

REPORT NUMBER: NCAP-MGA-2011-041

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

**HONDA OF AMERICA MFG., INC.
2011 Honda CR-V LX 5-Dr SUV
NHTSA No.: MB5308**

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



Test Date: November 15, 2010

Final Report Date: December 28, 2010

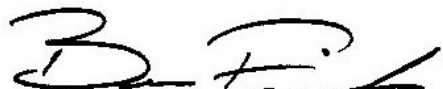
FINAL REPORT

**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: December 28, 2010

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on the 2011 Honda CR-V LX 5-Dr SUV 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 November 15, 2010. The impact velocity was 56.3 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 584 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>133</td> <td>307</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>52</td> <td>21</td> <td>15</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>1</td> <td>0.34</td> <td>0.68</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>2620</td> <td>967</td> <td>1070</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>2520</td> <td>39</td> <td>129</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>1228</td> <td>2638</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>6805</td> <td>3364</td> <td>3388</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	133	307	Maximum Chest Compression	mm	63	52	21	15	Nij	N/A	1	1	0.34	0.68	Neck Tension	N	4170	2620	967	1070	Neck Compression	N	4000	2520	39	129	Left Femur Force	N	10008	6805	1228	2638	Right Femur Force	N	10008	6805	3364	3388
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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 CR-V LX 5-Dr SUV at a velocity of 56.3 kph. The test was performed at MGA Research Corporation on November 15, 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 223 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 584 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 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)	133	76.4	91.4	21	0.34	967	39	1228	3364
Passenger (5 th)	307	70.9	85.9	15	0.68	1070	129	2638	3388

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

TEST NOTES

There was no valid data collected for:
Top of Engine X after 40 msec.
Bottom of Engine X after 20 msec.

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 CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB5308	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	Yes
Make	Honda	Power Steering	Yes
Model	CR-V	Driver Front Airbag	Yes
Body Style	MPV	Driver Curtain Airbag	Yes
VIN	5J6RE4H33BL003484	Driver Head/Torso Airbag	No
Body Color	Glacier Blue M.	Driver Torso Airbag	Yes
Delivery Date	10/26/2010	Driver Torso/Pelvis Airbag	No
Odometer (mi)	45	Driver Pelvis Airbag	No
Odometer (km)	72	Driver Knee Airbag	No
Dealer	Rosen Honda	Pass. Front Airbag	Yes
Transmission	Automatic	Pass. Curtain Airbag	Yes
Final Drive	4WD	Pass. Head/Torso Airbag	No
Type/No. Cylinders	4	Pass. Torso Airbag	Yes
Engine Displacement (L)	2.4	Pass. Torso/Pelvis Airbag	No
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)	2070
Date of Manufacture	09/'10	GAWR Front (kg)	1050
		GAWR Rear (kg)	1040

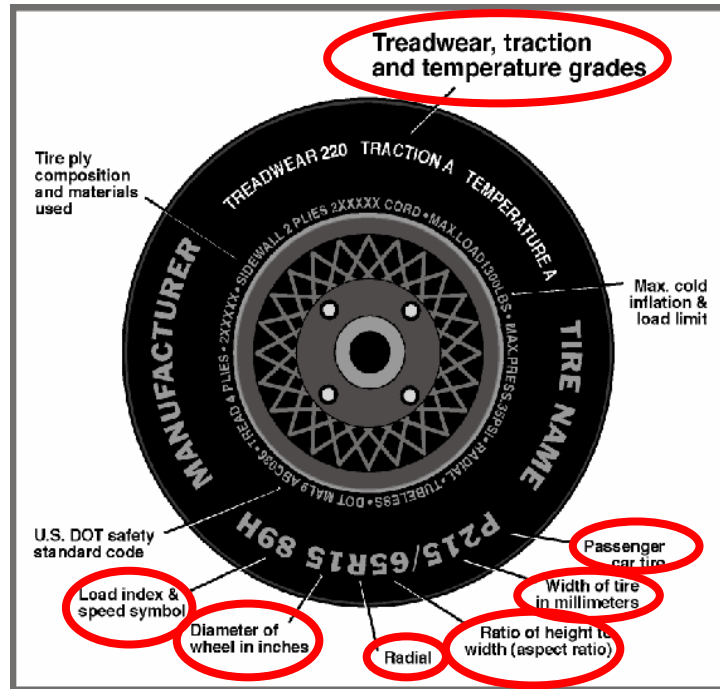
VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split 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 CR-V LX 5-Dr SUV
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NHTSA No.: MB5308
 Test Date: 11/15/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	210	210
Recommended Tire Size	225/65R17	225/65R17
Tire Size on Vehicle	225/65R17	225/65R17
Tire Manufacturer	Continental	Continental
Tire Model	4X4 Contact	4X4 Contact
Treadwear	360	360
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index & Speed Symbol	102T	102T
Tire Material	Rubber	Rubber
DOT Safety Code Right	FDF5	FDF5
DOT Safety Code Left	FDF5	FDF5

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

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	465.4	335.7		506.2	398.7	
Right	kg	436.8	352.0		463.1	401.4	
Ratio	%	56.7	43.3		54.8	45.2	
Totals	kg	902.2	687.7	1589.9	969.3	800.1	1769.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1589.9
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	1775.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	787	791	790	797	1133
As Tested	mm	774	781	768	776	1185
Post Test	mm	810	840	772	758	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2620
Total Vehicle Length at Left Side	mm	4406
Total Vehicle Length at Centerline	mm	4546
Total Vehicle Length at Right Side	mm	4406
Weight of Ballast in Cargo Area	kg	27.2
Weight of Vehicle Components Removed	kg	29.9
Amount of Stoddard Solvent in Fuel Tank	L	53.7

List of components removed to meet test weight: Spare tire, right tail light, trunk carpet, rear foot carpet, and tool kit.

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

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4546
2	Total Width	1800
3	Bumper Top Height	585
4	Bumper Bottom Height	480
5	Longitudinal Member Top Height	590
6	Distance between Longitudinal Members	1020
7	Longitudinal Member Width	57
8	Engine Top Height	834
9	Engine Bottom Height	220
10	Engine and Gearbox Width	810
11	Front Bumper-Engine Distance	470
12	Front Shock Absorber Fixing Height	1005
13	Bonnet Leading Edge Height	878
14	Front Shock Absorber Fixing Width	1160
15	Front Bumper – Front Axle Distance	900
16	Front Axle – A-Pillar Distance	454
17	A-Pillar – B-Pillar Distance	1100
18	B-Pillar – Rear Axle Distance	1050
19	B-Pillar – C-Pillar Distance	612
20	Roof Sill Bottom Height	1475
21	Roof Sill Top Height	1654
22	Floor Sill bottom Height	290
23	Floor Sill Top Height	433

DATA SHEET NO. 2

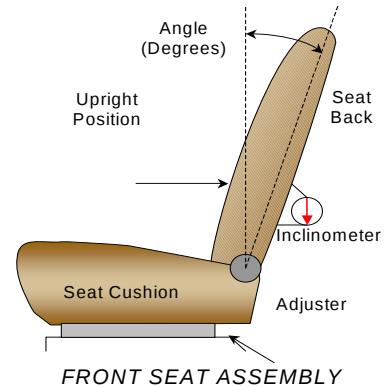
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

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	14.0° on headrest post
Passenger Seat Back Angle	6.0° on headrest post

SEAT FORE/AFT POSITIONS

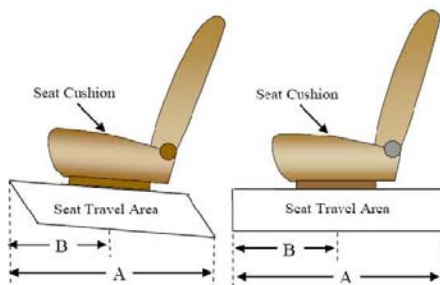
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

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 mm (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 CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

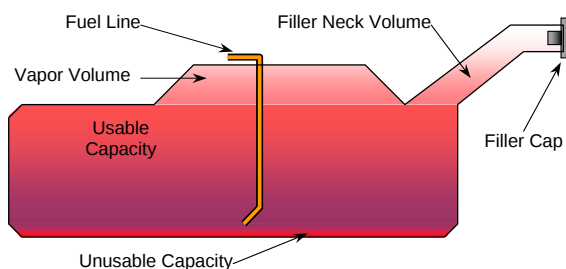
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	58.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	53.4 to 54.5
Actual Amount of Solvent used	53.7
1/3 of Usable Capacity	19.3

FUEL PUMP

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

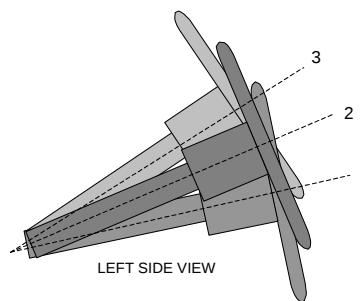
The vehicle is equipped with an electric fuel pump. After the ignition key is turned from LOCK (0) to ON (II) position, the pump will be filled up for two seconds, and then the pressure is maintained. The fuel pipe is on the left side.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITION

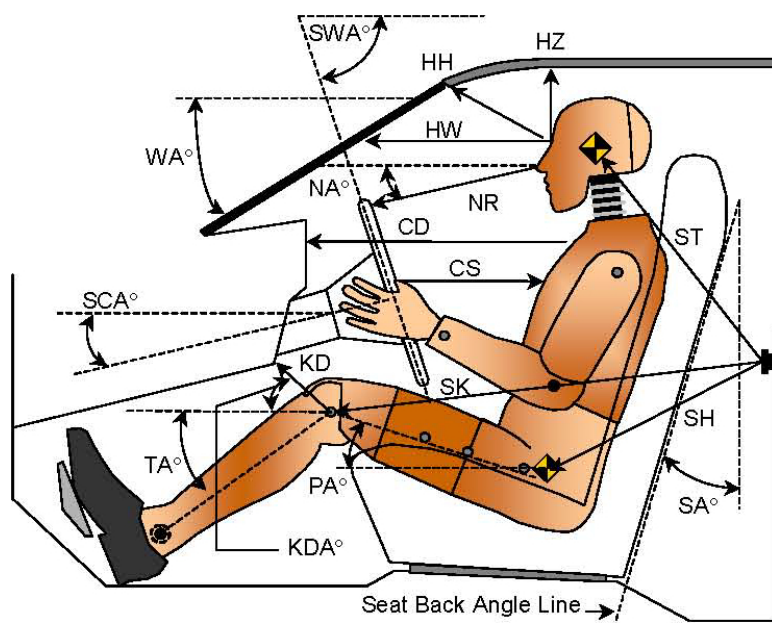
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	64.2	240
Geometric Center – Position 2	61.9	225
Uppermost – Position 3	59.6	210
Telescoping Steering Wheel Travel		30
Test Position	61.9	225

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

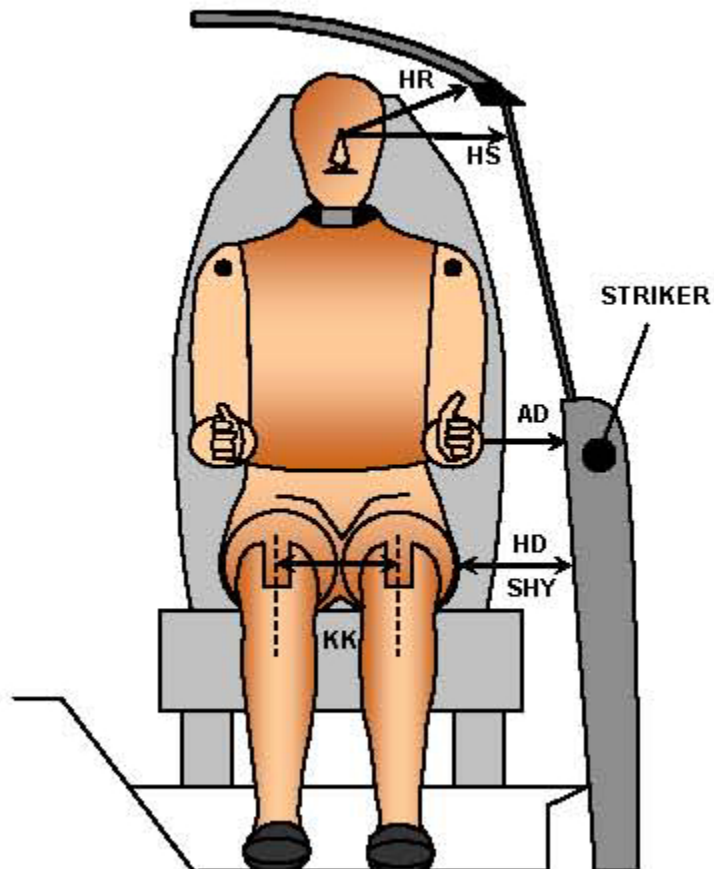


Code	Measurement Description	Driver S/N 351		Passenger S/N 634	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		27.3		
SWA	Steering Wheel Angle		61.9		
SCA	Steering Column Angle		28.1		
SA	Seat Back Angle (headrest bezel)		14.0		6.0
HZ	Head to Roof (Z)	222	90	235	90
HH	Head to Header	370	20.6	301	38.8
HW	Head to Windshield	642	0	642	0
NR	Nose to Rim	415	14.2		
CD	Chest to Dash	550		456	
CS	Chest to Steering Hub	314	5.8		
RA	Rim to Abdomen	175	0		
KDL	Left Knee to Dash	147	27.0	93	32.4
KDR	Right Knee to Dash	68	31.6	99	34.1
PA	Pelvic Angle		24.6		21.2
TA	Tibia Angle		50.1		50.7
SK	Striker to Knee	620	91.8	690	90.6
ST	Striker to Head	572	12.7	545	26.3
SH	Striker to H-Point	237	116.1	365	100.2

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
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 Test Date: 11/15/2010



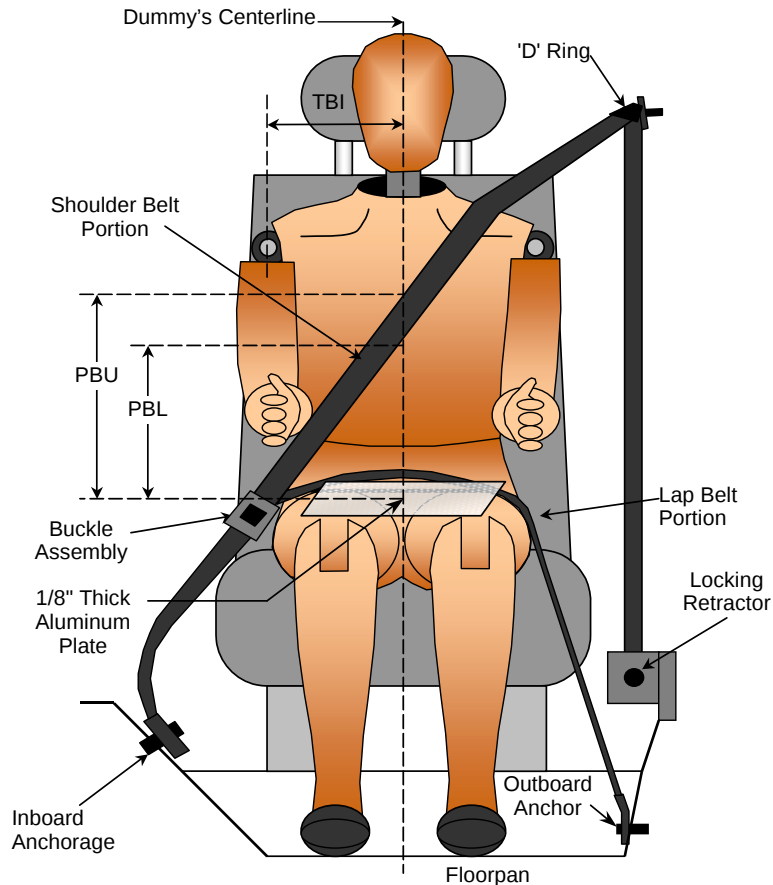
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 351	Passenger S/N 634
		Length (mm)	
AD	Arm to Door	123	75
HD	H-Point to Door	180	136
HR	Head to Side Header	225	250
HS	Head to Side Window	330	354
KK	Knee to Knee	345	220
SHY	Striker to H-Point (Y Direction)	255	285
AA	Ankle to Ankle	360	189

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

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	387	335
PBL - To surface of reference to belt lower edge	mm	302	235

BELT LENGTH DATA

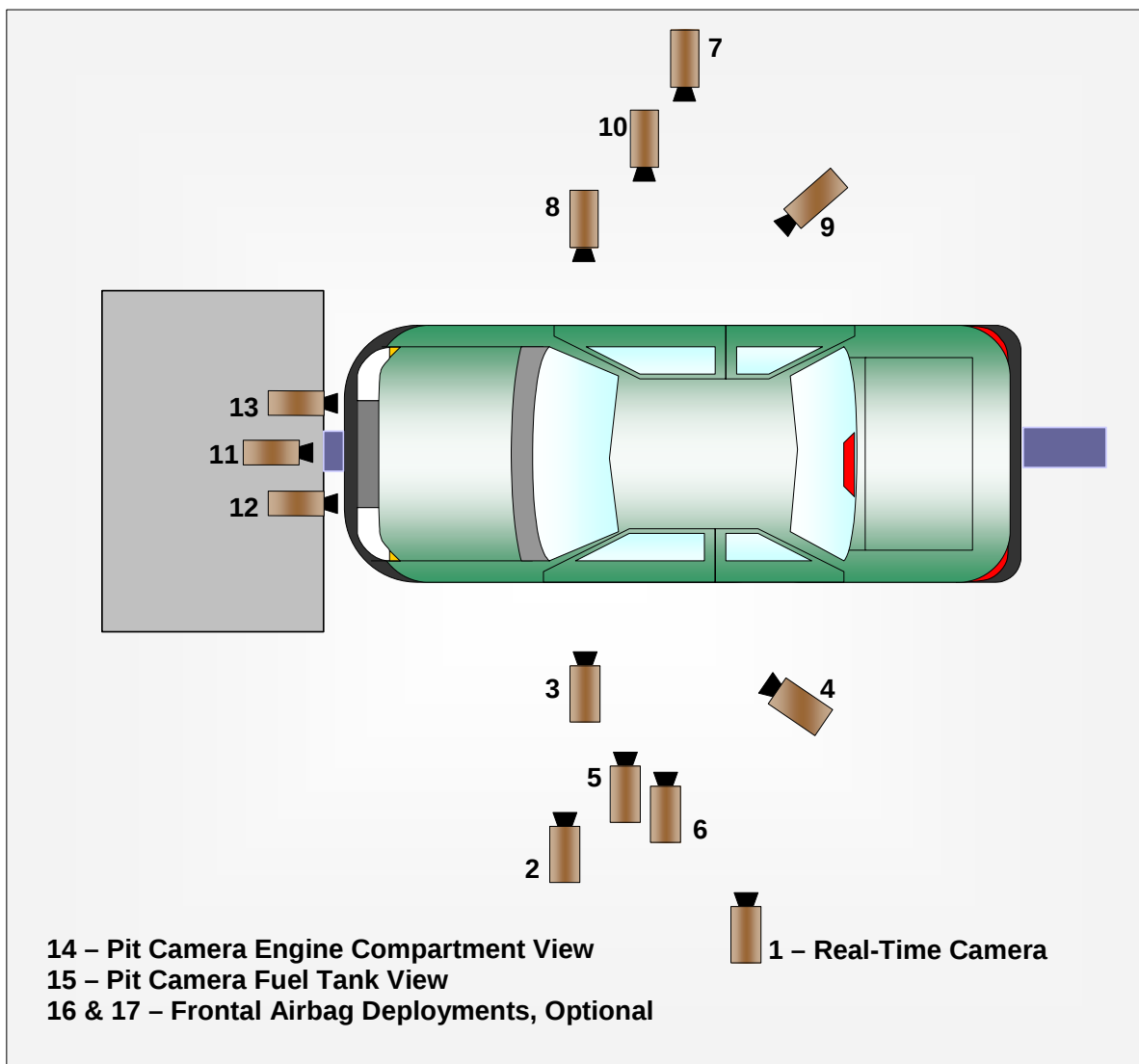
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	830	890
Lap Belt Length as measured on ATD	mm	500	450
Remainder of belt of reel	mm	1550	1560
Total Belt Length for Continuous Webbing Systems	mm	2880	2900

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

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
Test Date: 11/15/2010

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)

CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

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	1280	-5130	-1270	24	1000
3	Driver Close-Up	1360	-6270	-1640	35	1000
4	Driver Angle	5710	-4860	-1830	50	1000
5	Steering Column Top	550	-5380	-1230	24	1000
6	Steering Column Bottom	530	-5350	-850	24	1000
7	Right Overall	2160	6360	-1260	20	1000
8	Passenger Close-Up	1340	6240	-1650	35	1000
9	Passenger Angle	5680	4790	-1860	50	1000
10	Right Front Half	1310	5220	-1330	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	1400	0	3150	24	1000
15	Pit Rear	3340	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

***COORDINATES:**

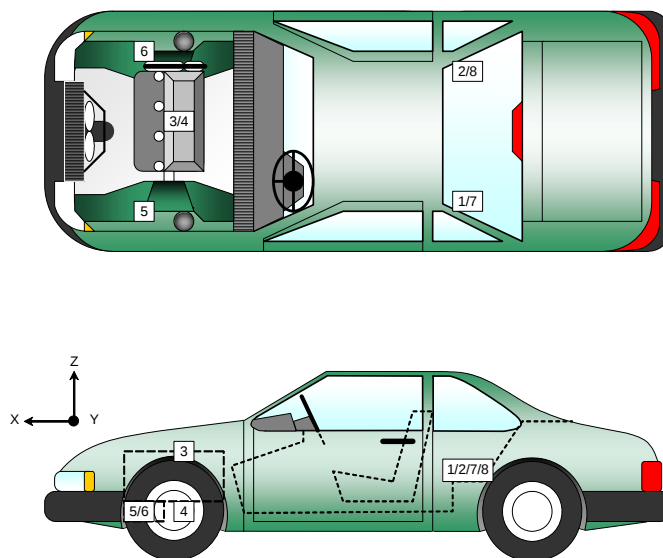
+X = forward of impact plane
 +Y = right of monorail centerline
 +Z = below ground level

Cameras 16 & 17 were not used for this test.

DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member X	1785	-335	-381
2	Right Rear X-Member X	1785	335	-381
3	Engine Top X	3839	0	-865
4	Engine Bottom X	3728	0	-280
5	Left Brake Caliper X	3756	-675	-240
6	Right Brake Caliper X	3756	675	-240
7	Left Rear X-Member Z	1785	-335	-381
8	Right Rear X-Member Z	1785	335	-381

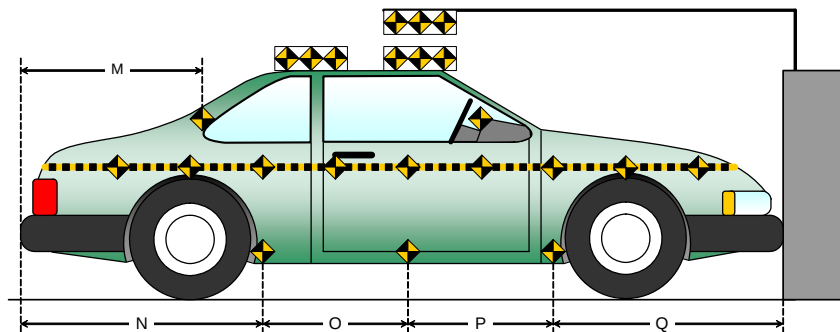
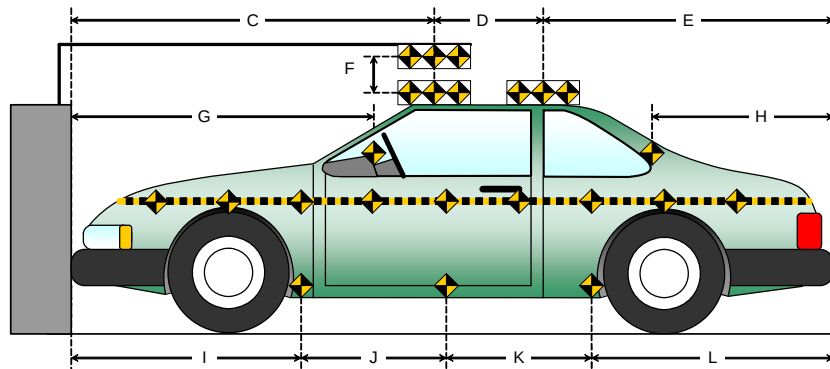
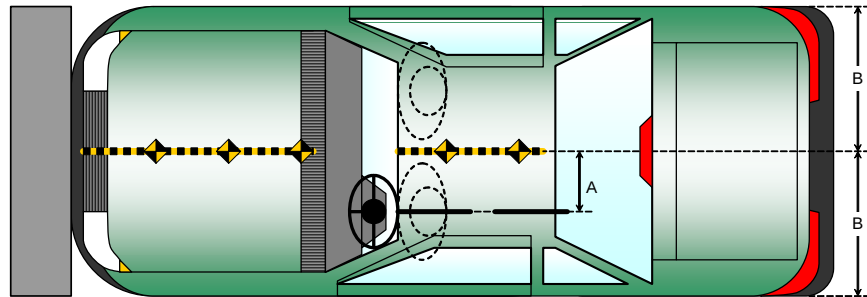
Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

Item	Value (mm)
A	380
B	900
C	2275
D	670
E	1601
F	145
G	
H	1232
I	1355
J	835
K	835
L	1521
M	1234
N	1521
O	835
P	835
Q	1355



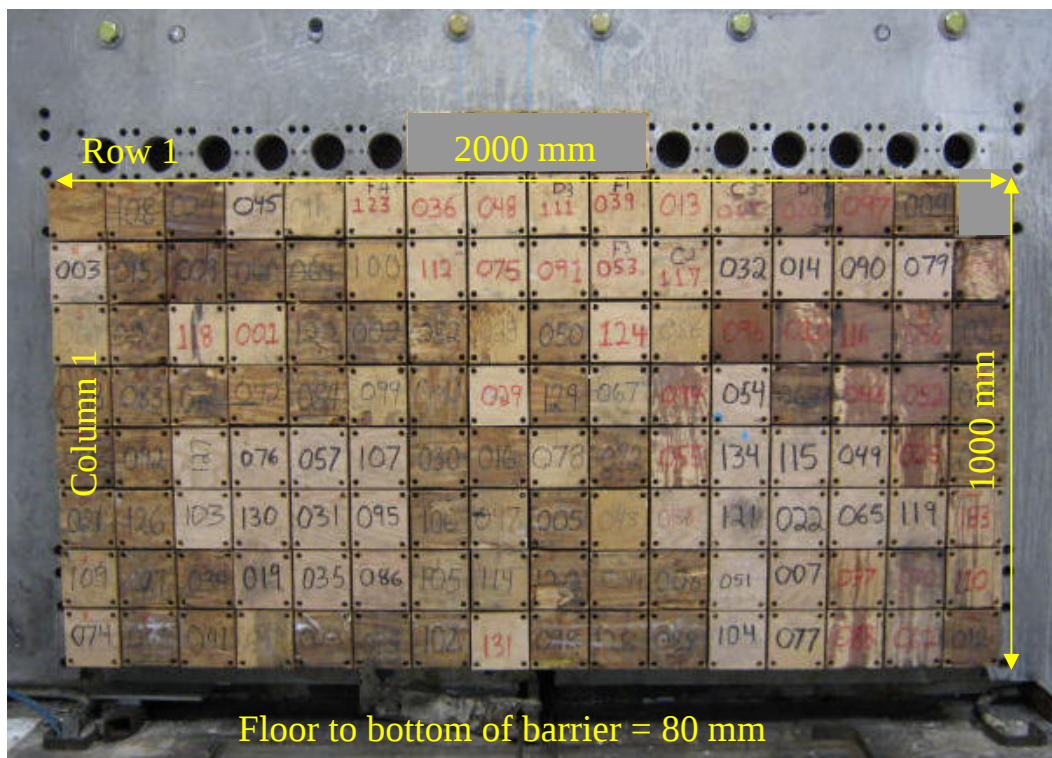
DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

Advanced Research Load Cell Barrier



1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16
2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	2-9	2-10	2-11	2-12	2-13	2-14	2-15	2-16
3-1	3-2	3-3	3-4	3-5	3-6	3-7	3-8	3-9	3-10	3-11	3-12	3-13	3-14	3-15	3-16
4-1	4-2	4-3	4-4	4-5	4-6	4-7	4-8	4-9	4-10	4-11	4-12	4-13	4-14	4-15	4-16
5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	5-12	5-13	5-14	5-15	5-16
6-1	6-2	6-3	6-4	6-5	6-6	6-7	6-8	6-9	6-10	6-11	6-12	6-13	6-14	6-15	6-16
7-1	7-2	7-3	7-4	7-5	7-6	7-7	7-8	7-9	7-10	7-11	7-12	7-13	7-14	7-15	7-16
8-1	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10	8-11	8-12	8-13	8-14	8-15	8-16
9-1	9-2	9-3	9-4	9-5	9-6	9-7	9-8	9-9	9-10	9-11	9-12	9-13	9-14	9-15	9-16

Load Cells are 121 mm x 121 mm with a 7 mm gap in between each load cell.

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
Test Date: 11/15/2010

INSTRUMENTATION

Driver Dummy Data Channels	44
Passenger Dummy Data Channels	44
Vehicle Structure Accelerometers	8
Barrier Channels	127
Total	223

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 CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

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	831
Center	mm	805
Right Side	mm	810
Average	mm	815

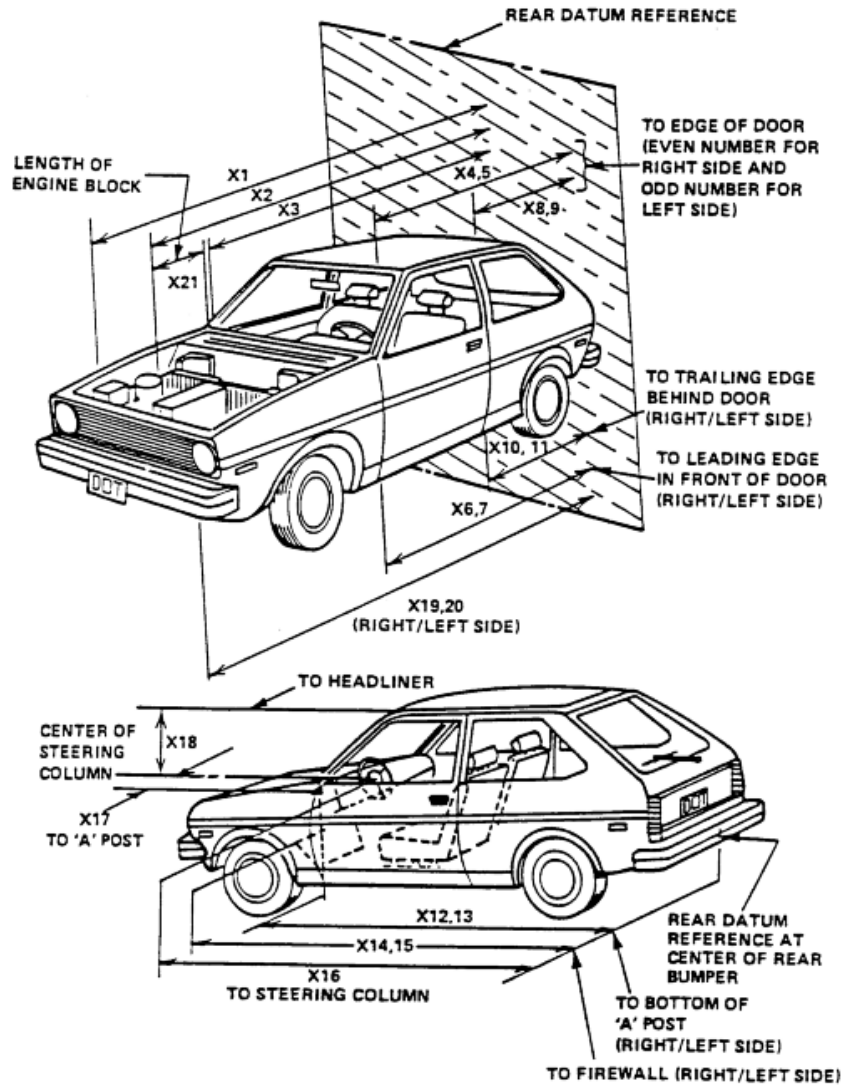
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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 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 CR-V LX 5-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
Test Date: 11/15/2010



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4546	3962	584
2	RSOV to Front of Engine	mm	4075	3782	293
3	RSOV to Firewall	mm	3620	3564	56
4	RSOV to Upper Leading Edge of Right Door	mm	3132	3132	0
5	RSOV to Upper Leading Edge of Left Door	mm	3135	3134	1
6	RSOV to Lower Leading Edge of Right Door	mm	3122	3118	4
7	RSOV to Lower Leading Edge of Left Door	mm	3125	3116	9
8	RSOV to Upper Trailing Edge of Right Door	mm	2032	2052	-20
9	RSOV to Upper Trailing Edge of Left Door	mm	2032	2033	-1
10	RSOV to Lower Trailing Edge of Right Door	mm	2061	2054	7
11	RSOV to Lower Trailing Edge of Left Door	mm	2061	2047	14
12	RSOV to Bottom of "A" Post of Right Side	mm	3134	3141	-7
13	RSOV to Bottom of "A" Post of Left Side	mm	3133	3122	11
14	RSOV to Firewall, Right Side	mm	3680	3563	117
15	RSOV to Firewall, Left Side	mm	3683	3651	32
16	RSOV to Steering Column	mm	2704	2711	-7
17	Center of Steering Column to "A" Post	mm	352	356	-4
18	Center of Steering Column to Headliner	mm	410	417	-7
19	RSOV to Right Side of Front Bumper	mm	4406	3952	454
20	RSOV to Left Side of Front Bumper	mm	4406	3954	452
21	Length of Engine Block	mm	382	382	0
RD	RSOV to Right Side of Dash Panel	mm	2892	2881	11
CD	RSOV to Center of Dash Panel	mm	2927	2932	-5
LD	RSOV to Left Side of Dash Panel	mm	2890	2882	8

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

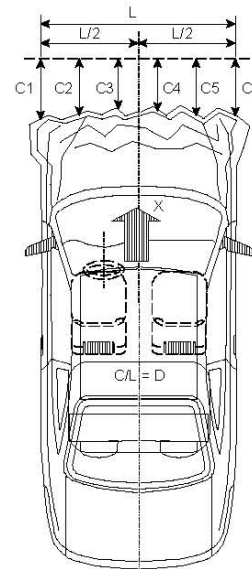
NHTSA No.: MB5308
 Test Date: 11/15/2010

VEHICLE INFORMATION

VIN: 5J6RE4H33BL003484 Wheelbase (mm): 2620
 Vehicle Size Category: MPV Test Weight (kg): 1769.4

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15
 Cal. Procedure/Interval: MGA procedure / 6 month
 Integration Algorithm: Trapezoidal Linearity: > 99%
 Impact Velocity (km/h): 56.3
 Velocity Change (km/h): 63.1
 Time of Separation (msec): 120



CRUSH PROFILE

Collision Deformation Classification: Frontal
 Midpoint of Damage: Centerline
 Damage Region Length (mm): 1190
 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4406	3954	452
C2	Crush zone 2 at left side	mm	4502	3937	565
C3	Crush zone 3 at left side	mm	4528	3952	576
C4	Crush zone 4 at right side	mm	4528	3991	537
C5	Crush zone 5 at right side	mm	4502	3938	564
C6	Crush zone 6 at right side	mm	4406	3952	454
L	C1 TO C6	mm	1190	1171	19

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

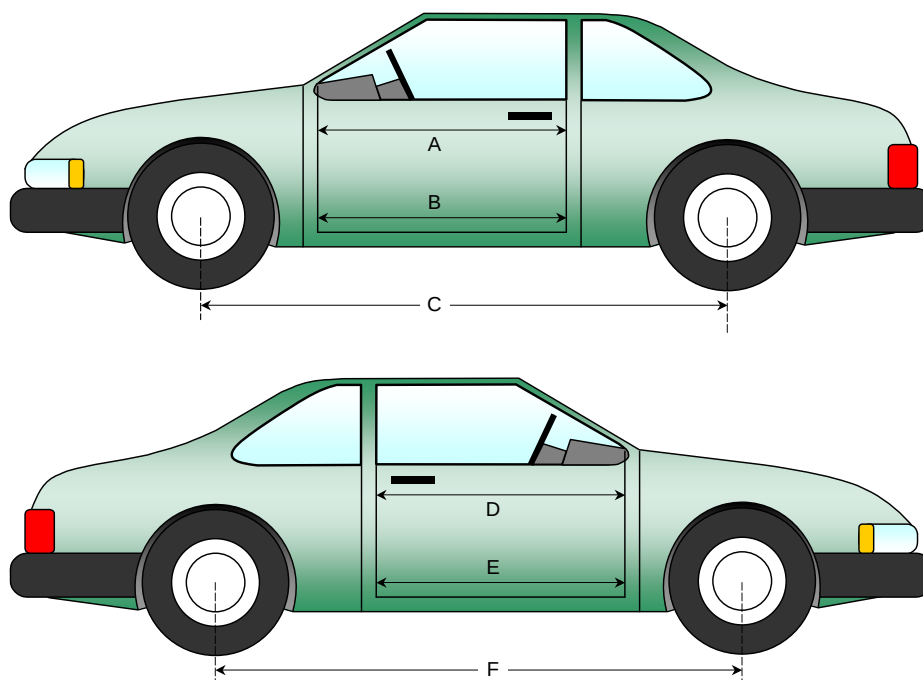
NHTSA No.: MB5308
 Test Date: 11/15/2010

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1015	1012	3
B	Left Side Lower	mm	900	902	-2
D	Right Side Upper	mm	1004	1012	-8
E	Right Side Lower	mm	893	894	-1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2620	2518	102
F	Right Side Wheelbase	mm	2620	2497	123



DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

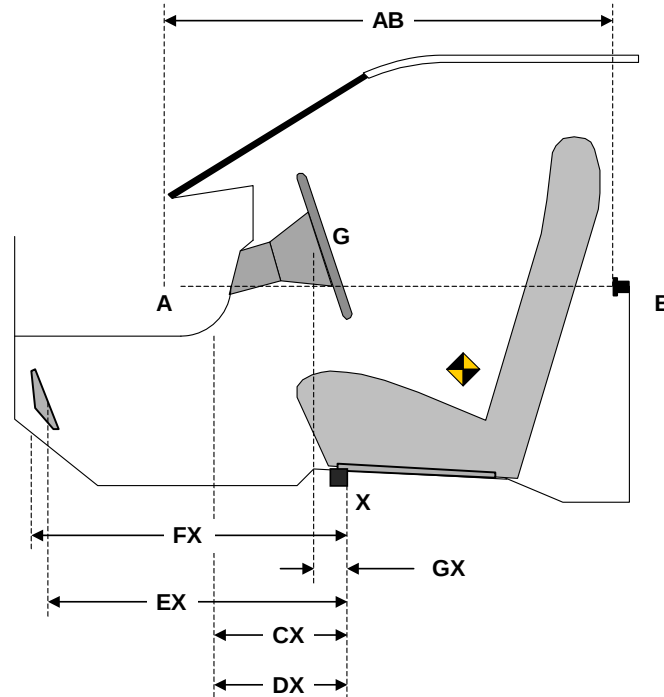
Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	870	870	0
CX	Left Knee Bolster to X	mm	336	351	-15
DX	Right Knee Bolster to X	mm	310	322	-12
EX	Brake Pedal to X	mm	610	595	15
FX	Foot Rest to X	mm	624	628	-4
GX	Center of Steering Column Wheel Hub to X	mm	159	196	-37

X = Front of Seat Track (stationary)

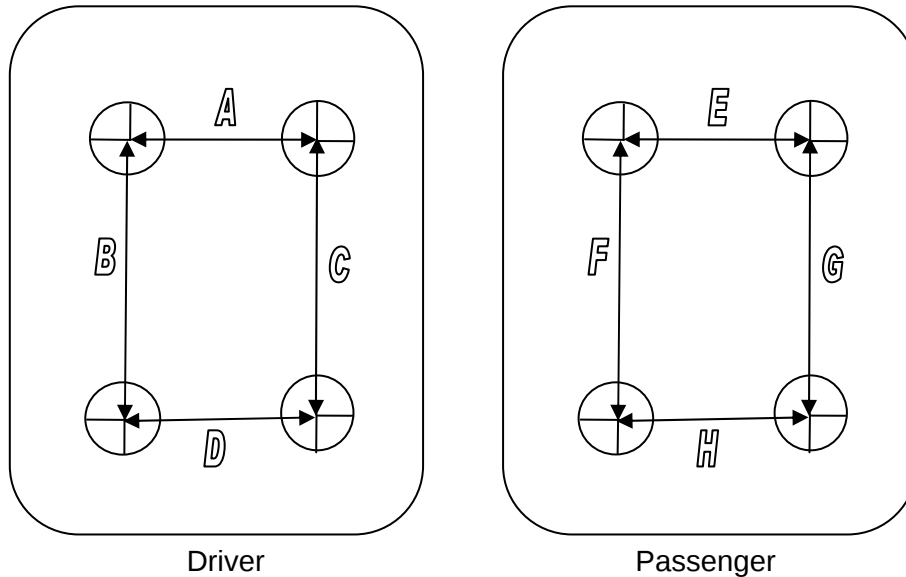


DRIVER COMPARTMENT

DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010



TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	200	193	7
B	mm	200	195	5
C	mm	200	194	6
D	mm	200	195	5
E	mm	200	196	4
F	mm	200	191	9
G	mm	200	195	5
H	mm	200	199	1

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

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

Windshield Mounting Details:

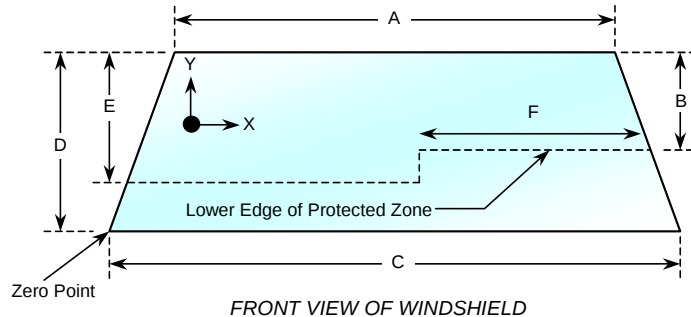
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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	2226	2226	100
Right Side	2226	2226	100
Total	4452	4452	100



Item	Units	Value
A	mm	1218
B	mm	564
C	mm	1544
D	mm	845
E	mm	585
F	mm	511

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 CR-V LX 5-Dr SUV</u>	NHTSA No.:	<u>MB5308</u>
Test Program:	<u>NCAP Frontal Barrier Impact Test</u>	Test Date:	<u>11/15/2010</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Time:	<u>10:12 am</u>	Temperature:	<u>21° C</u>
------------	-----------------	--------------	--------------

