

REPORT NUMBER: NCAP-MGA-2011-027

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

**HONDA OF AMERICA MFG., INC.
2011 Honda Accord LX 4-Dr Sedan
NHTSA No.: MB5305**

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



Test Date: September 30, 2010

Final Report Date: October 28, 2010

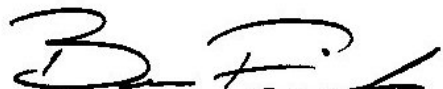
FINAL REPORT

**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: October 28, 2010

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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NHTSA, Office of Crashworthiness Standards

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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 Accord LX 4-Dr Sedan 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 September 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 564 mm 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">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>99</td> <td>146</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>52</td> <td>25</td> <td>16</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>1</td> <td>0.29</td> <td>0.35</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>2620</td> <td>842</td> <td>864</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>2520</td> <td>148</td> <td>214</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1930</td> <td>1048</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1293</td> <td>2146</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	99	146	Maximum Chest Compression	mm	63	52	25	16	Nij	N/A	1	1	0.29	0.35	Neck Tension	N	4170	2620	842	864	Neck Compression	N	4000	2520	148	214	Left Femur Force	N	10008	6805	1930	1048	Right Femur Force	N	10008	6805	1293	2146
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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 Accord LX 4-Dr Sedan at a velocity of 56.5 kph. The test was performed at MGA Research Corporation on September 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 belts 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 96 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 564 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 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 glovebox.

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)	99	68.5	83.5	25	0.29	842	148	1930	1293
Passenger (5 th)	146	59.6	74.6	16	0.35	864	214	1048	2146

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

TEST NOTES

There was no valid data collected for:
Bottom of Engine X after 20 msec.
Left Brake Caliper X after 60 msec.

No barrier load cells were used for this test.

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 Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB5305	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	No
Make	Honda	Power Steering	Yes
Model	Accord	Driver Front Airbag	Yes
Body Style	Sedan	Driver Curtain Airbag	Yes
VIN	1HGCP2F39BA002902	Driver Head/Torso Airbag	No
Body Color	Polished Metal M.	Driver Torso Airbag	No
Delivery Date	9/13/2010	Driver Torso/Pelvis Airbag	Yes
Odometer (mi)	42	Driver Pelvis Airbag	No
Odometer (km)	68	Driver Knee Airbag	No
Dealer	Rosen Honda	Pass. Front Airbag	Yes
Transmission	Automatic	Pass. Curtain Airbag	Yes
Final Drive	Front	Pass. Head/Torso Airbag	No
Type/No. Cylinders	4	Pass. Torso Airbag	No
Engine Displacement (L)	2.4	Pass. Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Pass. Pelvis Airbag	No
Roof Rack	No	Pass. Knee Airbag	No
Sunroof/T-Top	No	Pretensioners	Yes
Tinted Glass	No	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 of America Mfg., Inc.	GVWR (kg)	1950
Date of Manufacture	08/'10	GAWR Front (kg)	1060
		GAWR Rear (kg)	915

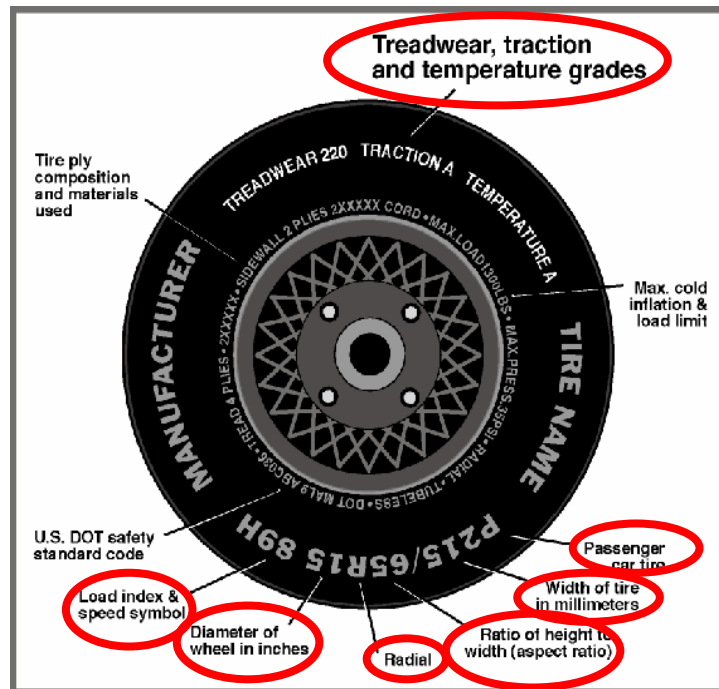
VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				385
Cargo Weight (RCLW) (kg)				45

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

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	210	210
Recommended Tire Size	P215/60R16	P215/60R16
Tire Size on Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Dunlop	Dunlop
Tire Model	Sport 7000	Sport 7000
Treadwear	340	340
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index & Speed Symbol	94H	94H
Tire Material	Rubber	Rubber
DOT Safety Code Right	M6X8 JA2R	M6X8 JA2R
DOT Safety Code Left	M6X8 JA2R	M6X8 JA2R

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

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	451.8	292.6		490.3	360.2	
Right	kg	445.9	293.5		473.1	339.3	
Ratio	%	60.5	39.5		57.9	42.1	
Totals	kg	897.7	586.1	1483.8	963.4	699.5	1662.9

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1483.8
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Target Vehicle Target Weight (TVTW)	kg	1669.4

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	691	693	703	708	1104
As Tested	mm	682	685	680	681	1175
Post Test	mm	673	683	683	675	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2794
Total Vehicle Length at Left Side	mm	4814
Total Vehicle Length at Centerline	mm	4964
Total Vehicle Length at Right Side	mm	4814
Weight of Ballast in Cargo Area	kg	25.9
Weight of Vehicle Components Removed	kg	10.0
Amount of Stoddard Solvent in Fuel Tank	L	65.1

List of components removed to meet test weight: Spare tire & tools, trunk carpet, right tail light.

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

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4964
2	Total Width	1850
3	Bumper Top Height	530
4	Bumper Bottom Height	435
5	Longitudinal Member Top Height	520
6	Distance between Longitudinal Members	950
7	Longitudinal Member Width	105
8	Engine Top Height	819
9	Engine Bottom Height	170
10	Engine and Gearbox Width	680
11	Front Bumper-Engine Distance	520
12	Front Shock Absorber Fixing Height	830
13	Bonnet Leading Edge Height	779
14	Front Shock Absorber Fixing Width	150
15	Front Bumper – Front Axle Distance	1015
16	Front Axle – A-Pillar Distance	495
17	A-Pillar – B-Pillar Distance	1129
18	B-Pillar – Rear Axle Distance	1174
19	B-Pillar – C-Pillar Distance	1195
20	Roof Sill Bottom Height	1330
21	Roof Sill Top Height	1444
22	Floor Sill bottom Height	195
23	Floor Sill Top Height	393

DATA SHEET NO. 2

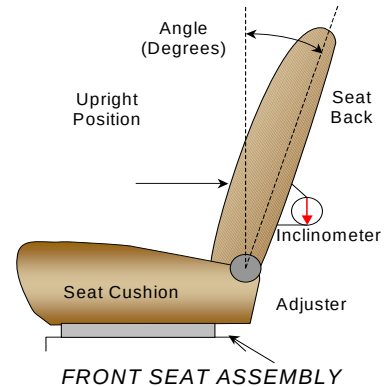
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

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	4 th detent (forward-most as 0)
Passenger Seat Back Angle	2 nd detent (forward-most as 0)

SEAT FORE/AFT POSITIONS

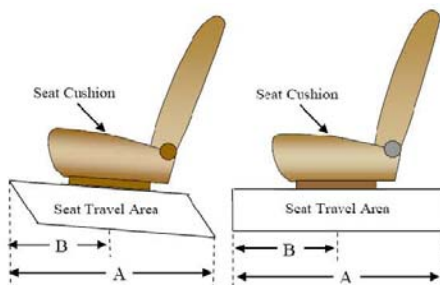
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

SEAT FORE/AFT POSITIONS	Total Fore/Aft Travel	Placed in Position #
Driver Seat	25 detents	11 th detent (forward-most as 0)
Passenger Seat	25 detents	0 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 Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

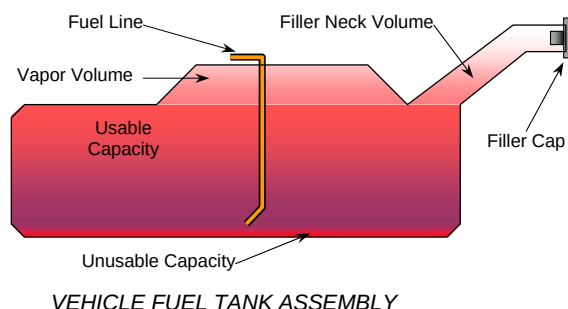
NHTSA No.: MB5305
 Test Date: 9/30/2010

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	70.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	64.4 to 65.8
Actual Amount of Solvent used	65.1
1/3 of Usable Capacity	23.3

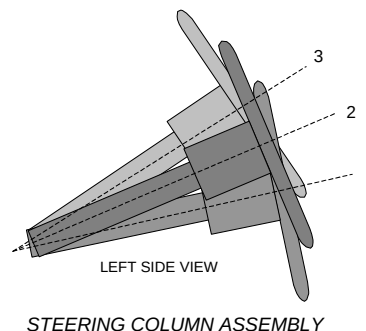
Describe the fuel pump type, its behavior, and the location of the fuel filler pipe.

The vehicle is equipped with an electric fuel pump. 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

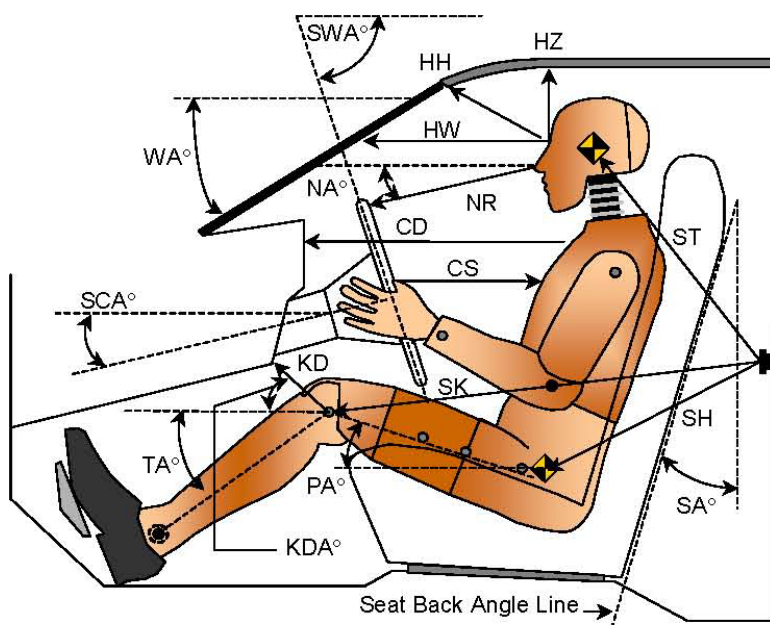
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	71.1	264
Geometric Center – Position 2	67.6	247
Uppermost – Position 3	64.1	230
Telescoping Steering Wheel Travel		34
Test Position	67.6	247

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

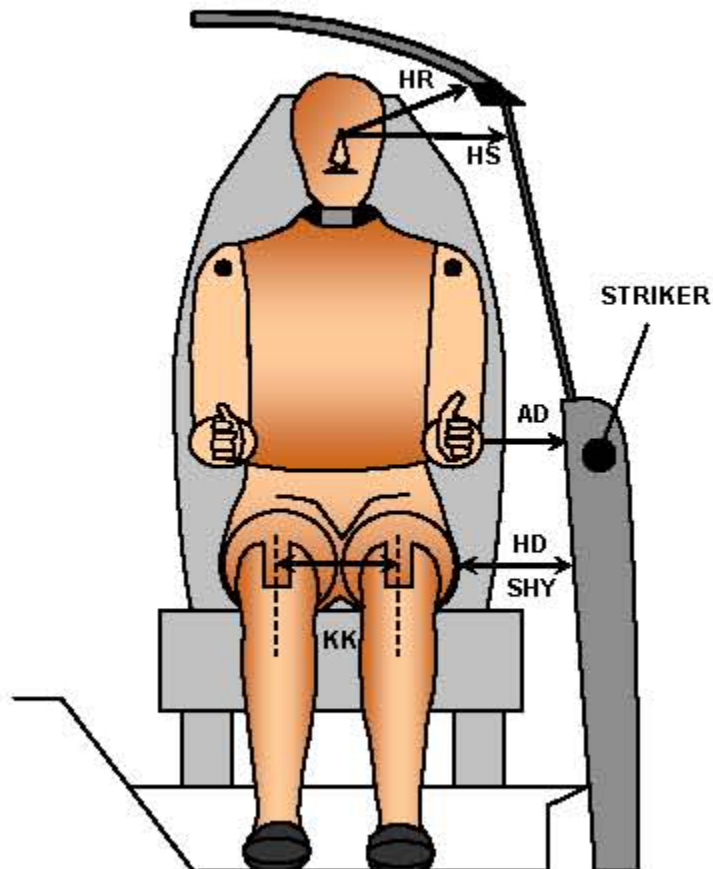


Code	Measurement Description	Driver S/N 351		Passenger S/N 634	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		27.9		
SWA	Steering Wheel Angle		67.6		
SCA	Steering Column Angle		22.4		
SA	Seat Back Angle (headrest bezel)		9.4		3.1
HZ	Head to Roof (Z)	198	90	214	90
HH	Head to Header	332	26.8	266	48.4
HW	Head to Windshield	599	0	600	0
NR	Nose to Rim	384	8.2		
CD	Chest to Dash	540		383	
CS	Chest to Steering Hub	311	1.9		
RA	Rim to Abdomen	188	0		
KDL	Left Knee to Dash	131	38.6	104	41.5
KDR	Right Knee to Dash	130	36.6	102	37.7
PA	Pelvic Angle		22.2		19.7
TA	Tibia Angle		46.3		47.4
SK	Striker to Knee	589	97.3	696	97.2
ST	Striker to Head	497	9.2	501	32.0
SH	Striker to H-Point	258	131.7	405	111.2

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
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NHTSA No.: MB5305
 Test Date: 9/30/2010

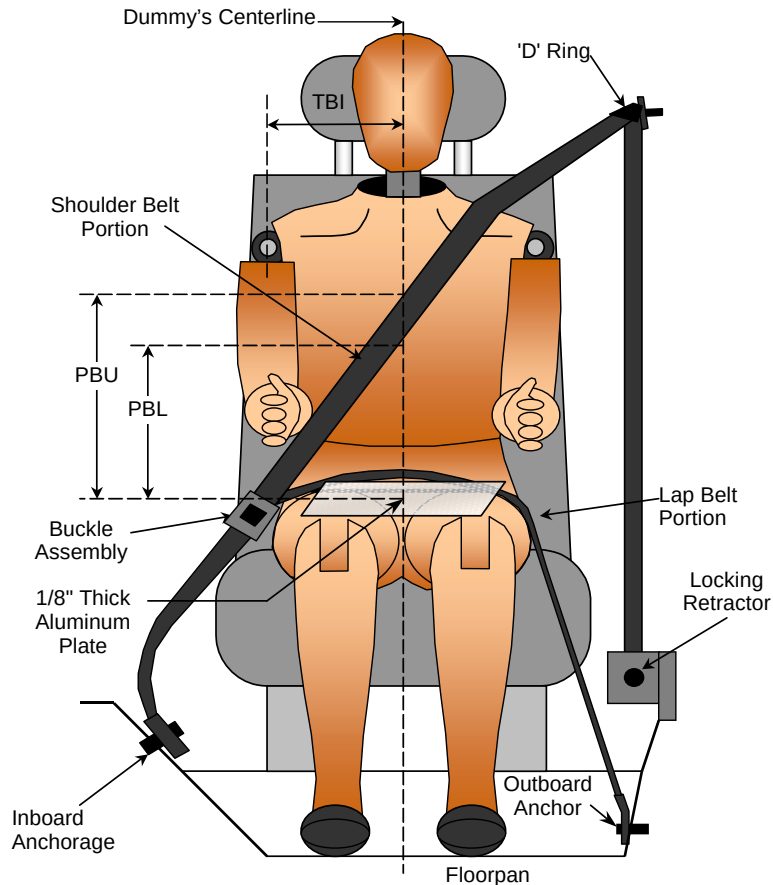


Code	Measurement Description	Driver S/N 351	Passenger S/N 634
		Length (mm)	
AD	Arm to Door	152	97
HD	H-Point to Door	160	200
HR	Head to Side Header	205	245
HS	Head to Side Window	332	354
KK	Knee to Knee	327	220
SHY	Striker to H-Point (Y Direction)	300	305
AA	Ankle to Ankle	345	162

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

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	370	310
PBL - To surface of reference to belt lower edge	mm	285	220

BELT LENGTH DATA

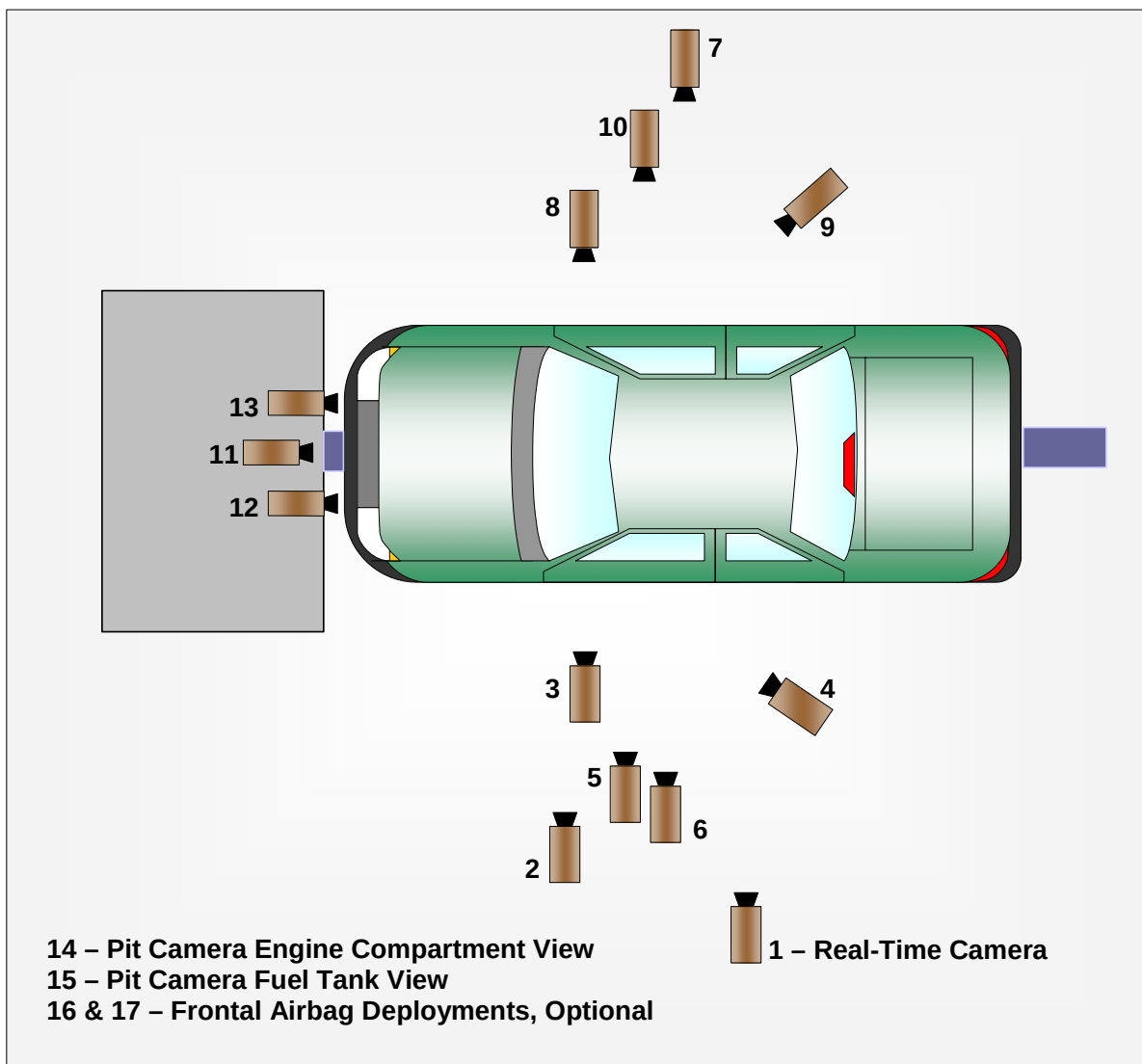
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	950	920
Lap Belt Length as measured on ATD	mm	500	500
Remainder of belt of reel	mm	1870	1880
Total Belt Length for Continuous Webbing Systems	mm	3320	3300

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

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
Test Date: 9/30/2010

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)

CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

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	1050	-5110	-1170	24	1000
3	Driver Close-Up	1540	-6580	-1610	35	1000
4	Driver Angle	5410	-4730	-1900	50	1000
5	Steering Column Top	790	-5150	-1250	25	1000
6	Steering Column Bottom	770	-5130	-840	25	1000
7	Right Overall	2180	6760	-1080	20	1000
8	Passenger Close-Up	1590	6200	-1670	35	1000
9	Passenger Angle	5440	4970	-1840	50	1000
10	Right Front Half	1030	5130	-1140	24	1000
11	Windshield	-260	0	-2860	24	1000
12	Top Driver	-30	-360	-2270	8	1000
13	Top Passenger	-30	360	-2270	8	1000
14	Pit Front	1150	0	3150	24	1000
15	Pit Rear	3230	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

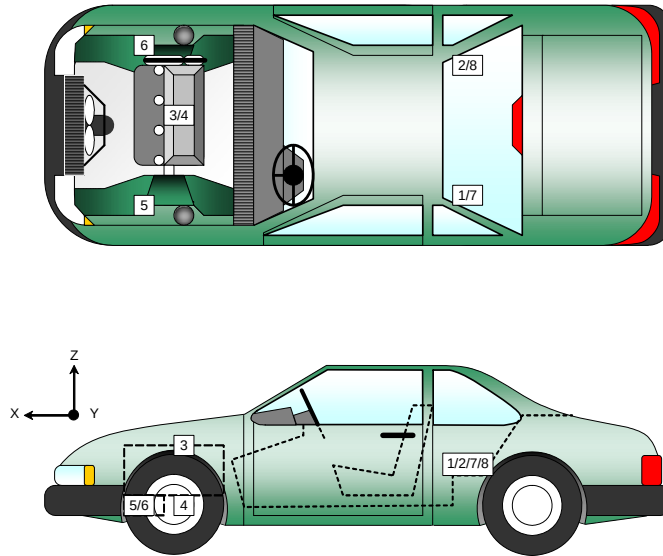
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 16 & 17 were not used for this test.

DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member X	2066	-390	-195
2	Right Rear X-Member X	2066	390	-195
3	Engine Top X	4094	0	-817
4	Engine Bottom X	4105	0	-240
5	Left Brake Caliper X	4015	-697	-225
6	Right Brake Caliper X	4015	697	-225
7	Left Rear X-Member Z	2066	-390	-195
8	Right Rear X-Member Z	2066	390	-195

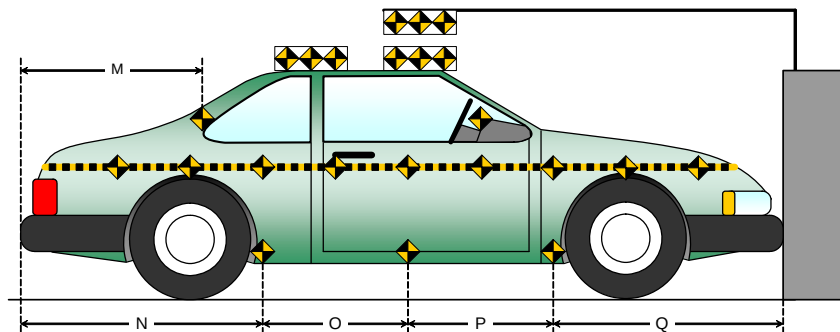
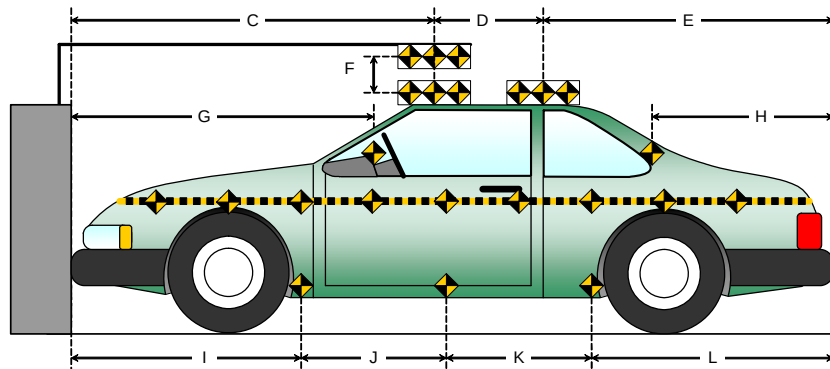
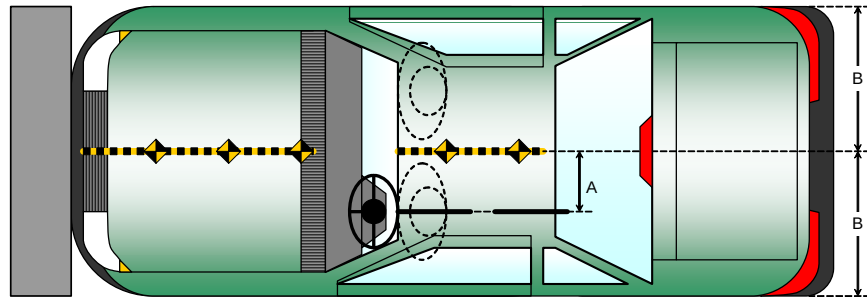
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

Item	Value (mm)
A	375
B	925
C	2465
D	668
E	1831
F	110
G	
H	1123
I	1447
J	970
K	960
L	1587
M	1120
N	1587
O	961
P	967
Q	1449



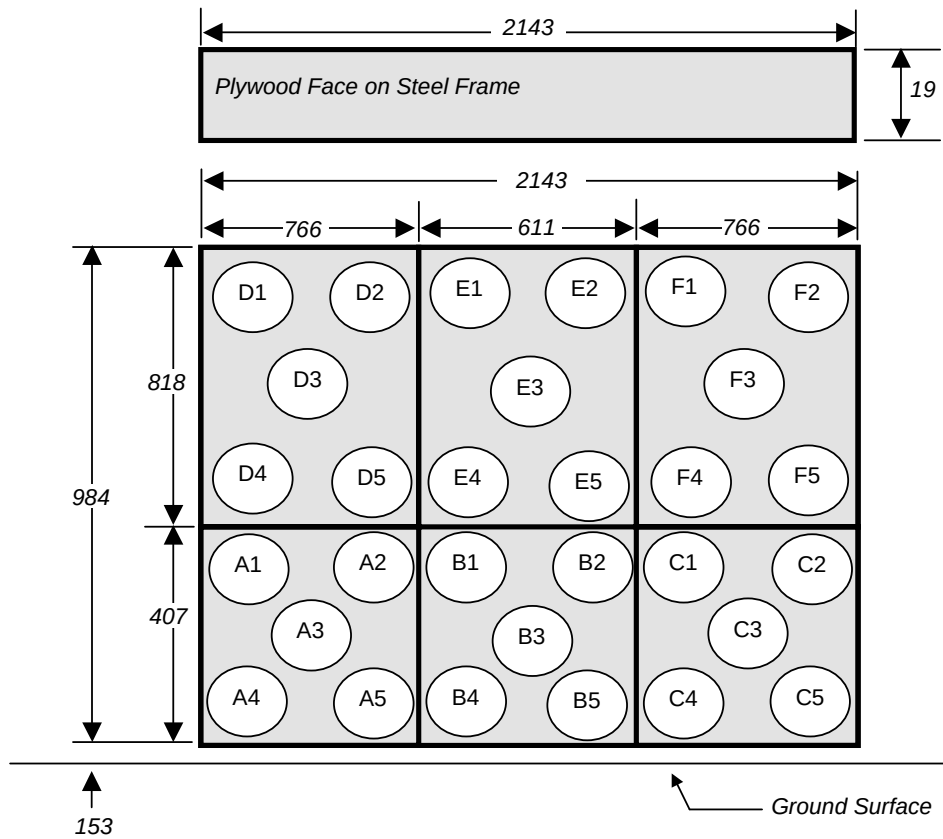
DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

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 Accord LX 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
Test Date: 9/30/2010

INSTRUMENTATION

Driver Dummy Data Channels	44
Passenger Dummy Data Channels	44
Vehicle Structure Accelerometers	8
Barrier Channels	0 (see test notes)
Total	96

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 Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

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	Airbag	Airbag
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	723
Center	mm	683
Right Side	mm	762
Average	mm	723

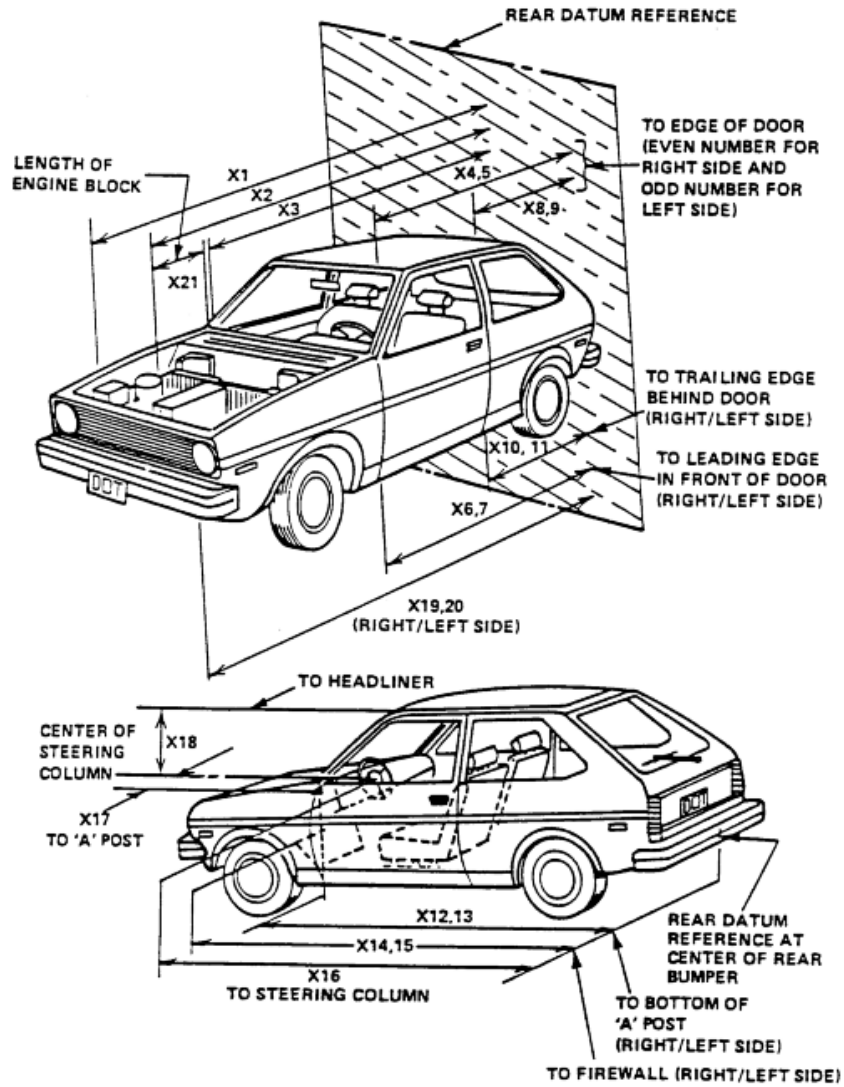
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12 **VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4964	4400	564
2	RSOV to Front of Engine	mm	4215	3982	233
3	RSOV to Firewall	mm	3820	3819	1
4	RSOV to Upper Leading Edge of Right Door	mm	3389	3389	0
5	RSOV to Upper Leading Edge of Left Door	mm	3402	3396	6
6	RSOV to Lower Leading Edge of Right Door	mm	3393	3392	1
7	RSOV to Lower Leading Edge of Left Door	mm	3404	3398	6
8	RSOV to Upper Trailing Edge of Right Door	mm	2253	2255	-2
9	RSOV to Upper Trailing Edge of Left Door	mm	2271	2255	16
10	RSOV to Lower Trailing Edge of Right Door	mm	2281	2279	2
11	RSOV to Lower Trailing Edge of Left Door	mm	2284	2280	4
12	RSOV to Bottom of "A" Post of Right Side	mm	3347	3346	1
13	RSOV to Bottom of "A" Post of Left Side	mm	3357	3353	4
14	RSOV to Firewall, Right Side	mm	3759	3752	7
15	RSOV to Firewall, Left Side	mm	3729	3720	9
16	RSOV to Steering Column	mm	2920	2905	15
17	Center of Steering Column to "A" Post	mm	357	338	19
18	Center of Steering Column to Headliner	mm	426	400	26
19	RSOV to Right Side of Front Bumper	mm	4814	4312	502
20	RSOV to Left Side of Front Bumper	mm	4814	4358	456
21	Length of Engine Block	mm	280	280	0
RD	RSOV to Right Side of Dash Panel	mm	3024	3015	9
CD	RSOV to Center of Dash Panel	mm	3090	3079	11
LD	RSOV to Left Side of Dash Panel	mm	3035	3021	14

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

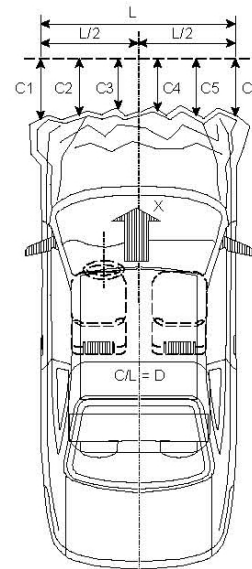
NHTSA No.: MB5305
 Test Date: 9/30/2010

VEHICLE INFORMATION

VIN: 1HGCP2F39BA002902 Wheelbase (mm): 2794
 Vehicle Size Category: Sedan Test Weight (kg): 1662.9

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): 56.5
 Velocity Change (km/h): 66.6
 Time of Separation (msec): 121.1



CRUSH PROFILE

Collision Deformation Classification: Frontal
 Midpoint of Damage: Centerline
 Damage Region Length (mm): 1060
 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4814	4358	456
C2	Crush zone 2 at left side	mm	4885	4384	501
C3	Crush zone 3 at left side	mm	4910	4395	515
C4	Crush zone 4 at right side	mm	4910	4384	526
C5	Crush zone 5 at right side	mm	4885	4337	548
C6	Crush zone 6 at right side	mm	4814	4312	502
L	C1 TO C6	mm	1060	1050	10

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

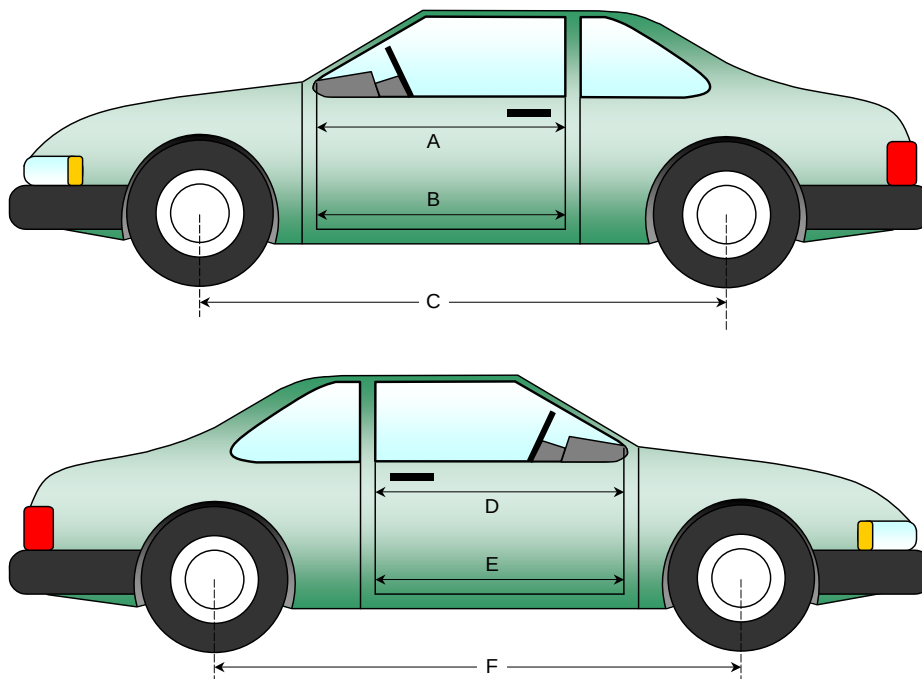
NHTSA No.: MB5305
 Test Date: 9/30/2010

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1065	1060	5
B	Left Side Lower	mm	945	940	5
D	Right Side Upper	mm	1065	1060	5
E	Right Side Lower	mm	945	940	5

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2794	2700	94
F	Right Side Wheelbase	mm	2794	2695	99



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

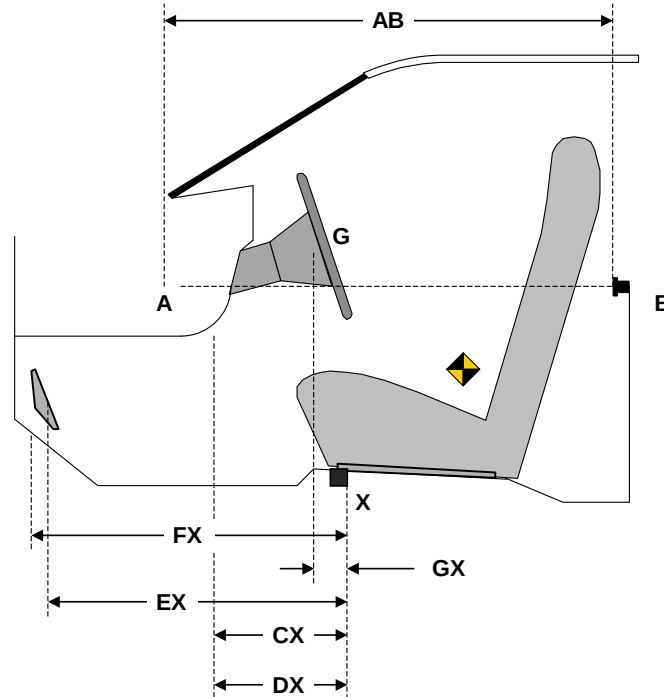
Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	818	816	2
CX	Left Knee Bolster to X	mm	295	296	-1
DX	Right Knee Bolster to X	mm	300	301	-1
EX	Brake Pedal to X	mm	582	585	-3
FX	Foot Rest to X	mm	628	620	8
GX	Center of Steering Column Wheel Hub to X	mm	100	95	5

X = Front of Seat Track (stationary)

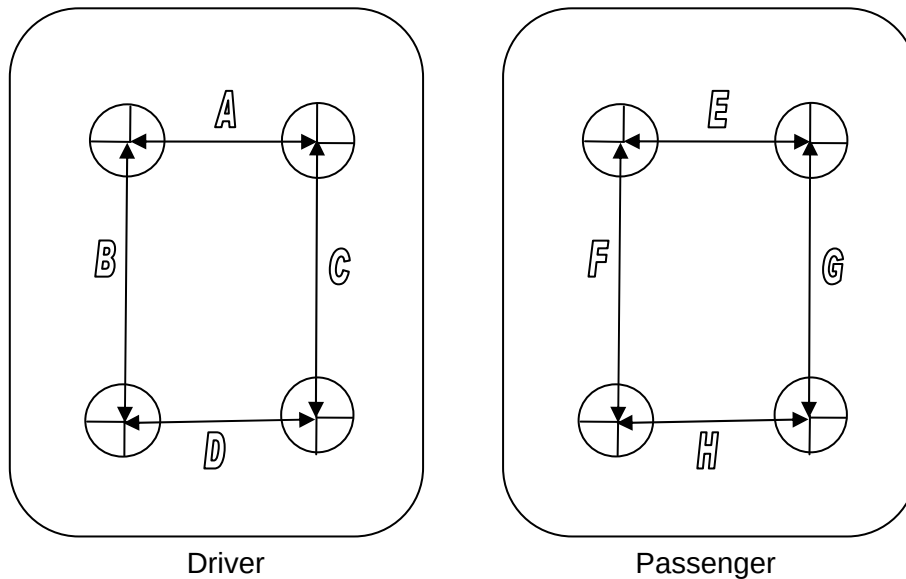


DRIVER COMPARTMENT

DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010



TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	150	150	0
B	mm	150	150	0
C	mm	150	150	0
D	mm	150	150	0
E	mm	150	150	0
F	mm	150	150	0
G	mm	150	150	0
H	mm	150	150	0

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

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

Windshield Mounting Details:

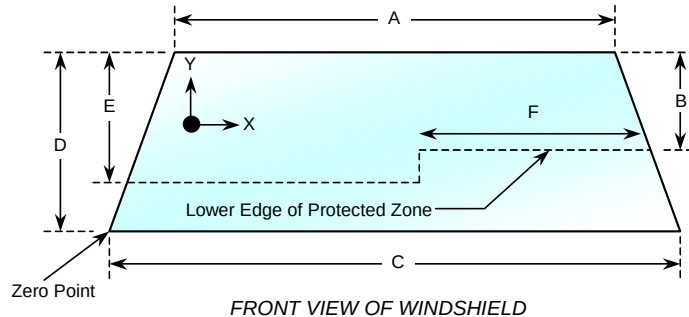
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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	2175	2175	100
Right Side	2175	2175	100
Total	4350	4350	100



Item	Units	Value
A	mm	1200
B	mm	467
C	mm	1530
D	mm	810
E	mm	545
F	mm	514

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 Accord LX 4-Dr Sedan</u>	NHTSA No.:	<u>MB5305</u>
Test Program:	<u>NCAP Frontal Barrier Impact Test</u>	Test Date:	<u>9/30/2010</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Time:	<u>10:11 am</u>	Temperature:	<u>21° C</u>
------------	-----------------	--------------	--------------

