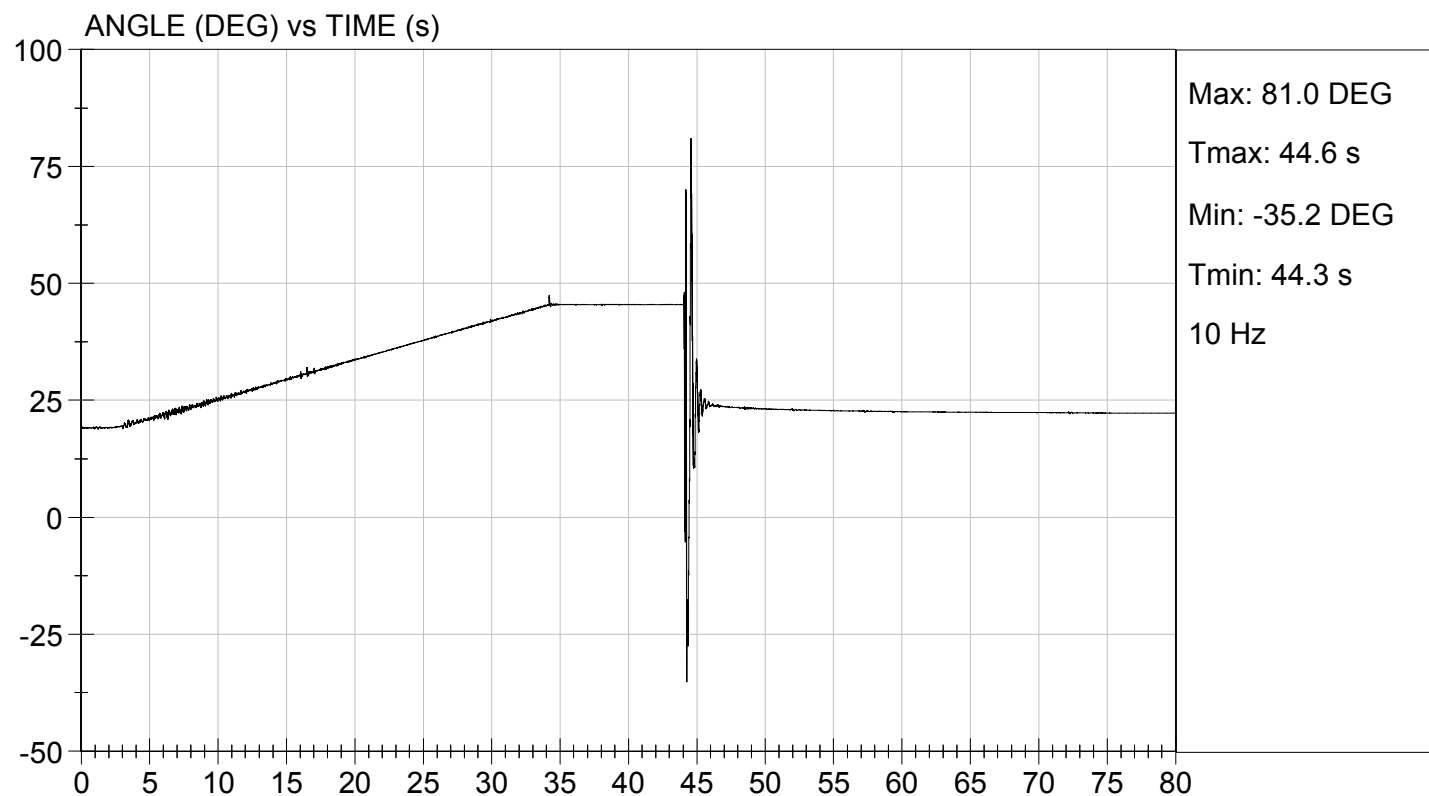
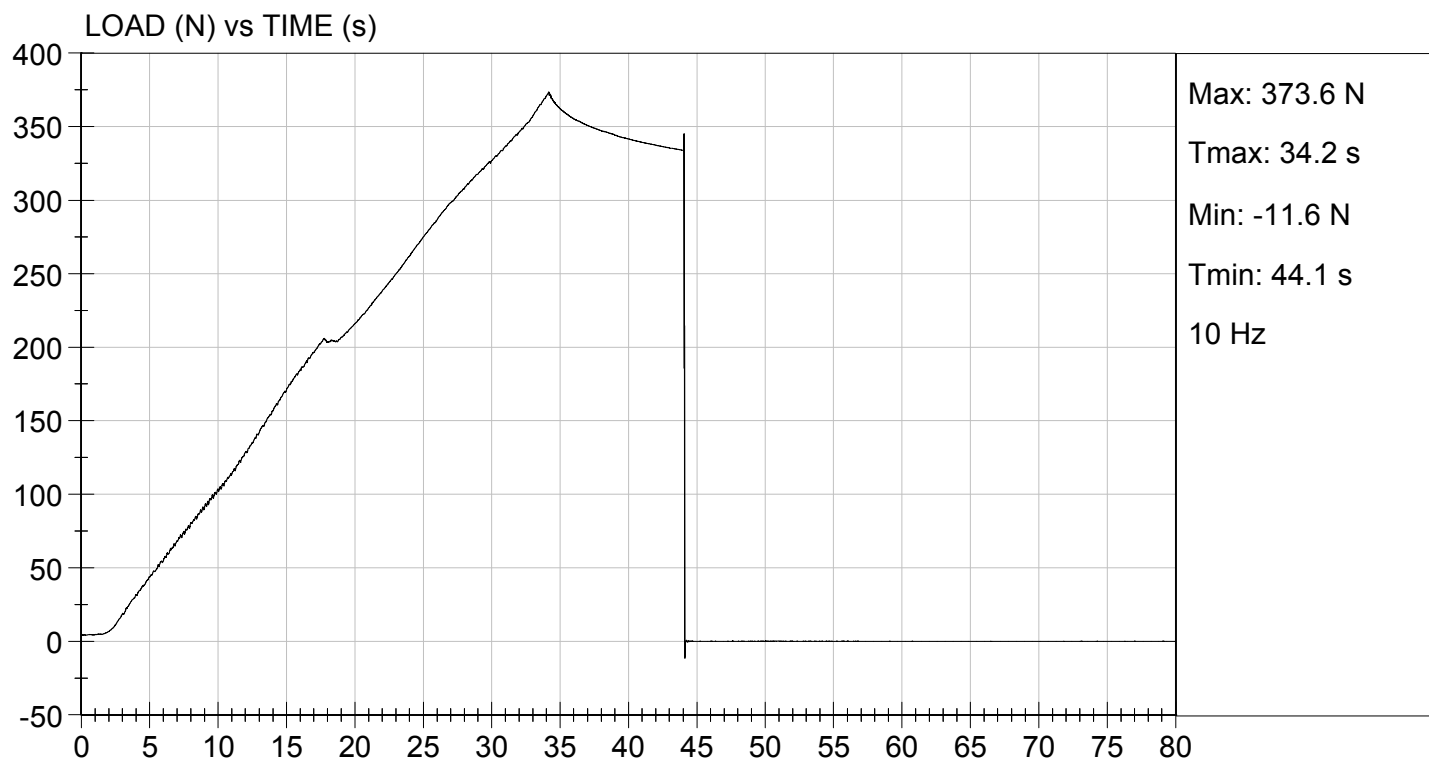
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	3	Pass
Force at 45 deg	N	320 to 390	374	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.8	Pass
Overall Result				Pass