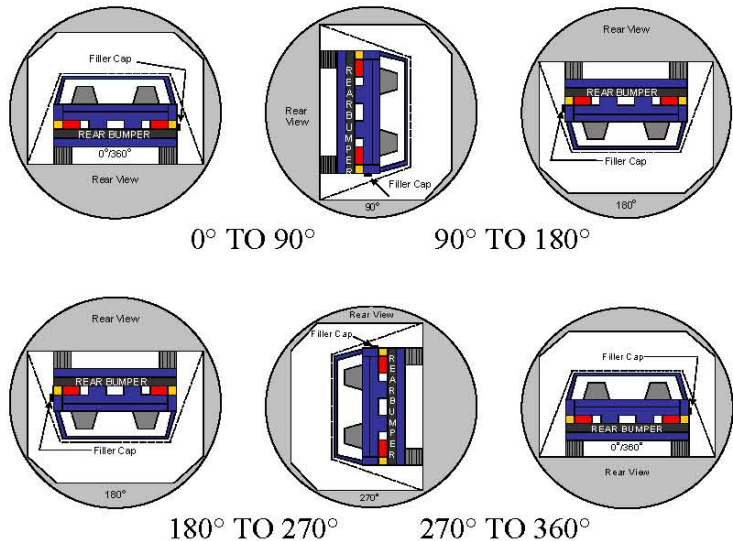
- | | |
|---|--------------|
| A. From impact until vehicle motion ceases:
(Maximum Allowable = 1 ounce) | <u>0</u> oz. |
| B. For the 5 minute period after motion ceases:
(Maximum allowable = 5 ounces) | <u>None</u> |
| C. For the following 25 minutes:
(Maximum allowable = 1 oz./minute) | <u>None</u>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

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2011 Honda CR-V LX 5-Dr SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
 Test Date: 11/15/2010

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°	116	300	416
90° to 180°	111	300	411
180° to 270°	103	300	403
270° to 360°	108	300	408

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

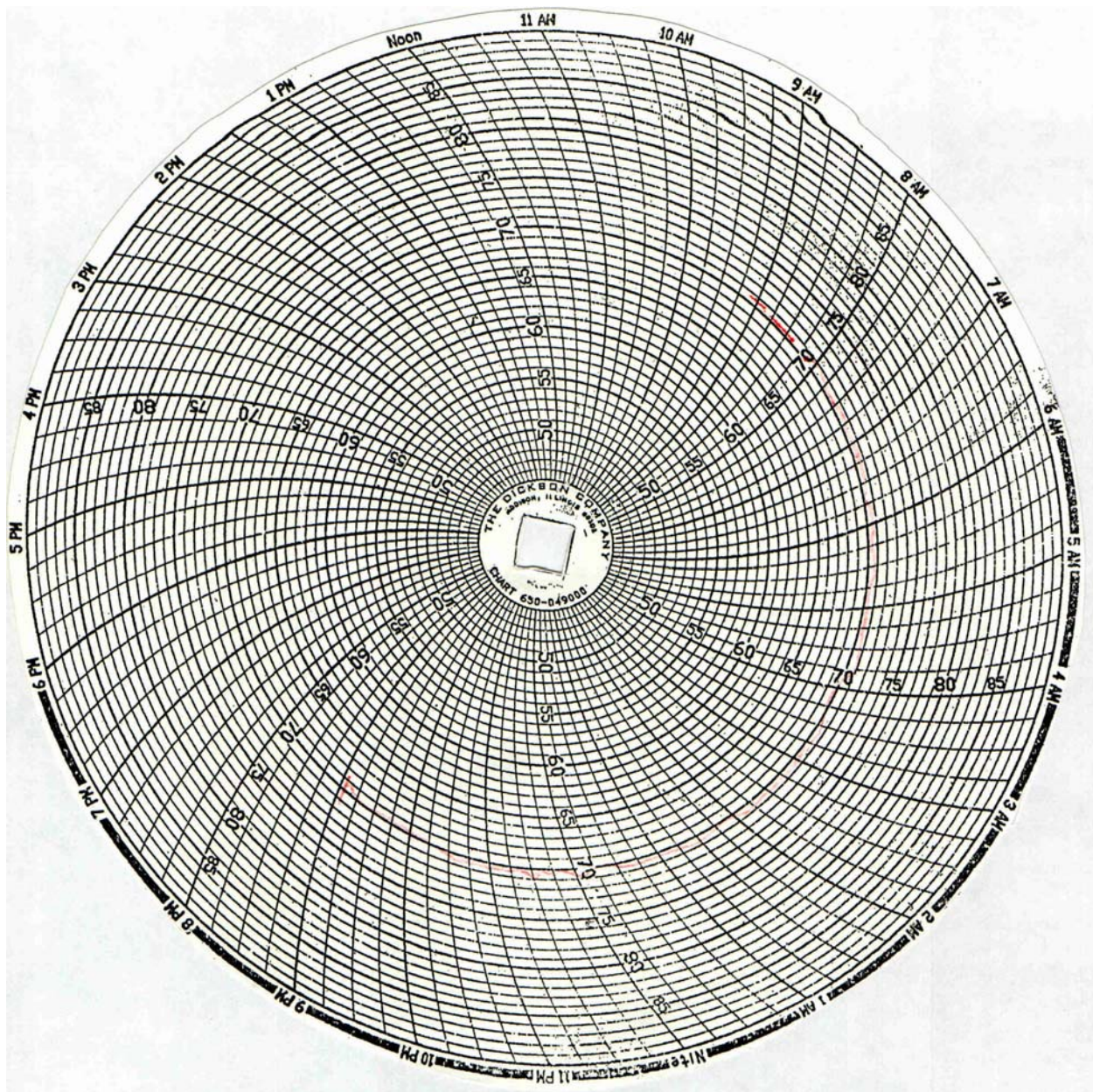
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 CR-V LX 5-Dr SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5308
Test Date: 11/15/2010



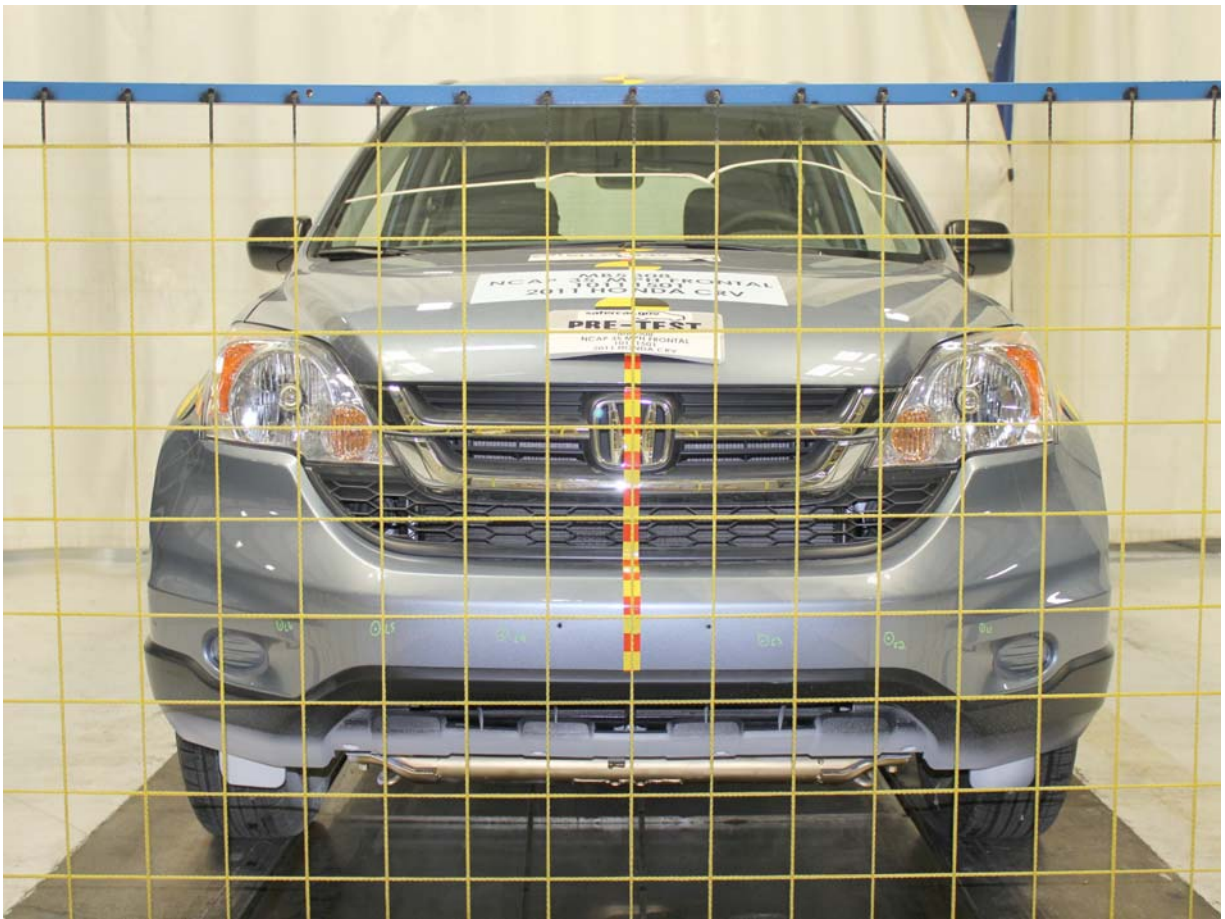
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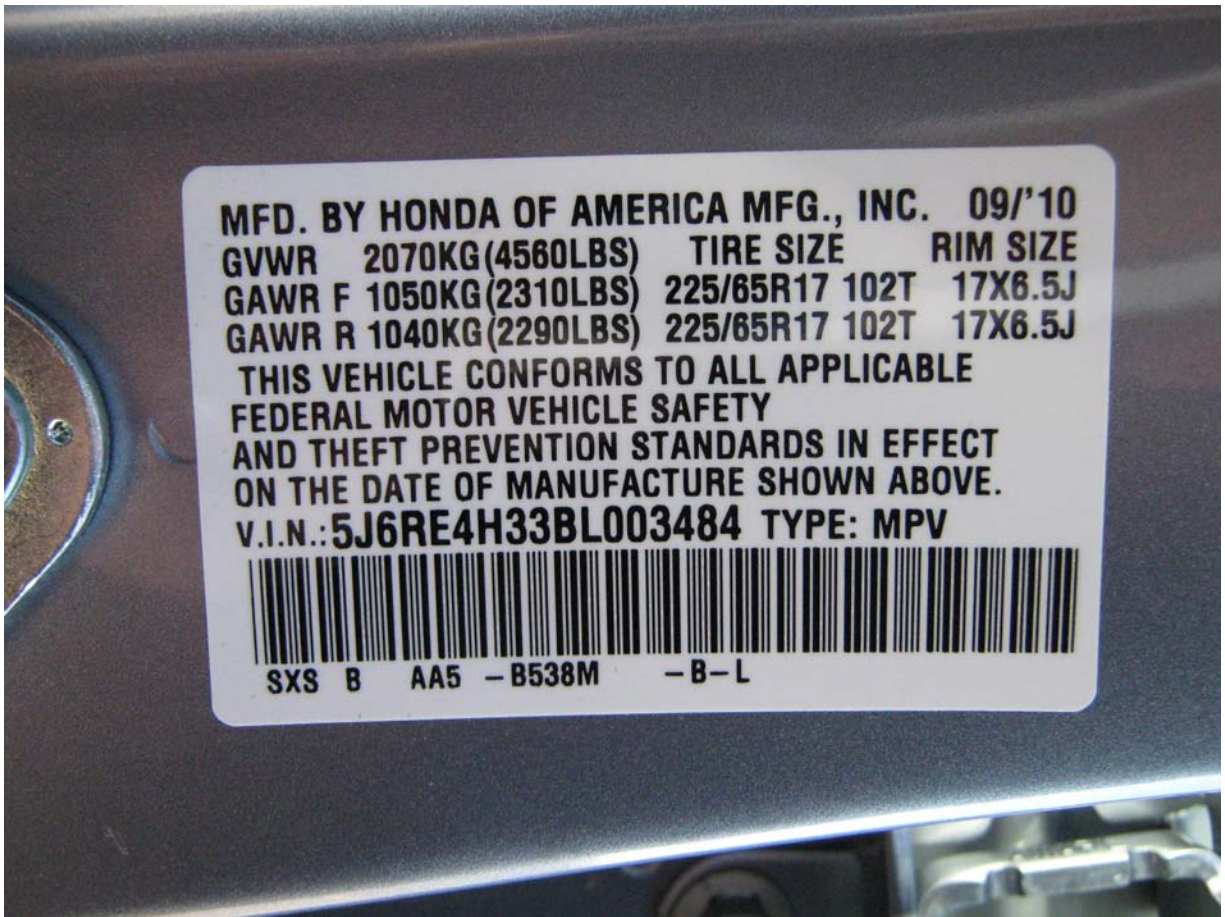
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Load Cell Location



Load Cell Wall



Manufacturer's Label



Tire Placard



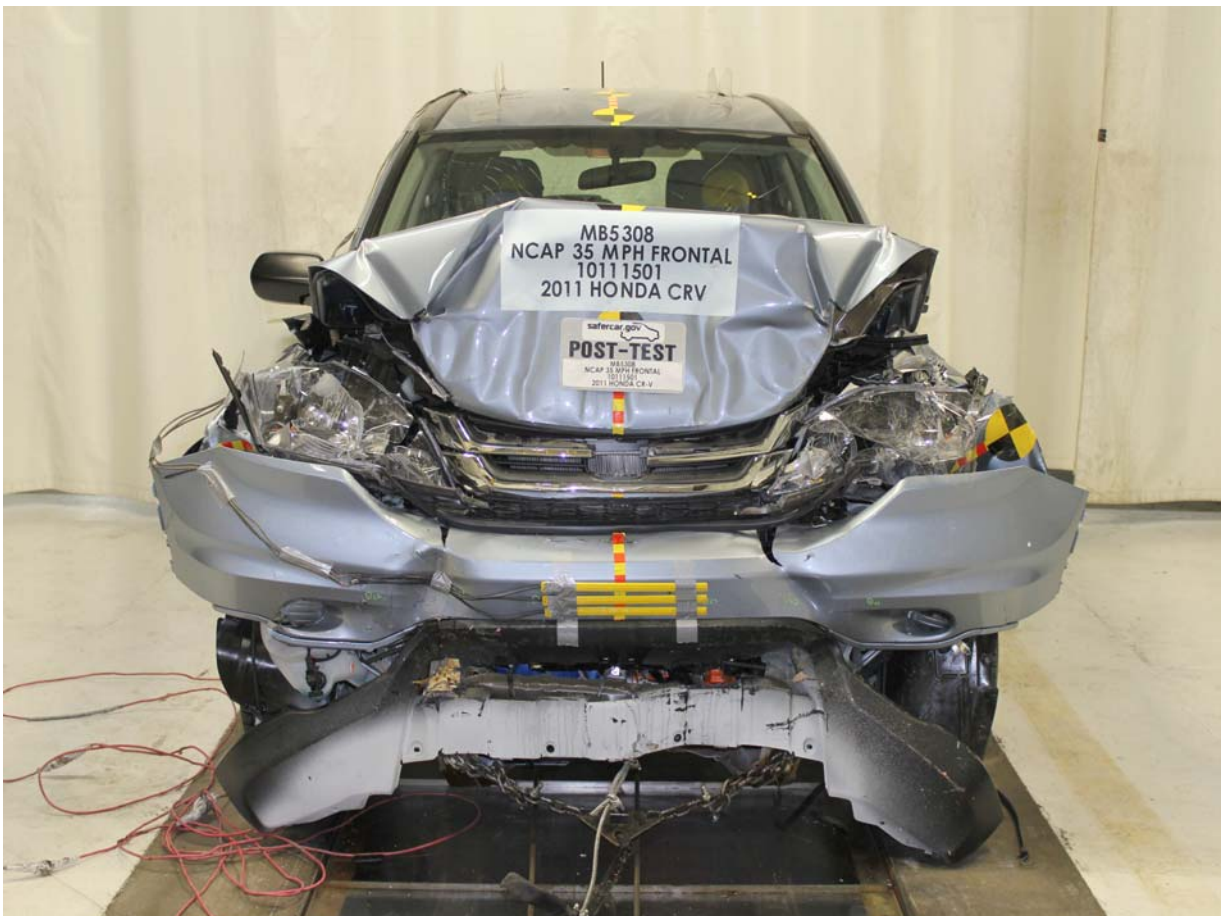
Right Front Three-Quarter View, As Received



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



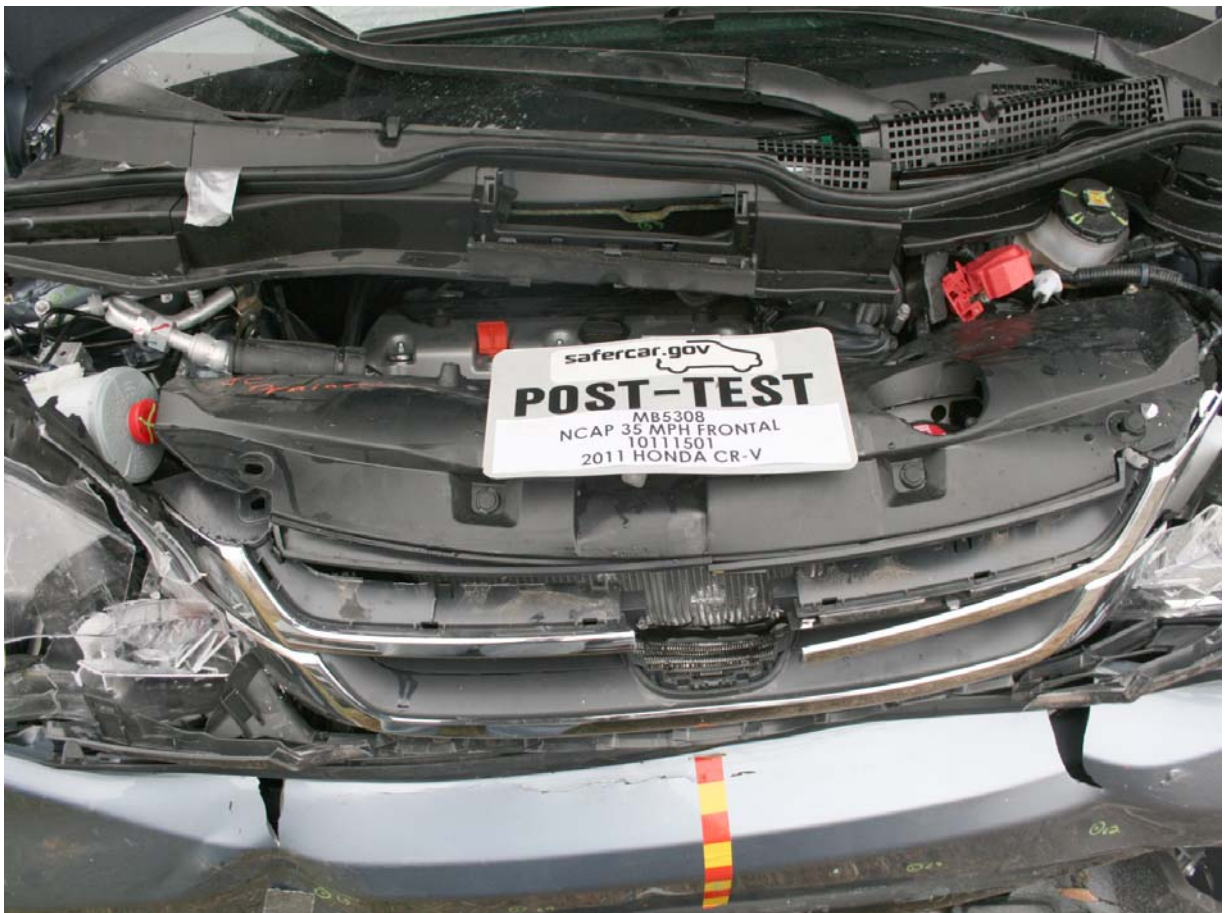
Pre-Test Windshield View



Post-Test Windshield View



Pre-Test Engine Compartment View



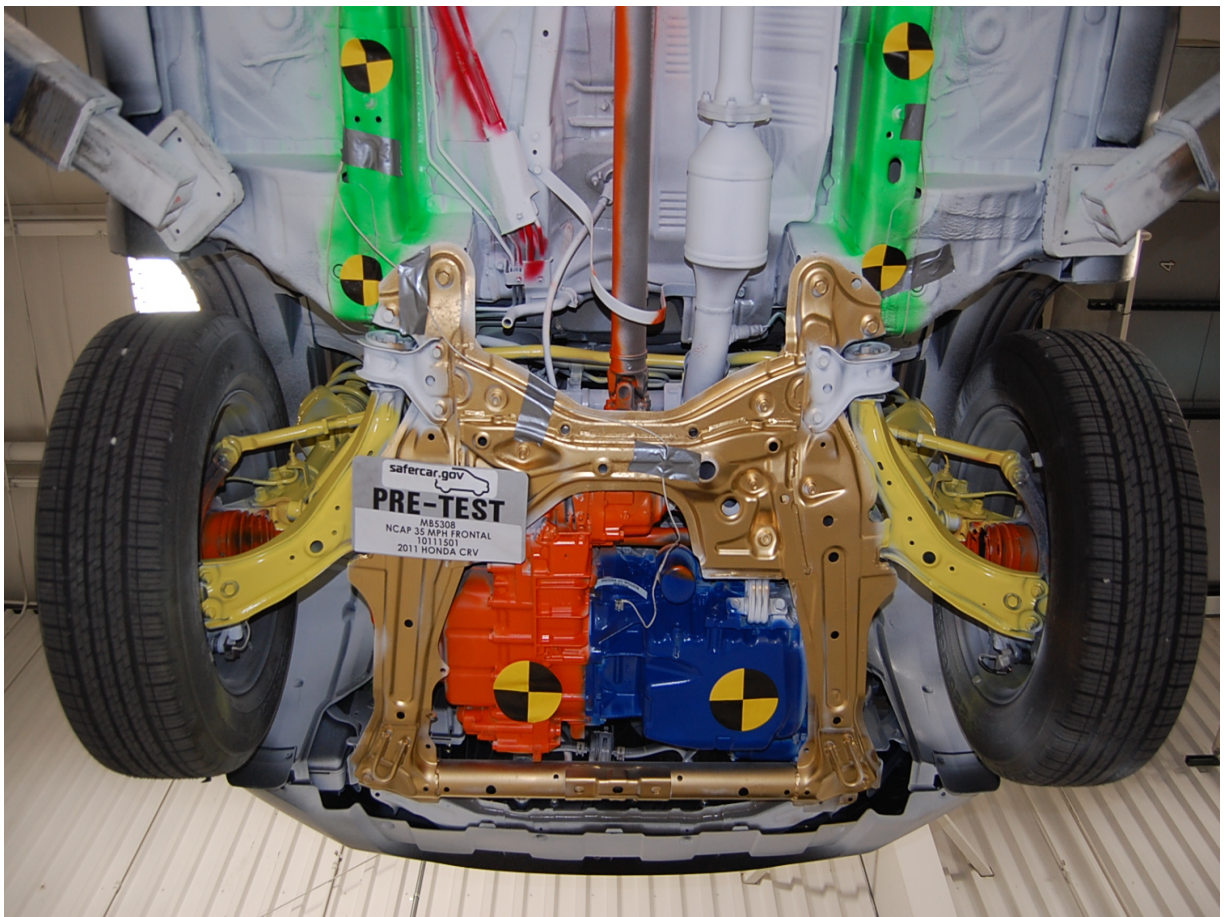
Post-Test Engine Compartment View



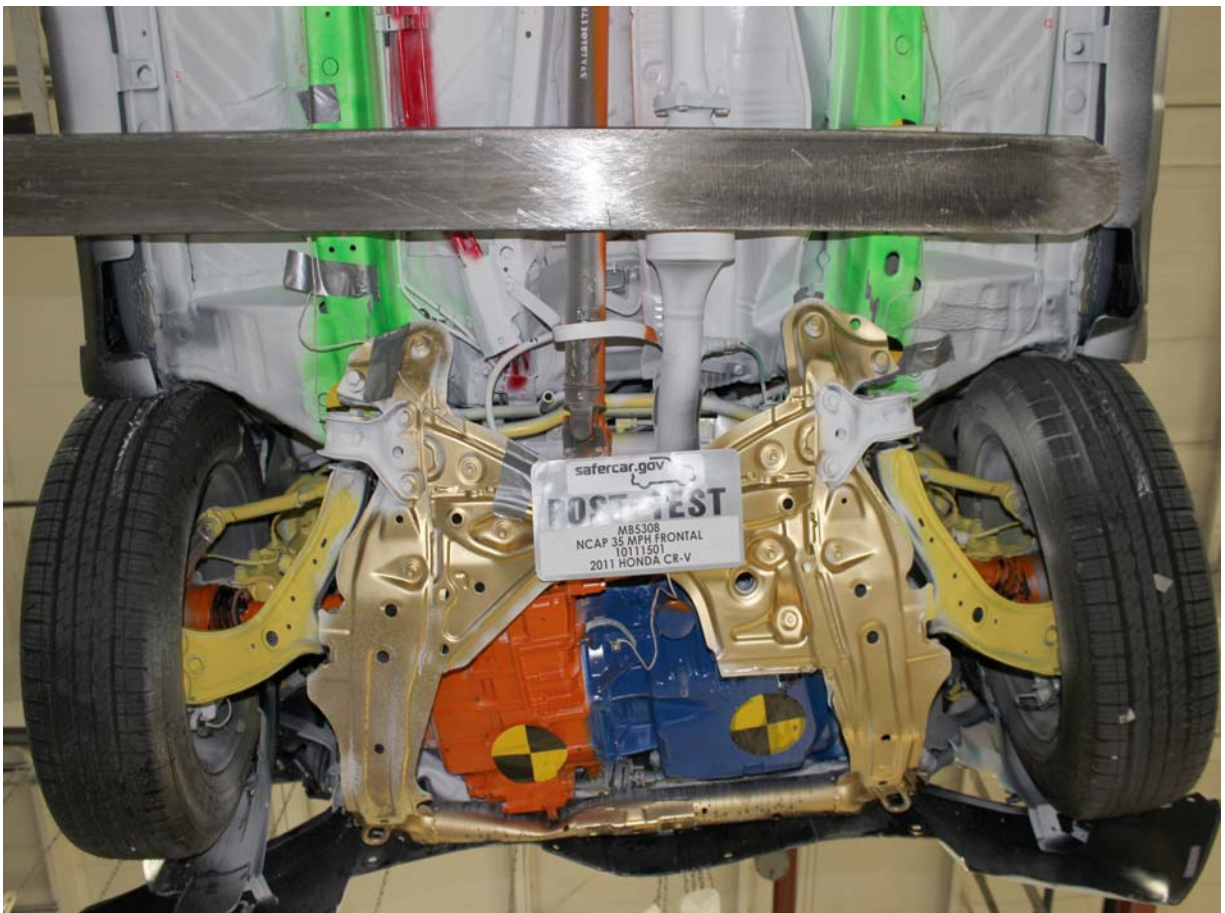
Pre-Test Fuel Cap View



Post-Test Fuel Cap View



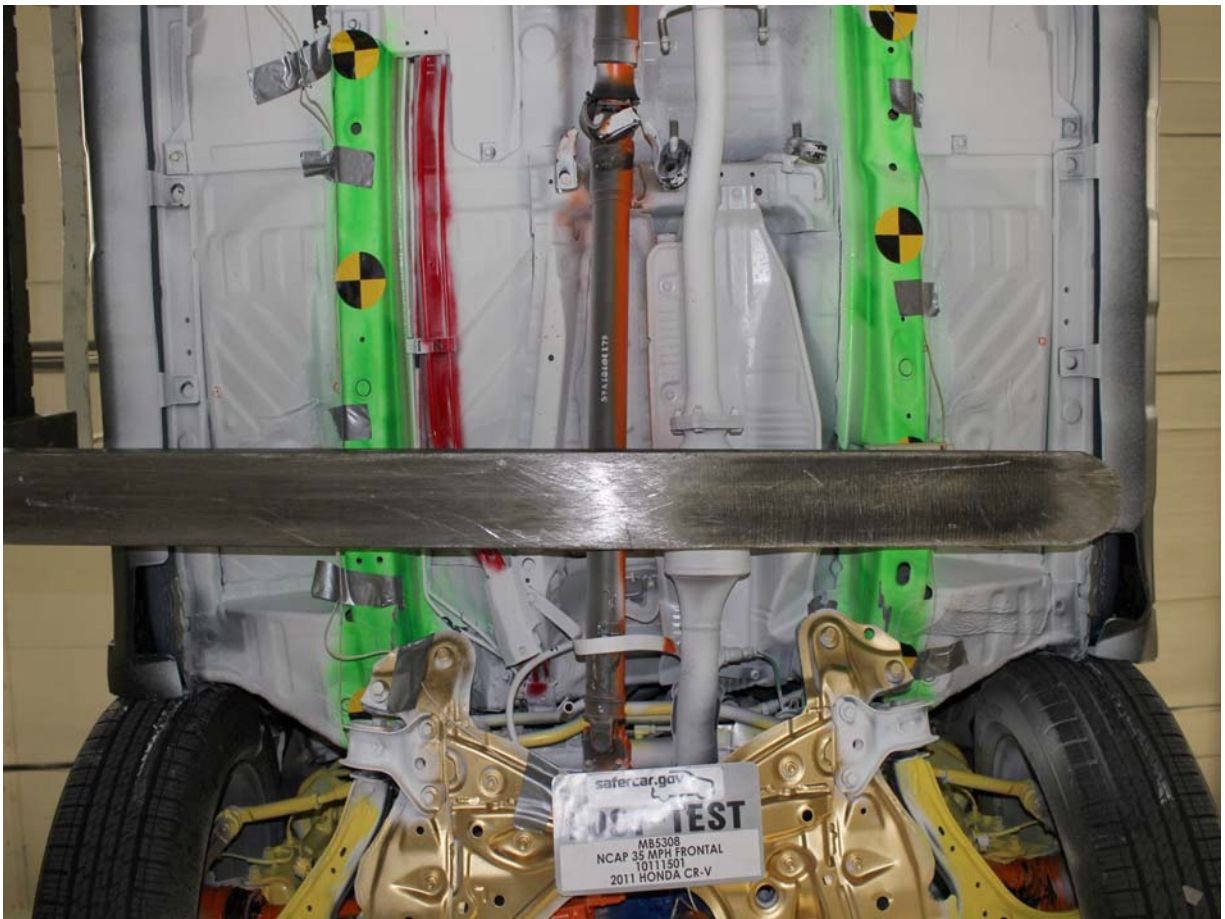
Pre-Test Front Underbody View



Post-Test Front Underbody View



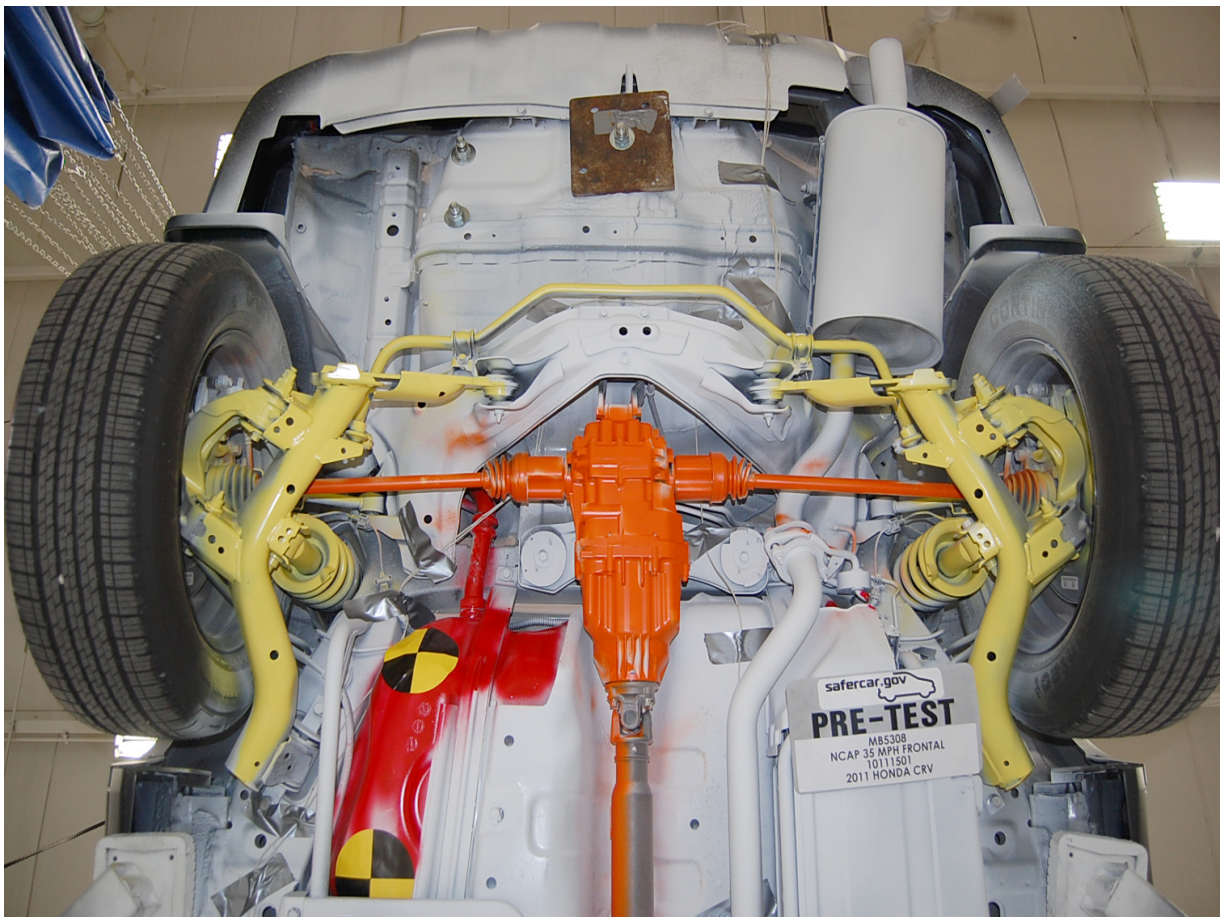
Pre-Test Mid Underbody View



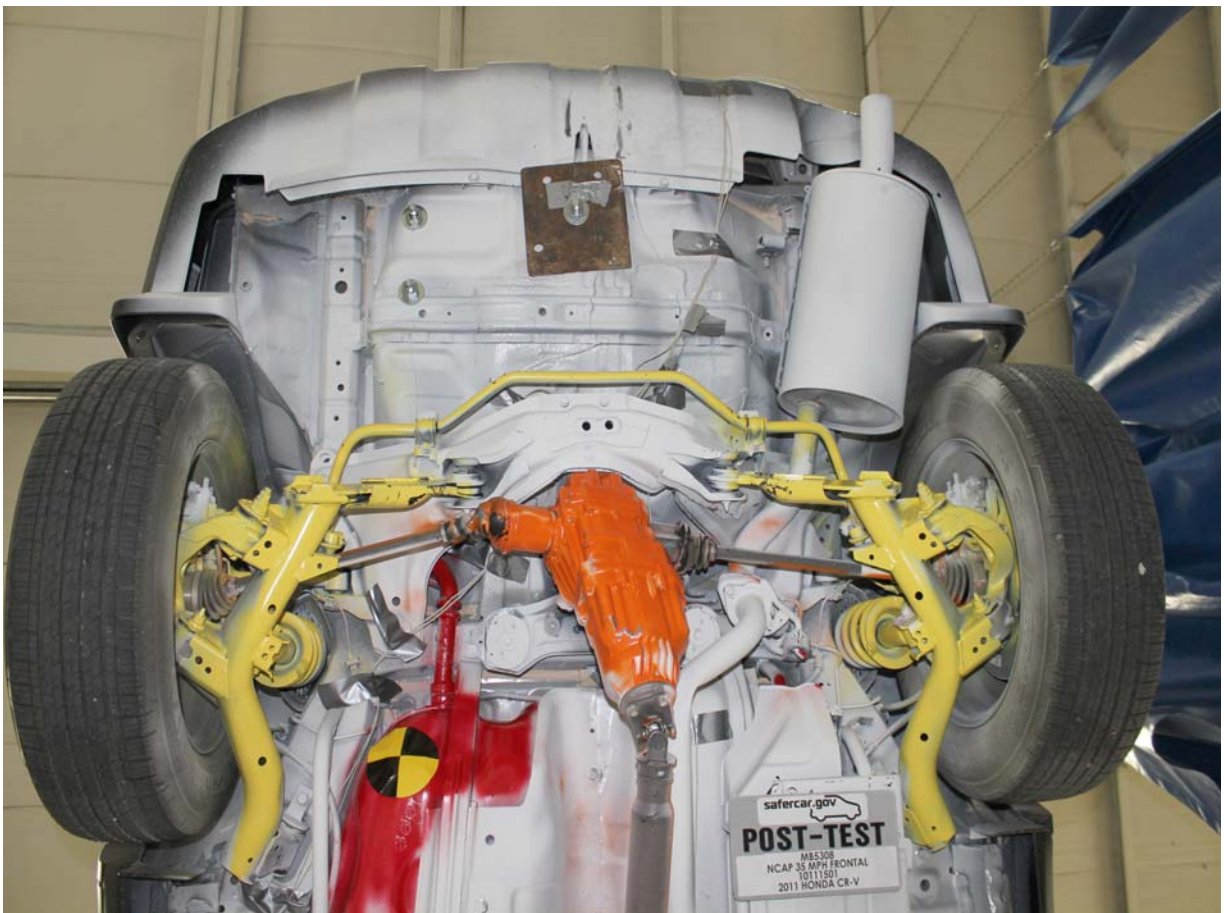
Post-Test Mid Front Underbody View



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



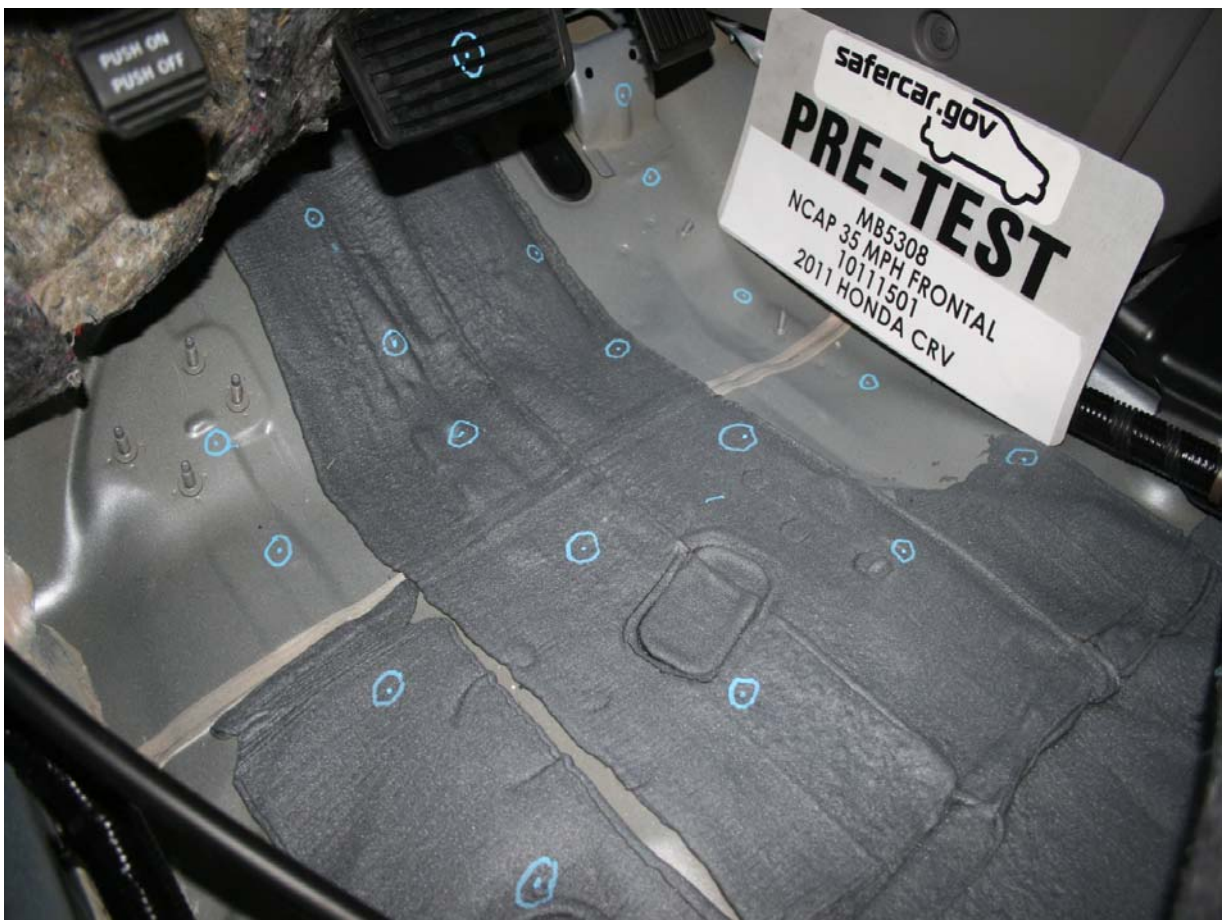
Post-Test Driver Dummy Feet



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



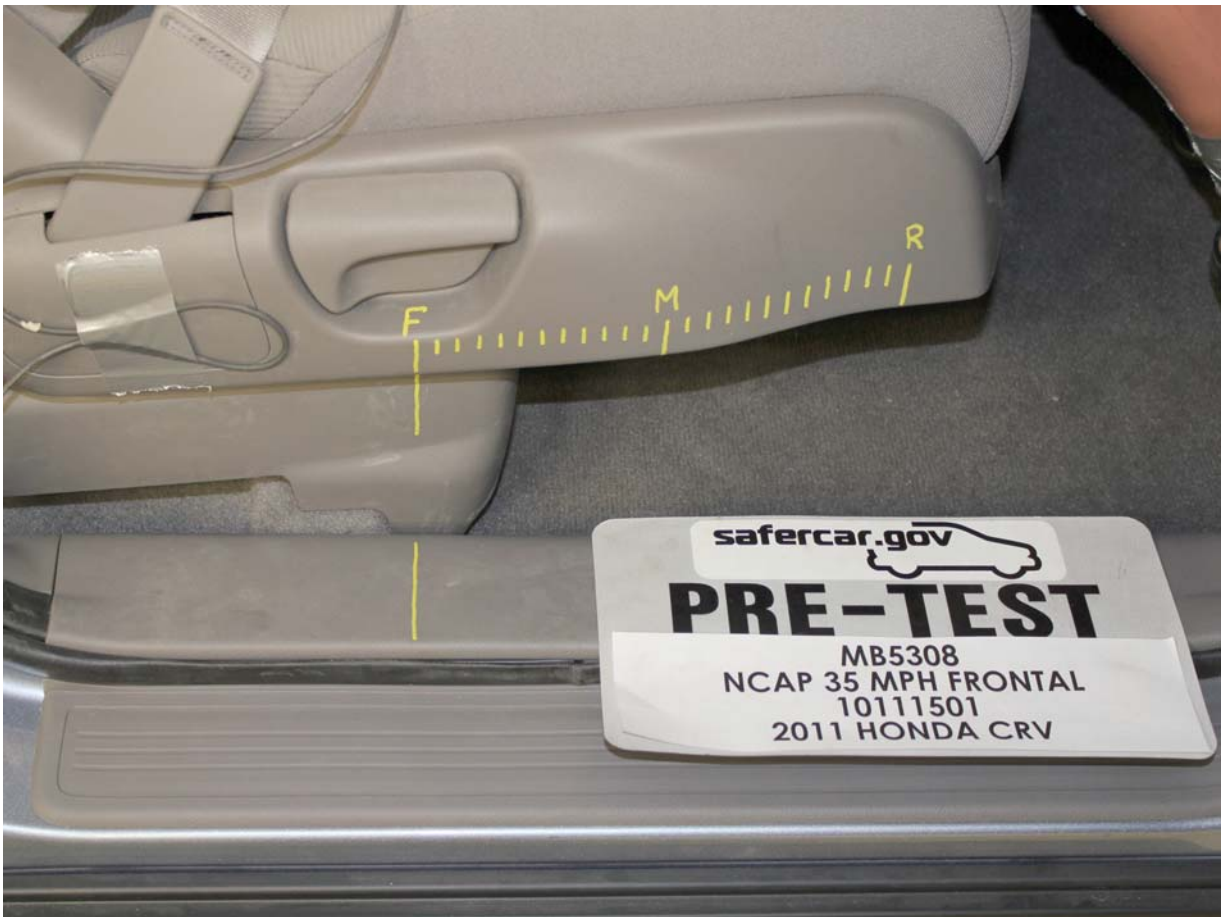
Post-Test Passenger Dummy Window View



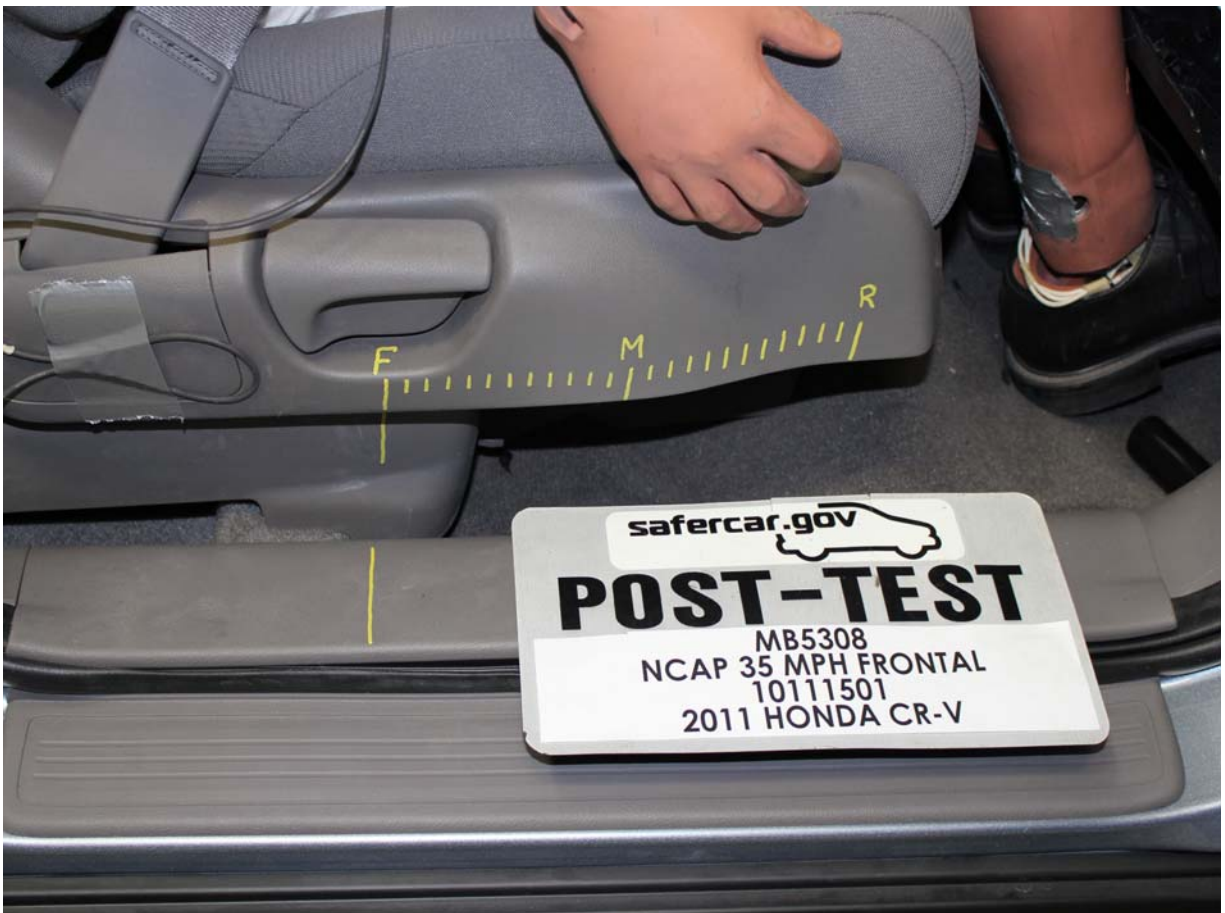
Pre-Test Passenger Dummy and Vehicle Interior (Door Open)