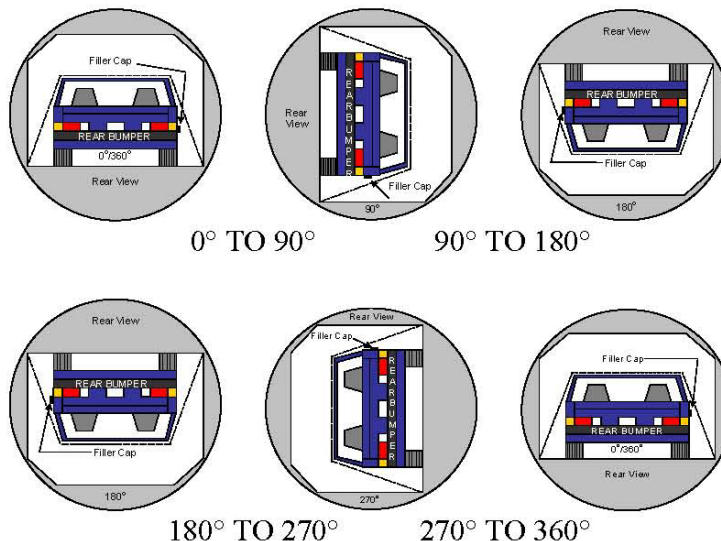
- | | |
|---|--------------|
| A. From impact until vehicle motion ceases:
(Maximum Allowable = 1 ounce) | <u>0</u> oz. |
| B. For the 5 minute period after motion ceases:
(Maximum allowable = 5 ounces) | <u>None</u> |
| C. For the following 25 minutes:
(Maximum allowable = 1 oz./minute) | <u>None</u>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

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2011 Honda Accord LX 4-Dr Sedan
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
 Test Date: 9/30/2010

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°	118	300	418
90° to 180°	118	300	418
180° to 270°	106	300	406
270° to 360°	123	300	423

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

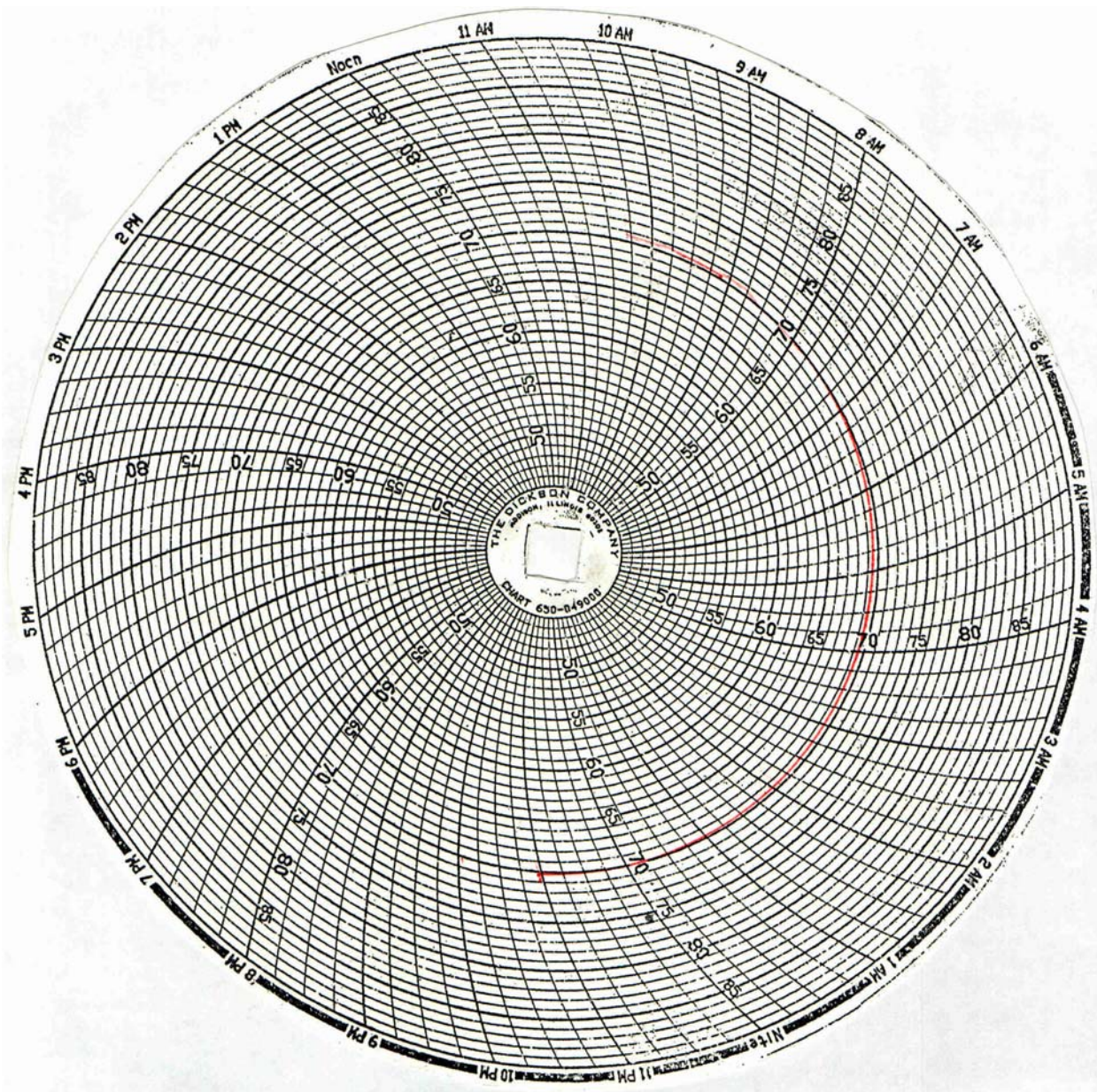
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Accord LX 4-Dr Sedan
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5305
Test Date: 9/30/2010



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

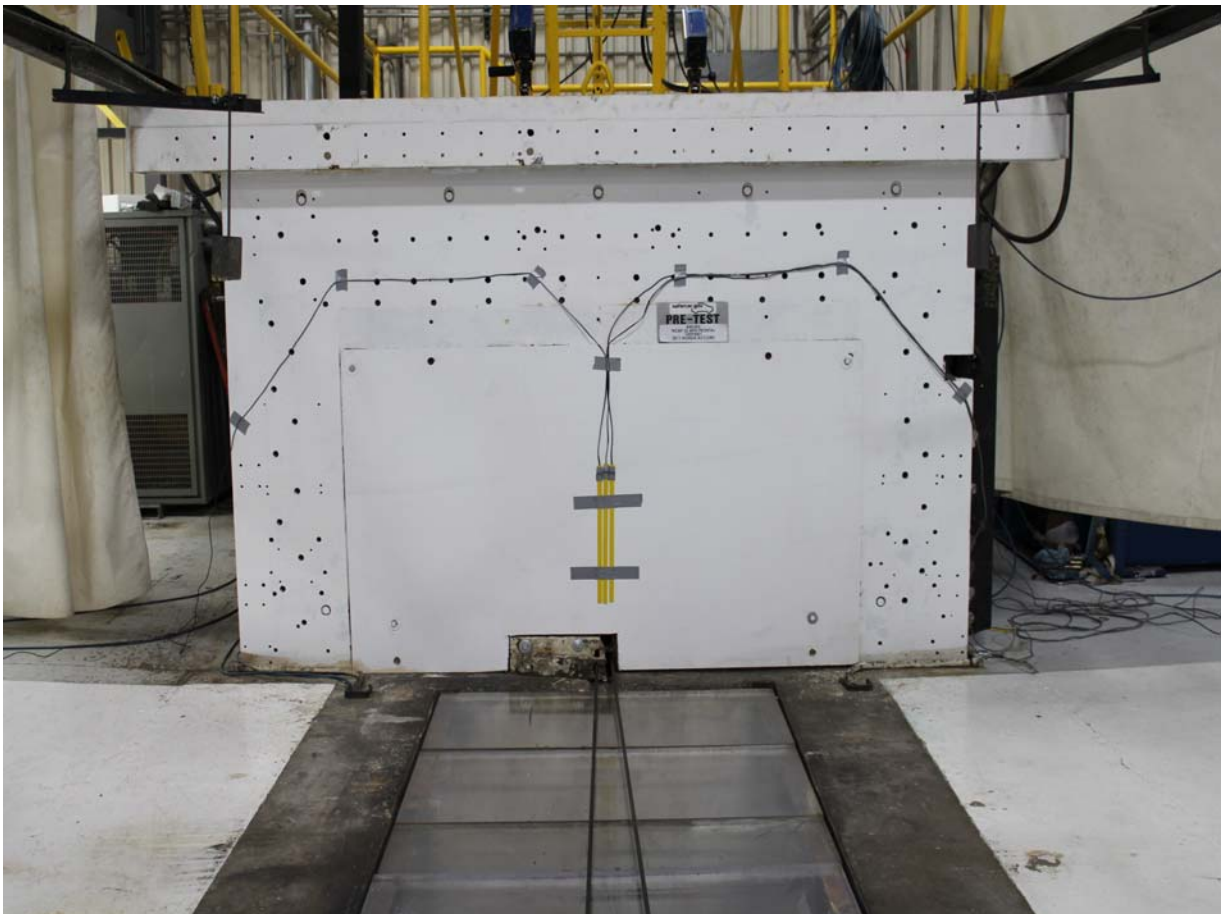
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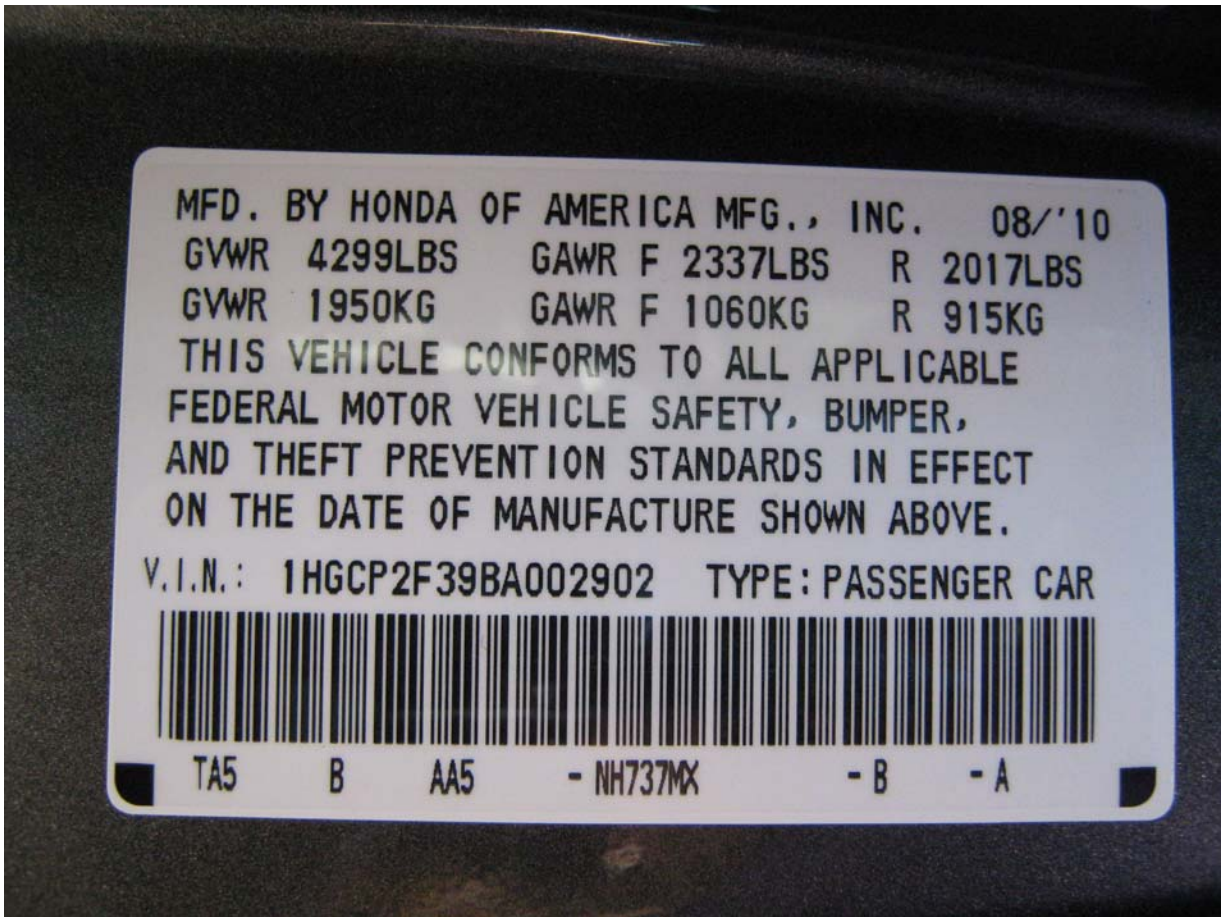
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PHOTOGRAPH NOT APPLICABLE

Load Cell Location



Barrier Wall



Manufacturer's Label



Tire Placard



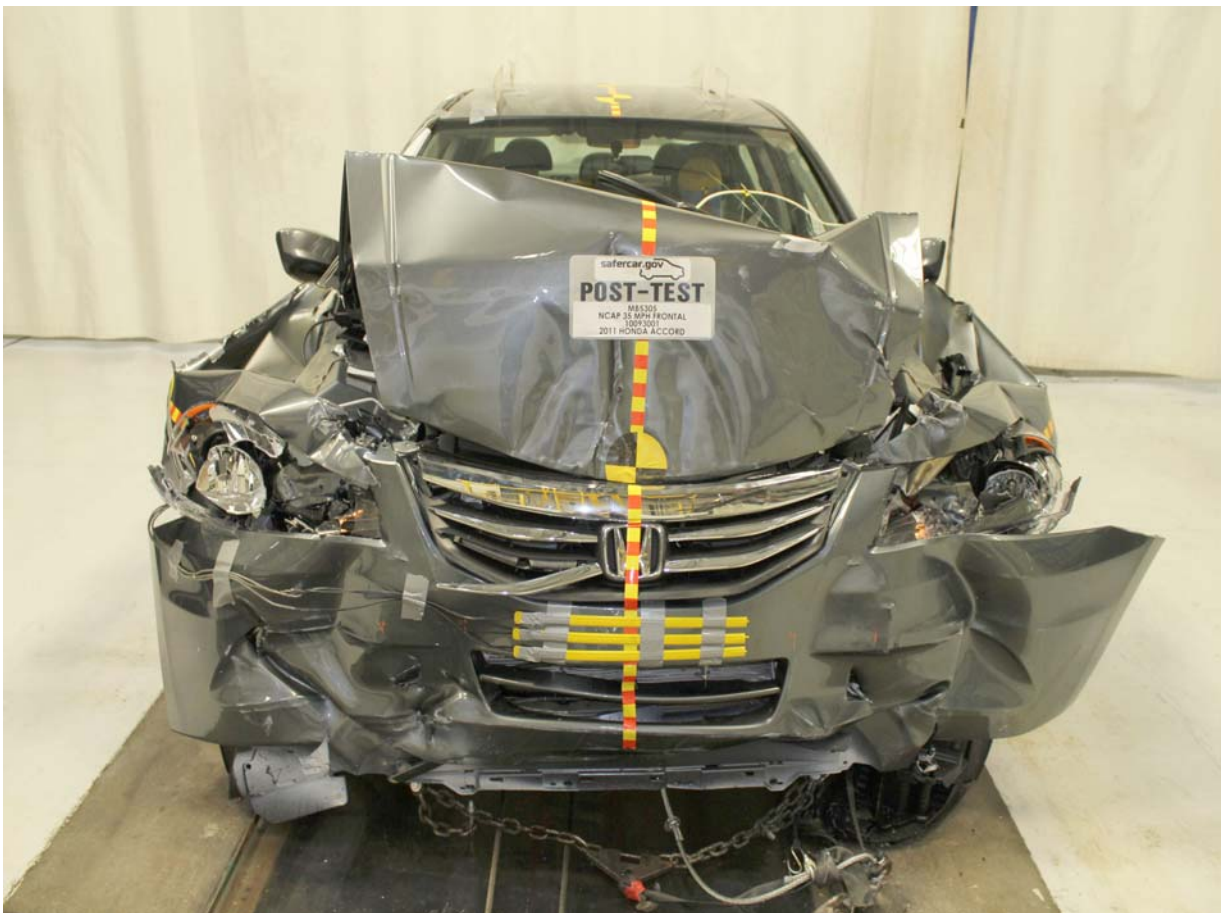
Right Front Three-Quarter View, As Received



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



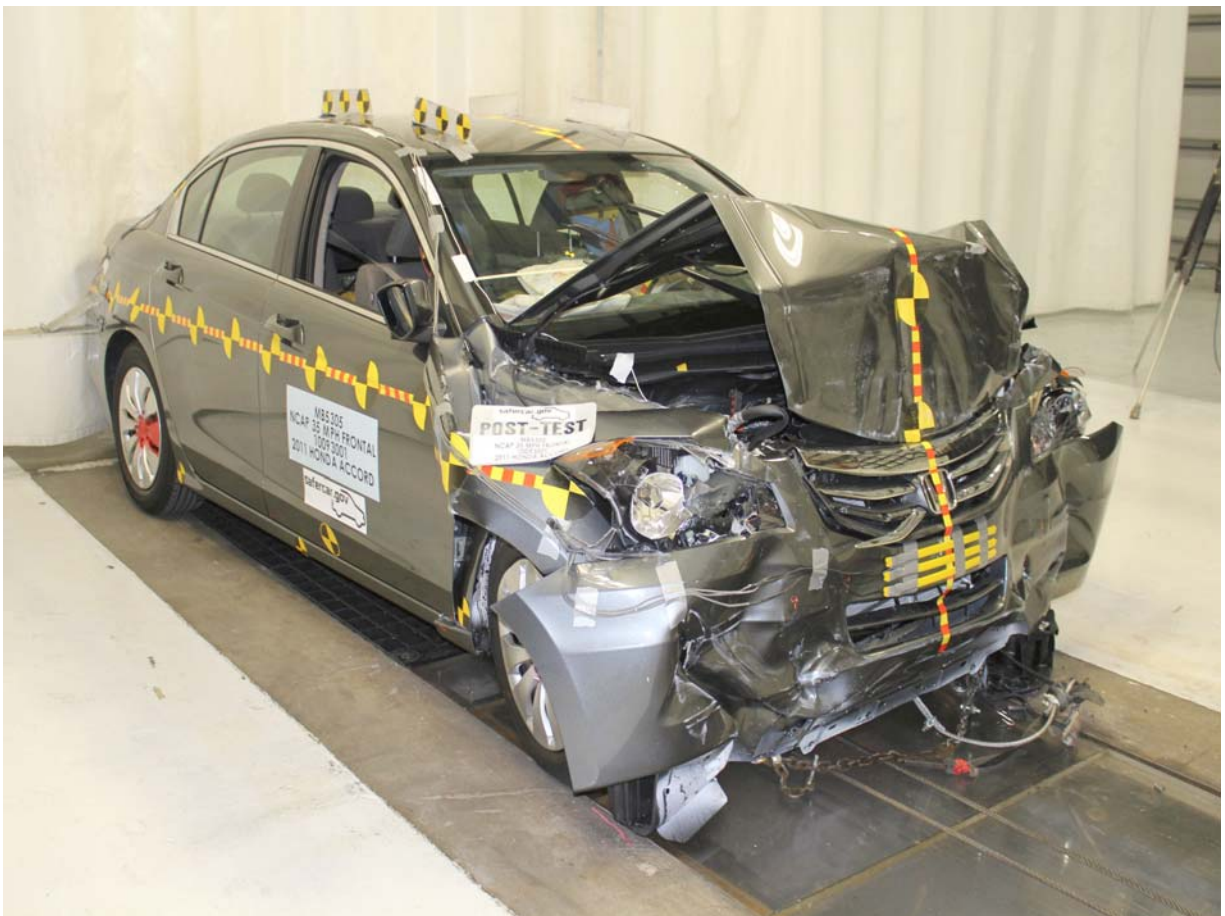
Pre-Test Right Side View (with vehicle at barrier)



Post-Test Right Side View



Pre-Test Right Front Three-Quarter View



Post-Test Right Front Three-Quarter View



Pre-Test Left Rear Three-Quarter View (with vehicle at barrier)



Post-Test Left Rear Three-Quarter View



Pre-Test Windshield View



Post-Test Windshield View



Pre-Test Engine Compartment View



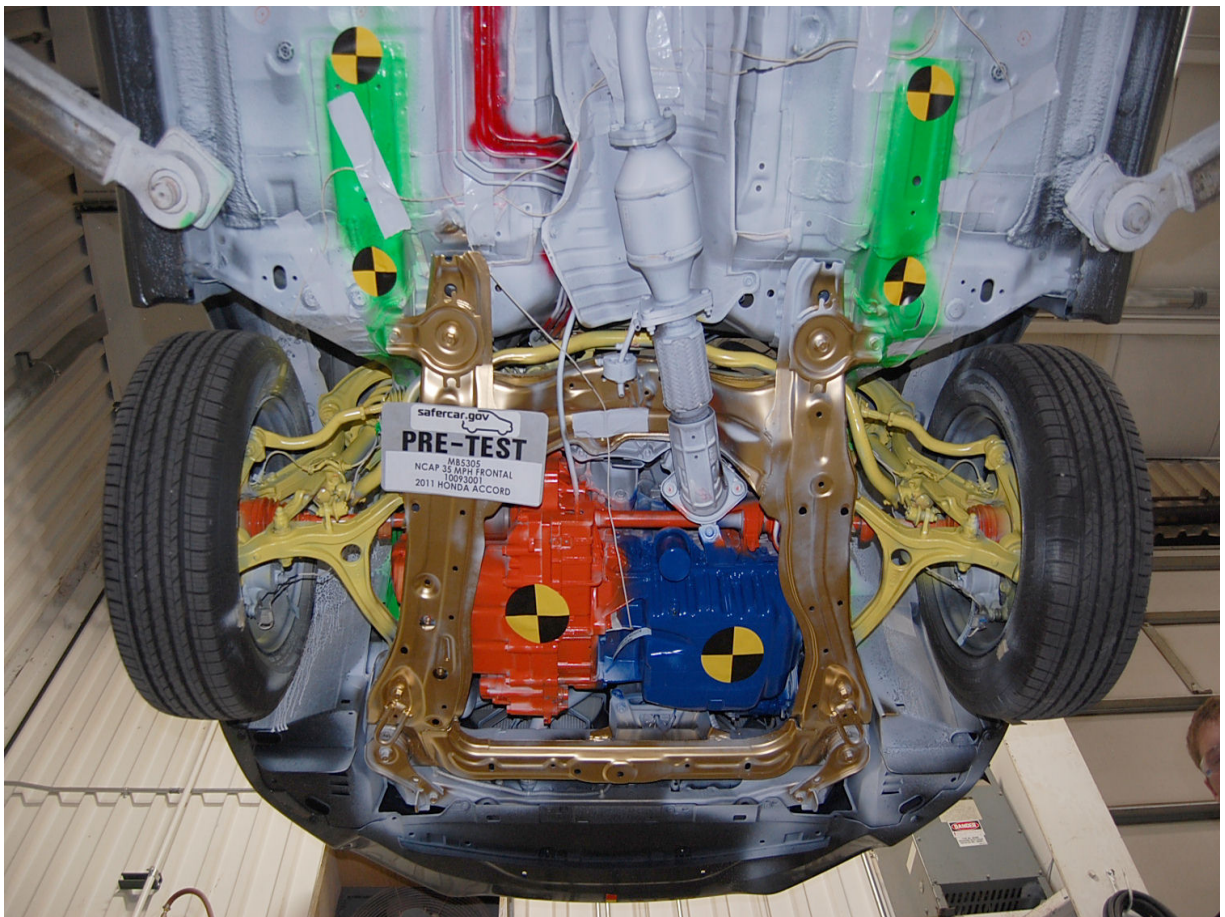
Post-Test Engine Compartment View



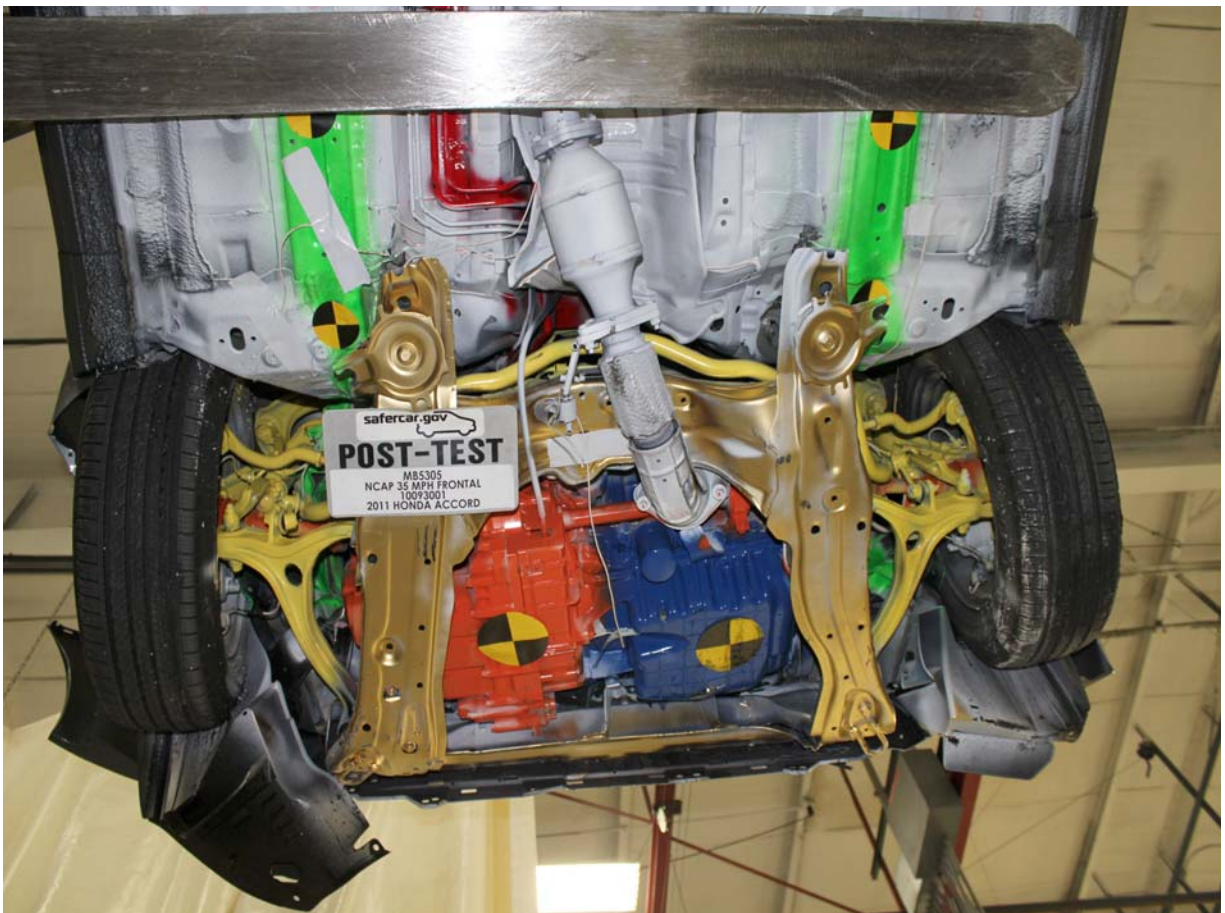
Pre-Test Fuel Cap View



Post-Test Fuel Cap View



Pre-Test Front Underbody View



Post-Test Front Underbody View



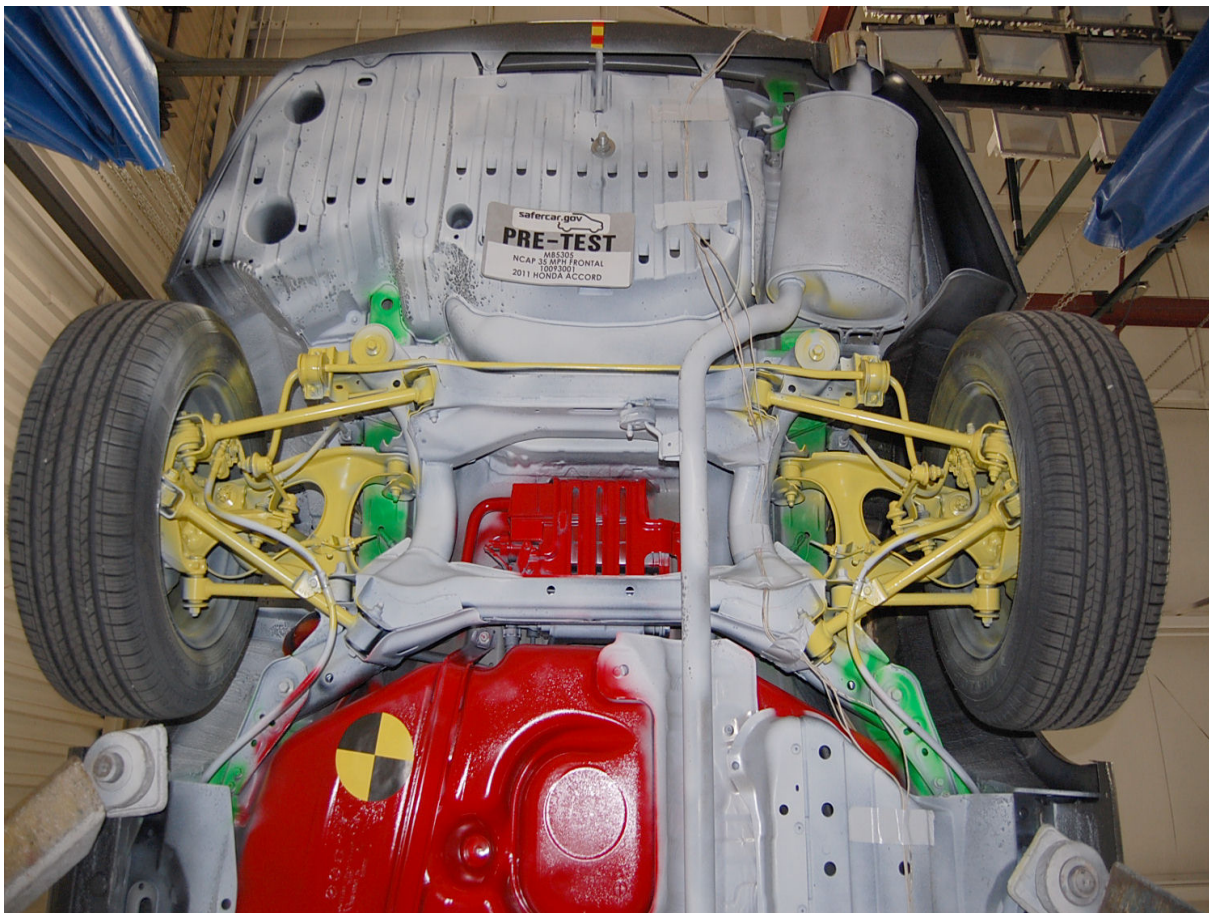
Pre-Test Mid Front Underbody View



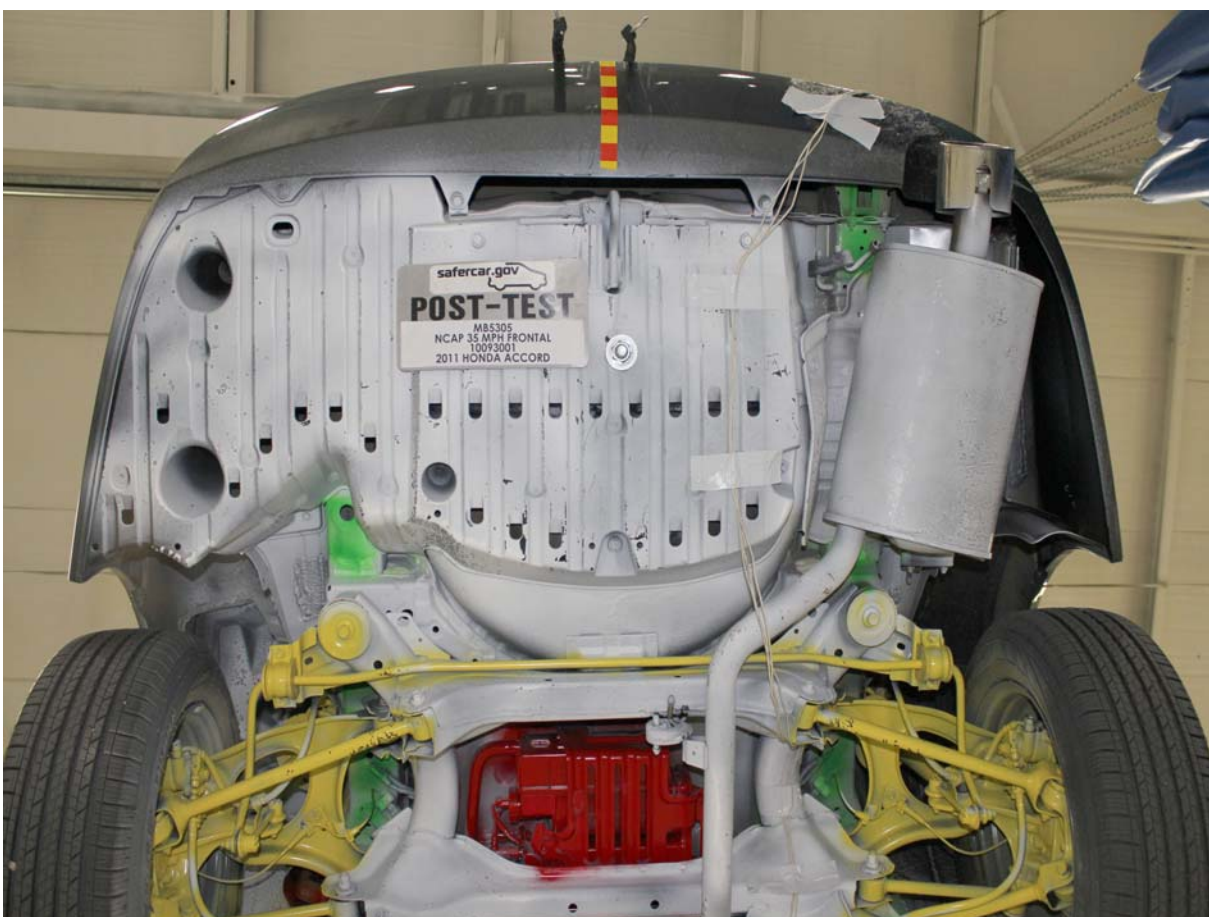
Post-Test Mid Front Underbody View



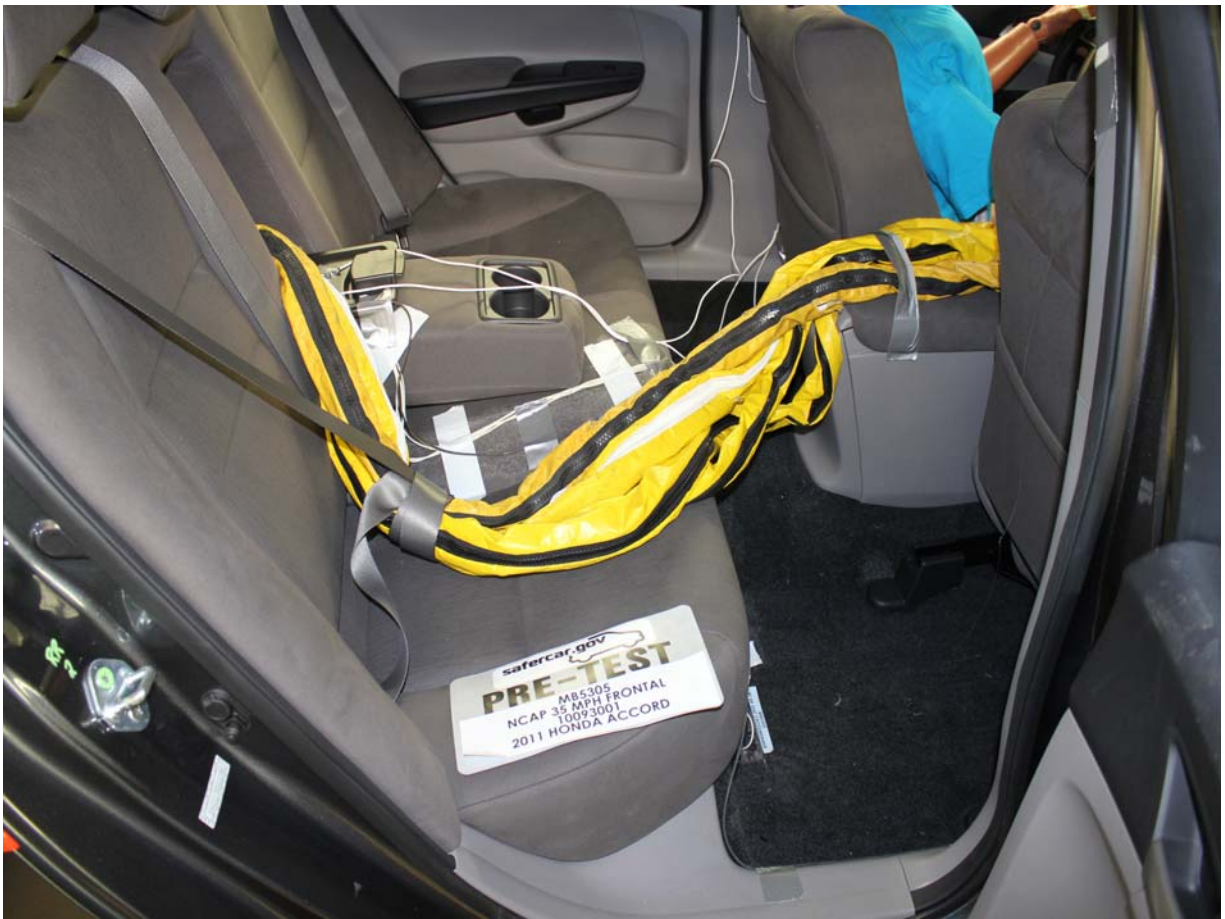
Post-Test Mid Rear Underbody View



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



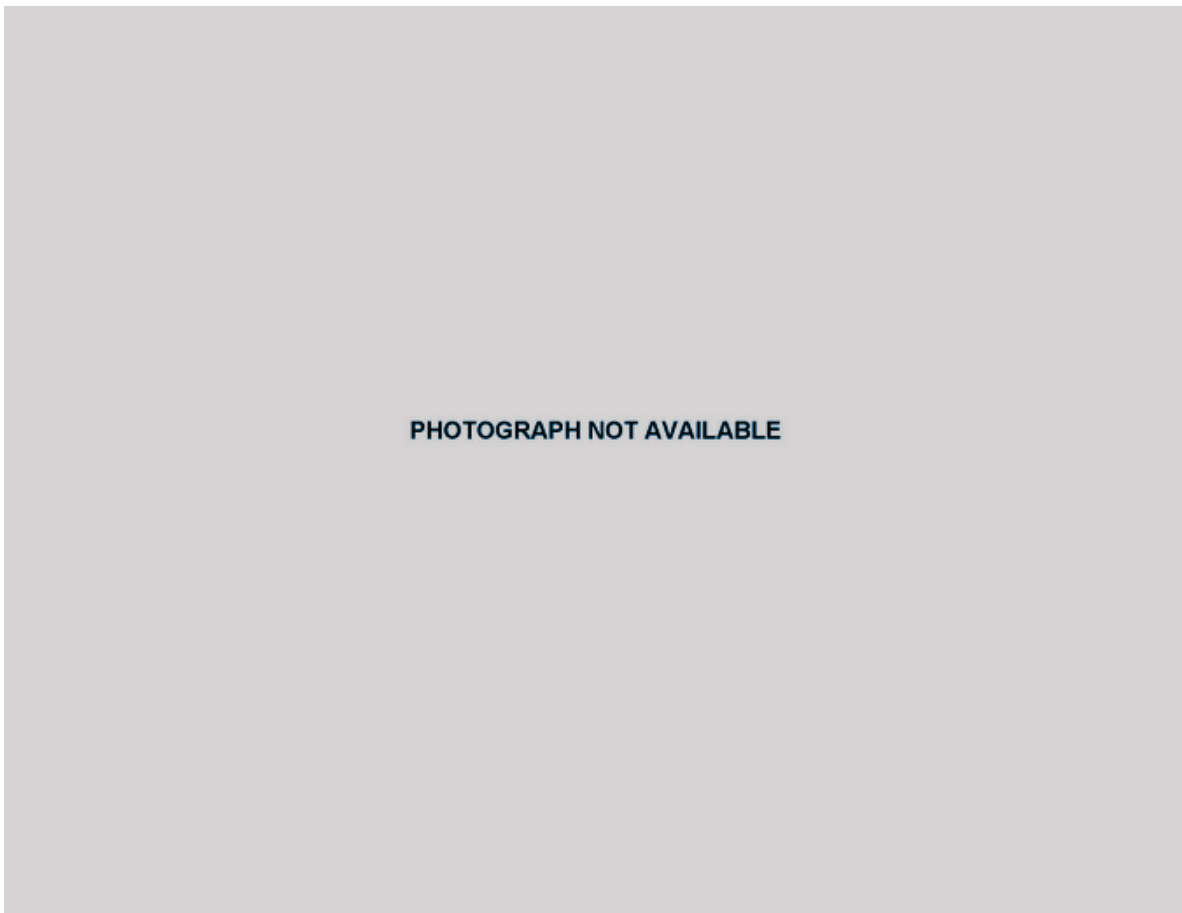
Pre-Test Driver Dummy and Vehicle Interior (Door Open)



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 Driver Dummy Feet



Post-Test Driver Dummy Feet



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



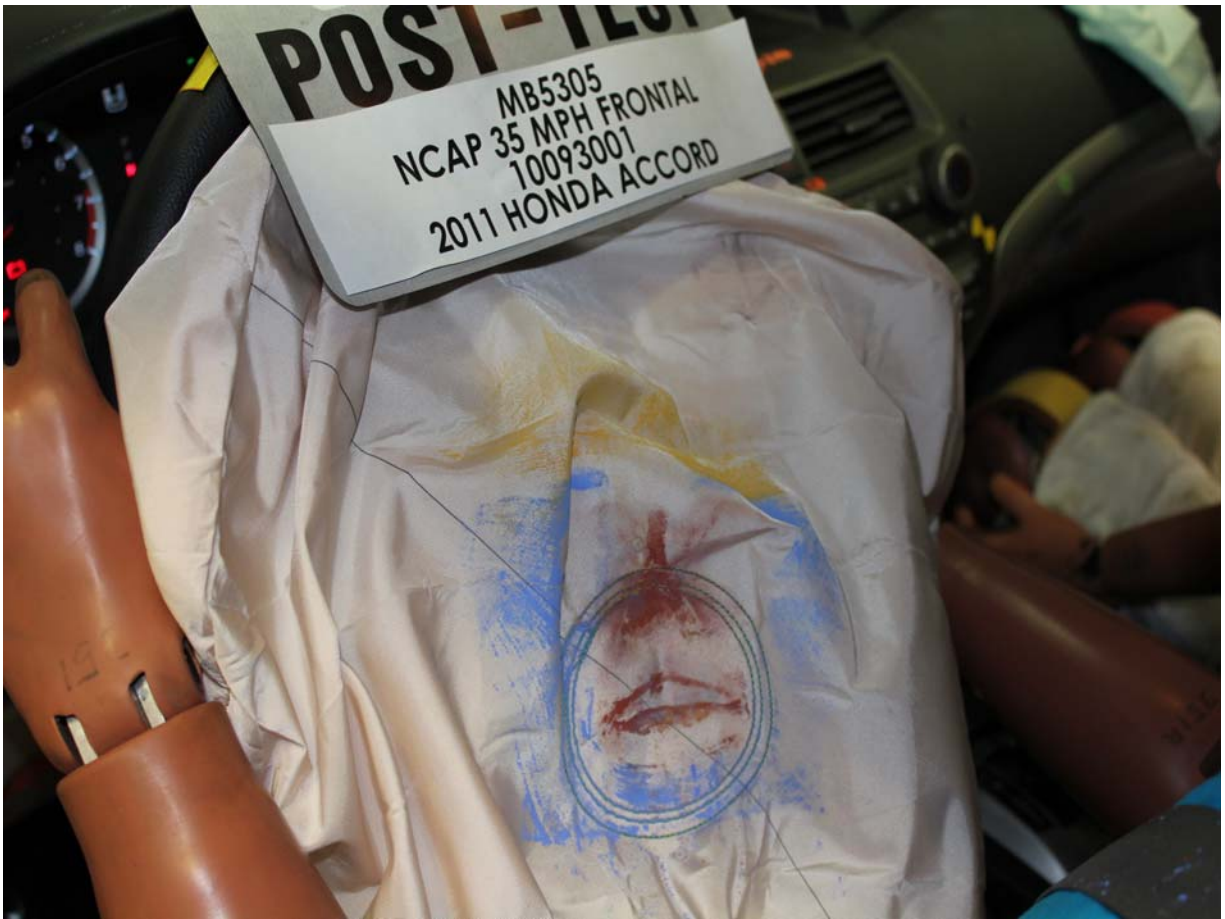
Post-Test Driver's Side Knee Bolster (without dummy)



