

**REPORT NUMBER: NCAP-MGA-2017-004**

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

**FORD MOTOR CO.  
2017 Ford Fusion SE AWD 4-Door Sedan  
NHTSA No.: M20170201**

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



**Test Date: June 15, 2016**

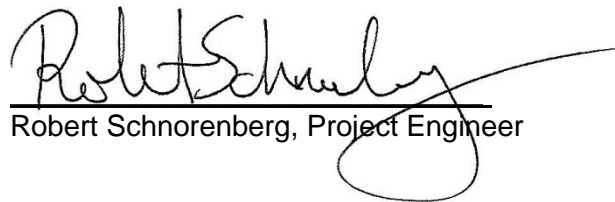
**Final Report Date: August 22, 2016**

**FINAL REPORT**

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

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Approval Date: August 22, 2016

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: \_\_\_\_\_

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

Date: \_\_\_\_\_

### Technical Report Documentation Page

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15. Supplementary Notes																																																									
<p>16. Abstract</p> <p>A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2017 Ford Fusion SE AWD 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 June 15, 2016.</p> <p>The impact velocity of the vehicle was 56.24 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 441mm located at the vehicle's centerline. The test vehicle's performance was as follows:</p>																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>15</sub>)</td> <td>N/A</td> <td>700</td> <td style="background-color: yellow;">234</td> <td>700</td> <td style="background-color: yellow;">400</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td style="background-color: yellow;">17</td> <td>52</td> <td style="background-color: yellow;">11</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td style="background-color: yellow;">0.32</td> <td>1</td> <td style="background-color: yellow;">0.65</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td style="background-color: yellow;">1042</td> <td>2620</td> <td style="background-color: yellow;">1024</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td style="background-color: yellow;">114</td> <td>2520</td> <td style="background-color: yellow;">74</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td style="background-color: yellow;">1032</td> <td>6805</td> <td style="background-color: yellow;">66</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td style="background-color: yellow;">1574</td> <td>6805</td> <td style="background-color: yellow;">74</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC <sub>15</sub> )	N/A	700	234	700	400	Maximum Chest	mm	63	17	52	11	Nij	N/A	1	0.32	1	0.65	Neck Tension	N	4170	1042	2620	1024	Neck Compression	N	4000	114	2520	74	Left Femur Force	N	10008	1032	6805	66	Right Femur Force	N	10008	1574	6805	74
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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 Ford Fusion SE AWD 4-Door Sedan at a velocity of 56.24 km/h. The test was performed at MGA Research Corporation on June 15, 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 50<sup>th</sup> percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5<sup>th</sup> percentile female test device (ATD) was placed in the right-front passenger seating position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. 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. 138) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

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

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

The maximum static crush of the vehicle was 441mm at the vehicle centerline and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD position	HIC <sub>15</sub>	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 <sup>th</sup> )	234	0.32	1042	114	40	17	1032	1574
Passenger (5 <sup>th</sup> )	400	0.65	1024	74	49	11	66	74

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

### TEST NOTES

Barrier K-16 My 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 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	M20170201	Traction Control System (TCS)	Yes
Model Year	2017	Power Steering	Yes
Make	Ford	Power Window Auto-Reverse	Yes
Model	Fusion SE AWD	Driver Frontal Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	3FA6P0T93HR104516	Driver Head/Torso Airbag	No
Body Color	Ingot Silver Metallic	Driver Torso Airbag	No
Odometer (km/mi)	18km / 11mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.0 L	Driver Pelvis Airbag	No
Type/No. Cylinders	4	Driver Knee Airbag	Yes
Engine Placement	Lateral	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	AWD	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Front Pass. Knee Airbag	Yes
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	N/A

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

**DATA FROM CERTIFICATION LABEL**

Manufactured By	FORD MOTOR CO.	GVWR (kg)	2168
Date of Manufacture	04/16	GAWR Front (kg)	1145
		GAWR Rear (kg)	1046

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

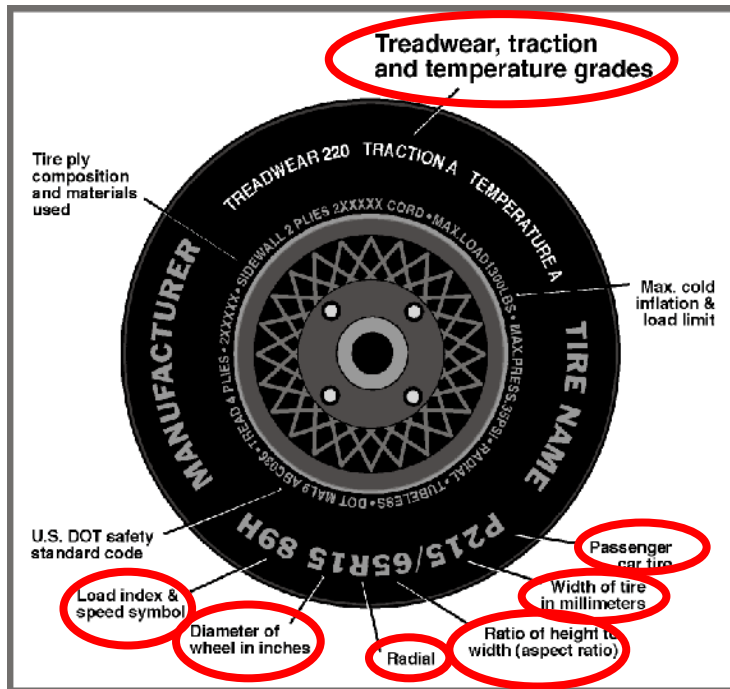
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contoured		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				375
Cargo Weight (RCLW) (kg)				35

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**VEHICLE TIRE INFORMATION**



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	235	235
Recommended Tire Size	235/45R18	235/45R18
Tire Size on Vehicle	235/45R18	235/45R18
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle	Eagle
Treadwear	400	400
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index/Speed Symbol	94V	94V
Tire Material	Rubber	Rubber
DOT Safety Code Left	4BFU JN1R 1116	4BFU JN1R 1116
DOT Safety Code Right	4BFU JN1R 1116	4BFU JN1R 1116

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
Test Date: 6/15/2016

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	494.0	361.0		527.0	427.0	
Right	kg	502.5	338.0		519.0	391.5	
Ratio	%	58.8%	41.2%		56.1%	43.9%	
Totals	kg	996.5	699.0	1695.5	1046.0	818.5	1864.5

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1695.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	141
Rated Cargo/Luggage Weight (RCLW)	kg	35
Calculated Test Vehicle Target Weight (TVTW)	kg	1871.5

**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	718	712	721	721	1171
As Tested	mm	703	705	697	696	1247
Post Test	mm	770	802	675	689	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2840
Total Vehicle Length at Left Side	mm	4730
Total Vehicle Length at Centerline	mm	4876
Total Vehicle Length at Right Side	mm	4730
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	55
Amount of Stoddard Solvent in Fuel Tank	L	63.2

List of components removed to meet test weight: LR, RR door trim panel, rear seat cushion, LR, RR speakers, LR, RR window glass / motor / track.

List of components removed for instrumentation, data box, and equipment installation: Cargo area carpet and trim, LR/RR floor mat, jack and tool kit, spare tire and cover, RR tail light.

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	4876
2	Total Width	1840
3	Bumper Top Height	505
4	Bumper Bottom Height	392
5	Longitudinal Member Top Height	820
6	Distance between Longitudinal Members	930
7	Longitudinal Member Width	58
8	Engine Top Height	905
9	Engine Bottom Height	194
10	Engine and Gearbox Width	842
11	Front Bumper-Engine Distance	286
12	Front Shock Absorber Fixing Height	892
13	Bonnet Leading Edge Height	804
14	Front Shock Absorber Fixing Width	1180
15	Front Bumper – Front Axle Distance	941
16	Front Axle – A-Pillar Distance	440
17	A-Pillar – B-Pillar Distance	1171
18	B-Pillar – Rear Axle Distance	1231
19	B-Pillar – C-Pillar Distance	805
20	Roof Sill Bottom Height	1338
21	Roof Sill Top Height	1450
22	Floor Sill Bottom Height	129
23	Floor Sill Top Height	420

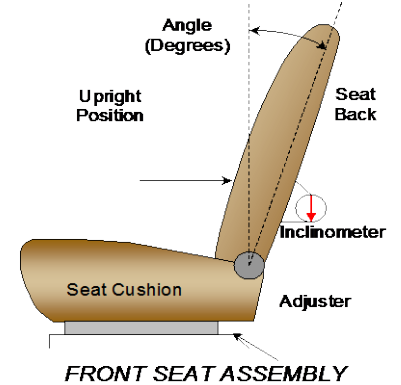
**DATA SHEET NO. 2**  
**SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**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	2.5° on headrest post
Passenger Seat Back Angle	1.9° on headrest post

**SEAT FORE/AFT POSITIONS**

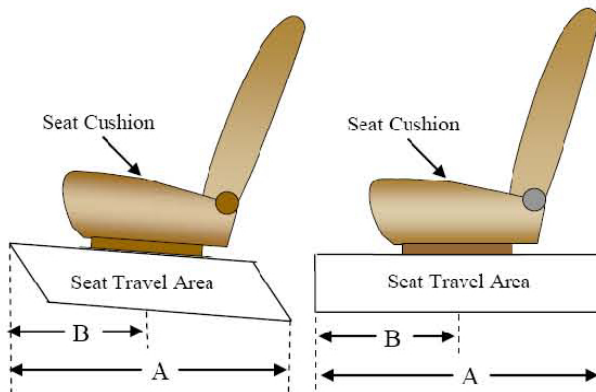
The driver and passenger seat fore/aft positions are adjusted following Appendix F, “Driver & Passenger Dummy Seating & Positioning Procedures” in the NCAP Test Procedure dated October 2015.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	322 mm	161 mm
Passenger Seat	267 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 <sup>st</sup> as 1)	0 (1 <sup>st</sup> as 0)
Passenger Seat	4 (1 <sup>st</sup> as 1)	0 (1 <sup>st</sup> as 0)



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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
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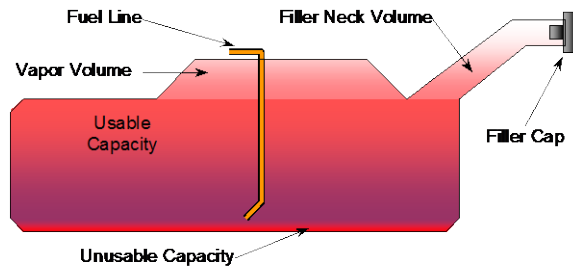
**FUEL TANK CAPACITY DATA**

	Liters
Usable Capacity of "Standard Tank"	68.1
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	62.7 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.

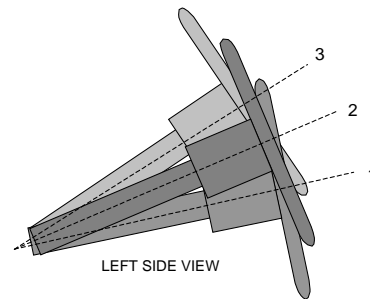
Fuel pump cycles for a brief period when key is moved to on position, but does not pump fuel unless engine is running. The filler neck is located on the driver's side.



VEHICLE FUEL TANK ASSEMBLY

**STEERING COLUMN ADJUSTMENT**

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



STEERING COLUMN ASSEMBLY

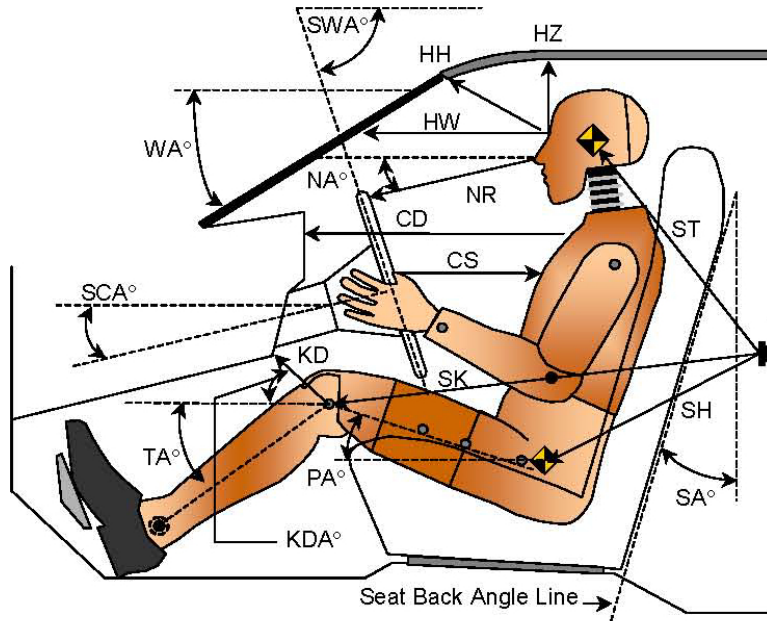
**STEERING COLUMN POSITION**

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	69.7	186
Geometric Center Position 2	66.7	212
Uppermost Position 3	63.7	237
Telescoping Steering Wheel Travel		51
Test Position	66.7	212

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016



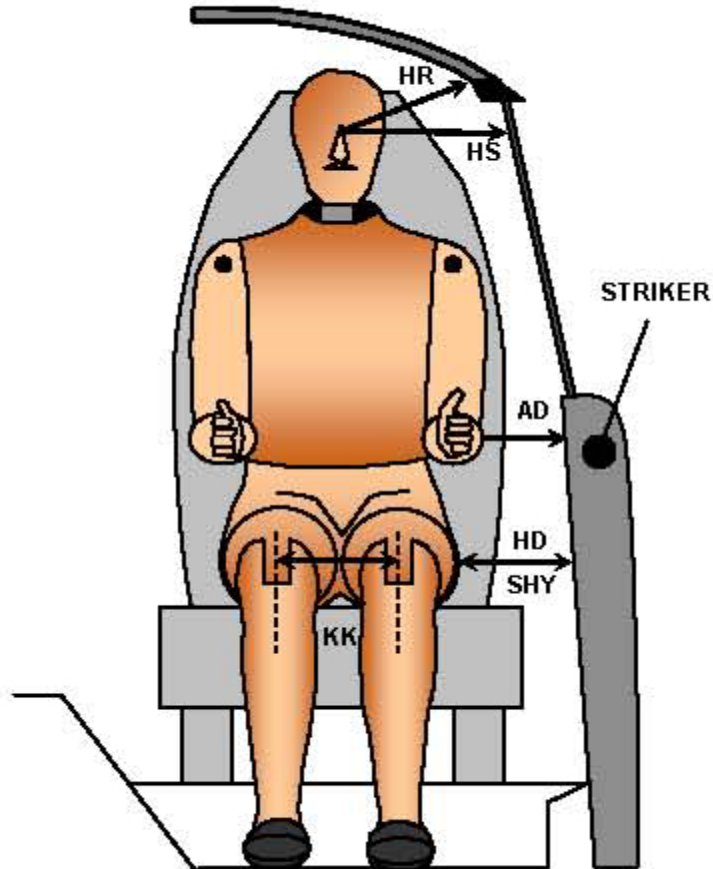
**LEFT SIDE VIEW**

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		18.1		
SWA°	Steering Wheel Angle		66.7		
SCA°	Steering Column Angle		23.3		
SA°	Seat Back Angle		2.5		1.9
HZ	Head to Roof (Z)	207	90	207	90
HH	Head to Header	362	23.5	285	44.5
HW	Head to Windshield	682	0	691	0
NR	Nose to Rim	374	7.9		
CD	Chest to Dash	529		423	
CS	Chest to Steering Hub	302	2.1		
RA	Rim to Abdomen	175	0		
KDL	Left Knee to Dash	213	30.1	153	30.6
KDR	Right Knee to Dash	208	31.9	151	29.3
PA°	Pelvic Angle		23.7		19.9
TA°	Tibia Angle		48.4		46.1
SK	Striker to Knee	553	92.5	639	94.7
ST	Striker to Head	490	12.5	457	28.9
SH	Striker to H-Point	251	132.6	346	111.1

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016



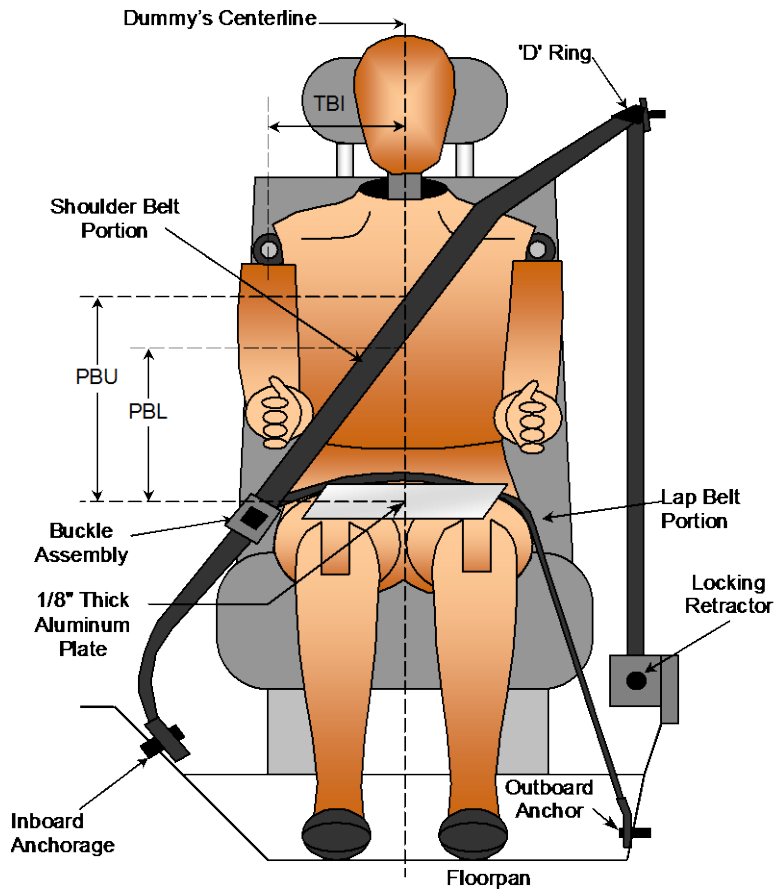
**FRONT VIEW OF DUMMY**

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	144	103
HD	H-Point to Door	141	168
HR	Head to Side Header	217	245
HS	Head to Side Window	343	368
KK	Knee to Knee	342	229
SHY	Striker to H-Point (Y Direction)	287	320
AA	Ankle to Ankle	324	179

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016



**FRONT VIEW OF DUMMY**

**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	400	330
PBL - Top surface of reference to belt lower edge	mm	310	240

**BELT LENGTH DATA**

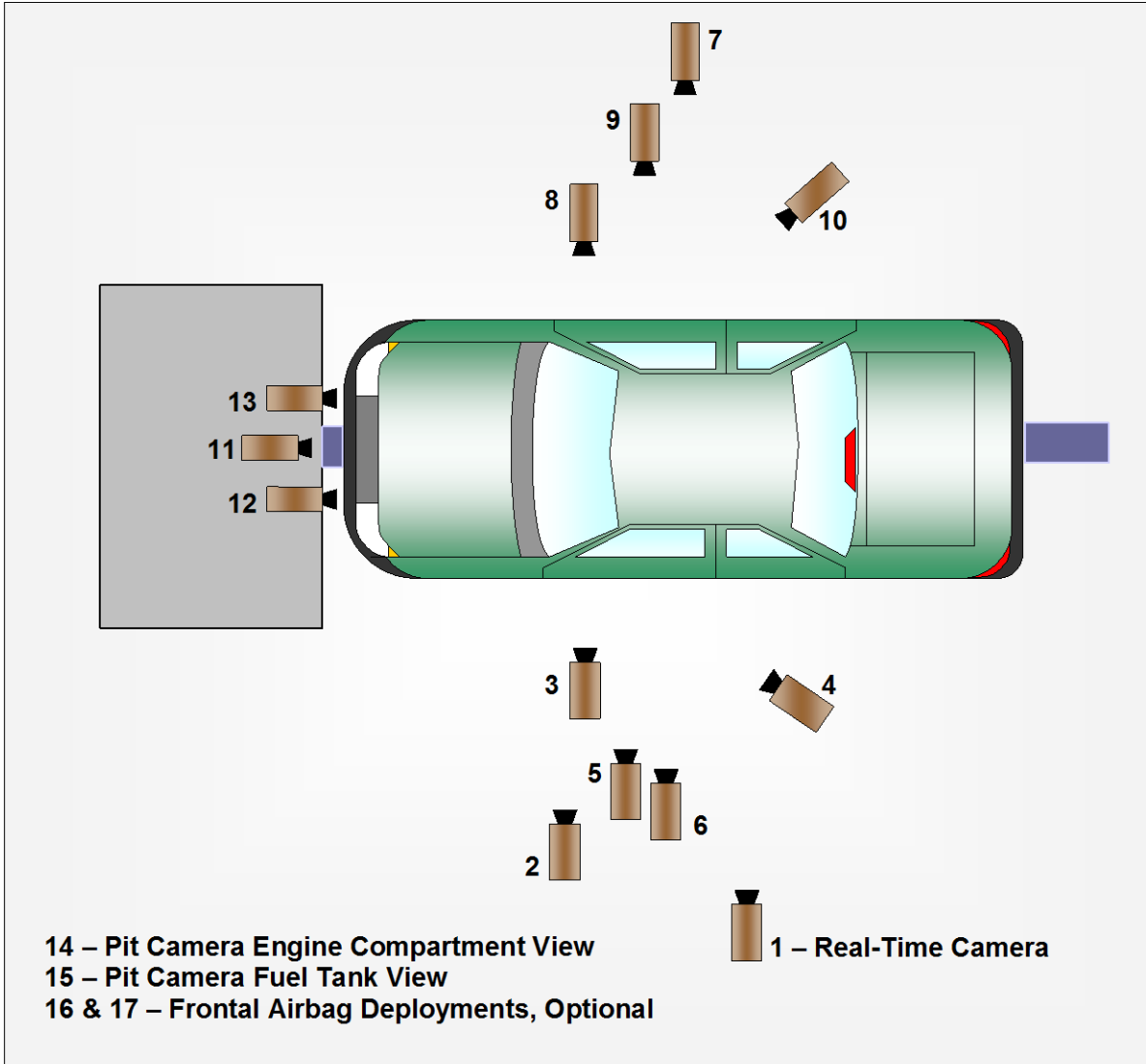
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	835	890
Lap Belt Length as measured on ATD	mm	650	685
Remainder of belt on reel	mm	915	825
Total Belt Length for Continuous Webbing Systems	mm	3050	3050

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
Test Date: 6/15/2016

**CAMERA POSITIONS FOR FRONTAL IMPACTS**



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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**CAMERA LOCATIONS**

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	-1360	-6590	-2040	35	1000
3	Left Front Half	-1180	-5120	-1120	24	1000
4	Left Angle	-6110	-5070	-2000	50	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	-2210	6690	-1110	20	1000
8	Passenger Close-Up	-1320	6810	-2010	35	1000
9	Right Front Half	-1170	5090	-1110	24	1000
10	Right Angle	-6050	5110	-2050	50	1000
11	Windshield	430	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	-1140	0	3150	24	1000
15	Pit Rear	-3050	0	3150	24	1000
16	Onboard Driver Side				12	1000
17	Onboard Passenger Side				12	1000
18	Real-Time Pan View					30

**\*COORDINATES:**

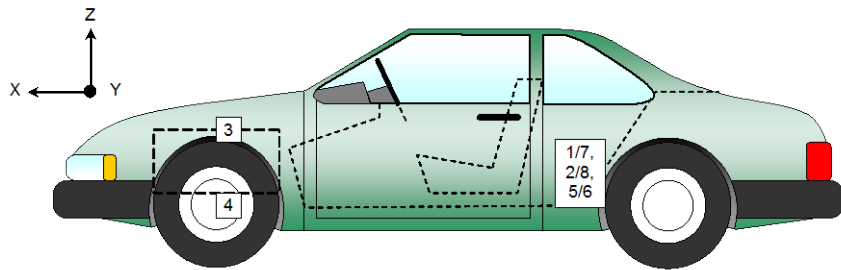
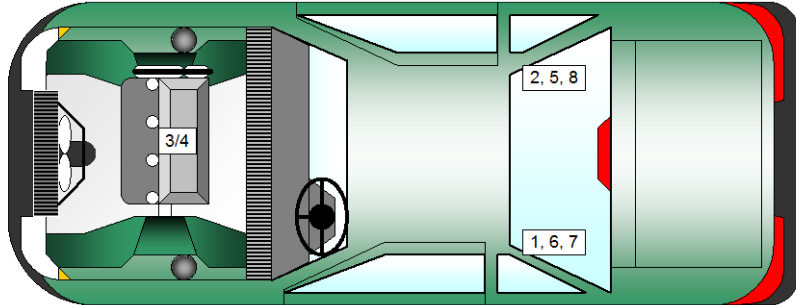
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 5 & 6 were not used for this test.

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016



**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	2035	-370	-244
2	Right Rear Crossmember Accelerometer – X Direction	2045	378	-245
3	Engine Top X	4159	15	-844
4	Engine Bottom X	4077	29	-194
5	Left Rear Crossmember Accelerometer – Z Direction	2035	-370	-244
6	Right Rear Crossmember Accelerometer – Z Direction	2045	378	-245
7	Left Rear Crossmember Accelerometer Redundant – X Direction	2078	-370	-244
8	Right Rear Crossmember Accelerometer Redundant – X Direction	2088	-378	-245

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

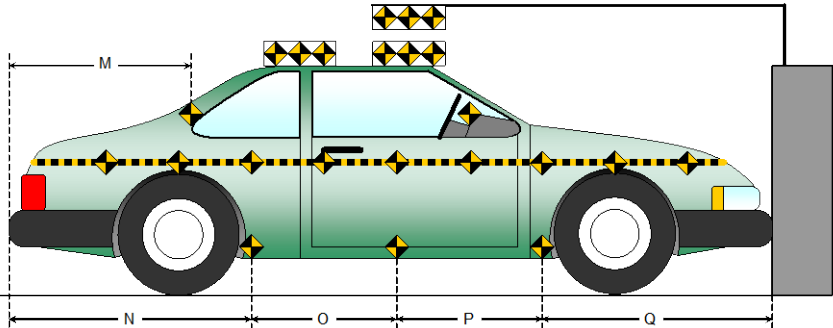
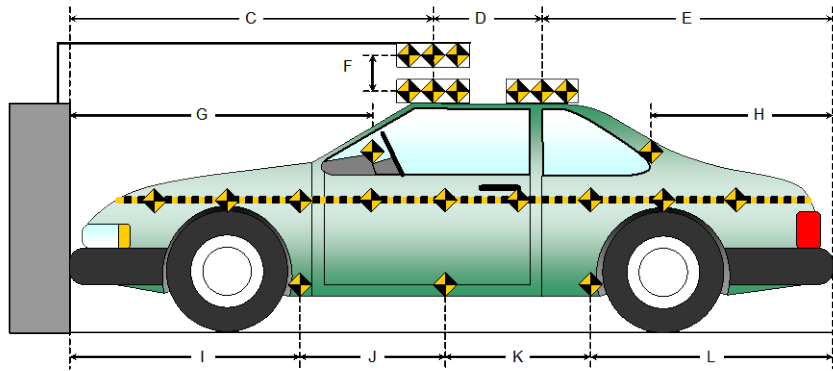
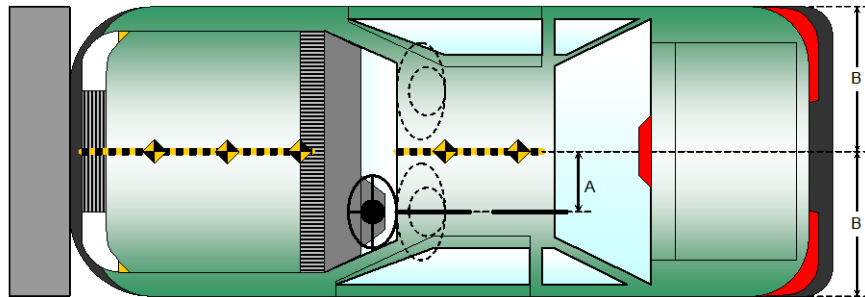
**DATA SHEET NO. 8**

**PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

Item	Value (mm)
A	382
B	920
C	2350
D	617
E	1909
F	220
G	
H	1486
I	1380
J	987
K	987
L	1522
M	1486
N	1522
O	987
P	987
Q	1380



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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**Advanced Research Load Cell Barrier**

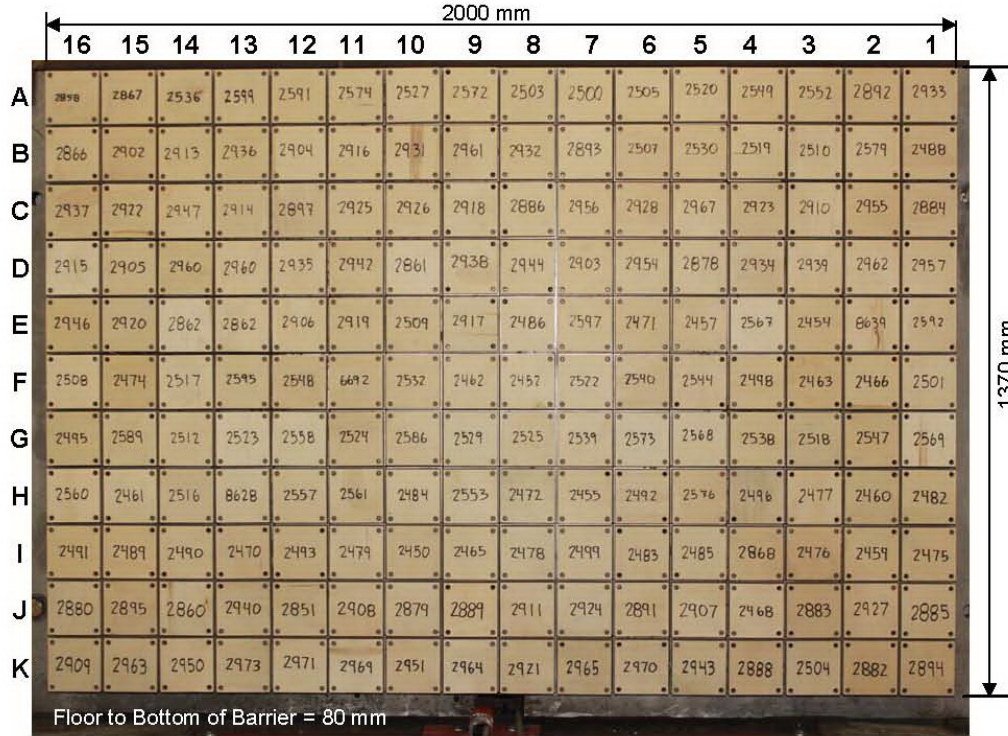


Photo for Reference Only

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 Ford Fusion SE AWD 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
Test Date: 6/15/2016

**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 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

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

**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	None
Other Notable Effects	Rear window broken by opening trunk

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	980
Center	mm	935
Right Side	mm	985
Average	mm	967

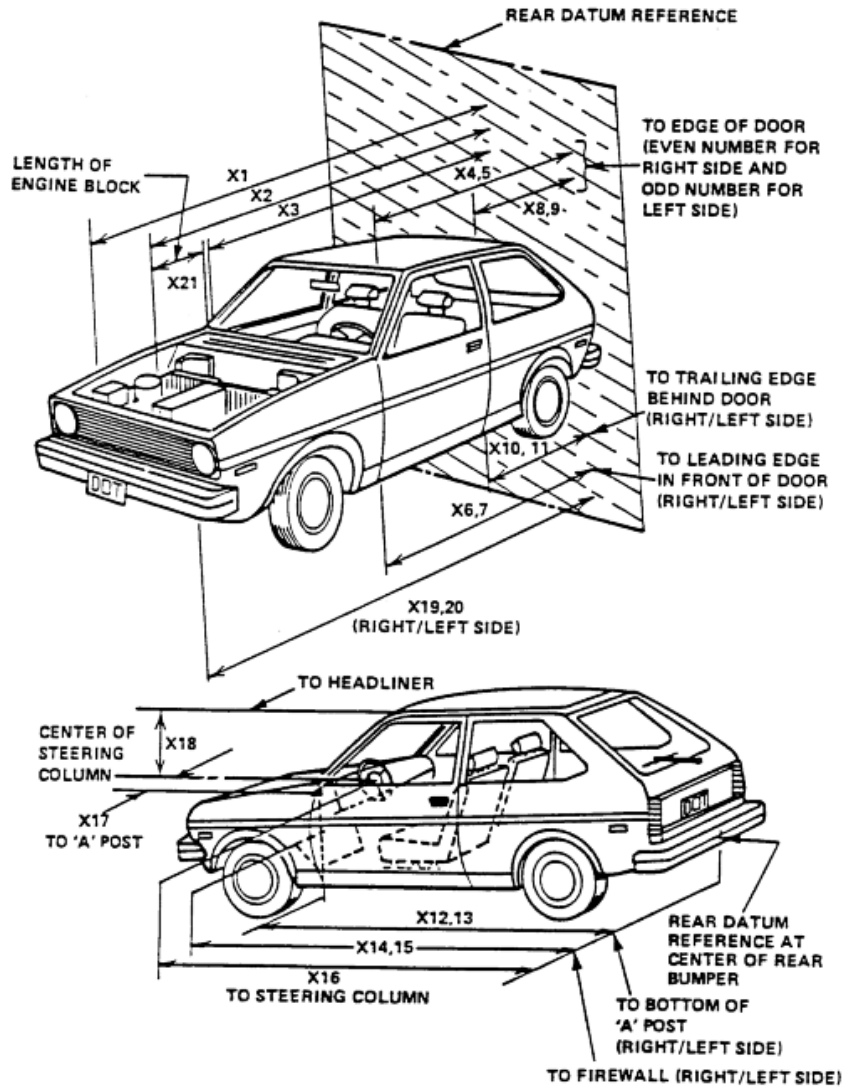
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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	Yes	Yes	Yes	No
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	

## DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016



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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**RSOV (Rear Surface of Vehicle)**

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4876	4435	441
2	RSOV to Front of Engine	mm	4258	4118	140
3	RSOV to Firewall	mm	3849	3849	0
4	RSOV to Upper Leading Edge of Right Door	mm	3344	3352	-8
5	RSOV to Upper Leading Edge of Left Door	mm	3344	3343	1
6	RSOV to Lower Leading Edge of Right Door	mm	3355	3366	-11
7	RSOV to Lower Leading Edge of Left Door	mm	3355	3345	10
8	RSOV to Upper Trailing Edge of Right Door	mm	2242	2250	-8
9	RSOV to Upper Trailing Edge of Left Door	mm	2242	2249	-7
10	RSOV to Lower Trailing Edge of Right Door	mm	2298	2306	-8
11	RSOV to Lower Trailing Edge of Left Door	mm	2298	2299	-1
12	RSOV to Bottom of "A" Post of Right Side	mm	3368	3386	-18
13	RSOV to Bottom of "A" Post of Left Side	mm	3365	3375	-10
14	RSOV to Firewall, Right Side	mm	3609	3617	-8
15	RSOV to Firewall, Left Side	mm	3620	3639	-19
16	RSOV to Steering Column	mm	2843	2947	-104
17	Center of Steering Column to "A" Post	mm	360	357	3
18	Center of Steering Column to Headliner	mm	398	419	-21
19	RSOV to Right Side of Front Bumper	mm	4730	4401	329
20	RSOV to Left Side of Front Bumper	mm	4730	4354	376
21	Length of Engine Block	mm	508	508	0
RD	RSOV to Right Side of Dash Panel	mm	3130	3117	13
CD	RSOV to Center of Dash Panel	mm	3210	3201	9
LD	RSOV to Left Side of Dash Panel	mm	3130	3132	-2

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
Test Date: 6/15/2016

**VEHICLE INFORMATION**

VIN: 3FA6P0T93HR104516 Wheelbase (mm): 2840  
Vehicle Size Category: Passenger Car Test Weight (kg): 1864.5

**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): 56.24

Velocity Change (km/h): 65.3

Time of Separation (msec): 98

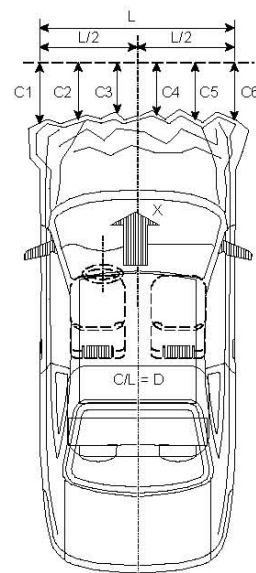
**CRUSH PROFILE**

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1212

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4730	4354	376
C2	Crush zone 2 at left side	mm	4815	4374	441
C3	Crush zone 3 at left side	mm	4836	4395	441
C4	Crush zone 4 at right side	mm	4836	4403	433
C5	Crush zone 5 at right side	mm	4815	4414	401
C6	Crush zone 6 at right side	mm	4730	4401	329
L	C1 TO C6	mm	1212	1198	14

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

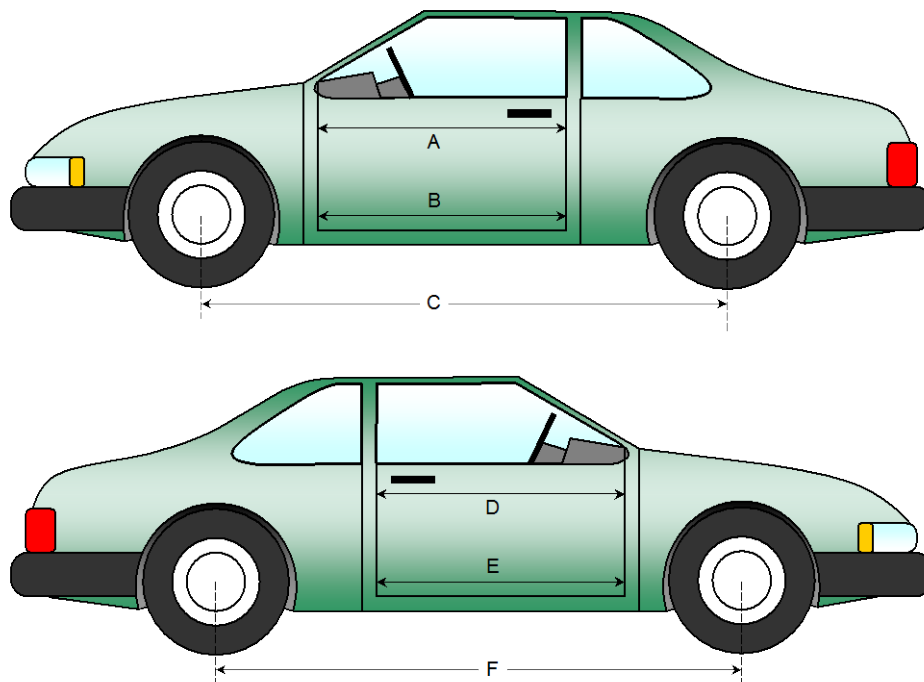
NHTSA No.: M20170201  
 Test Date: 6/15/2016

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	982	982	0
B	Left Side Lower	mm	822	822	0
D	Right Side Upper	mm	982	982	0
E	Right Side Lower	mm	822	822	0

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2840	2761	79
F	Right Side Wheelbase	mm	2840	2744	96



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

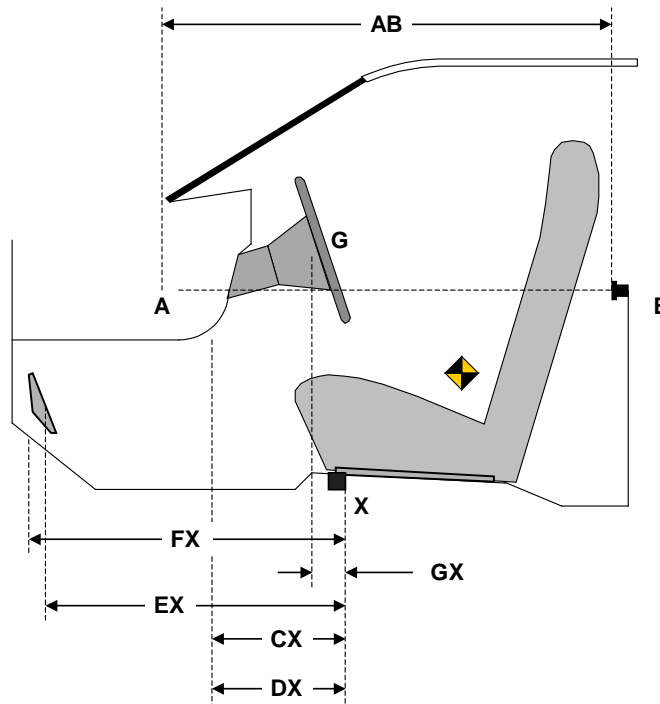
Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	890	890	0
CX	Left Knee Bolster to X	mm	248	251	-3
DX	Right Knee Bolster to X	mm	218	218	0
EX	Brake Pedal to X	mm	497	446	51
FX	Foot Rest to X	mm	519	517	2
GX	Center of Steering Column Wheel Hub to X	mm	-17	57	-74

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 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

**Windshield Mounting Details:**

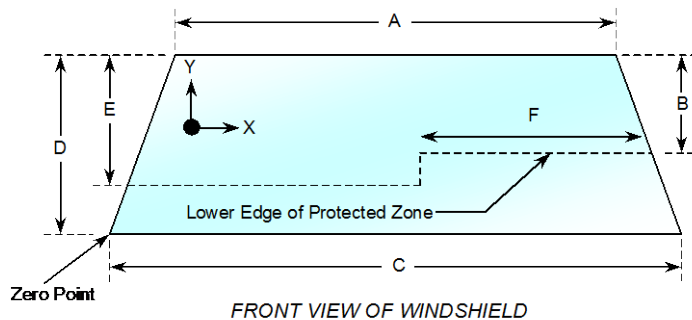
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.8° C.

**WINDSHIELD PERIPHERY MEASUREMENTS**

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2189	2189	100.0
Right Side	2209	2209	100.0
Total	4398	4398	100.0



Item	Units	Value
A	mm	1240
B	mm	530
C	mm	1512
D	mm	823
E	mm	522
F	mm	531

**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 Ford Fusion SE AWD 4-Door Sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
Test Date: 6/15/2016

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

Temperature at Time of Impact: 21.8°C

Test Time: 11:13 a.m.

