

REPORT NUMBER: SPNCAP-MGA-2016-004

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Side Impact Pole Test**

**KIA MOTORS MANUFACTURING GEORGIA, INC.
2016 Kia Sorento L 5-Dr SUV
NHTSA No.: O20164201**

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



Test Date: March 24, 2015

Final Report Date: May 1, 2015

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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Prepared by: 
Nicholas Abels, Project Engineer

Approved by: 
Ben Fischer, Project Engineer

Approval Date: May 1, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2016 Kia Sorento L 5-Dr SUV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on March 24, 2015. The impact velocity was 32.1 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.6°C. The test vehicle post-test maximum crush was 314 mm at level 3. The test vehicle's performance was as follows: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>261</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>45</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3067</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>19</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>12</td> </tr> </tbody> </table> *Proposed IARV The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.						Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	261	Resultant Lower Spine Acceleration	Gs	82	45	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3067	Maximum Thoracic Rib Deflection	mm	38*	19	Maximum Abdomen Rib Deflection	mm	45*	12
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		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 Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																														
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2015 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00353. The purpose of this test is to generate comparative side impact performance in a 2016 Kia Sorento L 5-Dr SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated September 2013.

SECTION 2 SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2016 Kia Sorento L 5-Dr SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.1 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on March 24, 2015. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure dated September 2013. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

Primary and Redundant Head CG Triaxial Accelerometers
Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
Abdomen Upper Rib and Lower Rib Displacement Potentiometers
Lower Spine (T12) Triaxial Accelerometers
Iliac Load Cell
Acetabulum Load Cell

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D contains the test equipment and instrumentation calibration data.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	261
Resultant Lower Spine Acceleration	Gs	82	45
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3067
Maximum Thoracic Rib Deflection	mm	38*	19
Maximum Abdominal Rib Deflection	mm	45*	12

*Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No			
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other				

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

GENERAL COMMENTS

Left Floor Sill Y has no valid data after 5 ms.
Left A-Post @ Sill Y has no valid data after 50 ms.
Left Lower A-Post Y has no valid data after 50 ms.
Left B-Post @ Sill Y has no valid data after 13 ms.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
Test Date: 3/24/2015

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20164201	Traction Control System (TCS)	Yes
Model Year	2016	Auto-Leveling System	No
Make	Kia	Automatic Door Locks (ADL)	Yes
Model	Sorento L	Power Window Auto-Reverse	Yes
Body Style	5-Dr SUV	Other Optional Feature	N/A
VIN	5XYPG4A36GG006917	Driver Front Airbag	Yes
Body Color	Sparkling Gray	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	101 / 63	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.4	Driver Torso Airbag	No
Type/No. Cylinders	4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Restraint Feature	N/A

Does owner's manual provide instructions to turn off automatic door locks?	Yes
--	-----

DATA FROM CERTIFICATION LABEL

Manufactured By	Kia Motors Manufacturing Georgia, Inc.	GVWR (kg)	2280
Date of Manufacture	12/14	GAWR Front (kg)	1350
Vehicle Type	MPV	GAWR Rear (kg)	1395

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	(A)
Capacity Weight (VCW) (kg)				420	(B)
DSC x 68.04 kg				340	(A-B)
Rated Cargo and Luggage Weight (RCLW) (kg)				80	

VEHICLE SEAT TYPE

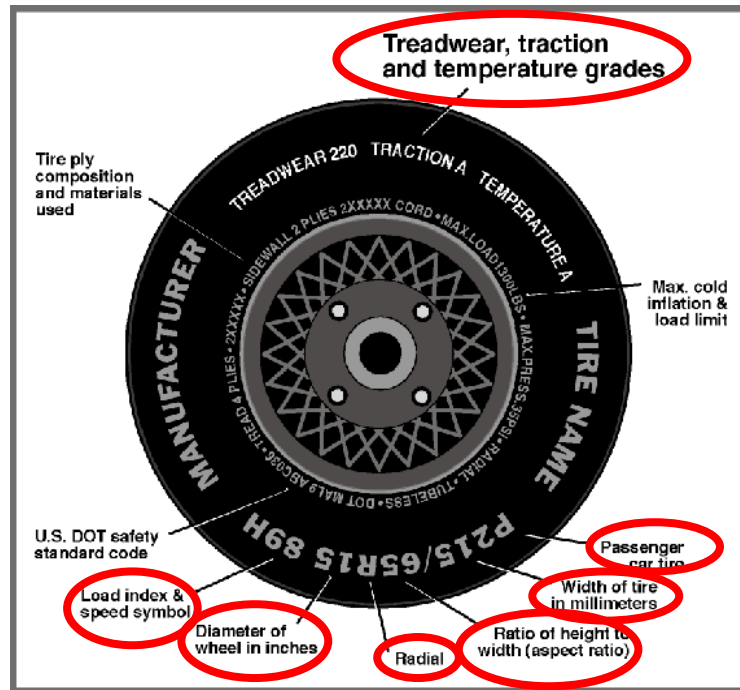
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X					X	
Rear or Second Row			X		X		
Third Row Seat							

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

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	235	235
Recommended Tire Size	235/65R17	235/65R17
Tire Size on Vehicle	235/65R17	235/65R17
Tire Manufacturer	Hankook	Hankook
Tire Model	Dynapro HP2	Dynapro HP2
Treadwear	540	540
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index/Speed Symbol	104H	104H
Tire Material	Rubber	Rubber
DOT Safety Code Left	5M8R RTH 4014	5M8R RTH 4014
DOT Safety Code Right	5M8R RTH 4014	5M8R RTH 4014

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

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	273	266	266	266
Tire Placard	kpa	235	235	235	235
Owner's Manual	kpa				
As Tested	kpa	235	235	235	235

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	491.5	373.5		500.5	432.5		501.5	441.5	
Right	kg	477.0	349.0		479.5	404.0		471.0	408.5	
Ratio	%	57.3	42.7		53.9	46.1		53.4	46.6	
Totals	kg	968.5	722.5	1691.0	980.0	836.5	1816.5	972.5	850.0	1822.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1691.0	(A)
Actual Weight of 1 P572V ATD (SID-IIs) ATD Used	kg	52	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	80	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1823.0	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range
 (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? **YES**

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	deg	-0.5	-0.4	0.0	Yes
Front Pass. Sill Angle (front-to-rear)*	deg	-0.6	-0.5	-0.3	Yes
Front Bumper Angle (left-to-right)**	deg	0.0	-0.2	-0.2	Yes
Rear Bumper Angle (left-to-right)**	deg	0.0	-0.3	-0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1188	1280	1297	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	19	22	29	

*ND=Nose Down (-), NU=Nose Up (+) ** LD=Left Down (-), LU=Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements.

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast (if any)	34
Cargo carpet, Cargo divider/organizer, rear floor mats, jack/tool kit, and right tail light.	23

Test height adjustable suspension setting, if applicable:	Not Applicable
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DATA SHEET NO. 2
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	16.2	13.2	14.7
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear- most	Mid- Fore/Aft	Forward- Most
Driver Seat	14.7	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

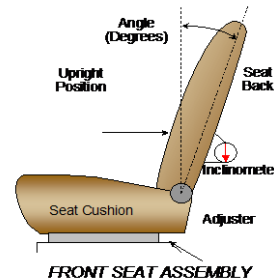
NHTSA No. O20164201
 Test Date: 3/24/2015

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	240		0	
Front Passenger Seat	240		0	
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents	Degree	Detent
Driver Seat w/Seated Dummy	64.3		-6.9	
Front Passenger Seat	64.2		-7.0	
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

Seat back angles measured on headrest post guide.

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

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

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5 (1 st as 1)	Lowest

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

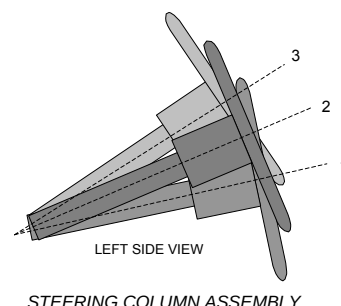
Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

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 Test Date: 3/24/2015

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

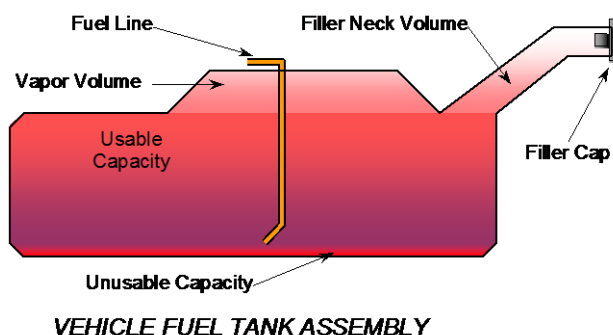
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	67.2	236
Geometric Center, Position 2	64.2	260
Uppermost, Position 3	61.2	284
Telescoping Steering Wheel Travel		48
Test Position	64.2	260



FUEL PUMP

Describe the fuel pump type, details about how it operates and the location of the fuel filler pipe.

The electric fuel pump operates when key is "ON" position.



FUEL TANK CAPACITY DATA

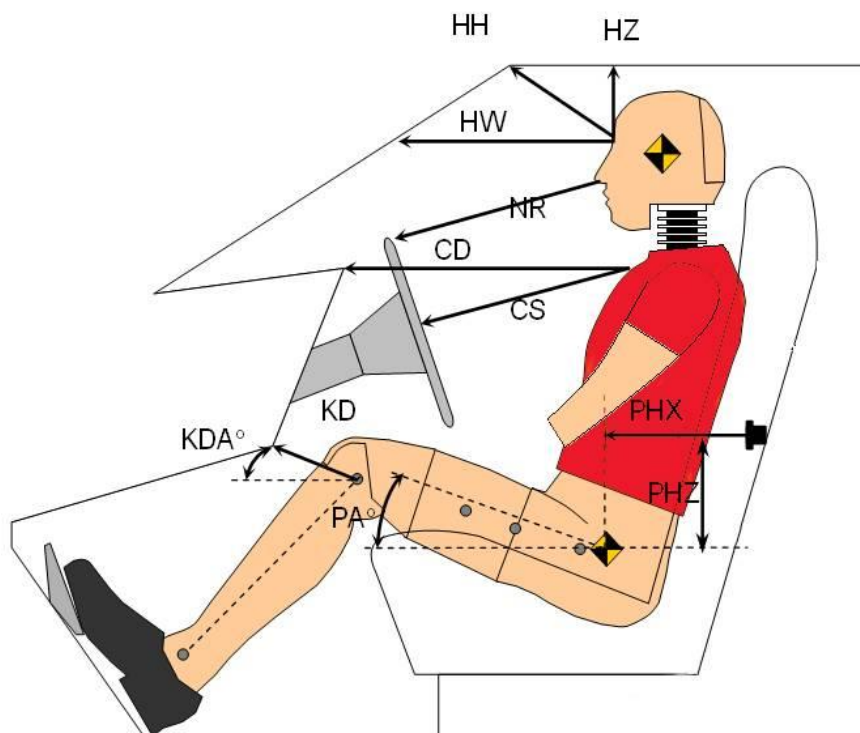
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	71.0
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	71.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	66.0
Actual Amount of Solvent Used	66.0
1/3 of Usable Capacity	23.7

Is the actual amount of solvent used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in Form No. 1? **YES**

.DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015



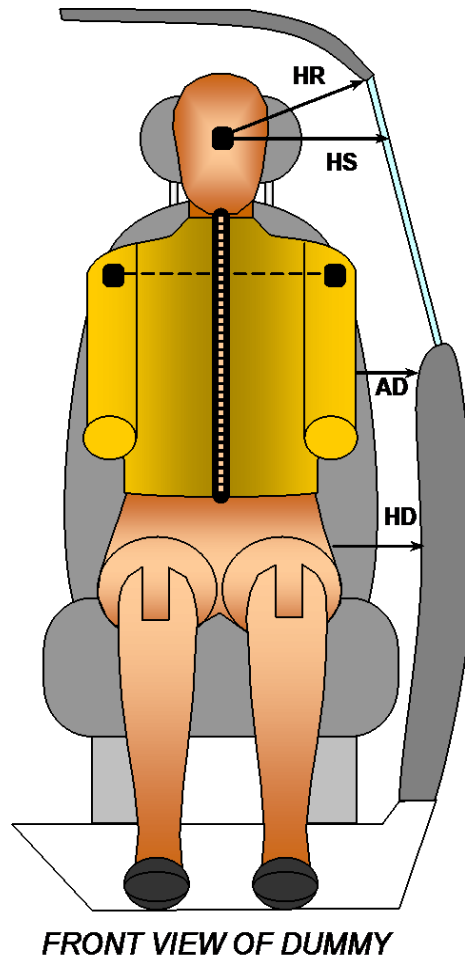
LEFT SIDE VIEW

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	278	
HW	Head to Windshield	632	
HZ	Head to Roof Liner	218	
NR	Nose to Rim	250	
CD	Chest to Dashboard	437	
CS	Chest to Steering Wheel	175	
KDL/KDAL°	Left Knee to Dash	113	20.2
KDR/KDAR°	Right Knee to Dash	105	19.1
PAX°	Pelvic Tilt Angle (X-Axis)		21.0
PAY°	Pelvic Tilt Angle (Y-Axis)		-0.8
PHX	Hip Point to Striker (X-Axis)	323	
PHZ	Hip Point to Striker (Z-Axis)	234	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
Test Date: 3/24/2015

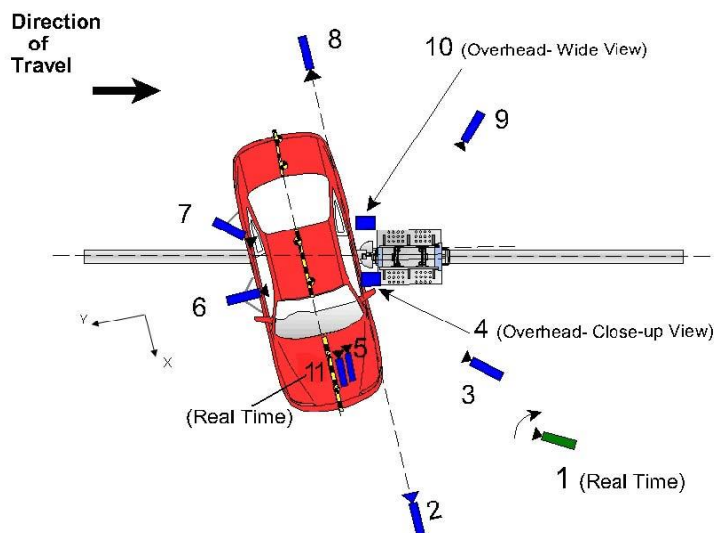


Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	267
HS	Head to Side Window	386
AD	Arm to Door	184
HD	Hip Point to Door	178

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
Test Date: 3/24/2015



Reference: (from Point of Impact for X and Y; from Ground for Z):
+X = Forward of Impact, + Y = Right of Impact, +Z = Down

Camera No.	View	Coordinates (mm)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real-Time Pan View					30
2	Front Ground Level	170	5540	-1910	24	1000
3	Impact Side 45° Forward	-1970	3250	-1930	20	1000
4	Overhead Closeup	0	-30	-4890	50	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	110	-6400	-2000	24	1000
9	Impact Side 45° Rearward	-4190	-3660	-1910	20	1000
10	Overhead Wide View	270	0	-4910	14	1000
11	Real-Time Dummy Front View					30

* All measurements accurate to ± 6 mm

Note: Vehicle was at a 75° angle to the rigid pole.

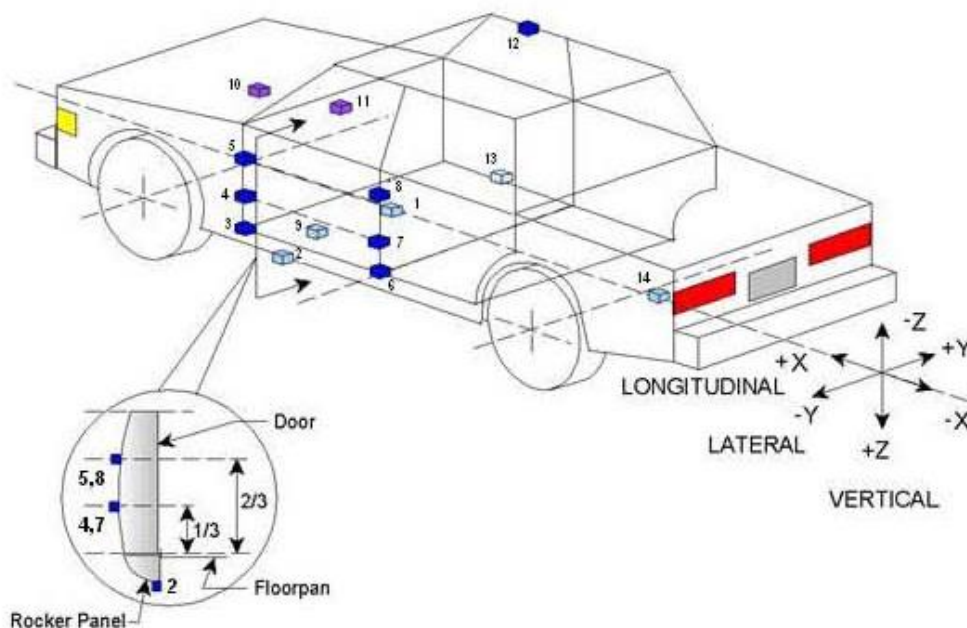
Explain why camera(s) did not operate as intended: None

INSTRUMENTATION	Number of Channels
Driver Dummy	16
Vehicle Structure	18
Pole Load Cells	8
TOTAL	42

DATA SHEET NO. 6 **VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
Test Date: 3/24/2015



	Accelerometer Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2505	250	-270
2	Left Floor Sill	2839	-750	-260
3	A Pillar Sill	3306	-748	-255
4	A Pillar Low	3256	-847	-667
5	A Pillar Mid	3262	-832	-913
6	B Pillar Sill	2273	-755	-265
7	B Pillar Low	2278	-764	-697
8	B Pillar Mid	2263	-745	-949
9	Driver Seat Track	2444	-390	-335
10	Engine Top	4020	50	-861
11	Firewall	3742	0	-997
12	Right Roof	2309	510	-1650
13	Right Floor Sill	2787	750	-261
14	Rear Floorpan	201	0	-595