Pre-Test Driver's Side Floorpan



Post-Test Driver's Side Floorpan



Post-Test Driver Dummy 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



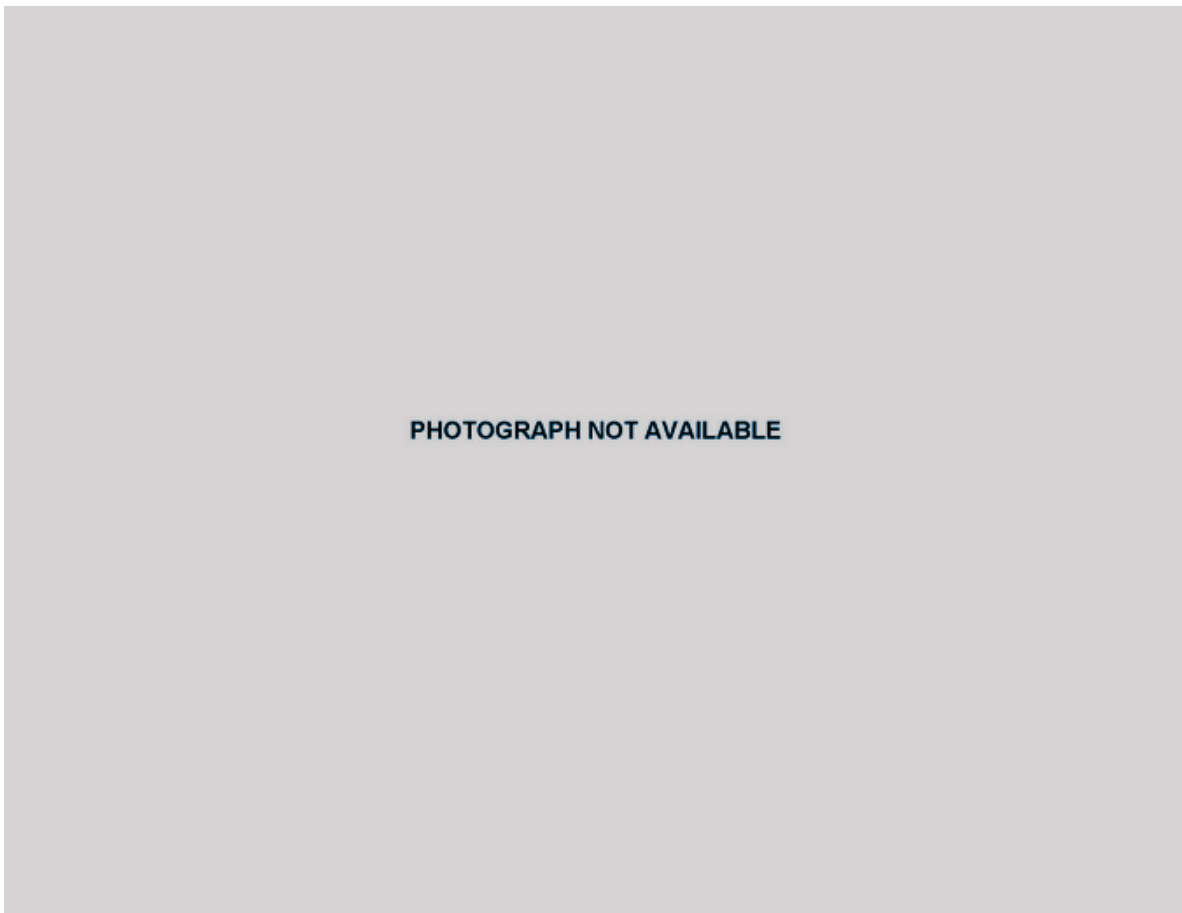
Pre-Test Passenger Dummy and Vehicle Interior (Door Open)



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 (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 Contact with Airbag



Post-Test Passenger Dummy Contact with Headrest



Post-Test Passenger Dummy Contact with Glovebox



Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

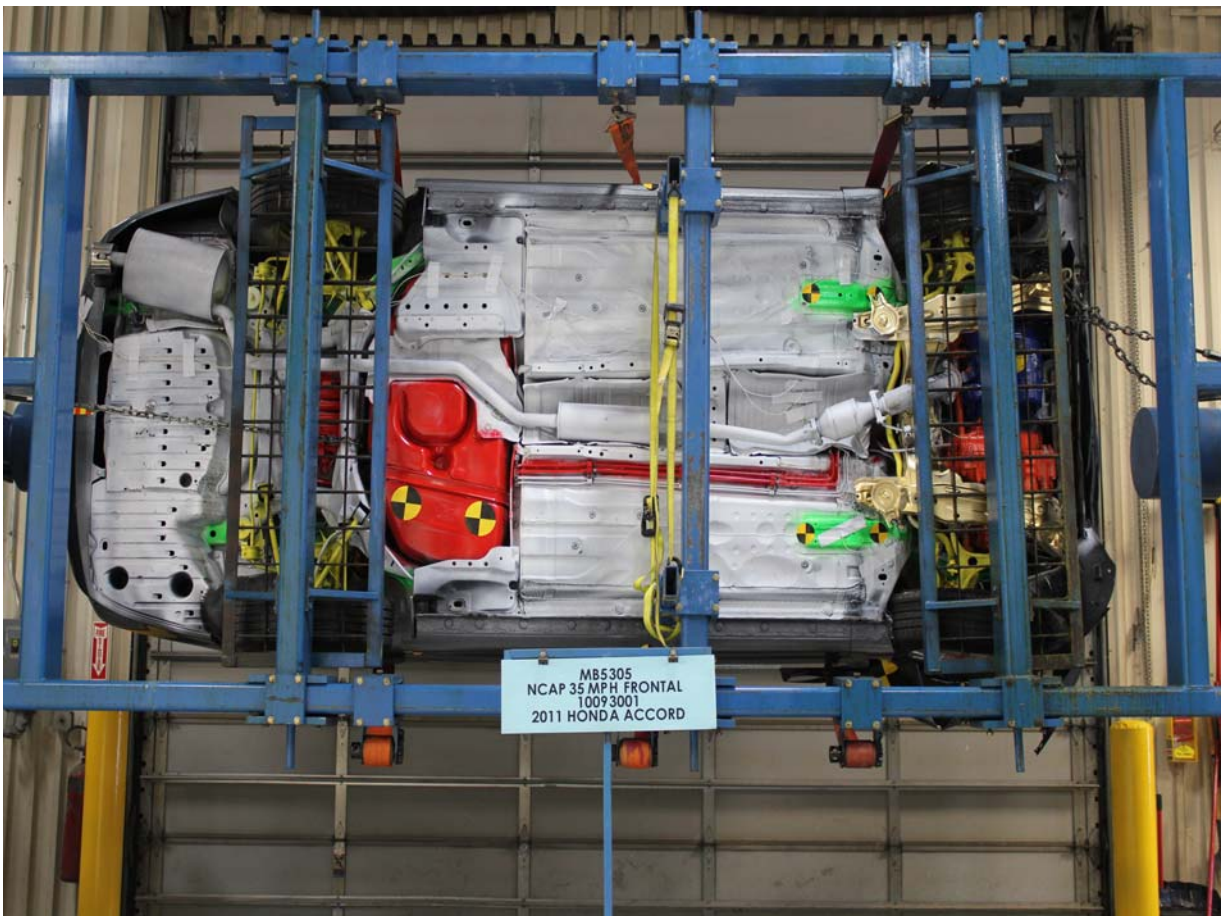
Post-Test Stoddard Solvent Spillage Location View



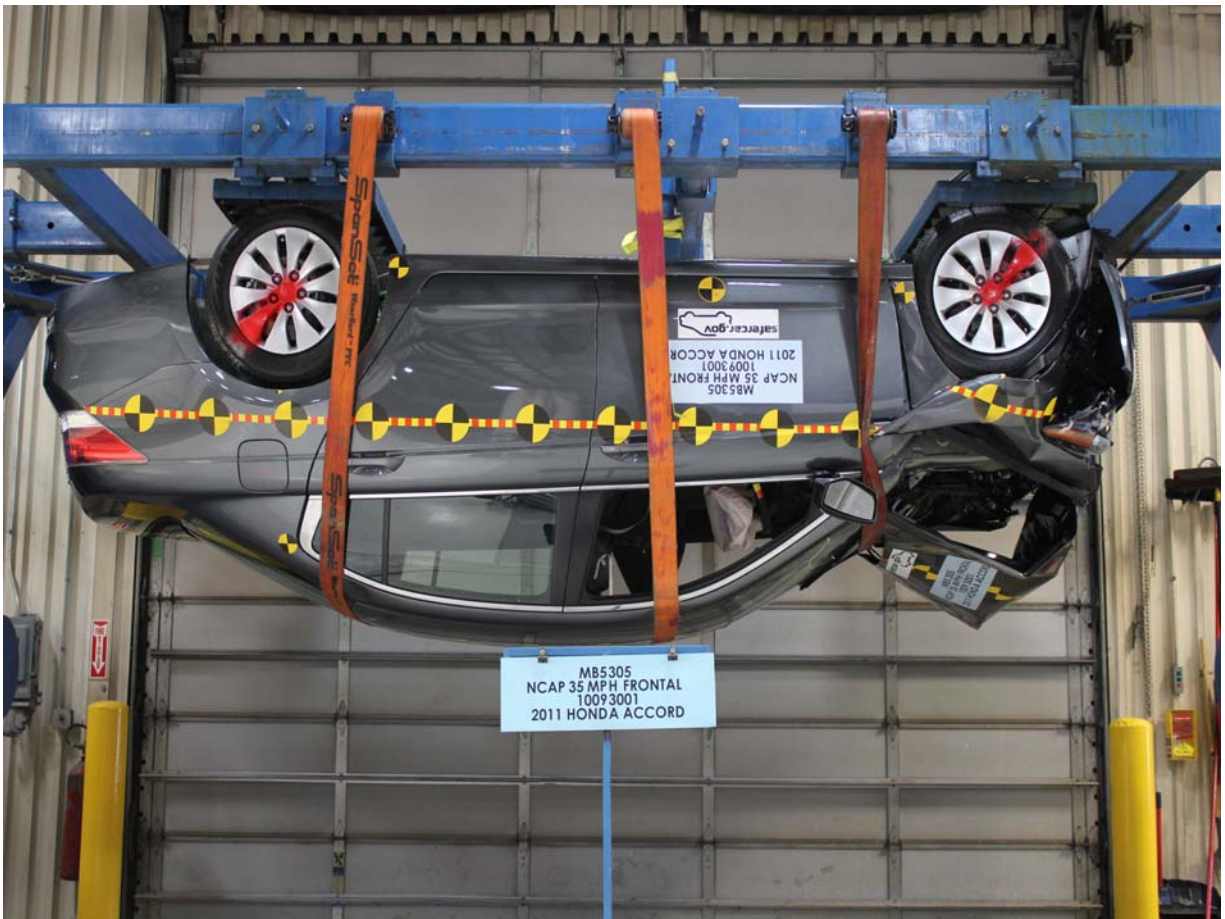
Post-Test Speed Trap Read-Out



Vehicle at 0 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

PHOTOGRAPH NOT AVAILABLE

Vehicle at 360 Degrees on Static Rollover Device



Vehicle Impact

2011 ACCORD 4DR LX
 VEHICLE NUMBER: 1HGCP2F39BA002902
 ENGINE NUMBER: K24Z2-4000891 EXT: POLISHED METAL M.
 CONTROL NUMBER: 897197 (NT) GRAY

- **TECHNICAL FEATURES***
- 177HP 2.4-Liter DOHC 16-Valve
- 1-PTC 4-Cylinder Engine
- 5-Speed Automatic Transmission
- With Grade Logic Control
- 4-Wheel Disc Brakes
- Front Double Wishbone Suspension
- Rear Multi-Link Suspension
- Variable Gear Ratio and Assist
- Rack-and-Pinion Power Steering
- Front and Rear Stabilizer Bars
- Immobilizer, Theft-Deterrent System

- 160-Watt AM/FM/CD/MP3
- Audio System with a Speakers
- Steering Wheel-Mounted Controls
- Radio Data System (RDS)
- MP3/Auxiliary Input Jack
- Air Conditioning
- Air Filtration System
- Power Windows and Door Locks
- Driver's Auto Up/Down Window
- Tilt & Telescopic Steering Column
- Illuminated Vizion Vanity Mirrors
- Cruise Control
- Floor Mats
- Maintenance Minder System

- Drivers and Front Passengers' Side Airbags (SABs)
- Dual-Stage Airbags (DSAs)
- Vehicle Stability Assist (VSA)
- Anti-Lock Braking System (ABS)
- Brakes Assist
- Electronic Brake Distribution (EBD)
- ACES Body Structure
- Tire Pressure Monitoring System
- A-Pillar Seat Belts
- Front Seat Belts with Automatic Retracting System
- Active Front Head Restraints
- Side-Impact Door Beams
- Daytime Running Lights (DRL)
- LATCH System for Child Seats

- 16" x 8.5" Steel Wheels with Full Wheel Covers
- P215/60 R16 All-Season Tires
- Power Door Mirrors
- Remote Entry System with Trunk
- Gasmax and Power Window Controls

**Manufacturer's
Suggested
Retail Price**

Full Tank of Fuel

No Charge

Destination and Handling

750.00

\$22,730.00

ROSEN HONDA
7000 GRAND AVENUE
GURNEE, IL 60031

OHIO, BLR: 207653
REF NO: 40339
HN CODE: HN-7853
EMISSION: 50 STATE

PORT OF ENTRY:	MARYSVILLE
DELIVERY POINT:	SOHALMURG
SHIP#:	537-012
ROW/SPACE:	
TRANS.METHOD:	TRUCK
VIN:	1HGDPF33BA002602

ORIG. DL#: 20785
REF. NO: 40338
VIN CODE: HN-7
EMISSION: 50 51
DEALER: 207853

FOR THIS VEHICLE
Final Assembly Plant:
MARYSVILLE, OHIO
USA

Country of Origin: Engine:
U.S.A.

Transmission:
U.S.A.

Environmental Performance

Protect the environment, choose vehicles with higher scores!



Vehicle emissions are a primary contributor to global warming and smog. Scores are determined by the California Air Resources Board based on this vehicle's measured emissions. Please visit www.DriveClean.ca.gov for more information. **AIR RESOURCES BOARD** California Environmental Protection Agency

EPA Fuel Economy Estimates

CITY MPG
23
Expected range
for most drivers
19 to 27 MPG

HIGHWAY MPG

34

Expected range
for most drivers
28 to 40 MPG

Your actual mileage will vary depending on how you drive and maintain your vehicle

**Estimated
Annual Fuel Cost
\$1,665**
based on 15,000 miles
at \$3.00 per gallon

Combined Fuel Economy

27 **ALL LARGE CARS**

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: **80 %**

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

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver	Not Rated
	Passenger	Not Rated

Star ratings based on the risk of injury in a frontal impact.

Star ratings based on the risk of injury in a frontal impact.

Side	Front seat	Not Rated
Crash	Rear seat	Not Rated

THE UNIVERSITY OF CHICAGO PRESS

Bollaver

Chaf ratings based on the risk of roll-over in a short-term credit

Star ratings range from 1 to 5 stars (★ ★ ★ ★ ★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA).

www.safercar.gov or 1-888-327-4236

This vehicle is equipped with a front bumper of a type that has been tested at an impact speed of 8 miles per hour, and a rear bumper of a type that has been tested at an impact speed of 5 miles per hour, resulting in no damage to the vehicle's body and safety systems and minimal damage to the bumper and attached hardware. "Minimal damage to the bumper" means minor cosmetic damage that can be repaired with the use of common repair materials and without replacing any parts. The stronger the bumper, the less likely the vehicle will require repair after a low-speed collision. This vehicle exceeds the current federal bumper standard of 2.5 miles per hour.

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

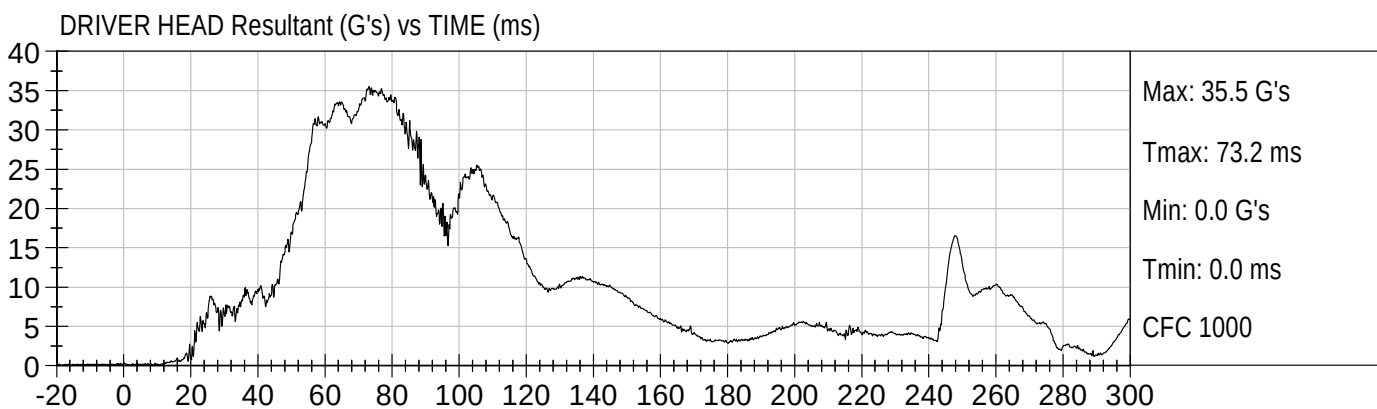
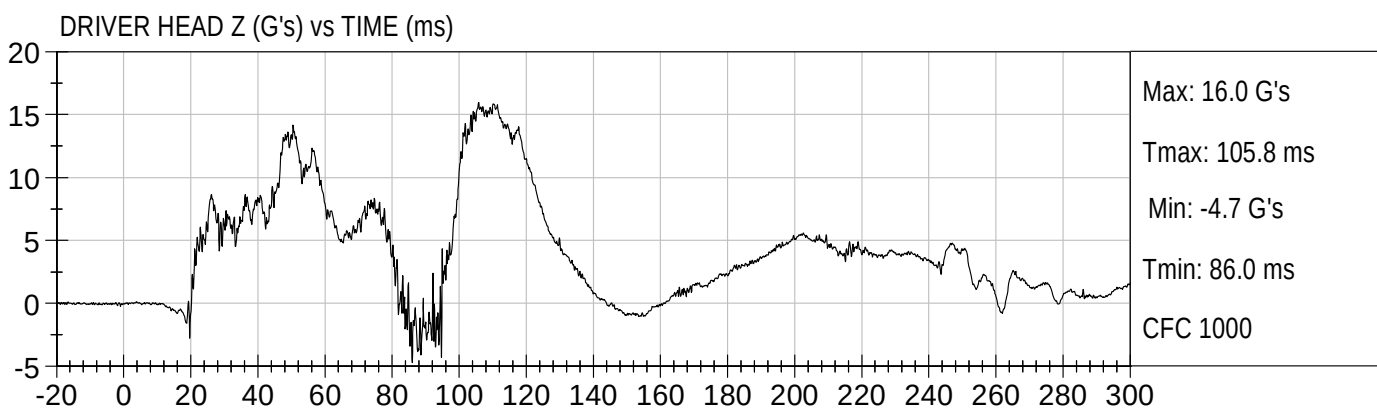
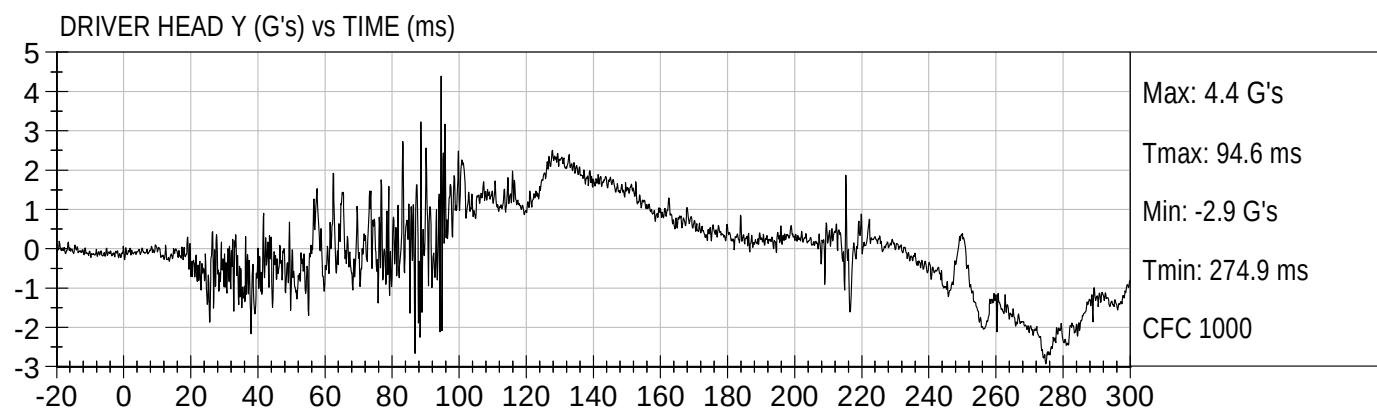
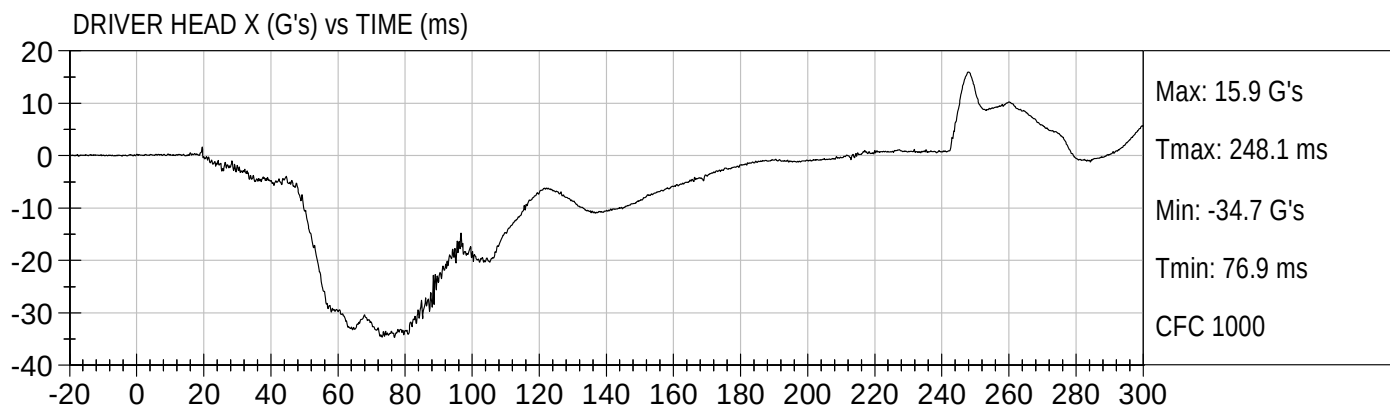
Driver Left Upper Tibia Force Z

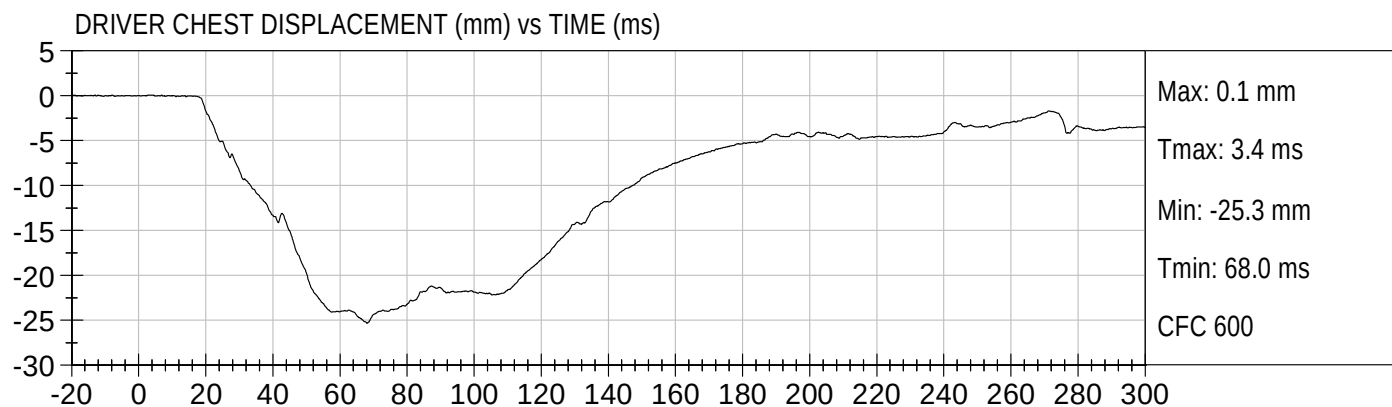
Driver Left Lower Tibia Moment X

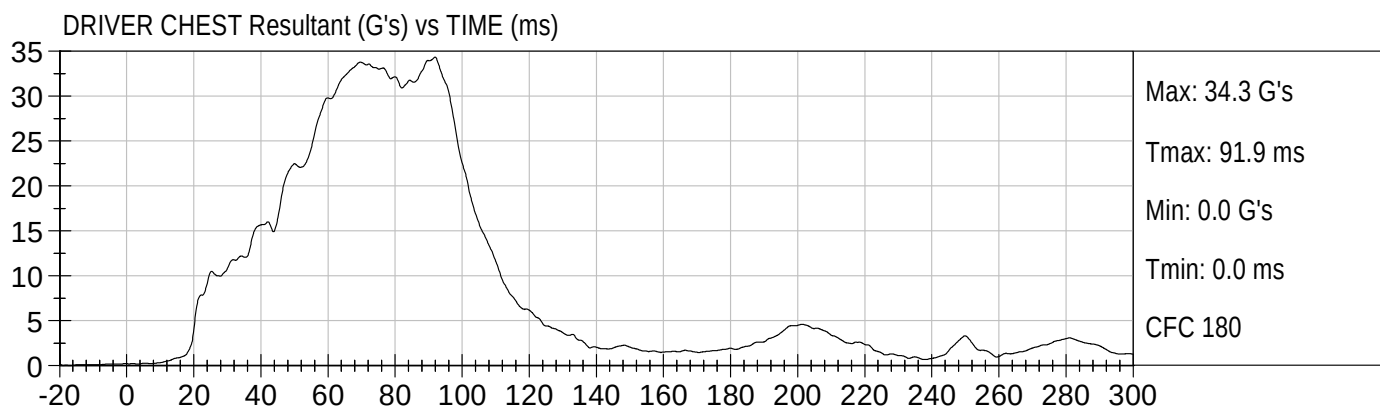
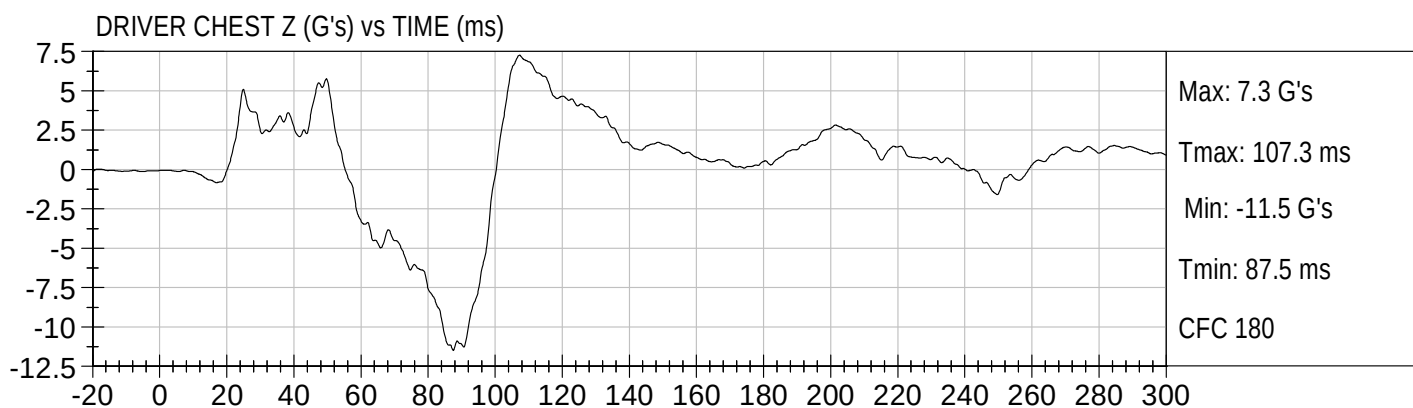
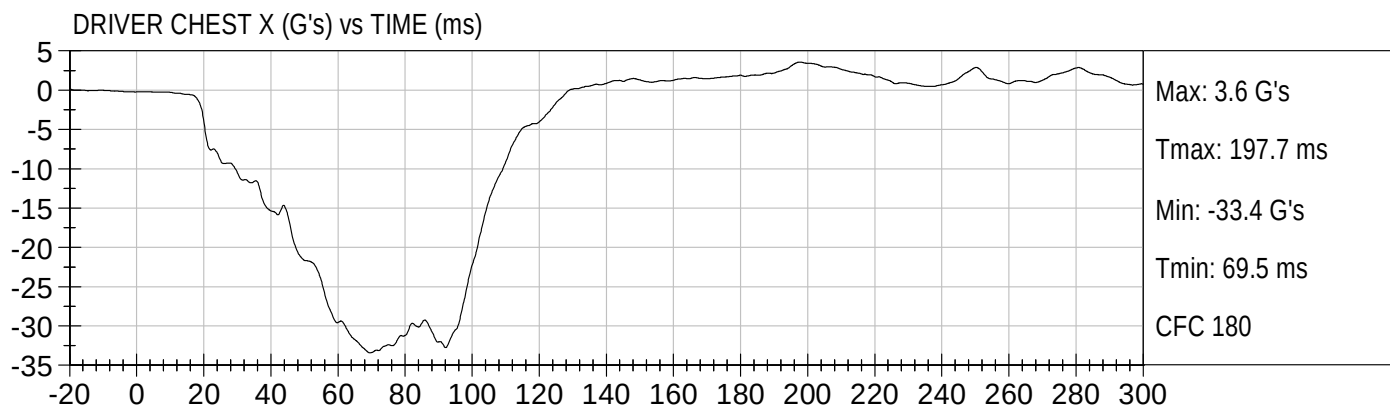
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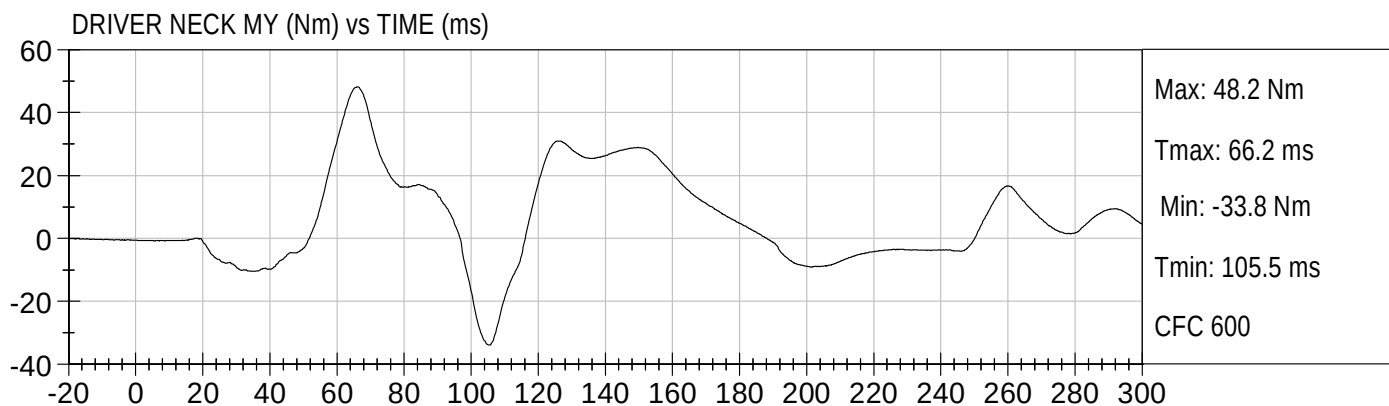
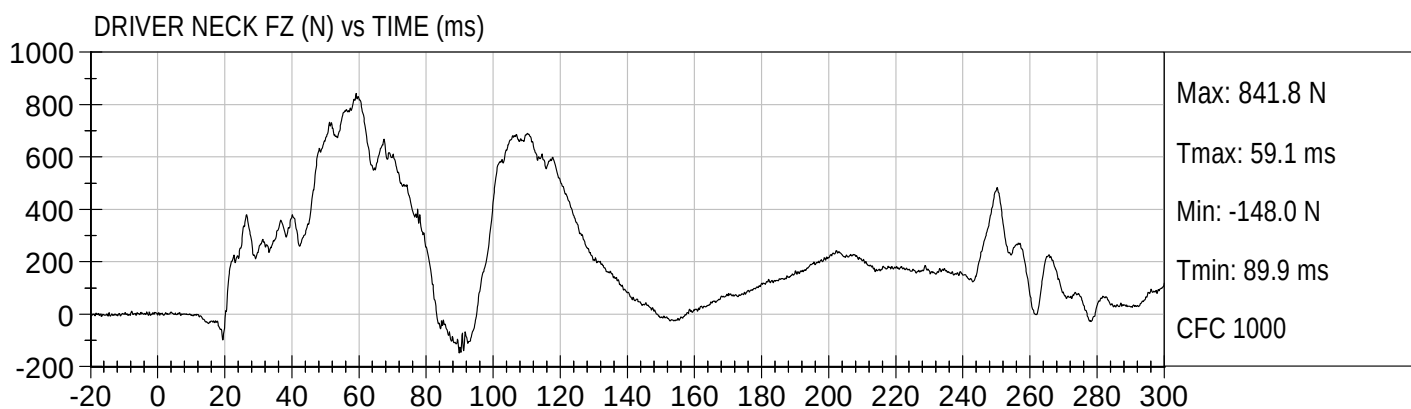
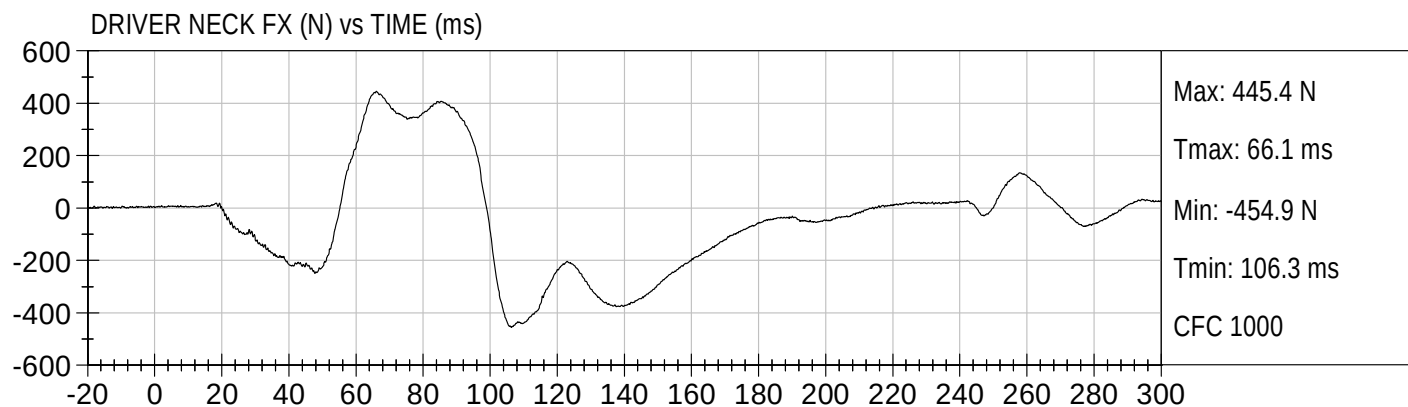
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft 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 Shoulder Belt Force – not installed
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



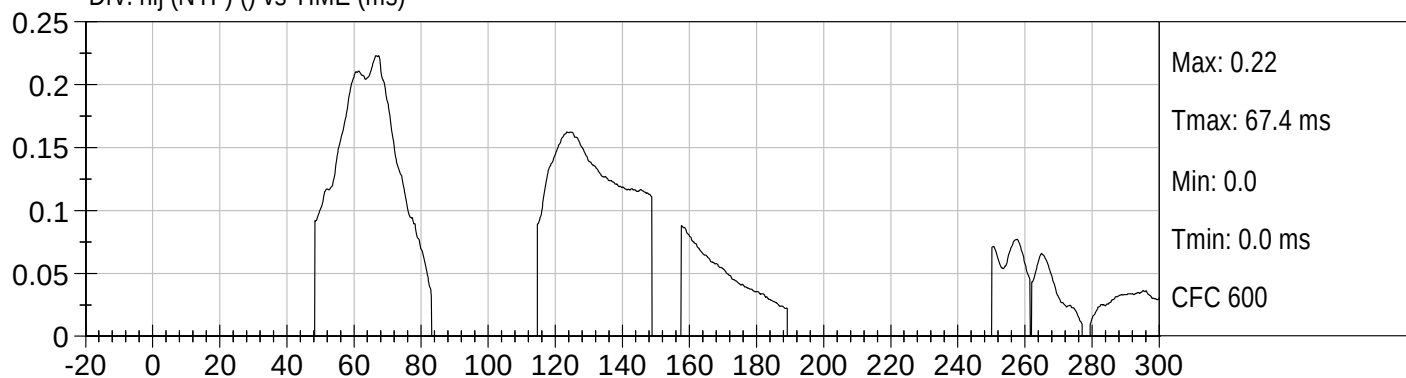




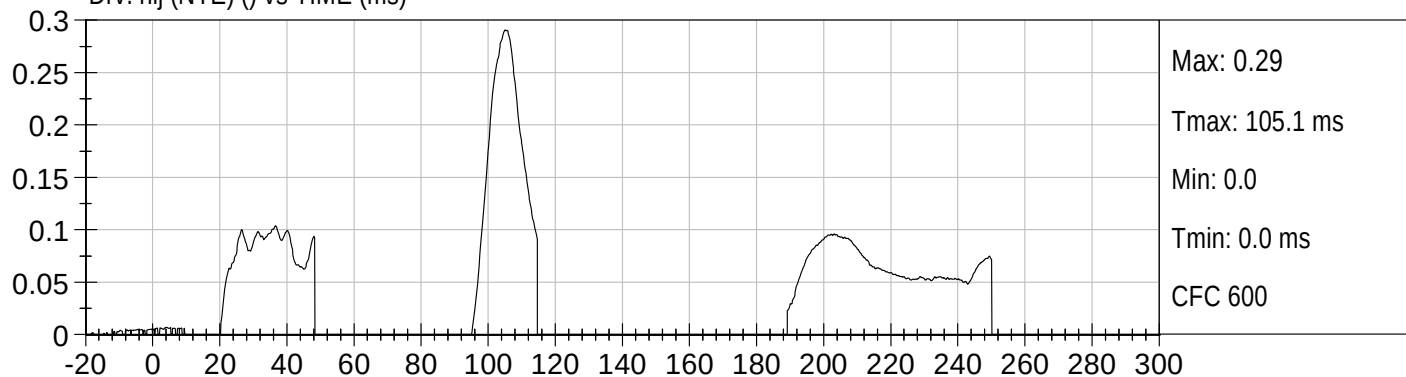




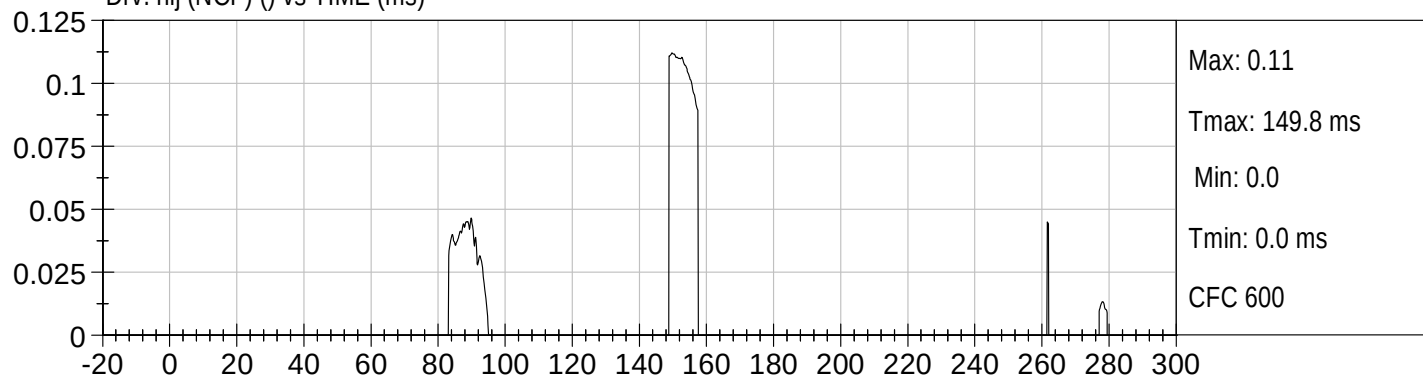
Drv. nij (NTF) () vs TIME (ms)



