

REPORT NUMBER: NCAP-MGA-2011-008

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

**HONDA MFG. OF ALABAMA, LLC
2011 Honda Pilot LX 4WD
NHTSA No.: MB5300**

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



Test Date: July 30, 2010

Final Report Date: August 19, 2010

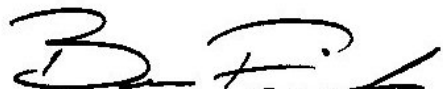
FINAL REPORT

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

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-06-D-00028.

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Approval Date: August 19, 2010

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 the 2011 Honda Pilot LX 4WD in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure for the generation of consumer information on vehicle frontal crash protection. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on July 30, 2010. The impact velocity was 56.5 km/h and the ambient temperature at the barrier face at the time of impact was 21°C. The target vehicle post-test maximum crush was 604 mm located at the vehicle's centerline. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Threshold</th> <th rowspan="2">Driver ATD</th> <th rowspan="2">Passenger ATD</th> </tr> <tr> <th>50th</th> <th>5th</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>700</td> <td>156</td> <td>320</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>52</td> <td>20</td> <td>15</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>1</td> <td>0.3</td> <td>0.4</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>2620</td> <td>1153</td> <td>614</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>2520</td> <td>251</td> <td>227</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>2581</td> <td>3716</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>3339</td> <td>3330</td> </tr> </tbody> </table>				Measurement Description	Units	Threshold		Driver ATD	Passenger ATD	50 th	5 th	Head Injury Criteria (HIC ₁₅)	N/A	700	700	156	320	Maximum Chest Compression	mm	63	52	20	15	Nij	N/A	1	1	0.3	0.4	Neck Tension	N	4170	2620	1153	614	Neck Compression	N	4000	2520	251	227	Left Femur Force	N	10008	6805	2581	3716	Right Femur Force	N	10008	6805	3339	3330
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-06-D-00028. 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 Standard's NCAP Frontal Laboratory Test Procedure dated January 2010.

SUMMARY

A load cell barrier was impacted by a 2011 Honda Pilot LX 4WD at a velocity of 56.5 kph. The test was performed at MGA Research Corporation on July 30, 2010. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

Two 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 on the driver's lap and shoulder belt and the passenger's lap belt to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. 634) were calibrated previous to this test. Certification details, along with verification data, are found in Appendix C of this report.

The 102 channels of data were recorded on an on-board data acquisition system. Appendix B contains the dummy head, chest displacement, neck, and femur 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 604 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's head and chest contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee bolster. The passenger's head and chest contacted the airbag. The passenger's head also contacted the headrest. The passenger's knees contacted the glove box.

The occupant data is summarized below:

ATD position	HIC ₁₅	T ¹	T ²	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp. (N)	Left Femur (N)	Right Femur (N)
Driver (50 th)	156	70.4	85.4	20	0.3	1153	251	2581	3339
Passenger (5 th)	320	67.0	82.0	15	0.4	614	227	3716	3330

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

TEST NOTES

None

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: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB5300	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	Yes
Make	Honda	Power Steering	Yes
Model	Pilot	Driver Front Airbag	Yes
Body Style	MPV	Driver Curtain Airbag	Yes
VIN	5FNYP4H28BB013727	Driver Head/Torso Airbag	No
Body Color	Polished Metal M.	Driver Torso Airbag	No
Delivery Date	7/13/2010	Driver Torso/Pelvis Airbag	Yes
Odometer (mi)	193	Driver Pelvis Airbag	No
Odometer (km)	311	Driver Knee Airbag	No
Dealer	Boyland Honda	Pass. Front Airbag	Yes
Transmission	Automatic	Pass. Curtain Airbag	Yes
Final Drive	4WD	Pass. Head/Torso Airbag	No
Type/No. Cylinders	6	Pass. Torso Airbag	No
Engine Displacement (L)	3.5	Pass. Torso/Pelvis Airbag	Yes
Engine Placement	Longitudinal	Pass. Pelvis Airbag	No
Roof Rack	No	Pass. Knee Airbag	No
Sunroof/T-Top	No	Pretensioners	Yes
Tinted Glass	Yes	Load Limiters	Yes
Traction Control	Yes	Automatic Door Locks	Yes
Power Brakes	Yes	Bucket Seats	Yes
Front Disc	Yes	Tilt Steering	Yes
Rear Disc	Yes	Other	
Does owner's manual provide instructions to turn off automatic door locks?	Yes		

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda Mfg. of Alabama, LLC	GVWR (kg)	2765
Date of Manufacture	04/'10	GAWR Front (kg)	1325
		GAWR Rear (kg)	1475

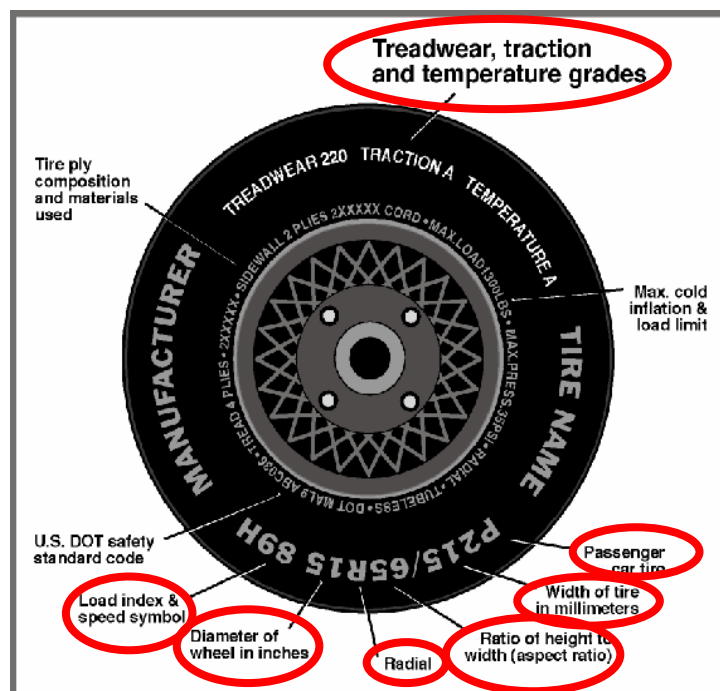
VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	60/40 Fold-Down	60/40 Fold-Down	
Designated Seating Capacity (DSC)	2	3	3	8
Capacity Weight (VCW) (kg)				600
Cargo Weight (RCLW) (kg)				56

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

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	P245/65R17	P245/65R17
Tire Size on Vehicle	P245/65R17	P245/65R17
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Fortera	Fortera
Treadwear	540	540
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 poly	2 poly
Tire Plies Body	5	5
Load Index & Speed Symbol	105T	105T
Tire Material	Rubber	Rubber
DOT Safety Code Right	DOT 4B8T 011R 2010	DOT 4B8T 011R 2010
DOT Safety Code Left	DOT 4B8T 011R 2010	DOT 4B8T 011R 2010

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

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	560.2	475.4		595.1	547.5	
Right	kg	557.5	449.9		584.2	503.5	
Ratio	%	54.7	45.3		52.9	47.1	
Totals	kg	1117.7	925.3	2043.0	1179.3	1051.0	2230.3

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2043.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	56
Calculated Target Vehicle Target Weight (TVTW)	kg	2239.6

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	810	812	822	827	1258
As Tested	mm	804	806	817	820	1309
Post Test	mm	900	866	838	810	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2778
Total Vehicle Length at Left Side	mm	4015
Total Vehicle Length at Centerline	mm	4847
Total Vehicle Length at Right Side	mm	4015
Weight of Ballast in Cargo Area	kg	30.4
Weight of Vehicle Components Removed	kg	14.5
Amount of Stoddard Solvent in Fuel Tank	L	73.8

List of components removed to meet test weight: Right rear tail light, rear storage box, jack & tools.

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

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4847
2	Total Width	1965
3	Bumper Top Height	594
4	Bumper Bottom Height	506
5	Longitudinal Member Top Height	635
6	Distance between Longitudinal Members	1090
7	Longitudinal Member Width	60
8	Engine Top Height	951
9	Engine Bottom Height	265
10	Engine and Gearbox Width	940
11	Front Bumper-Engine Distance	450
12	Front Shock Absorber Fixing Height	1087
13	Bonnet Leading Edge Height	1115
14	Front Shock Absorber Fixing Width	66
15	Front Bumper – Front Axle Distance	974
16	Front Axle – A-Pillar Distance	580
17	A-Pillar – B-Pillar Distance	939
18	B-Pillar – Rear Axle Distance	1280
19	B-Pillar – C-Pillar Distance	755
20	Roof Sill Bottom Height	1705
21	Roof Sill Top Height	1758
22	Floor Sill bottom Height	290
23	Floor Sill Top Height	487

DATA SHEET NO. 2

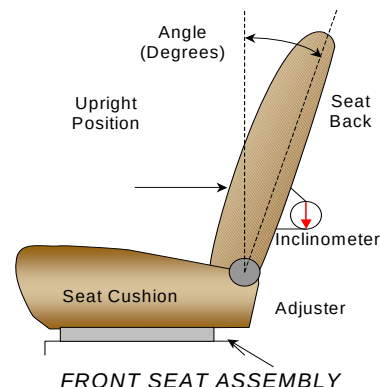
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

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 Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.



SEAT BACK ANGLE	Degrees
Driver Seat Back Angle	12.8° on headrest post guide
Passenger Seat Back Angle	11.1° on headrest post guide

SEAT FORE/AFT POSITIONS

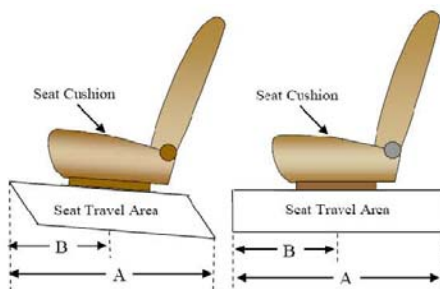
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

SEAT FORE/AFT POSITIONS	Total Fore/Aft Travel	Placed in Position #
Driver Seat	24 detents	11 th detent (forward-most as 0)
Passenger Seat	24 detents	2 nd detent (forward-most as 0)

SEAT BELT UPPER ANCHORAGES

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

SEAT BELT UPPER ANCHORAGES	Total # of Positions	Placed in Position #
Driver Seat	4	0 (uppermost as 0)
Passenger Seat	4	0 (uppermost as 0)



DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

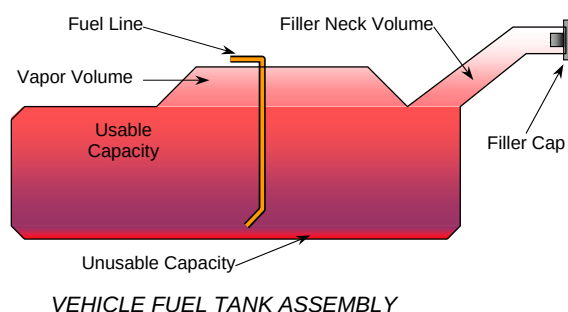
NHTSA No.: MB5300
 Test Date: 7/30/2010

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	79.5
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	73.1 to 74.7
Actual Amount of Solvent used	73.8
1/3 of Usable Capacity	26.5

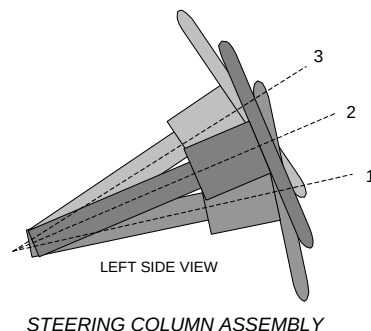
Describe the fuel pump type, its behavior, and the location of the fuel filler pipe.

The vehicle is equipped with an electric fuel pump. Fuel pump will operate after the ignition key is turned from LOCK (0) to ON (II) position, the pump will be filled up for two seconds, and then the pressure is maintained. The fuel filler pipe is located on the left side.



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 POSITION

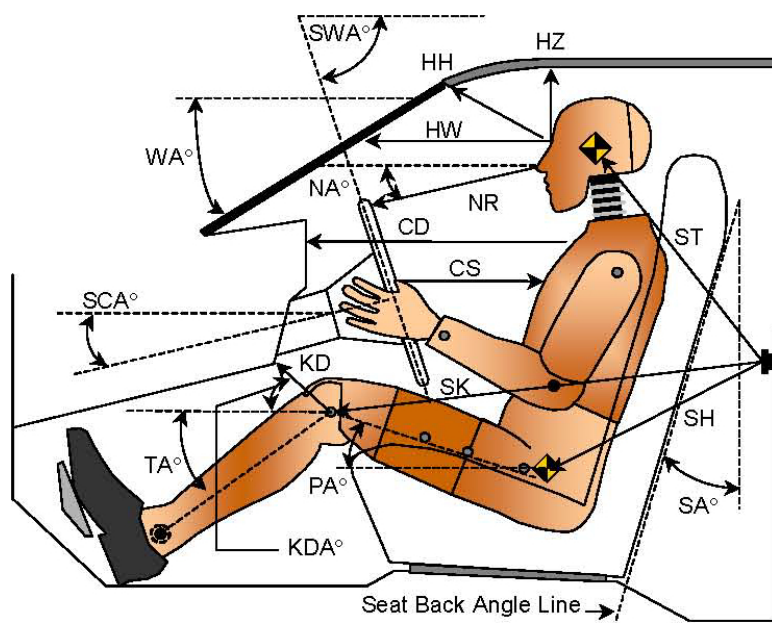
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	68.0	210
Geometric Center – Position 2	65.0	190
Uppermost – Position 3	62.0	170
Telescoping Steering Wheel Travel		40
Test Position	65.0	190

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

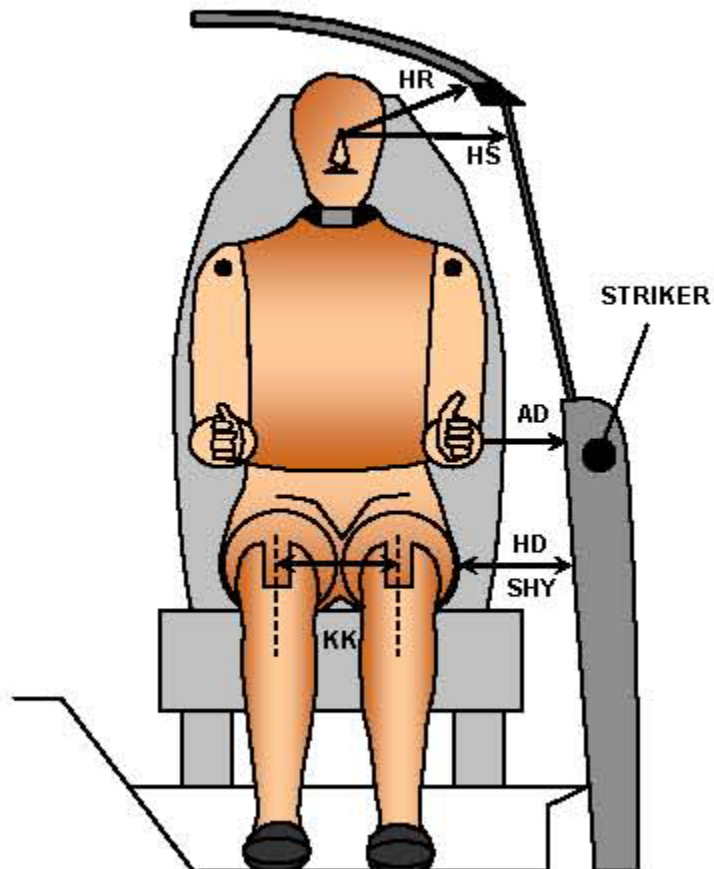


Code	Measurement Description	Driver S/N 351		Passenger S/N 634	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		35.4		
SWA	Steering Wheel Angle		65.0		
SCA	Steering Column Angle		25.0		
SA	Seat Back Angle (headrest post guide)		12.8		11.1
HZ	Head to Roof (Z)	246	90	287	90
HH	Head to Header	450	24.9	388	32.9
HW	Head to Windshield	677	0	657	0
NR	Nose to Rim	385	12.8		
CD	Chest to Dash	528		441	
CS	Chest to Steering Hub	297	1.6		
RA	Rim to Abdomen	177	0		
KDL	Left Knee to Dash	154	20.2	74	19.9
KDR	Right Knee to Dash	118	21.4	76	18.1
PA	Pelvic Angle		24.0		18.2
TA	Tibia Angle		56.2		57.1
SK	Striker to Knee	574	88.3	720	94.1
ST	Striker to Head	566	7.3	570	30.4
SH	Striker to H-Point	237	118.6	354	96.2

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

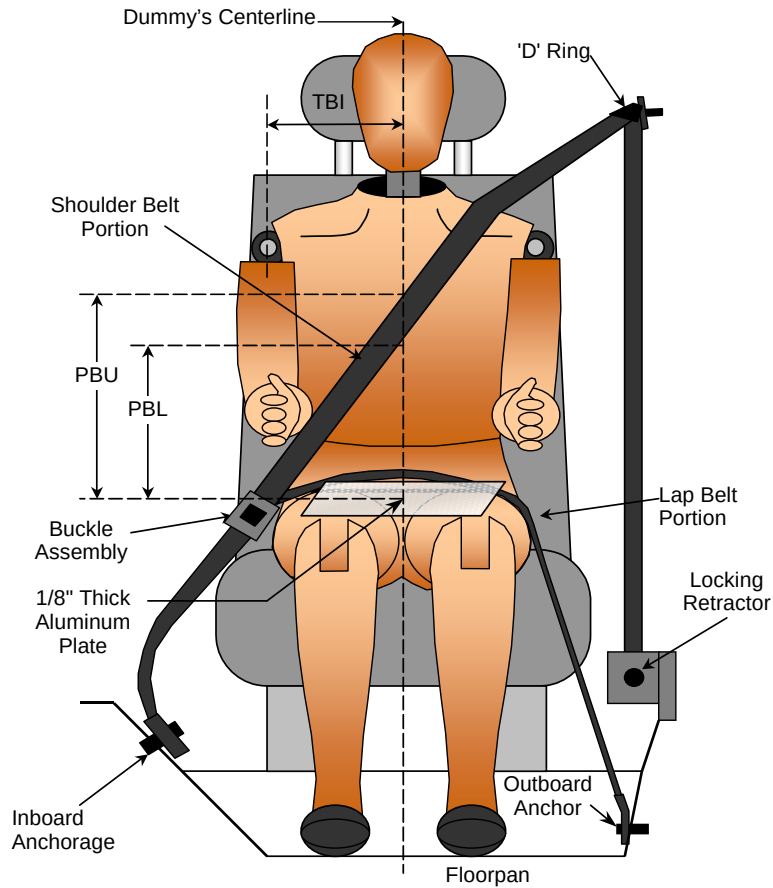


Code	Measurement Description	Driver S/N 351	Passenger S/N 634
		Length (mm)	
AD	Arm to Door	141	85
HD	H-Point to Door	179	242
HR	Head to Side Header	254	288
HS	Head to Side Window	366	389
KK	Knee to Knee	335	209
SHY	Striker to H-Point (Y Direction)	305	315
AA	Ankle to Ankle	345	203

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

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	360	280
PBL - To surface of reference to belt lower edge	mm	285	195

BELT LENGTH DATA

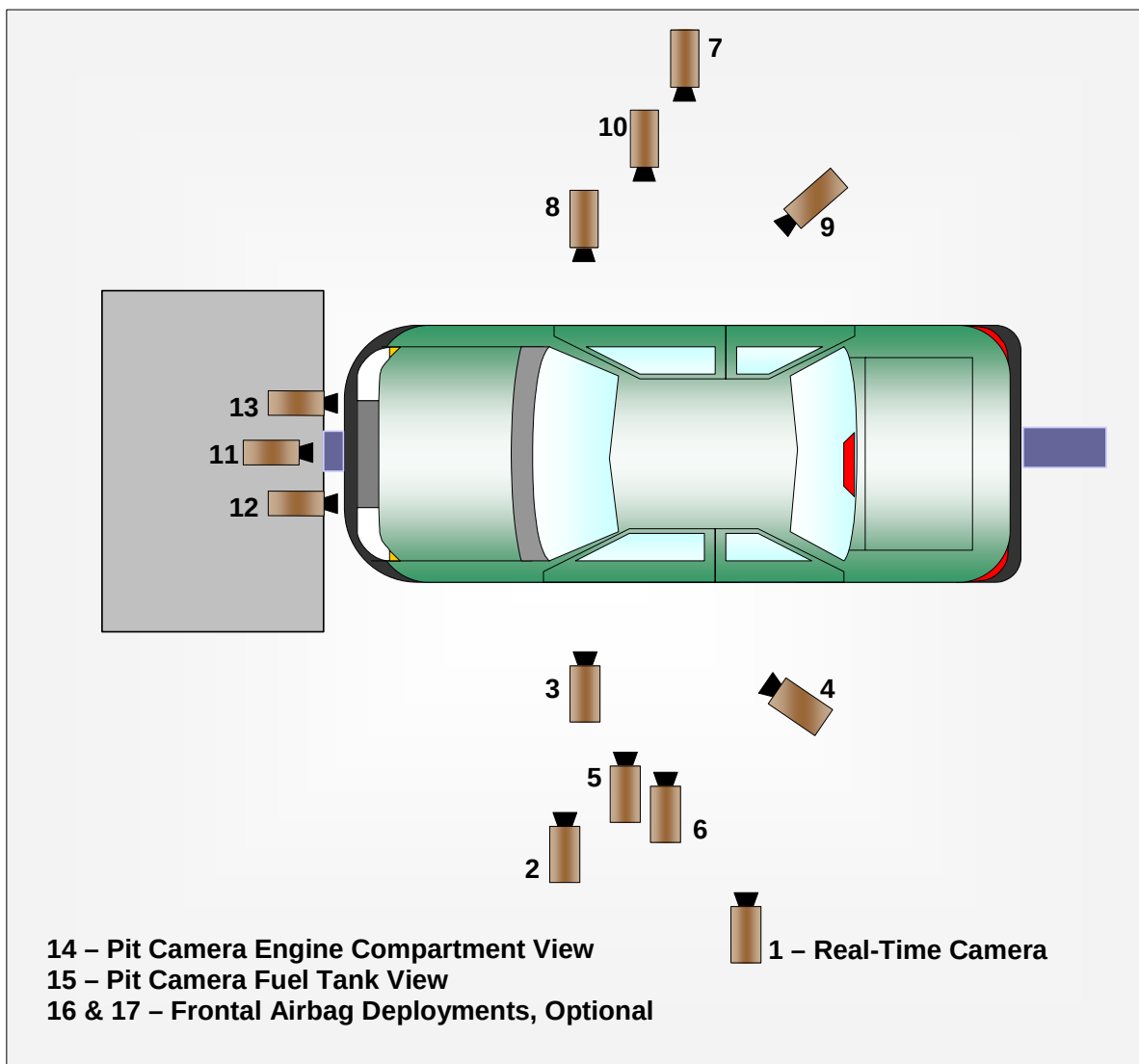
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	870	940
Lap Belt Length as measured on ATD	mm	575	505
Reminder of belt of reel	mm	1165	1180
Total Belt Length for Continuous Webbing Systems	mm	2610	2625

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

Test Vehicle: 2011 Honda Pilot LX 4WD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
Test Date: 7/30/2010

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)

CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Side View					30
2	Left Front Half	1200	-5120	-1140	24	1000
3	Driver Close-Up	1350	-6120	-1710	35	1000
4	Driver Angle	5460	-4710	-2000	50	1000
5	Steering Column Top	740	-5350	-1240	25	1000
6	Steering Column Bottom	710	-5380	-860	25	1000
7	Right Overall	2040	6350	-1080	20	1000
8	Passenger Close-Up	1390	6180	-1650	35	1000
9	Passenger Angle	5530	4680	-2040	50	1000
10	Right Front Half	1210	4980	-1260	24	1000
11	Windshield	-260	0	-2860	24	1000
12	Top Driver	-30	-360	-2270	16	1000
13	Top Passenger	-30	360	-2270	16	1000
14	Pit Front	1160	0	3150	24	1000
15	Pit Rear	3250	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

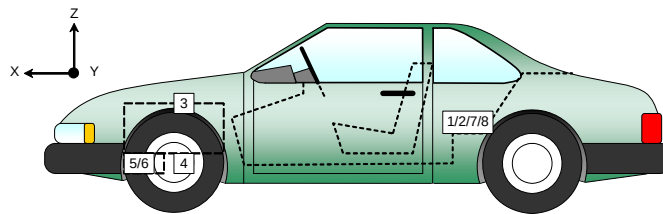
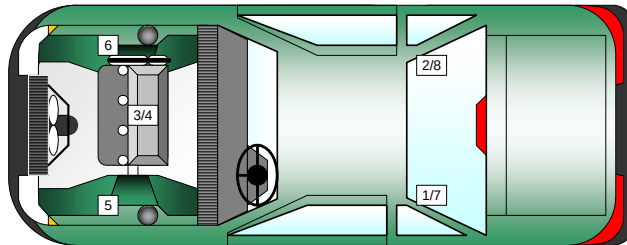
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 16 & 17 were not used for this test.

DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010



ACCELEROMETER LOCATION				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Left Rear X-Member X	2105	-370	-457
2	Right Rear X-Member X	2105	370	-457
3	Engine Top X	4240	0	-951
4	Engine Bottom X	4105	0	-316
5	Left Brake Caliper X	4021	-747	-227
6	Right Brake Caliper X	4021	747	-283
7	Left Rear X-Member Z	2105	-370	-457
8	Right Rear X-Member Z	2105	370	-457

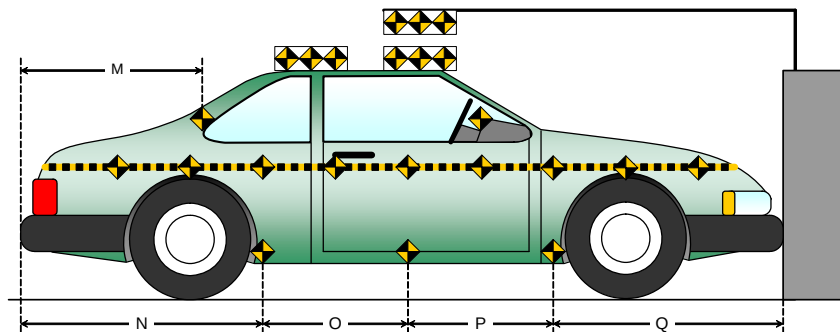
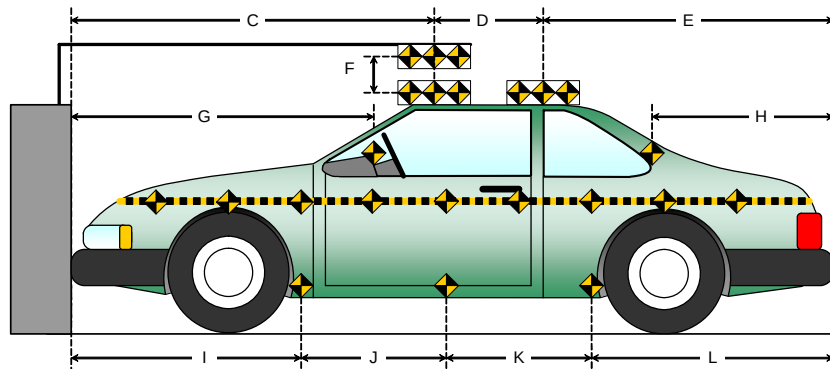
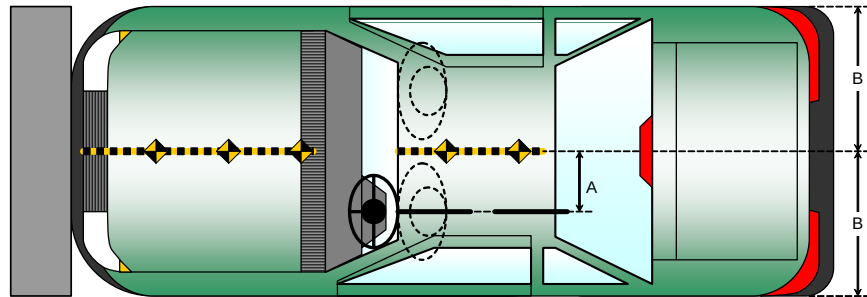
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

Item	Value (mm)
A	420
B	992
C	2285
D	665
E	1897
F	64
G	
H	1275
I	1550
J	939
K	755
L	1603
M	1285
N	1604
O	756
P	940
Q	1547



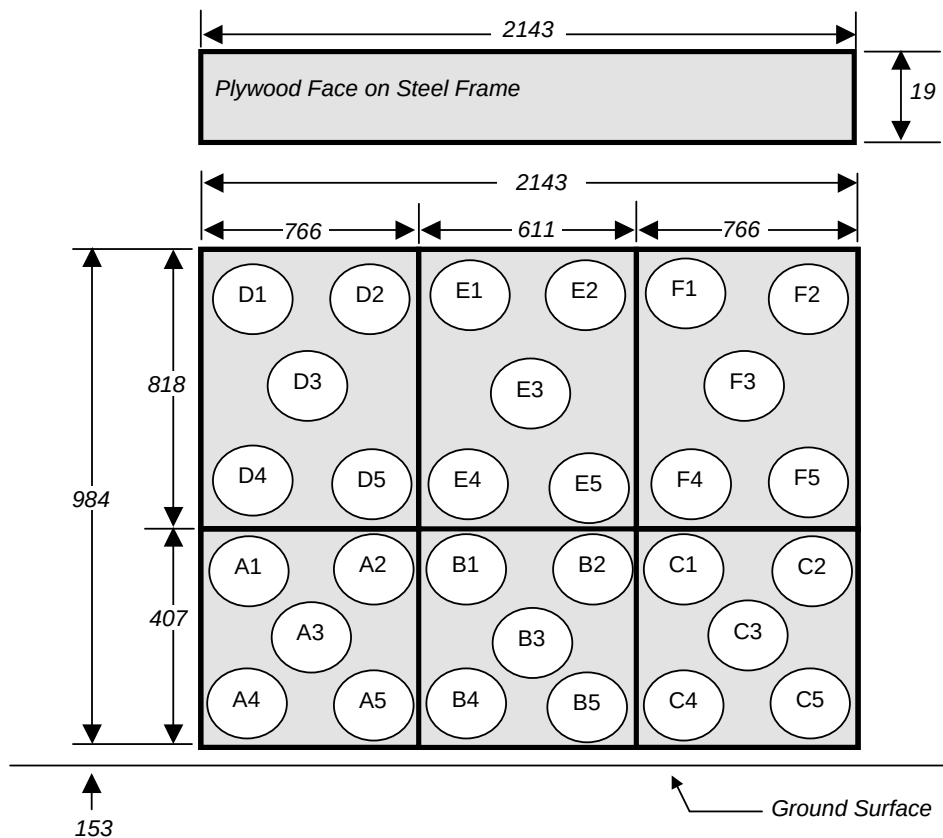
DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

30 Load Cell Rigid Barrier Load Cell Locations on Fixed Barrier



Group 4 D1-D5	Group 5 E1-E5	Group 6 F1-F5
Group 1 A1-A5	Group 2 B1-B5	Group 3 C1-C5

6 Groups of 5 Load Cells Each

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Honda Pilot LX 4WD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
Test Date: 7/30/2010

INSTRUMENTATION

Driver Dummy Data Channels	44
Passenger Dummy Data Channels	44
Vehicle Structure Accelerometers	8
Barrier Channels	6
Total	102

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: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

TEST DUMMY INFORMATION AND CONTACT

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

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were 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	Cracked
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	498
Center	mm	580
Right Side	mm	545
Average	mm	541

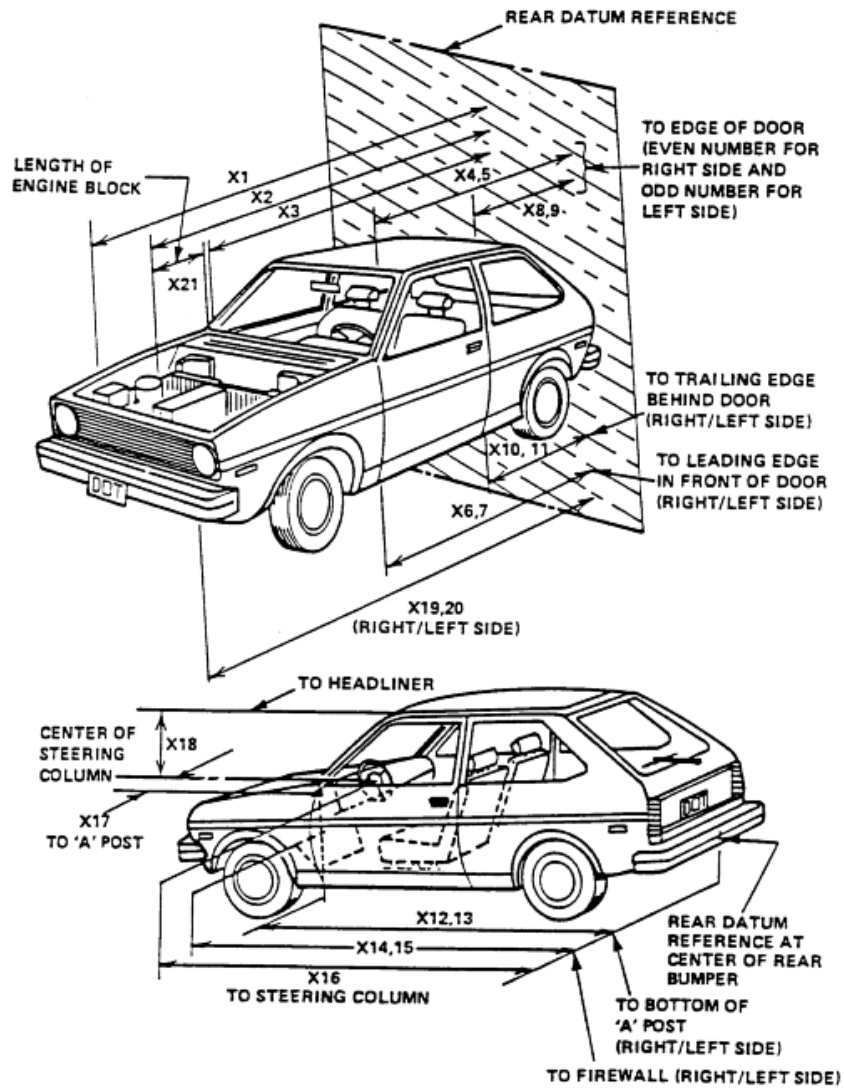
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Left Front (Passenger) P2	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Knee Airbag	No		No	
Curtain Side Airbag	Yes	No	Yes	No
Torso/Pelvis Side Airbag	Yes	No	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Honda Pilot LX 4WD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
Test Date: 7/30/2010



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4847	4243	604
2	RSOV to Front of Engine	mm	4395	4051	344
3	RSOV to Firewall	mm	3812	3879	-67
4	RSOV to Upper Leading Edge of Right Door	mm	3395	3379	16
5	RSOV to Upper Leading Edge of Left Door	mm	3395	3381	14
6	RSOV to Lower Leading Edge of Right Door	mm	3326	3346	-20
7	RSOV to Lower Leading Edge of Left Door	mm	3326	3344	-18
8	RSOV to Upper Trailing Edge of Right Door	mm	2332	2329	3
9	RSOV to Upper Trailing Edge of Left Door	mm	2332	2323	9
10	RSOV to Lower Trailing Edge of Right Door	mm	2323	2333	-10
11	RSOV to Lower Trailing Edge of Left Door	mm	2323	2340	-17
12	RSOV to Bottom of "A" Post of Right Side	mm	3274	3274	0
13	RSOV to Bottom of "A" Post of Left Side	mm	3274	3274	0
14	RSOV to Firewall, Right Side	mm	3836	3664	172
15	RSOV to Firewall, Left Side	mm	3837	3705	132
16	RSOV to Steering Column	mm	2941	3055	-114
17	Center of Steering Column to "A" Post	mm	440	429	11
18	Center of Steering Column to Headliner	mm	476	440	36
19	RSOV to Right Side of Front Bumper	mm	4700	4302	398
20	RSOV to Left Side of Front Bumper	mm	4700	4335	365
21	Length of Engine Block	mm	605	605	0
RD	RSOV to Right Side of Dash Panel	mm	3241	3230	11
CD	RSOV to Center of Dash Panel	mm	3170	3232	-62
LD	RSOV to Left Side of Dash Panel	mm	3225	3245	-20

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

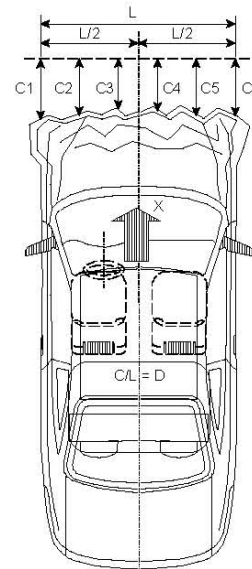
NHTSA No.: MB5300
 Test Date: 7/30/2010

VEHICLE INFORMATION

VIN: 5FNYP4H28BB013727 Wheelbase (mm): 2778
 Vehicle Size Category: MPV Test Weight (kg): 2230

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 16
 Cal. Procedure/Interval: MGA procedure / 6 month
 Integration Algorithm: Trapezoidal Linearity: > 99%
 Impact Velocity (km/h): 56.5
 Velocity Change (km/h): 63.2
 Time of Separation (msec): 108.2



CRUSH PROFILE

Collision Deformation Classification: Frontal
 Midpoint of Damage: Centerline
 Damage Region Length (mm): 1404
 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4700	4335	365
C2	Crush zone 2 at left side	mm	4795	4266	529
C3	Crush zone 3 at left side	mm	4820	4251	569
C4	Crush zone 4 at right side	mm	4820	4236	584
C5	Crush zone 5 at right side	mm	4795	4253	542
C6	Crush zone 6 at right side	mm	4700	4302	398
L	C1 TO C6	mm	1404	1345	59

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

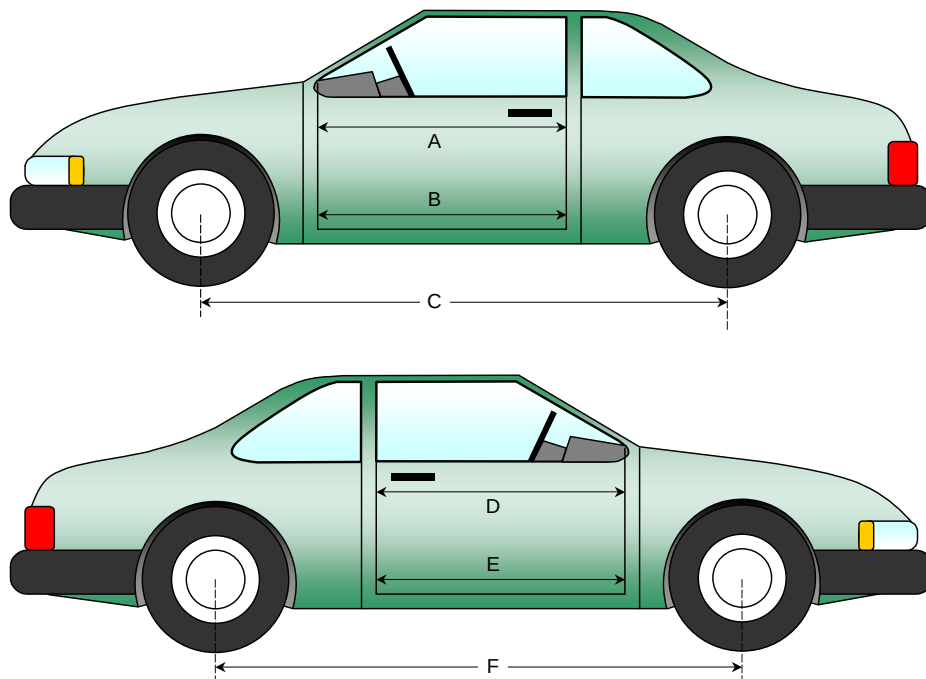
NHTSA No.: MB5300
 Test Date: 7/30/2010

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	962	962	0
B	Left Side Lower	mm	860	860	0
D	Right Side Upper	mm	962	962	0
E	Right Side Lower	mm	860	860	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2778	2702	76
F	Right Side Wheelbase	mm	2778	2659	119



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

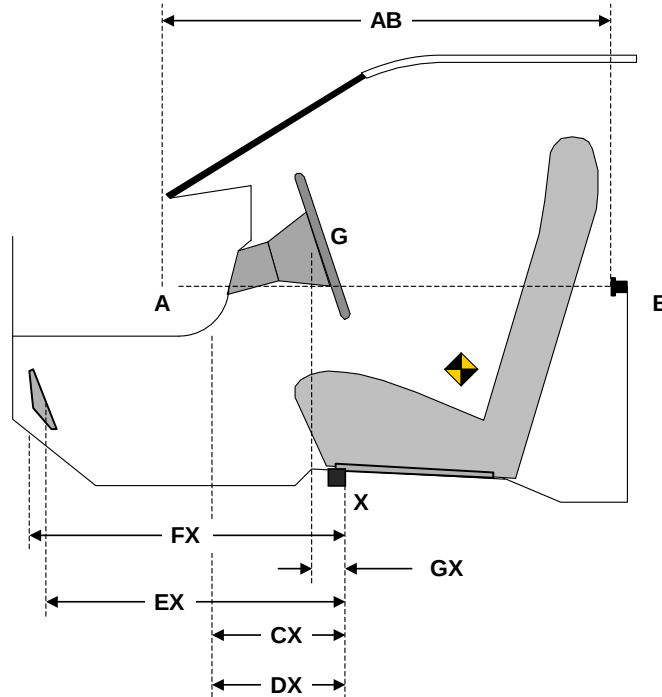
Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	756	756	0
CX	Left Knee Bolster to X	mm	310	313	-3
DX	Right Knee Bolster to X	mm	285	280	5
EX	Brake Pedal to X	mm	549	465	84
FX	Foot Rest to X	mm	562	520	42
GX	Center of Steering Column Wheel Hub to X	mm	55	115	-60

X = Front of Seat Track (stationary)