Laboratory Technician

11/07/2016

Test Date


Approved By

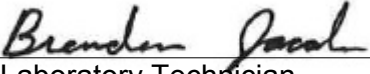


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

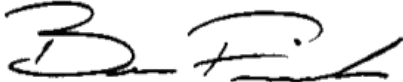
Test ID: D164091

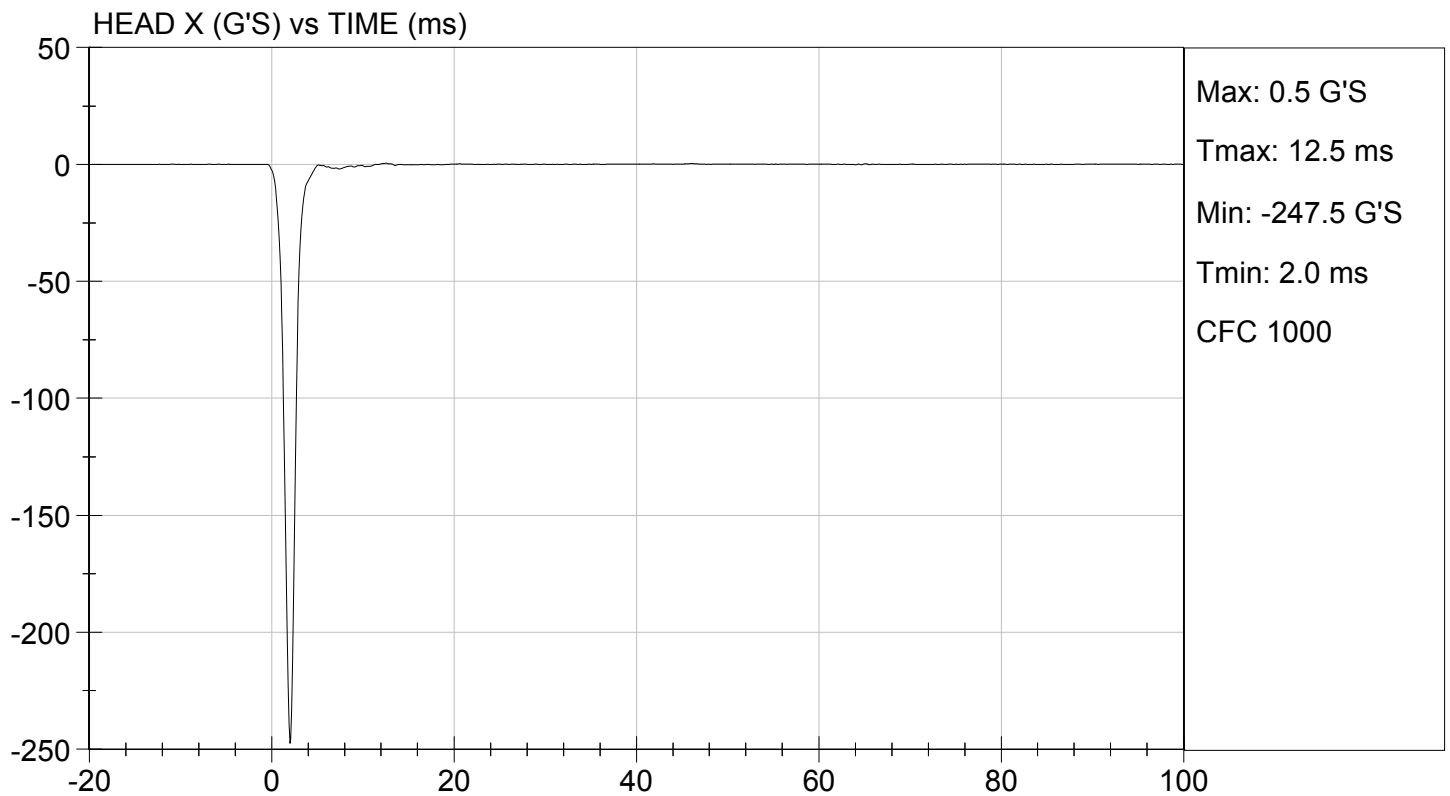
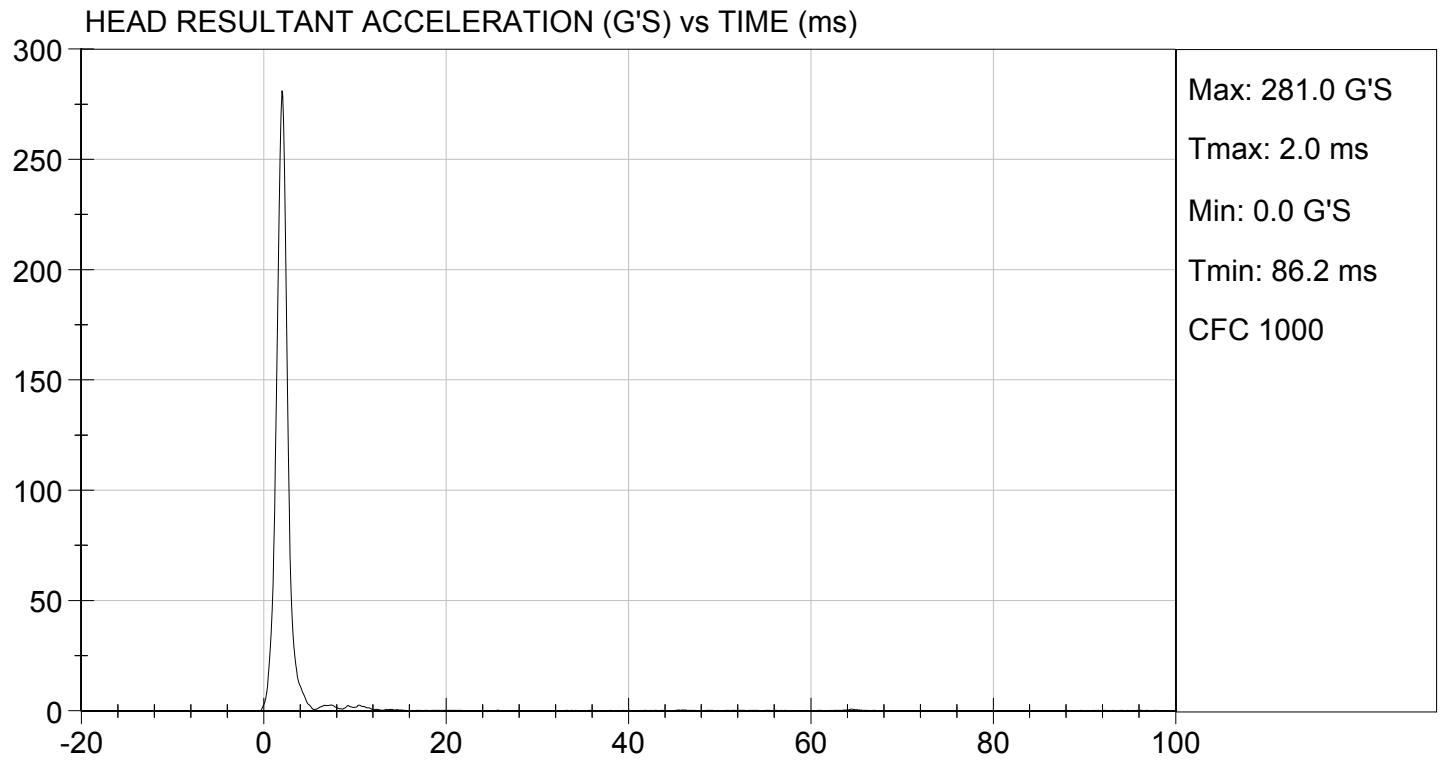
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	250 to 300	281	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	4.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

