REPORT NUMBER: NCAP-MGA-2012-055

NEW CAR ASSESSMENT PROGRAM (NCAP)
Frontal Barrier Impact Test

NISSAN MOTOR CO., LTD
2012 Nissan Juke S AWD SUV
NHTSA No.: MC5208

MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105

Test Date: January 18, 2012

Final Report Date: March 9, 2012

FINAL REPORT

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

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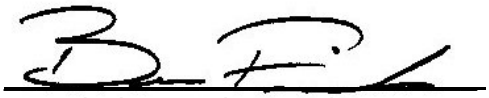
Approved by: 
Ben Fischer, Project Engineer

Approval Date: March 9, 2012

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

1. Report No. NCAP-MGA-2012-055	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of New Car Assessment Program Frontal Impact Testing of 2012 Nissan Juke S AWD SUV, NHTSA No.: MC5208		*5. Report Date* March 9, 2012 *6. Performing Organization Code* MGA
7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		*8. Performing Organization Report No.* NCAP-MGA-2012-055
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
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590		*13. Type of Report and Period Covered* Final Test Report January 18 to March 9, 2012 *14. Sponsoring Agency Code* NVS-111
15. Supplementary Notes		

16. Abstract

A 56.3 km/h NCAP Frontal Impact Test was conducted on the 2012 Nissan Juke S AWD SUV in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on January 18, 2012.

The impact velocity was 56.4 km/h and the ambient temperature at the barrier face at the time of impact was 21.0°C. The target vehicle post-test maximum crush was 467 mm located to the right of the vehicle's centerline. The test vehicle's performance was as follows:

Measurement Description	Units	Threshold		Driver ATD	Passenger ATD
		50th	5th		
Head Injury Criteria (HIC_{15})	N/A	700	700	266	190
Maximum Chest Compression	mm	63	52	25	17
Nij	N/A	1	1	0.26	0.73
Neck Tension	N	4170	2620	1560	1082
Neck Compression	N	4000	2520	283	841
Left Femur Force	N	10008	6805	3781	2466
Right Femur Force	N	10008	6805	4905	3287

17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE, Room E12-100 Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833	
19. Security Classification of Report Unclassified	*20. Security Classification of Page* Unclassified	*21. No. of Pages* 163	22. Price

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SECTION 1
PURPOSE AND SUMMARY OF TEST

PURPOSE

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

The 56.3 km/h frontal barrier impact was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure.

SUMMARY

A load cell barrier was impacted by a 2012 Nissan Juke S AWD SUV at a velocity of 56.4 kph. The test was performed at MGA Research Corporation on January 18, 2012. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also installed on the driver's lap and shoulder belts and the passenger's lap and shoulder belts to measure dummy torso and pelvic section loading.

The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. 634) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 100 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 467 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD position	HIC_{15}	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50^{th})	266	0.26	1560	283	49	25	3781	4905
Passenger (5^{th})	190	0.73	1082	841	51	17	2466	3287

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 Left Ankle Z is questionable data from 43-47 ms.
Driver Left Foot Z – Front is questionable data from 44-48 ms.
Driver Right Ankle X is questionable data from 40-41 ms.
Driver Right Ankle Z is questionable data from 40-42 ms.
Driver Right Foot Z – Front is questionable data from 40-42 ms.
Top of Engine X is questionable data from 51-73 ms.
Left Brake Caliper X is questionable data from 50-54 ms.
Right Rear Seat Crossmember has no valid data.

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC5208	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Nissan	Automatic Door Locks (ADLs)	Yes
Model	Juke	Power Window Auto-Reverse	Yes
Body Style	SUV	Other Optional Feature	N/A
VIN	JN8AF5MV4CT106612	Driver Front Airbag	Yes
Body Color	Cayenne Red	Driver Curtain Airbag	Yes
Odometer (km/mi)	177 / 110	Driver Torso Airbag	No
Engine Displacement (L)	1.6	Driver Torso/Pelvis Airbag	Yes
Type/No. Cylinders	4	Driver Pelvis Airbag	No
Engine Placement	Lateral	Driver Knee Airbag	No
Transmission Type	Automatic	Pass. Front Airbag	Yes
Transmission Speeds	Variable	Pass. Curtain Airbag	Yes
Overdrive	No	Pass. Torso Airbag	No
Final Drive	AWD	Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Pass. Knee Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Pass. Seat Belt Pretensioner	Yes
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Pass. Load Limiter	Yes
All-Wheel Drive (AWD)	Yes	Other Safety Restraint	N/A
Does owner's manual provide instructions to turn off automatic door locks?			No

DATA FROM CERTIFICATION LABEL

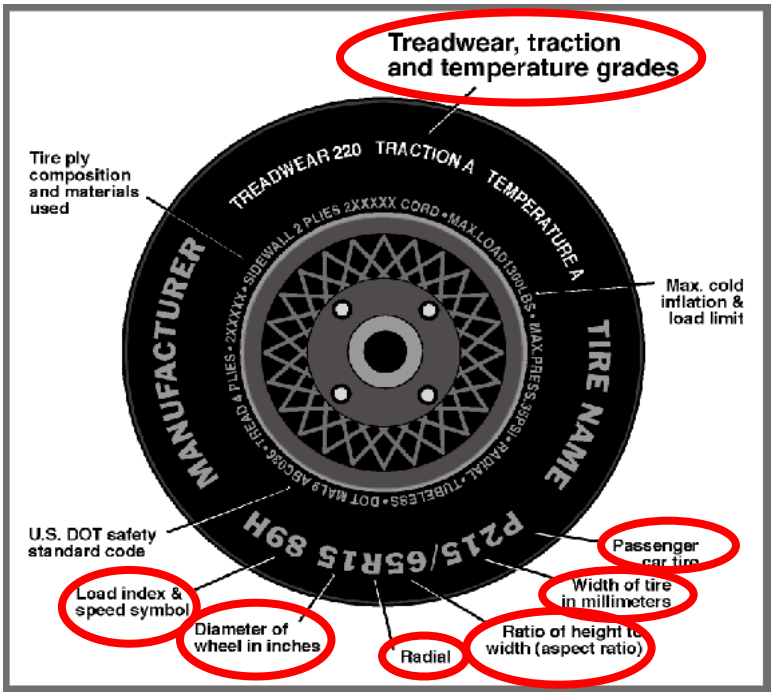
Manufactured By	Nissan Motor Co., Ltd	GVWR (kg)	1890
Date of Manufacture	9/11	GAWR Front (kg)	1010
Vehicle Type	MPV	GAWR Rear (kg)	910

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: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	240	240
Recommended Tire Size	P215/55R17	P215/55R17

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P215/55R17	P215/55R17
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle RS-A	Eagle RS-A
Tire Type	Passenger	Passenger
Tire Width	215	215
Aspect Ratio	55	55
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	93V	93V
Treadwear	260	260
Traction Grade	A	A
Temperature Grade	A	A
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	432.2	288.0		466.8	351.6	
Right	kg	429.6	279.9		455.4	339.7	
Ratio	%	60.3	39.7		57.2	42.8	
Totals	kg	861.8	567.9	1429.7	922.2	691.3	1613.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1429.7
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	50
Calculated Vehicle Target Weight (TVTW)	kg	1620.3

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	728	738	735	727	1005
As Tested	mm	725	730	714	718	1084
Post Test	mm	745	747	728	679	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2530
Total Vehicle Length at Left Side	mm	3964
Total Vehicle Length at Centerline	mm	4122
Total Vehicle Length at Right Side	mm	3964
Weight of Ballast in Cargo Area	kg	30.8
Weight of Vehicle Components Removed	kg	24.0
Amount of Stoddard Solvent in Fuel Tank	L	41.9

List of components removed: Right taillight, trunk carpet, jack/tools, spare tire, and rear floor mats.

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

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

TARGET VEHICLE STRUCTURAL MEASUREMENT

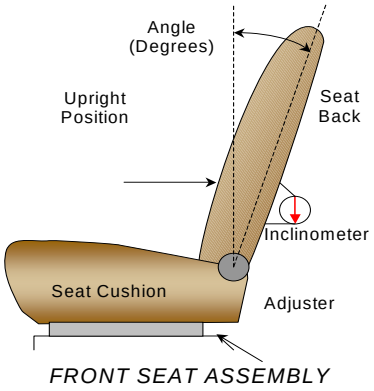
	Elements	Pre-Test (mm)
1	Total Length	4122
2	Total Width	1728
3	Bumper Top Height	670
4	Bumper Bottom Height	530
5	Longitudinal Member Top Height	634
6	Distance between Longitudinal Members	906
7	Longitudinal Member Width	75
8	Engine Top Height	932
9	Engine Bottom Height	205
10	Engine and Gearbox Width	915
11	Front Bumper-Engine Distance	282
12	Front Shock Absorber Fixing Height	926
13	Bonnet Leading Edge Height	866
14	Front Shock Absorber Fixing Width	1178
15	Front Bumper – Front Axle Distance	833
16	Front Axle – A-Pillar Distance	433
17	A-Pillar – B-Pillar Distance	1103
18	B-Pillar – Rear Axle Distance	999
19	B-Pillar – C-Pillar Distance	578
20	Roof Sill Bottom Height	1411
21	Roof Sill Top Height	1536
22	Floor Sill Bottom Height	268
23	Floor Sill Top Height	387

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

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012

NOMINAL DESIGN RIDING POSITION

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



SEAT BACK ANGLE	Degrees
Driver Seat Back Angle	1.0° on headrest post
Passenger Seat Back Angle	-1.2° on headrest post

SEAT FORE/AFT POSITIONS

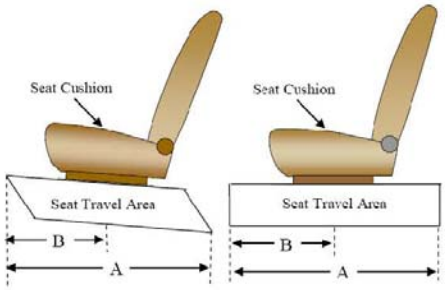
The driver and passenger seat fore/aft positions are adjusted following Appendix F, "Driver & Passenger Dummy Seating & Positioning Procedures" in the NCAP Test Procedure dated January 2010.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	24 detents (1st as 0)	10th detent (1st as 0)
Passenger Seat	24 detents (1st as 0)	0 detent (1st as 0)

SEAT BELT UPPER ANCHORAGES

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

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



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

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

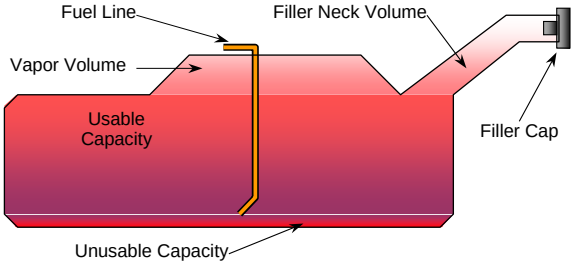
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	45.0
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	41.4 to 42.4
Actual Amount of Solvent used	41.9
1/3 of Usable Capacity	15.0

FUEL PUMP

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

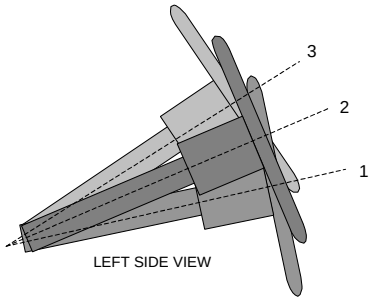
The vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel when the ignition key is the "ON" position. The fuel pipe is on the right side.



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.



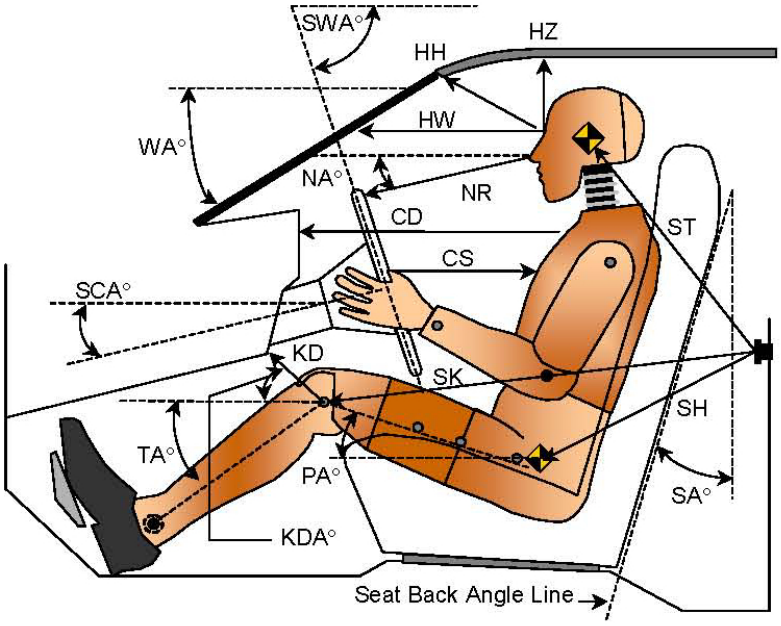
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITION

	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	66.9	
Geometric Center – Position 2	64.1	
Uppermost – Position 3	61.3	
Telescoping Steering Wheel Travel		
Test Position	64.1	

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012



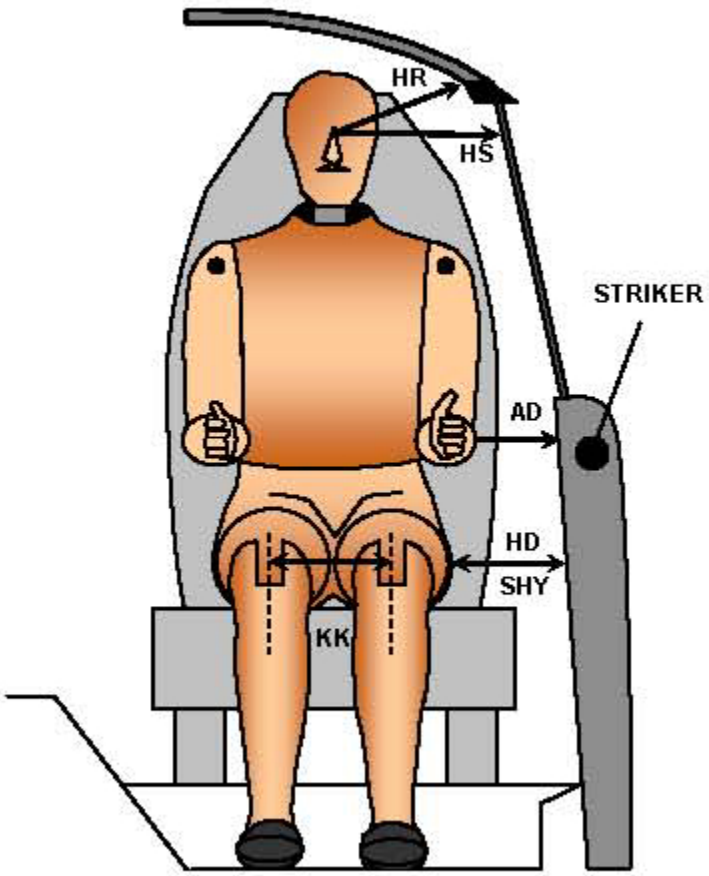
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N 351		Passenger S/N 634	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		27.8		
SWA°	Steering Wheel Angle		64.1		
SCA°	Steering Column Angle		25.9		
SA°	Seat Back Angle (on headrest post)		1.0		-1.2
HZ	Head to Roof (Z)	206	90	219	90
HH	Head to Header	328	19.6	271	45.9
HW	Head to Windshield	613	0	597	0
NR	Nose to Rim	390	15.9		
CD	Chest to Dash	505		374	
CS	Chest to Steering Hub	292	4.8		
RA	Rim to Abdomen	179	0		
KDL	Left Knee to Dash	128	37.0	83	32.7
KDR	Right Knee to Dash	139	39.3	86	35.8
PA°	Pelvic Angle		24.2		20.3
TA°	Tibia Angle		51.4		52.6
SK	Striker to Knee	579	87.6	700	93.4
ST	Striker to Head	518	10.6	488	26.5
SH	Striker to H-Point	275	121.8	402	109.6

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5208
Test Date: 01/18/2012

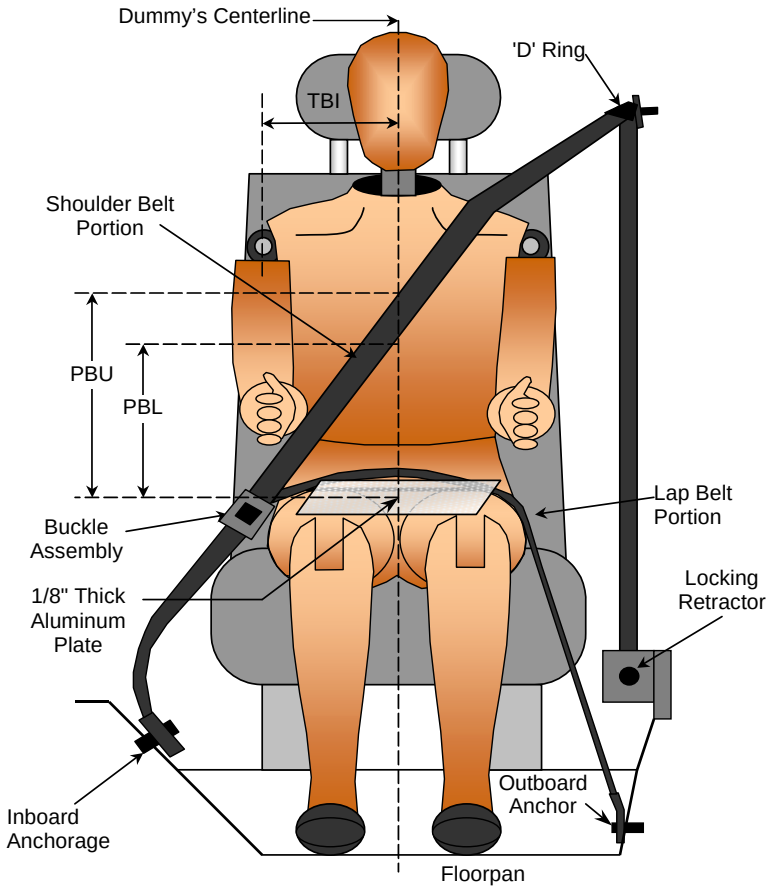


FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 351	Passenger S/N 634
		Length (mm)	
AD	Arm to Door	74	142
HD	H-Point to Door	138	195
HR	Head to Side Header	206	241
HS	Head to Side Window	290	328
KK	Knee to Knee	290	220
SHY	Striker to H-Point (Y Direction)	332	315
AA	Ankle to Ankle	290	148

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	340	270
PBL - Top surface of reference to belt lower edge	mm	265	180

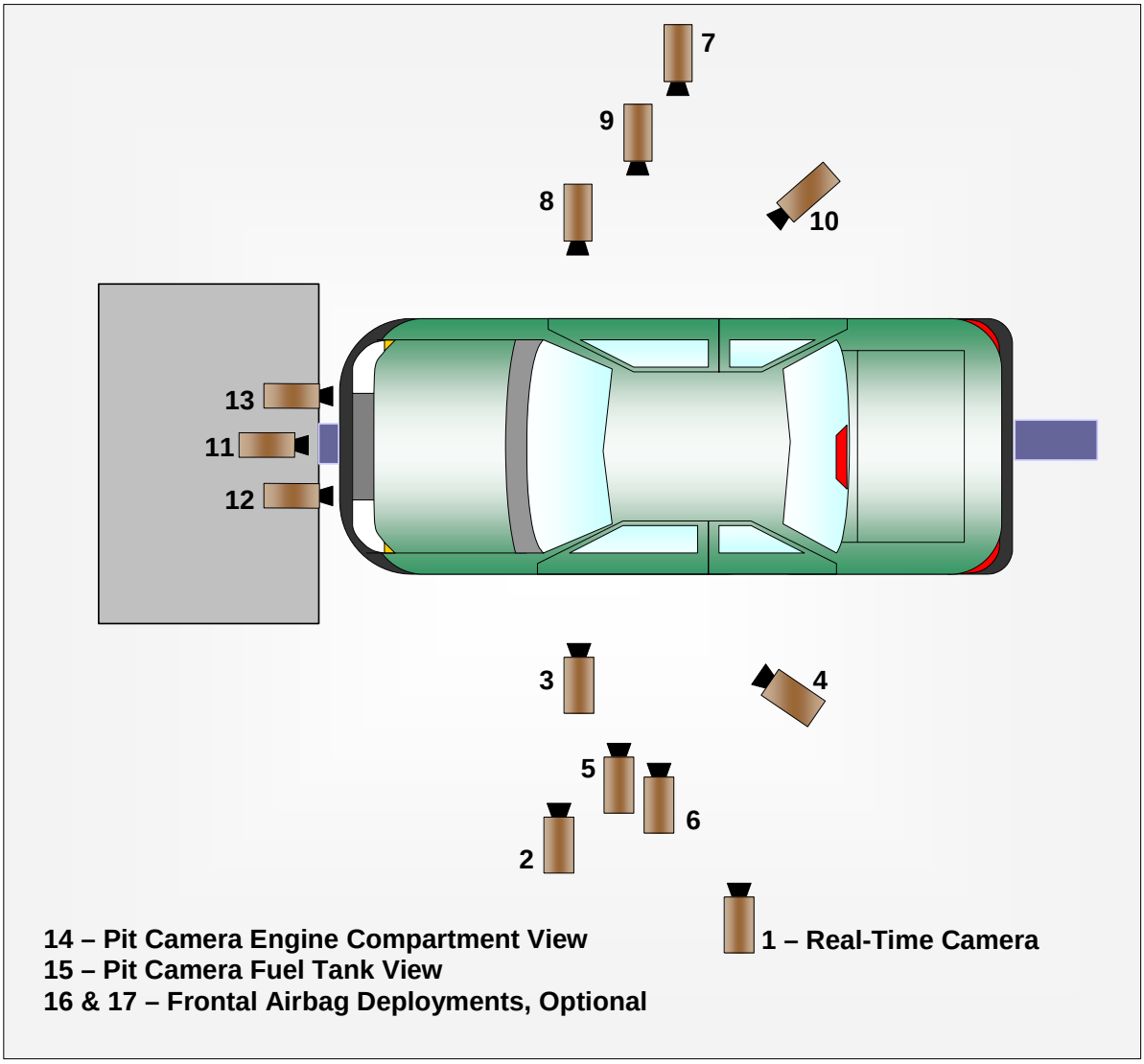
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	903	915
Lap Belt Length as measured on ATD	mm	940	980
Remainder of belt on reel	mm	1457	1385
Total Belt Length for Continuous Webbing Systems	mm	3300	3280

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

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

1 – Real-Time Camera

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

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

CAMERA LOCATIONS

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1380	-6280	-1830	35	1000
3	Left Front Half	1050	-4700	-1060	24	1000
4	Left Angle	5490	-4900	-1920	50	1000
5	Steering Column - Top	480	-5210	-1230	24	1000
6	Steering Column - Bottom	490	-5200	-830	24	1000
7	Right Overall	1990	5990	-1070	20	1000
8	Passenger Close-Up	1490	6360	-1830	35	1000
9	Right Front Half	1210	4770	-1080	24	1000
10	Right Angle	5710	4700	-1930	50	1000
11	Windshield	-130	0	-2810	24	1000
12	Driver Windshield	250	-450	-2030	12.5	1000
13	Passenger Windshield	250	450	-2030	12.5	1000
14	Pit Front	1040	0	3150	24	1000
15	Pit Rear	2830	0	3150	24	1000
16	Onboard Driver Side (optional)					
17	Onboard Passenger Side (optional)					
18	Real-Time Pan View					30

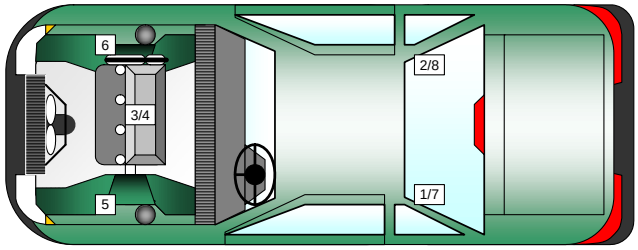
*COORDINATES:

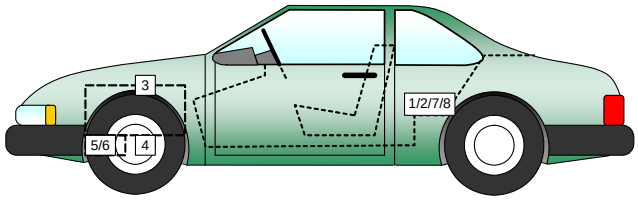
+X = forward of impact plane
+Y = right of monorail centerline
+Z = below ground level

Cameras 16 & 17 were not used for this test.

DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012





VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1438	-416	-270
2	Right Rear Accelerometer – X Direction	1438	418	-270
3	Engine Top X	3552	0	-934
4	Engine Bottom X	3387	95	-282
5	Left Brake Caliper X	3391	-700	-238
6	Right Brake Caliper X	3391	700	-238
7	Left Rear Accelerometer Redundant – X Direction			
8	Right Rear Accelerometer Redundant – X Direction			

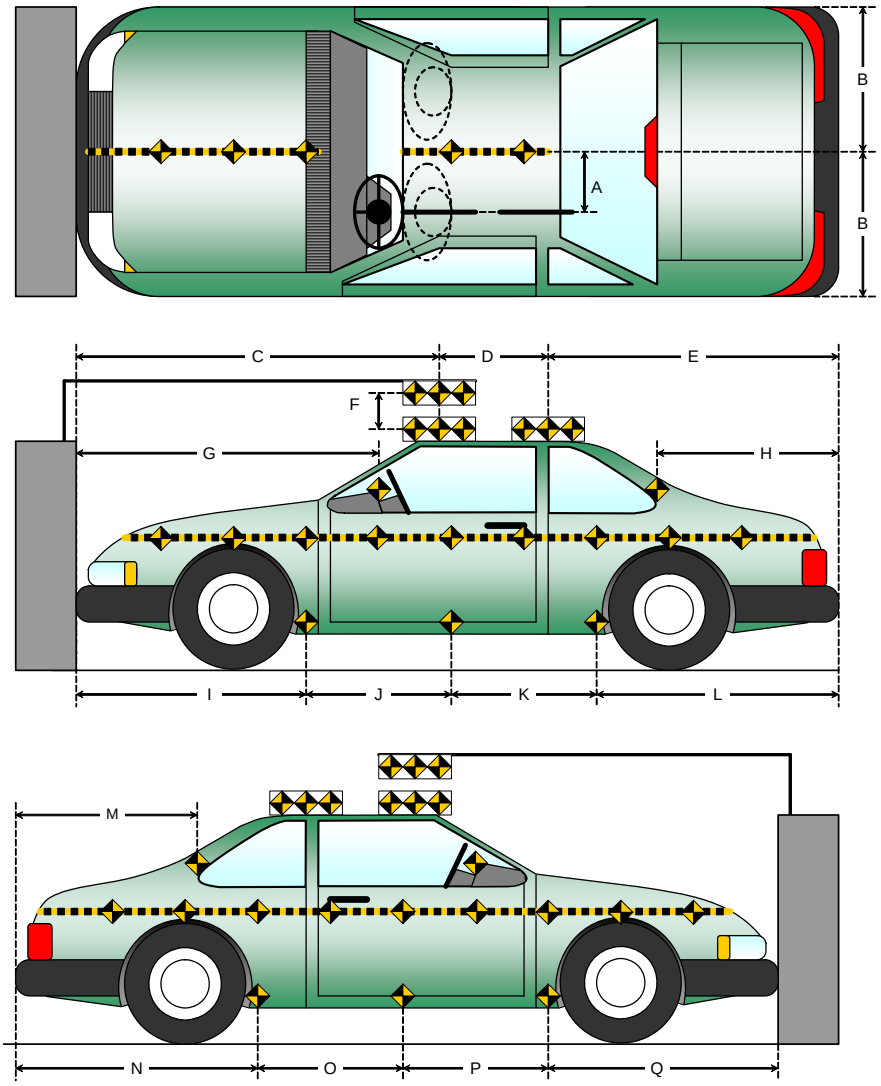
Reference Points: X - Rear Surface of Vehicle (+ forward)
Y - Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5208
Test Date: 01/18/2012

Item	Value (mm)
A	328
B	864
C	2160
D	675
E	1287
F	60
G	
H	959
I	1264
J	840
K	840
L	1178
M	959
N	1178
O	840
P	840
Q	1264



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MC5208
Test Date: 01/18/2012

Advanced Research Load Cell Barrier

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

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

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

INSTRUMENTATION

Driver Dummy Data Channels	46
Passenger Dummy Data Channels	46
Vehicle Structure Accelerometers	8
Barrier Channels	0
Total	100

CAMERA COVERAGE

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

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

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

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

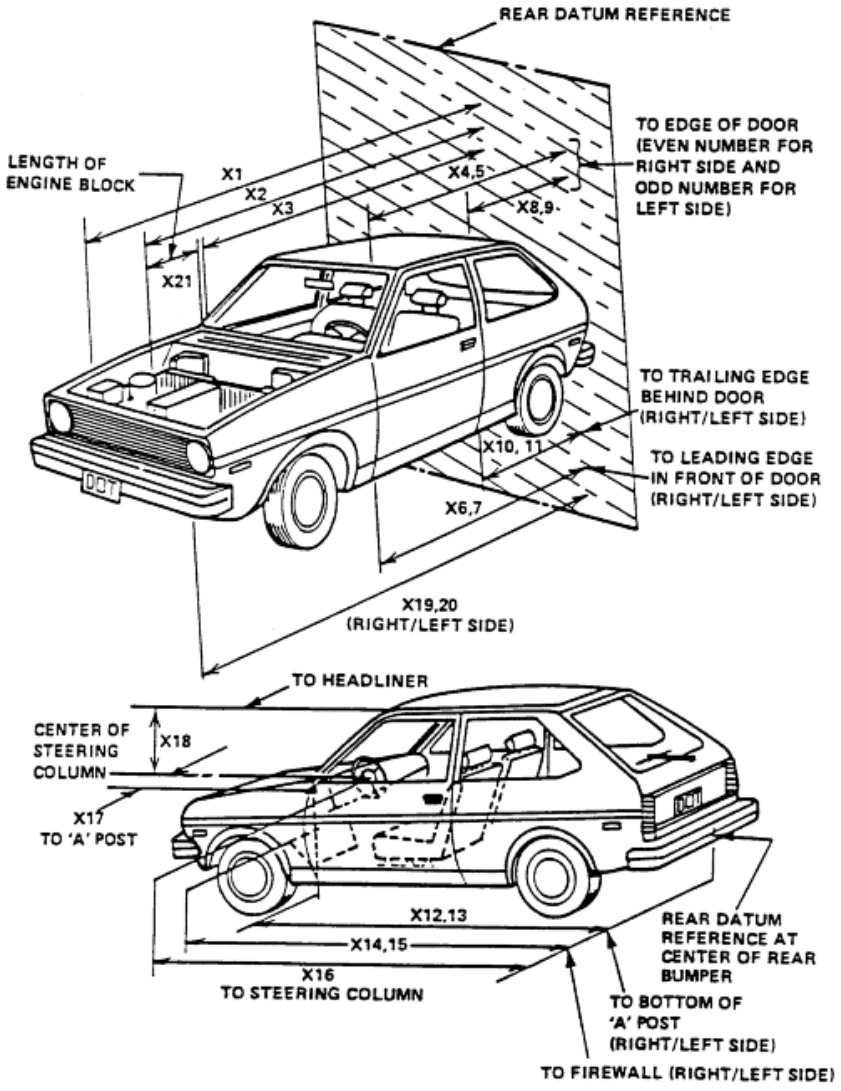
Measured Parameter	Units	Value
Left Side	mm	2565
Center	mm	2530
Right Side	mm	2522
Average	mm	2539

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2012 Nissan Juke S AWD SUV	NHTSA No.:	MC5208
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	01/18/2012



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

RSOV (Rear Surface of Vehicle)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4122	3656	466
2	RSOV to Front of Engine	mm	3642	3434	208
3	RSOV to Firewall	mm	3206	3120	86
4	RSOV to Upper Leading Edge of Right Door	mm	2777	2768	9
5	RSOV to Upper Leading Edge of Left Door	mm	2777	2751	26
6	RSOV to Lower Leading Edge of Right Door	mm	2746	2740	6
7	RSOV to Lower Leading Edge of Left Door	mm	2746	2736	10
8	RSOV to Upper Trailing Edge of Right Door	mm	1681	1674	7
9	RSOV to Upper Trailing Edge of Left Door	mm	1681	1673	8
10	RSOV to Lower Trailing Edge of Right Door	mm	1722	1710	12
11	RSOV to Lower Trailing Edge of Left Door	mm	1722	1705	17
12	RSOV to Bottom of “A” Post of Right Side	mm	2825	2809	16
13	RSOV to Bottom of “A” Post of Left Side	mm	2825	2806	19
14	RSOV to Firewall, Right Side	mm	3184	3033	151
15	RSOV to Firewall, Left Side	mm	3184	3091	93
16	RSOV to Steering Column	mm	2374	2348	26
17	Center of Steering Column to “A” Post	mm	364	334	30
18	Center of Steering Column to Headliner	mm	457	433	24
19	RSOV to Right Side of Front Bumper	mm	3964	3527	437
20	RSOV to Left Side of Front Bumper	mm	3964	3515	449
21	Length of Engine Block	mm	538	538	0
RD	RSOV to Right Side of Dash Panel	mm	2509	2497	12
CD	RSOV to Center of Dash Panel	mm	2542	2538	4
LD	RSOV to Left Side of Dash Panel	mm	2536	2524	12

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

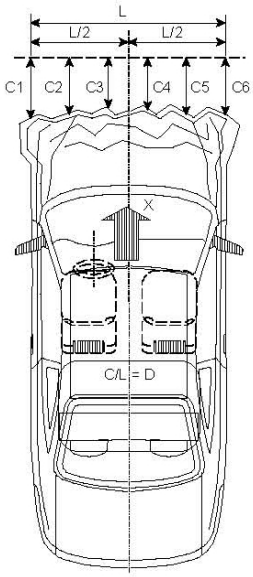
Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

VEHICLE INFORMATION

VIN: JN8AF5MV4CT106612 Wheelbase (mm): 2530
Vehicle Size Category: MPV Test Weight (kg): 1613.5

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 15
Cal. Procedure/Interval: MGA procedure / 6 month
Integration Algorithm: Trapezoidal Linearity: > 99%
Impact Velocity (km/h): 56.4
Velocity Change (km/h): 61.8
Time of Separation (msec): 77.2



CRUSH PROFILE

Collision Deformation Classification: Frontal
Midpoint of Damage: Centerline
Damage Region Length (mm): 1264
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	3964	3515	449
C2	Crush zone 2 at left side	mm	4055	3589	466
C3	Crush zone 3 at left side	mm	4082	3616	466
C4	Crush zone 4 at right side	mm	4082	3615	467
C5	Crush zone 5 at right side	mm	4055	3595	460
C6	Crush zone 6 at right side	mm	3964	3527	437
L	C1 TO C6	mm	1264	1250	14

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

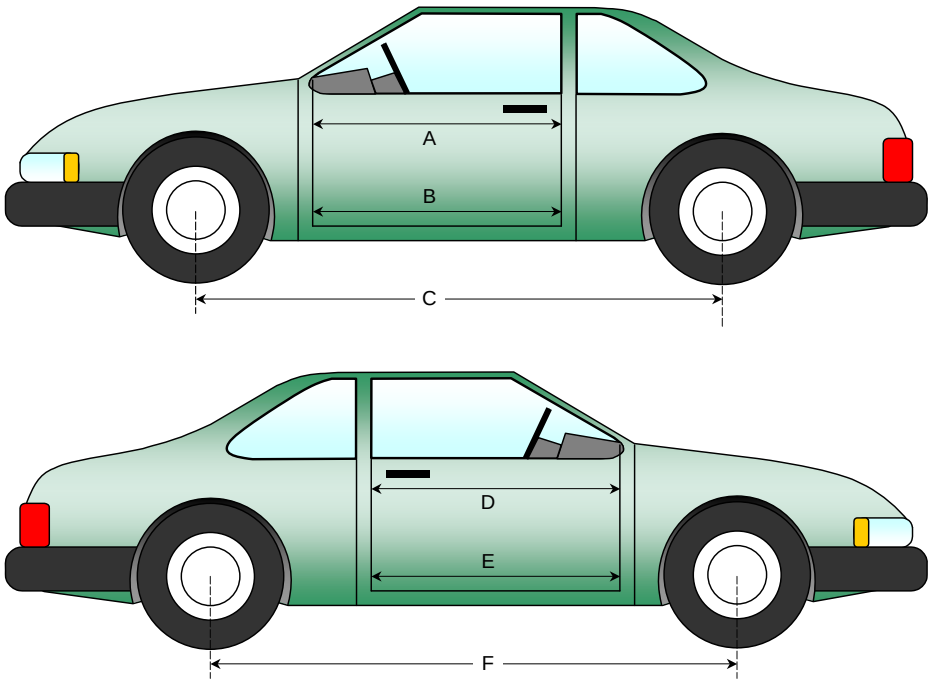
Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1002	1000	2
B	Left Side Lower	mm	942	942	0
D	Right Side Upper	mm	1002	1000	2
E	Right Side Lower	mm	942	942	5

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2530	2500	30
F	Right Side Wheelbase	mm	2530	2492	38



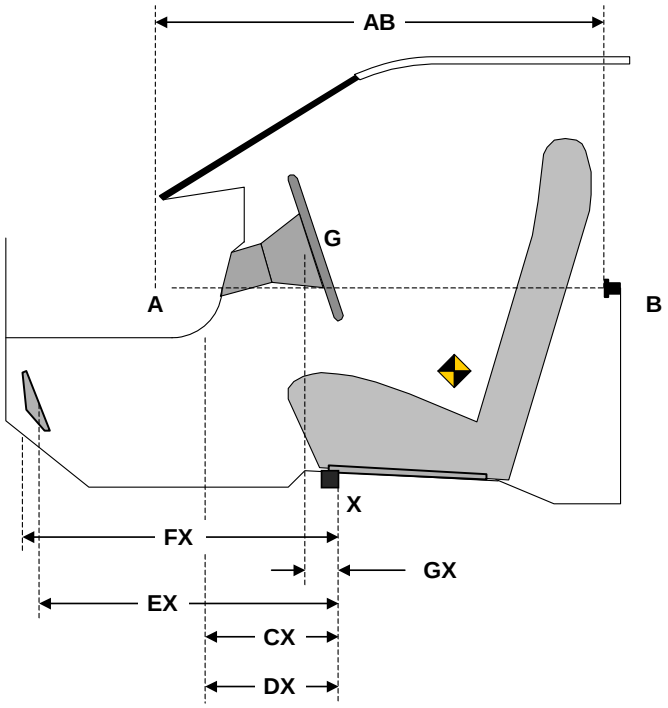
DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	725	722	3
CX	Left Knee Bolster to X	mm	271	297	-26
DX	Right Knee Bolster to X	mm	296	310	-14
EX	Brake Pedal to X	mm	584	590	-6
FX	Foot Rest to X	mm	652	642	10
GX	Center of Steering Column Wheel Hub to X	mm	86	147	-61

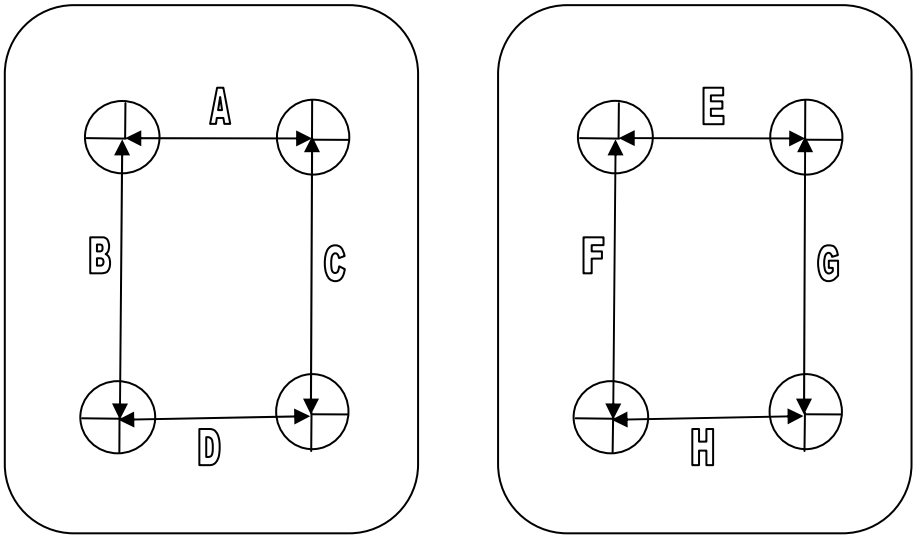
X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012



Driver Passenger

TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	300	300	0
B	mm	300	300	0
C	mm	300	300	0
D	mm	300	300	0
E	mm	300	296	4
F	mm	300	300	0
G	mm	300	300	0
H	mm	300	300	0

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

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

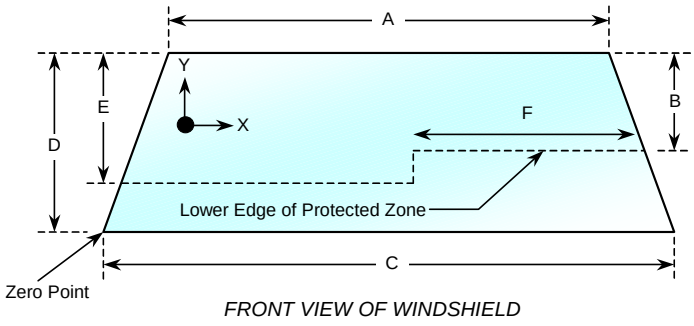
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 21.0°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	1957	1957	100
Right Side	1957	1957	100
Total	3914	3914	100



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1110
B	mm	412
C	mm	1452
D	mm	676
E	mm	452
F	mm	465

AREA OF PROTECTED ZONE FAILURES - NONE

A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield. **None**

X	Y

B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component. **None**

X	Y

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

Test Vehicle: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

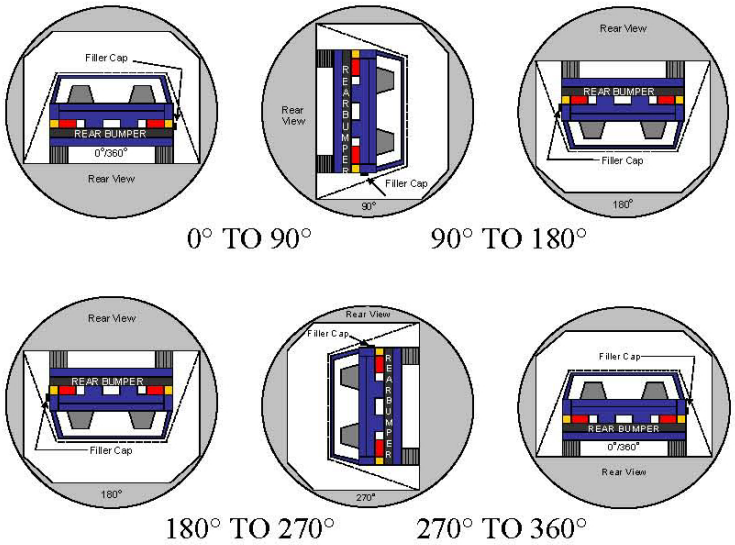
Test Time: 11:00 am Temperature: 21.0° C

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: 2012 Nissan Juke S AWD SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: MC5208
Test Date: 01/18/2012

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	113	300	413
90° to 180°	109	300	409
180° to 270°	105	300	405
270° to 360°	116	300	416

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

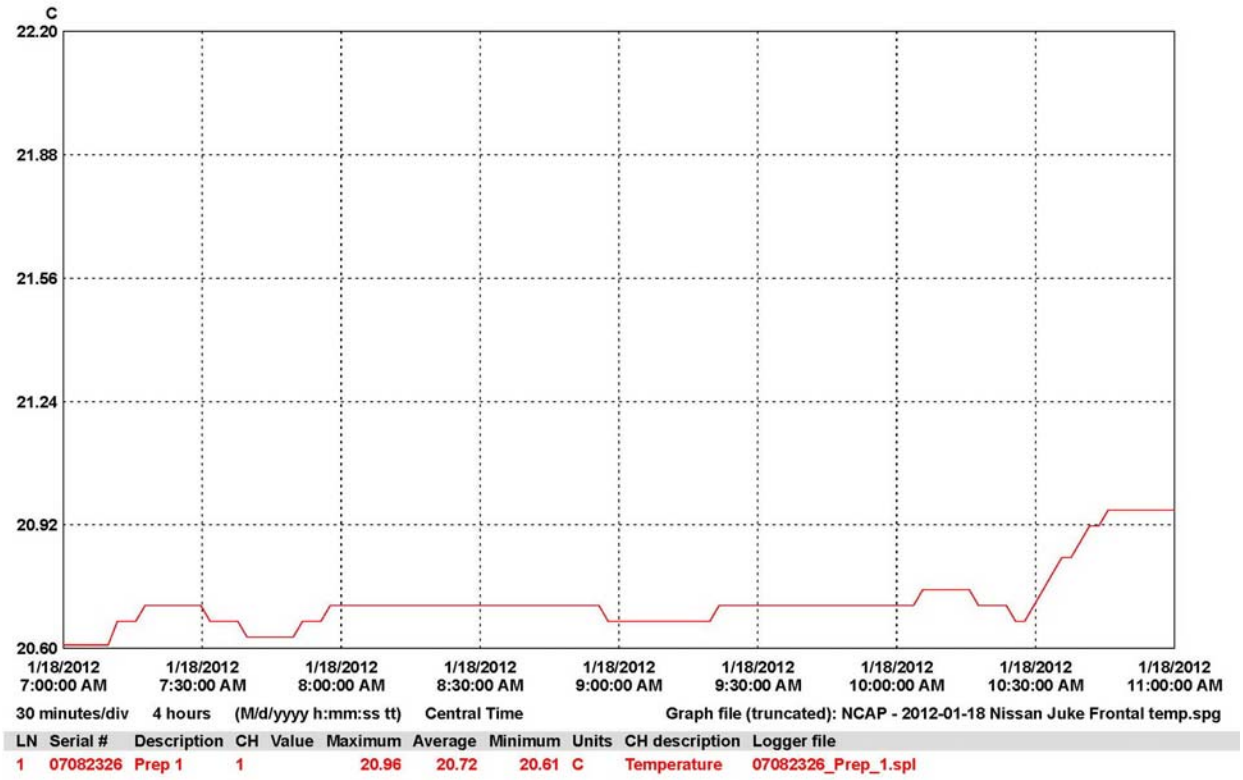
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