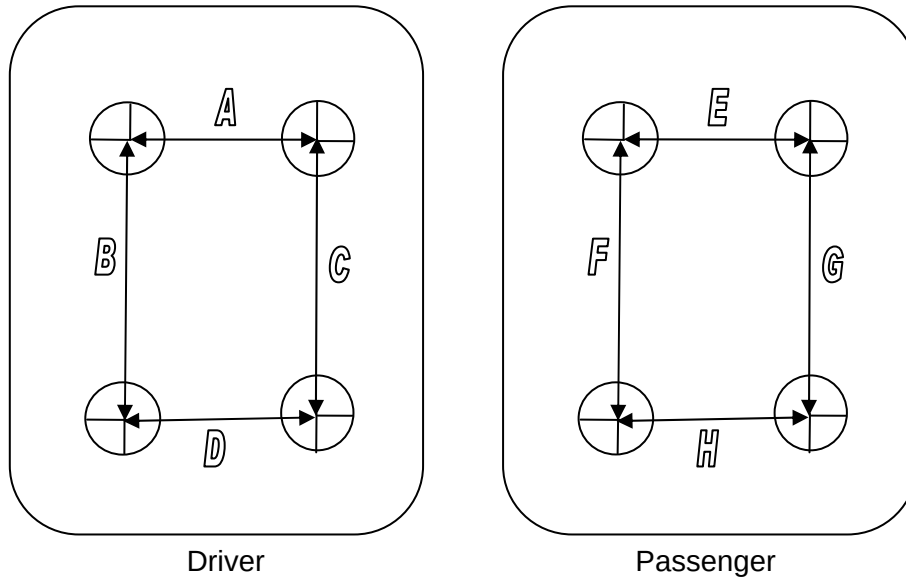


DRIVER COMPARTMENT

DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010



TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	295	290	5
B	mm	240	240	0
C	mm	240	240	0
D	mm	280	280	0
E	mm	225	225	0
F	mm	225	225	0
G	mm	225	225	0
H	mm	205	205	0

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

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

Windshield Mounting Details:

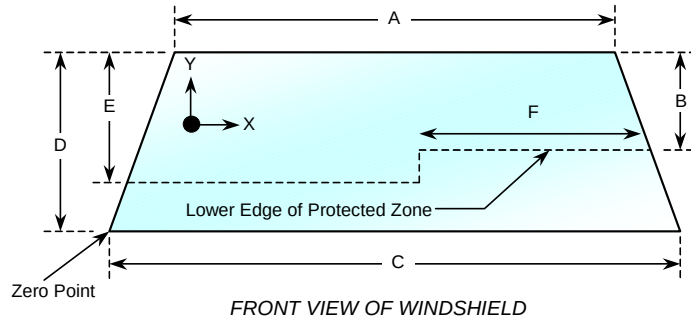
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pretest 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°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2241	2241	100
Right Side	2241	2241	100
Total	4482	4482	100



Item	Units	Value
A	mm	1370
B	mm	460
C	mm	1592
D	mm	760
E	mm	464
F	mm	461

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, 219 (PARTIAL), AND 301 DATA

Test Vehicle:	<u>2011 Honda Pilot LX 4WD</u>	NHTSA No.:	<u>MB5300</u>
Test Program:	<u>NCAP Frontal Barrier Impact Test</u>	Test Date:	<u>7/30/2010</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Time:	<u>10:49 am</u>	Temperature:	<u>21° C</u>
------------	-----------------	--------------	--------------

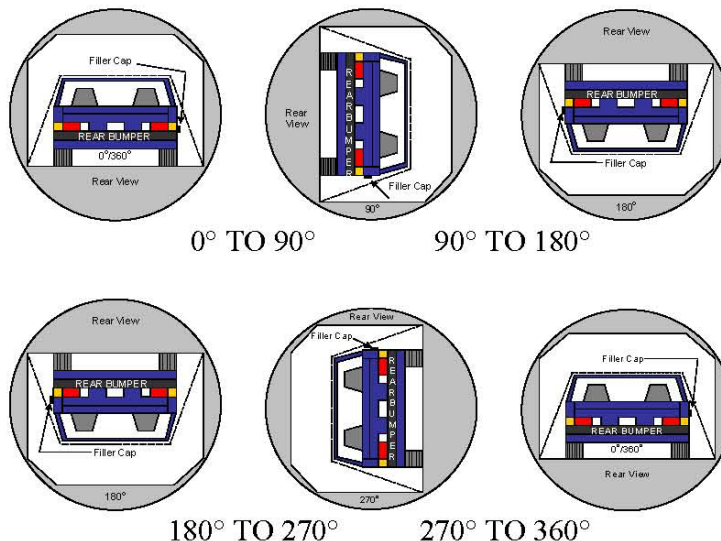
- | | |
|---|--------------|
| A. From impact until vehicle motion ceases:
(Maximum Allowable = 1 ounce) | <u>0</u> oz. |
| B. For the 5 minute period after motion ceases:
(Maximum allowable = 5 ounces) | <u>None</u> |
| C. For the following 25 minutes:
(Maximum allowable = 1 oz./minute) | <u>None</u>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

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2011 Honda Pilot LX 4WD
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
 Test Date: 7/30/2010

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°	113	300	413
90° to 180°	110	300	410
180° to 270°	108	300	408
270° to 360°	114	300	414

FMVSS 301 ROLLOVER 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

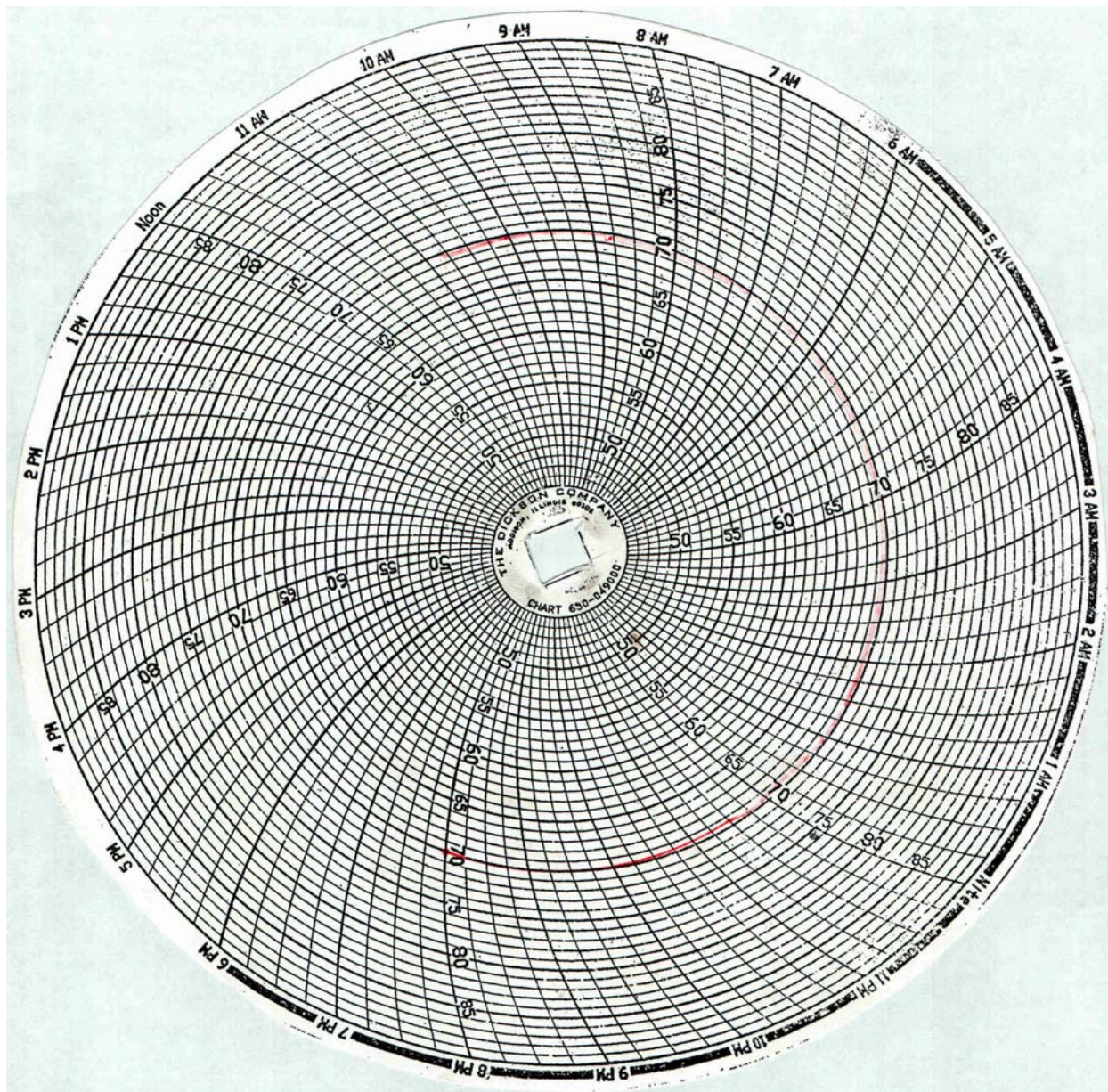
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2011 Honda Pilot LX 4WD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5300
Test Date: 7/30/2010



APPENDIX A
PHOTOGRAPHS

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Load Cell Location



Load Cell Wall

MFD. BY HONDA MFG. OF ALABAMA, LLC 04/' 10
GVWR 2765KG(6096LBS) TIRE SIZE RIM SIZE
GAWR F 1325KG(2921LBS) P245/65R17 105T 17X7.5J
GAWR R 1475KG(3252LBS) P245/65R17 105T 17X7.5J
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY
AND THEFT PREVENTION STANDARDS IN EFFECT
ON THE DATE OF MANUFACTURE SHOWN ABOVE.
V.I.N.:5FNYF4H28BB013727 TYPE: MPV



SZA B AA5 -NH737M -A -B

Manufacturer's Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY : TOTAL 8 : FRONT 2 : REAR 6

The combined weight of occupants and cargo should never exceed 600kg or 1320lbs.

TIRE	SIZE	COLD TIRE PRESSURE	SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION
FRONT	P245/65R17 105T	220KPA, 32PSI	
REAR		220KPA, 32PSI	
SPARE	T165/80D17 104M	420KPA, 60PSI	

Tire Placard



Right Front Three-Quarter View, As Received



Left Rear Three-Quarter View, As Received



Pre-Test Front View



Post-Test Front View



Pre-Test Left Side View (with vehicle at barrier)



Post-Test Left Side View



Pre-Test Right Side View (with vehicle at barrier)



Post-Test Right Side View



Pre-Test Right Front $\frac{3}{4}$ View



Post-Test Right Front $\frac{3}{4}$ View



Pre-Test Left Rear $\frac{3}{4}$ View (with vehicle at barrier)



Post-Test Left Rear $\frac{3}{4}$ View



Pre-Test Windshield View



1007 3001

Post-Test Windshield View



Pre-Test Engine Compartment View



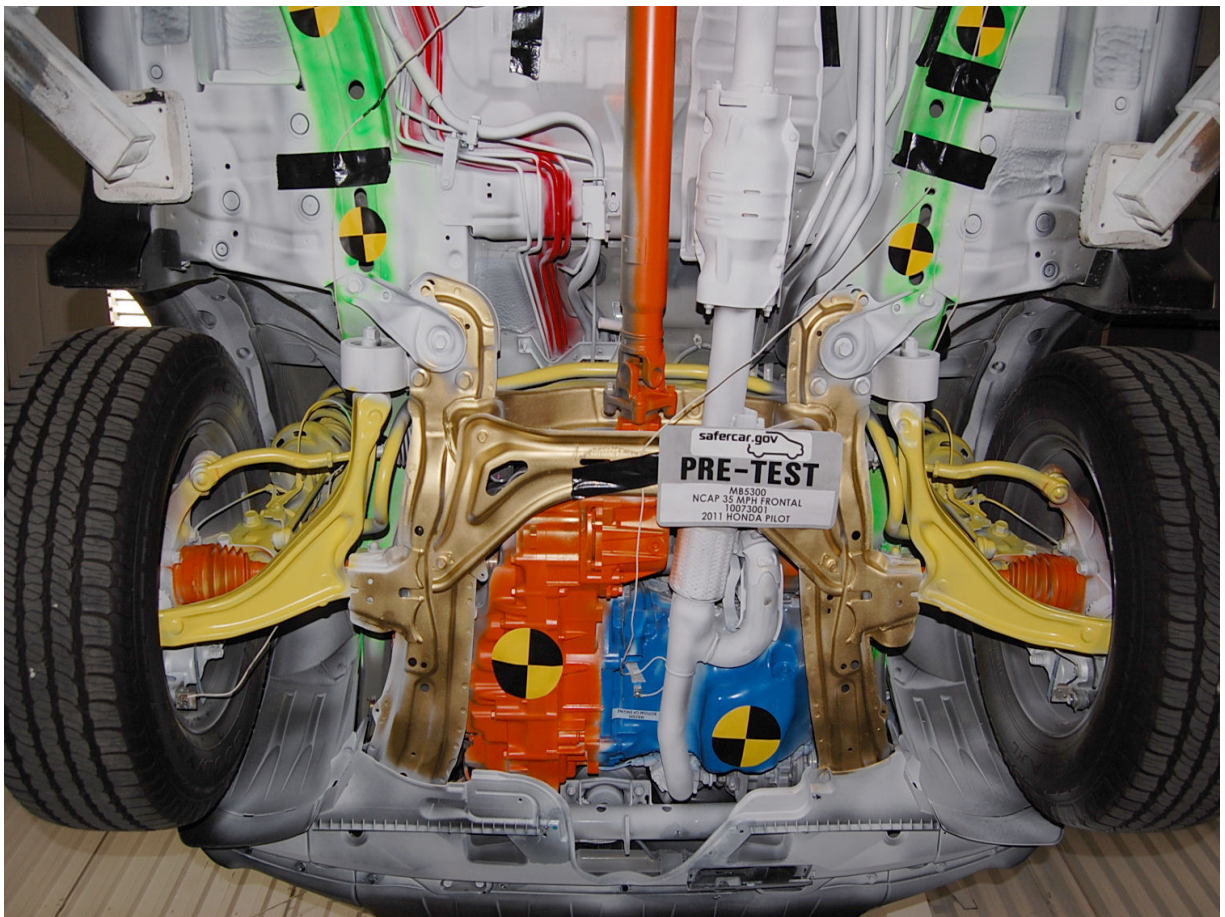
Post-Test Engine Compartment View



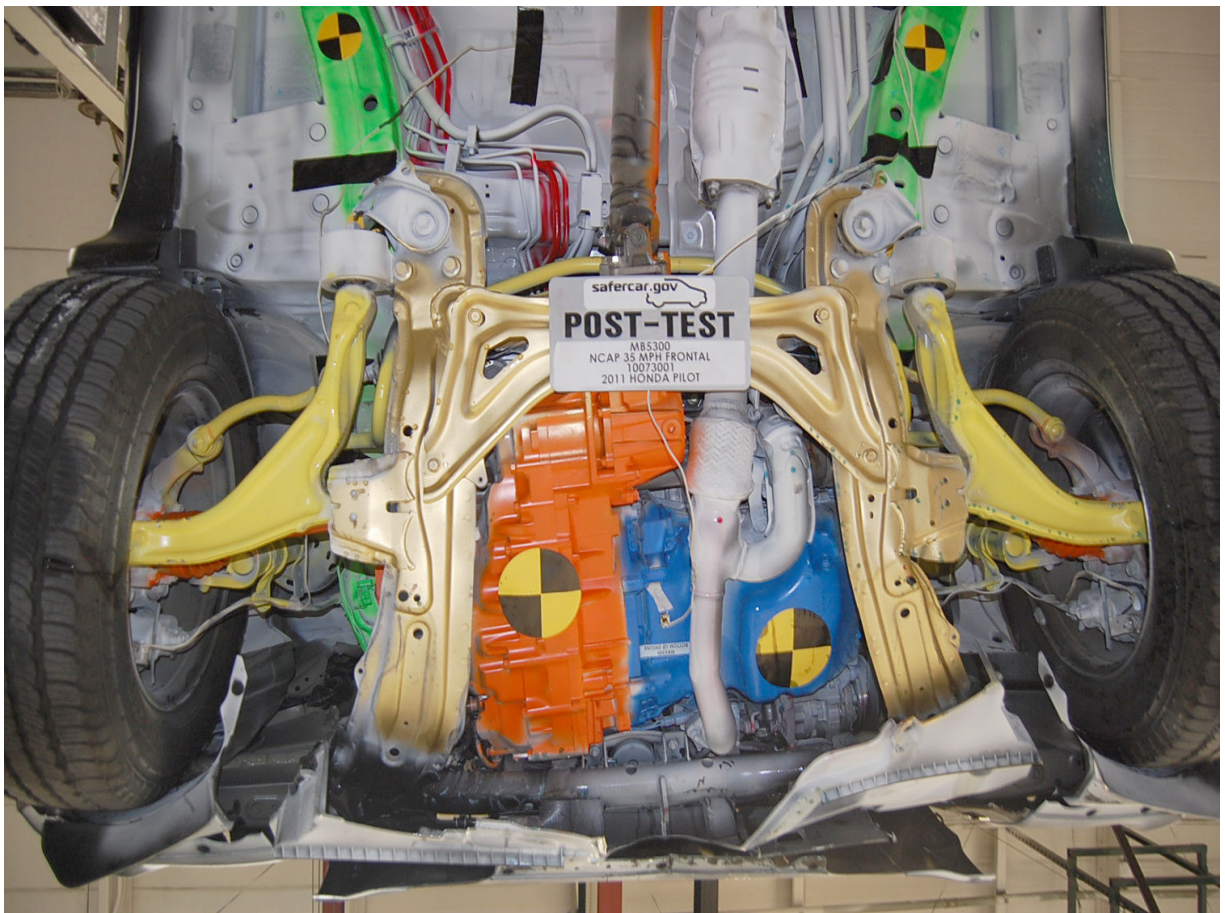
Pre-Test Fuel Cap View



Post-Test Fuel Cap View



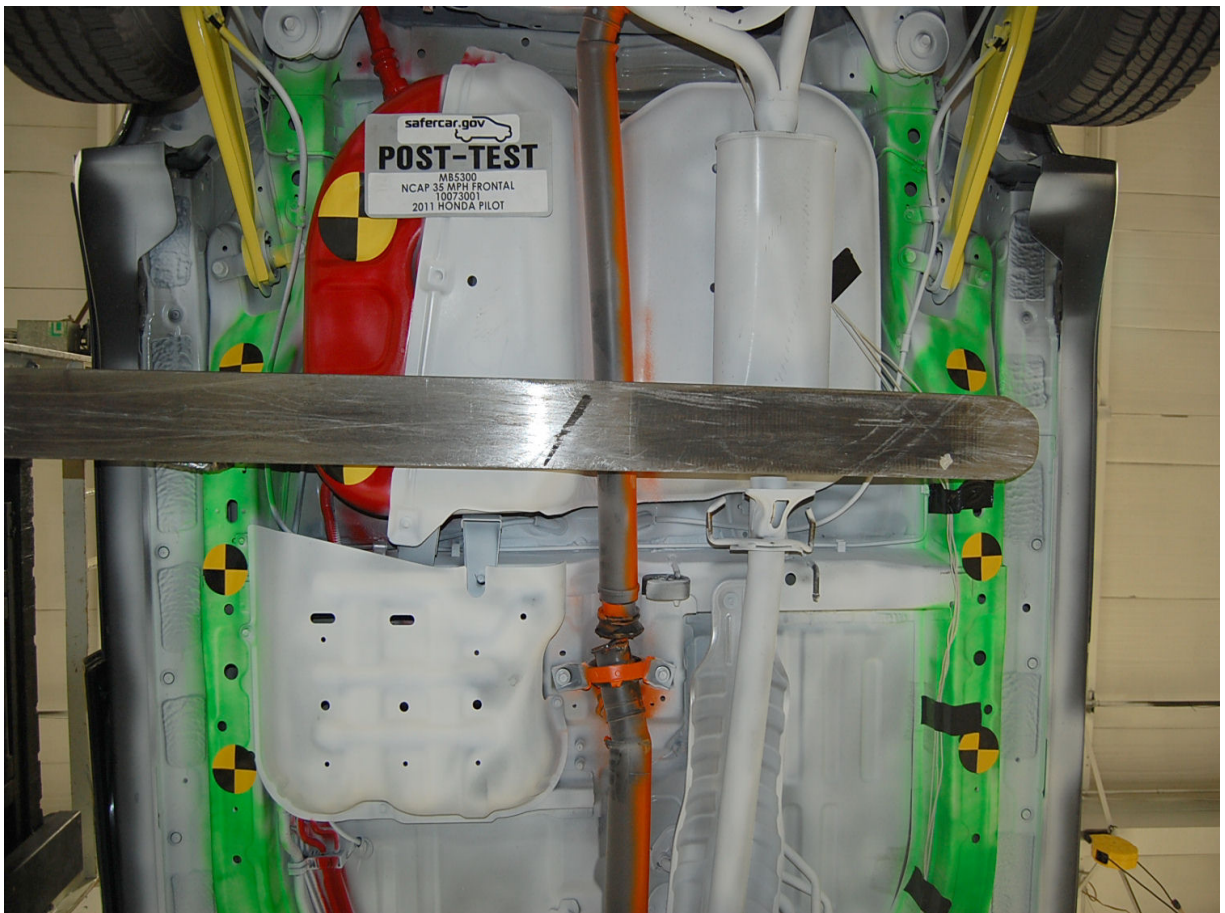
Pre-Test Front Underbody View



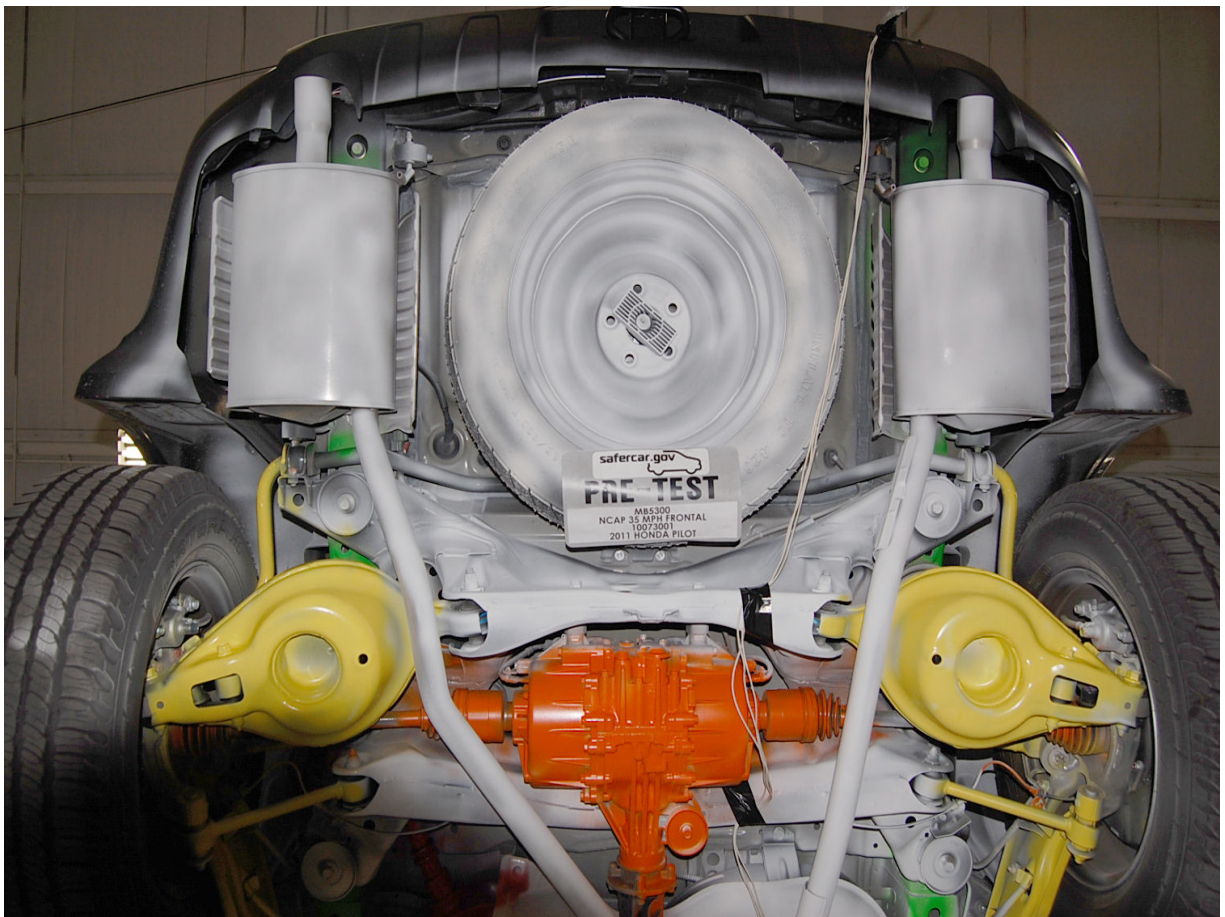
Post-Test Front Underbody View



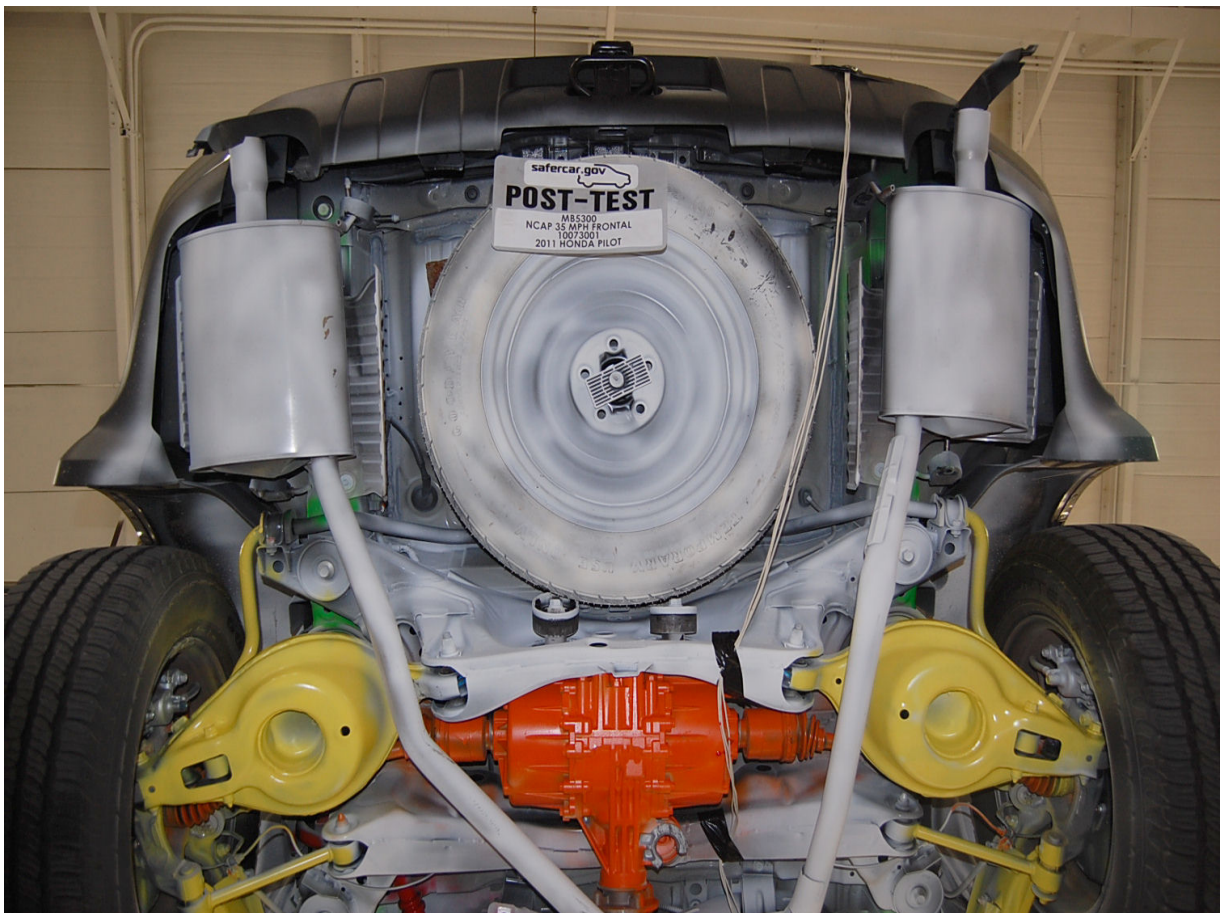
Pre-Test Mid Underbody View



Post-Test Mid 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



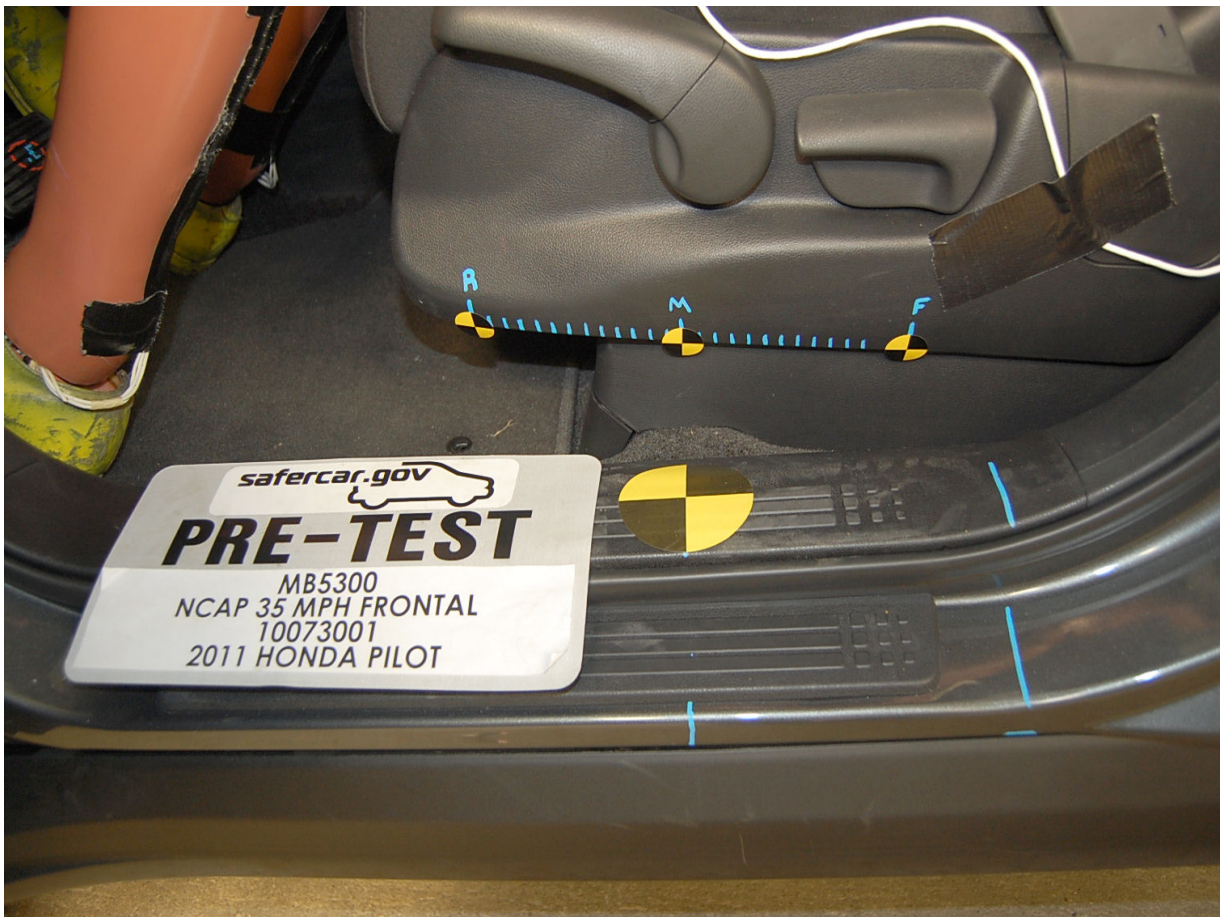
Post-Test Driver Dummy Window View



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 Driver Dummy Feet



Post-Test Driver Dummy Feet



Pre-Test Driver's Side Knee Bolster



Post-Test Driver's Side Knee Bolster



Pre-Test Driver's Side Floorpan



Post-Test Driver's Side Floorpan



Post-Test Driver Dummy Contact with Airbag



Post-Test Driver Dummy Contact with Headrest



Post-Test Driver Dummy Contact with Knee Bolster



Pre-Test View of Steering Column Shear Capsule



Post-Test View of Steering Column Shear Capsule



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 Passenger Dummy Feet



Post-Test Passenger Dummy Feet



Pre-Test Passenger's Side Knee Bolster



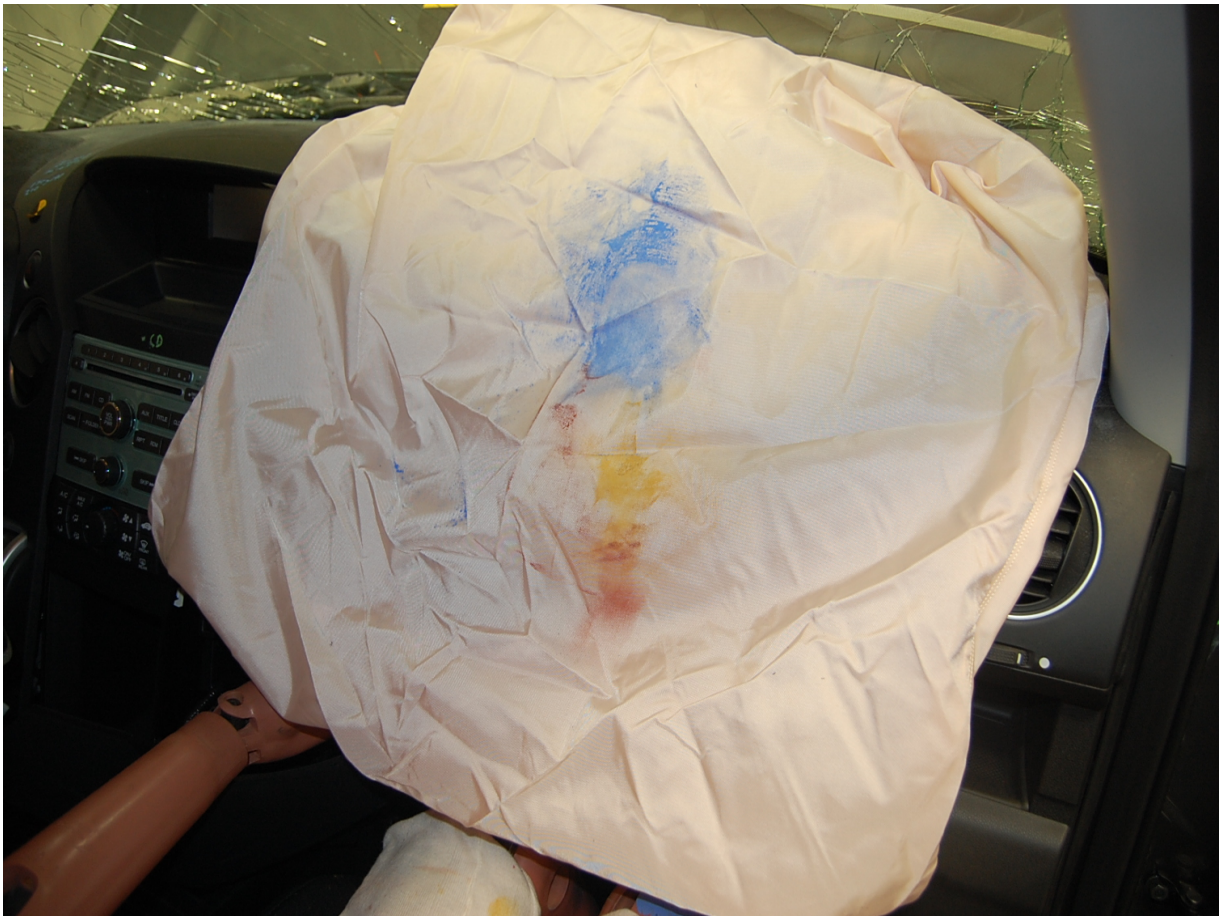
Post-Test Passenger's Side Knee Bolster



Pre-Test Passenger's Side Floorpan



Post-Test Passenger's Side Floorpan



Post-Test Passenger Dummy Contact with Airbag



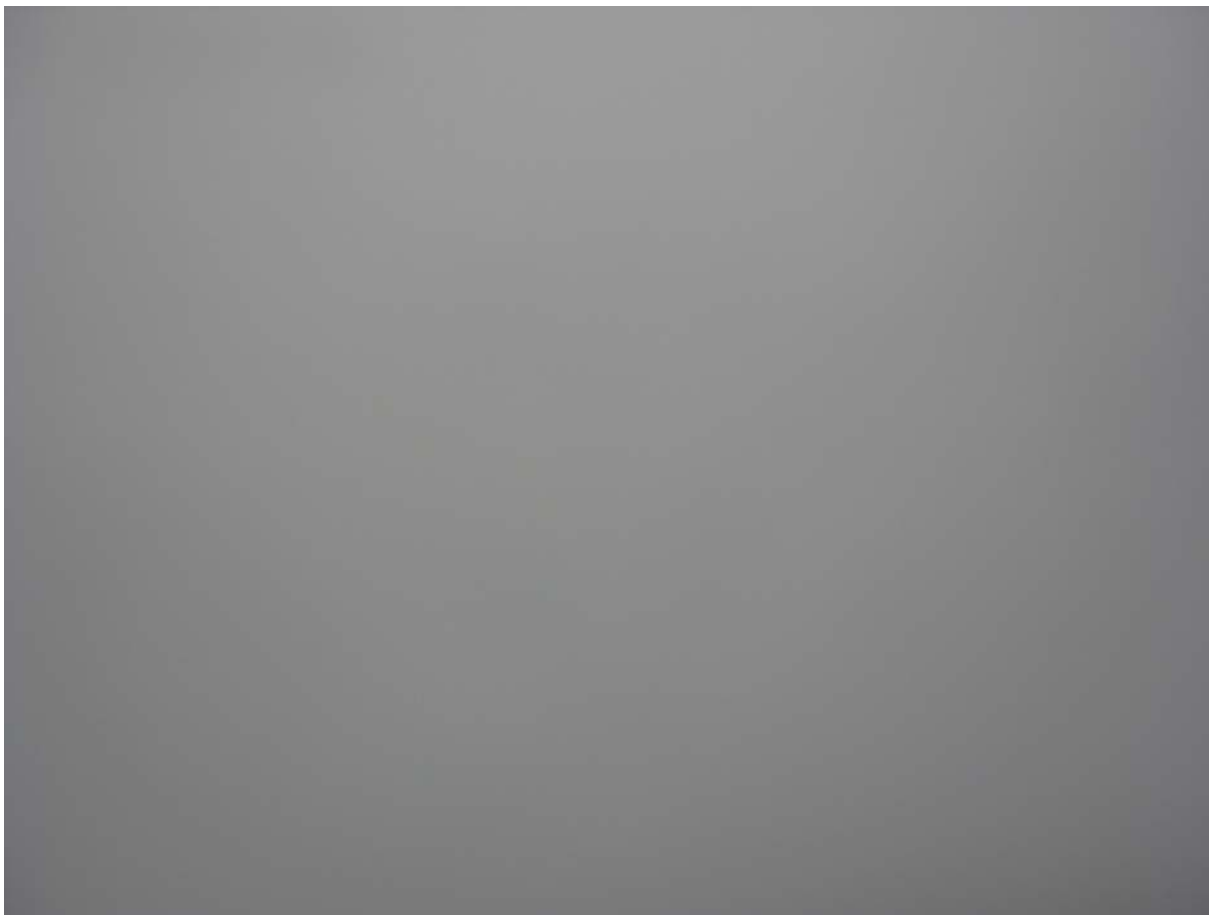
Post-Test Passenger Dummy Contact with Headrest



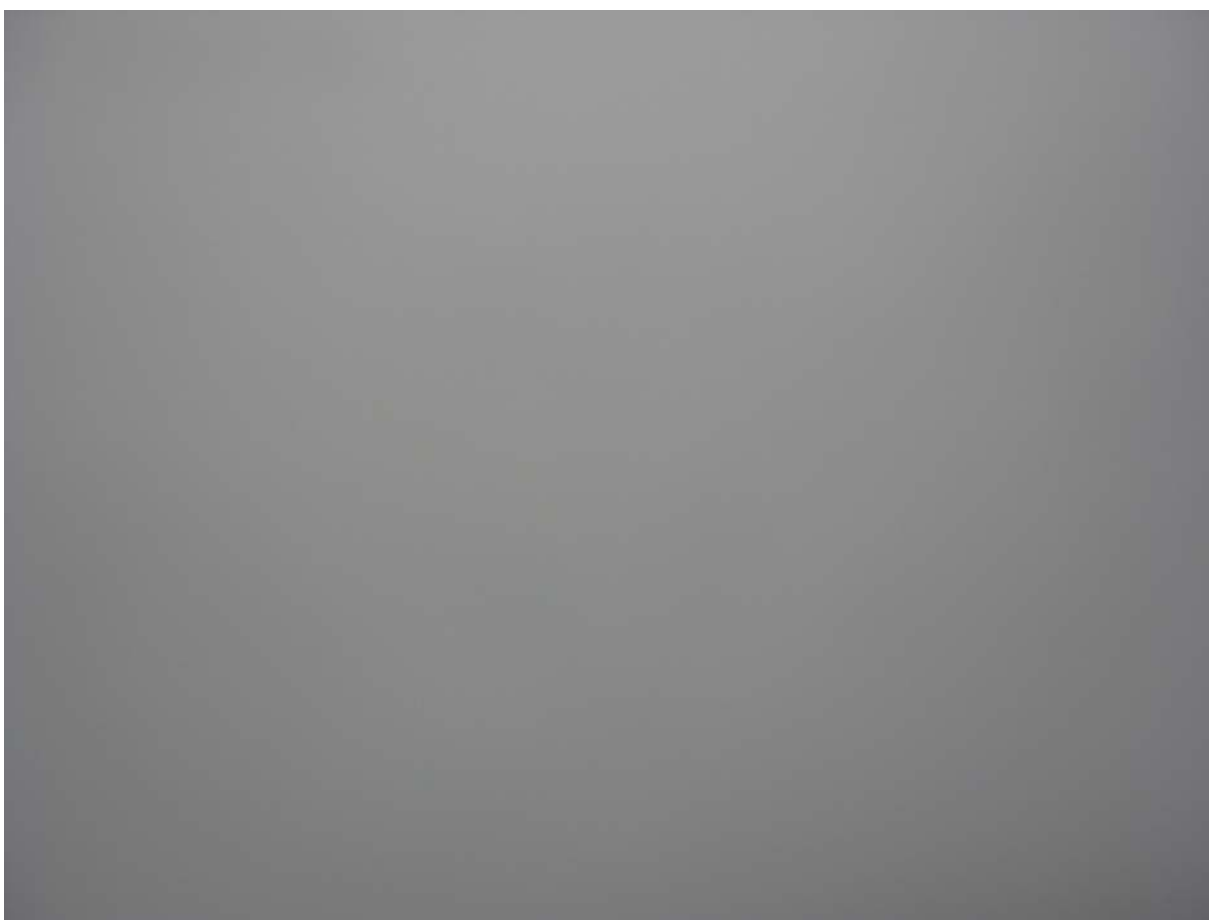
Post-Test Passenger Dummy Contact with Glovebox