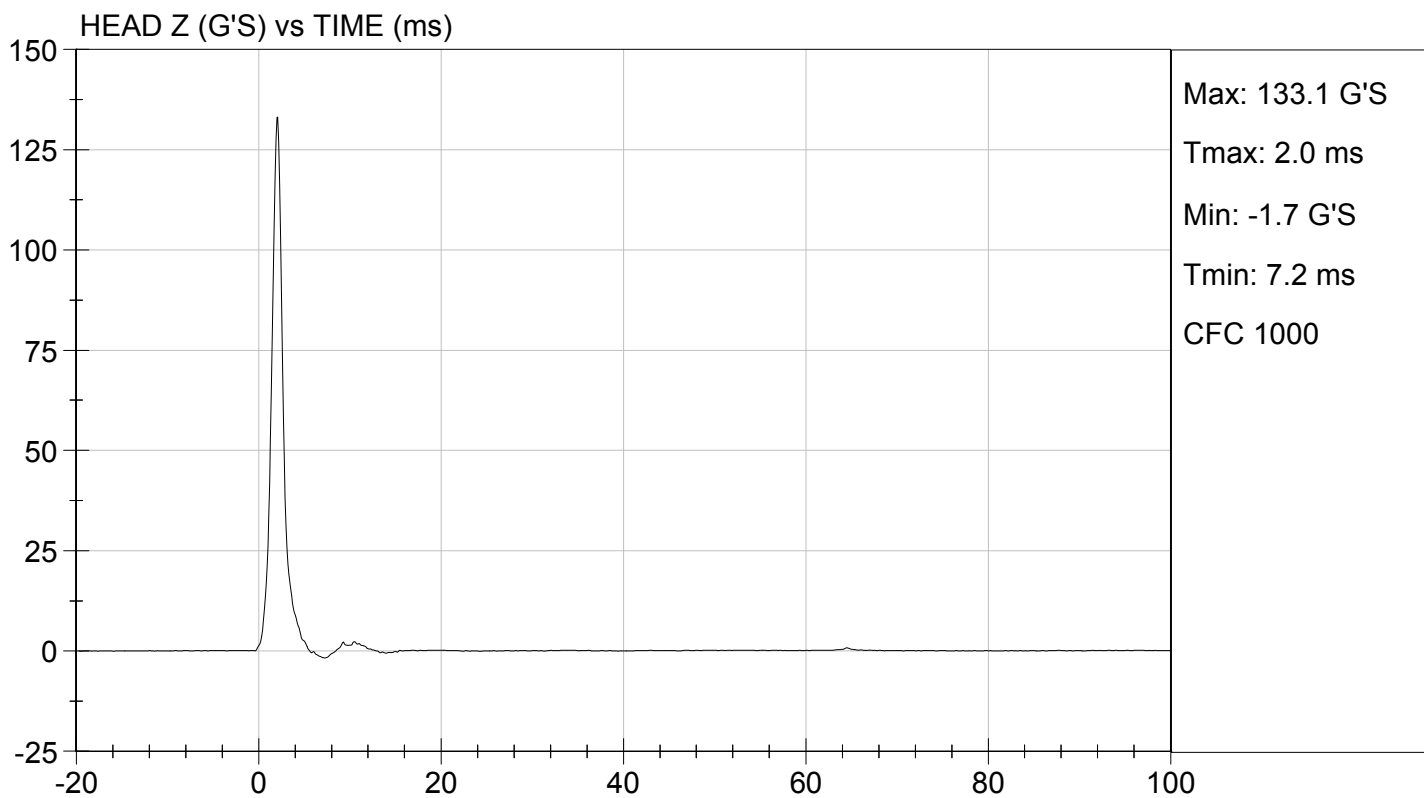
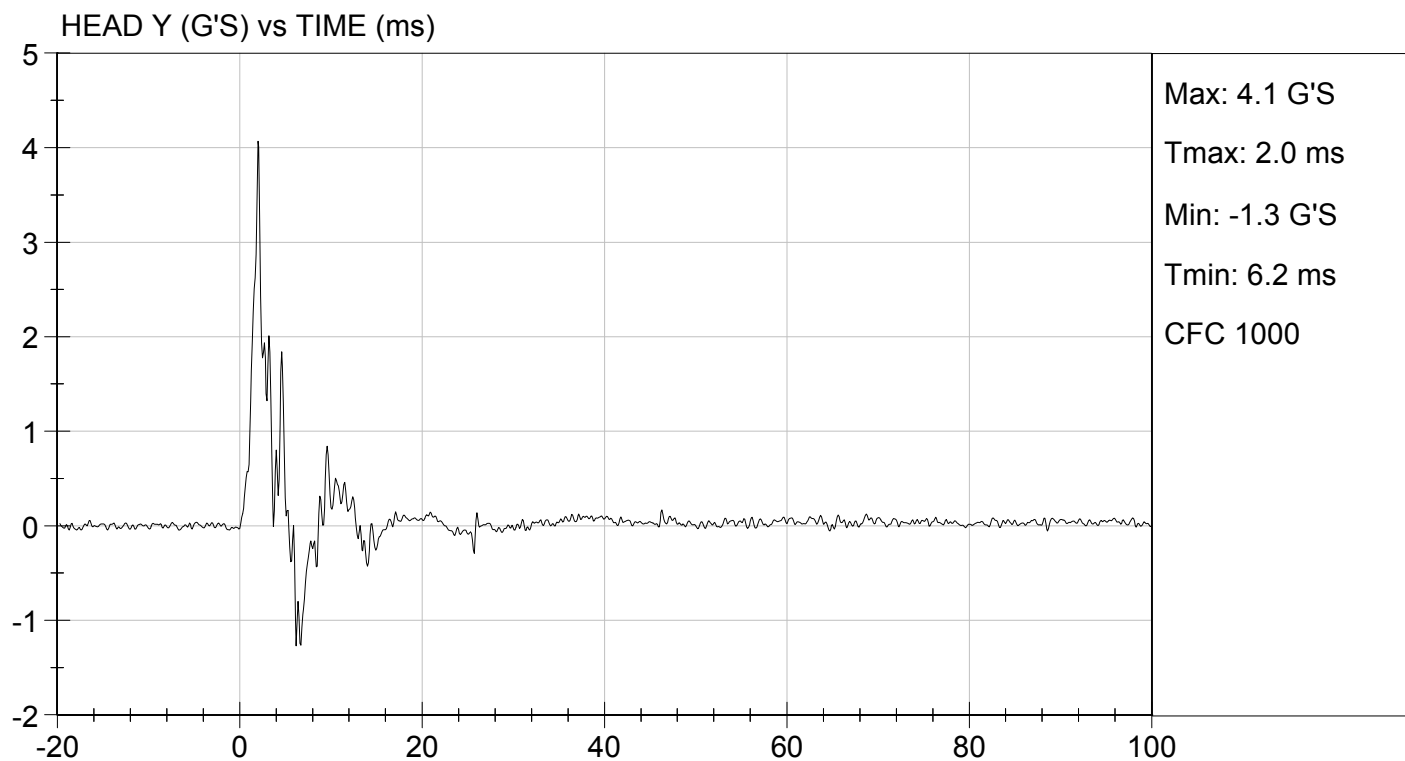

