

REPORT NUMBER: NCAP-MGA-2015-002

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

**HYUNDAI MOTOR COMPANY
2015 Hyundai Genesis AWD 4-Dr Sedan
NHTSA No.: O20154200**

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



Test Date: June 5, 2014

Final Report Date: July 17, 2014

FINAL REPORT

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

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Approval Date: July 17, 2014

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2015 Hyundai Genesis AWD 4-Dr Sedan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on June 5, 2014. The impact velocity of the vehicle was 56.3 km/h and the ambient temperature at the barrier face at the time of impact was 21.3°C. The target vehicle post-test maximum crush was 574 located at the vehicle's centerline. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>97</td> <td>700</td> <td>180</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td>19</td> <td>52</td> <td>10</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.21</td> <td>1</td> <td>0.35</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>840</td> <td>2620</td> <td>573</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>97</td> <td>2520</td> <td>196</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>1194</td> <td>6805</td> <td>653</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>2287</td> <td>6805</td> <td>246</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	97	700	180	Maximum Chest	mm	63	19	52	10	Nij	N/A	1	0.21	1	0.35	Neck Tension	N	4170	840	2620	573	Neck Compression	N	4000	97	2520	196	Left Femur Force	N	10008	1194	6805	653	Right Femur Force	N	10008	2287	6805	246
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3

<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat Adjustment, Fuel System, and Steering Wheel Data	8
3	Dummy Longitudinal Clearance Dimensions	10
4	Dummy Lateral Clearance Dimensions	11
5	Seat Belt Positioning Data	12
6	High-Speed Camera Locations and Data	13
7	Vehicle Accelerometer Locations	15
8	Photographic Reference Target Locations	16
9	Load Cell Locations on Fixed Barrier	17
10	Test Vehicle Summary of Results	18
11	Post-Test Observations	19
12	Vehicle Profile Measurements	20
13	Accident Investigation Division Data	22
14	Vehicle Intrusion Measurements	23
15	Summary of FMVSS 212, FMVSS 219 (Partial) Data, and 301 Data	25
16	FMVSS 301 Static Rollover Results	27
17	Dummy/Vehicle Temperature Stabilization Data	28

<u>Appendix</u>		
A	Photographs	A
B	Dummy Response Data Traces	B
C	Dummy Calibration and Performance Verification Data	C

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 2015 Hyundai Genesis AWD 4-Dr Sedan at a velocity of 56.3 km/h. The test was performed at MGA Research Corporation on June 5, 2014. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also installed on the driver's shoulder belt and the passenger's shoulder belt to measure dummy torso 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 628 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 574 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th)	97	0.21	840	97	39	19	1194	2287
Passenger (5 th)	180	0.35	573	196	49	10	653	246

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

TEST NOTES

Left Rear Seat Crossmember X has no valid data
 Left Rear Seat Crossmember Z has no valid data
 Right Rear Seat Crossmember X has no valid data after 46ms
 Right Rear Seat Crossmember Z has no valid data after 46ms
 Left Rear Seat Crossmember Xr has no valid data
 Right Rear Seat Crossmember Xr has no valid data after 46ms
 Barrier K-03 FX has questionable 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: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20154200	Traction Control System (TCS)	Yes
Model Year	2015	Power Steering	Yes
Make	Hyundai	Power Window Auto-Reverse	No
Model	Genesis	Driver Frontal Airbag	Yes
Body Style	Sedan	Driver Curtain Airbag	Yes
VIN	KMHGN4JE9FU018592	Driver Head/Torso Airbag	No
Body Color	Santiago Silver	Driver Torso Airbag	No
Odometer (km/mi)	264 / 164	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	3.8	Driver Pelvis Airbag	No
Type/No. Cylinders	6	Driver Knee Airbag	Yes
Engine Placement	Longitudinal	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	8	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	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Driver Inboard Seat Airbag	Yes

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Hyundai Motor Company	GVWR (kg)	2500
Date of Manufacture	MAR/28/14	GAWR Front (kg)	1270
		GAWR Rear (kg)	1325

VEHICLE SEATING AND WEIGHT CAPACITY DATA

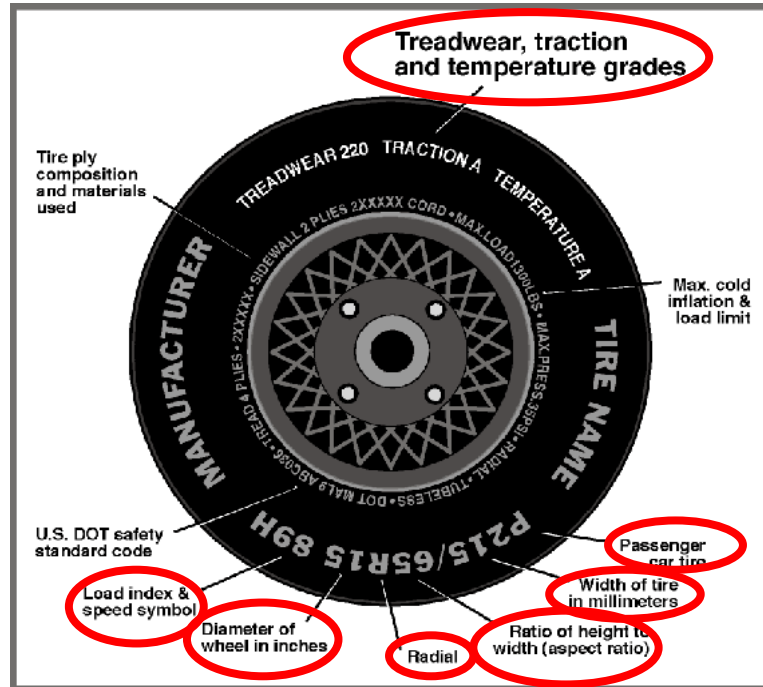
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				410
Cargo Weight (RCLW) (kg)				70

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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	245/45R18	245/45R18
Tire Size on Vehicle	245/45R18	245/45R18
Tire Manufacturer	Hankook	Hankook
Tire Model	Ventus Noble	Ventus Noble
Treadwear	500	500
Traction	AA	AA
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	96W	96W
Tire Material	Rubber	Rubber
DOT Safety Code Left	T7EF 1AH 1214	T7EF 1AH 1214
DOT Safety Code Right	T7EF 1AH 1214	T7EF 1AH 1214

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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
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 Test Date: 6/05/2014

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	507.5	476.0		542.0	558.0	
Right	kg	534.5	470.5		548.0	544.5	
Ratio	%	52.4	47.6		49.7	50.3	
Totals	kg	1042.0	946.5	1988.5	1090.0	1102.5	2192.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1988.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	70
Calculated Test Vehicle Target Weight (TVTW)	kg	2199.1

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	717	711	714	718	1433
As Tested	mm	704	704	678	679	1514
Post Test	mm	800	796	677	680	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3010
Total Vehicle Length at Left Side	mm	4801
Total Vehicle Length at Centerline	mm	4987
Total Vehicle Length at Right Side	mm	4801
Weight of Ballast in Cargo Area	kg	53.5
Weight of Vehicle Components Removed	kg	31.3
Amount of Stoddard Solvent in Fuel Tank	L	71.5

List of components removed to meet test weight: Right taillight, rear floor mats, jack & tools, spare tire, trunk trim.

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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4987
2	Total Width	1880
3	Bumper Top Height	560
4	Bumper Bottom Height	460
5	Longitudinal Member Top Height	558
6	Distance between Longitudinal Members	795
7	Longitudinal Member Width	90
8	Engine Top Height	897
9	Engine Bottom Height	175
10	Engine and Gearbox Width	1110
11	Front Bumper-Engine Distance	503
12	Front Shock Absorber Fixing Height	874
13	Bonnet Leading Edge Height	823
14	Front Shock Absorber Fixing Width	1274
15	Front Bumper – Front Axle Distance	852
16	Front Axle – A-Pillar Distance	425
17	A-Pillar – B-Pillar Distance	1385
18	B-Pillar – Rear Axle Distance	1200
19	B-Pillar – C-Pillar Distance	767
20	Roof Sill Bottom Height	1262
21	Roof Sill Top Height	1469
22	Floor Sill Bottom Height	184
23	Floor Sill Top Height	347

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

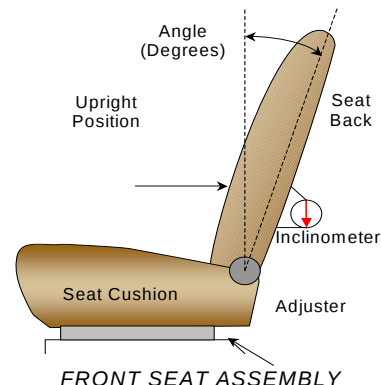
Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

NOMINAL DESIGN RIDING POSITION

The driver seat back is positioned as close as possible to the manufacturer's design angle. For the passenger seat back, seat back is adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated August 2013.

	Degrees
Driver Seat Back Angle	2.6° on headrest post
Passenger Seat Back Angle	-2.9° on headrest post



SEAT FORE/AFT POSITIONS

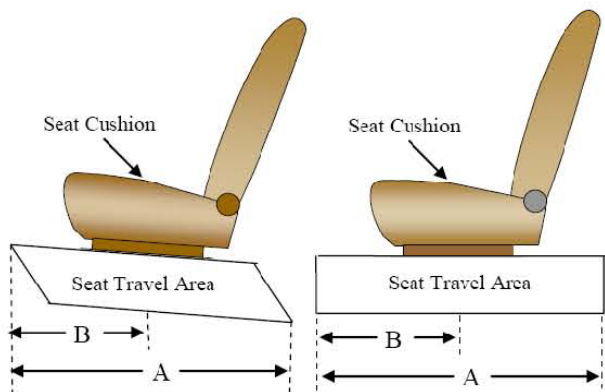
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated August 2013.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	298 mm	149 mm (foremost as 0)
Passenger Seat	240 mm	0 mm (foremost as 0)

SEAT BELT UPPER ANCHORAGES

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

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



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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

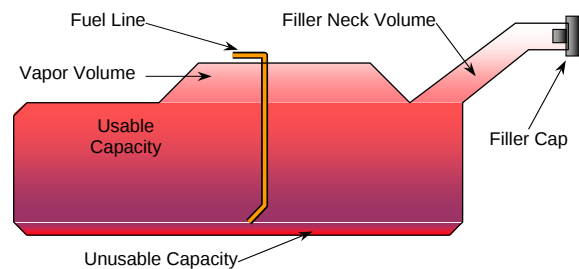
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	76.8
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	70.7 to 72.2
Actual Amount of Solvent used	71.5
1/3 of Usable Capacity	25.6

FUEL PUMP

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

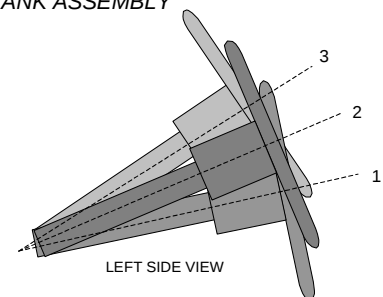
The vehicle is equipped with an electric fuel pump.
The fuel pump will pump fuel when the key is in the "ON" position. The fuel pipe is on the left side.



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

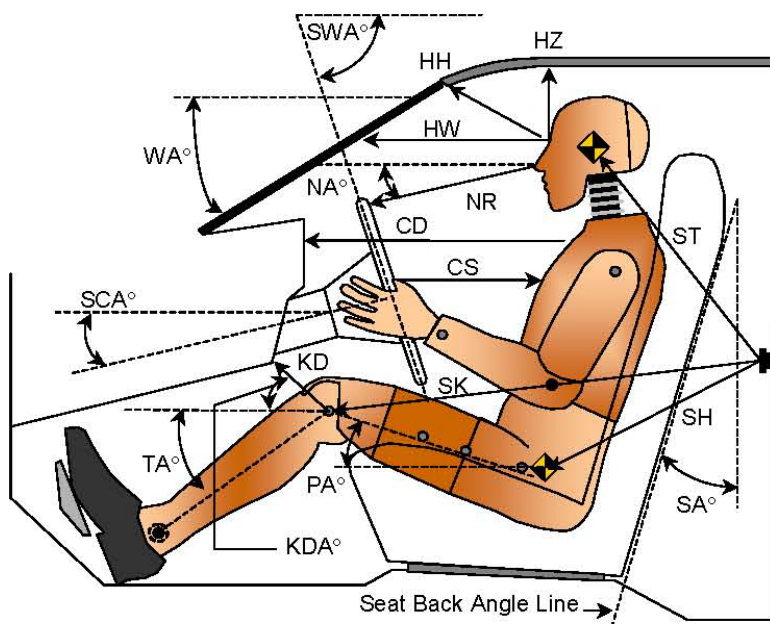
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	69.8	290
Geometric Center Position 2	67.6	265
Uppermost Position 3	65.4	240
Telescoping Steering Wheel Travel		50
Test Position	67.6	265

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014



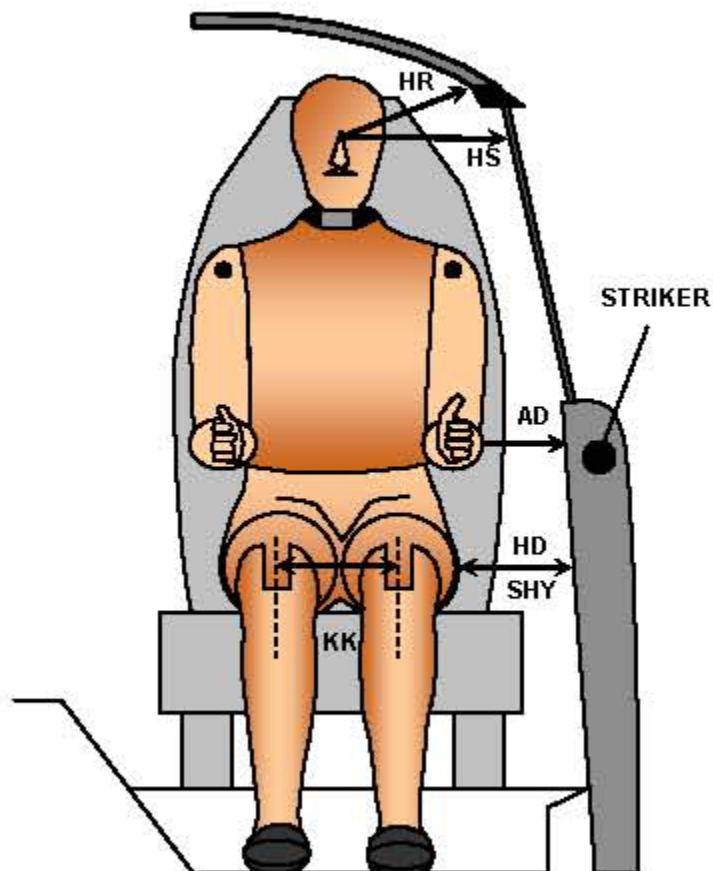
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		23.3		
SWA°	Steering Wheel Angle		67.6		
SCA°	Steering Column Angle		22.4		
SA°	Seat Back Angle (on headrest post)		2.6		-2.9
HZ	Head to Roof (Z)	202	90.0	185	90.0
HH	Head to Header	336	24.4	265	40.9
HW	Head to Windshield	635	0.0	593	0.0
NR	Nose to Rim	392	7.7		
CD	Chest to Dash	528		371	
CS	Chest to Steering Hub	311	3.4		
RA	Rim to Abdomen	195	0.0		
KDL	Left Knee to Dash	203	32.1	114	40.2
KDR	Right Knee to Dash	171	40.4	125	38.1
PA°	Pelvic Angle		23.7		19.0
TA°	Tibia Angle		37.8		46.0
SK	Striker to Knee	601	107.6	669	103.6
ST	Striker to Head	381	13.2	379	37.9
SH	Striker to H-Point	369	147.7	409	128.9

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014



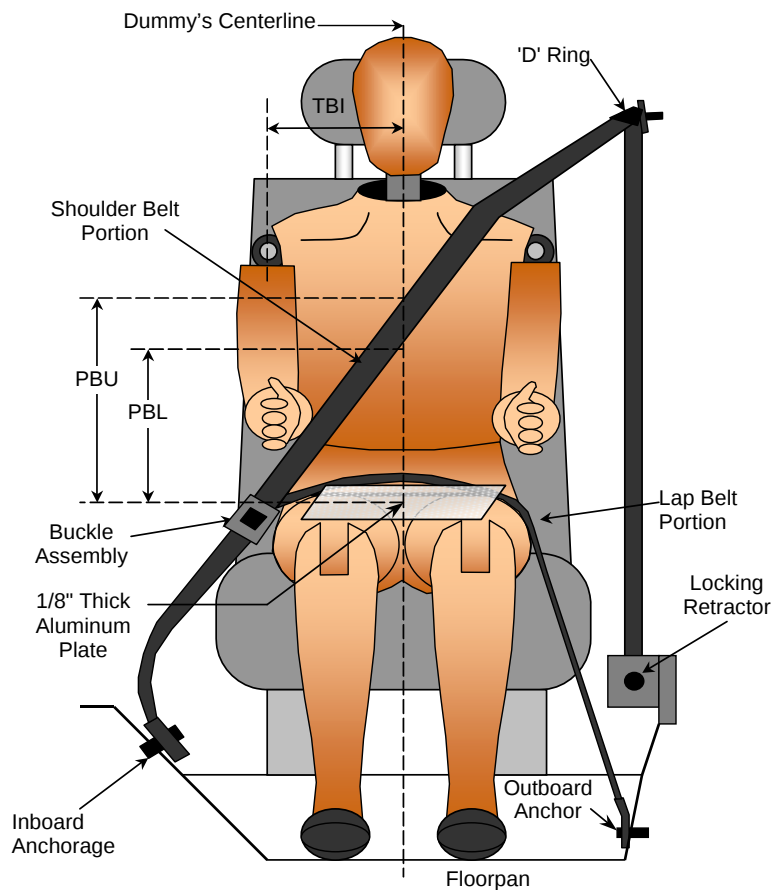
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	111	86
HD	H-Point to Door	145	252
HR	Head to Side Header	209	232
HS	Head to Side Window	332	357
KK	Knee to Knee	354	228
SHY	Striker to H-Point (Y Direction)	275	326
AA	Ankle to Ankle	340	183

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	370	330
PBL - Top surface of reference to belt lower edge	mm	300	250

BELT LENGTH DATA

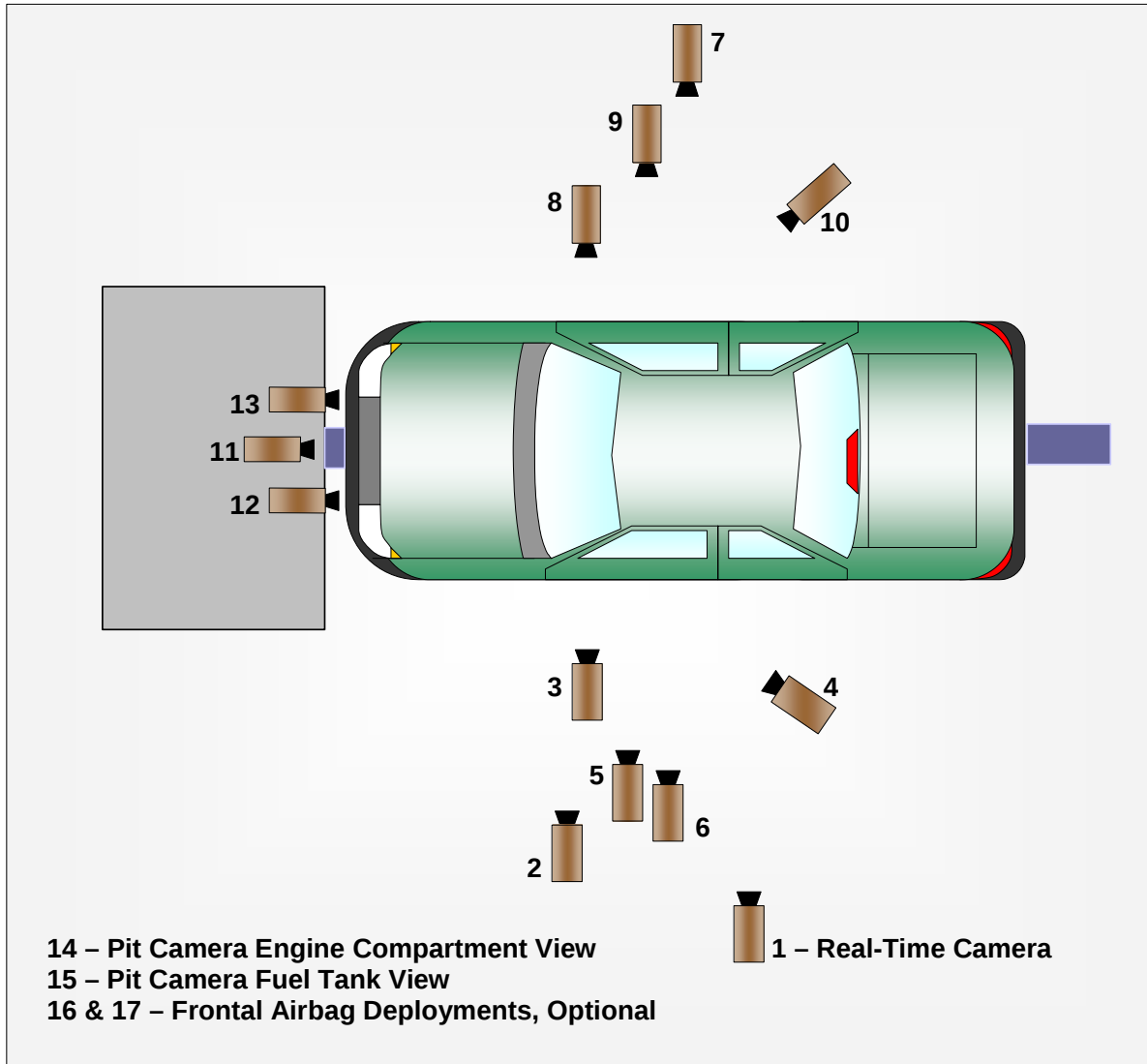
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	900	935
Lap Belt Length as measured on ATD	mm	450	485
Remainder of belt on reel	mm	1770	1700
Total Belt Length for Continuous Webbing Systems	mm	3120	3120

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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1570	-6810	-1860	35	1000
3	Left Front Half	1120	-5410	-1150	24	1000
4	Left Angle	5630	-4600	-1940	50	1000
5	Steering Column - Top	600	-5060	-1200	24	1000
6	Steering Column - Bottom	580	-5100	-800	24	1000
7	Right Overall	2240	6900	-1210	20	1000
8	Passenger Close-Up	1710	6820	-1930	35	1000
9	Right Front Half	1390	5430	-1260	24	1000
10	Right Angle	5620	5120	-1970	50	1000
11	Windshield	-50	0	-2810	20	1000
12	Driver Windshield	30	-450	-2030	8.5	1000
13	Passenger Windshield	30	450	-2303	8.5	1000
14	Pit Front	1100	0	3150	24	1000
15	Pit Rear	3070	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

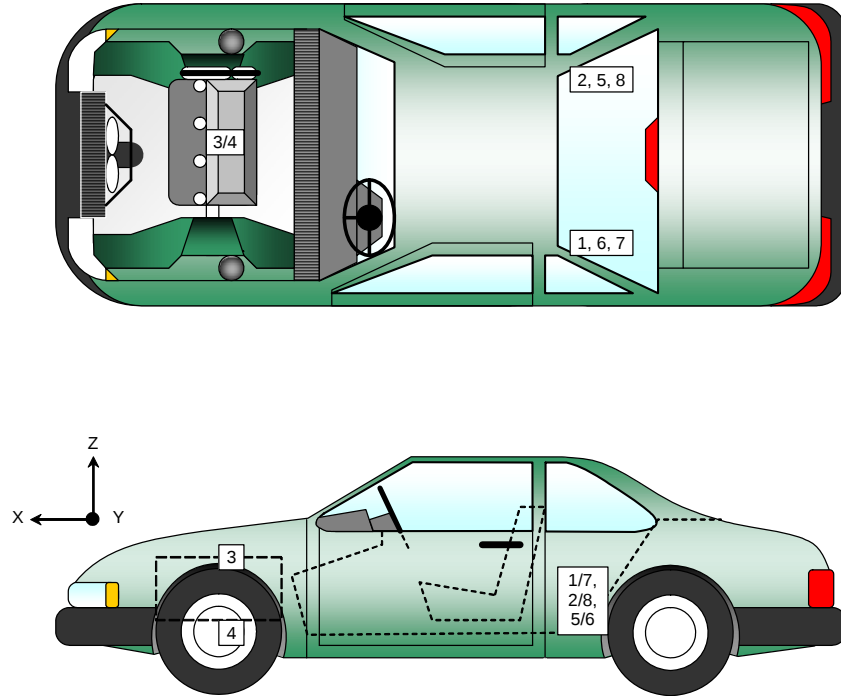
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 16 & 17 were not used for this test.

DATA SHEET NO. 7 VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	2020	-472	-237
2	Right Rear Crossmember Accelerometer – X Direction	2020	478	-237
3	Engine Top X	4153	25	-837
4	Engine Bottom X	4105	0	-168
5	Left Rear Crossmember Accelerometer – Z Direction	2020	-472	-237
6	Right Rear Crossmember Accelerometer – Z Direction	2020	478	-237
7	Left Rear Crossmember Accelerometer Redundant – X Direction	2020	-472	-237
8	Right Rear Crossmember Accelerometer Redundant – X Direction	2020	478	-237

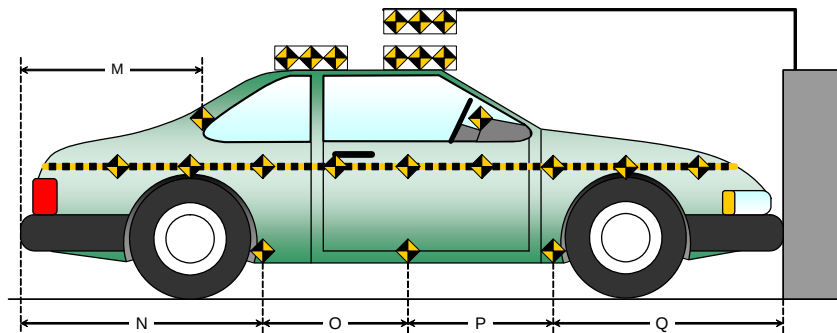
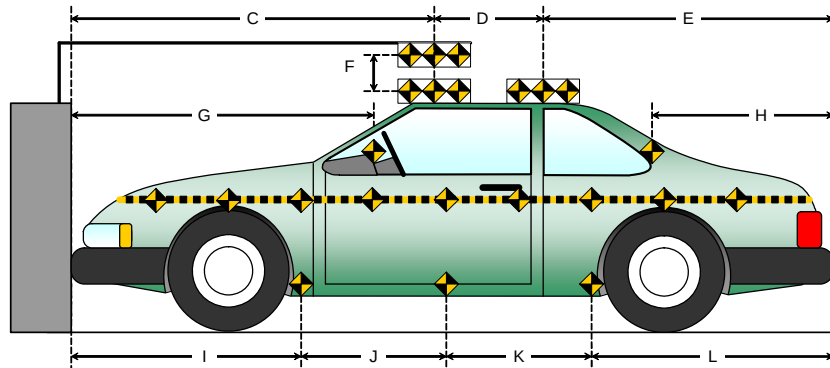
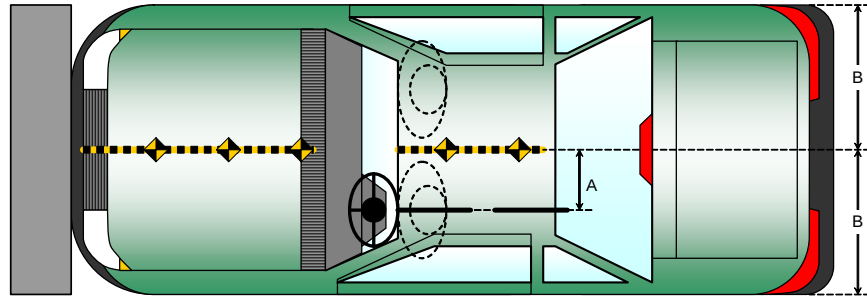
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: Q20154200
 Test Date: 6/05/2014

Item	Value (mm)
A	380
B	940
C	2530
D	615
E	1842
F	176
G	
H	1432
I	1277
J	1080
K	1080
L	1550
M	1432
N	1550
O	1080
P	1080
Q	1277



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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

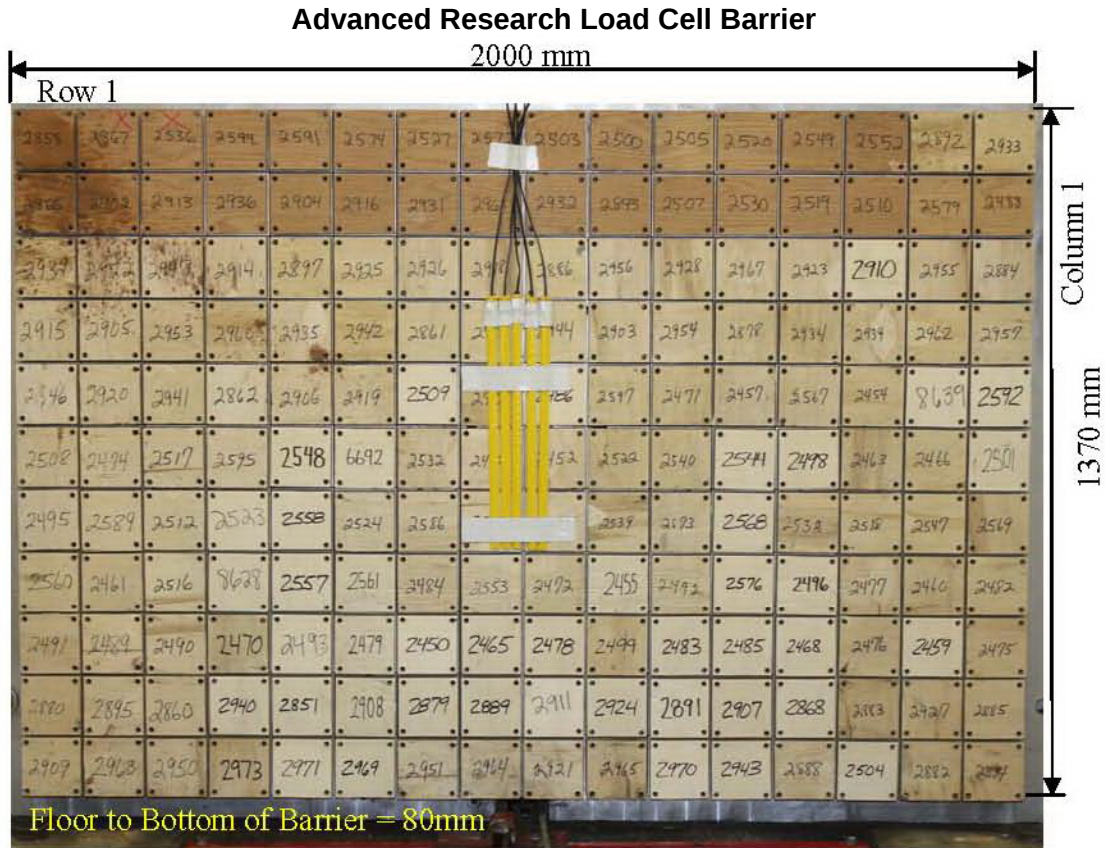


Photo for Reference Only

								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: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014

INSTRUMENTATION

Driver Dummy Data Channels	46
Passenger Dummy Data Channels	46
Vehicle Structure Accelerometers	8
Barrier Channels	528
Total	628

CAMERA COVERAGE

High-Speed Vehicle Onboard	0
High-Speed Offboard	14
Real-Time	2
Total	16

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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

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

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	805
Center	mm	750
Right Side	mm	761
Average	mm	772

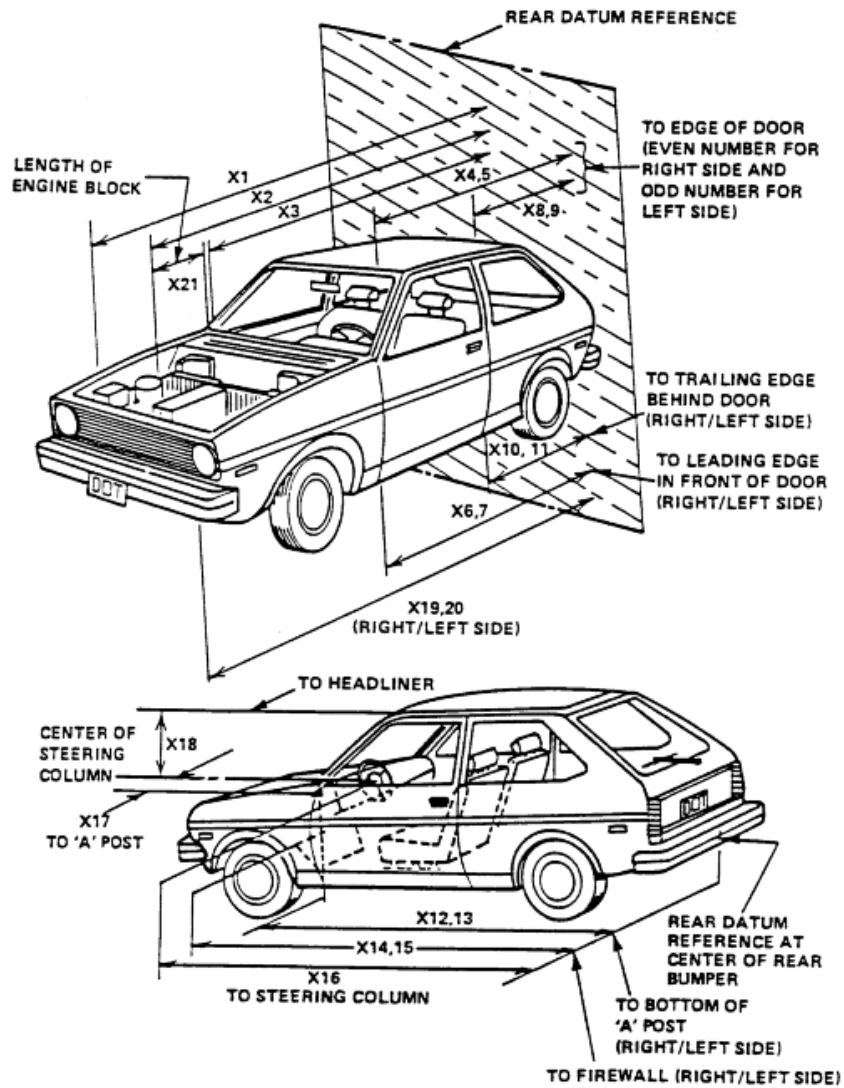
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	Disabled	Yes	Disabled
Torso/Pelvis Side Airbag	Yes	No	Yes	No
Knee Airbag	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: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4987	4413	574
2	RSOV to Front of Engine	mm	4292	4254	38
3	RSOV to Firewall	mm	3744	3722	22
4	RSOV to Upper Leading Edge of Right Door	mm	3363	3363	0
5	RSOV to Upper Leading Edge of Left Door	mm	3363	3361	2
6	RSOV to Lower Leading Edge of Right Door	mm	3419	3419	0
7	RSOV to Lower Leading Edge of Left Door	mm	3419	3419	0
8	RSOV to Upper Trailing Edge of Right Door	mm	2281	2281	0
9	RSOV to Upper Trailing Edge of Left Door	mm	2281	2281	0
10	RSOV to Lower Trailing Edge of Right Door	mm	2307	2307	0
11	RSOV to Lower Trailing Edge of Left Door	mm	2307	2308	-1
12	RSOV to Bottom of "A" Post of Right Side	mm	3422	3422	0
13	RSOV to Bottom of "A" Post of Left Side	mm	3422	3422	0
14	RSOV to Firewall, Right Side	mm	3503	3503	0
15	RSOV to Firewall, Left Side	mm	3503	3503	0
16	RSOV to Steering Column	mm	2904	2948	-44
17	Center of Steering Column to "A" Post	mm	366	376	-10
18	Center of Steering Column to Headliner	mm	405	442	-37
19	RSOV to Right Side of Front Bumper	mm	4801	4440	361
20	RSOV to Left Side of Front Bumper	mm	4801	4472	329
21	Length of Engine Block	mm	630	630	0
RD	RSOV to Right Side of Dash Panel	mm	3110	3110	0
CD	RSOV to Center of Dash Panel	mm	3123	3123	0
LD	RSOV to Left Side of Dash Panel	mm	3112	3112	0

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014

VEHICLE INFORMATION

VIN: KMHGN4JE9FU018592 Wheelbase (mm): 3010
Vehicle Size Category: Sedan Test Weight (kg): 2192.5

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15

Cal. Procedure/Interval: MGA procedure / 6 month

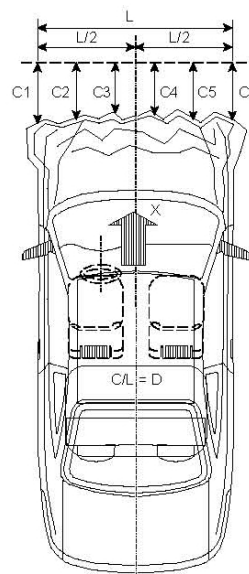
Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.3

Velocity Change (km/h): No valid data

Time of Separation (msec): No valid data



CRUSH PROFILE

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1520

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4801	4472	329
C2	Crush zone 2 at left side	mm	4912	4470	442
C3	Crush zone 3 at left side	mm	4954	4497	457
C4	Crush zone 4 at right side	mm	4954	4445	509
C5	Crush zone 5 at right side	mm	4912	4453	459
C6	Crush zone 6 at right side	mm	4801	4440	361
L	C1 TO C6	mm	1520	1515	5

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

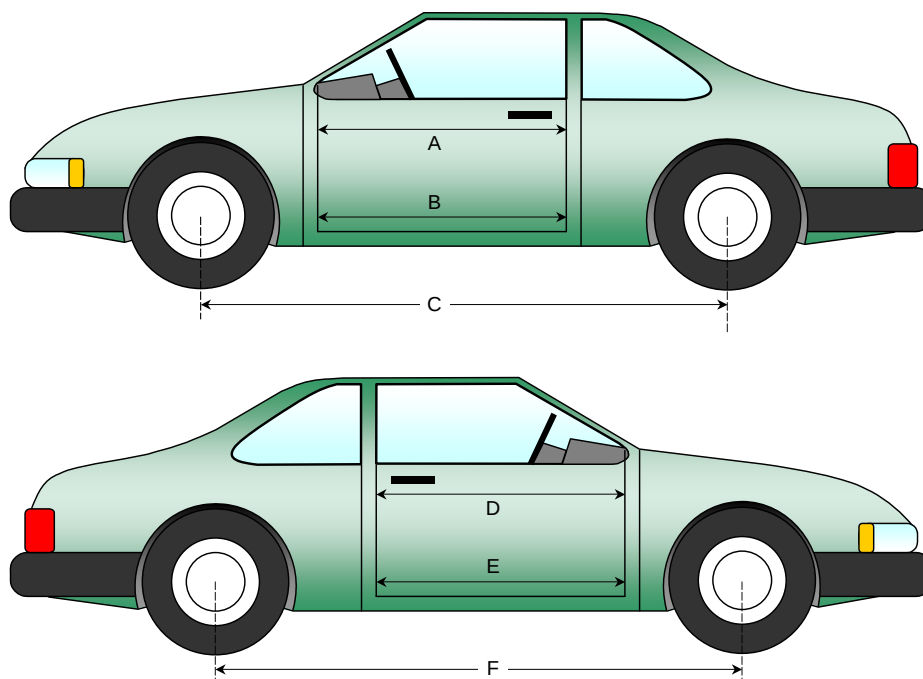
NHTSA No.: O20154200
Test Date: 6/05/2014

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1040	1038	2
B	Left Side Lower	mm	968	967	1
D	Right Side Upper	mm	1048	1040	8
E	Right Side Lower	mm	968	968	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3010	2945	65
F	Right Side Wheelbase	mm	3010	2938	72



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

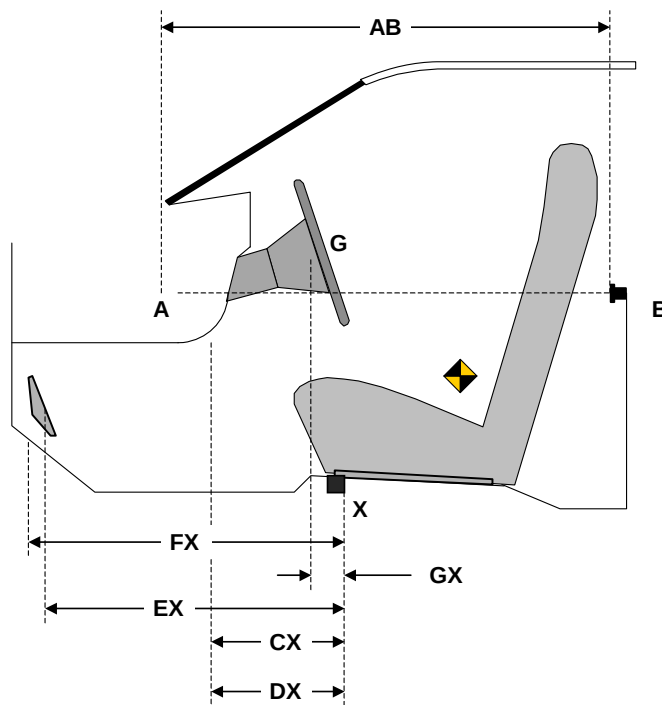
Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	730	730	0
CX	Left Knee Bolster to X	mm	271	271	0
DX	Right Knee Bolster to X	mm	257	256	1
EX	Brake Pedal to X	mm	593	587	6
FX	Foot Rest to X	mm	664	664	0
GX	Center of Steering Column Wheel Hub to X	mm	54	109	-55

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: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

Windshield Mounting Details:

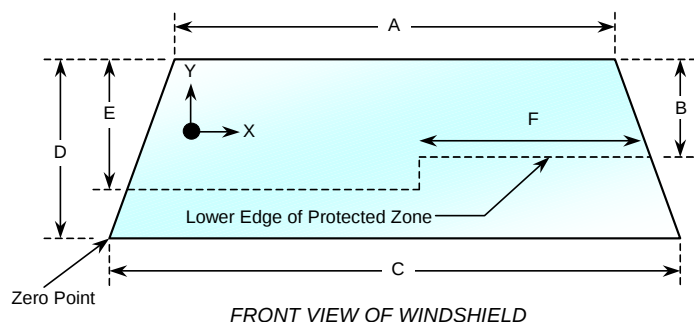
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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	2139	2139	100
Right Side	2139	2139	100
Total	4278	4278	100



Item	Units	Value
A	mm	1218
B	mm	401
C	mm	1504
D	mm	778
E	mm	470
F	mm	498

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: 2015 Hyundai Genesis AWD 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
Test Date: 6/05/2014

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.3°C Test Time: 11:18 a.m.

