REPORT NUMBER: NCAP-MGA-2011-012

NEW CAR ASSESSMENT PROGRAM (NCAP)
Frontal Barrier Impact Test

NISSAN MOTOR COMPANY, LTD.
2011 Infiniti M37X AWD
NHTSA No.: MB5205

MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105

Test Date: August 13, 2010

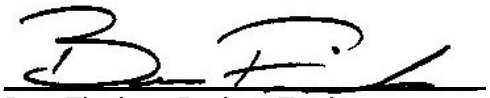
Final Report Date: September 29, 2010

FINAL REPORT

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

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

Prepared by: 
Donna Janovicz, Project Manager

Approved by: 
Ben Fischer, Project Engineer

Approval Date: September 29, 2010

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		*10. Work Unit No.* *11. Contract or Grant No.* DTNH22-06-D-00028
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16. Abstract

A 56.3 km/h NCAP Frontal Impact Test was conducted on the 2011 Infiniti M37X AWD in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure for the generation of consumer information on vehicle frontal crash protection. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on August 13, 2010.

The impact velocity was 56.2 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 492 mm located at 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	250	216
Maximum Chest Compression	mm	63	52	21	17
Nij	N/A	1	1	0.2	0.7
Neck Tension	N	4170	2620	1010	940
Neck Compression	N	4000	2520	82	317
Left Femur Force	N	10008	6805	3543	2576
Right Femur Force	N	10008	6805	3460	1740

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 Adm. Technical Reference Division 1200 New Jersey Ave, SE Washington, D.C. 20590	
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-06-D-00028. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact was conducted in accordance with the Office of Crashworthiness Standard's NCAP Frontal Laboratory Test Procedure dated January 2010.

SUMMARY

A load cell barrier was impacted by a of 2011 Infiniti M37X AWD at a velocity of 56.2 kph. The test was performed at MGA Research Corporation on August 13, 2010. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were on the driver's lap and shoulder belts and the passenger's lap belt to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. 138) were calibrated previous to this test. Certification details, along with verification data, are found in Appendix C of this report.

The 102 channels of data were recorded on an on-board data acquisition system. Appendix B contains the dummy head, chest displacement, neck, and femur response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard Solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 492 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD position	HIC_{15}	T^1	T^2	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp. (N)	Left Femur (N)	Right Femur (N)
Driver (50^{th})	250	69.5	84.5	21	0.2	1010	82	3543	3460
Passenger (5^{th})	216	64.5	79.5	17	0.7	940	317	2576	1740

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

TEST NOTES

There was no valid data collected for:

Driver Neck Force X after 110 msec. No valid data between 53-82 msec.
Left Brake Caliper X after 40 msec.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MB5205
Test Date: 8/13/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB5205
Model Year	2011
Make	Infiniti
Model	M37
Body Style	Sedan
VIN	JN1BY1AR4BM371469
Body Color	Platinum Graphite
Delivery Date	7/19/2010
Odometer (mi)	71
Odometer (km)	114
Dealer	Fields Infiniti
Transmission	Automatic
Final Drive	AWD
Type/No. Cylinders	6
Engine Displacement (L)	3.7
Engine Placement	Longitudinal
Roof Rack	No
Sunroof/T-Top	Yes
Tinted Glass	Yes
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes
Does owner's manual provide instructions to turn off automatic door locks?	Yes

Anti-Lock Brakes	Yes
All Wheel Drive	Yes
Power Steering	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Pass. Front Airbag	Yes
Pass. Curtain Airbag	Yes
Pass. Head/Torso Airbag	No
Pass. Torso Airbag	No
Pass. Torso/Pelvis Airbag	Yes
Pass. Pelvis Airbag	No
Pass. Knee Airbag	No
Pretensioners	Yes
Load Limiters	Yes
Automatic Door Locks	Yes
Bucket Seats	Yes
Tilt Steering	Yes
Other	

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Company, Ltd.
Date of Manufacture	03/10

GVWR (kg)	2330
GAWR Front (kg)	1172
GAWR Rear (kg)	1191

VEHICLE SEATING AND WEIGHT CAPACITY DATA

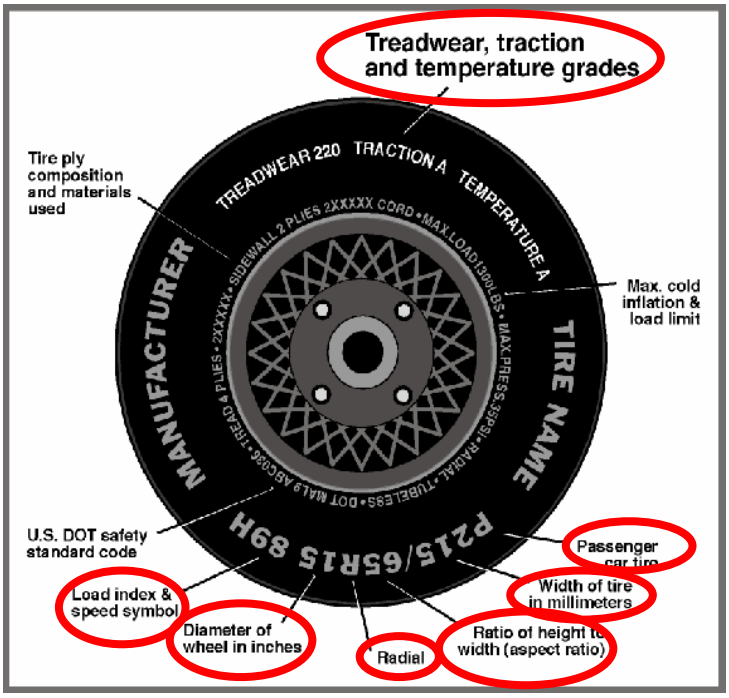
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Designated Seating Capacity (DSC)	2	3		5
Capacity Weight (VCW) (kg)				390
Cargo Weight (RCLW) (kg)				50

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5205
Test Date: 8/13/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	P245/50R18	P245/50R18
Tire Size on Vehicle	P245/50R18	P245/50R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy MXM4	Primacy MXM4
Treadwear	500	500
Traction	AA	AA
Temperature Grades	A	A
Tire Plies Sidewall	2 poly	2 poly
Tire Plies Body	5	5
Load Index & Speed Symbol	99V	99V
Tire Material	Rubber	Rubber
DOT Safety Code Right	DOT B9XU 004X	DOT B9XU 004X
DOT Safety Code Left	DOT B9XU 004X	DOT B9XU 004X

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	503.9	406.0		538.0	471.7	
Right	kg	515.3	410.5		533.0	475.8	
Ratio	%	55.5	45.5		53.1	46.9	
Totals	kg	1019.2	816.5	1835.7	1071.0	947.5	2018.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1835.7
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	50
Calculated Target Vehicle Target Weight (TVTW)	kg	2026.3

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	760	761	758	761	1288
As Tested	mm	754	754	734	738	1359
Post Test	mm	712	759	726	765	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2895
Total Vehicle Length at Left Side	mm	4745
Total Vehicle Length at Centerline	mm	4906
Total Vehicle Length at Right Side	mm	4745
Weight of Ballast in Cargo Area	kg	36.6
Weight of Vehicle Components Removed	kg	25.9
Amount of Stoddard Solvent in Fuel Tank	L	69.7

List of components removed to meet test weight: Right rear tail light, spare tire & tools, first aid kit.

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4906
2	Total Width	1866
3	Bumper Top Height	540
4	Bumper Bottom Height	425
5	Longitudinal Member Top Height	550
6	Distance between Longitudinal Members	765
7	Longitudinal Member Width	60
8	Engine Top Height	913
9	Engine Bottom Height	190
10	Engine and Gearbox Width	1514
11	Front Bumper-Engine Distance	570
12	Front Shock Absorber Fixing Height	780
13	Bonnet Leading Edge Height	812
14	Front Shock Absorber Fixing Width	116
15	Front Bumper – Front Axle Distance	900
16	Front Axle – A-Pillar Distance	630
17	A-Pillar – B-Pillar Distance	1045
18	B-Pillar – Rear Axle Distance	1085
19	B-Pillar – C-Pillar Distance	645
20	Roof Sill Bottom Height	1435
21	Roof Sill Top Height	1484
22	Floor Sill bottom Height	375
23	Floor Sill Top Height	395

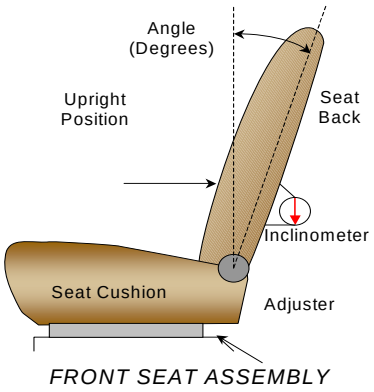
DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

NOMINAL DESIGN RIDING POSITION

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



SEAT BACK ANGLE	Degrees
Driver Seat Back Angle	1.8° on headrest post
Passenger Seat Back Angle	1.2° on headrest post

SEAT FORE/AFT POSITIONS

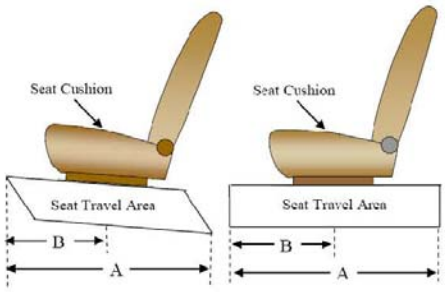
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

SEAT FORE/AFT POSITIONS	Total Fore/Aft Travel	Placed in Position #
Driver Seat	299 mm	149 mm (forward-most as 0)
Passenger Seat	264 mm	0 mm (forward-most as 0)

SEAT BELT UPPER ANCHORAGES

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

SEAT BELT UPPER ANCHORAGES	Total # of Positions	Placed in Position #
Driver Seat	3	0 (uppermost as 0)
Passenger Seat	3	0 (uppermost as 0)



DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

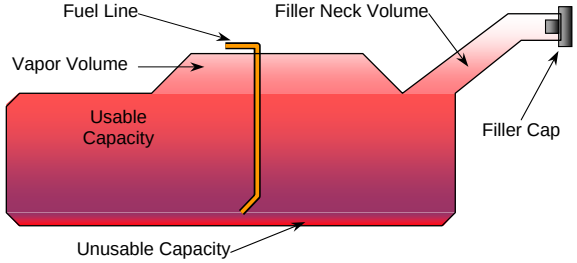
Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	75.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	69.0 to 70.5
Actual Amount of Solvent used	69.7
1/3 of Usable Capacity	25.0

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

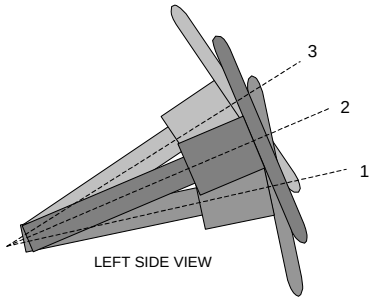
The vehicle is equipped with an electric fuel pump. Fuel pump will operate when the ignition key is in the "ON" position. The fuel filler pipe is located on the right side.



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

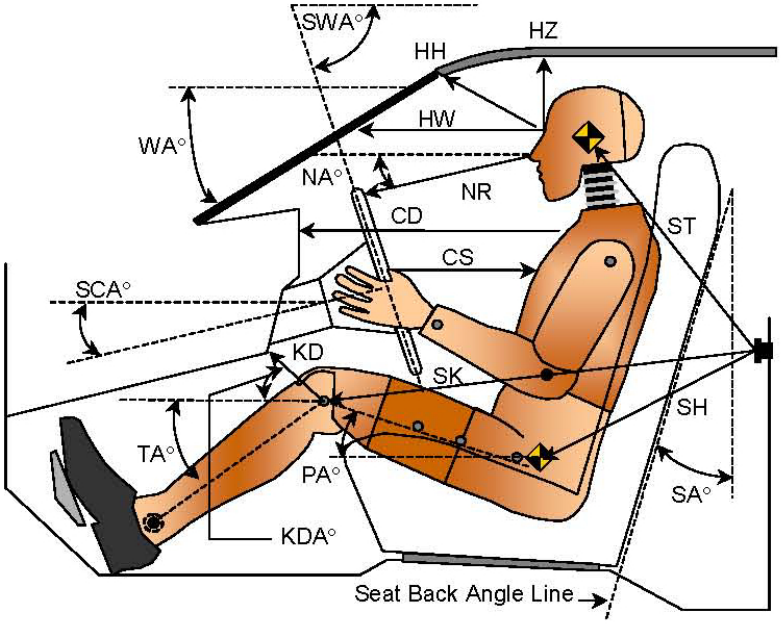
STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	79.0	205
Geometric Center – Position 2	69.0	185
Uppermost – Position 3	59.0	165
Telescoping Steering Wheel Travel		40
Test Position	69.0	185

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

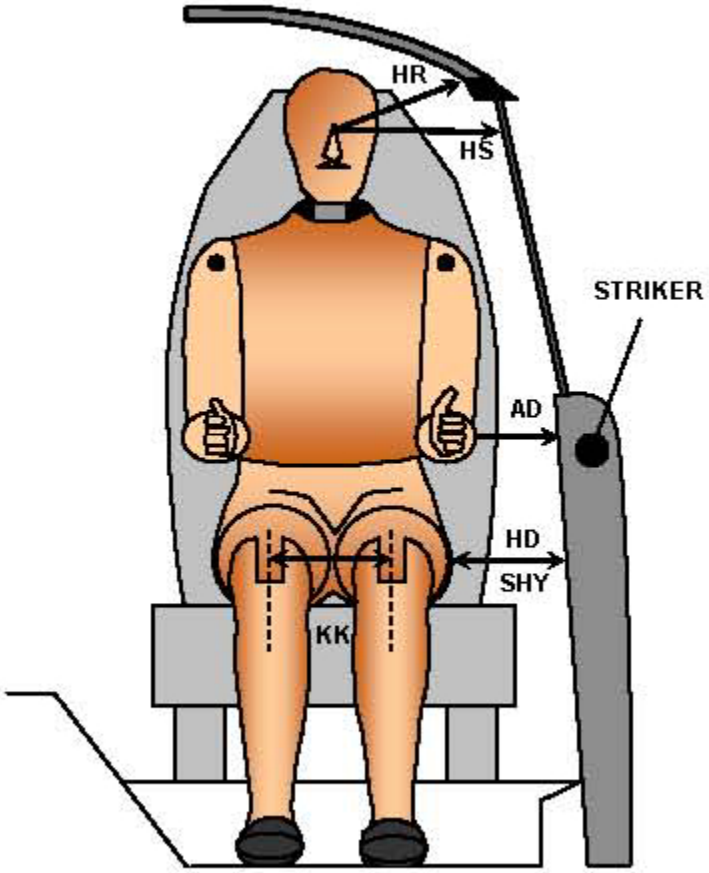


Code	Measurement Description	Driver S/N 351		Passenger S/N 138	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		26.2		
SWA	Steering Wheel Angle		69.0		
SCA	Steering Column Angle		21.0		
SA	Seat Back Angle (headrest post)		1.8		1.2
HZ	Head to Roof (Z)	148	90	140	90
HH	Head to Header	320	24.8	214	46.9
HW	Head to Windshield	592	0	489	0
NR	Nose to Rim	365	6.7		
CD	Chest to Dash	529		370	
CS	Chest to Steering Hub	284	3.7		
RA	Rim to Abdomen	176	0		
KDL	Left Knee to Dash	170	35.9	63	32.2
KDR	Right Knee to Dash	134	19.5	75	31.1
PA	Pelvic Angle		24.3		18.5
TA	Tibia Angle		36.2		51.4
SK	Striker to Knee	640	99.4	740	92.7
ST	Striker to Head	491	19.5	520	37.3
SH	Striker to H-Point	315	123.2	467	107.6

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

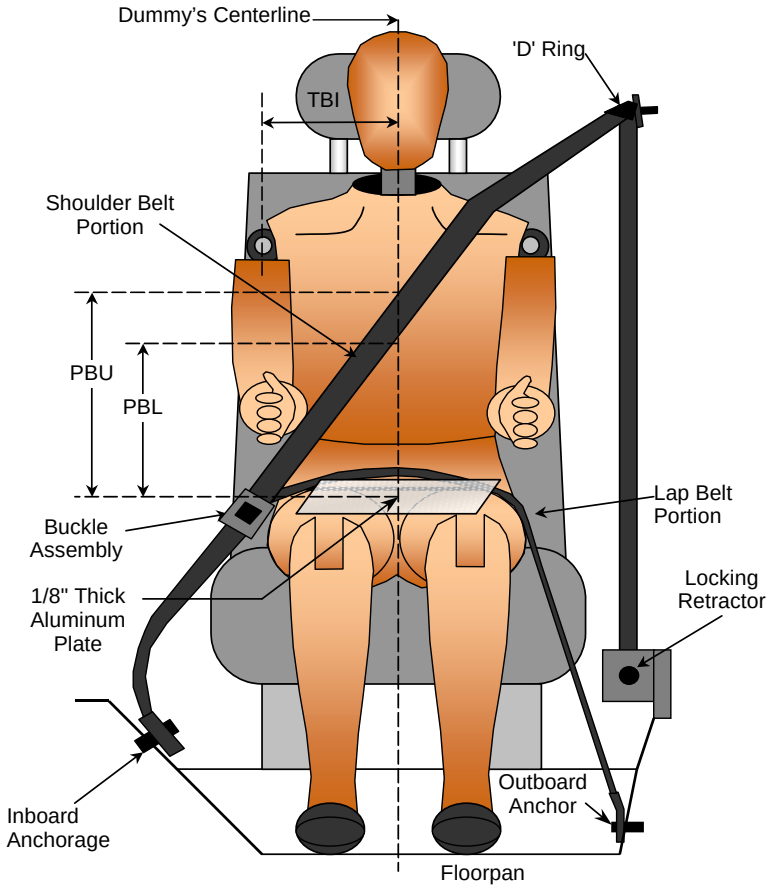


Code	Measurement Description	Driver S/N 351	Passenger S/N 138
		Length (mm)	
AD	Arm to Door	120	169
HD	H-Point to Door	123	178
HR	Head to Side Header	198	209
HS	Head to Side Window	323	344
KK	Knee to Knee	336	219
SHY	Striker to H-Point (Y Direction)	275	325
AA	Ankle to Ankle	325	179

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MB5205
Test Date: 8/13/2010



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	385	295
PBL - To surface of reference to belt lower edge	mm	310	210

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	920	900
Lap Belt Length as measured on ATD	mm	810	920
Reminder of belt of reel	mm	840	780
Total Belt Length for Continuous Webbing Systems	mm	2570	2600

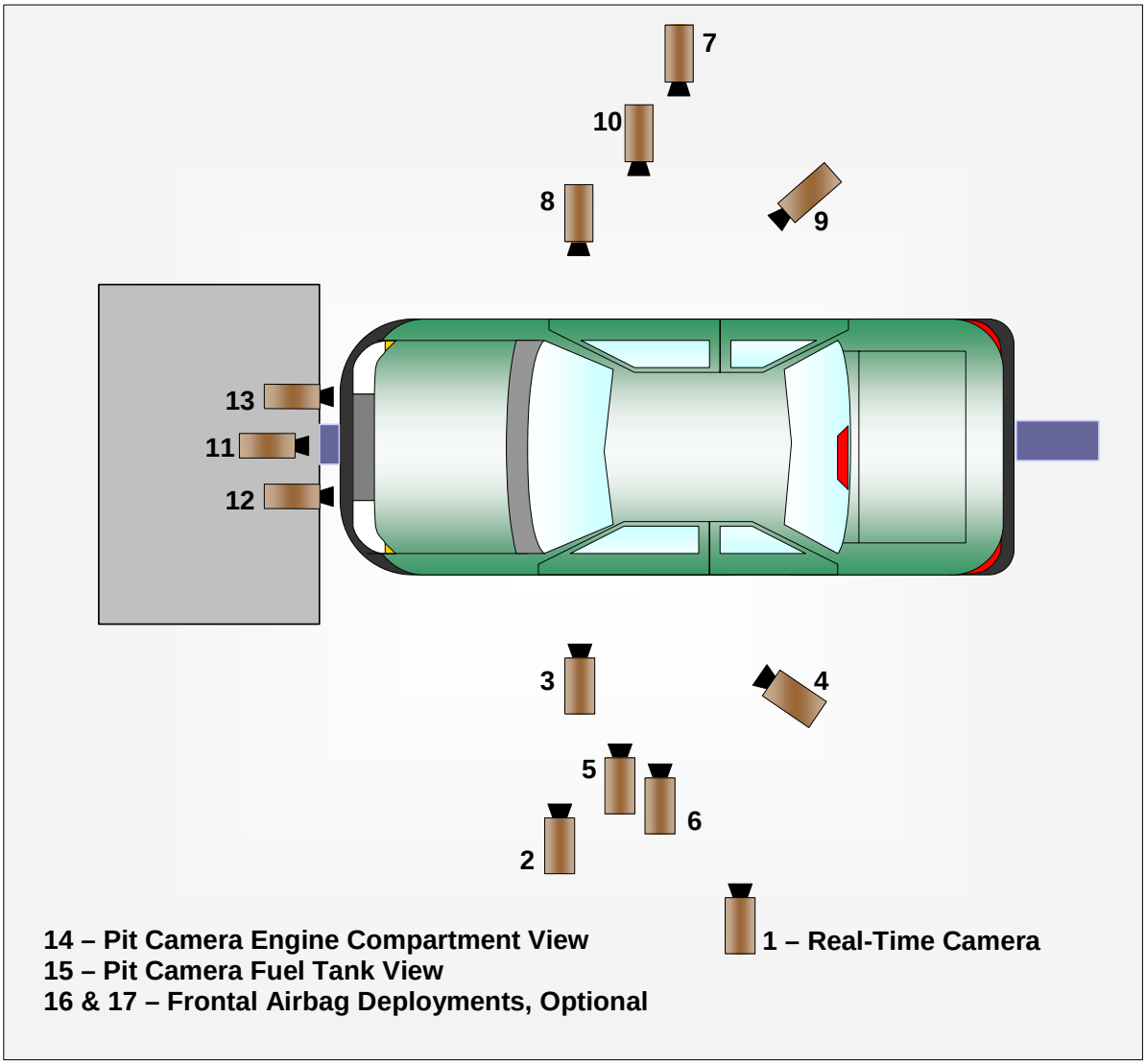
DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5205
Test Date: 8/13/2010

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: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Side View					30
2	Left Front Half	1390	-5110	-1150	24	1000
3	Driver Close-Up	1640	-6180	-1580	35	1000
4	Driver Angle	5410	-4930	-1920	50	1000
5	Steering Column Top	890	-5120	-1260	25	1000
6	Steering Column Bottom	870	-5100	-860	25	1000
7	Right Overall	2180	6760	-1310	20	1000
8	Passenger Close-Up	1660	6200	-1550	35	1000
9	Passenger Angle	5390	4970	-1880	50	1000
10	Right Front Half	1360	5130	-1240	24	1000
11	Windshield	-260	0	-2860	24	1000
12	Top Driver	-30	-360	-2270	16	1000
13	Top Passenger	-30	360	-2270	16	1000
14	Pit Front	1250	0	3150	24	1000
15	Pit Rear	3180	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

*COORDINATES:

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

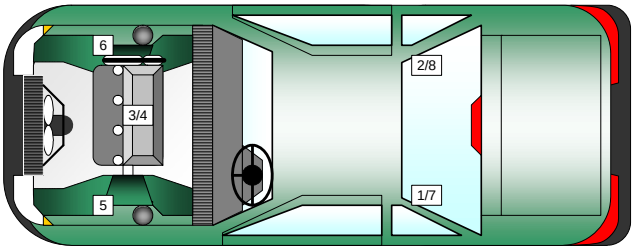
Cameras 16 & 17 were not used for this test.

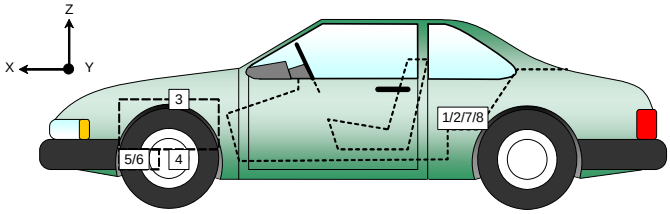
DATA SHEET NO. 7

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5205
Test Date: 8/13/2010





ACCELEROMETER LOCATION				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Left Rear X-Member X	2059	-380	-255
2	Right Rear X-Member X	2059	380	-255
3	Engine Top X	4115	0	-902
4	Engine Bottom X	4184	0	-189
5	Left Brake Caliper X	4175	-688	-219
6	Right Brake Caliper X	4175	688	-219
7	Left Rear X-Member Z	2059	-380	-255
8	Right Rear X-Member Z	2059	380	-255

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

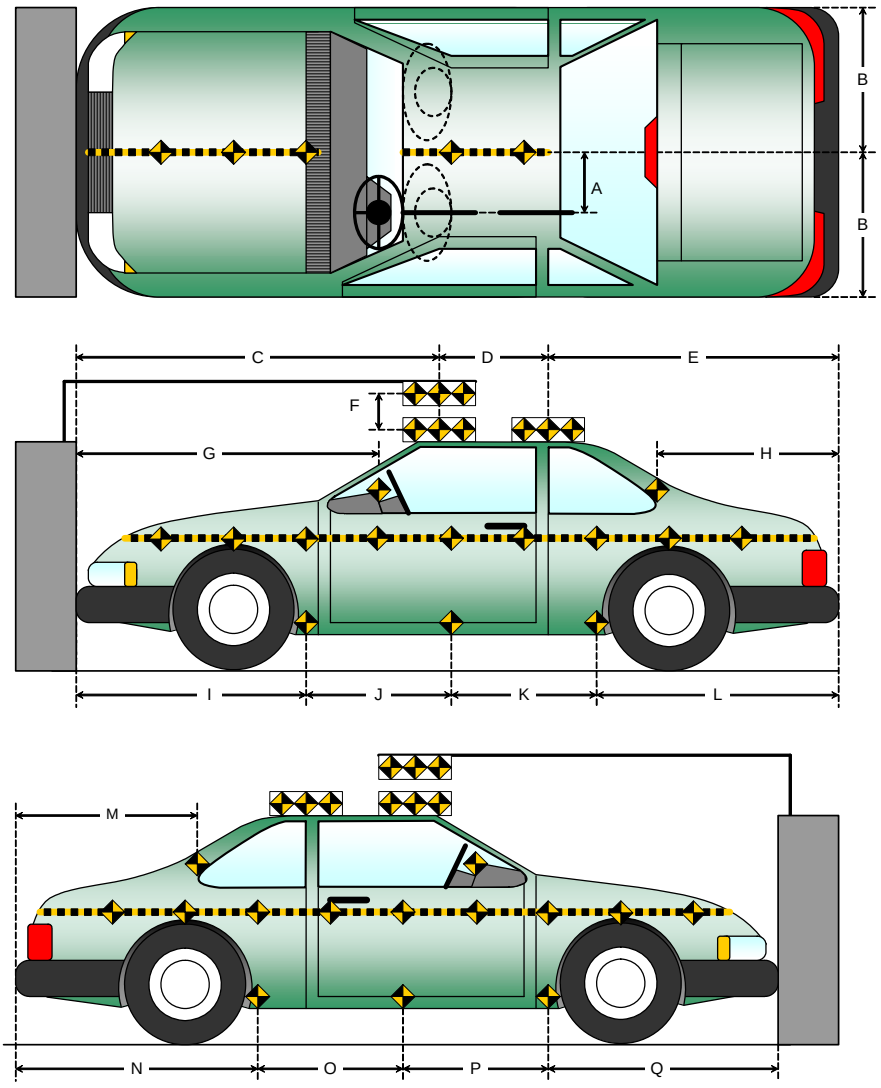
DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MB5205
Test Date: 8/13/2010

Item	Value (mm)
A	400
B	933
C	2450
D	670
E	1786
F	125
G	
H	964
I	1330
J	1370
K	645
L	1561
M	964
N	1561
O	645
P	1370
Q	1330



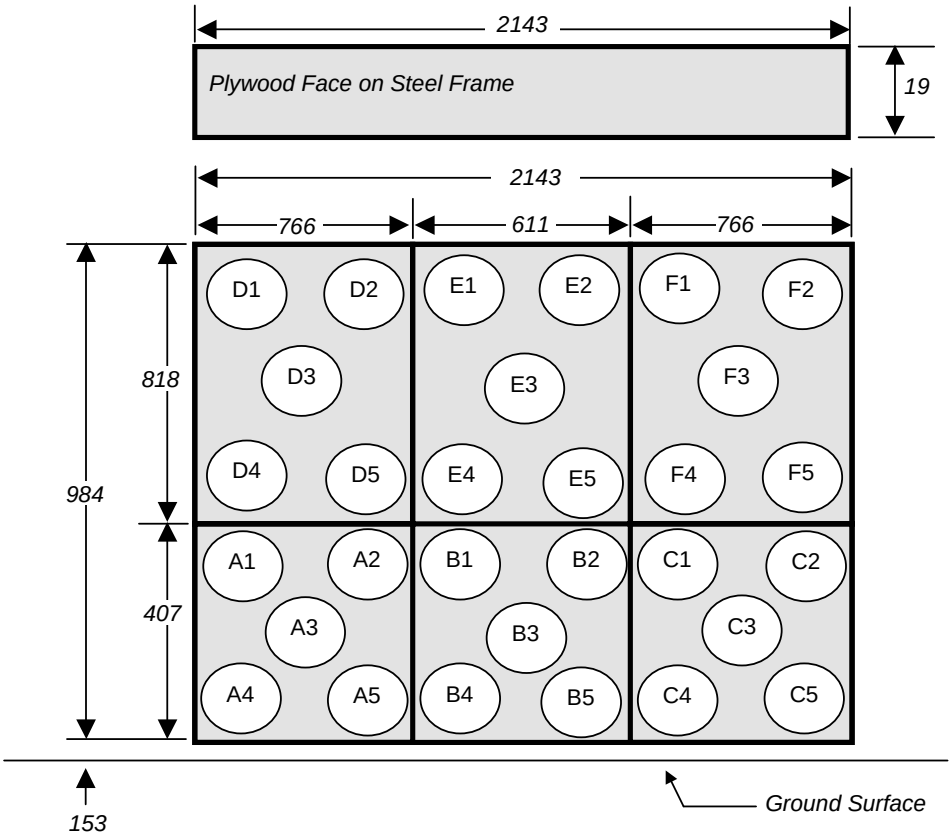
DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

30 Load Cell Rigid Barrier

Load Cell Locations on Fixed Barrier



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

6 Groups of 5 Load Cells Each

DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MB5205
Test Date: 8/13/2010

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

TEST DUMMY INFORMATION AND CONTACT

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

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	748
Center	mm	627
Right Side	mm	688
Average	mm	688

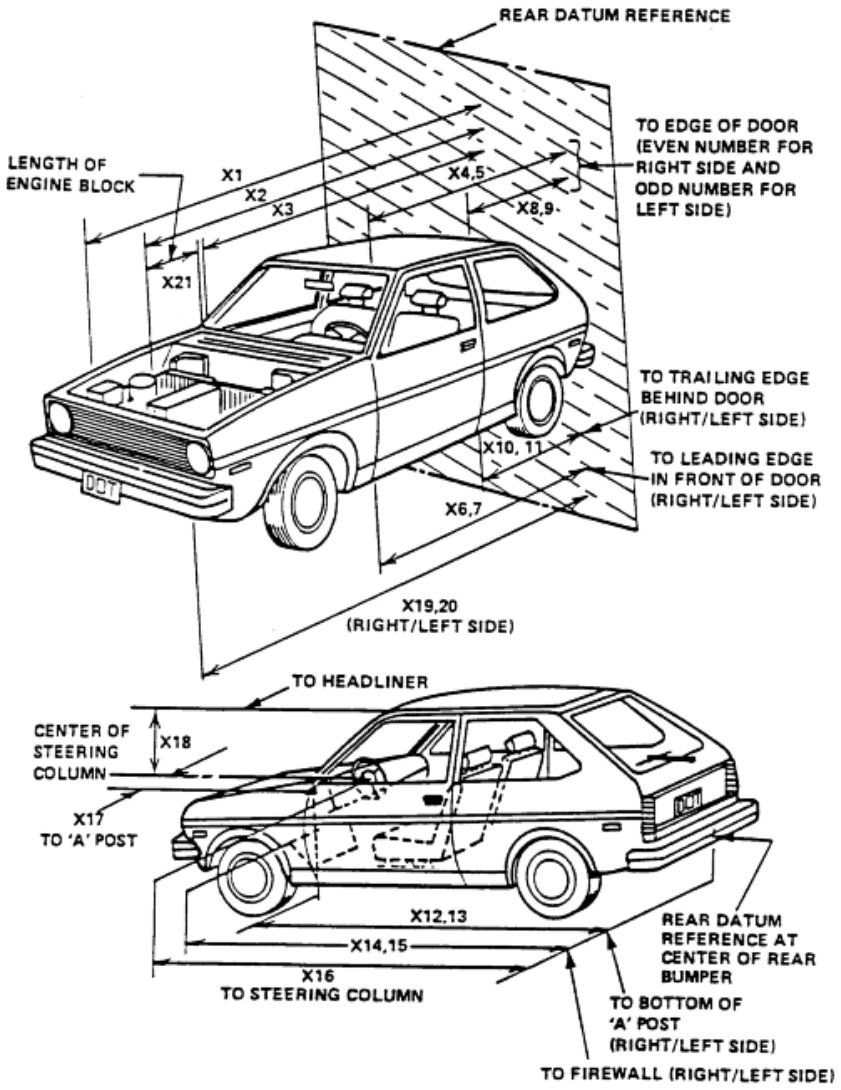
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010



DATA SHEET NO. 12 (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4906	4414	492
2	RSOV to Front of Engine	mm	4309	4155	154
3	RSOV to Firewall	mm	3649	3590	59
4	RSOV to Upper Leading Edge of Right Door	mm	3366	3365	1
5	RSOV to Upper Leading Edge of Left Door	mm	3366	3364	2
6	RSOV to Lower Leading Edge of Right Door	mm	3350	3341	9
7	RSOV to Lower Leading Edge of Left Door	mm	3350	3337	13
8	RSOV to Upper Trailing Edge of Right Door	mm	2210	2210	0
9	RSOV to Upper Trailing Edge of Left Door	mm	2210	2210	0
10	RSOV to Lower Trailing Edge of Right Door	mm	2205	2205	0
11	RSOV to Lower Trailing Edge of Left Door	mm	2205	2198	7
12	RSOV to Bottom of “A” Post of Right Side	mm	3328	3305	23
13	RSOV to Bottom of “A” Post of Left Side	mm	3328	3315	13
14	RSOV to Firewall, Right Side	mm	3945	3910	35
15	RSOV to Firewall, Left Side	mm	3948	3875	73
16	RSOV to Steering Column	mm	2825	2885	-60
17	Center of Steering Column to “A” Post	mm	325	355	-30
18	Center of Steering Column to Headliner	mm	380	430	-50
19	RSOV to Right Side of Front Bumper	mm	4745	4390	355
20	RSOV to Left Side of Front Bumper	mm	4745	4385	360
21	Length of Engine Block	mm	510	500	10
RD	RSOV to Right Side of Dash Panel	mm	3048	3025	23
CD	RSOV to Center of Dash Panel	mm	3097	3081	16
LD	RSOV to Left Side of Dash Panel	mm	3042	3005	37

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

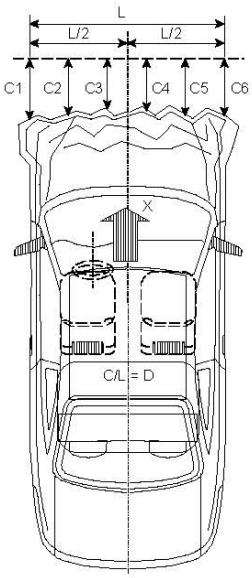
Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

VEHICLE INFORMATION

VIN: JN1BY1AR4BM371469 Wheelbase (mm): 2895
Vehicle Size Category: Sedan Test Weight (kg): 2018.5

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): 56.2
Velocity Change (km/h): 62.9
Time of Separation (msec): 92.8



CRUSH PROFILE

Collision Deformation Classification: Frontal
Midpoint of Damage: Centerline
Damage Region Length (mm): 1388
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4745	4385	360
C2	Crush zone 2 at left side	mm	4827	4390	437
C3	Crush zone 3 at left side	mm	4885	4435	450
C4	Crush zone 4 at right side	mm	4885	4443	442
C5	Crush zone 5 at right side	mm	4827	4385	442
C6	Crush zone 6 at right side	mm	4745	4390	355
L	C1 TO C6	mm	1388	1380	8

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

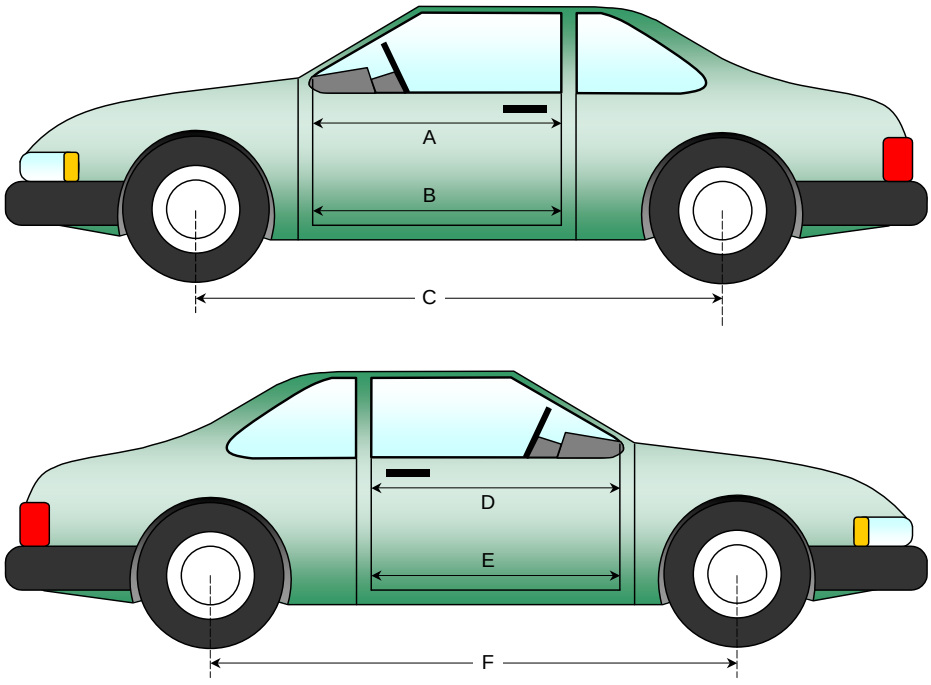
Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MB5205
Test Date: 8/13/2010

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1070	1070	0
B	Left Side Lower	mm	970	970	0
D	Right Side Upper	mm	1070	1070	0
E	Right Side Lower	mm	970	970	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2895	2845	50
F	Right Side Wheelbase	mm	2895	2780	115



DATA SHEET NO. 14 (CONTINUED)

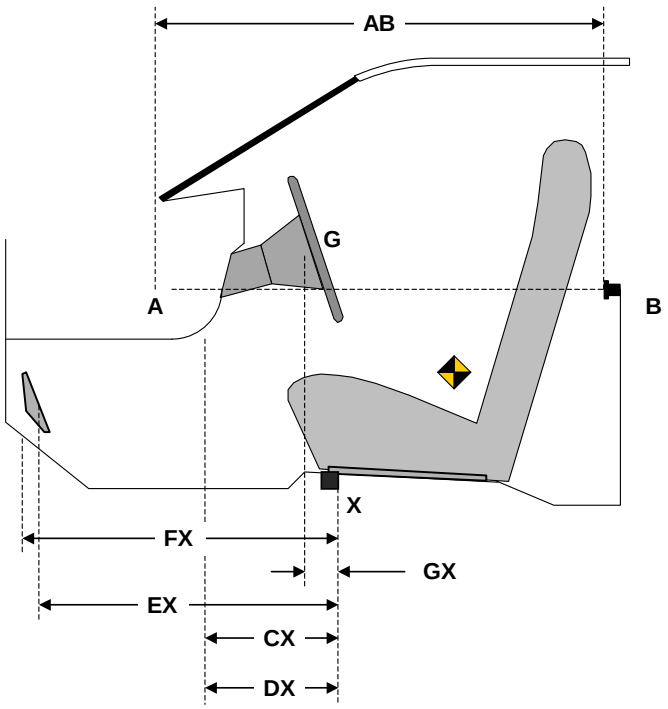
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MB5205
Test Date: 8/13/2010

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	740	740	0
CX	Left Knee Bolster to X	mm	315	316	-1
DX	Right Knee Bolster to X	mm	305	316	-11
EX	Brake Pedal to X	mm	570	481	89
FX	Foot Rest to X	mm	605	600	5
GX	Center of Steering Column Wheel Hub to X	mm	21	40	-19

X = Front of Seat Track (stationary)

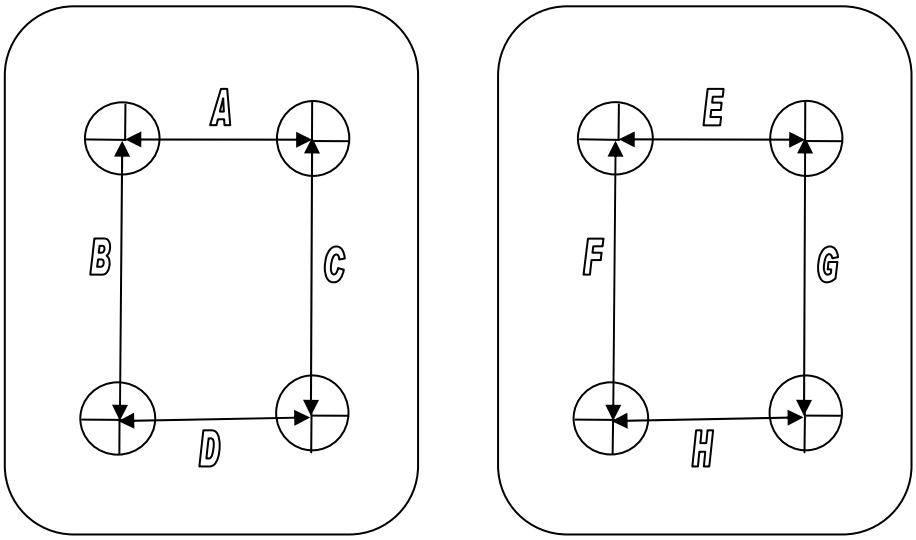


DRIVER COMPARTMENT

DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010



Driver Passenger

TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	160	159	1
B	mm	160	159	1
C	mm	160	160	0
D	mm	160	162	-2
E	mm	160	160	0
F	mm	160	159	1
G	mm	160	159	1
H	mm	160	143	17

DATA SHEET NO. 15

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2011 Infiniti M37X AWD
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MB5205
Test Date: 8/13/2010

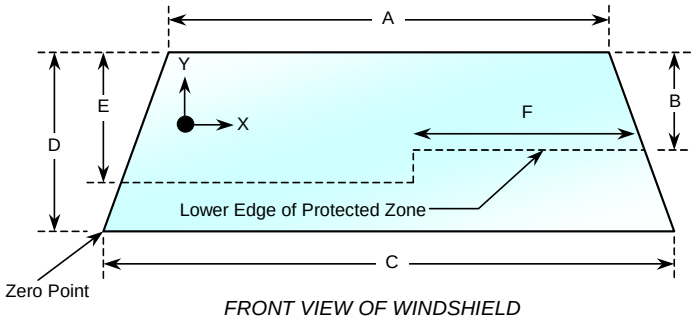
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles, which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2152	2152	100
Right Side	2152	2152	100
Total	4304	4304	100



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1231
B	mm	367
C	mm	1409
D	mm	832
E	mm	458
F	mm	525

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:	2011 Infiniti M37X AWD	NHTSA No.:	MB5205
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	8/13/2010

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Time: 10:57 am Temperature: 21° C

A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: None
(Maximum allowable = 5 ounces)

C. For the following 25 minutes: None
(Maximum allowable = 1 oz./minute)

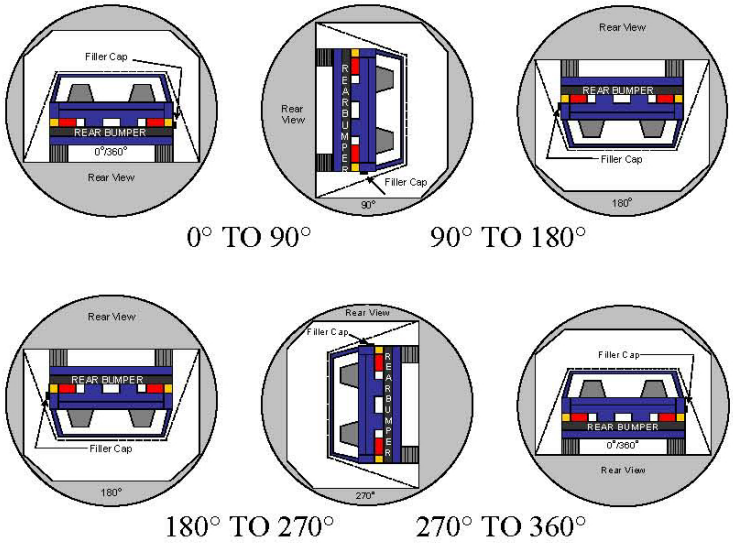
D. Spillage Details: None

DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage: **None**



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	111	300	411
90° to 180°	112	300	412
180° to 270°	108	300	408
270° to 360°	116	300	416