Laboratory Technician

12/05/2016

Test Date


Approved By





MGA RESEARCH CORPORATION

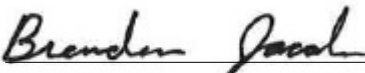
NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

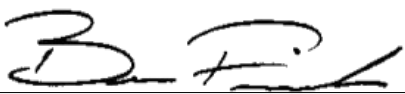
ATD Serial No: 634

Test I.D: D164092

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	6.89 to 7.13	6.96	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.8	Pass
	30 ms	m/s	5.8 to 7.0	6.8	Pass
D Plane Rotation	Max	deg	77 to 91	81	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	82	Pass
Overall Results					Pass


 Laboratory Technician

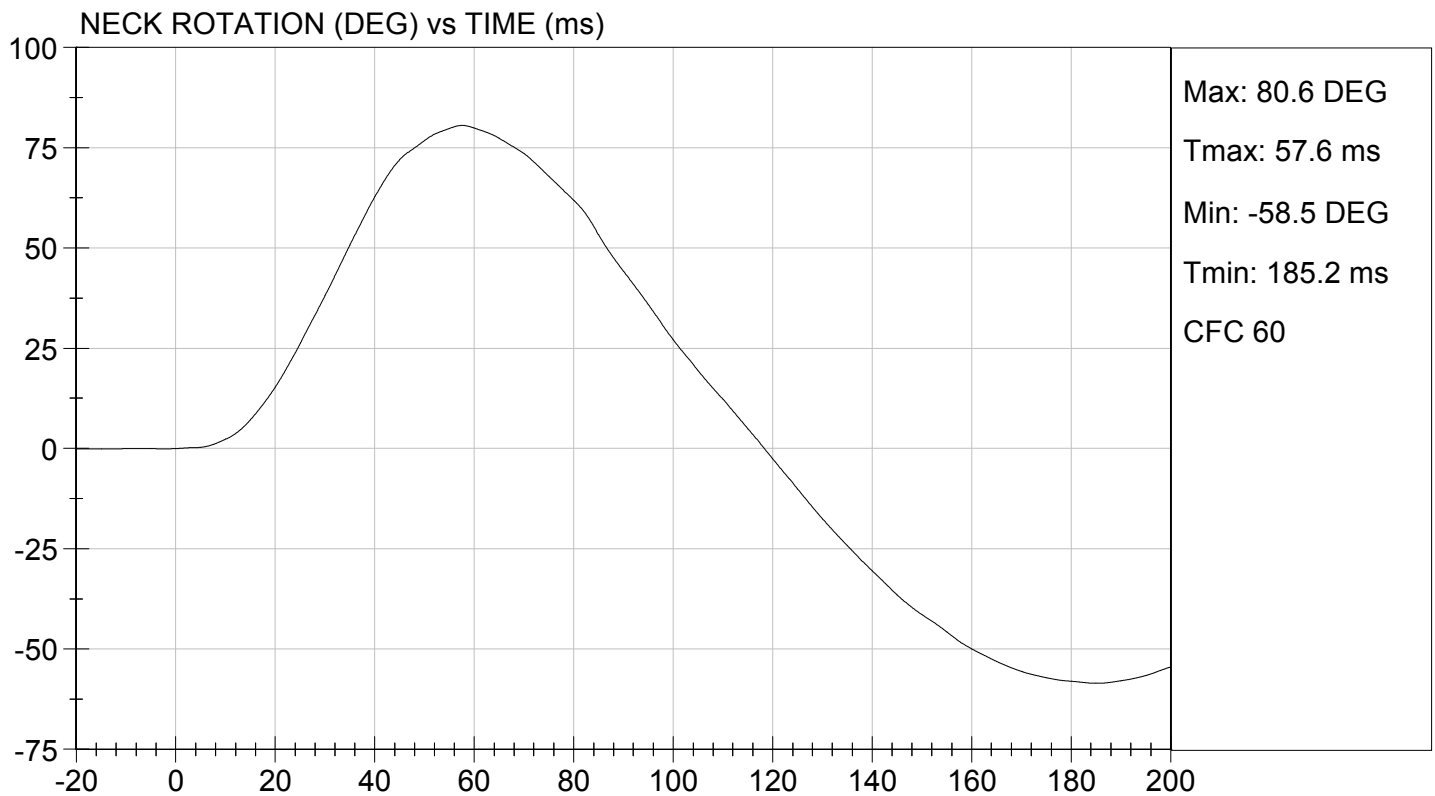
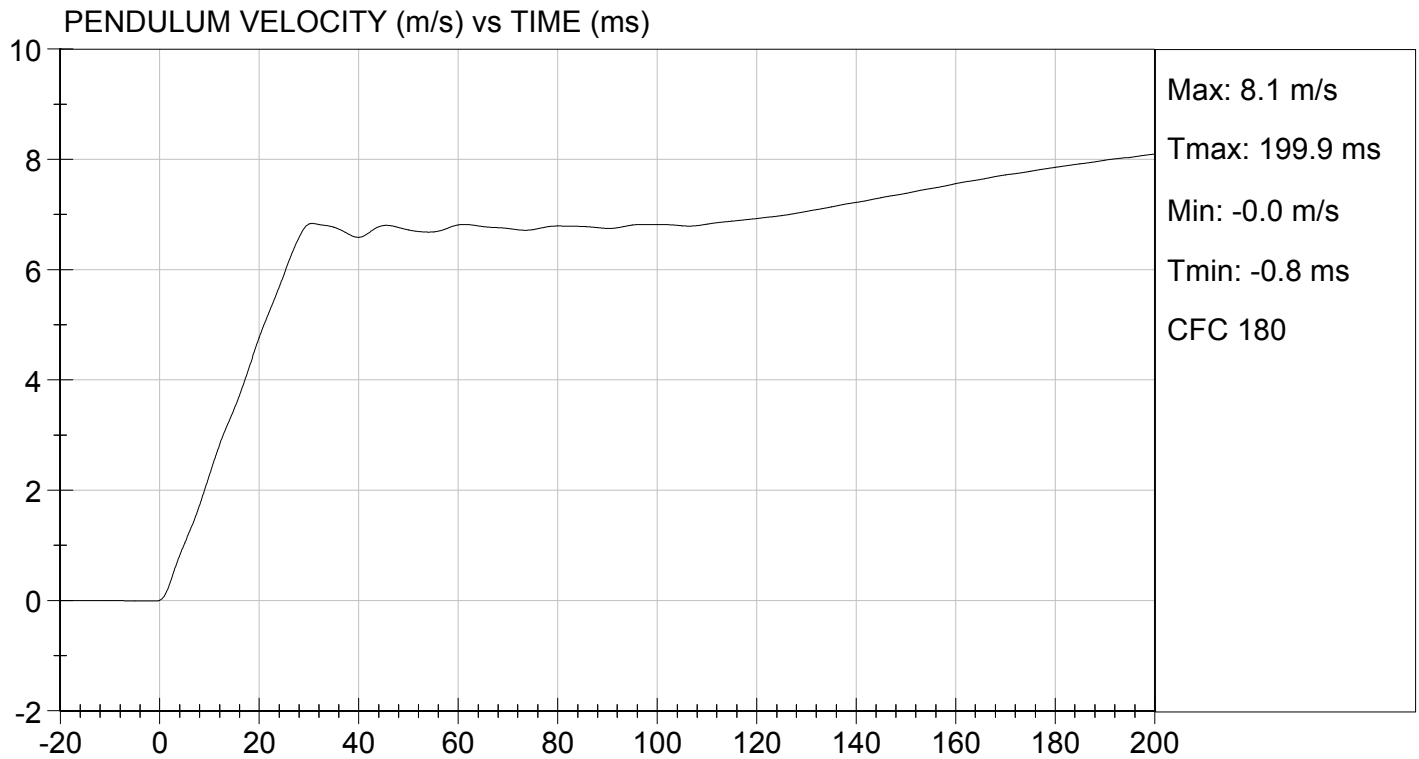
12/05/2016
 Test Date


