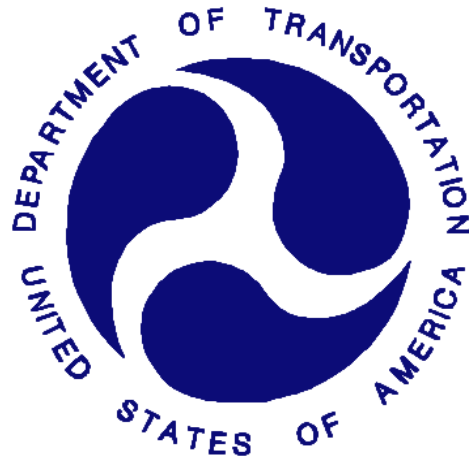


REPORT NUMBER: NCAP-MGA-2016-011

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

**NISSAN MOTOR CO., LTD.
2016 Nissan Maxima S 4-Dr Sedan
NHTSA No.: M20165200**

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



Test Date: July 10, 2015

Final Report Date: September 3, 2015

FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE
Room W43-410
Washington, DC 20590**

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Prepared by: alex Pinelli
Alex Pinelli, Project Engineer

Approved by: Ben Fischer
Ben Fischer, Project Engineer

Approval Date: September 3, 2015

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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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2016 Nissan Maxima S 4-Dr 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 July 10, 2015. The impact velocity of the vehicle was 56.3 km/h and the ambient temperature at the barrier face at the time of impact was 21.8°C. The target vehicle post-test maximum crush was 541 located at 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>220</td> <td>700</td> <td>129</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td>23</td> <td>52</td> <td>17</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.23</td> <td>1</td> <td>0.37</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>945</td> <td>2620</td> <td>586</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>267</td> <td>2520</td> <td>247</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>950</td> <td>6805</td> <td>2466</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>1769</td> <td>6805</td> <td>225</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	220	700	129	Maximum Chest	mm	63	23	52	17	Nij	N/A	1	0.23	1	0.37	Neck Tension	N	4170	945	2620	586	Neck Compression	N	4000	267	2520	247	Left Femur Force	N	10008	950	6805	2466	Right Femur Force	N	10008	1769	6805	225
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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 2016 Nissan Maxima S 4-Dr Sedan at a velocity of 56.3 km/h. The test was performed at MGA Research Corporation on July 10, 2015. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

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

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

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

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. 20.0 oz. of Stoddard Solvent leakage was collected during the first 5 minutes of the 0° to 90° phase of the static rollover. Additionally, 4.6 oz. and 4.2 oz. were collected during the sixth and seventh minute from the onset of rotation, respectively. The static rollover was terminated after the 0° to 90° phase.

The maximum static crush of the vehicle was 541 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

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)	220	0.23	945	267	44	23	950	1769
Passenger (5 th)	129	0.37	586	247	44	17	2466	225

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

TEST NOTES

Top of Engine X has no valid data after 50 ms.
 Barrier K-16 MY has no valid data after 10 ms.
 Barrier D-06 MY has no valid data after 10 ms.
 Barrier C-04 FX has no valid data.
 Barrier C-04 MY has no valid data.
 Barrier C-04 MZ has no valid data.
 Barrier I-05 MY has no valid data.
 Driver Shoulder Belt did not run.
 Driver Lap Belt did not run.
 Passenger Shoulder belt did not run.
 Passenger Lap Belt did not run.

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: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20165200	Traction Control System (TCS)	Yes
Model Year	2016	Power Steering	Yes
Make	Nissan	Power Window Auto-Reverse	Yes
Model	Maxima S	Driver Frontal Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	1N4AA6AP3GC380451	Driver Head/Torso Airbag	No
Body Color	Deep Blue Pearl	Driver Torso Airbag	No
Odometer (km/mi)	29 / 18	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	3.5	Driver Pelvis Airbag	No
Type/No. Cylinders	6	Driver Knee Airbag	No
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds		Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	FWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Front Pass. Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	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	NISSAN MOTOR CO., LTD.	GVWR (kg)	2105
Date of Manufacture	05/15	GAWR Front (kg)	1130
		GAWR Rear (kg)	990

VEHICLE SEATING AND WEIGHT CAPACITY DATA

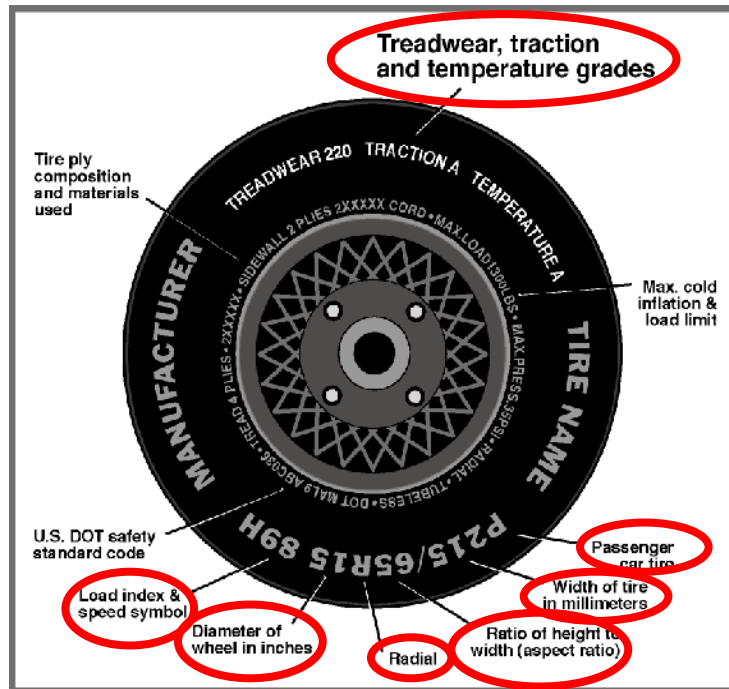
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				408
Cargo Weight (RCLW) (kg)				68

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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	P245/45/R18	P245/45/R18
Tire Size on Vehicle	P245/45/R18	P245/45/R18
Tire Manufacturer	Continental	Continental
Tire Model	Procontact	Procontact
Treadwear	400	400
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	96V	96V
Tire Material	Rubber	Rubber
DOT Safety Code Left	6G8U WBVA 1115	6G8U WBVA 1115
DOT Safety Code Right	6G8U WBVA 1115	6G8U WBVA 1115

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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	486.5	307.5		512.0	390.5	
Right	kg	486.0	308.0		505.0	382.0	
Ratio	%	61.2	38.8		56.8	43.2	
Totals	kg	972.5	615.5	1588.0	1017.0	772.5	1789.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1588.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	68
Calculated Test Vehicle Target Weight (TVTW)	kg	1797.0

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	708	706	714	719	1073
As Tested	mm	703	705	687	692	1195
Post Test	mm	772	739	704	662	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2768
Total Vehicle Length at Left Side	mm	4714
Total Vehicle Length at Centerline	mm	4900
Total Vehicle Length at Right Side	mm	4714
Weight of Ballast in Cargo Area	kg	12
Weight of Vehicle Components Removed	kg	30
Amount of Stoddard Solvent in Fuel Tank	L	63.2

List of components removed to meet test weight: Right rear headrest, right rear speaker, right taillight.

List of components removed for instrumentation, data box, and equipment installation: Cargo area carpet, cargo divider, jack and tools, spare tire and spare tire cover.

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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4900
2	Total Width	1856
3	Bumper Top Height	550
4	Bumper Bottom Height	415
5	Longitudinal Member Top Height	561
6	Distance between Longitudinal Members	940
7	Longitudinal Member Width	112
8	Engine Top Height	910
9	Engine Bottom Height	170
10	Engine and Gearbox Width	855
11	Front Bumper-Engine Distance	516
12	Front Shock Absorber Fixing Height	883
13	Bonnet Leading Edge Height	804
14	Front Shock Absorber Fixing Width	1165
15	Front Bumper – Front Axle Distance	1012
16	Front Axle – A-Pillar Distance	538
17	A-Pillar – B-Pillar Distance	1144
18	B-Pillar – Rear Axle Distance	1086
19	B-Pillar – C-Pillar Distance	950
20	Roof Sill Bottom Height	1306
21	Roof Sill Top Height	1412
22	Floor Sill Bottom Height	198
23	Floor Sill Top Height	400

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

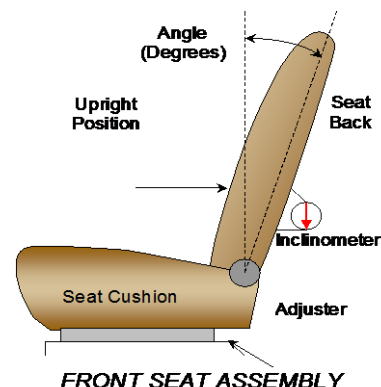
Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

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 August 2013.

	Degrees
Driver Seat Back Angle	7.5° on headrest post guide
Passenger Seat Back Angle	3.1° on headrest post guide



SEAT FORE/AFT POSITIONS

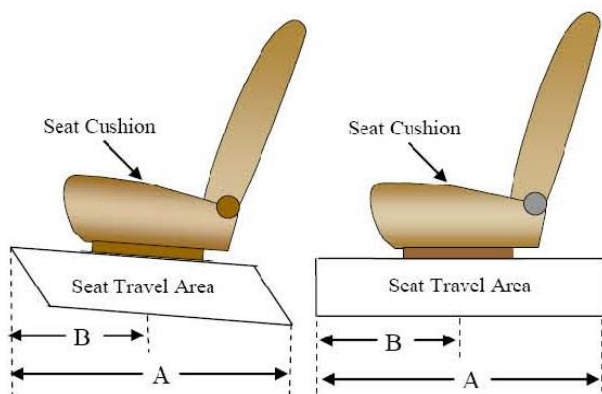
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated August 2013.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	280 mm	140 mm
Passenger Seat	240 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	3 (1 st as 1)	0 (1 st as 0)
Passenger Seat	3 (1 st as 1)	0 (1 st as 0)



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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

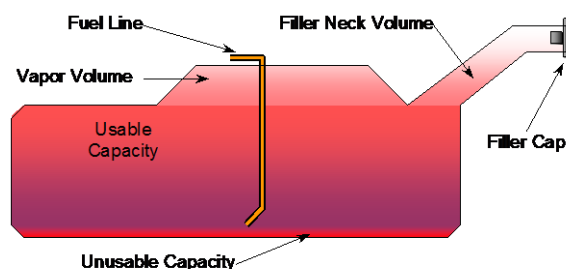
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	68.1
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	62.8 to 64.0
Actual Amount of Solvent used	63.2
1/3 of Usable Capacity	22.7

FUEL PUMP

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

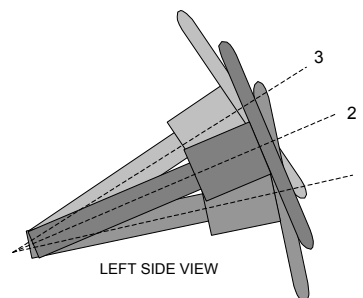
The electric fuel pump operates when the engine is running. The fuel filler pipe is located on the left hand side of the vehicle.



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

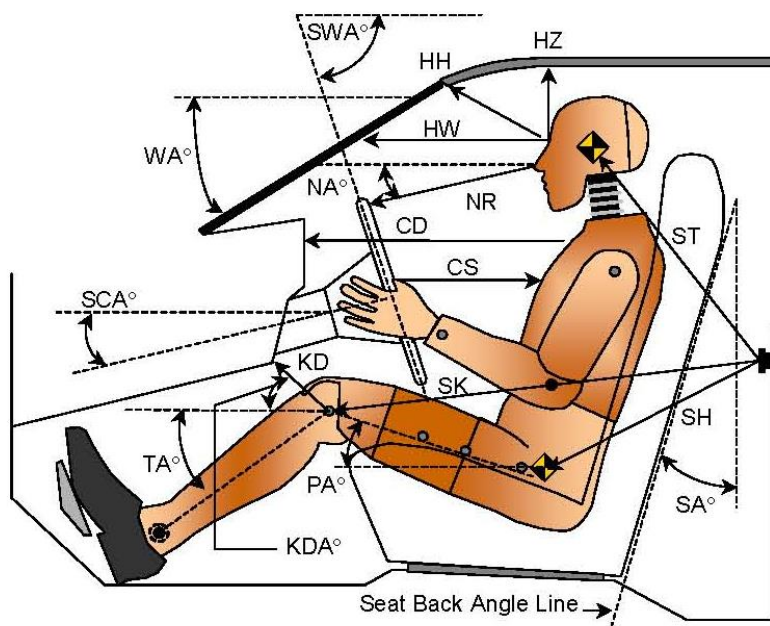
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	69.0	170
Geometric Center Position 2	66.3	200
Uppermost Position 3	63.6	230
Telescoping Steering Wheel Travel		60
Test Position	66.3	200

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015



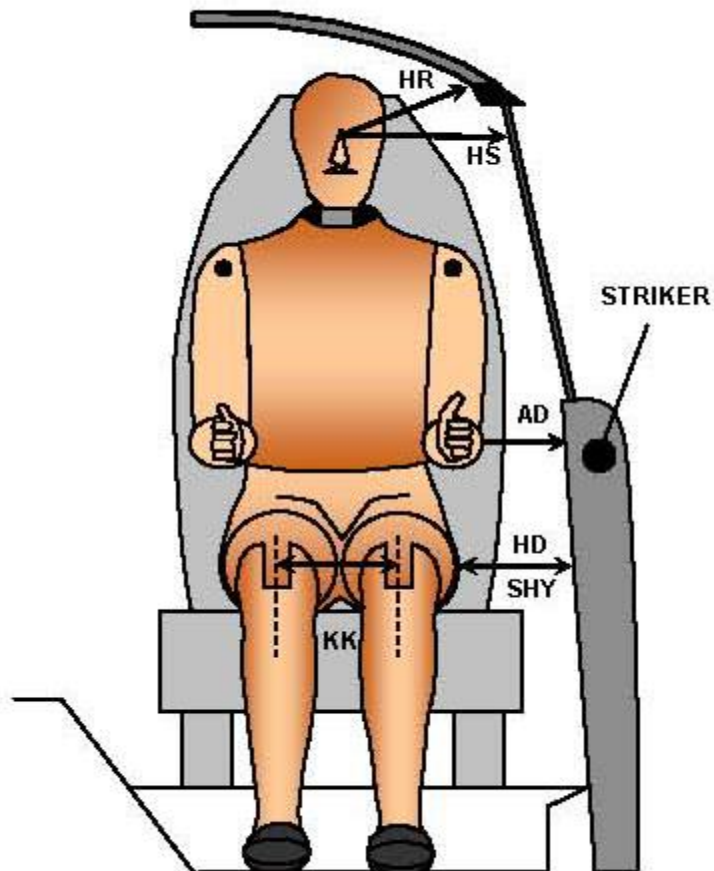
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		21.2		
SWA°	Steering Wheel Angle		66.3		
SCA°	Steering Column Angle		23.7		
SA°	Seat Back Angle (on headrest post)		7.5		3.1
HZ	Head to Roof (Z)	170	90	194	90
HH	Head to Header	338	25.1	280	49.6
HW	Head to Windshield	670	0	708	0
NR	Nose to Rim	377	11.5		
CD	Chest to Dash	525		390	
CS	Chest to Steering Hub	294	2.2		
RA	Rim to Abdomen	192	0		
KDL	Left Knee to Dash	177	28.9	97	37.9
KDR	Right Knee to Dash	129	29.5	123	35.2
PA°	Pelvic Angle		24.6		22.2
TA°	Tibia Angle		40.7		47.2
SK	Striker to Knee	589	88.6	662	91.8
ST	Striker to Head	532	12.8	504	33.8
SH	Striker to H-Point	254	120.9	364	105.7

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015



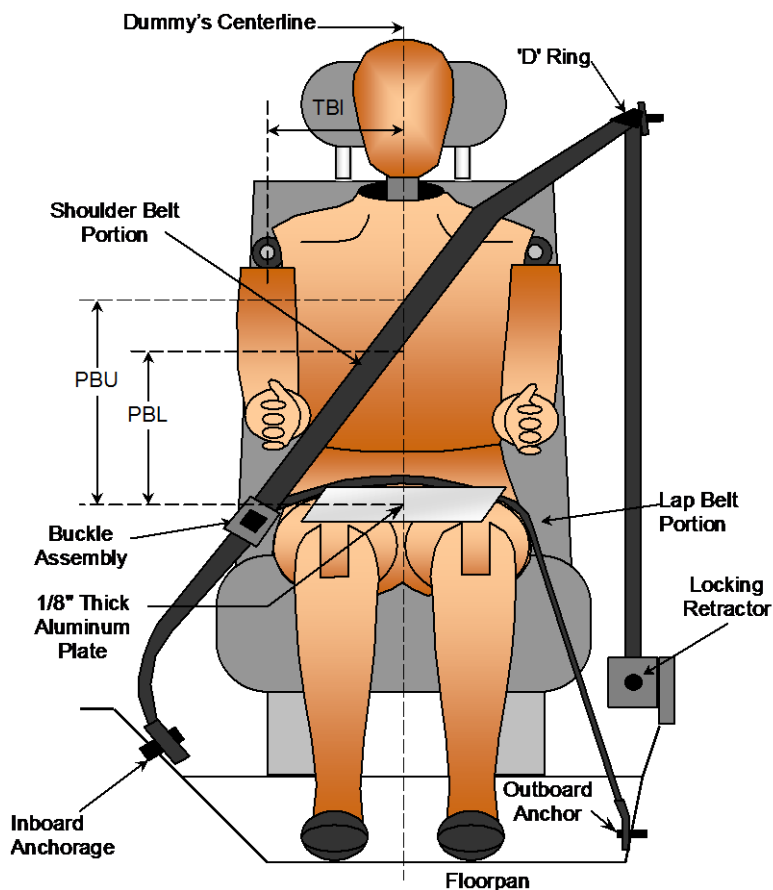
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	125	83
HD	H-Point to Door	148	180
HR	Head to Side Header	208	260
HS	Head to Side Window	326	370
KK	Knee to Knee	356	229
SHY	Striker to H-Point (Y Direction)	270	327
AA	Ankle to Ankle	339	175

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	320	300
PBL - Top surface of reference to belt lower edge	mm	240	205

BELT LENGTH DATA

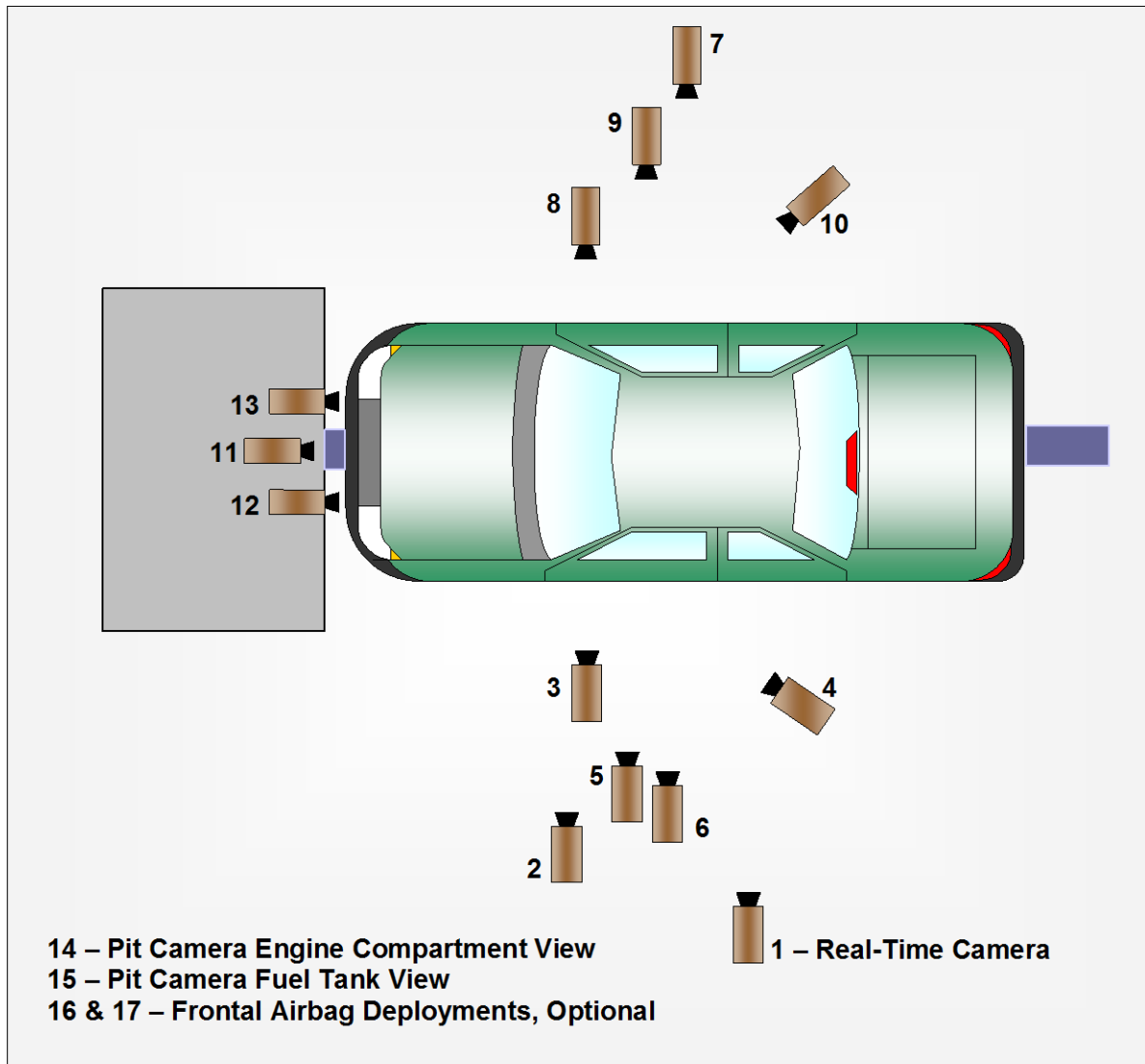
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	850	890
Lap Belt Length as measured on ATD	mm	595	660
Remainder of belt on reel	mm	1205	1100
Total Belt Length for Continuous Webbing Systems	mm	3450	3450

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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	-1710	-6580	-1840	35	1000
3	Left Front Half	-1270	-5310	-1150	24	1000
4	Left Angle	-5590	-5000	-1830	50	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	-2240	6730	-1170	20	**
8	Passenger Close-Up	-1660	6310	-1820	35	1000
9	Right Front Half	-1380	5140	-1150	24	**
10	Right Angle	-5680	5050	-1830	50	1000
11	Windshield	430	0	-2810	20	**
12	Driver Windshield	30	-450	-2030	8.5	1000
13	Passenger Windshield	30	450	-2030	8.5	**
14	Pit Front	-1050	0	3150	24	1000
15	Pit Rear	-3110	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

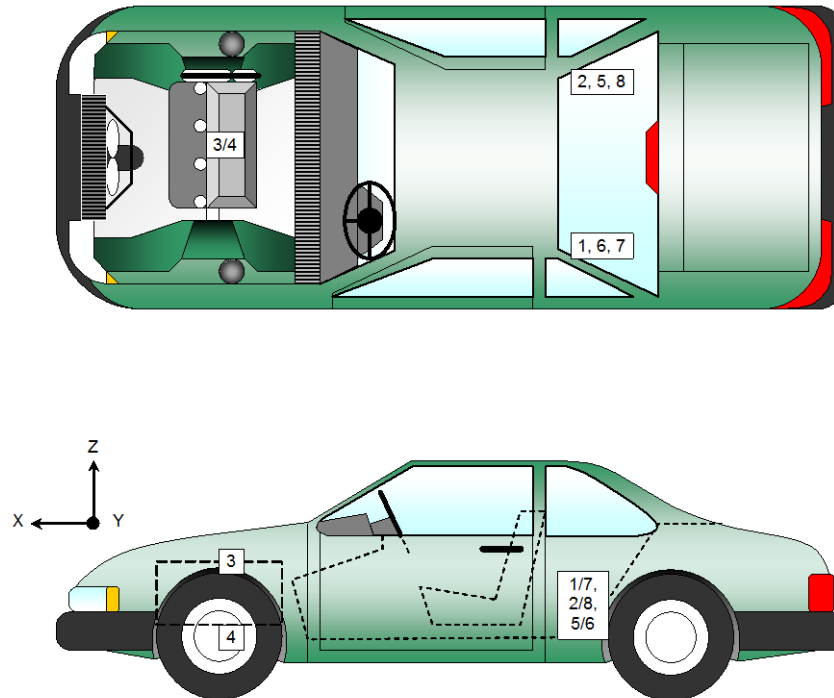
Cameras 5 & 6 were not used for this test.

**Camera 7, 9, 11 and 13 did not trigger.

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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	1981	-315	-235
2	Right Rear Crossmember Accelerometer – X Direction	1966	310	-220
3	Engine Top X	4008	94	-853
4	Engine Bottom X	4062	330	-165
5	Left Rear Crossmember Accelerometer – Z Direction	1981	-355	-235
6	Right Rear Crossmember Accelerometer – Z Direction	1966	350	-220

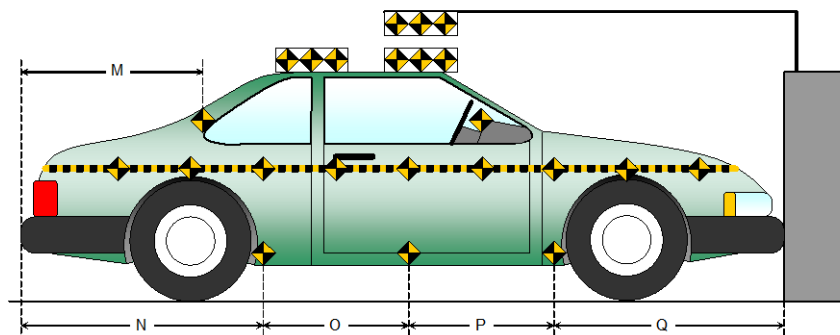
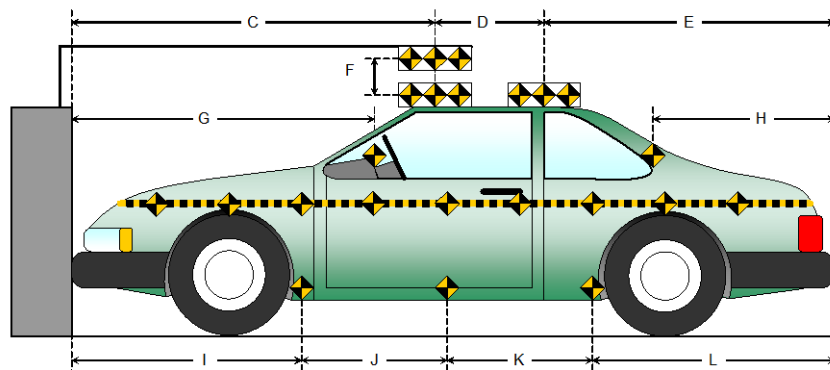
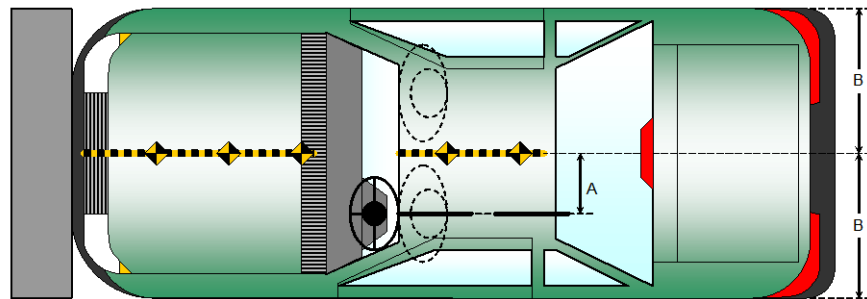
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

Item	Value (mm)
A	376
B	928
C	2445
D	607
E	1848
F	120
G	
H	1256
I	1434
J	952
K	952
L	1562
M	1256
N	1562
O	952
P	952
Q	1434



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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

Advanced Research Load Cell Barrier

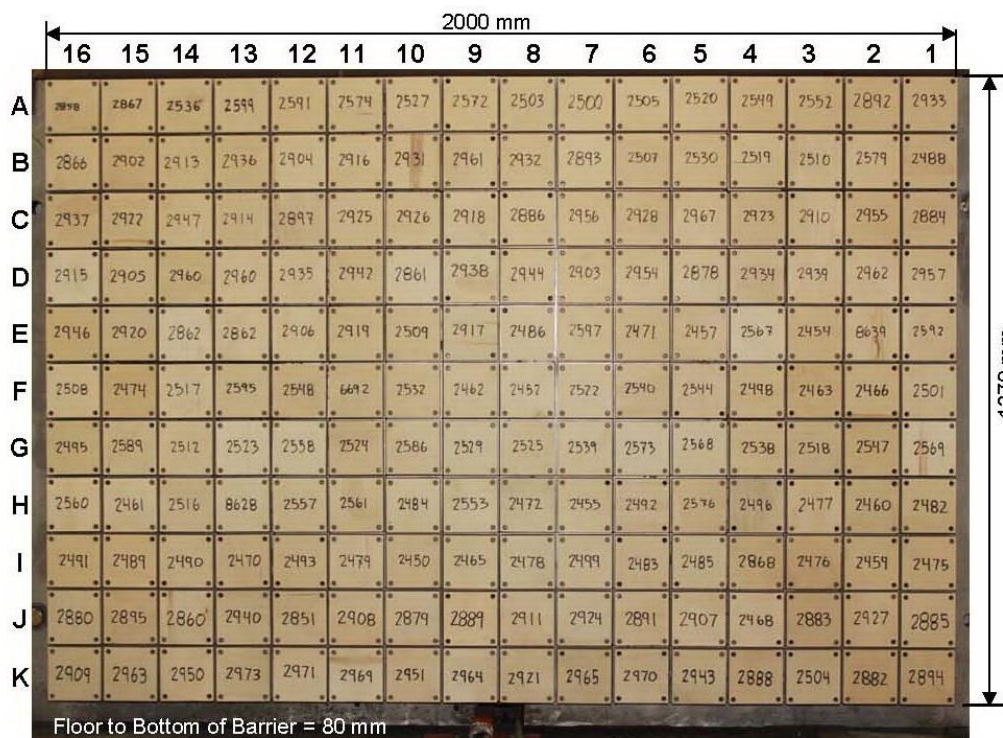


Photo for Reference Only

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: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015

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: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

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

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	Cracked
Window Damage	LF/RF Cracked
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	2009
Center	mm	1982
Right Side	mm	1958
Average	mm	1983

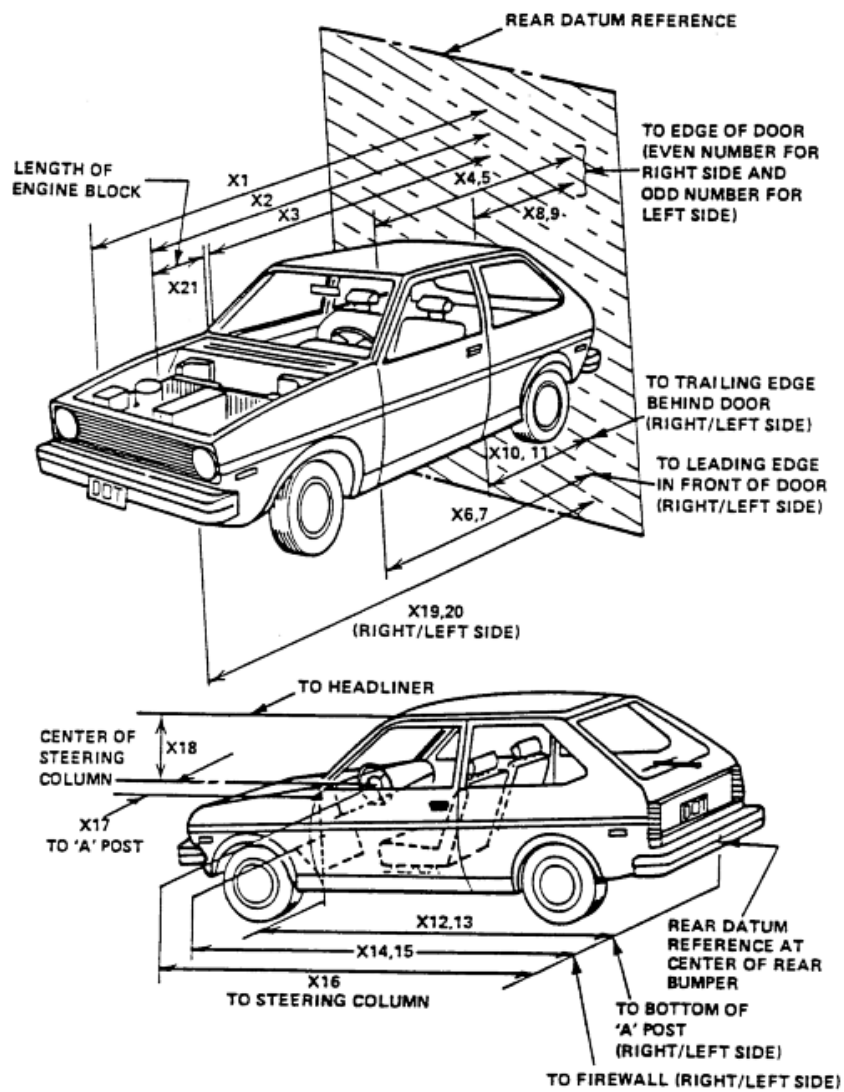
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4900	4359	541
2	RSOV to Front of Engine	mm	4354	4068	286
3	RSOV to Firewall	mm	3800	3688	112
4	RSOV to Upper Leading Edge of Right Door	mm	3318	3310	8
5	RSOV to Upper Leading Edge of Left Door	mm	3318	3312	6
6	RSOV to Lower Leading Edge of Right Door	mm	3306	3327	-21
7	RSOV to Lower Leading Edge of Left Door	mm	3306	3331	-25
8	RSOV to Upper Trailing Edge of Right Door	mm	2176	2170	6
9	RSOV to Upper Trailing Edge of Left Door	mm	2176	2172	4
10	RSOV to Lower Trailing Edge of Right Door	mm	2196	2198	-2
11	RSOV to Lower Trailing Edge of Left Door	mm	2196	2199	-3
12	RSOV to Bottom of "A" Post of Right Side	mm	3320	3318	2
13	RSOV to Bottom of "A" Post of Left Side	mm	3320	3325	-5
14	RSOV to Firewall, Right Side	mm	3566	3537	29
15	RSOV to Firewall, Left Side	mm	3566	3542	24
16	RSOV to Steering Column	mm	2814	2885	-71
17	Center of Steering Column to "A" Post	mm	405	434	-29
18	Center of Steering Column to Headliner	mm	405	465	-60
19	RSOV to Right Side of Front Bumper	mm	4714	4331	383
20	RSOV to Left Side of Front Bumper	mm	4714	4302	412
21	Length of Engine Block	mm	478	478	0
RD	RSOV to Right Side of Dash Panel	mm	3075	3072	3
CD	RSOV to Center of Dash Panel	mm	3091	3088	3
LD	RSOV to Left Side of Dash Panel	mm	3098	3096	2

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015

VEHICLE INFORMATION

VIN: 1N4AA6AP3GC380451 Wheelbase (mm): 2768
Vehicle Size Category: Passenger Car Test Weight (kg): 1789.5

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): 56.3

Velocity Change (km/h): 67.2

Time of Separation (msec): 95.9

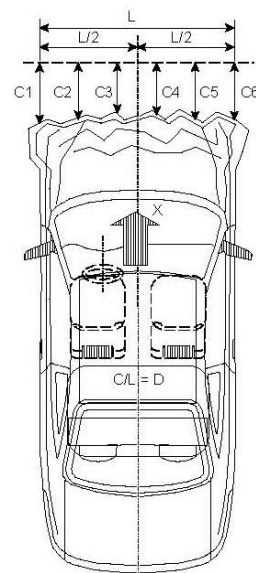
CRUSH PROFILE

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1180

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4714	4302	412
C2	Crush zone 2 at left side	mm	4794	4312	482
C3	Crush zone 3 at left side	mm	4850	4318	532
C4	Crush zone 4 at right side	mm	4850	4330	520
C5	Crush zone 5 at right side	mm	4794	4327	467
C6	Crush zone 6 at right side	mm	4714	4331	383
L	C1 TO C6	mm	1180	1170	10

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

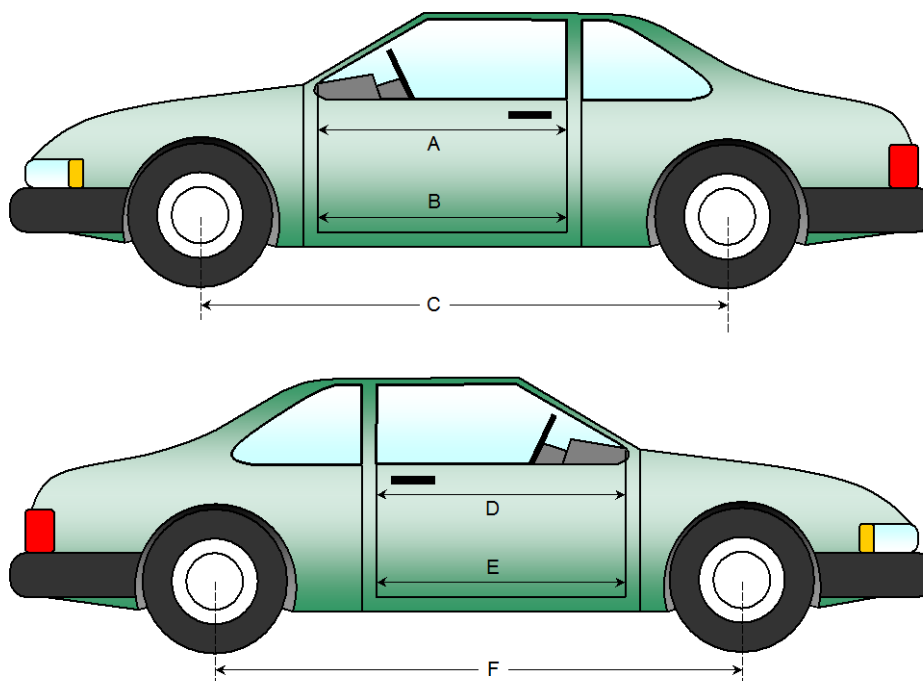
NHTSA No.: M20165200
Test Date: 7/10/2015

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1060	1060	0
B	Left Side Lower	mm	980	980	0
D	Right Side Upper	mm	1060	1058	2
E	Right Side Lower	mm	980	979	1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2768	2745	23
F	Right Side Wheelbase	mm	2768	2703	65



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

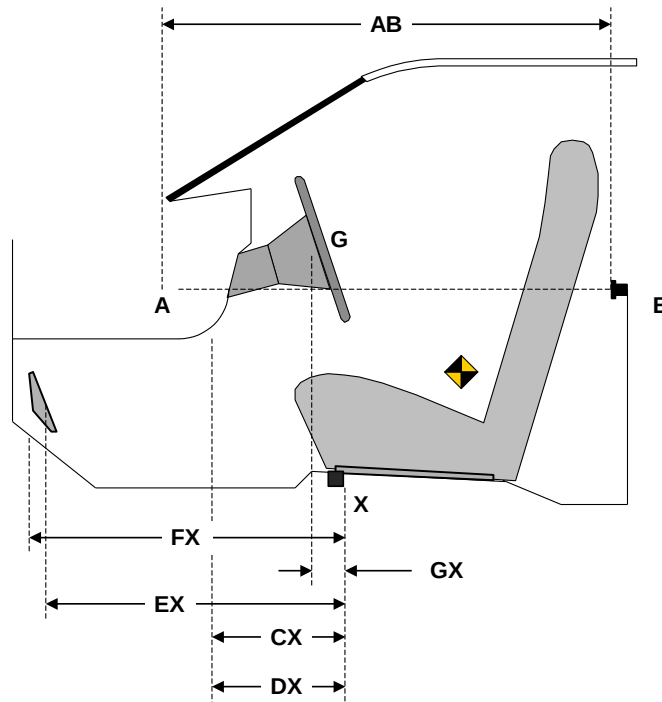
Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	804	804	0
CX	Left Knee Bolster to X	mm	236	235	1
DX	Right Knee Bolster to X	mm	254	260	-6
EX	Brake Pedal to X	mm	562	582	-20
FX	Foot Rest to X	mm	559	553	6
GX	Center of Steering Column Wheel Hub to X	mm	30	75	-45

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: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

Windshield Mounting Details:

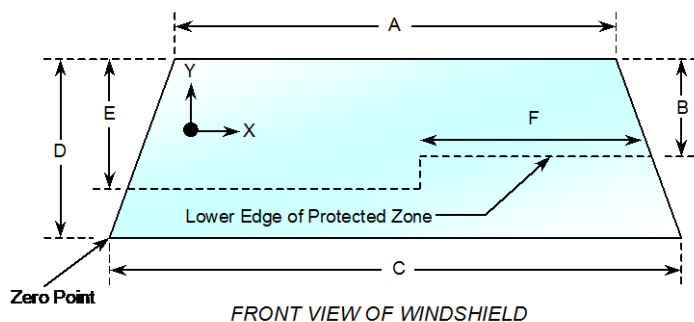
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.8° C.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2262	2262	100
Right Side	2262	2262	100
Total	4524	4524	100



Item	Units	Value
A	mm	1244
B	mm	460
C	mm	1404
D	mm	938
E	mm	538
F	mm	502

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: 2016 Nissan Maxima S 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
Test Date: 7/10/2015

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.8°C Test Time: 11:03 a.m.

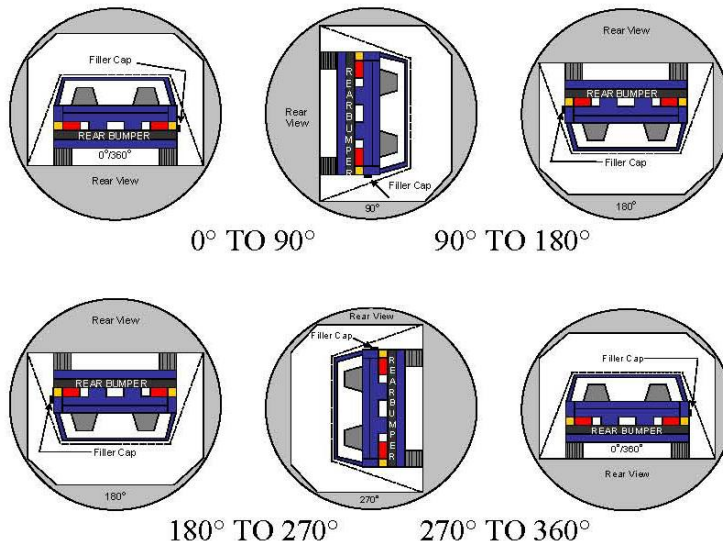
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

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

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015

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: Stoddard Solvent leakage originated from the fuel pump to fuel tank seal area on the top side of the fuel tank.