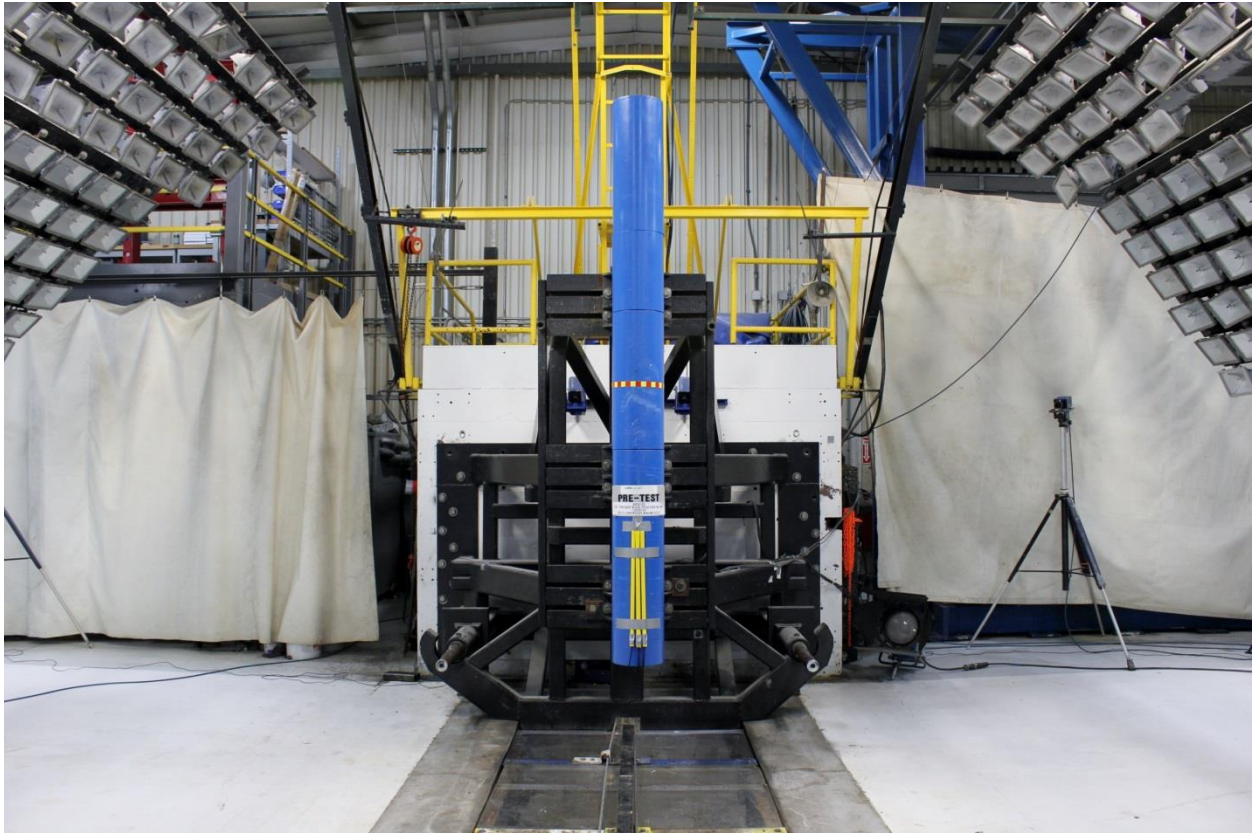
Reference:

X – Test Vehicle Rear Bumper (+forward)
Y – Test Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
Test Date: 3/24/2015



254 mm Diameter Rigid Pole

Load Cell Locations	
ID	Height From Impact Surface (mm)
1	182
2	470
3	698
4	986
5	1212
6	1641
7	1854
8	2053

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
Test Date: 3/24/2015

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag, Headrest
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Side Airbag
Upper Torso	Side Airbag, Seat Back
Lower Torso	Side Airbag, Seat Back
Left Hip	Side Airbag, Seat Pan
Left Knee	Door Panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	Fixed	No	Fixed
Seat Disengagement from Floor Pan	No	Fixed	No	Fixed
Seat Back Movement from Initial Position	No	Fixed	No	Fixed
Seat Back Collapse	No	Fixed	No	Fixed

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	Cracked
Side Window Damage	Left Front Window Broken
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST-TEST OBSERVATIONS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No			
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other				

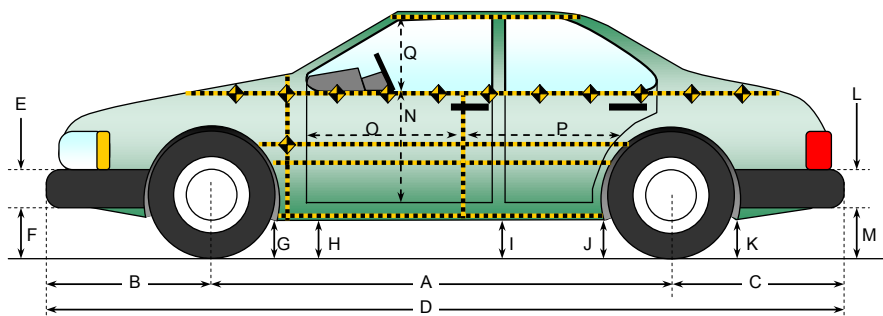
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1092
Actual Impact Point (Aft of Front Axle)	mm		1092
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	0
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.06
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.12

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
Test Date: 3/24/2015



All measurements in (mm) with tolerance of ± 3 mm

LEFT SIDE VIEW

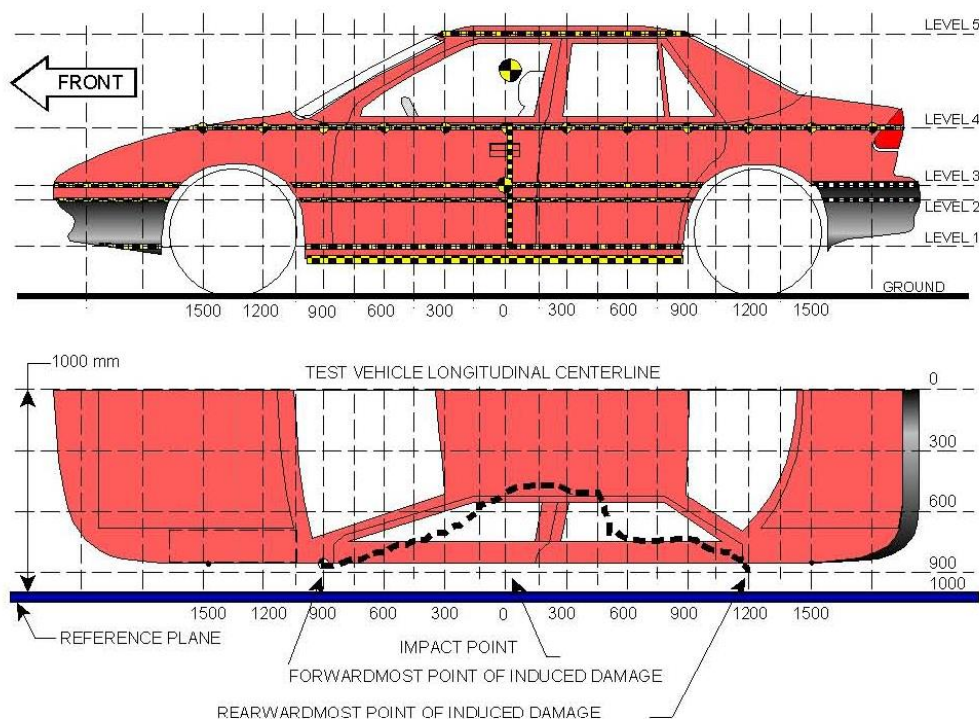
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2780	2707	73
B	Front Axle to FSOV	927	973	-46
C	Rear Axle to RSOV	1049	1058	-9
D	Total Vehicle Length at Centerline	4762	4738	24
E	Front Bumper Thickness	100	100	0
F	Front Bumper Bottom to Ground	217	225	-8
G	Sill Height at Front Wheel Well	234	230	4
H	Sill Height at Front Door Leading Edge	236	239	-3
I	Sill Height at B-Pillar	242	221	21
J1	Sill Height at Rear Wheel Well	244	276	-32
J2	Pinch Weld Height at Rear Wheel Well	243	274	-31
K	Sill Height Aft of Rear Wheel Well	294	306	-12
L	Rear Bumper Thickness	110	110	0
M	Rear Bumper Bottom to Ground	353	344	9
N	Sill Height to Bottom of Front Window Sill	930	902	28
O	Front Door Leading Edge to Impact CL	570	410	160
P	Rear Door Trailing Edge to Impact CL	1450	1357	93
Q	Front Window Opening	404	364	40
R	Right Side Length	3888	3900	-12
S	Left Side Length	3888	3791	97
T	Vehicle Width at B-Pillars	1862	1798	64

DATA SHEET NO. 10 **VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015



NOTE: The measurements are taken along the vertical impact reference line.
 Vehicle measurements forward of the vertical impact reference line are negative.

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	372	298	75
2	Occupant Hip Point	675	313	75
3	Mid Door	699	314	75
4	Window Sill	1098	273	75
5	Window Top	1580	83	0

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015

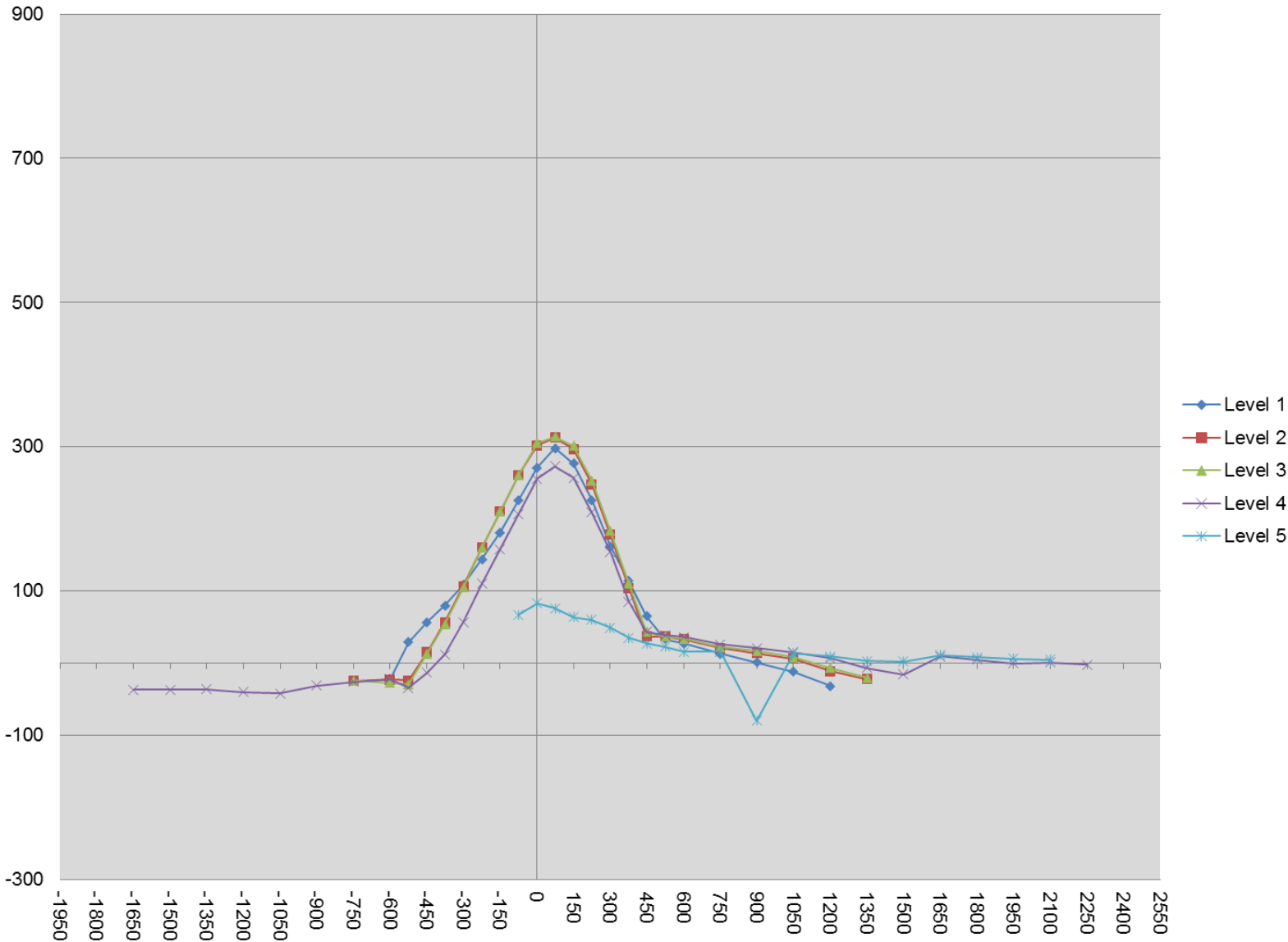
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1650				397					360					-37	
-1500				358					321					-37	
-1350				328					292					-36	
-1200				306					266					-40	
-1050				288					246					-42	
-900				273					242					-31	
-750		159	157	263			134	133	237			-25	-24	-26	
-600	191	164	164	259		169	141	137	237		-22	-23	-27	-22	
-525	194	171	170	257		223	147	141	223		29	-24	-29	-34	
-450	197	175	173	254		254	190	186	241		57	15	13	-13	
-375	199	177	176	250		279	234	230	262		80	57	54	12	
-300	200	179	177	247		309	286	282	304		109	107	105	57	
-225	201	181	178	243		345	341	338	353		144	160	160	110	
-150	200	182	179	242		381	392	389	400		181	210	210	158	
-75	198	182	179	238	475	424	443	440	445	542	226	261	261	207	67
0	196	183	179	237	465	467	485	484	493	548	271	302	305	256	83
75	193	182	179	234	460	491	495	493	507	536	298	313	314	273	76
150	192	182	179	230	456	469	479	480	487	520	277	297	301	257	64
225	192	183	179	228	453	418	431	432	437	513	226	248	253	209	60
300	192	184	179	225	453	354	362	362	379	502	162	178	183	154	49
375	193	184	179	223	453	307	288	289	308	488	114	104	110	85	35
450	194	186	180	220	452	259	223	223	263	479	65	37	43	43	27
525	194	187	182	219	450	227	224	219	258	473	33	37	37	39	23
600	195	188	182	218	451	222	221	216	254	467	27	33	34	36	16
750	197	189	184	216	454	210	210	206	242	470	13	21	22	26	16
900	201	189	183	213	547	202	203	200	234	467	1	14	17	21	-80
1050	204	180	178	211	458	192	186	186	226	472	-12	6	8	15	14
1200	197	165	165	210	460	165	154	158	217	469	-32	-11	-7	7	9
1350		157	157	211	465		135	137	204	468		-22	-20	-7	3
1500				213	468				197	470				-16	2
1650				214	476				223	487				9	11
1800				219	483				224	491				5	8
1950				226	495				226	501				0	6
2100				233	506				234	511				1	5
2250				248					246					-2	

Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush pile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

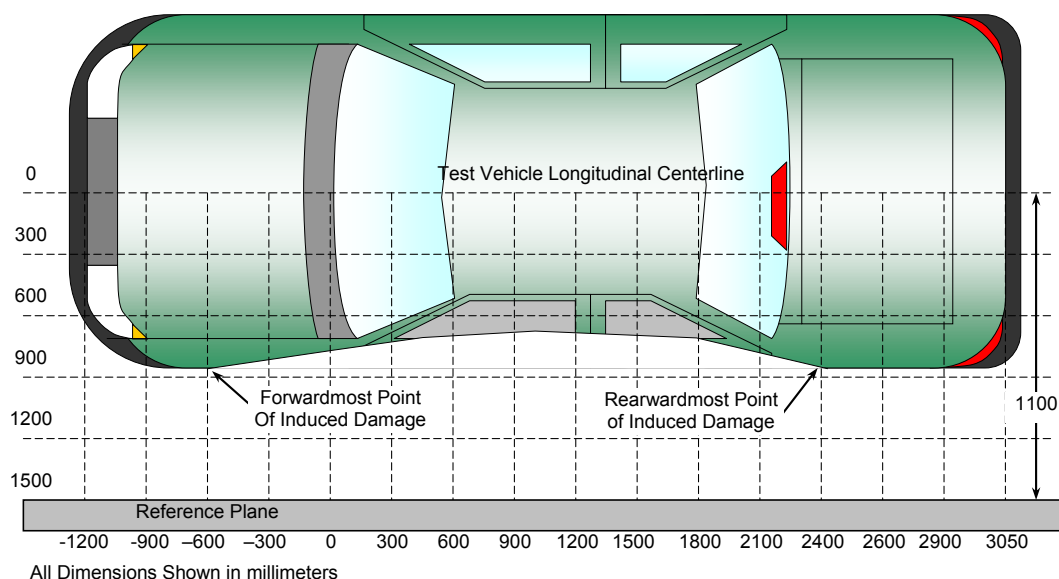
NHTSA No. O20164201
Test Date: 3/24/2015



DATA SHEET NO. 11 **VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	450	3	194	221	27
2	215	3	192	373	181
3	-20	3	193	492	299
4	-255	3	200	386	186
5	-490	3	198	242	44
6	-725	3	192	140	-52

DATA SHEET NO. 12
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

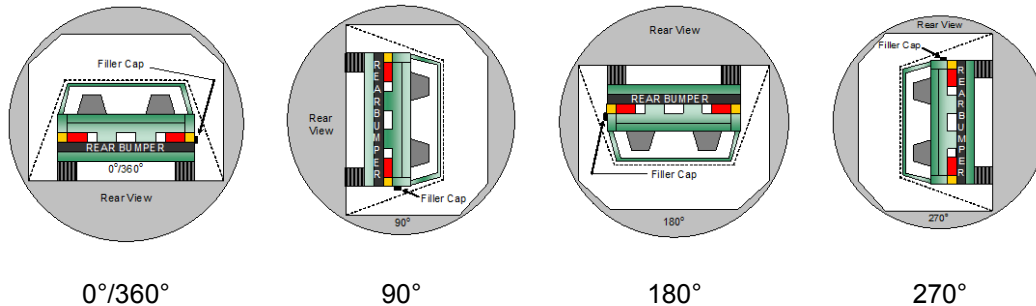
NHTSA No. O20164201
 Test Date: 3/24/2015

Test Time: 10:07 a.m.