 Approved By



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

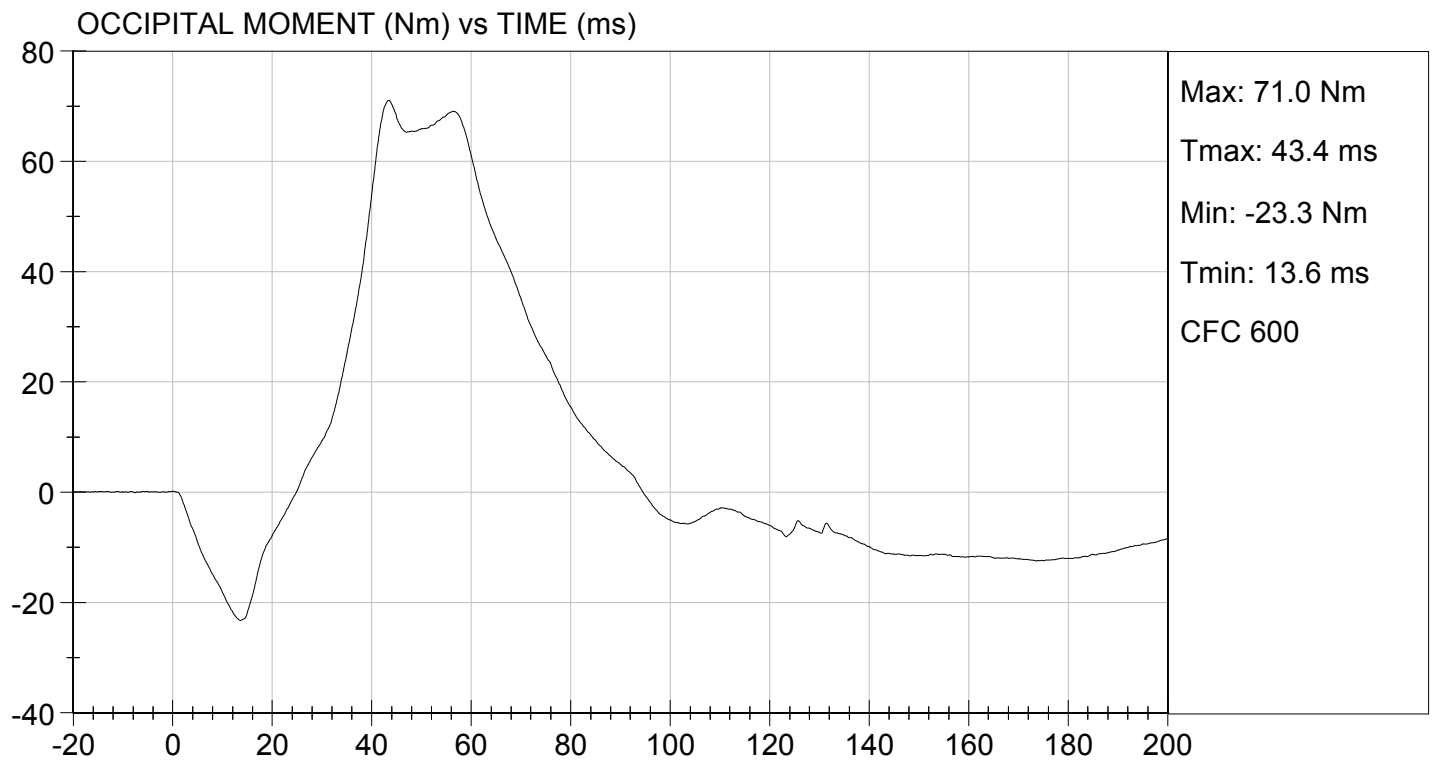
TEST DATE: 12/05/2016
TEST #: D164092





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

TEST DATE: 12/05/2016
TEST #: D164092

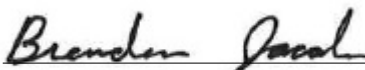


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

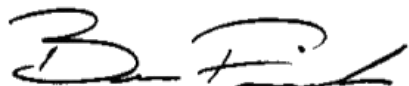