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: 2012 Nissan Juke S AWD SUV NHTSA No.: MC5208
Test Program: NCAP Frontal Barrier Impact Test Test Date: 01/18/2012

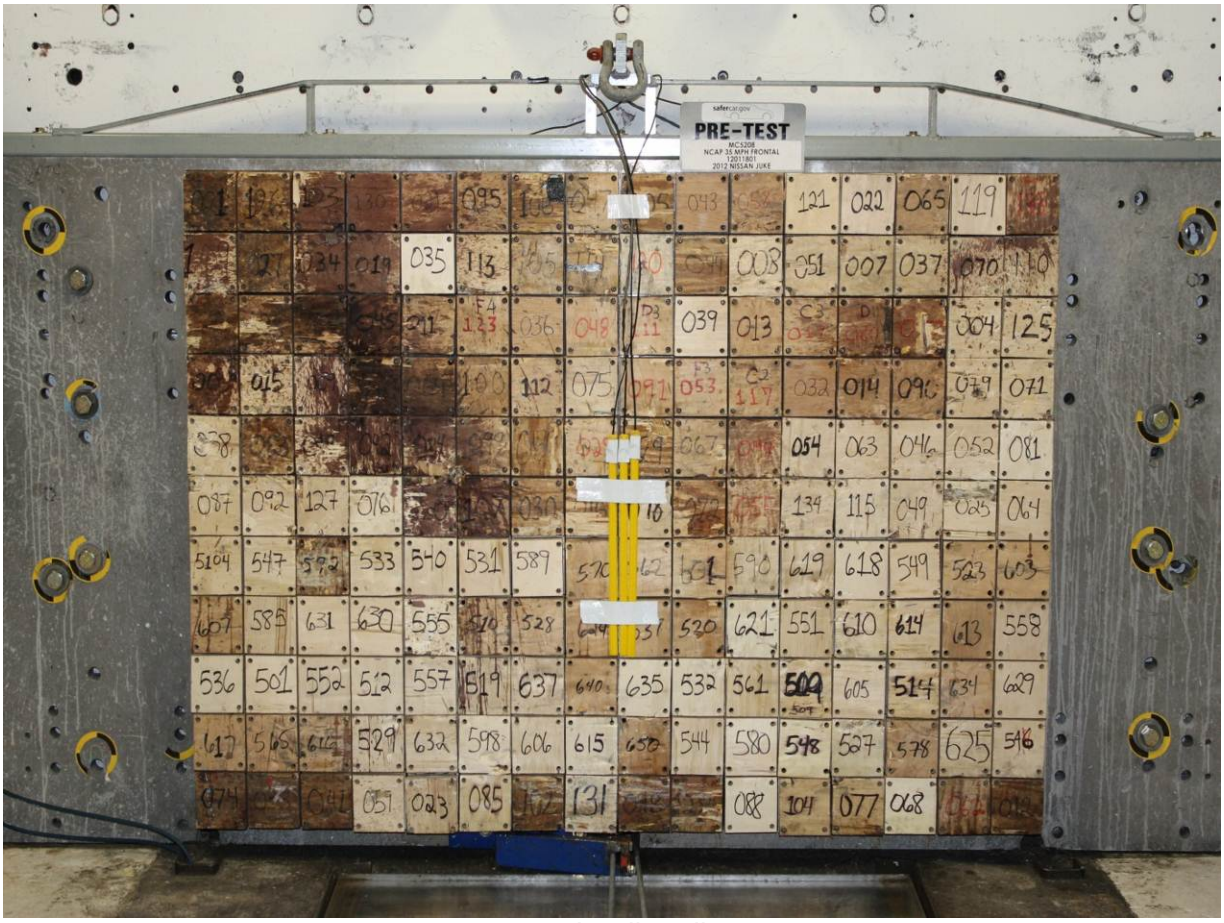


APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Load Cell Location



Load Cell Wall

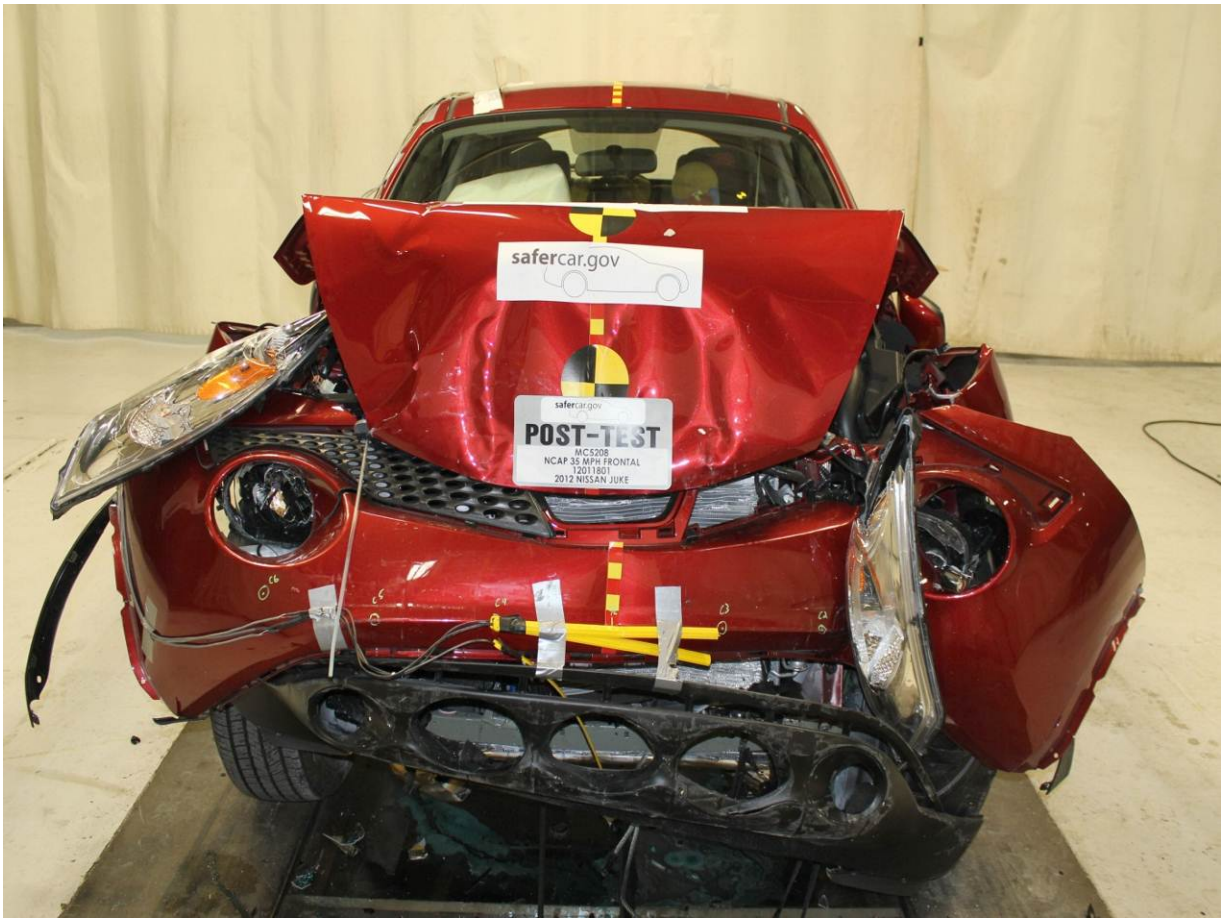
Manufacturer's Label

Tire Placard

2012 Nissan Juke S Frontal As Delivered

Left Rear Three-Quarter View, As Received

Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle

Pre-Test Left View of Test Vehicle

Post-Test Left View of Test Vehicle

Pre-Test Right View of Test Vehicle

Post-Test Right View of Test Vehicle

Pre-Test Right Front Three-Quarter View

Post-Test Right Front Three-Quarter View

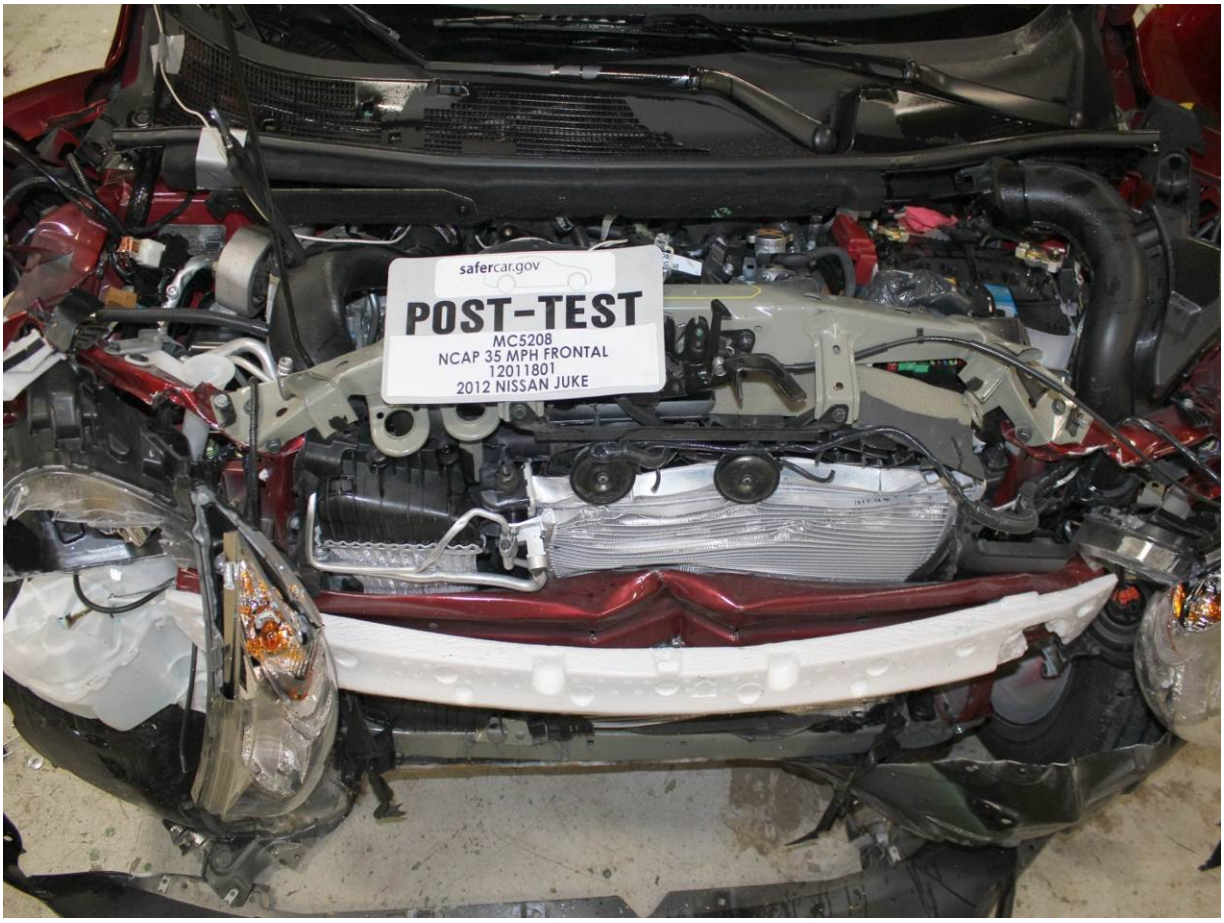
Pre-Test Left Rear Three-Quarter View

Post-Test Left Rear Three-Quarter View

Pre-Test Windshield View

Post-Test Windshield View

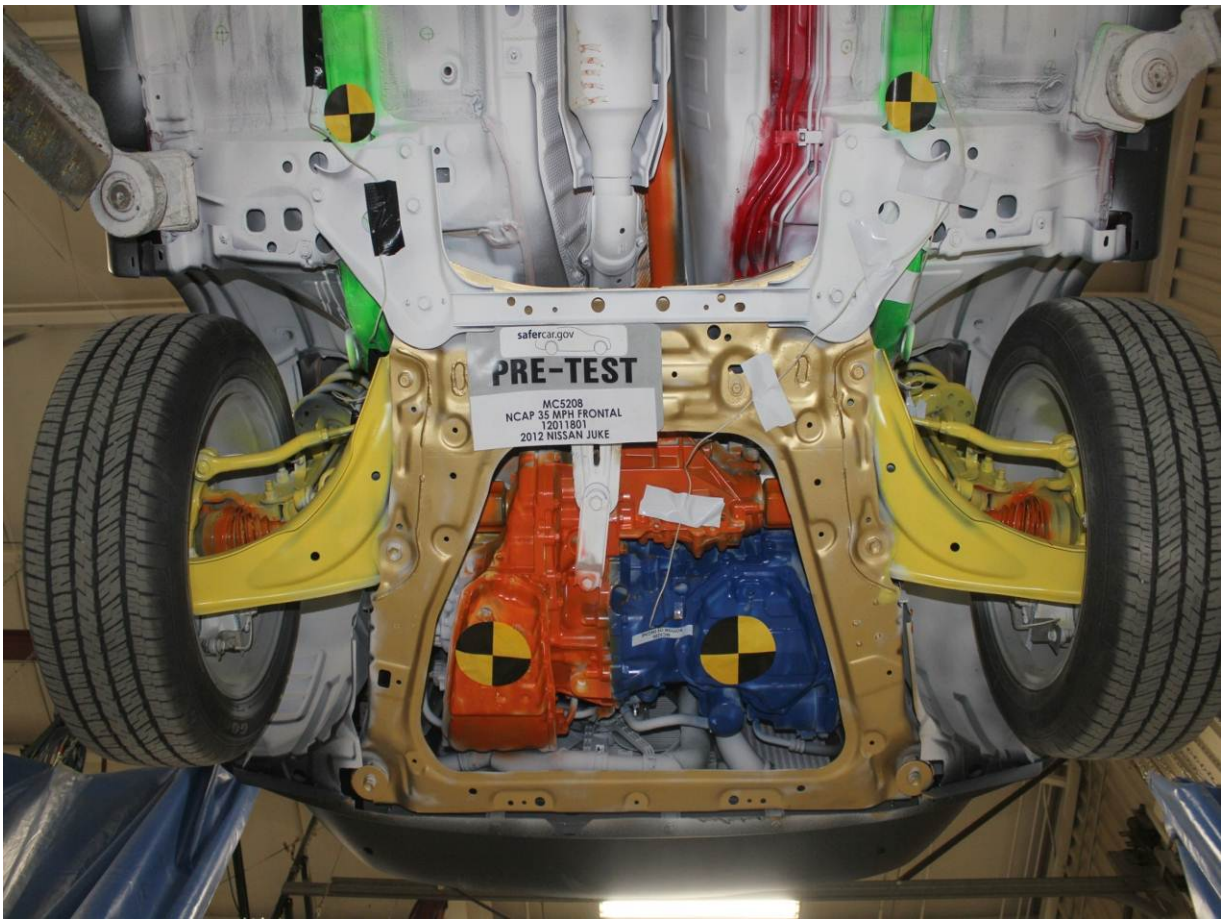
Pre-Test Engine Compartment View



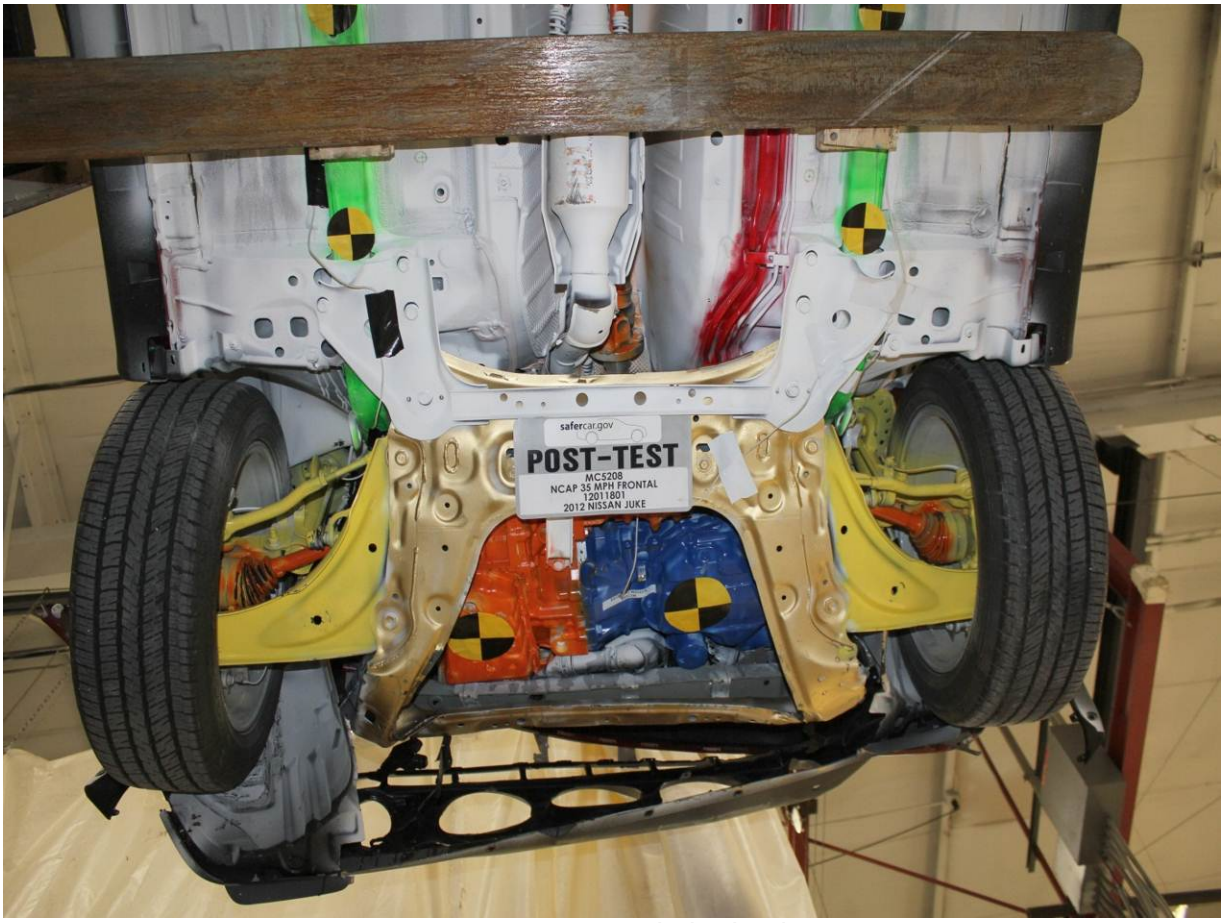
Post-Test Engine Compartment View

Pre-Test Fuel Filler Cap View

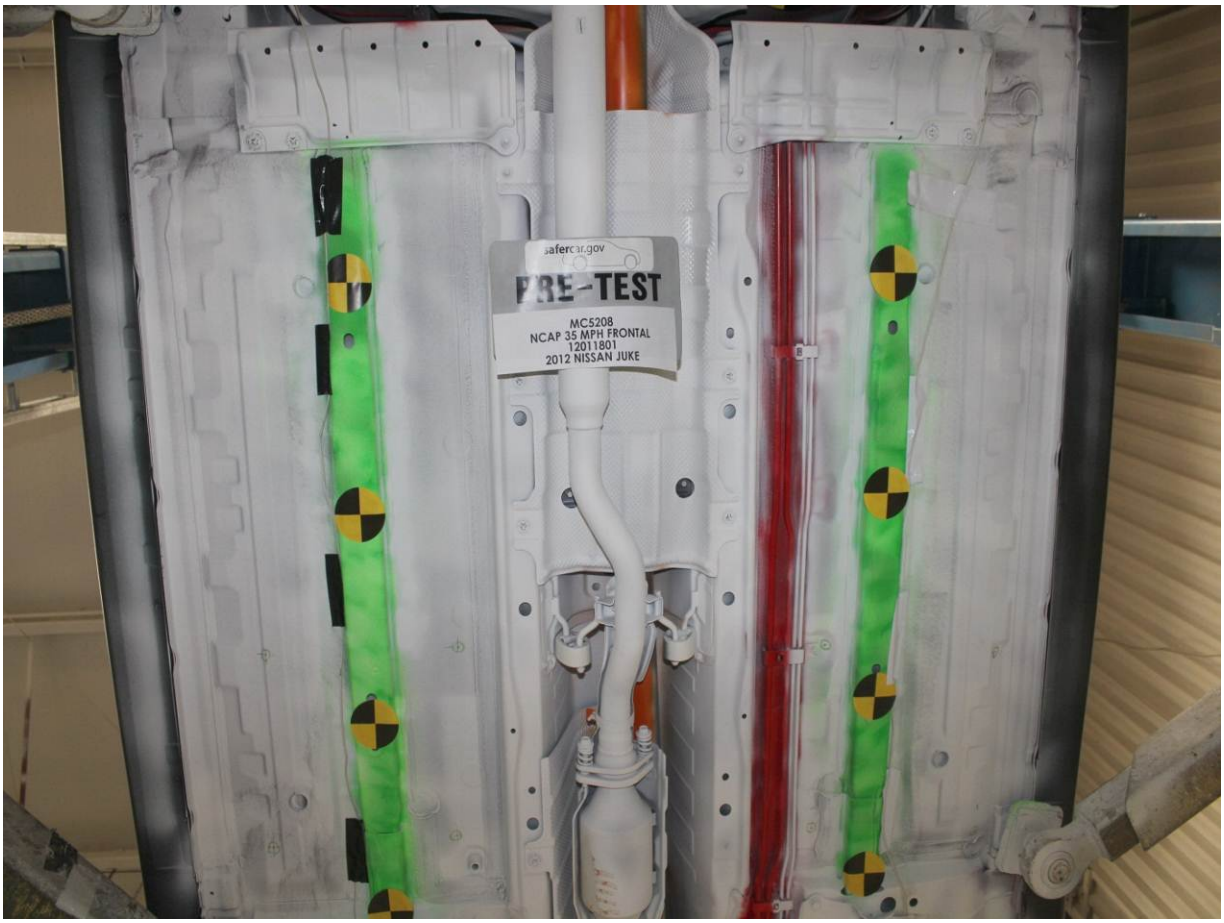
Post-Test Fuel Filler Cap View



Pre-Test Front Underbody View

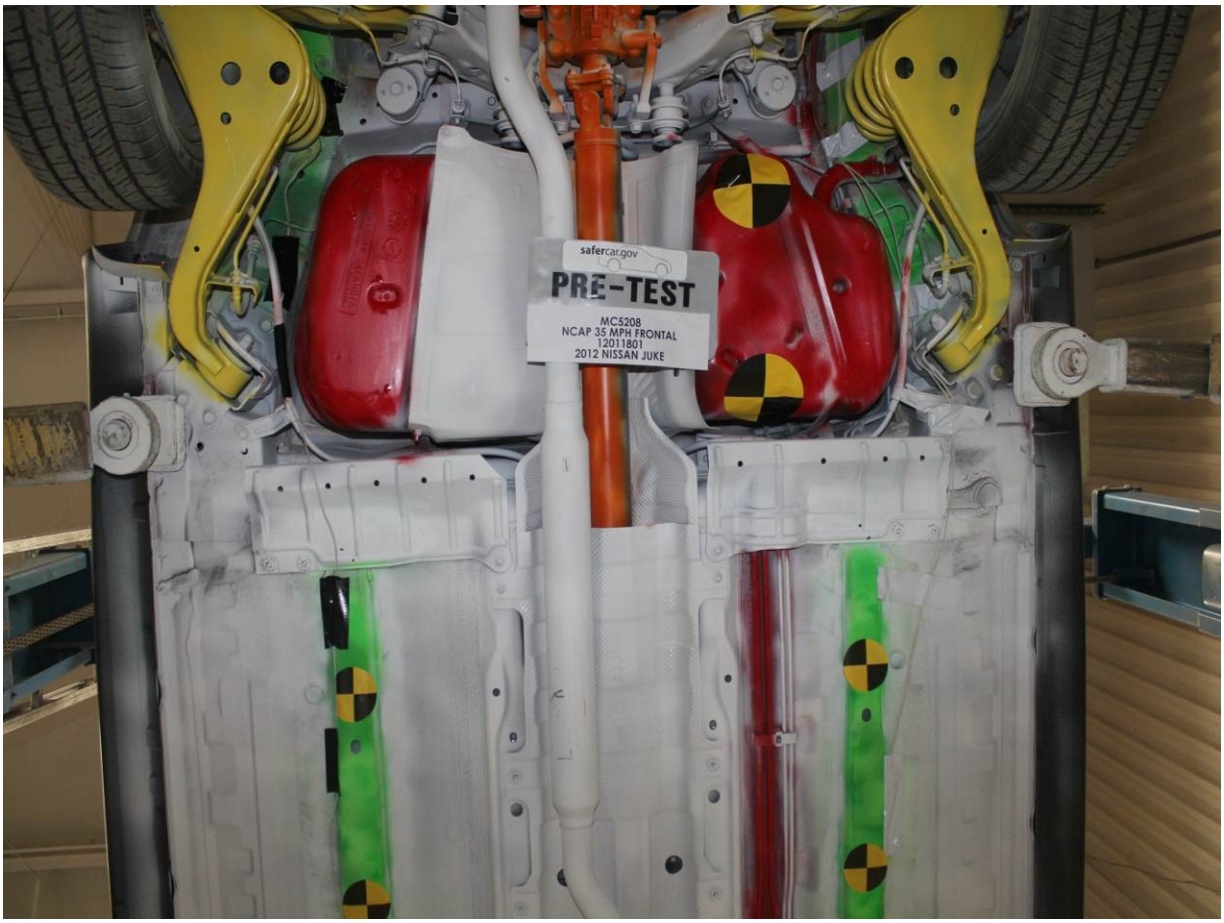


Post-Test Front Underbody View

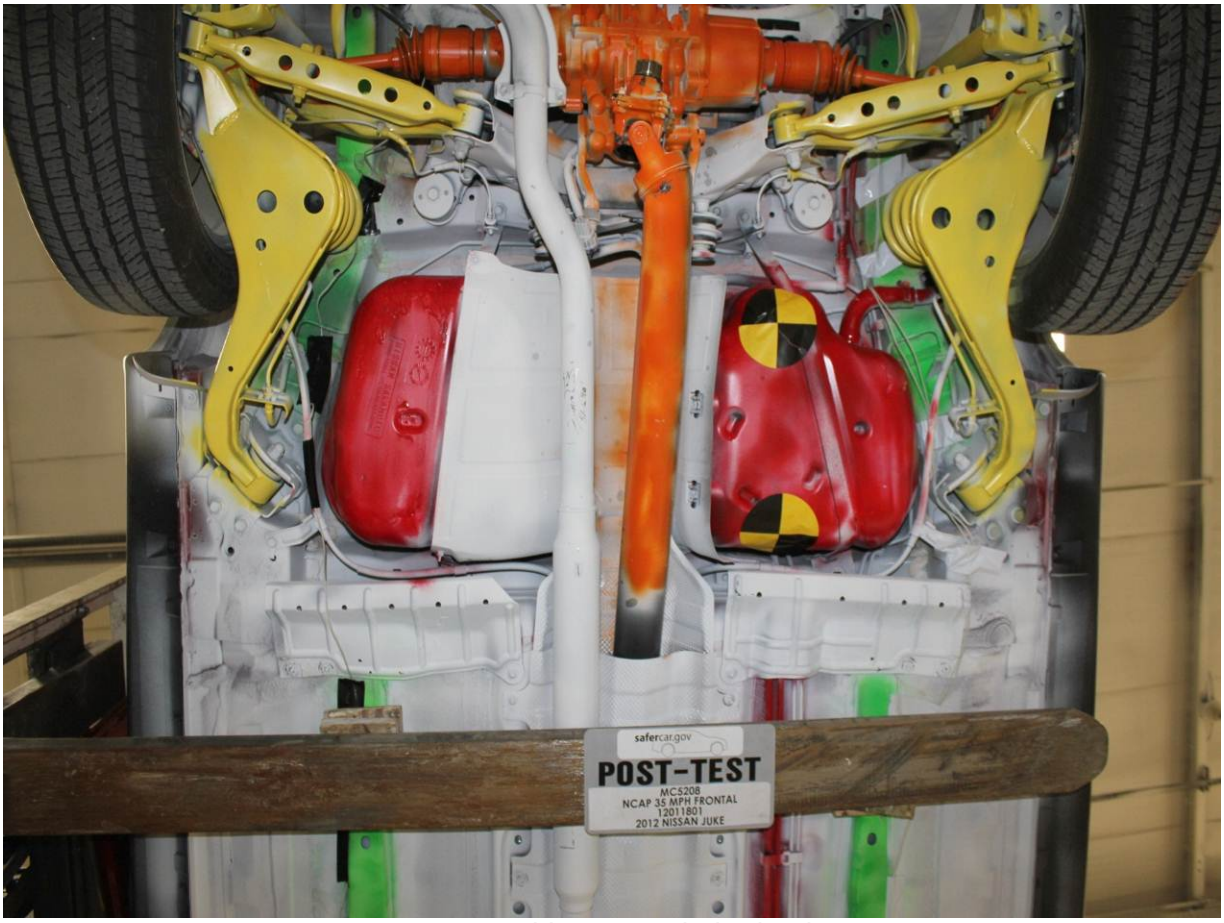


Pre-Test Mid Front Underbody View

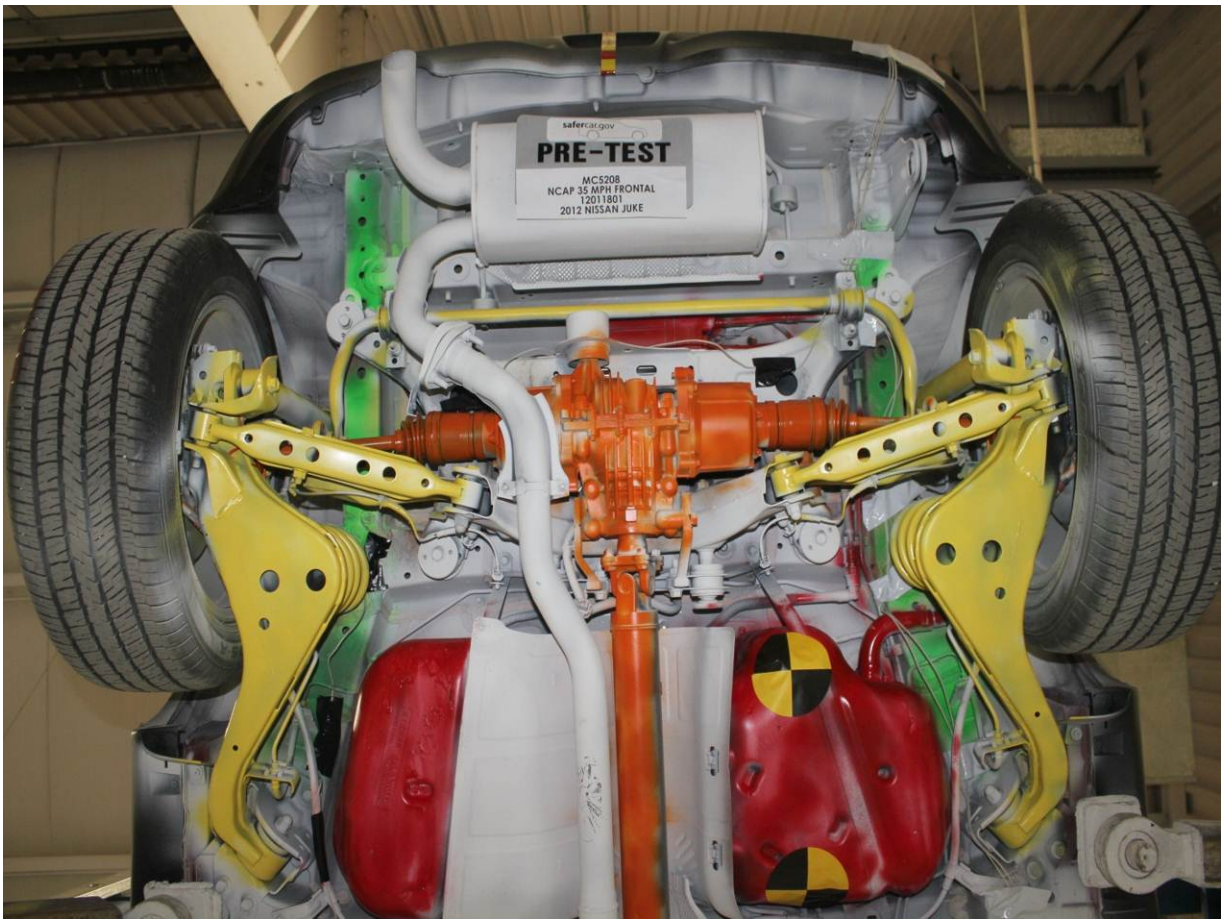
Post-Test Mid Front Underbody View



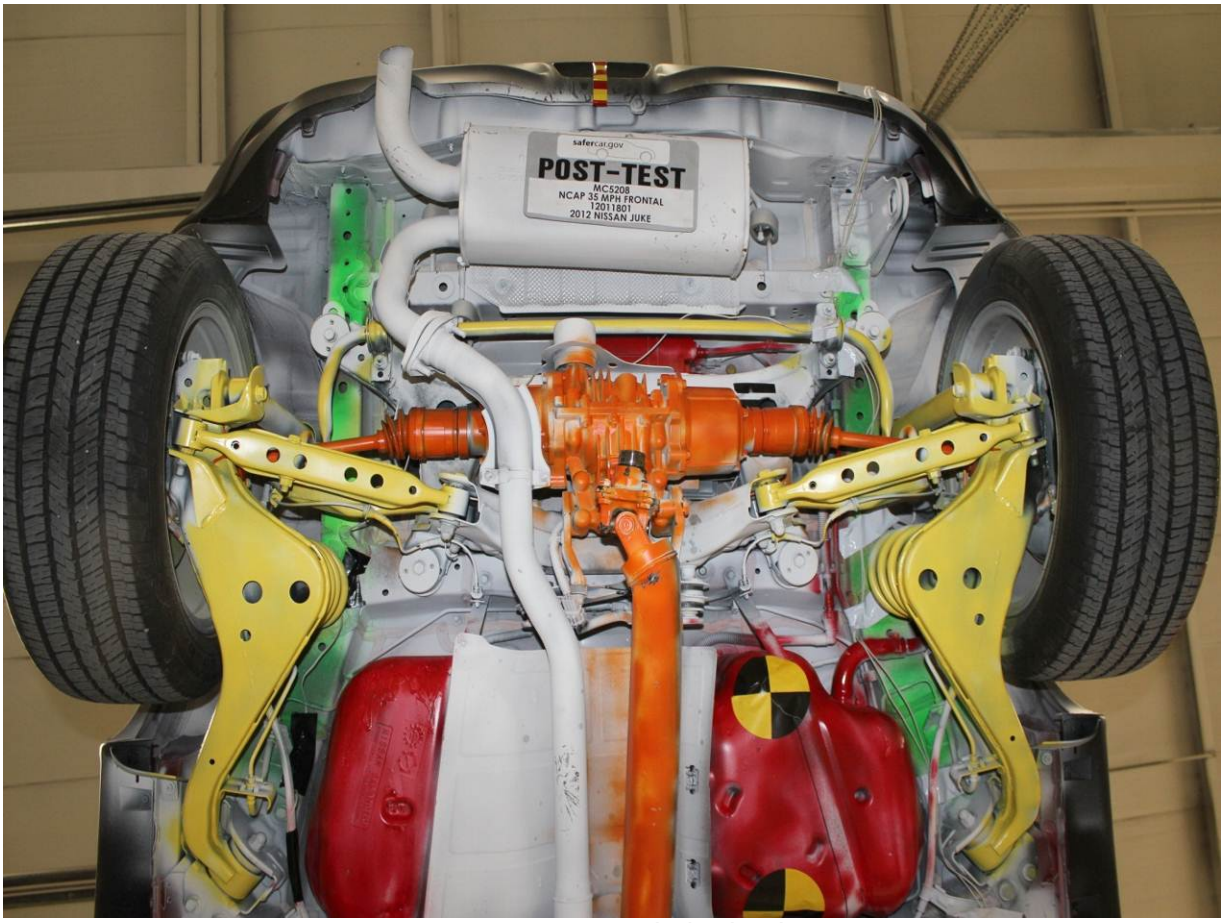
Pre-Test Mid Rear Underbody View



Post-Test Mid Rear Underbody View



Pre-Test Rear Underbody View



Post-Test Rear Underbody View

Pre-Test Dummy Cable Routing

Post-Test Dummy Cable Routing

Pre-Test Driver Dummy Front View

Post-Test Driver Dummy Front View

Pre-Test Driver Dummy Window View

Post-Test Driver Dummy Window View

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

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

Pre-Test Driver's Seat Fore-Aft Markings

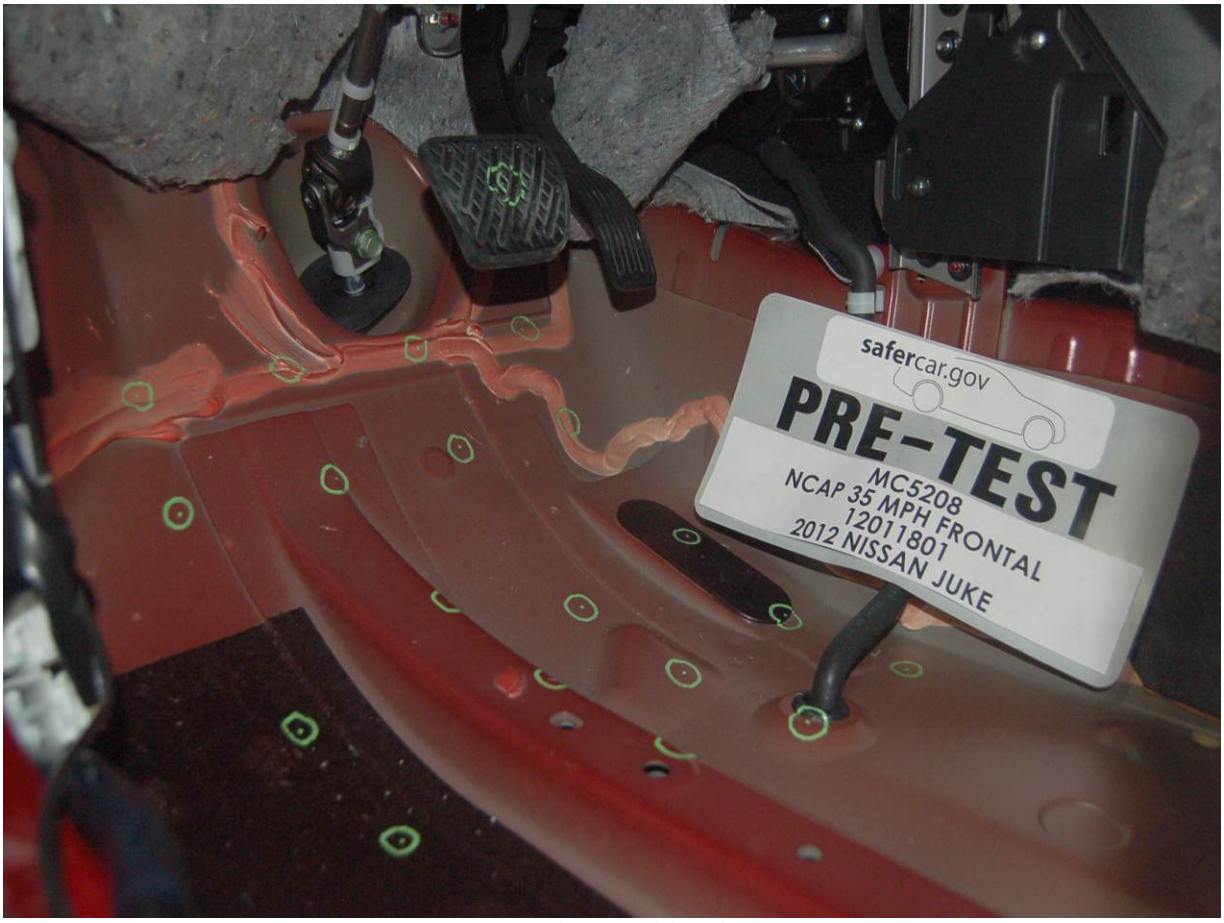
Post-Test Driver's Seat Fore-Aft Markings