Temperature: 21.6°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

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	111	300	411
90° to 180°	110	300	410
180° to 270°	108	300	408
270° to 360°	112	300	412

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

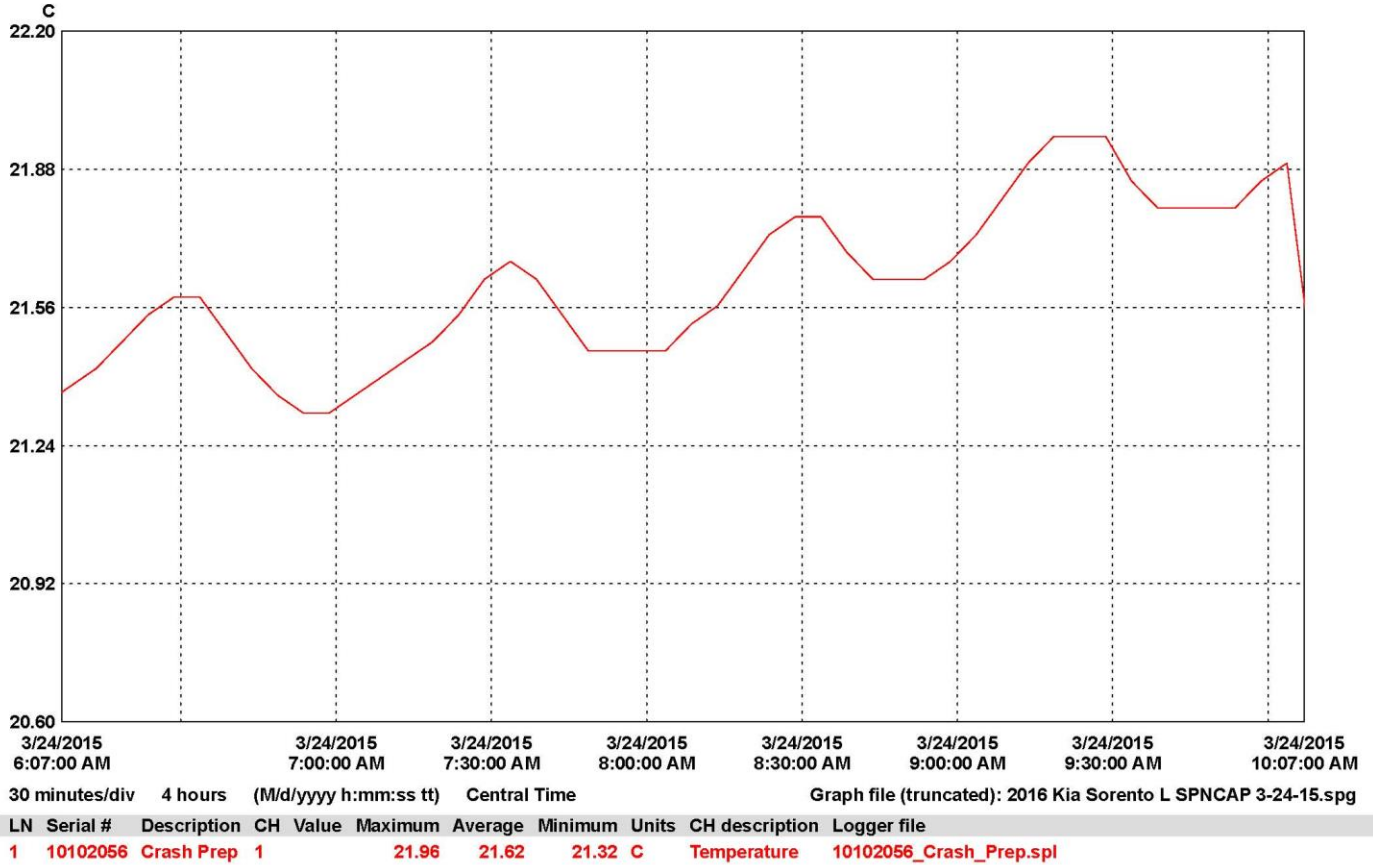
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 13
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2016 Kia Sorento L 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. O20164201
 Test Date: 3/24/2015



**APPENDIX A
PHOTOGRAPHS**

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No. 001 - As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



No. 002 - As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



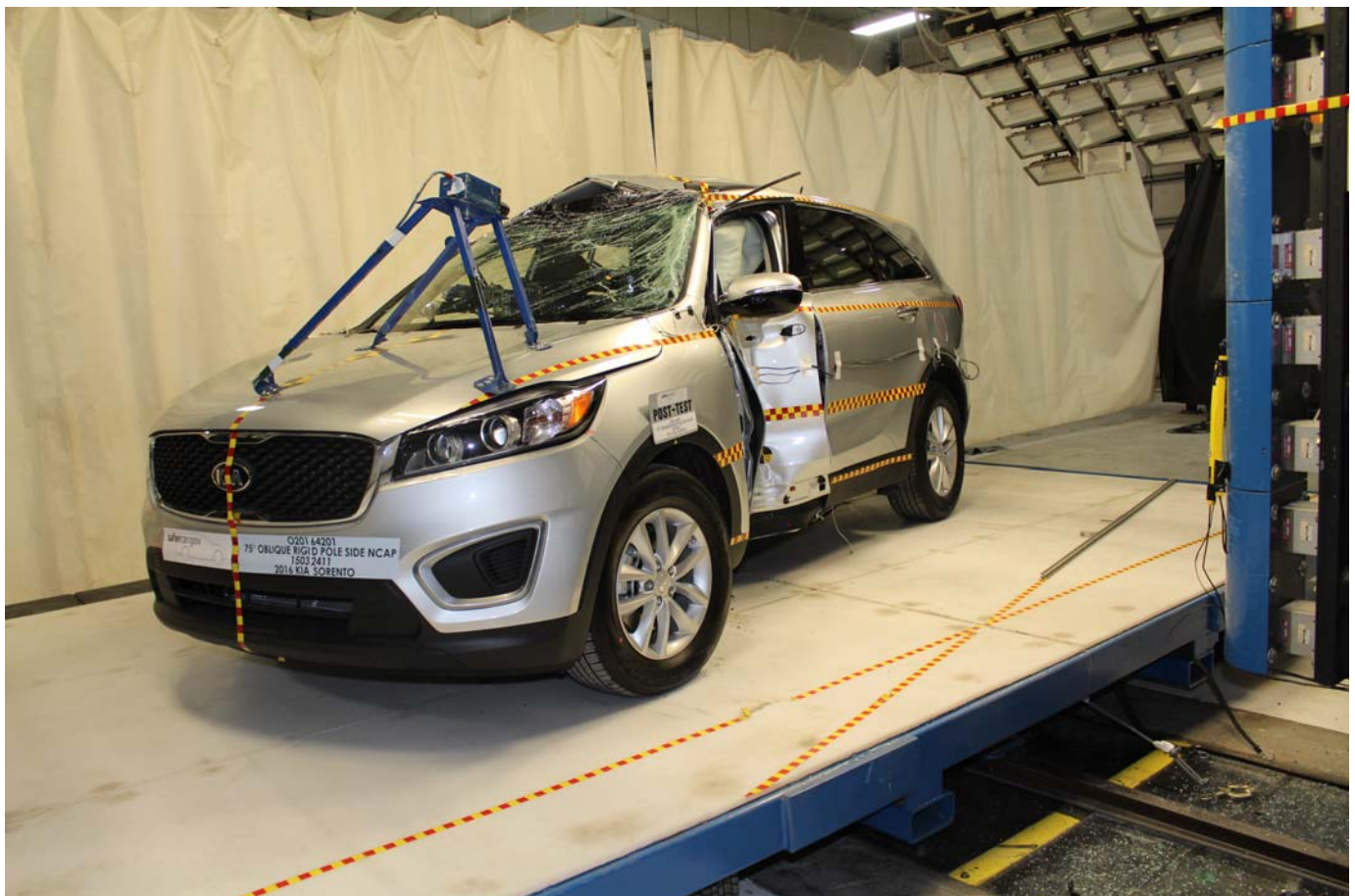
No. 003 - Pre-Test Frontal View of Test Vehicle



No. 004 - Post-Test Frontal View of Test Vehicle



No. 005 - Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



No. 006 - Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



No. 007 - Pre-Test Left Side View of Test Vehicle



No. 008 - Post-Test Left Side View of Test Vehicle



No. 009 - Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



No. 010 - Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



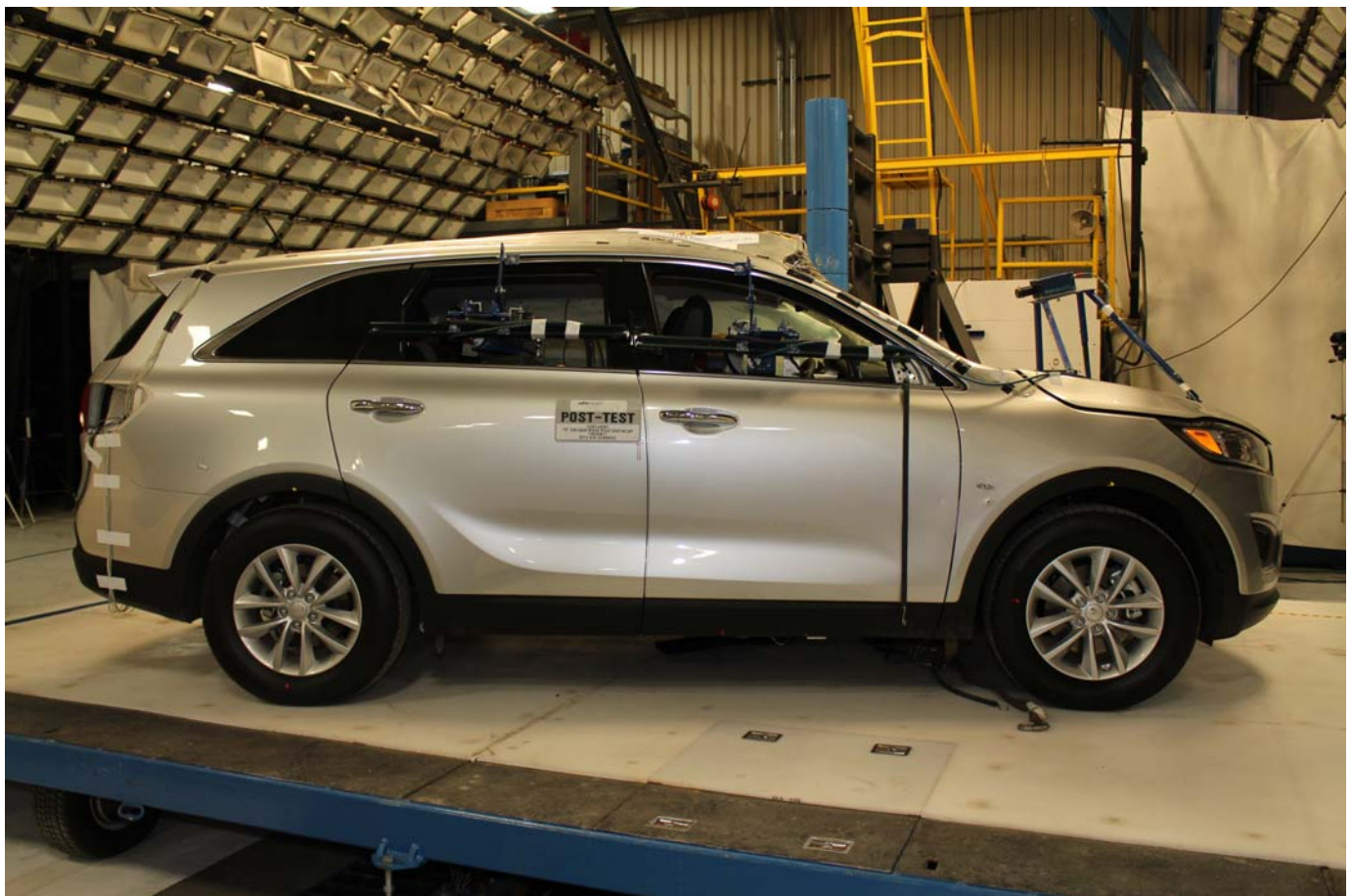
No. 011 - Pre-Test Rear View of Test Vehicle



No. 012 - Post-Test Rear View of Test Vehicle



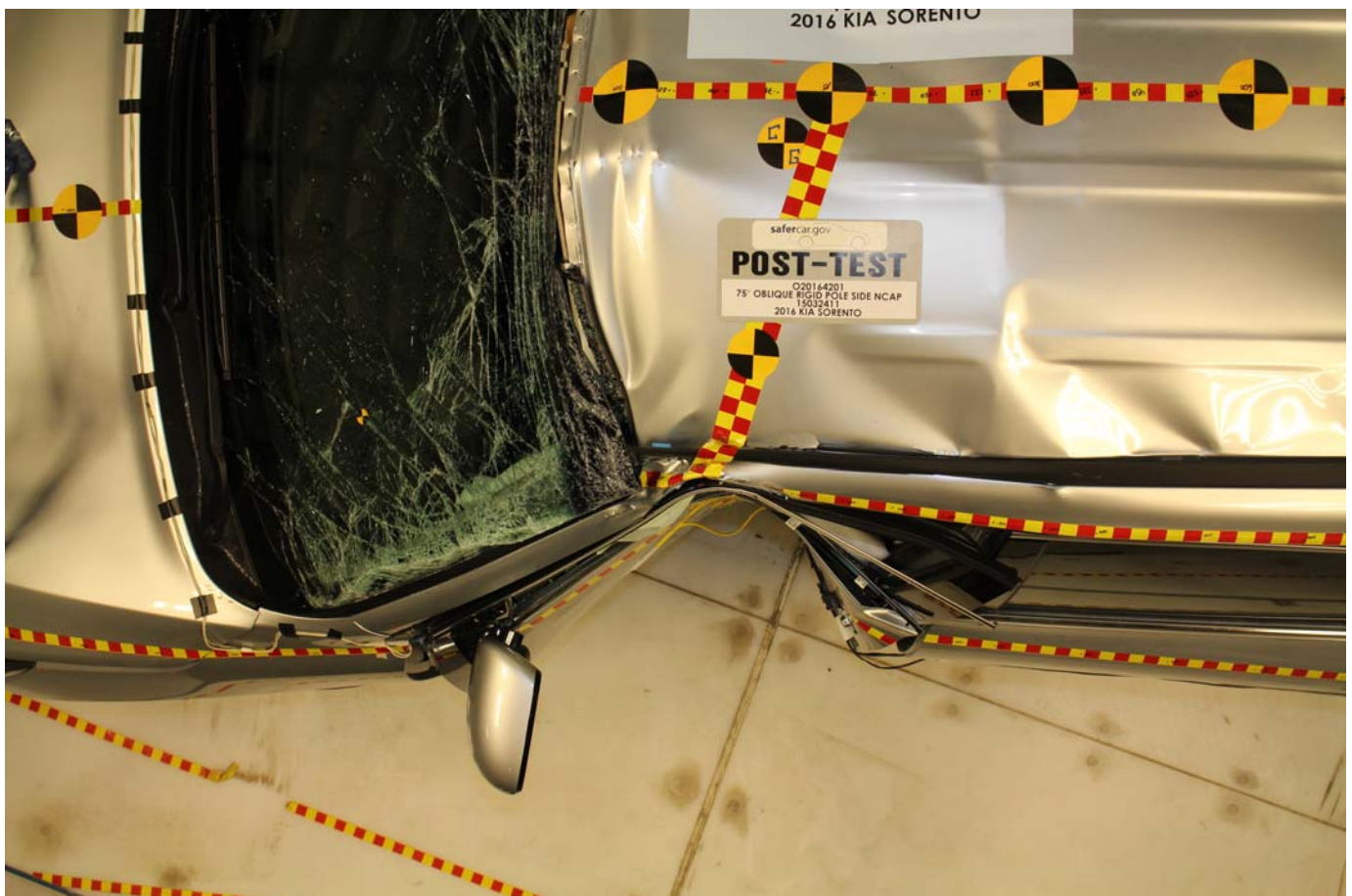
No. 013 - Pre-Test Right Side View of Test Vehicle



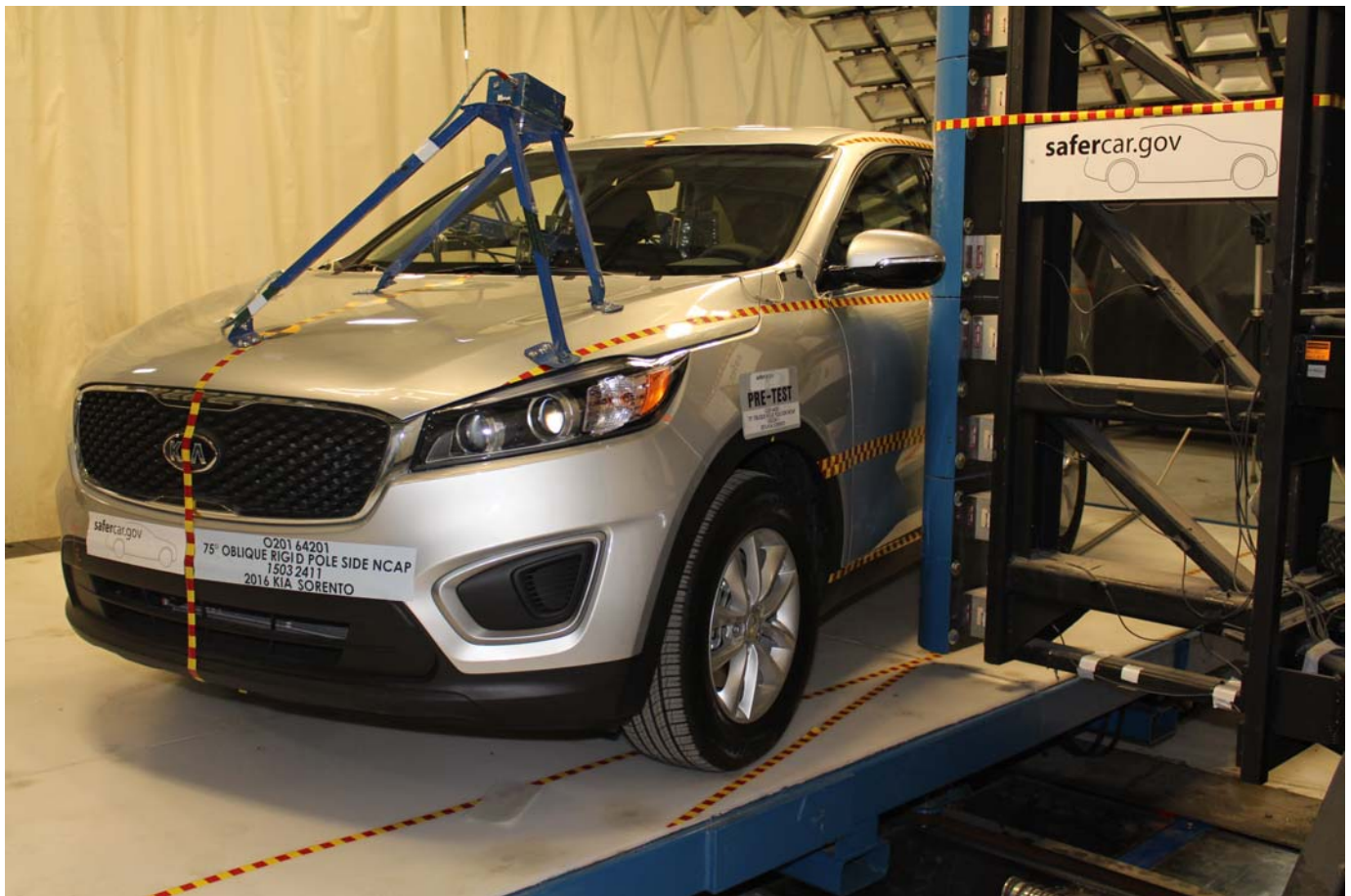
No. 014 - Post-Test Right Side View of Test Vehicle