ATD Serial No: 634

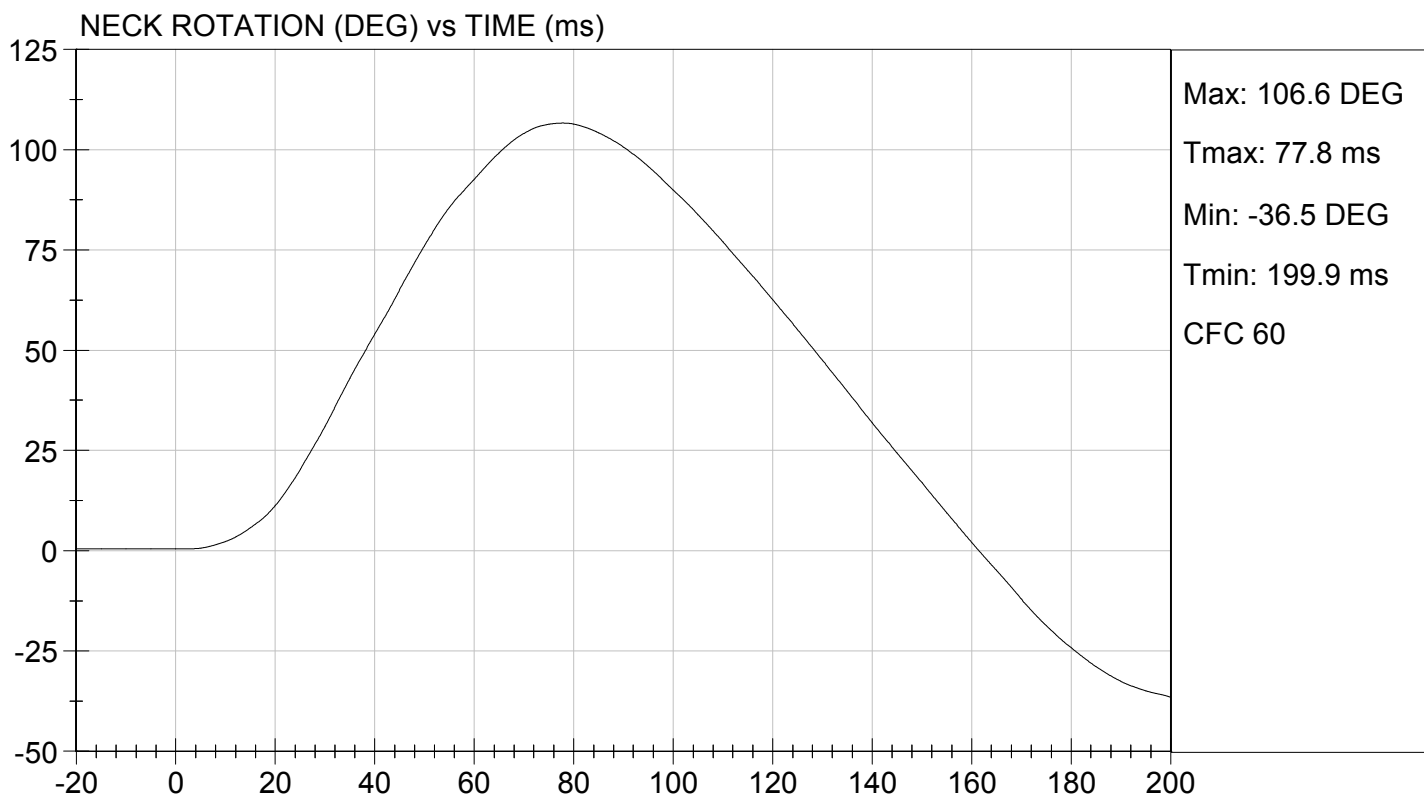
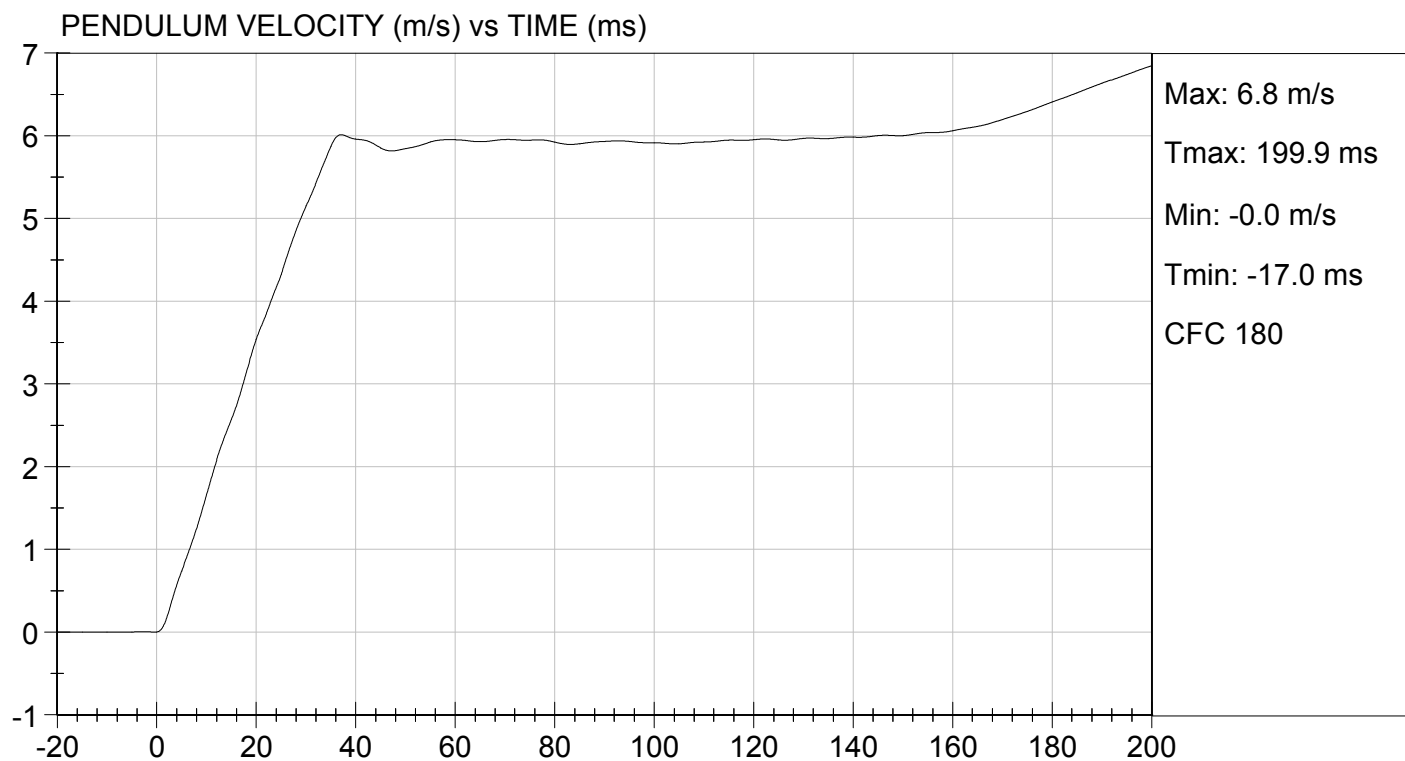
Test I.D: D164093

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.7	Pass
	20 ms	m/s	3.1 to 3.9	3.5	Pass
	30 ms	m/s	4.6 to 5.6	5.1	Pass
D Plane Rotation	Max	deg	99 to 114	107	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	102	Pass
Overall Results					Pass