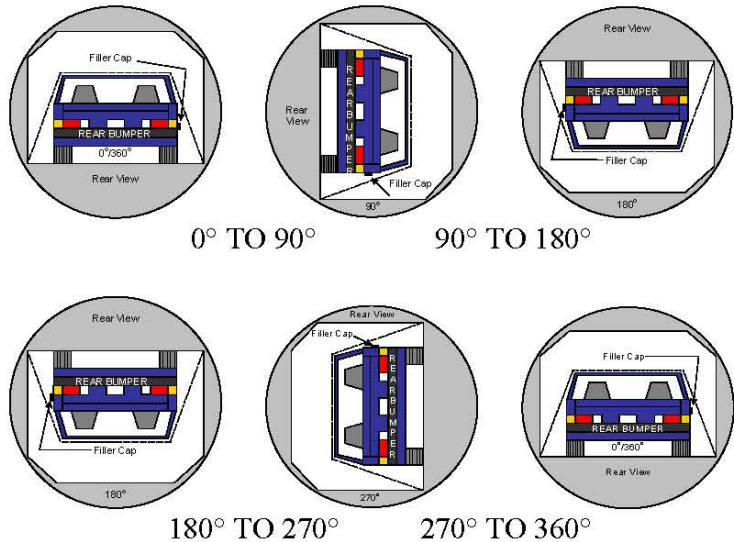
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: None

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

Test Vehicle: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014

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°	114	300	414
90° to 180°	112	300	412
180° to 270°	108	300	408
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

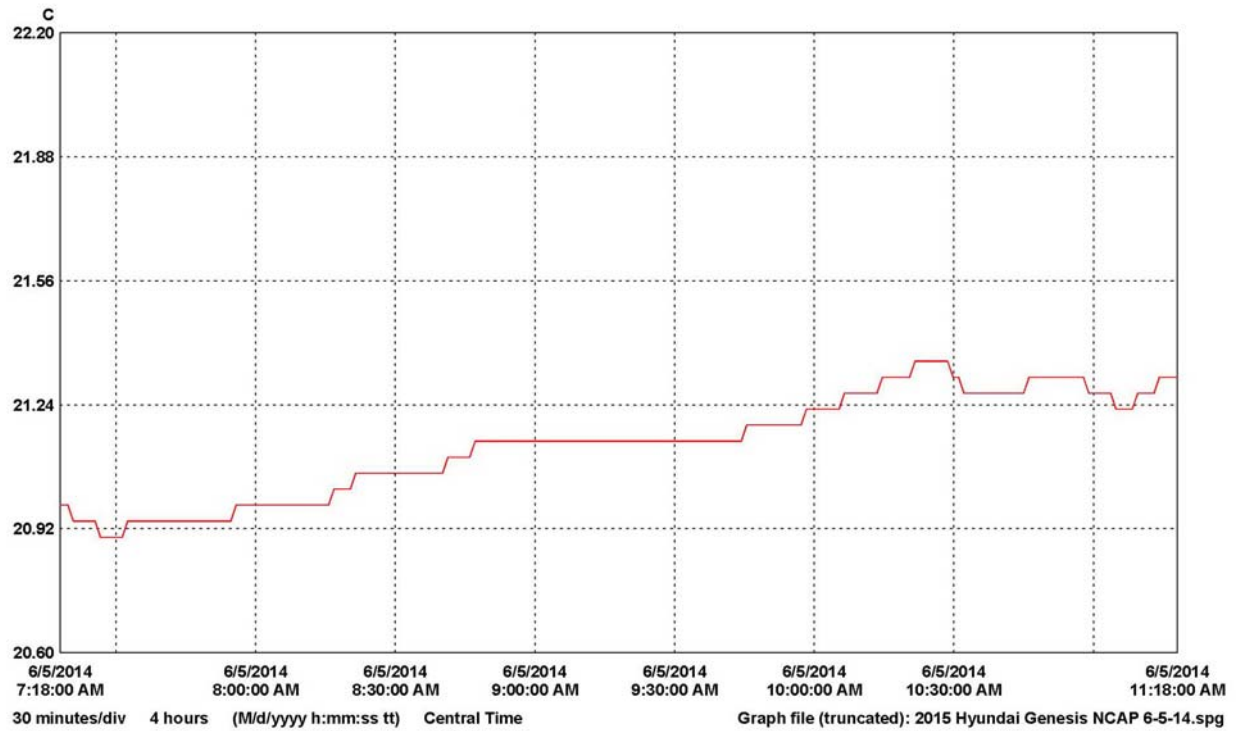
SOLVENT SPILLAGE LOCATION TABLE

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: 2015 Hyundai Genesis AWD 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: O20154200
 Test Date: 6/05/2014



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	10102162	MGATemp_10102162	1		21.35	21.14	20.90	C	Temperature	10102162_MGATemp_10102162.spl

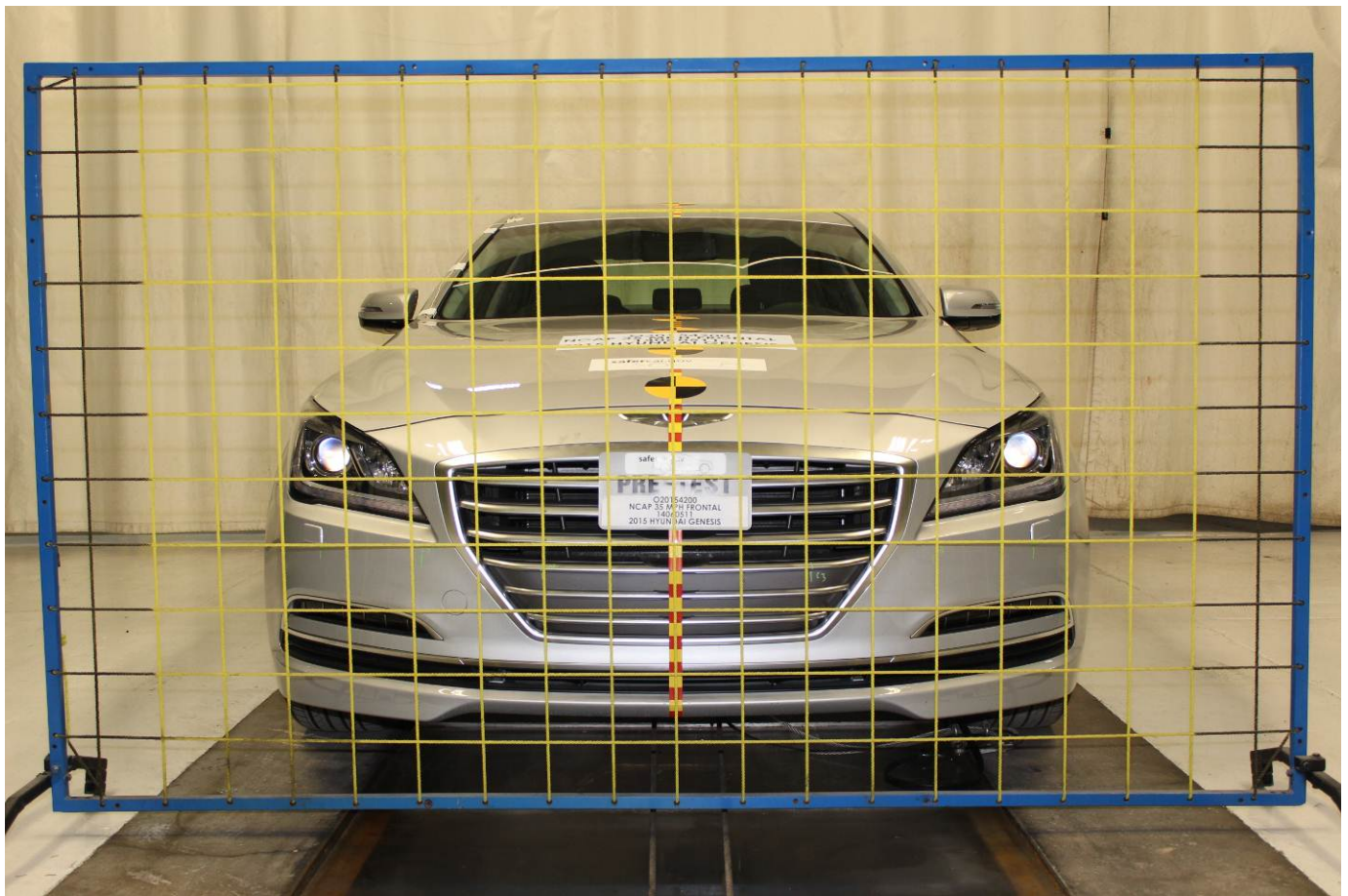
**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS

		<u>Page No.</u>
Photo No. 1.	Load Cell Location	A-1
Photo No. 2.	Load Cell Wall	A-1
Photo No. 3.	Manufacturer's Label	A-2
Photo No. 4.	Tire Placard	A-2
Photo No. 5.	Load Carrying Capacity Reduced Label	A-3
Photo No. 6.	2015 Hyundai Genesis Frontal As Delivered	A-3
Photo No. 7.	Left Rear 3-4 View, As Received	A-4
Photo No. 8.	Pre-Test Front View of Test Vehicle	A-4
Photo No. 9.	Post-Test Front View of Test Vehicle	A-5
Photo No. 10.	Pre-Test Left View of Test Vehicle	A-5
Photo No. 11.	Post-Test Left View of Test Vehicle	A-6
Photo No. 12.	Pre-Test Right View of Test Vehicle	A-6
Photo No. 13.	Post-Test Right View of Test Vehicle	A-7
Photo No. 14.	Pre-Test Right Front 3-4 View	A-7
Photo No. 15.	Post-Test Right Front 3-4 View	A-8
Photo No. 16.	Pre-Test Left Rear 3-4 View	A-8
Photo No. 17.	Post-Test Left Rear 3-4 View	A-9
Photo No. 18.	Pre-Test Windshield View	A-9
Photo No. 19.	Post-Test Windshield View	A-10
Photo No. 20.	Pre-Test Engine Compartment View	A-10
Photo No. 21.	Post-Test Engine Compartment View	A-11
Photo No. 22.	Pre-Test Fuel Filler Cap View	A-11
Photo No. 23.	Post-Test Fuel Filler Cap View	A-12
Photo No. 24.	Pre-Test Front Underbody View	A-12
Photo No. 25.	Post-Test Front Underbody View	A-13
Photo No. 26.	Pre-Test Mid Front Underbody View	A-13
Photo No. 27.	Post-Test Mid Front Underbody View	A-14
Photo No. 28.	Pre-Test Mid Rear Underbody View	A-14
Photo No. 29.	Post-Test Mid Rear Underbody View	A-15

		<u>Page No.</u>
Photo No. 30.	Pre-Test Rear Underbody View	A-15
Photo No. 31.	Post-Test Rear Underbody View	A-16
Photo No. 32.	Pre-Test Dummy Cable Routing	A-16
Photo No. 33.	Post-Test Dummy Cable Routing	A-17
Photo No. 34.	Pre-Test Driver Dummy Front View	A-17
Photo No. 35.	Post-Test Driver Dummy Front View	A-18
Photo No. 36.	Pre-Test Driver Dummy Window View	A-18
Photo No. 37.	Post-Test Driver Dummy Window View	A-19
Photo No. 38.	Pre-Test Driver Dummy and Vehicle Interior (Door Open)	A-19
Photo No. 39.	Post-Test Driver Dummy and Vehicle Interior (Door Open)	A-20
Photo No. 40.	Pre-Test Driver's Seat Fore-Aft Markings	A-20
Photo No. 41.	Post-Test Driver's Seat Fore-Aft Markings	A-21
Photo No. 42.	Pre-Test View of Belt Anchorage for Driver Dummy	A-21
Photo No. 43.	Post-Test View of Belt Anchorage for Driver Dummy	A-22
Photo No. 44.	Pre-Test Driver Dummy Feet	A-22
Photo No. 45.	Post-Test Driver Dummy Feet	A-23
Photo No. 46.	Pre-Test Driver's Side Knee Bolster (without dummy)	A-23
Photo No. 47.	Post-Test Driver's Side Knee Bolster (without dummy)	A-24
Photo No. 48.	Pre-Test Driver's Side Floorpan	A-24
Photo No. 49.	Post-Test Driver's Side Floorpan	A-25
Photo No. 50.	Post-Test Driver Dummy Face	A-25
Photo No. 51.	Post-Test Driver Dummy Contact with Airbag	A-26
Photo No. 52.	Post-Test Driver Dummy Contact with Headrest	A-26
Photo No. 53.	Post-Test Driver Dummy Contact with Knee Airbag	A-27
Photo No. 54.	Pre-Test View of the Steering Wheel	A-27
Photo No. 55.	Post-Test View of the Steering Wheel	A-28
Photo No. 56.	Pre-Test Passenger Dummy Front View	A-28
Photo No. 57.	Post-Test Passenger Dummy Front View	A-29
Photo No. 58.	Pre-Test Passenger Dummy Window View	A-29
Photo No. 59.	Post-Test Passenger Dummy Window View	A-30

		<u>Page No.</u>
Photo No. 60.	Pre-Test Passenger Dummy and Vehicle Interior (Door Open)	A-30
Photo No. 61.	Post-Test Passenger Dummy and Vehicle Interior (Door Open)	A-31
Photo No. 62.	Pre-Test Passenger's Seat Fore-Aft Markings	A-31
Photo No. 63.	Post-Test Passenger's Seat Fore-Aft Markings	A-32
Photo No. 64.	Pre-Test View of Belt Anchorage for Passenger Dummy	A-32
Photo No. 65.	Post-Test View of Belt Anchorage for Passenger Dummy	A-33
Photo No. 66.	Pre-Test Passenger Dummy Feet	A-33
Photo No. 67.	Post-Test Passenger Dummy Feet	A-34
Photo No. 68.	Pre-Test Passenger's Side Knee Bolster (without dummy)	A-34
Photo No. 69.	Post-Test Passenger's Side Knee Bolster (without dummy)	A-35
Photo No. 70.	Pre-Test Passenger's Side Floorpan	A-35
Photo No. 71.	Post-Test Passenger's Side Floorpan	A-36
Photo No. 72.	Post-Test Passenger Dummy Face	A-36
Photo No. 73.	Post-Test Passenger Dummy Contact with Airbag	A-37
Photo No. 74.	Post-Test Passenger Dummy Contact with Headrest	A-37
Photo No. 75.	Post-Test Passenger Dummy Contact with Glovebox	A-38
Photo No. 76.	Ballast Installed in Vehicle	A-38
Photo No. 77.	Post-Test Stoddard Solvent Spillage Location View	A-39
Photo No. 78.	Post-Test Speed Trap Read-Out	A-39
Photo No. 79.	Vehicle at 0 Degree on Static Rollover Device	A-40
Photo No. 80.	Vehicle at 90 Degrees on Static Rollover Device	A-40
Photo No. 81.	Vehicle at 180 Degrees on Static Rollover Device	A-41
Photo No. 82.	Vehicle at 270 Degrees on Static Rollover Device	A-41
Photo No. 83.	Vehicle at 360 Degrees on Static Rollover Device	A-42
Photo No. 84.	2015 Hyundai Genesis Frontal Impact Event	A-42
Photo No. 85.	Monroney Label Photograph	A-43



Load Cell Location



Load Cell Wall


MANUFACTURED IN KOREA BY
HYUNDAI MOTOR COMPANY
 MAR/28/14 GVWR 5511 lbs PAINT Y6S
 GAWR FRONT 2800 lbs GAWR REAR 2921 lbs TRIM RRY
 THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S.A. FEDERAL
 MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS
 IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE
 V.I.N KMHG4JE9FU018592
 PASSENGER CAR



020154200

Manufacturer's Label


TIRE AND LOADING INFORMATION
RENSEIGNEMENTS SUR LES PNEUS ET LE CHARGEMENT

SEATING CAPACITY NOMBRE DE PLACES		TOTAL 5	FRONT AVANT 2	REAR ARRIÈRE 3
--------------------------------------	--	---------	------------------	-------------------

The combined weight of occupants and cargo should never exceed 410 kg or 904 lbs.
 Le poids total des occupants et du chargement ne doit jamais dépasser 410 kg ou 904 lbs.

TIRE PNEU	SIZE DIMENSIONS	COLD TIRE PRESSURE PRESSION DES PNEUS À FROID
FRONT AVANT	245/45R18	230kPa, 33psi
REAR ARRIÈRE	245/45R18	230kPa, 33psi
SPARE DE SECOURS	T135/80R18	420kPa, 60psi

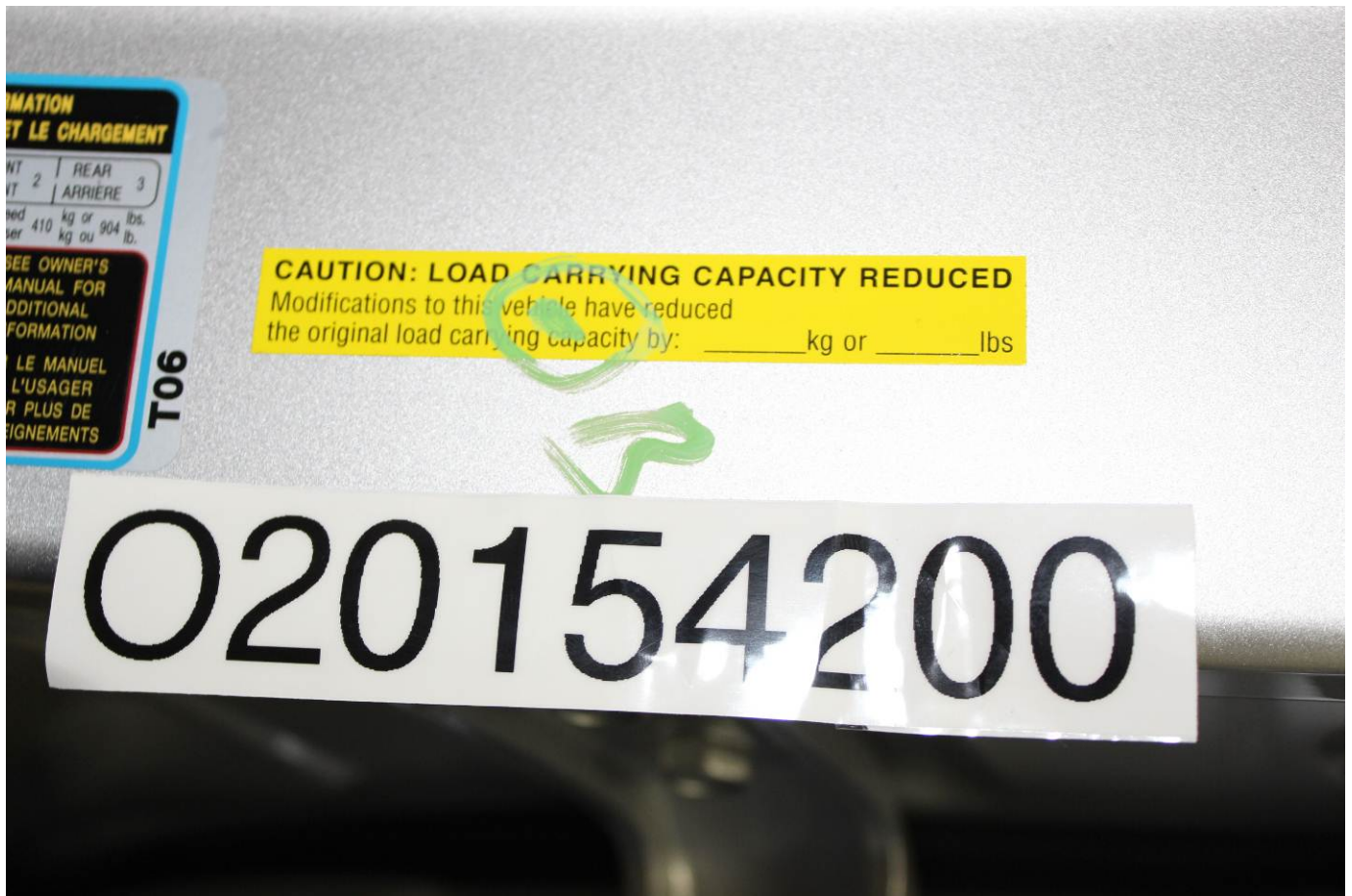
SEE OWNER'S
 MANUAL FOR
 ADDITIONAL
 INFORMATION
 VOIR LE MANUEL
 DE L'USAGER
 POUR PLUS DE
 RENSEIGNEMENTS

CAUTION
 Modification
 the original

106

020154200

Tire Placard



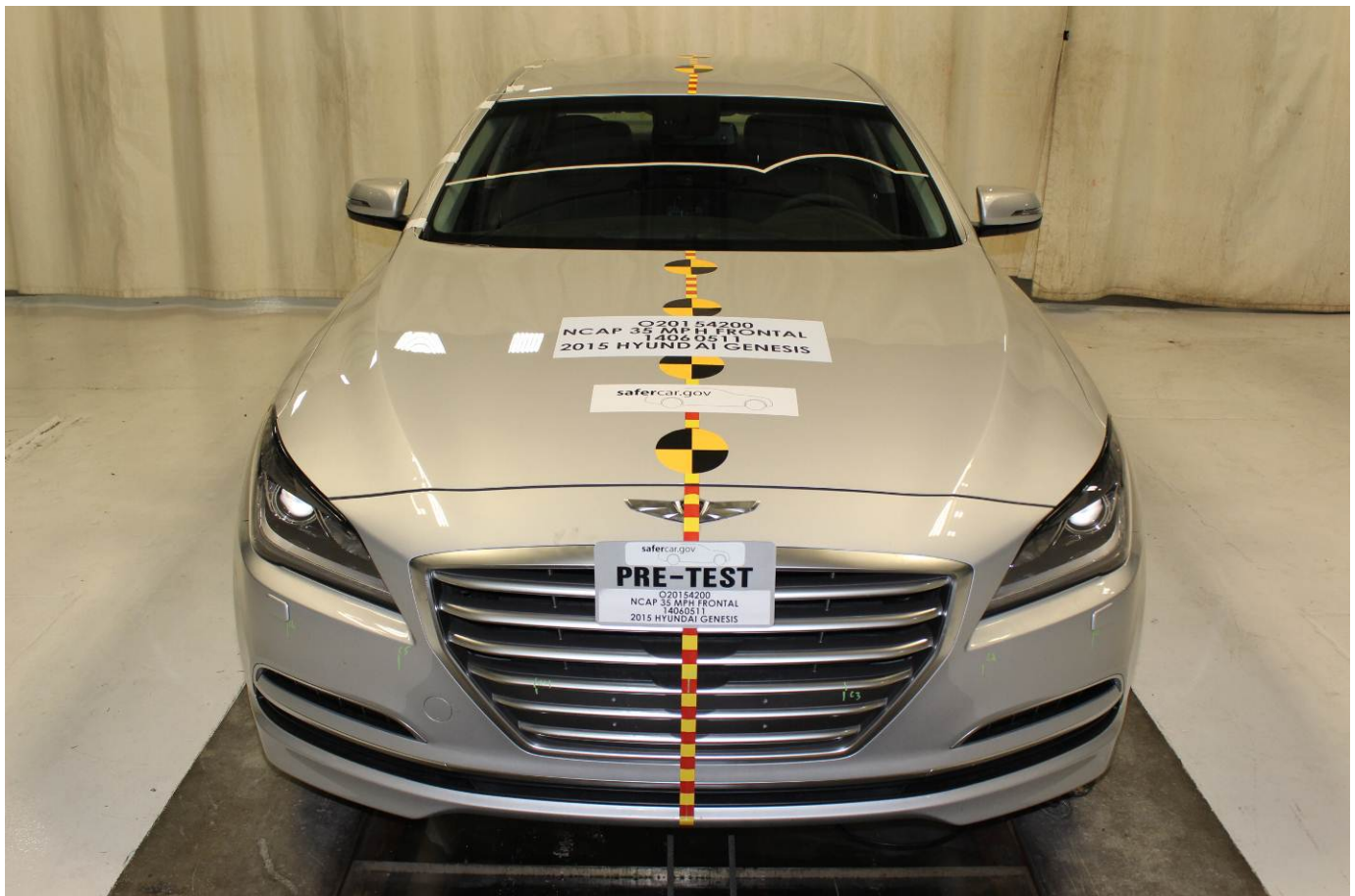
Load Carrying Capacity Reduced Label



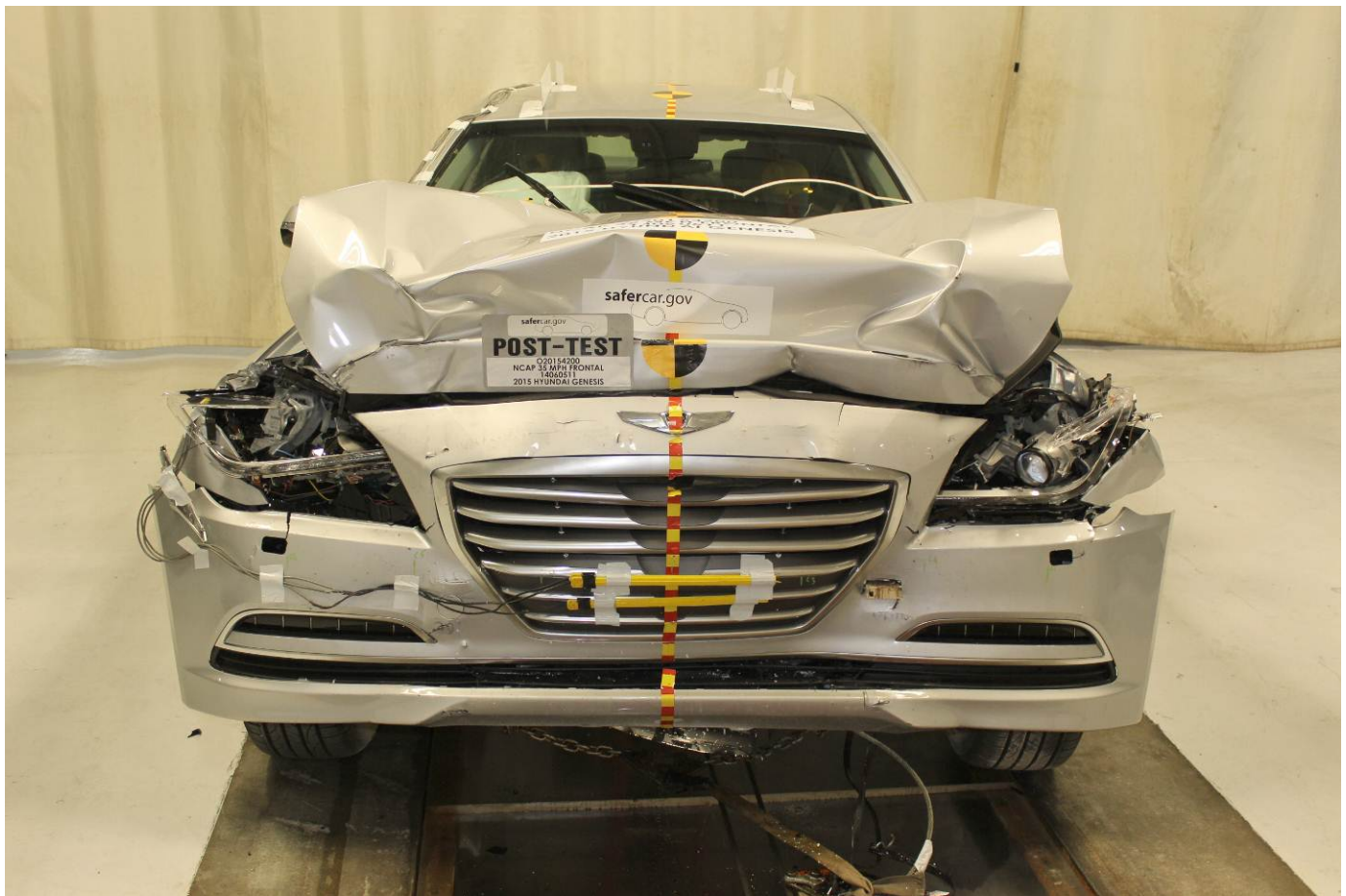
2015 Hyundai Genesis Frontal As Delivered