Ballast Installed in Vehicle



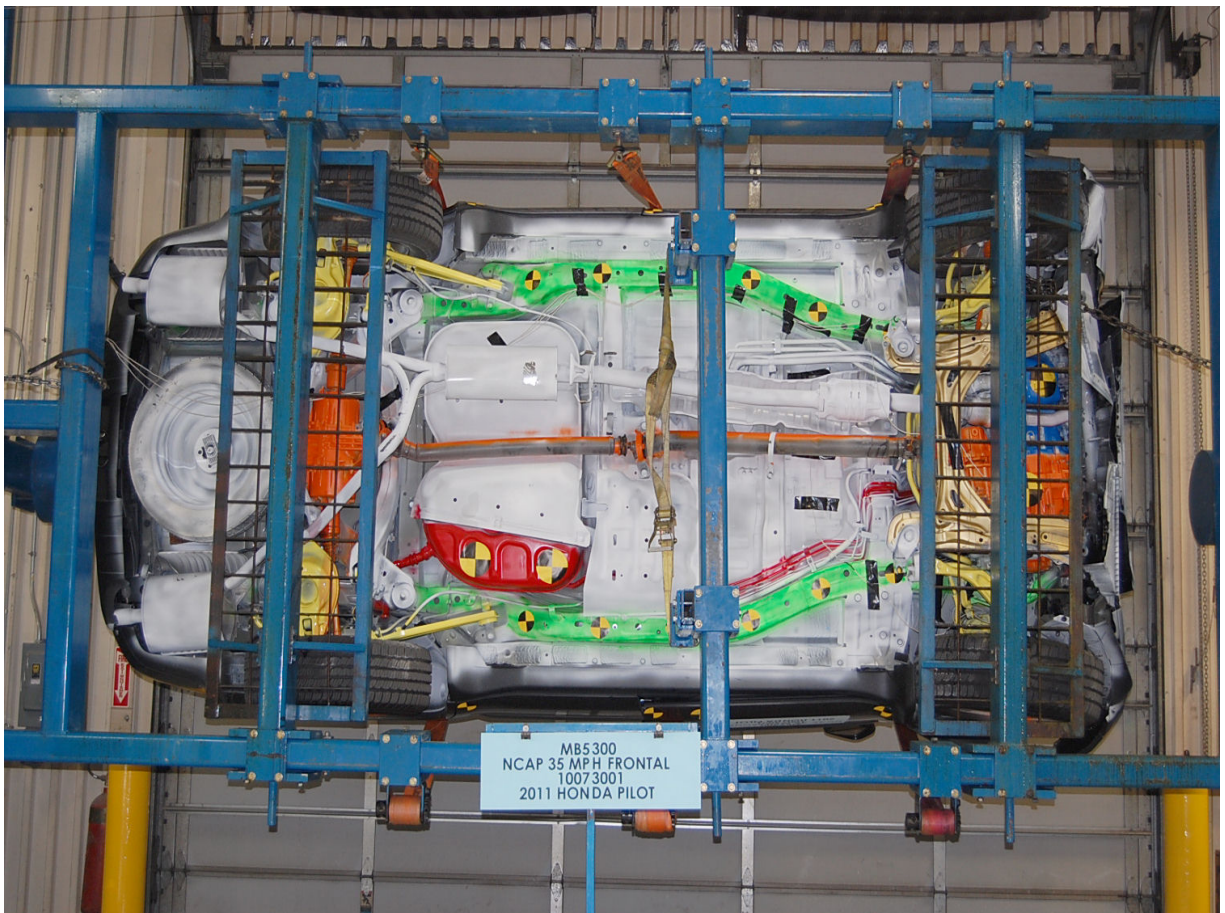
Post-Test Stoddard Solvent Spillage Location View



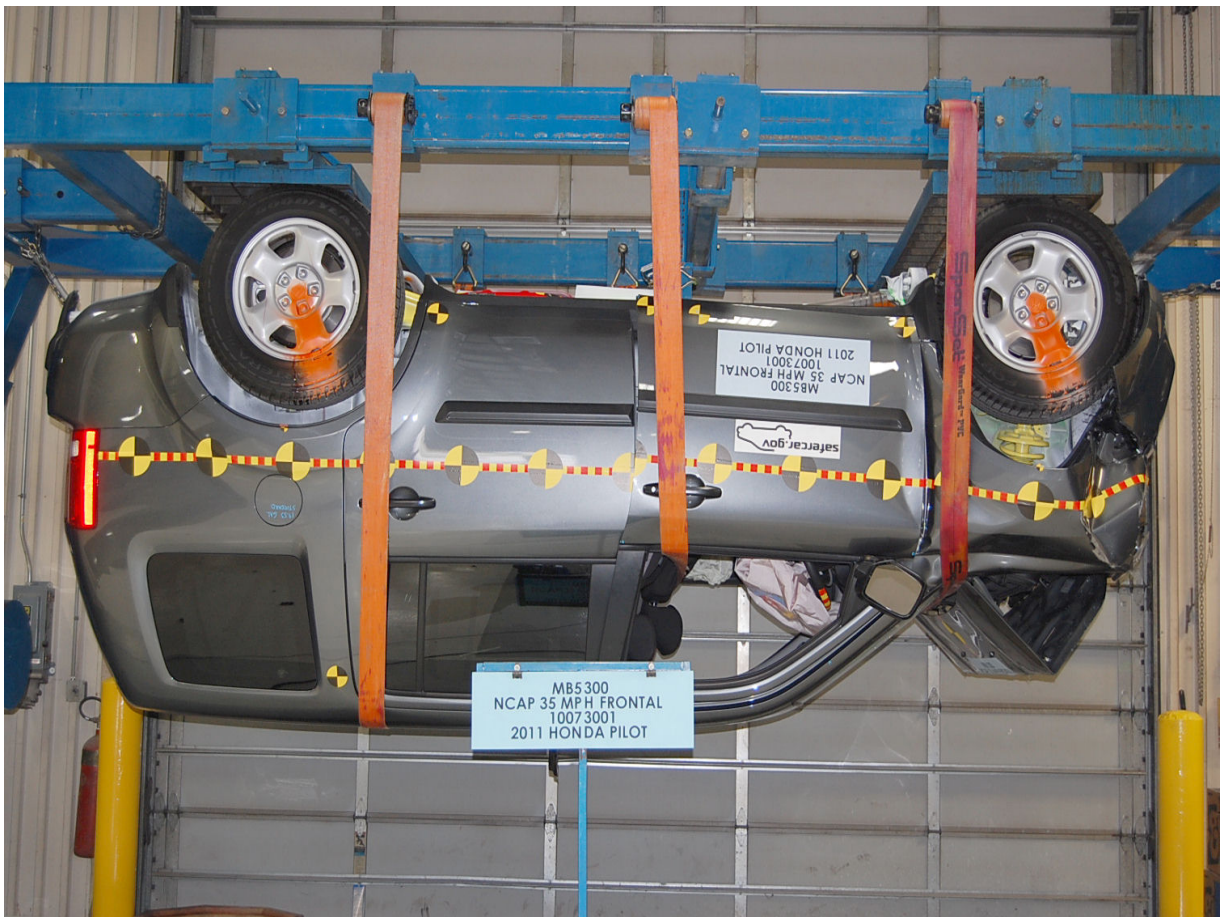
Post-Test Speed Trap Read-Out



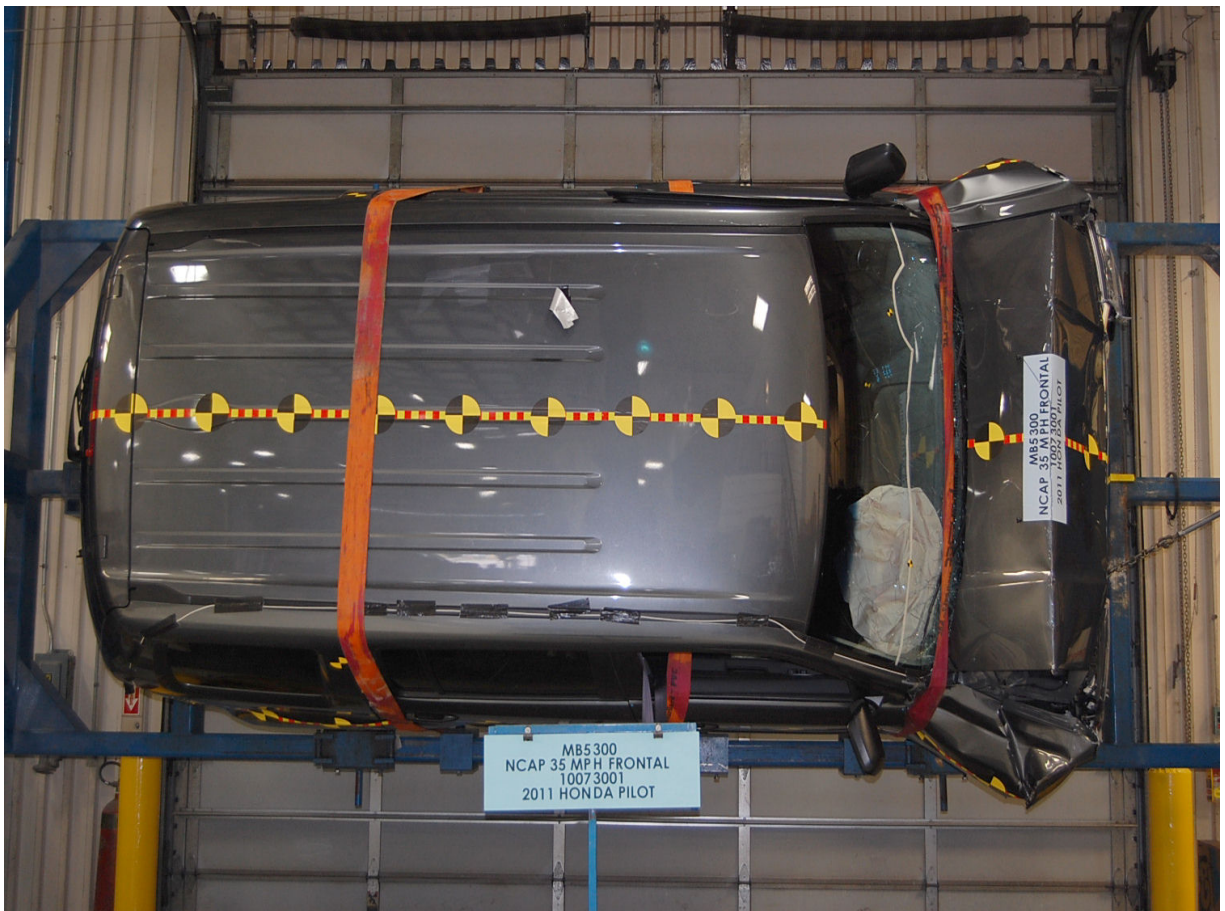
Vehicle at 0 Degrees on Static Rollover Device



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



Vehicle Impact

APPENDIX B
DUMMY RESPONSE DATA

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The following 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 Shoulder Belt Force

Driver Lap Belt Force

Driver Left Upper Tibia Moment X

Driver Left Upper Tibia Moment Y

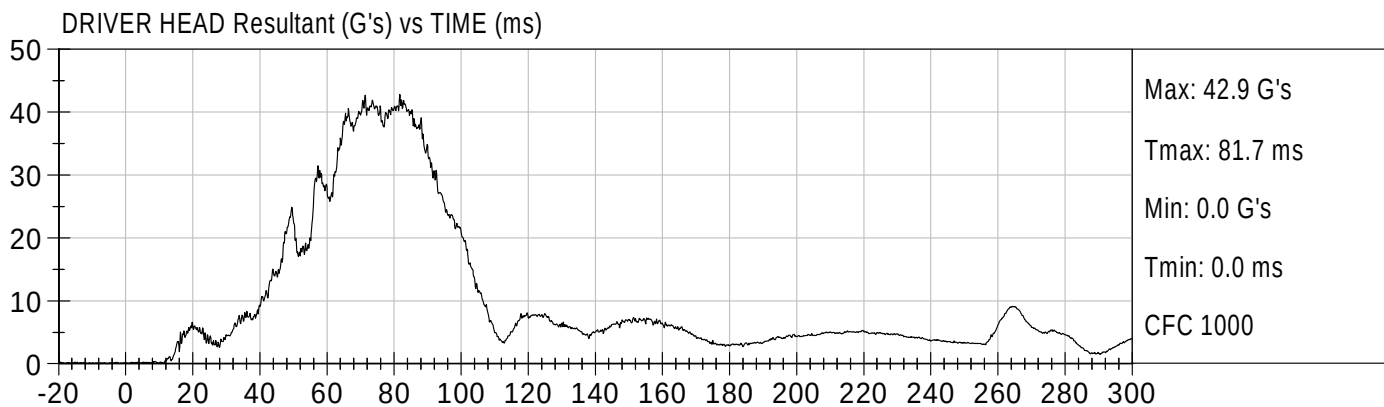
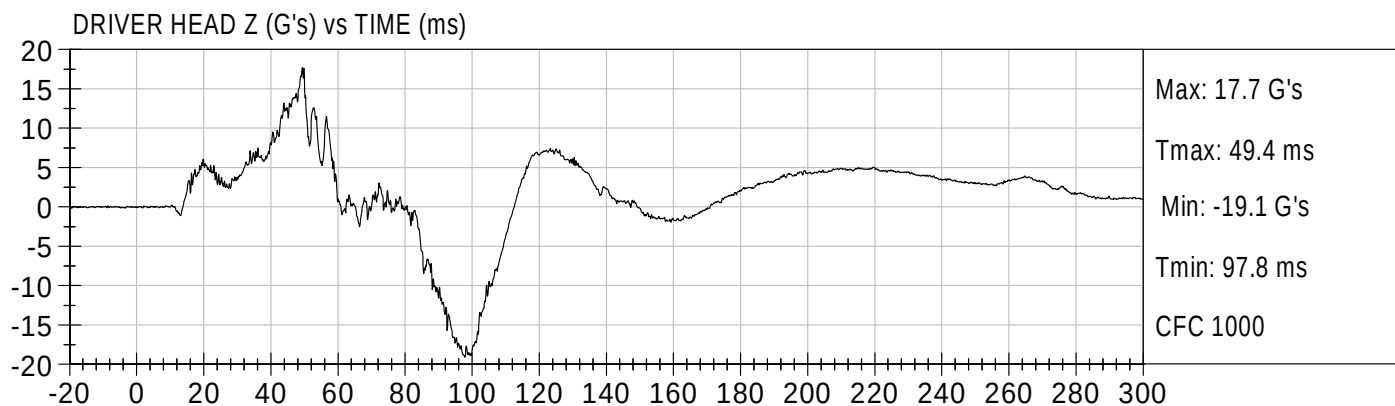
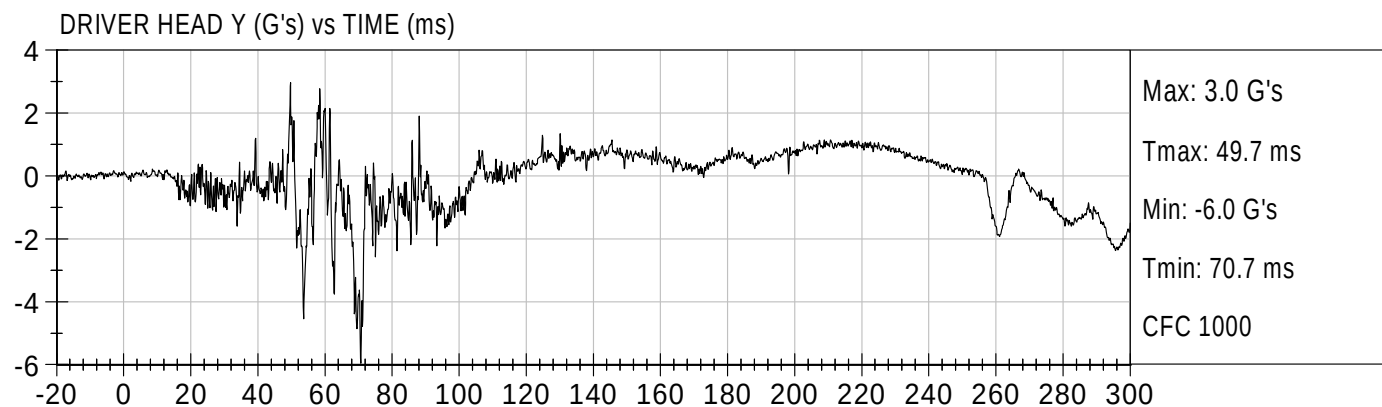
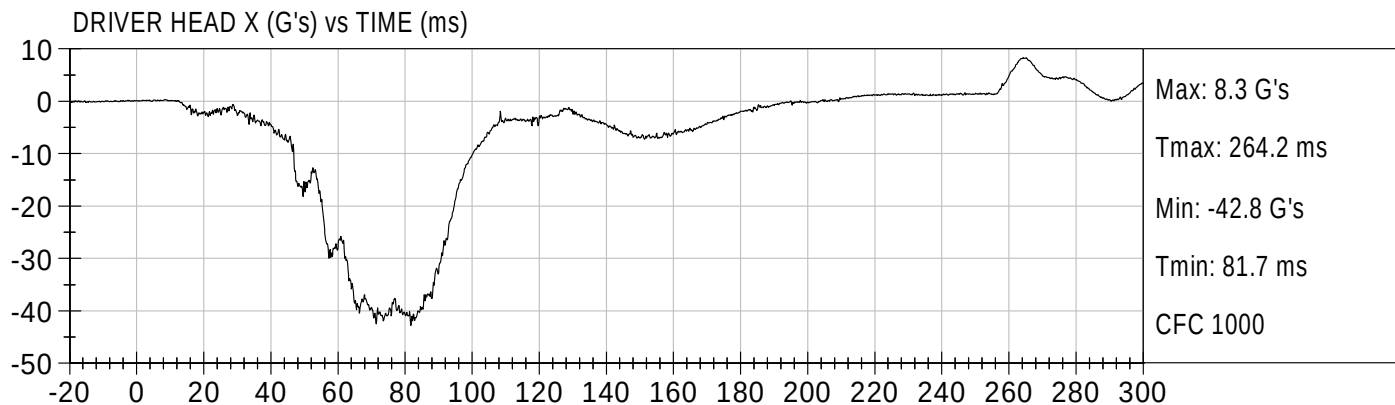
Driver Left Upper Tibia Force Z

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
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 Lap Belt Force
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

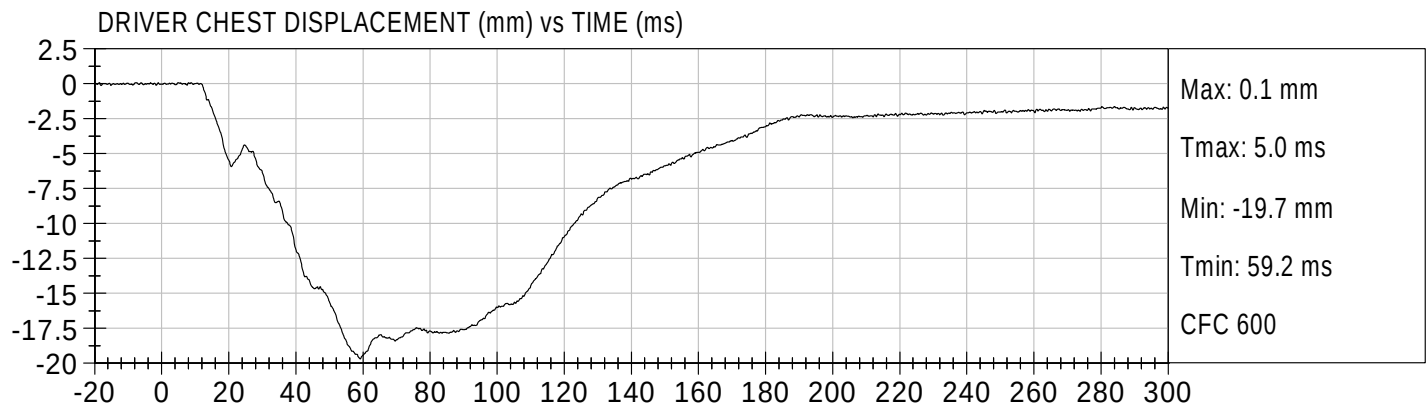
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Brake Caliper X
Vehicle Right Brake Caliper X
Barrier Force – Upper Left
Barrier Force – Upper Center
Barrier Force – Upper Right
Barrier Force – Lower Left
Barrier Force – Lower Center
Barrier Force – Lower Right

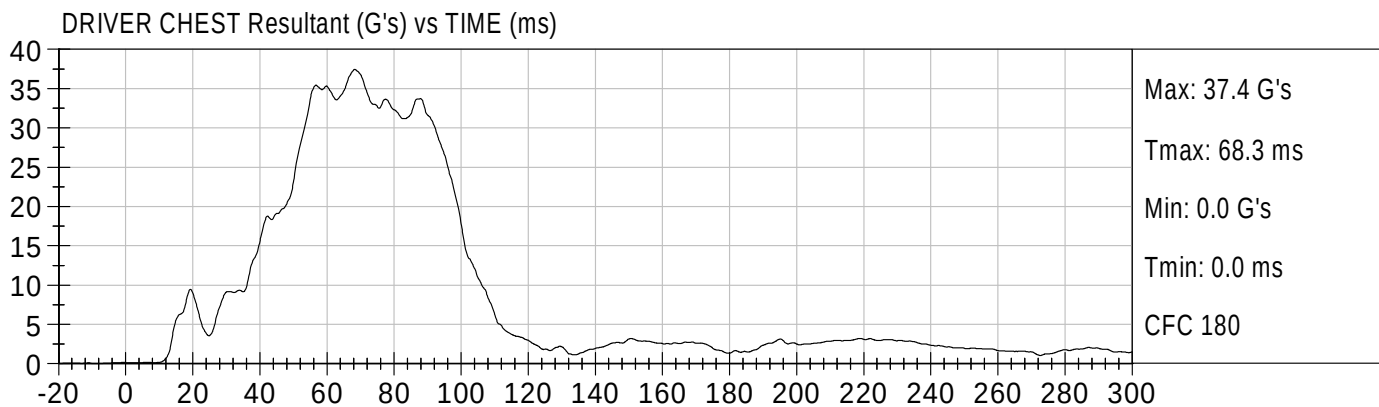
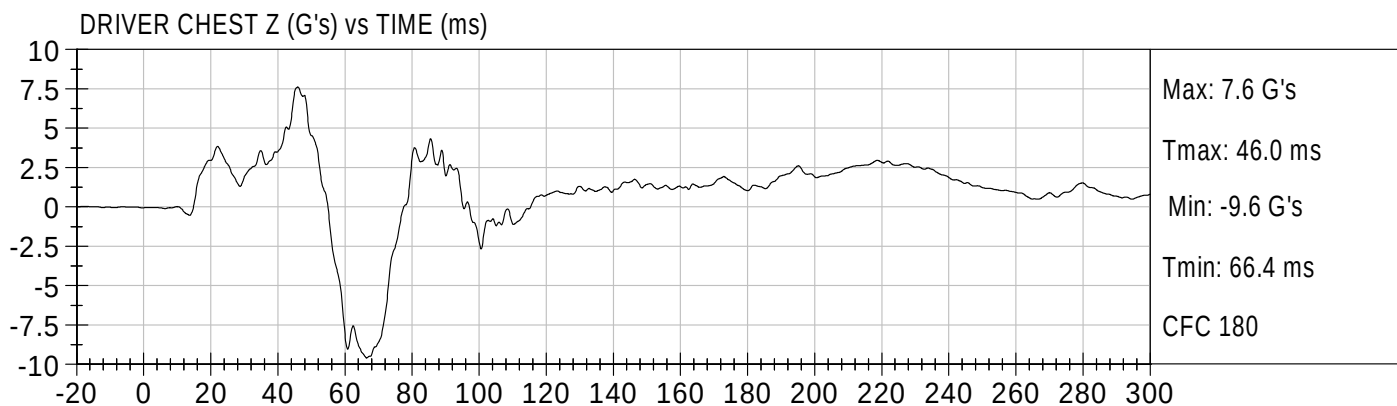
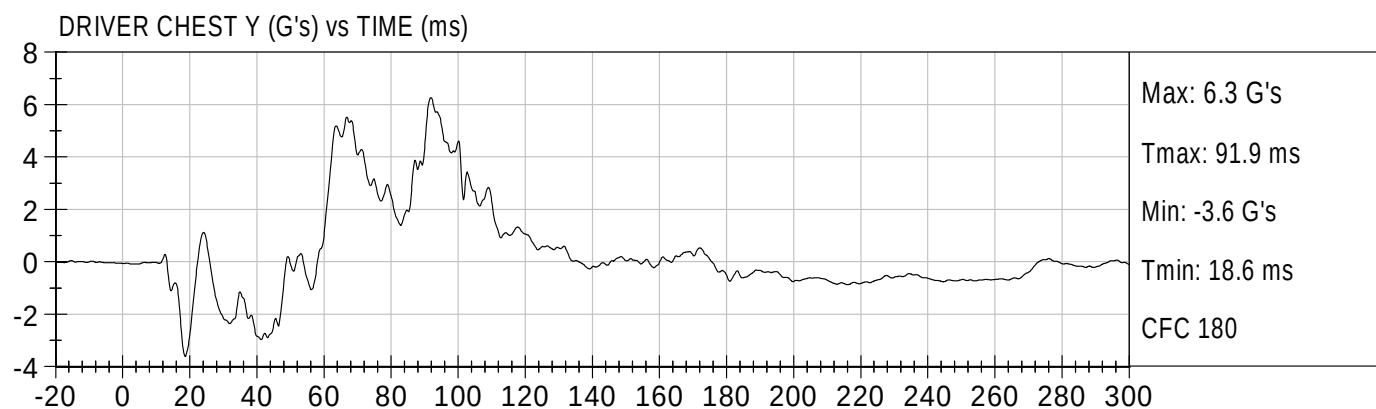
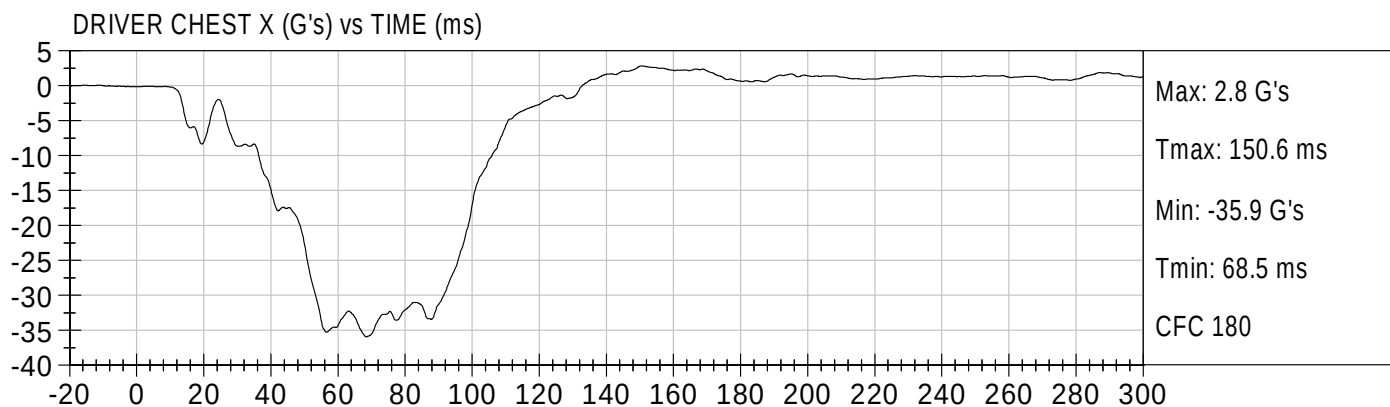


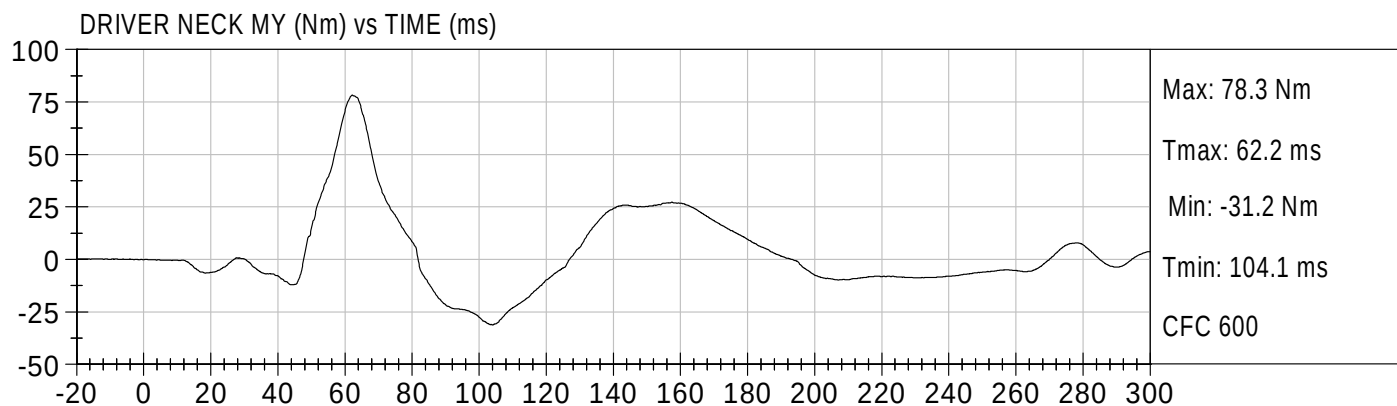
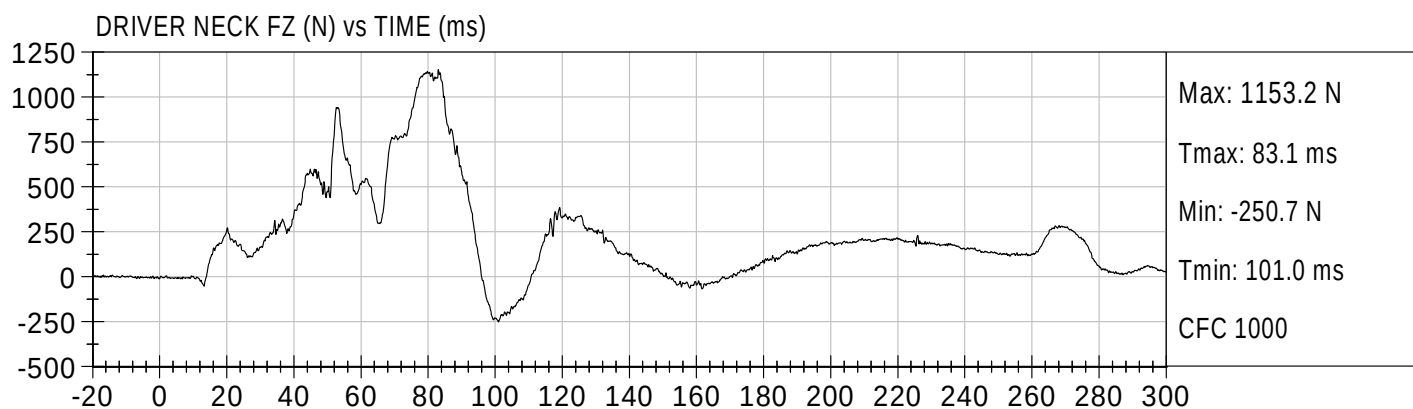
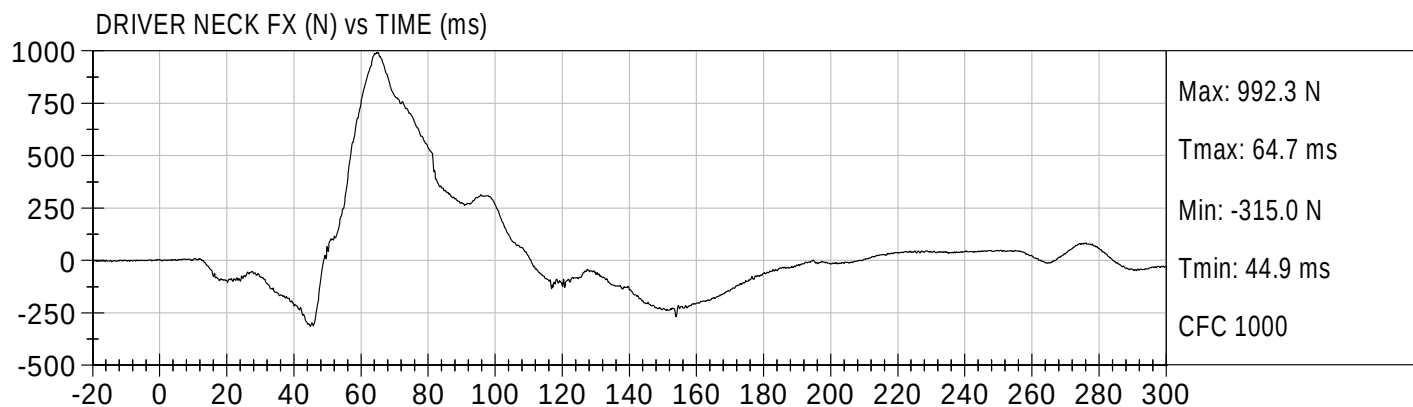


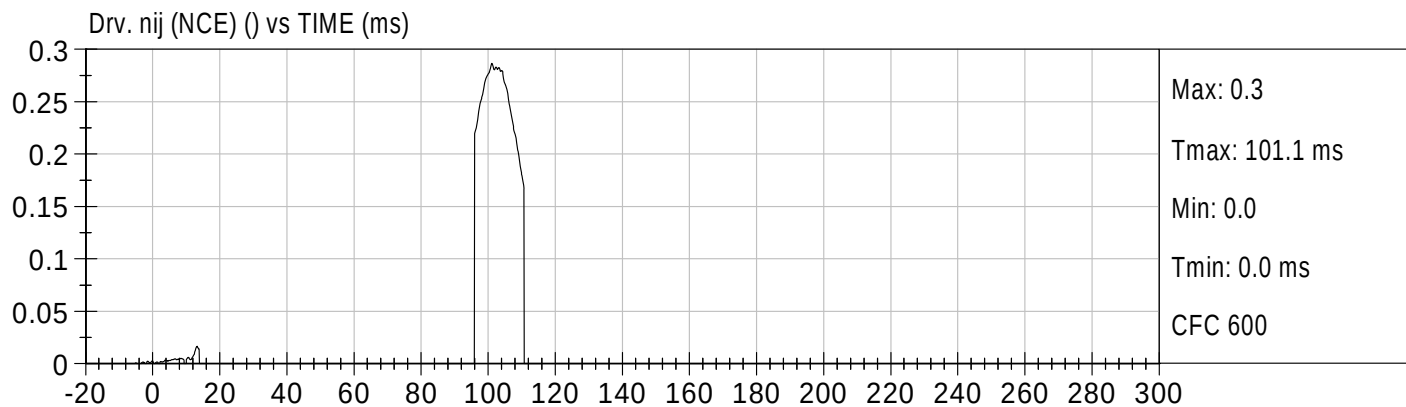
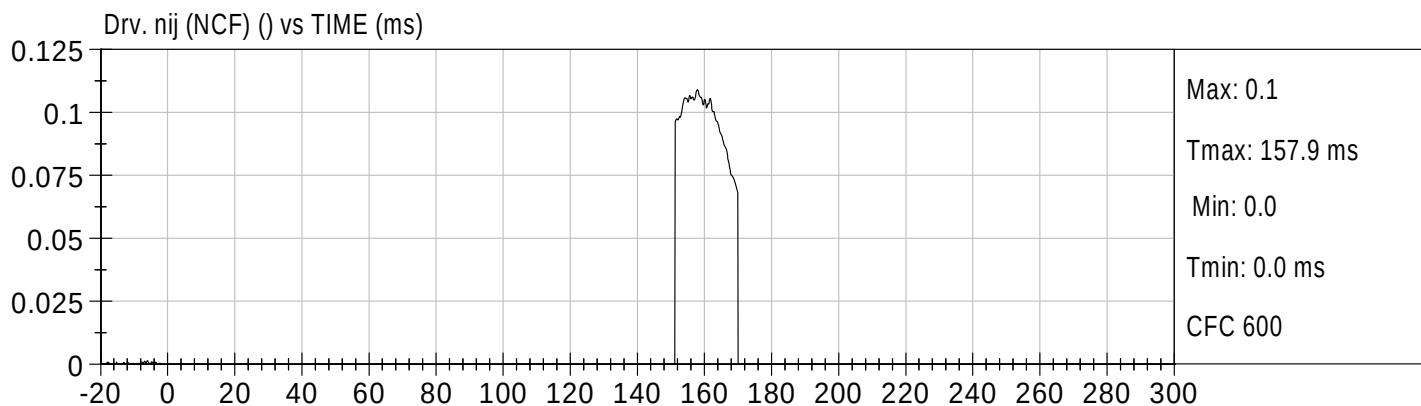
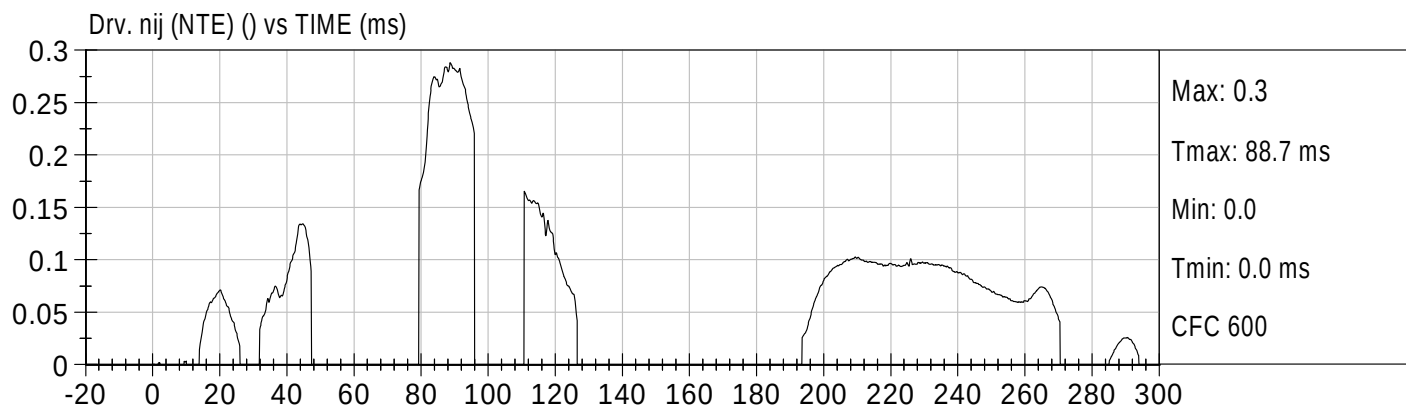
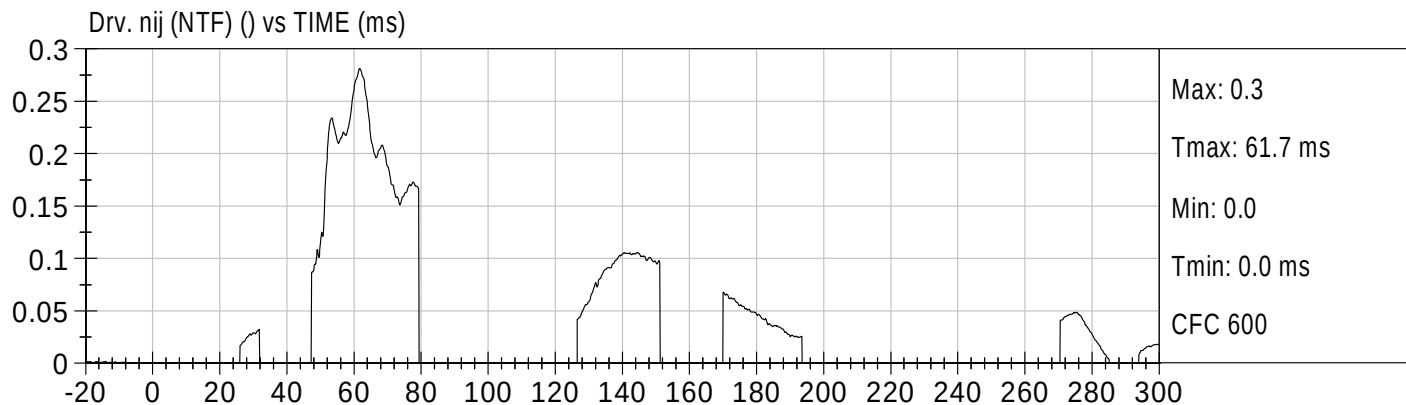
NCAP 35mph Frontal
2011 Honda Pilot - MB5300