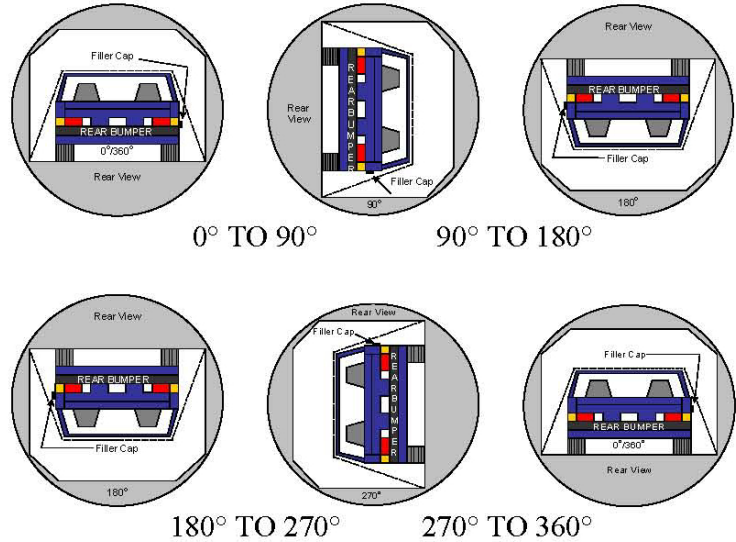
- A. From impact until vehicle motion ceases:   0   oz.  
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases:   0   oz.  
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes:   0   oz.  
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016

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°	110	300	410
90° to 180°	110	300	410
180° to 270°	107	300	407
270° to 360°	112	300	412

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

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

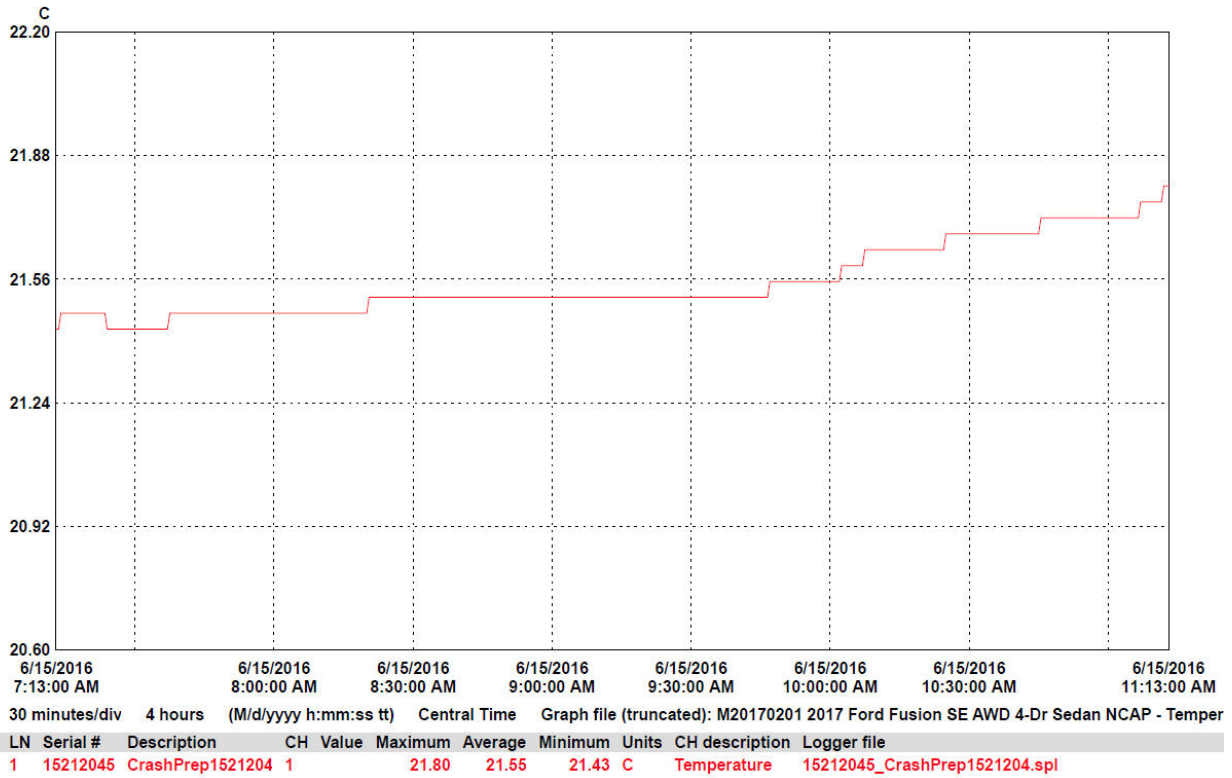
**SOLVENT SPILLAGE LOCATION TABLE**

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

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

Test Vehicle: 2017 Ford Fusion SE AWD 4-Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20170201  
 Test Date: 6/15/2016



**APPENDIX A  
PHOTOGRAPHS**

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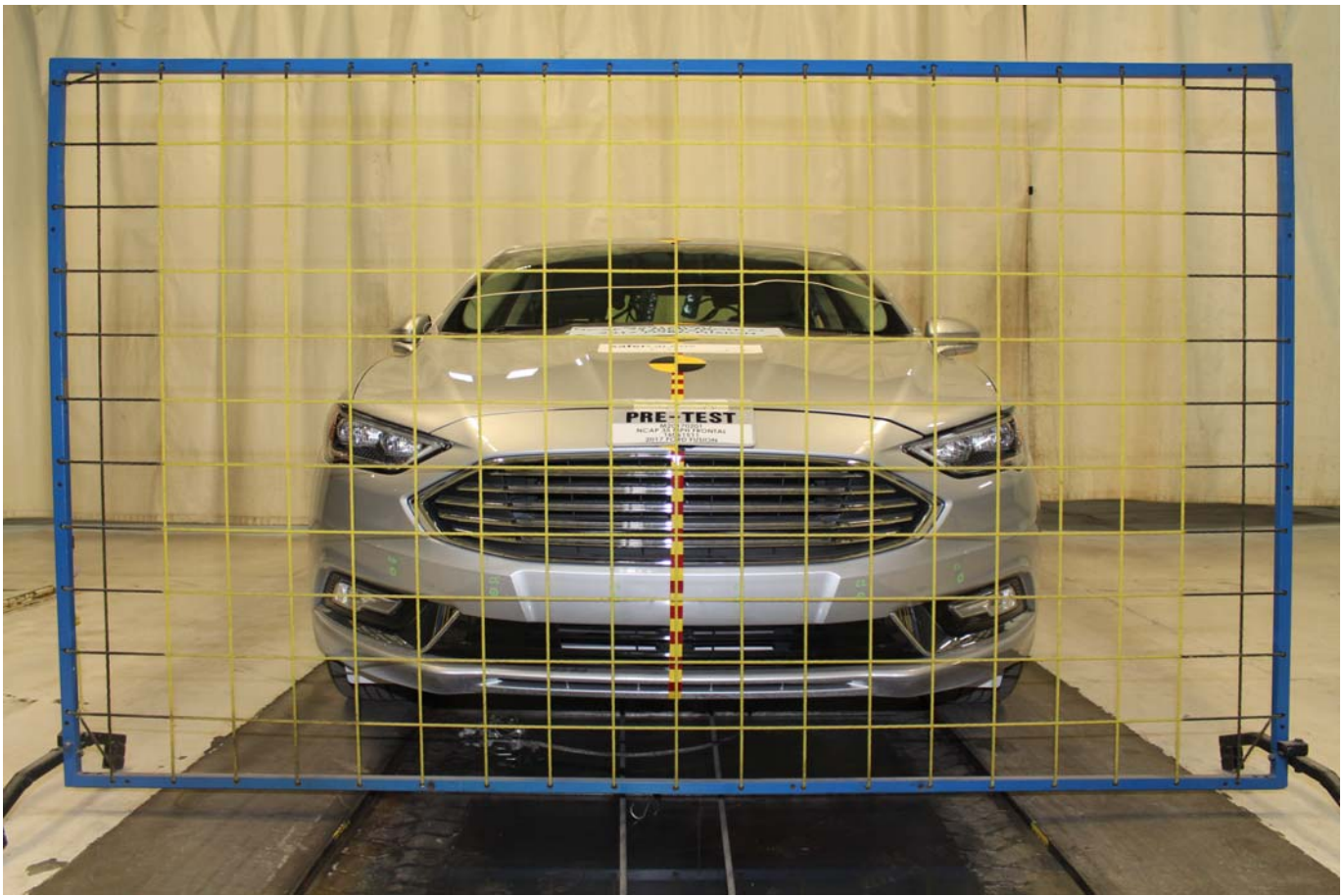


Photo No. 001 - Load Cell Location



Photo No. 002 - Pre-Test Load Cell Wall



Photo No. 003 - Post-Test Load Cell Wall



Photo No. 004 - Manufacturer's Label

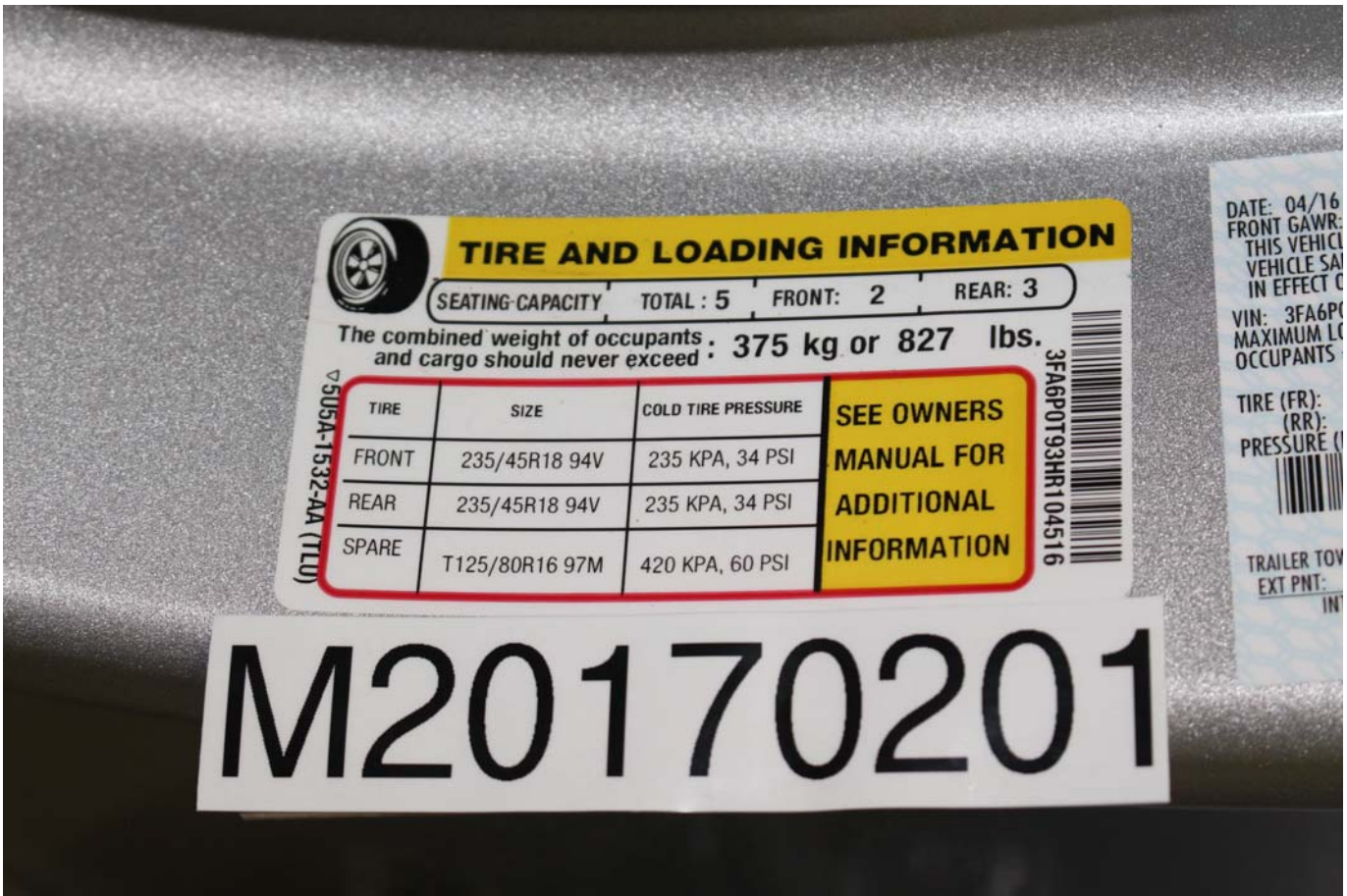


Photo No. 005 - Tire Placard



Photo No. 006 - 2017 Ford Fusion SE AWD Frontal As Delivered



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



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

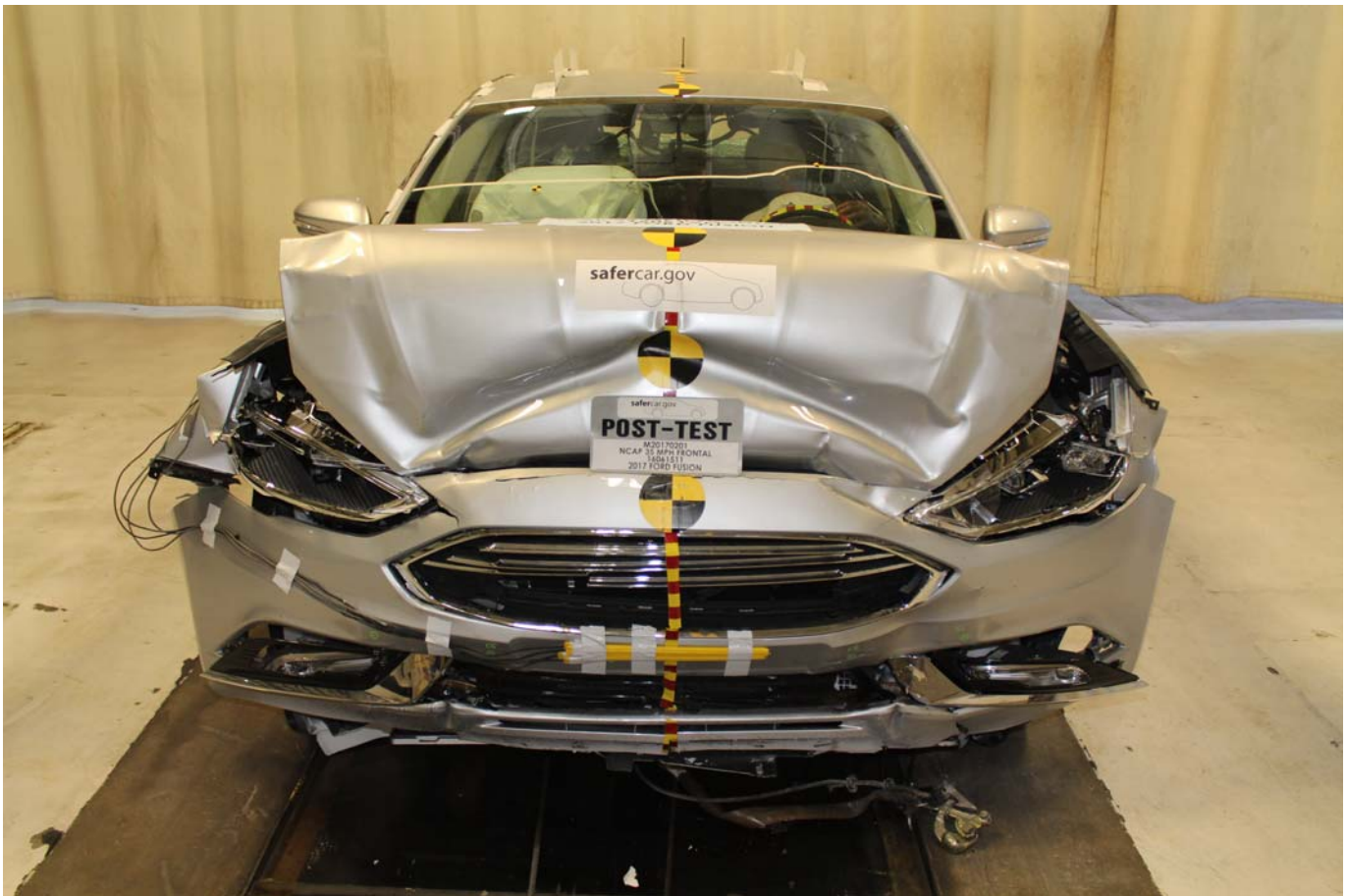


Photo No. 009 - Post-Test Front View of Test Vehicle



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

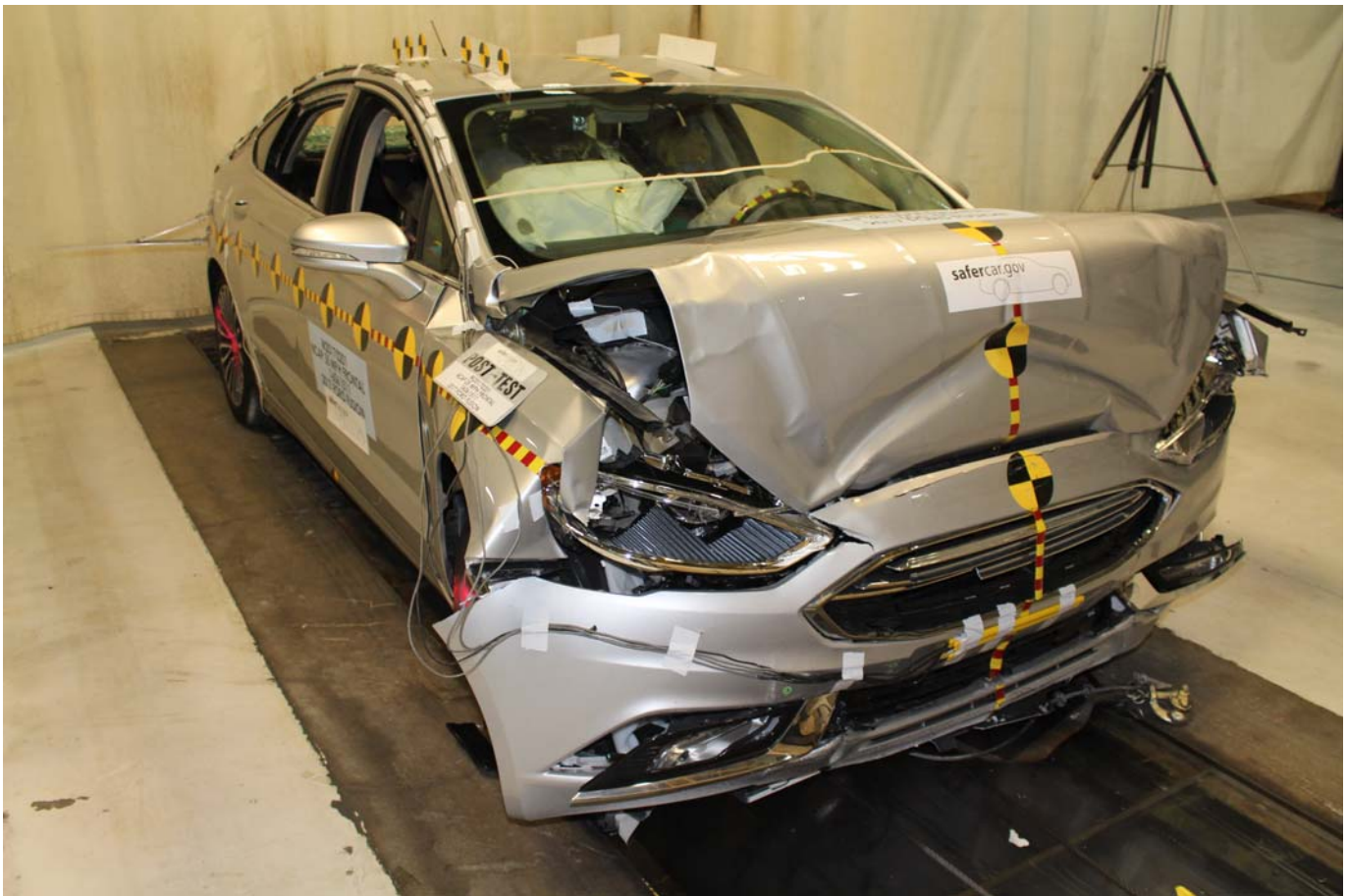


Photo No. 015 - Post-Test Right Front 3-4 View



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

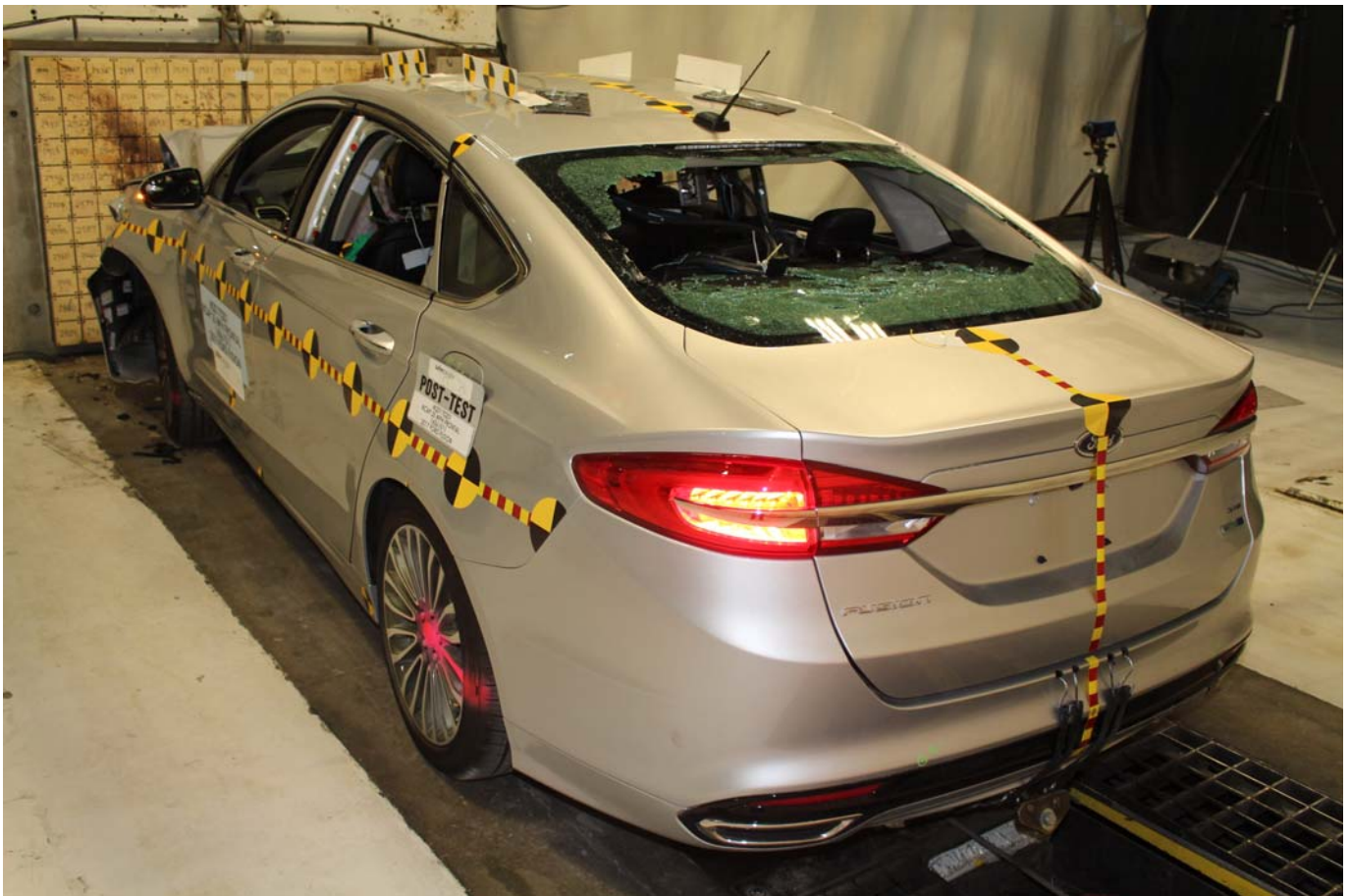


Photo No. 017 - Post-Test Left Rear 3-4 View



Photo No. 018 - Pre-Test Windshield View



Photo No. 019 - Post-Test Windshield View



Photo No. 020 - Pre-Test Engine Compartment View

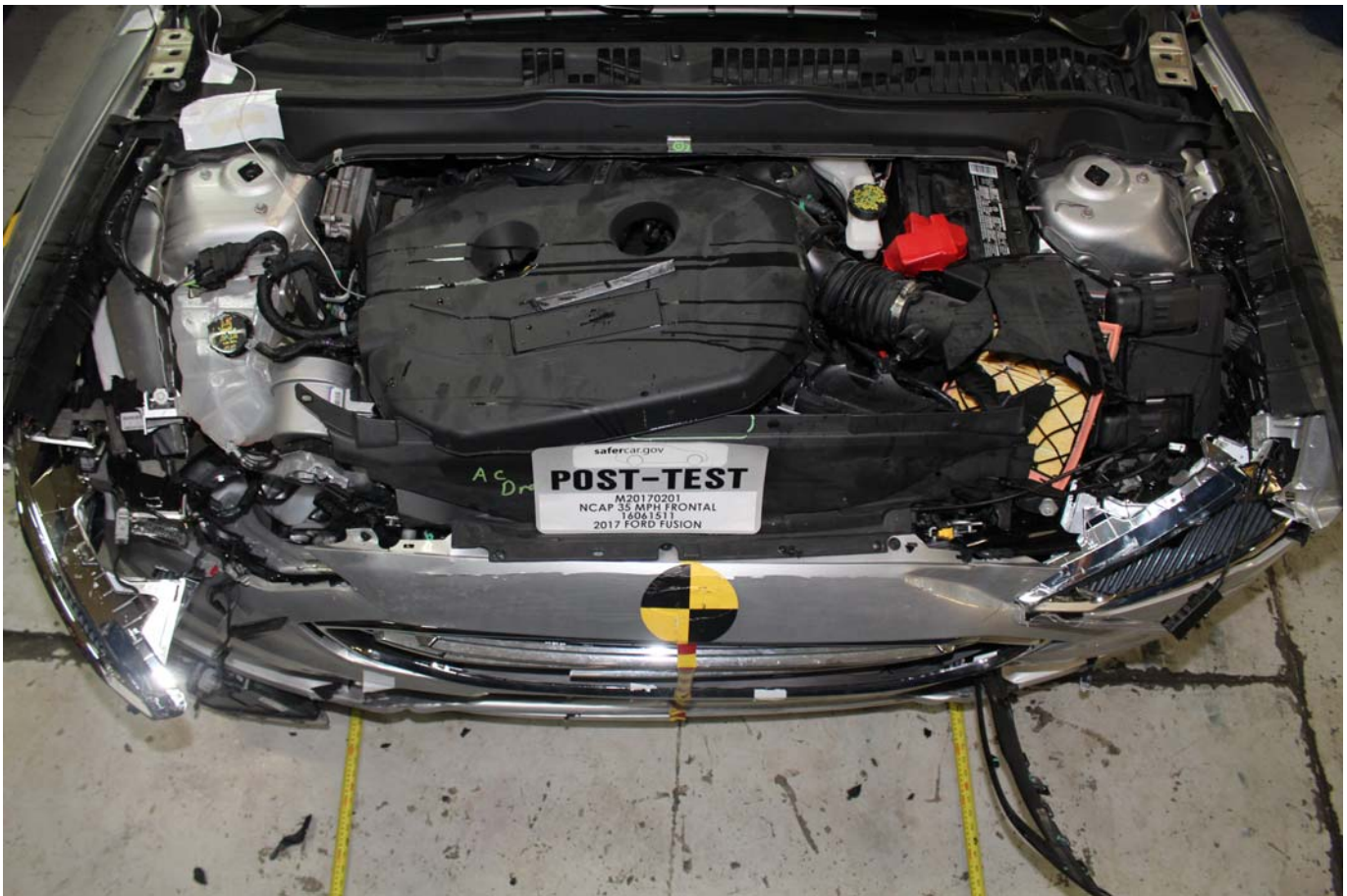


Photo No. 021 - Post-Test Engine Compartment View



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

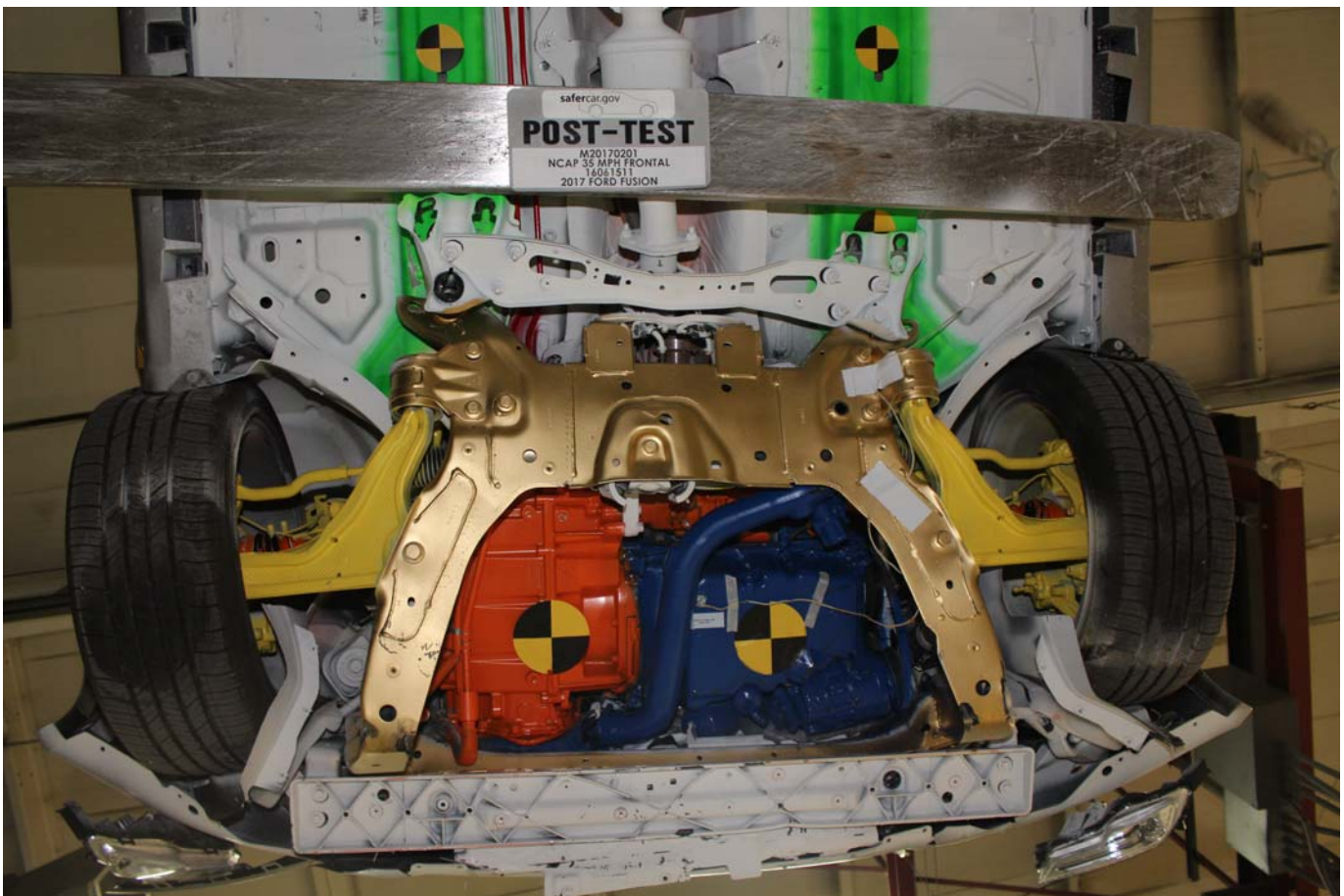


Photo No. 025 - Post-Test Front Underbody View



Photo No. 026 - Pre-Test Rear Underbody View

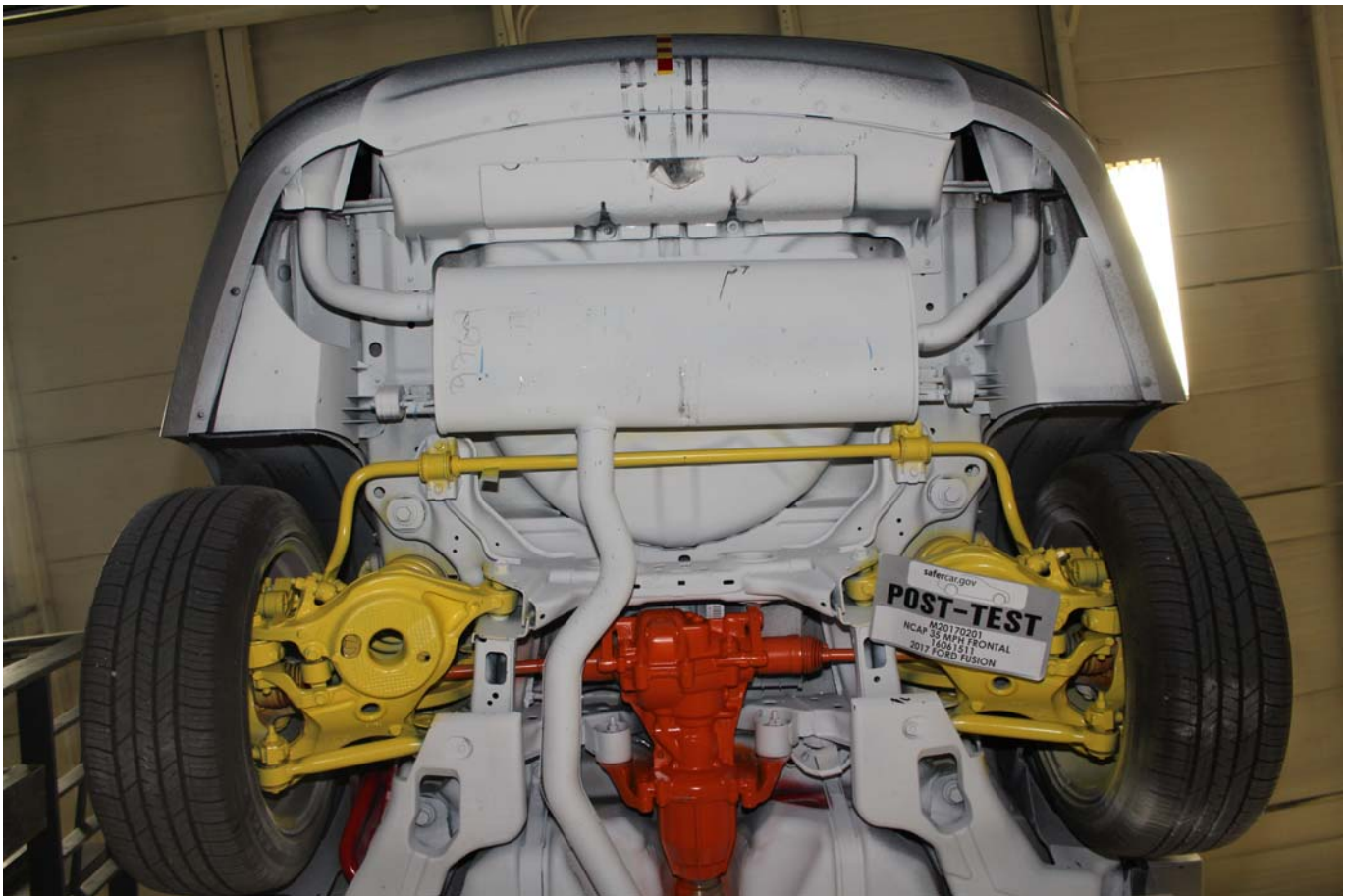


Photo No. 027 - Post-Test Rear Underbody View



Photo No. 028 - Pre-Test Dummy Cable Routing



Photo No. 029 - Post-Test Dummy Cable Routing

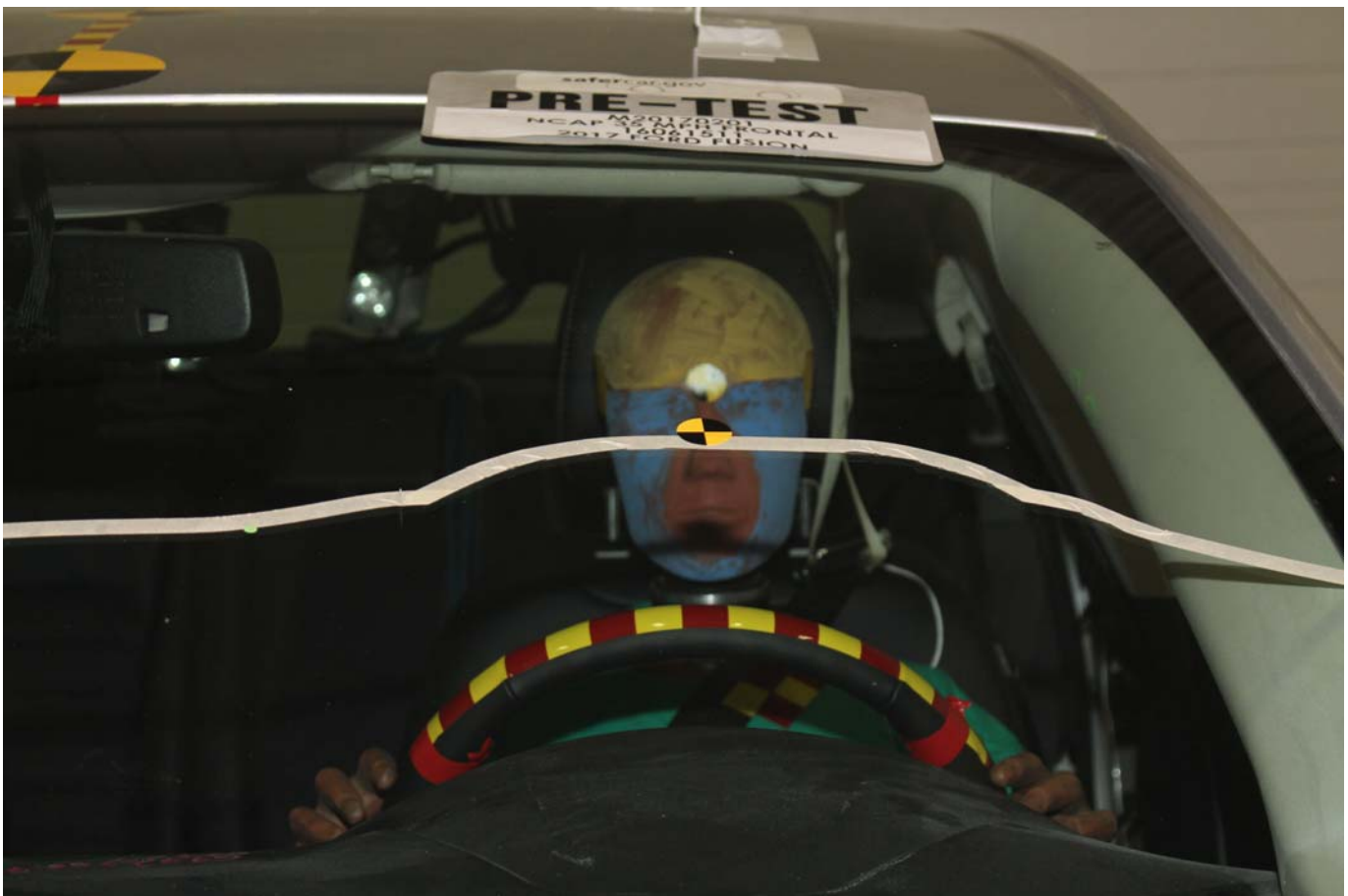


Photo No. 030 - Pre-Test Driver Dummy Front View



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's Seat Fore-Aft Markings



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



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



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



Photo No. 040 - Pre-Test Driver Dummy Feet



Photo No. 041 - Post-Test Driver Dummy Feet



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



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



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



Photo No. 045 - Post-Test Driver's 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's Seat Fore-Aft Markings

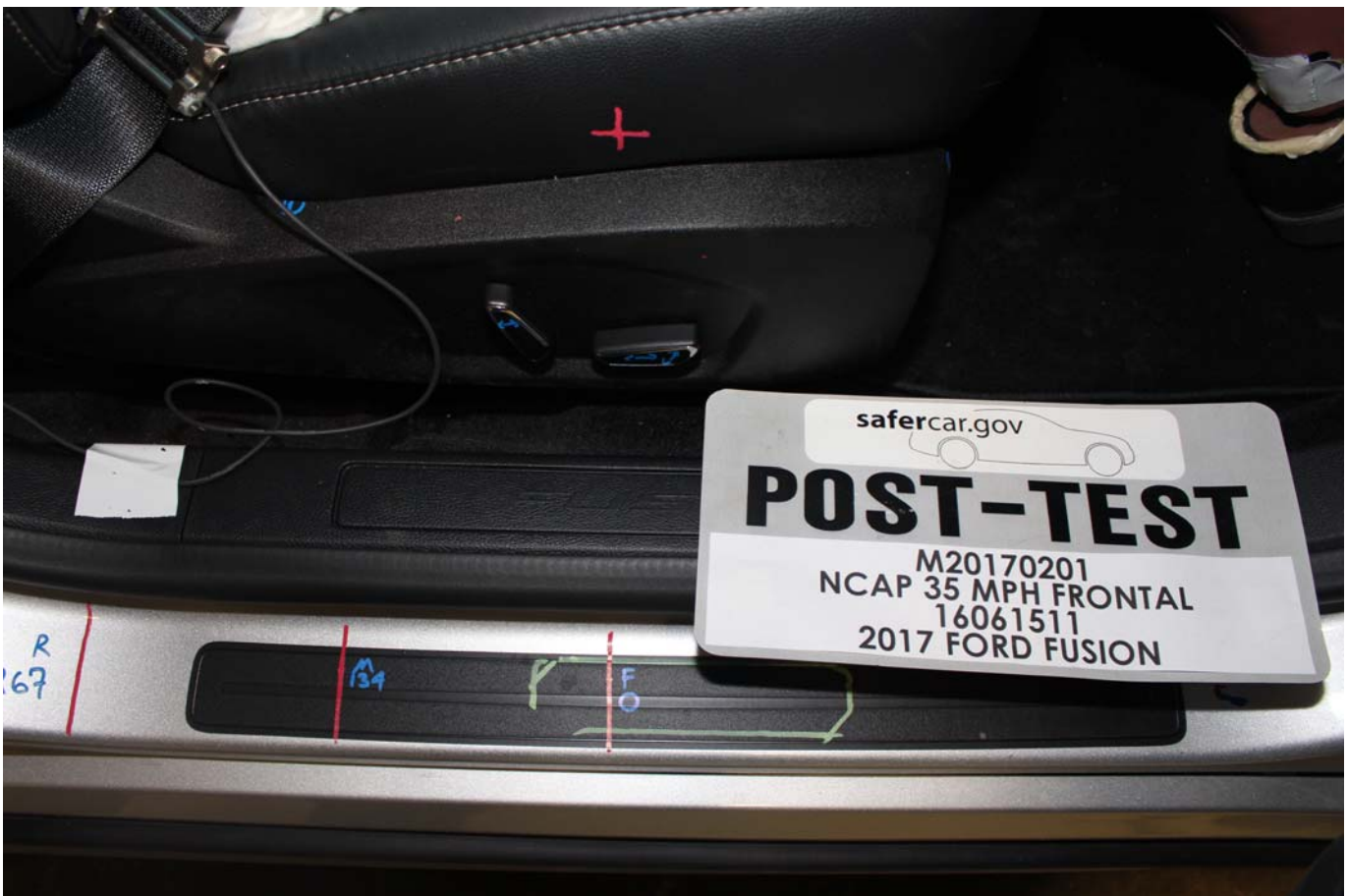


Photo No. 058 - Post-Test Passenger's Seat Fore-Aft Markings



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



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



Photo No. 061 - Pre-Test Passenger Dummy Feet



Photo No. 062 - Post-Test Passenger Dummy Feet



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



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



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



Photo No. 066 - Post-Test Passenger's 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

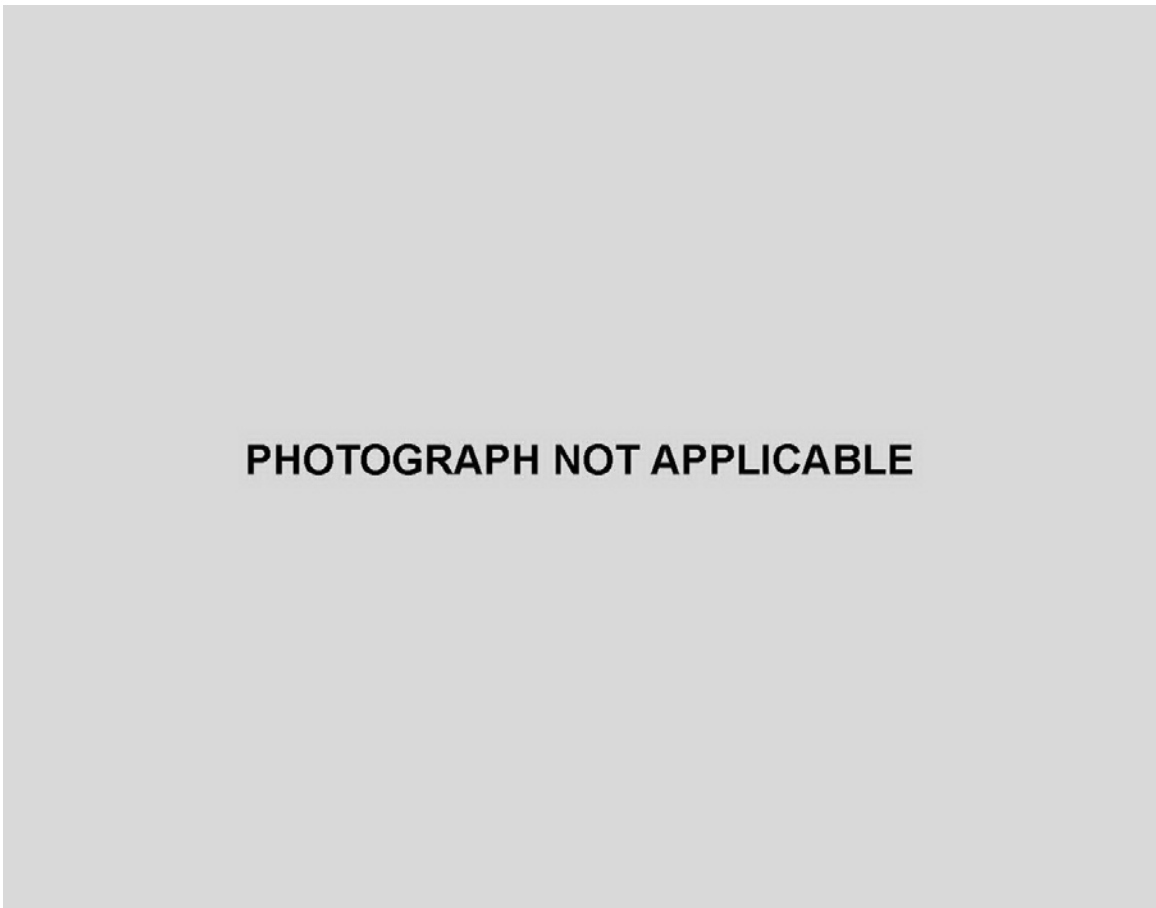


Photo No. 070 - Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

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

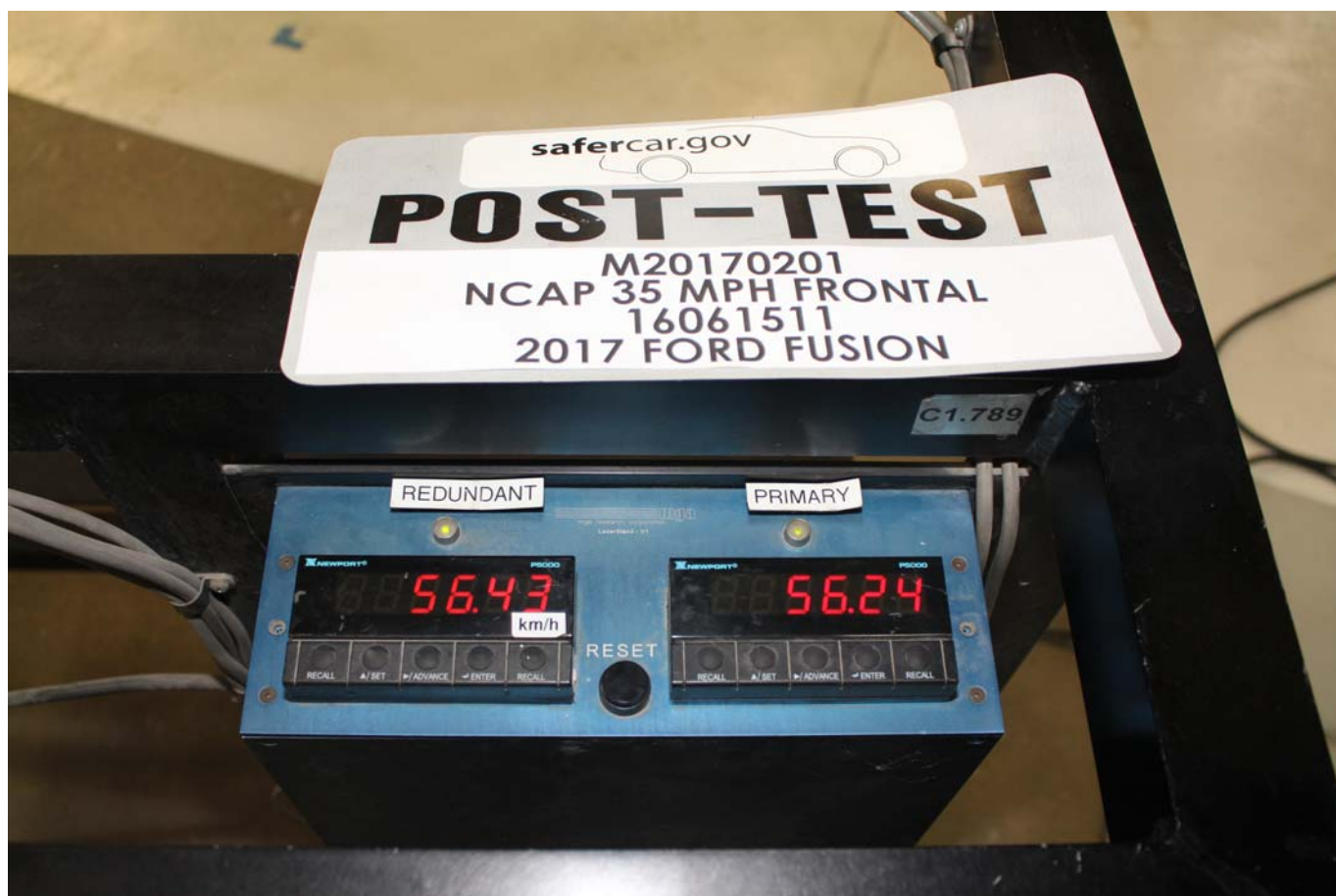


Photo No. 072 - Post-Test Speed Trap Read-Out



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

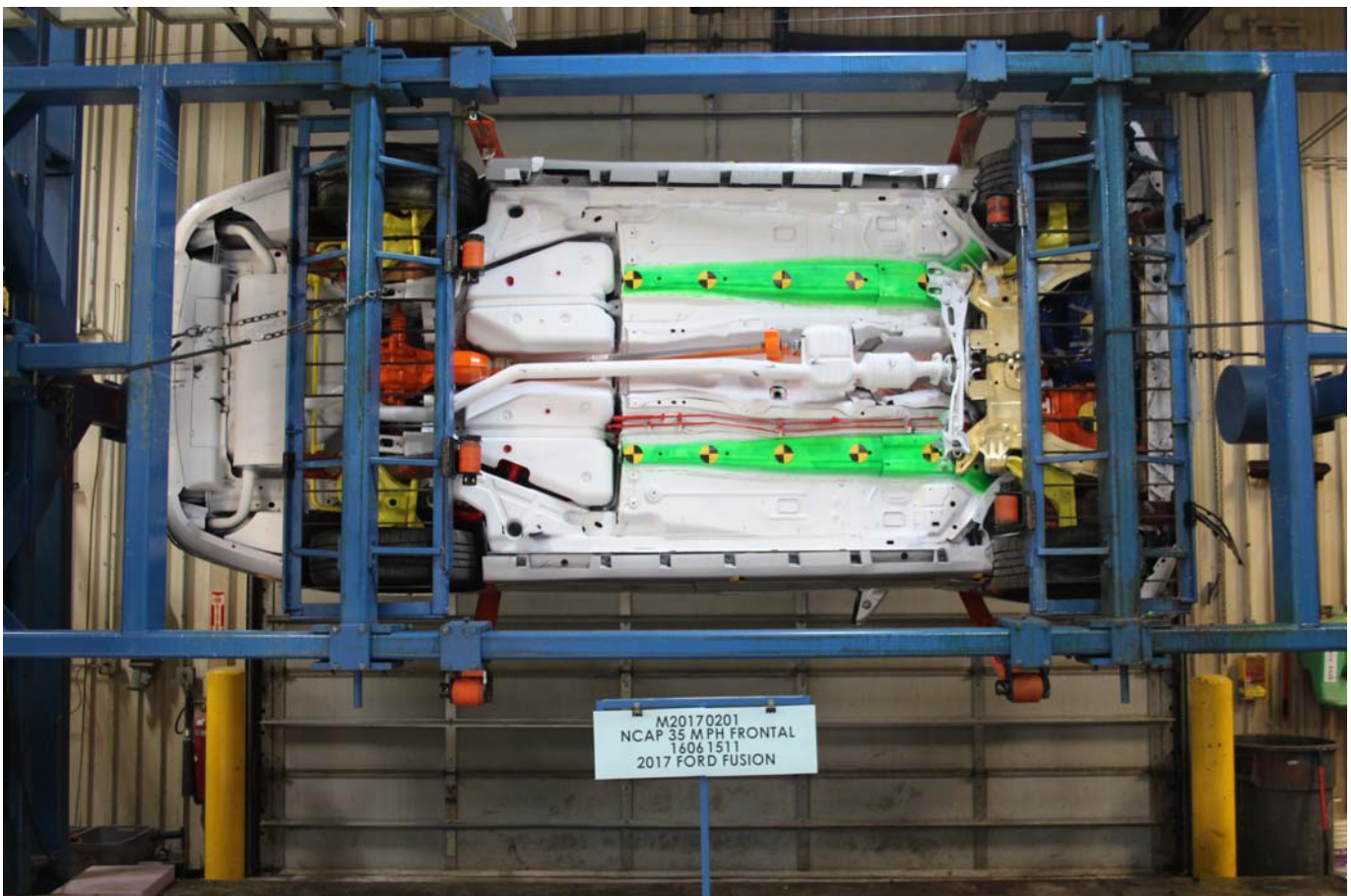


Photo No. 074 - Vehicle at 90 Degrees on Static Rollover Device



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 - 2017 Ford Fusion SE AWD Frontal Impact Event



# VEHICLE DESCRIPTION FUSION

## HR 104516

Go Further  
ford.com

2017 FUSION SE AWD  
5-PASSENGER  
2.0L ECOBOOST ENGINE  
6-SPD AUTO TRANSMISSION

EXTERIOR  
INGOT SILVER METALLIC  
INTERIOR  
EBONY

### STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE

**EXTERIOR**  
\* CONFIGURABLE DAYTIME RUNNING LAMPS  
\* EASY FUEL CAPLESS FILLER  
\* EXHAUST TIP - BRIGHT  
\* GLASS - SOLAR-TINTED  
\* HEADLAMPS - AUTOLAMP (ON/OFF)  
\* LED SIGNATURE LIGHTING  
\* MANUAL FOLD POWER MIRRORS  
\* TAILLAMPS-LED  
\* WIPERS - INTERMITTENT

**INTERIOR**  
\* 3RD ROW SPLIT FOLD REAR SEAT  
\* CUPHOLDERS - 4  
\* DRIVER SEAT - POWER LUMBAR  
\* FLOORMATS-1ST AND 2ND ROW  
\* POWERPOINTS - 12V (3)  
\* REAR A/C & HEAT DUCTS  
\* ROTARY GEAR SHIFT DIAL  
\* SEATS-10-WAY PWR DRIVER & 6-WAY PWR PASS  
\* TILT STEERING WHL/ CRUISE & AUDIO CONTROLS  
\* WINDOWS-1-TOUCH UP/DOWN FRONT/REAR  
\* WINDOWS-GLOBAL OPEN/CLOSE

**FUNCTIONAL**  
\* BRAKES - ANTI-LOCK SYSTEM  
\* BRAKES - FOUR-WHEEL DISC  
\* BRAKE ASSIST  
\* ELECTRIC-ASSIST PARK BRAKE  
\* HILL START ASSIST  
\* MYKEY  
\* POWER STEERING W/EPAS  
\* PUSH-BUTTON START  
\* REAR VIEW CAMERA  
\* REMOTE KEYLESS ENTRY  
\* SECURITYCODE KEYLESS KEYPAD  
\* SYNC XM - SYNC IN/A/NSHM

**SAFETY/SECURITY**  
\* AIRBAGS-DRIVER/PASS FRONT  
\* AIRBAGS - FRONT SEAT  
\* MOUNTED SIDE IMPACT  
\* AIRBAGS - SIDE AIR CURTAIN  
\* ADVANCEDTRAC ESC  
\* CHILD SAFETY REAR DR LOCKS  
\* LATCH CHILD SAFETY SYSTEM  
\* PERIMETER ALARM  
\* SECURILOCK® ANTI-THEFT SYS  
\* TPMS - INDIVIDUAL

**WARRANTY**  
\* 3YR/50,000 BUMPER / BUMPER  
\* 5YR/100,000 POWERTRAIN  
\* 5YR/100,000 ROADSIDE ASSIST

### INCLUDED ON THIS VEHICLE

(MSRP)

EQUIPMENT ABOVE 2017A 3,190.00

SE LUXURY PACKAGE  
HEATED FRONT SEATS

OPTIONAL EQUIPMENT/OTHER  
50 STATE EMISSIONS  
18" MACH-ALUM PNT POCKETS WHLS

NO CHARGE  
685.00

### PRICE INFORMATION

BASE PRICE 327,405.00  
TOTAL OPTIONS/OTHER 3,000.00  
TOTAL VEHICLE & OPTIONS/OTHER 31,296.00  
DESTINATION & DELIVERY 875.00  
TOTAL BEFORE DISCOUNTS 352,176.00  
SYNC AND SOUND DISCOUNT - 400.00  
SE AWD PACKAGE DISCOUNT - 798.00  
TOTAL SAVINGS - 1,285.00

TOTAL MSRP \$30,885.00

SOLD TO  
Suburban Ford of Waterford, LL  
5600 Highland Road  
Waterford MI 48327

400 950  
RYP1

DEALER NO.  
48B 050

TOTAL MSRP \$30,885.00

SHIP TO (IF OTHER THAN SOLD TO)

SHIP TWO

FINAL ASSEMBLY PLANT  
HERMOSILLO

This label is affixed pursuant to the Federal Automobile Information Disclosure Act, Government, License, and Title Fees, State and Local Taxes are not included. Dealer installed options or accessories are not included unless listed above.