Left Rear 3-4 View, As Received



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle



Pre-Test Left View of Test Vehicle



Post-Test Left View of Test Vehicle



Pre-Test Right View of Test Vehicle



Post-Test Right View of Test Vehicle



Pre-Test Right Front 3-4 View



Post-Test Right Front 3-4 View



Pre-Test Left Rear 3-4 View



Post-Test Left Rear 3-4 View



Pre-Test Windshield View



Post-Test Windshield View



Pre-Test Engine Compartment View



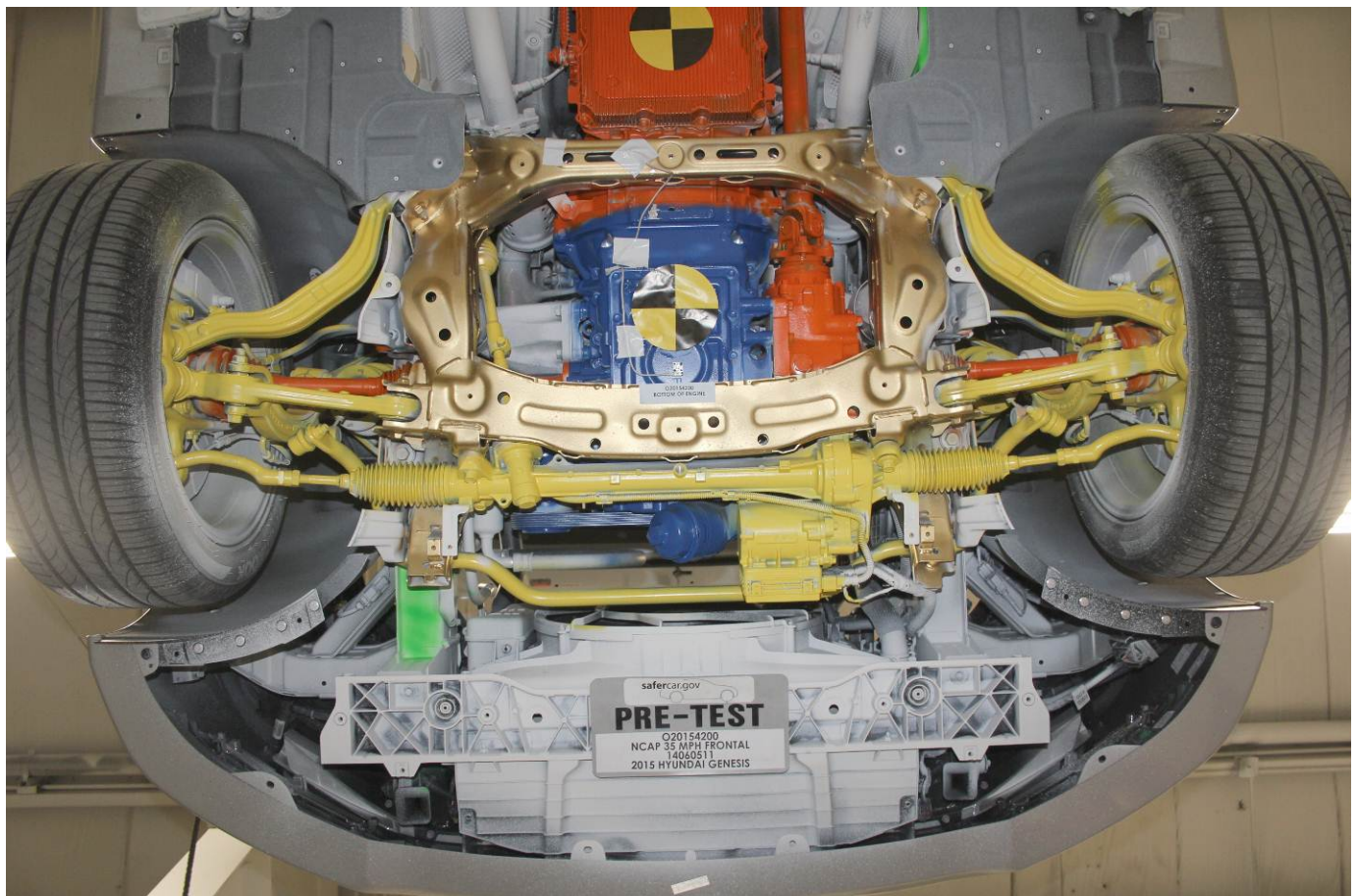
Post-Test Engine Compartment View



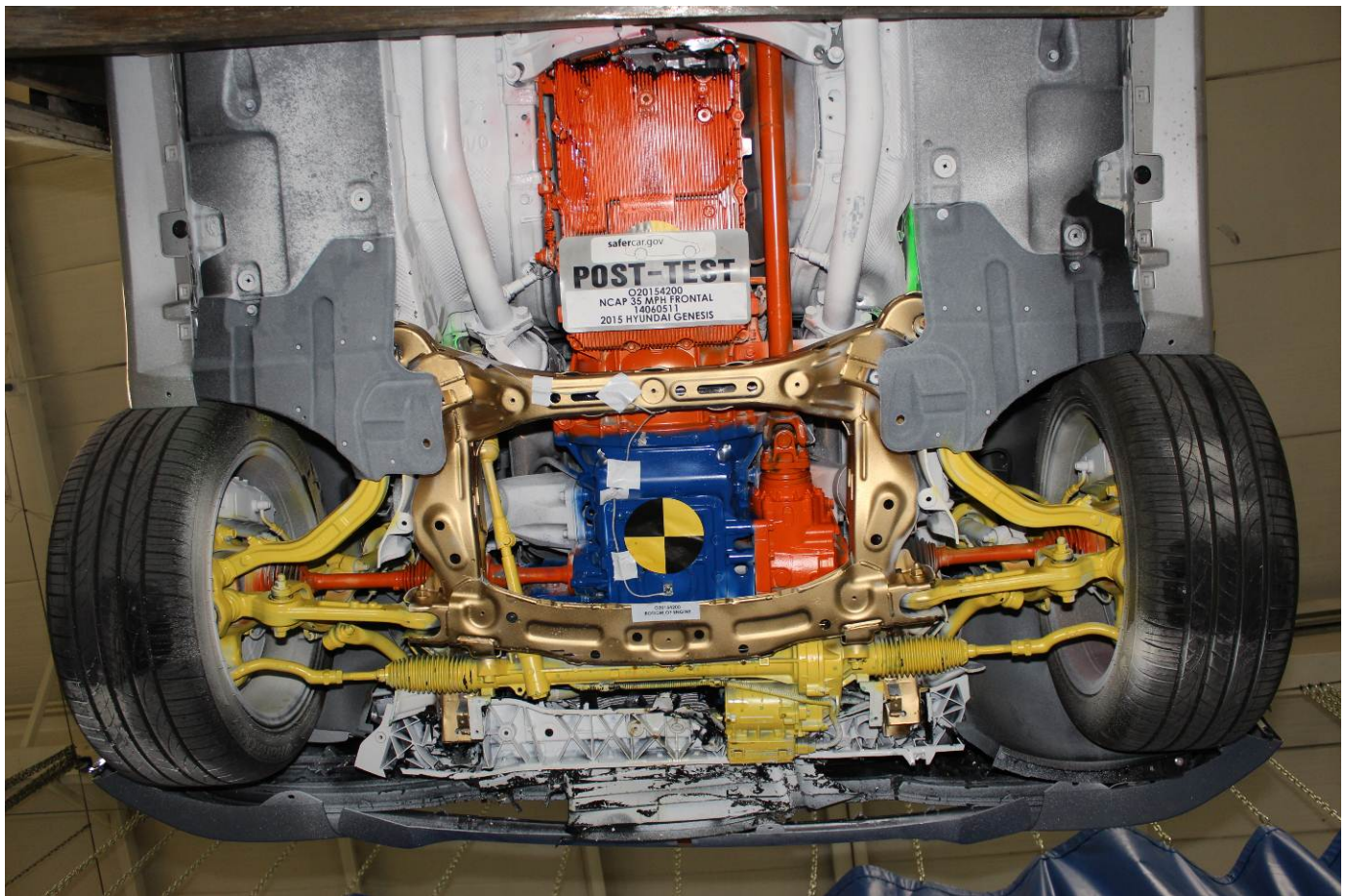
Pre-Test Fuel Filler Cap View



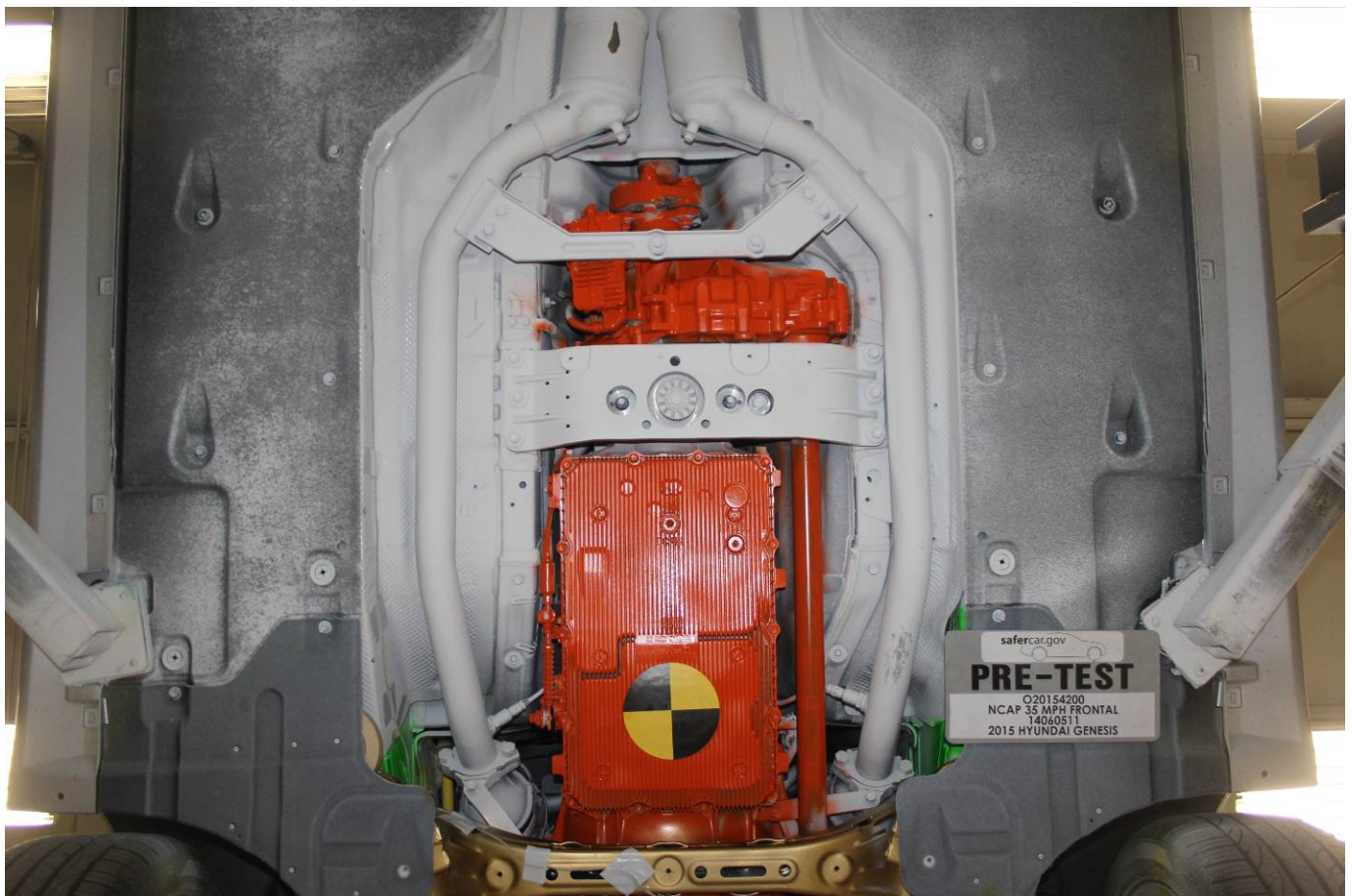
Post-Test Fuel Filler Cap View



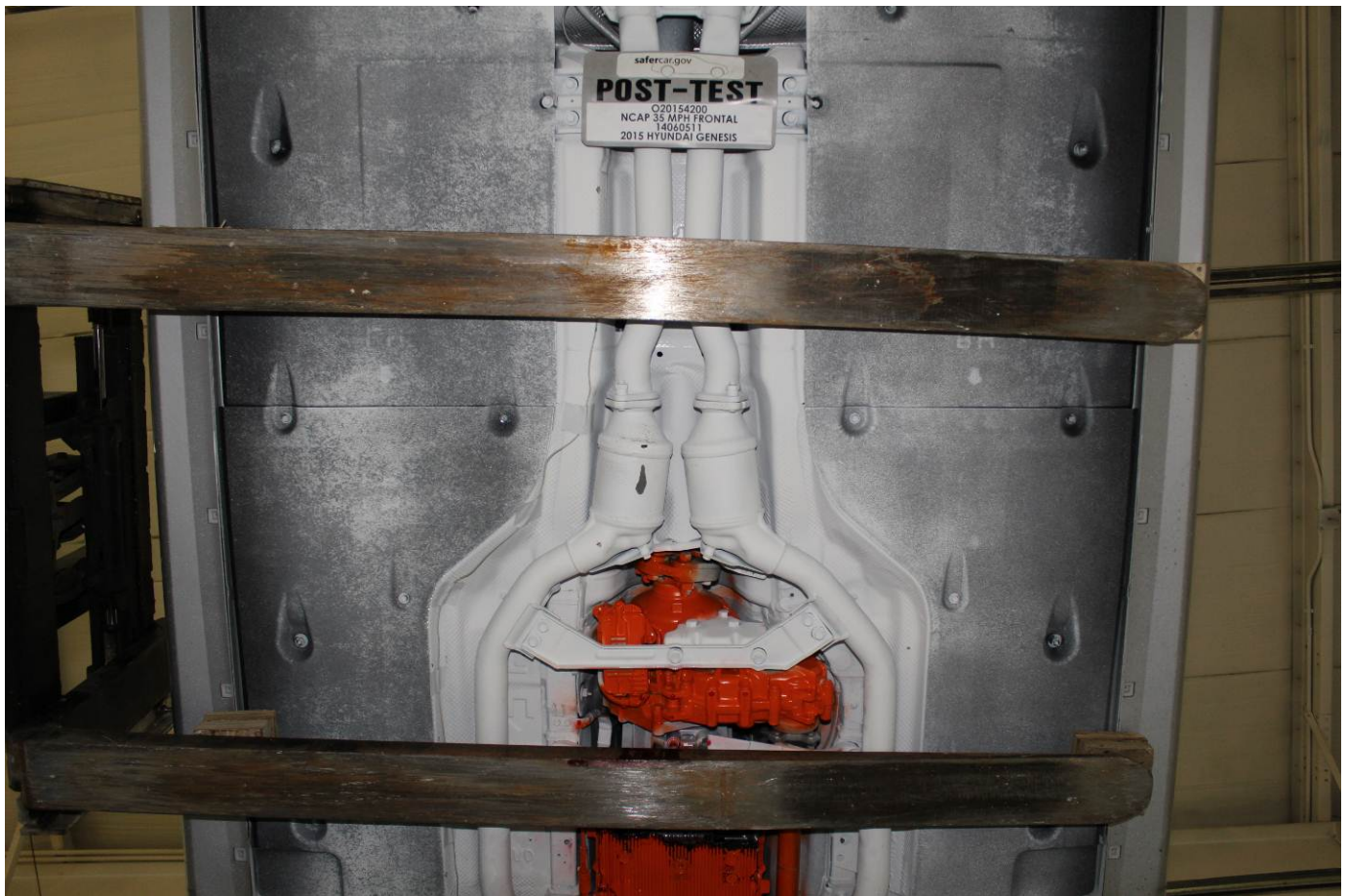
Pre-Test Front Underbody View



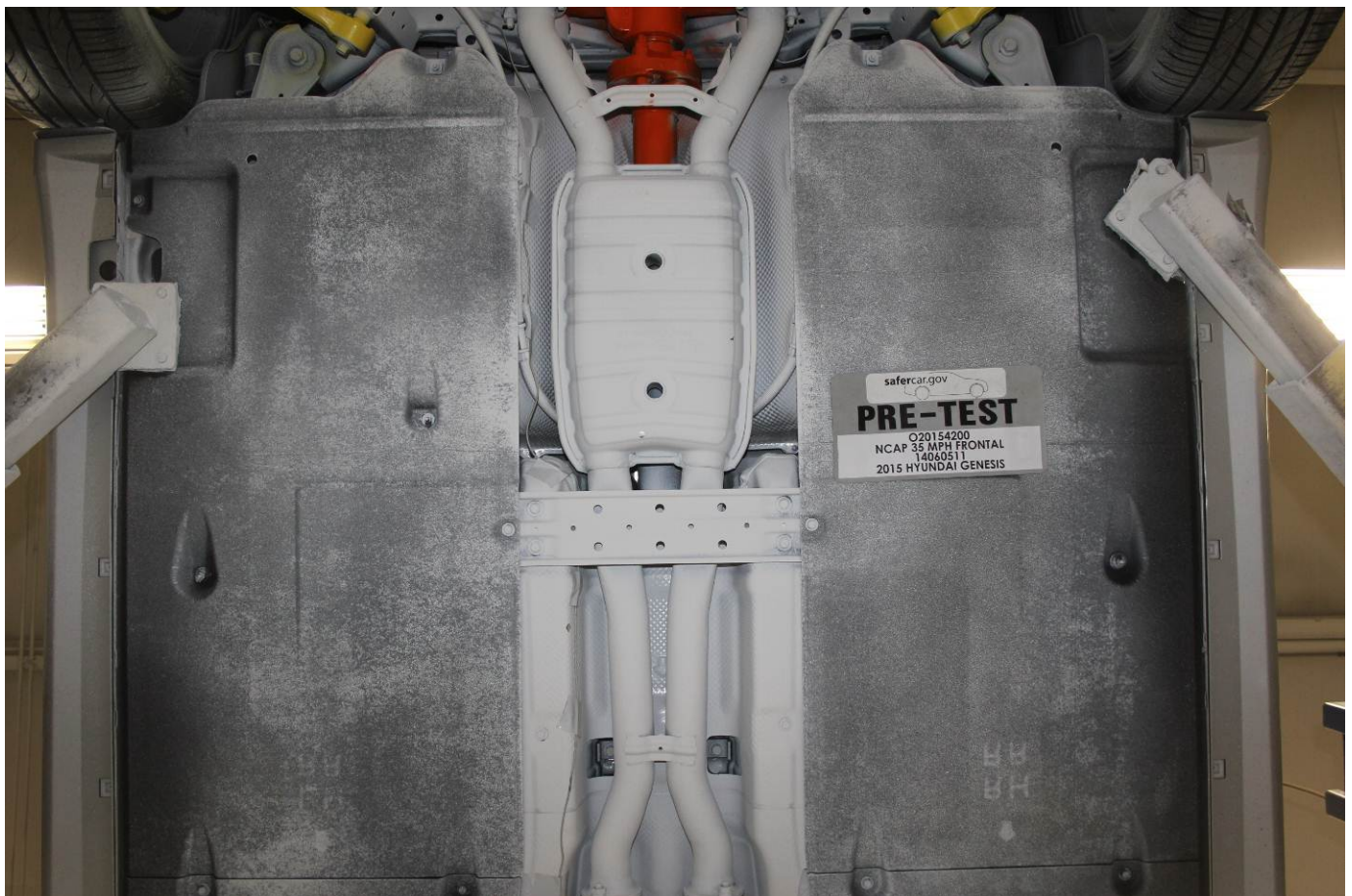
Post-Test Front Underbody View



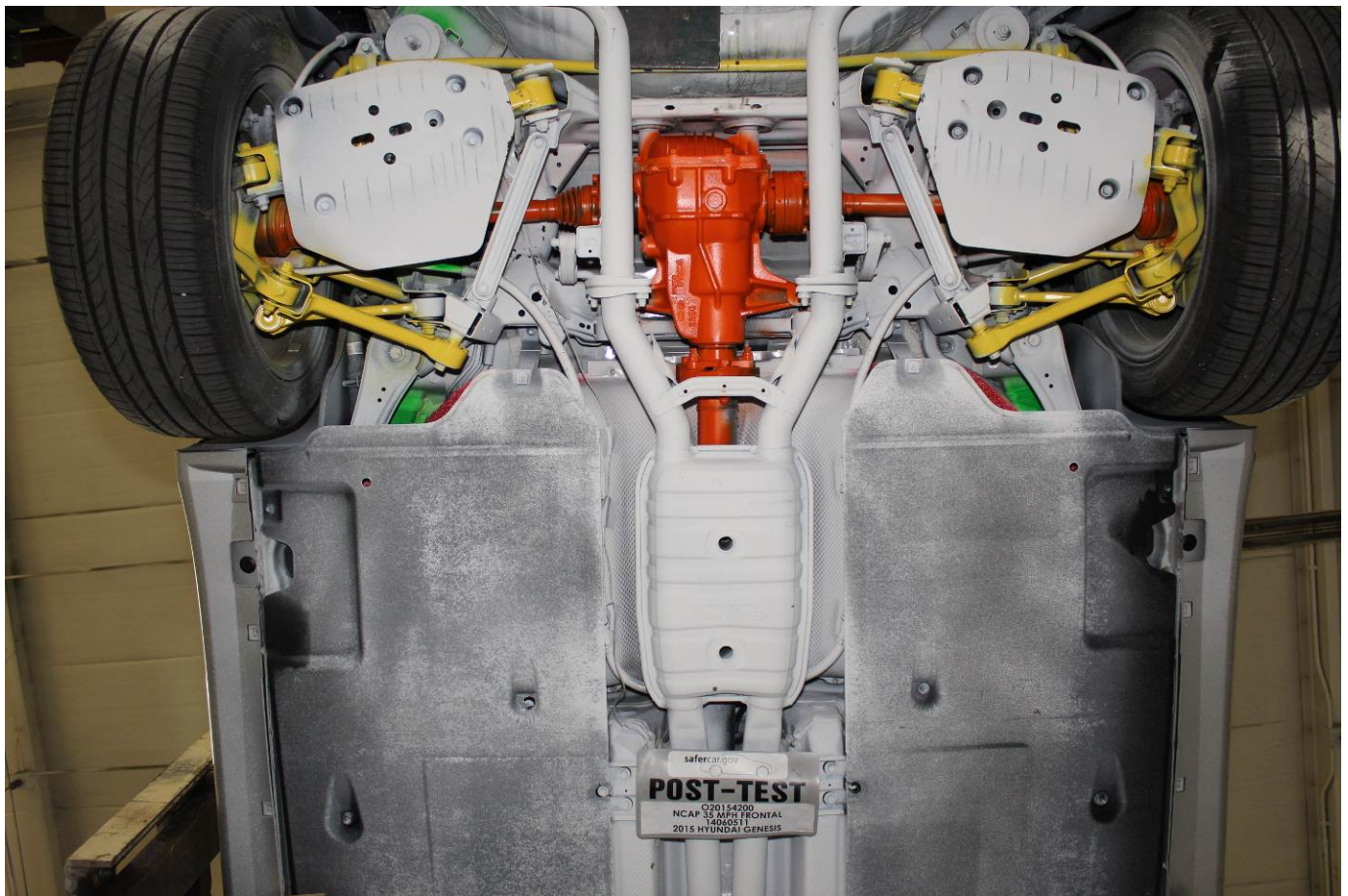
Pre-Test Mid Front Underbody View



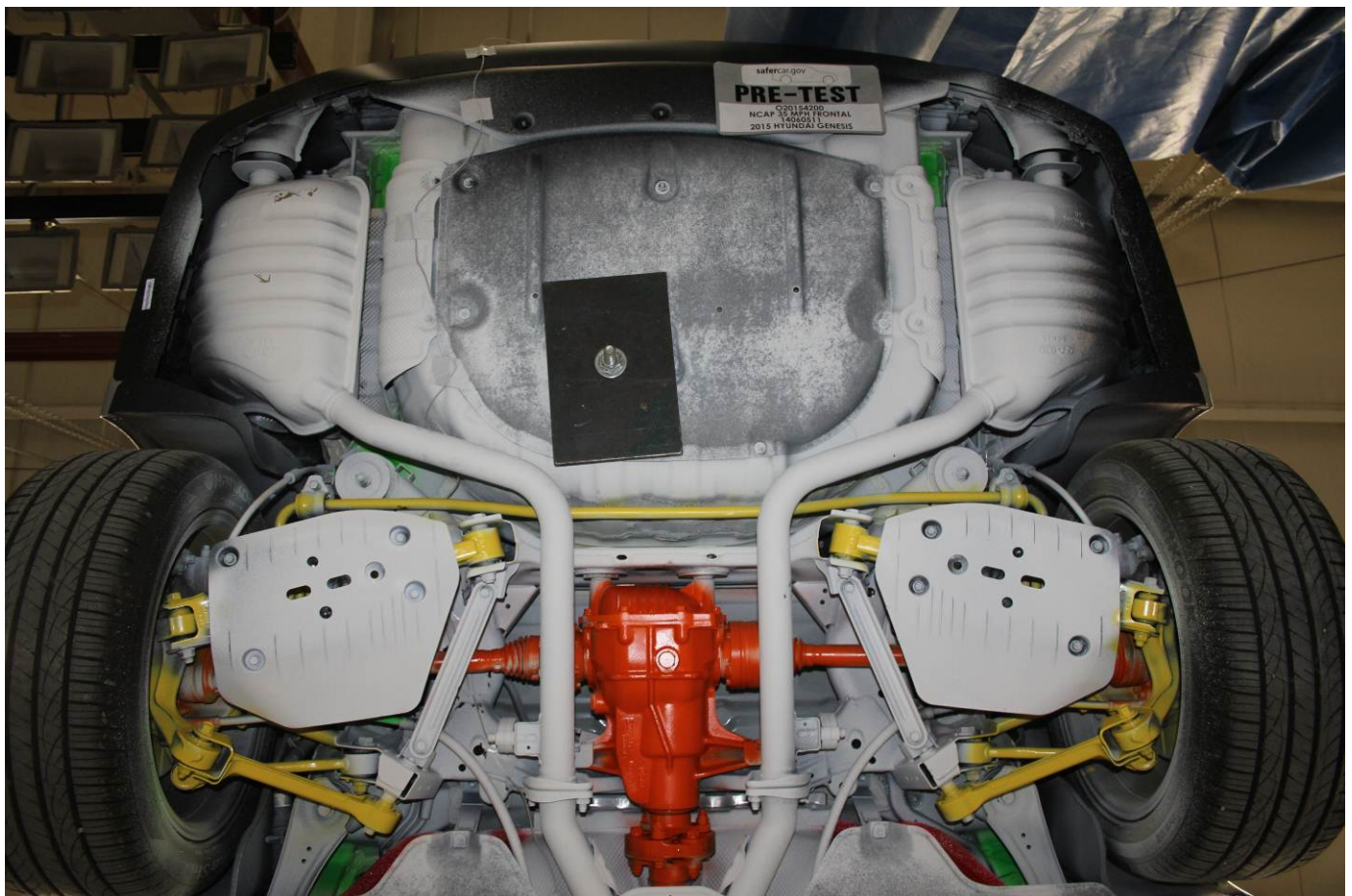
Post-Test Mid Front Underbody View



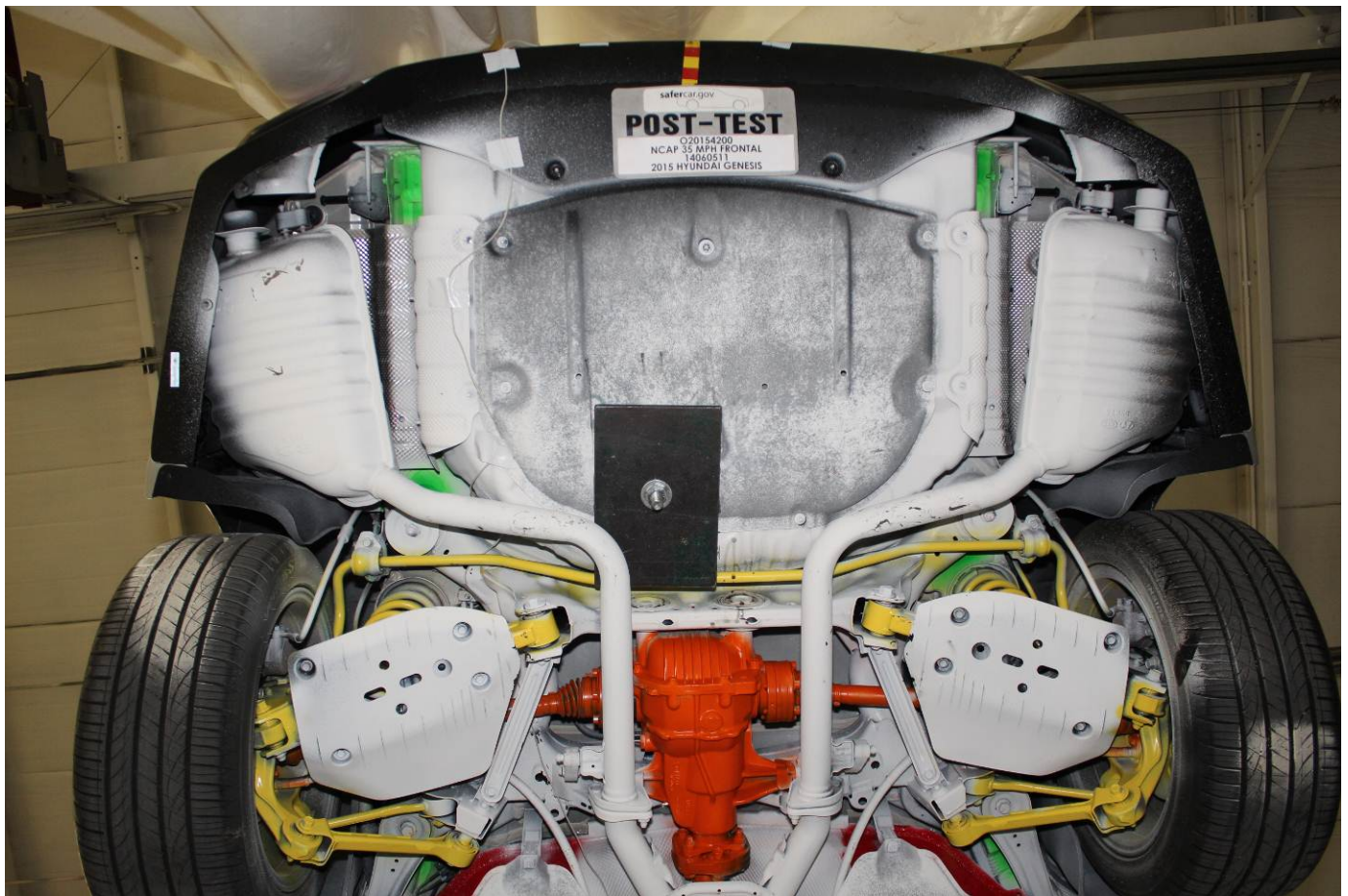
Pre-Test Mid Rear Underbody View



Post-Test Mid Rear Underbody View



Pre-Test Rear Underbody View



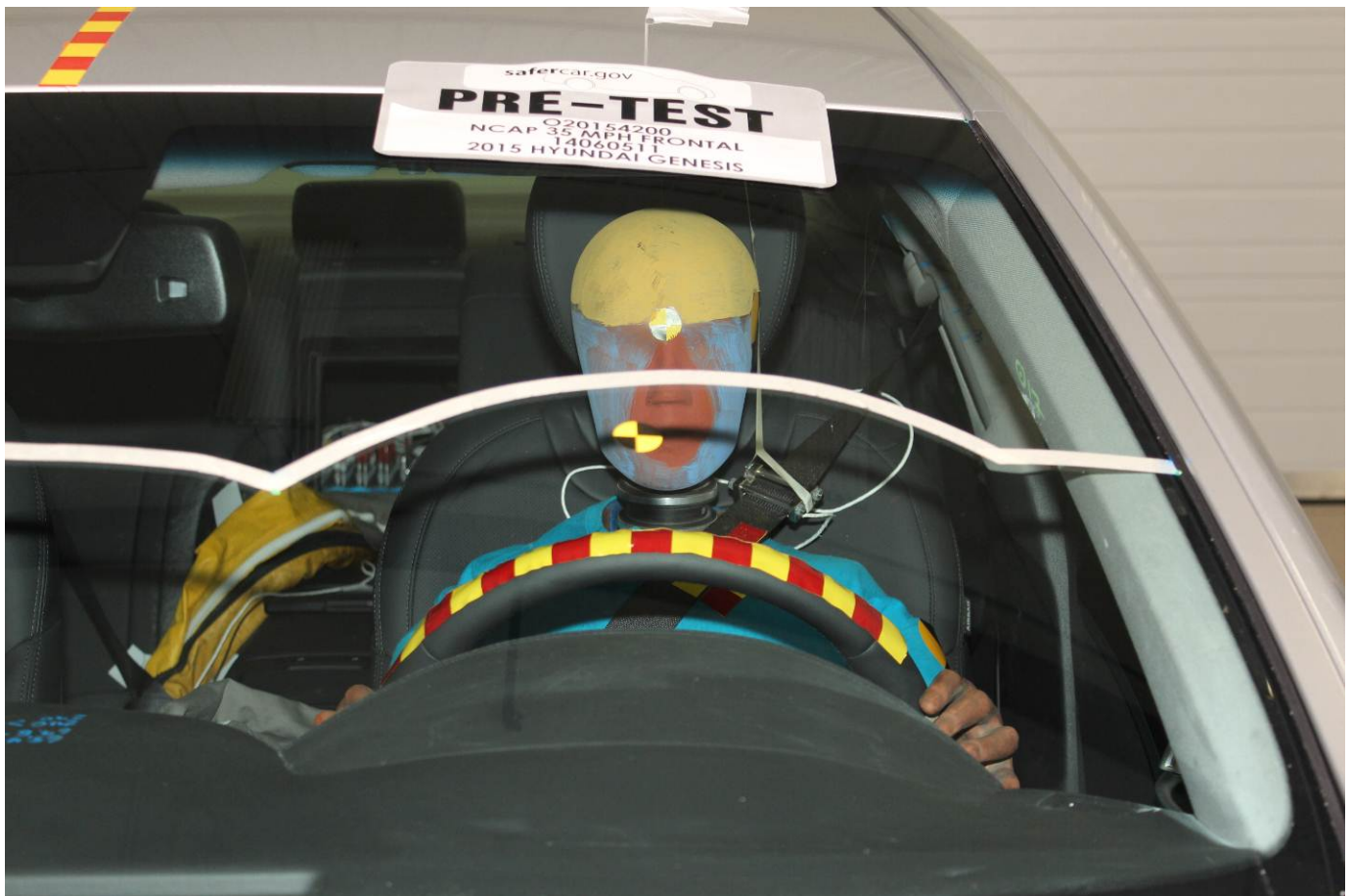
Post-Test Rear Underbody View



Pre-Test Dummy Cable Routing



Post-Test Dummy Cable Routing



Pre-Test Driver Dummy Front View



Post-Test Driver Dummy Front View



Pre-Test Driver Dummy Window View



Post-Test Driver Dummy Window View



Pre-Test Driver Dummy and Vehicle Interior (Door Open)



Post-Test Driver Dummy and Vehicle Interior (Door Open)



Pre-Test Driver's Seat Fore-Aft Markings



Post-Test Driver's Seat Fore-Aft Markings



Pre-Test View of Belt Anchorage for Driver Dummy



Post-Test View of Belt Anchorage for Driver Dummy



Pre-Test Driver Dummy Feet



Post-Test Driver Dummy Feet



Pre-Test Driver's Side Knee Bolster (without dummy)



Post-Test Driver's Side Knee Bolster (without dummy)



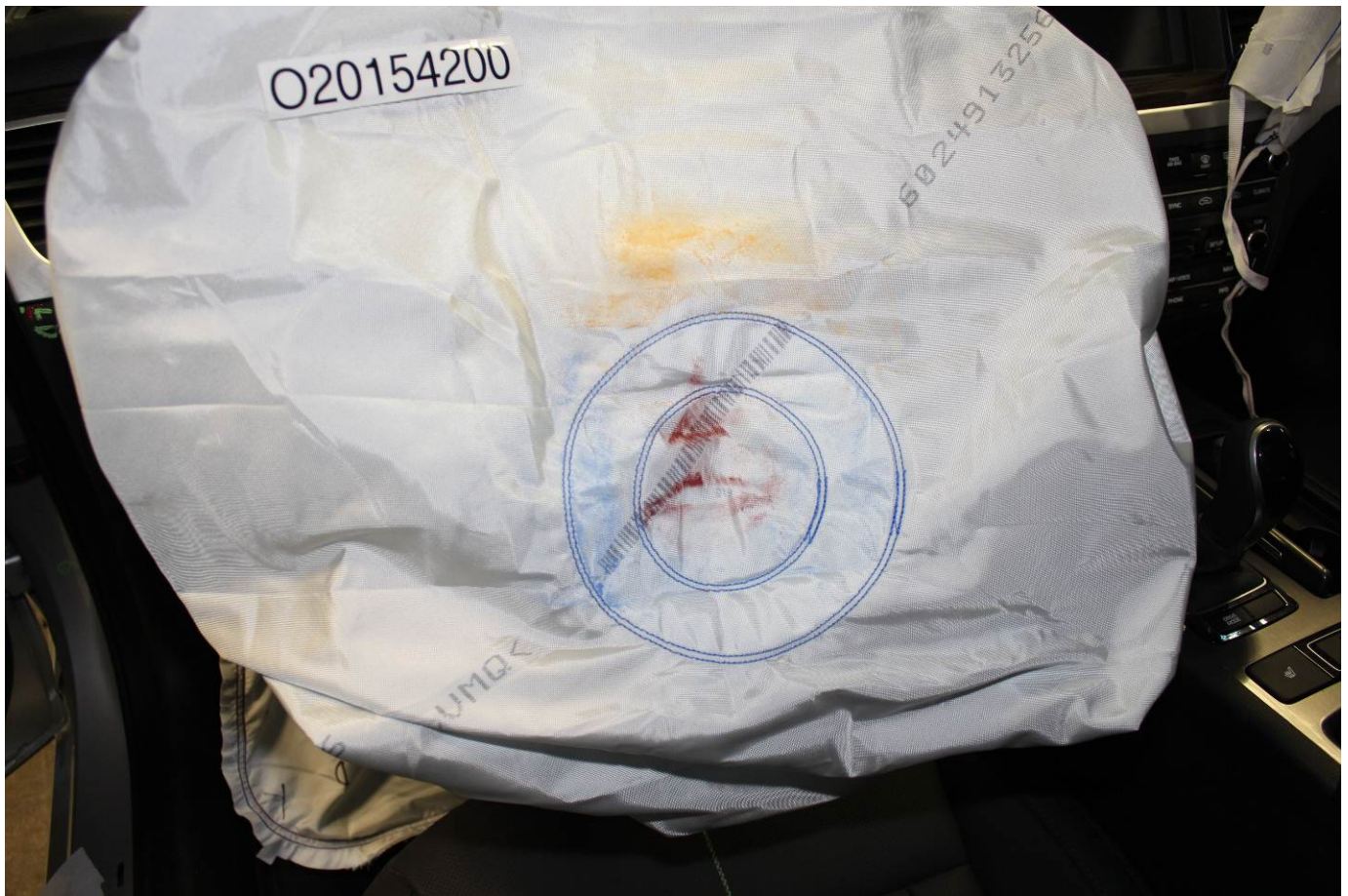
Pre-Test Driver's Side Floorpan



Post-Test Driver's Side Floorpan



Post-Test Driver Dummy Face



Post-Test Driver Dummy Contact with Airbag



Post-Test Driver Dummy Contact with Headrest



Post-Test Driver Dummy Contact with Knee Airbag



Pre-Test View of the Steering Wheel



Post-Test View of the Steering Wheel



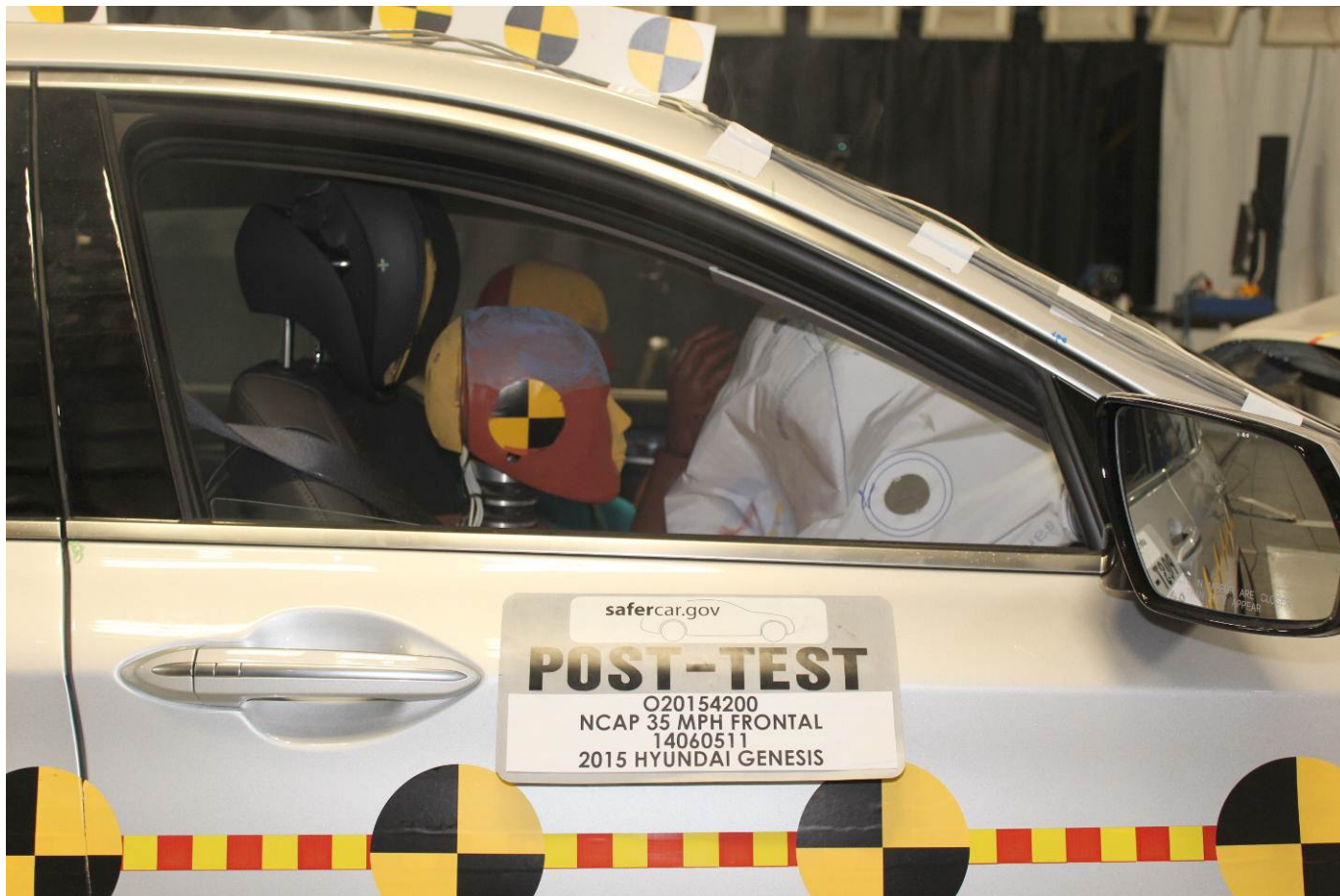
Pre-Test Passenger Dummy Front View



Post-Test Passenger Dummy Front View



Pre-Test Passenger Dummy Window View



Post-Test Passenger Dummy Window View



Pre-Test Passenger Dummy and Vehicle Interior (Door Open)



Post-Test Passenger Dummy and Vehicle Interior (Door Open)



Pre-Test Passenger's Seat Fore-Aft Markings



Post-Test Passenger's Seat Fore-Aft Markings



Pre-Test View of Belt Anchorage for Passenger Dummy



Post-Test View of Belt Anchorage for Passenger Dummy



Pre-Test Passenger Dummy Feet



Post-Test Passenger Dummy Feet



Pre-Test Passenger's Side Knee Bolster (without dummy)



Post-Test Passenger's Side Knee Bolster (without dummy)



Pre-Test Passenger's Side Floorpan



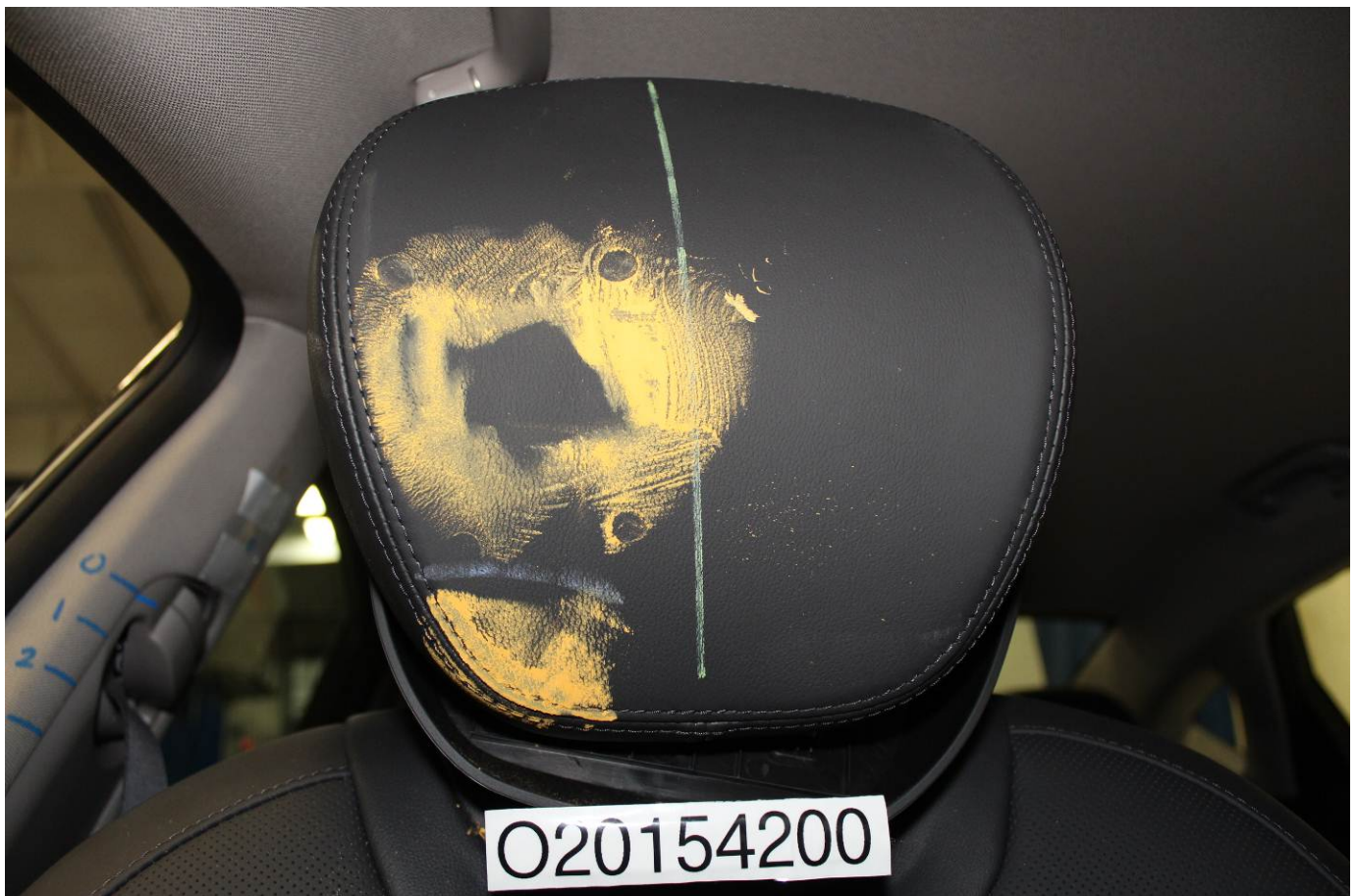
Post-Test Passenger's Side Floorpan



Post-Test Passenger Dummy Face



Post-Test Passenger Dummy Contact with Airbag



Post-Test Passenger Dummy Contact with Headrest



Post-Test Passenger Dummy Contact with Glovebox



Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

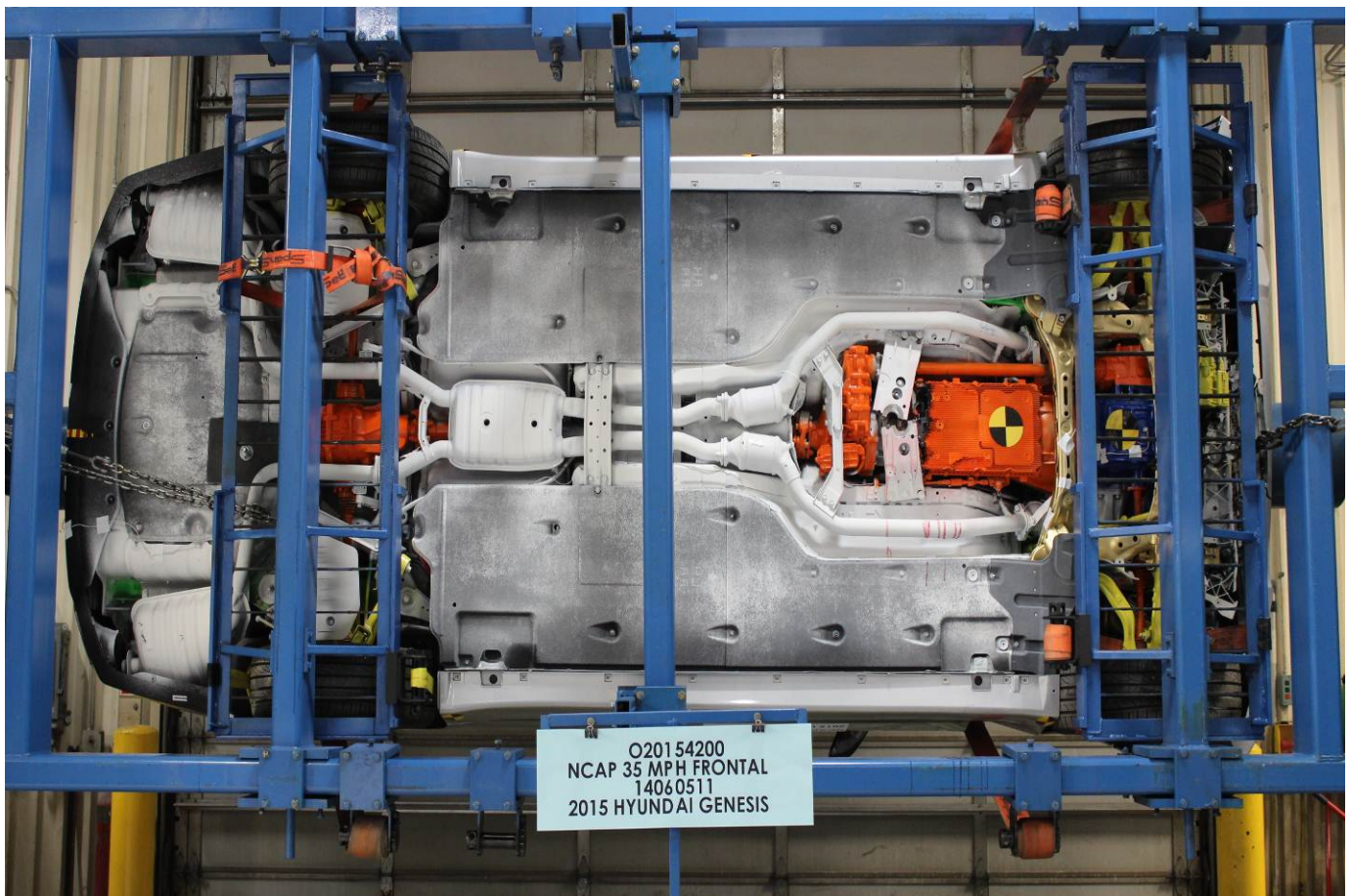
Post-Test Stoddard Solvent Spillage Location View



Post-Test Speed Trap Read-Out



Vehicle at 0 Degree on Static Rollover Device



Vehicle at 90 Degrees on Static Rollover Device



Vehicle at 180 Degrees on Static Rollover Device



Vehicle at 270 Degrees on Static Rollover Device



Vehicle at 360 Degrees on Static Rollover Device



2015 Hyundai Genesis Frontal Impact Event



2015 GENESIS AWD 3.8

SOLD TO: IL051
ROGERS HYUNDAI
2645 S. MICHIGAN AVE.
CHICAGO IL 60616

SHIPPED TO: IL051

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

VIN: KMHGV4JEFU018592
MODEL: B1402A05
ENGINE: G60JEA230230
PORT OF ENTRY: PT
EXTERIOR COLOR: SANTIAGO SILVER
INTERIOR/SEAT COLOR: BLACK/BLACK
TRANSPORT: TRUCK
ACCESSORY WEIGHT: 10 lbs / 4 kgs.
EMISSIONS: This vehicle is certified to meet emission requirements in all 50 states.

STANDARD FEATURES:

AMERICA'S BEST WARRANTY

- *5-year/60,000-mile New Vehicle Warranty*
- *10-year/100,000-mile Powertrain Warranty*
- *7-year/Unlimited-mile Anti-rust/perforation Warranty*
- *5-year/Unlimited-mile Roadside Assistance
- *Limited warranties, see dealer for details

ADVANCED SAFETY TECHNOLOGY

- *Vehicle Stability Management System
- *Electronic Stability Control (ESC) with Traction Control (TCS)
- *ABS with Electronic Brake Force Distribution & Brake Assist
- *4-Wheel Disc Brakes
- *9 Airbags including Driver's Knee Airbag
- *6-Whiplash Front Head Restraints

POWERTRAIN TECHNOLOGY

- *3.8L DOHC V6 GDI & Dual CVT Aluminum Engine with 311 HP (Regular)
- *6-Speed Auto Transmission with SHIFTRONIC® & Paddle Shifters
- *Intelligent Drive Mode Select
- *HTRAC All-Wheel Drive
- *High Performance Gas Shock Absorbers
- *5-Link Fully-Independent Front and Rear Suspension

COMFORT & CONVENIENCE

- *18-Inch Alloy Wheels with P245/45R18 All-Season Tires
- *Auto Headlights with Optimize Running Lights & LED Accents
- *Rain-Sensing Wipers w/ Auto Defogger Windshield & Headlamp Washer
- *Heated Dual Power Outside Mirrors with Turn Signal Indicators
- *Power Folding Outside Mirrors with "Concave Logo" Paddle Lamps
- *Leather Seating Surfaces with Heated Front & Rear Seats
- *12-way Power Front Seats with Power Lumbar
- *Leather-Wrapped Tilt & Telescopic-Heated Steering Wheel
- *Steering-Wheel-Mounted Cruise & Audio Controls
- *Proximity Key Entry with Push-Button Start
- *Navigation System with 8" Display and Rearview Camera
- *4.2" TFT LCD Multi-Info Display & Electrochromic Gauges
- *Dual Automatic Temperature Control
- *Auto-Dimming Rearview Mirror with Compass & HomeLink®
- *Bluetooth® Hands-Free Phone System with Audio Streaming
- *Hyundai Blue Link® powered by Google (TM)
- *Blue Link Connected Care Complimentary Trial (enrollment required)
- *AM/FM/SiriusXM®/COMPOND® Radio® Audio System w/ 7 Speakers
- *SiriusXM® Travel Link® including 3-Year Complimentary Services
- *Tire Pressure Monitor with Individual Tire Pressure Indicator
- *Carpenter Floor Mats & Cargo Net / Hands-Free Smart Trunk Opener
- *Full Tank of Gas

Manufacturer's Suggested Retail Price:

\$40,500.00

ADDED FEATURES:

INCLUDED
INCLUDED
INCLUDED
INCLUDED

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Inland Freight & Handling:

\$950.00

Total Price:

\$41,450.00

Genesis offers dynamic design, advanced safety,
premium performance & smart luxury.



EPA DOT Fuel Economy and Environment

Gasoline Vehicle

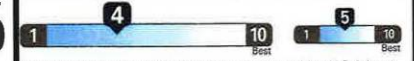
Fuel Economy
19 **16** **25** **MPG**
combined city/hwy city highway
5.3 gallons per 100 miles

Large Cars range from 14 to 28 MPG.
The best vehicle rates 119 MPG.

You spend
\$2,750
more in fuel costs
over 5 years
compared to the
average new vehicle.

Annual fuel cost
\$ 2,750

Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only)

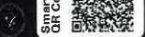


This vehicle emits 459 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs \$11,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. MPGs is miles per gallon; gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov

Calculate personalized estimates and compare vehicles



Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service, Gasoline license and title fees, state and local taxes and dealer-installed options and accessories are not included in the manufacturer's suggested retail price. This label has been affixed to this vehicle by Hyundai Motor America, pursuant to the requirements of 15 U.S.C. 1231 et seq, which prohibits its removal or alteration prior to delivery to the ultimate purchaser.

PART CONTENT INFORMATION
FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 5 %
MAJOR SOURCES OF FOREIGN PARTS CONTENT: KOREA: 81 %

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

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: ASAN, KOREA
COUNTRY OF ORIGIN:
ENGINE: KOREA
TRANSMISSION: KOREA



Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Page No.

List of Data Plots Provided in the Test Report

Figure No. 1.	Driver Head X Acceleration vs. Time	B-1
Figure No. 2.	Driver Head Y Acceleration vs. Time	B-1
Figure No. 3.	Driver Head Z Acceleration vs. Time	B-1
Figure No. 4.	Driver Head Resultant Acceleration vs. Time	B-1
Figure No. 5.	Driver Chest Displacement vs. Time	B-2
Figure No. 6.	Driver Chest X Acceleration vs. Time	B-3
Figure No. 7.	Driver Chest Y Acceleration vs. Time	B-3
Figure No. 8.	Driver Chest Z Acceleration vs. Time	B-3
Figure No. 9.	Driver Chest Resultant Acceleration vs. Time	B-3
Figure No. 10.	Driver Neck Force X vs. Time	B-4
Figure No. 11.	Driver Neck Force Z vs. Time	B-4
Figure No. 12.	Driver Neck Moment Y vs. Time	B-4
Figure No. 13.	Driver Nij (NTF) vs. Time	B-5
Figure No. 14.	Driver Nij (NTE) vs. Time	B-5
Figure No. 15.	Driver Nij (NCF) vs. Time	B-5
Figure No. 16.	Driver Nij (NCE) vs. Time	B-5
Figure No. 17.	Driver Left Femur Force vs. Time	B-6
Figure No. 18.	Driver Right Femur Force vs. Time	B-6
Figure No. 19.	Passenger Head X Acceleration vs. Time	B-7
Figure No. 20.	Passenger Head Y Acceleration vs. Time	B-7
Figure No. 21.	Passenger Head Z Acceleration vs. Time	B-7
Figure No. 22.	Passenger Head Resultant Acceleration vs. Time	B-7
Figure No. 23.	Passenger Chest Displacement vs. Time	B-8
Figure No. 24.	Passenger Chest X Acceleration vs. Time	B-9
Figure No. 25.	Passenger Chest Y Acceleration vs. Time	B-9
Figure No. 26.	Passenger Chest Z Acceleration vs. Time	B-9
Figure No. 27.	Passenger Chest Resultant Z Acceleration vs. Time	B-9

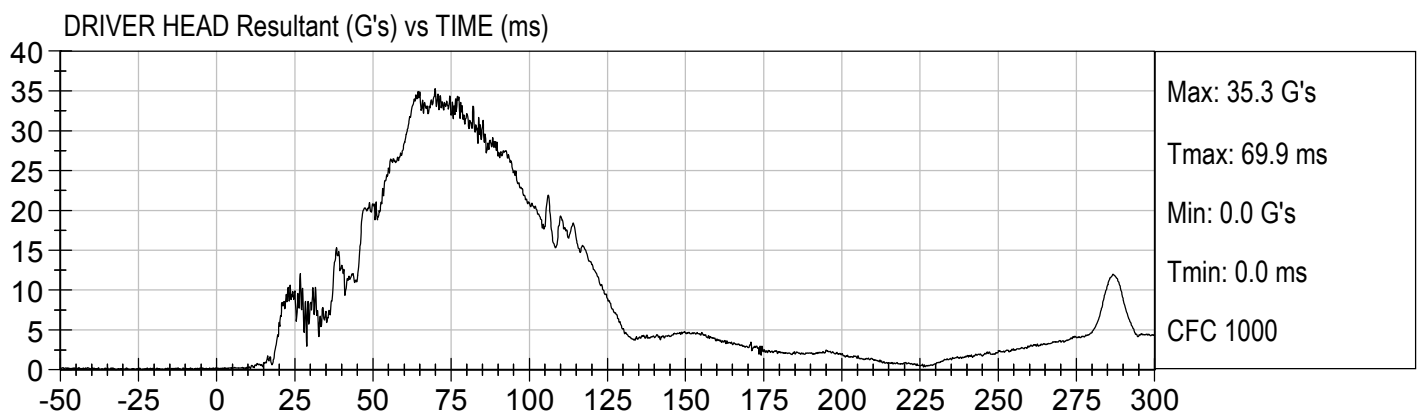
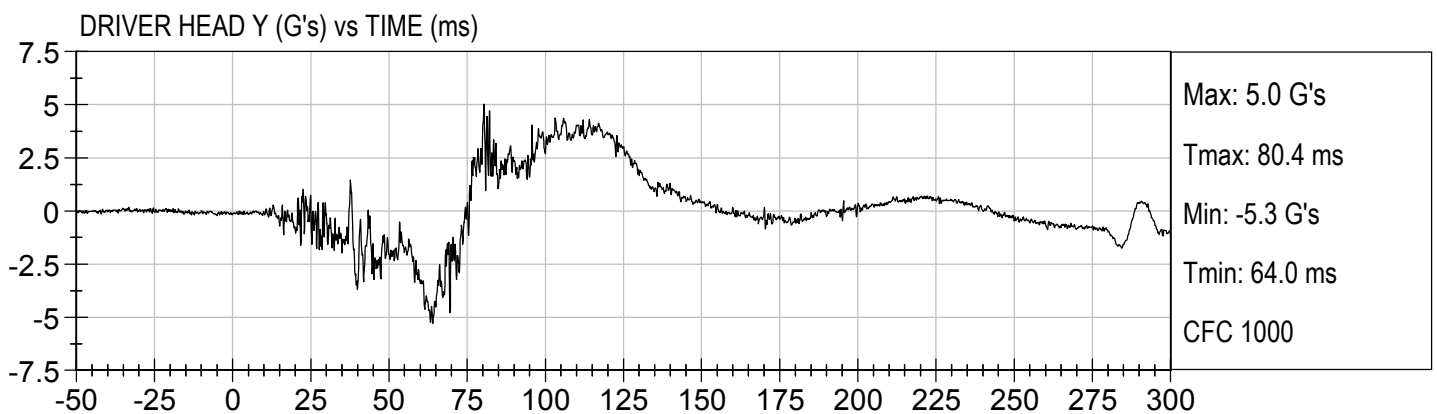
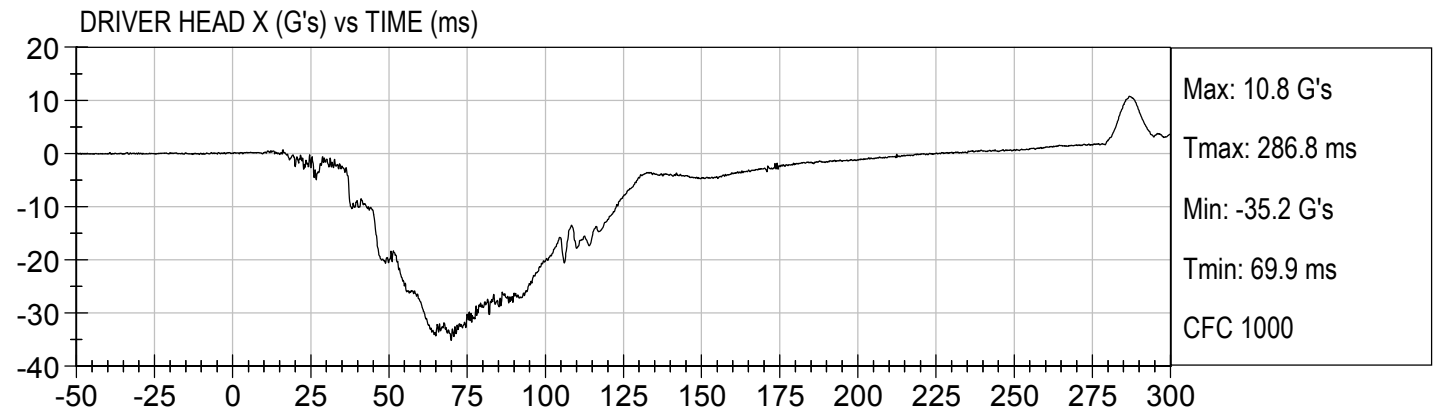
	<u>Page No.</u>
Figure No. 28. Passenger Neck Force X vs. Time	B-10
Figure No. 29. Passenger Neck Force Z vs. Time	B-10
Figure No. 30. Passenger Neck Moment Y vs. Time	B-10
Figure No. 31. Passenger Nij (NTF) vs. Time	B-11
Figure No. 32. Passenger Nij (NTE) vs. Time	B-11
Figure No. 33. Passenger Nij (NCF)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

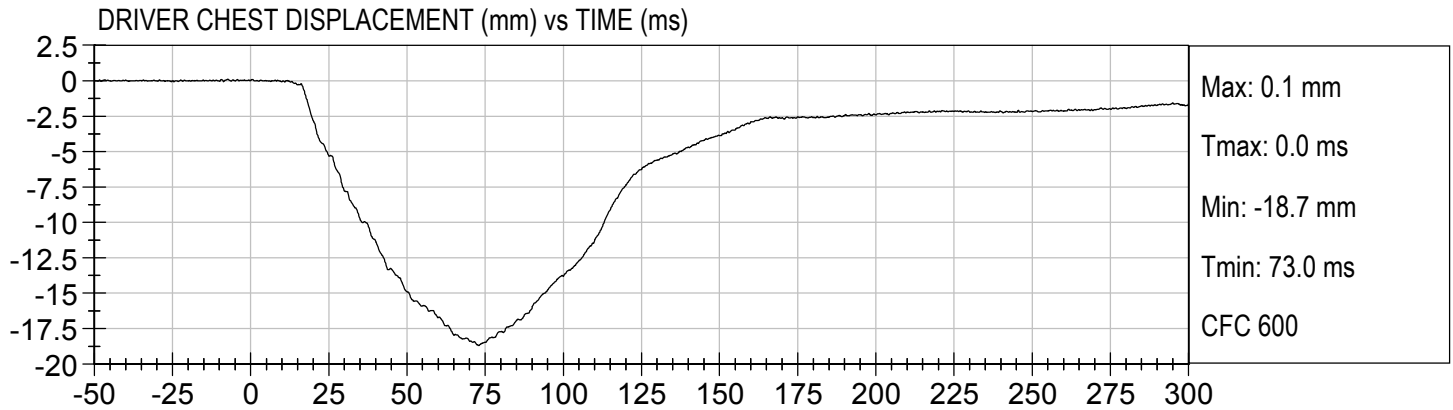
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

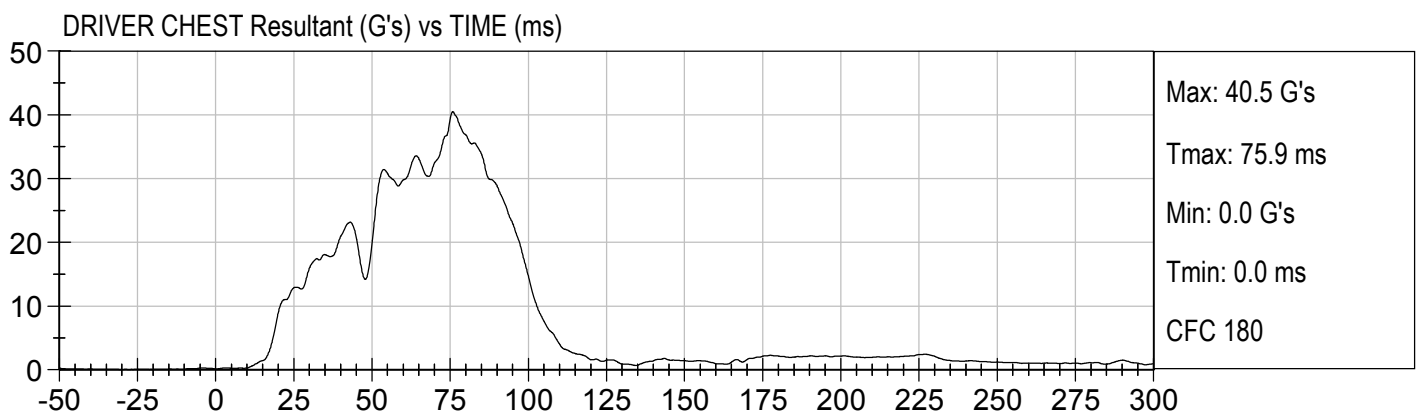
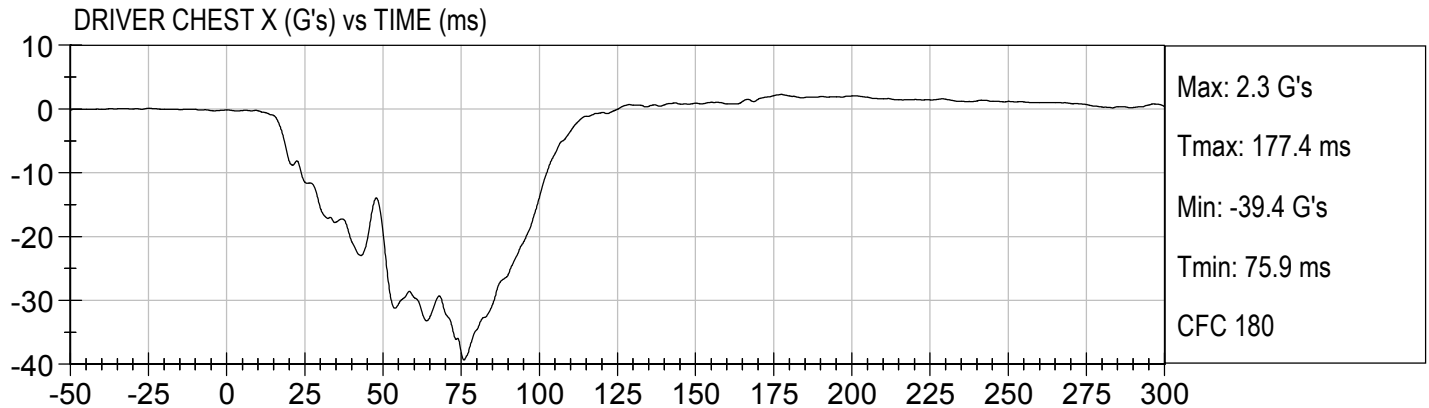
Driver Head X Redundant
 Driver Head Y Redundant
 Driver Head Z Redundant
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Redundant
 Driver Chest Y Redundant
 Driver Chest Z Redundant
 Driver Pelvis X
 Driver Pelvis Y
 Driver Pelvis Z
 Driver Left Femur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

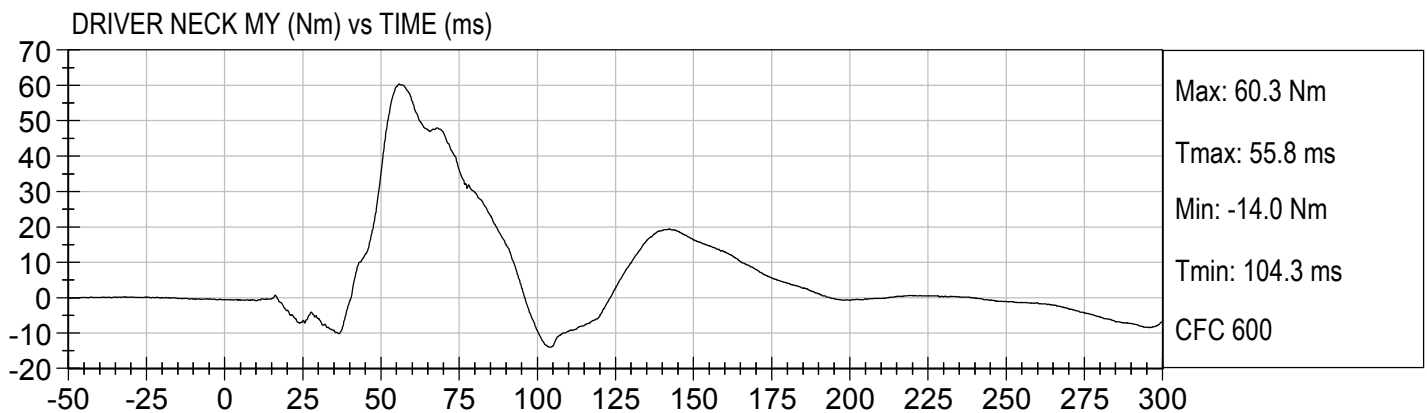
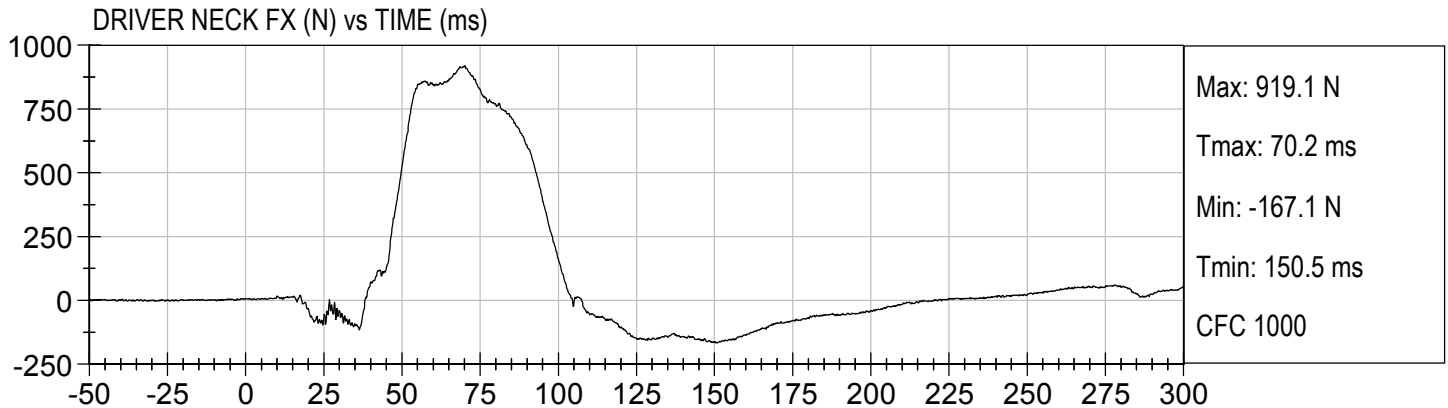
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left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

