REPORT NUMBER: NCAP-MGA-2012-005

NEW CAR ASSESSMENT PROGRAM (NCAP)
Frontal Barrier Impact Test

CHRYSLER GROUP LLC
2012 Chrysler Town & Country Minivan
NHTSA No.: MC0300

MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105

Test Date: September 27, 2011

Final Report Date: October 21, 2011

FINAL REPORT

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

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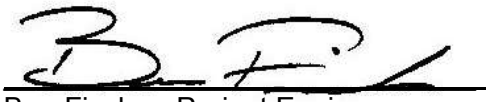
Approved by: 
Ben Fischer, Project Engineer

Approval Date: October 21, 2011

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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15. Supplementary Notes		

16. Abstract

A 56.3 km/h NCAP Frontal Impact Test was conducted on the 2012 Chrysler Town & Country Minivan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on September 27, 2011.

The impact velocity was 56.4 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 520 mm located to the left of the vehicle's centerline. The test vehicle's performance was as follows:

Measurement Description	Units	Threshold		Driver ATD	Passenger ATD
		50th	5th		
Head Injury Criteria (HIC_{15})	N/A	700	700	247	130
Maximum Chest Compression	mm	63	52	23	12
Nij	N/A	1	1	0.36	0.37
Neck Tension	N	4170	2620	1544	638
Neck Compression	N	4000	2520	49	89
Left Femur Force	N	10008	6805	3450	2341
Right Femur Force	N	10008	6805	3479	2959

17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE, Room E12-100 Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833	
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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 Standards Frontal NCAP Laboratory Test Procedure.

SUMMARY

A load cell barrier was impacted by a 2012 Chrysler Town & Country Minivan at a velocity of 56.4 kph. The test was performed at MGA Research Corporation on September 27, 2011. 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 also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading.

The driver (position 1) ATD (Serial No. 036) and the right-front passenger (position 2) ATD (Serial No. 634) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 228 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 520 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head and chest contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee bag and knee bolster. The passenger's visible contact points were as follows: The passenger's head and chest contacted the airbag. The passenger's head also contacted the headrest and seatbelt. The passenger's knees contacted the glovebox and dash panel.

The occupant data is summarized below:

ATD position	HIC_{15}	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50^{th})	247	0.36	1544	49	38	23	3450	3479
Passenger (5^{th})	130	0.37	638	89	39	12	2341	2959

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 73 msec.
Bottom of Engine X after 45 msec.
Right Brake Caliper X after 60 msec.

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0300	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Chrysler	Automatic Door Locks (ADLs)	Yes
Model	Town & Country	Power Window Auto-Reverse	No
Body Style	Minivan	Other Optional Feature	N/A
VIN	2C4RC1BG3CR106922	Driver Front Airbag	Yes
Body Color	Deep Cherry Red Crystal	Driver Curtain Airbag	Yes
Odometer (km/mi)	164 / 102	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.6	Driver Torso Airbag	No
Type/No. Cylinders	6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	6	Pass. Curtain Airbag	Yes
Overdrive	Yes	Pass. Head/Torso Airbag	No
Final Drive	Front	Pass. Torso Airbag	No
Roof Rack	Yes	Pass. Torso/Pelvis Airbag	Yes
Sunroof/T-Top	No	Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Pass. Seat Belt Pretensioner	No
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
All-Wheel Drive (AWD)	No	Other Safety Restraint	N/A
Does owner's manual provide instructions to turn off automatic door locks?			Yes

DATA FROM CERTIFICATION LABEL

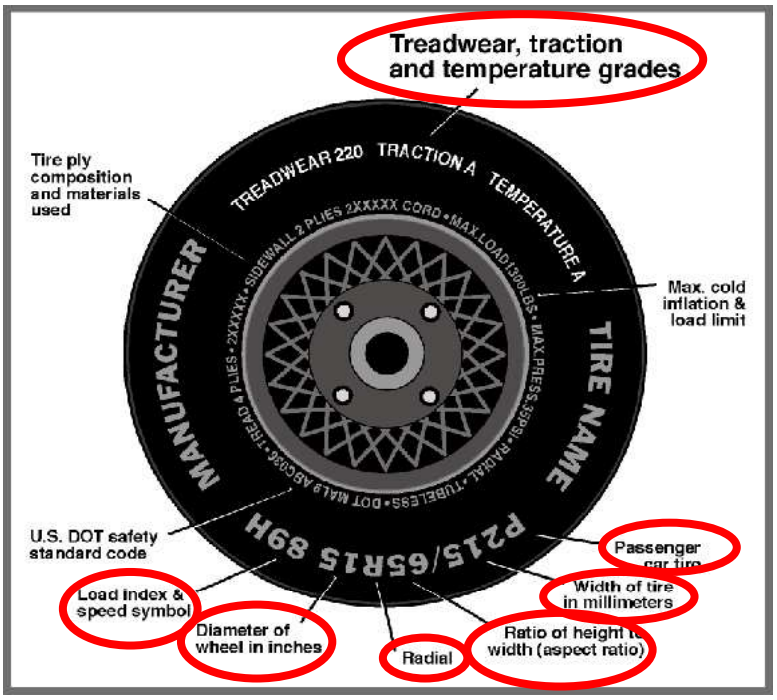
Manufactured By	Chrysler Group LLC	GVWR (kg)	2745
Date of Manufacture	8-11	GAWR Front (kg)	1339
Vehicle Type	MPV	GAWR Rear (kg)	1407

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	Split Bench	
Designated Seating Capacity (DSC)	2	2	3	7
Capacity Weight (VCW) (kg)				521
Cargo Weight (RCLW) (kg)				45

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

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	250	250
Recommended Tire Size	235/60R16	235/60R16

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	235/60R16	235/60R16
Tire Manufacturer	Kumho	Kumho
Tire Name	Solus	Solus
Tire Type	Passenger	Passenger
Tire Width	235	235
Aspect Ratio	60	60
Radial	Yes	Yes
Wheel Diameter	16	16
Load Index/Speed Symbol	100H	100H
Treadwear	480	480
Traction Grade	A	A
Temperature Grade	A	A
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	591.9	473.6		630.1	534.8	
Right	kg	575.2	452.2		596.4	511.2	
Ratio	%	55.8	44.2		54.0	46.0	
Totals	kg	1167.1	925.8	2092.9	1226.5	1046.0	2272.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2092.9
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Vehicle Target Weight (TVTW)	kg	2278.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	753	758	770	762	1362
As Tested	mm	750	750	746	747	1418
Post Test	mm	760	781	731	748	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3080
Total Vehicle Length at Left Side	mm	5032
Total Vehicle Length at Centerline	mm	5181
Total Vehicle Length at Right Side	mm	5032
Weight of Ballast in Cargo Area	kg	18.1
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	L	75.7

List of components removed to meet test weight: None

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

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

TARGET VEHICLE STRUCTURAL MEASUREMENT

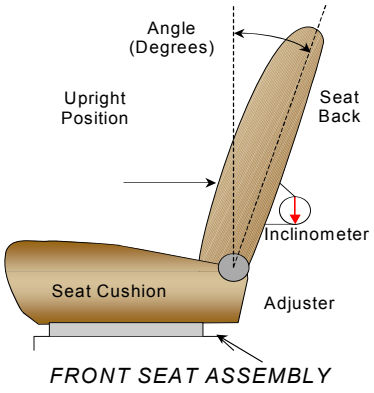
	Elements	Pre-Test (mm)
1	Total Length	5181
2	Total Width	1970
3	Bumper Top Height	565
4	Bumper Bottom Height	470
5	Longitudinal Member Top Height	610
6	Distance between Longitudinal Members	970
7	Longitudinal Member Width	75
8	Engine Top Height	906
9	Engine Bottom Height	185
10	Engine and Gearbox Width	1050
11	Front Bumper-Engine Distance	350
12	Front Shock Absorber Fixing Height	1000
13	Bonnet Leading Edge Height	870
14	Front Shock Absorber Fixing Width	1310
15	Front Bumper – Front Axle Distance	980
16	Front Axle – A-Pillar Distance	457
17	A-Pillar – B-Pillar Distance	1083
18	B-Pillar – Rear Axle Distance	1542
19	B-Pillar – C-Pillar Distance	1088
20	Roof Sill Bottom Height	1538
21	Roof Sill Top Height	1661
22	Floor Sill Bottom Height	215
23	Floor Sill Top Height	345

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

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

NOMINAL DESIGN RIDING POSITION

The driver seat back is positioned as close as possible to the manufacturer's design angle. For the passenger seat back, seat back is adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.



SEAT BACK ANGLE	Degrees
Driver Seat Back Angle	8.7° on headrest post
Passenger Seat Back Angle	12.4° on headrest post

SEAT FORE/AFT POSITIONS

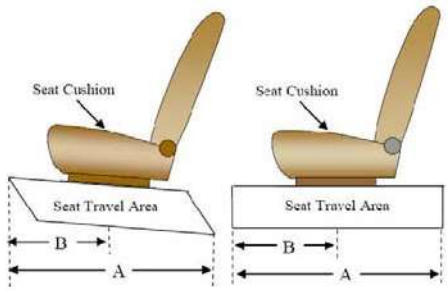
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	265 mm	133 mm (forward-most as 0)
Passenger Seat	32 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.

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



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

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

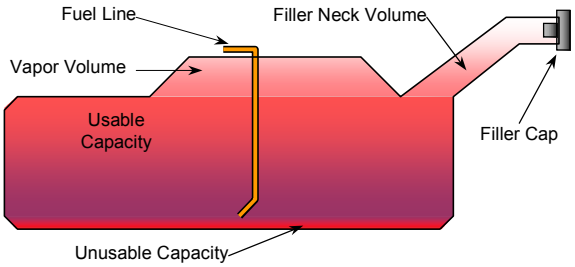
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	75.7
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	69.6 to 71.2
Actual Amount of Solvent used	70.4
1/3 of Usable Capacity	25.2

FUEL PUMP

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

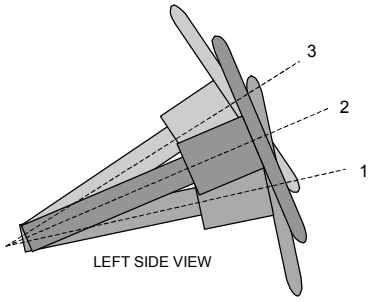
The vehicle is equipped with an electric fuel pump. The pump starts pumping fuel when the key is in the 'on' position. The fuel pipe is on the left side.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



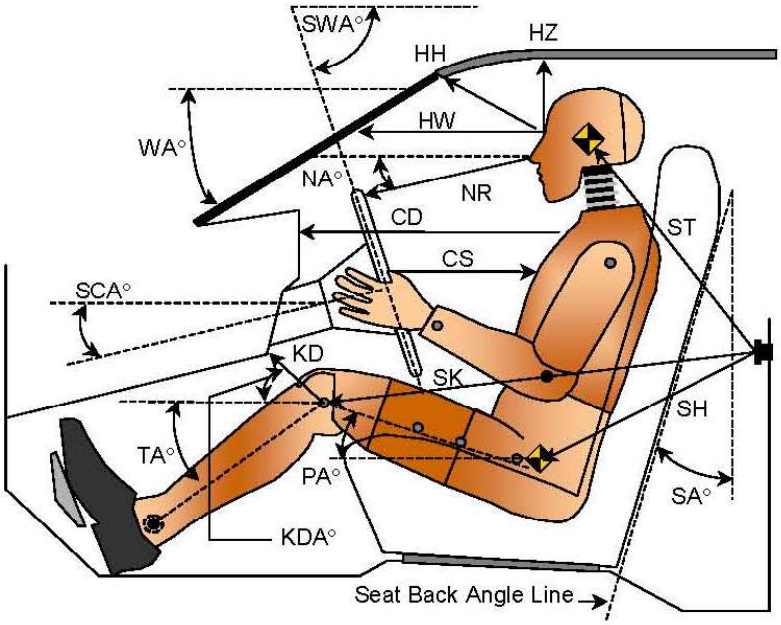
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	68.4	218
Geometric Center – Position 2	65.2	199
Uppermost – Position 3	62.0	180
Telescoping Steering Wheel Travel		38
Test Position	65.2	199

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

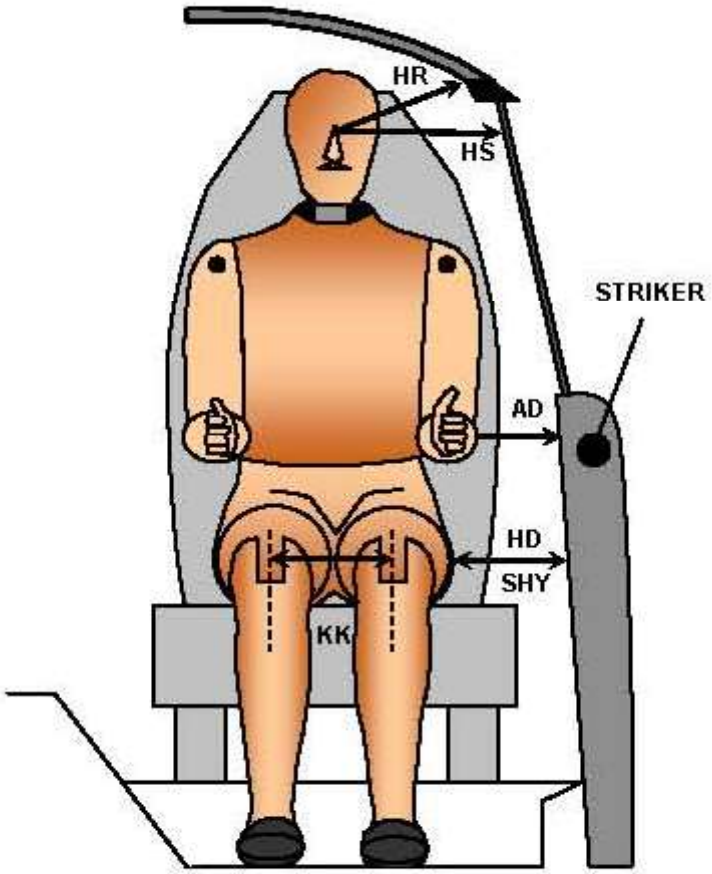
Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011



Code	Measurement Description	Driver S/N 036		Passenger S/N 634	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		31.9		
SWA°	Steering Wheel Angle		65.2		
SCA°	Steering Column Angle		24.8		
SA°	Seat Back Angle (on headrest post)		8.7		12.4
HZ	Head to Roof (Z)	216	90	222	90
HH	Head to Header	325	27.6	268	44.0
HW	Head to Windshield	692	0	659	0
NR	Nose to Rim	385	11.8		
CD	Chest to Dash	520		372	
CS	Chest to Steering Hub	277	1.1		
RA	Rim to Abdomen	175	0		
KDL	Left Knee to Dash	110	32.7	108	28.4
KDR	Right Knee to Dash	78	30.8	115	30.3
PA°	Pelvic Angle		24.1		19.5
TA°	Tibia Angle		58.4		58.6
SK	Striker to Knee	624	80.1	685	91.5
ST	Striker to Head	655	10.8	591	23.7
SH	Striker to H-Point	239	90.6	340	92.2

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

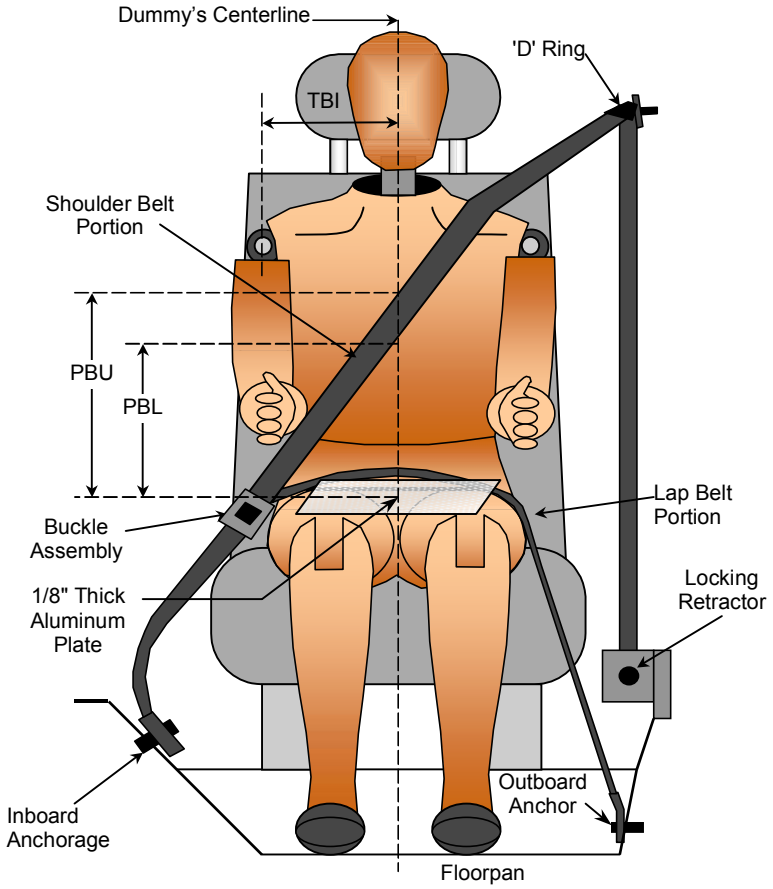


FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 036	Passenger S/N 634
		Length (mm)	
AD	Arm to Door	147	99
HD	H-Point to Door	172	183
HR	Head to Side Header	260	279
HS	Head to Side Window	385	423
KK	Knee to Knee	320	228
SHY	Striker to H-Point (Y Direction)	305	321
AA	Ankle to Ankle	335	184

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	360	345
PBL - Top surface of reference to belt lower edge	mm	280	250

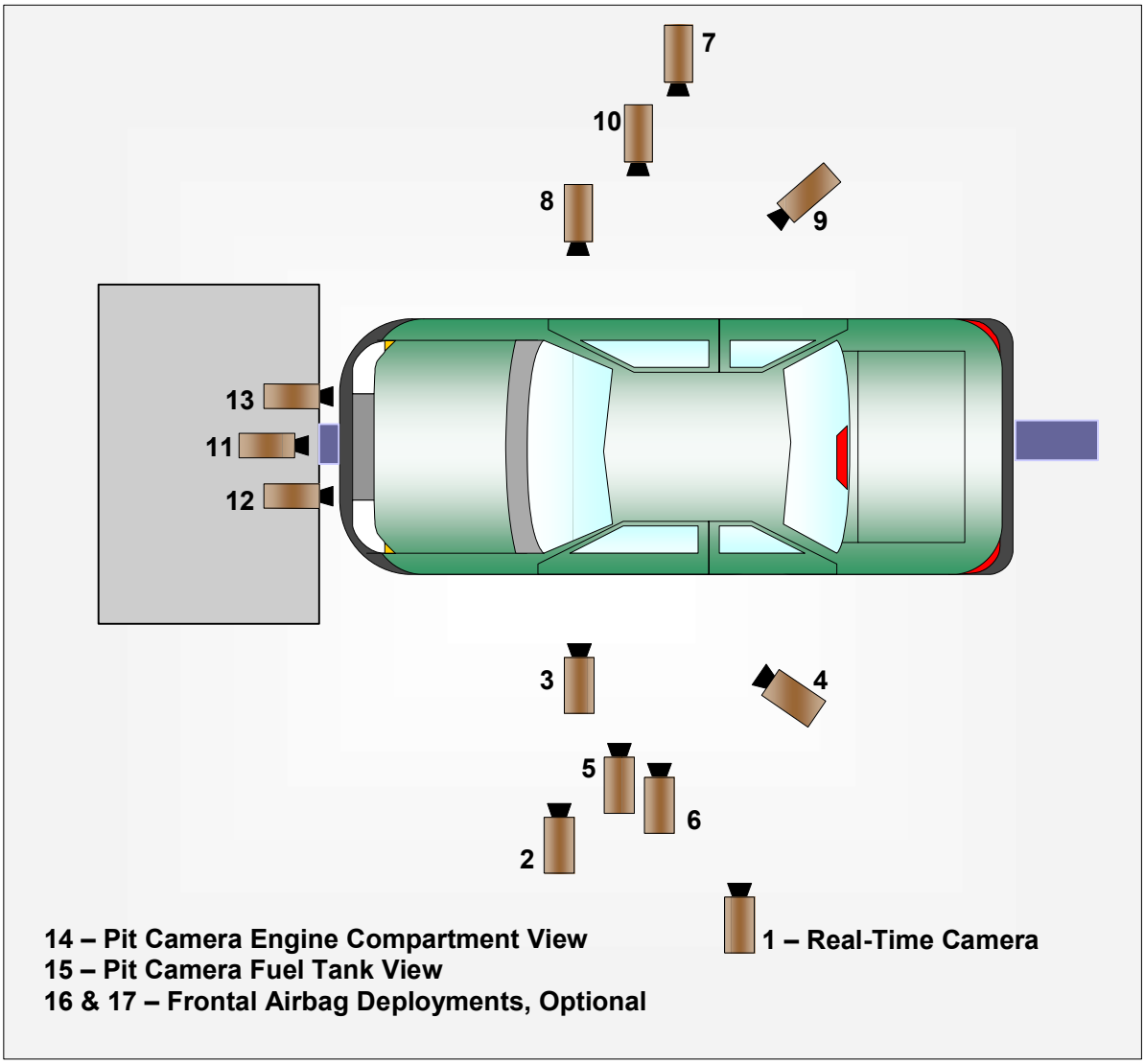
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	880	910
Lap Belt Length as measured on ATD	mm	605	550
Remainder of belt on reel	mm	1715	1720
Total Belt Length for Continuous Webbing Systems	mm	3200	3180

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

Test Vehicle:	2012 Chrysler Town & Country Minivan	NHTSA No.:	MC0300
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	9/27/2011

CAMERA POSITIONS FOR FRONTAL IMPACTS



14 – Pit Camera Engine Compartment View
15 – Pit Camera Fuel Tank View
16 & 17 – Frontal Airbag Deployments, Optional
1 – Real-Time Camera

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

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1460	-6750	-1820	35	1000
3	Left Front Half	1240	-5200	-1070	24	1000
4	Left Angle	5670	-5160	-1970	50	1000
5	Steering Column - Top	570	-5160	-1240	24	1000
6	Steering Column - Bottom	550	-5110	-830	24	1000
7	Right Overall	2340	7210	-1080	20	1000
8	Passenger Close-Up	1710	6520	-1810	35	1000
9	Right Front Half	1200	5180	-1060	24	1000
10	Right Angle	5870	4760	-1940	50	1000
11	Windshield	-320	0	-2860	20	1000
12	Driver Windshield	-30	-360	-2040	8.5	1000
13	Passenger Windshield	-30	360	-2040	8.5	1000
14	Pit Front	1040	0	3150	24	1000
15	Pit Rear	3020	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

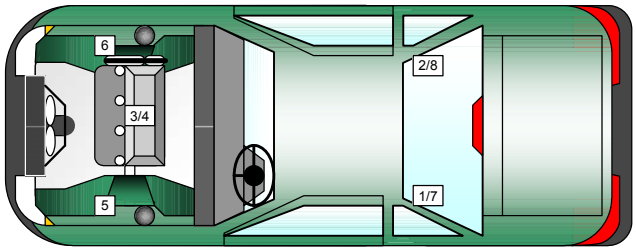
*COORDINATES:

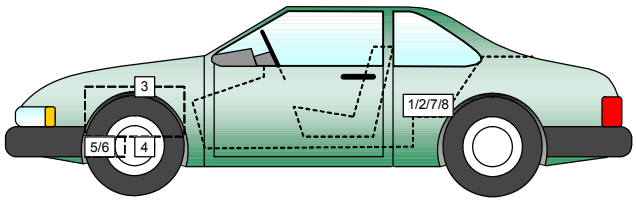
+X = forward of impact plane
+Y = right of monorail centerline
+Z = below ground level

Cameras 16 & 17 were not used for this test.

DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011





VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

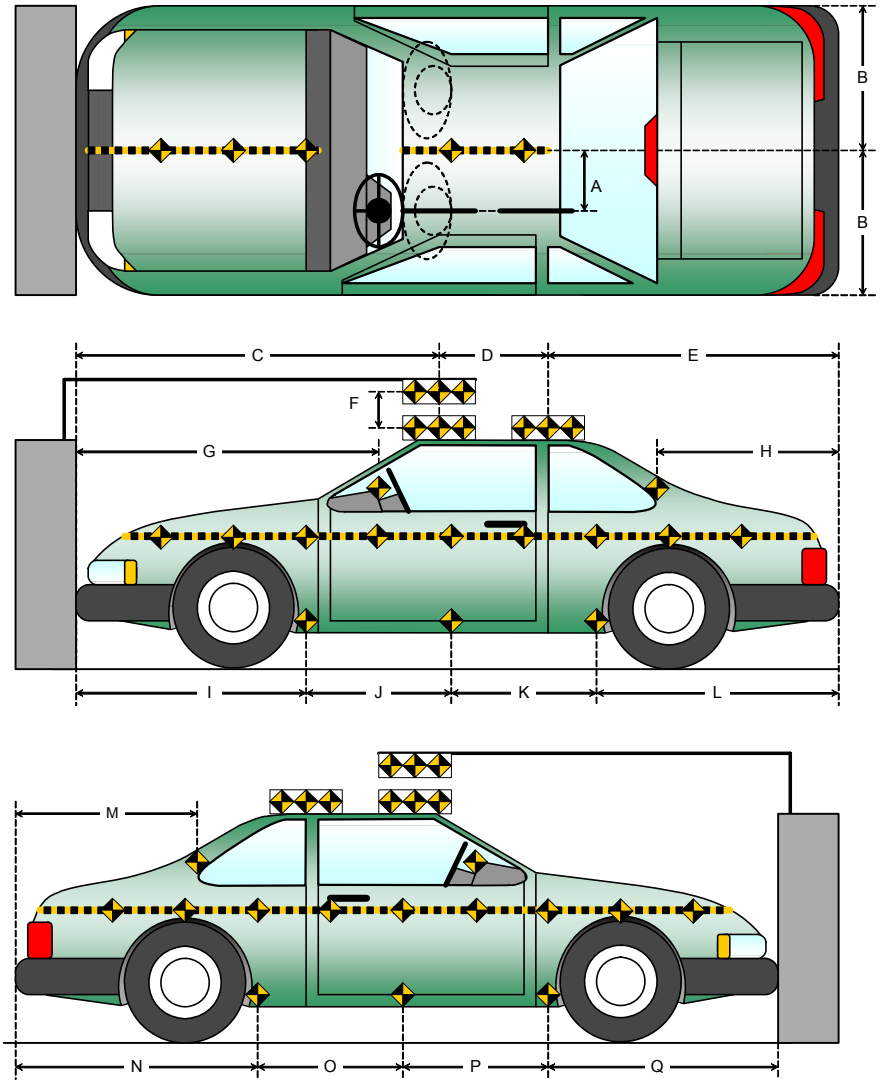
No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2185	-360	-200
2	Right Rear Accelerometer – X Direction	2185	360	-200
3	Engine Top X	4410	0	-910
4	Engine Bottom X	4410	0	-310
5	Left Brake Caliper X	4283	-735	-240
6	Right Brake Caliper X	4283	735	-240
7	Left Rear Accelerometer Redundant – X Direction	2185	-360	-200
8	Right Rear Accelerometer Redundant – X Direction	2185	360	-200

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: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

Item	Value (mm)
A	420
B	985
C	2425
D	660
E	2096
F	53
G	
H	1444
I	1447
J	1080
K	1080
L	1574
M	1444
N	1574
O	1080
P	1080
Q	1447



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

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

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: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

INSTRUMENTATION

Driver Dummy Data Channels	46
Passenger Dummy Data Channels	46
Vehicle Structure Accelerometers	8
Barrier Channels	128
Total	228

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: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 036	HIII 5% / 634
Head Contact	Airbag, Headrest	Airbag, Headrest, Seatbelt
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bag, Knee Bolster	Glovebox
Right Knee Contact	Knee Bag, 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

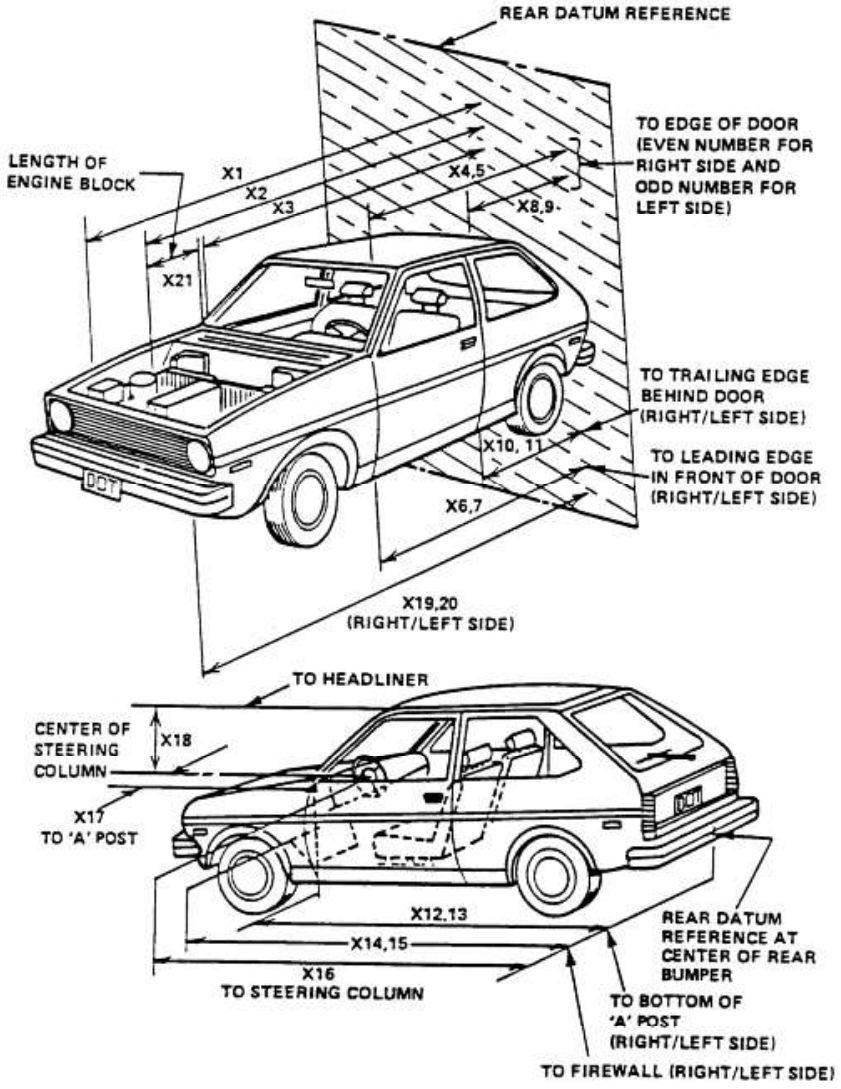
Measured Parameter	Units	Value
Left Side	mm	2720
Center	mm	2630
Right Side	mm	2595
Average	mm	2648

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Right Front (Passenger)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Knee Airbag	Yes	Yes	No	
Curtain Side Airbag	Yes	Disabled	Yes	Disabled
Torso/Abdomen/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: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	5181	4663	518
2	RSOV to Front of Engine	mm	4645	4400	245
3	RSOV to Firewall	mm	4290	4250	40
4	RSOV to Upper Leading Edge of Right Door	mm	3681	3680	1
5	RSOV to Upper Leading Edge of Left Door	mm	3681	3675	6
6	RSOV to Lower Leading Edge of Right Door	mm	3610	3610	0
7	RSOV to Lower Leading Edge of Left Door	mm	3610	3610	0
8	RSOV to Upper Trailing Edge of Right Door	mm	2610	2610	0
9	RSOV to Upper Trailing Edge of Left Door	mm	2610	2610	0
10	RSOV to Lower Trailing Edge of Right Door	mm	2607	2600	7
11	RSOV to Lower Trailing Edge of Left Door	mm	2607	2605	2
12	RSOV to Bottom of “A” Post of Right Side	mm	3563	3560	3
13	RSOV to Bottom of “A” Post of Left Side	mm	3570	3570	0
14	RSOV to Firewall, Right Side	mm	4218	4210	8
15	RSOV to Firewall, Left Side	mm	4245	4235	10
16	RSOV to Steering Column	mm	3194	3154	40
17	Center of Steering Column to “A” Post	mm	415	400	15
18	Center of Steering Column to Headliner	mm	440	430	10
19	RSOV to Right Side of Front Bumper	mm	5032	4680	352
20	RSOV to Left Side of Front Bumper	mm	5032	4580	452
21	Length of Engine Block	mm	500	500	0
RD	RSOV to Right Side of Dash Panel	mm	3388	3385	3
CD	RSOV to Center of Dash Panel	mm	3410	3410	0
LD	RSOV to Left Side of Dash Panel	mm	3400	3405	-5

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

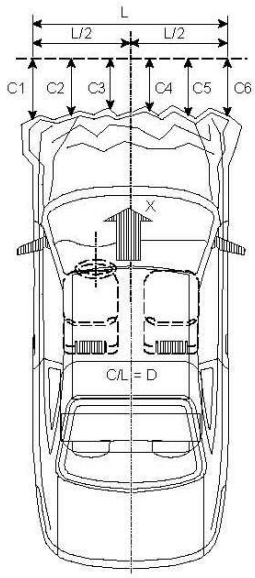
Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

VEHICLE INFORMATION

VIN: 2C4RC1BG3CR106922 Wheelbase (mm): 3080
Vehicle Size Category: MPV Test Weight (kg): 2272.5

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15
Cal. Procedure/Interval: MGA procedure / 6 month
Integration Algorithm: Trapezoidal Linearity: > 99%
Impact Velocity (km/h): 56.4
Velocity Change (km/h): 62.6
Time of Separation (msec): 124.1



CRUSH PROFILE

Collision Deformation Classification: Frontal
Midpoint of Damage: Centerline
Damage Region Length (mm): 1224
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5032	4580	452
C2	Crush zone 2 at left side	mm	5095	4575	520
C3	Crush zone 3 at left side	mm	5128	4630	498
C4	Crush zone 4 at right side	mm	5128	4685	443
C5	Crush zone 5 at right side	mm	5095	4696	399
C6	Crush zone 6 at right side	mm	5032	4680	352
L	C1 TO C6	mm	1224	1218	6

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

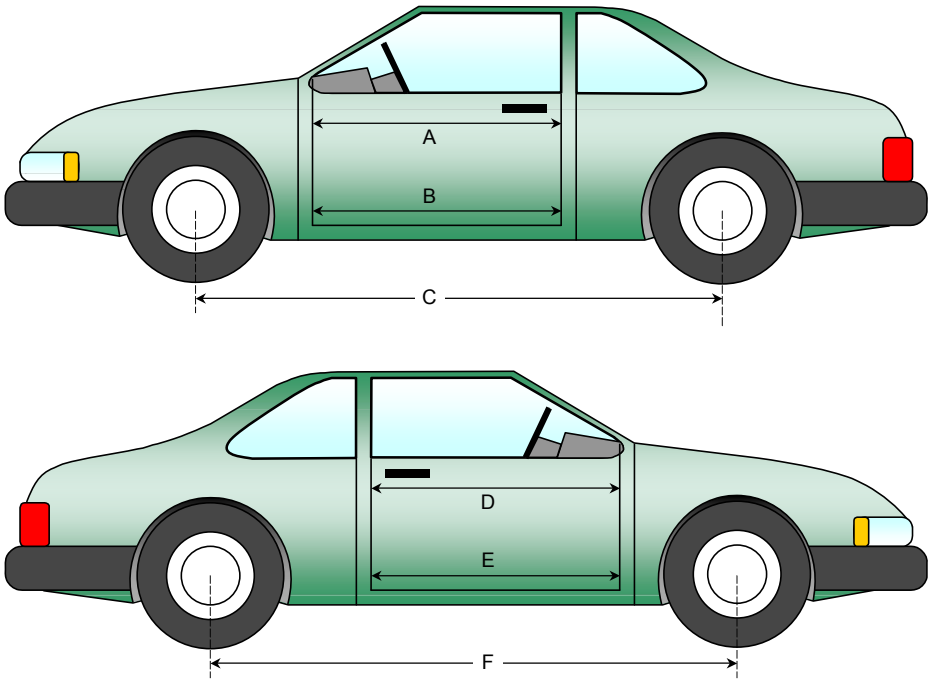
Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	980	980	0
B	Left Side Lower	mm	965	965	0
D	Right Side Upper	mm	980	980	0
E	Right Side Lower	mm	965	965	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3080	3005	75
F	Right Side Wheelbase	mm	3080	3002	78



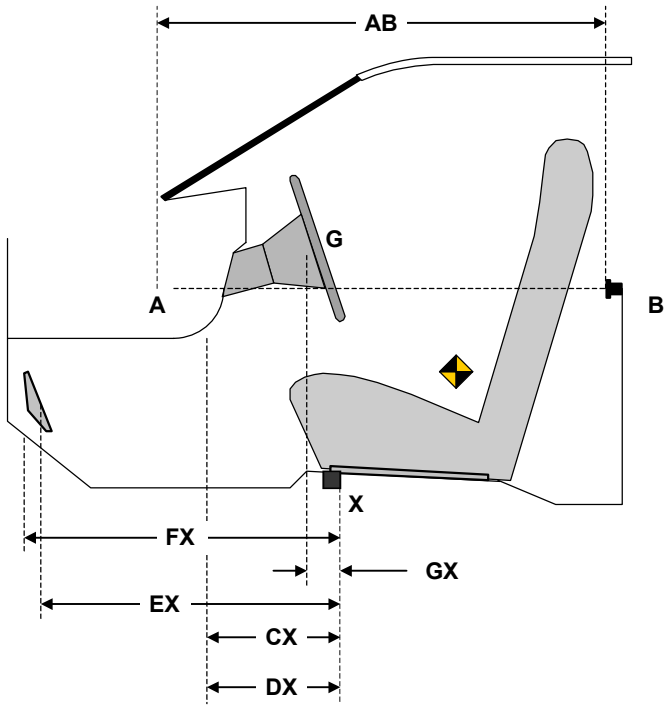
DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	860	860	0
CX	Left Knee Bolster to X	mm	226	233	-7
DX	Right Knee Bolster to X	mm	205	215	-10
EX	Brake Pedal to X	mm	520	485	35
FX	Foot Rest to X	mm	565	527	38
GX	Center of Steering Column Wheel Hub to X	mm	60	110	-50

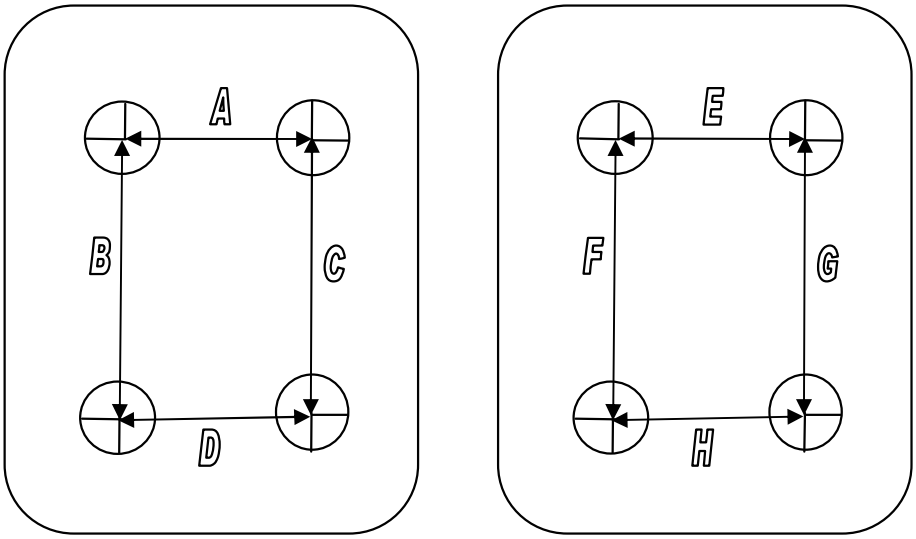
X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011



Driver Passenger

TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	365	365	0
B	mm	365	361	4
C	mm	365	362	3
D	mm	365	365	0
E	mm	365	365	0
F	mm	365	360	5
G	mm	365	361	4
H	mm	365	365	0

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

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

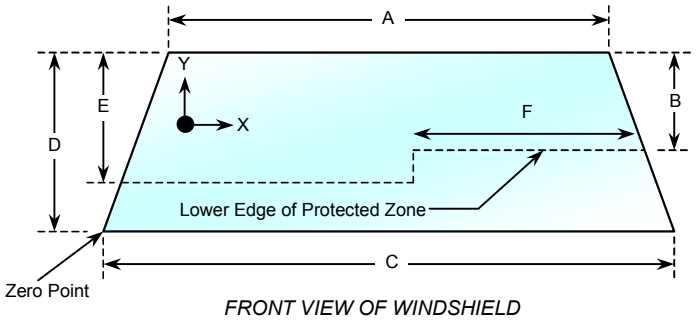
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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	2459	2459	100
Right Side	2459	2459	100
Total	4918	4918	100



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1422
B	mm	585
C	mm	1708
D	mm	894
E	mm	584
F	mm	501

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:	2012 Chrysler Town & Country Minivan	NHTSA No.:	MC0300
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	9/27/2011

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

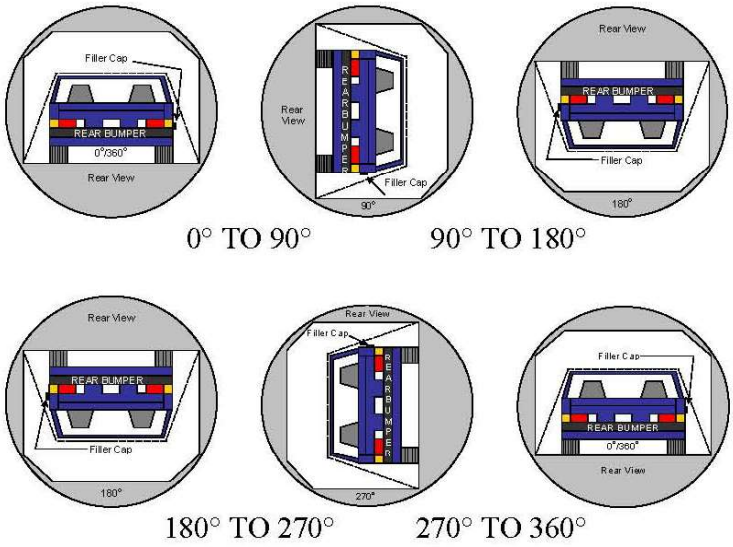
Test Time: 10:19 am Temperature: 21° C

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

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

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°	121	300	421
90° to 180°	115	300	415
180° to 270°	109	300	409
270° to 360°	115	300	415