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

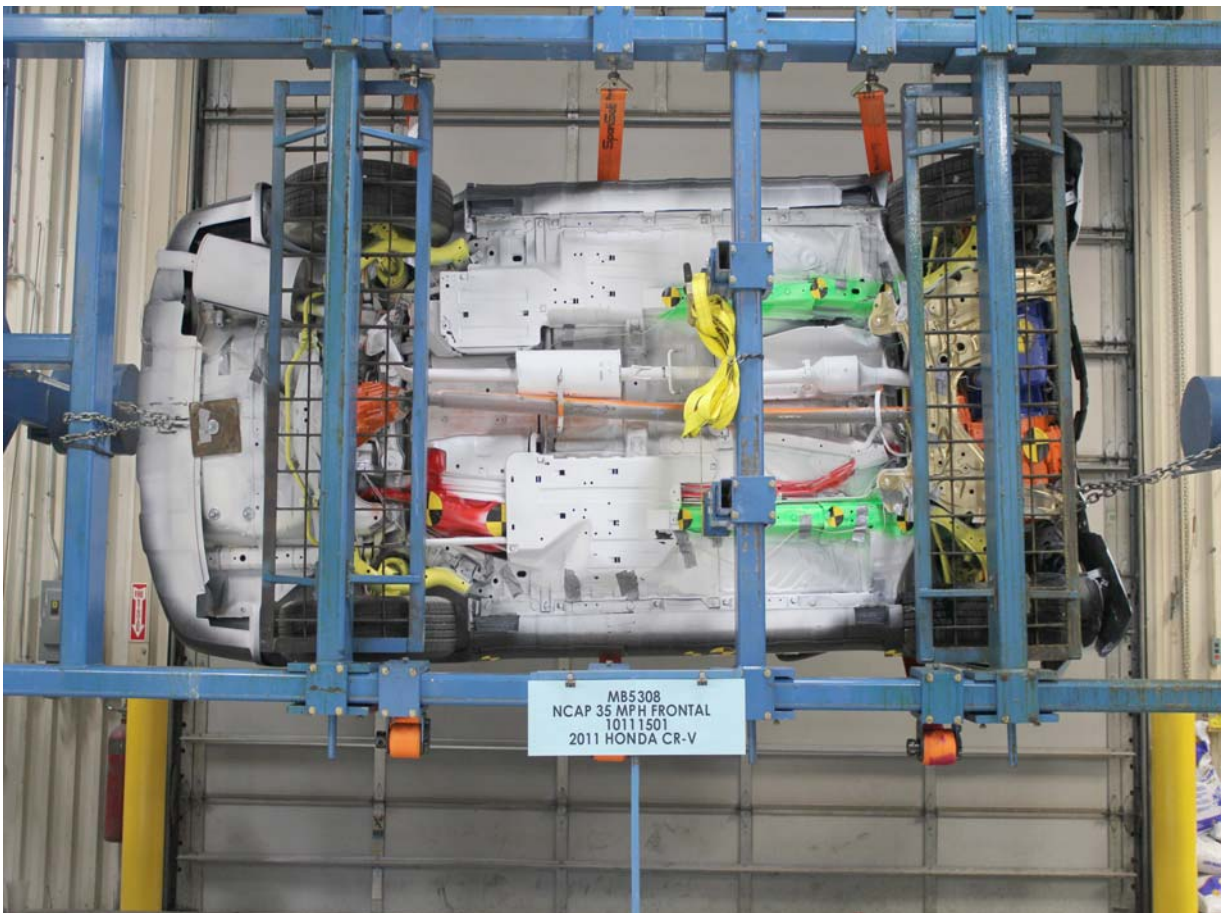
Post-Test Stoddard Solvent Spillage Location View



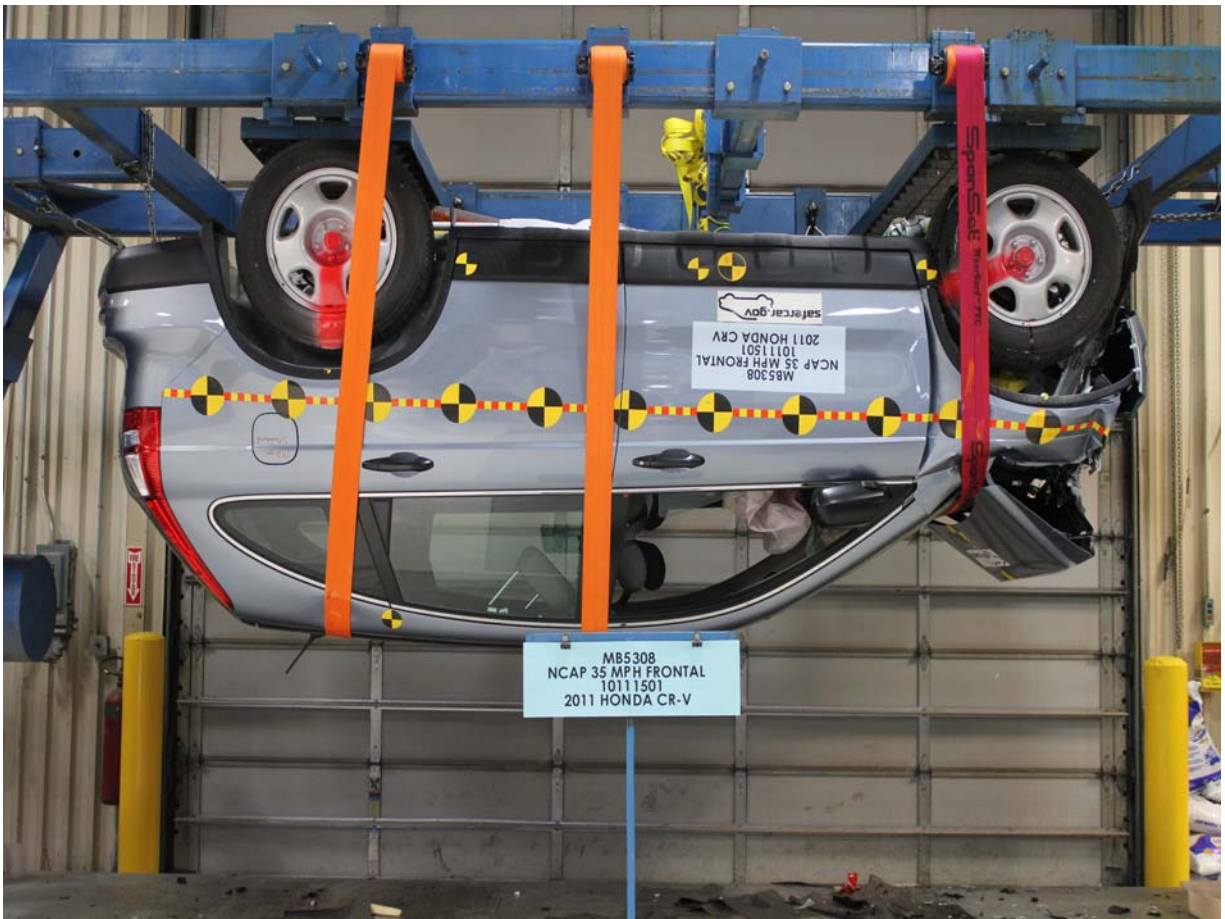
Post-Test Speed Trap Read-Out



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



Vehicle at 360 Degrees on Static Rollover Device



Vehicle Impact



2011 CR-V 5DR 4WD LX
VEHICLE NUMBER: 5J6RE4H33BL003484
ENGINE NUMBER: K24ZE-2000994 EXT: GLACIER BLUE M.
CONTROL NUMBER: 957171 INT: GRAY

STANDARD EQUIPMENT AT NO EXTRA COST

- TECHNICAL FEATURES ***
 - 180hp 2.4-Liter DOHC 16-Valve i-VTEC 4-Cylinder Engine
 - 5-Speed Automatic Transmission with Grade Logic Control
 - Real Time 4-Wheel Drive System
 - 4-Wheel Disc Brakes
 - Front MacPherson Strut Suspension
 - Rear Multi-Link Suspension
 - Drive-by-Wire Throttle System
 - Variable-Assist Rack-and-Pinion Power Steering Stabilizer Bars
 - Front and Rear Side-Impact Beams
 - Immobilizer Throttle Disarm System
- SAFETY FEATURES ***
 - Driver's and Front Passenger's Dual-Stage Airbags (SRS)
 - Driver's and Front Passenger's Side Airbags
 - Side Curtain Airbags with Rollover Sensor
 - Vehicle Stability Assist (VSA)
 - Anti-Lock Braking System (ABS)
 - Electronic Brake Distribution (EBD)
 - 3-Point Seat Belts
 - Active Front Head Restraints
 - Side-Impact Door Beams
 - The Pressure Monitoring System
 - ACE Body Structure
 - Front and Rear Crumple Zones
 - LATCH System for Child Seats
- EXTERIOR FEATURES ***
 - 17" x 6.5" Steel Wheels
 - P225/55 R17 All-Season Tires
 - Removable Windshield Wipers
 - Power Windows
 - Rear Wiper with Washer
 - Rear Window Defroster
 - Remote Entry System
- INTERIOR FEATURES ***
 - AM/FM/CD Audio System with 4 Speakers
 - MP3/Auxiliary Input Jack
 - Air Conditioning with Air Filtration System
 - Driver's Seat Height Adjustment and Tumble Rear Seats
 - 60/40 Split Sliding Fold and Tumble Rear Seat Center Armrest
 - Power Windows and Door Locks
 - Power Auto Up/Down Window
 - 12-Volt Power Windows
 - Cruise Control
 - Floor Mats
 - Folding Center Tray Table
 - Sunglasses Holder with Conversation Mirror
 - Maintenance Minder System

Manufacturer's Suggested Retail Price **\$22,945.00**
Full Tank of Fuel **No Charge**

~~135736~~
135736

Destination and Handling 780.00
TOTAL VEHICLE PRICE
(Includes Pre-Delivery Service)
\$23,725.00

License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

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

ROSEN HONDA
7000 GRAND AVENUE
GURNEE, IL 60031
ORIG. DLR: 207853
REF. NO.: 40348
VIN CODE: HN-3501
EMISSION: 50 STATE
PORT OF ENTRY: EAST LIBERTY
DELIVERY POINT: SCHAUMBURG
SHIP#: 619-007
ROW/SPACE: 619-007
TRANSMETHOD: TRUCK
VIN: 5J6RE4H33BL003484



EPA Fuel Economy Estimates

CITY MPG

21

Expected range for most drivers 17 to 25 MPG

Estimated Annual Fuel Cost **\$1,958**
based on 15,000 miles at \$3.00 per gallon

Combined Fuel Economy

This Vehicle **23**

10 32
All SUVs

HIGHWAY MPG

27

Expected range for most drivers 22 to 32 MPG

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



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: **60 %**
Major Sources of Foreign Parts Content:
JAPAN 35 %

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

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	Not Rated
Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.		Not Rated
Side Crash	Front seat Rear seat	Not Rated
Star ratings based on the risk of injury in a side impact.		Not Rated
Rollover		★★★★
Star ratings based on the risk of rollover in a single vehicle crash.		

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

FOR THIS VEHICLE
Final Assembly Point:
USA
Country of Origin: Engine:
U.S.A.
Transmission:
JAPAN

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

APPENDIX B
DUMMY RESPONSE DATA

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Figure No. 3.	Driver Head Z Acceleration vs. Time	B-1
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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

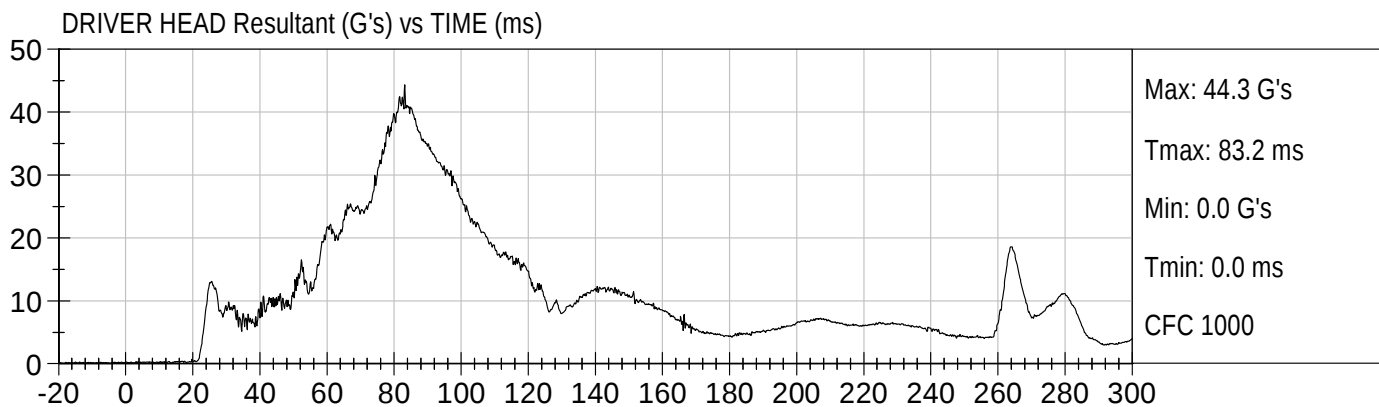
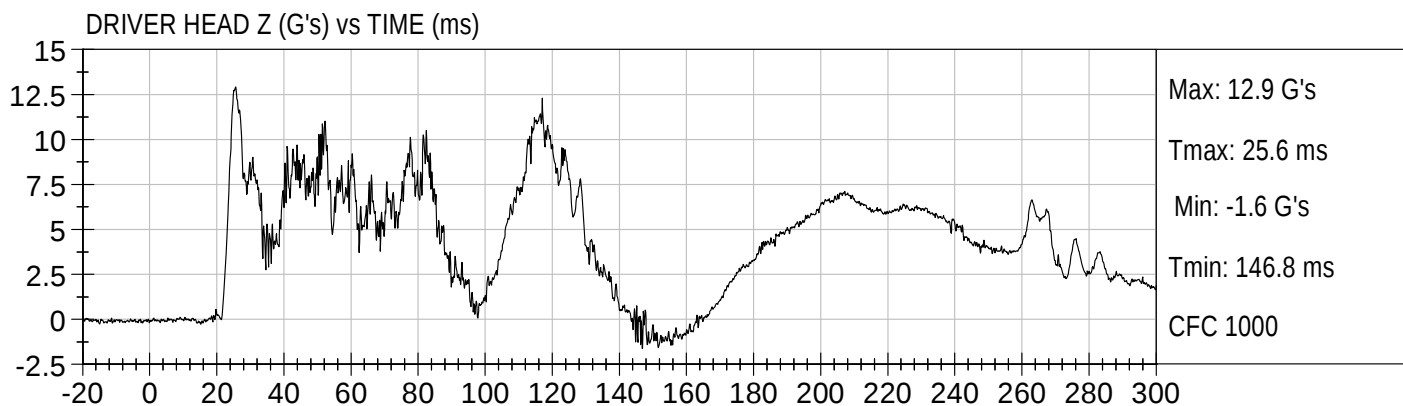
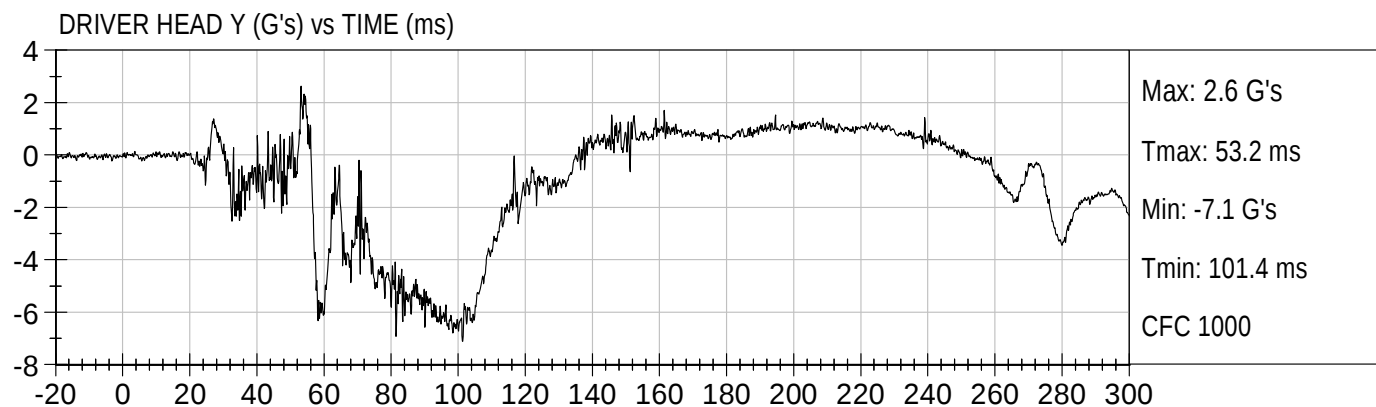
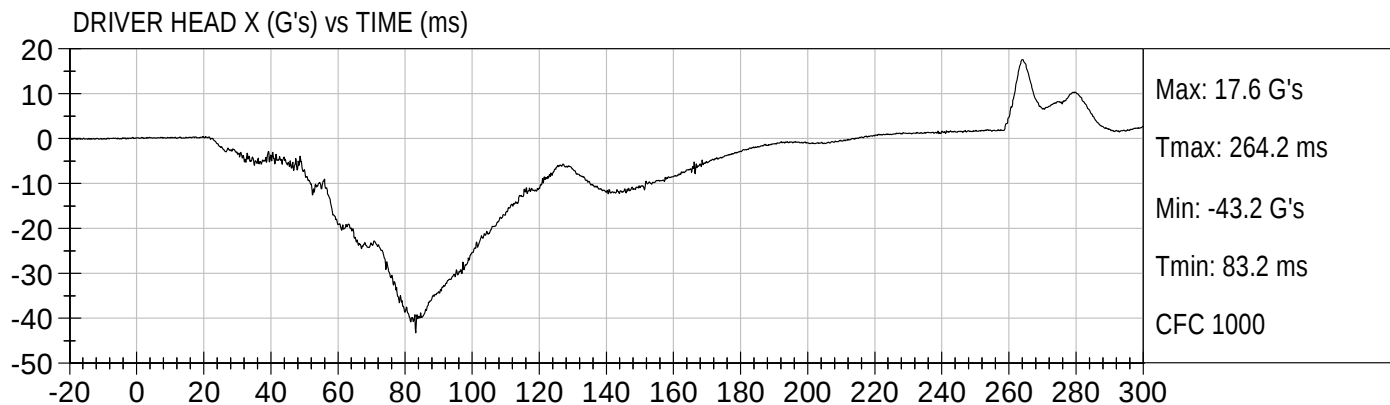
Driver Left Upper Tibia Force Z

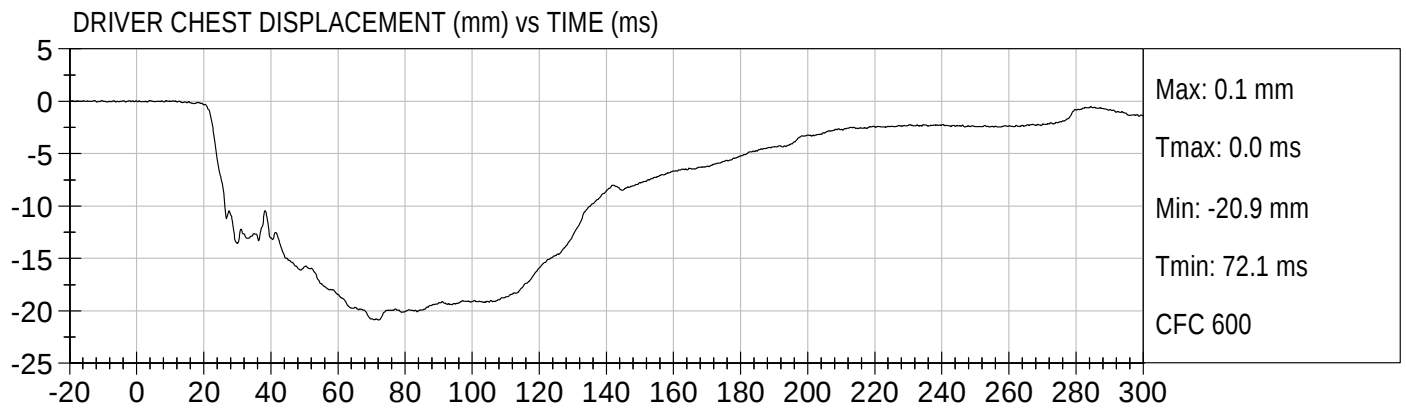
Driver Left Lower Tibia Moment X

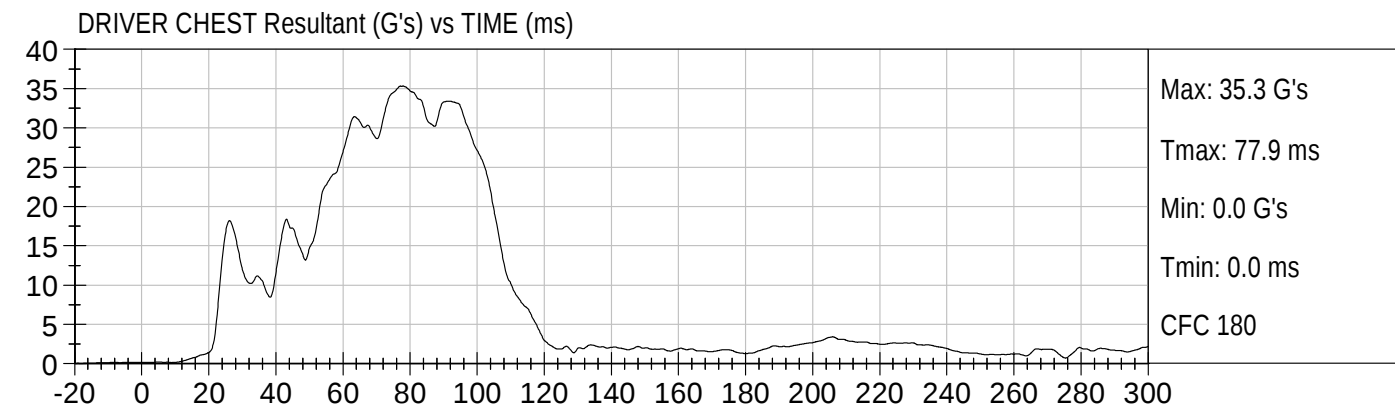
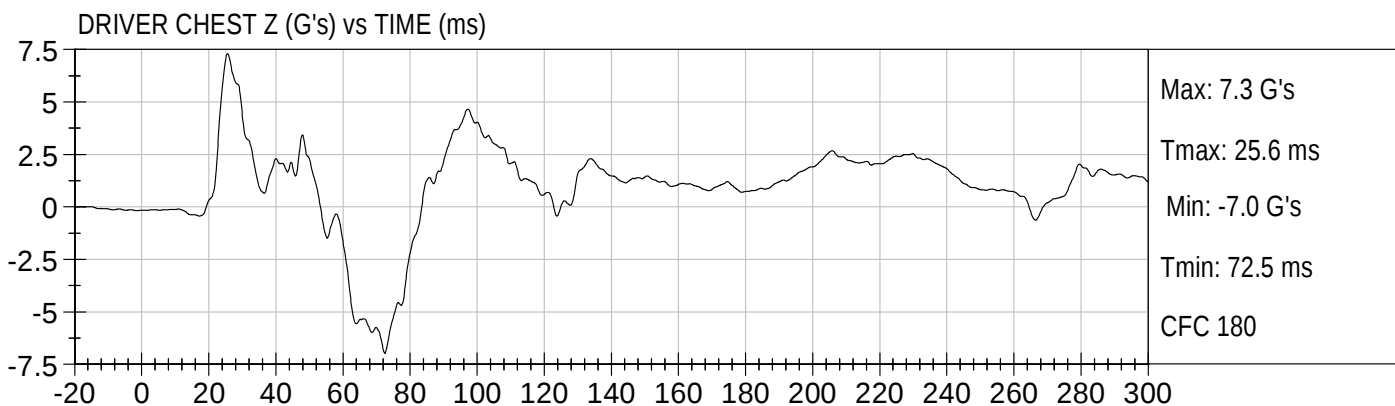
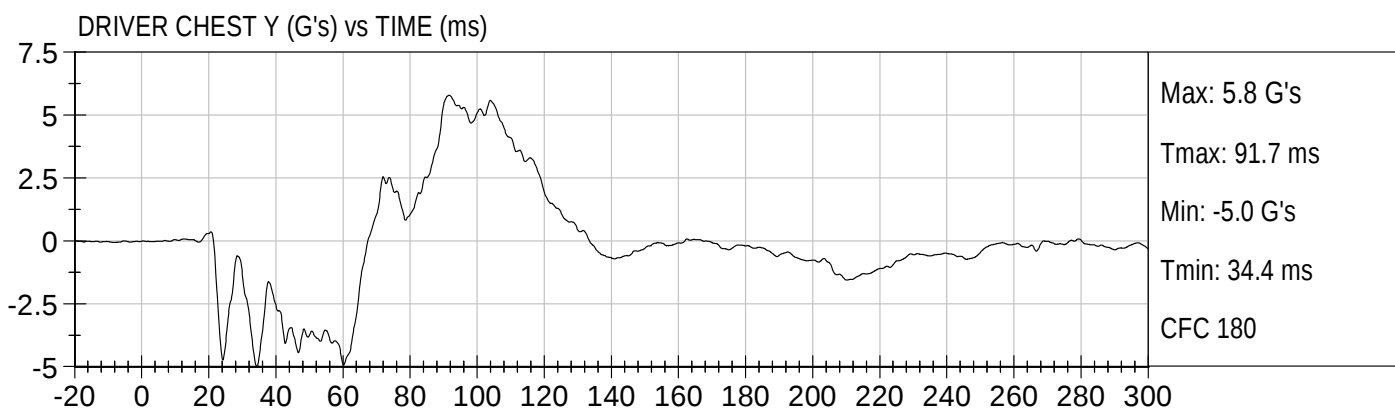
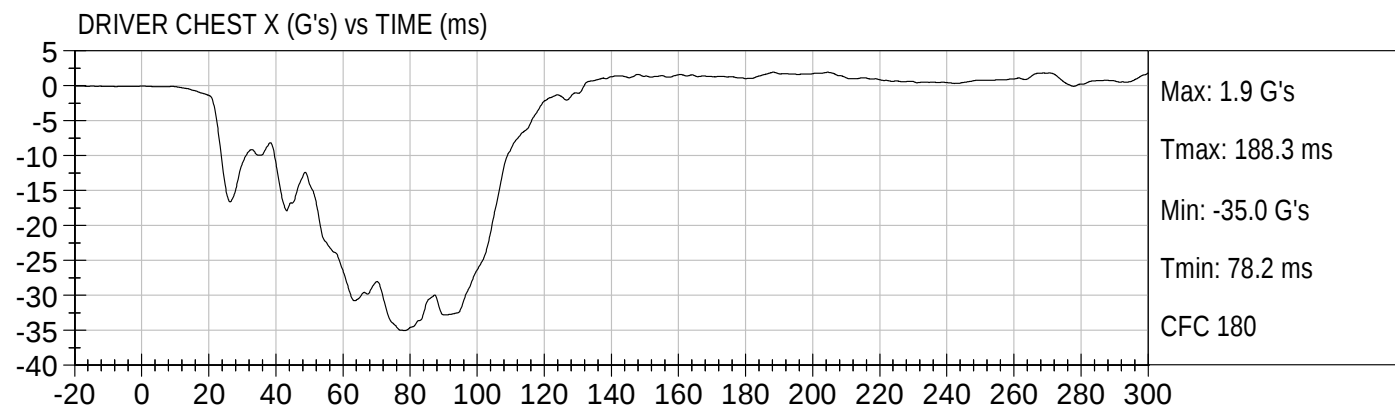
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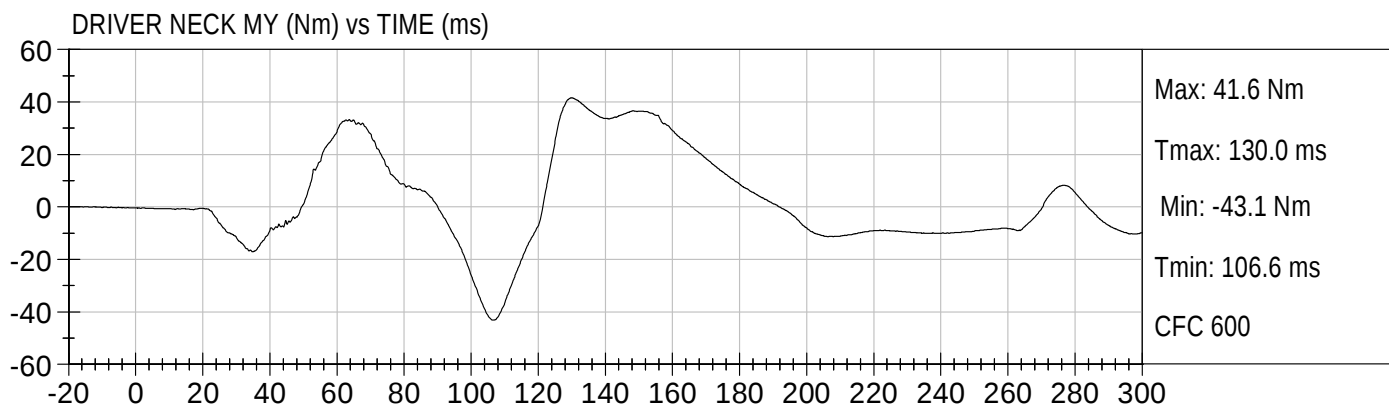
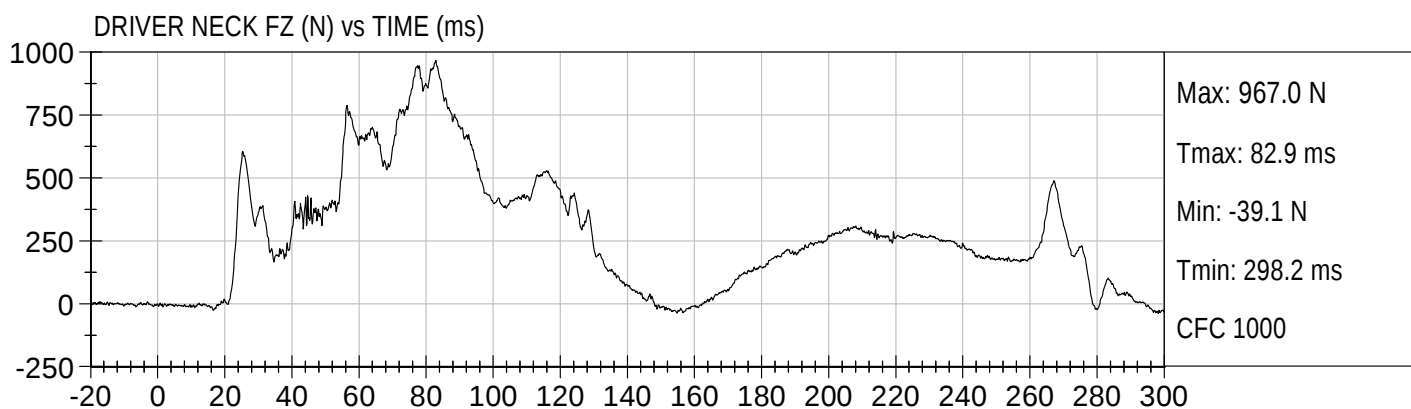
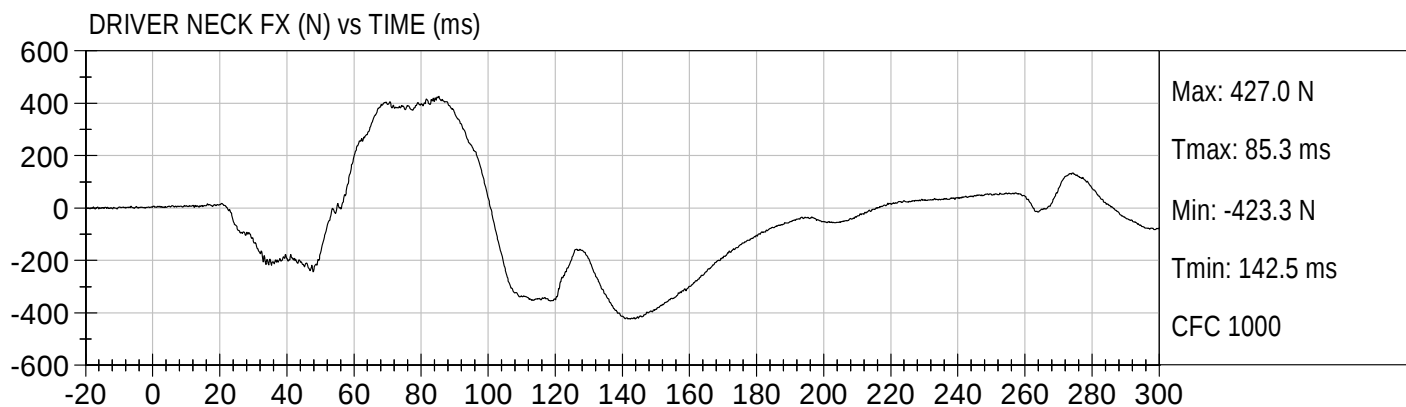
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft 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

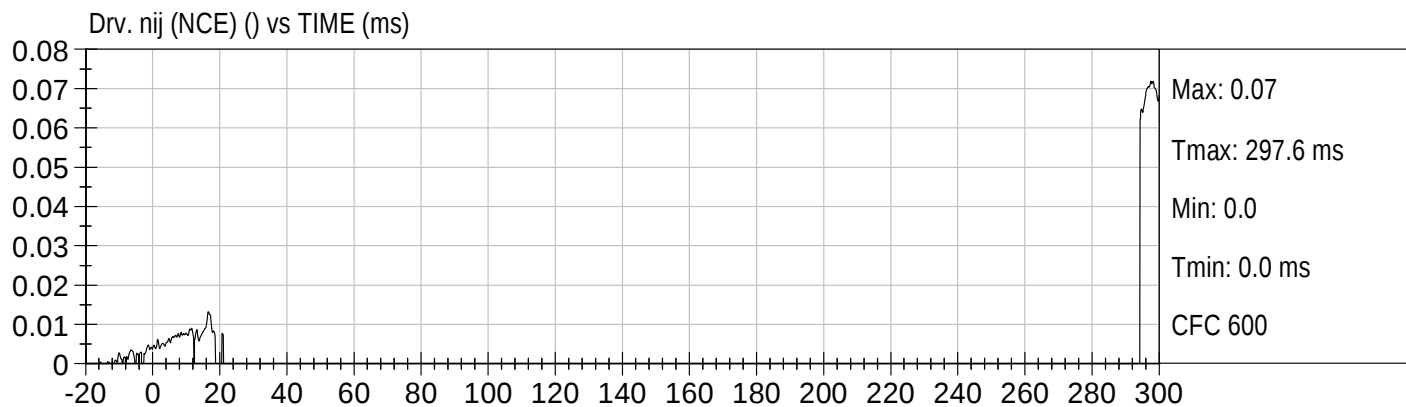
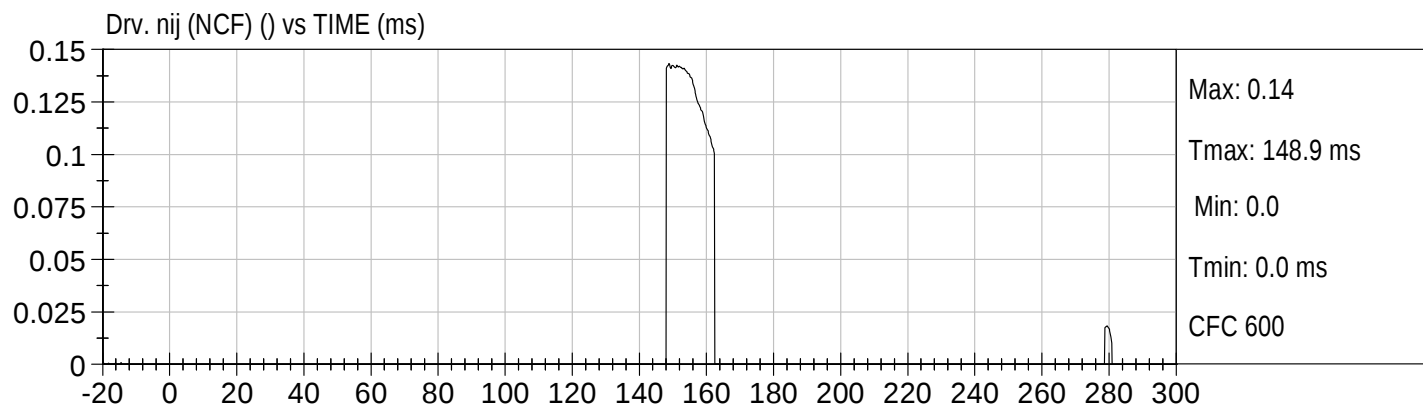
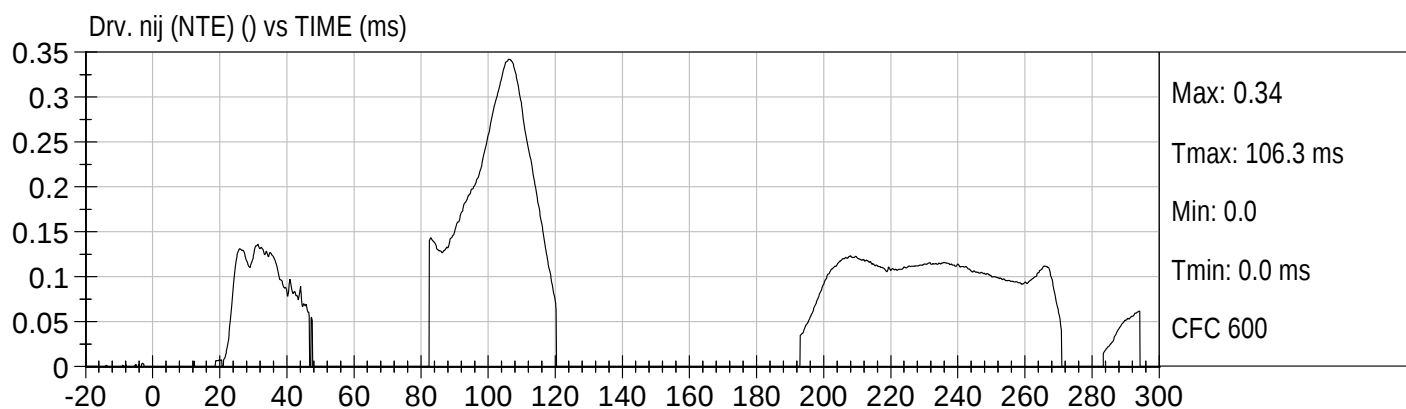
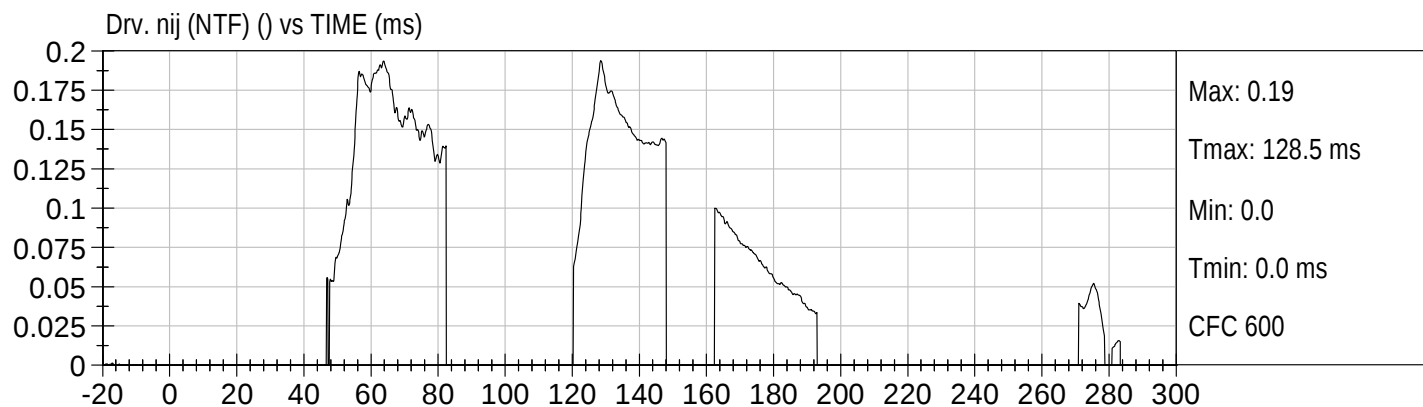
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger 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