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

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

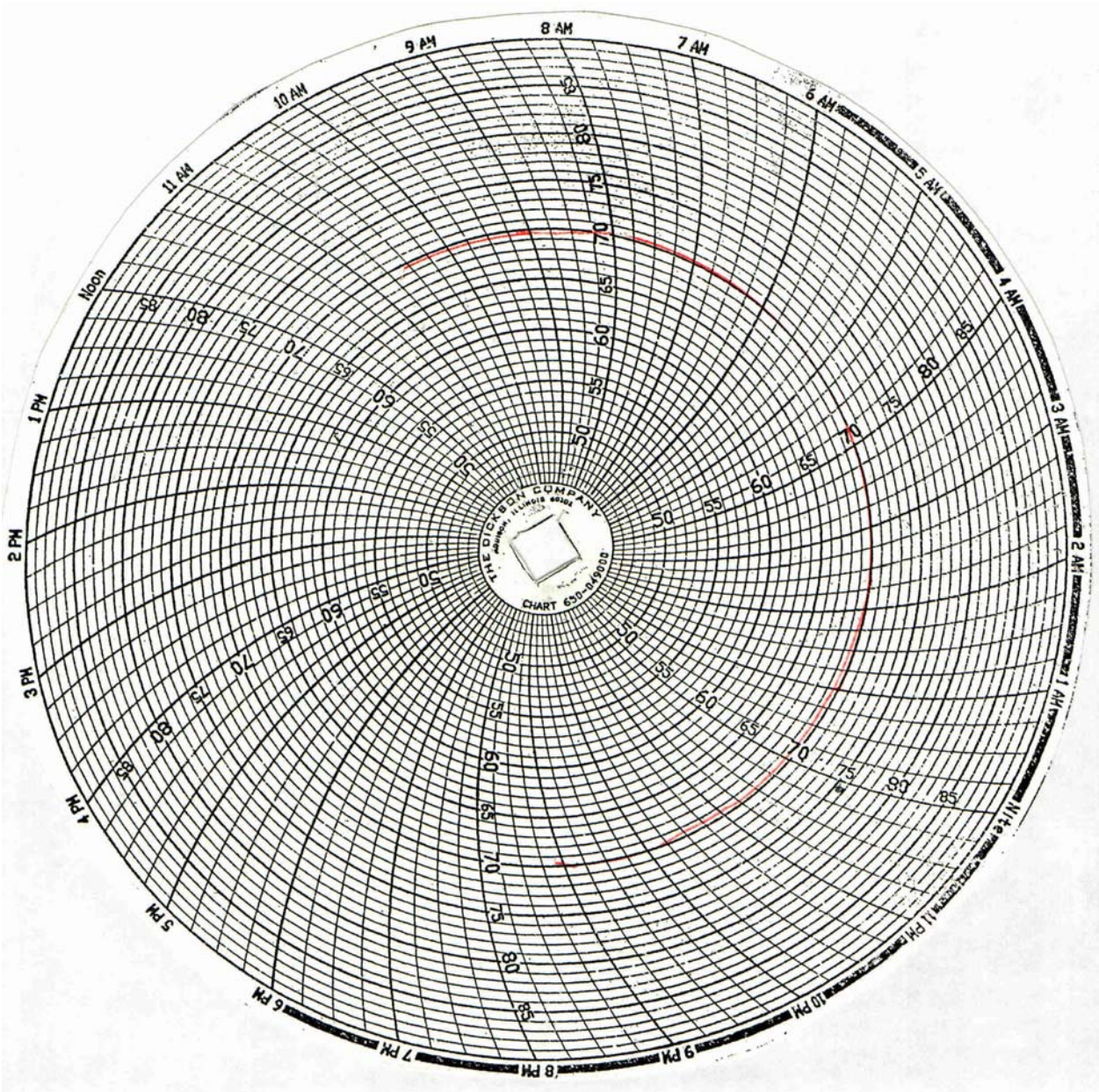
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2011 Infiniti M37X AWD NHTSA No.: MB5205
Test Program: NCAP Frontal Barrier Impact Test Test Date: 8/13/2010

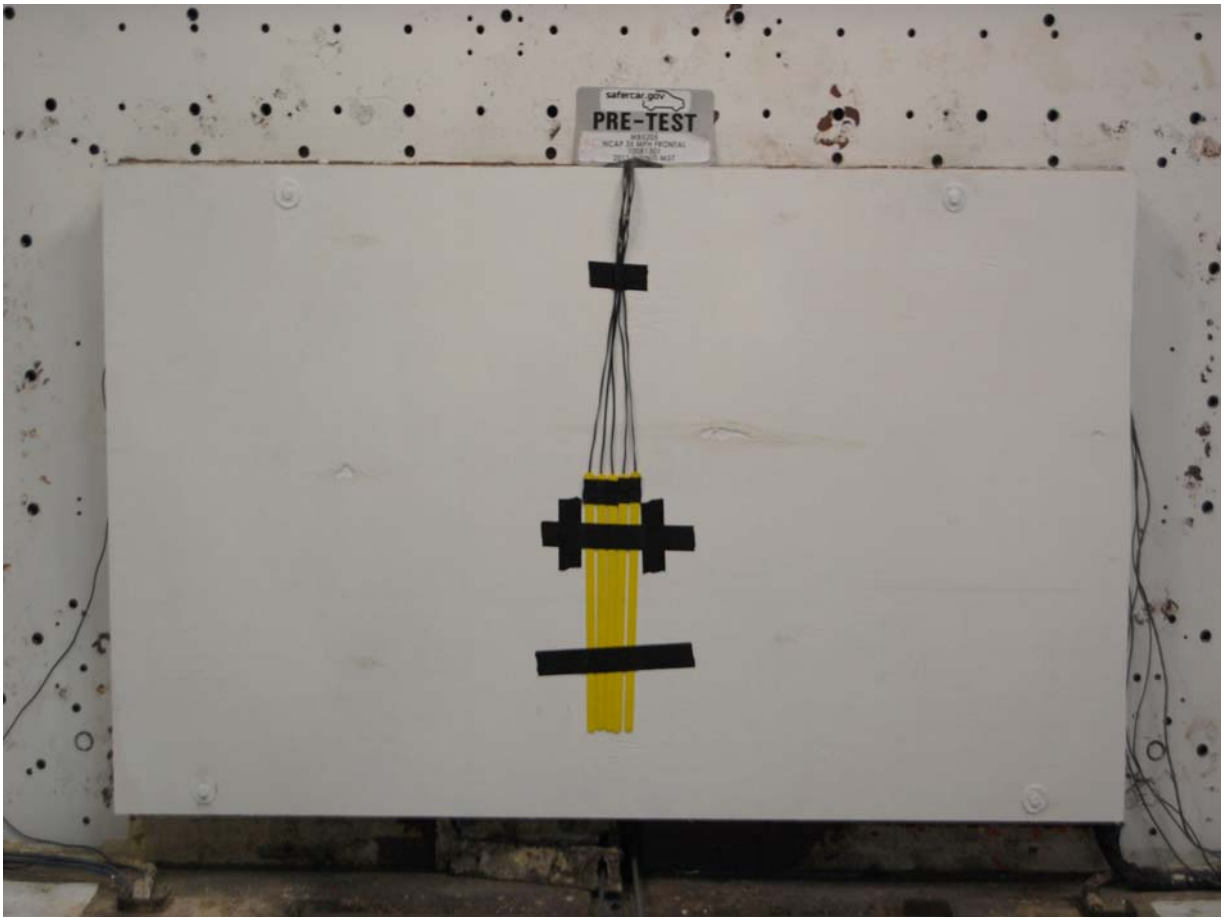


APPENDIX A

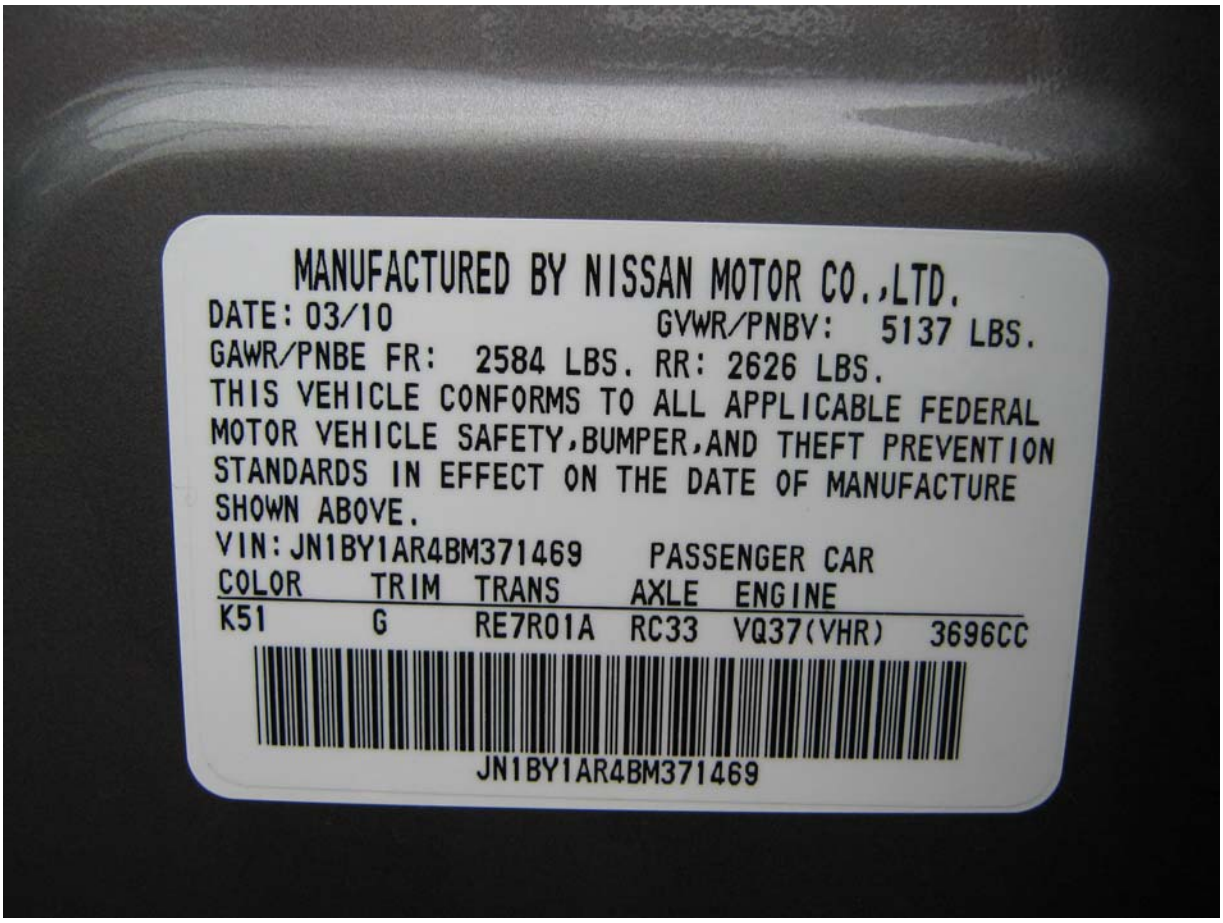
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

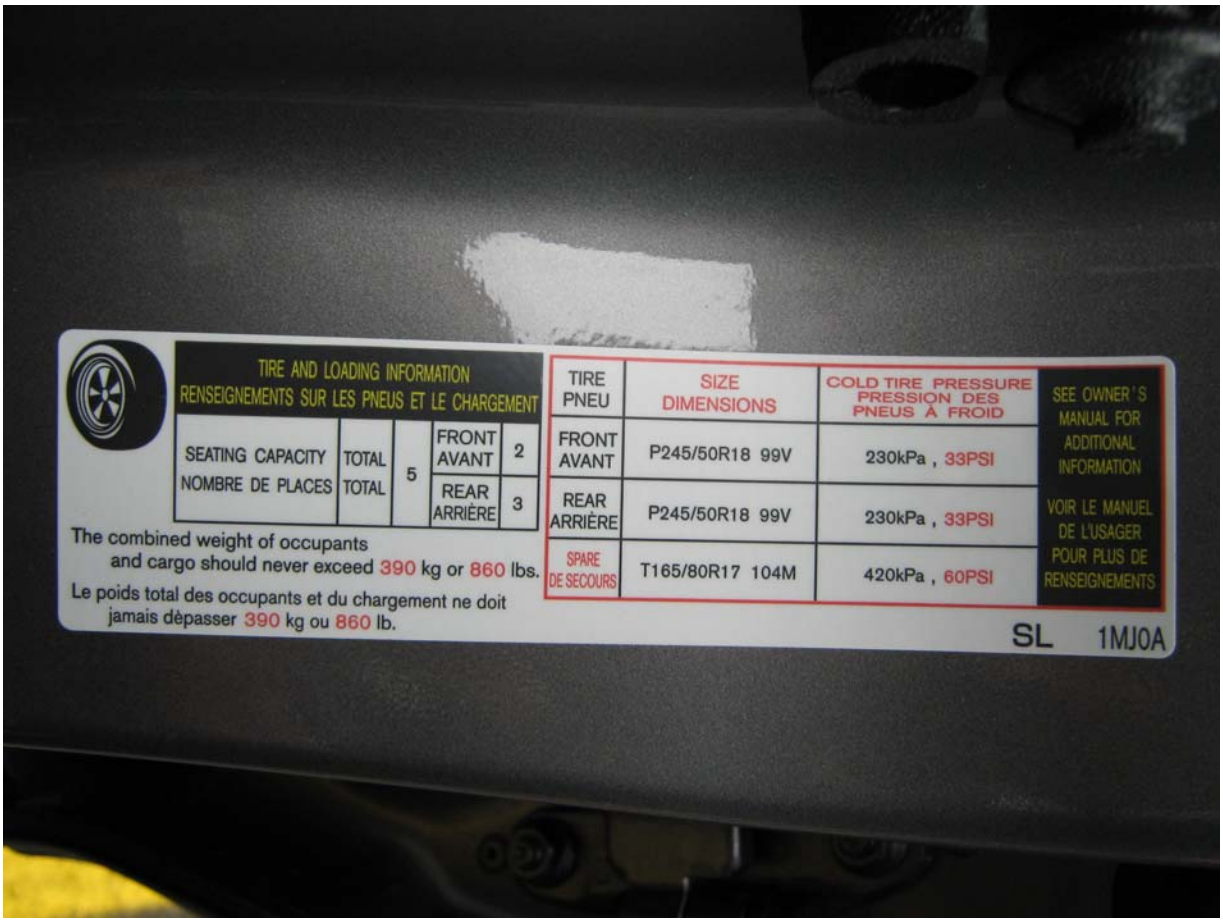
Load Cell Location



Load Cell Wall



Manufacturer's Label



Tire Placard

Right Front Three-Quarter View, As Received

Left Rear Three-Quarter View, As Received

Pre-Test Front View


Post-Test Front View

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

Post-Test Left Side View

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

Post-Test Right Side View

Pre-Test Right Front ¾ View

Post-Test Right Front ¾ View

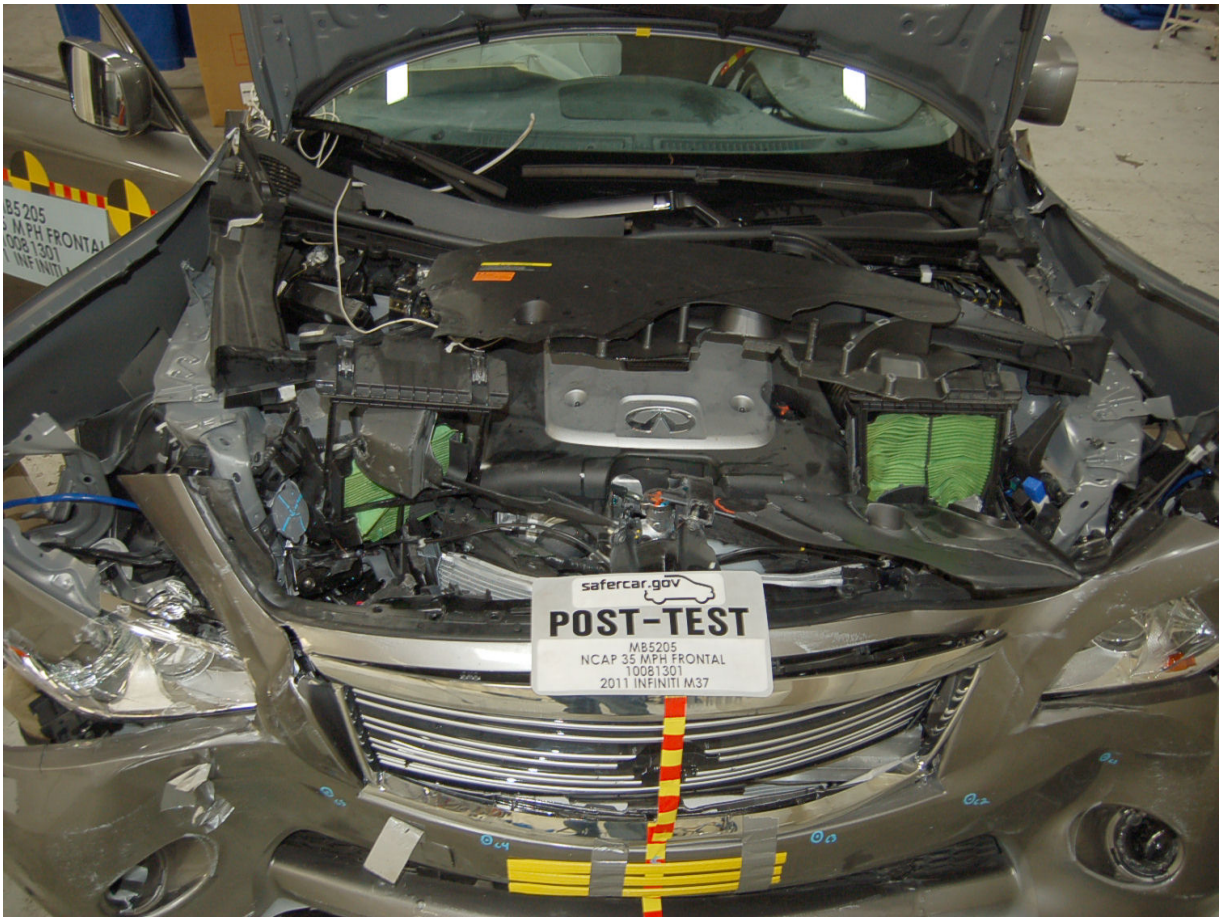
Pre-Test Left Rear ¾ View (with vehicle at barrier)