Pre-Test Driver Dummy Feet

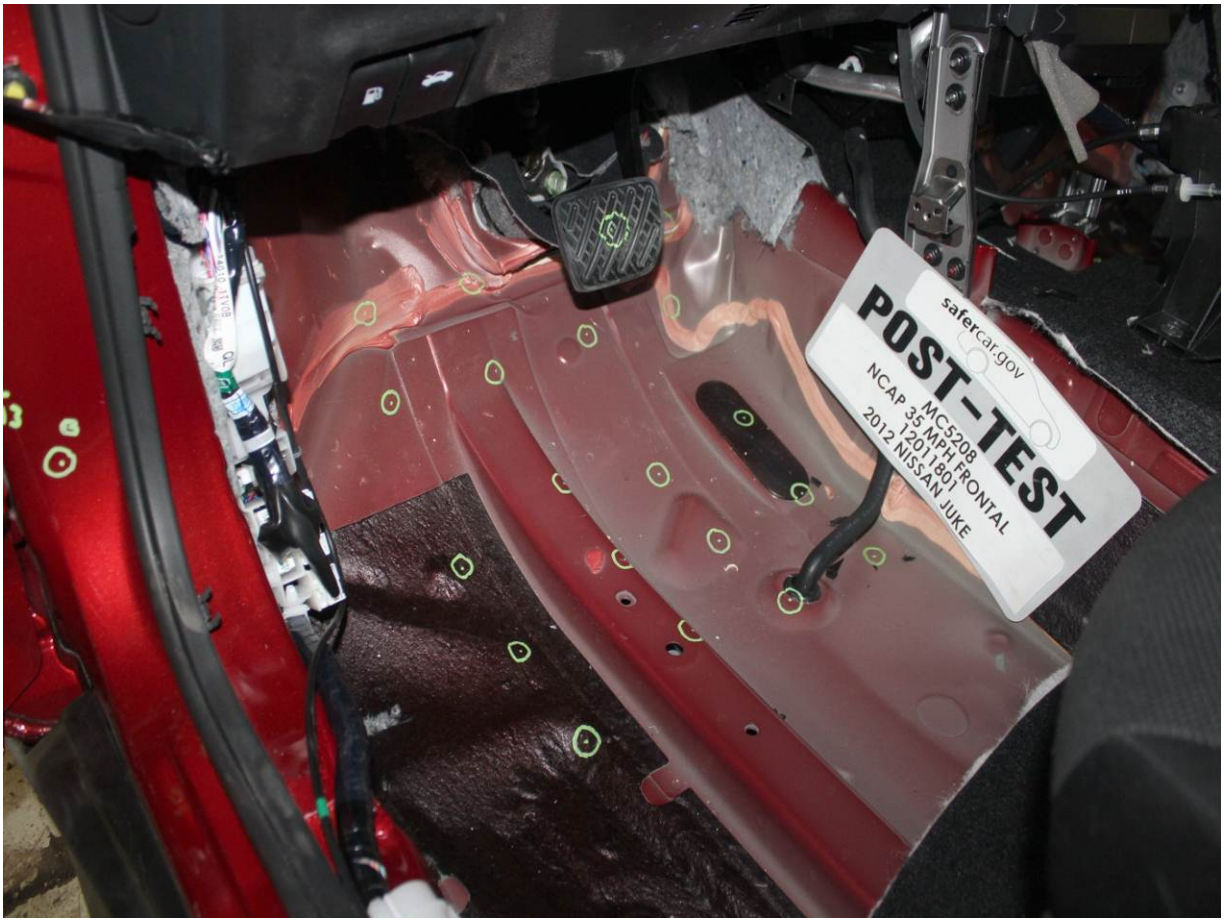
Post-Test Driver Dummy Feet

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

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

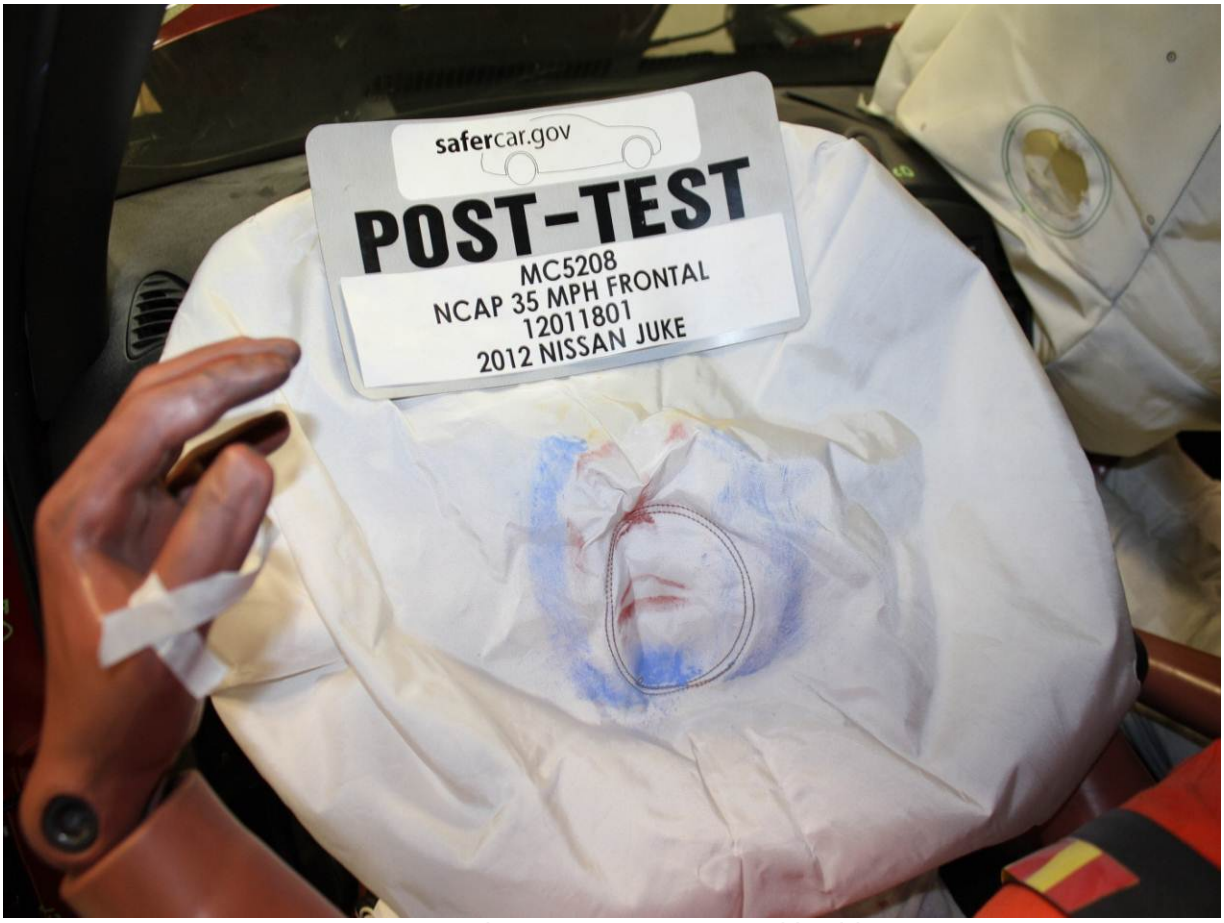


Pre-Test Driver's Side Floorpan



Post-Test Driver's Side Floorpan

Post-Test Driver Dummy Face



Post-Test Driver Dummy Contact with Airbag

Post-Test Driver Dummy Contact with Headrest

Post-Test Driver Dummy Contact with Knee Bolster

Pre-Test View of the Steering Wheel

Post-Test View of the Steering Wheel

Pre-Test Passenger Dummy Front View

Post-Test Passenger Dummy Front View

Pre-Test Passenger Dummy Window View

Post-Test Passenger Dummy Window View

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

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

Pre-Test Passenger's Seat Fore-Aft Markings

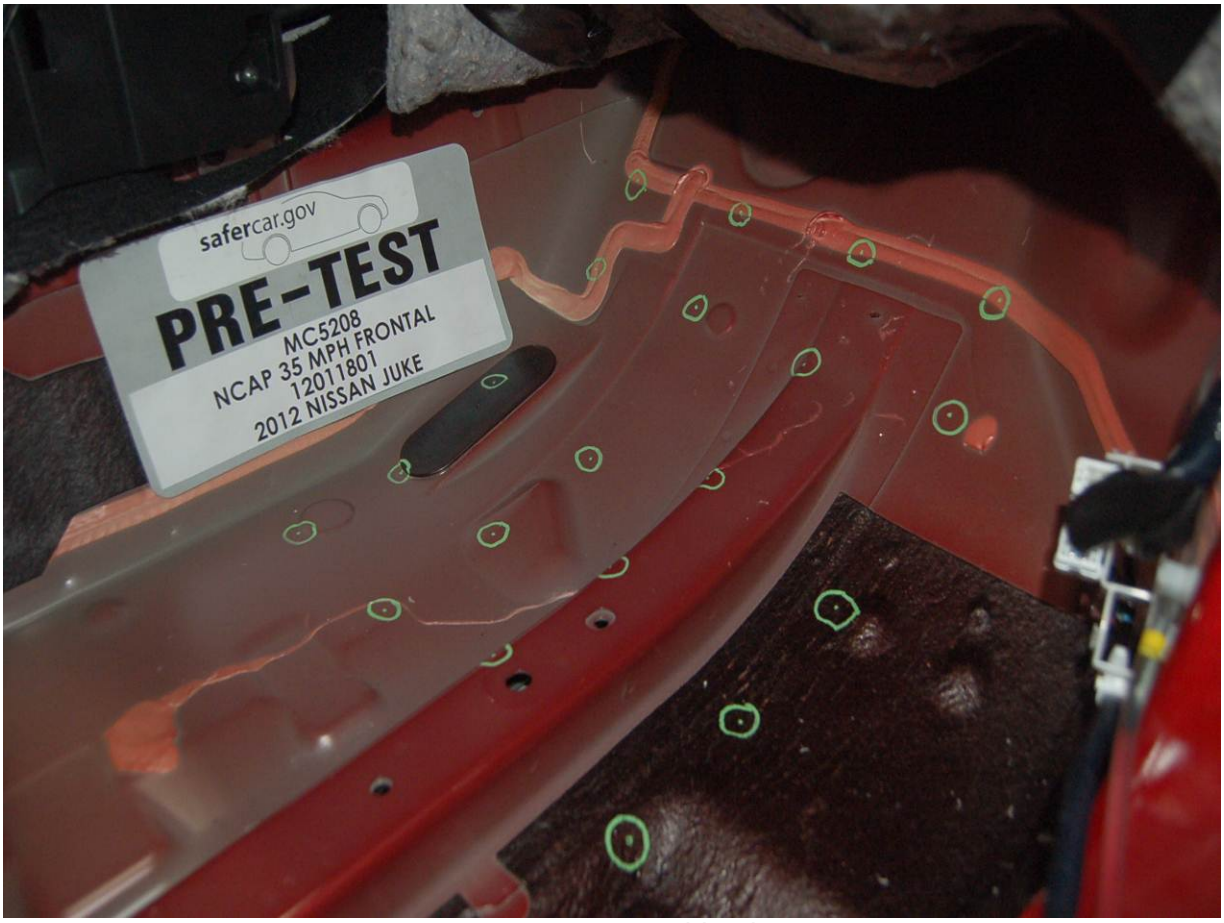
Post-Test Passenger's Seat Fore-Aft Markings

Pre-Test Passenger Dummy Feet

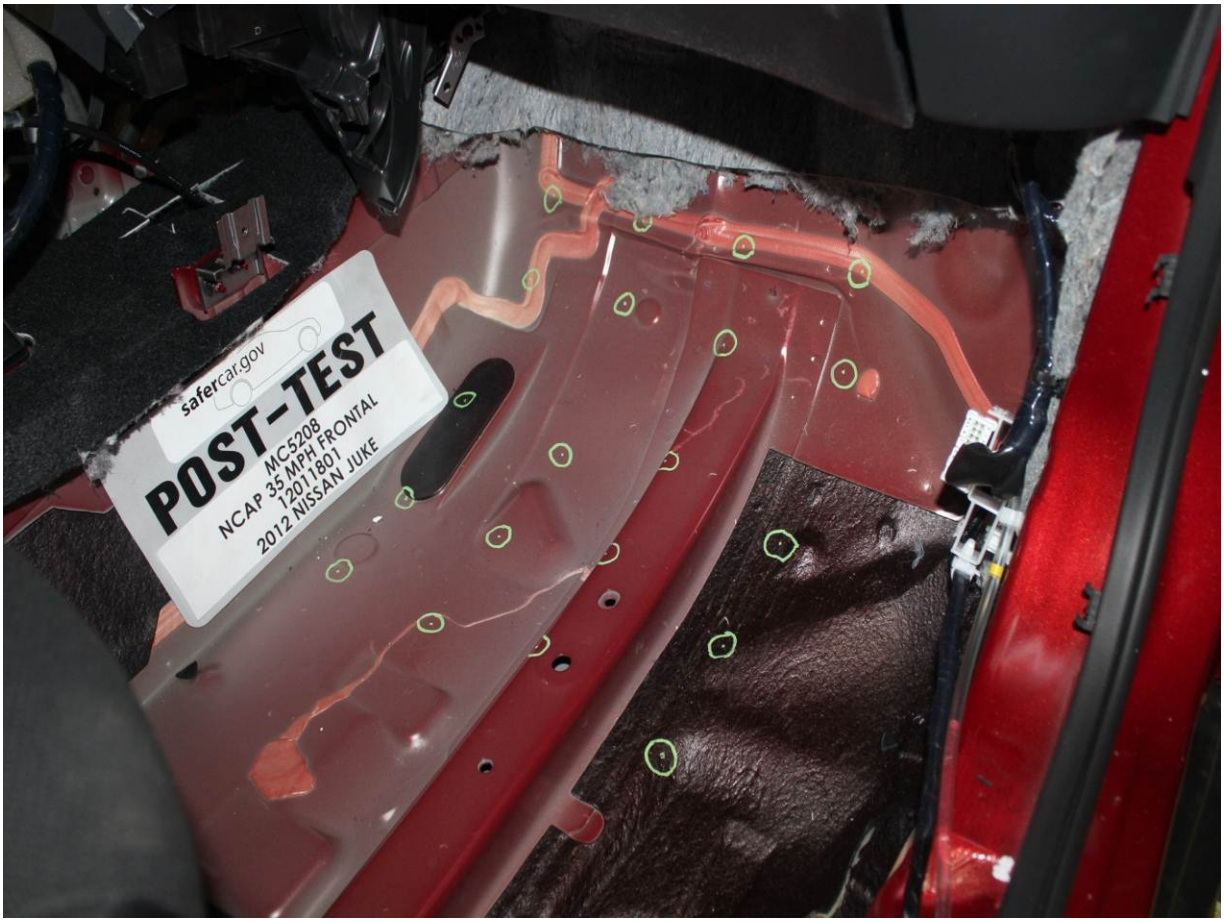
Post-Test Passenger Dummy Feet

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

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



Pre-Test Passenger's Side Floorpan



Post-Test Passenger's Side Floorpan

Post-Test Passenger Dummy Contact with Airbag

Post-Test Passenger Dummy Contact with Headrest

Post-Test Passenger Dummy Contact with Knee Bolster

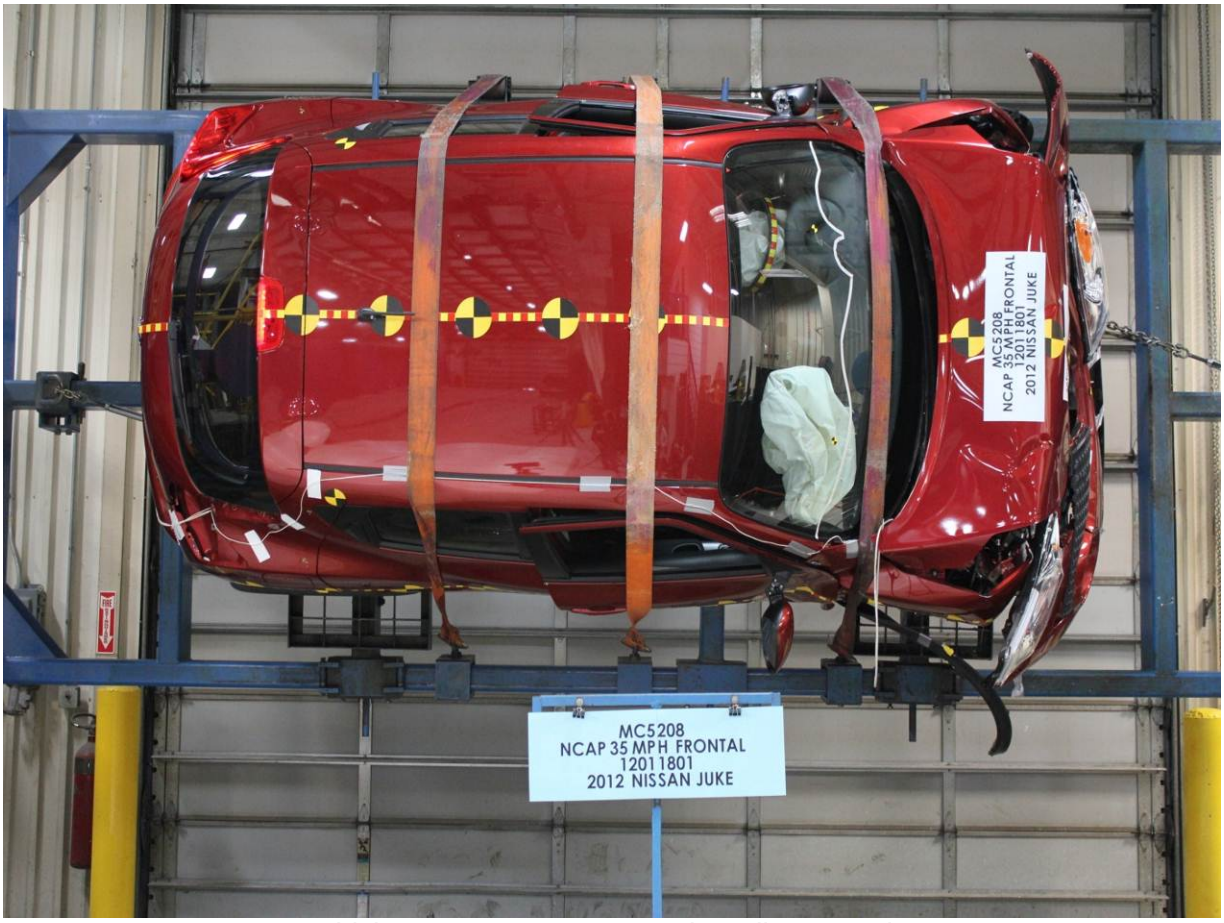
Ballast Installed in Vehicle

PHOTOGRAPH NOT APPLICABLE

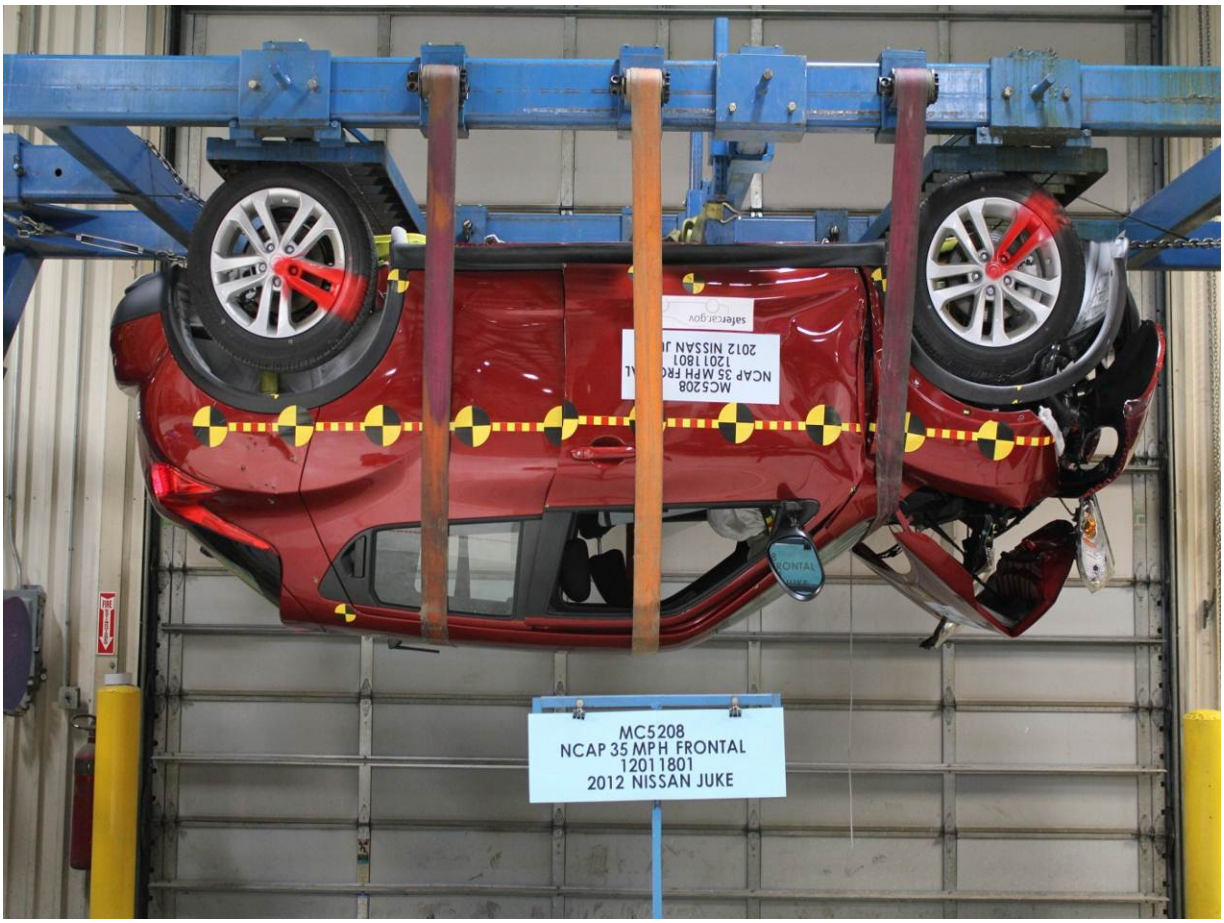
Post-Test Stoddard Solvent Spillage Location View

Post-Test Speed Trap Read-Out

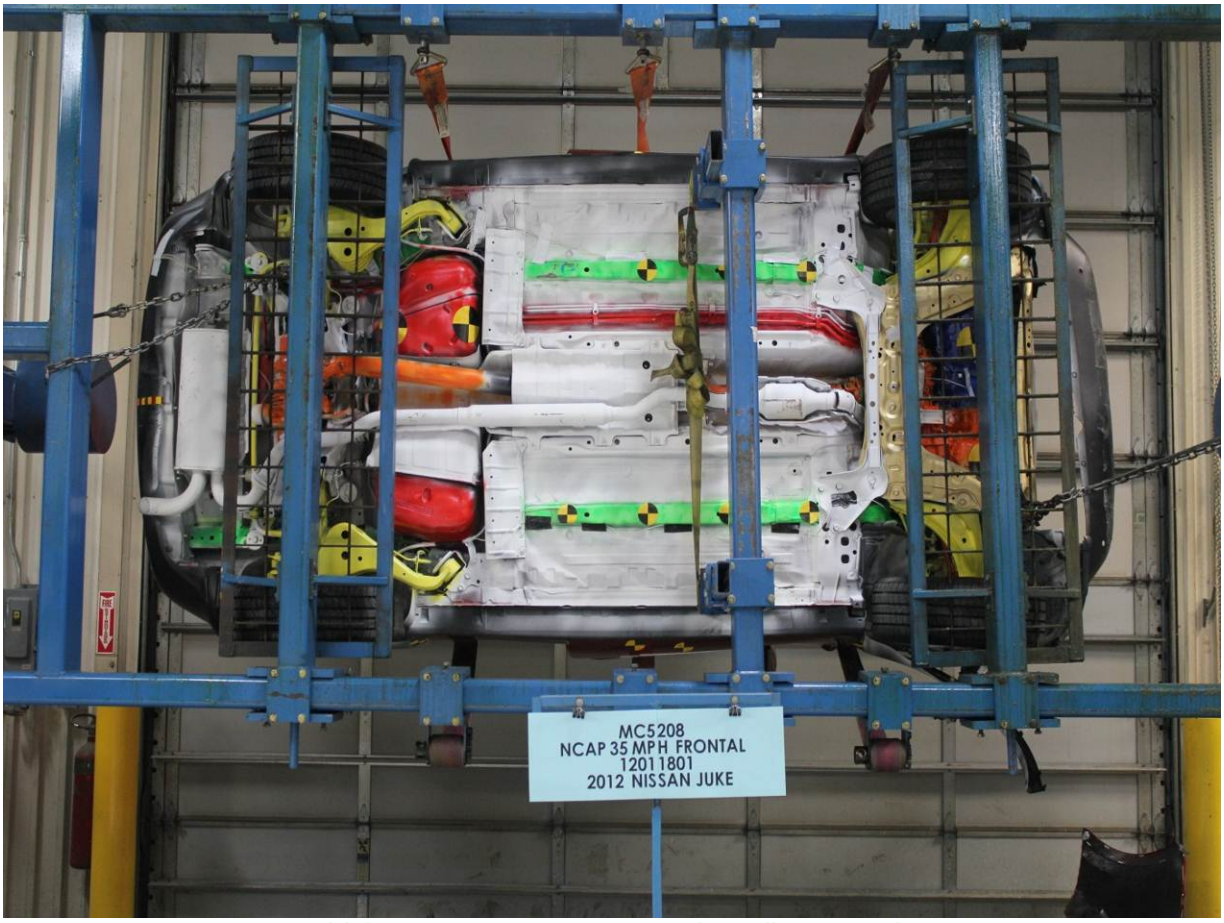
Vehicle at 0 Degrees on Static Rollover Device



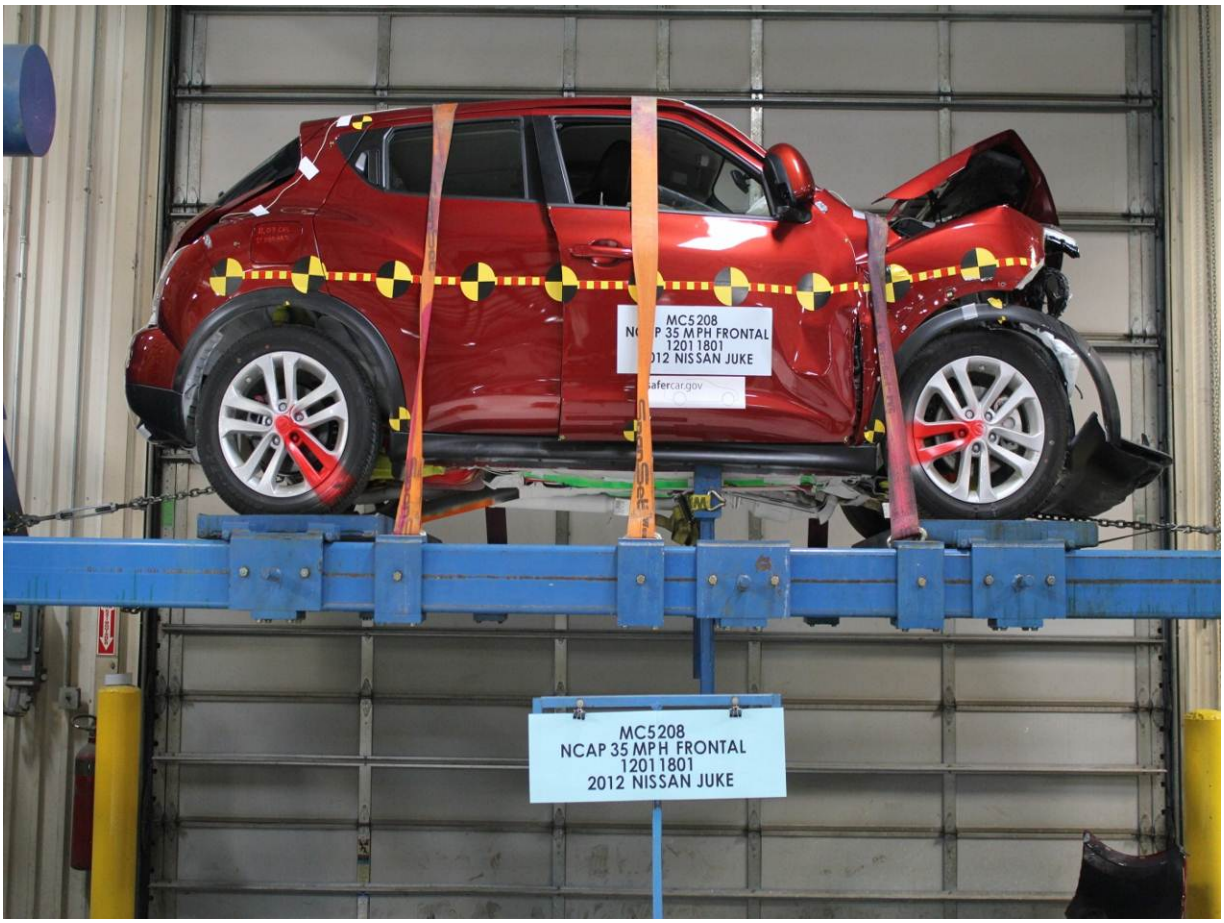
Vehicle at 90 Degrees on Static Rollover Device



Vehicle at 180 Degrees on Static Rollover Device

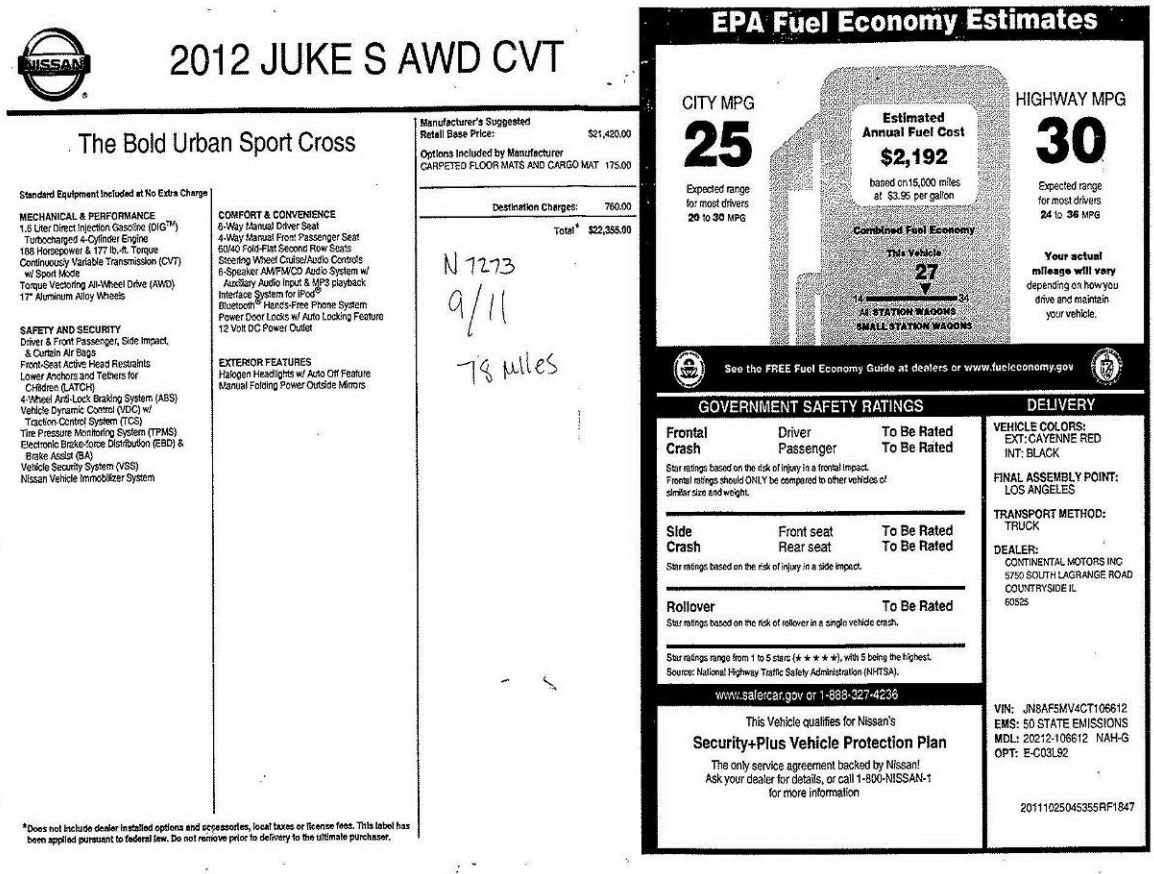


Vehicle at 270 Degrees on Static Rollover Device



Vehicle at 360 Degrees on Static Rollover Device

2012 Nissan Juke S Frontal Impact Event



2012 JUKE S AWD CVT

The Bold Urban Sport Cross

Manufacturer's Suggested Retail Base Price: $21,420.00

Options Included by Manufacturer
CARPETED FLOOR MATS AND CARGO MAT 175.00

Destination Charges: 760.00

Total* $22,355.00

N 7273
9/11
78 miles

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
1.6 Liter Direct Injection Gasoline (DIG™) Turbocharged 4-Cylinder Engine
188 Horsepower & 177 lb.-ft. Torque
Continuously Variable Transmission (CVT) w/ Sport Mode
Torque Vectoring All-Wheel Drive (AWD)
17" Aluminum Alloy Wheels

SAFETY AND SECURITY
Driver & Front Passenger, Side Impact, & Curtain Air Bags
Front-Seat Active Head Restraints
Lower Anchors and Tethers for CHildren (LATCH)
4-Wheel Anti-Lock Braking System (ABS)
Vehicle Dynamic Control (VDC) w/ Traction Control System (TCS)
Tire Pressure Monitoring System (TPMS)
Electronic Brake-force Distribution (EBD) & Brake Assist (BA)
Vehicle Security System (VSS)
Nissan Vehicle Immobilizer System

COMFORT & CONVENIENCE
6-Way Manual Driver Seat
4-Way Manual Front Passenger Seat
60/40 Fold-Flat Second Row Seats
Steering Wheel Cruise/Audio Controls
6-Speaker AM/FM/CD Audio System w/ Auxiliary Audio Input & MP3 playback Interface System for iPod®
Bluetooth® Hands-Free Phone System
Power Door Locks w/ Auto Locking Feature
12 Volt DC Power Outlet

EXTERIOR FEATURES
Halogen Headlights w/ Auto Off Feature
Manual Folding Power Outside Mirrors

*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.

EPA Fuel Economy Estimates

CITY MPG **25**
Expected range for most drivers **20** to **30** MPG

Estimated Annual Fuel Cost
$2,192
based on 15,000 miles at $3.95 per gallon

Combined Fuel Economy
This Vehicle **27**
14 — 34
All STATION WAGONS
SMALL STATION WAGONS

HIGHWAY MPG **30**
Expected range for most drivers **24** to **36** MPG

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

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

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver	To Be Rated
	Passenger	To Be 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	To Be Rated
	Rear seat	To Be Rated

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

Rollover To Be 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

This Vehicle qualifies for Nissan's
Security+Plus Vehicle Protection Plan
The only service agreement backed by Nissan!
Ask your dealer for details, or call 1-800-NISSAN-1 for more information

DELIVERY

VEHICLE COLORS:
EXT: CAYENNE RED
INT: BLACK

FINAL ASSEMBLY POINT:
LOS ANGELES

TRANSPORT METHOD:
TRUCK

DEALER:
CONTINENTAL MOTORS INC
5750 SOUTH LAGRANGE ROAD
COUNTRYSIDE IL
60525

VIN: JN8AF5MV4CT106612
EMS: 50 STATE EMISSIONS
MDL: 20212-106612 NAH-G
OPT: E-C03L92

20111025045355RP1847

Monroney Label

APPENDIX B

DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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

Driver Head X Redundant

Driver Head Y Redundant

Driver Head Z Redundant

Driver Upper Neck Force Y

Driver Upper Neck Moment X

Driver Upper Neck Moment Z

Driver Chest X Redundant

Driver Chest Y Redundant

Driver Chest Z Redundant

Driver Pelvis X

Driver Pelvis Y

Driver Pelvis Z

Driver Left Femur Redundant

Driver Right Femur Redundant

Driver Left Upper Tibia Moment X

Driver Left Upper Tibia Moment Y

Driver Left Upper Tibia Force Z

Driver Left Lower Tibia Moment X

Driver Left Lower Tibia Moment Y

Driver Left Lower Tibia Force Z

Driver Right Upper Tibia Moment X

Driver Right Upper Tibia Moment Y

Driver Right Upper Tibia Force Z

Driver Right Lower Tibia Moment X

Driver Right Lower Tibia Moment Y

Driver Right Lower Tibia Force Z

Driver Left Foot Fore Z

Driver Left Foot Aft X

Driver Left Foot Aft Z

Driver Right Foot Fore Z

Driver Right Foot Aft X

Driver Right Foot Aft Z

Driver Lap Belt Force

Driver Shoulder Belt Force

Passenger Head X Redundant

Passenger Head Y Redundant

Passenger Head Z Redundant

Passenger Upper Neck Force Y

Passenger Upper Neck Moment X

Passenger Upper Neck Moment Z

Passenger Chest X Redundant

Passenger Chest Y Redundant

Passenger Chest Z Redundant

Passenger Pelvis X

Passenger Pelvis Y

Passenger Pelvis Z

Passenger Left Femur Redundant

Passenger Right Femur Redundant

Passenger Left Upper Tibia Moment X

Passenger Left Upper Tibia Moment Y

Passenger Left Upper Tibia Force Z

Passenger Left Lower Tibia Moment X

Passenger Left Lower Tibia Moment Y

Passenger Left Lower Tibia Force Z

Passenger Right Upper Tibia Moment X

Passenger Right Upper Tibia Moment Y

Passenger Right Upper Tibia Force Z

Passenger Right Lower Tibia Moment X

Passenger Right Lower Tibia Moment Y

Passenger Right Lower Tibia Force Z

Passenger Left Foot Fore Z

Passenger Left Foot Aft X

Passenger Left Foot Aft Z

Passenger Right Foot Fore Z

Passenger Right Foot Aft X

Passenger Right Foot Aft Z

Passenger Lap Belt Force

Passenger Shoulder Belt Force

Left Rear Seat Crossmember X

Right Rear Seat Crossmember X

Vehicle Engine Top X

Vehicle Engine Bottom X

Vehicle Left Brake Caliper X

Vehicle Right Brake Caliper X

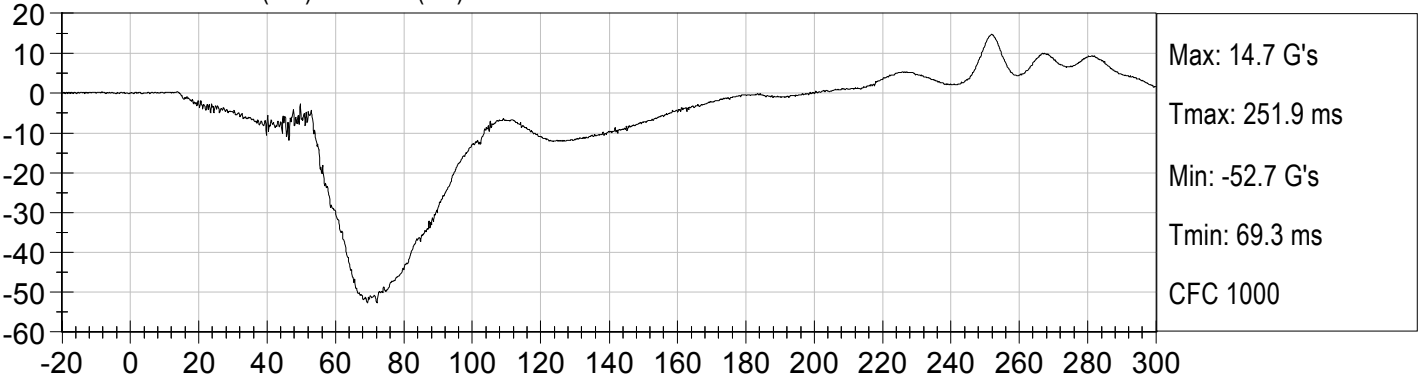
Left Rear Seat Crossmember Xr

Right Rear Seat Crossmember Xr

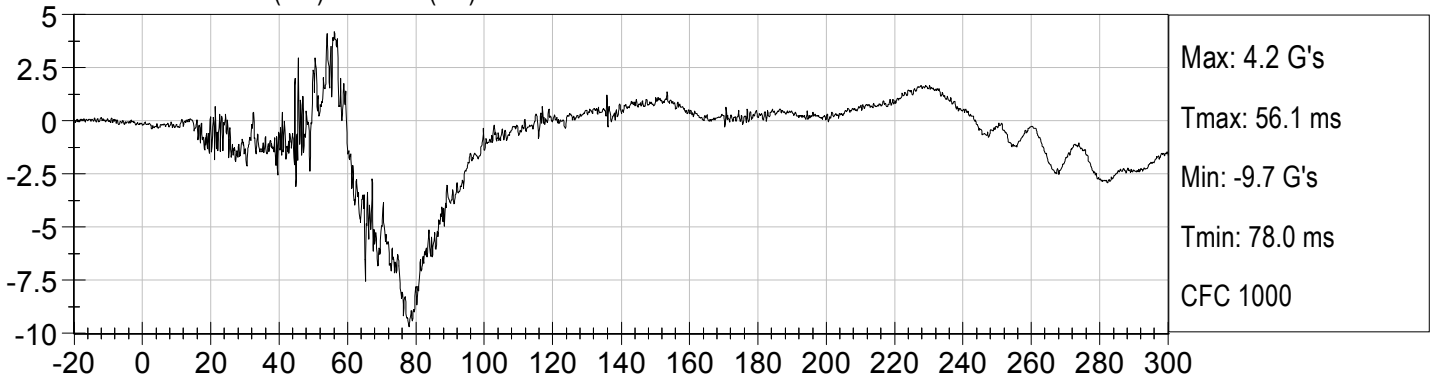
NCAP 35mph Frontal
2012 Nissan Juke - MC5208

Test Date: 01/18/2012
Speed: 35.1 mph (56.4 km/h)

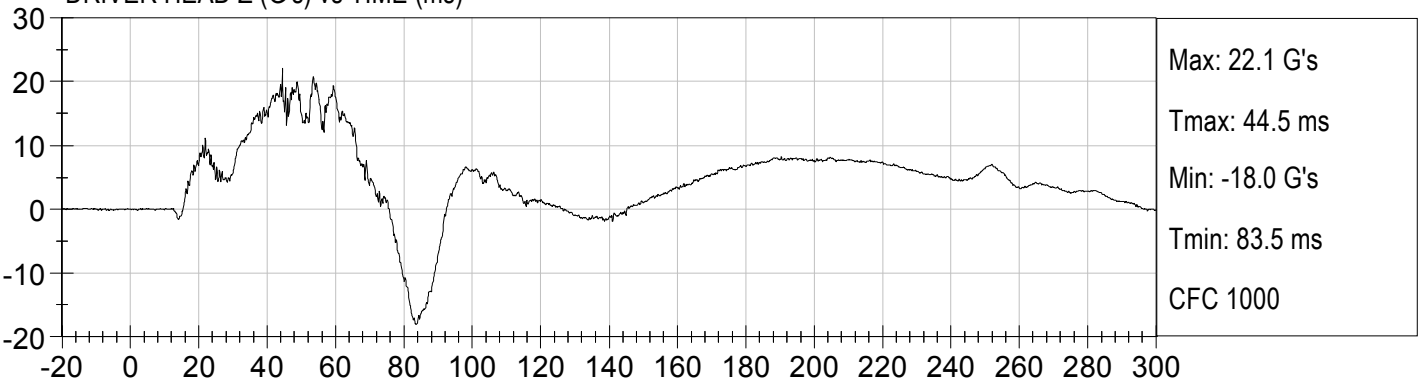
DRIVER HEAD X (G's) vs TIME (ms)



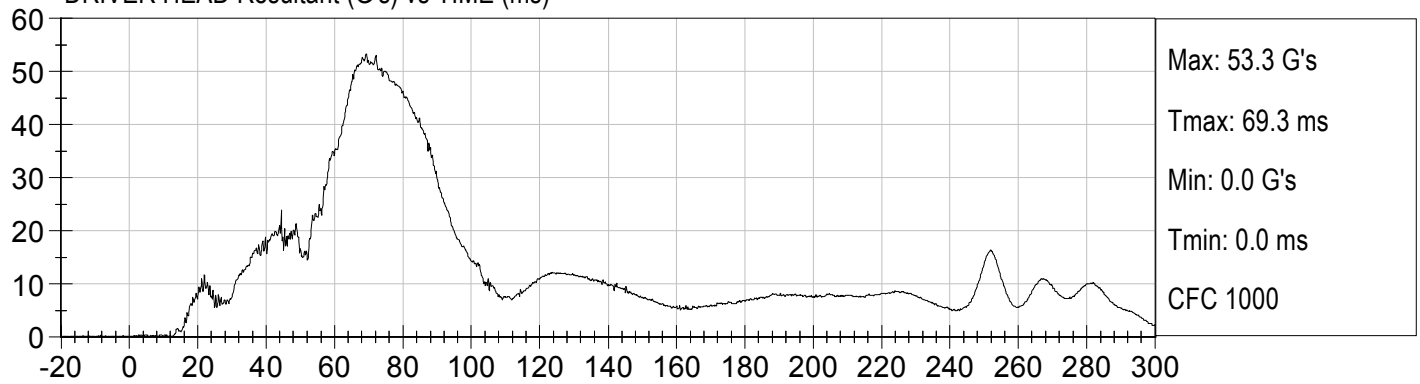
DRIVER HEAD Y (G's) vs TIME (ms)



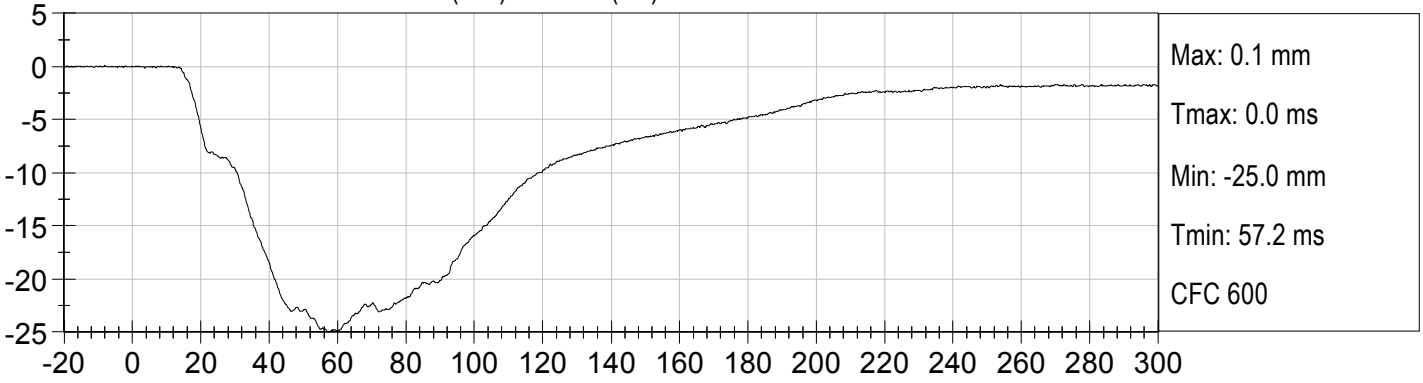
DRIVER HEAD Z (G's) vs TIME (ms)



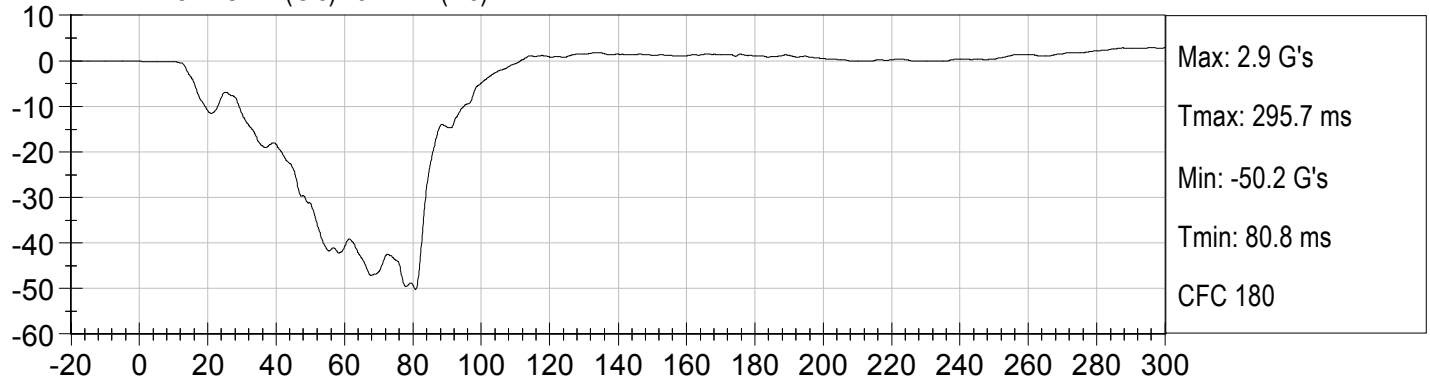
DRIVER HEAD Resultant (G's) vs TIME (ms)



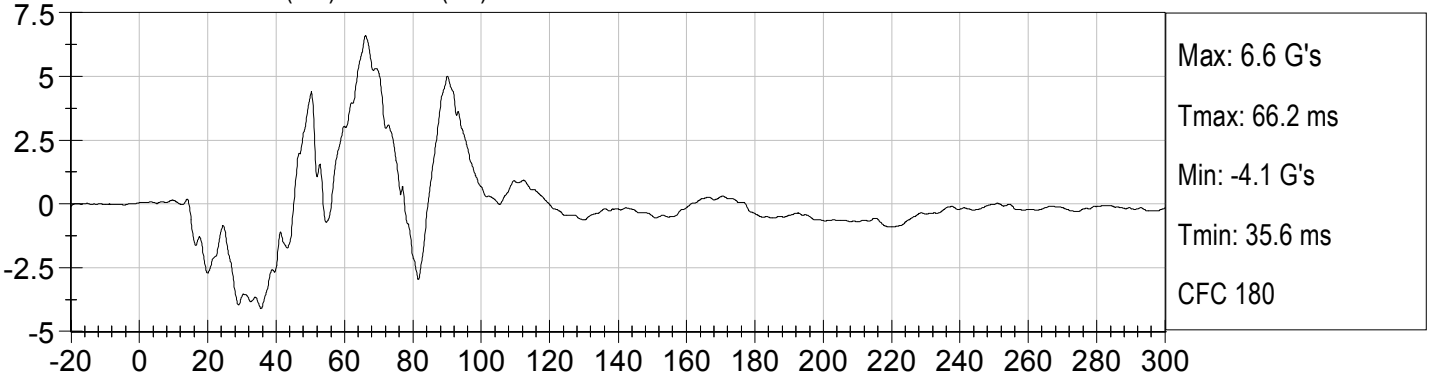
DRIVER CHEST DISPLACEMENT (mm) vs TIME (ms)