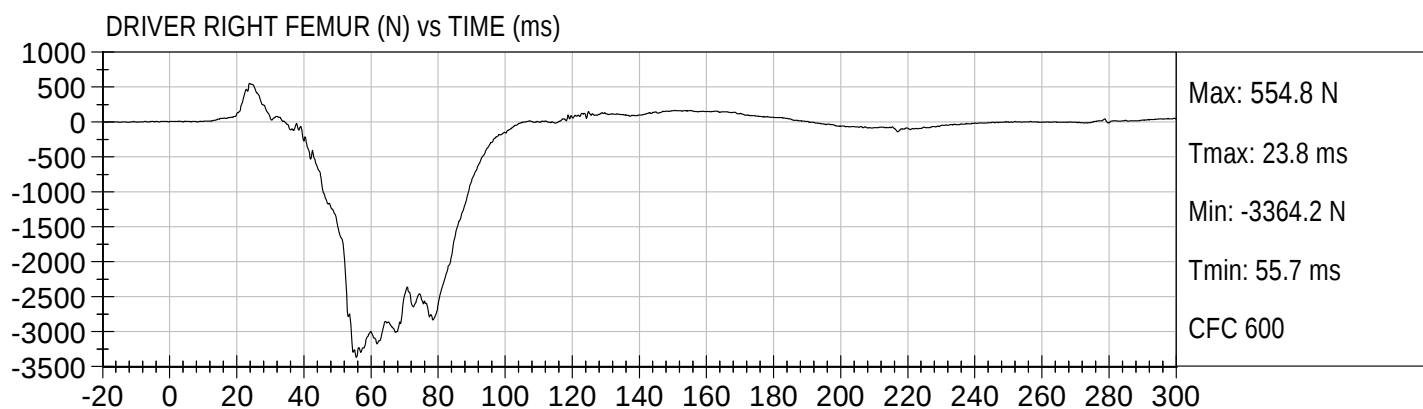
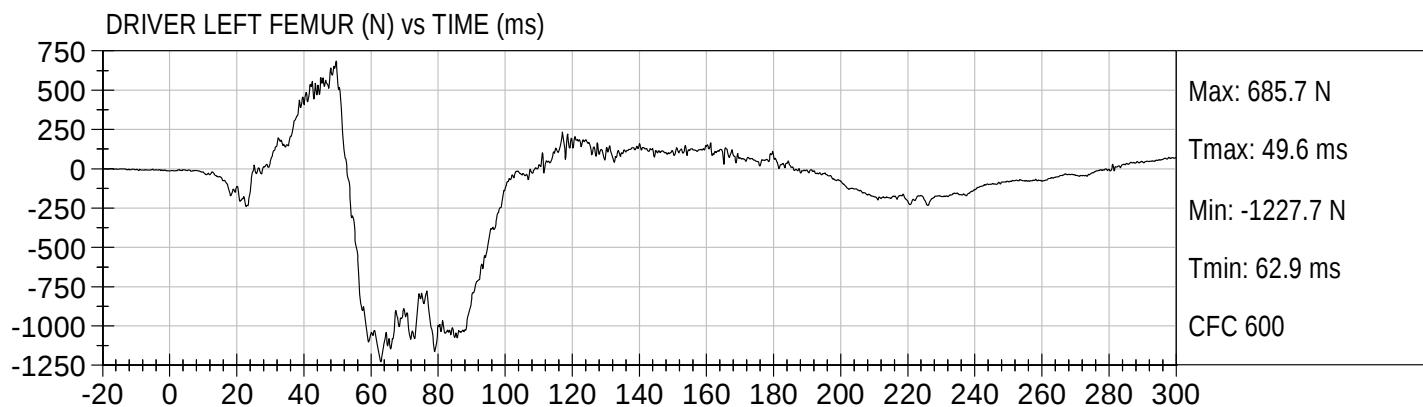


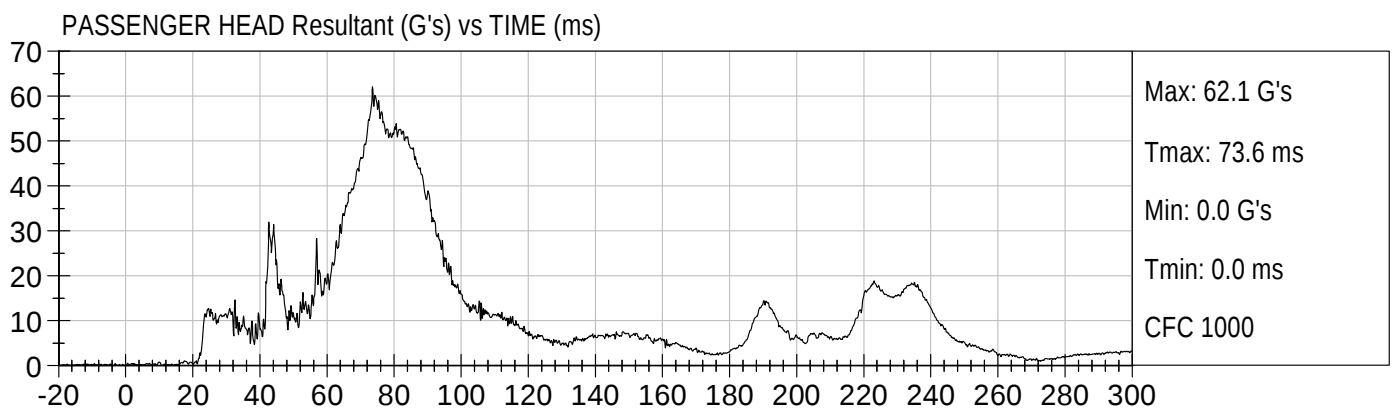
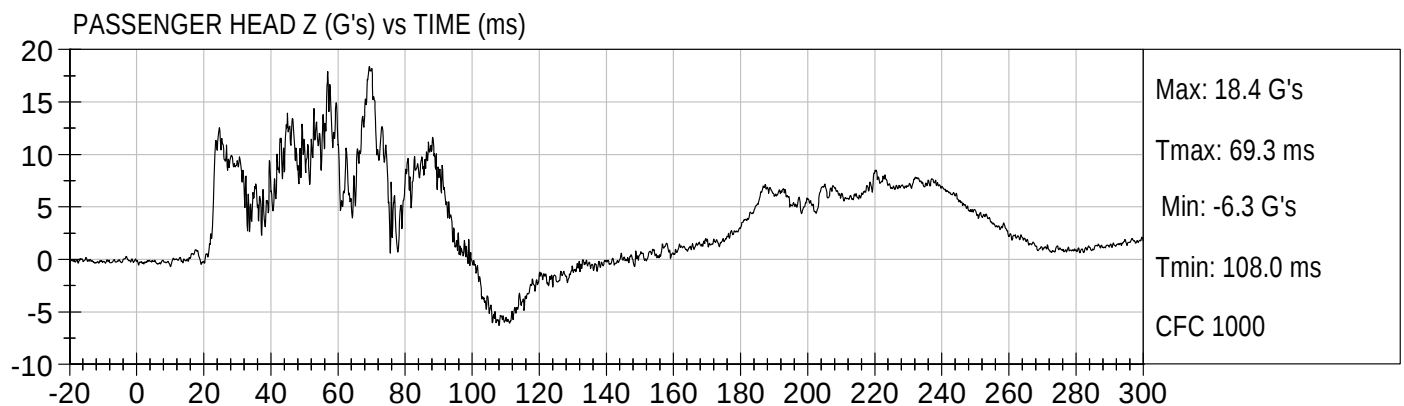
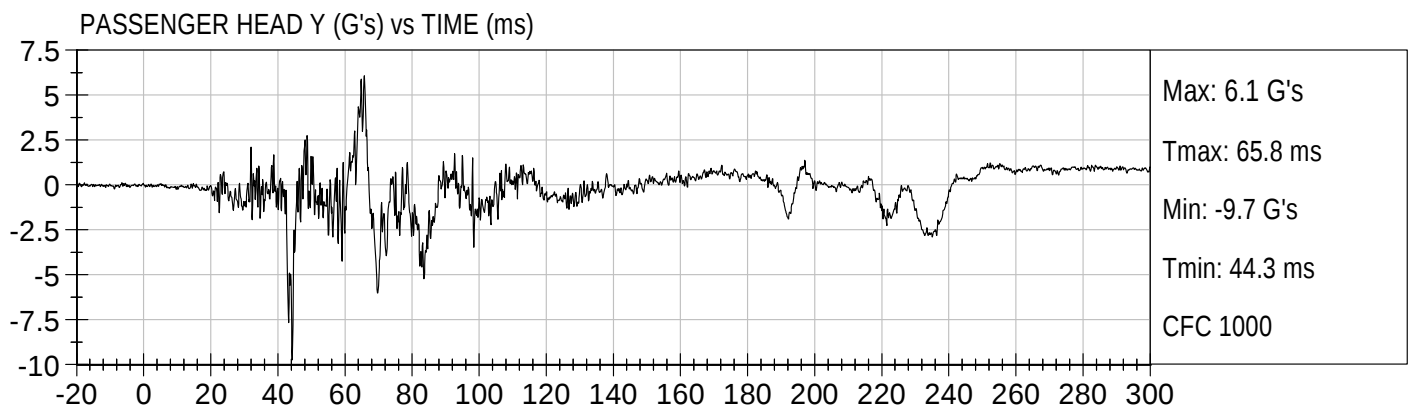
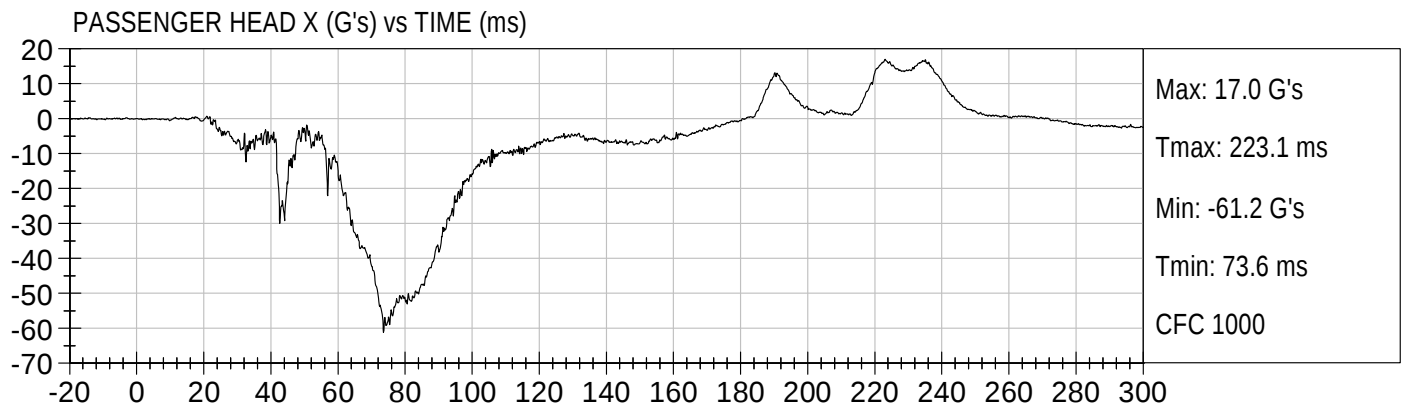


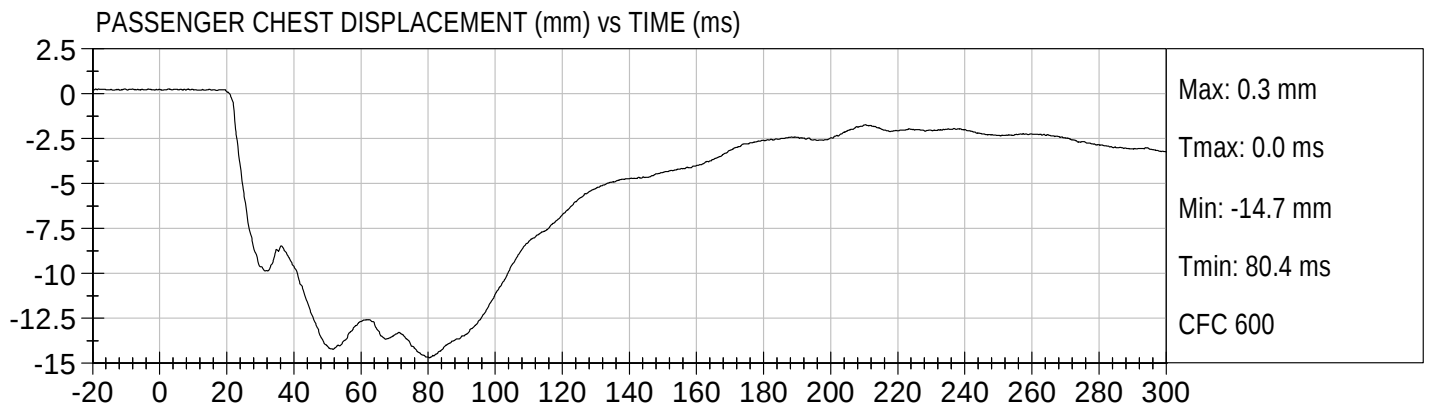






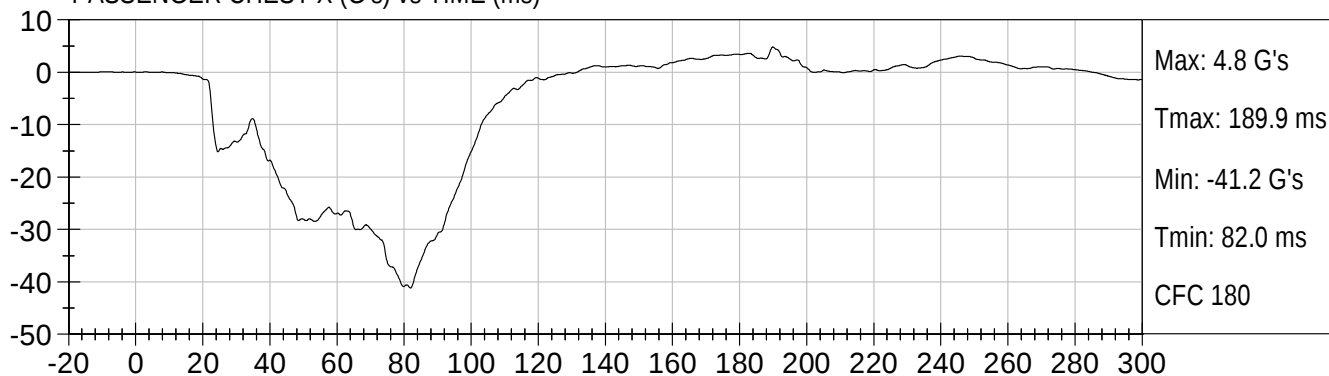




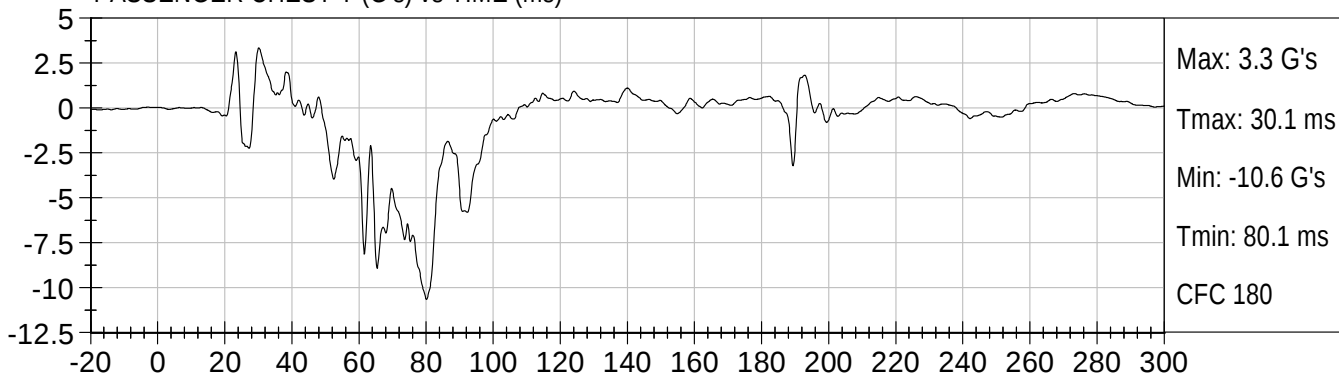




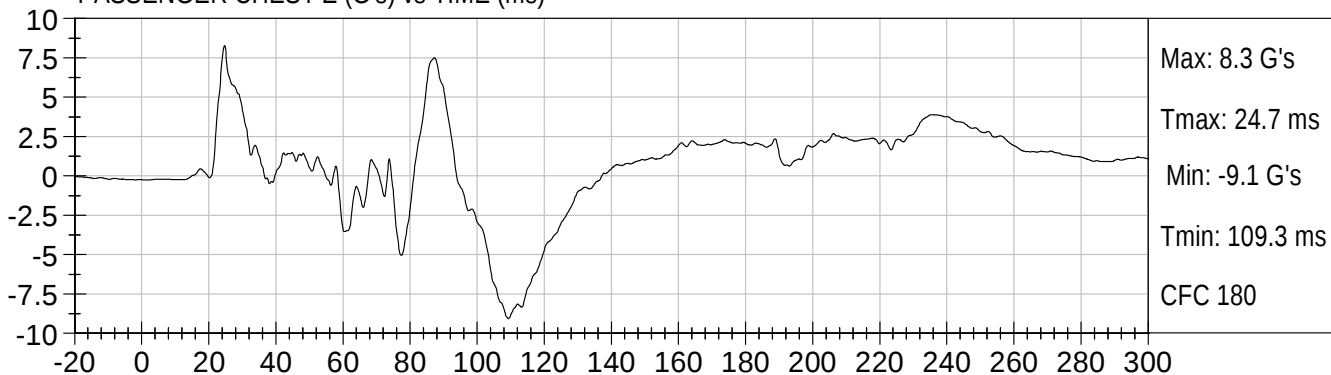
PASSENGER CHEST X (G's) vs TIME (ms)



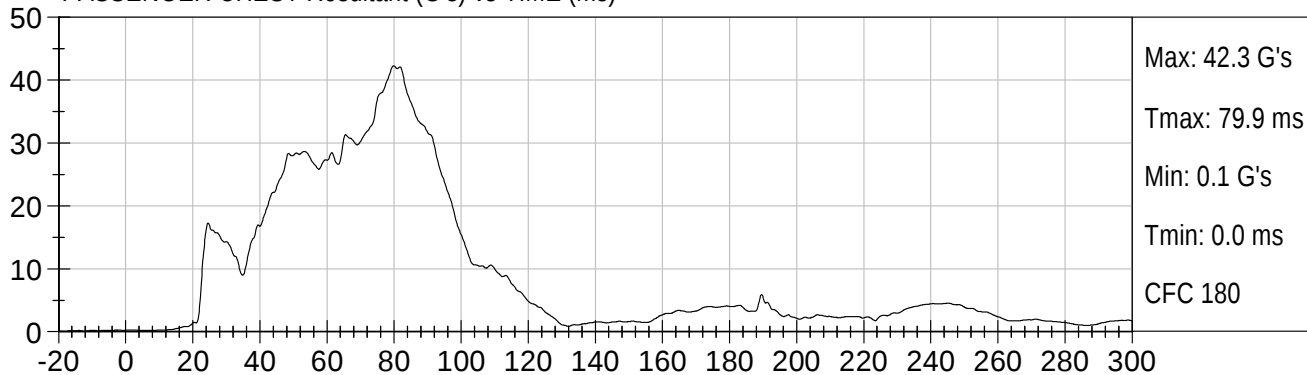
PASSENGER CHEST Y (G's) vs TIME (ms)

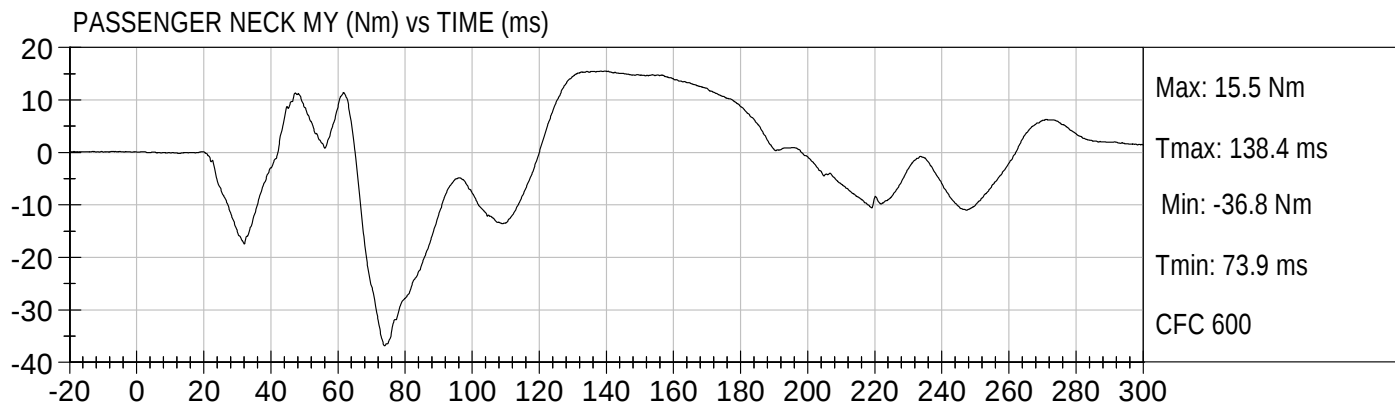
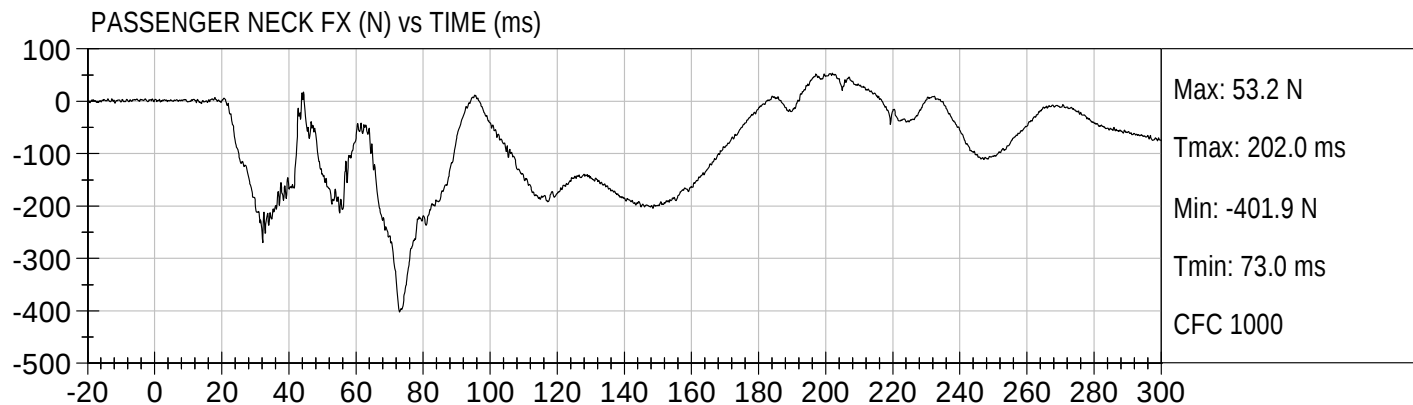


PASSENGER CHEST Z (G's) vs TIME (ms)



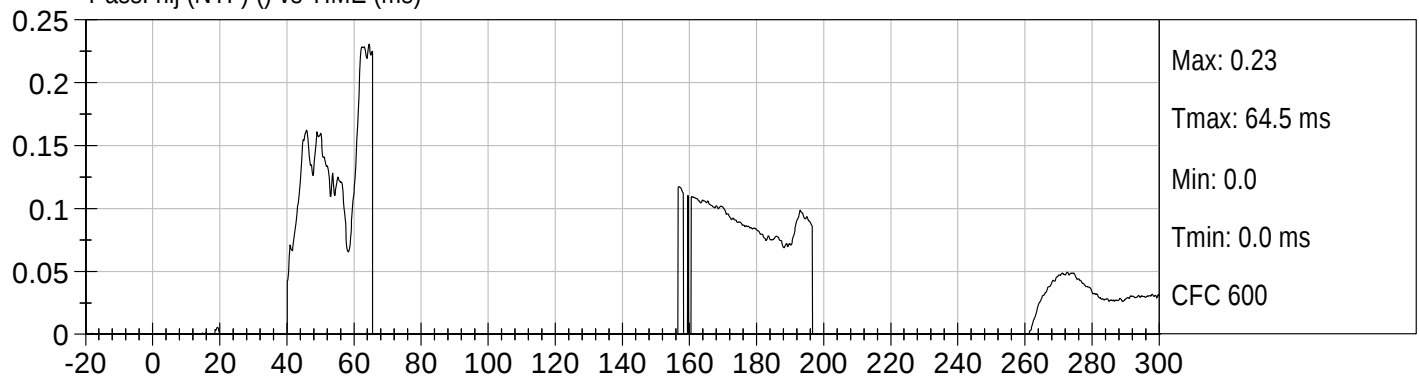
PASSENGER CHEST Resultant (G's) vs TIME (ms)



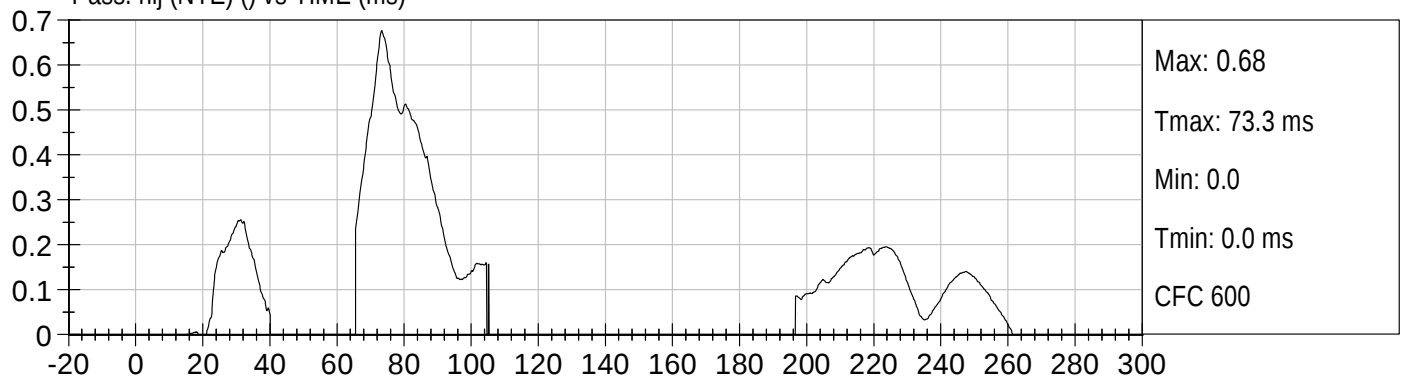




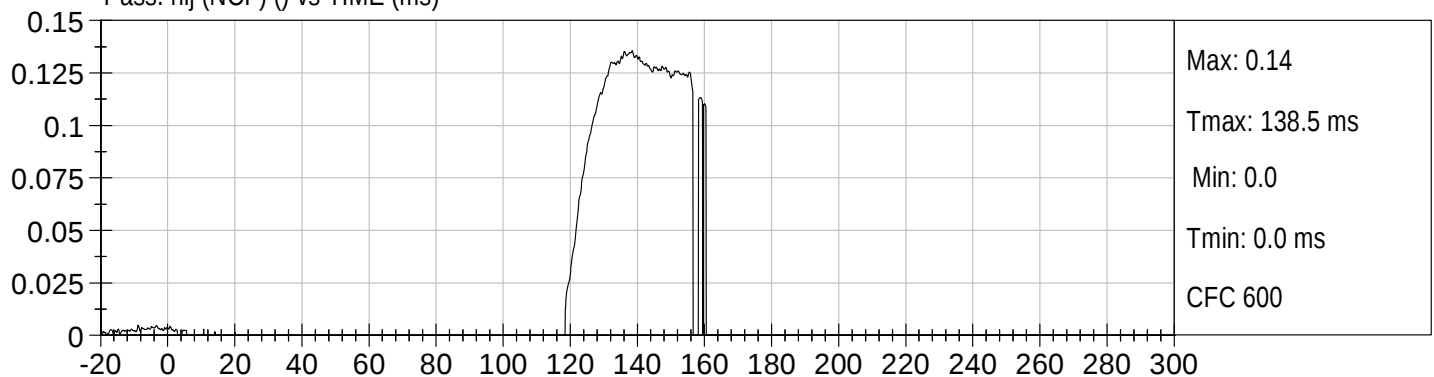
Pass. nij (NTF) () vs TIME (ms)



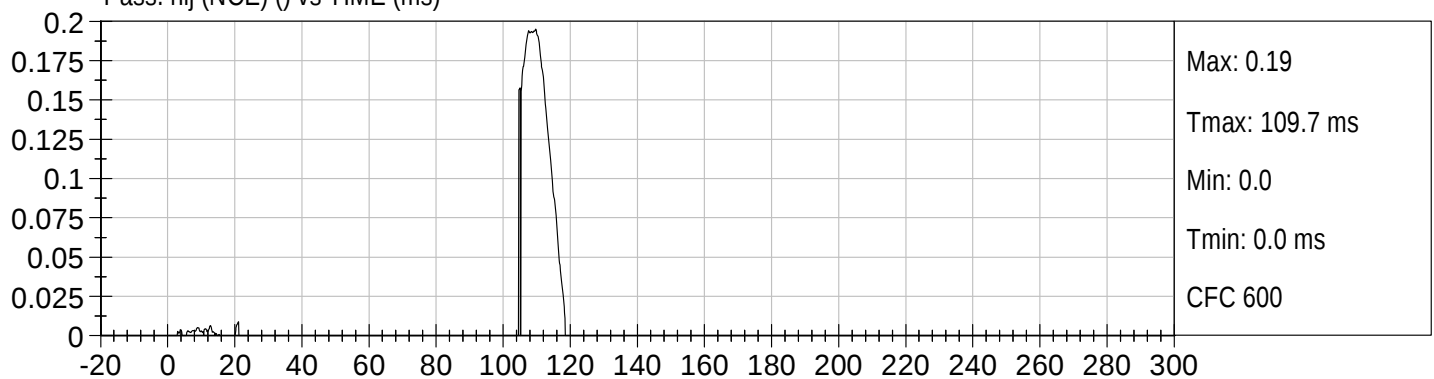
Pass. nij (NTE) () vs TIME (ms)

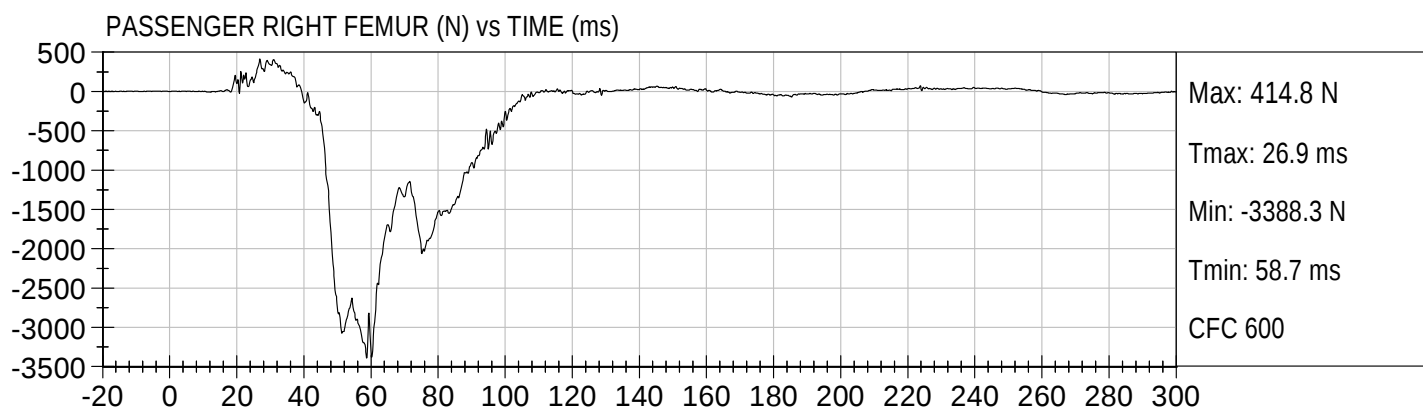
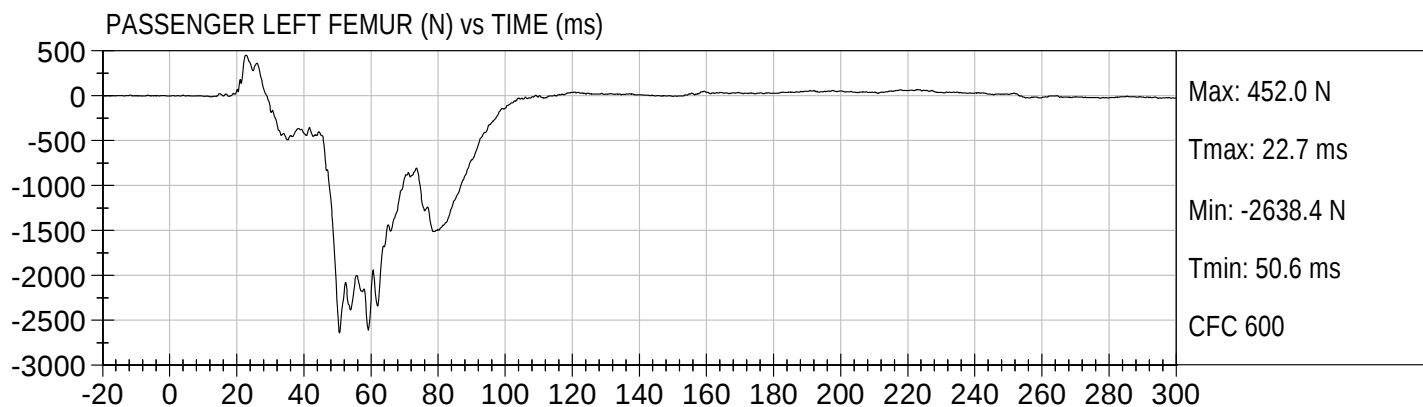


Pass. nij (NCF) () vs TIME (ms)



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





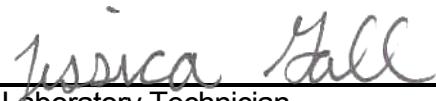
APPENDIX C
DUMMY CALIBRATION DATA

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

ATD Serial No: 351

Test ID: D103931

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Peak Resultant Acceleration	G's	225 - 275	266	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-11.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

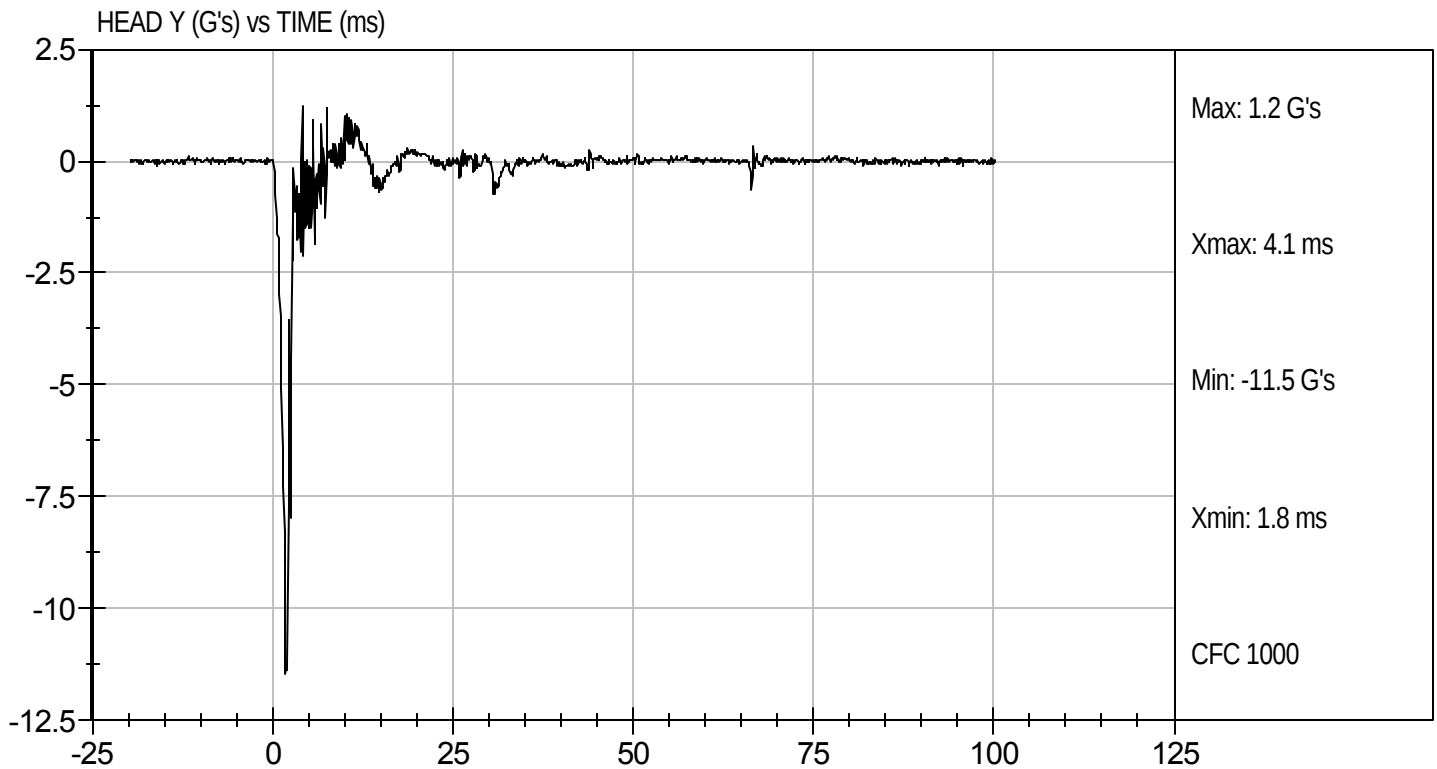
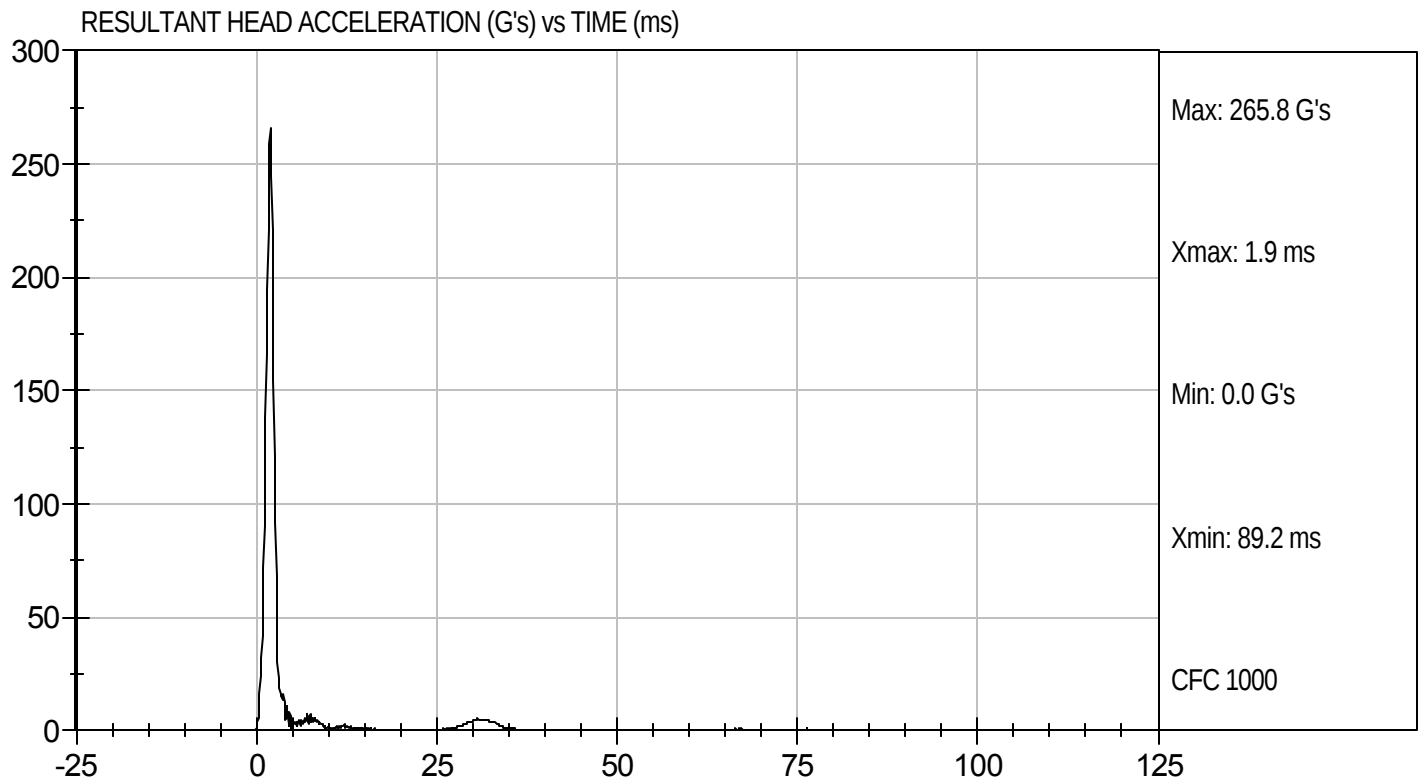
11/11/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D103931