Post-Test Left Rear ¾ View

Pre-Test Windshield View

Post-Test Windshield View

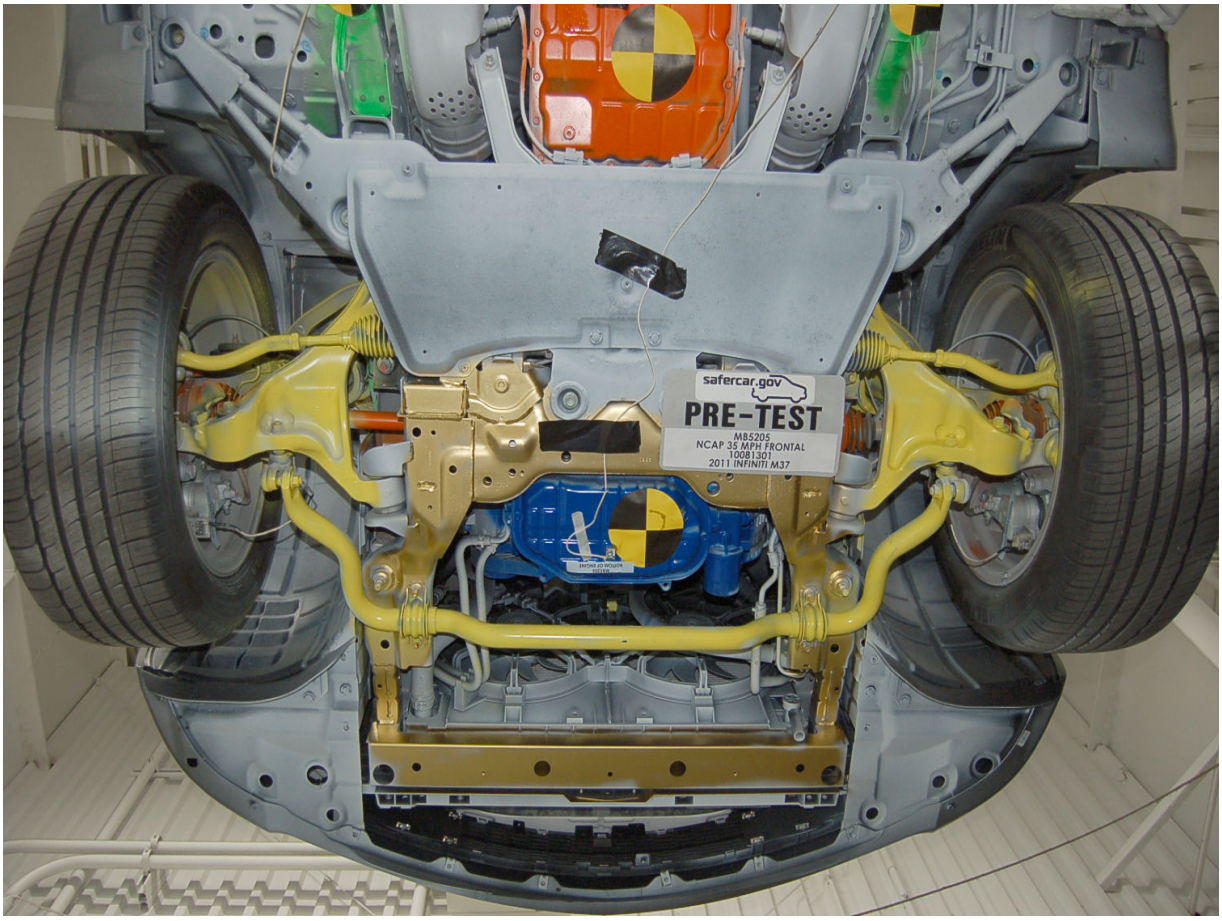
Pre-Test Engine Compartment View



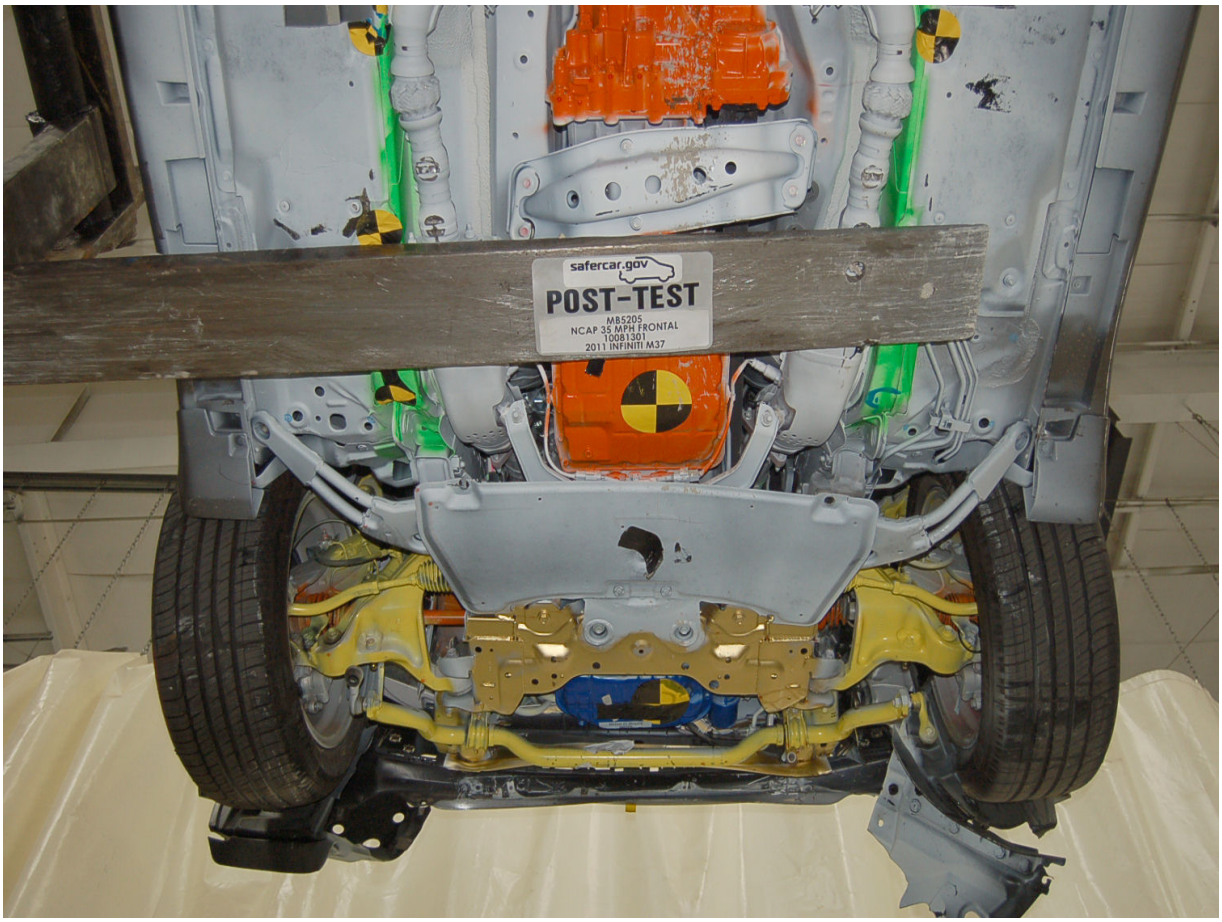
Post-Test Engine Compartment View

Pre-Test Fuel Filler Cap View

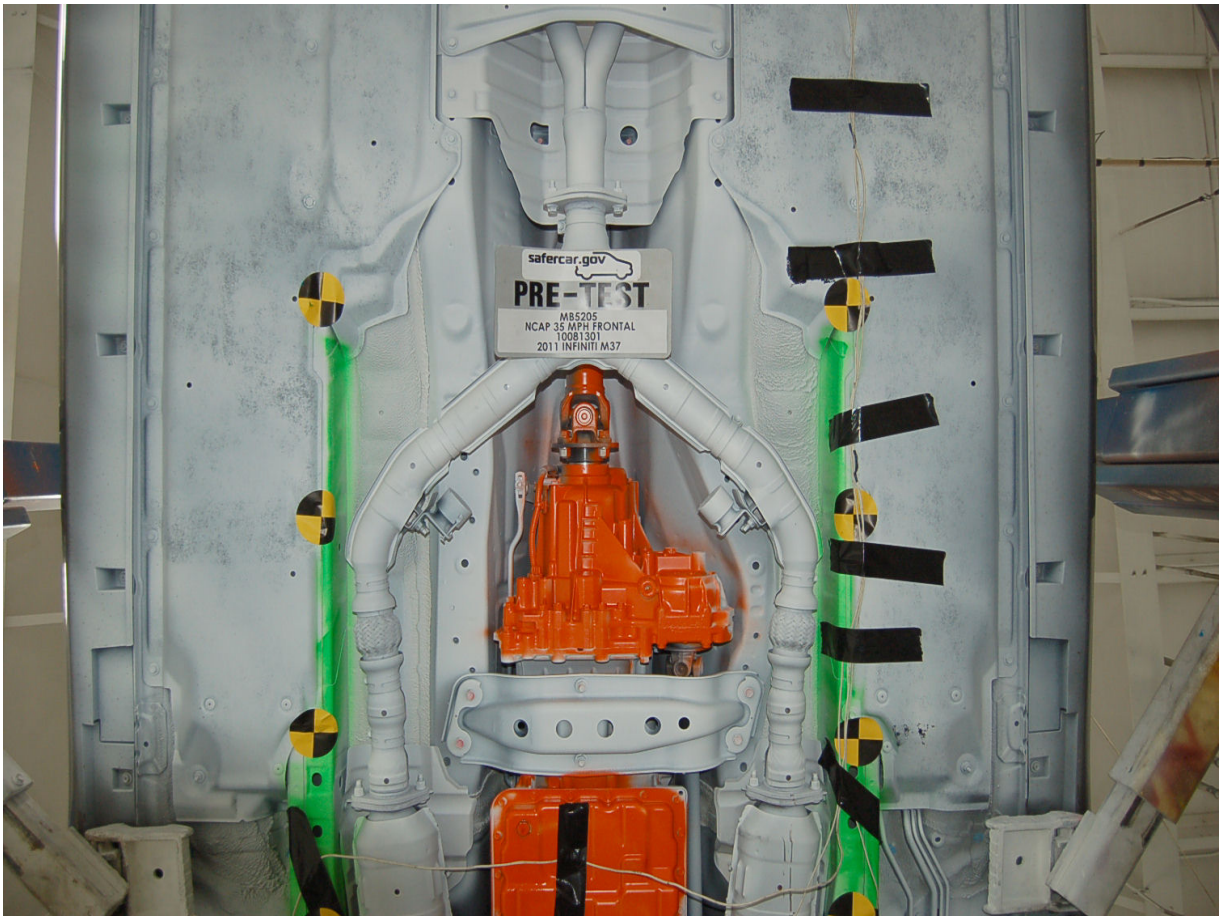
Post-Test Fuel Filler Cap View



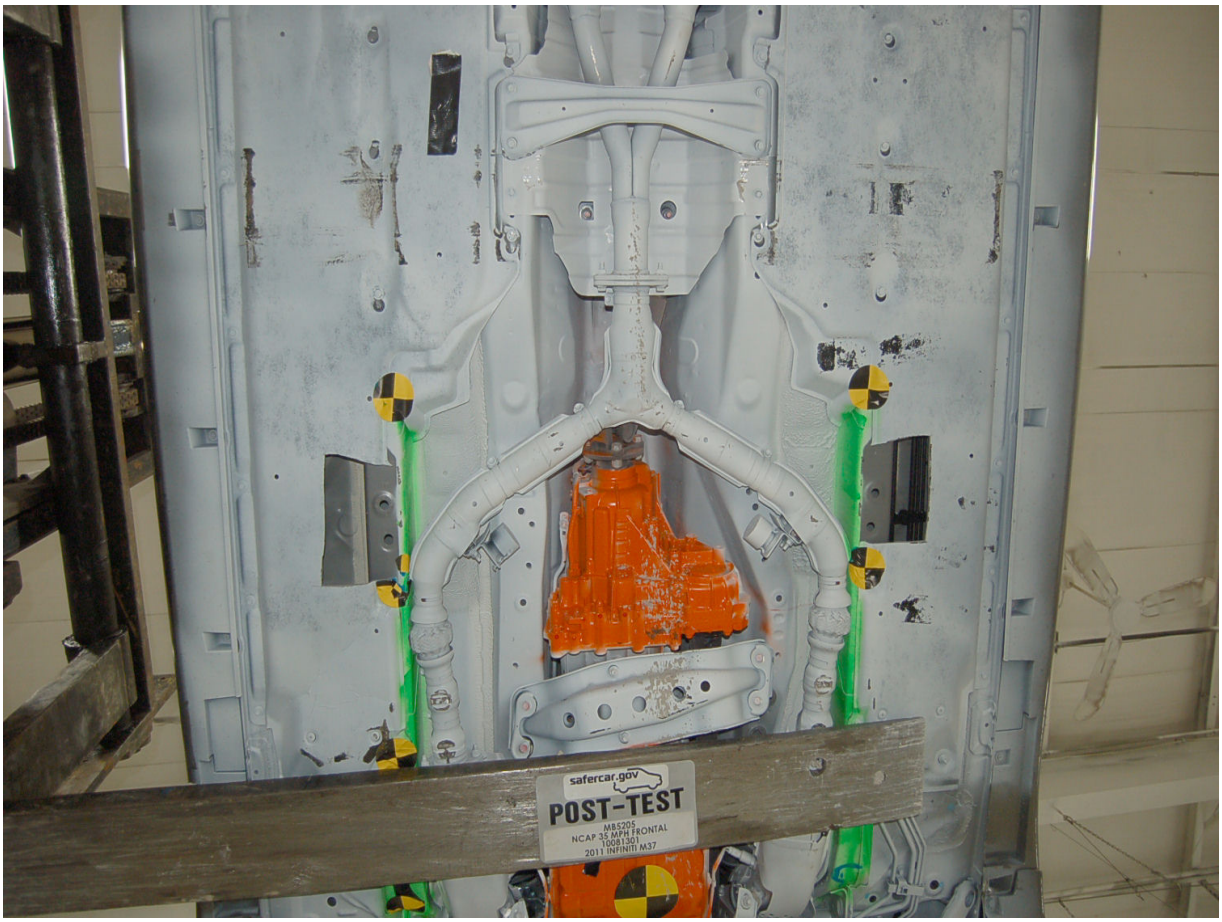
Pre-Test Front Underbody View



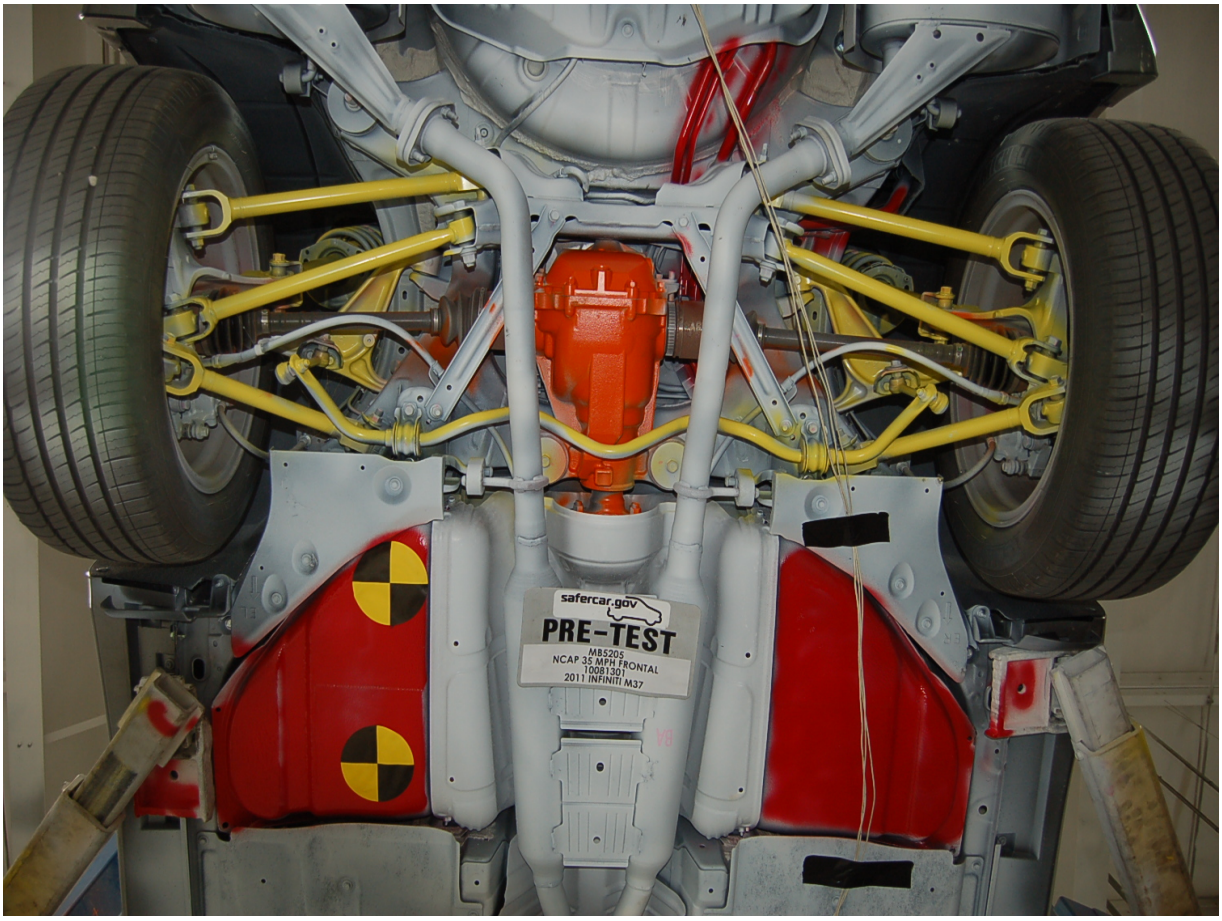
Post-Test Front Underbody View



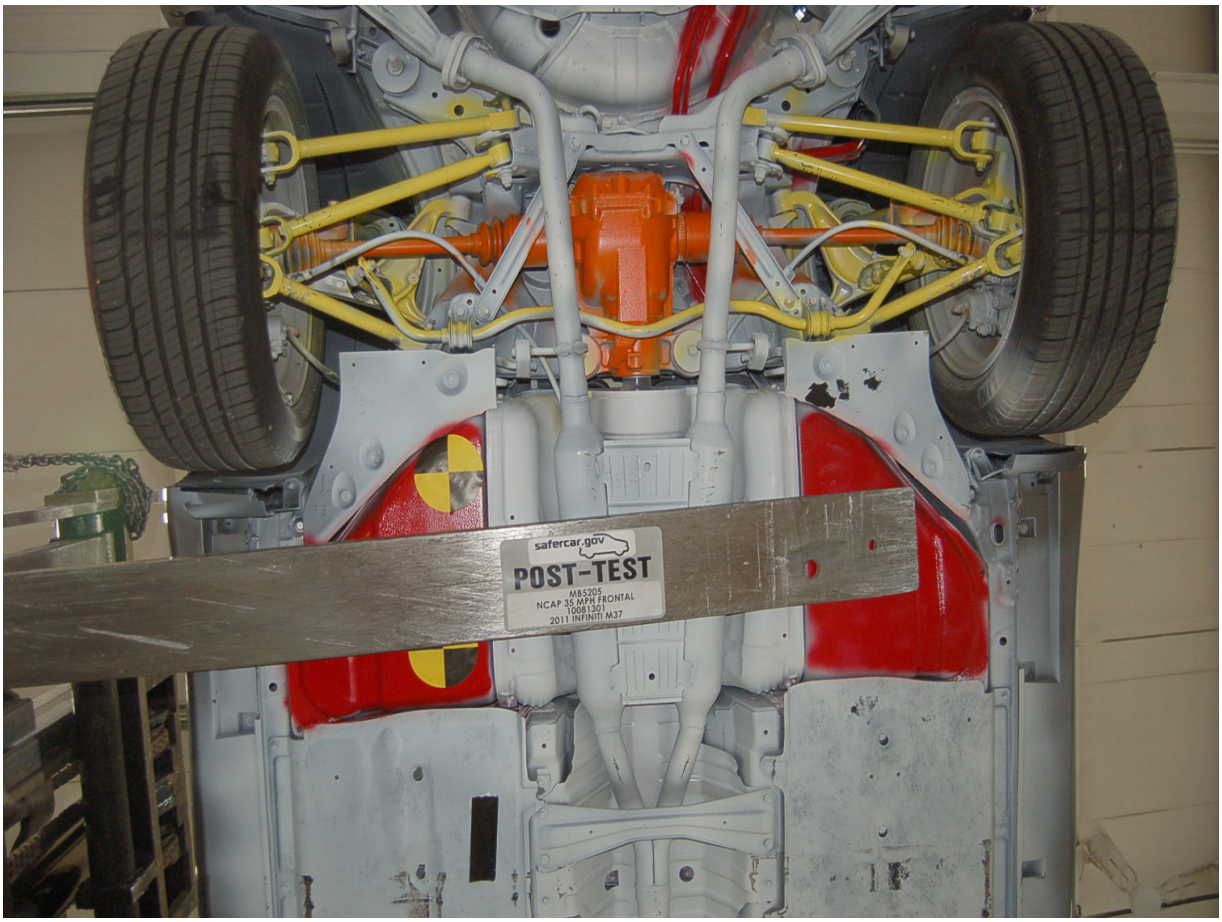
Pre-Test Mid Front Underbody View



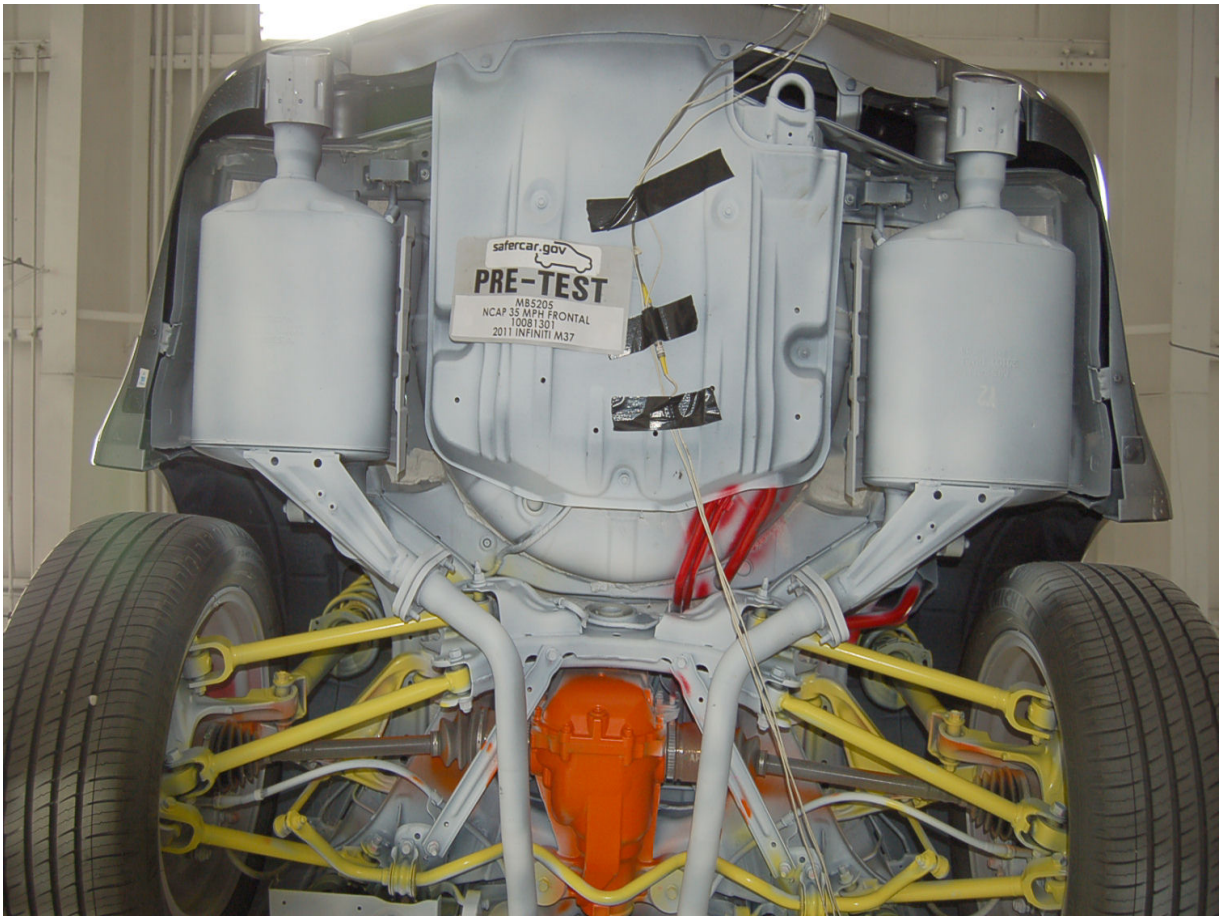
Post-Test Mid Front Underbody View



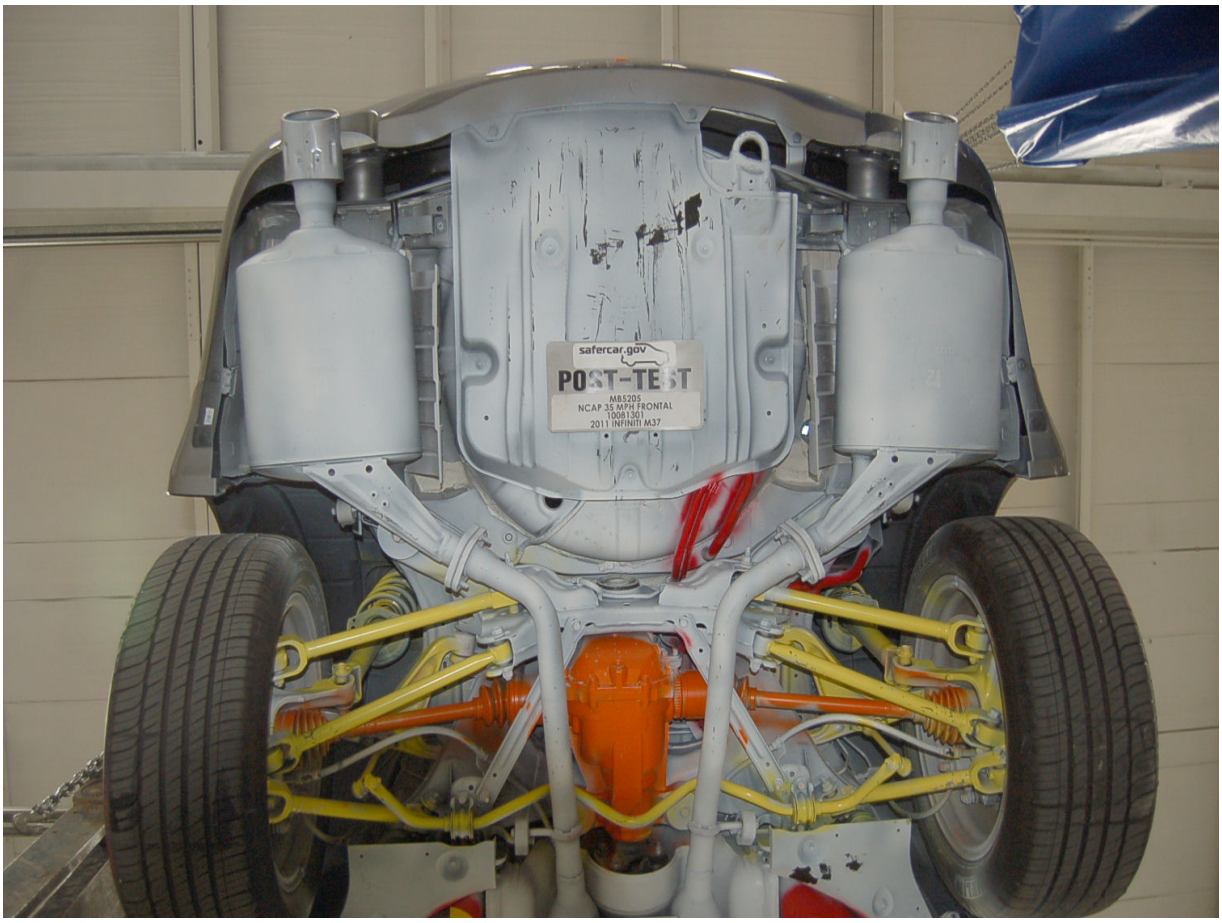
Pre-Test Mid Rear Underbody View



Post-Test Mid Rear Underbody View



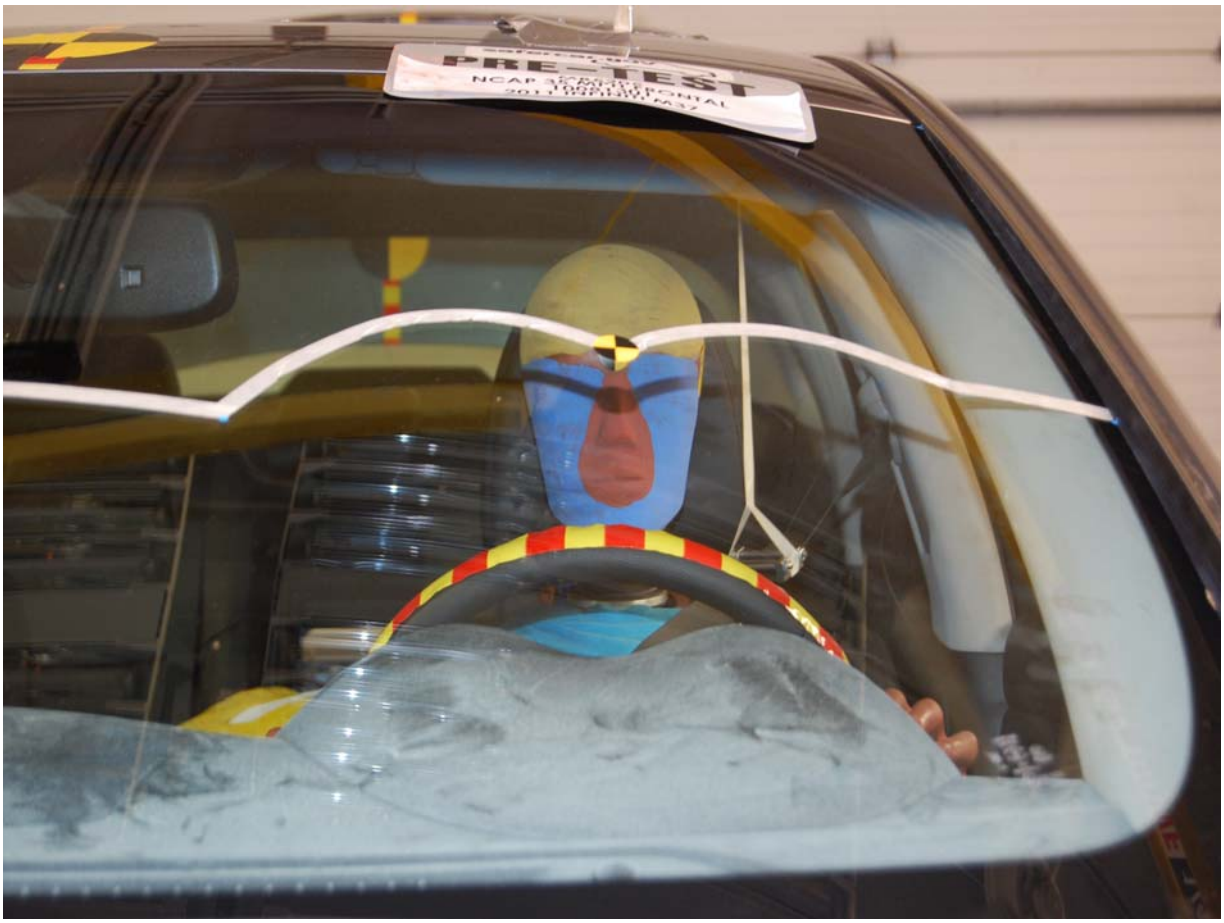
Pre-Test Rear Underbody View



Post-Test Rear Underbody View

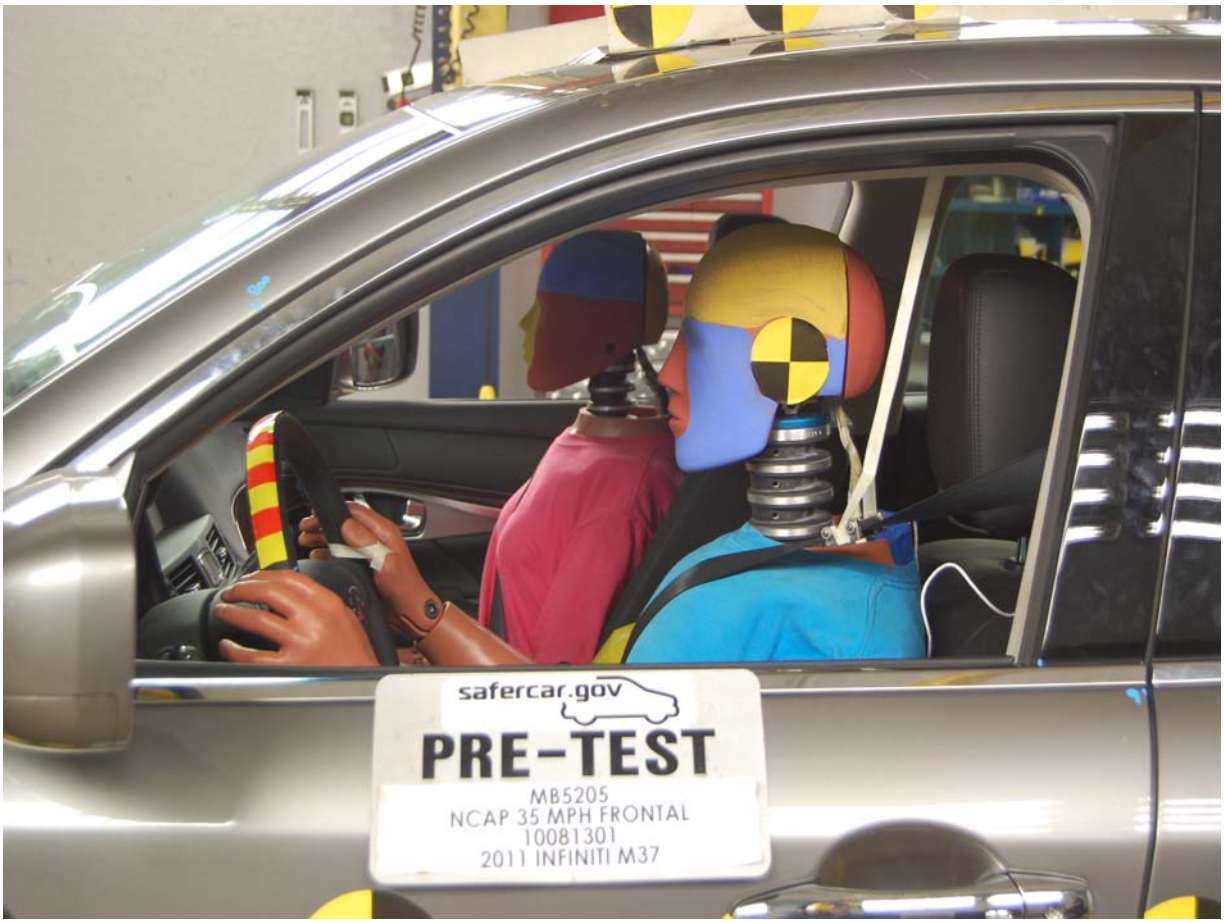
Pre-Test Dummy Cable Routing

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

Post-Test Driver's Side Knee Bolster

Pre-Test Driver's Side Floorpan

Post-Test Driver's Side Floorpan

Post-Test Driver Dummy Airbag Contact


Post-Test Driver Dummy Side Header Contact

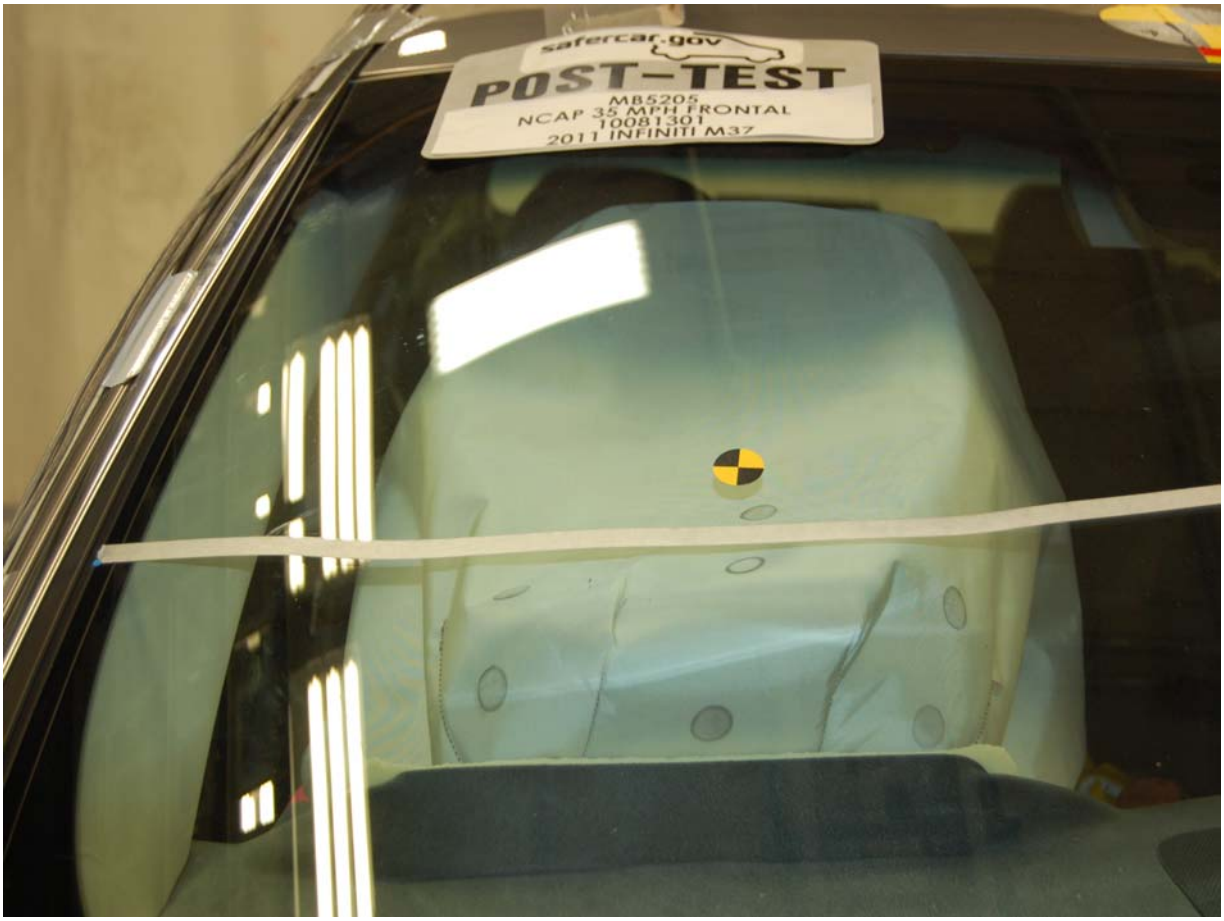
Post-Test Driver Dummy Headrest Contact

Post-Test Driver Dummy Knee Bolster Contact

Pre-Test View of Steering Column Shear Capsule


Post-Test View of Steering Column Shear Capsule

Pre-Test Passenger Dummy Front View



Post-Test Passenger Dummy Front View

Pre-Test Passenger Dummy Window View

Post-Test Passenger Dummy Window View

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

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

Pre-Test Passenger's Seat Fore-Aft Markings

Post-Test Passenger's Seat Fore-Aft Markings

Pre-Test Passenger Dummy Feet

Post-Test Passenger Dummy Feet

Pre-Test Passenger's Side Knee Bolster

Post-Test Passenger's Side Knee Bolster

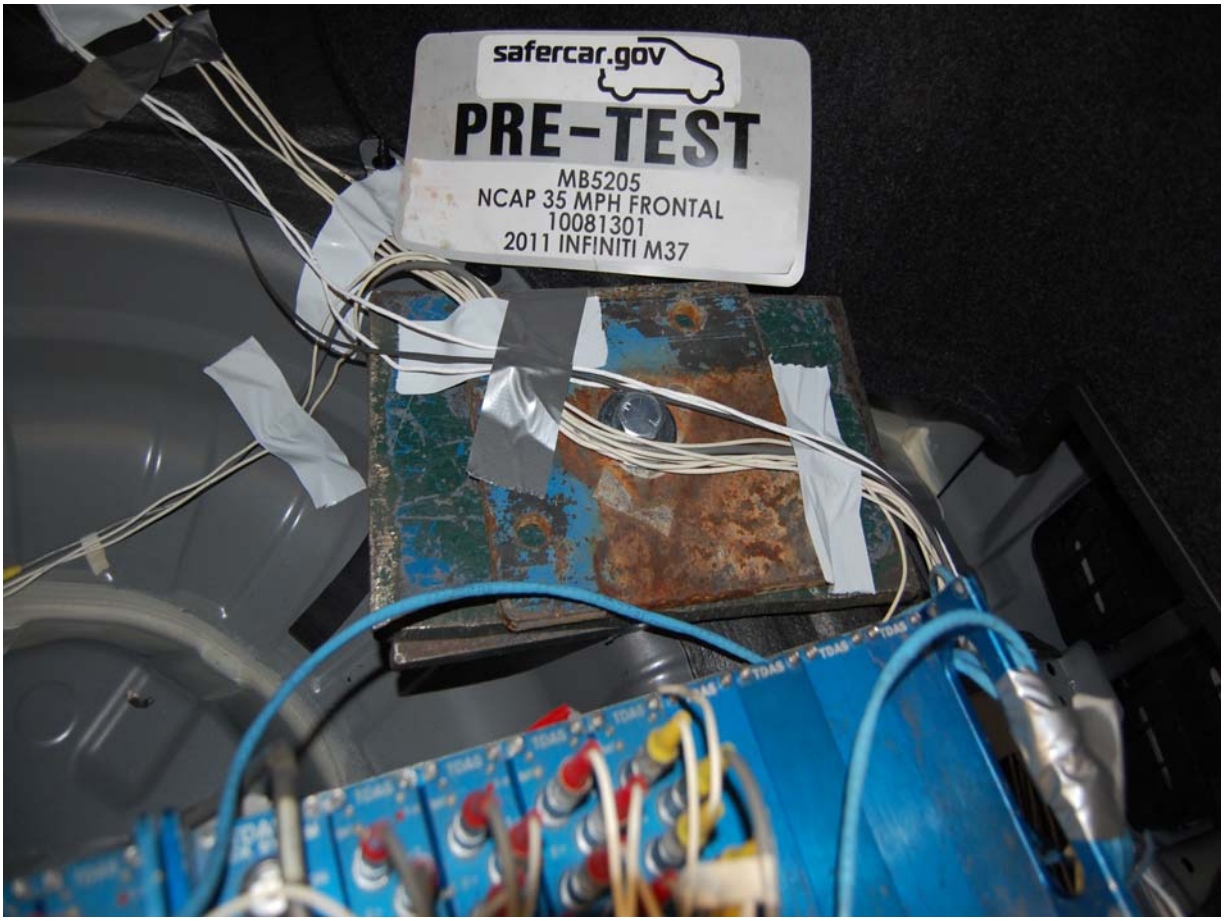
Pre-Test Passenger's Side Floorpan

Post-Test Passenger's Side Floorpan

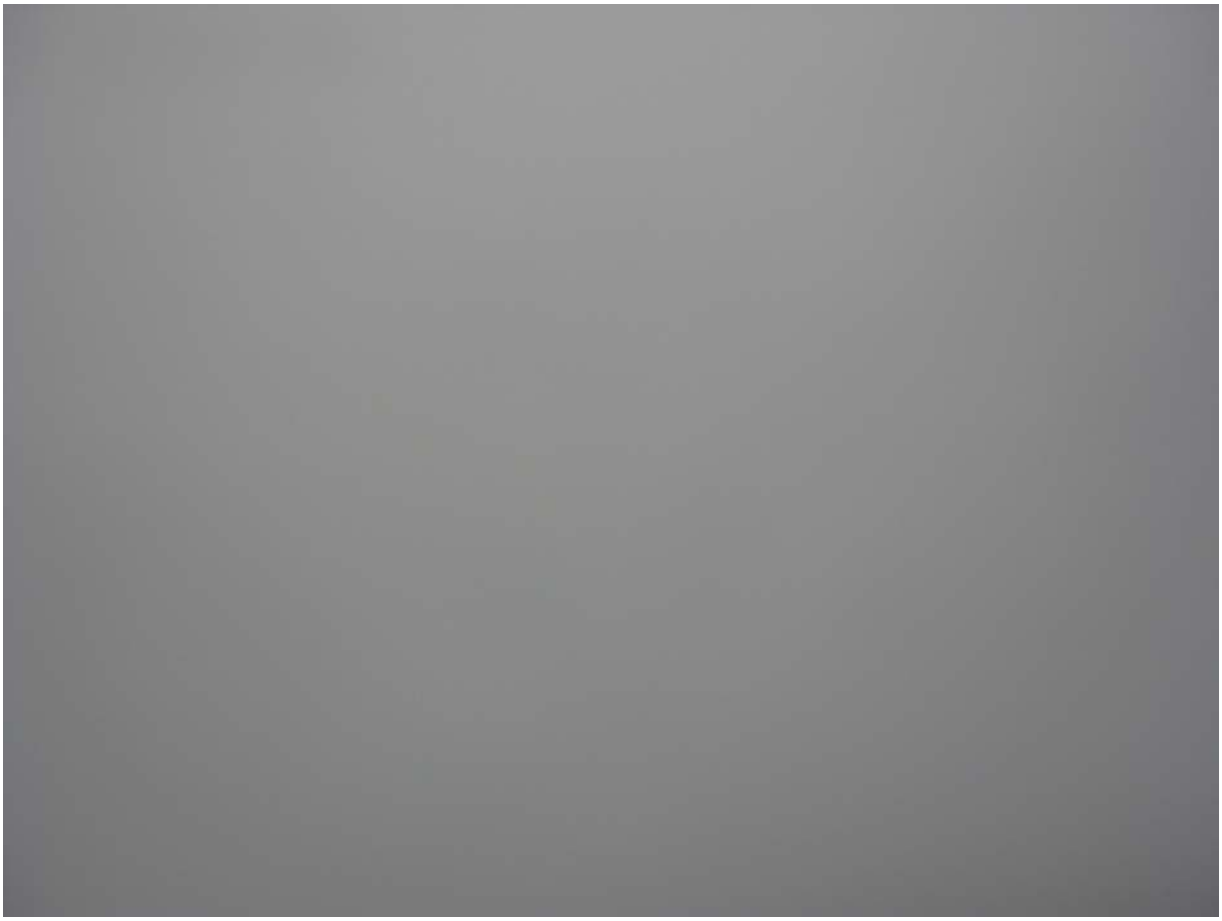
Post-Test Passenger Dummy Airbag Contact


Post-Test Passenger Dummy Headrest Contact

Post-Test Passenger Dummy Glovebox Contact



Ballast Installed in Vehicle



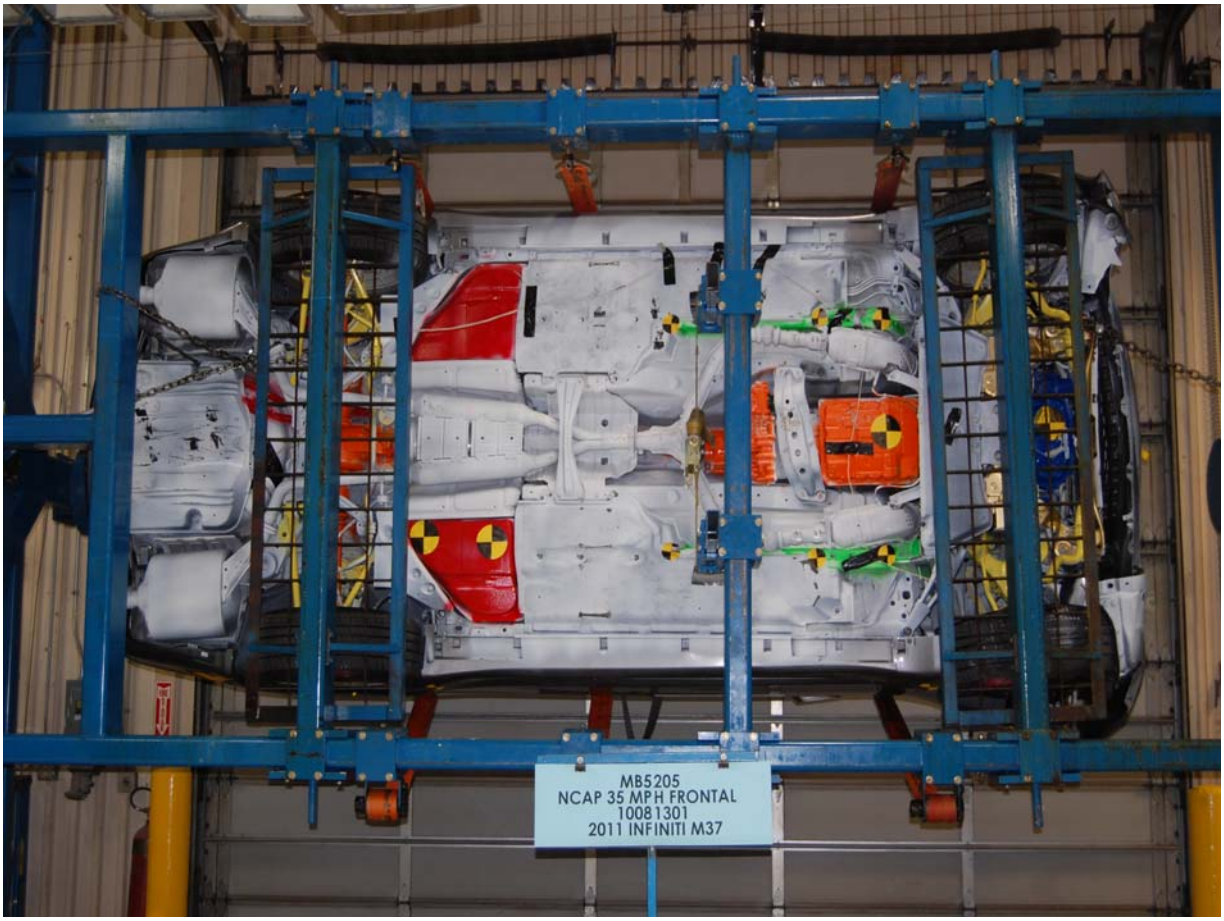
Post-Test Stoddard Solvent Spillage Location View, if required

Post-Test Speed Trap Read-Out

Vehicle at 0 Degrees on Static Rollover Device

Vehicle at 90 Degrees on Static Rollover Device

Vehicle at 180 Degrees on Static Rollover Device



Vehicle at 270 Degrees on Static Rollover Device

Vehicle at 360 Degrees on Static Rollover Device

Vehicle Impact

INFINITI.

2011 M37X AWD

Standard Equipment Included at No Extra Charge

POWERTRAIN:
3.7-liter DOHC 24-valve V6 engine
330 horsepower
270 lb-ft torque
ATTESA E-TS® All-Wheel Drive System with Snow Mode
7-speed automatic transmission
Manual shift mode w/Downshift Rev Matching
Independent front and rear suspension
Front and rear stabilizer bars
Infiniti Drive Mode Selector

EXTERIOR:
Power sliding, tinted glass moonroof
High Intensity Discharge (HID) bi-functional xenon headlights
18-inch aluminum-alloy wheels
245/50R18 V-rated all-season tires
Power folding/adjustable heated outside mirrors with reverse tilt down feature
Rain-sensing windshield wipers
Front door handle courtesy lights
Dual exhaust with polished tips

INTERIOR:
Leather-appointed seats
10-way power/heated front seats
Adjustable power lumbar support for front seats
Intelligent Key with Push Button Ignition
Sequential welcome lighting
Dual occupant memory system for driver's seat, steering wheel, outside mirrors, climate control & audio setting linked to Intelligent Keys
Power tilt/telescopic steering wheel
One-touch auto-up/down windows
Entry & exit assist system for driver
7-inch color display w/Infiniti Controller
XM® Satellite Radio****
6-speaker AM/FM audio system
Single disc CD player
USB connection port for iPod® interface and other compatible devices
RearView Monitor
Steering wheel with multi-function controls
Bluetooth® Hands-free Phone System
HomeLink® Universal Transceiver
Dual Zone Automatic Temperature Control
Rear seat climate control vents
Infiniti signature analog clock
Cigarette lighter with front and rear ashtrays

SAFETY & SECURITY:
Infiniti Advanced Air Bag System (AABS)
Front seat-mounted side-impact supplemental air bags
Roof-mounted curtain side-impact supplemental air bags
3-point ALR/ELR seat belts (driver ELR only)
Front seat belts with pretensioners and load limiters
Front-seat Active Head Restraints
Lower Anchors and Tethers for CHildren (LATCH)
4-wheel Anti-lock Braking System (ABS)
Brake Assist
Electronic Brake force Distribution (EBD)
Vehicle Dynamic Control (VDC) with Traction Control System (TCS)
Tire Pressure Monitoring System (TPMS)
Zone body construction with front and rear crumple zones
Vehicle Security System (VSS)
Infiniti Vehicle Immobilizer System
Emergency inside trunk release

++ Optional equipment replaces standard equipment
+++ Replaces optional equipment

***Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.**

Manufacturer's Suggested Retail Base Price:	$48,400.00
Options Included by Manufacturer	
BODY-COLOR SPLASH GUARDS	165.00
TRUNK MAT, TRUNK NET & FIRST AID KIT	195.00
Destination Charges:	865.00
Total*	**$49,625.00**

****XM® Includes activation & 3 months of radio service only. XM® radio, XM NavTraffic® & XM NavWeather™ coverage and/or features not available in HI or AK and some markets.

EPA Fuel Economy Estimates

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

Estimated Annual Fuel Cost
$2,100
based on 15,000 miles at $2.80 per gallon

HIGHWAY MPG
24
Expected range for most drivers **19** to **29** MPG

Combined Fuel Economy
This Vehicle
20
12 — 50
All **MIDSIZE CARS**

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 Not Rated
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

TOTAL OWNERSHIP EXPERIENCE®

Every Infiniti Vehicle includes Infiniti's:
- 4-Year/60,000 Mile Basic Limited Warranty Coverage**
- 6-Year/70,000 Mile Powertrain Limited Warranty Coverage**
- 7-Year/Unlimited Mileage Corrosion Limited Warranty Coverage**
- 24-Hour Roadside Assistance***
- Complimentary Service Loan Car***

** Please see the Infiniti Warranty Information booklet for details.
*** Please ask your Infiniti retailer for details.

INFINITI.

DELIVERY

VEHICLE COLORS:
EXT: PLATINUM GRAPHI
INT: GRAPHITE

FINAL ASSEMBLY POINT:
LOS ANGELES

TRANSPORT METHOD:
TRUCK

DEALER:
FIELDS INFINITI
2100 FRONTAGE RD
GLENCOE IL
60022

VIN: JN1BY1AR4BM371469
EMS: 50 STATE EMISSIONS
MDL: 94211-371469 K51-G
OPT: A-B92C03L92S55Z66

20100319000112AS70207

Monroney Label

APPENDIX B

DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

Driver Head X Redundant

Driver Head Y Redundant

Driver Head Z Redundant

Driver Upper Neck Force Y

Driver Upper Neck Moment X

Driver Upper Neck Moment Z

Driver Chest X Redundant

Driver Chest Y Redundant

Driver Chest Z Redundant

Driver Pelvis X

Driver Pelvis Y

Driver Pelvis Z

Driver Shoulder Belt Force

Driver Lap Belt Force

Driver Left Upper Tibia Moment X

Driver Left Upper Tibia Moment Y

Driver Left Upper Tibia Force Z

Driver Left Lower Tibia Moment X

Driver Left Lower Tibia Moment Y

Driver Left Lower Tibia Force Z

Driver Right Upper Tibia Moment X

Driver Right Upper Tibia Moment Y

Driver Right Upper Tibia Force Z

Driver Right Lower Tibia Moment X

Driver Right Lower Tibia Moment Y

Driver Right Lower Tibia Force Z

Driver Left Foot Fore Z

Driver Left Foot Aft X

Driver Left Foot Aft Z

Driver Right Foot Fore Z

Driver Right Foot Aft X

Driver Right Foot Aft Z

Passenger Head X Redundant

Passenger Head Y Redundant

Passenger Head Z Redundant

Passenger Upper Neck Force Y

Passenger Upper Neck Moment X

Passenger Upper Neck Moment Z

Passenger Chest X Redundant

Passenger Chest Y Redundant

Passenger Chest Z Redundant

Passenger Pelvis X

Passenger Pelvis Y

Passenger Pelvis Z

Passenger Lap Belt Force

Passenger Shoulder Belt Force – not installed

Passenger Left Upper Tibia Moment X

Passenger Left Upper Tibia Moment Y

Passenger Left Upper Tibia Force Z

Passenger Left Lower Tibia Moment X

Passenger Left Lower Tibia Moment Y

Passenger Left Lower Tibia Force Z

Passenger Right Upper Tibia Moment X

Passenger Right Upper Tibia Moment Y

Passenger Right Upper Tibia Force Z

Passenger Right Lower Tibia Moment X

Passenger Right Lower Tibia Moment Y

Passenger Right Lower Tibia Force Z

Passenger Left Foot Fore Z

Passenger Left Foot Aft X

Passenger Left Foot Aft Z

Passenger Right Foot Fore Z

Passenger Right Foot Aft X

Passenger Right Foot Aft Z

Left Rear Seat Crossmember X

Left Rear Seat Crossmember Z

Right Rear Seat Crossmember X

Right Rear Seat Crossmember Z

Vehicle Engine Top X

Vehicle Engine Bottom X

Vehicle Left Brake Caliper X

Vehicle Right Brake Caliper X

Barrier Force – Upper Left

Barrier Force – Upper Center

Barrier Force – Upper Right

Barrier Force – Lower Left

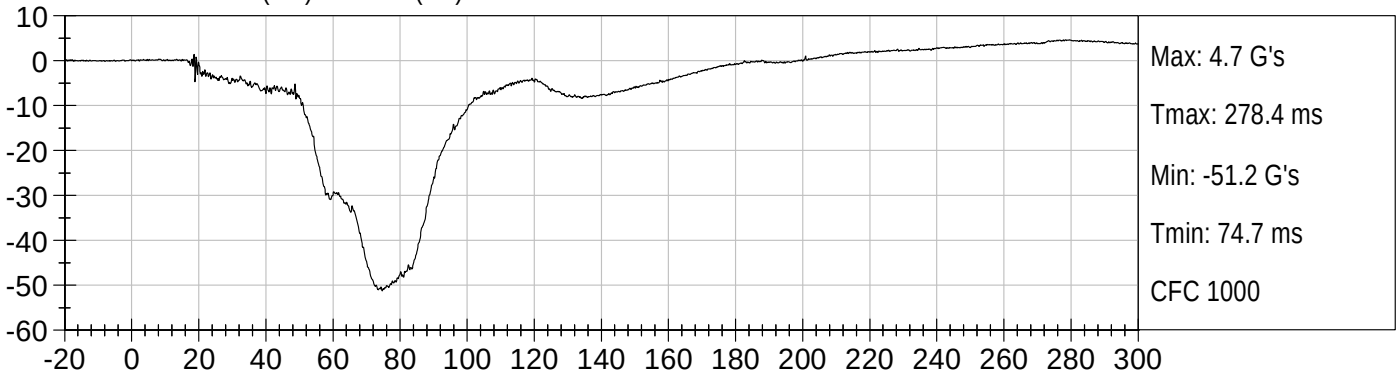
Barrier Force – Lower Center

Barrier Force – Lower Right

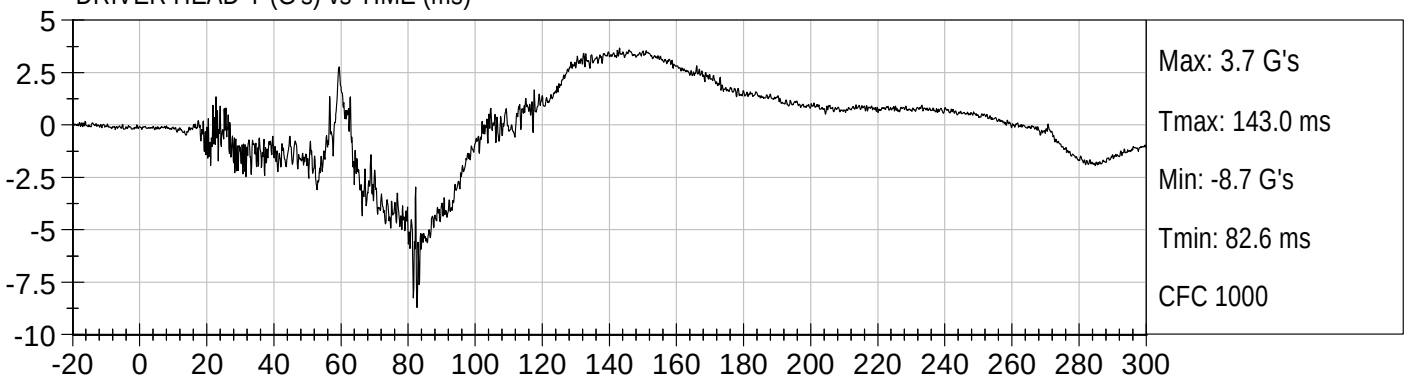
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

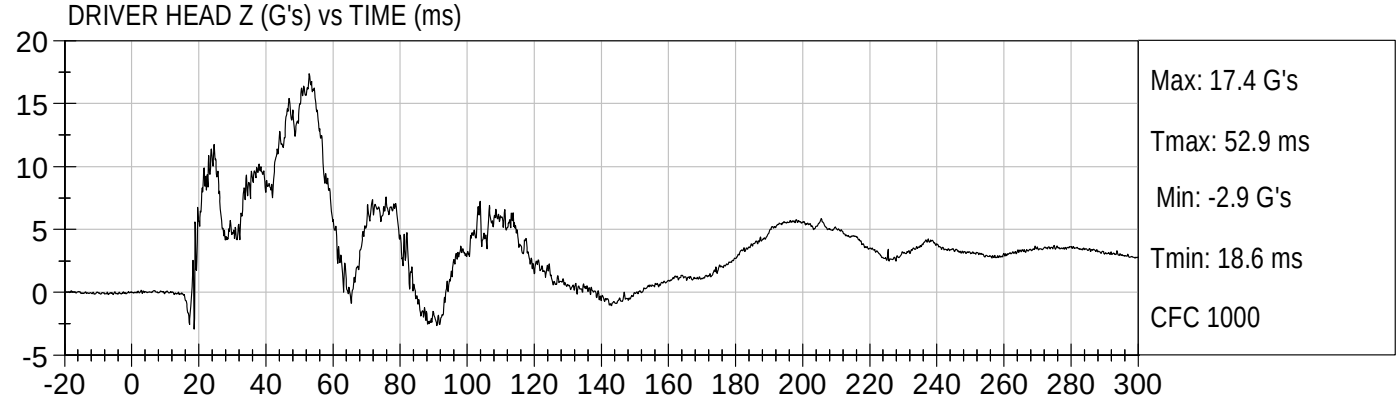
DRIVER HEAD X (G's) vs TIME (ms)



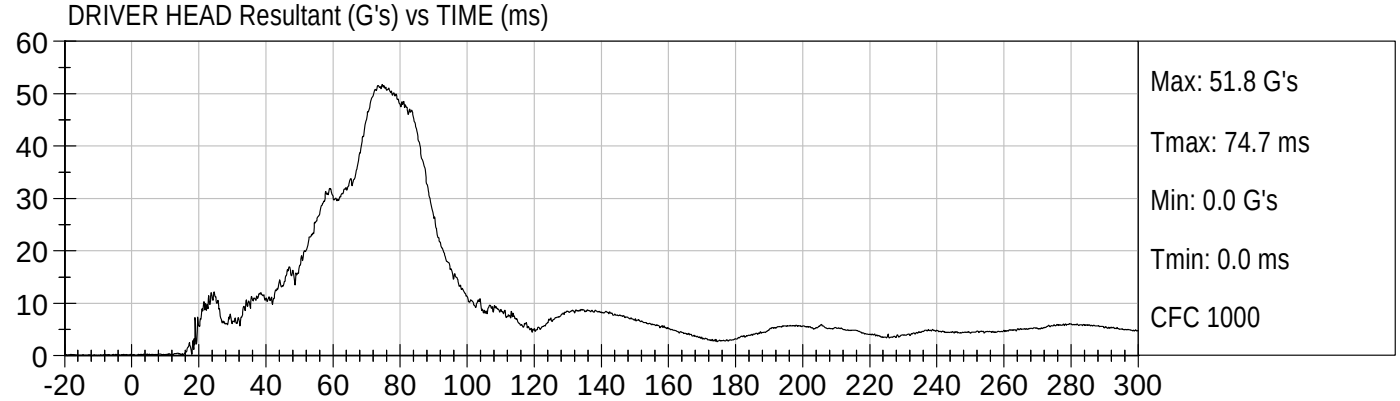
DRIVER HEAD Y (G's) vs TIME (ms)



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



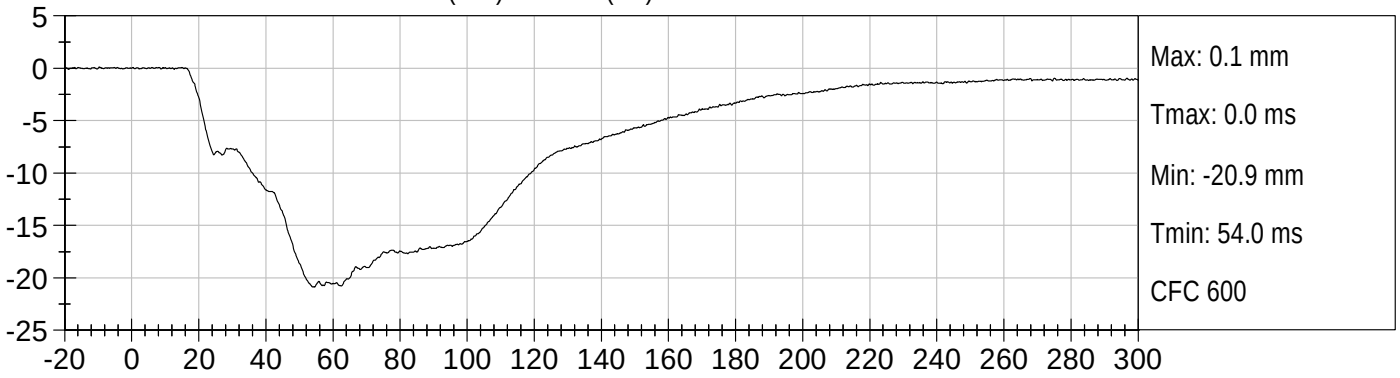
DRIVER HEAD Resultant (G's) vs TIME (ms)



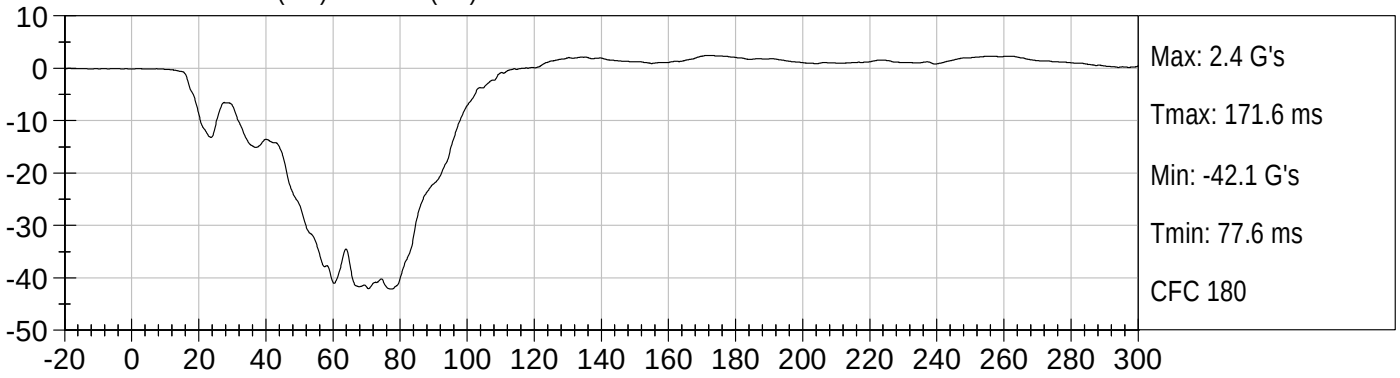
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

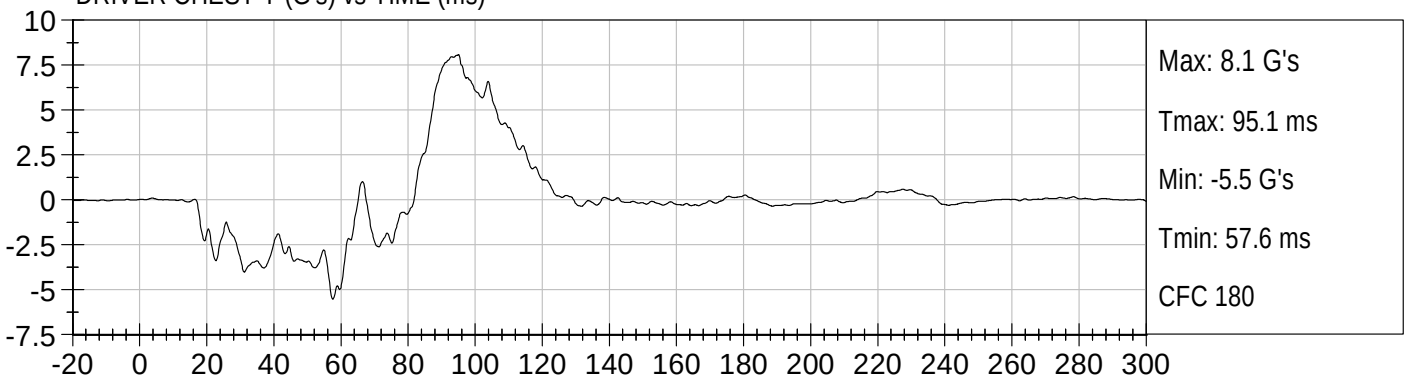
DRIVER CHEST DISPLACEMENT (mm) vs TIME (ms)