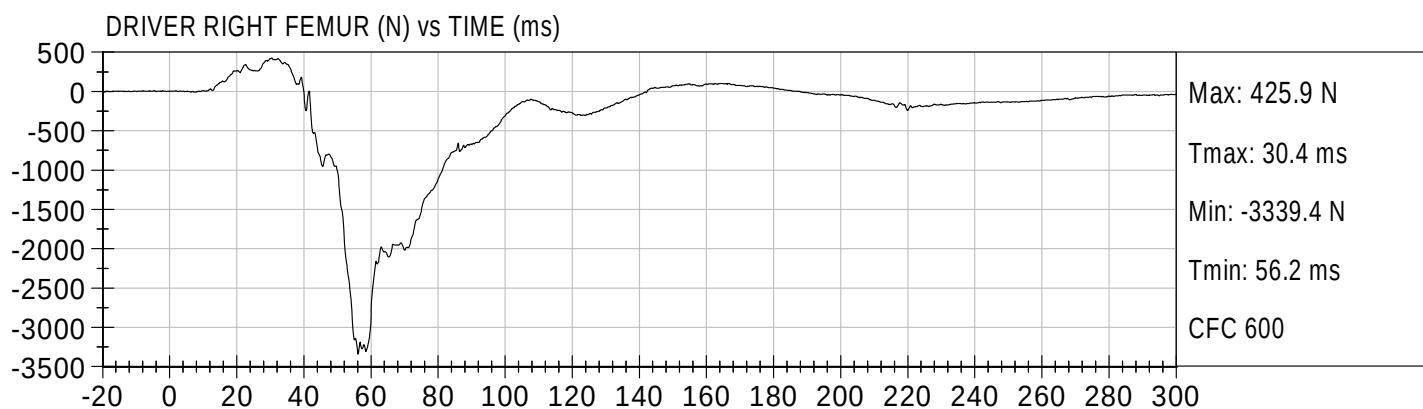
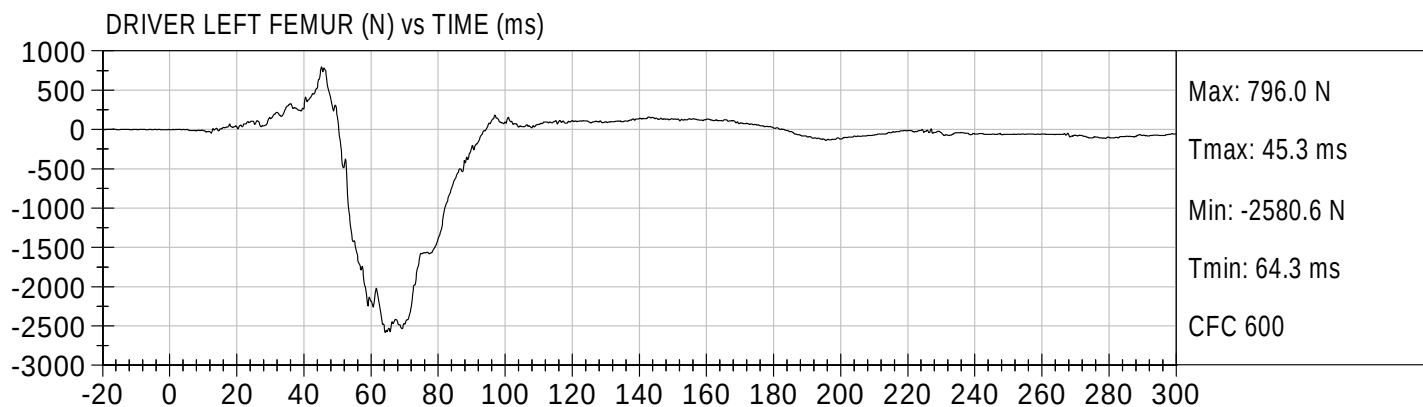
Test Date: 07/30/2010
Speed: 35.1 mph (56.5 km/h)

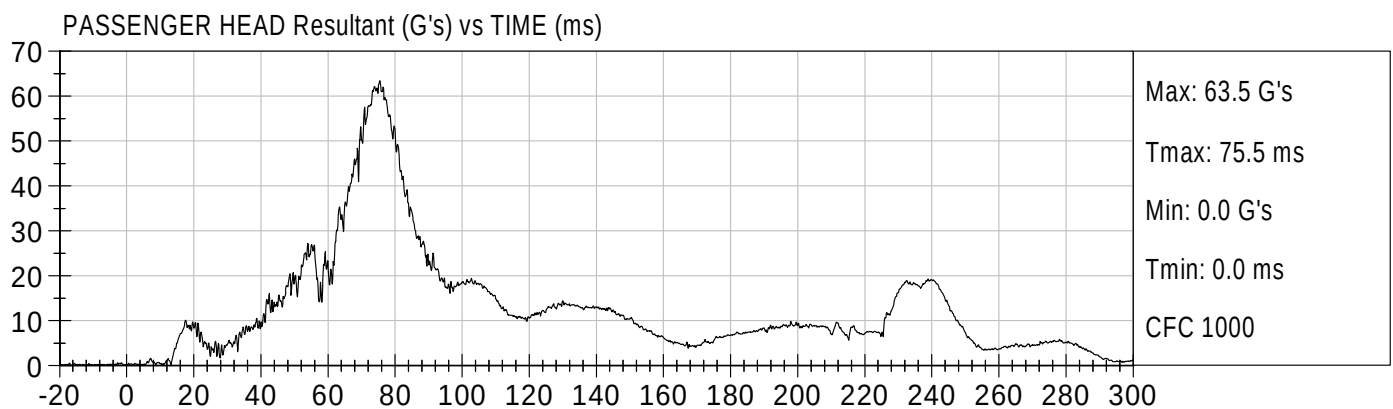
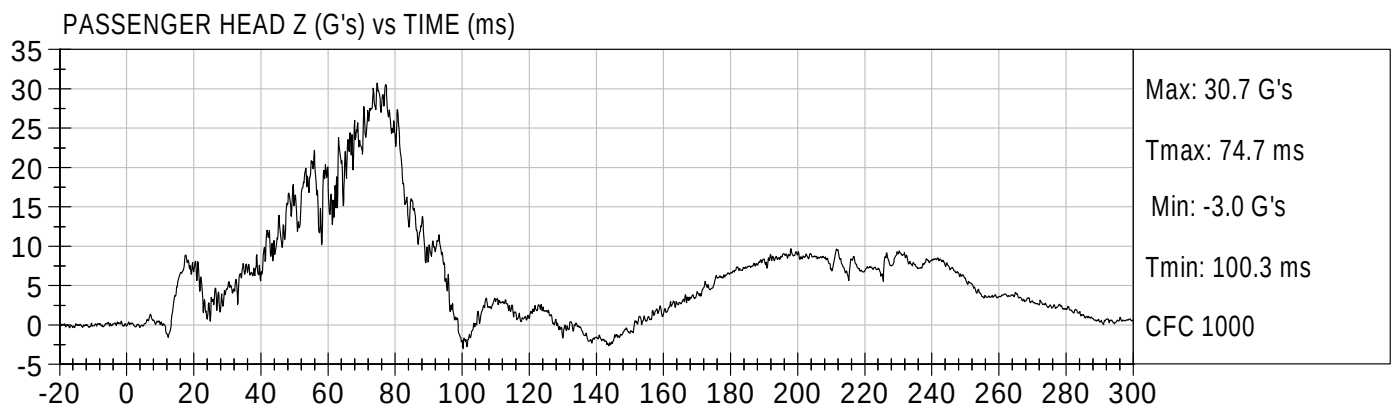
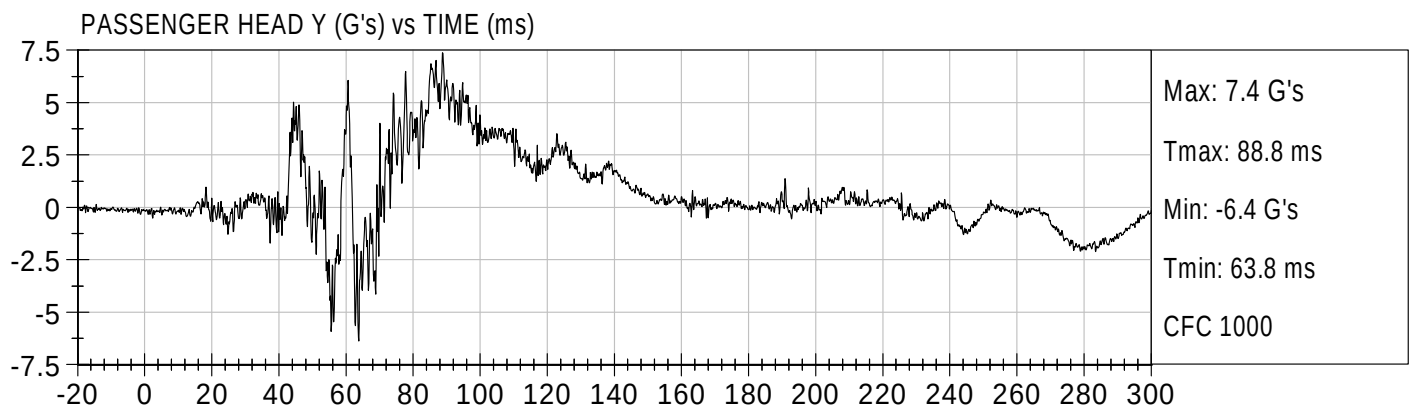
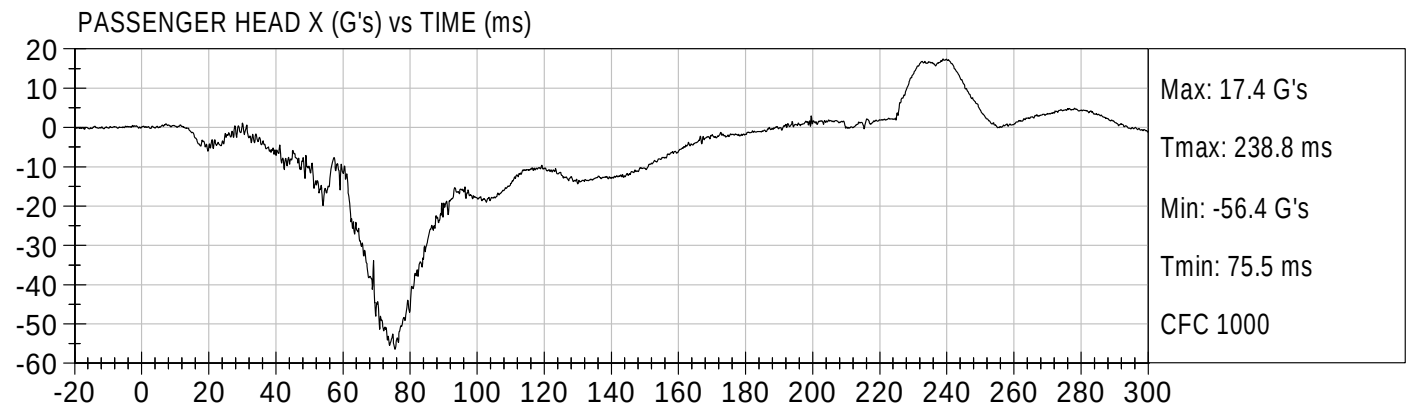








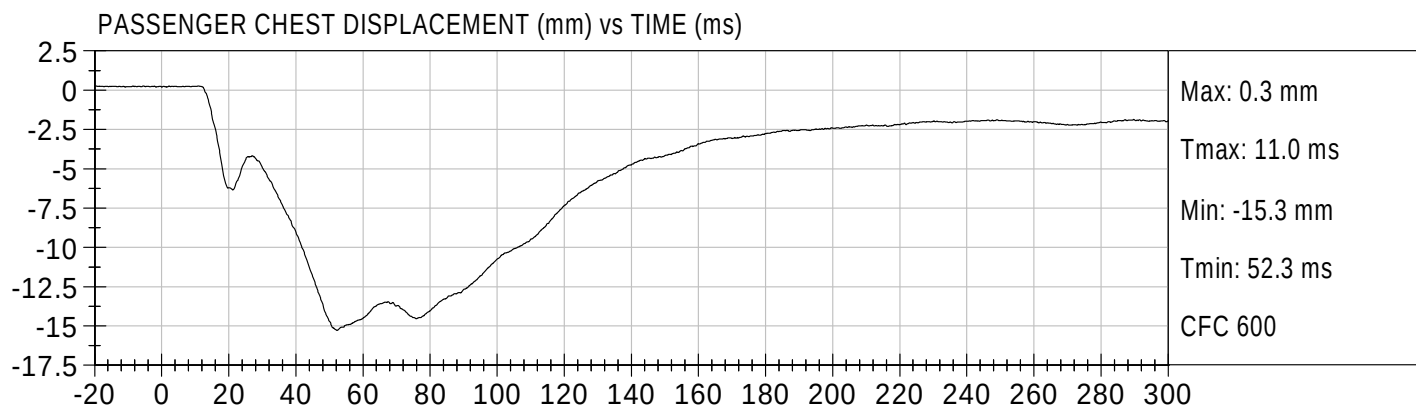


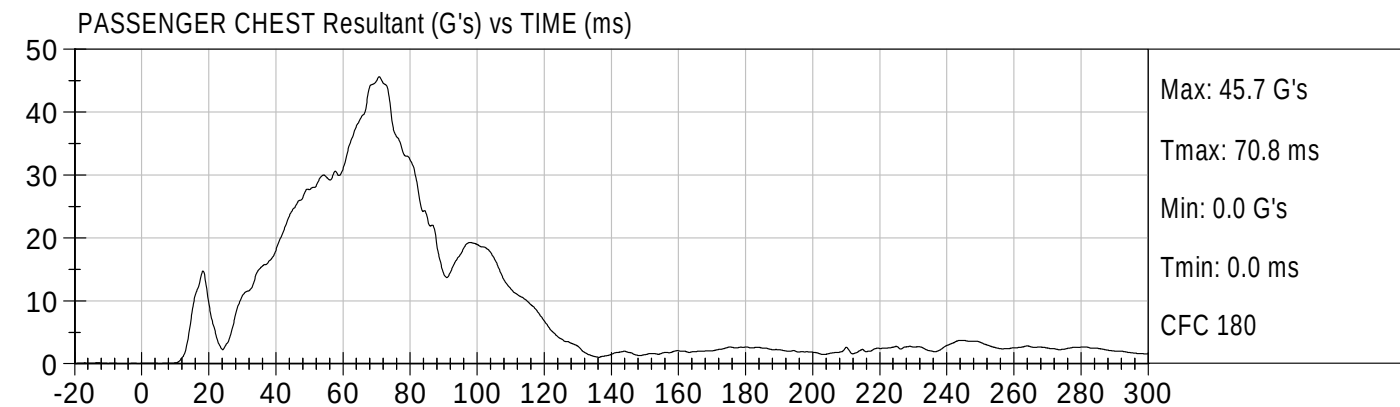
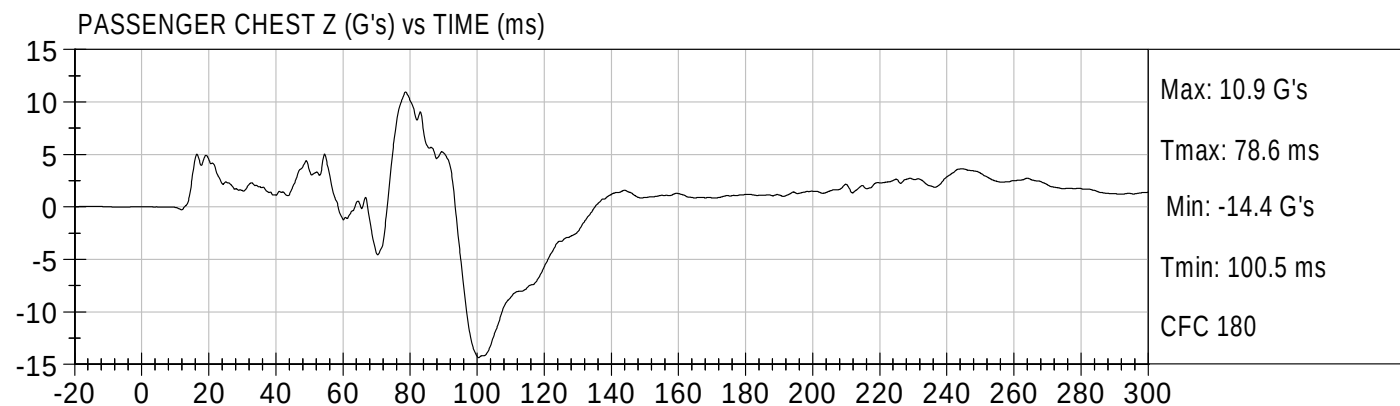
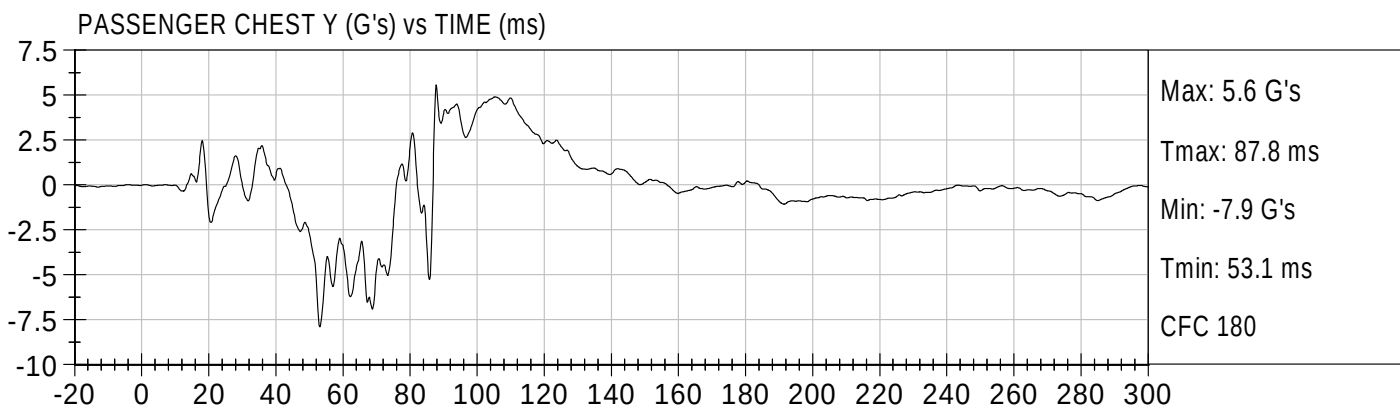
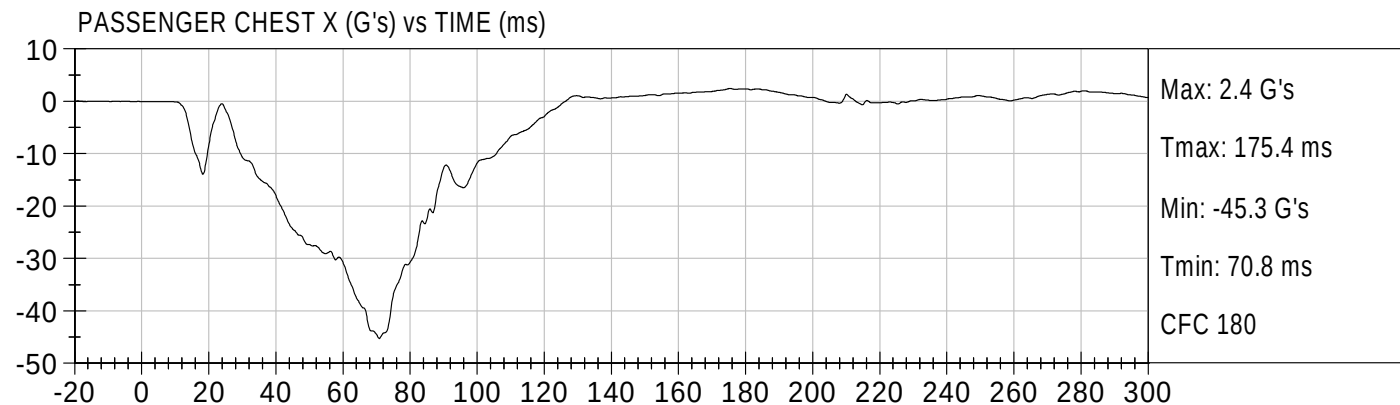


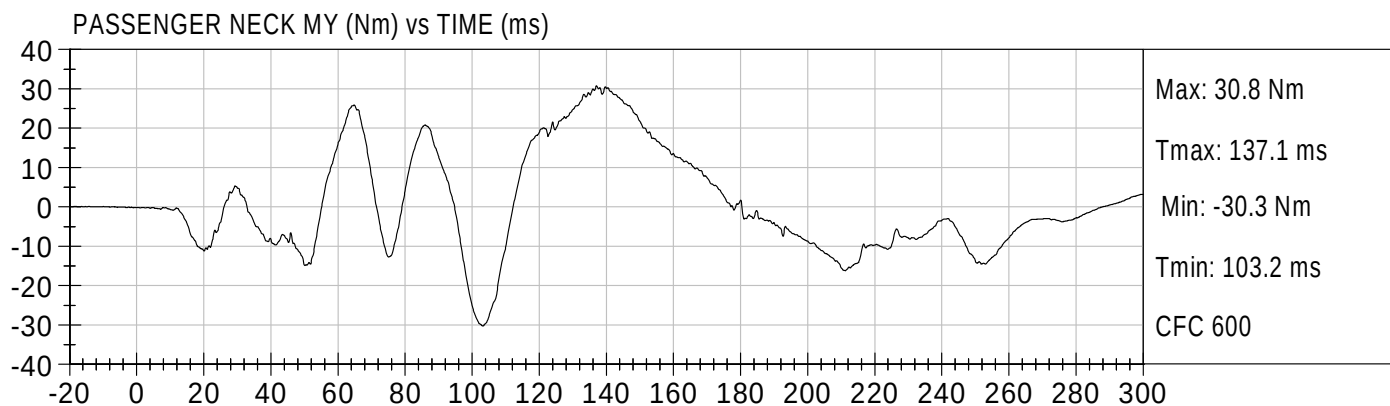
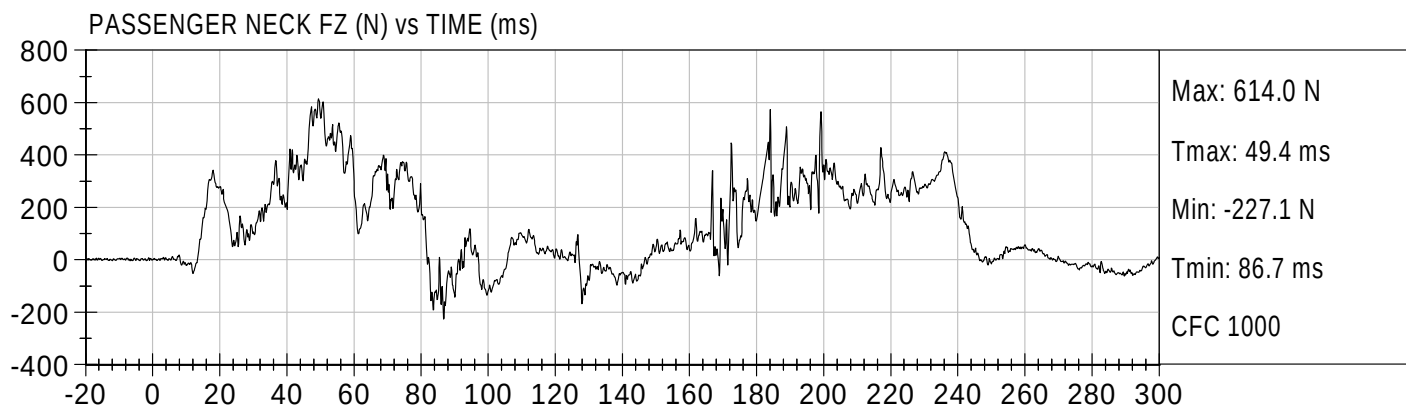
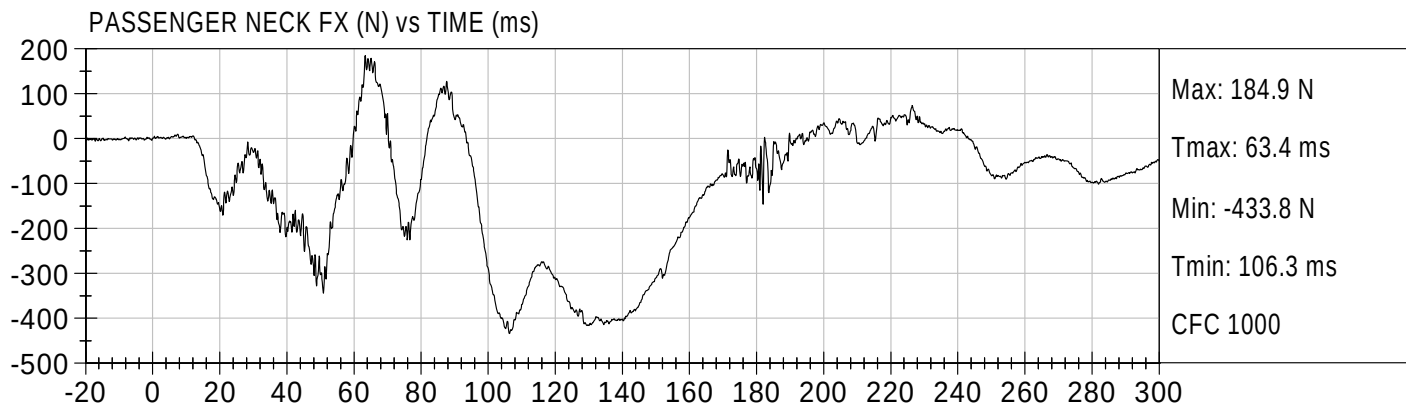


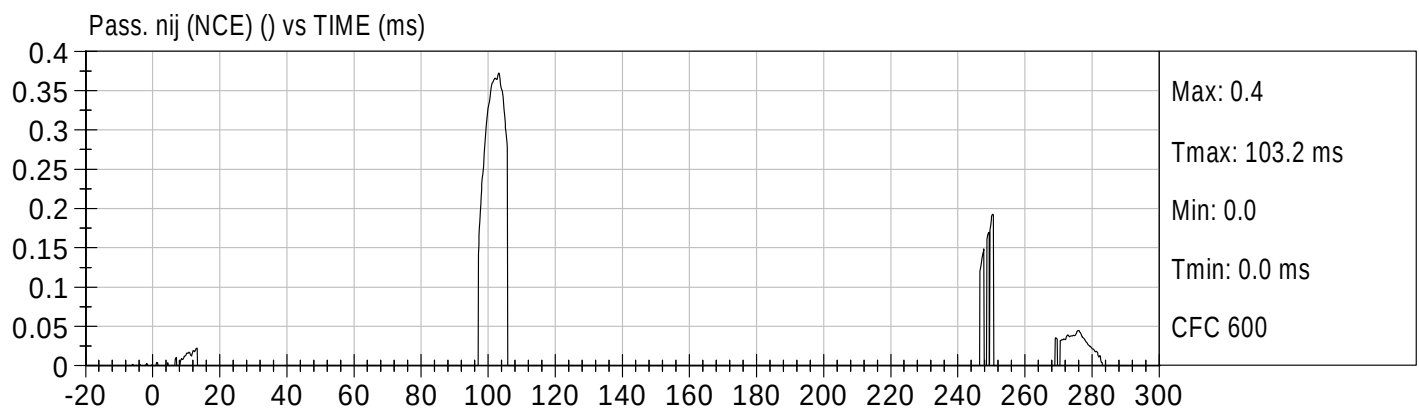
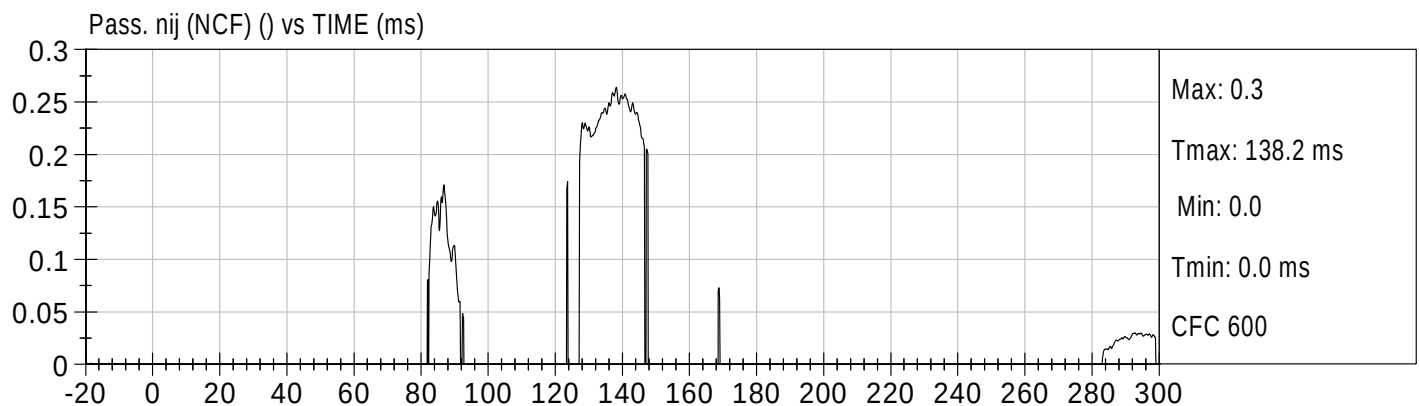
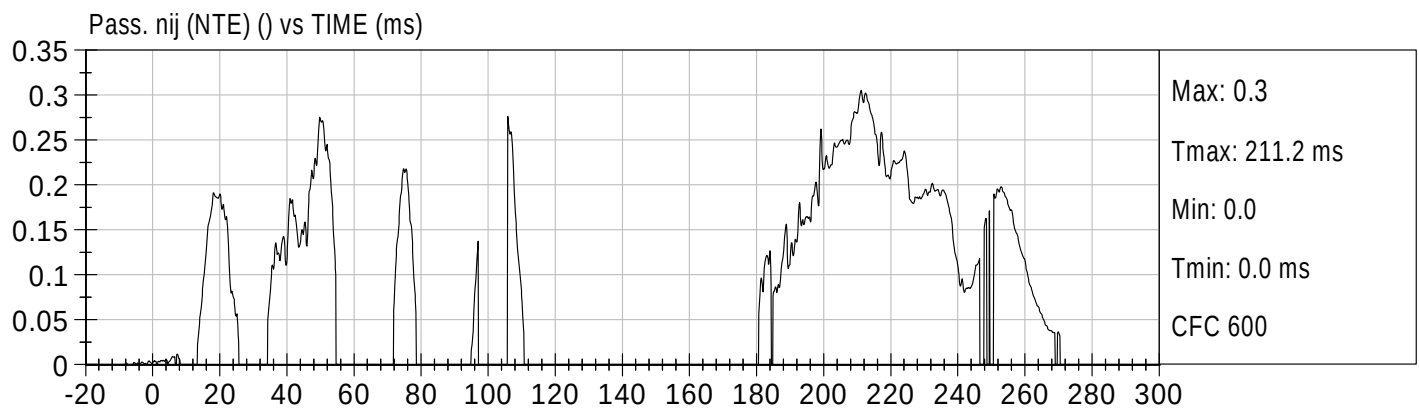
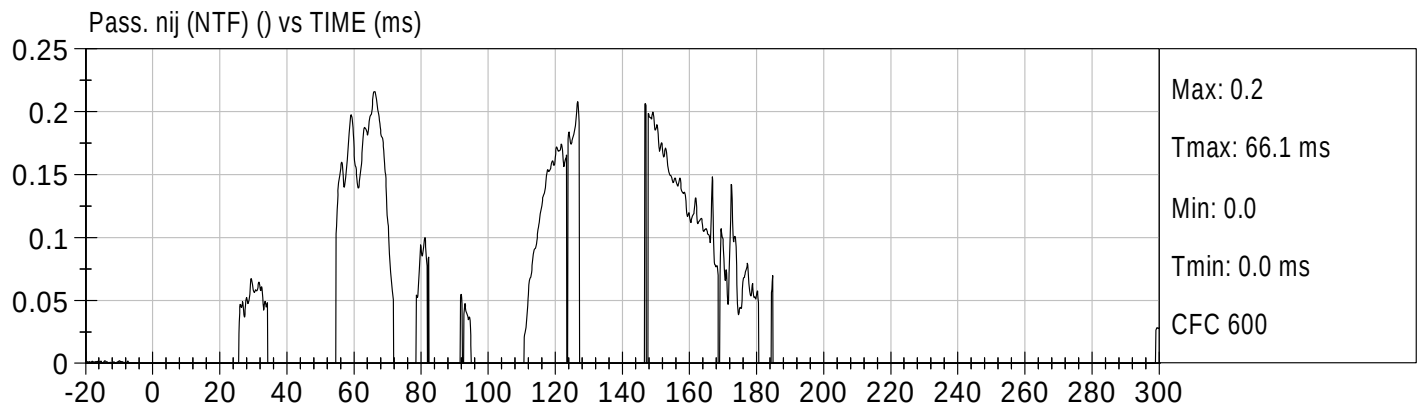
NCAP 35mph Frontal
2011 Honda Pilot - MB5300

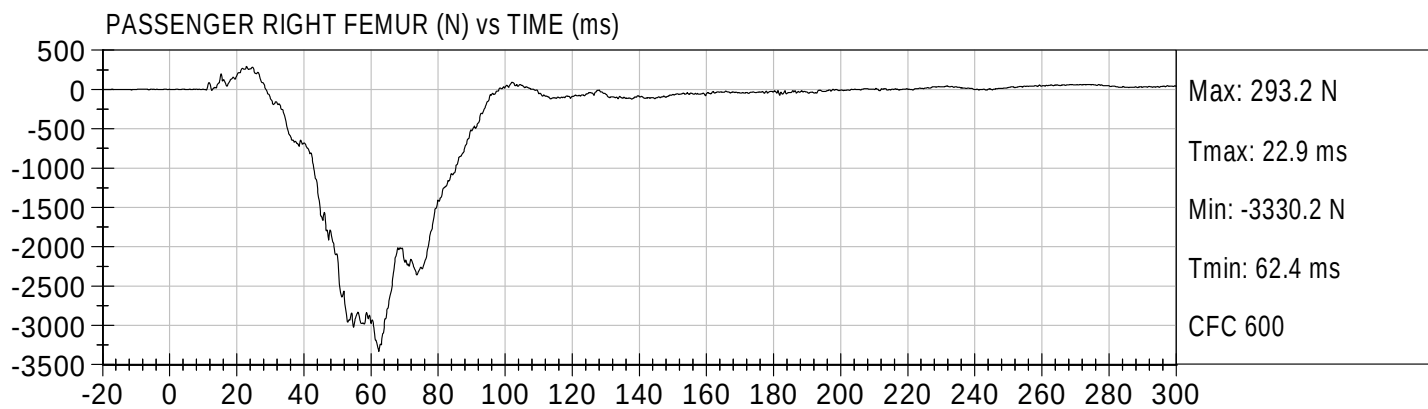
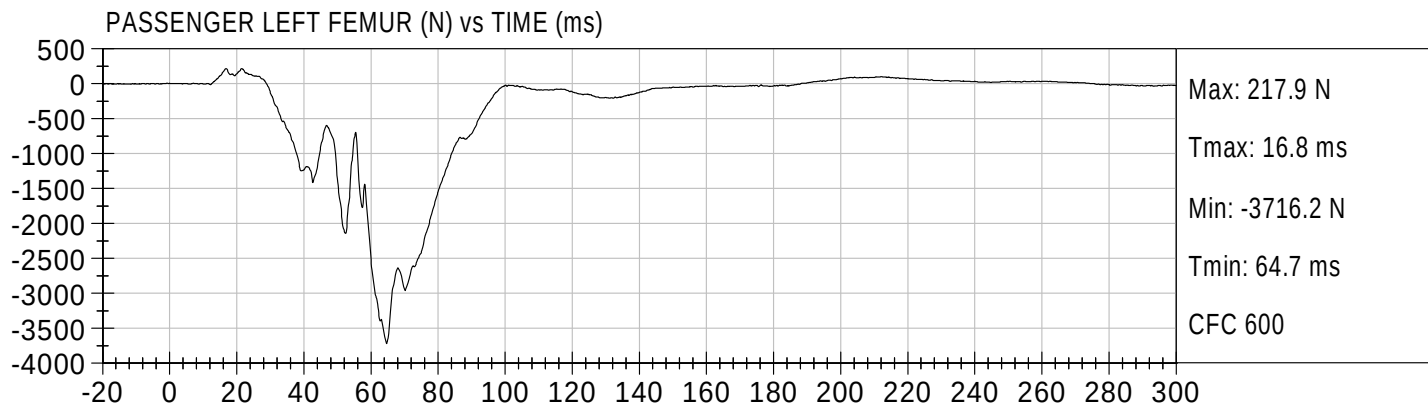
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Speed: 35.1 mph (56.5 km/h)











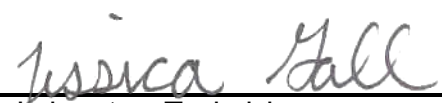
APPENDIX C
DUMMY CALIBRATION DATA

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

ATD Serial No: 351

Test ID: D102441

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Peak Resultant Acceleration	G's	225 - 275	268	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-8.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

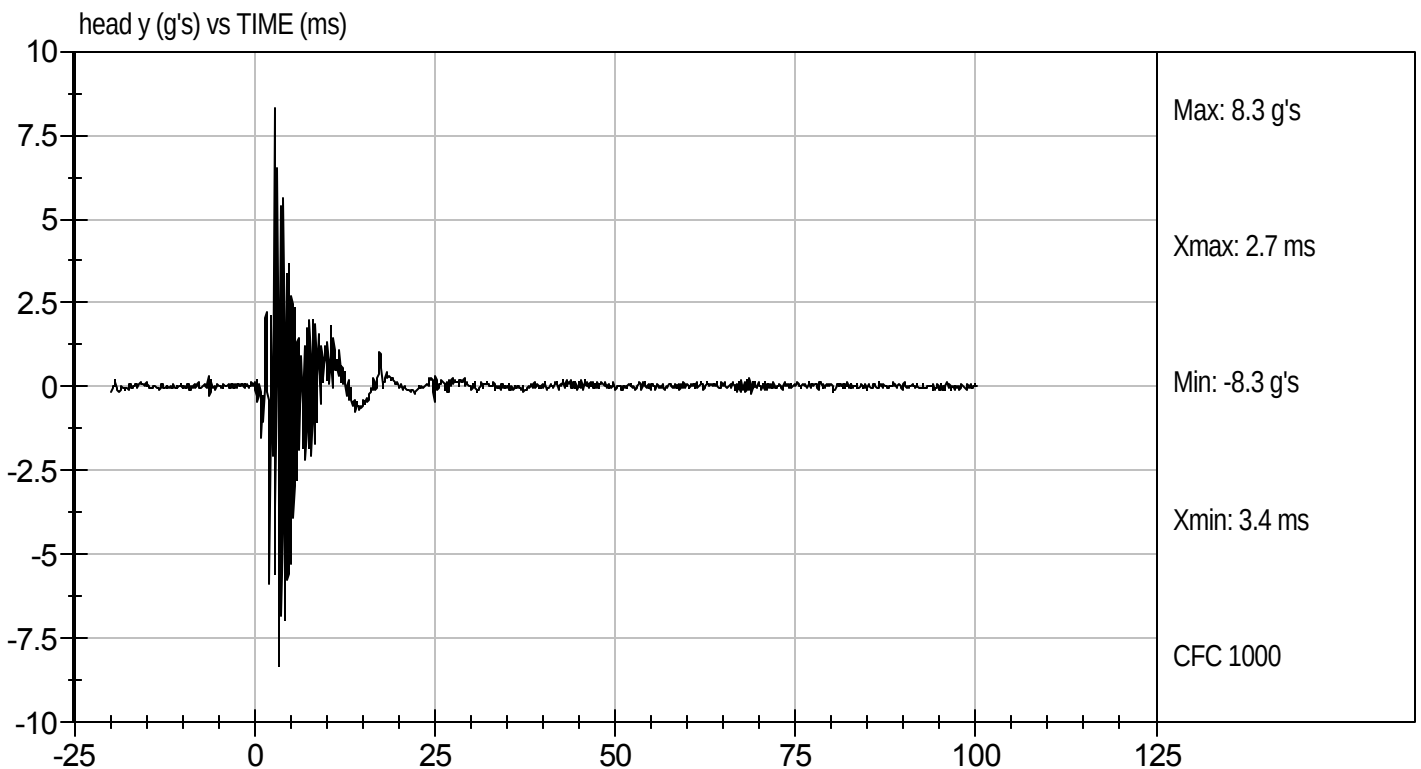
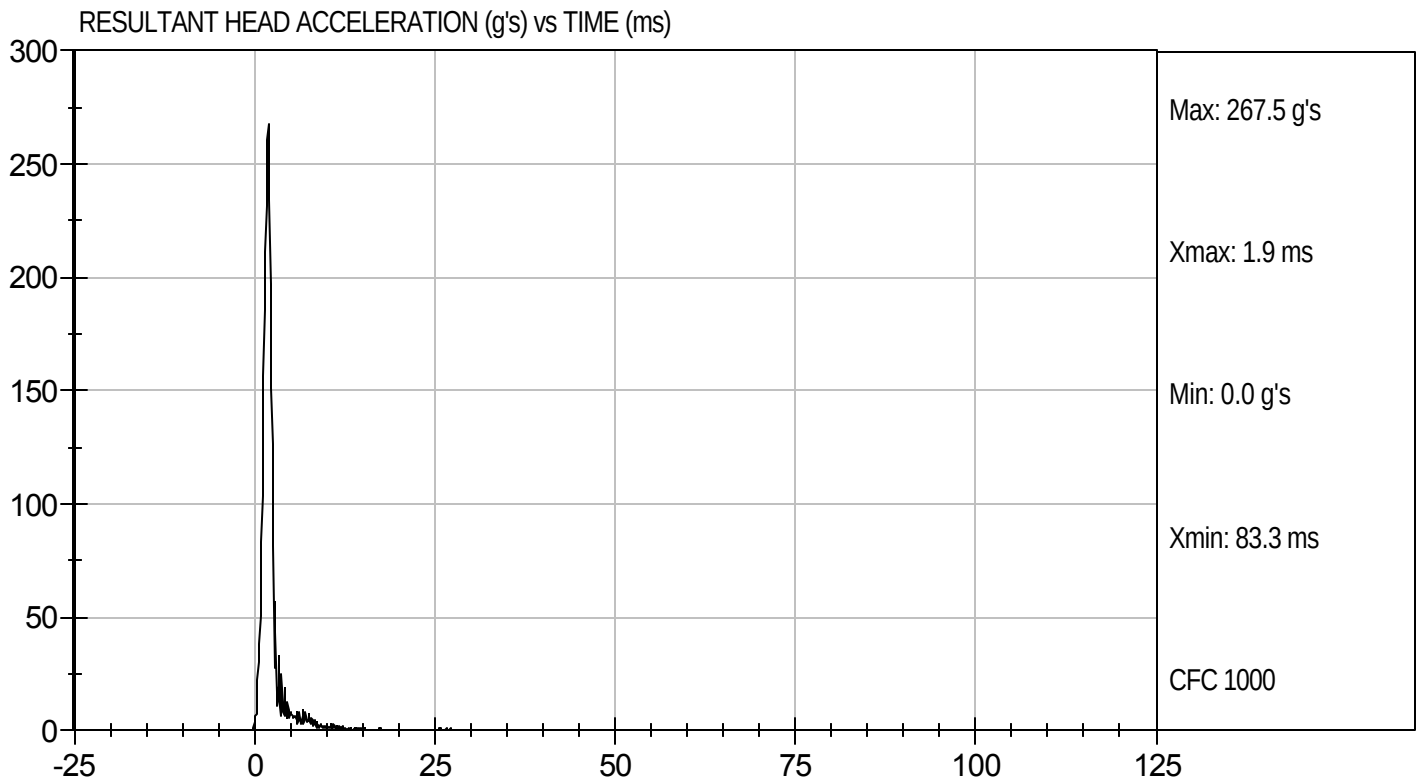
7/28/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D102441