Test Date: 11/11/10
Velocity: 0 ft/s, 0.00 m/s

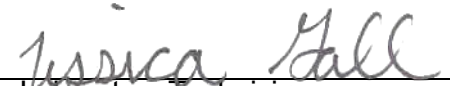


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D.: D103932

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	35	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.98	Pass
	20 ms	G's	17.60 to 22.60	17.79	Pass
	30 ms	G's	12.50 to 18.50	16.52	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	16.5	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	70.0	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	117.5	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	95.3	Pass
	Time	ms	47.0 to 58.0	47.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.5	Pass
Overall Test Results					Pass


 Laboratory Technician

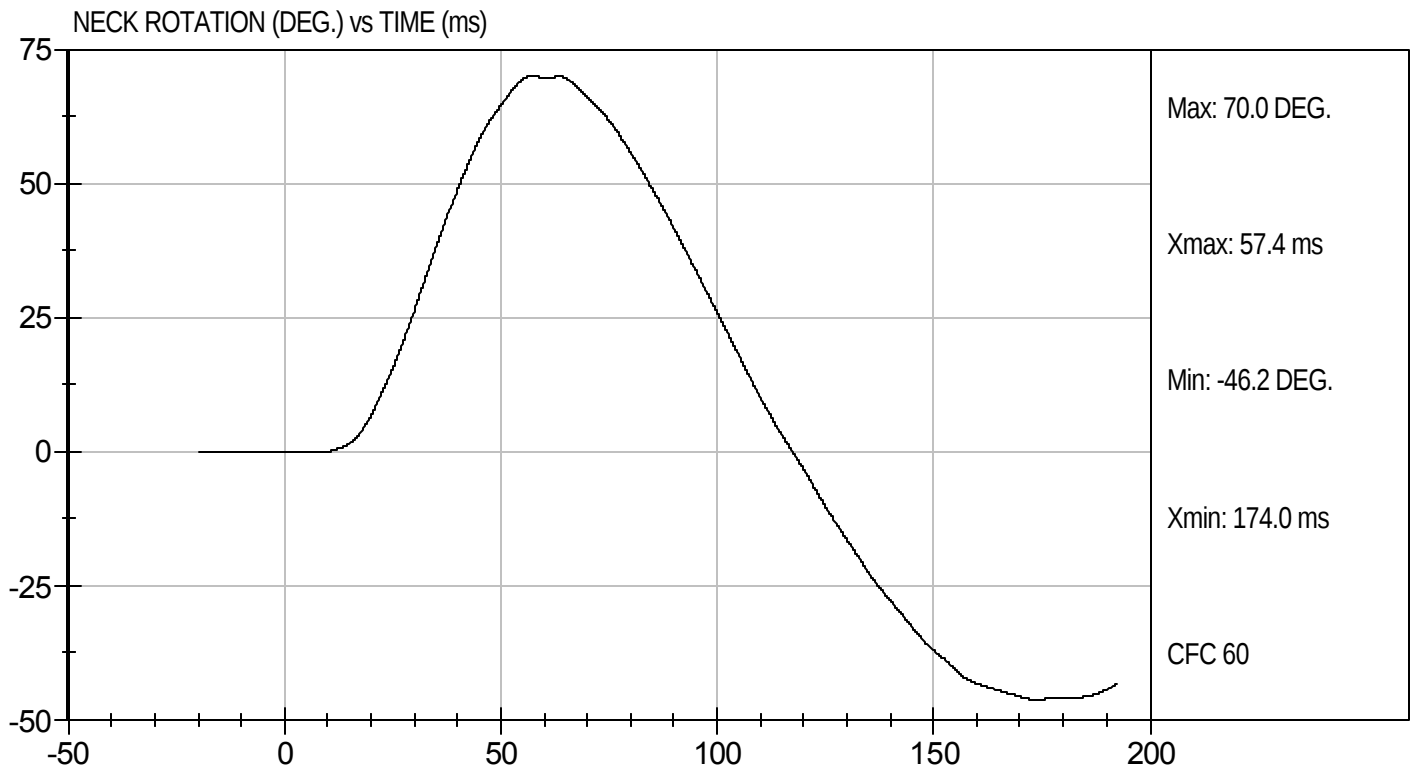
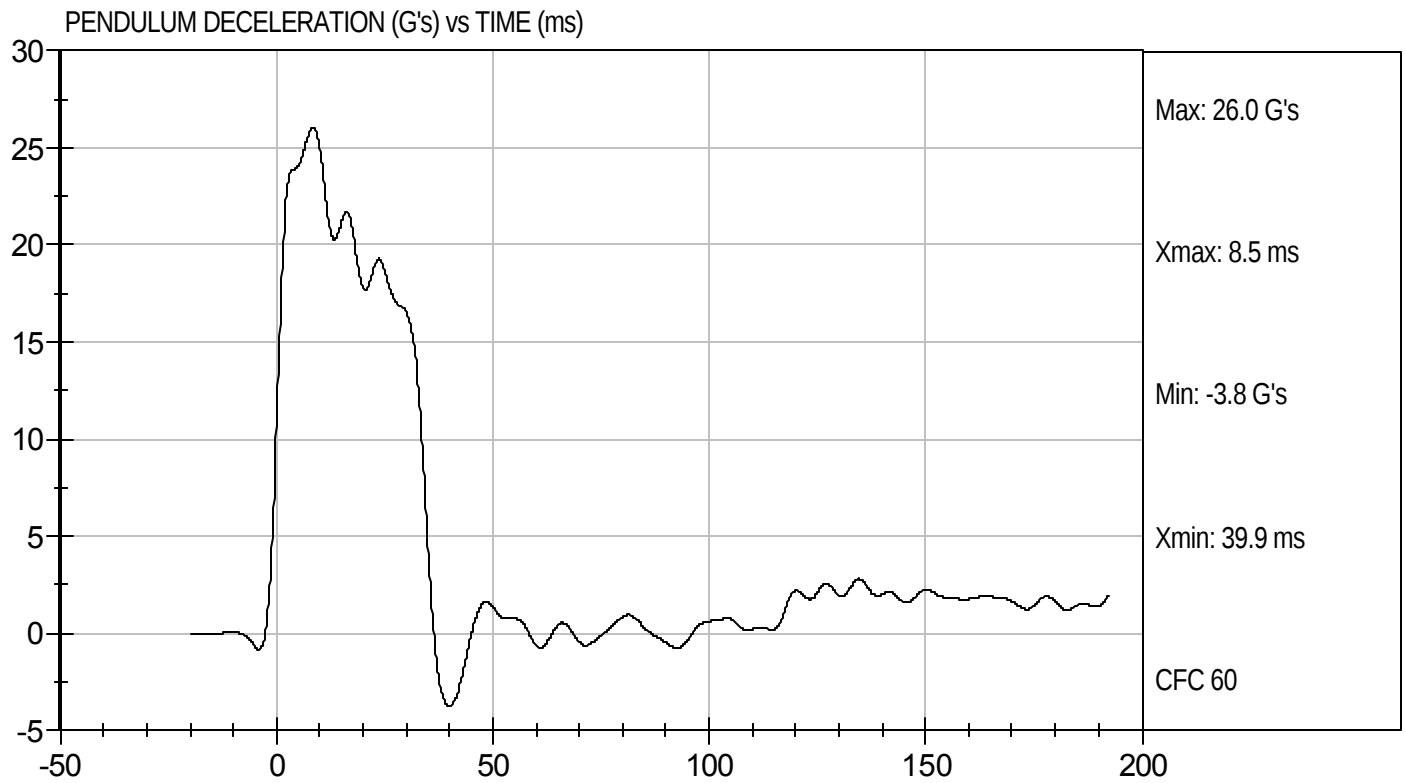
11/12/10
 Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D103932

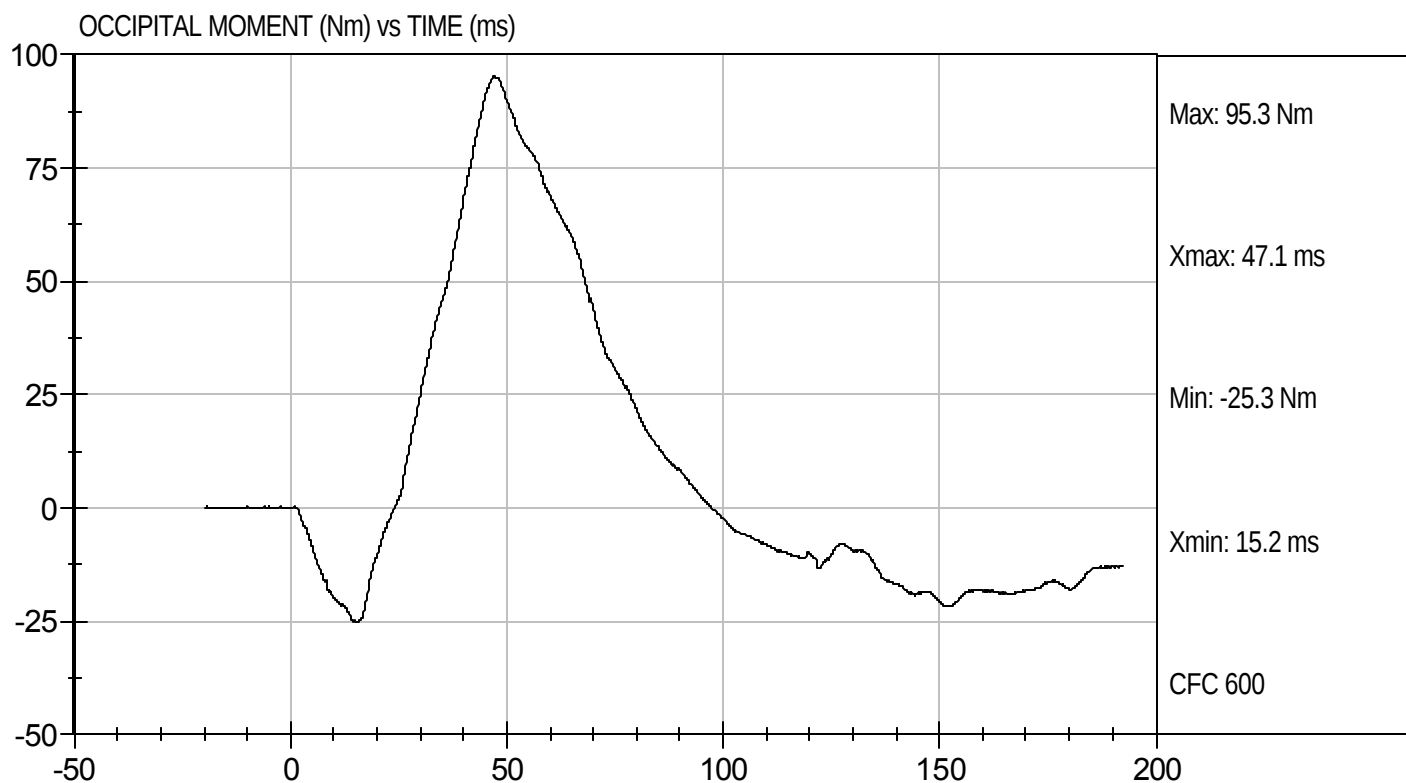
Test Date: 11/12/10
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D103932

Test Date: 11/12/10
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.: D103933

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	35	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.99	Pass
	20 ms	G's	14.00 to 19.00	15.90	Pass
	30 ms	G's	11.00 to 16.00	12.38	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.4	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.0	Pass
	Time	ms	72.0 to 82.0	76.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	156.5	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-63.6	Pass
	Time	ms	65.0 to 79.0	70.6	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	142.0	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

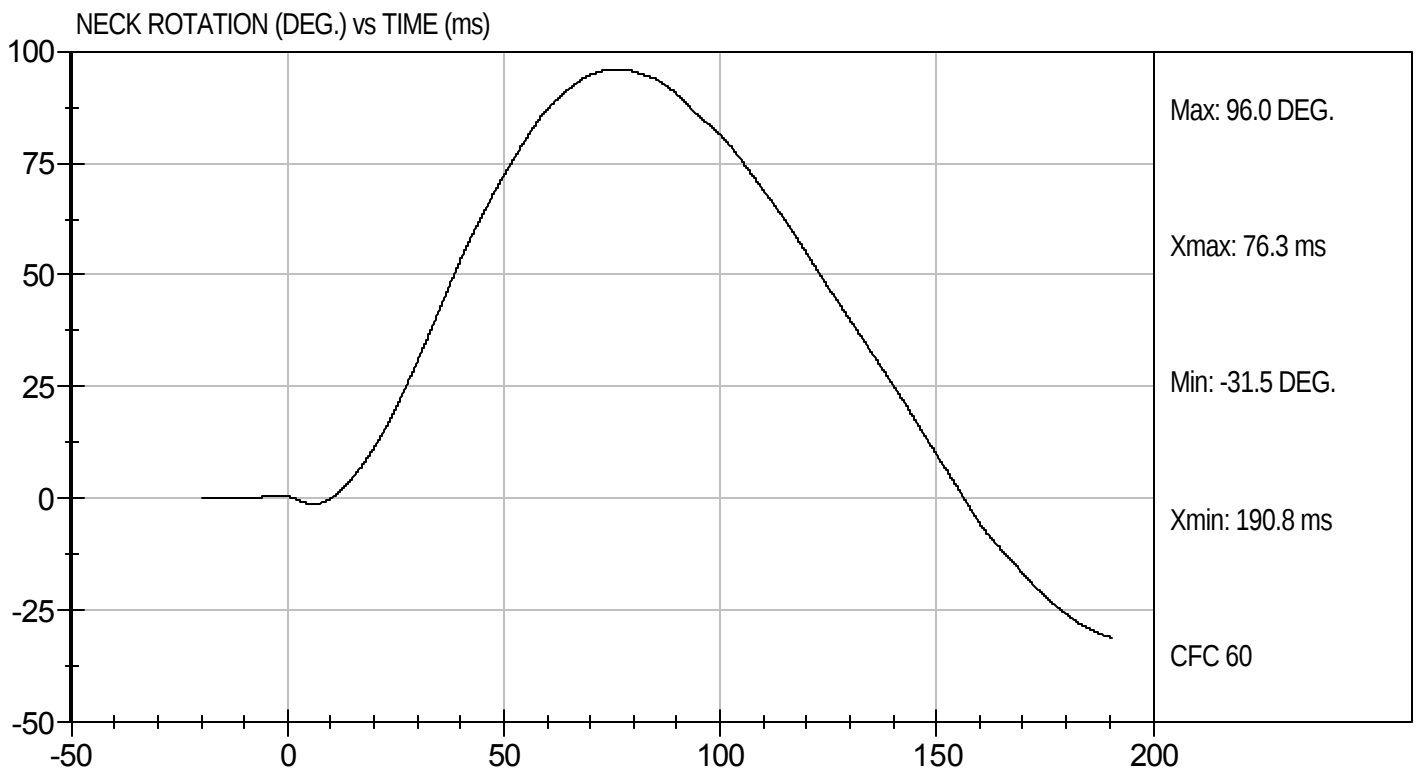
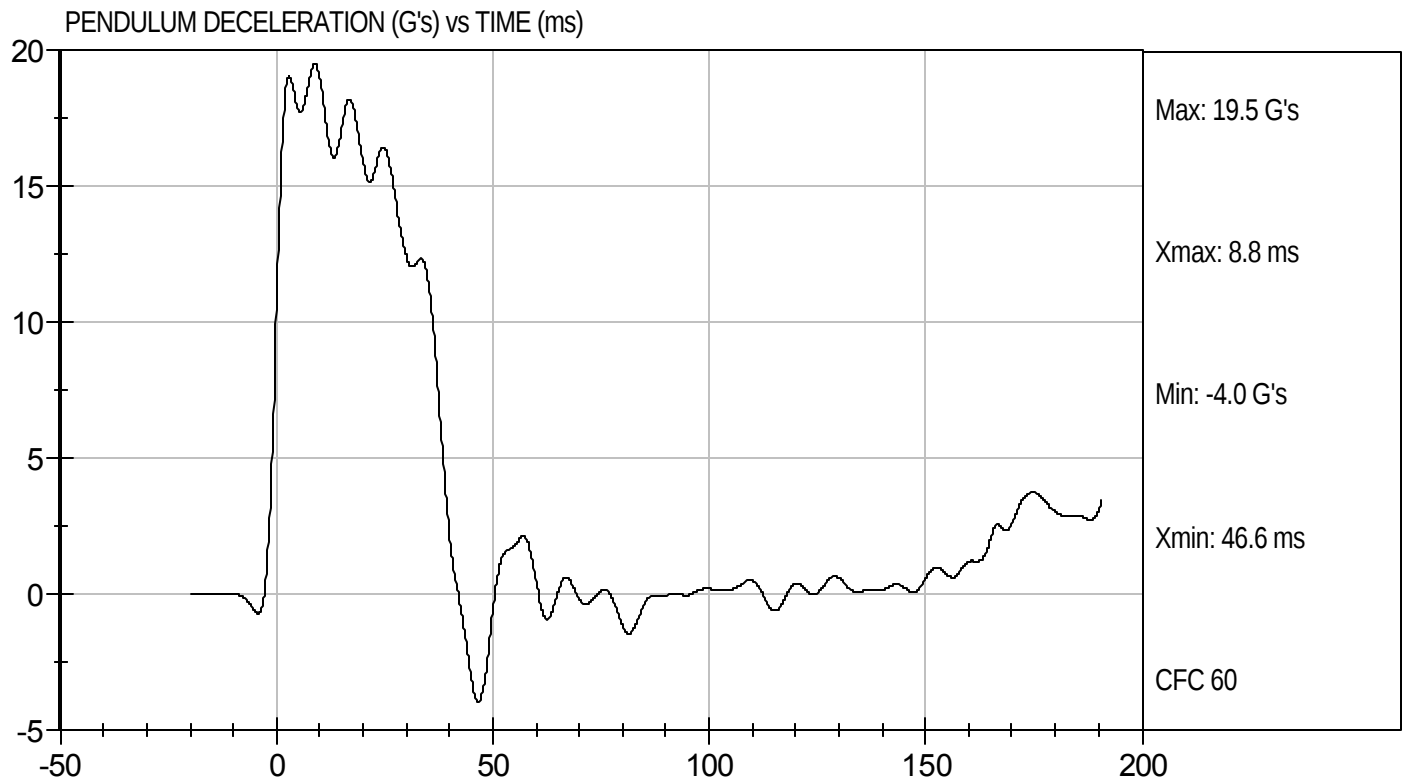
11/12/10
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D103933

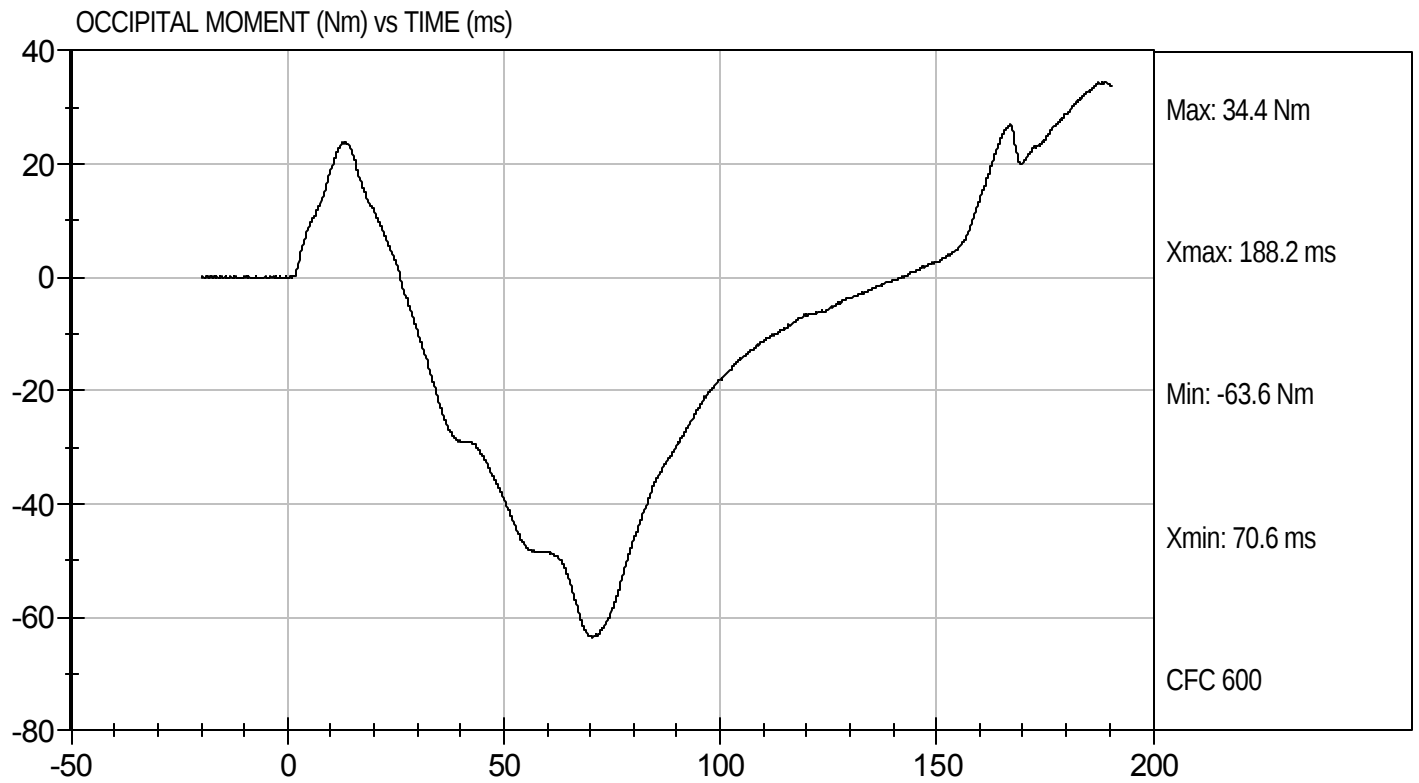
Test Date: 11/12/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D103933

Test Date: 11/12/10
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: D103934

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	42	Pass
Probe Velocity	m/s	6.58 to 6.82	6.69	Pass
Peak Probe Force	N	5159 to 5893	5,379	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.41	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Overall Test Results			Pass	


Laboratory Technician

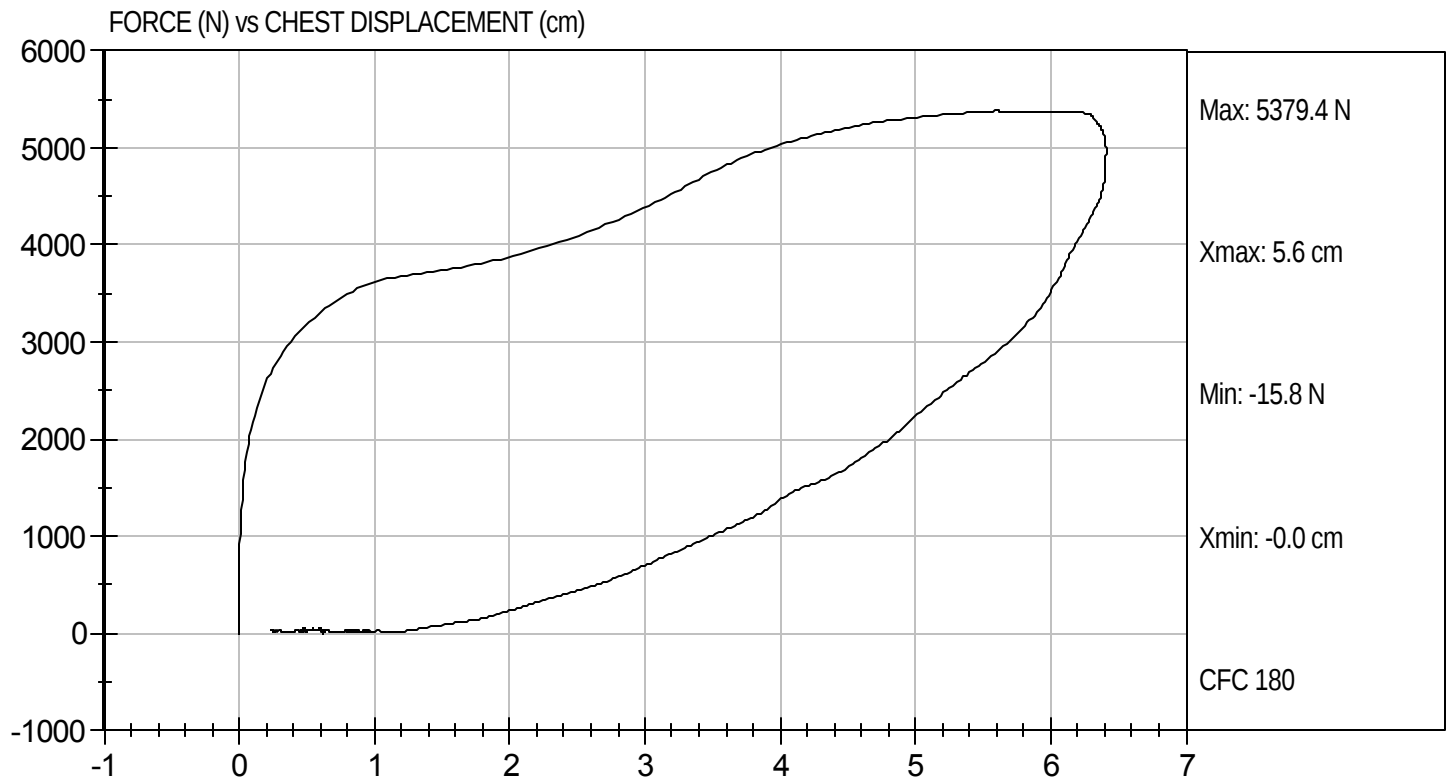
11/11/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D103934

Test Date: 11/11/10
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: D103935

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	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	Newtons	4715 to 5782	5,686	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

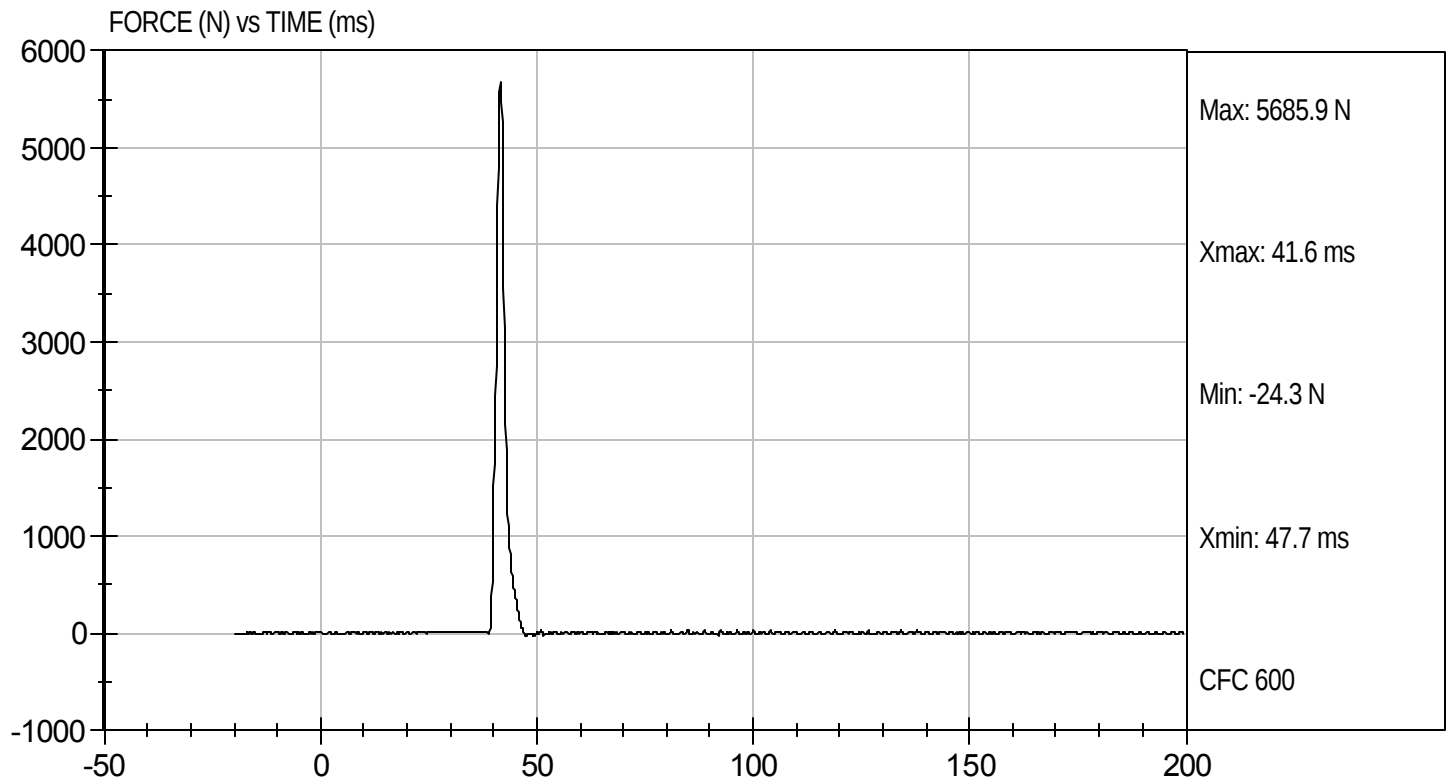
11/12/10
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D103935

Test Date: 11/12/10
Velocity: 6.80 ft/s, 2.07 m/s

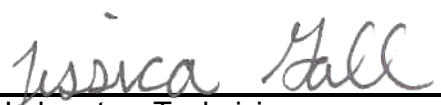


MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D103936

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	39	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,326	Pass
Overall Test Results				Pass


Laboratory Technician

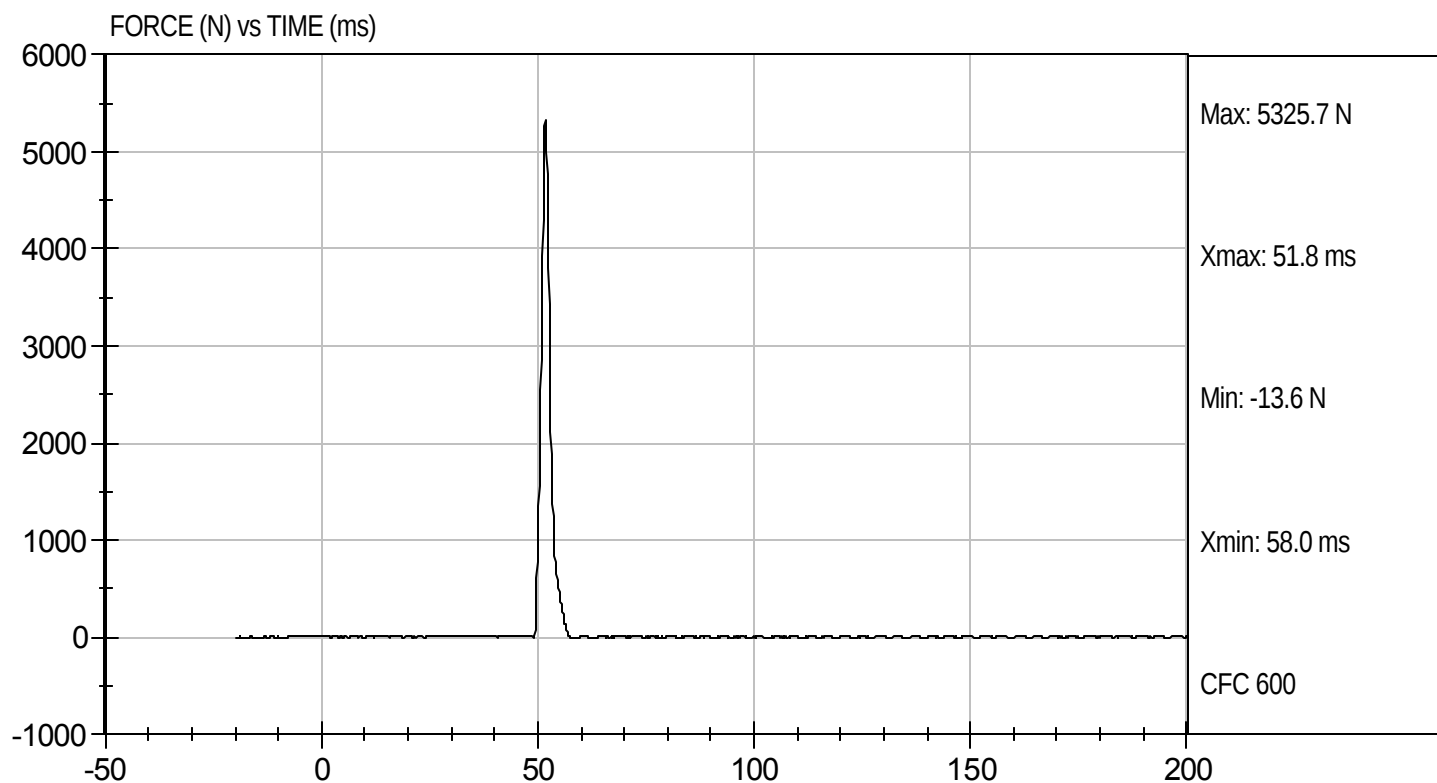
11/12/10
Test Date


Approved By



Test Desc: Left Knee
Component ID: D103936

Test Date: 11/12/10
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: D103930

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	34	34	Pass
Rotation Rate	deg/s	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	49.8	45.3	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	47	48	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

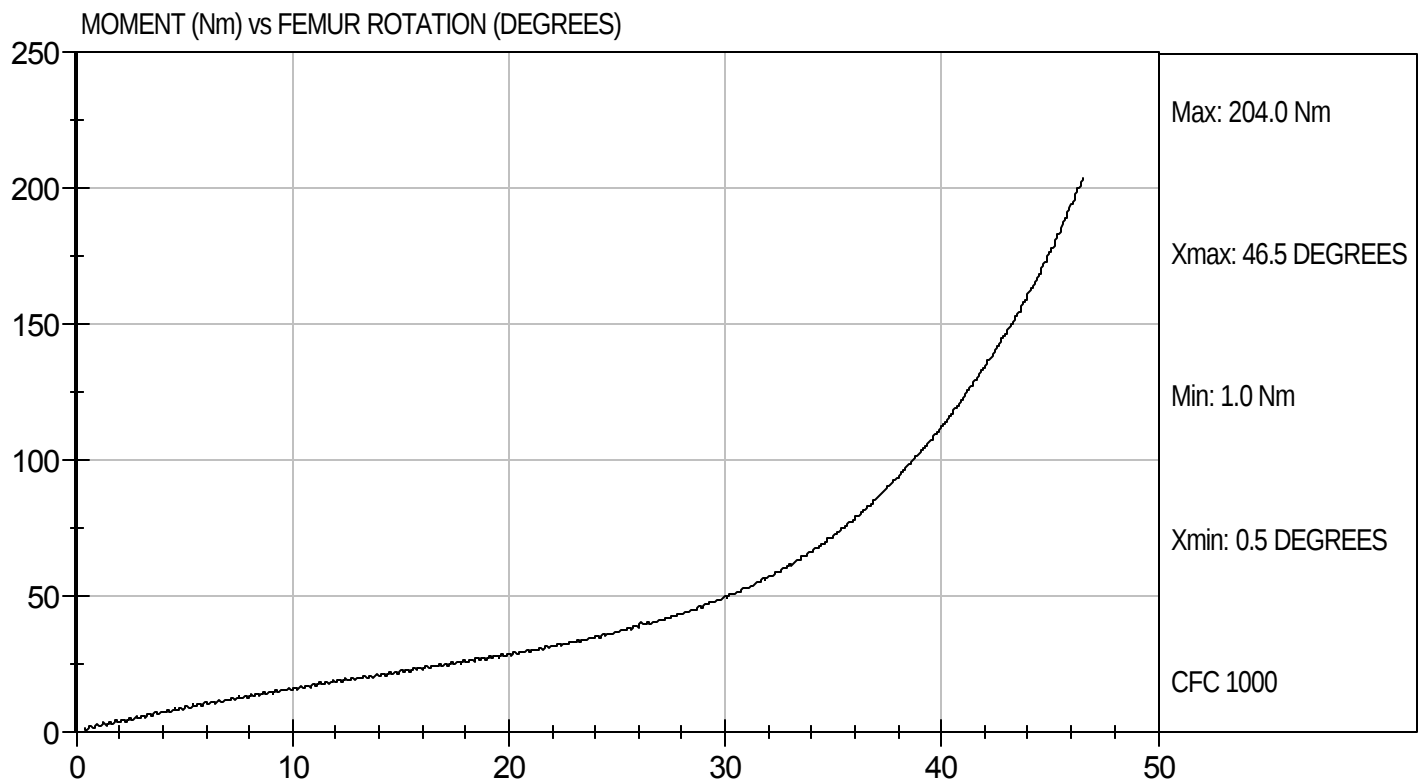
11/12/10
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D103939

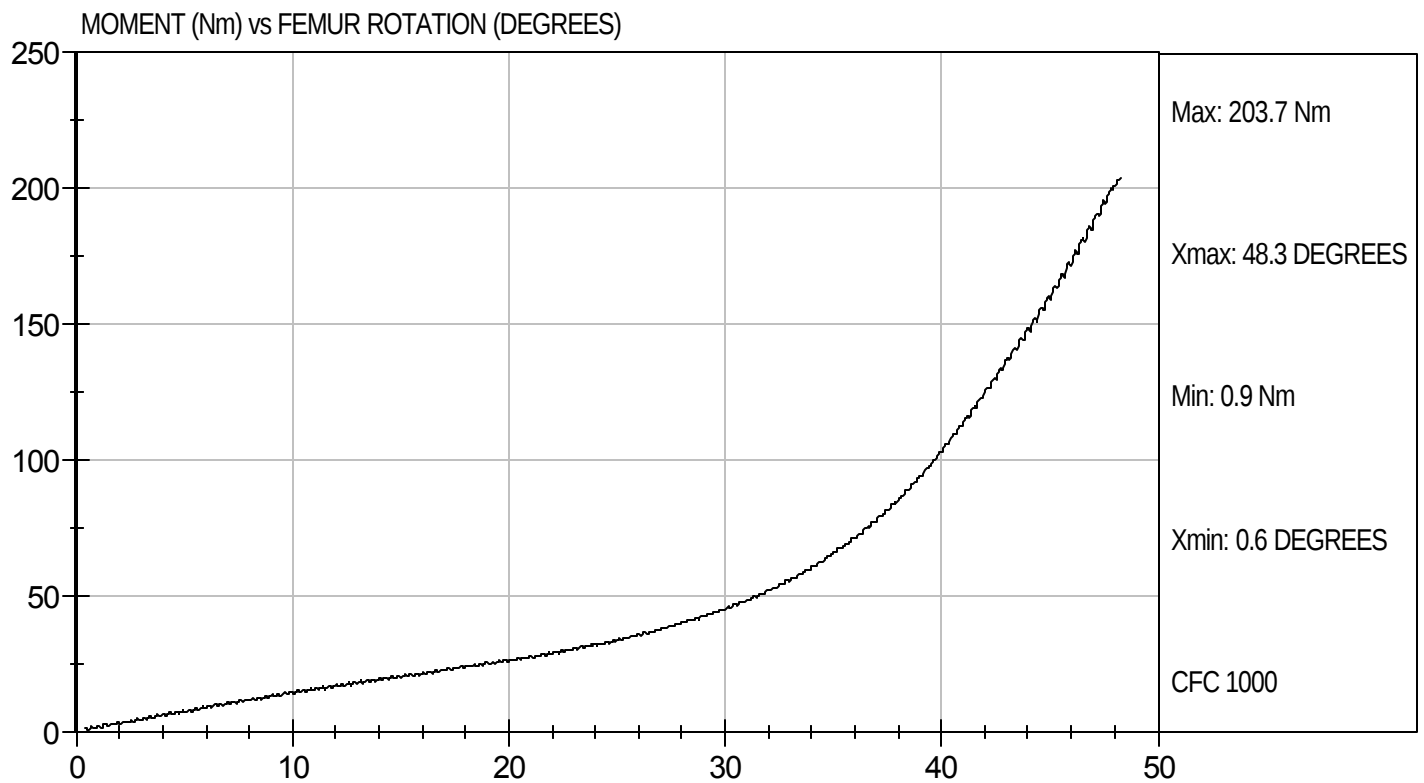
Test Date: 11/12/10
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D103930

Test Date: 11/12/10
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: D103971