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	118	300	418
90° to 180°			
180° to 270°			
270° to 360°			

FMVSS 301 SPILLAGE TABLE (units in ounces)

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight Minute
0° to 90°	20.0	4.6	4.2	
90° to 180°				
180° to 270°				
270° to 360°				

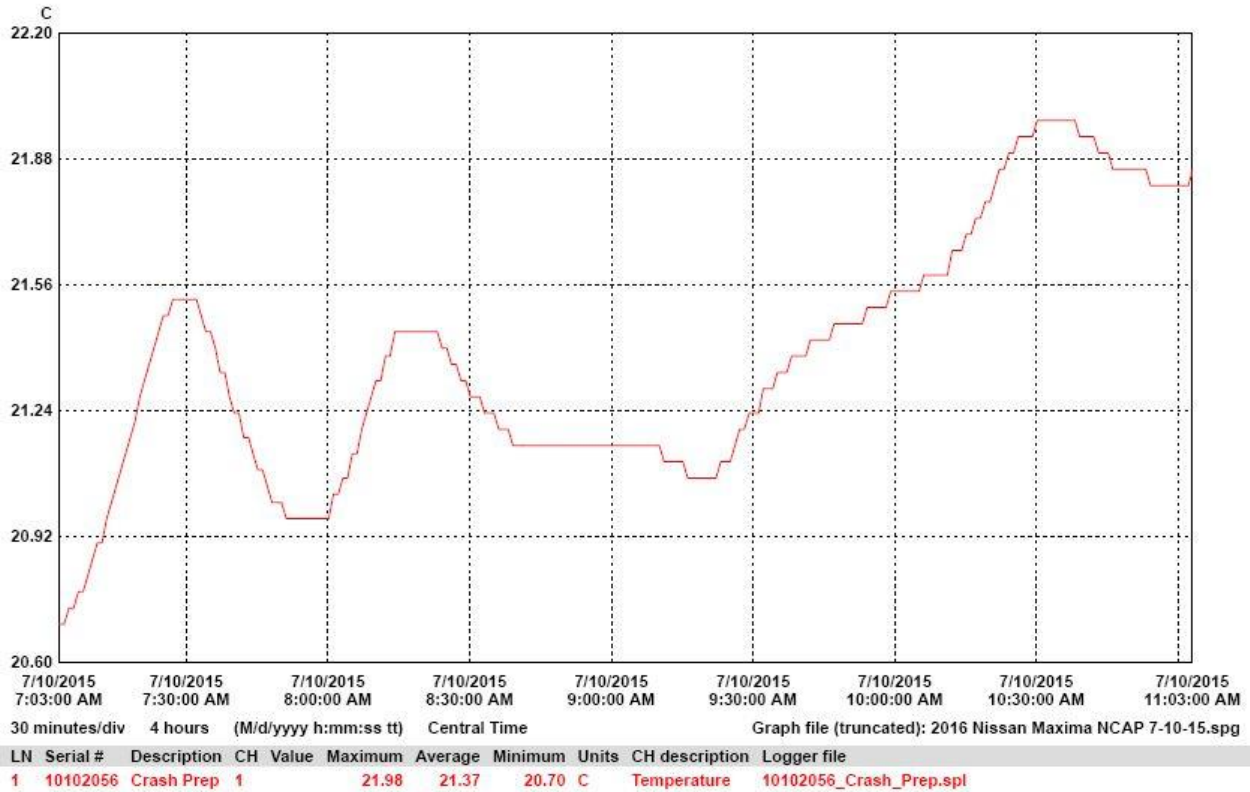
SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	Fuel sending unit seal.
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 17
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2016 Nissan Maxima S 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20165200
 Test Date: 7/10/2015



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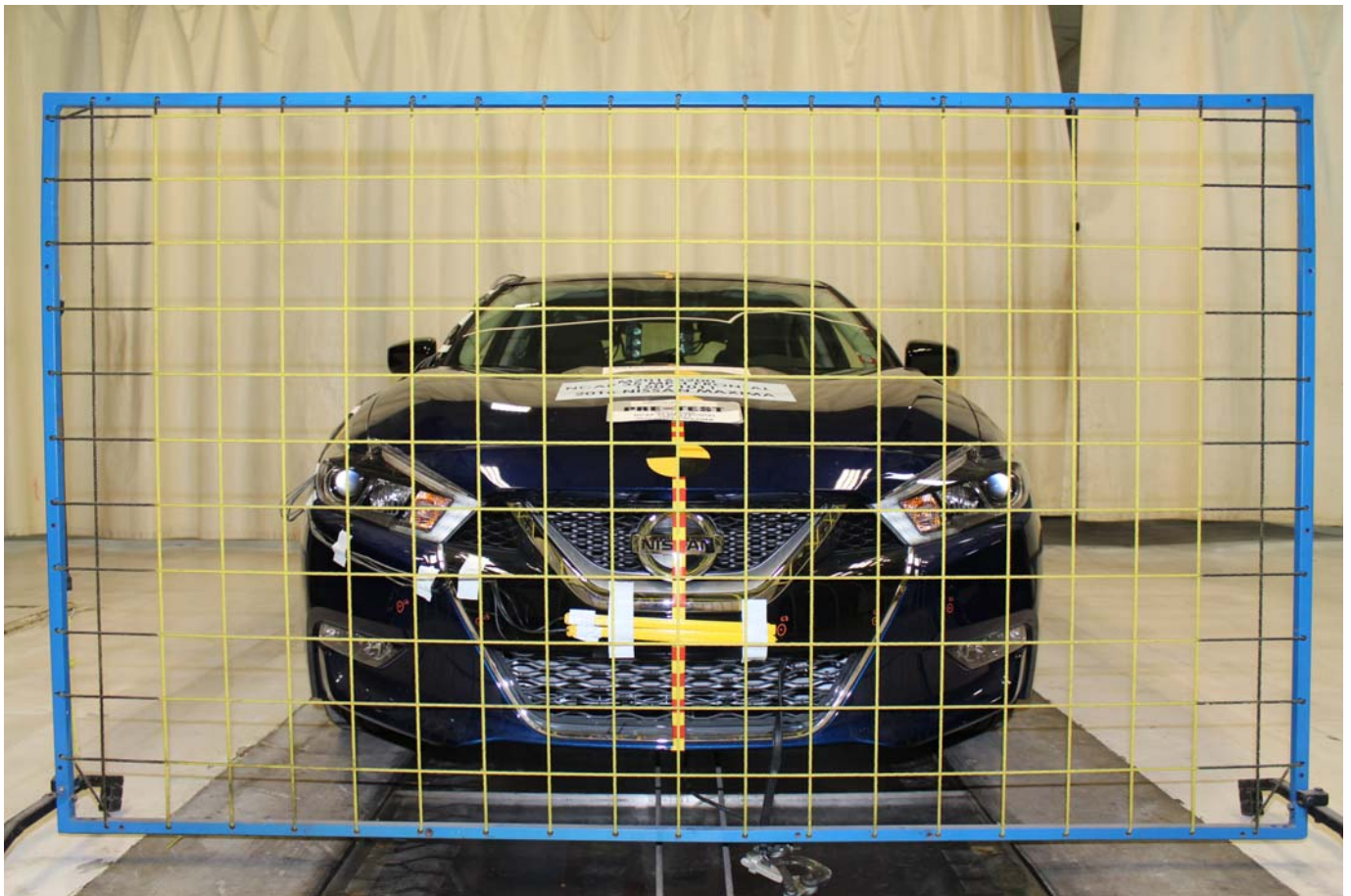


Photo No. 001 - Load Cell Location



Photo No. 002 - Load Cell Wall



Photo No. 003 - Manufacturer's Label



Photo No. 004 - Tire Placard



Photo No. 005 - 2016 Nissan Maxima Frontal As Delivered



Photo No. 006 - Left Rear 3-4 View, As Received

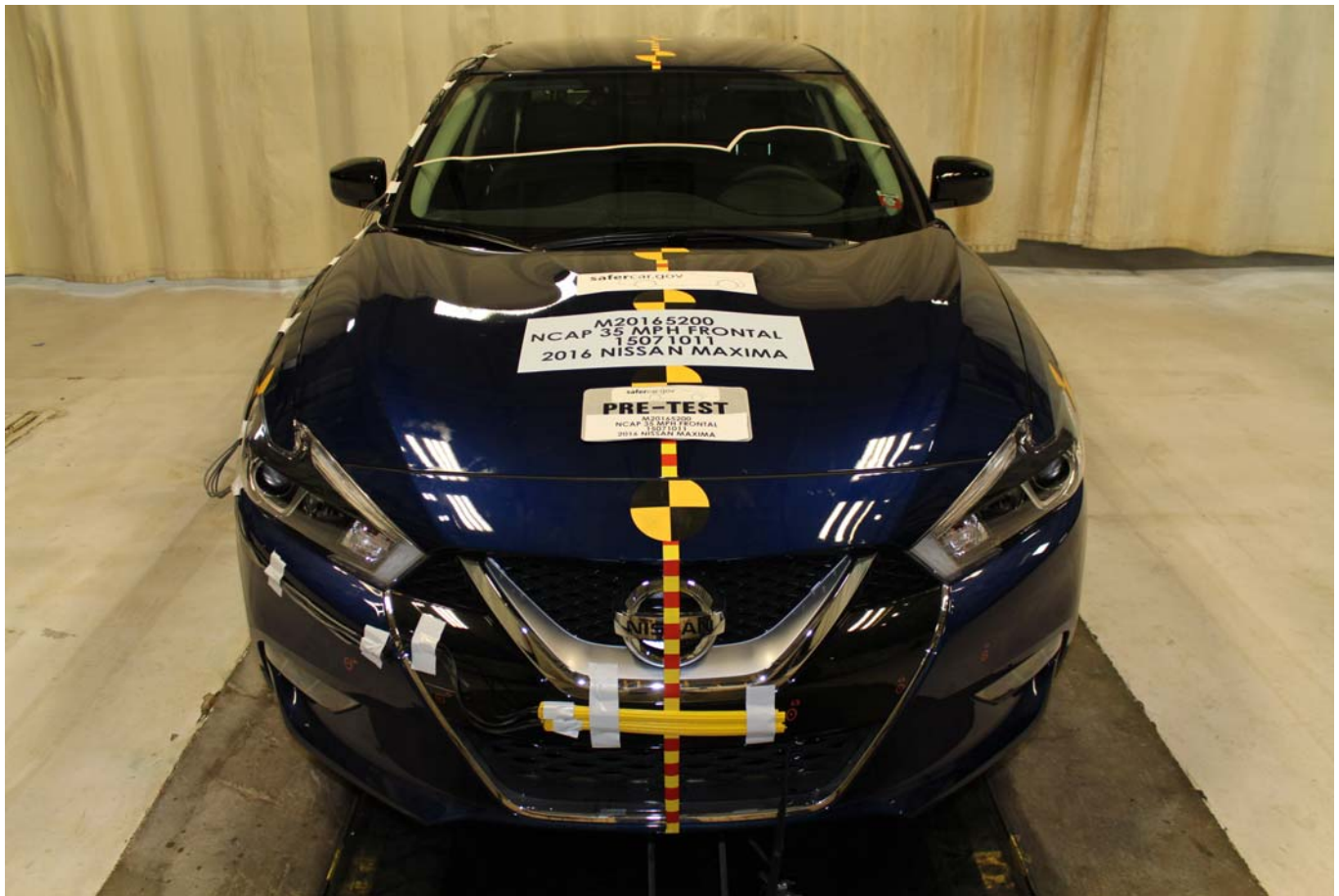


Photo No. 007 - Pre-Test Front View of Test Vehicle

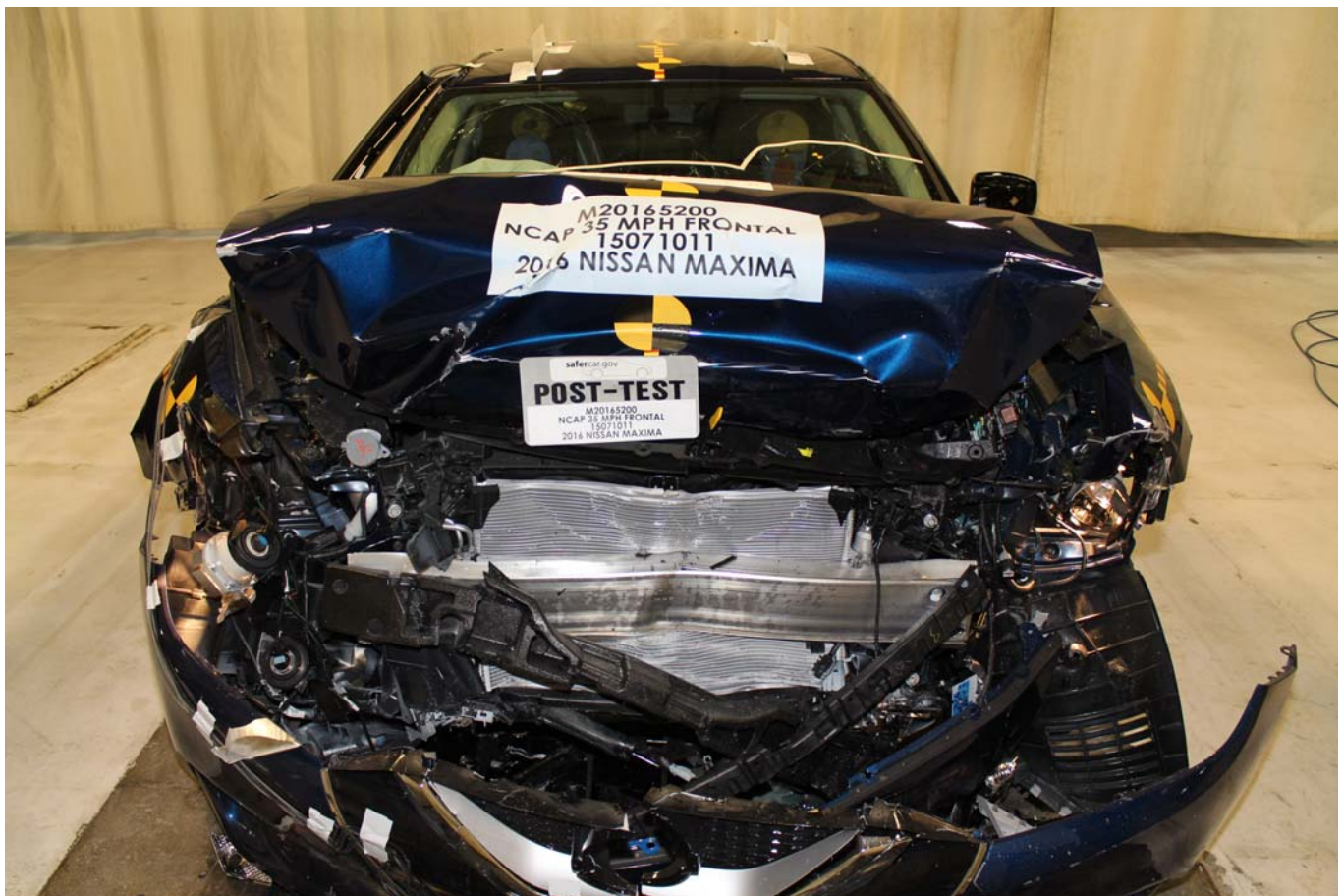


Photo No. 008 - Post-Test Front View of Test Vehicle



Photo No. 009 - Pre-Test Left View of Test Vehicle

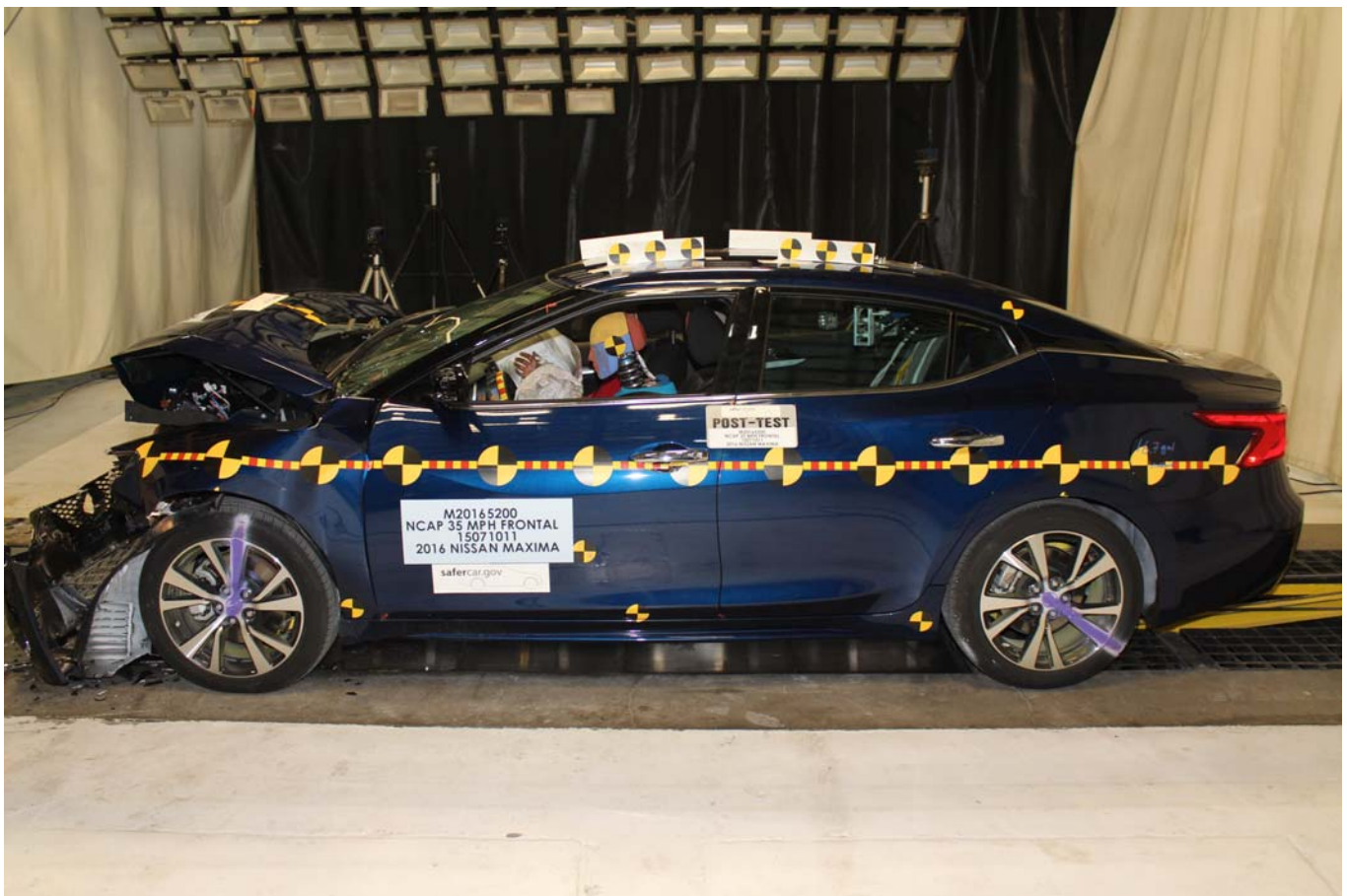


Photo No. 010 - Post-Test Left View of Test Vehicle



Photo No. 011 - Pre-Test Right View of Test Vehicle

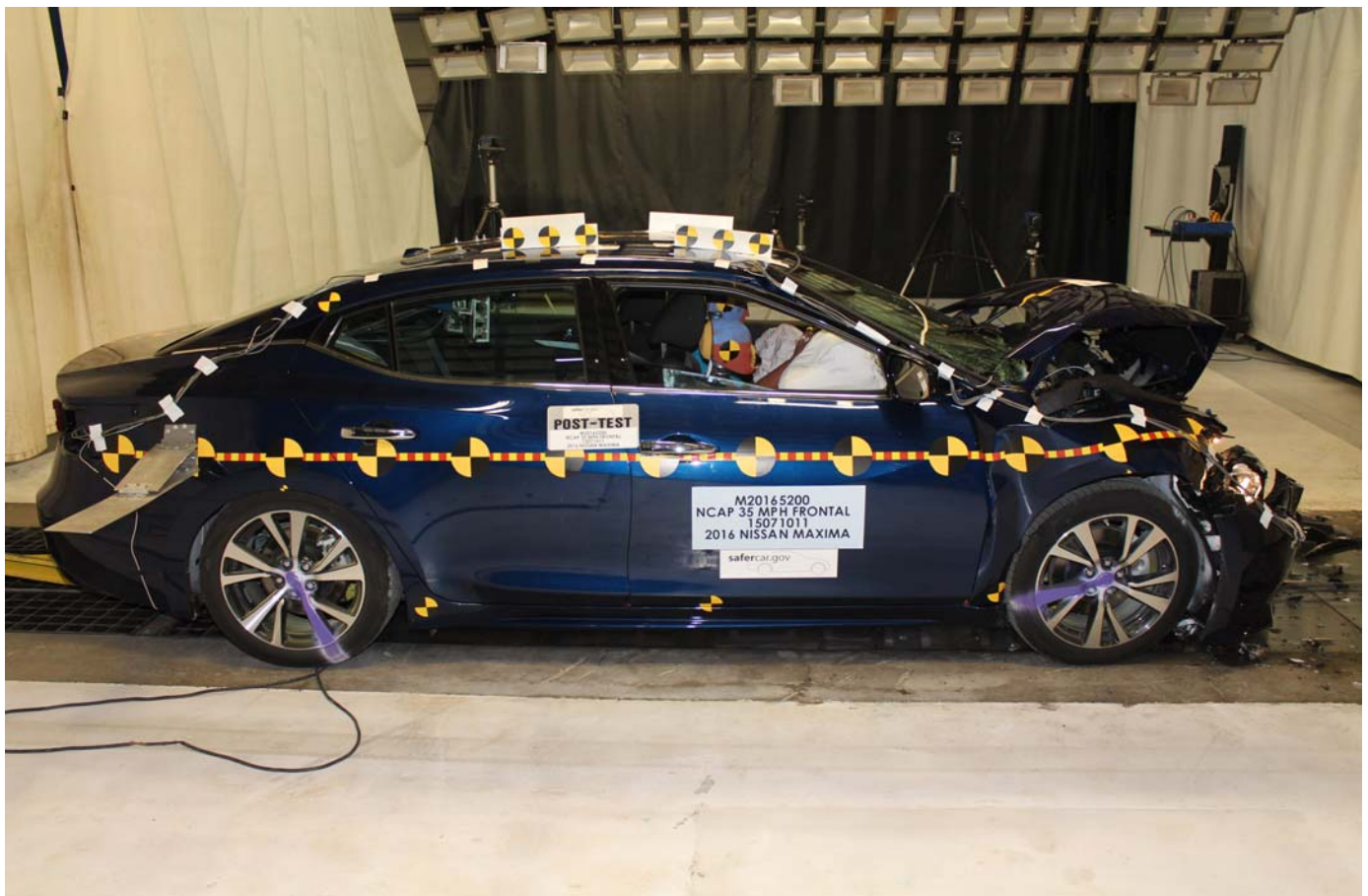


Photo No. 012 - Post-Test Right View of Test Vehicle



Photo No. 013 - Pre-Test Right Front 3-4 View



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



Photo No. 015 - Pre-Test Left Rear 3-4 View



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



Photo No. 017 - Pre-Test Windshield View



Photo No. 018 - Post-Test Windshield View



Photo No. 019 - Pre-Test Engine Compartment View



Photo No. 020 - Post-Test Engine Compartment View



Photo No. 021 - Pre-Test Fuel Filler Cap View



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

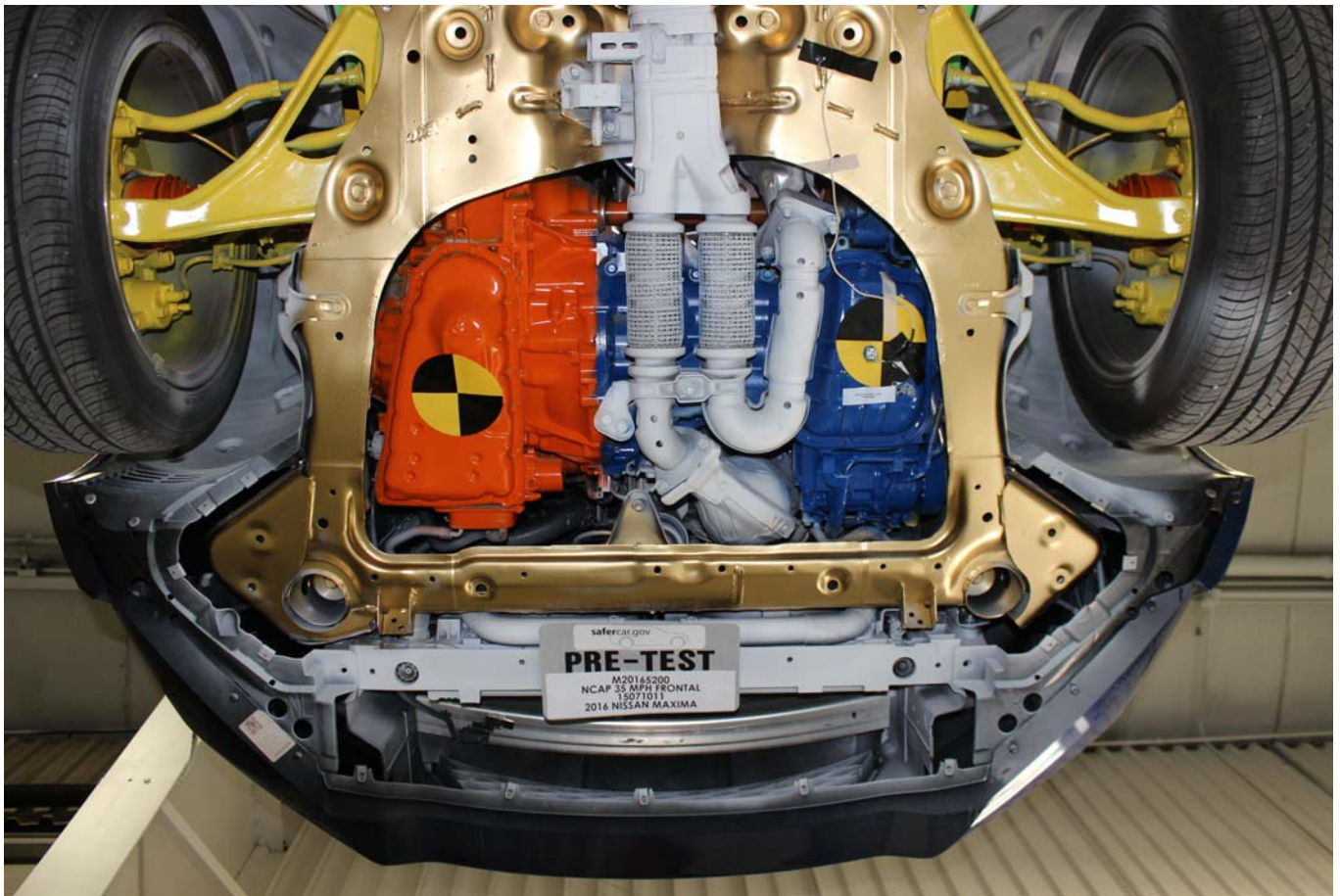


Photo No. 023 - Pre-Test Front Underbody View

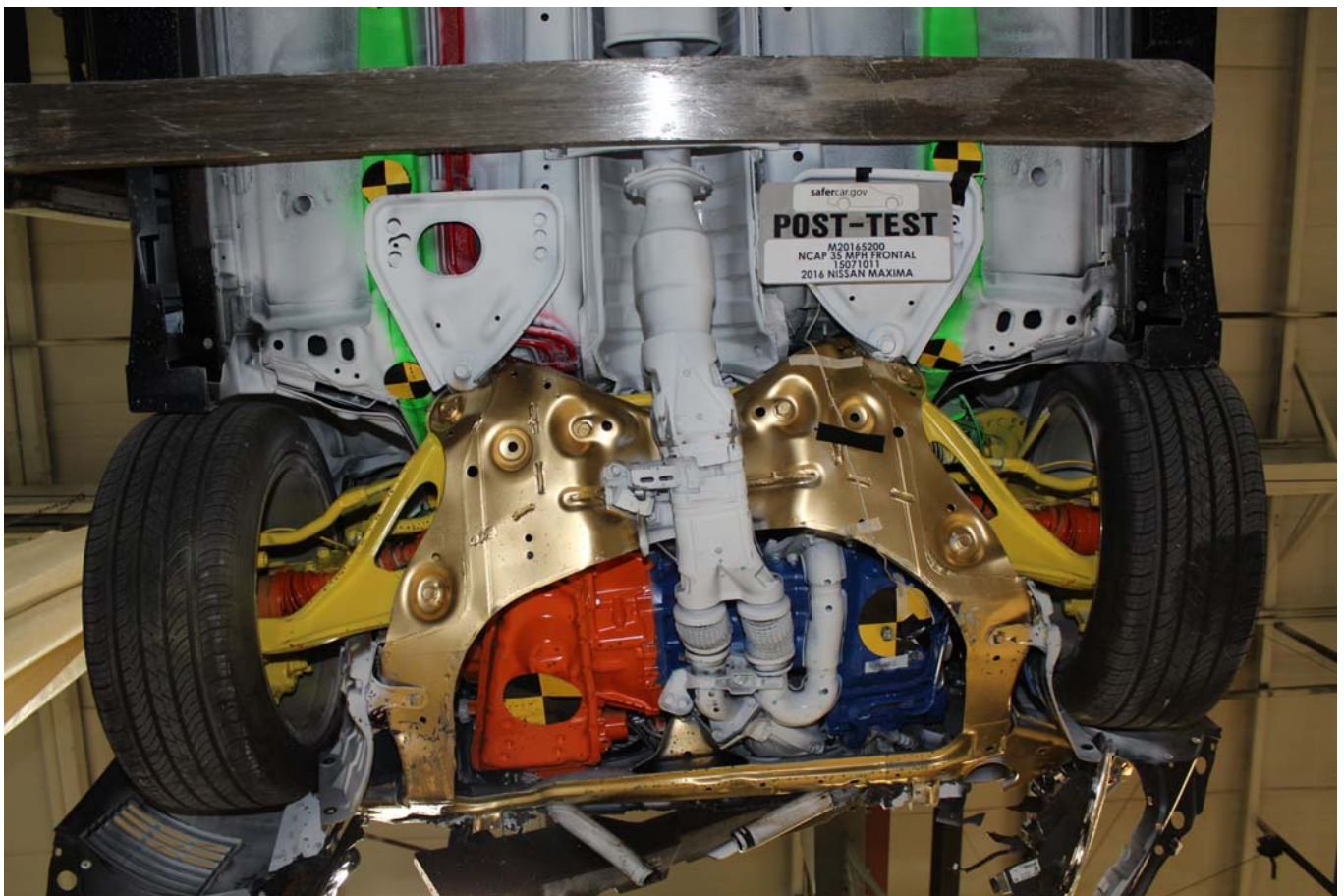


Photo No. 024 - Post-Test Front Underbody View

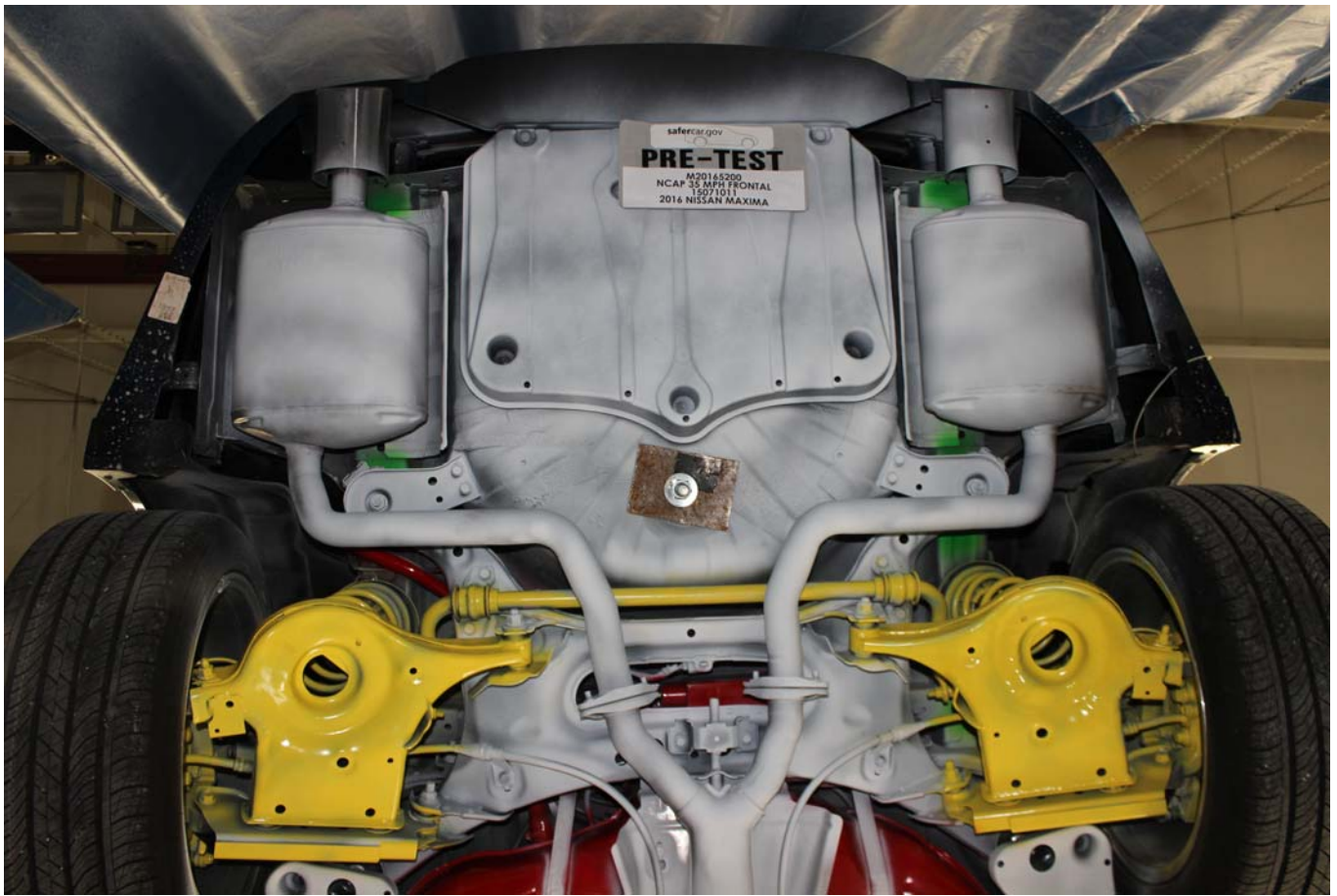


Photo No. 025 - Pre-Test Rear Underbody View

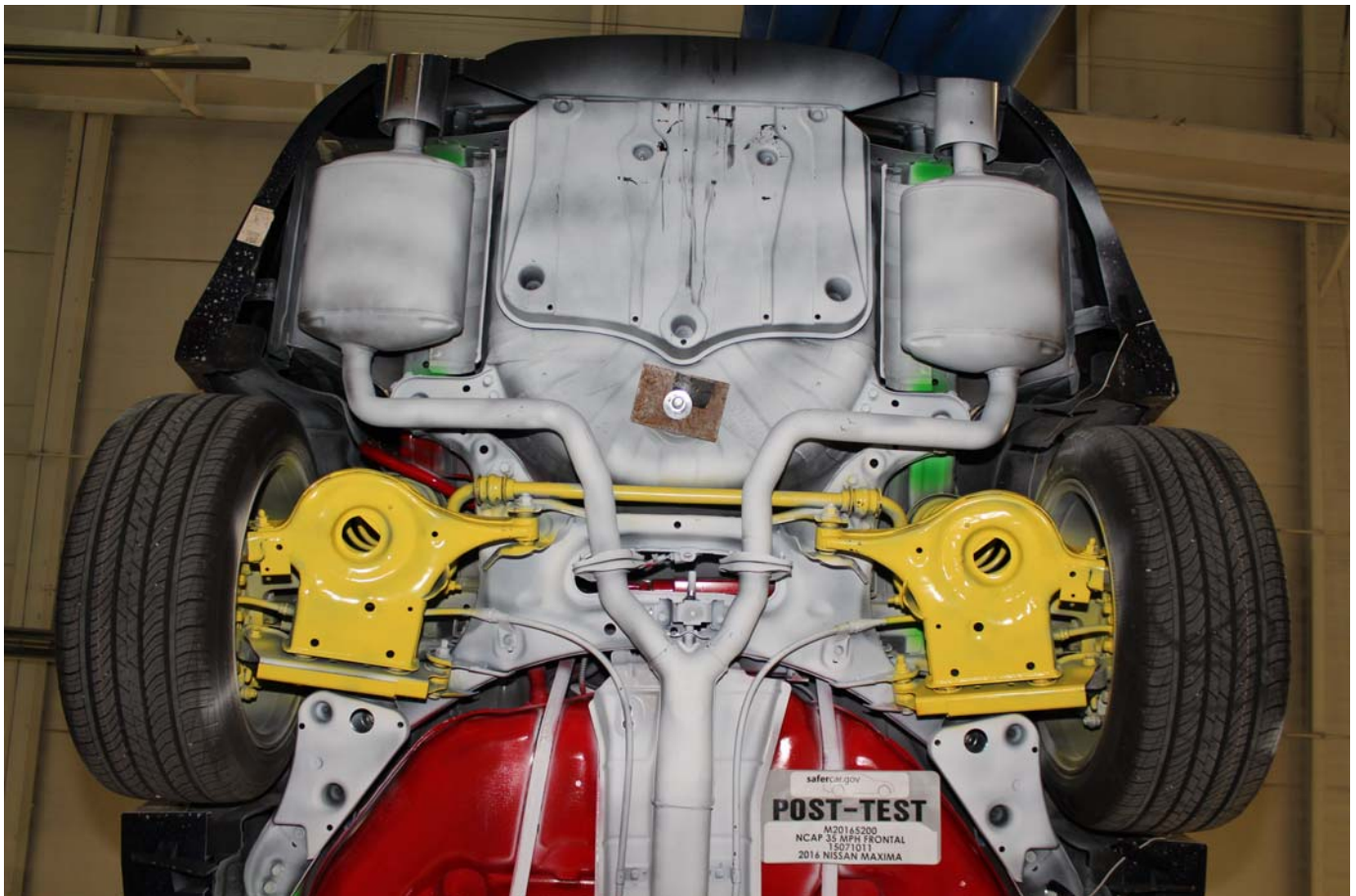


Photo No. 026 - Post-Test Rear Underbody View



Photo No. 027 - Pre-Test Dummy Cable Routing



Photo No. 028 - Post-Test Dummy Cable Routing



Photo No. 029 - Pre-Test Driver Dummy Front View



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



Photo No. 031 - Pre-Test Driver Dummy Window View



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



Photo No. 033 - Pre-Test Driver Dummy and Vehicle Interior (Door Open)

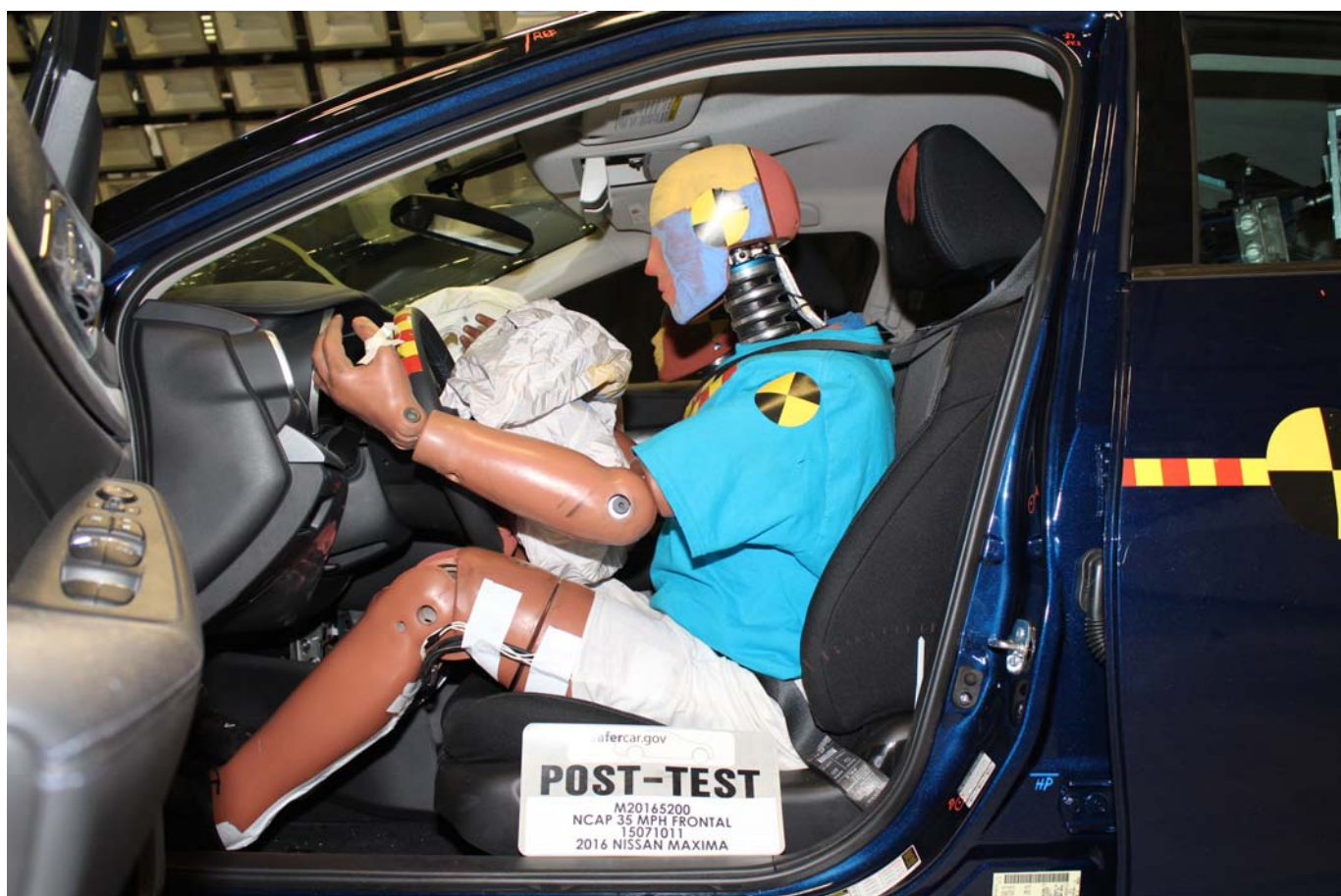


Photo No. 034 - Post-Test Driver Dummy and Vehicle Interior (Door Open)



Photo No. 035 - Pre-Test Driver's Seat Fore-Aft Markings



Photo No. 036 - Post-Test Driver's Seat Fore-Aft Markings



Photo No. 037 - Pre-Test View of Belt Anchorage for Driver Dummy



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



Photo No. 039 - Pre-Test Driver Dummy Feet



Photo No. 040 - Post-Test Driver Dummy Feet



Photo No. 041 - Pre-Test Driver's Side Knee Bolster (without dummy)



Photo No. 042 - Post-Test Driver's Side Knee Bolster (without dummy)



Photo No. 043 - Pre-Test Driver's Side Floorpan



Photo No. 044 - Post-Test Driver's Side Floorpan



Photo No. 045 - Post-Test Driver Dummy Face



Photo No. 046 - Post-Test Driver Dummy Contact with Airbag



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



Photo No. 047a - Post-Test Driver Dummy Contact with Knee Bolster



Photo No. 048 - Pre-Test View of the Steering Wheel



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



Photo No. 050 - Pre-Test Passenger Dummy Front View



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



Photo No. 052 - Pre-Test Passenger Dummy Window View



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



Photo No. 054 - Pre-Test Passenger Dummy and Vehicle Interior (Door Open)



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

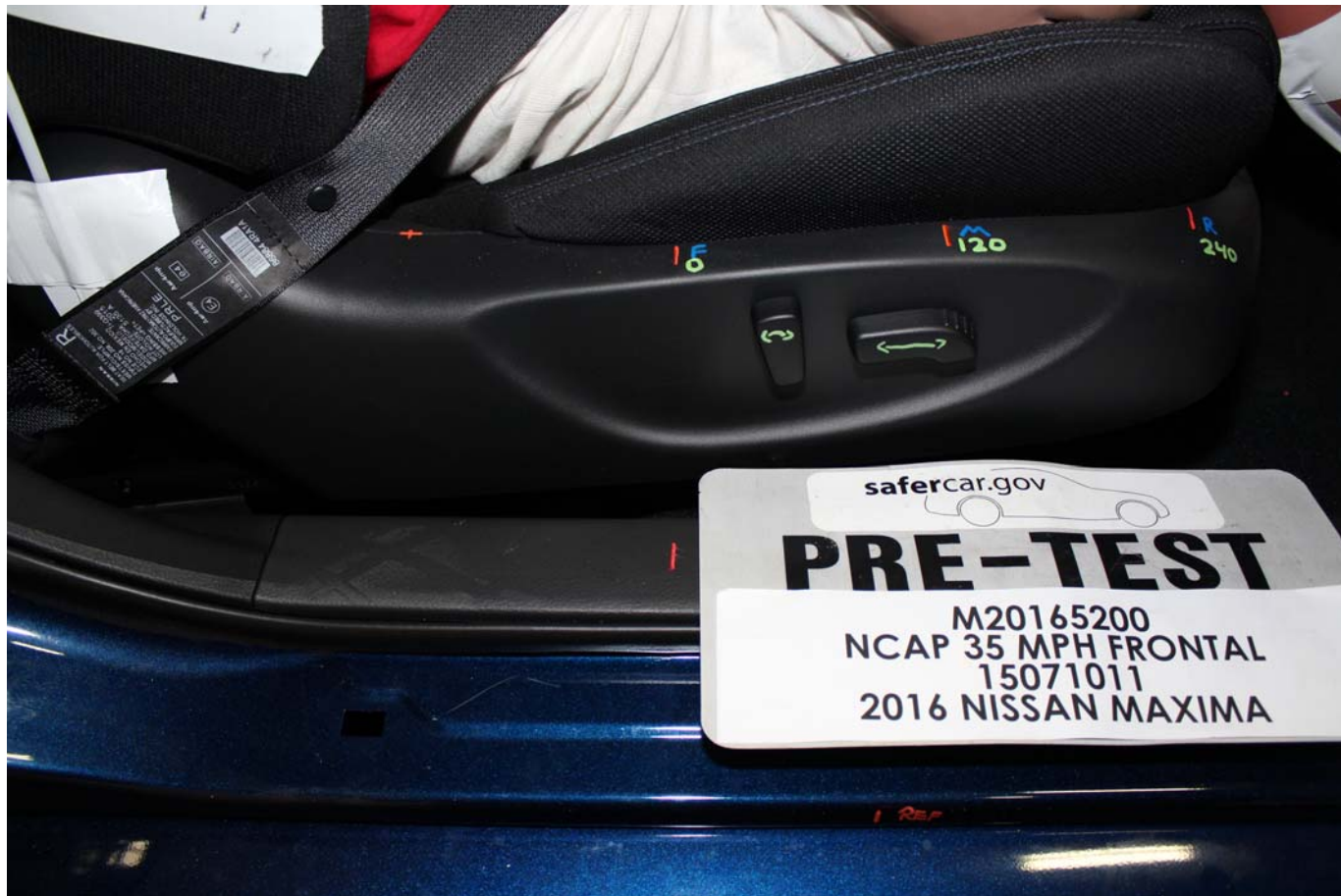


Photo No. 056 - Pre-Test Passenger's Seat Fore-Aft Markings



Photo No. 057 - Post-Test Passenger's Seat Fore-Aft Markings



Photo No. 058 - Pre-Test View of Belt Anchorage for Passenger Dummy



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



Photo No. 060 - Pre-Test Passenger Dummy Feet



Photo No. 061 - Post-Test Passenger Dummy Feet



Photo No. 062 - Pre-Test Passenger's Side Knee Bolster (without dummy)



Photo No. 063 - Post-Test Passenger's Side Knee Bolster (without dummy)