SHIP THROUGH

METHOD OF TRANSIT  
RAIL

ITEM #  
48-0700 O/T 2

GD062 N RA 2X 724 000605 04 06 16

## EPA DOT Fuel Economy and Environment

Gasoline Vehicle

### Fuel Economy

**23** MPG  
combined city/hwy  
20 city  
29 highway  
4.3 gallons per 100 miles

Midsize Cars range from 13 to 114 MPG. The best vehicle rates 110 MPG.

You spend **\$1,000** more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost **\$1,600**

Fuel Economy & Greenhouse Gas Rating (table only) Smog Rating (table only)  
5  
1 10 Best 1 10 Best  
This vehicle emits 366 grams CO<sub>2</sub> per mile. The best emits 0 grams per mile (table only). Producing and distributing fuel also create emissions. Learn more at [fuelconomy.gov](http://fuelconomy.gov).

Actual results will vary for many reasons, including driving conditions and how you drive. The average driver spends about \$8,000 on fuel over 5 years. Don't underestimate the benefit of 15,000 miles per year at 30-45 mpg. EPA's mileage estimates are based on a standard driver of average weight and driving.

### fuelconomy.gov

Calculate personalized estimates and compare vehicles.

### 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 Not Rated  
Passenger Not Rated

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash Front seat Not Rated  
Rear seat Not Rated

Based on the risk of injury in a side impact.

Rollover ★★★★★

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](http://www.safercar.gov) or 1-888-327-4236



3FA6P0193HR104516



Scan this code to experience this vehicle or text 3FHR104516 to 40028

or Visit [ford.com/windowsticker](http://ford.com/windowsticker)

Standard message. A rate plan may apply.



It's all on Ford Protect! The only extended service plan fully backed by Ford and honored at every Ford dealership in the U.S., Canada and Mexico. See your Ford dealer for additional details, or visit [www.FordProtect.com](http://www.FordProtect.com) for more information.



Choose the vehicle you want. Whether you decide to lease or finance, you'll find the choices that are right for you. See your Ford Dealer for details or visit [www.FordCredit.com](http://www.FordCredit.com).

Photo No. 079 - Monroney Label Photograph

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

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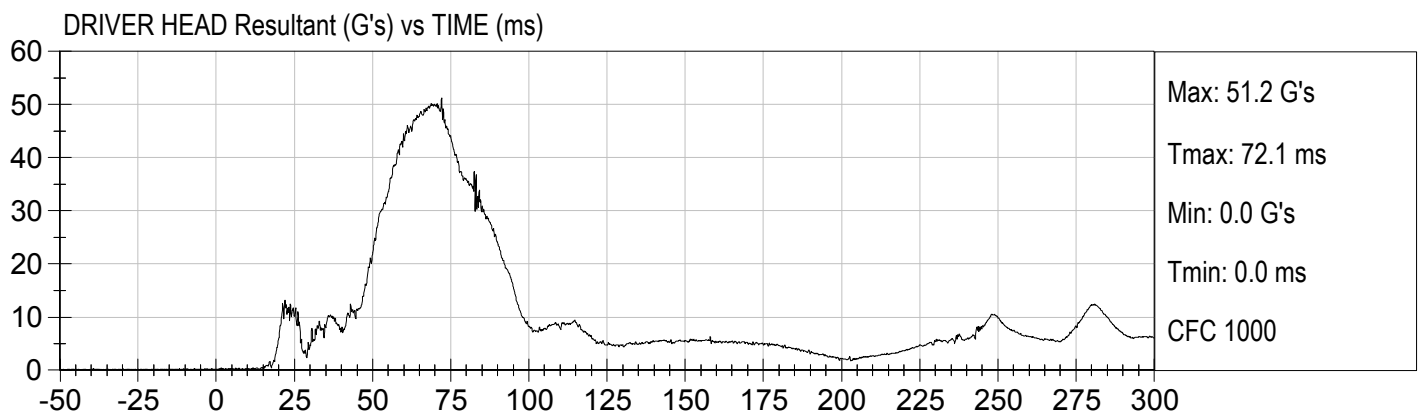
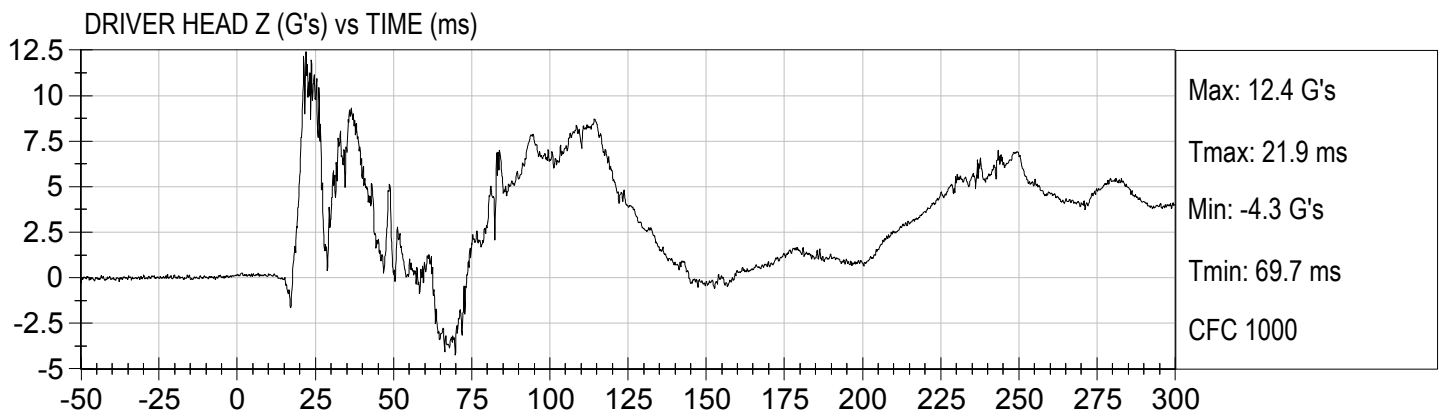
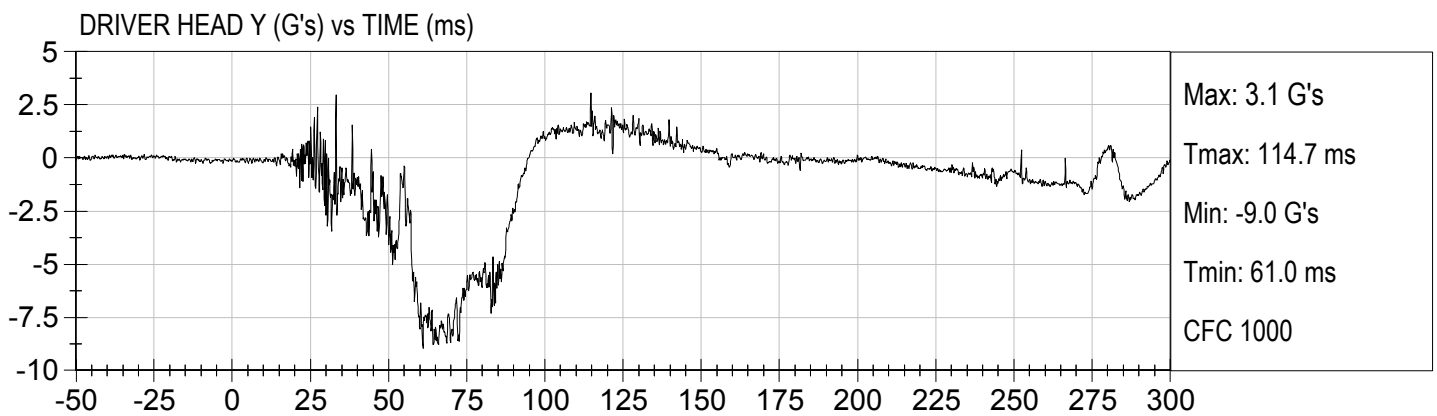
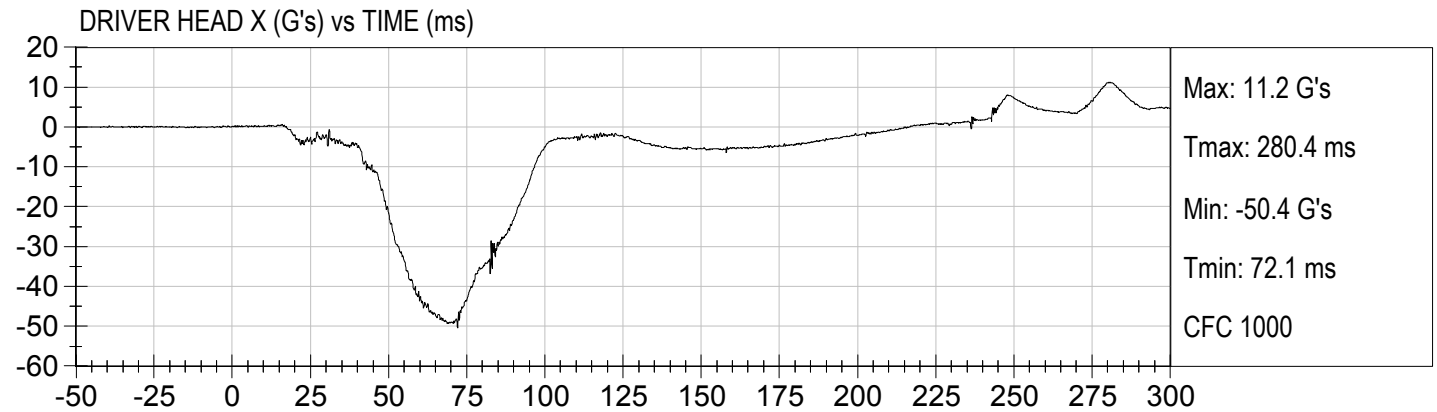
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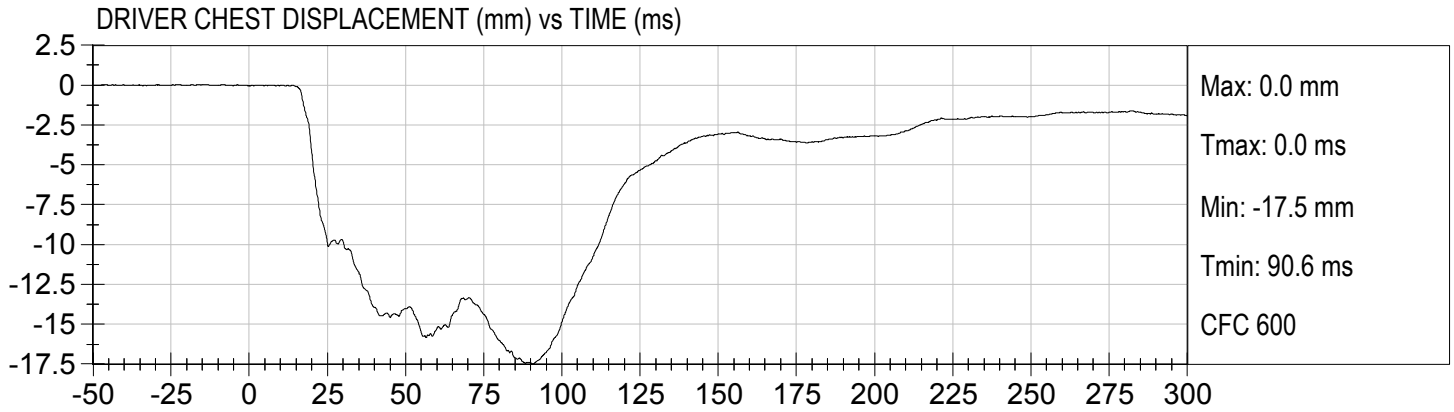
**The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)**

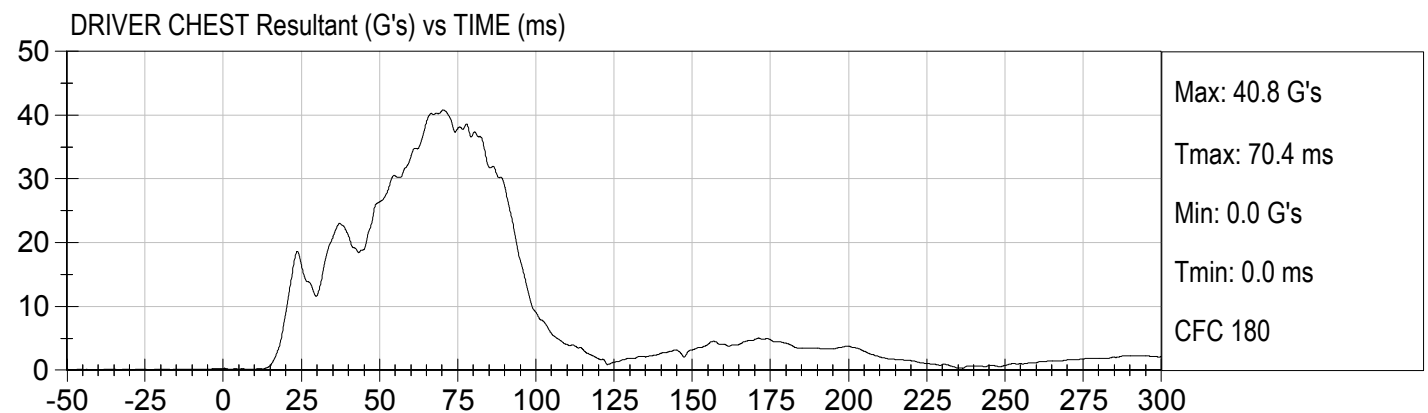
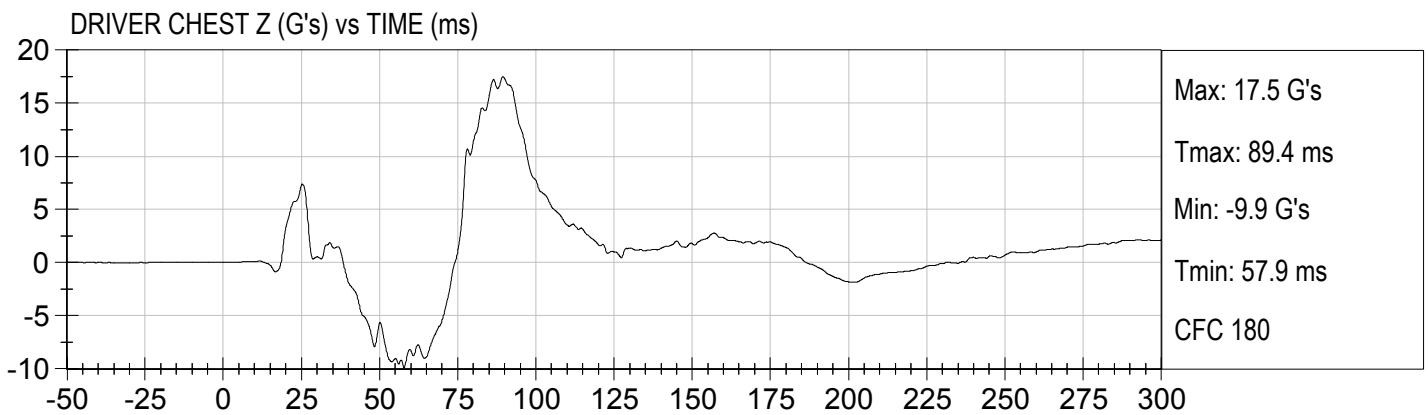
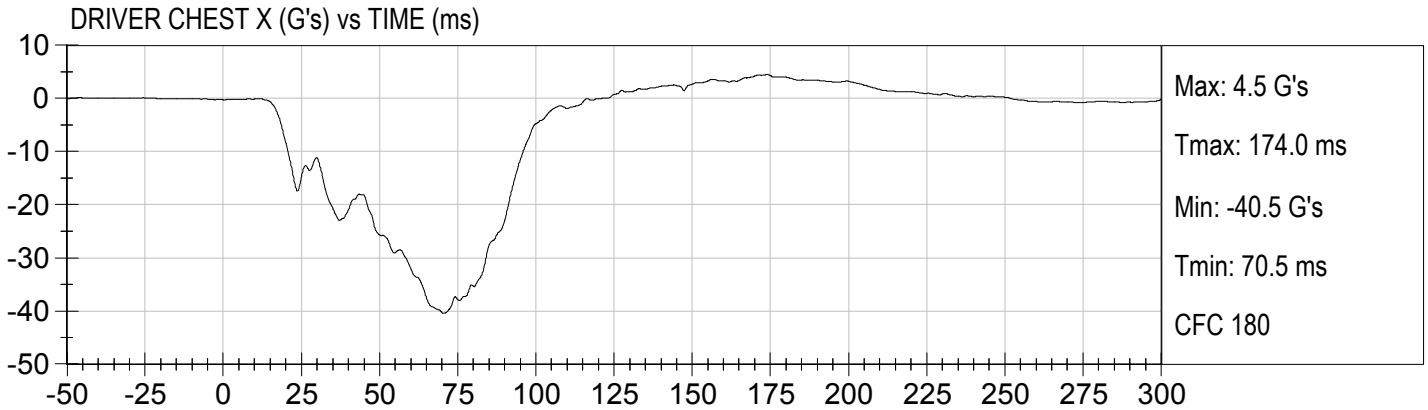
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 Driver Upper Neck Moment X  
 Driver Upper Neck Moment Z  
 Driver Chest X Redundant  
 Driver Chest Y Redundant  
 Driver Chest Z Redundant  
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 Driver Left Upper Tibia Moment Y

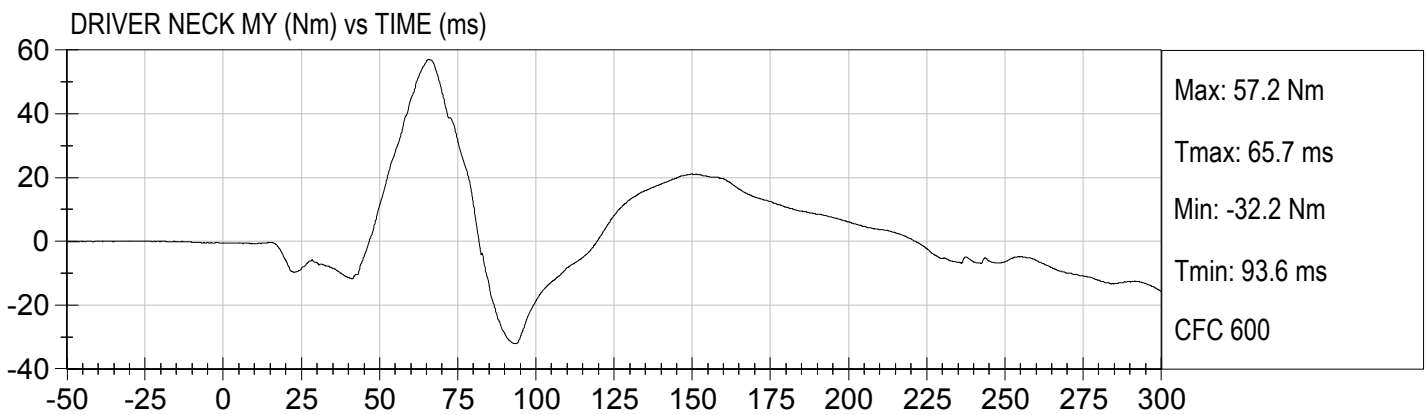
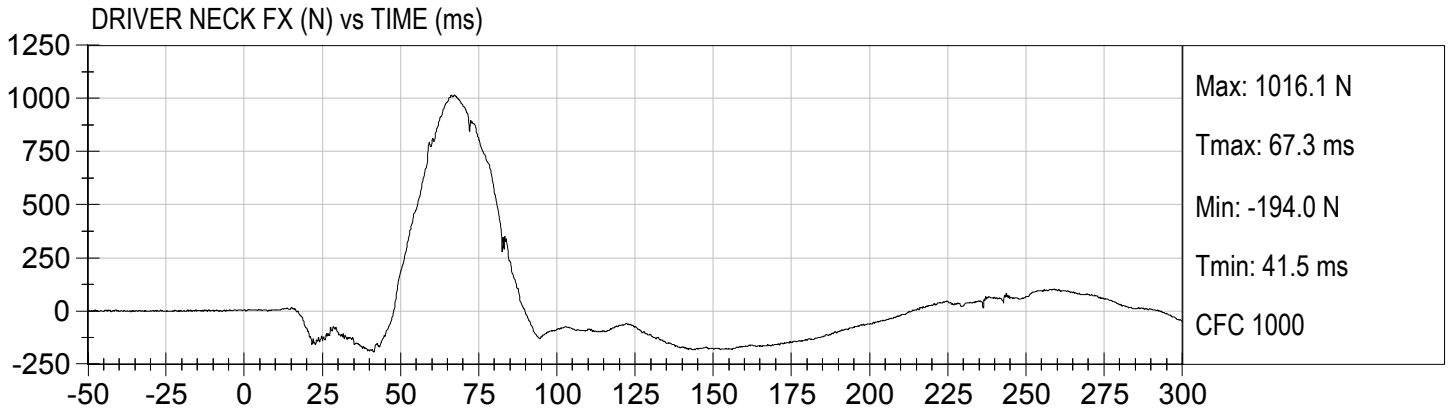
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Driver Right Lower Tibia Moment Y  
Driver Right Lower Tibia Force Z  
Driver Left Foot Fore Z  
Driver Left Foot Aft X  
Driver Left Foot Aft Z  
Driver Right Foot Fore Z  
Driver Right Foot Aft X  
Driver Right Foot Aft Z  
Driver Lap Belt Force  
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  
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Passenger Chest Y Redundant  
Passenger Chest Z Redundant  
Passenger Pelvis X  
Passenger Pelvis Y

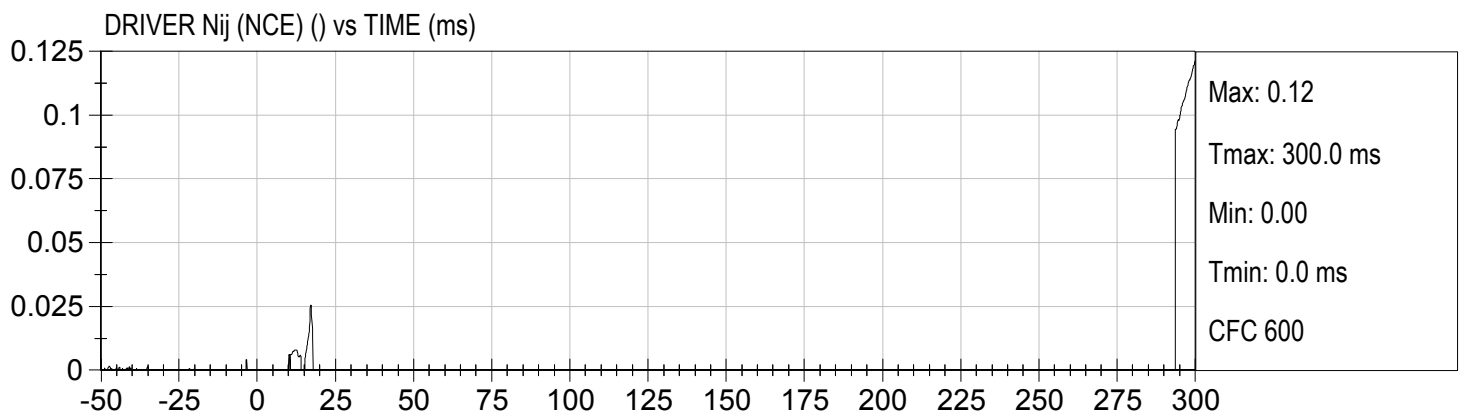
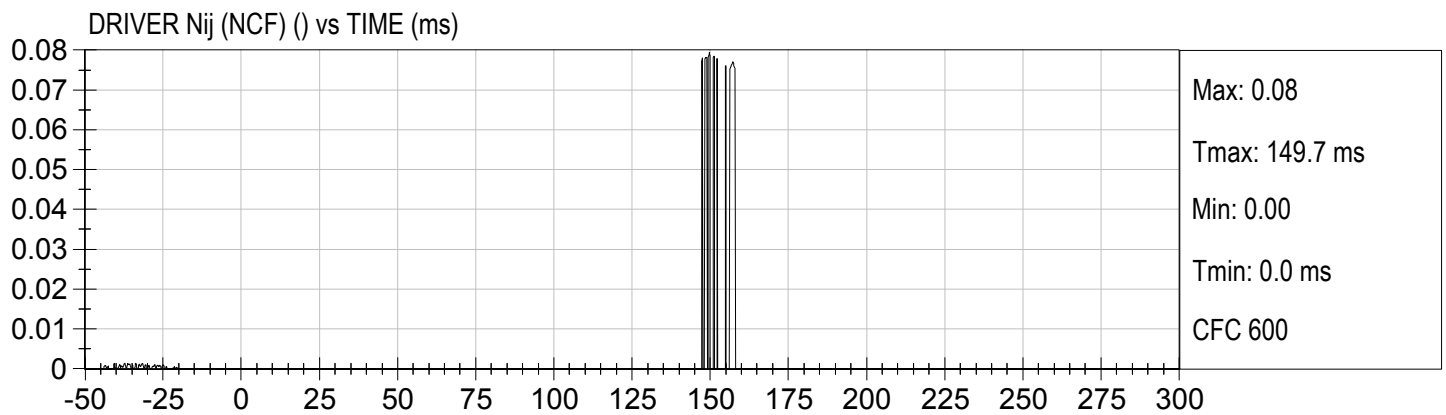
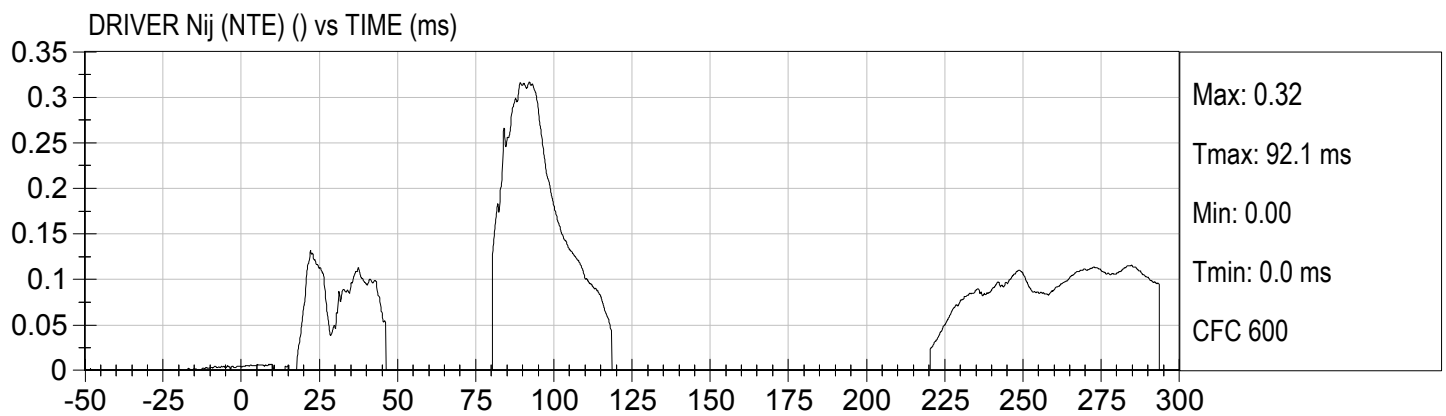
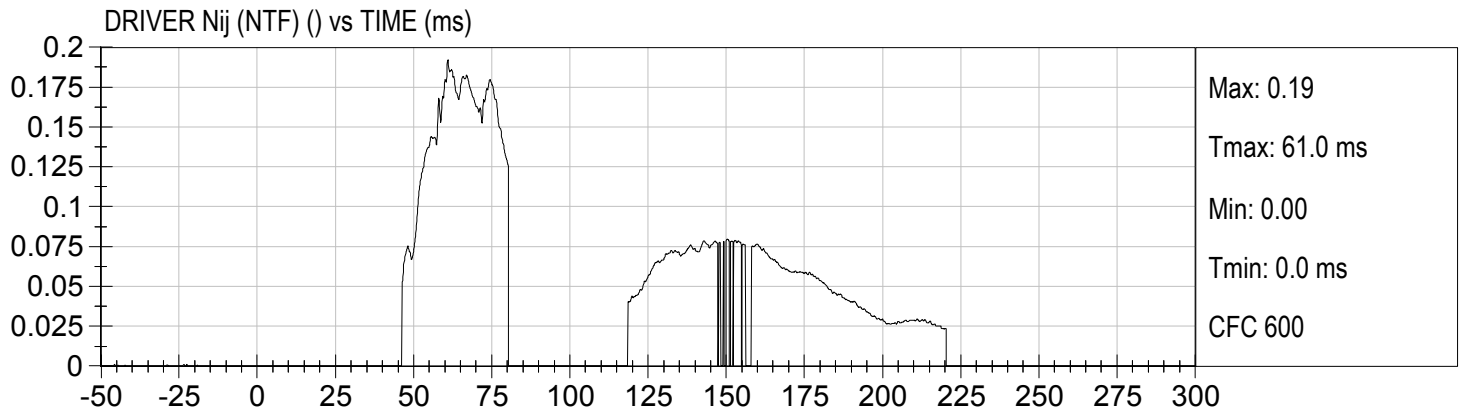
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Passenger Left Lower Tibia Moment Y  
Passenger Left Lower Tibia Force Z  
Passenger Right Upper Tibia Moment X  
Passenger Right Upper Tibia Moment Y  
Passenger Right Upper Tibia Force Z  
Passenger Right Lower Tibia Moment X  
Passenger Right Lower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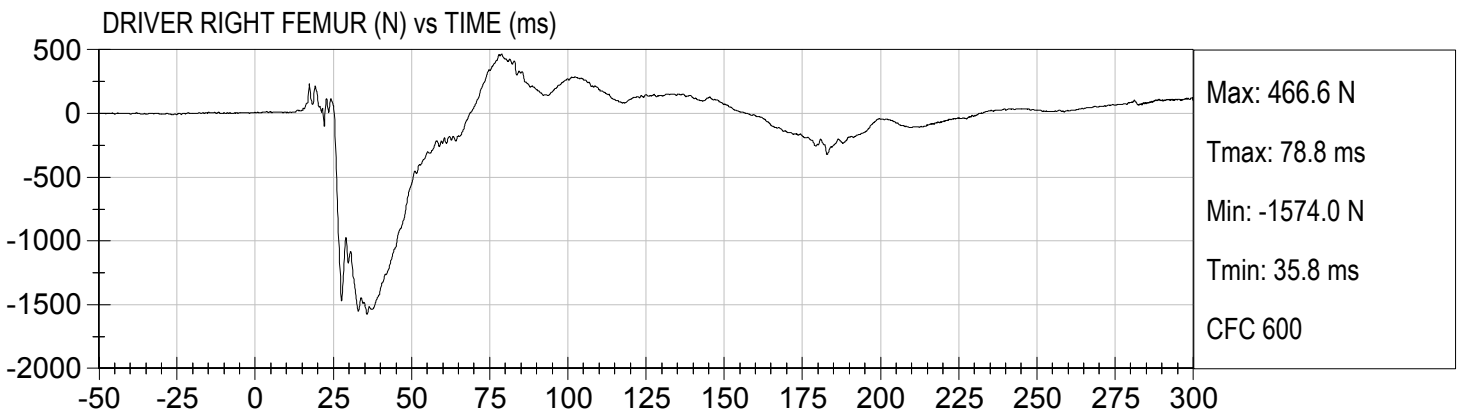
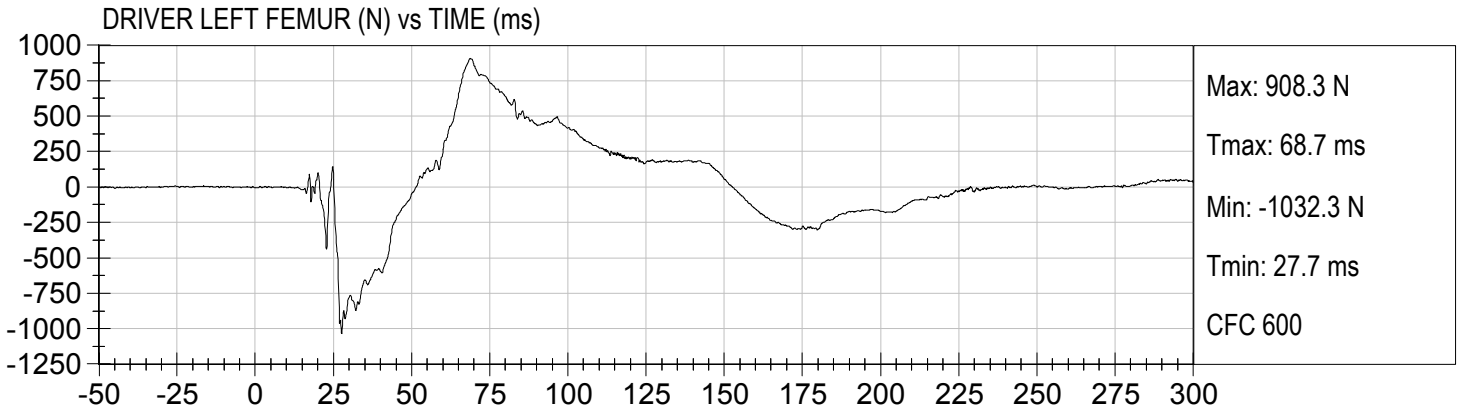


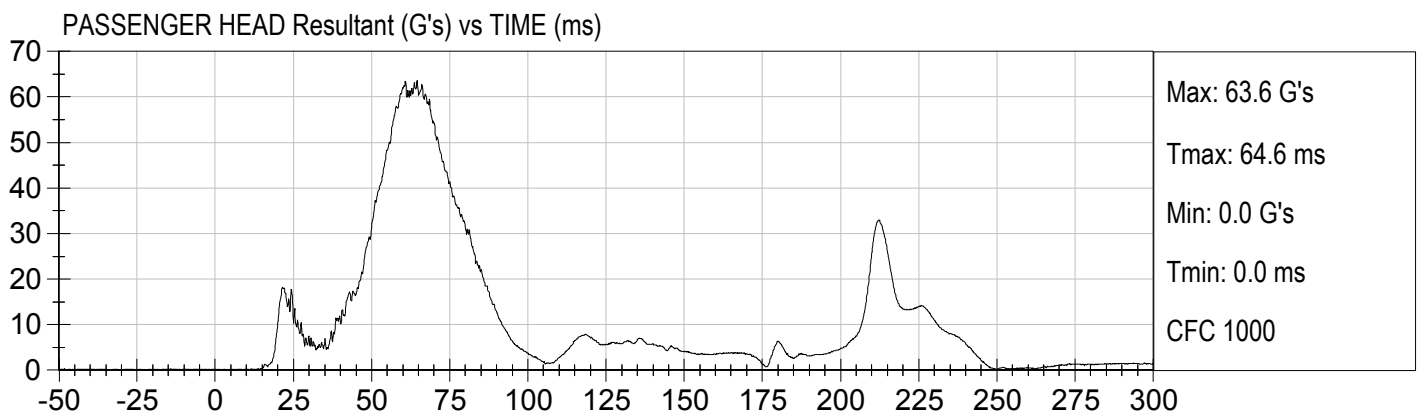
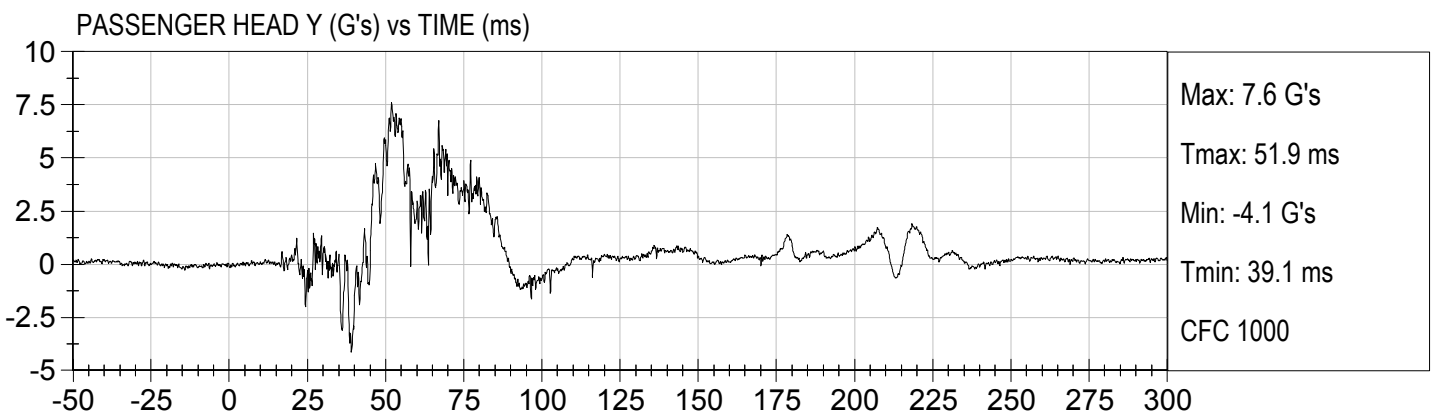
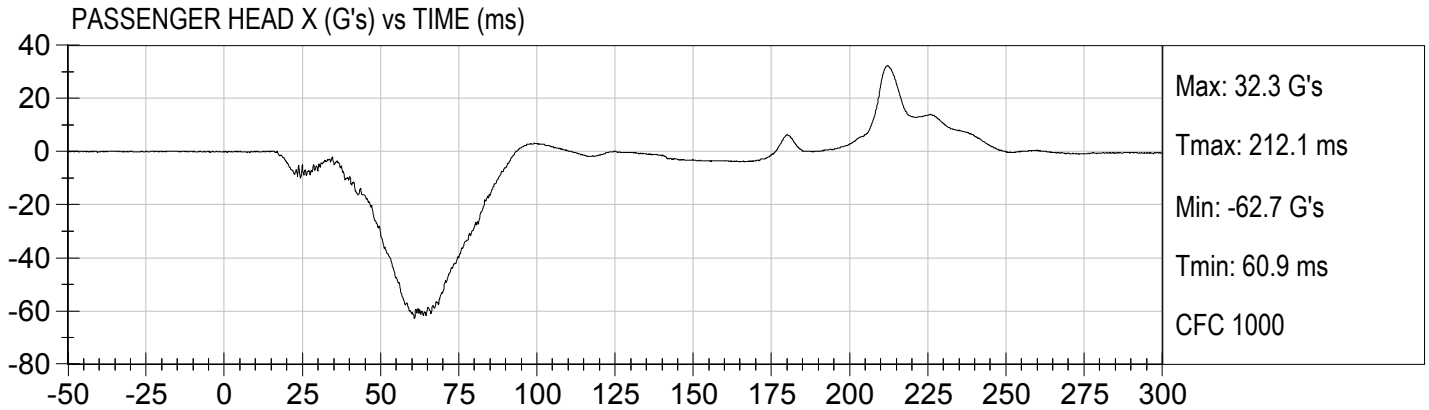