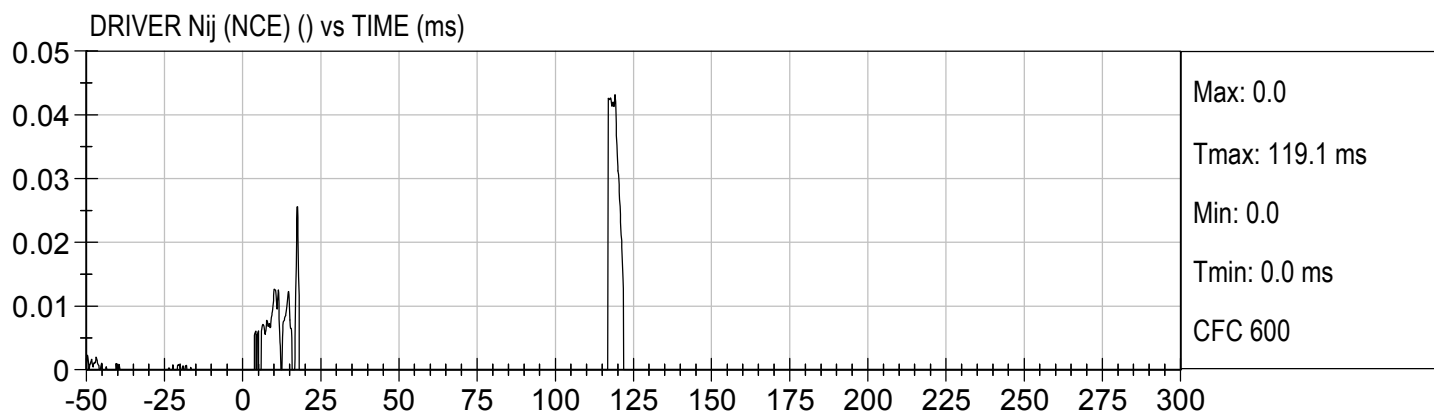
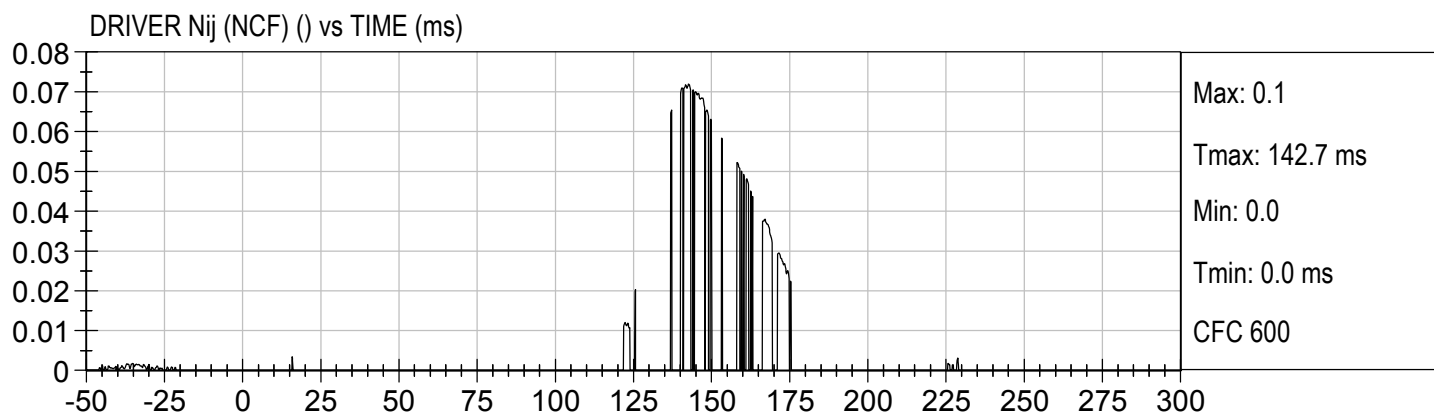
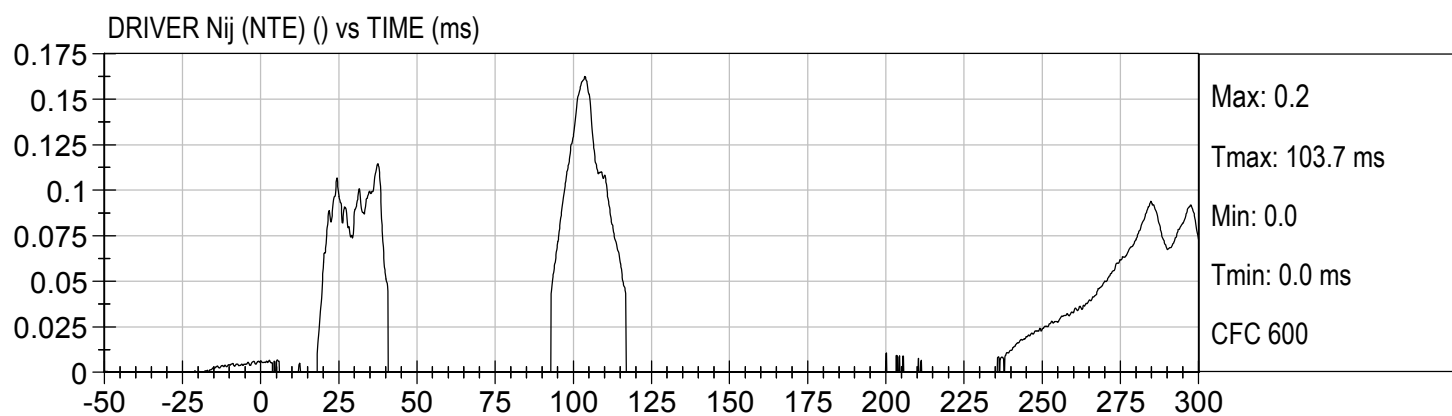
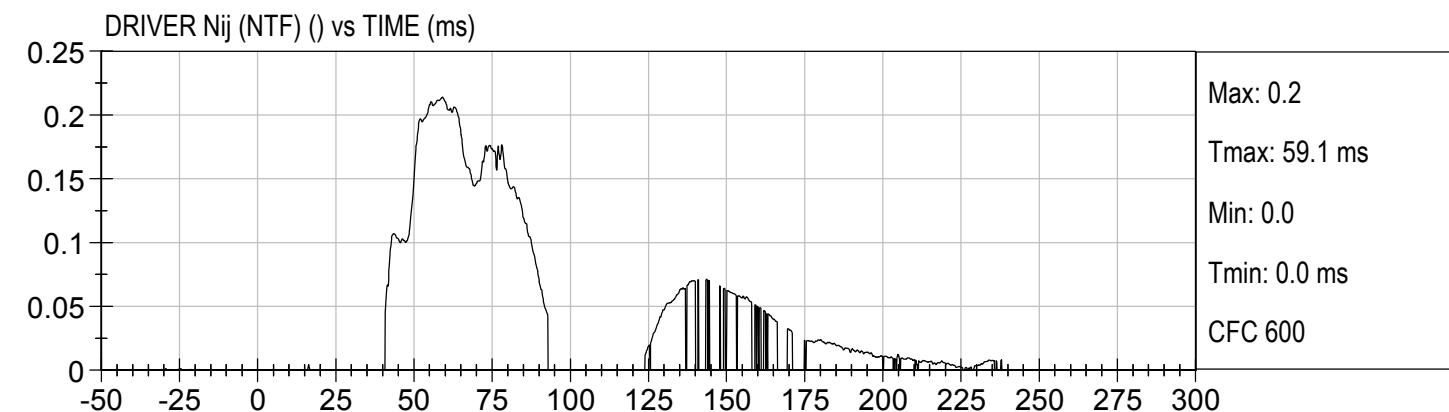
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right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

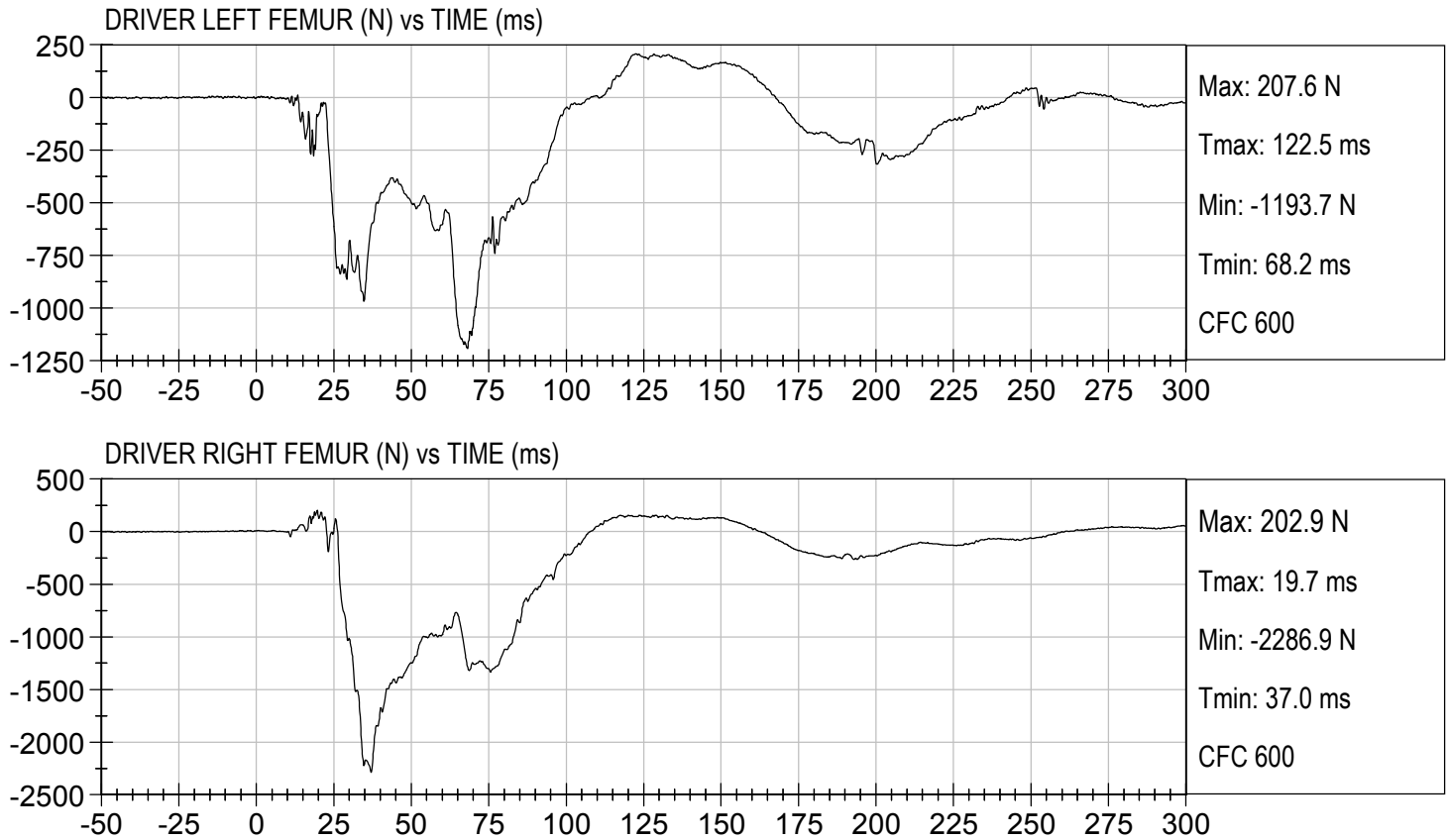


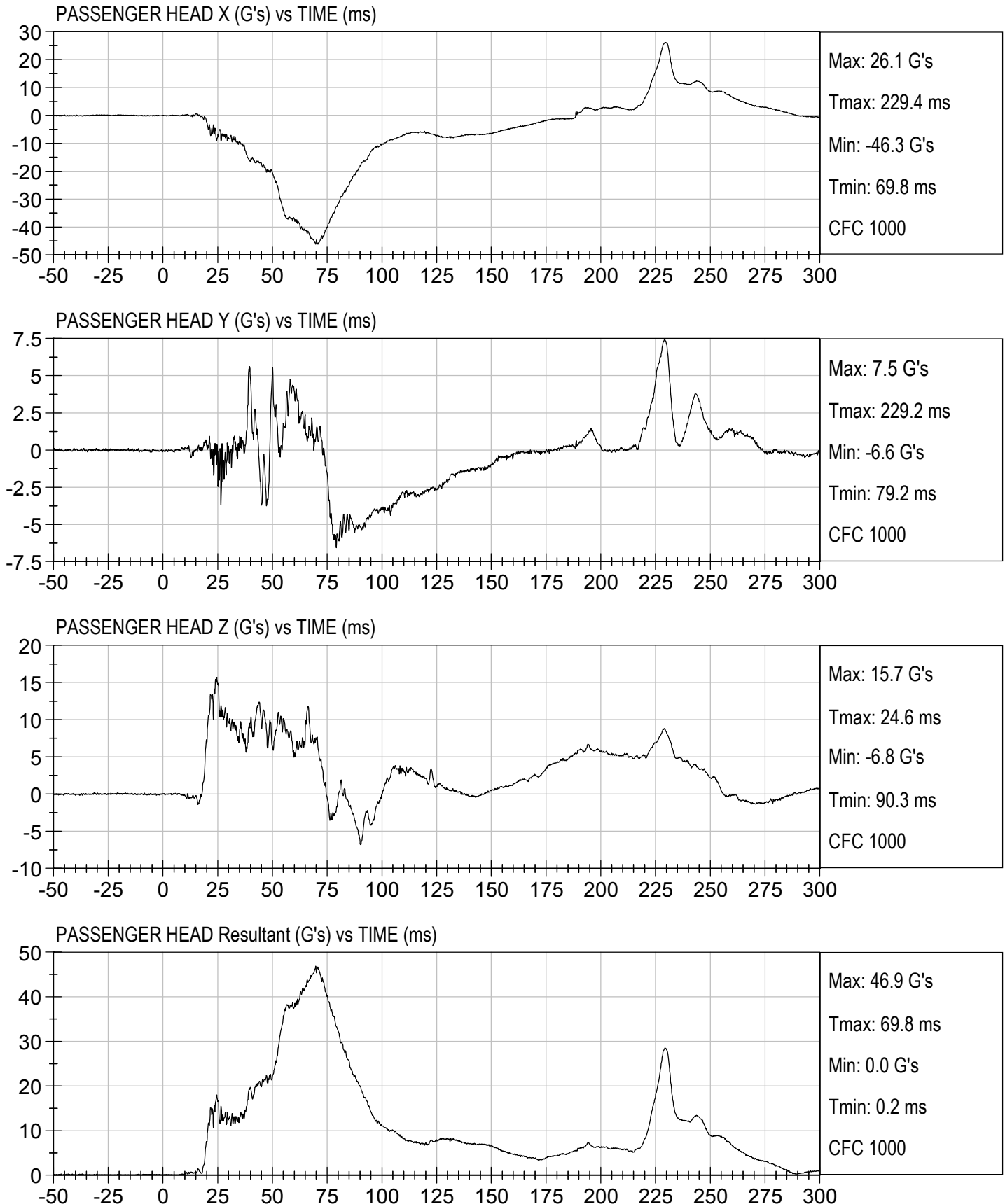


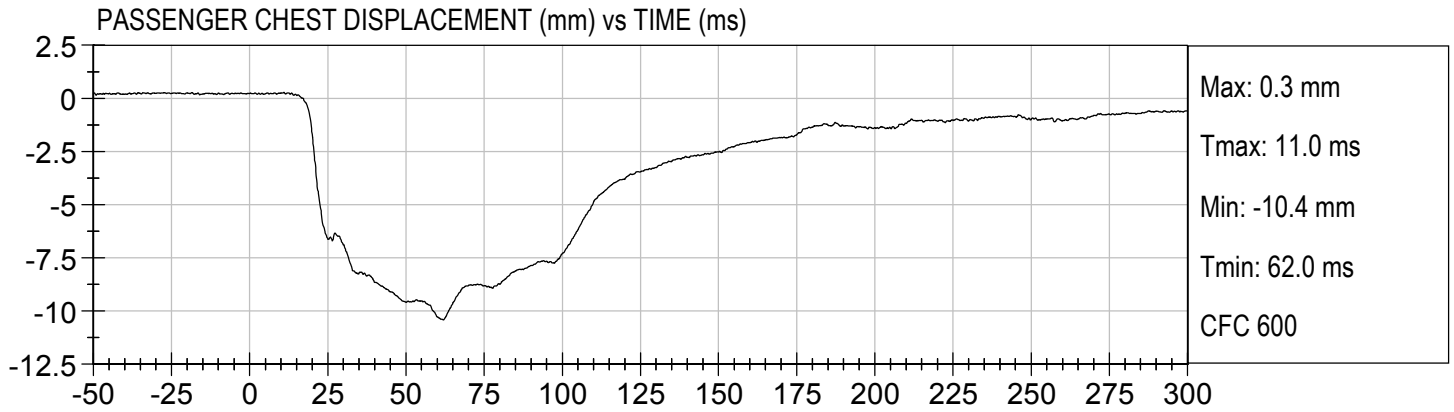


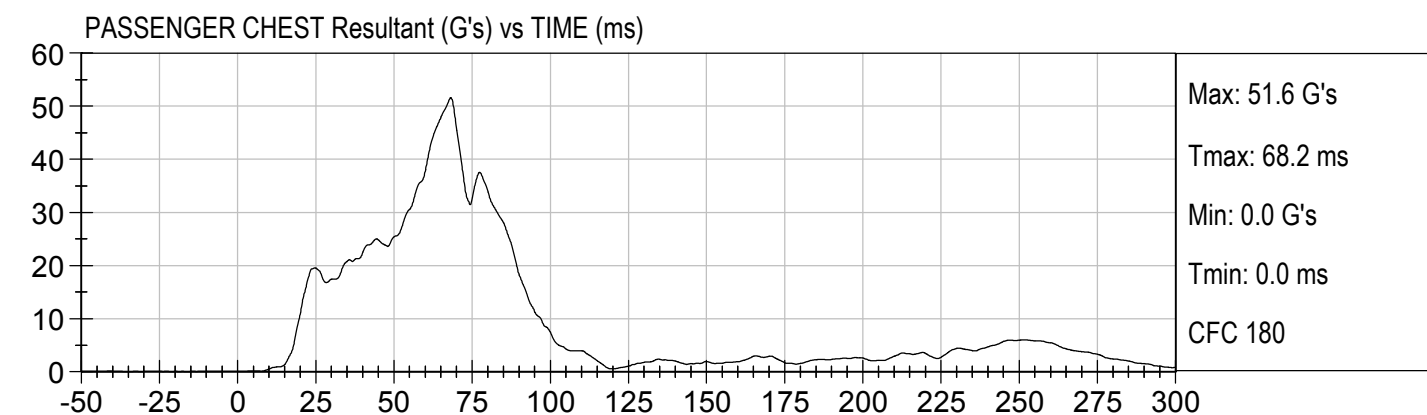
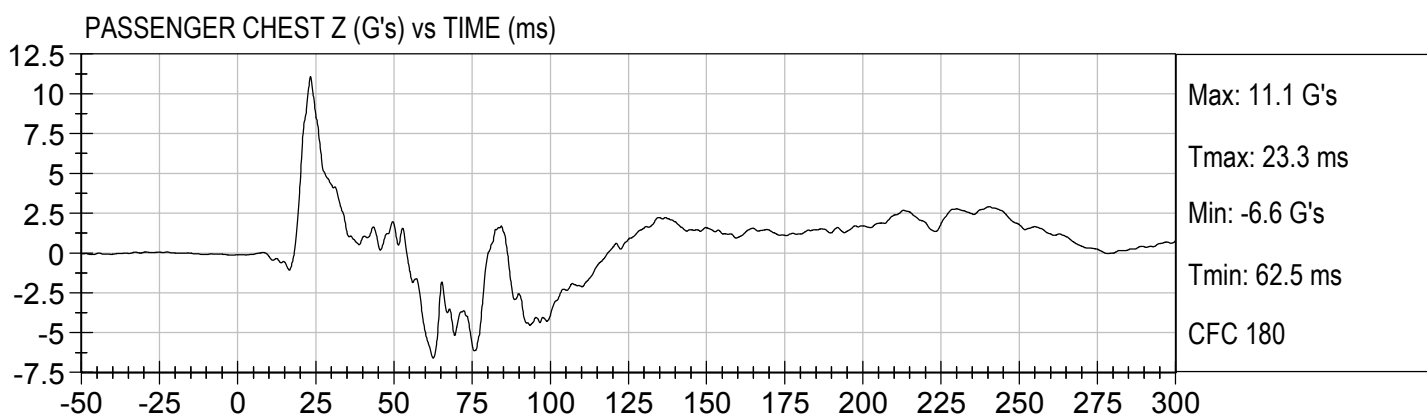
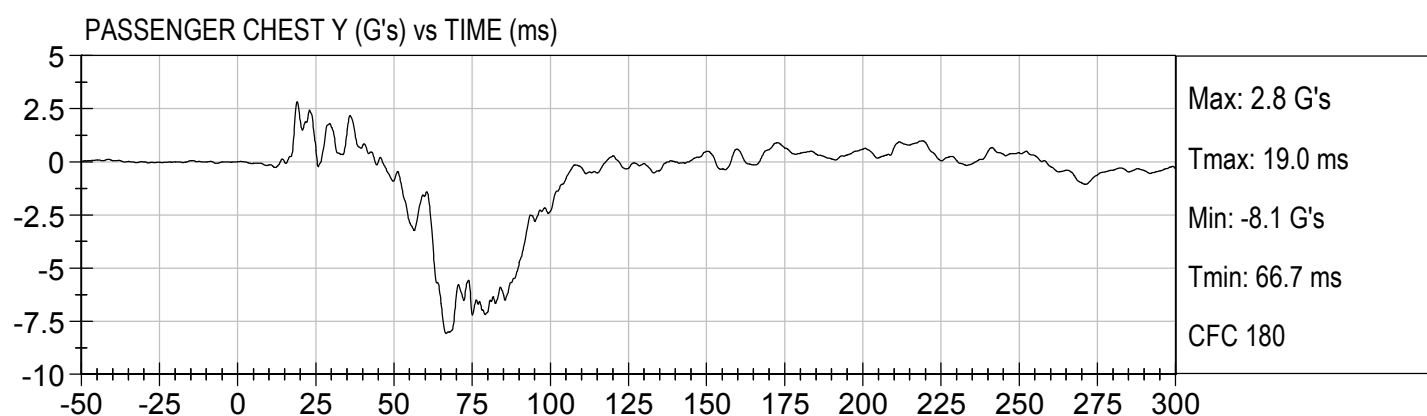
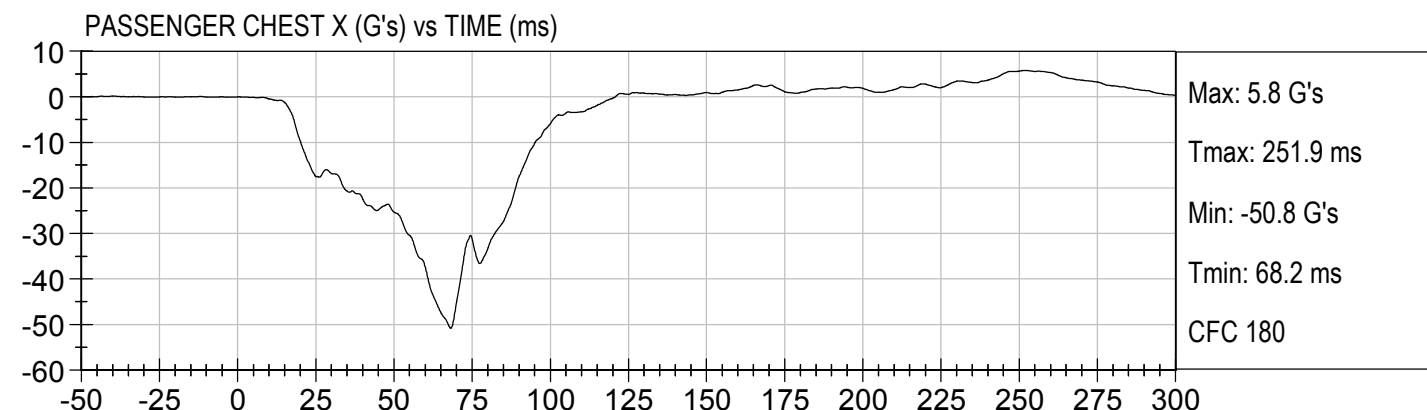


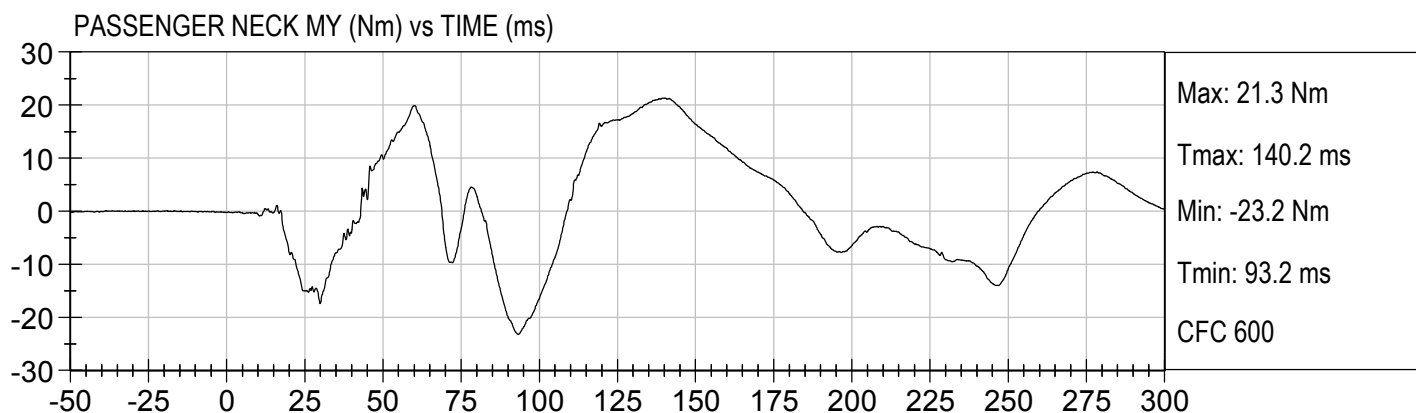
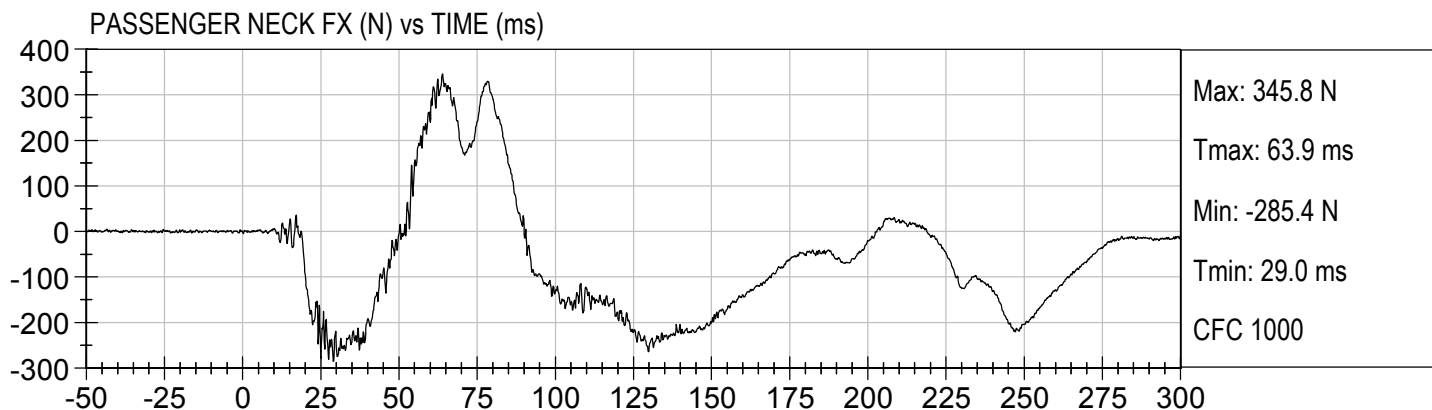


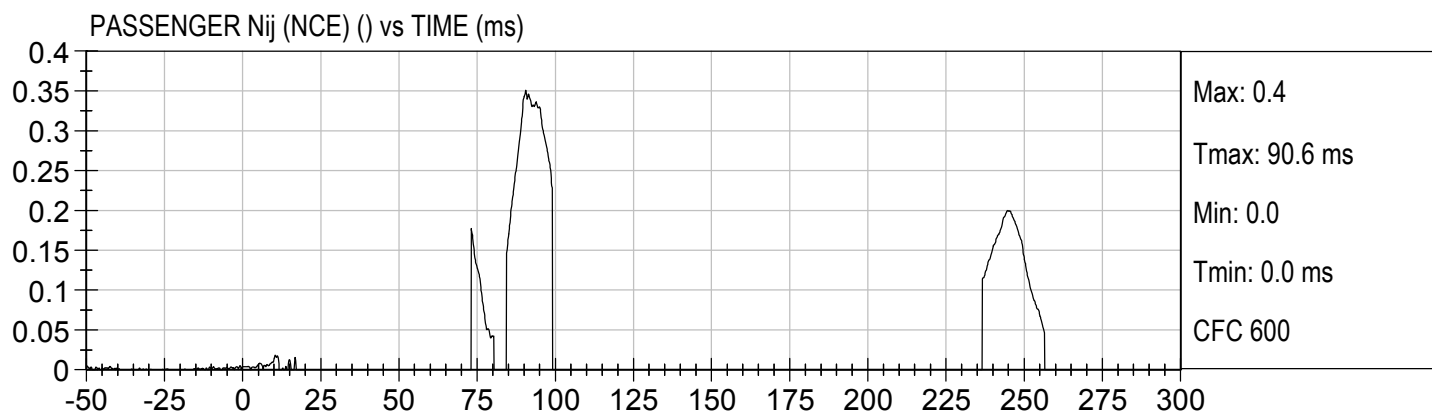
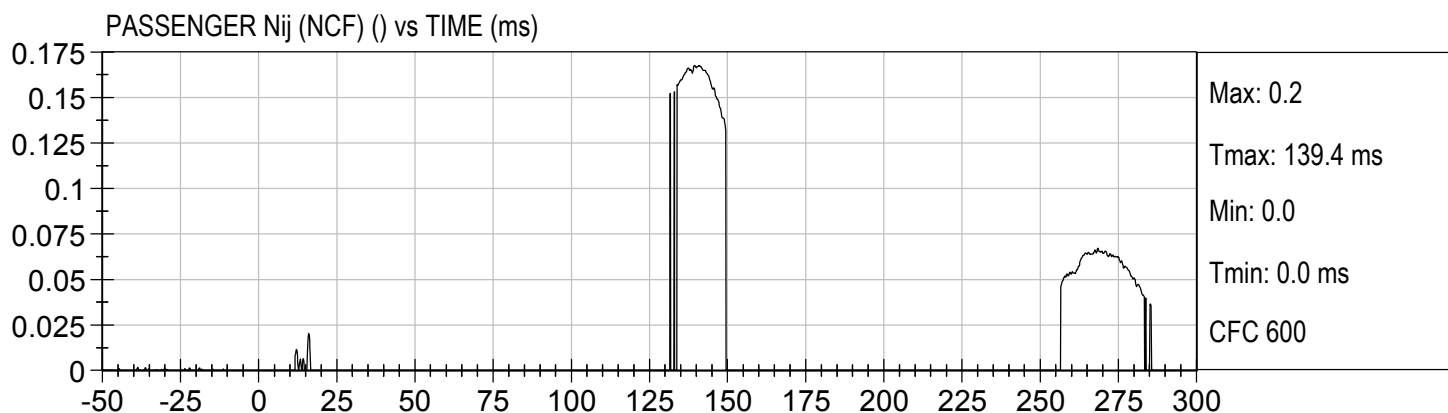
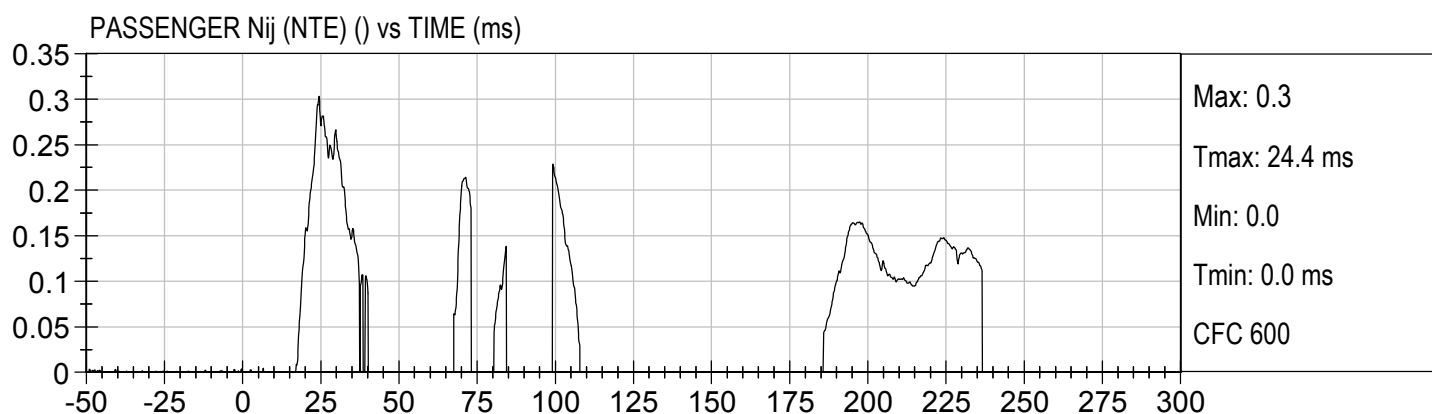
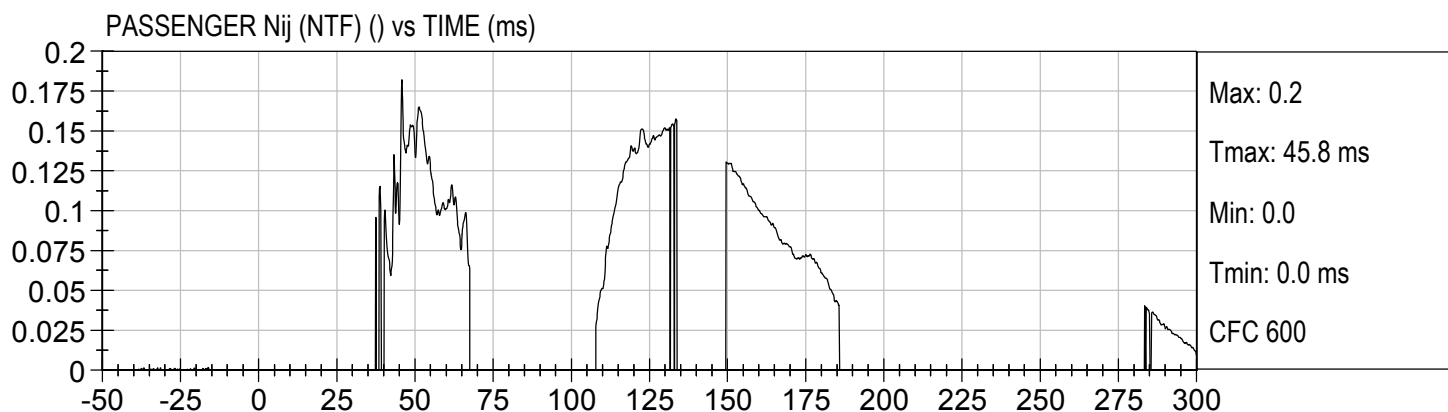


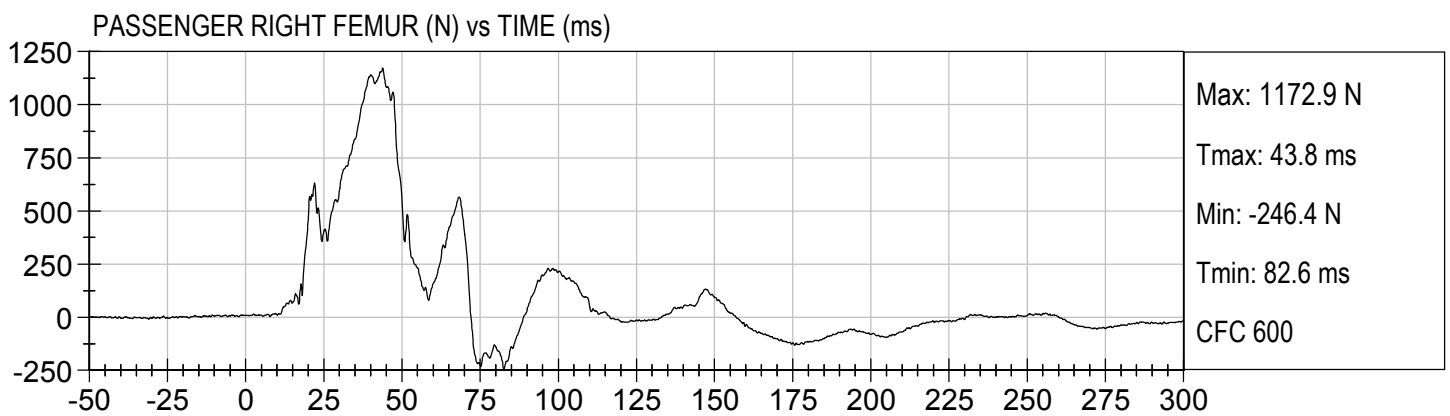
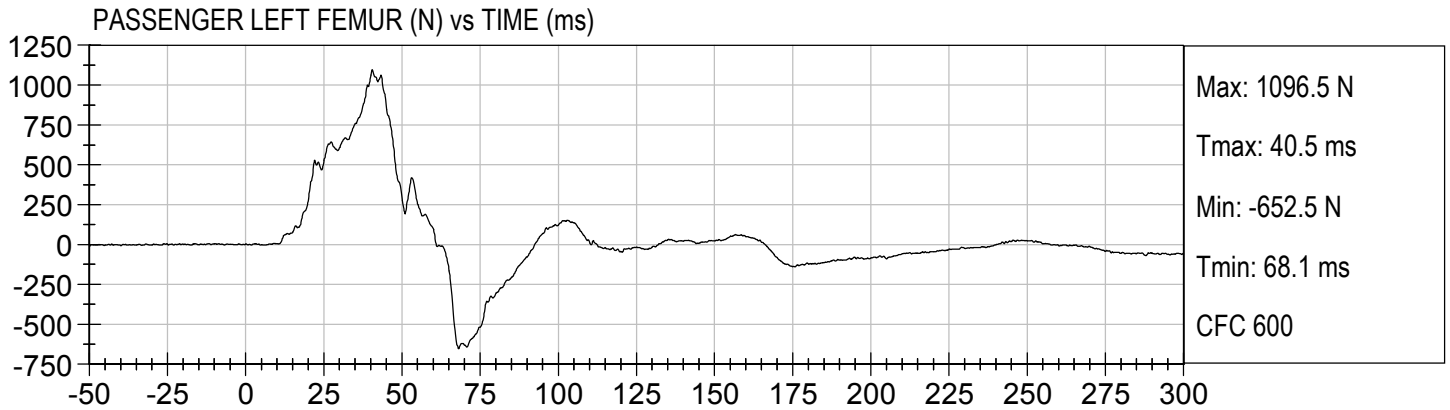












APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

Hybrid III, 50th External Measurements
SN: 351

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

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

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

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

ATD Serial No: 351

Test ID: D141831

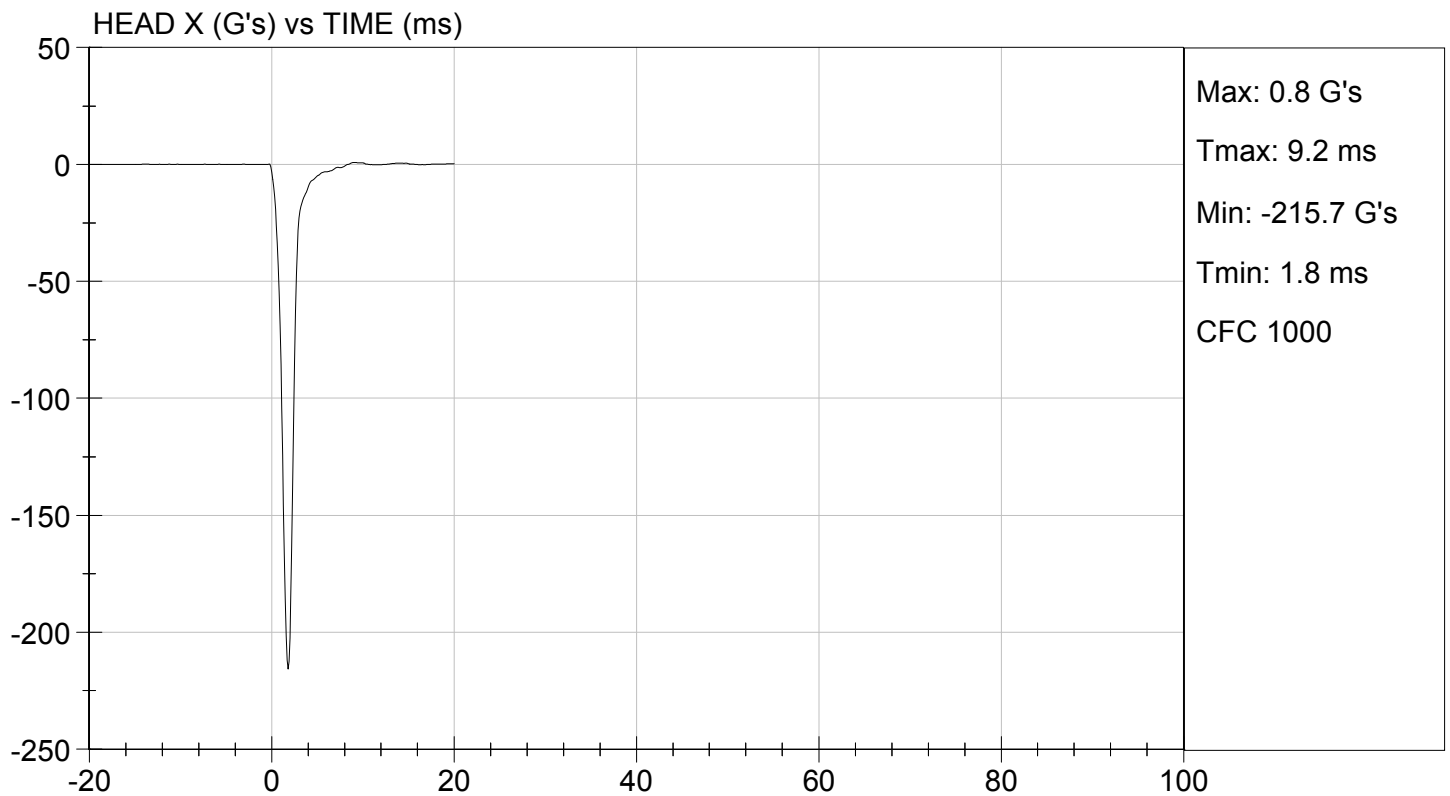
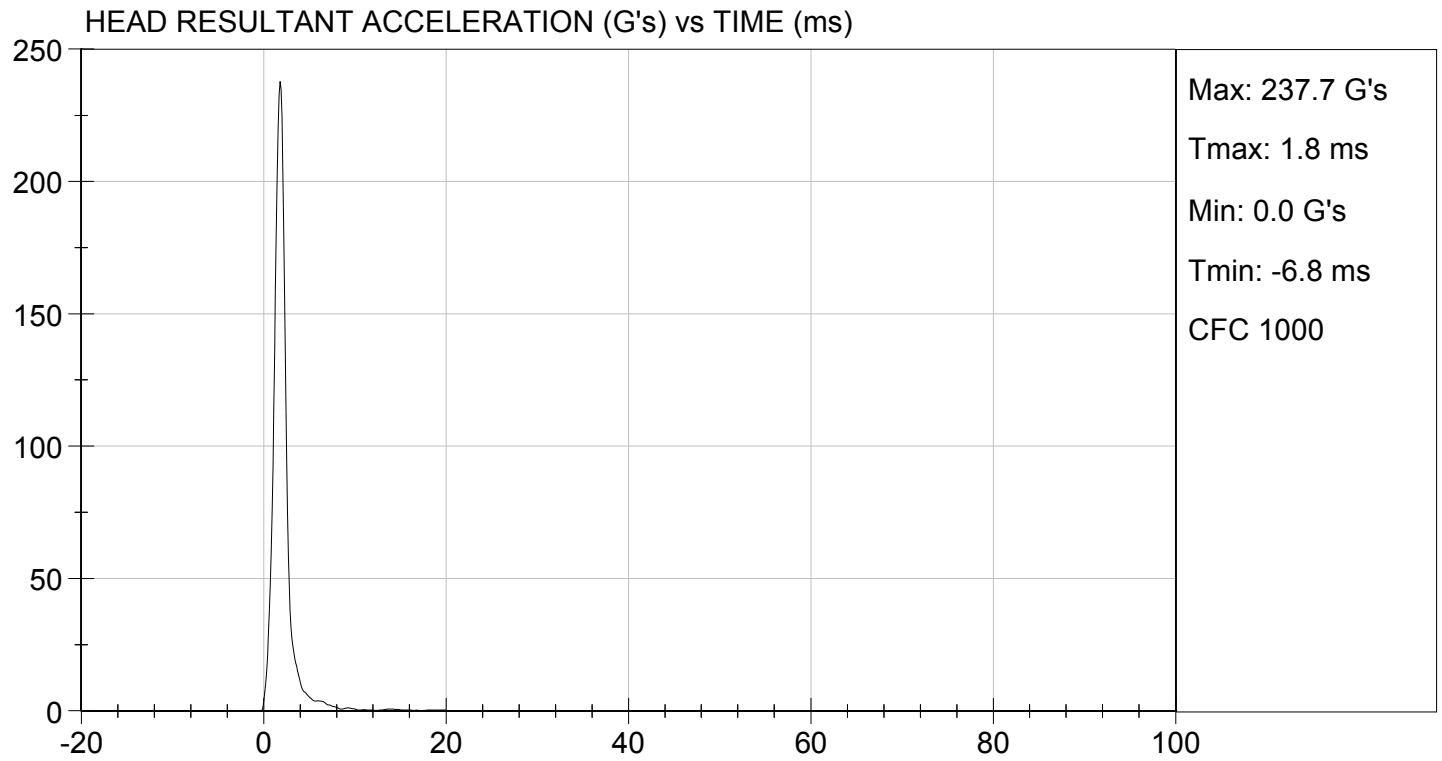
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Peak Resultant Acceleration	G's	225 to 275	238	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-12.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

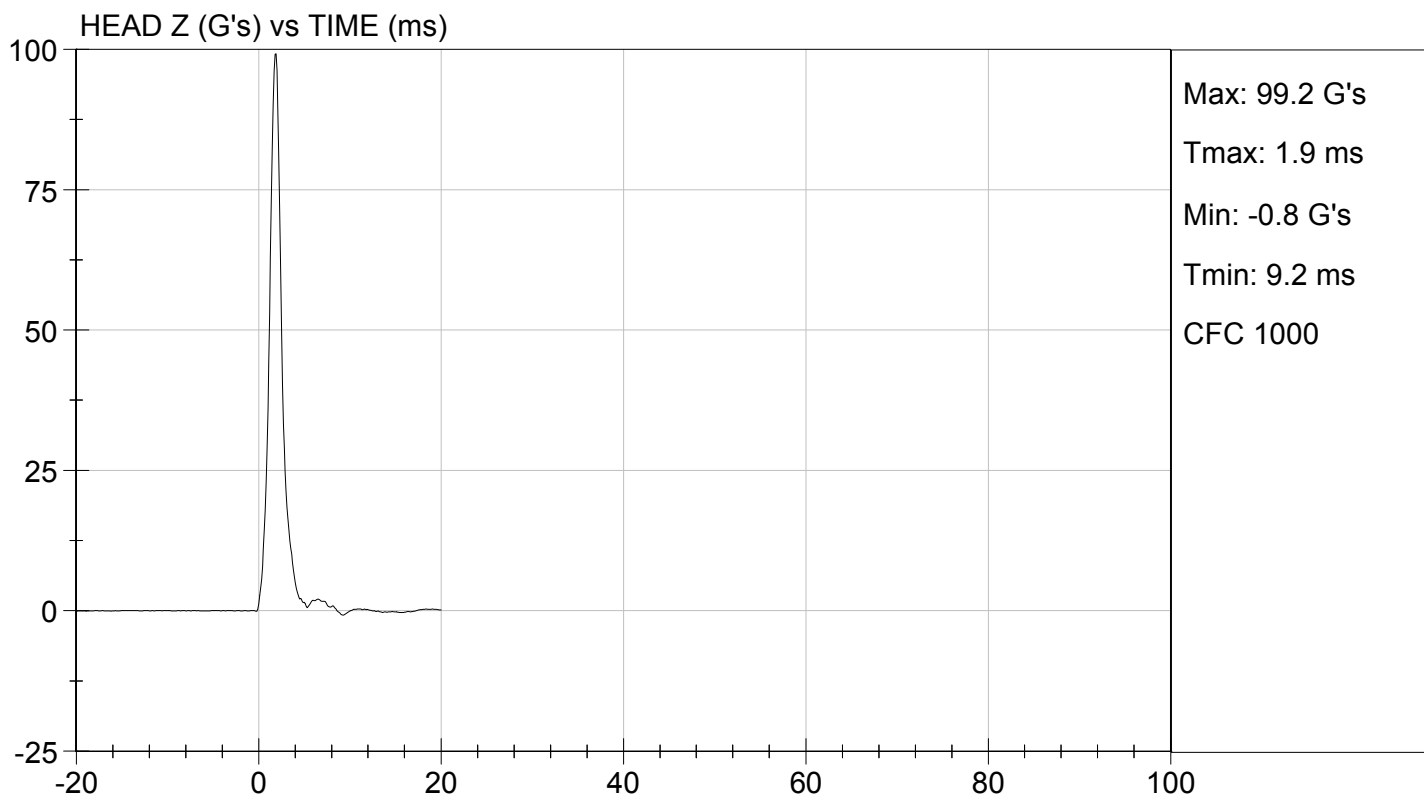
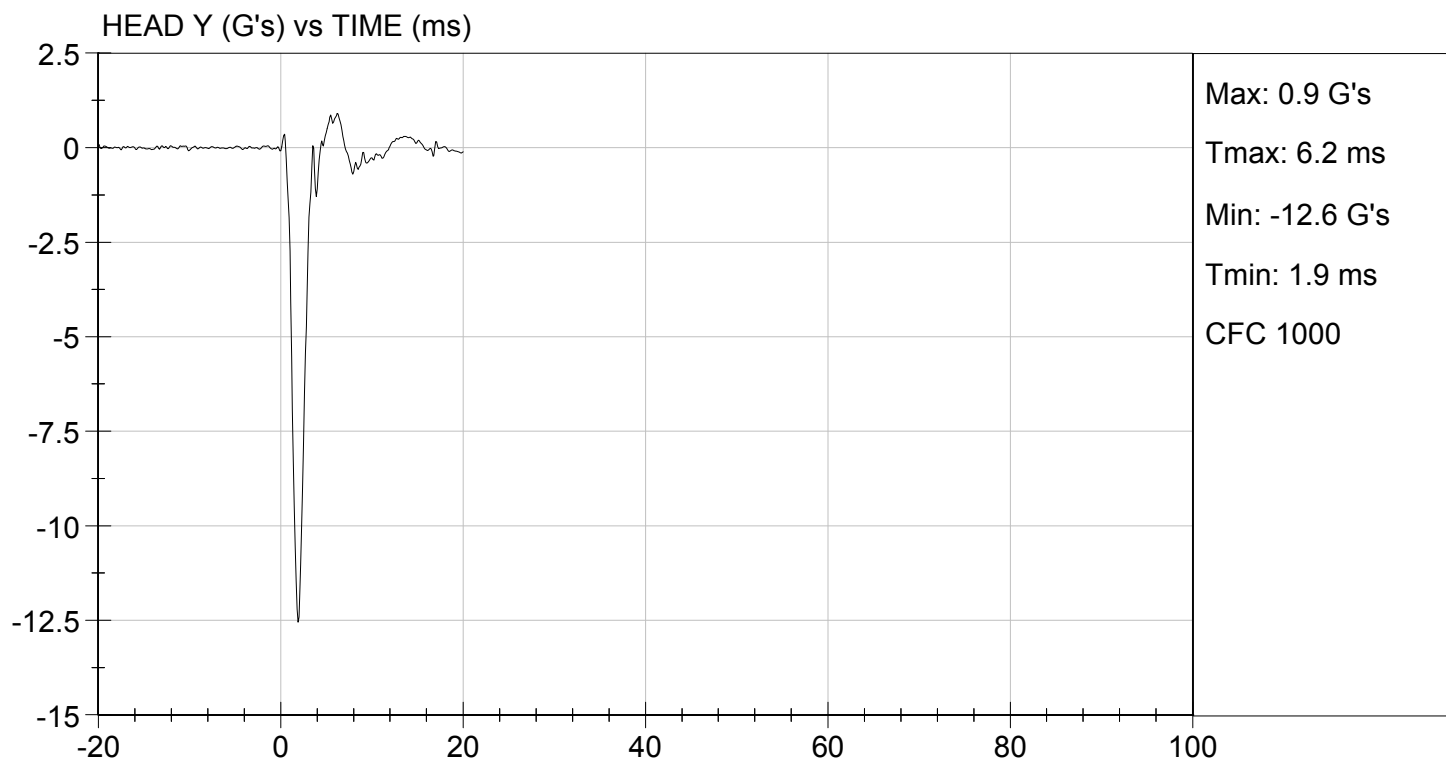
Jessica Gall
Laboratory Technician