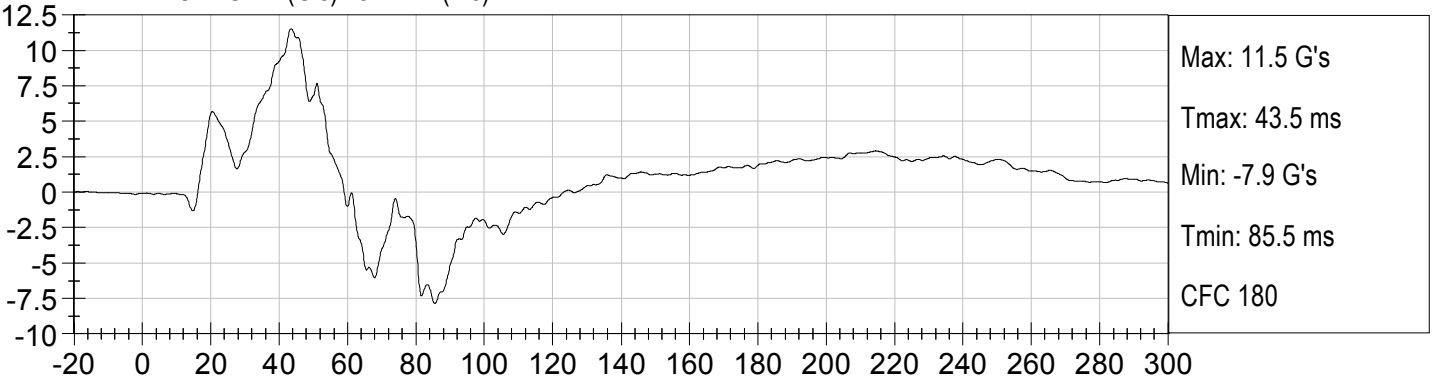
DRIVER CHEST X (G's) vs TIME (ms)



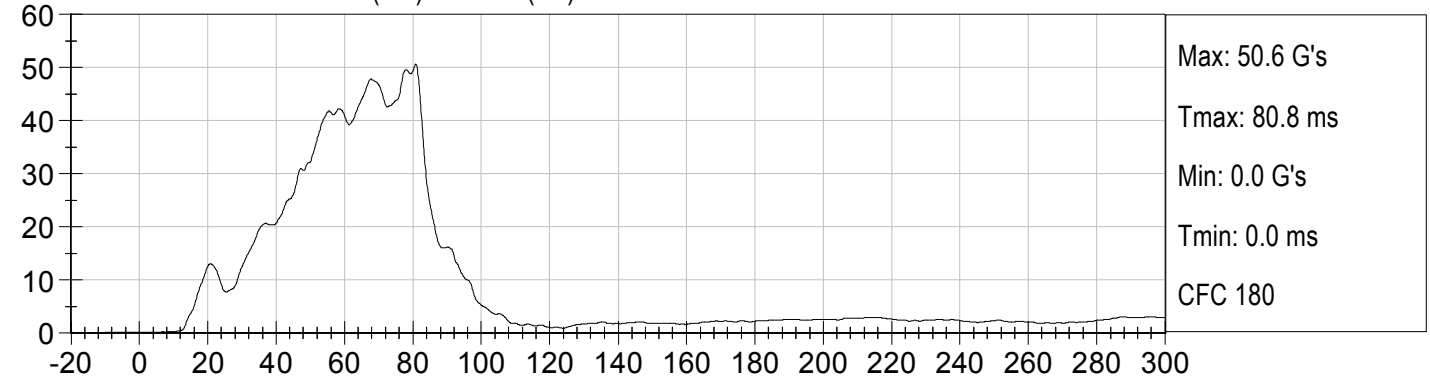
DRIVER CHEST Y (G's) vs TIME (ms)



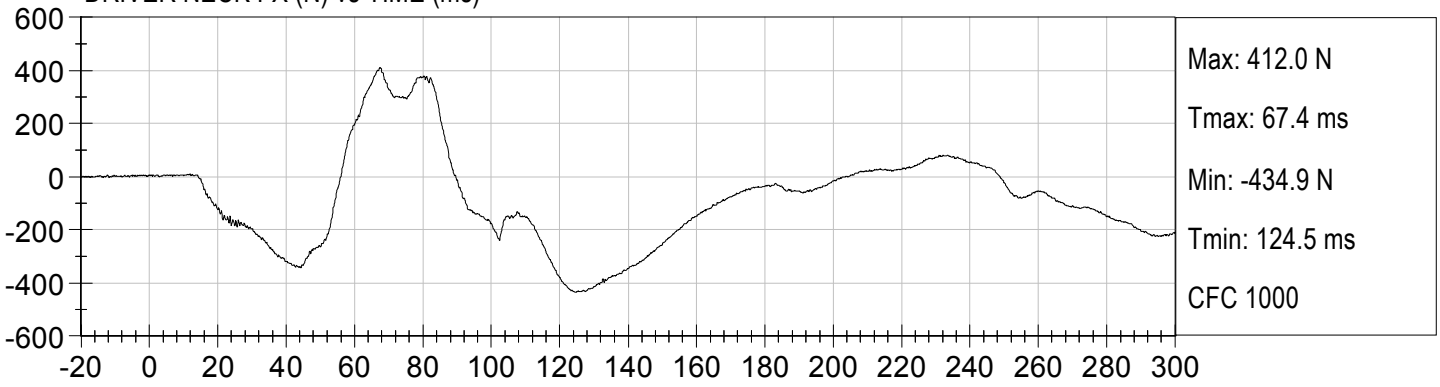
DRIVER CHEST Z (G's) vs TIME (ms)



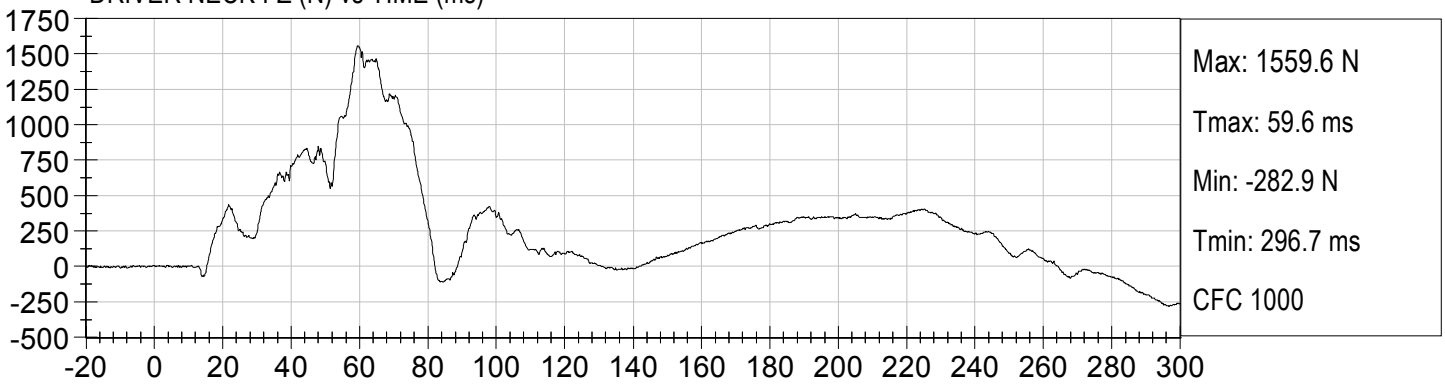
DRIVER CHEST Resultant (G's) vs TIME (ms)



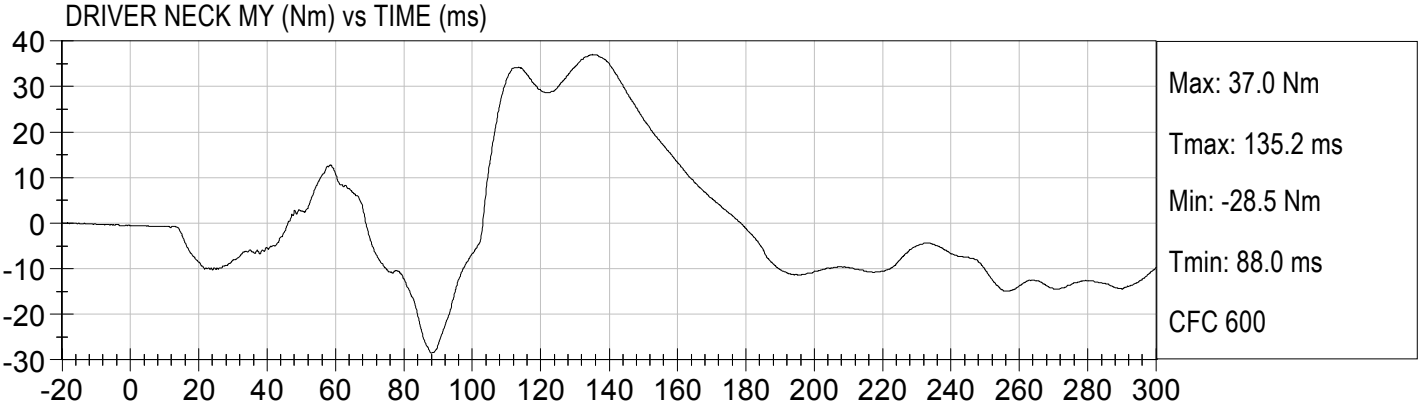
DRIVER NECK FX (N) vs TIME (ms)



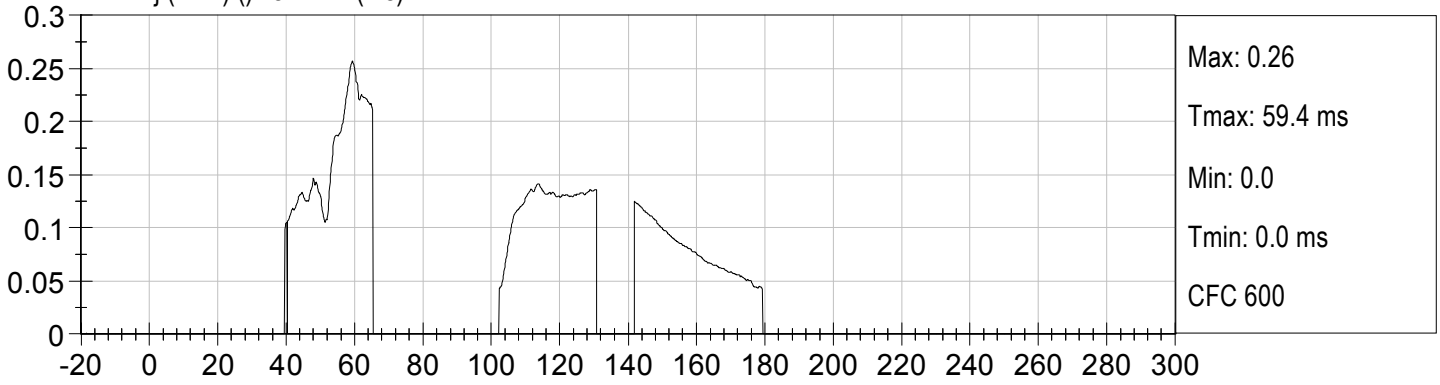
DRIVER NECK FZ (N) vs TIME (ms)



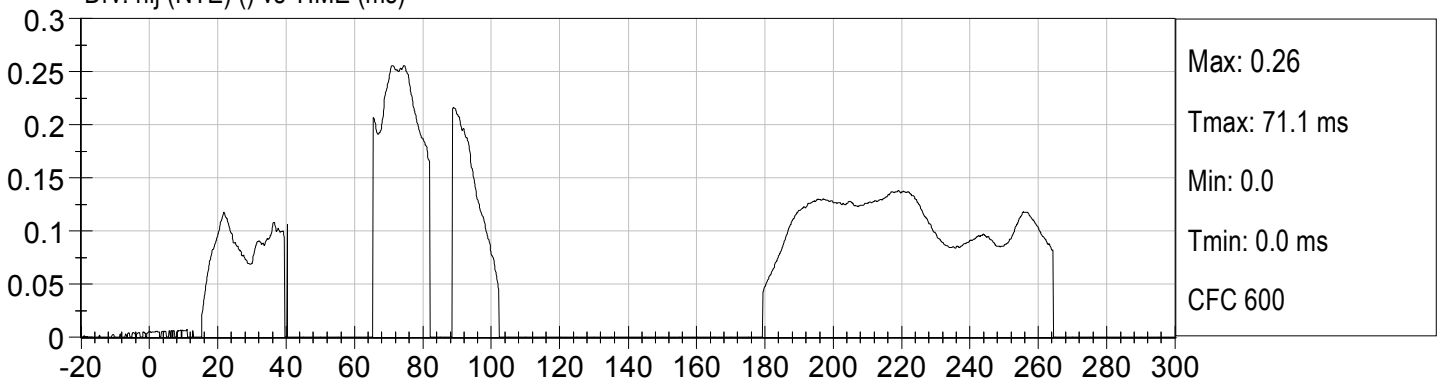
DRIVER NECK MY (Nm) vs TIME (ms)



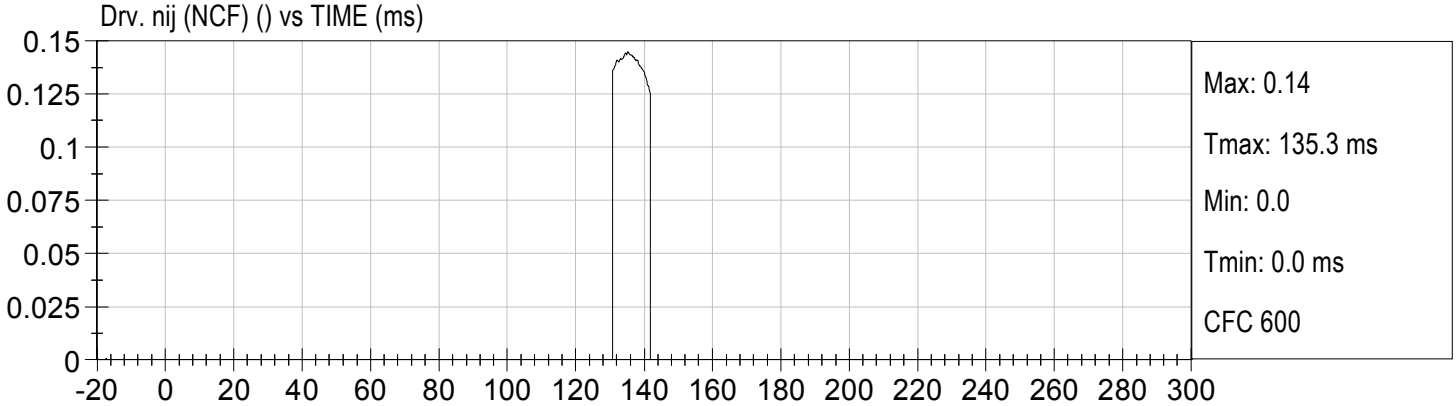
Drv. nij (NTF) () vs TIME (ms)



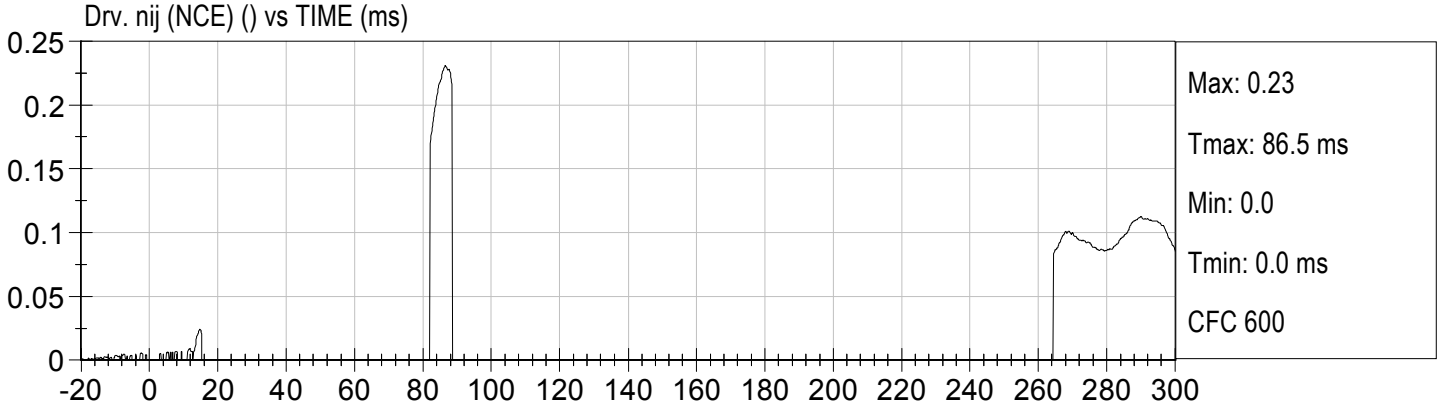
Drv. nij (NTE) () vs TIME (ms)



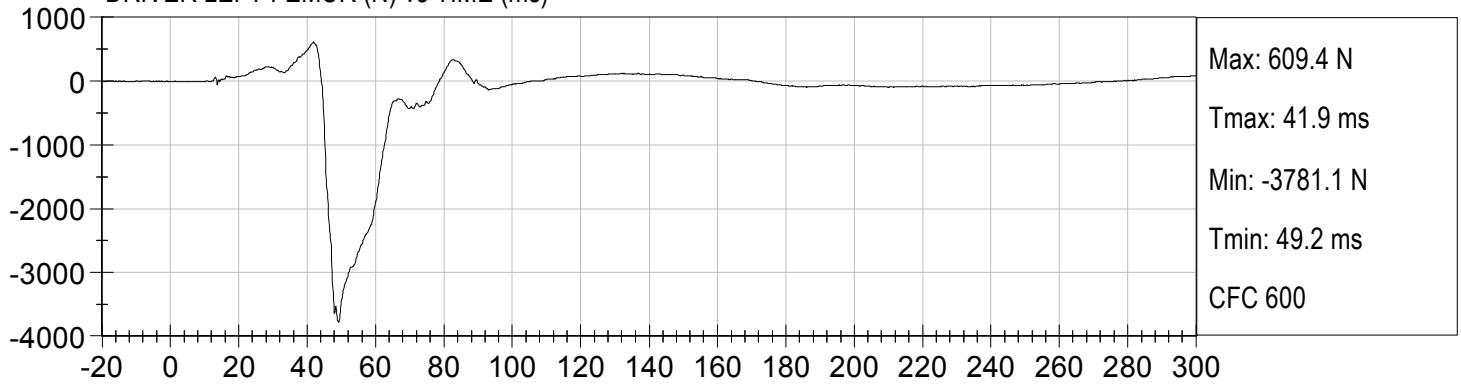
Drv. nij (NCF) () vs TIME (ms)



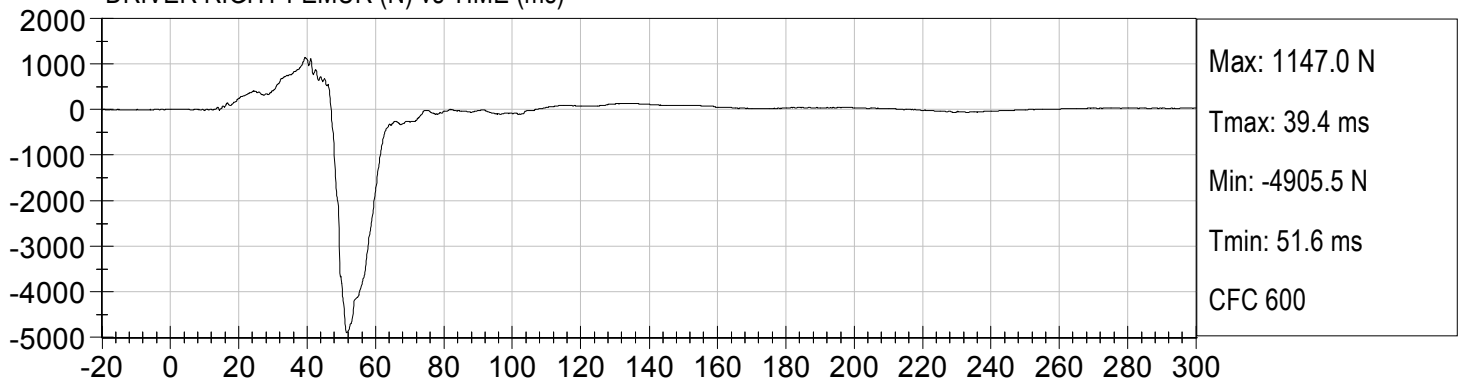
Drv. nij (NCE) () vs TIME (ms)



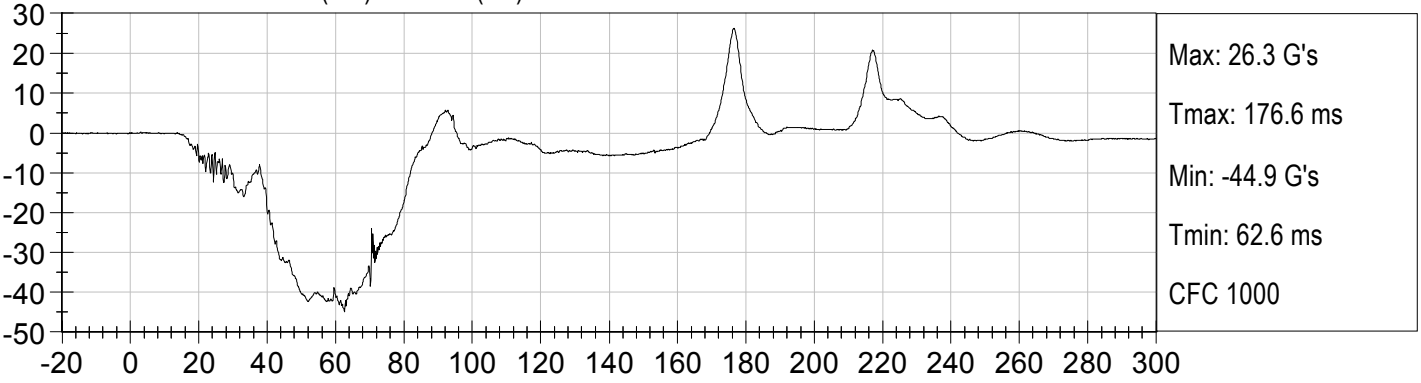
DRIVER LEFT FEMUR (N) vs TIME (ms)



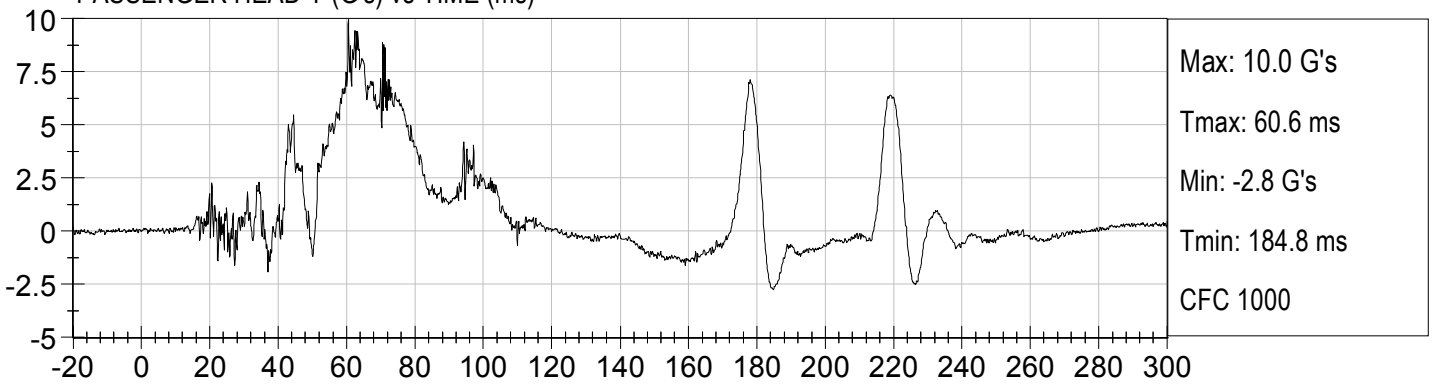
DRIVER RIGHT FEMUR (N) vs TIME (ms)



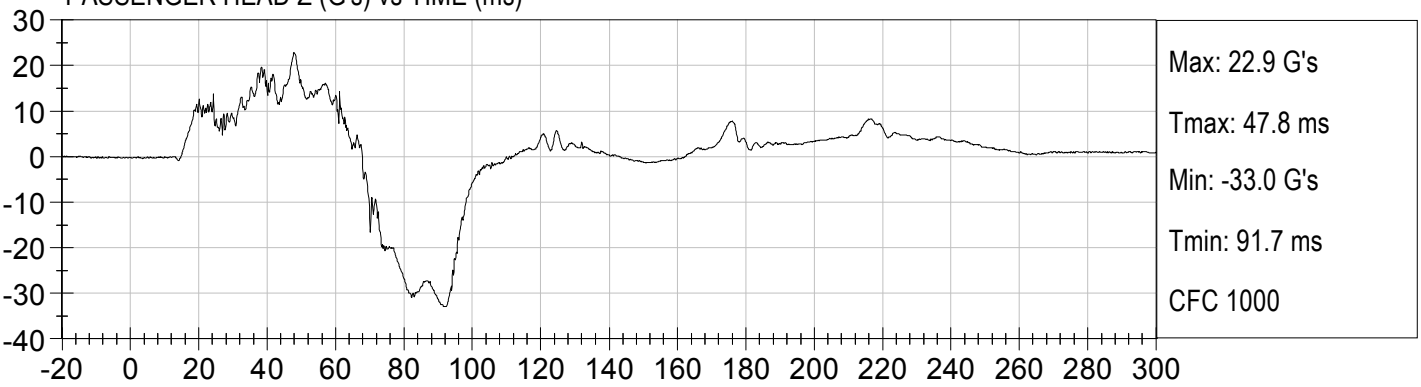
PASSENGER HEAD X (G's) vs TIME (ms)



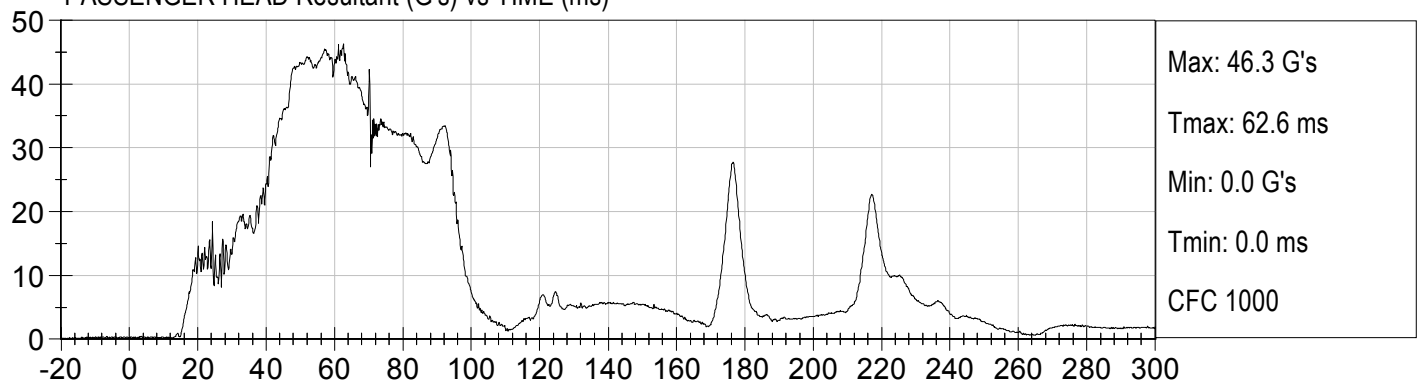
PASSENGER HEAD Y (G's) vs TIME (ms)



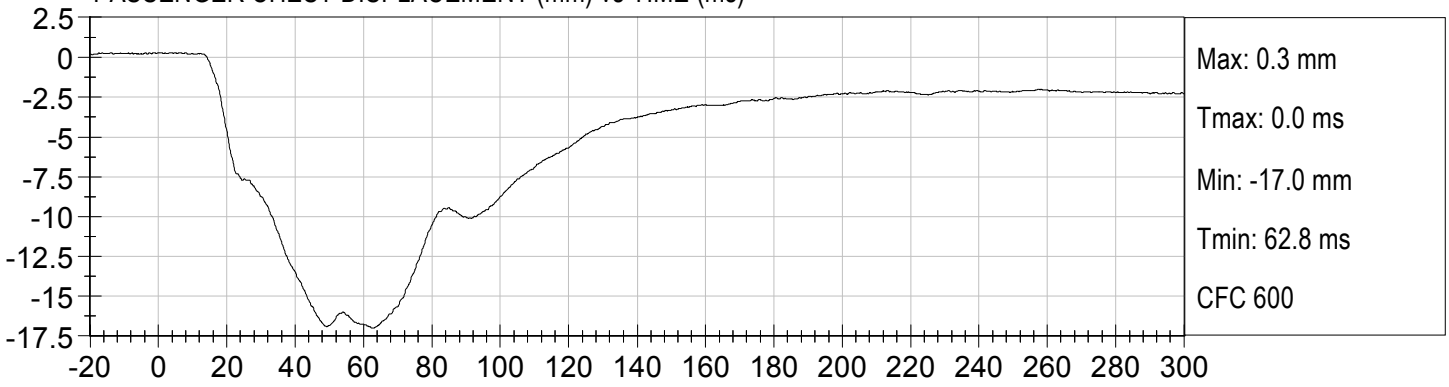
PASSENGER HEAD Z (G's) vs TIME (ms)



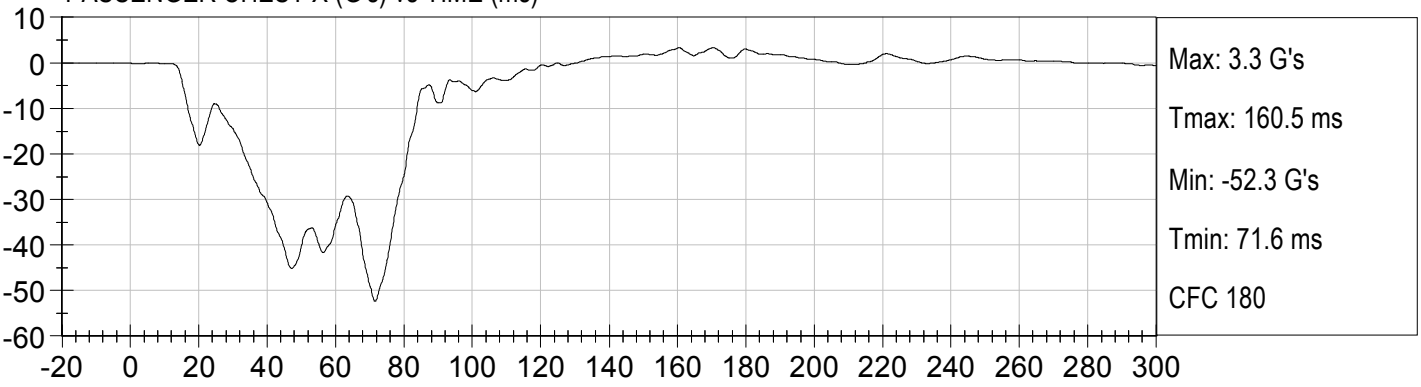
PASSENGER HEAD Resultant (G's) vs TIME (ms)



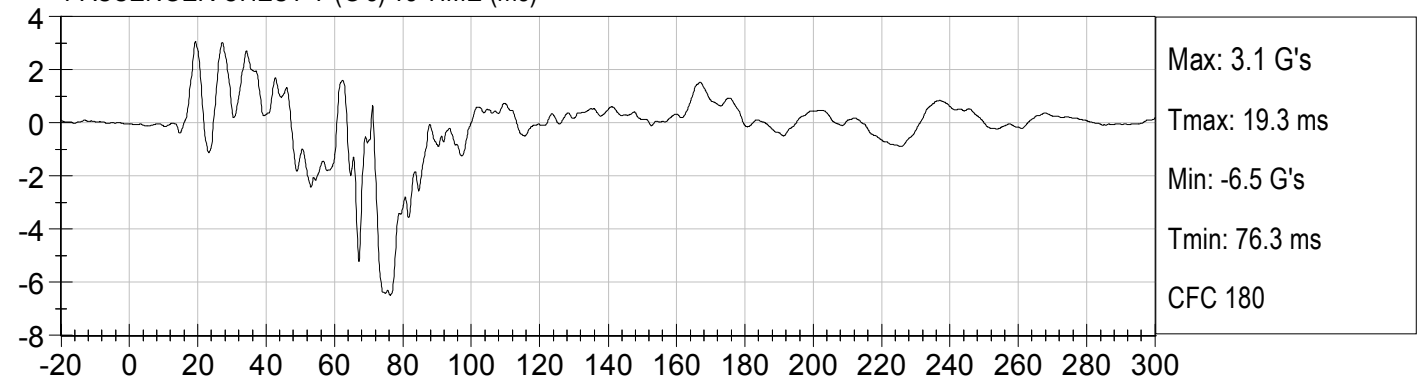
PASSENGER CHEST DISPLACEMENT (mm) vs TIME (ms)



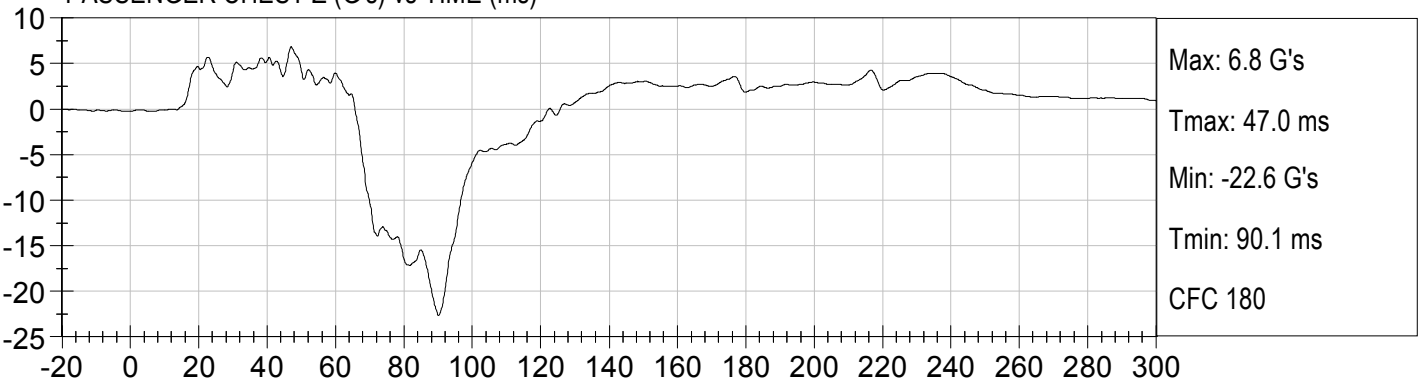
PASSENGER CHEST X (G's) vs TIME (ms)



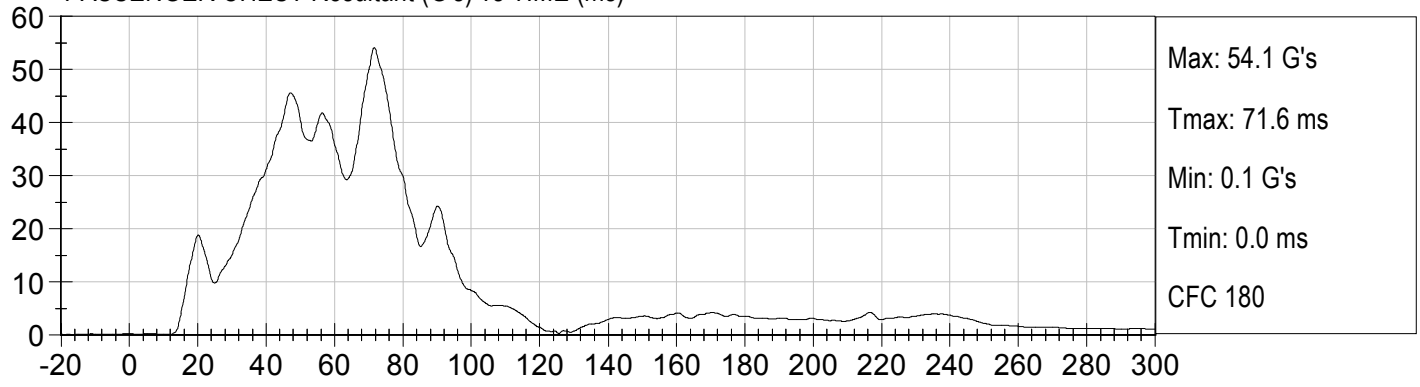
PASSENGER CHEST Y (G's) vs TIME (ms)



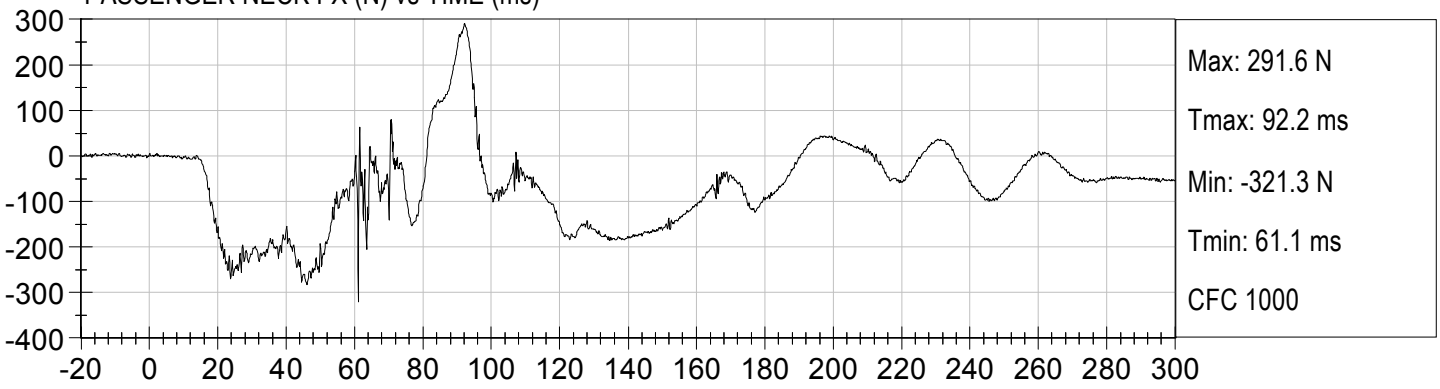
PASSENGER CHEST Z (G's) vs TIME (ms)



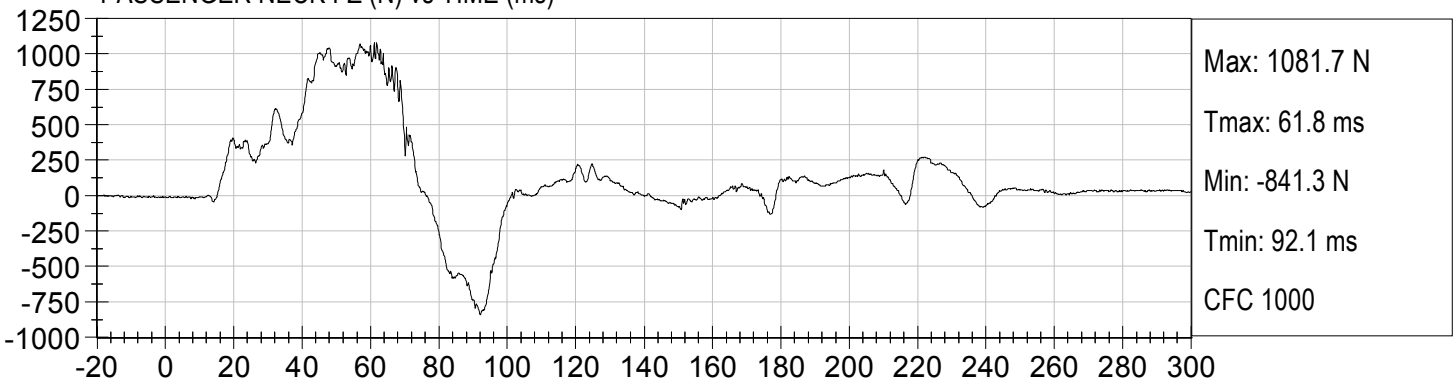
PASSENGER CHEST Resultant (G's) vs TIME (ms)



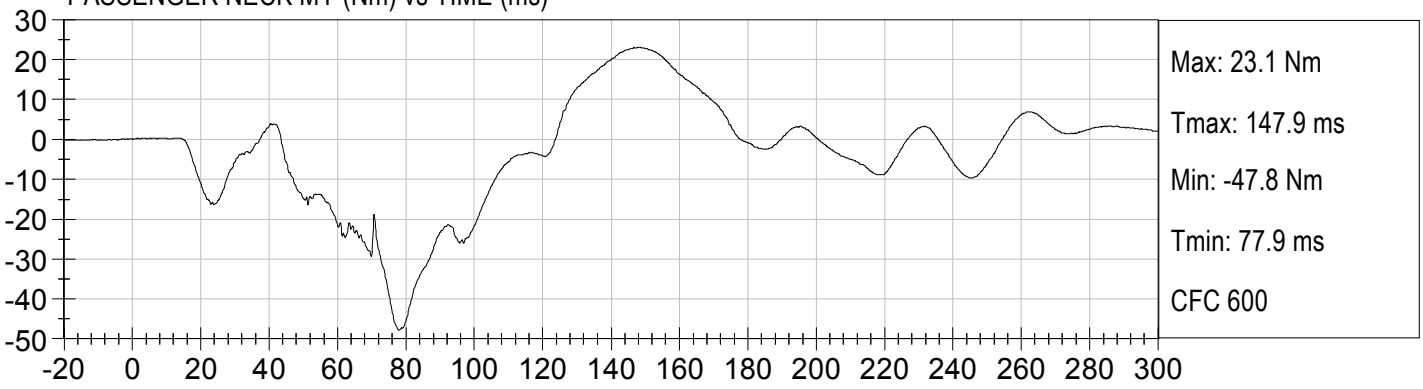
PASSENGER NECK FX (N) vs TIME (ms)



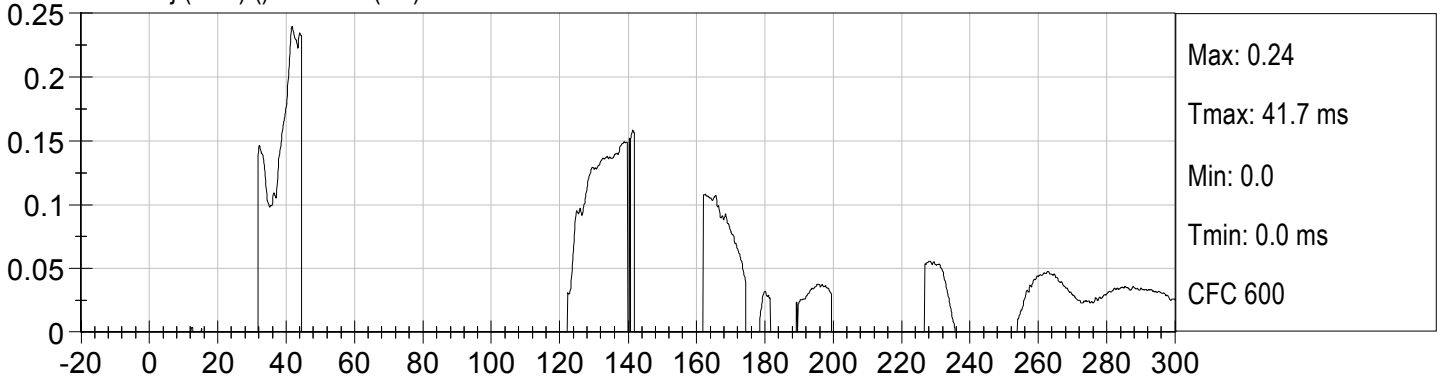
PASSENGER NECK FZ (N) vs TIME (ms)



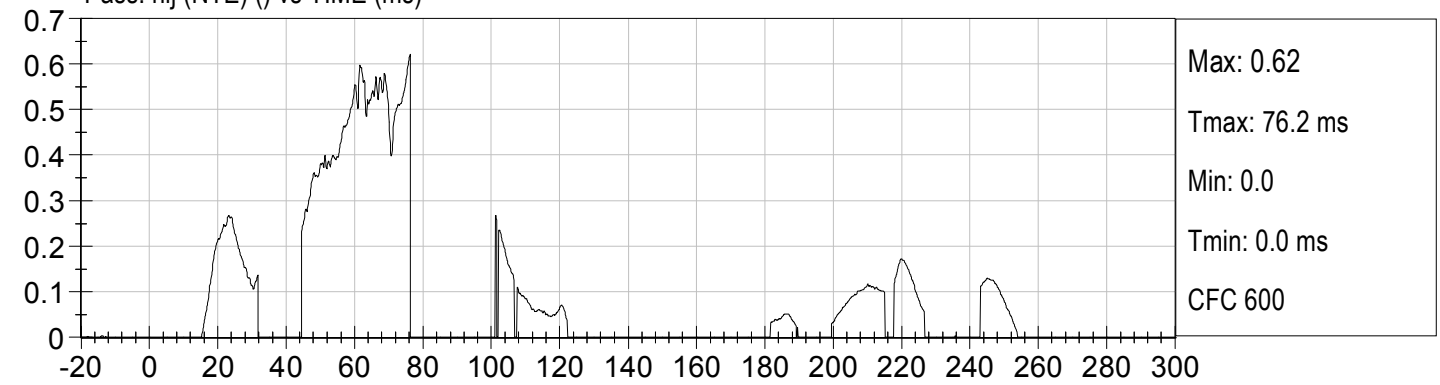
PASSENGER NECK MY (Nm) vs TIME (ms)