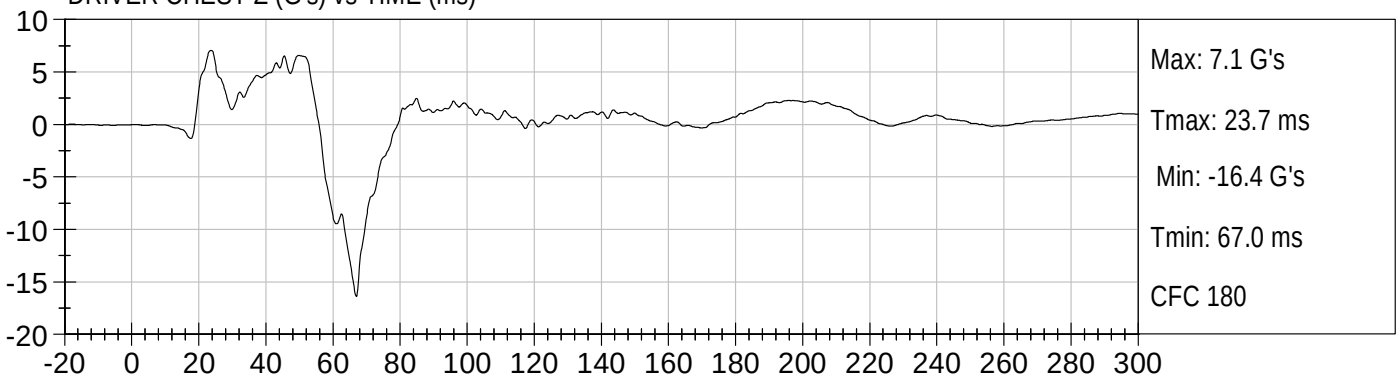
DRIVER CHEST X (G's) vs TIME (ms)



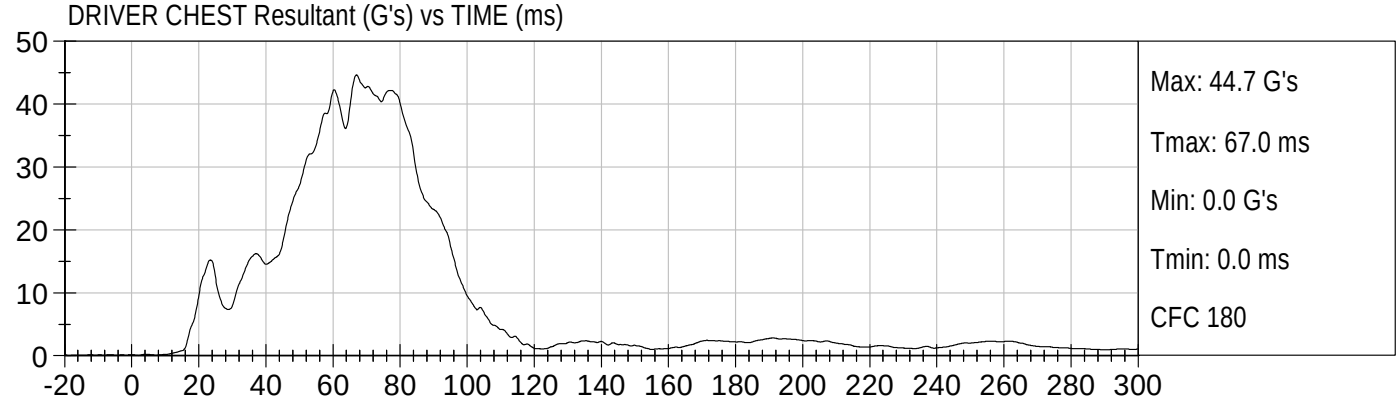
DRIVER CHEST Y (G's) vs TIME (ms)



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



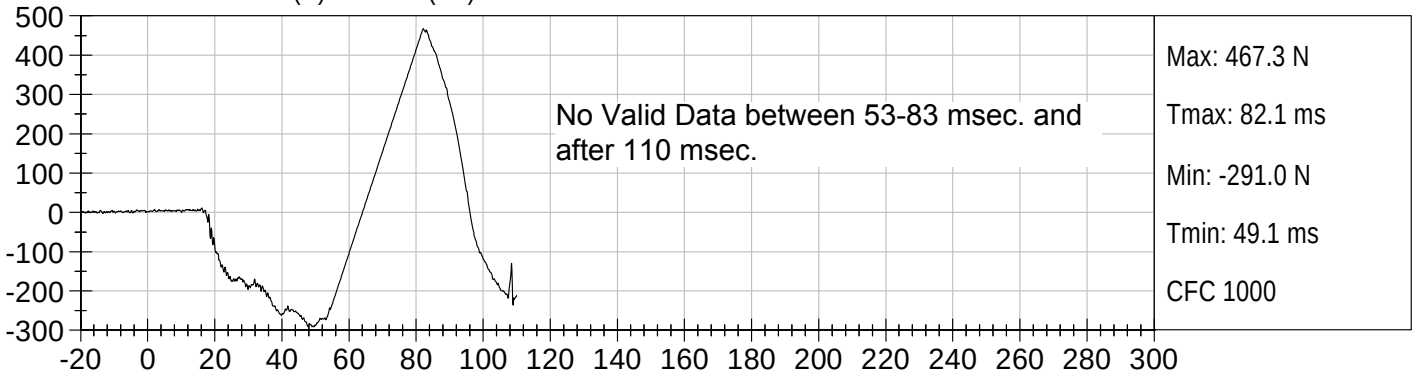
DRIVER CHEST Resultant (G's) vs TIME (ms)



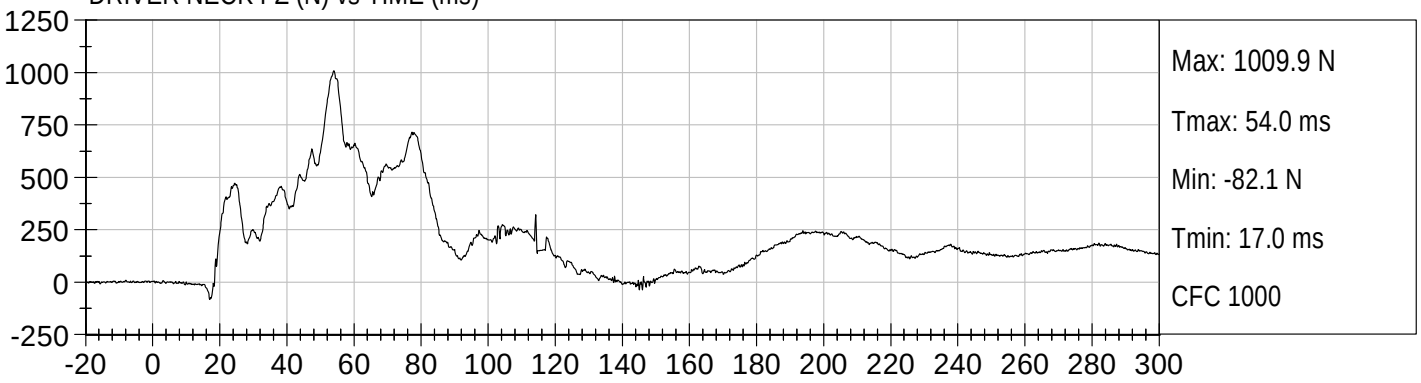
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

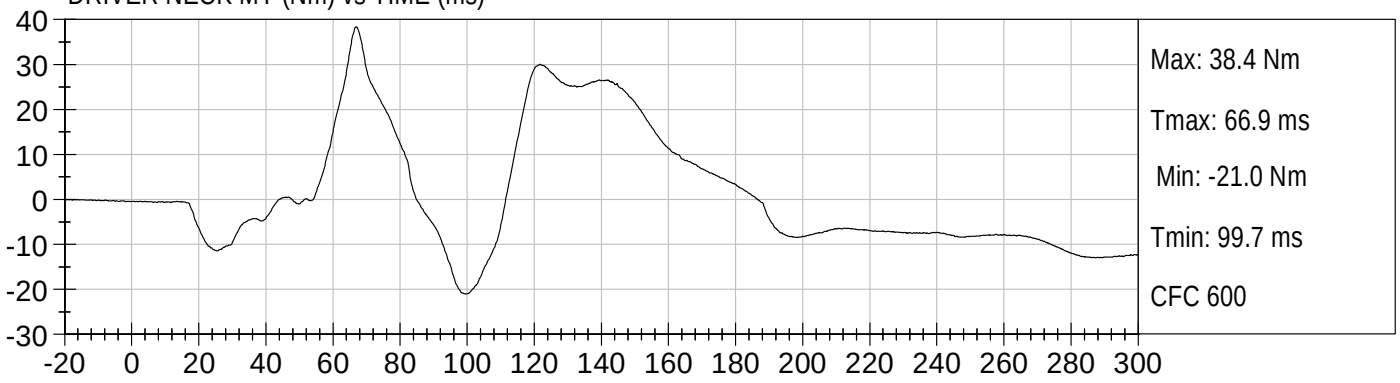
DRIVER NECK FX (N) vs TIME (ms)

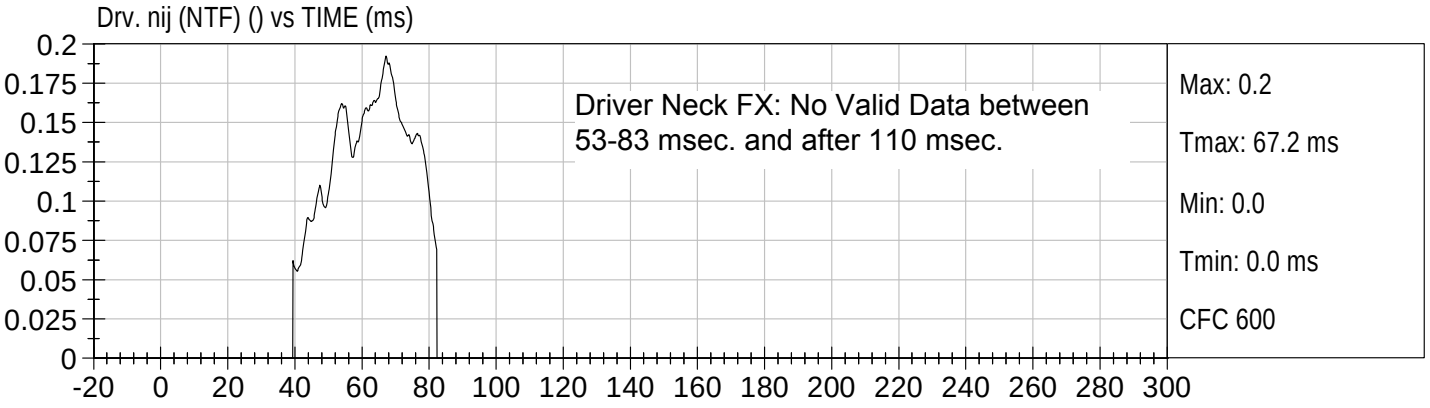


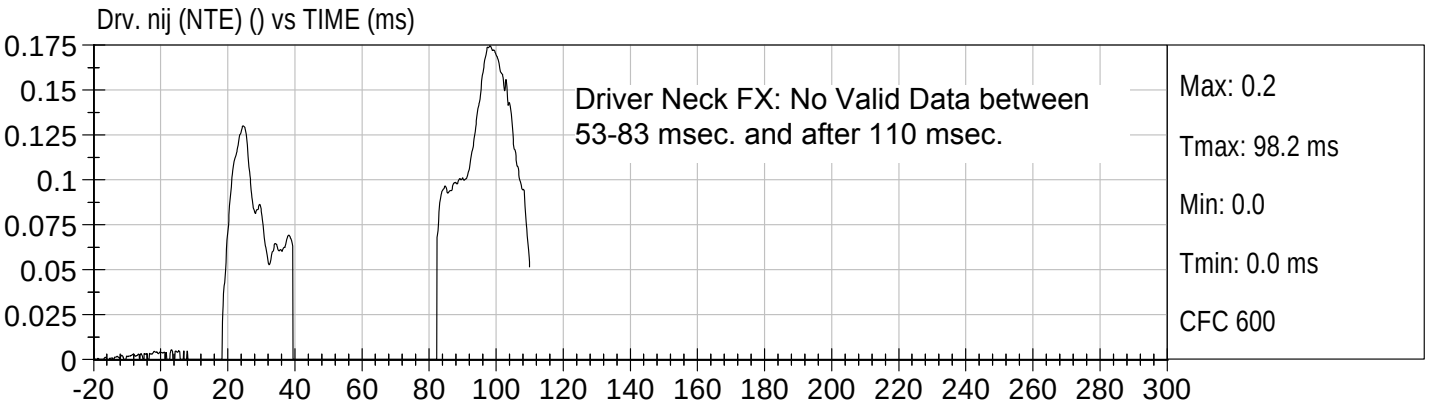
DRIVER NECK FZ (N) vs TIME (ms)

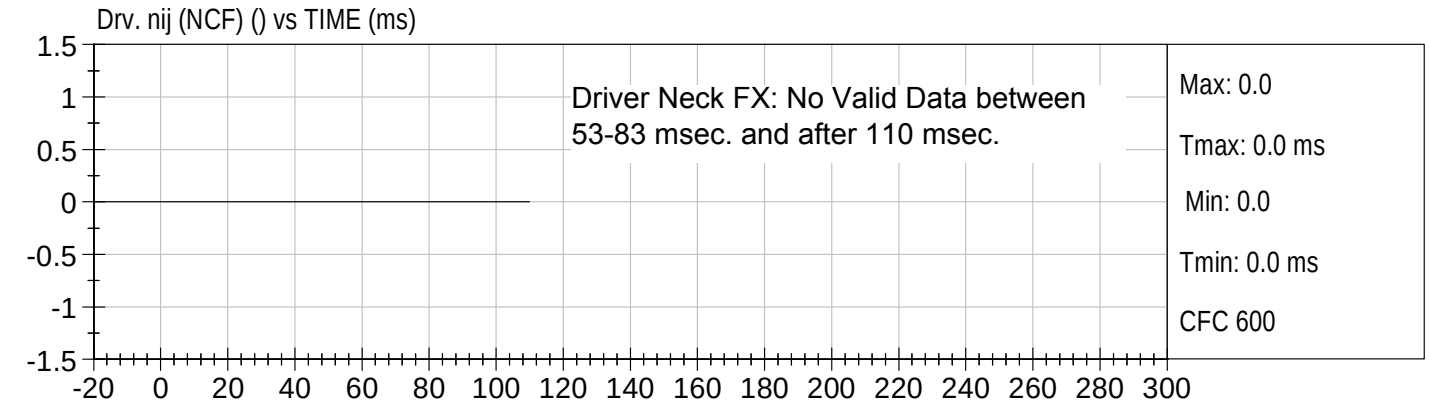


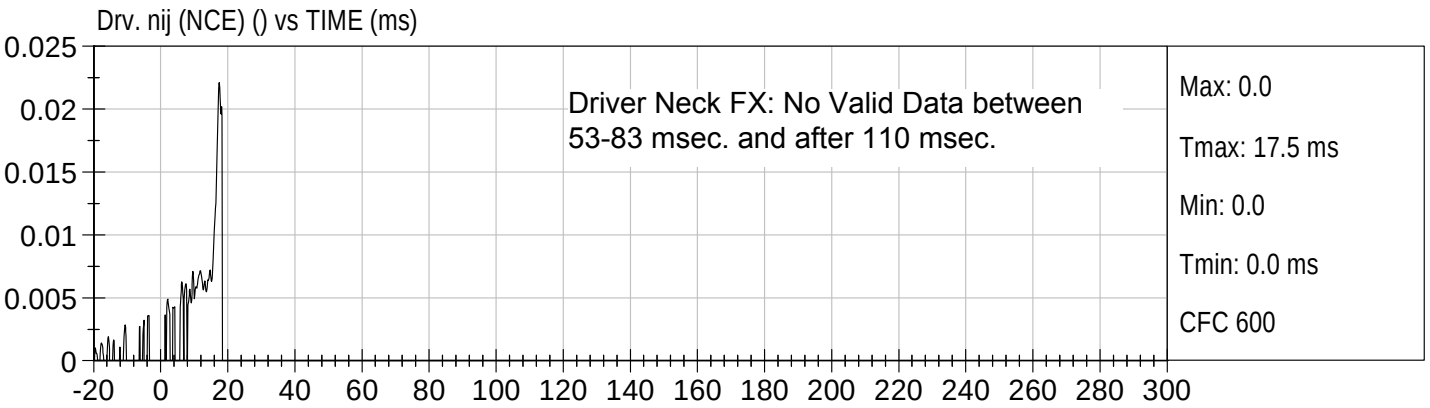
DRIVER NECK MY (Nm) vs TIME (ms)




Drv. nij (NTF) () vs TIME (ms)
Driver Neck FX: No Valid Data between 53-83 msec. and after 110 msec.
Max: 0.2
Tmax: 67.2 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600


Drv. nij (NTE) () vs TIME (ms)
Driver Neck FX: No Valid Data between 53-83 msec. and after 110 msec.
Max: 0.2
Tmax: 98.2 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

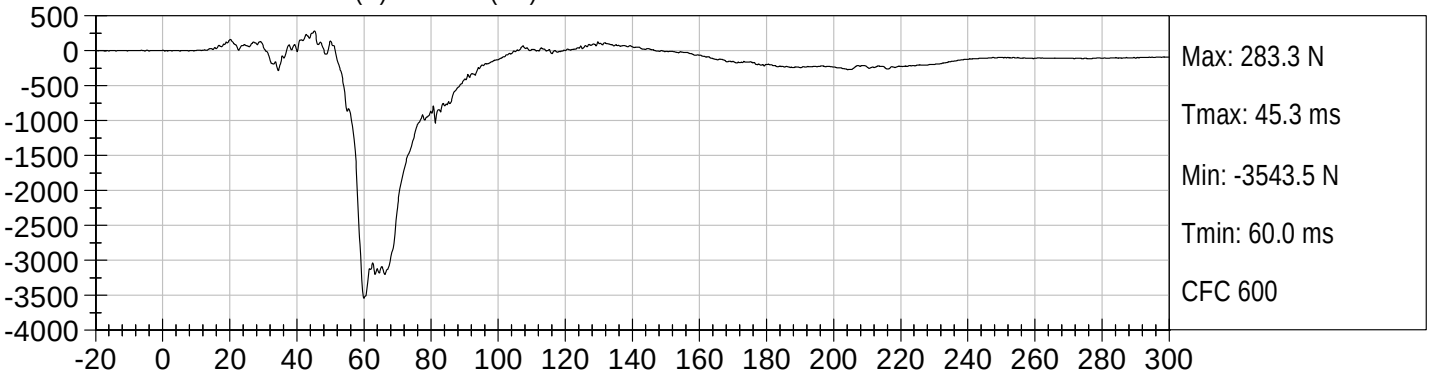

Drv. nij (NCF) () vs TIME (ms)
Driver Neck FX: No Valid Data between 53-83 msec. and after 110 msec.
Max: 0.0
Tmax: 0.0 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600


Drv. nij (NCE) () vs TIME (ms)
Driver Neck FX: No Valid Data between 53-83 msec. and after 110 msec.
Max: 0.0
Tmax: 17.5 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

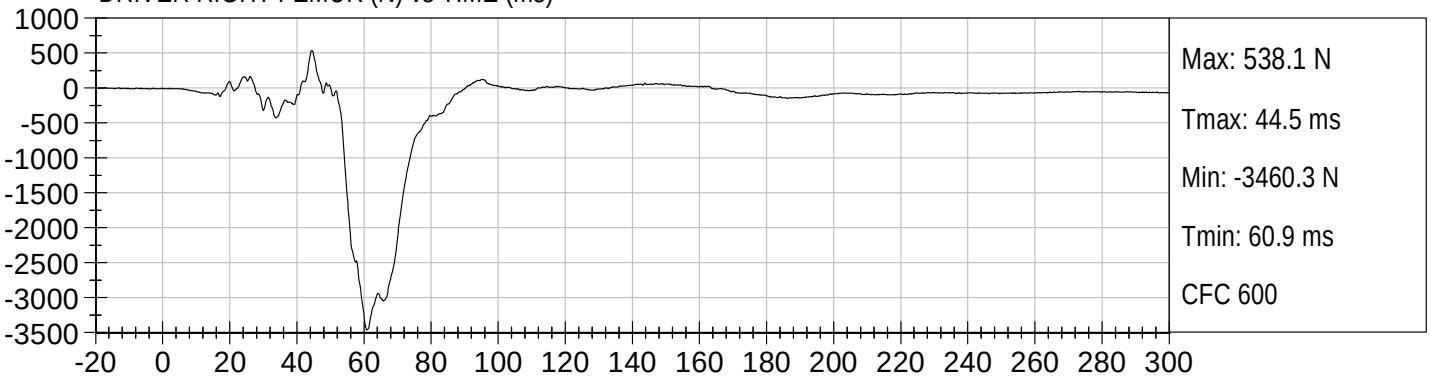
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

DRIVER LEFT FEMUR (N) vs TIME (ms)



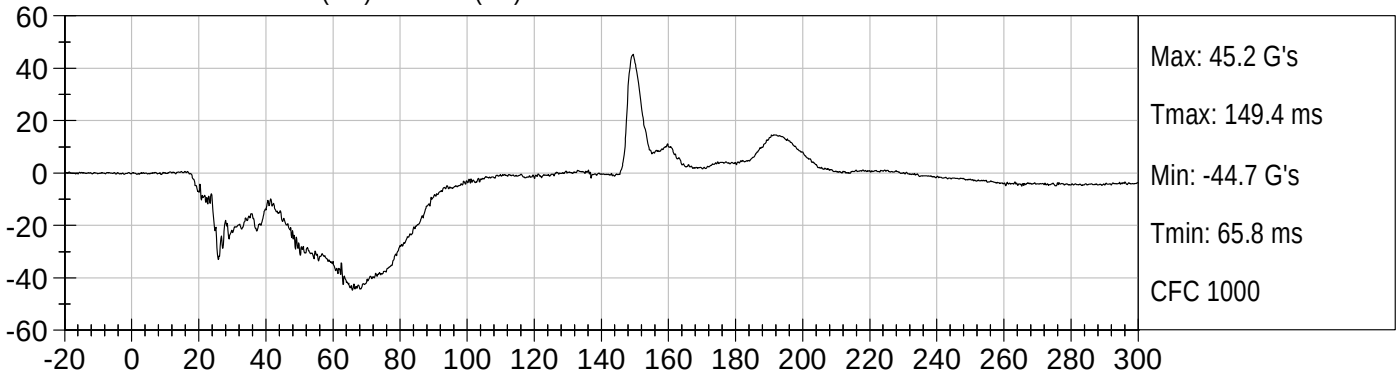
DRIVER RIGHT FEMUR (N) vs TIME (ms)



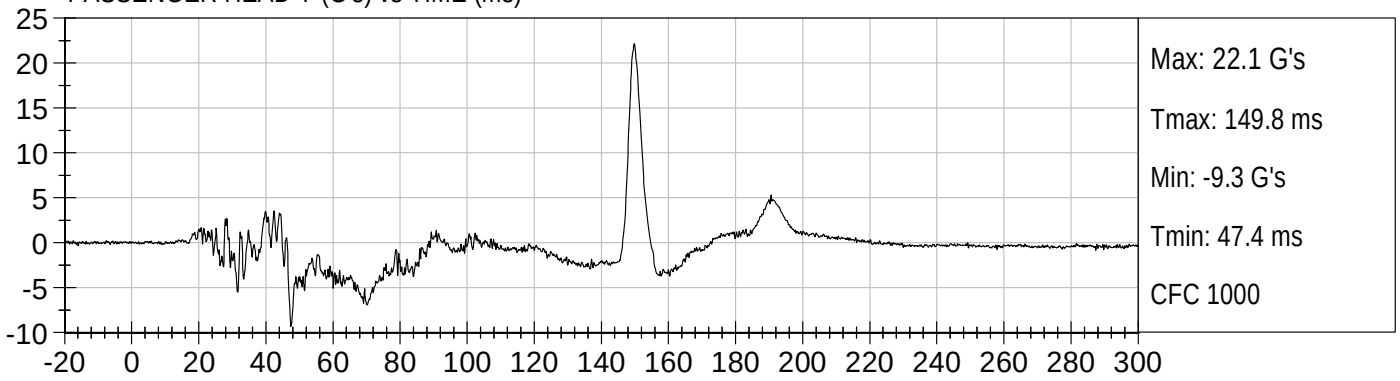
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

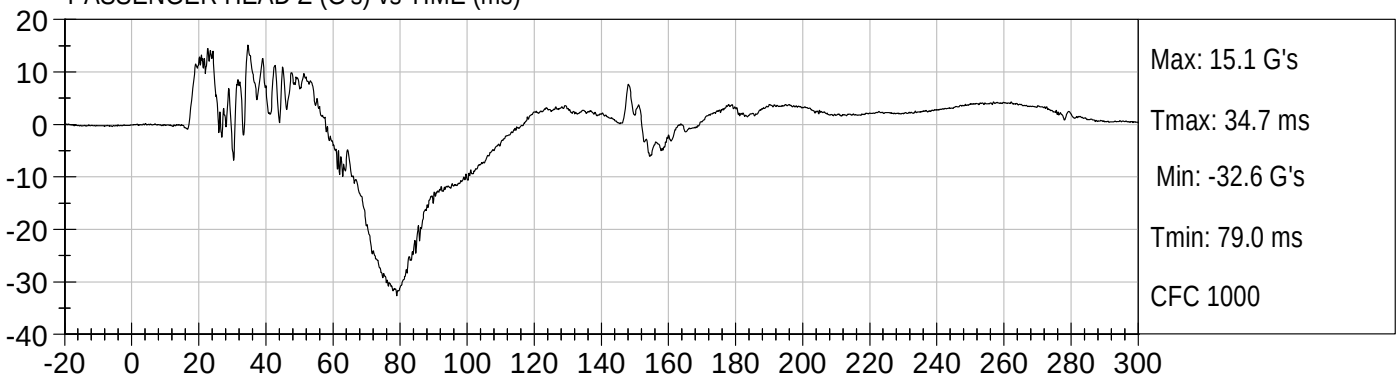
PASSENGER HEAD X (G's) vs TIME (ms)



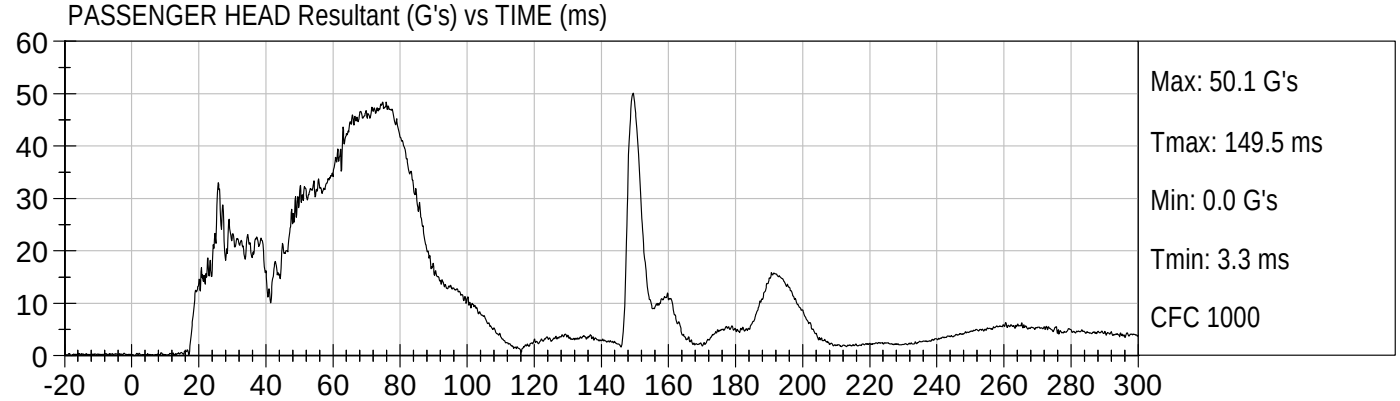
PASSENGER HEAD Y (G's) vs TIME (ms)



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

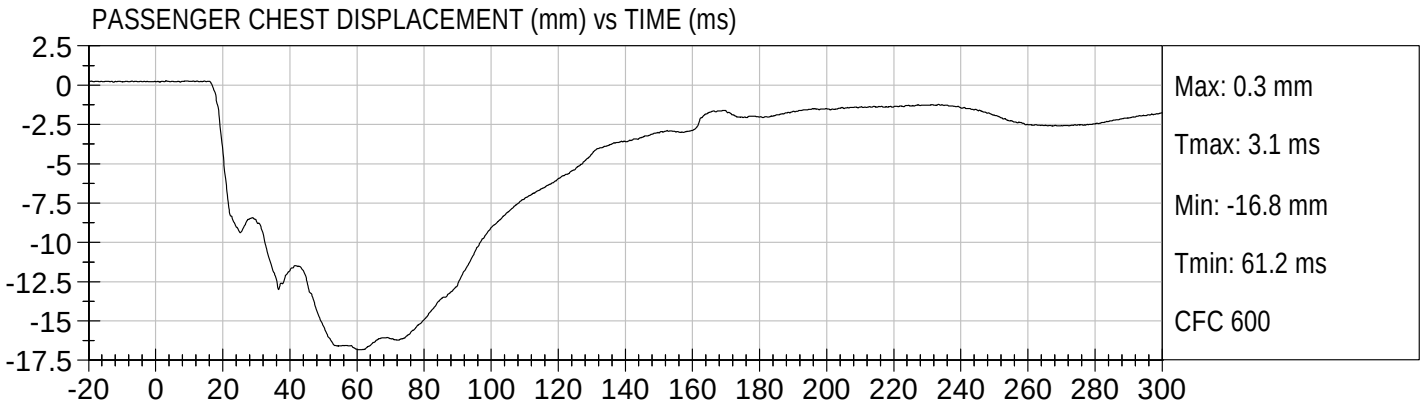


PASSENGER HEAD Resultant (G's) vs TIME (ms)



NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

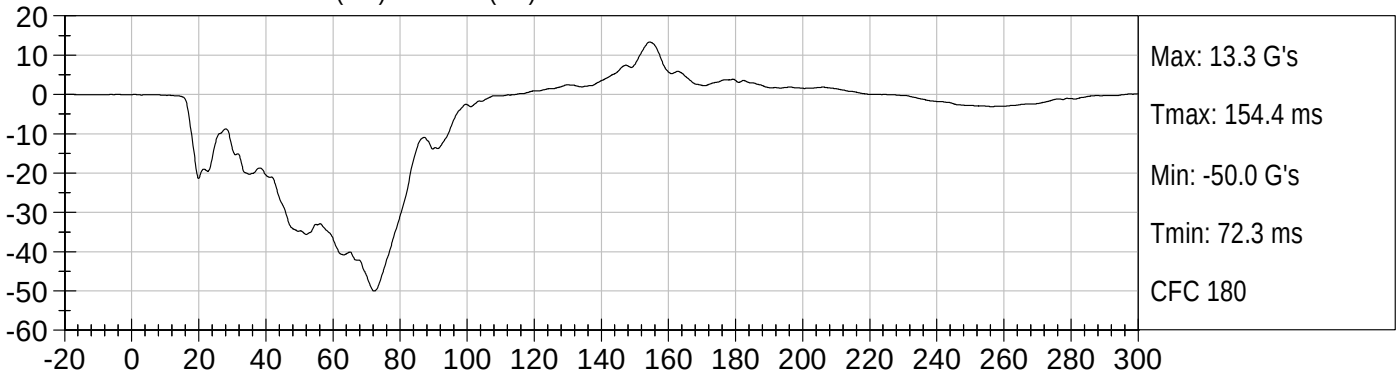
Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)



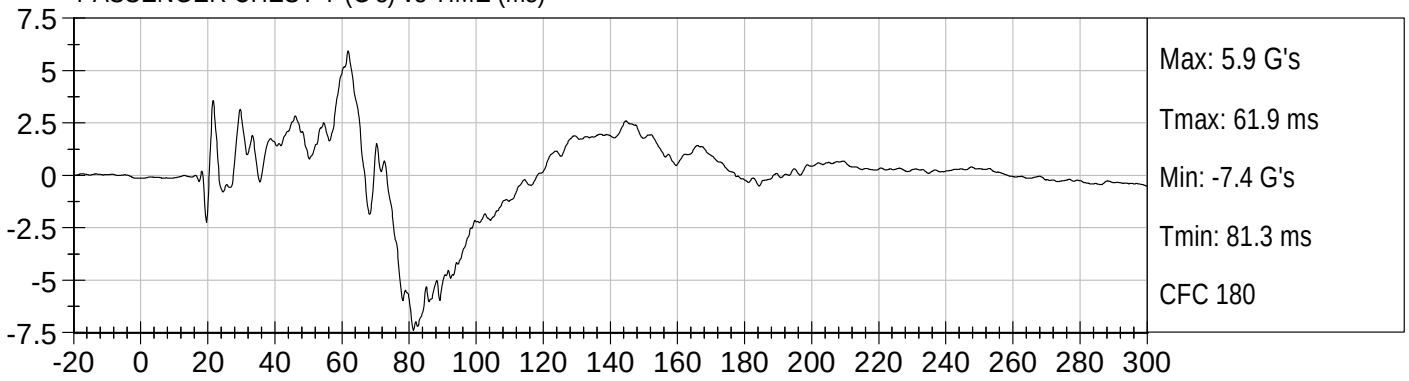
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

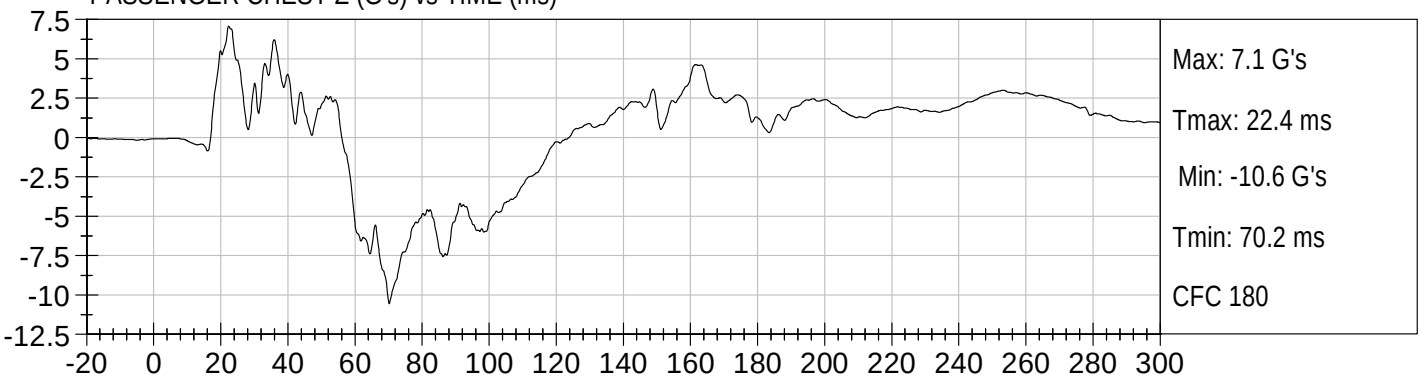
PASSENGER CHEST X (G's) vs TIME (ms)



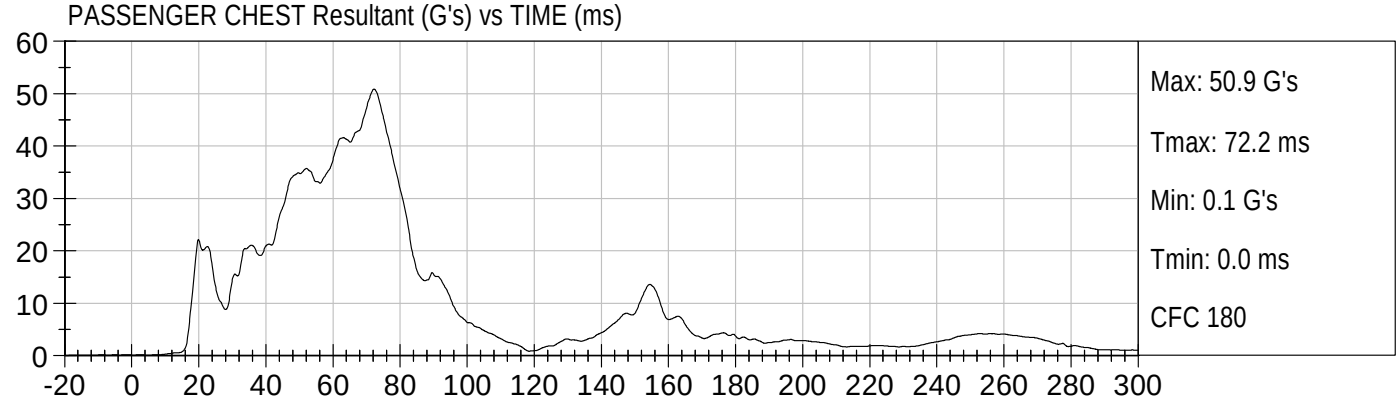
PASSENGER CHEST Y (G's) vs TIME (ms)



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



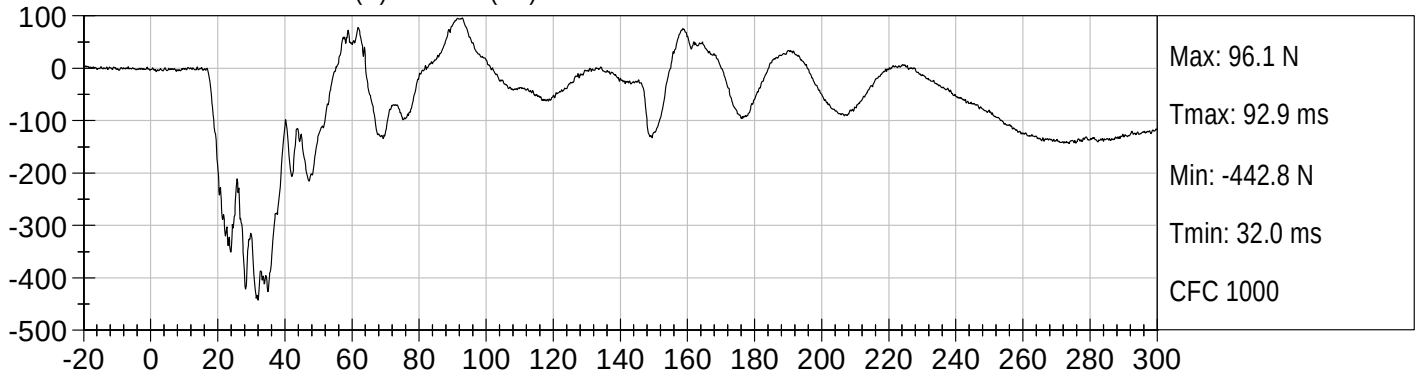
PASSENGER CHEST Resultant (G's) vs TIME (ms)



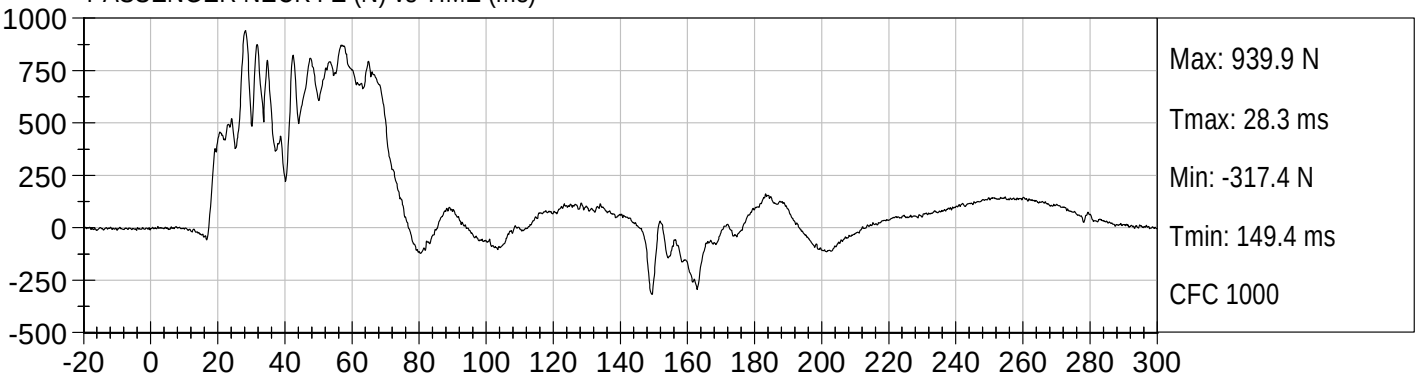
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

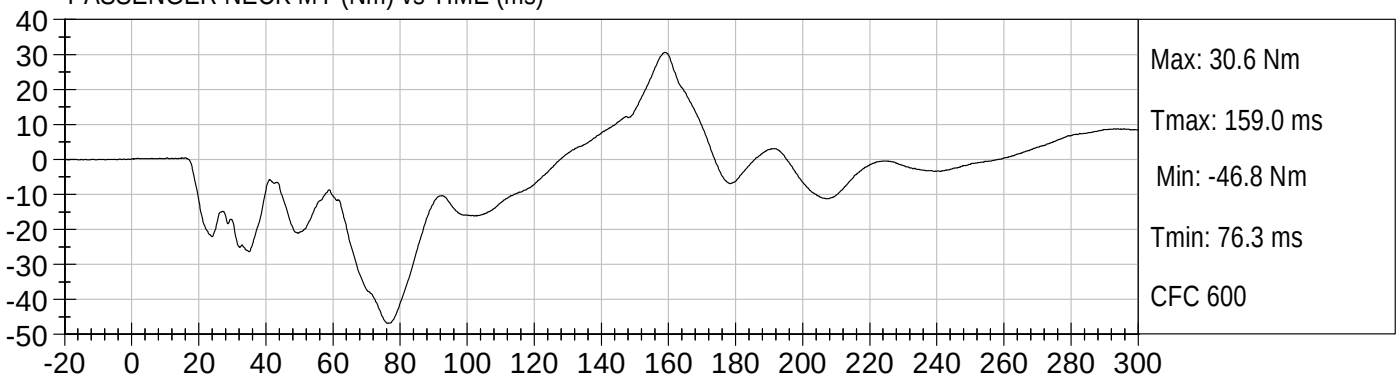
PASSENGER NECK FX (N) vs TIME (ms)



PASSENGER NECK FZ (N) vs TIME (ms)

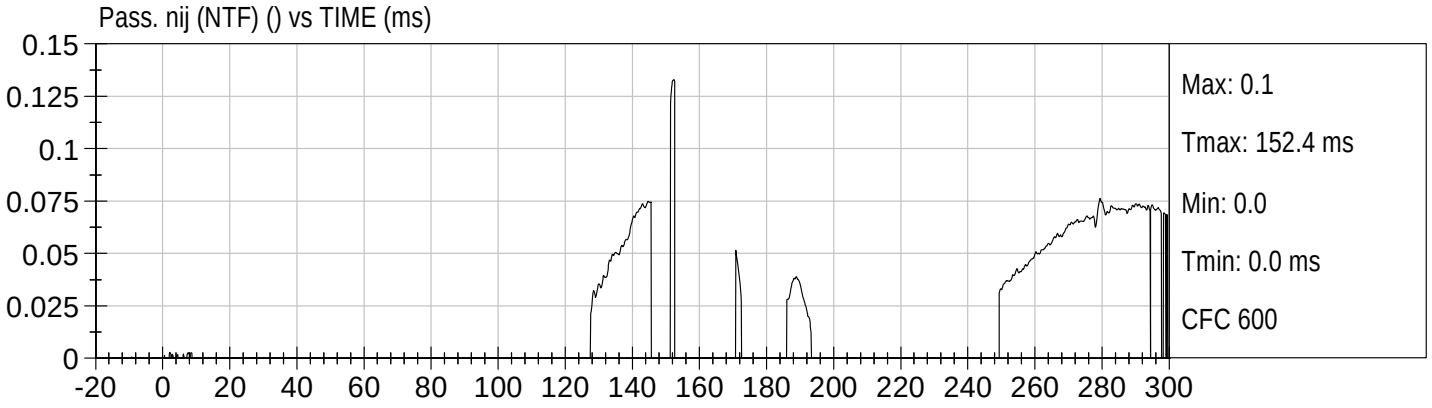


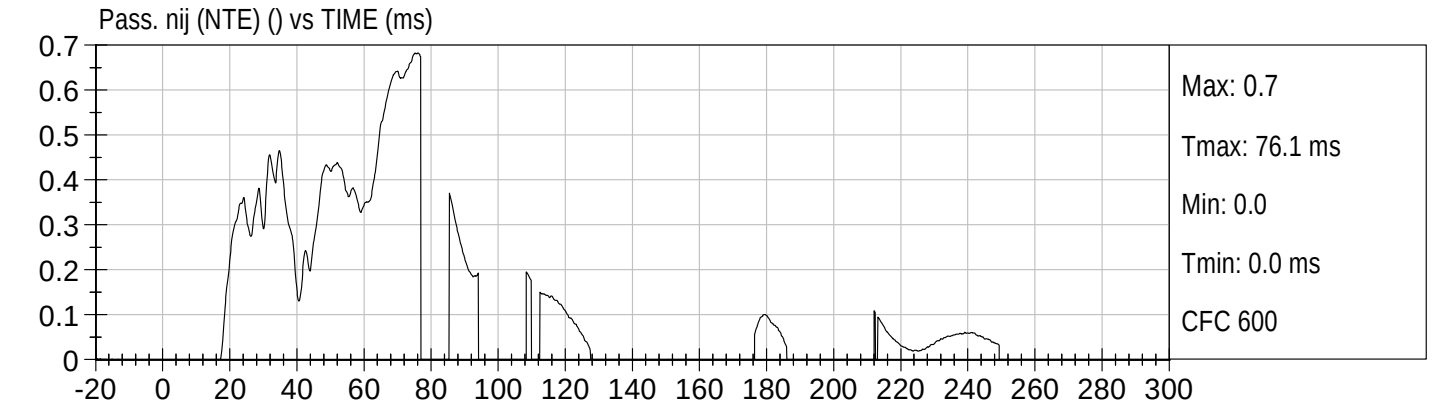
PASSENGER NECK MY (Nm) vs TIME (ms)