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

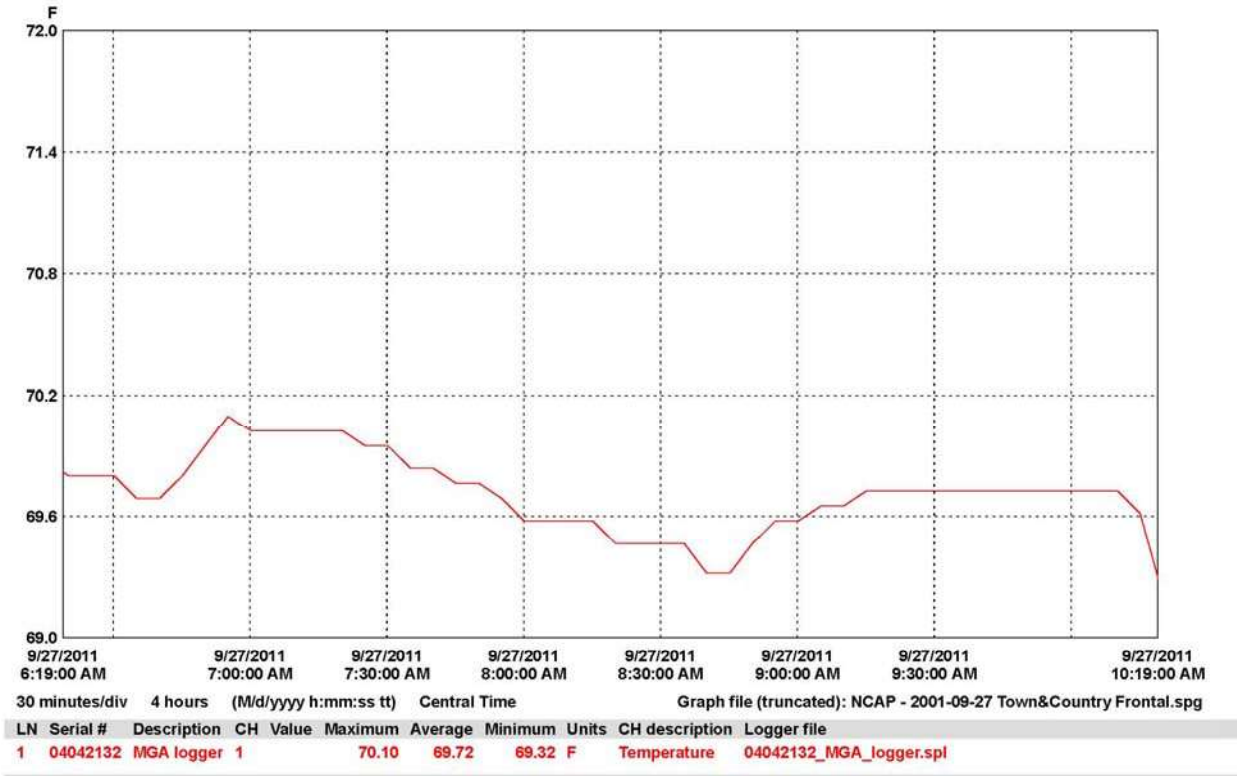
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

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: 2012 Chrysler Town & Country Minivan NHTSA No.: MC0300
Test Program: NCAP Frontal Barrier Impact Test Test Date: 9/27/2011

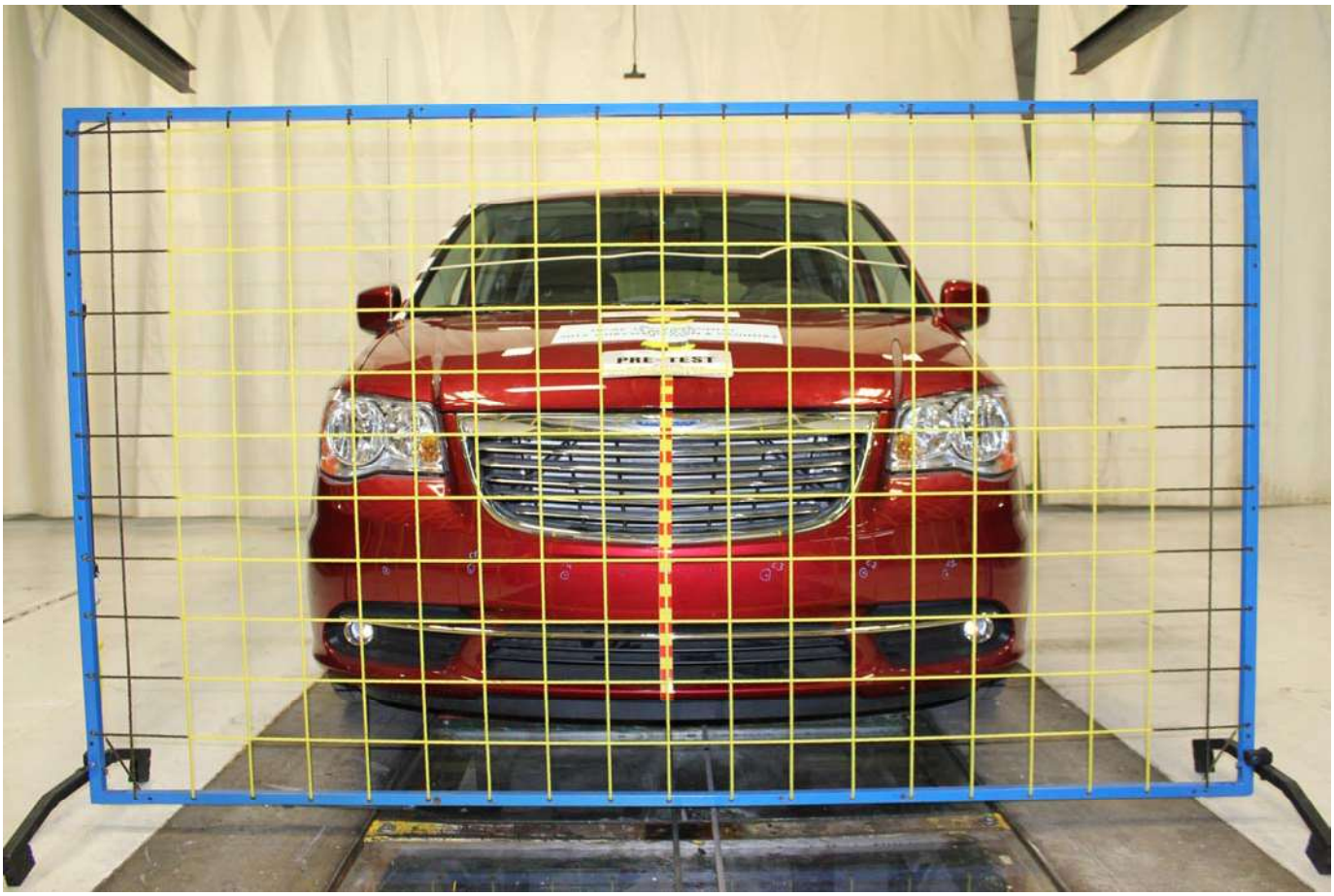


LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	04042132	MGA logger	1		70.10	69.72	69.32	F	Temperature	04042132_MGA_logger.spl

APPENDIX A

PHOTOGRAPHS

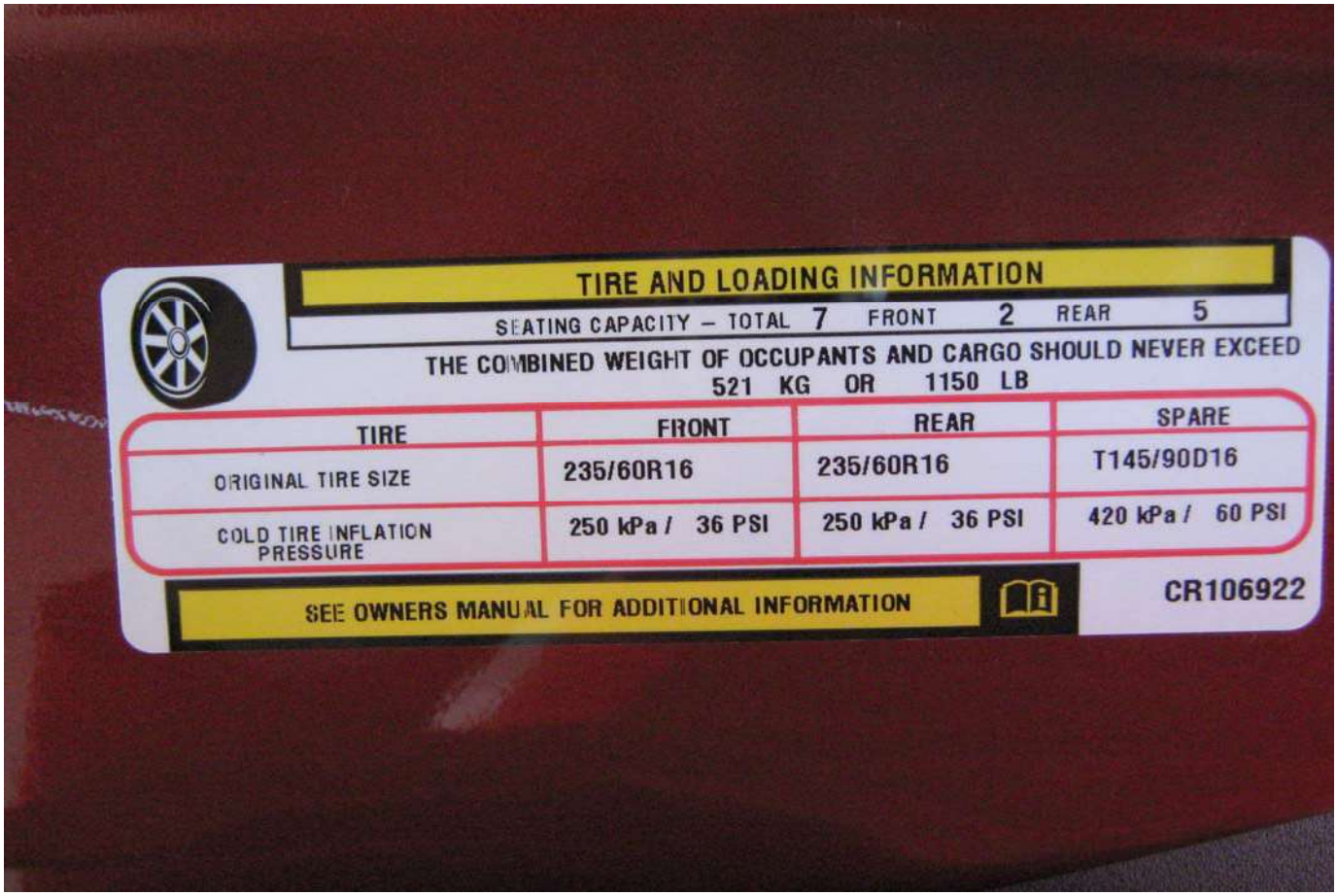
TABLE OF PHOTOGRAPHS



Load Cell Location

Load Cell Wall

Manufacturer's Label

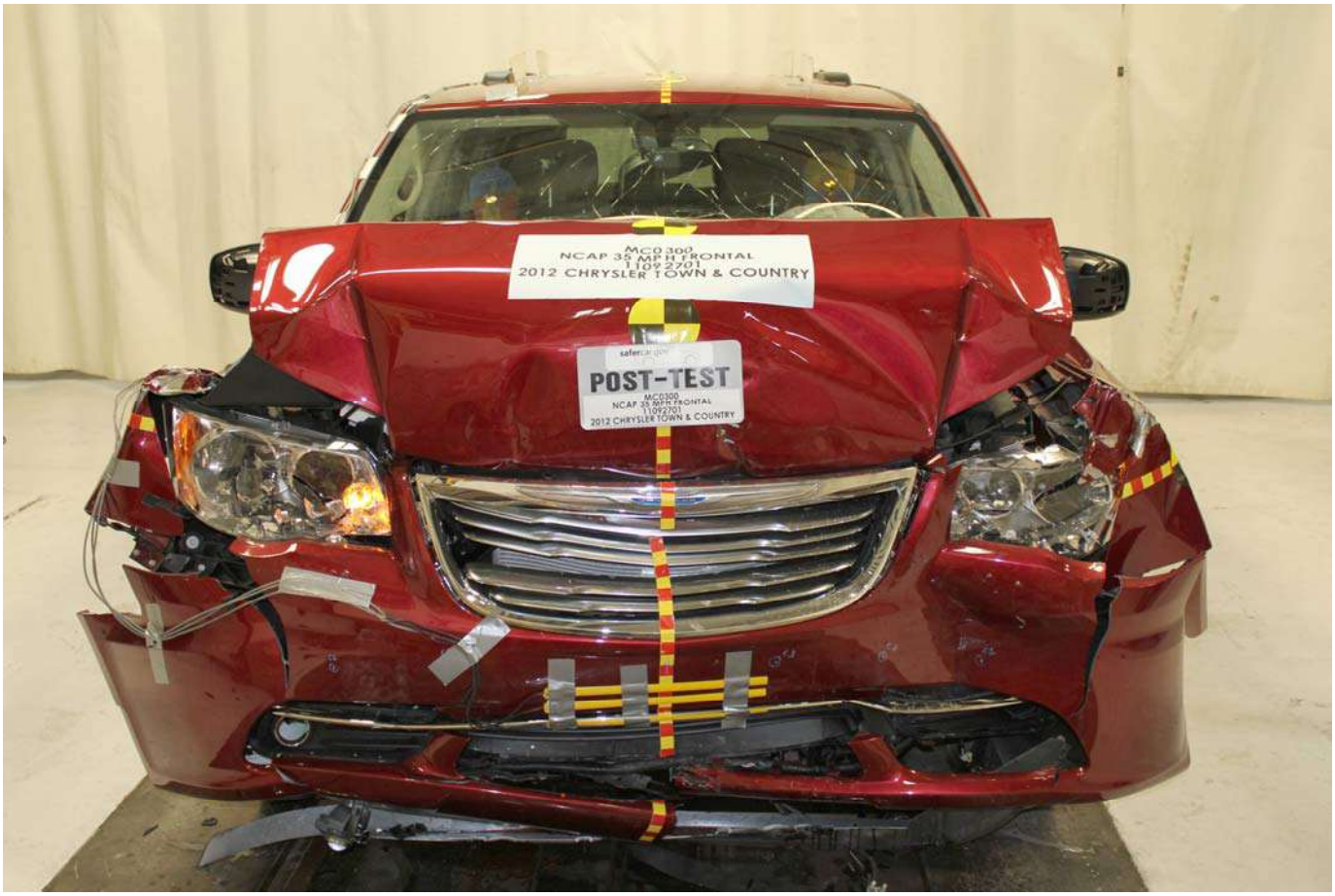


Tire Placard

2012 Chrysler Town & Country Frontal As Delivered

Left Rear Three-Quarter View, As Received

Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle

Pre-Test Left View of Test Vehicle

Post-Test Left View of Test Vehicle

Pre-Test Right View of Test Vehicle

Post-Test Right View of Test Vehicle

Pre-Test Right Front Three-Quarter View

Post-Test Right Front Three-Quarter View

Pre-Test Left Rear Three-Quarter View

Post-Test Left Rear Three-Quarter View

Pre-Test Windshield View

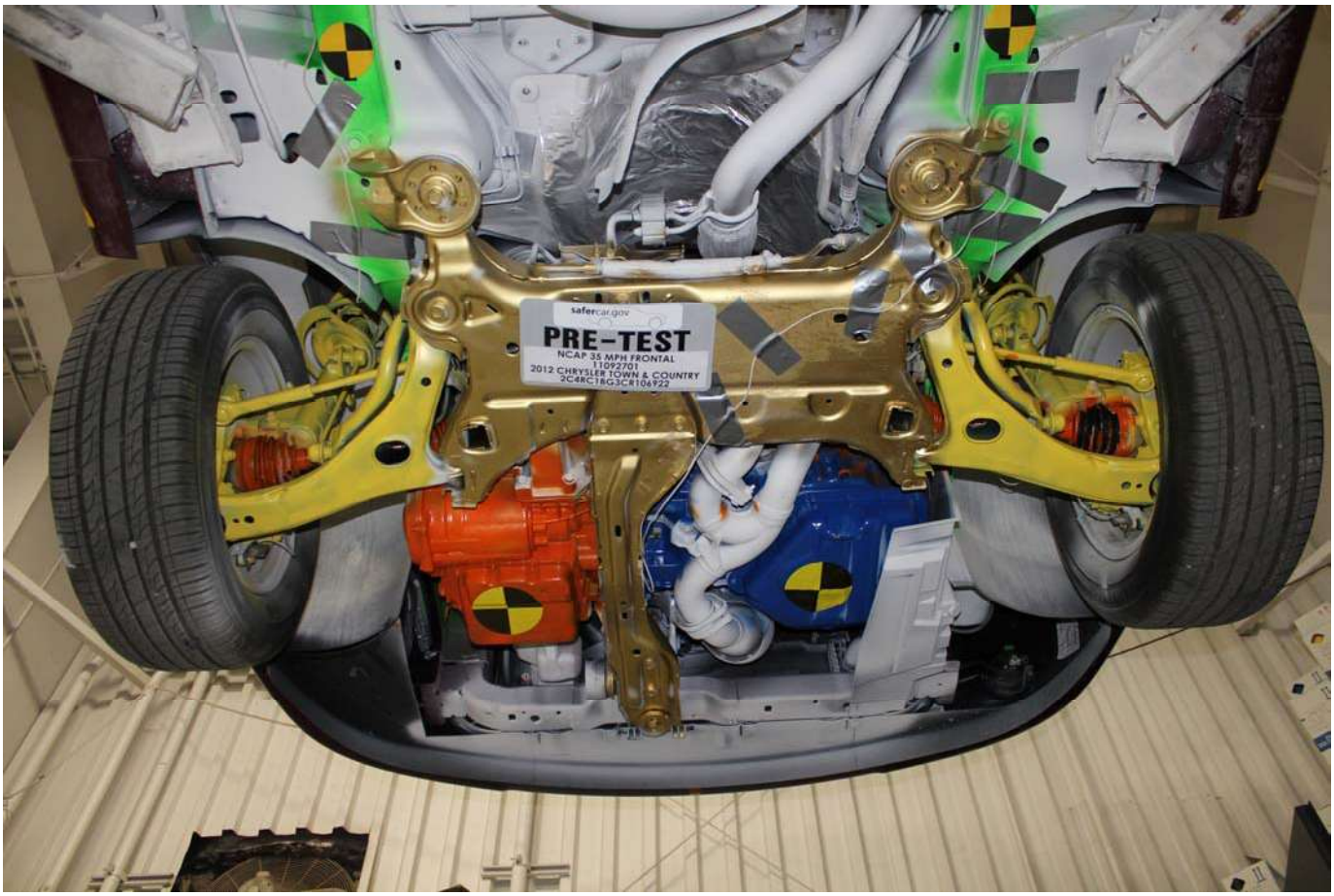
Post-Test Windshield View

Pre-Test Engine Compartment View

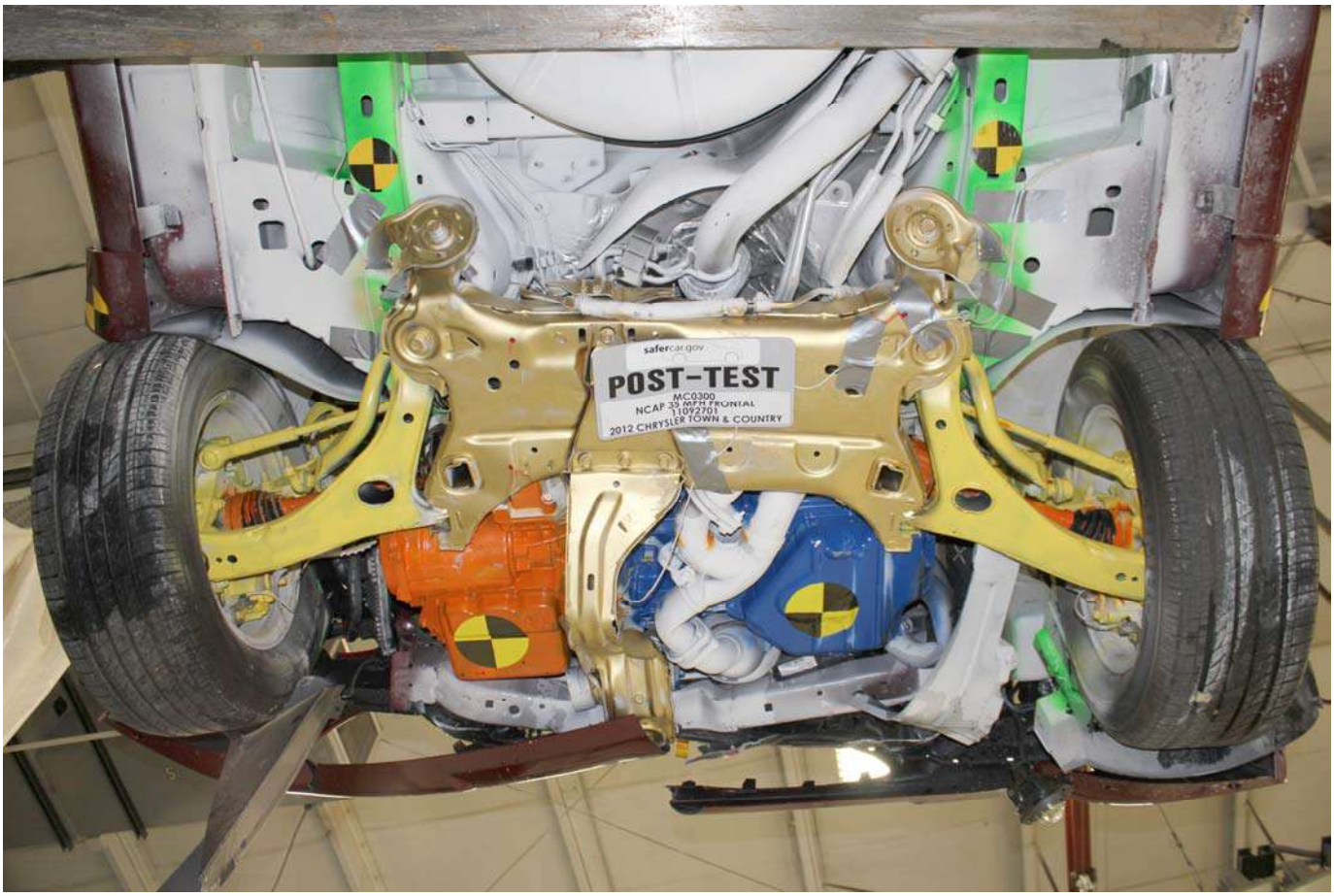
Post-Test Engine Compartment View

Pre-Test Fuel Filler Cap View

Post-Test Fuel Filler Cap View

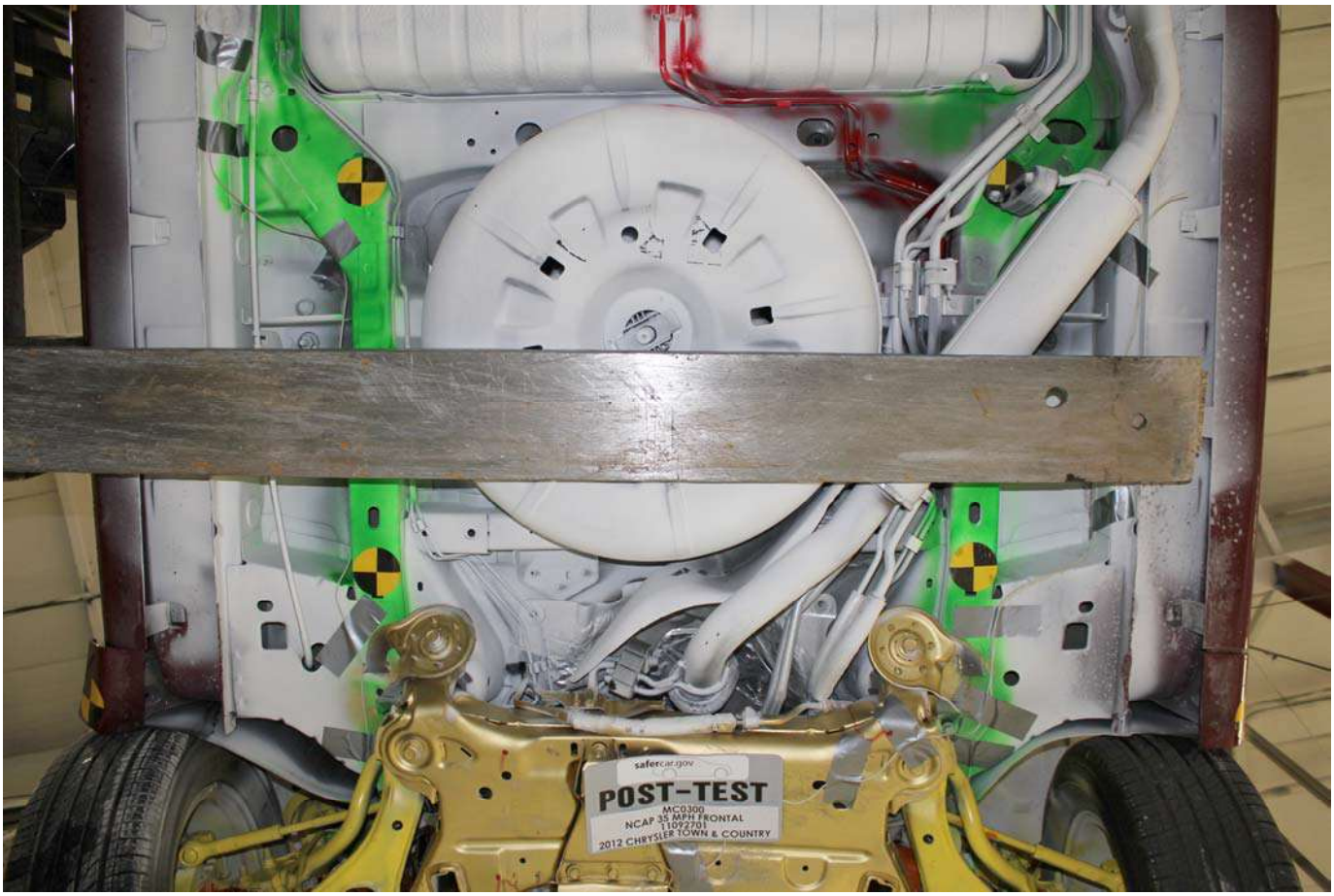


Pre-Test Front Underbody View



Post-Test Front Underbody View

Pre-Test Mid Front Underbody View



Post-Test Mid Front Underbody View

Pre-Test Mid Rear Underbody View

Post-Test Mid Rear Underbody View

Pre-Test Rear Underbody View

Post-Test Rear Underbody View

Pre-Test Dummy Cable Routing

Post-Test Dummy Cable Routing

Pre-Test Driver Dummy Front View

Post-Test Driver Dummy Front View

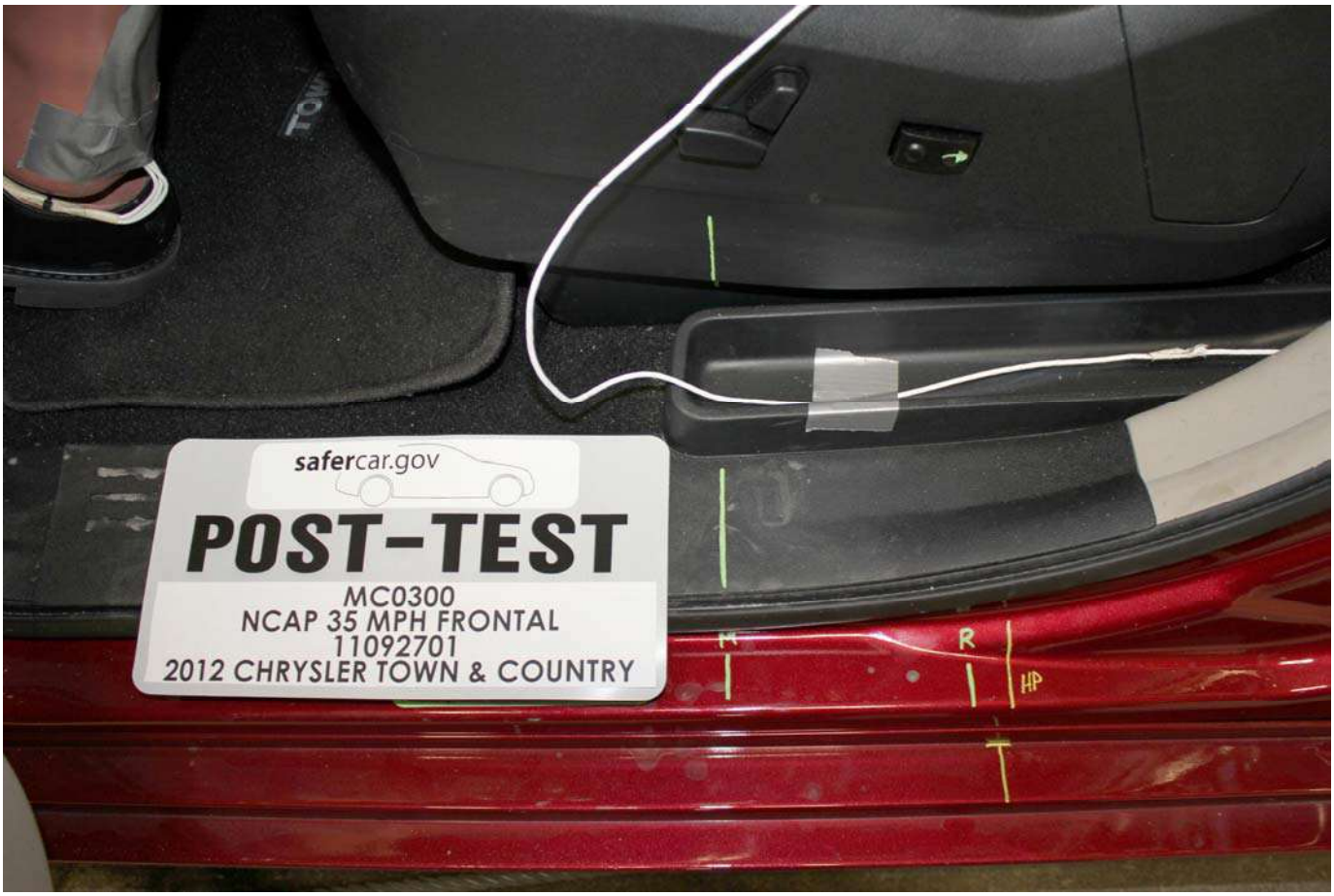
Pre-Test Driver Dummy Window View

Post-Test Driver Dummy Window View

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

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

Pre-Test Driver's Seat Fore-Aft Markings



Post-Test Driver's Seat Fore-Aft Markings

Pre-Test Driver Dummy Feet

Post-Test Driver Dummy Feet

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

Post-Test Driver's Side Left Knee Bolster

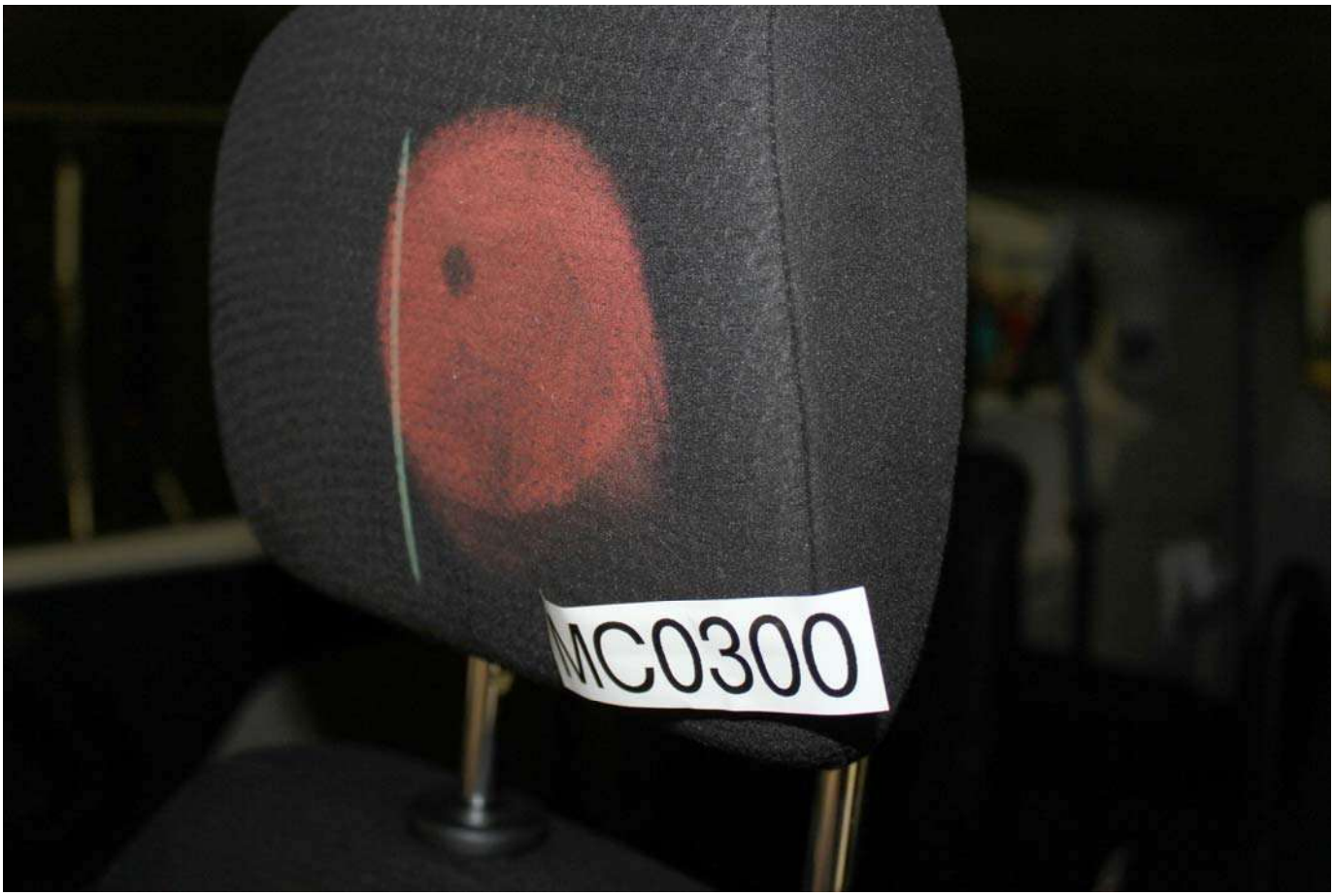
Post-Test Driver's Side Right Knee Bolster

Pre-Test Driver's Side Floorpan

Post-Test Driver's Side Floorpan

Post-Test Driver Dummy Face

Post-Test Driver Dummy Contact with Airbag



Post-Test Driver Dummy Contact with Headrest

Post-Test Driver Dummy Contact with Knee Bag

Pre-Test View of the Steering Wheel

Post-Test View of the Steering Wheel

Pre-Test Passenger Dummy Front View

Post-Test Passenger Dummy Front View

Pre-Test Passenger Dummy Window View

Post-Test Passenger Dummy Window View

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

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

Pre-Test Passenger's Seat Fore-Aft Markings

Post-Test Passenger's Seat Fore-Aft Markings

Pre-Test Passenger Dummy Feet

Post-Test Passenger Dummy Feet

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

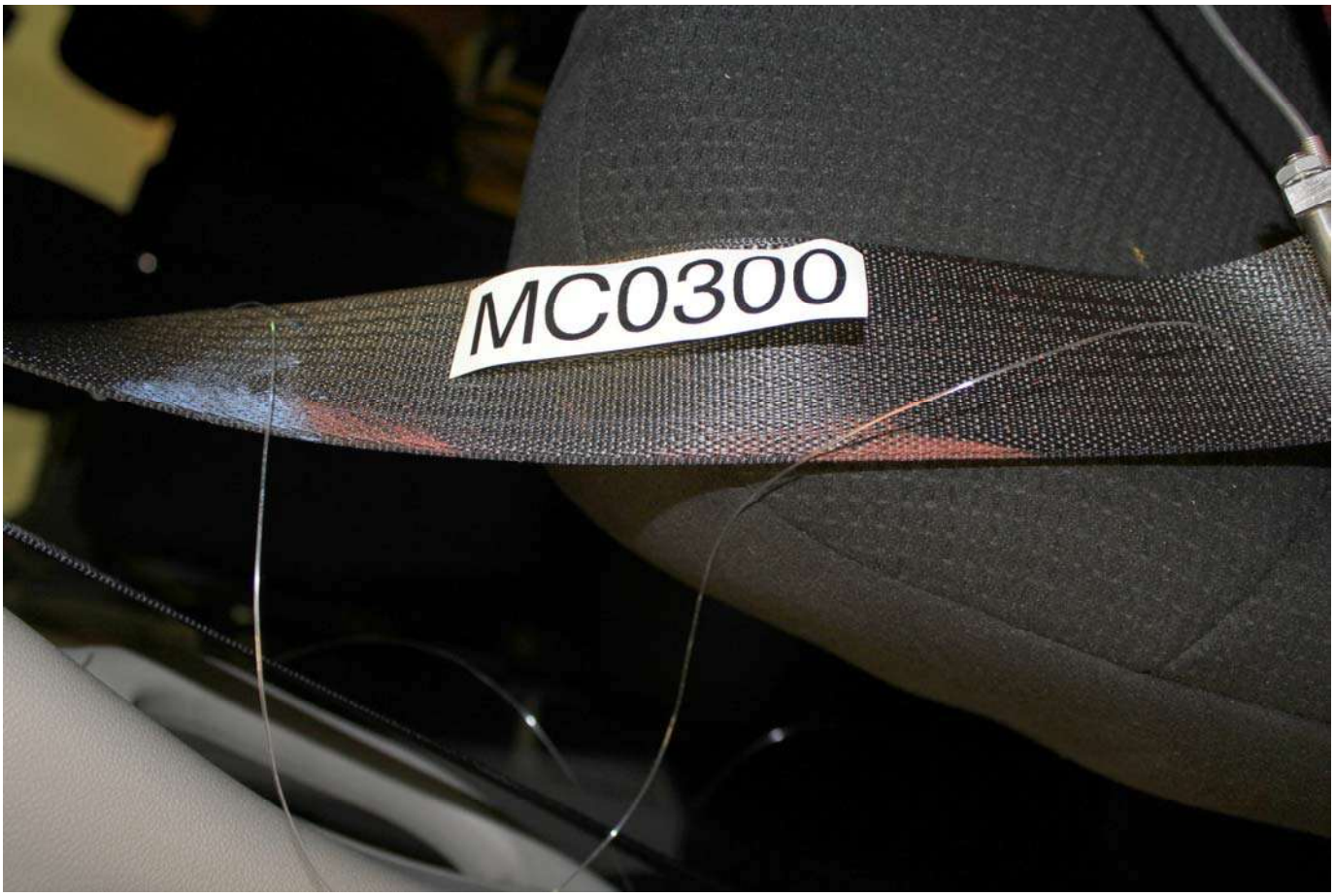
Post-Test Passenger's Side Knee Bolster (without dummy)

Pre-Test Passenger's Side Floorpan

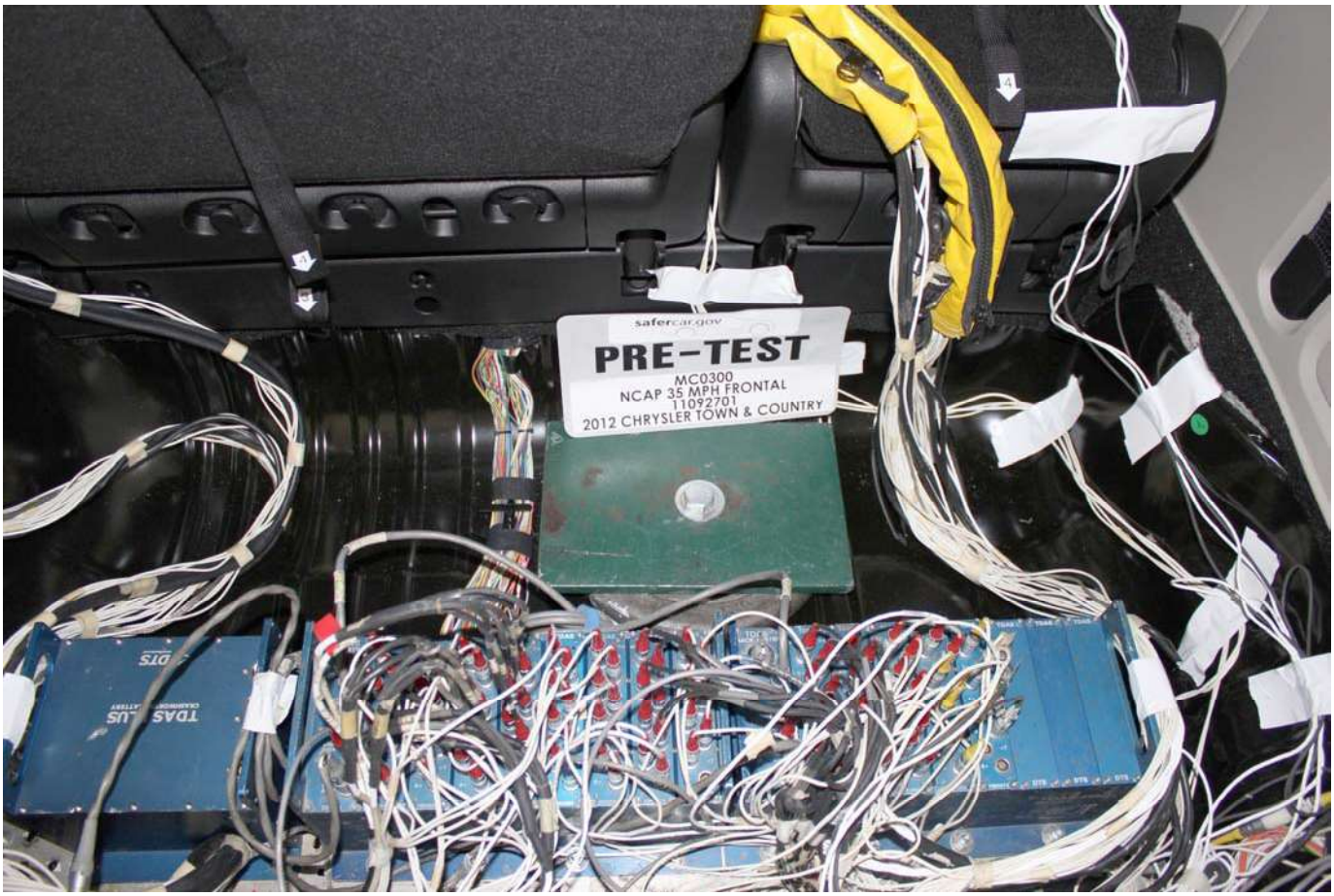
Post-Test Passenger's Side Floorpan

Post-Test Passenger Dummy Contact with Airbag

Post-Test Passenger Dummy Contact with Headrest



Post-Test Passenger Dummy Contact with Seatbelt



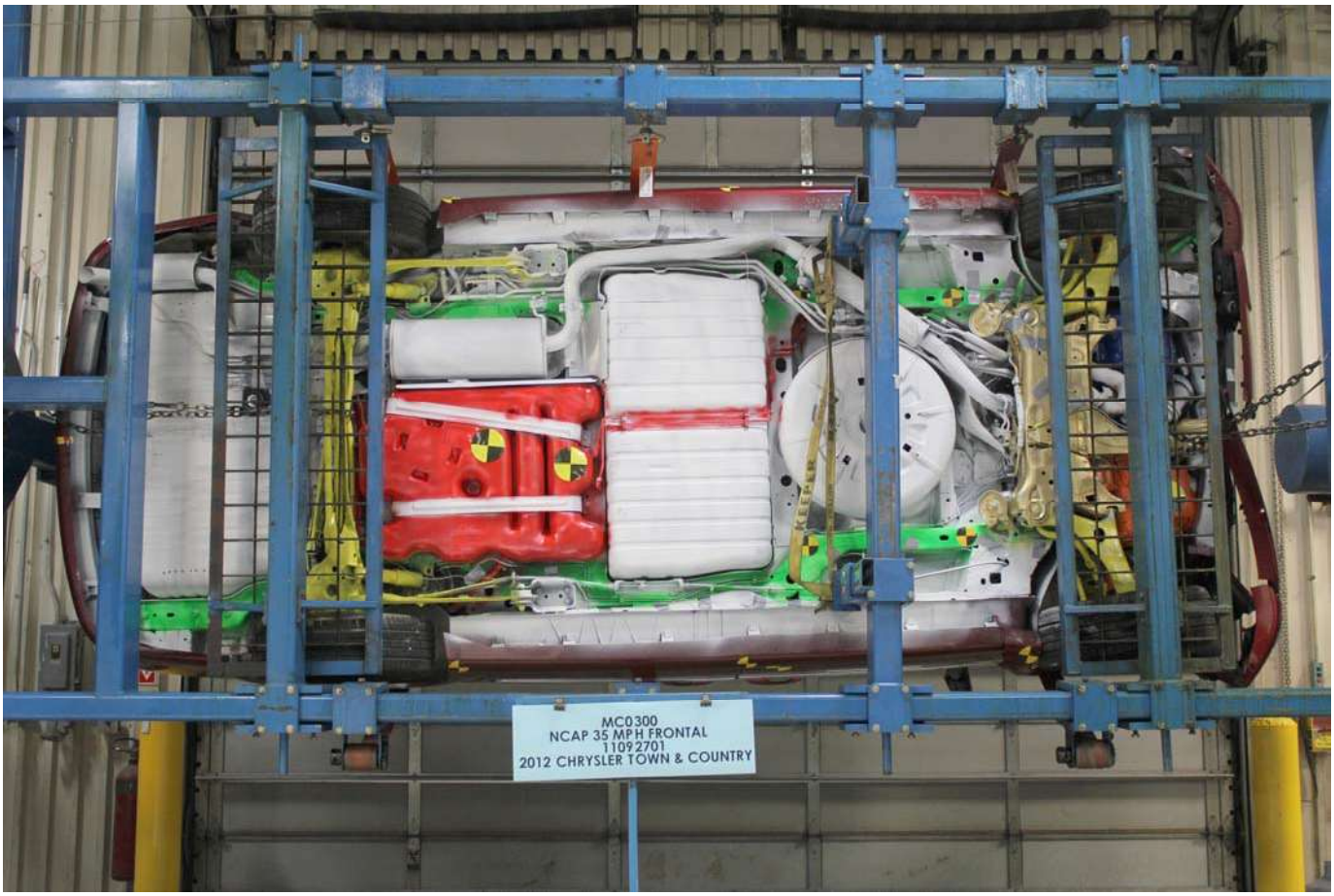
Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