Photo No. 064 - Pre-Test Passenger's Side Floorpan



Photo No. 065 - Post-Test Passenger's Side Floorpan



Photo No. 066 - Post-Test Passenger Dummy Face



Photo No. 067 - Post-Test Passenger Dummy Contact with Airbag



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



Photo No. 068a - Post-Test Passenger Dummy Contact with Glovebox



Photo No. 069 - Ballast Installed in Vehicle



Photo No. 070 - Post-Test Stoddard Solvent Spillage Location View



Photo No. 071 - Post-Test Speed Trap Read-Out

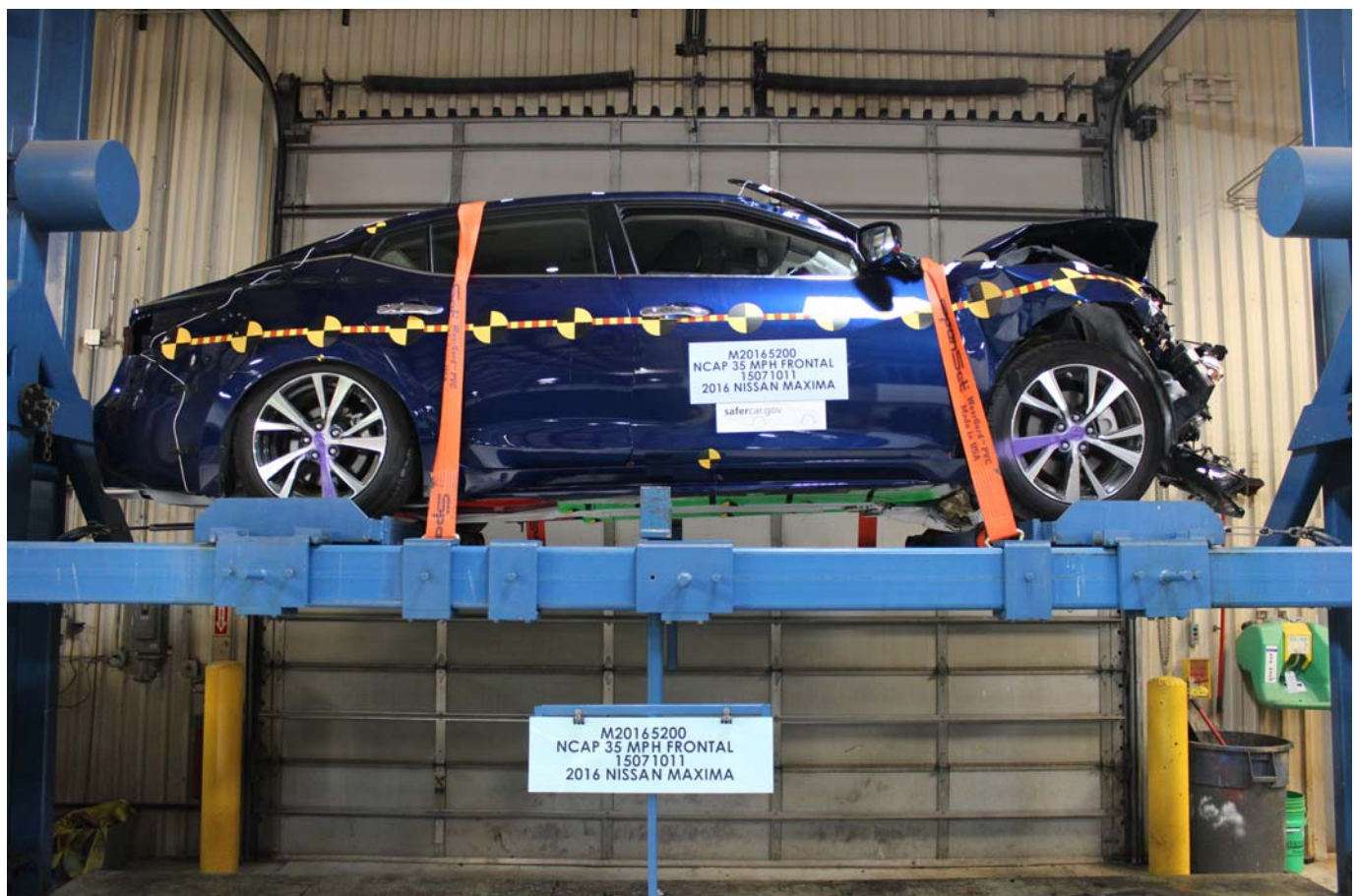


Photo No. 072 - Vehicle at 0 Degree on Static Rollover Device

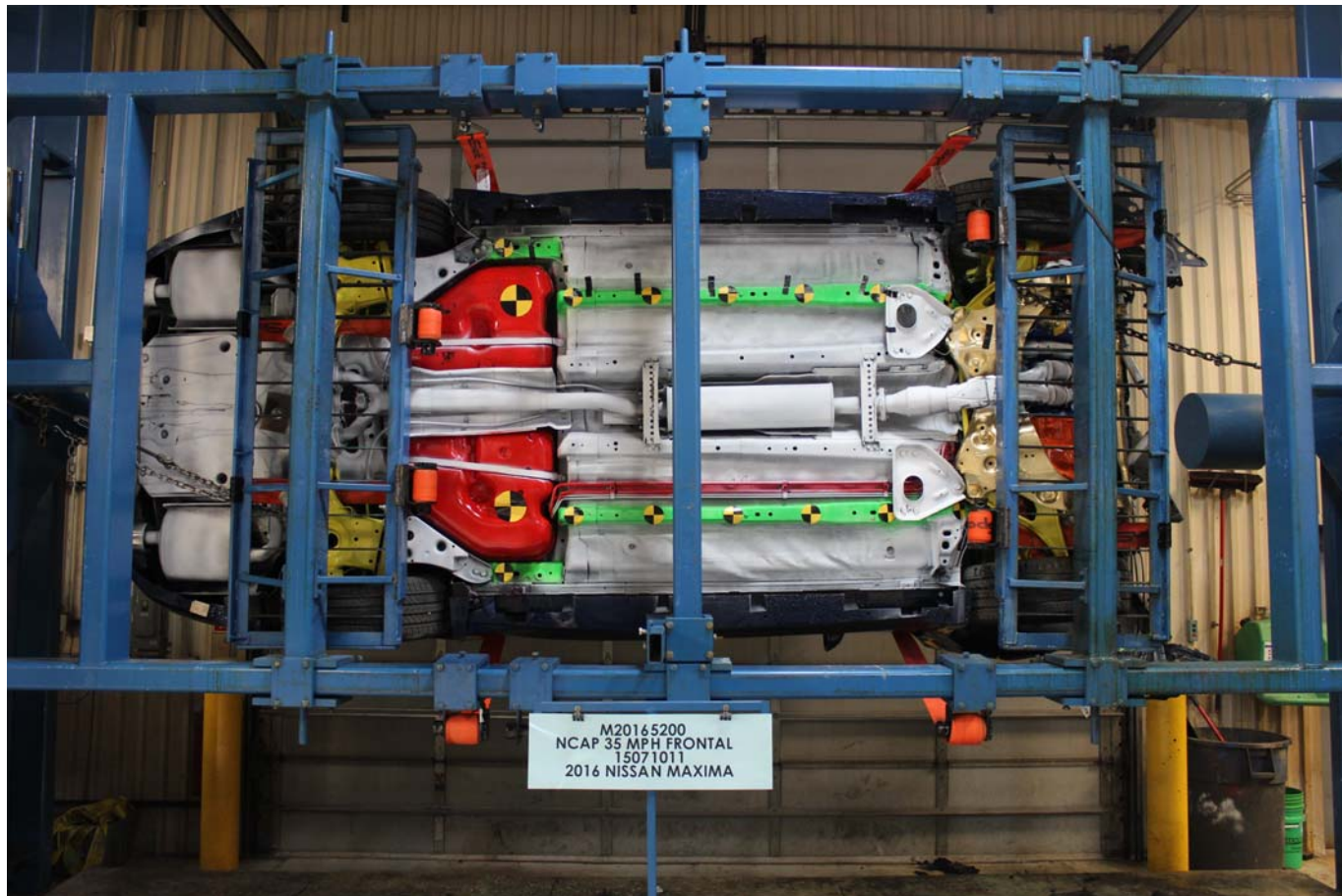


Photo No. 073 - Vehicle at 90 Degrees on Static Rollover Device

PHOTOGRAPH NOT APPLICABLE

Photo No. 074 - Vehicle at 180 Degrees on Static Rollover Device

PHOTOGRAPH NOT APPLICABLE

Photo No. 075 - Vehicle at 270 Degrees on Static Rollover Device

PHOTOGRAPH NOT APPLICABLE

Photo No. 076 - Vehicle at 360 Degrees on Static Rollover Device



Photo No. 077 - 2016 Nissan Maxima Frontal Impact Event



2016 NISSAN MAXIMA S

Scan QR code for general model information & options

Fuel Economy and Environment

Fuel Economy

25 MPG
combined city/hwy

22 city 30 highway

4.0 gallons per 100 miles

Annual fuel cost \$2,000

Fuel Economy & Greenhouse Gas Rating

6

Smog Rating

5

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score

Not Rated

Frontal Crash

Driver Not Rated

Passenger Not Rated

Side Crash

Front seat Not Rated

Rear seat Not Rated

Rollover

Not Rated

Gasoline Vehicle

You spend \$1,000 more in fuel costs over 5 years

DELIVERY

VEHICLE COLORS:

EXT: DEEP BLUE PEARL

INT: CHARCOAL

FINAL ASSEMBLY POINT:

SMYRNA

TRANSPORT METHOD:

TRUCK

DEALER:

HOSELTON NISSAN

66 MARSH RD

EAST ROCHESTER NY 14445

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE

3.5-liter DCHIC 24-Valve V6 Engine

300 Horsepower & 261 lb-ft Torque

Xtronic Transmission

Drive Mode Selector (Normal & Sport)

18" Machined Aluminum Alloy Wheels

SAFETY & SECURITY

Driver & Front Passenger, Side-Impact, & Curtain Air Bags

Lower Anchors & Tethers for Children (LATCH)

4-Wheel Anti-Lock Braking System (ABS)

Vehicle Dynamic Control (VDC)

W/ Traction Control System (TCS)

Electronic Brake Force Distribution (EBD)

& Brake Assist (BA)

Tire Pressure Monitoring System (TPMS)

& Easy-Fill Tire Alert

Nissan Vehicle Immobilizer System

Vehicle Security System

EXTERIOR

HaloGen Headlights

Automatic On/Off Headlights

LED Signature Daytime Running Lights

Front Fog Lights (HaloGen)

COMFORT & CONVENIENCE

NissanConnect™ W/ Navigation™

8" Color Display W/ Multi-Touch Control

Nissan Voice Recognition For Navigation & Audio

Rear/View Monitor (RVM)

Remote Engine Start W/ Intelligent Climate Control

8-Way Power Driver's & 4-Way Power Front Passenger's Seat

Cloth Seats

"Zero Gravity" Front Seats

60/40 Split Fold Down Rear Seats

Razor Steel Faceted Finishes

Leather-Wrapped D-Shaped Steering Wheel

Cruise Control

AM/FM/CD Audio System W/ 8 Speakers

SiriusXM Satellite Radio™

SiriusXM Traffic™ & SiriusXM Travel Link™ ***

Bluetooth® Hands-Free Phone System

Streaming Audio Via Bluetooth®

7" Advanced Drive Assist Display (ADAD)

Dual-Zone Automatic Temperature Control

Nissan Intelligent Key® W/ Push-Button Ignition

HomeLink® Universal Receiver

Two Front USB Connection Ports

Manufacturer's Suggested Retail Base Price:

\$32,410.00

Options Included by Manufacturer

SPLASH GUARDS 150.00

FLOOR MATS, TRUNK MAT & TRUNK NET (6-piece set) 220.00

DESTINATION CHARGES

\$25.00

Total*

\$33,645.00

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

Photo No. 078 - Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

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Figure No. 8.	Driver Chest Z Acceleration vs. Time	B-3
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Figure No. 10.	Driver Neck Force X vs. Time	B-4
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Figure No. 15.	Driver Nij (NCF) vs. Time	B-5
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Figure No. 22.	Passenger Head Resultant Acceleration vs. Time	B-7
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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

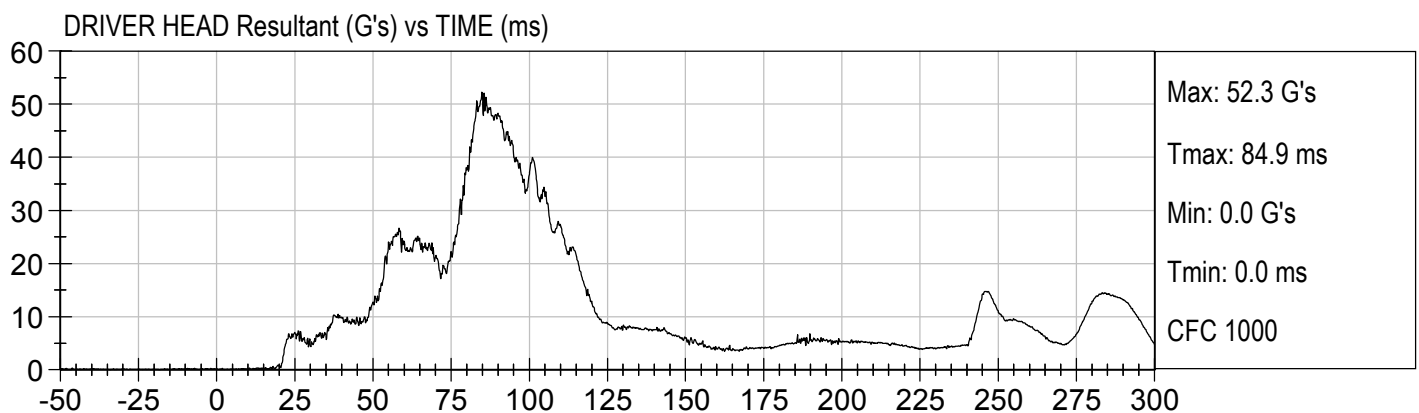
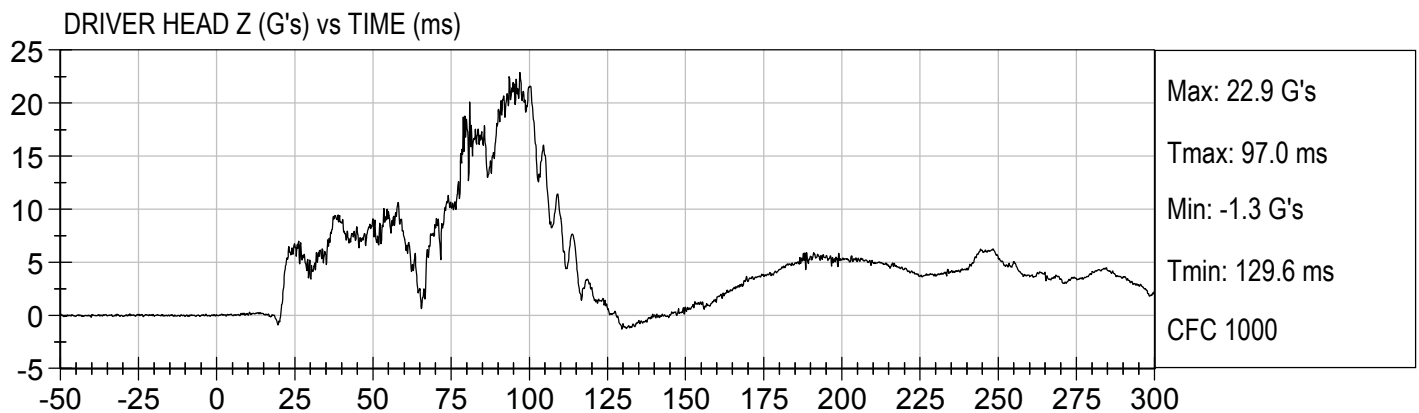
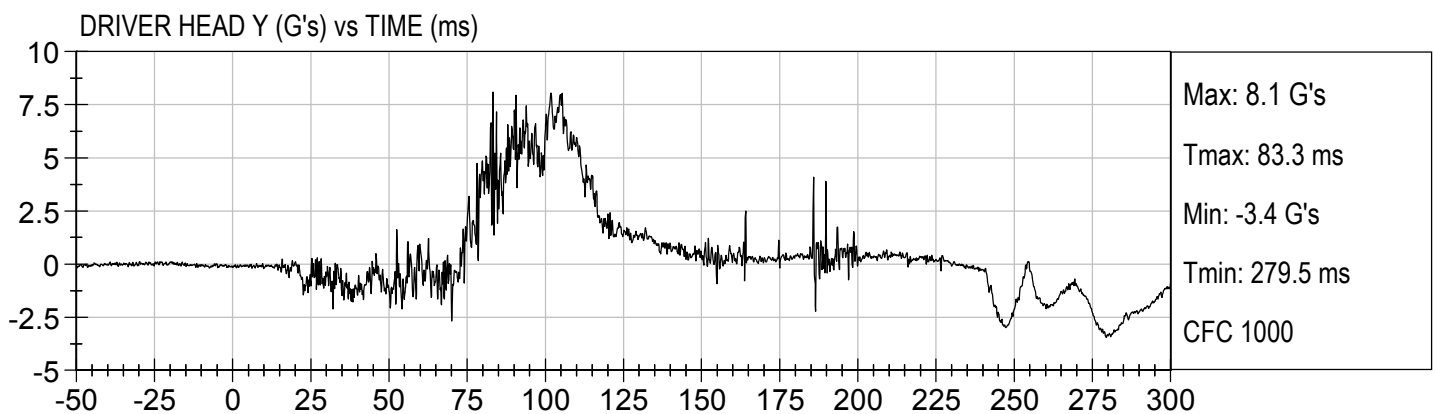
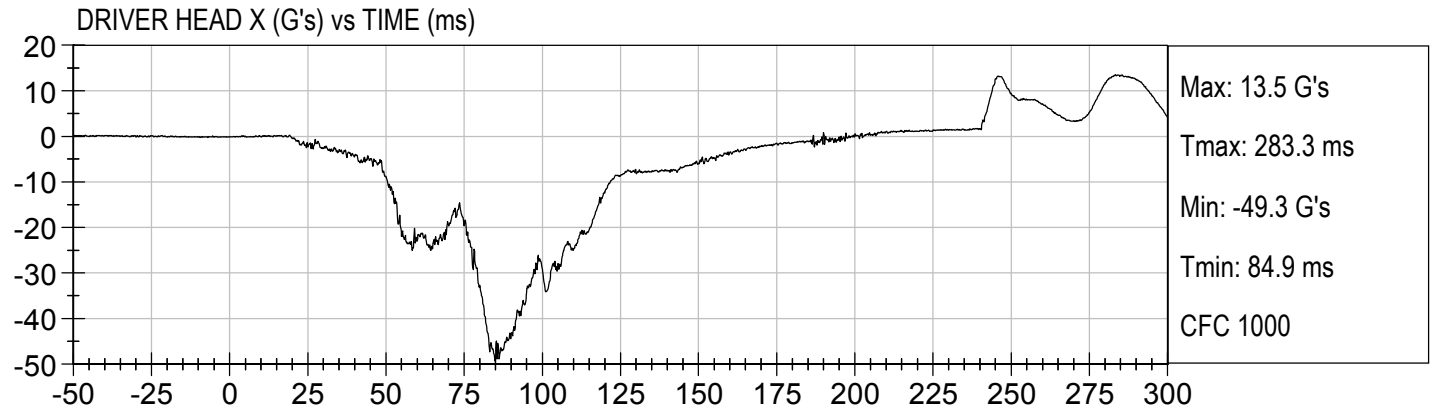
		<u>Page No.</u>
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Figure No. 29.	Passenger Neck Force Z vs. Time	B-10
Figure No. 30.	Passenger Neck Moment Y vs. Time	B-10
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Figure No. 33.	Passenger Nij (NCF) vs. Time	B-11
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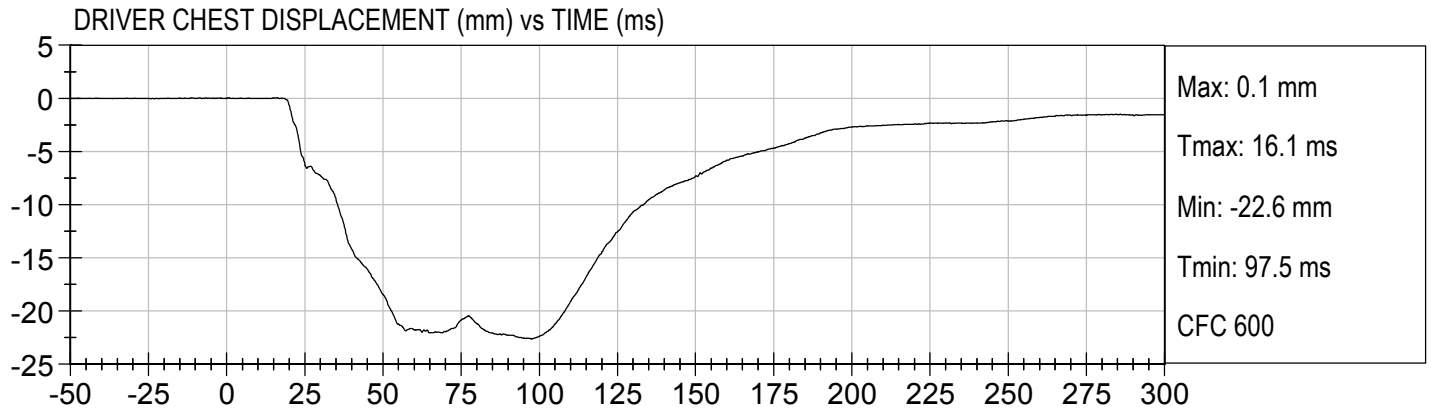
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

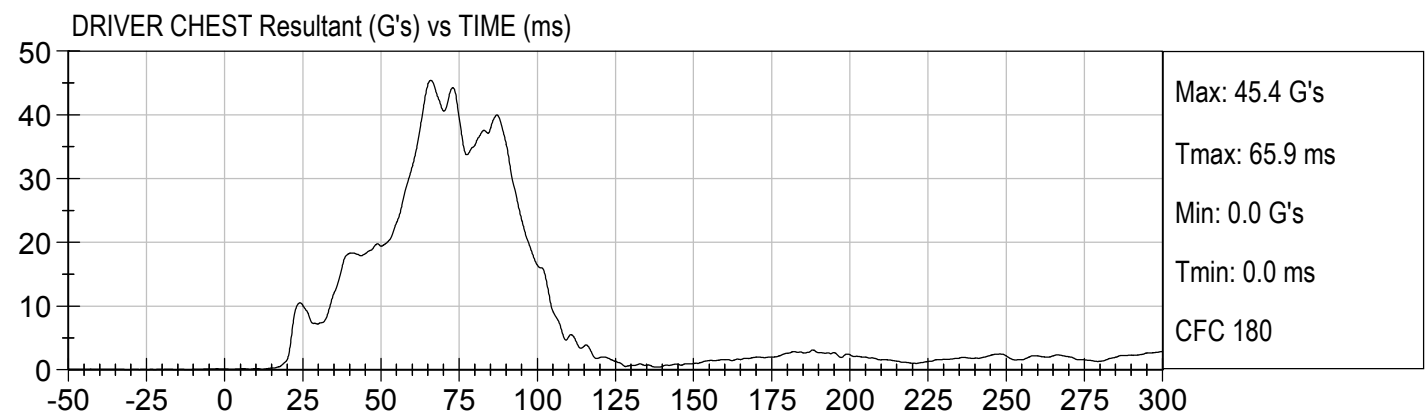
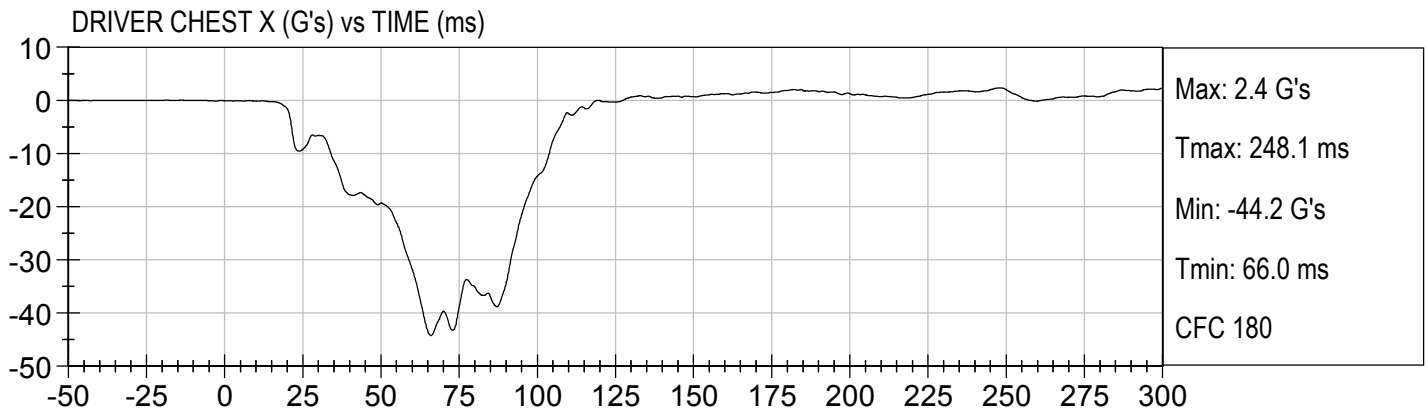
Driver Head X Redundant
 Driver Head Y Redundant
 Driver Head Z Redundant
 Driver Head Angular Velocity X
 Driver Head Angular Velocity Y
 Driver Head Angular Velocity Z
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant
 Driver Chest Y Redundant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

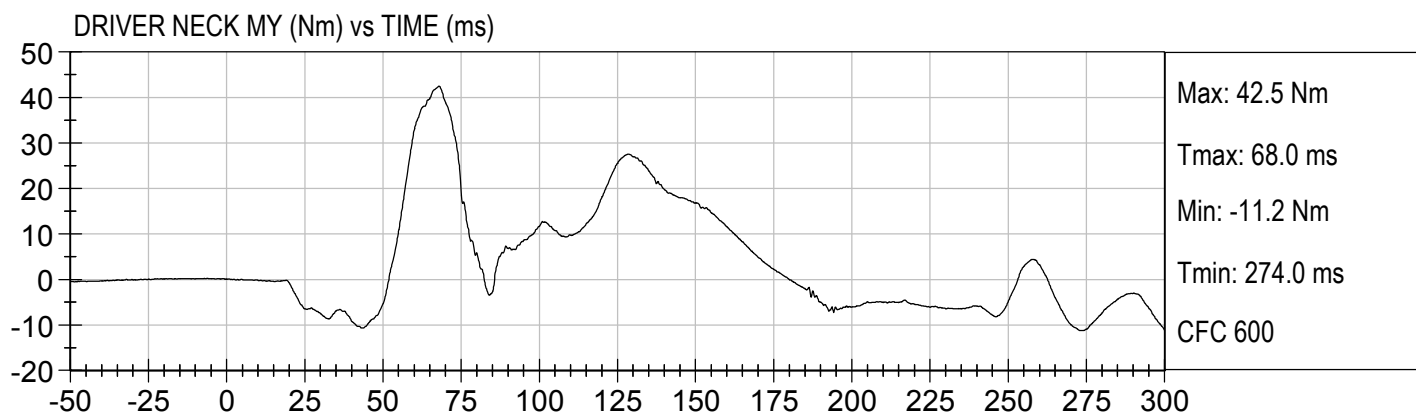
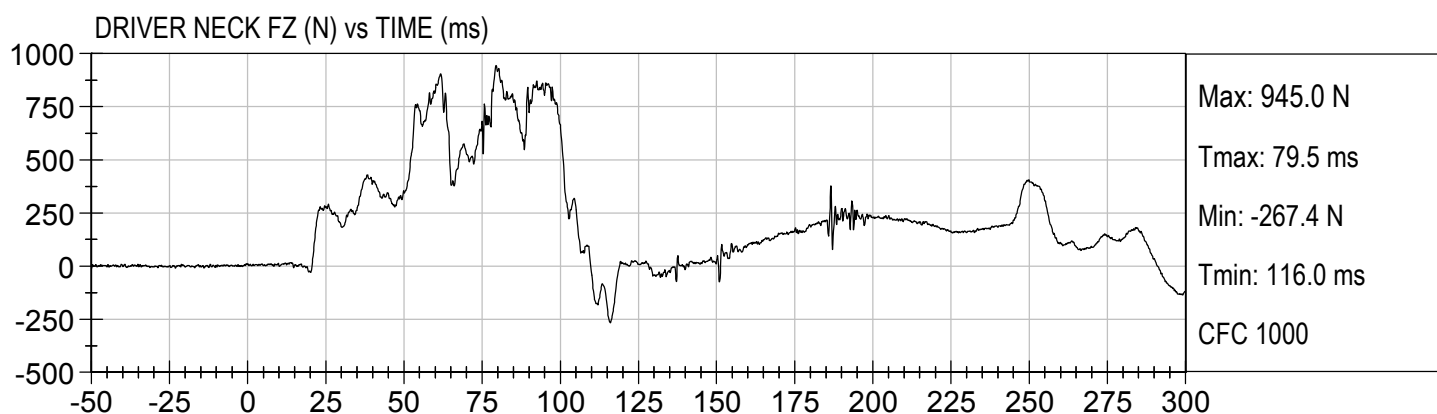
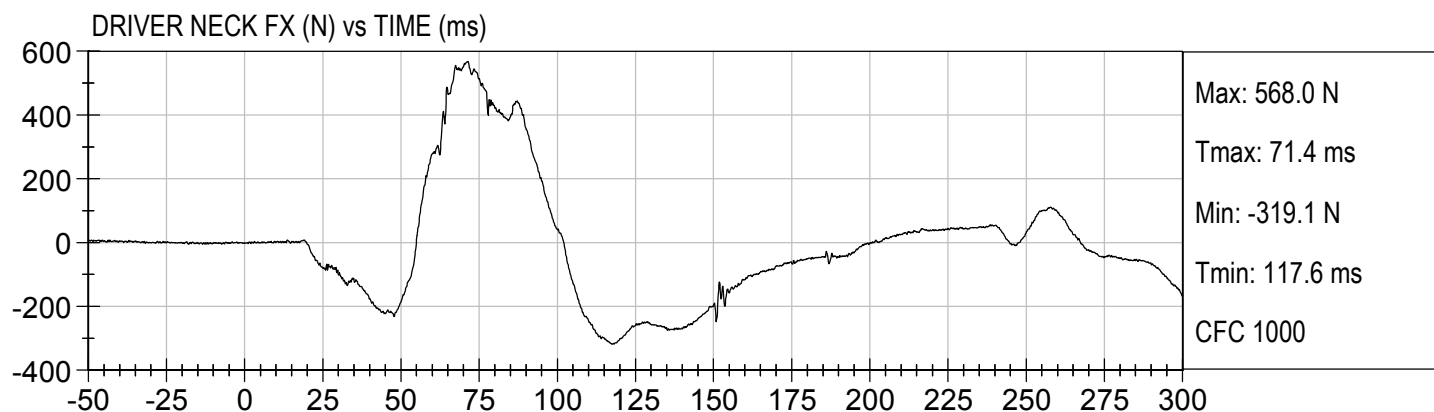
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver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

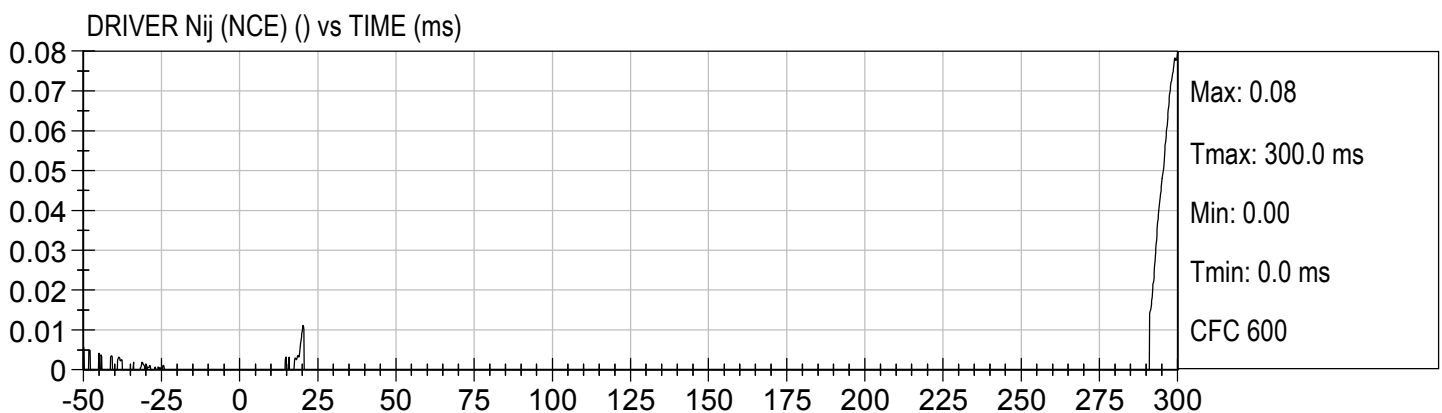
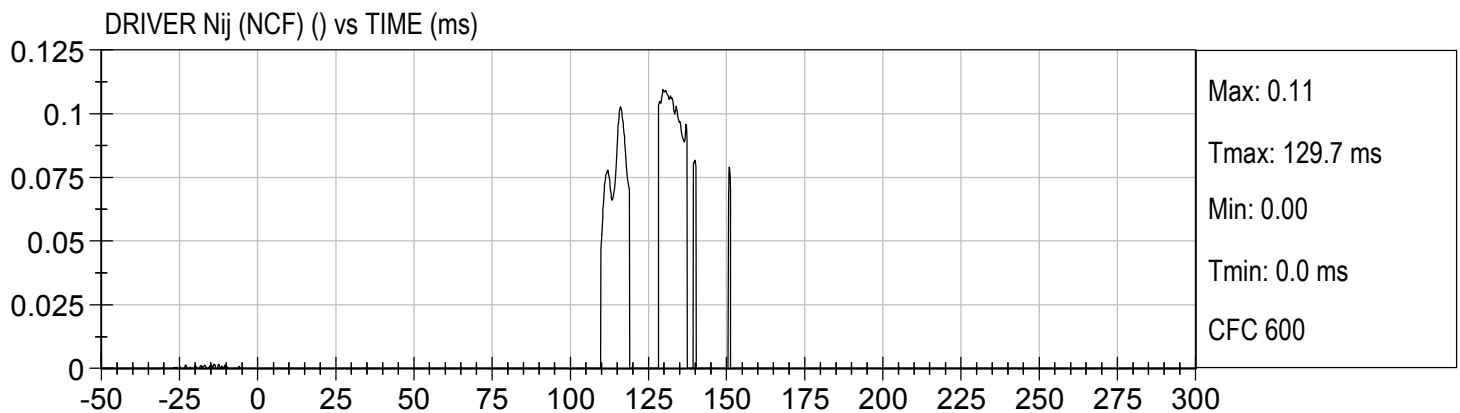
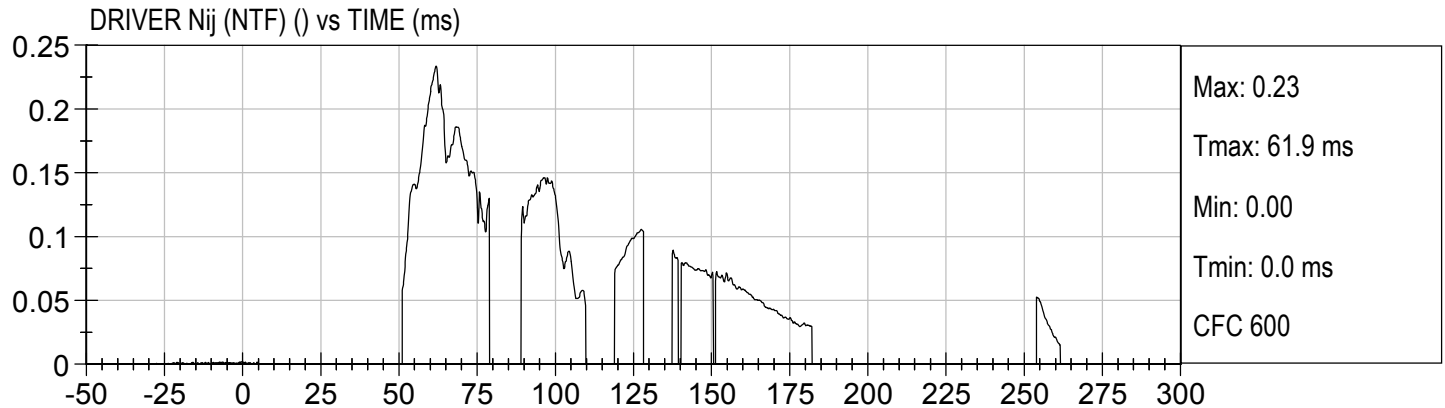
Passenger Pelvis Z
Passenger Left Femur Redundant
Passenger Right Femur Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger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

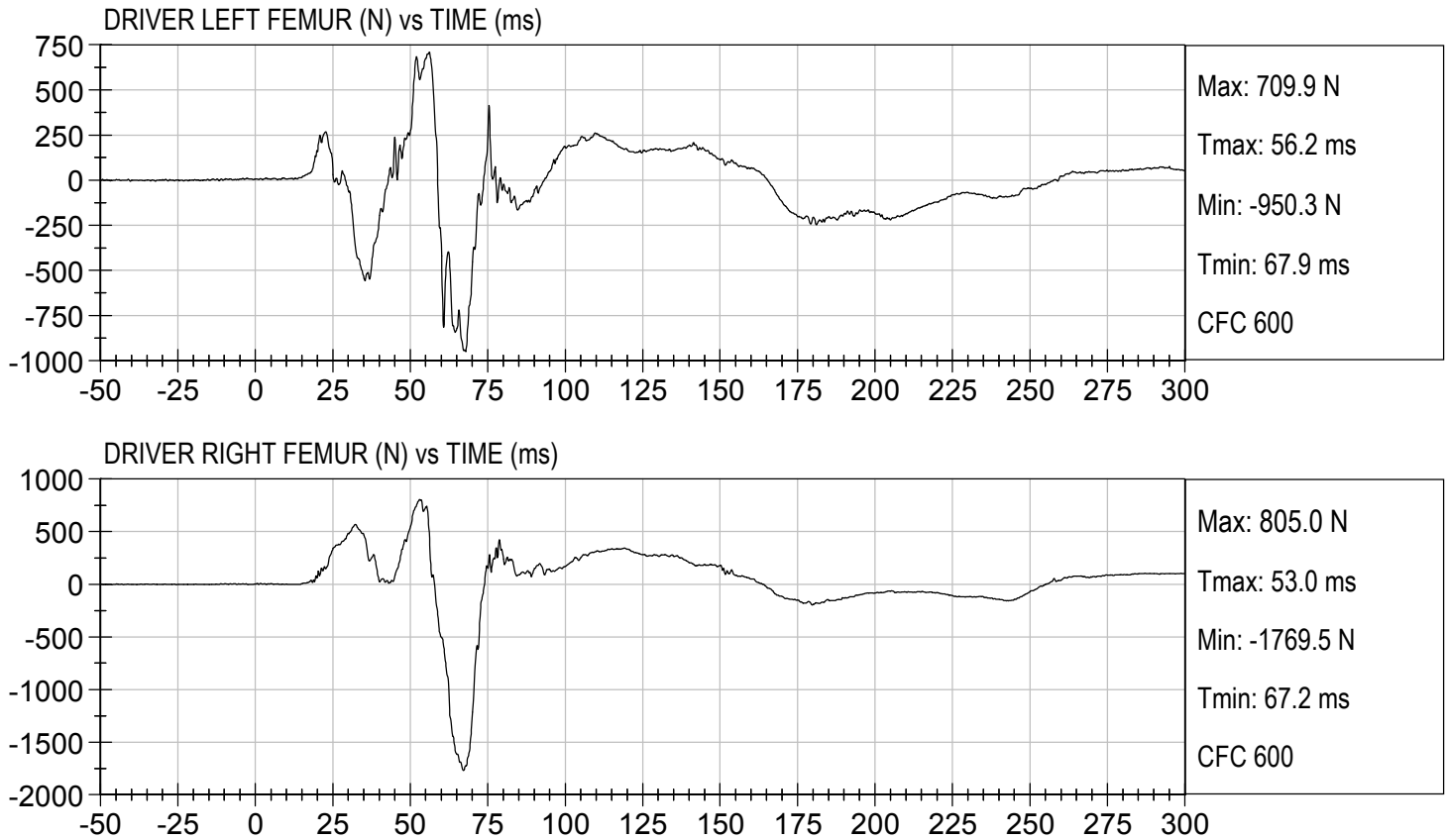


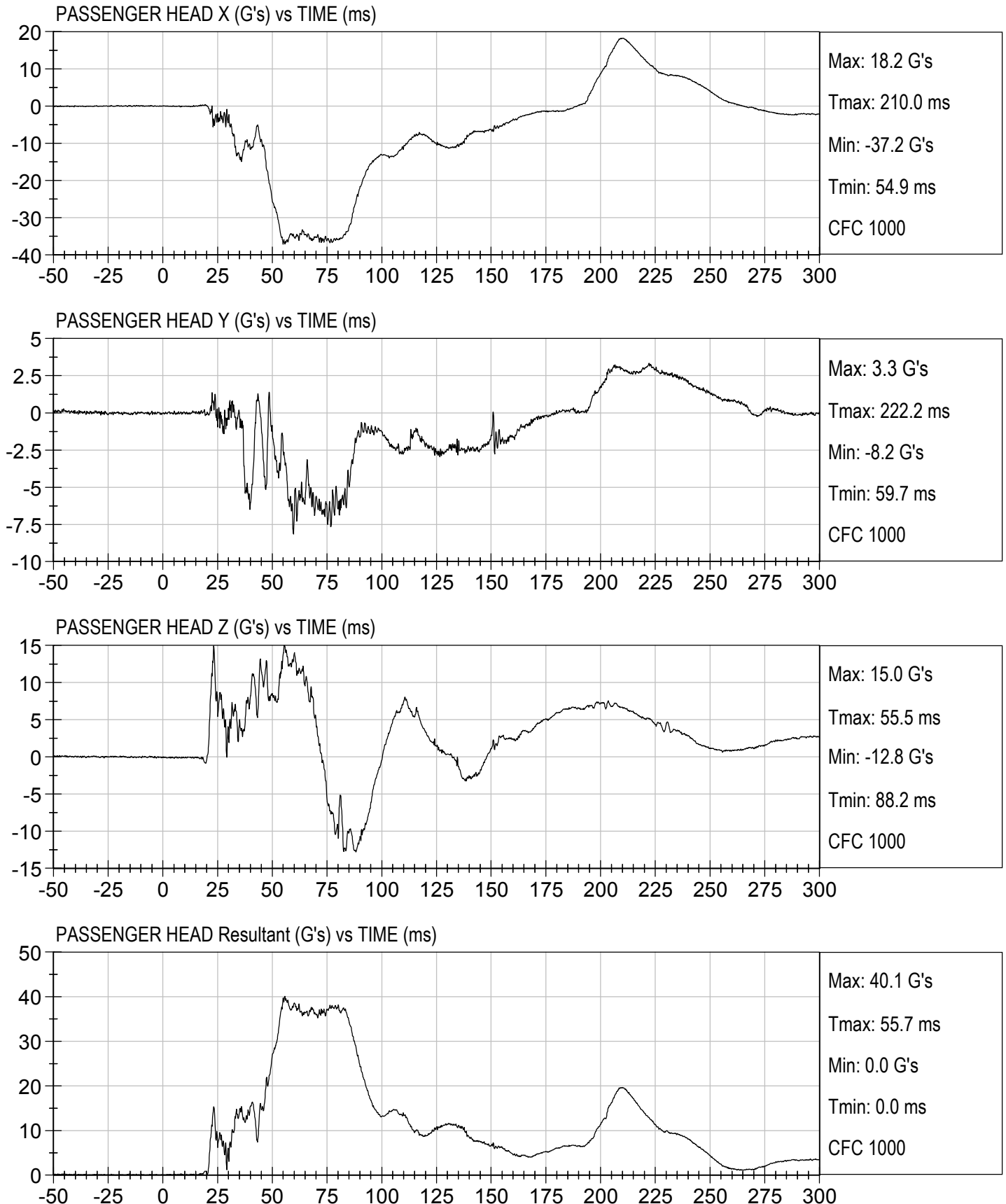


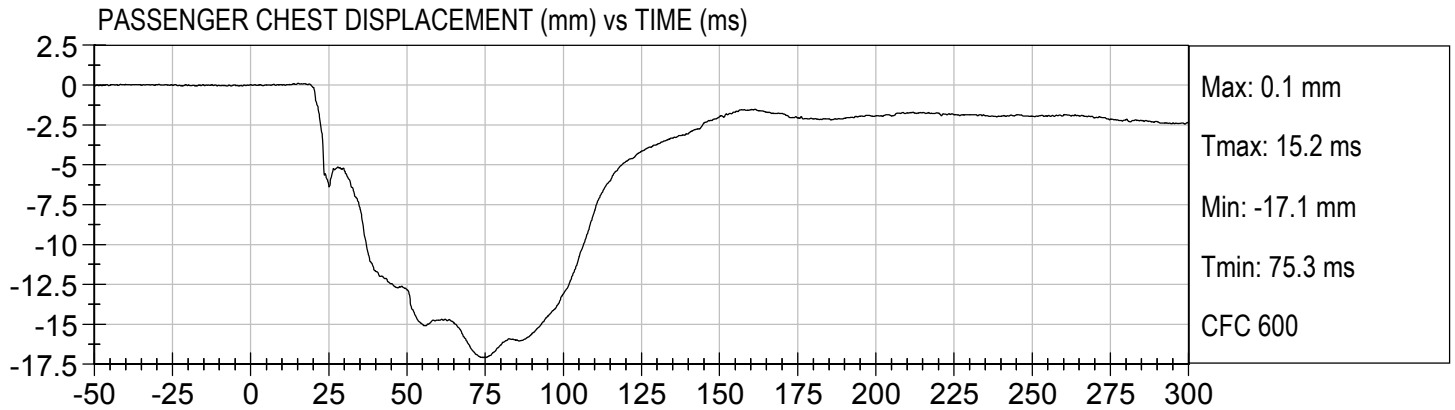


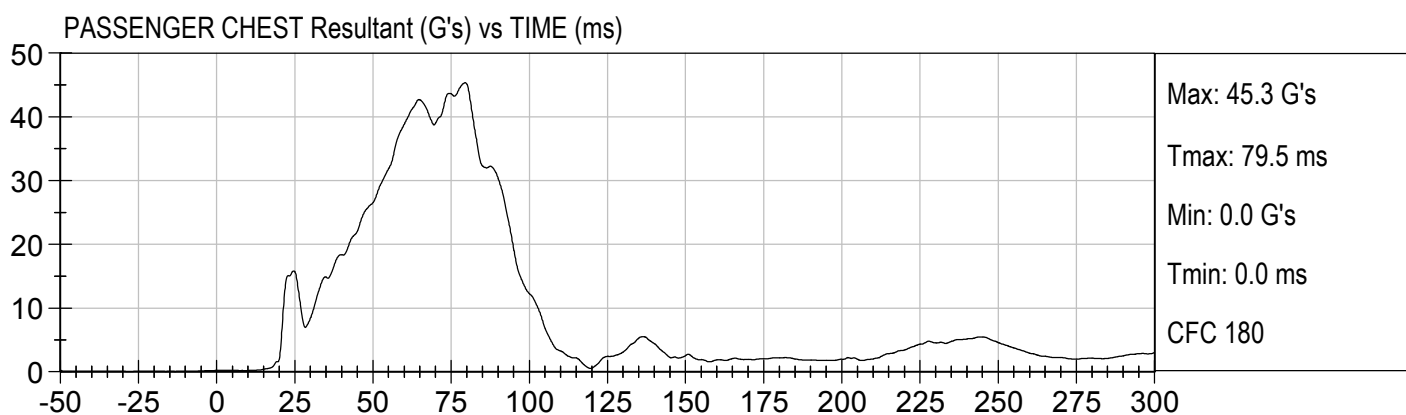
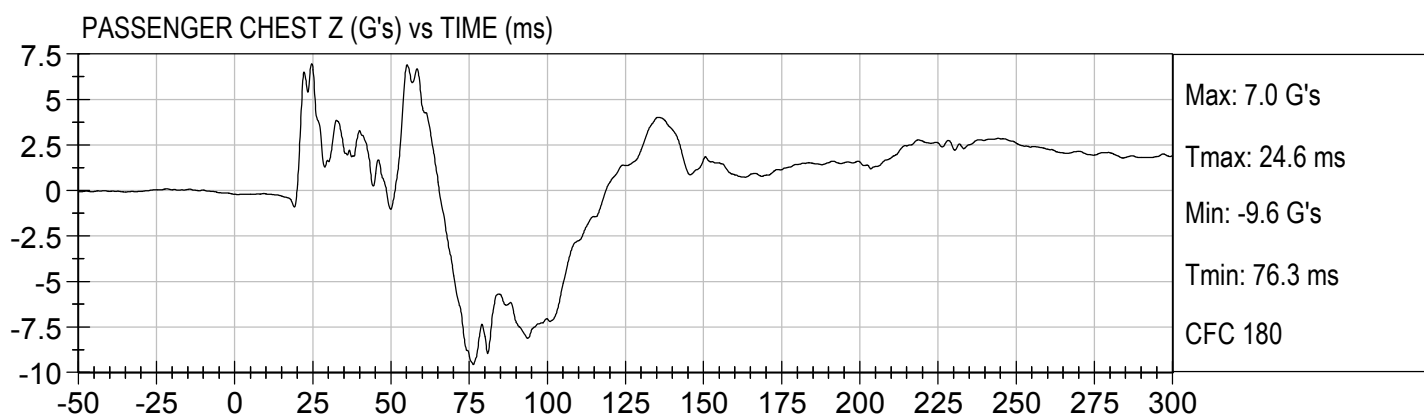
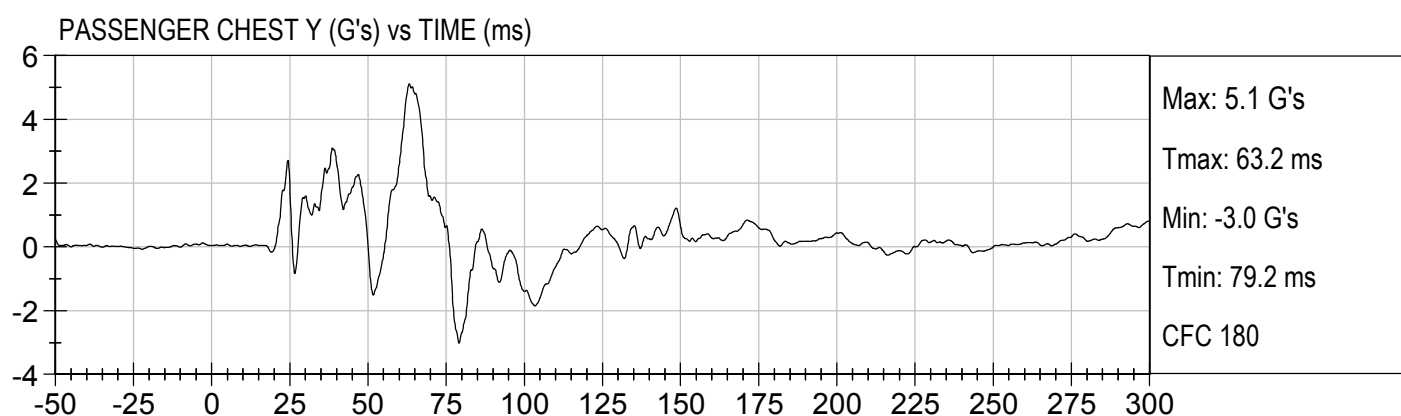
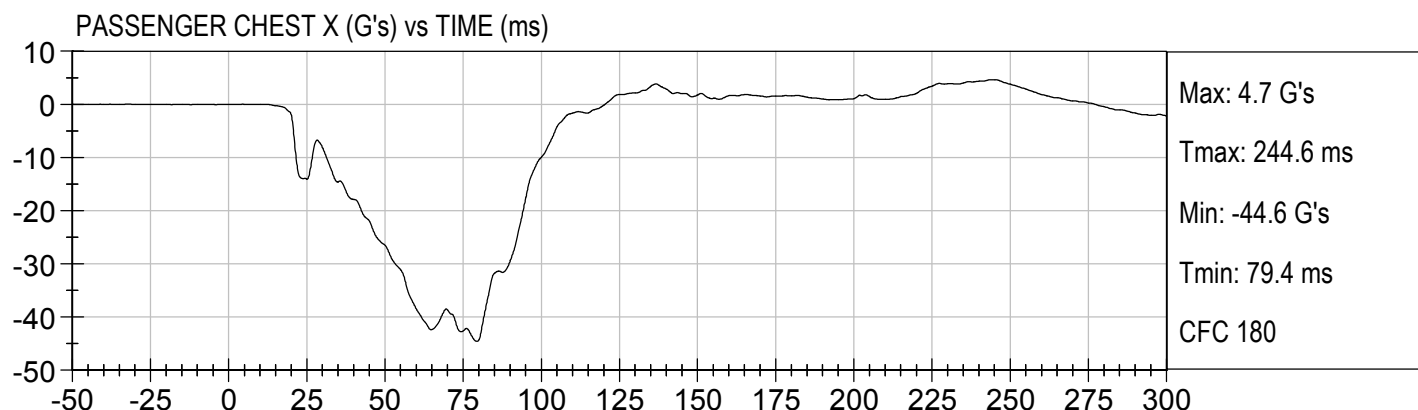