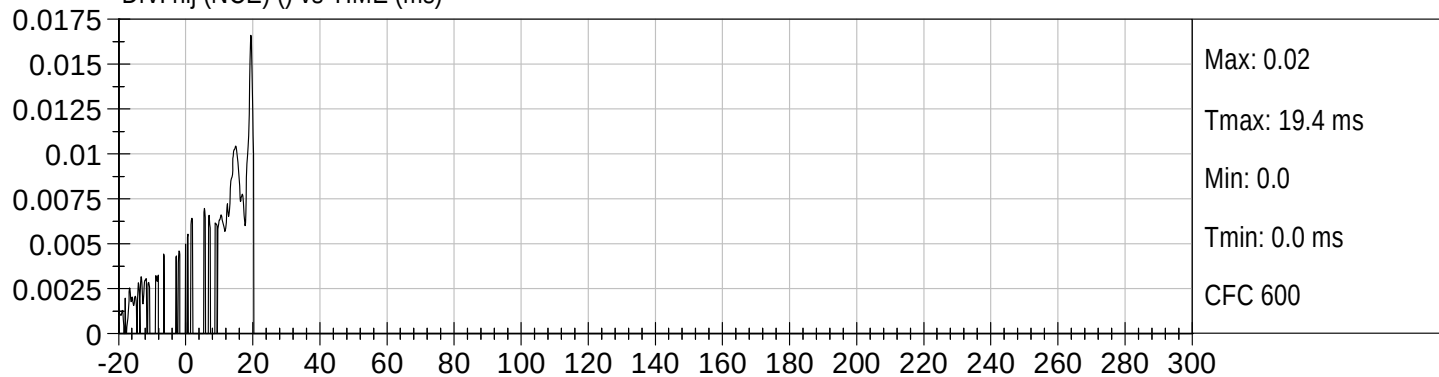
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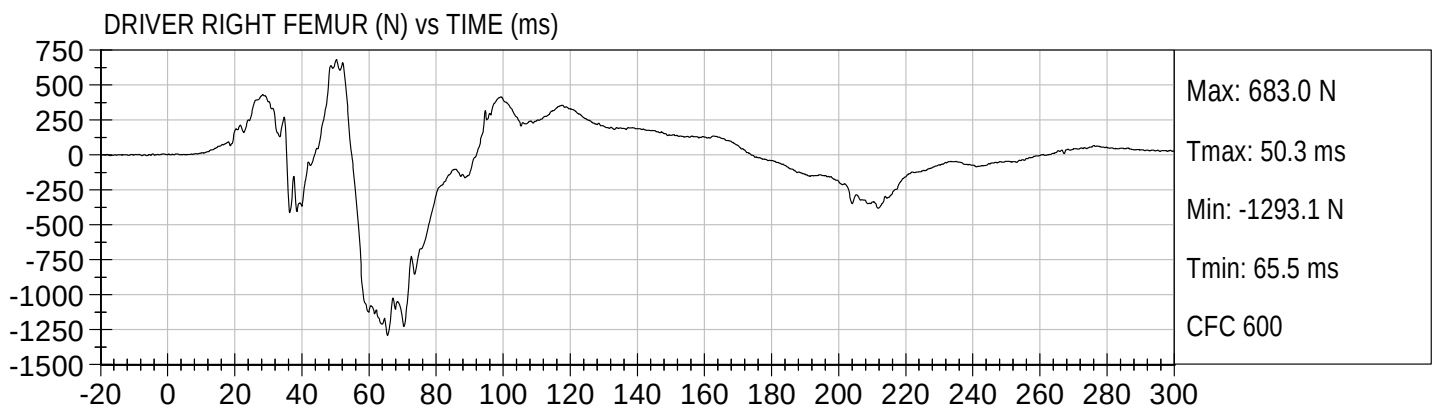
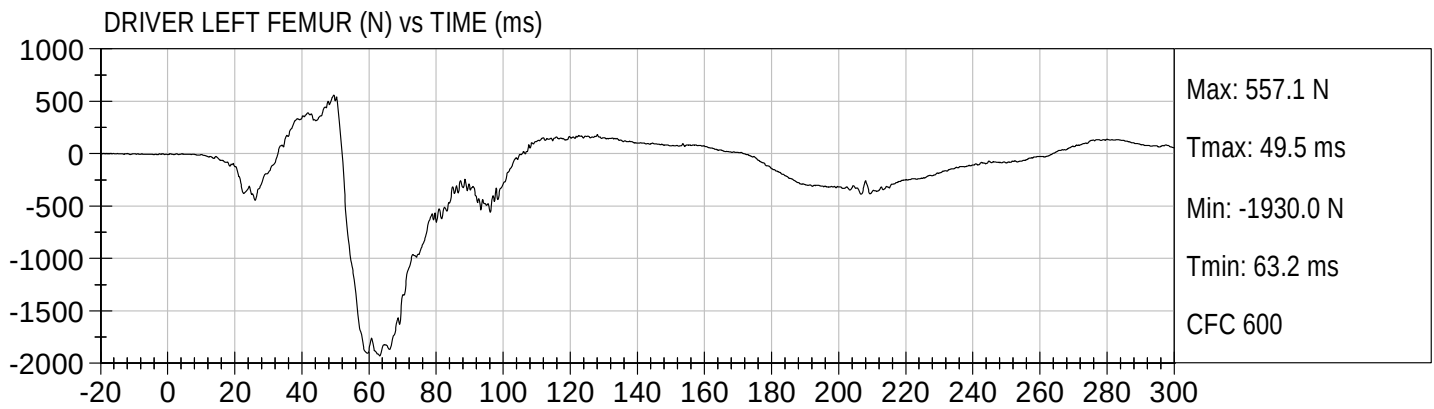


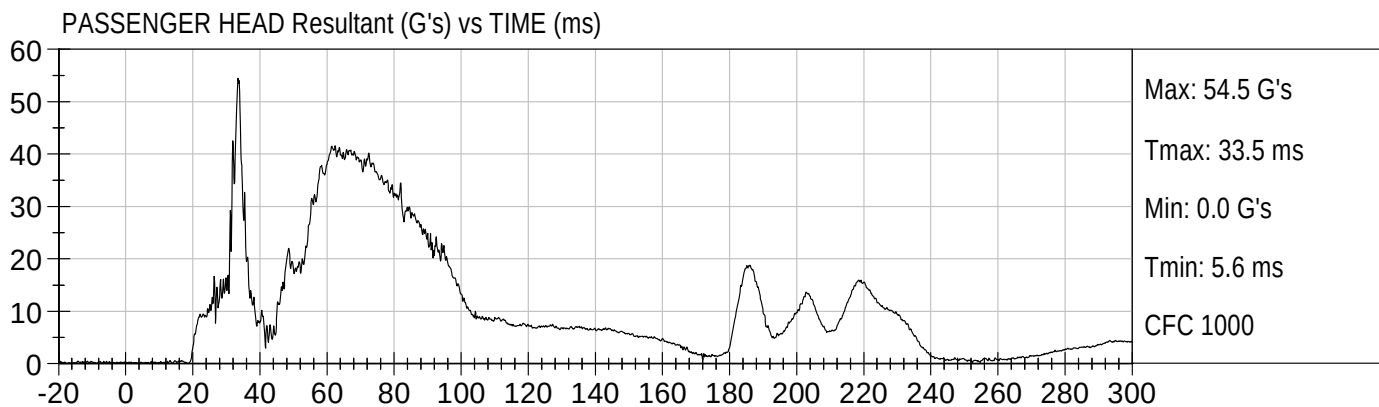
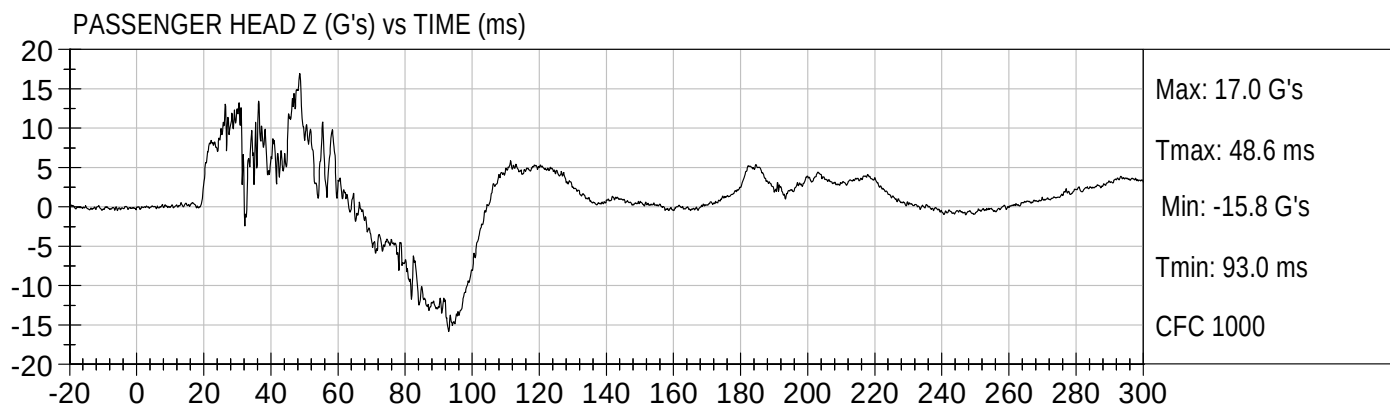
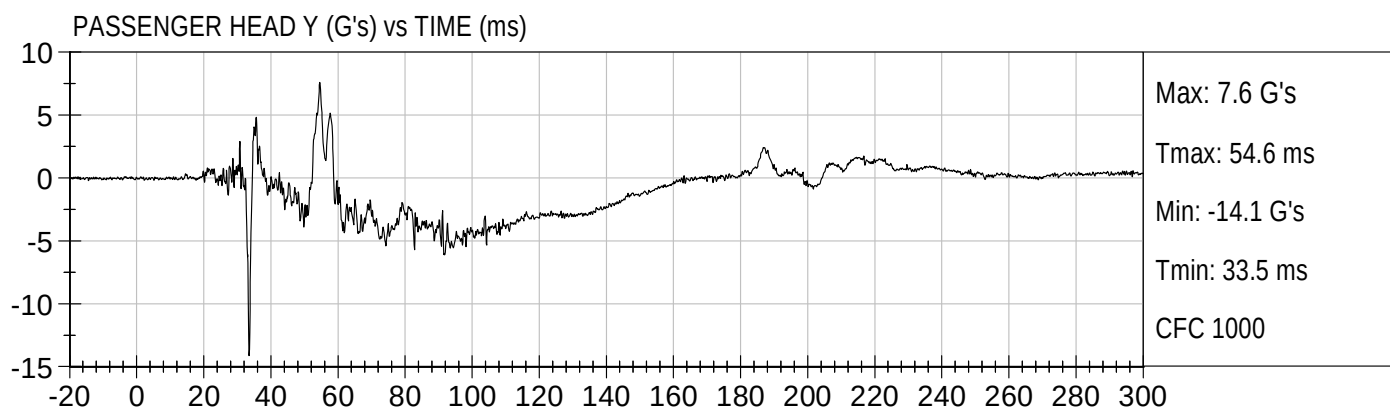
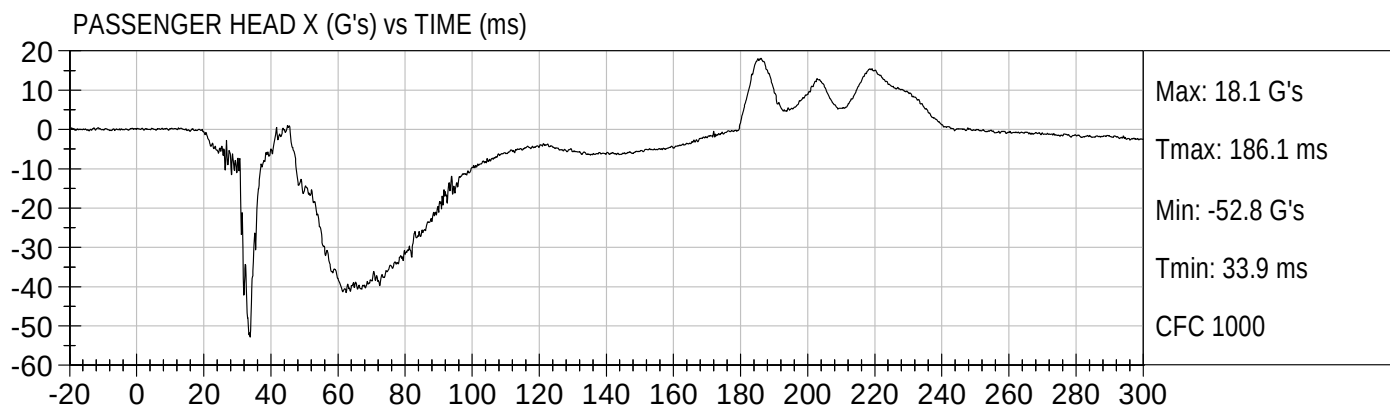
Drv. nij (NCF) () vs TIME (ms)

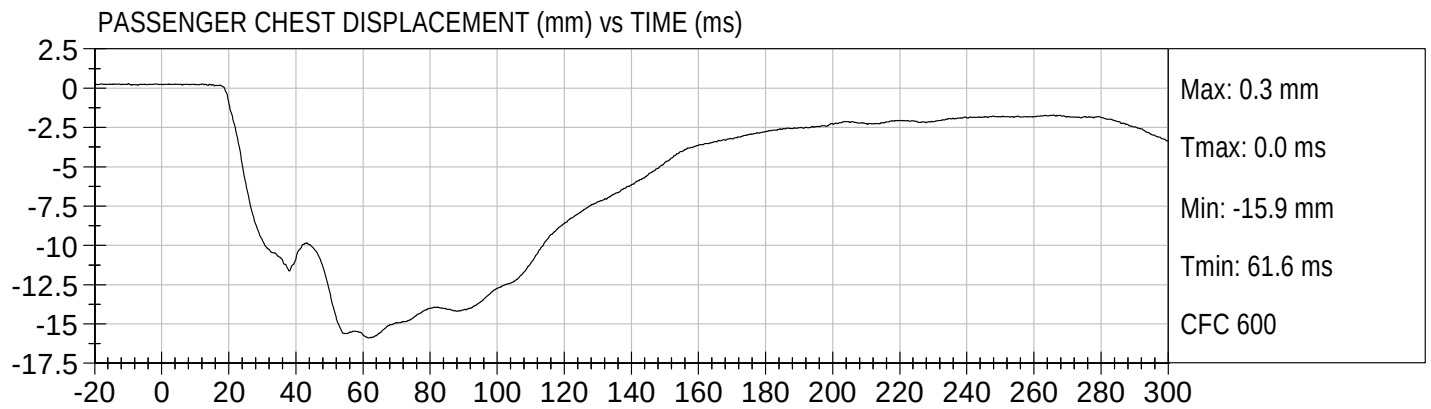


Drv. nij (NCE) () vs TIME (ms)



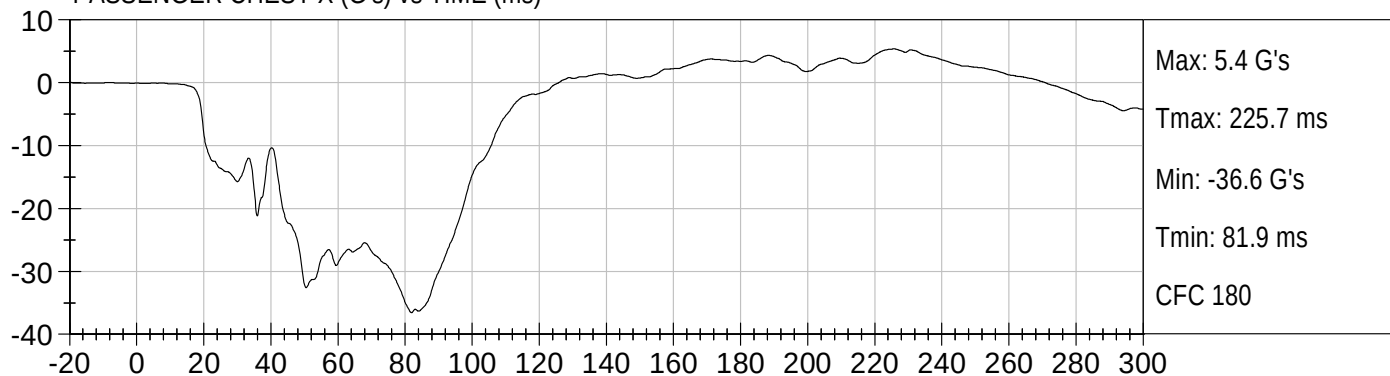




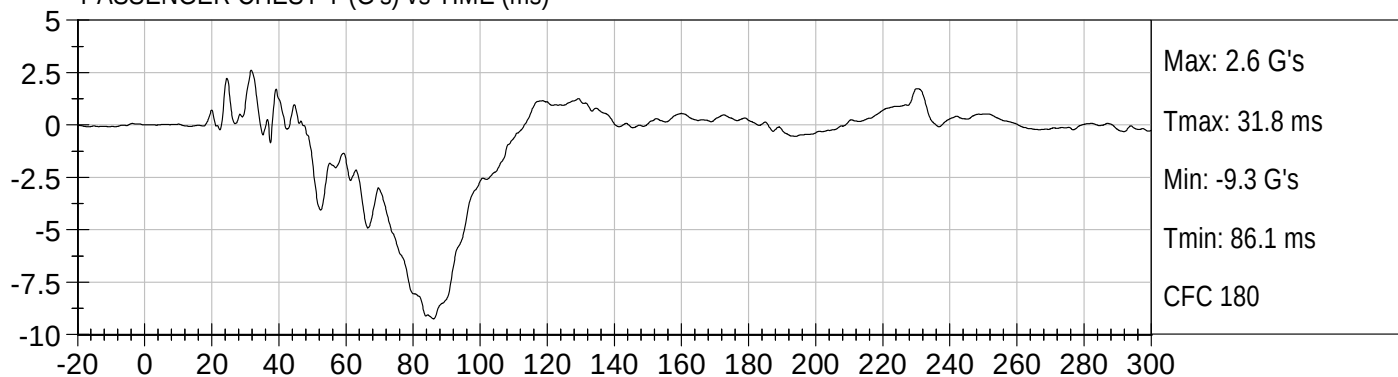




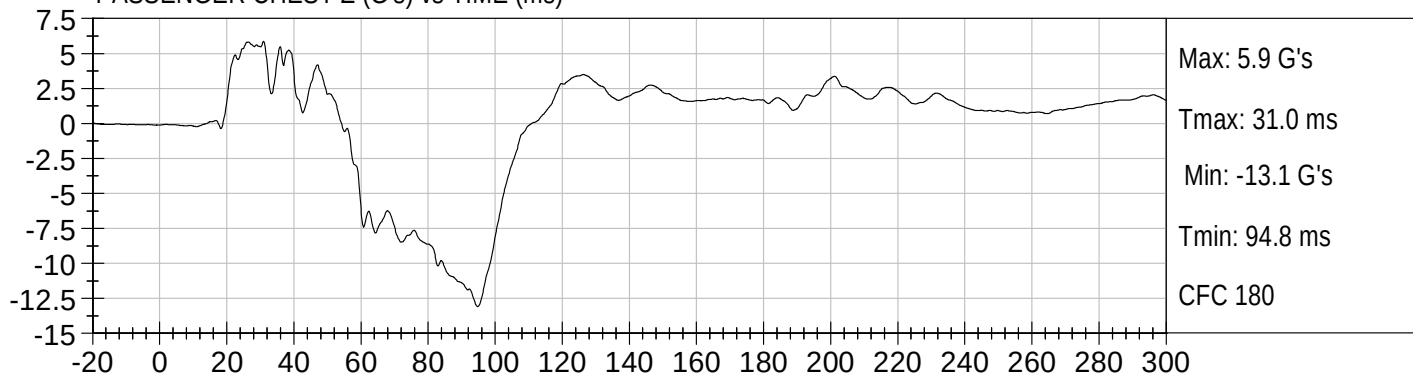
PASSENGER CHEST X (G's) vs TIME (ms)



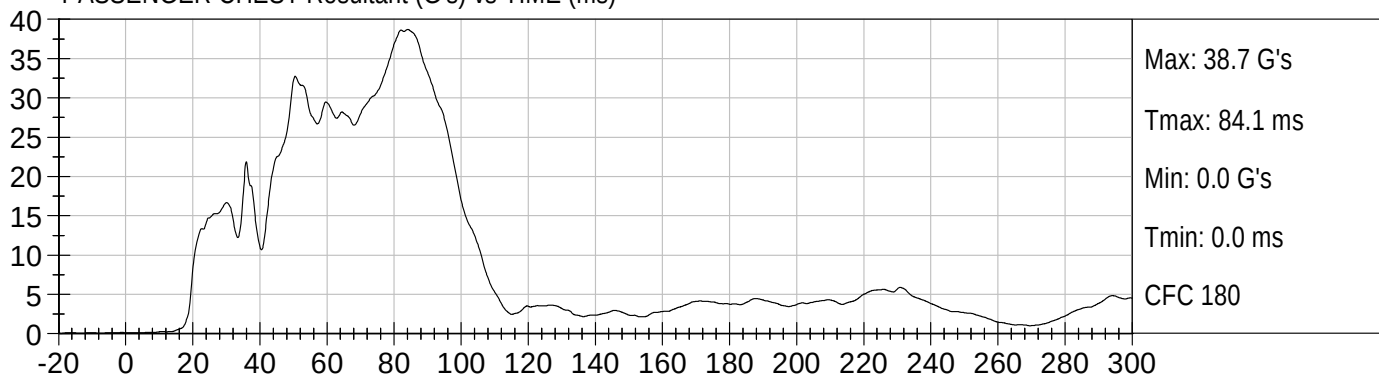
PASSENGER CHEST Y (G's) vs TIME (ms)



PASSENGER CHEST Z (G's) vs TIME (ms)

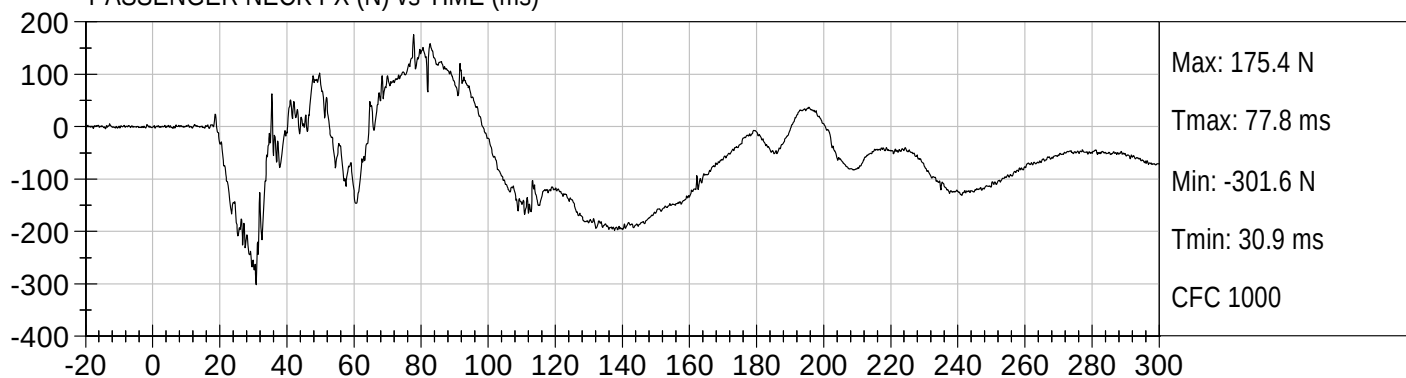


PASSENGER CHEST Resultant (G's) vs TIME (ms)

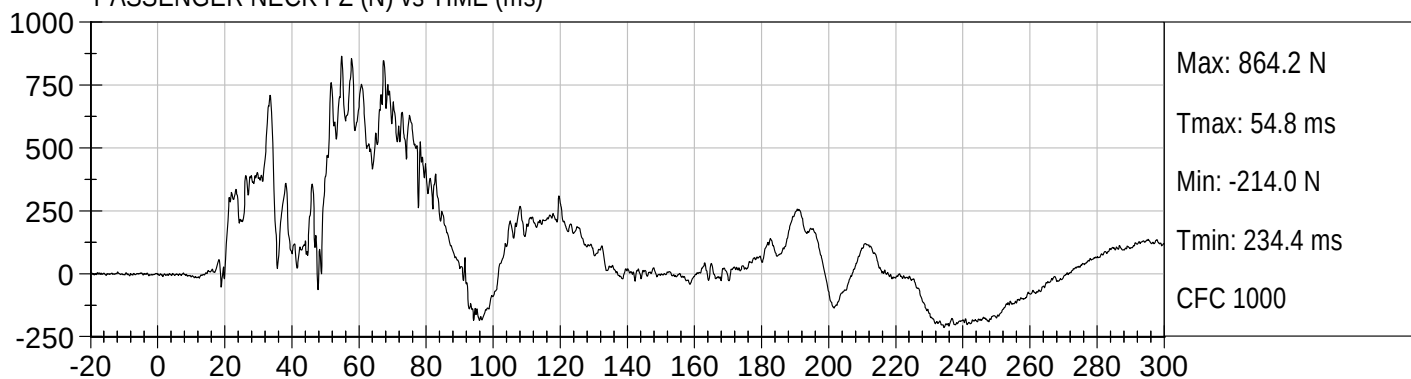




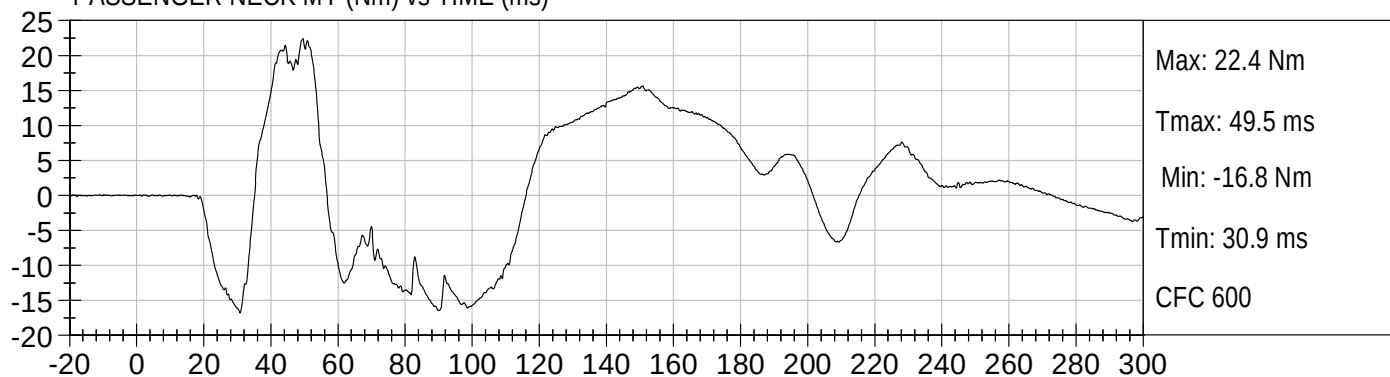
PASSENGER NECK FX (N) vs TIME (ms)



PASSENGER NECK FZ (N) vs TIME (ms)

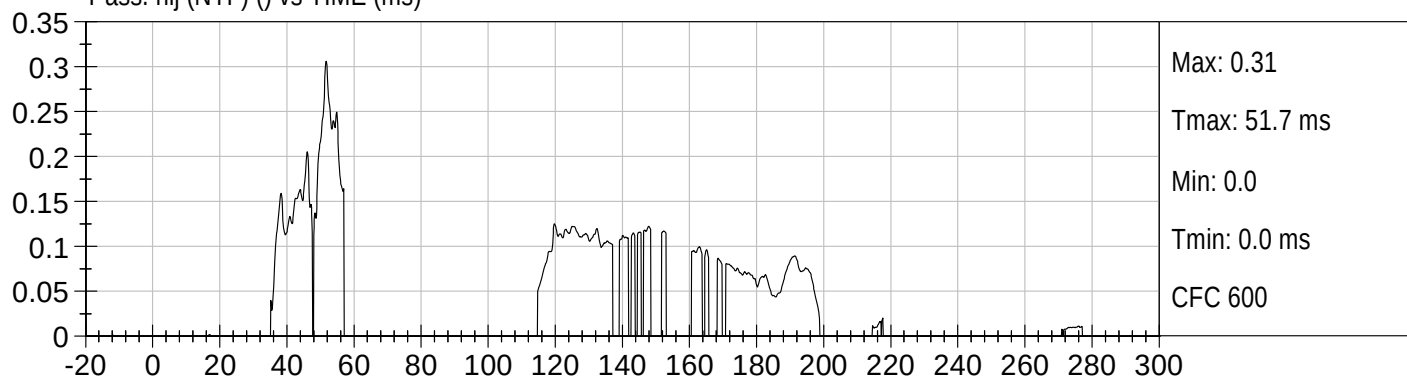


PASSENGER NECK MY (Nm) vs TIME (ms)

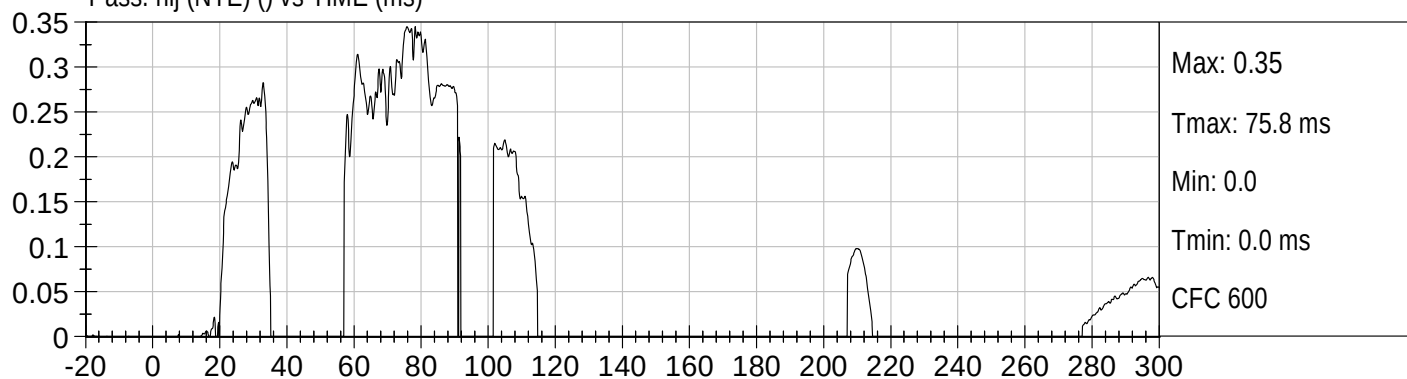




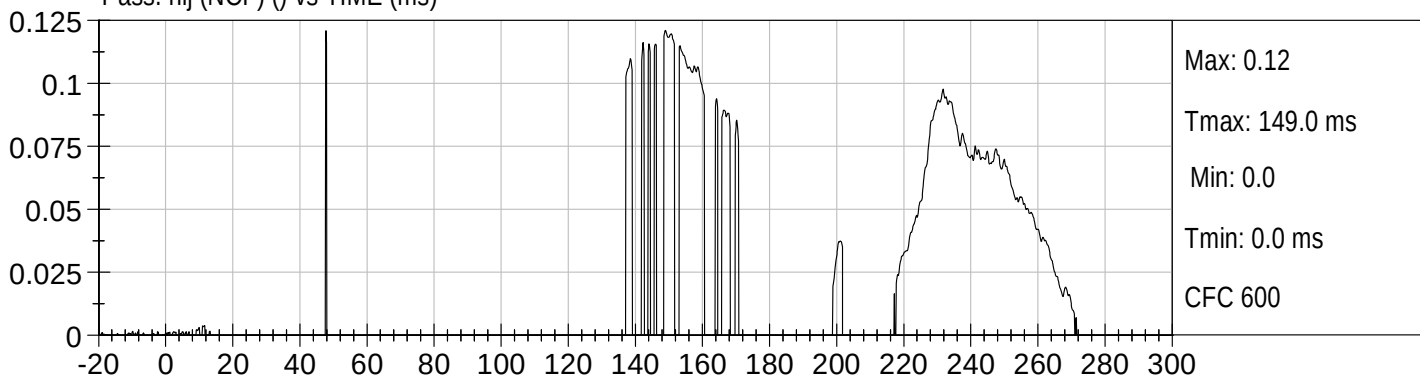
Pass. nij (NTF) () vs TIME (ms)



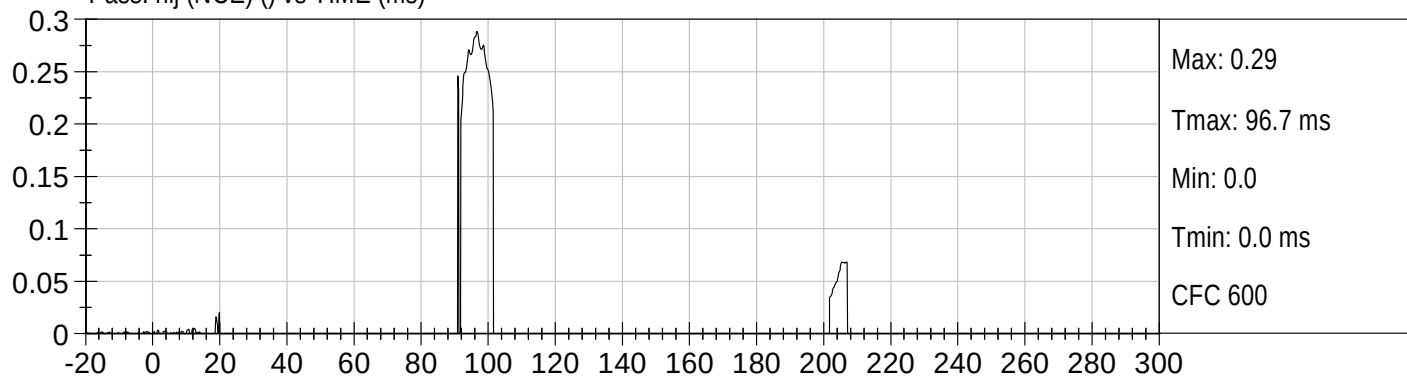
Pass. nij (NTE) () vs TIME (ms)

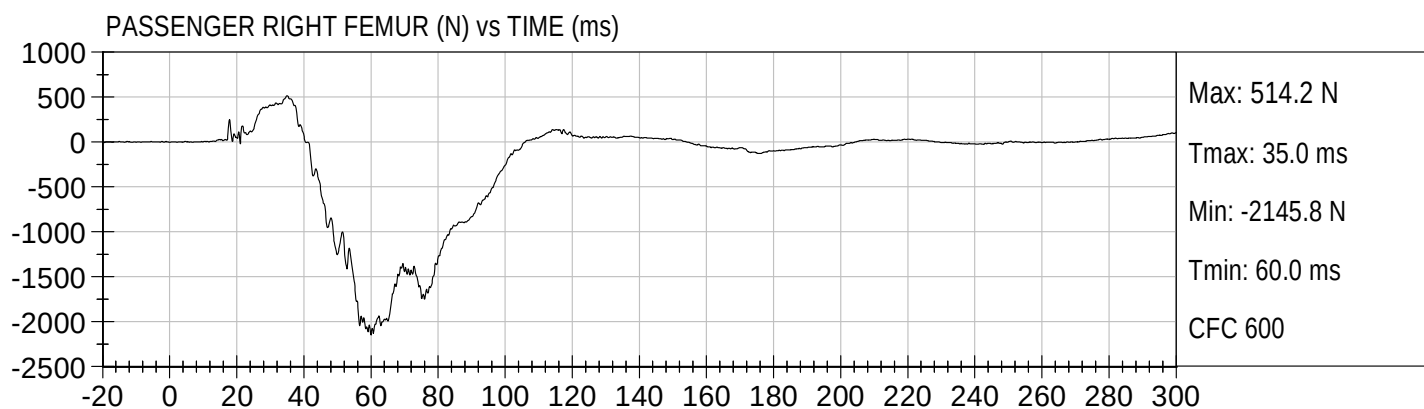
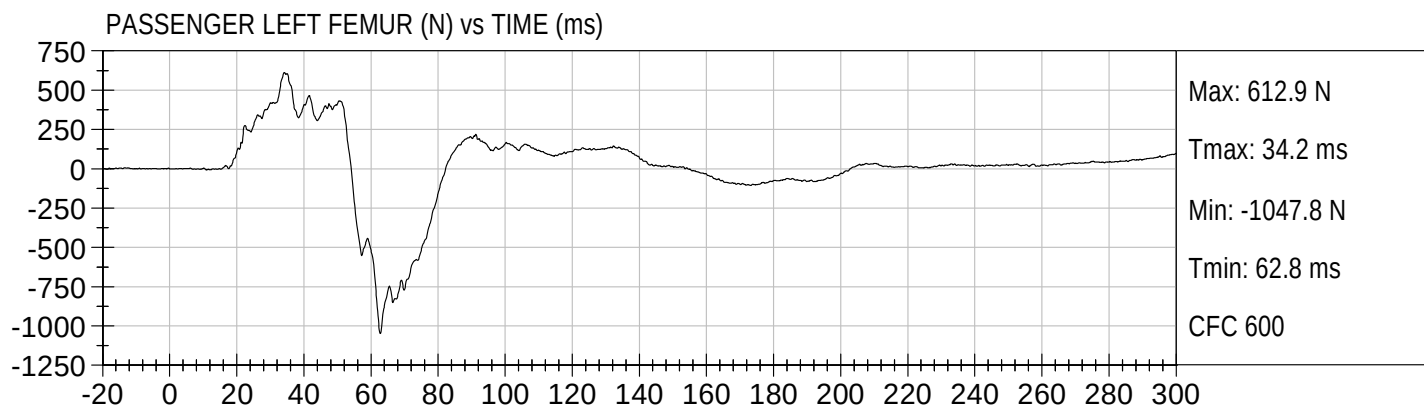


Pass. nij (NCF) () vs TIME (ms)



Pass. nij (NCE) () vs TIME (ms)





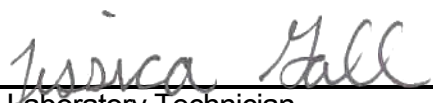
APPENDIX C
DUMMY CALIBRATION DATA

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

ATD Serial No: 351

Test ID: D103131

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	54	Pass
Peak Resultant Acceleration	G's	225 - 275	259	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	8.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass



Laboratory Technician

9/20/10
Test Date

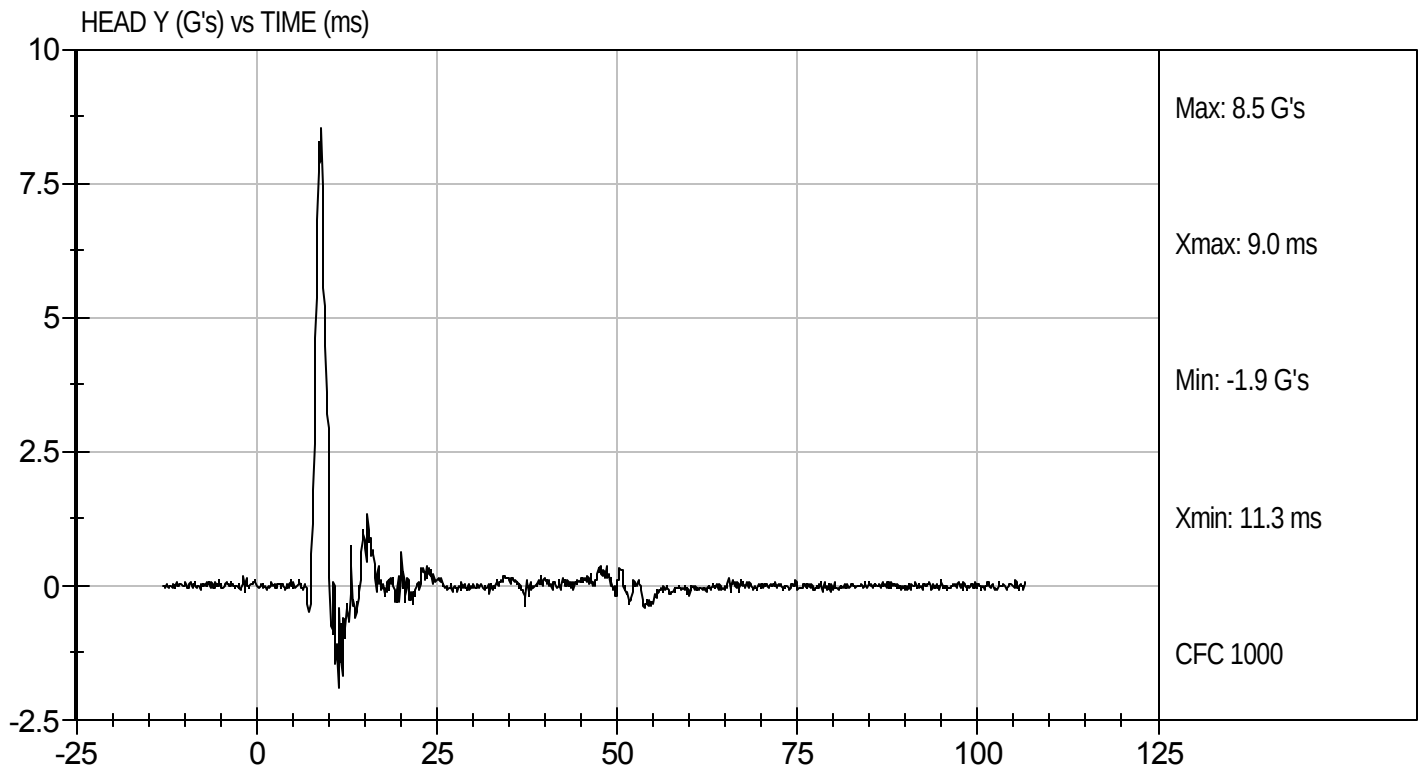
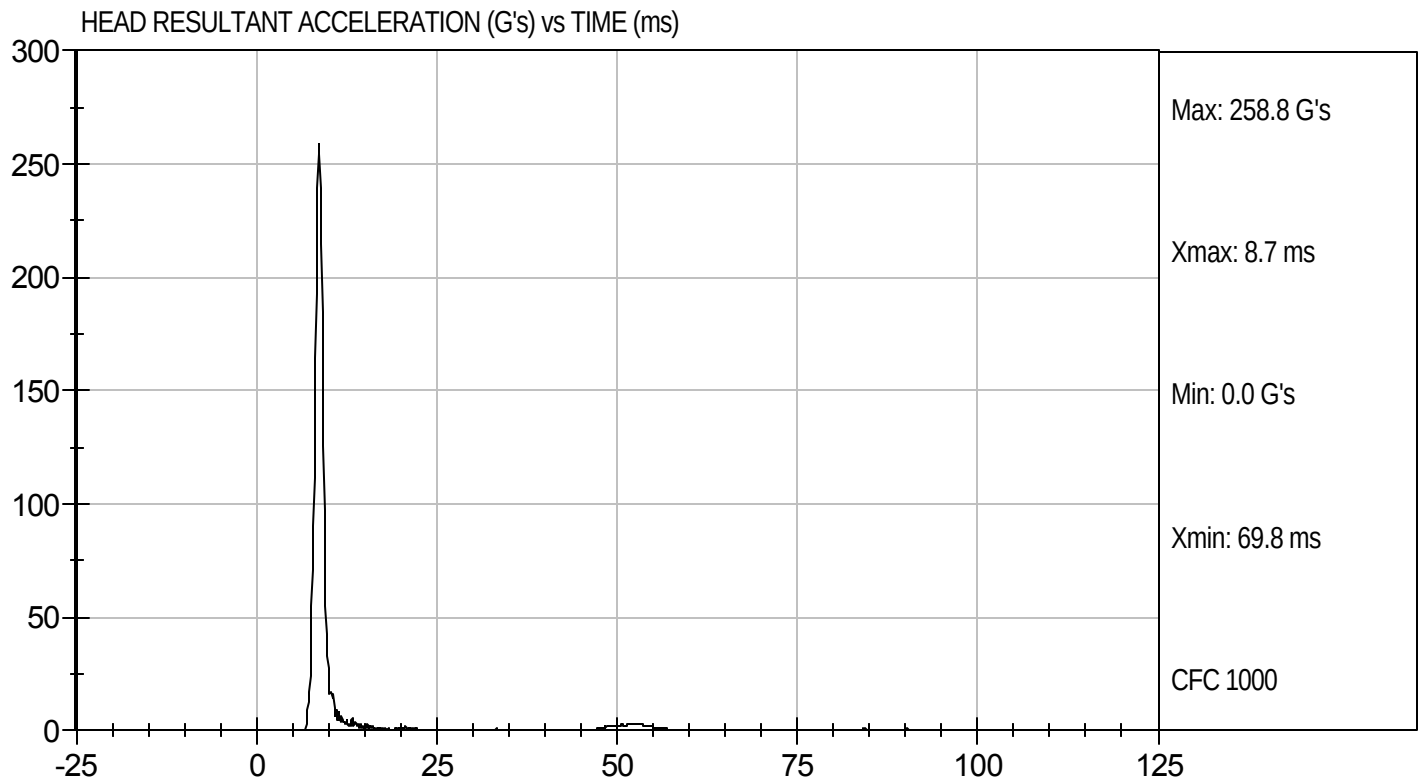