No. 015 - Pre-Test Overhead View of Test Area



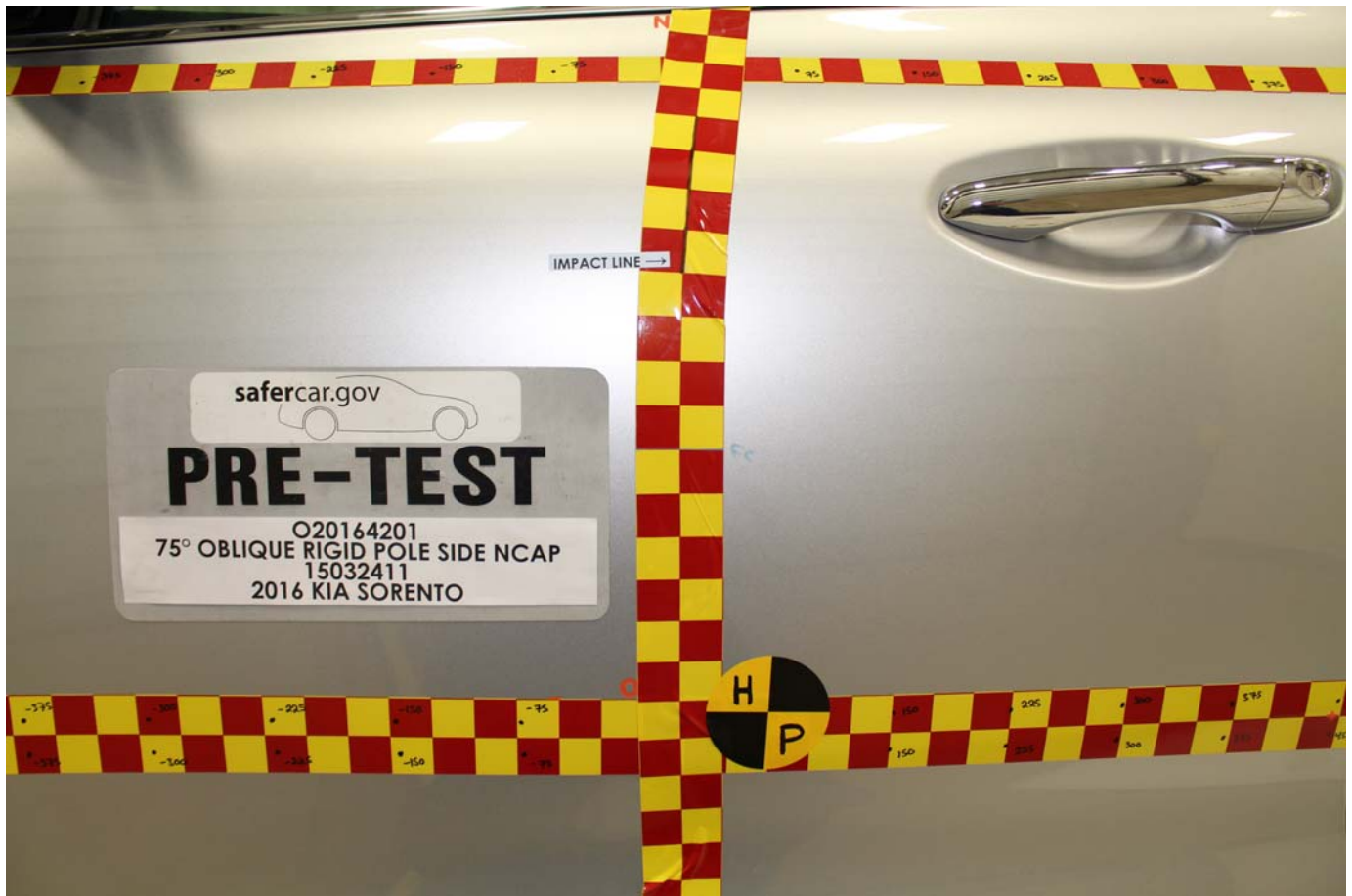
No. 016 - Post-Test Overhead View of Test Area



No. 017 - Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



No. 018 - Pre-Test Right Side View of Pole Positioned Against Side of Vehicle



No. 019 - Pre-Test Close-Up View of Impact Point Target



No. 020 - Post-Test Close-Up View of Impact Point Target Showing Impact Location



No. 021 - Pre-Test Front Close-Up View of Dummy Head and Chest



No. 022 - Post-Test Front Close-Up View of Dummy



No. 023 - Pre-Test Left Side View of Dummy Showing Belt and Chalking



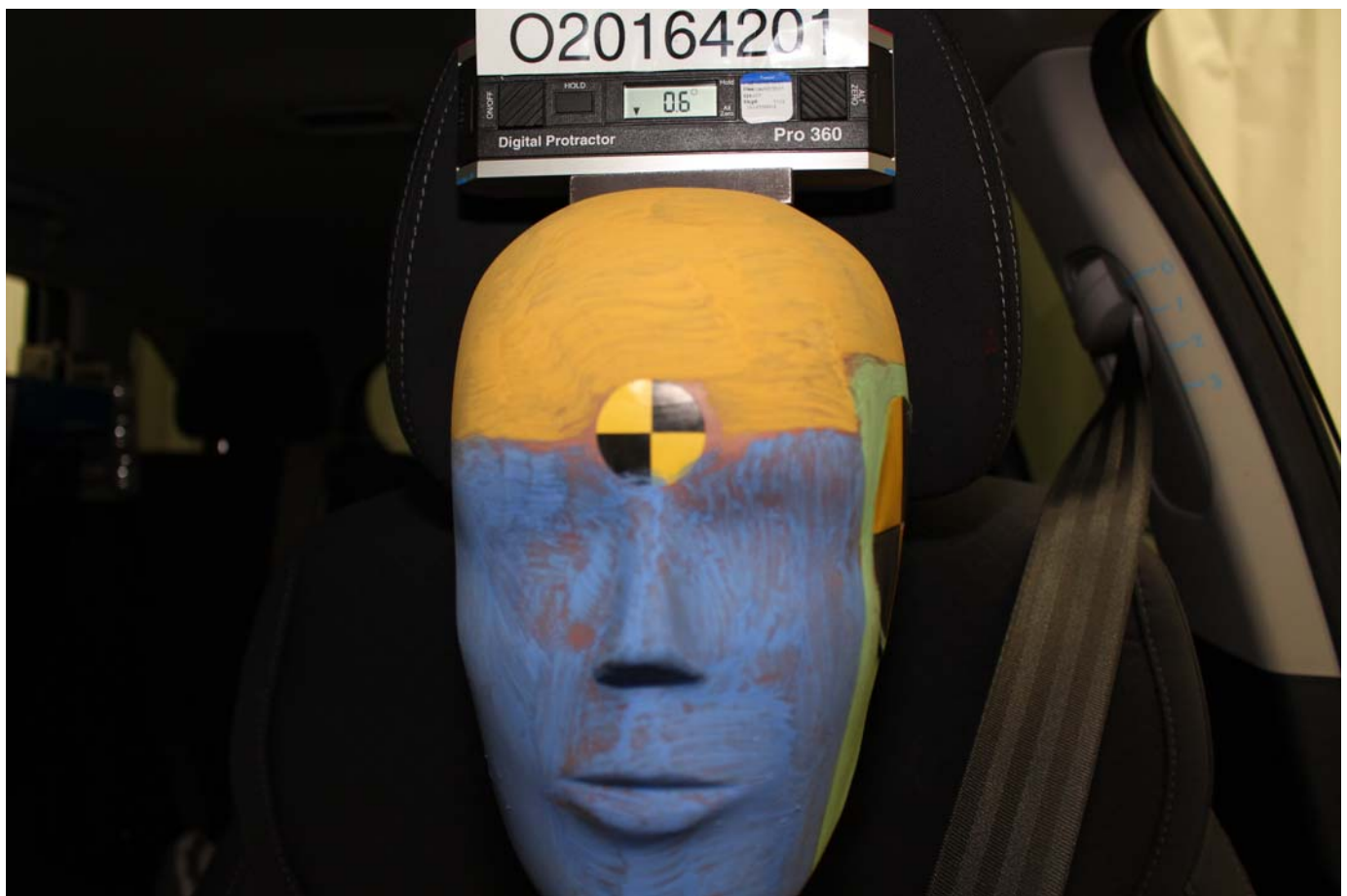
No. 024 - Pre-Test Left Side View of Dummy Shoulder and Door Top View



No. 025 - Post-Test Left Side View of Dummy Shoulder and Door Top View



No. 026 - Pre-Test Front View of Seat Back Prior to Dummy Positioning



No. 027 - Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



No. 028 - Pre-Test Front View of Seat Pan Prior to Dummy Positioning



No. 029 - Pre-Test Overhead View of Dummy Thighs on Seat Pan



No. 030 - Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket



No. 031 - Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level



No. 032 - Pre-Test Placement of Dummy's Feet



No. 033 - Pre-Test View of Belt Anchorage for Dummy



No. 034 - Pre-Test Left Side View of Steering Wheel



No. 035 - Pre-Test View of Disengaged Parking Brake



No. 036 - Pre-Test View of Parking Brake



No. 037 - Pre-Test Close-Up Left Side View of Driver Seat Track



No. 038 - Pre-Test Close-Up Left Side View of Driver Seat Back



No. 039 - Pre-Test Close-Up View of Driver Seat Back or Head Restraint



No. 040 - Pre-Test Dummy and Door Clearance View



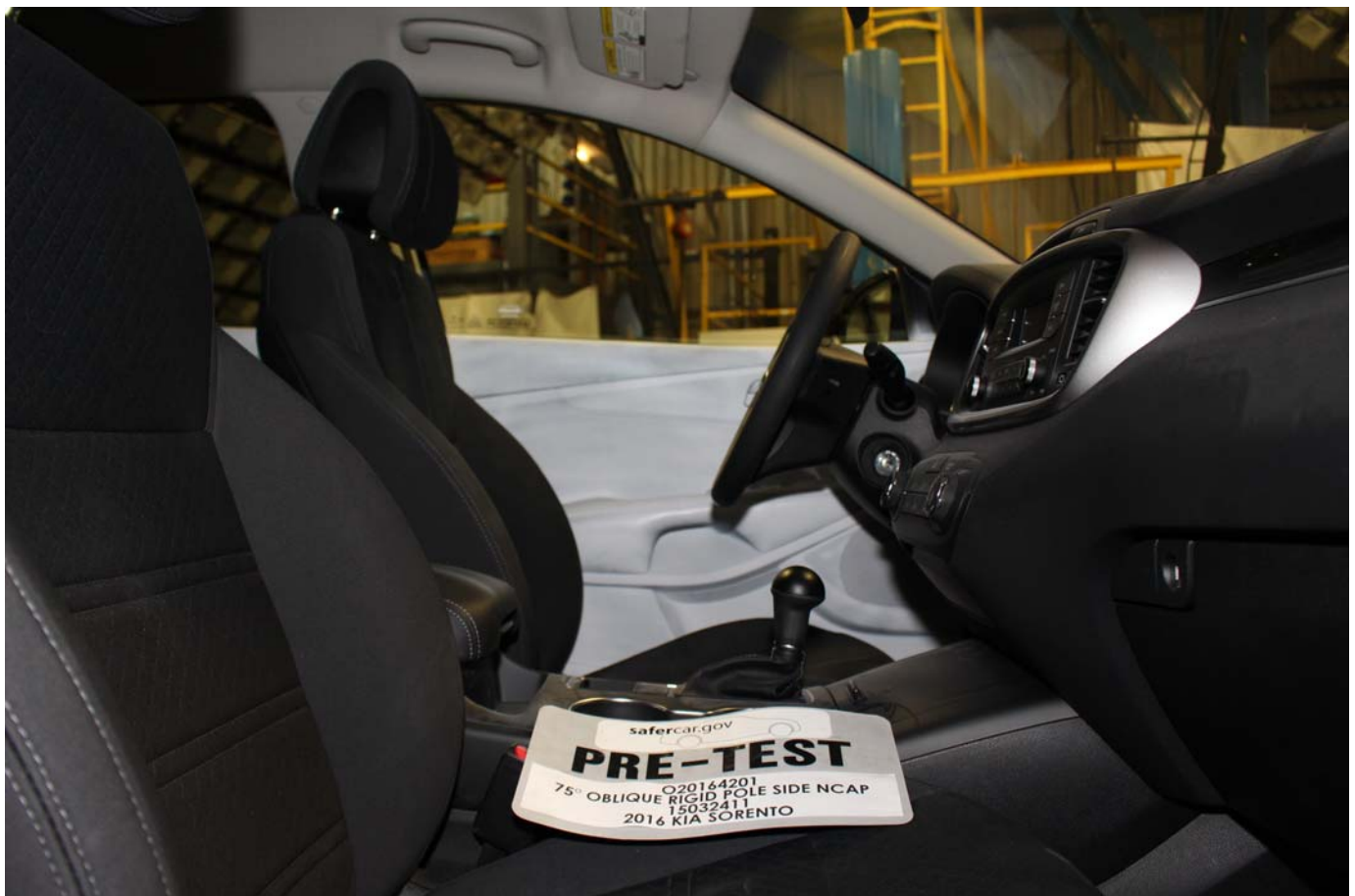
No. 041 - Post-Test Dummy and Door Clearance View



No. 042 - Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



No. 043 - Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



No. 044 - Pre-Test Inner Door Panel View



No. 045 - Post-Test Inner Door Panel View Showing Dummy Contact Location



No. 046 - Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



No. 047 - Post-Test Dummy Close-Up Head Contact with Side Air Bag View



No. 048 - Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



No. 049 - Post-Test Dummy Close-Up Torso Contact with Side Air Bag View



No. 050 - Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



No. 051 - Post-Test Dummy Close-Up Pelvis Contact with Side Air Bag View



No. 052 - Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



No. 053 - Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



No. 054 - Post-Test View of Fuel Filler Cap or Fuel Filler Neck



No. 055 - Close-Up View of Vehicle's Certification Label



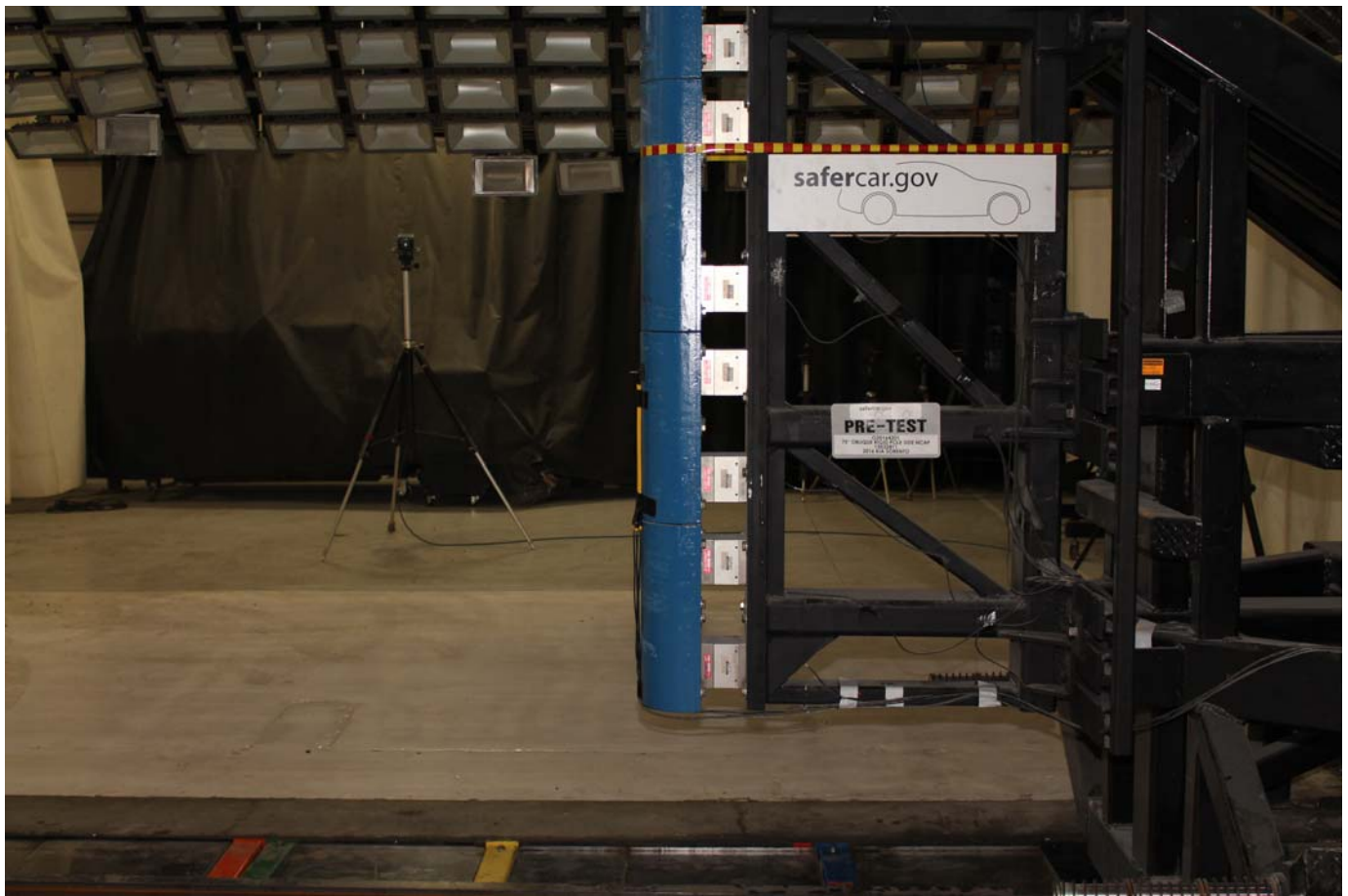
No. 056 - Close-Up View of Vehicle's Tire Information Placard or Label



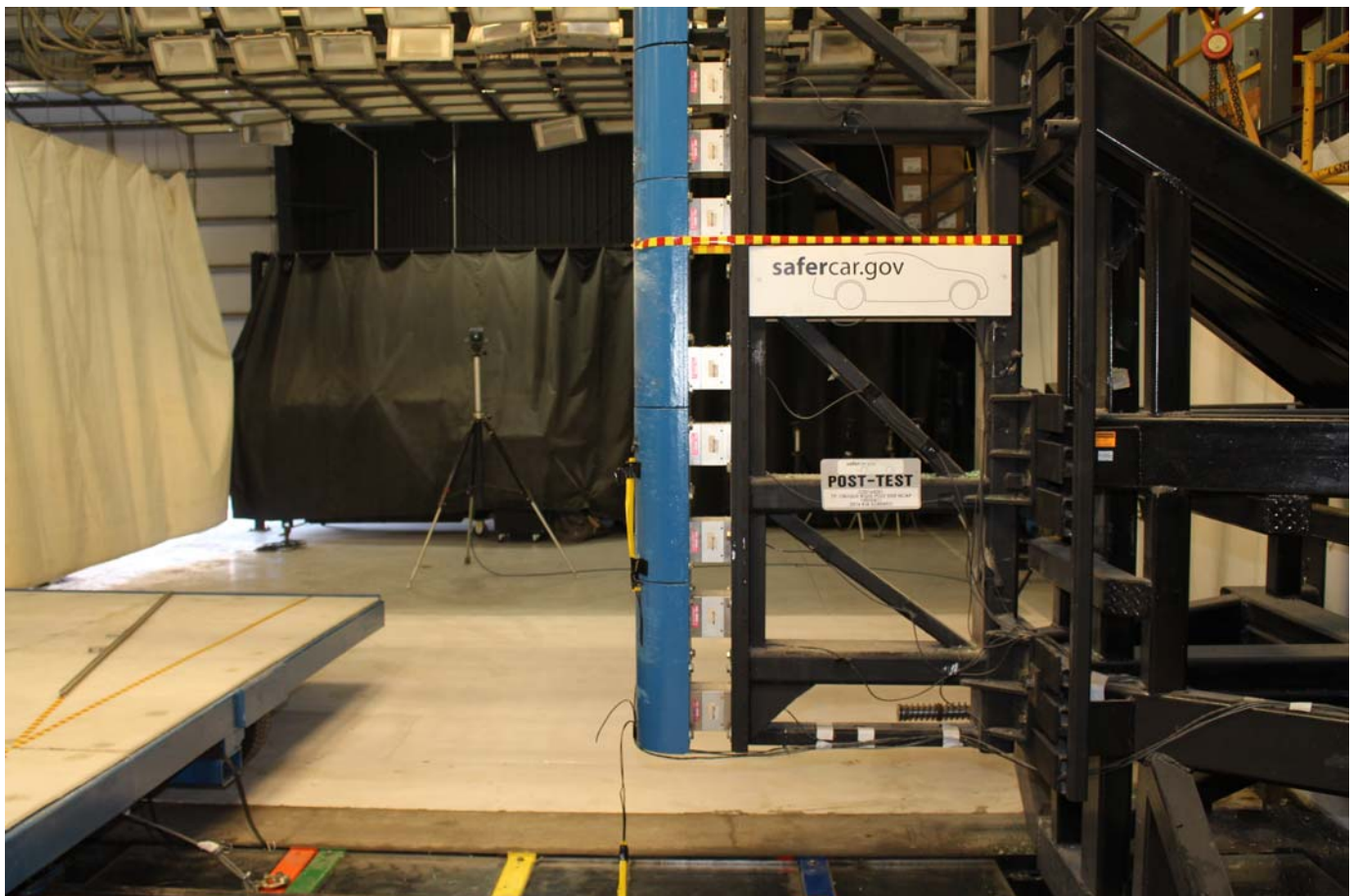
No. 057 - Pre-Test Pole Barrier Front View