Test Date: 7/28/10
Velocity: 0 ft/s, 0.00 m/s



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

ATD Serial No: 351

Test I.D: D102442

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	48	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.15	Pass
	20 ms	G's	17.60 to 22.60	19.98	Pass
	30 ms	G's	12.50 to 18.50	15.25	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.15	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	67.6	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	113.4	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	99.1	Pass
	Time	ms	47.0 to 58.0	47.2	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.5	Pass
Overall Test Results					Pass


 Laboratory Technician

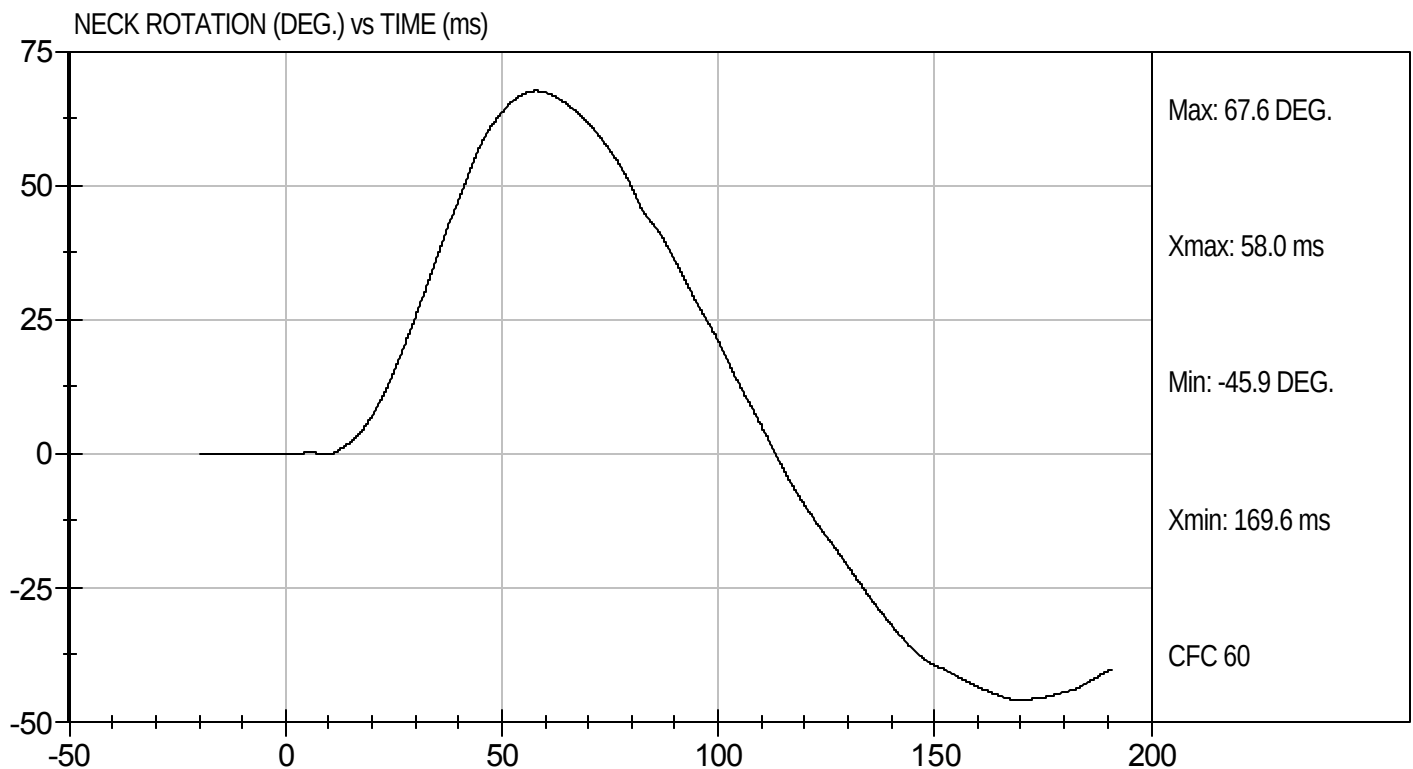
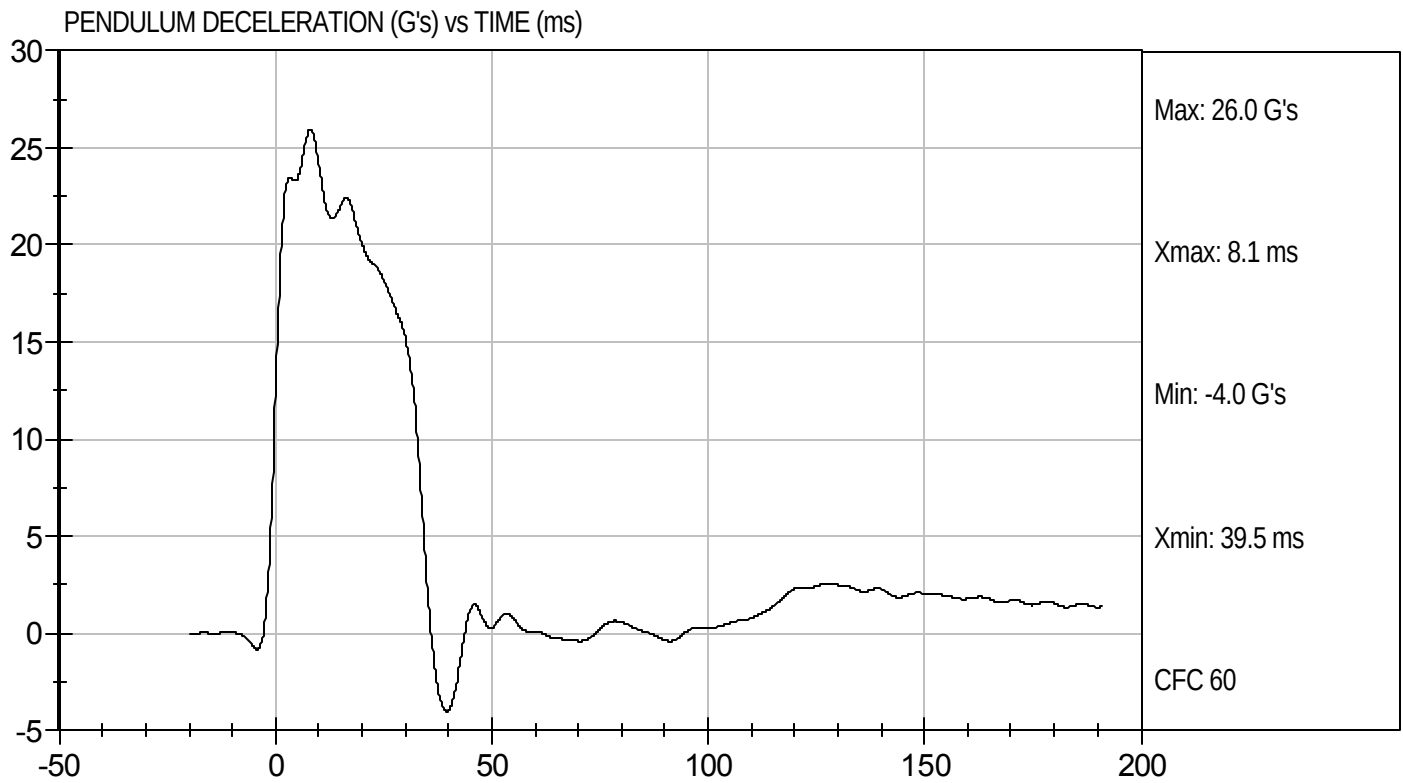
7/29/10
 Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D102442

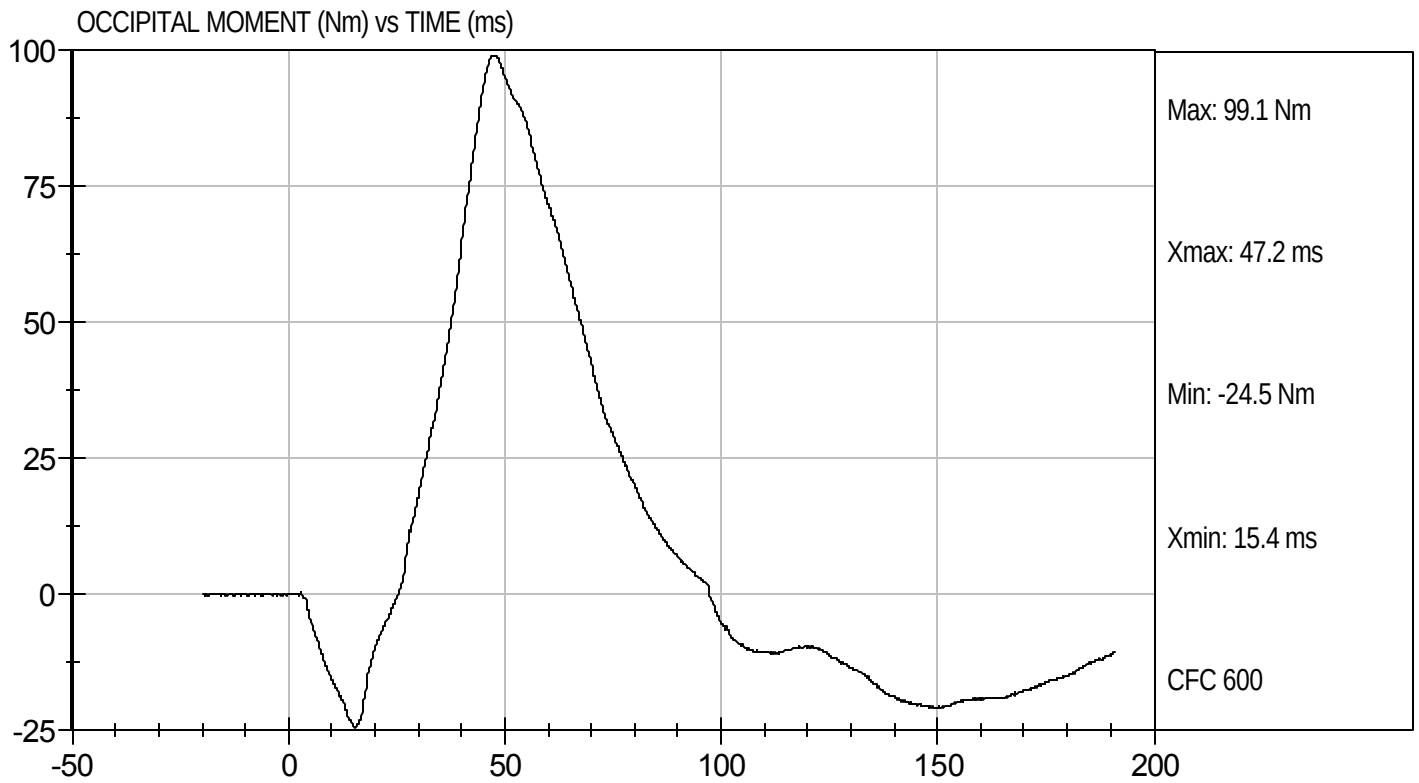
Test Date: 7/29/10
Velocity: 22.83 ft/s, 6.96 m/s





Test Desc: Neck Flexion
Component ID: D102442

Test Date: 7/29/10
Velocity: 22.83 ft/s, 6.96 m/s



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

ATD Serial No: 351

Test I.D: D102443

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	48	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.57	Pass
	20 ms	G's	14.00 to 19.00	16.08	Pass
	30 ms	G's	11.00 to 16.00	14.02	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.93	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	91.2	Pass
	Time	ms	72.0 to 82.0	72.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	148.6	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-64.9	Pass
	Time	ms	65.0 to 79.0	68.3	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	137.2	Pass
Overall Test Results					Pass


 Laboratory Technician

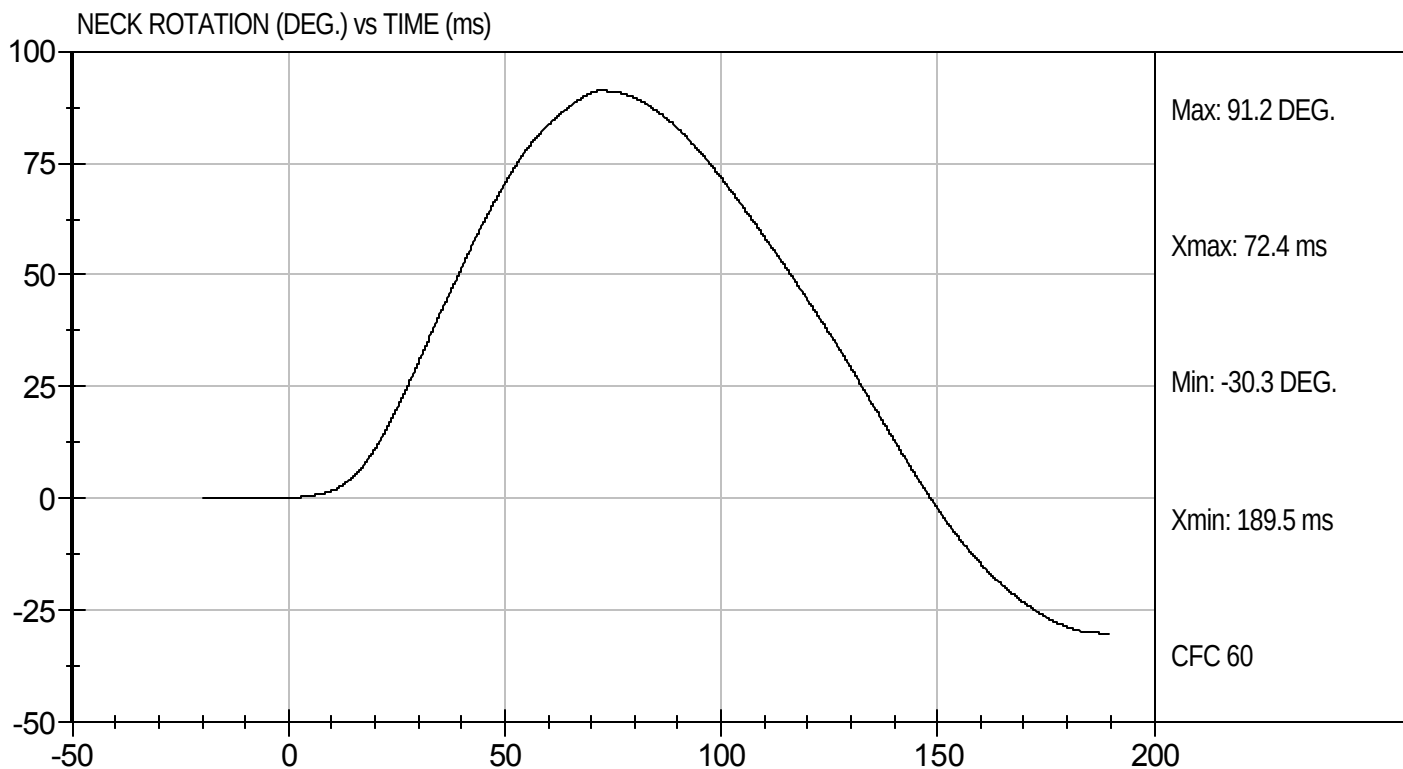
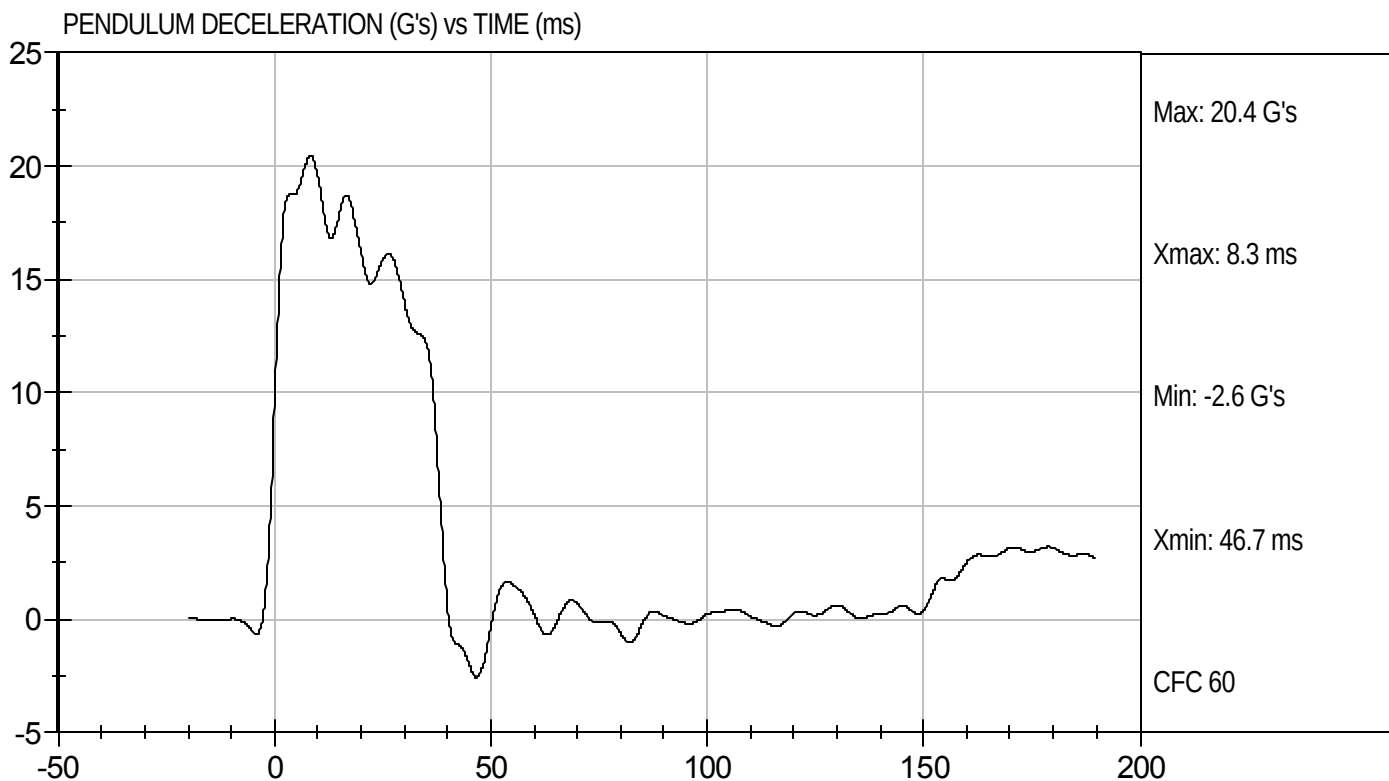
7/29/10
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D102443

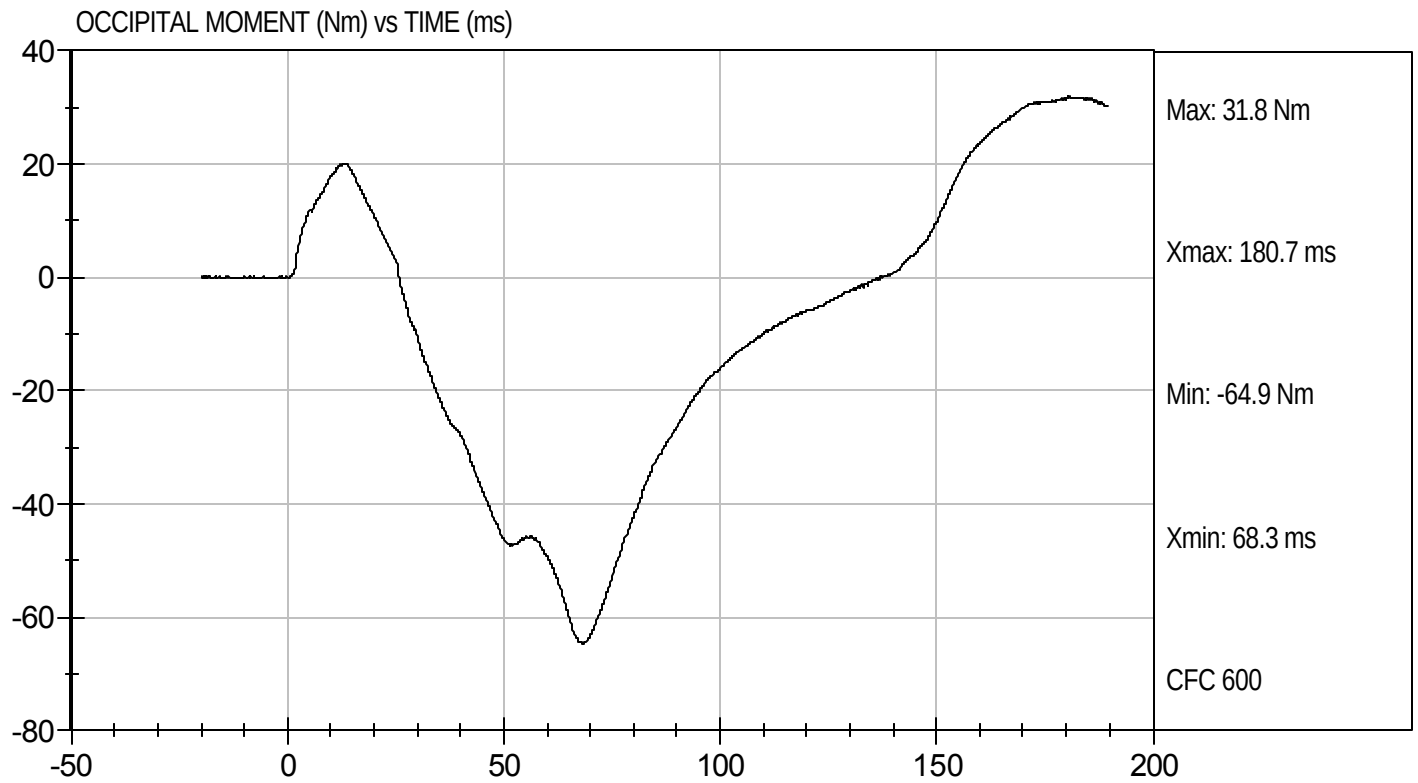
Test Date: 7/29/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D102443

Test Date: 7/29/10
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D102444

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,454	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.46	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results			Pass	


Laboratory Technician

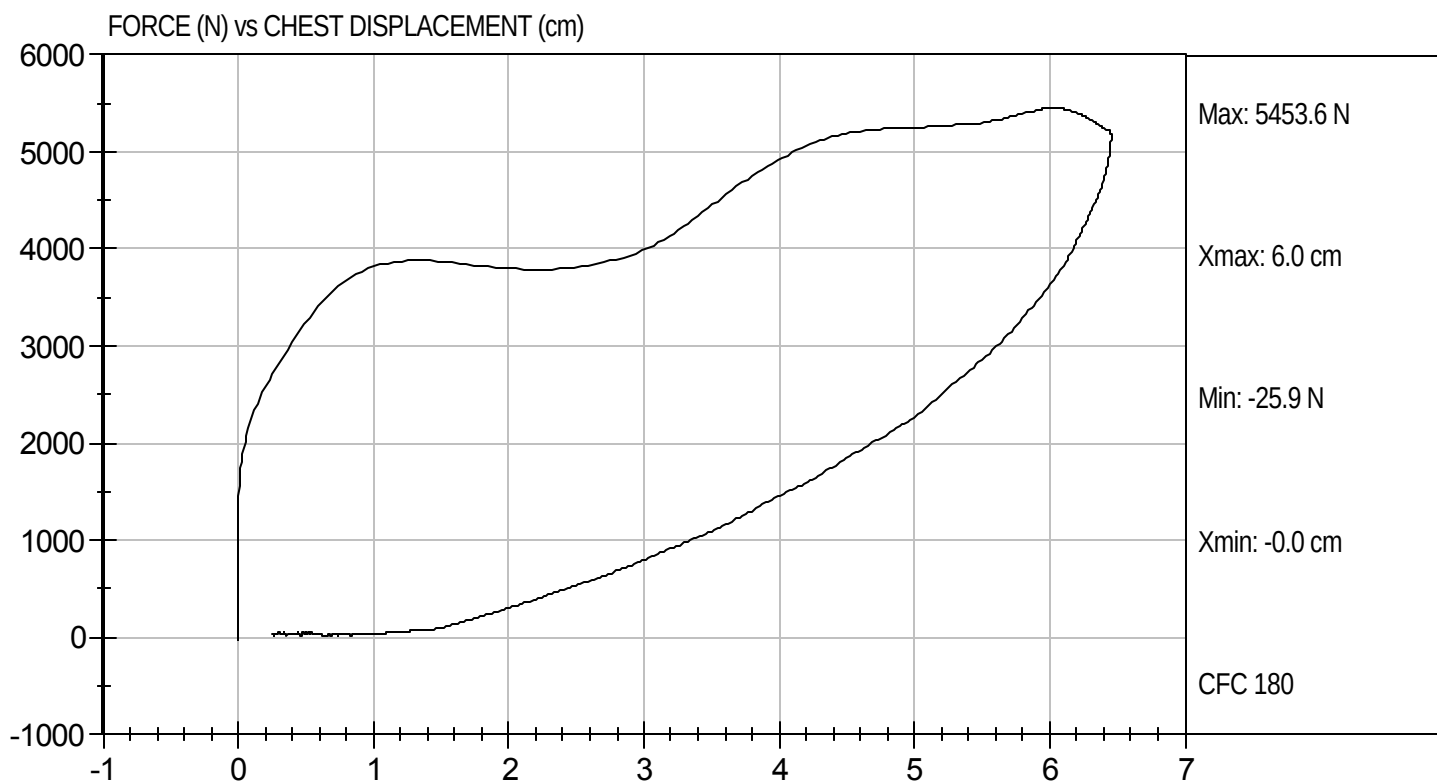
7/29/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D102444

Test Date: 7/29/10
Velocity: 22.22 ft/s, 6.77 m/s

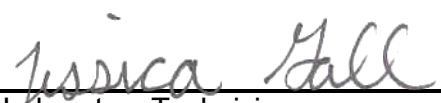


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D102445

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5,581	Pass
Overall Test Results				Pass


Laboratory Technician

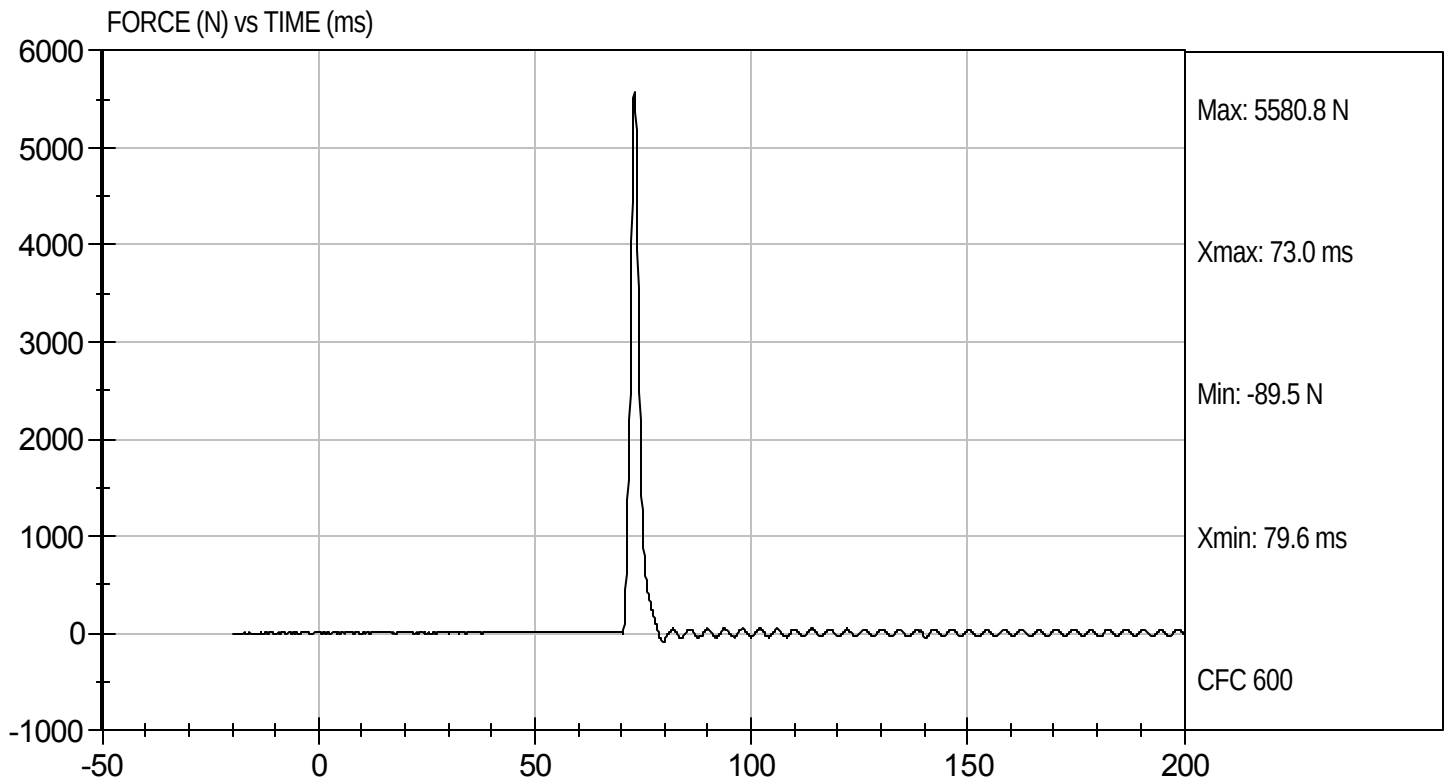
7/28/10
Test Date


Approved By



Test Desc: Right Knee
Component ID: D102445

Test Date: 7/28/10
Velocity: 6.83 ft/s, 2.08 m/s

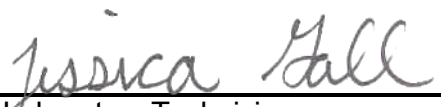


MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D102446

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5,701	Pass
Overall Test Results				Pass


Laboratory Technician

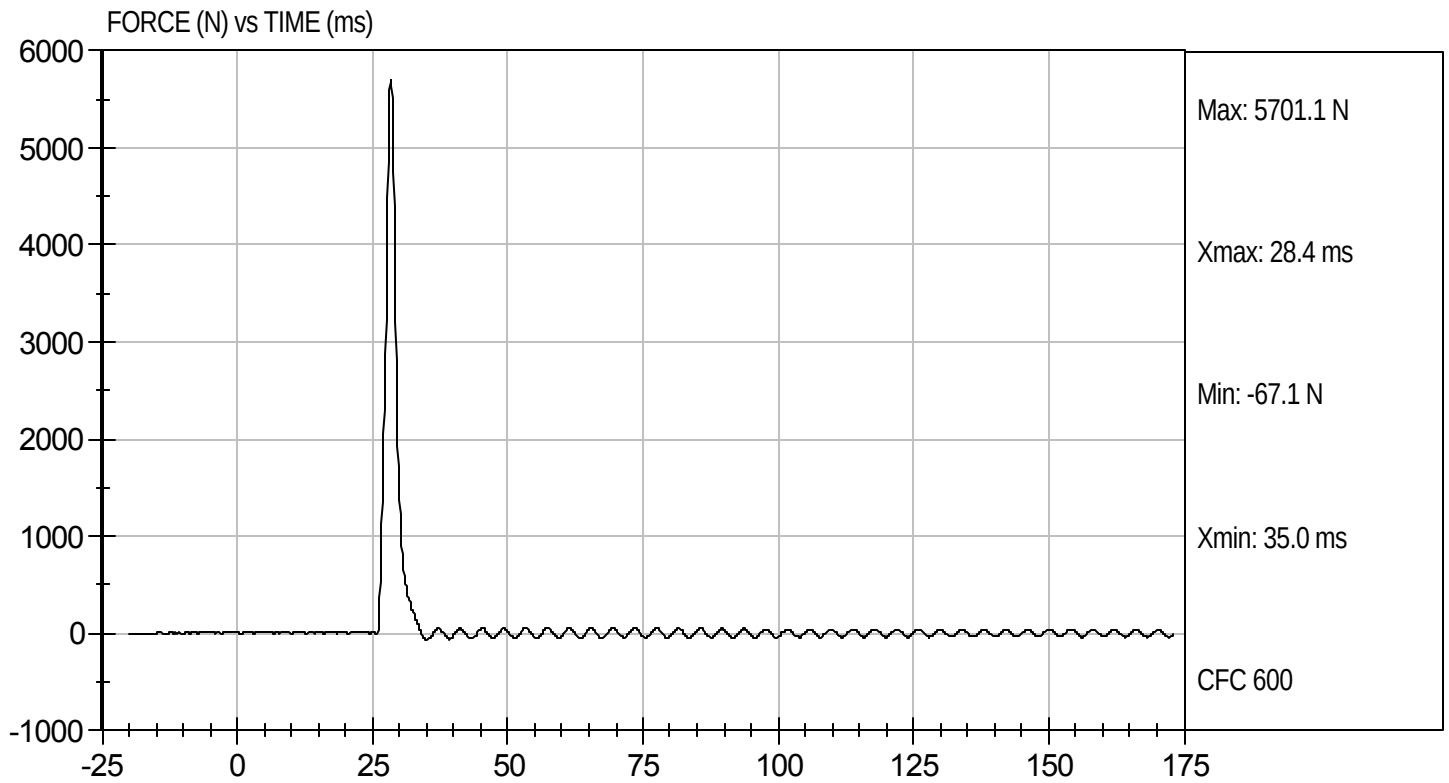
7/28/10
Test Date


Approved By



Test Desc: Left Knee
Component ID: D102446

Test Date: 7/28/10
Velocity: 6.97 ft/s, 2.12 m/s

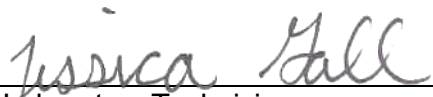


MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D102440

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.0	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	46	46	Pass
Rotation Rate	deg/s	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	57.6	64.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	45	45	Pass
Overall Test Results					Pass


 Laboratory Technician

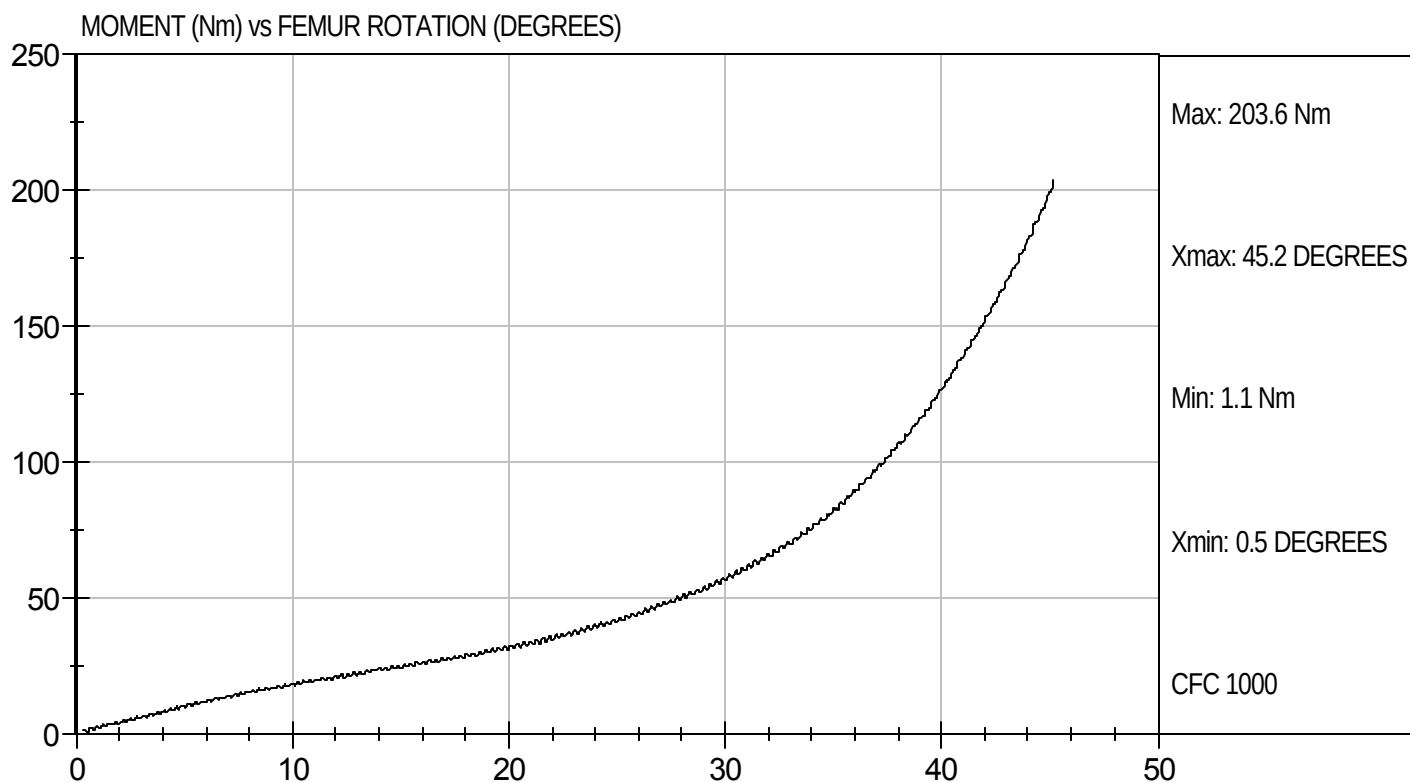
7/29/10
 Test Date


 Approved By



Test Desc: Hip Femur Flexion
Component ID: D102449

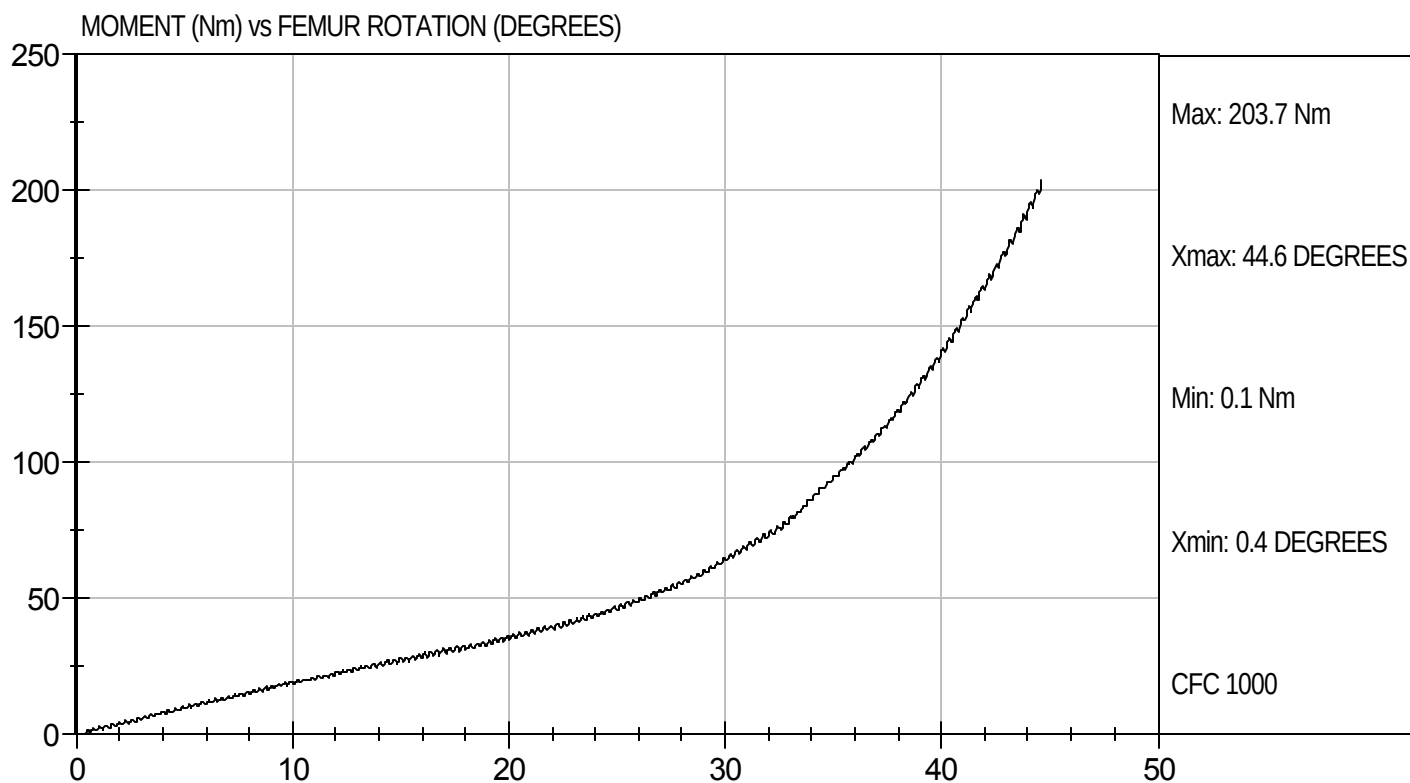
Test Date: 7/29/10
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D102440

Test Date: 7/29/10
Velocity: 0 ft/s, 0.00 m/s



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

ATD Serial No: 351

Test ID: D102471

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Peak Resultant Acceleration	G's	225 - 275	268	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	1.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