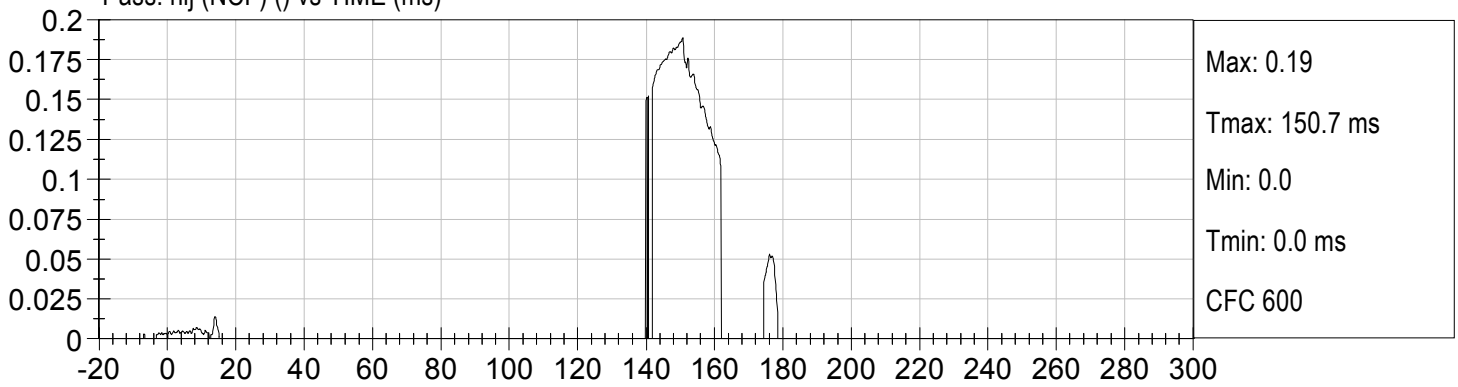
Pass. nij (NTF) () vs TIME (ms)



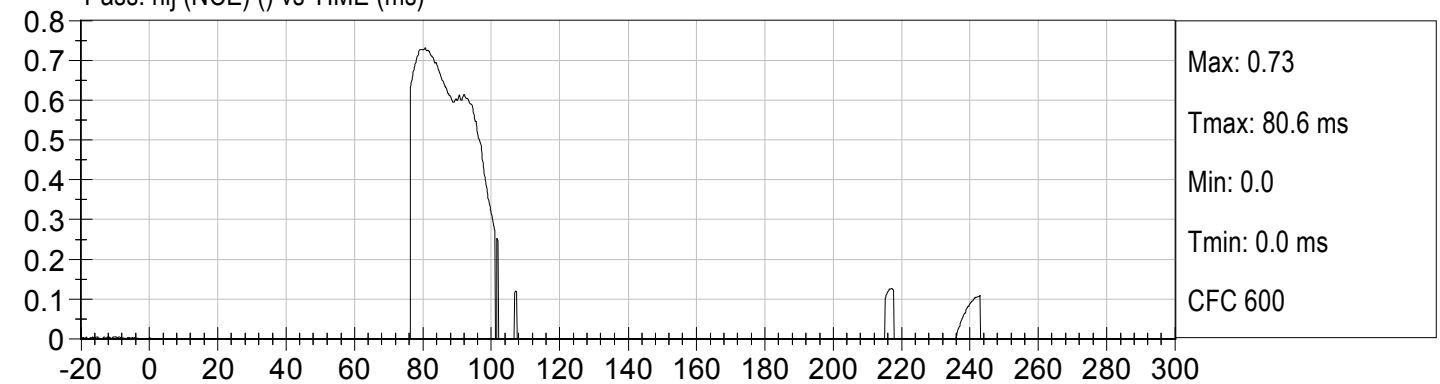
Pass. nij (NTE) () vs TIME (ms)



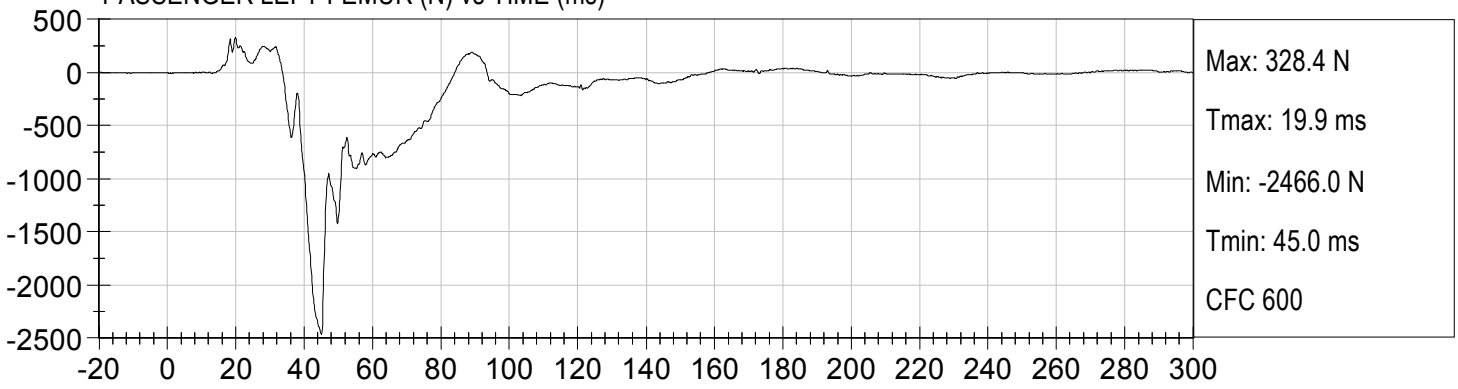
Pass. nij (NCF) () vs TIME (ms)



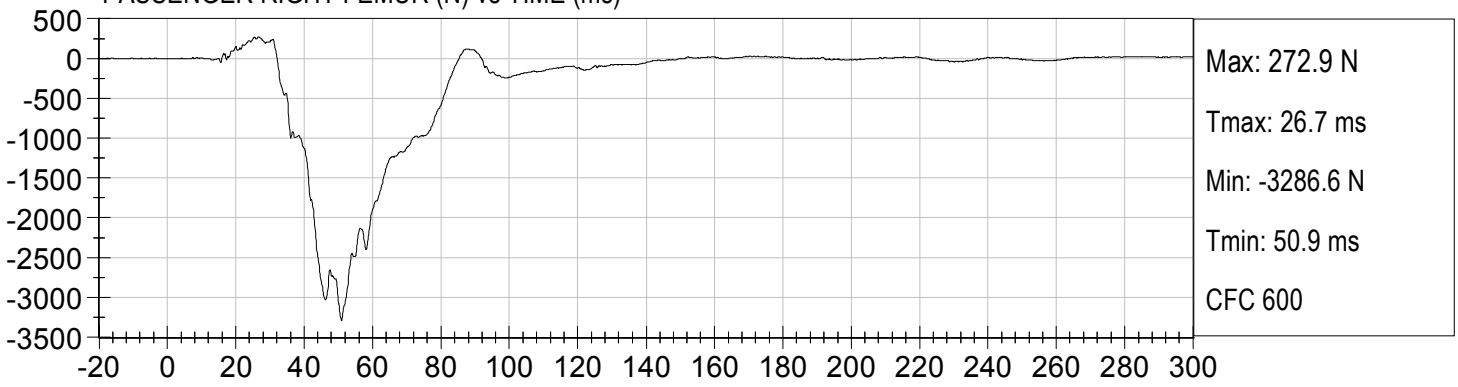
Pass. nij (NCE) () vs TIME (ms)



PASSENGER LEFT FEMUR (N) vs TIME (ms)



PASSENGER RIGHT FEMUR (N) vs TIME (ms)



APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

Hybrid III, 50th External Measurements
SN: 351

HYBRID III, PART 572, SUBPART E EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (inches)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	34.6–35.0	34.8
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	19.9-20.5	20.0
C	H-POINT HEIGHT	Reference	3.3-3.5	3.4
D	H-POINT LOCATION FROM BACKLINE	Reference	5.3-5.5	5.5
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	3.3-3.7	3.5
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	5.5-6.1	6.0
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	11.4-12.0	11.8
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	1.6-1.8	1.7
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	13.0-13.6	13.3
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	7.5-8.3	7.8
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	22.8-23.8	23.8
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	16.9-17.9	17.0
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	19.1-19.7	19.5
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. “K”.	17.8-18.8	18.8

HYBRID III, SUBPART E EXTERIOR DIMENSIONS, continued				
DIMENSION	DESCRIPTION	DETAILS		ACTUAL MEASUREMENT
O	CHEST DEPTH WITHOUT JACKET	Measured 16.9-17.1 in. above seat surface	8.4-9.0	8.5
P	FOOT LENGTH	Tip of toe to rear of heal	9.9-10.5	10.3
V	SHOULDER BREADTH	Outside edges of right and left shoulder clevises	16.3-17.2	16.5
W	FOOT BREADTH	The widest part of the foot	3.6-4.2	4.0
Y	CHEST CIRCUMFERENCE (WITH CHEST JACKET)	Measured 16.9-17.1 in. above seat surface	38.2-39.4	39.2
Z	WAIST CIRCUMFERENCE	Measured 8.9-9.1 in. above seat surface	32.9-34.1	33.7
AA	REFERENCE LOCATION FOR MEASUREMENT OF CHEST CIRCUMFERENCE	Reference	16.9-17.1	17.0
BB	REFERENCE LOCATION FOR MEASUREMENT OF WAIST CIRCUMFERENCE	Reference	8.9-9.1	9.0

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

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test ID:** D12151

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	225 - 275	241	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-8.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

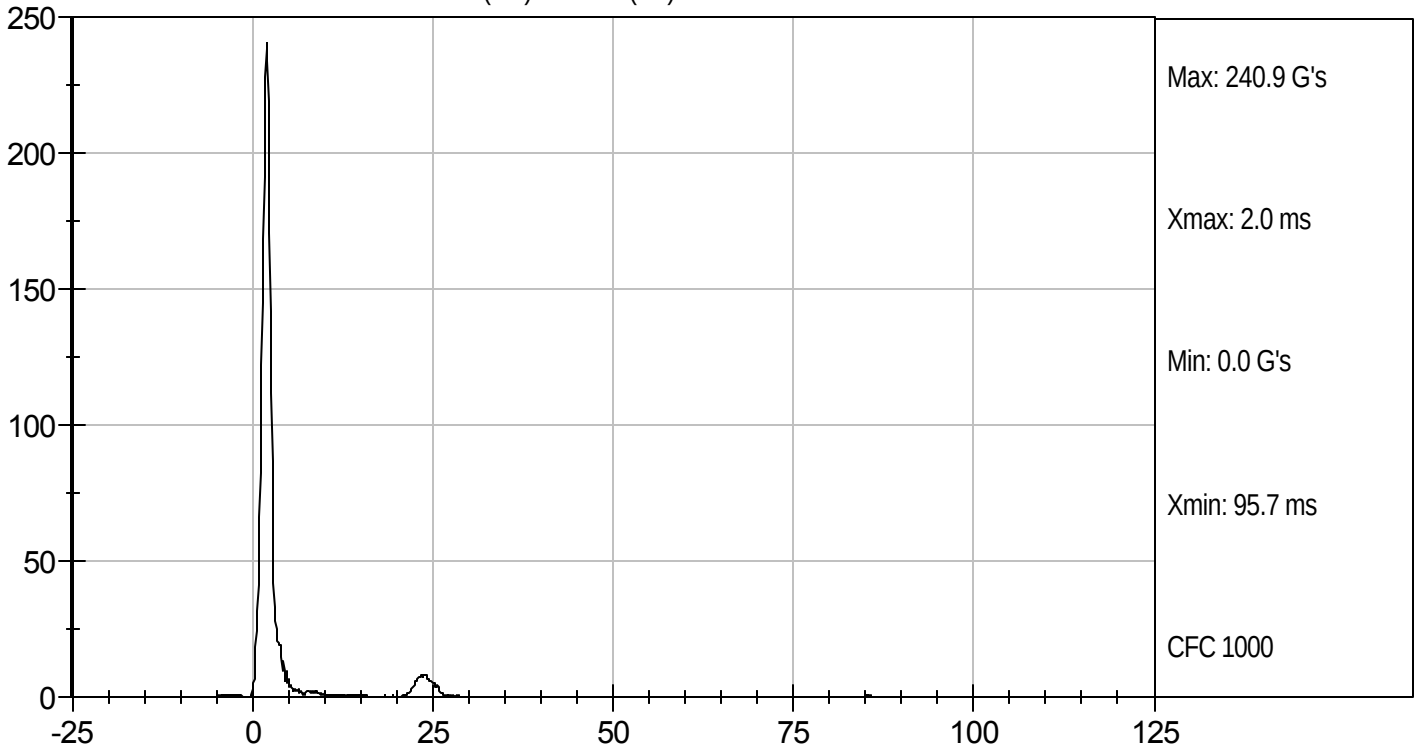
1/13/12
Test Date

David Winkelbauer
Approved By

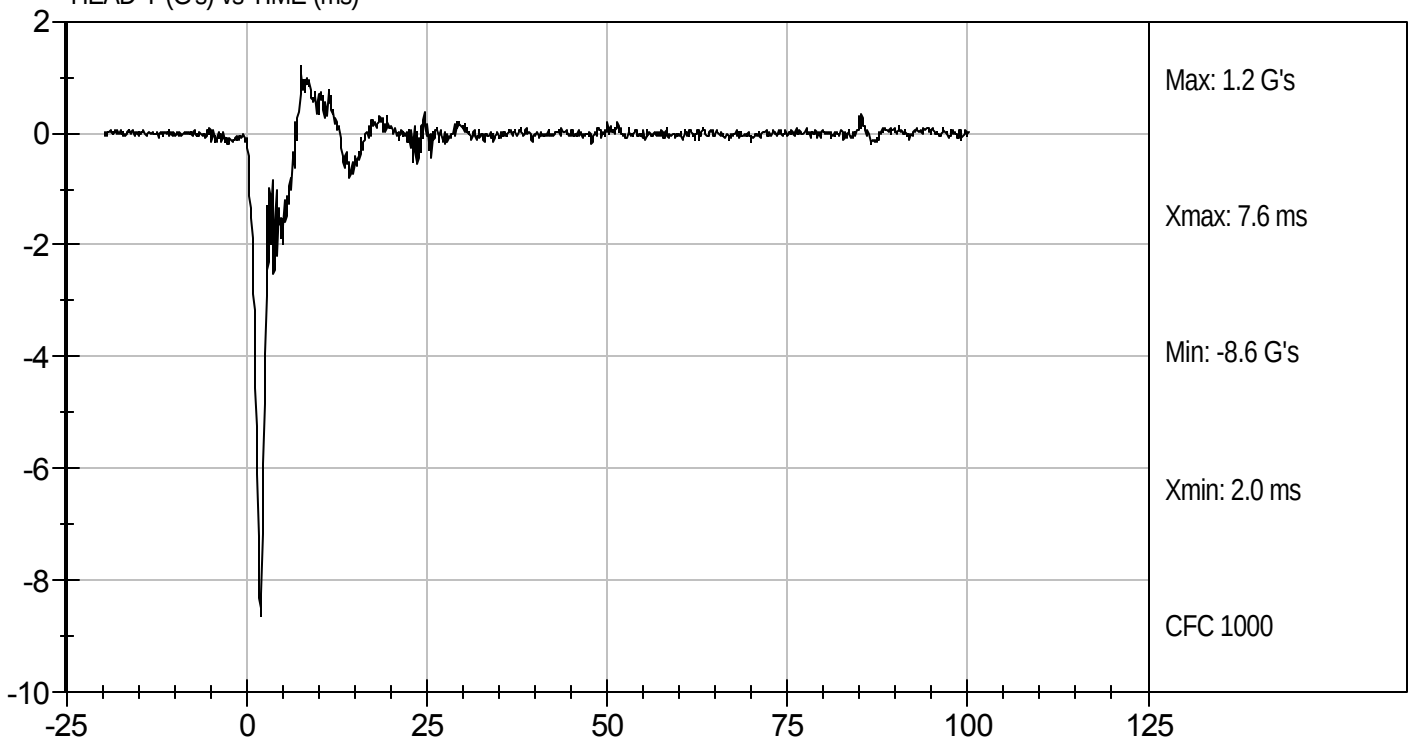
Test Desc: Head Drop
Component ID: D12151

Test Date: 1/13/12
Velocity: 0 ft/s, 0 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:** D12152

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.41	Pass
	20 ms	G's	17.60 to 22.60	18.85	Pass
	30 ms	G's	12.50 to 18.50	14.28	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.2	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	69.8	Pass
	Time	ms	57.0 to 64.0	57.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	113.3	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	91.5	Pass
	Time	ms	47.0 to 58.0	47.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.6	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

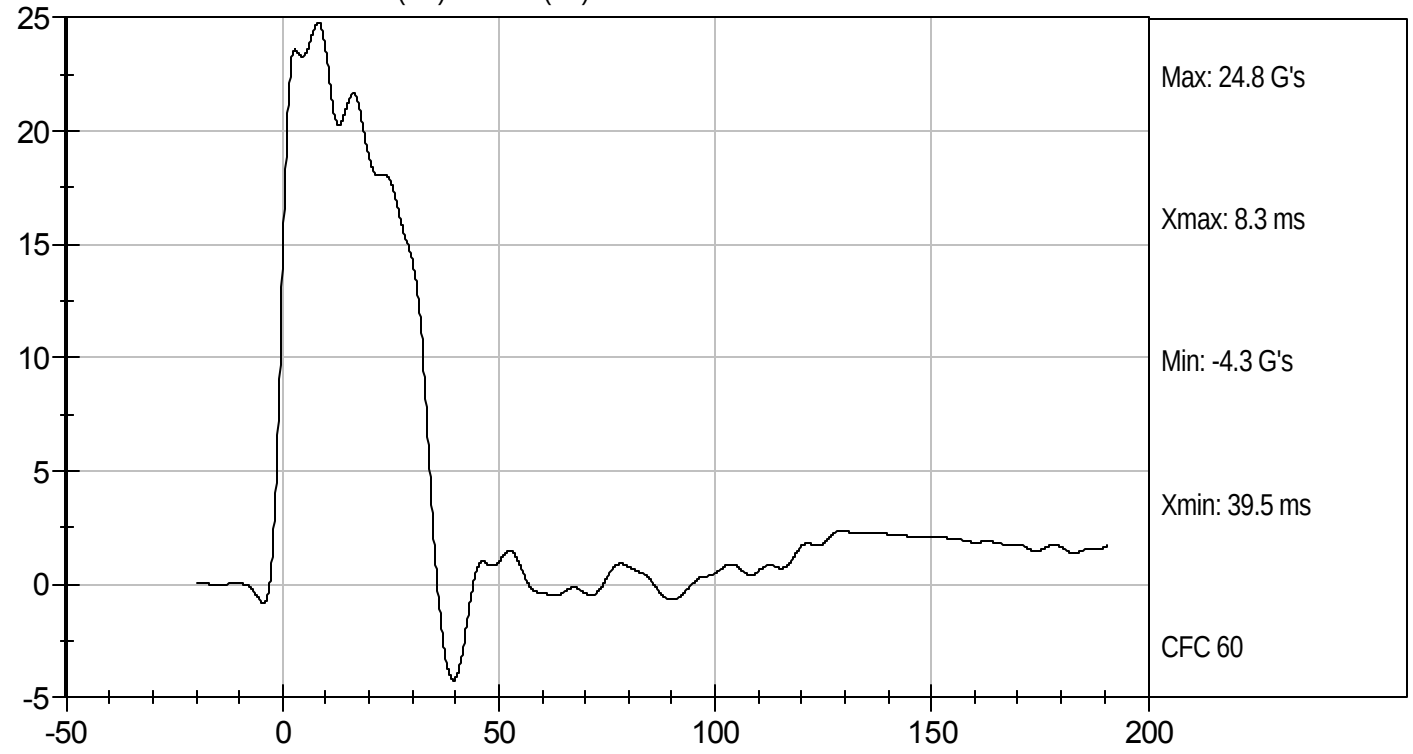
1/13/12
Test Date

David Winkelbauer
Approved By

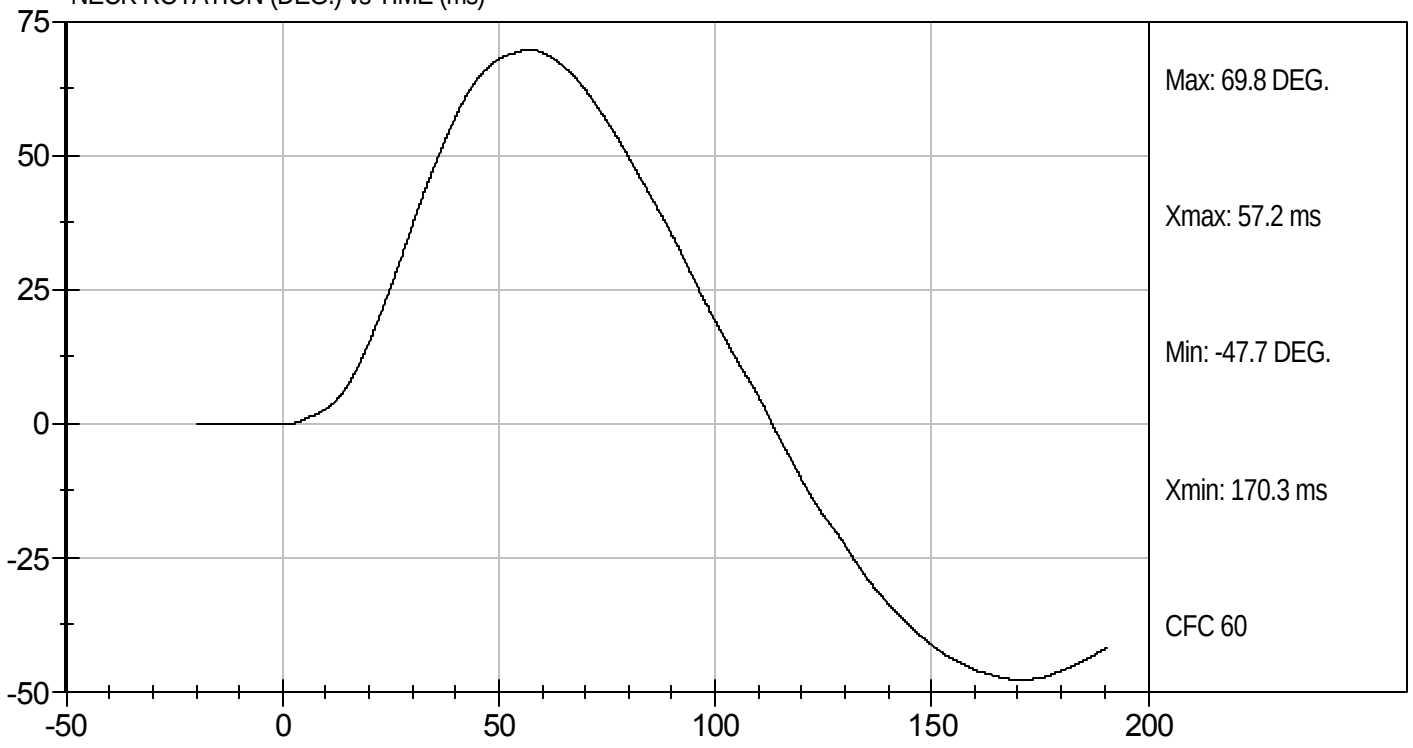
Test Desc: Neck Flexion
Component ID: D12152

Test Date: 1/13/12
Velocity: 22.83 ft/s, 6.96 m/s

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

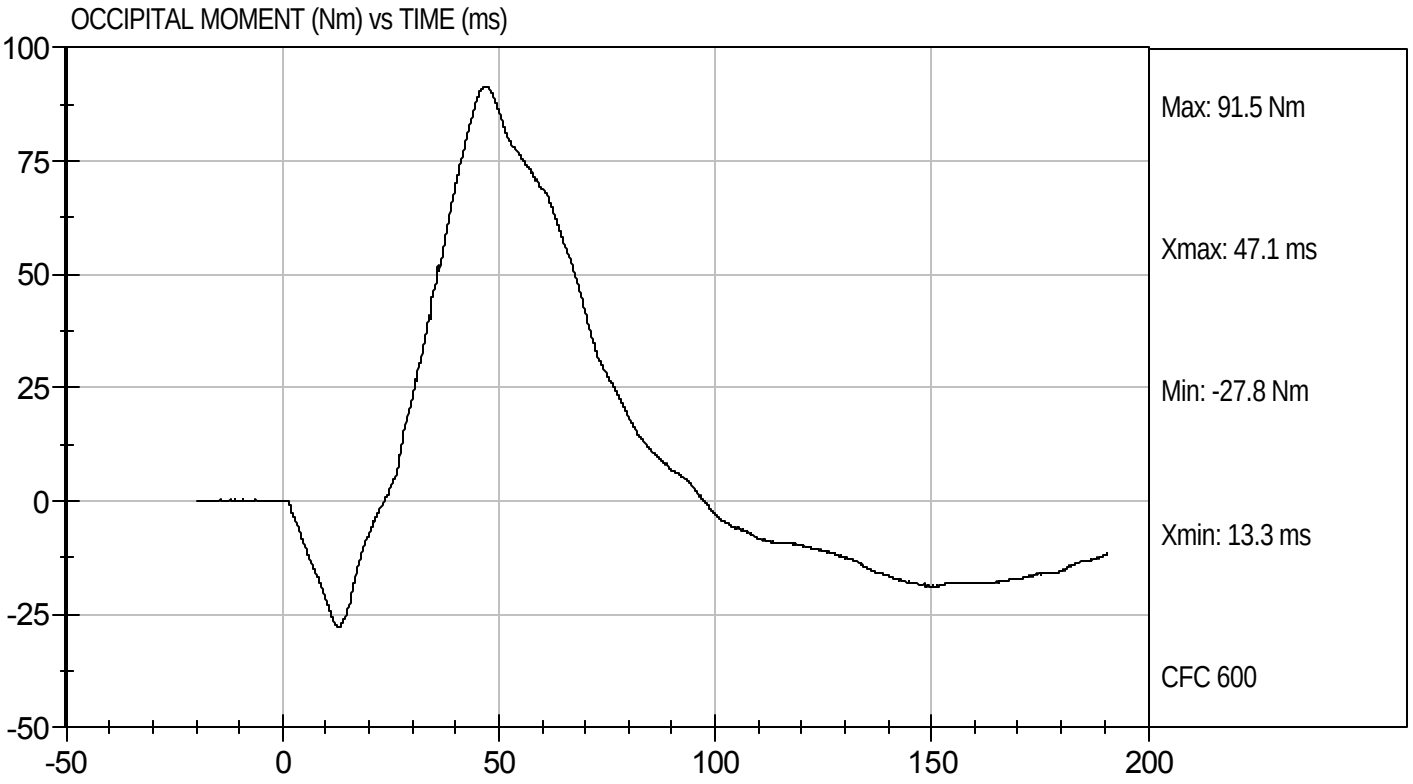


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Component ID: D12152

Test Date: 1/13/12
Velocity: 22.83 ft/s, 6.96 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D12153

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.13	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	20.64	Pass
	20 ms	G's	14.00 to 19.00	17.18	Pass
	30 ms	G's	11.00 to 16.00	13.79	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	14.0	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	97.3	Pass
	Time	ms	72.0 to 82.0	76.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	156.1	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-59.8	Pass
	Time	ms	65.0 to 79.0	68.7	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	141.3	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

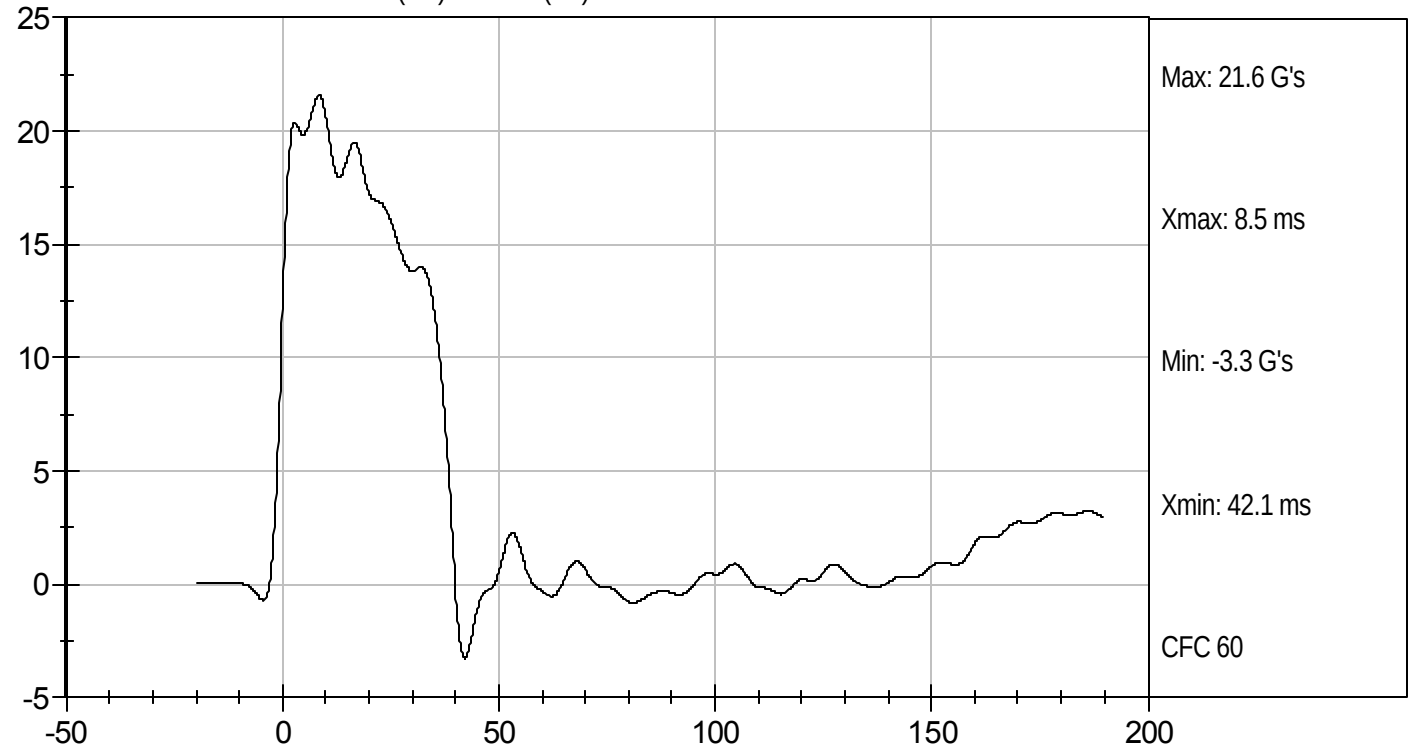
1/13/12
Test Date

David Winkelbauer
Approved By

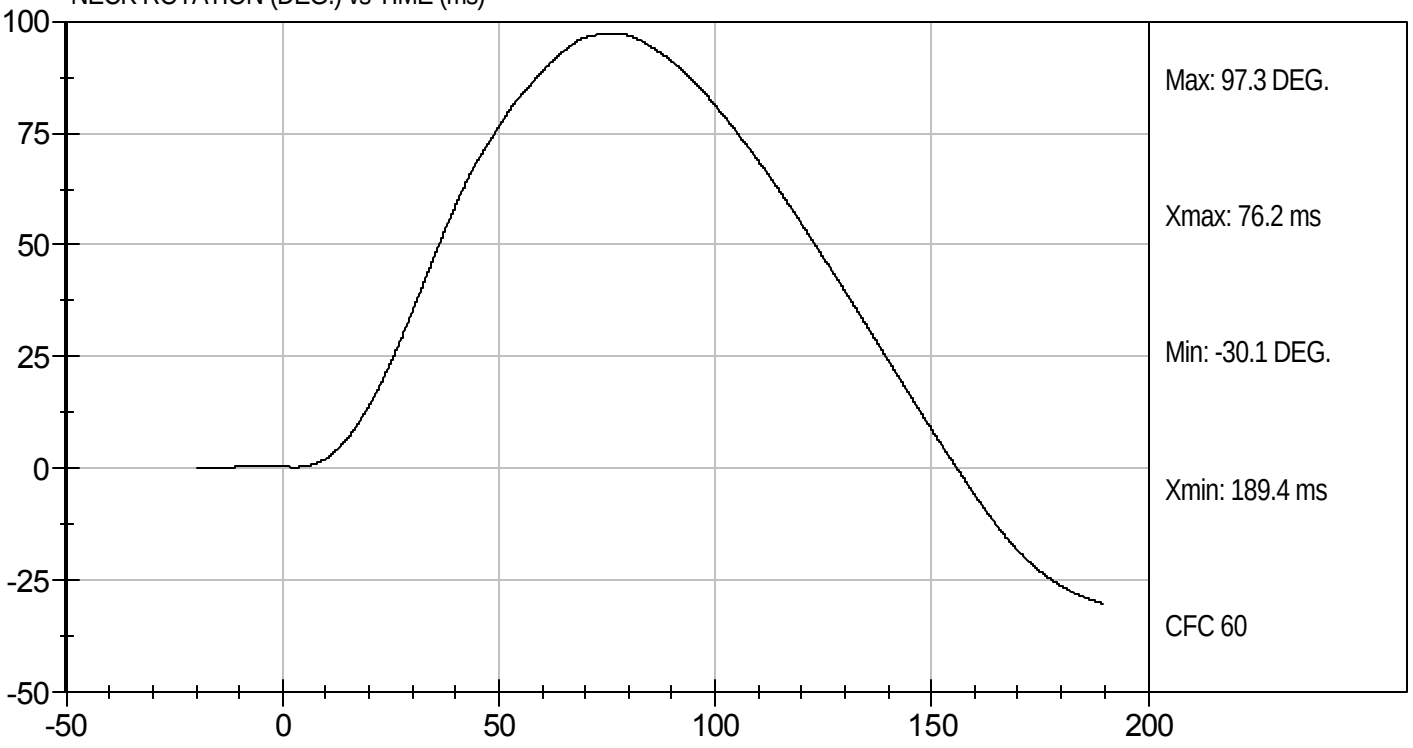
Test Desc: Neck Extension
Component ID: D12153

Test Date: 1/13/12
Velocity: 20.10 ft/s, 6.13 m/s

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

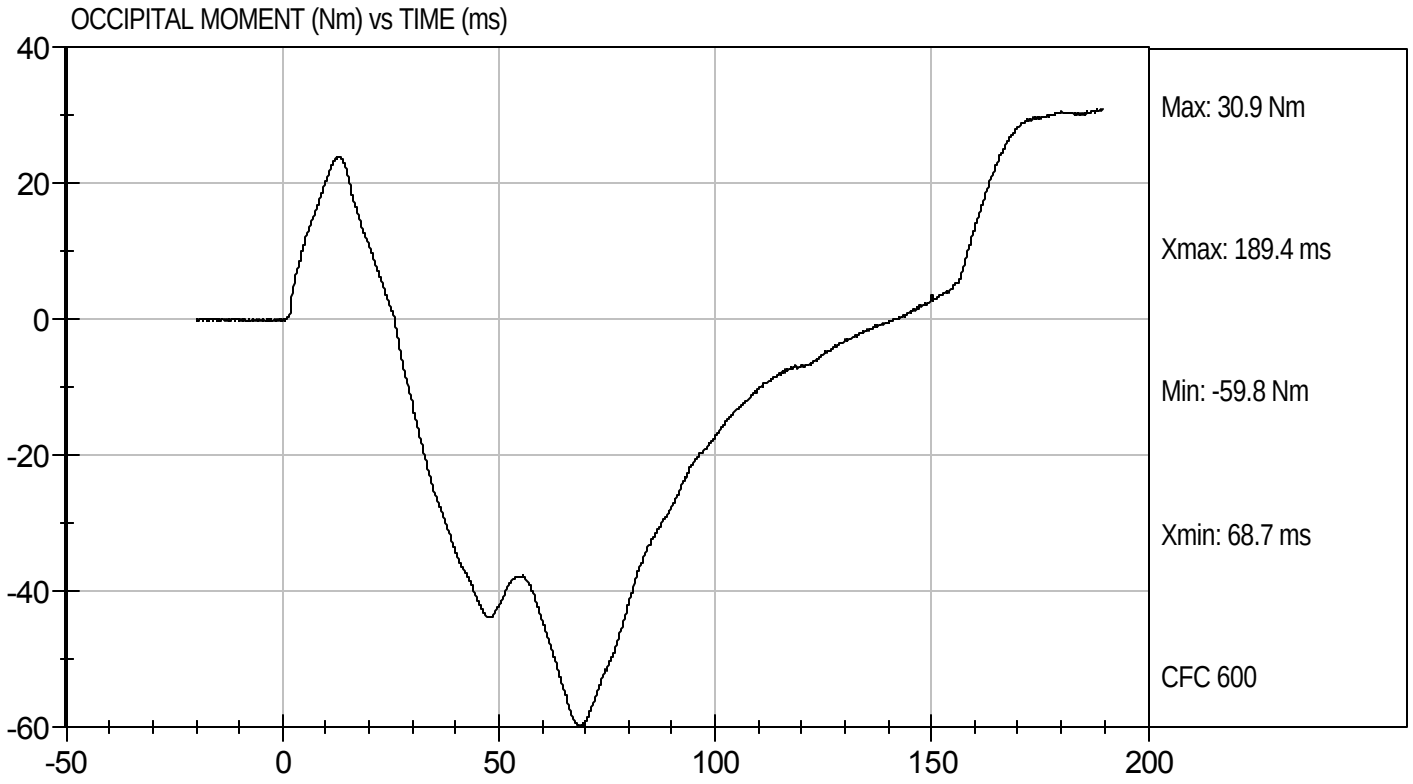


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D12153

Test Date: 1/13/12
Velocity: 20.10 ft/s, 6.13 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D12154

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	22	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,296	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.57	Pass
Internal Hysteresis	%	69 to 85	70	Pass
		Overall Test Results		Pass

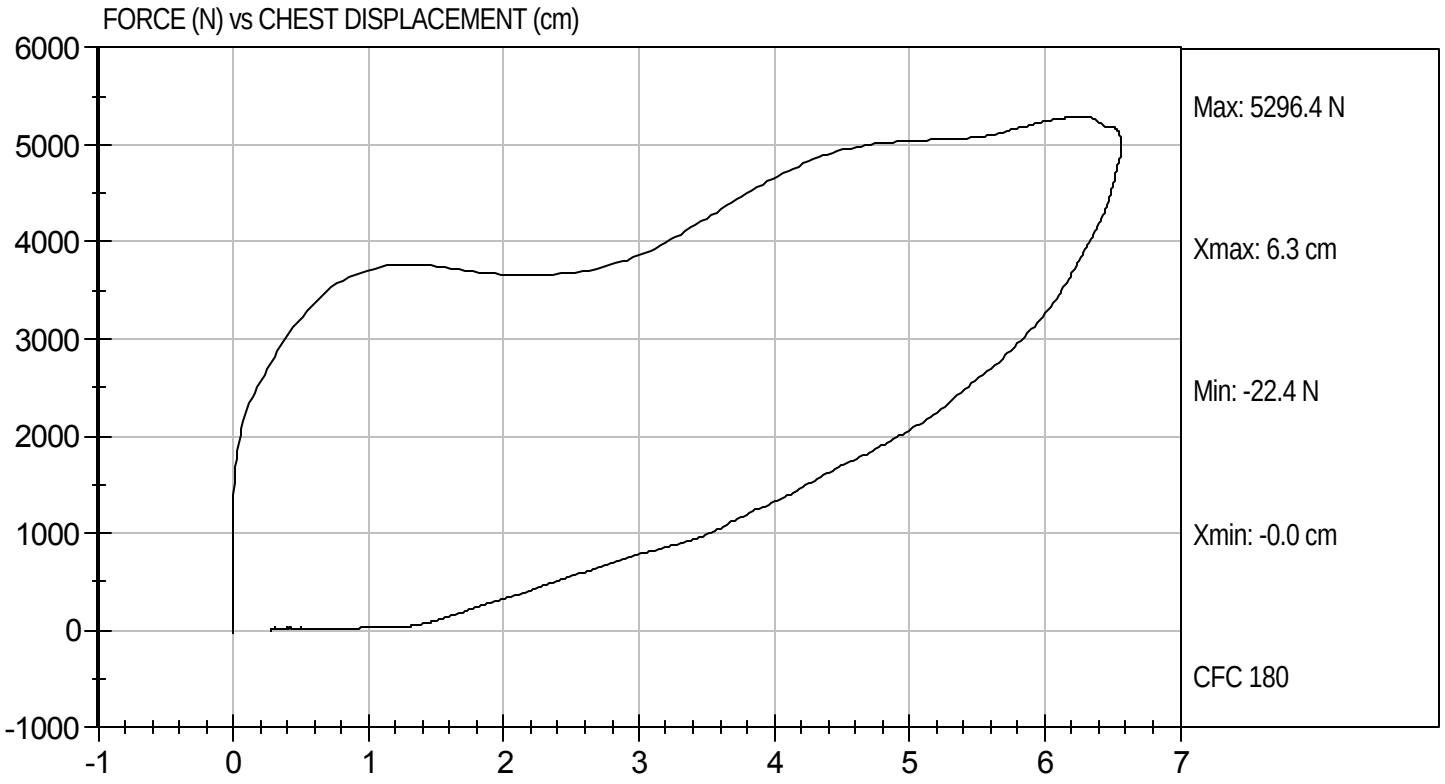
Jessica Gall
Laboratory Technician

1/13/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D12154

Test Date: 1/13/12
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D12155

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5,097	Pass
		Overall Test Results		Pass

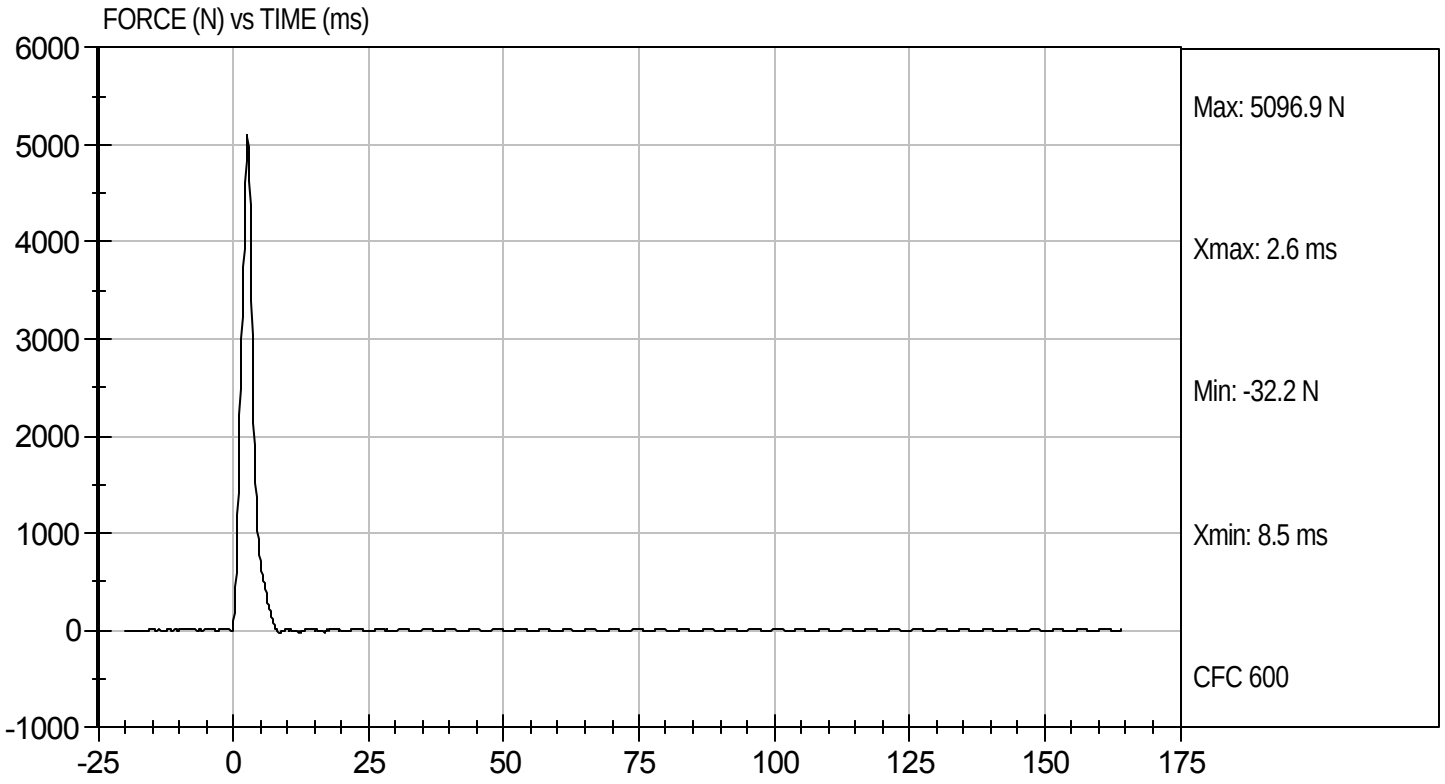
Jessica Gall
Laboratory Technician

1/12/12
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D12155

Test Date: 1/12/12
Velocity: 6.92 ft/s, 2.11 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D12156

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5,014	Pass
		Overall Test Results		Pass