05/14/2014

Test Date

David Winkelbauer
Approved By





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

ATD Serial No: 351

Test I.D: D141832

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.13	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	27.02	Pass
	20 ms	G's	17.60 to 22.60	18.13	Pass
	30 ms	G's	12.50 to 18.50	17.87	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	17.8	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	39.4	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	68.9	Pass
	Time	ms	57.0 to 64.0	58.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	119.3	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	94.8	Pass
	Time	ms	47.0 to 58.0	51.8	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.5	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

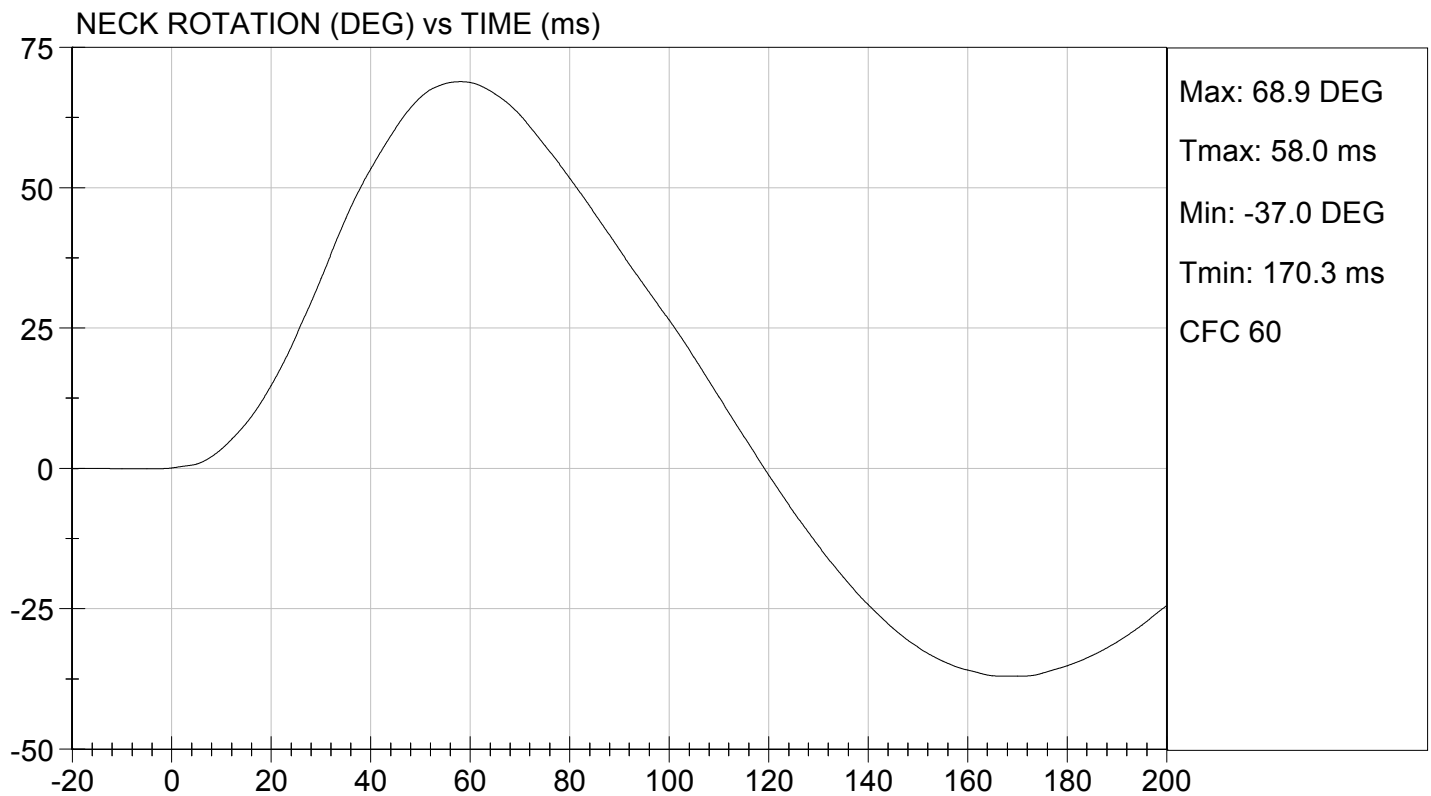
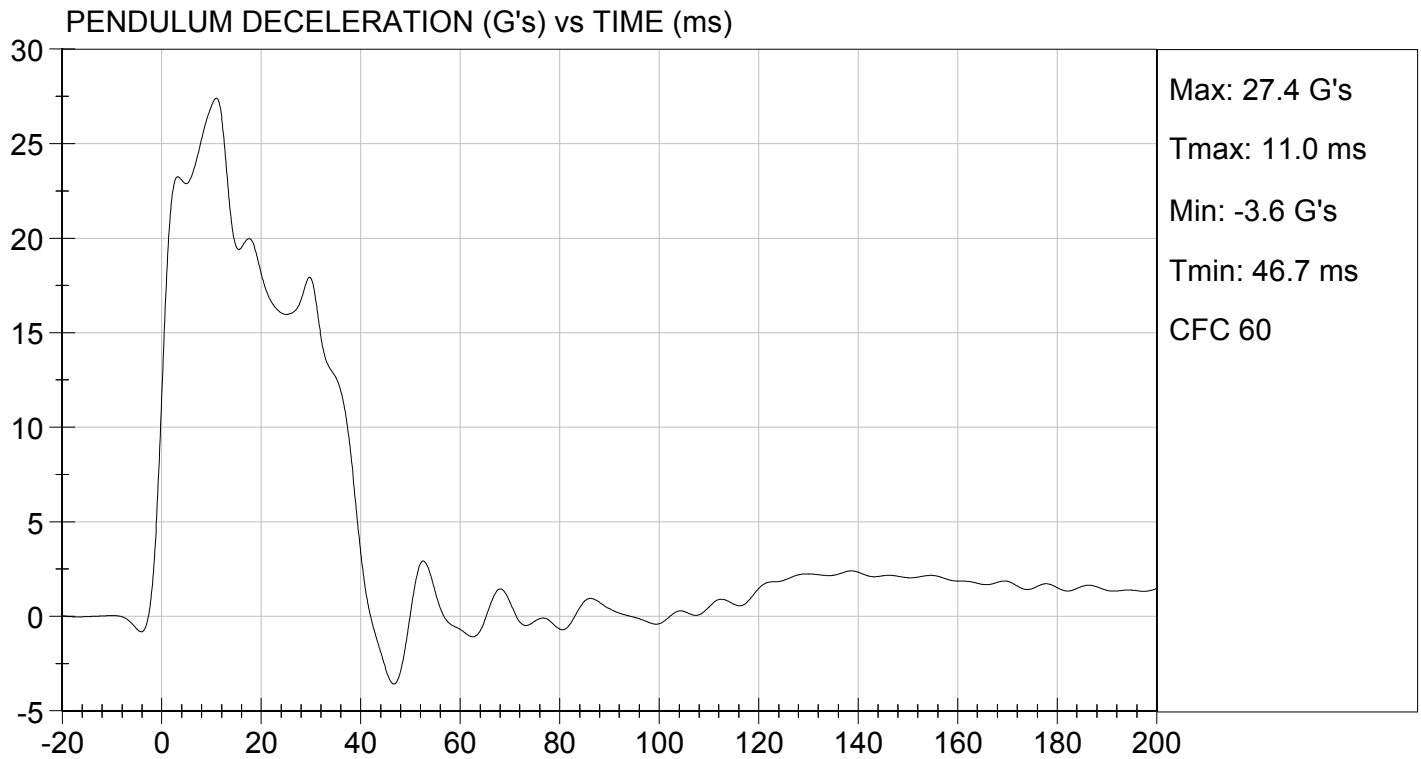
05/14/2014
Test Date

David Winkelbauer
Approved By



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

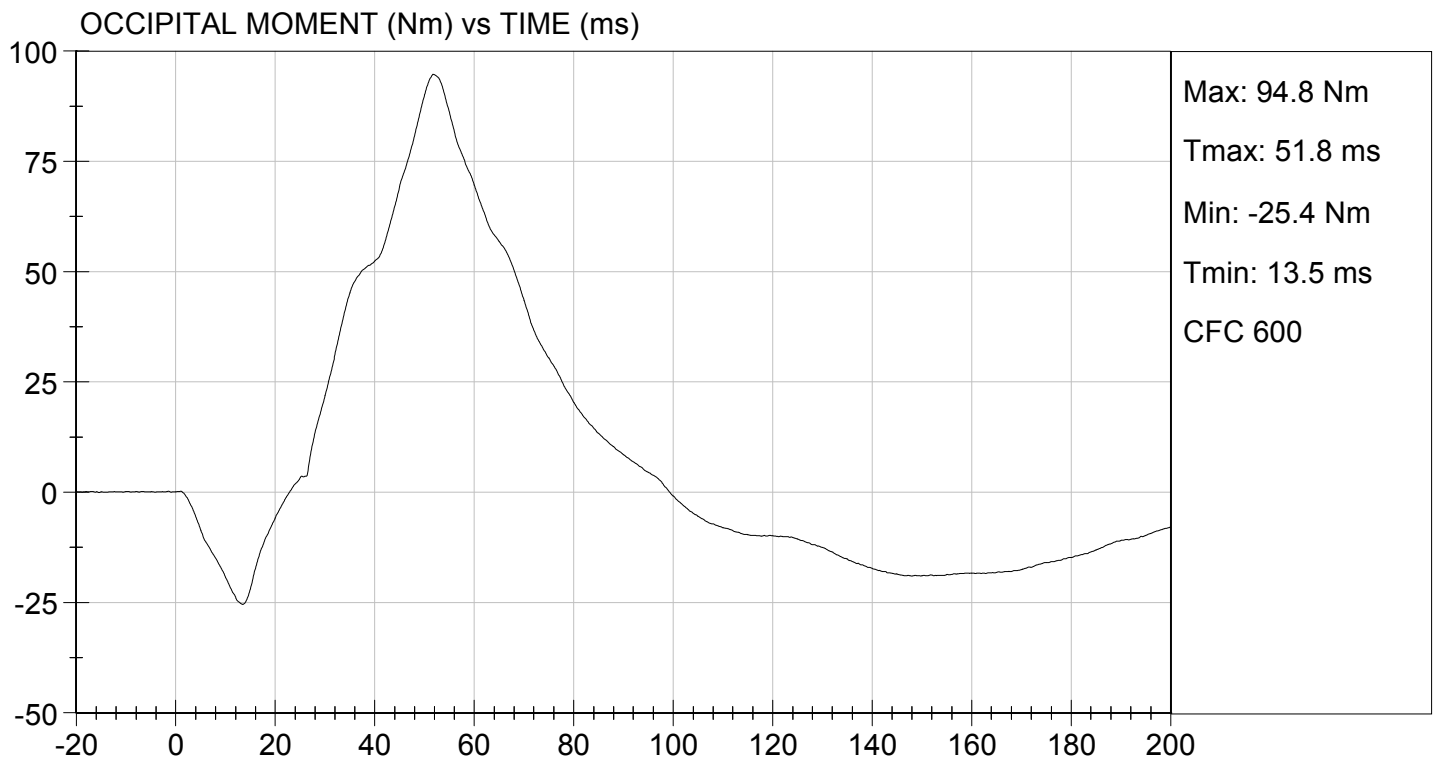
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TEST #: D141832





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

TEST DATE: 05/14/2014
TEST #: D141832

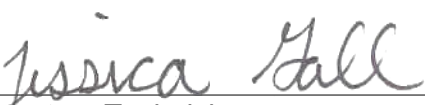


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

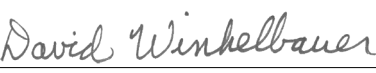
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Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.19	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.13	Pass
	20 ms	G's	14.00 to 19.00	15.77	Pass
	30 ms	G's	11.00 to 16.00	11.10	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	11.1	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	41.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	91.6	Pass
	Time	ms	72.0 to 82.0	76.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	157.8	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-57.7	Pass
	Time	ms	65.0 to 79.0	71.3	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.1	Pass
Overall Test Results					Pass


 Laboratory Technician

05/14/2014

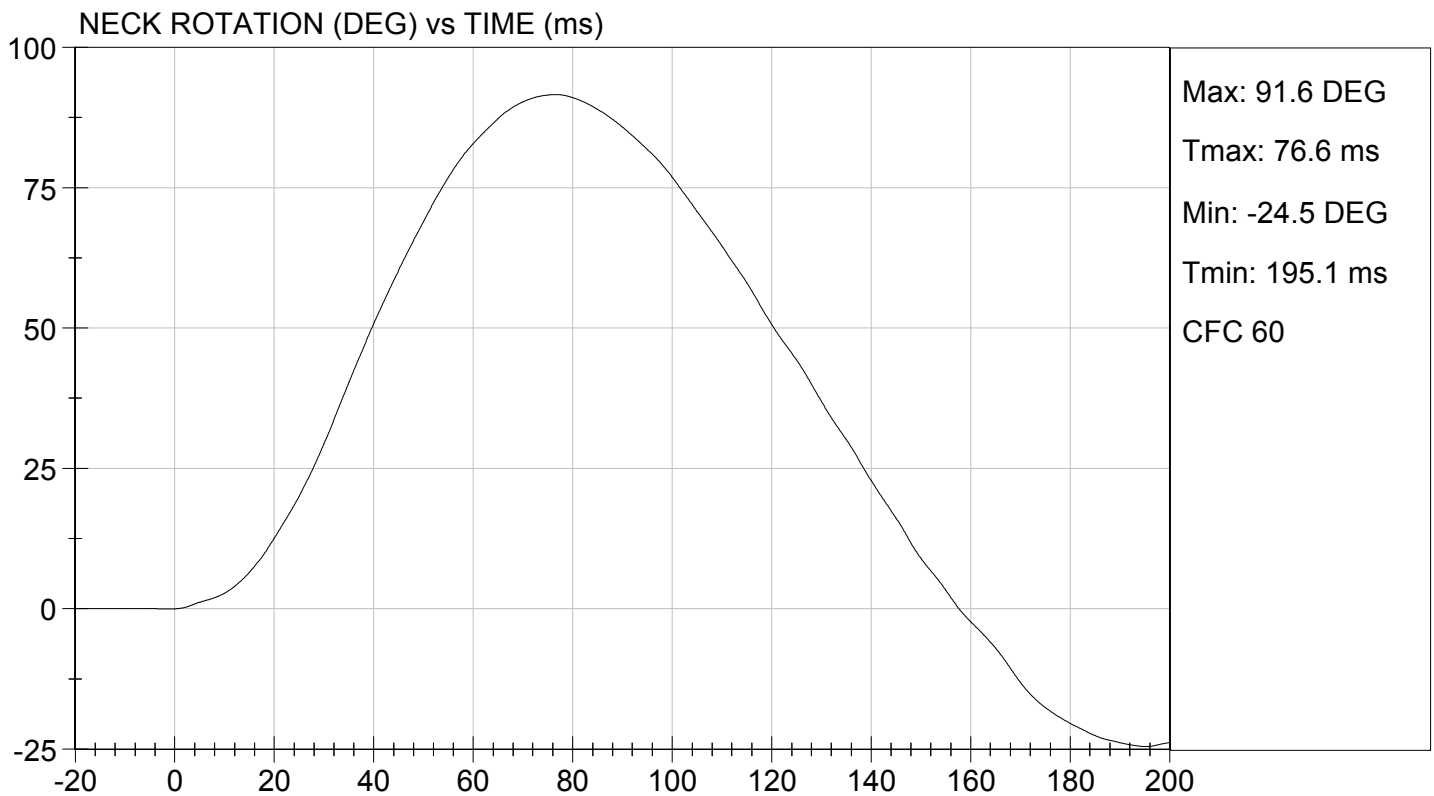
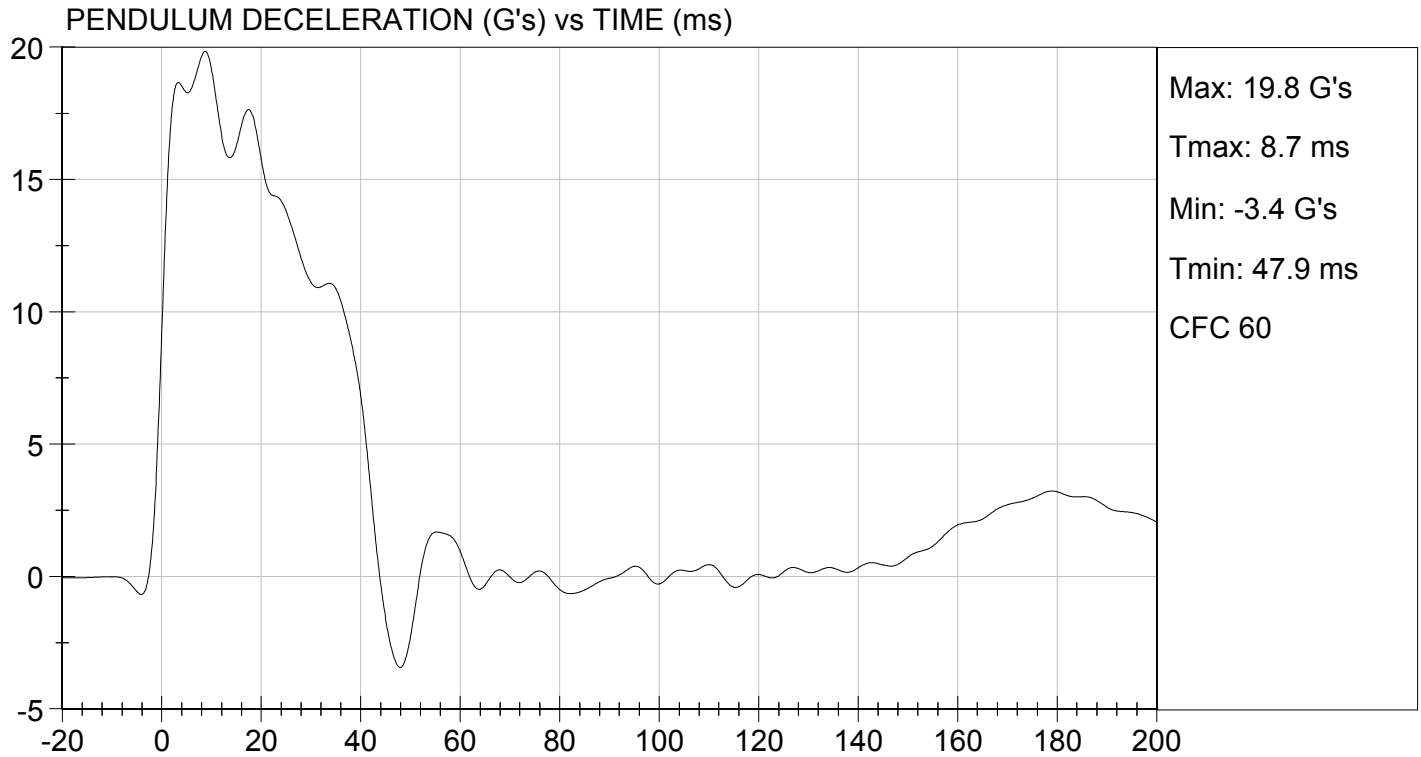
Test Date


 Approved By



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

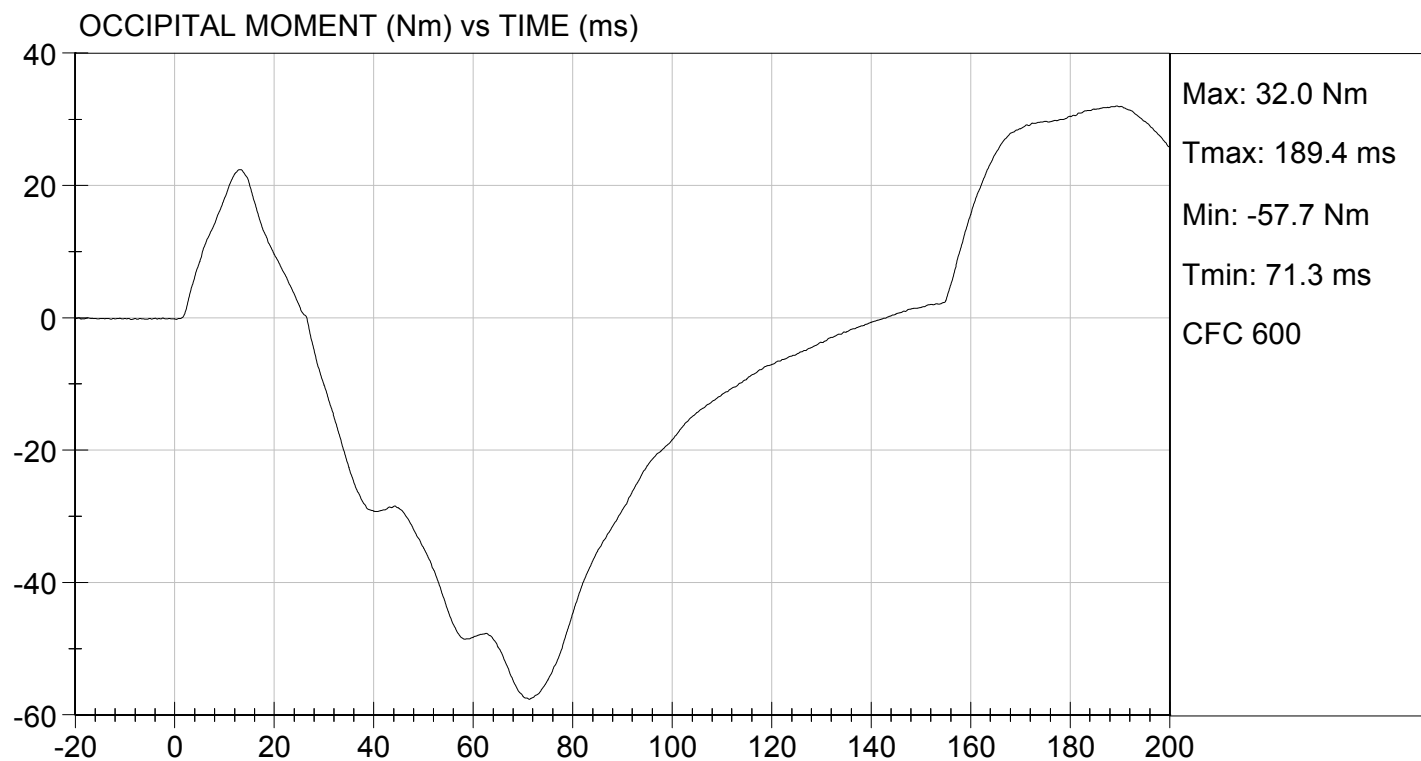
TEST DATE: 05/14/2014
TEST #: D141833





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

TEST DATE: 05/14/2014
TEST #: D141833



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D141834

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,261	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.55	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results			Pass	


Laboratory Technician

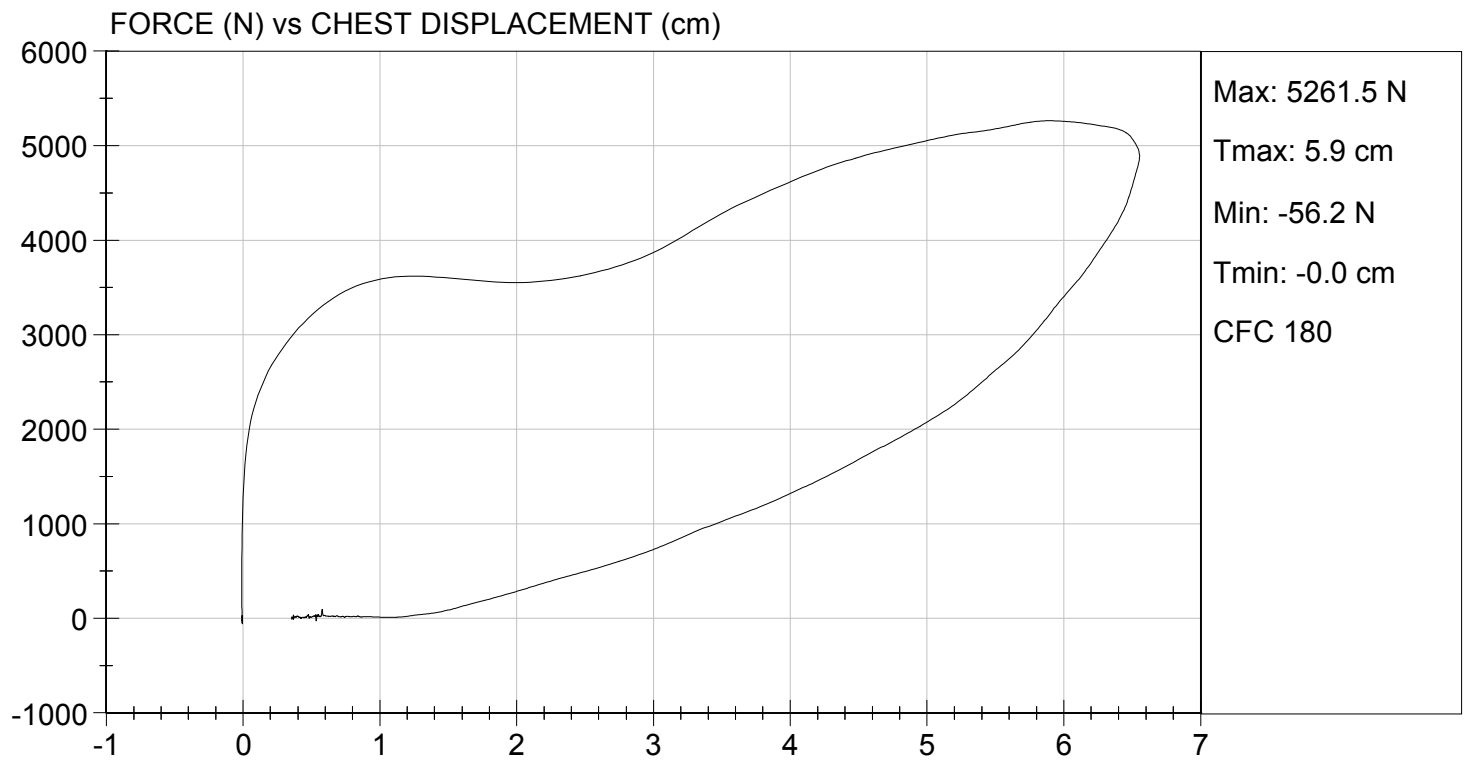
05/14/2014
Test Date


Approved By



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

TEST DATE: 05/14/2014
TEST #: D141834

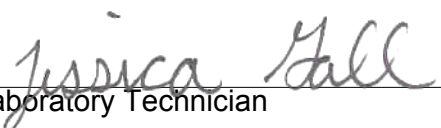


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D141835

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	4,822	Pass
Overall Test Results				Pass


Laboratory Technician

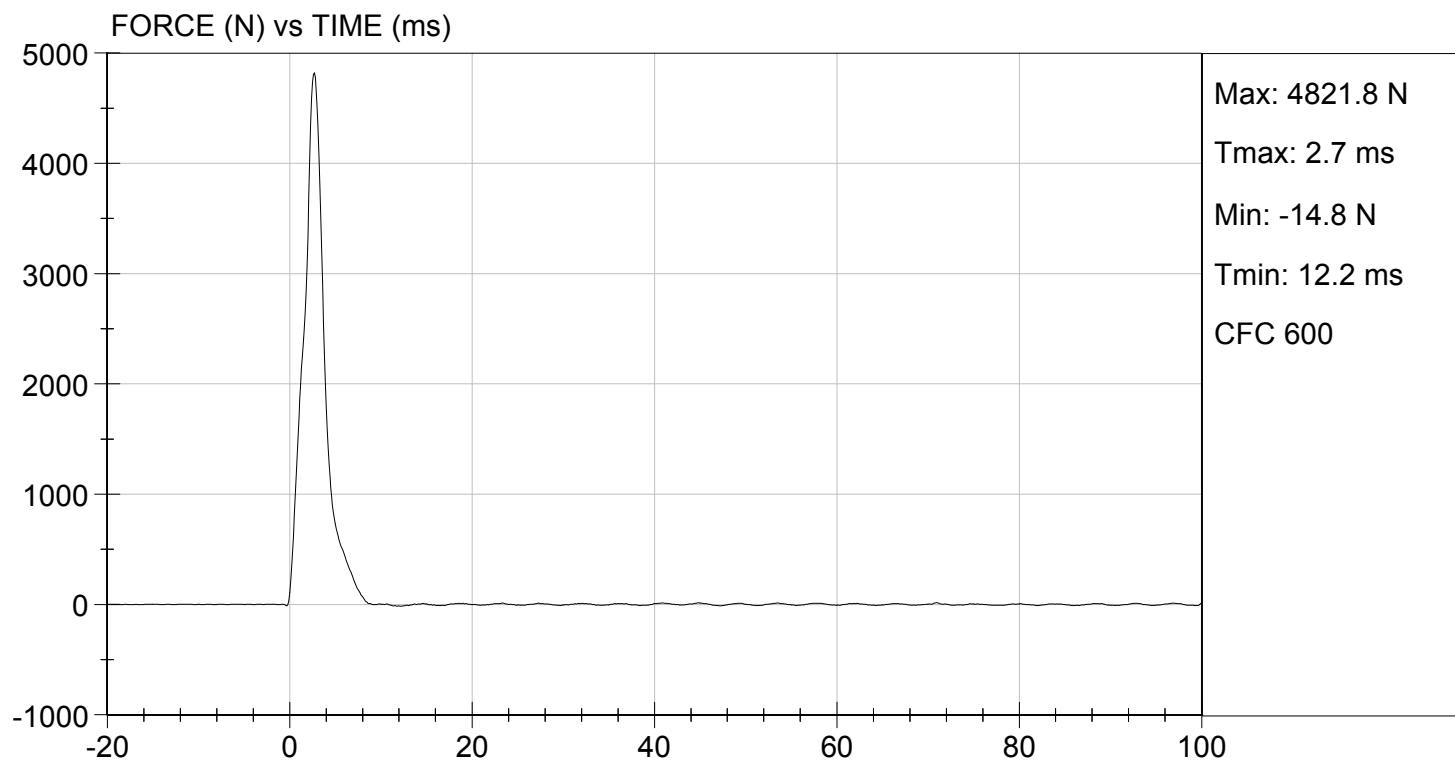
05/14/2014
Test Date


Approved By



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

TEST DATE: 05/14/2014
TEST #: D141835

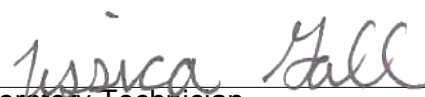


MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D141836

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.13	Pass
Peak Probe Force	N	4715 to 5782	5,417	Pass
Overall Test Results				Pass


Laboratory Technician

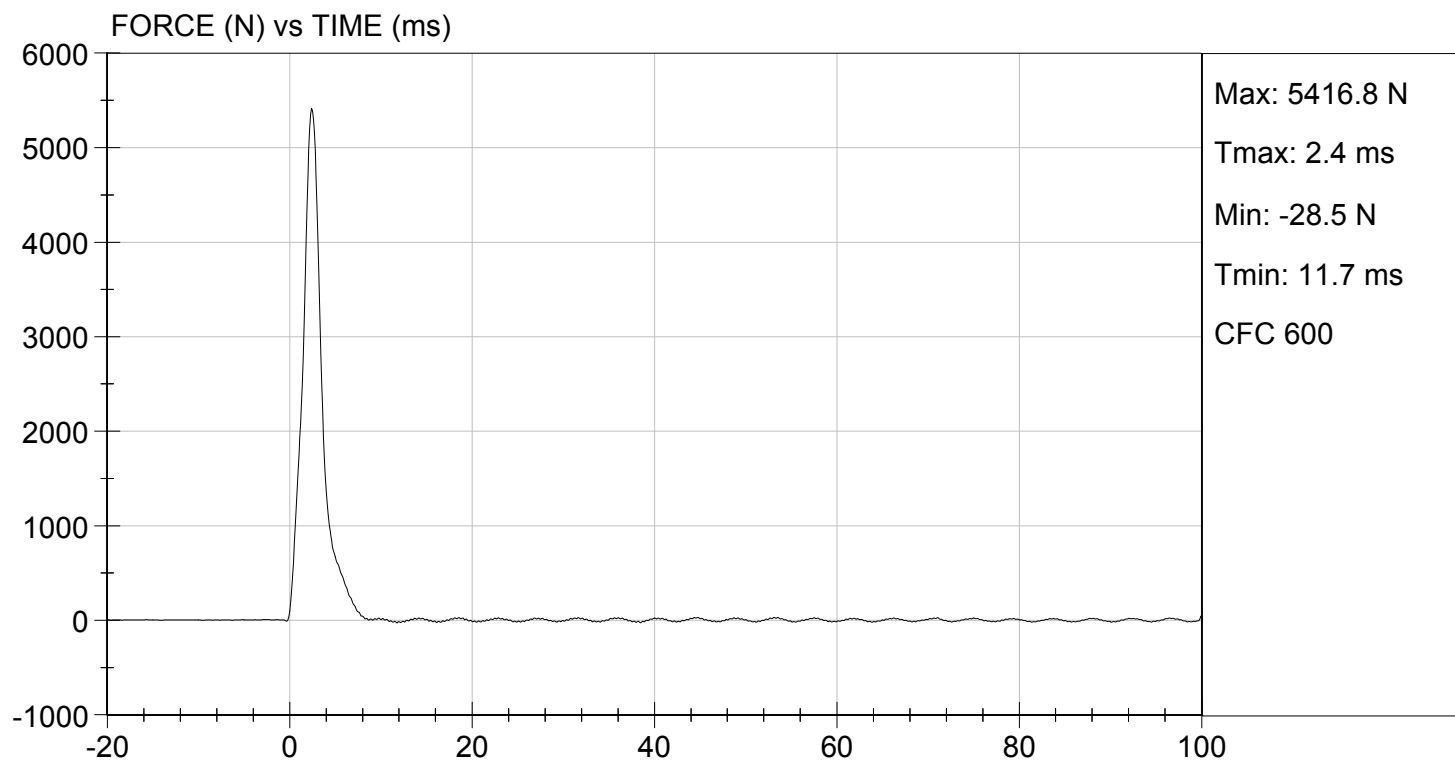
05/14/2014
Test Date


Approved By



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

TEST DATE: 05/14/2014
TEST #: D141836

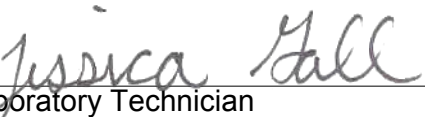


MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

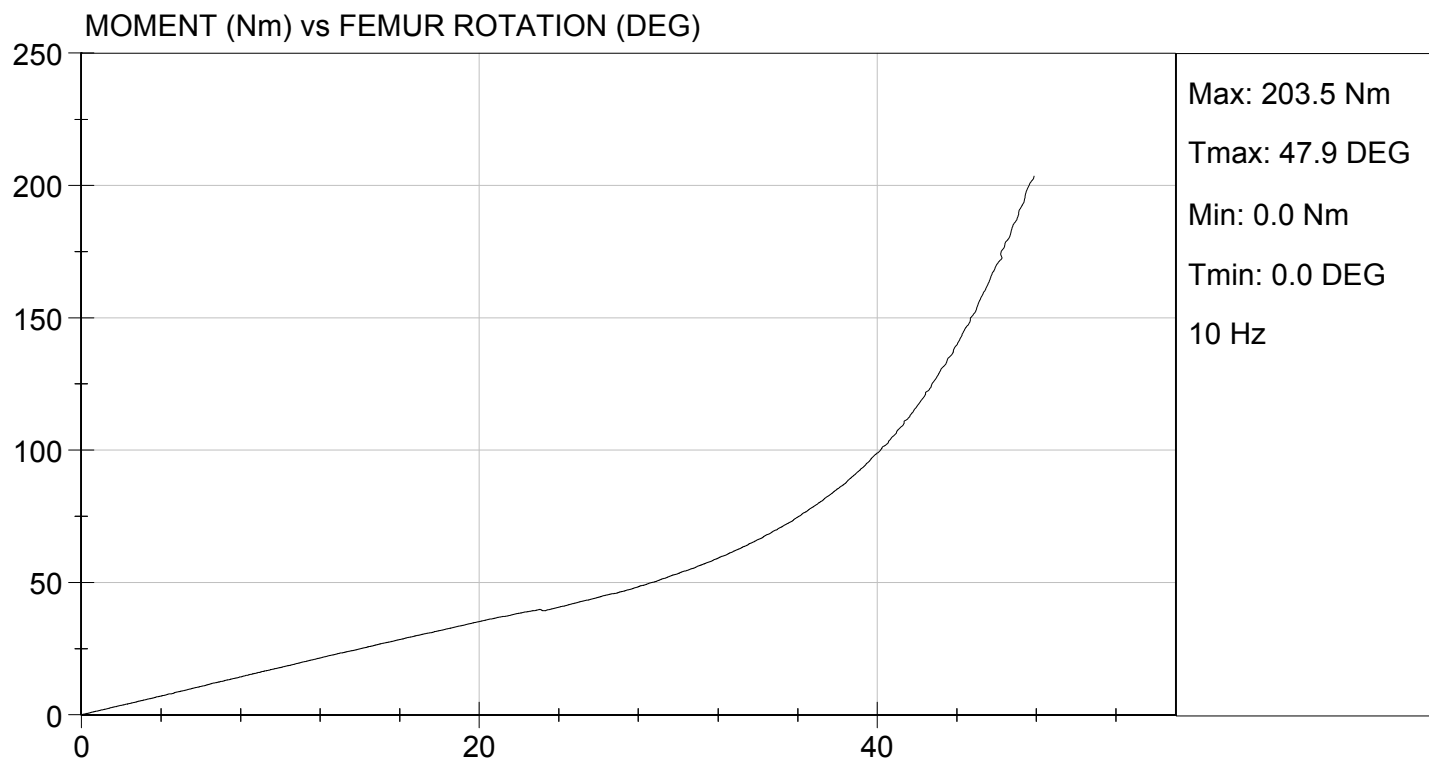
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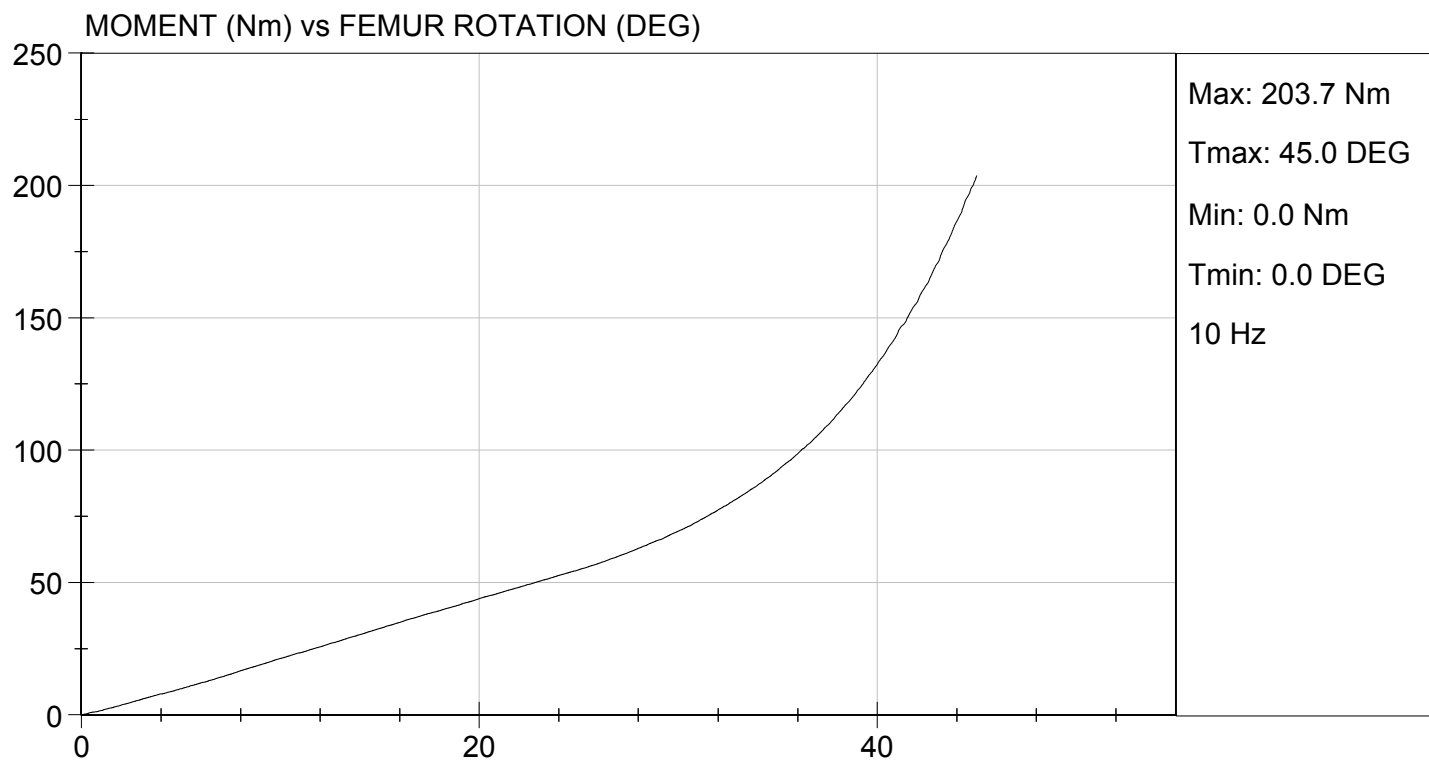
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.1	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	50	50	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.2	6.1	Pass
30 Degrees	Nm	94.9 Nm Max	53.3	69.3	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	47.9	45.0	Pass
Overall Test Results					Pass


 Laboratory Technician

05/14/2014
 Test Date


 Approved By





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

ATD Serial No: 351

Test ID: D142071

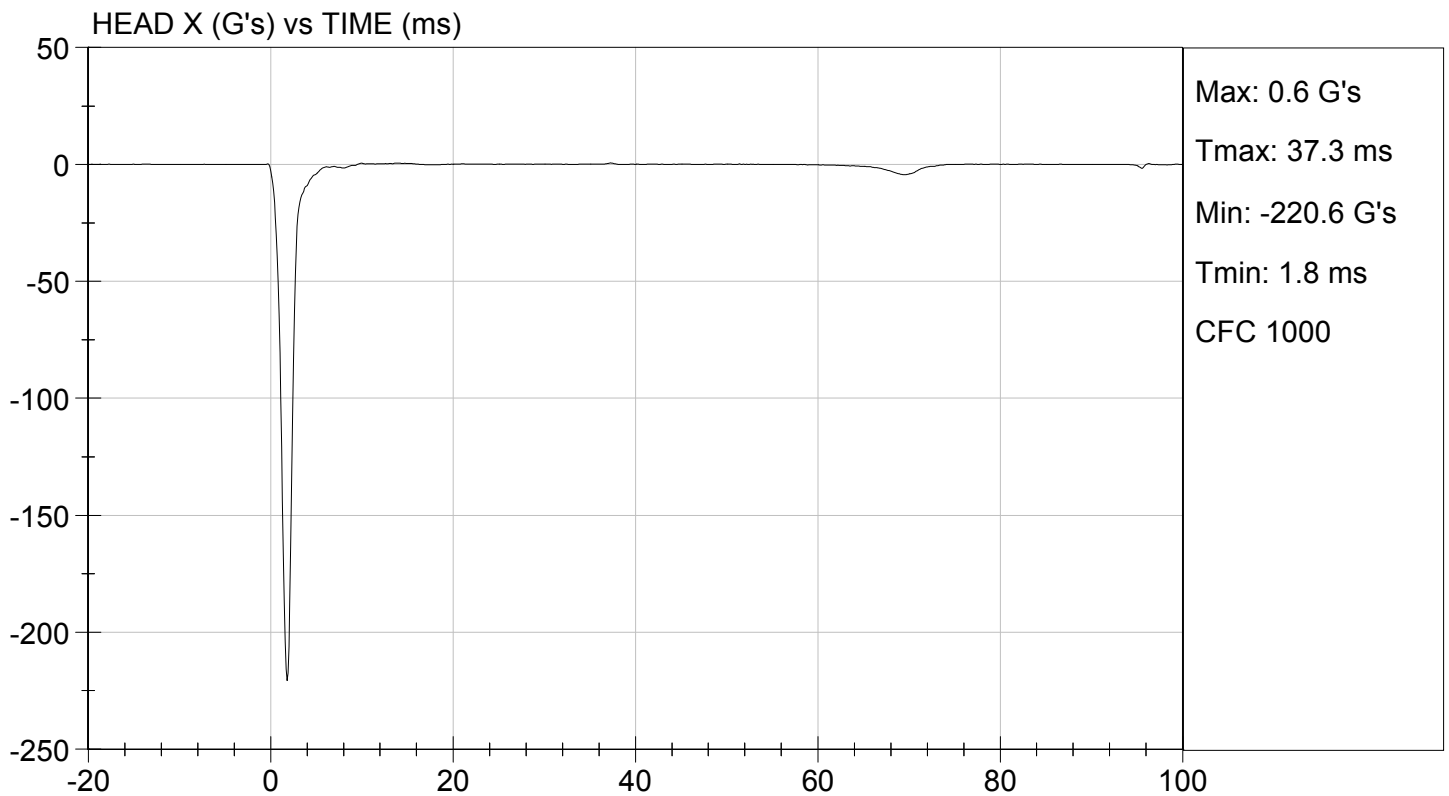
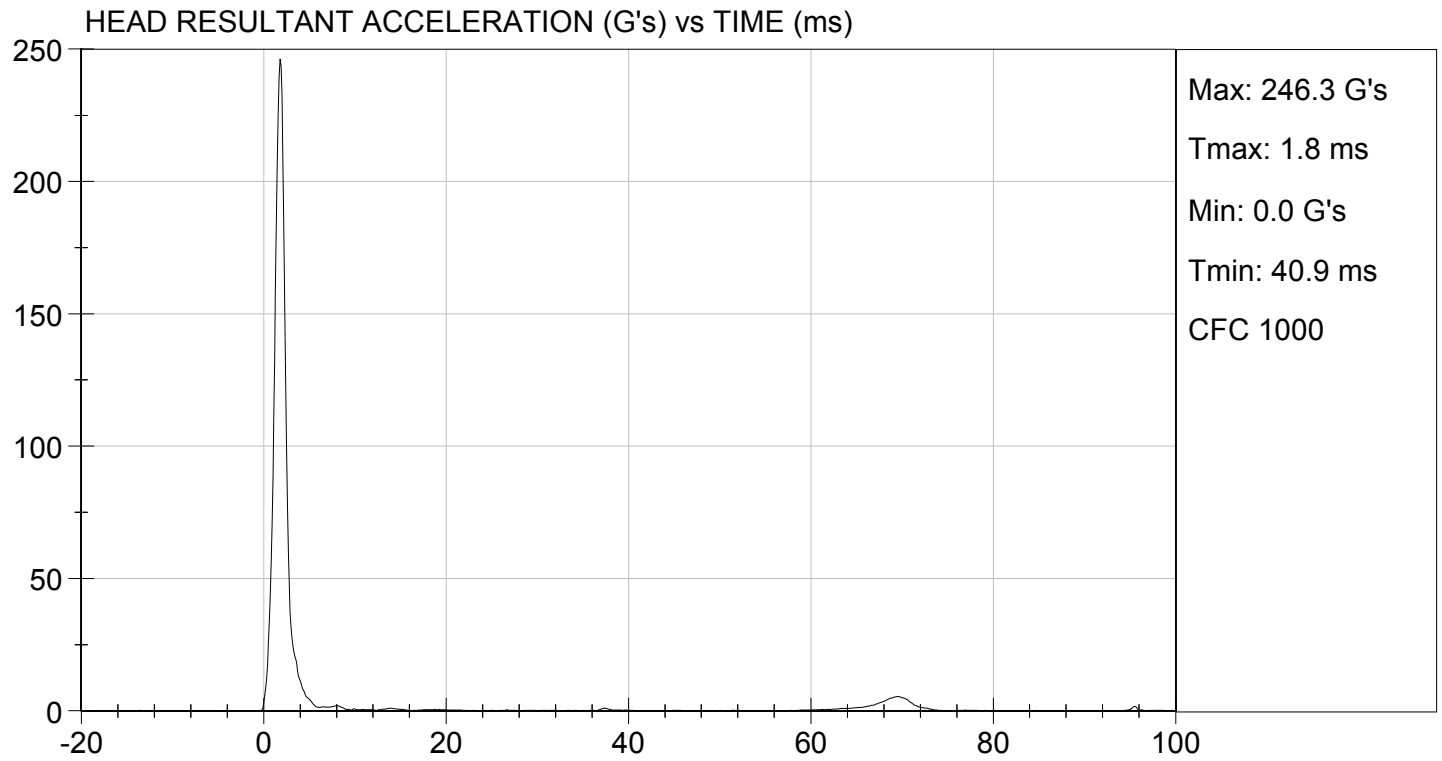
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	225 to 275	246	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-6.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