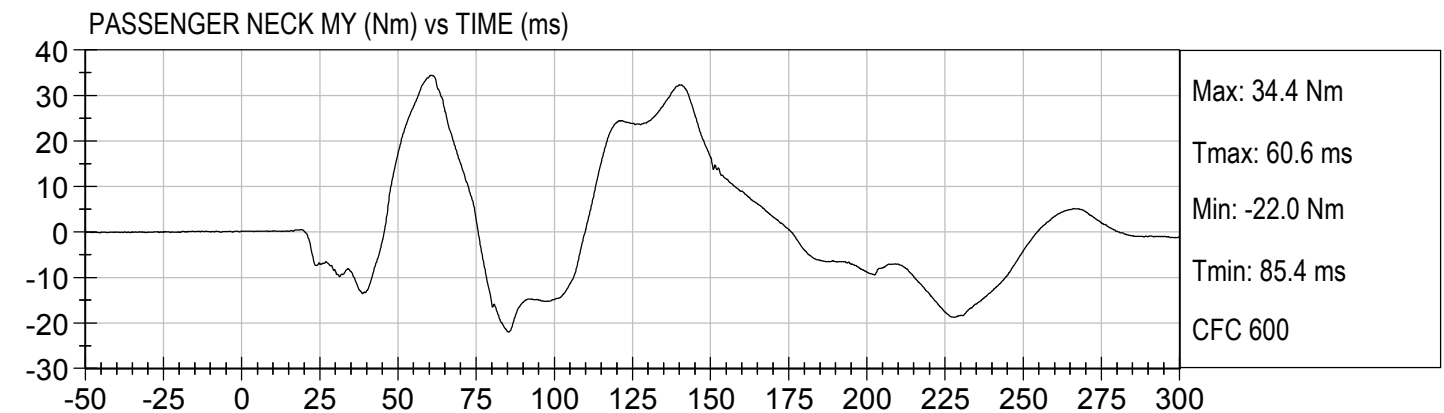
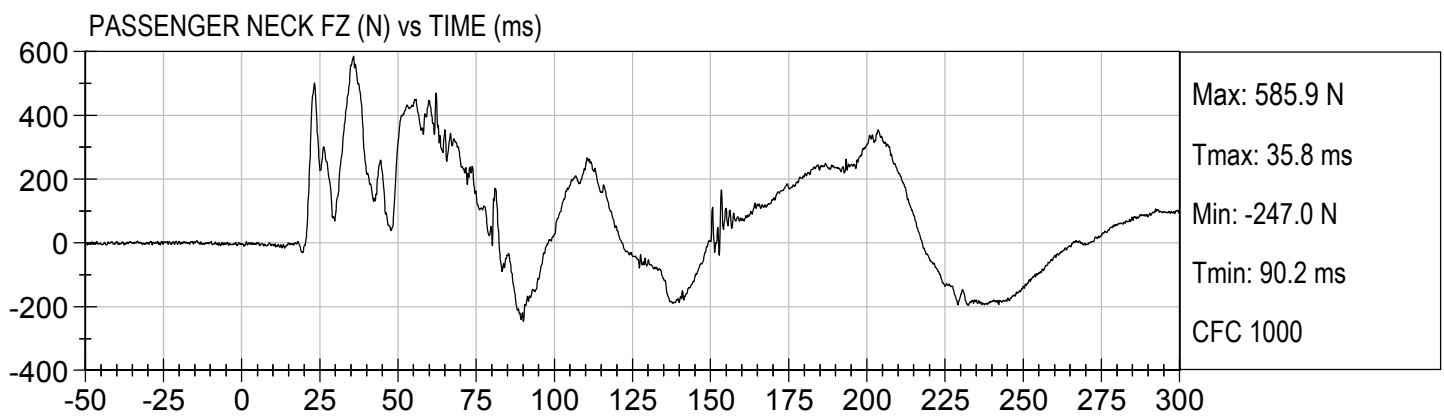
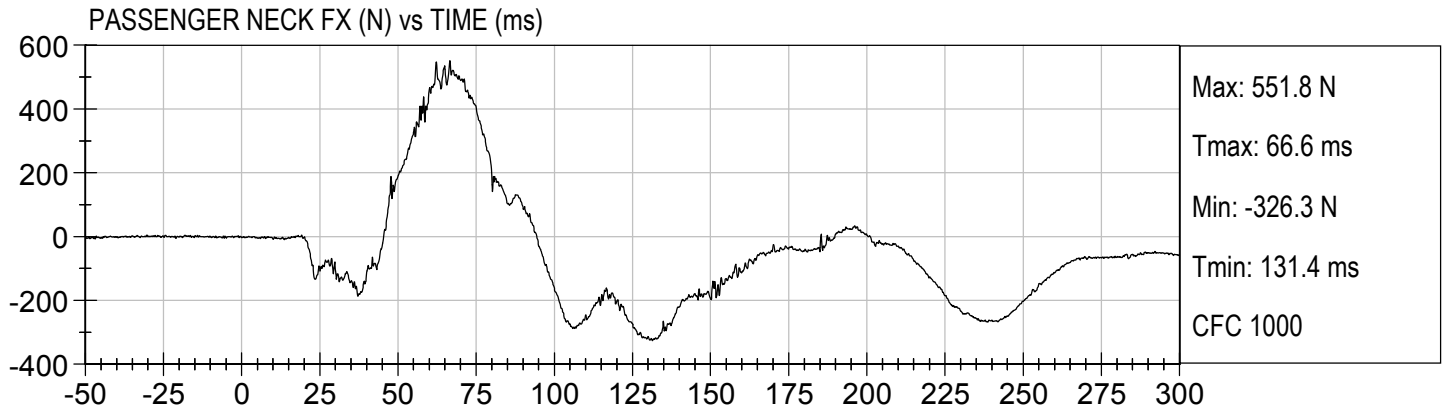


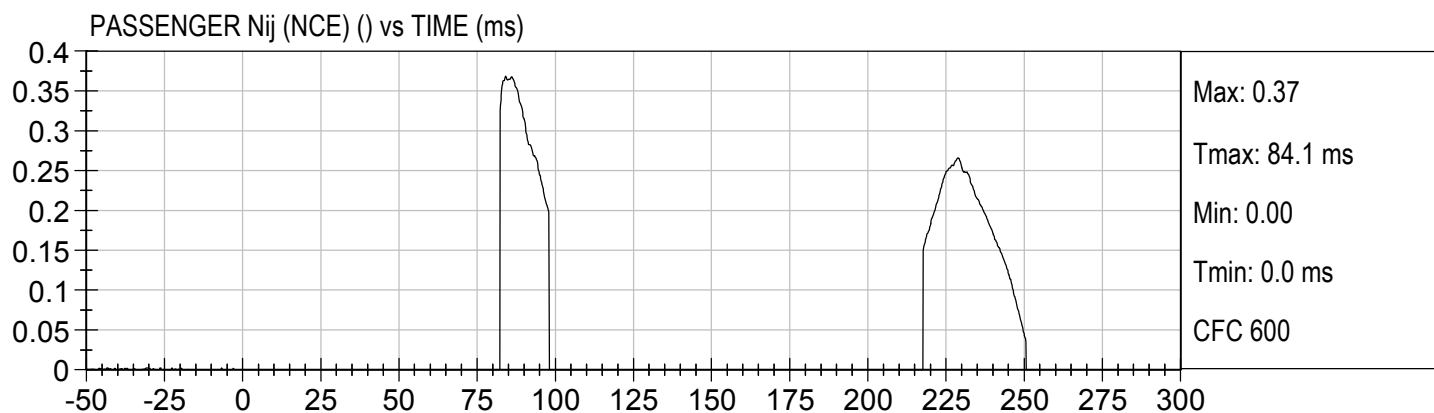
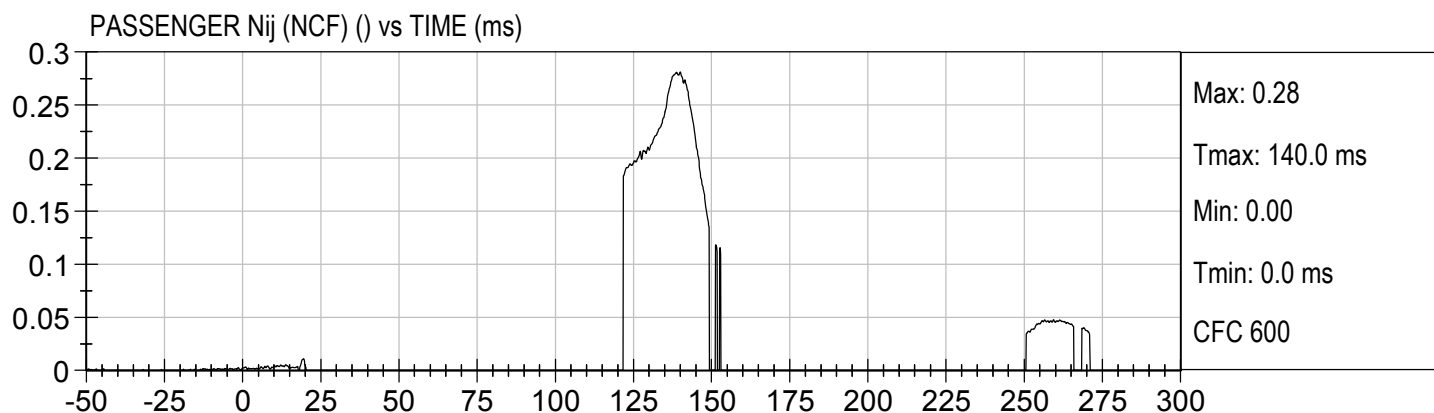
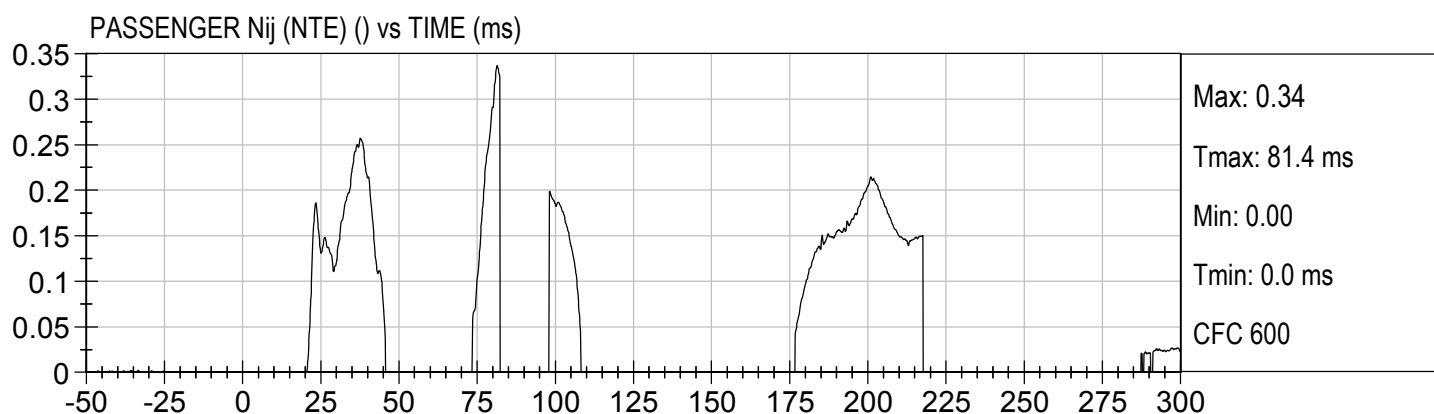
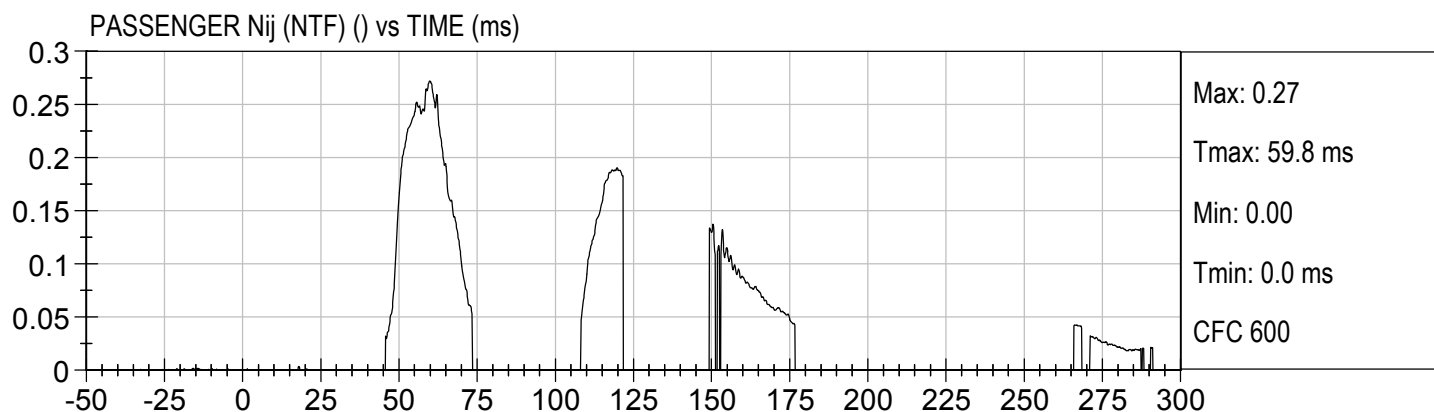


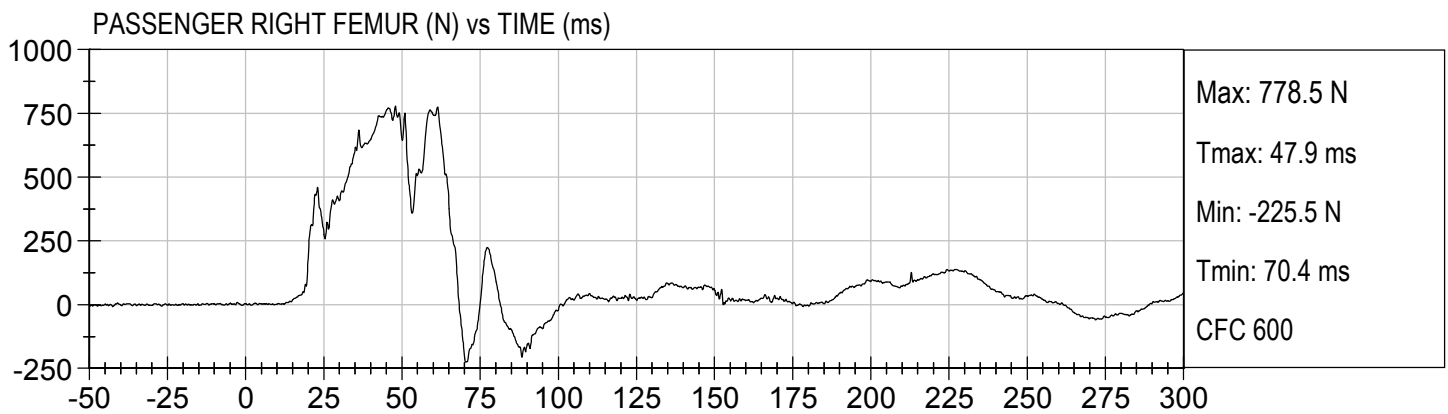
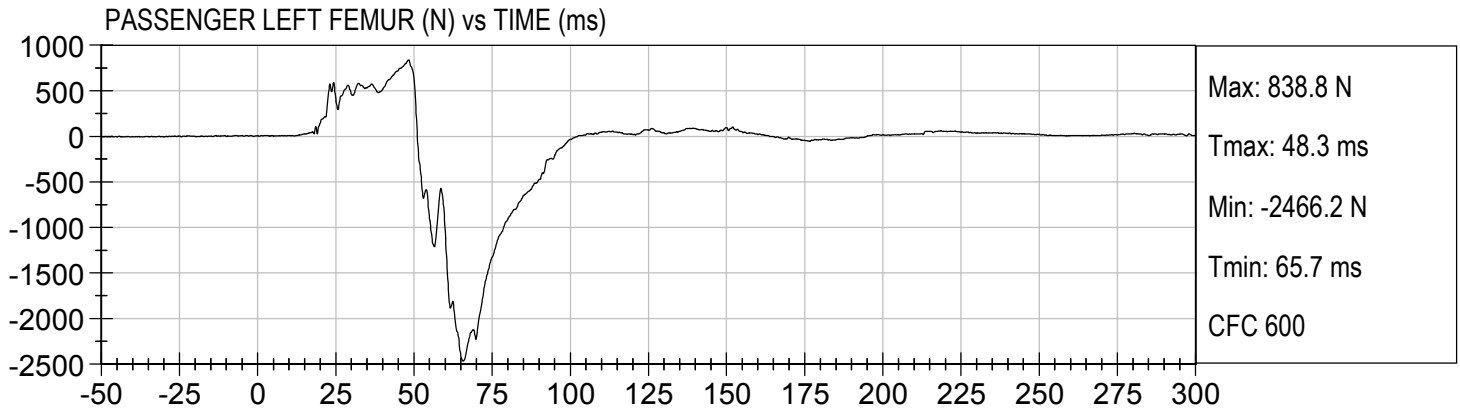












APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

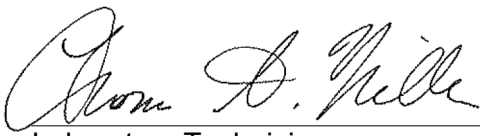
NOTE: THE H-POINT IS LOCATED 1.83 INCHES FORWARD AND 2.57 INCHES DOWN FROM THE CENTER OF THE PELVIS ANGLE REFERENCE HOLE.

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

ATD Serial No: 351

Test ID: D151731

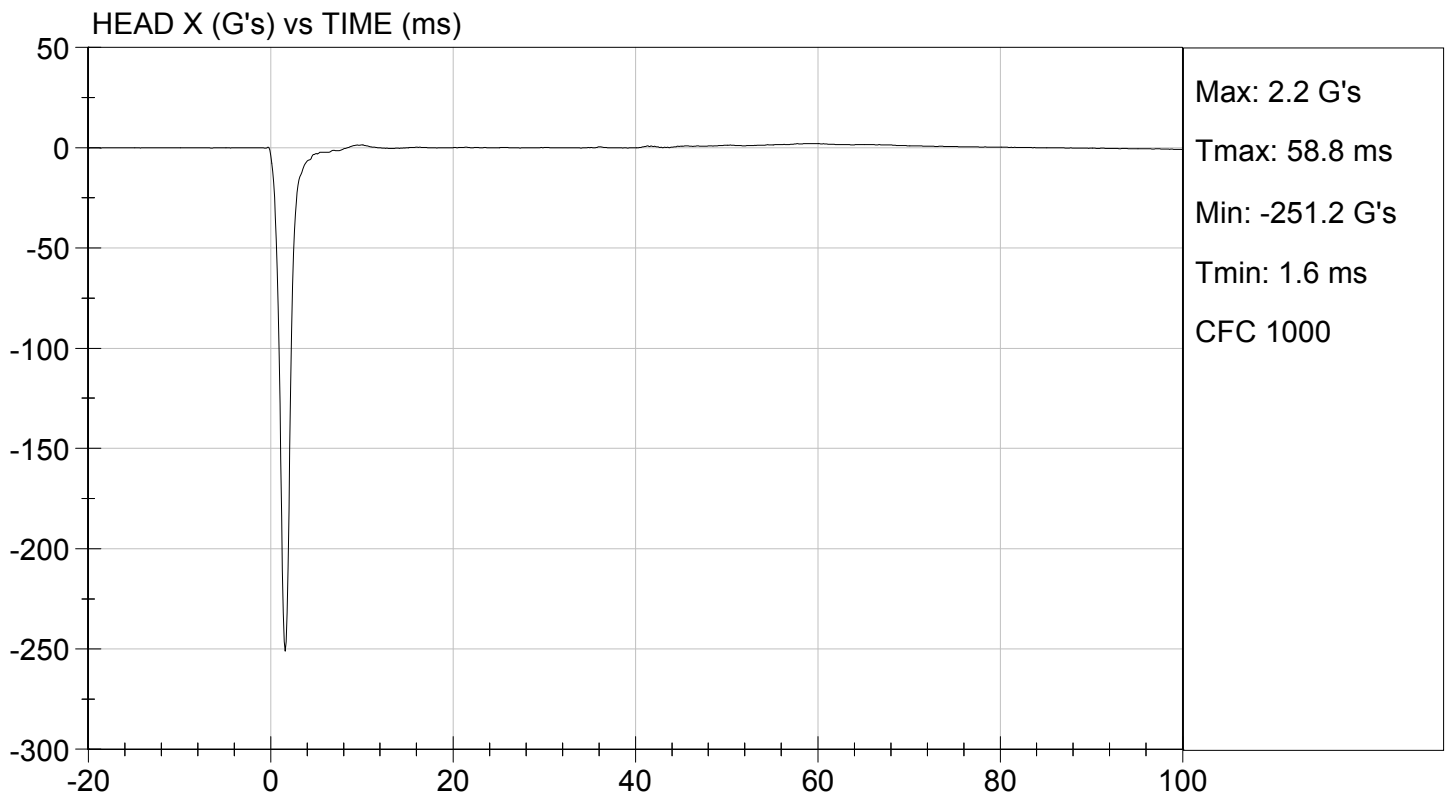
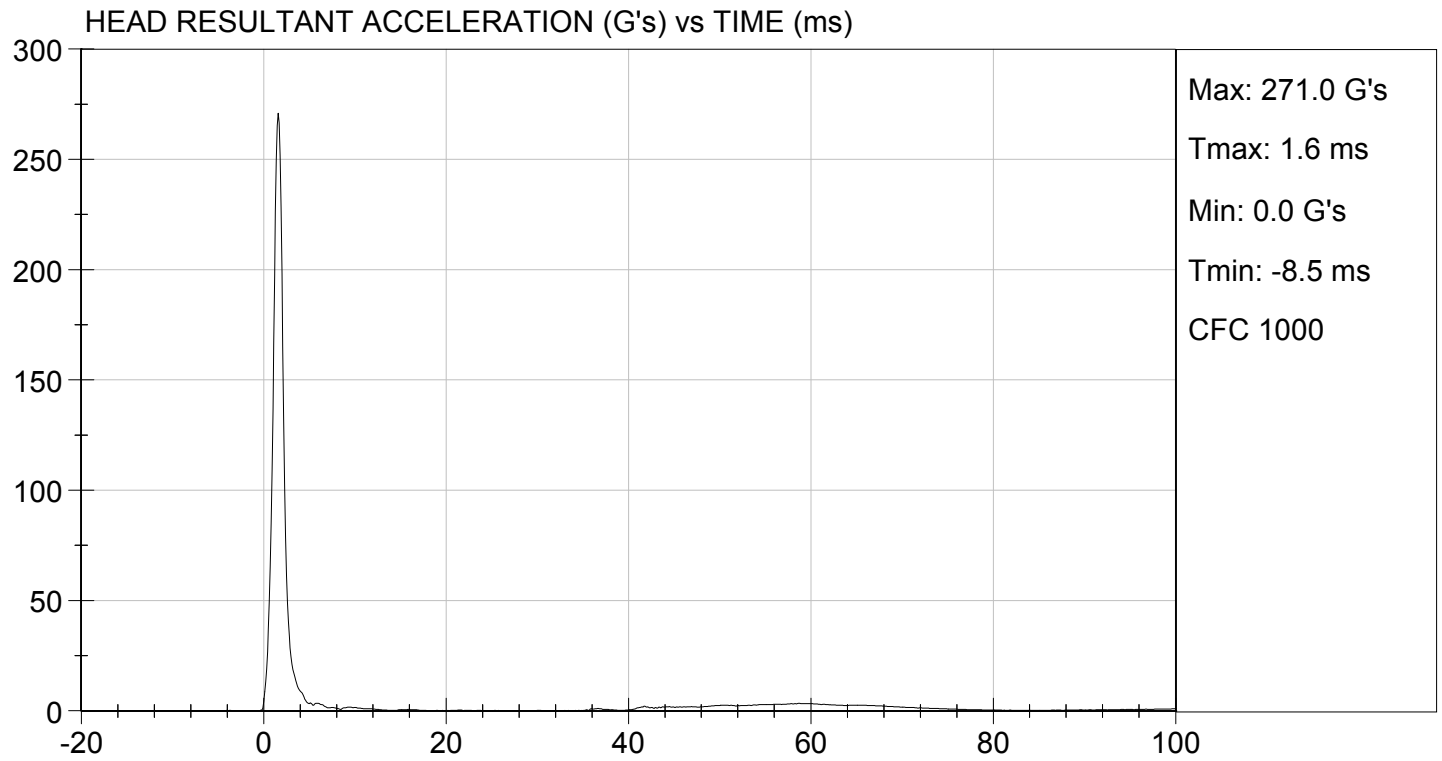
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Peak Resultant Acceleration	G's	225 to 275	271	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-14.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

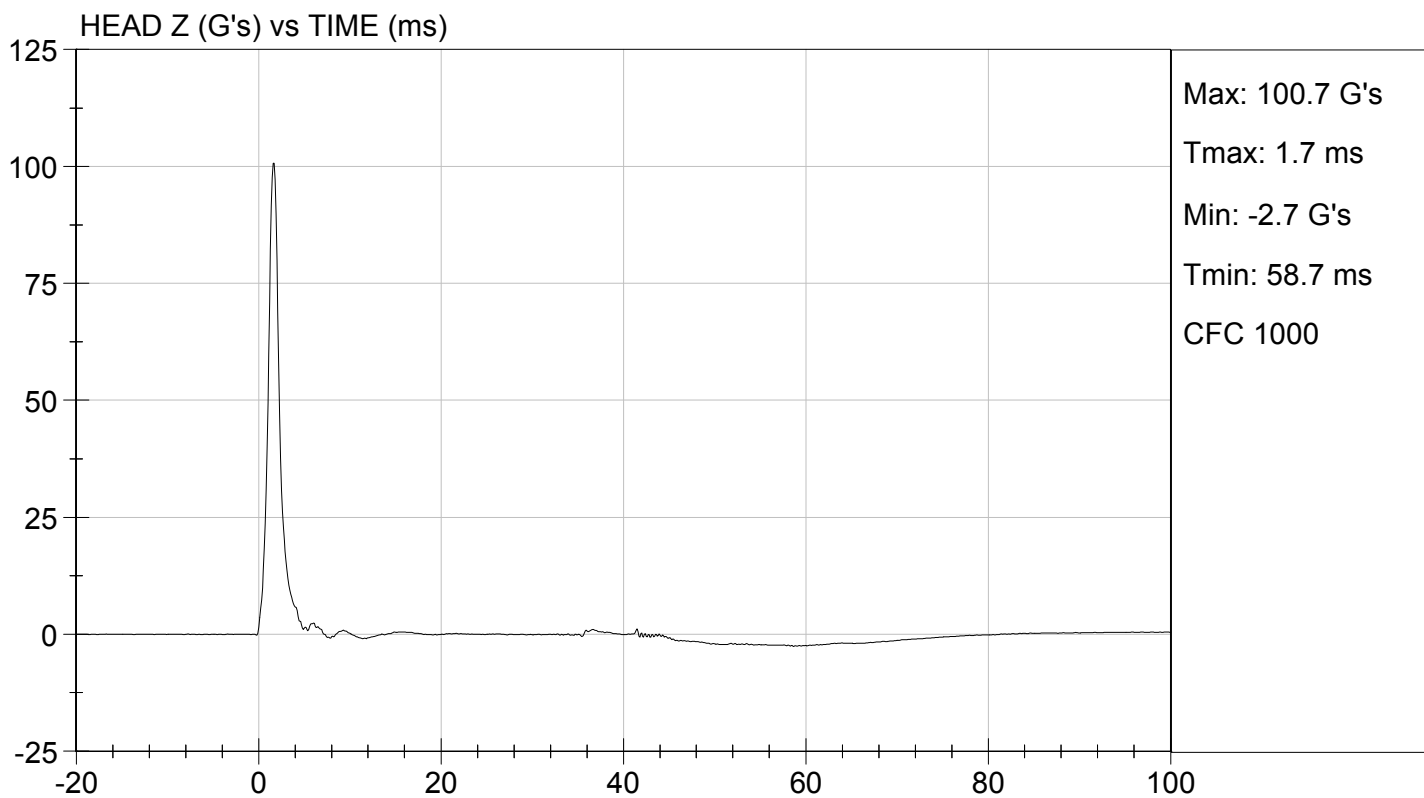
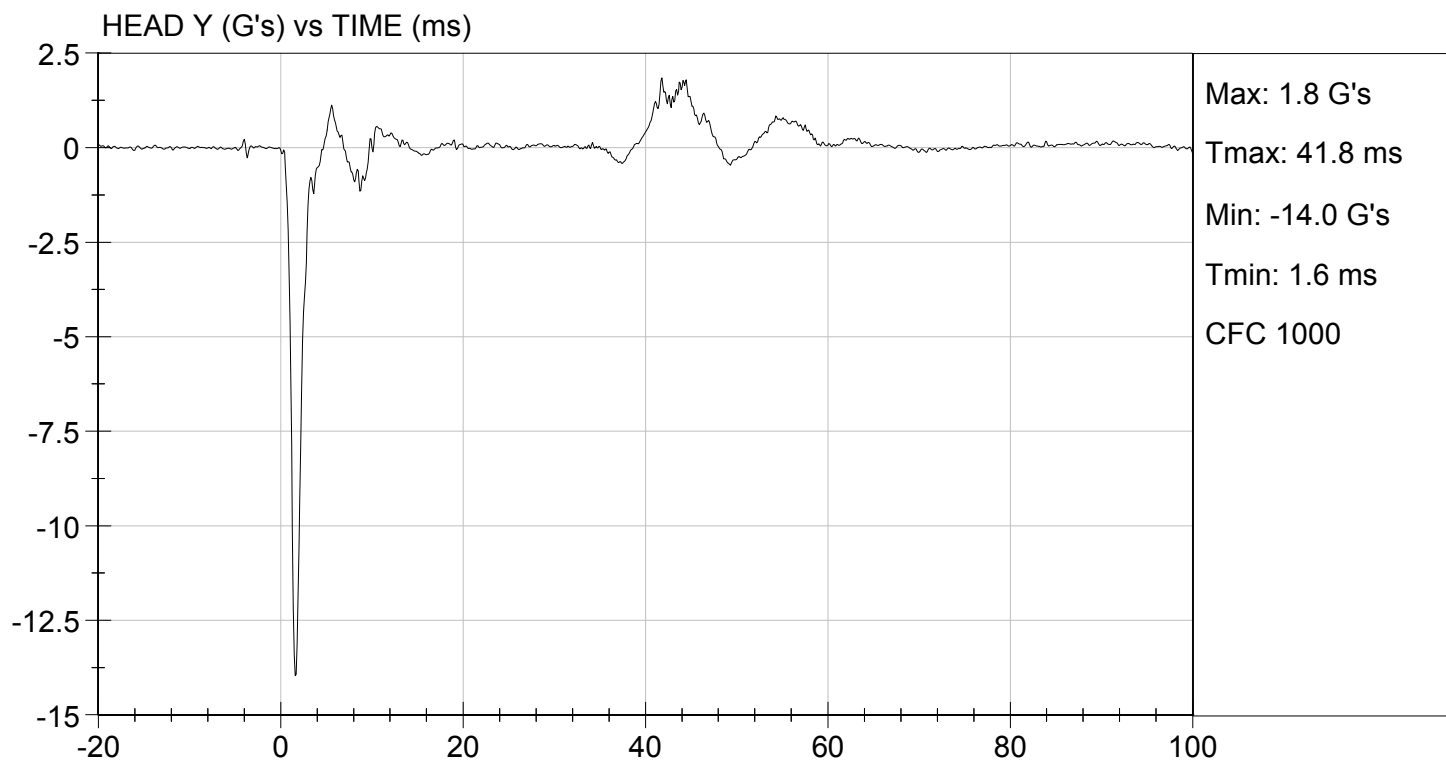

Laboratory Technician

06/16/2015

Test Date


Approved By





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

ATD Serial No: 351

Test I.D: D151732

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	45	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.96	Pass
	20 ms	G's	17.60 to 22.60	19.80	Pass
	30 ms	G's	12.50 to 18.50	12.63	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	39.5	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	70.3	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	118.4	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	89.9	Pass
	Time	ms	47.0 to 58.0	52.3	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	104.8	Pass
Overall Test Results					Pass


 Laboratory Technician

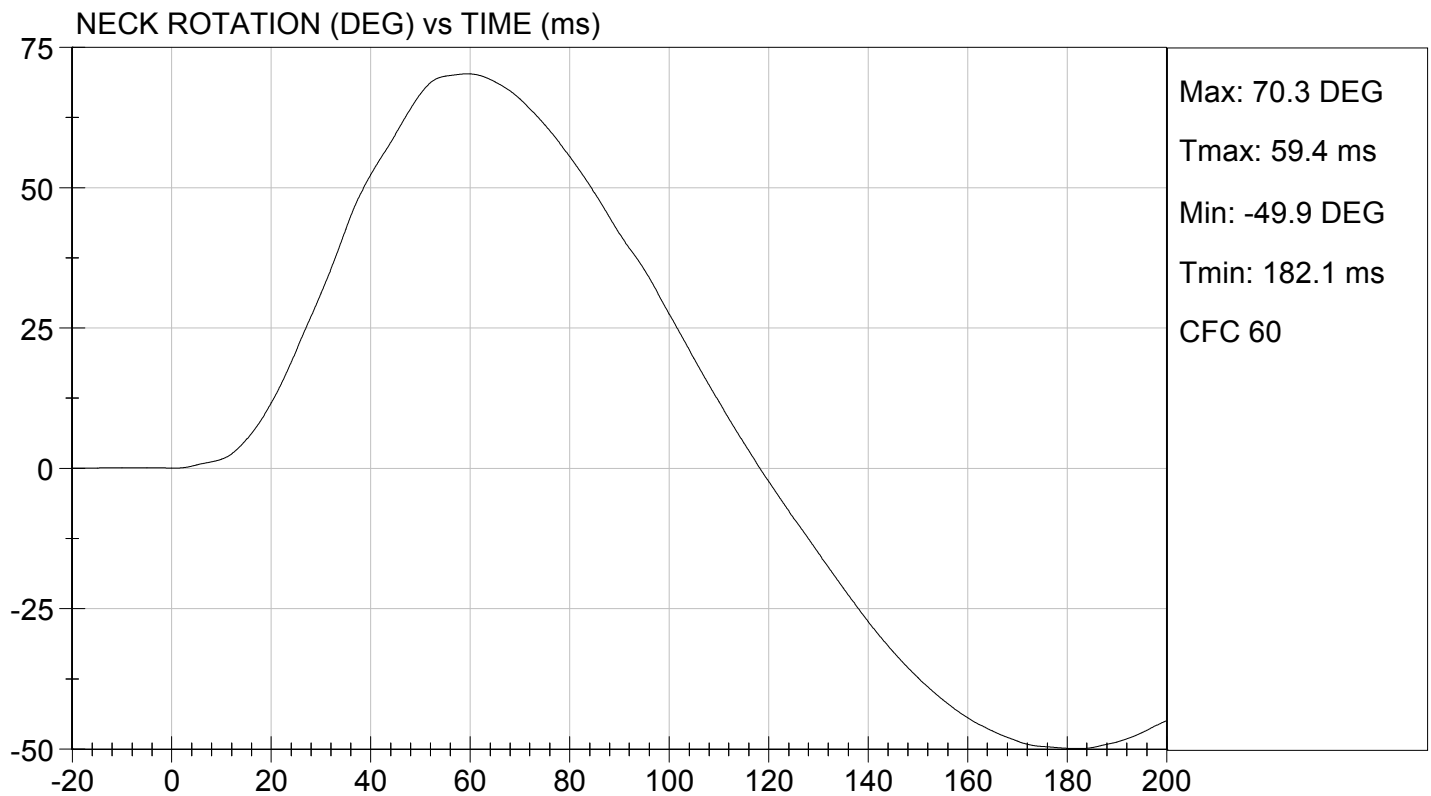
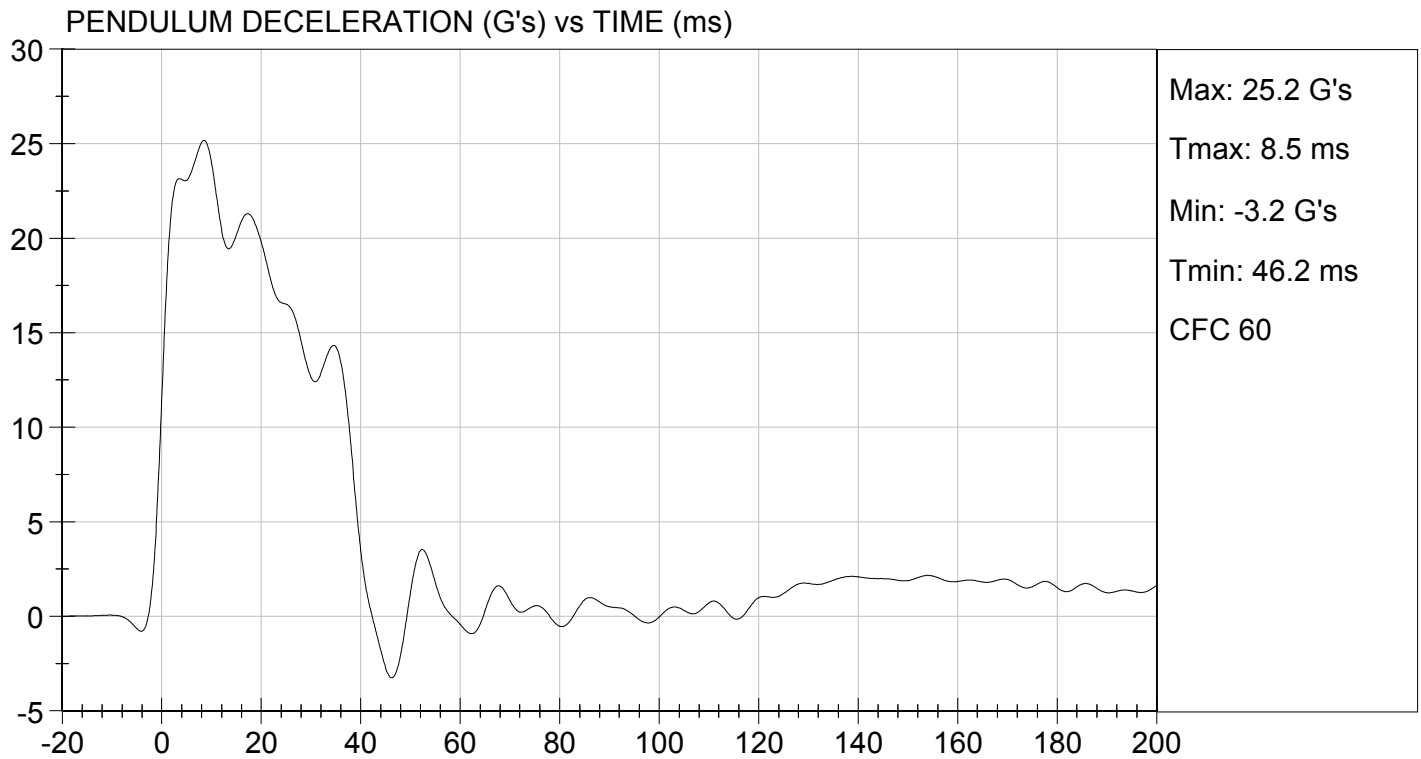
06/16/2015
 Test Date