No. 058 - Post-Test Pole Barrier Front View



No. 059 - Pre-Test Pole Barrier Side View



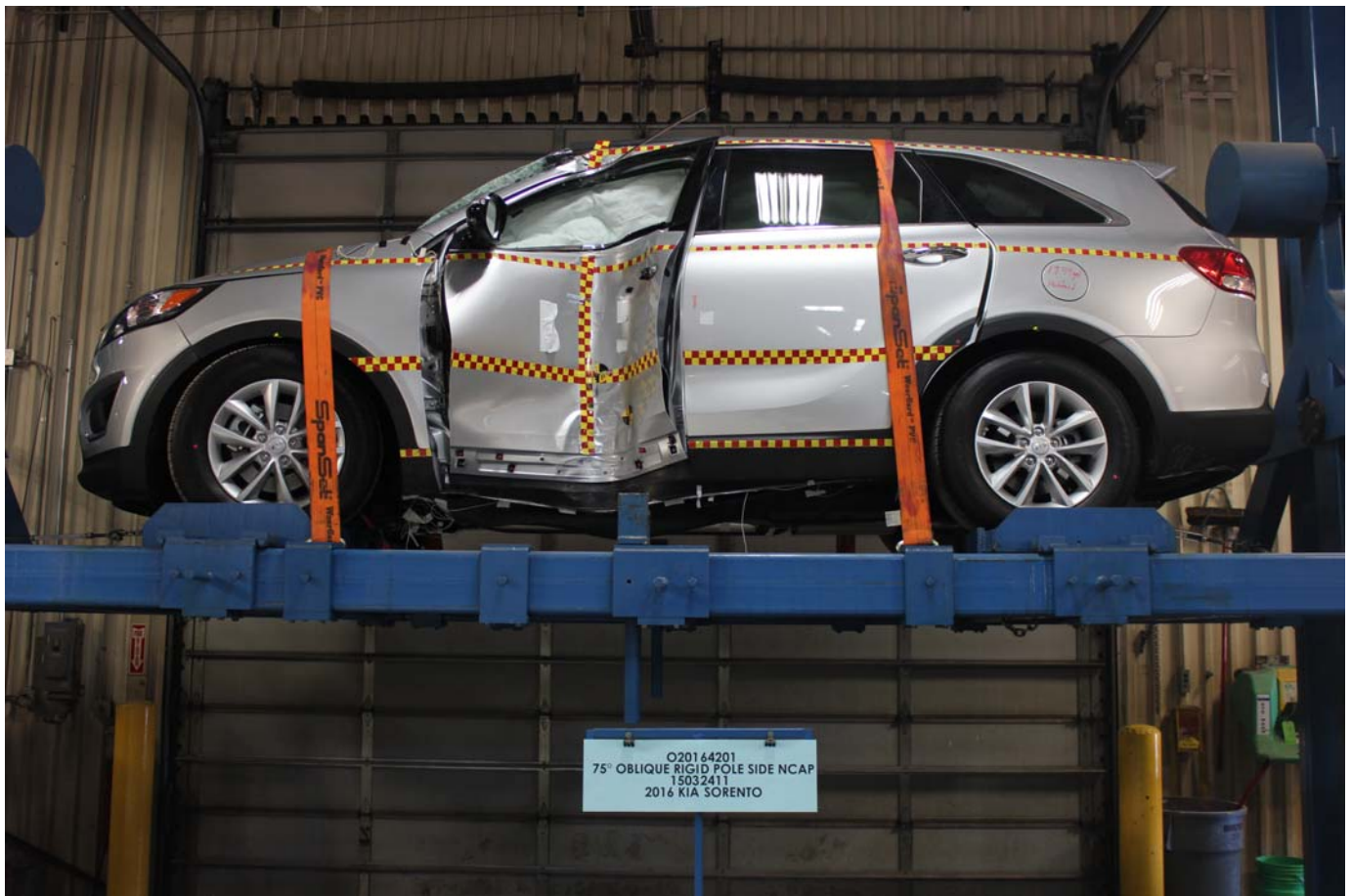
No. 060 - Post-Test Pole Barrier Side View



No. 061 - Pre-Test Ballast View



No. 062 - Post-Test Primary and Redundant Speed Trap Read-Out



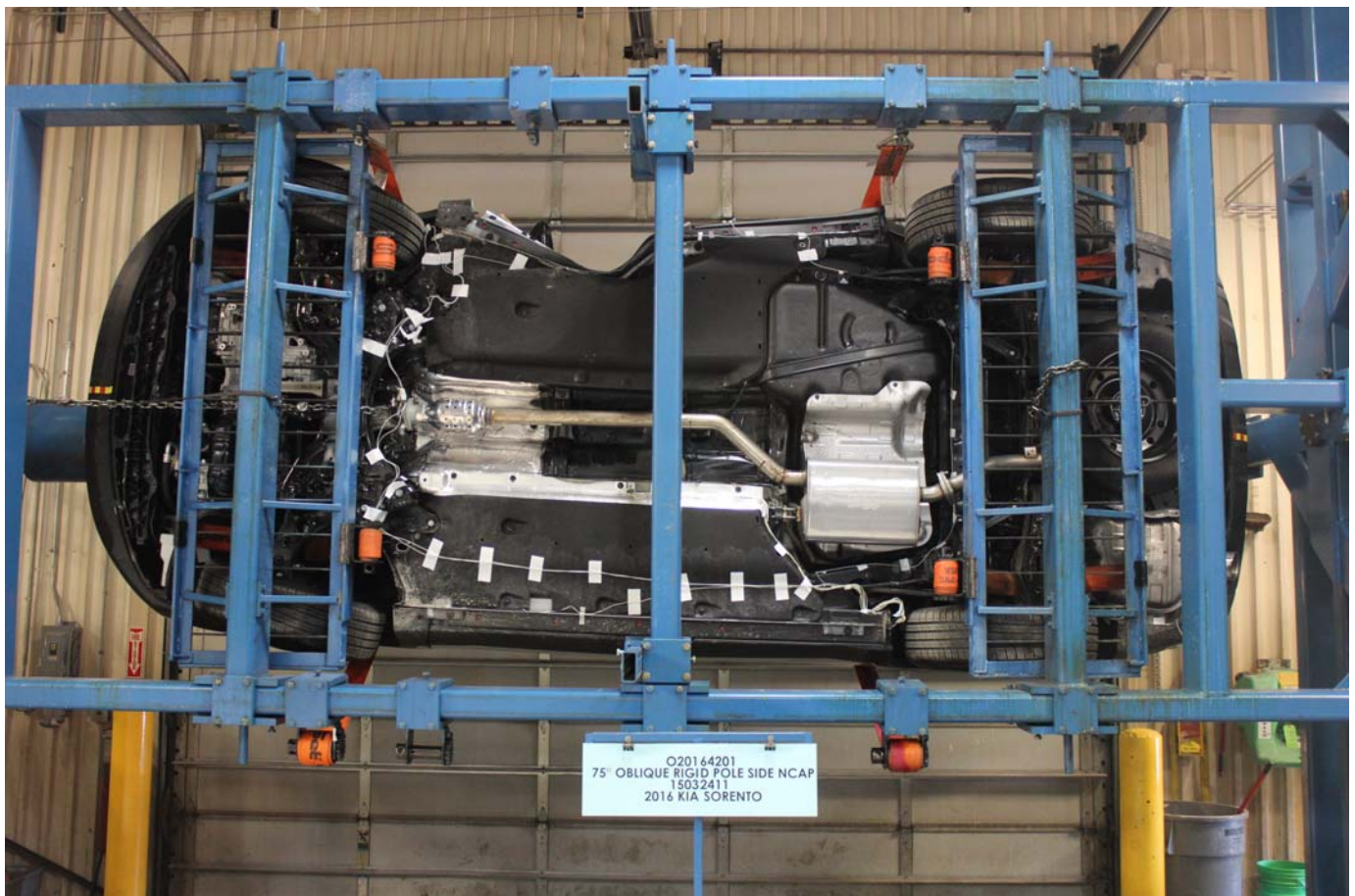
No. 063 - FMVSS No. 301 Static Rollover 0 Degrees



No. 064 - FMVSS No. 301 Static Rollover 90 Degrees



No. 065 - FMVSS No. 301 Static Rollover 180 Degrees



No. 066 - FMVSS No. 301 Static Rollover 270 Degrees



No. 067 - FMVSS No. 301 Static Rollover 360 Degrees



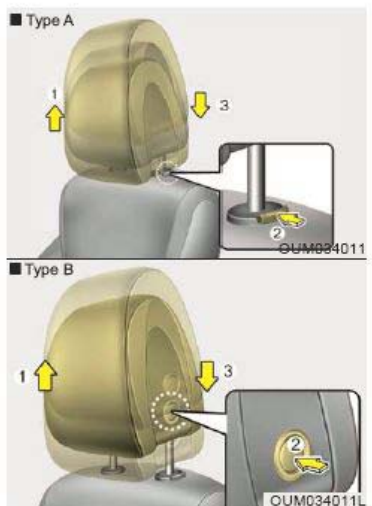
No. 068 - Impact Event

2016 KIA SORENTO L FWD MODEL / OPTION CODE: 73212 / 010 EXTERIOR / INTERIOR: SPARKLING SILVER/BLK VEHICLE ID NUMBER: 5XYPG4A36G006917 ENGINE NUMBER: G4KJEK71 PORT OF ENTRY: WEST POINT MODE OF TRANSPORT: TRUCK	SOLD TO: WI001 ROSEN KIA 5575 SOUTH 27TH STREET MILWAUKEE WI 53221 SHIP TO: WI001	62 Mi. kia.com 
STANDARD FEATURES MECHANICAL 2.4L GDI 4-Cylinder Engine 6-Speed Automatic Transmission w/ Sportmatic Independent Front and Rear Suspension Alloy Wheels SAFETY Dual Front Advanced Airbags Side Curtain Airbags (1st & 2nd Row) Lower Anchors and Tethers for Children (LATCH) Anti-Lock Braking System (ABS) Traction Control System (TCS) Electronic Stability Control (ESC) Hill-start Assist Control (HAC) Tire Pressure Monitoring System (TPMS) INTERIOR, COMFORT & CONVENIENCE Air Conditioning Power Windows, Door Locks & Outside Mirrors AM/FM/CD/MP3 Audio System SIRIUSXM® Satellite Radio w/free 3-mo. subscription* USB/Auxiliary Input Jacks Bluetooth® Wireless Technology YES Essentials Seat Fabric Material 40/20/40 Split Folding 2nd Row Seats Rear Center Armrest with Cupholders Remote Keyless Entry Cruise Control Steering Wheel Controls (Bluetooth/Audio/Cruise) Tilt and Telescopic Steering Column Dual Illuminated Visor Vanity Mirrors Drive Mode Select (DMS) EXTERIOR Heated Outside Mirrors w/ Turn Signal Indicators Privacy Glass WARRANTY 10 Year/100,000 Mile Limited Powertrain Warranty 5 Year/80,000 Mile Limited Basic Warranty 5 Year/60,000 Mile Roadside Assistance *Ask dealer for details	MANUFACTURER'S SUGGESTED RETAIL PRICE ▶ \$24,900.00 ADDITIONAL INSTALLED EQUIPMENT: (In addition to or in place of standard features) Carpeted Floor Mats \$130.00 Cargo Tray \$95.00 MSRP INCLUDING OPTIONS \$25,125.00 INLAND FREIGHT AND HANDLING \$895.00 TOTAL MANUFACTURER'S SUGGESTED RETAIL PRICE ▶ \$26,020.00 TOTAL ADDITIONAL WEIGHT: 14.8	EPA DOT Fuel Economy and Environment Fuel Economy 24 MPG combined city/hwy 21 city 29 highway 4.2 gallons per 100 miles SMALL SUVs range from 17 to 33 MPG. The best vehicle rates 119 MPGe. You spend \$500 more in fuel costs over 5 years compared to the average new vehicle. Annual fuel cost \$1900 Fuel Economy & Greenhouse Gas Rating (tailpipe only) 5 Best Smog Rating (tailpipe only) 5 Best This vehicle emits 324 grams CO ₂ per mile. The best emits 6 grams per mile (tailpipe only). Producing and delivering fuel also cause emissions, best score at www.epa.gov . Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 25 MPG and costs \$8,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. 500G is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog. fuel economy.gov Calculate personalized estimates and compare vehicles GOVERNMENT 5-STAR SAFETY RATINGS This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk. PARTS CONTENT INFORMATION FOR VEHICLES IN THIS CAR LINE U.S./CANADIAN PARTS CONTENT: 53% MAJOR SOURCES OF FOREIGN PARTS: KOREA: 47% NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS. FOR THIS VEHICLE FINAL ASSEMBLY POINT: USA COUNTRY OF ORIGIN ENGINE: USA TRANSMISSION: USA 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 Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. License and title fees, state and local taxes and other dealer installed options and accessories are not included in the manufacturer's suggested retail price.

No. 069 - Monroney Label

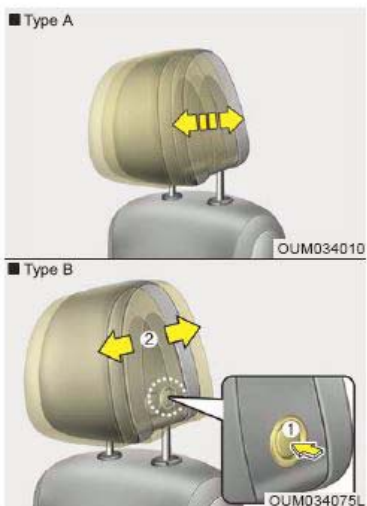
Safety features of your vehicle

Adjusting the height up and down



To raise the headrest, pull it up to the desired position (1). To lower the headrest, push and hold the release button (2) on the headrest support and lower the headrest to the desired position (3).

Forward and backward adjustment



The headrest may be adjusted forward to 4 different positions by pulling the headrest forward to the desired detent. To adjust the headrest to its full rearward position.

Type A

Pull it fully forward to the farthest position and release it.

Type B

Press and hold the release button (1), and adjust position of the headrest.

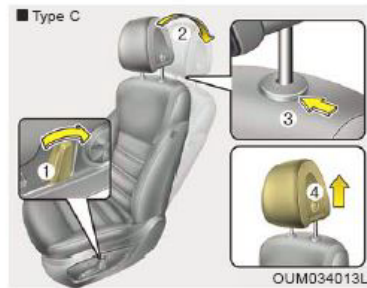
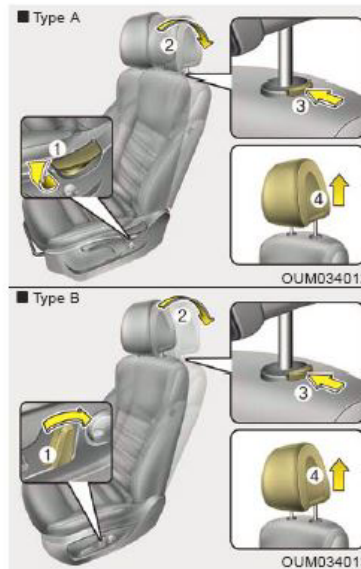
Adjust the headrest so that it properly supports the head and neck.



CAUTION

If you recline the seatback towards the front with the head rest and seat cushion raised, the head rest may come in contact with the sunvisor or other parts of the vehicle.

Removal and reinstallation



To remove the headrest:

1. Recline the seatback (2) with the recline lever or switch (1).
2. Raise headrest as far as it can go.
3. Press the headrest release button (3) or press the release button with slim tool (3) (for Type C) while pulling the headrest up (4).

WARNING

NEVER allow anyone to ride in a seat with the headrest removed.