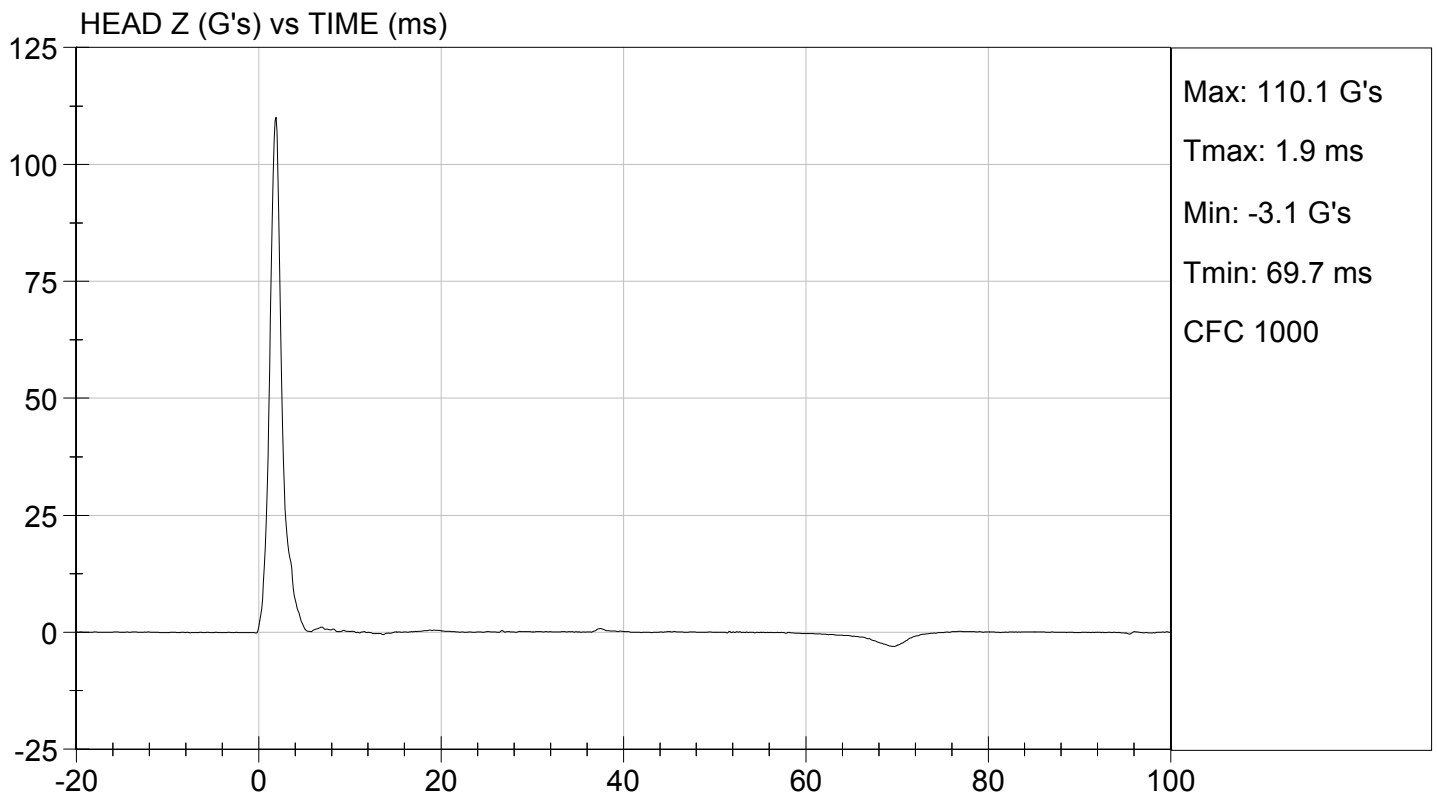
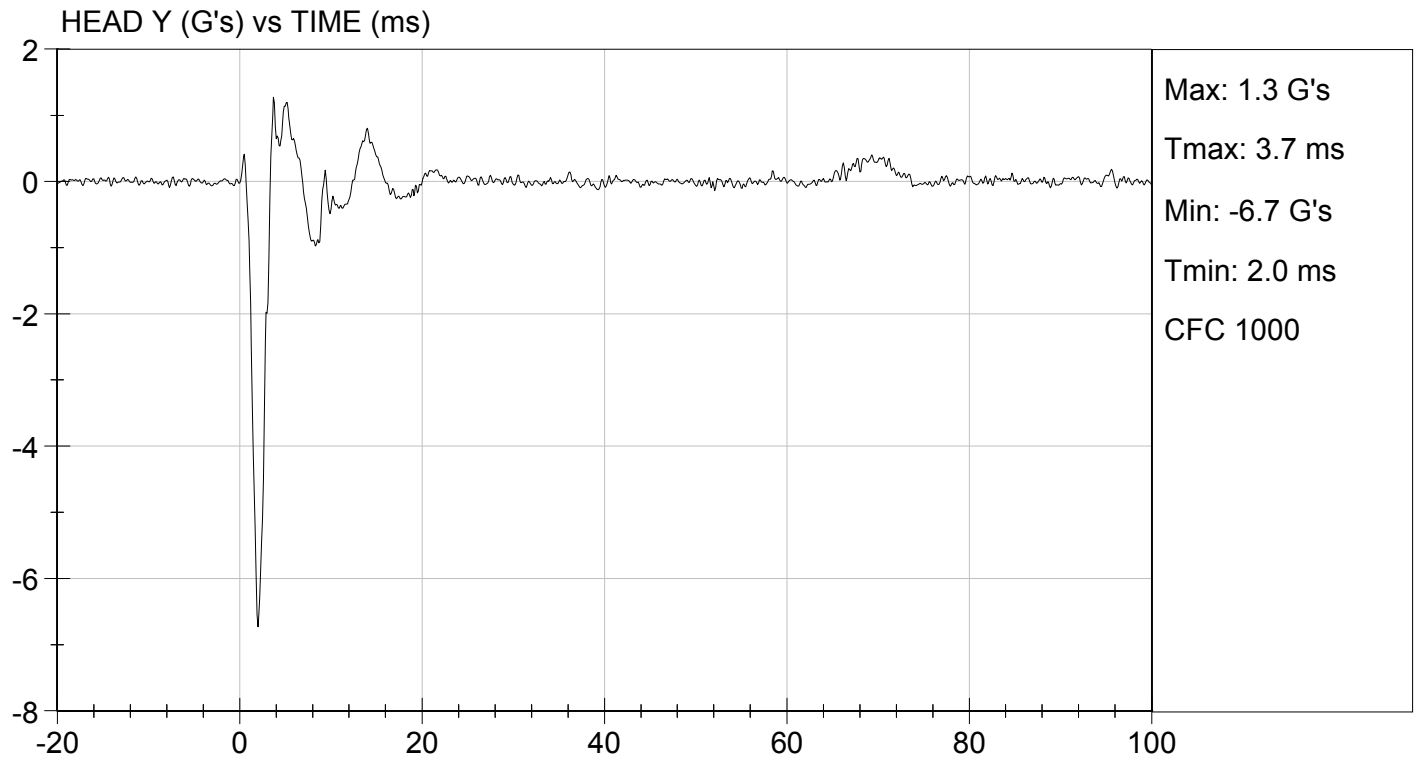

Laboratory Technician

06/05/2014

Test Date


Approved By





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

ATD Serial No: 351

Test I.D: D142072

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.61	Pass
	20 ms	G's	17.60 to 22.60	18.25	Pass
	30 ms	G's	12.50 to 18.50	14.31	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	38.4	Pass
Maximum "D" Plane Rotation	Maximum	Deg	64.0 to 78.0	67.7	Pass
	Time	ms	57.0 to 64.0	57.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	113.2	Pass
Moment About Occipital Condyle	Maximum	Nm	88.1 to 108.5	93.4	Pass
	Time	ms	47.0 to 58.0	50.4	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.5	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

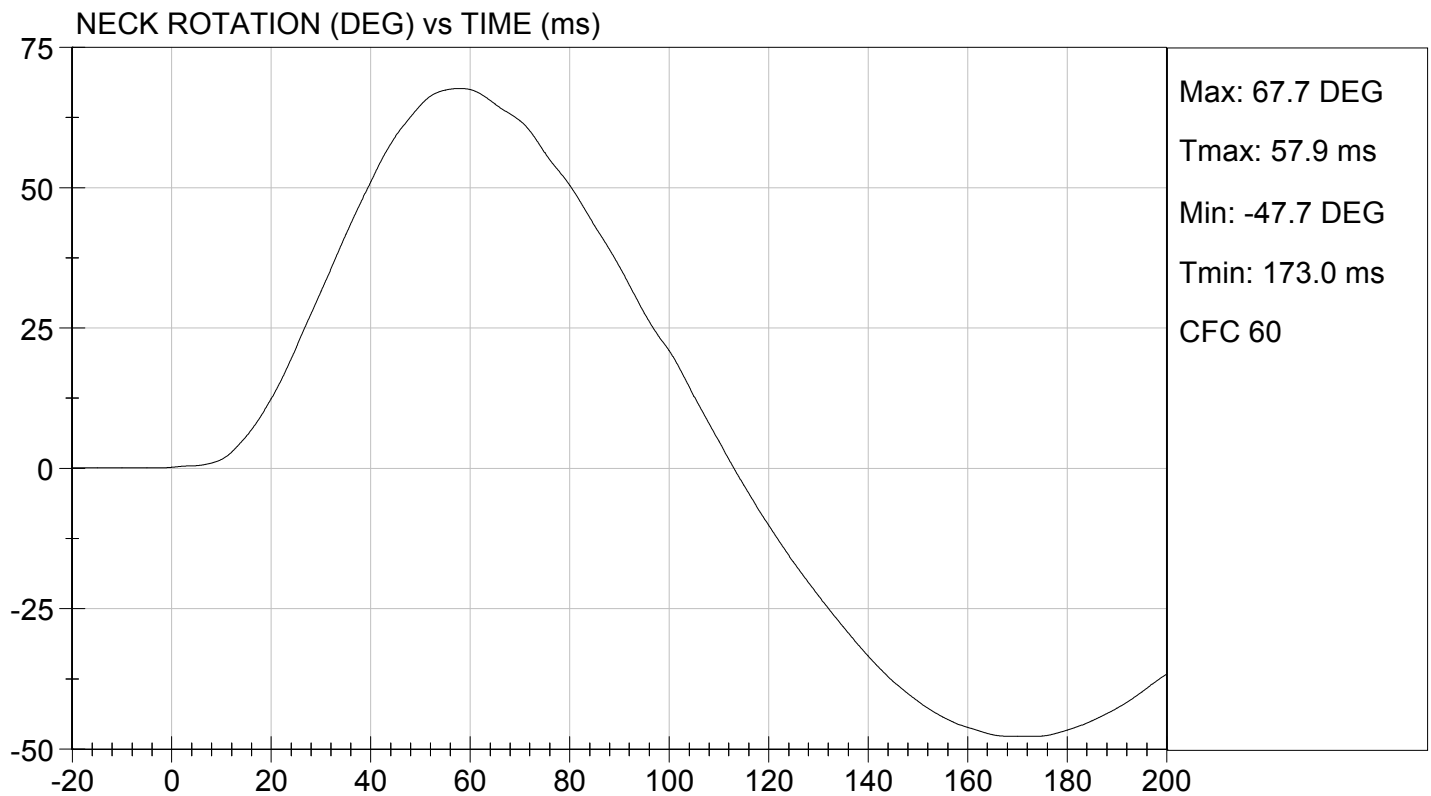
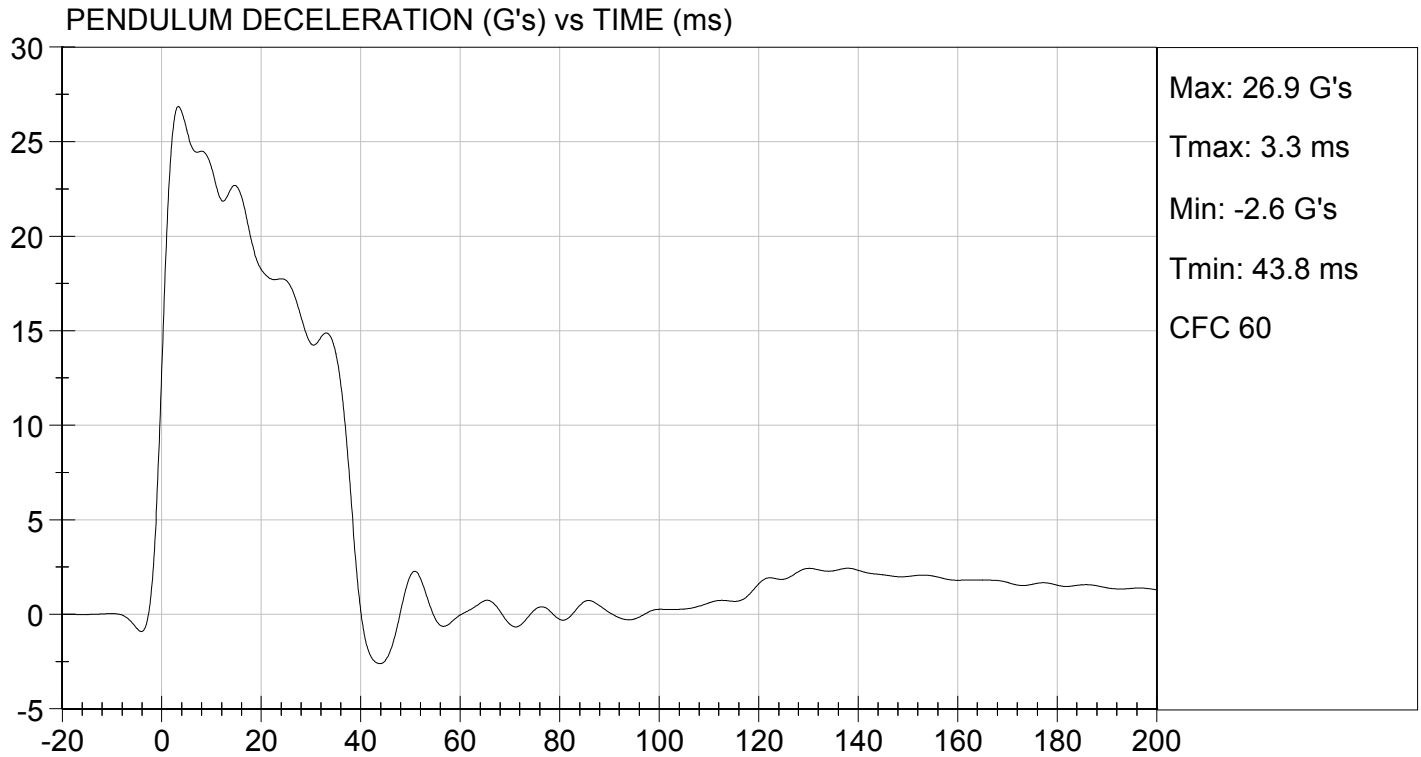
06/06/2014
Test Date

David Winkelbauer
Approved By



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

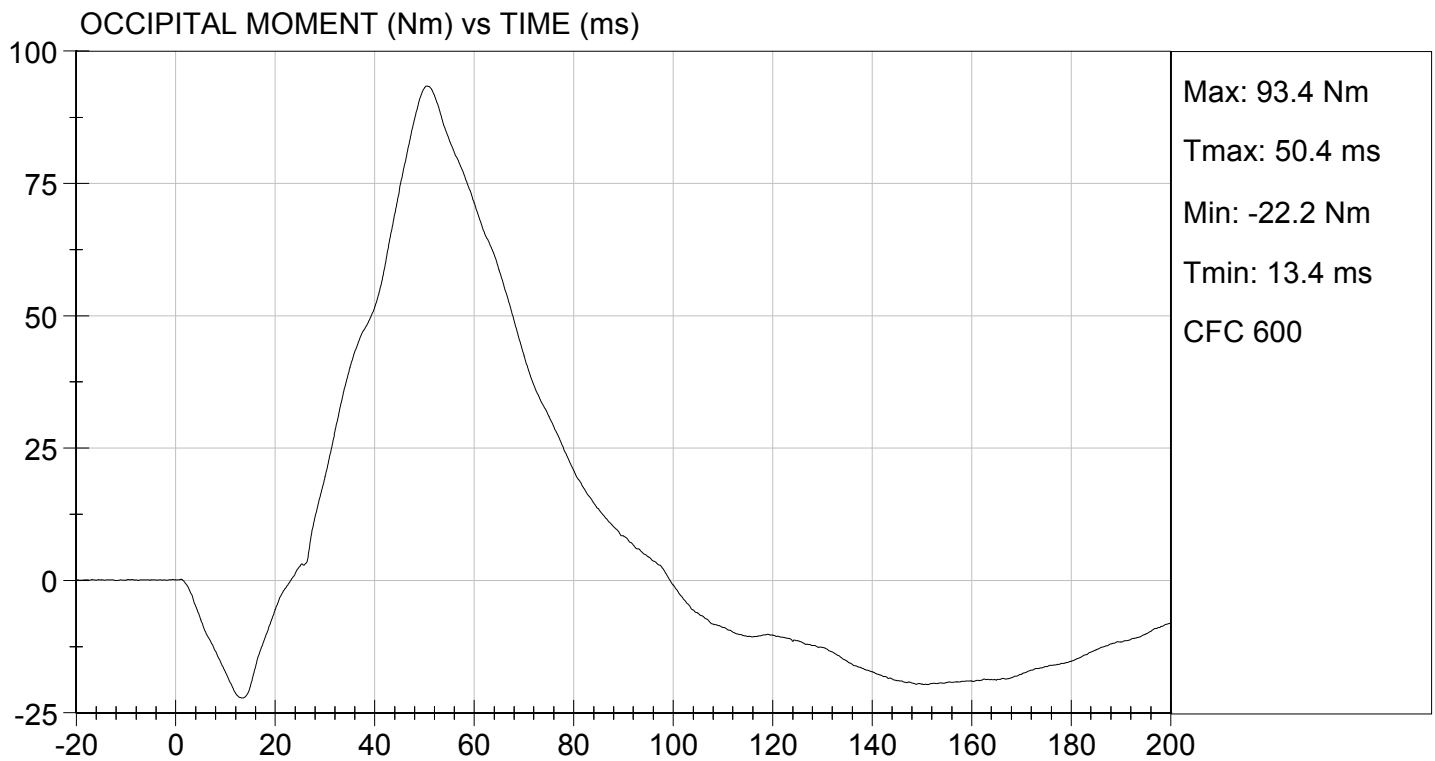
TEST DATE: 06/06/2014
TEST #: D142072





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

TEST DATE: 06/06/2014
TEST #: D142072



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

ATD Serial No: 351

Test I.D: D142073

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	44	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.13	Pass
	20 ms	G's	14.00 to 19.00	16.72	Pass
	30 ms	G's	11.00 to 16.00	12.45	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.4	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	93.6	Pass
	Time	ms	72.0 to 82.0	75.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	152.2	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-59.9	Pass
	Time	ms	65.0 to 79.0	69.2	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.0	Pass
Overall Test Results					Pass


Laboratory Technician

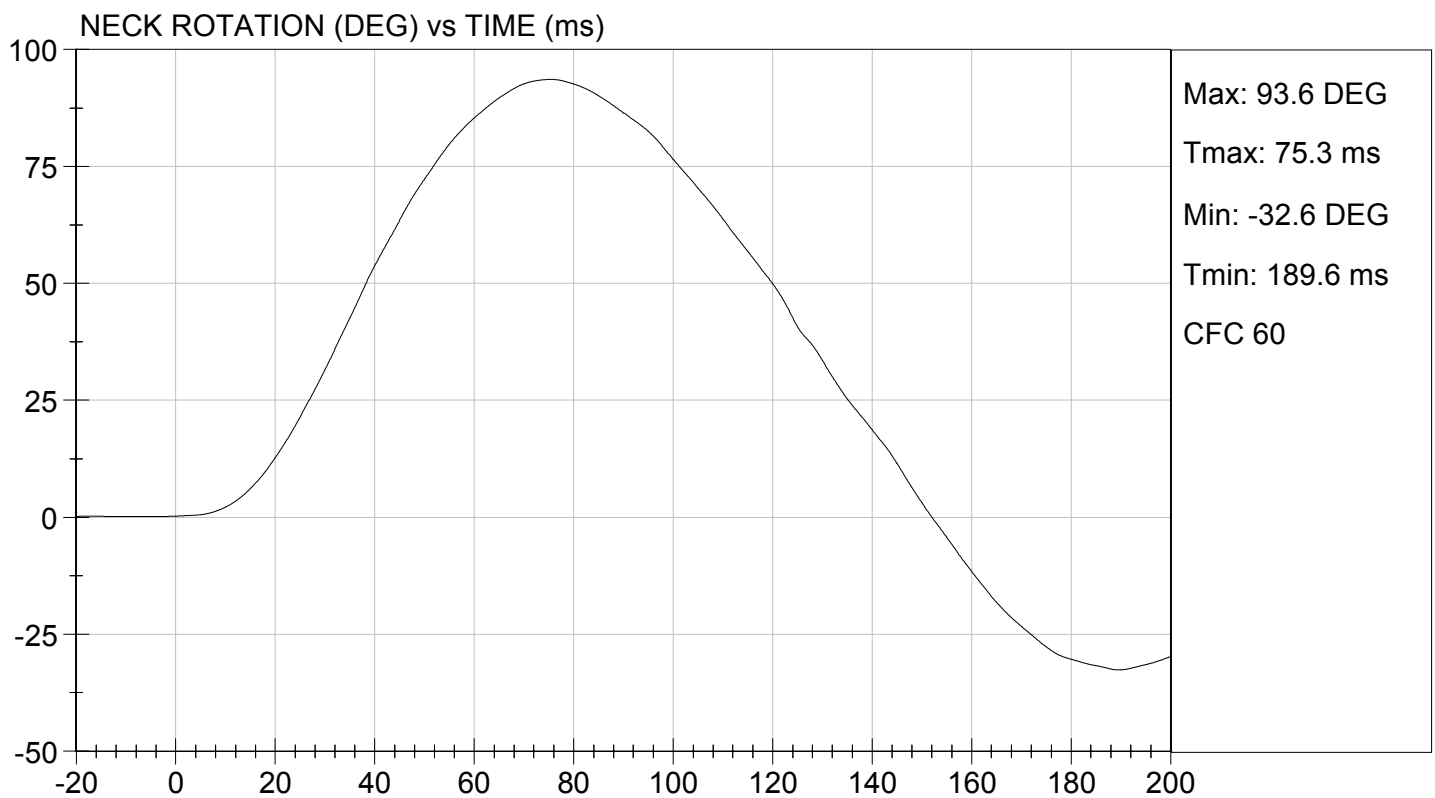
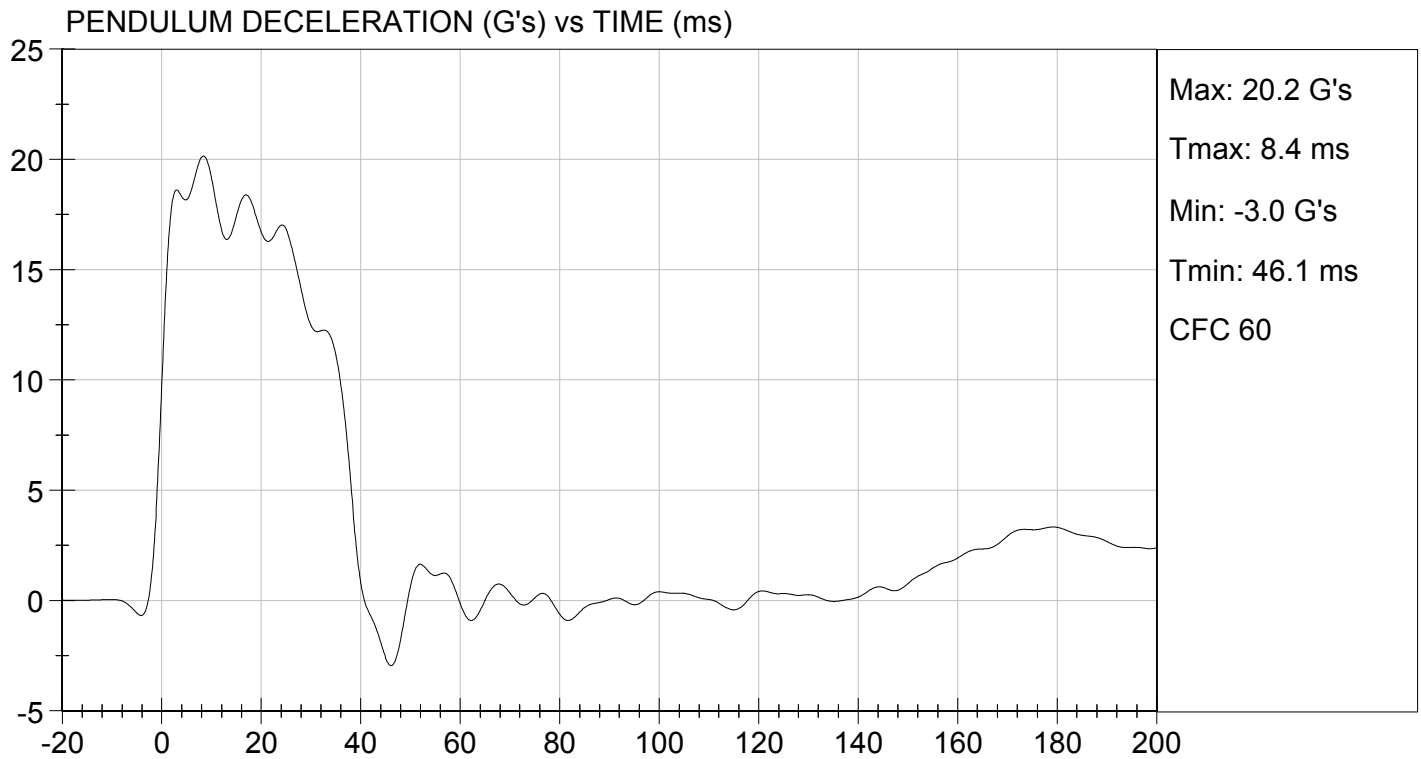
06/06/2014
Test Date


Approved By



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

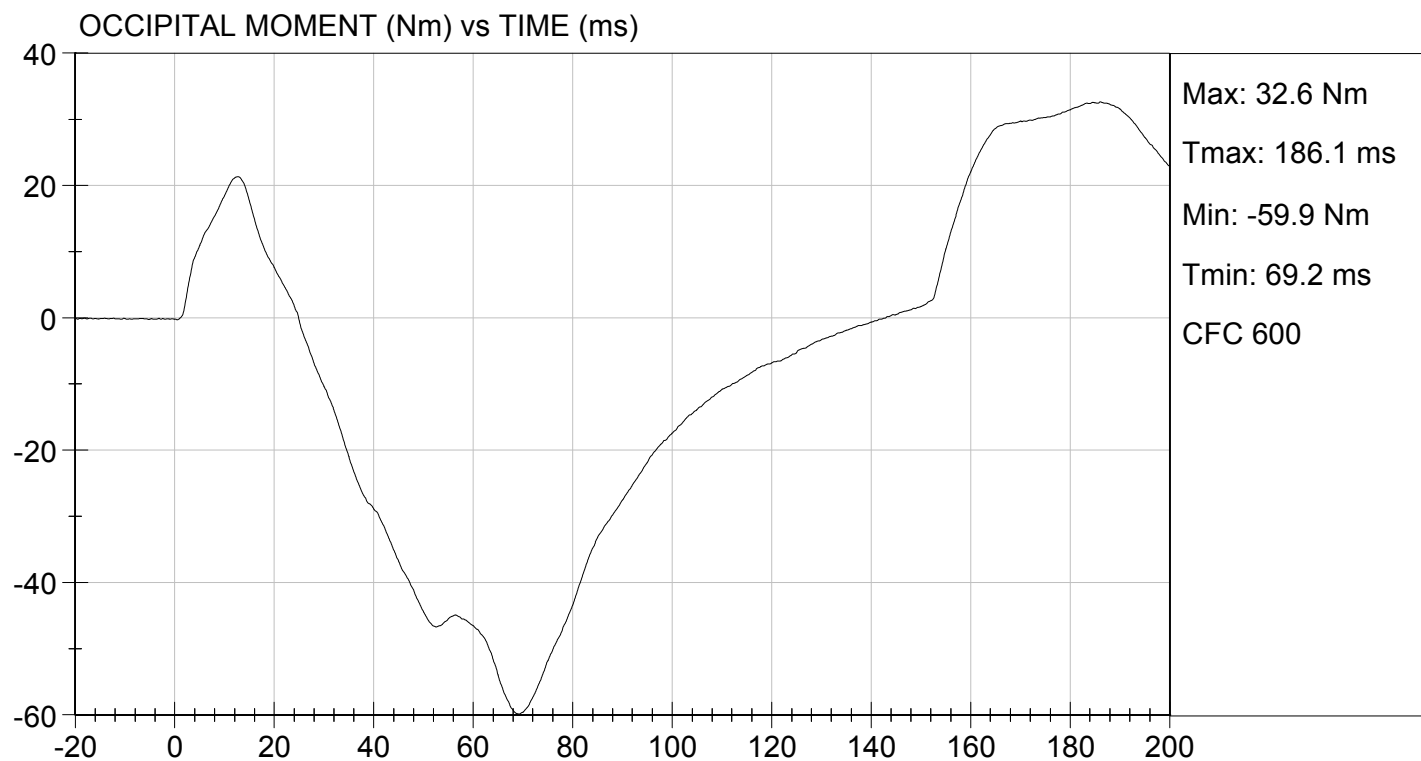
TEST DATE: 06/06/2014
TEST #: D142073





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

TEST DATE: 06/06/2014
TEST #: D142073



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D142074

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	N	5159 to 5893	5,386	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.59	Pass
Internal Hysteresis	%	69 to 85	71	Pass
			Overall Test Results	Pass


Laboratory Technician

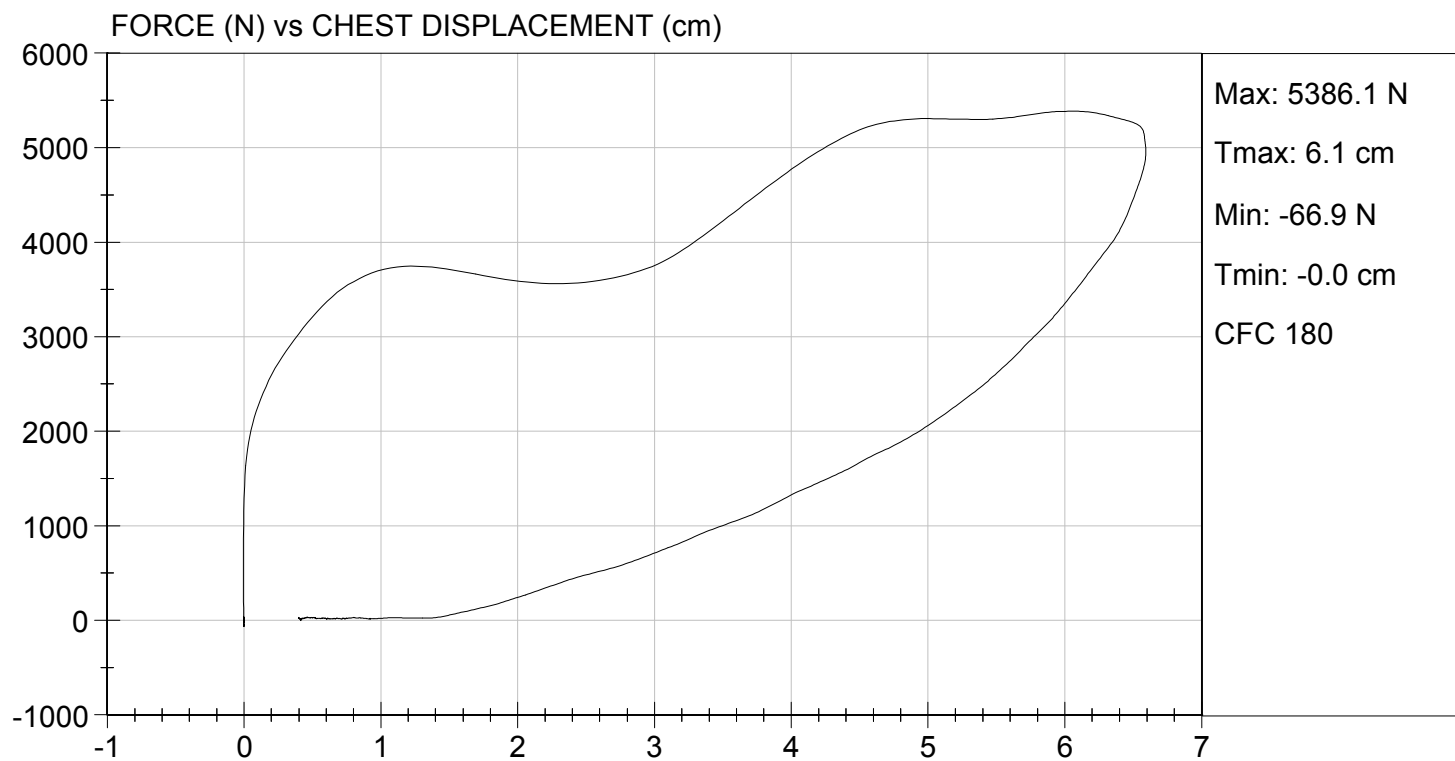
06/06/2014
Test Date


Approved By



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

TEST DATE: 06/06/2014
TEST #: D142074

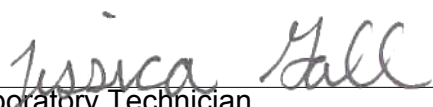


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D142075

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	N	4715 to 5782	5,327	Pass
Overall Test Results				Pass


Laboratory Technician

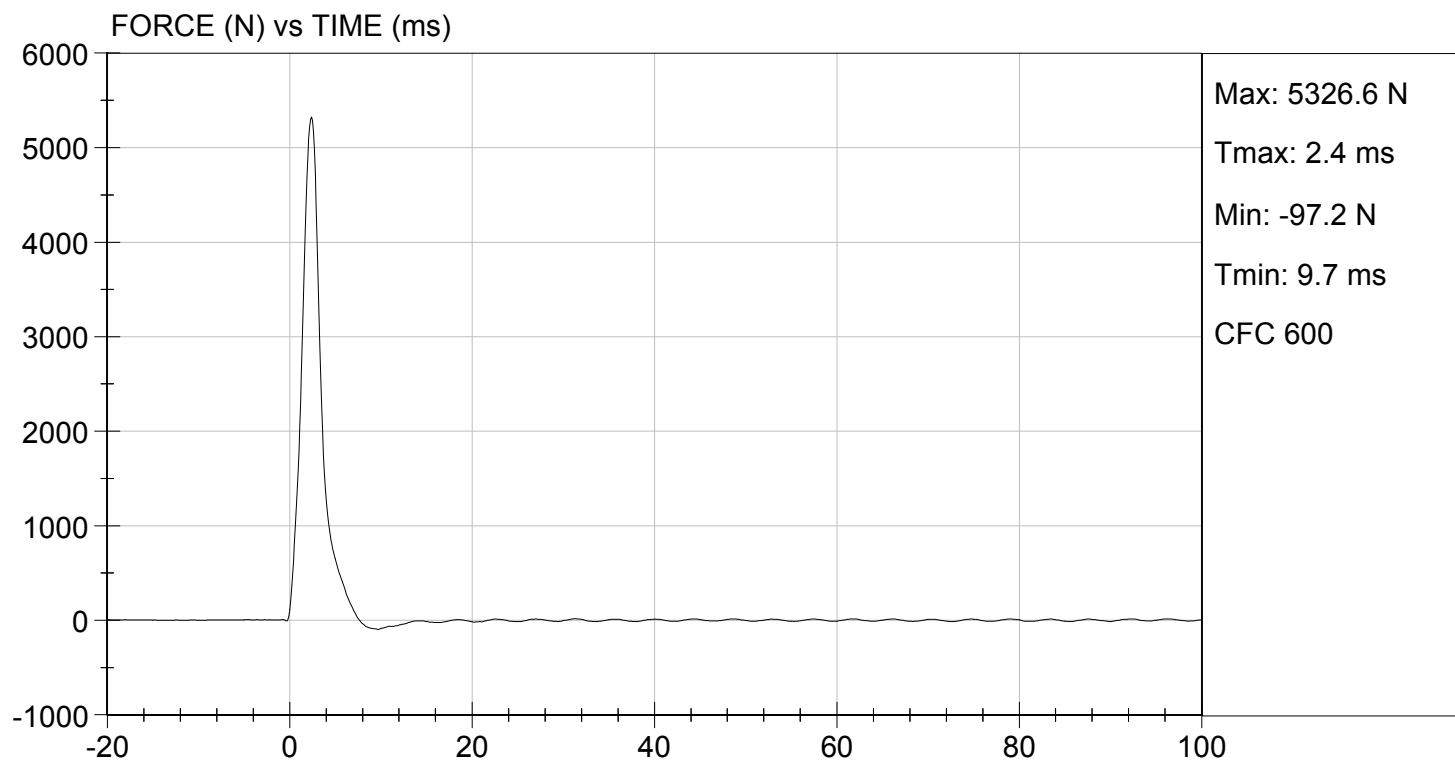
06/06/2014
Test Date


Approved By



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

TEST DATE: 06/06/2014
TEST #: D142075



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

ATD Serial No: 351

Test I.D: D142076

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	N	4715 to 5782	5,193	Pass
Overall Test Results				Pass


Laboratory Technician

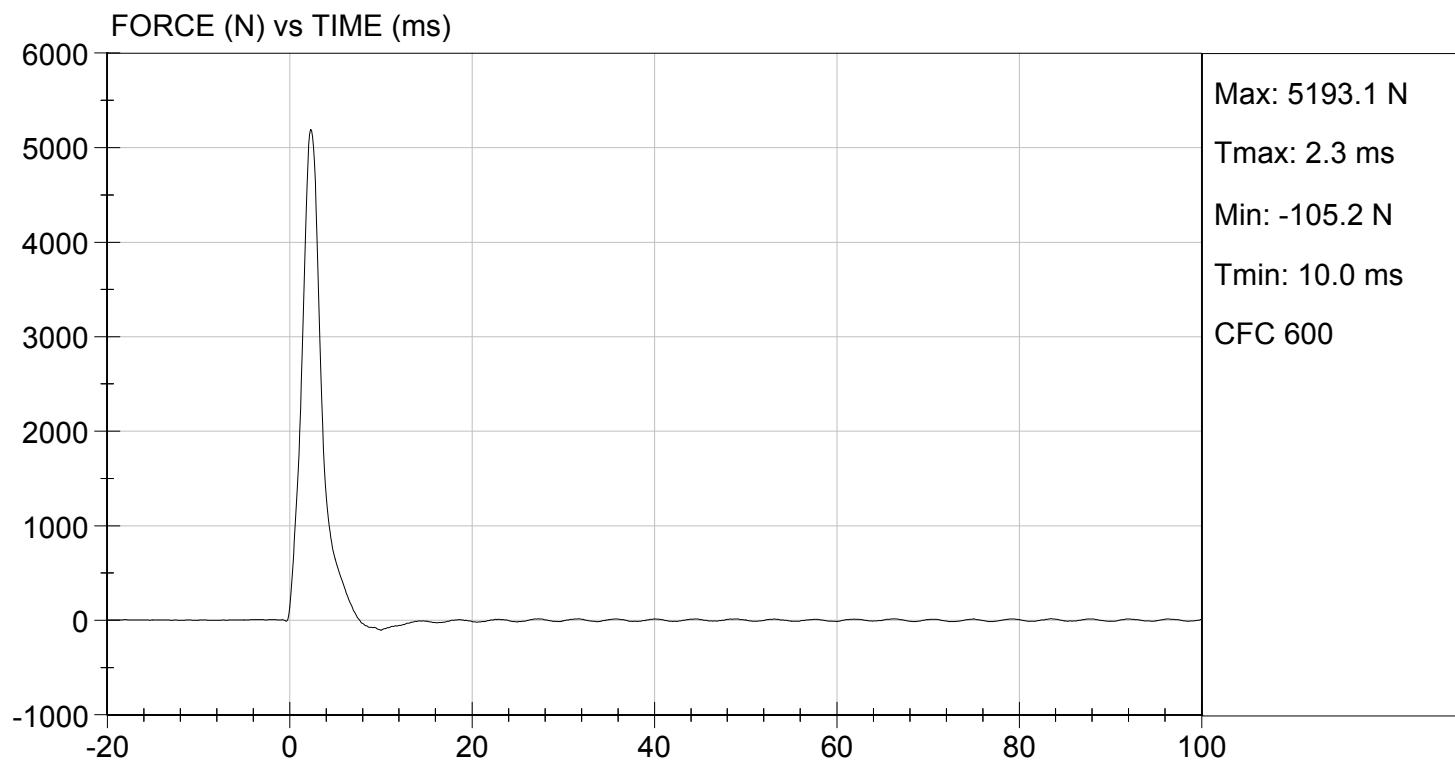
06/06/2014
Test Date


Approved By



TEST DESC: LEFT KNEE
VELOCITY: 6.81 ft/s, 2.08 m/s

TEST DATE: 06/06/2014
TEST #: D142076



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

ATD Serial No: 351

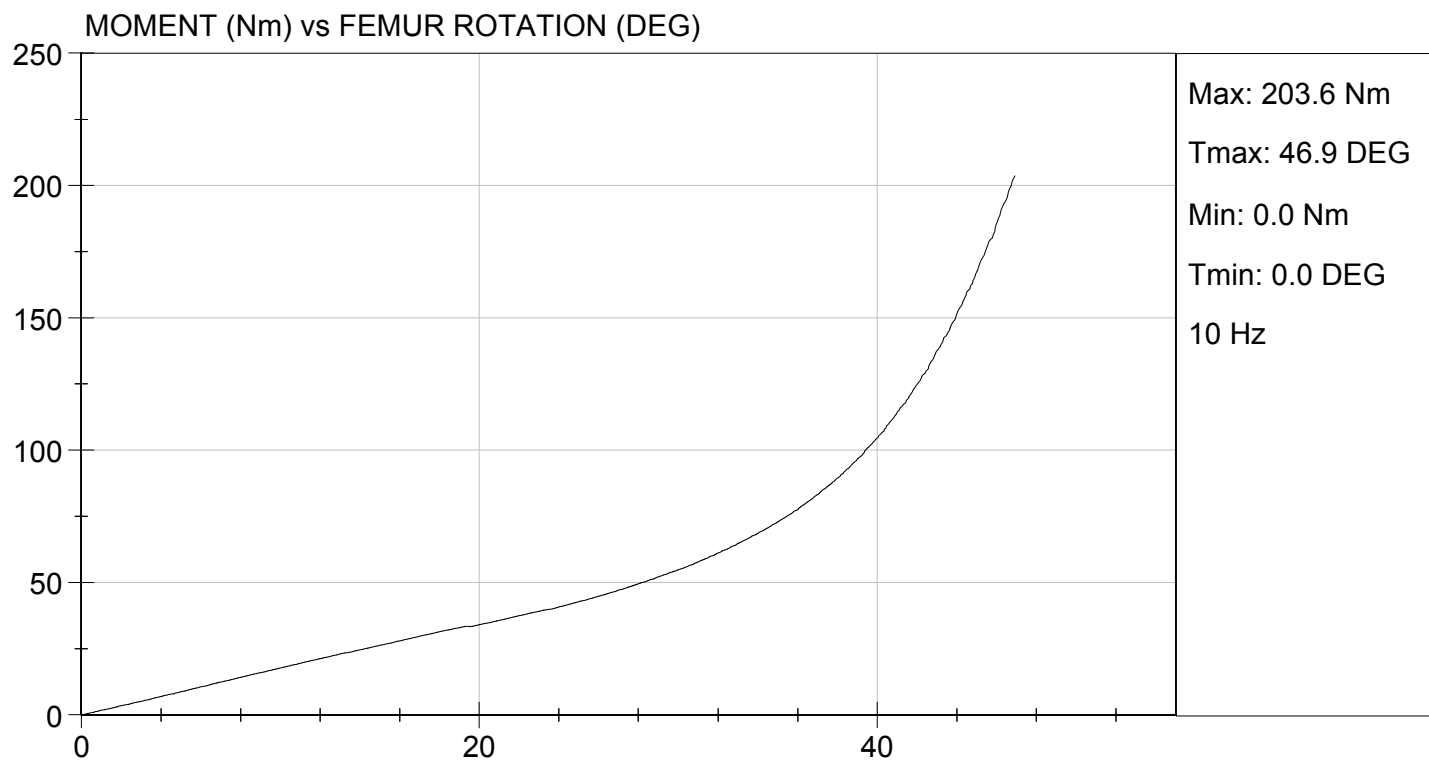
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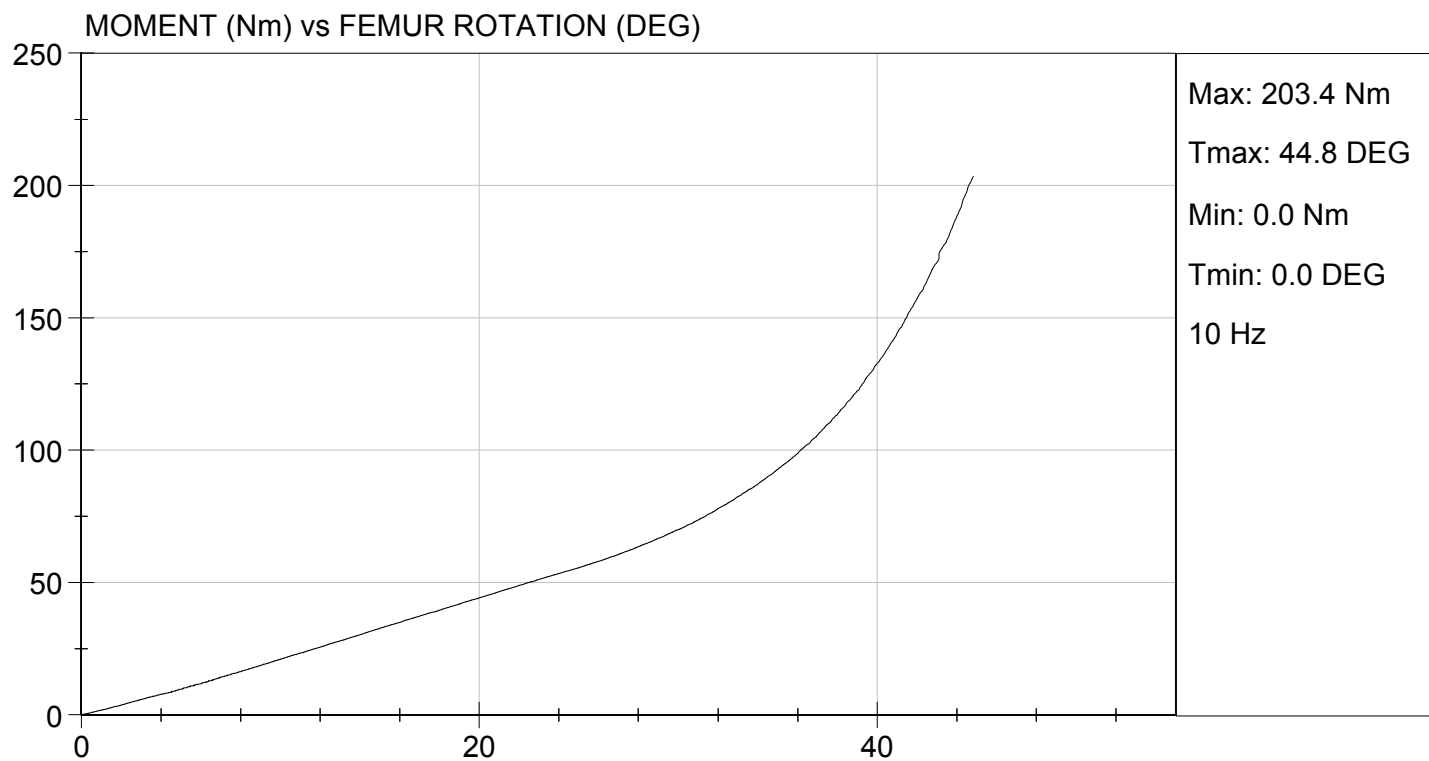
Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	49	49	Pass
Rotation Rate	deg/s	5.0 to 10.0	6.1	6.1	Pass
30 Degrees	Nm	94.9 Nm Max	54.8	70.0	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 to 50.0 Degree Max Rotation	46.9	44.8	Pass
Overall Test Results					Pass