 Approved By



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

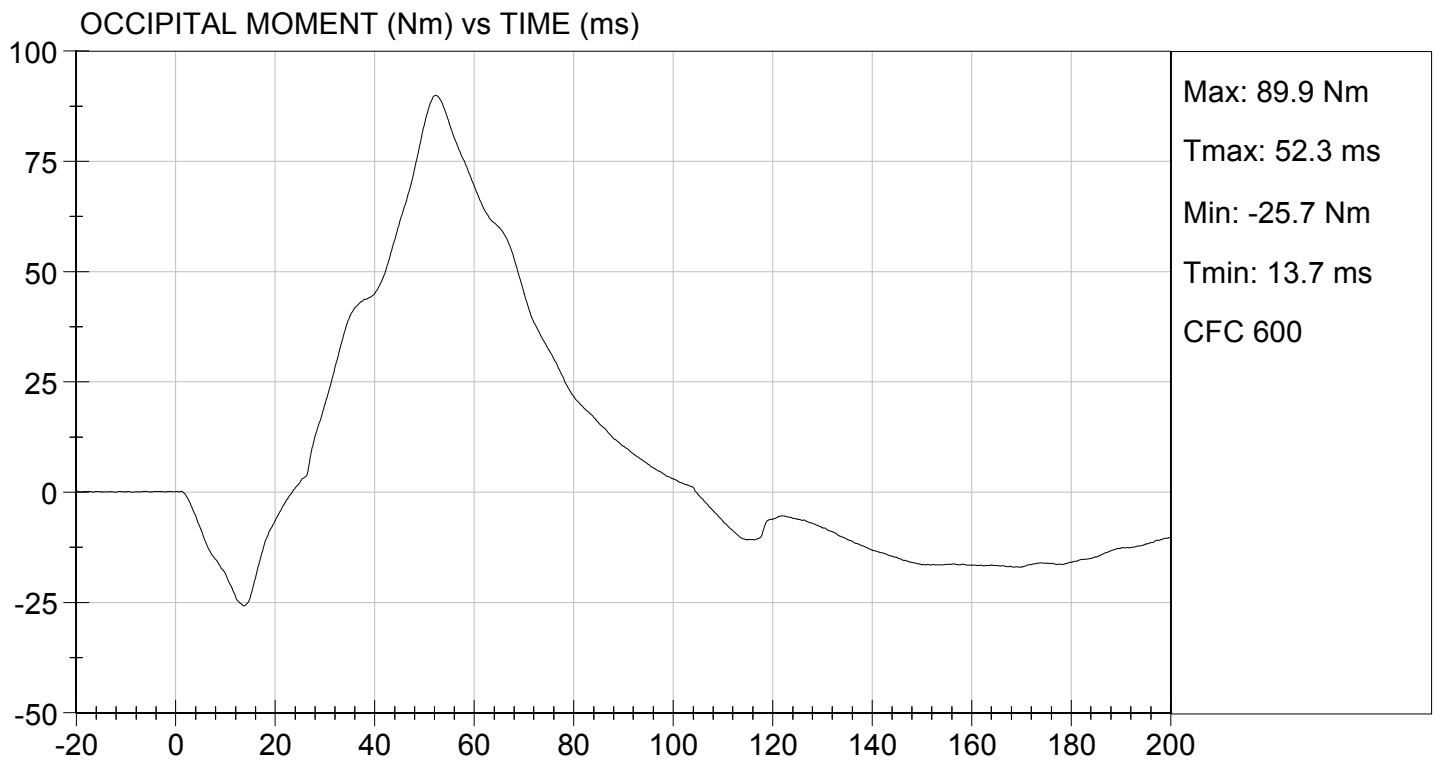
TEST DATE: 06/16/2015
TEST #: D151732





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

TEST DATE: 06/16/2015
TEST #: D151732



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

ATD Serial No: 351

Test I.D: D151733

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	45	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.17	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.94	Pass
	20 ms	G's	14.00 to 19.00	17.73	Pass
	30 ms	G's	11.00 to 16.00	12.67	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.1	Pass
	Time	ms	72.0 to 82.0	78.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	161.0	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-64.2	Pass
	Time	ms	65.0 to 79.0	71.1	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	147.0	Pass
Overall Test Results					Pass


 Laboratory Technician

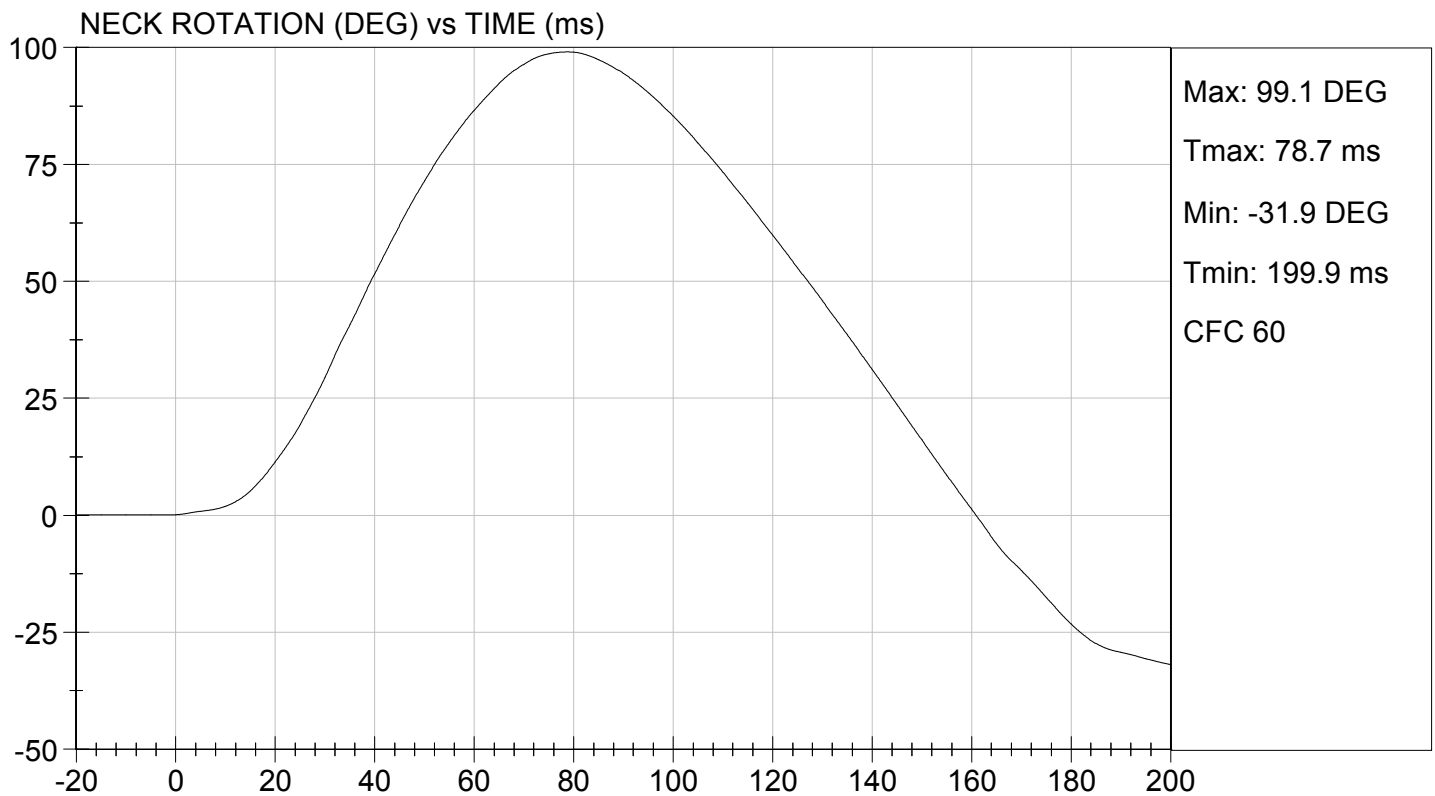
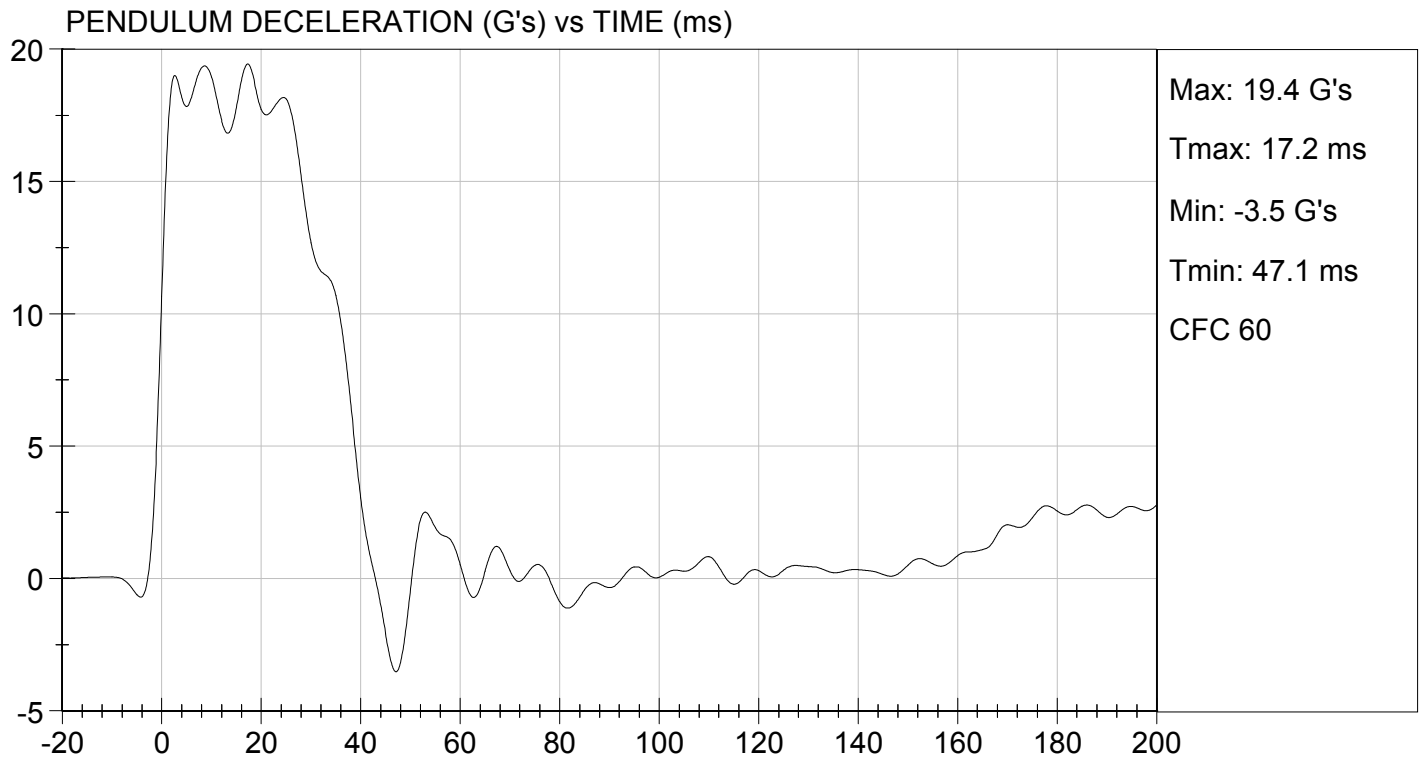
06/16/2015
 Test Date


 Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 20.23 ft/s, 6.17 m/s

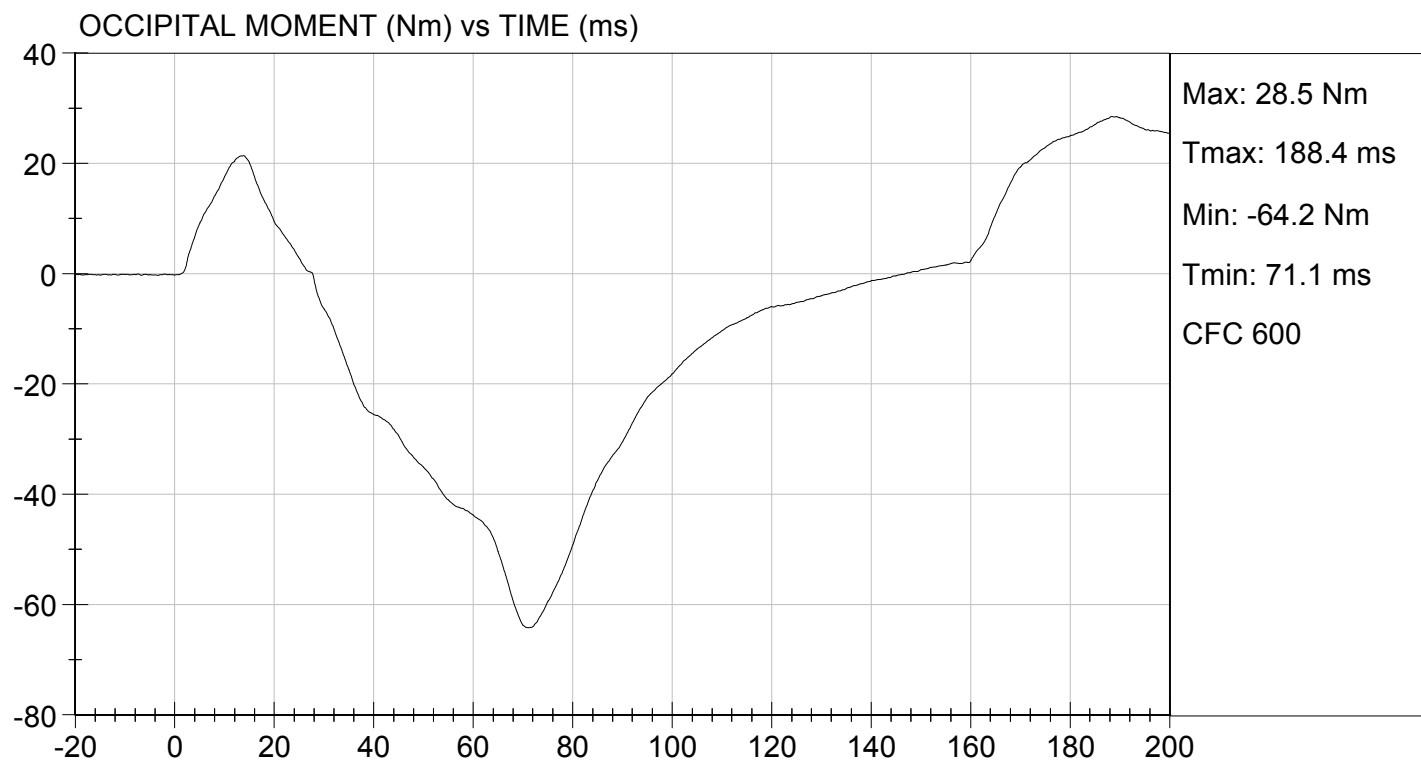
TEST DATE: 06/16/2015
TEST #: D151733





TEST DESC: NECK EXTENSION
VELOCITY: 20.23 ft/s, 6.17 m/s

TEST DATE: 06/16/2015
TEST #: D151733



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D151734

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	47	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,270	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.10	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results				Pass


Laboratory Technician

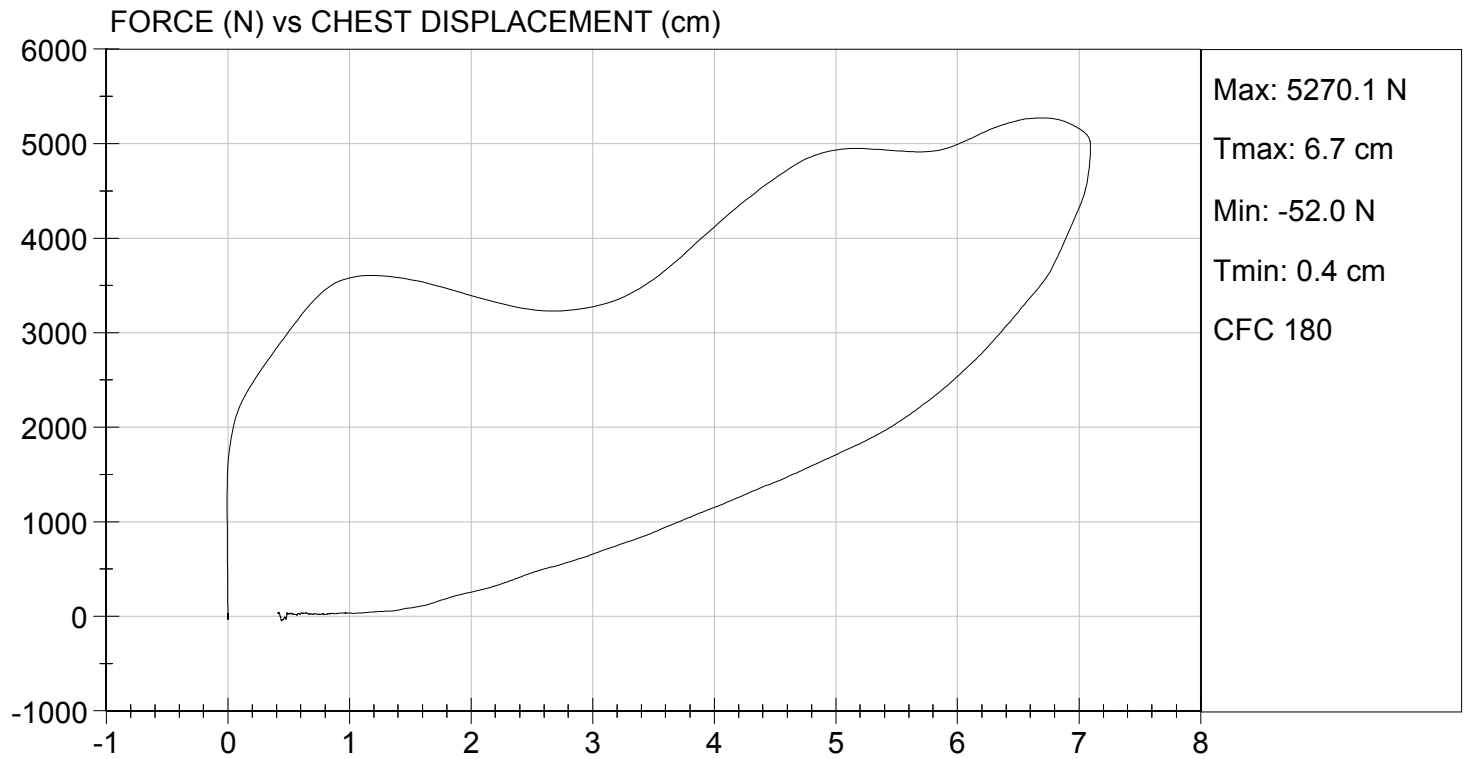
06/17/2015
Test Date


Approved By



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

TEST DATE: 06/17/2015
TEST #: D151734



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

ATD Serial No: 351

Test I.D: D151735

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	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,639	Pass
Overall Test Results				Pass


Laboratory Technician

06/17/2015

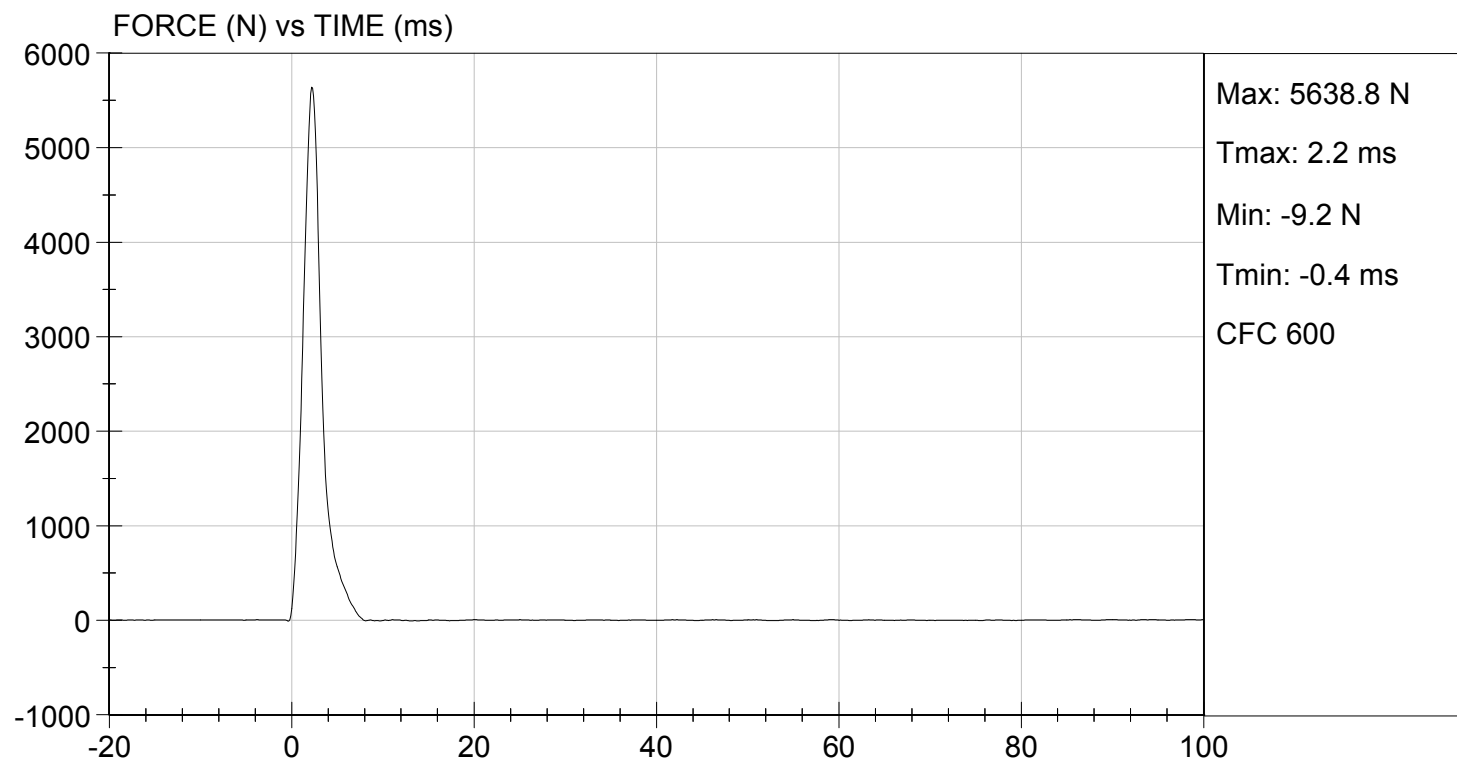
Test Date


Approved By



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

TEST DATE: 06/17/2015
TEST #: D151735



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

ATD Serial No: 351

Test I.D: D151736

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	45	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,361	Pass
Overall Test Results				Pass


Laboratory Technician

06/17/2015

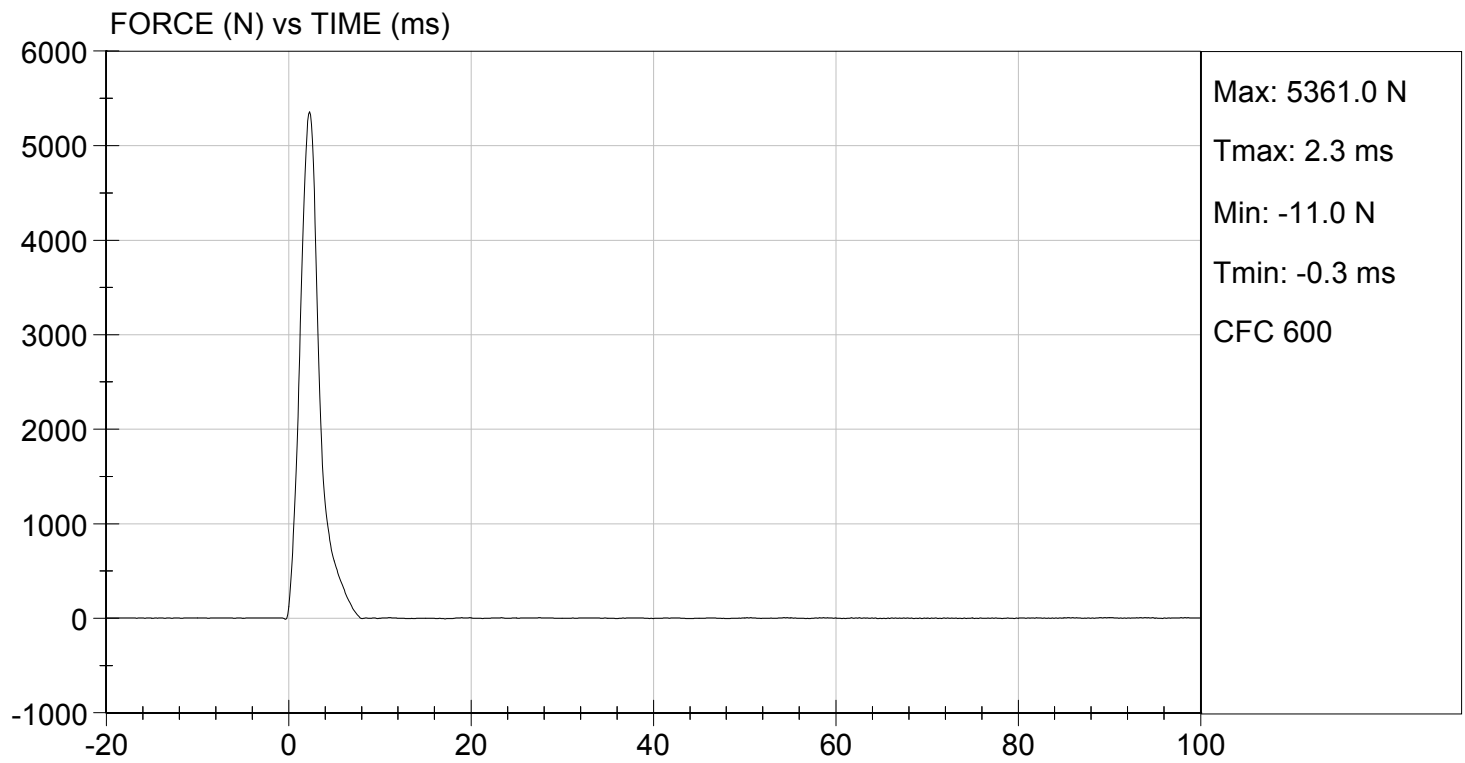
Test Date


Approved By



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

TEST DATE: 06/17/2015
TEST #: D151736



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

ATD Serial No: 351

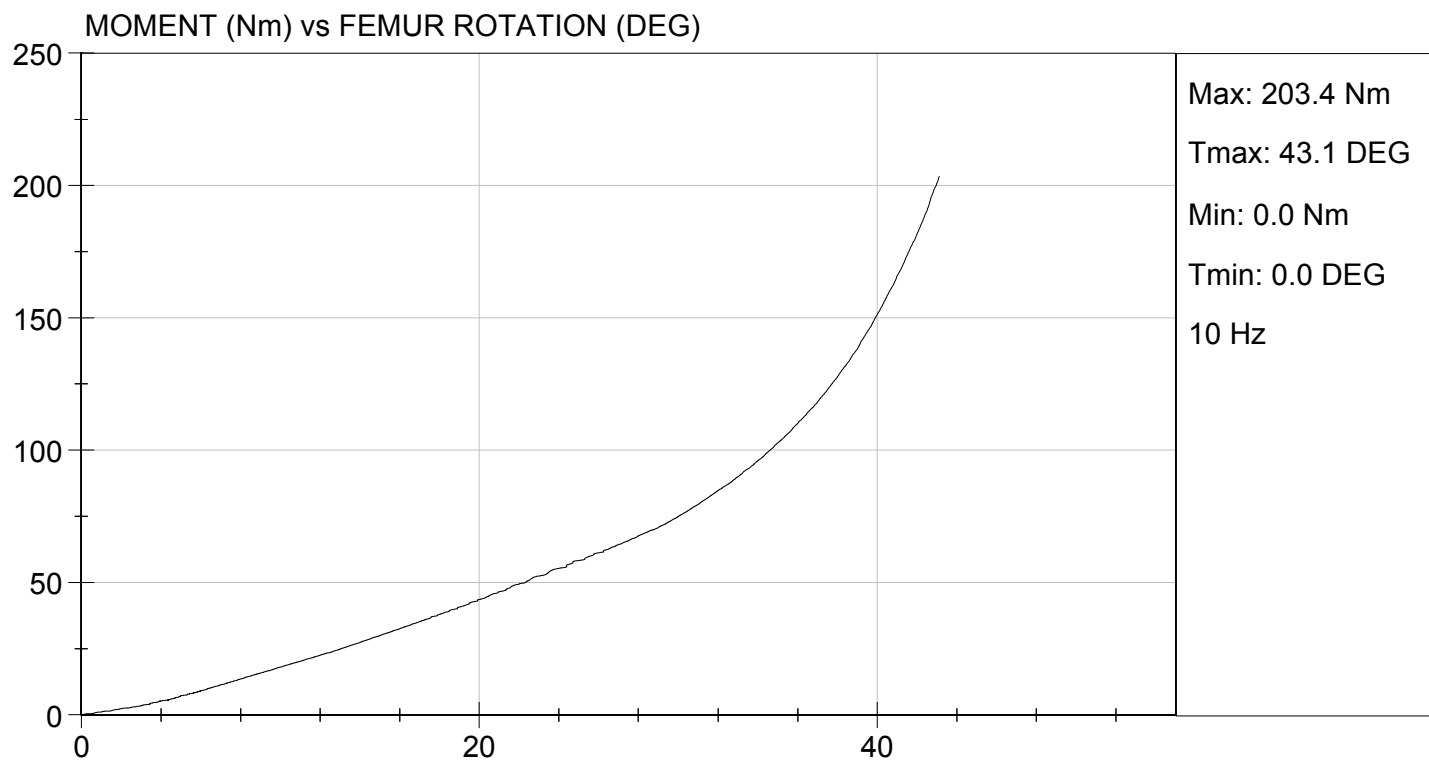
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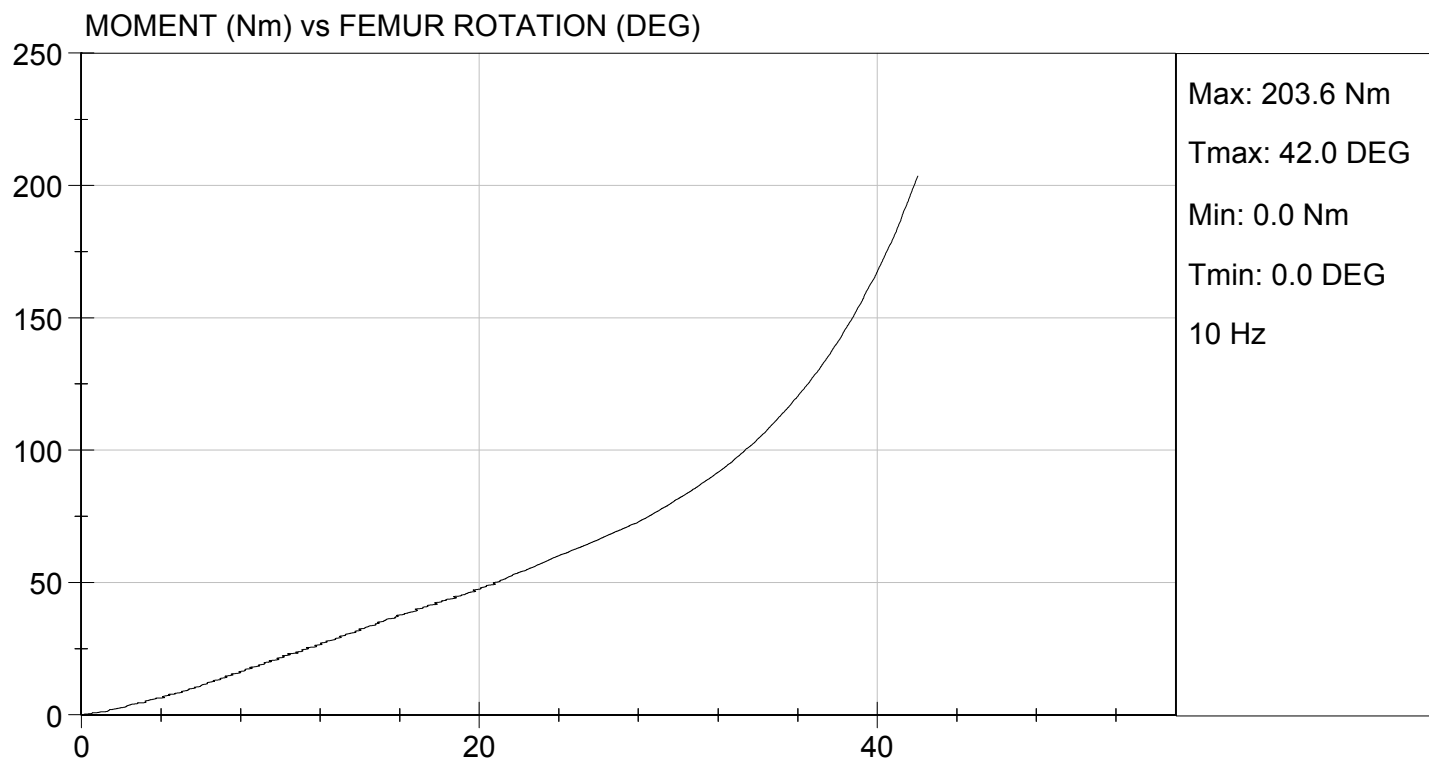
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.4	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	48	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	74.9	81.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	43.1	42.0	Pass
Overall Test Results					Pass


 Laboratory Technician


 Approved By

06/16/2015
 Test Date





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

ATD Serial No: 351

Test ID: D152021

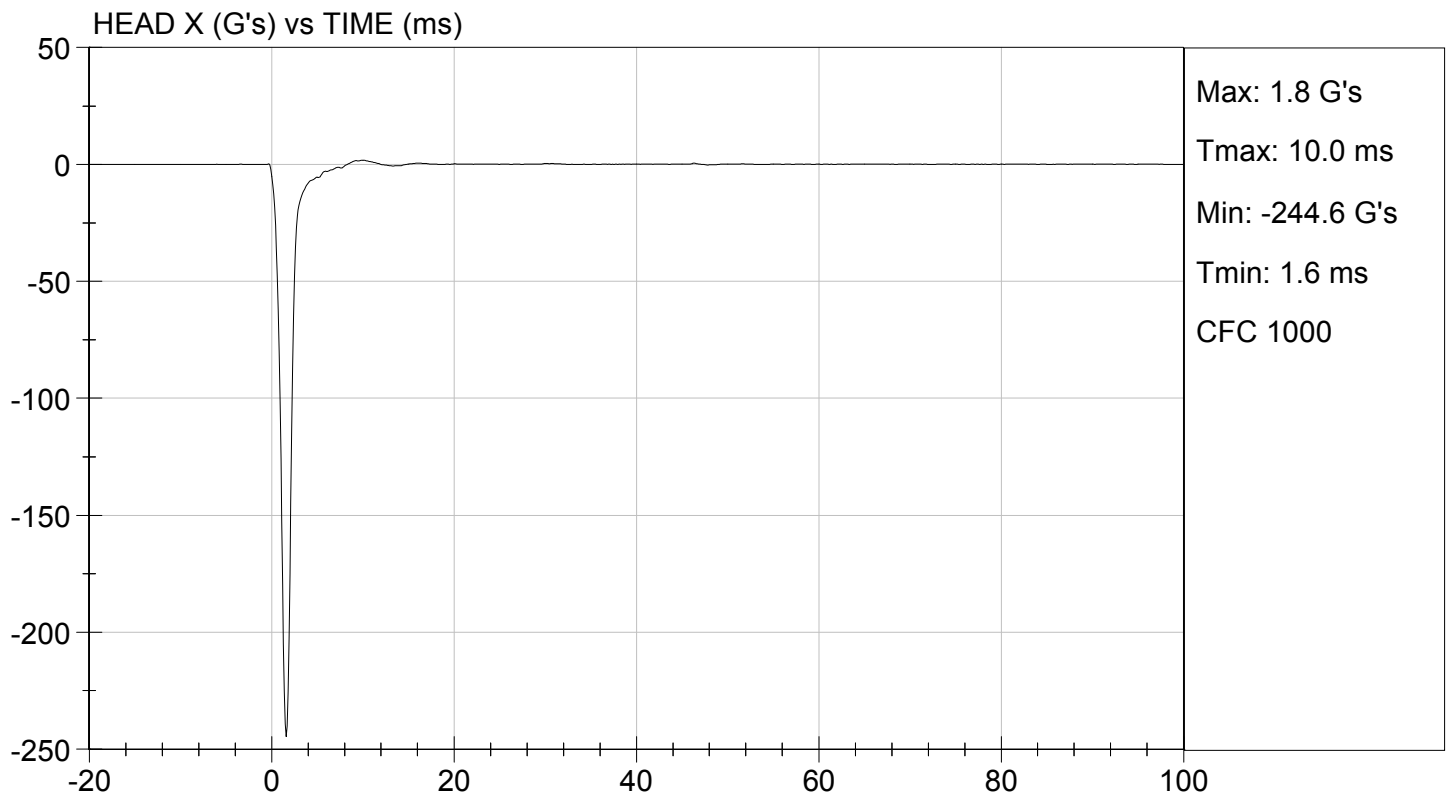
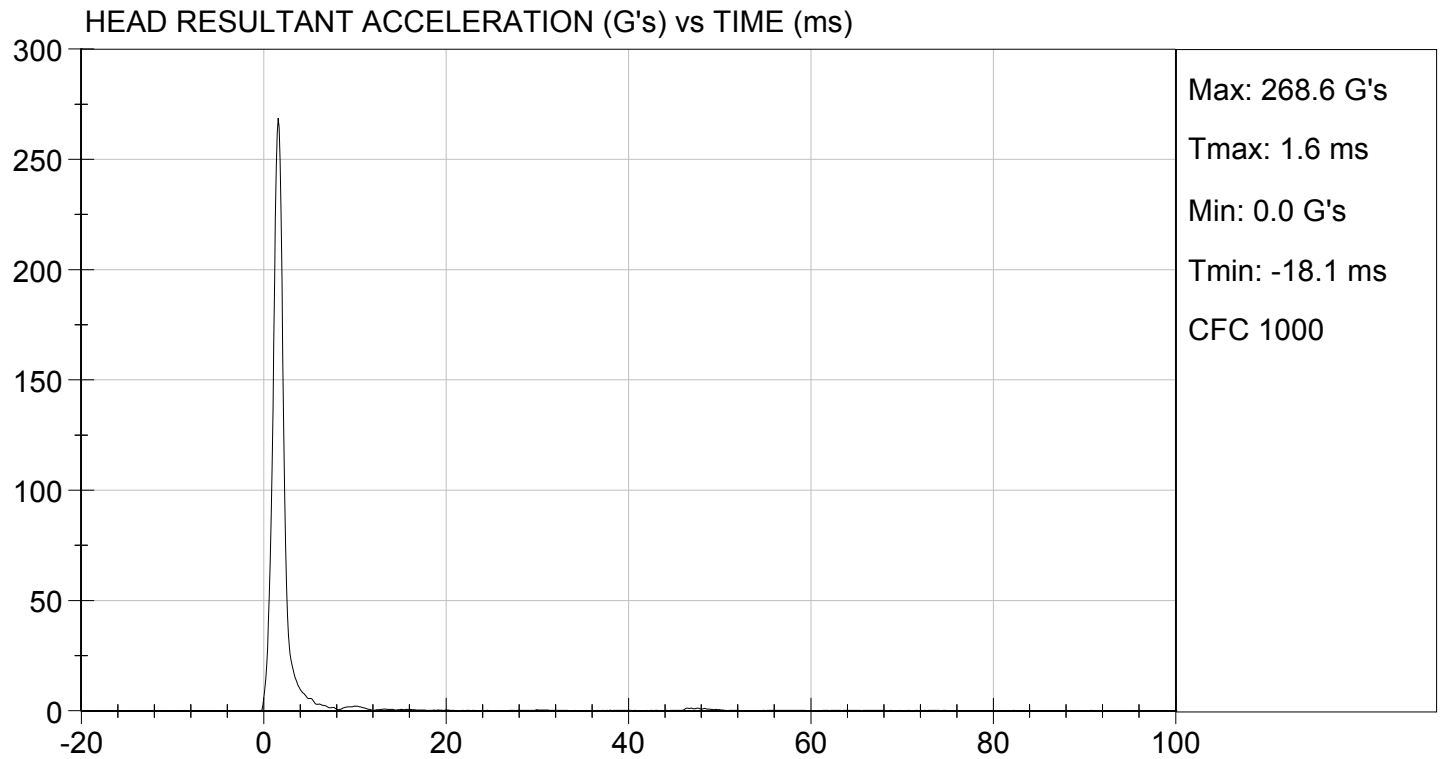
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	225 to 275	269	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	6.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

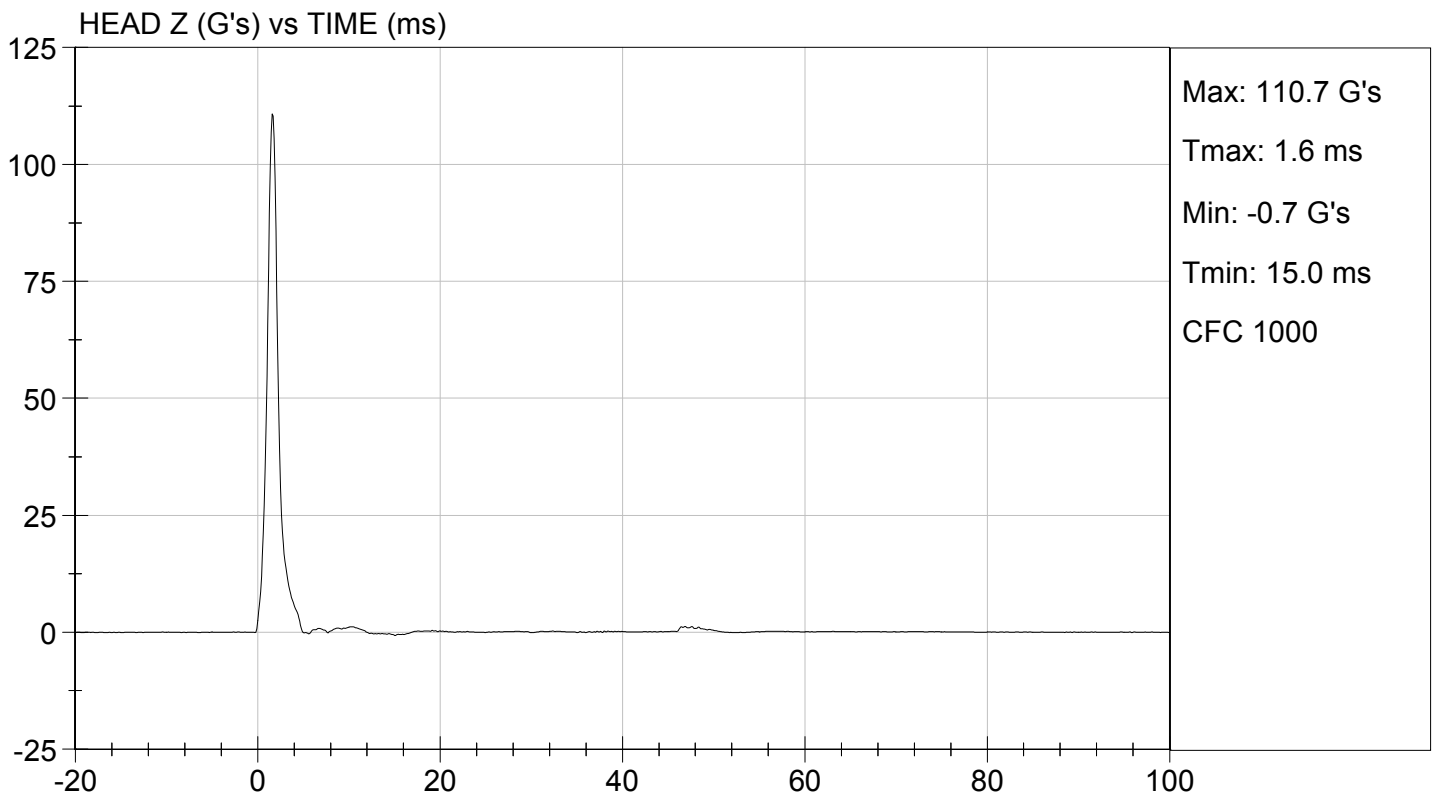
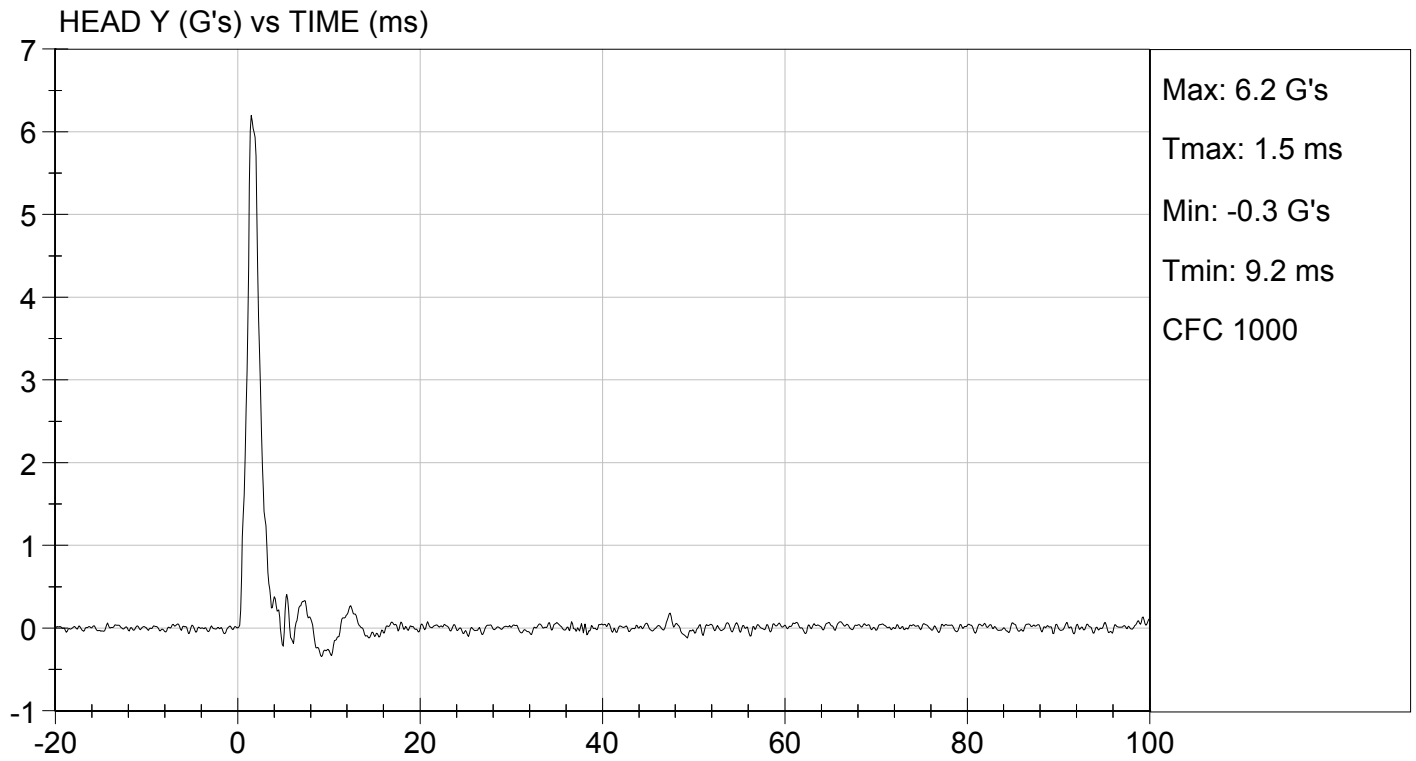
David Schoedel
Laboratory Technician