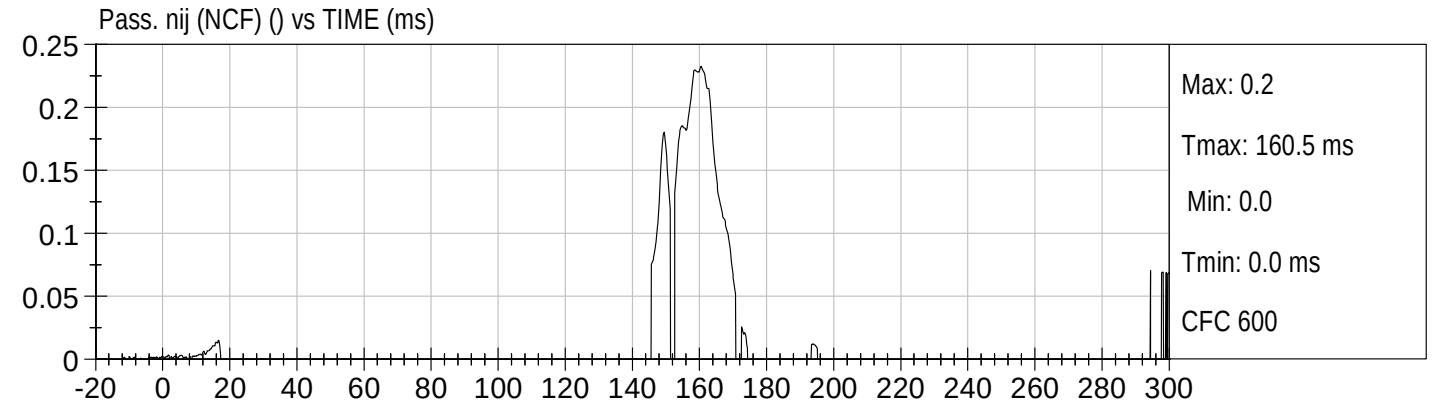


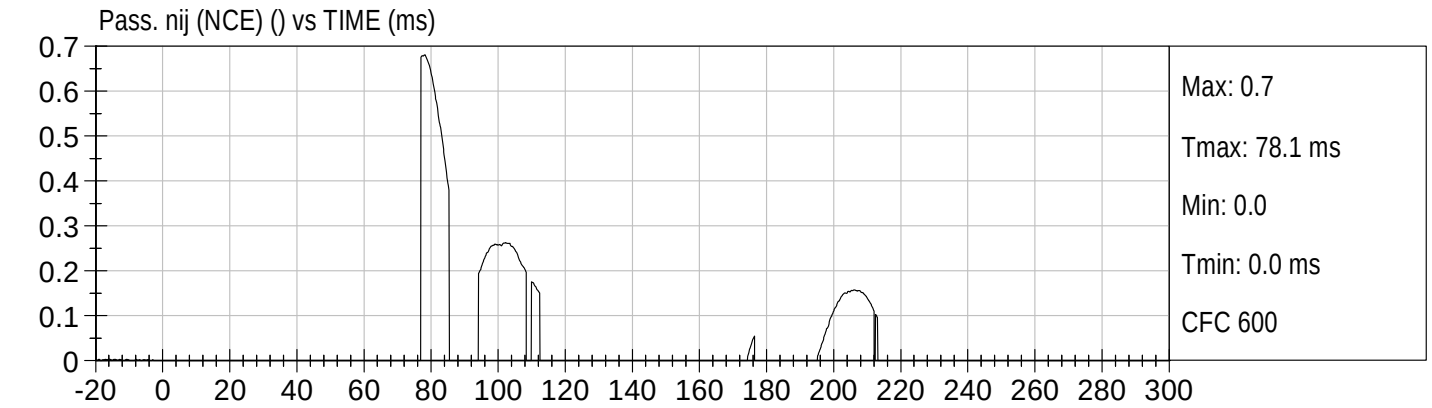
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)





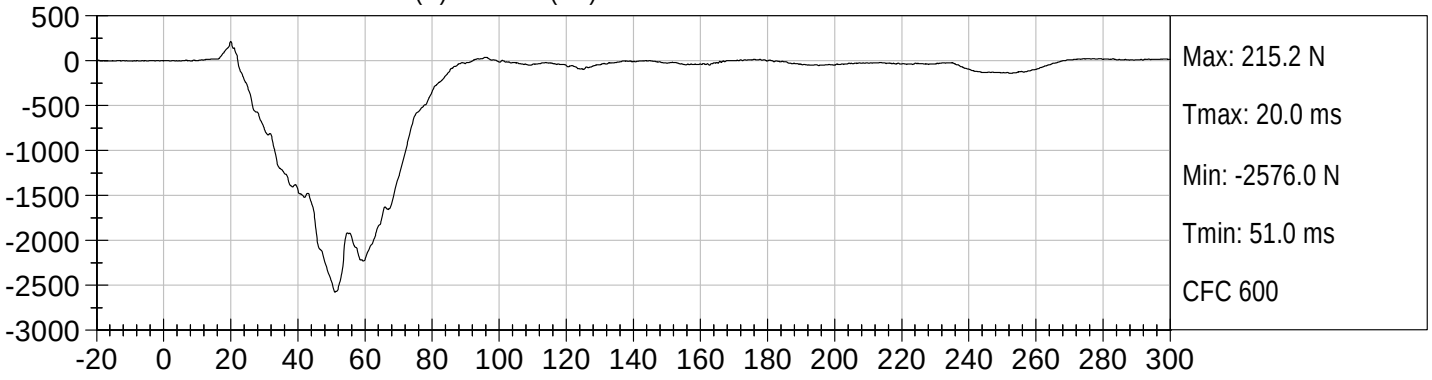




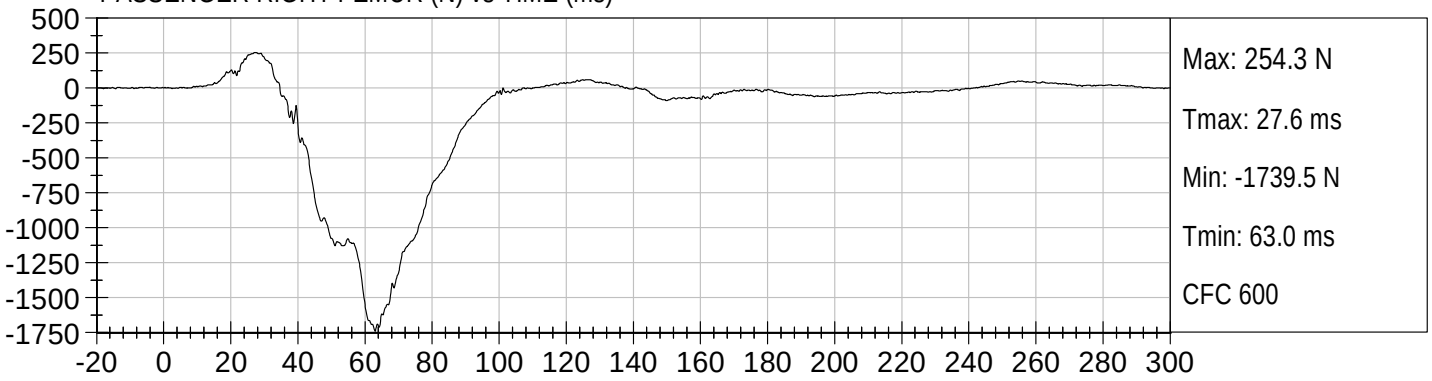
NCAP 35mph Frontal
2011 Infiniti M37 - MB5205

Test Date: 08/13/2010
Speed: 34.9 mph (56.2 km/h)

PASSENGER LEFT FEMUR (N) vs TIME (ms)



PASSENGER RIGHT FEMUR (N) vs TIME (ms)



APPENDIX C

DUMMY CALIBRATION DATA

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test ID:** D102471

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

Jessica Hall
Laboratory Technician

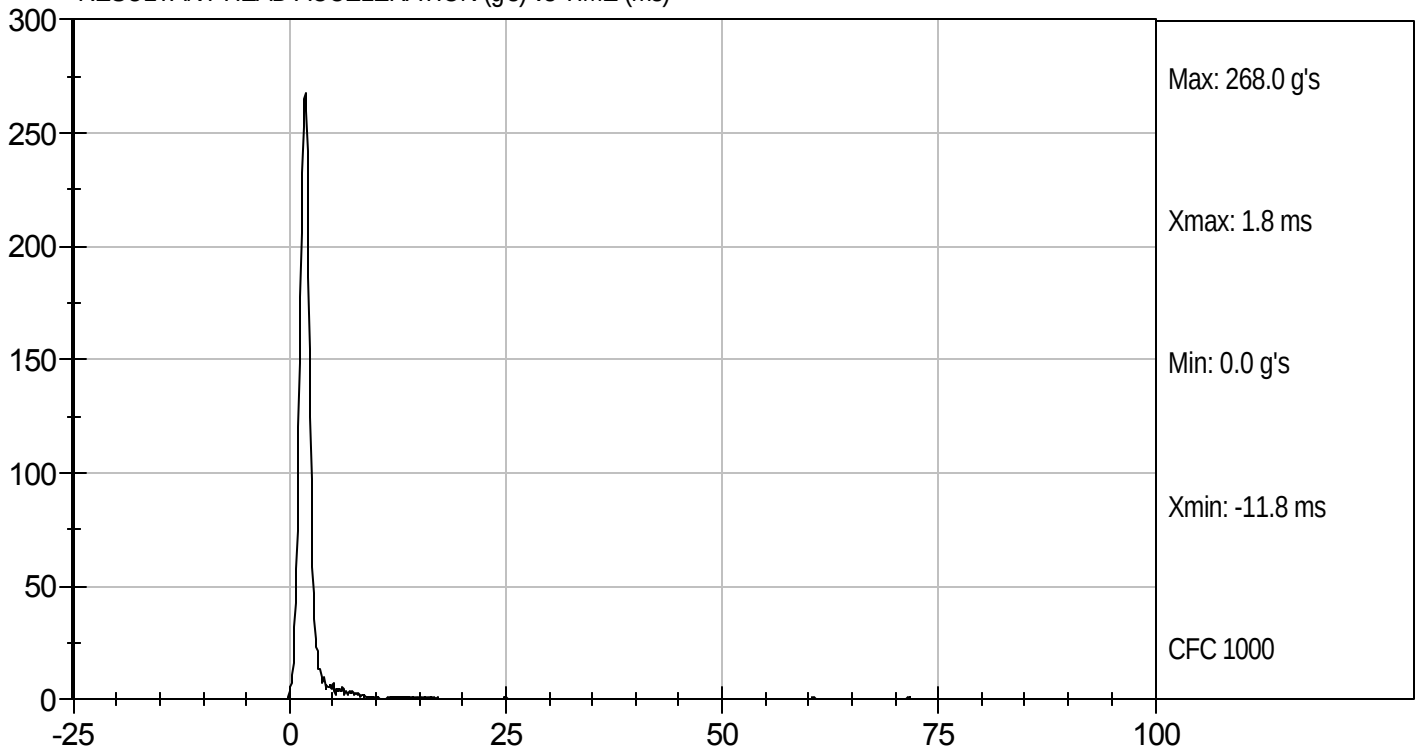
8/2/10
Test Date

David Winkelbauer
Approved By

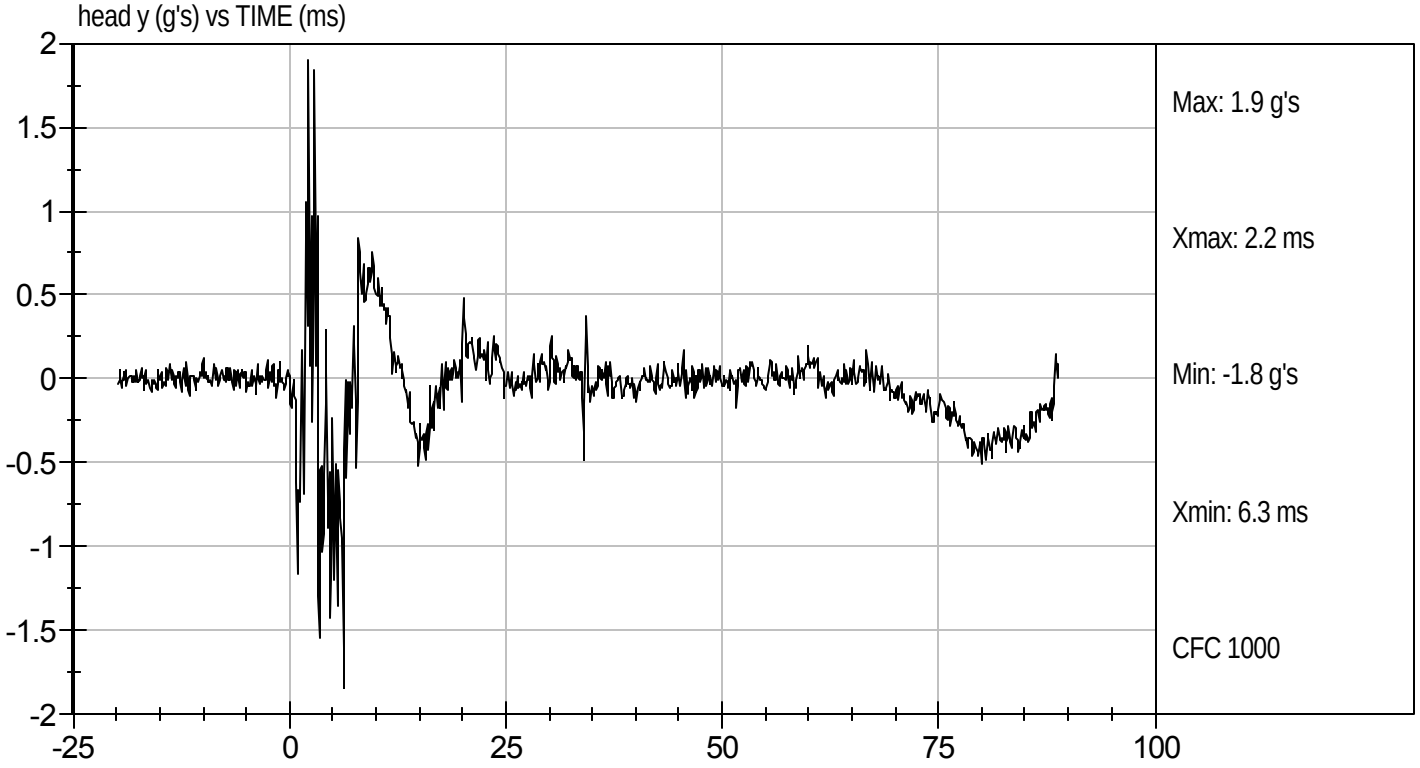
Test Desc: Head Drop
Component ID: D102471

Test Date: 8/2/10
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: 351 **Test I.D:** D102472

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

Jessica Hall
Laboratory Technician

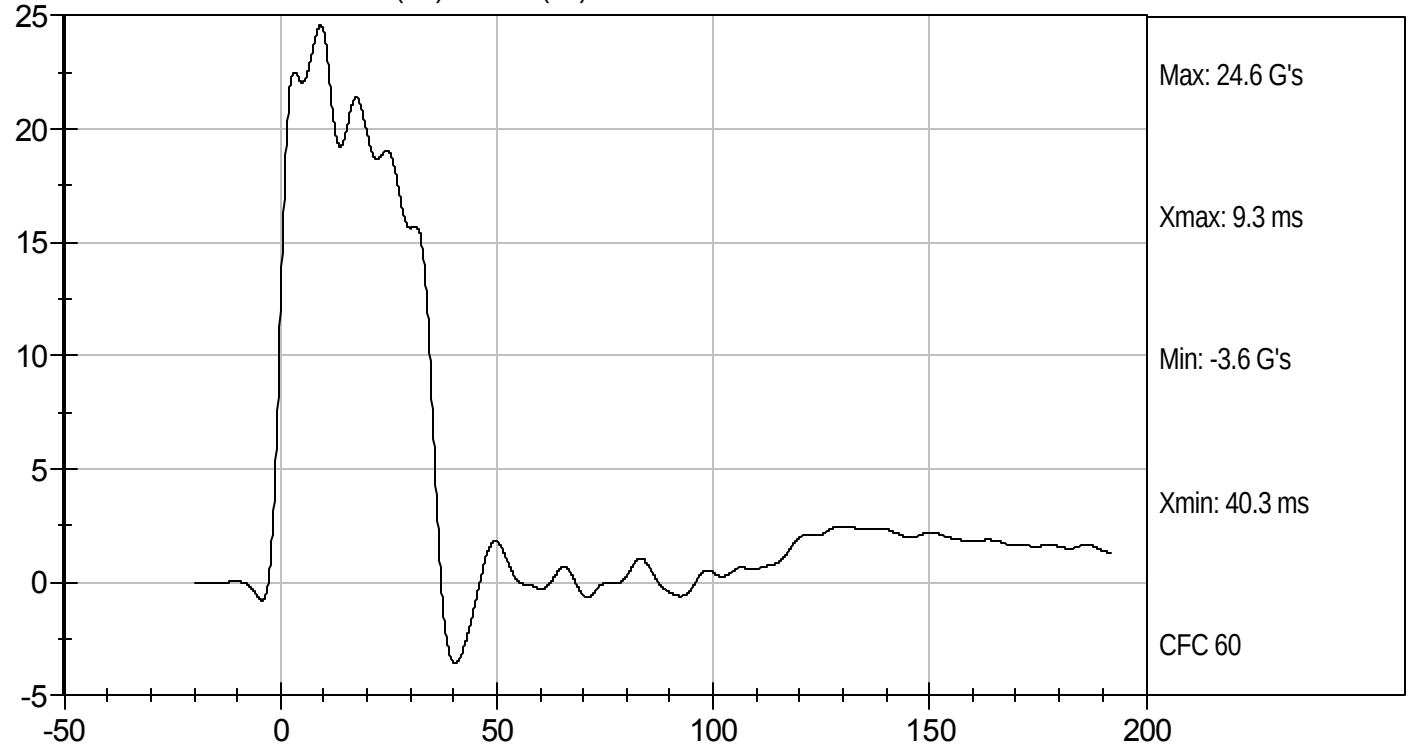
8/2/10
Test Date

David Winkelbauer
Approved By

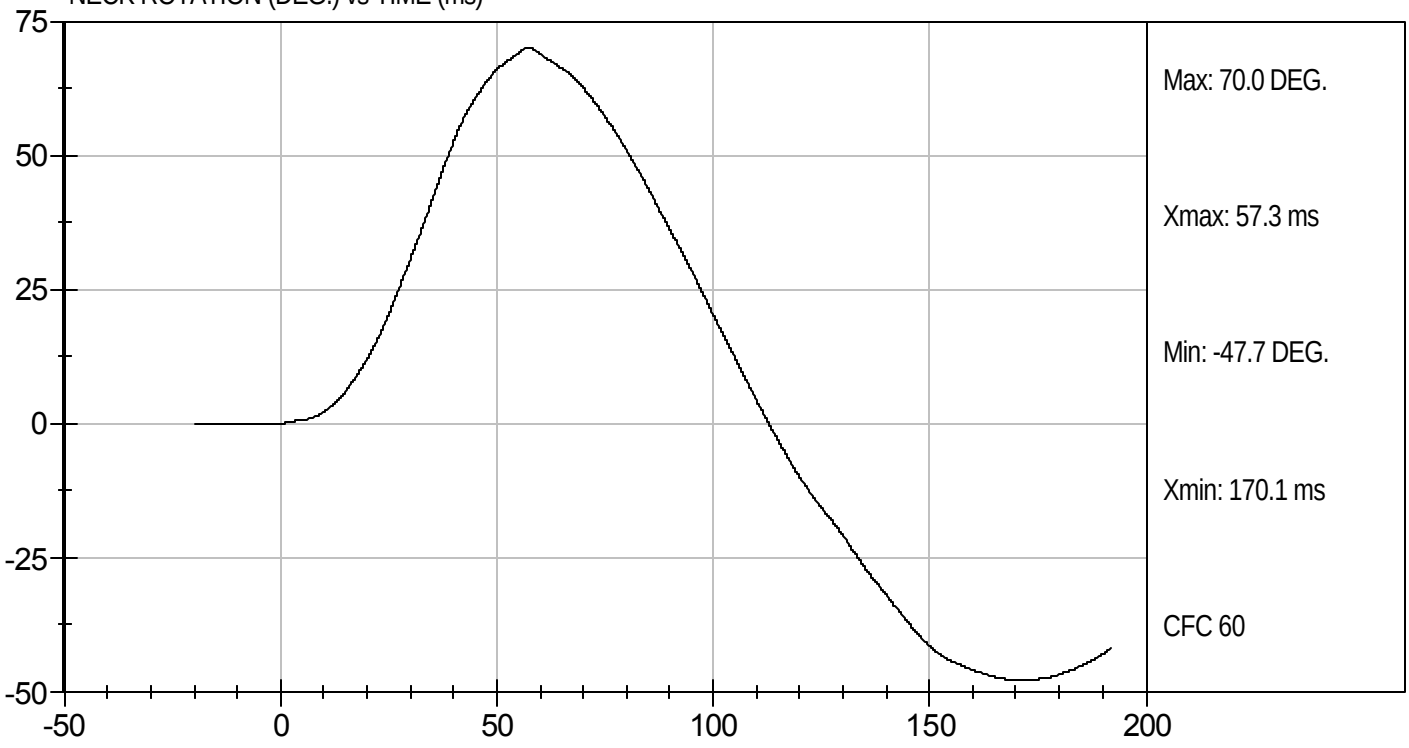
Test Desc: Neck Flexion
Component ID: D102472

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

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

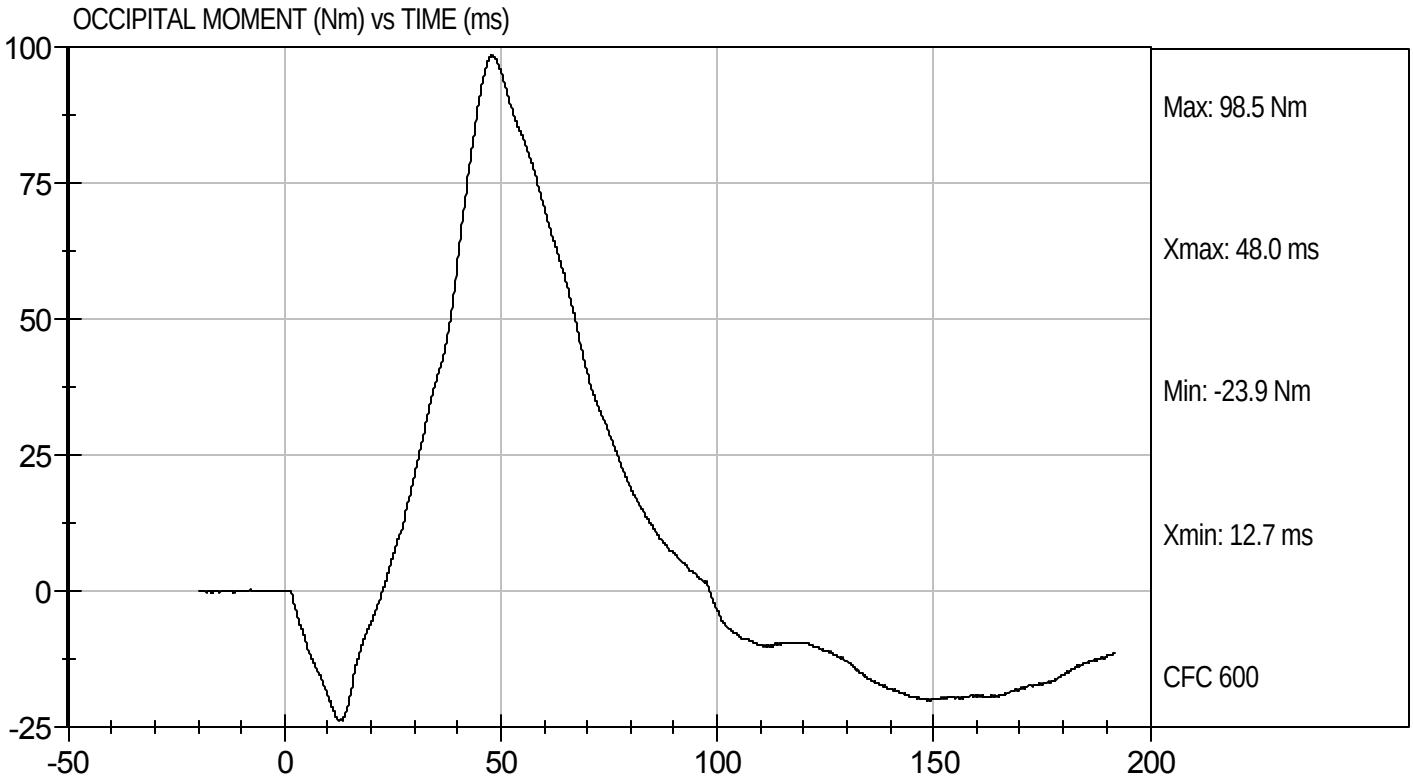


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Component ID: D102472

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



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102473

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

Jessica Hall
Laboratory Technician

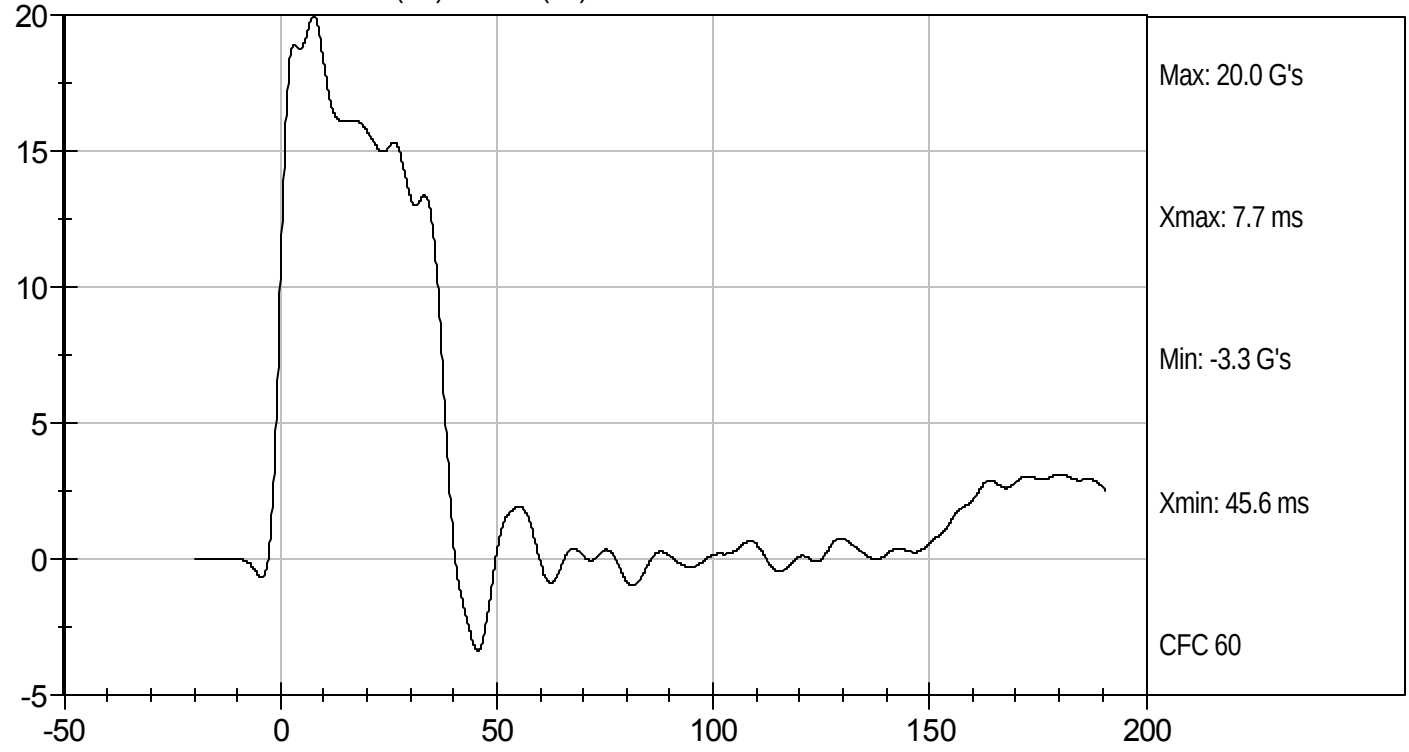
8/2/10
Test Date

David Winkelbauer
Approved By

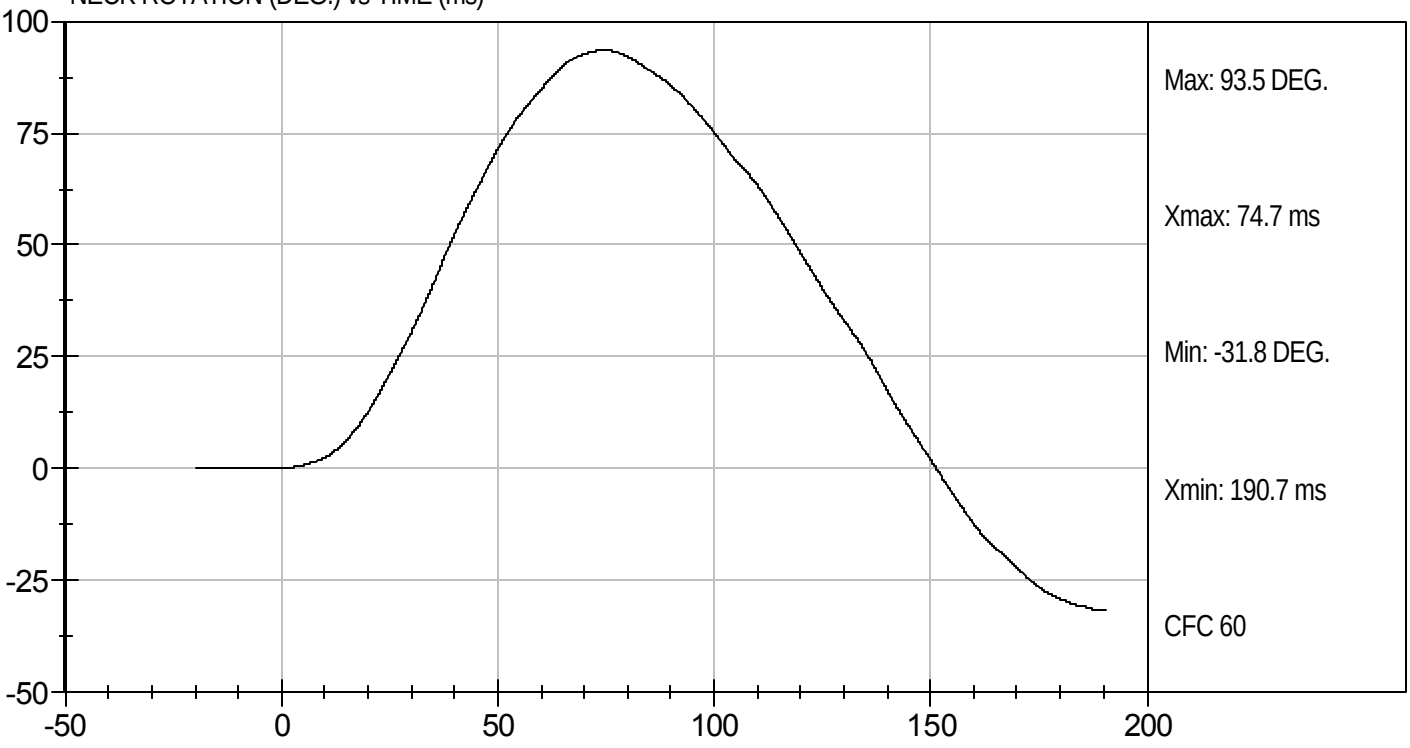
Test Desc: Neck Extension
Component ID: D102473