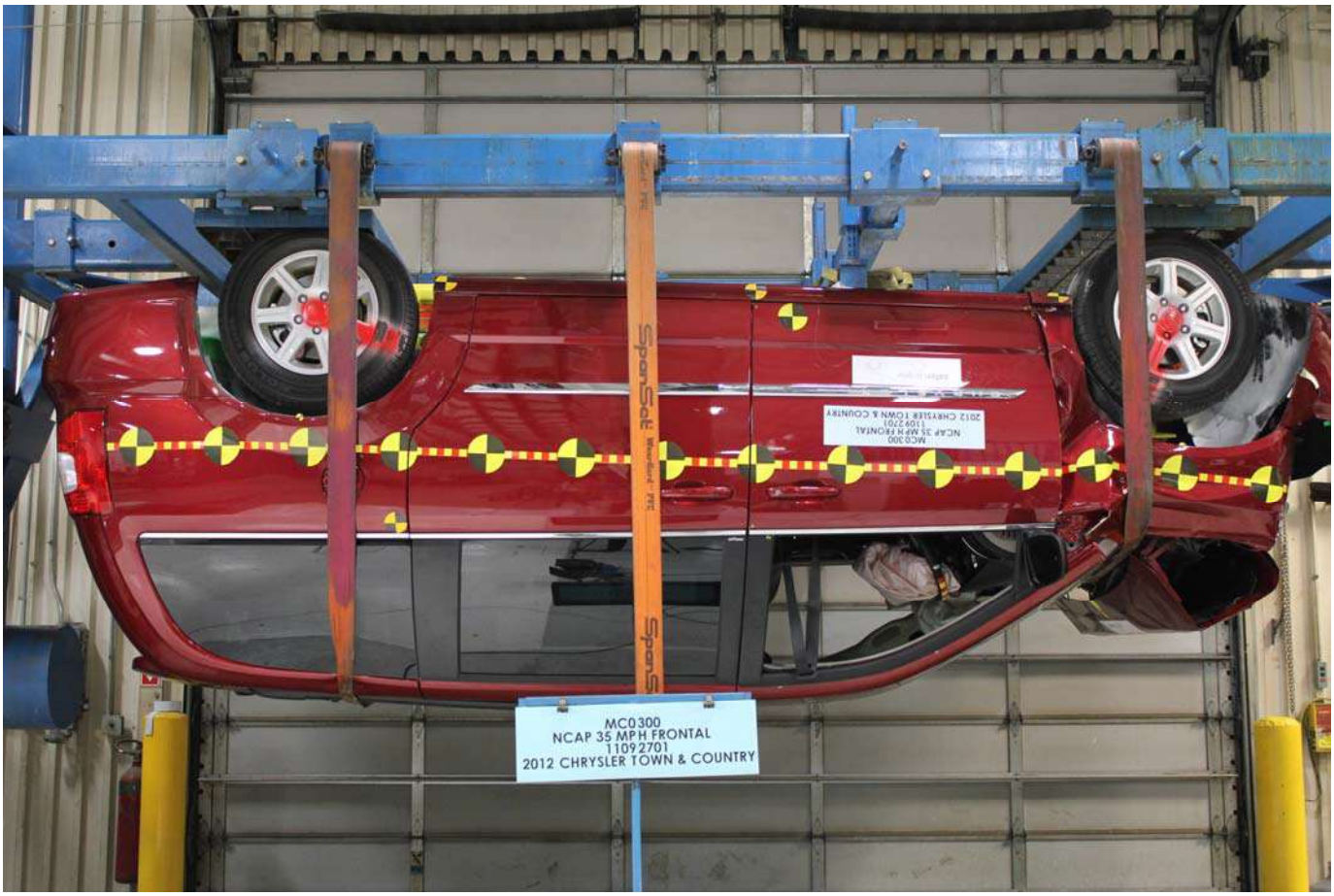
Post-Test Stoddard Solvent Spillage Location View

Post-Test Speed Trap Read-Out

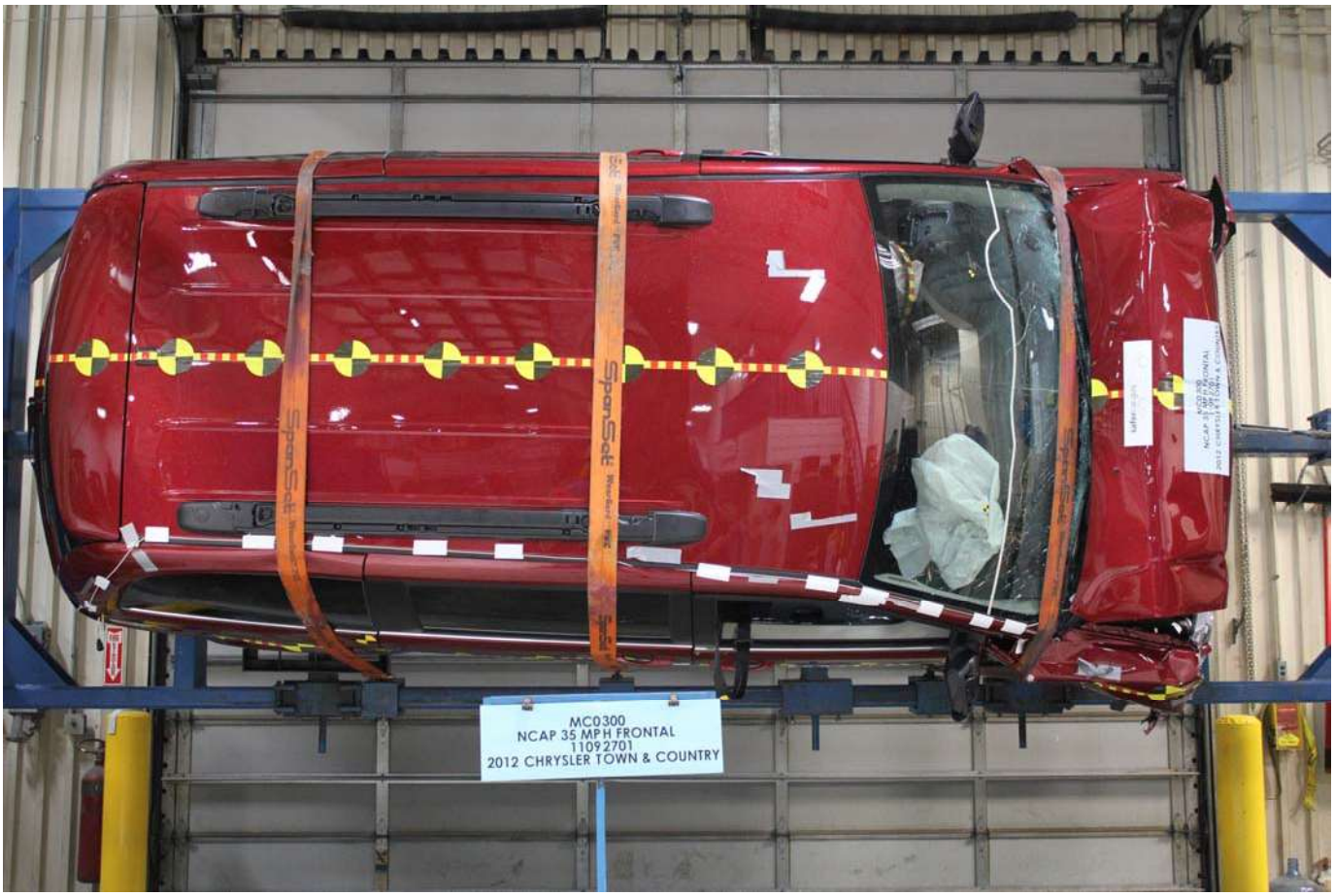
Vehicle at 0 Degrees on Static Rollover Device



Vehicle at 90 Degrees on Static Rollover Device



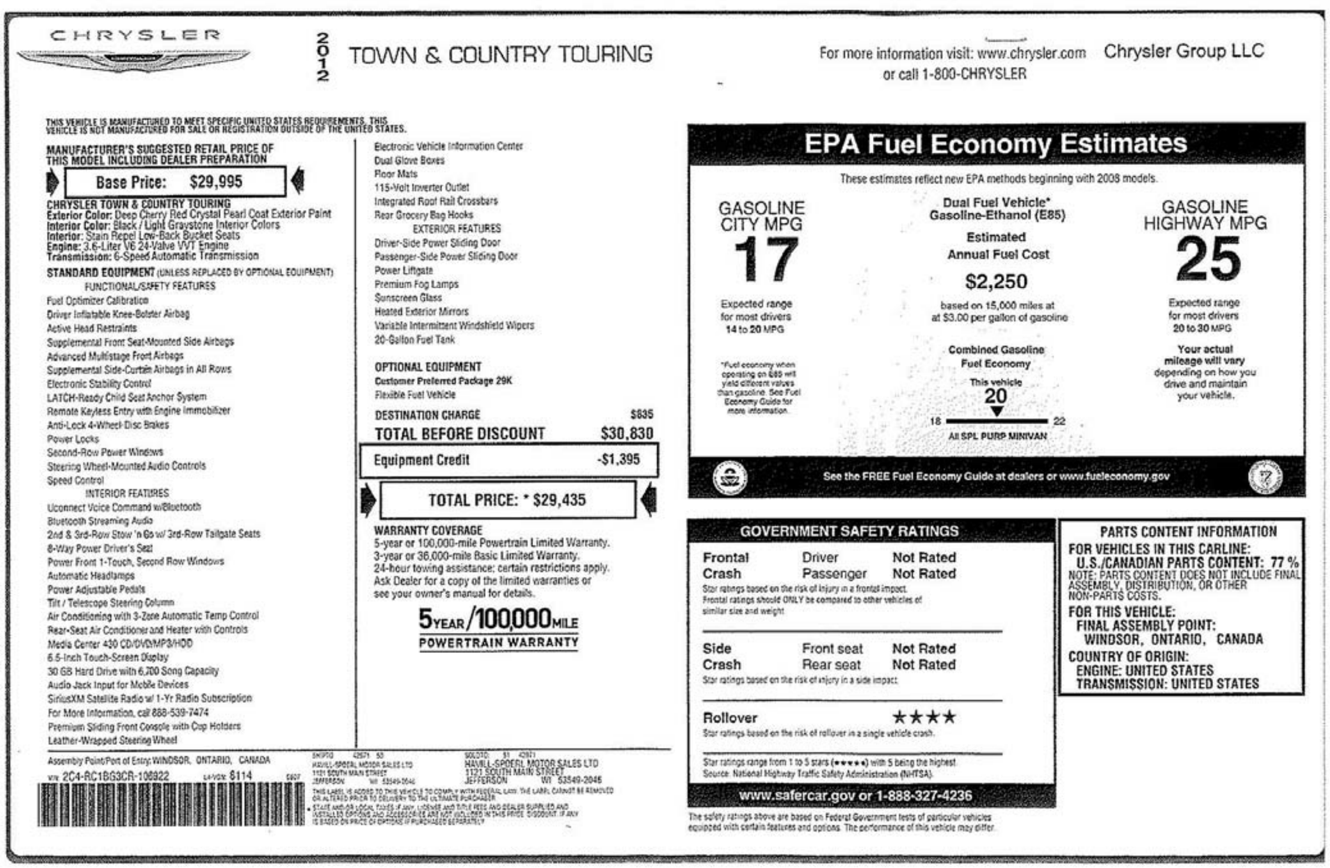
Vehicle at 180 Degrees on Static Rollover Device



Vehicle at 270 Degrees on Static Rollover Device

Vehicle at 360 Degrees on Static Rollover Device

2012 Chrysler Town & Country Frontal Impact Event



CHRYSLER

2012 TOWN & COUNTRY TOURING

For more information visit: www.chrysler.com
or call 1-800-CHRYSLER

Chrysler Group LLC

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $29,995

CHRYSLER TOWN & COUNTRY TOURING
Exterior Color: Deep Cherry Red Crystal Pearl Coat Exterior Paint
Interior Color: Black / Light Graystone Interior Colors
Interior: Stain Repel Low-Back Bucket Seats
Engine: 3.6-Liter V6 24-Valve VVT Engine
Transmission: 6-Speed Automatic Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES

Fuel Optimizer Calibration
Driver Inflatable Knee-Bolster Airbag
Active Head Restraints
Supplemental Front Seat-Mounted Side Airbags
Advanced Multistage Front Airbags
Supplemental Side-Curtain Airbags in All Rows
Electronic Stability Control
LATCH-Ready Child Seat Anchor System
Remote Keyless Entry with Engine Immobilizer
Anti-Lock 4-Wheel Disc Brakes
Power Locks
Second-Row Power Windows
Steering Wheel-Mounted Audio Controls
Speed Control

INTERIOR FEATURES

Uconnect Voice Command w/Bluetooth
Bluetooth Streaming Audio
2nd & 3rd-Row Stow 'n Go w/ 3rd-Row Tailgate Seats
8-Way Power Driver's Seat
Power Front 1-Touch, Second Row Windows
Automatic Headlamps
Power Adjustable Pedals
Tilt / Telescope Steering Column
Air Conditioning with 3-Zone Automatic Temp Control
Rear-Seat Air Conditioner and Heater with Controls
Media Center 430 CD/DVD/MP3/HDD
6.5-Inch Touch-Screen Display
30 GB Hard Drive with 6,700 Song Capacity
Audio Jack Input for Mobile Devices
SiriusXM Satellite Radio w/ 1-Yr Radio Subscription
For More Information, call 888-539-7474
Premium Sliding Front Console with Cup Holders
Leather-Wrapped Steering Wheel
Electronic Vehicle Information Center
Dual Glove Boxes
Floor Mats
115-Volt Inverter Outlet
Integrated Roof Rail Crossbars
Rear Grocery Bag Hooks

EXTERIOR FEATURES

Driver-Side Power Sliding Door
Passenger-Side Power Sliding Door
Power Liftgate
Premium Fog Lamps
Sunscreen Glass
Heated Exterior Mirrors
Variable Intermittent Windshield Wipers
20-Gallon Fuel Tank

OPTIONAL EQUIPMENT
Customer Preferred Package 29K
Flexible Fuel Vehicle

DESTINATION CHARGE	$835
TOTAL BEFORE DISCOUNT	**$30,830**
Equipment Credit	-$1,395

TOTAL PRICE: * $29,435

WARRANTY COVERAGE
5-year or 100,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
24-hour towing assistance; certain restrictions apply.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5YEAR/100,000MILE POWERTRAIN WARRANTY

Assembly Point/Port of Entry: WINDSOR, ONTARIO, CANADA
VIN 2C4-RC1BG3CR-108922 LA-VON $114

SHIP TO 42571 50
HAVILL-SPOERL MOTOR SALES LTD
1121 SOUTH MAIN STREET
JEFFERSON WI 53549-2046

SOLD TO 51 42571
HAVILL-SPOERL MOTOR SALES LTD
1121 SOUTH MAIN STREET
JEFFERSON WI 53549-2046

THIS LABEL IS AFFIXED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.
* STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA Fuel Economy Estimates

These estimates reflect new EPA methods beginning with 2008 models.

GASOLINE CITY MPG
17
Expected range for most drivers 14 to 20 MPG

*Fuel economy when operating on E85 will yield different values than gasoline. See Fuel Economy Guide for more information.

Dual Fuel Vehicle*
Gasoline-Ethanol (E85)

Estimated Annual Fuel Cost
$2,250
based on 15,000 miles at at $3.00 per gallon of gasoline

Combined Gasoline Fuel Economy
This vehicle 20
18 — 22
All SPL PURP MINIVAN

GASOLINE HIGHWAY MPG
25
Expected range for most drivers 20 to 30 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

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver	Not Rated
	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.

Side Crash	Front seat	Not Rated
	Rear seat	Not Rated

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

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).

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

The safety ratings above are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ.

PARTS CONTENT INFORMATION
FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 77 %
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
WINDSOR, ONTARIO, CANADA
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

Monroney Label

APPENDIX B

DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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

Driver Head X Redundant

Driver Head Y Redundant

Driver Head Z Redundant

Driver Upper Neck Force Y

Driver Upper Neck Moment X

Driver Upper Neck Moment Z

Driver Chest X Redundant

Driver Chest Y Redundant

Driver Chest Z Redundant

Driver Pelvis X

Driver Pelvis Y

Driver Pelvis Z

Driver Left Femur Redundant

Driver Right Femur Redundant

Driver Left Upper Tibia Moment X

Driver Left Upper Tibia Moment Y

Driver Left Upper Tibia Force Z

Driver Left Lower Tibia Moment X

Driver Left Lower Tibia Moment Y

Driver Left Lower Tibia Force Z

Driver Right Upper Tibia Moment X

Driver Right Upper Tibia Moment Y

Driver Right Upper Tibia Force Z

Driver Right Lower Tibia Moment X

Driver Right Lower Tibia Moment Y

Driver Right Lower Tibia Force Z

Driver Left Foot Fore Z

Driver Left Foot Aft X

Driver Left Foot Aft Z

Driver Right Foot Fore Z

Driver Right Foot Aft X

Driver Right Foot Aft Z

Driver Lap Belt Force

Driver Shoulder Belt Force

Passenger Head X Redundant

Passenger Head Y Redundant

Passenger Head Z Redundant

Passenger Upper Neck Force Y

Passenger Upper Neck Moment X

Passenger Upper Neck Moment Z

Passenger Chest X Redundant

Passenger Chest Y Redundant

Passenger Chest Z Redundant

Passenger Pelvis X

Passenger Pelvis Y

Passenger Pelvis Z

Passenger Left Femur Redundant

Passenger Right Femur Redundant

Passenger Left Upper Tibia Moment X

Passenger Left Upper Tibia Moment Y

Passenger Left Upper Tibia Force Z

Passenger Left Lower Tibia Moment X

Passenger Left Lower Tibia Moment Y

Passenger Left Lower Tibia Force Z

Passenger Right Upper Tibia Moment X

Passenger Right Upper Tibia Moment Y

Passenger Right Upper Tibia Force Z

Passenger Right Lower Tibia Moment X

Passenger Right Lower Tibia Moment Y

Passenger Right Lower Tibia Force Z

Passenger Left Foot Fore Z

Passenger Left Foot Aft X

Passenger Left Foot Aft Z

Passenger Right Foot Fore Z

Passenger Right Foot Aft X

Passenger Right Foot Aft Z

Passenger Lap Belt Force

Passenger Shoulder Belt Force

Left Rear Seat Crossmember X

Right Rear Seat Crossmember X

Vehicle Engine Top X

Vehicle Engine Bottom X

Vehicle Left Brake Caliper X

Vehicle Right Brake Caliper X

Left Rear Seat Crossmember Xr

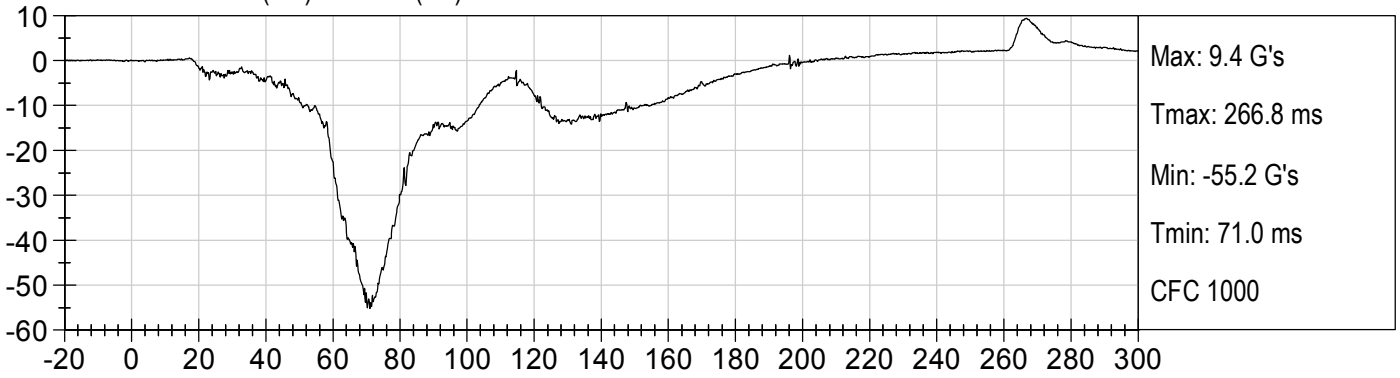
Right Rear Seat Crossmember Xr

Advanced Research Load Cell Barrier – 128 channels

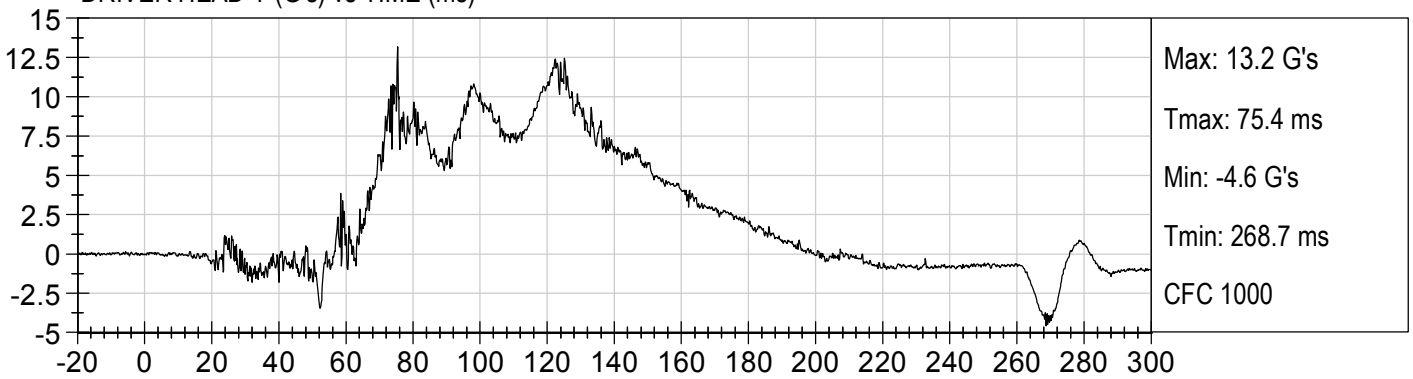
NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)

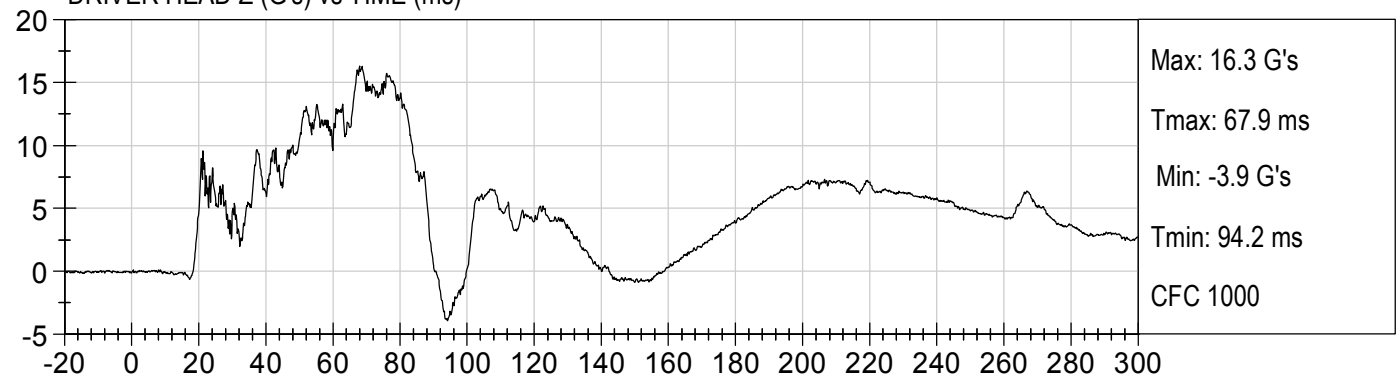
DRIVER HEAD X (G's) vs TIME (ms)



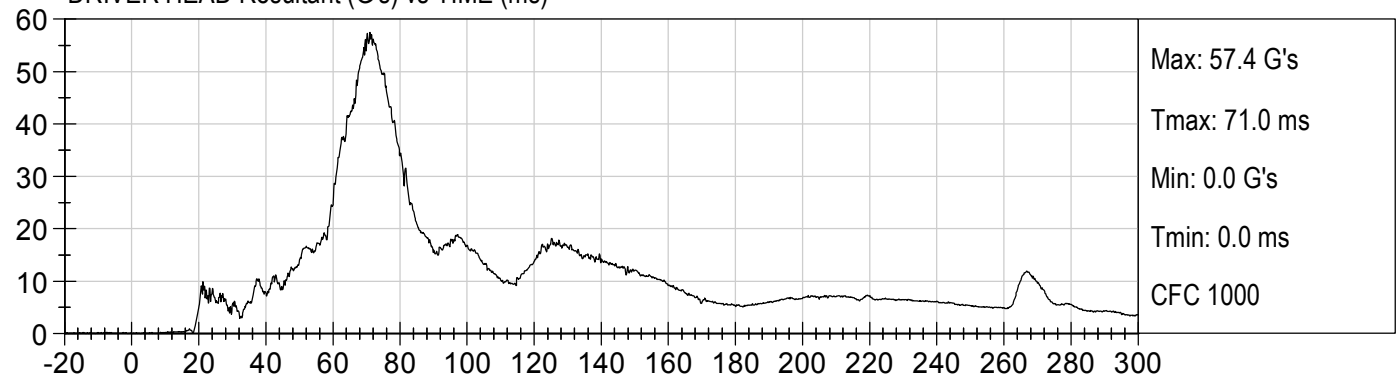
DRIVER HEAD Y (G's) vs TIME (ms)



DRIVER HEAD Z (G's) vs TIME (ms)

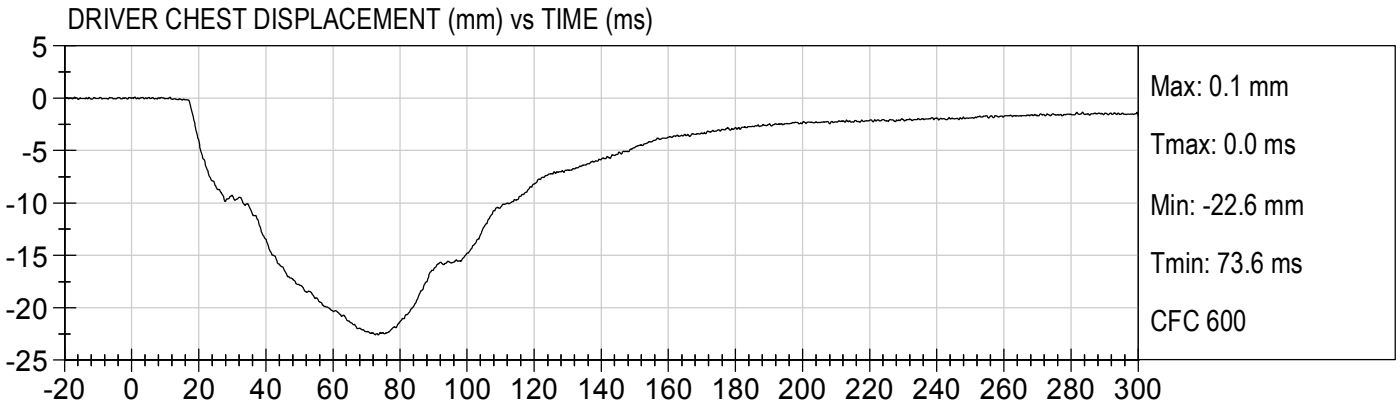


DRIVER HEAD Resultant (G's) vs TIME (ms)



NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

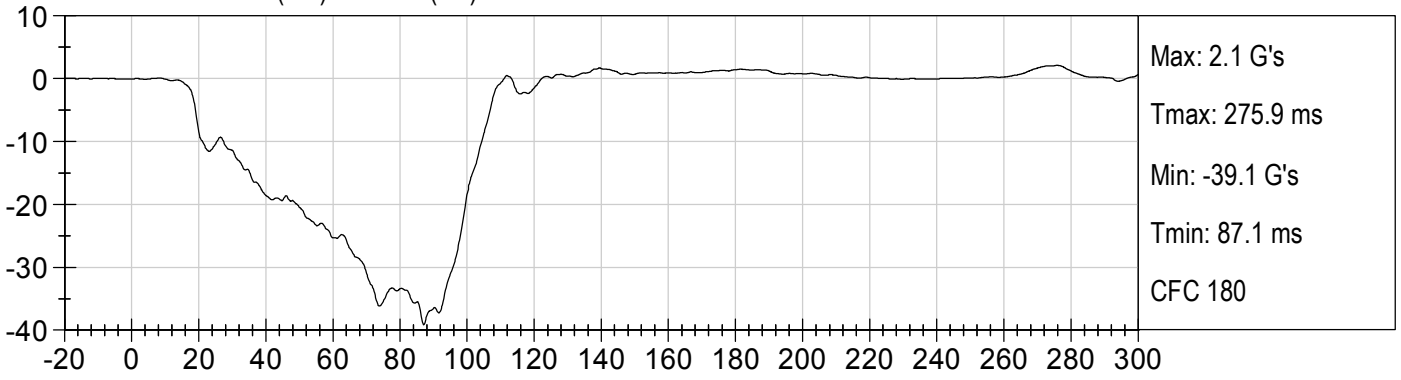
Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)



NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

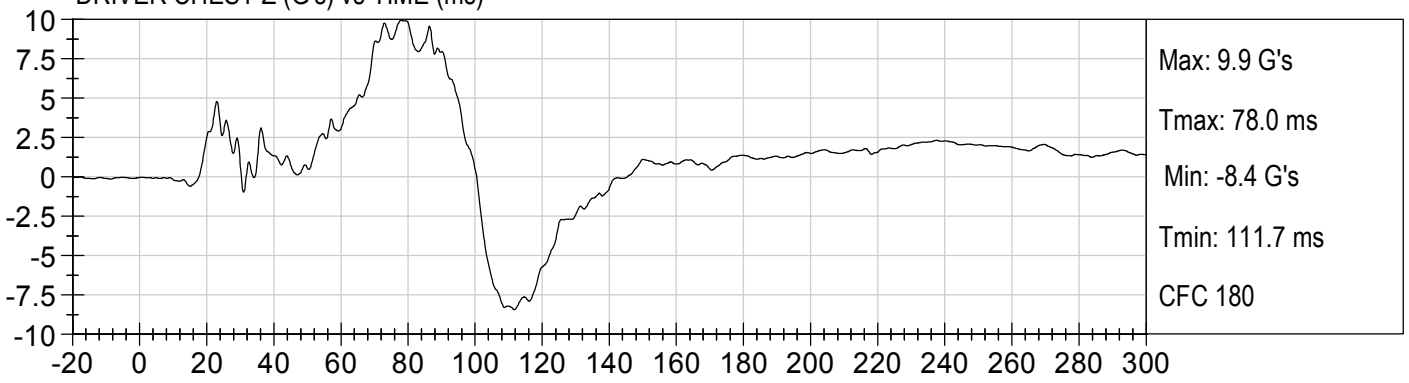
Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)

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

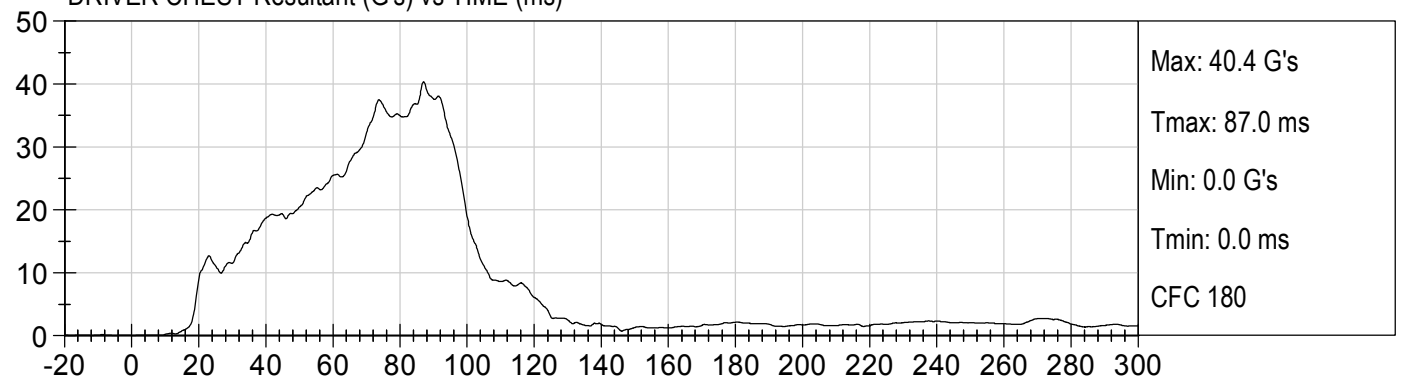


DRIVER CHEST Y (G's) vs TIME (ms)

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



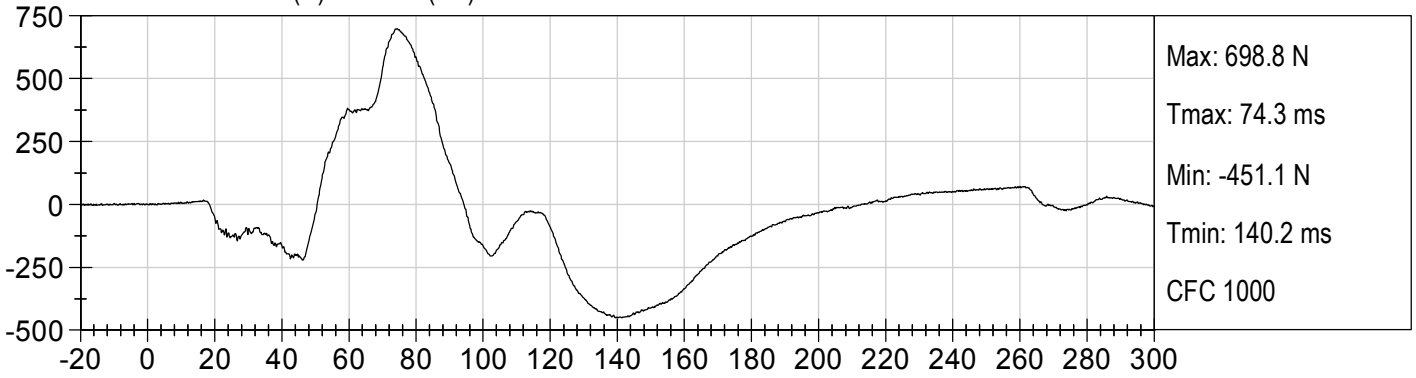
DRIVER CHEST Resultant (G's) vs TIME (ms)



NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

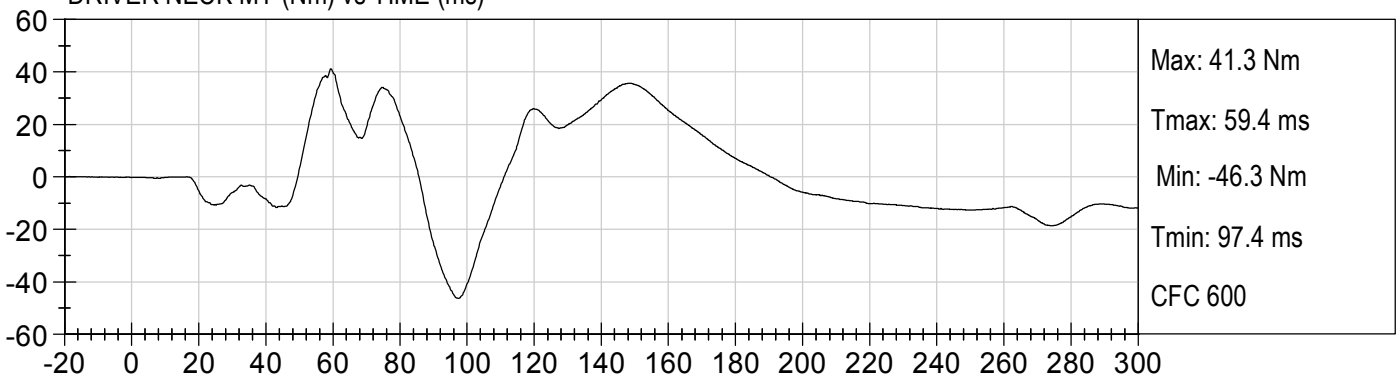
Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)

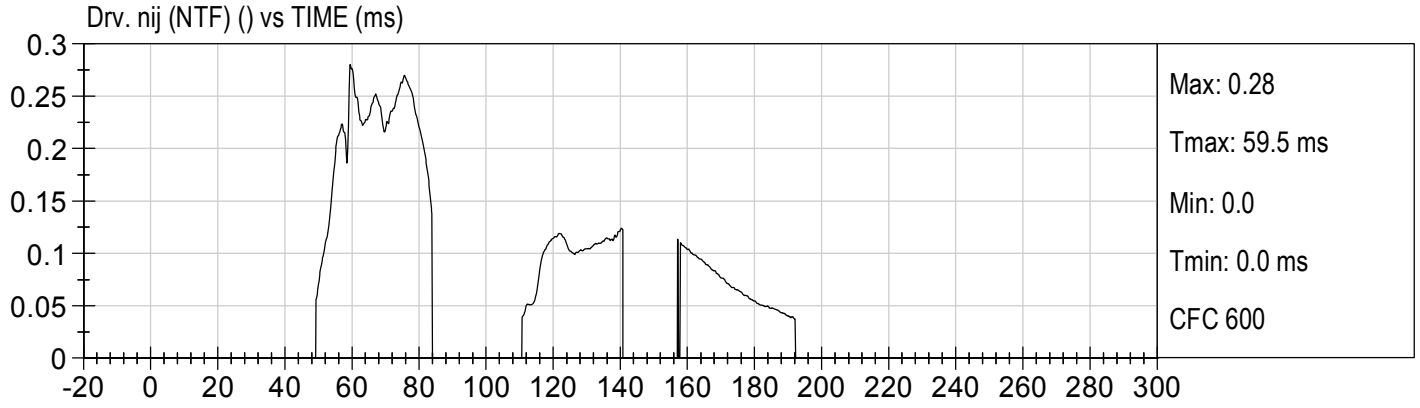
DRIVER NECK FX (N) vs TIME (ms)

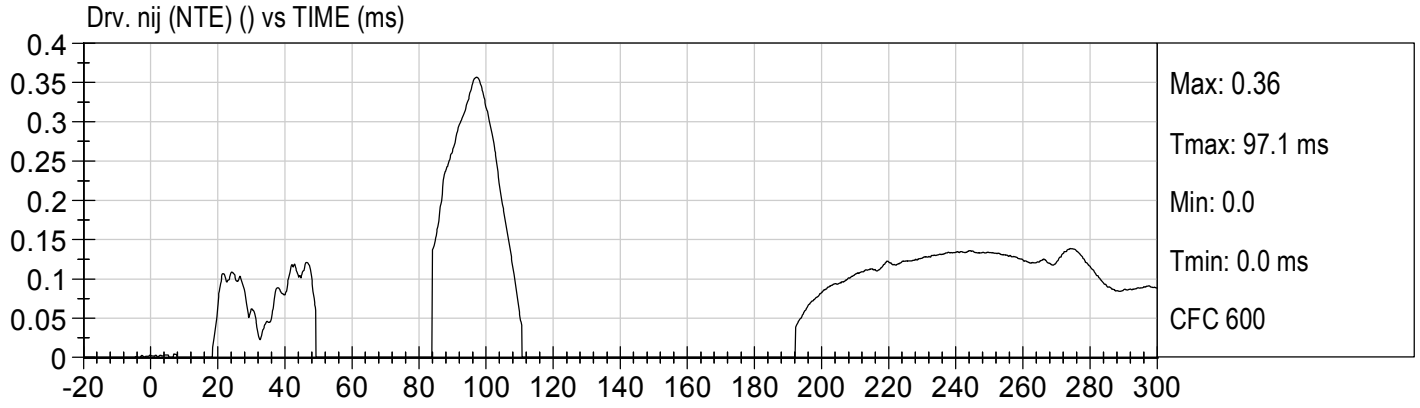


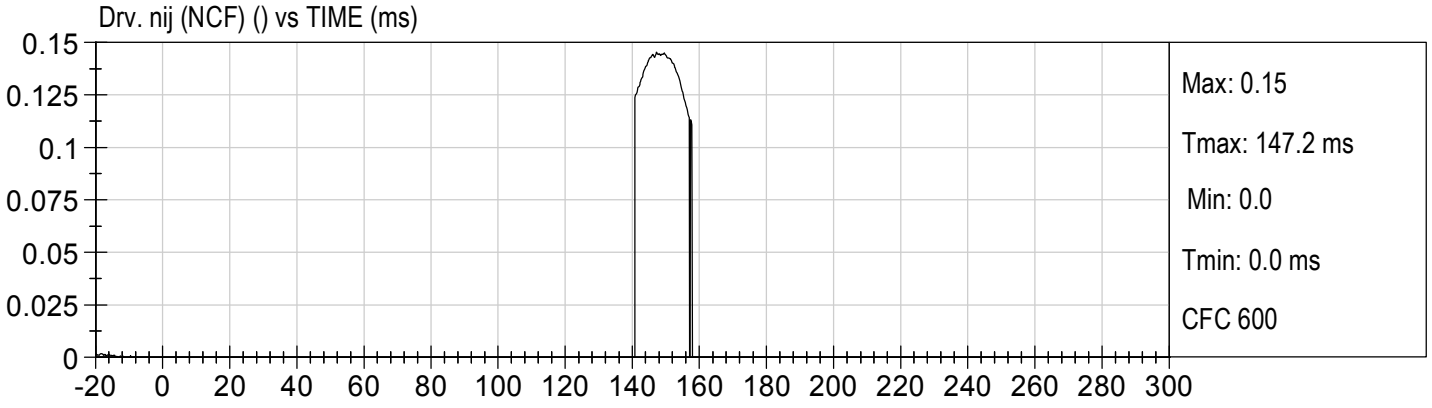
DRIVER NECK FZ (N) vs TIME (ms)