 Laboratory Technician

12/05/2016
 Test Date

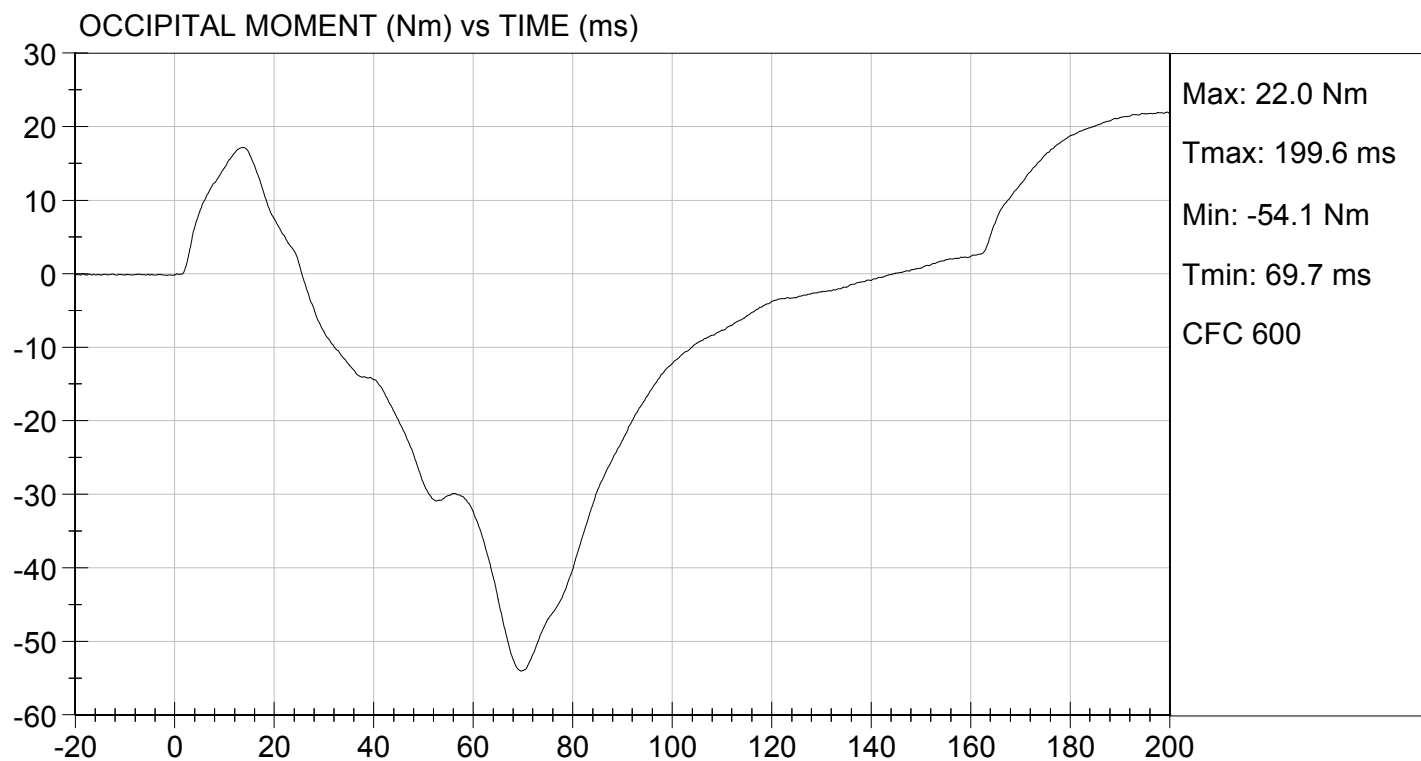

 Approved By





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

TEST DATE: 12/05/2016
TEST #: D164093

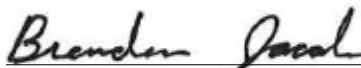


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

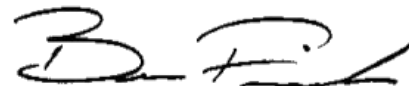
Test I.D: D164094

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Relative Humidity	%	10 to 70	29	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	4321	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4317	Pass
Overall Test Results				Pass


Laboratory Technician

12/05/2016

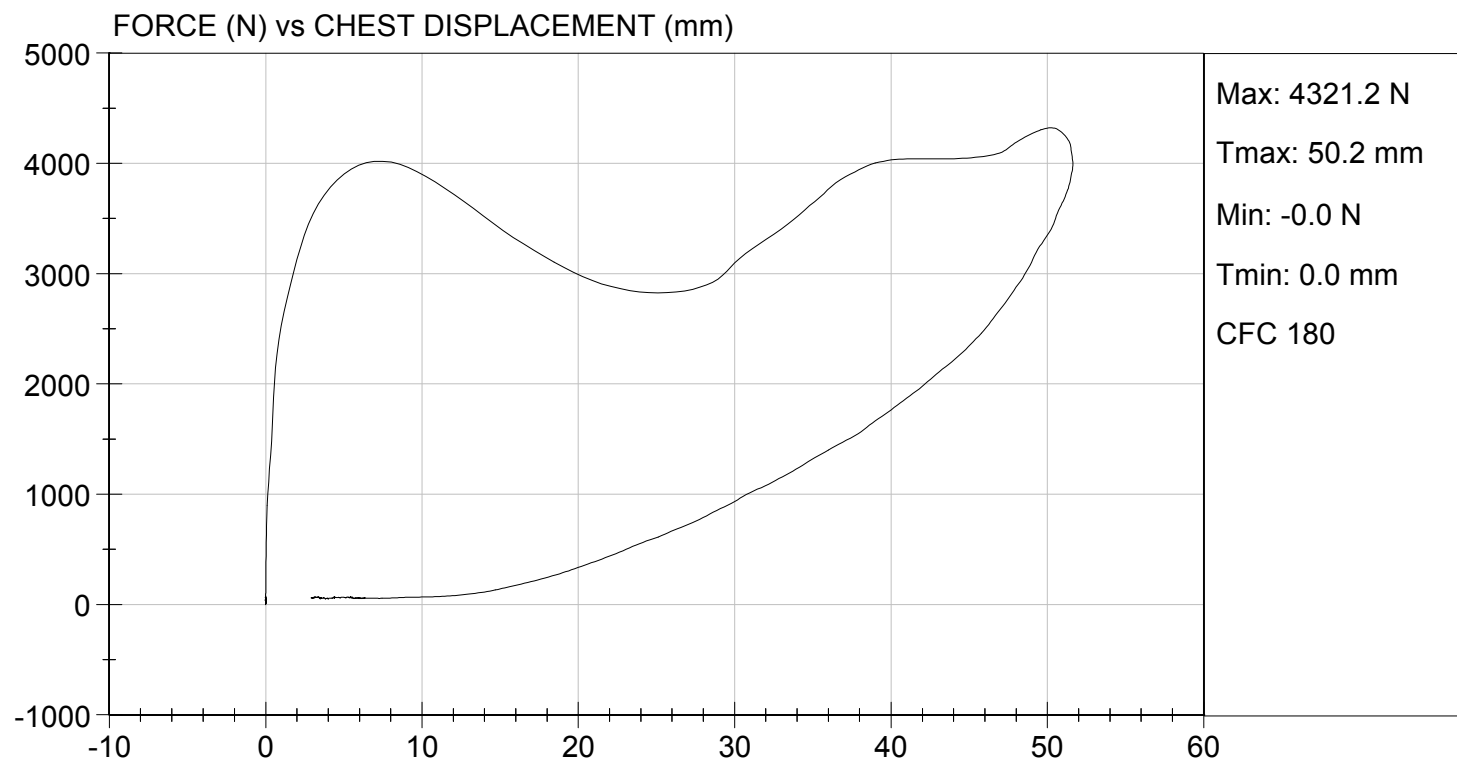
Test Date


Approved By



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

TEST DATE: 12/05/2016
TEST #: D164094



MGA RESEARCH CORPORATION

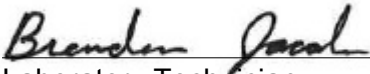
RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

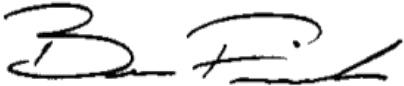
Test I.D: D164095

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	28	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	N	3450 to 4060	3780	Pass
Overall Test Results				Pass