 Laboratory Technician

06/06/2014
 Test Date


 Approved By





Hybrid III, 5th External Measurements
SN: 138

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

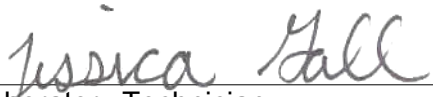
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. "K".	414-439.4	430.5
HYBRID III, SUBPART O EXTERNAL DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT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

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test ID: D141971

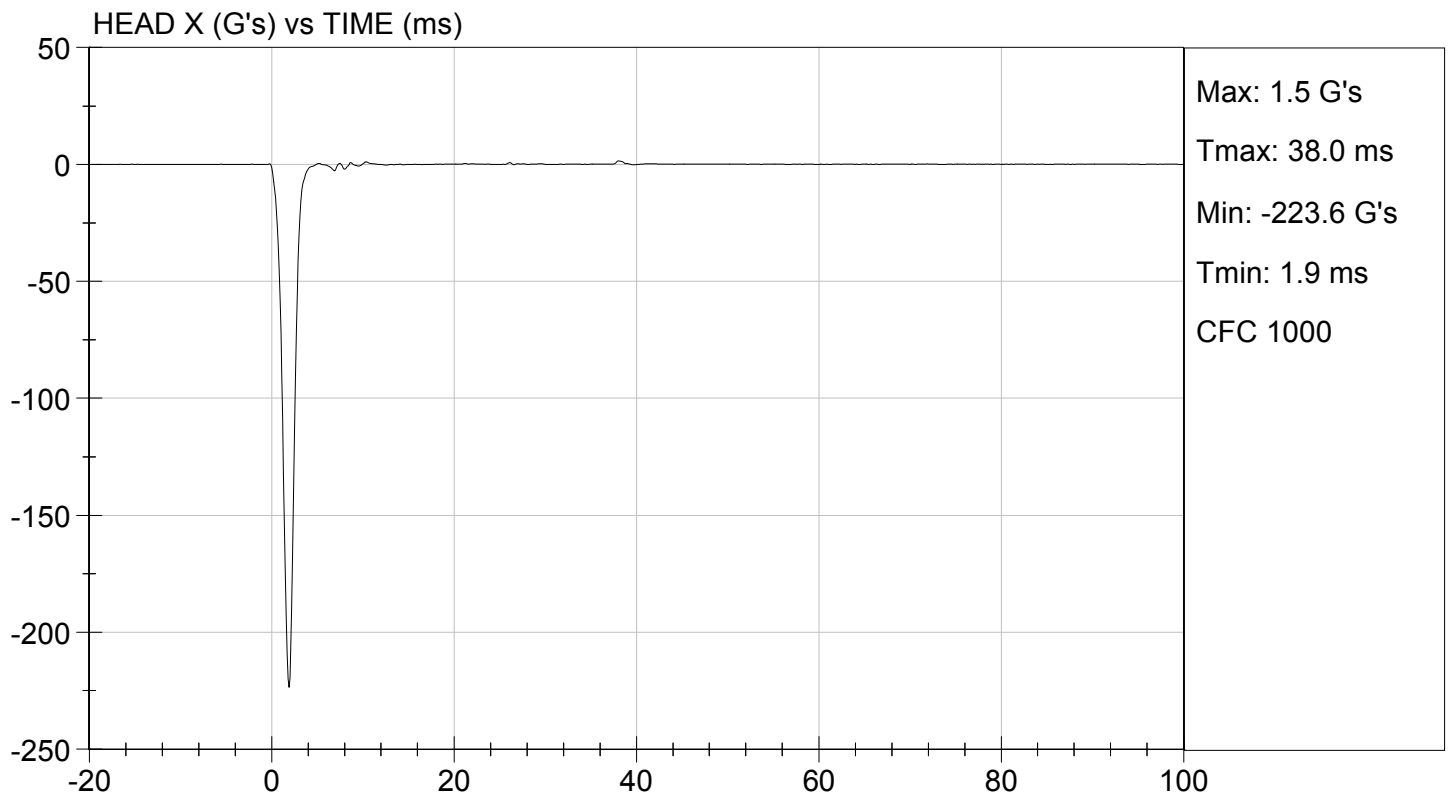
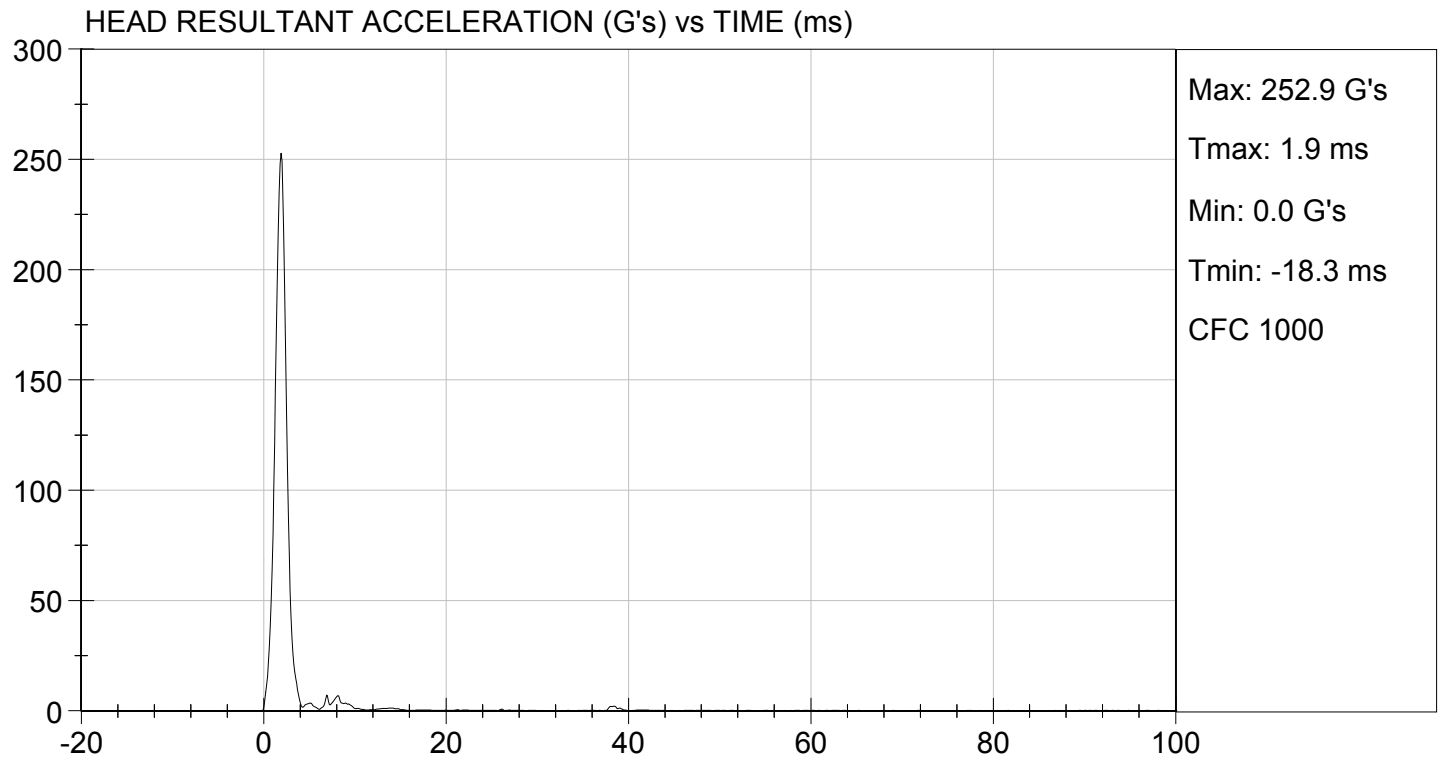
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Peak Resultant Acceleration	G's	250 to 300	253	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-11.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

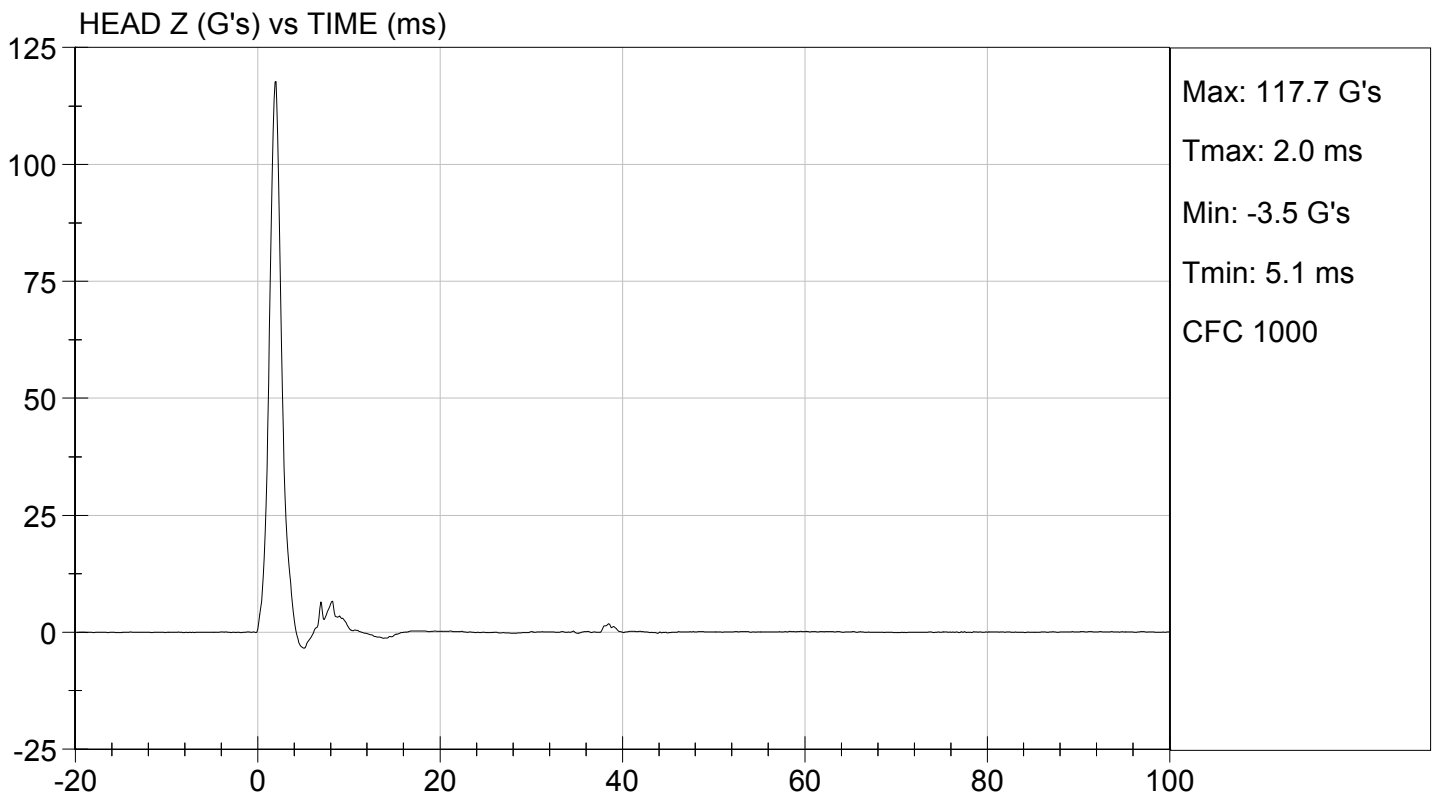
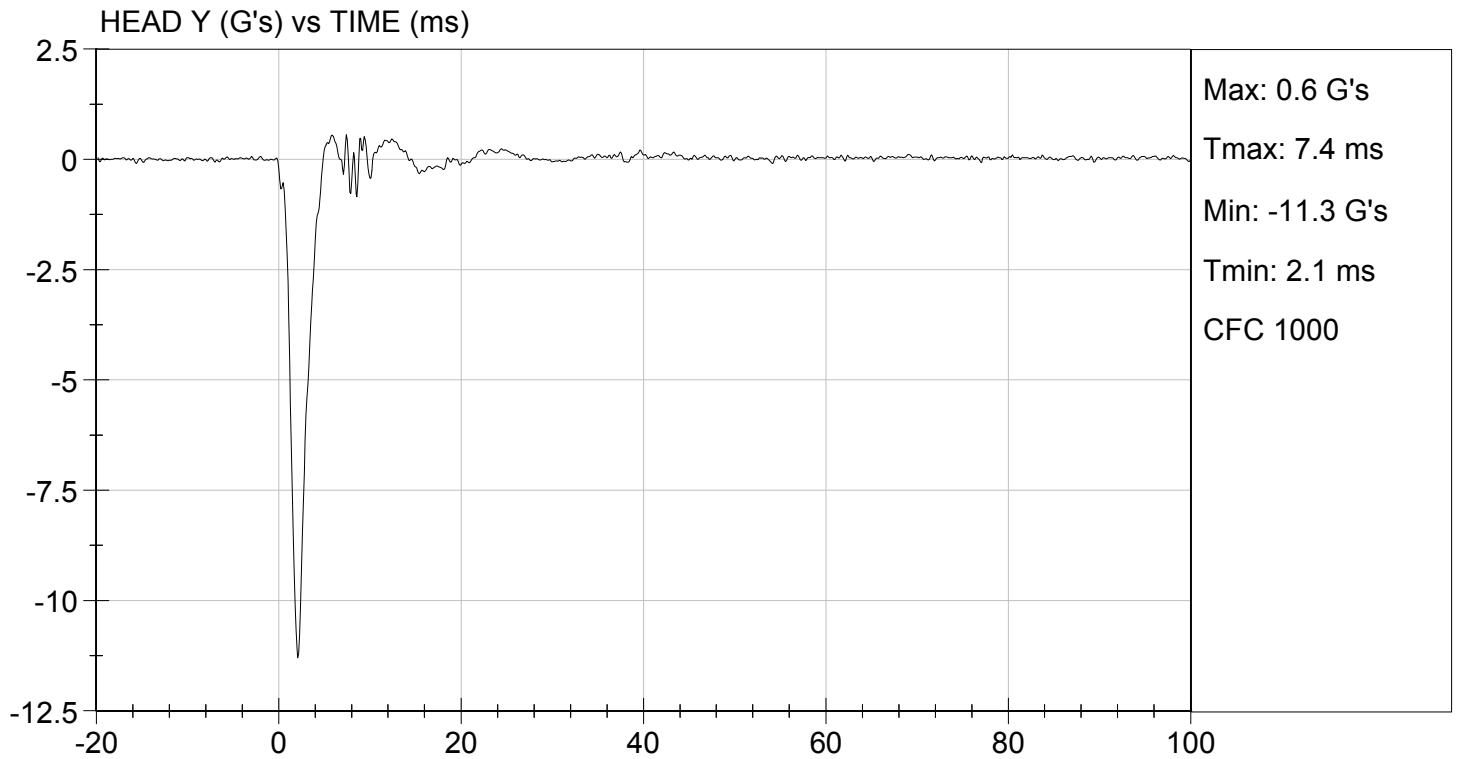

Laboratory Technician

05/30/2014

Test Date


Approved By





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D141972

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	55	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.13	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.3	Pass
	30 ms	m/s	5.8 to 7.0	5.9	Pass
D Plane Rotation	Max	deg	77 to 91	80	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	74	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results					Pass

Jessica Gall
 Laboratory Technician

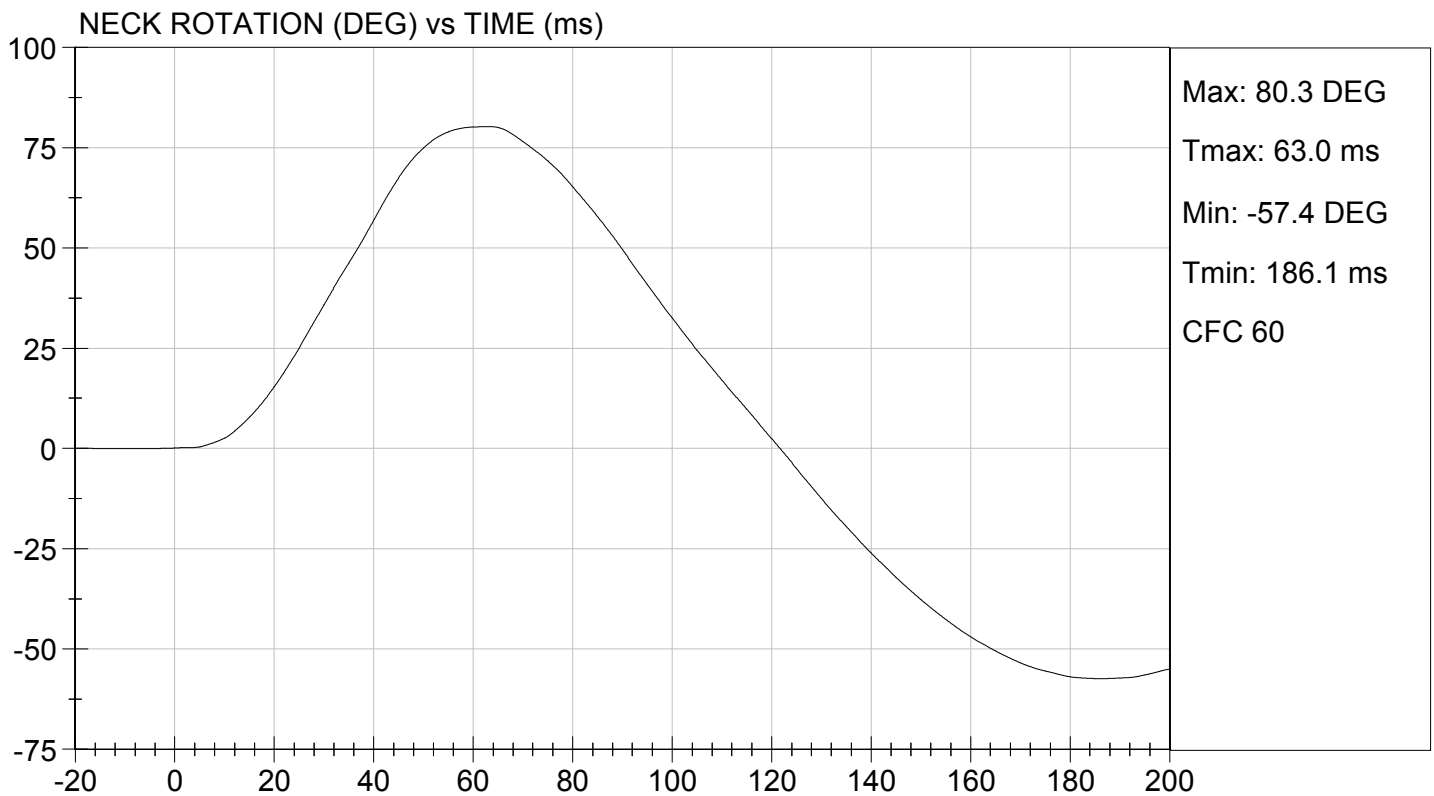
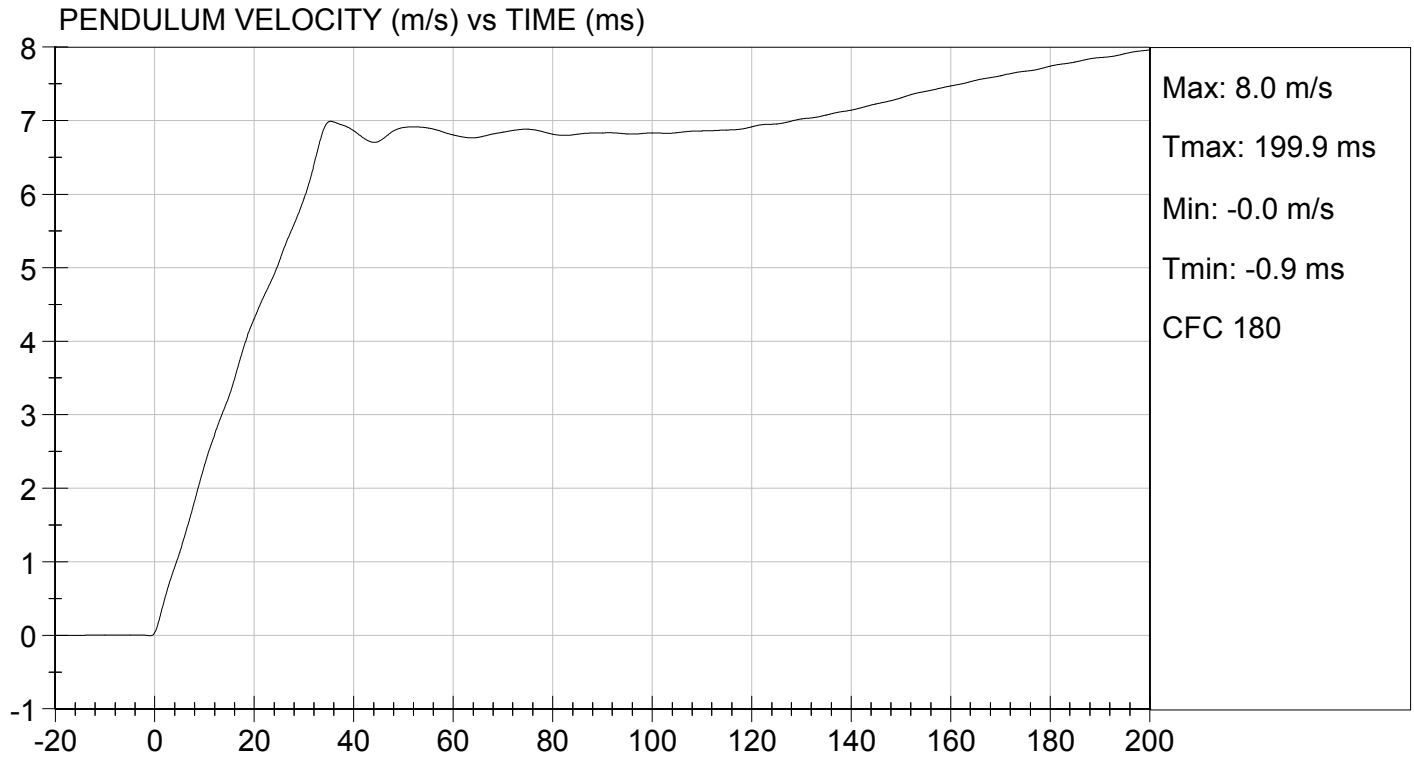
06/02/2014
 Test Date

David Winkelbauer
 Approved By



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

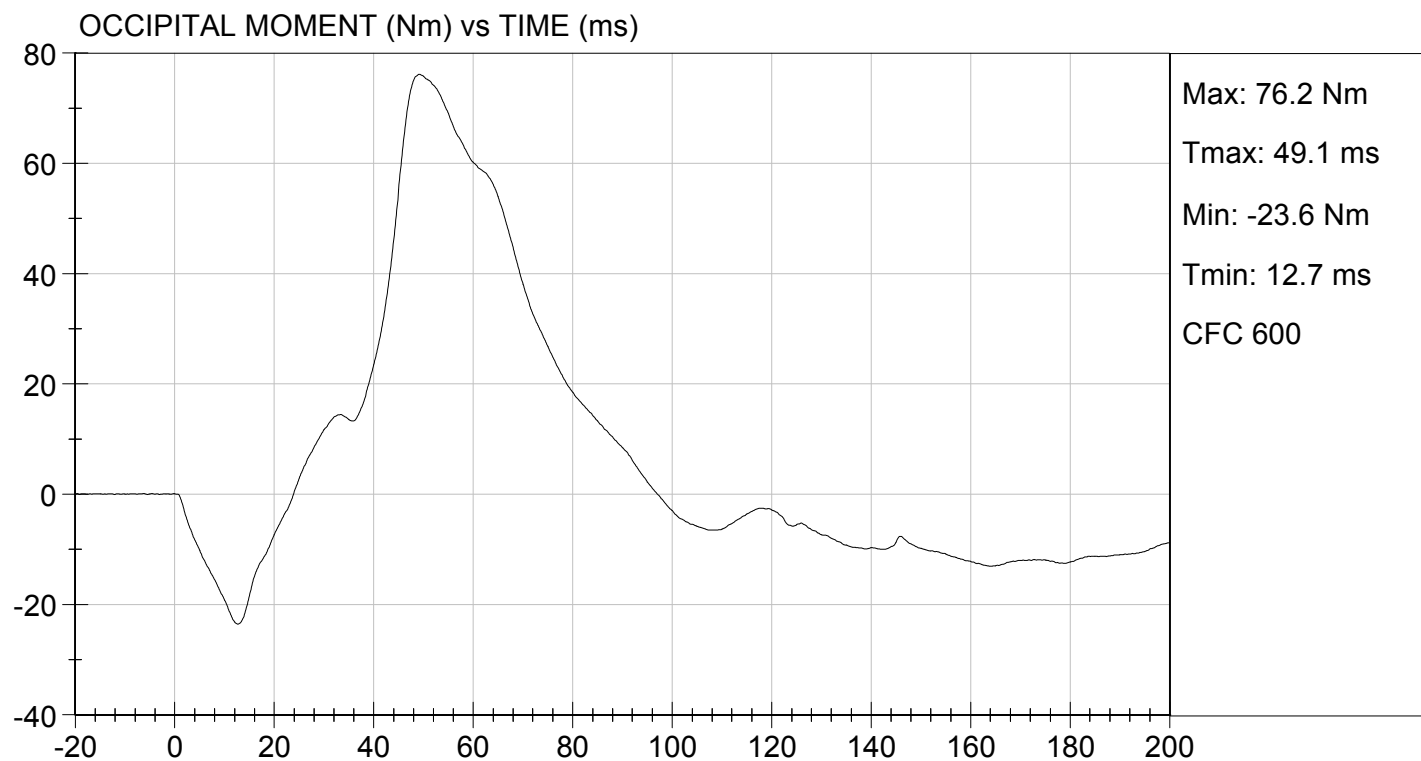
TEST DATE: 06/02/2014
TEST #: D141972





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

TEST DATE: 06/02/2014
TEST #: D141972



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D141973

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	55	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.19	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.5	Pass
	20 ms	m/s	3.1 to 3.9	3.3	Pass
	30 ms	m/s	4.6 to 5.6	4.7	Pass
D Plane Rotation	Max	deg	99 to 114	106	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

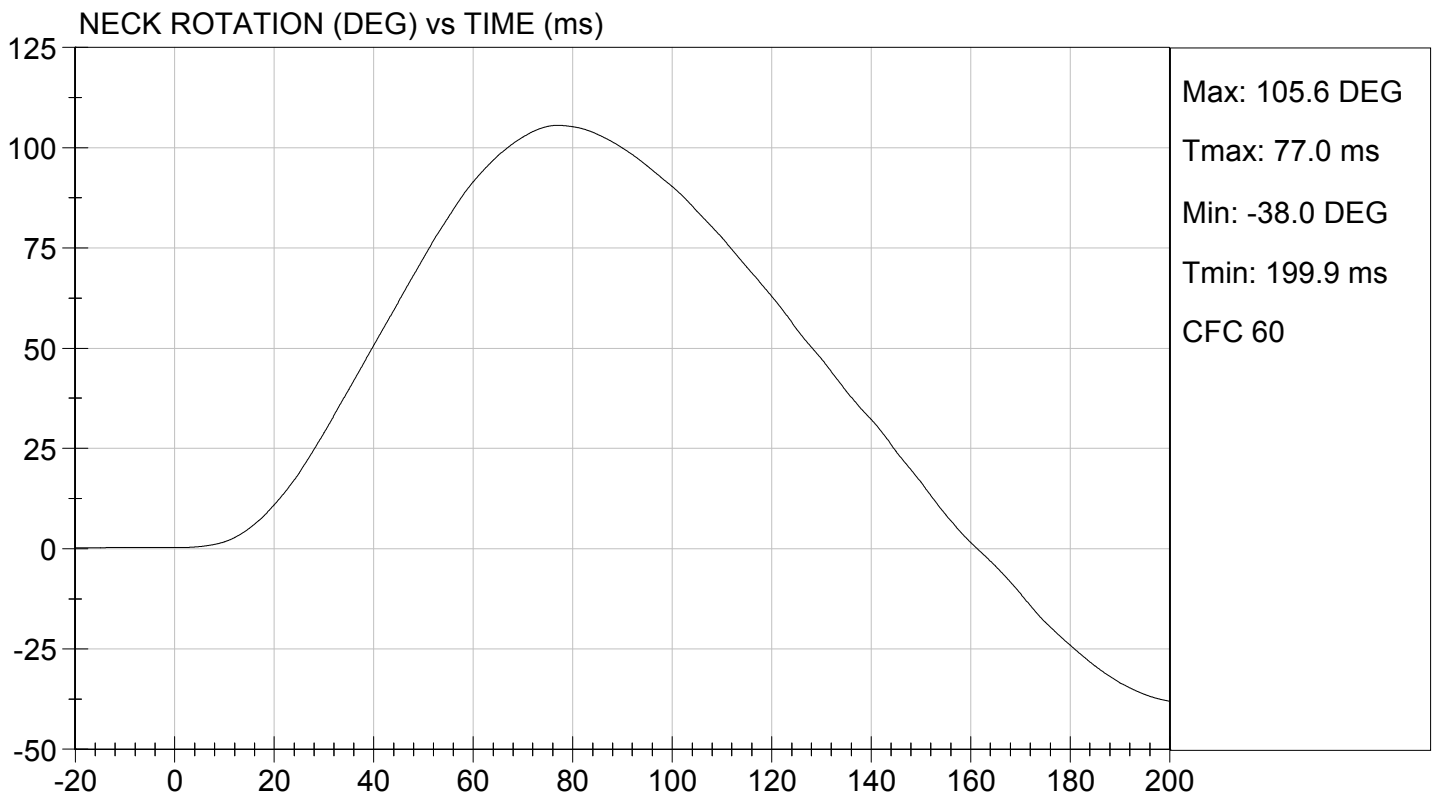
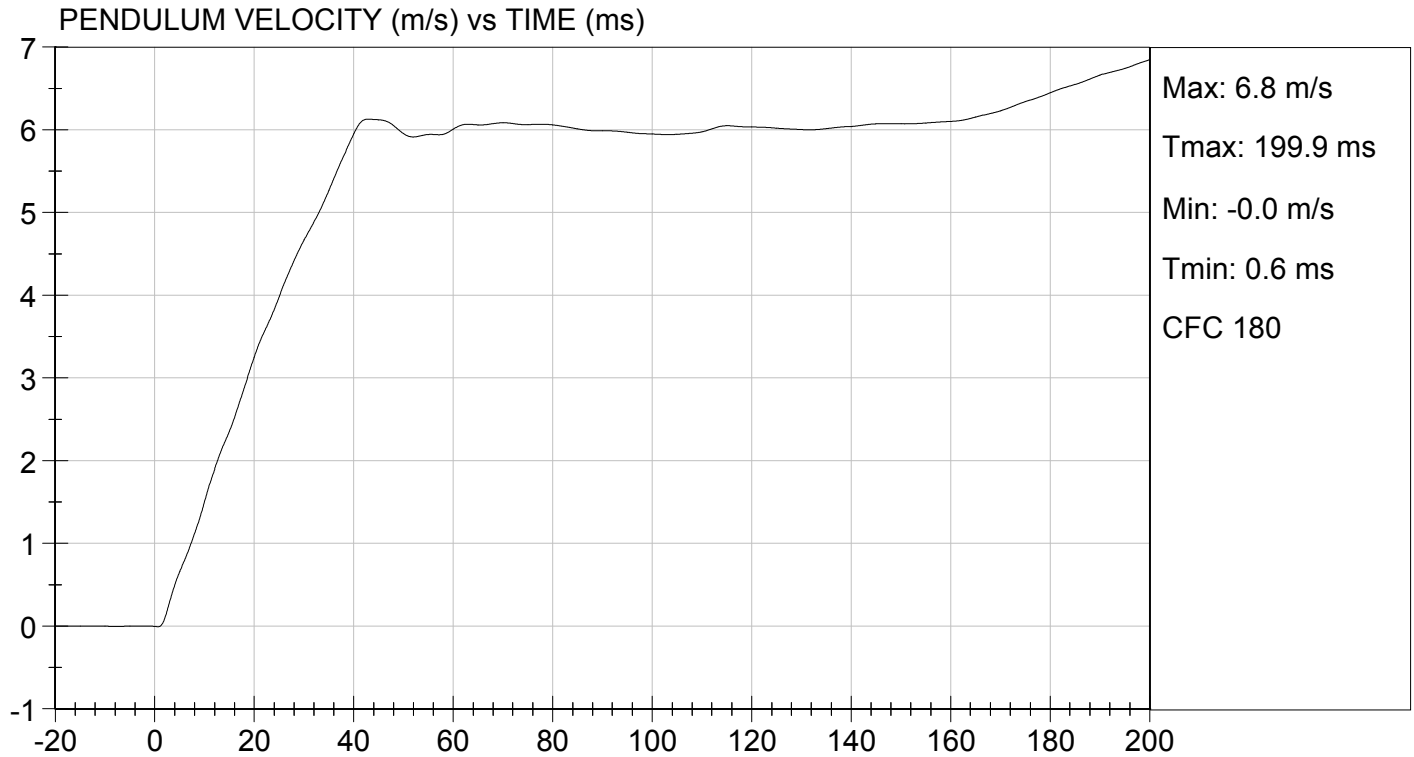
06/02/2014
 Test Date


 Approved By



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

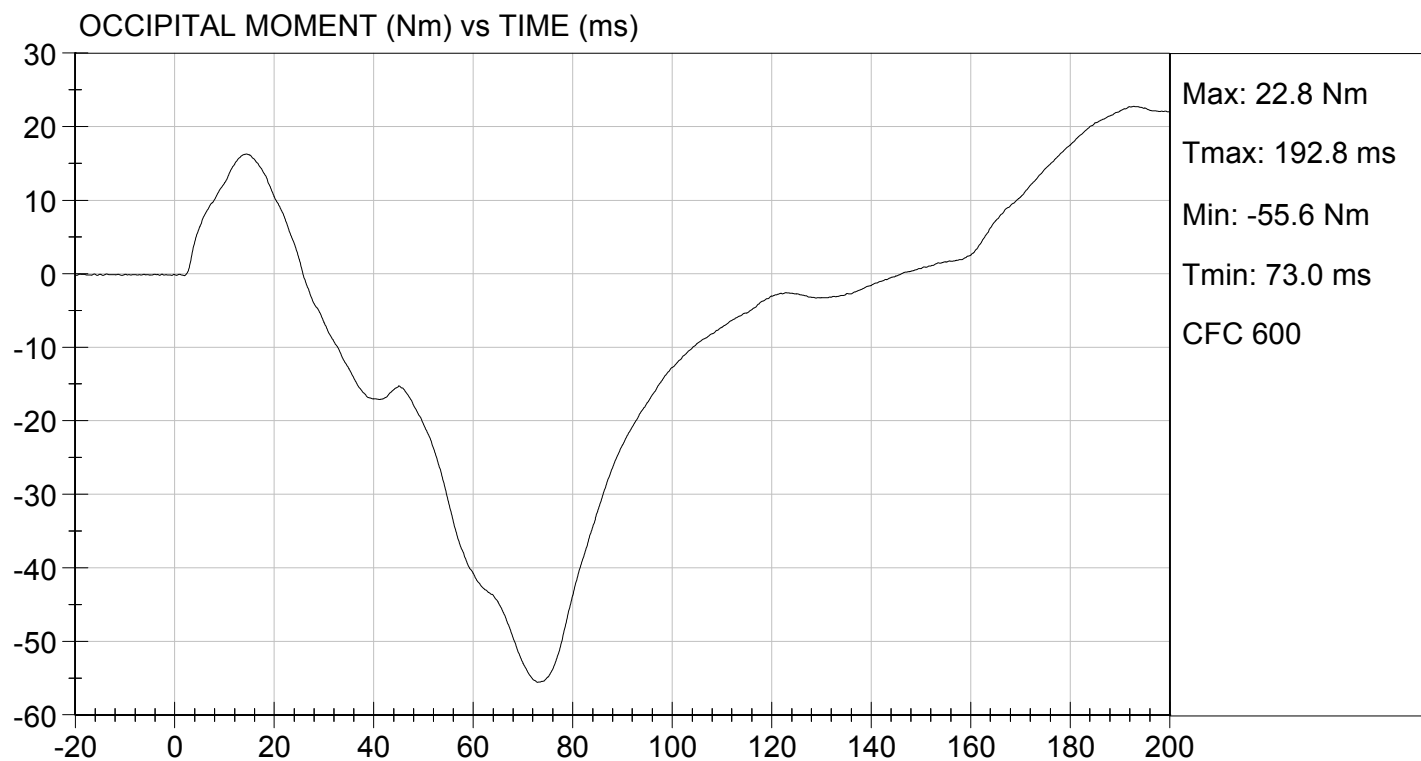
TEST DATE: 06/02/2014
TEST #: D141973





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

TEST DATE: 06/02/2014
TEST #: D141973

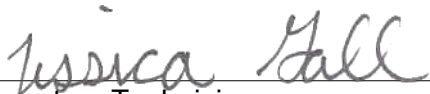


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D141974

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	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	56	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4367	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4282	Pass
Overall Test Results				Pass


Laboratory Technician

06/03/2014

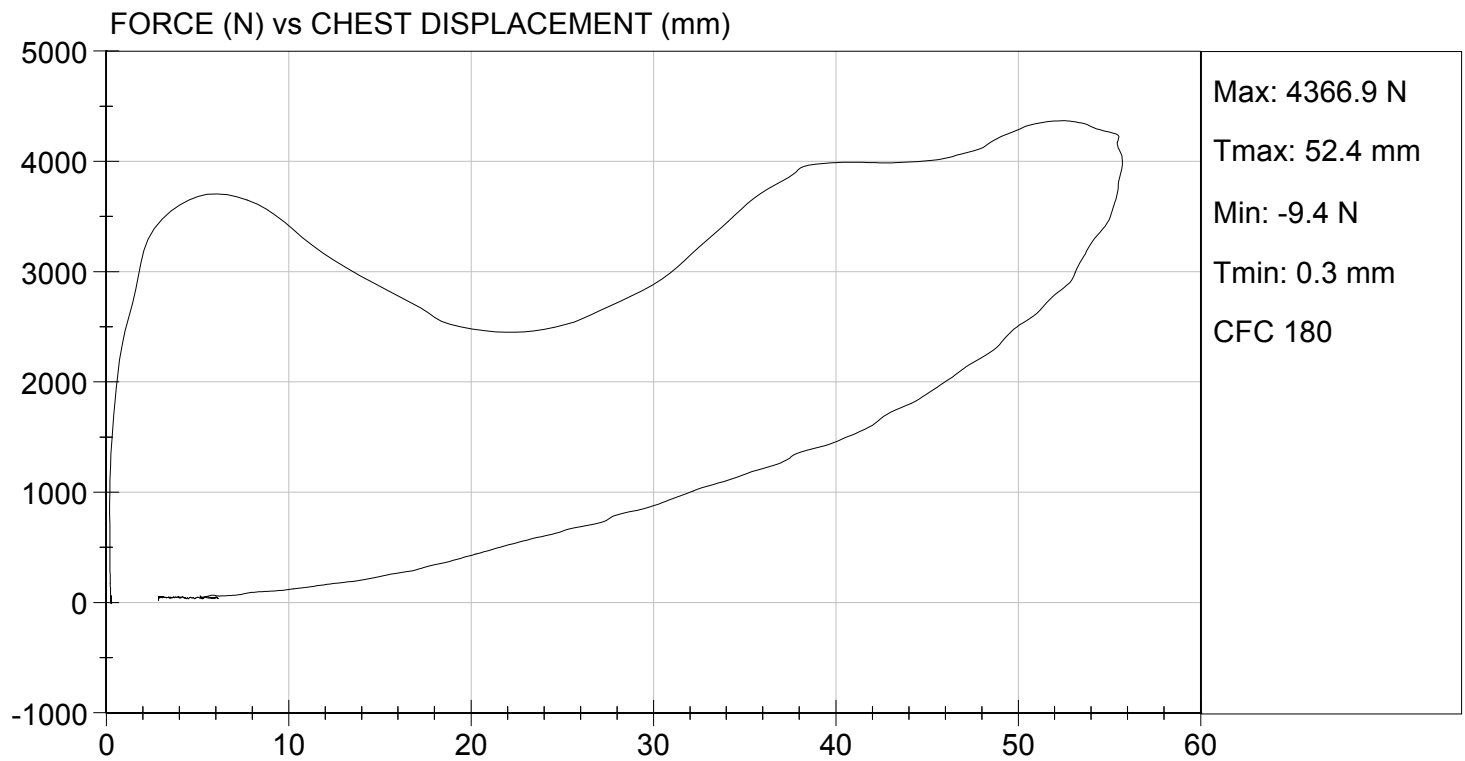
Test Date


Approved By



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

TEST DATE: 06/03/2014
TEST #: D141974



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D141975

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
Probe Speed	m/s	2.07 to 2.13	2.07	Pass
Maximum Force	N	3450 to 4060	3612	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

05/30/2014

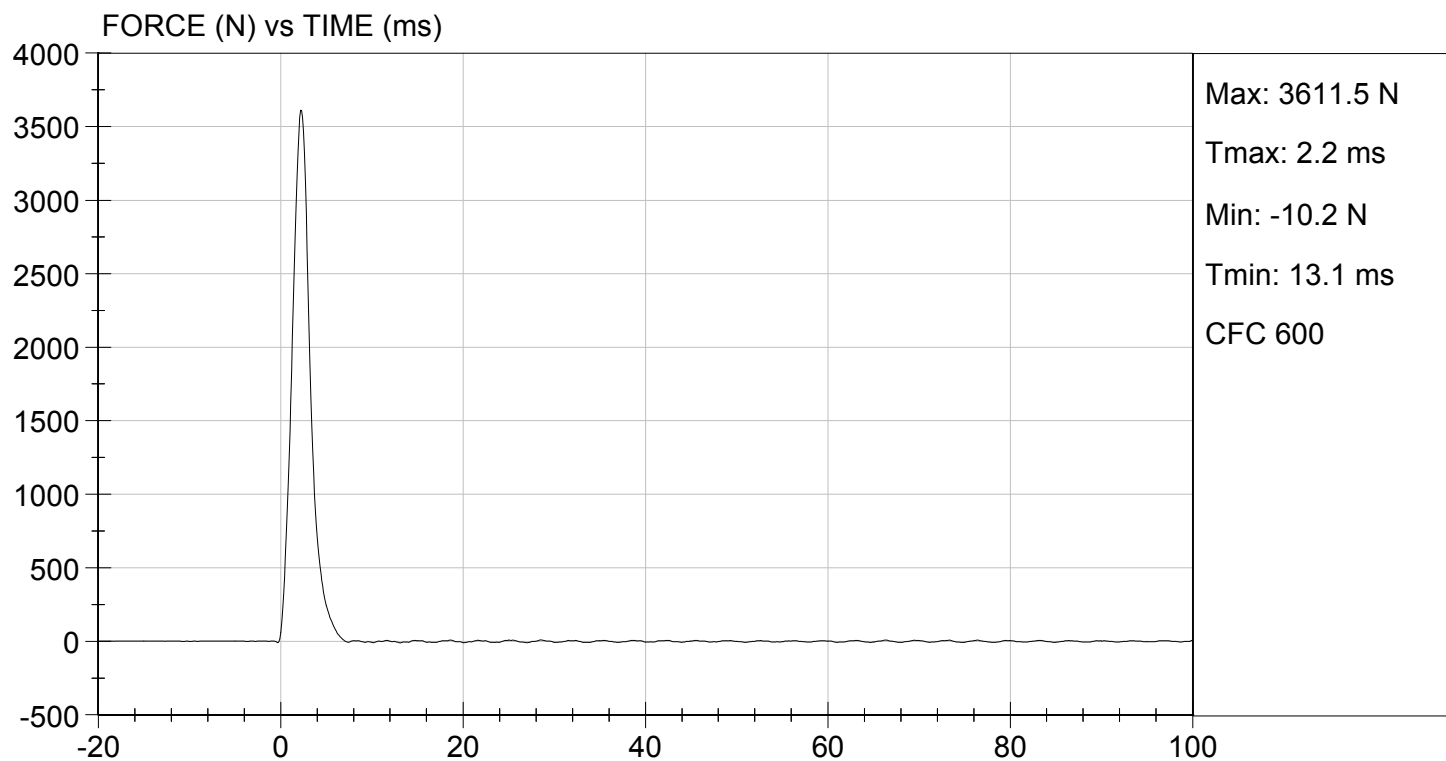
Test Date

David Winkelbauer
Approved By



TEST DESC: RIGHT KNEE
VELOCITY: 6.8 ft/s, 2.07 m/s

TEST DATE: 05/30/2014
TEST #: D141975



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D141976

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
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	N	3450 to 4060	3562	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

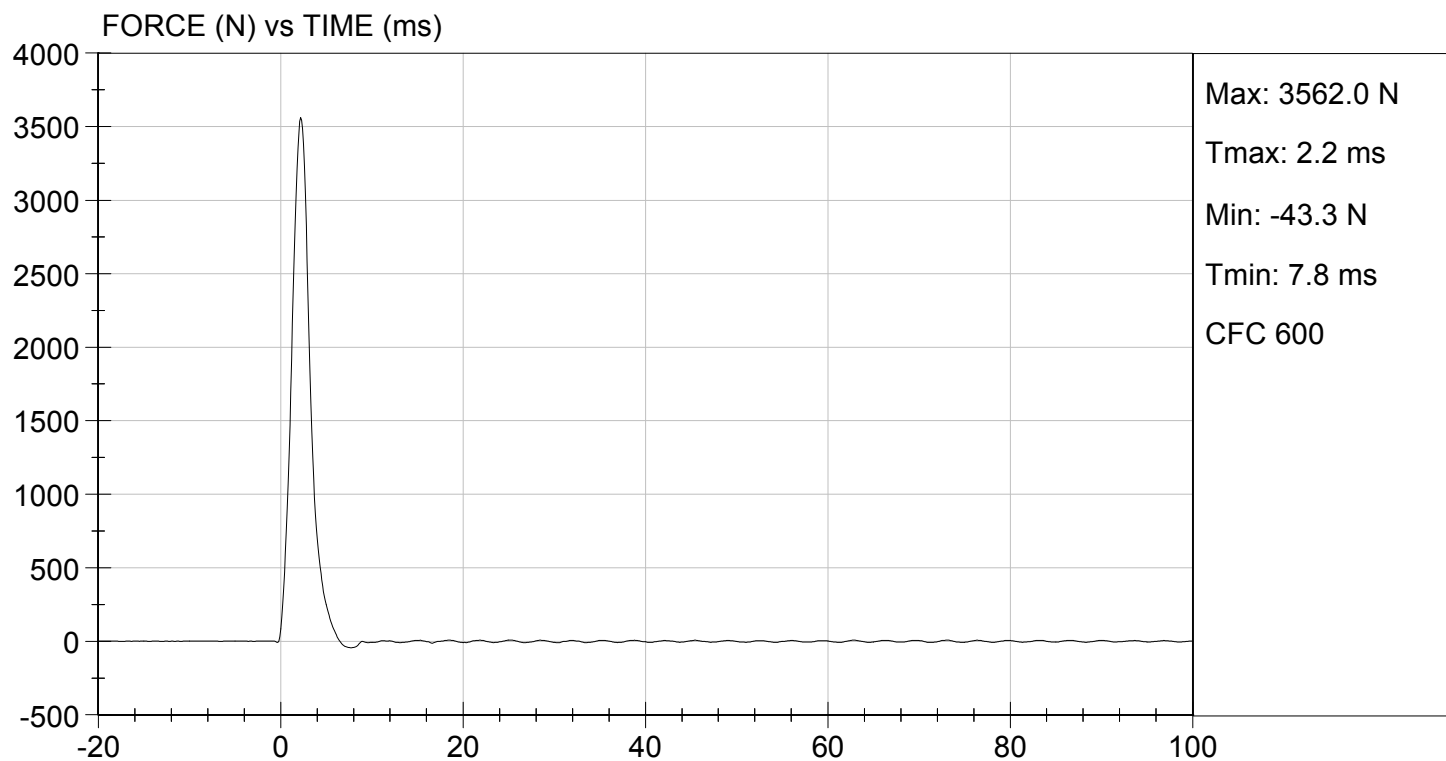
05/30/2014
Test Date

David Winkelbauer
Approved By



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

TEST DATE: 05/30/2014
TEST #: D141976



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D141977

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	54	Pass
Initial Angle	deg	0 to 20	16	Pass
Return Angle	deg	+/- 8	1	Pass
Force at 45 deg	N	320 to 390	374	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