3 | 13

No. 071 - Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



No. 072 - Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B
DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

		<u>Page No.</u>
Figure No. 1.	Driver Head CG Acceleration (X) vs. Time	B-1
Figure No. 2.	Driver Head CG Acceleration (Y) vs. Time	B-1
Figure No. 3.	Driver Head CG Acceleration (Z) vs. Time	B-1
Figure No. 4.	Driver Head CG Resultant Acceleration (X) vs. Time	B-1
Figure No. 5.	Driver Lower Spine T12 Acceleration (X) vs. Time	B-2
Figure No. 6.	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-2
Figure No. 7.	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-2
Figure No. 8.	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-2
Figure No. 9.	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-3
Figure No. 10.	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-3
Figure No. 11.	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-3

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov

Additional Driver Dummy Instrumentation Data

Driver Head CG Redundant Acceleration (X) vs. Time

Driver Head CG Redundant Acceleration (Y) vs. Time

Driver Head CG Redundant Acceleration (Z) vs. Time

Driver Upper Thorax Rib Deflection (Y)

Driver Middle Thorax Rib Deflection (Y)

Driver Lower Thorax Rib Deflection (Y)

Driver Upper Abdomen Rib Deflection (Y)

Driver Lower Abdomen Rib Deflection (Y)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)

Vehicle Center of Gravity Acceleration (Y)

Vehicle Center of Gravity Acceleration (Z)

Left Floor Sill Acceleration (Y)

Left A-Pillar Sill Acceleration (Y)

Left Lower A-Pillar Acceleration (Y)

Left Mid A-Pillar Acceleration (Y)

Left B-Pillar Sill Acceleration (Y)

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

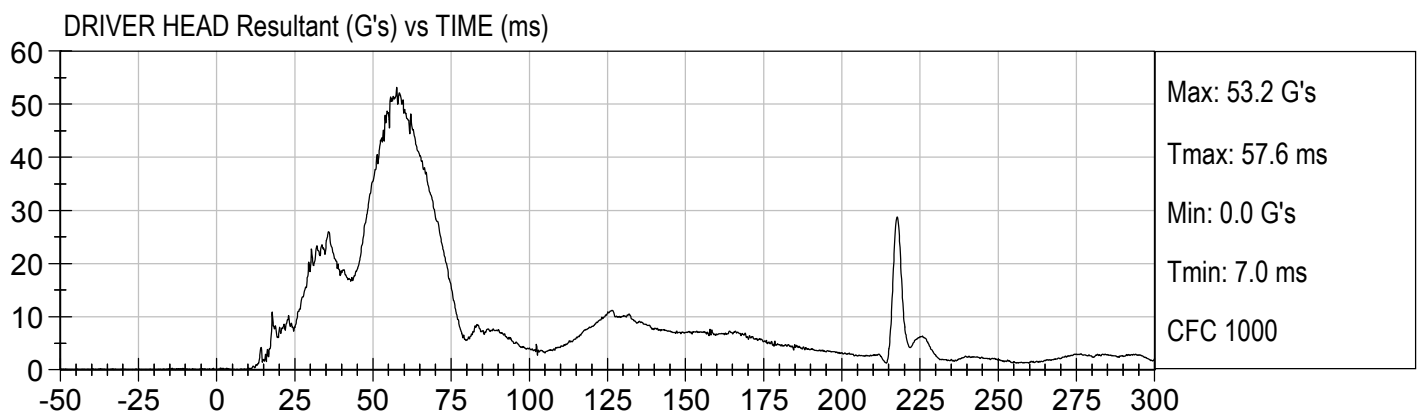
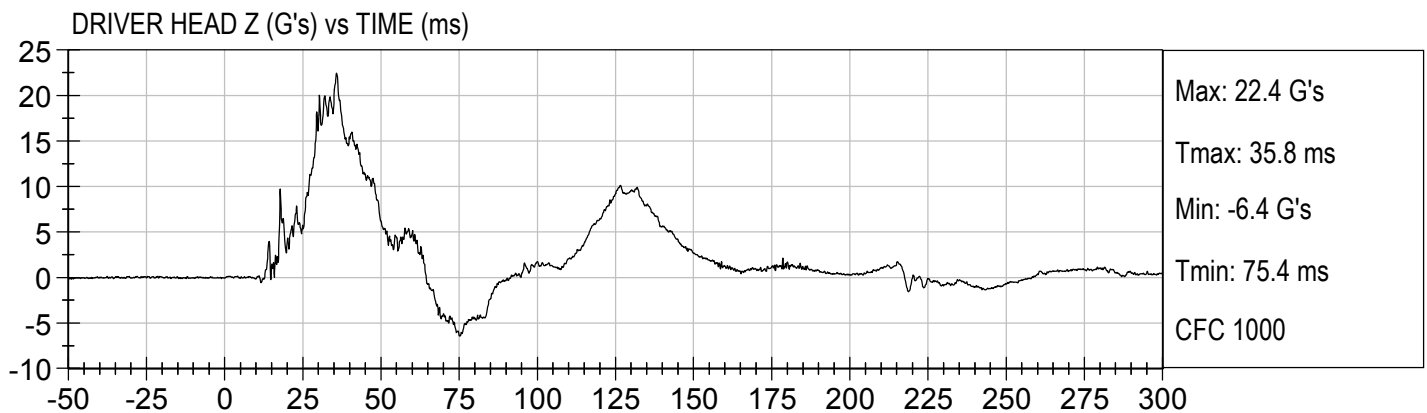
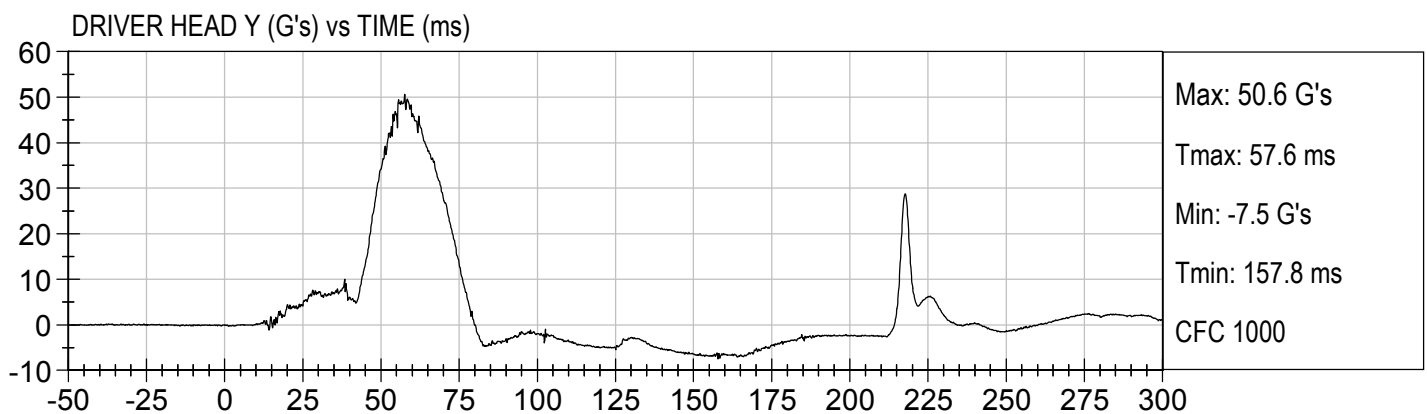
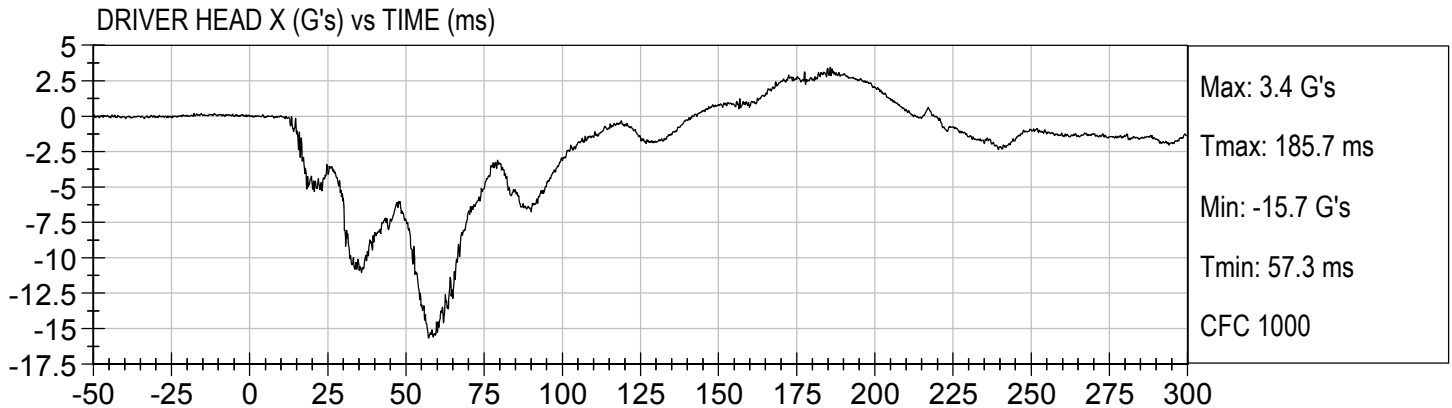
Load Cell Pole Barrier #4 Force (Y)

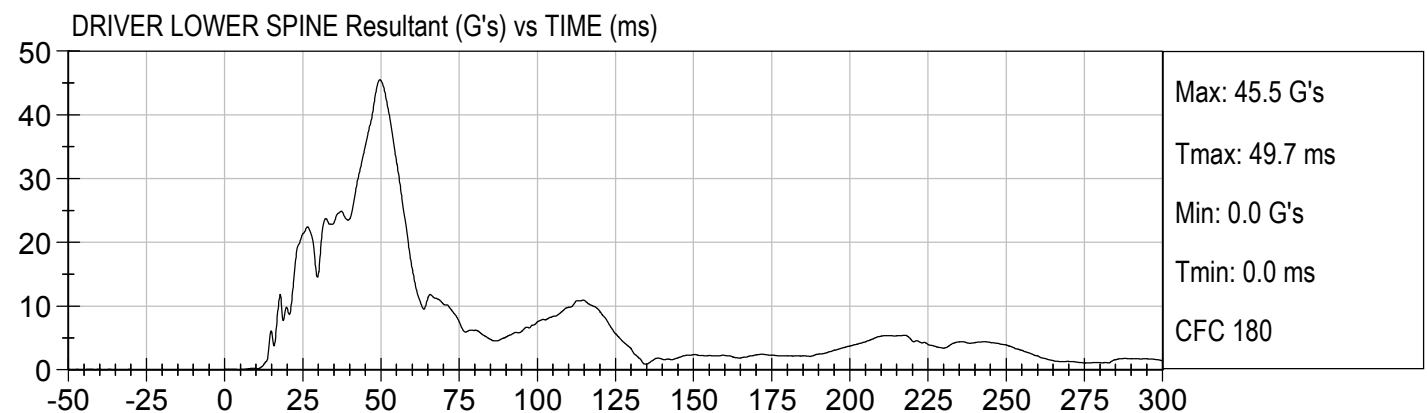
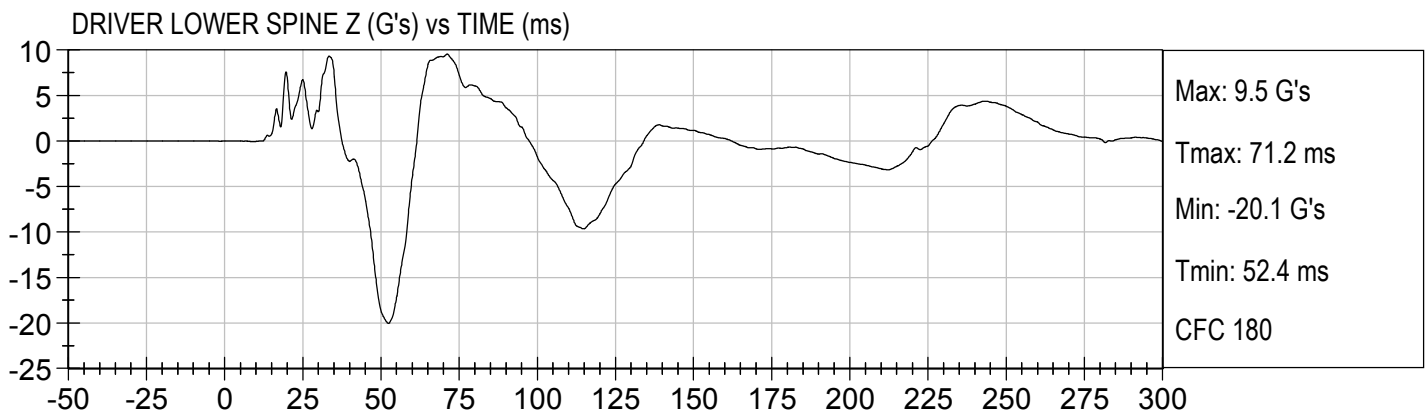
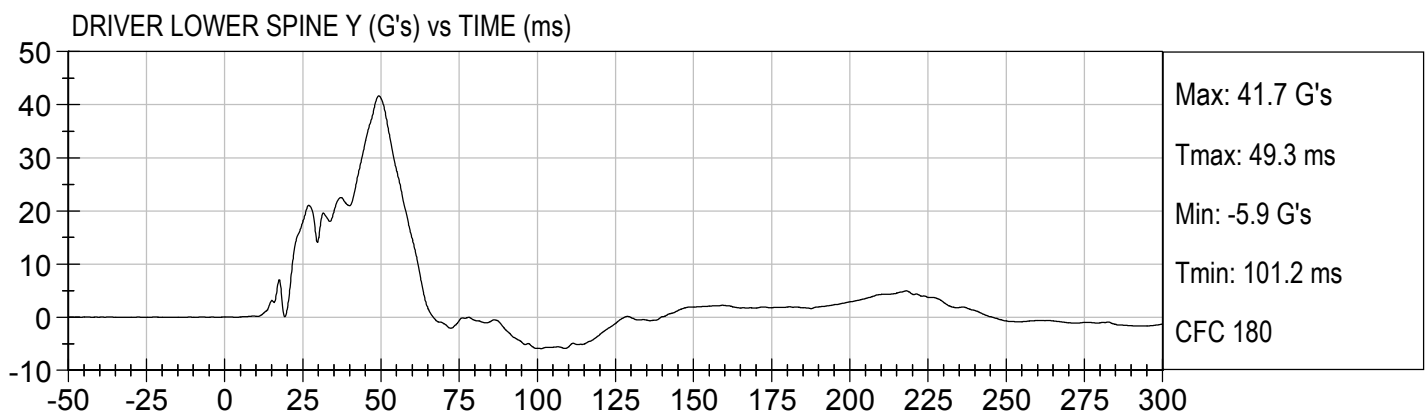
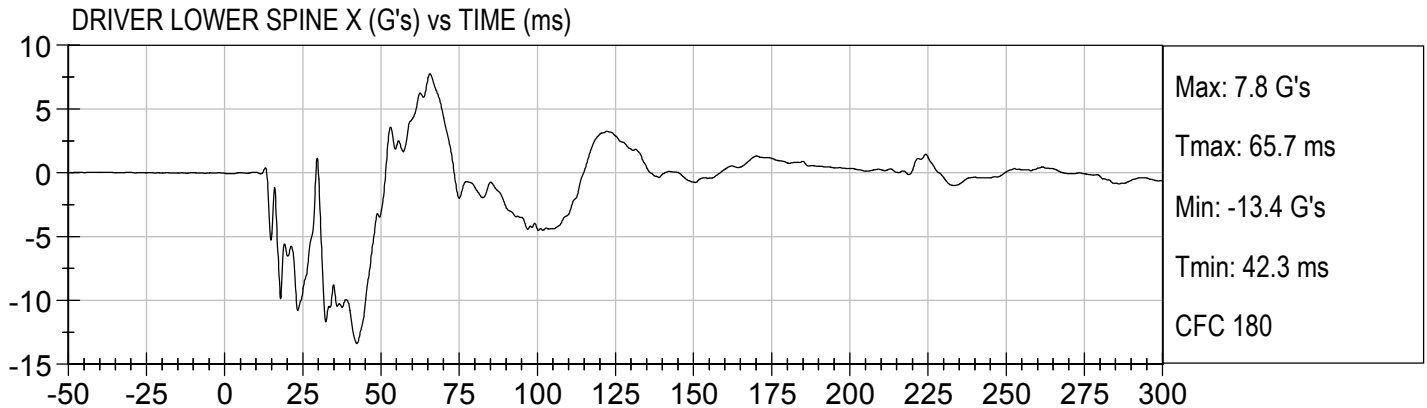
Load Cell Pole Barrier #5 Force (Y)

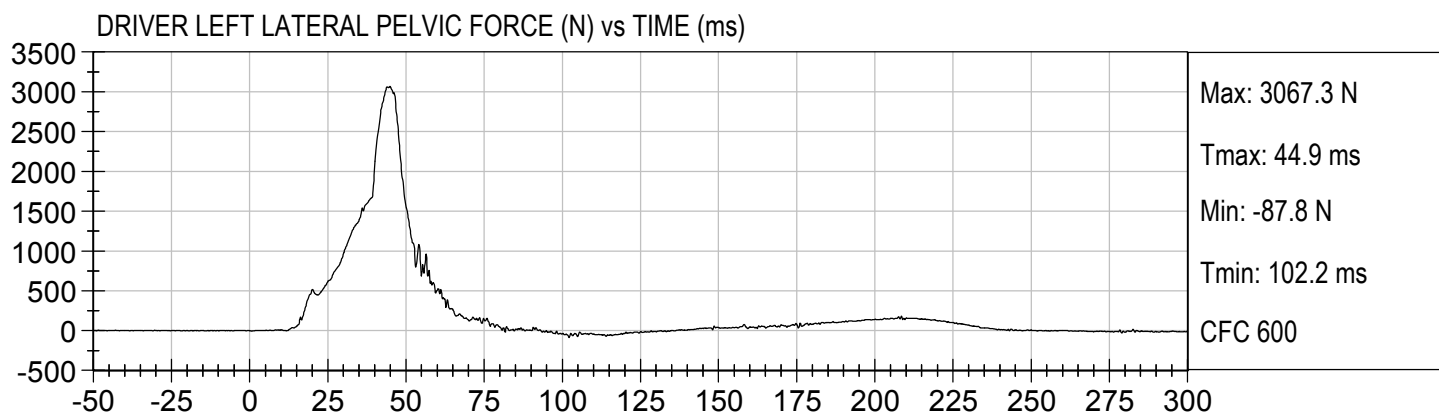
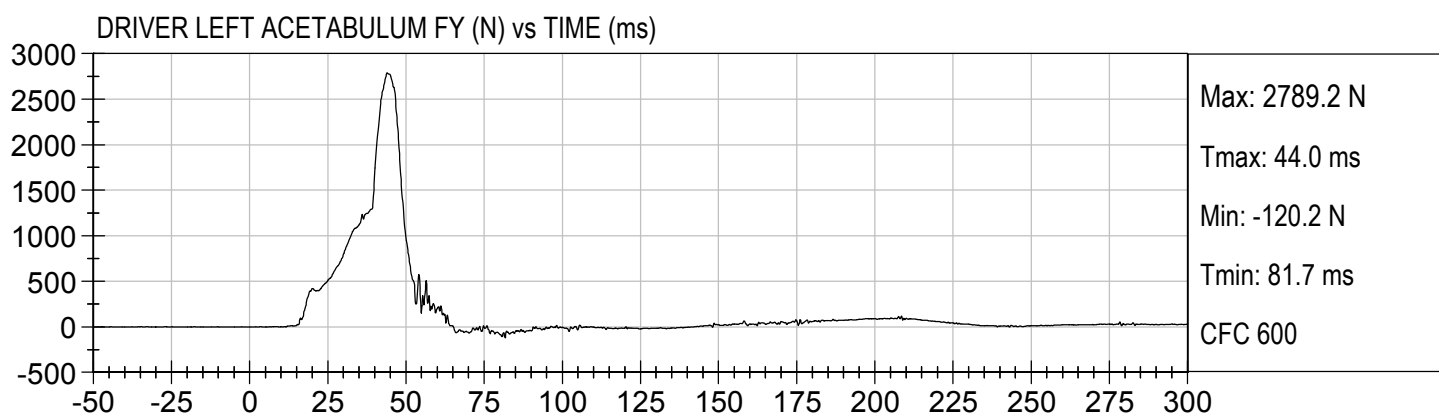
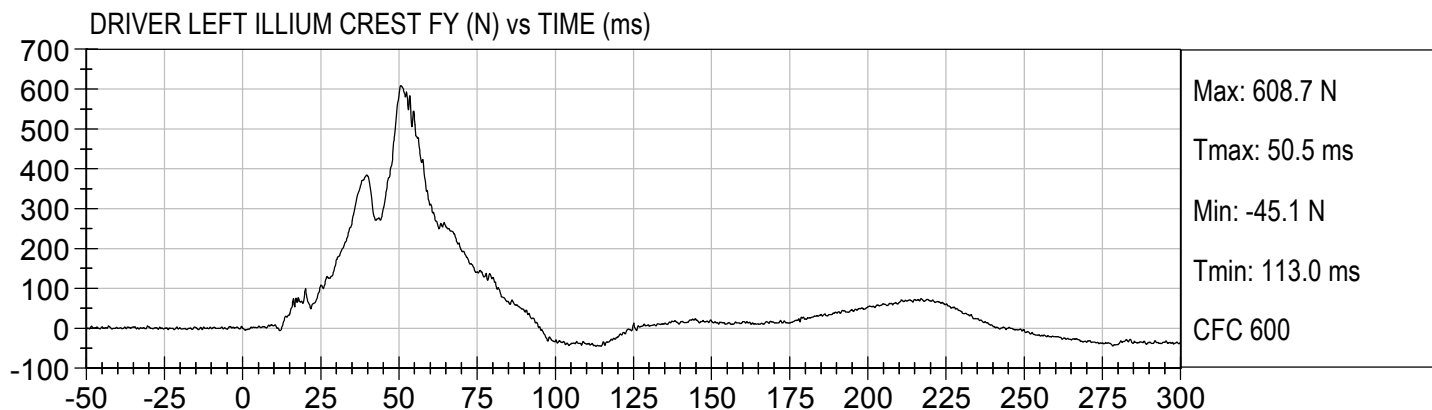
Load Cell Pole Barrier #6 Force (Y)

Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)







APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SID-IIsD External Measurements
SN: 306

No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	785	Pass
B	Shoulder Pivot Height	437 - 453	449	Pass
C	H-point Height	79 - 89	86	Pass
D	H-point from Seatback	141 - 151	147	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	120	Pass
G	Head Breadth	140 - 148	141	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	182	Pass
J	Head Circumference	541 - 551	550	Pass
K	Buttock to Knee Length	514 - 540	538	Pass
L	Popliteal Height	343 - 369	349	Pass
M	Knee Pivot to Floor Height	392 - 409	394	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	198	Pass
P	Foot Length	216 - 232	222	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	317	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	483	Pass
V	Shoulder Width	341 - 357	351	Pass
W	Foot Width	78 - 94	82	Pass
Y	Chest Circumference w/ jacket	851 - 881	863	Pass
Z	Waist Circumference	761 - 791	782	Pass

MGA RESEARCH CORPORATION
HEAD DROP TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

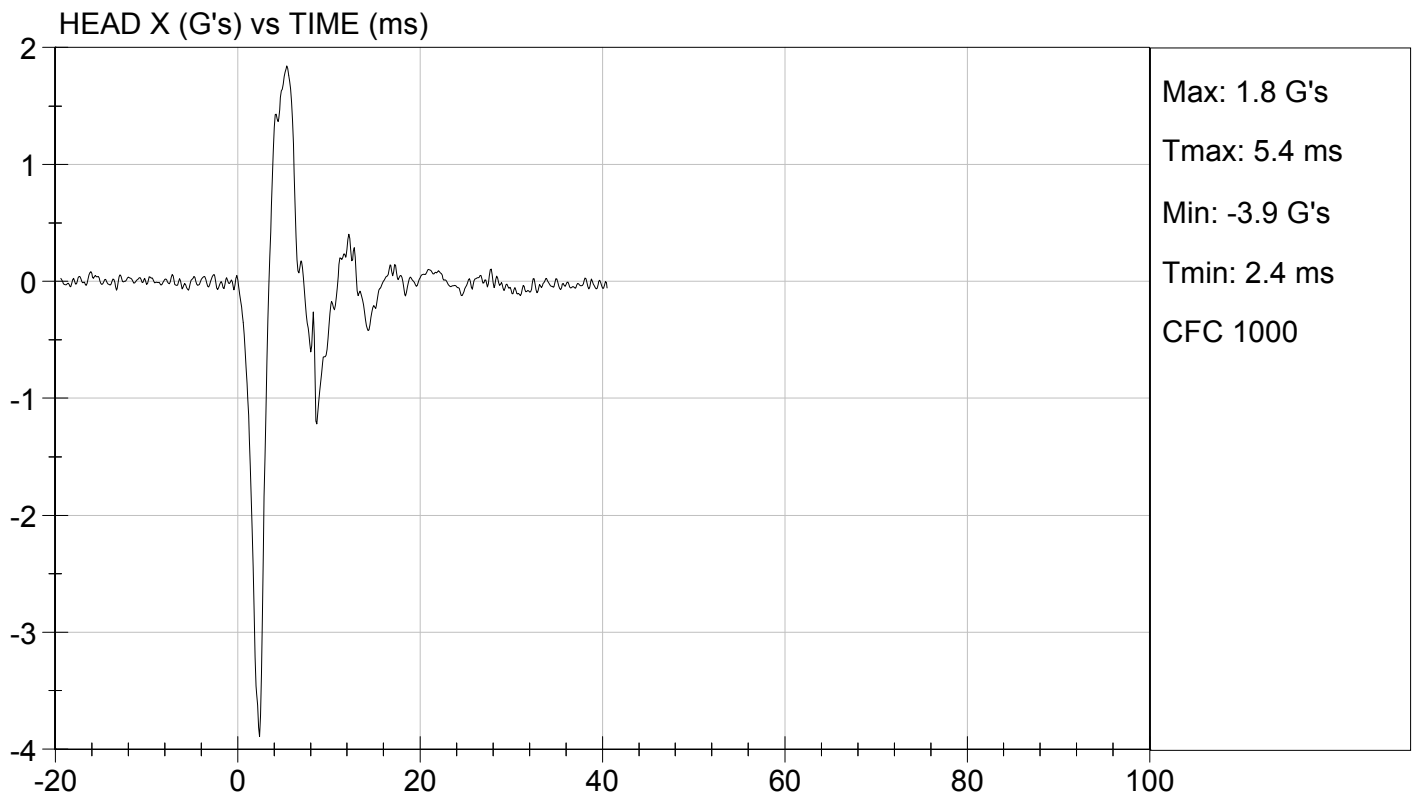
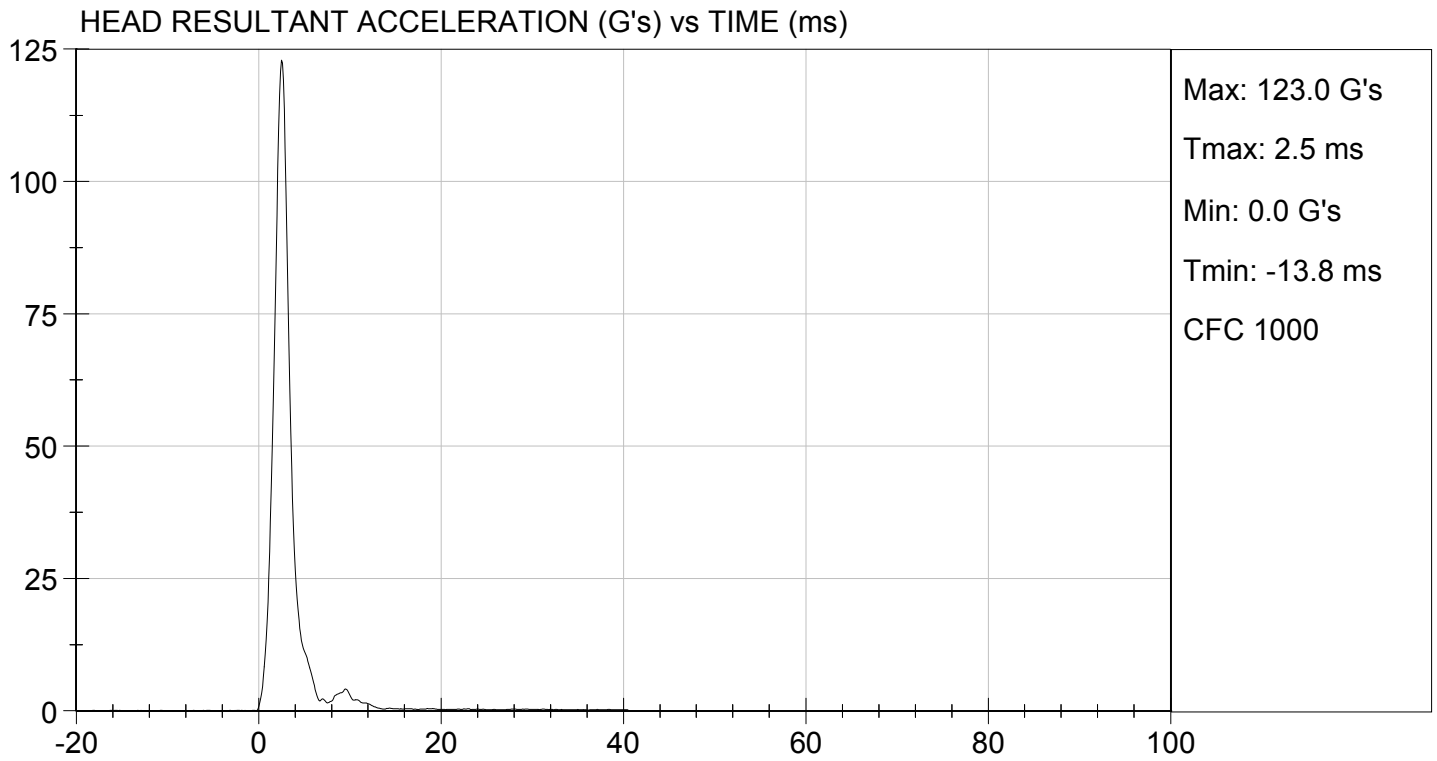
Test ID: D15581

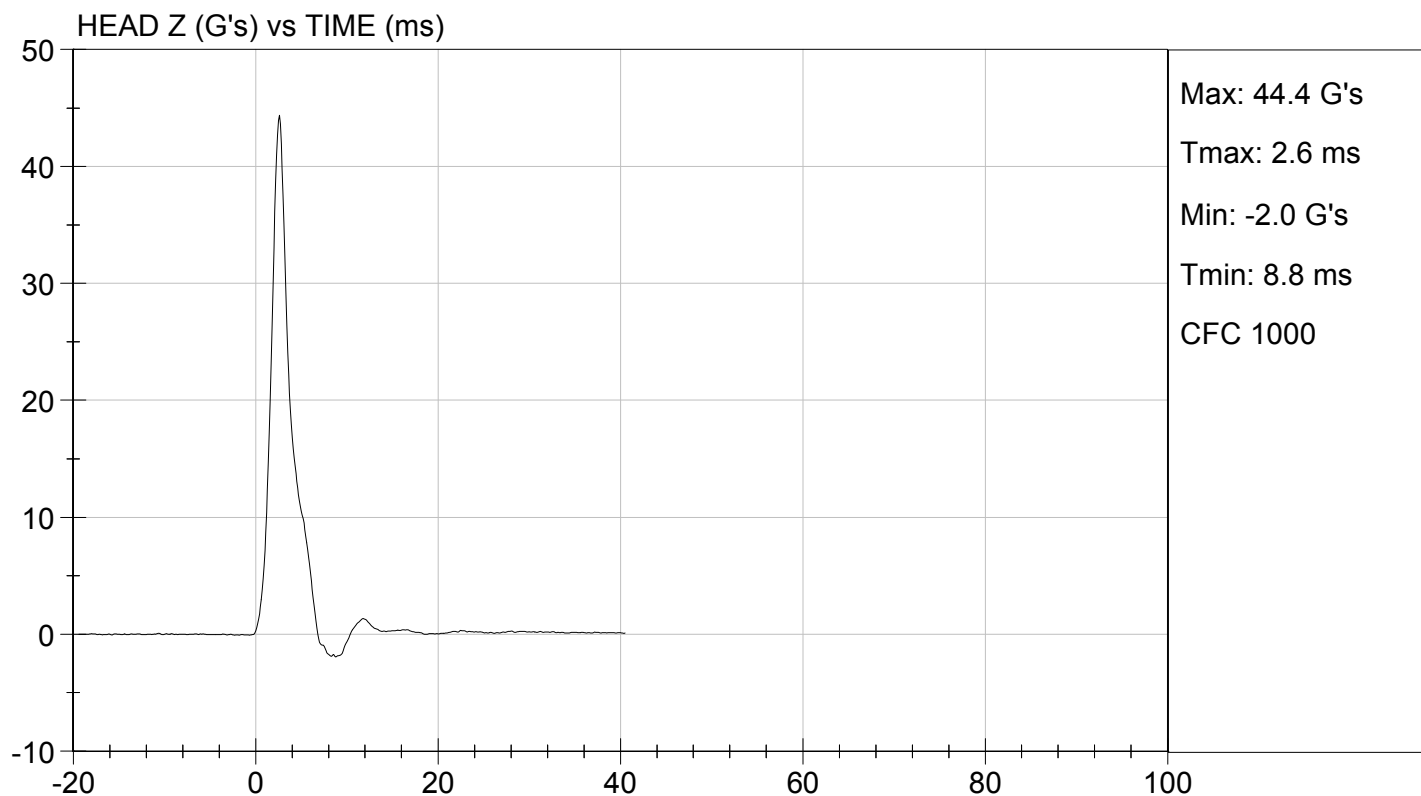
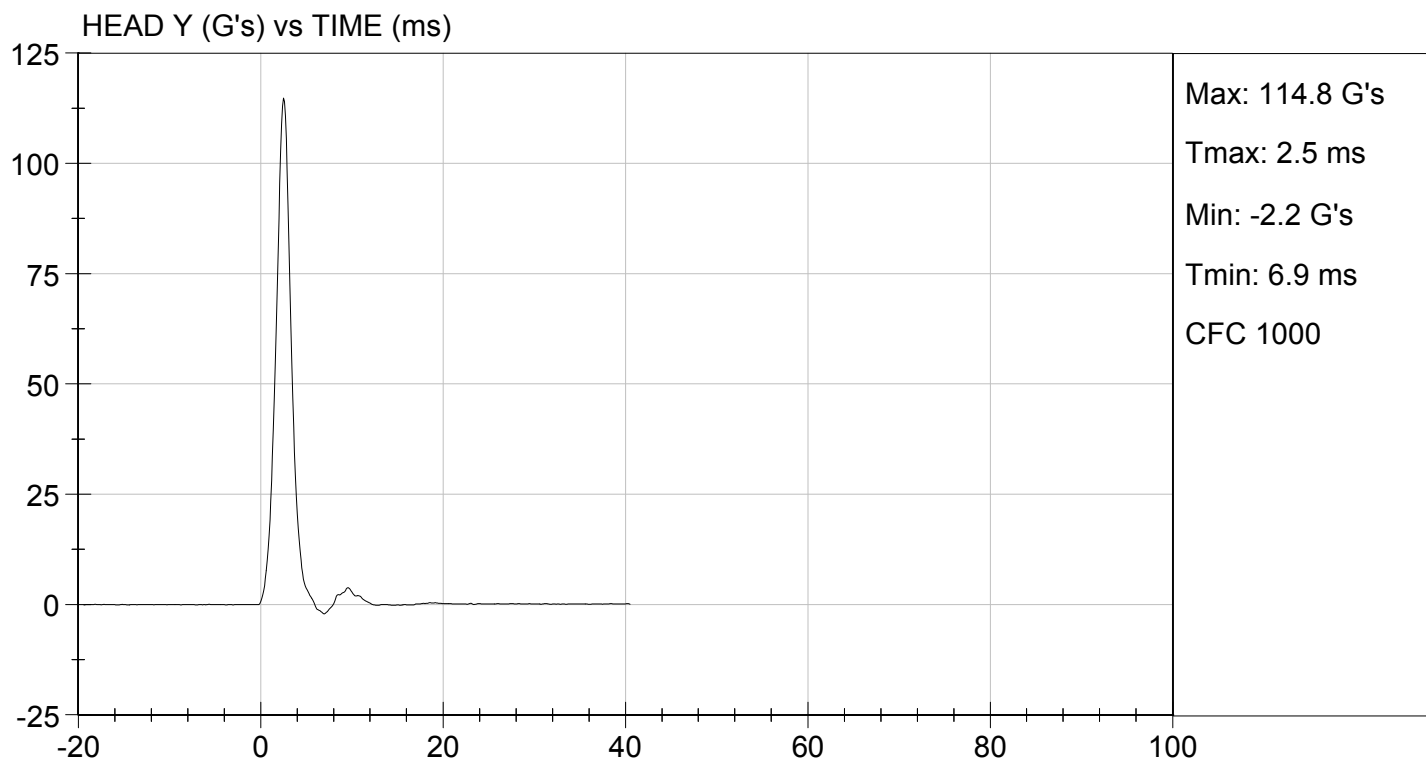
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Peak Resultant Acceleration	G's	115 to 137	123	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-3.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

02/26/2015
Test Date

Jessica Hall
Approved By





MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15582

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	22.0	Pass
Humidity		%	10 to 70	24	Pass
Impact Velocity		m/s	5.51 to 5.63	5.63	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.62	Pass
	15 ms	m/s	3.30 to 4.10	3.62	Pass
	20 ms	m/s	4.40 to 5.40	4.78	Pass
	25 ms	m/s	5.40 to 6.10	5.70	Pass
	25-100 ms	m/s	5.50 to 6.20	5.75	Pass
Maximum D-Plane Rotation		deg	71 to 81	76	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	62	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-41	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	116	Pass
Overall Test Results					Pass