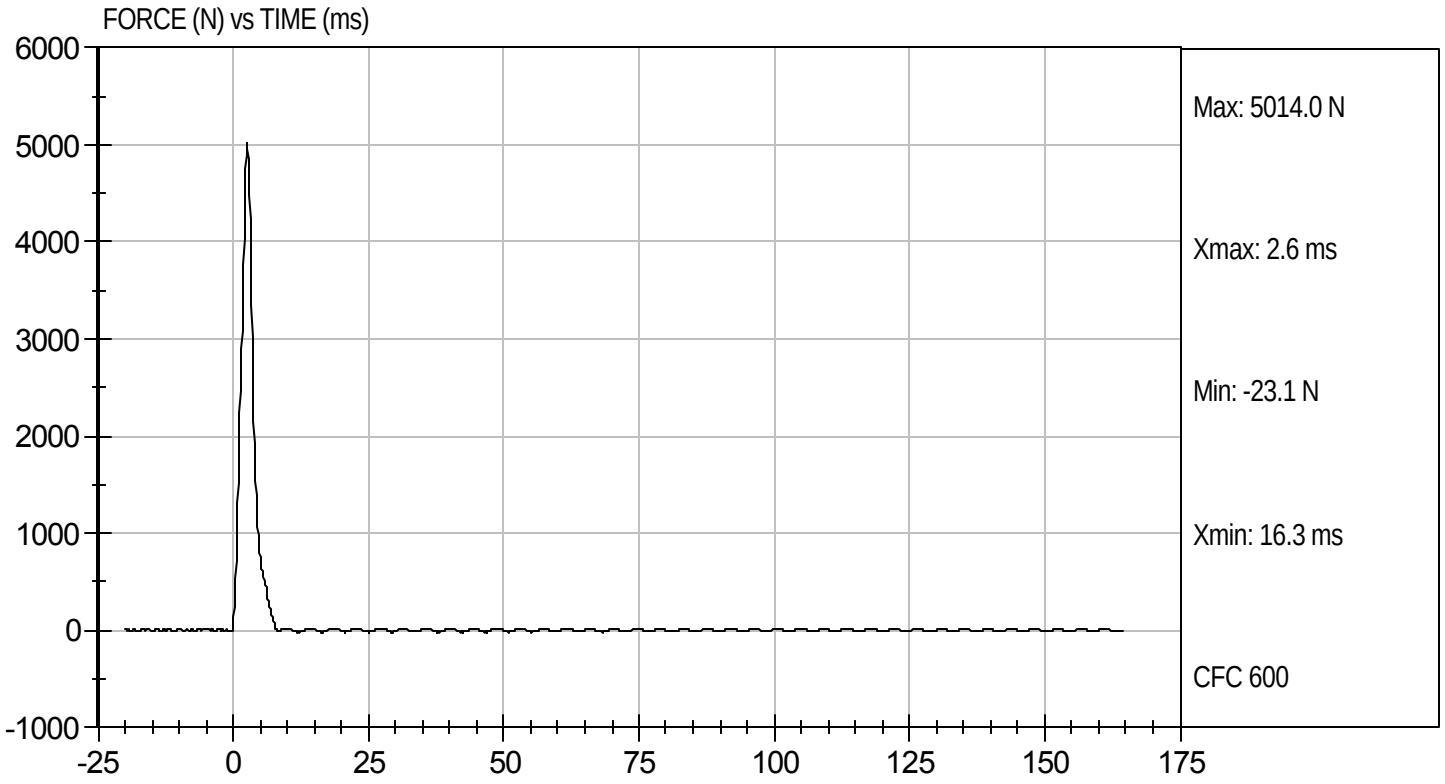
Jessica Hall
Laboratory Technician

1/12/12
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D12156

Test Date: 1/12/12
Velocity: 6.94 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D12150

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.0	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	27	27	Pass
Rotation Rate	deg/s	5.0 -10.0	5.7	5.7	Pass
30 Degrees	Nm	94.9 Nm Max	61.0	60.9	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	43.3	42.4	Pass
		Overall Test Results			Pass

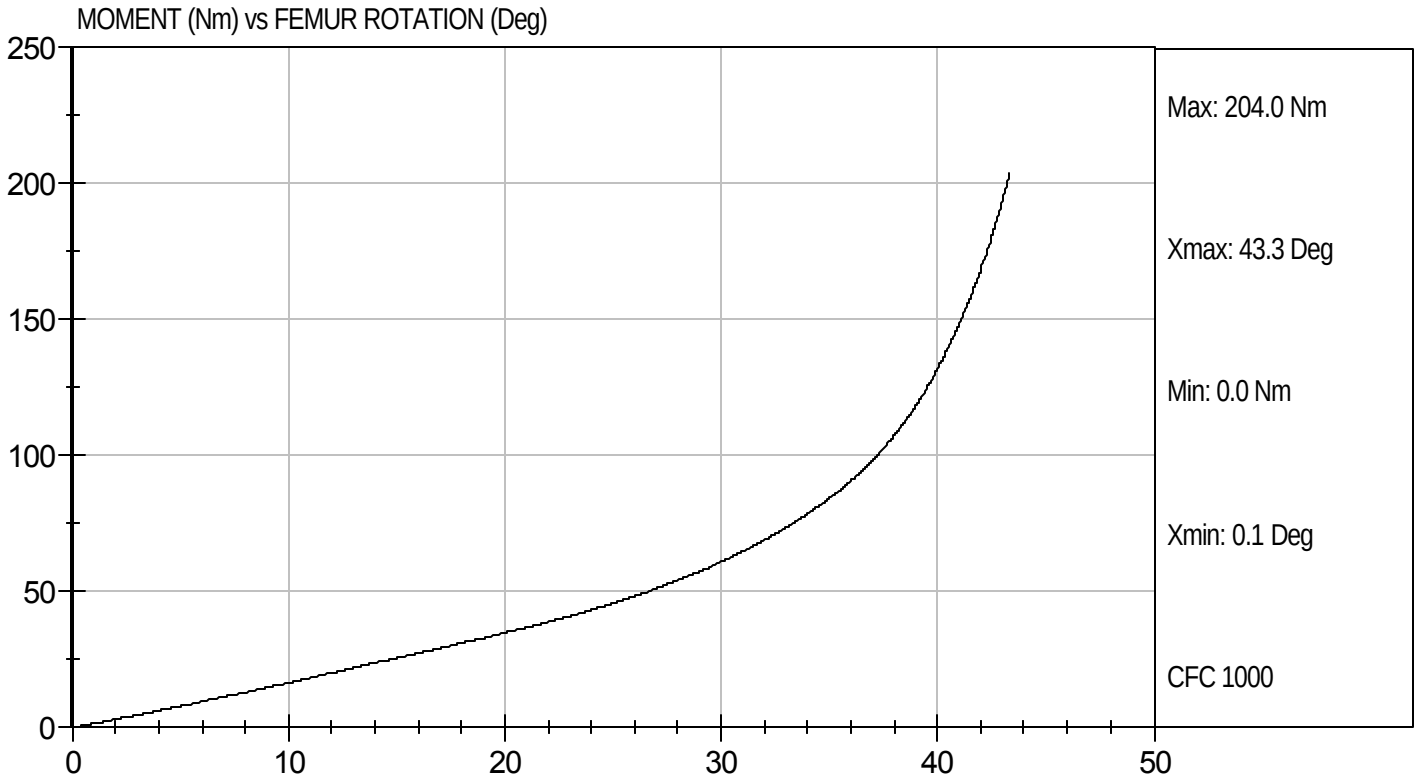
Jessica Hall
Laboratory Technician

1/12/12
Test Date

David Winkelbauer
Approved By

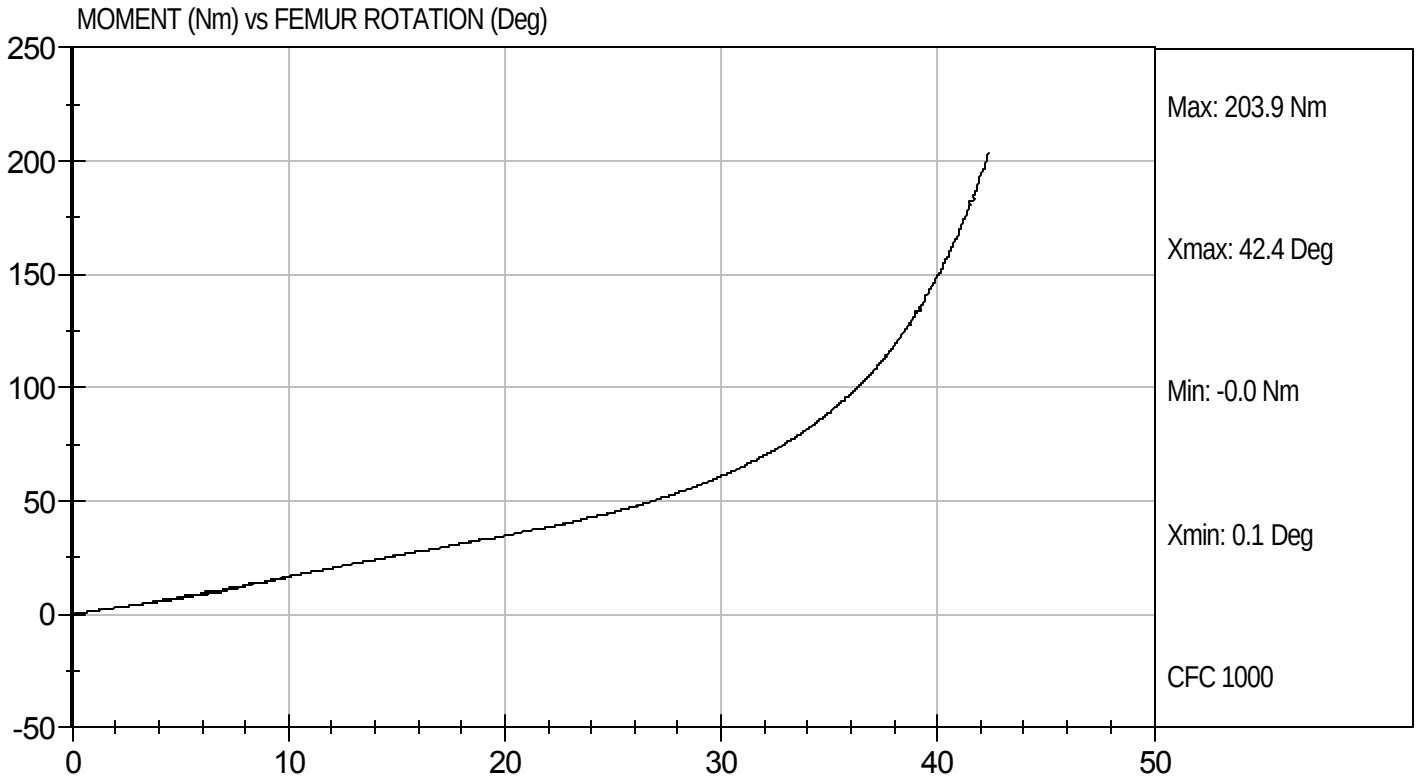
Test Desc: Hip Femur Flexion
Component ID: D12159

Test Date: 1/12/12
Velocity: 0 ft/s, 0.00 m/s



Test Desc: Hip Femur Flexion
Component ID: D12150

Test Date: 1/12/12
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:** D12211

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	15	Pass
Peak Resultant Acceleration	G's	225 - 275	273	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	8.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

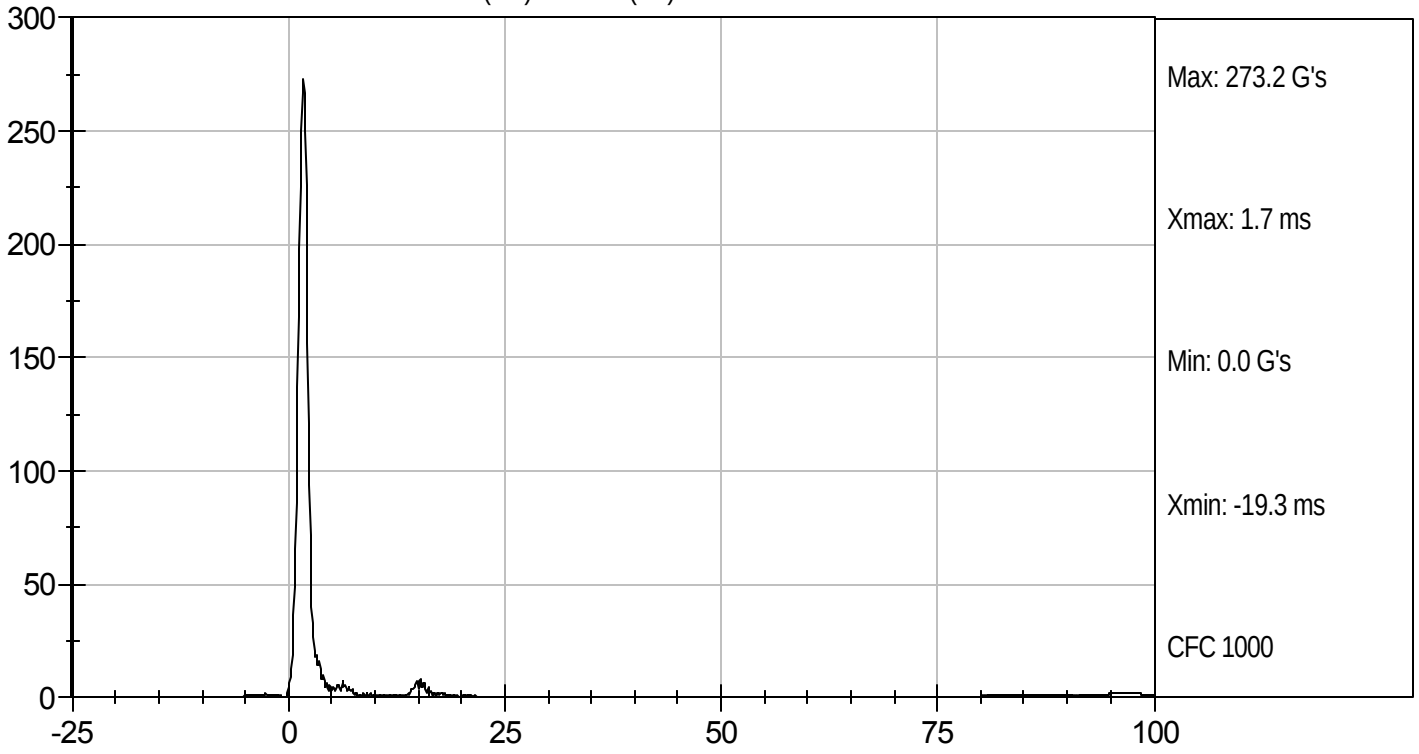
1/18/12
Test Date

David Winkelbauer
Approved By

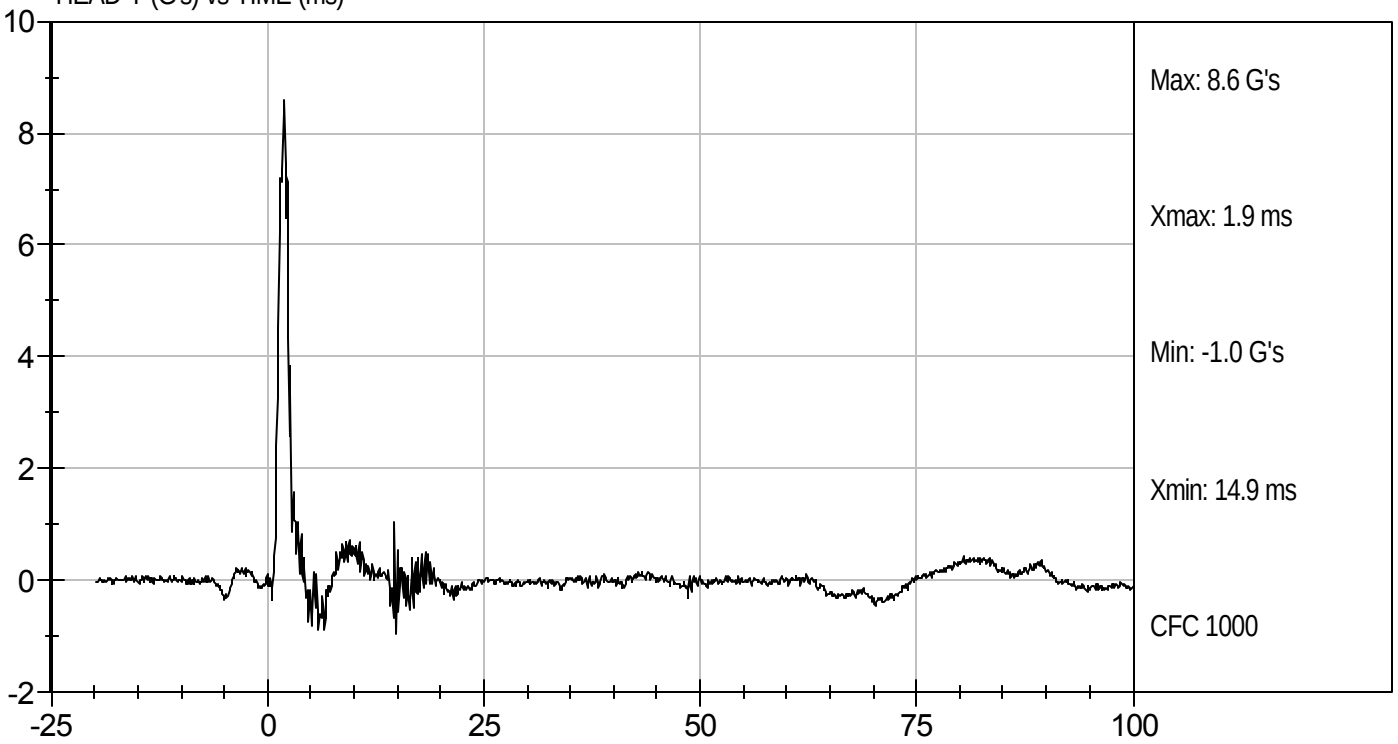
Test Desc: Head Drop
Component ID: D12211

Test Date: 1/18/12
Velocity: 0 ft/s, 0 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:** D12212

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	19	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	G's	22.50 to 27.50	23.27	Pass
	20 ms	G's	17.60 to 22.60	18.20	Pass
	30 ms	G's	12.50 to 18.50	14.16	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 29.0	14.1	Pass
Deceleration Decay Time to Cross 5 G's		ms	34.0 to 42.0	34.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	68.1	Pass
	Time	ms	57.0 to 64.0	58.3	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	113.0 to 128.0	116.8	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	91.4	Pass
	Time	ms	47.0 to 58.0	47.1	Pass
Positive Moment Decay Time To Zero Crossing		ms	97.0 to 107.0	97.5	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

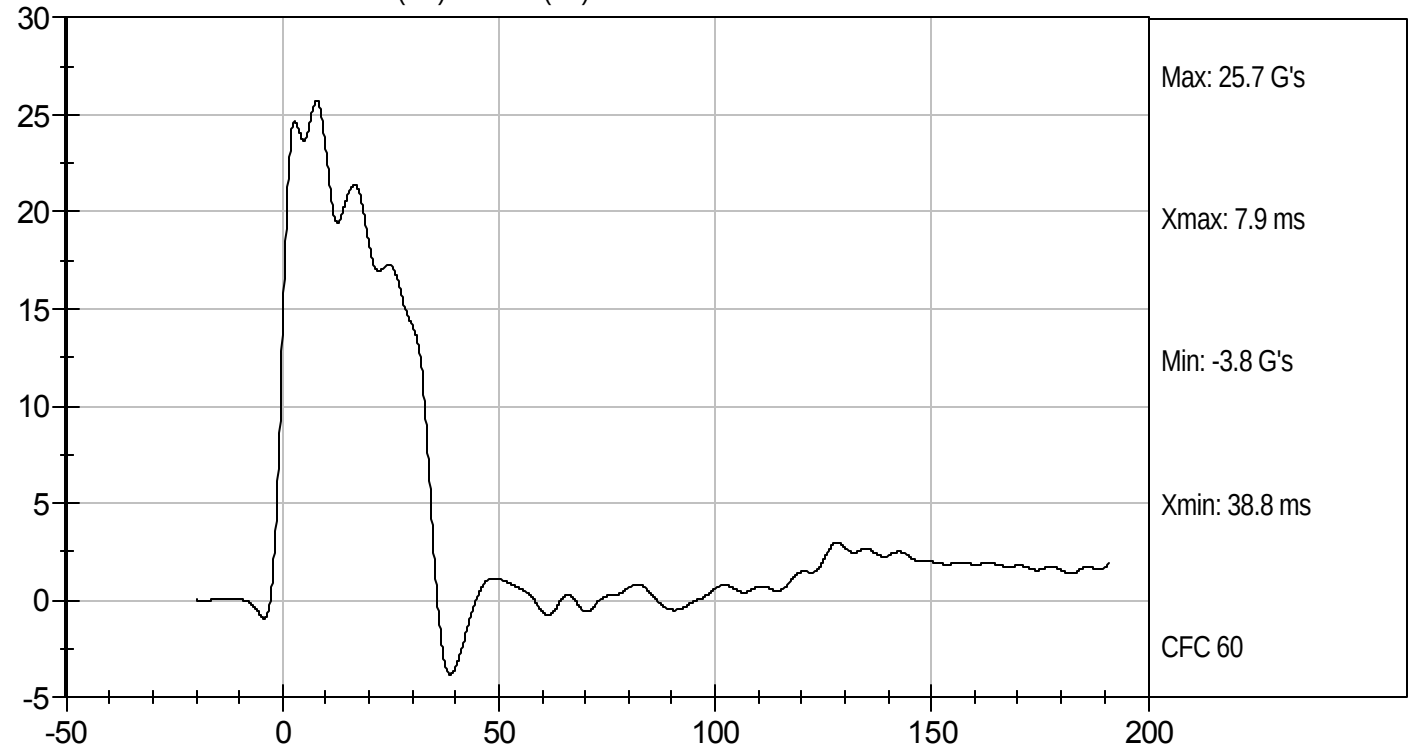
1/18/12
Test Date

David Winkelbauer
Approved By

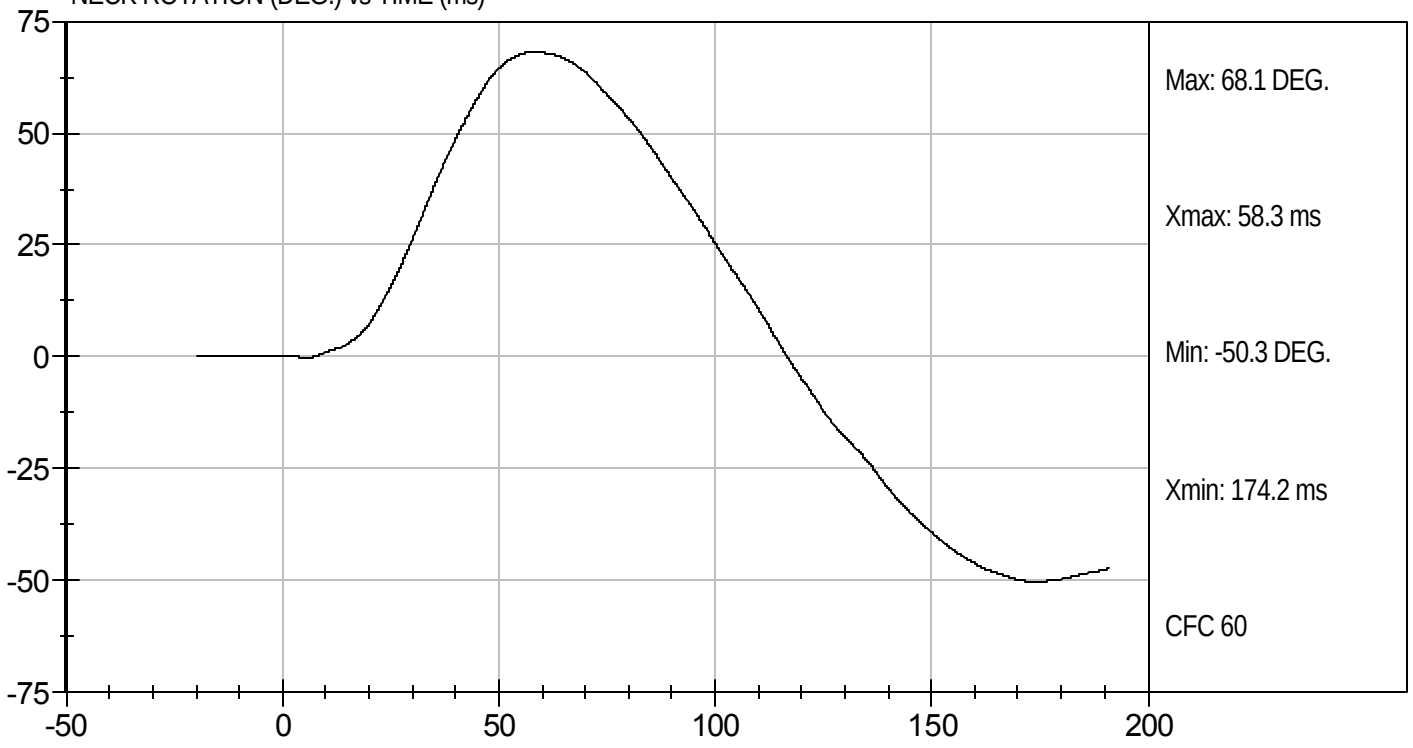
Test Desc: Neck Flexion
Component ID: D12212

Test Date: 1/18/12
Velocity: 23.15 ft/s, 7.06 m/s

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

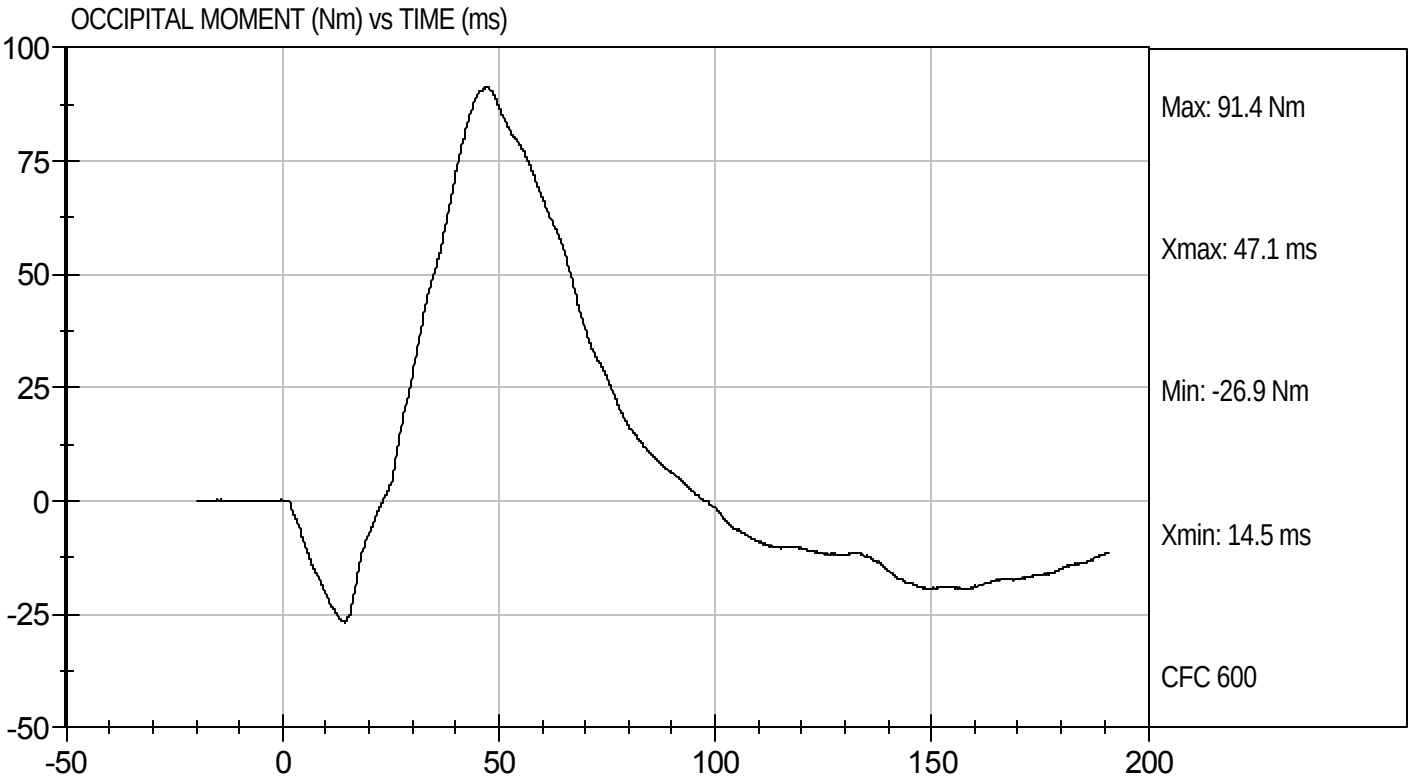


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Component ID: D12212

Test Date: 1/18/12
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:** D12213

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	19	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 ms	G's	17.20 to 21.20	19.53	Pass
	20 ms	G's	14.00 to 19.00	17.25	Pass
	30 ms	G's	11.00 to 16.00	14.58	Pass
Peak Pendulum Deceleration After 30 ms		G's	<= 22.0	14.5	Pass
Deceleration Decay Time to Cross 5 G's		ms	38.0 to 46.0	38.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.6	Pass
	Time	ms	72.0 to 82.0	75.6	Pass
"D" Plane Rotation Decay Time To Zero Crossing		ms	147.0 to 174.0	155.1	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to -79.9	-61.0	Pass
	Time	ms	65.0 to 79.0	69.3	Pass
Negative Moment Decay Time To Zero Crossing		ms	120.0 to 148.0	140.6	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

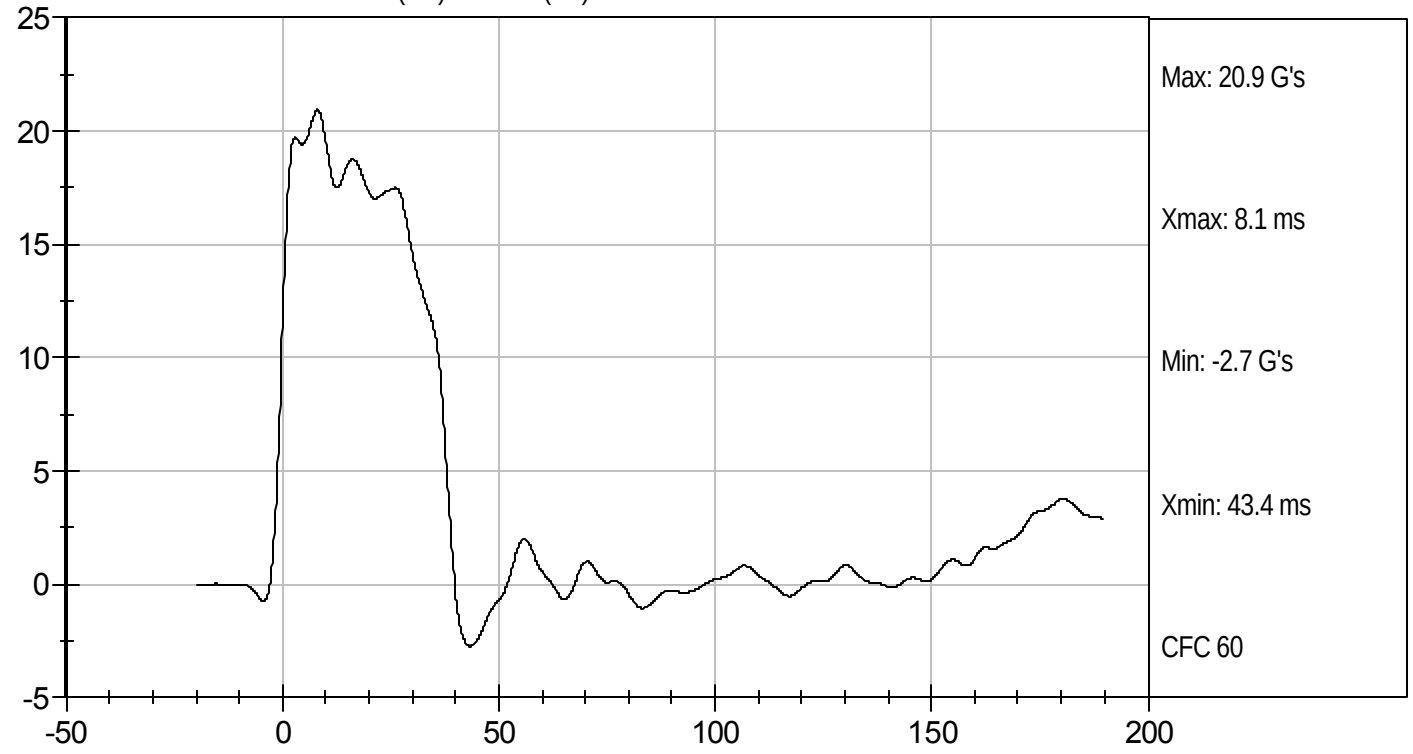
1/18/12
Test Date

David Winkelbauer
Approved By

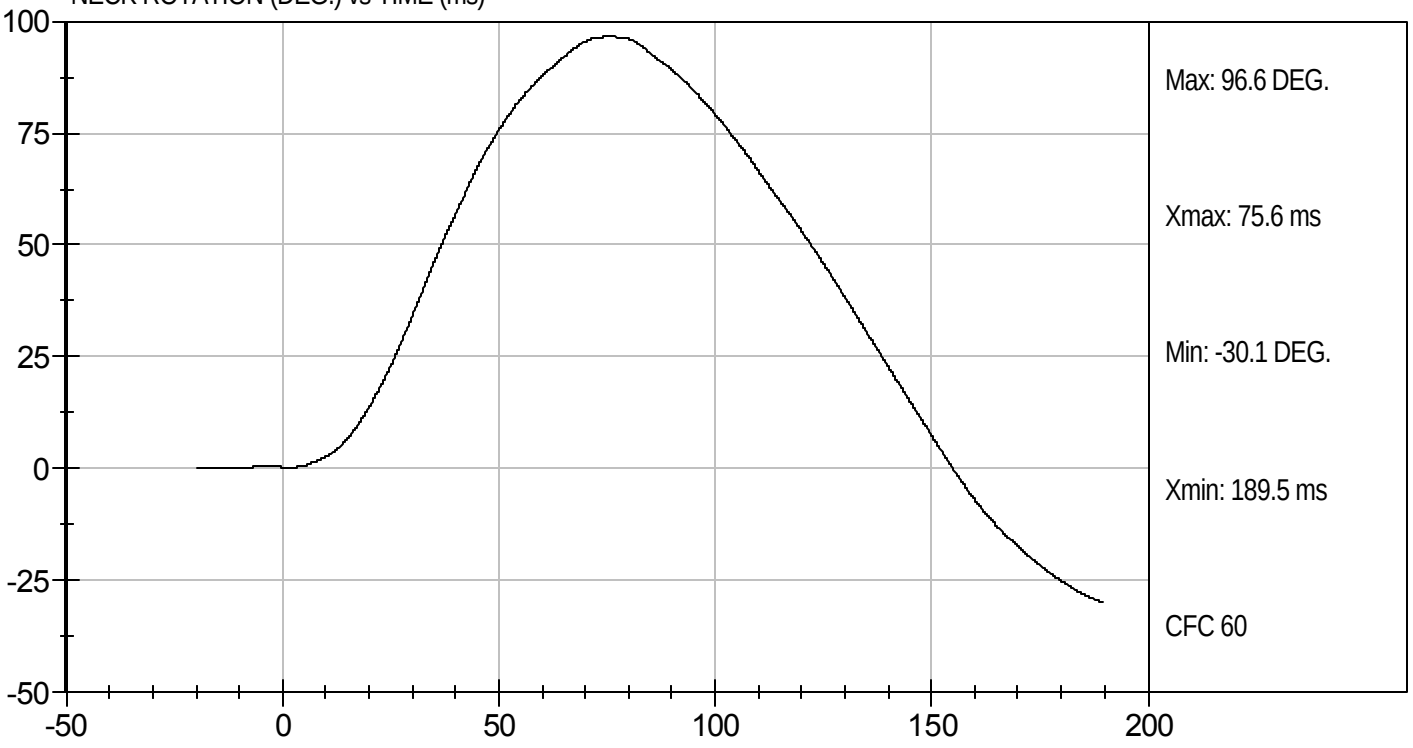
Test Desc: Neck Extension
Component ID: D12213

Test Date: 1/18/12
Velocity: 20.08 ft/s, 6.12 m/s

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

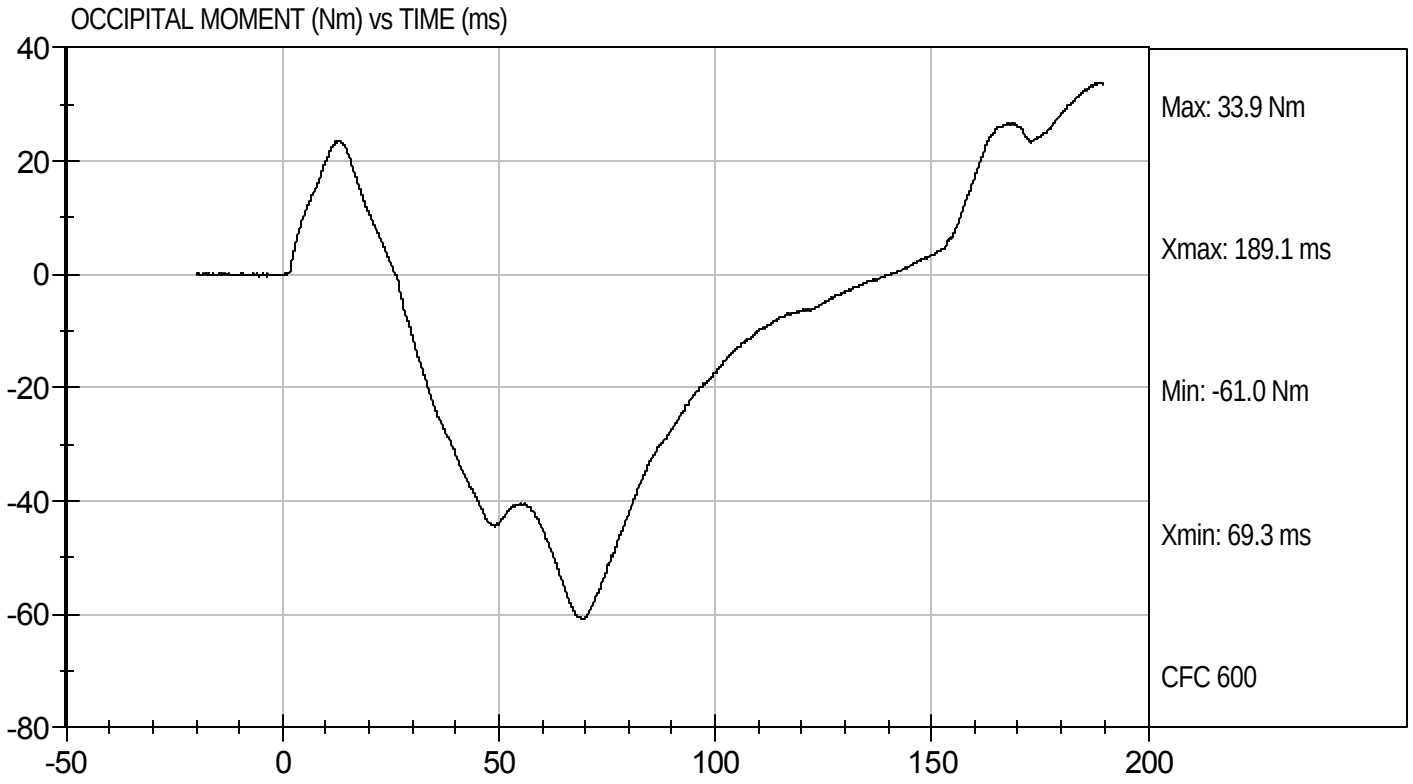


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D12213

Test Date: 1/18/12
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:** D12214

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Velocity	m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force	N	5159 to 5893	5,309	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.47	Pass
Internal Hysteresis	%	69 to 85	71	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D12214

Test Date: 1/18/12
Velocity: 22.22 ft/s, 6.77 m/s

MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D12215

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,436	Pass
		Overall Test Results		Pass

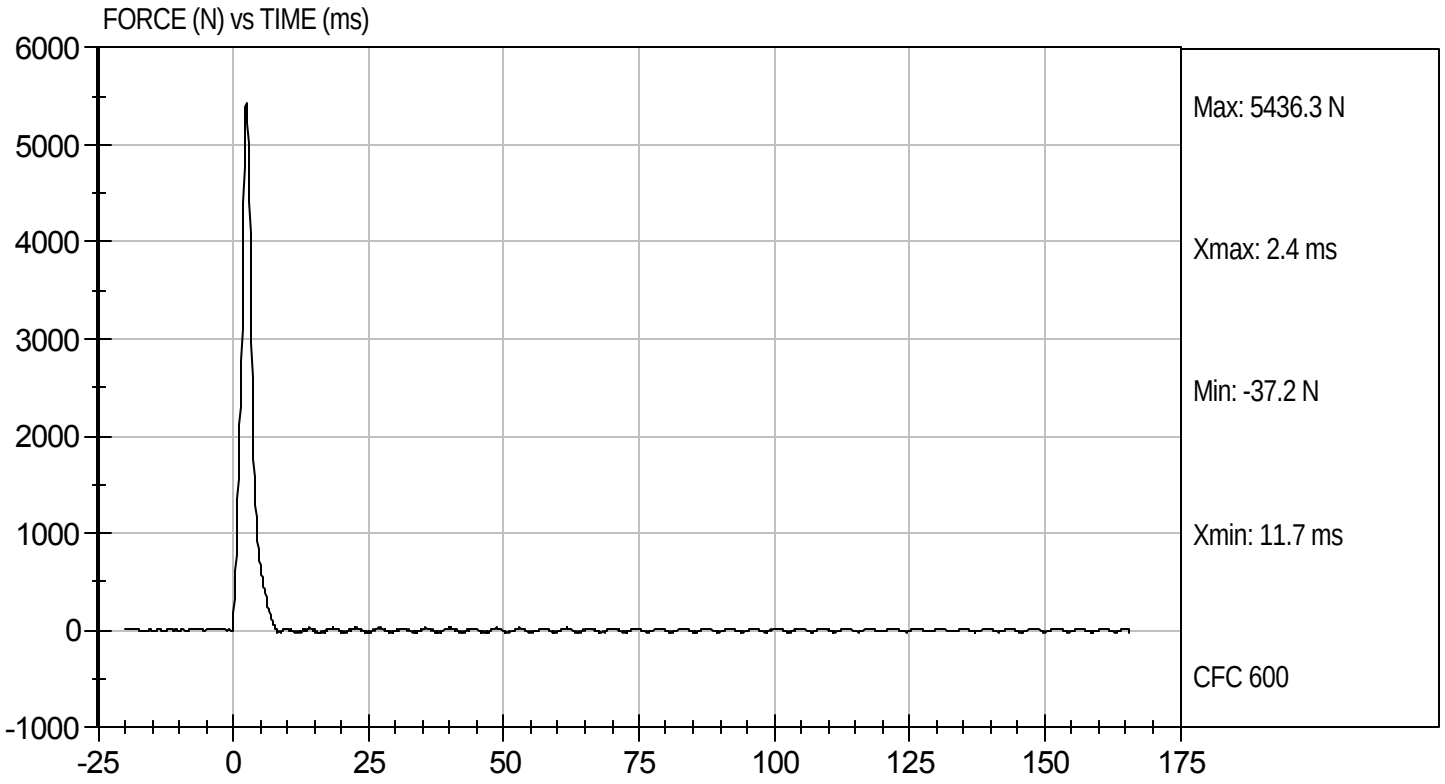
Jessica Hall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D12215

Test Date: 1/18/12
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:** D12216

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,210	Pass
		Overall Test Results		Pass

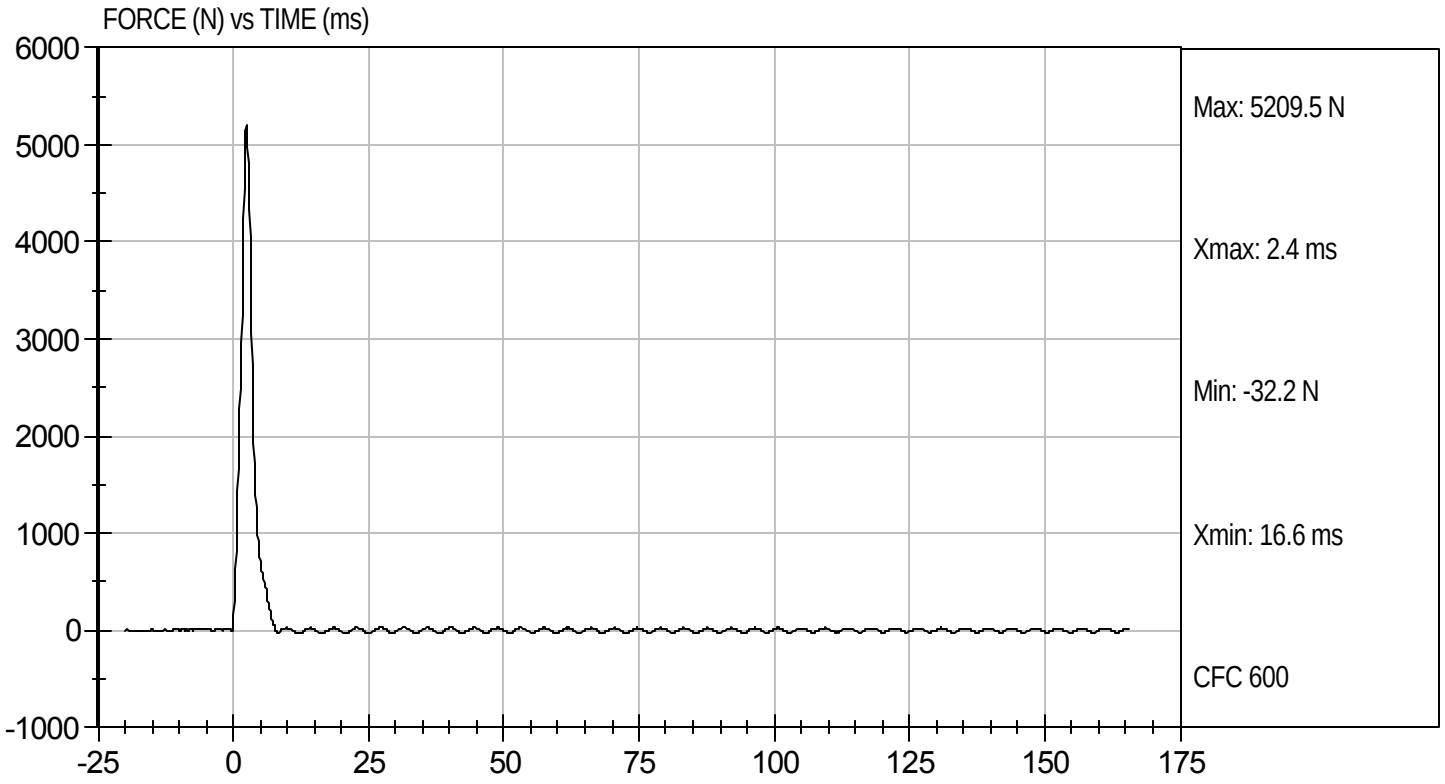
Jessica Hall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D12216