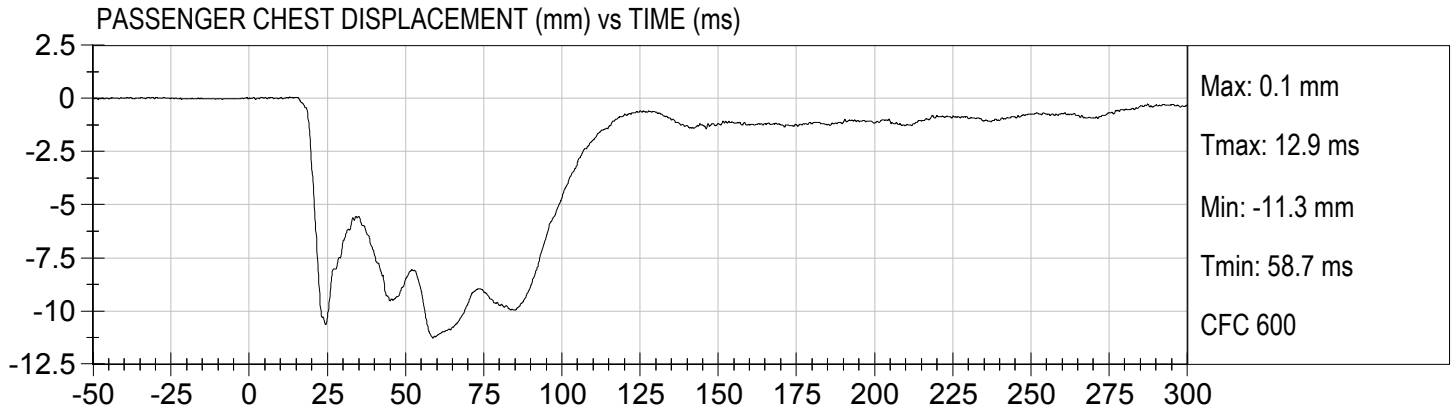


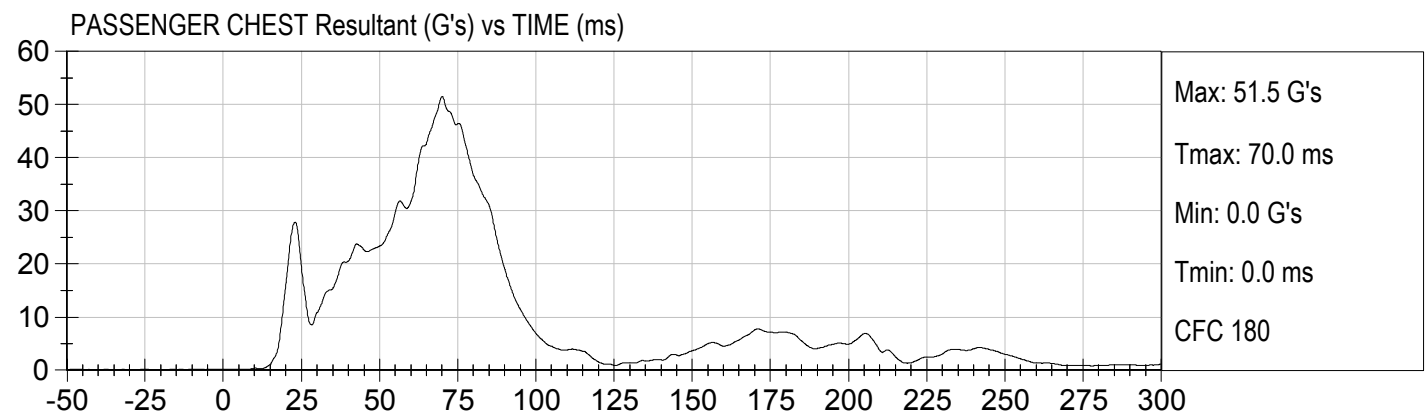
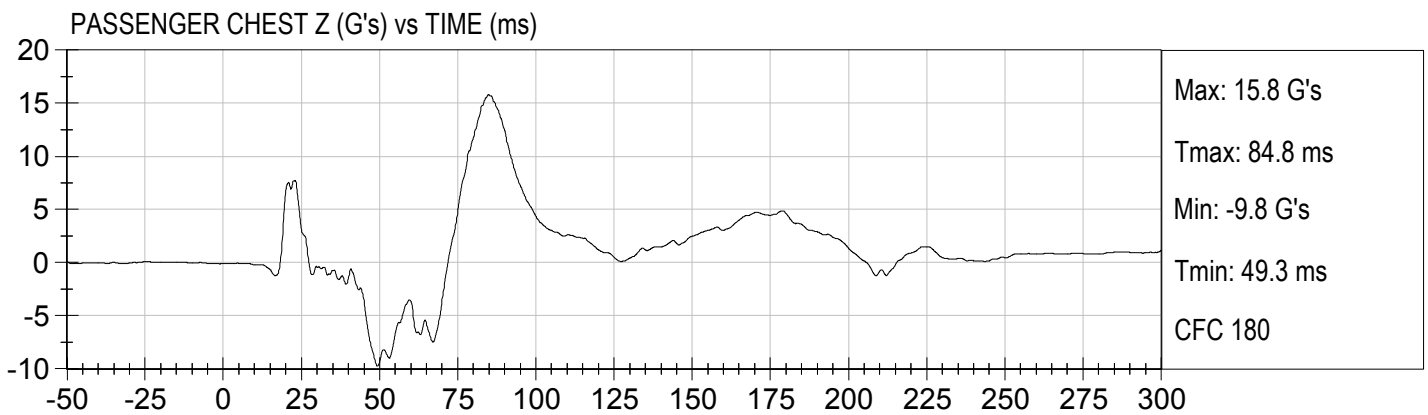
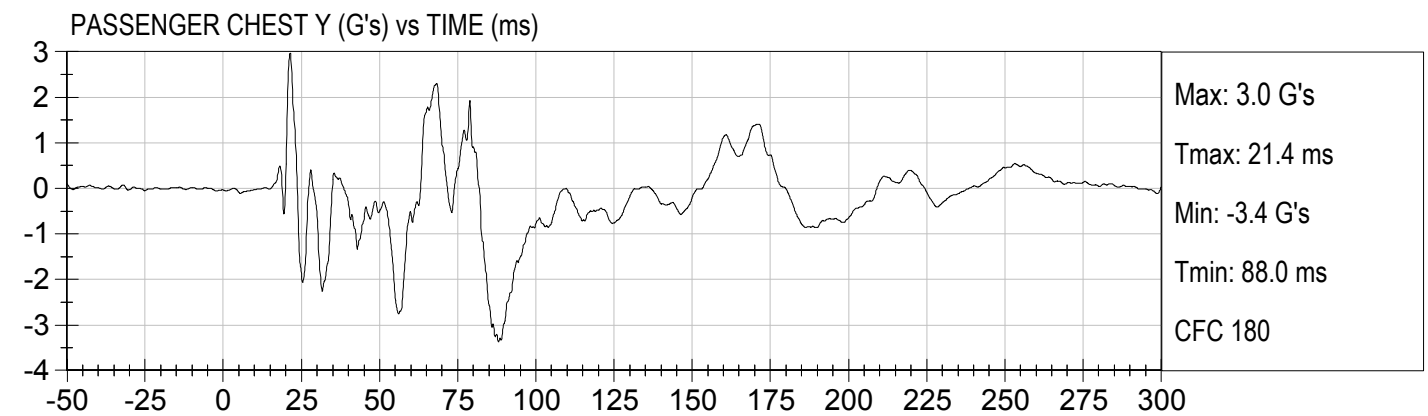
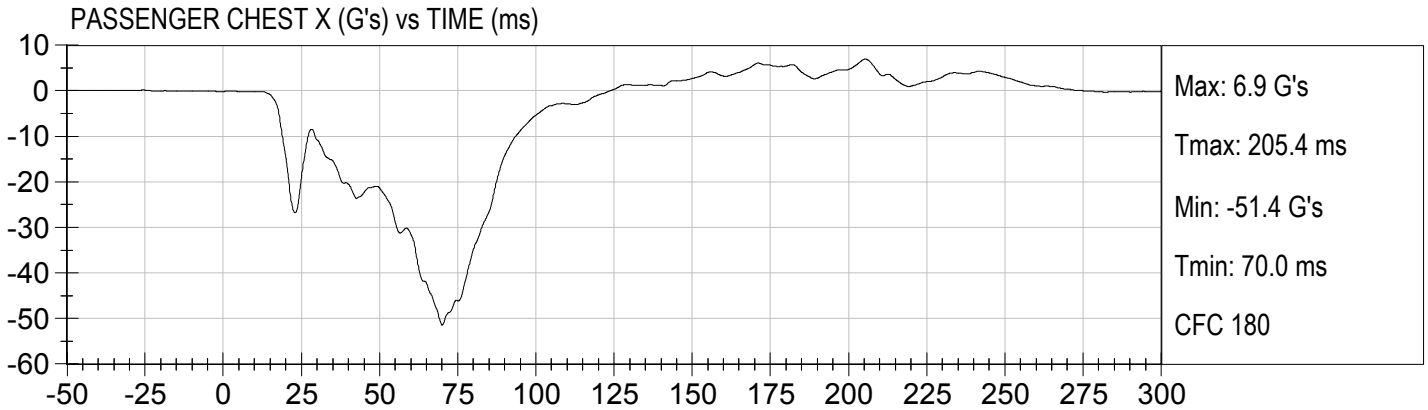


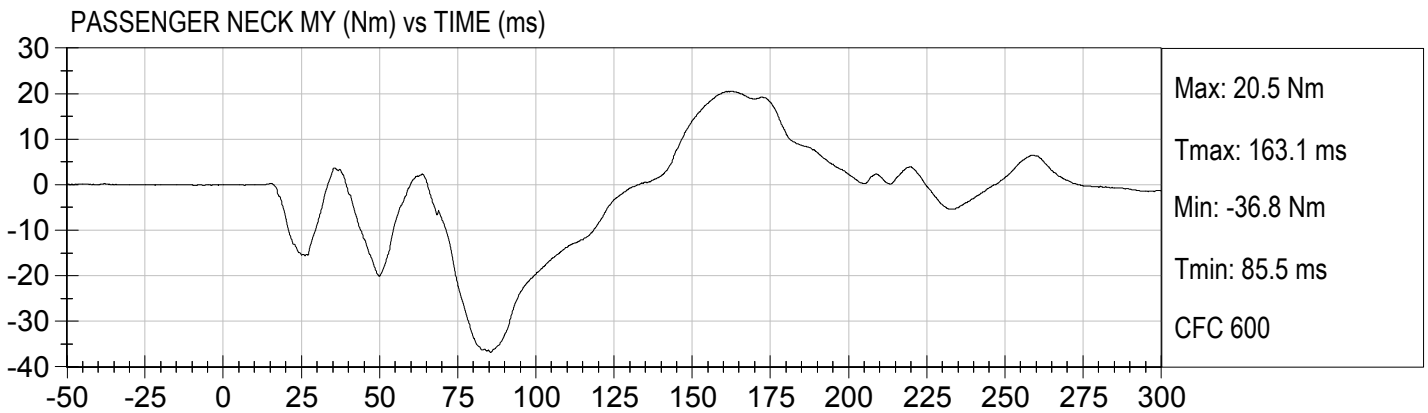
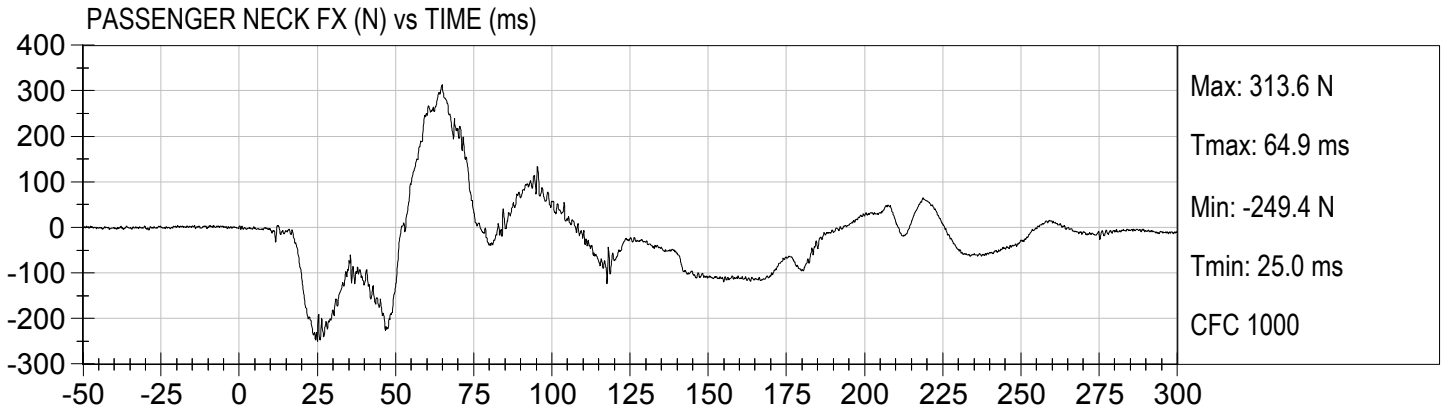


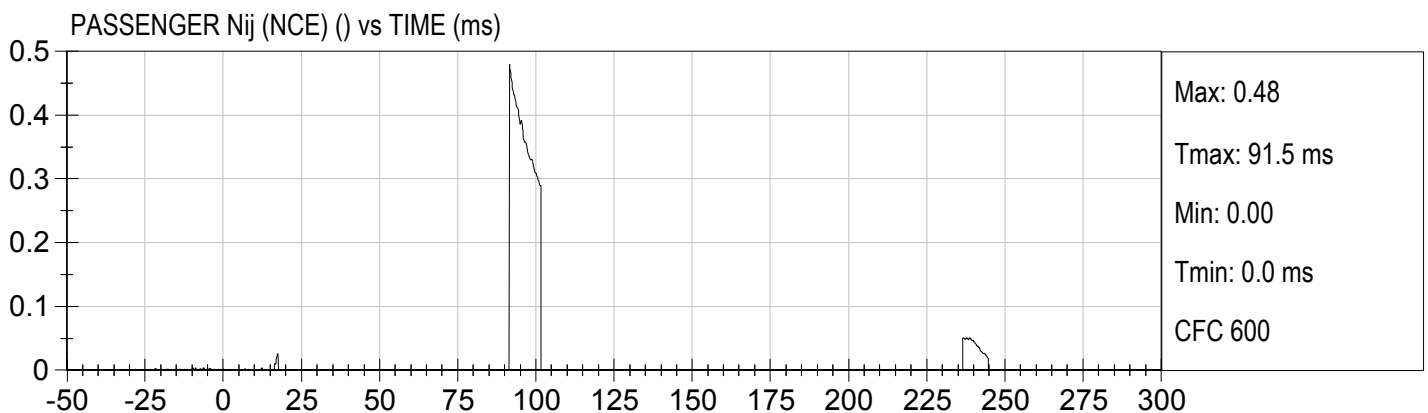
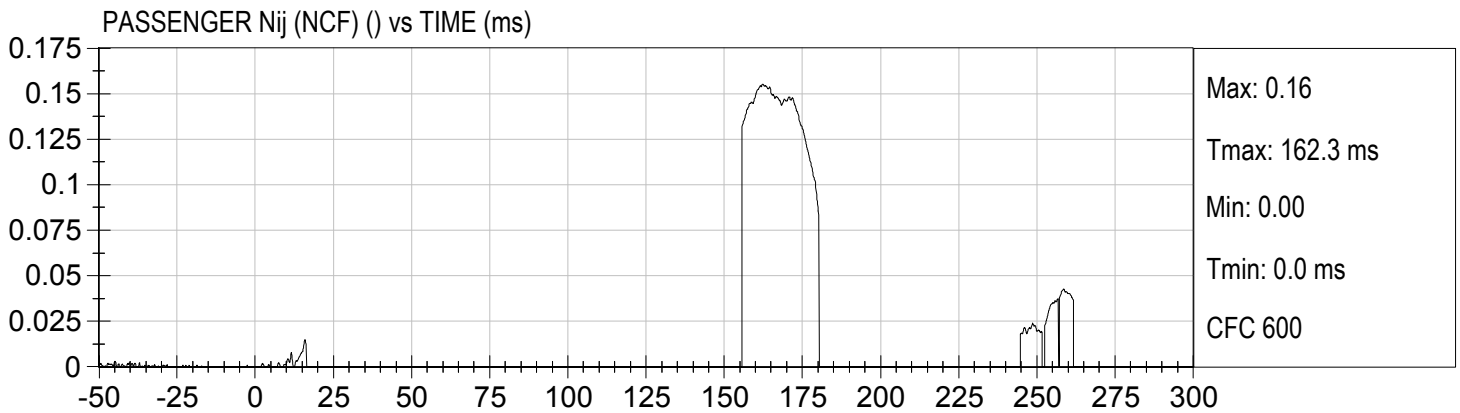
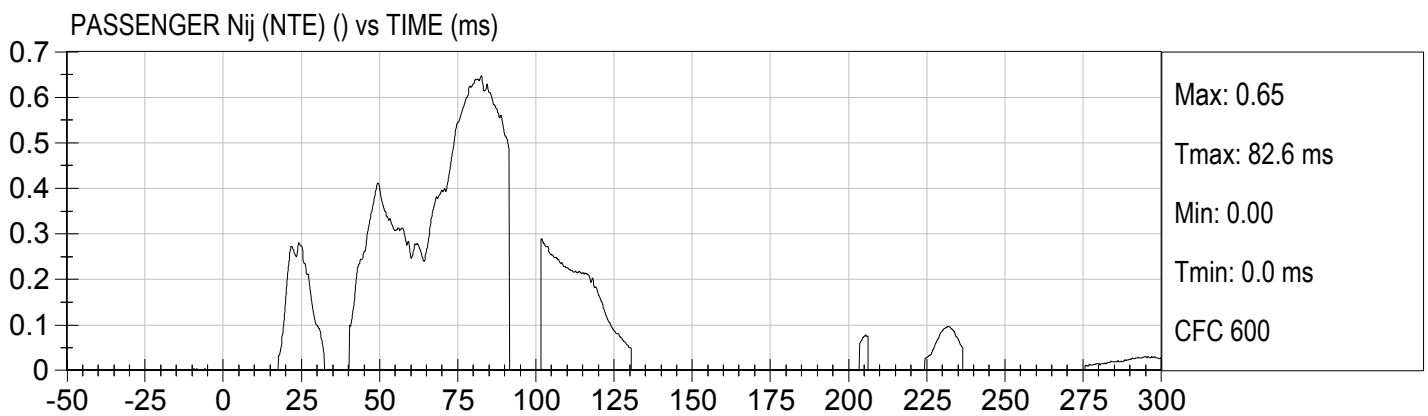
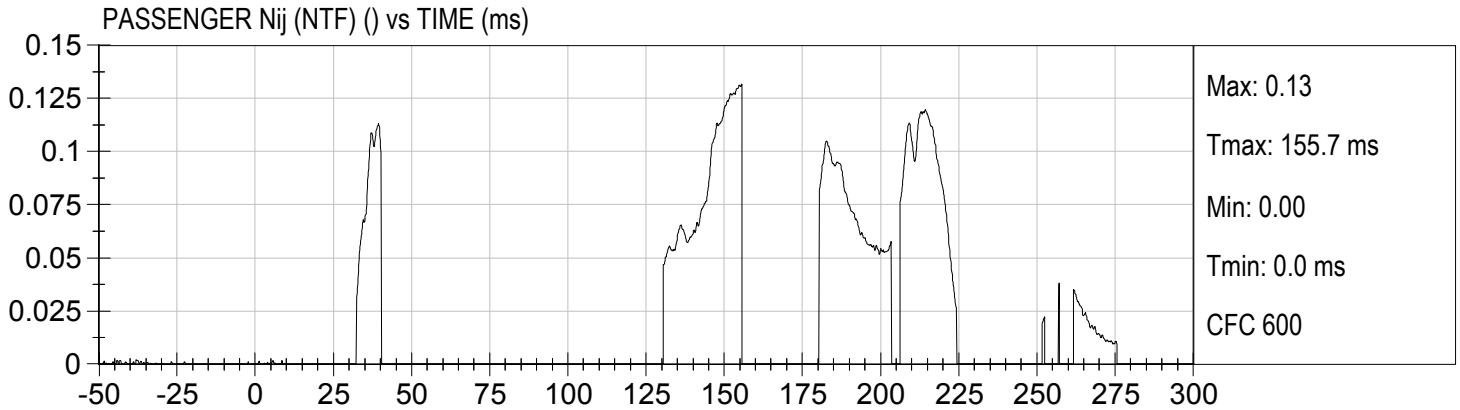


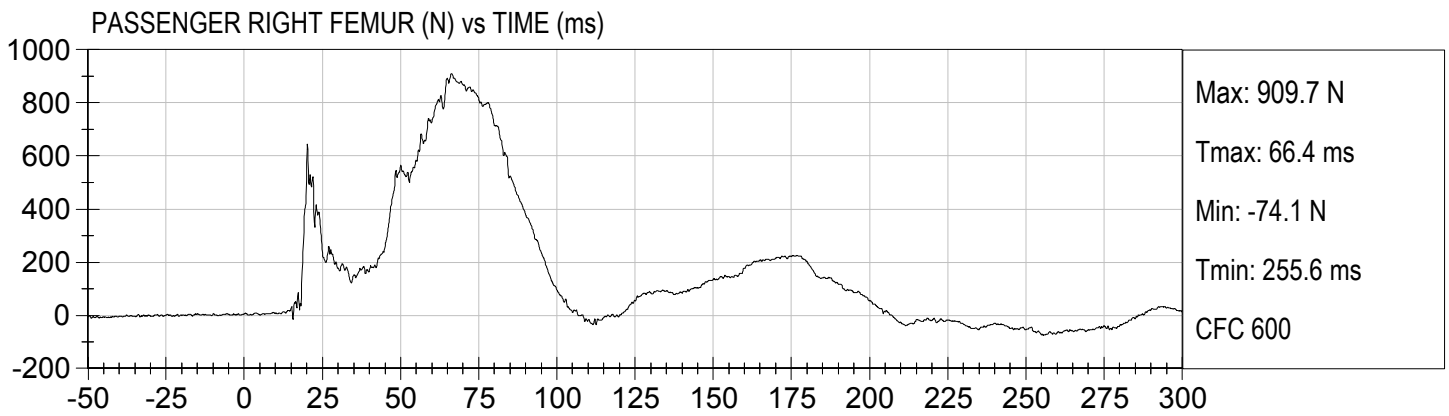
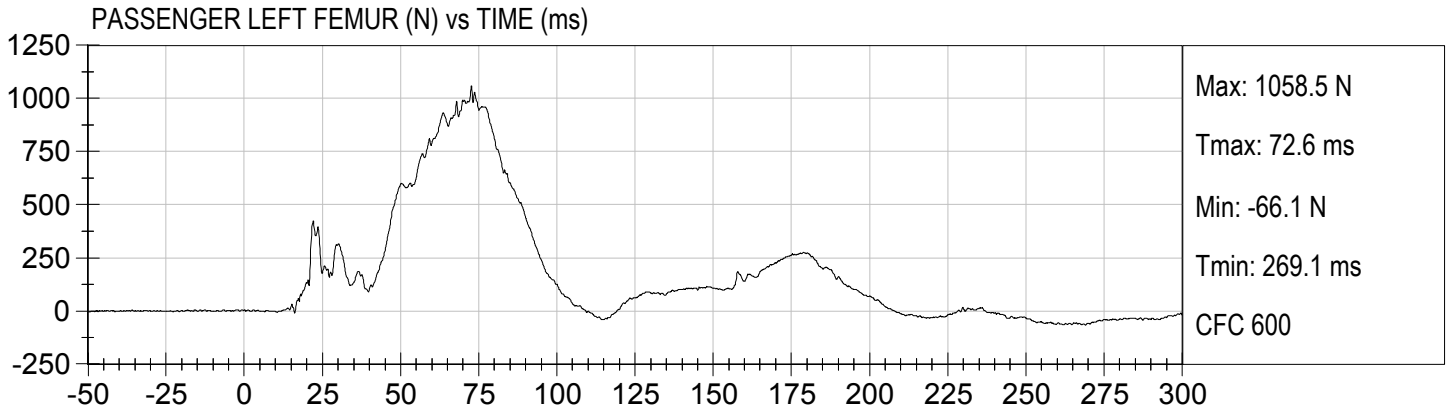












**APPENDIX C**  
**DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA**

**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**

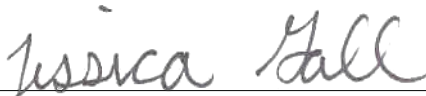
**ATD Serial No:** 351

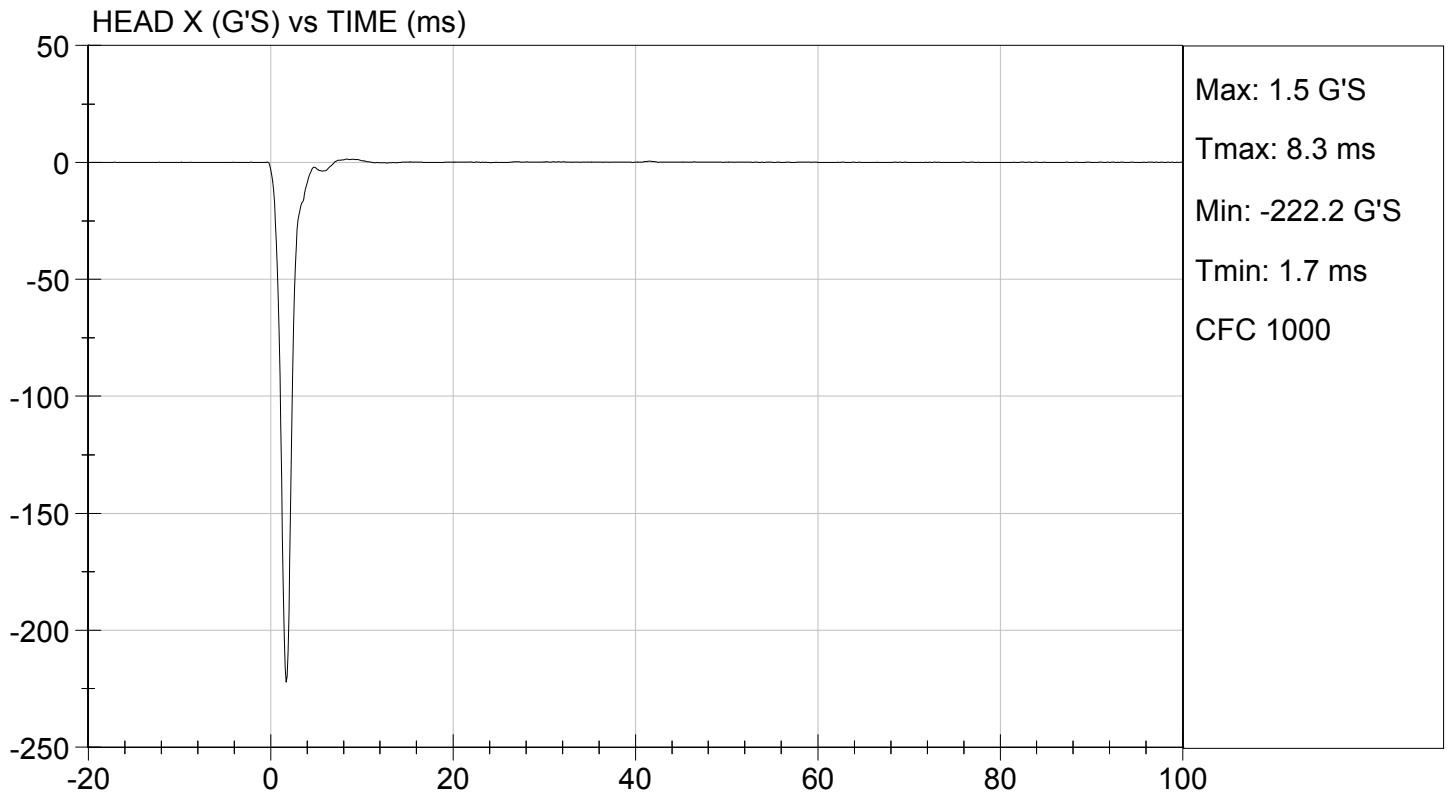
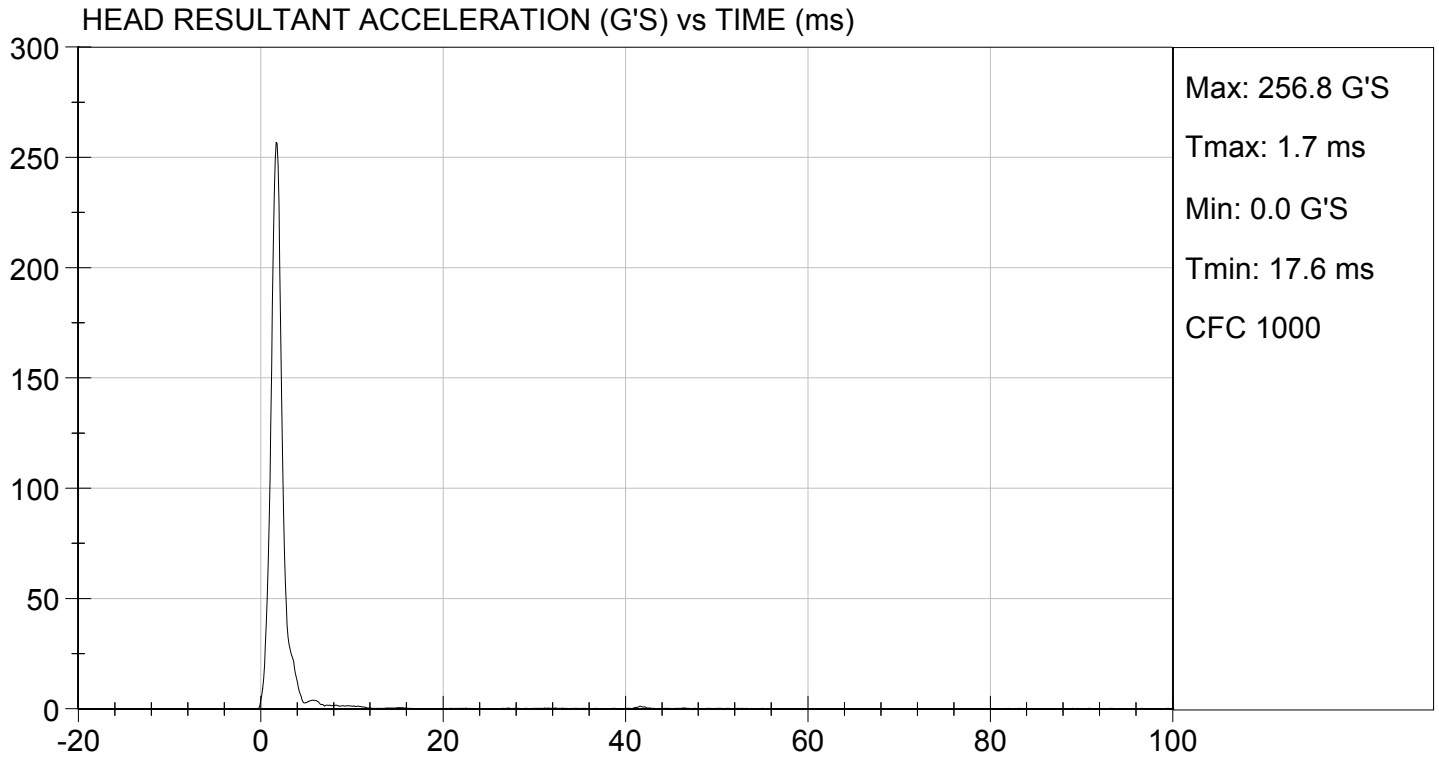
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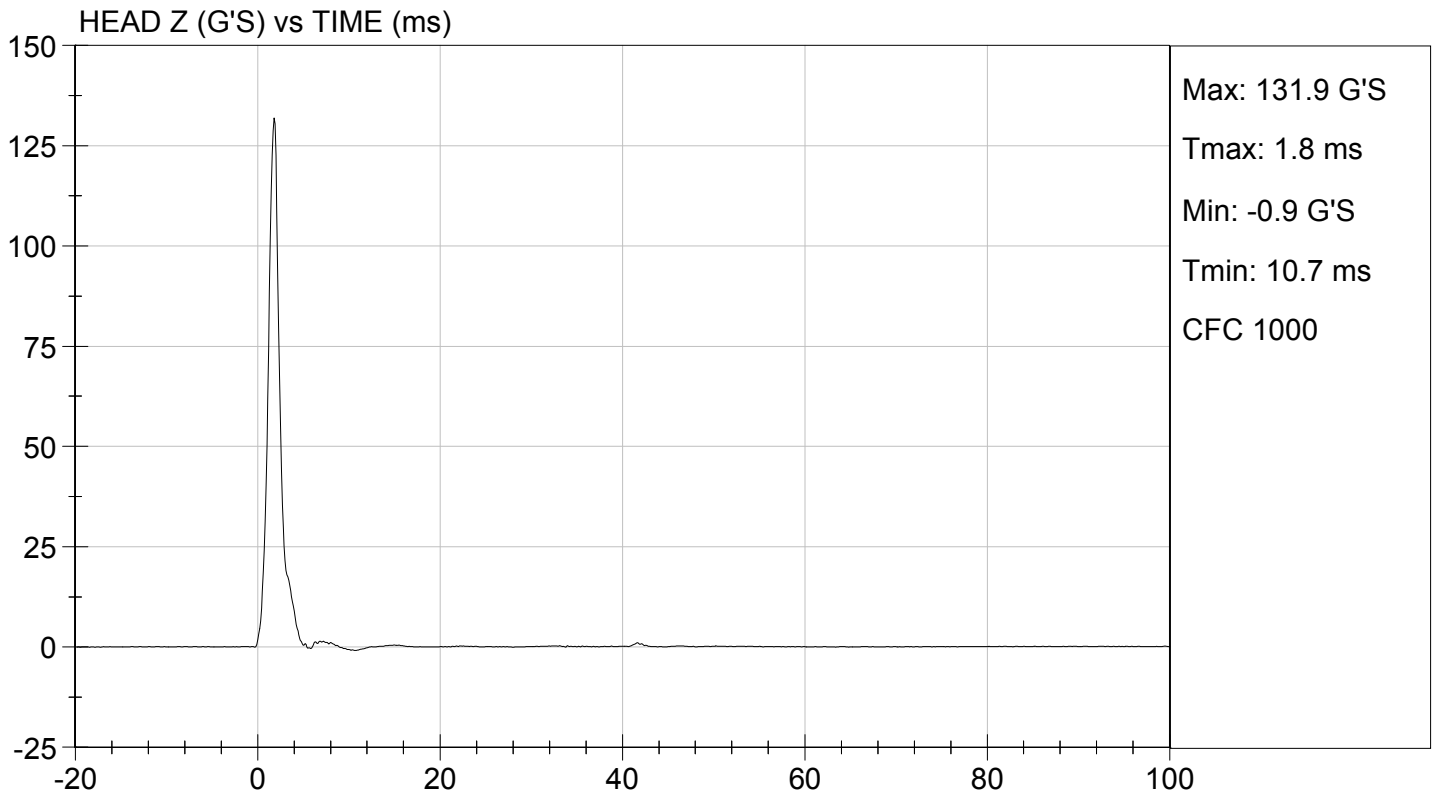
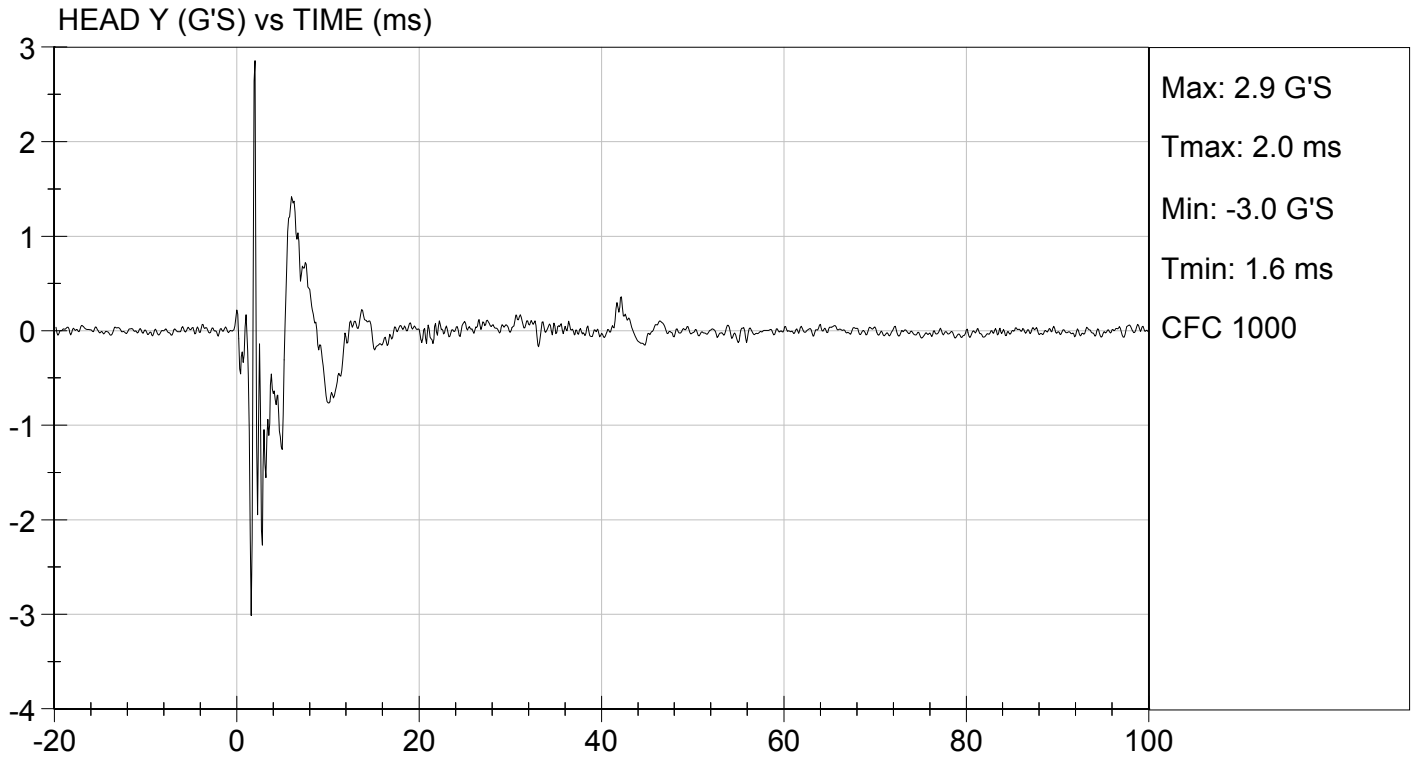
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Peak Resultant Acceleration	G's	225 to 275	257	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

06/09/2016  
 Test Date

  
 Approved By





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

**ATD Serial No:** 351

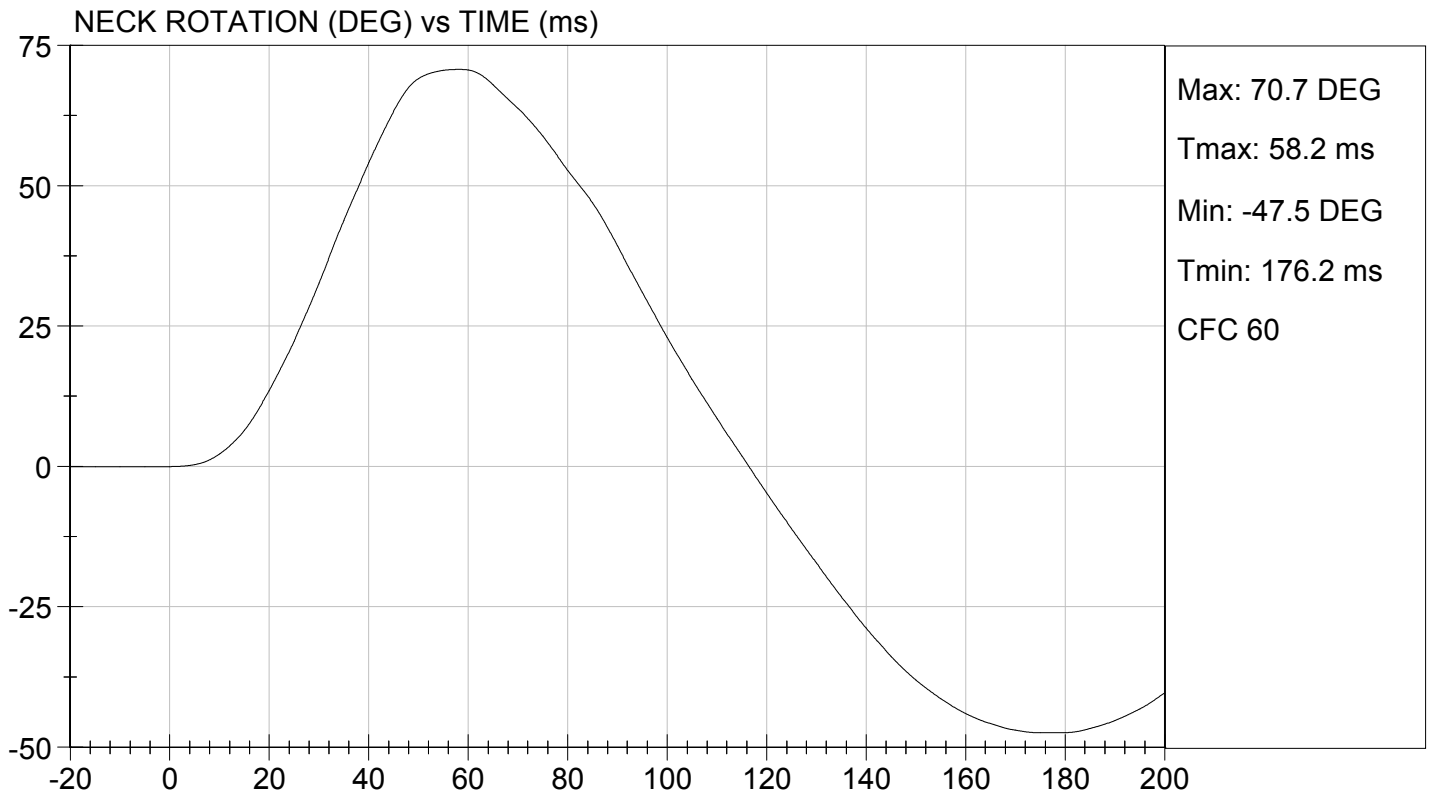
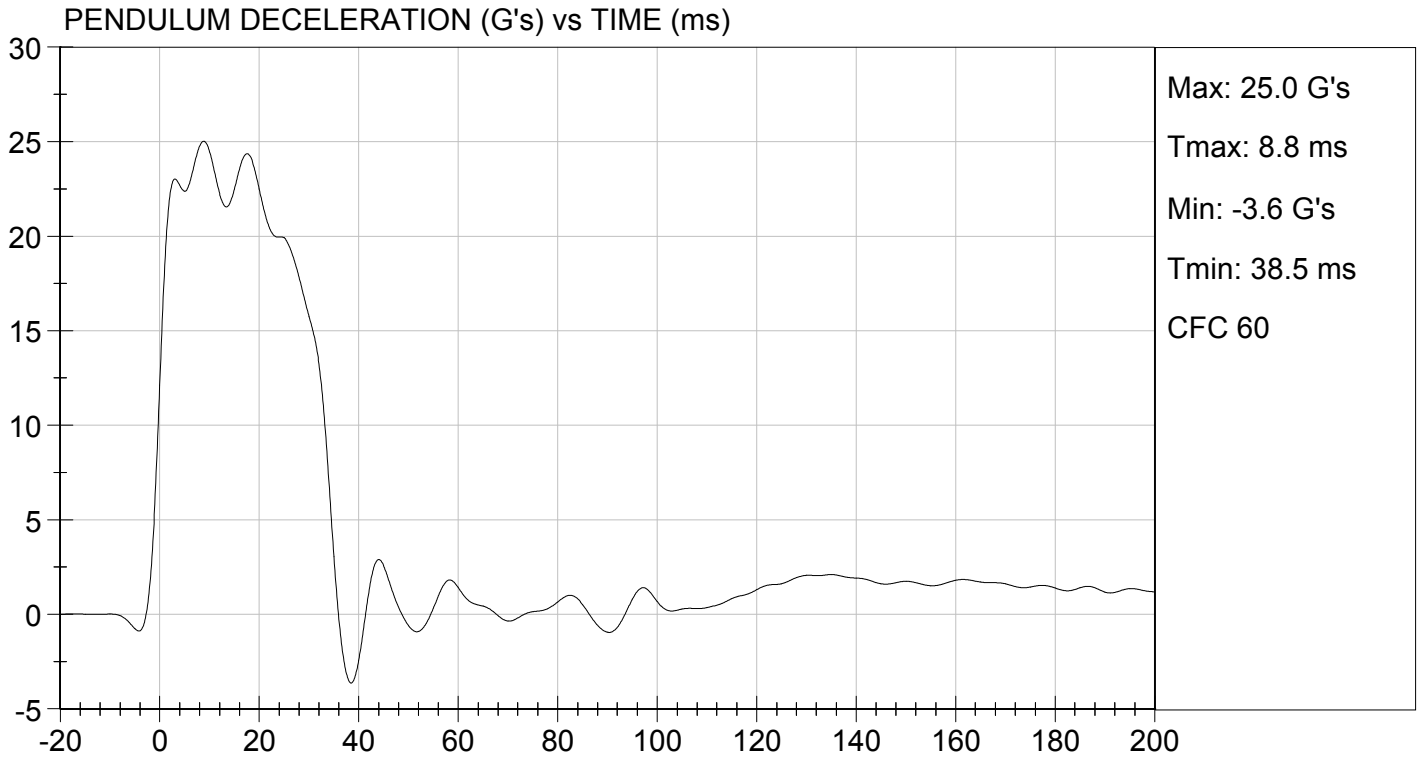
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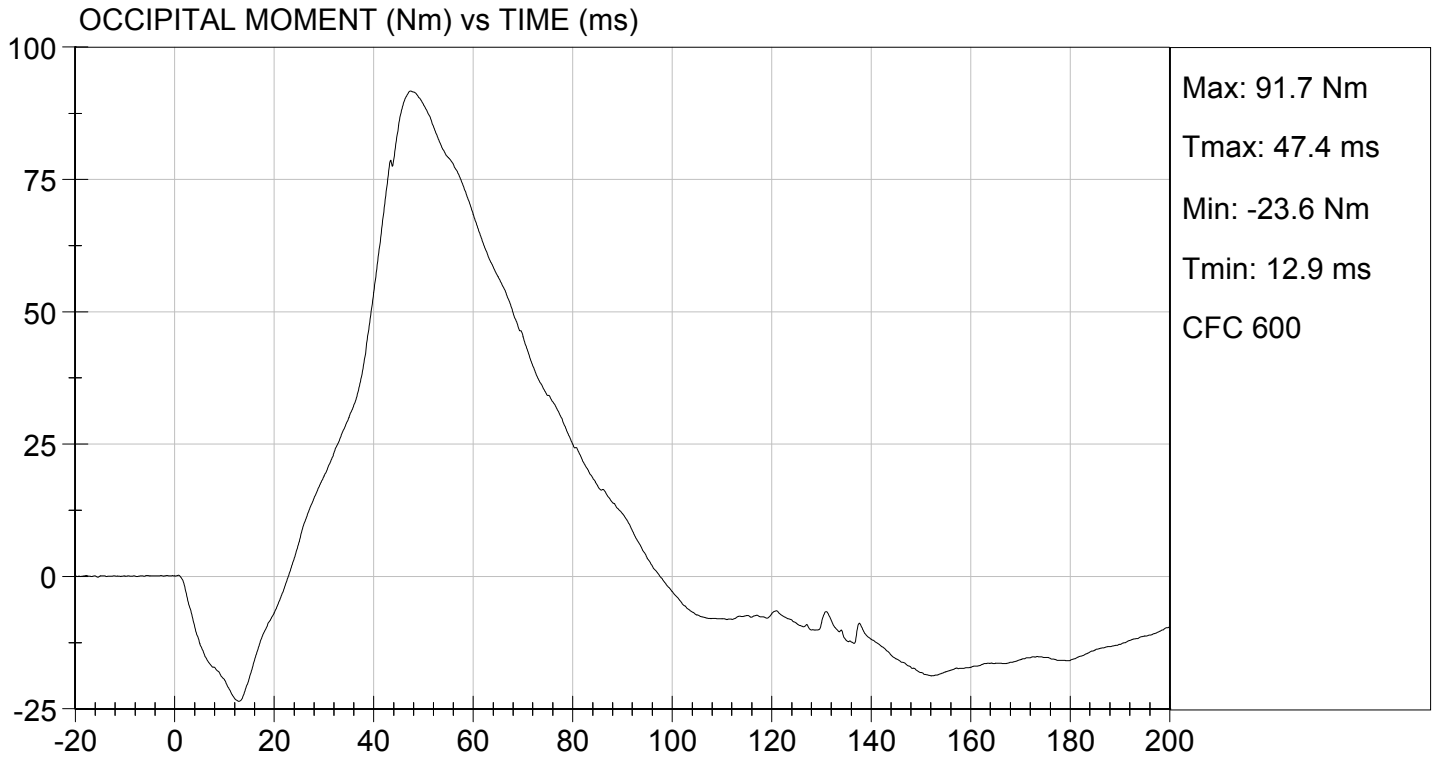
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.47	Pass
	20 ms	G's	17.60 to 22.60	22.50	Pass
	30 ms	G's	12.50 to 18.50	15.74	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.6	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	70.7	Pass
	Time	ms	57.0 to 64.0	58.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	116.6	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	91.7	Pass
	Time	ms	47.0 to 58.0	47.4	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.7	Pass
<b>Overall Test Results</b>					<b>Pass</b>