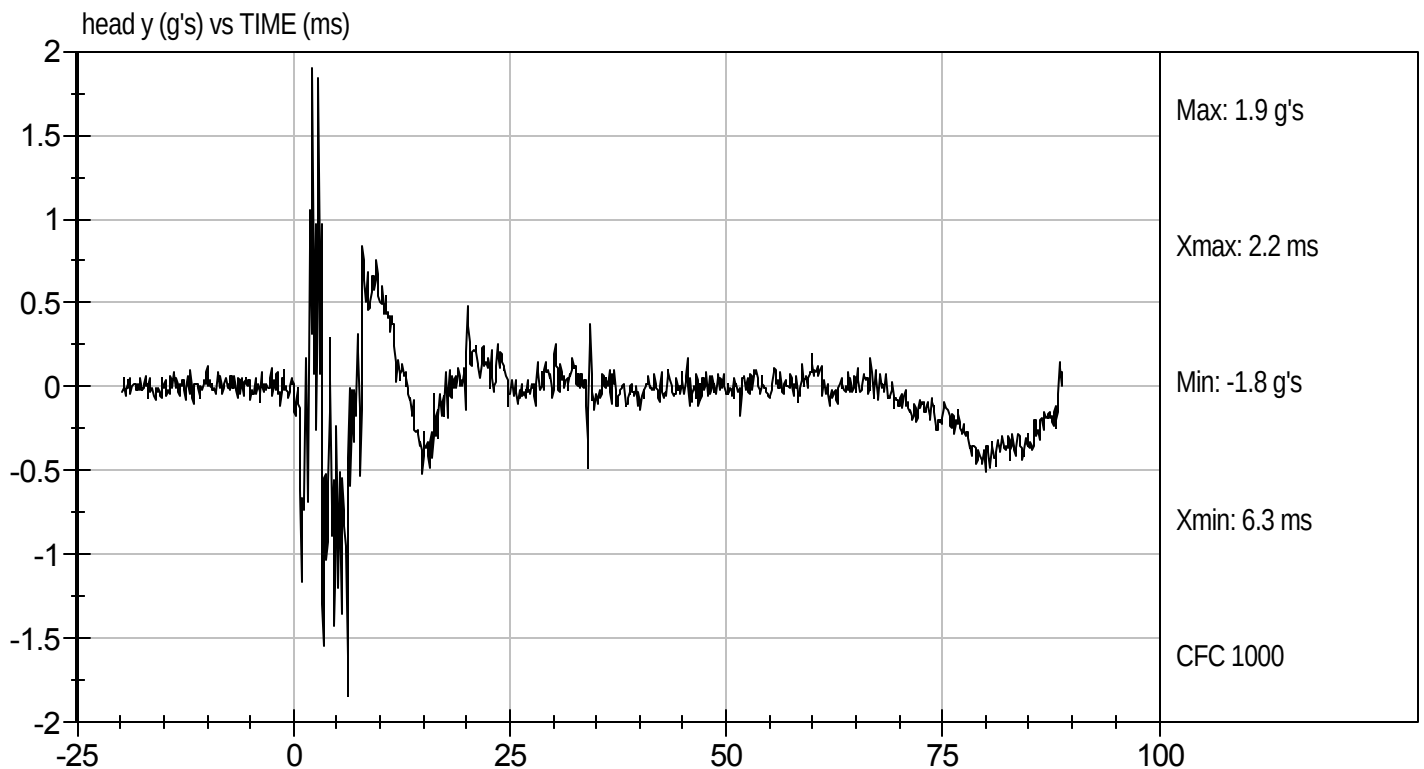
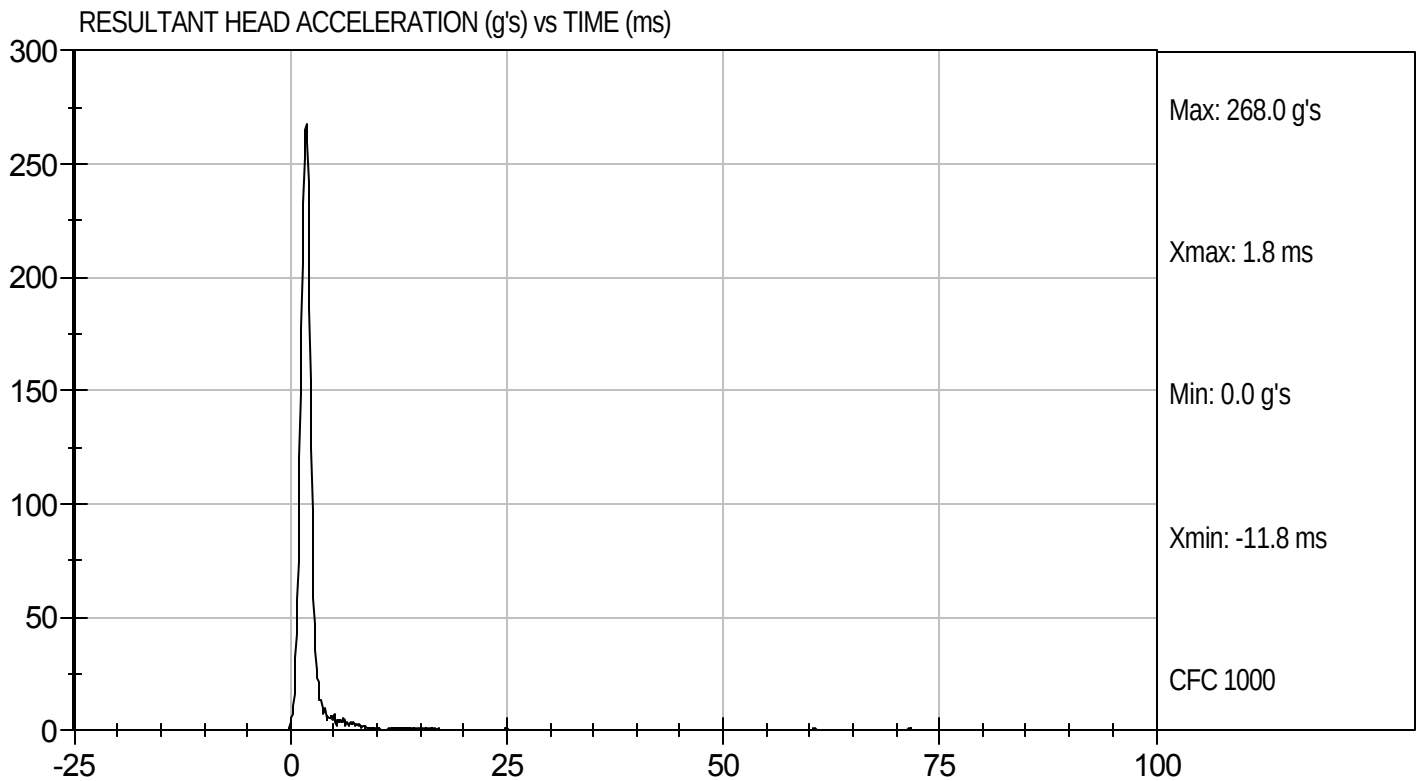
8/2/10
 Test Date


 Approved By



Test Desc: Head Drop
Component ID: D102471

Test Date: 8/2/10
Velocity: 0 ft/s, 0.00 m/s

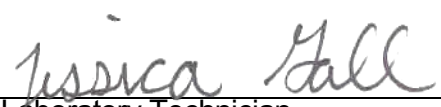


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D102472

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	47	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.20	Pass
	20 ms	G's	17.60 to 22.60	19.81	Pass
	30 ms	G's	12.50 to 18.50	15.63	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.70	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	35.8	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	70.0	Pass
	Time	ms	57.0 to 64.0	57.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	113.0	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	98.5	Pass
	Time	ms	47.0 to 58.0	48.0	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	98.4	Pass
Overall Test Results					Pass


 Laboratory Technician

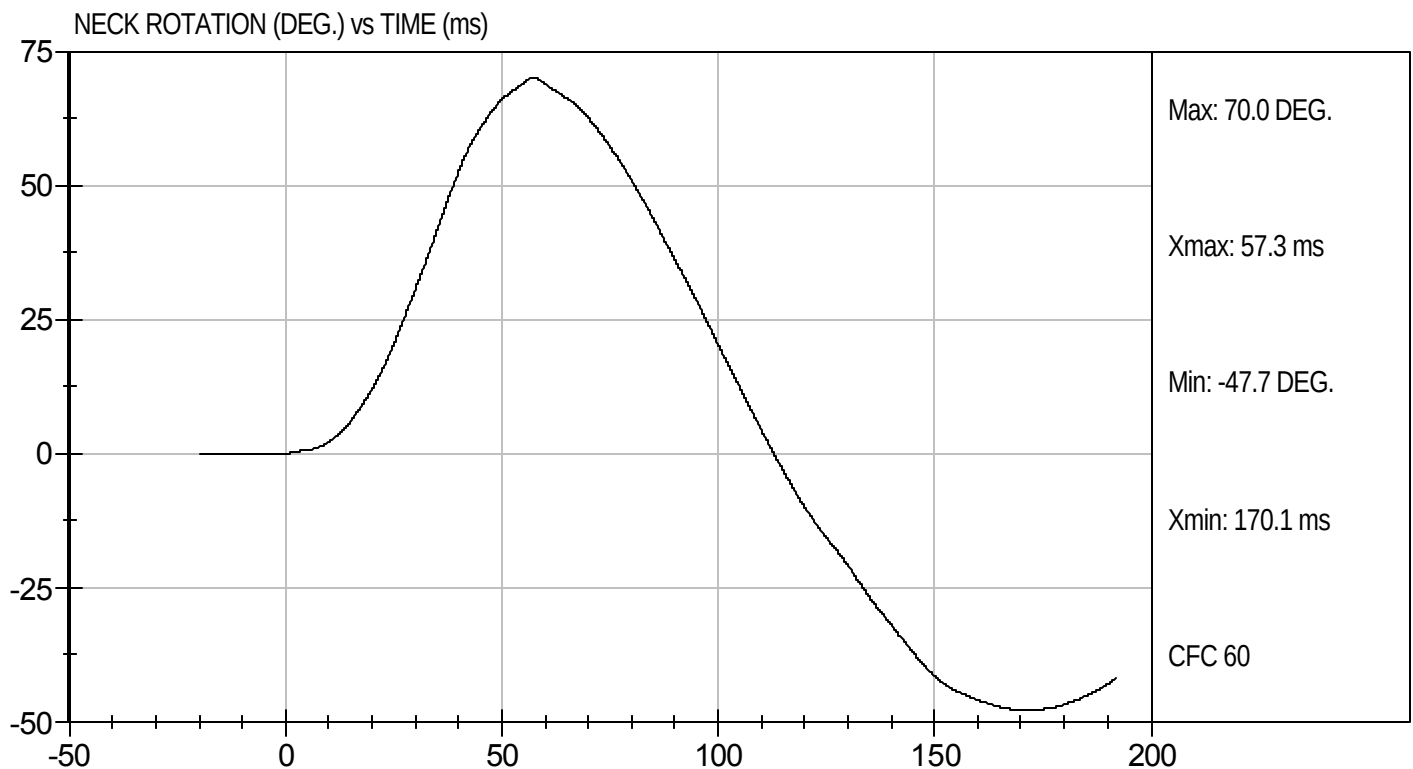
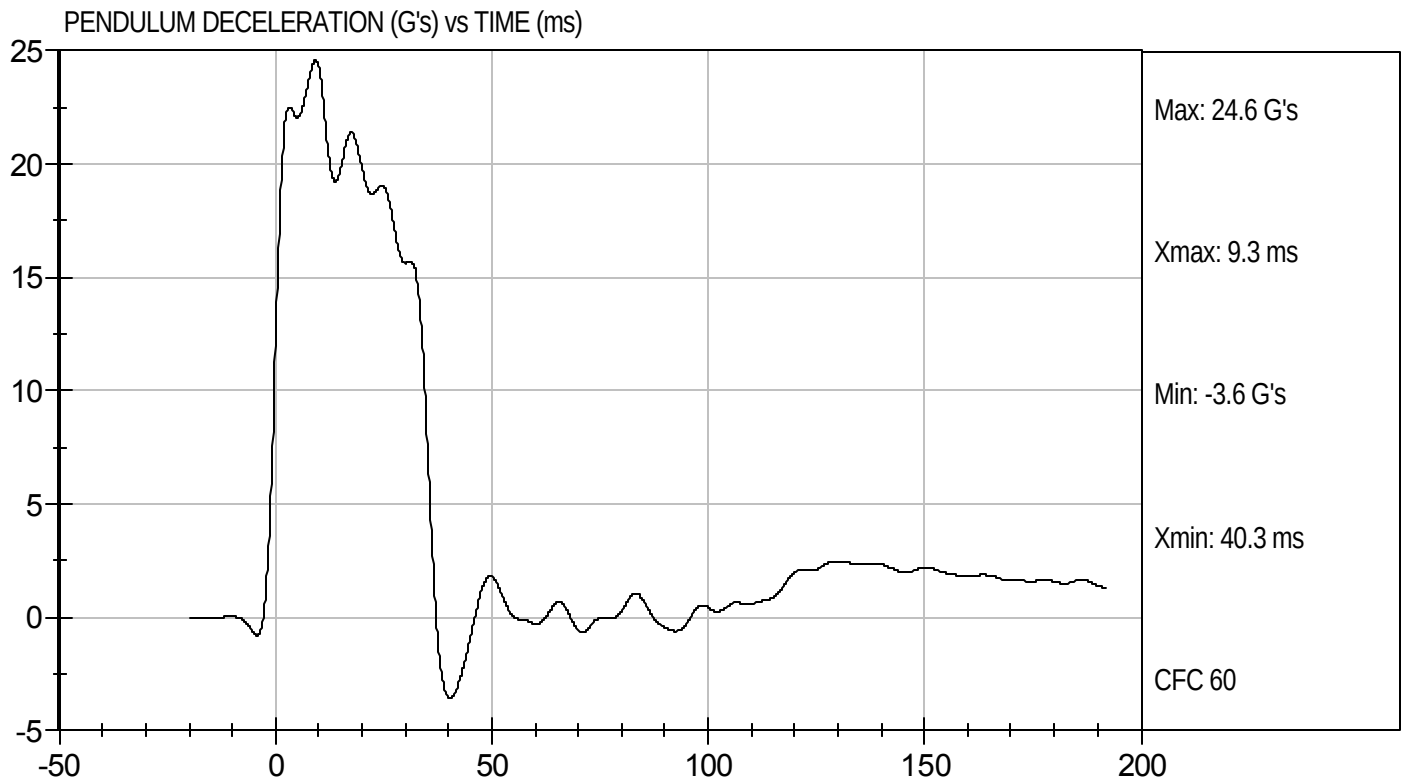
8/2/10
 Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D102472

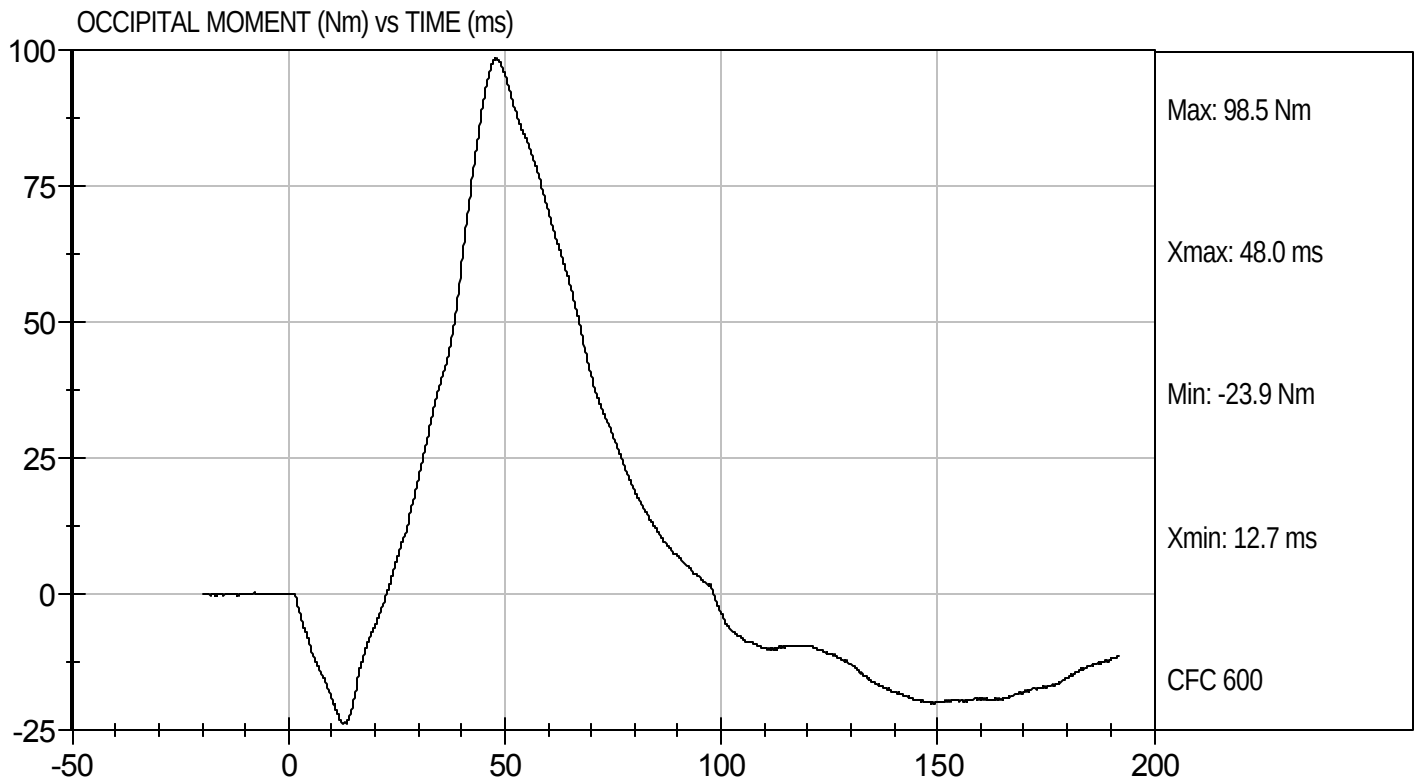
Test Date: 8/2/10
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D102472

Test Date: 8/2/10
Velocity: 23.15 ft/s, 7.06 m/s

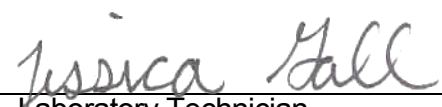


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D102473

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	47	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.17	Pass
	20 ms	G's	14.00 to 19.00	15.75	Pass
	30 ms	G's	11.00 to 16.00	13.33	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.38	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.3	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	93.5	Pass
	Time	ms	72.0 to 82.0	74.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	151.5	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-63.7	Pass
	Time	ms	65.0 to 79.0	69.5	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	140.8	Pass
Overall Test Results					Pass


 Laboratory Technician

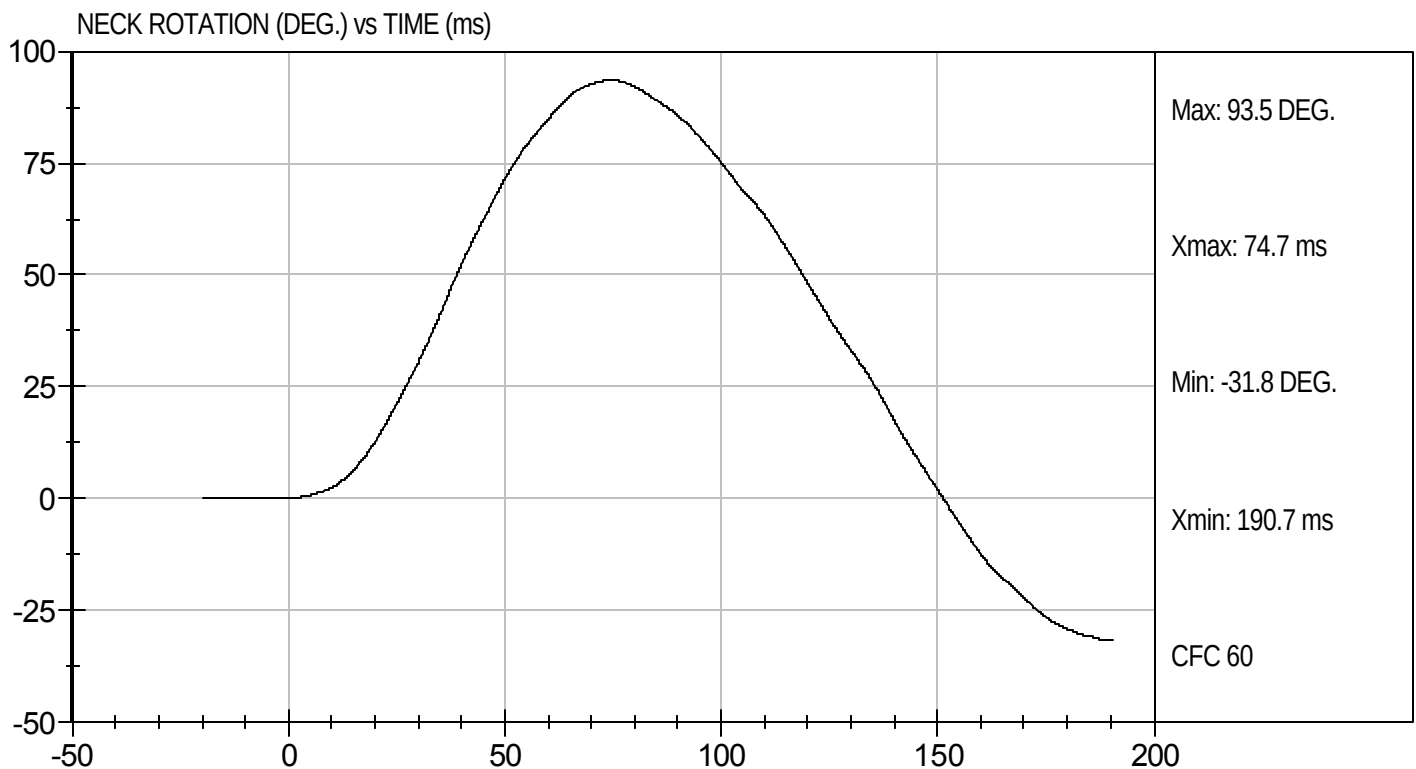
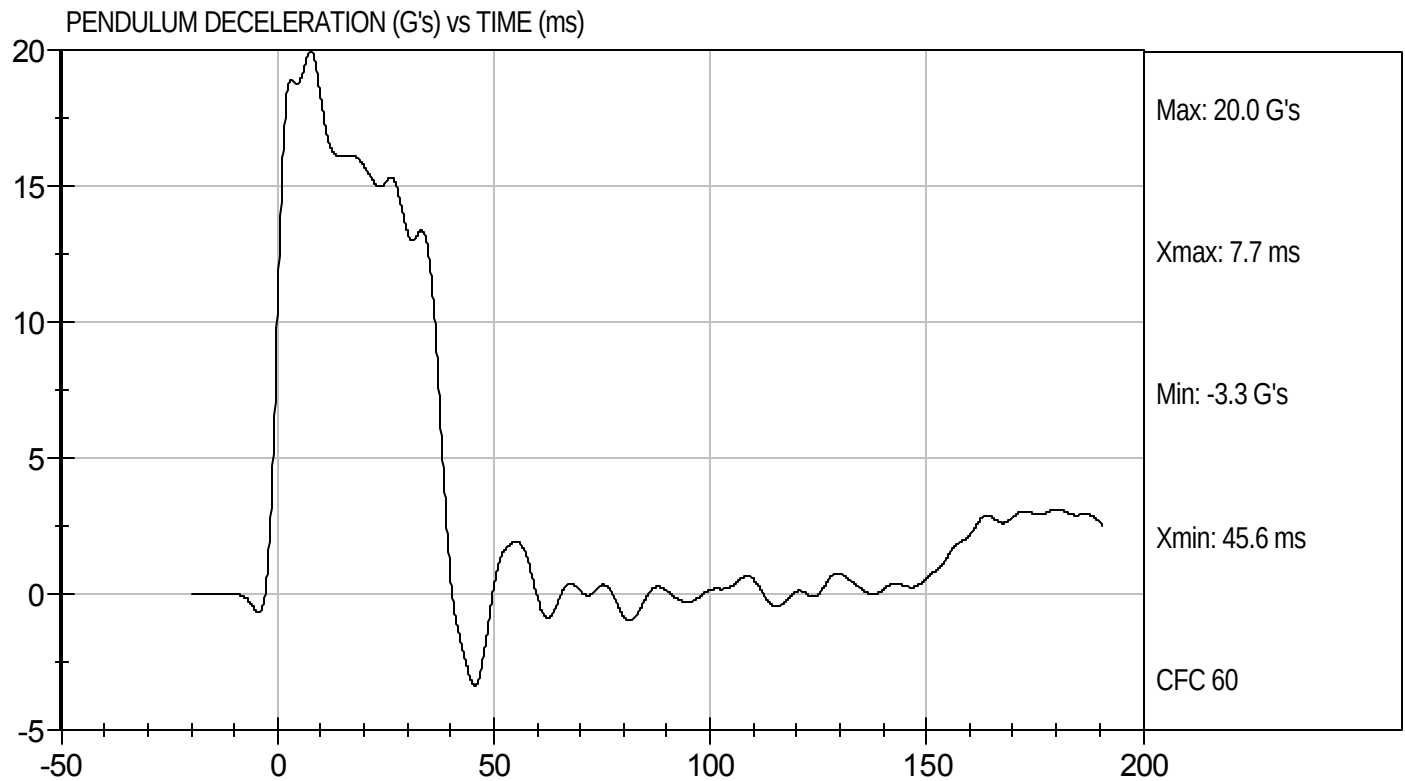
8/2/10
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D102473

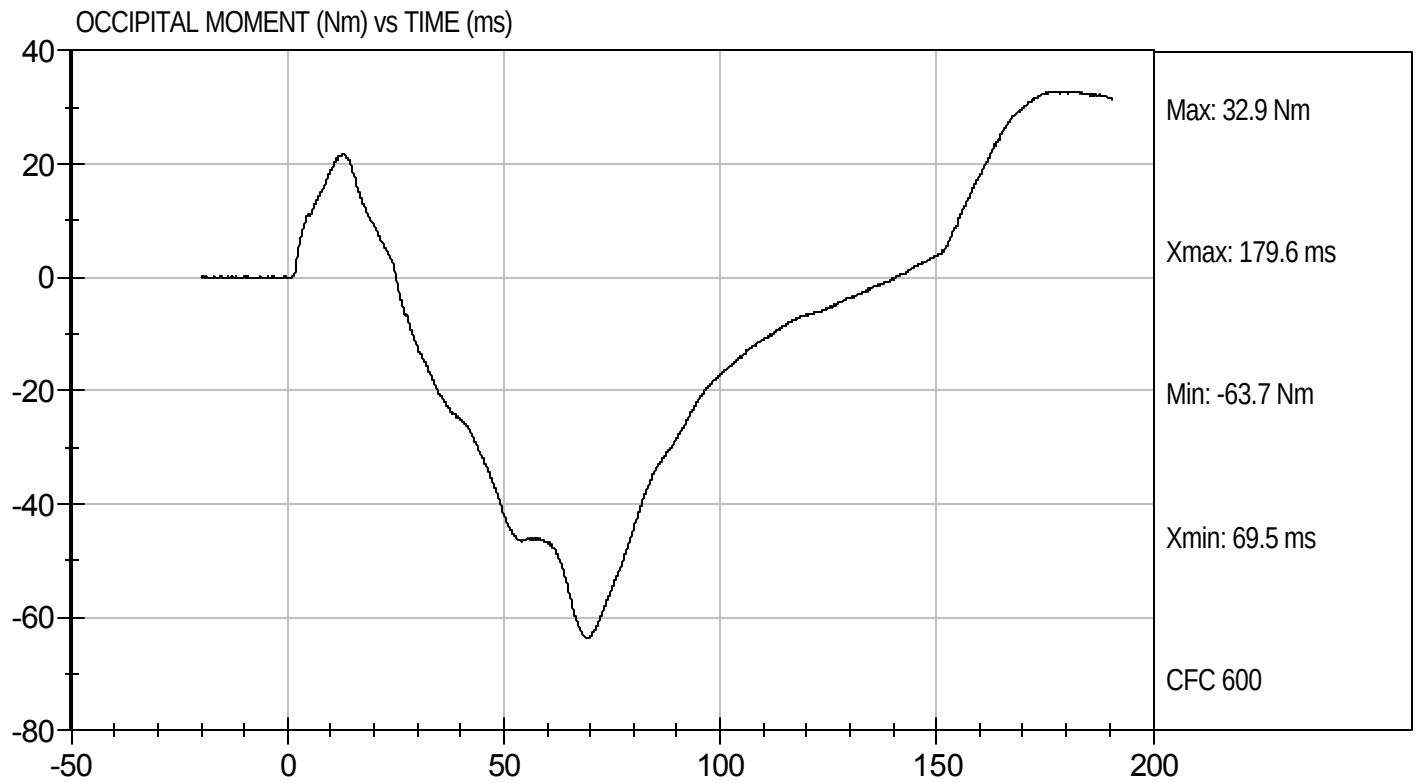
Test Date: 8/2/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D102473

Test Date: 8/2/10
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D102474

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	6.58 to 6.82	6.69	Pass
Peak Probe Force	N	5159 to 5893	5,386	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.42	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Overall Test Results			Pass	


Laboratory Technician

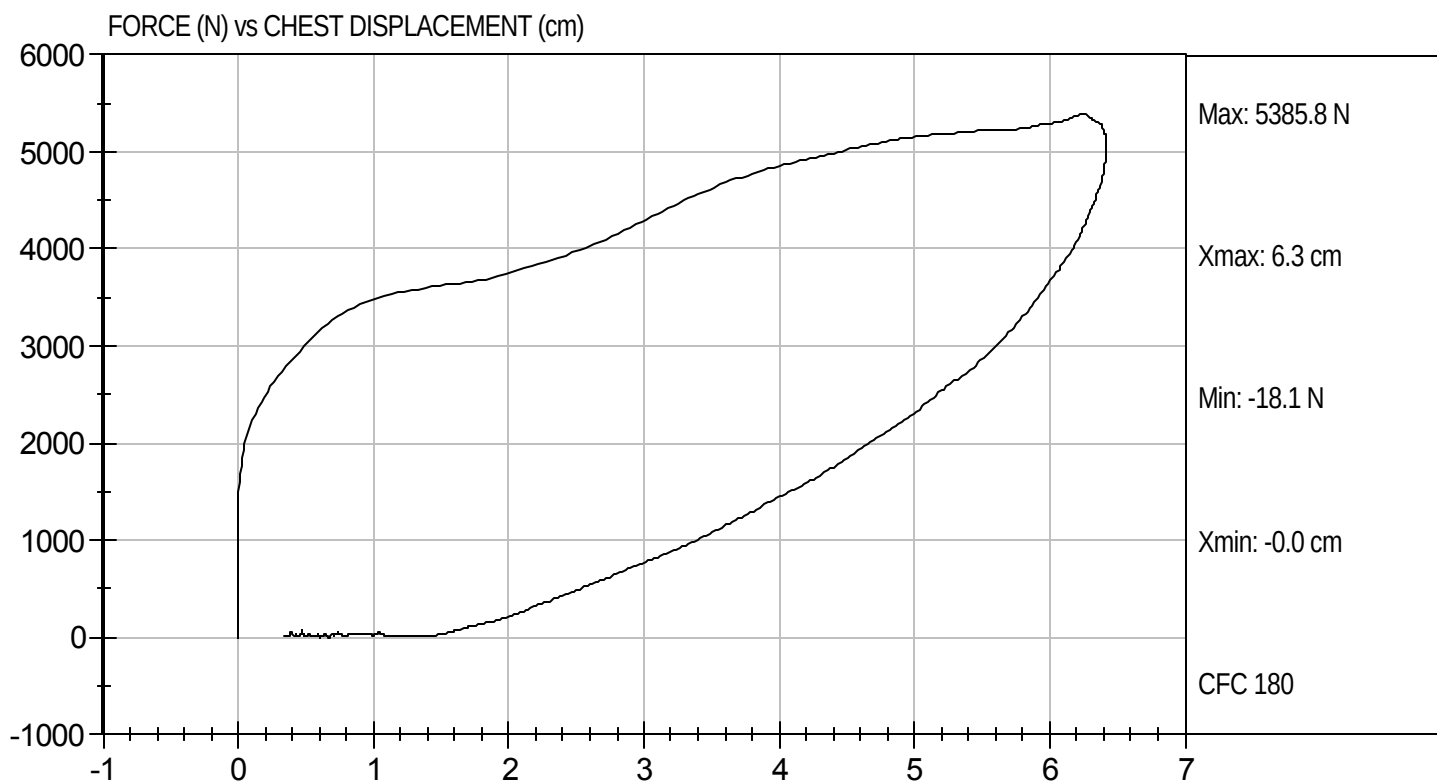
7/30/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D102474

Test Date: 7/30/10
Velocity: 21.96 ft/s, 6.69 m/s



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

ATD Serial No: 351

Test I.D: D102475

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,781	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

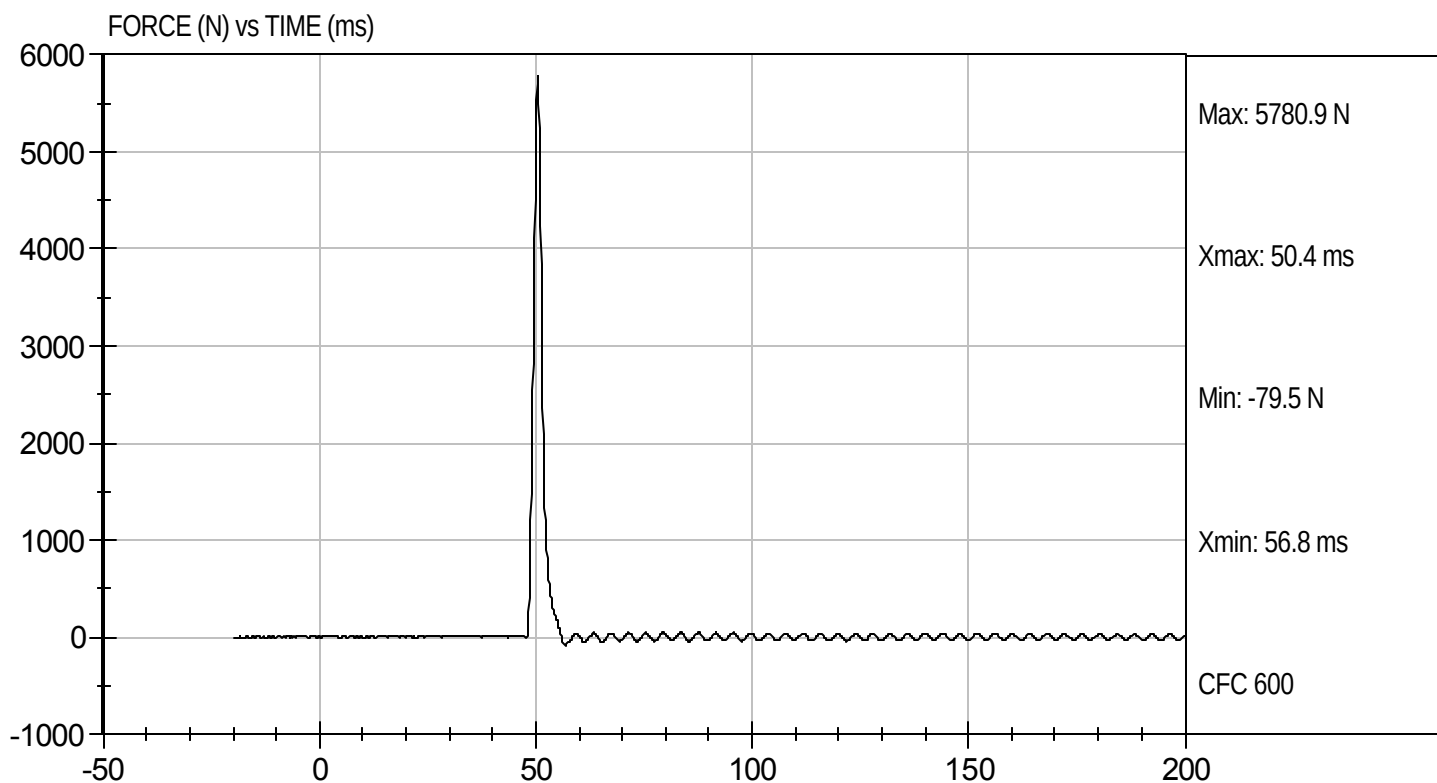
8/2/10
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D102475

Test Date: 8/2/10
Velocity: 6.9 ft/s, 2.10 m/s



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

ATD Serial No: 351

Test I.D: D102476

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	Newtons	4715 to 5782	5,723	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

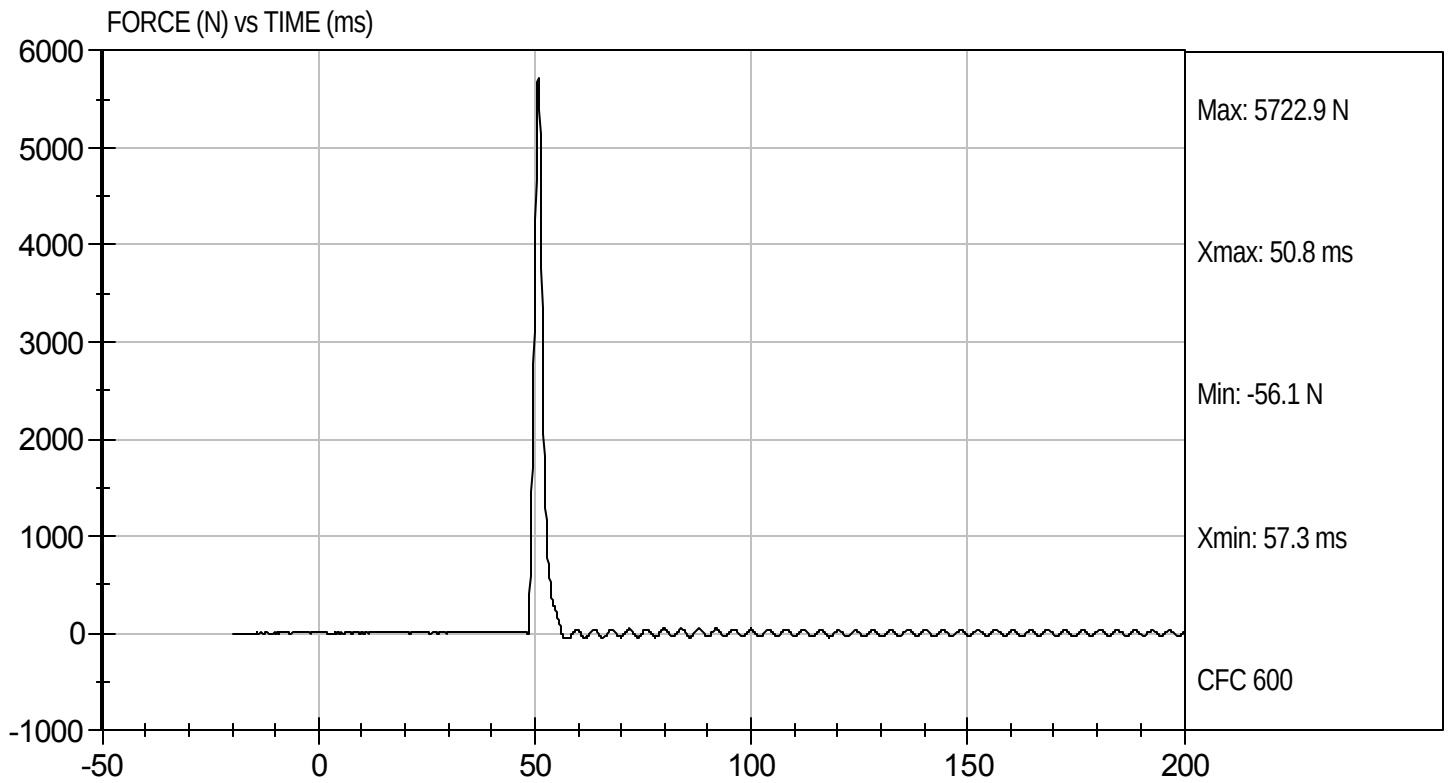
8/2/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D102476

Test Date: 8/2/10
Velocity: 6.8 ft/s, 2.07 m/s



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

ATD Serial No: 351

Test I.D: D102470

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	47	47	Pass
Rotation Rate	deg/s	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	55.6	57.4	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	46	46	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

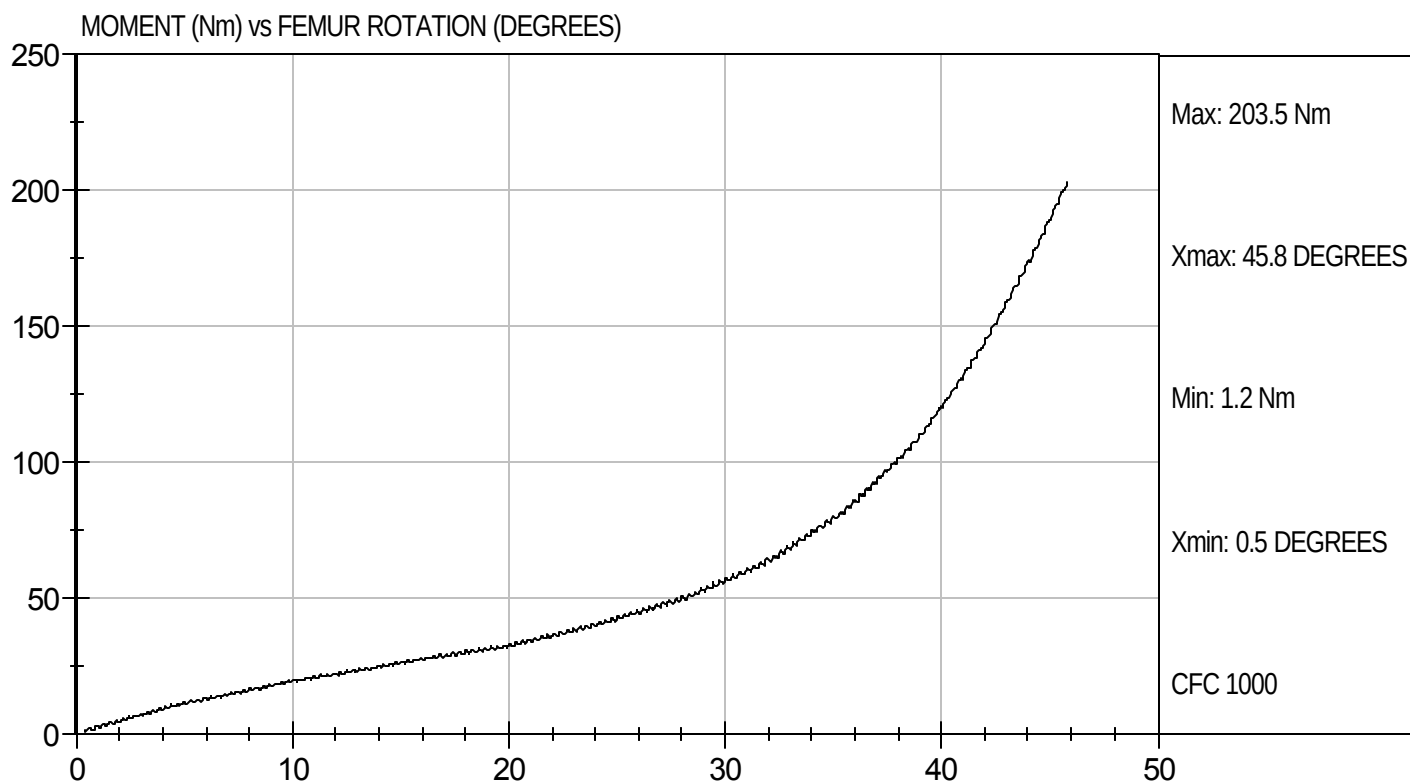
8/2/10
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D102479