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

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

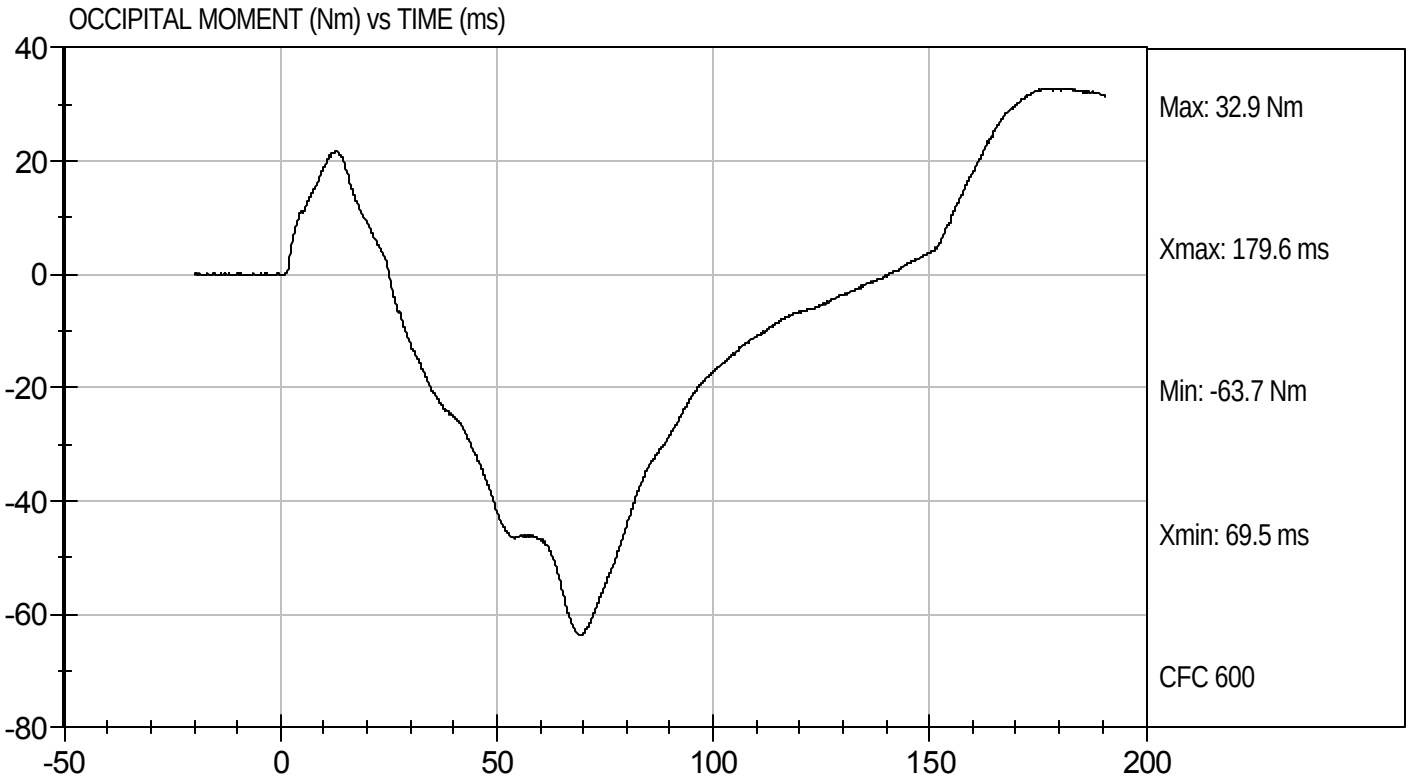


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D102473

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



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102474

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

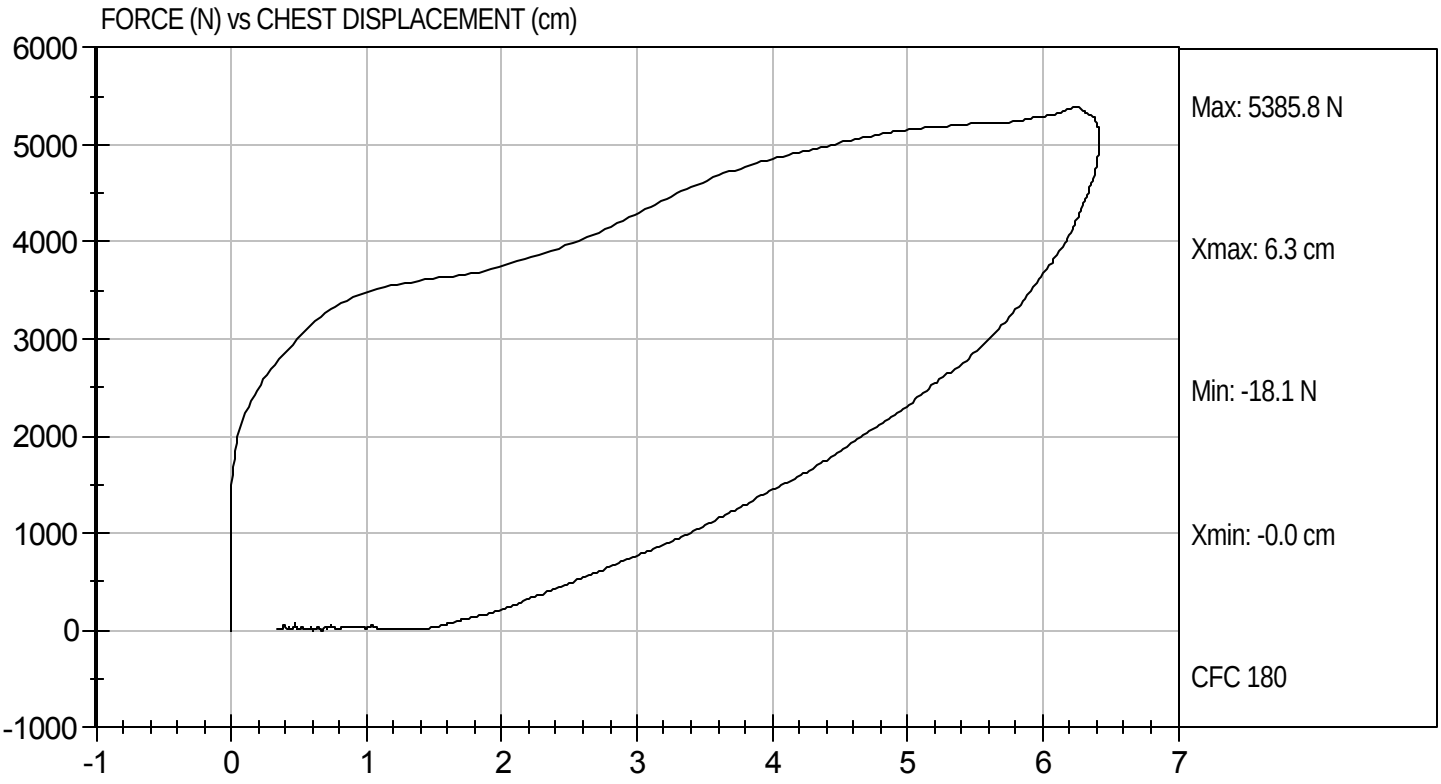
Jessica Hall
Laboratory Technician

7/30/10
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D102474

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



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102475

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

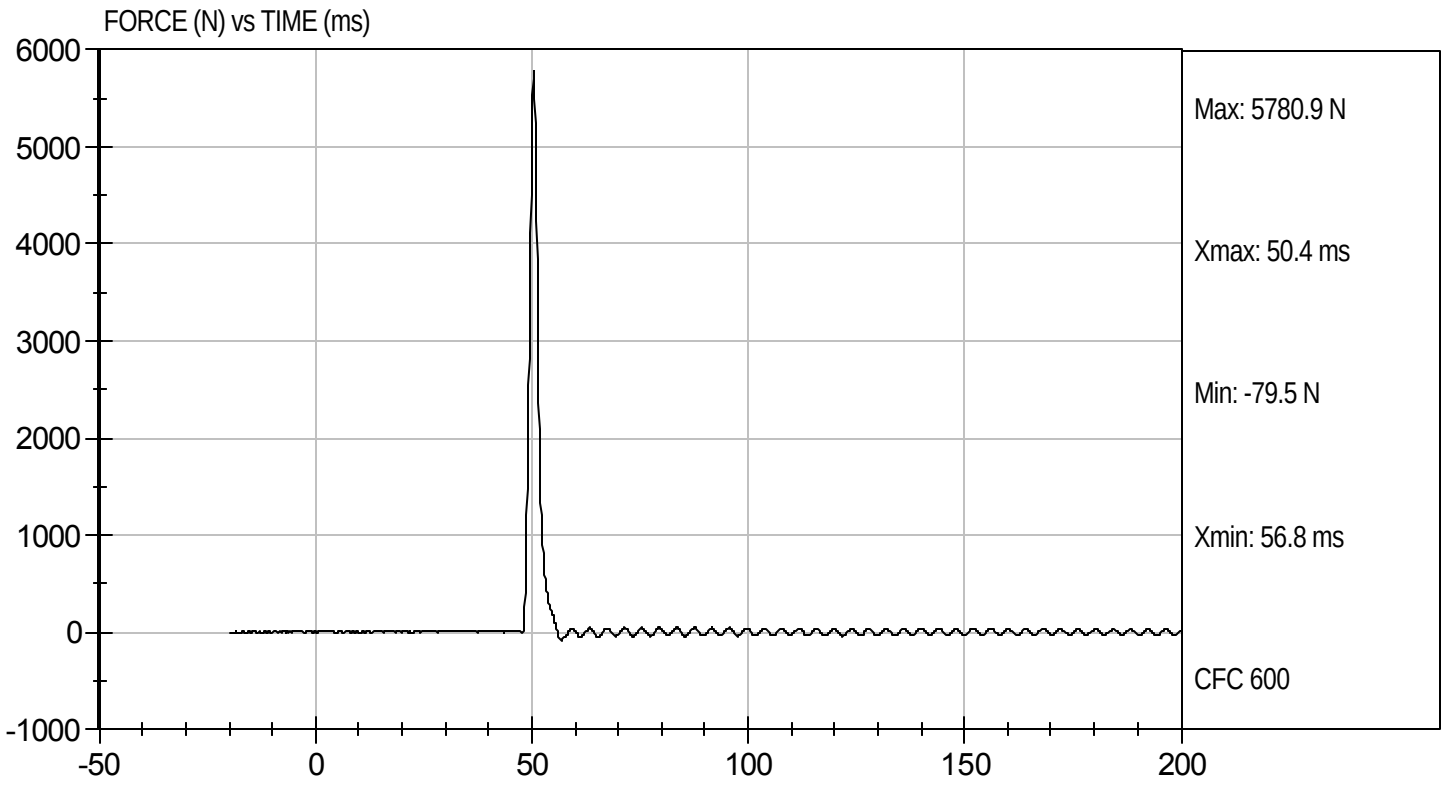
Jessica Gall
Laboratory Technician

8/2/10
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D102475

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



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102476

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

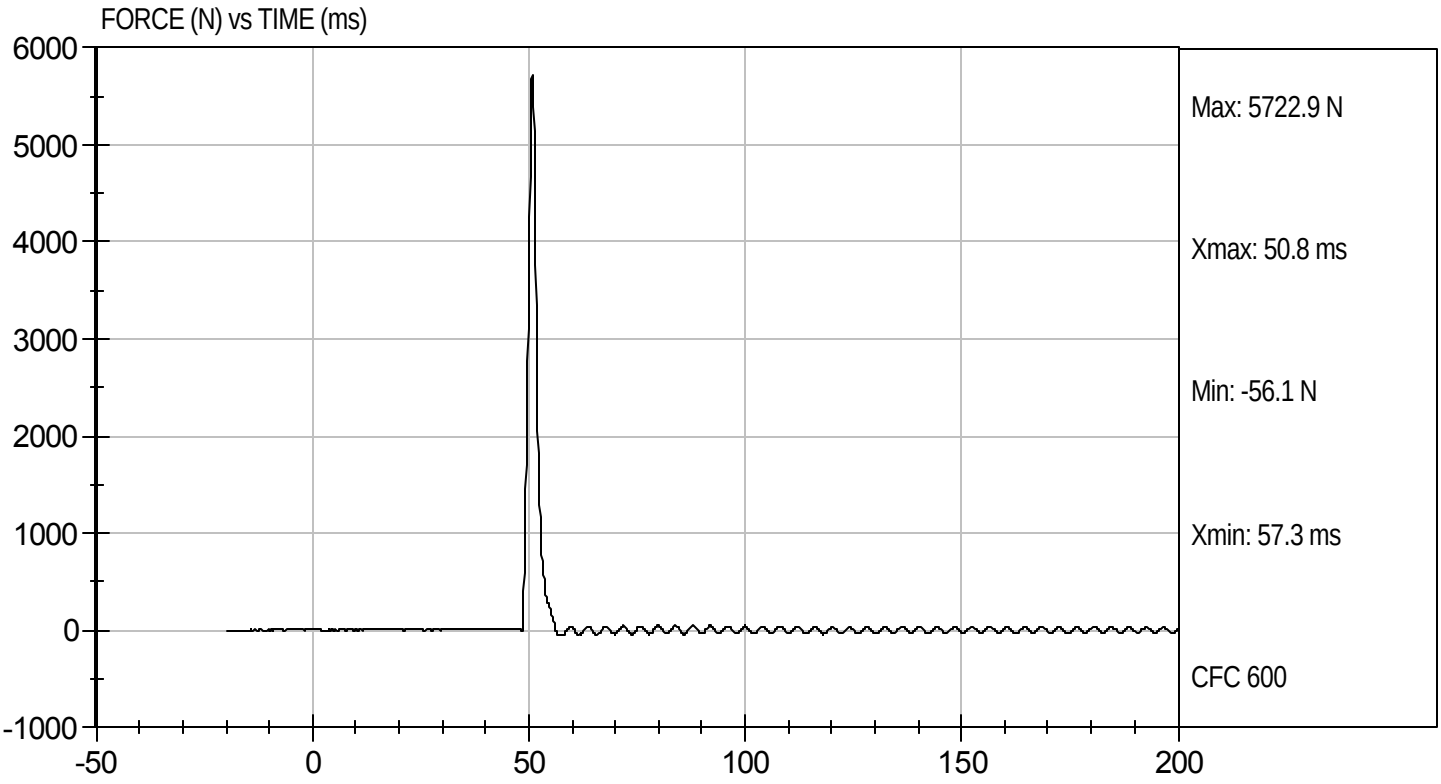
Jessica Hall
Laboratory Technician

8/2/10
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D102476

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



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102470

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

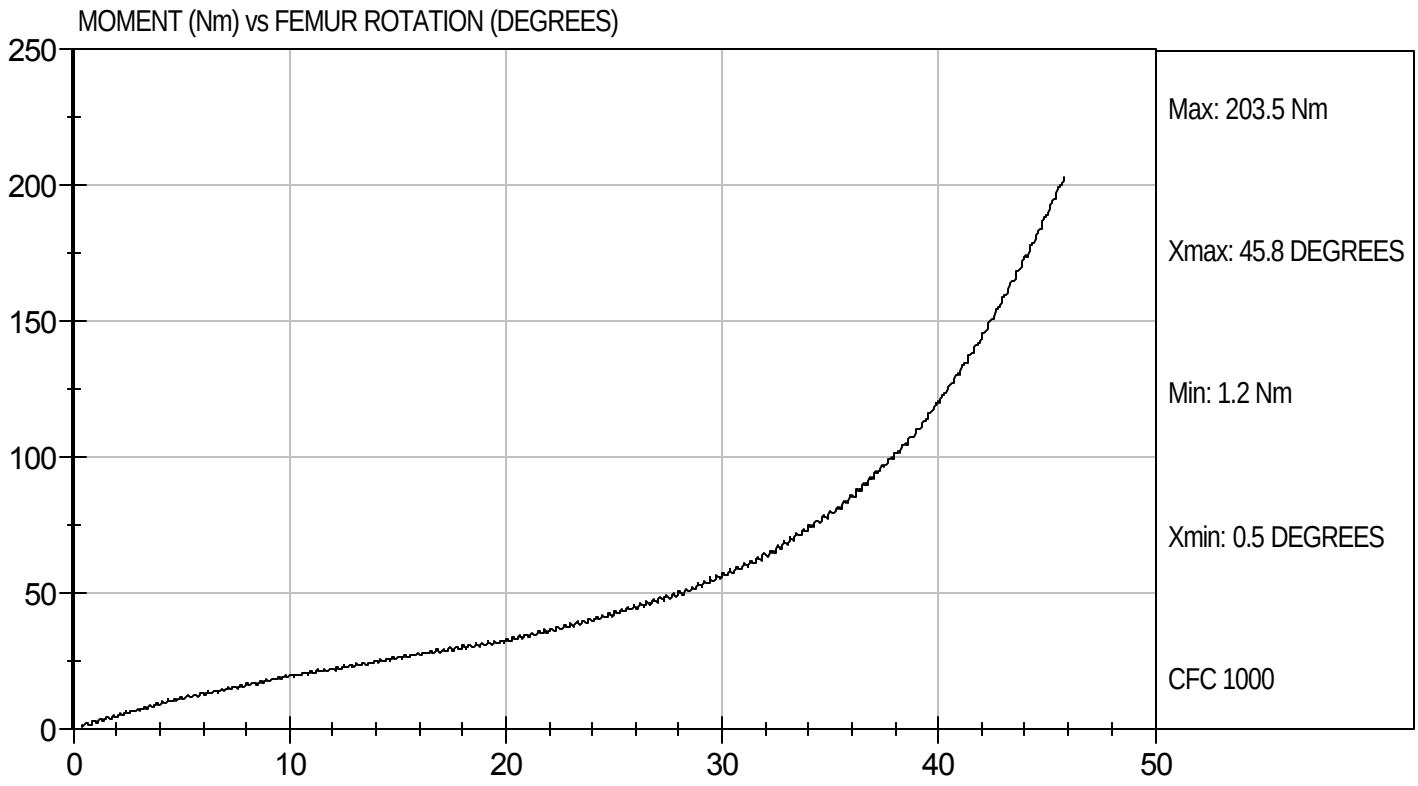
Jessica Hall
Laboratory Technician

8/2/10
Test Date

David Winkelbauer
Approved By

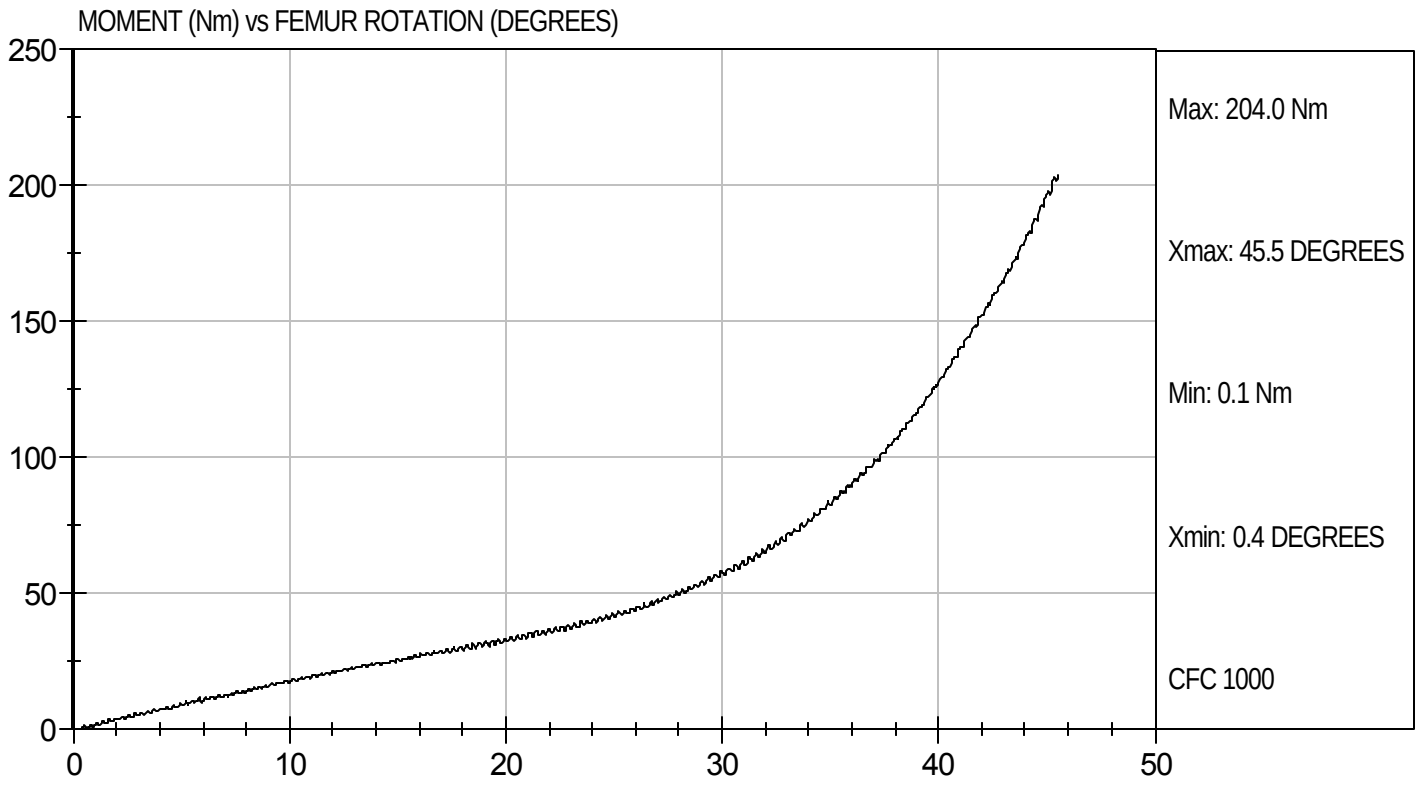
Test Desc: Hip Femur Flexion
Component ID: D102479

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



Test Desc: Hip Femur Flexion
Component ID: D102470

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



MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test ID:** D102591

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Peak Resultant Acceleration	G's	225 - 275	271	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	3.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

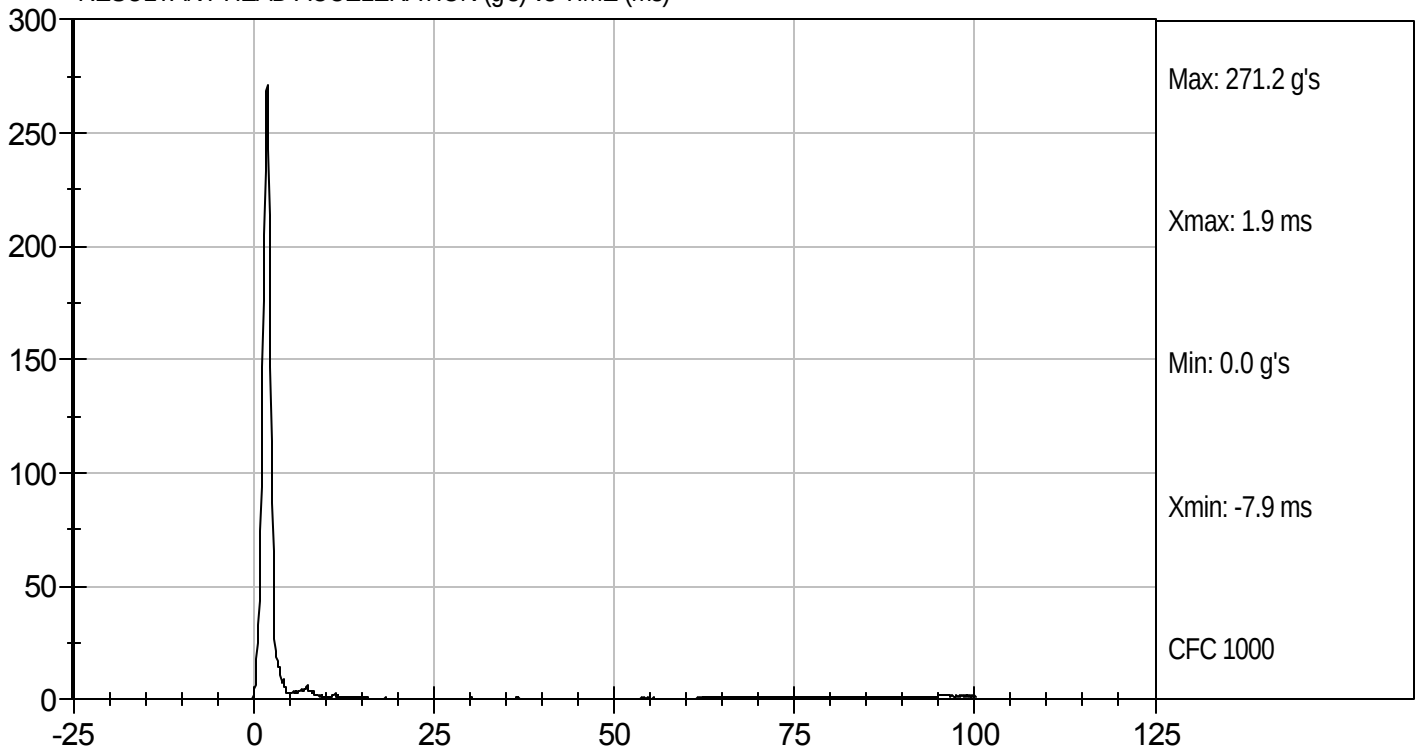
8/13/10
Test Date

David Winkelbauer
Approved By

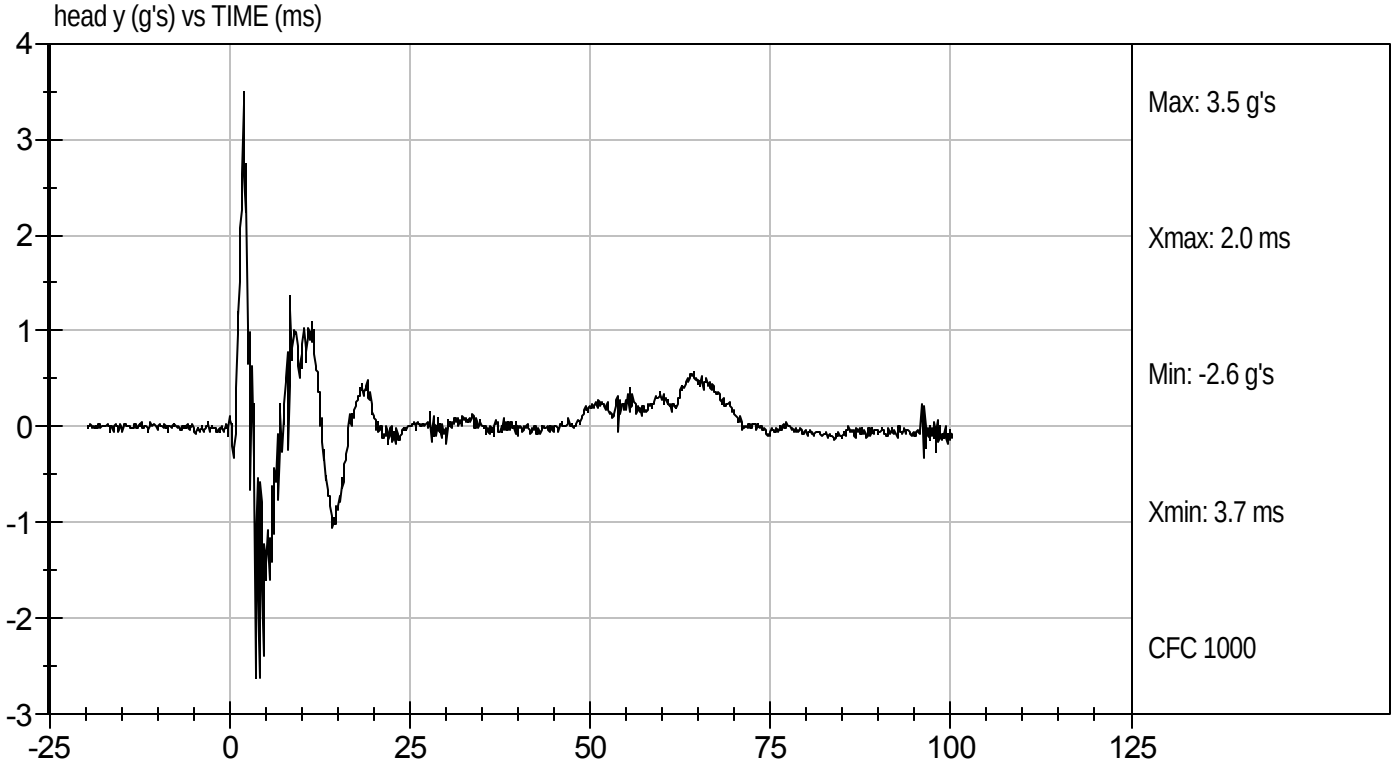
Test Desc: Head Drop
Component ID: D102591

Test Date: 8/13/10
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: 351 **Test I.D:** D102592

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	24.83	Pass
	20 ms	G's	17.60 to 22.60	19.25	Pass
	30 ms	G's	12.50 to 18.50	14.10	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.04	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	36.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	71.9	Pass
	Time	ms	57.0 to 64.0	57.8	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	113.2	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	94.8	Pass
	Time	ms	47.0 to 58.0	49.6	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	101.2	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

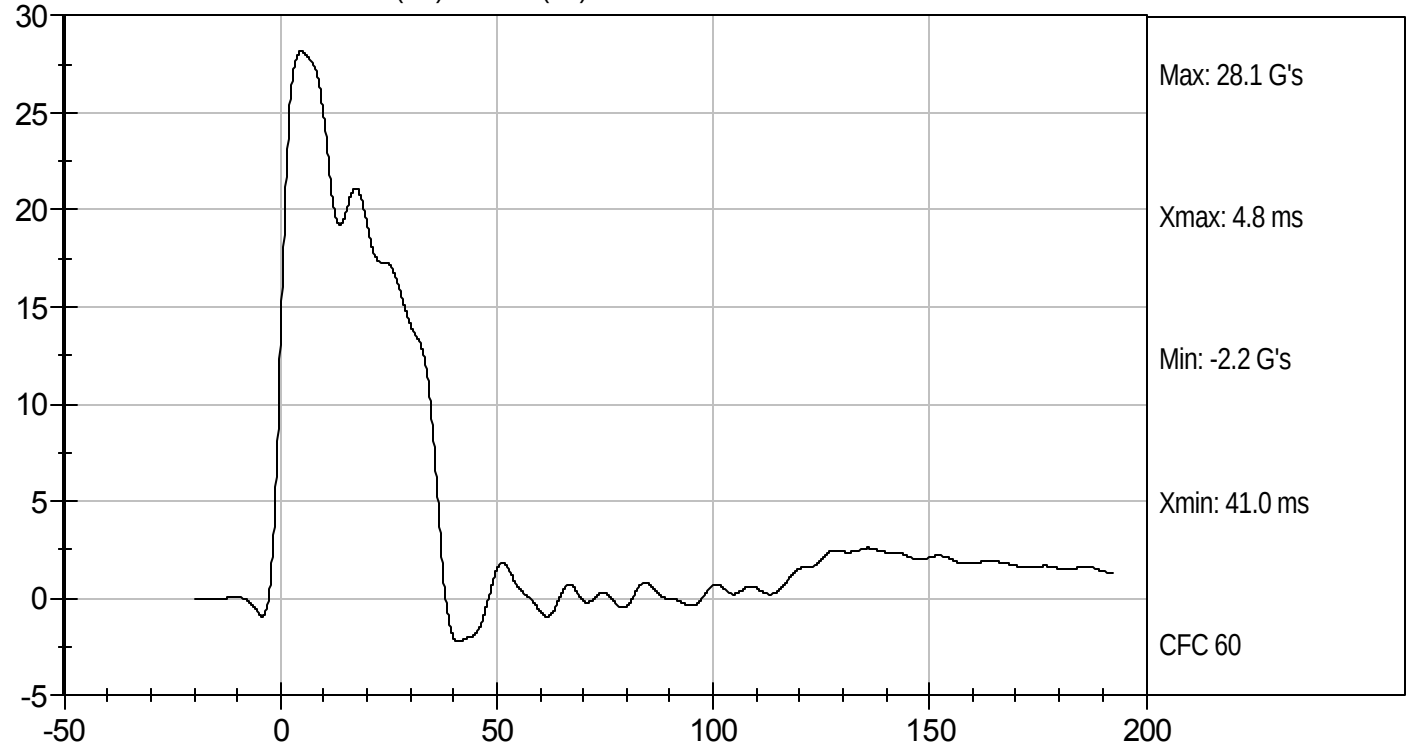
8/16/10
Test Date

David Winkelbauer
Approved By

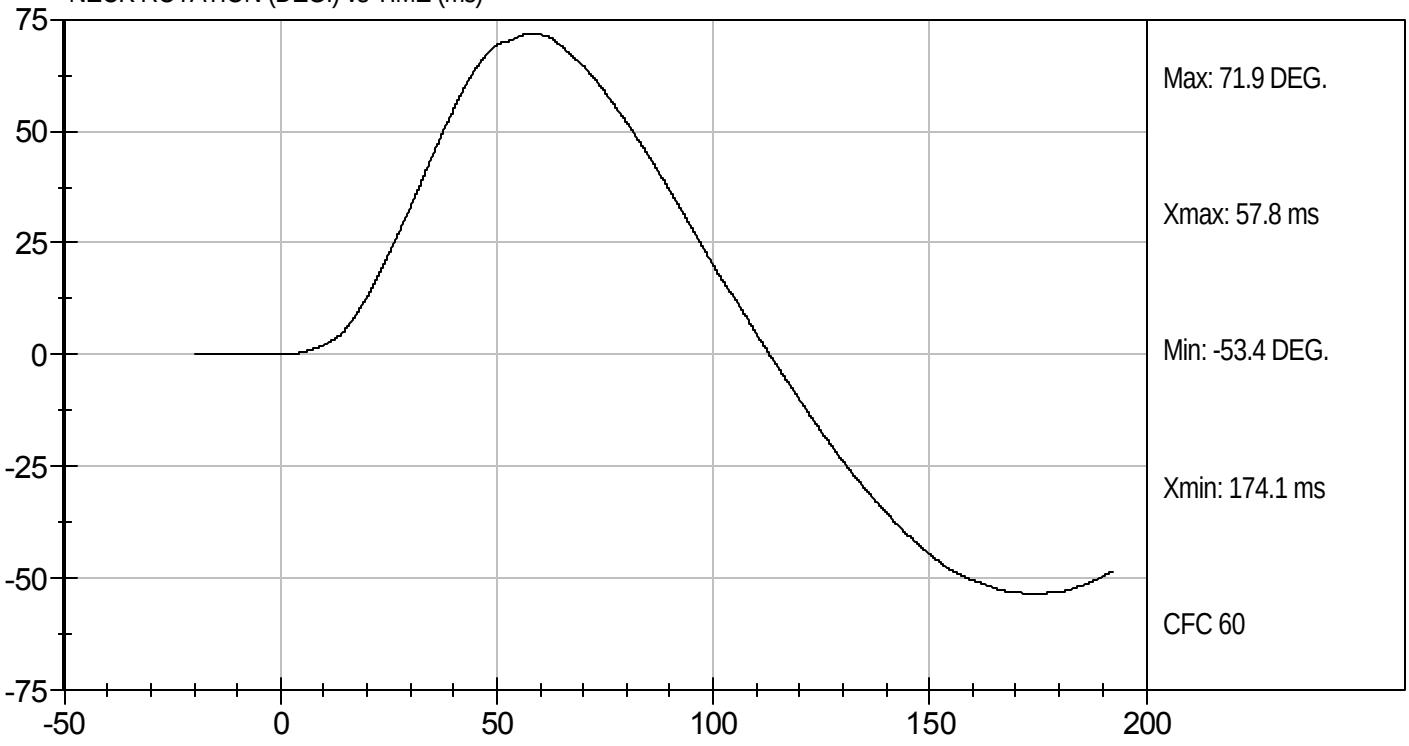
Test Desc: Neck Flexion
Component ID: D102592

Test Date: 8/16/10
Velocity: 23.1 ft/s, 7.04 m/s

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

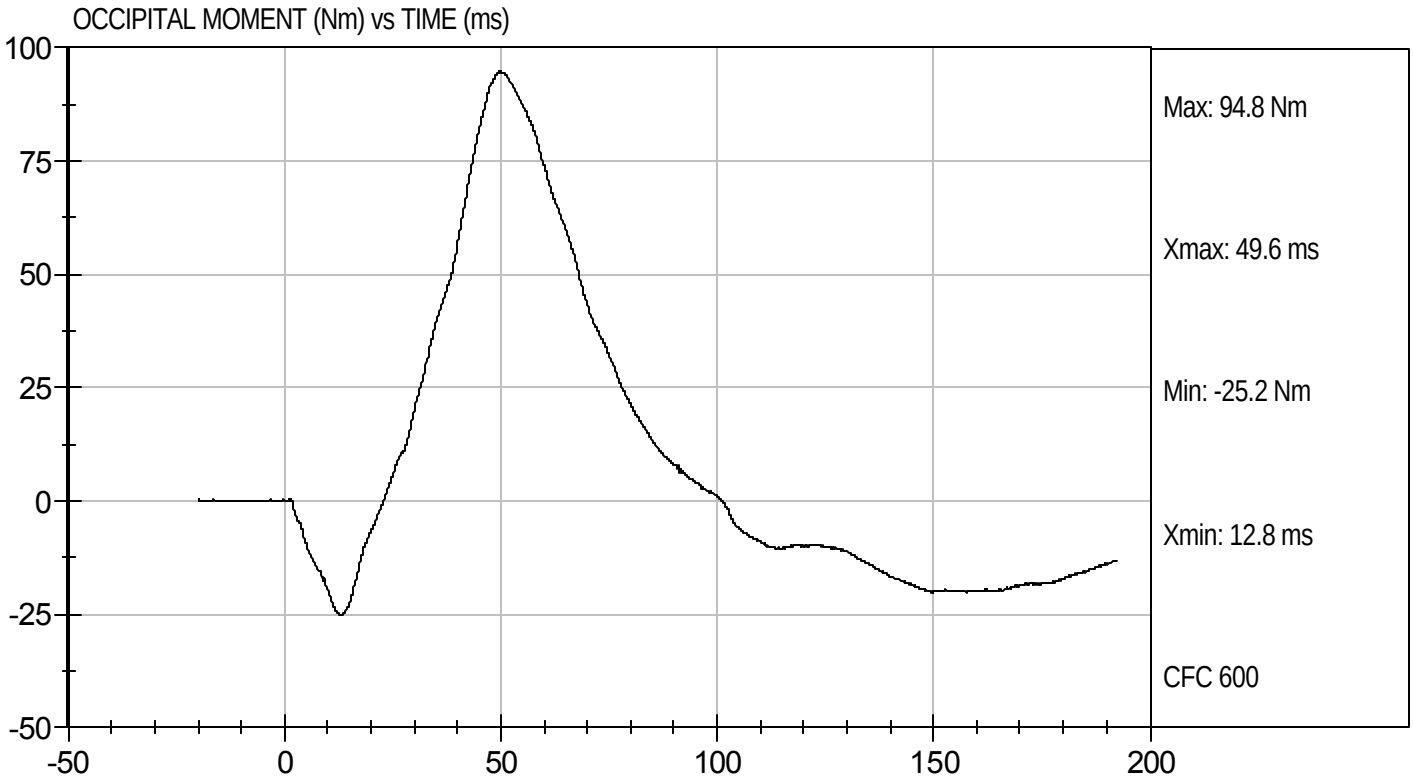


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Component ID: D102592

Test Date: 8/16/10
Velocity: 23.1 ft/s, 7.04 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102593

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.04	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	17.71	Pass
	20 ms	G's	14.00 to 19.00	15.46	Pass
	30 ms	G's	11.00 to 16.00	12.58	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	13.13	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	39.3	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	93.5	Pass
	Time	ms	72.0 to 82.0	76.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	154.0	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.9	Pass
	Time	ms	65.0 to 79.0	70.4	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	141.8	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

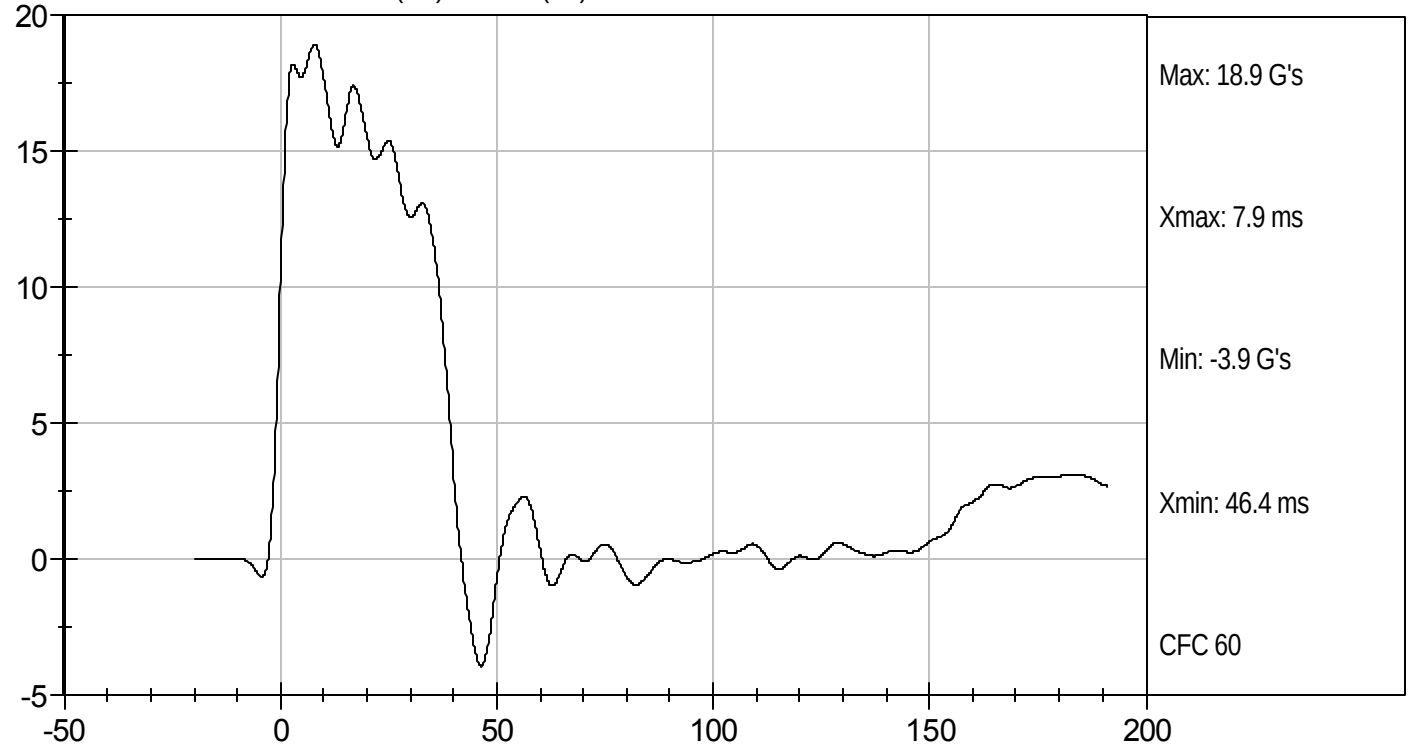
8/16/10
Test Date

David Winkelbauer
Approved By

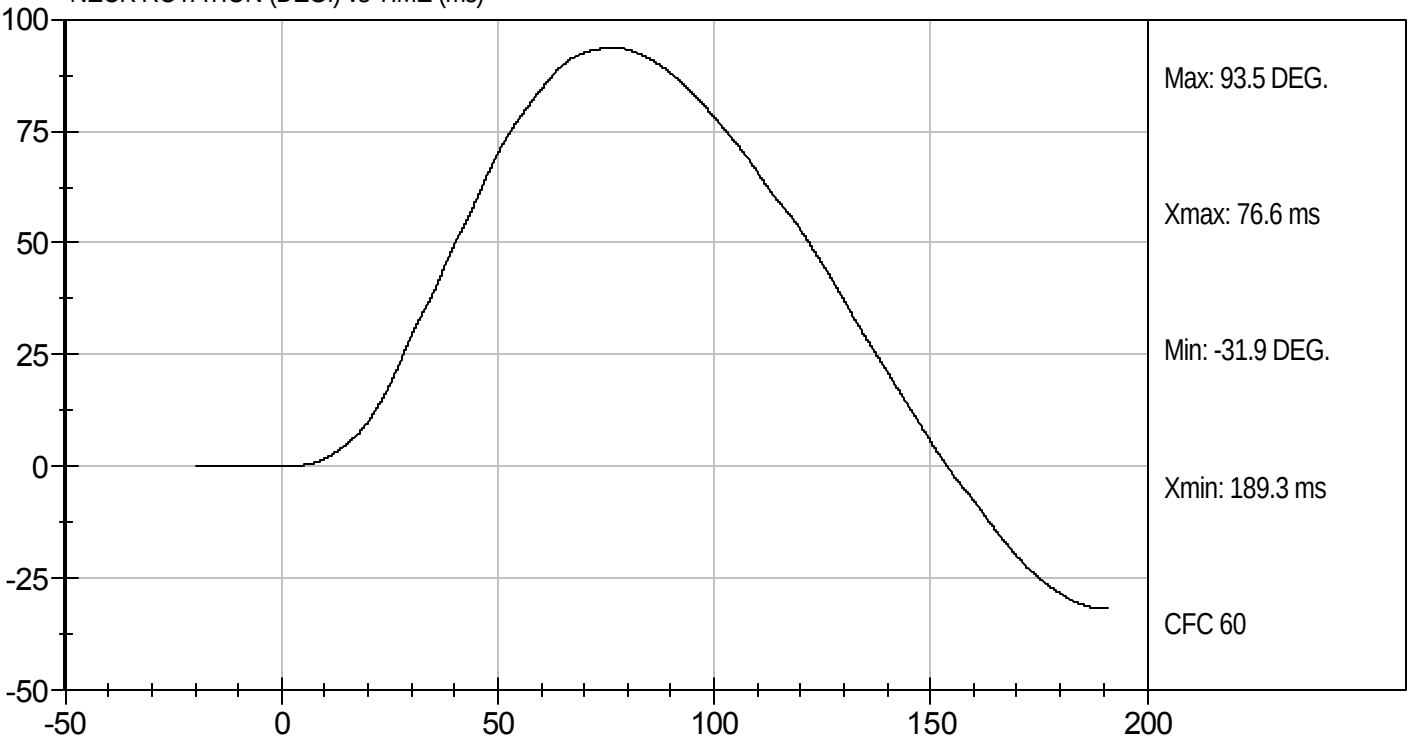
Test Desc: Neck Extension
Component ID: D102593

Test Date: 8/16/10
Velocity: 19.8 ft/s, 6.04 m/s

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

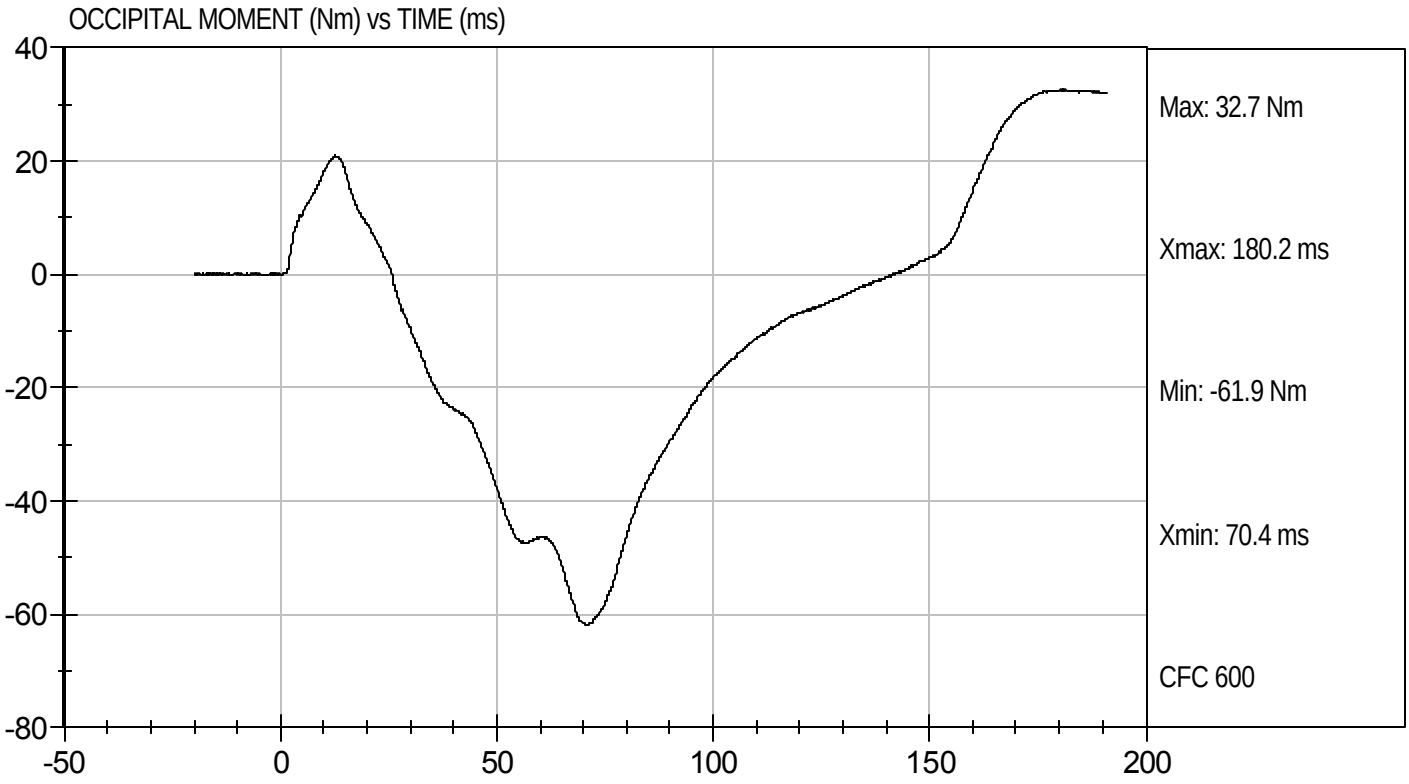


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D102593

Test Date: 8/16/10
Velocity: 19.8 ft/s, 6.04 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102594

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	50	Pass
Probe Velocity	m/s	6.58 to 6.82	6.60	Pass
Peak Probe Force	N	5159 to 5893	5,321	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.44	Pass
Internal Hysteresis	%	69 to 85	71	Pass
		Overall Test Results		Pass

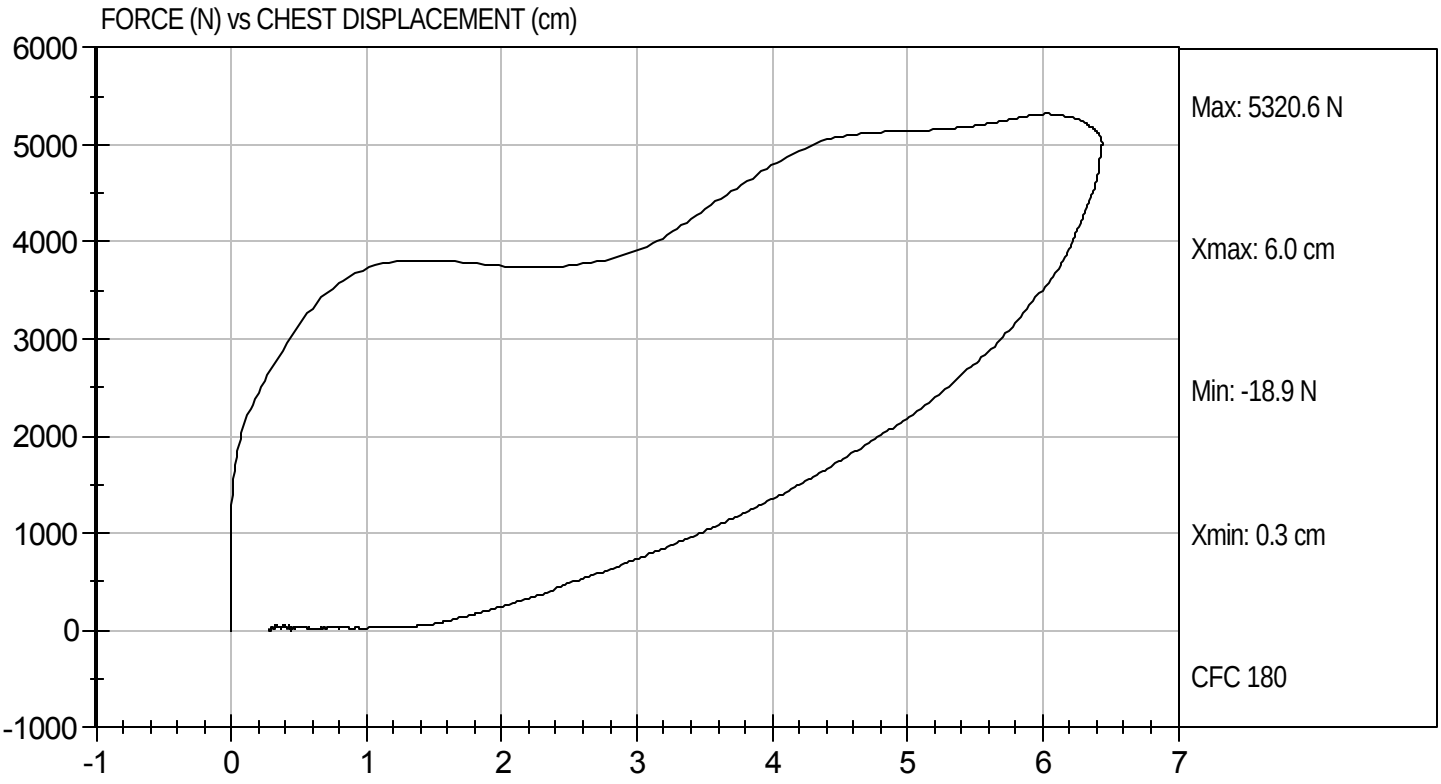
Jessica Hall
Laboratory Technician

8/13/10
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D102594

Test Date: 8/13/10
Velocity: 21.65 ft/s, 6.60 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102595

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,441	Pass
		Overall Test Results		Pass

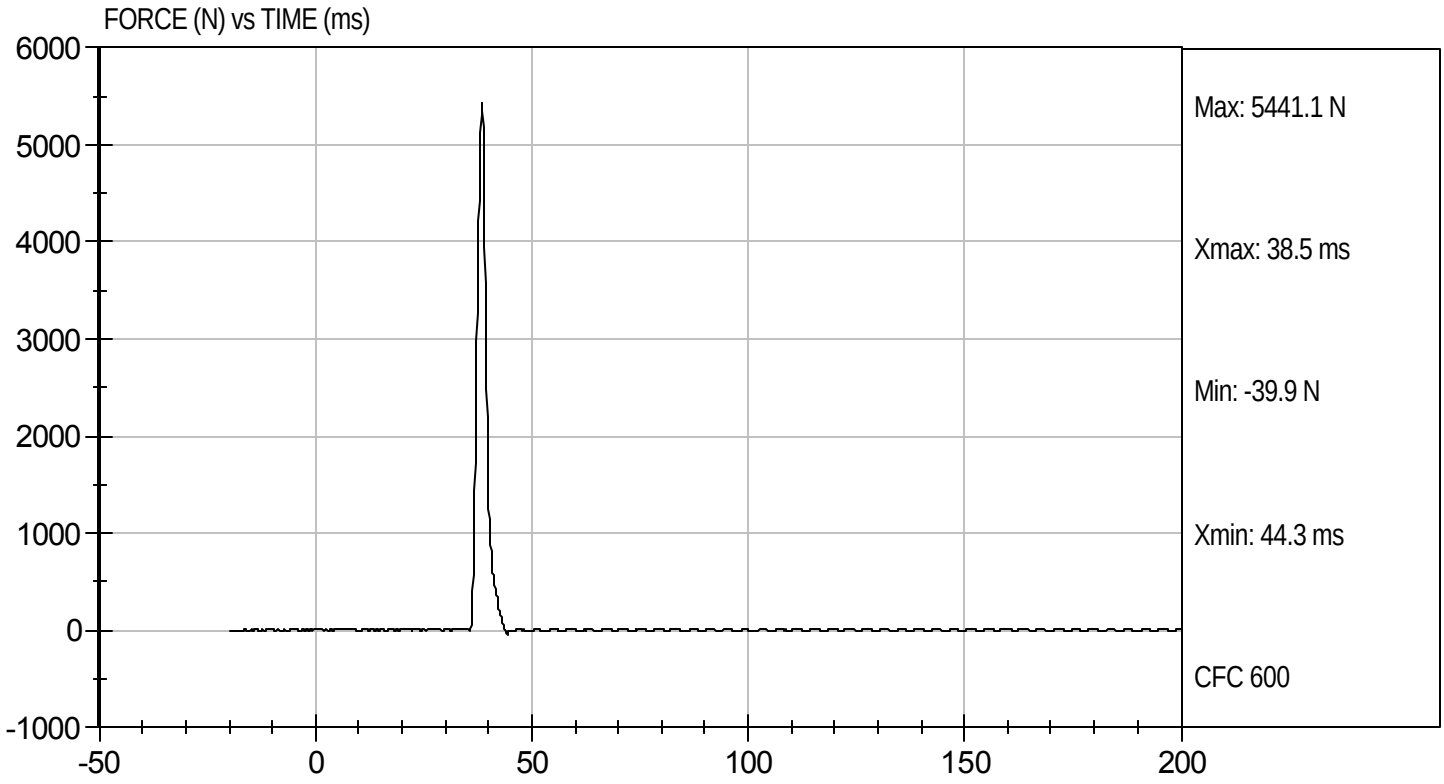
Jessica Hall
Laboratory Technician

8/16/10
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D102595

Test Date: 8/16/10
Velocity: 6.88 ft/s, 2.10 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102596