Jessica Hall  
Laboratory Technician

06/09/2016  
Test Date

Tom D. Yelle  
Approved By






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

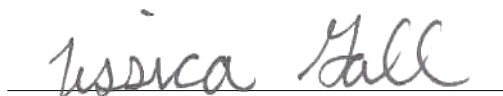
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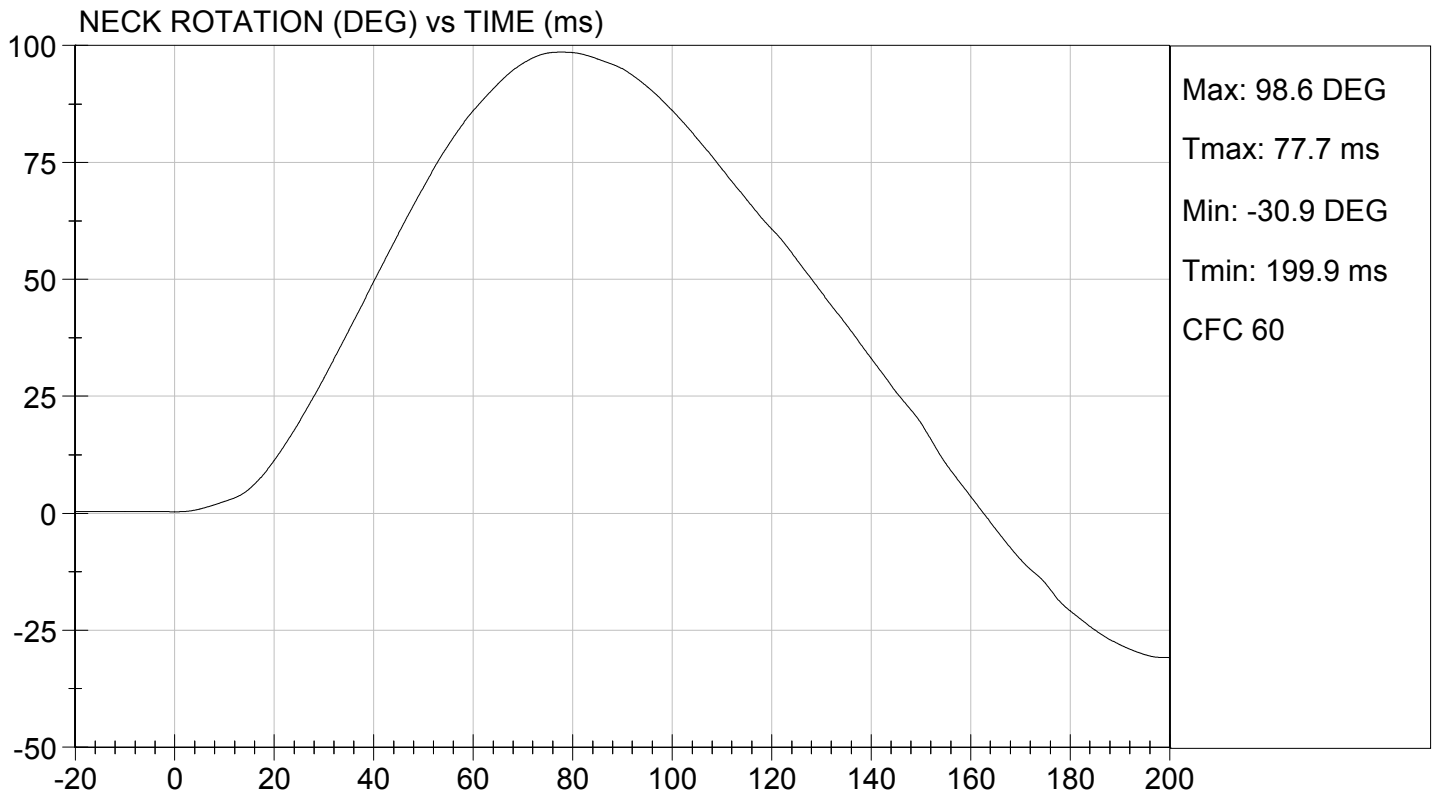
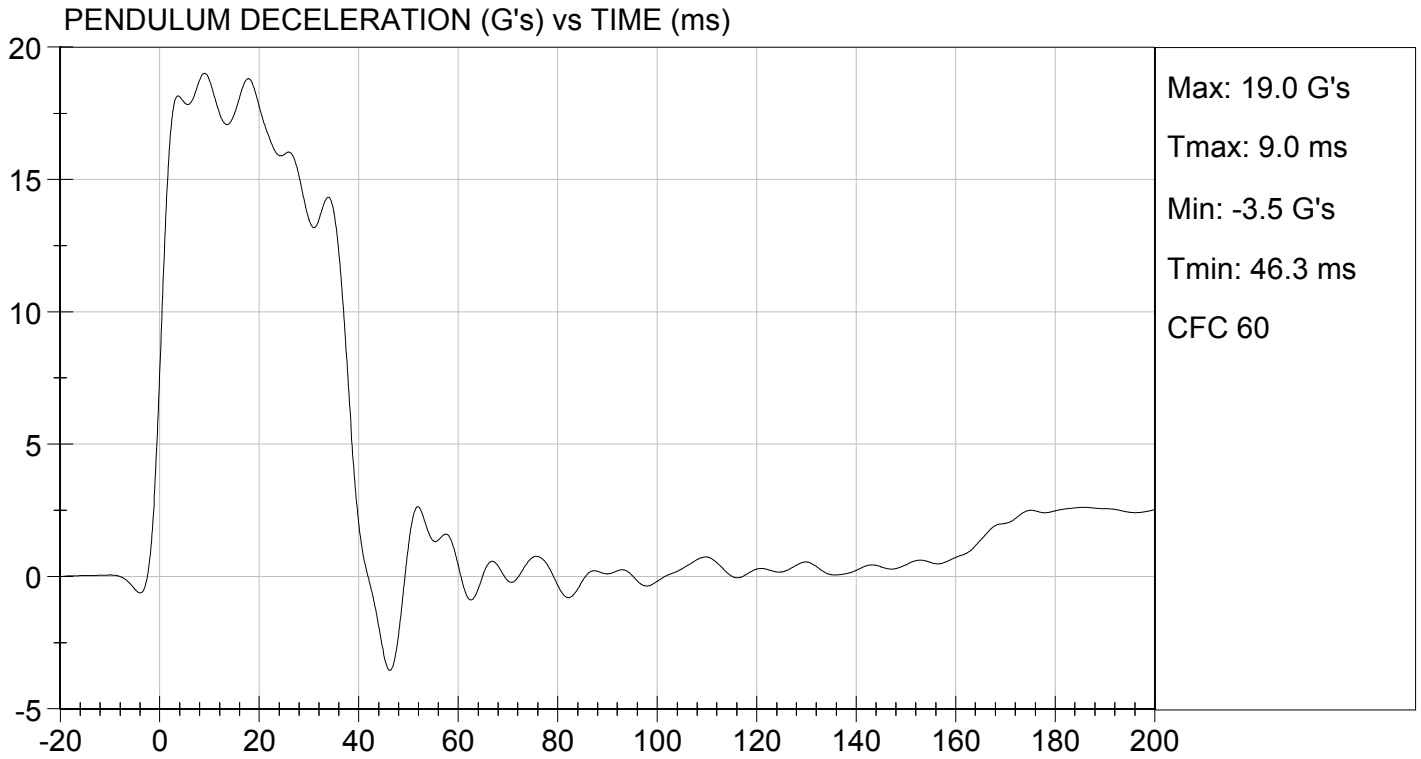
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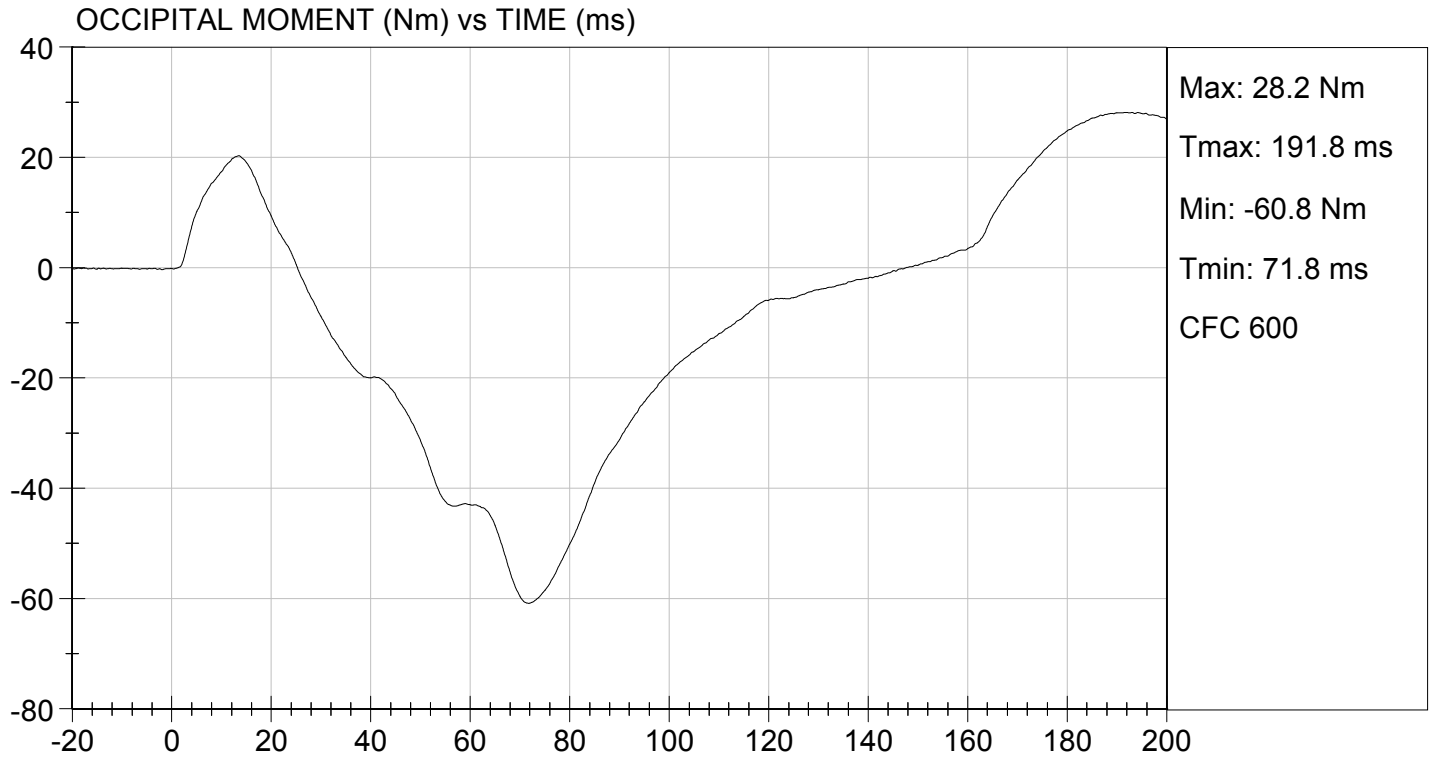
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.73	Pass
	20 ms	G's	14.00 to 19.00	17.76	Pass
	30 ms	G's	11.00 to 16.00	13.47	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	14.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	98.6	Pass
	Time	ms	72.0 to 82.0	77.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	162.7	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-60.8	Pass
	Time	ms	65.0 to 79.0	71.8	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	147.7	Pass
<b>Overall Test Results</b>					<b>Pass</b>

  
Laboratory Technician

06/09/2016  
Test Date

  
Approved By





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

**ATD Serial No:** 351

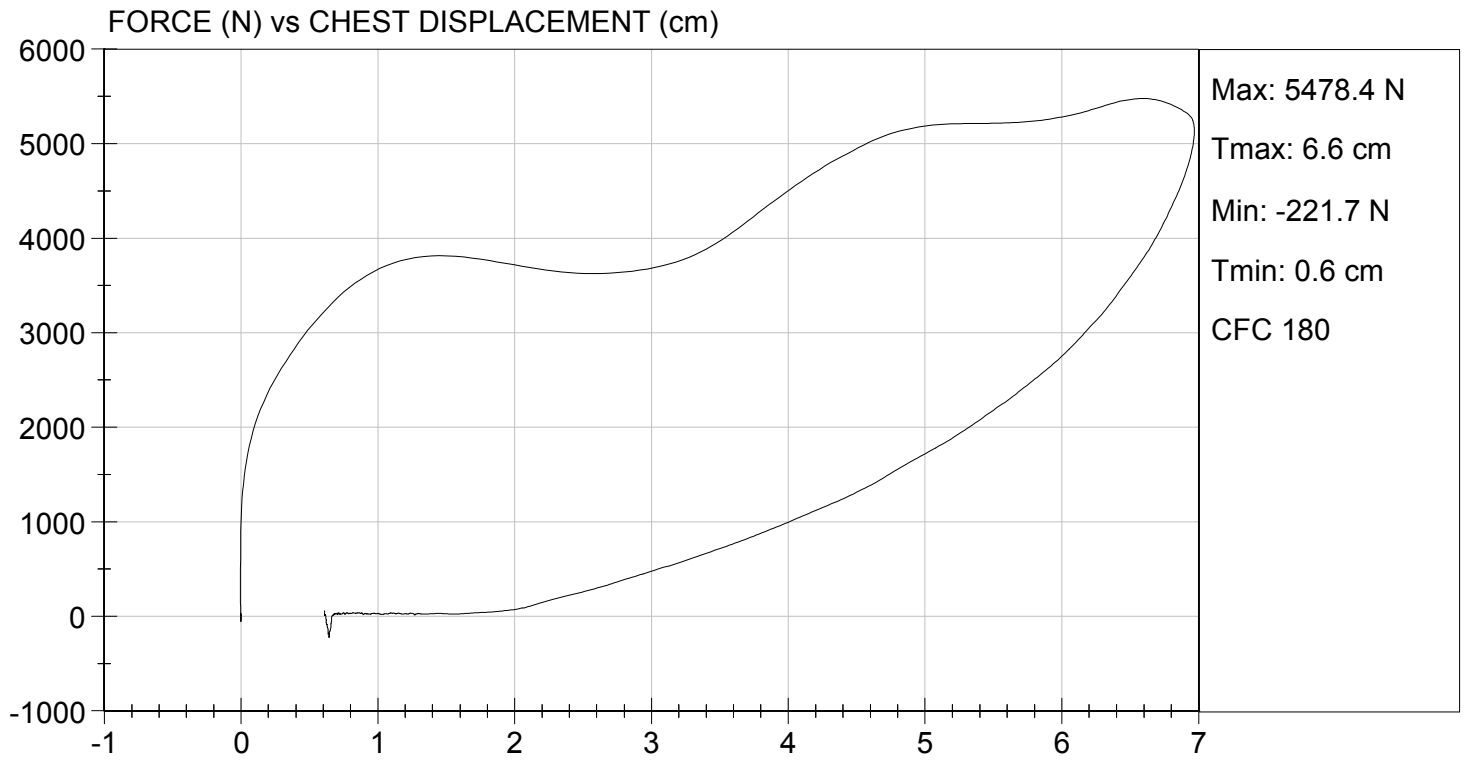
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Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,478	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.97	Pass
Internal Hysteresis	%	69 to 85	73	Pass
<b>Overall Test Results</b>				<b>Pass</b>

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

06/14/2016  
 \_\_\_\_\_  
 Test Date

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




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

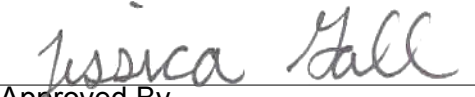
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**Test I.D:** D161995

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	46	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	N	4715 to 5782	5,096	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

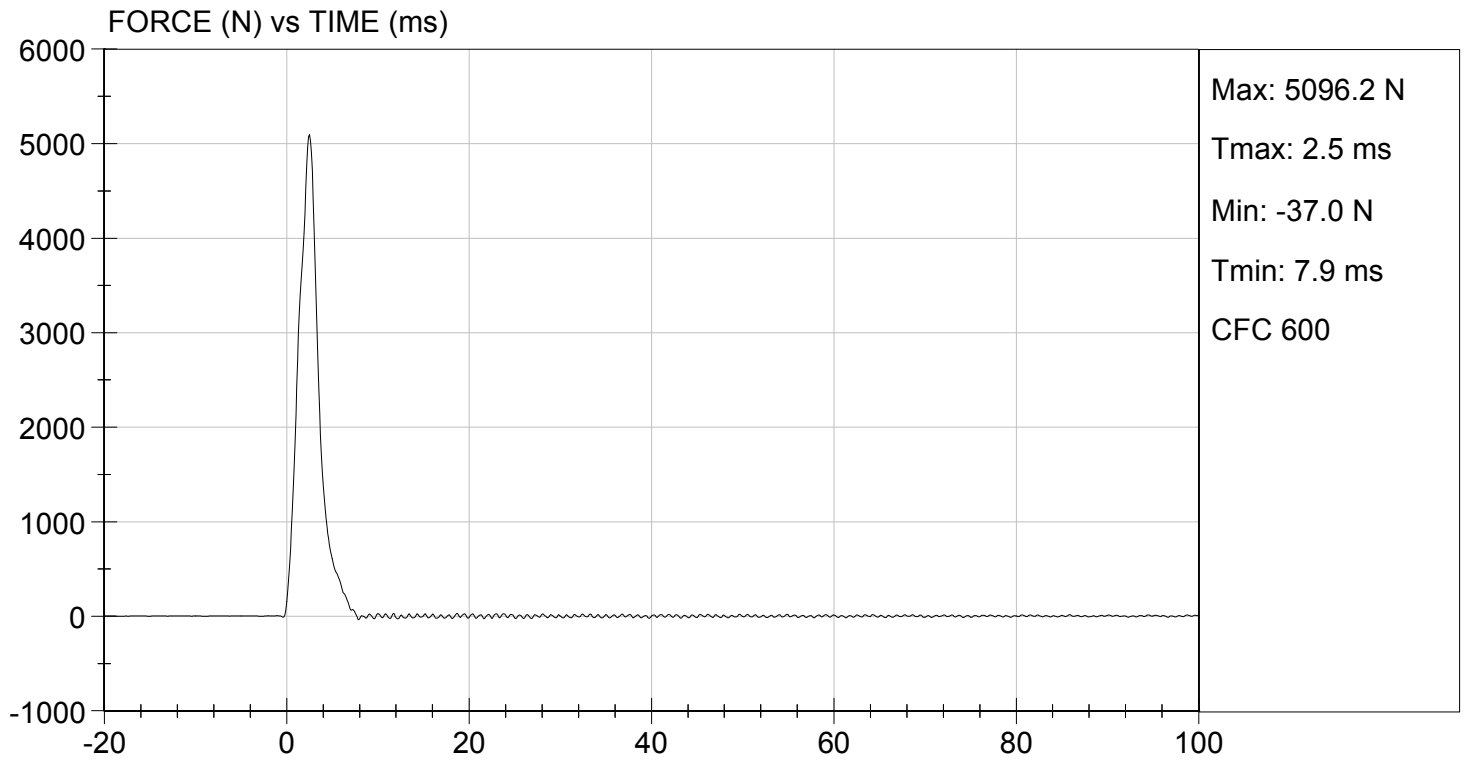
06/09/2016  
 Test Date

  
 Approved By



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

TEST DATE: 06/09/2016  
TEST #: D161995



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


**ATD Serial No:** 351

**Test I.D:** D161996

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	46	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5,322	Pass
Overall Test Results				Pass

  
 Laboratory Technician

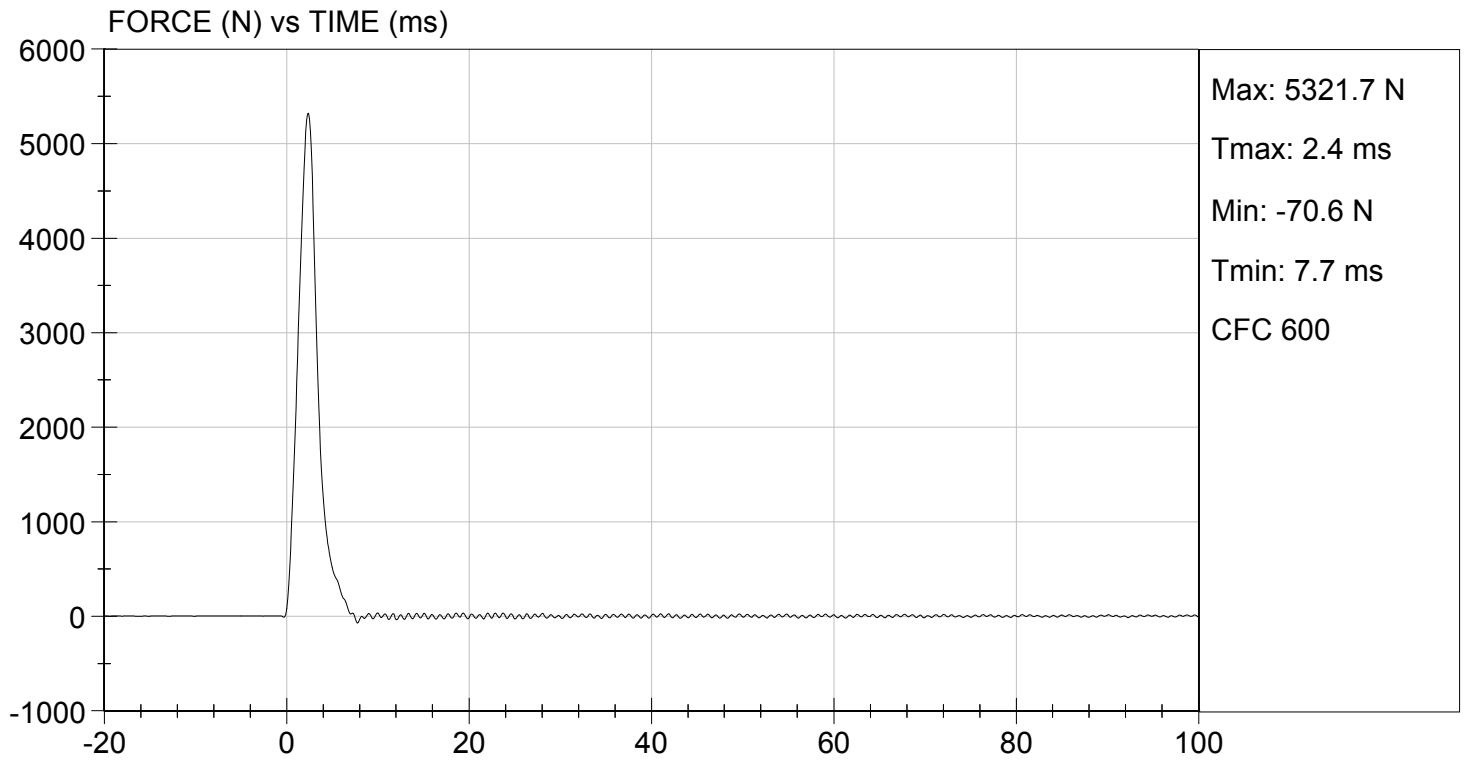
06/09/2016  
 Test Date

  
 Approved By



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

TEST DATE: 06/09/2016  
TEST #: D161996



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

**ATD Serial No:** 351

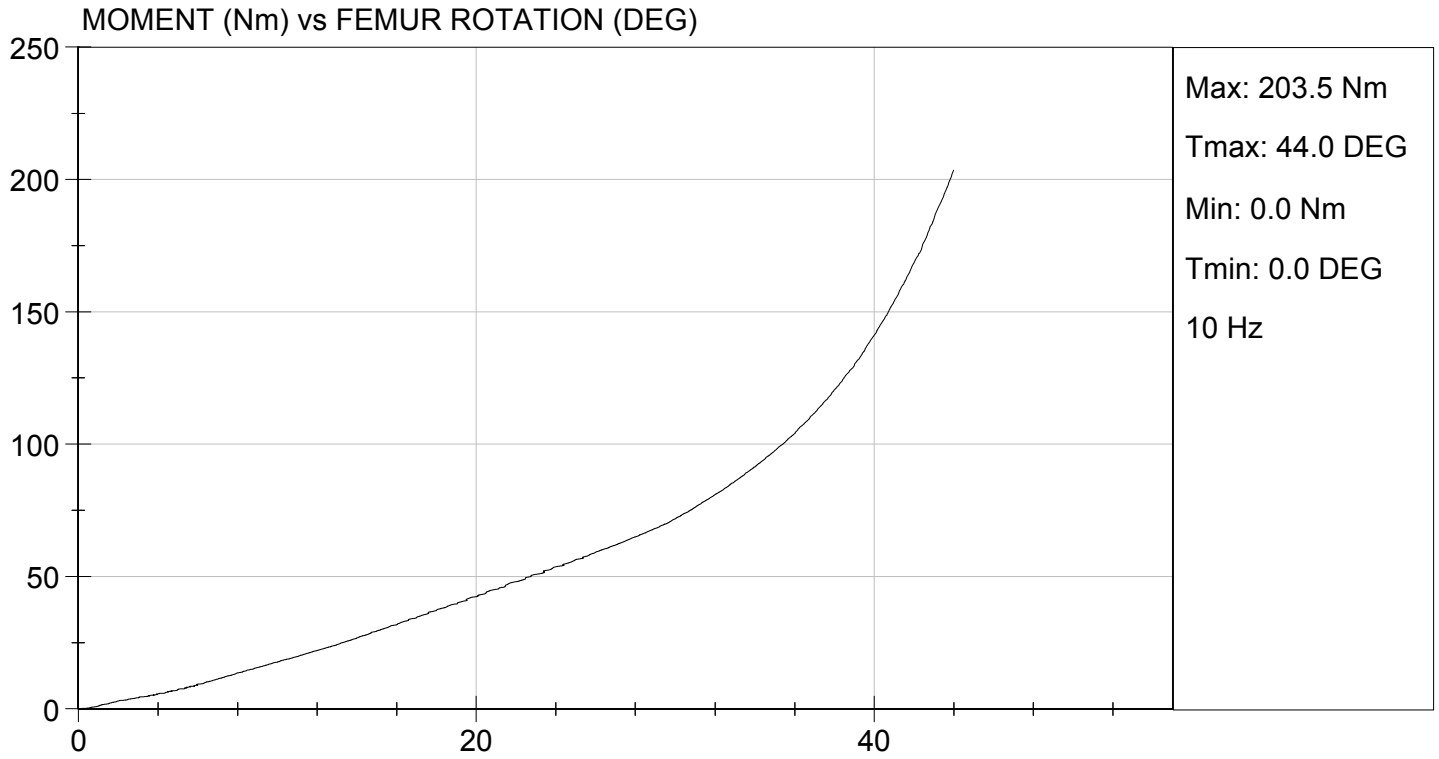
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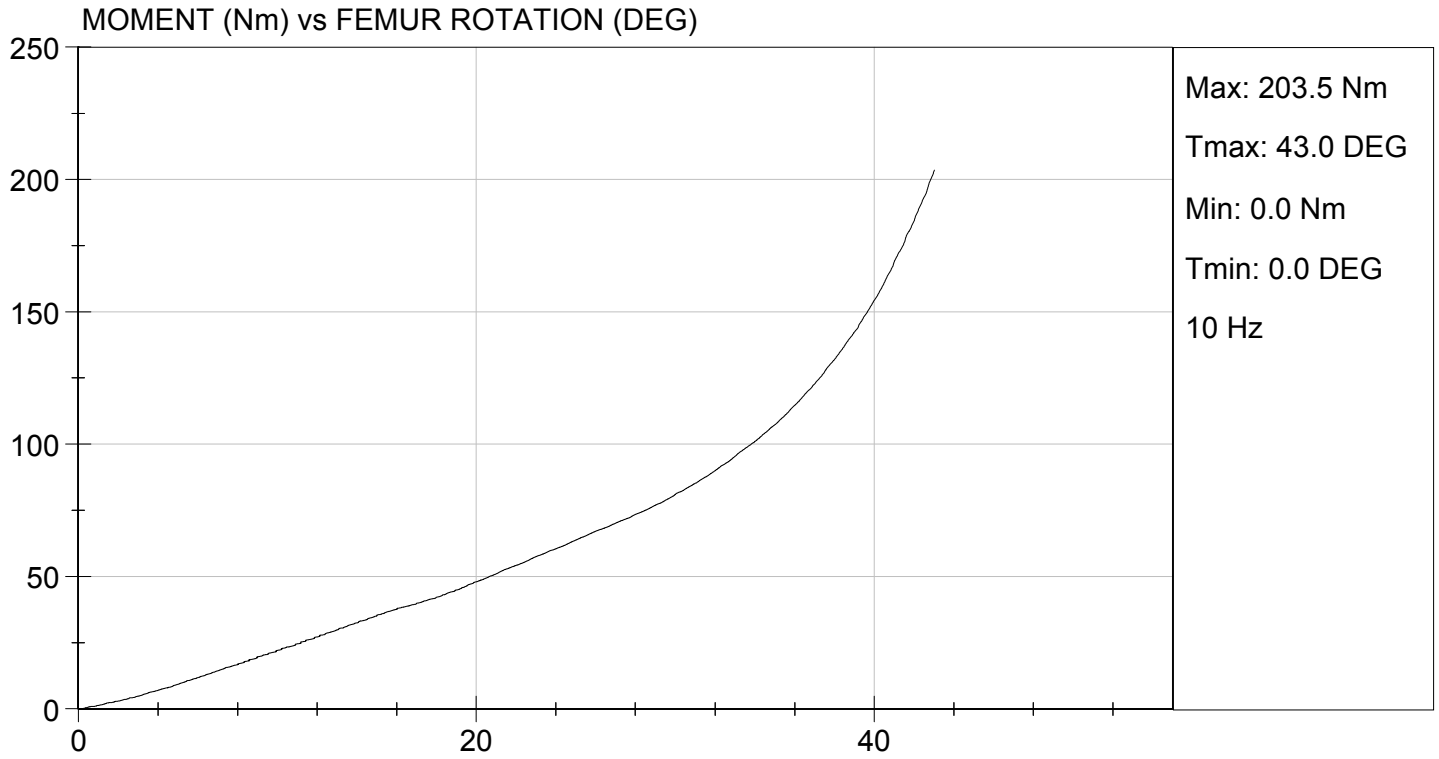
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.8	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	47	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.3	Pass
30 Degrees	Nm	94.9 Nm Max	71.9	81.0	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.0	43.0	Pass
Overall Test Results					Pass

  
 Laboratory Technician

06/09/2016  
 Test Date

  
 Approved By





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

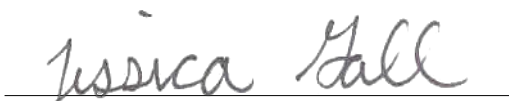
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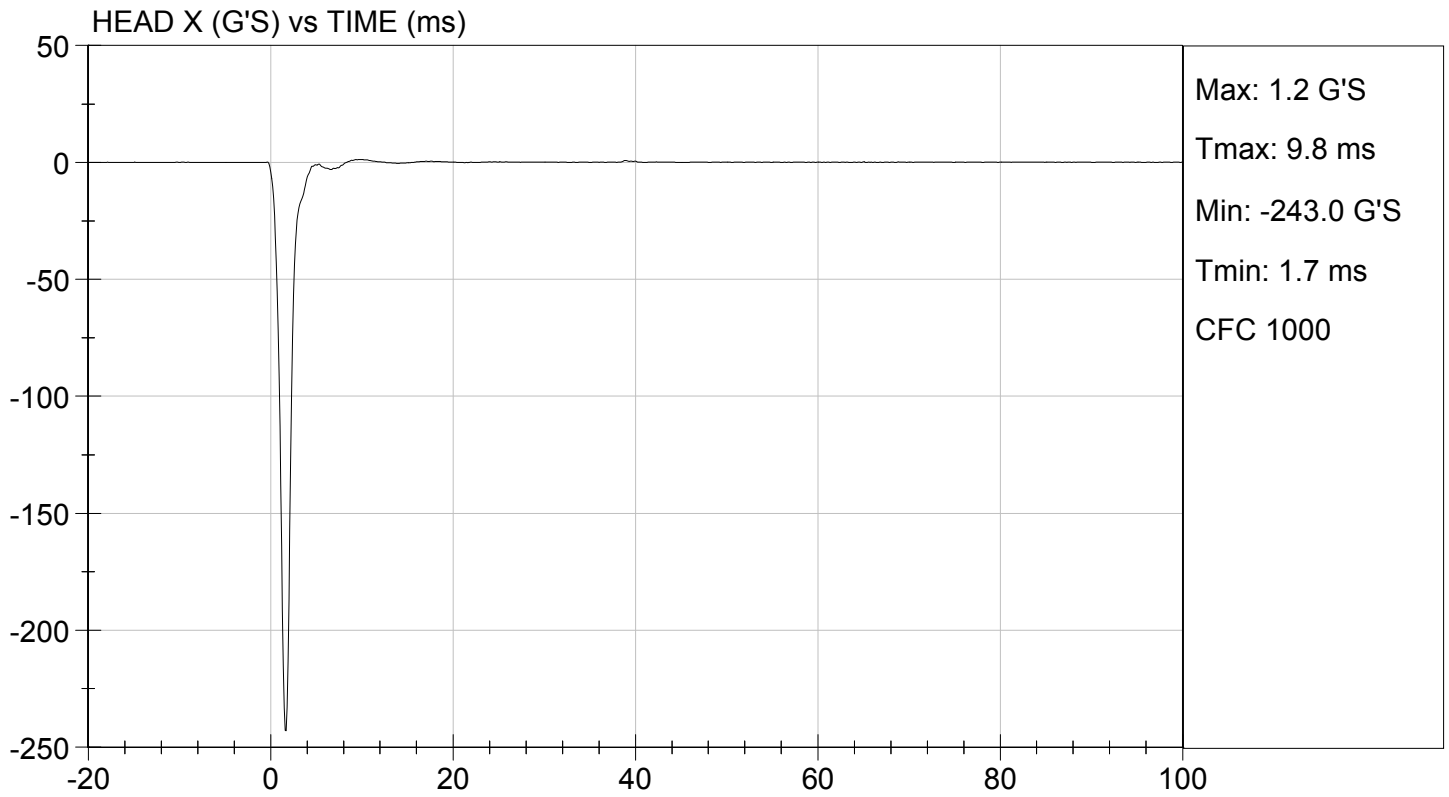
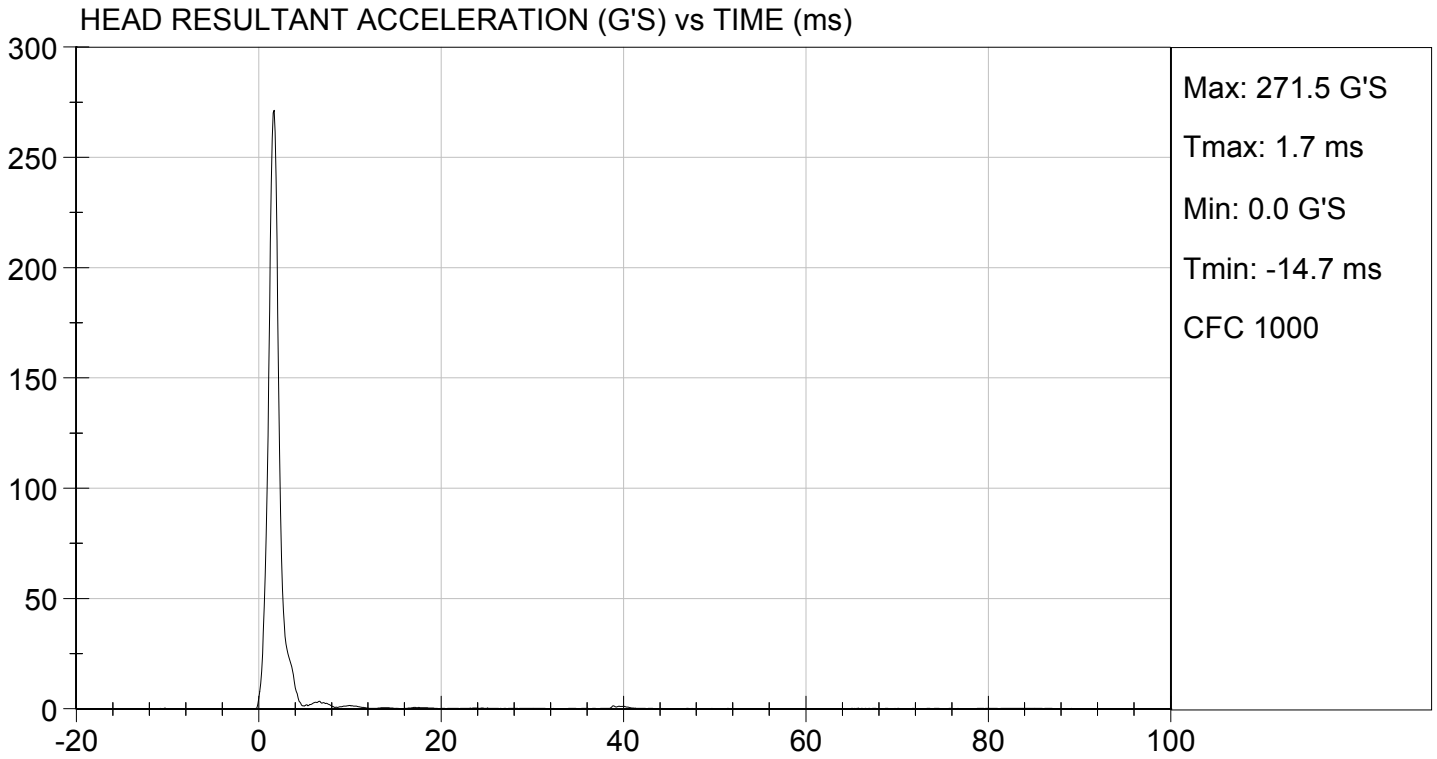
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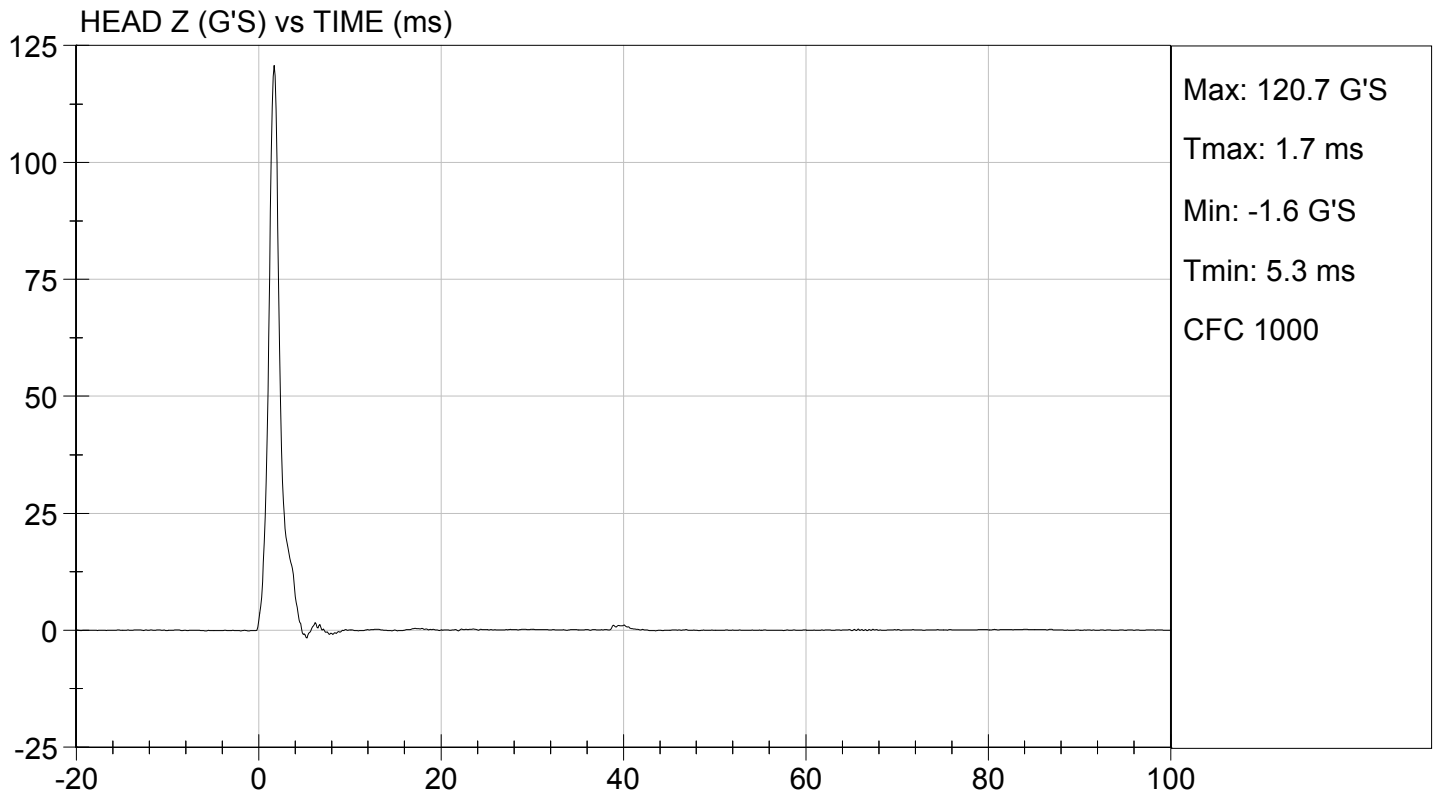
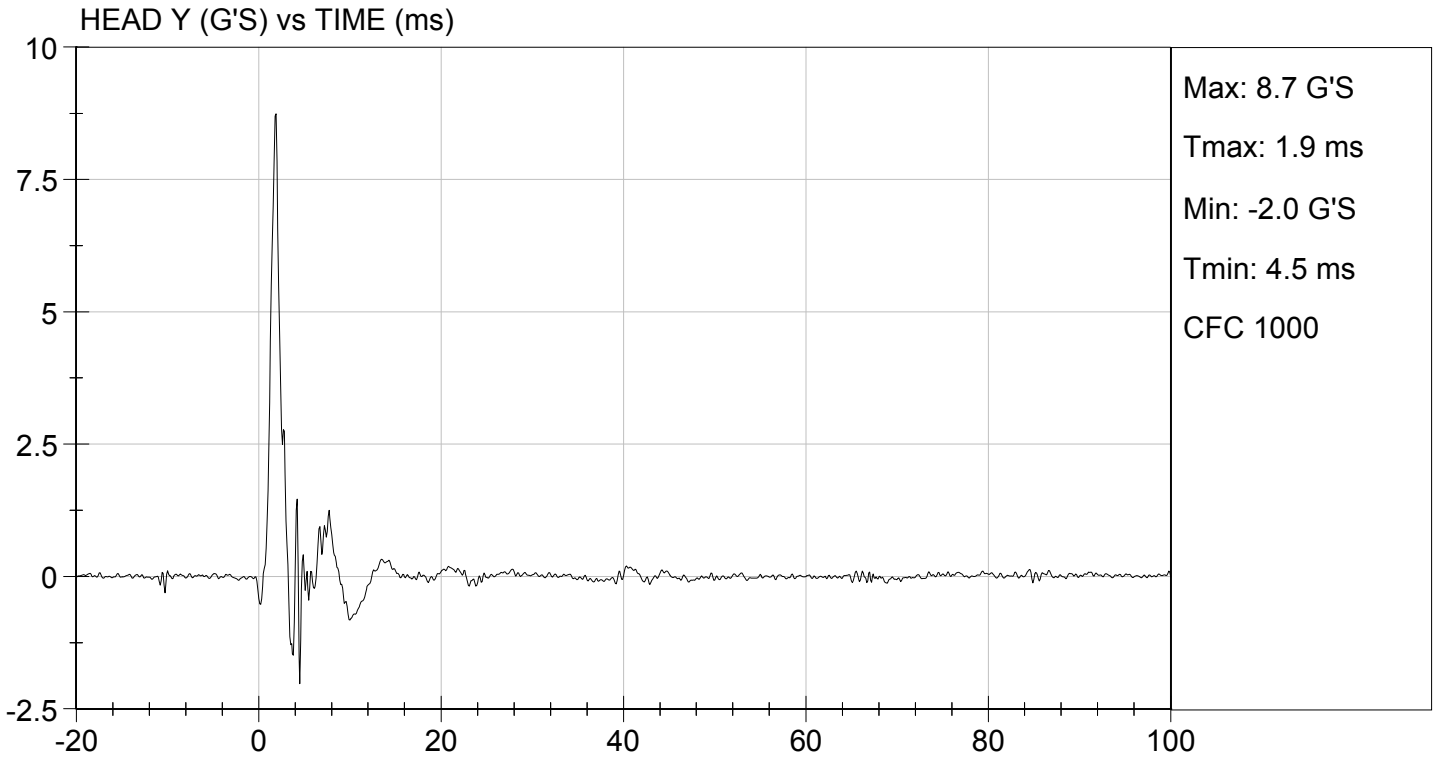
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Peak Resultant Acceleration	G's	225 to 275	271	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	8.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