Approved By



Test Desc: Head Drop
Component ID: D103131

Test Date: 9/20/10
Velocity: 0 ft/s, 0.00 m/s

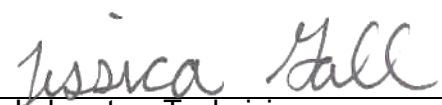


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D103132

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	48	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.18	Pass
	20 ms	G's	17.60 to 22.60	19.27	Pass
	30 ms	G's	12.50 to 18.50	13.39	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.36	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	40.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	65.3	Pass
	Time	ms	57.0 to 64.0	57.4	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	92.7	Pass
	Time	ms	47.0 to 58.0	52.9	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	101.5	Pass
Overall Test Results					Pass


 Laboratory Technician

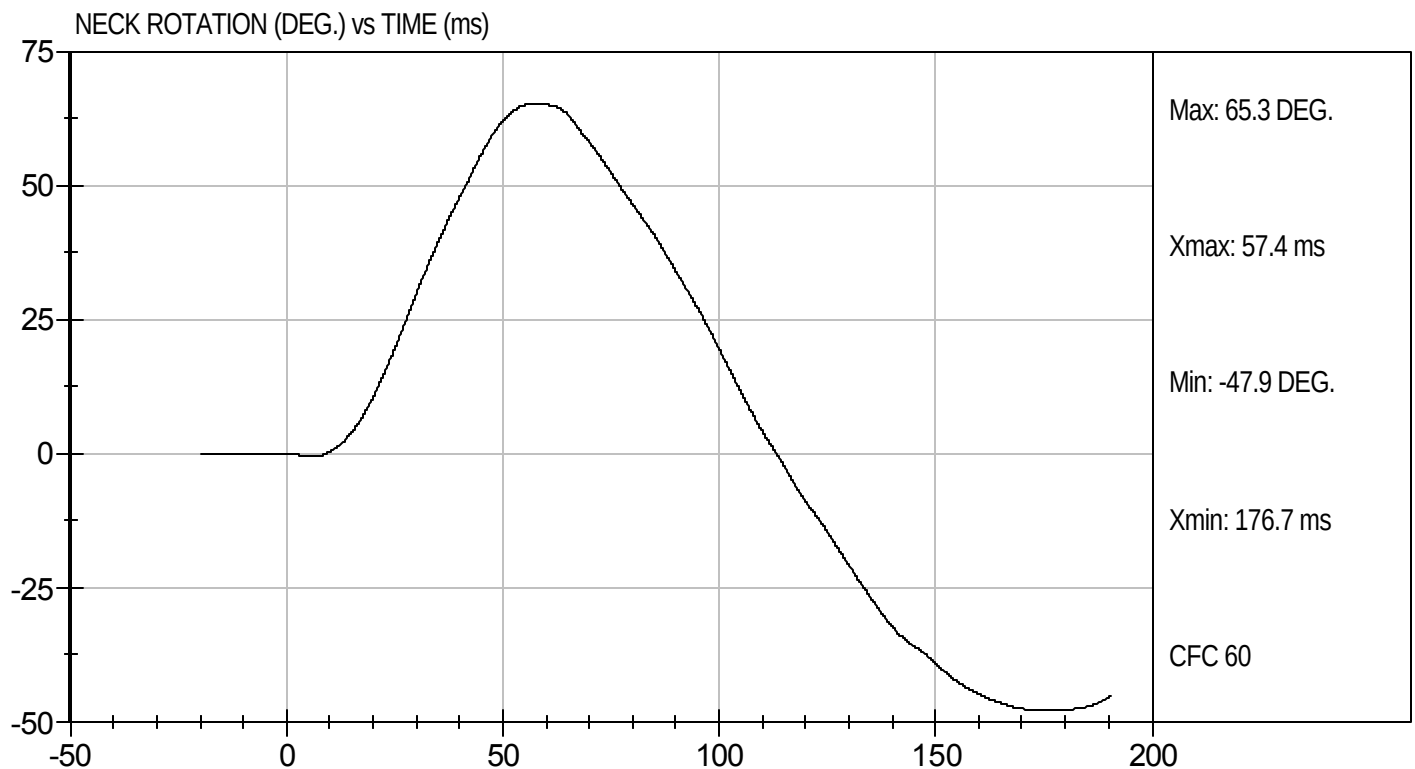
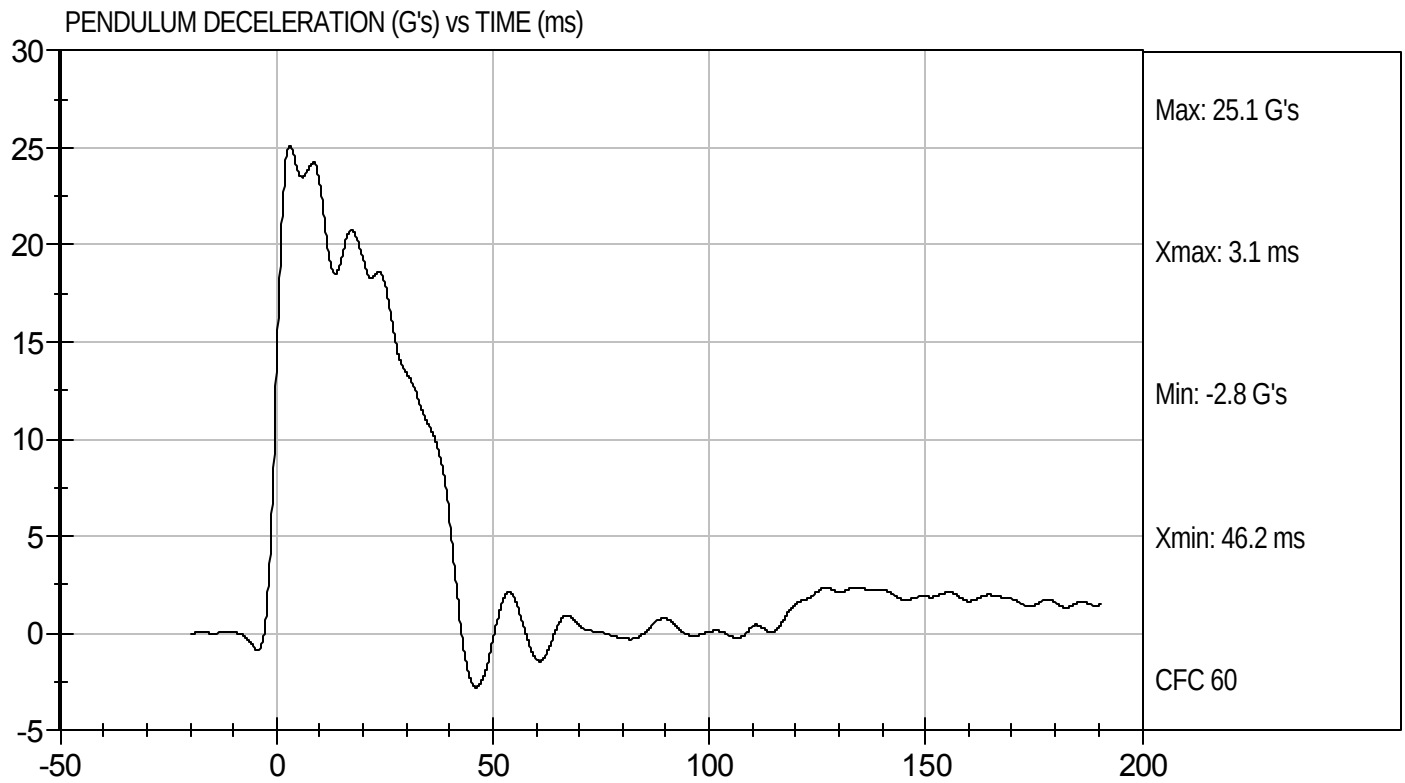
9/20/10
 Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D103132

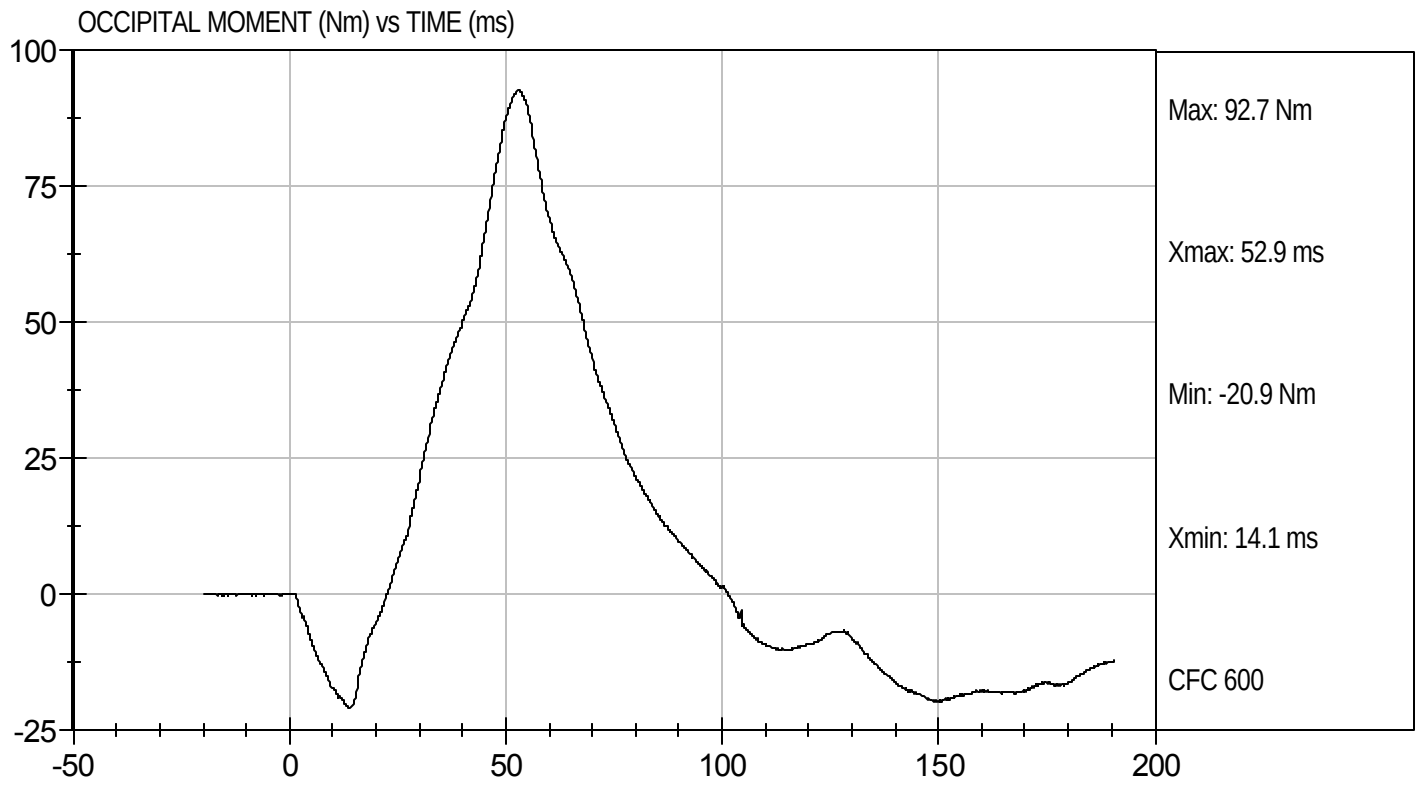
Test Date: 9/20/10
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D103132

Test Date: 9/20/10
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.: D103133

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	58	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.33	Pass
	20 ms	G's	14.00 to 19.00	15.68	Pass
	30 ms	G's	11.00 to 16.00	11.88	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.21	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	93.4	Pass
	Time	ms	72.0 to 82.0	76.8	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	157.2	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-56.5	Pass
	Time	ms	65.0 to 79.0	69.8	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	143.2	Pass
Overall Test Results					Pass


 Laboratory Technician

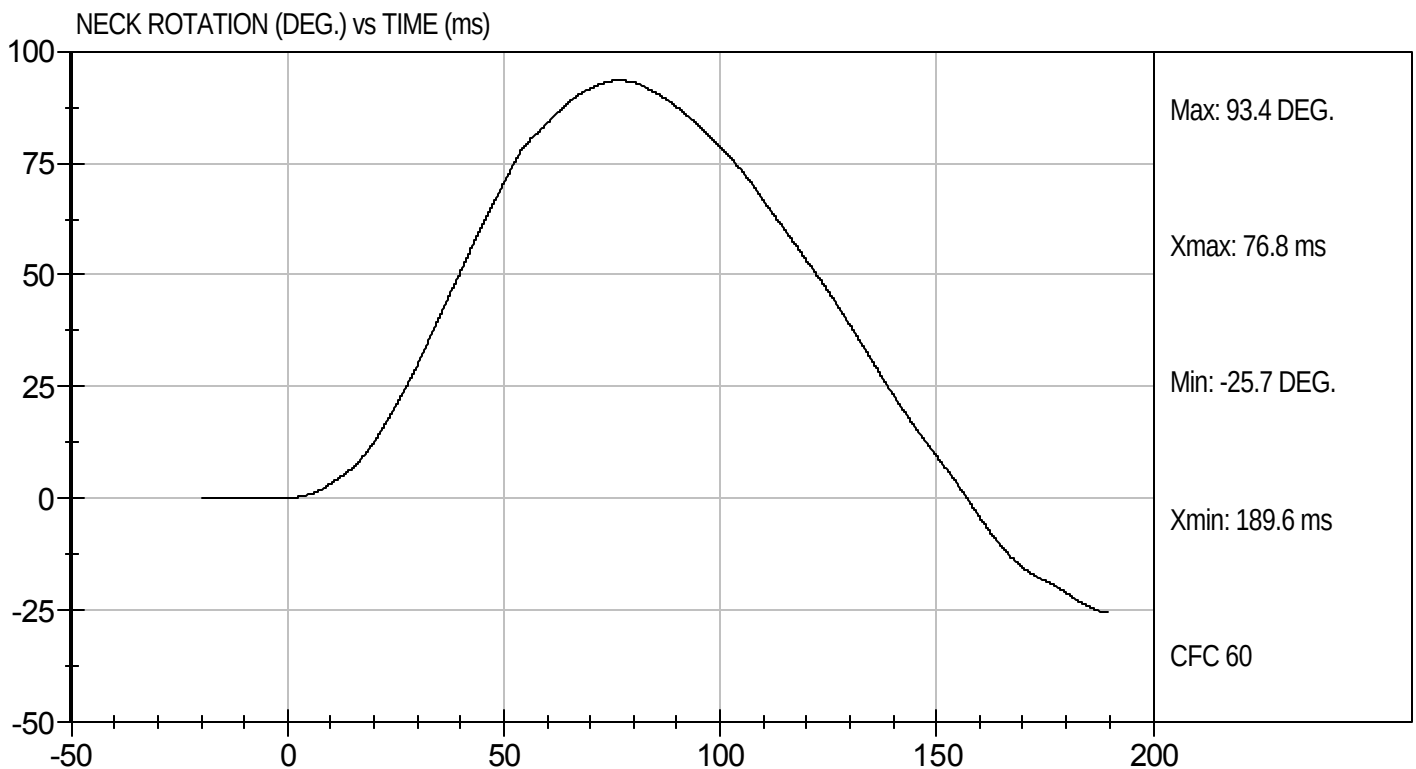
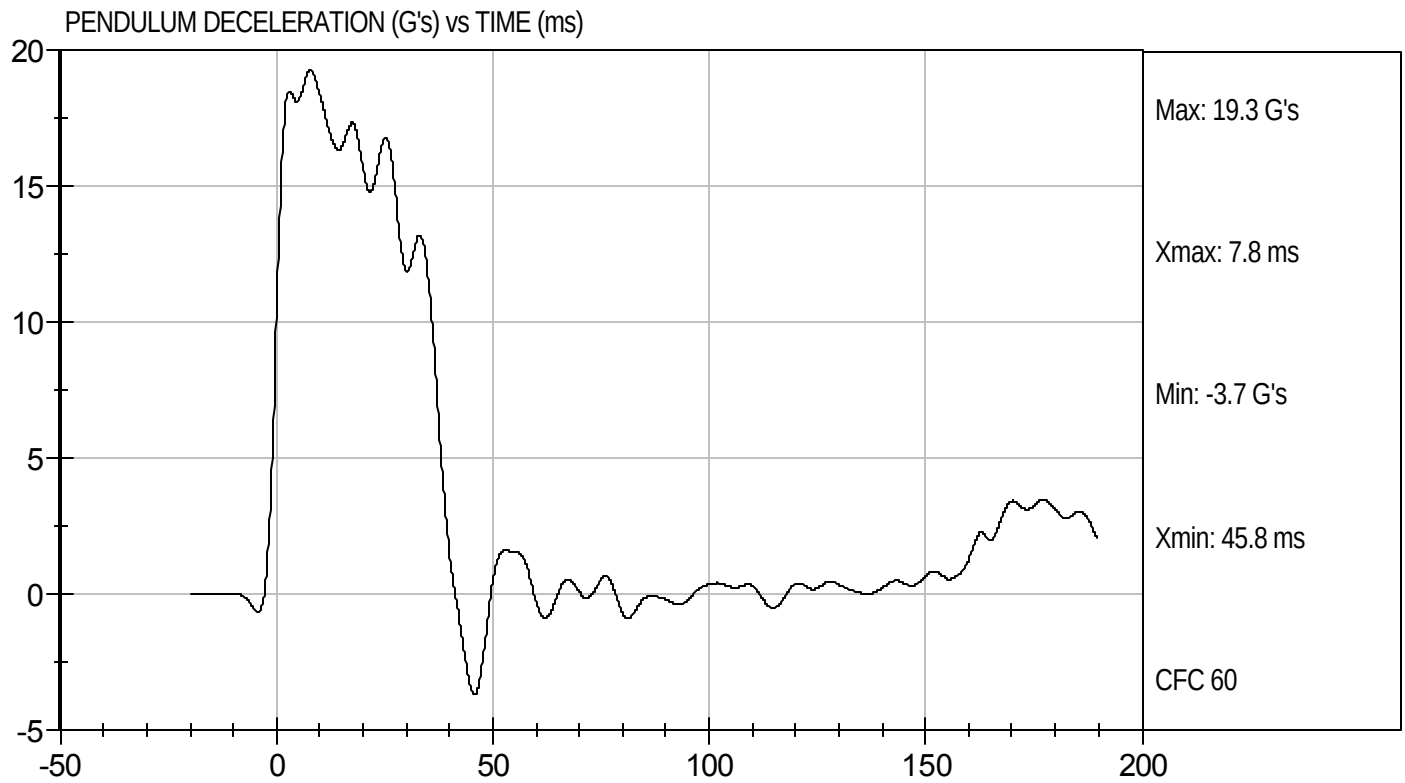
9/21/10
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D103133

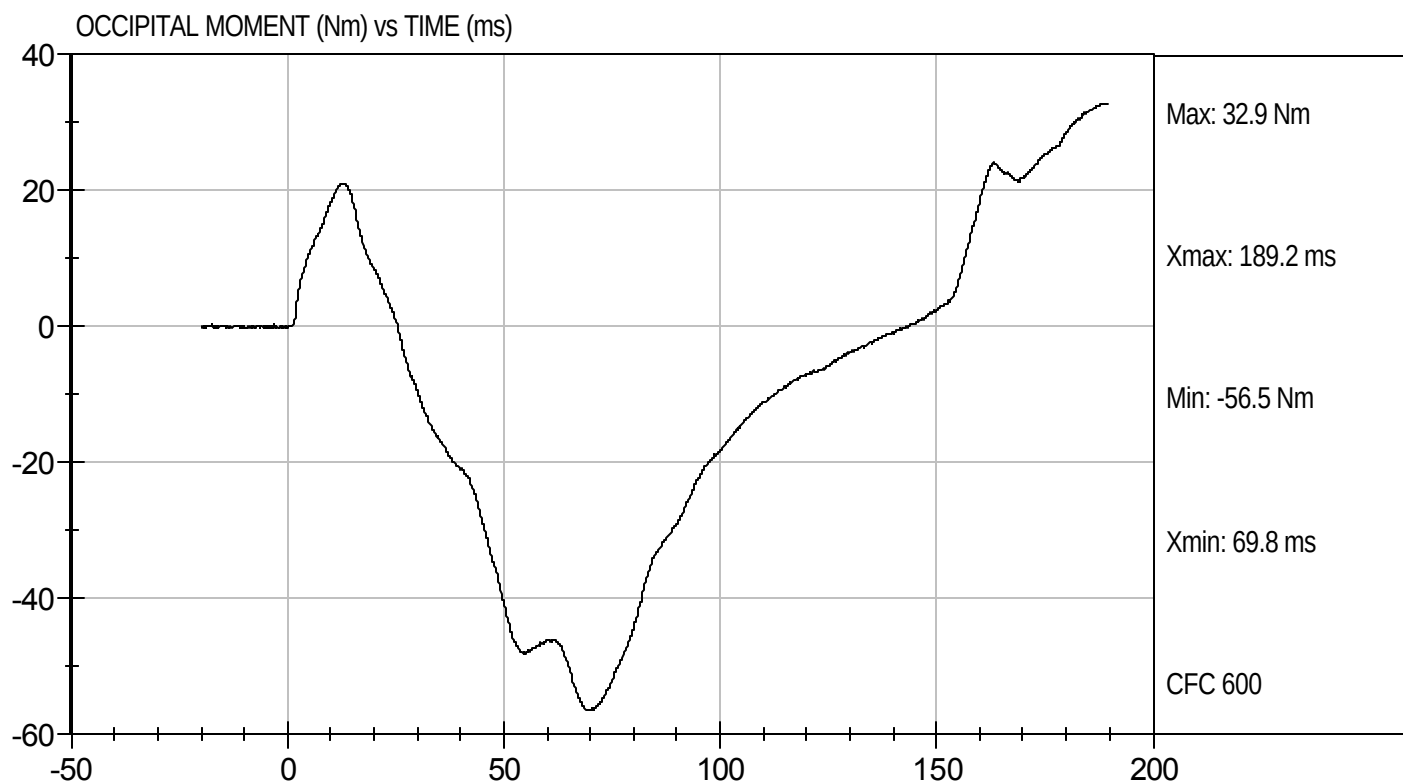
Test Date: 9/21/10
Velocity: 19.84 ft/s, 6.05 m/s





Test Desc: Neck Extension
Component ID: D103133

Test Date: 9/21/10
Velocity: 19.84 ft/s, 6.05 m/s

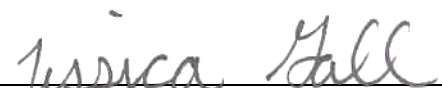


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D103134

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,278	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.37	Pass
Internal Hysteresis	%	69 to 85	72	Pass
			Overall Test Results	Pass


Laboratory Technician

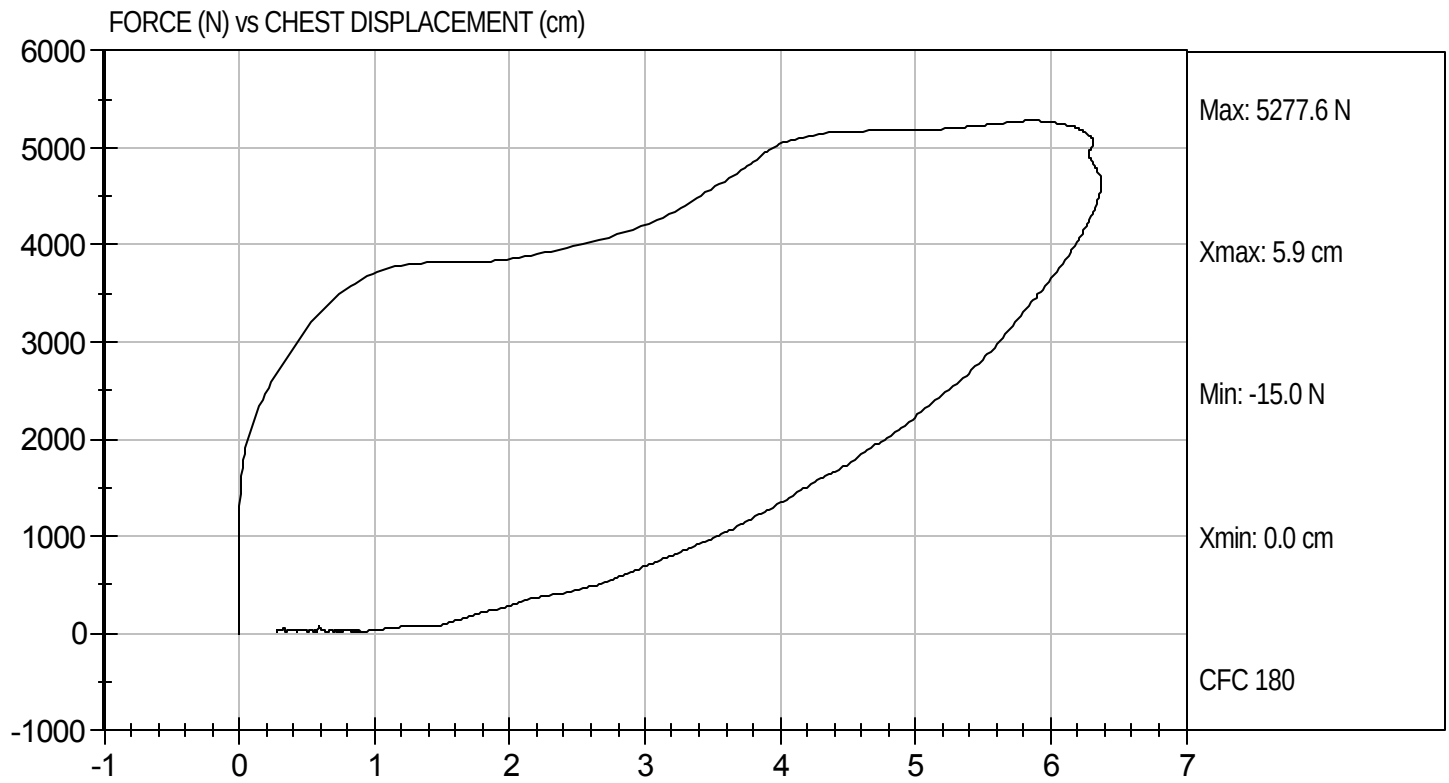
9/21/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D103134

Test Date: 9/21/10
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: D103135

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	58	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,574	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

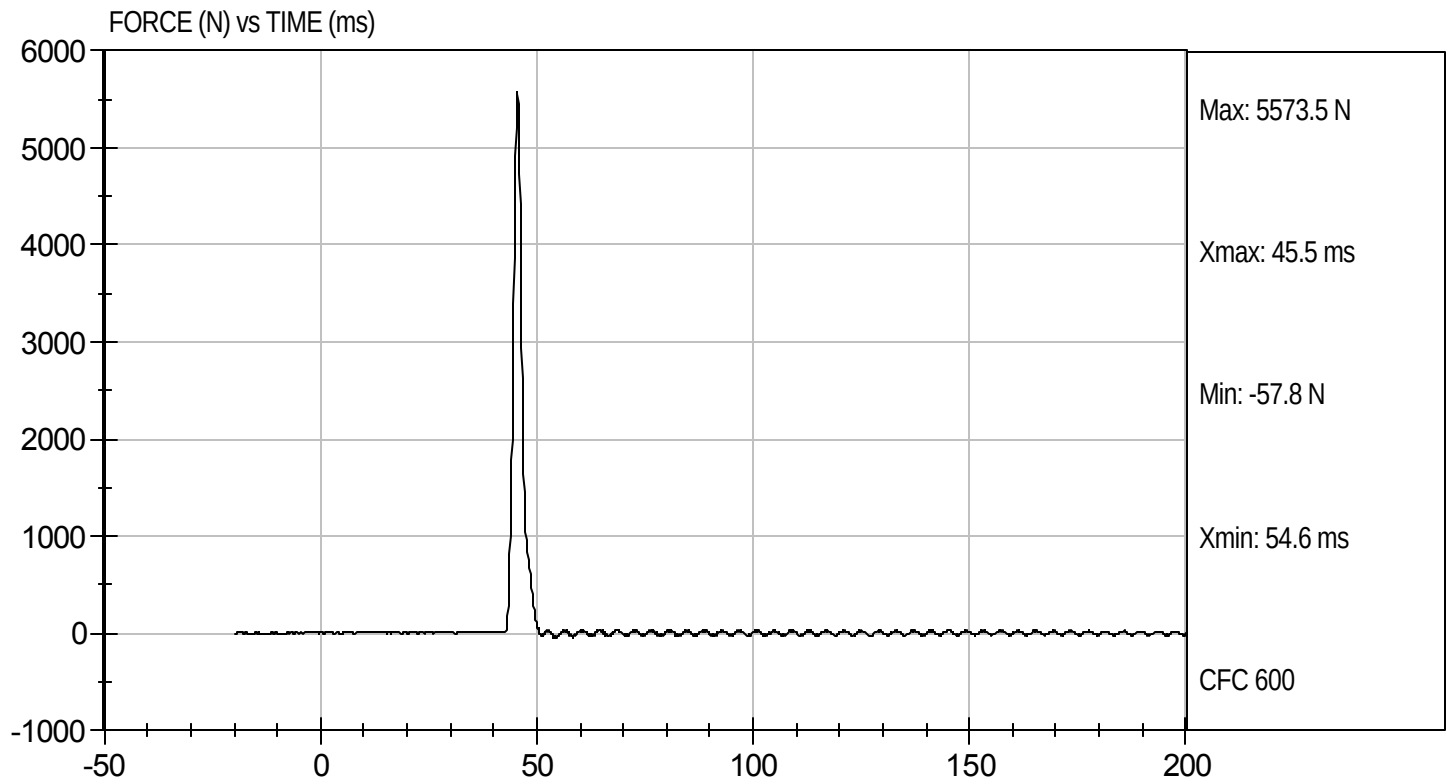
9/21/10
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D103135

Test Date: 9/21/10
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: D103136

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	58	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,649	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

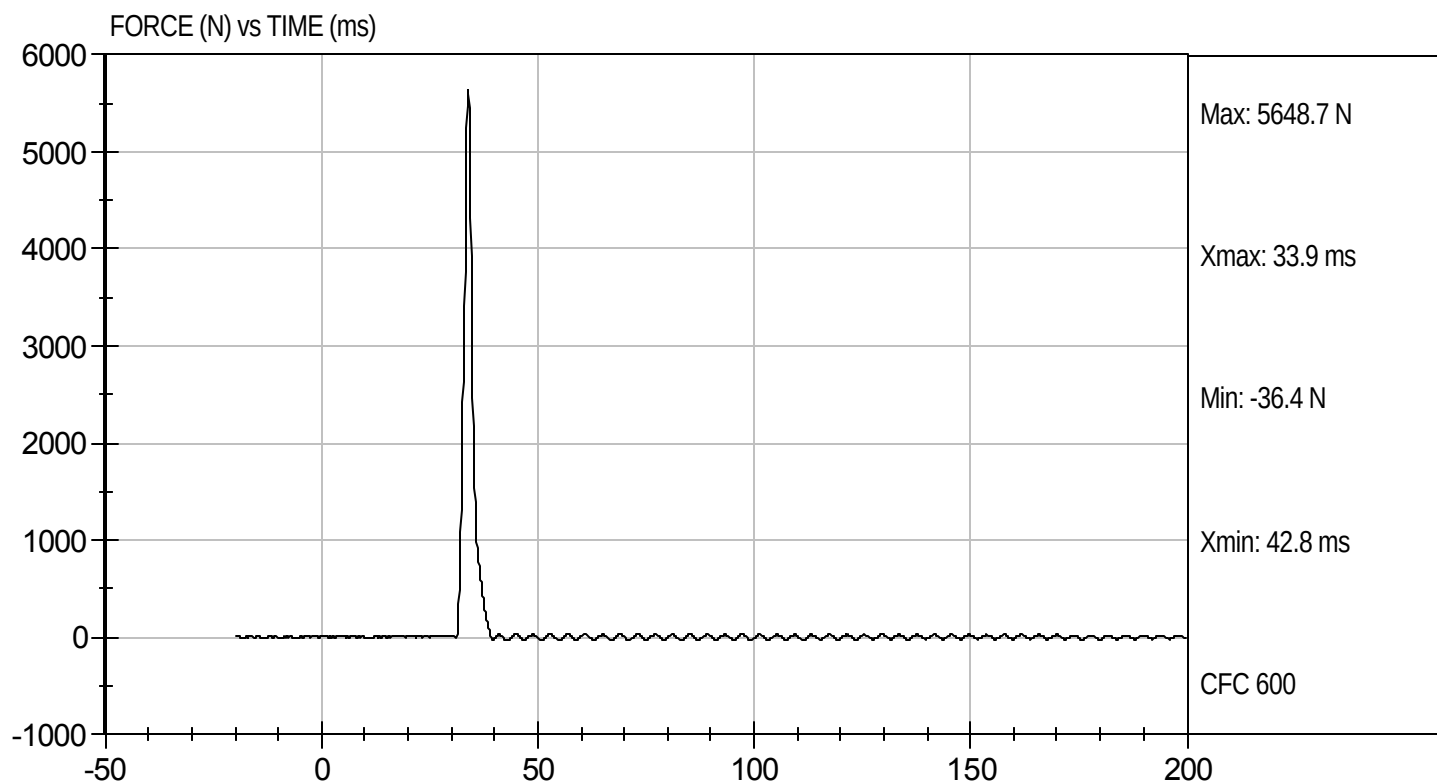
9/21/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D103136

Test Date: 9/21/10
Velocity: 6.85 ft/s, 2.09 m/s

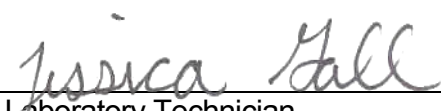


MGA RESEARCH CORPORATION
HIP-FEMUR FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D103130

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.9	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	54	54	Pass
Rotation Rate	deg/s	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	58.3	47.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	46	48	Pass
Overall Test Results					Pass


 Laboratory Technician

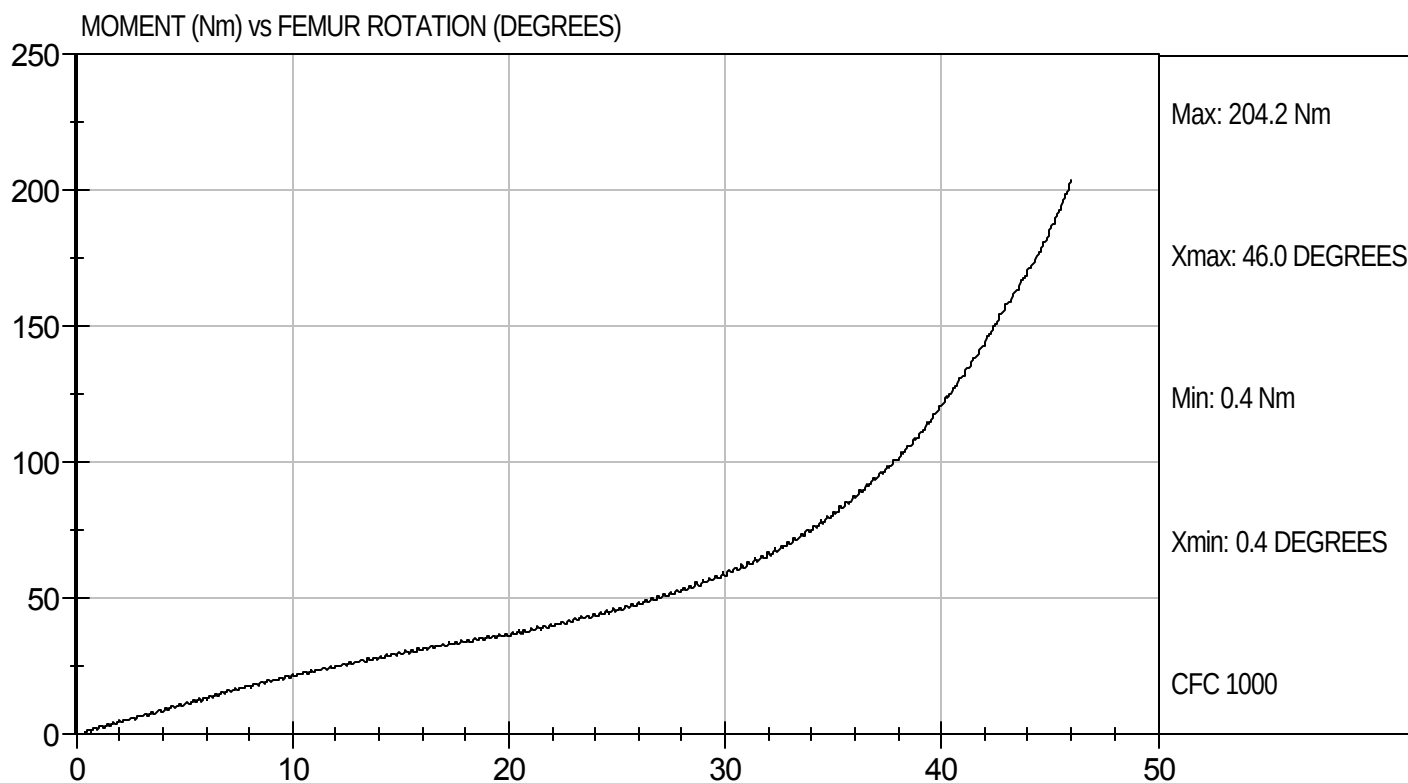
9/21/10
 Test Date


 Approved By



Test Desc: Hip Femur Flexion
Component ID: D103139

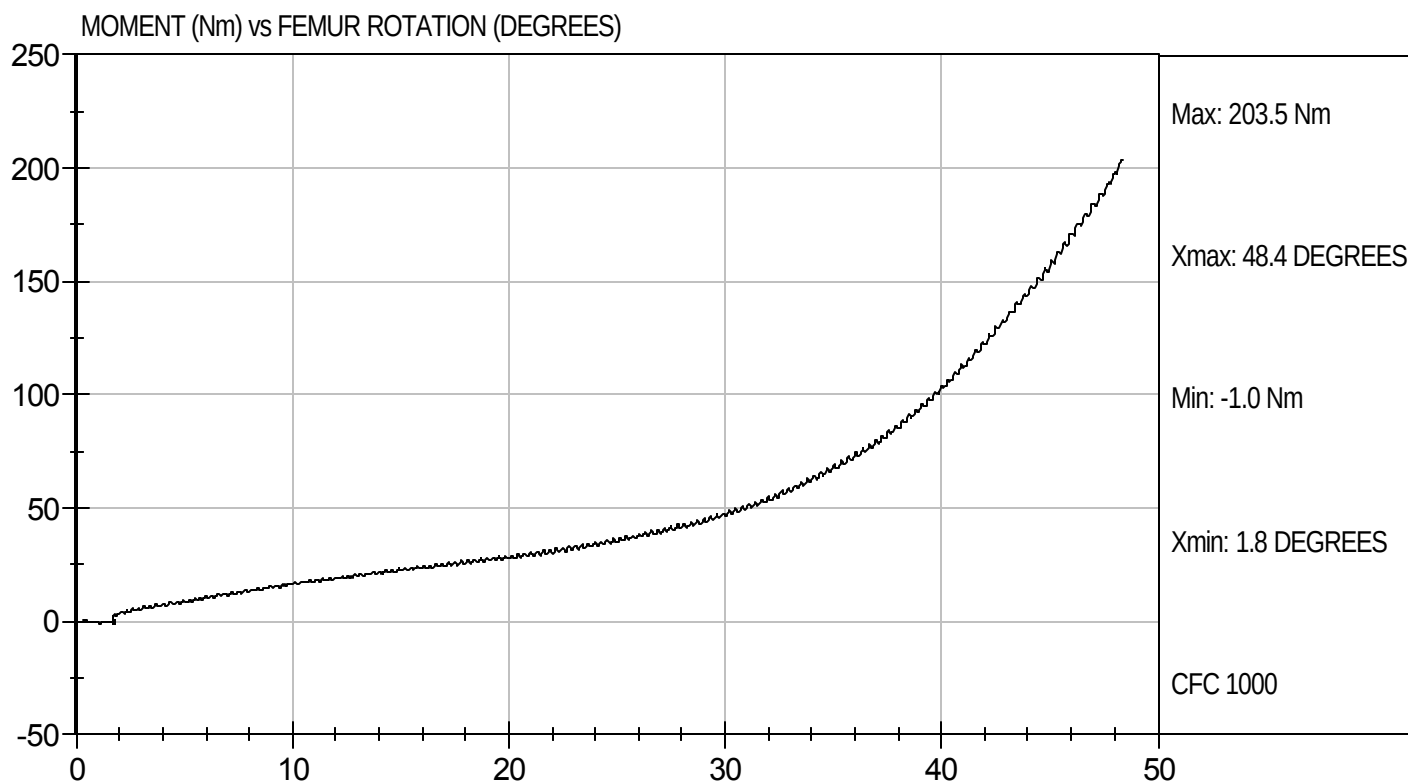
Test Date: 9/21/10
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D103130