Laboratory Technician

12/05/2016

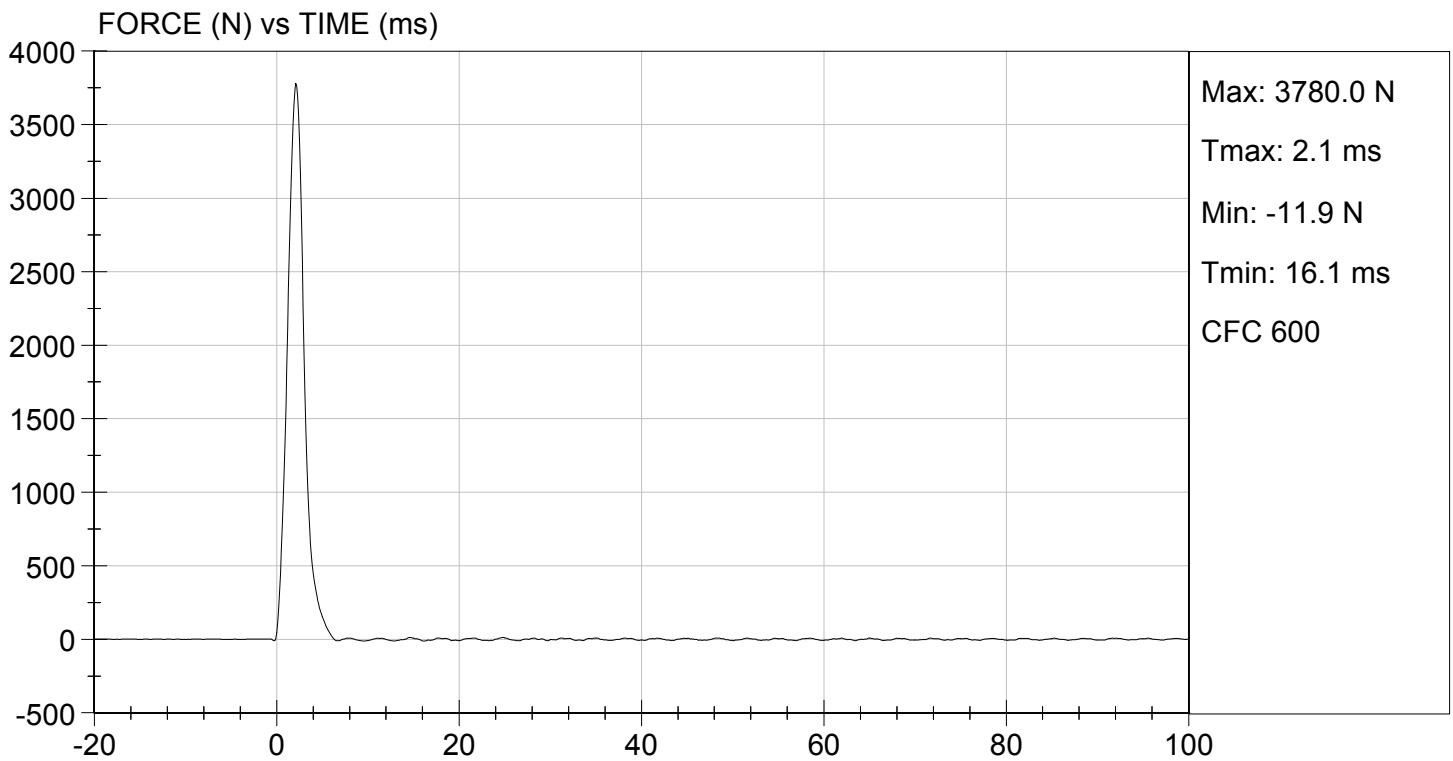
Test Date


Approved By



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

TEST DATE: 12/05/2016
TEST #: D164095



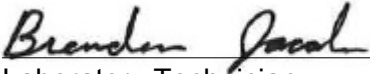
MGA RESEARCH CORPORATION

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

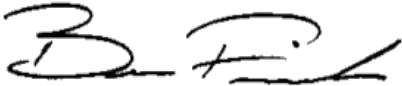
ATD Serial No: 634

Test I.D: D164096

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	28	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3795	Pass
Overall Test Results				Pass


Laboratory Technician

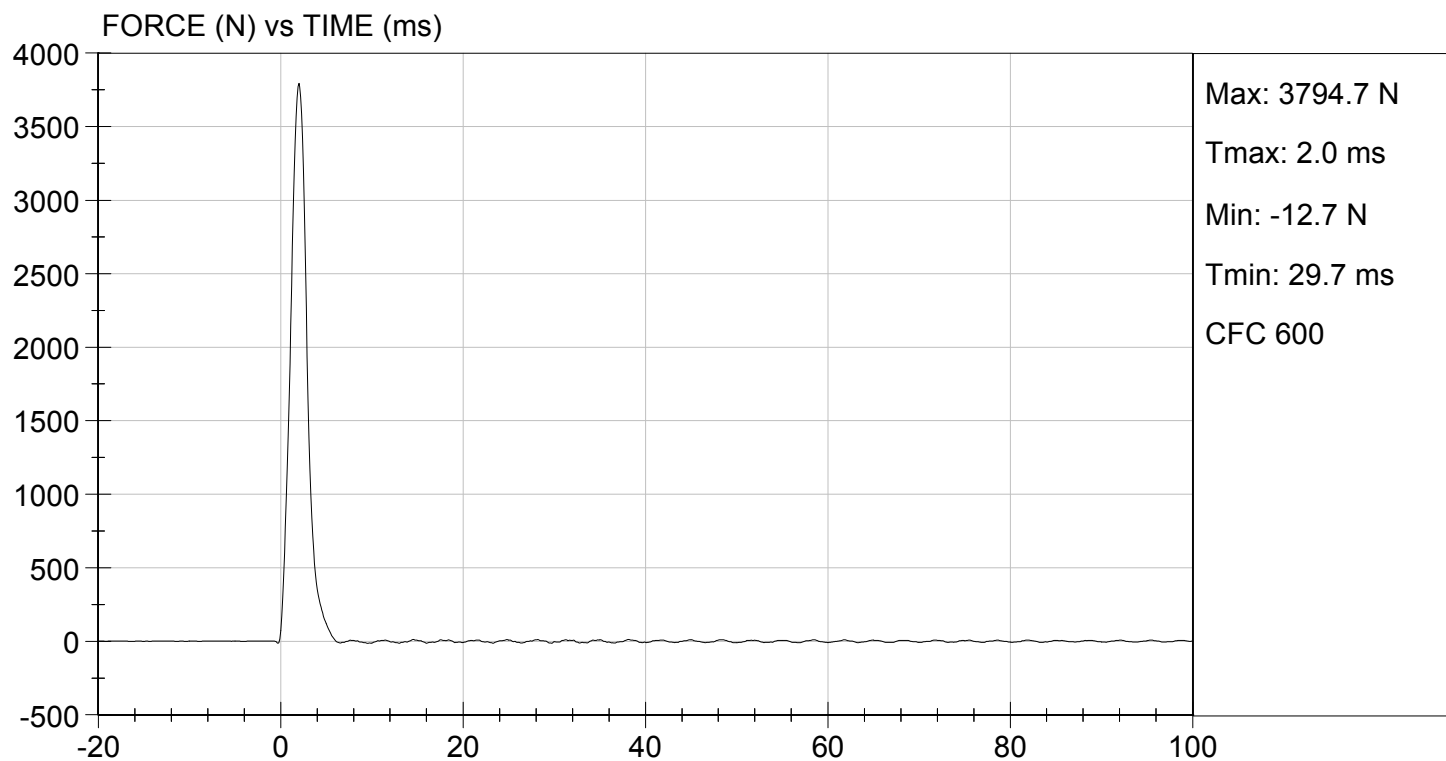
12/05/2016
Test Date


Approved By



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

TEST DATE: 12/05/2016
TEST #: D164096



MGA RESEARCH CORPORATION

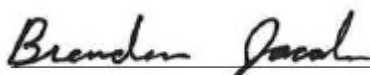
TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

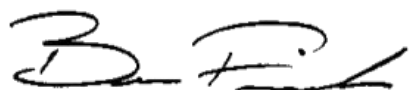
Test I.D: D164097

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Initial Angle	deg	0 to 20	20	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	357	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result			Pass	


Laboratory Technician

12/05/2016

Test Date


Approved By