07/10/2015

Test Date

Jessica Hall
Approved By





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

ATD Serial No: 351

Test I.D: D152022

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	43	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	25.69	Pass
	20 ms	G's	17.60 to 22.60	19.90	Pass
	30 ms	G's	12.50 to 18.50	13.59	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.5	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	37.2	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	72.6	Pass
	Time	ms	57.0 to 64.0	57.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	117.3	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	90.4	Pass
	Time	ms	47.0 to 58.0	50.7	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	102.7	Pass
Overall Test Results					Pass

David Schoedel
Laboratory Technician

07/10/2015

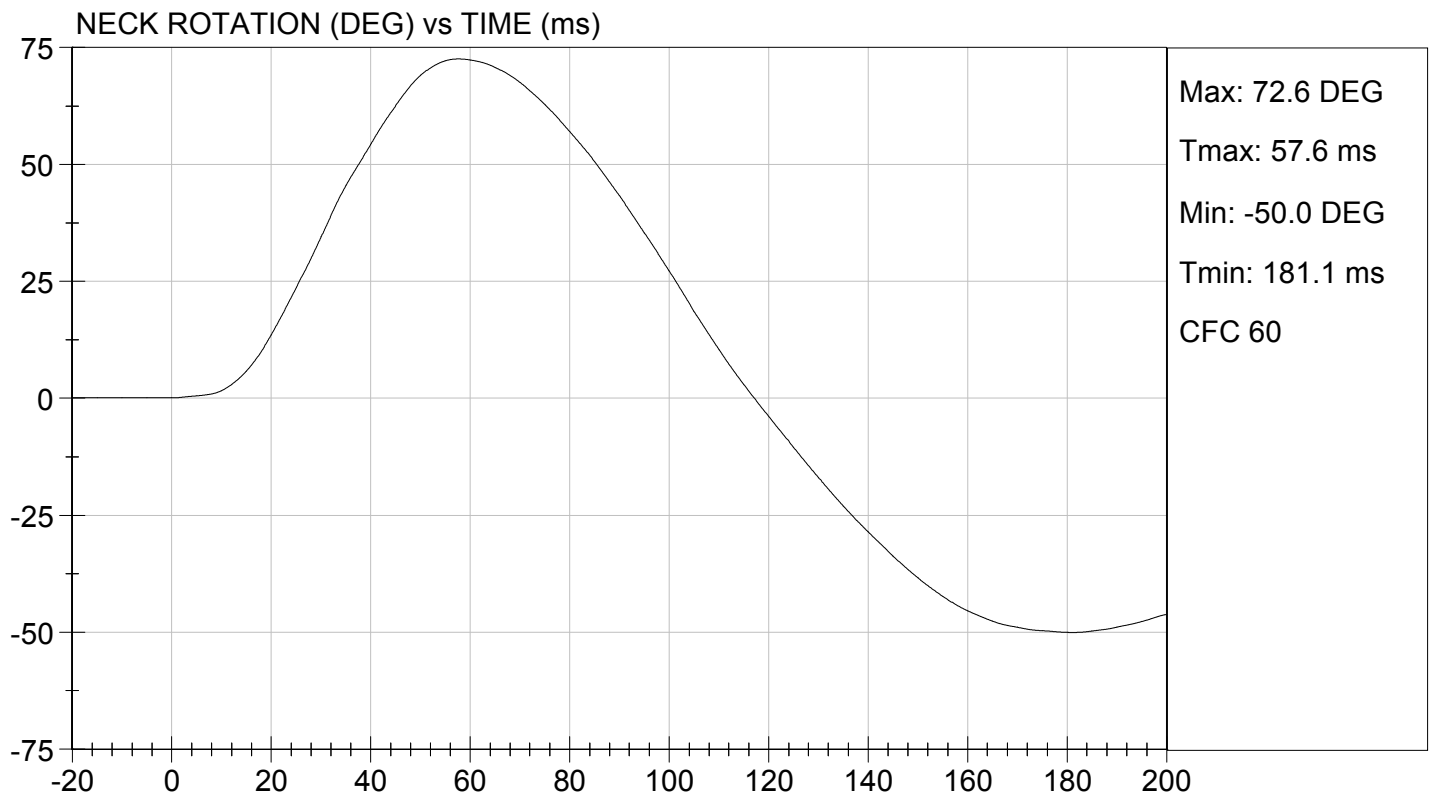
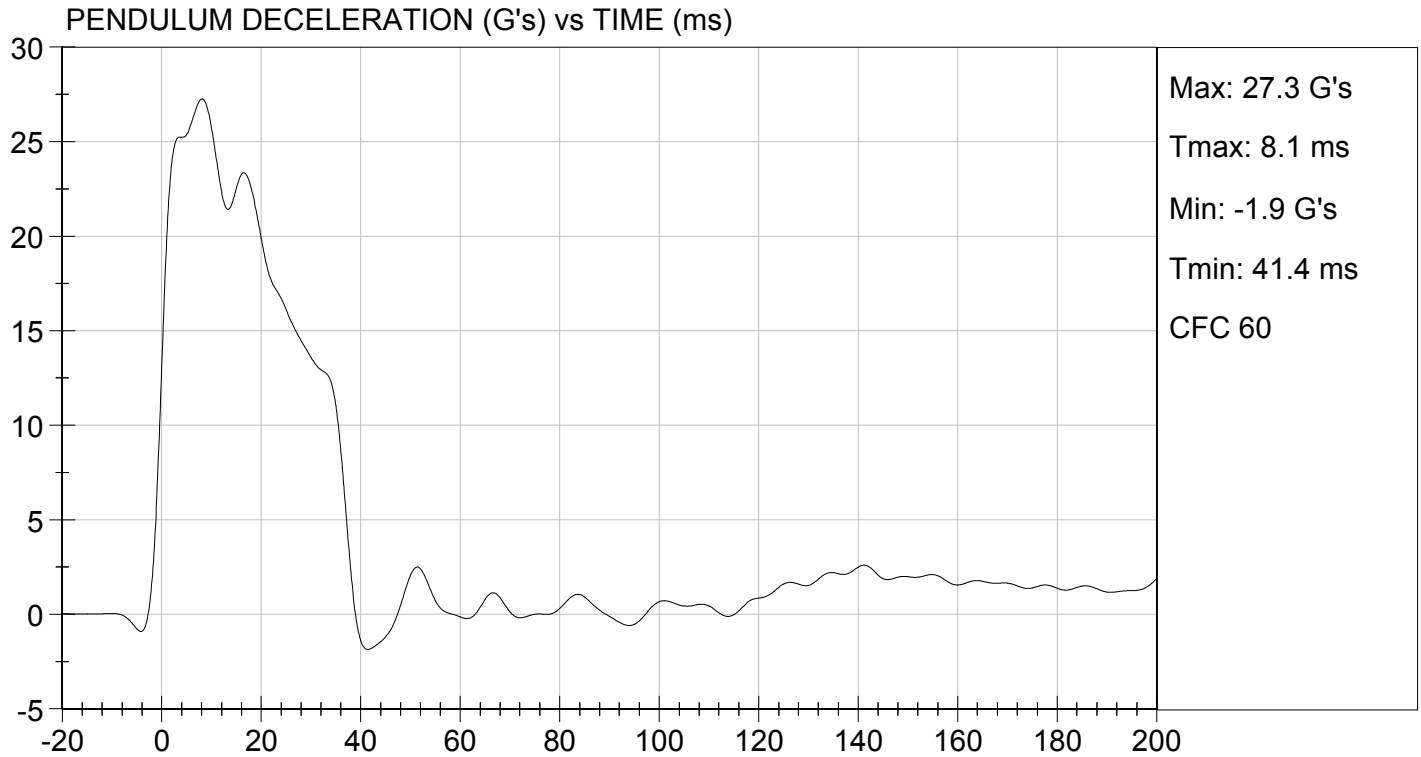
Test Date

Jessica Hall
Approved By



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

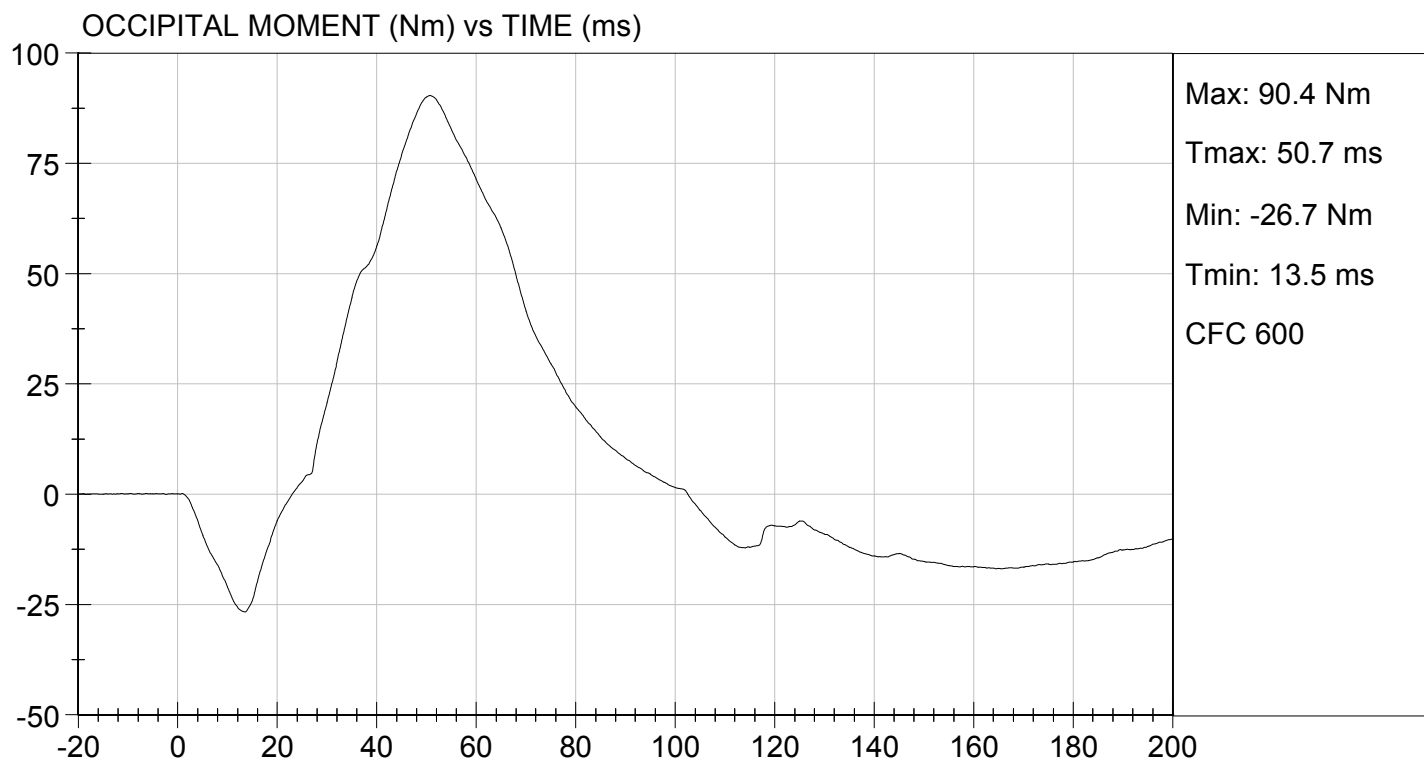
TEST DATE: 07/10/2015
TEST #: D152022





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

TEST DATE: 07/10/2015
TEST #: D152022



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

ATD Serial No: 351

Test I.D: D152023

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	43	Pass
Pendulum Velocity		m/s	5.95 to 6.19	5.98	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.61	Pass
	20 ms	G's	14.00 to 19.00	15.39	Pass
	30 ms	G's	11.00 to 16.00	11.24	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	11.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	45.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	101.0	Pass
	Time	ms	72.0 to 82.0	81.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	165.7	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-59.6	Pass
	Time	ms	65.0 to 79.0	75.6	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.8	Pass
Overall Test Results					Pass

David Schoedel
Laboratory Technician

07/10/2015

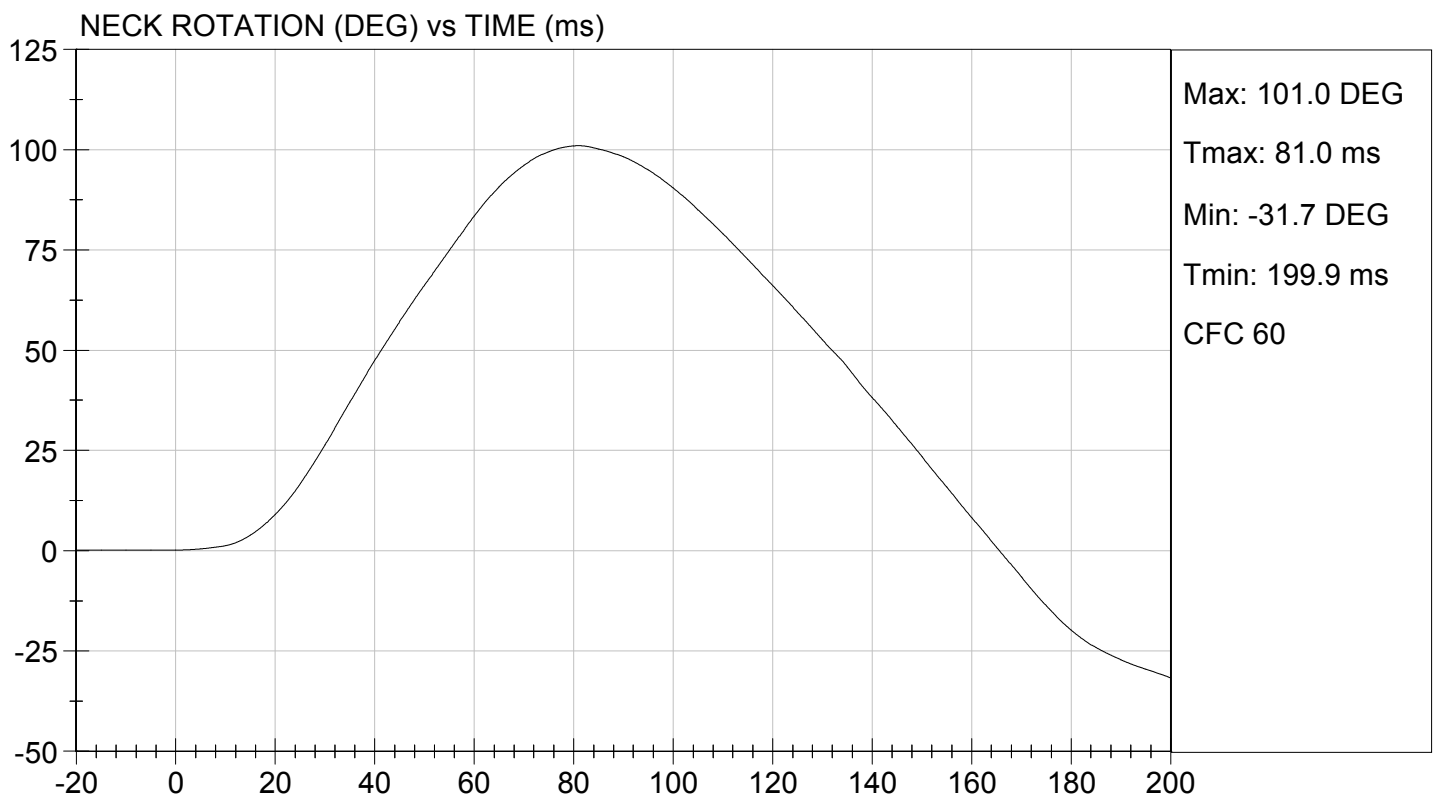
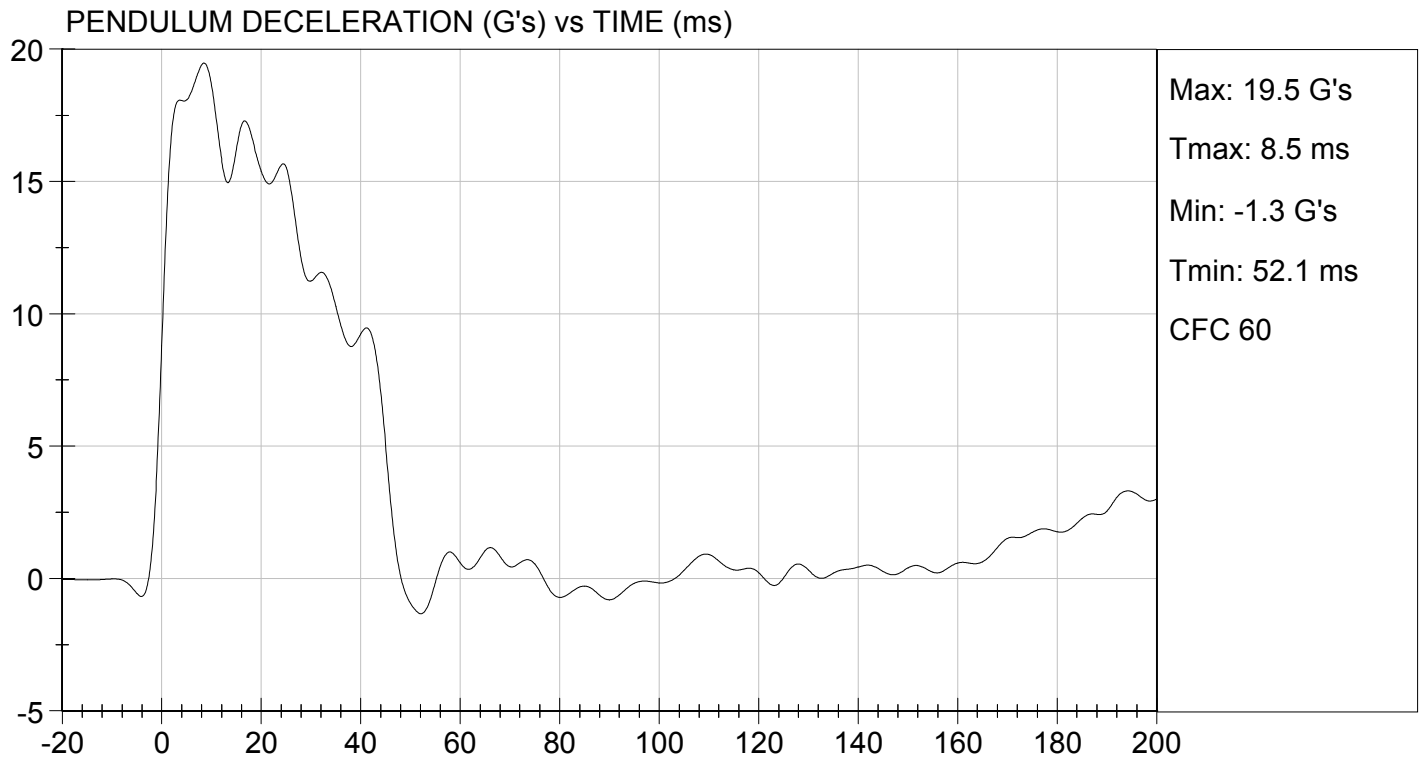
Test Date

Jessica Hall
Approved By



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

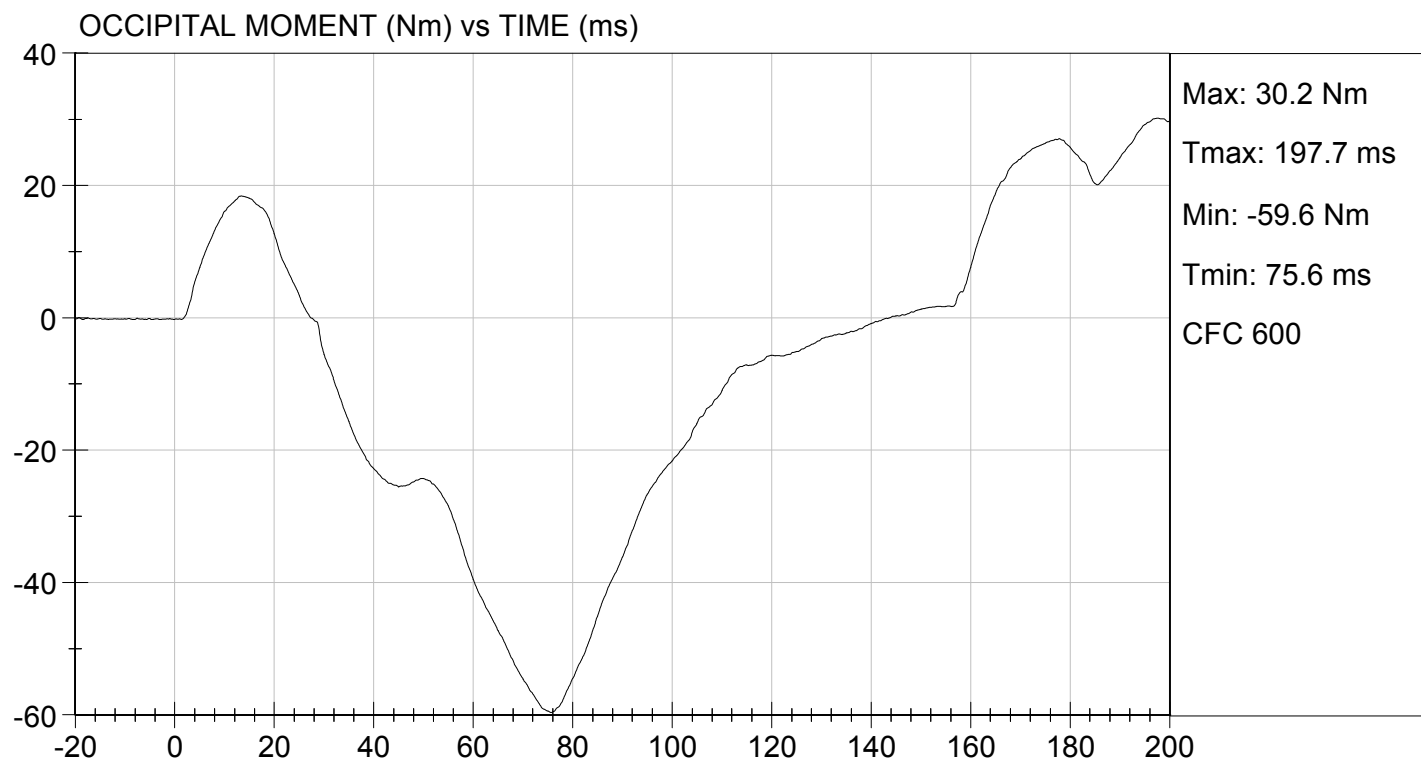
TEST DATE: 07/10/2015
TEST #: D152023





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

TEST DATE: 07/10/2015
TEST #: D152023



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

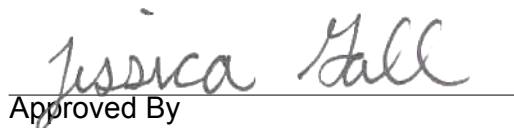
ATD Serial No: 351

Test I.D: D152024

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,427	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	7.01	Pass
Internal Hysteresis	%	69 to 85	70	Pass
			Overall Test Results	Pass


Laboratory Technician

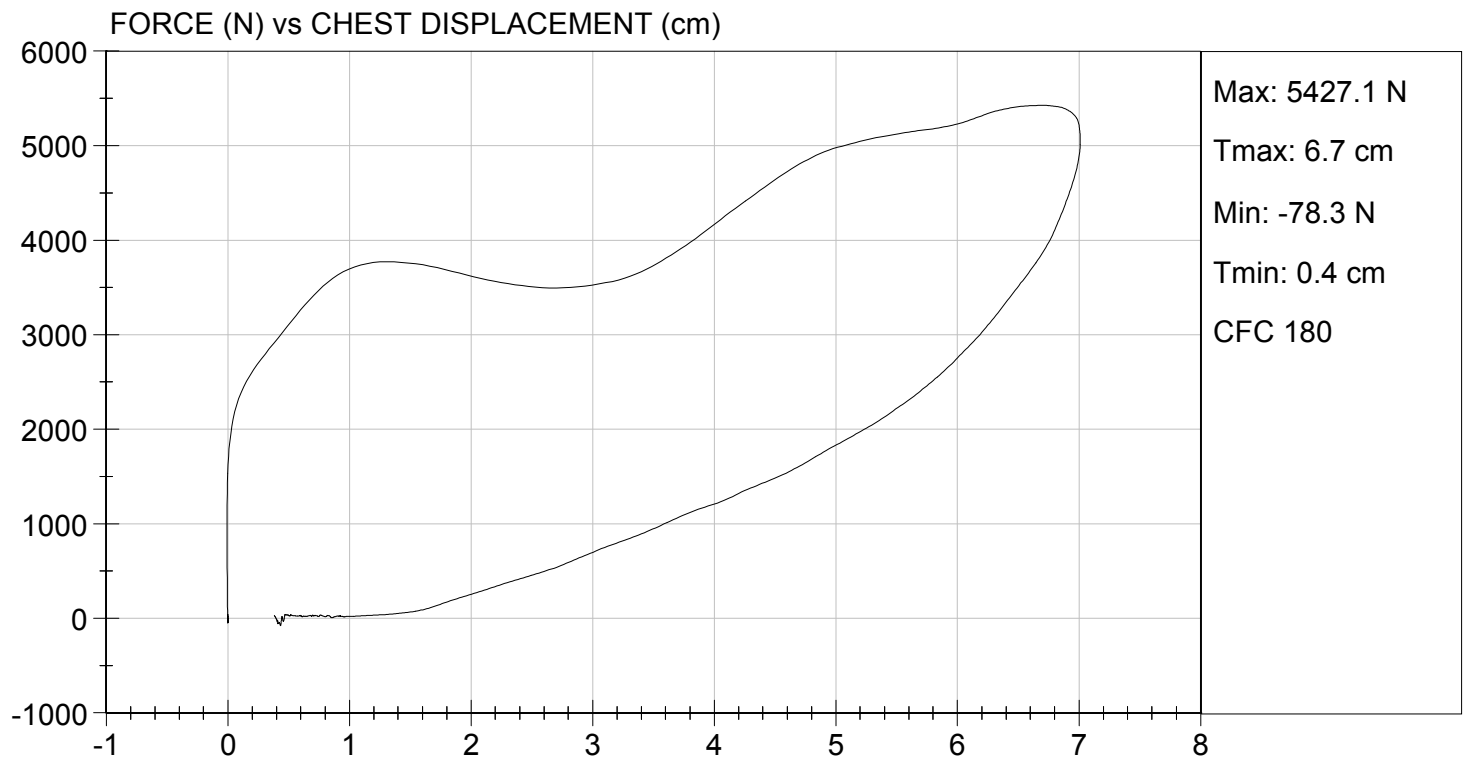
07/10/2015
Test Date


Approved By



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

TEST DATE: 07/10/2015
TEST #: D152024



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

ATD Serial No: 351

Test I.D: D152025

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	43	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,523	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

07/10/2015

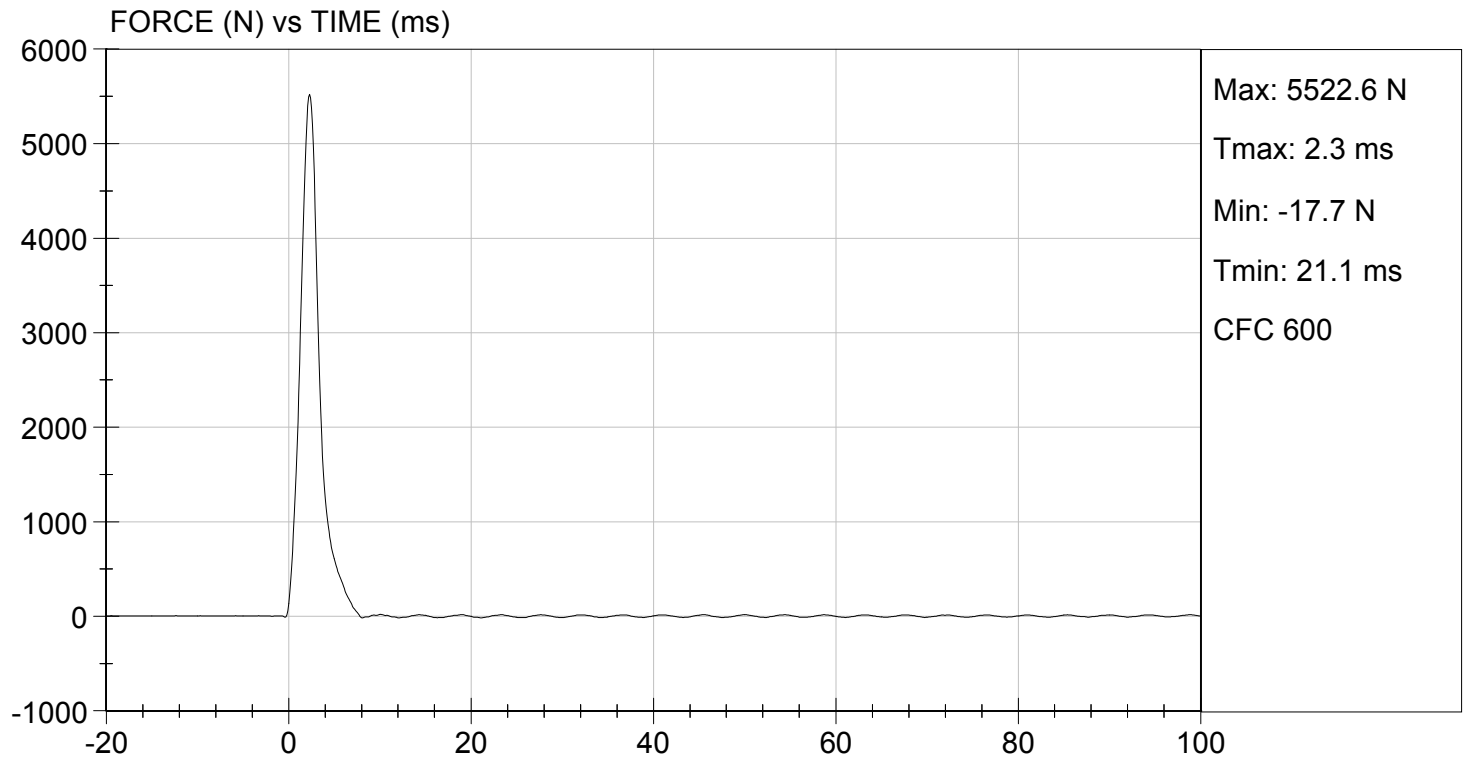
Test Date

Jessica Hall
Approved By



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

TEST DATE: 07/10/2015
TEST #: D152025



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

ATD Serial No: 351

Test I.D: D152026

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	43	Pass
Probe Velocity	m/s	2.07 to 2.13	2.13	Pass
Peak Probe Force	N	4715 to 5782	5,179	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

07/10/2015

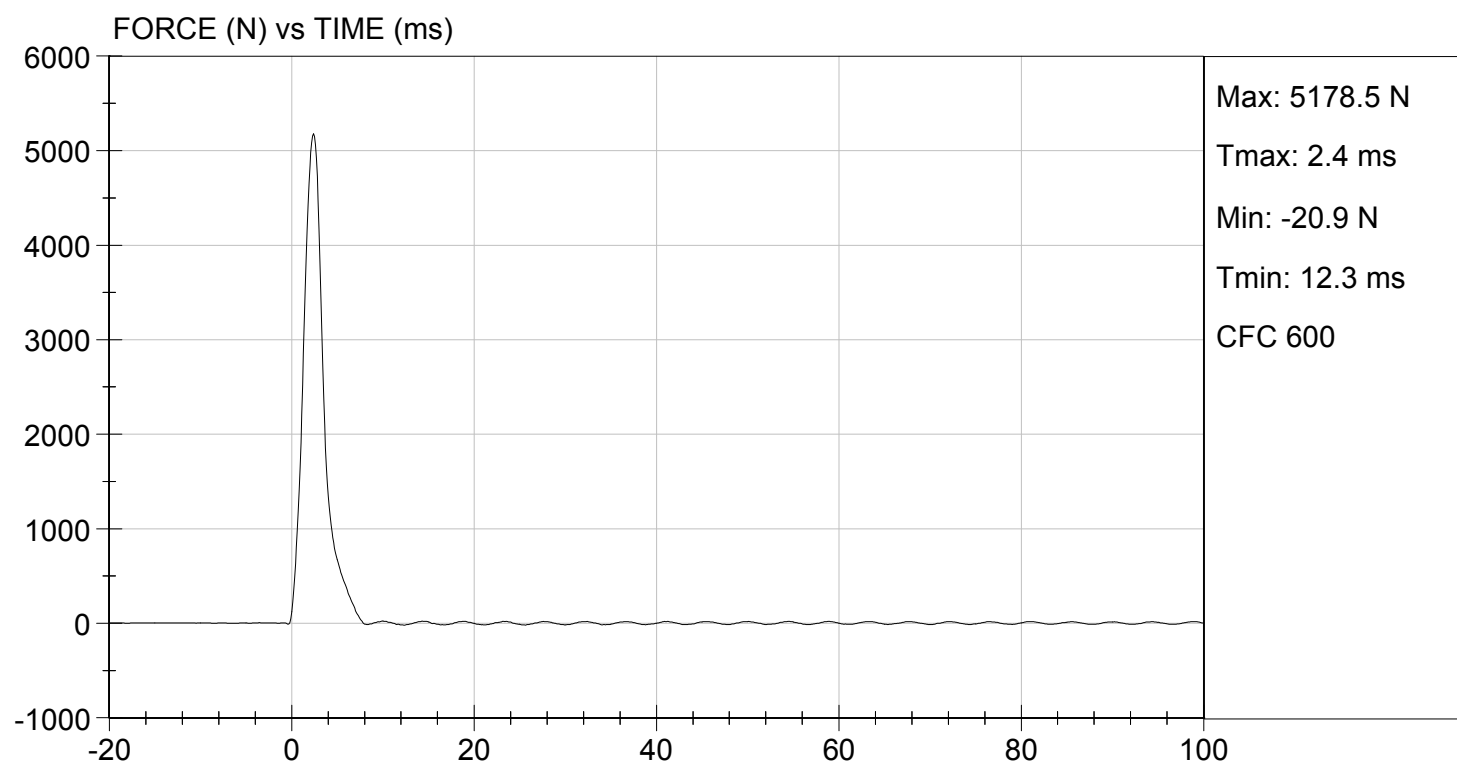
Test Date

Jessica Hall
Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.98 ft/s, 2.13 m/s

TEST DATE: 07/10/2015
TEST #: D152026



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

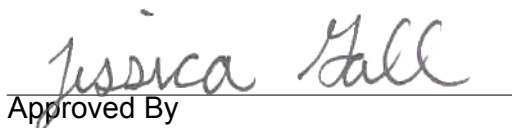
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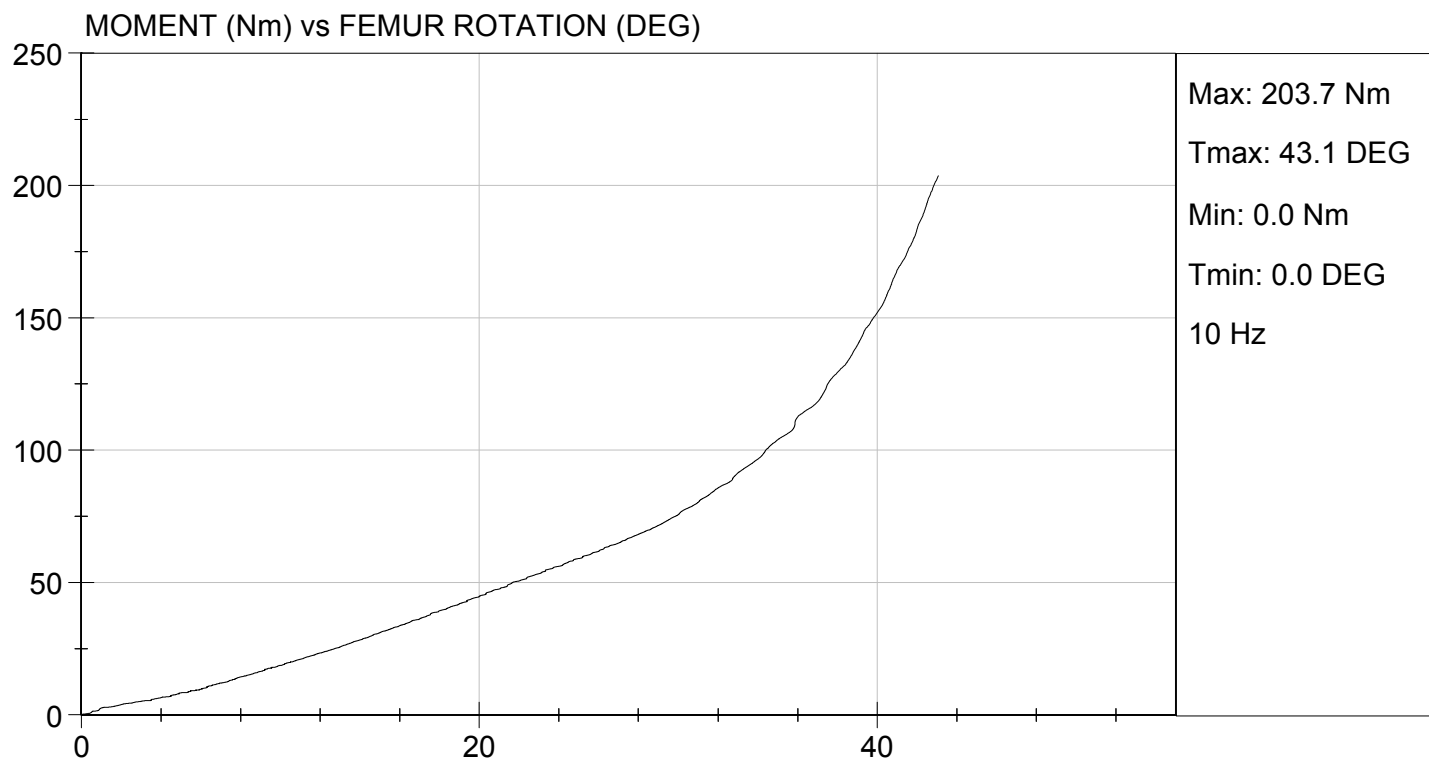
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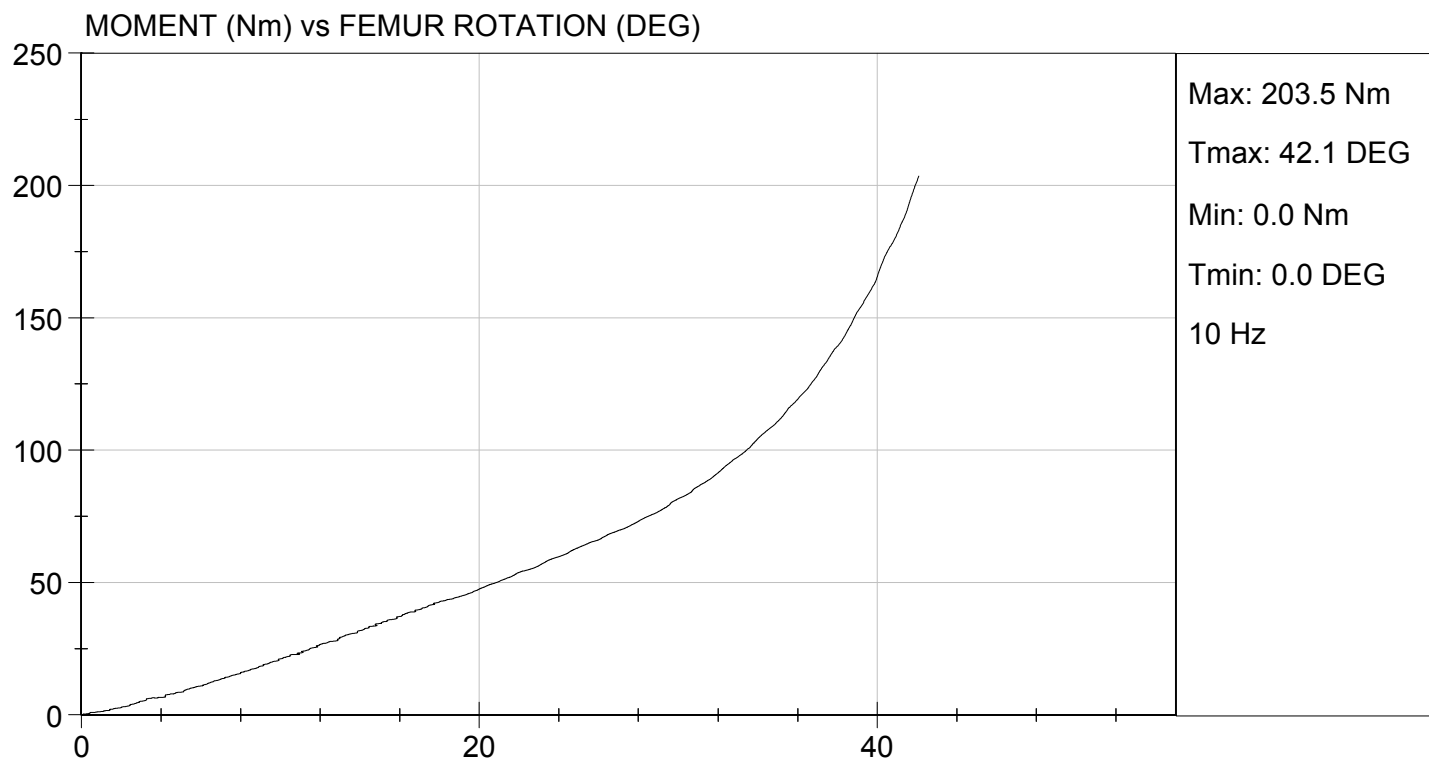
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.9	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	43	43	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.2	Pass
30 Degrees	Nm	94.9 Nm Max	75.7	81.6	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	43.1	42.1	Pass
Overall Test Results					Pass


Laboratory Technician

07/10/2015
Test Date


Approved By





Hybrid III, 5th External Measurements
SN: 138

HYBRID III, PART 572, SUBPART O EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	774.7-800.1	785.1
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	456.8
C	H-POINT HEIGHT	Reference	81.3-86.3	84.0
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	146.2
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	78.0
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	127.5
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	243.9-259.1	249.6
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	43.2-48.2	45.0
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	276.8-297.2	280.2
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	201.9
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	520.7-546.1	526.7
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376.0	362.3
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	398.0

N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. "K".	414-439.4	430.5
HYBRID III, SUBPART O EXTERNAL DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 304.8 ± 5.1 mm above seat surface	175.3-190.5	184.6
P	FOOT LENGTH	Tip of toe to rear of heel	218.5-233.7	221.0
Q	STANDING HEIGHT	(THEORETICAL)	1501.1	N/A
R	BUTTOCK TO KNEE PIVOT LENGTH	The rear surface of the buttocks to the knee pivot bolt	457.2-482.6	472.6
S	HEAD BREADTH	The widest part of the head	137.1-147.3	141.9
T	HEAD DEPTH	Back of the head to the forehead	177.8-188.0	184.2
U	HIP BREADTH	The widest part of the hip	299.7-314.9	307.4
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	350.5-365.7	360.5
W	FOOT BREADTH	The widest part of the foot	78.8-94.0	85.0
X	HEAD CIRCUMFERENCE	Measured at the point as in dim. "T"	528.3-548.7	546.2
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 345.4 ± 12.7 mm above seat surface	850.9-881.3	875.1
Z	WAIST CIRCUMFERENCE	Measured 165.1 ± 5.1 mm above seat surface	759.5-789.9	785.4
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	332.7-358.1	345.4
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	160.1-170.2	165.1