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5,666	Pass
		Overall Test Results		Pass

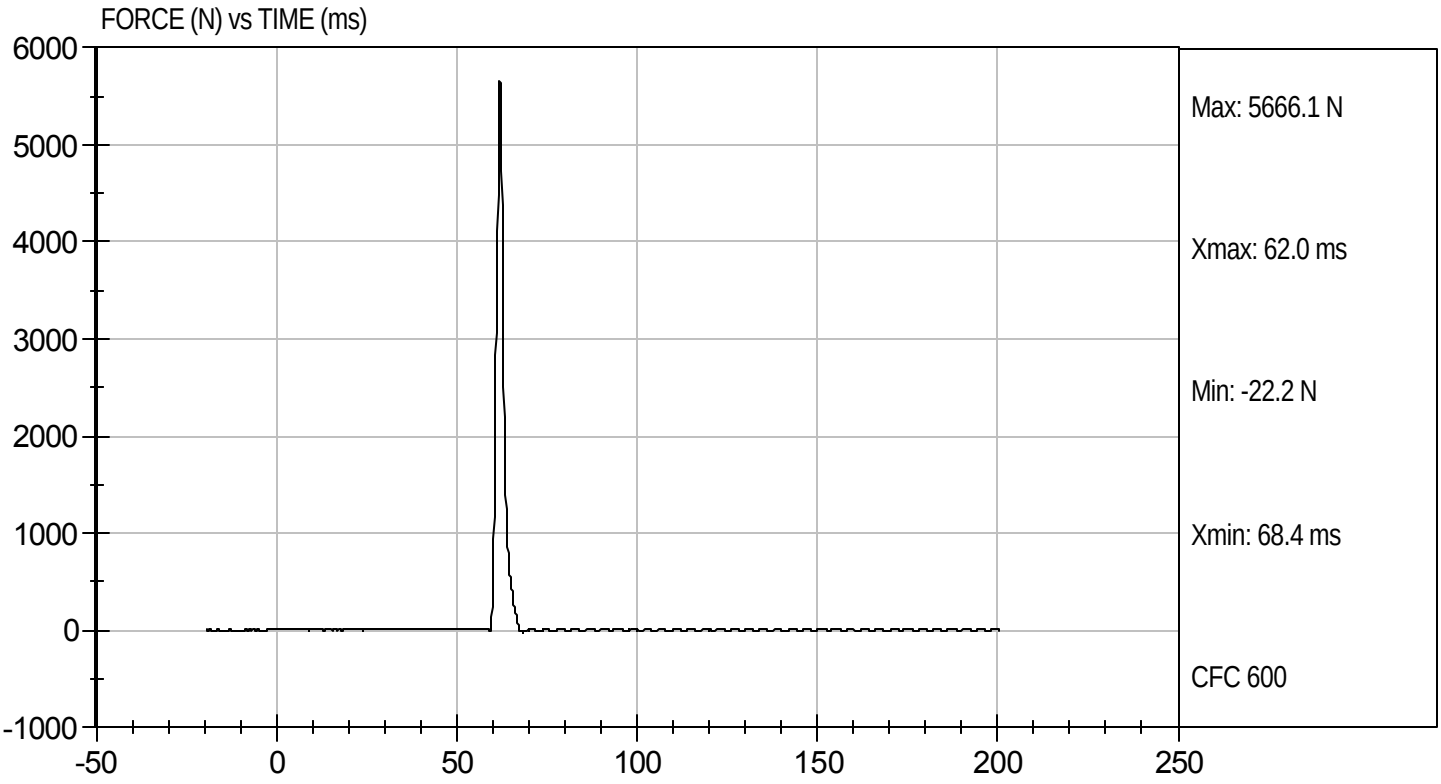
Jessica Gall
Laboratory Technician

8/16/10
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D102596

Test Date: 8/16/10
Velocity: 6.91 ft/s, 2.11 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D102590

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	47	47	Pass
Rotation Rate	deg/s	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	58.6	54.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	45	46	Pass
		Overall Test Results			Pass

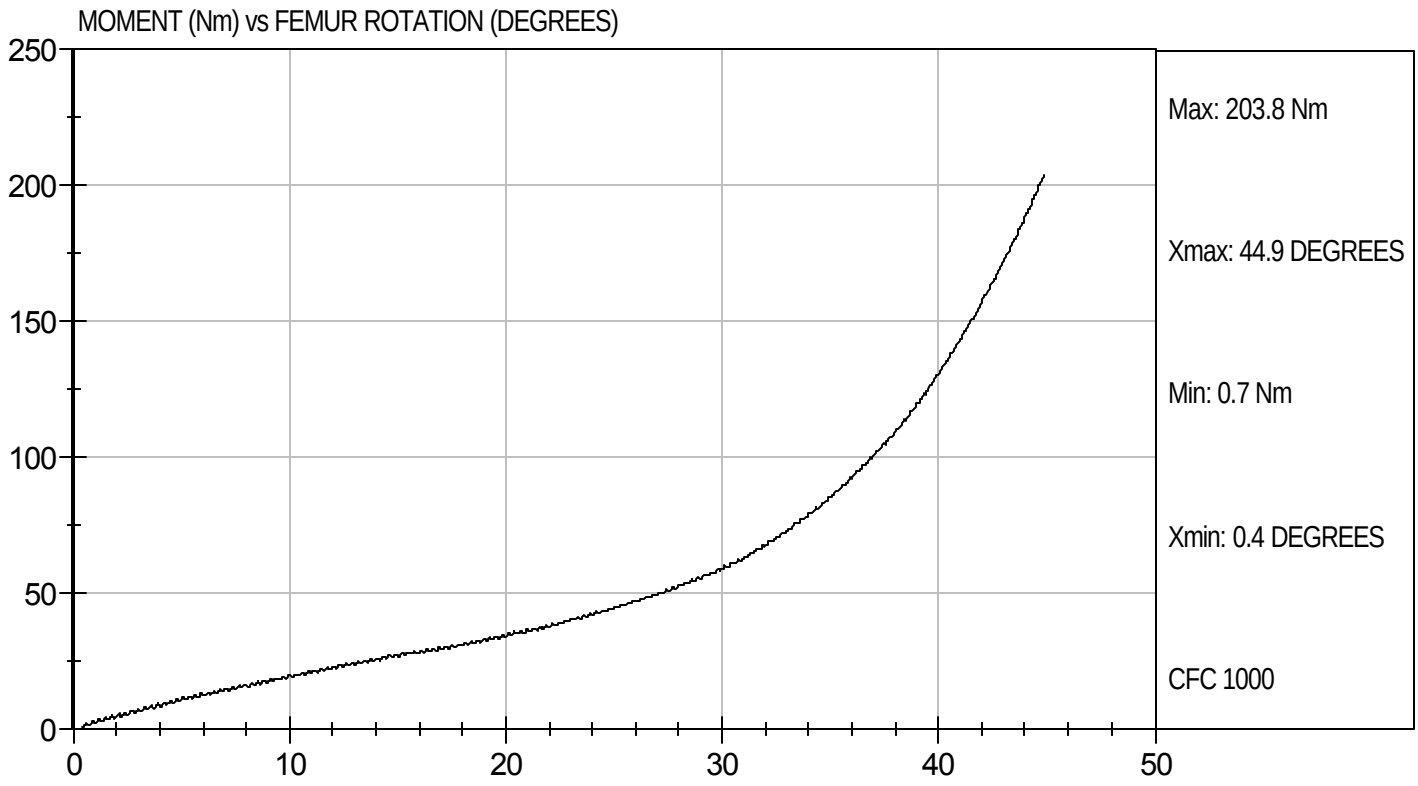
Jessica Hall
Laboratory Technician

8/16/10
Test Date

David Winkelbauer
Approved By

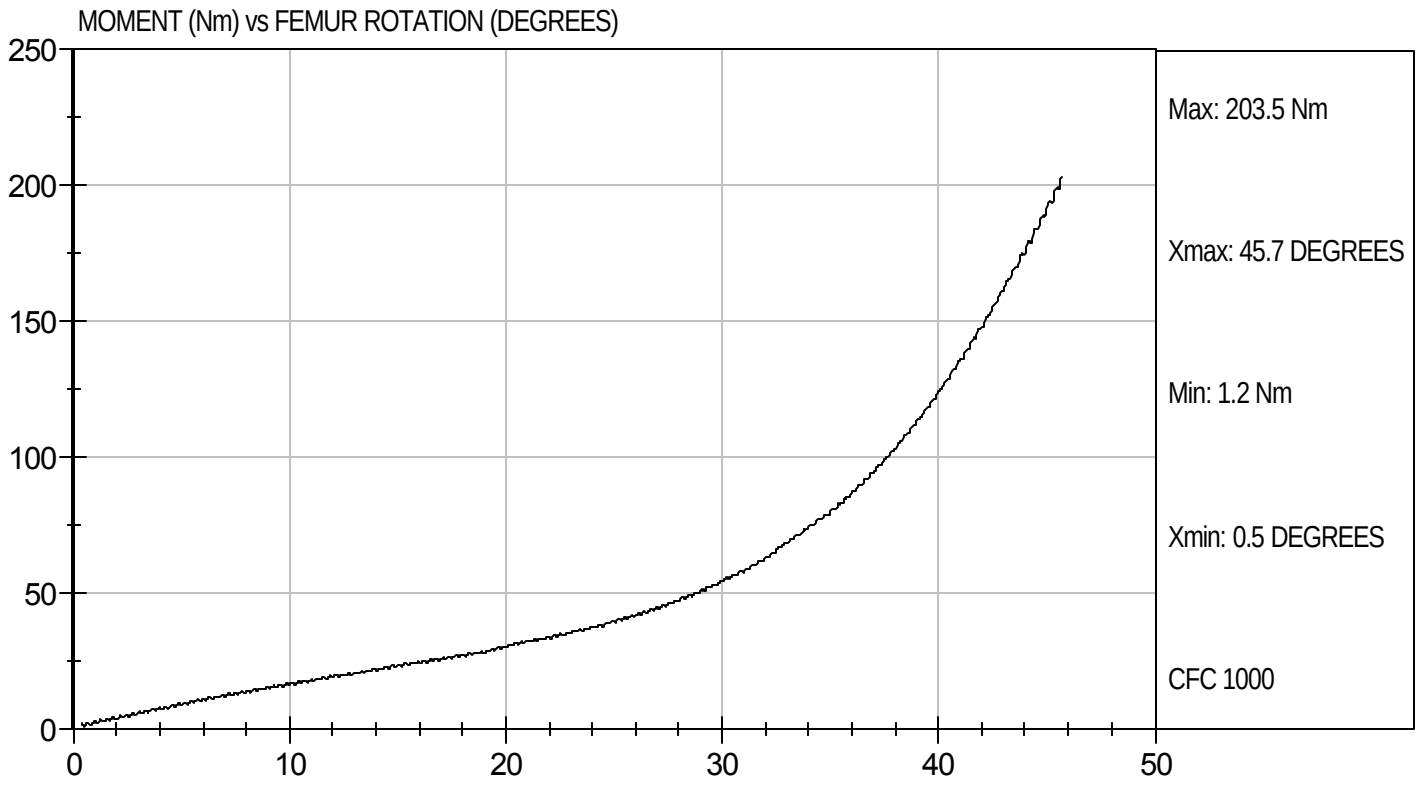
Test Desc: Hip Femur Flexion
Component ID: D102599

Test Date: 8/16/10
Velocity: 0 ft/s, 0.00 m/s



Test Desc: Hip Femur Flexion
Component ID: D102590

Test Date: 8/16/10
Velocity: 0 ft/s, 0.00 m/s



MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test ID:** D102431

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Peak Resultant Acceleration	G's	250 to 300	271	Pass
Peak Lateral Acceleration	G's	+/- 15	-2.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

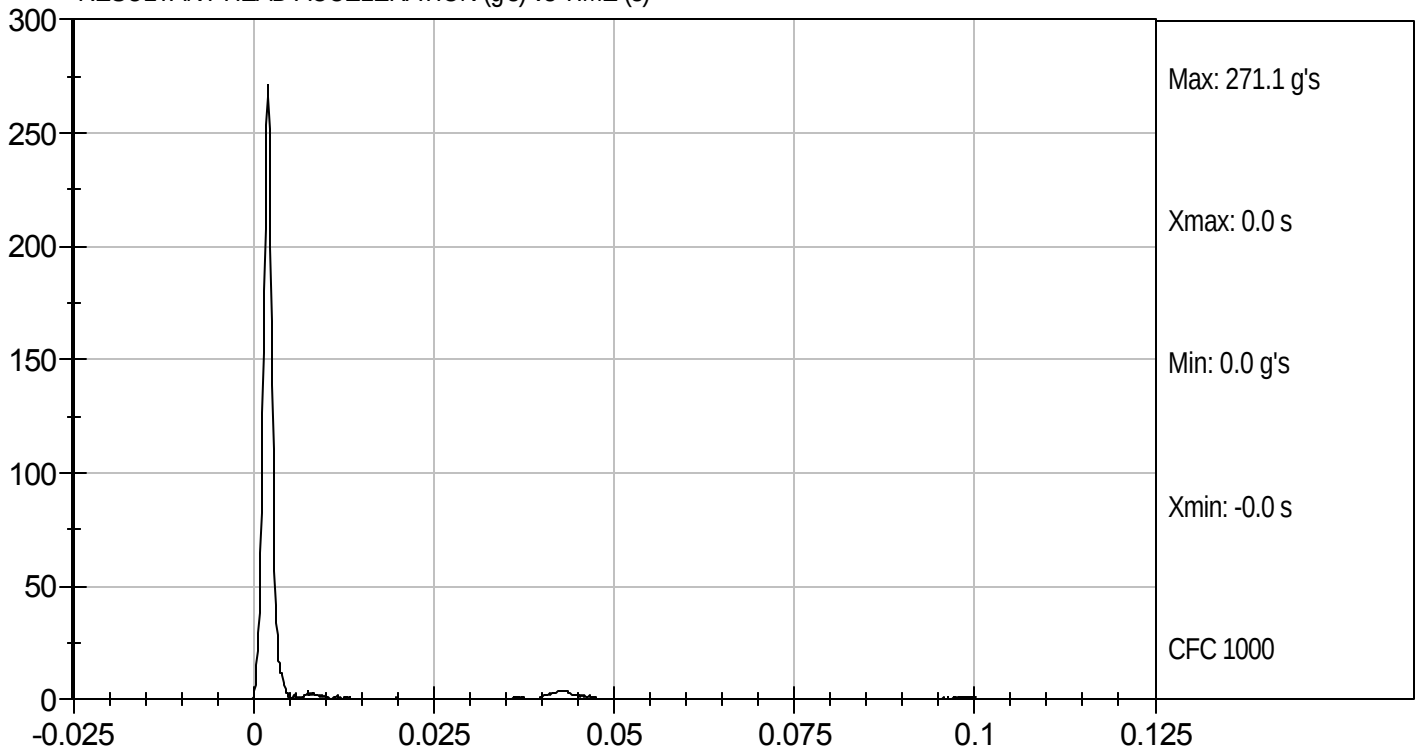
7/28/10
Test Date

David Winkelbauer
Approved By

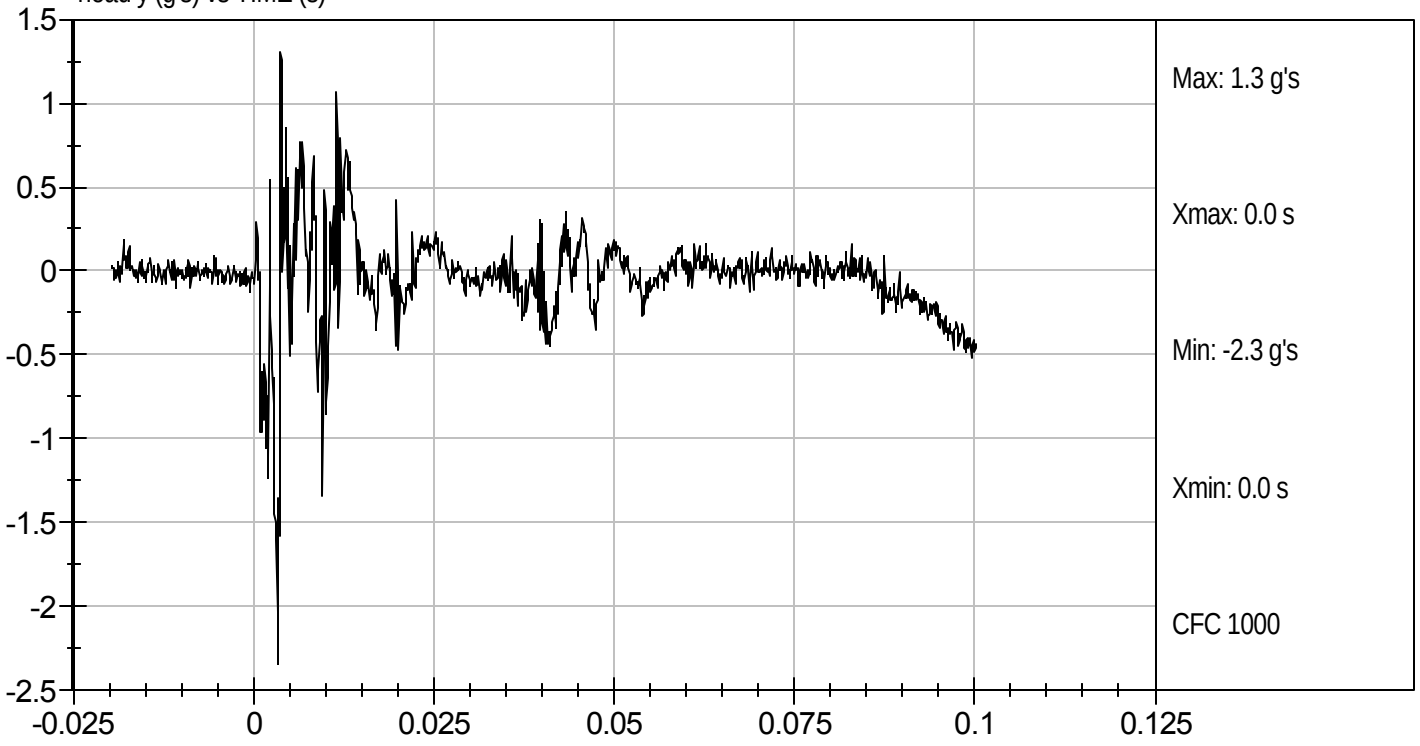
Test Desc: Head Drop
Component ID: D102431

Test Date: 7/28/10
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: 138 **Test I.D:** D102432

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	48	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.5	Pass
	30 ms	m/s	5.8 to 7.0	6.2	Pass
D Plane Rotation	Max	deg	77 to 91	77	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	74	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	85	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

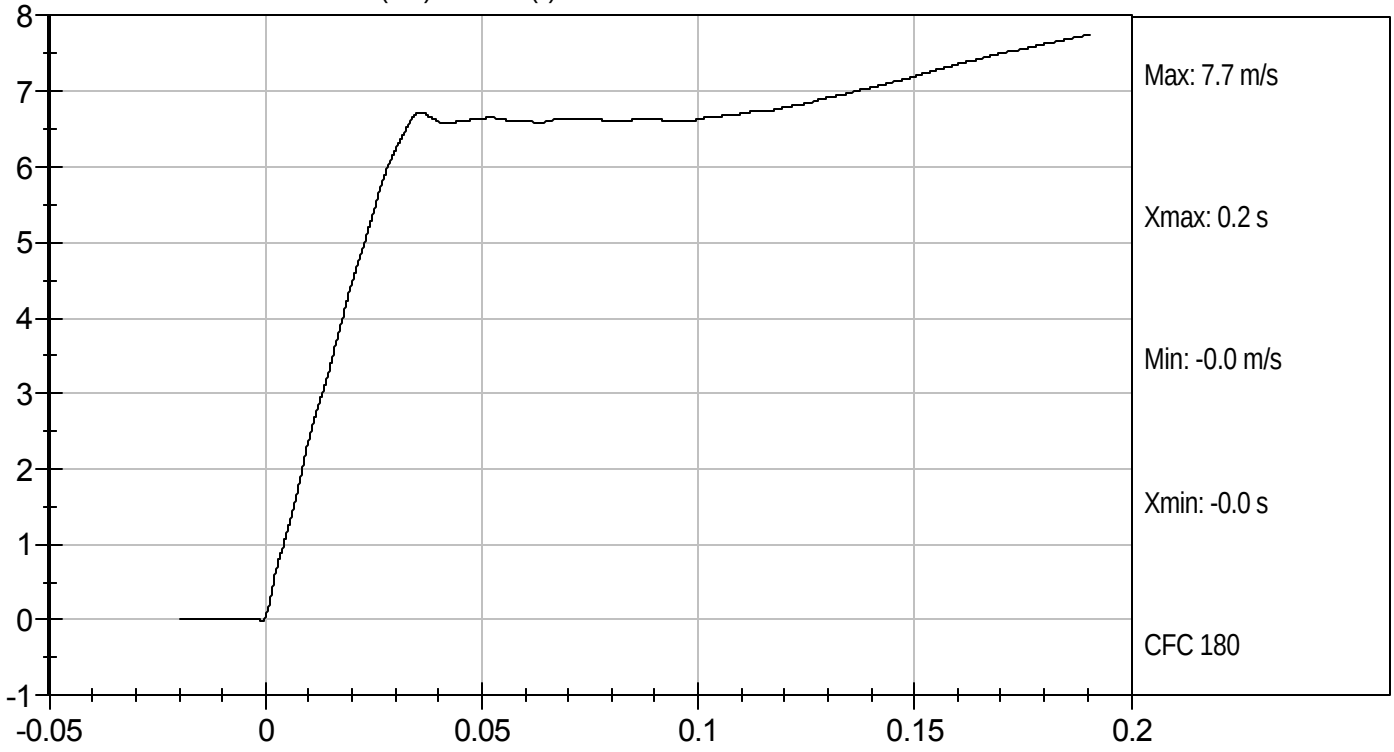
7/29/10
Test Date

David Winkelbauer
Approved By

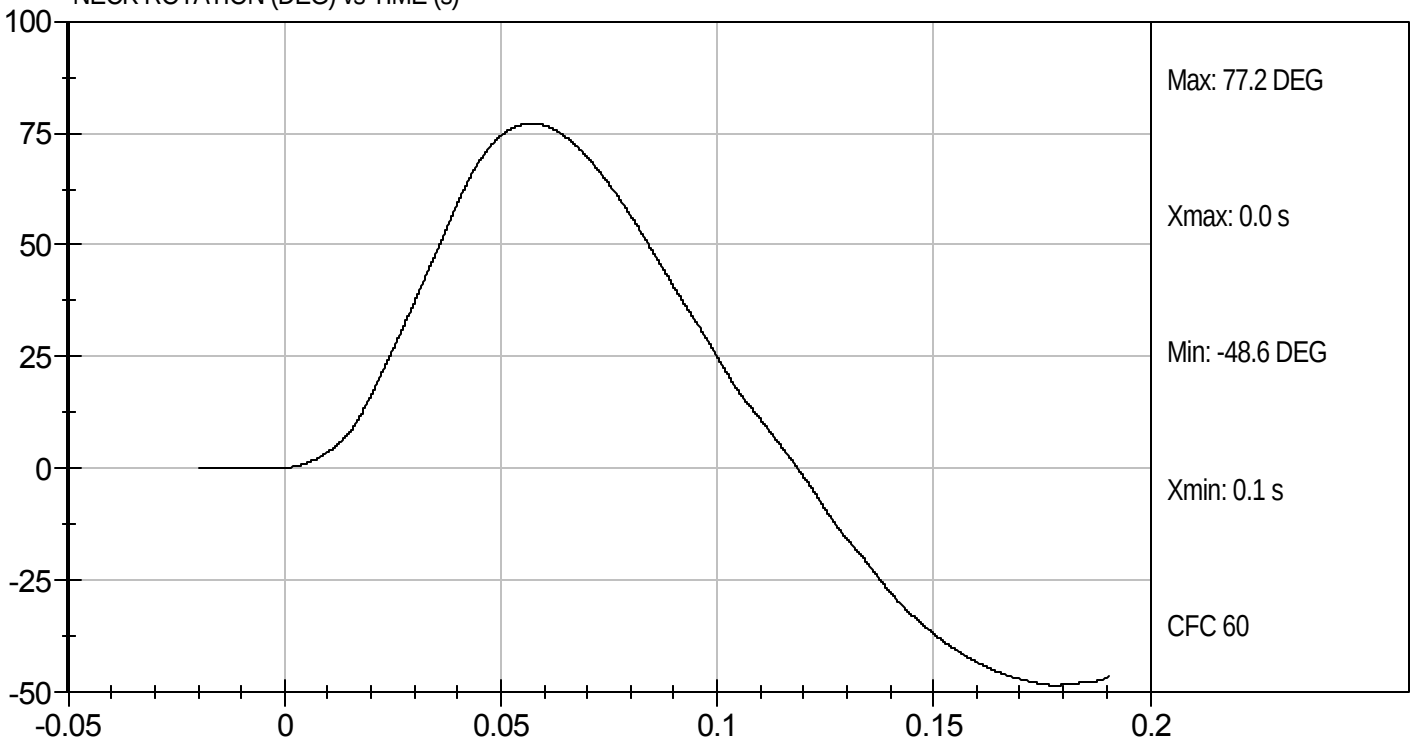
Test Desc: Neck Flexion
Component ID: D102432

Test Date: 7/29/10
Velocity: 23.15 ft/s, 7.06 m/s

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

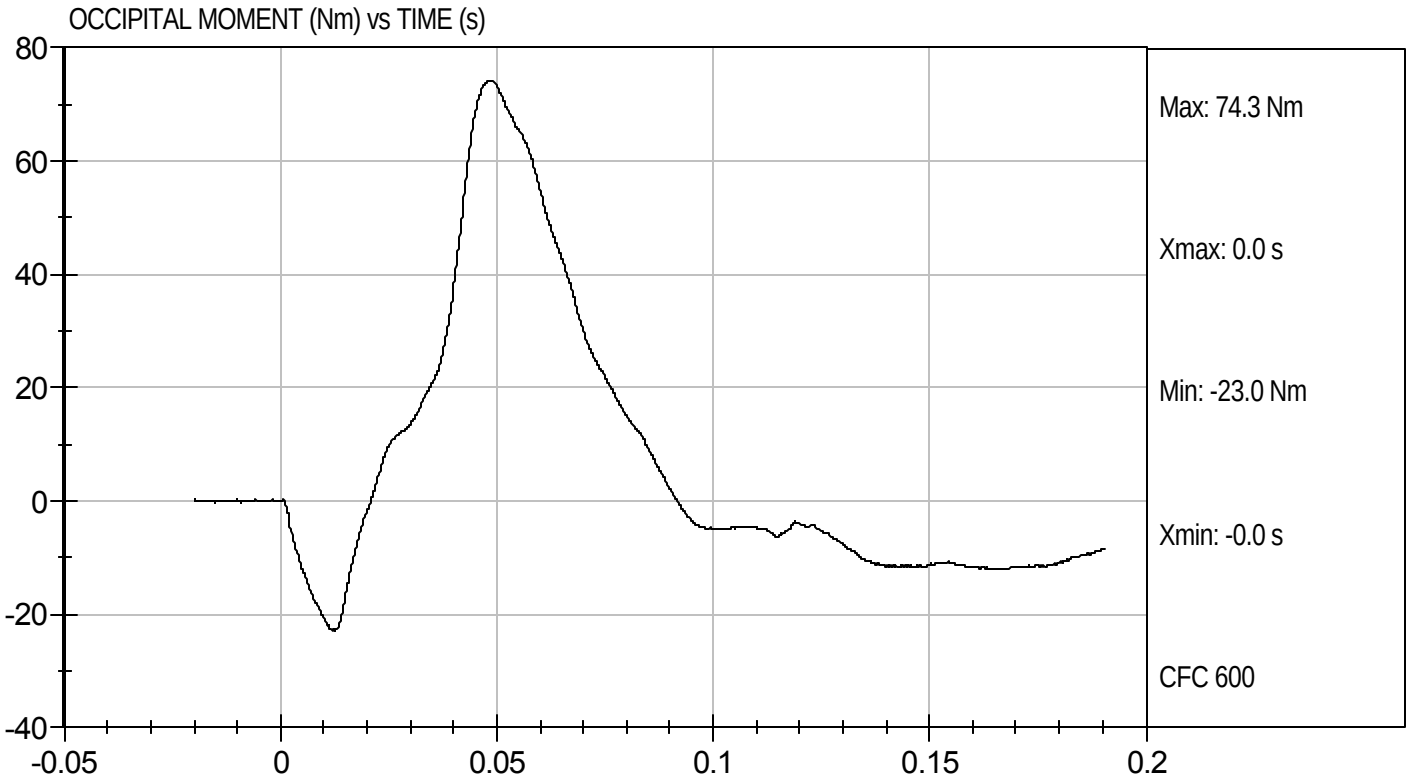


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Flexion
Component ID: D102432

Test Date: 7/29/10
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102433

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	48	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.16	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.9	Pass
	20 ms	m/s	3.1 to 3.9	3.8	Pass
	30 ms	m/s	4.6 to 5.6	5.5	Pass
D Plane Rotation	Max	deg	99 to 114	103	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-59	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	97	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

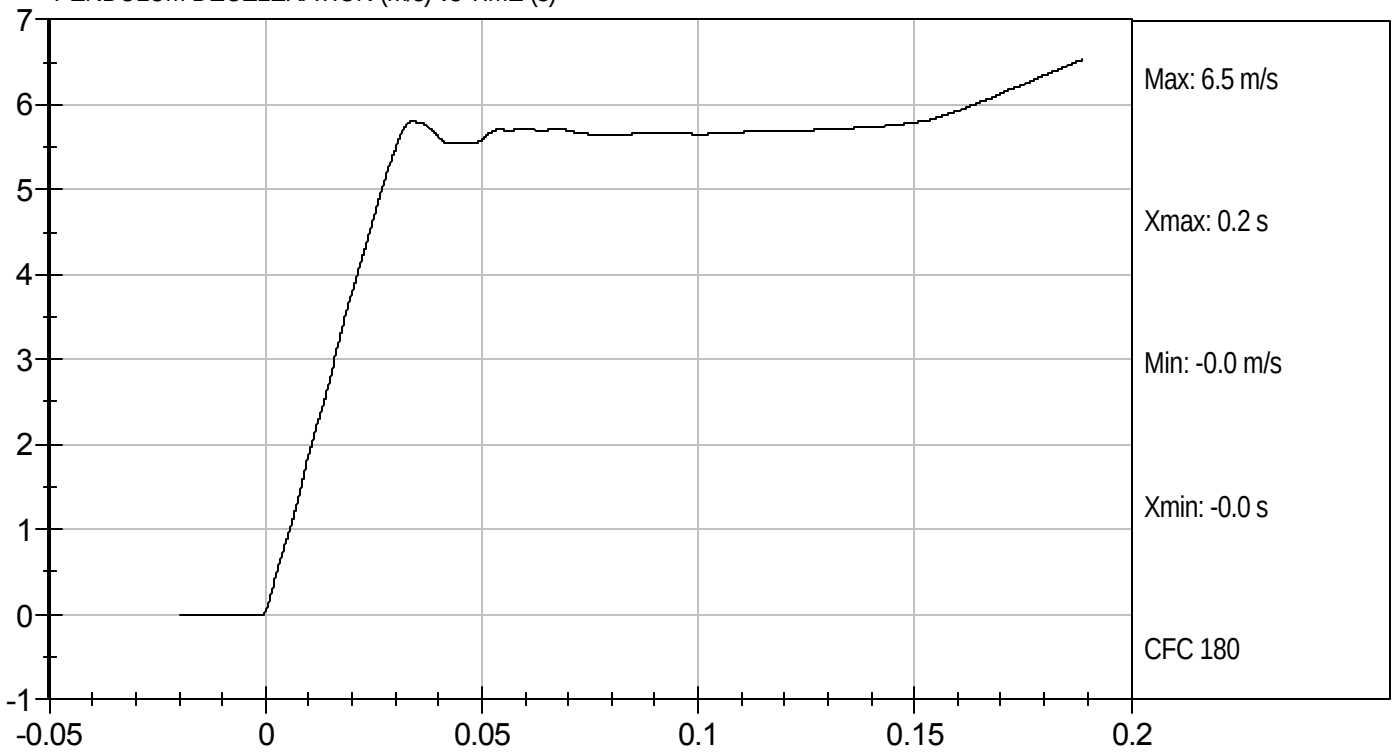
7/29/10
Test Date

David Winkelbauer
Approved By

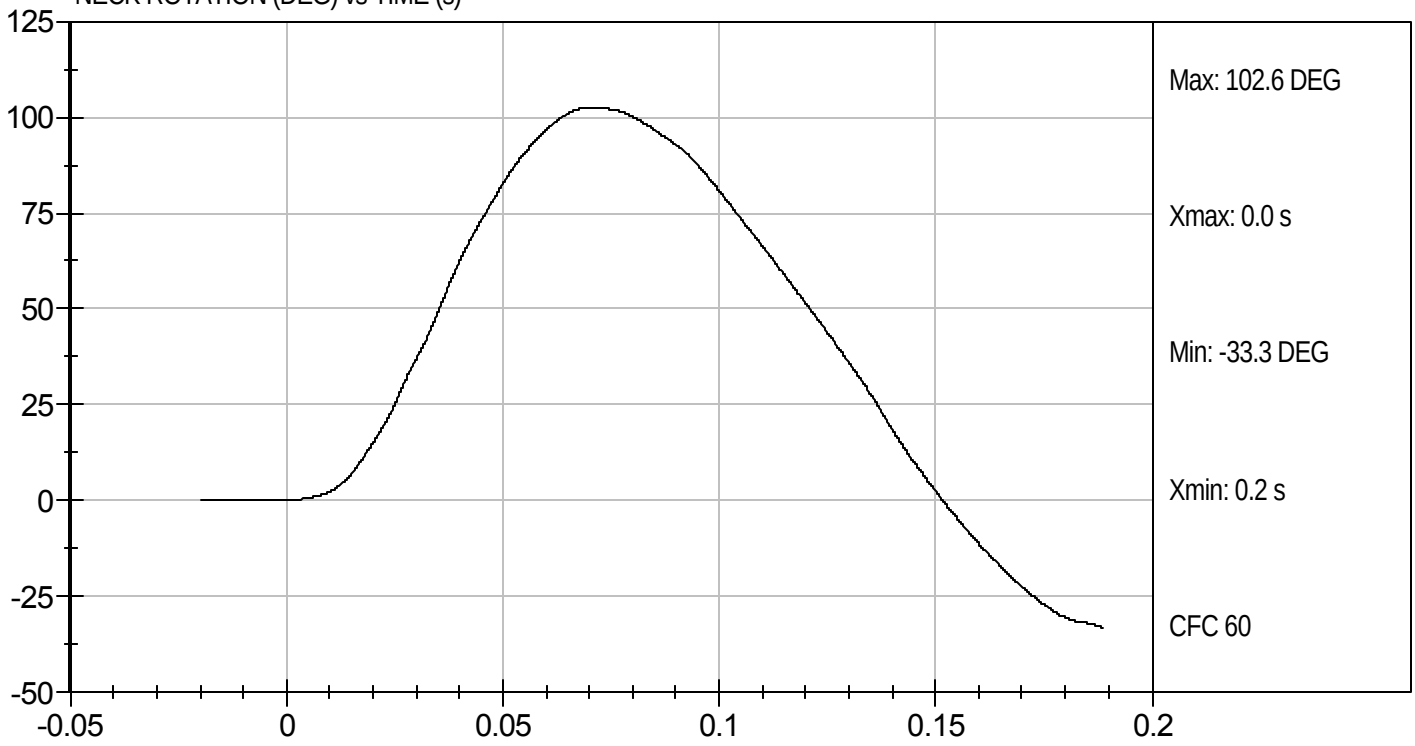
Test Desc: Neck Extension
Component ID: D102433

Test Date: 7/29/10
Velocity: 20.20 ft/s, 6.16 m/s

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

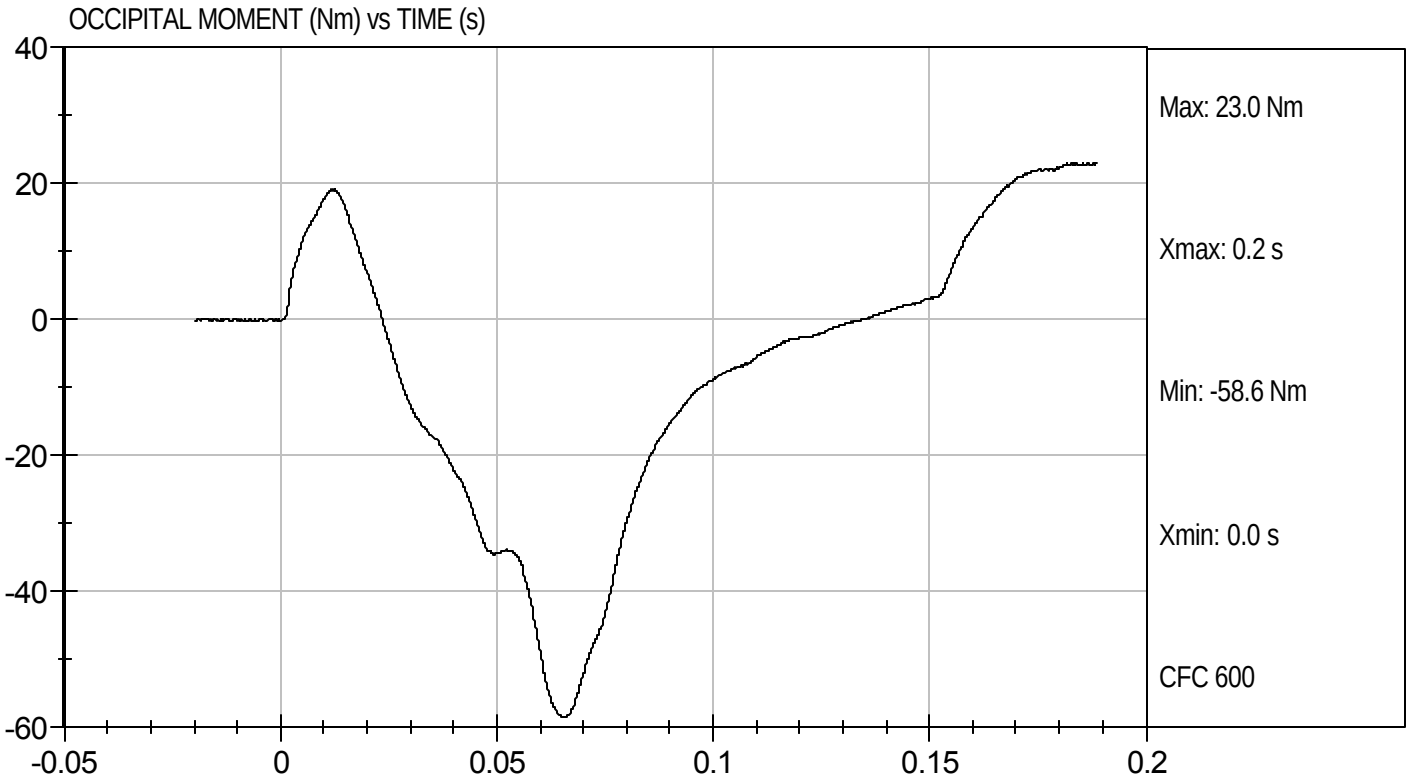


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Extension
Component ID: D102433

Test Date: 7/29/10
Velocity: 20.20 ft/s, 6.16 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102434

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Relative Humidity	%	10 to 70	47	Pass
Probe Speed	m/s	6.59 to 6.83	6.60	Pass
Peak Deflection	mm	50 to 58	54	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.09	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4086	Pass
		Overall Test Results		Pass

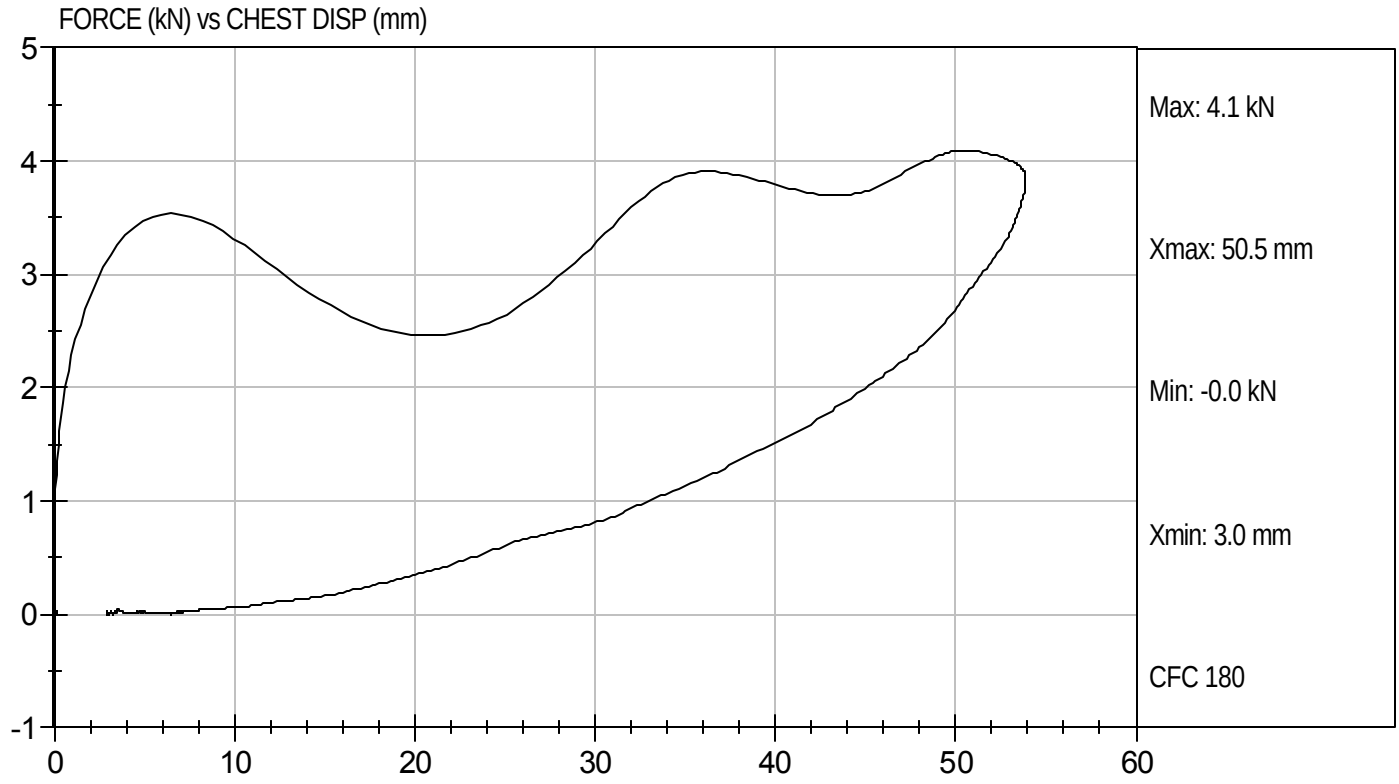
Jessica Hall
Laboratory Technician

7/29/10
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D102434

Test Date: 7/29/10
Velocity: 21.65 ft/s, 6.60 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102435

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.68	Pass
		Overall Test Results		Pass