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Peak Resultant Acceleration	G's	225 - 275	255	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-5.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

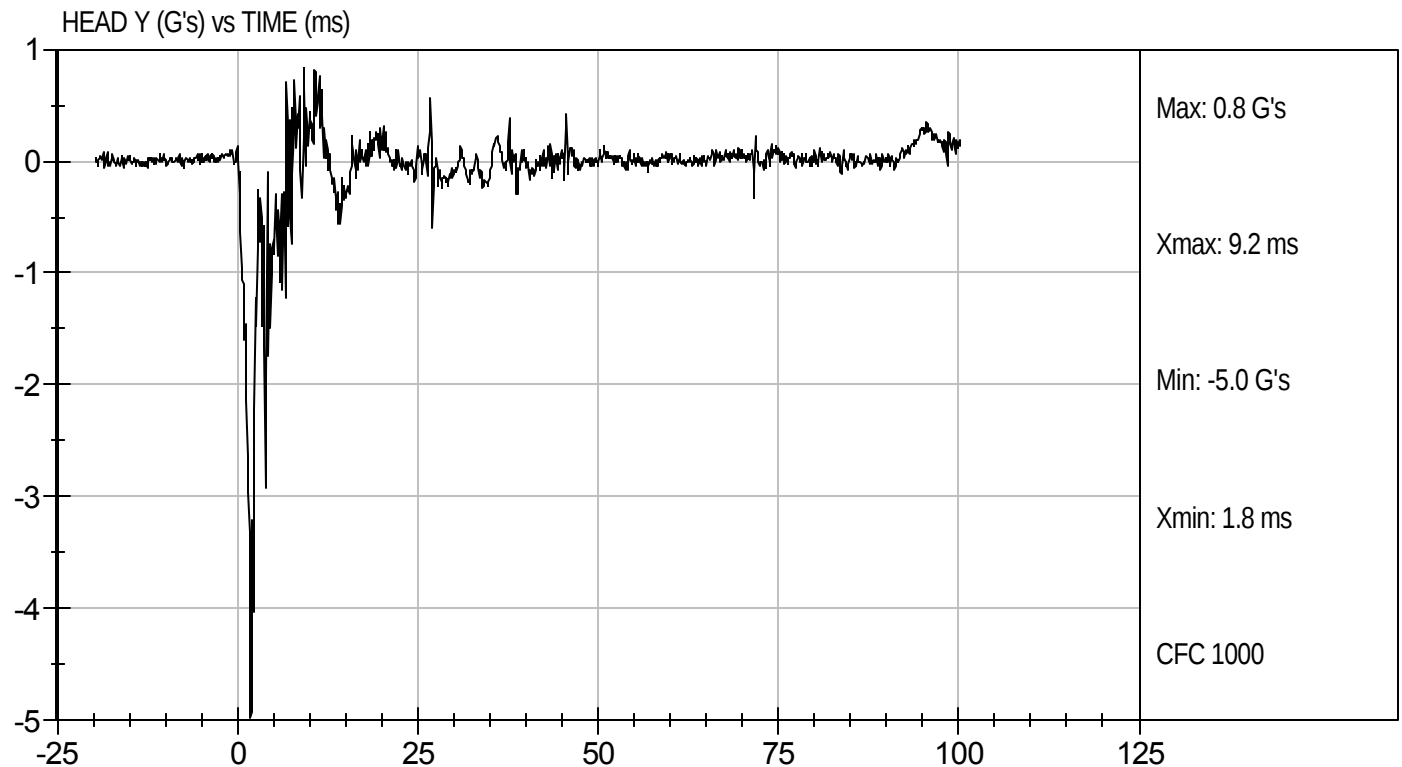
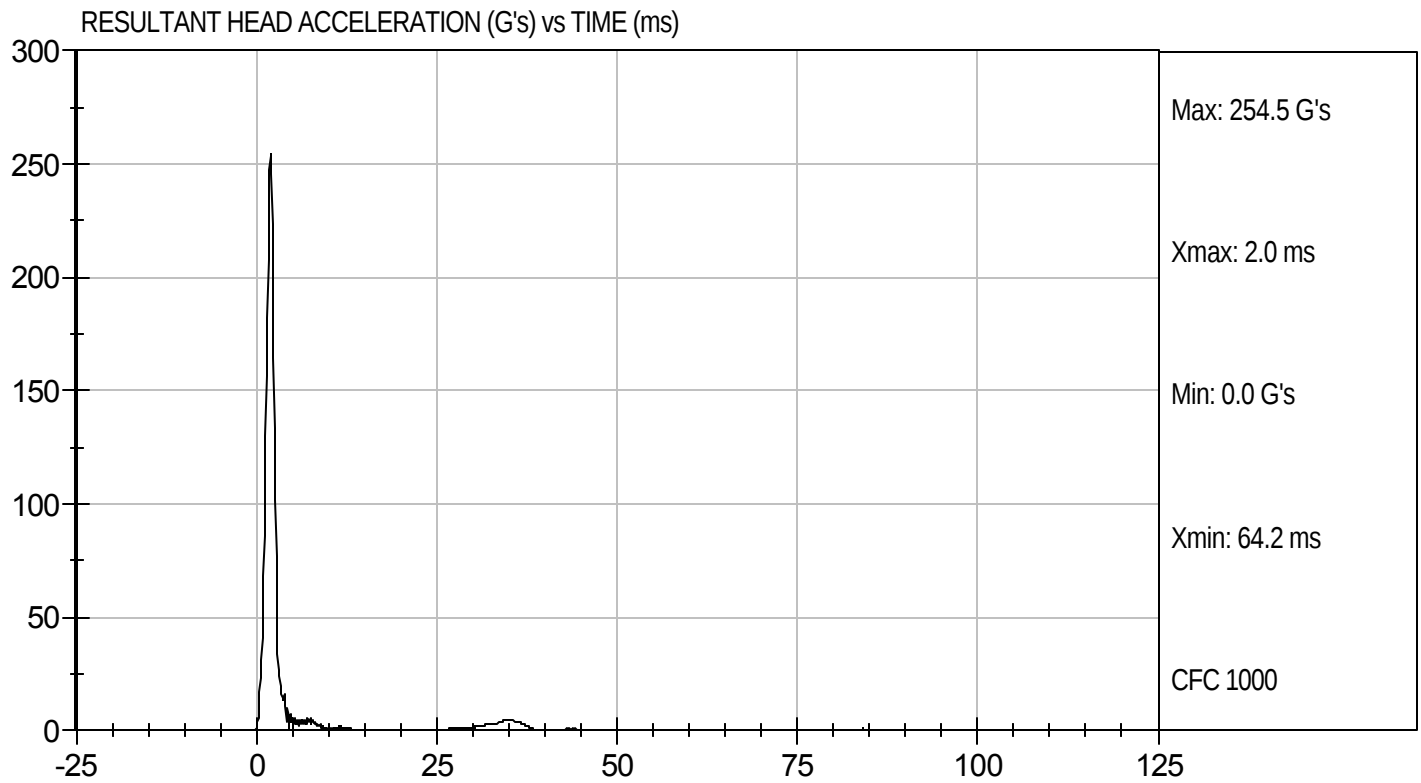
11/16/10
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D103971

Test Date: 11/16/10
Velocity: 0 ft/s, 0.00 m/s

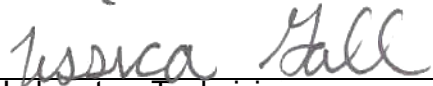


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D103972

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	34	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.44	Pass
	20 ms	G's	17.60 to 22.60	18.43	Pass
	30 ms	G's	12.50 to 18.50	14.58	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.49	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	69.8	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	114.0	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	92.0	Pass
	Time	ms	47.0 to 58.0	47.4	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	100.7	Pass
Overall Test Results					Pass


 Laboratory Technician

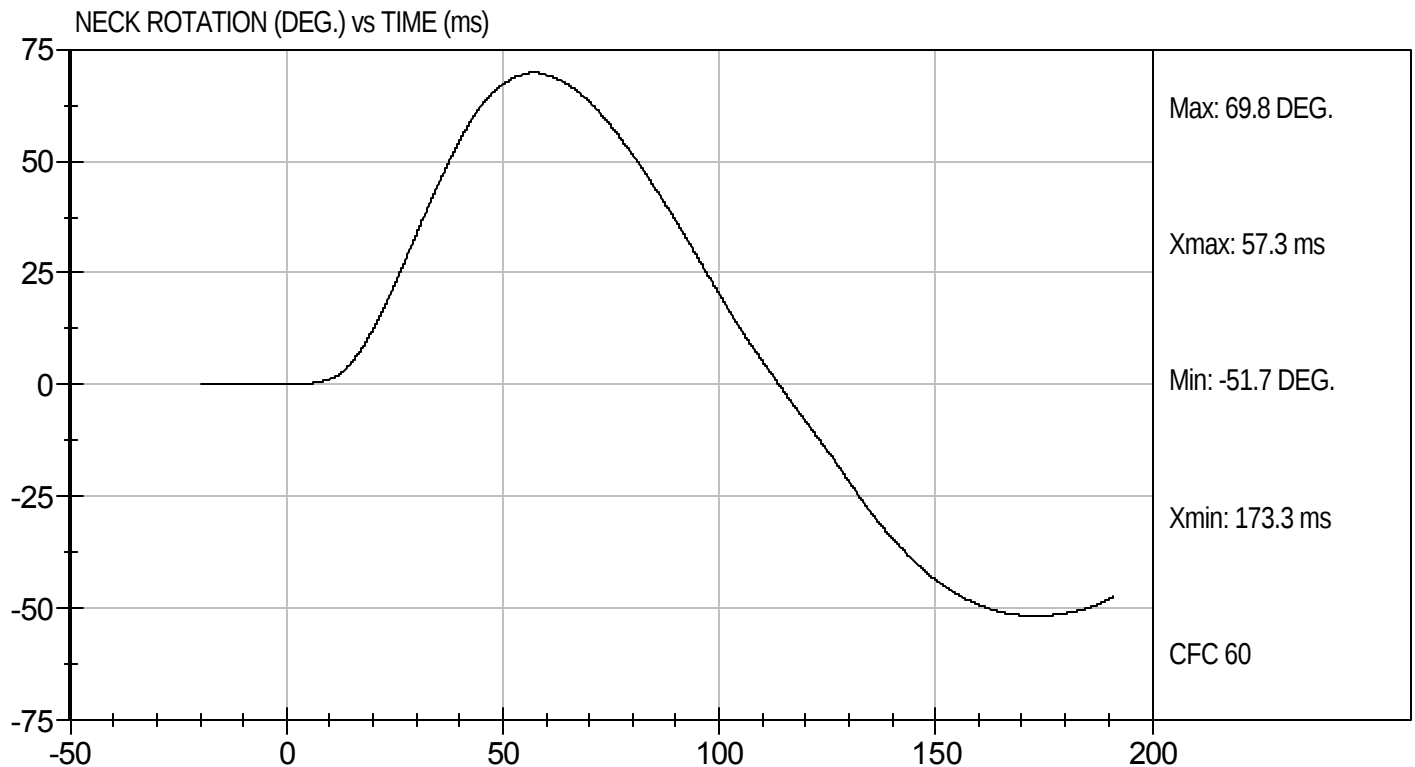
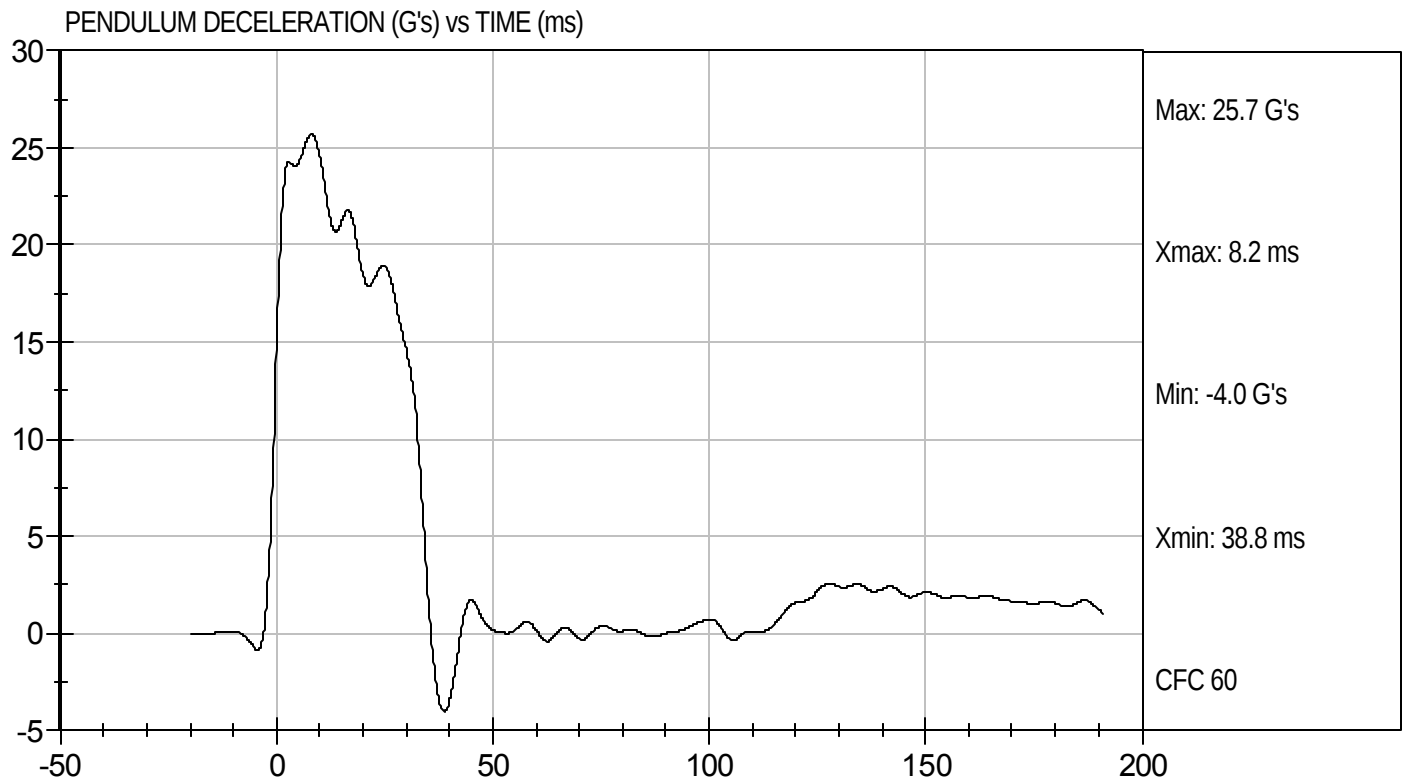
11/15/10
 Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D103972

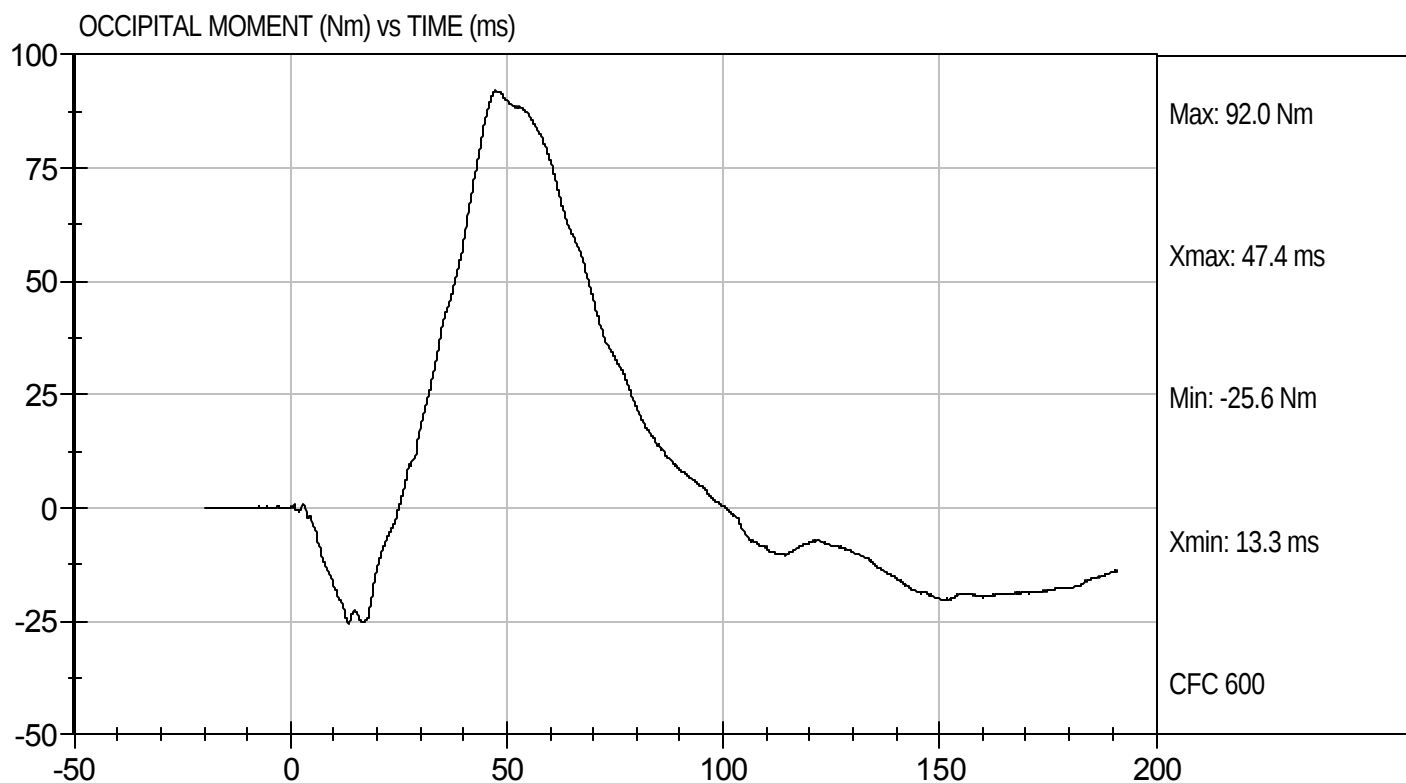
Test Date: 11/15/10
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D103972

Test Date: 11/15/10
Velocity: 23.15 ft/s, 7.06 m/s

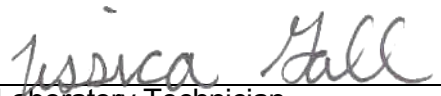


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D.: D103973

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	35	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.76	Pass
	20 ms	G's	14.00 to 19.00	16.06	Pass
	30 ms	G's	11.00 to 16.00	12.21	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	12.2	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	95.8	Pass
	Time	ms	72.0 to 82.0	76.7	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	-61.4	Pass
	Time	ms	65.0 to 79.0	71.0	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	144.5	Pass
Overall Test Results					Pass


 Laboratory Technician

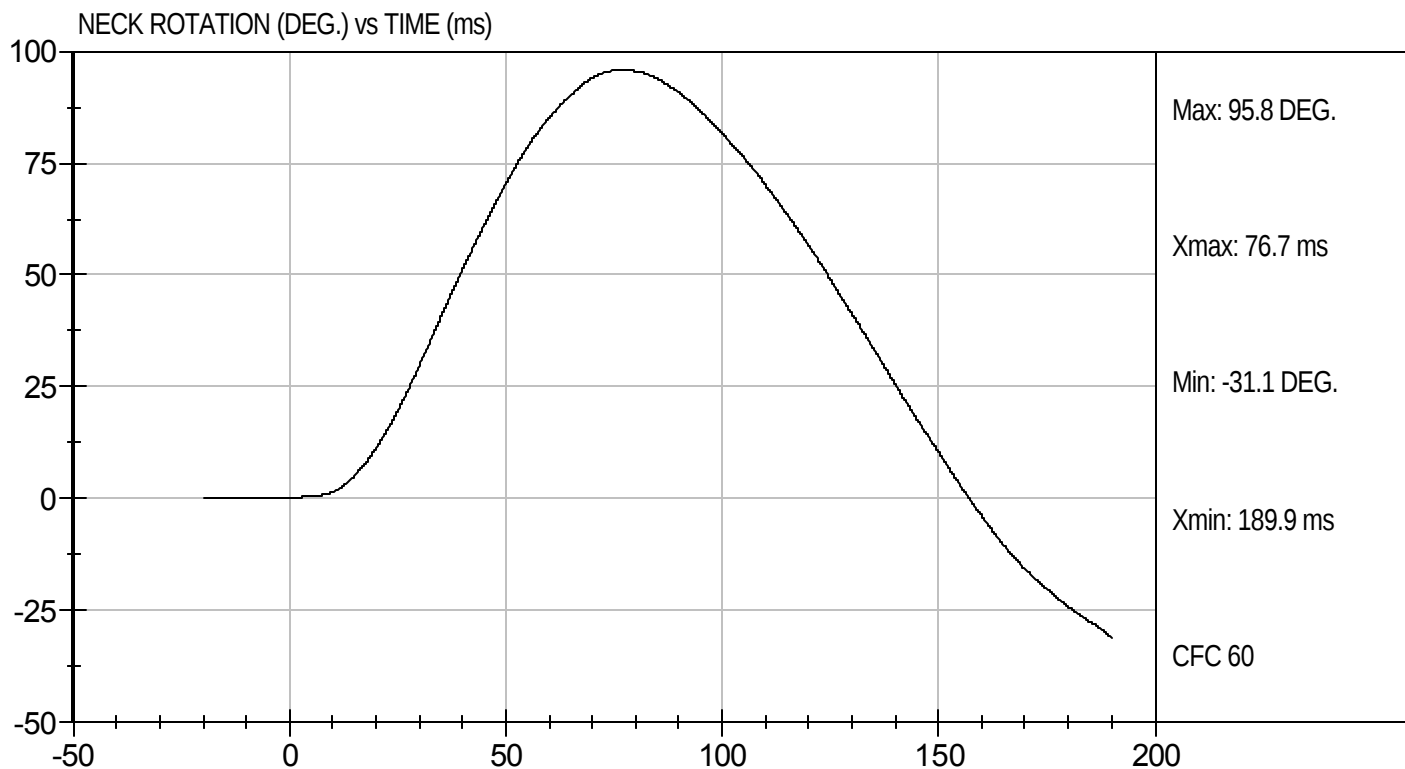
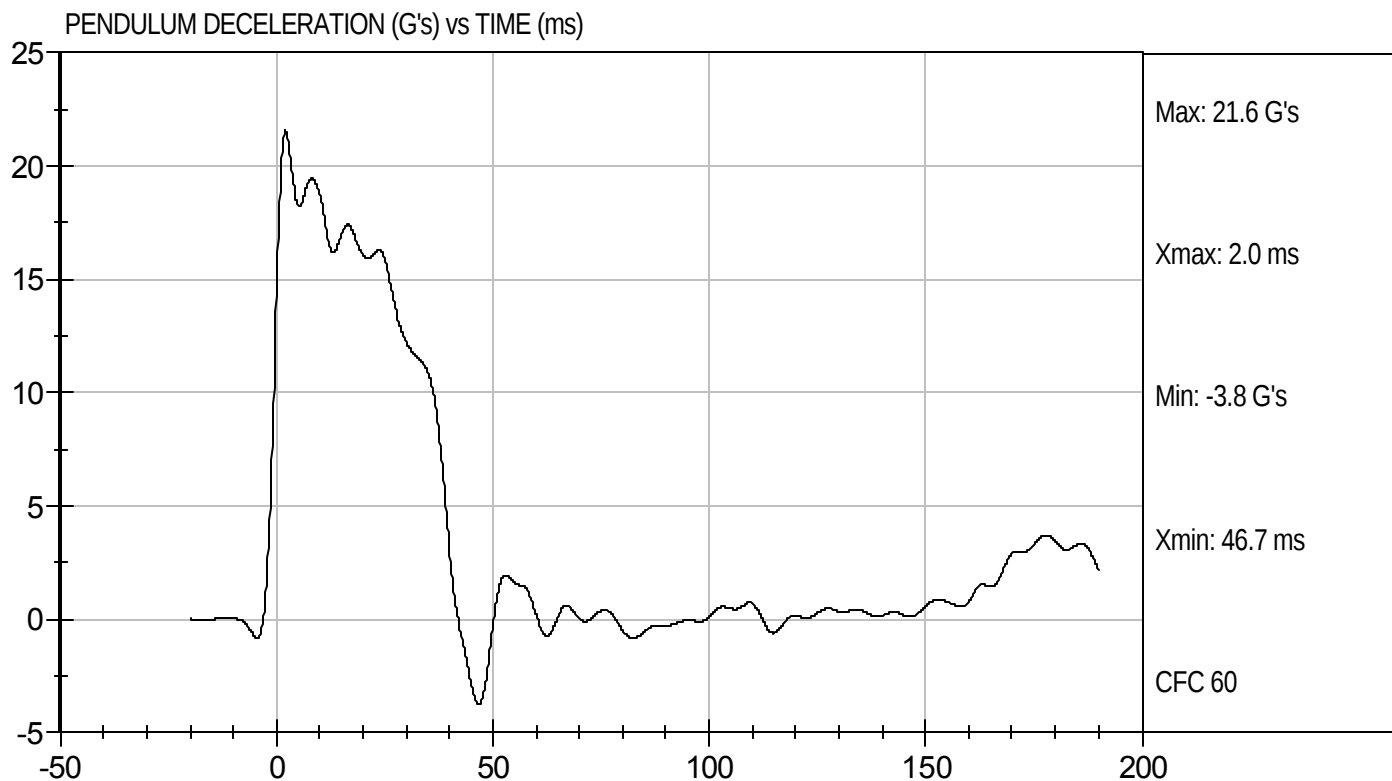
11/15/10
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D103973

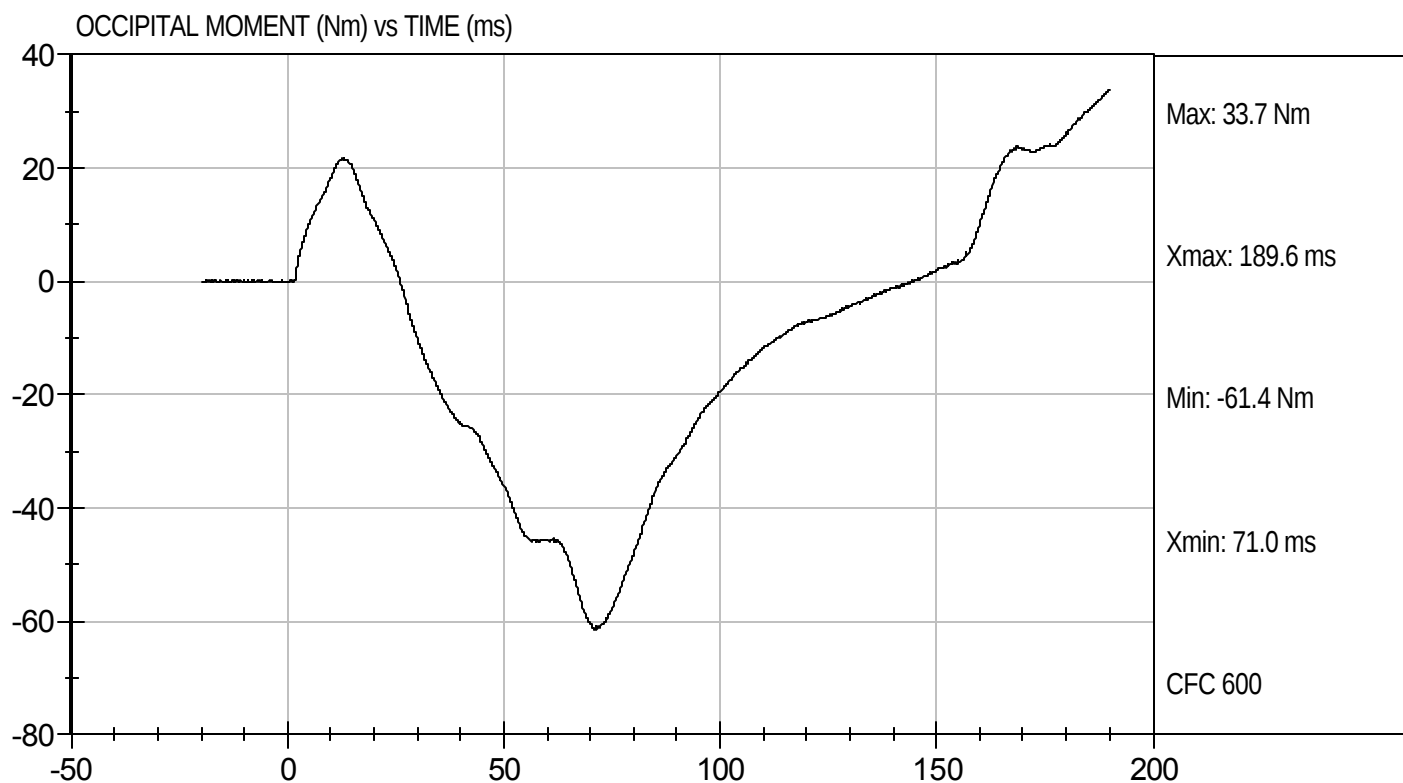
Test Date: 11/15/10
Velocity: 20.10 ft/s, 6.13 m/s





Test Desc: Neck Extension
Component ID: D103973

Test Date: 11/15/10
Velocity: 20.10 ft/s, 6.13 m/s

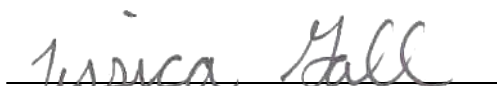


MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351

Test I.D: D103974

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	6.58 to 6.82	6.60	Pass
Peak Probe Force	N	5159 to 5893	5,384	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.45	Pass
Internal Hysteresis	%	69 to 85	71	Pass
			Overall Test Results	Pass


Laboratory Technician

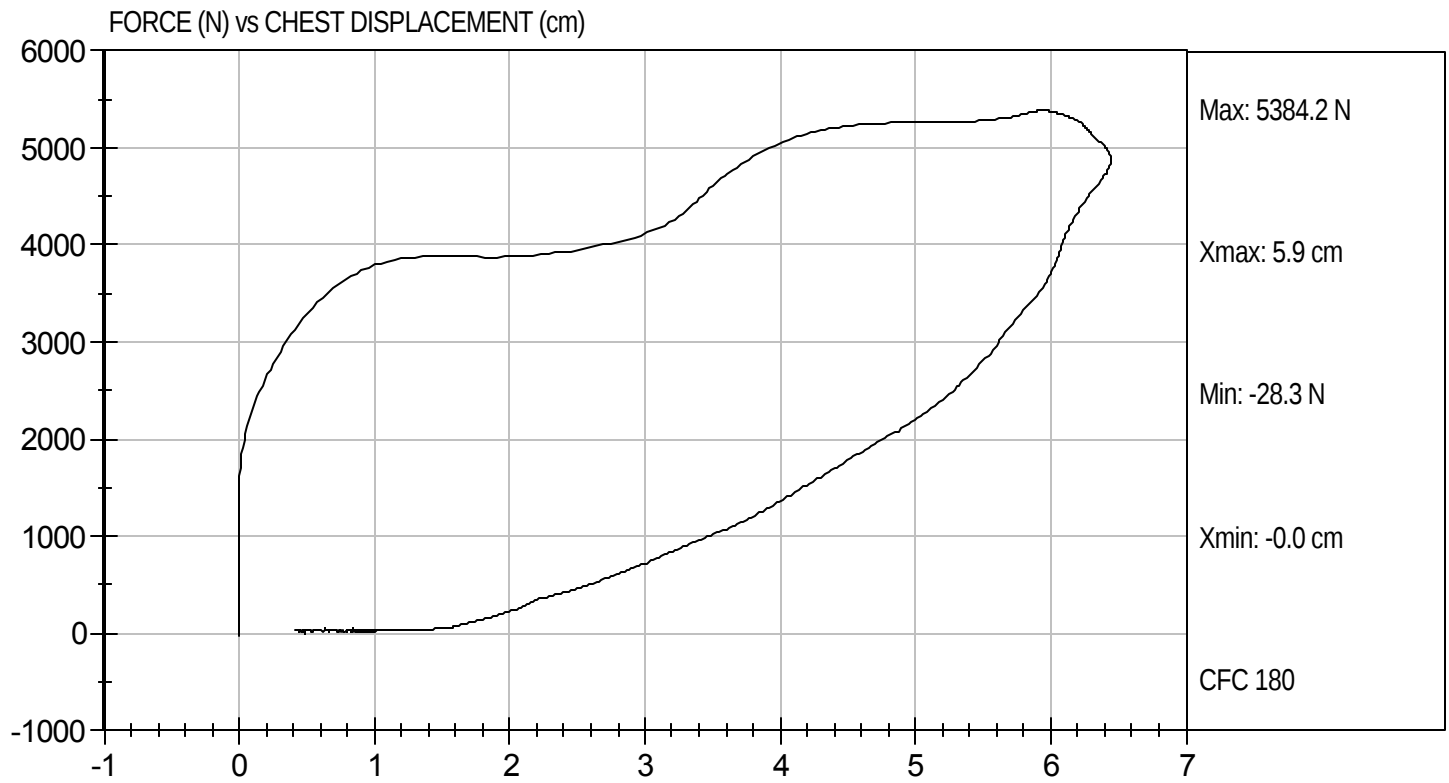
11/16/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D103974

Test Date: 11/16/10
Velocity: 21.64 ft/s, 6.60 m/s



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

ATD Serial No: 351

Test I.D: D103975

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5,729	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

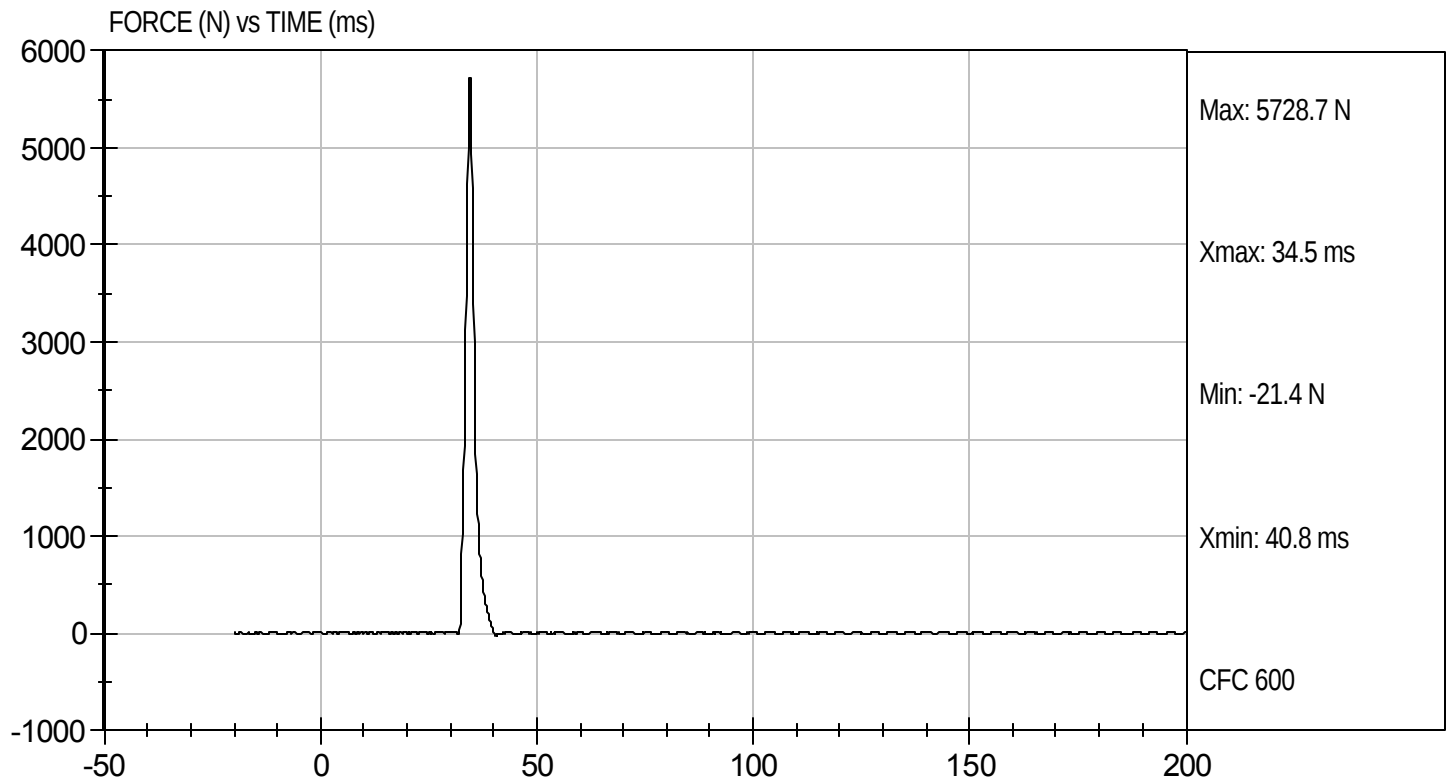
11/16/10
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D103975

Test Date: 11/16/10
Velocity: 6.944 ft/s, 2.12 m/s



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

ATD Serial No: 351

Test I.D: D103976

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5,742	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

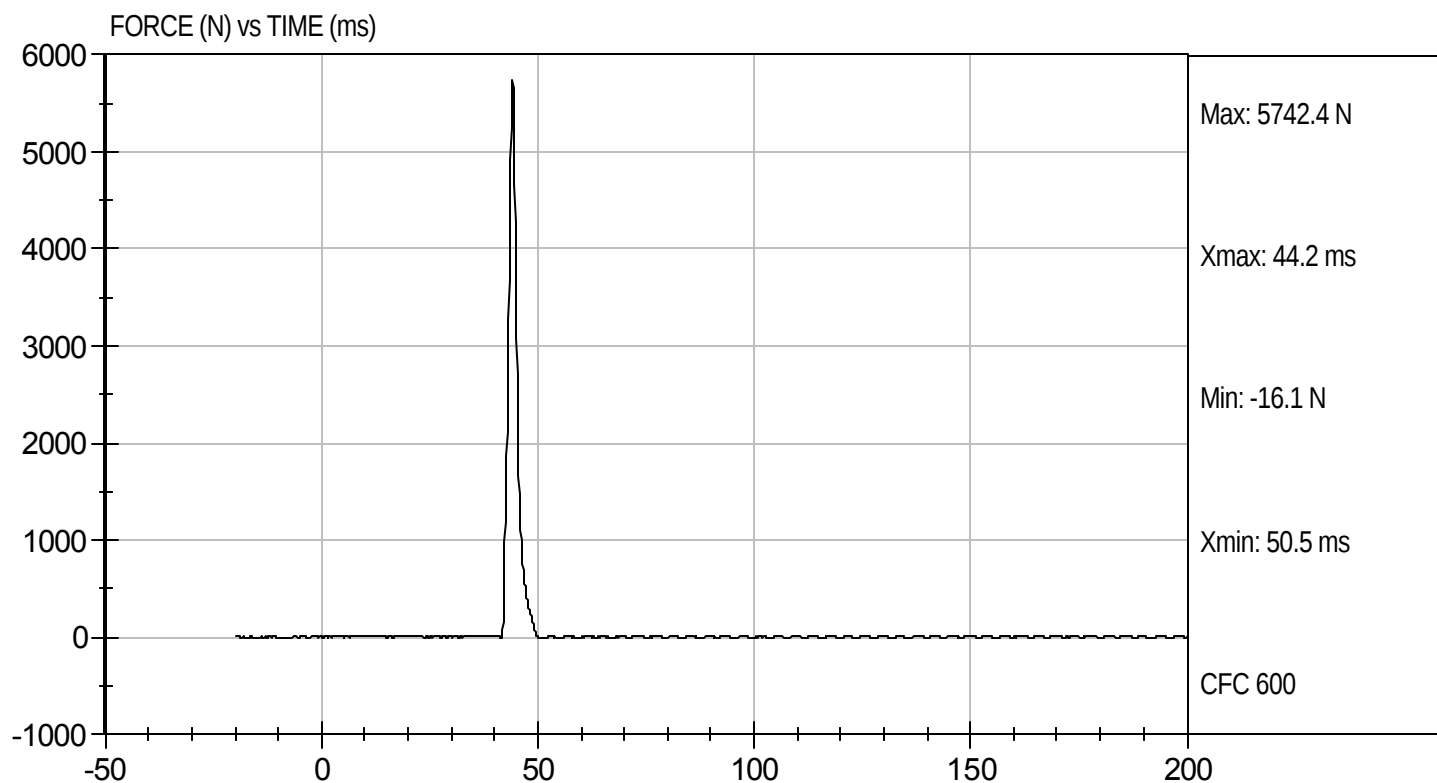
11/16/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D103976

Test Date: 11/16/10
Velocity: 6.91 ft/s, 2.11 m/s



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

ATD Serial No: 351

Test I.D: D103970

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.1	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	31	31	Pass
Rotation Rate	deg/s	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	43.4	40.1	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	48	49	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