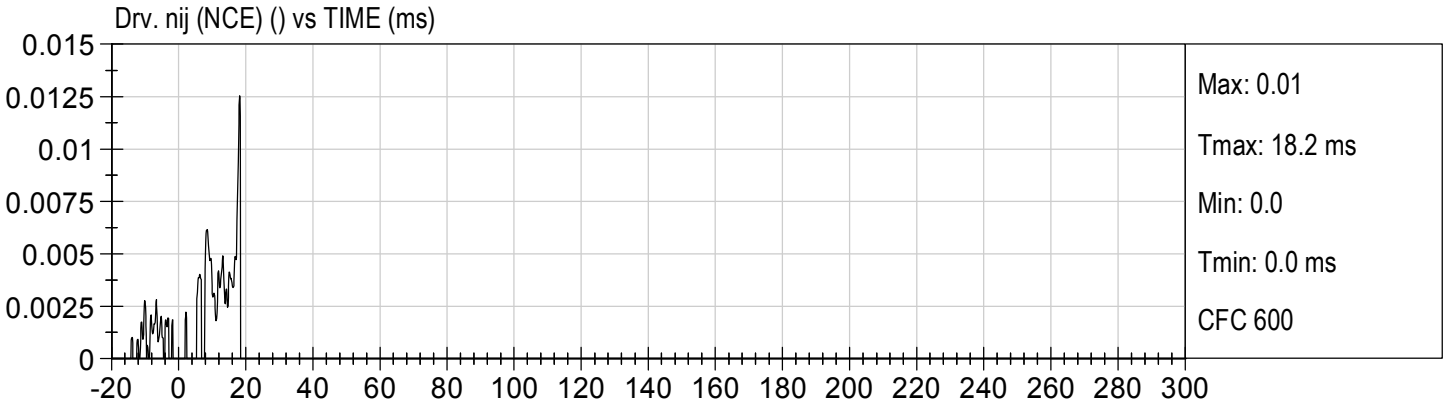
DRIVER NECK MY (Nm) vs TIME (ms)




Drv. nij (NTF) () vs TIME (ms)
0.3
0.25
0.2
0.15
0.1
0.05
0
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.28
Tmax: 59.5 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600


Drv. nij (NTE) () vs TIME (ms)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.36
Tmax: 97.1 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

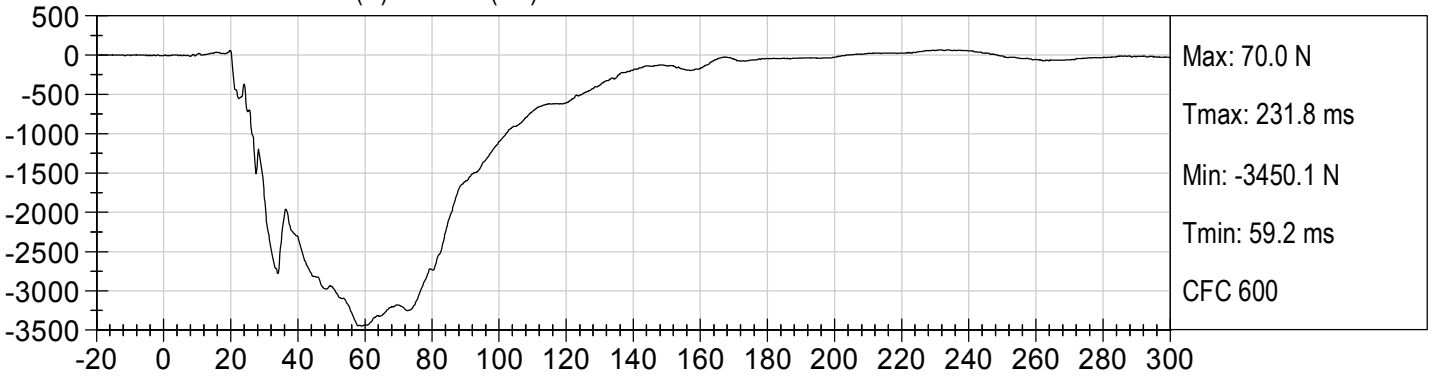

Drv. nij (NCF) () vs TIME (ms)
0.15
0.125
0.1
0.075
0.05
0.025
0
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.15
Tmax: 147.2 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600


Drv. nij (NCE) () vs TIME (ms)
0.015
0.0125
0.01
0.0075
0.005
0.0025
0
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.01
Tmax: 18.2 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

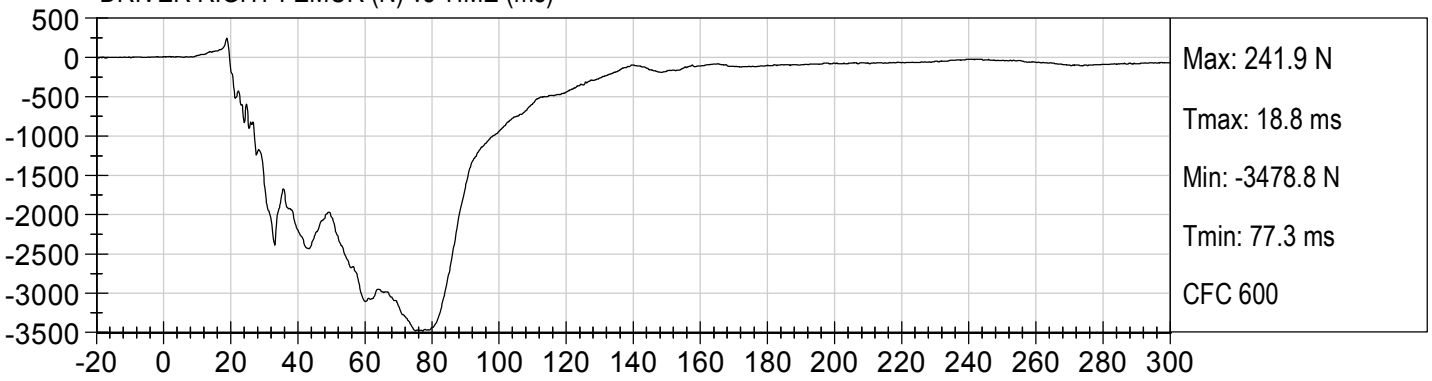
NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)

DRIVER LEFT FEMUR (N) vs TIME (ms)



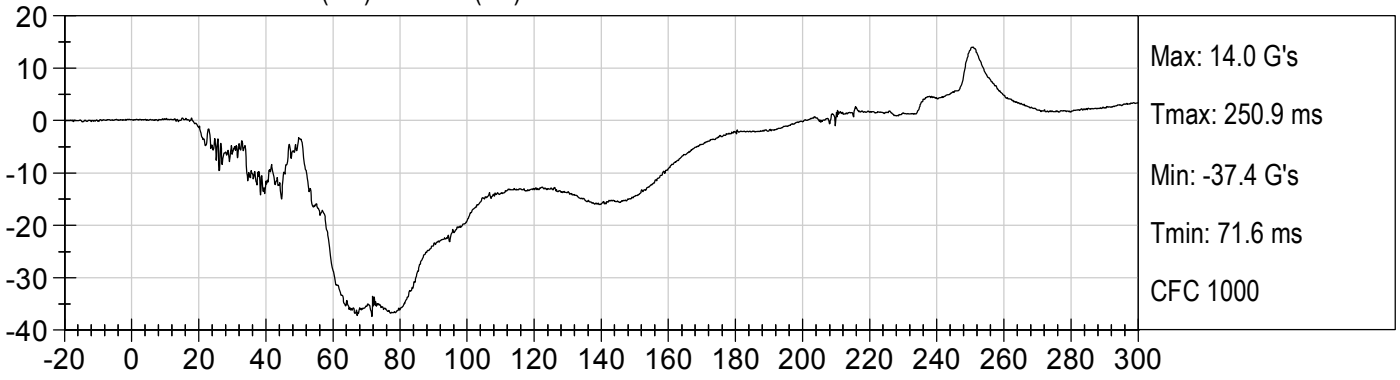
DRIVER RIGHT FEMUR (N) vs TIME (ms)



NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

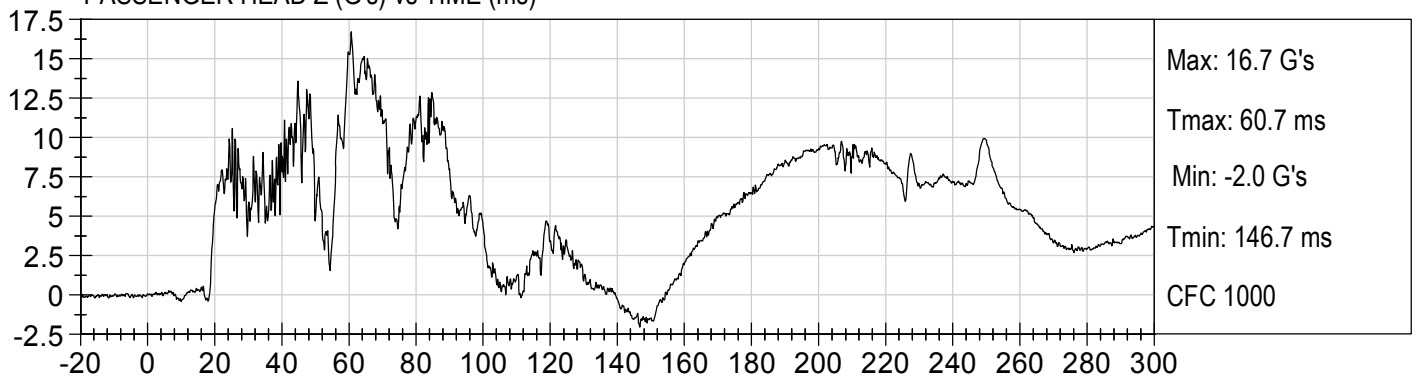
Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)

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

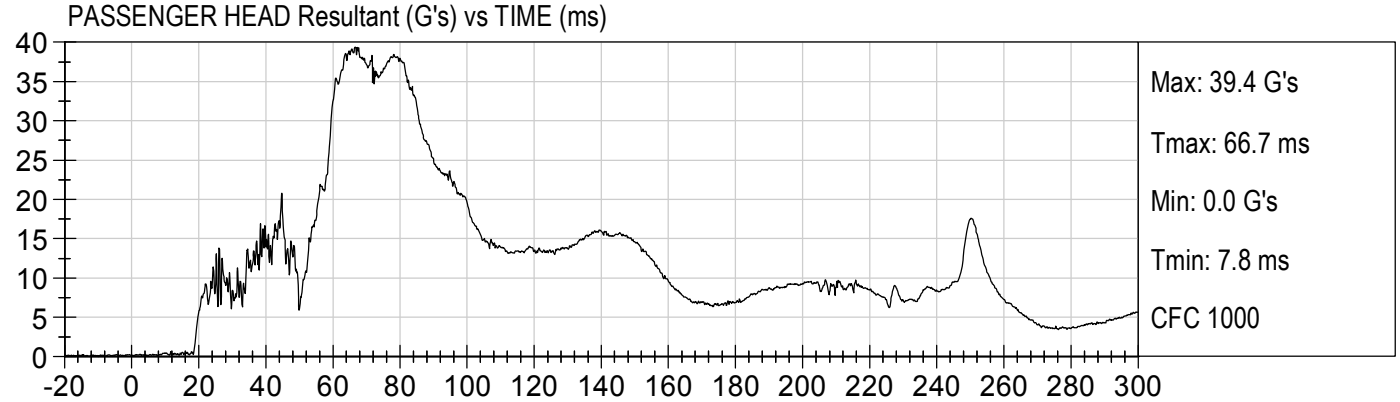


PASSENGER HEAD Y (G's) vs TIME (ms)

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

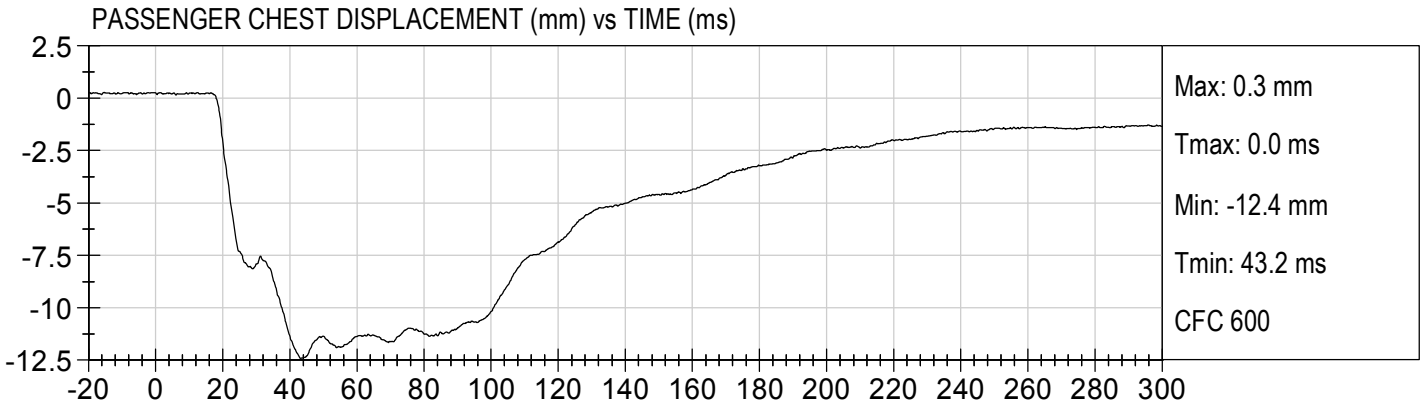


PASSENGER HEAD Resultant (G's) vs TIME (ms)

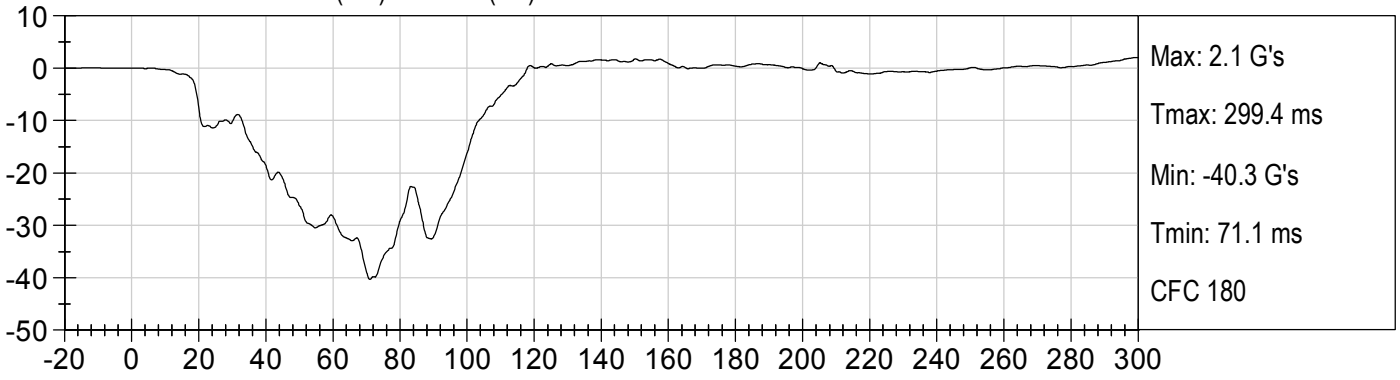


NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

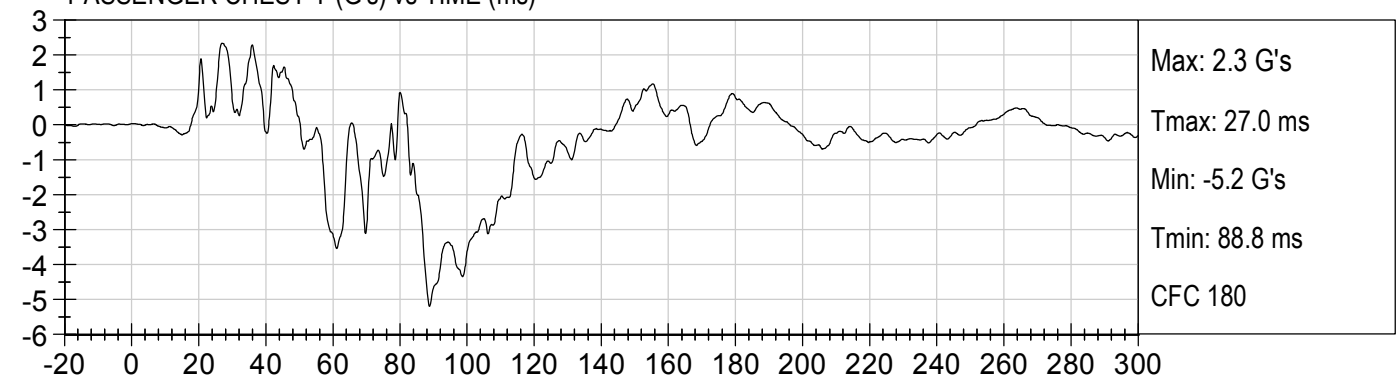
Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)



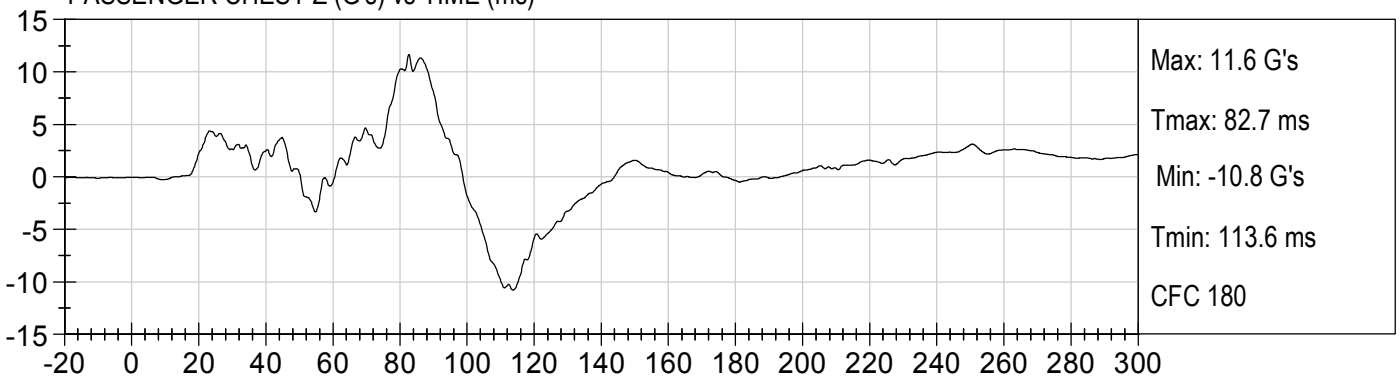
PASSENGER CHEST X (G's) vs TIME (ms)



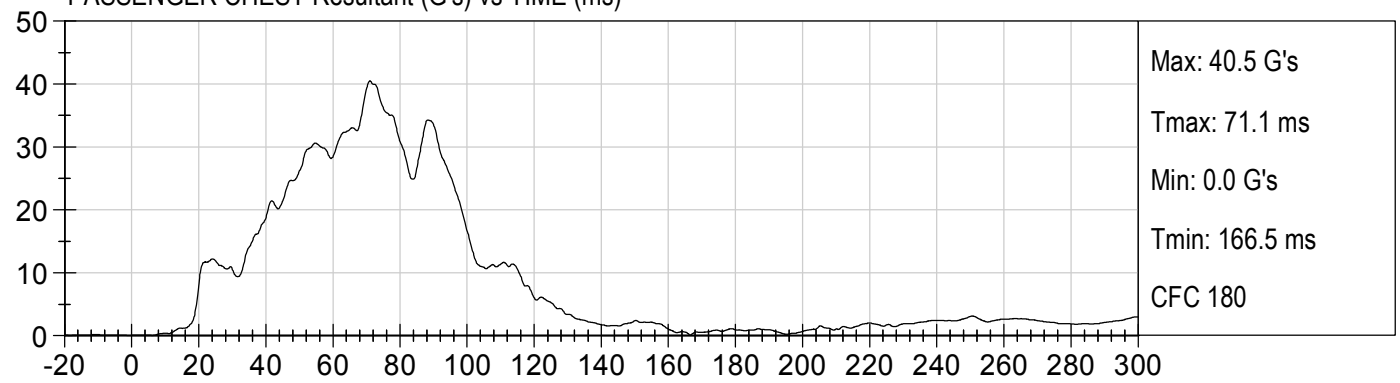
PASSENGER CHEST Y (G's) vs TIME (ms)



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



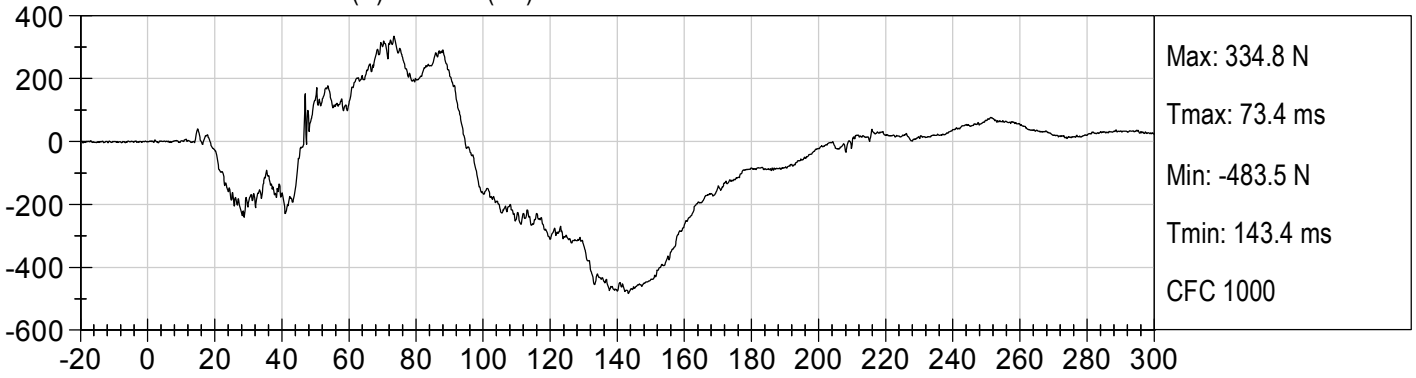
PASSENGER CHEST Resultant (G's) vs TIME (ms)



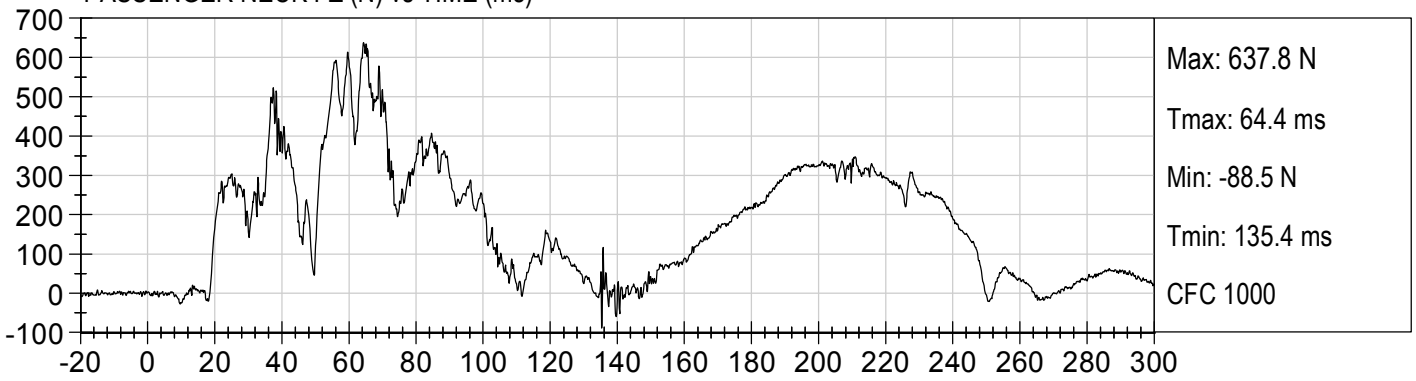
NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)

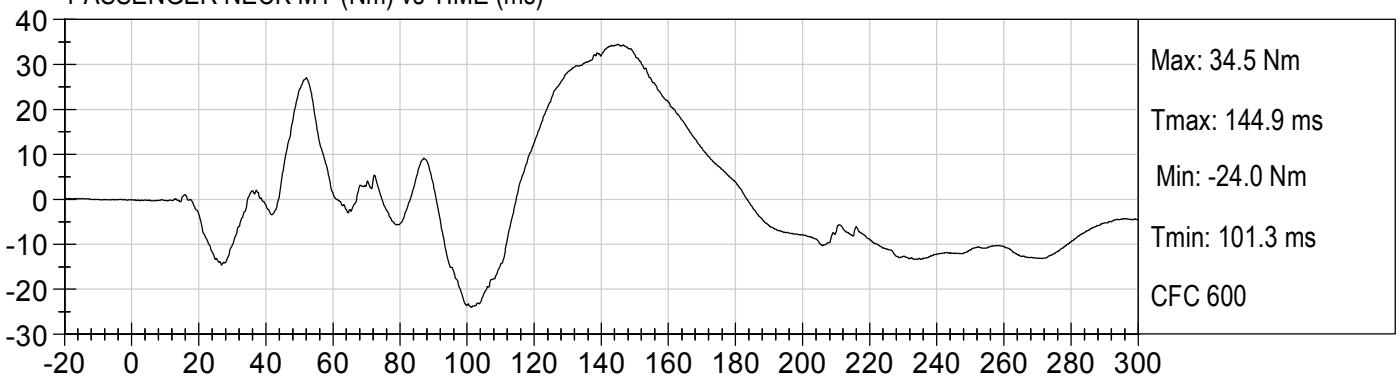
PASSENGER NECK FX (N) vs TIME (ms)



PASSENGER NECK FZ (N) vs TIME (ms)

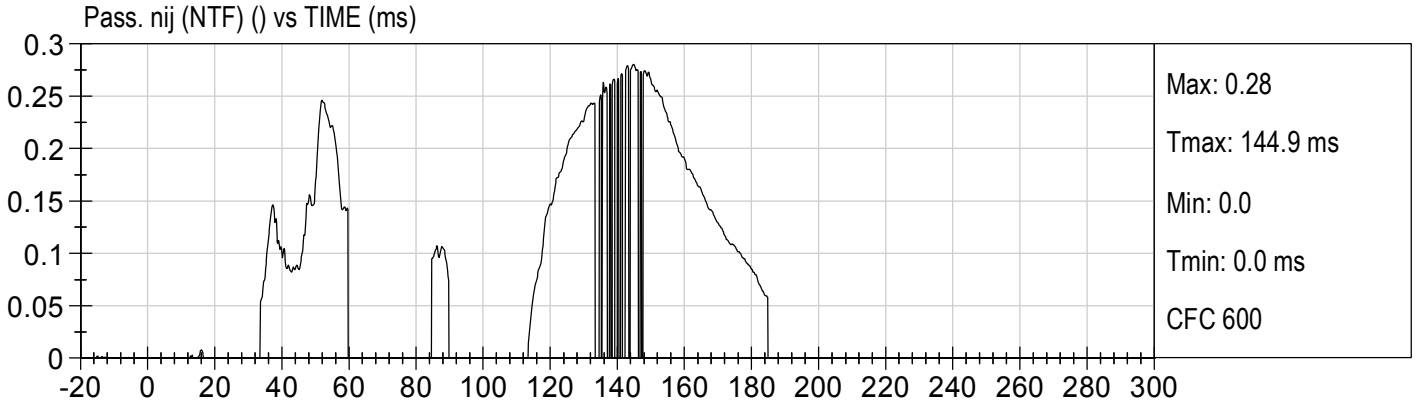


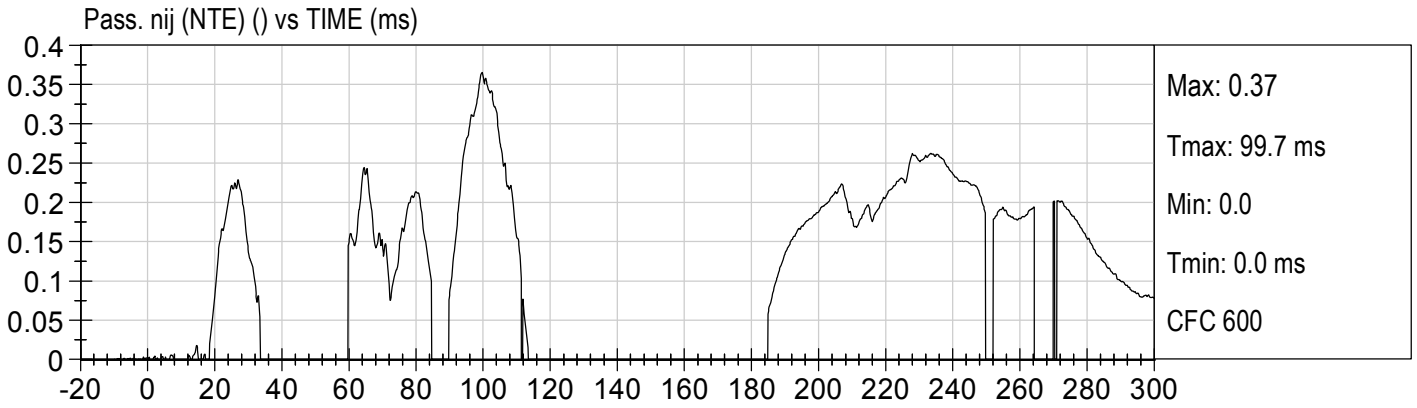
PASSENGER NECK MY (Nm) vs TIME (ms)

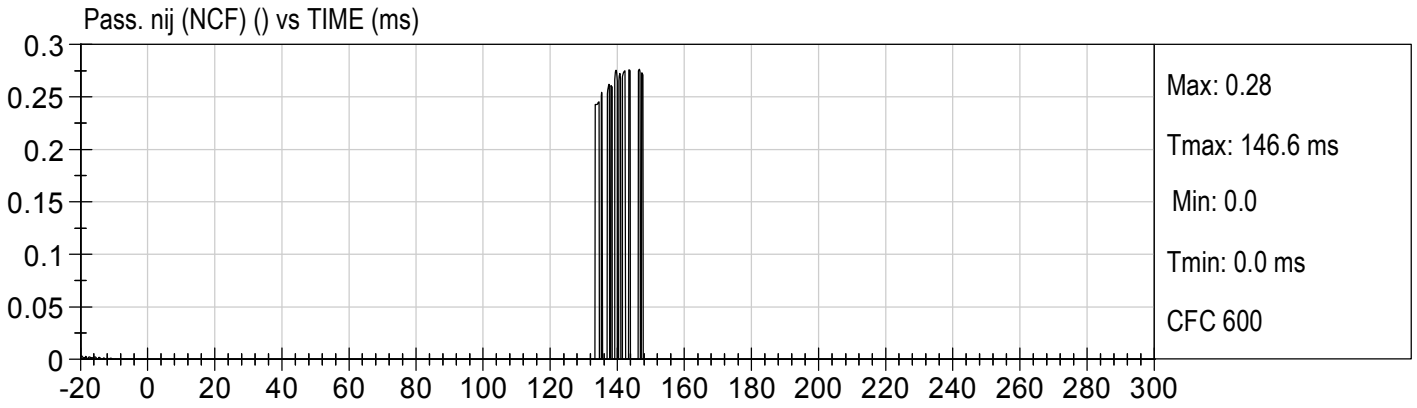


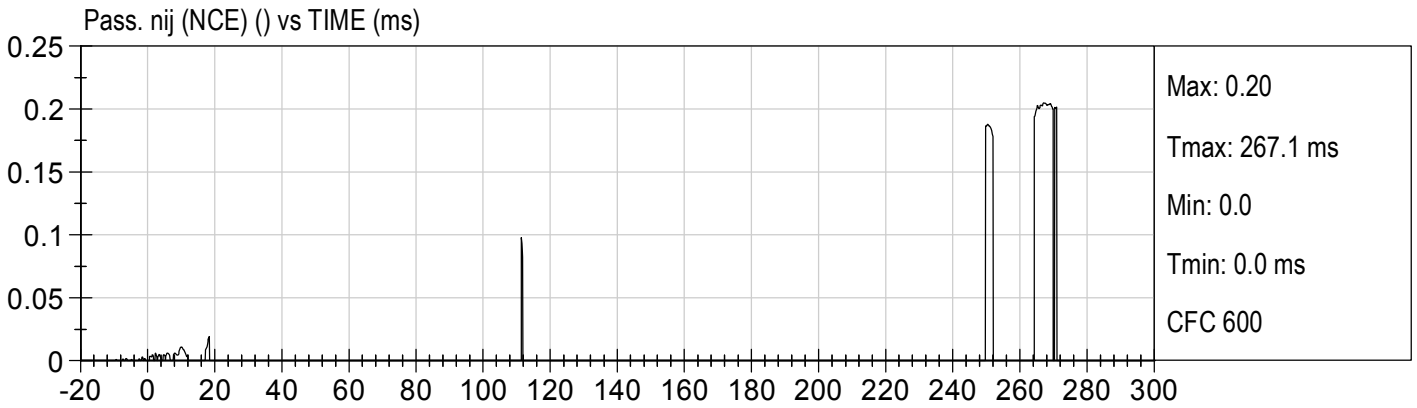
NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)





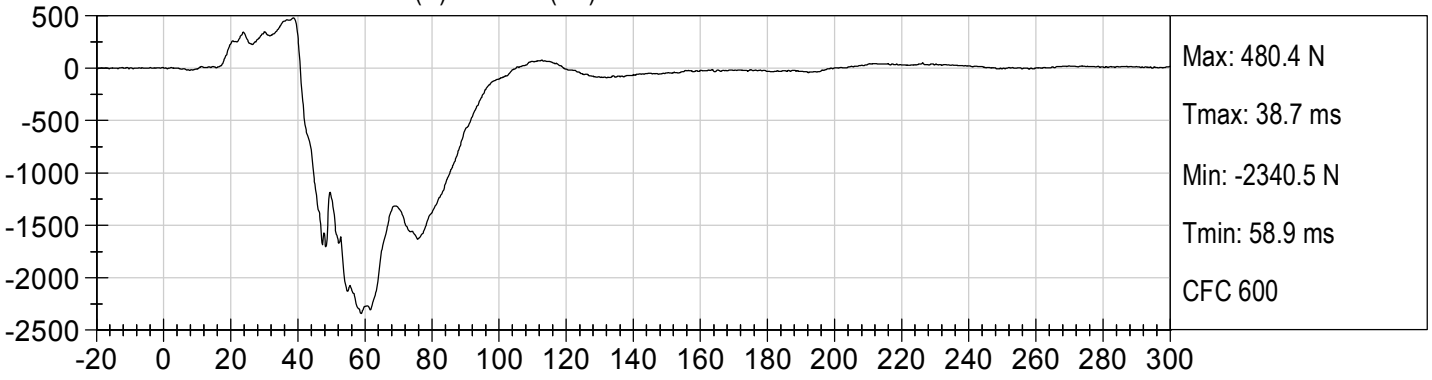




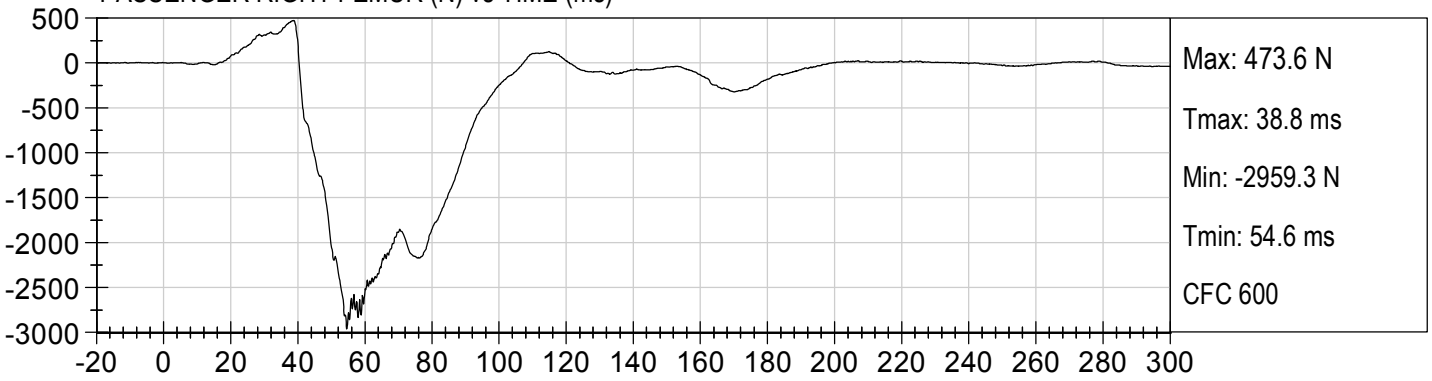
NCAP 35mph Frontal
2012 Chrysler Town & Country - MC0300

Test Date: 09/27/2011
Speed: 35.0 mph (56.4 km/h)

PASSENGER LEFT FEMUR (N) vs TIME (ms)



PASSENGER RIGHT FEMUR (N) vs TIME (ms)



APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

Hybrid III, 50th External Measurements
SN: 036

HYBRID III, PART 572, SUBPART E EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (inches)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	34.6–35.0	34.7
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	19.9-20.5	20.0
C	H-POINT HEIGHT	Reference	3.3-3.5	3.4
D	H-POINT LOCATION FROM BACKLINE	Reference	5.3-5.5	5.4
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	3.3-3.7	3.6
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	5.5-6.1	5.8
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	11.4-12.0	11.5
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	1.6-1.8	1.7
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	13.0-13.6	13.0
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	7.5-8.3	7.9
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	22.8-23.8	23.8
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	16.9-17.9	17.3
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	19.1-19.7	19.5
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. “K”.	17.8-18.8	17.9

HYBRID III, SUBPART E EXTERIOR DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS		ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 16.9-17.1 in. above seat surface	8.4-9.0	8.8
P	FOOT LENGTH	Tip of toe to rear of heal	9.9-10.5	10.0
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	16.3-17.2	16.4
W	FOOT BREADTH	The widest part of the foot	3.6-4.2	4.1
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 16.9-17.1 in. above seat surface	38.2-39.4	38.4
Z	WAIST CIRCUMFERENCE	Measured 8.9-9.1 in. above seat surface	32.9-34.1	34.0
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	16.9-17.1	17.0
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	8.9-9.1	9.0

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

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test ID:** D112721

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	225 - 275	249	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-12.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

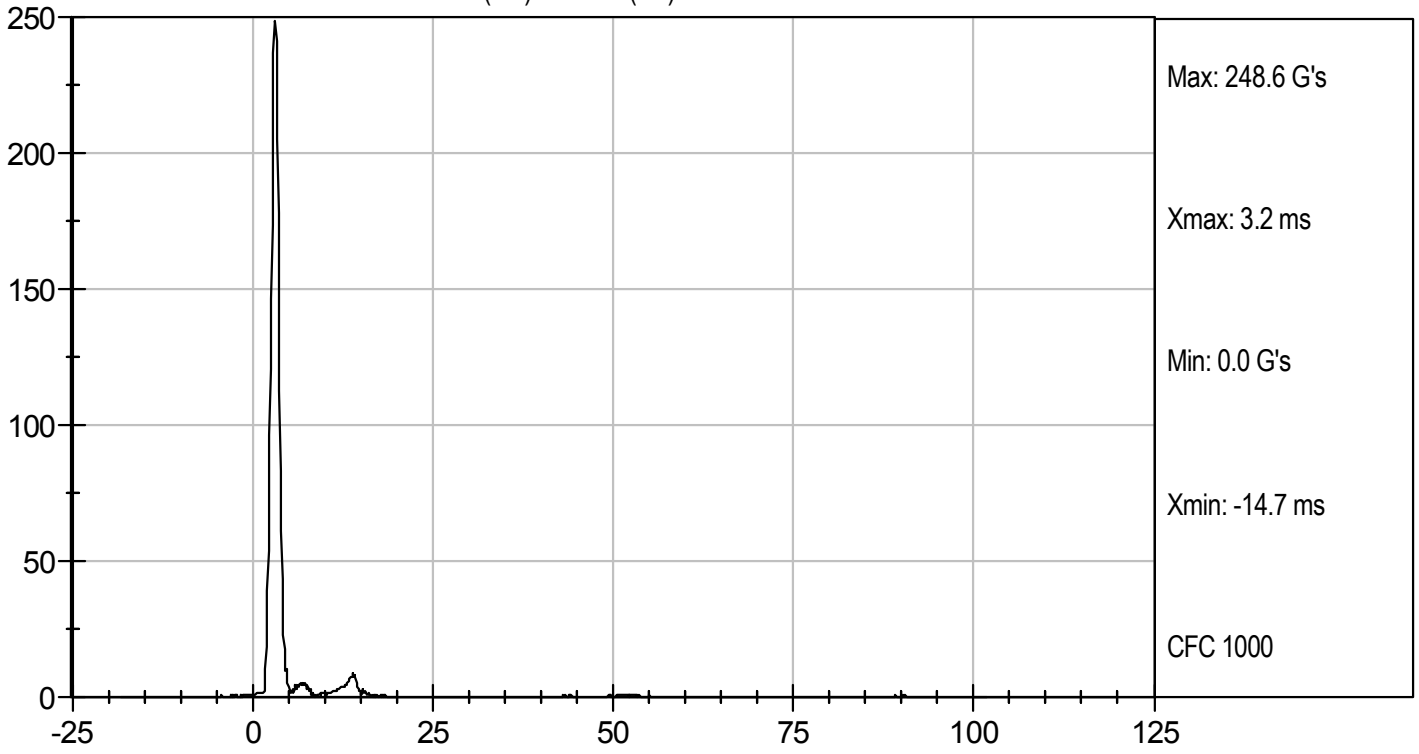
8/10/11
Test Date

David Winkelbauer
Approved By

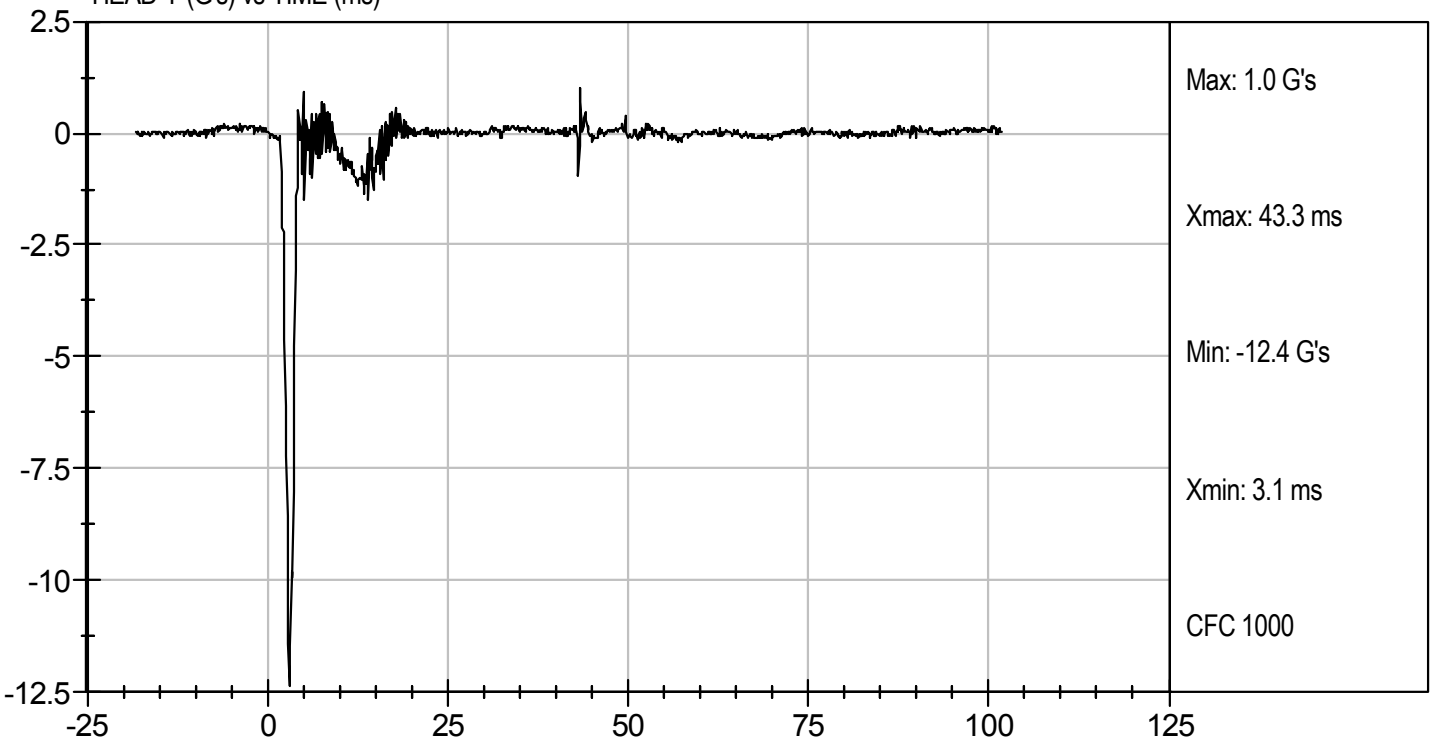
Test Desc: Head Drop
Component ID: D112721