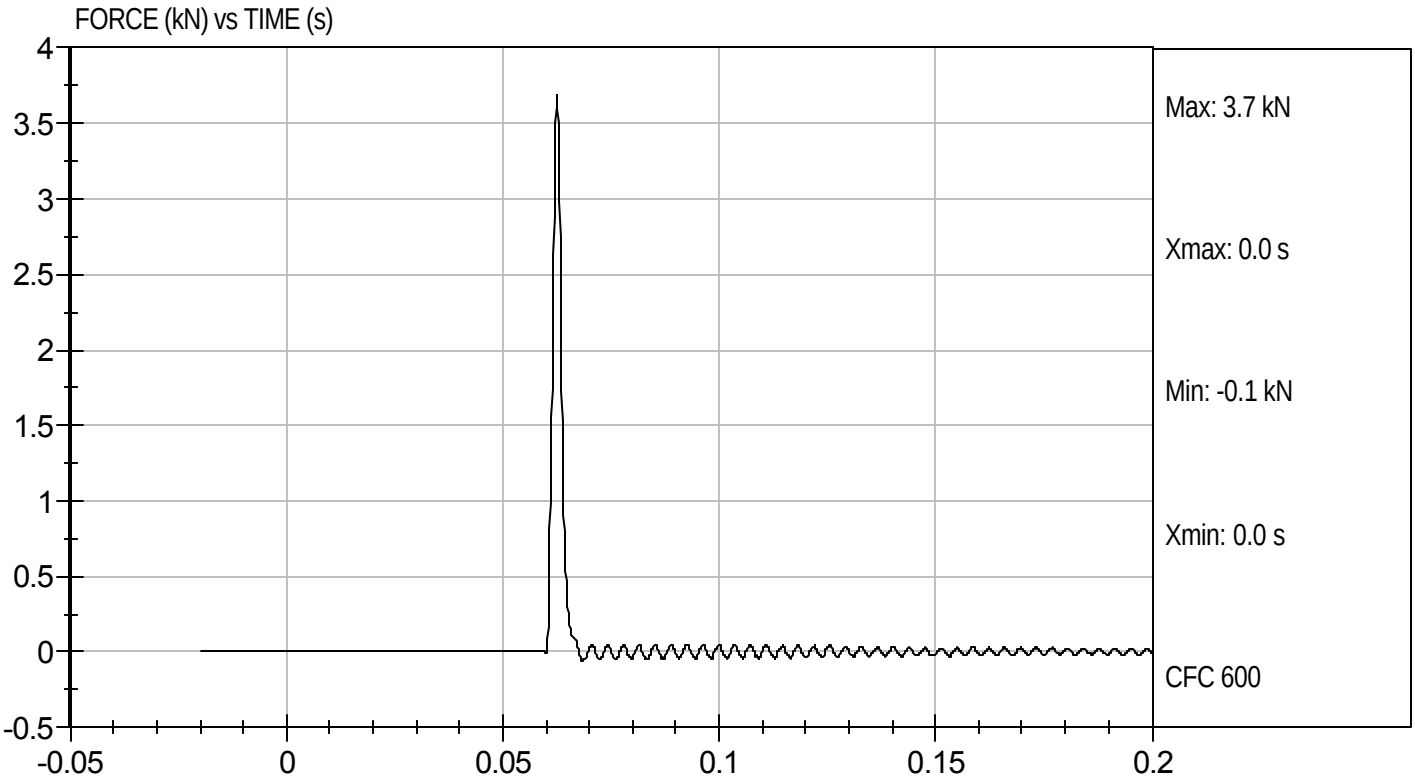
Jessica Hall
Laboratory Technician

7/28/10
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D102435

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



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102436

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.79	Pass
		Overall Test Results		Pass

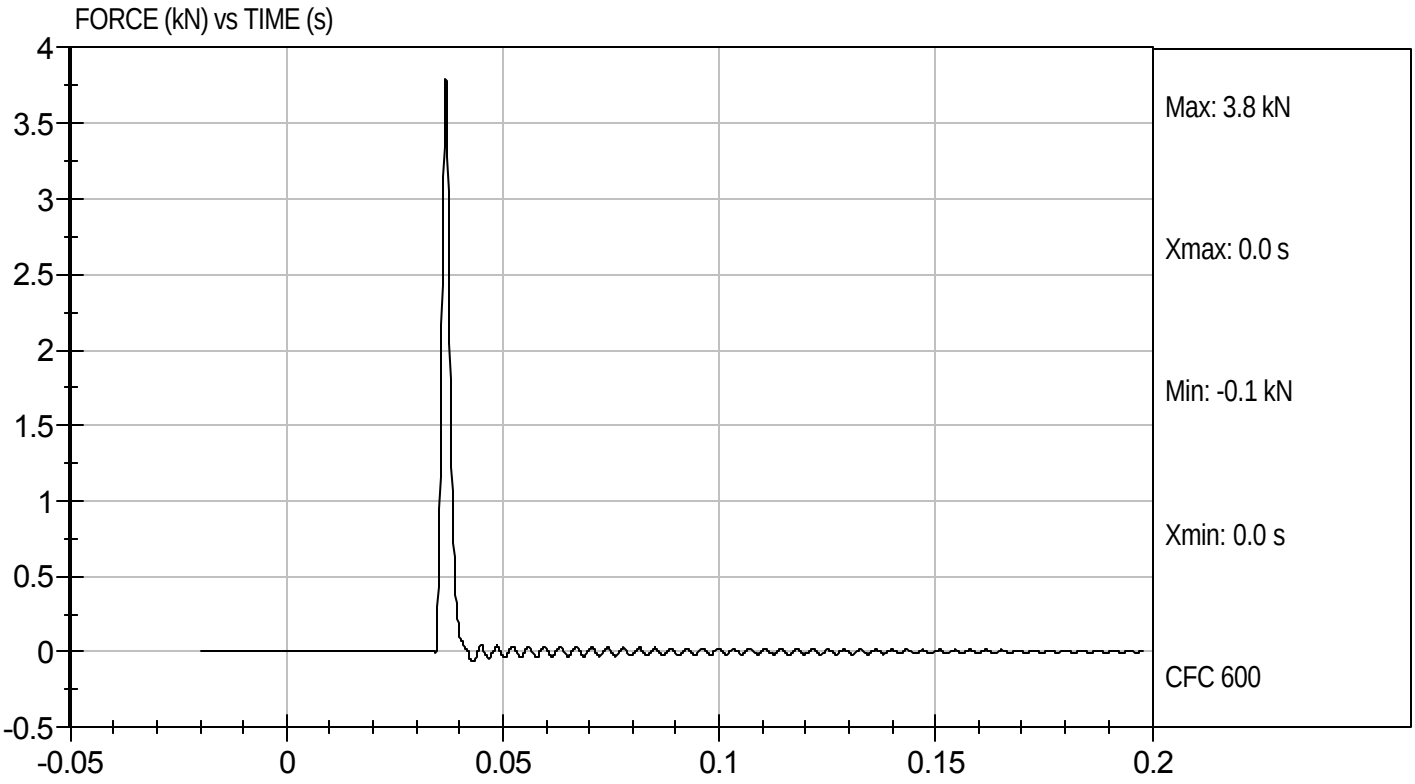
Jessica Gall
Laboratory Technician

7/28/10
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D102436

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



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102437

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	361	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
		Overall Result		Pass

Jessica Gall
Laboratory Technician

7/29/10
Test Date

David Winkelbauer
Approved By

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test ID:** D102601

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	50	Pass
Peak Resultant Acceleration	G's	250 to 300	261	Pass
Peak Lateral Acceleration	G's	+/- 15	-1.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

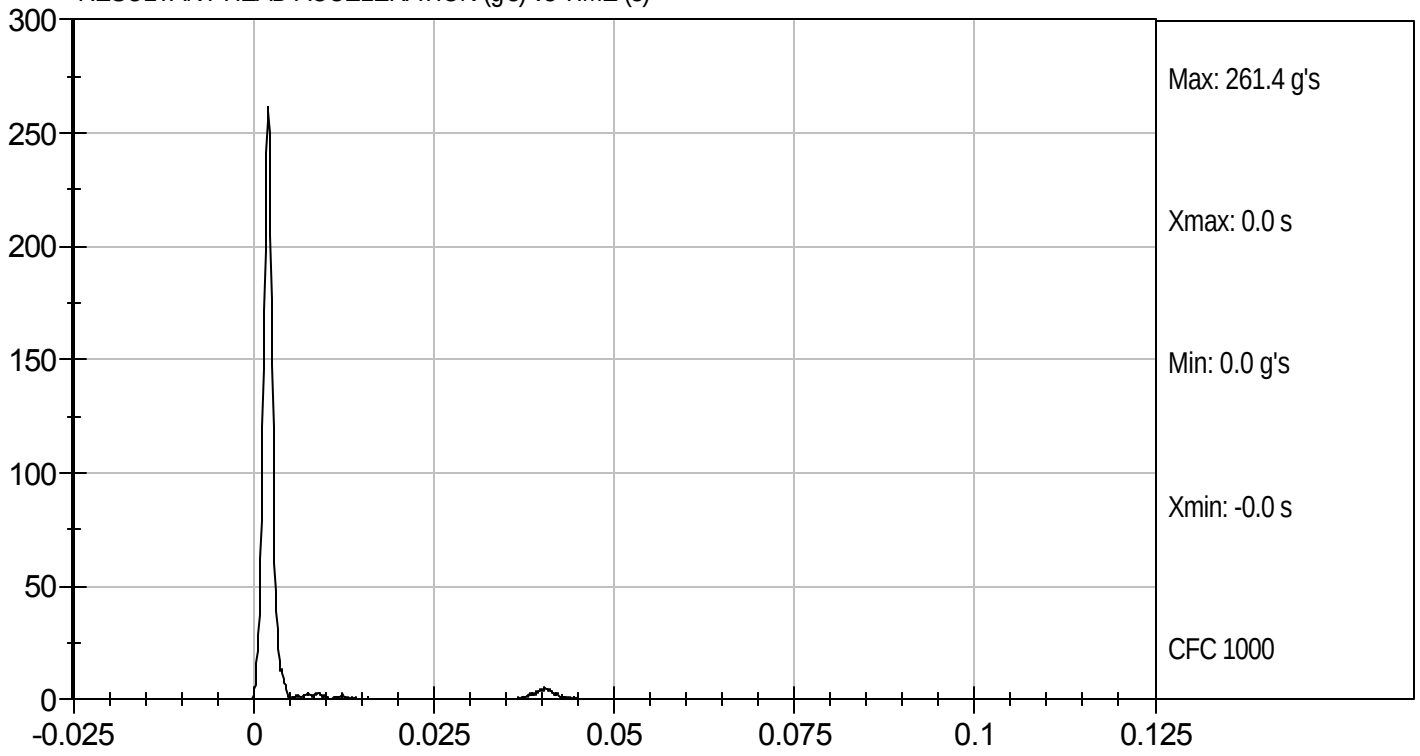
8/13/10
Test Date

David Winkelbauer
Approved By

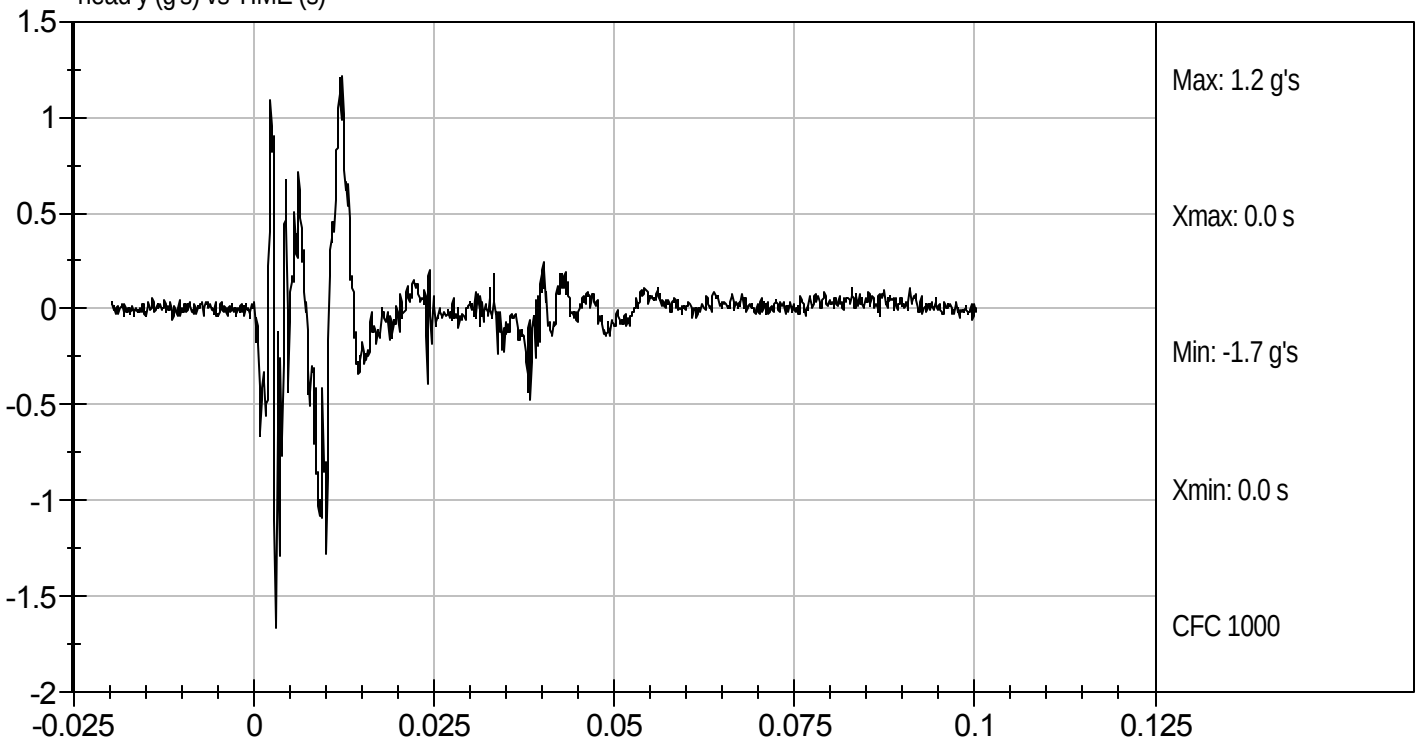
Test Desc: Head Drop
Component ID: D102601

Test Date: 8/13/10
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: 138 **Test I.D:** D102602

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	52	Pass
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	4.7	Pass
	30 ms	m/s	5.8 to 7.0	6.5	Pass
D Plane Rotation	Max	deg	77 to 91	79	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	72	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	82	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

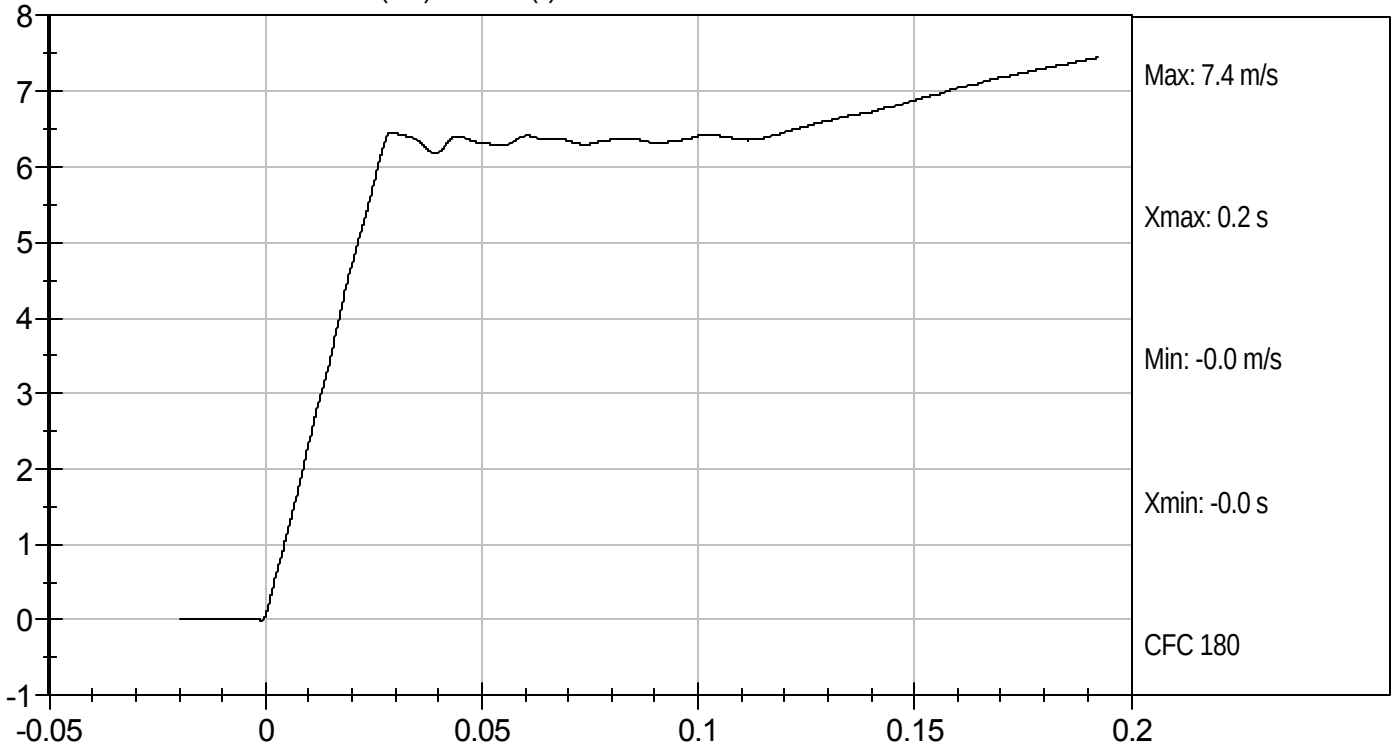
8/13/10
Test Date

David Winkelbauer
Approved By

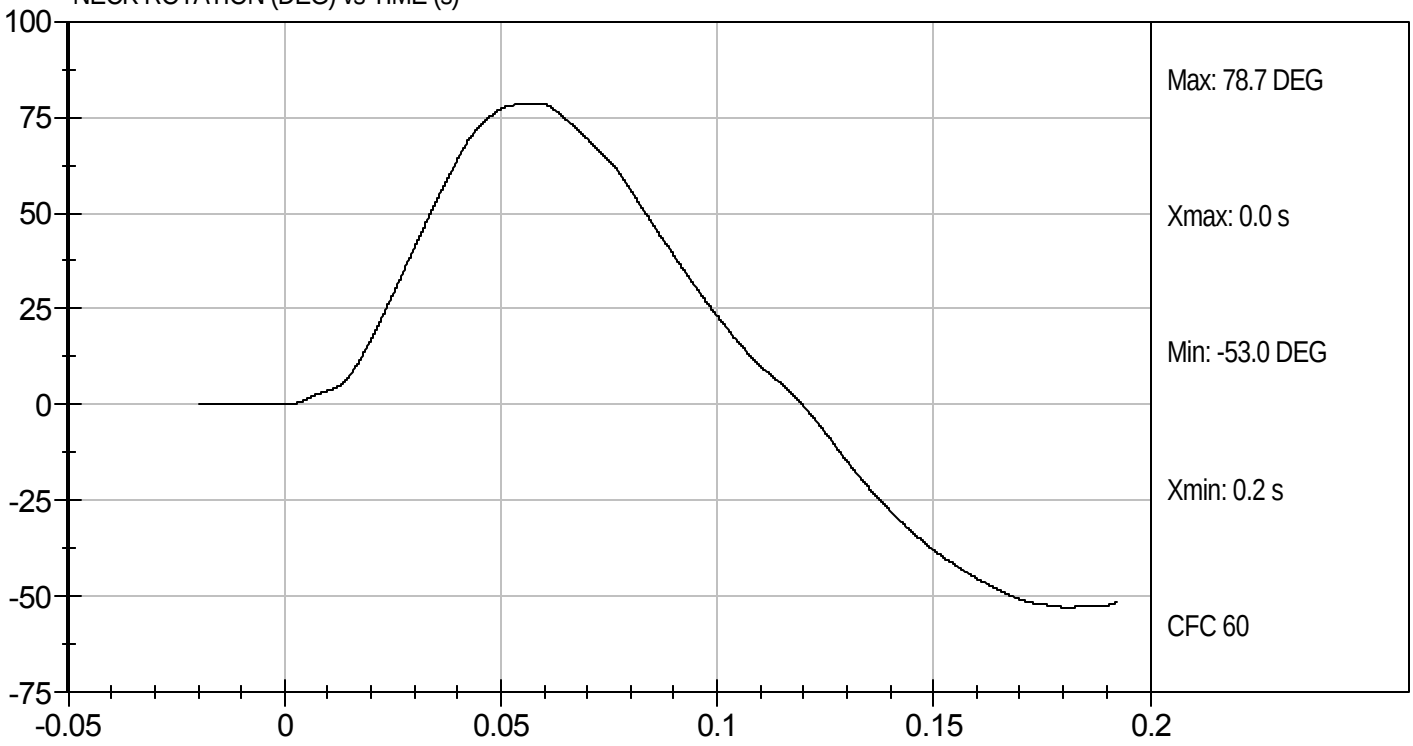
Test Desc: Neck Flexion
Component ID: D102602

Test Date: 8/13/10
Velocity: 23.15 ft/s, 7.06 m/s

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

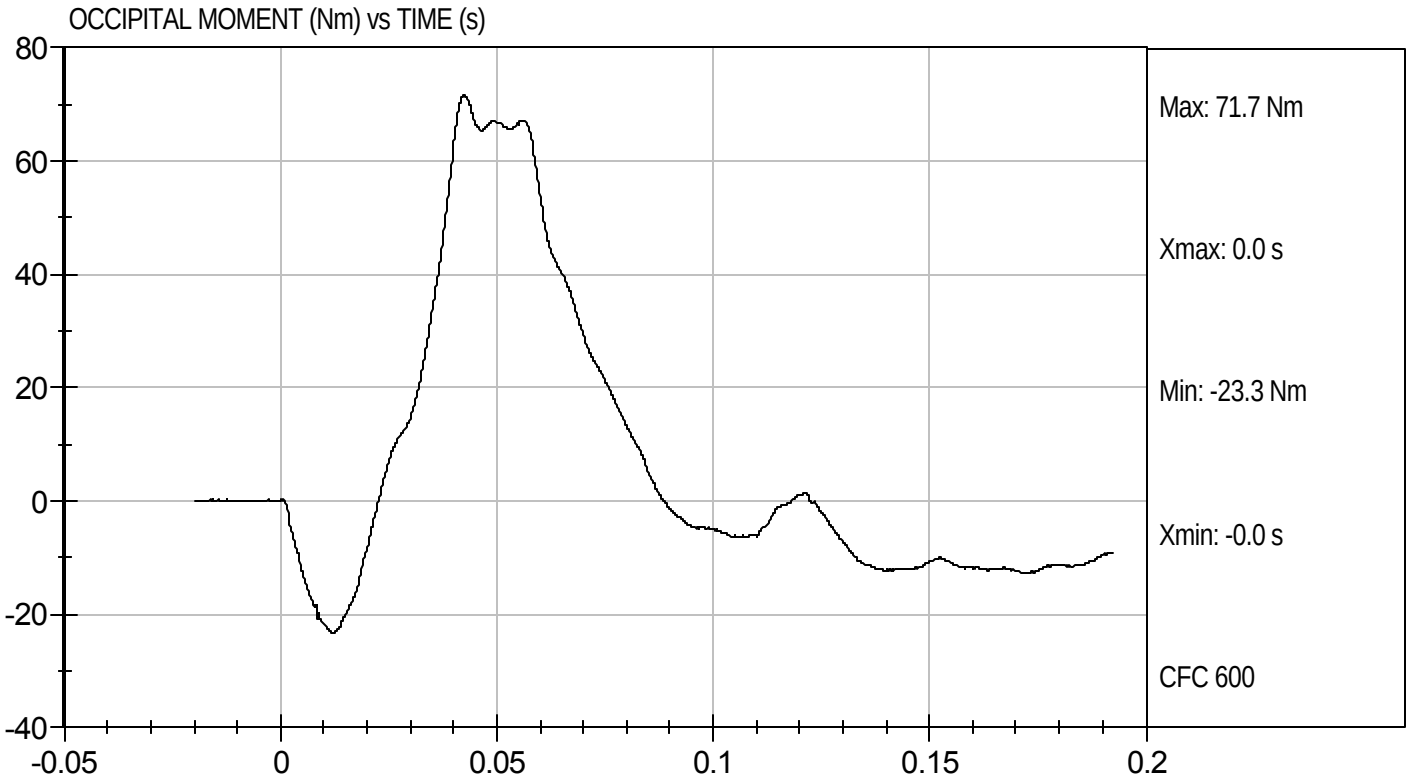


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Flexion
Component ID: D102602

Test Date: 8/13/10
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102603

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	52	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	m/s	1.5 to 1.9	1.9	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.4	Pass
D Plane Rotation	Max	deg	99 to 114	102	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-54	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	101	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

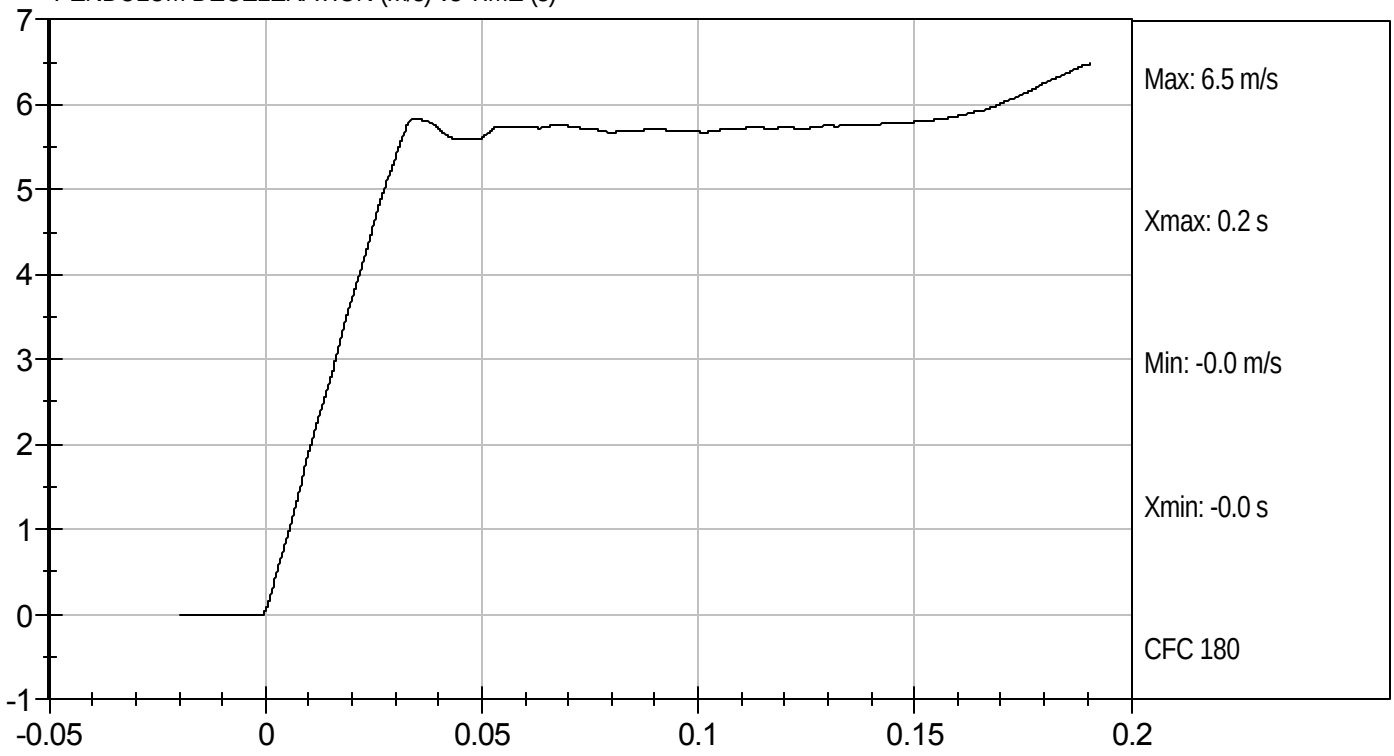
8/13/10
Test Date

David Winkelbauer
Approved By

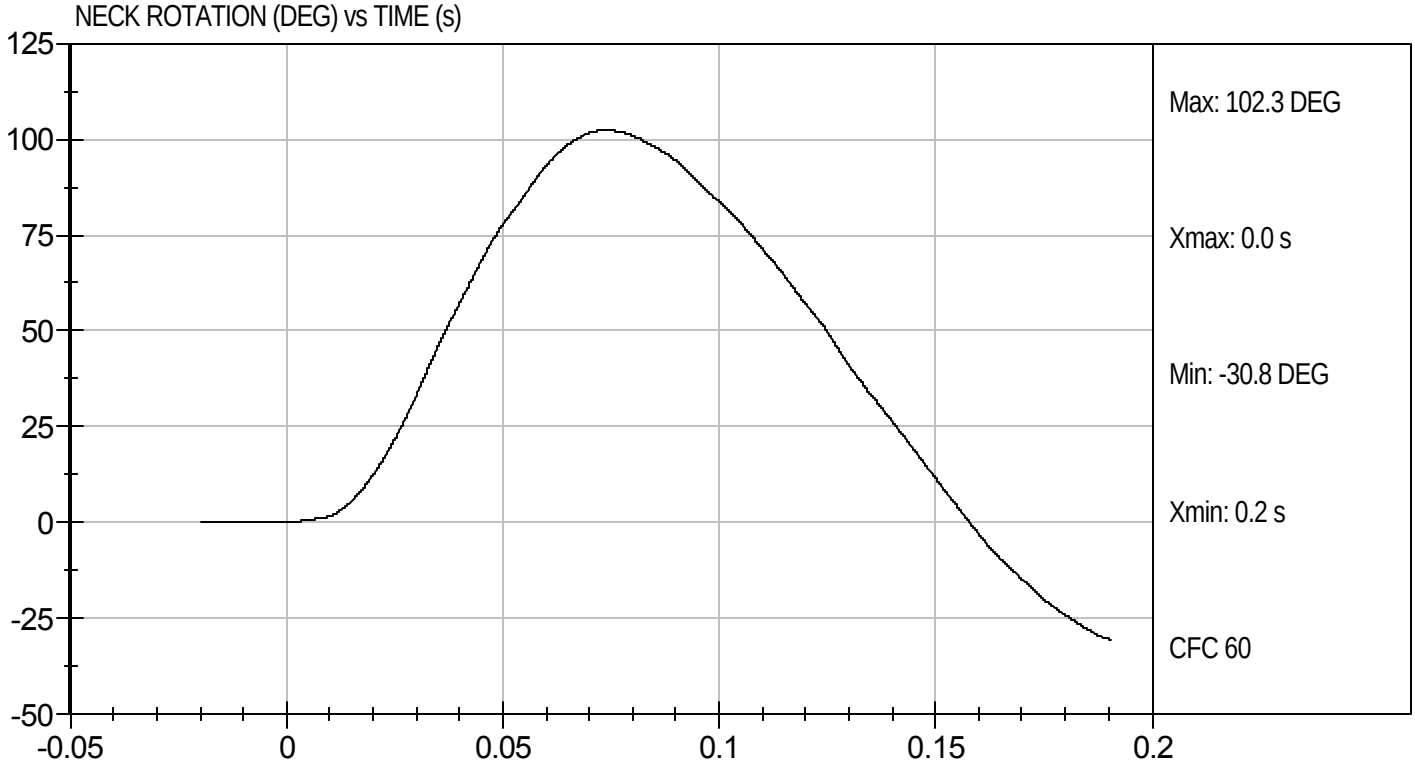
Test Desc: Neck Extension
Component ID: D102603

Test Date: 8/13/10
Velocity: 20.08 ft/s, 6.12 m/s

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

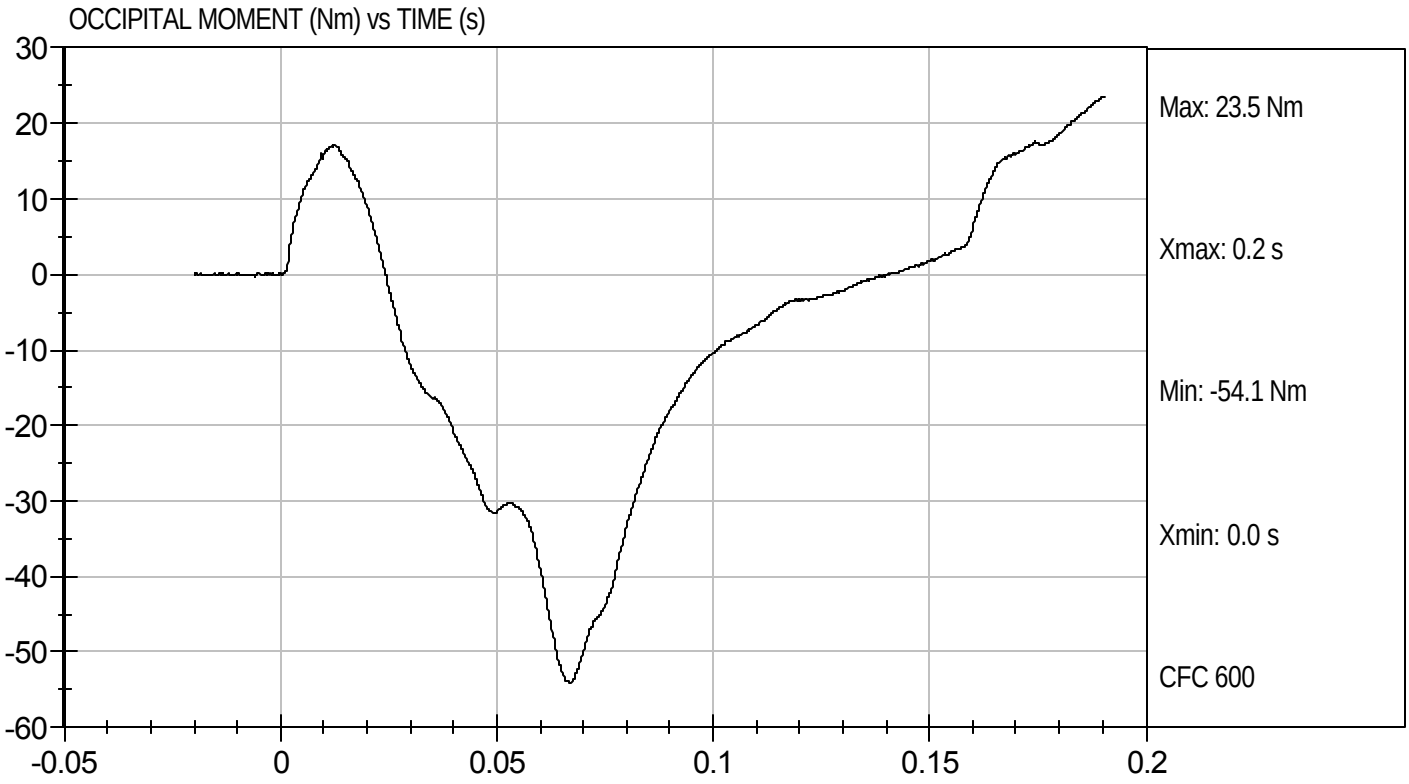


NECK ROTATION (DEG) vs TIME (s)



Test Desc: Neck Extension
Component ID: D102603

Test Date: 8/13/10
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102604

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Relative Humidity	%	10 to 70	46	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	4.2	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4254	Pass
		Overall Test Results		Pass

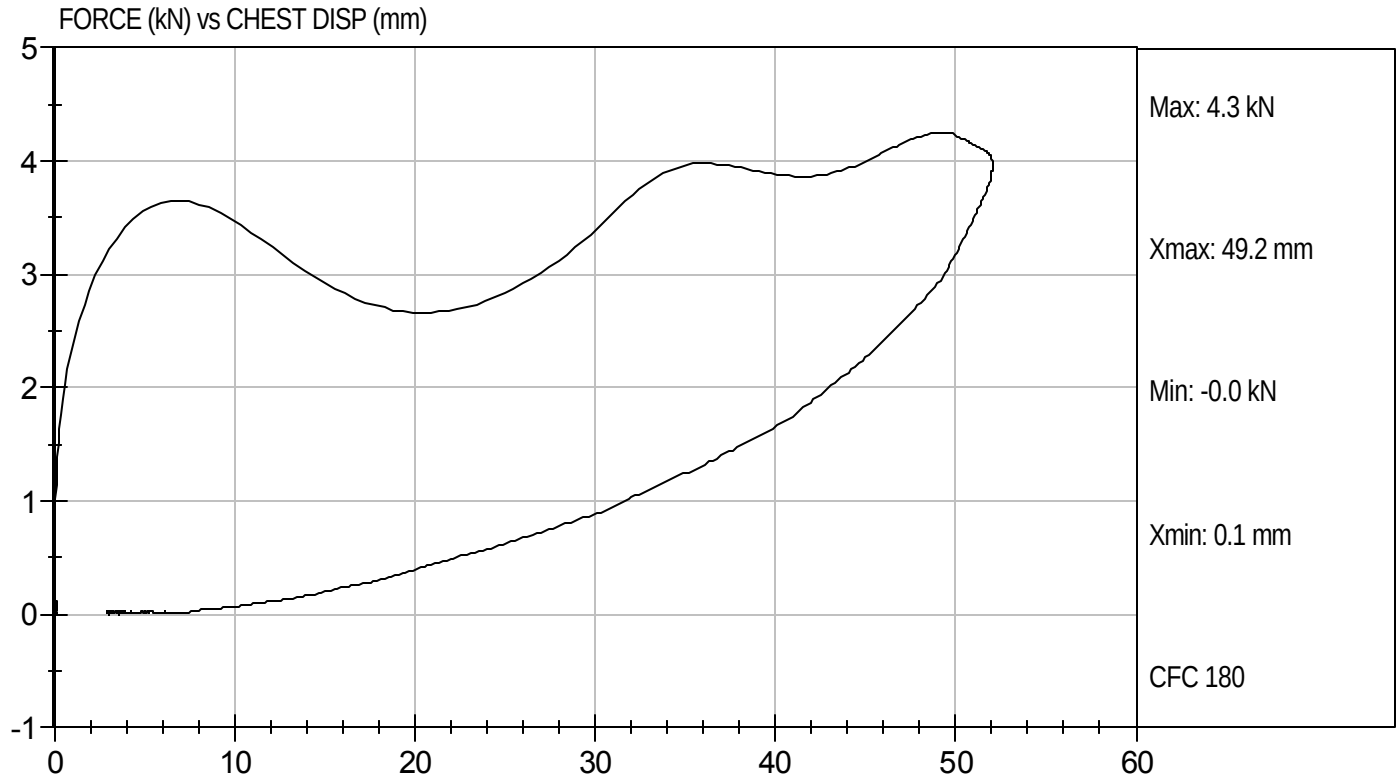
Jessica Hall
Laboratory Technician

8/16/10
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D102604

Test Date: 8/16/10
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102605

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Probe Speed	m/s	2.07 to 2.13	2.10	Pass
Maximum Force	kN	3.45 to 4.06	3.65	Pass
		Overall Test Results		Pass

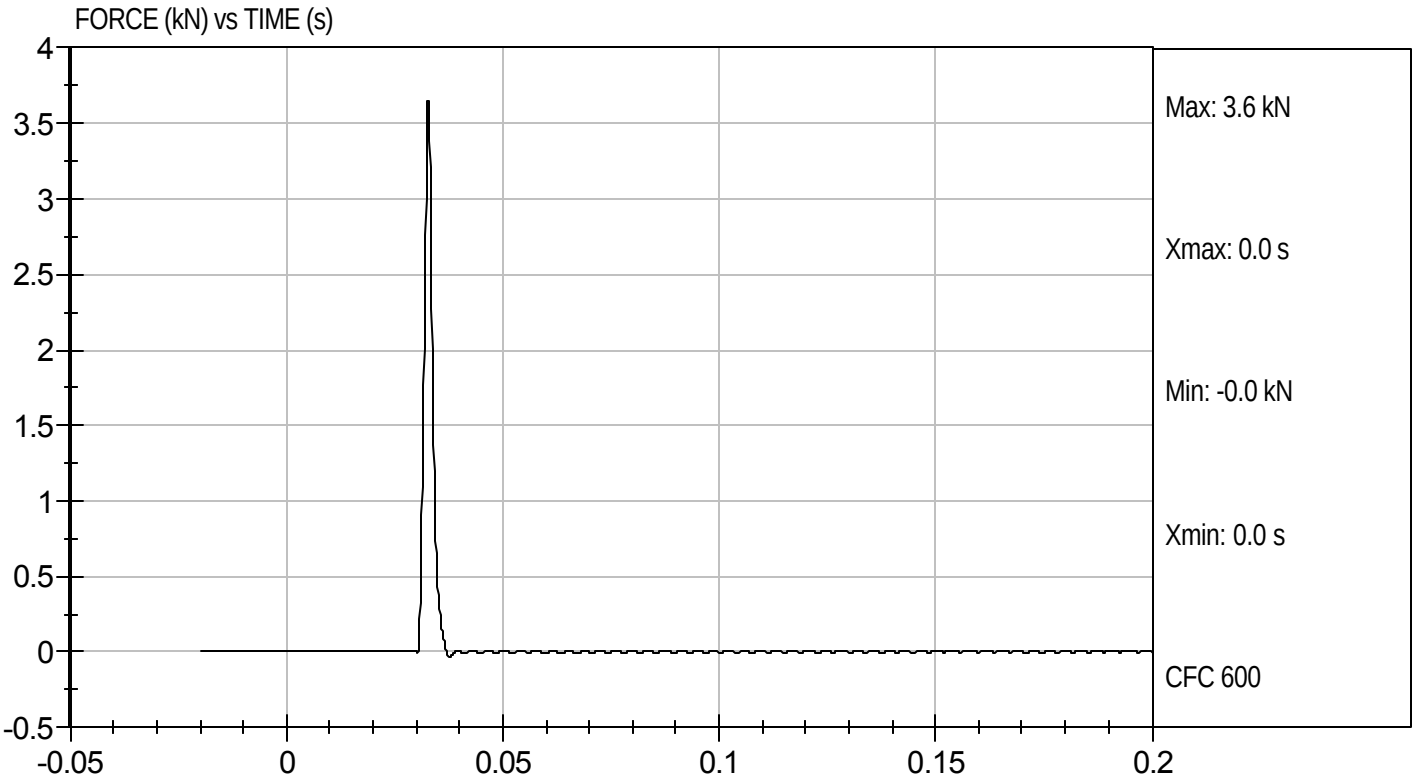
Jessica Gall
Laboratory Technician

8/13/10
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D102605

Test Date: 8/13/10
Velocity: 6.88 ft/s, 2.10 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** D102606

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Probe Speed	m/s	2.07 to 2.13	2.09	Pass
Maximum Force	kN	3.45 to 4.06	3.75	Pass
		Overall Test Results		Pass

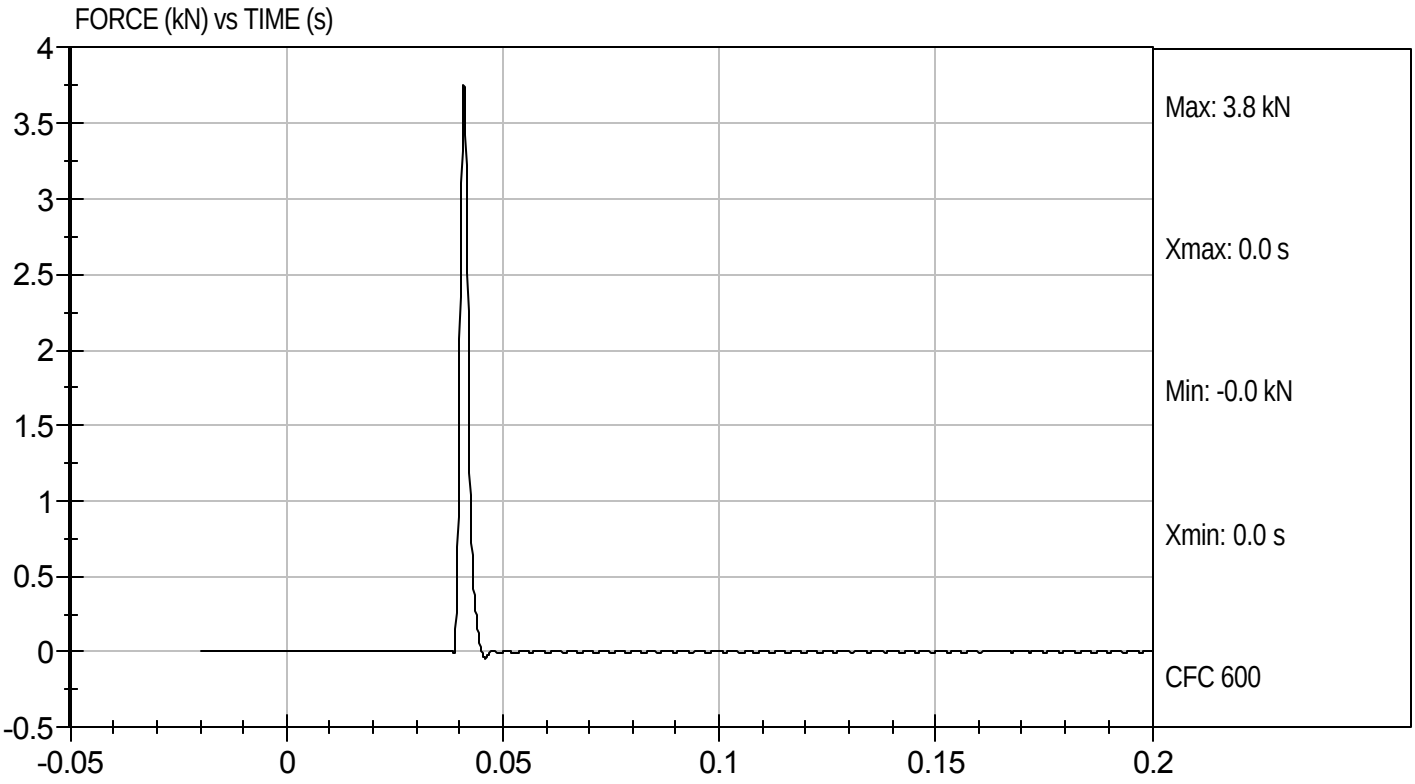
Jessica Gall
Laboratory Technician

8/13/10
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D102606

Test Date: 8/13/10
Velocity: 6.85 ft/s, 2.09 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 138 **Test I.D:** d102607

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	47	Pass
Initial Angle	deg	0 to 20	19	Pass
Return Angle	deg	+/- 8	4	Pass
Force at 45 deg	N	320 to 390	360	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
		Overall Result		Pass

Jessica Gall
Laboratory Technician

8/16/10
Test Date

David Winkelbauer
Approved By