06/02/2014

Test Date

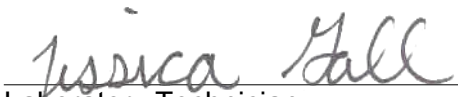
David Winkelbauer
Approved By

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

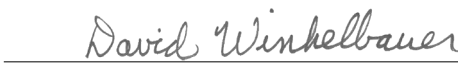
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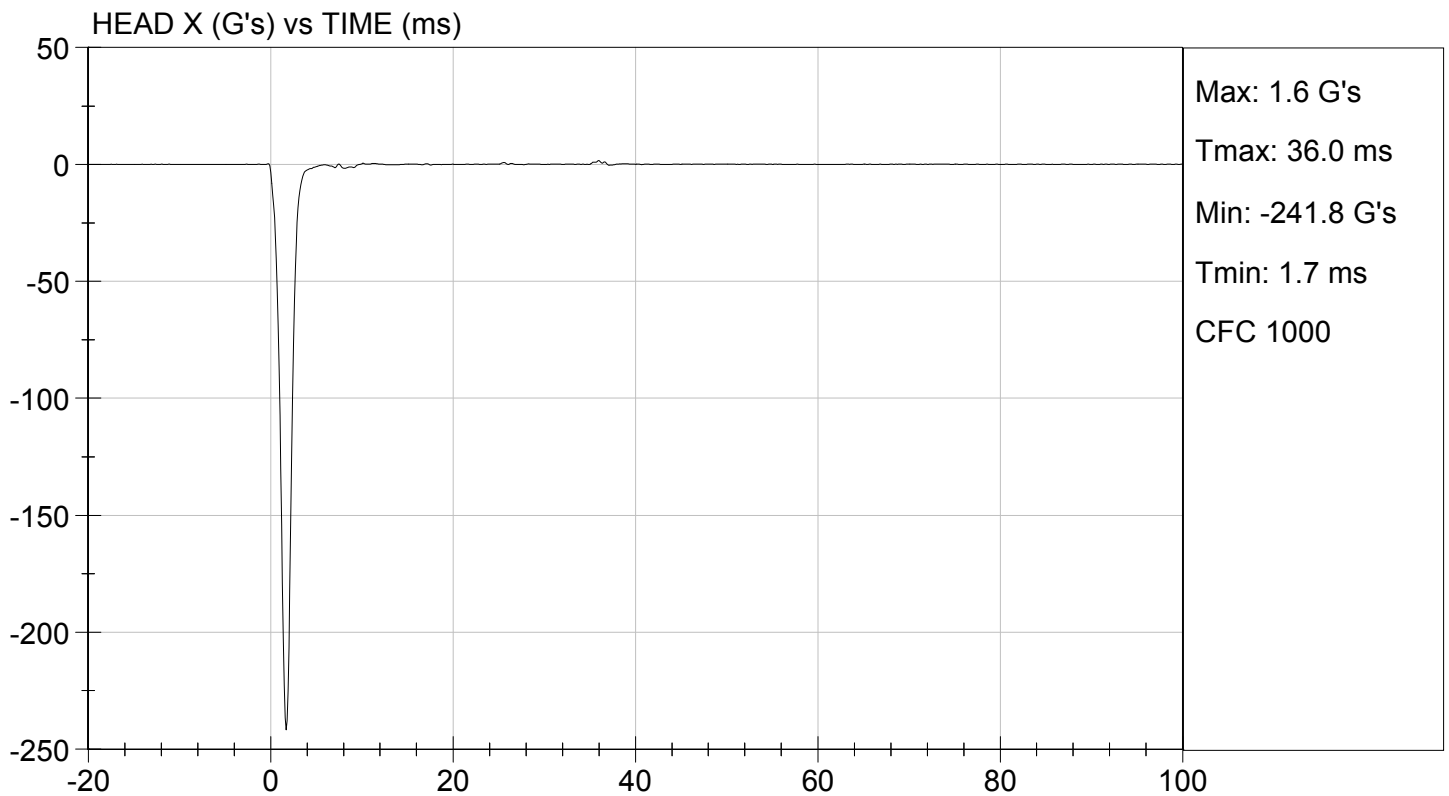
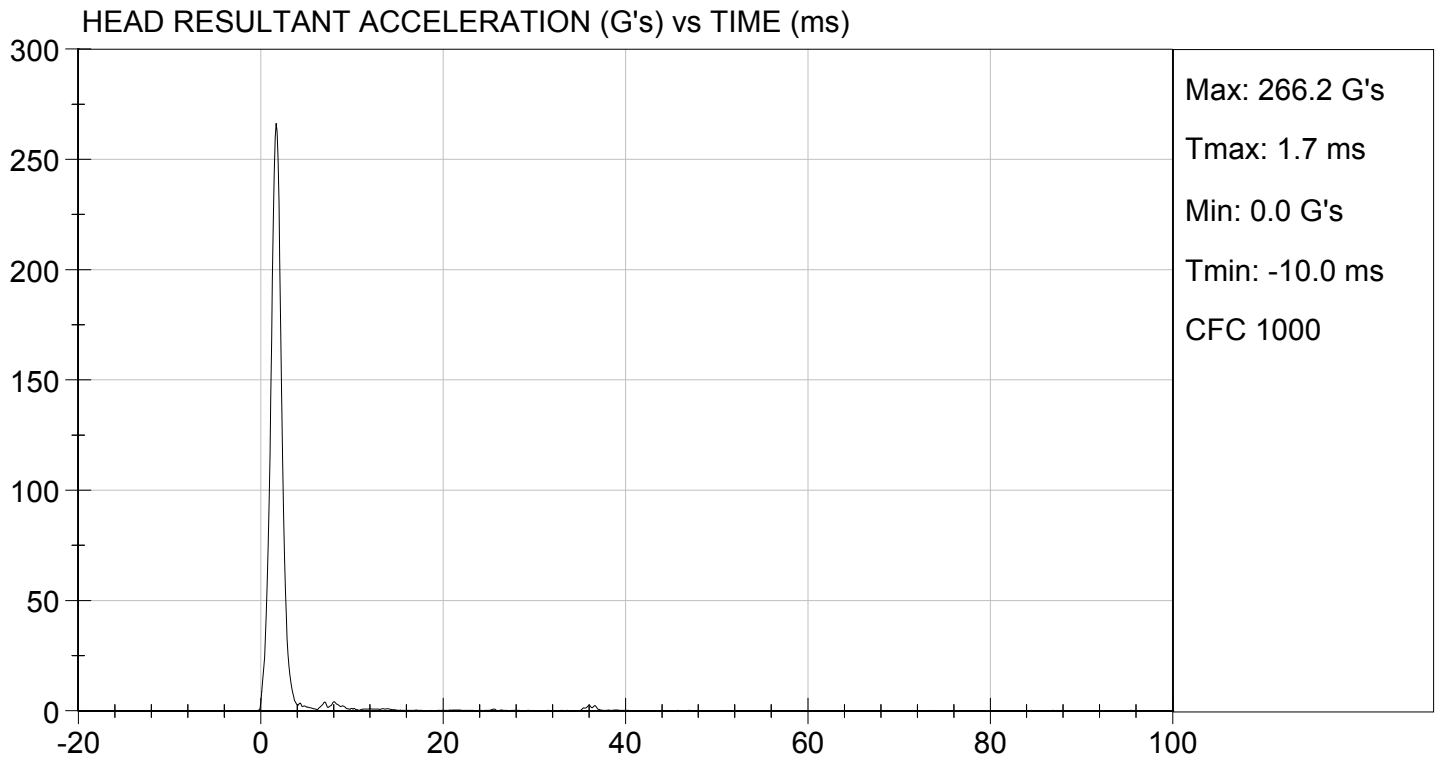
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	250 to 300	266	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-11.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

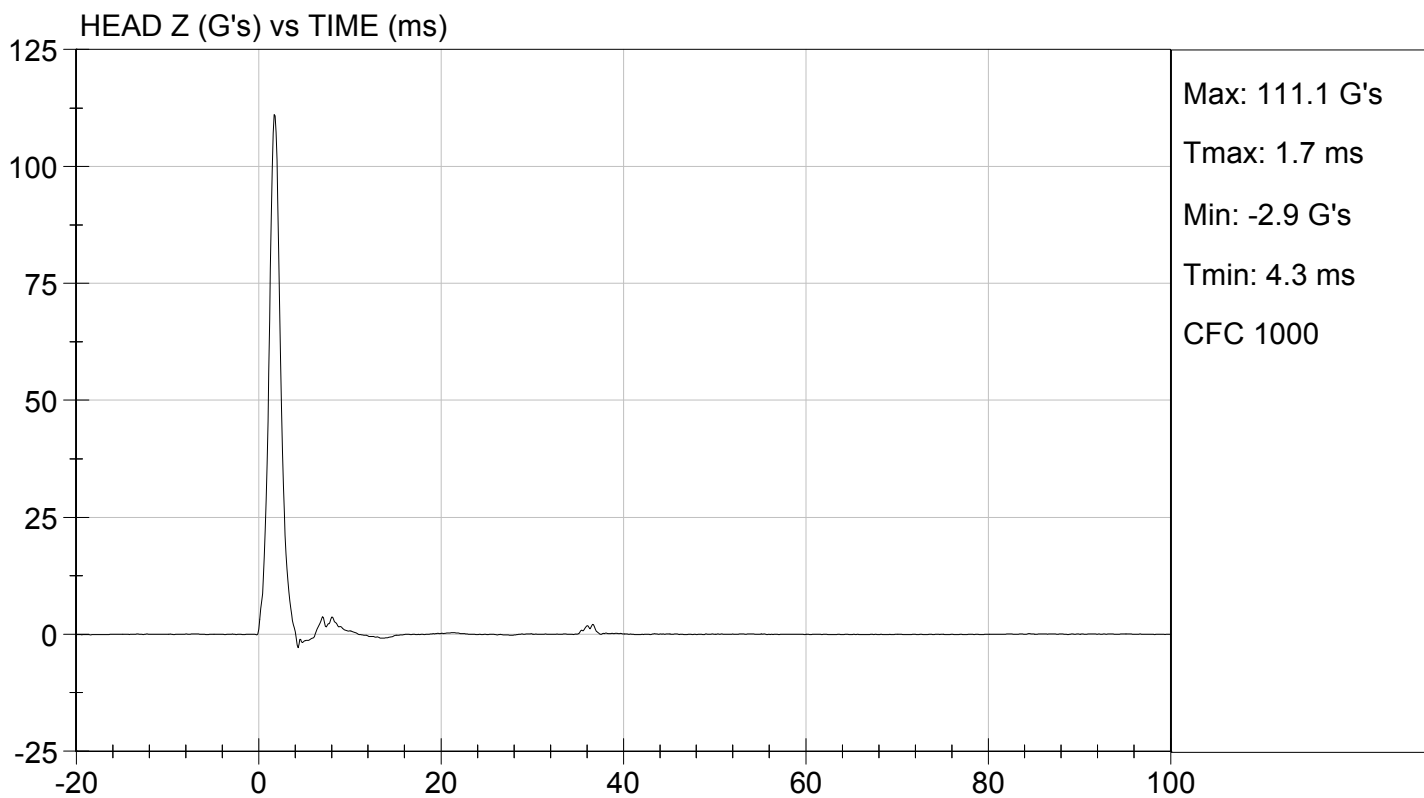
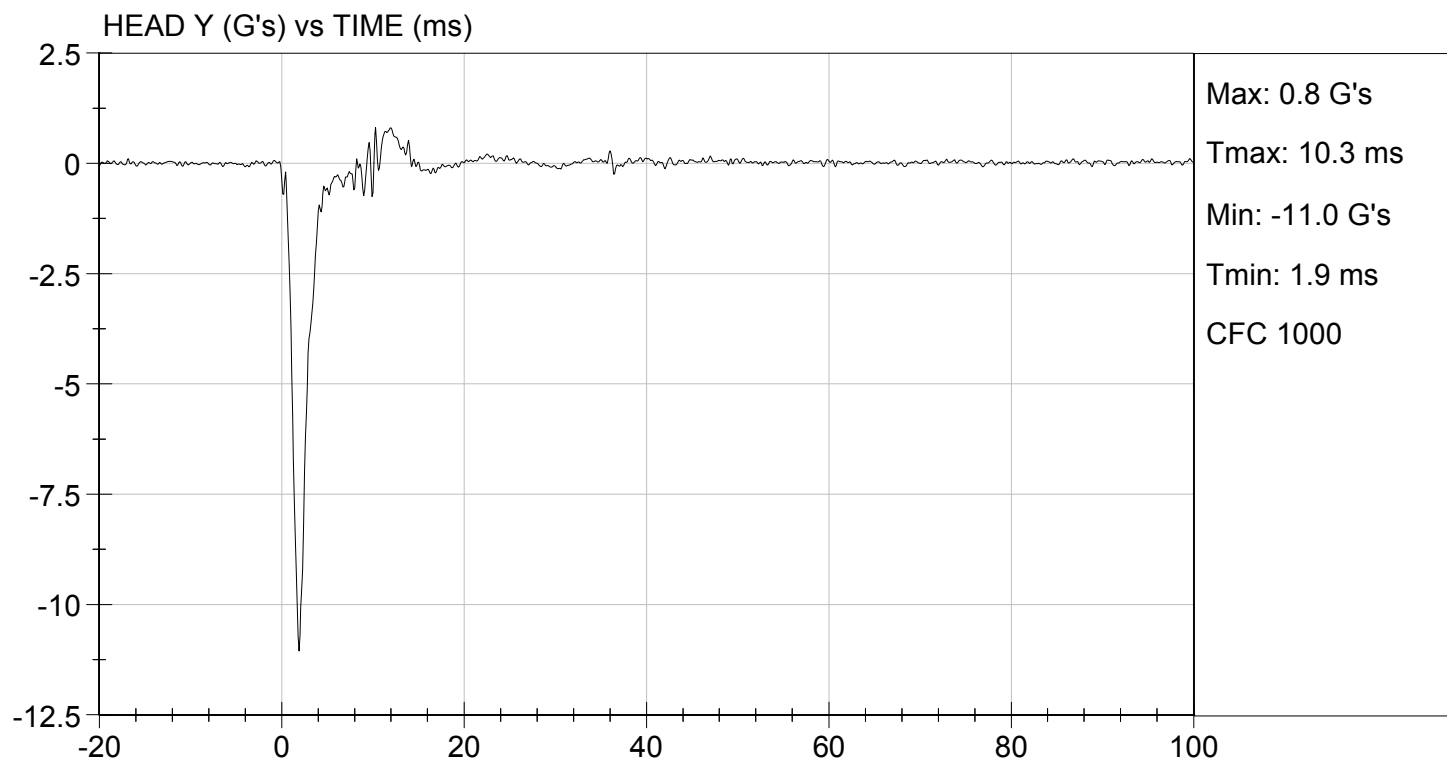

Laboratory Technician

06/05/2014

Test Date


Approved By





MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D142082

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.13	Pass
Pendulum Velocity	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.0	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	69 to 83	72	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	88	Pass
Overall Results					Pass


 Laboratory Technician

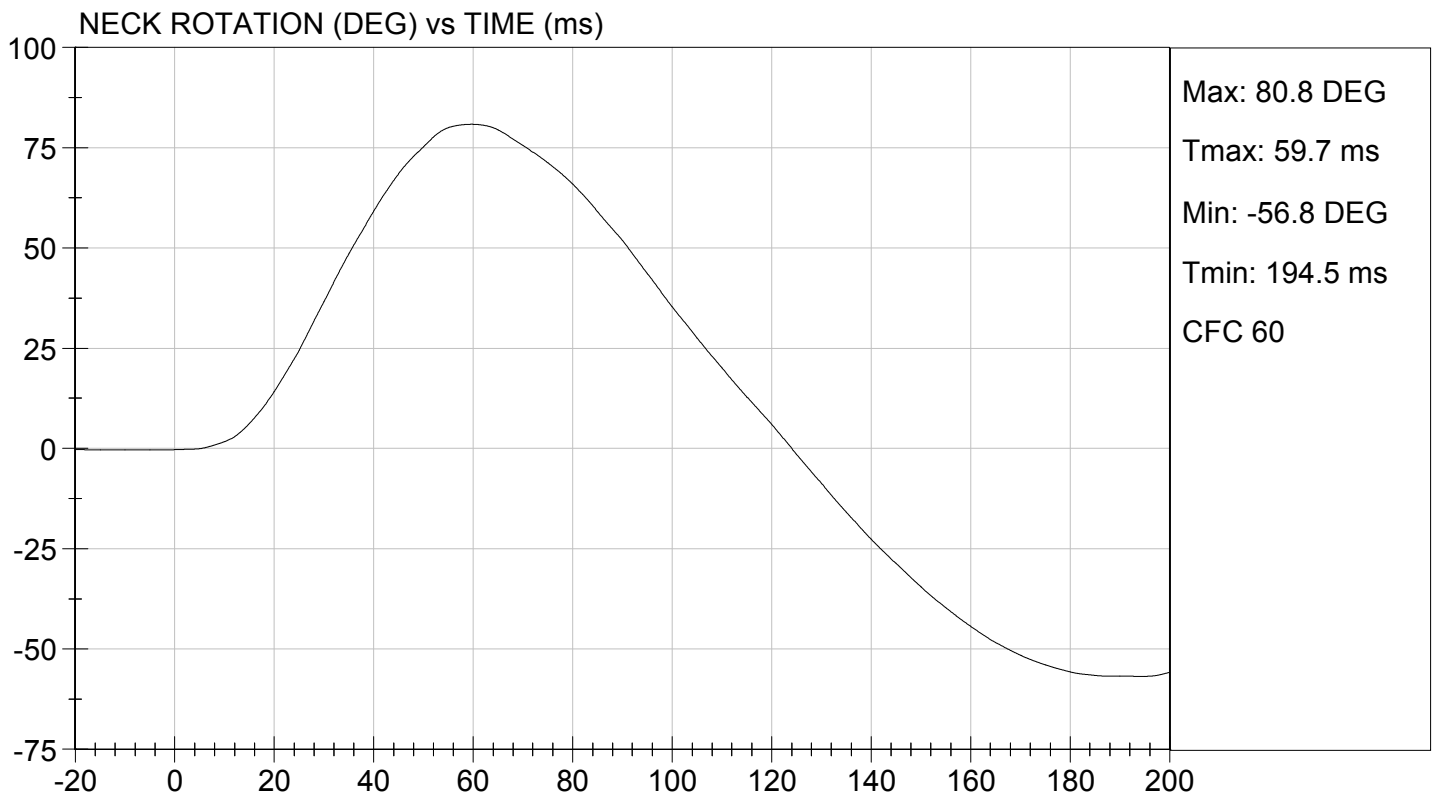
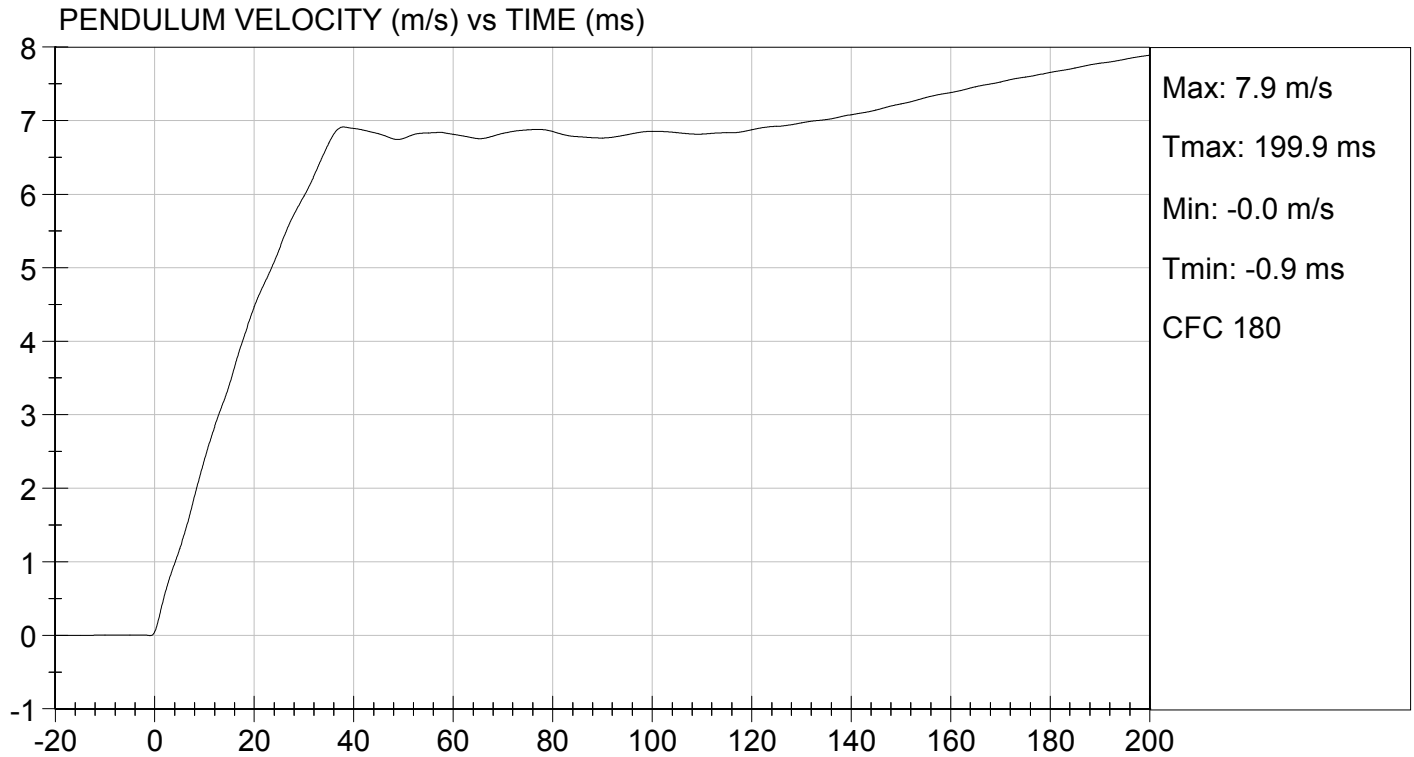
06/05/2014
 Test Date


 Approved By



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

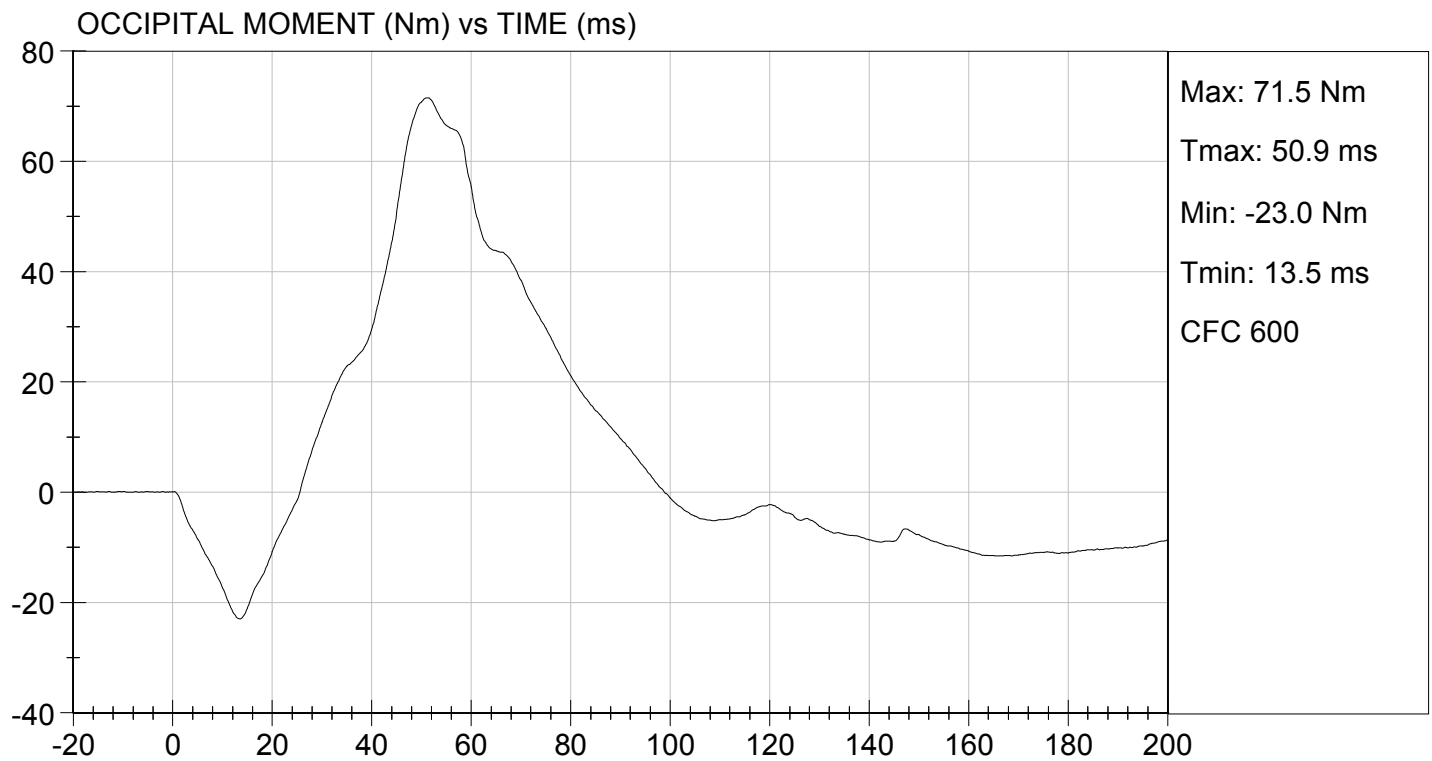
TEST DATE: 06/05/2014
TEST #: D142082





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

TEST DATE: 06/05/2014
TEST #: D142082

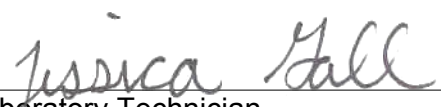


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D142083

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.18	Pass
Pendulum Velocity	10 ms	m/s	1.5 to 1.9	1.6	Pass
	20 ms	m/s	3.1 to 3.9	3.4	Pass
	30 ms	m/s	4.6 to 5.6	4.9	Pass
D Plane Rotation	Max	deg	99 to 114	110	Pass
Occipital Condyle Moment within Rotation Corridor		Nm	-65 to -53	-55	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	102	Pass
Overall Results					Pass


Laboratory Technician

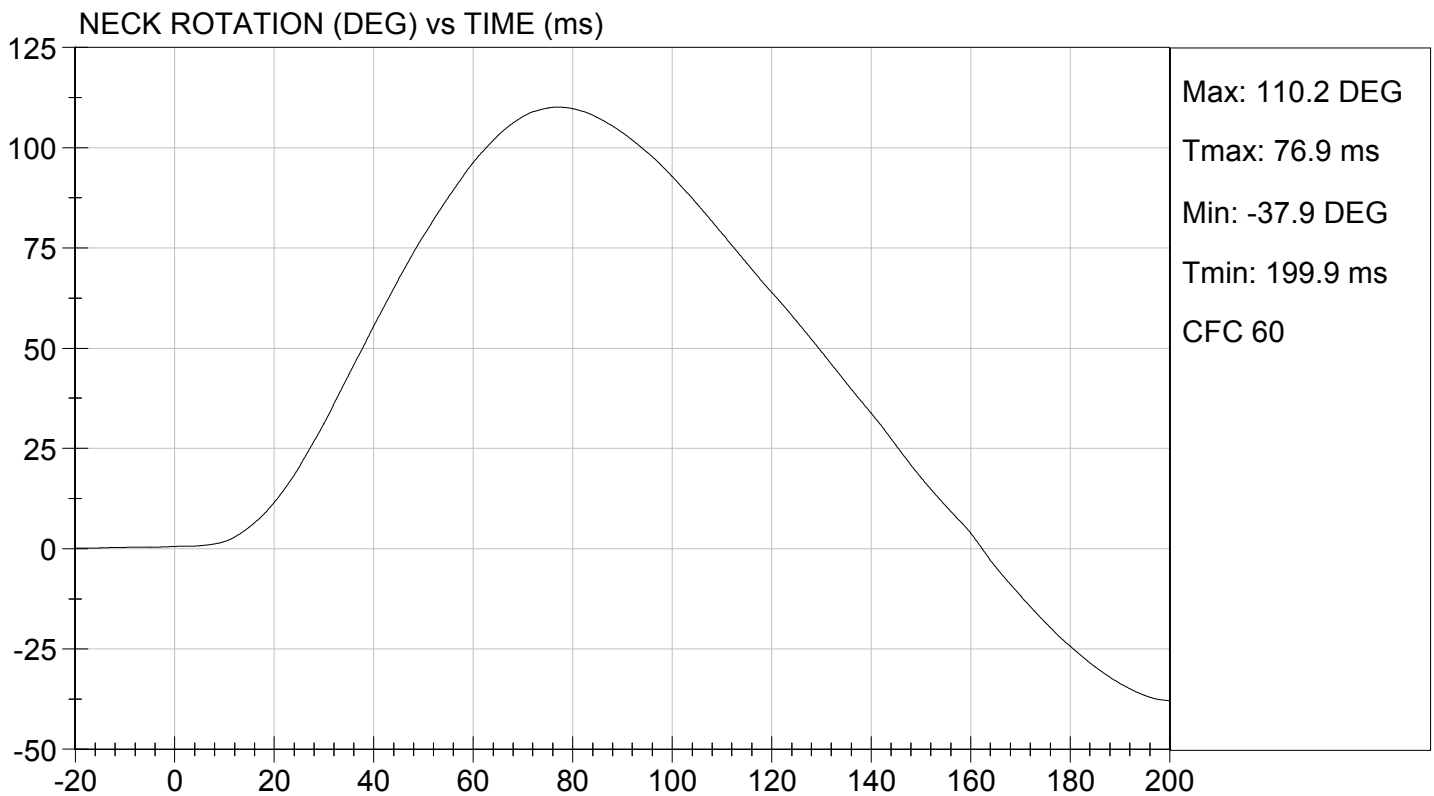
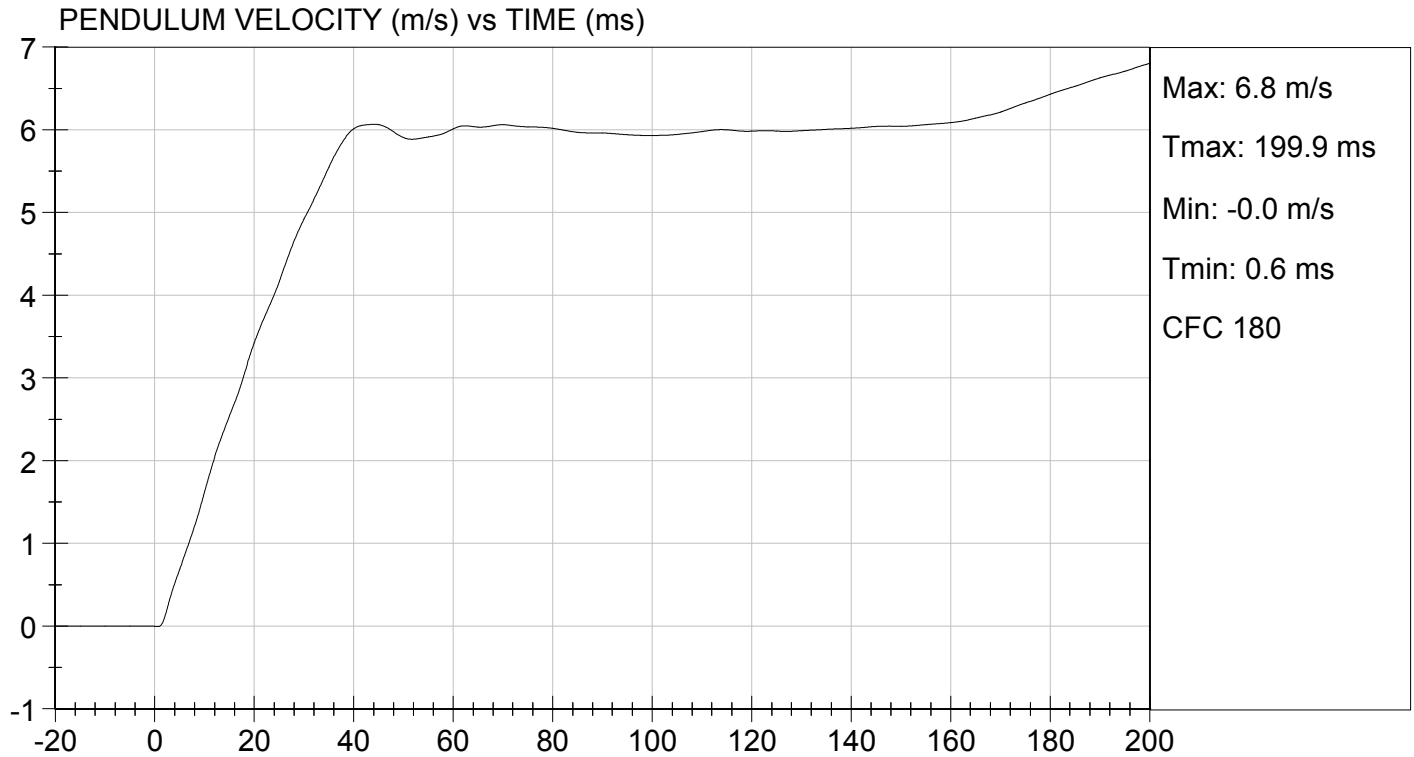
06/05/2014
Test Date


Approved By



TEST DESC: NECK EXTENSION
VELOCITY: 20.30 ft/s, 6.18 m/s

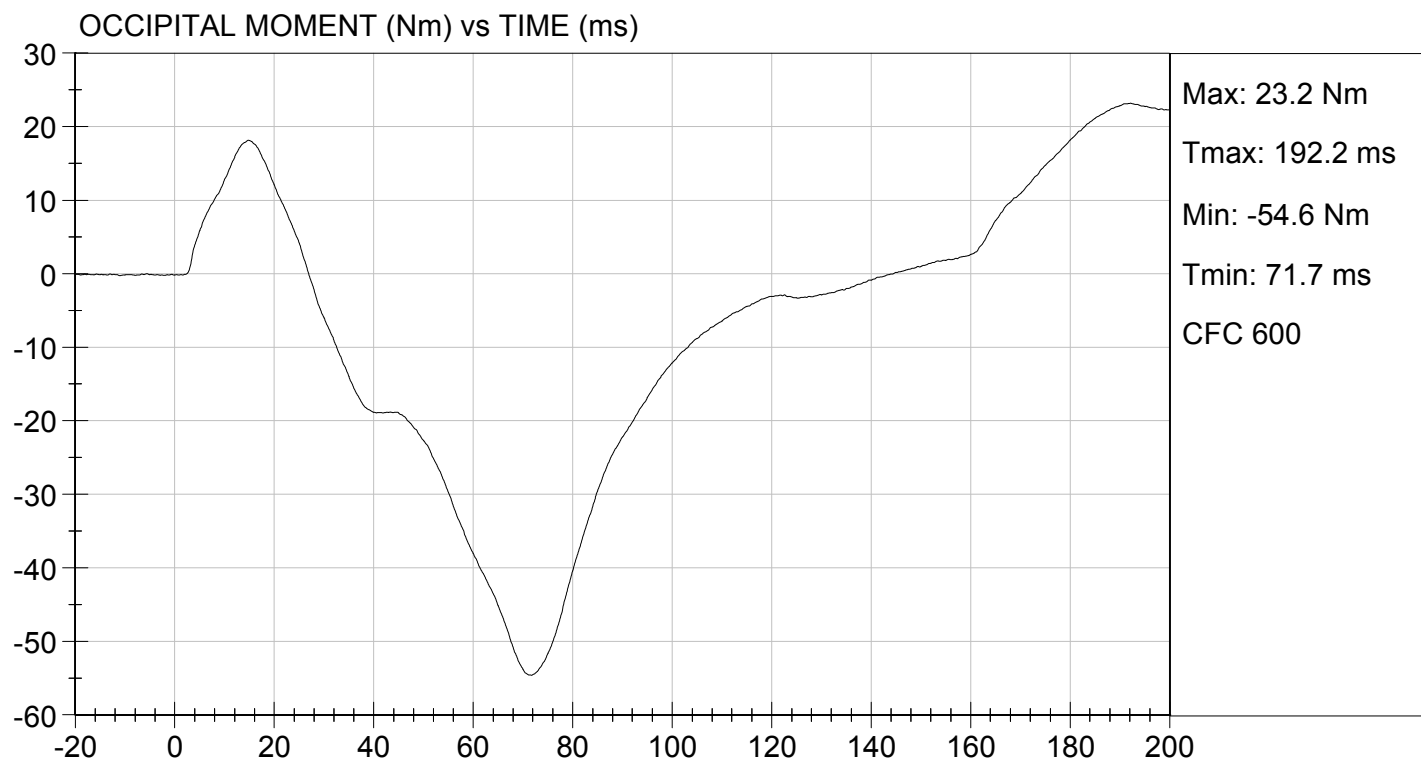
TEST DATE: 06/05/2014
TEST #: D142083





TEST DESC: NECK EXTENSION
VELOCITY: 20.30 ft/s, 6.18 m/s

TEST DATE: 06/05/2014
TEST #: D142083



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D142084

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Relative Humidity	%	10 to 70	49	Pass
Probe Speed	m/s	6.59 to 6.83	6.60	Pass
Peak Deflection	mm	50 to 58	57	Pass
Peak Resistive Force w/in Deflection Corridor	N	3900 to 4400	4134	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Peak Force 18 mm - 50 mm	N	<= 4600	4011	Pass
Overall Test Results				Pass


Laboratory Technician

06/06/2014

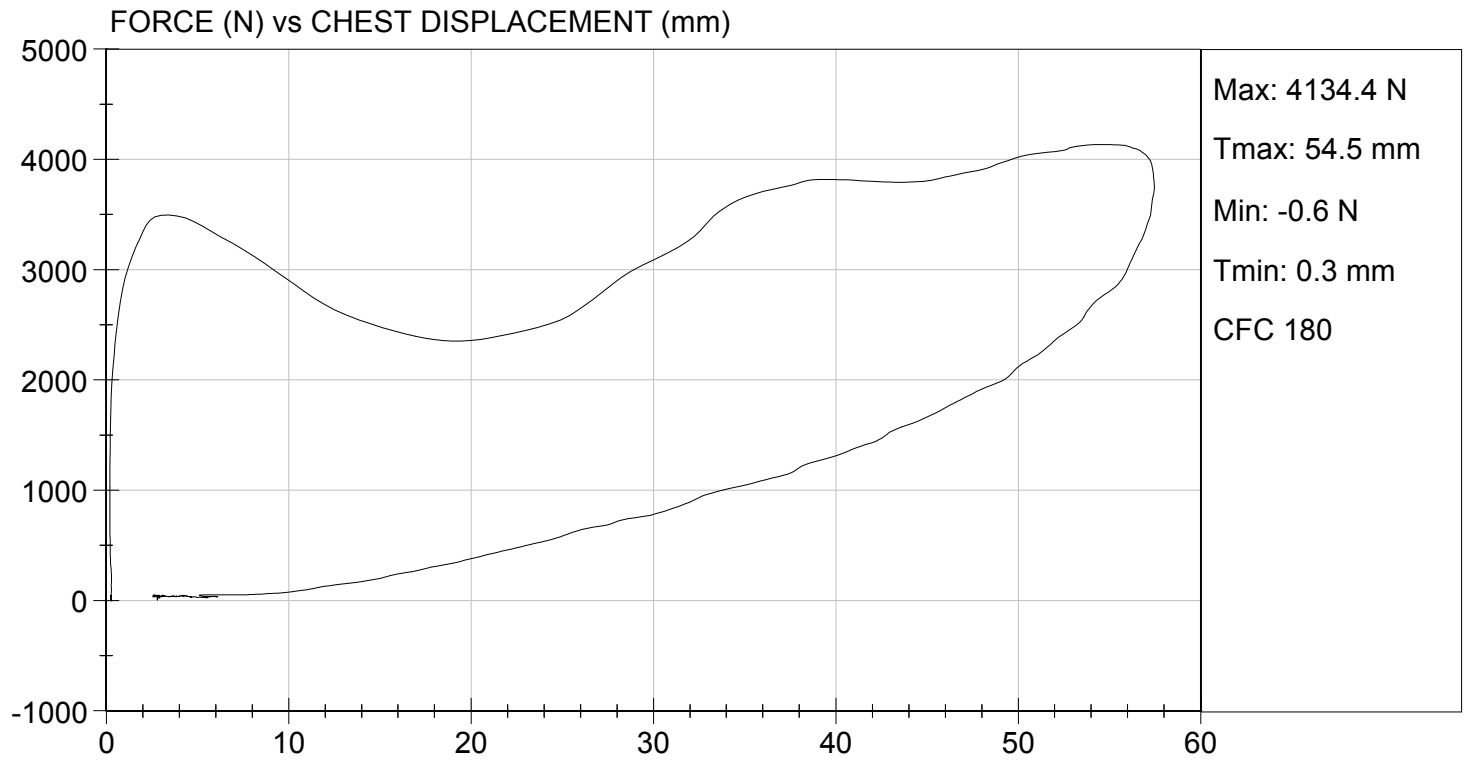
Test Date


Approved By



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

TEST DATE: 06/06/2014
TEST #: D142084



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D142085

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	N	3450 to 4060	3645	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

06/06/2014

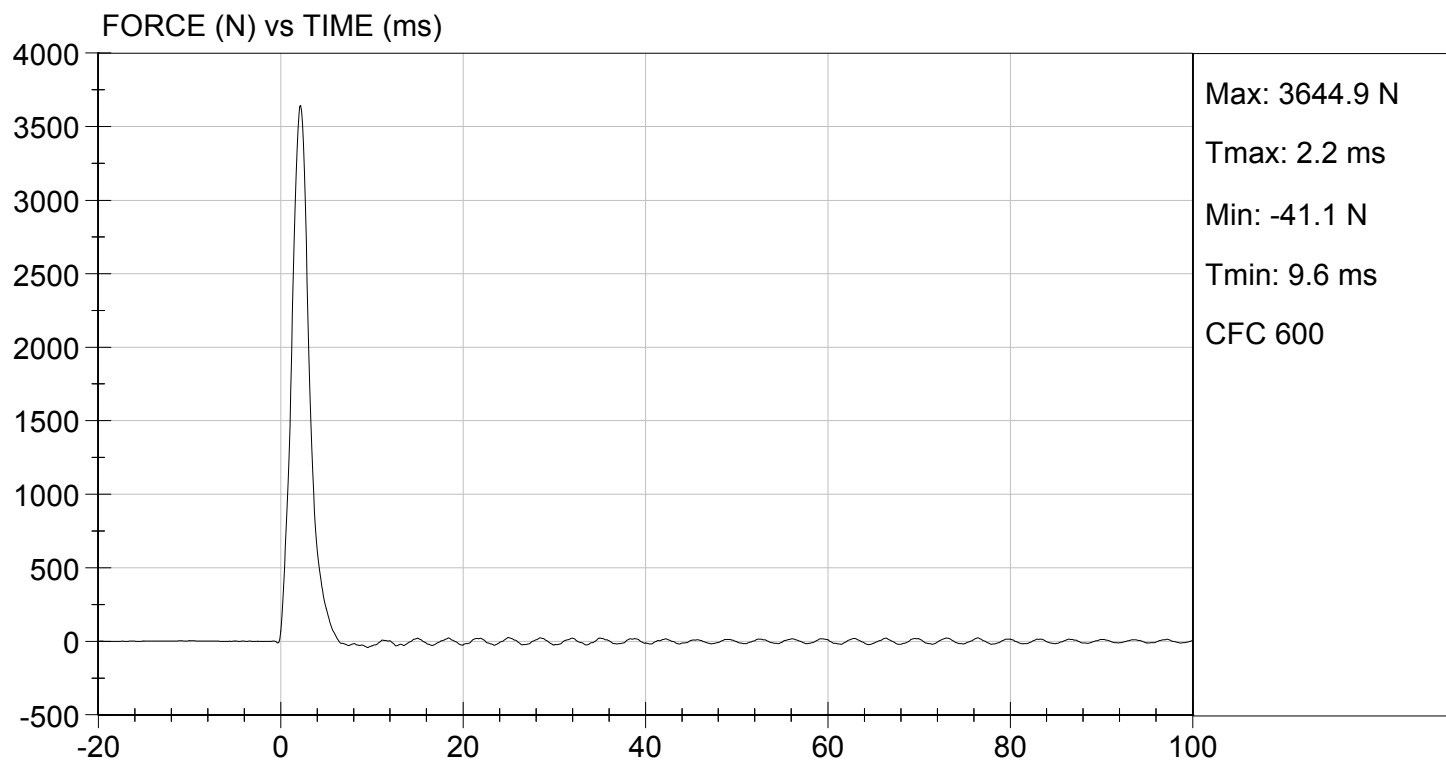
Test Date

David Winkelbauer
Approved By



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

TEST DATE: 06/06/2014
TEST #: D142085



MGA RESEARCH CORPORATION

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

ATD Serial No: 138

Test I.D: D142086

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	N	3450 to 4060	3547	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

06/06/2014

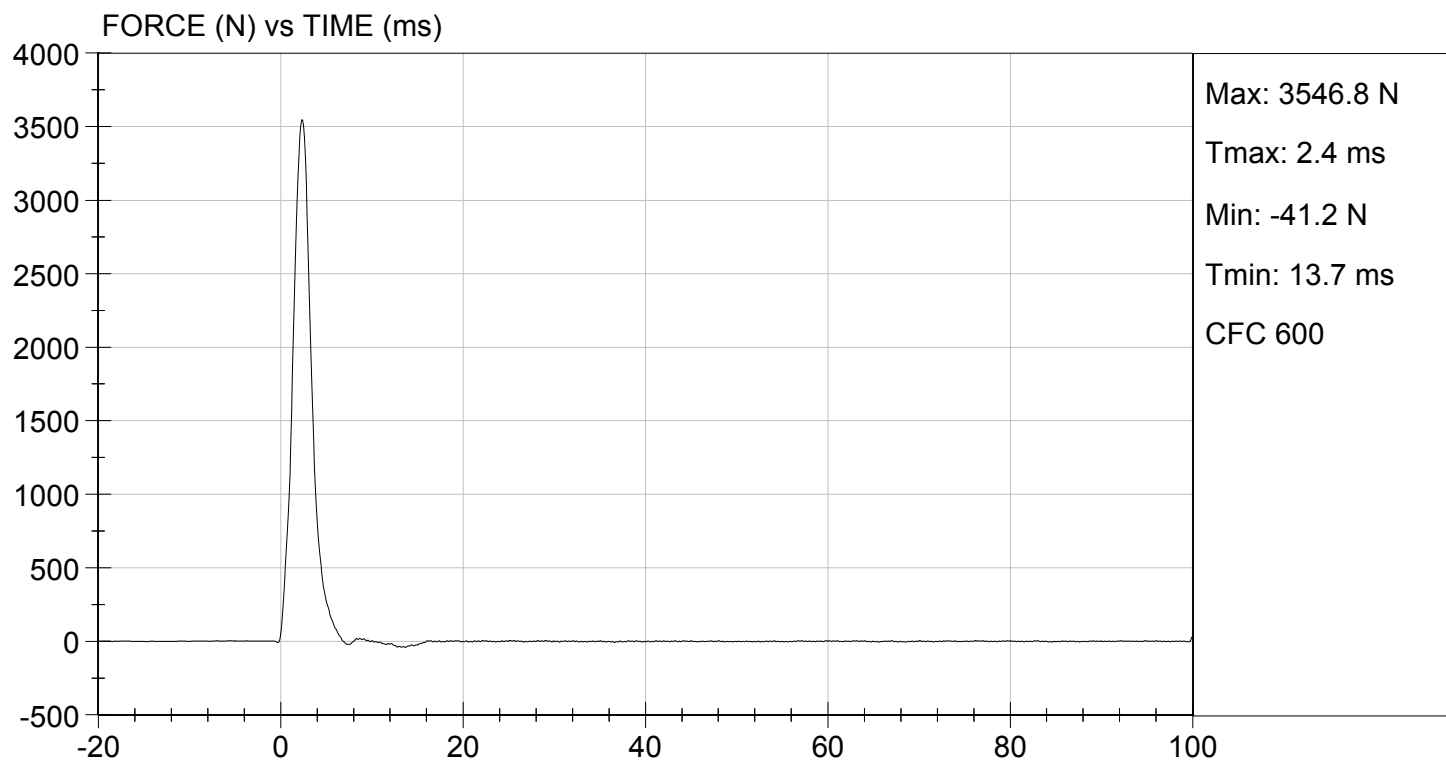
Test Date

David Winkelbauer
Approved By



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

TEST DATE: 06/06/2014
TEST #: D142086



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138

Test I.D: D142087

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	1	Pass
Force at 45 deg	N	320 to 390	378	Pass
Upper Torso Deflection Rate	deg/s	0.5 to 1.5	0.9	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

06/05/2014

Test Date

David Winkelbauer
Approved By