Test Date: 8/10/11
Velocity: 0 ft/s, 0.00 m/s

RESULTANT HEAD ACCELERATION (G's) vs TIME (ms)



HEAD Y (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D112722

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	47	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.61	Pass
	20 ms	G's	17.60 to 22.60	20.37	Pass
	30 ms	G's	12.50 to 18.50	14.35	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.3	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	71.1	Pass
	Time	ms	57.0 to 64.0	57.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	117.3	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	96.9	Pass
	Time	ms	47.0 to 58.0	47.6	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.5	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

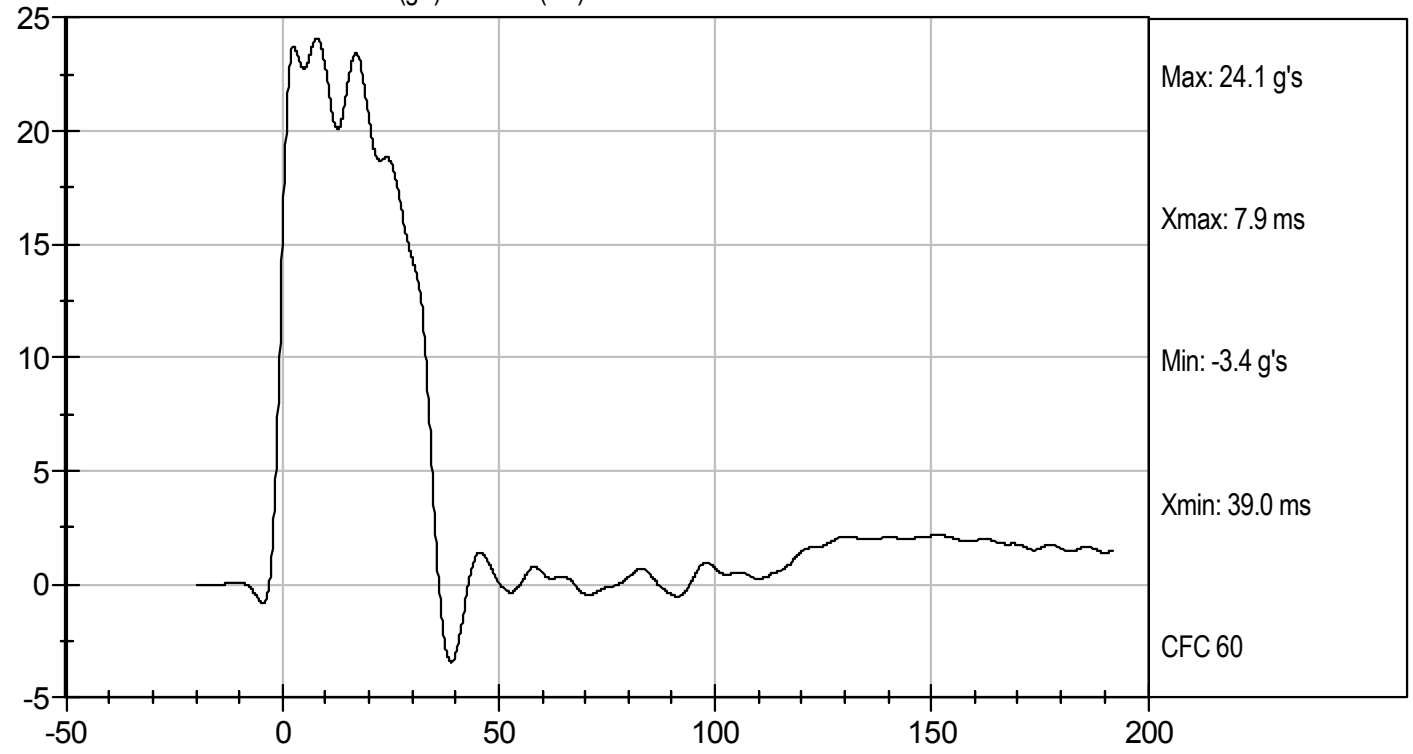
8/10/11
Test Date

David Winkelbauer
Approved By

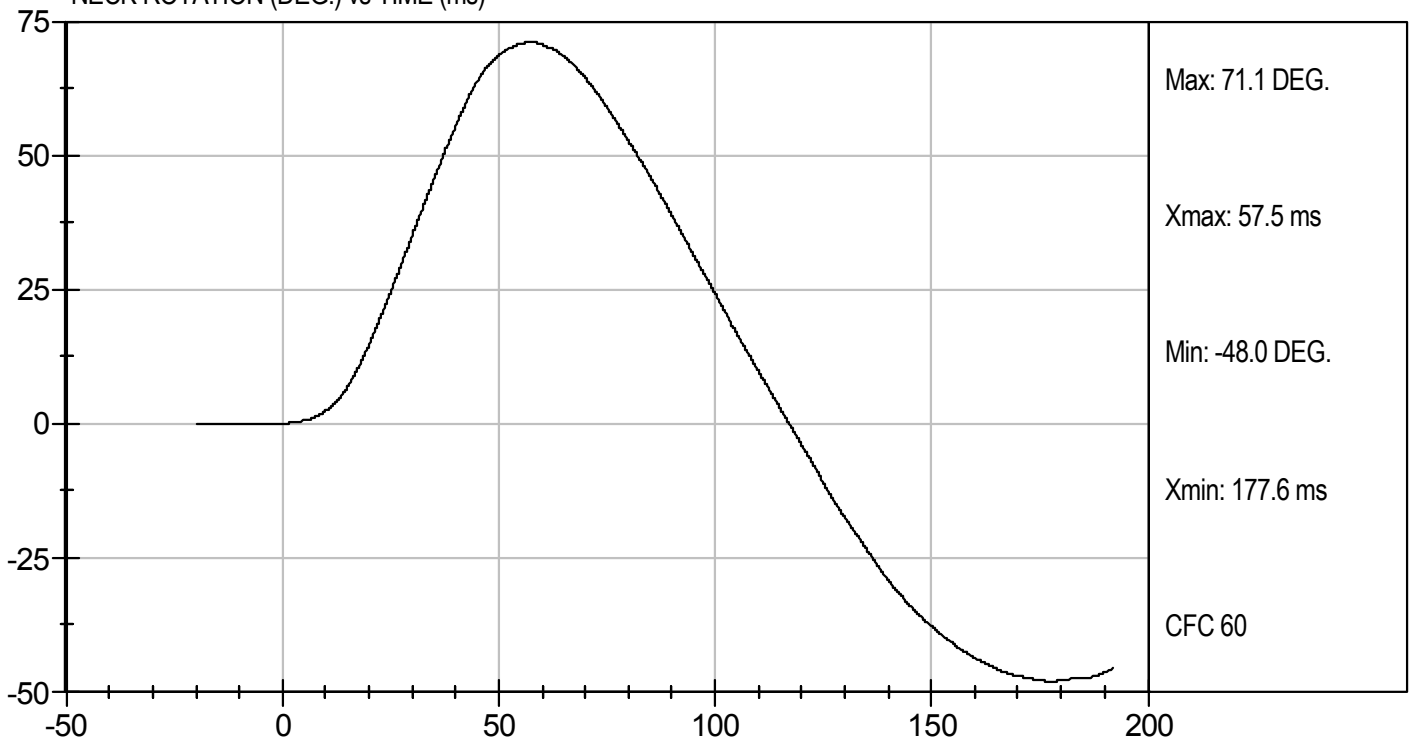
Test Desc: Neck Flexion
Component ID: D112722

Test Date: 8/10/11
Velocity: 23.15 ft/s, 7.06 m/s

PENDULUM DECELERATION (g's) vs TIME (ms)

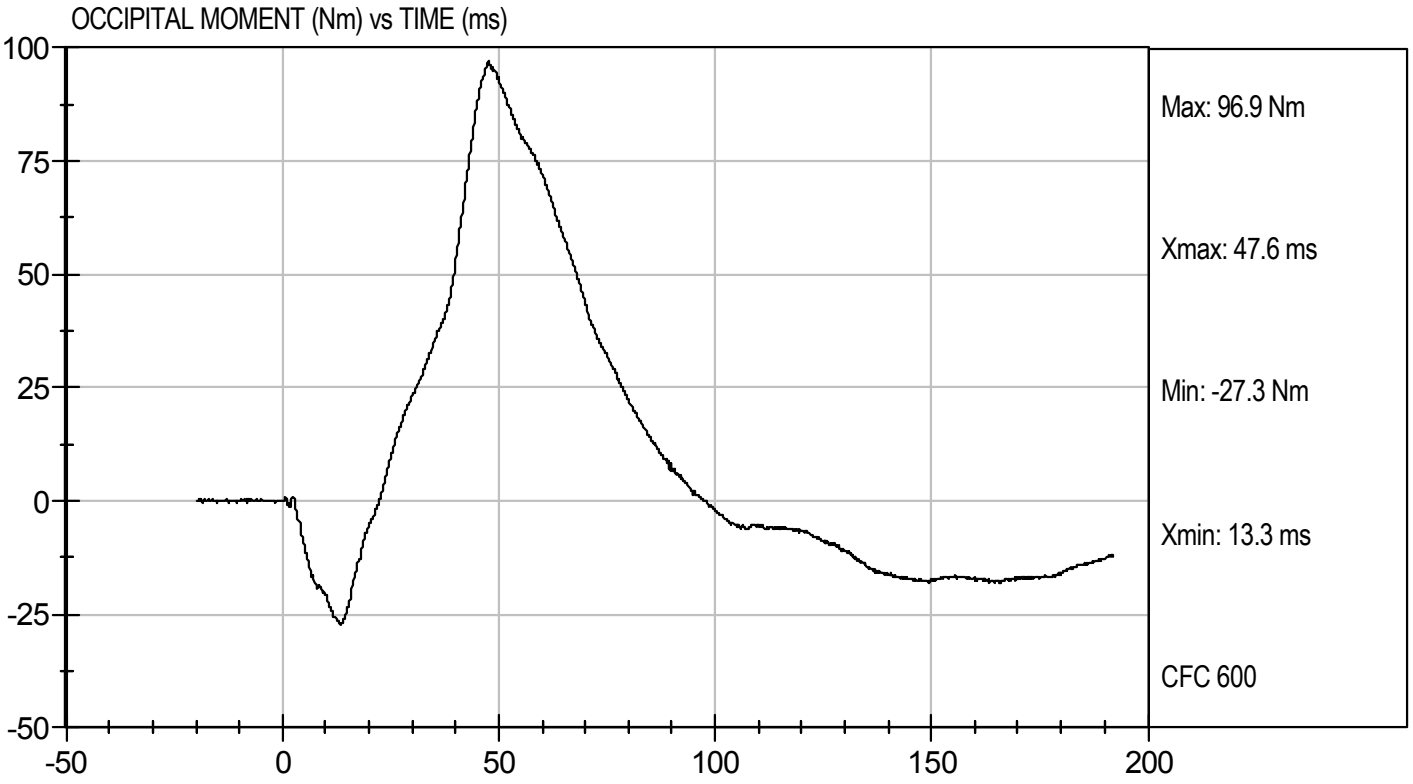


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Component ID: D112722

Test Date: 8/10/11
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D112723

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	47	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	18.94	Pass
	20 ms	G's	14.00 to 19.00	16.27	Pass
	30 ms	G's	11.00 to 16.00	11.85	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.9	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	98.2	Pass
	Time	ms	72.0 to 82.0	76.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	159.0	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-68.4	Pass
	Time	ms	65.0 to 79.0	68.8	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	140.9	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

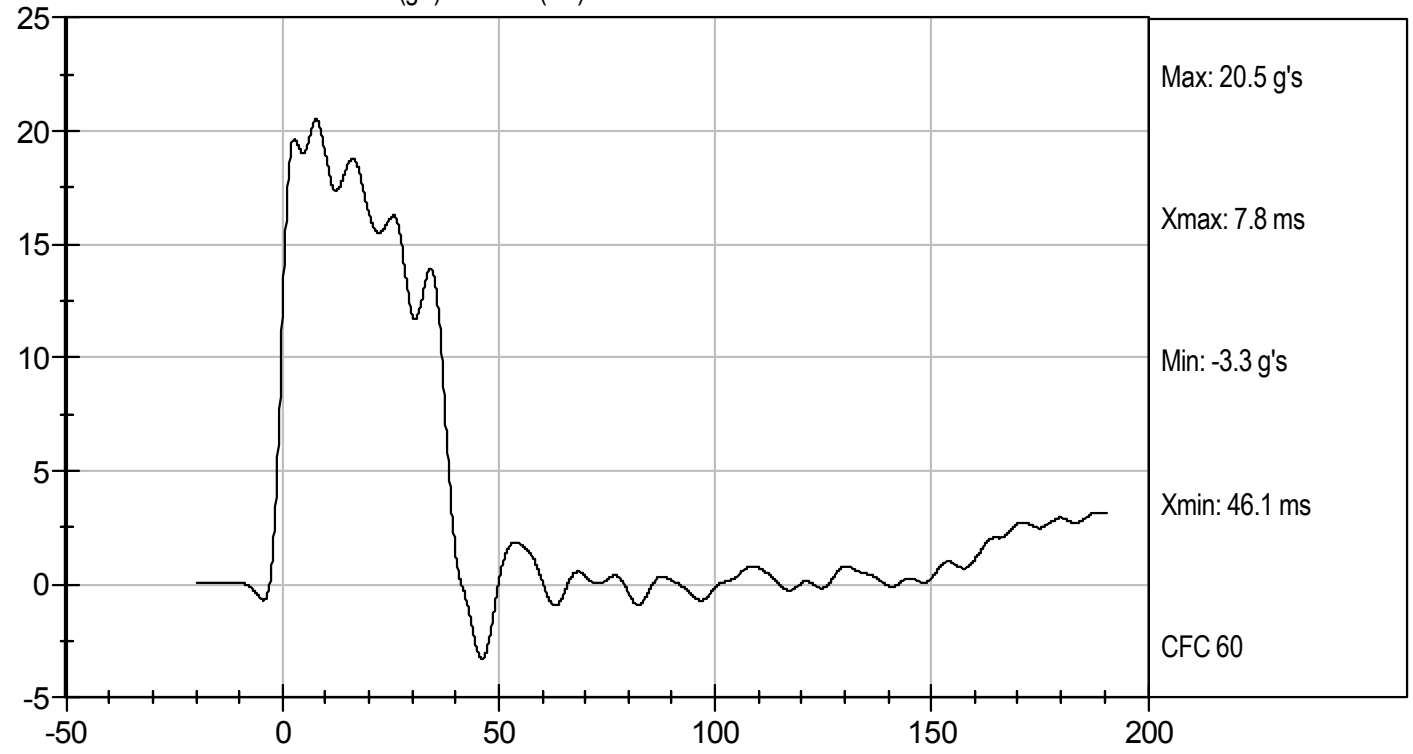
8/10/11
Test Date

David Winhellbauer
Approved By

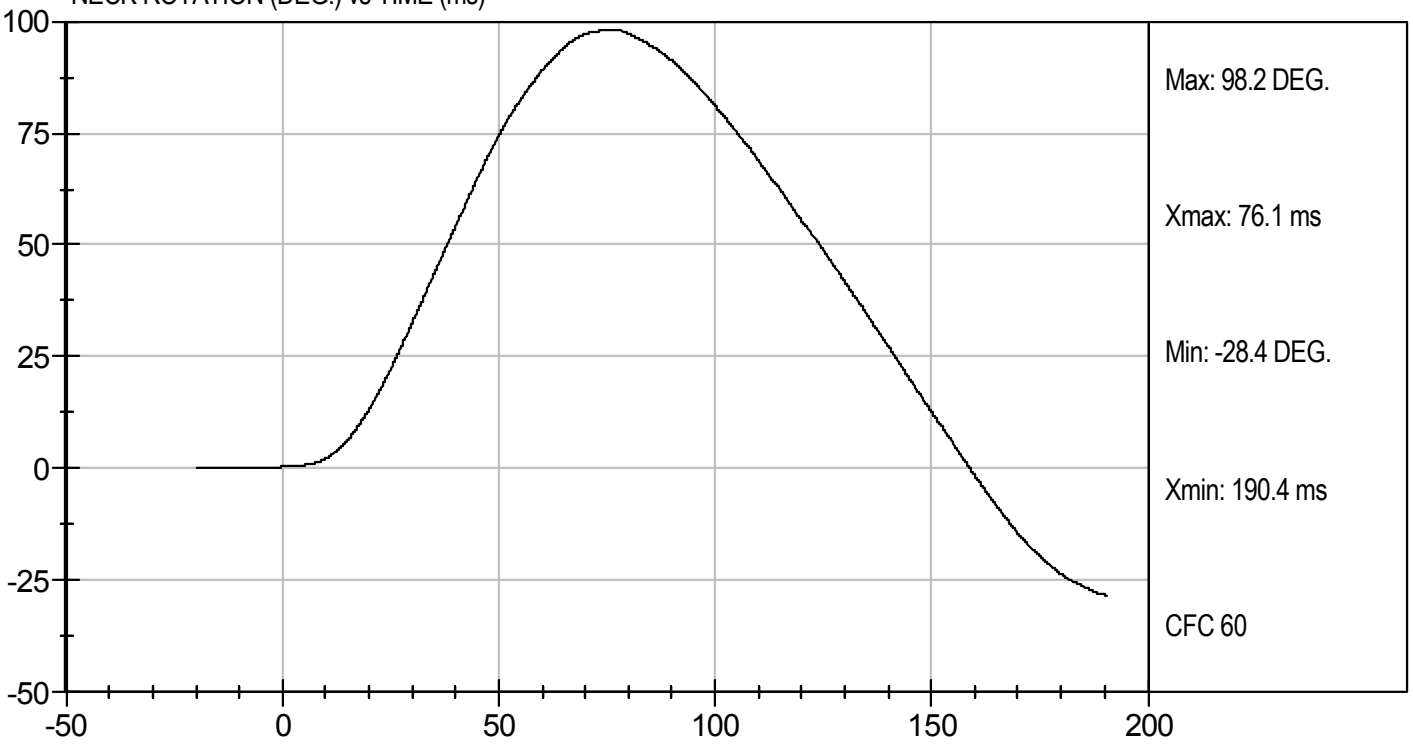
Test Desc: Neck Extension
Component ID: D112723

Test Date: 8/10/11
Velocity: 20.10 ft/s, 6.13 m/s

PENDULUM DECELERATION (g's) vs TIME (ms)

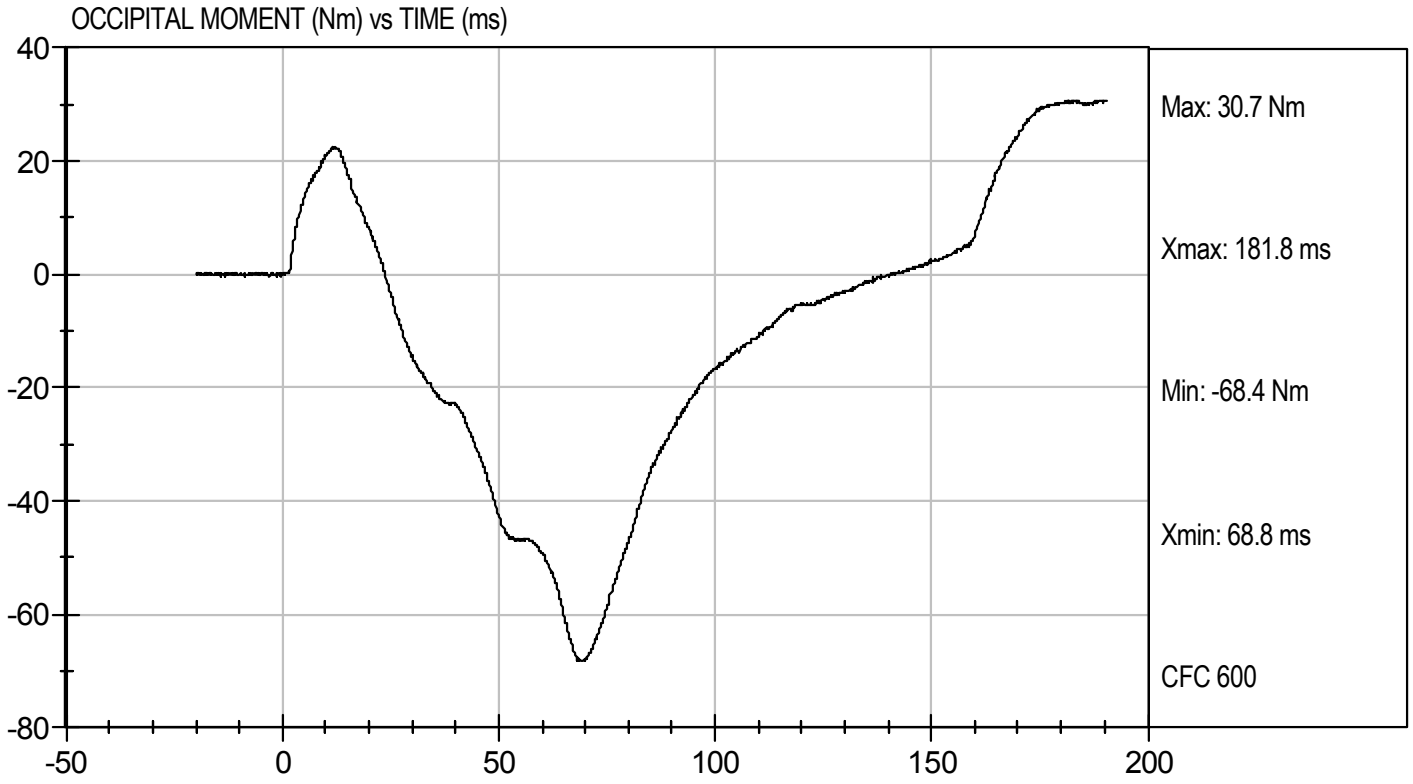


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D112723

Test Date: 8/10/11
Velocity: 20.10 ft/s, 6.13 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D112724

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,289	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.95	Pass
Internal Hysteresis	%	69 to 85	72	Pass
		Overall Test Results		Pass

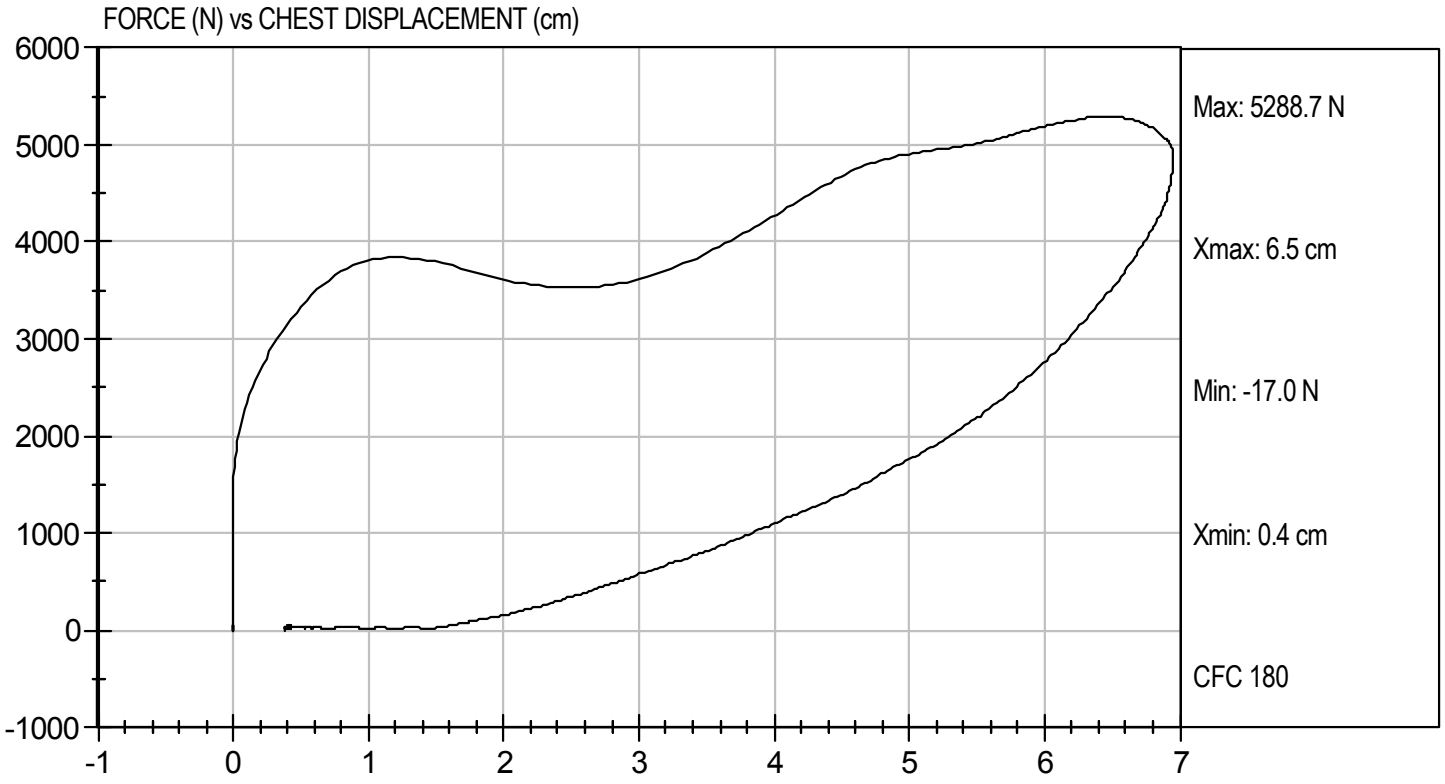
Jessica Gall
Laboratory Technician

8/11/11
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D112724

Test Date: 8/11/11
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D112725

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	4,754	Pass
		Overall Test Results		Pass

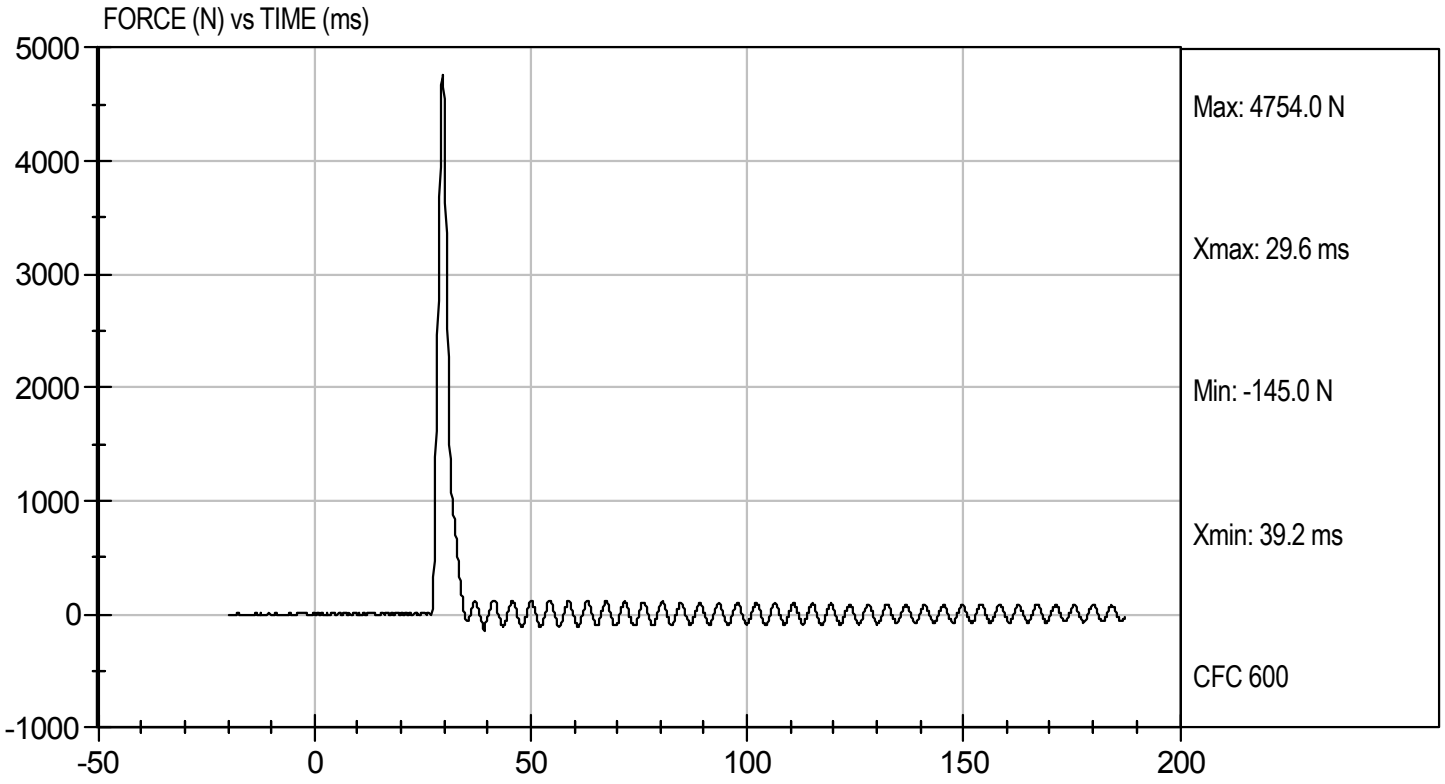
Jessica Gall
Laboratory Technician

8/10/11
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D112725

Test Date: 8/10/11
Velocity: 6.83 ft/s, 2.08 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D112726

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	4,717	Pass
		Overall Test Results		Pass

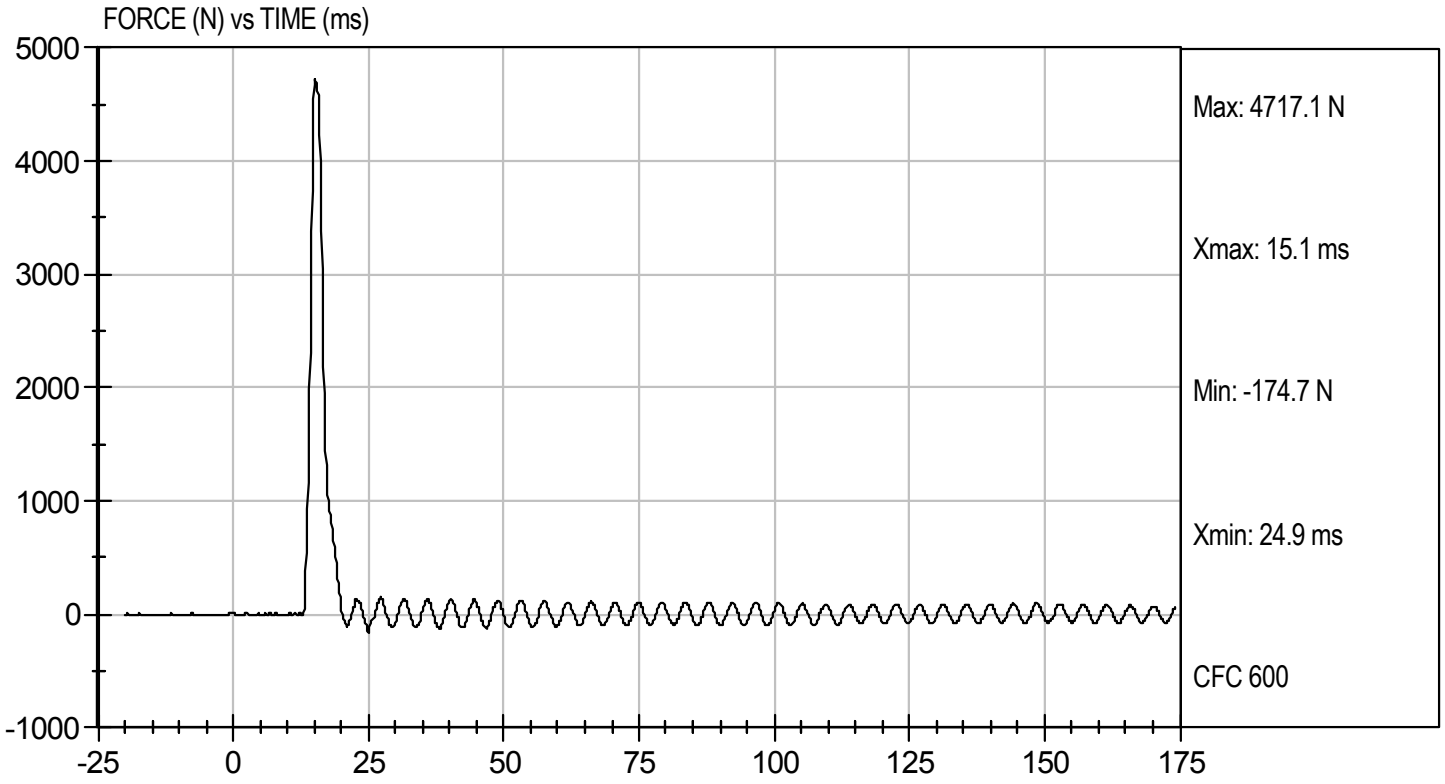
Jessica Gall
Laboratory Technician

08/10/11
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D112726

Test Date: 08/10/11
Velocity: 6.92 ft/s, 2.11 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D112720

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	50	50	Pass
Rotation Rate	deg/s	5.0 -10.0	6.0	6.0	Pass
30 Degrees	Nm	94.9 Nm Max	86.6	75.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	43.0	43.0	Pass
		Overall Test Results			Pass

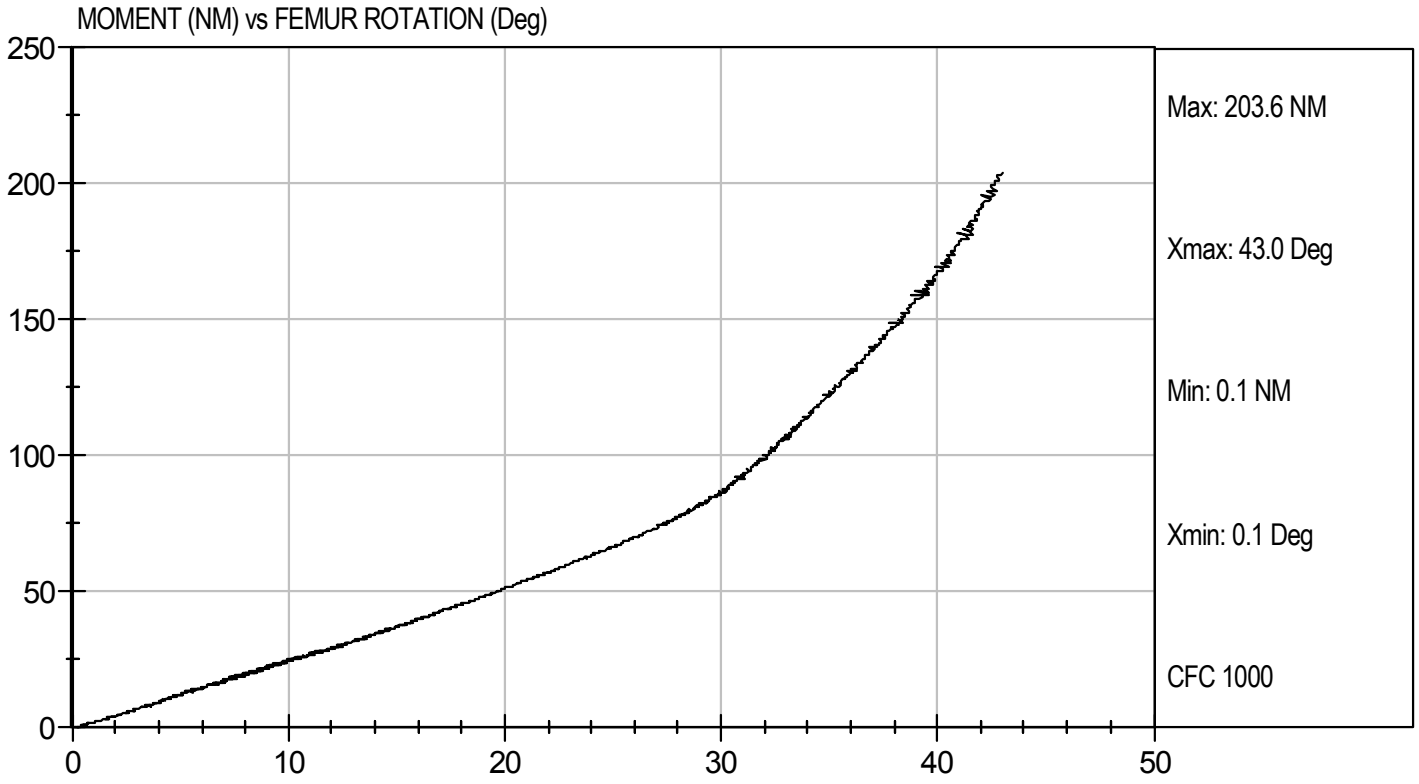
Jessica Gall
Laboratory Technician

8/11/11
Test Date

David Winkelbauer
Approved By

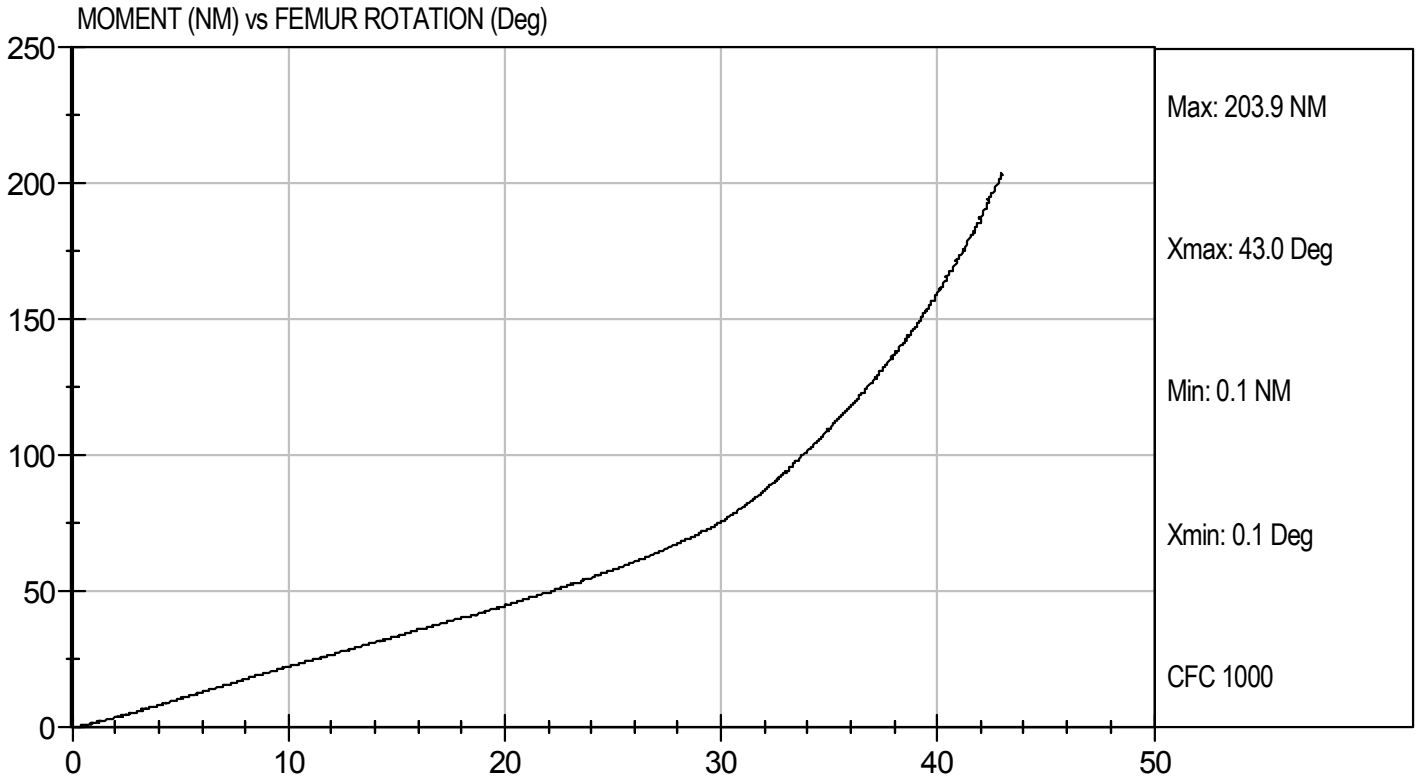
Test Desc: Hip Femur Flexion
Component ID: D112729