06/15/2016  
 Test Date

  
 Approved By





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

**ATD Serial No:** 351

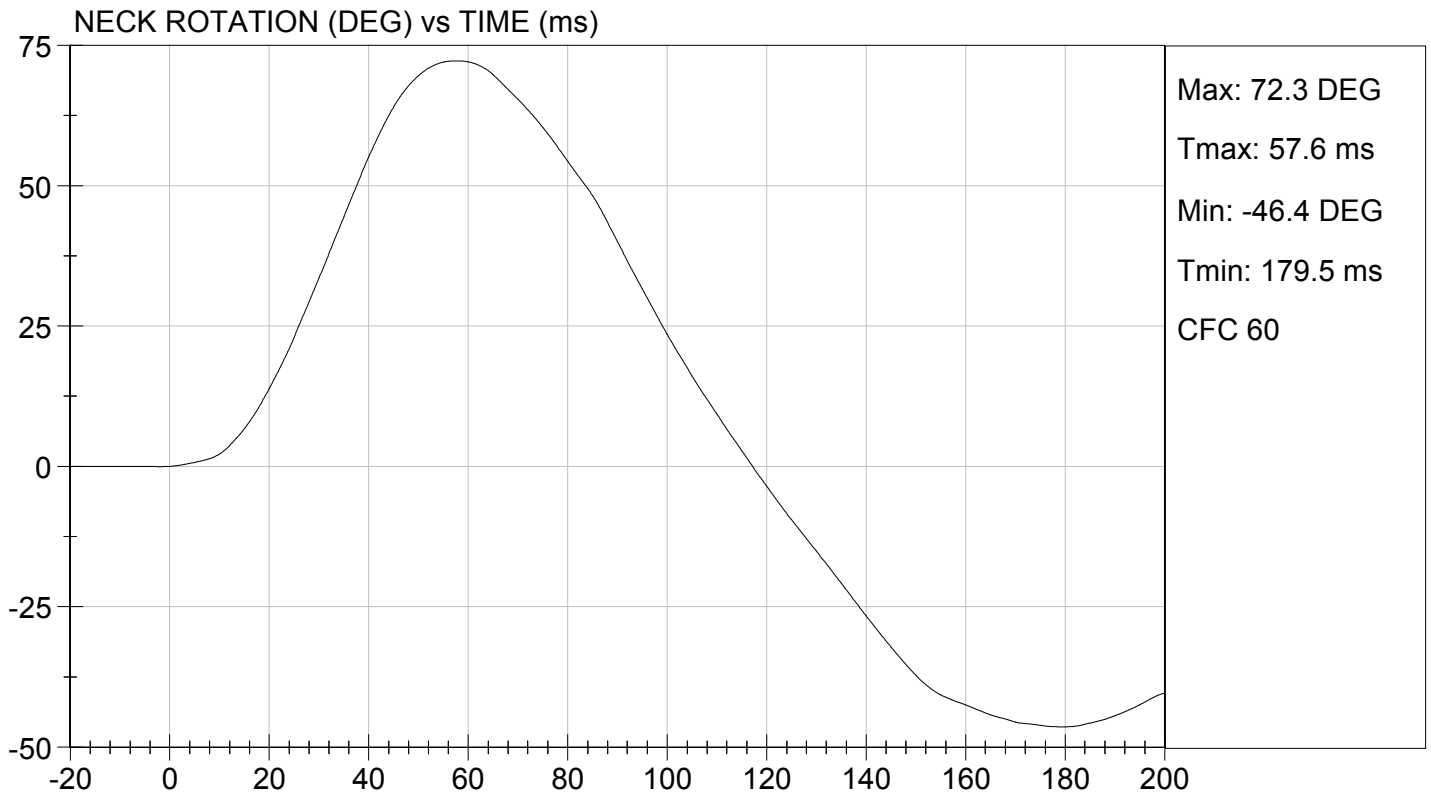
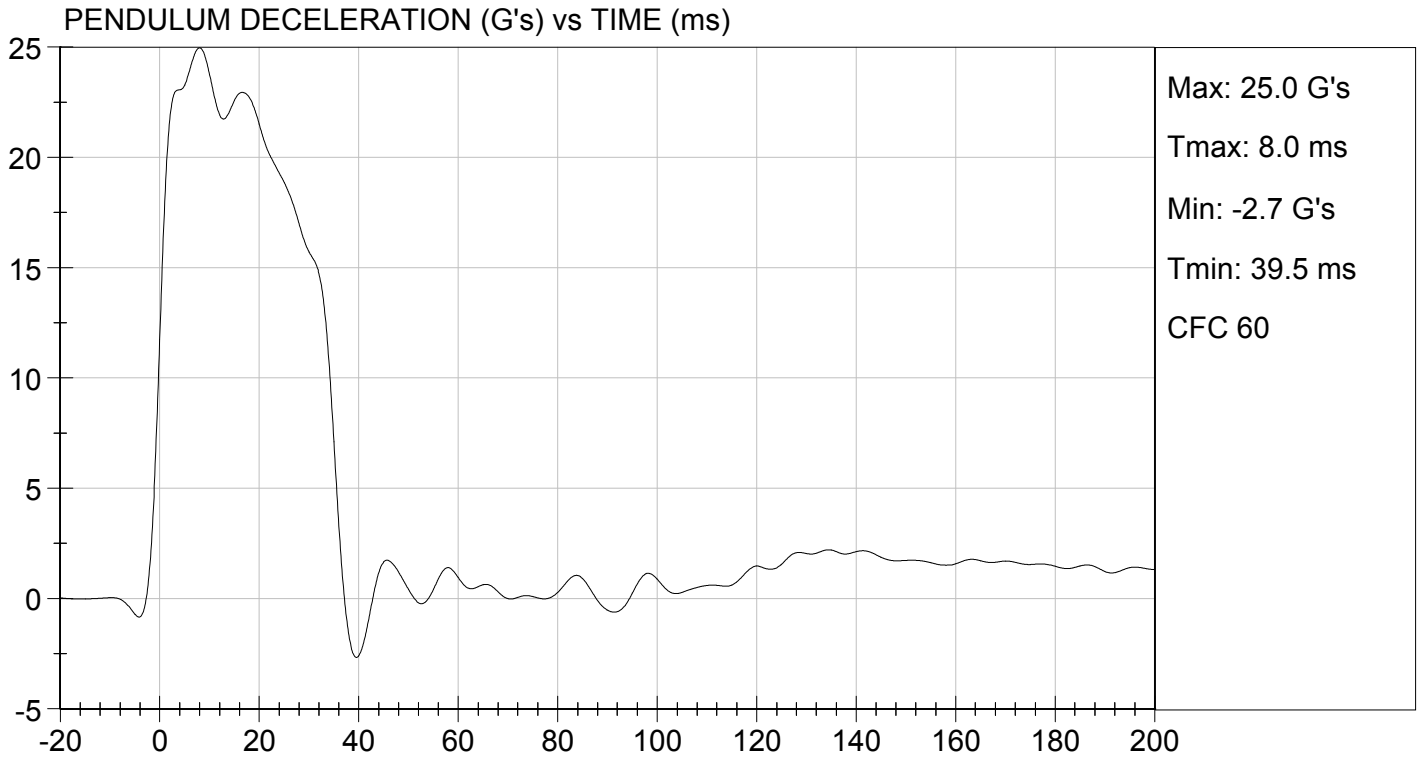
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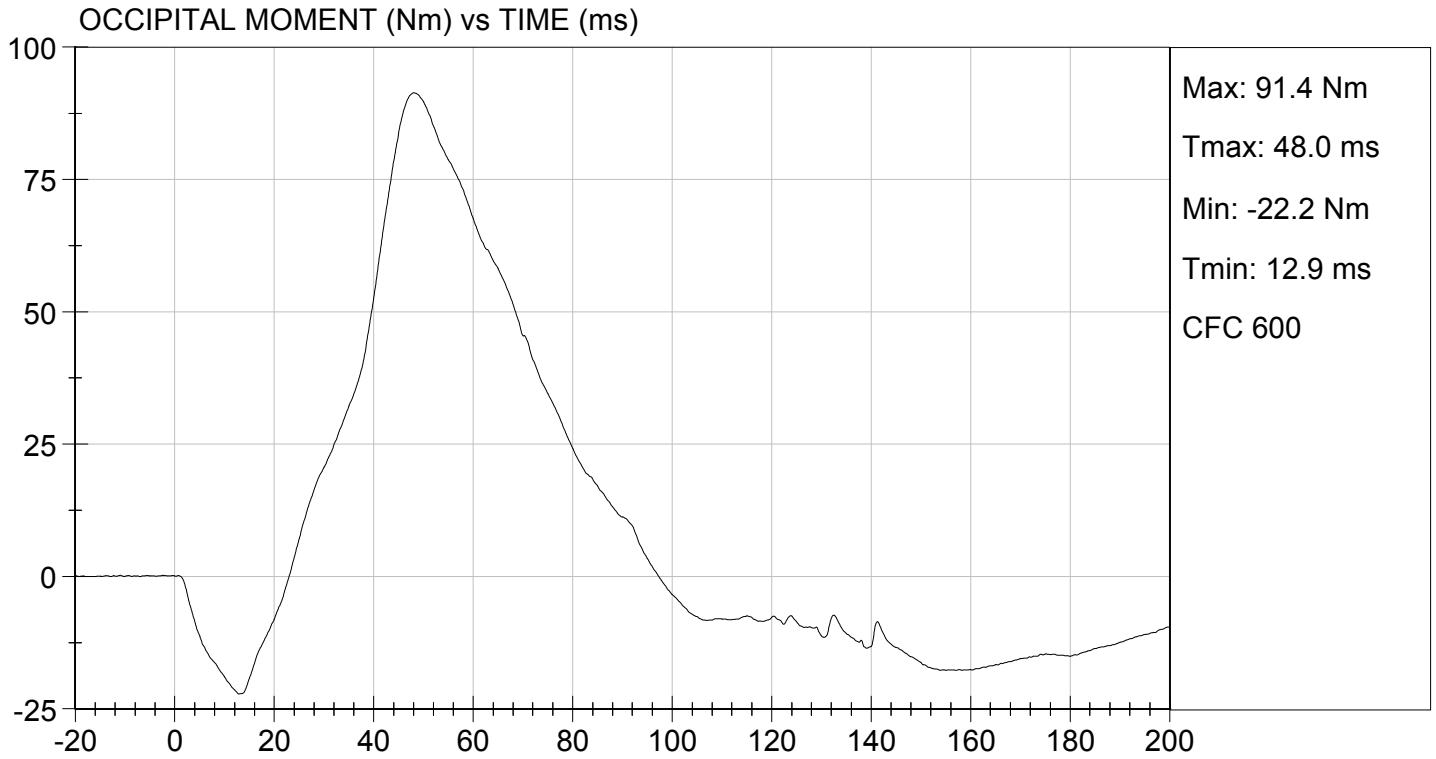
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	51	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.74	Pass
	20 ms	G's	17.60 to 22.60	21.51	Pass
	30 ms	G's	12.50 to 18.50	15.70	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.7	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	35.6	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	72.3	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	91.4	Pass
	Time	ms	47.0 to 58.0	48.0	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.4	Pass
<b>Overall Test Results</b>					<b>Pass</b>

Jessica Hall  
 Laboratory Technician

06/15/2016  
 Test Date

Adam D. Yelle  
 Approved By



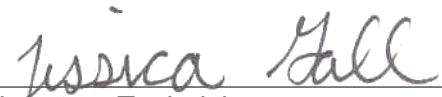


**MGA RESEARCH CORPORATION**  
**NECK EXTENSION TEST**  
**HYBRID III 50TH PERCENTILE MALE**


**ATD Serial No:** 351

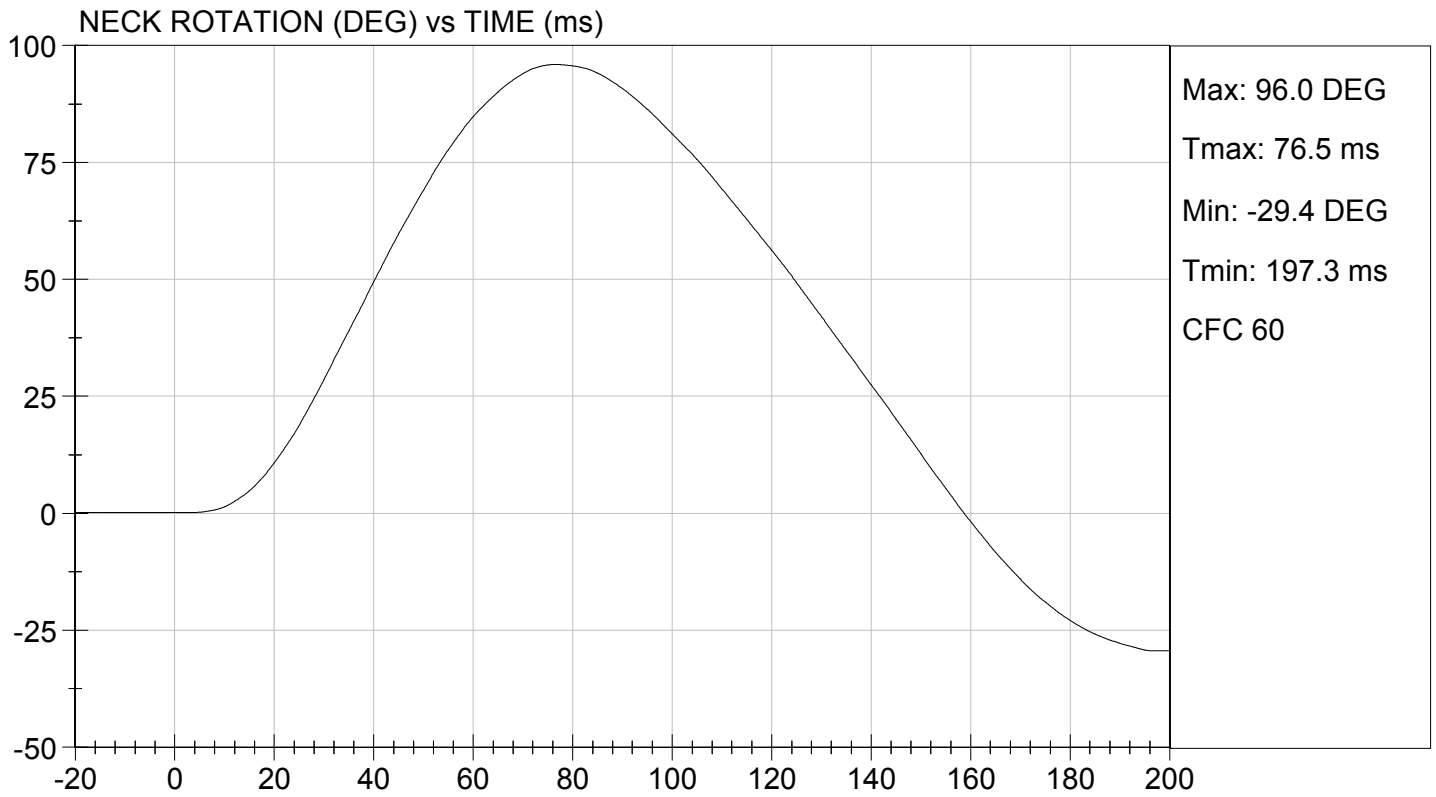
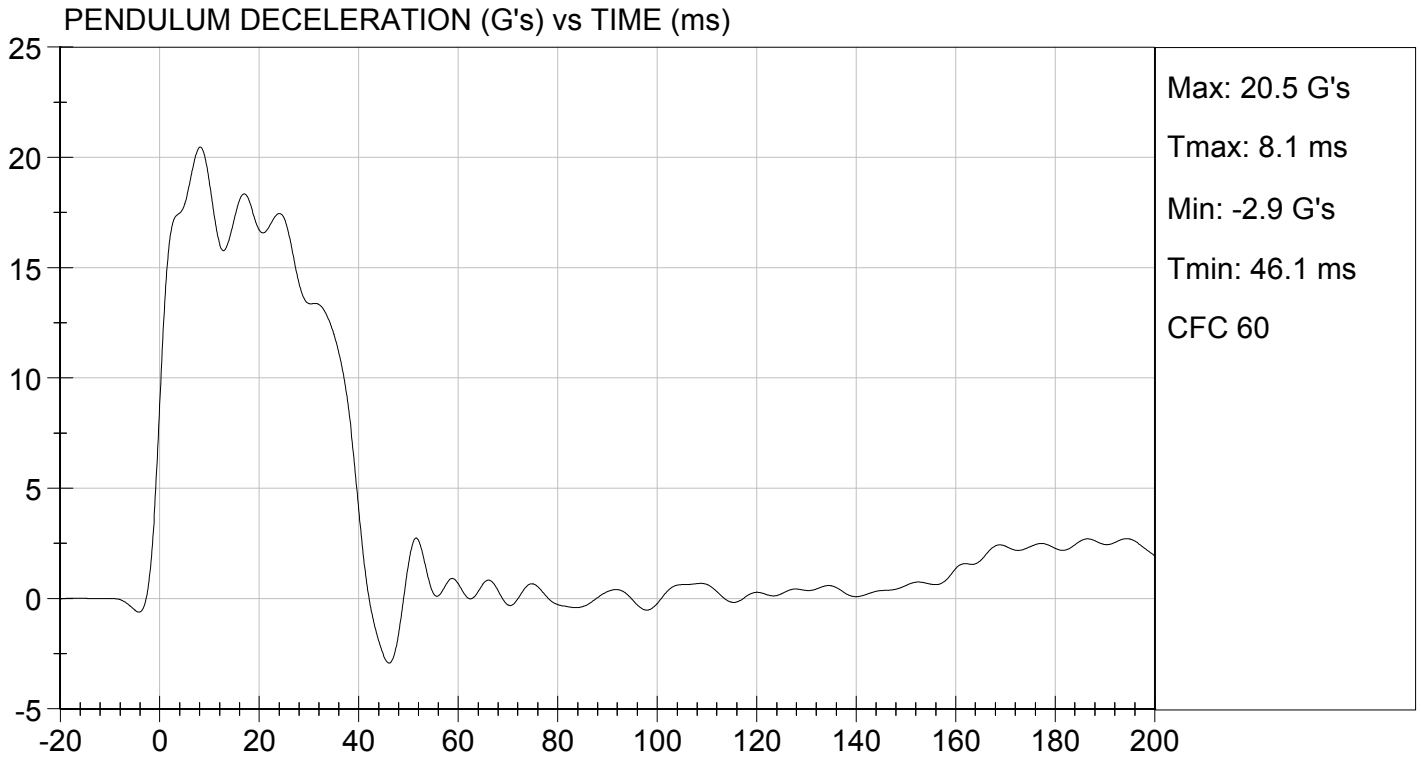
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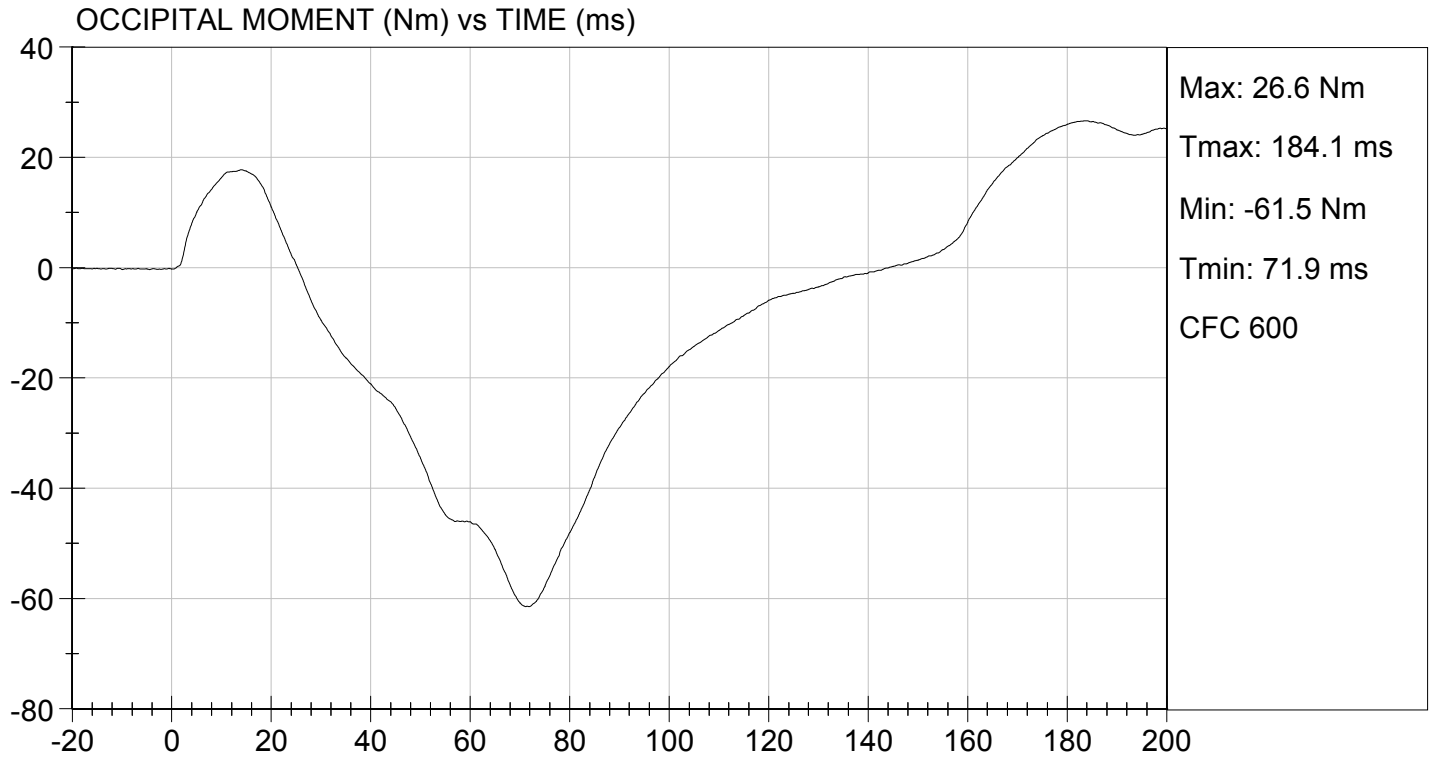
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	51	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.79	Pass
	20 ms	G's	14.00 to 19.00	16.71	Pass
	30 ms	G's	11.00 to 16.00	13.37	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.4	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.0	Pass
	Time	ms	72.0 to 82.0	76.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	158.9	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.5	Pass
	Time	ms	65.0 to 79.0	71.9	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	144.3	Pass
<b>Overall Test Results</b>					<b>Pass</b>

  
 Laboratory Technician

06/15/2016  
 Test Date

  
 Approved By





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

**ATD Serial No:** 351

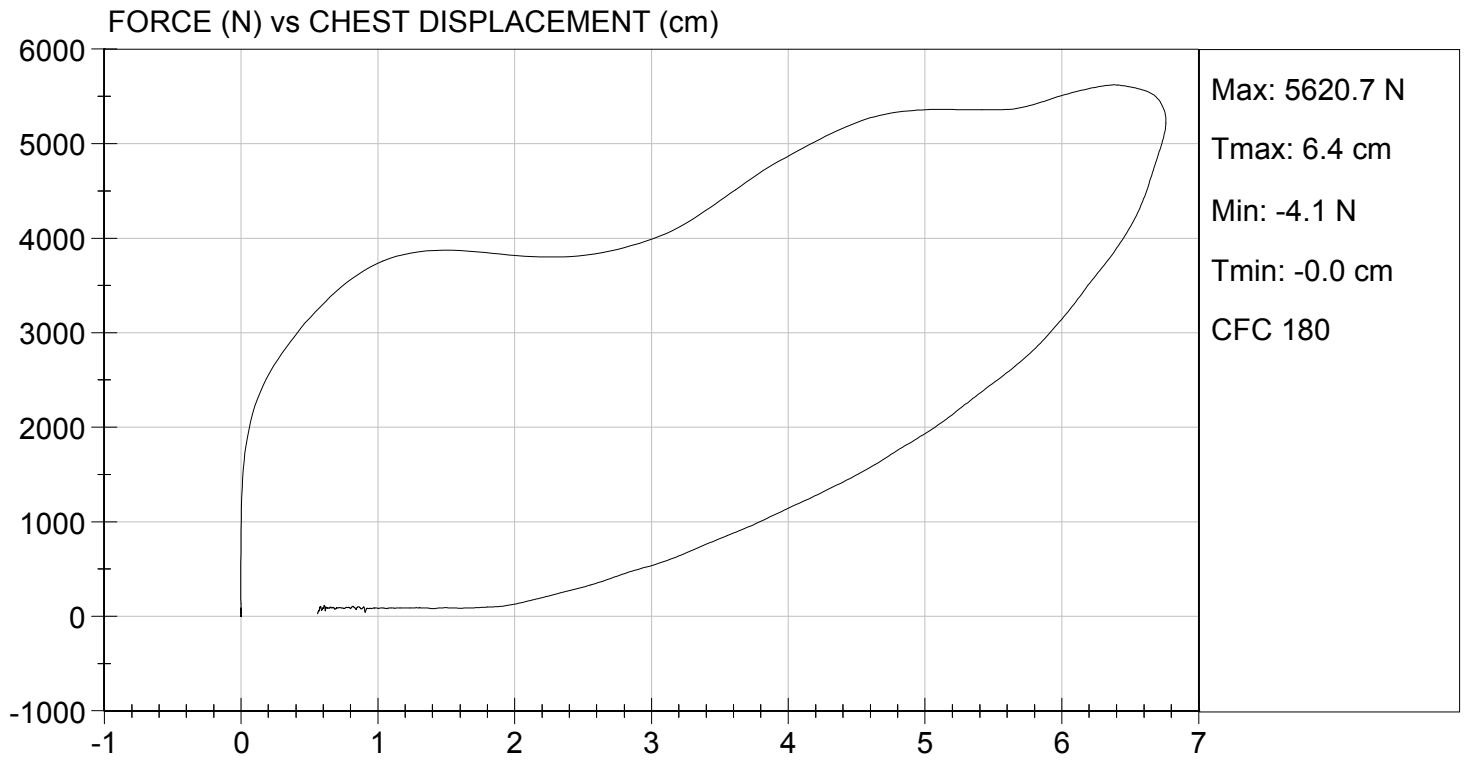
**Test I.D.:** D162074

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	48	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,621	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.76	Pass
Internal Hysteresis	%	69 to 85	72	Pass
<b>Overall Test Results</b>				<b>Pass</b>

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

06/16/2016  
 \_\_\_\_\_  
 Test Date

  
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 Approved By



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


**ATD Serial No:** 351

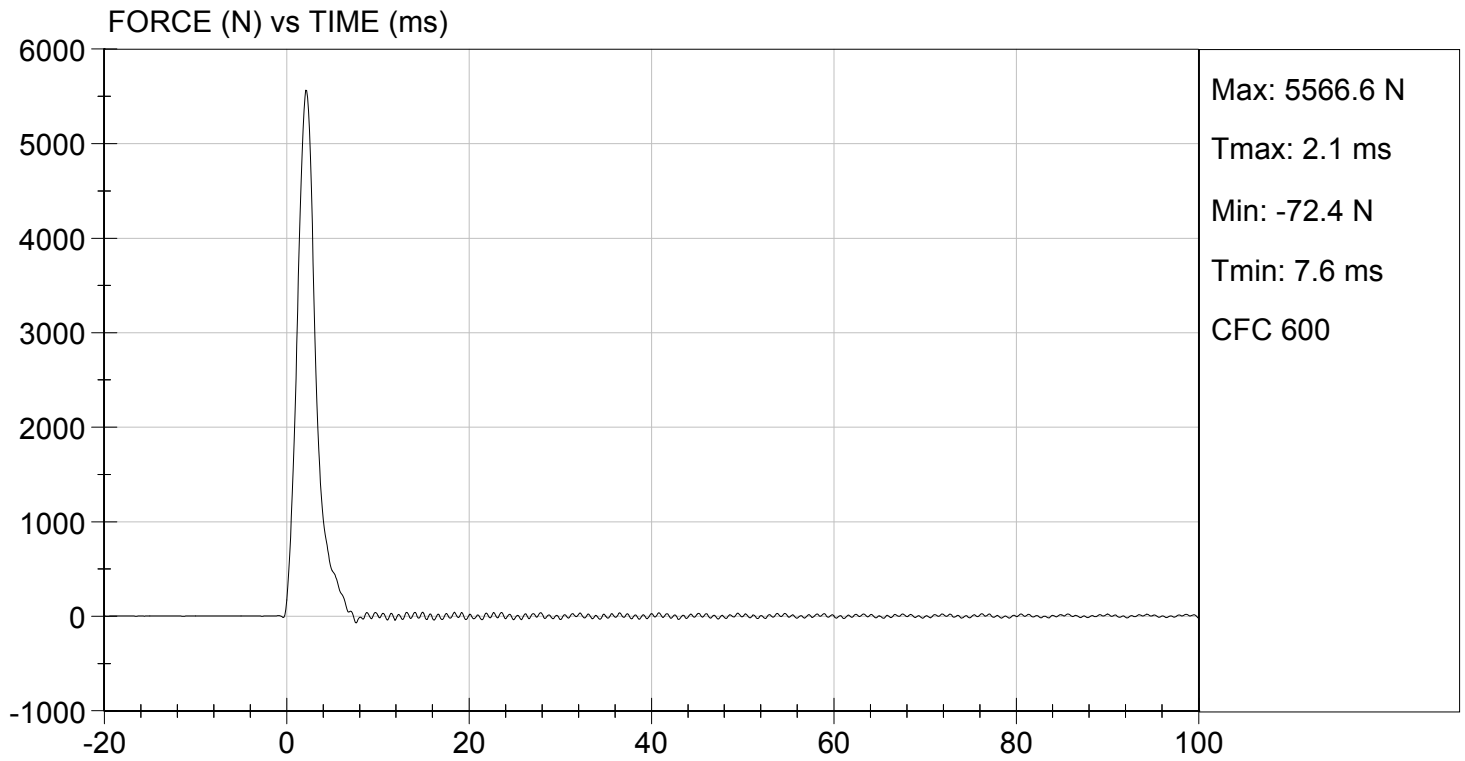
**Test I.D:** D162075

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	46	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	N	4715 to 5782	5,567	Pass
<b>Overall Test Results</b>				<b>Pass</b>

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

06/16/2016  
 \_\_\_\_\_  
 Test Date

  
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 Approved By



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

**ATD Serial No:** 351

**Test I.D:** D162076

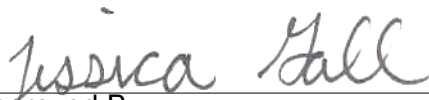
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	5,154	Pass
<b>Overall Test Results</b>				<b>Pass</b>



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

06/16/2016

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

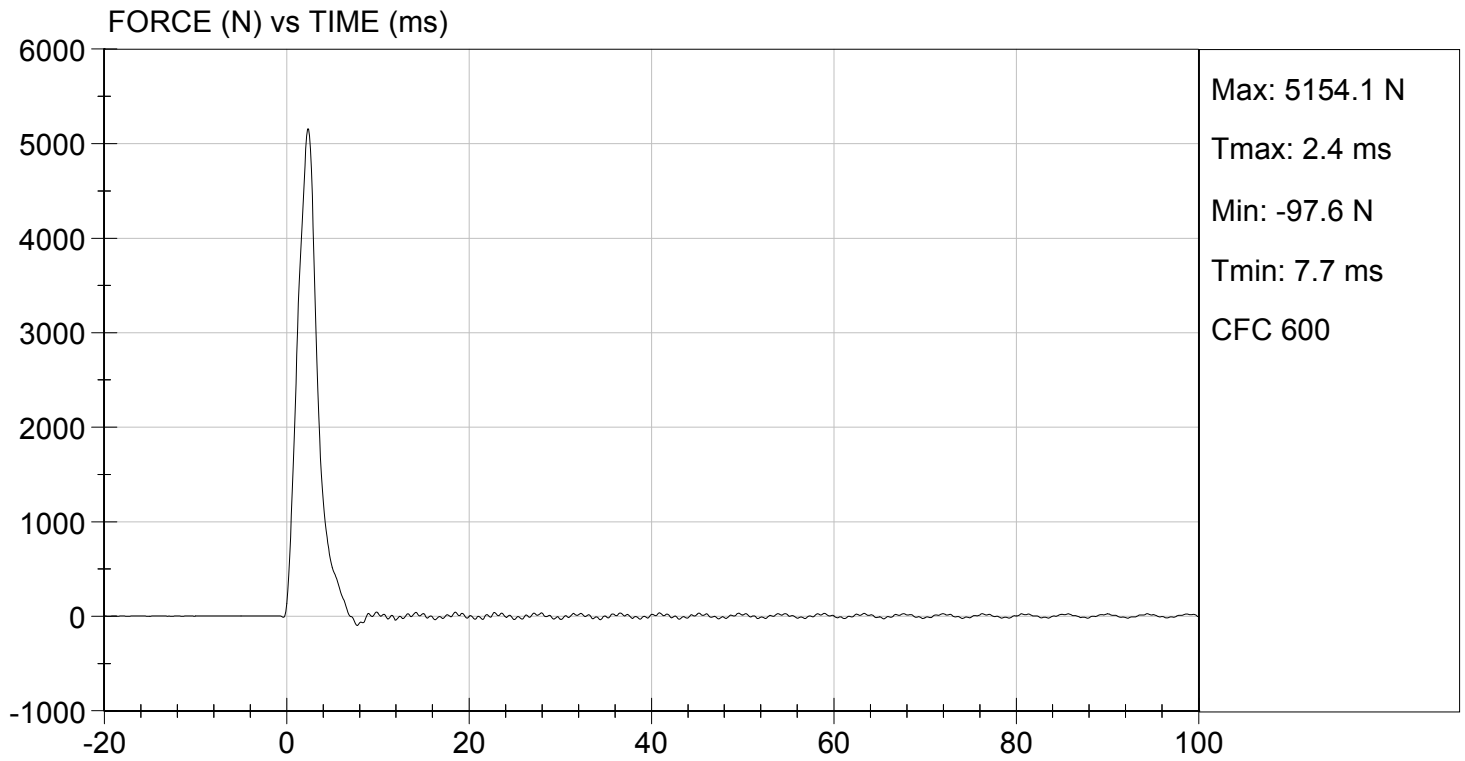


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 Approved By



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

TEST DATE: 06/16/2016  
TEST #: D162076



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

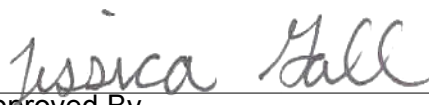
**ATD Serial No:** 351

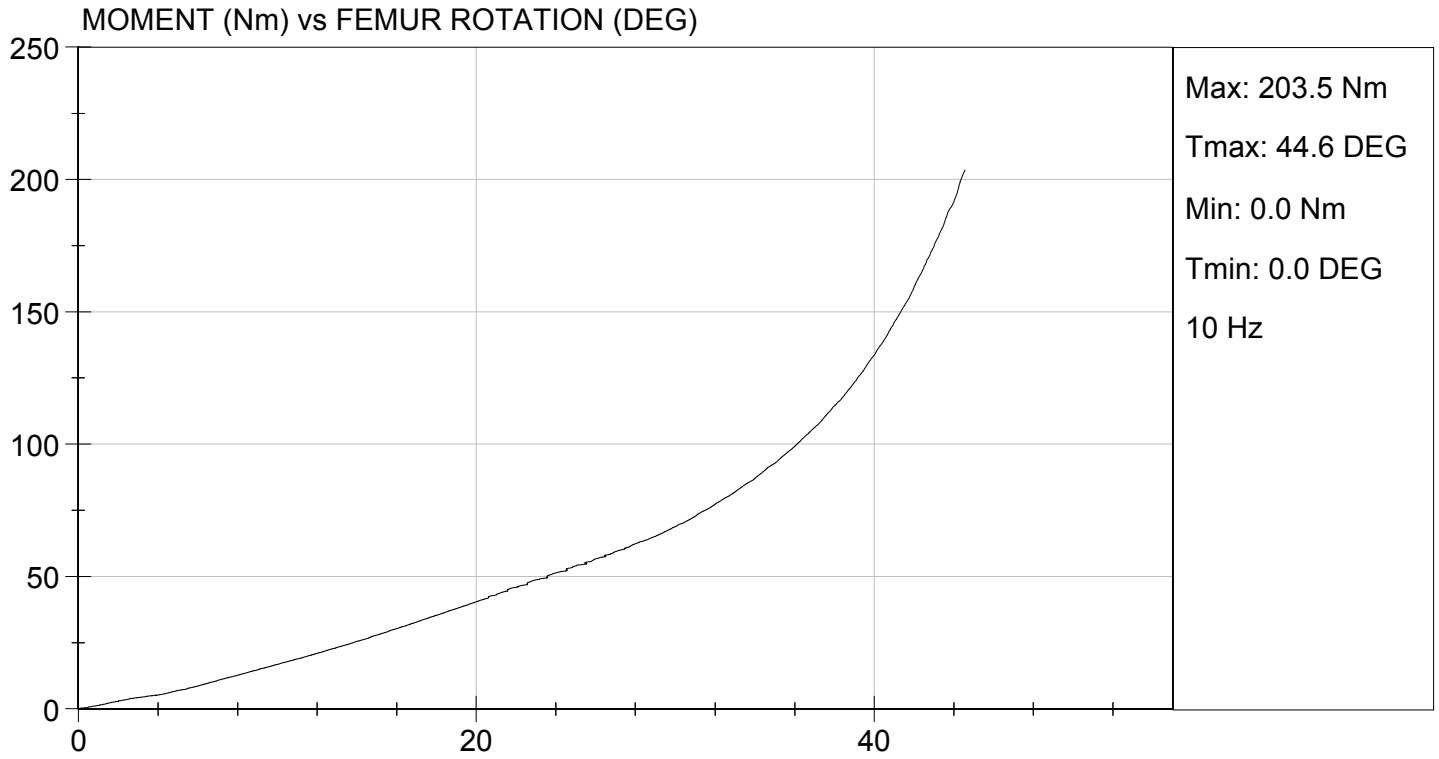
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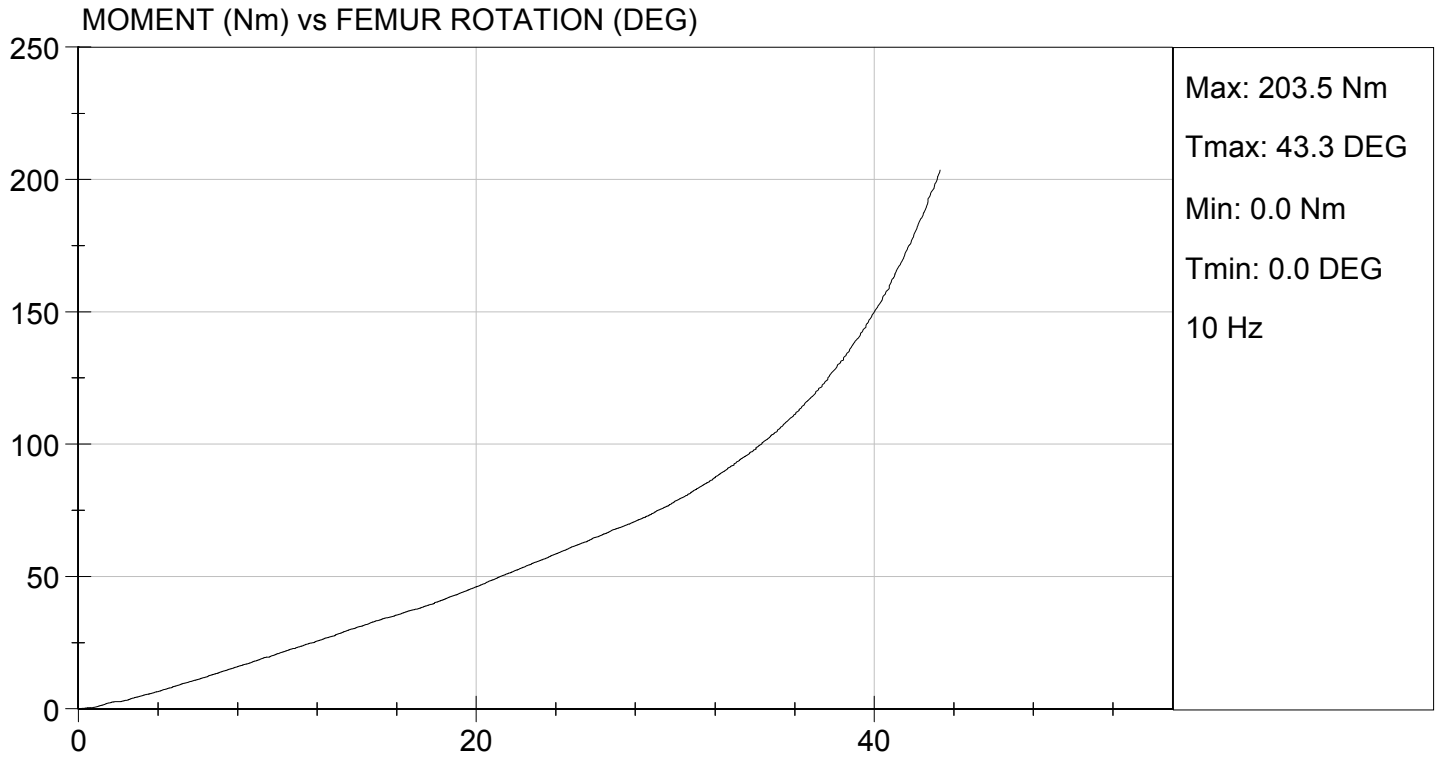
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.1	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	51	51	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.3	Pass
30 Degrees	Nm	94.9 Nm Max	68.8	78.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	44.6	43.3	Pass
Overall Test Results					Pass

  
 Laboratory Technician

06/15/2016  
 Test Date

  
 Approved By





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

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

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

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


**ATD Serial No:** 138

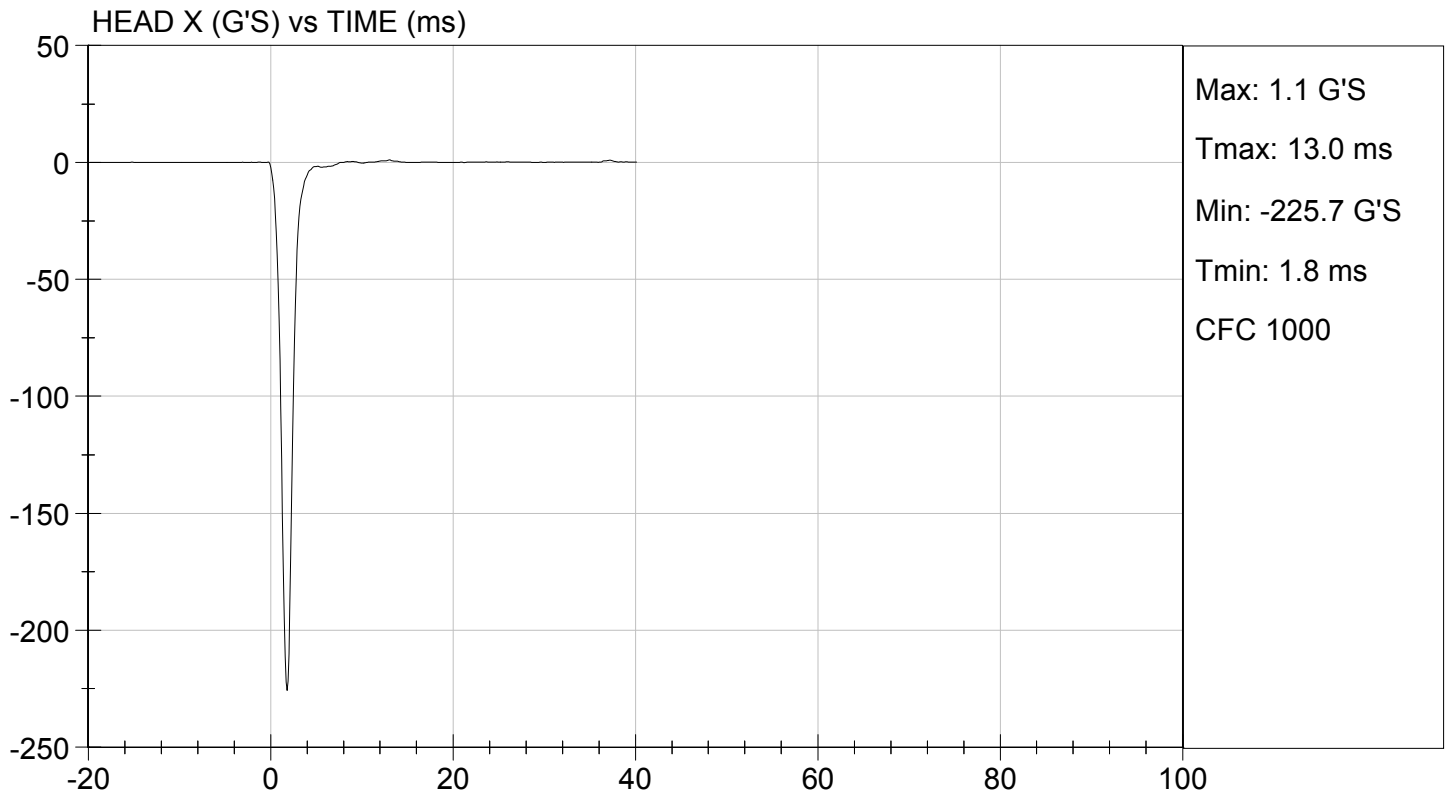
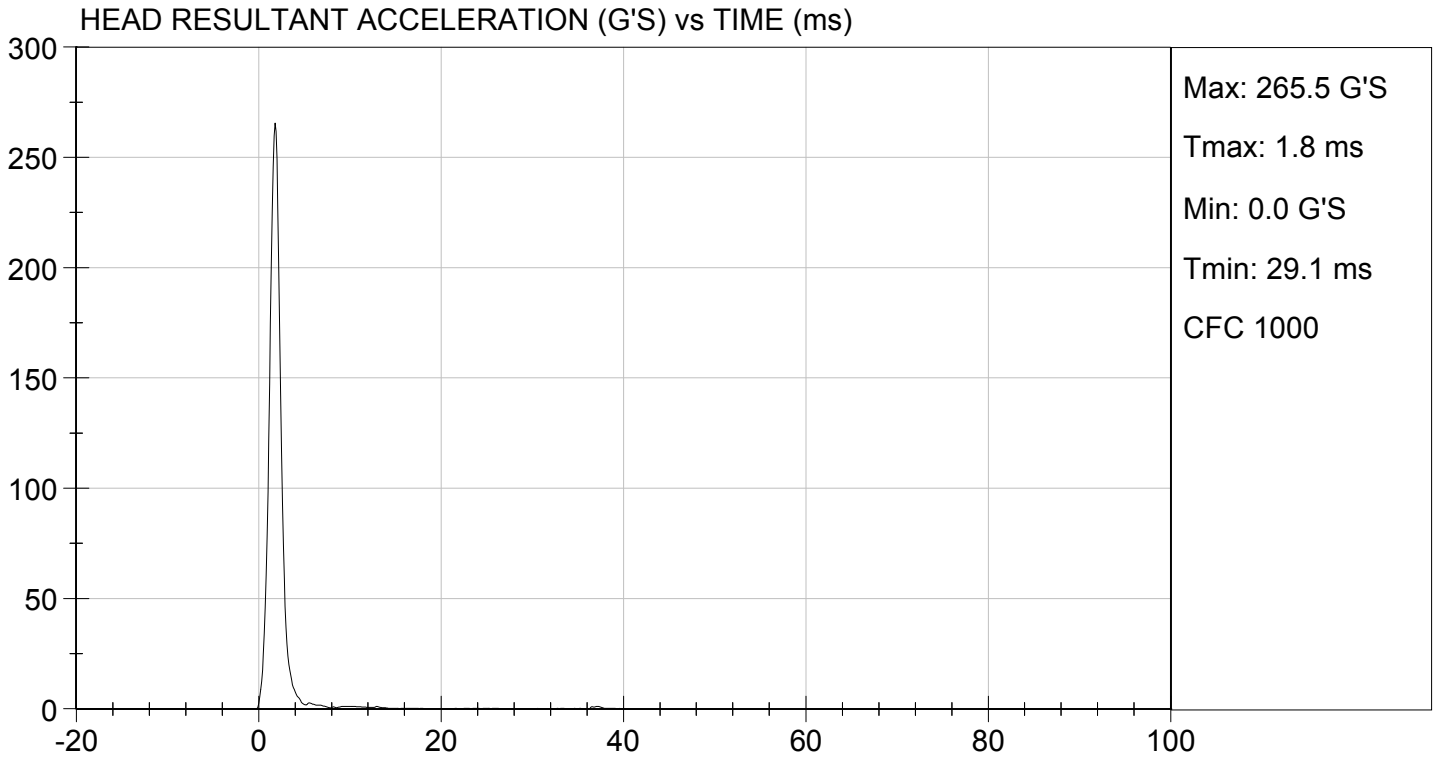
**Test ID:** D161981