Test Date: 9/21/10
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: D103321

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Peak Resultant Acceleration	G's	225 - 275	254	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	6.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

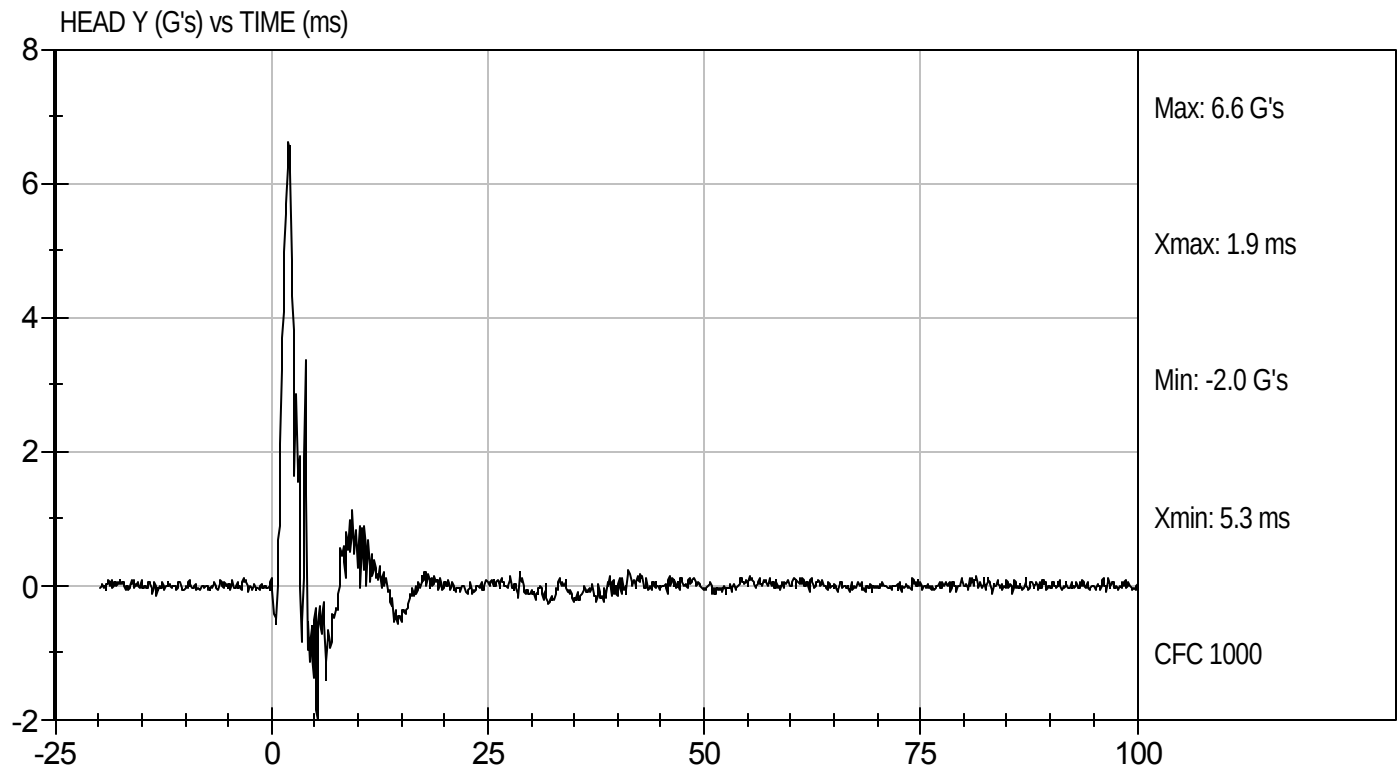
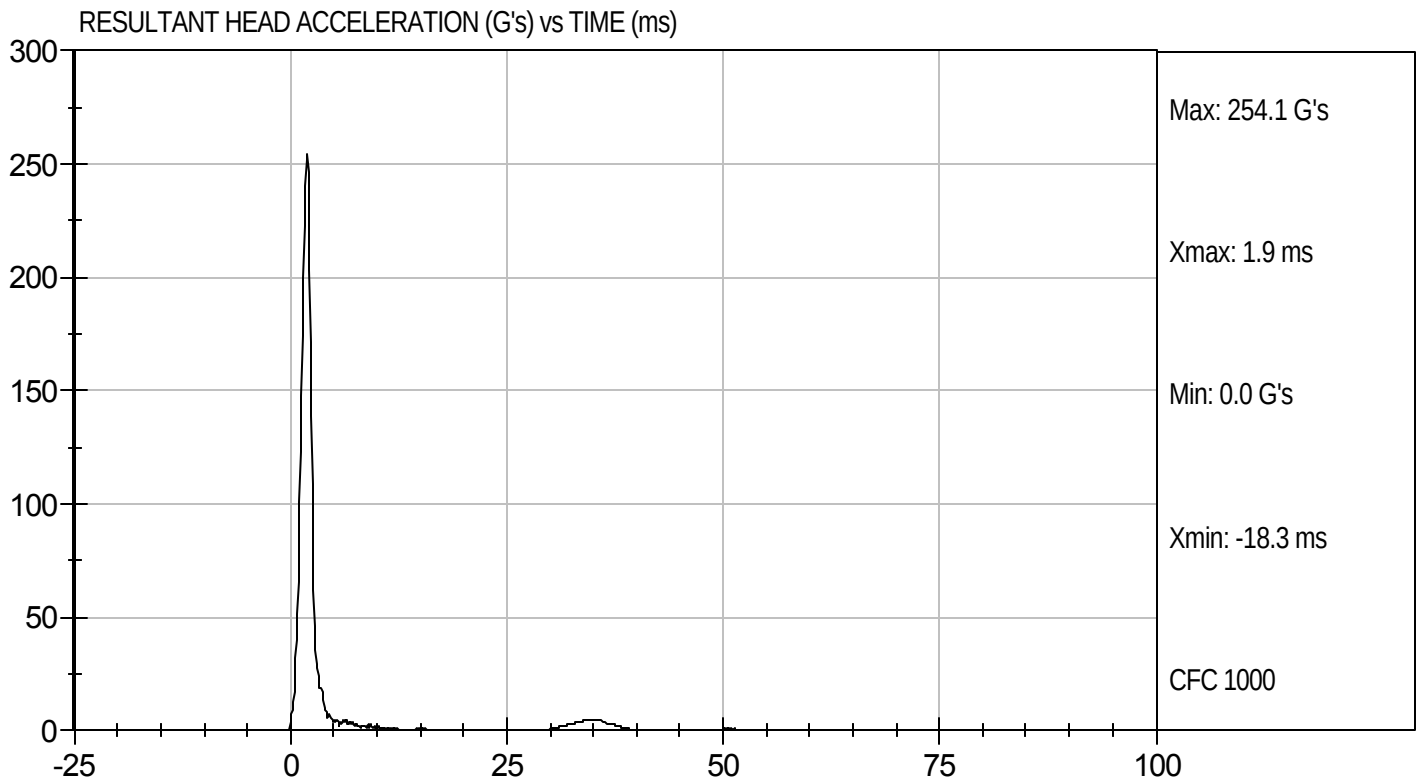
10/1/10
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D103321

Test Date: 10/1/10
Velocity: 0 ft/s, 0.00 m/s

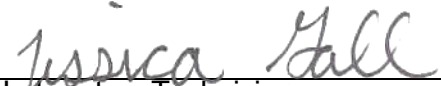


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D.: D103322

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	44	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.82	Pass
	20 ms	G's	17.60 to 22.60	18.66	Pass
	30 ms	G's	12.50 to 18.50	15.23	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	15.19	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.8	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	65.7	Pass
	Time	ms	57.0 to 64.0	60.9	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	113.2	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	94.4	Pass
	Time	ms	47.0 to 58.0	47.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	99.3	Pass
Overall Test Results					Pass


Laboratory Technician

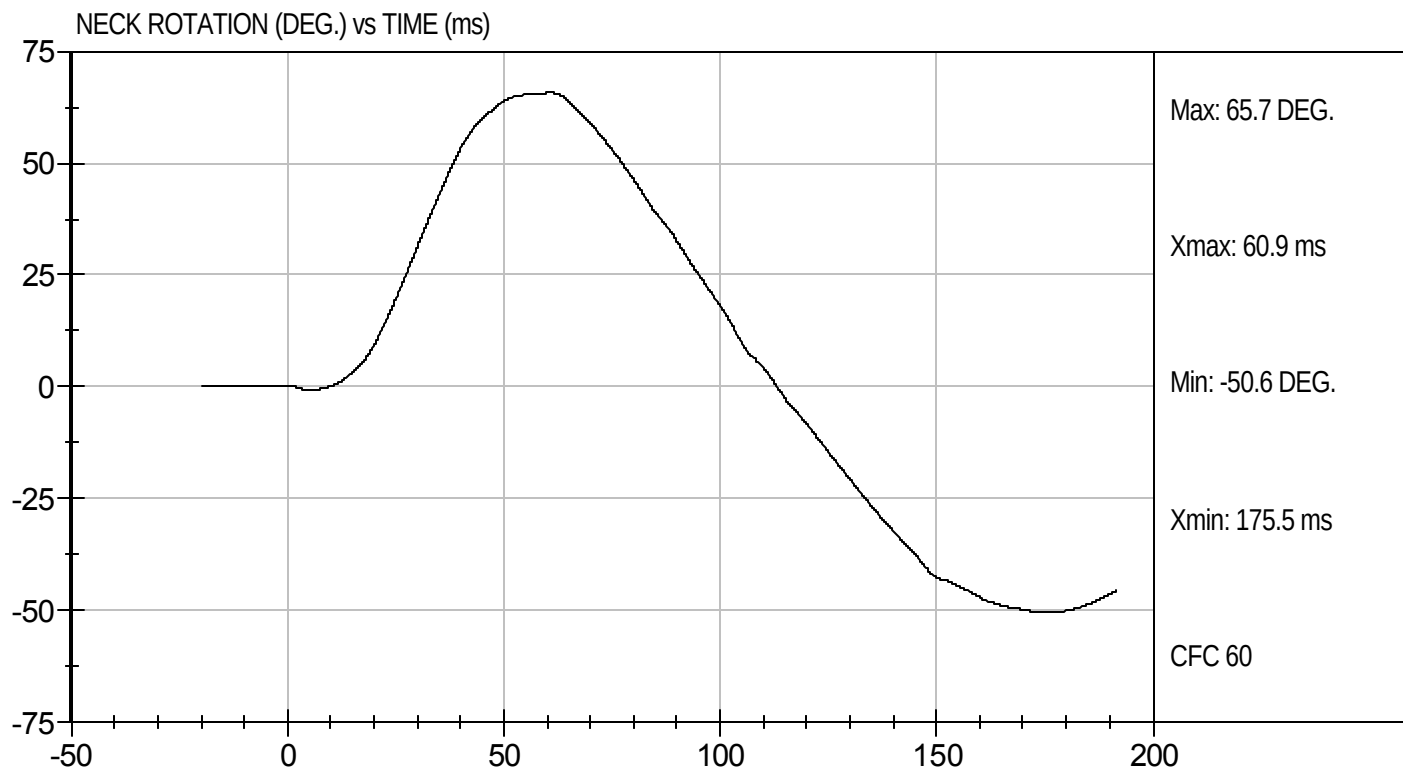
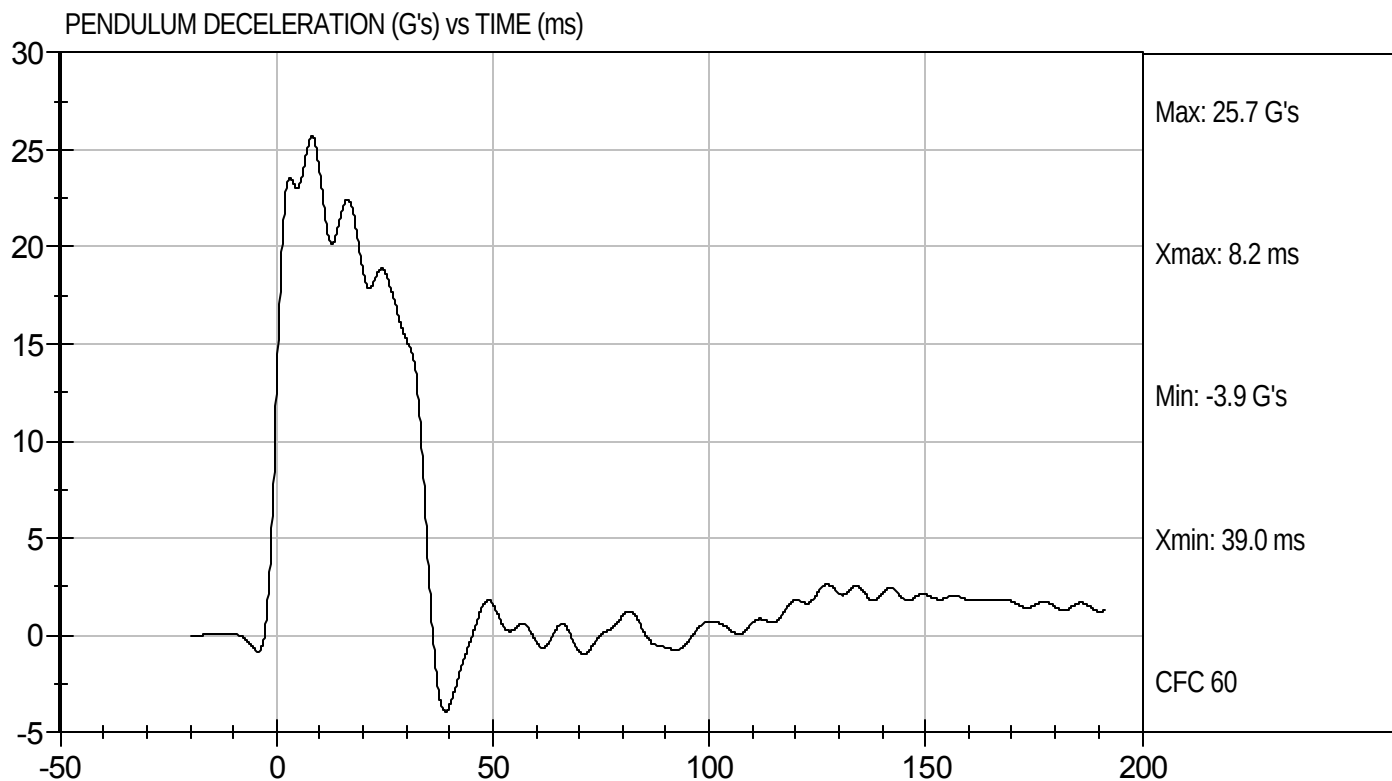
10/1/10
Test Date


Approved By



Test Desc: Neck Flexion
Component ID: D103322

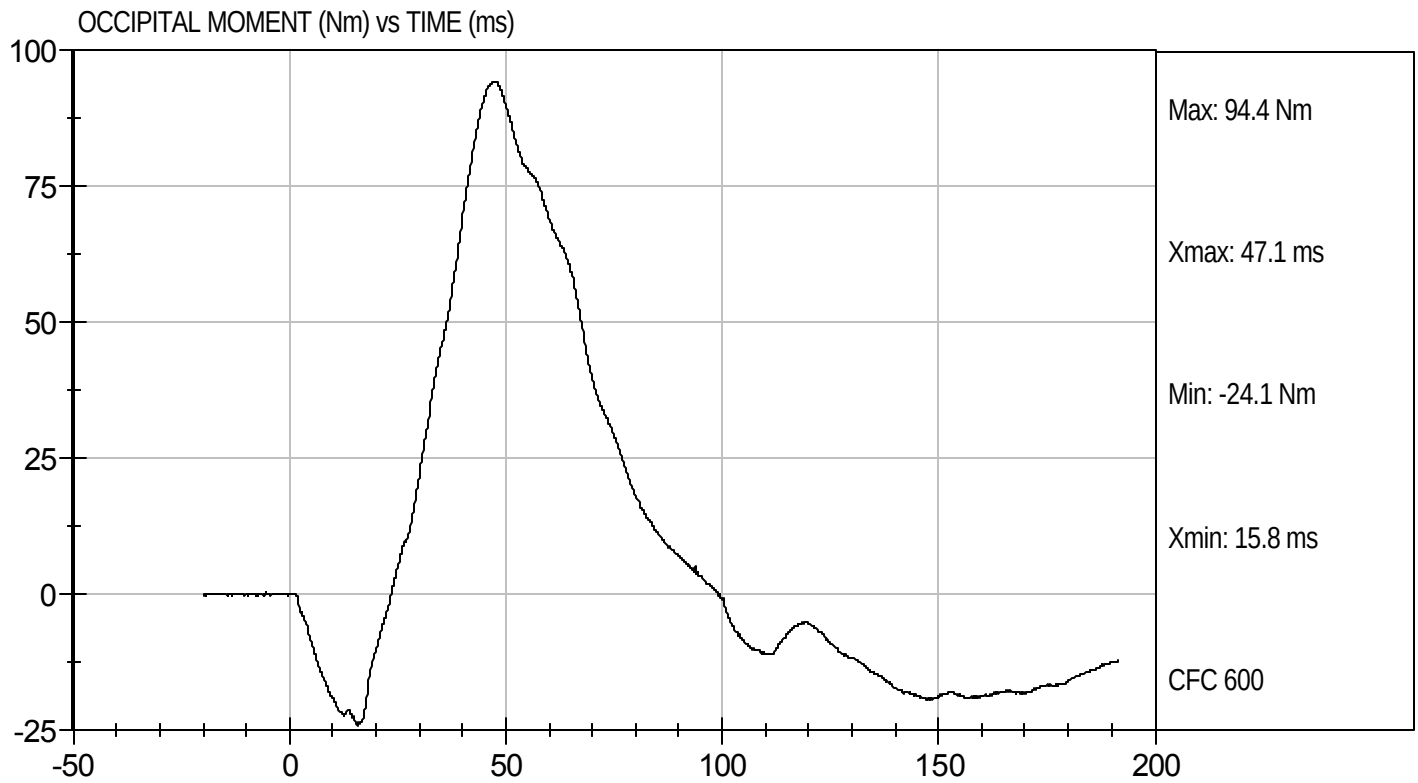
Test Date: 10/1/10
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D103322

Test Date: 10/1/10
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.: D103323

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	44	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	20.86	Pass
	20 ms	G's	14.00 to 19.00	16.51	Pass
	30 ms	G's	11.00 to 16.00	13.45	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.40	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.8	Pass
	Time	ms	72.0 to 82.0	76.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	153.9	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.2	Pass
	Time	ms	65.0 to 79.0	68.9	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	140.2	Pass
Overall Test Results					Pass


 Laboratory Technician

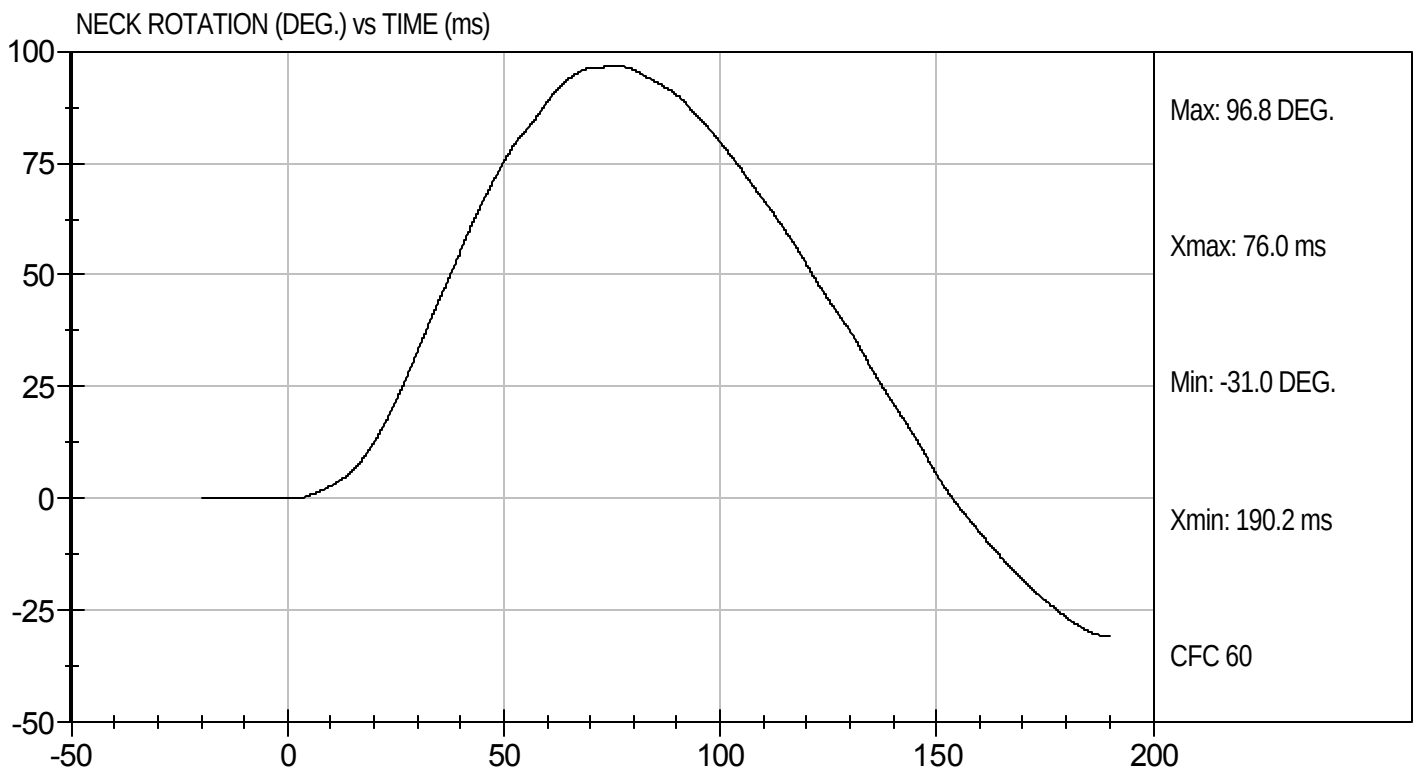
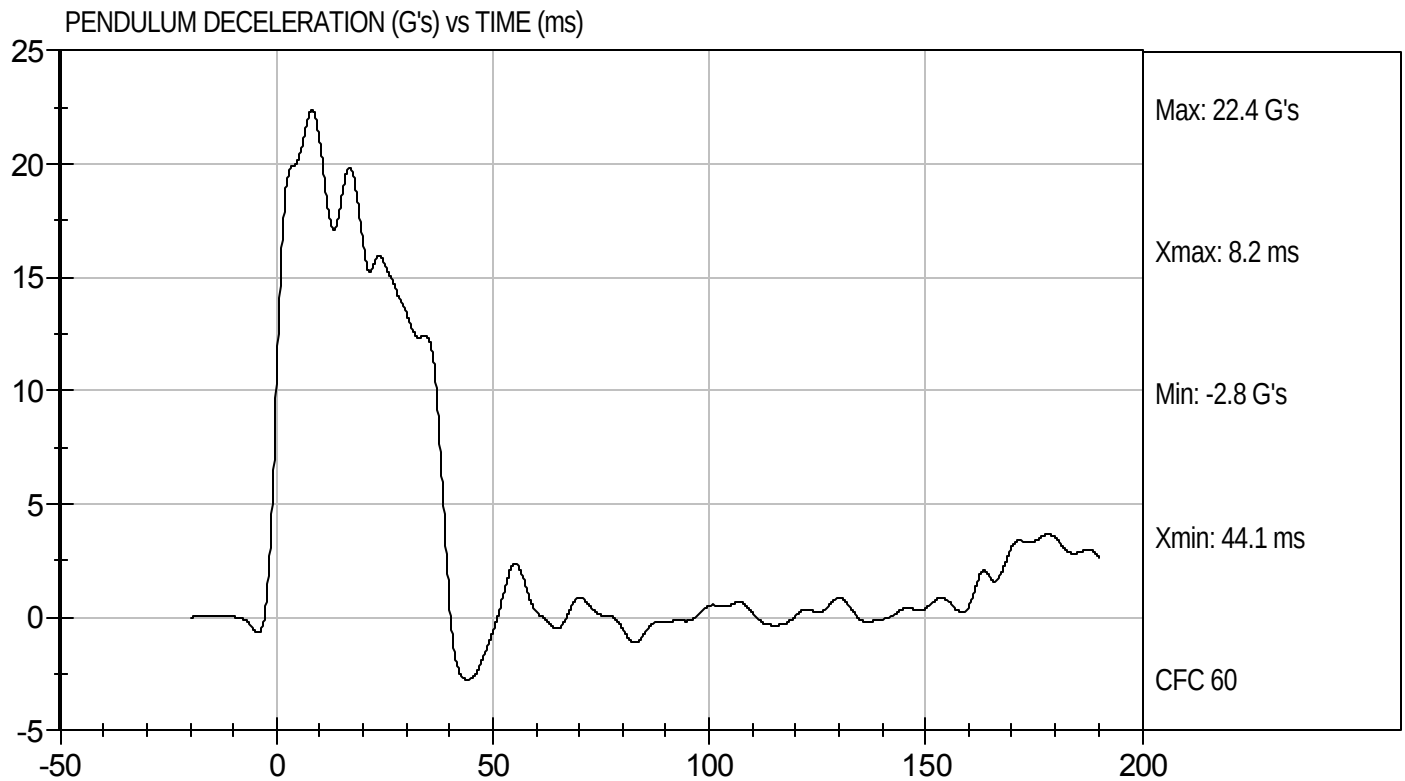
10/1/10
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D103323

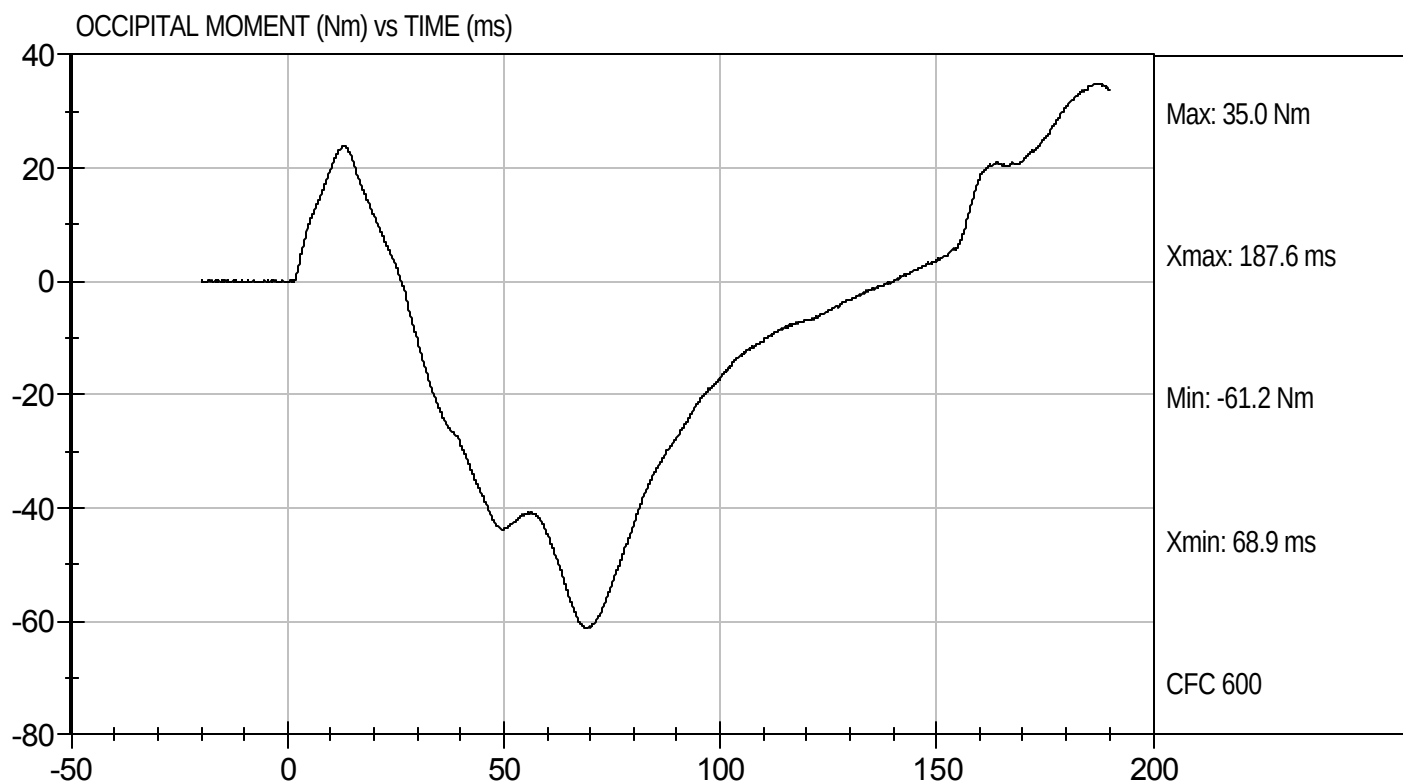
Test Date: 10/1/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D103323

Test Date: 10/1/10
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: D103324

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	36	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,356	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

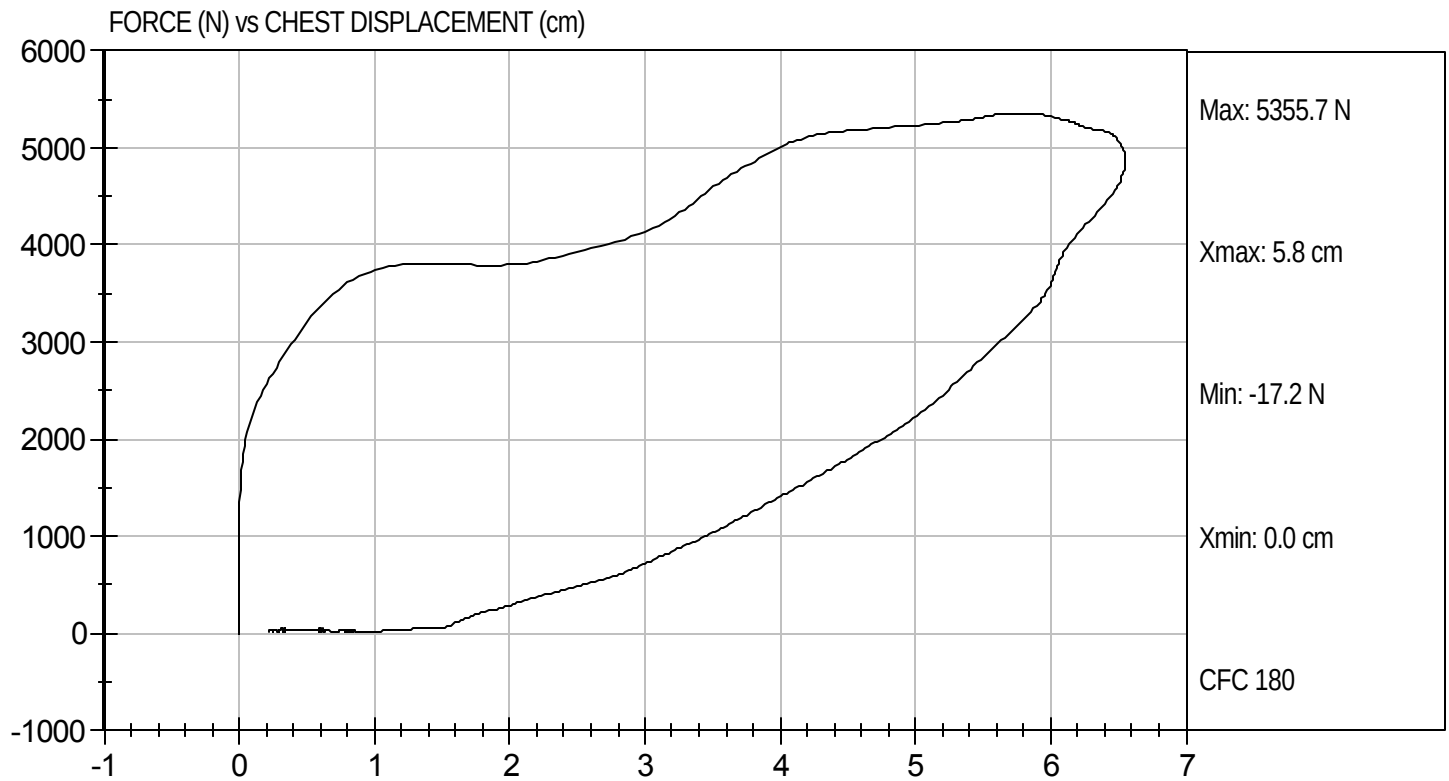
10/1/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D103324

Test Date: 10/1/10
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: D103325

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	37	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5,266	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

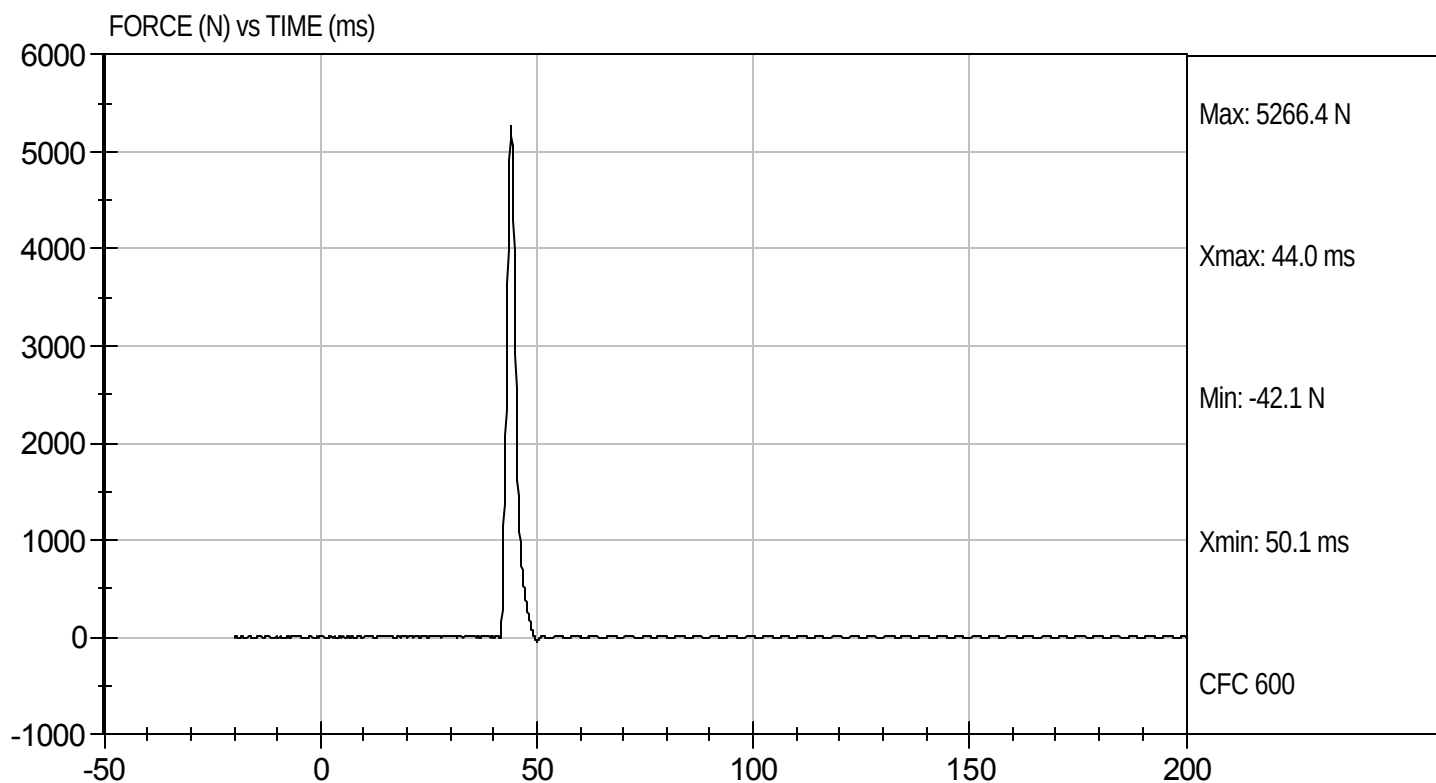
10/1/10
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D103325

Test Date: 10/1/10
Velocity: 6.92 ft/s, 2.11 m/s



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

ATD Serial No: 351

Test I.D: D103326

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	37	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5,396	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

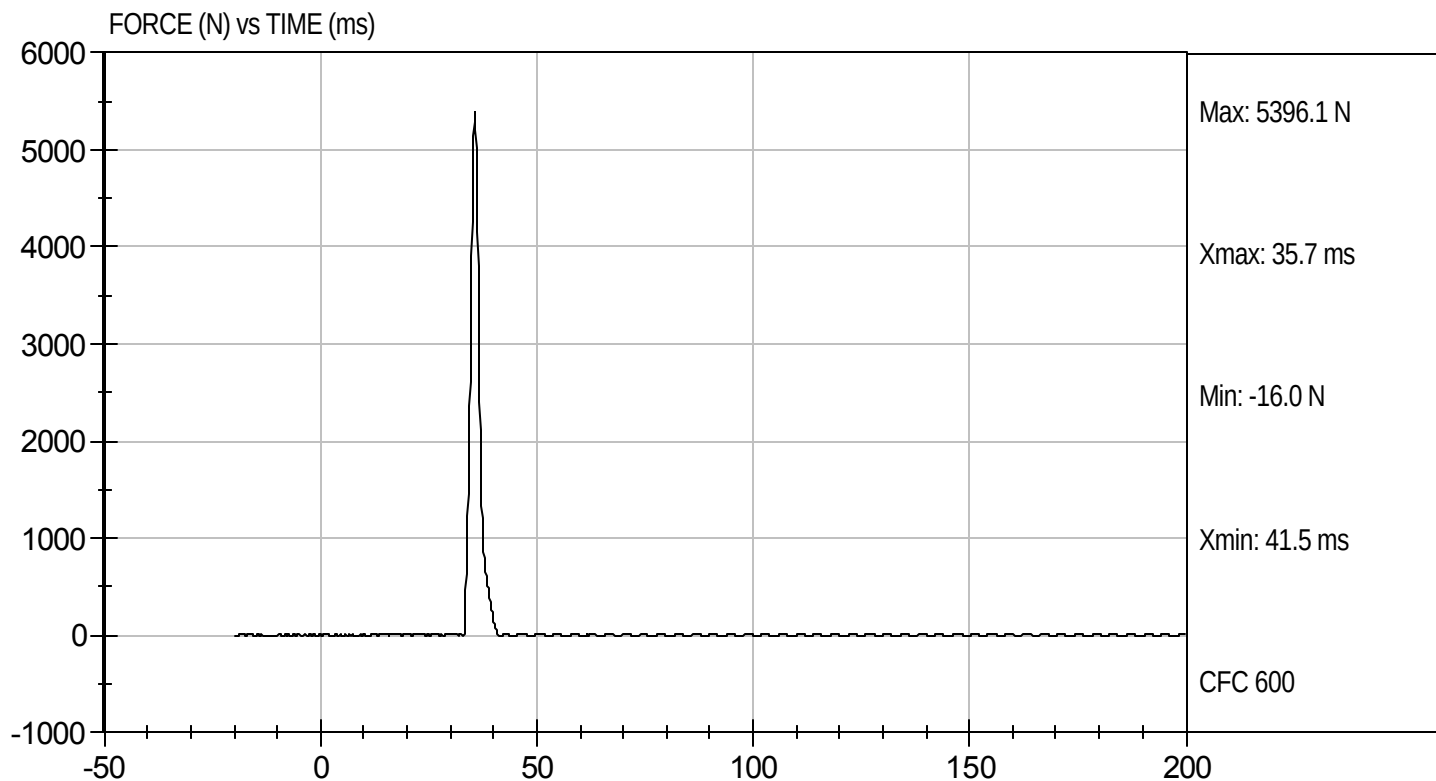
10/1/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D103326

Test Date: 10/1/10
Velocity: 6.83 ft/s, 2.08 m/s



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

ATD Serial No: 351

Test I.D: D103320

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	38	38	Pass
Rotation Rate	deg/s	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	55.8	44.1	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	46	49	Pass
Overall Test Results					Pass

Jessica Galt
Laboratory Technician

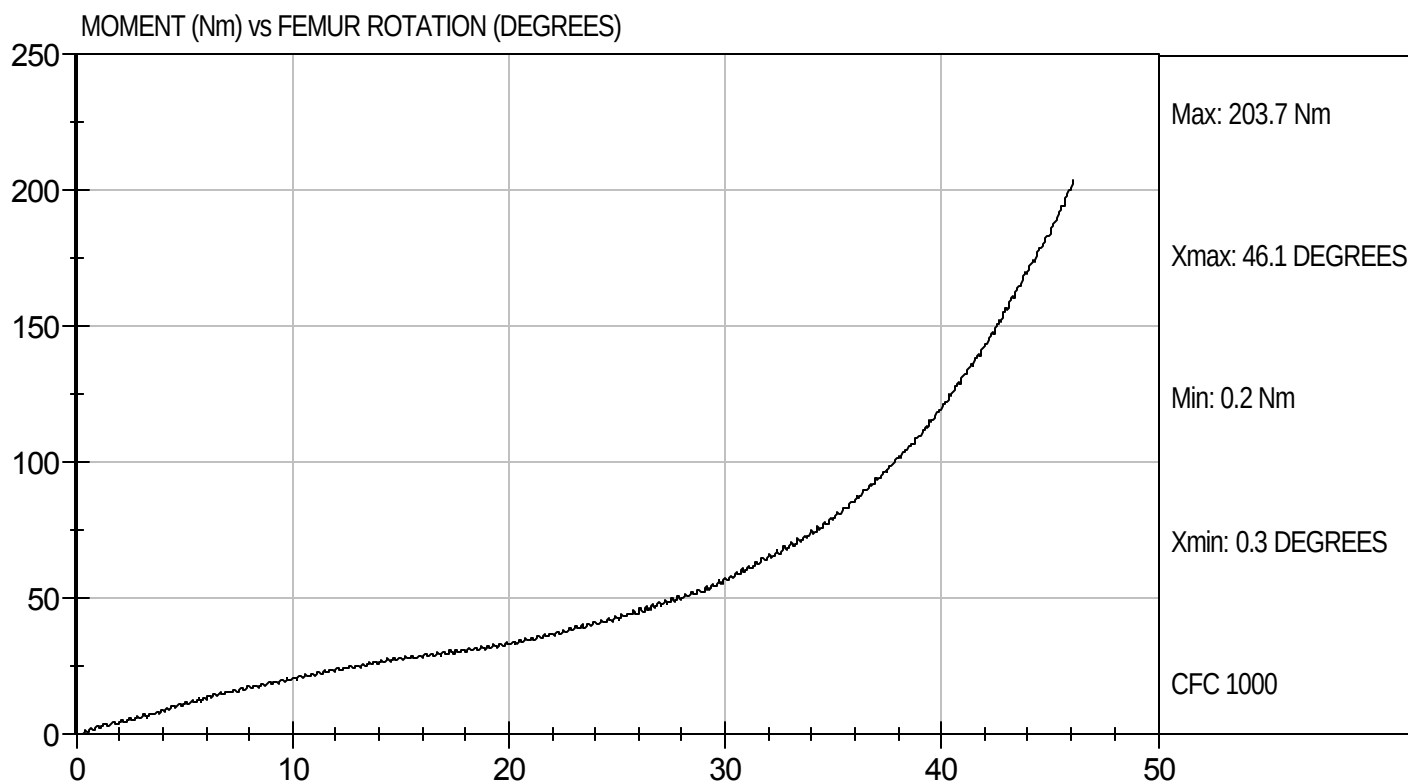
10/1/10
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D103329