Test Date: 8/11/11
Velocity: 0 ft/s, m/s



Test Desc: Hip Femur Flexion
Component ID: D112720

Test Date: 8/11/11
Velocity: 0 ft/s, 0.00 m/s



MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test ID:** D113211

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Peak Resultant Acceleration	G's	225 - 275	259	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-11.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

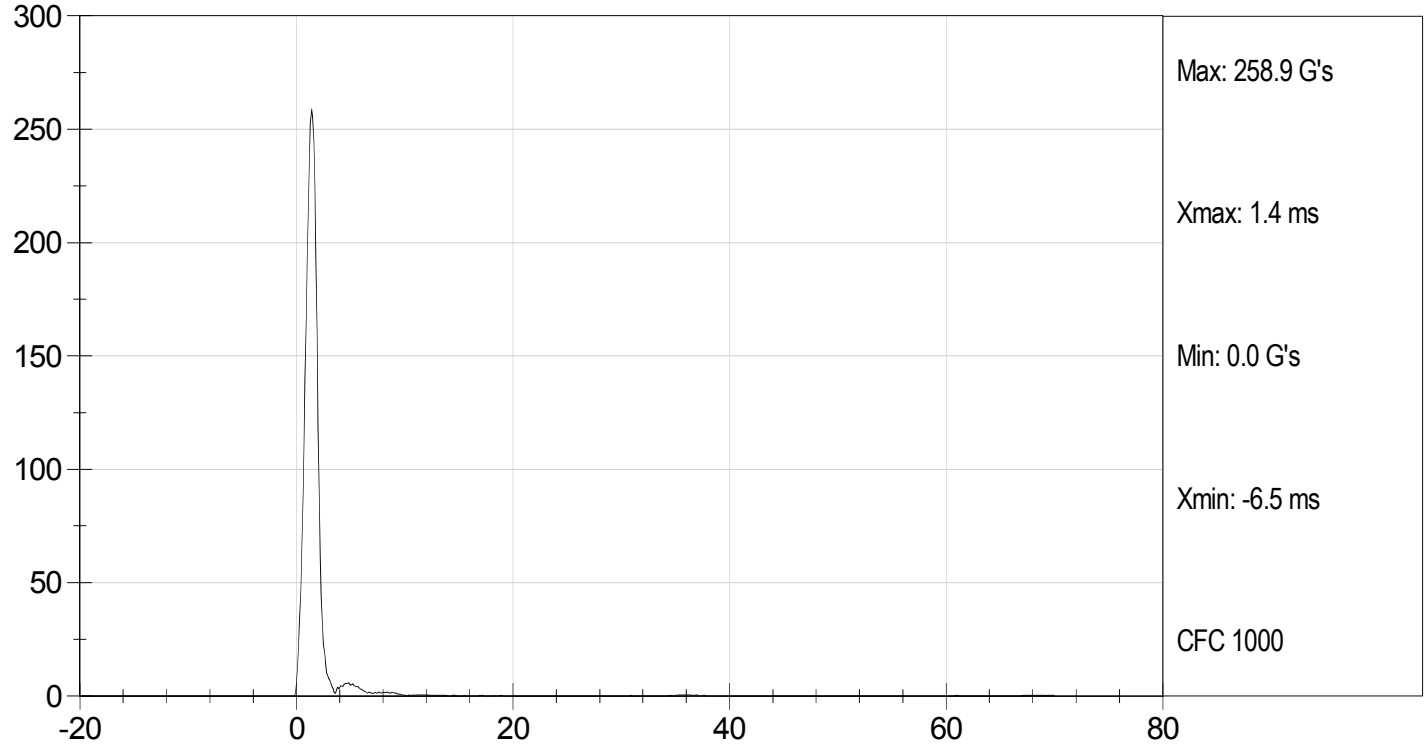
9/27/11
Test Date

David Winkelbauer
Approved By

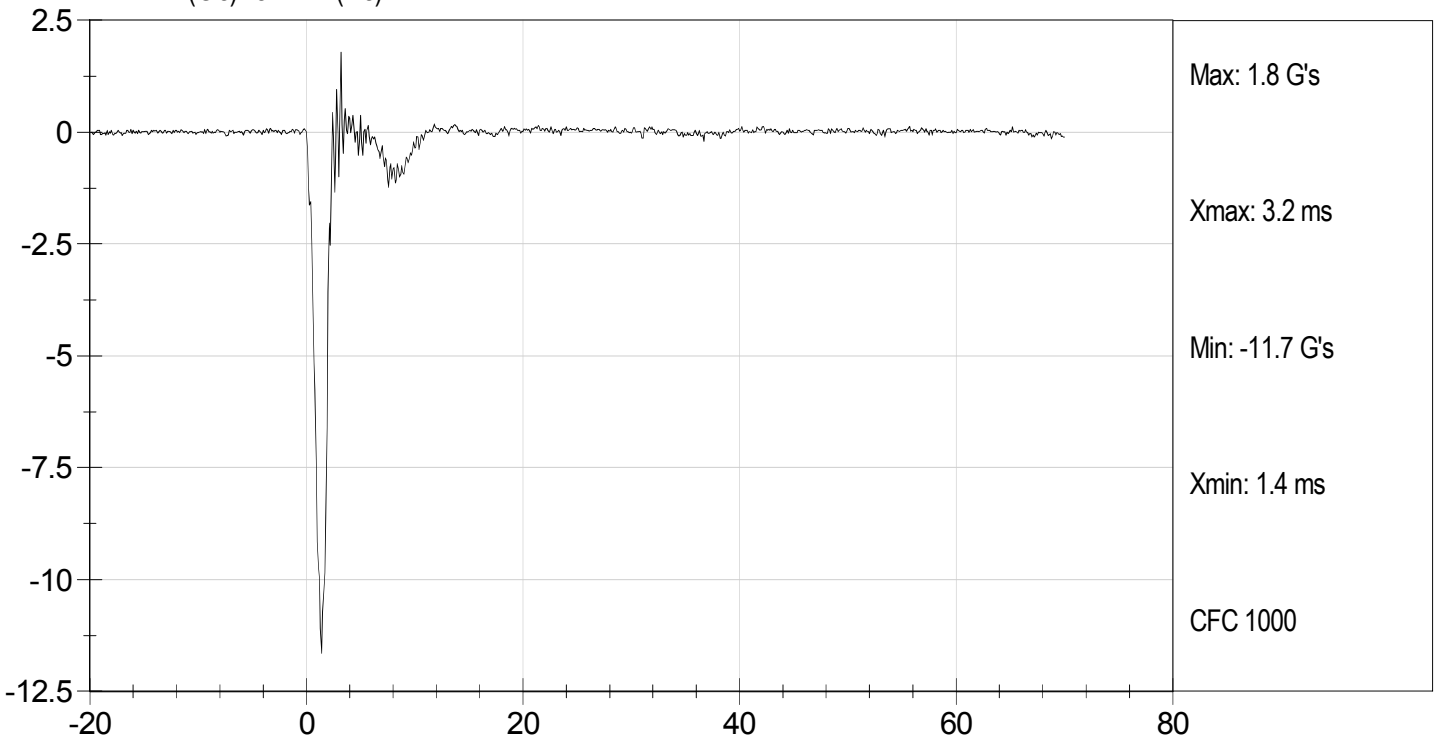
Test Desc: Head Drop
Component ID: D113211

Test Date: 9/27/11
Velocity: 0 ft/s, 0.00 m/s

RESULTANT HEAD ACCELERATION (G's) vs TIME (ms)



HEAD Y (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D113212

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	49	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	22.77	Pass
	20 ms	G's	17.60 to 22.60	17.75	Pass
	30 ms	G's	12.50 to 18.50	12.63	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	13.1	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	38.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	65.9	Pass
	Time	ms	57.0 to 64.0	59.8	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	117.6	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	96.0	Pass
	Time	ms	47.0 to 58.0	51.2	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.4	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

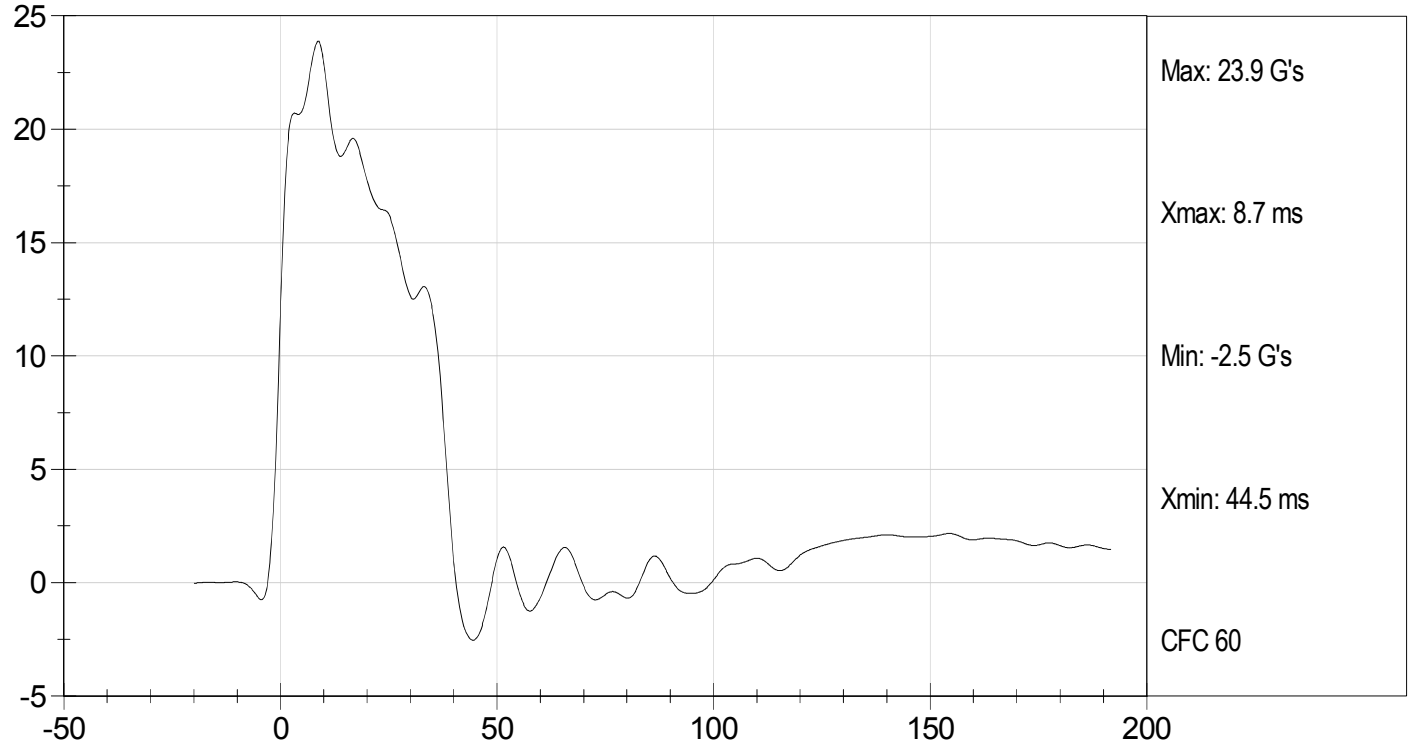
9/27/11
Test Date

David Winkelbauer
Approved By

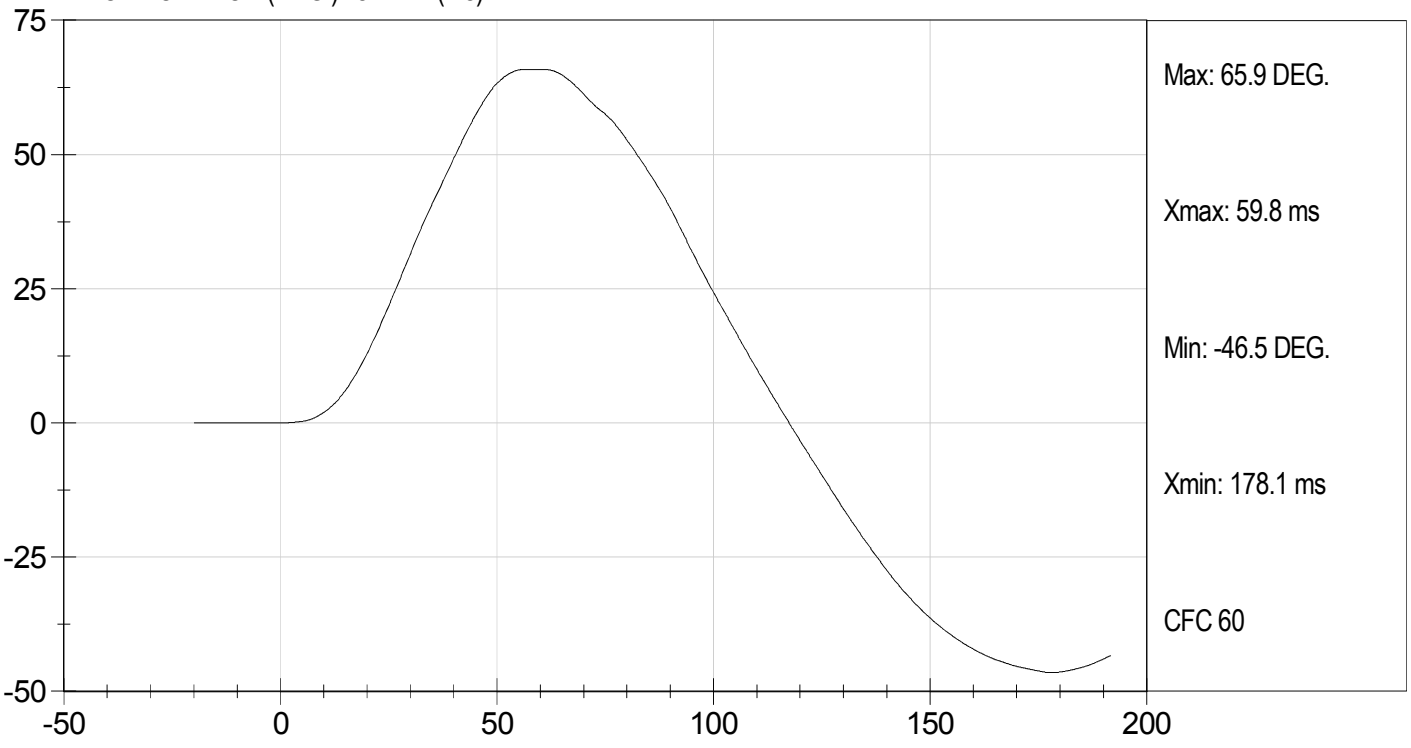
Test Desc: Neck Flexion
Component ID: D113212

Test Date: 9/27/11
Velocity: 22.83 ft/s, 6.96 m/s

PENDULUM DECELERATION (G's) vs TIME (ms)

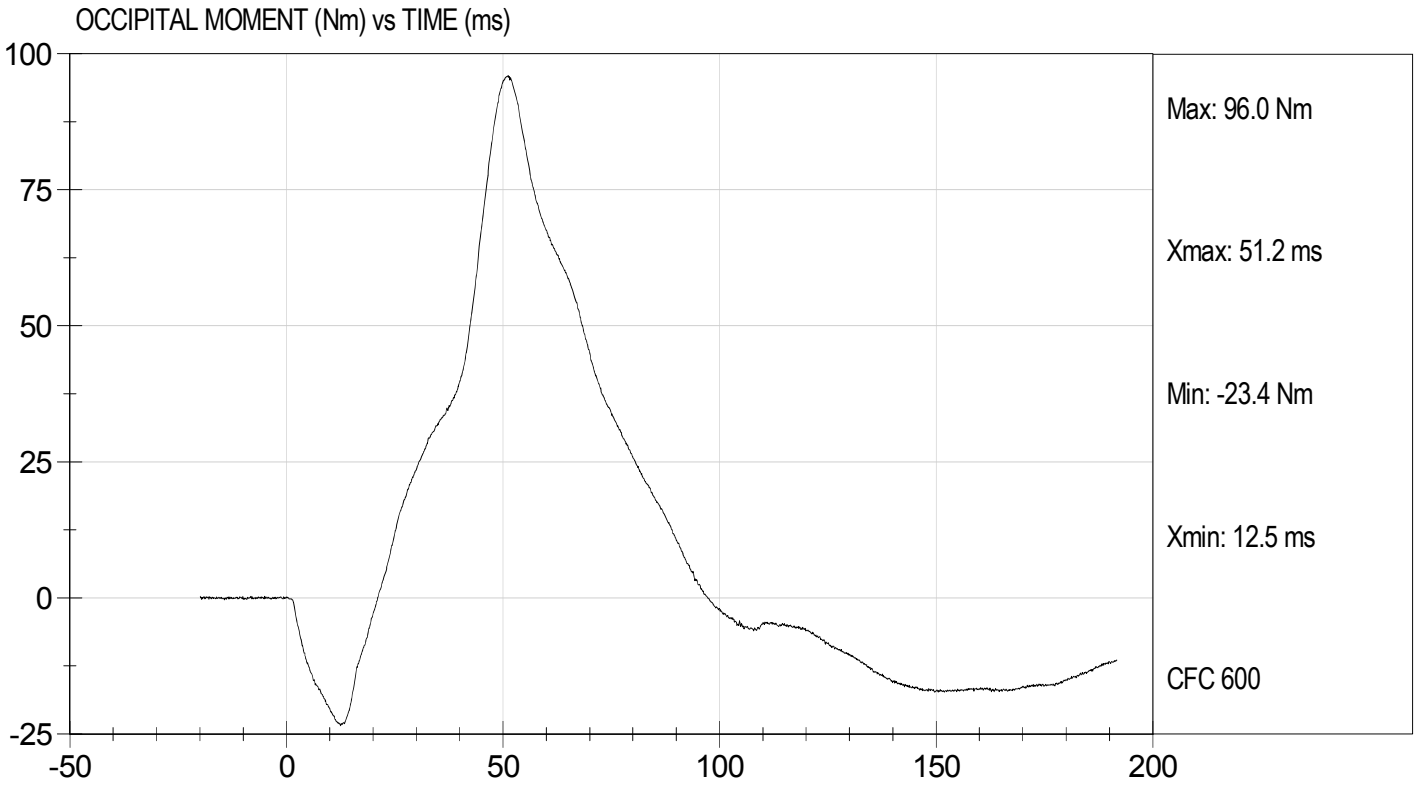


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Component ID: D113212

Test Date: 9/27/11
Velocity: 22.83 ft/s, 6.96 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D113213

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	49	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.89	Pass
	20 ms	G's	14.00 to 19.00	14.82	Pass
	30 ms	G's	11.00 to 16.00	11.58	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	11.6	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	40.3	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	95.9	Pass
	Time	ms	72.0 to 82.0	75.7	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	157.4	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-63.8	Pass
	Time	ms	65.0 to 79.0	70.6	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	140.7	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

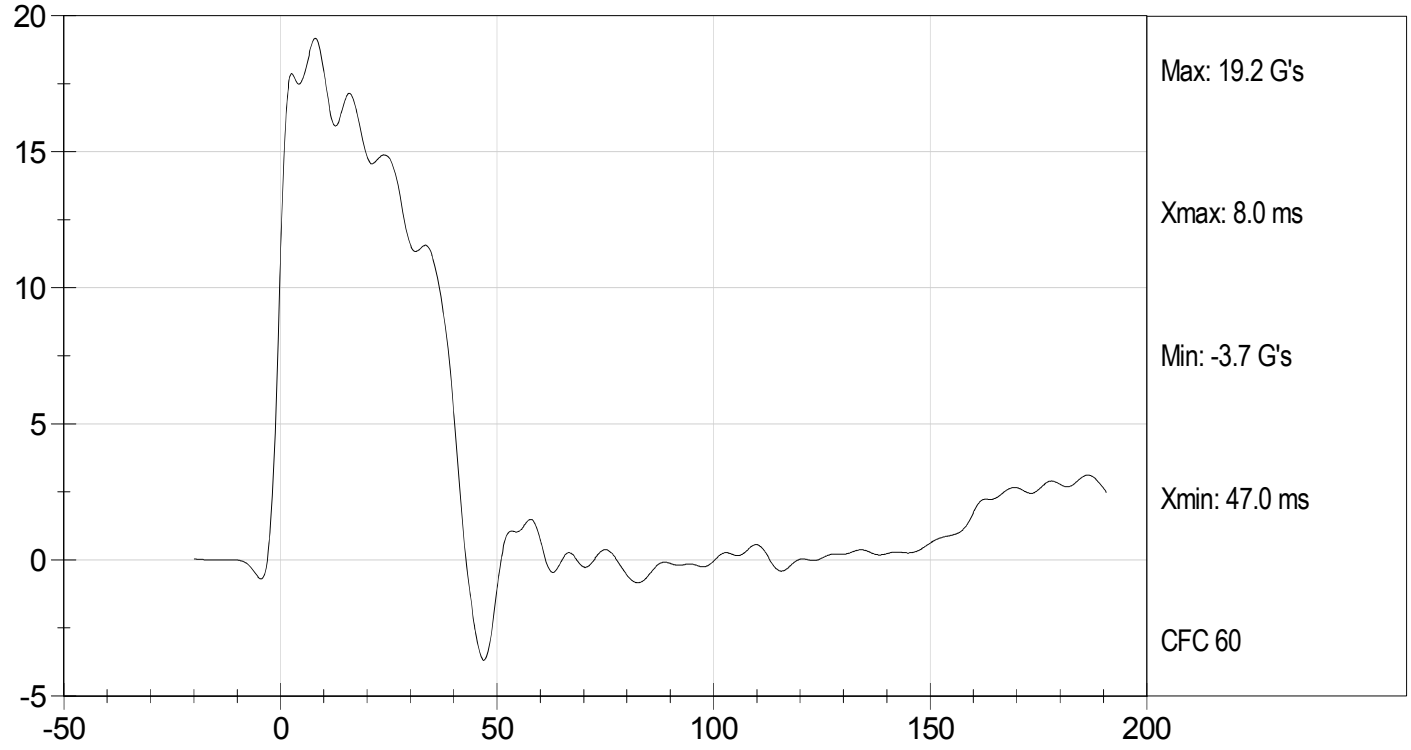
9/27/11
Test Date

David Winkelbauer
Approved By

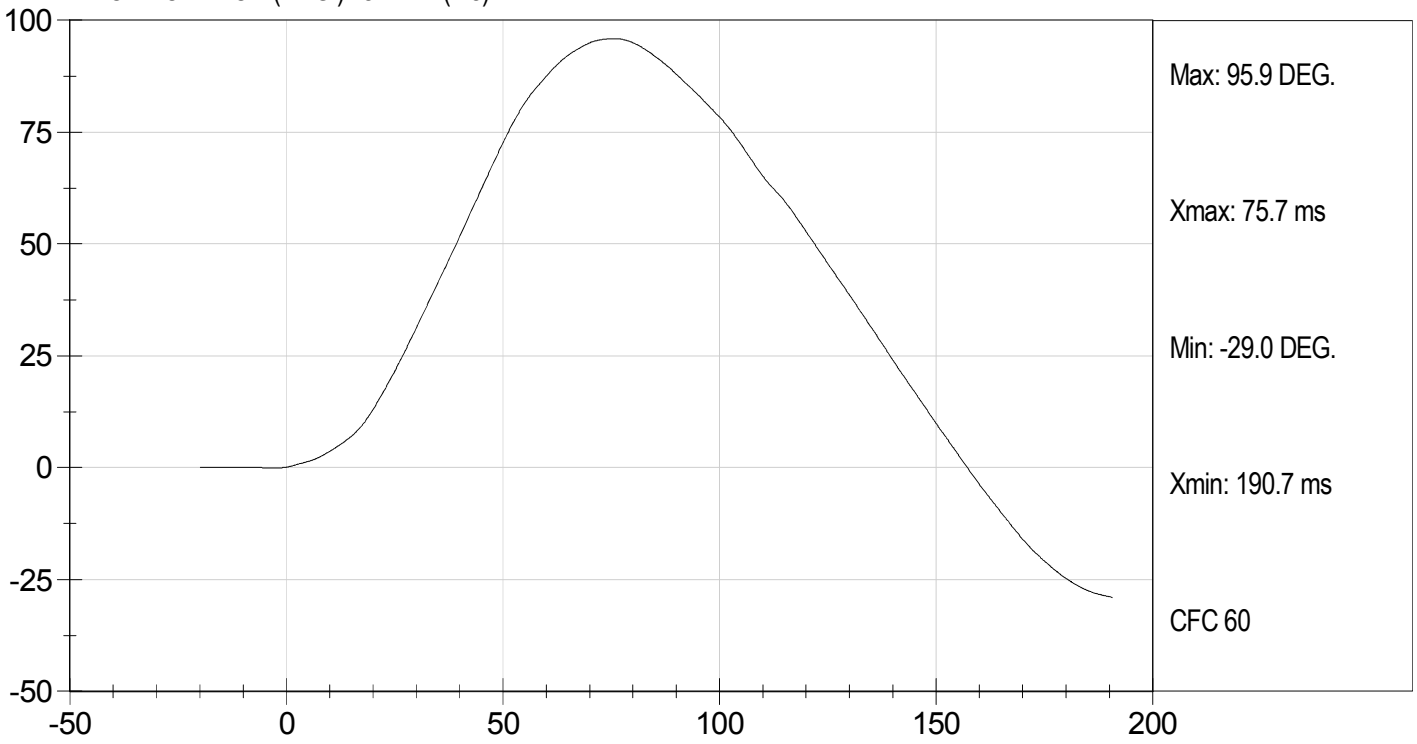
Test Desc: Neck Extension
Component ID: D113213

Test Date: 9/27/11
Velocity: 20.1 ft/s, 6.13 m/s

PENDULUM DECELERATION (G's) vs TIME (ms)

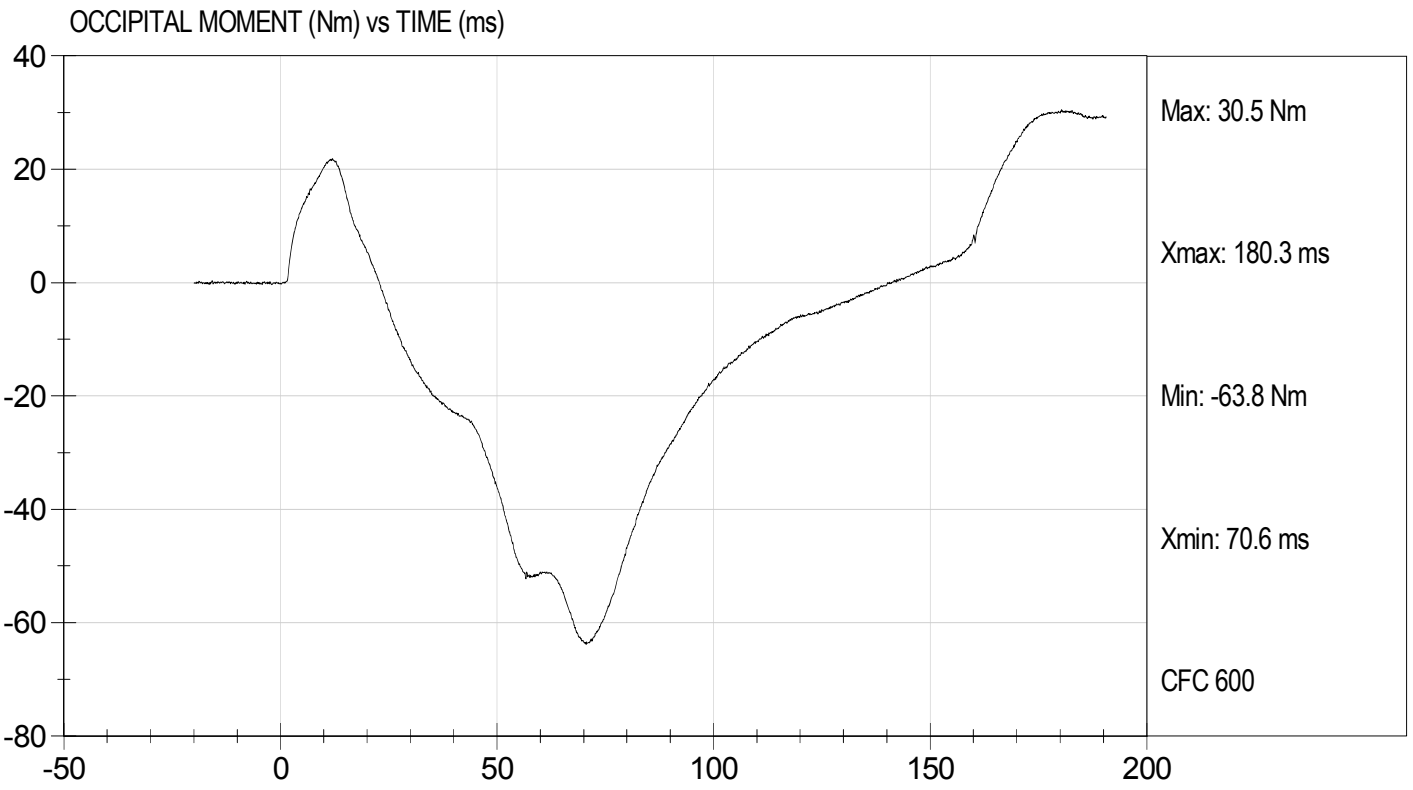


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D113213

Test Date: 9/27/11
Velocity: 20.1 ft/s, 6.13 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D113214

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	49	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,310	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.98	Pass
Internal Hysteresis	%	69 to 85	72	Pass
		Overall Test Results		Pass

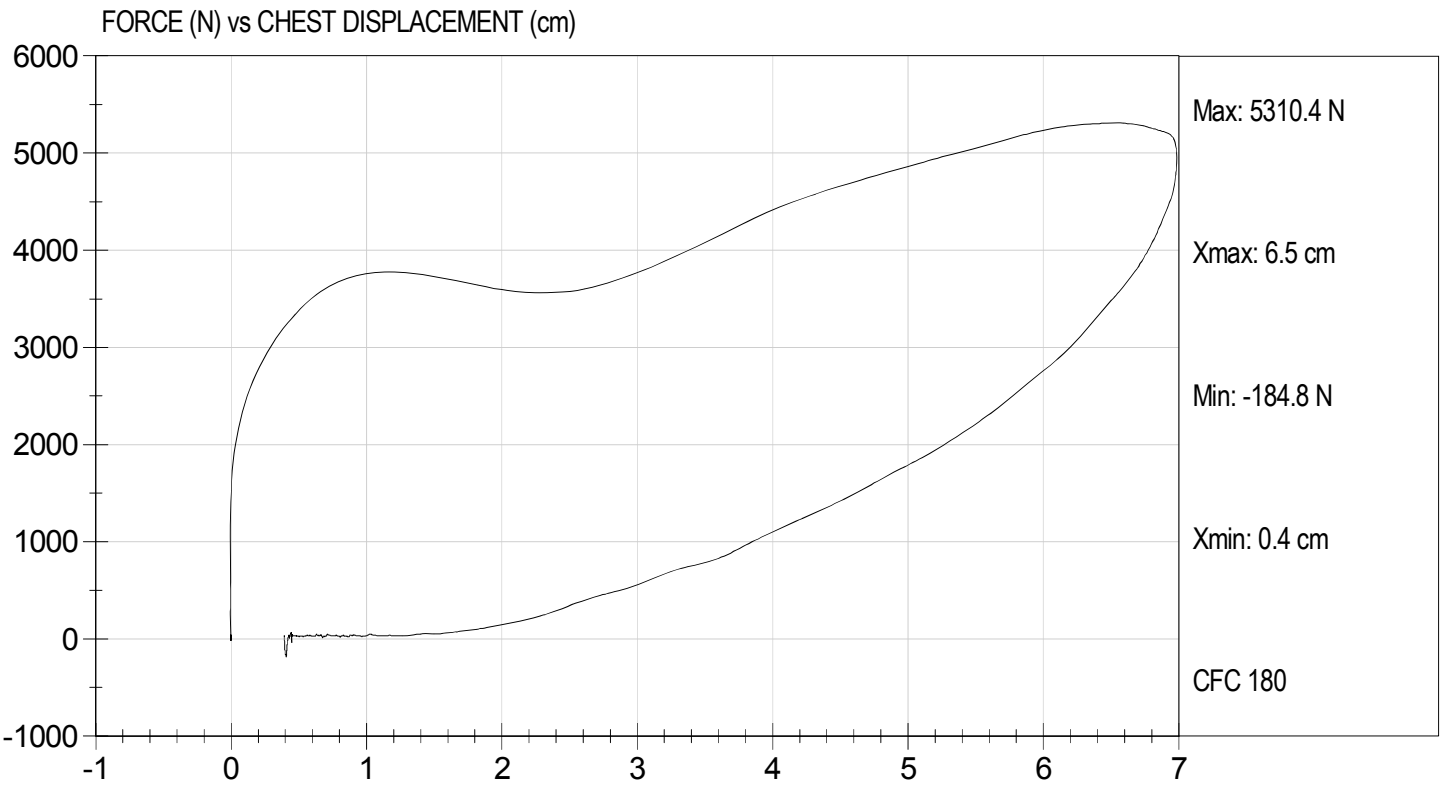
Jessica Gall
Laboratory Technician

9/27/11
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D113214

Test Date: 9/27/11
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D113215

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5,263	Pass
		Overall Test Results		Pass

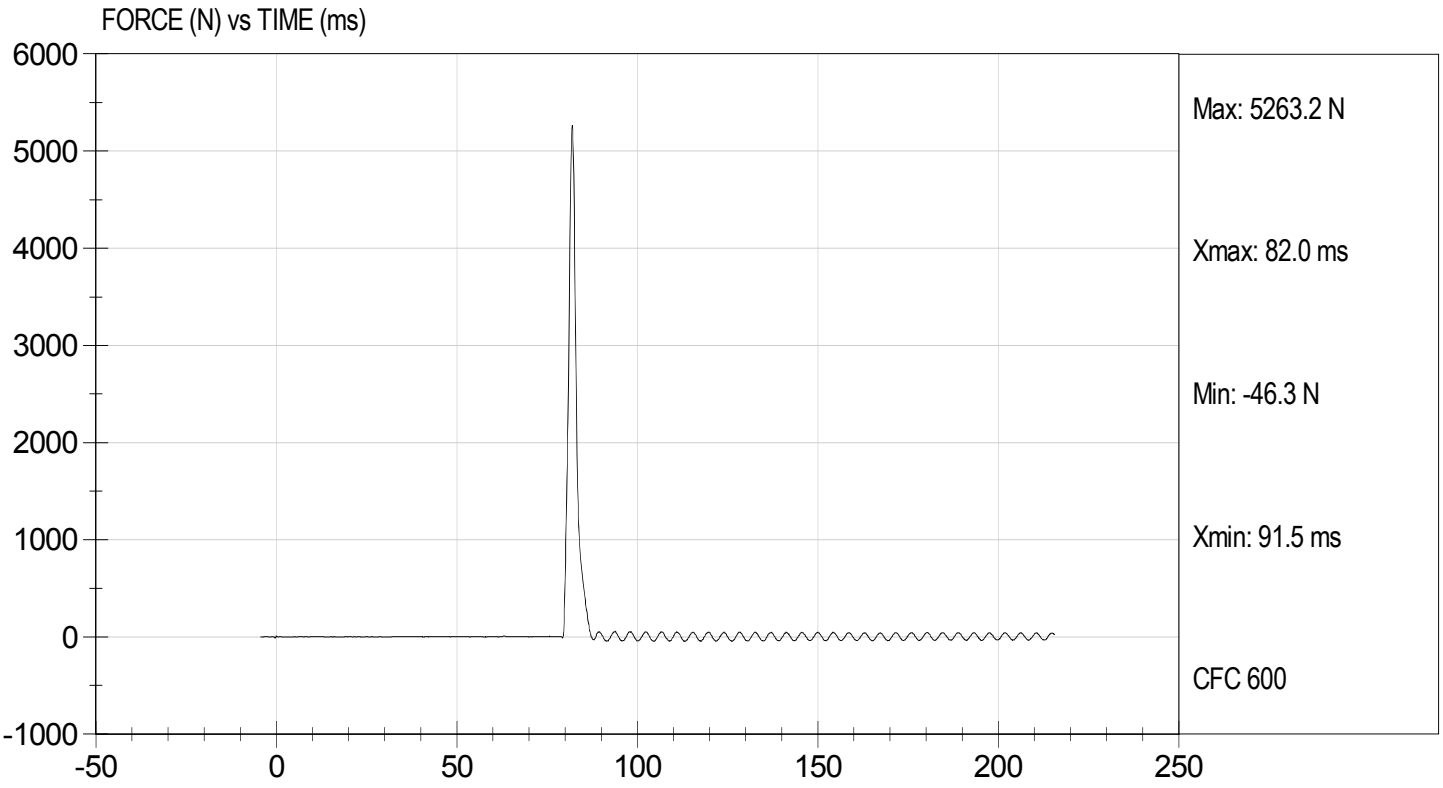
Jessica Gall
Laboratory Technician

9/27/11
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D113215

Test Date: 9/27/11
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D113216

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	4,902	Pass
		Overall Test Results		Pass

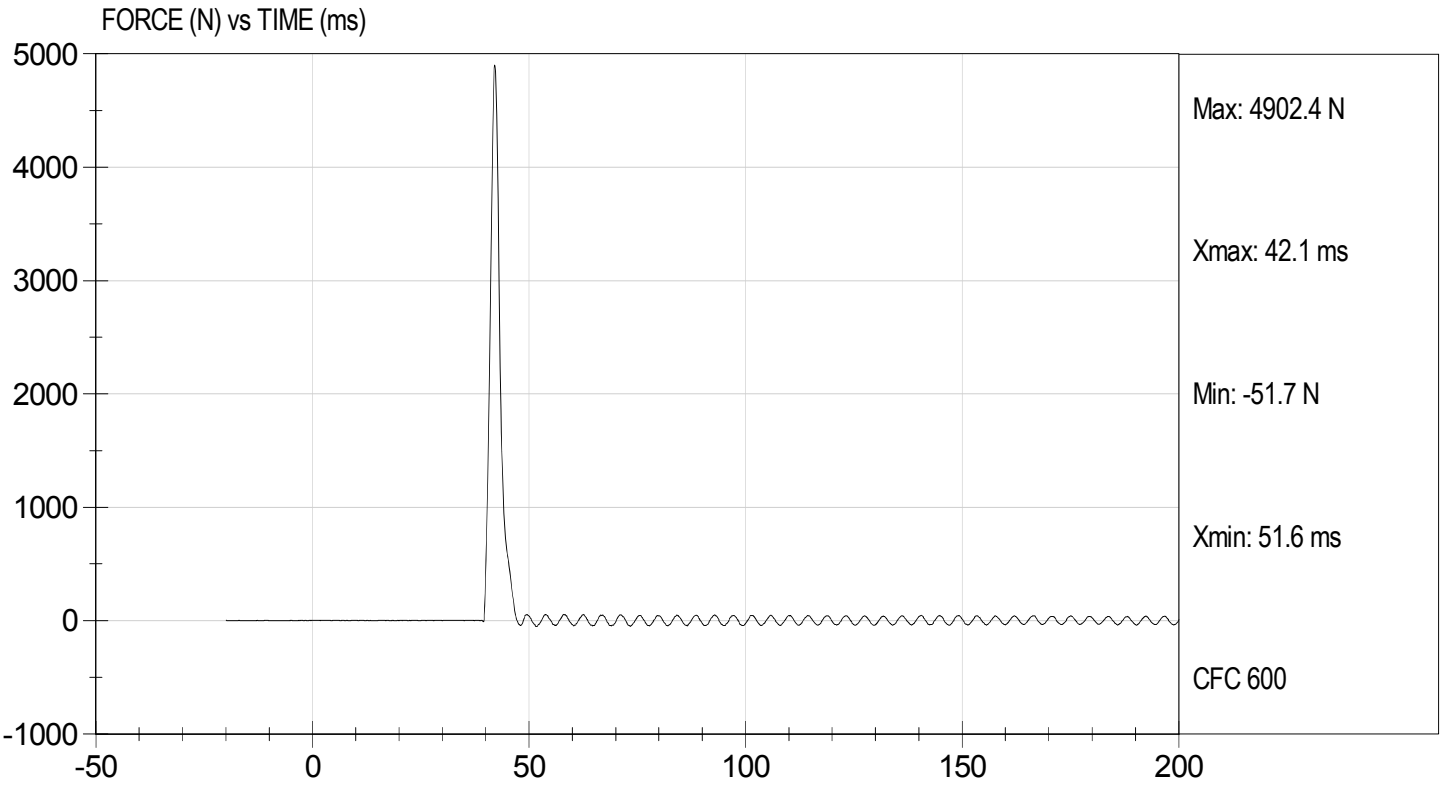
Jessica Gall
Laboratory Technician

9/27/11
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D113216

Test Date: 9/27/11
Velocity: 6.94 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 036 **Test I.D:** D113210

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.8	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	49	49	Pass
Rotation Rate	deg/s	5.0 -10.0	5.7	5.7	Pass
30 Degrees	Nm	94.9 Nm Max	92.5	78.1	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	40.4	41.0	Pass
		Overall Test Results			Pass