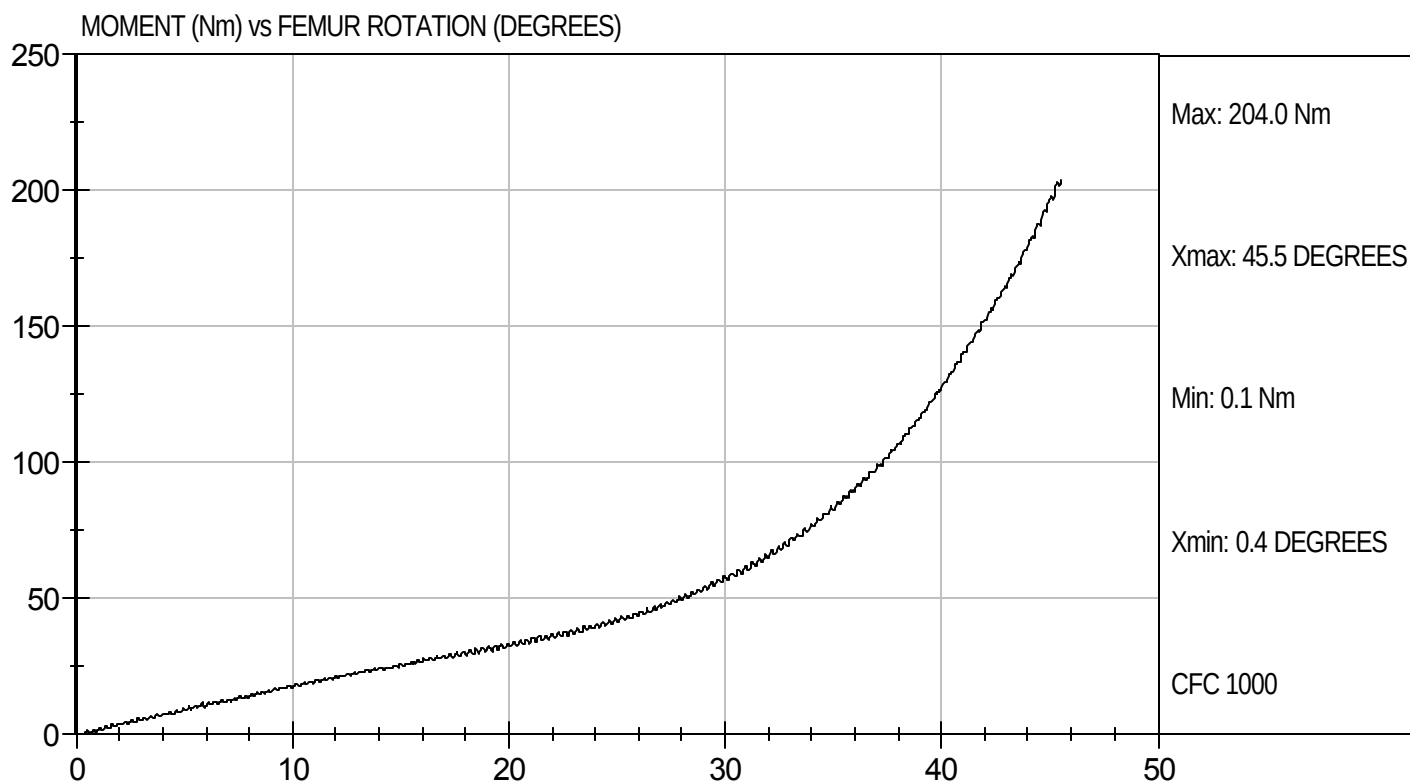
Test Date: 8/2/10
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D102470

Test Date: 8/2/10
Velocity: 0 ft/s, 0.00 m/s

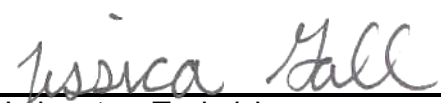


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D102351

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	53	Pass
Peak Resultant Acceleration	G's	250 to 300	283	Pass
Peak Lateral Acceleration	G's	+/- 15	-10	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

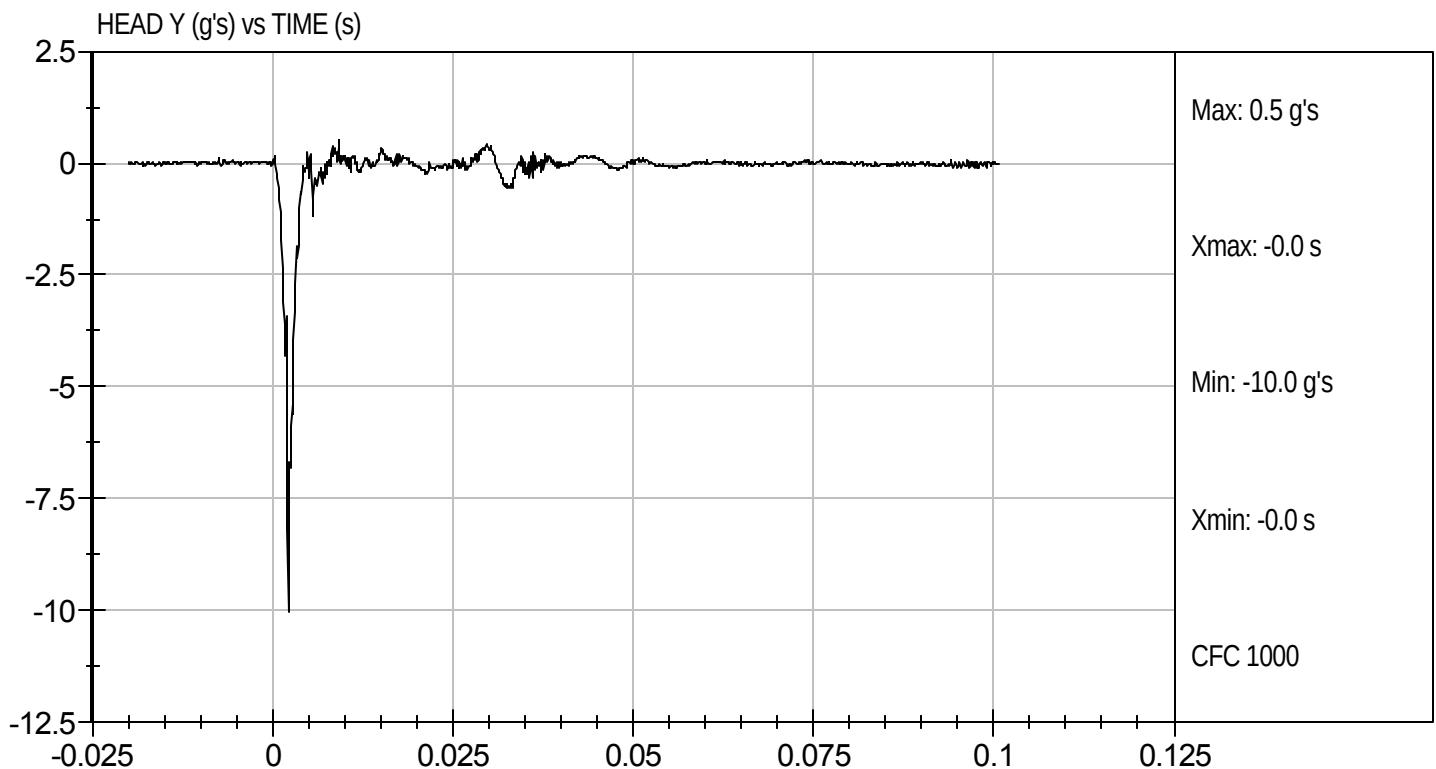
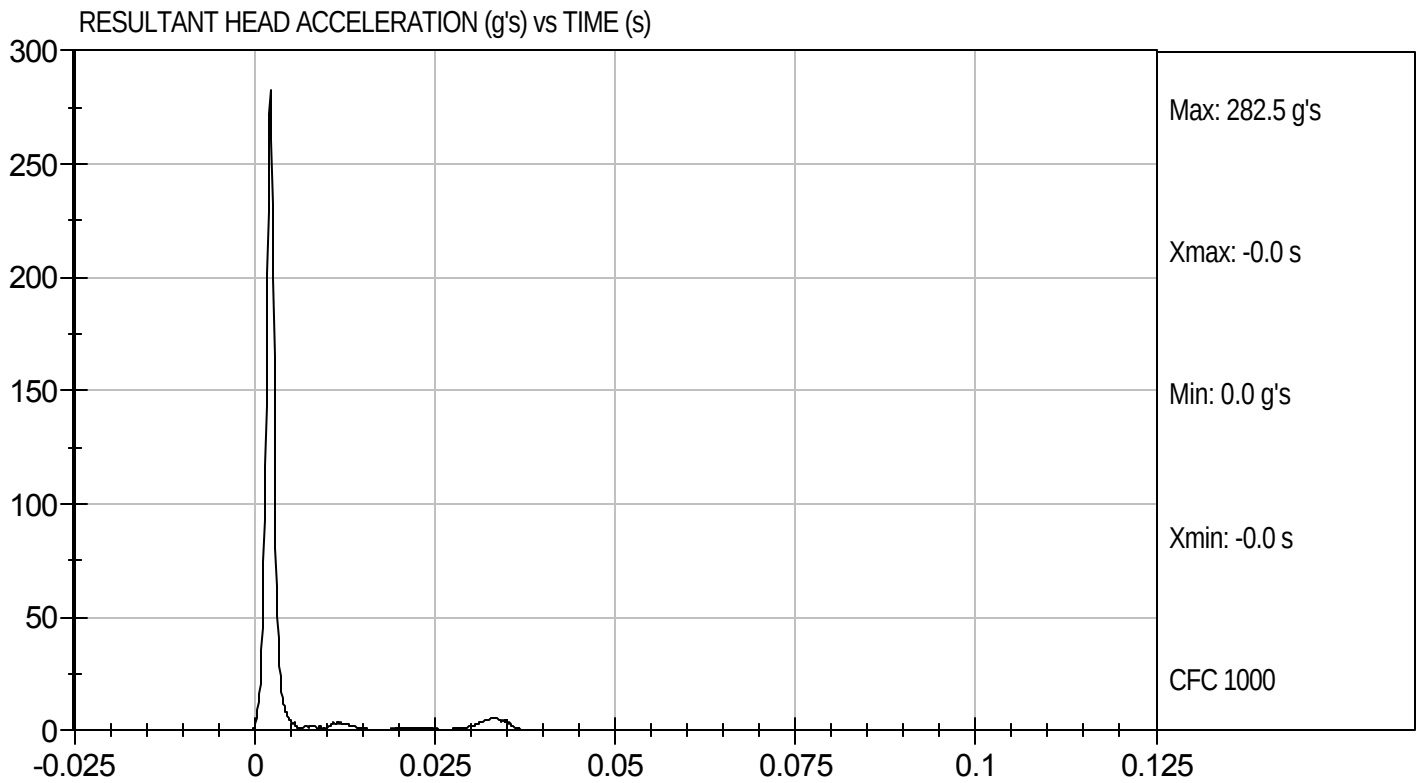
7/23/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D102351

Test Date: 7/23/10
Velocity: 0 ft/s, 0 m/s

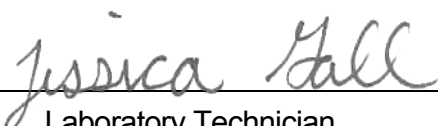


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102352

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	53	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.4	Pass
D Plane Rotation	Max	deg	77 to 91	77	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	69	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results				Pass	


 Laboratory Technician

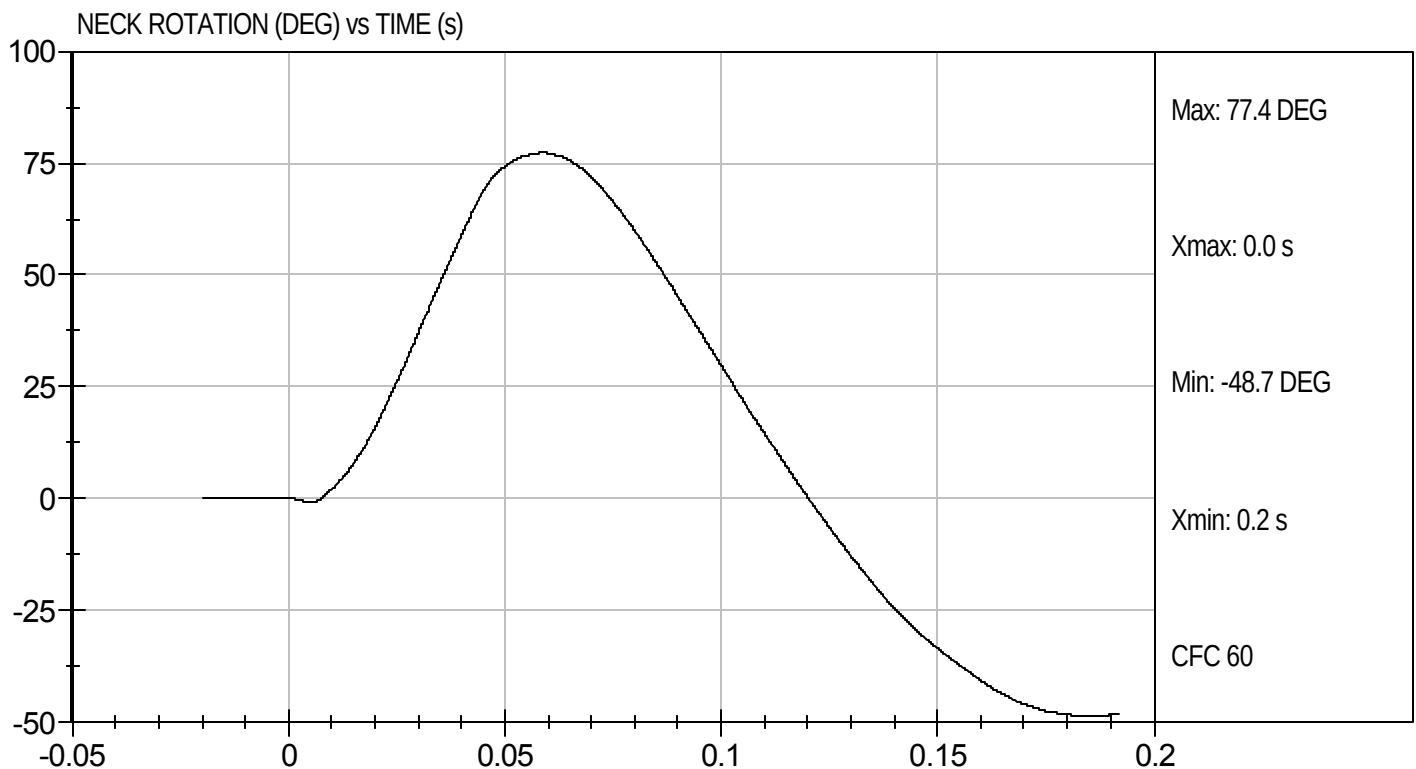
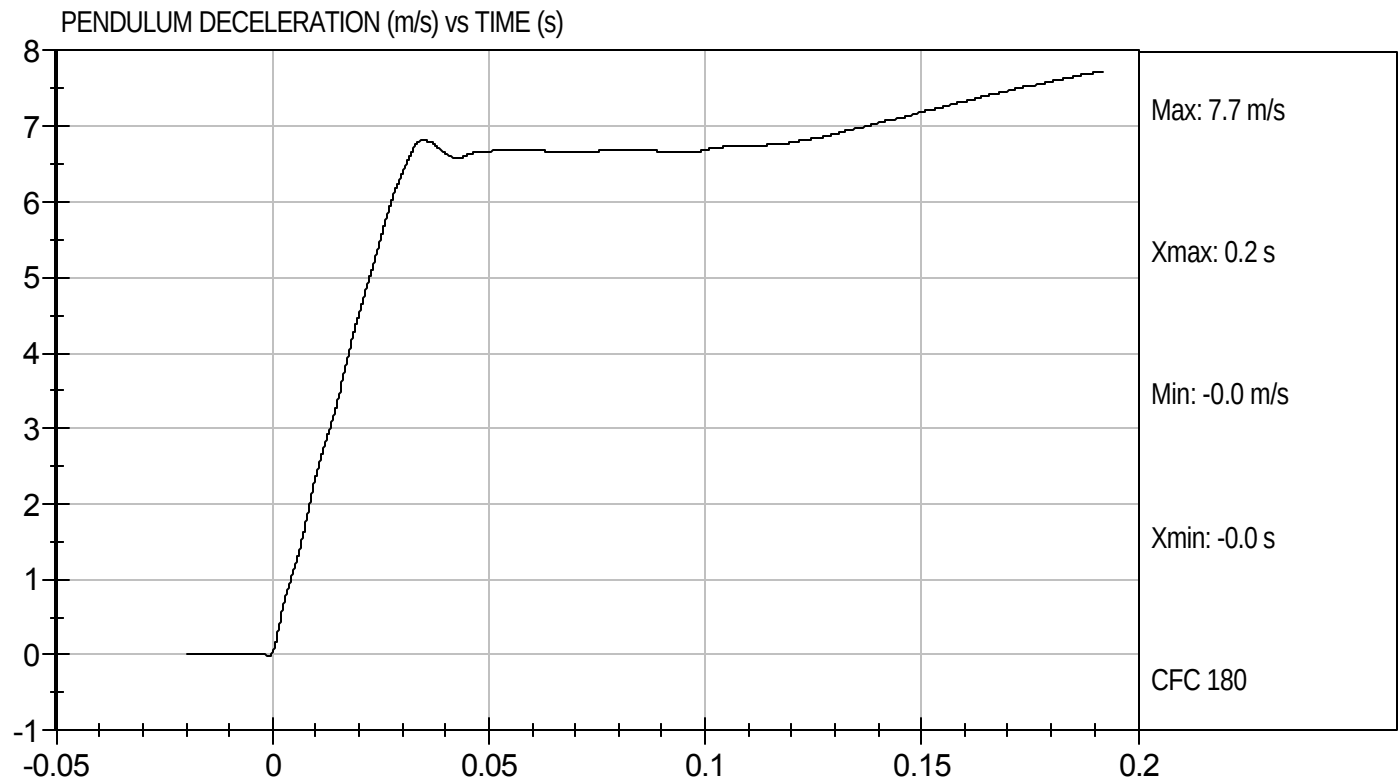
7/23/10
 Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D102352

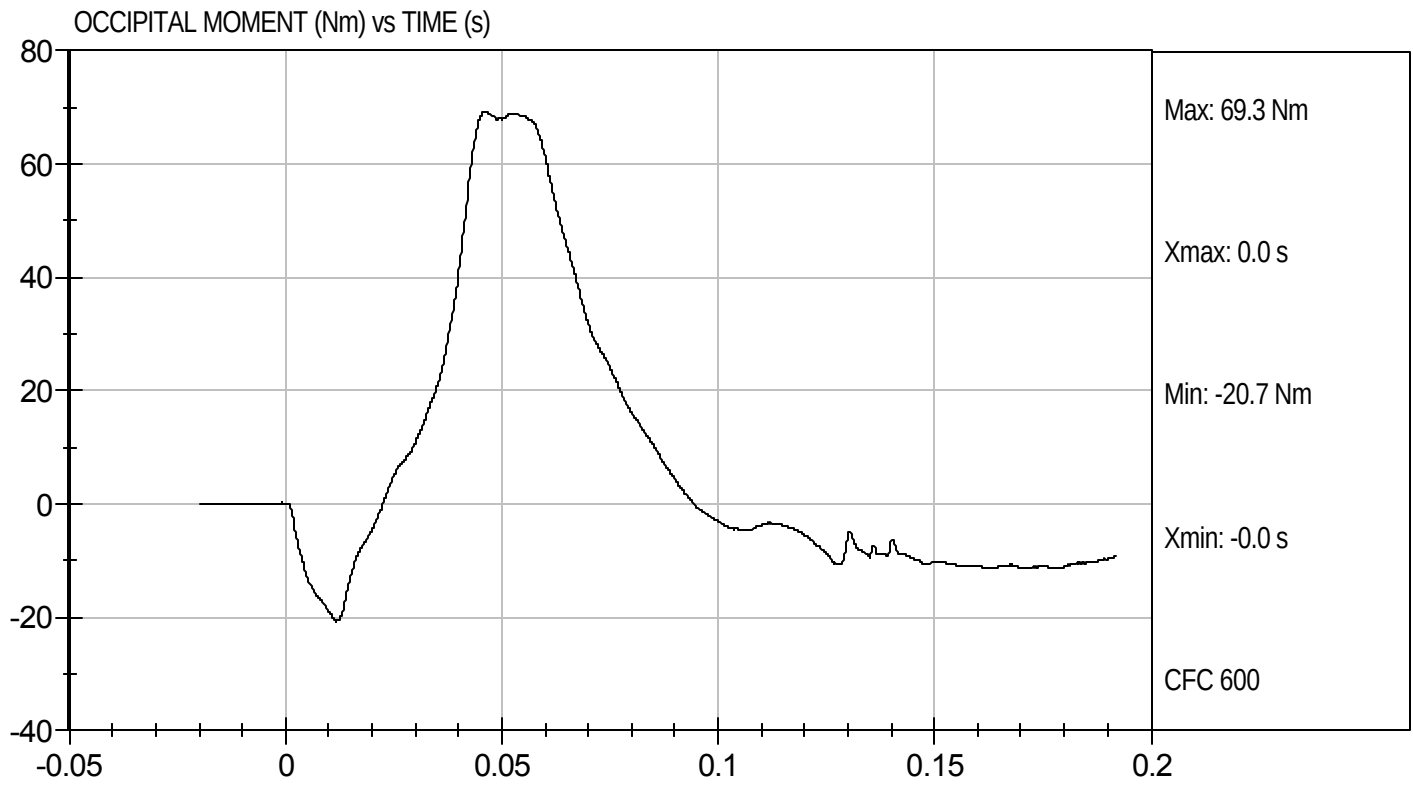
Test Date: 7/23/10
Velocity: 23.1 ft/s, 7.04 m/s





Test Desc: Neck Flexion
Component ID: D102352

Test Date: 7/23/10
Velocity: 23.1 ft/s, 7.04 m/s



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102353

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	53	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.19	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.6	Pass
	30 ms	m/s	4.6 to 5.6	5.1	Pass
D Plane Rotation	Max	deg	99 to 114	100	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-53	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	100	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

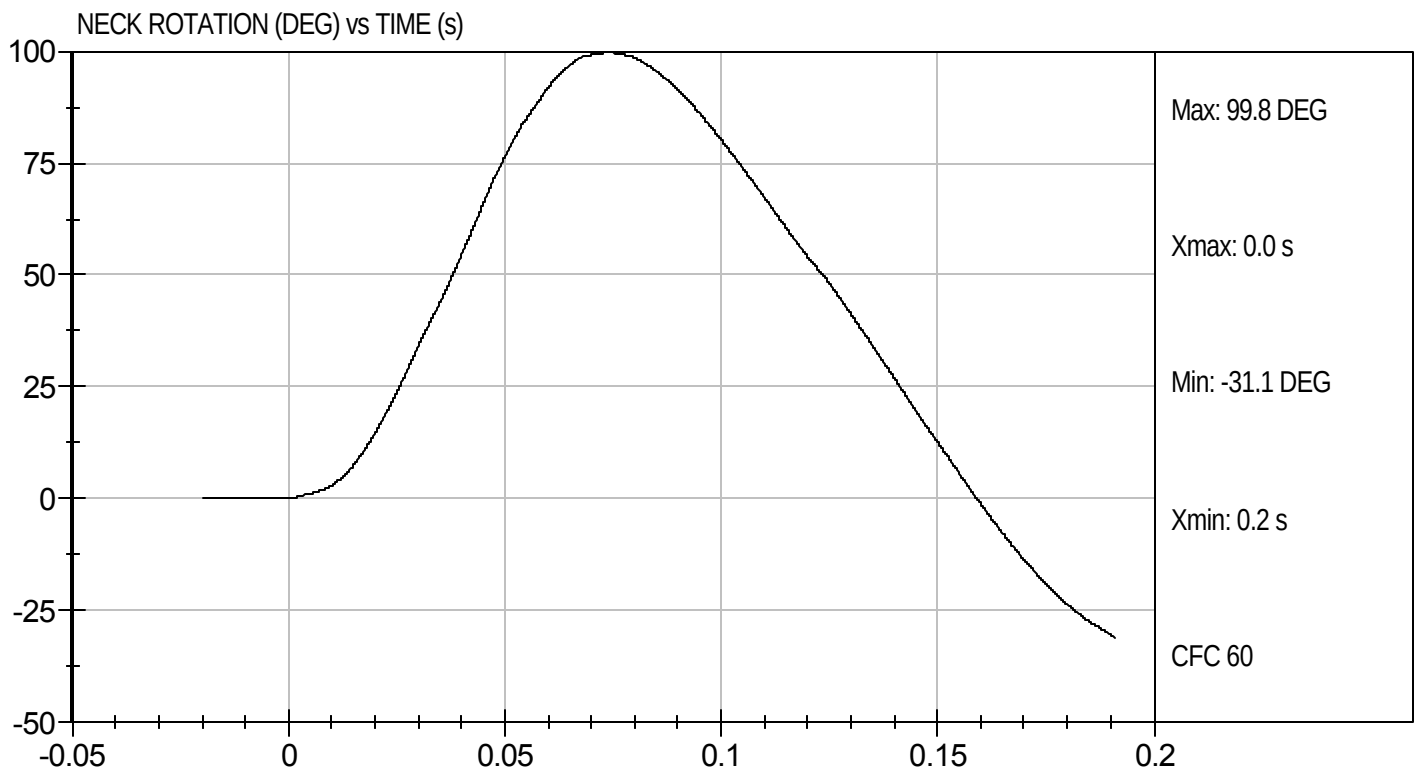
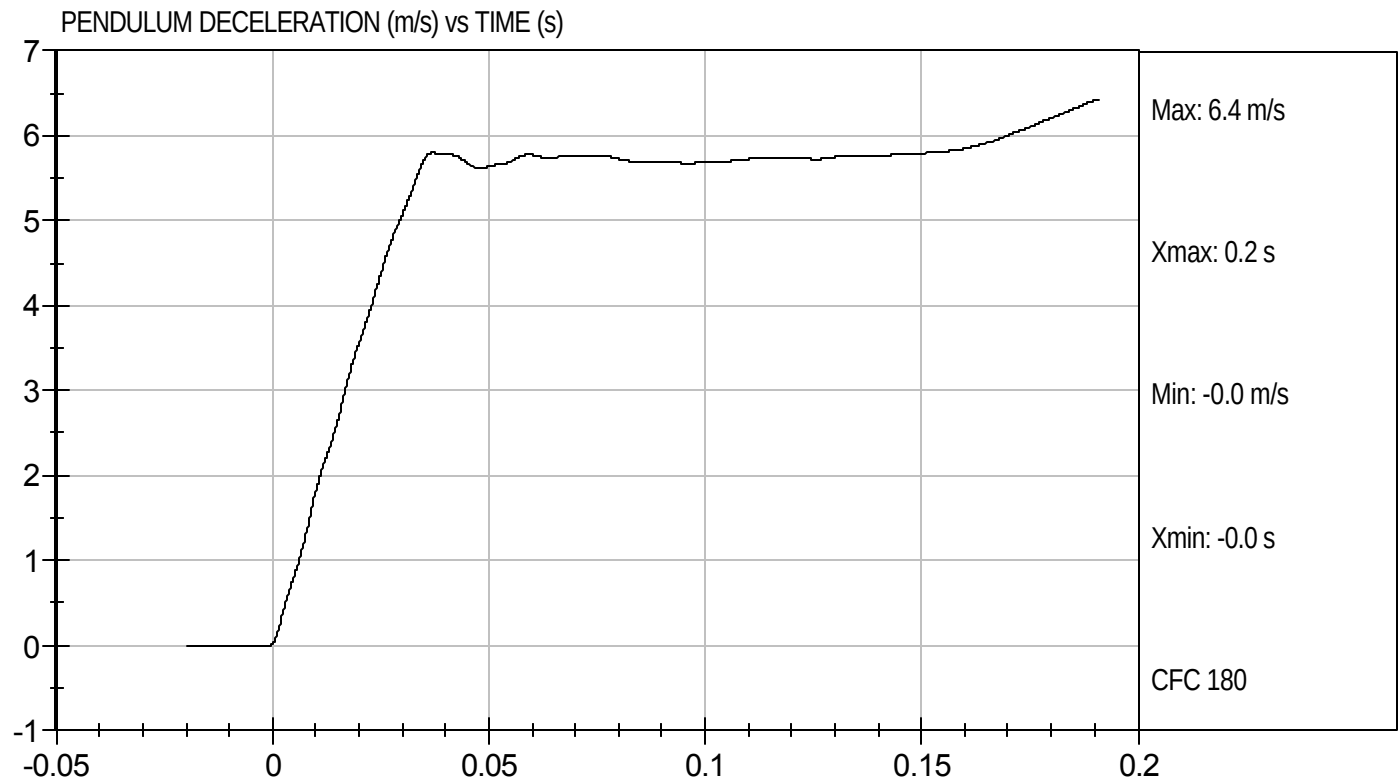
7/23/10
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D102353

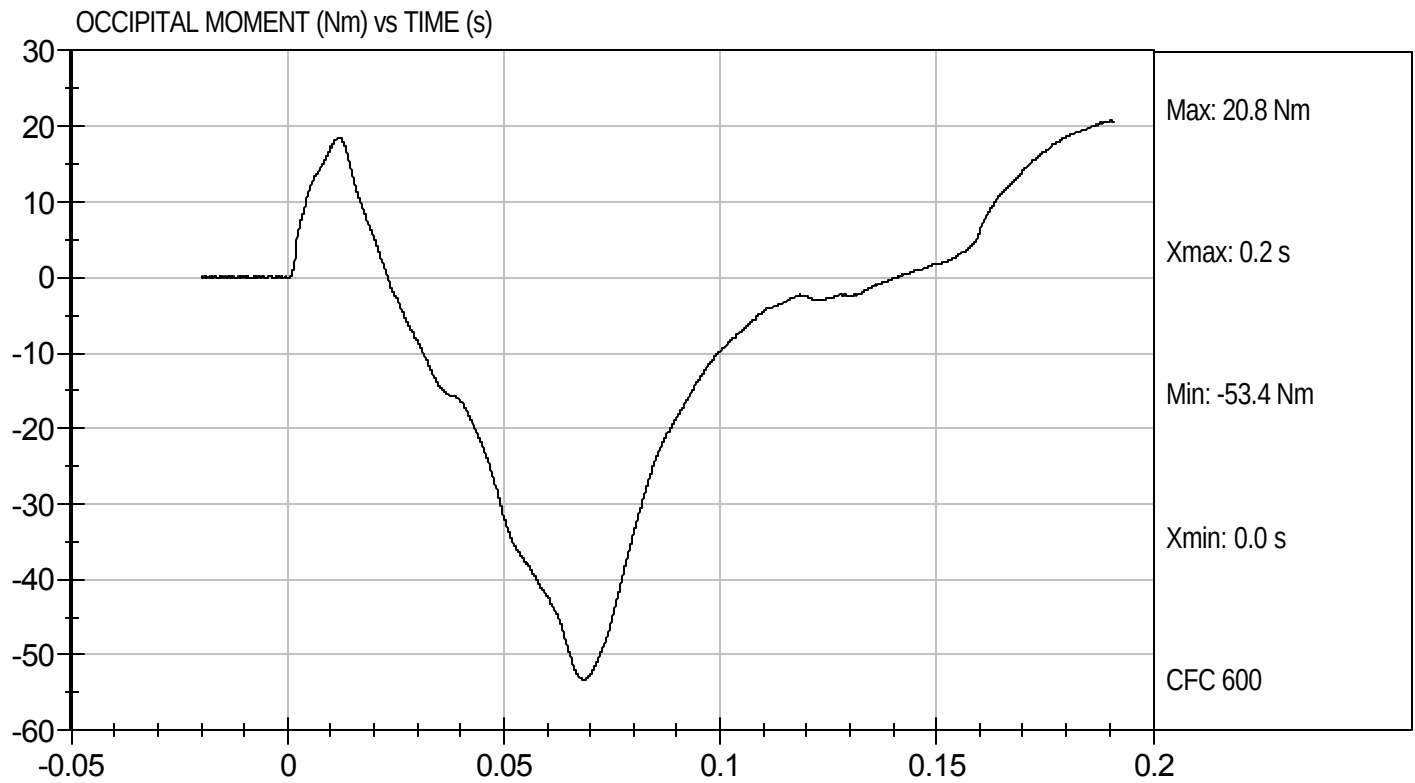
Test Date: 7/23/10
Velocity: 20.32 ft/s, 6.19 m/s





Test Desc: Neck Extension
Component ID: D102353

Test Date: 7/23/10
Velocity: 20.32 ft/s, 6.19 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102354

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.9	Pass
Relative Humidity	%	10 to 70	53	Pass
Probe Speed	m/s	6.59 to 6.83	6.68	Pass
Peak Deflection	mm	50 to 58	54	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.1	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	3981	Pass
			Overall Test Results	Pass


Laboratory Technician

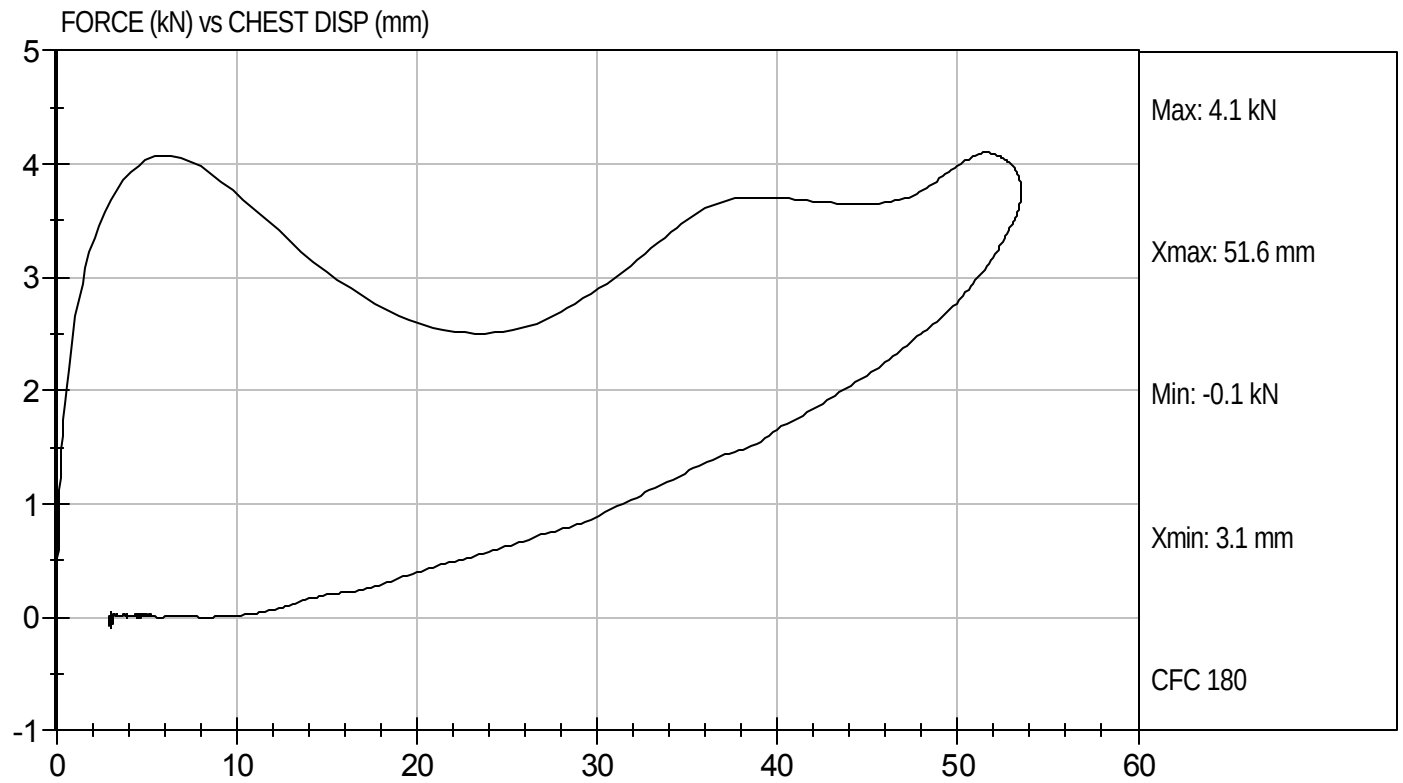
7/23/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D102354

Test Date: 7/23/10
Velocity: 21.93 ft/s, 6.68 m/s

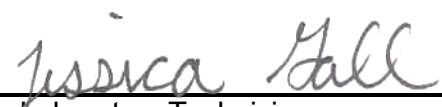


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102355

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	53	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	kN	3.45 to 4.06	3.50	Pass
Overall Test Results			Pass	


Laboratory Technician

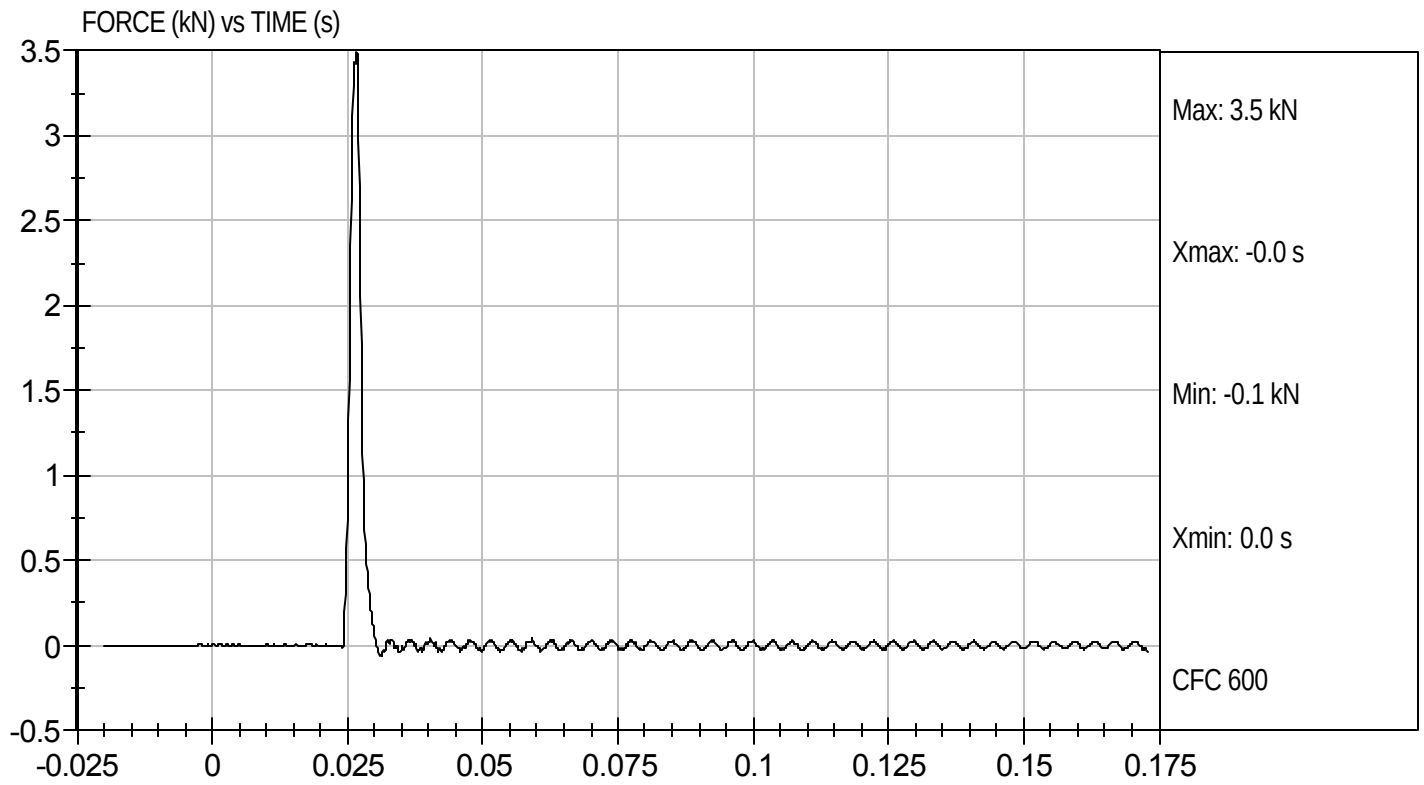
7/23/10
Test Date


Approved By



Test Desc: Right Knee
Component ID: D102355

Test Date: 7/23/10
Velocity: 7.0 ft/s, 2.13 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102356

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	53	Pass
Probe Speed	m/s	2.07 to 2.13	2.13	Pass
Maximum Force	kN	3.45 to 4.06	4.02	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

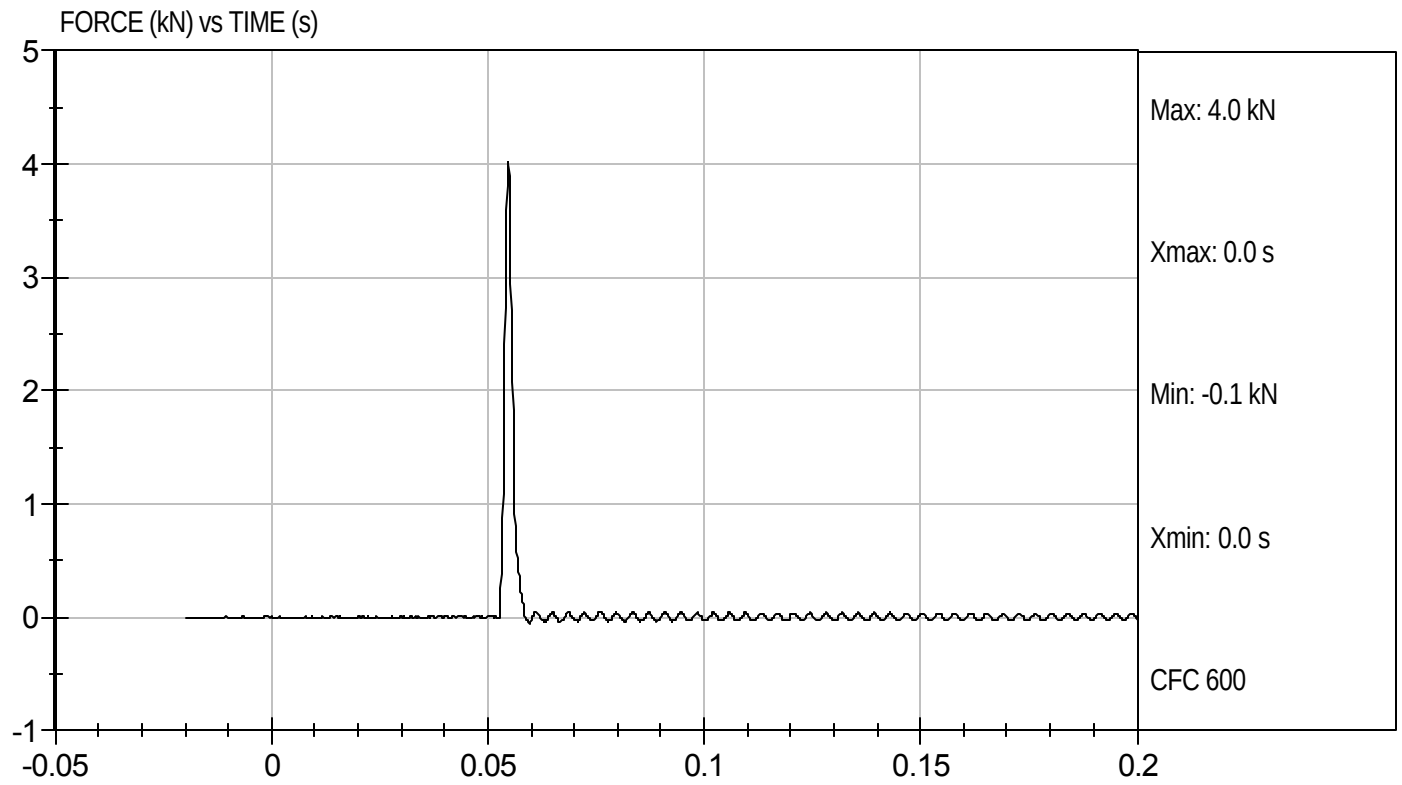
7/23/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D102356