Test Date: 1/18/12
Velocity: 6.88 ft/s, 2.10 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 351 **Test I.D:** D12210

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.8	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	17	17	Pass
Rotation Rate	deg/s	5.0 -10.0	5.7	5.7	Pass
30 Degrees	Nm	94.9 Nm Max	60.7	60.7	Pass
150 ft-lbf / 203.4 Nm	Deg	40.0 - 50.0 Degree Max Rotation	43.5	42.7	Pass
		Overall Test Results			Pass

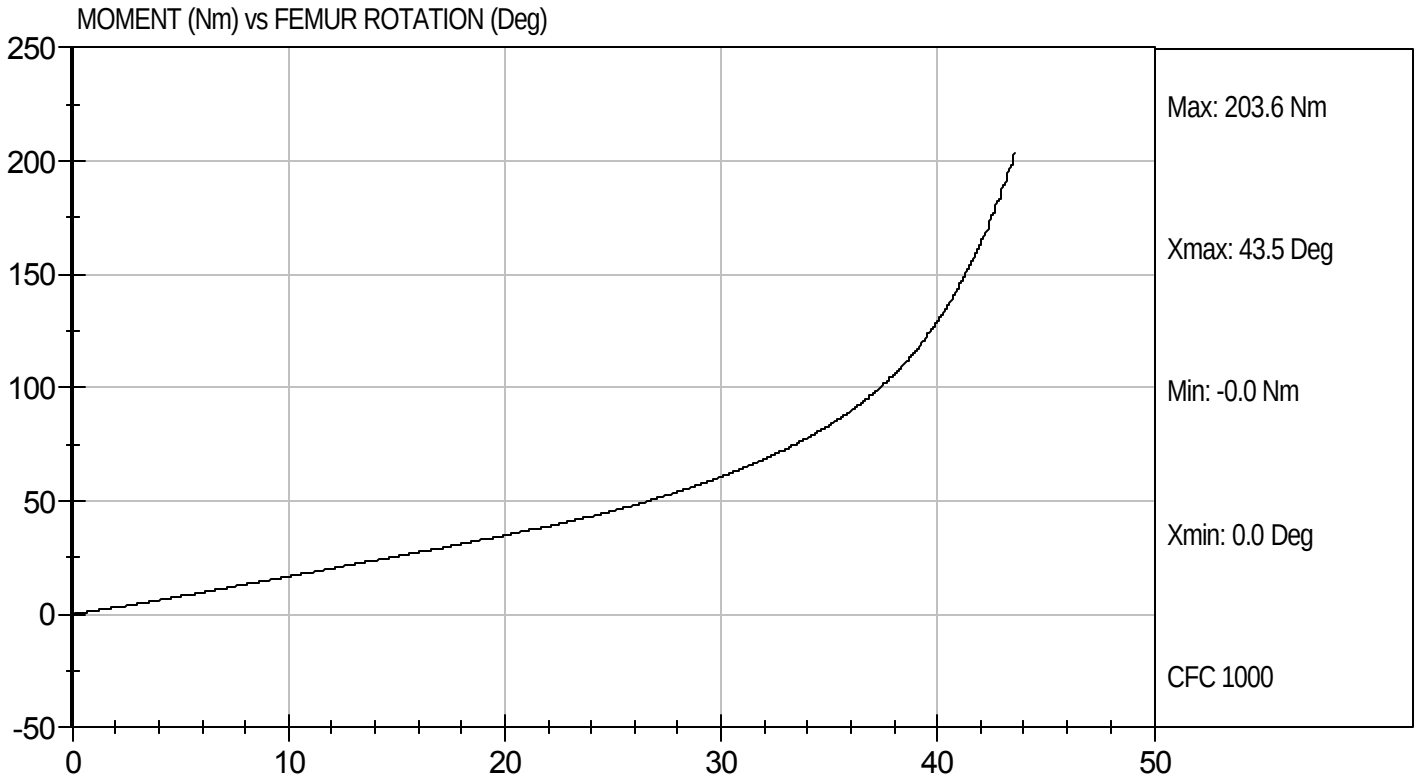
Jessica Hall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By

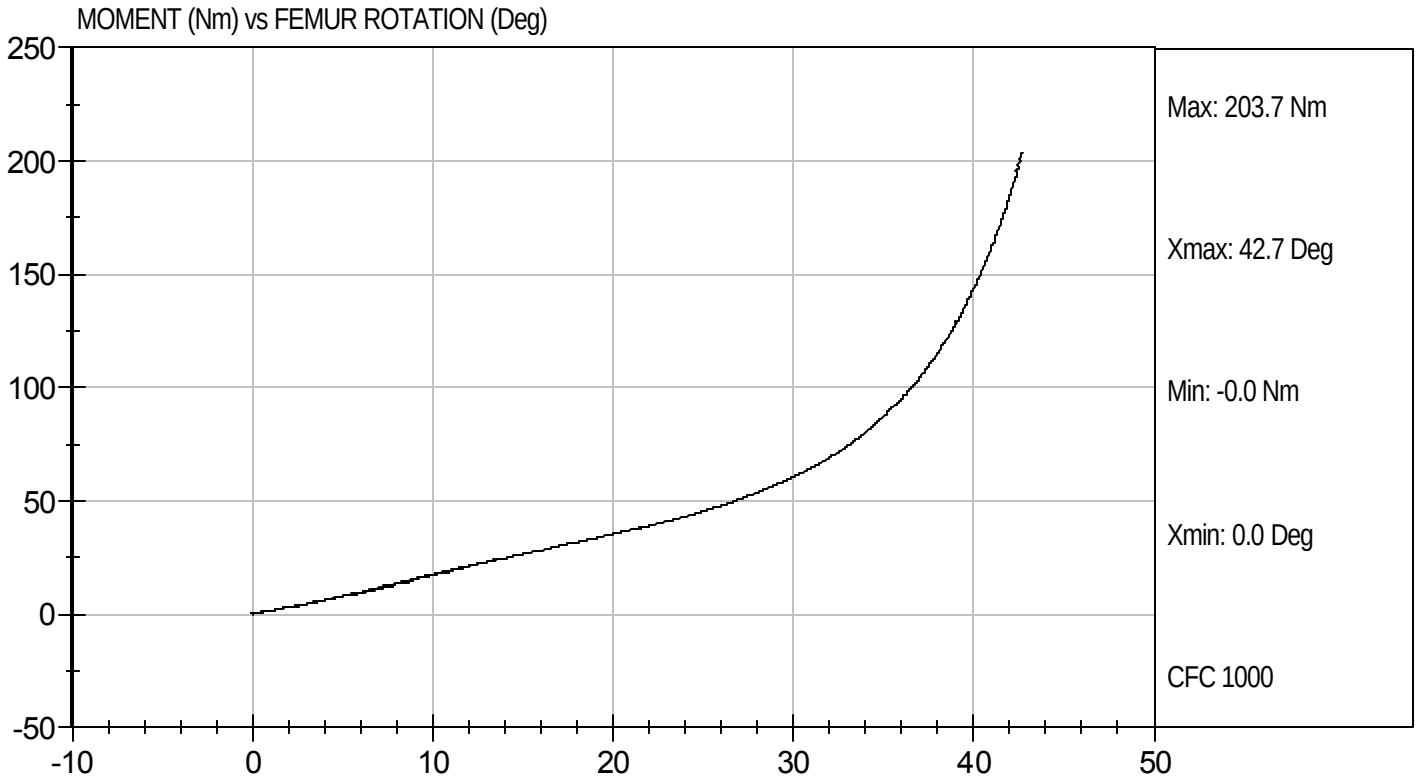
Test Desc: Hip Femur Flexion
Component ID: D12219

Test Date: 1/18/12
Velocity: 0 ft/s, 0.00 m/s



Test Desc: Hip Femur Flexion
Component ID: D12210

Test Date: 1/18/12
Velocity: 0 ft/s, 0.00 m/s



Hybrid III, 5th External Measurements
SN: 634

HYBRID III, PART 572, SUBPART O EXTERNAL DIMENSIONS				
DIMENSION	DESCRIPTION	DETAILS	ASSEMBLY DIMENSION (mm)	ACTUAL MEASUREMENT
A	TOTAL SITTING HEIGHT	Seat surface to highest point on top of the head.	774.7-800.1	784.6
B	SHOULDER PIVOT HEIGHT	Centerline of shoulder pivot bolt to the seat surface.	431.8-457.2	449.0
C	H-POINT HEIGHT	Reference	81.3-86.3	85.0
D	H-POINT LOCATION FROM BACKLINE	Reference	144.8-149.8	145.0
E	SHOULDER PIVOT FROM BACKLINE	Center of the shoulder clevis to the rear vertical surface of the fixture.	68.6-83.8	79.2
F	THIGH CLEARANCE	Measured at the highest point on the upper femur segment.	119.4-134.6	125.6
G	BACK OF ELBOW TO WRIST PIVOT	back of the elbow flesh to the wrist pivot in line with the elbow and wrist pivots	243.9-259.1	253.4
H	HEAD BACK TO BACKLINE	Back of Skull cap skin to seat rear vertical surface (Reference)	43.2-48.2	45.0
I	SHOULDER TO- ELBOW LENGTH	Measure from the highest point on top of the shoulder clevis to the lowest part of the flesh on the elbow in line with the elbow pivot bolt.	276.8-297.2	277.8
J	ELBOW REST HEIGHT	Measure from the flesh below the elbow pivot bolt to the seat surface.	182.8-203.2	197.5
K	BUTTOCK TO KNEE LENGTH	The forward most part of the knee flesh to the rear vertical surface of the fixture.	520.7-546.1	541.4
L	POPLITEAL HEIGHT	Seat surface to the plane of the horizontal plane of the bottom of the feet.	355.6-376.0	362.1
M	KNEE PIVOT HEIGHT	Centerline of knee pivot bolt to the horizontal plane of the bottom of the feet.	393.7-419.1	400.4
N	BUTTOCK POPLITEAL LENGTH	The rearmost surface of the lower leg to the same point on the rear surface of the buttocks used for dim. “K”.	414-439.4	428.6

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

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test ID:** D12161

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	25	Pass
Peak Resultant Acceleration	G's	250 to 300	285	Pass
Peak Lateral Acceleration	G's	+/- 15	-6.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Gale
Laboratory Technician

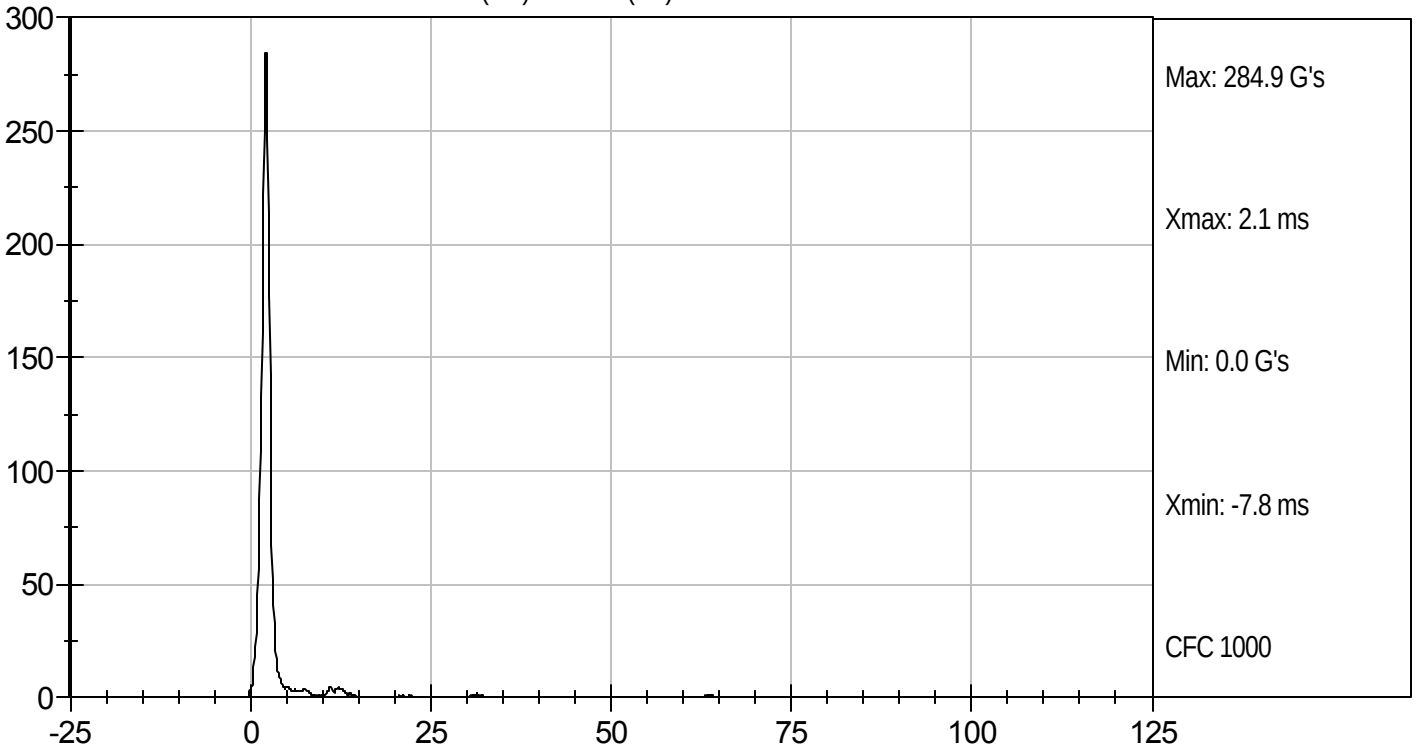
1/12/12
Test Date

David Winkelbauer
Approved By

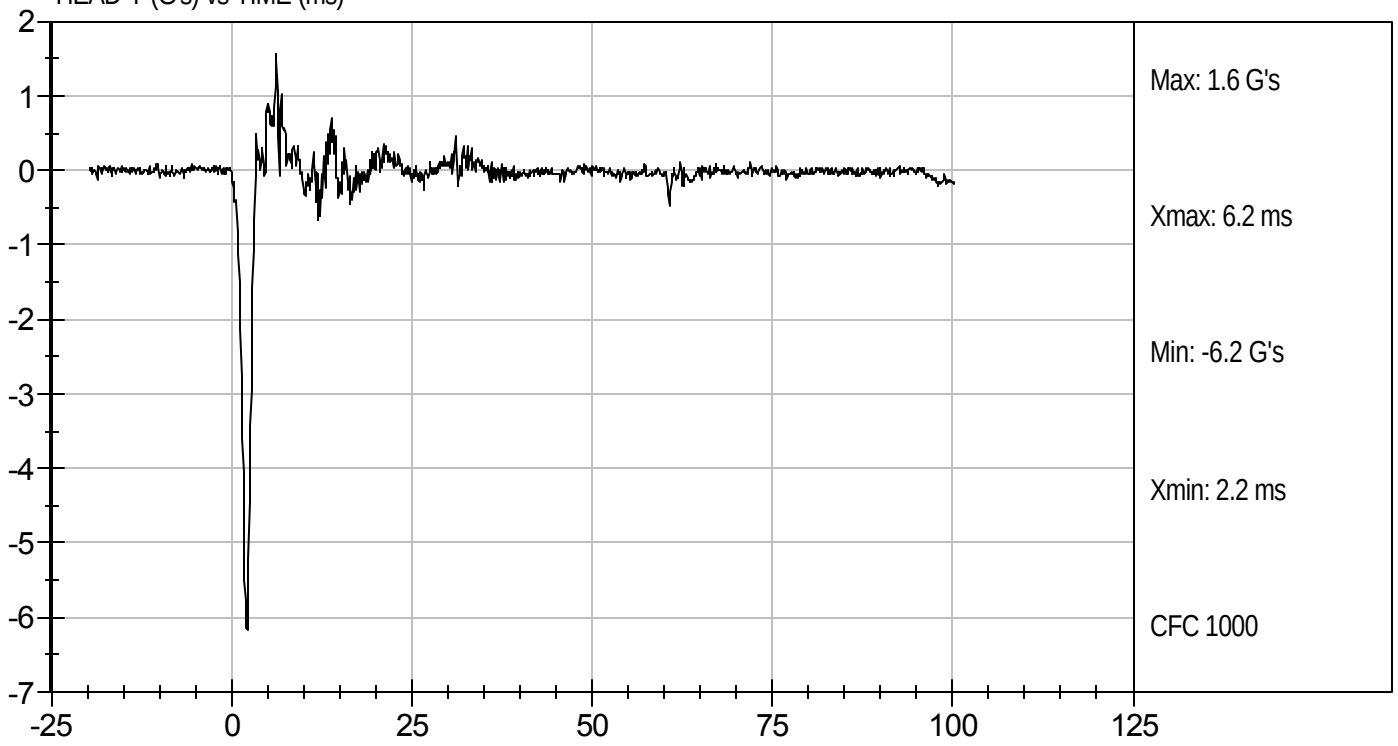
Test Desc: Head Drop
Component ID: D12161

Test Date: 1/12/12
Velocity: 0 ft/s, 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 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12162

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Pulse	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.6	Pass
	30 ms	m/s	5.8 to 7.0	6.3	Pass
D Plane Rotation	Max	deg	77 to 91	79	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 to 100	83	Pass
			Overall Results		Pass

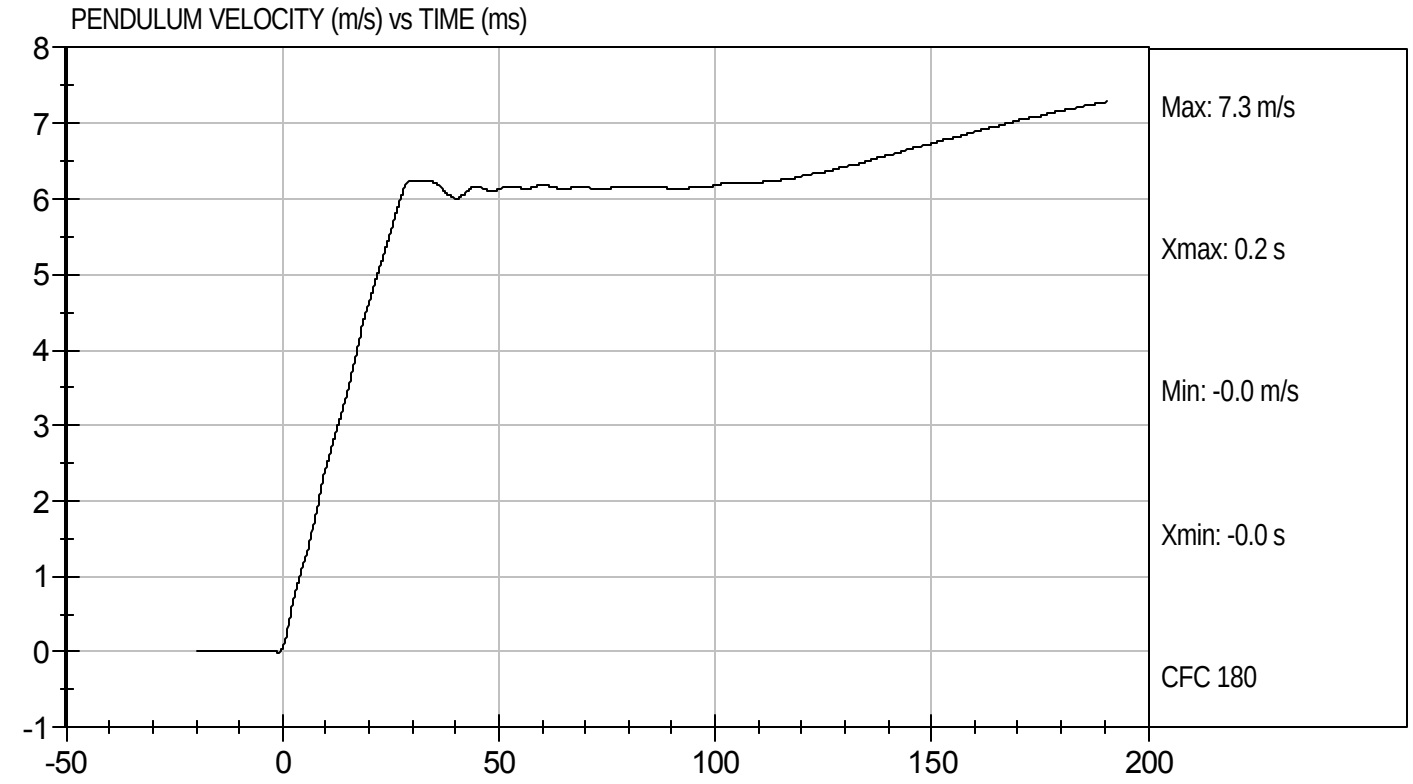
Jessica Hall
Laboratory Technician

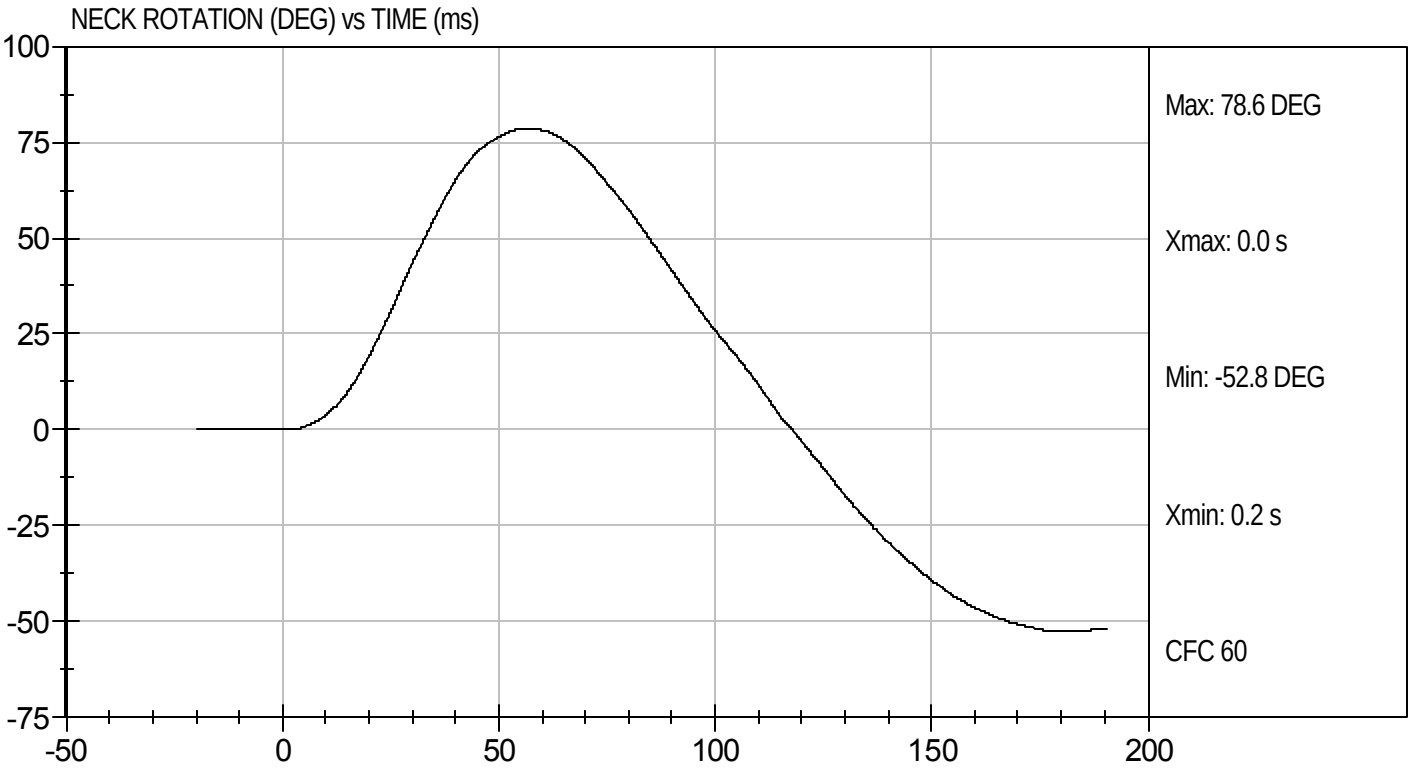
1/13/12
Test Date

David Winkelbauer
Approved By

Test Desc: Neck Flexion
Component ID: D12162

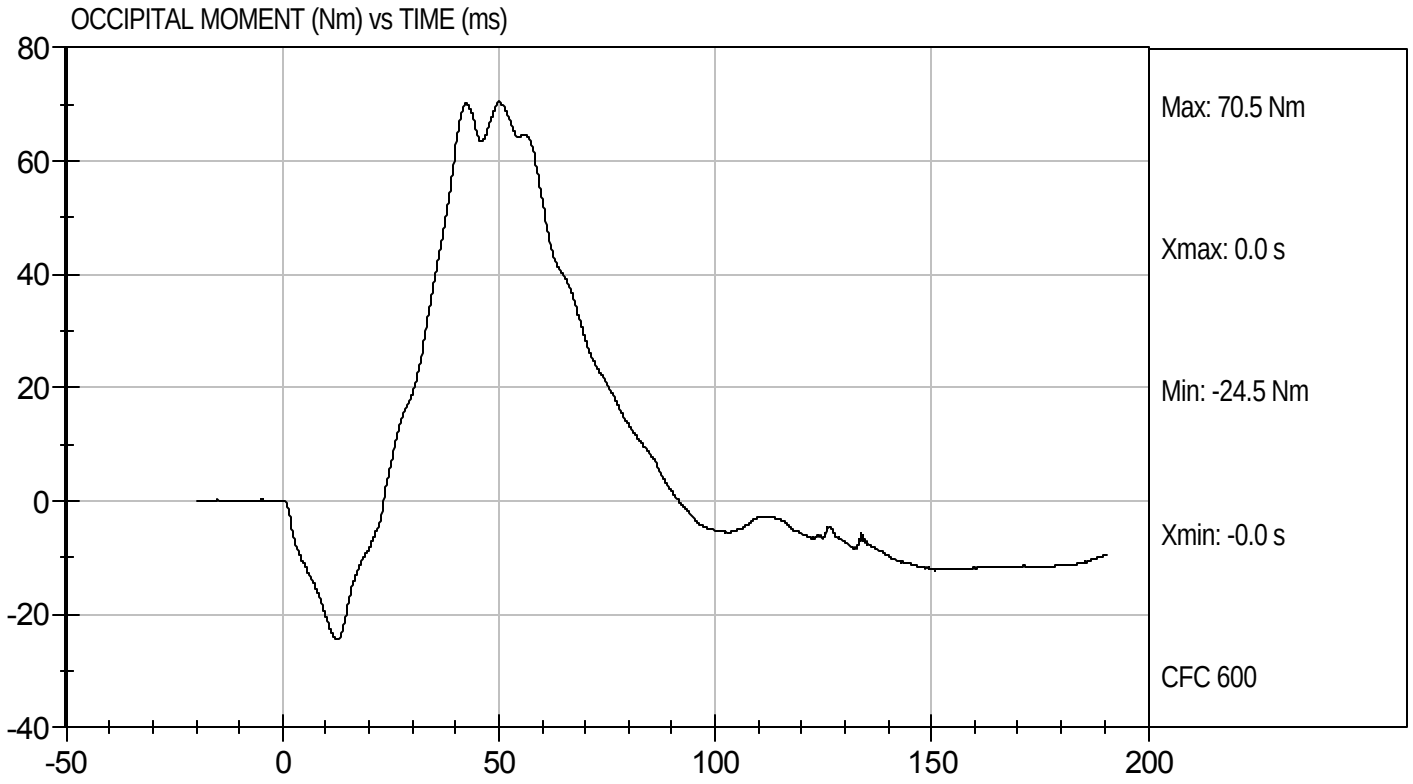
Test Date: 1/13/12
Velocity: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Flexion
Component ID: D12162

Test Date: 1/13/12
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12163

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Pulse	10 ms	m/s	1.5 to 1.9	1.9	Pass
	20 ms	m/s	3.1 to 3.9	3.7	Pass
	30 ms	m/s	4.6 to 5.6	5.2	Pass
D Plane Rotation	Max	deg	99 to 114	105	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-53	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	104	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

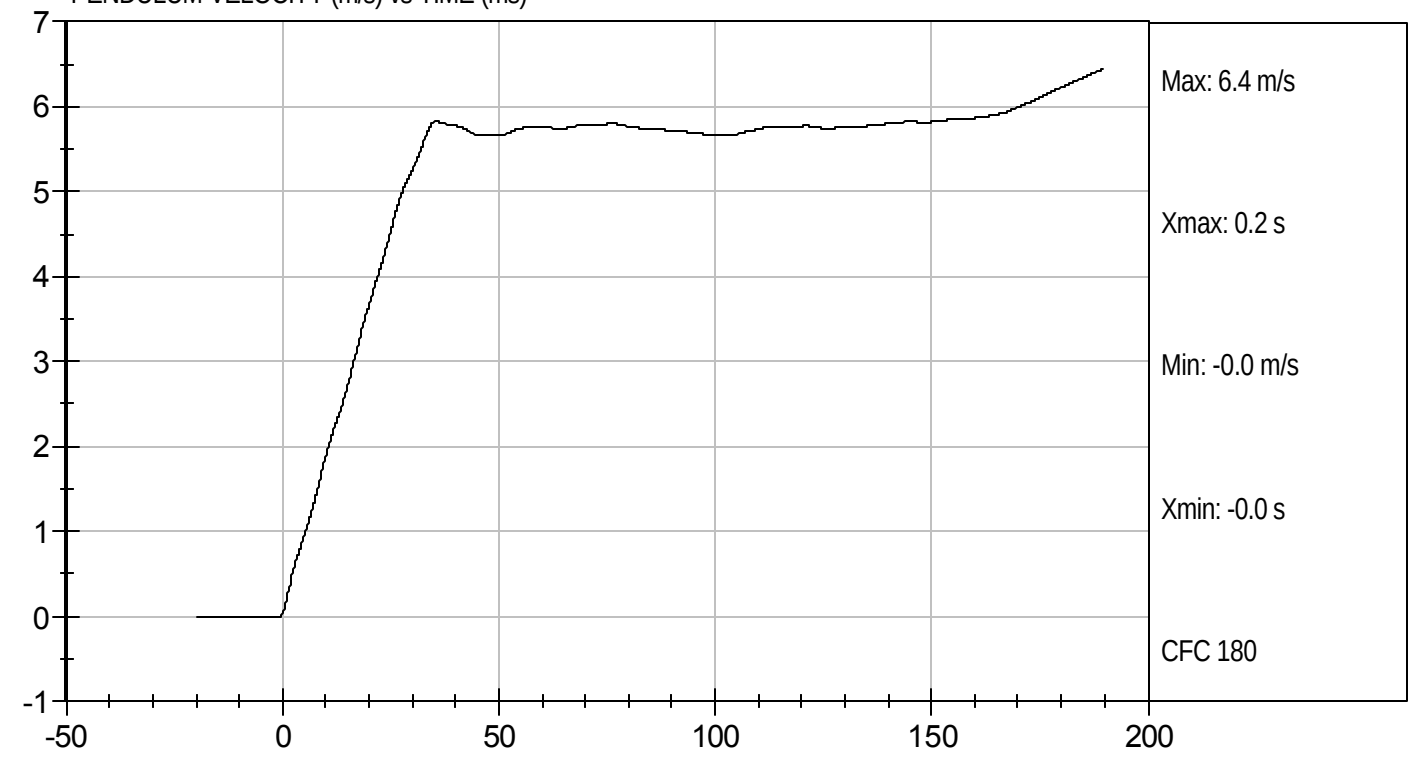
1/13/12
Test Date

David Winkelbauer
Approved By

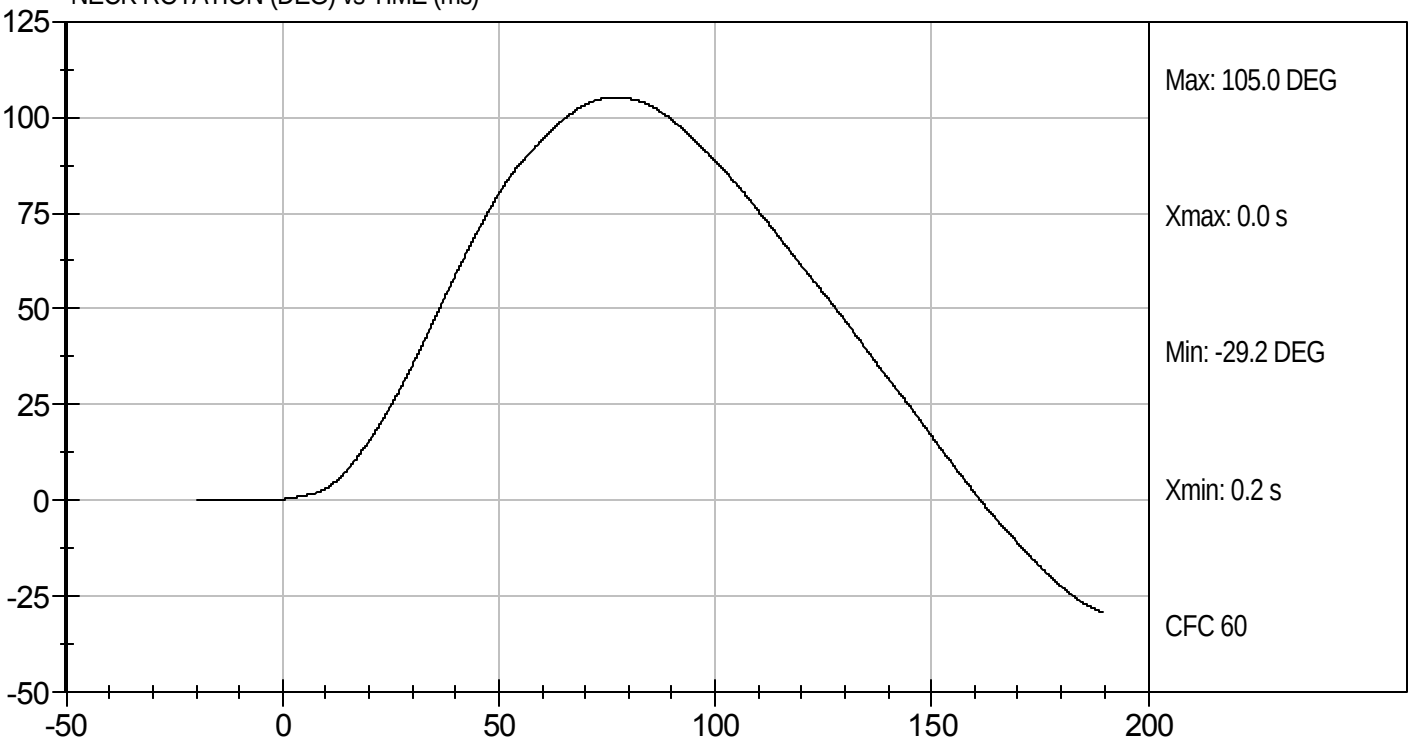
Test Desc: Neck Extension
Component ID: D12163

Test Date: 1/13/12
Velocity: 20.08 ft/s, 6.12 m/s

PENDULUM VELOCITY (m/s) vs TIME (ms)

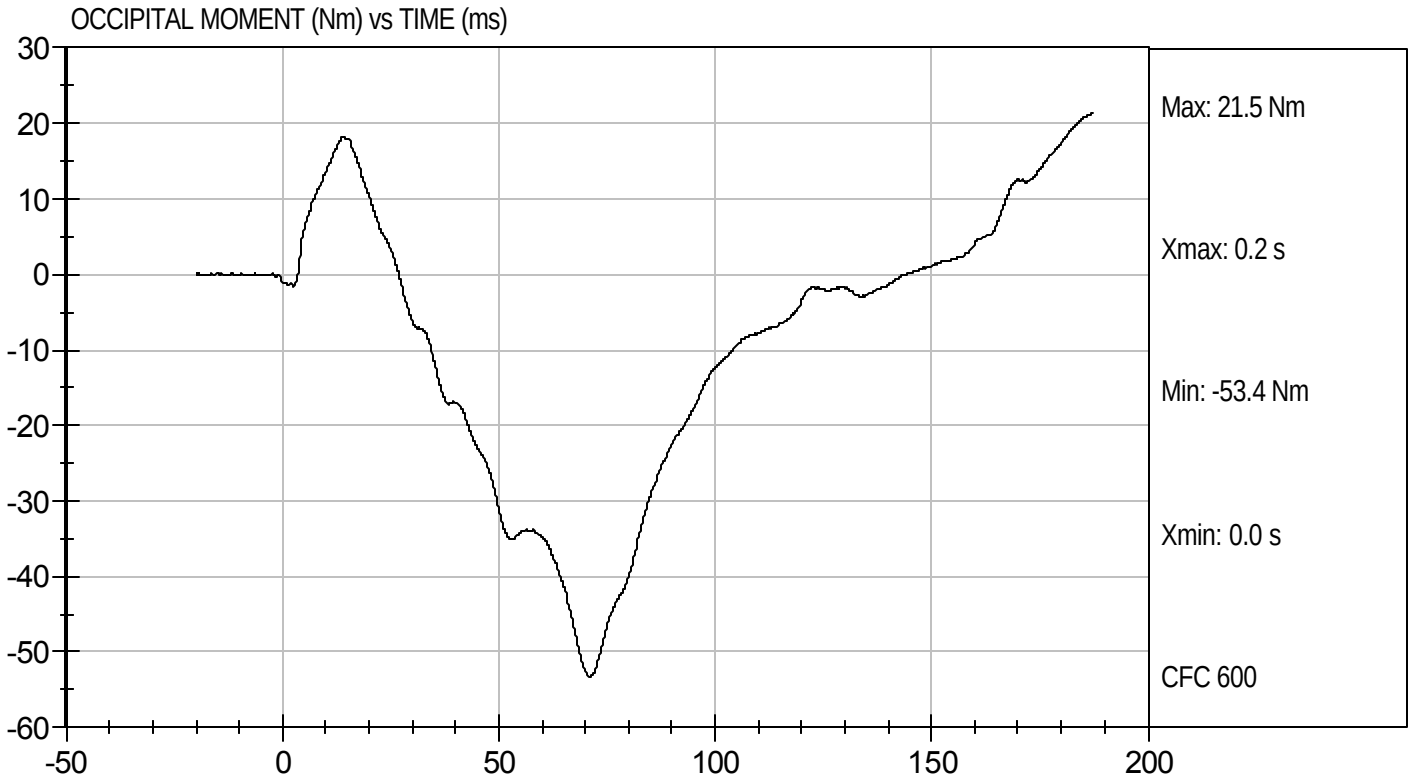


NECK ROTATION (DEG) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D12163

Test Date: 1/13/12
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12164

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.1	Pass
Relative Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	51	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.00	Pass
Internal Hysteresis	%	69 to 85	76	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	4146	Pass
		Overall Test Results		Pass

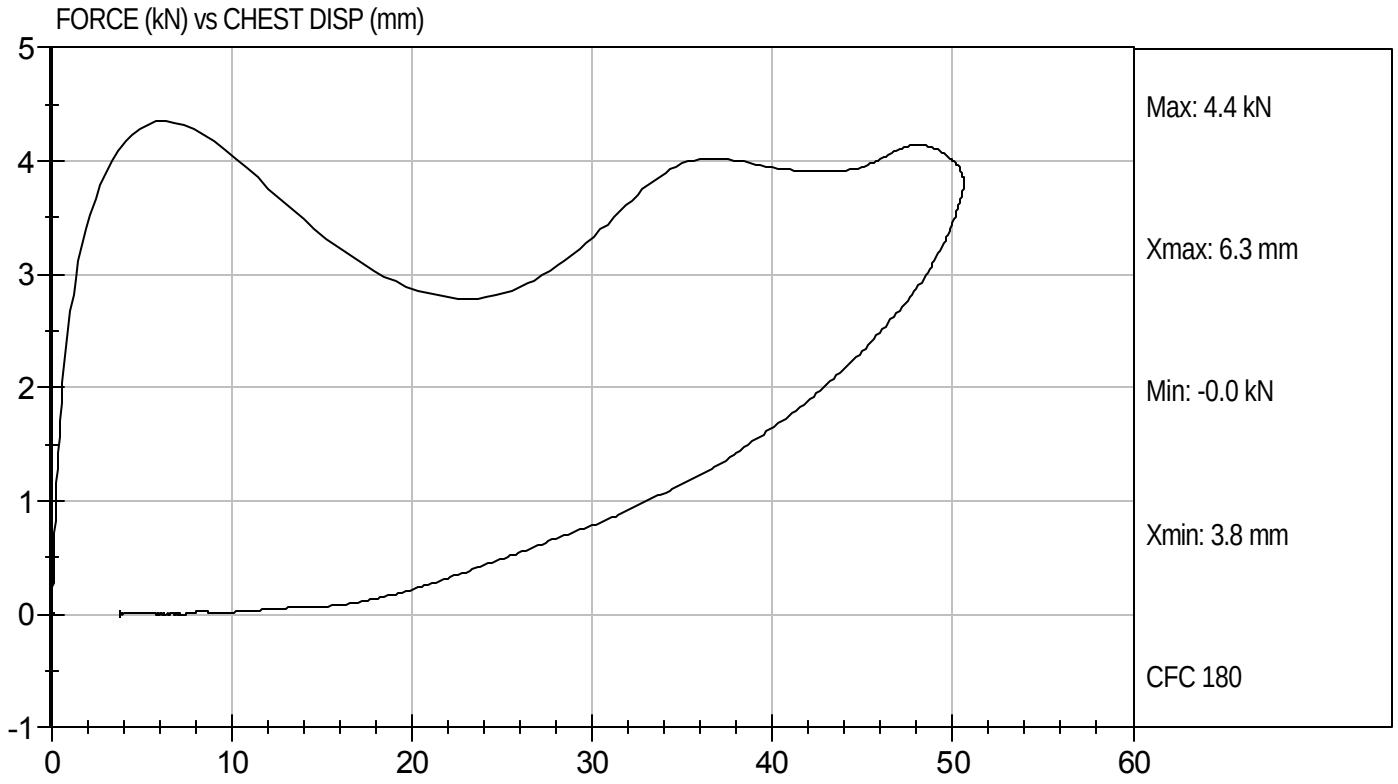
Jessica Hall
Laboratory Technician

1/13/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D12164

Test Date: 1/13/12
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12165

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.84	Pass
		Overall Test Results		Pass

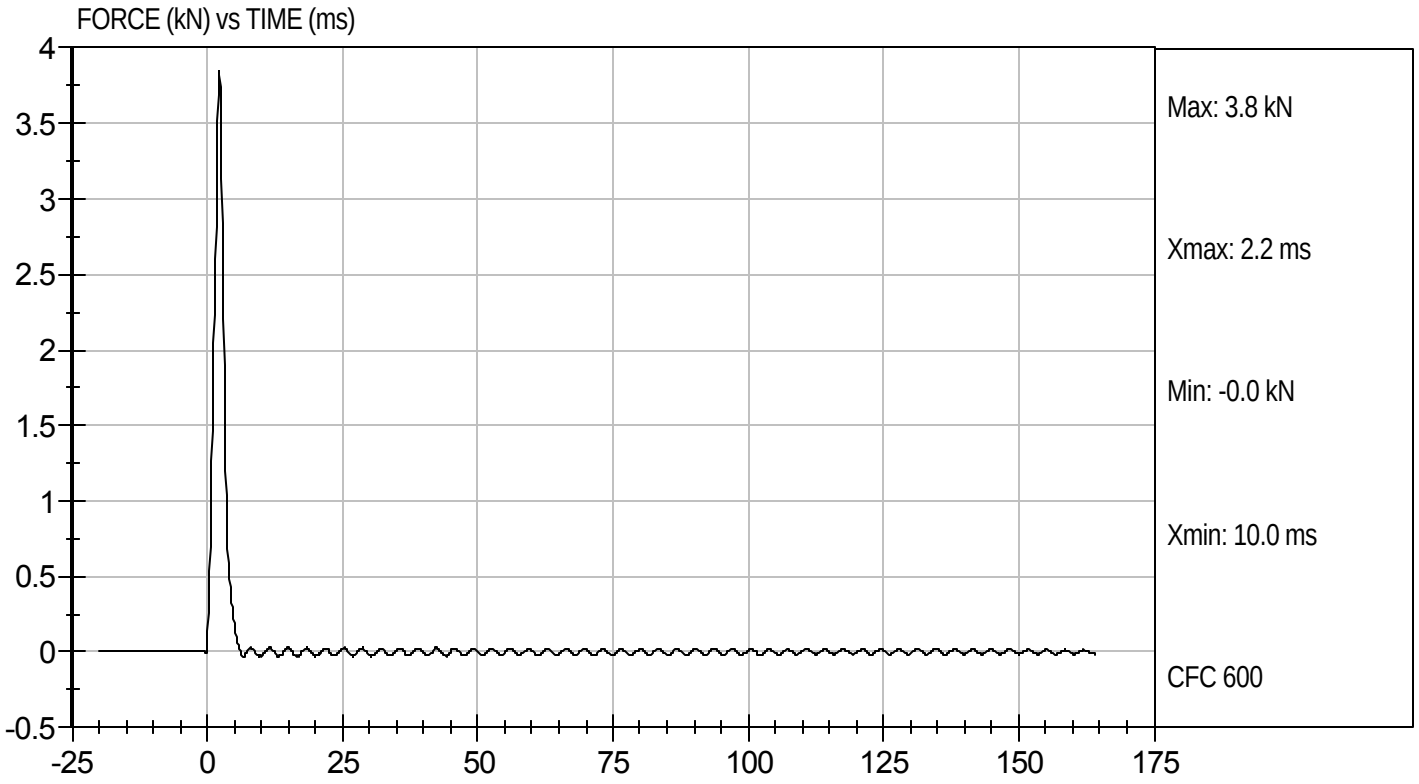
Jessica Hall
Laboratory Technician

1/12/12
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D12165

Test Date: 1/12/12
Velocity: 6.94 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12166