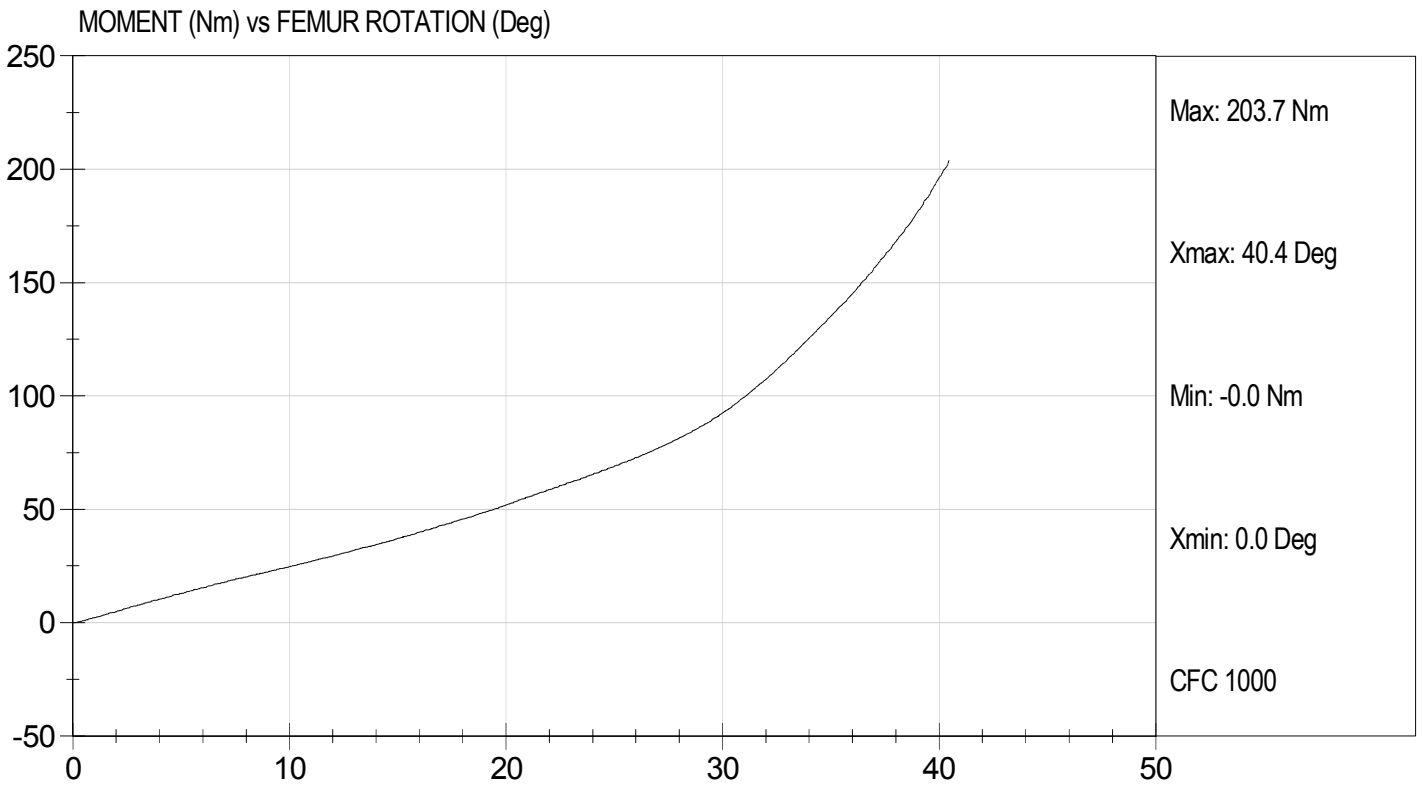
Jessica Hall
Laboratory Technician

9/27/11
Test Date

David Winkelbauer
Approved By

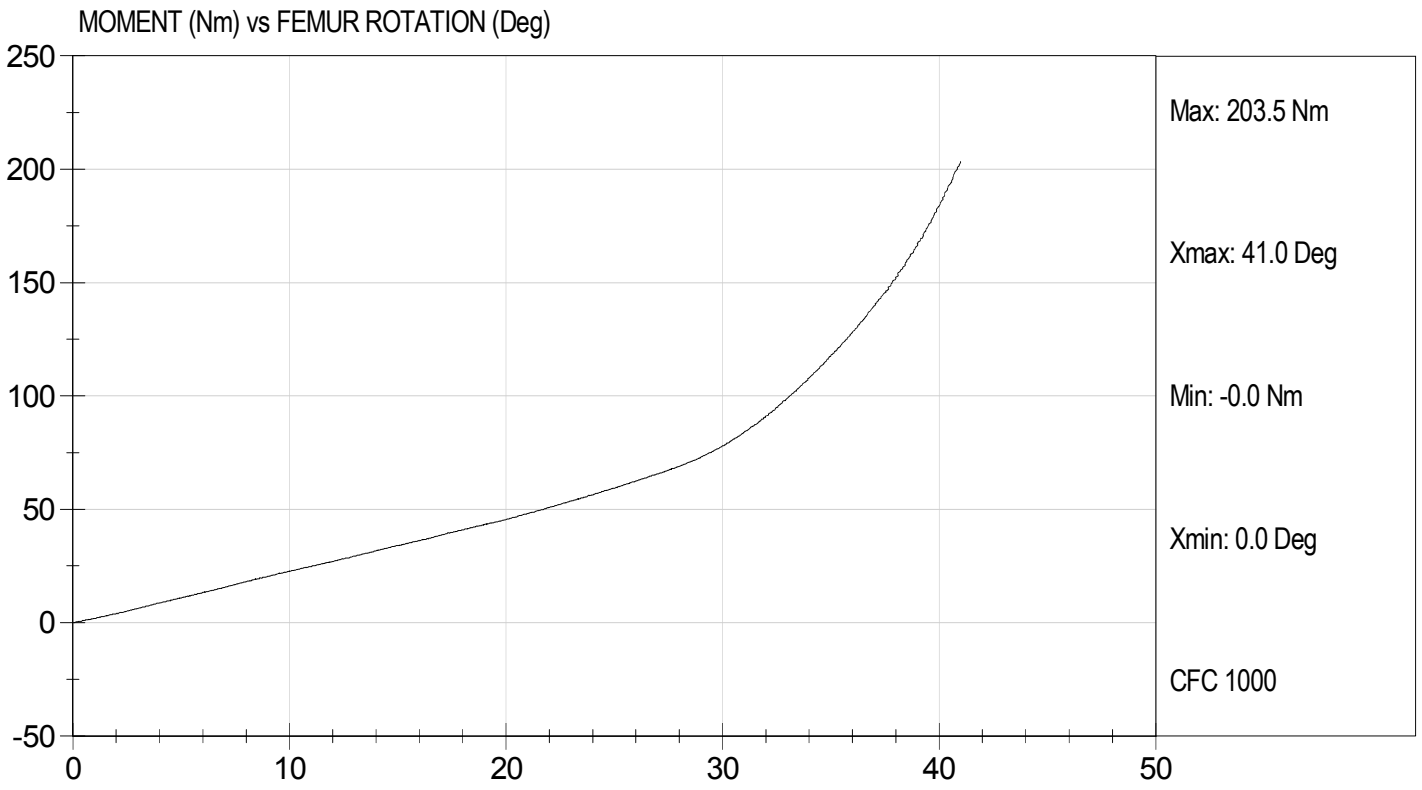
Test Desc: Hip Femur Flexion
Component ID: D113219

Test Date: 9/27/11
Velocity: 0 ft/s, 0.00 m/s



Test Desc: Hip Femur Flexion
Component ID: D113210

Test Date: 9/27/11
Velocity: 0 ft/s, 0.00 m/s



Hybrid III, 5th External Measurements
SN: 634

HYBRID III, PART 572, SUBPART O EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	774.7-800.1	784.6
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	449.0
C	H-POINT HEIGHT	Reference	81.3-86.3	85.0
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	145.0
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	79.2
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	125.6
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	243.9-259.1	2534
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	43.2-48.2	45.0
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	276.8-297.2	277.8
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	197.5
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	520.7-546.1	541.4
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376.0	362.1
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	400.4
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. “K”.	414-439.4	428.6

HYBRID III, SUBPART O EXTERNAL DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 304.8 ± 5.1 mm above seat surface	175.3-190.5	181.6
P	FOOT LENGTH	Tip of toe to rear of heal	218.5-233.7	224.7
Q	STANDING HEIGHT	(THEORETICAL)	1501.1	N/A
R	BUTTOCK TO KNEE PIVOT LENGTH	The rear surface of the buttocks to the knee pivot bolt	457.2-482.6	482.0
S	HEAD BREADTH	The widest part of the head	137.1-147.3	139.6
T	HEAD DEPTH	Back of the head to the forehead	177.8-188.0	179.2
U	HIP BREADTH	The widest part of the hip	299.7-314.9	306.1
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	350.5-365.7	355.5
W	FOOT BREADTH	The widest part of the foot	78.8-94.0	90.0
X	HEAD CIRCUMFERENCE	Measured at the point as in dim. “T”	528.3-548.7	540.6
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 345.4 ± 12.7 mm above seat surface	850.9-881.3	868.7
Z	WAIST CIRCUMFERENCE	Measured 165.1 ± 5.1 mm above seat surface	759.5-789.9	786.8
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	332.7-358.1	345.4
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	160.1-170.2	165.1

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test ID:** D112161

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	53	Pass
Peak Resultant Acceleration	G's	250 to 300	273	Pass
Peak Lateral Acceleration	G's	+/- 15	-5.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

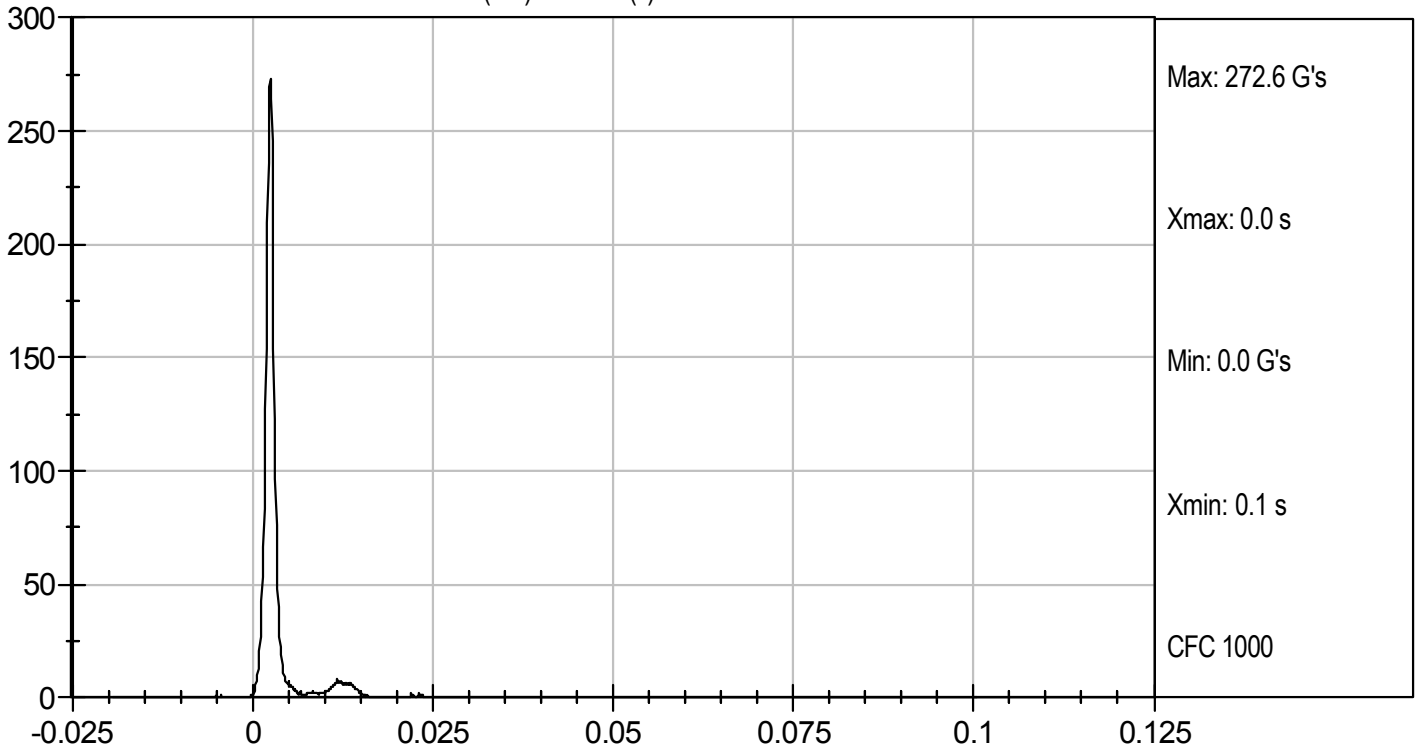
6/21/11
Test Date

David Winkelbauer
Approved By

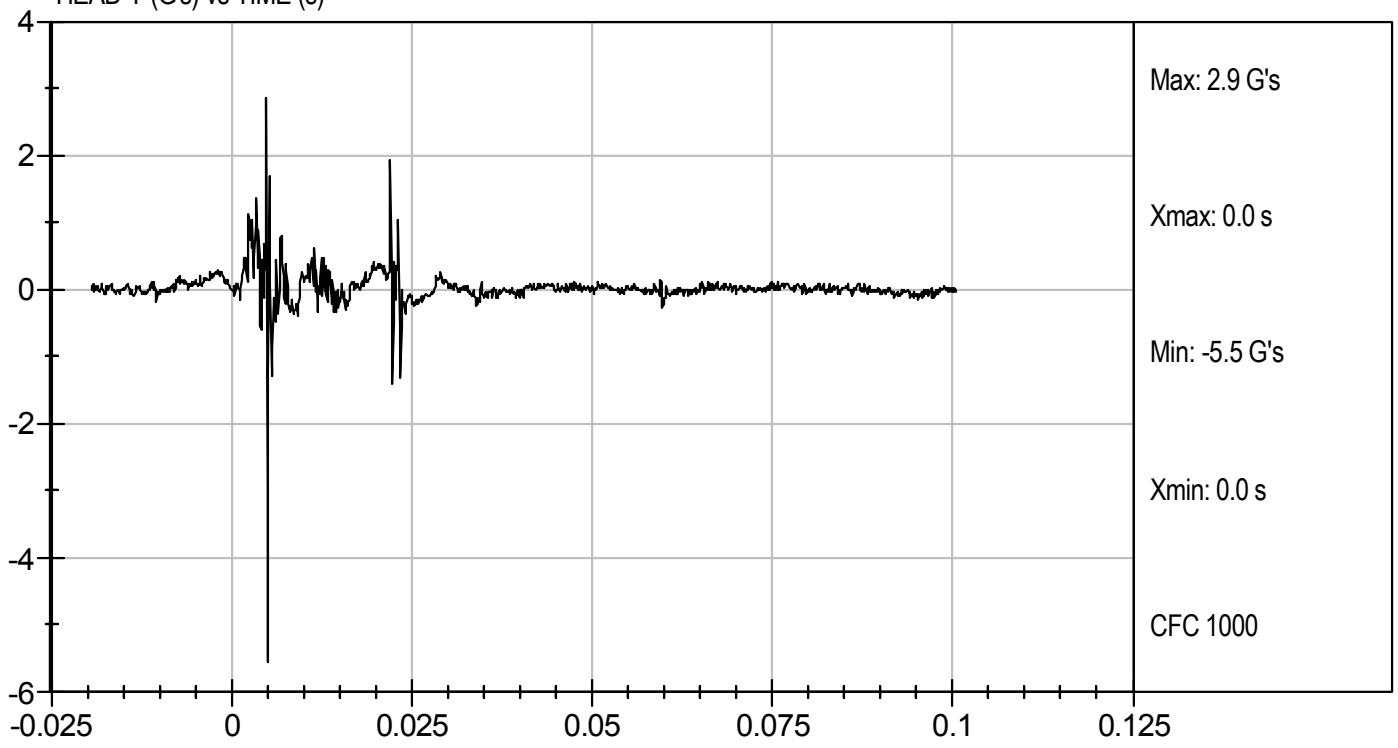
Test Desc: Head Drop
Component ID: D112161

Test Date: 6/21/11
Velocity: 0 ft/s, 0.00 m/s

RESULTANT HEAD ACCELERATION (G's) vs TIME (s)



HEAD Y (G's) vs TIME (s)



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D112162

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	58	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	4.6	Pass
	30 ms	m/s	5.8 to 7.0	6.2	Pass
D Plane Rotation	Max	deg	77 to 91	77	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	87	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

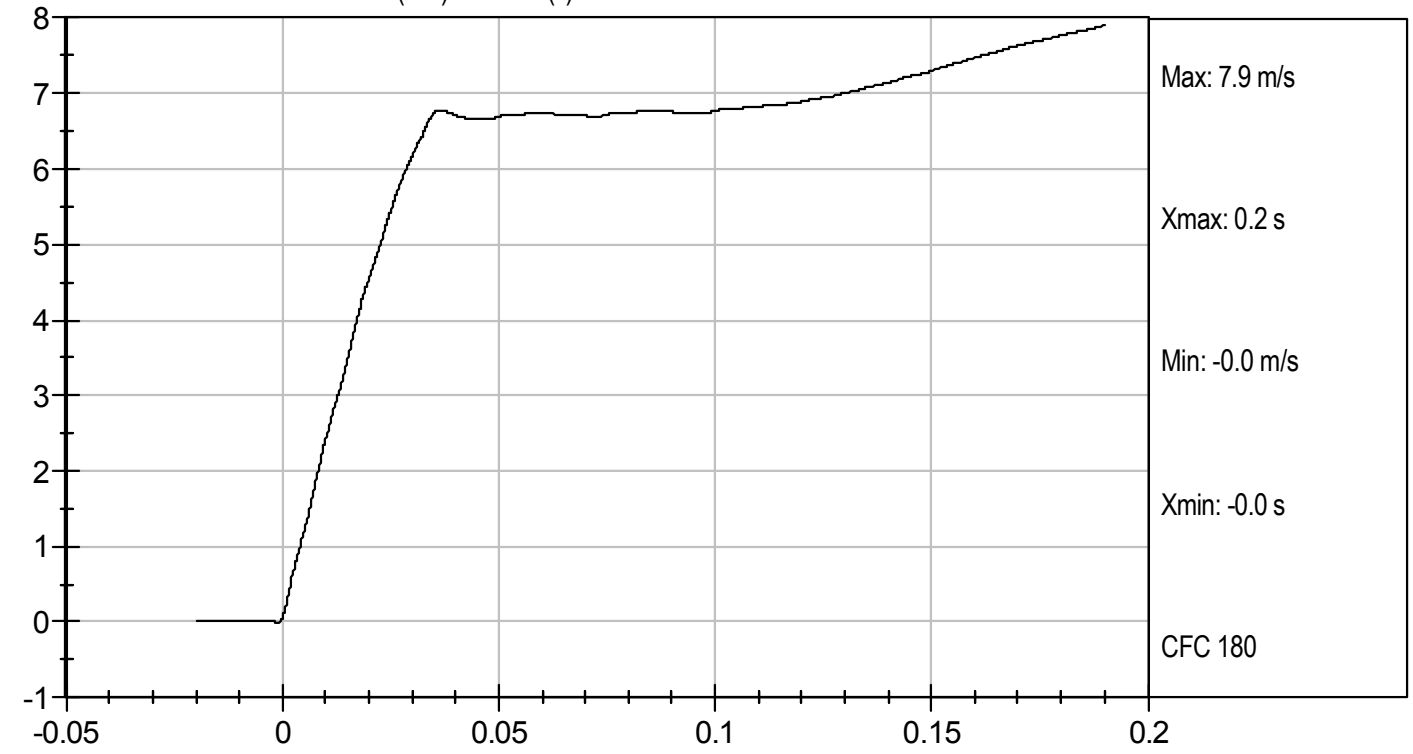
6/22/11
Test Date

David Winkelbauer
Approved By

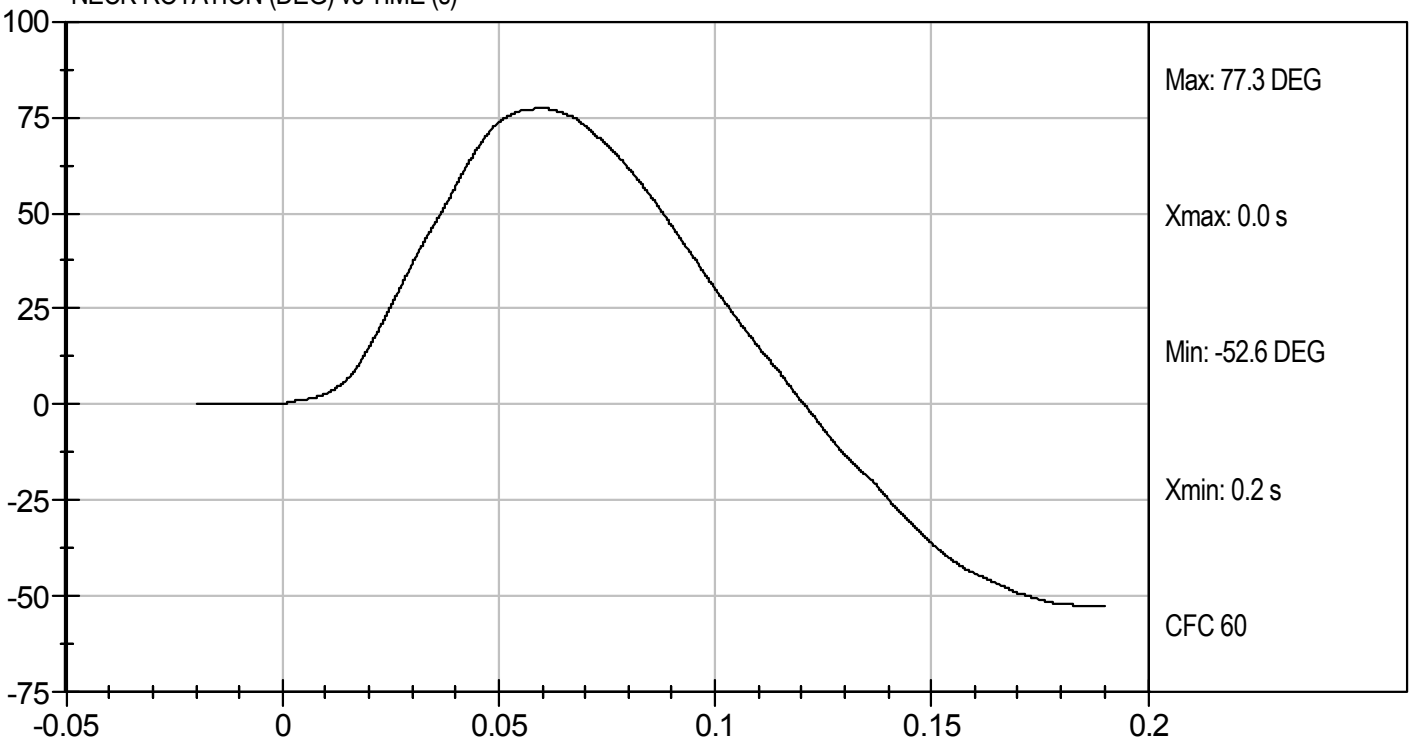
Test Desc: Neck Flexion
Component ID: D112162

Test Date: 6/22/11
Velocity: 23.15 ft/s, 7.06 m/s

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

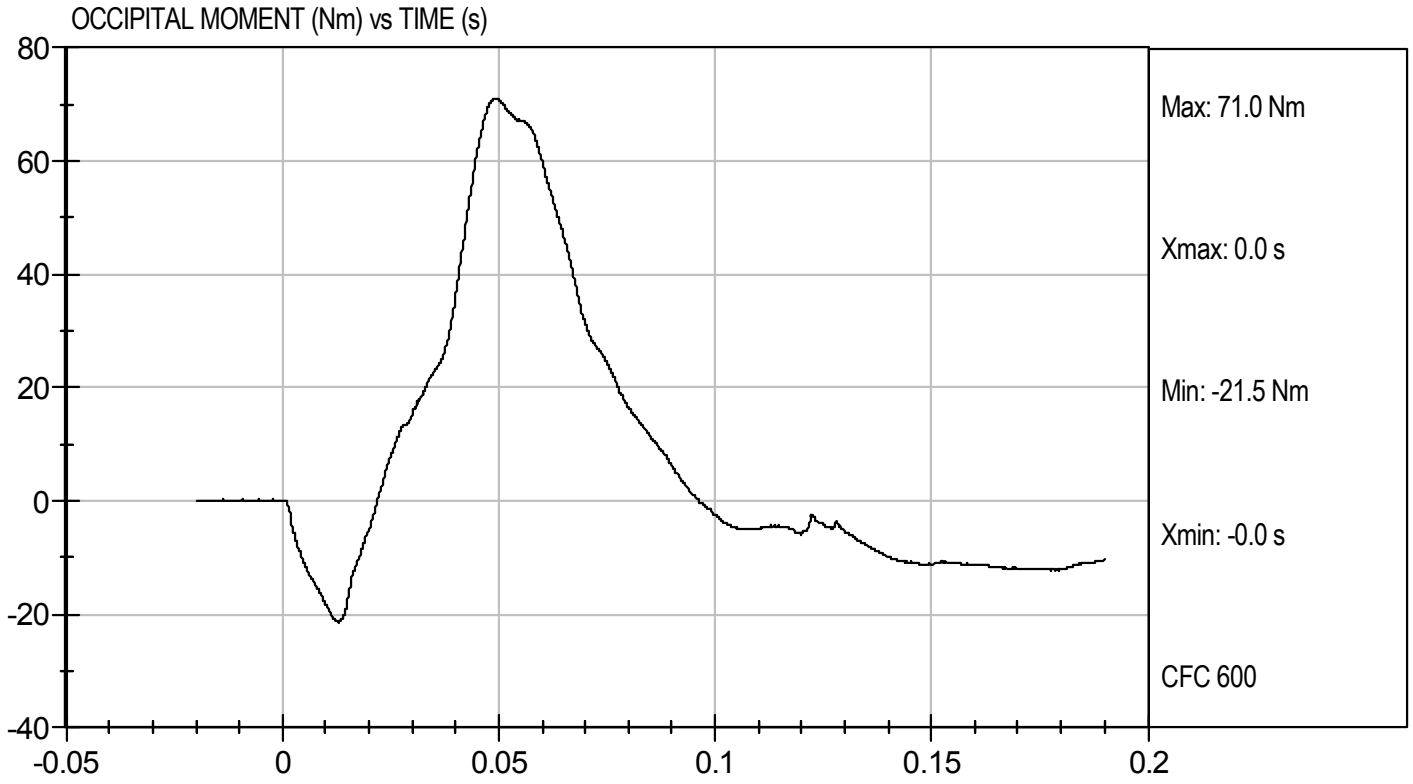


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Flexion
Component ID: D112162

Test Date: 6/22/11
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D112163

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	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	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.4	Pass
	30 ms	m/s	4.6 to 5.6	4.8	Pass
D Plane Rotation	Max	deg	99 to 114	103	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-53	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	107	Pass
			Overall Results		Pass

Jessica Gall
Laboratory Technician

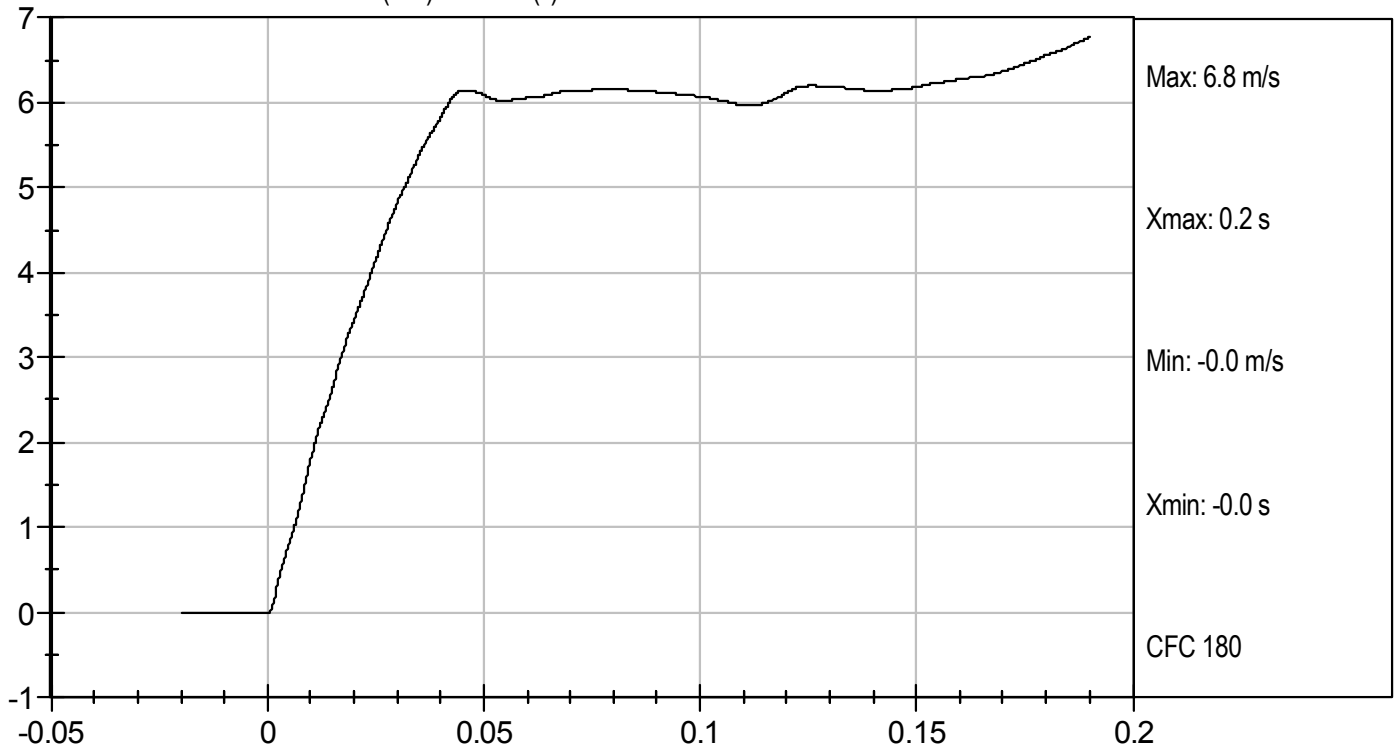
6/22/11
Test Date

David Winkelbauer
Approved By

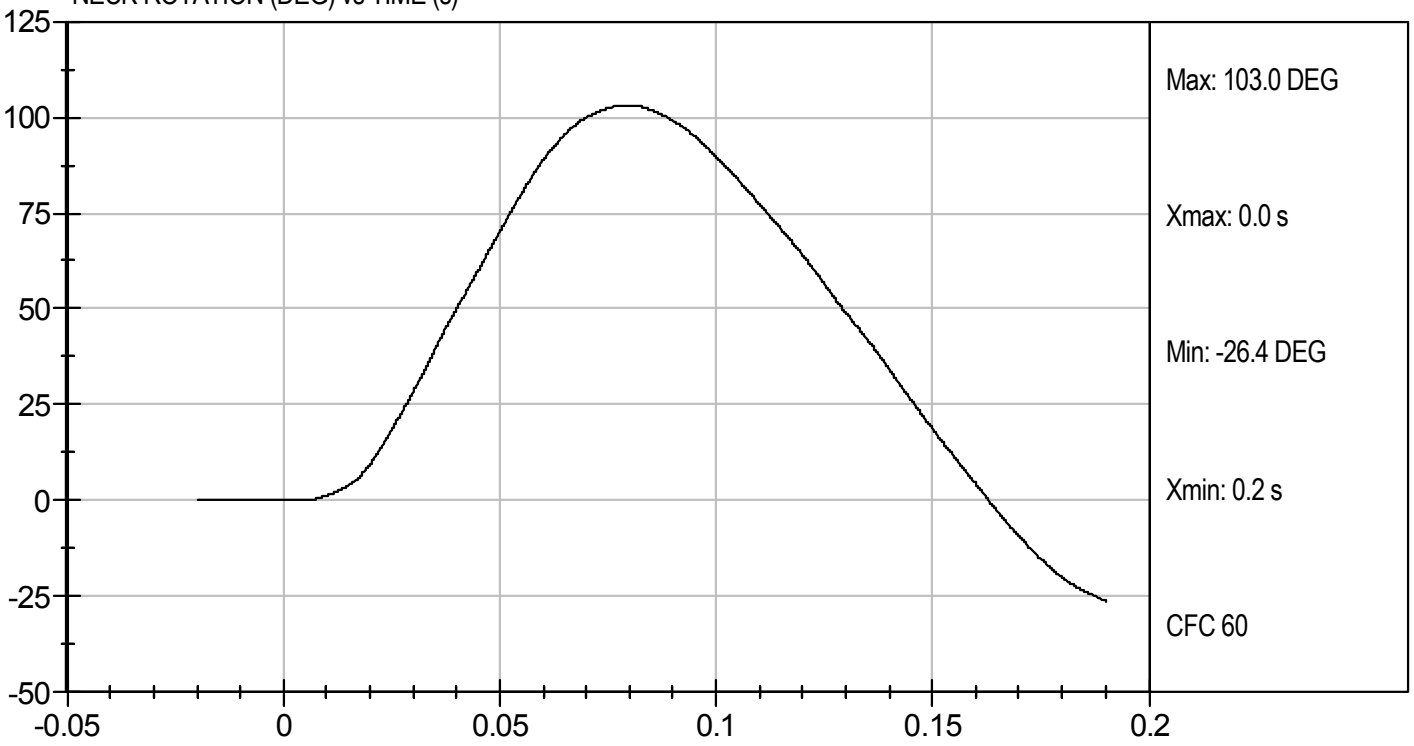
Test Desc: Neck Extension
Component ID: D112163

Test Date: 6/22/11
Velocity: 20.08 ft/s, 6.12 m/s

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

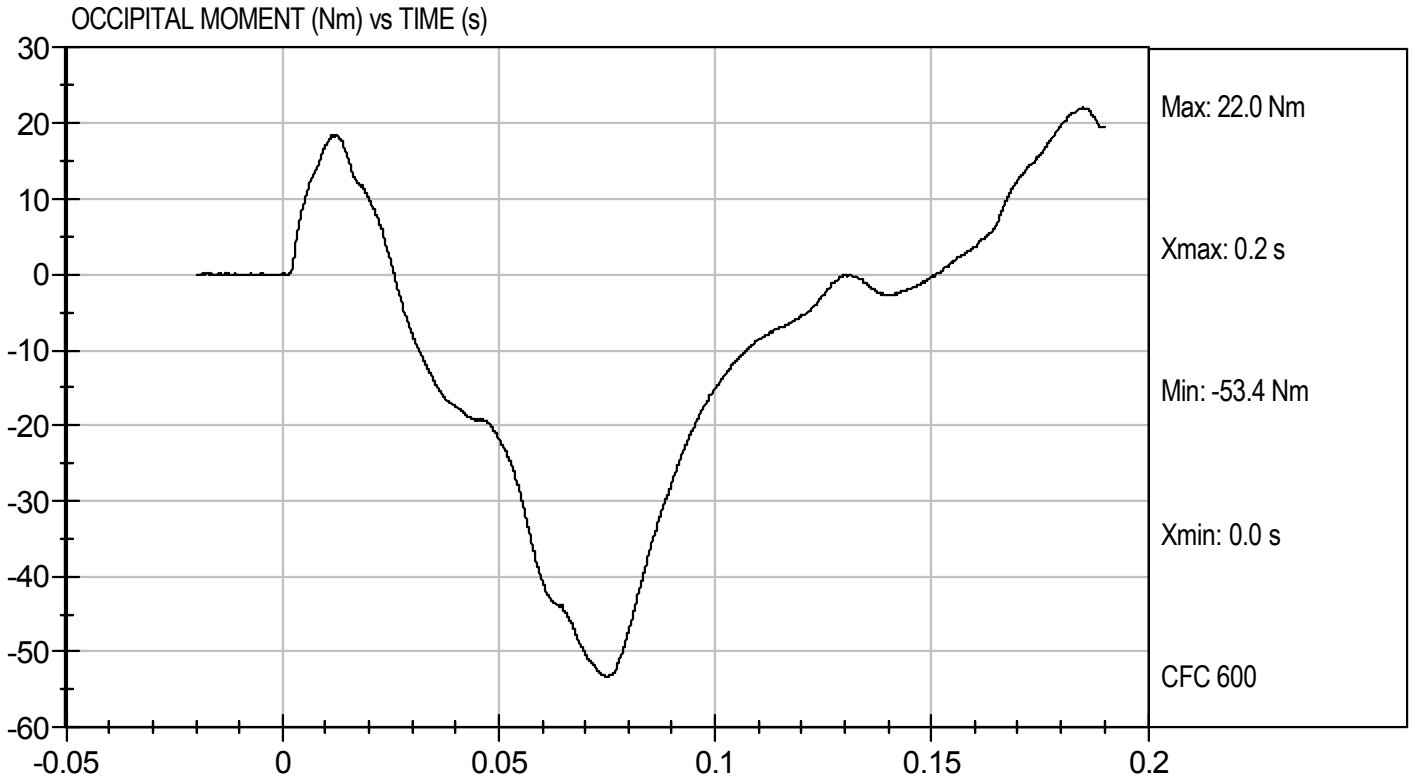


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Extension
Component ID: D112163

Test Date: 6/22/11
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:** D112164

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Relative Humidity	%	10 to 70	54	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	4.15	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4069	Pass
		Overall Test Results		Pass

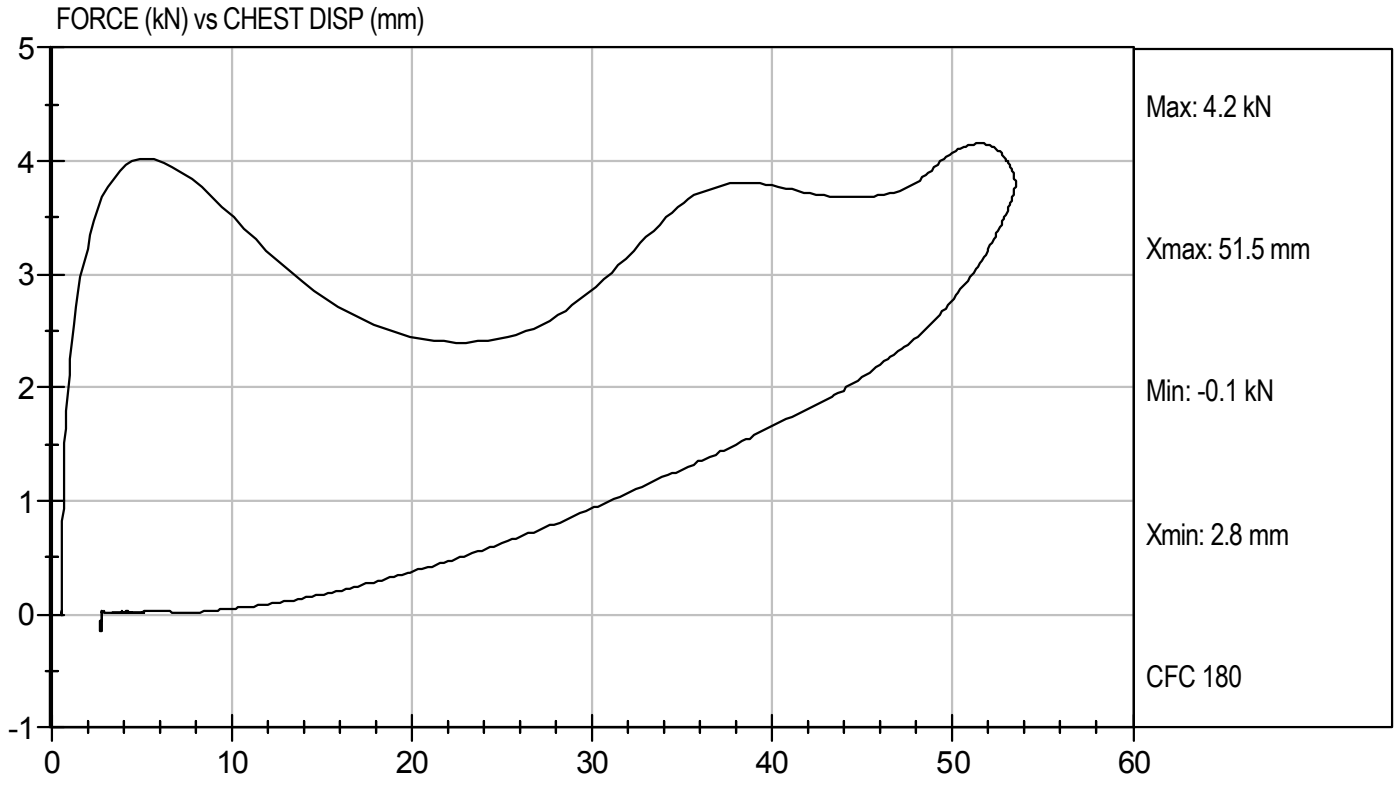
Jessica Hall
Laboratory Technician

6/22/11
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D112164

Test Date: 6/22/11
Velocity: 22.2 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D112165

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	54	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.88	Pass
		Overall Test Results		Pass

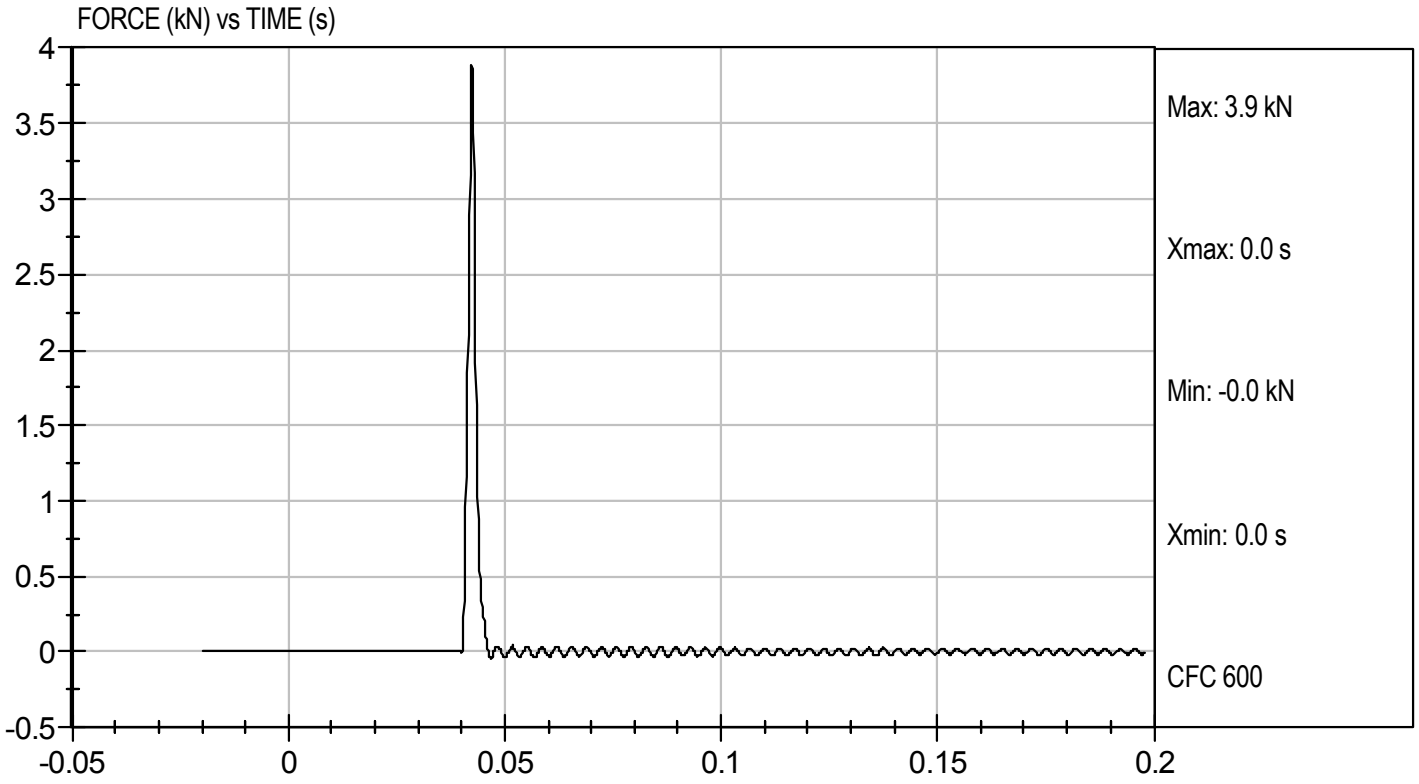
Jessica Gall
Laboratory Technician

6/21/11
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D112165

Test Date: 6/21/11
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:** D112166

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	54	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	kN	3.45 to 4.06	3.64	Pass
		Overall Test Results		Pass