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test ID: D151681

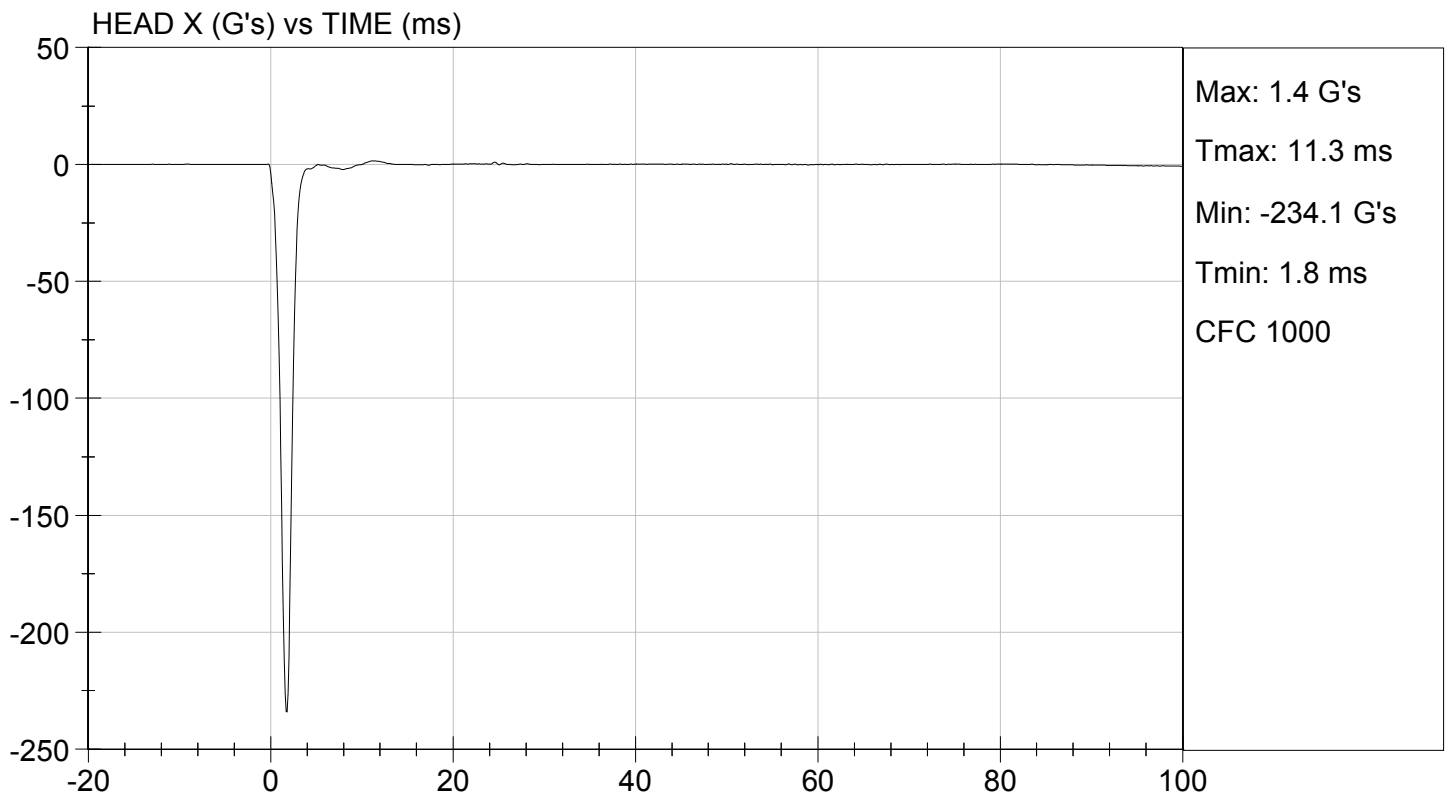
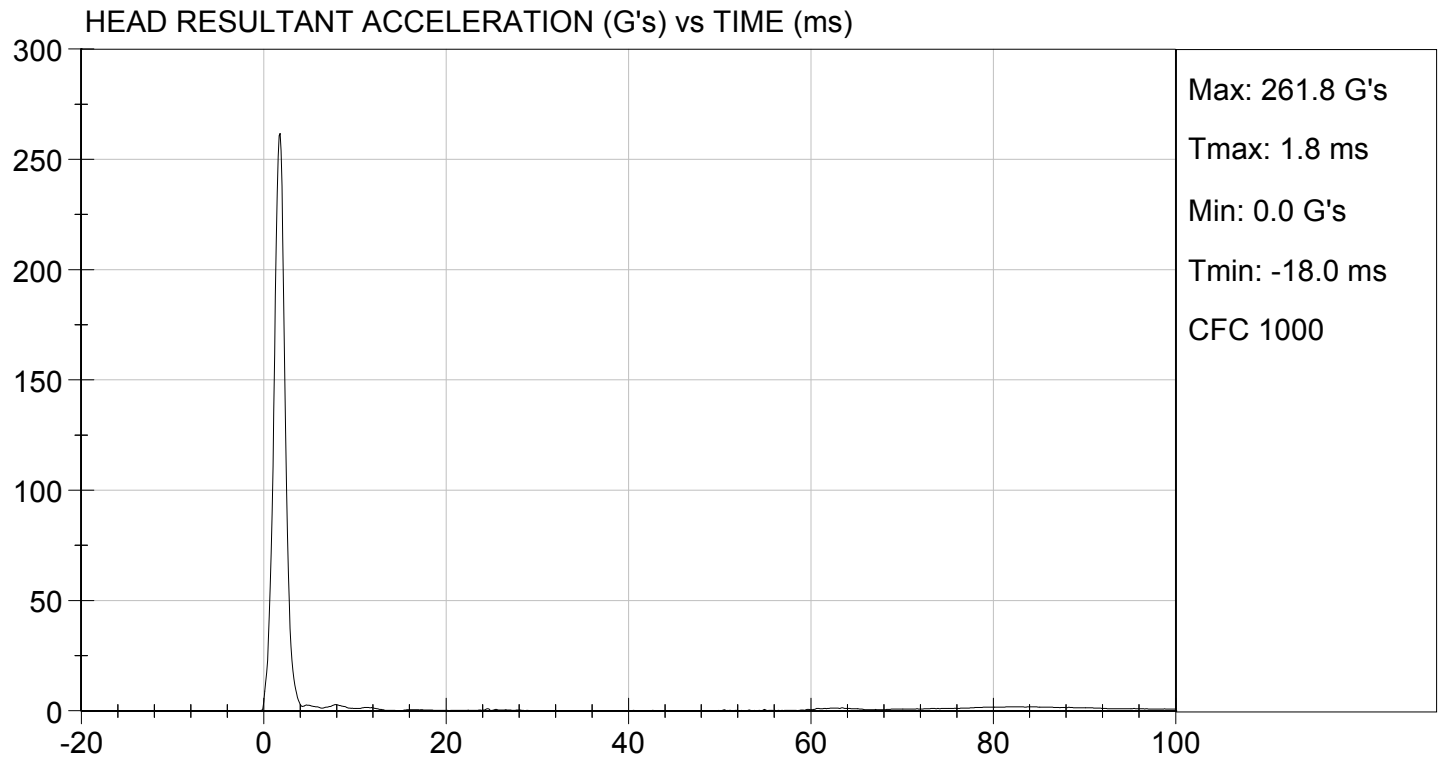
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Peak Resultant Acceleration	G's	250 to 300	262	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-4.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

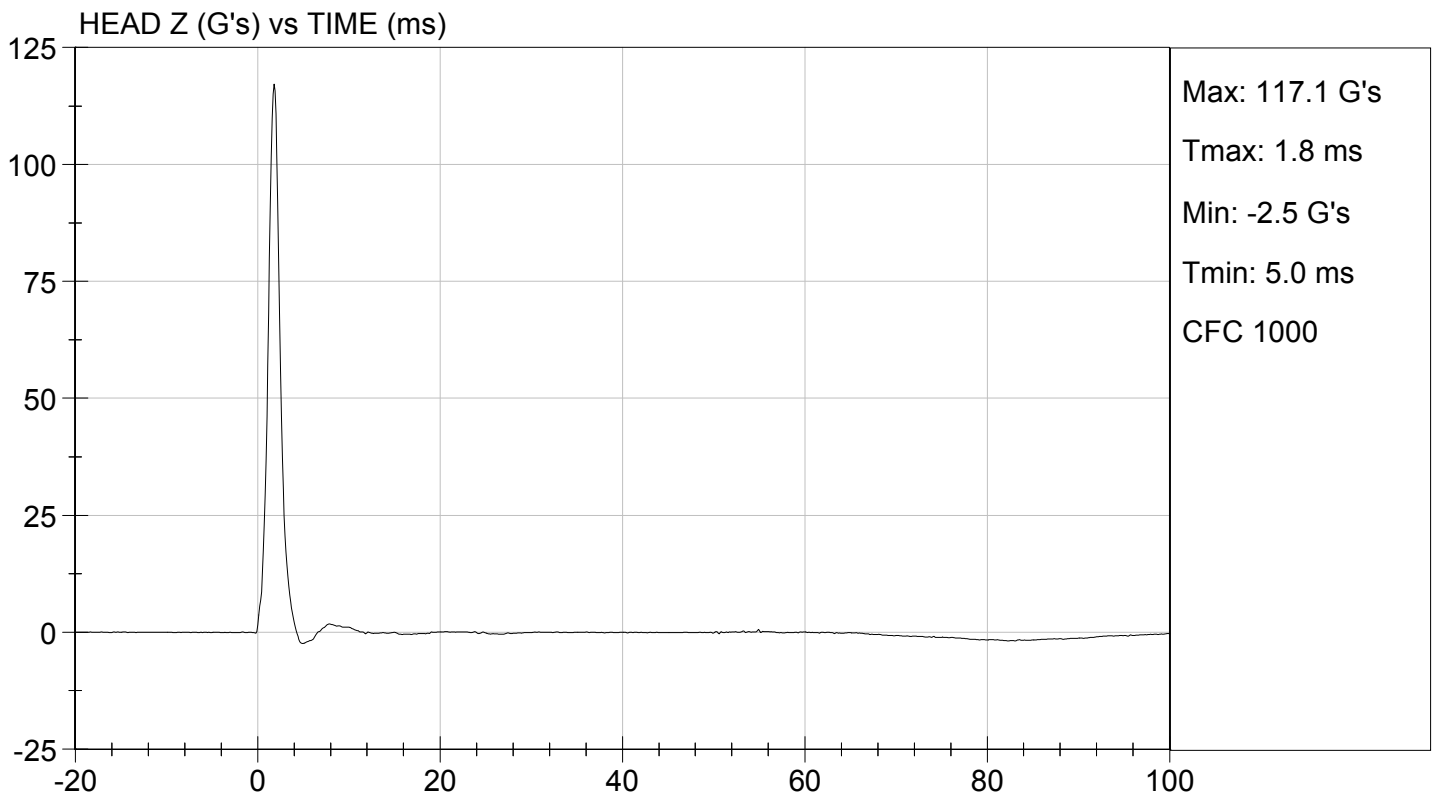
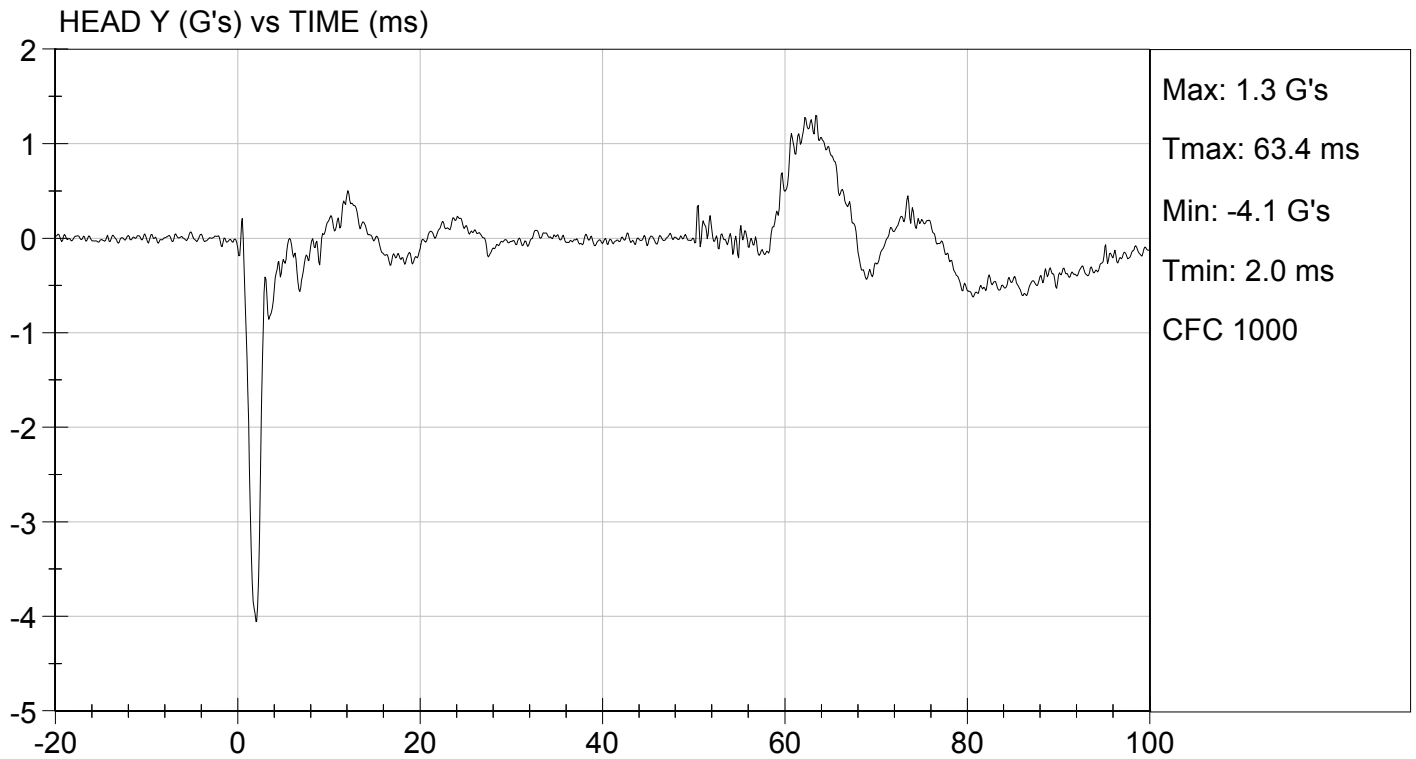
David Schoedel
Laboratory Technician

06/11/2015

Test Date

Jessica Hall
Approved By





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D151682

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Speed		m/s	6.89 to 7.13	6.96	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.4	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	73	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	84	Pass
Overall Results					Pass

David Schoedel
Laboratory Technician

06/11/2015

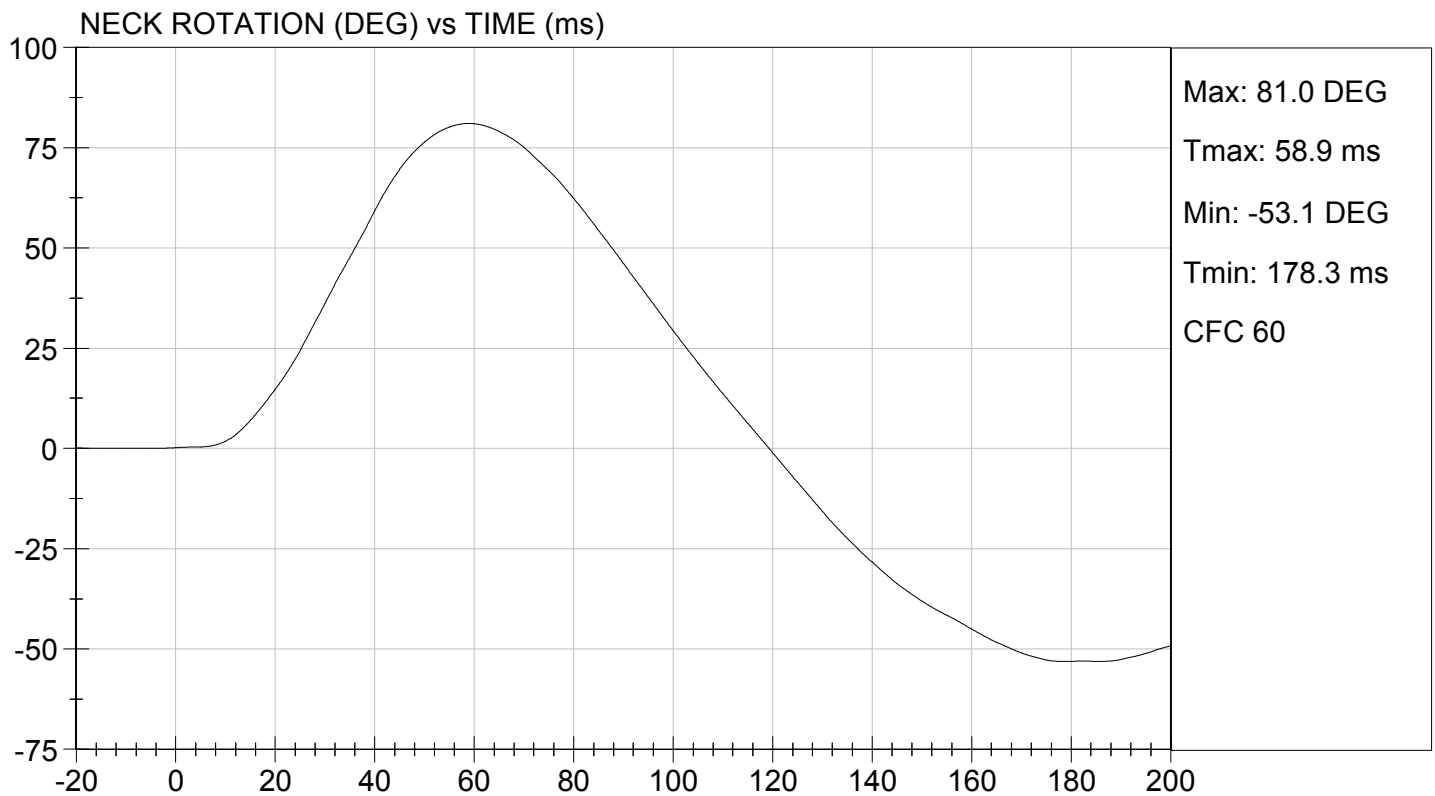
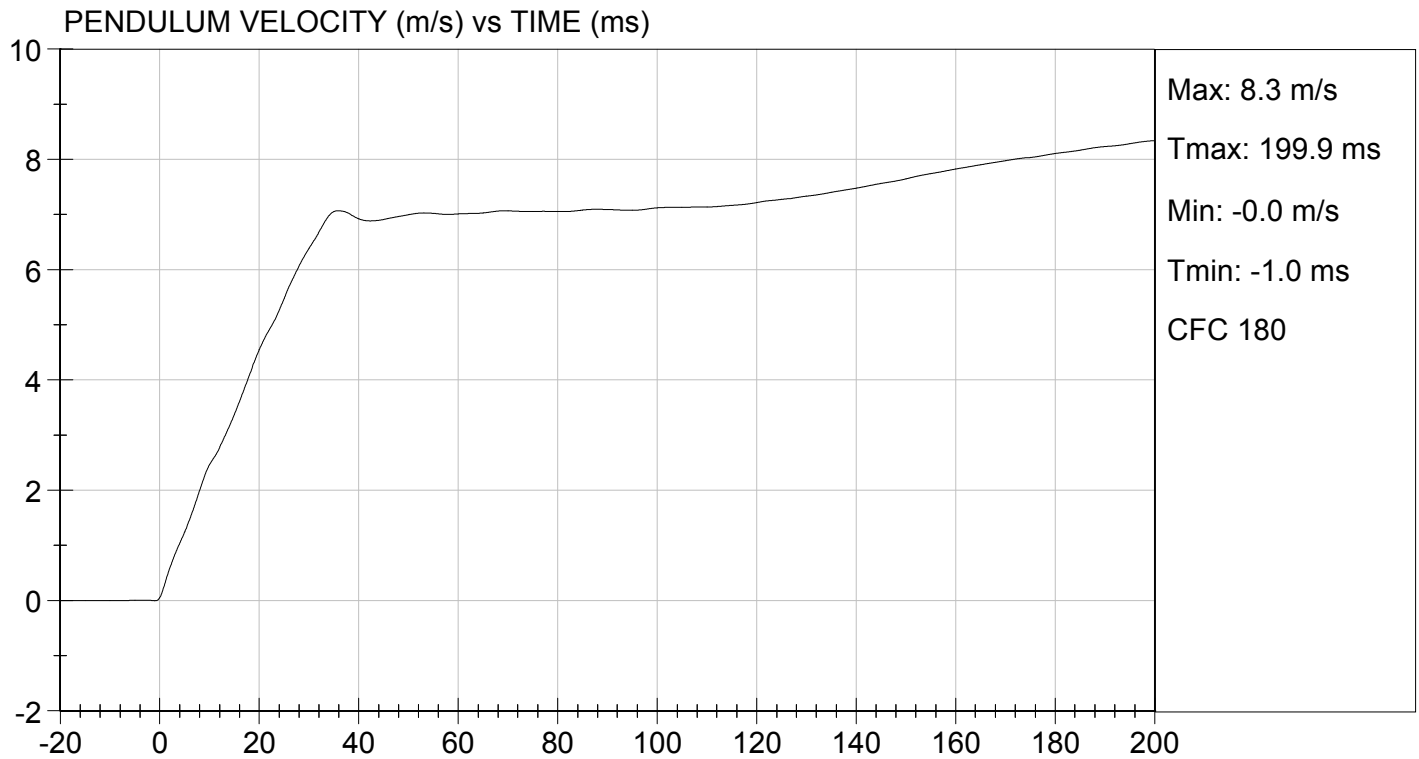
Test Date

Jessica Hall
Approved By



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

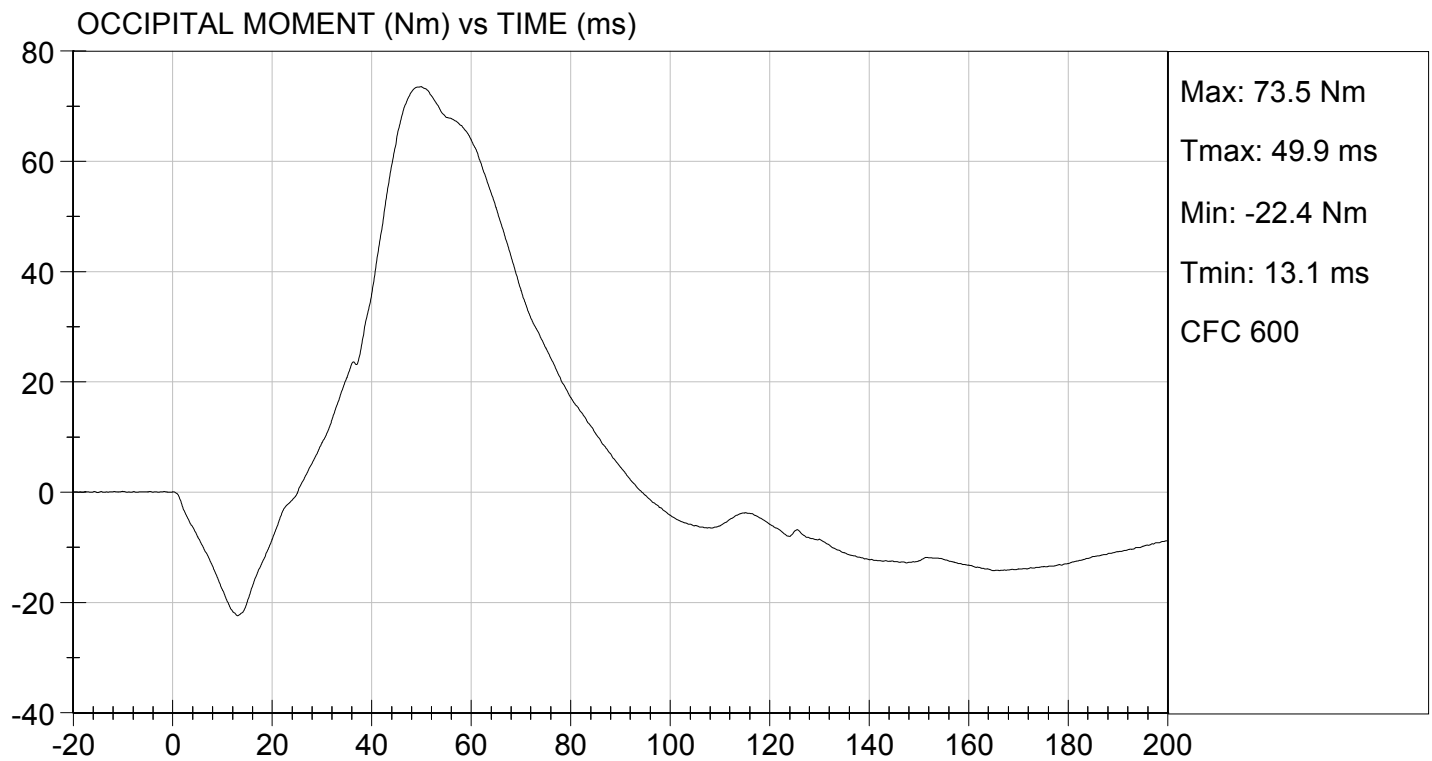
TEST DATE: 06/11/2015
TEST #: D151682





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

TEST DATE: 06/11/2015
TEST #: D151682



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D151683

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.6	Pass
	20 ms	m/s	3.1 to 3.9	3.4	Pass
	30 ms	m/s	4.6 to 5.6	4.9	Pass
D Plane Rotation	Max	deg	99 to 114	105	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-57	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	105	Pass
Overall Results					Pass

David Schoedel
Laboratory Technician

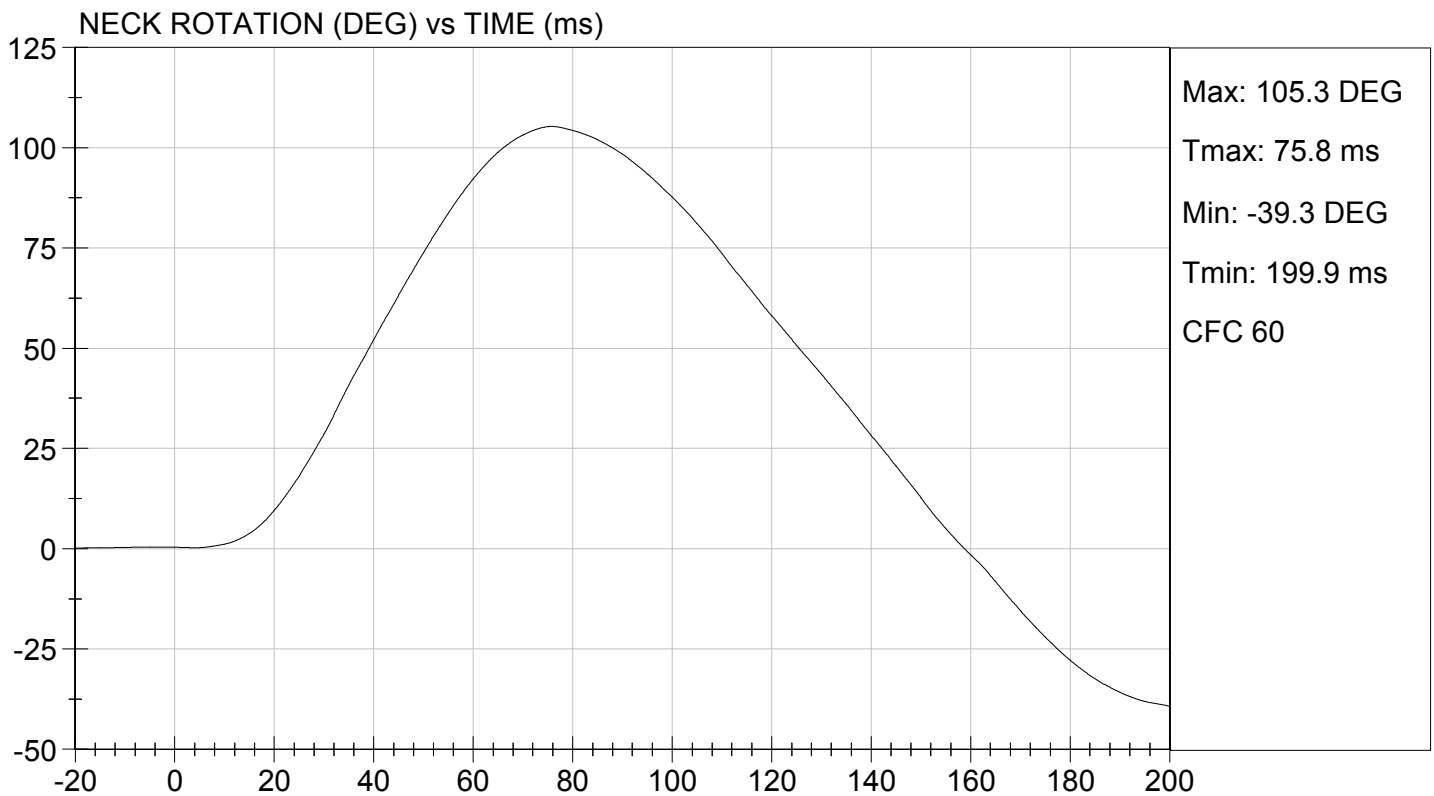
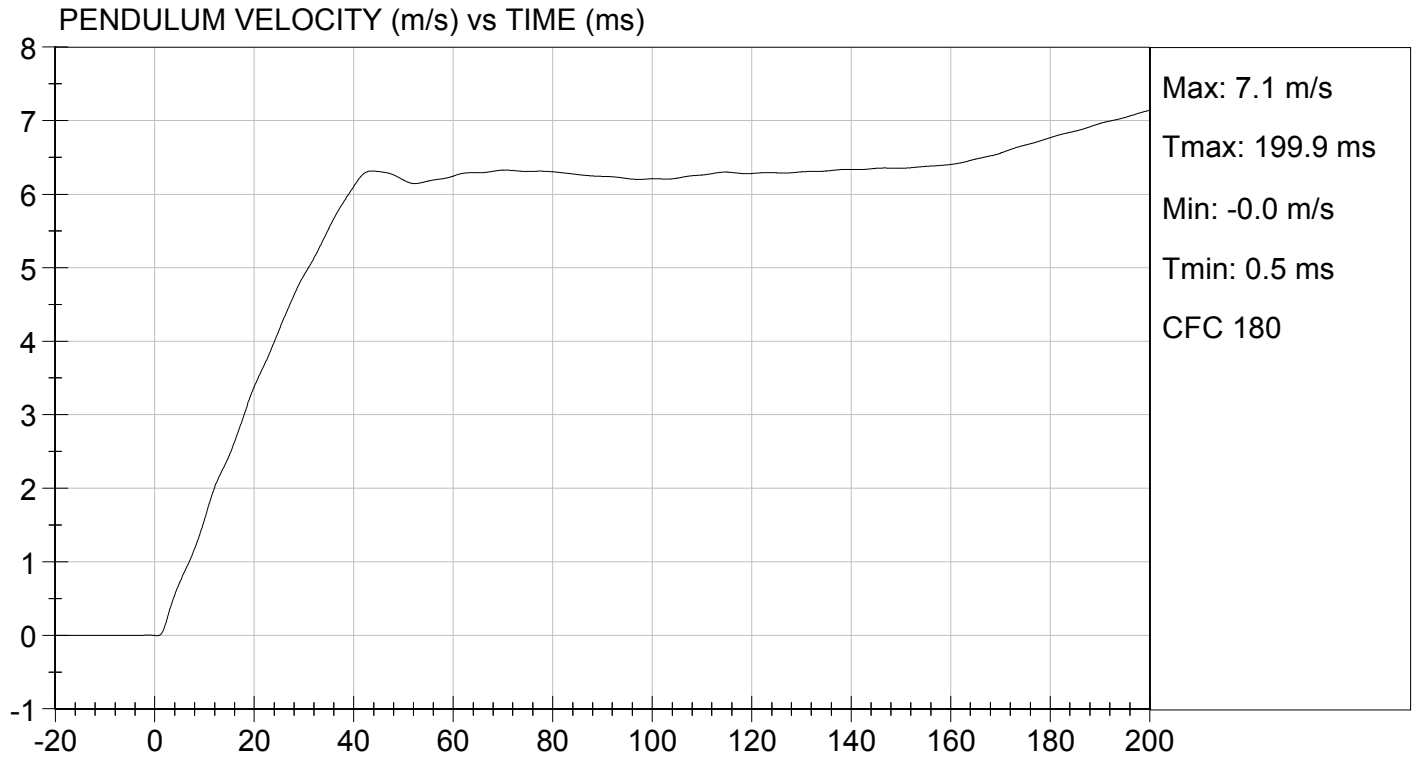
06/11/2015
Test Date

Jessica Hall
Approved By



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

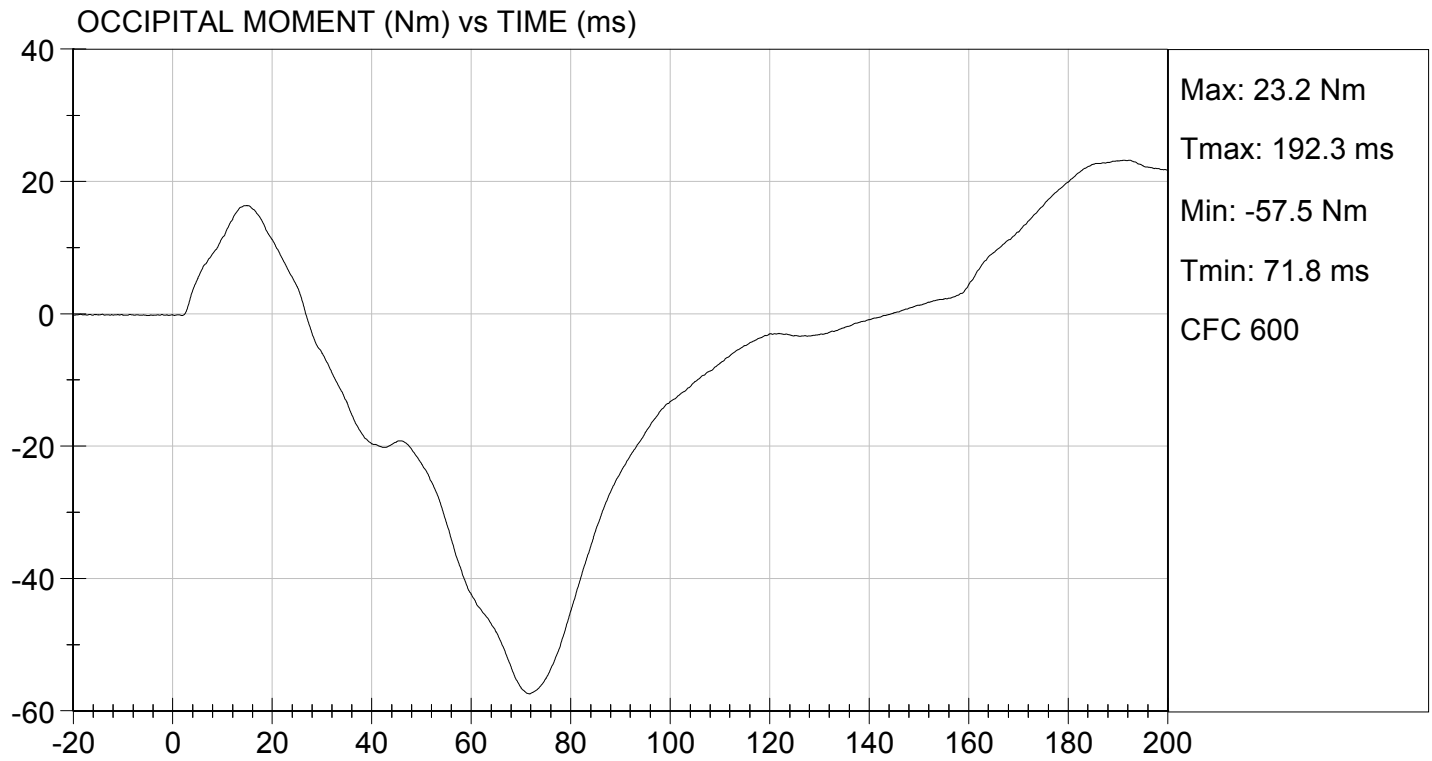
TEST DATE: 06/11/2015
TEST #: D151683





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

TEST DATE: 06/11/2015
TEST #: D151683



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D151684

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Relative Humidity	%	10 to 70	50	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	53	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4181	Pass
Internal Hysteresis	%	69 to 85	74	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4153	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

06/11/2015

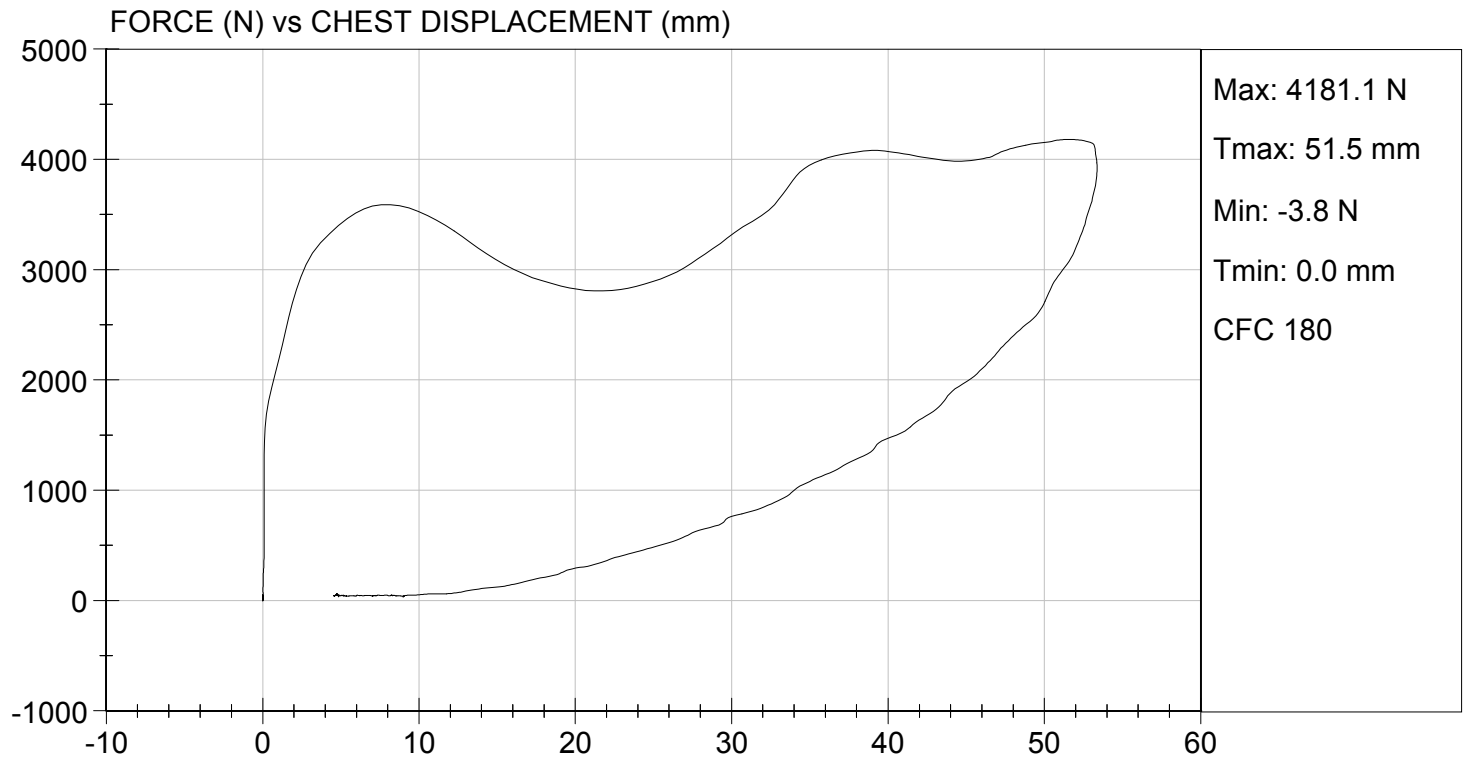
Test Date

Jessica Hall
Approved By



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

TEST DATE: 06/11/2015
TEST #: D151684



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D151685

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3617	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

06/11/2015

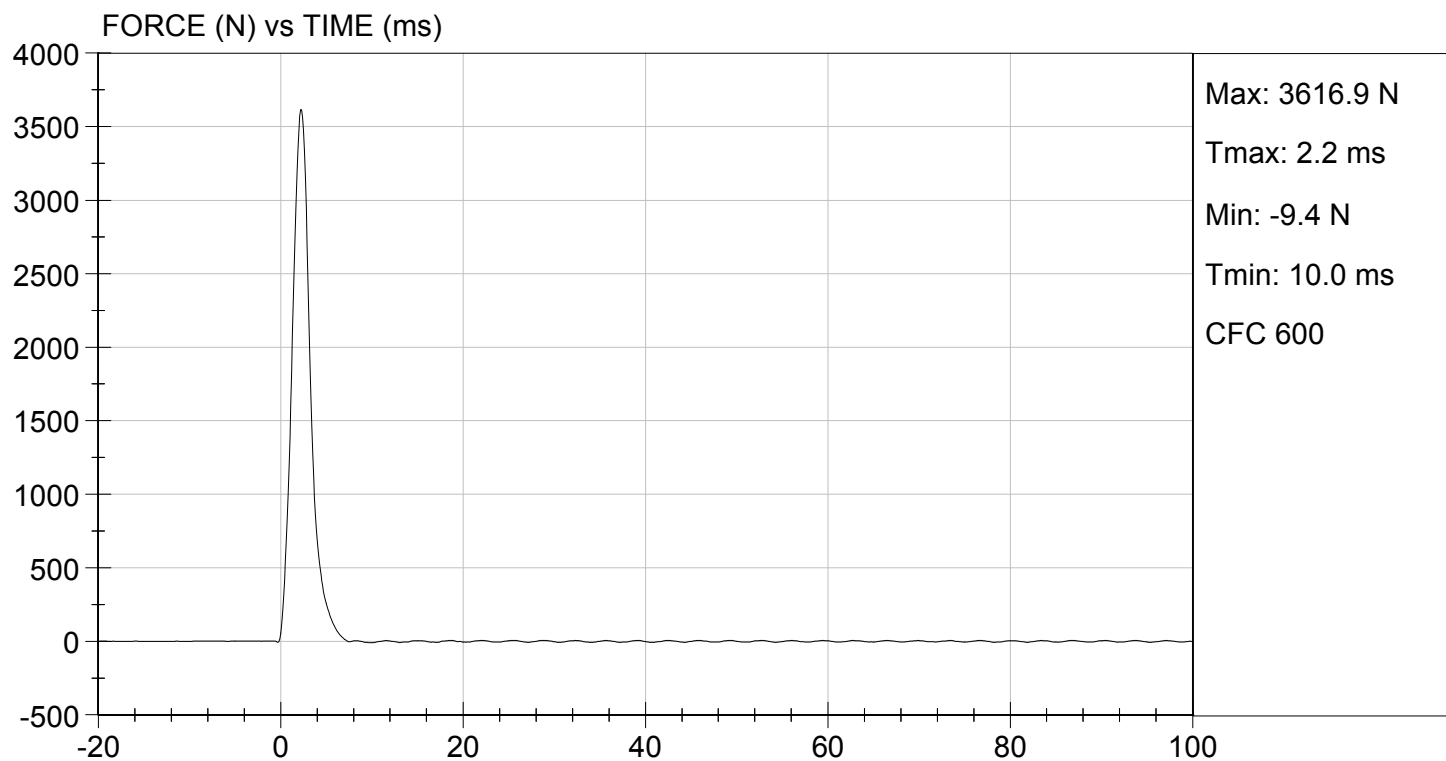
Test Date

Jessica Hall
Approved By



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

TEST DATE: 06/11/2015
TEST #: D151685



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D151686

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3636	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

06/11/2015

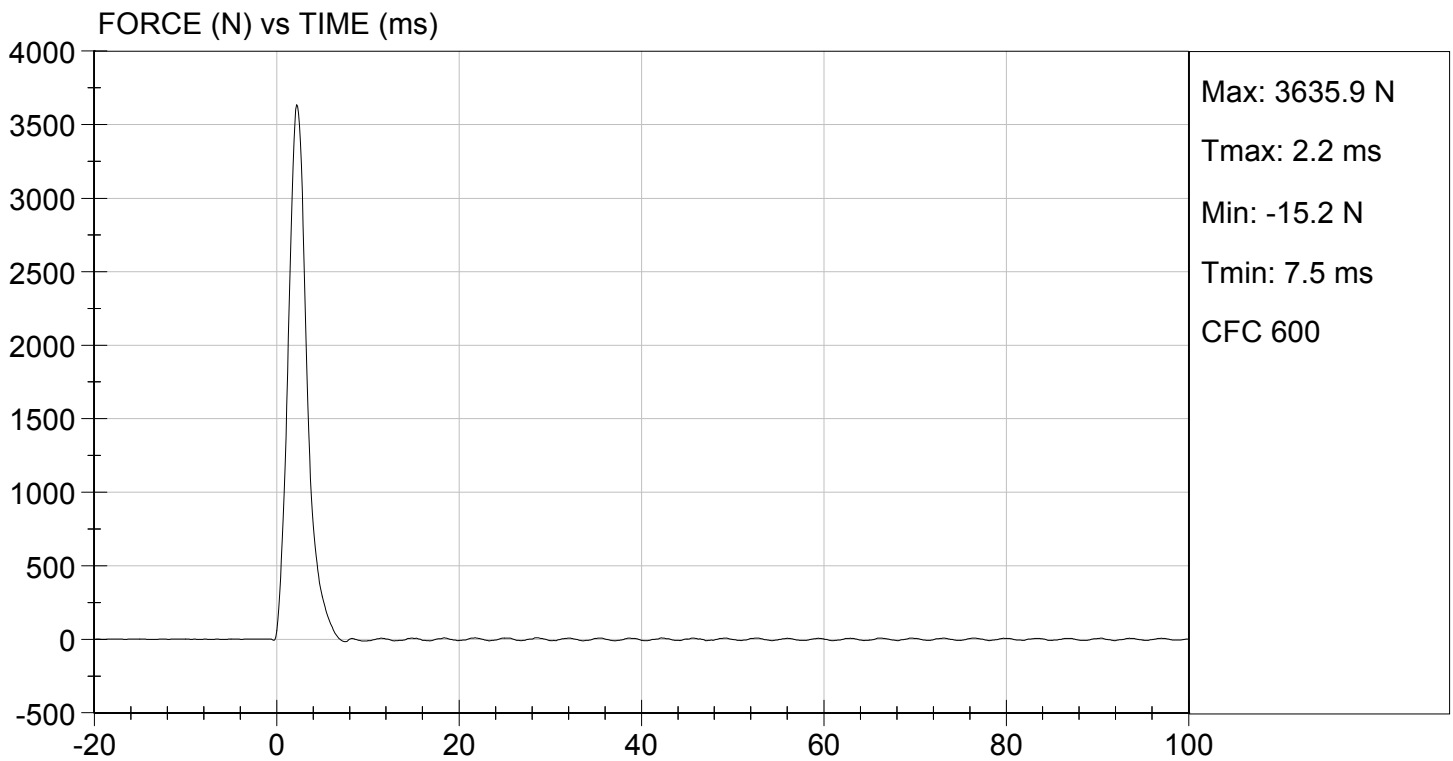
Test Date

Jessica Hall
Approved By



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

TEST DATE: 06/11/2015
TEST #: D151686



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D151687

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	325	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass