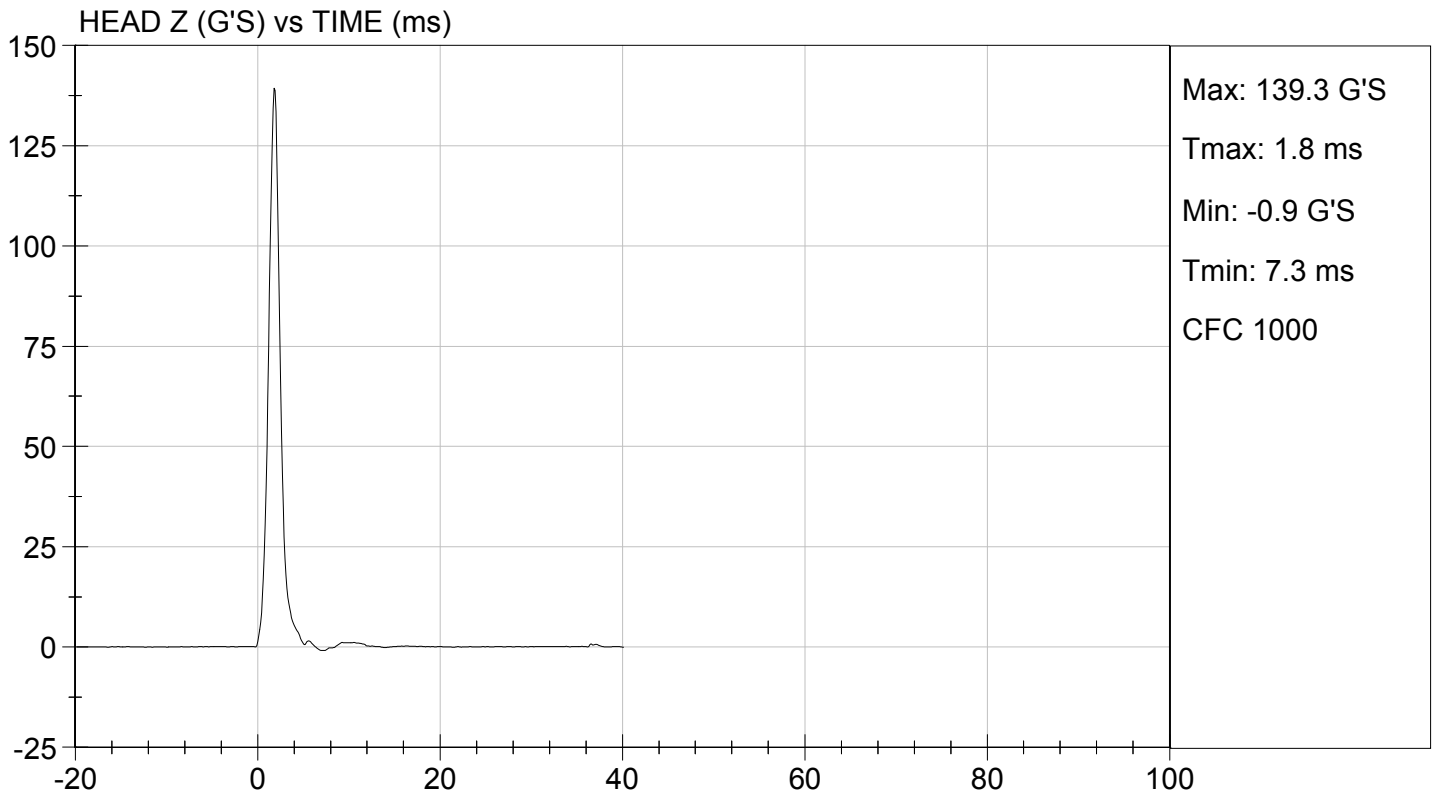
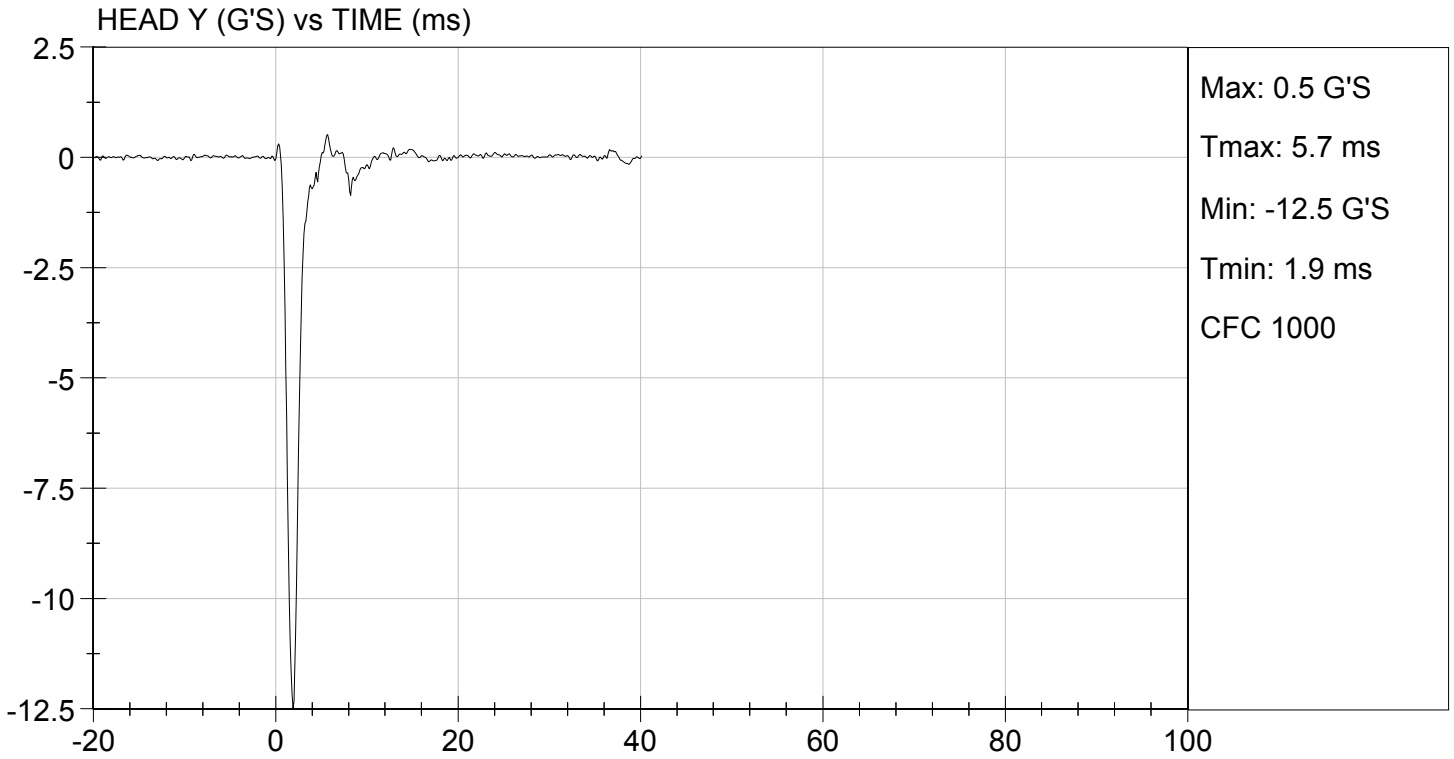
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	250 to 300	266	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-12.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>

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

06/08/2016  
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 Test Date

  
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 Approved By





**MGA RESEARCH CORPORATION**

**NECK FLEXION TEST**

**HYBRID III 5TH PERCENTILE**


ATD Serial No: 138

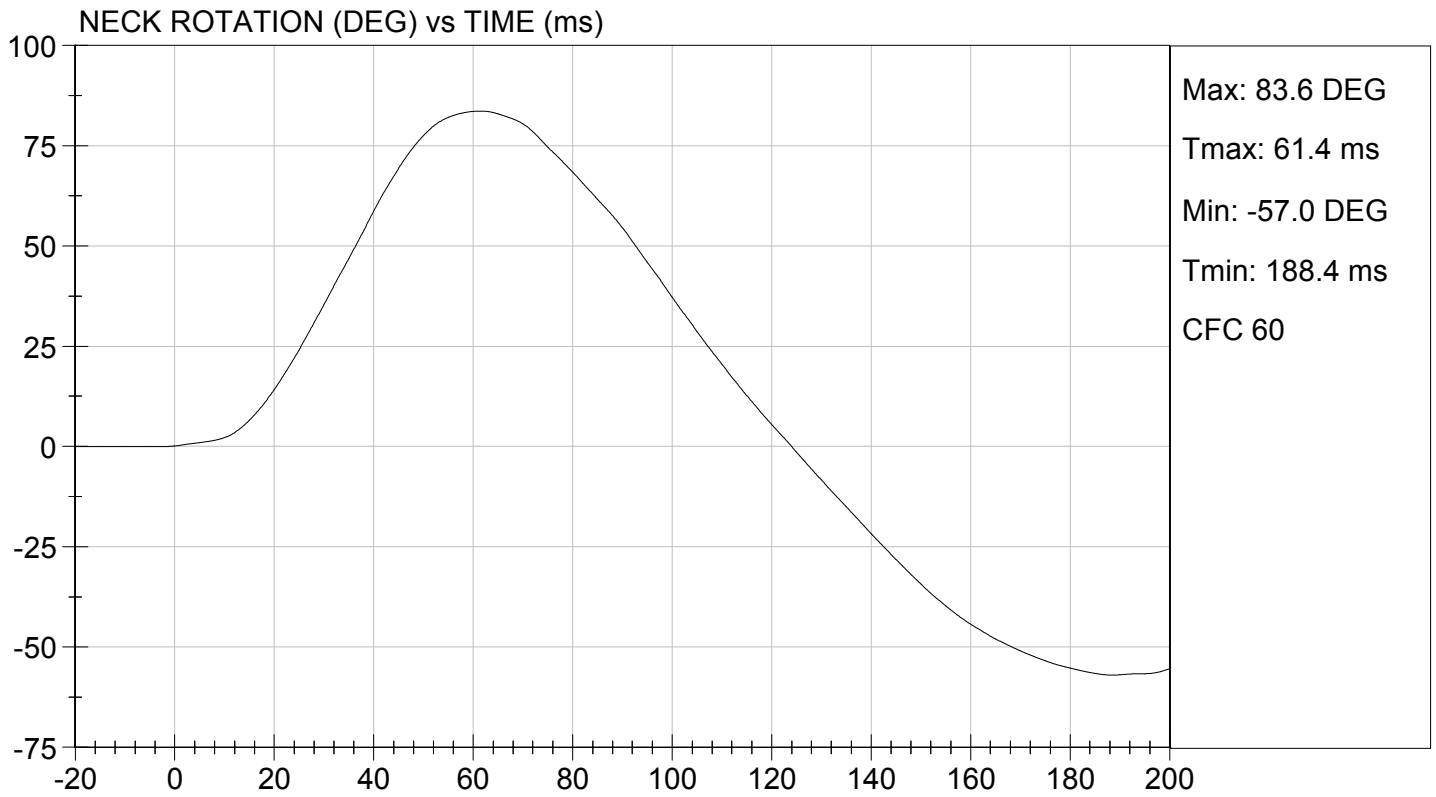
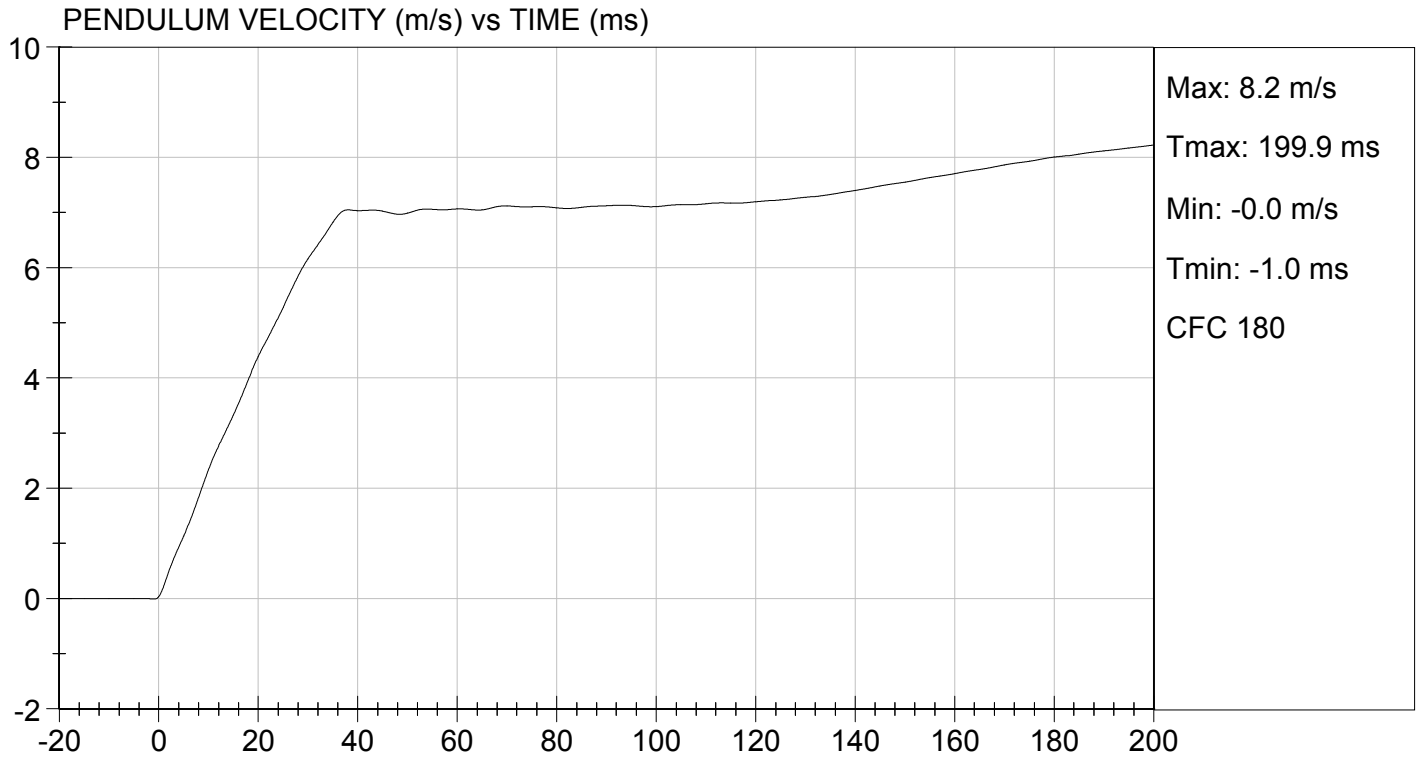
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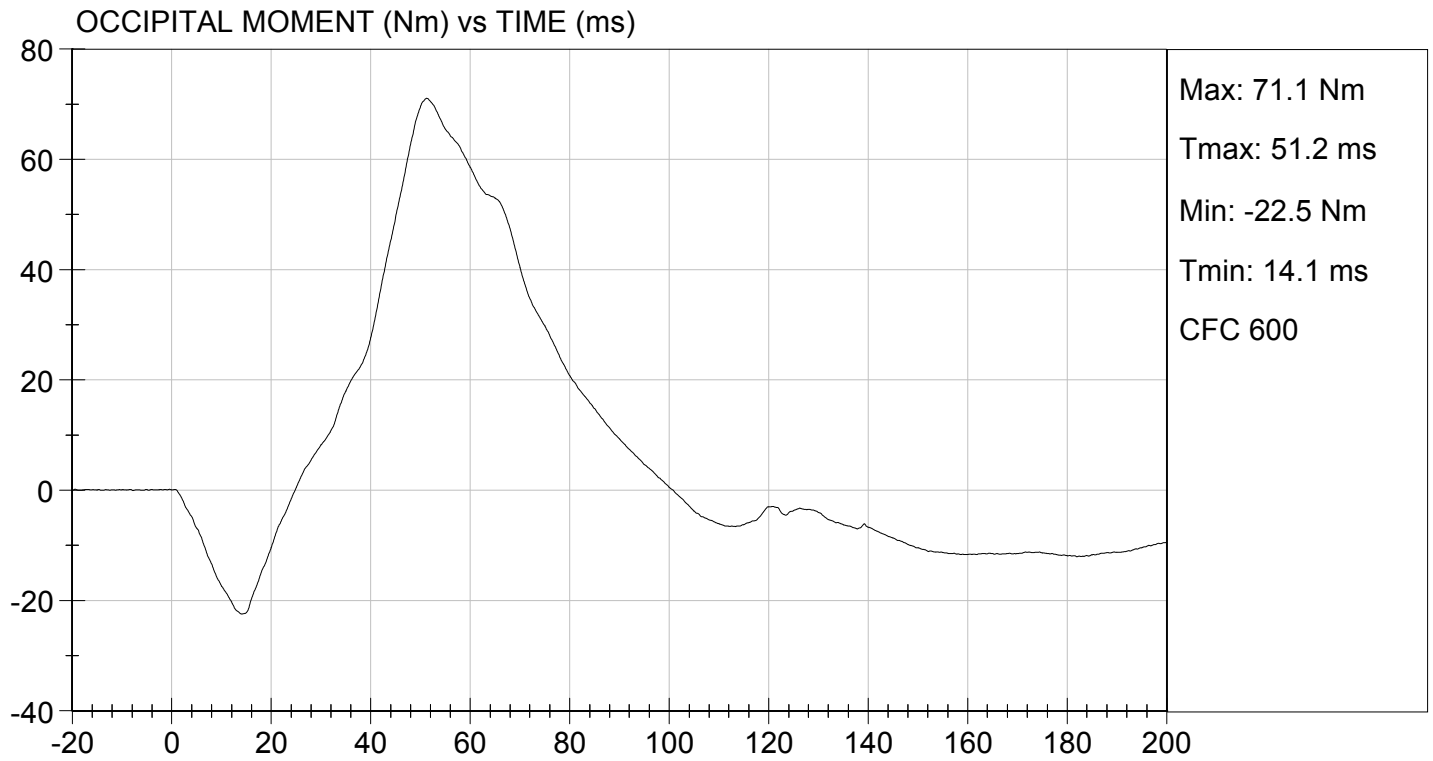
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Speed		m/s	6.89 to 7.13	6.96	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.4	Pass
	30 ms	m/s	5.8 to 7.0	6.2	Pass
D Plane Rotation	Max	deg	77 to 91	84	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	87	Pass
Overall Results					Pass

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

06/08/2016  
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 Test Date

  
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 Approved By





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


ATD Serial No: 138

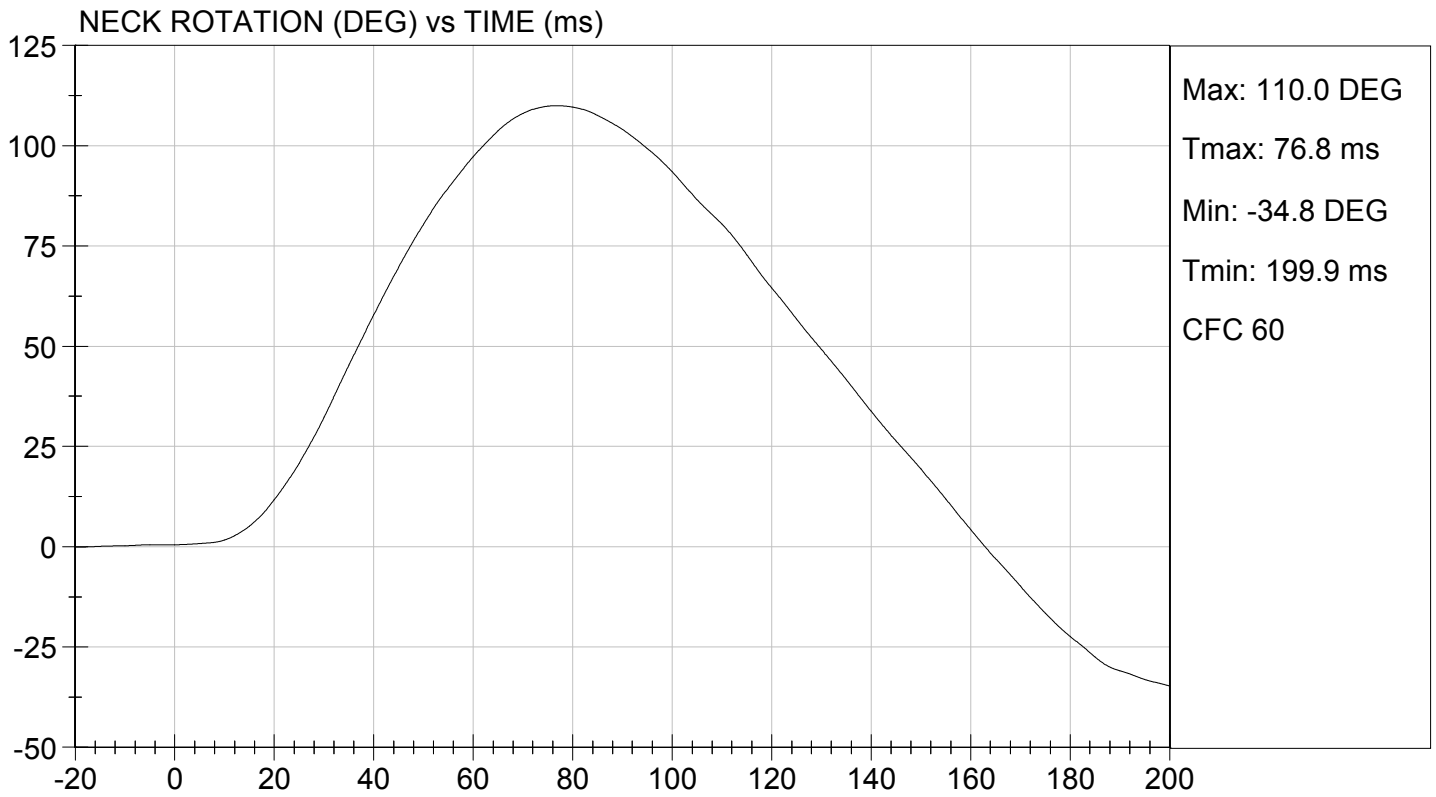
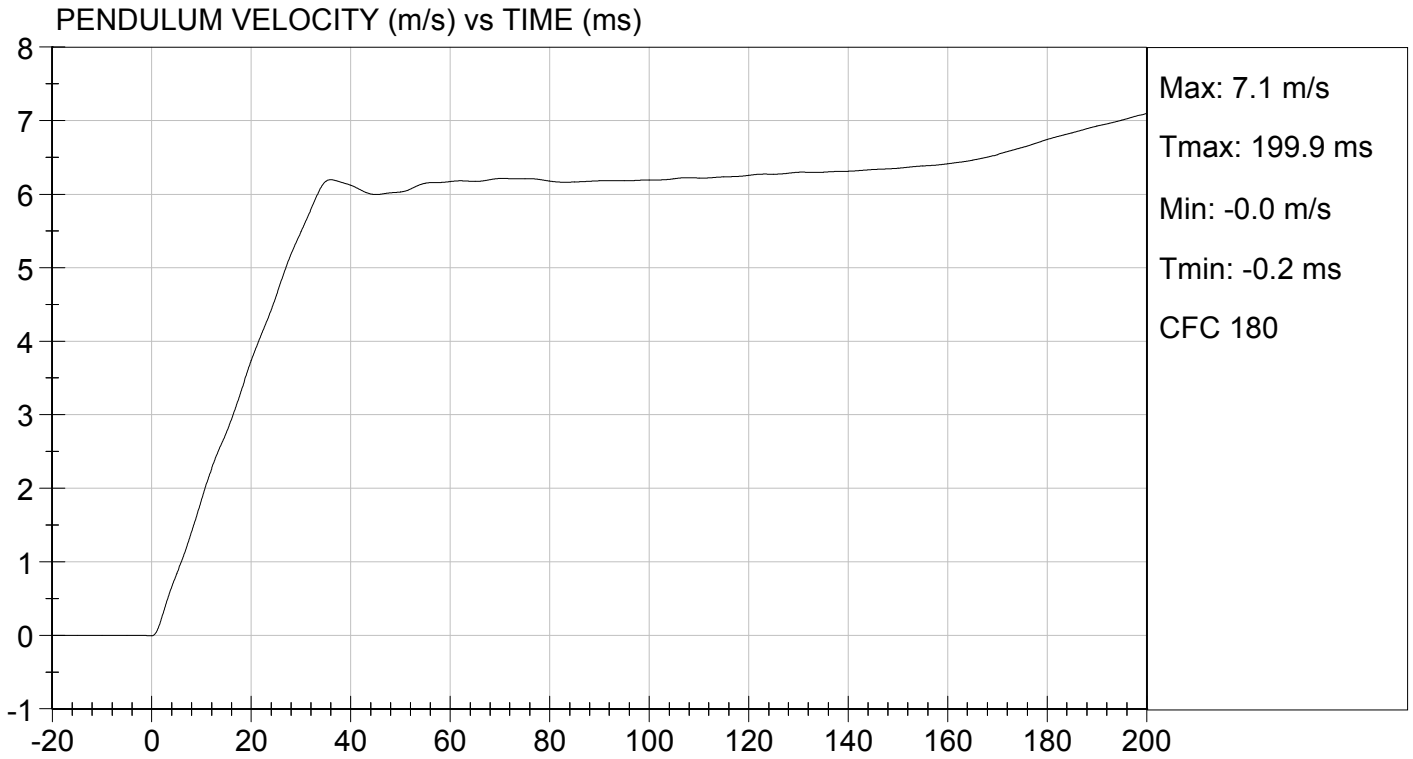
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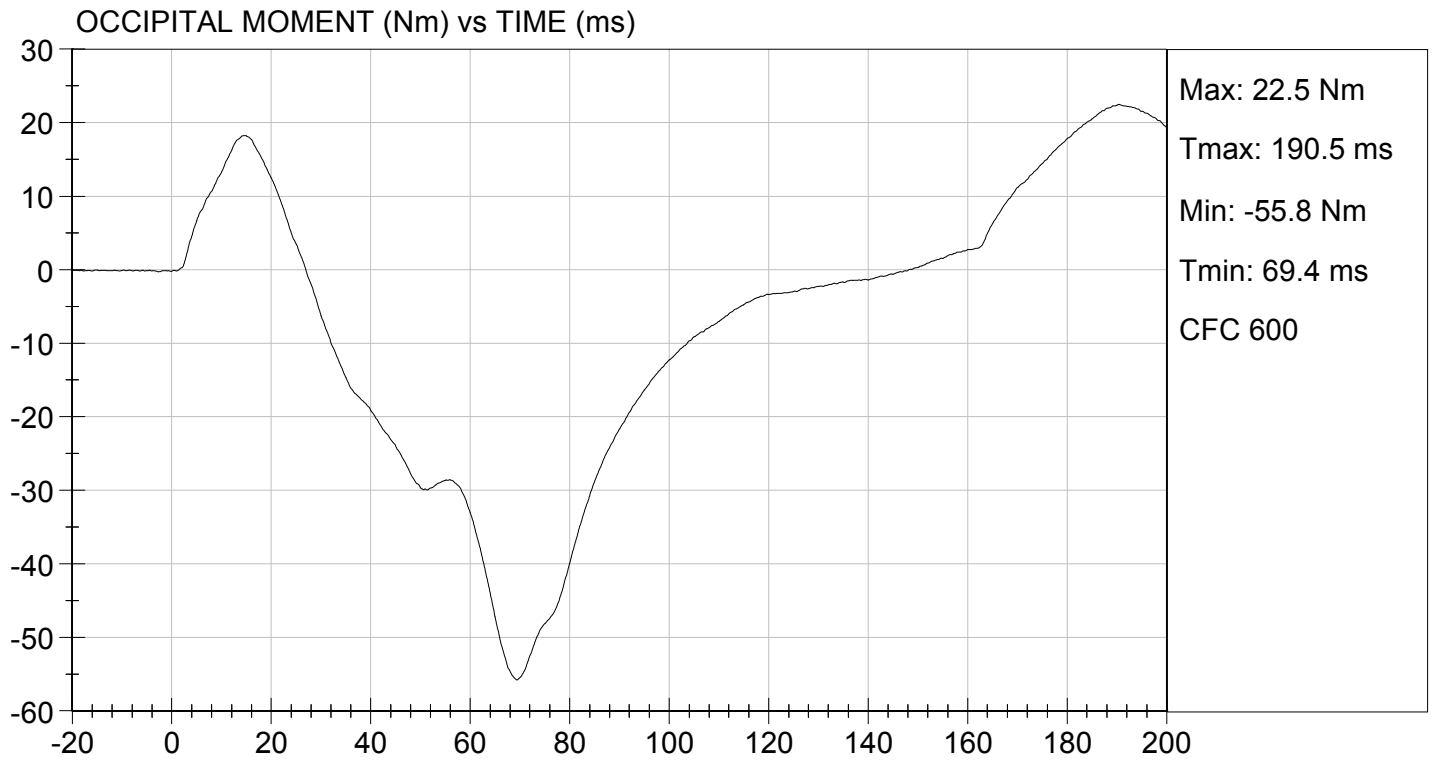
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Speed		m/s	5.95 to 6.19	5.98	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.5	Pass
D Plane Rotation	Max	deg	99 to 114	110	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-56	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	103	Pass
Overall Results					Pass

  
 Laboratory Technician

06/08/2016  
 Test Date

  
 Approved By





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

**ATD Serial No:** 138

**Test I.D:** D161984

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Relative Humidity	%	10 to 70	46	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	58	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4373	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4065	Pass
<b>Overall Test Results</b>				<b>Pass</b>



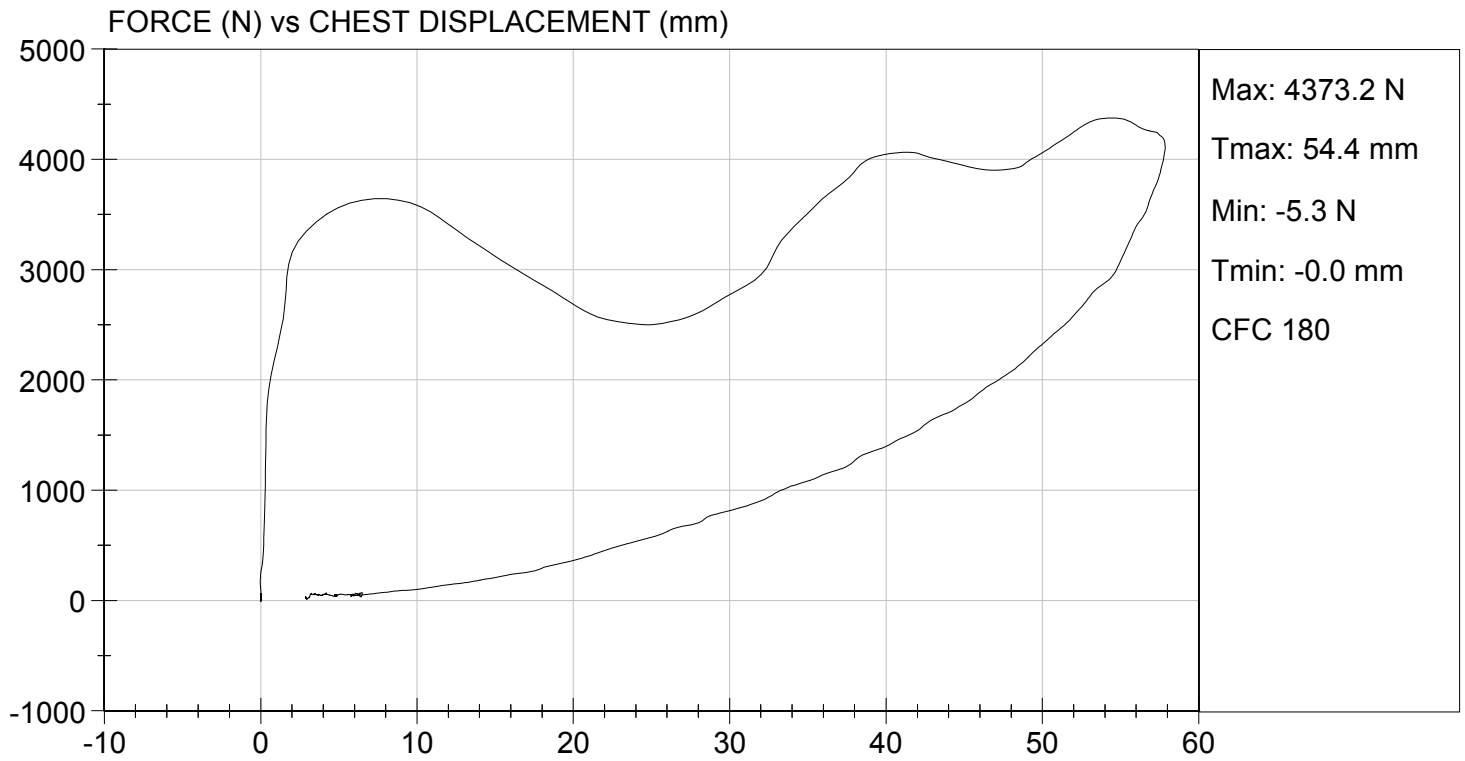
Laboratory Technician

06/09/2016

Test Date



Approved By



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

**ATD Serial No:** 138

**Test I.D:** D161985


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	45	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3657	Pass
<b>Overall Test Results</b>				<b>Pass</b>



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 Laboratory Technician

06/09/2016

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 Test Date

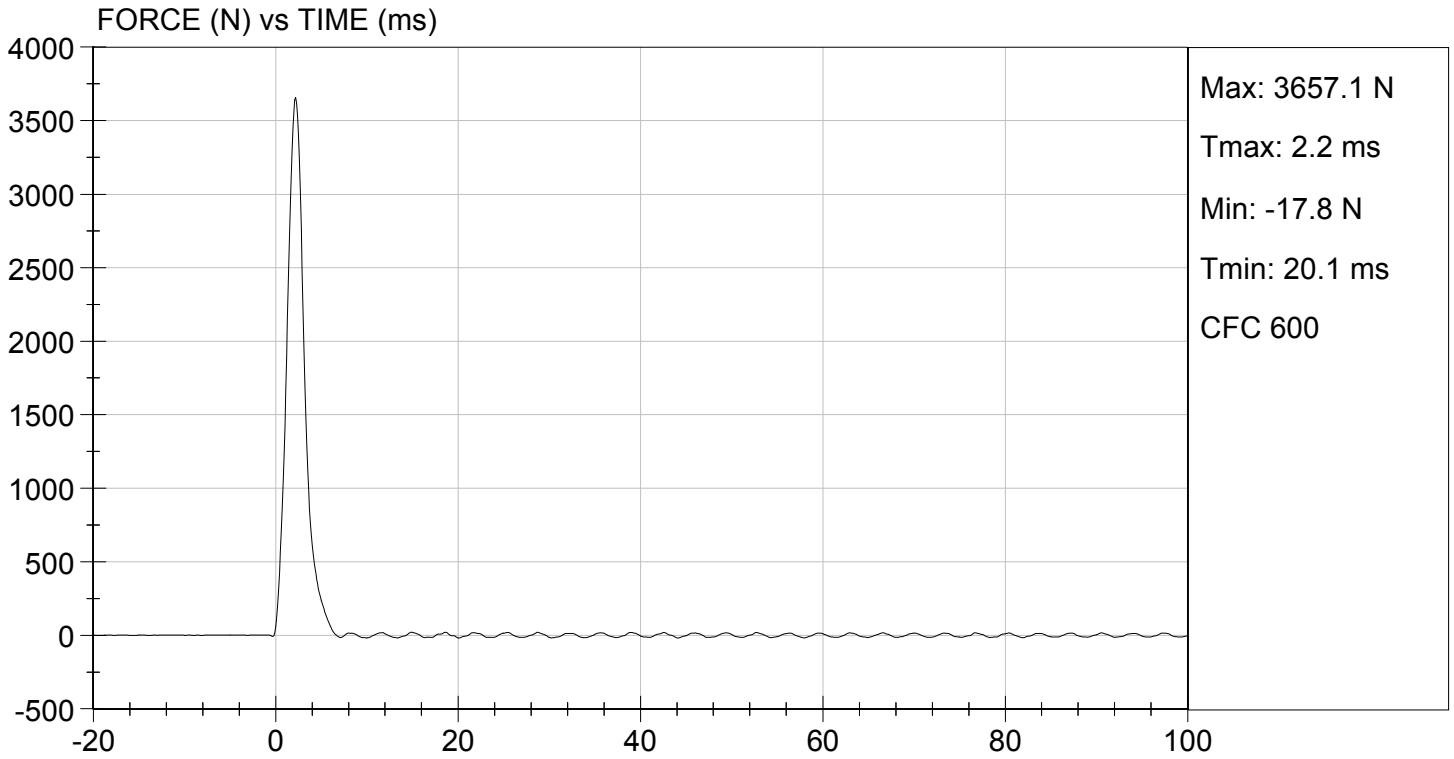


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 Approved By



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

TEST DATE: 06/09/2016  
TEST #: D161985



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST  
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D161986

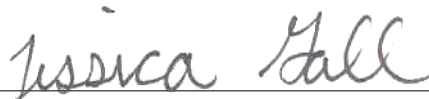
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	N	3450 to 4060	3550	Pass
Overall Test Results				Pass



Laboratory Technician

06/09/2016

Test Date

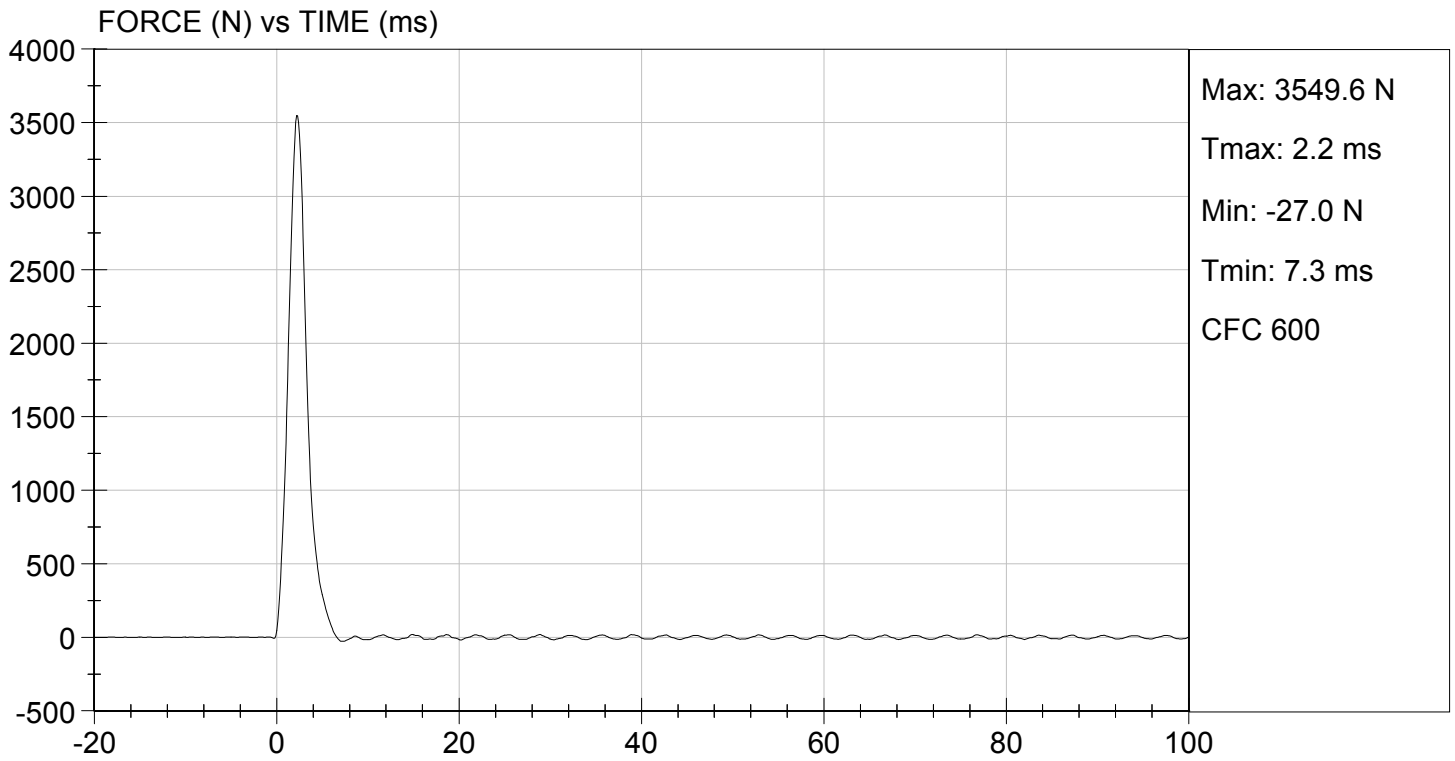


Approved By



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

TEST DATE: 06/09/2016  
TEST #: D161986



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

**ATD Serial No:** 138

**Test I.D.:** D161987

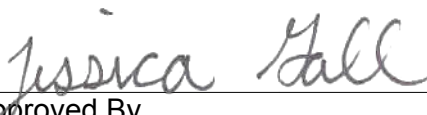
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Initial Angle	deg	0 to 20	20	Pass
Return Angle	deg	+/- 8	2	Pass
Force at 45 deg	N	320 to 390	373	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
<b>Overall Result</b>				<b>Pass</b>



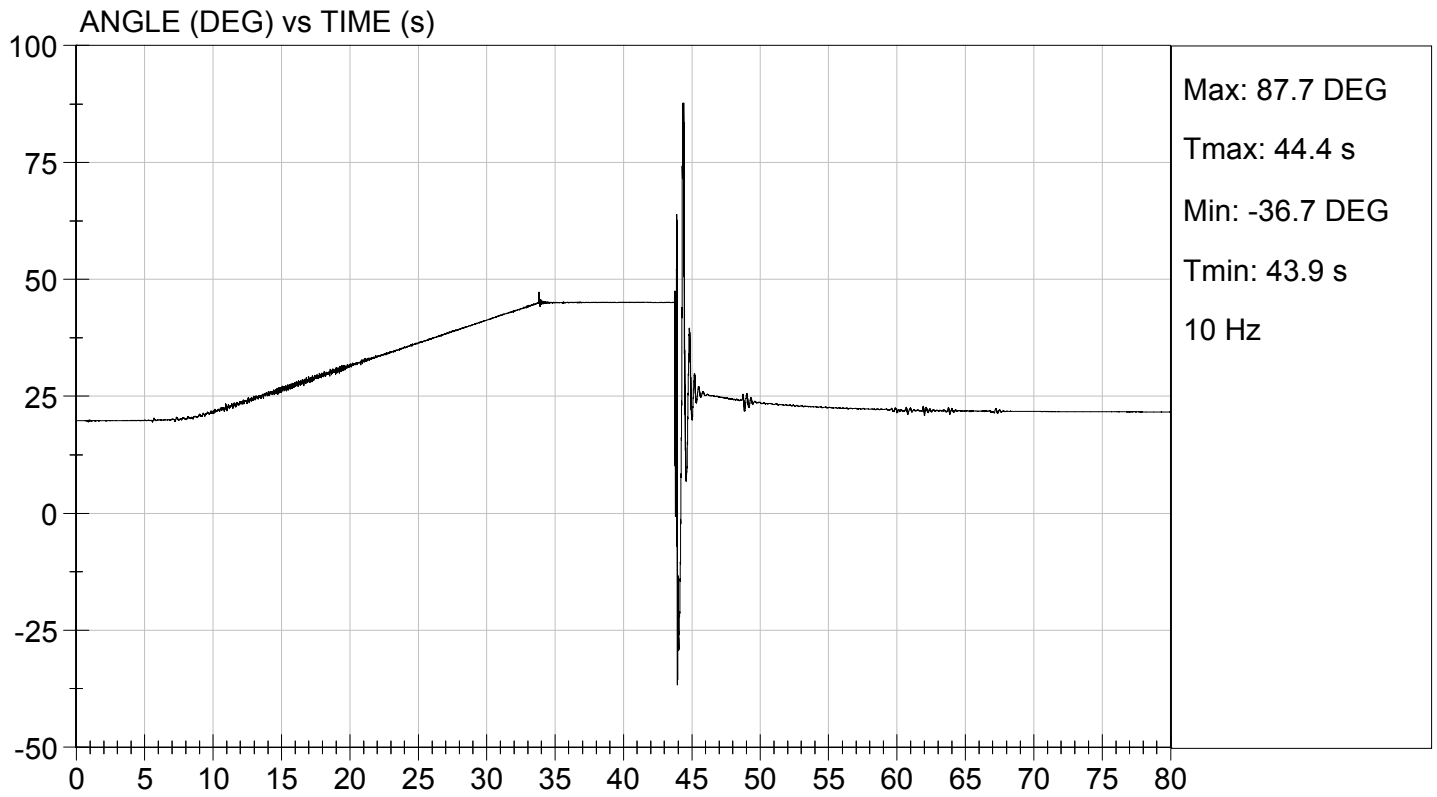
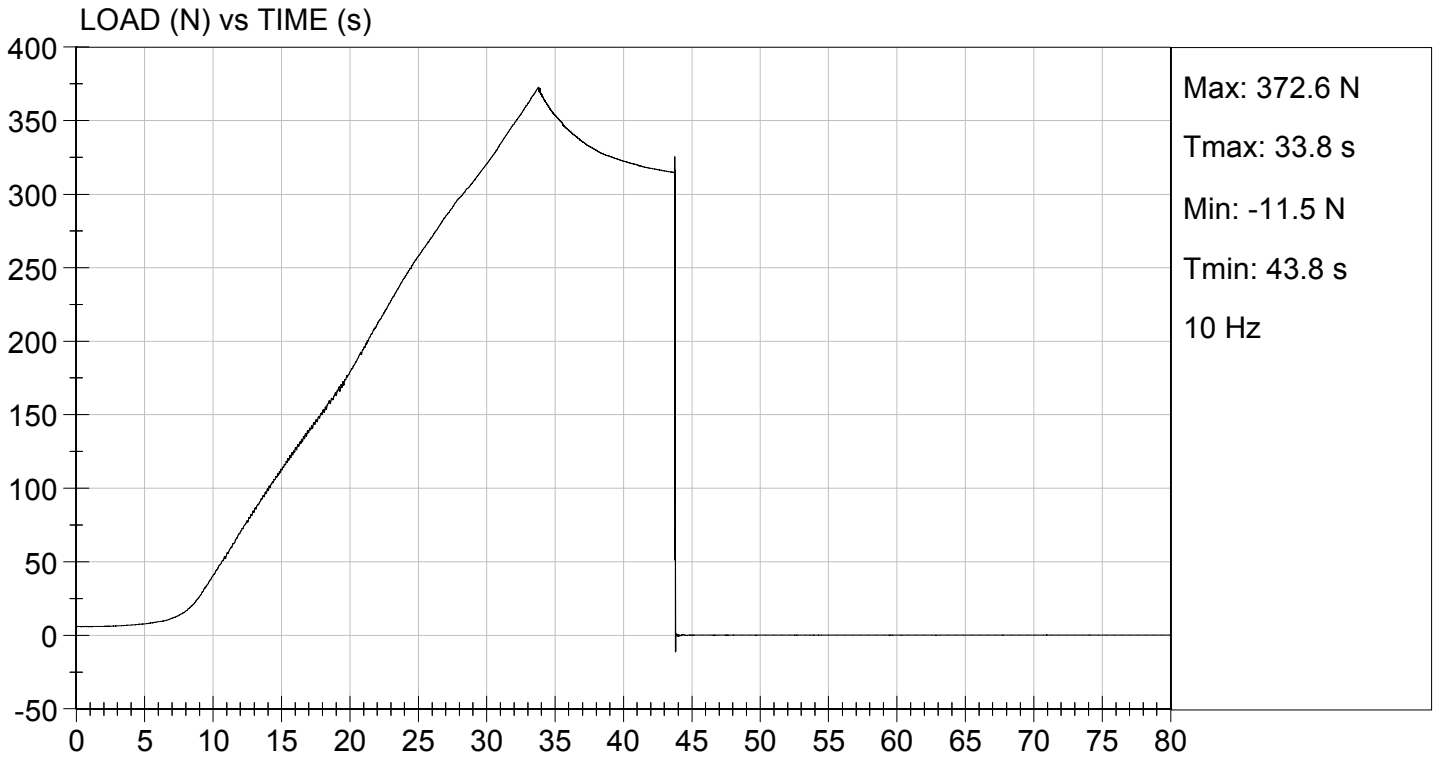
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 Laboratory Technician