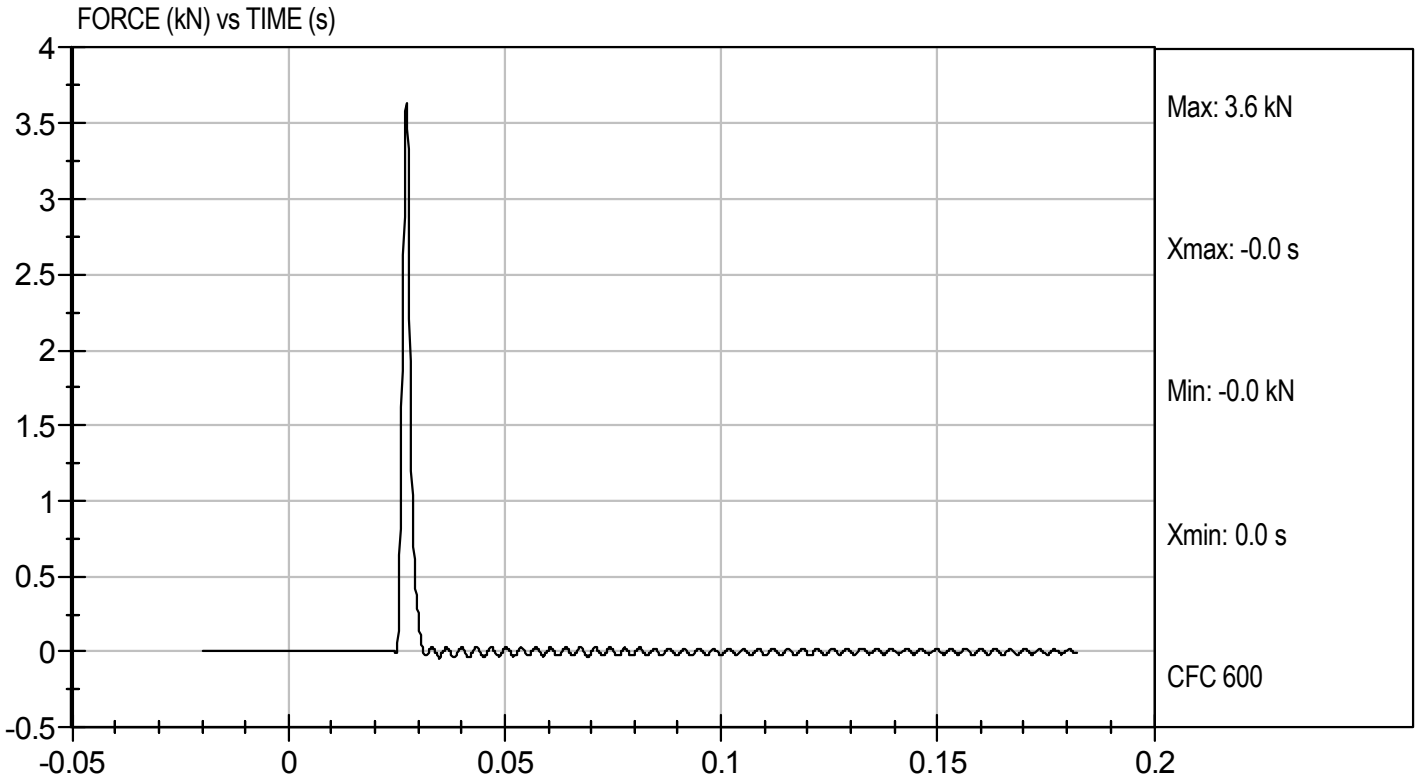
Jessica Hall
Laboratory Technician

6/21/11
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D112166

Test Date: 6/21/11
Velocity: 6.88 ft/s, 2.10 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D112167

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	54	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	347	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
		Overall Result		Pass

Jessica Gall
Laboratory Technician

6/21/11
Test Date

David Winkelbauer
Approved By

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test ID:** D113201

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	49	Pass
Peak Resultant Acceleration	G's	250 to 300	286	Pass
Peak Lateral Acceleration	G's	+/- 15	10	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

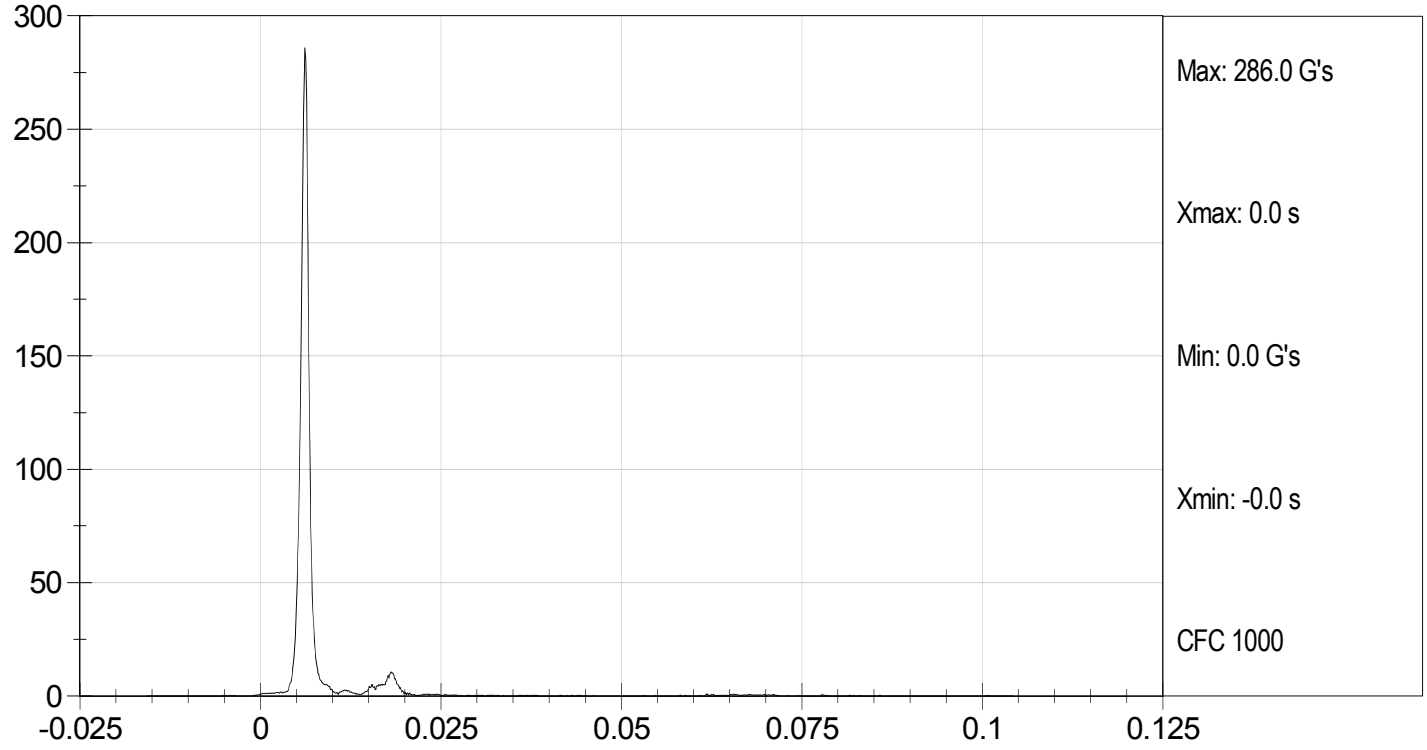
9/27/11
Test Date

David Winkelbauer
Approved By

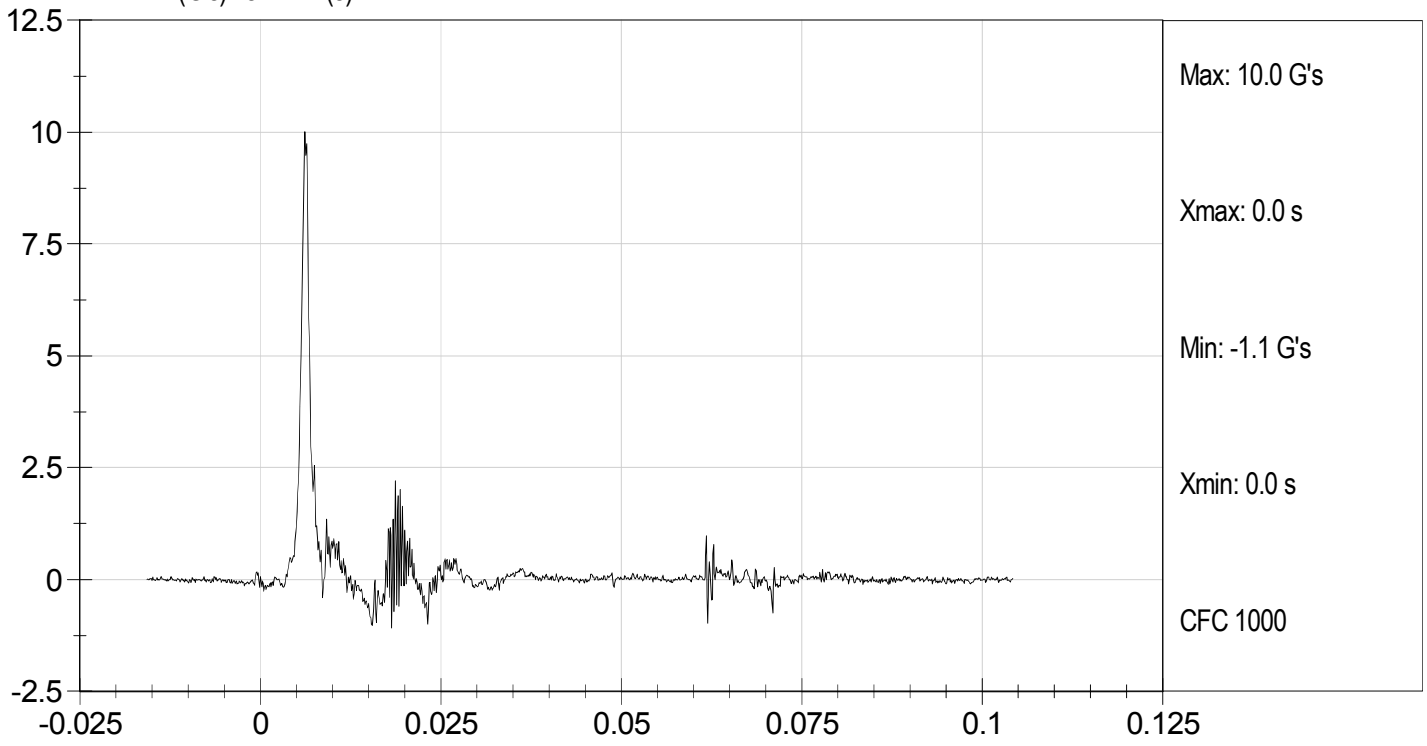
Test Desc: Head Drop
Component ID: D113201

Test Date: 9/27/11
Velocity: 0 ft/s, 0 m/s

RESULTANT HEAD ACCELERATION (G's) vs TIME (s)



HEAD Y (G's) vs TIME (s)



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D113202

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	50	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	4.4	Pass
	30 ms	m/s	5.8 to 7.0	6.0	Pass
D Plane Rotation	Max	deg	77 to 91	78	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	87	Pass
			Overall Results		Pass

Jessica Gall
Laboratory Technician

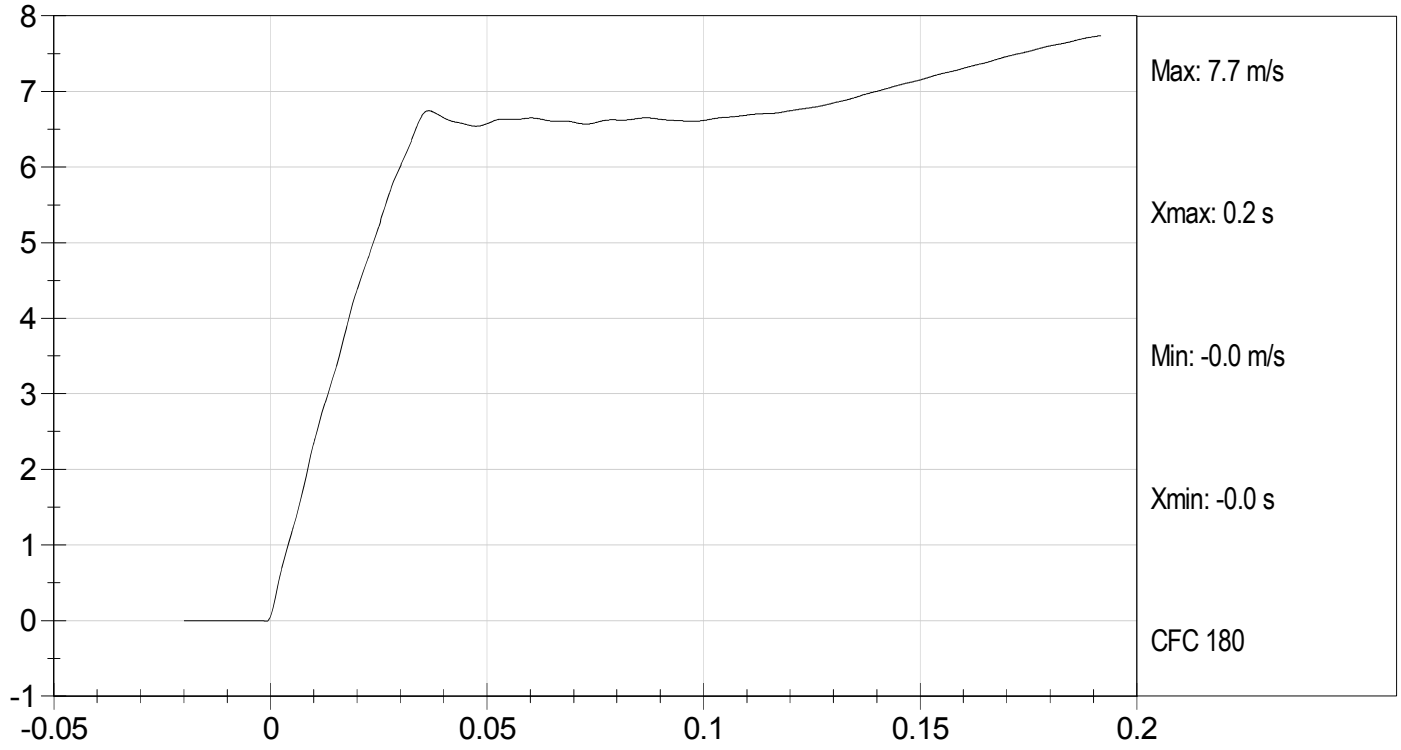
9/28/11
Test Date

David Winkelbauer
Approved By

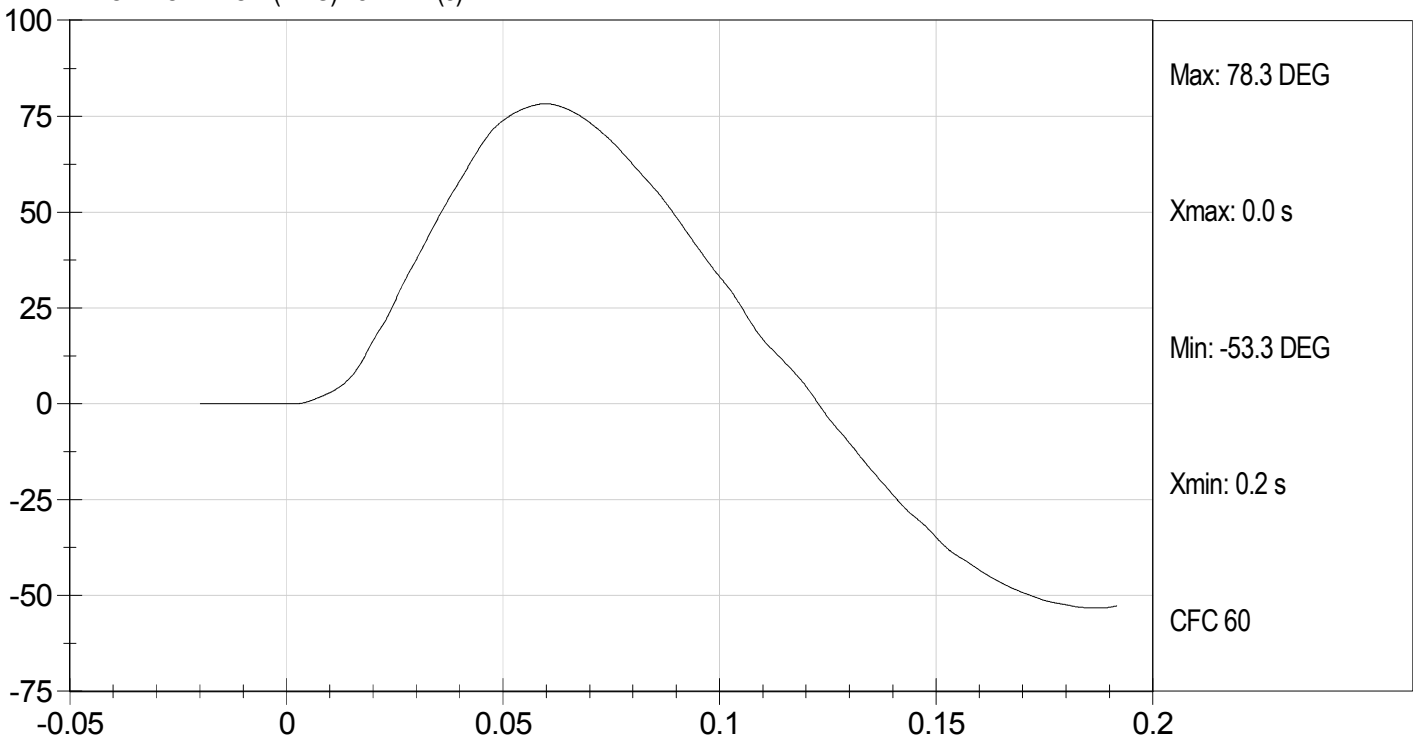
Test Desc: Neck Flexion
Component ID: D113202

Test Date: 9/28/11
Velocity: 23.15 ft/s, 7.06 m/s

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

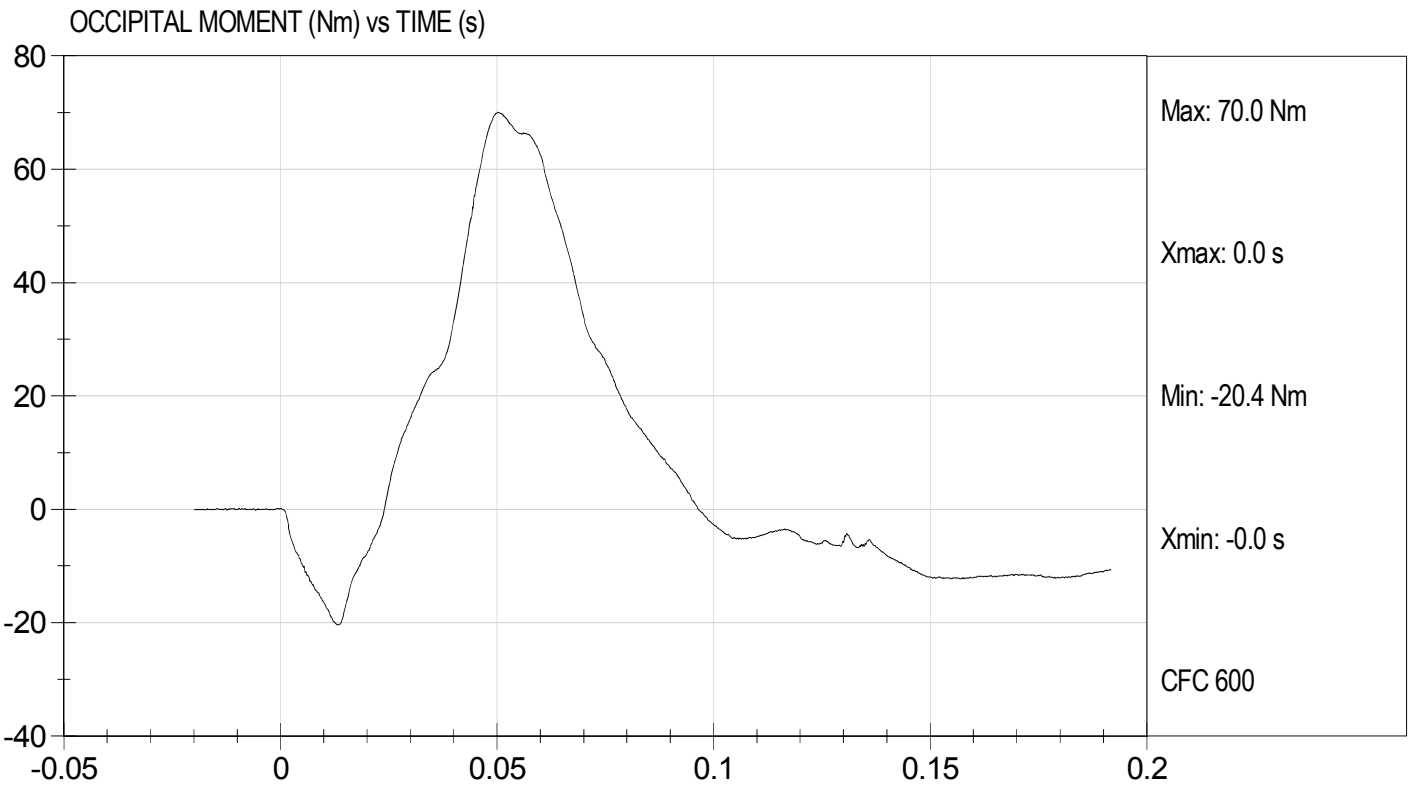


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Flexion
Component ID: D113202

Test Date: 9/28/11
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D113203

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	50	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.8	Pass
	20 ms	m/s	3.1 to 3.9	3.5	Pass
	30 ms	m/s	4.6 to 5.6	4.9	Pass
D Plane Rotation	Max	deg	99 to 114	104	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-53	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	103	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

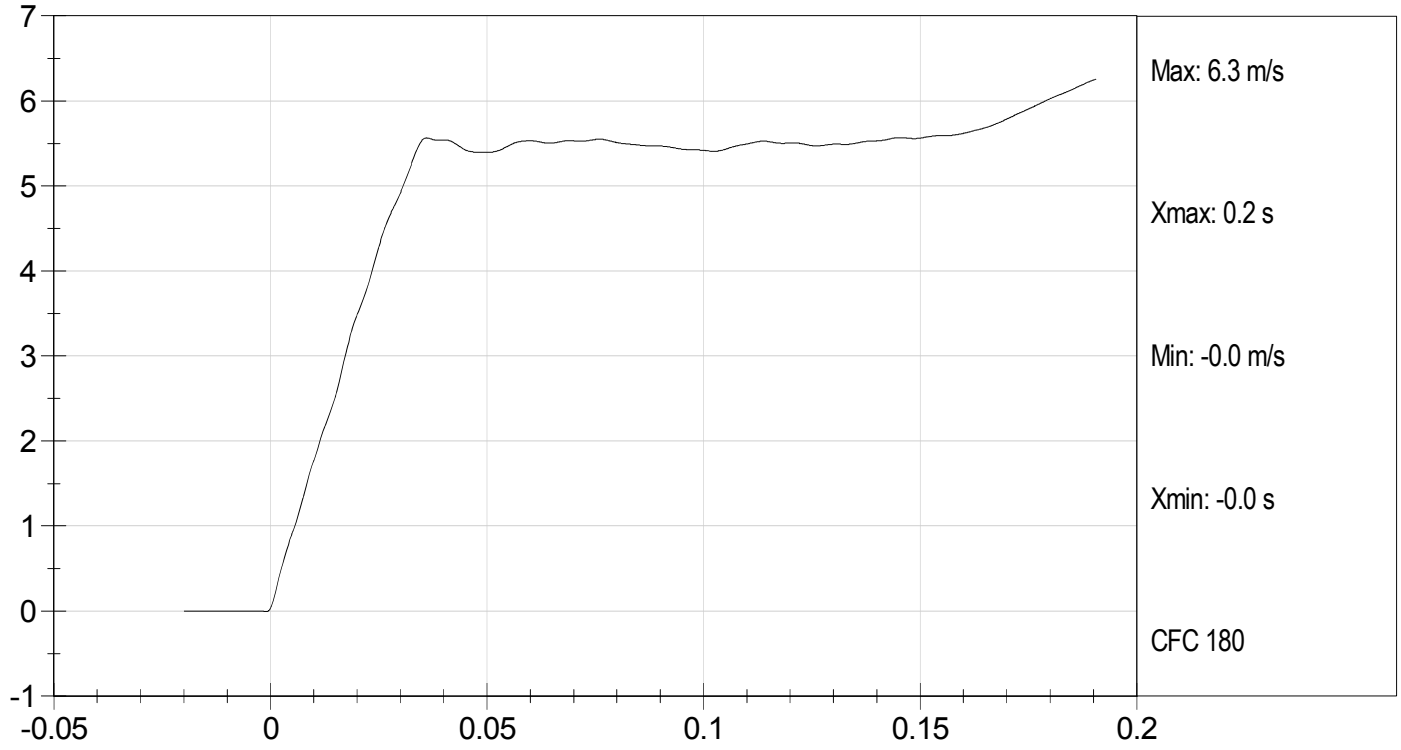
9/28/11
Test Date

David Winkelbauer
Approved By

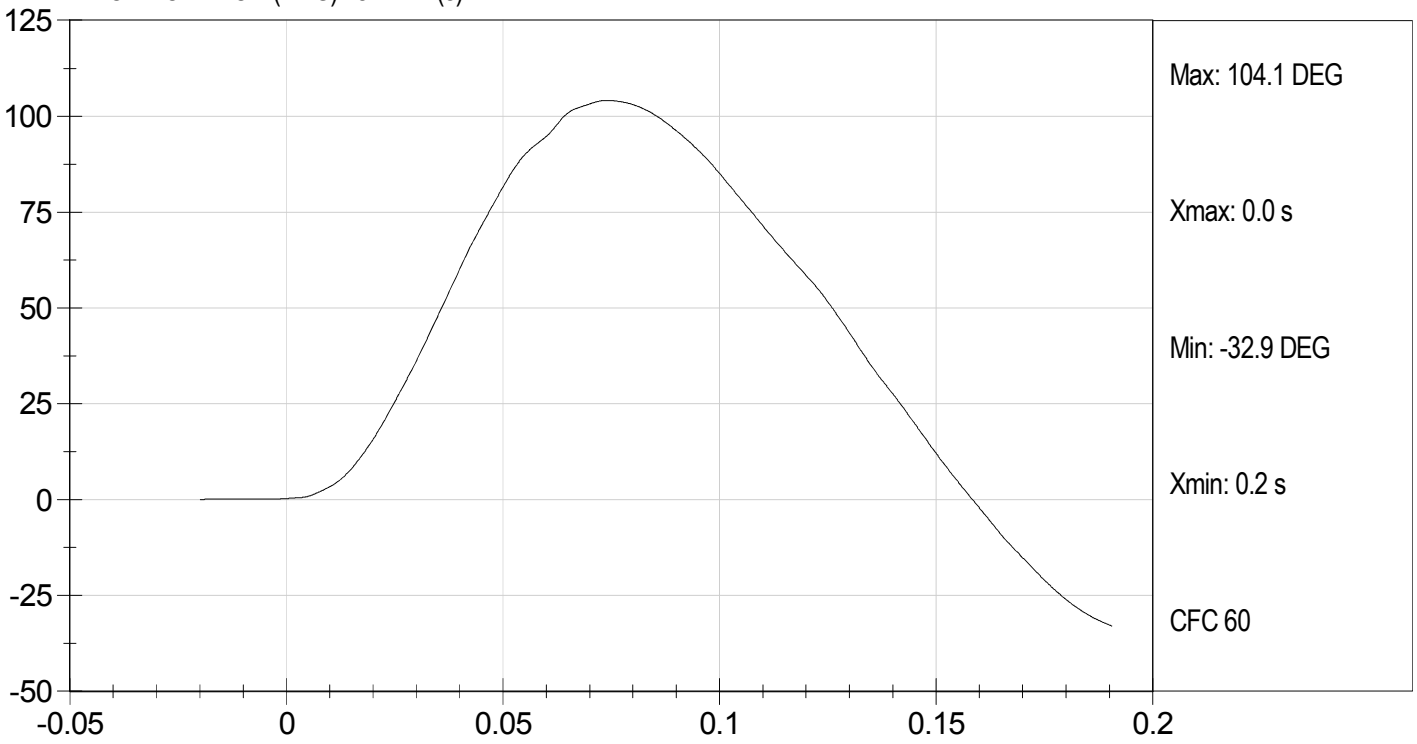
Test Desc: Neck Extension
Component ID: D113203

Test Date: 9/28/11
Velocity: 20.10 ft/s, 6.13 m/s

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

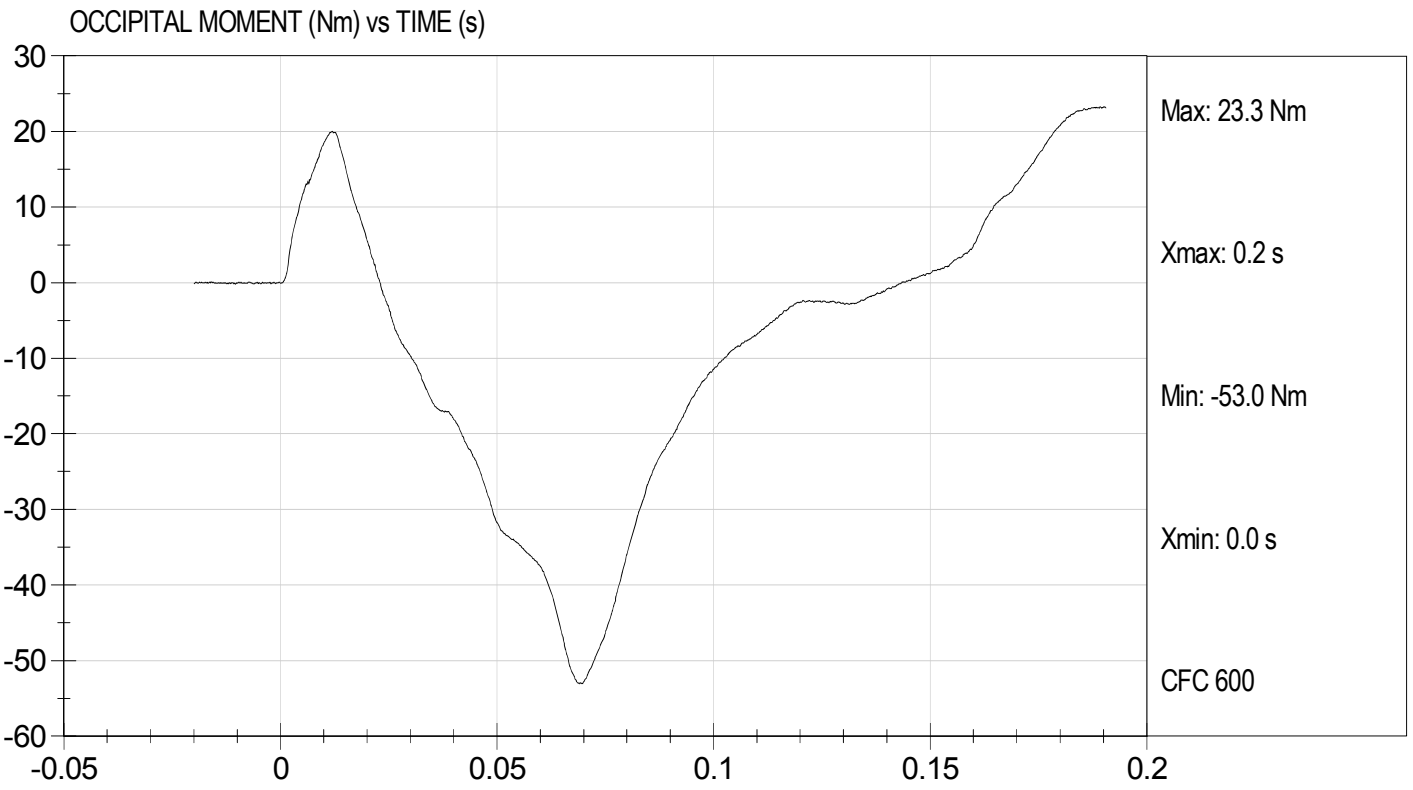


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Extension
Component ID: D113203

Test Date: 9/28/11
Velocity: 20.10 ft/s, 6.13 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D113204

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Relative Humidity	%	10 to 70	47	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	4.1	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4045	Pass
		Overall Test Results		Pass

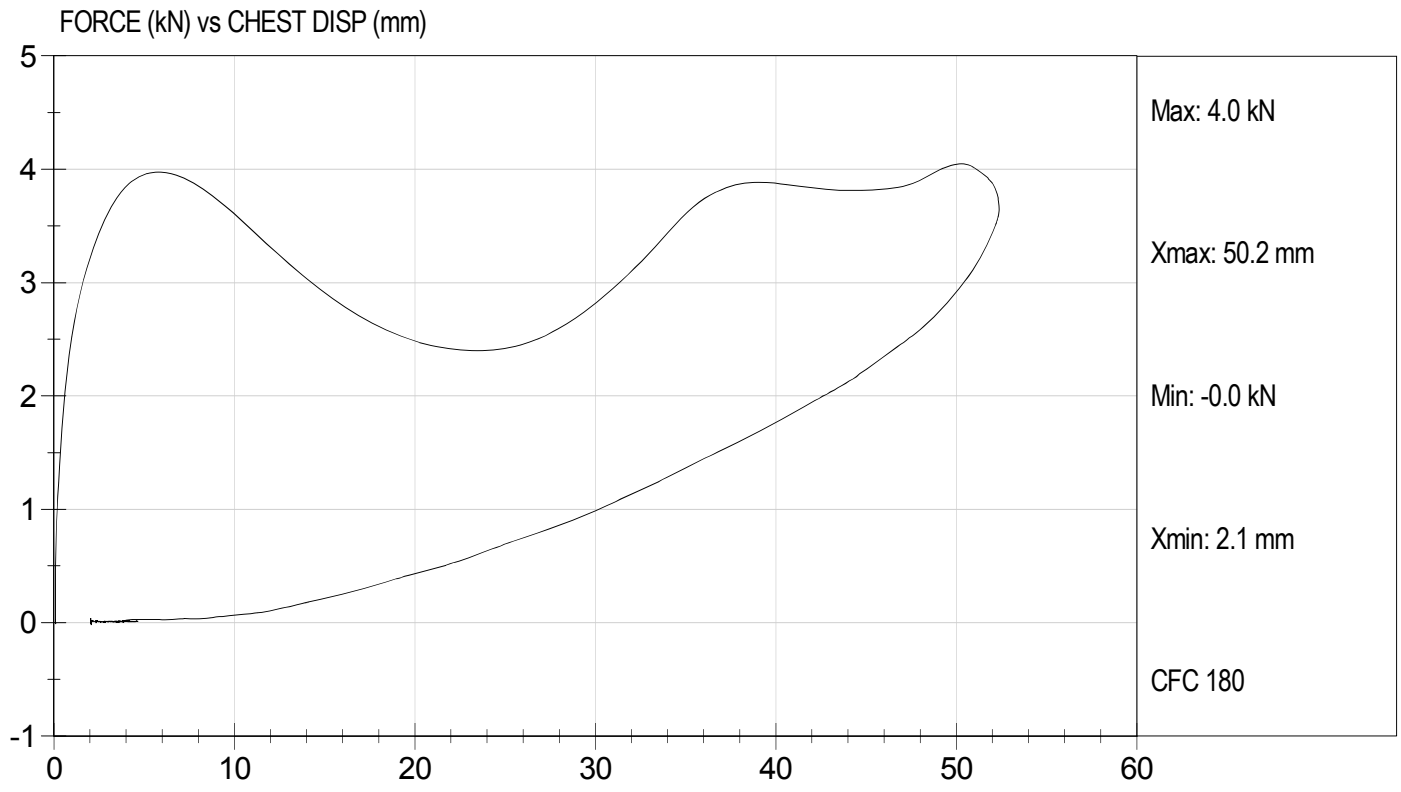
Jessica Hall
Laboratory Technician

9/28/11
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D113204

Test Date: 9/28/11
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:** D113205

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.57	Pass
		Overall Test Results		Pass

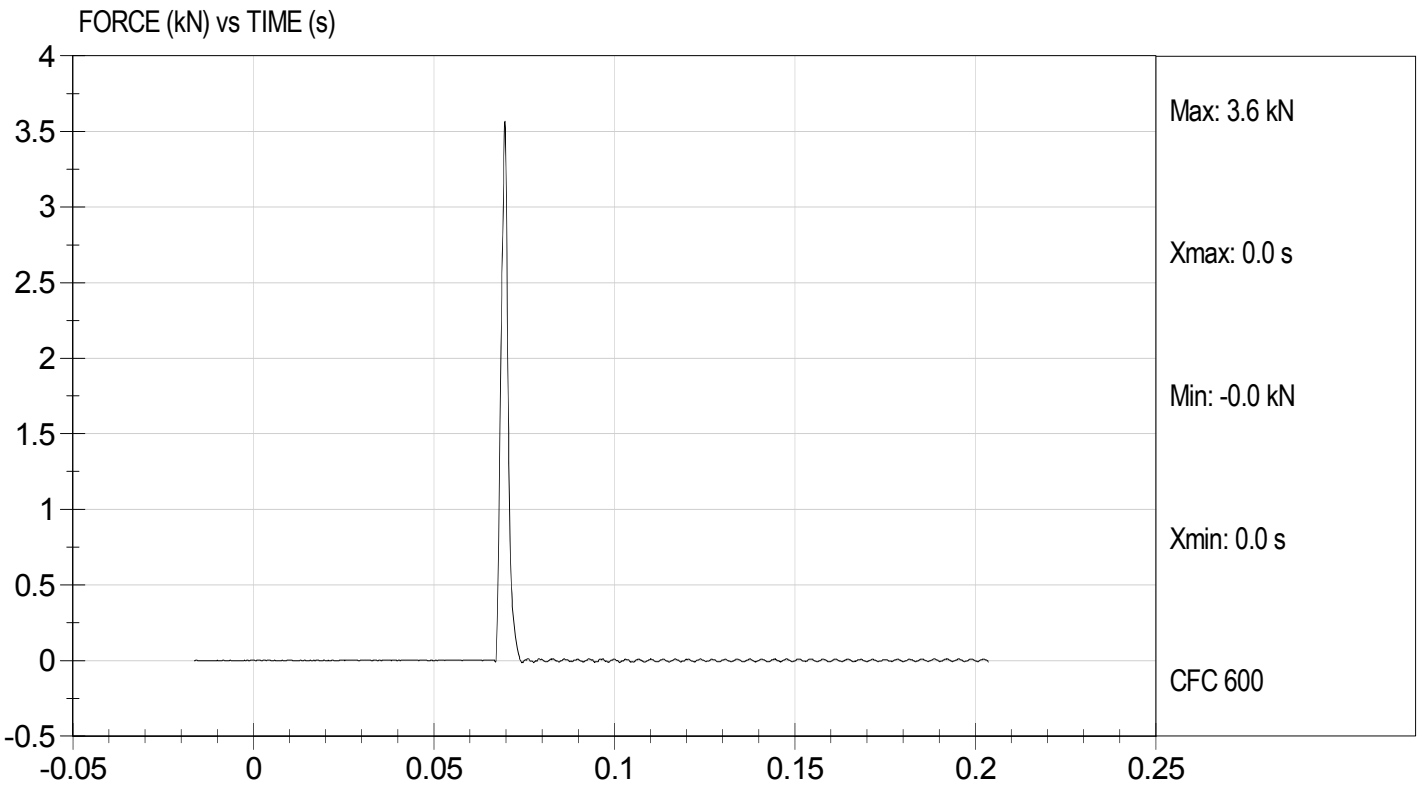
Jessica Hall
Laboratory Technician

9/27/11
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D113205

Test Date: 9/27/11
Velocity: 6.94 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D113206

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.53	Pass
		Overall Test Results		Pass

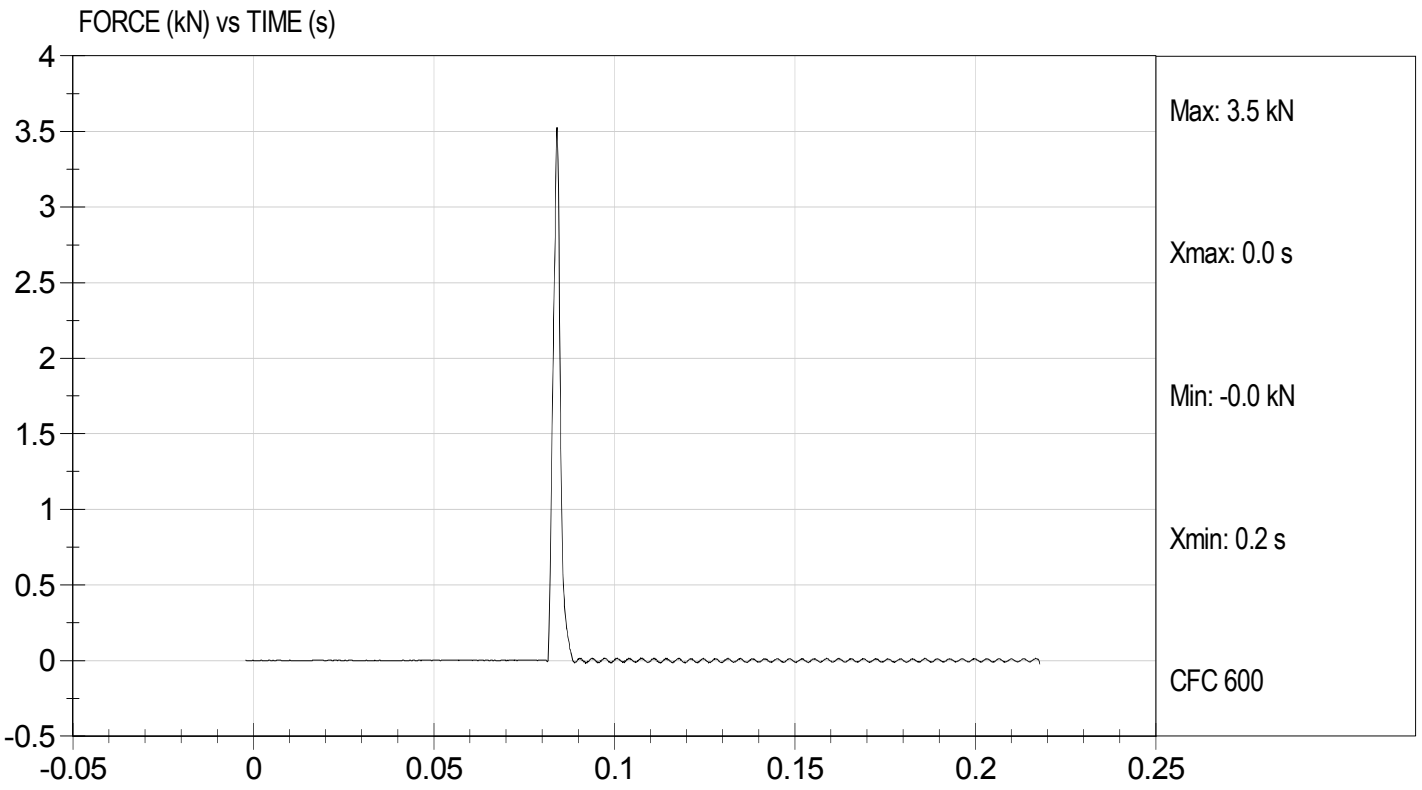
Jessica Hall
Laboratory Technician

9/27/11
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D113206

Test Date: 9/27/11
Velocity: 6.94 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D113207

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	6	Pass
Force at 45 deg	N	320 to 390	323	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 - 1.5	1.0	Pass
		Overall Result		Pass

Jessica Hall
Laboratory Technician

9/27/11
Test Date

David Winkelbauer
Approved By