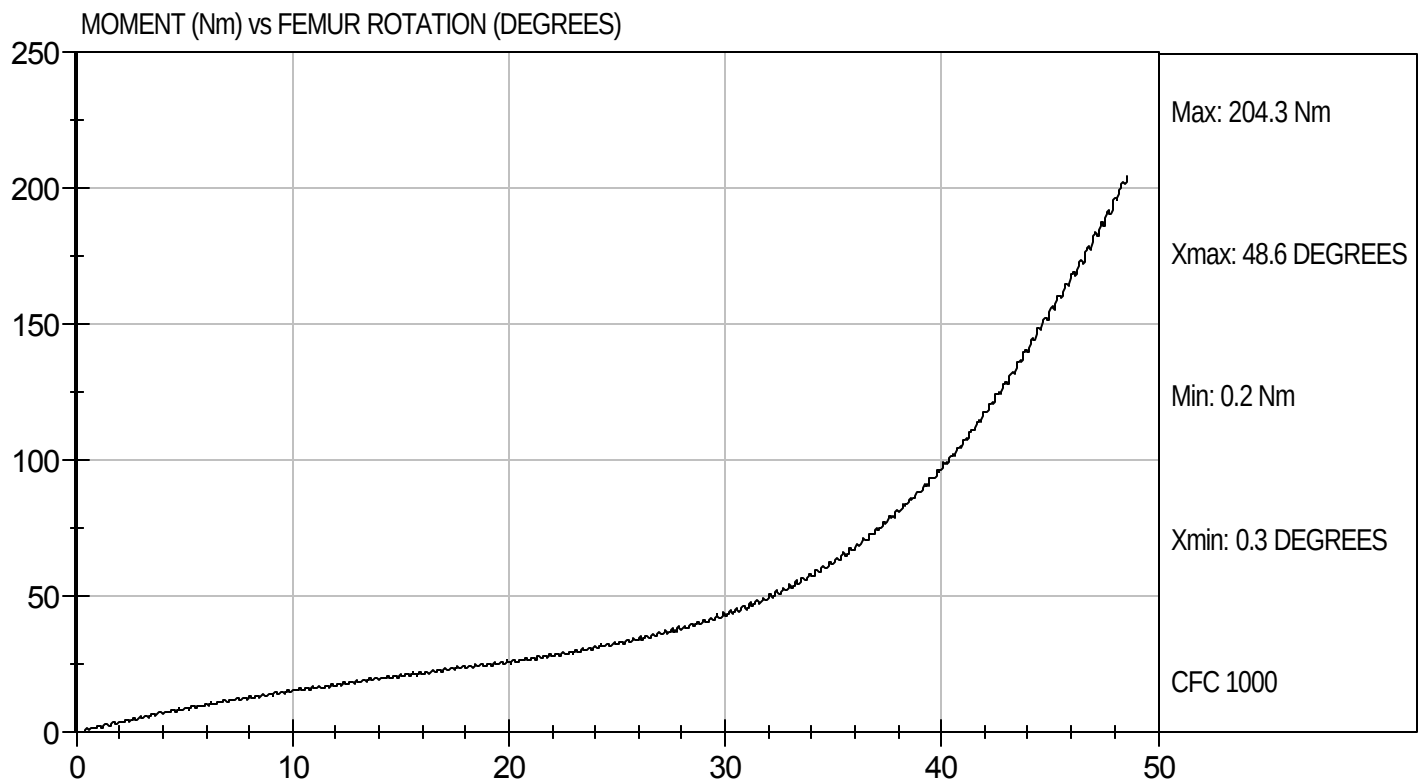
Test Date: 10/1/10
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D103320

Test Date: 10/1/10
Velocity: 0 ft/s, 0.00 m/s

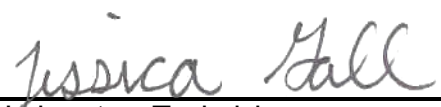


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D103141

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	55	Pass
Peak Resultant Acceleration	G's	250 to 300	285	Pass
Peak Lateral Acceleration	G's	+/- 15	-9.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

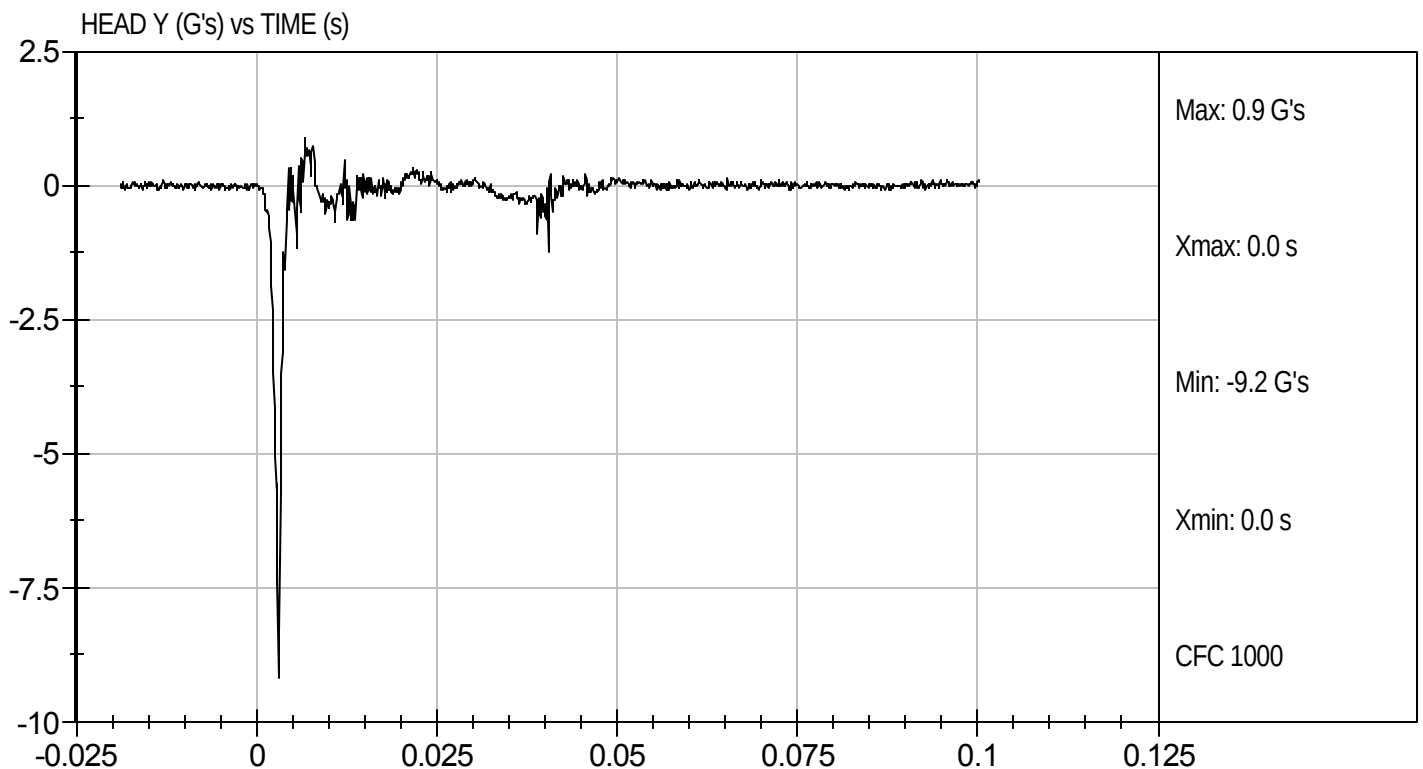
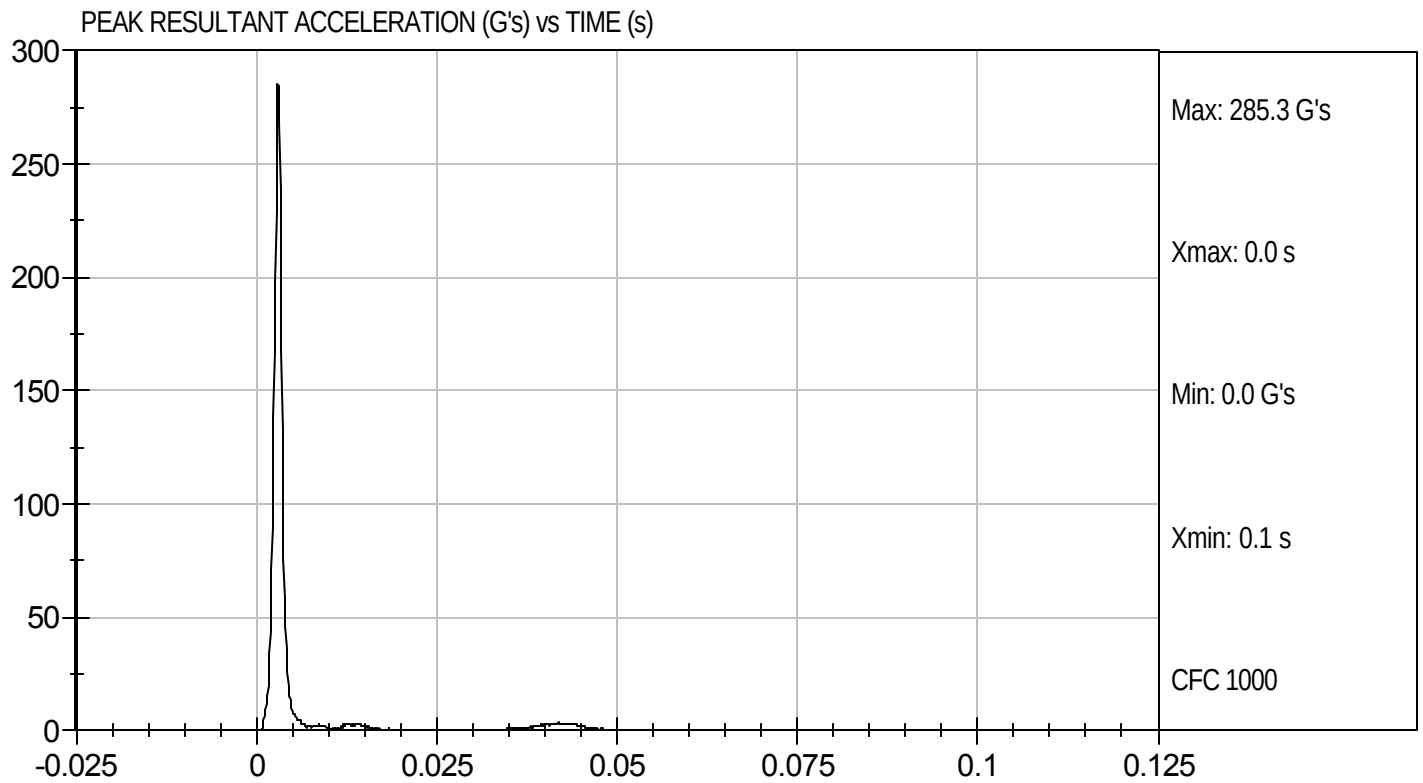
9/20/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D103141

Test Date: 9/20/10
Velocity: 0 ft/s, 0.00 m/s

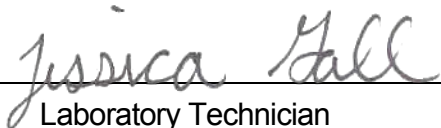


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103142

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	58	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 ms	m/s	2.1 to 2.5	2.5	Pass
	20 ms	m/s	4.0 to 5.0	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	86	Pass
Overall Results				Pass	


Laboratory Technician

9/21/10
Test Date

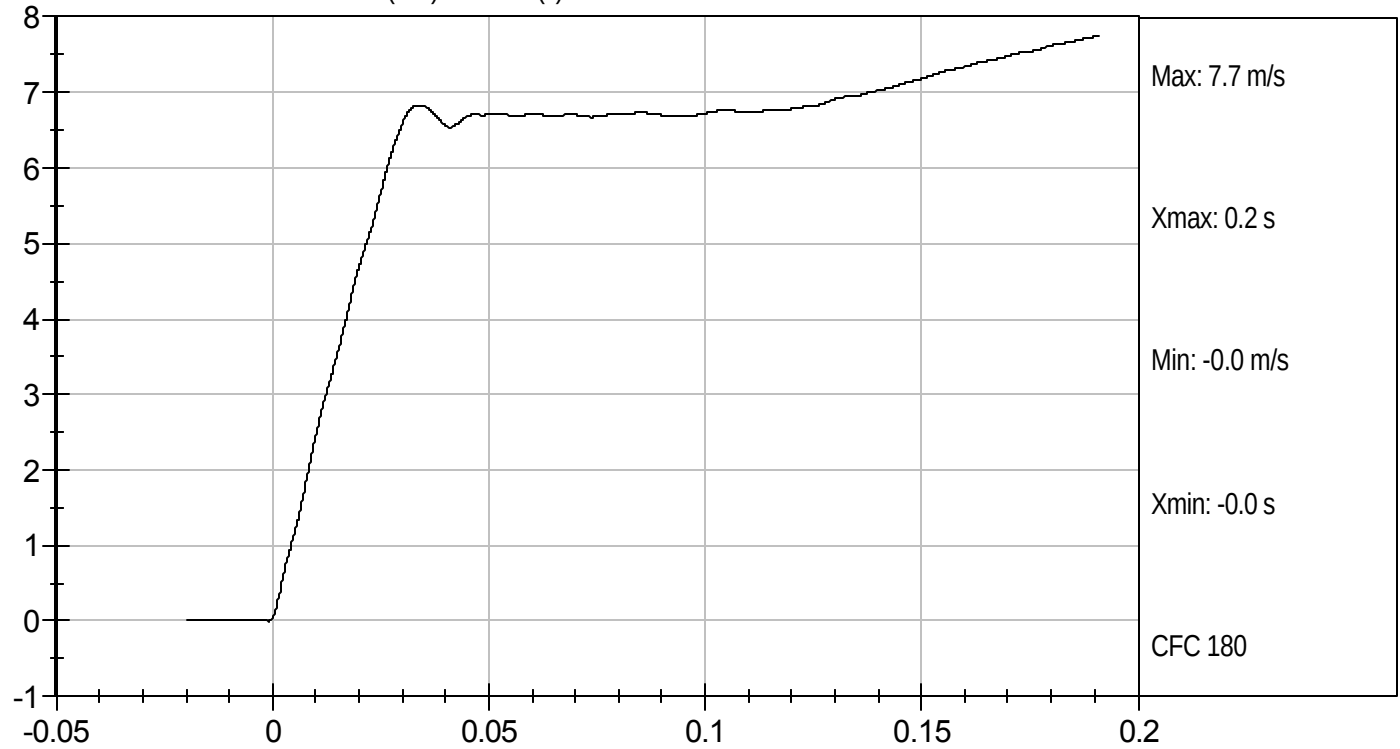

Approved By



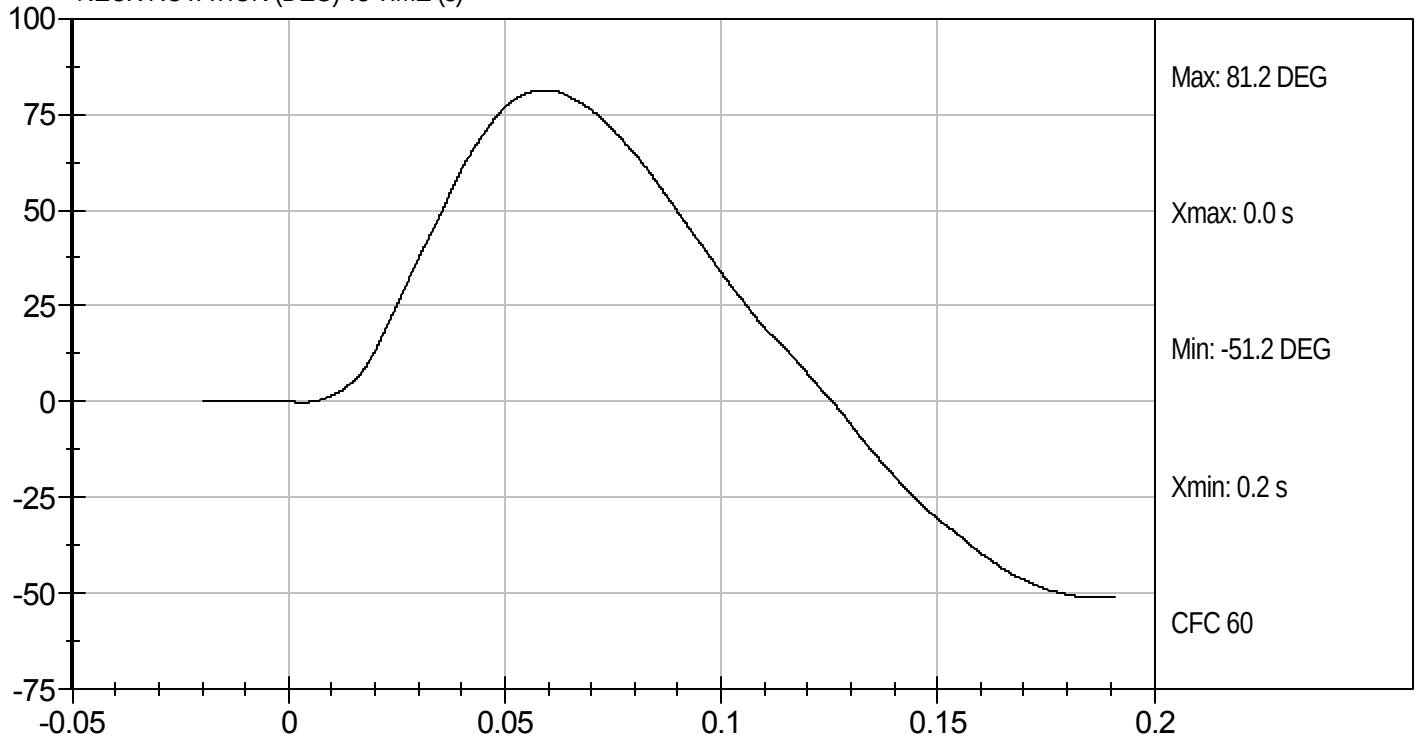
Test Desc: Neck Flexion
Component ID: D103142

Test Date: 9/21/10
Velocity: 23.1 ft/s, 7.04 m/s

PENDULUM DECELERATION (m/s) vs TIME (s)



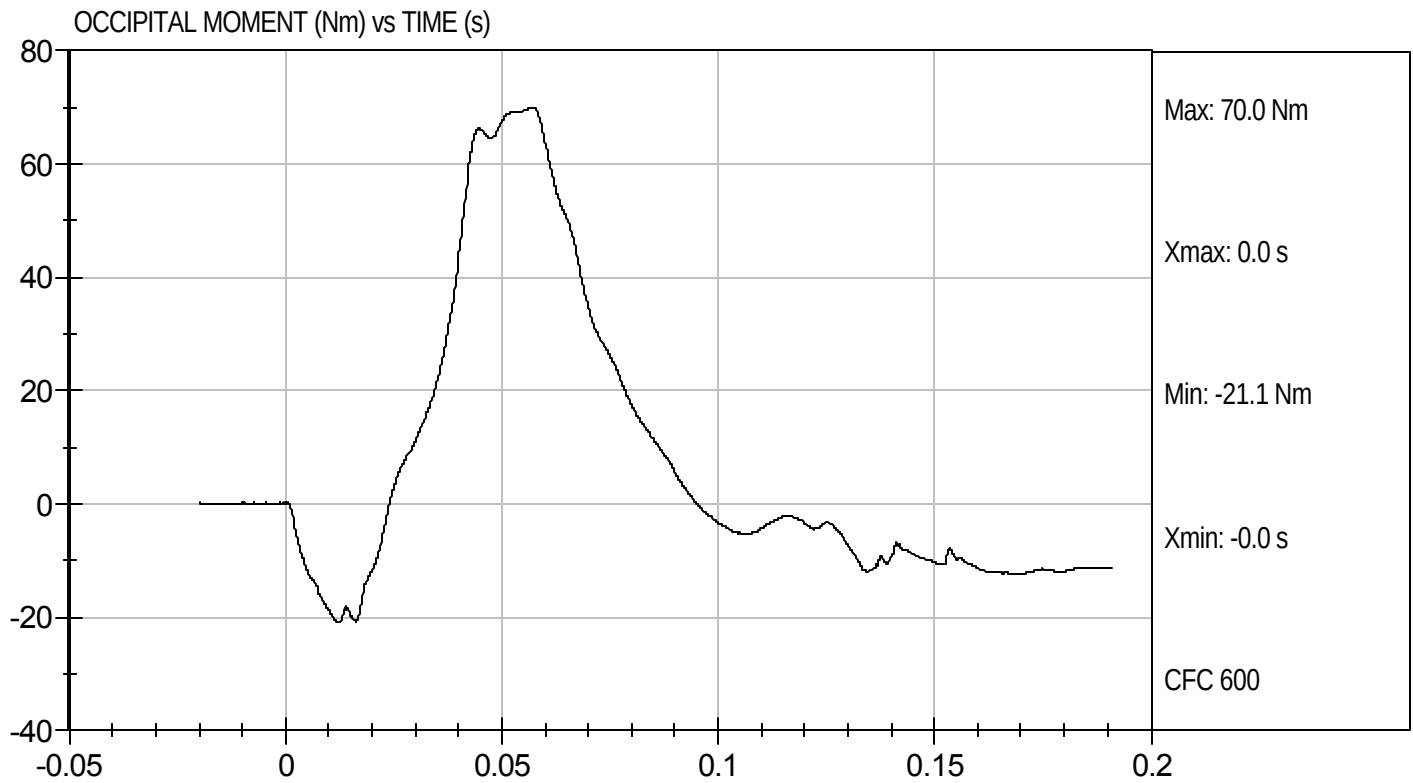
NECK ROTATION (DEG) vs TIME (s)





Test Desc: Neck Flexion
Component ID: D103142

Test Date: 9/21/10
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: D103143

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	58	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.9	Pass
	20 ms	m/s	3.1 to 3.9	3.8	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	99	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-58	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	97	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

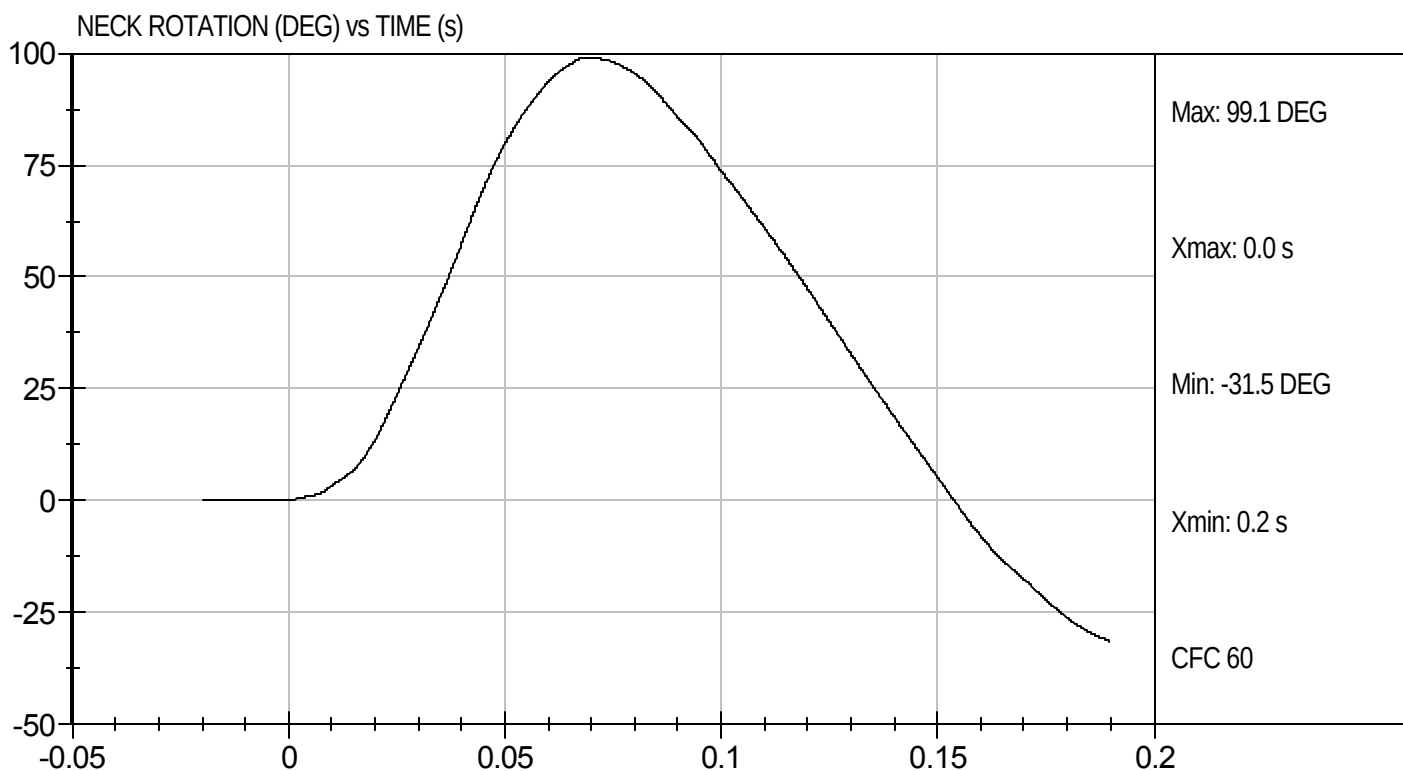
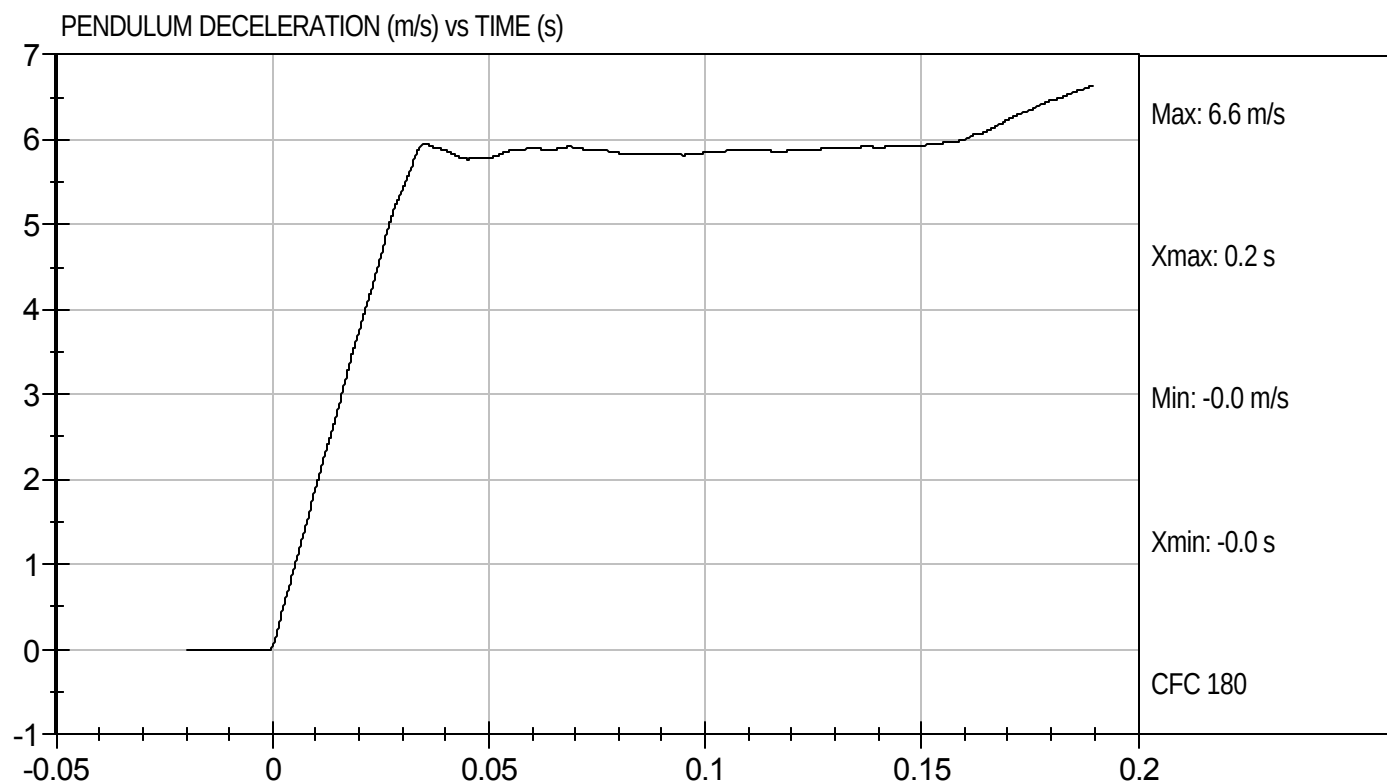
9/21/10
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D103143

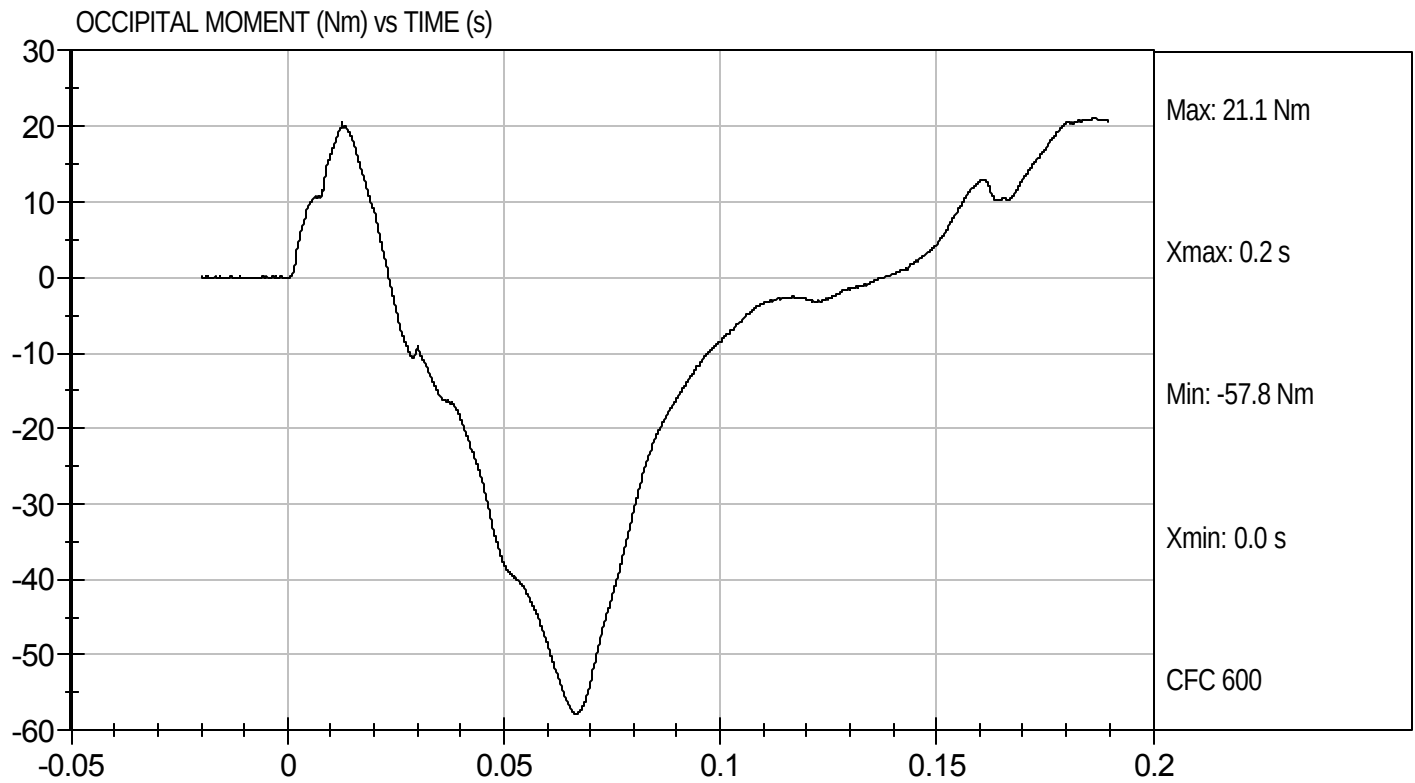
Test Date: 9/21/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D103143

Test Date: 9/21/10
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: D103144

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Relative Humidity	%	10 to 70	53	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	52	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.33	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4334	Pass
			Overall Test Results	Pass

Jessica Gall
Laboratory Technician

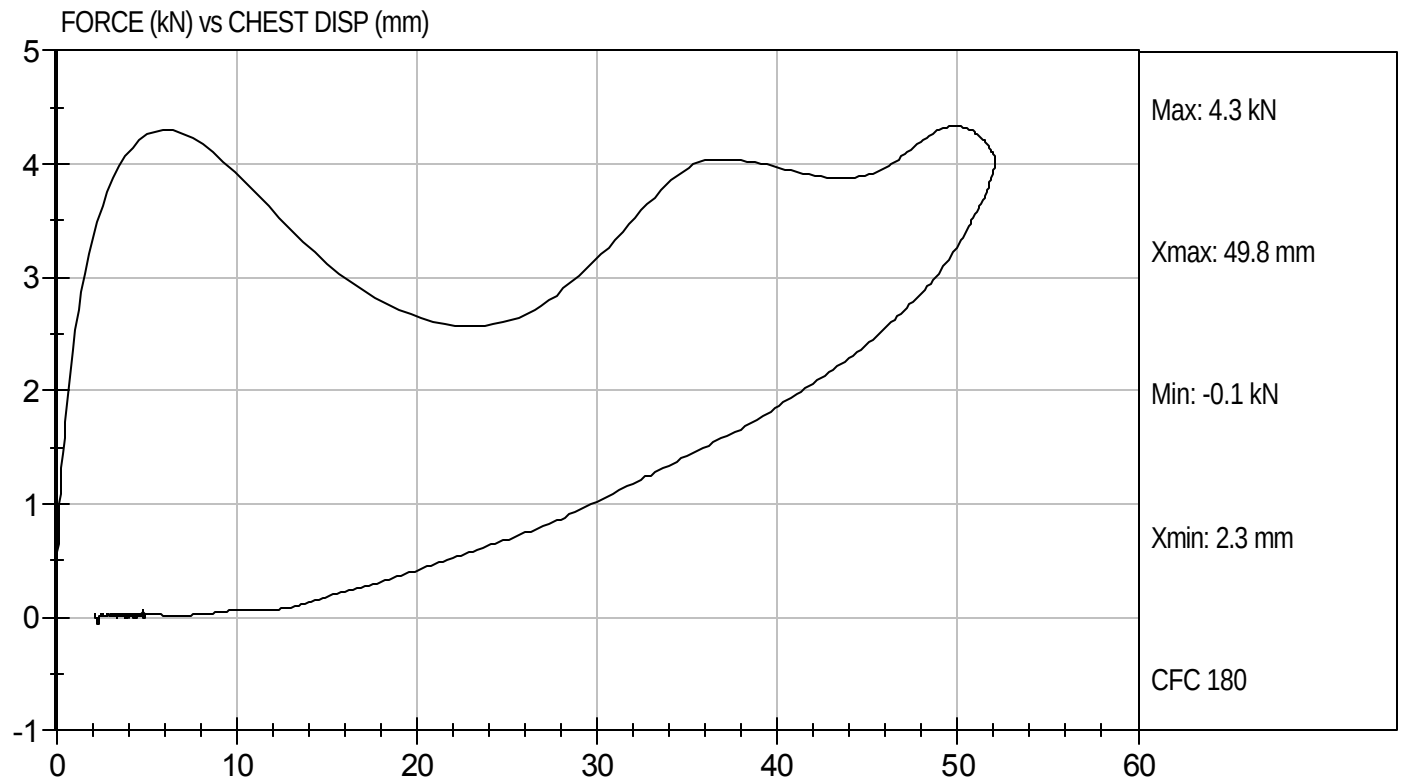
9/21/10
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D103144

Test Date: 9/21/10
Velocity: 22.22 ft/s, 6.77 m/s

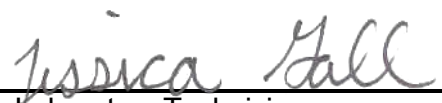


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103145

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	58	Pass
Probe Speed	m/s	2.07 to 2.13	2.08	Pass
Maximum Force	kN	3.45 to 4.06	3.80	Pass
Overall Test Results				Pass


Laboratory Technician

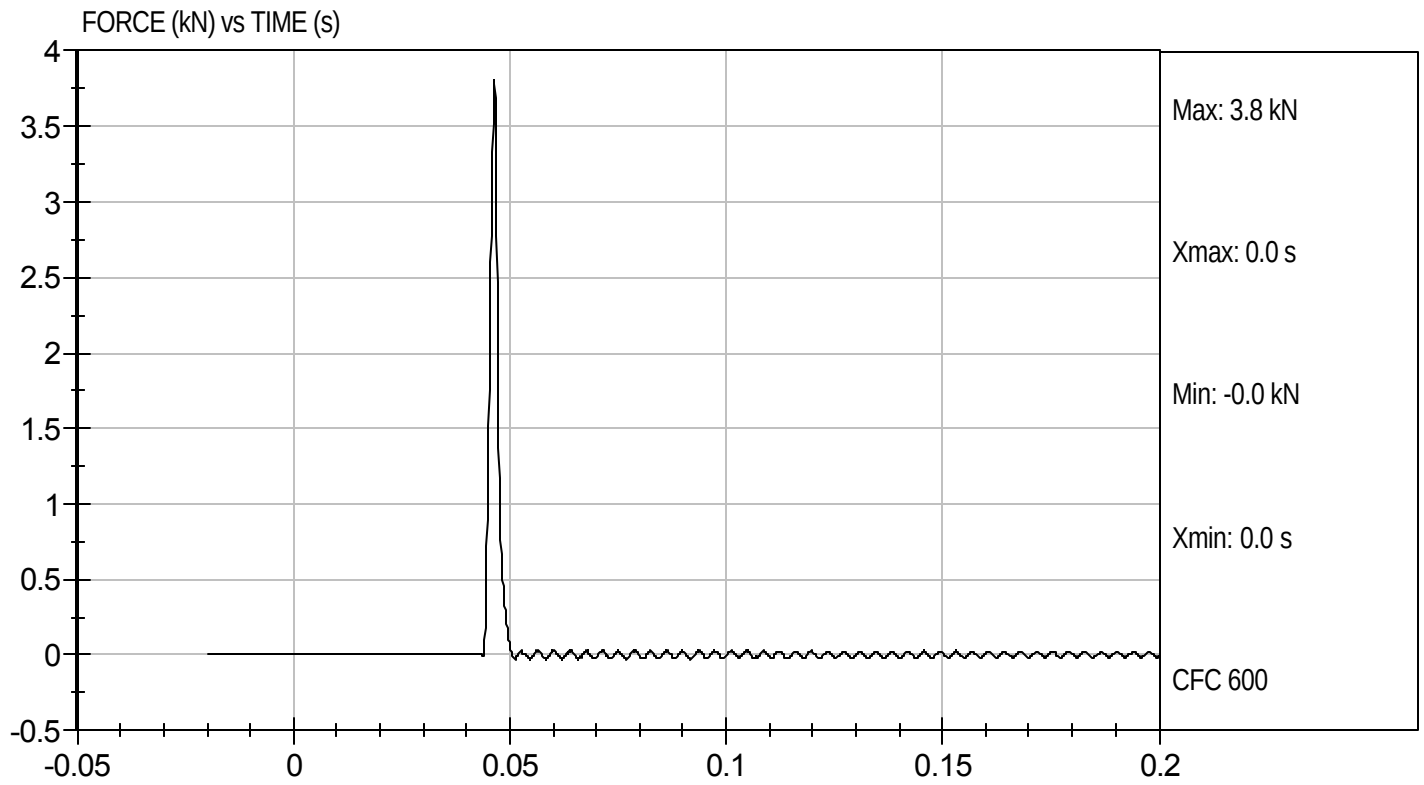
9/21/10
Test Date


Approved By



Test Desc: Right Knee
Component ID: D103145

Test Date: 9/21/10
Velocity: 6.83 ft/s, 2.08 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103146

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	58	Pass
Probe Speed	m/s	2.07 to 2.13	2.07	Pass
Maximum Force	kN	3.45 to 4.06	4.03	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