06/09/2016

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 Test Date



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 Approved By



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


ATD Serial No: 138

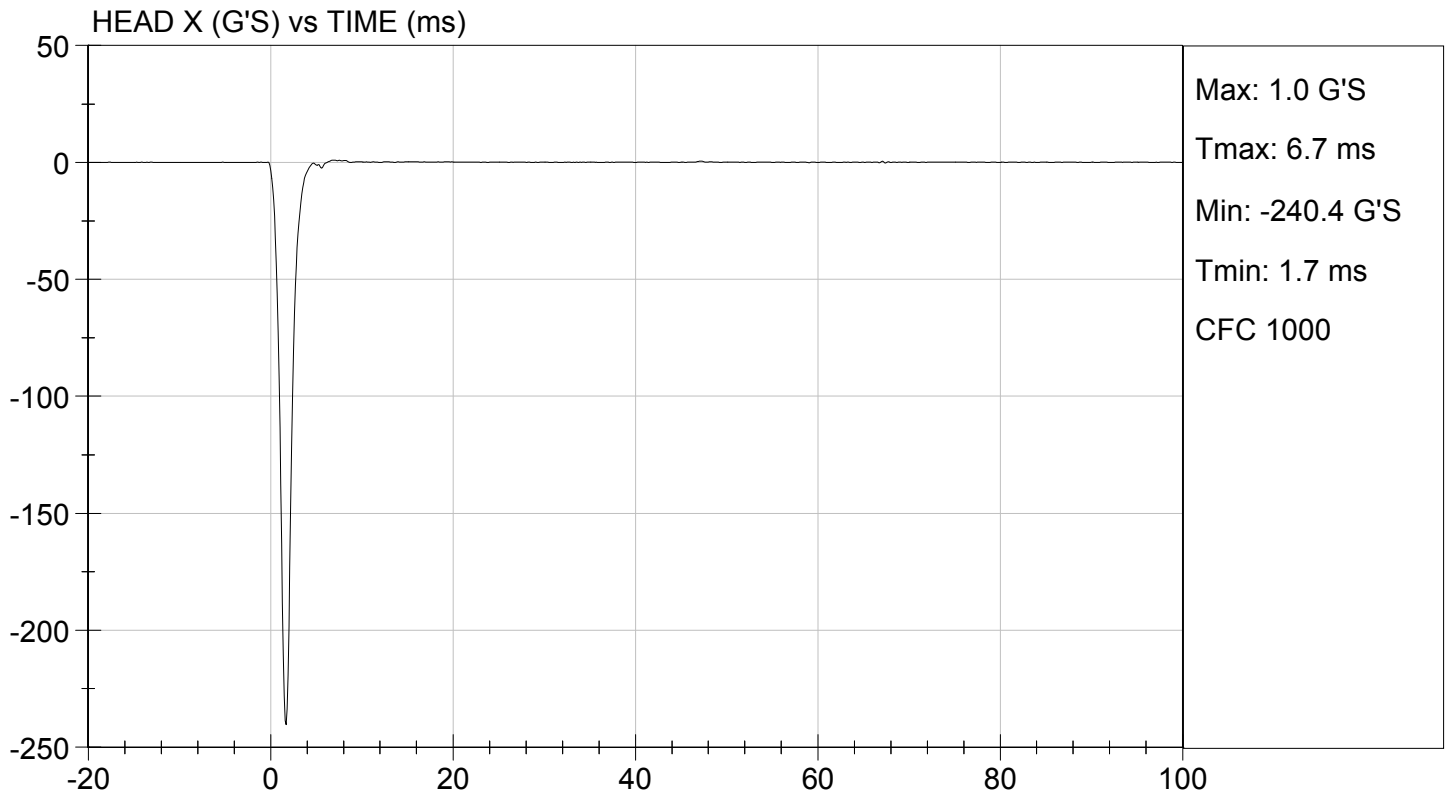
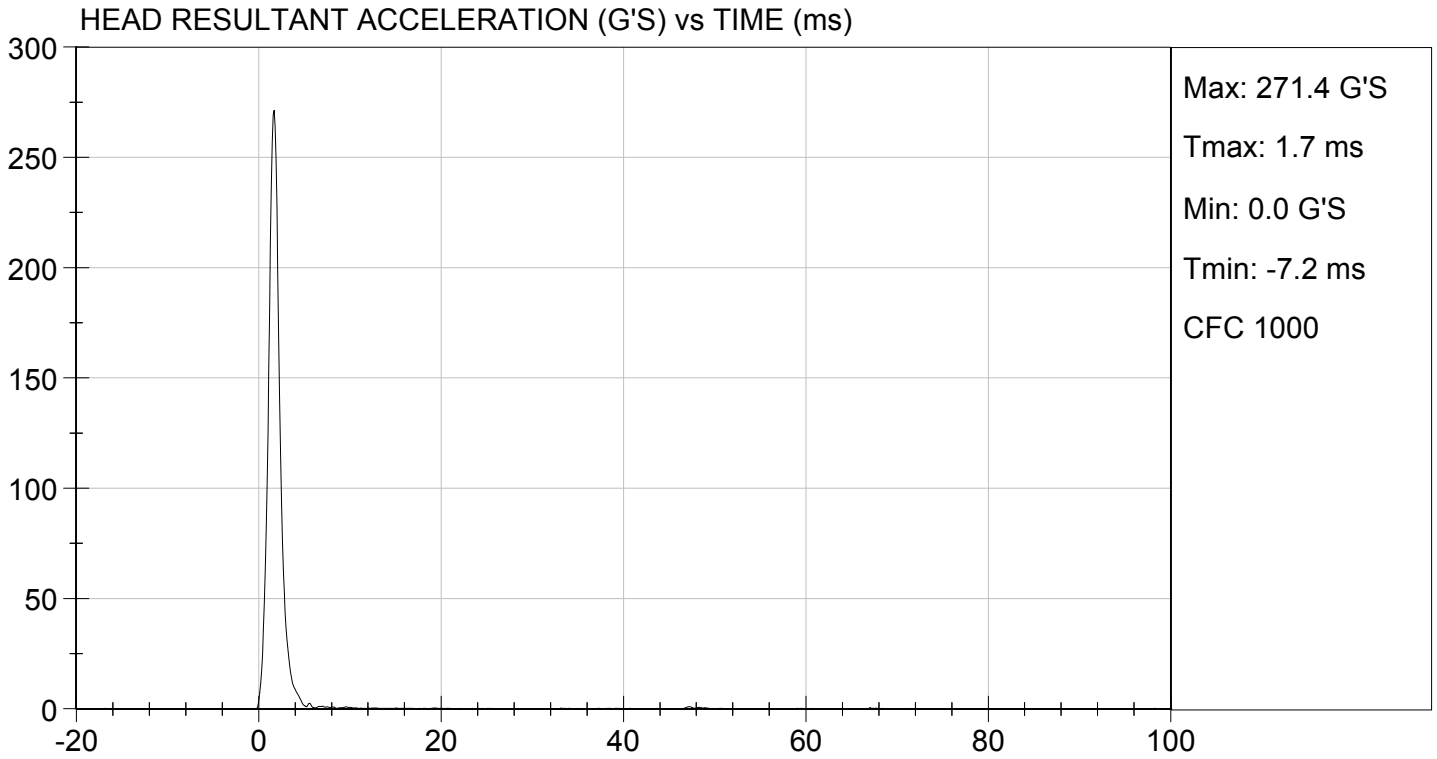
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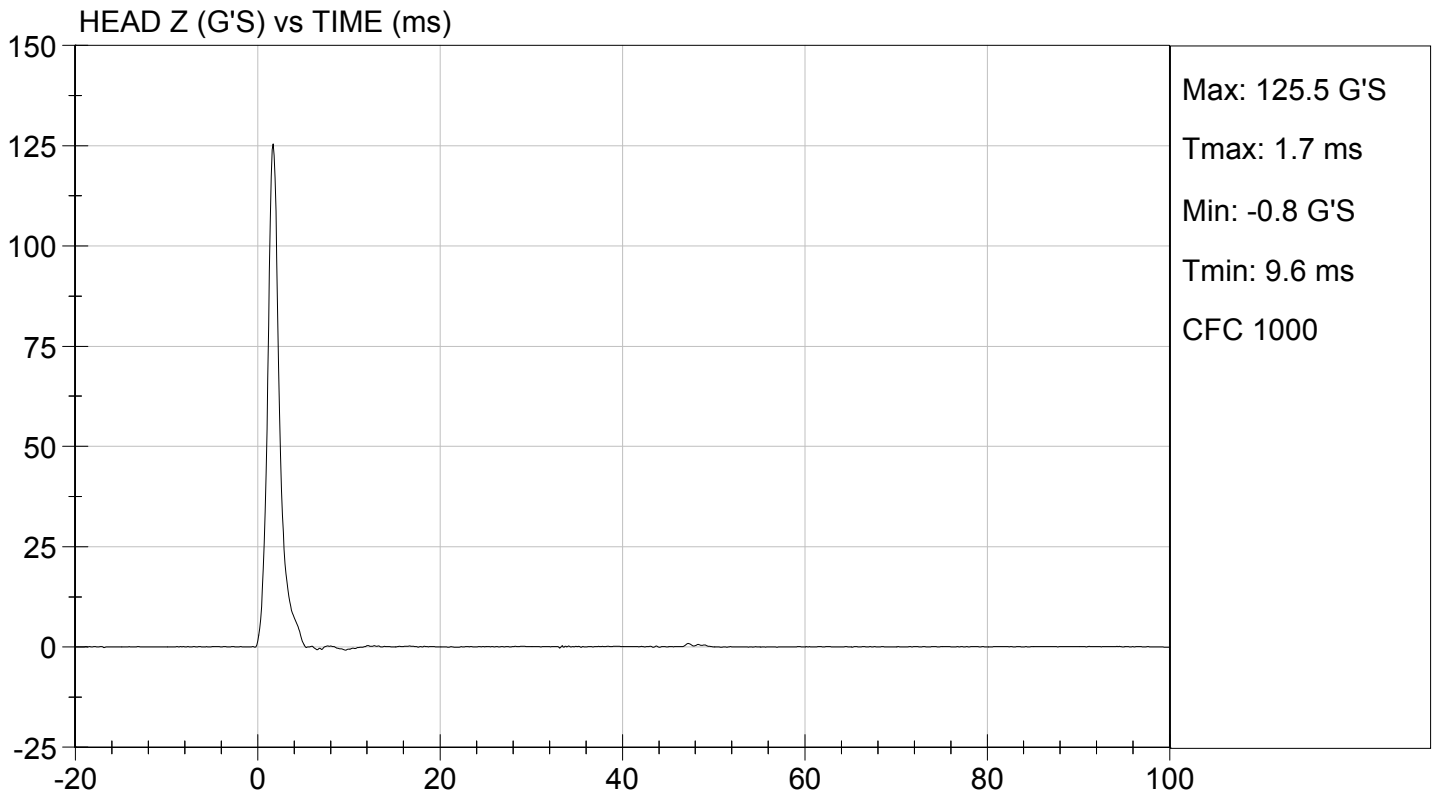
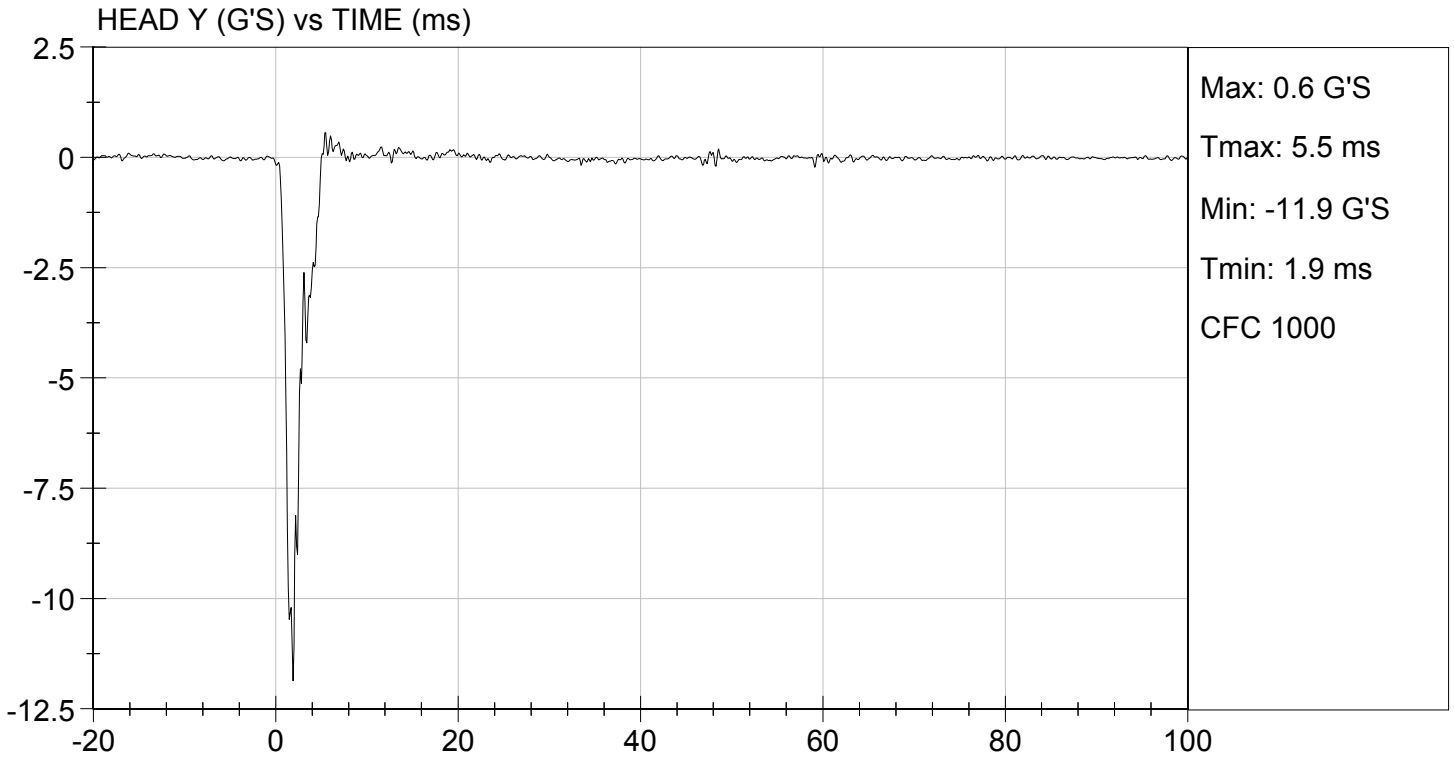
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Peak Resultant Acceleration	G's	250 to 300	271	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-11.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

  
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 Laboratory Technician

06/15/2016  
 \_\_\_\_\_  
 Test Date

  
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 Approved By





**MGA RESEARCH CORPORATION**

**NECK FLEXION TEST**

**HYBRID III 5TH PERCENTILE**

ATD Serial No: 138

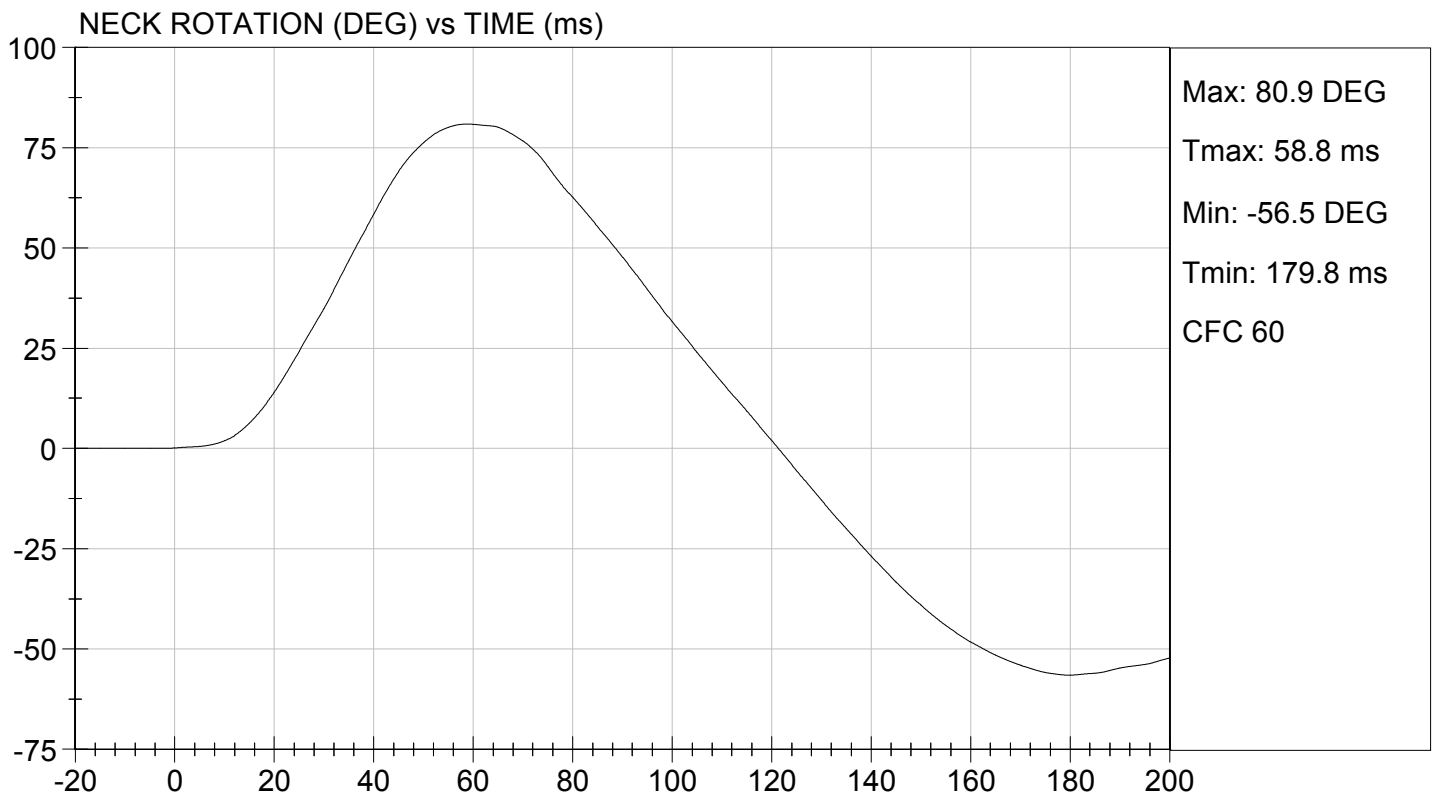
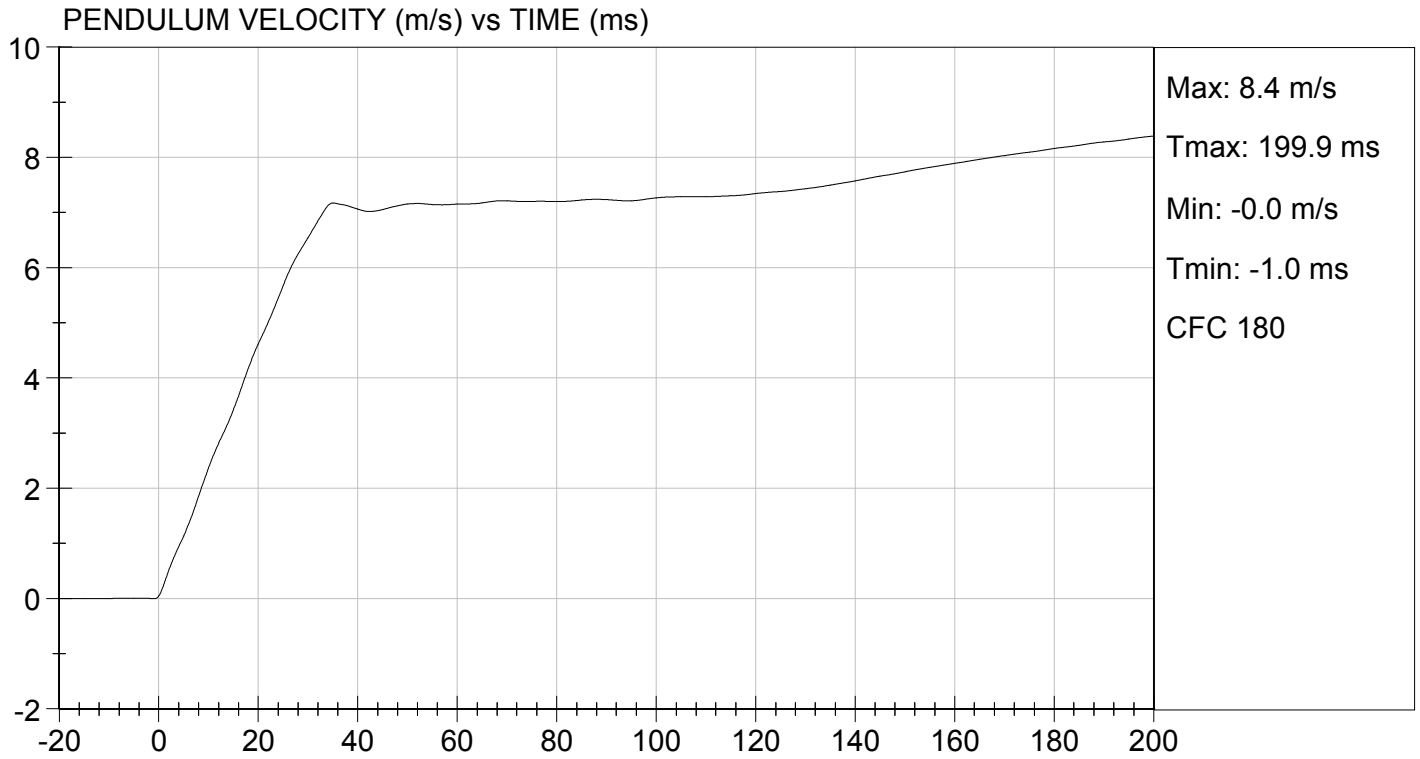
Test I.D.: D162082

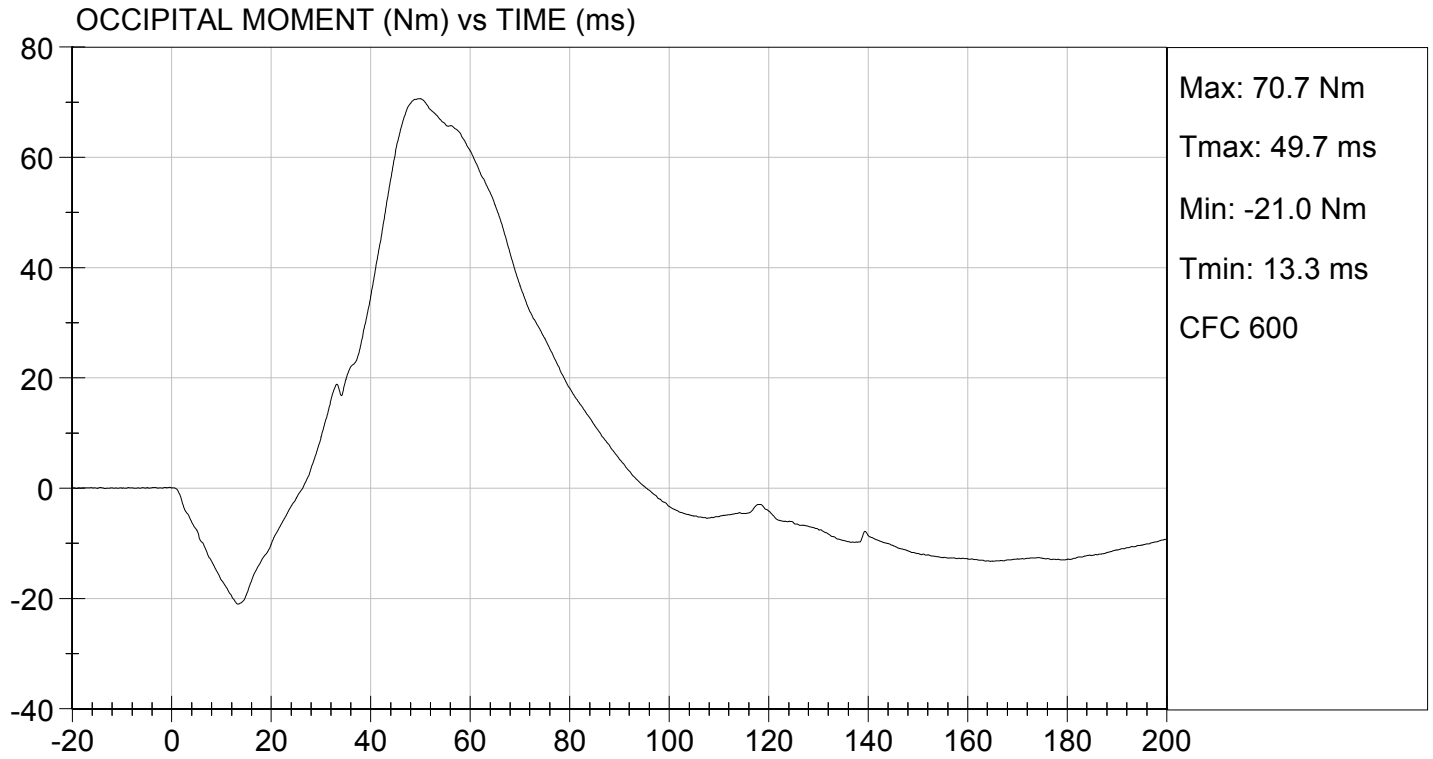
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	51	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.6	Pass
	30 ms	m/s	5.8 to 7.0	6.5	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
Overall Results					Pass

Jessica Hall  
Laboratory Technician

06/15/2016  
Test Date

Tom D. Hill  
Approved By





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


ATD Serial No: 138

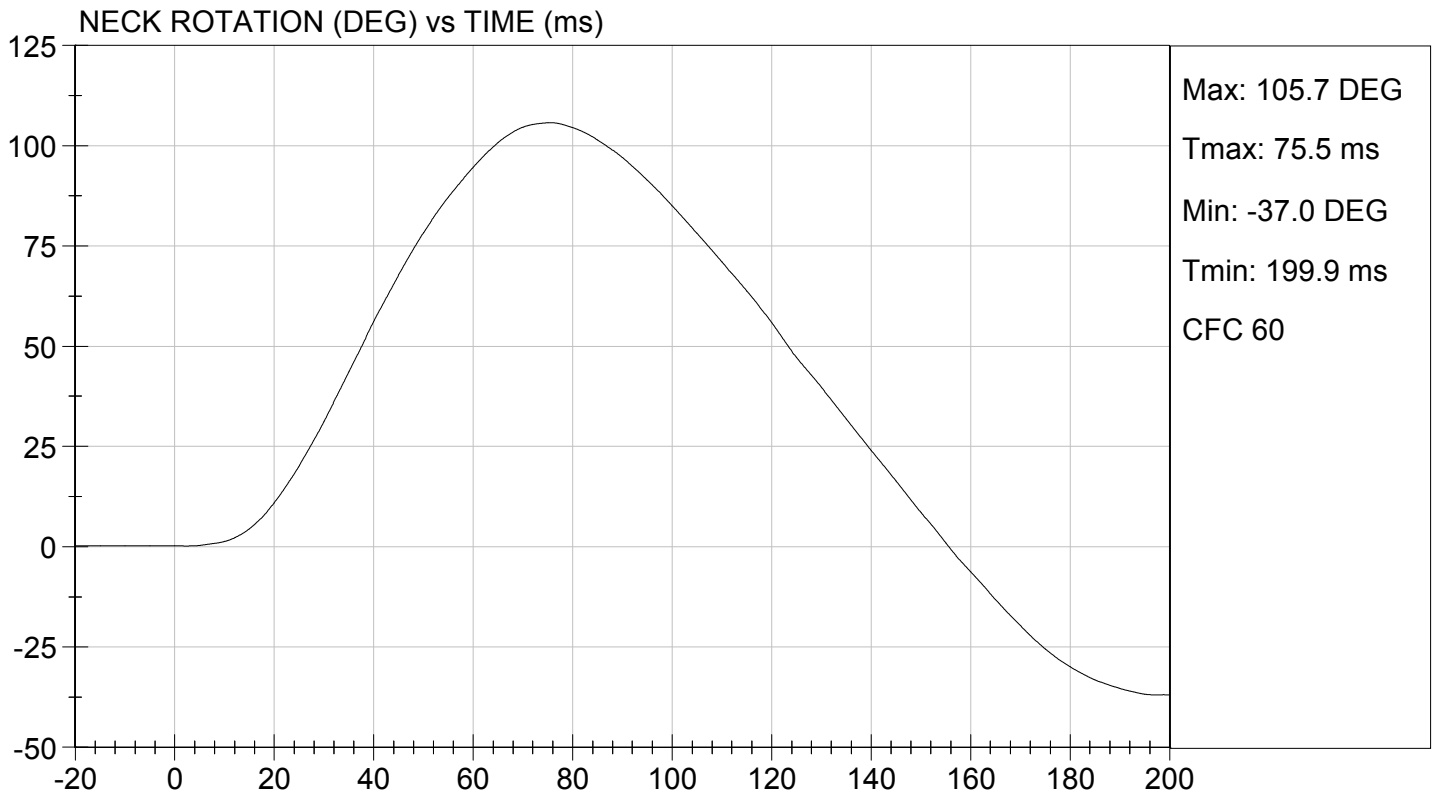
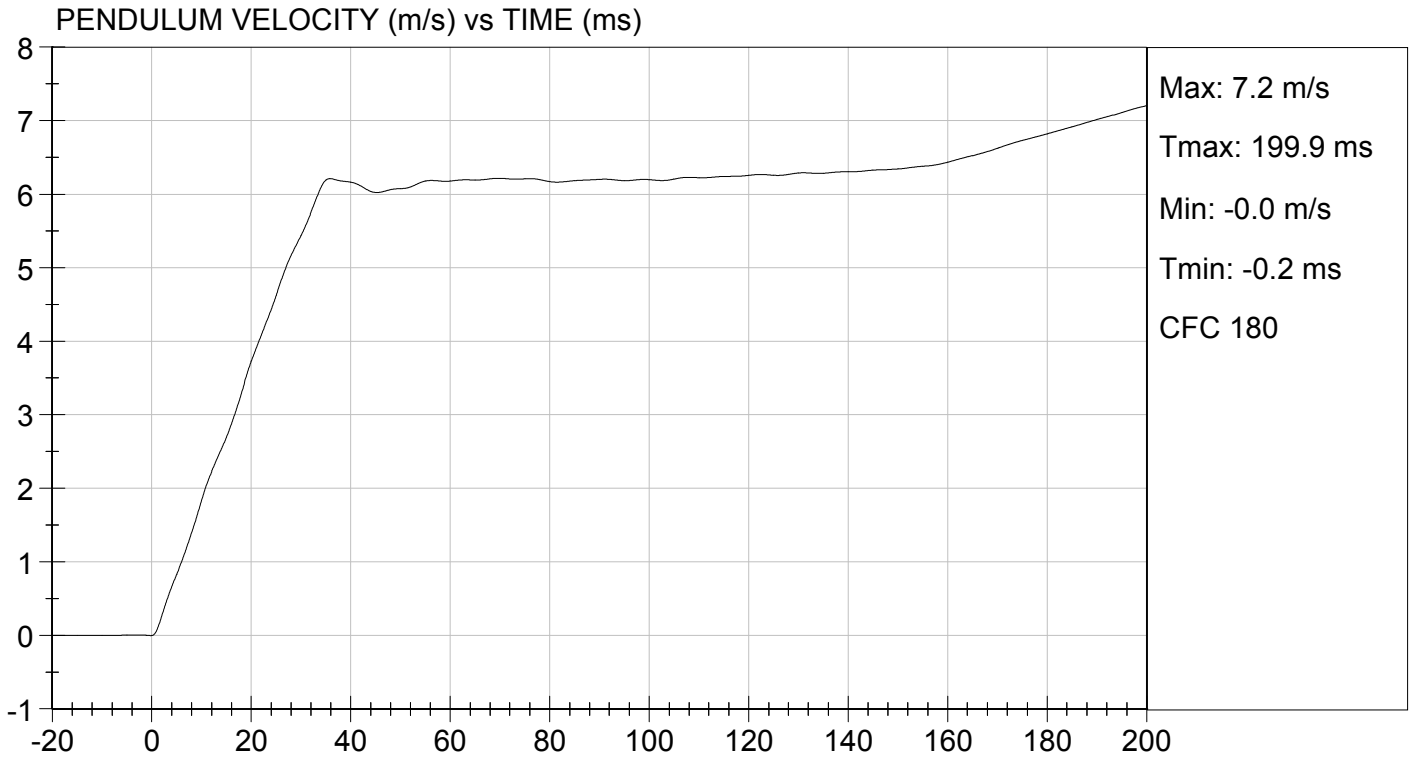
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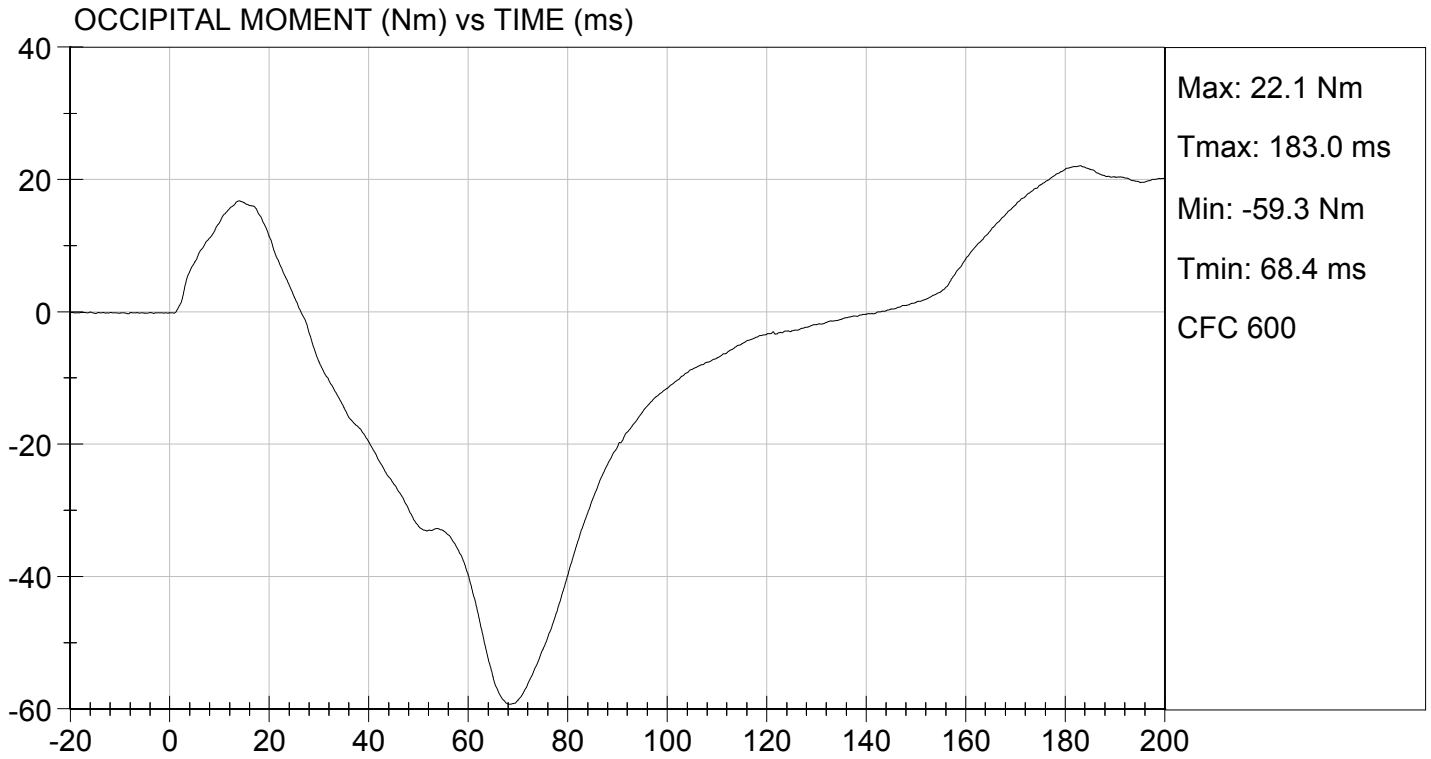
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	51	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	106	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-59	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	101	Pass
Overall Results					Pass

  
 Laboratory Technician

06/15/2016  
 Test Date

  
 Approved By





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

**ATD Serial No:** 138

**Test I.D.:** D162084

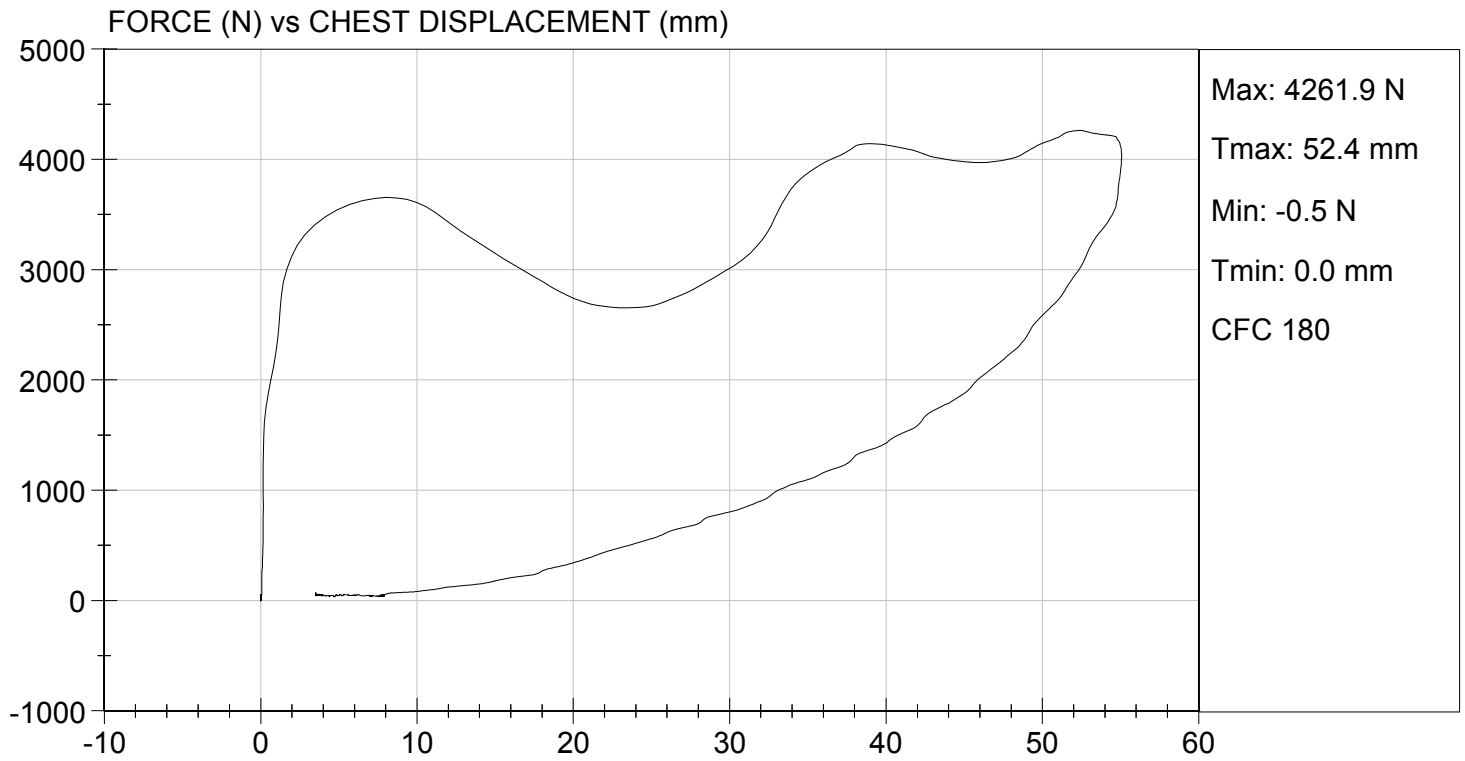
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	55	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4262	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4143	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

06/16/2016

Test Date

  
 Approved By

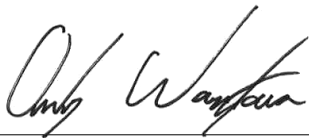


**MGA RESEARCH CORPORATION**  
**RIGHT KNEE IMPACT TEST**  
**HYBRID III 5TH PERCENTILE**

**ATD Serial No:** 138

**Test I.D:** D162085

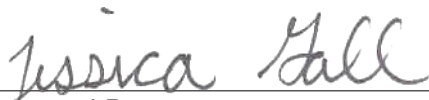
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Probe Speed	m/s	2.07 to 2.13	2.11	Pass
Maximum Force	N	3450 to 4060	3573	Pass
<b>Overall Test Results</b>				<b>Pass</b>



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

06/16/2016

Test Date

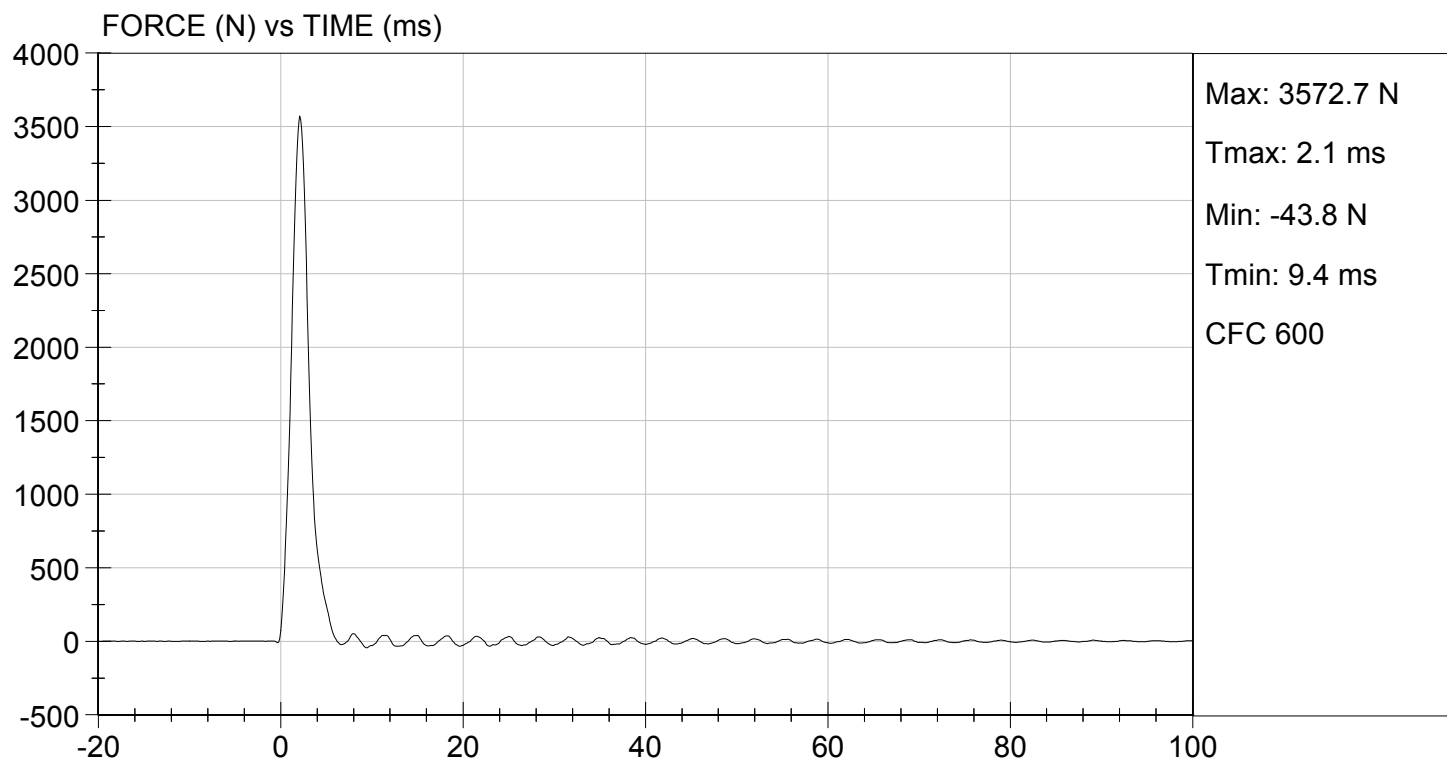


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 Approved By



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

TEST DATE: 06/16/2016  
TEST #: D162085



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


**ATD Serial No:** 138

**Test I.D:** D162086

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	46	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	N	3450 to 4060	3484	Pass
Overall Test Results				Pass

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

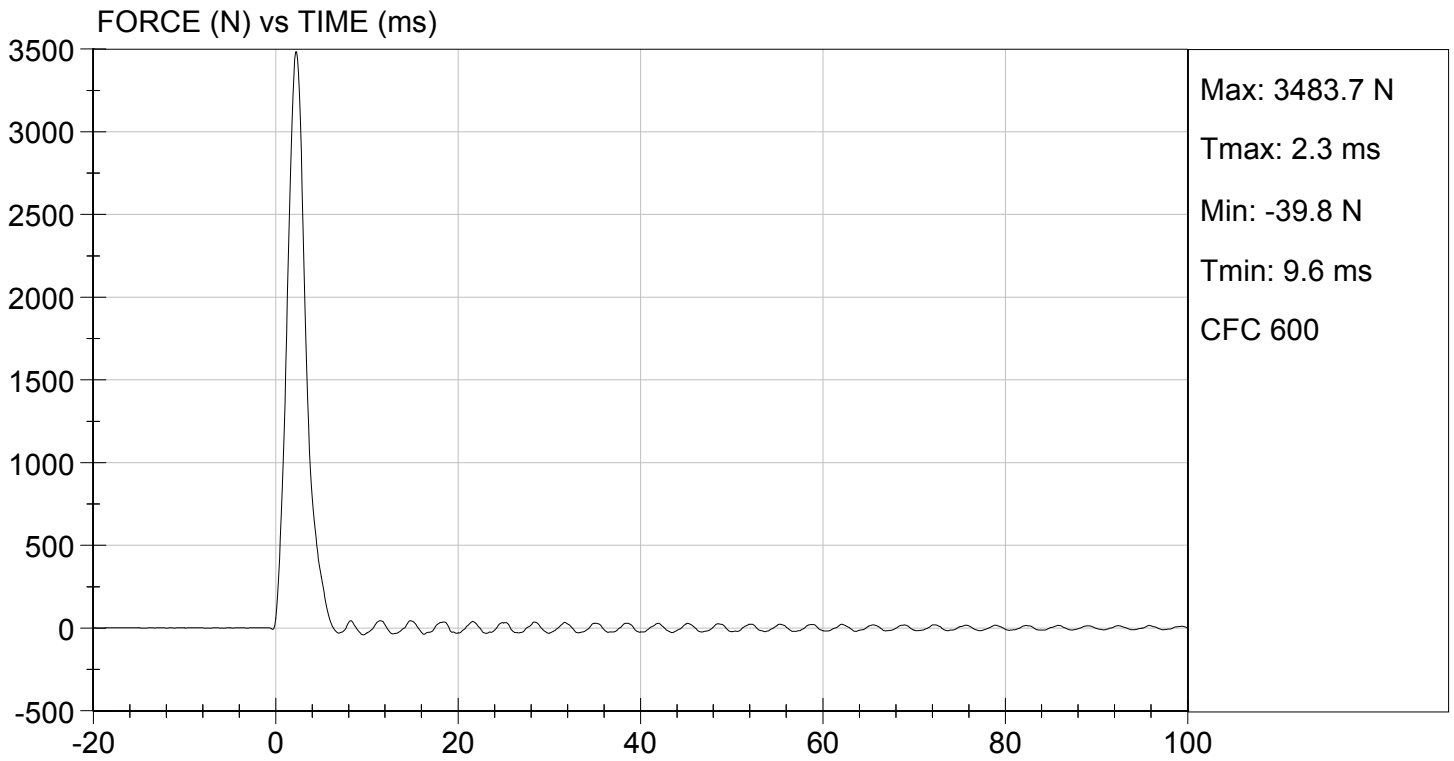
06/16/2016  
\_\_\_\_\_  
Test Date

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



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

TEST DATE: 06/16/2016  
TEST #: D162086



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

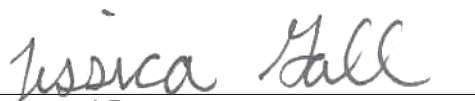
**ATD Serial No:** 138

**Test I.D:** D162087

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	48	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	2	Pass
Force at 45 deg	N	320 to 390	380	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	1.0	Pass
<b>Overall Result</b>				<b>Pass</b>

  
 Laboratory Technician

06/16/2016  
 Test Date

  
 Approved By