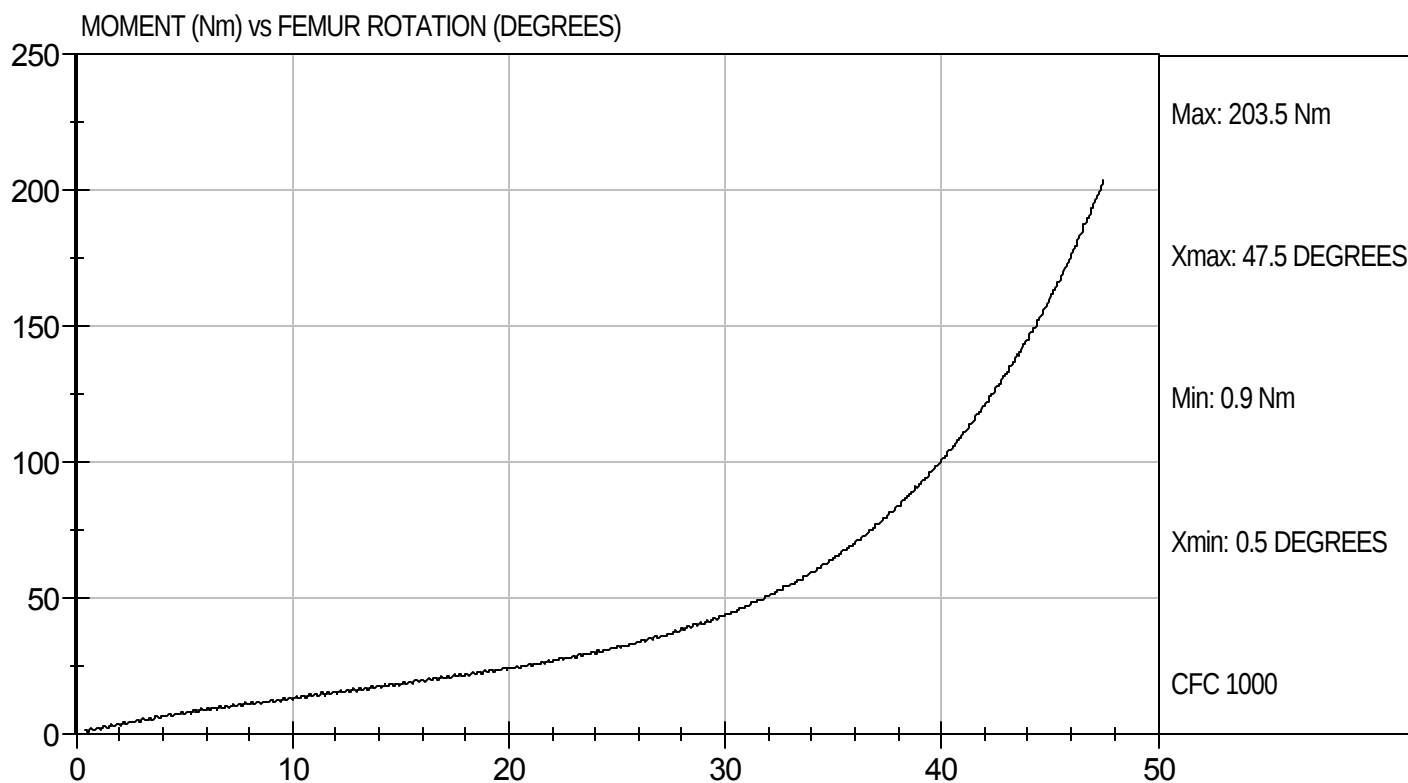
11/15/10
Test Date

David Winkelbauer
Approved By



Test Desc: Hip Femur Flexion
Component ID: D103979

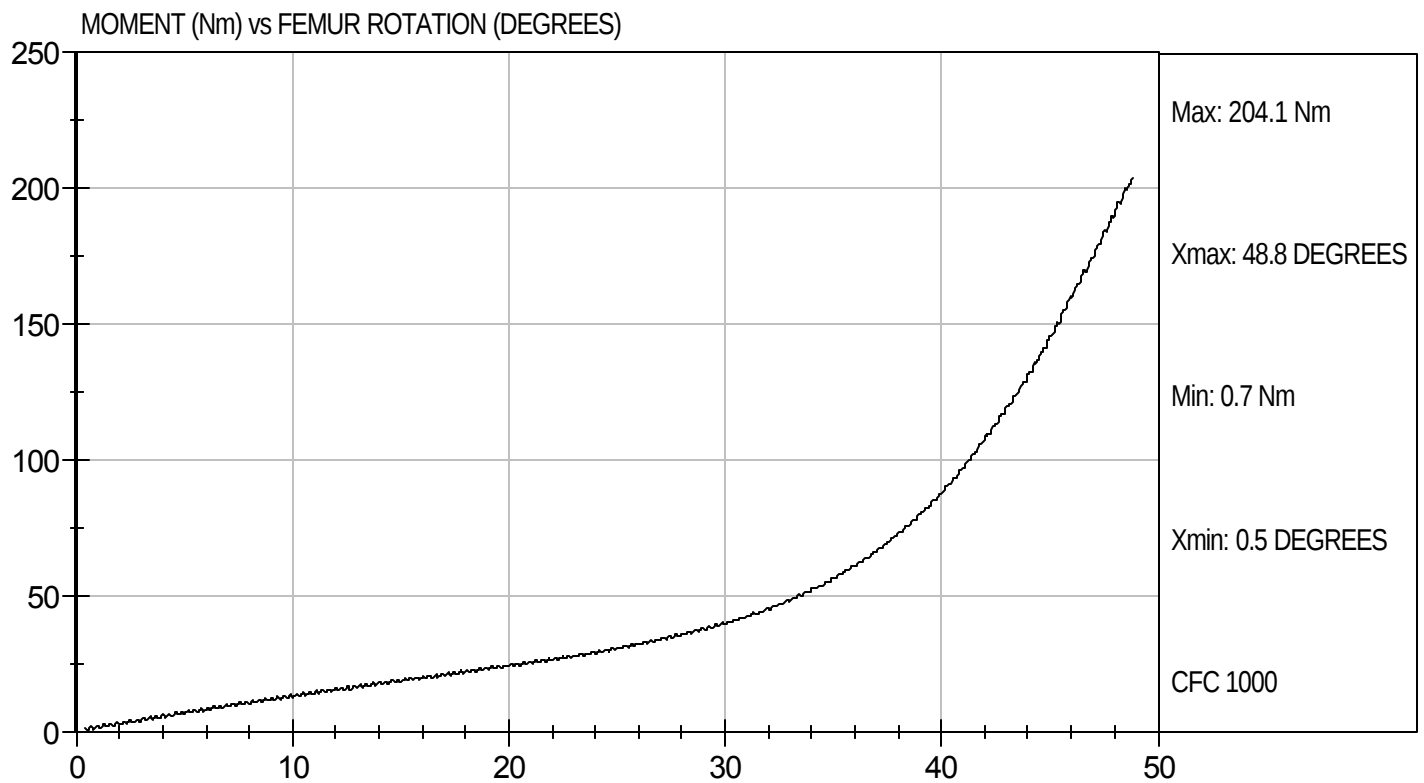
Test Date: 11/15/10
Velocity: 0 ft/s, 0.00 m/s





Test Desc: Hip Femur Flexion
Component ID: D103970

Test Date: 11/15/10
Velocity: 0 ft/s, 0.00 m/s

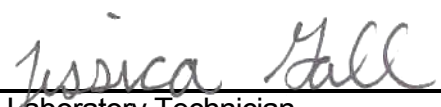


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test ID: D103941

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	250 to 300	274	Pass
Peak Lateral Acceleration	G's	+/- 15	-11.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

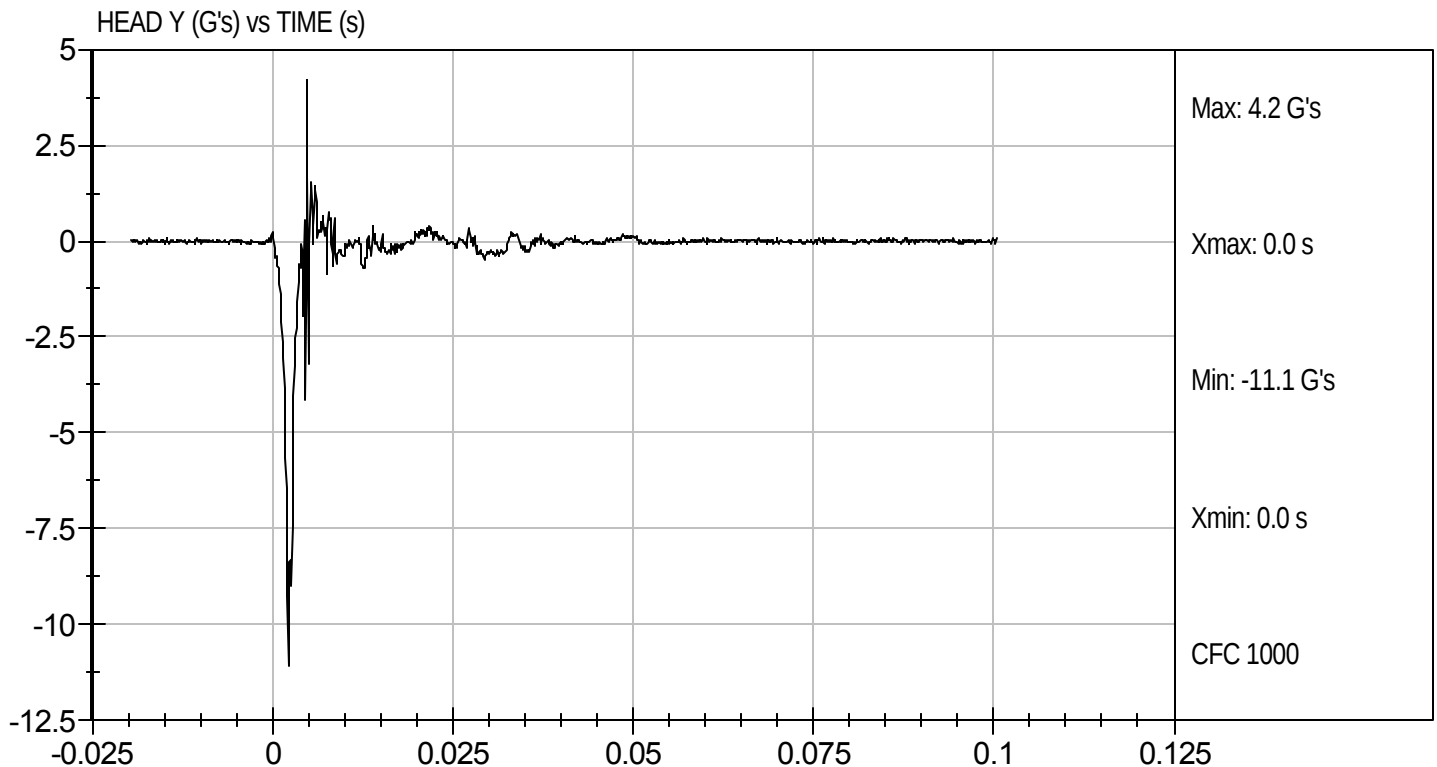
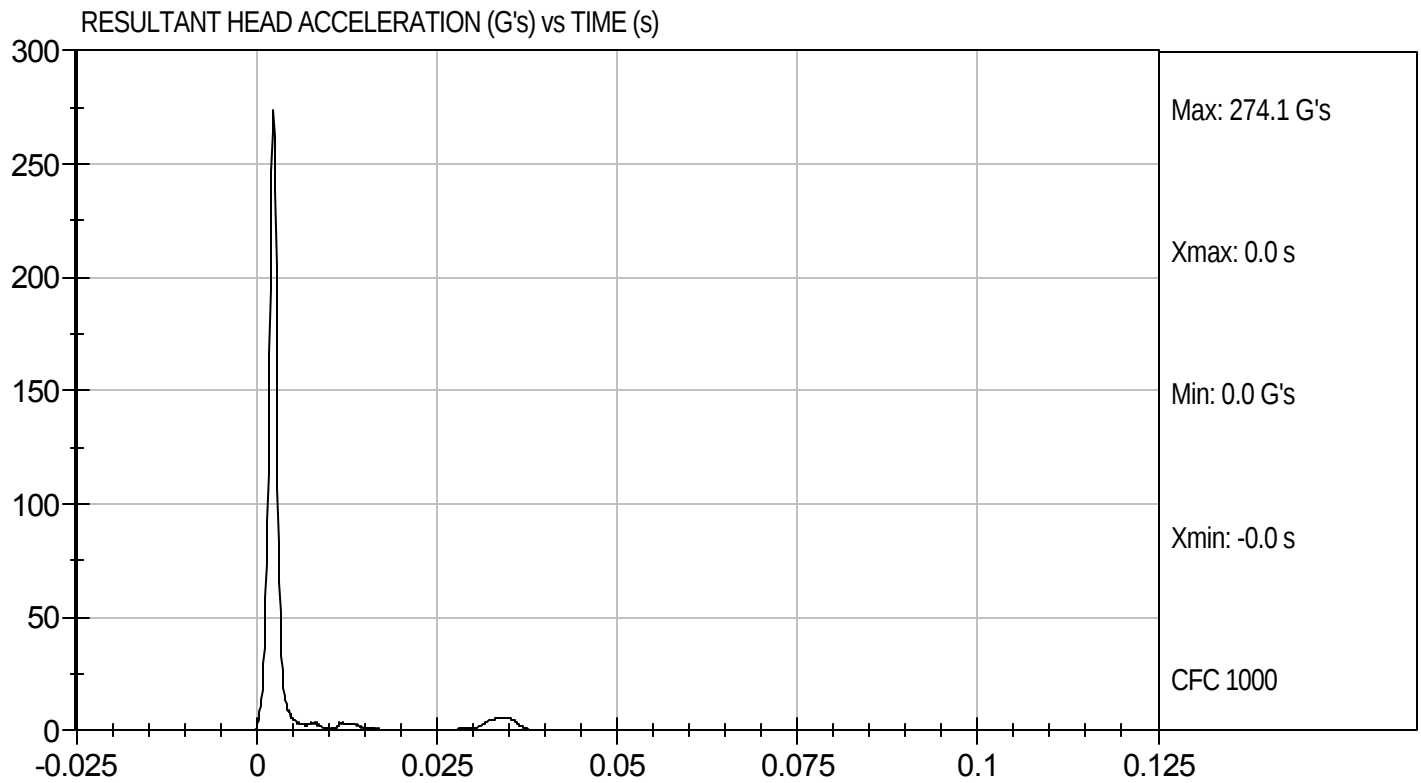
11/11/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D103941

Test Date: 11/11/10
Velocity: 0 ft/s, 0 m/s



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103942

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	39	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	6.3	Pass
D Plane Rotation	Max	deg	77 to 91	85	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	94	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

11/11/10
Test Date

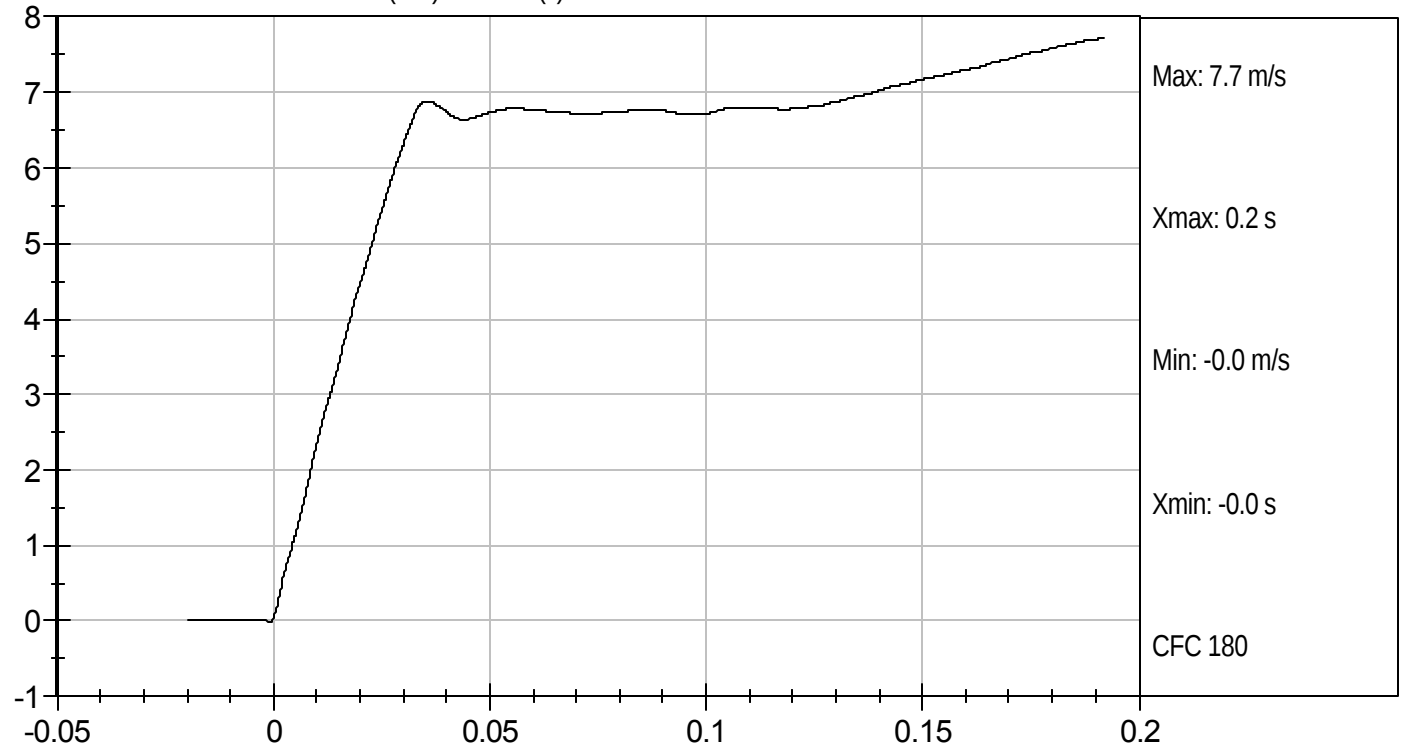
David Winkelbauer
Approved By



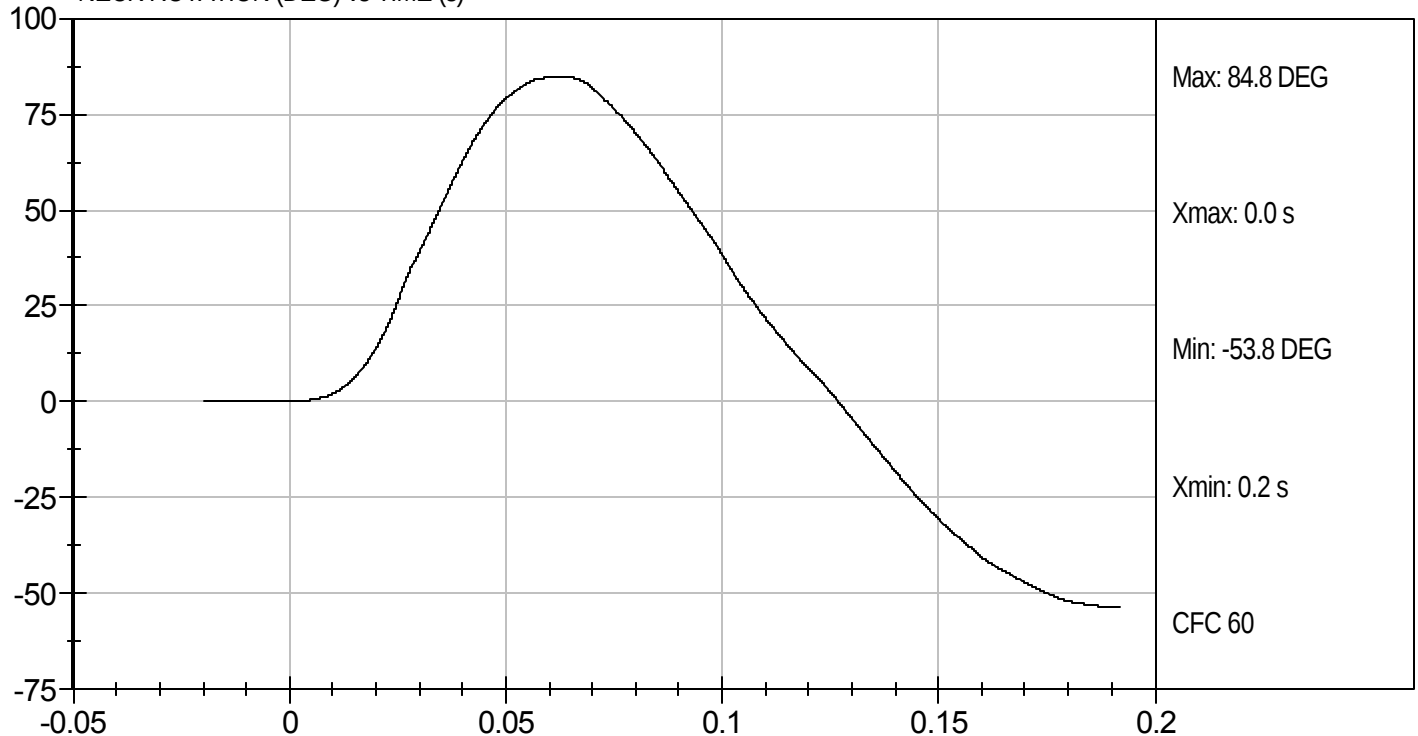
Test Desc: Neck Flexion
Component ID: D103942

Test Date: 11/11/10
Velocity: 23.15 ft/s, 7.06 m/s

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



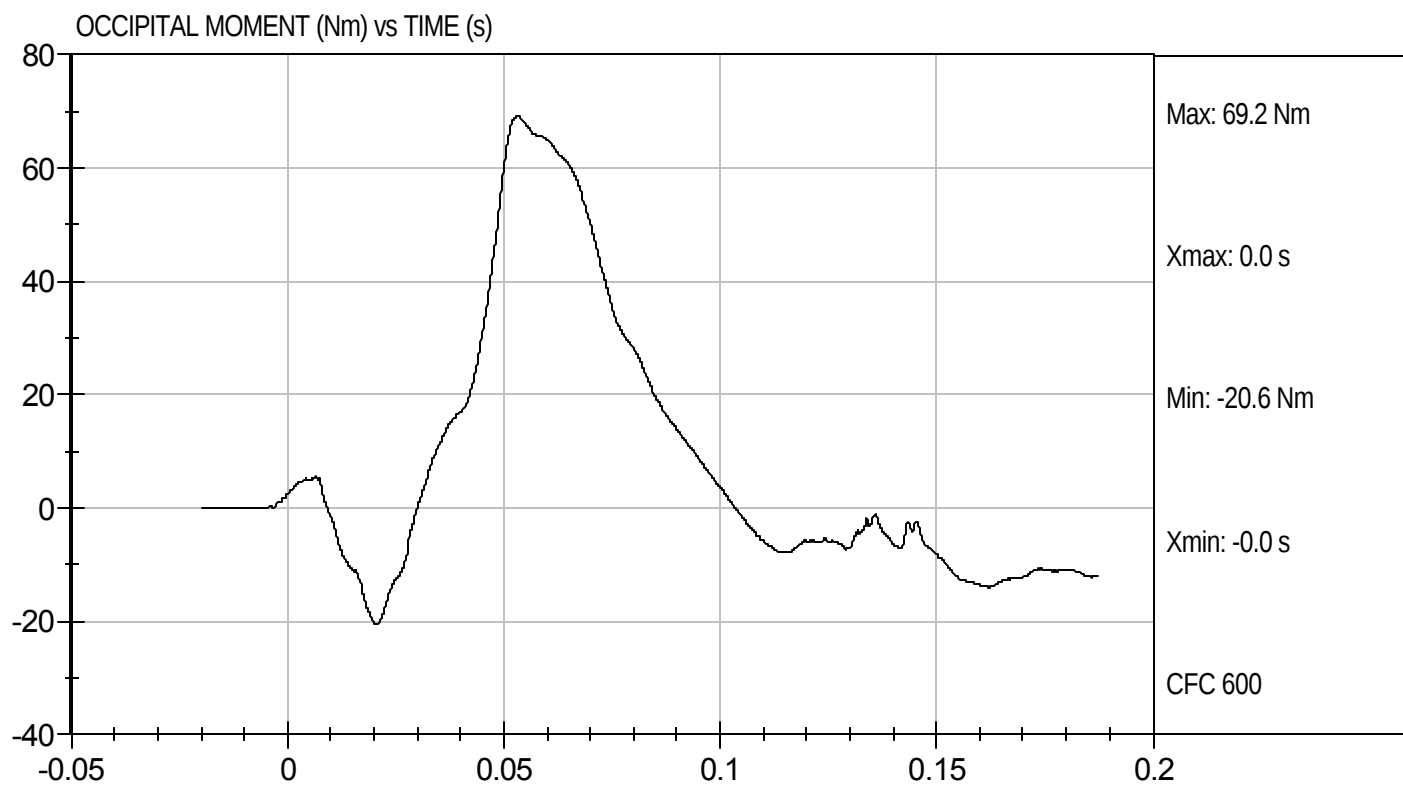
NECK ROTATION (DEG) vs TIME (s)





Test Desc: Neck Flexion
Component ID: D103942

Test Date: 11/11/10
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: D103943

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	35	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	5.5	Pass
D Plane Rotation	Max	deg	99 to 114	104	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

Jessica Galt
Laboratory Technician

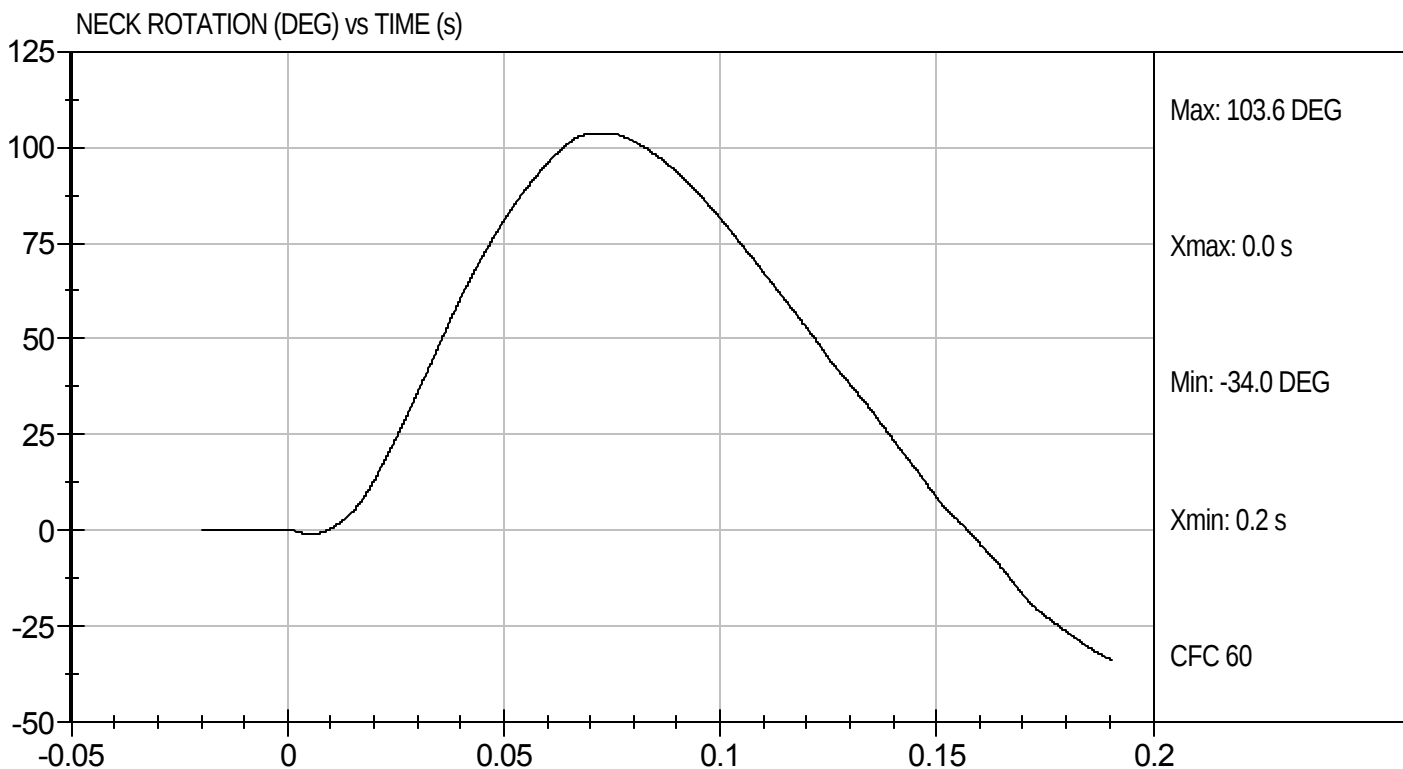
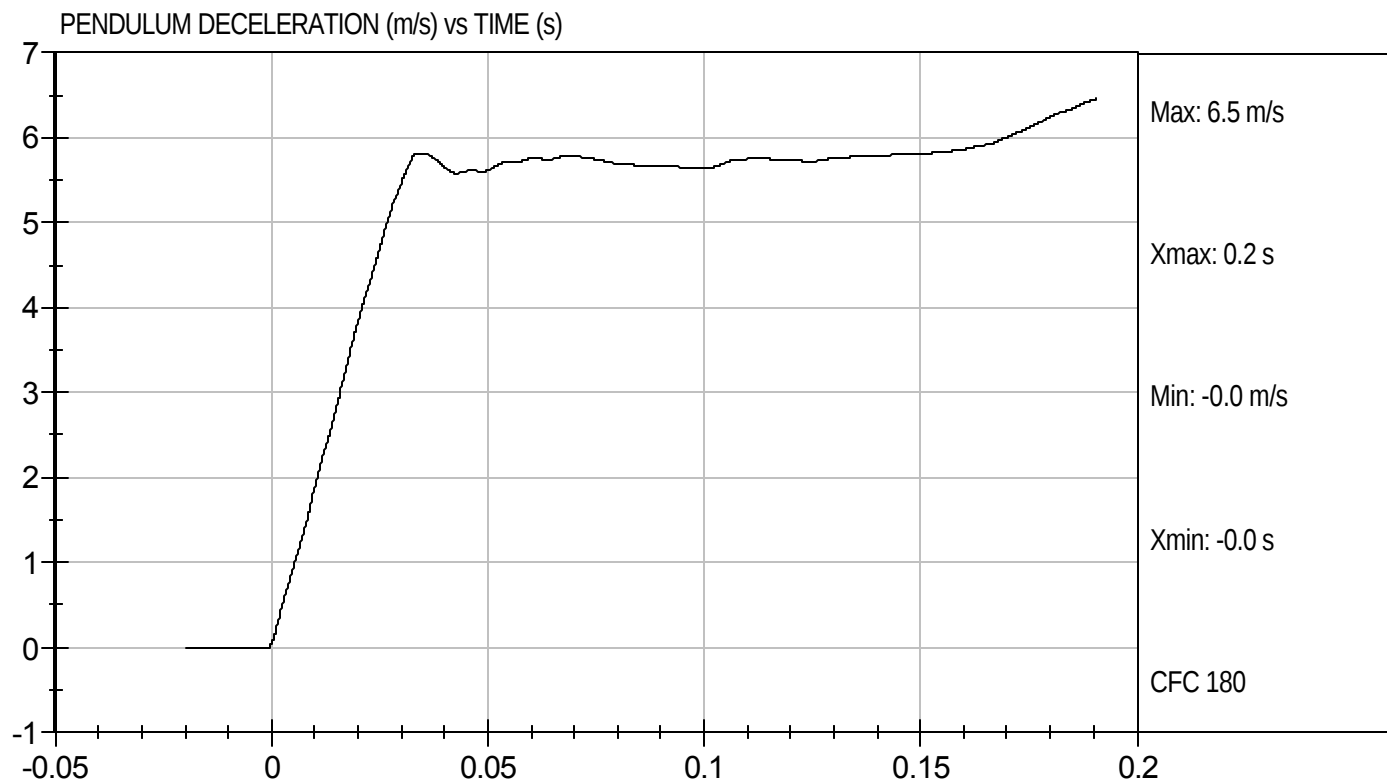
11/12/10
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D103943

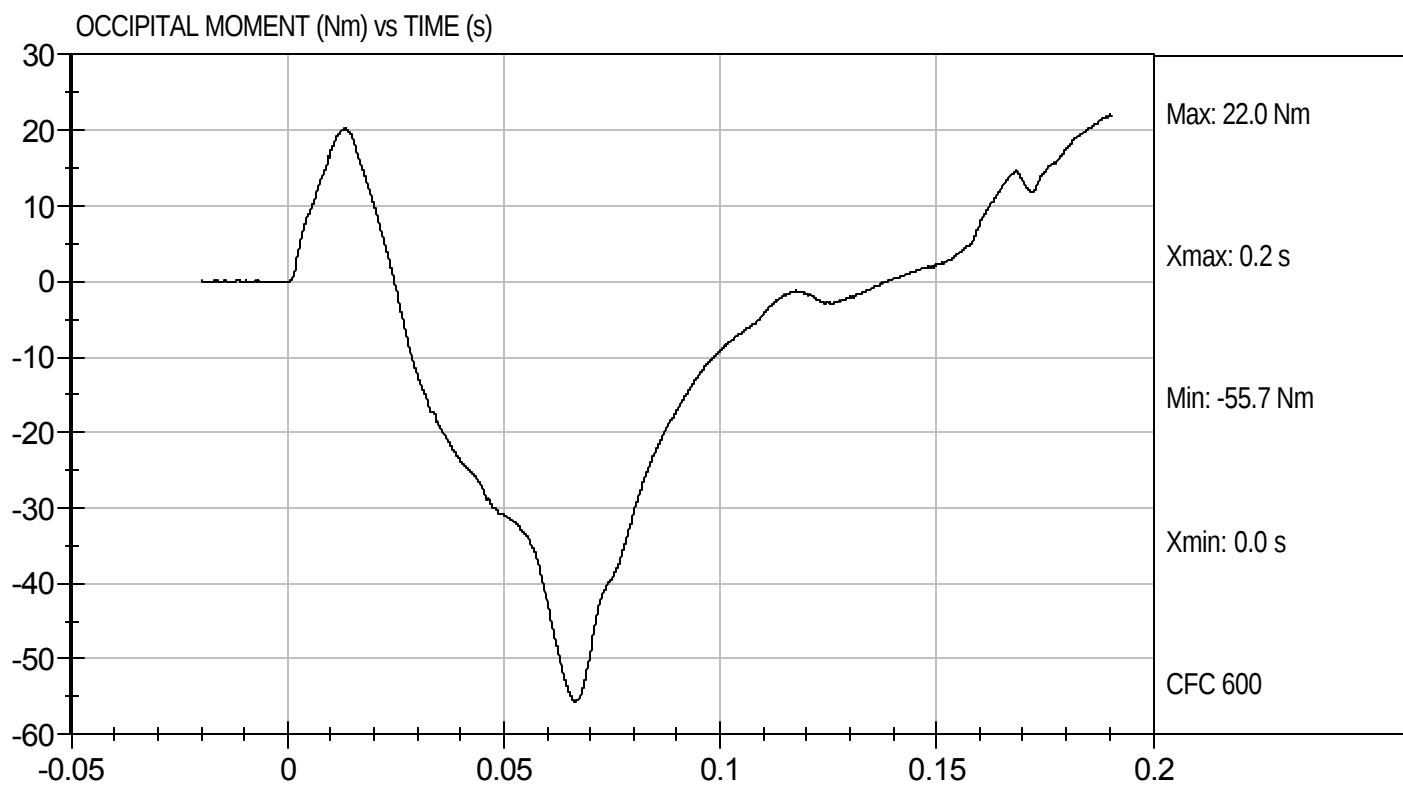
Test Date: 11/12/10
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Neck Extension
Component ID: D103943

Test Date: 11/12/10
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: D103944

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Relative Humidity	%	10 to 70	42	Pass
Probe Speed	m/s	6.59 to 6.83	6.69	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	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4047	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

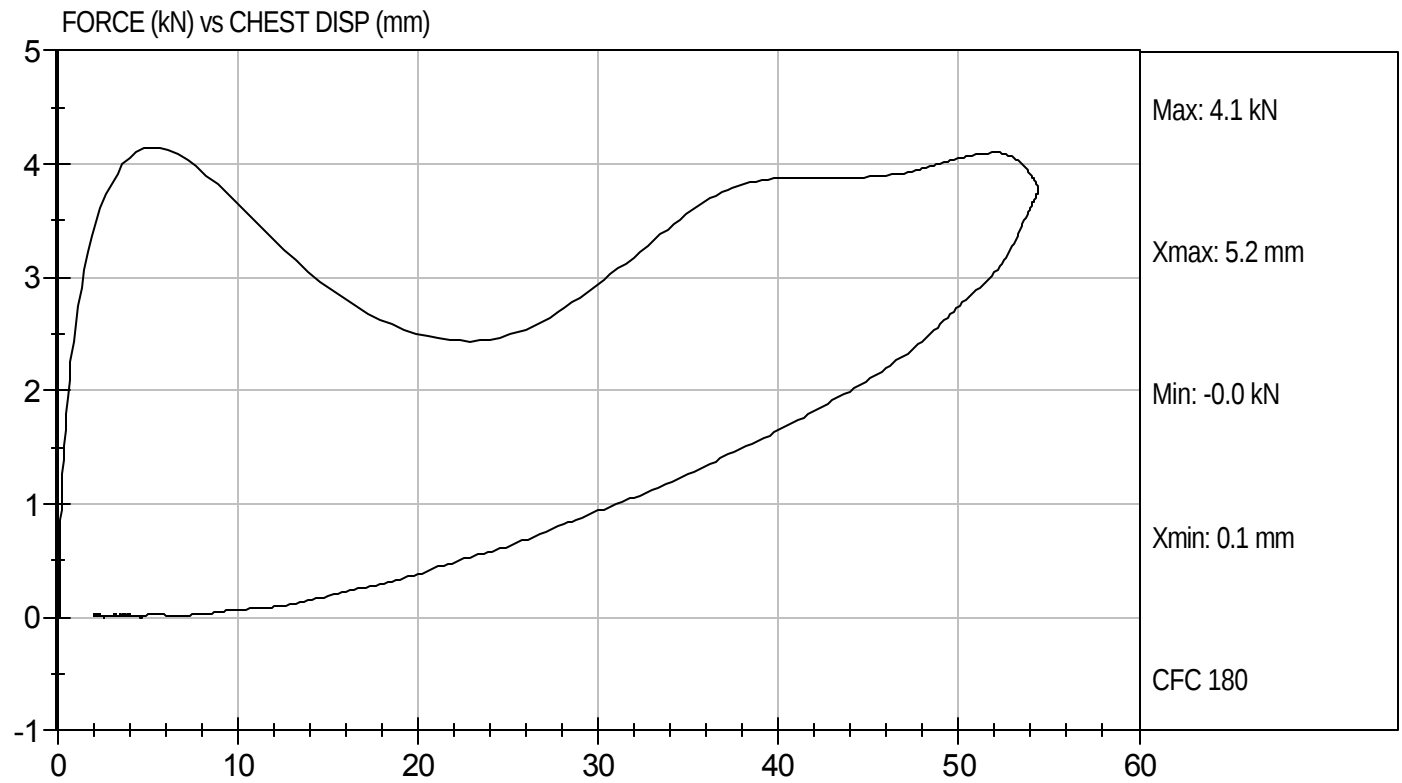
11/11/10
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D103944

Test Date: 11/11/10
Velocity: 21.96 ft/s, 6.69 m/s

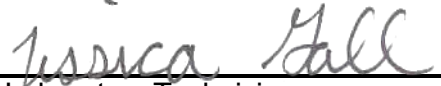


MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103945

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	39	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.75	Pass
Overall Test Results				Pass


Laboratory Technician

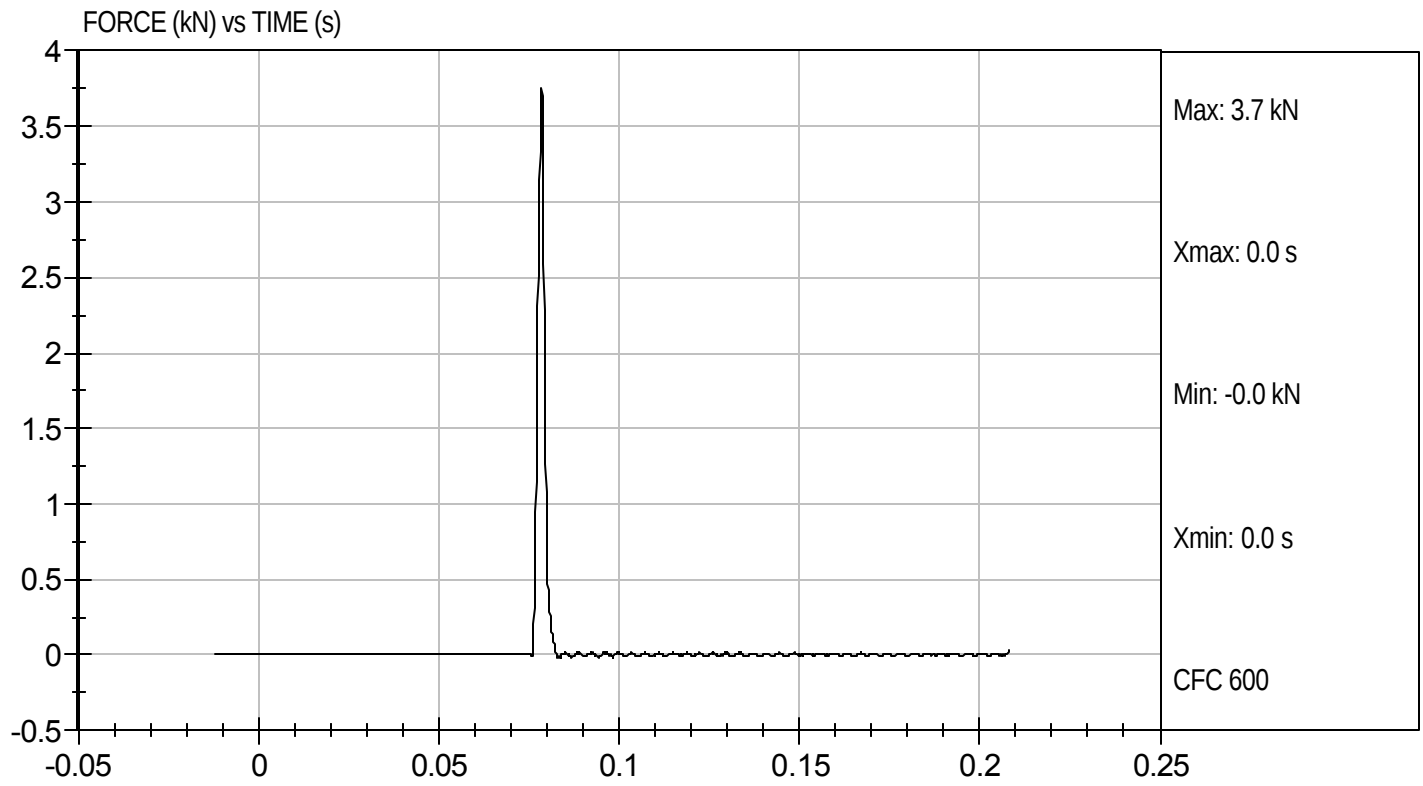
11/11/10
Test Date


Approved By



Test Desc: Right Knee
Component ID: D103945

Test Date: 11/11/10
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103946

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	39	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.87	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