Test Date: 7/23/10
Velocity: 7.0 ft/s, 2.13 m/s

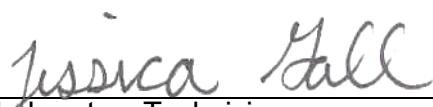


MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102357

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	56	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	6	Pass
Force at 45 deg	N	320 to 390	384	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass


Laboratory Technician

7/23/10
Test Date

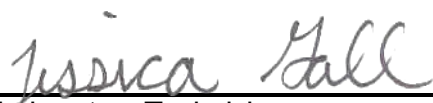

Approved By

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D102481

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	250 to 300	273	Pass
Peak Lateral Acceleration	G's	+/- 15	-2.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

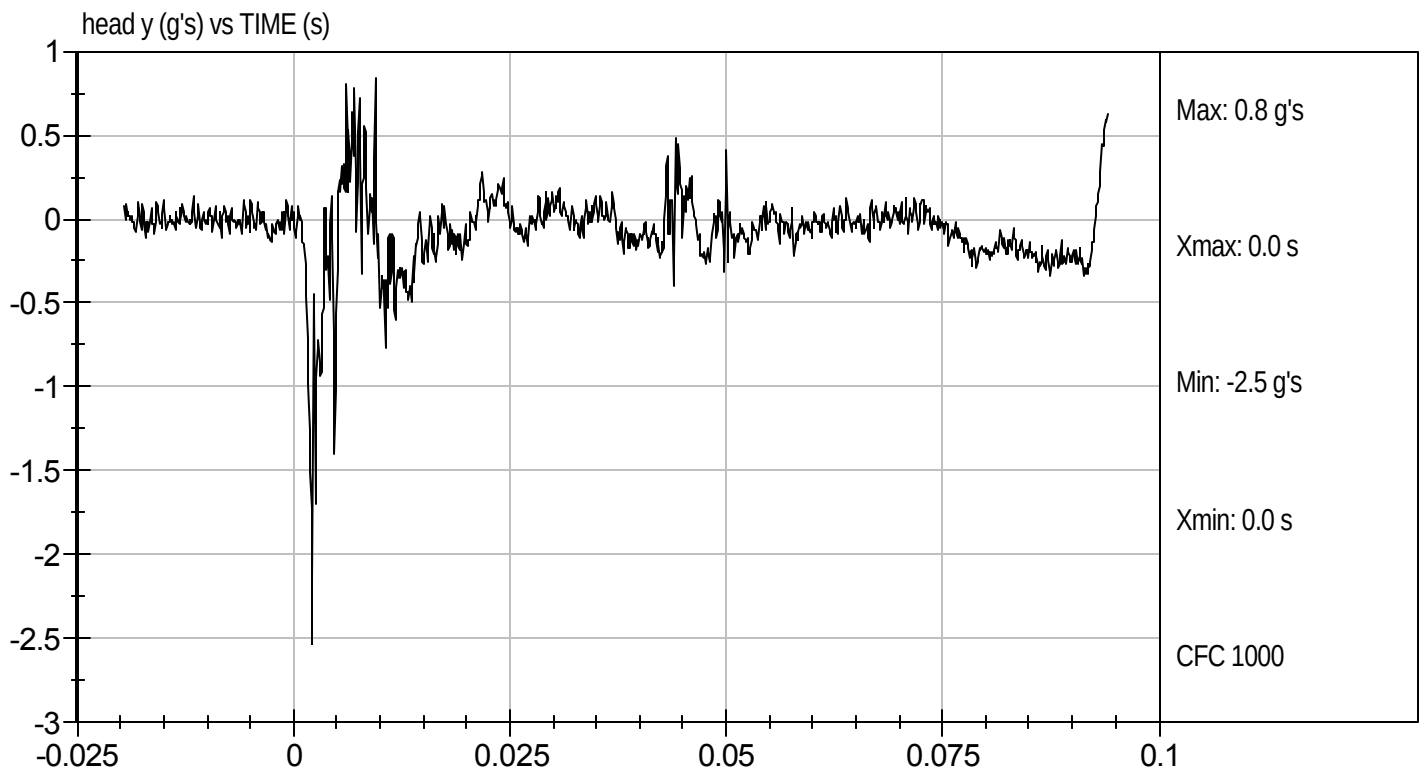
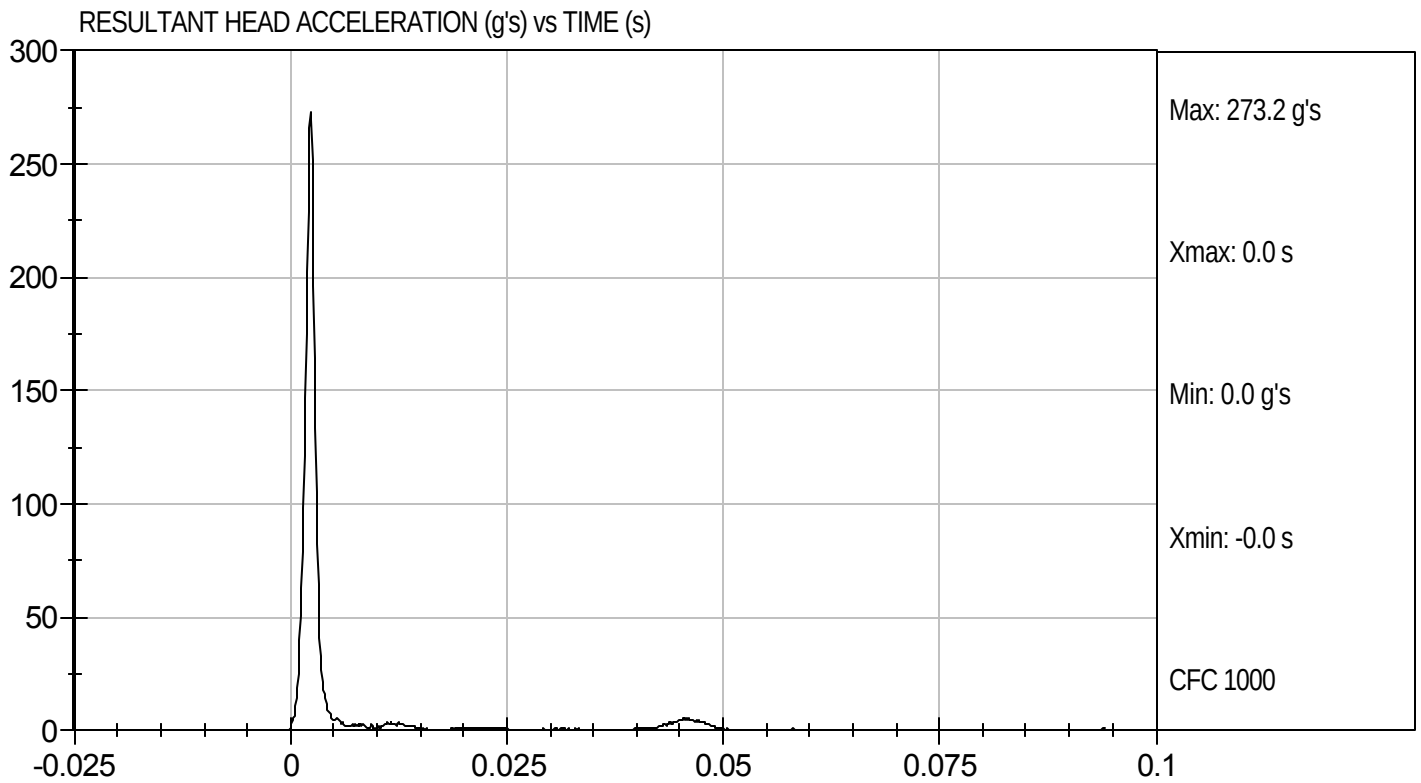
8/2/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D102481

Test Date: 8/2/10
Velocity: 0 ft/s, 0.00 m/s



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102482

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	47	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.8	Pass
	30 ms	m/s	5.8 to 7.0	6.7	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	69	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
Overall Results				Pass	


Laboratory Technician

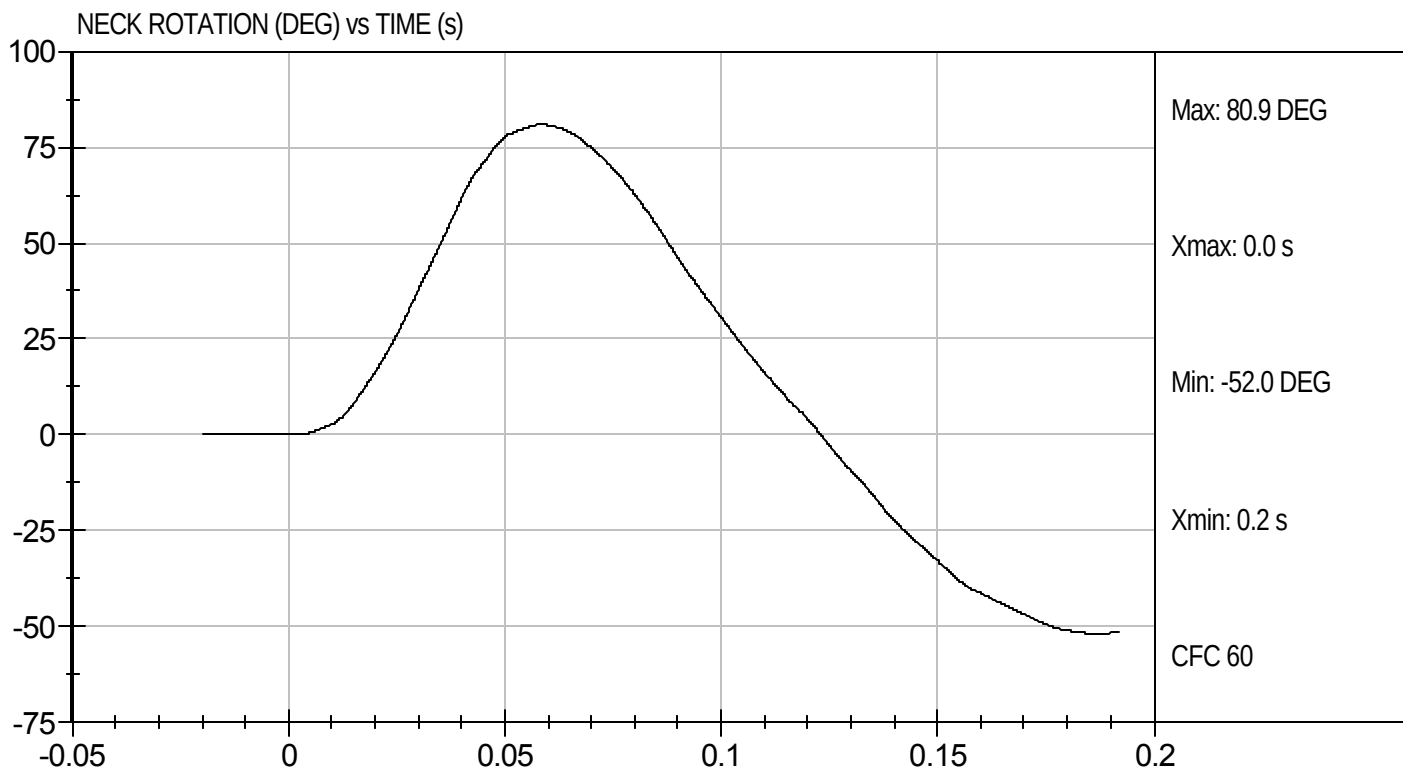
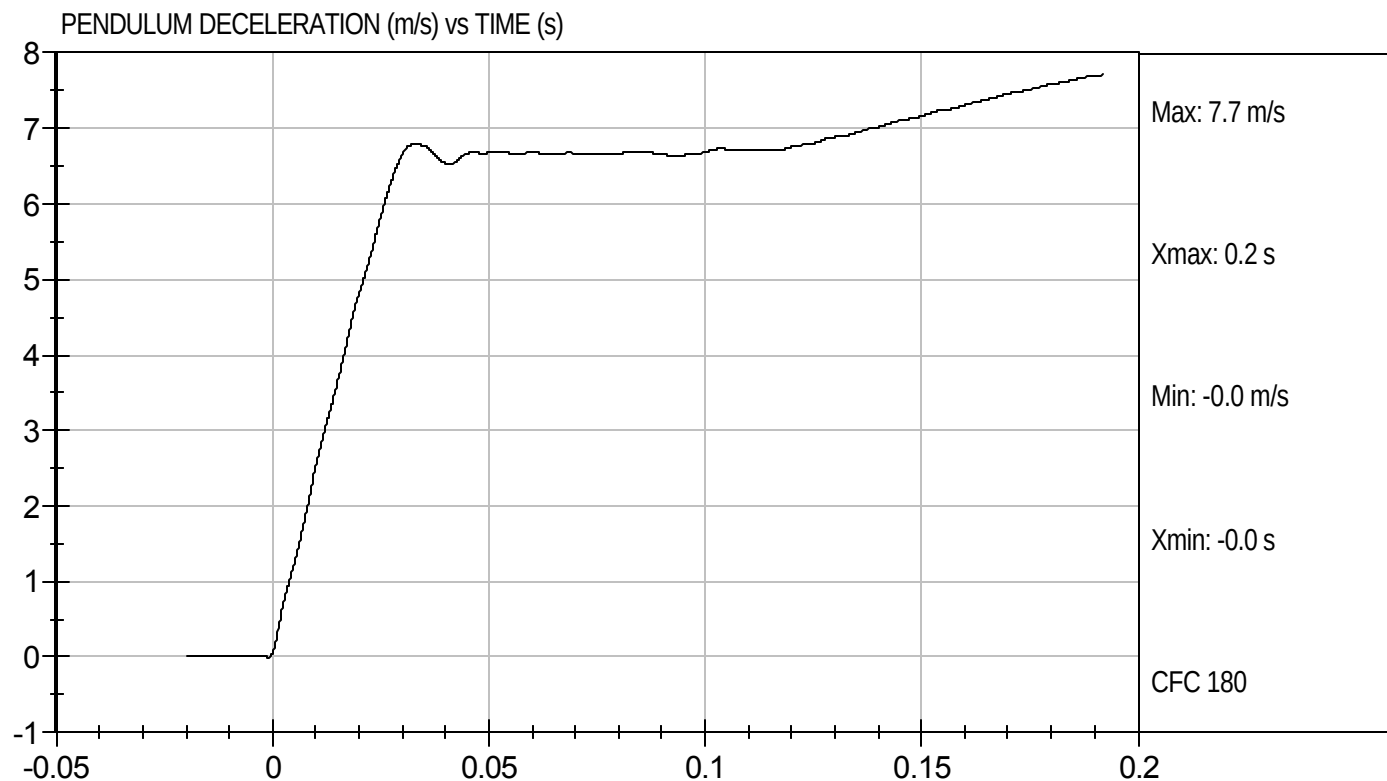
7/30/10
Test Date


Approved By



Test Desc: Neck Flexion
Component ID: D102482

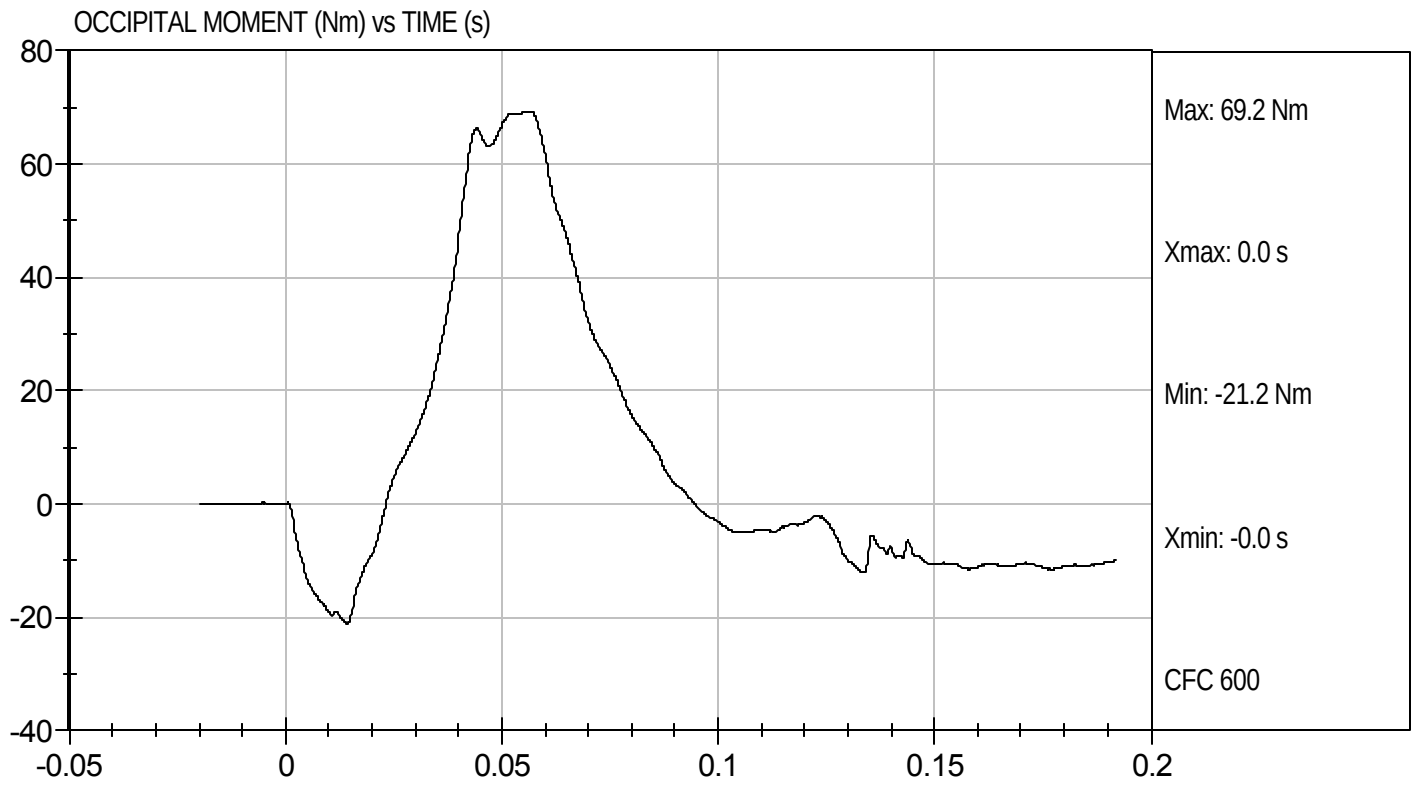
Test Date: 7/30/10
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D102482

Test Date: 7/30/10
Velocity: 23.15 ft/s, 7.06 m/s

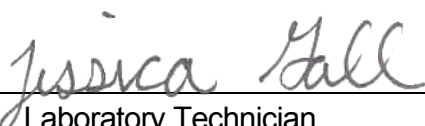


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102483

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	47	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.2	Pass
D Plane Rotation	Max	deg	99 to 114	101	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-56	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	99	Pass
Overall Results					Pass


 Laboratory Technician

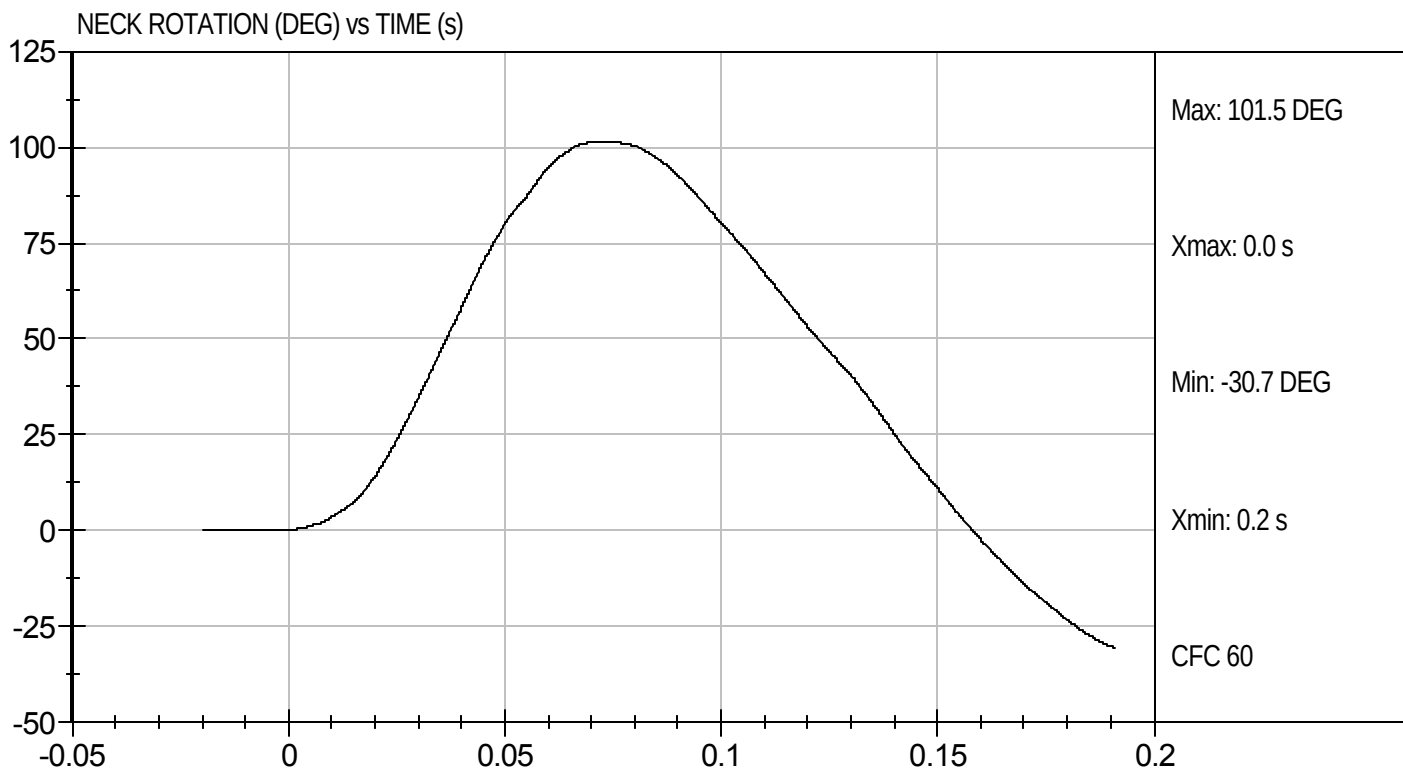
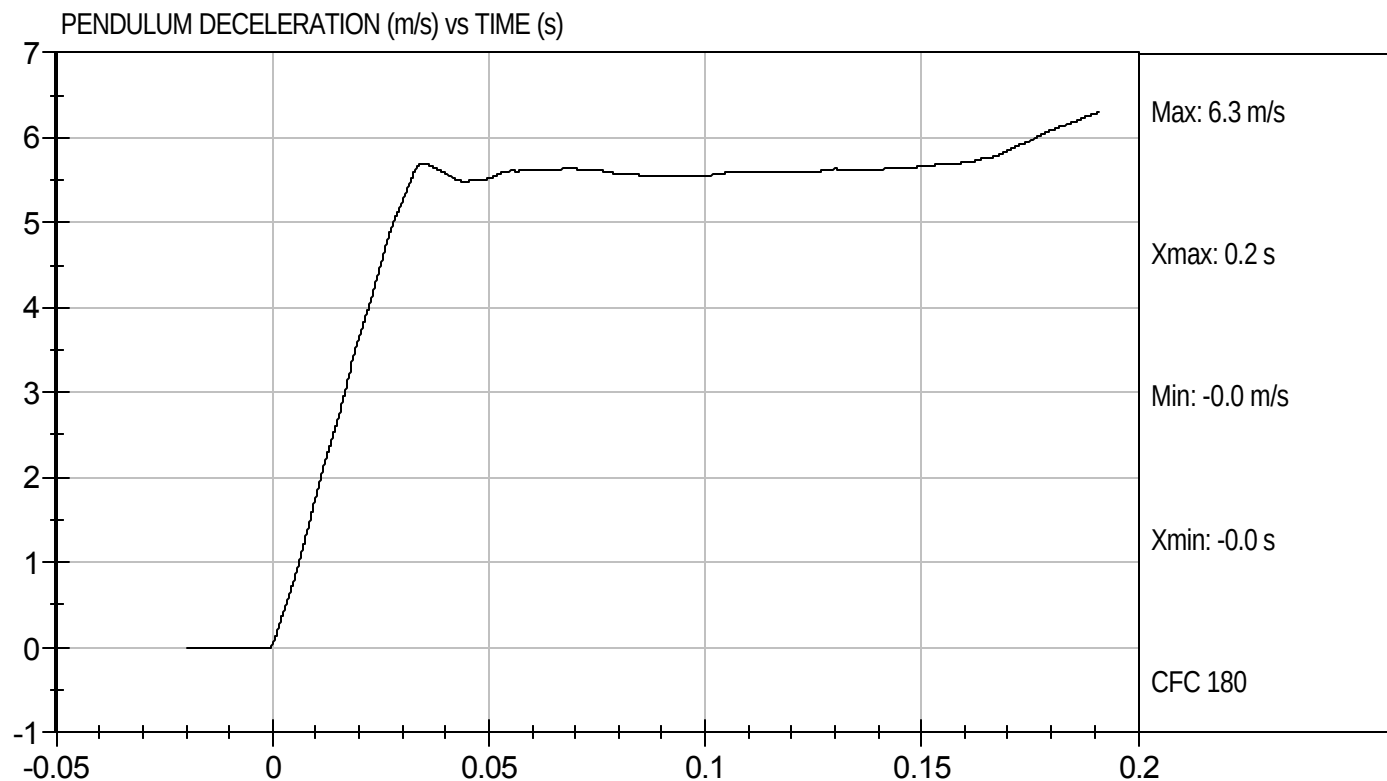
7/30/10
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D102483

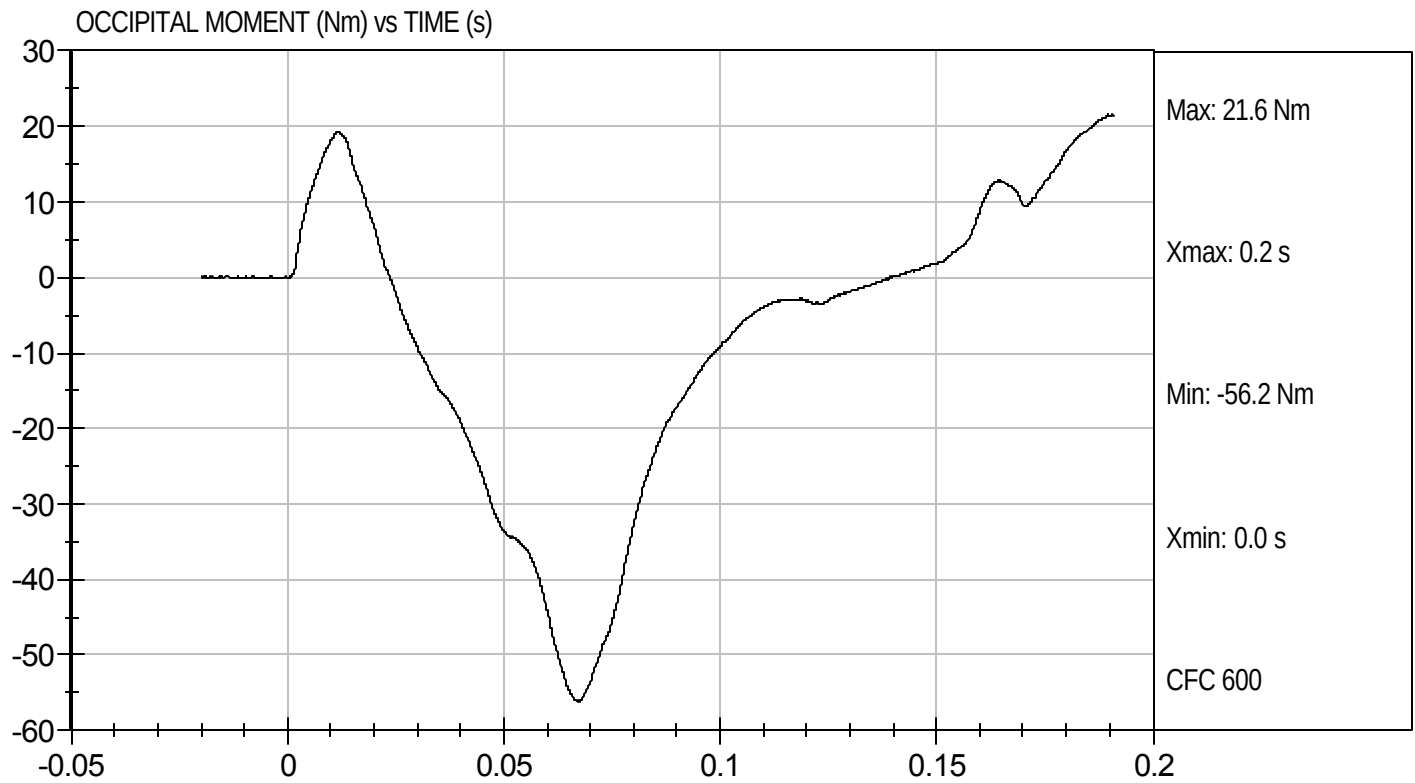
Test Date: 7/30/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D102483

Test Date: 7/30/10
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102484

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	6.77	Pass
Peak Deflection	mm	50 to 58	55	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.14	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4033	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

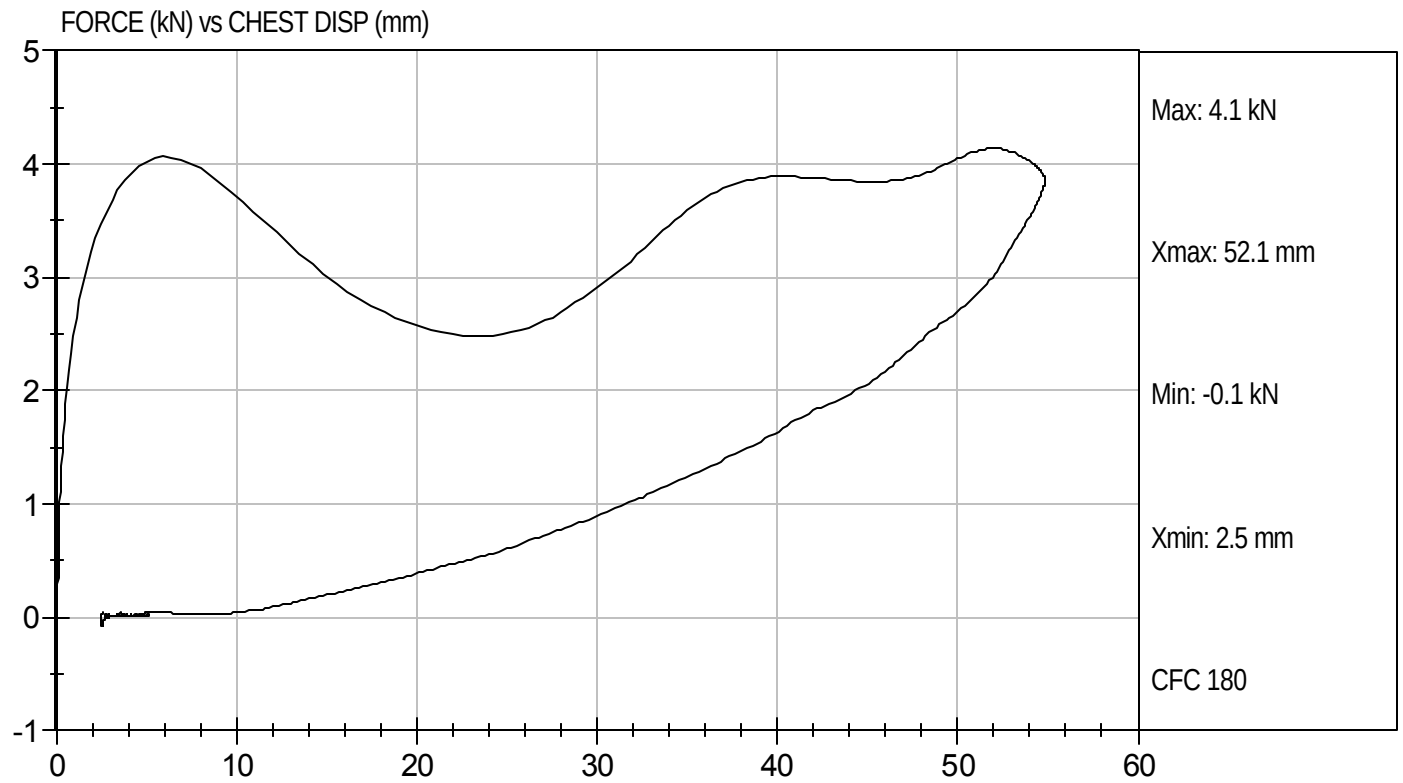
8/2/10
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D102484

Test Date: 8/2/10
Velocity: 22.22 ft/s, 6.77 m/s



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

ATD Serial No: 634

Test I.D: D102485

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.09	Pass
Maximum Force	kN	3.45 to 4.06	3.70	Pass
Overall Test Results				Pass


Laboratory Technician

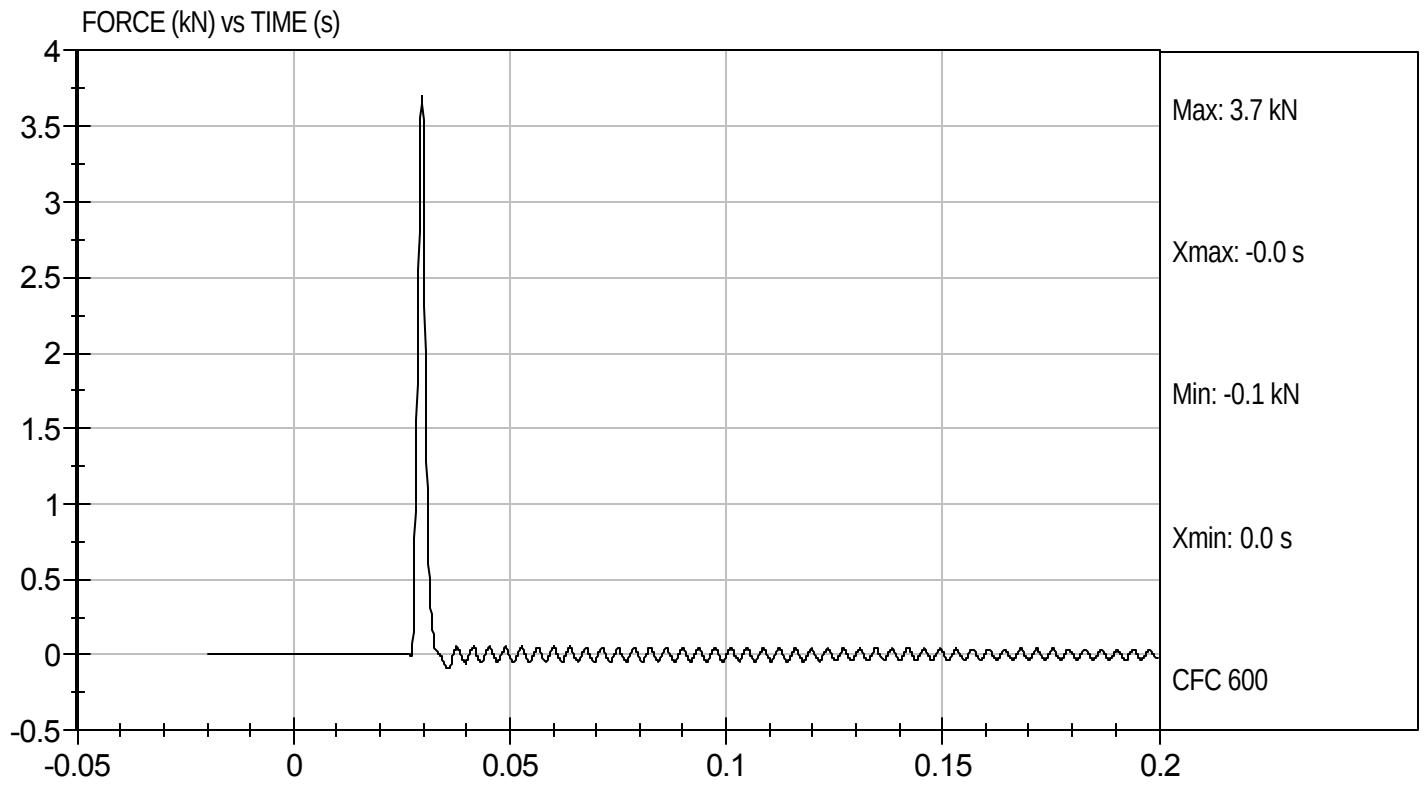
7/30/10
Test Date


Approved By



Test Desc: Right Knee
Component ID: D102485

Test Date: 7/30/10
Velocity: 6.86 ft/s, 2.09 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102486

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.92	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

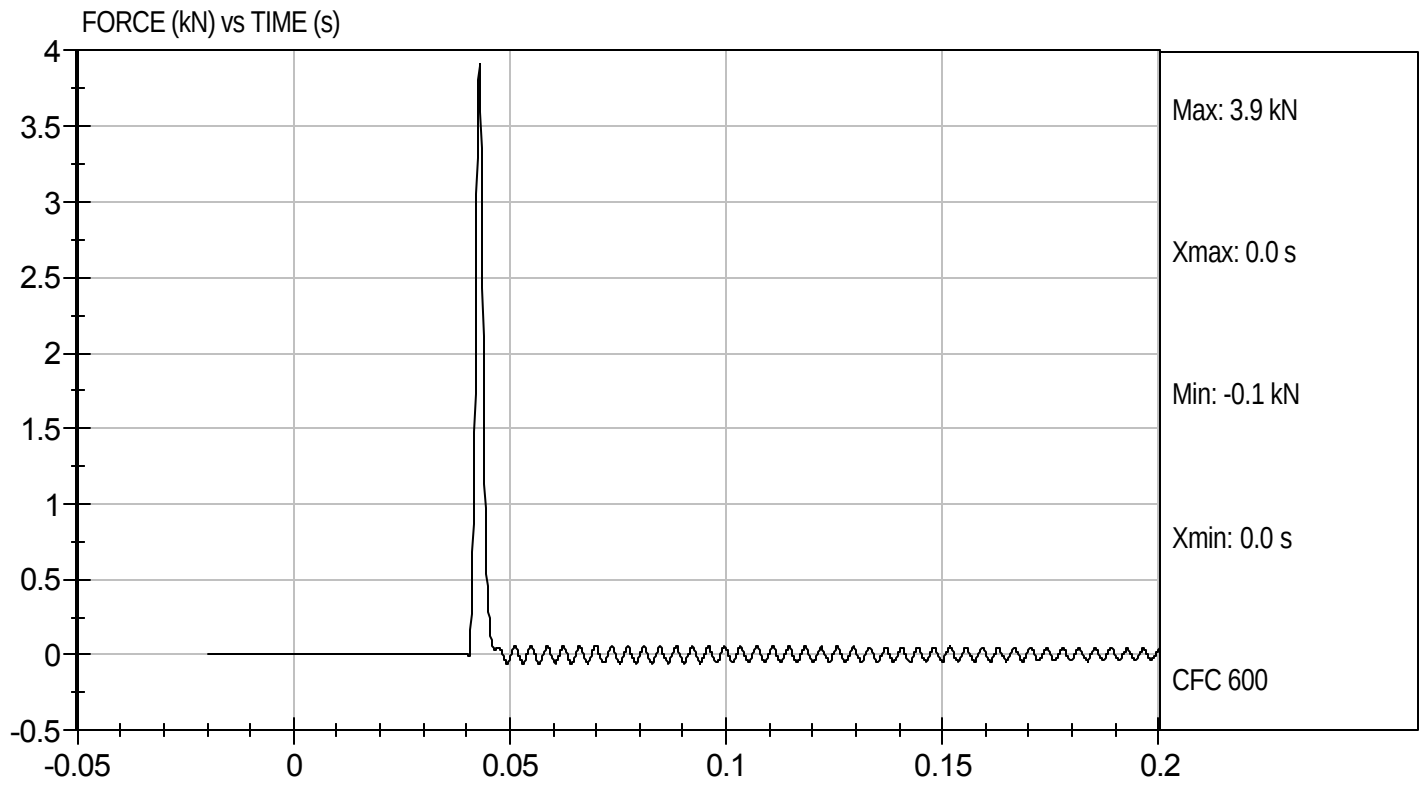
7/30/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D102486

Test Date: 7/30/10
Velocity: 6.97 ft/s, 2.12 m/s

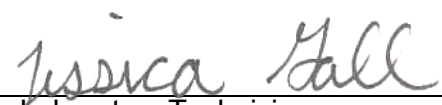


MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D102487

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	6	Pass
Force at 45 deg	N	320 to 390	386	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass


Laboratory Technician

8/2/10
Test Date


Approved By