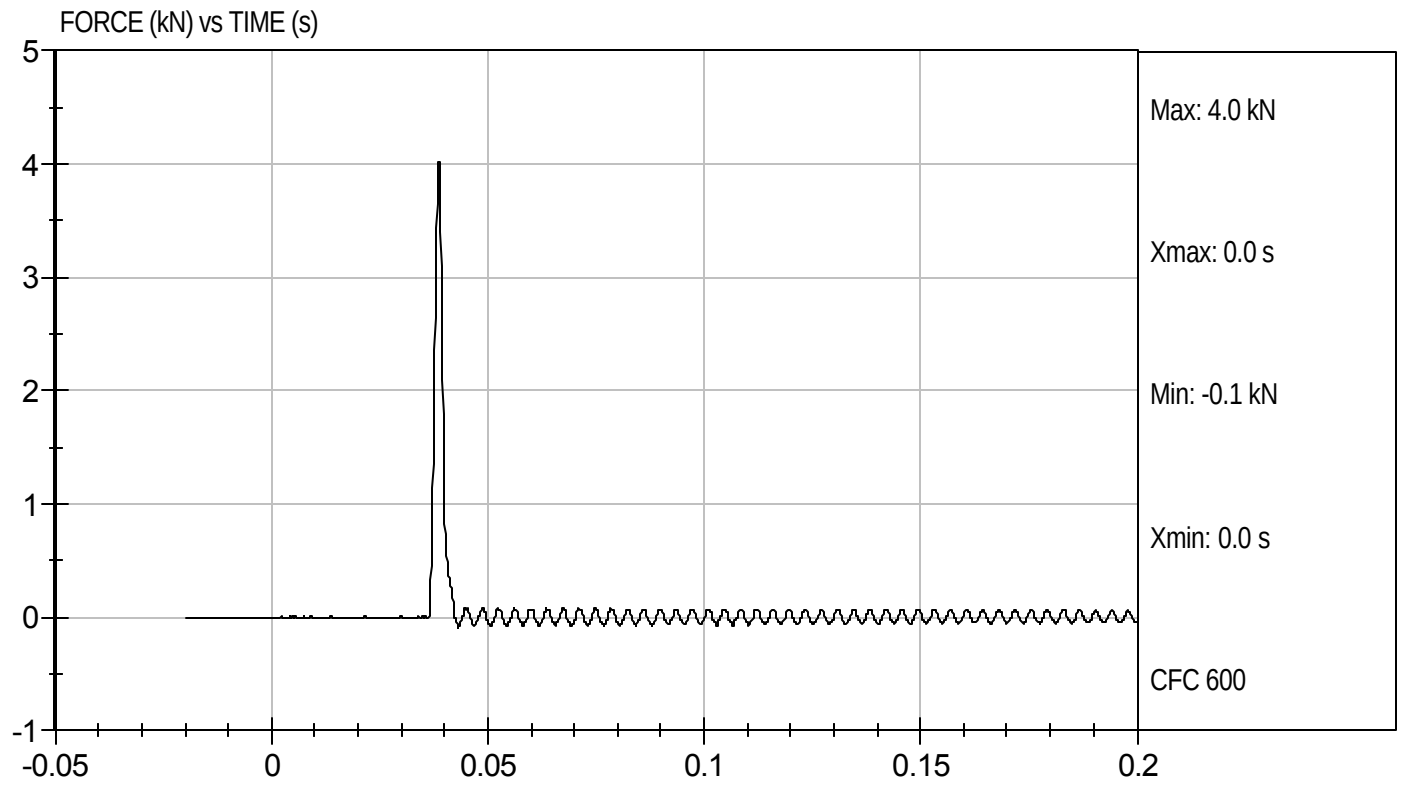
9/21/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D103146

Test Date: 9/21/10
Velocity: 6.802 ft/s, 2.07 m/s



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103147

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	55	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	7	Pass
Force at 45 deg	N	320 to 390	338	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

9/21/10
Test Date

David Winkelbauer
Approved By

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D103311

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Peak Resultant Acceleration	G's	250 to 300	276	Pass
Peak Lateral Acceleration	G's	+/- 15	10.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

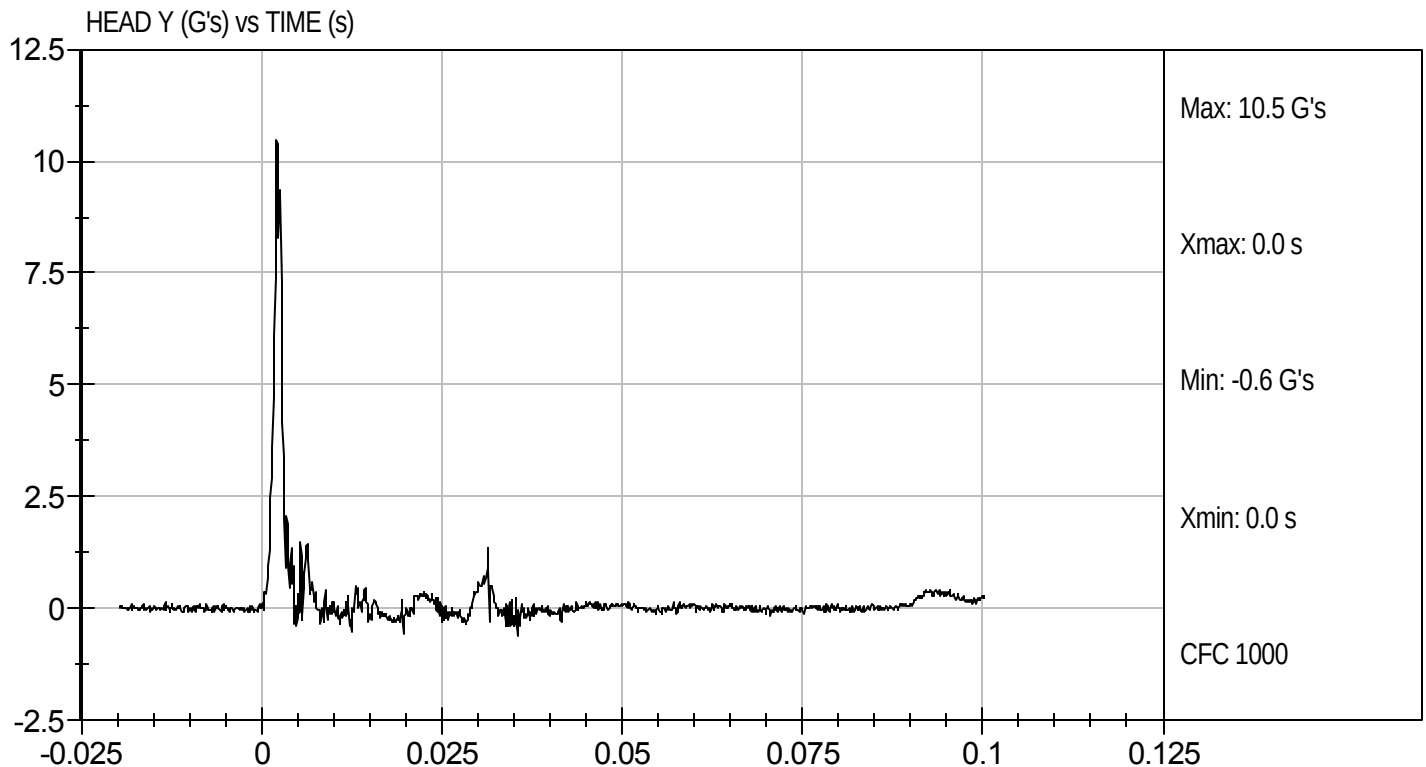
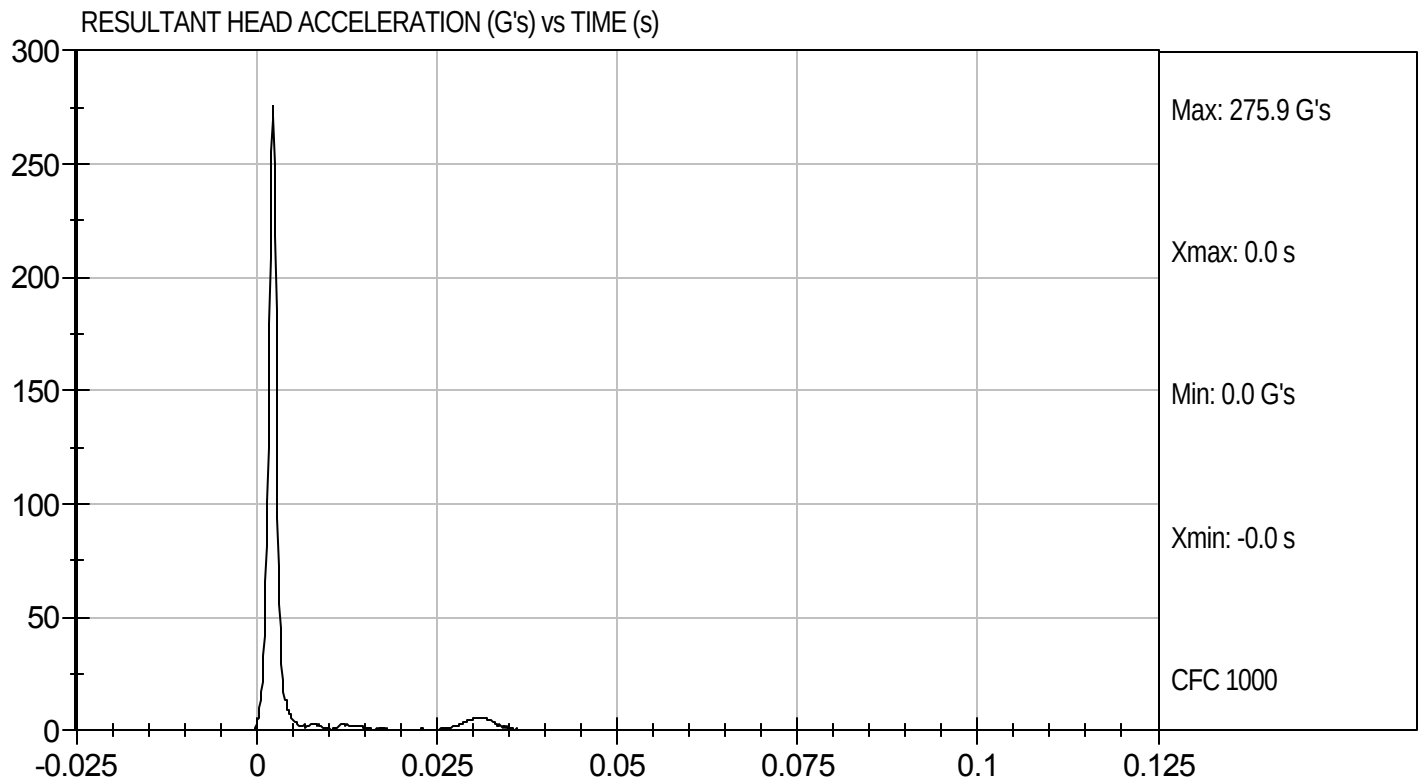
10/1/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D103311

Test Date: 10/1/10
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: D103312

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.9	Pass
Laboratory Relative Humidity		%	10 to 70	44	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.2	Pass
D Plane Rotation	Max	deg	77 to 91	81	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	70	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	89	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

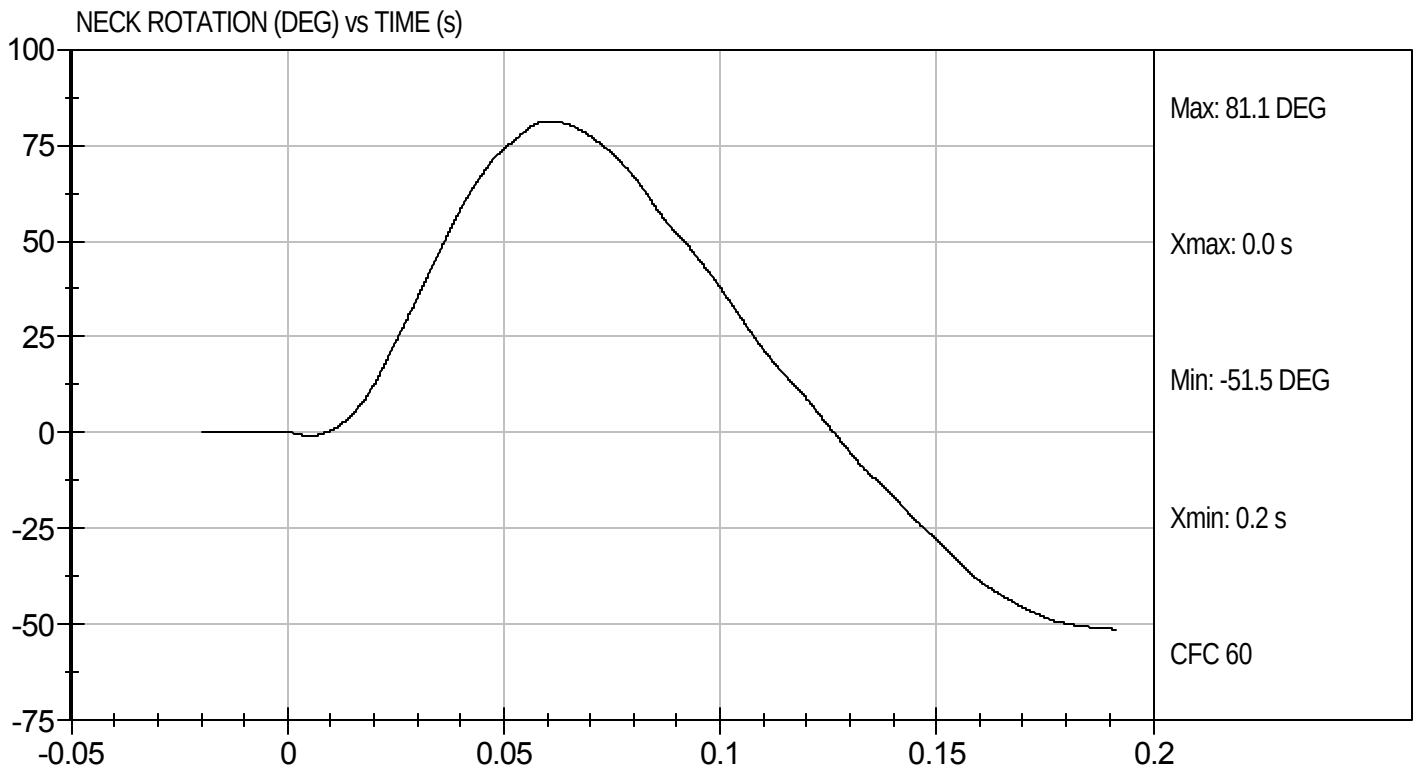
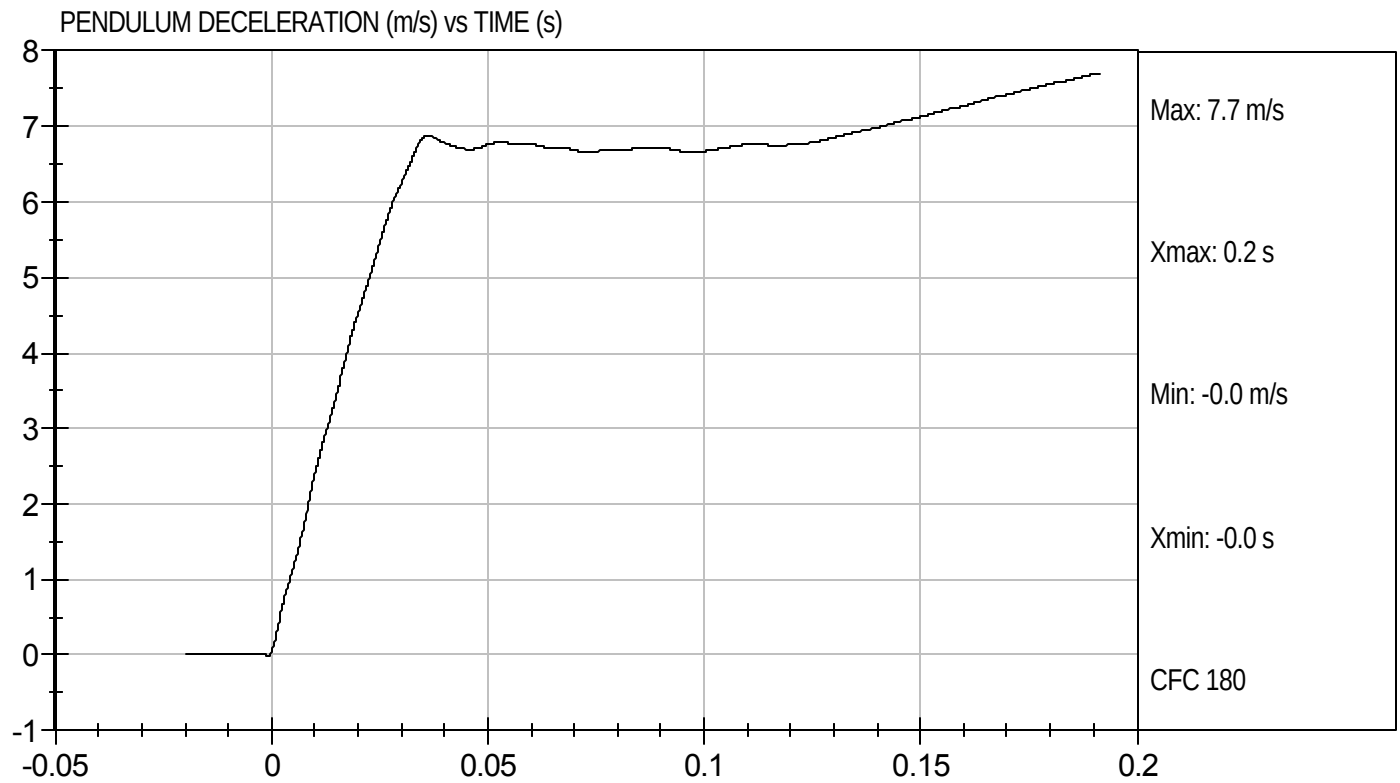
10/1/10
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Flexion
Component ID: D103312

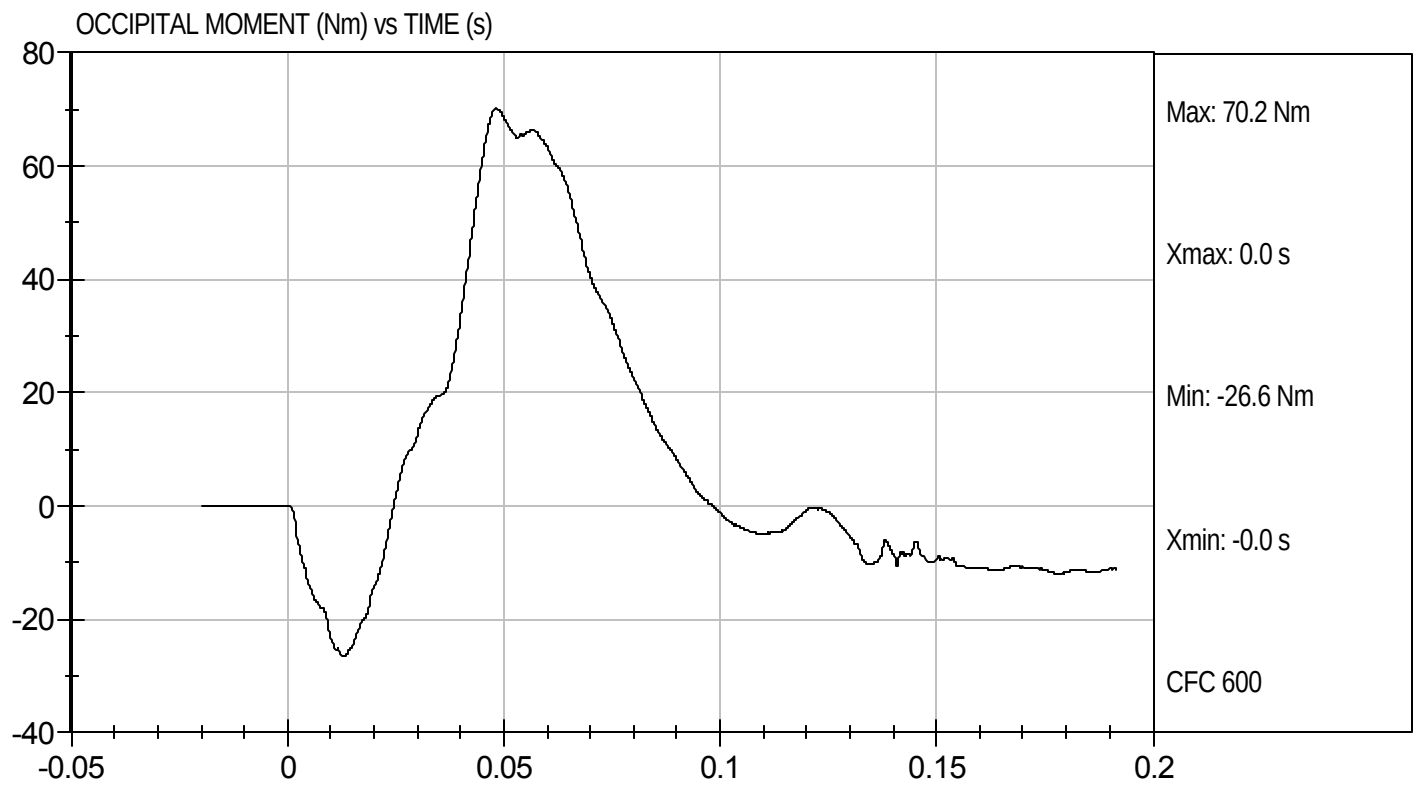
Test Date: 10/1/10
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D103312

Test Date: 10/1/10
Velocity: 23.15 ft/s, 7.06 m/s



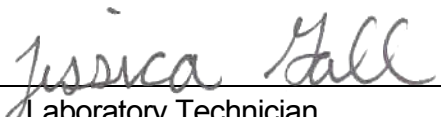
MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634Test I.D: D103313

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.9	Pass
Laboratory Relative Humidity		%	10 to 70	44	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.9	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	99	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-54	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	101	Pass
Overall Results					Pass


 Laboratory Technician

10/1/10

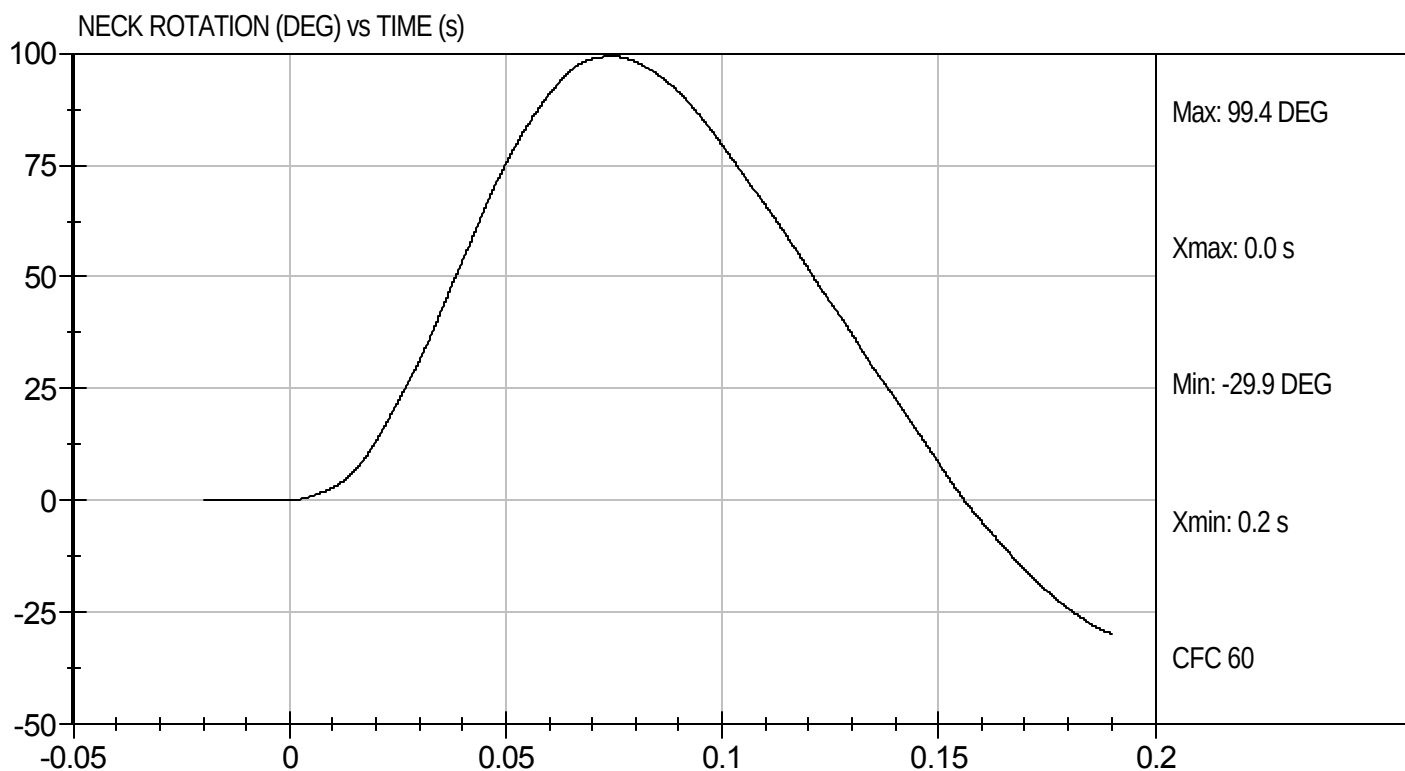
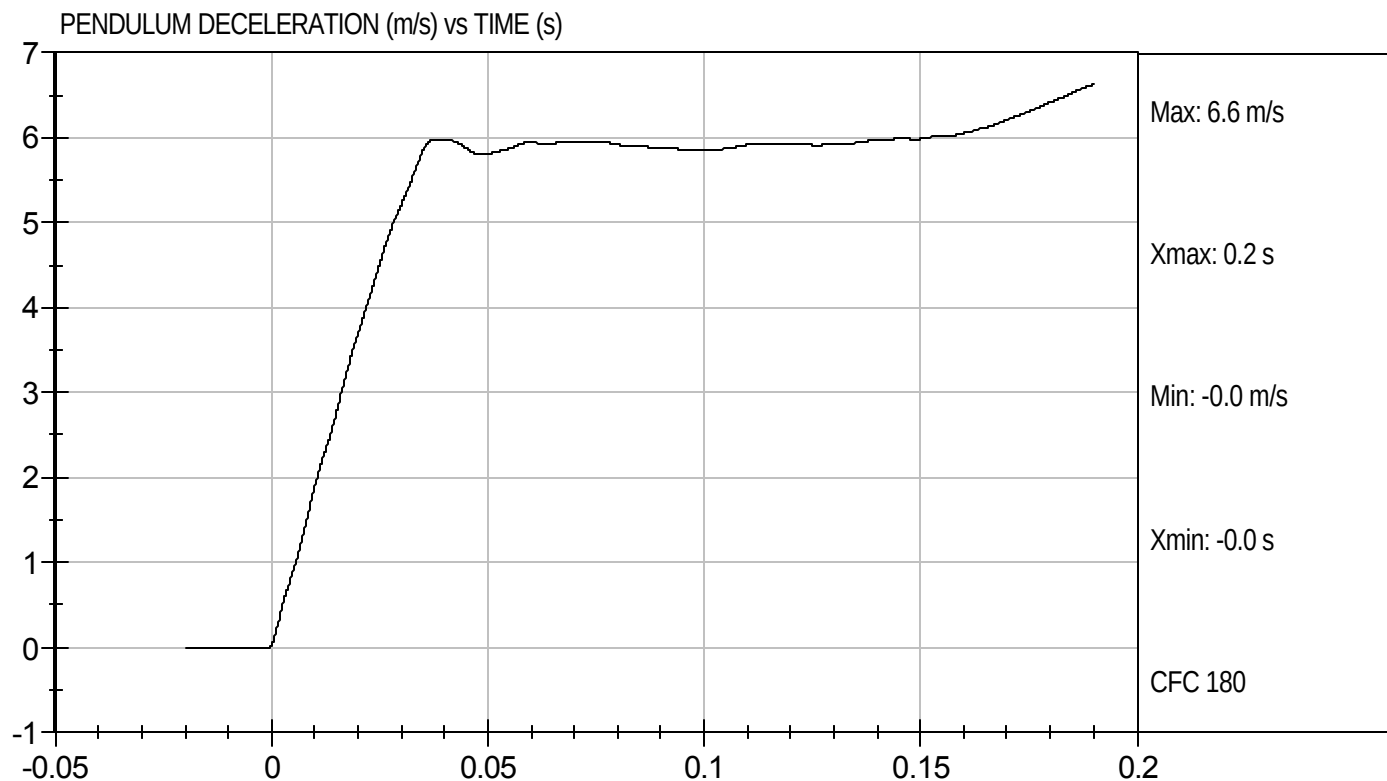
Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D103313

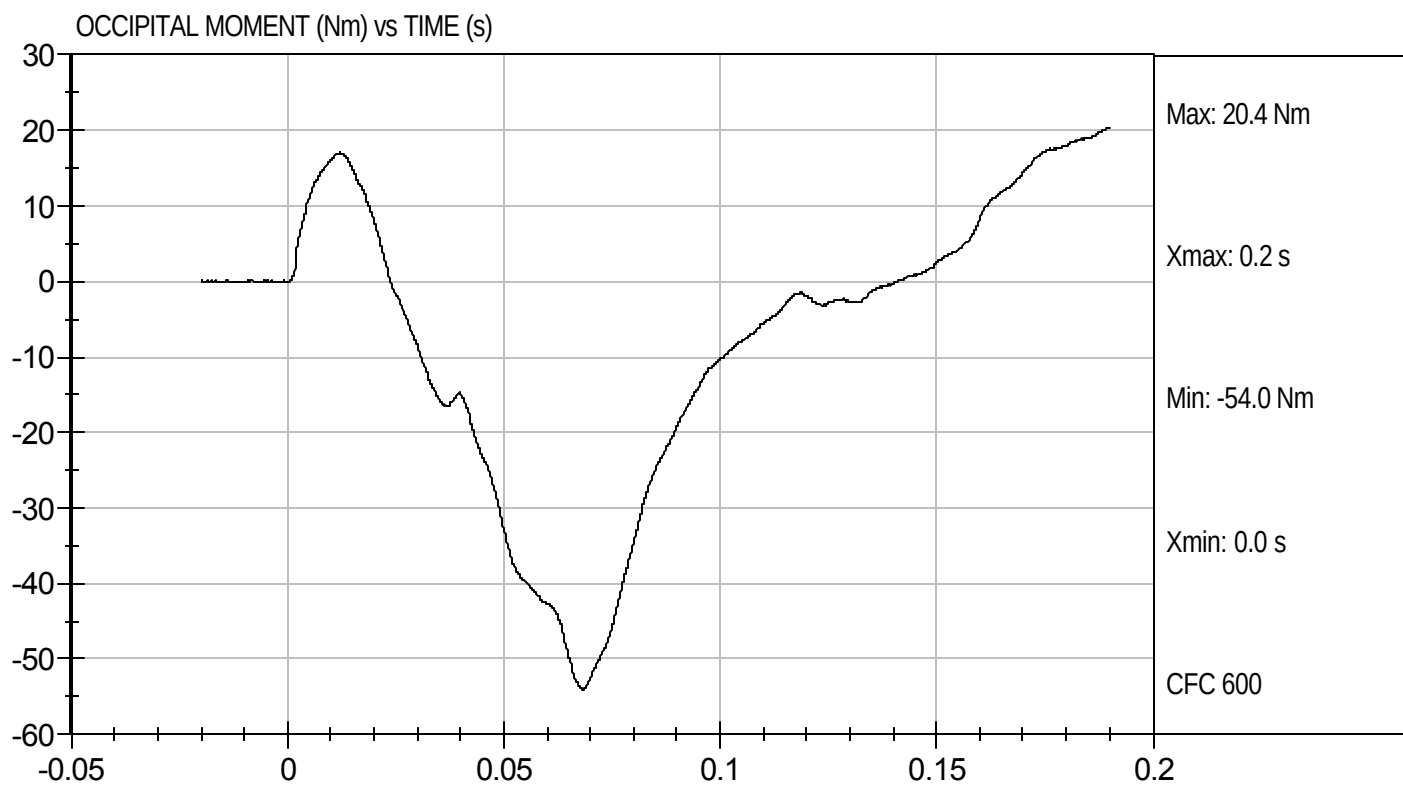
Test Date: 10/1/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D103313

Test Date: 10/1/10
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: D103314

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.1	Pass
Relative Humidity	%	10 to 70	37	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	54	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.20	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4132	Pass
			Overall Test Results	Pass


Laboratory Technician

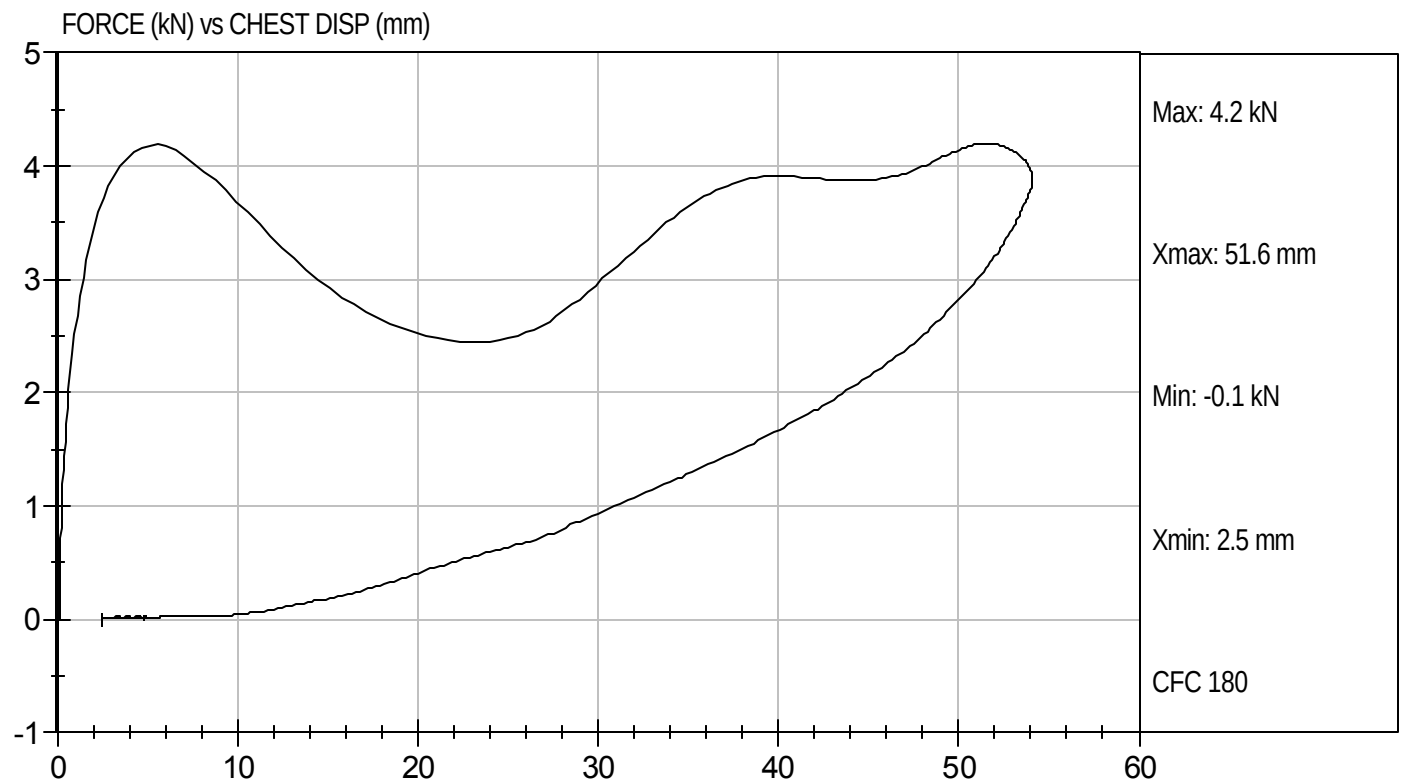
10/1/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D103314

Test Date: 10/1/10
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: D103315

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Speed	m/s	2.07 to 2.13	2.08	Pass
Maximum Force	kN	3.45 to 4.06	3.91	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

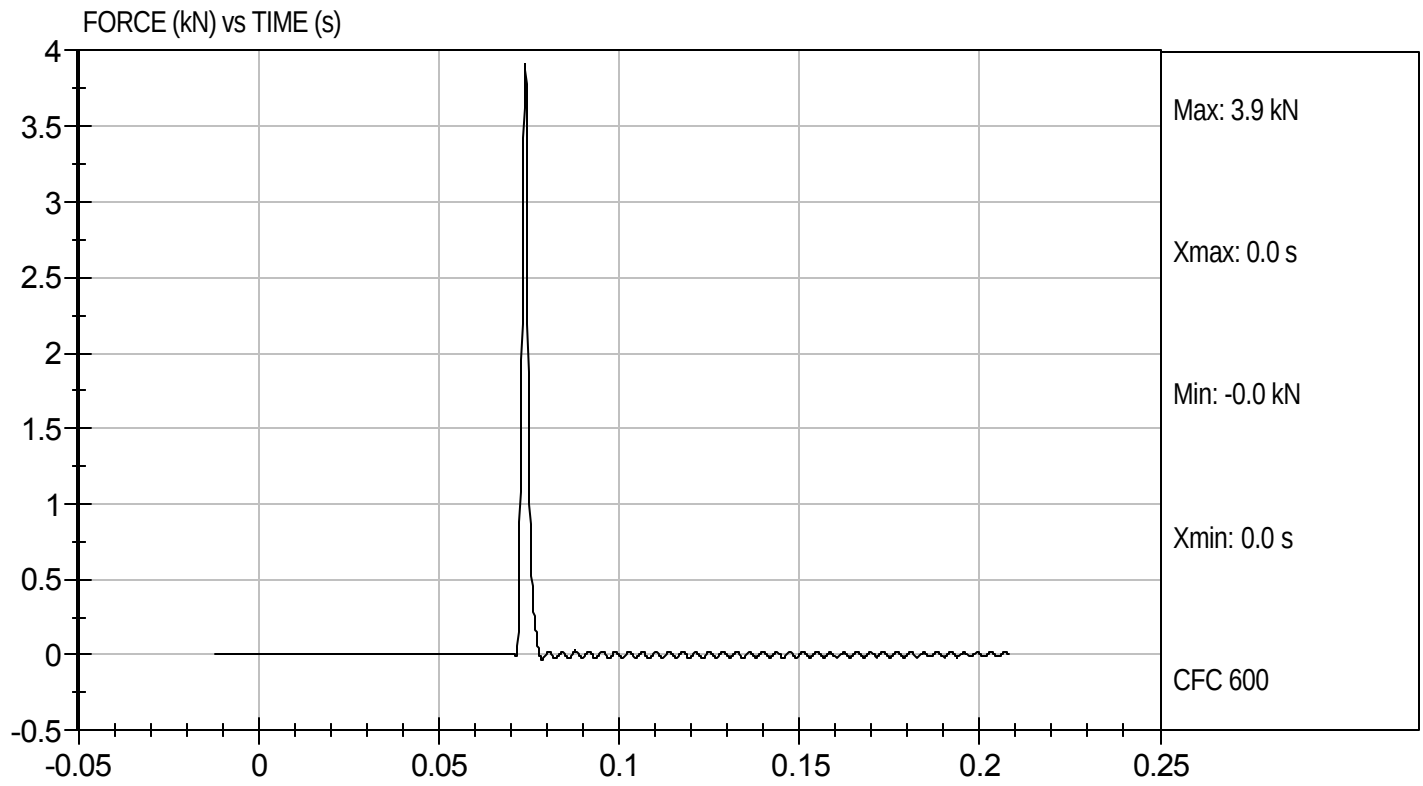
10/1/10
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D103315

Test Date: 10/1/10
Velocity: 6.83 ft/s, 2.08 m/s



MGA RESEARCH CORPORATION

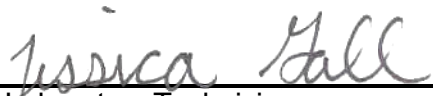
LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103316

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Speed	m/s	2.07 to 2.13	2.08	Pass
Maximum Force	kN	3.45 to 4.06	3.51	Pass
Overall Test Results				Pass


Laboratory Technician

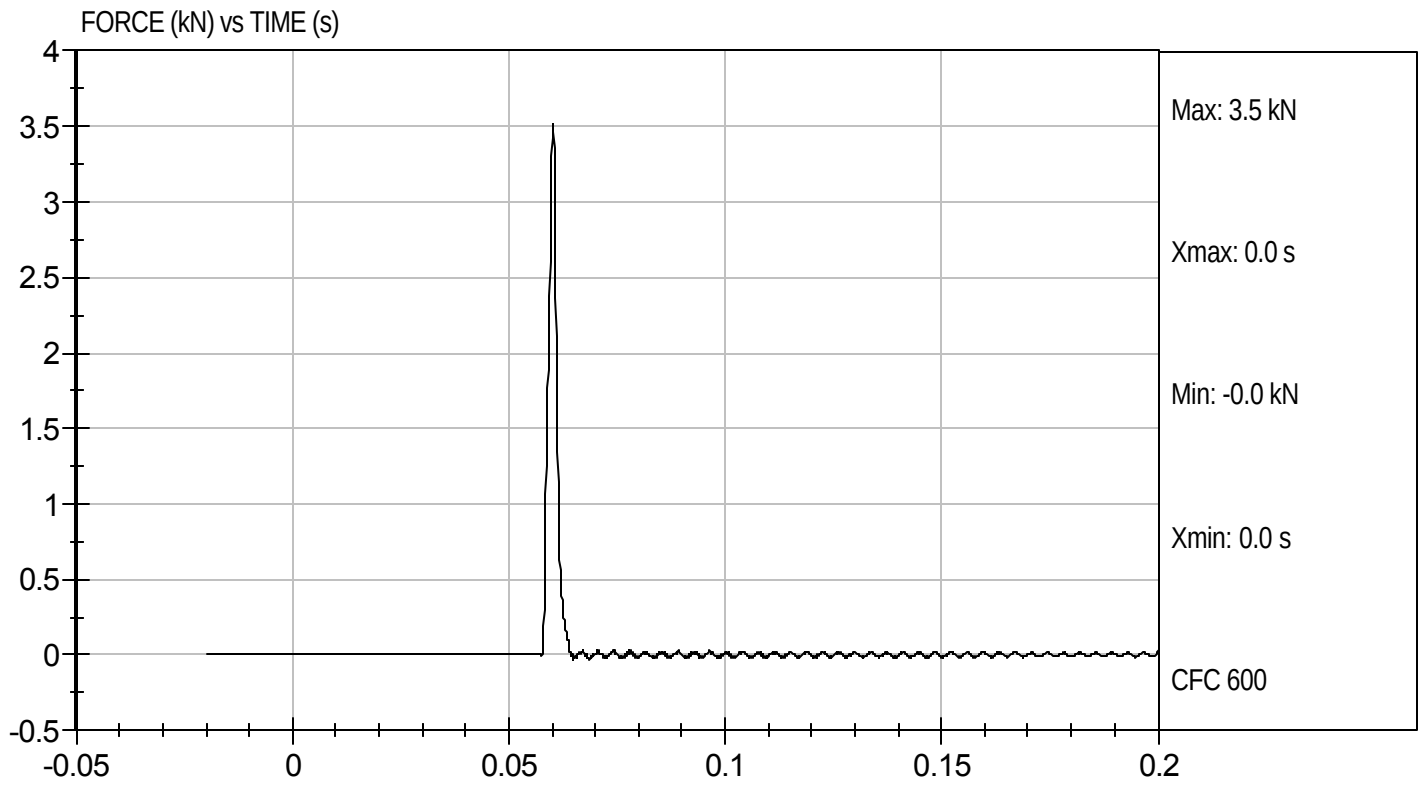
10/1/10
Test Date


Approved By



Test Desc: Left Knee
Component ID: D103316

Test Date: 10/1/10
Velocity: 6.83 ft/s, 2.08 m/s

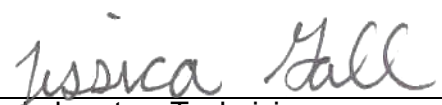


MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103317

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	7	Pass
Force at 45 deg	N	320 to 390	335	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass


Laboratory Technician

10/1/10
Test Date


Approved By