David Schoedel
Laboratory Technician

06/11/2015

Test Date

Jessica Hall
Approved By

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test ID: D152031

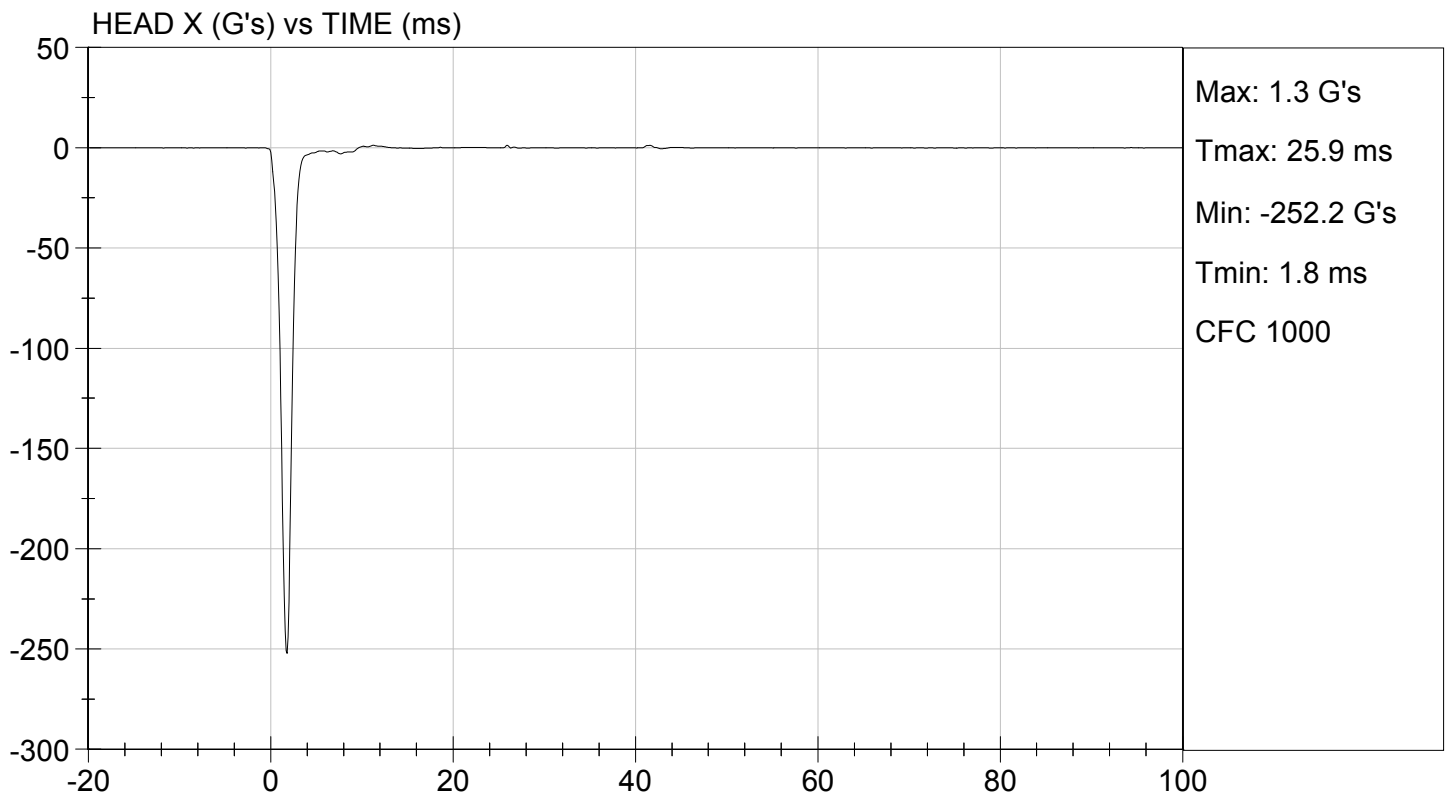
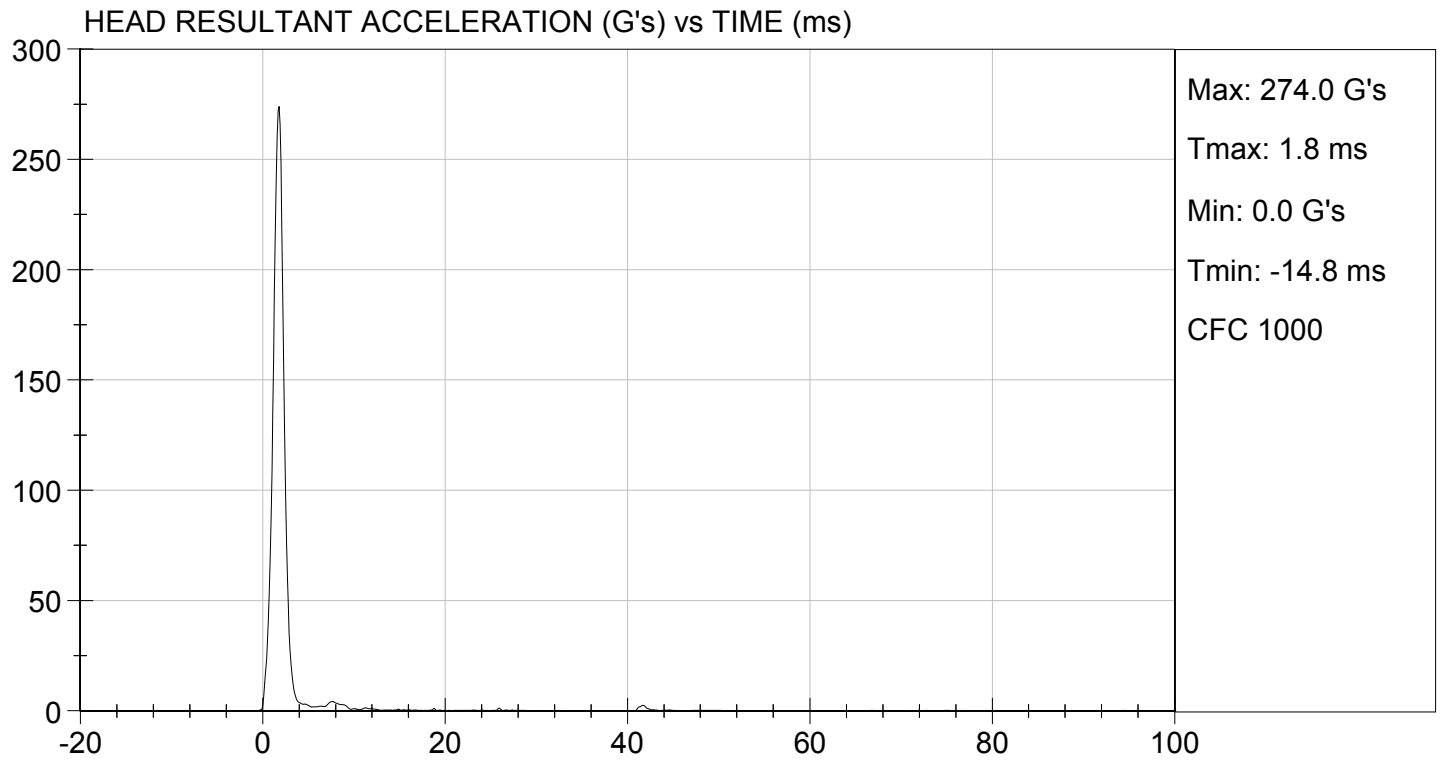
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	250 to 300	274	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	7.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

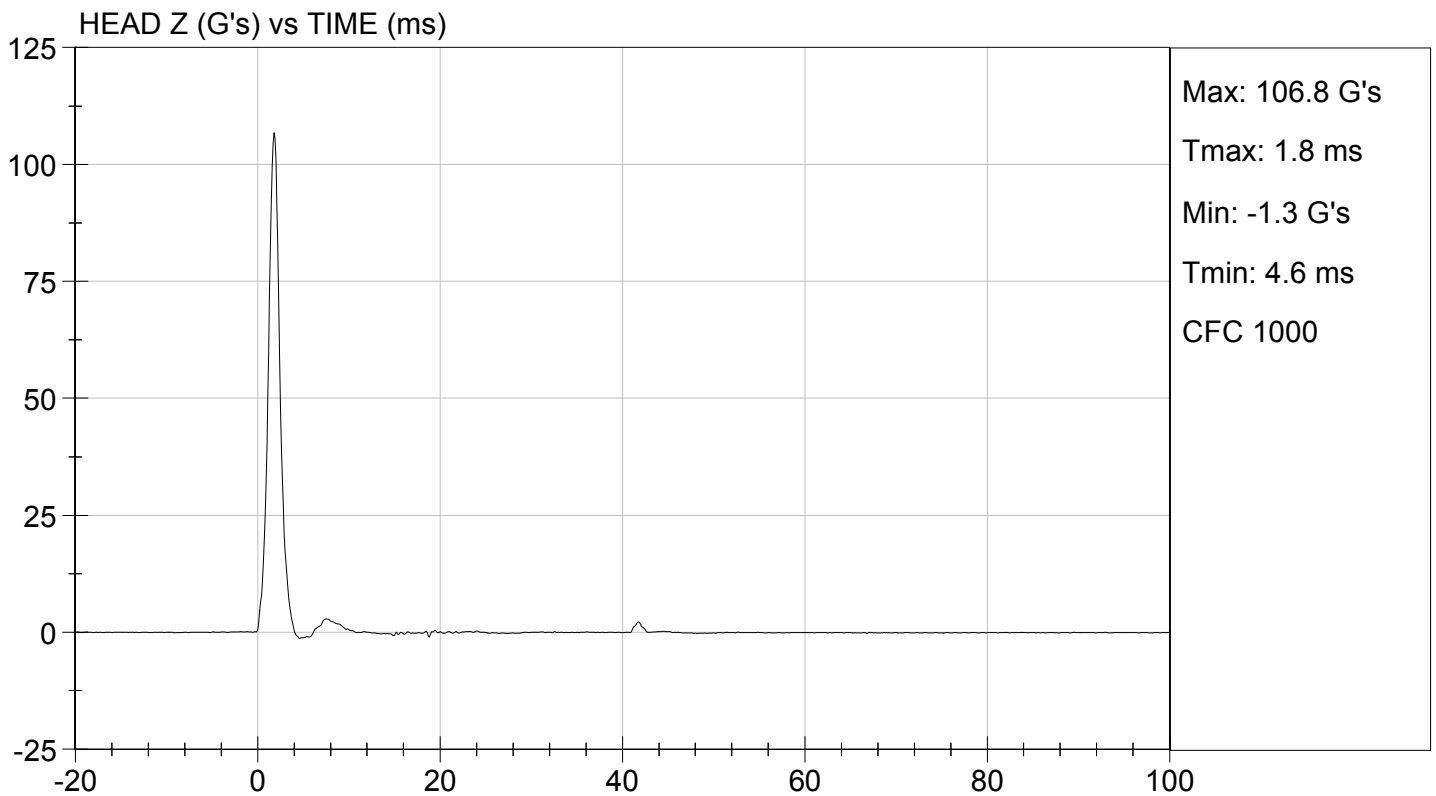
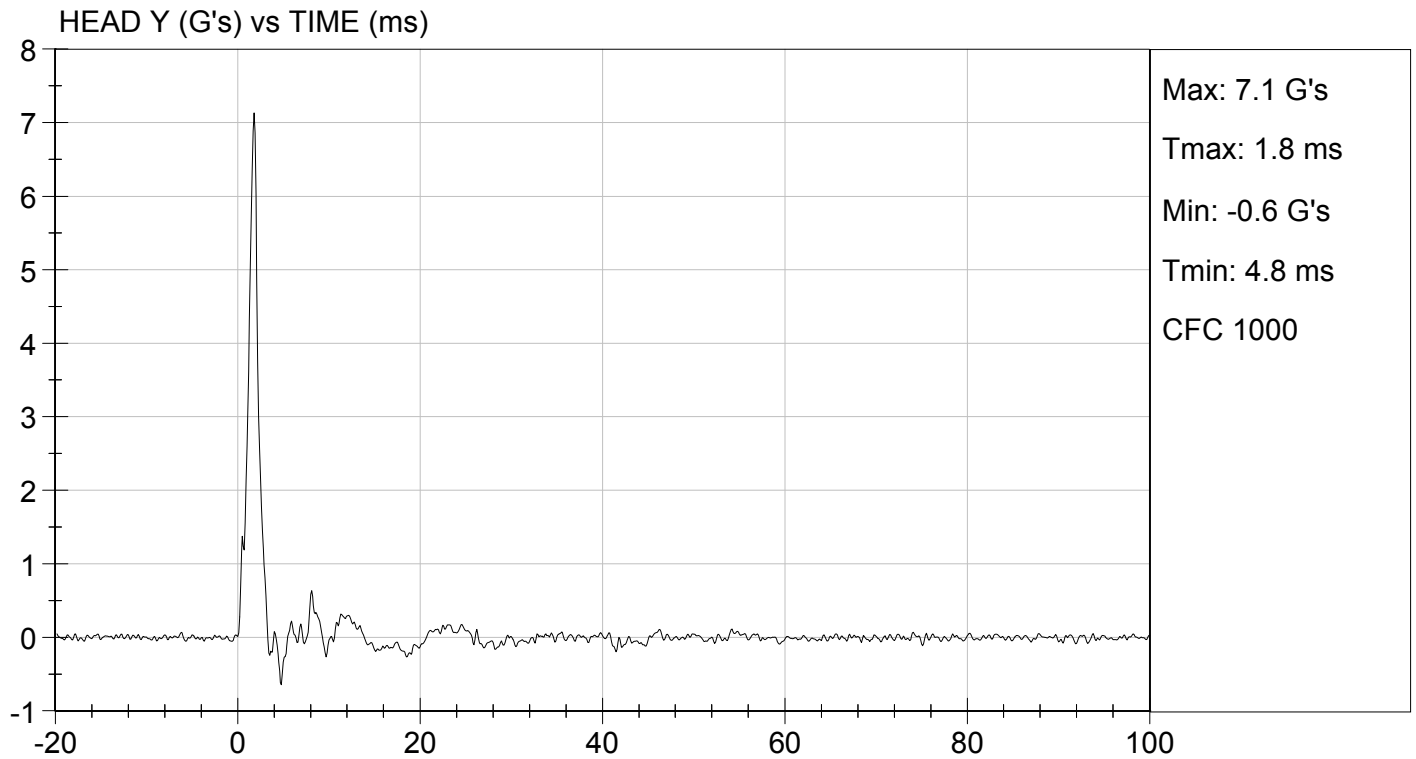
David Schoedel
Laboratory Technician

07/10/2015

Test Date

Jessica Hall
Approved By





MGA RESEARCH CORPORATION**NECK FLEXION TEST****HYBRID III 5TH PERCENTILE**ATD Serial No: 138Test I.D.: D152032

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	43	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	4.4	Pass
	30 ms	m/s	5.8 to 7.0	6.1	Pass
D Plane Rotation	Max	deg	77 to 91	82	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	79	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
Overall Results					Pass

David Schoedel
Laboratory Technician

07/10/2015

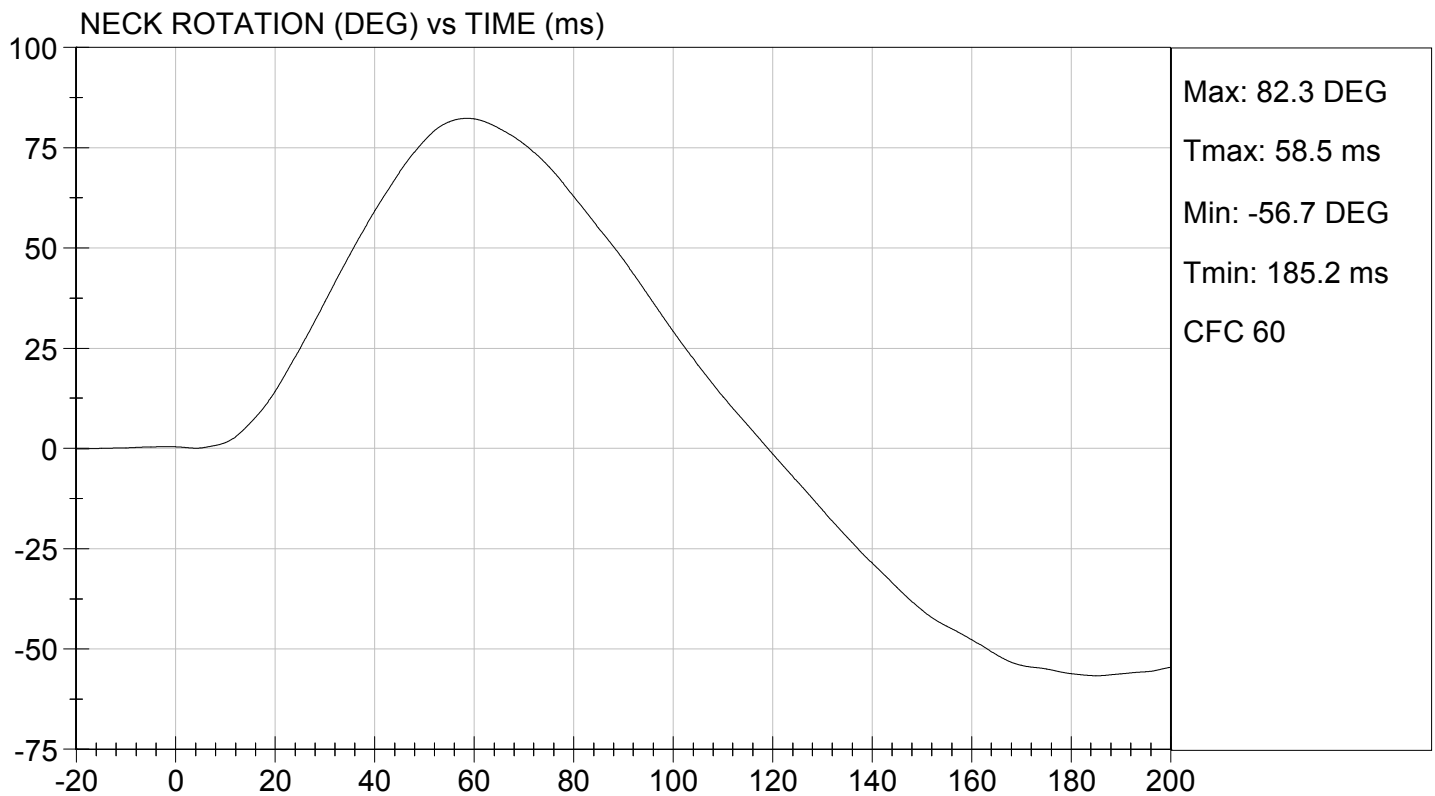
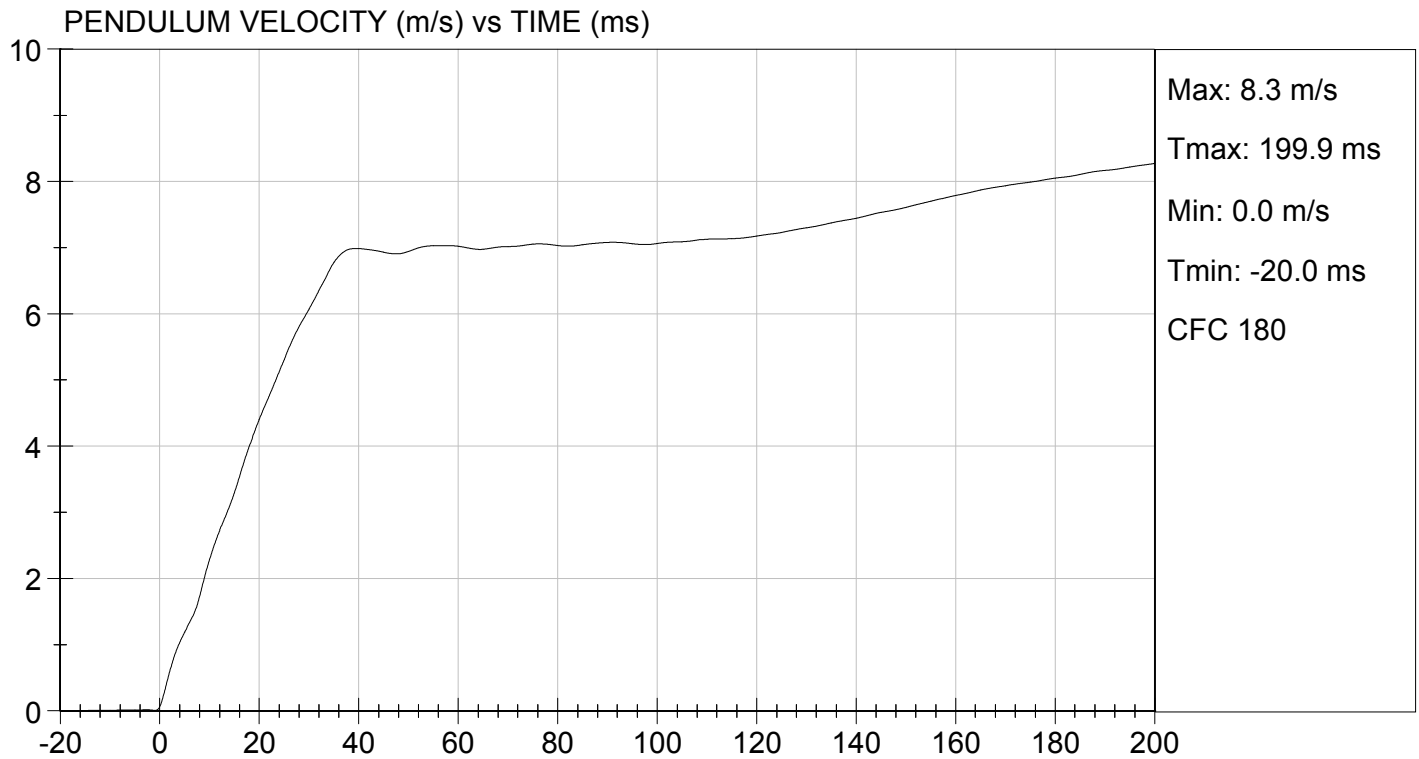
Test Date

Jessica Hall
Approved By



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

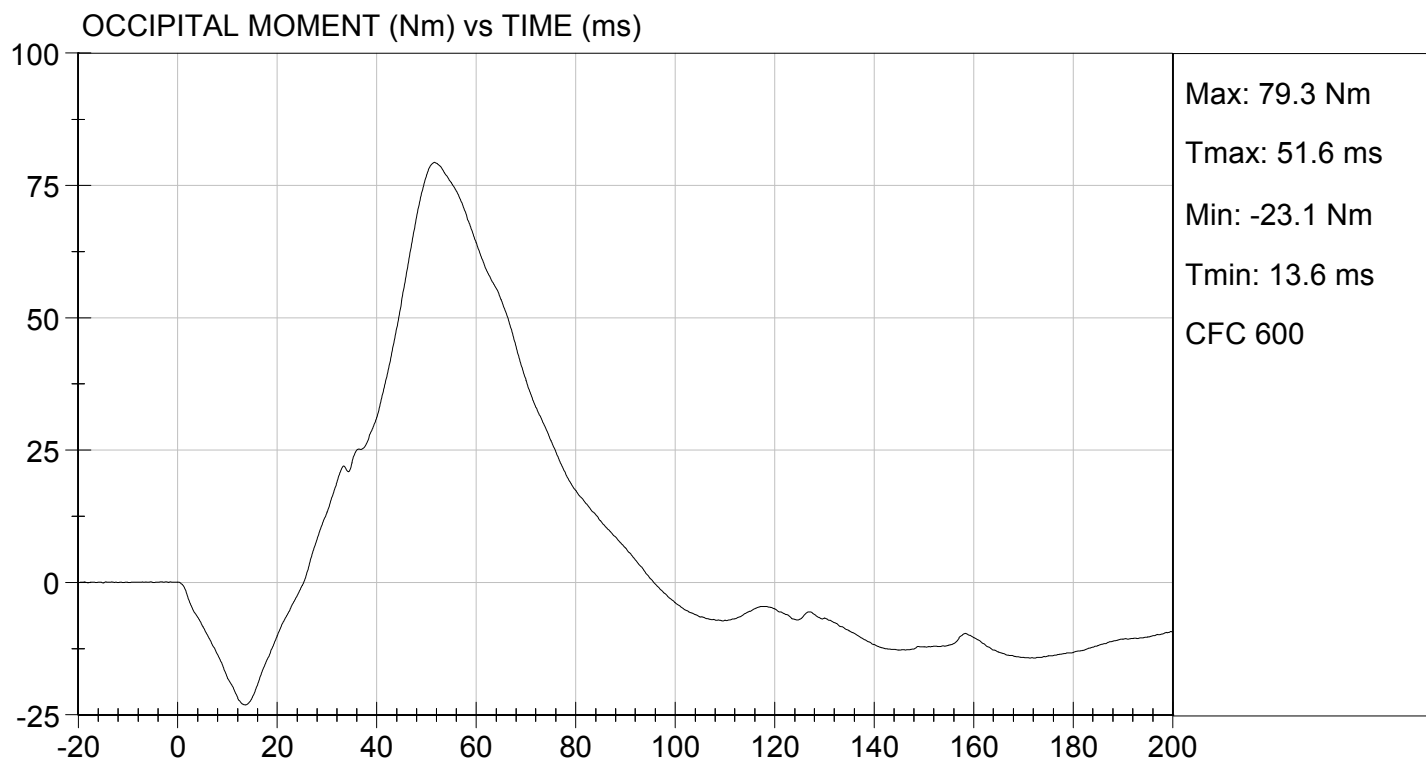
TEST DATE: 07/10/2015
TEST #: D152032





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

TEST DATE: 07/10/2015
TEST #: D152032



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D152033

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Pendulum Speed		m/s	5.95 to 6.19	5.98	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.8	Pass
	30 ms	m/s	4.6 to 5.6	5.5	Pass
D Plane Rotation	Max	deg	99 to 114	108	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-63	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	101	Pass
Overall Results					Pass

David Schoedel
Laboratory Technician

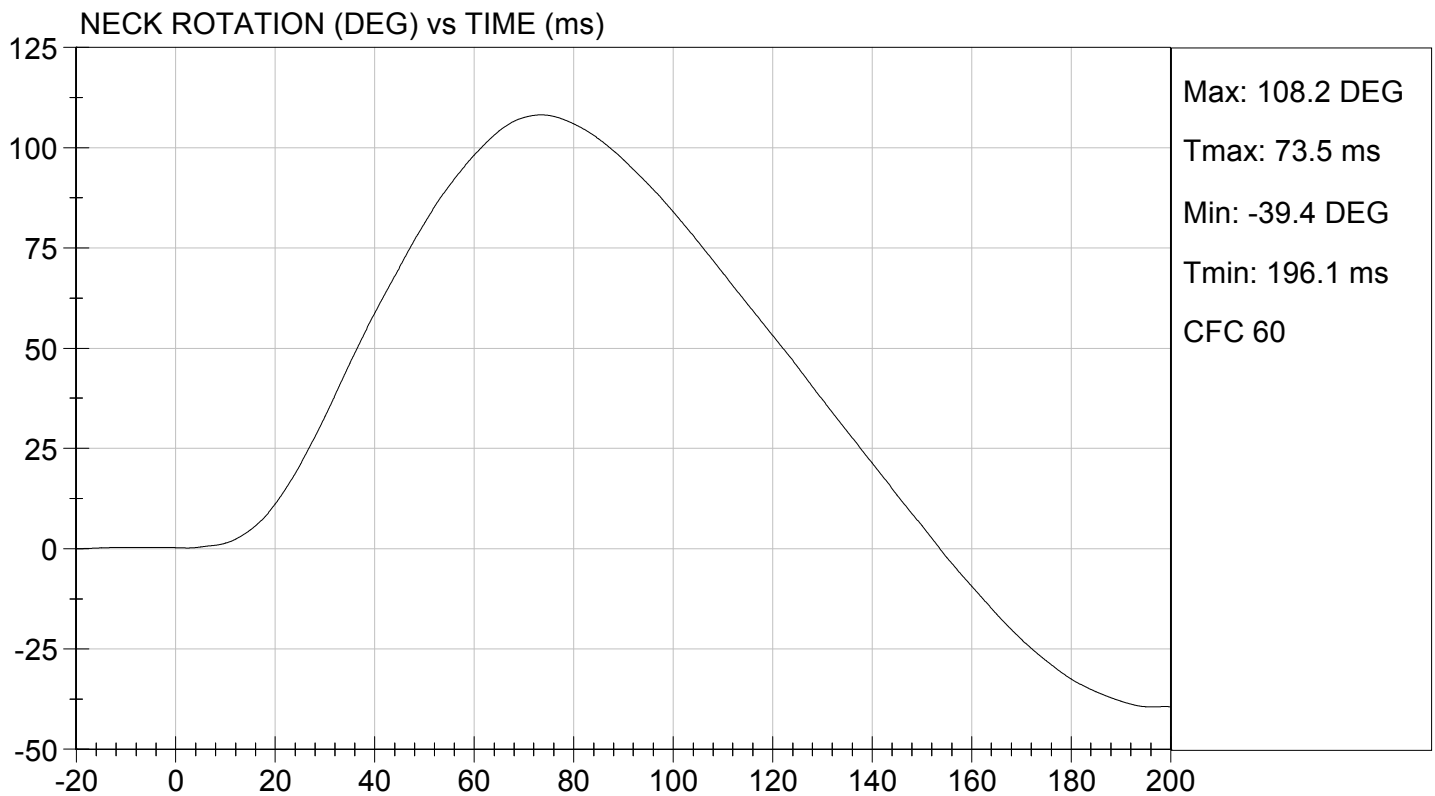
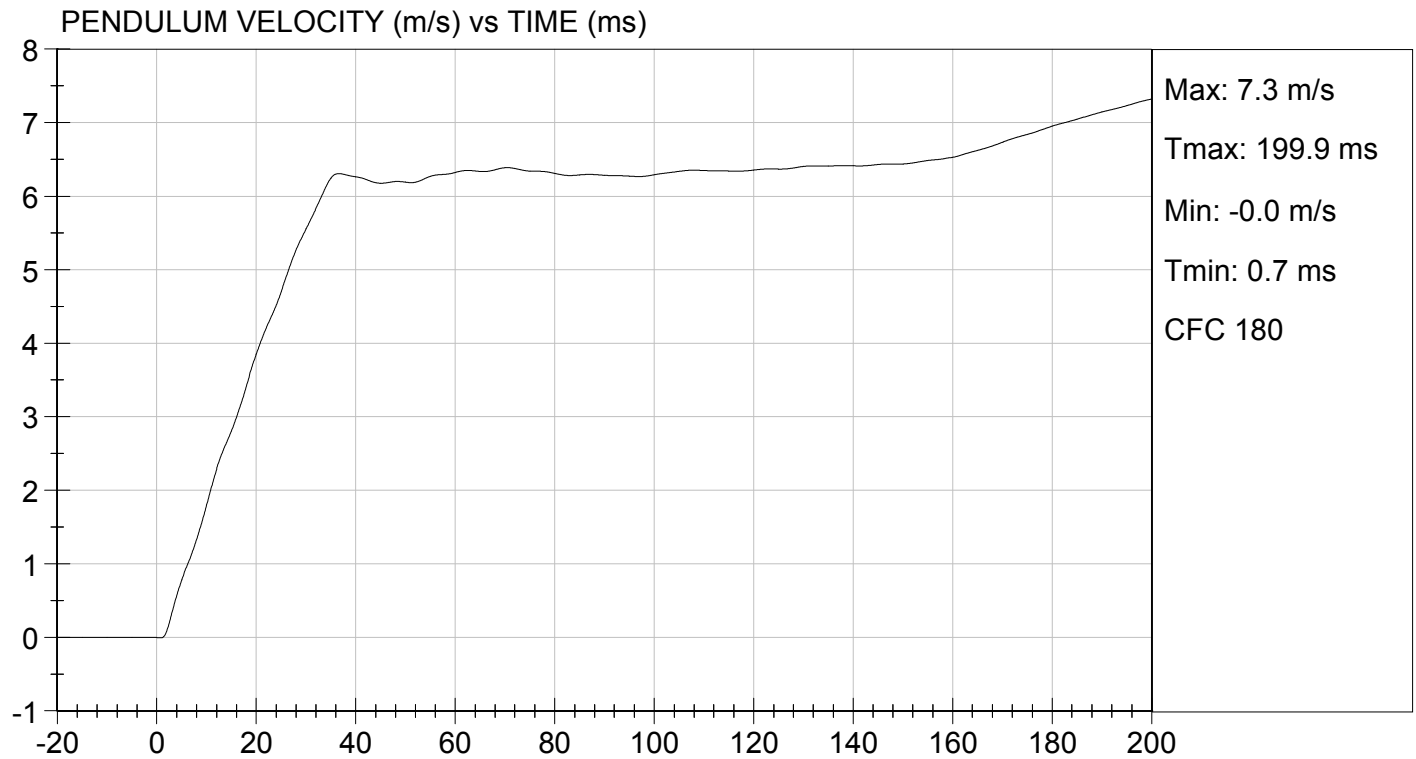
07/10/2015
Test Date

Jessica Hall
Approved By



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

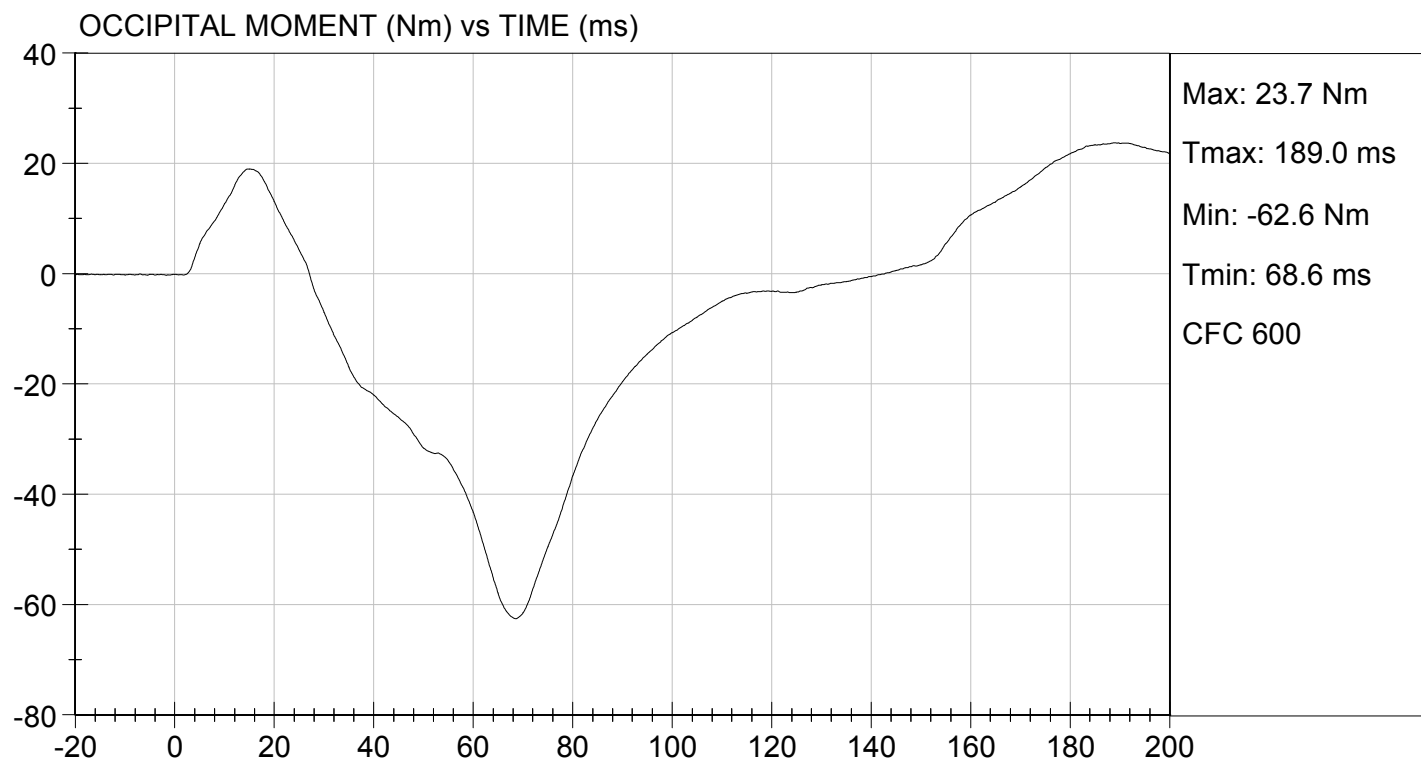
TEST DATE: 07/10/2015
TEST #: D152033





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

TEST DATE: 07/10/2015
TEST #: D152033



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D152034

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.1	Pass
Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	54	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4215	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4182	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

07/10/2015

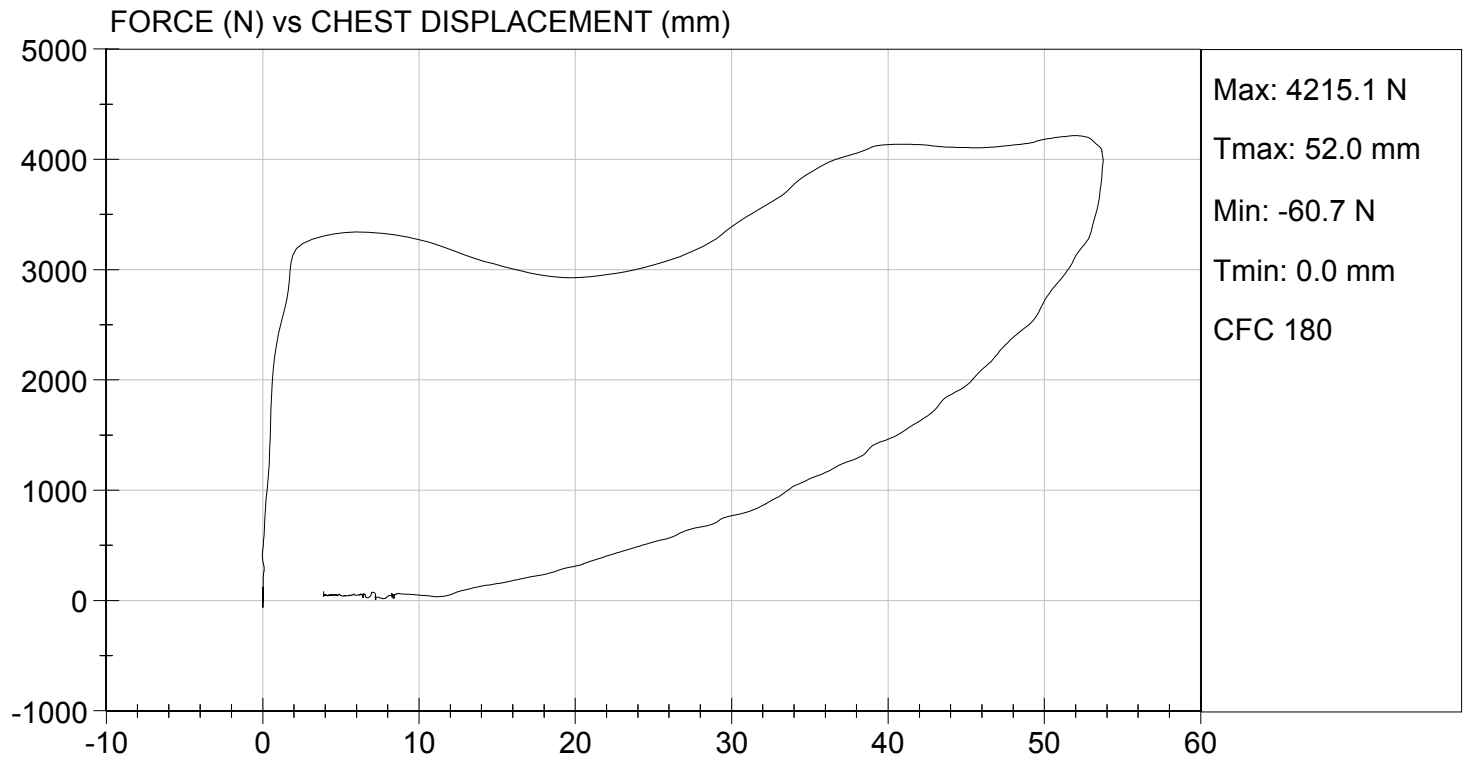
Test Date

Jessica Hall
Approved By



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

TEST DATE: 07/10/2015
TEST #: D152034



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D152035

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3452	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

07/10/2015

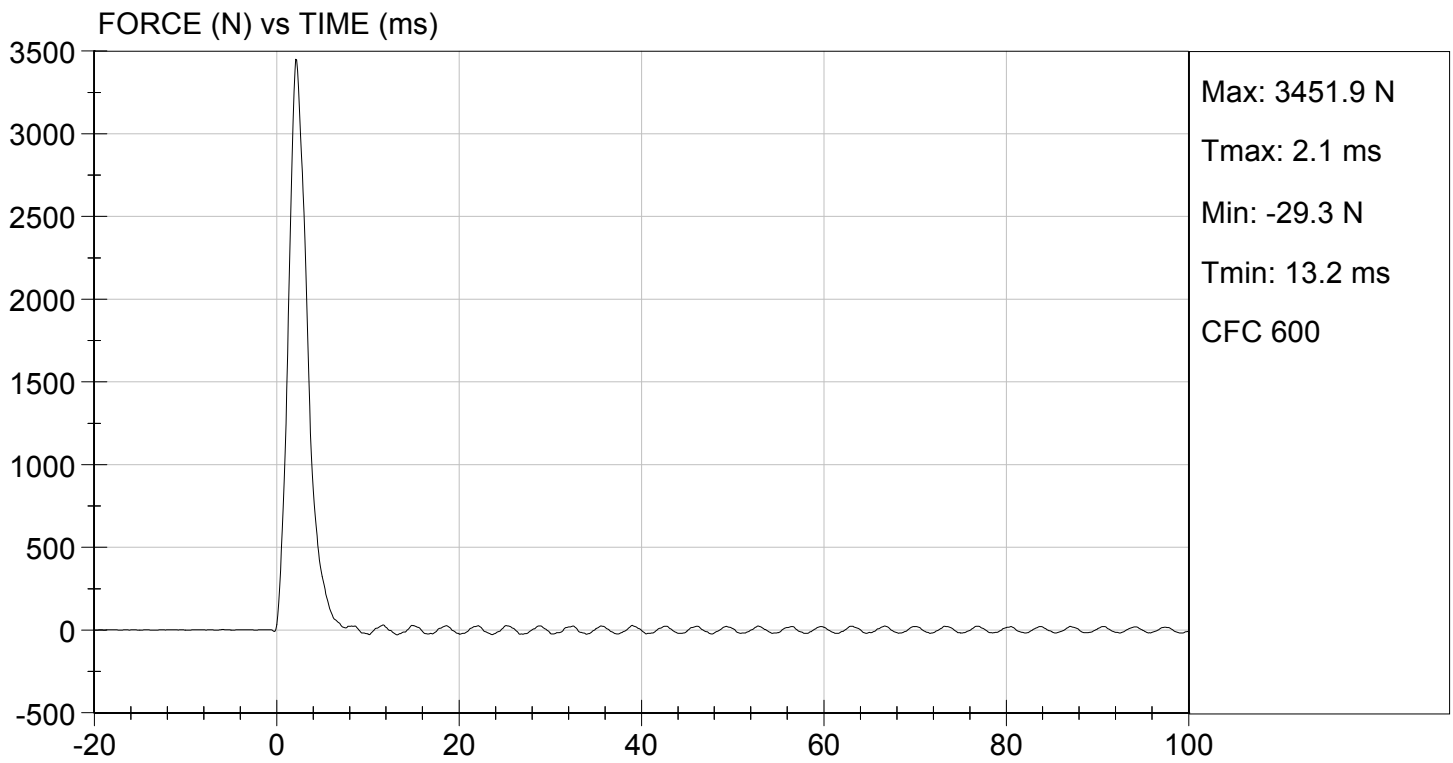
Test Date

Jessica Hall
Approved By



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

TEST DATE: 07/10/2015
TEST #: D152035



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D152036

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3552	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

07/10/2015

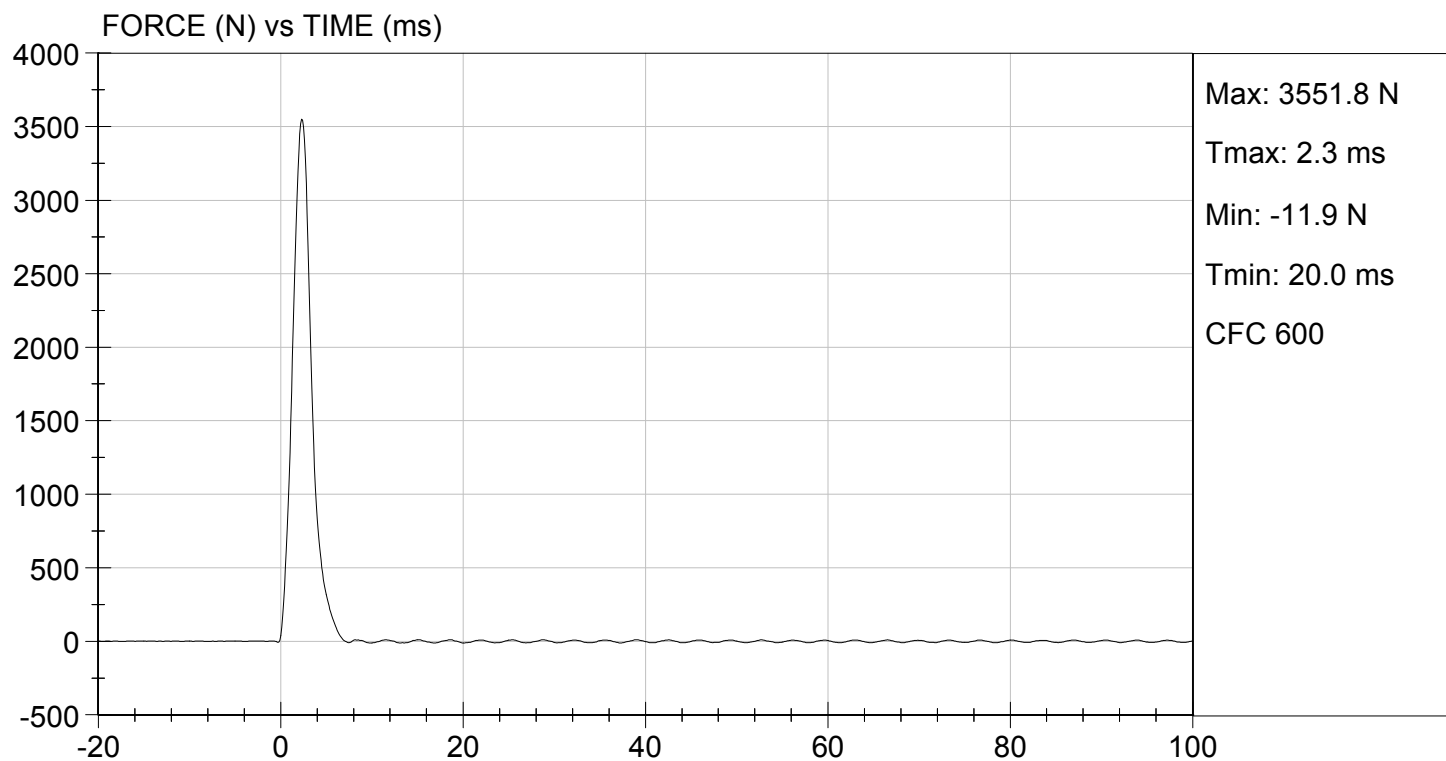
Test Date

Jessica Hall
Approved By



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

TEST DATE: 07/10/2015
TEST #: D152036



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D152037

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	2	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

David Schoedel
Laboratory Technician

07/10/2015

Test Date

Jessica Hall
Approved By