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.98	Pass
		Overall Test Results		Pass

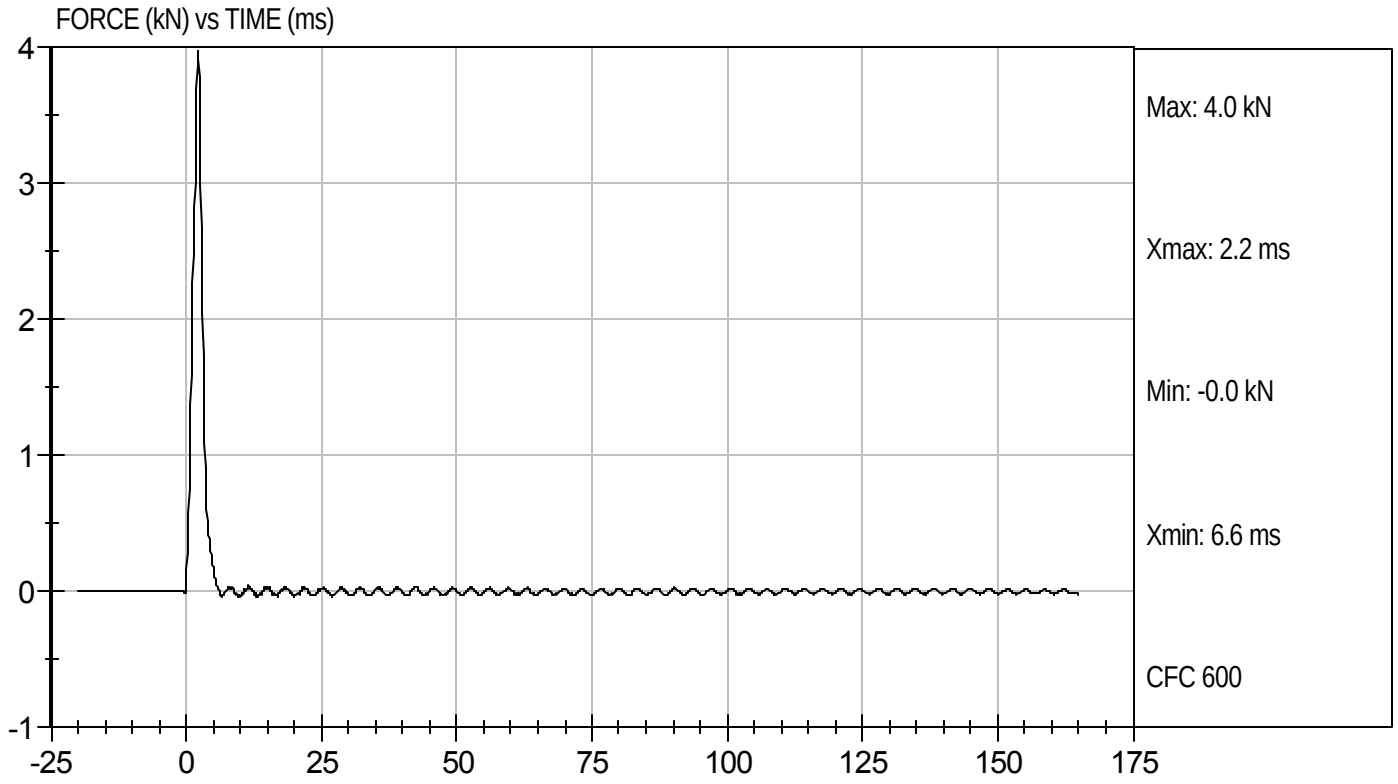
Jessica Hall
Laboratory Technician

1/12/12
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Component ID: D12166

Test Date: 1/12/12
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12167

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	25	Pass
Initial Angle	deg	0 to 20	17	Pass
Return Angle	deg	+/- 8	6	Pass
Force at 45 deg	N	320 to 390	382	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
		Overall Result		Pass

Jessica Hall
Laboratory Technician

1/12/12
Test Date

David Winkelbauer
Approved By

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test ID:** D12221

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Peak Resultant Acceleration	G's	250 to 300	266	Pass
Peak Lateral Acceleration	G's	+/- 15	1.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

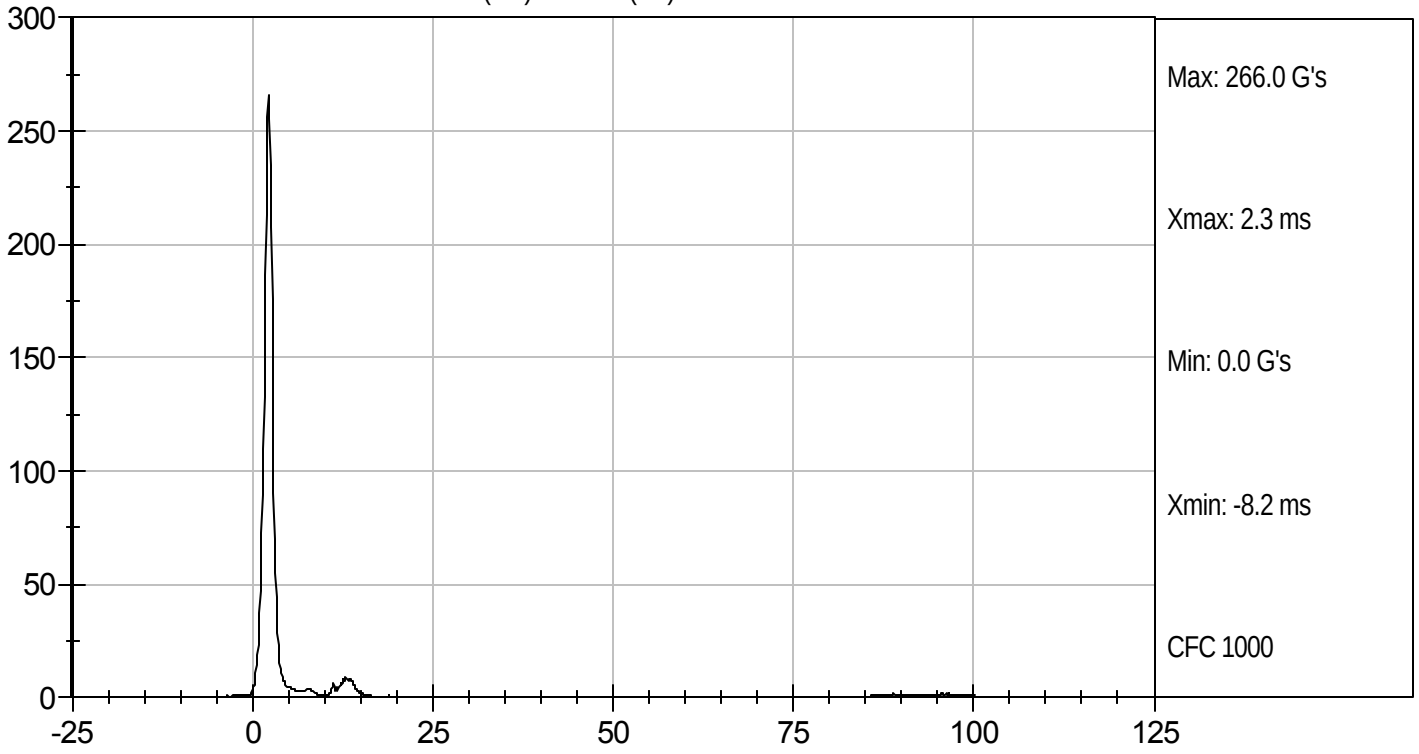
1/18/12
Test Date

David Winkelbauer
Approved By

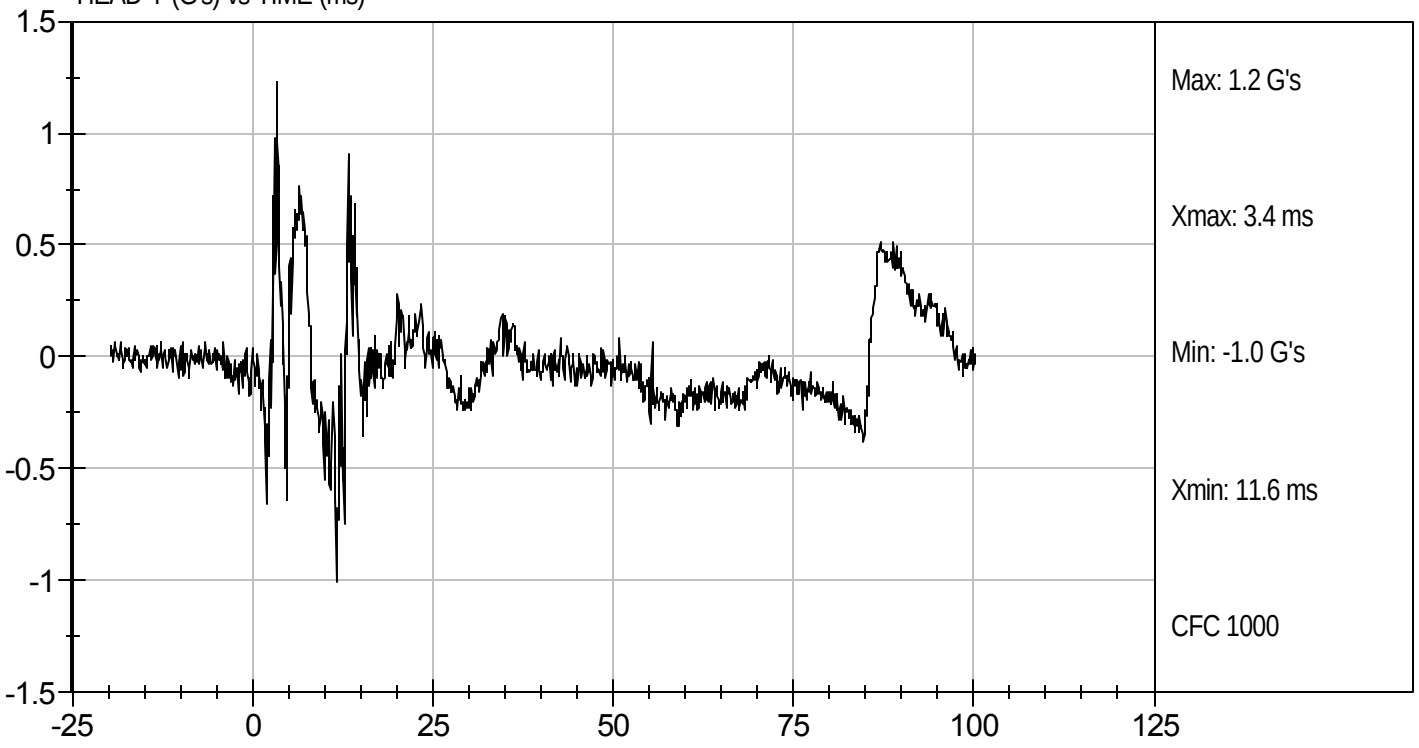
Test Desc: Head Drop
Component ID: D12221

Test Date: 1/18/12
Velocity: 0 ft/s, 0 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 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12222

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	18	Pass
Pendulum Speed		m/s	6.89 to 7.13	7.06	Pass
Pendulum Pulse	10 ms	m/s	2.1 to 2.5	2.4	Pass
	20 ms	m/s	4.0 to 5.0	4.6	Pass
	30 ms	m/s	5.8 to 7.0	6.2	Pass
D Plane Rotation	Max	deg	77 to 91	78	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	83	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

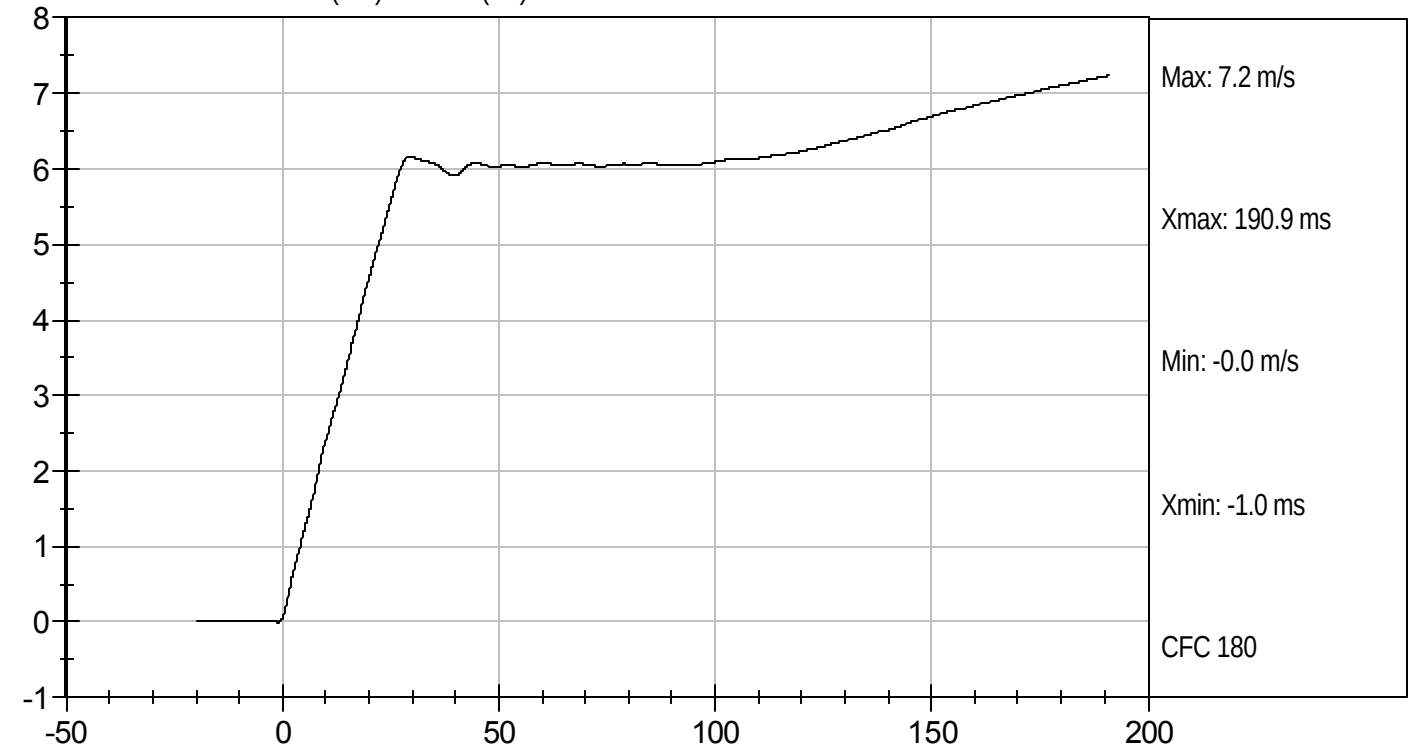
1/18/12
Test Date

David Winkelbauer
Approved By

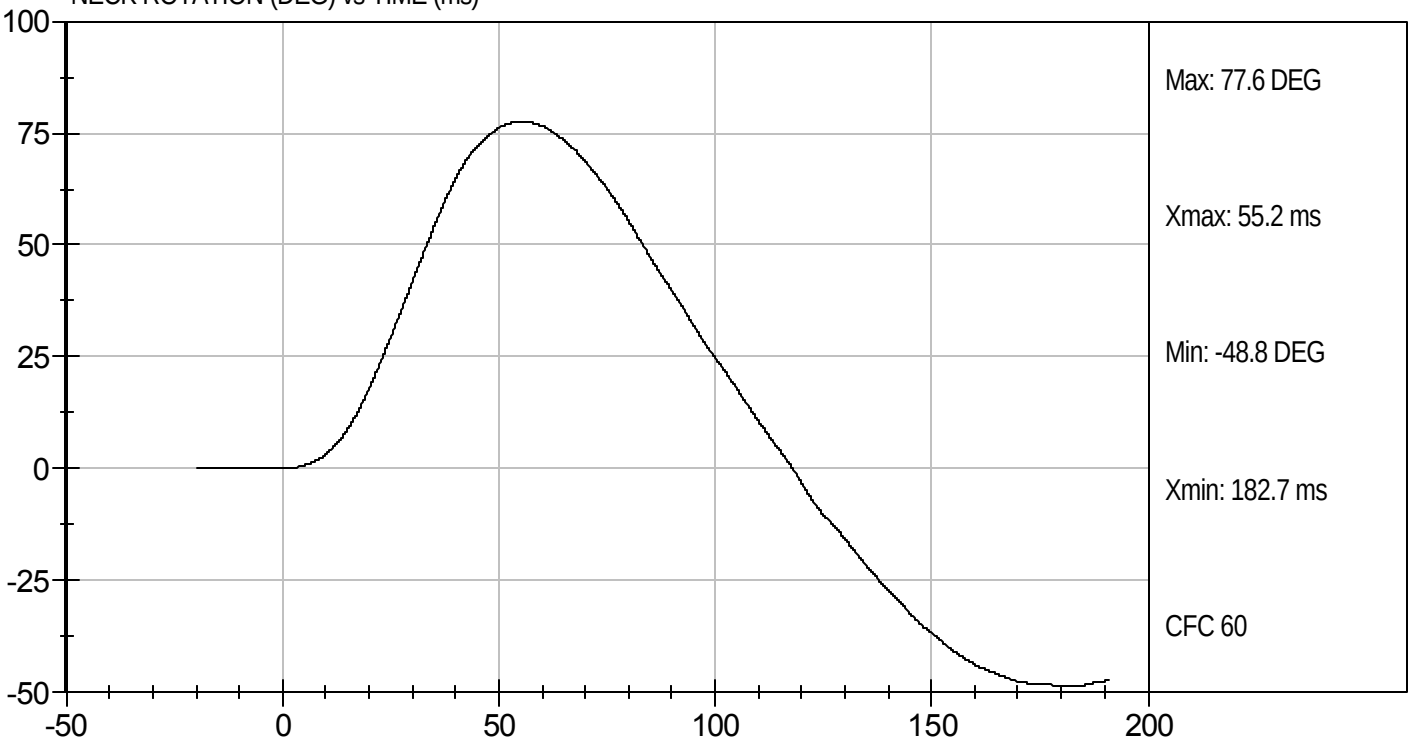
Test Desc: Neck Flexion
Component ID: D12222

Test Date: 1/18/12
Velocity: 23.15 ft/s, 7.06 m/s

PENDULUM VELOCITY (m/s) vs TIME (ms)

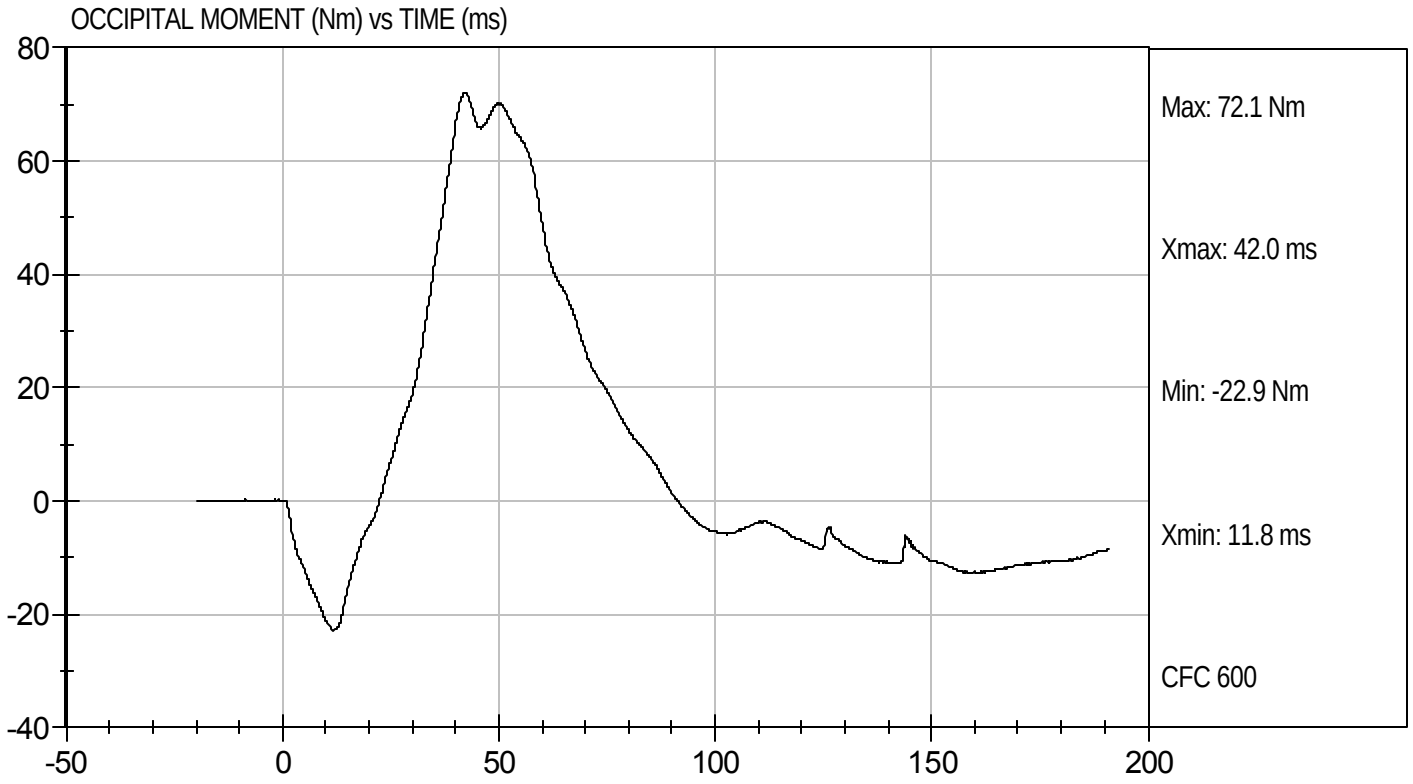


NECK ROTATION (DEG) vs TIME (ms)



Test Desc: Neck Flexion
Component ID: D12222

Test Date: 1/18/12
Velocity: 23.15 ft/s, 7.06 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12223

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	18	Pass
Pendulum Speed		m/s	5.95 to 6.19	6.12	Pass
Pendulum Pulse	10 ms	m/s	1.5 to 1.9	1.6	Pass
	20 ms	m/s	3.1 to 3.9	3.5	Pass
	30 ms	m/s	4.6 to 5.6	5.2	Pass
D Plane Rotation	Max	deg	99 to 114	102	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-53	Pass
Negative Moment Time Curve Decay to -10 Nm		ms	94 to 114	104	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

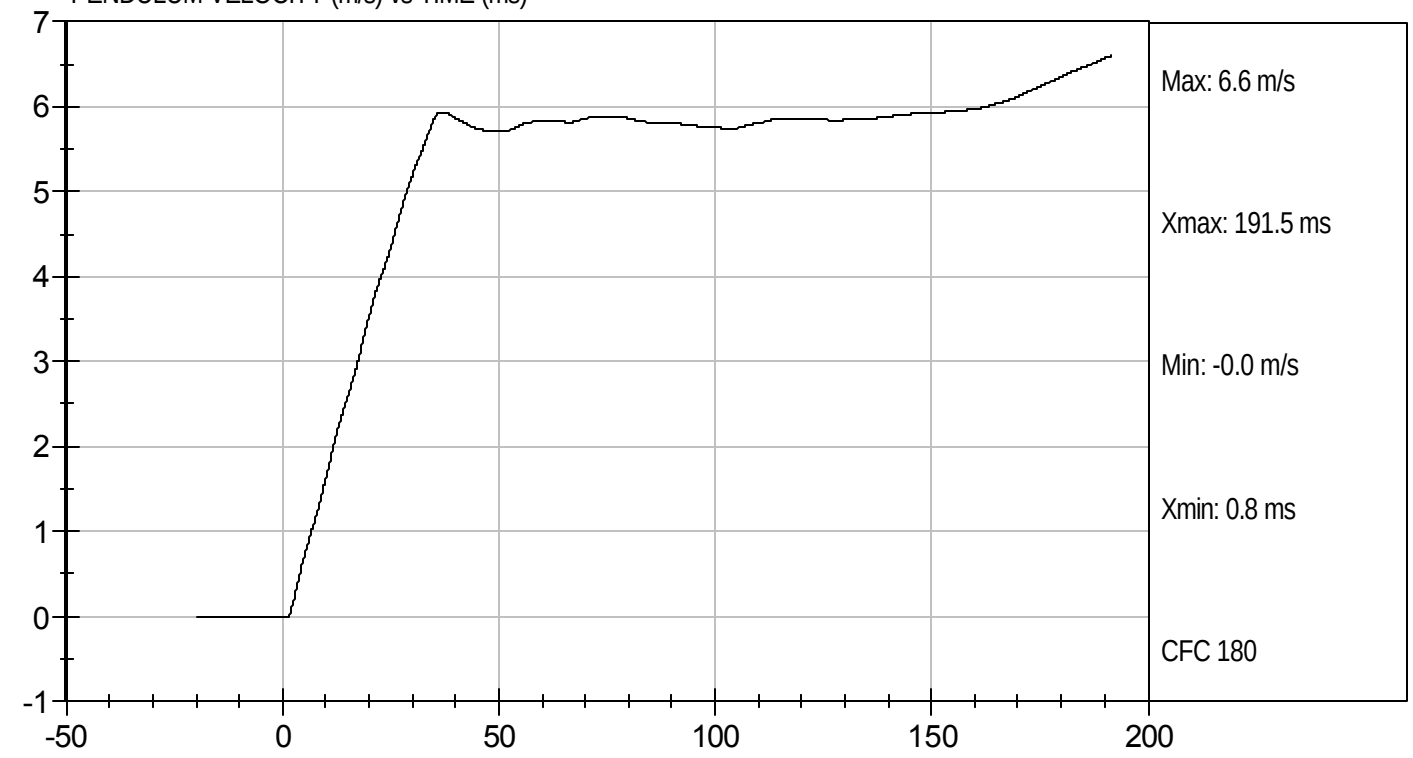
1/18/12
Test Date

David Winkelbauer
Approved By

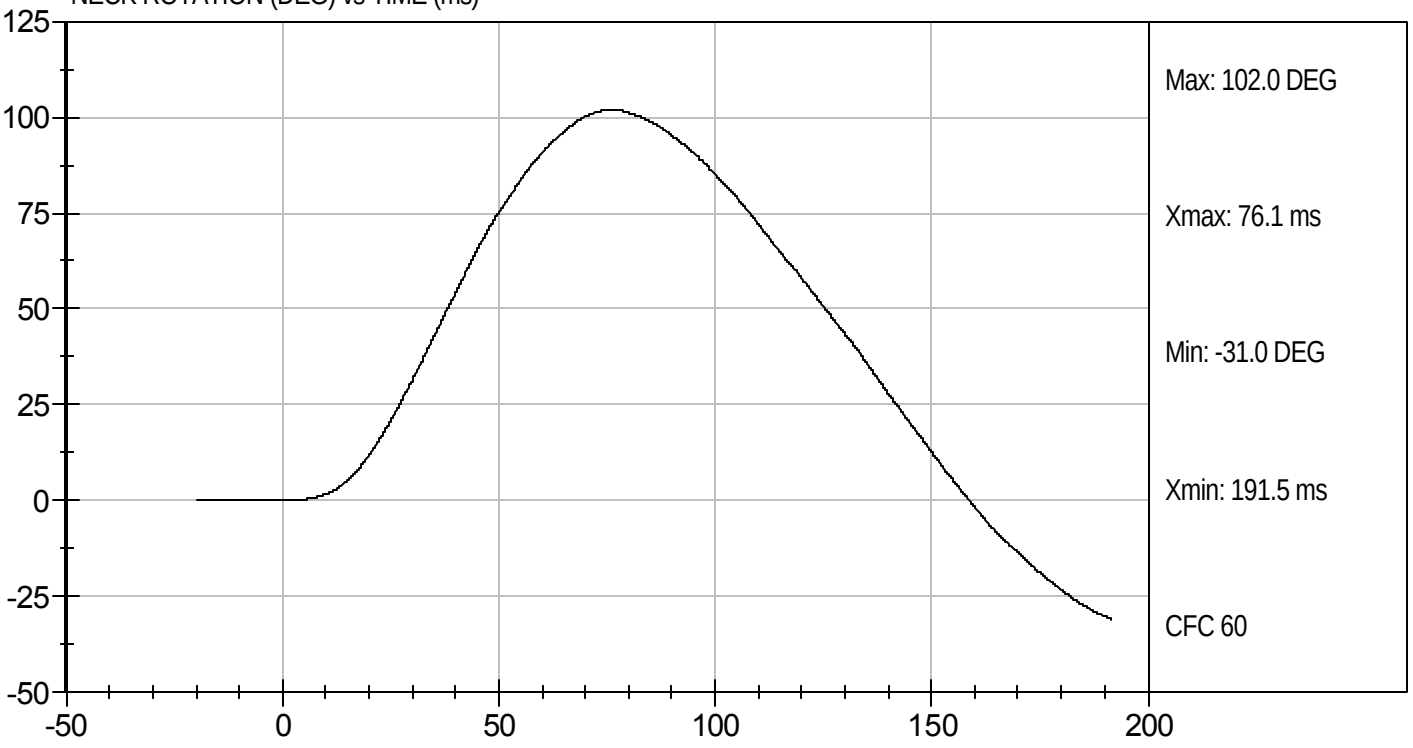
Test Desc: Neck Extension
Component ID: D12223

Test Date: 1/18/12
Velocity: 20.08 ft/s, 6.12 m/s

PENDULUM VELOCITY (m/s) vs TIME (ms)

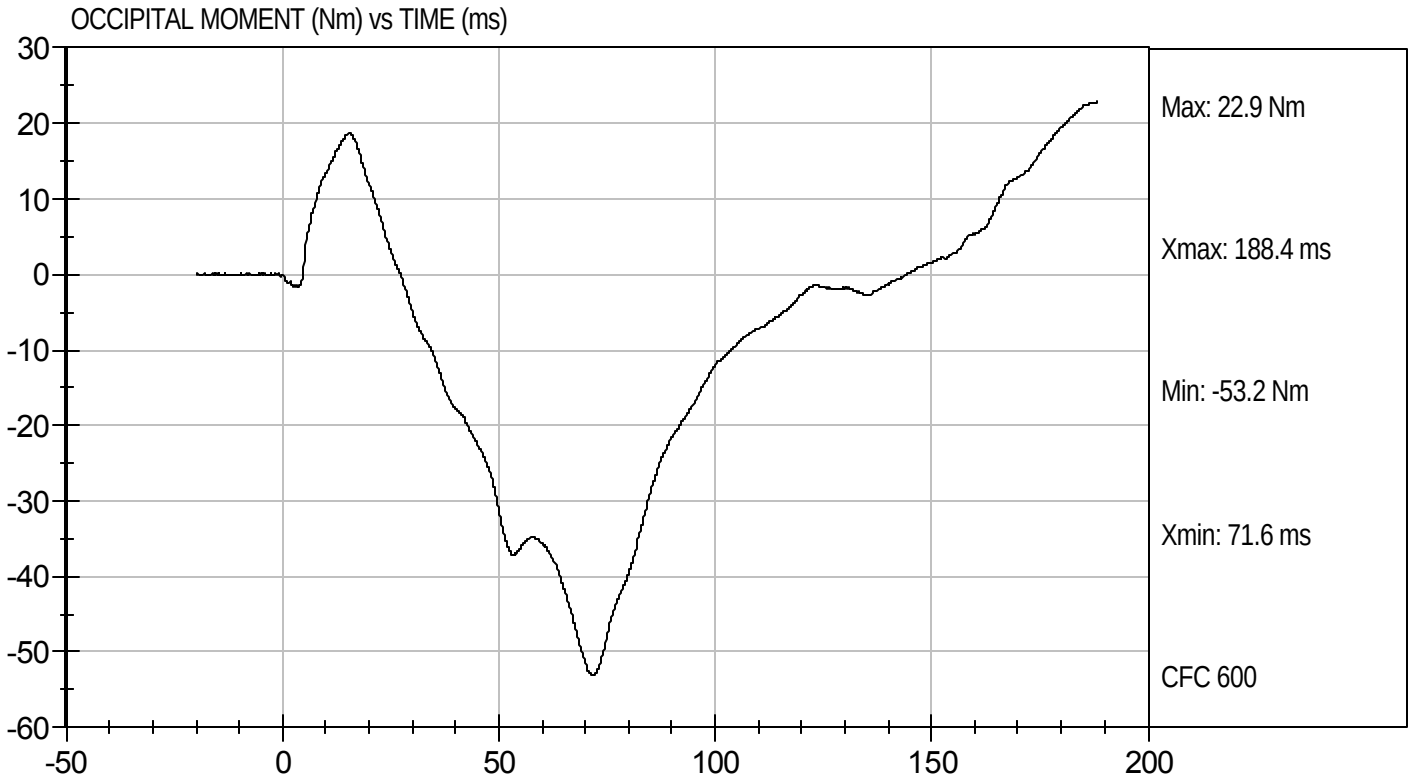


NECK ROTATION (DEG) vs TIME (ms)



Test Desc: Neck Extension
Component ID: D12223

Test Date: 1/18/12
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12224

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Relative Humidity	%	10 to 70	19	Pass
Probe Speed	m/s	6.59 to 6.83	6.77	Pass
Peak Deflection	mm	50 to 58	56	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.0	Pass
Internal Hysteresis	%	69 to 85	72	Pass
Peak Force 18 mm - 50 mm	N	<= 4,600 N	3932	Pass
		Overall Test Results		Pass

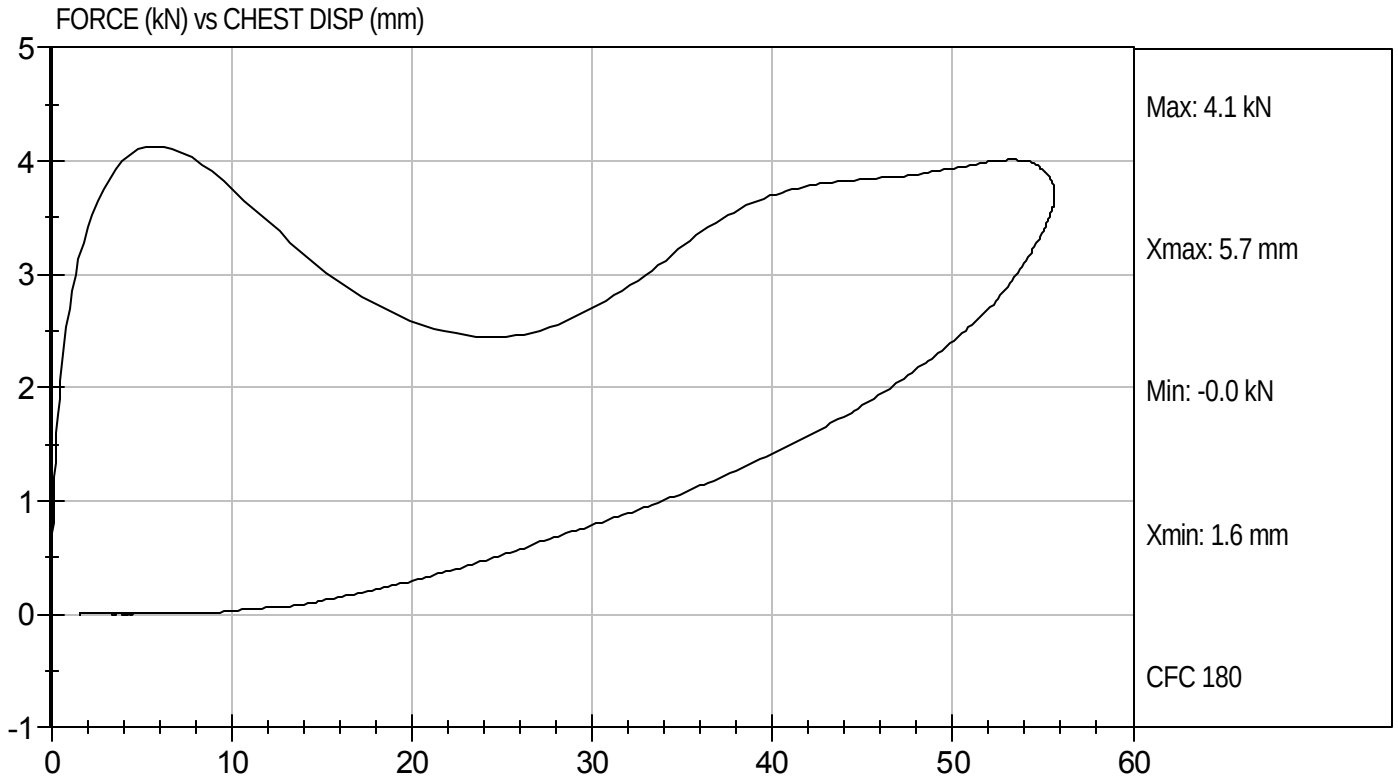
Jessica Gall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D12224

Test Date: 1/18/12
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12225

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.99	Pass
		Overall Test Results		Pass

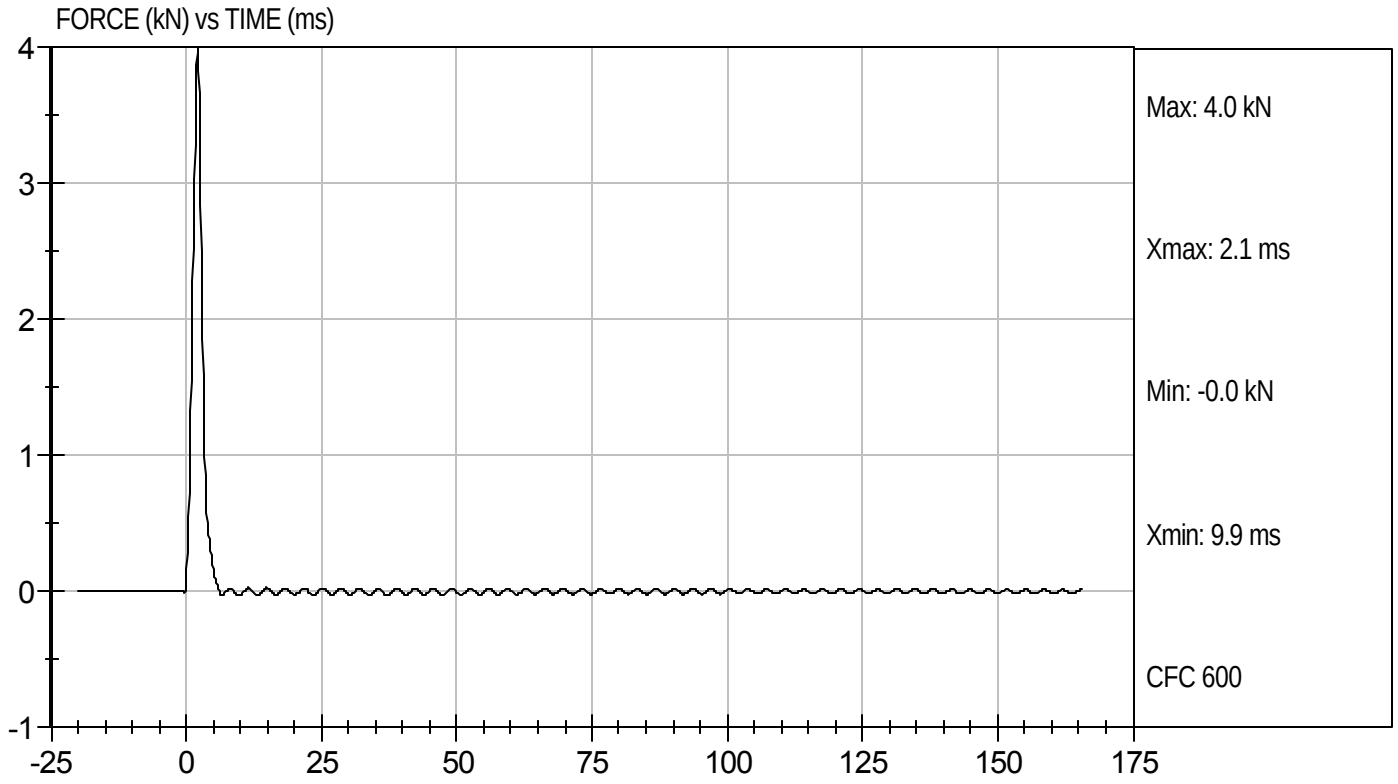
Jessica Hall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D12225

Test Date: 1/18/12
Velocity: 6.94 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12226

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Probe Speed	m/s	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	4.02	Pass
		Overall Test Results		Pass

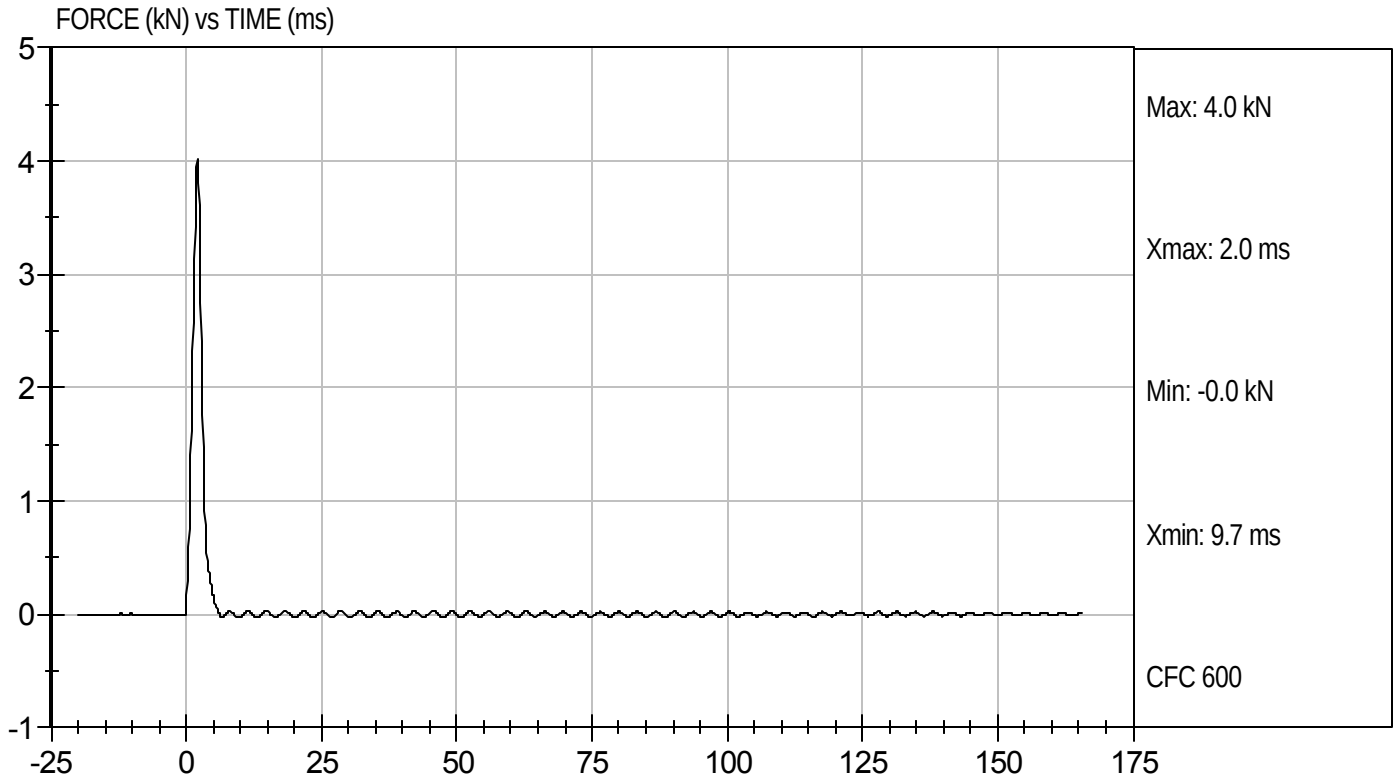
Jessica Hall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Component ID: D12226

Test Date: 1/18/12
Velocity: 6.94 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION

TORSO FLEXION TEST

HYBRID III 5TH PERCENTILE

ATD Serial No: 634 **Test I.D:** D12227

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	18	Pass
Initial Angle	deg	0 to 20	18	Pass
Return Angle	deg	+/- 8	5	Pass
Force at 45 deg	N	320 to 390	376	Pass
Upper Torso Deflection Rate	Deg/sec	0.5 to 1.5	1.0	Pass
		Overall Result		Pass

Jessica Hall
Laboratory Technician

1/18/12
Test Date

David Winkelbauer
Approved By