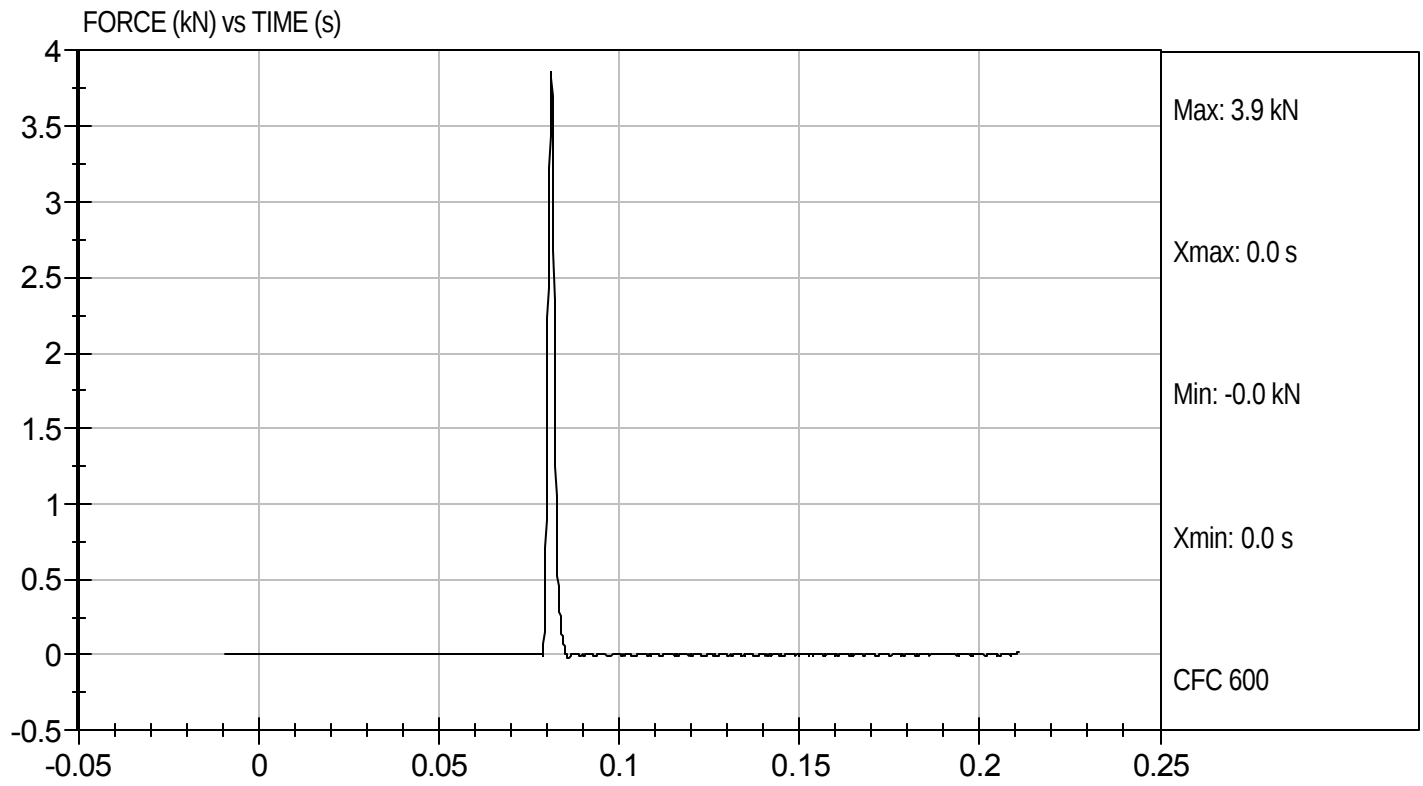
11/11/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D103946

Test Date: 11/11/10
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: D103947

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	35	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	6	Pass
Force at 45 deg	N	320 to 390	380	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass


Laboratory Technician

11/12/10
Test Date


Approved By

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

ATD Serial No: 634

Test ID: D103981

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Peak Resultant Acceleration	G's	225 - 275	273	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-2.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

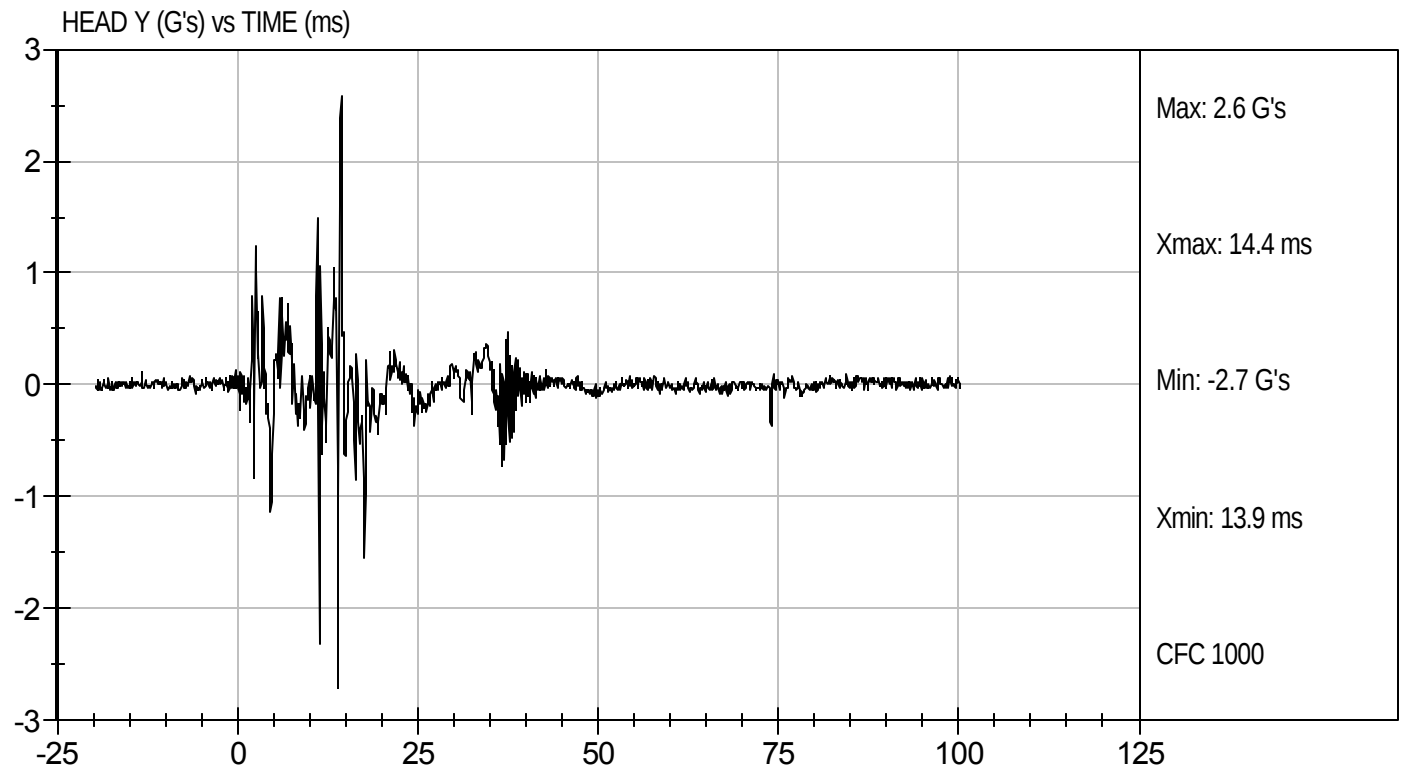
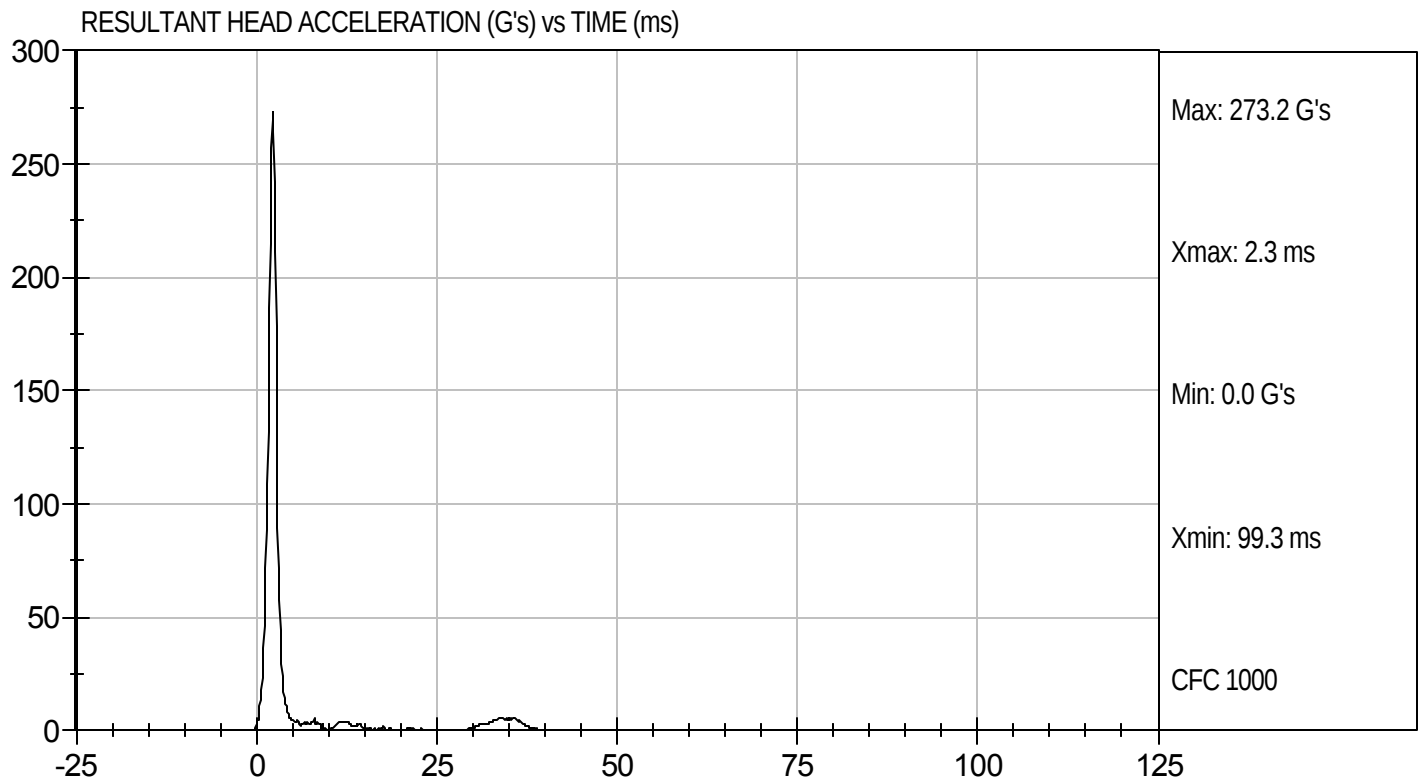
11/16/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D103981

Test Date: 11/16/10
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: D103982

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	35	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	2.1 to 2.5	2.3	Pass
	20 ms	m/s	4.0 to 5.0	4.3	Pass
	30 ms	m/s	5.8 to 7.0	6.0	Pass
D Plane Rotation	Max	deg	77 to 91	83	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	85	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

11/15/10
Test Date

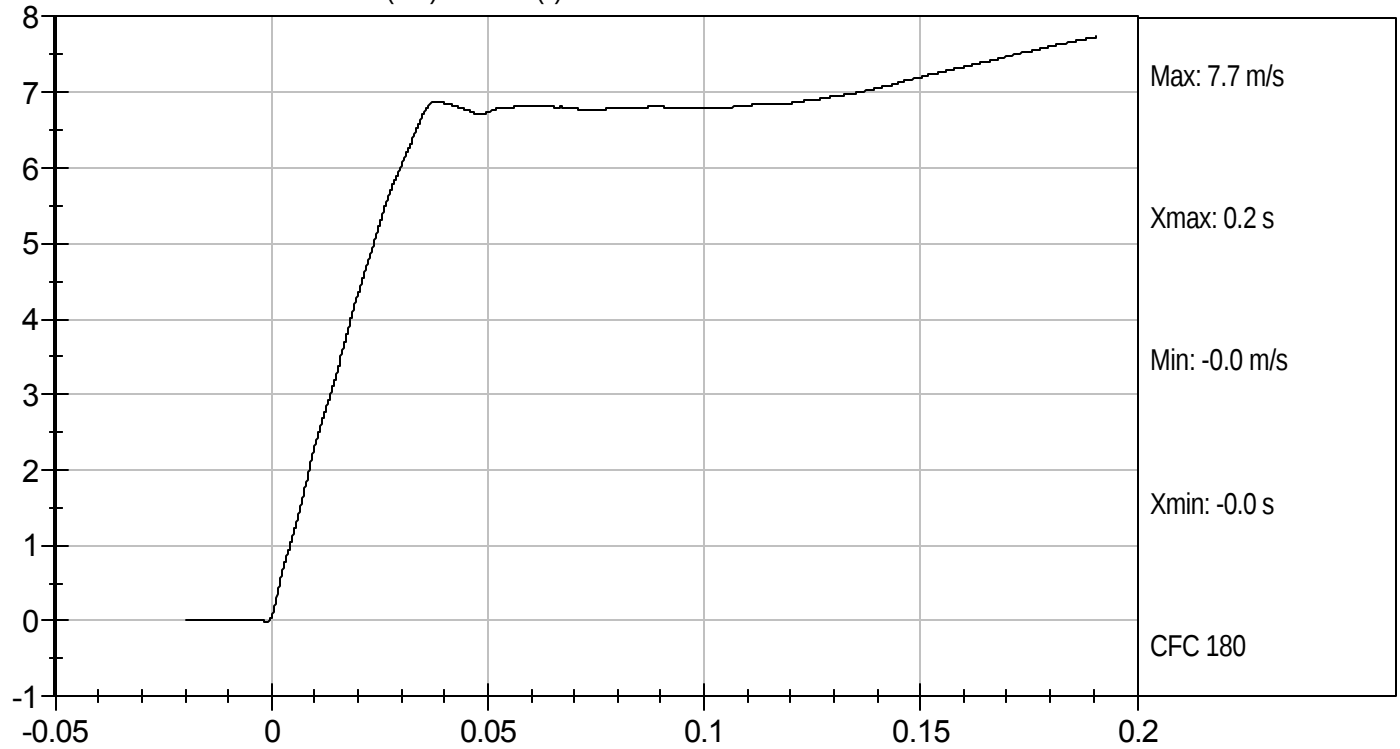
David Winkelbauer
Approved By



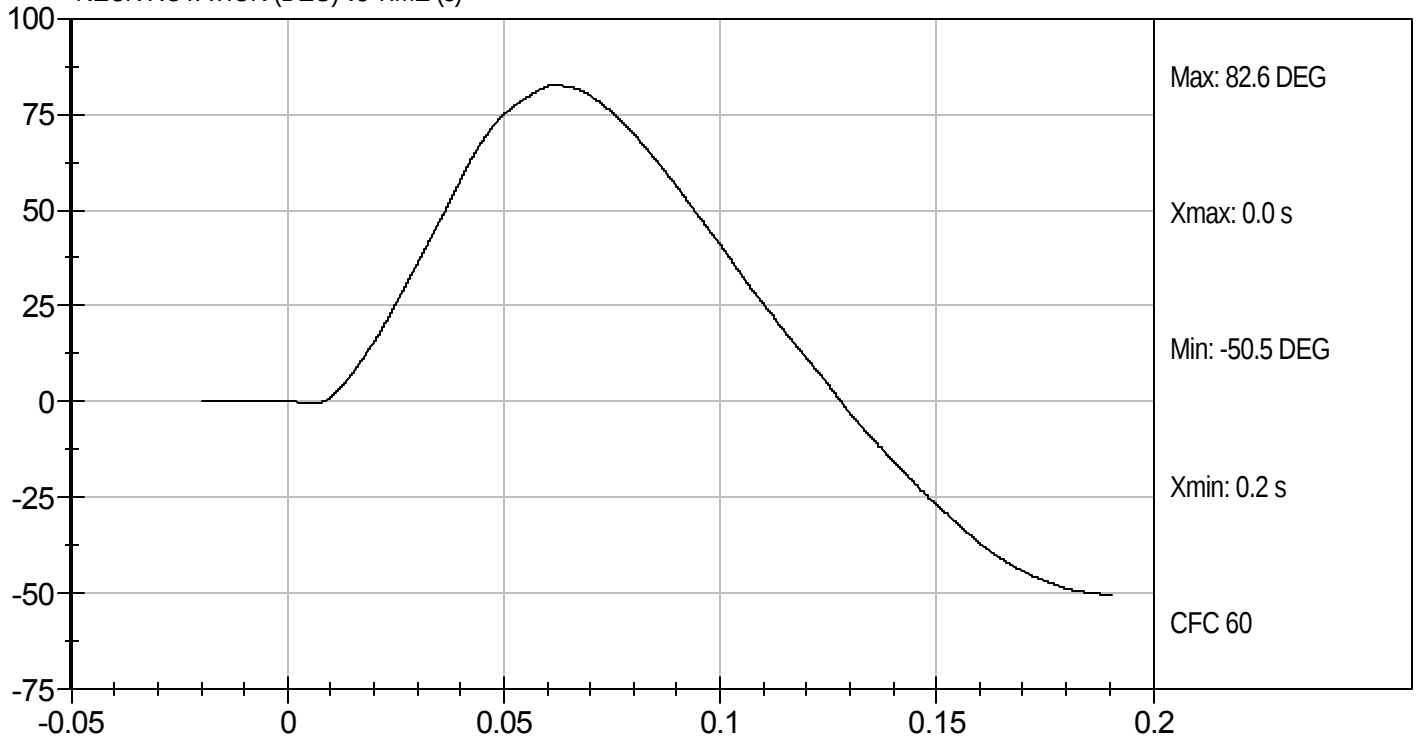
Test Desc: Neck Flexion
Component ID: D103982

Test Date: 11/15/10
Velocity: 23.15 ft/s, 7.06 m/s

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



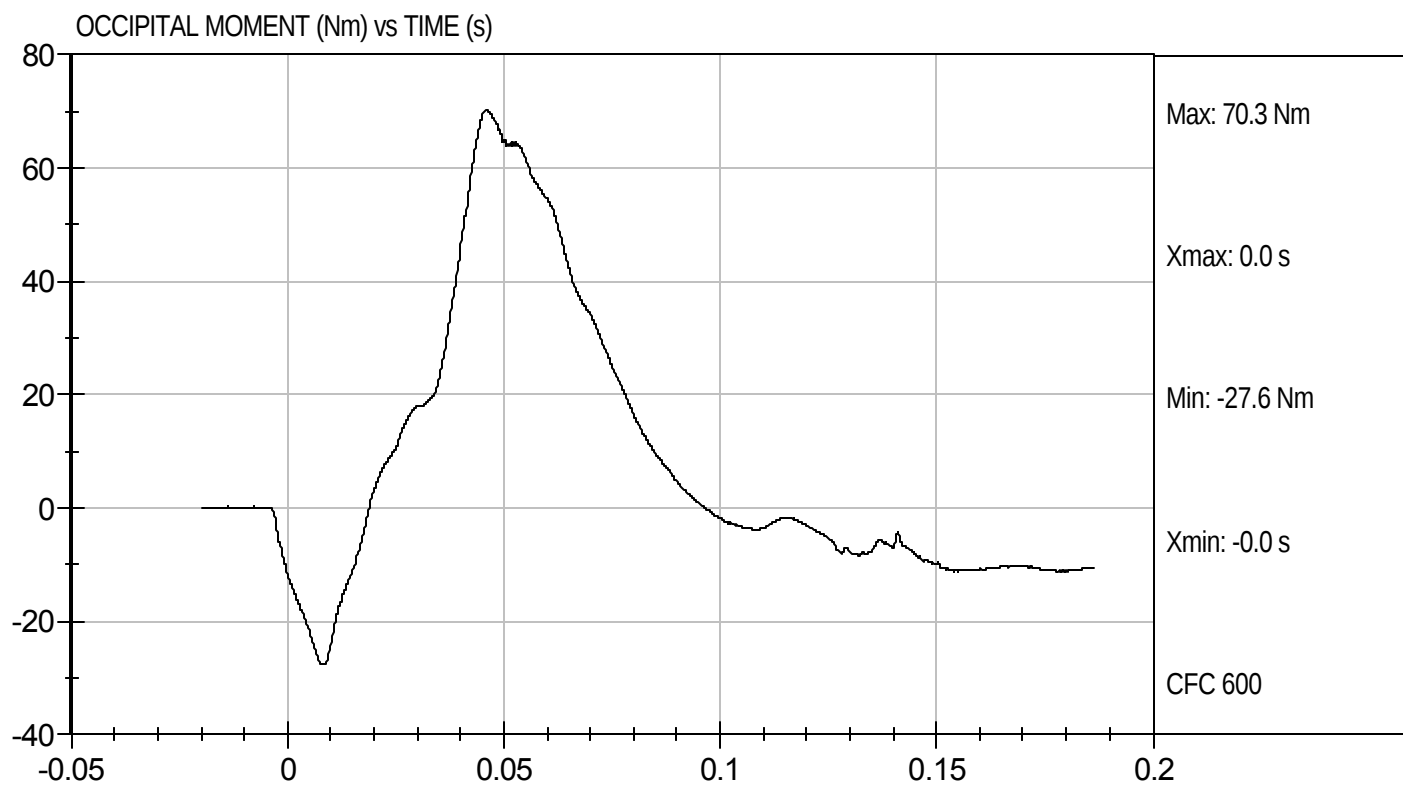
NECK ROTATION (DEG) vs TIME (s)





Test Desc: Neck Flexion
Component ID: D103982

Test Date: 11/15/10
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: D103983

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	35	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.16	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.8	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	103	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	95	Pass
Overall Results					Pass

Jessica Hall
Laboratory Technician

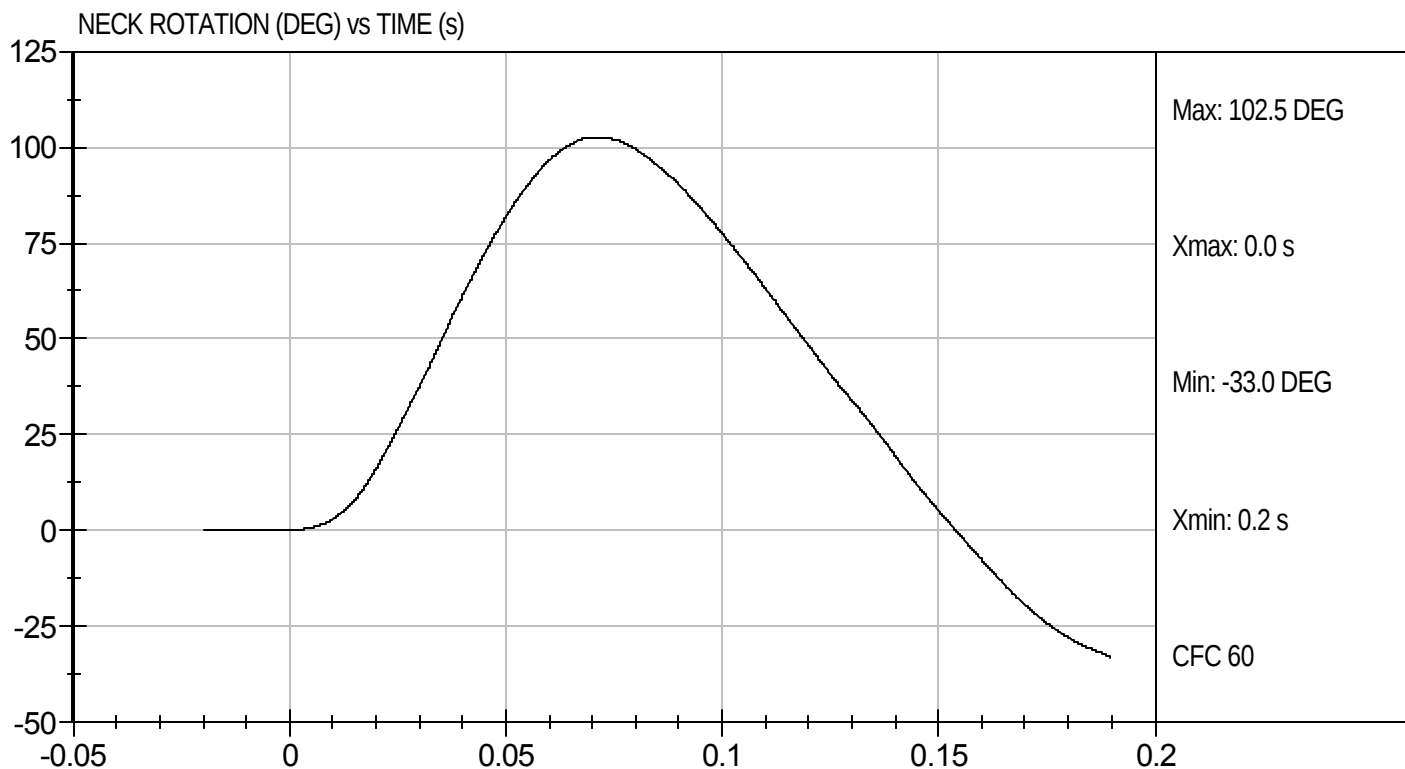
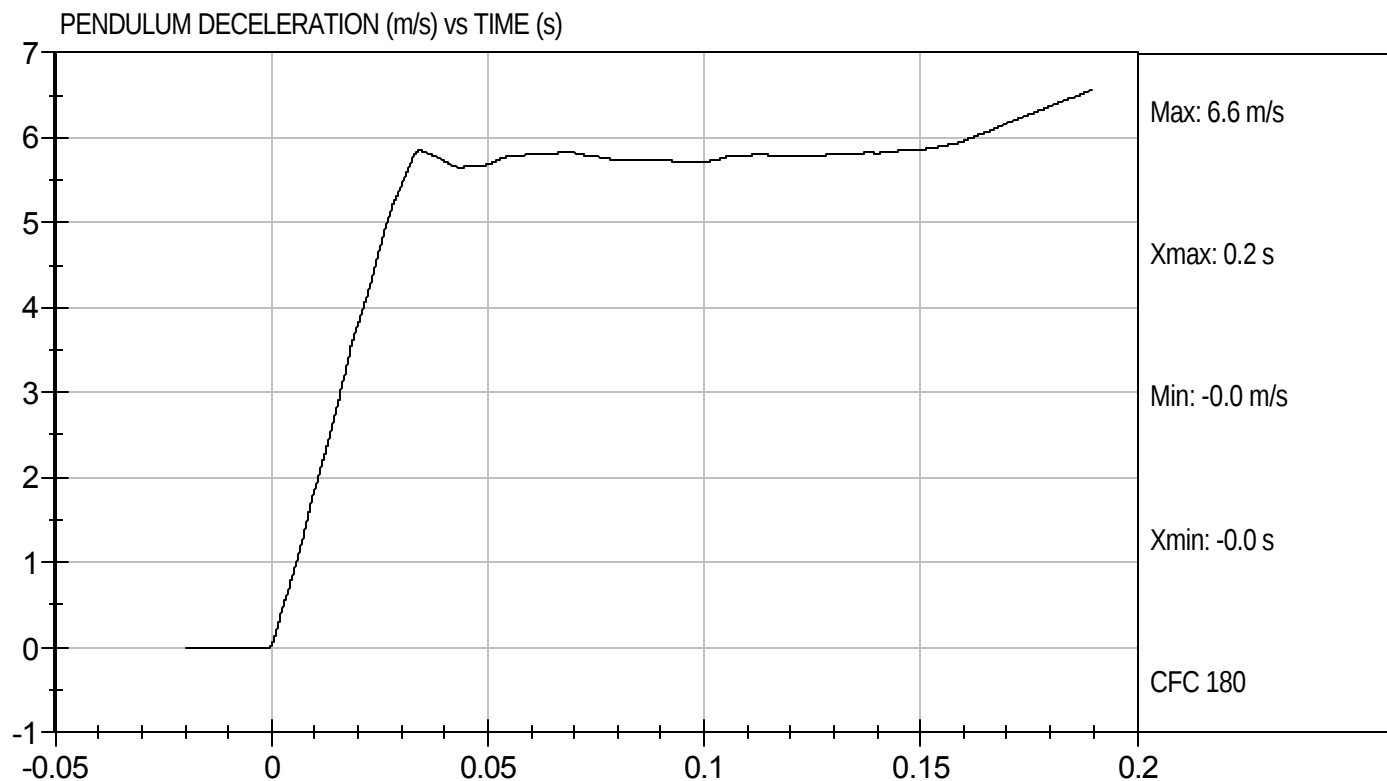
11/15/10
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Extension
Component ID: D103983

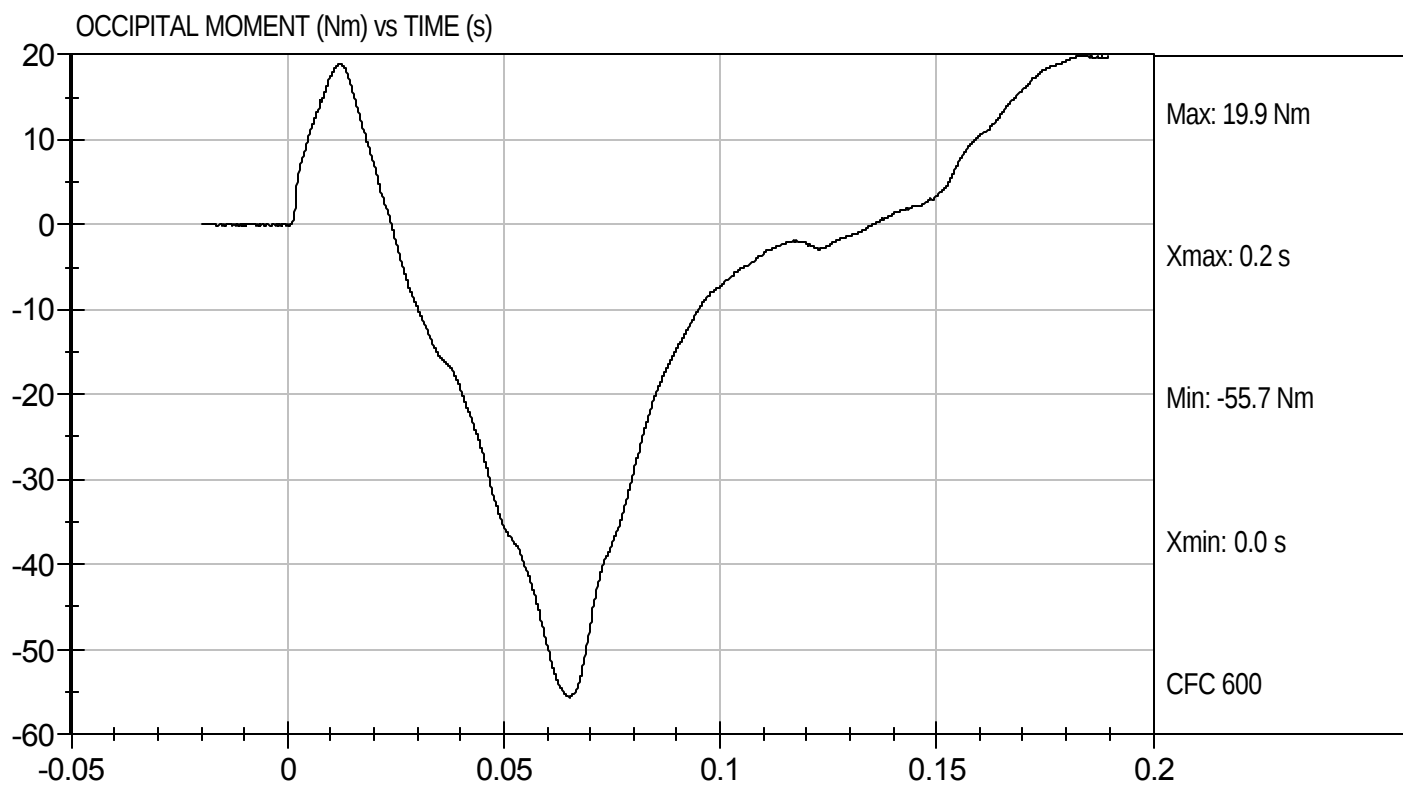
Test Date: 11/15/10
Velocity: 20.20 ft/s, 6.16 m/s





Test Desc: Neck Extension
Component ID: D103983

Test Date: 11/15/10
Velocity: 20.20 ft/s, 6.16 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103984

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.1	Pass
Relative Humidity	%	10 to 70	31	Pass
Probe Speed	m/s	6.59 to 6.83	6.60	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.2	Pass
Internal Hysteresis	%	69 to 85	70	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4226	Pass
			Overall Test Results	Pass


Laboratory Technician

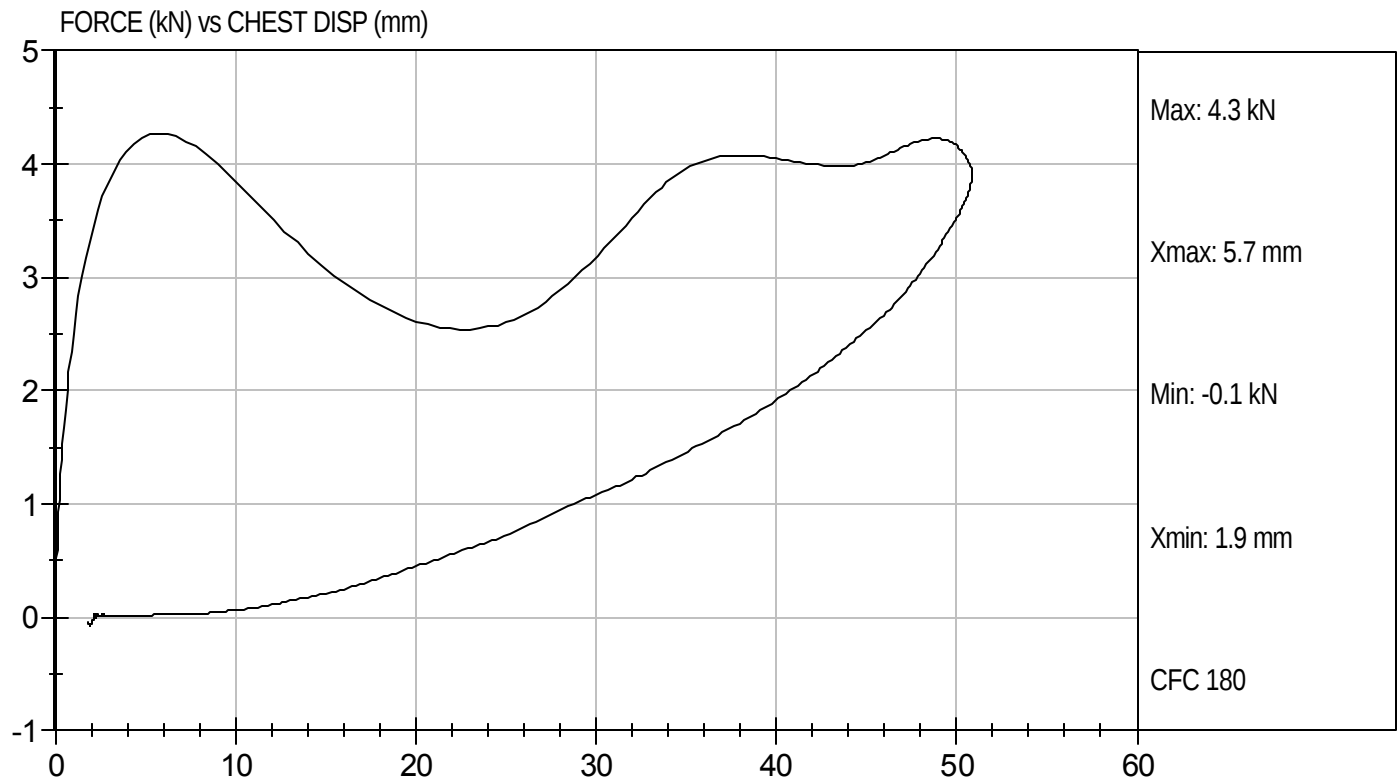
11/15/10
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D103984

Test Date: 11/15/10
Velocity: 21.64 ft/s, 6.60 m/s



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

ATD Serial No: 634

Test I.D: D103985

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.85	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

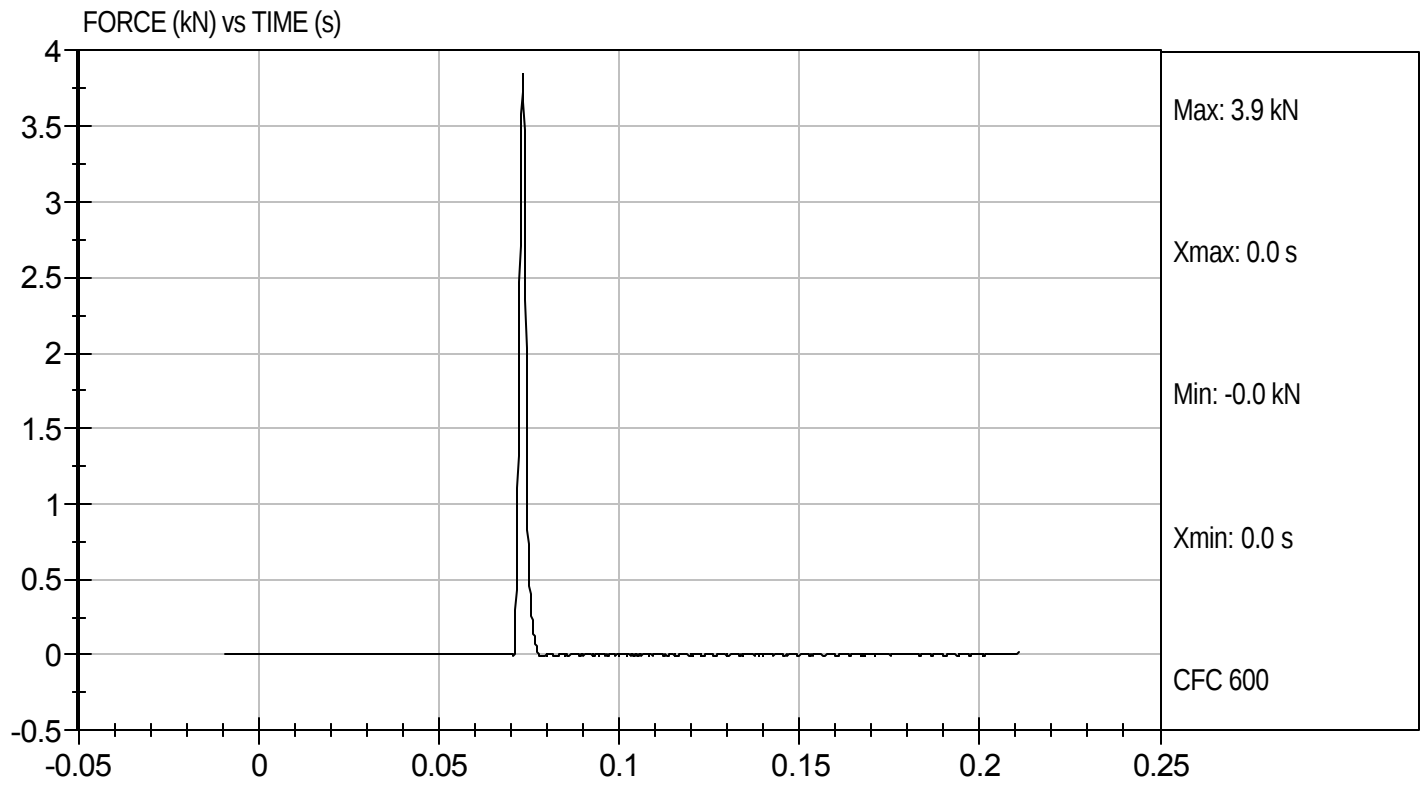
11/16/10
Test Date

David Winkelbauer
Approved By



Test Desc: Right Knee
Component ID: D103985

Test Date: 11/16/10
Velocity: 6.944 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634

Test I.D: D103986

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.55	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

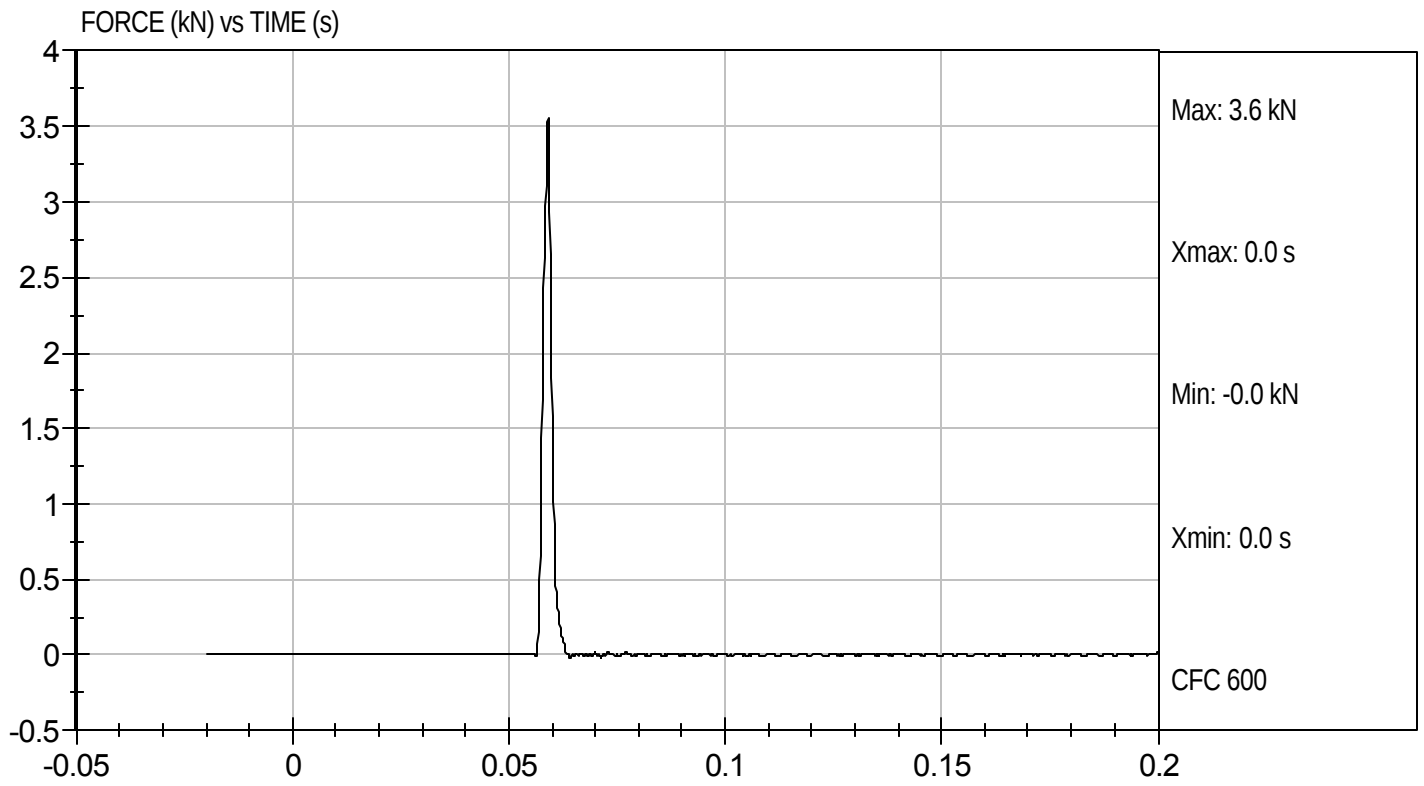
11/16/10
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Component ID: D103986

Test Date: 11/16/10
Velocity: 6.944 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634Test I.D: D103987

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	371	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
Overall Result				Pass

Jessica Hall
Laboratory Technician

11/15/10
Test Date

David Winkelbauer
Approved By