David Schoedel

Laboratory Technician

02/26/2015

Test Date

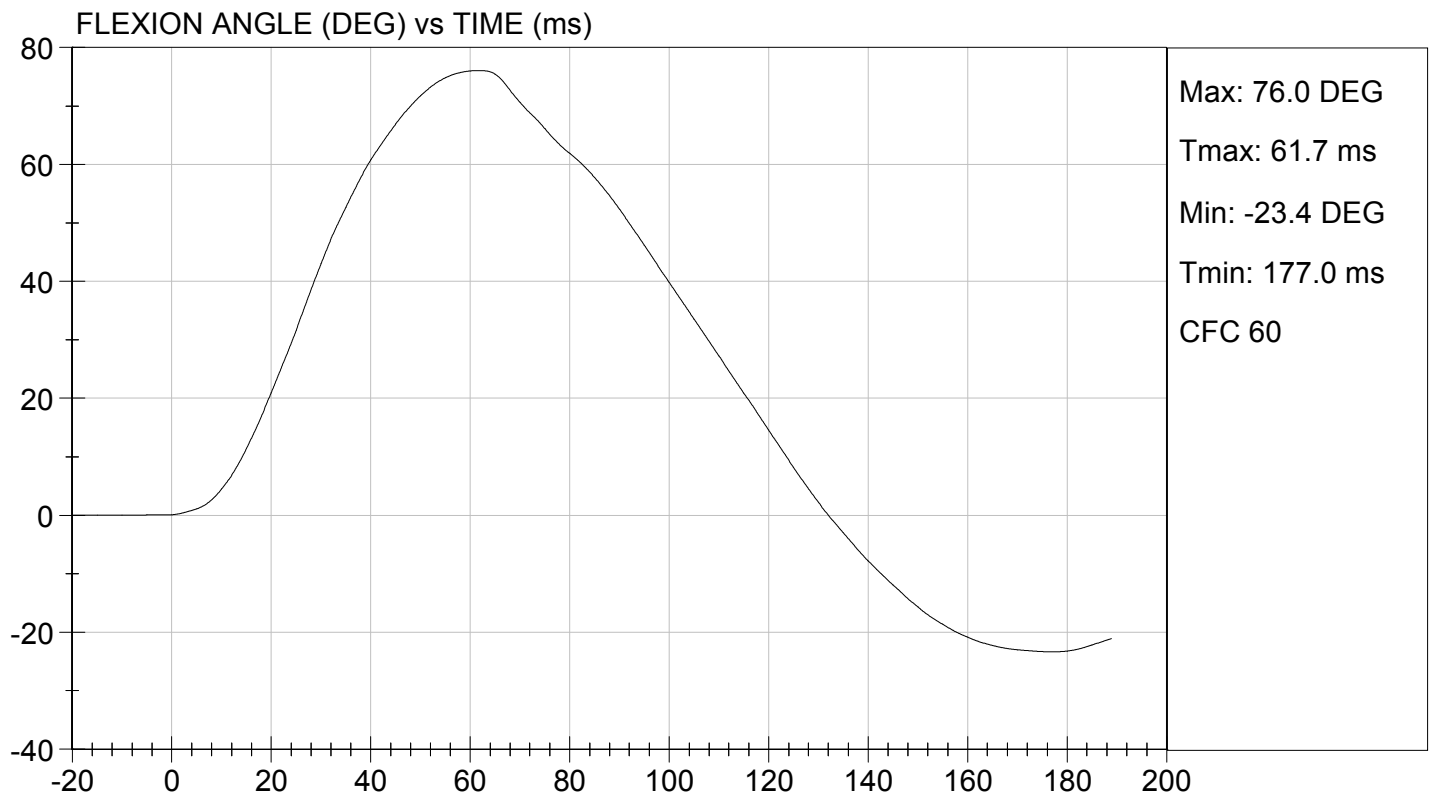
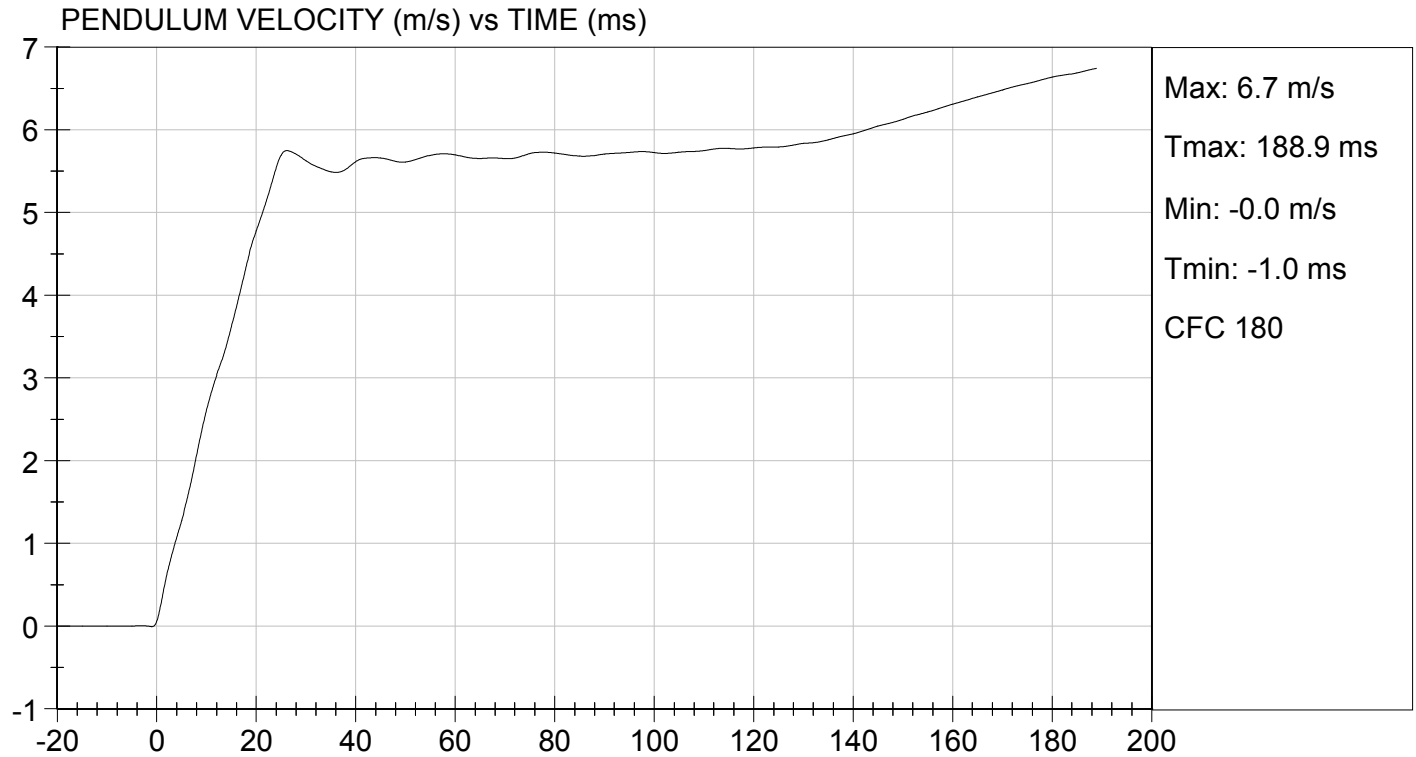
Jessica Hall

Approved By



TEST DESC: NECK BENDING
VELOCITY: 18.47 ft/s, 5.63 m/s

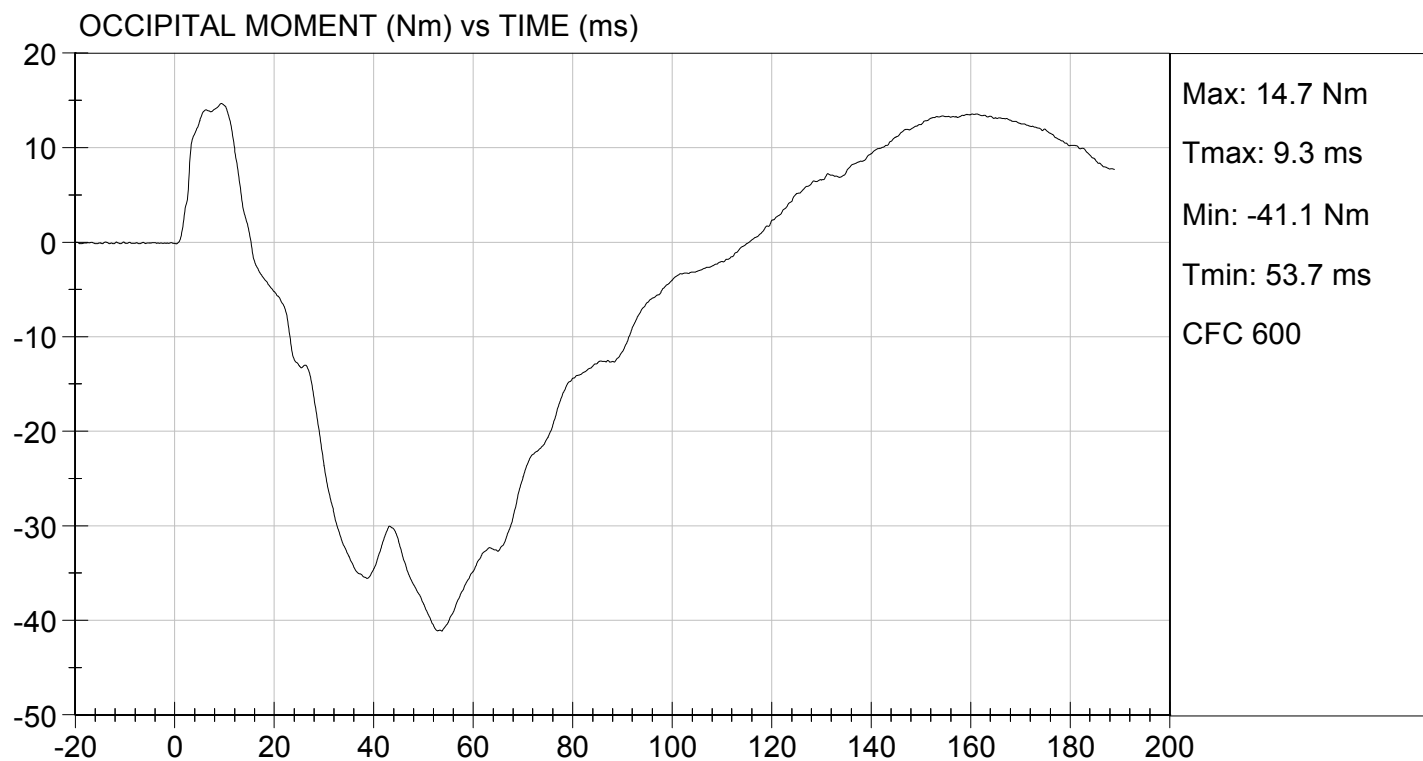
TEST DATE: 02/26/2015
TEST #: D15582





TEST DESC: NECK BENDING
VELOCITY: 18.47 ft/s, 5.63 m/s

TEST DATE: 02/26/2015
TEST #: D15582



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D15583

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	26	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results			Pass	

David Schoedel

Laboratory Technician

02/26/2015

Test Date

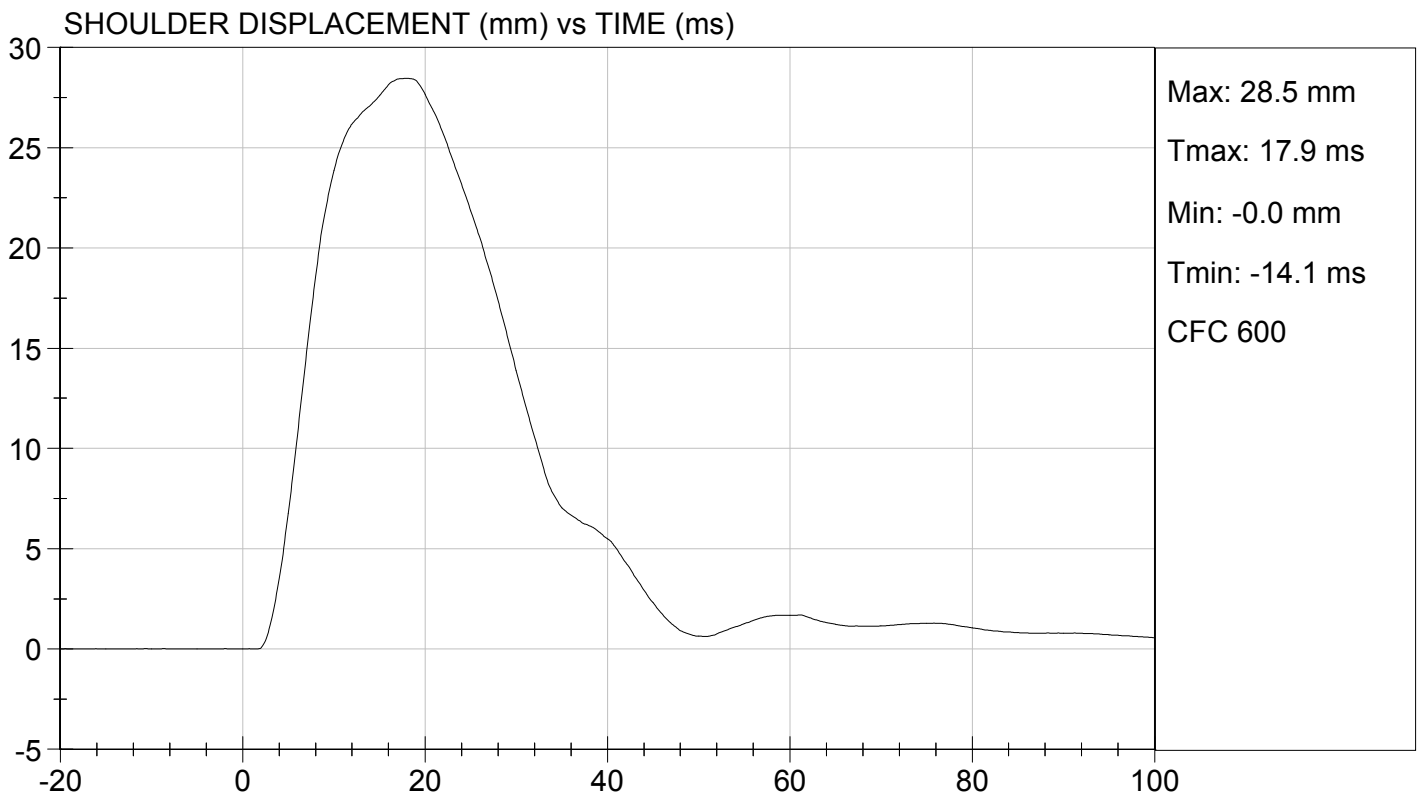
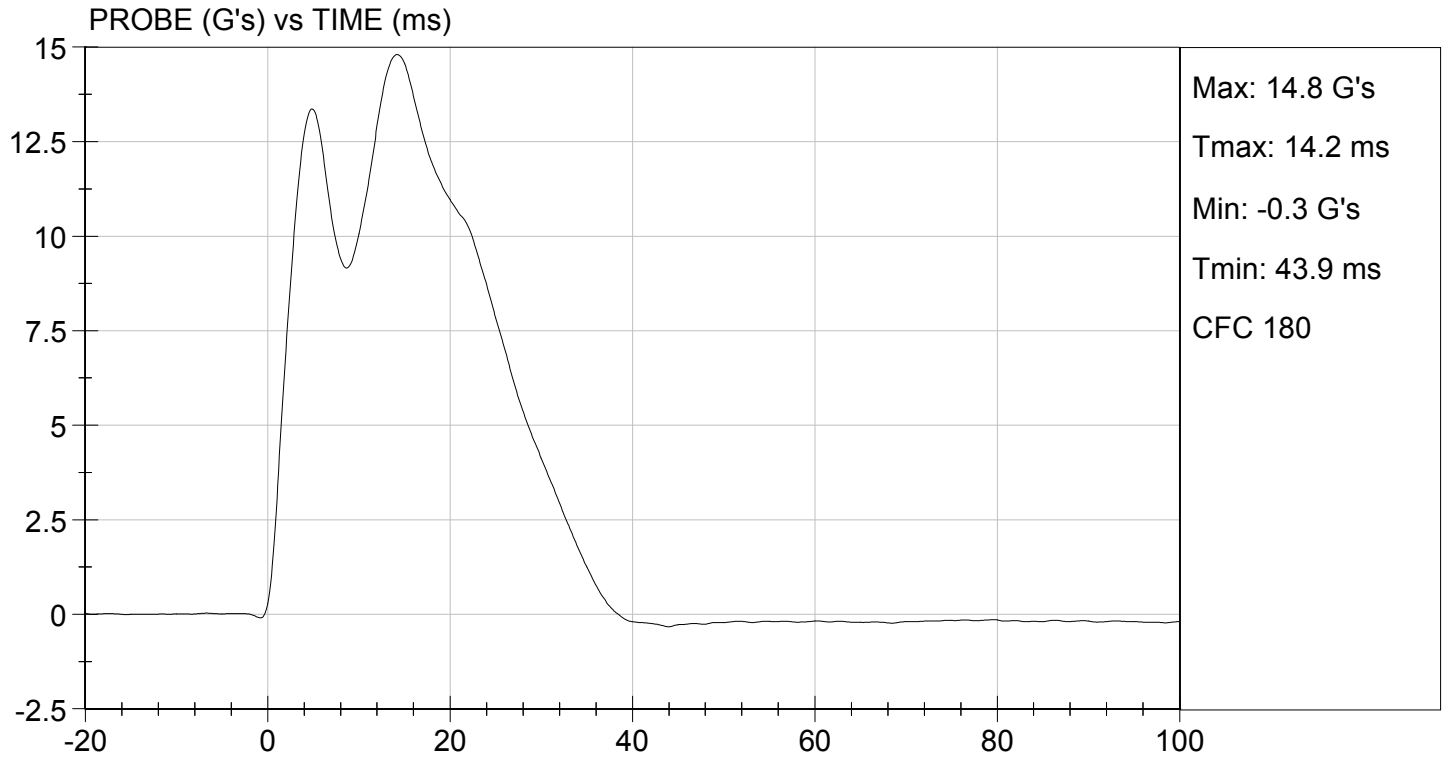
Jessica Hall

Approved By



TEST DESC: SHOULDER IMPACT
VELOCITY: 14.01 ft/s, 4.27 m/s

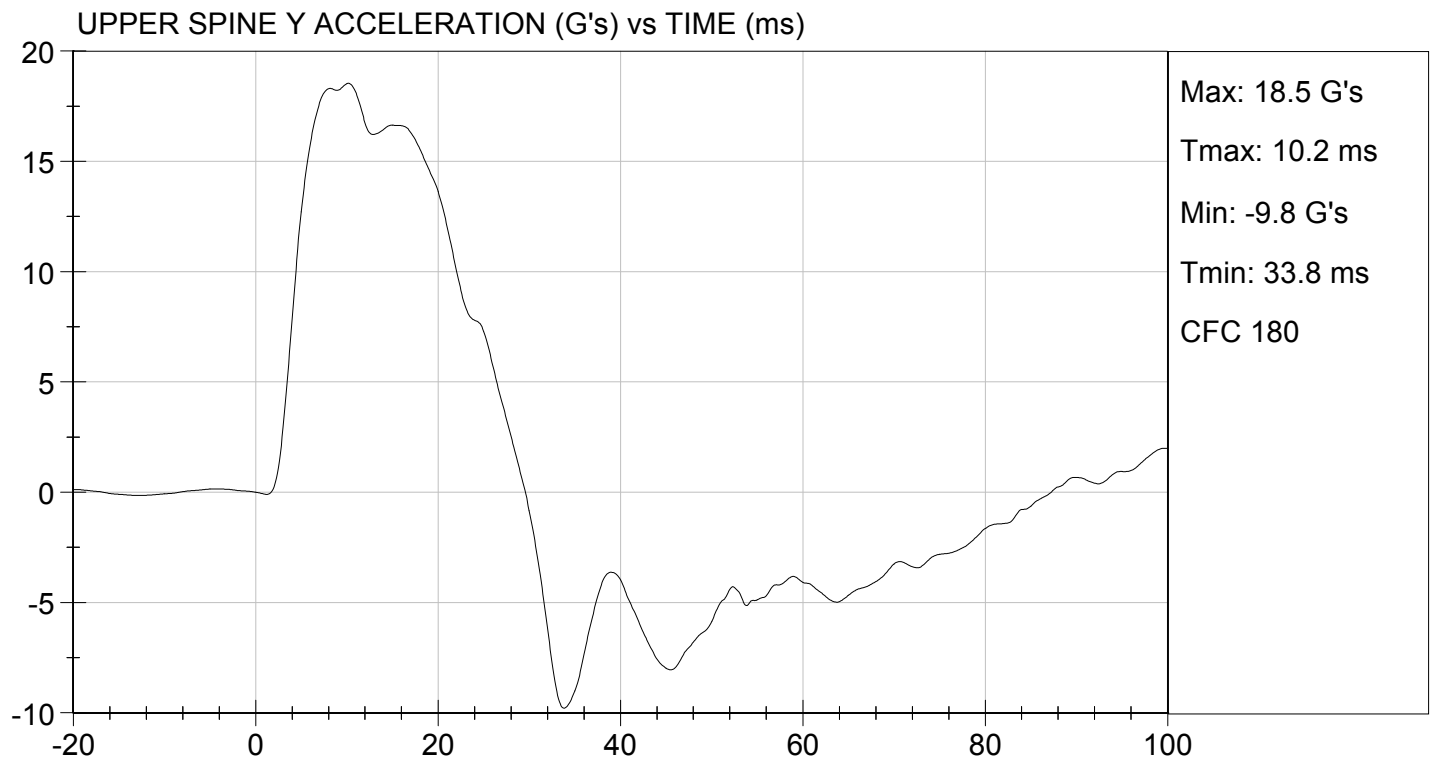
TEST DATE: 02/26/2015
TEST #: D15583





TEST DESC: SHOULDER IMPACT
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 02/26/2015
TEST #: D15583



MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15584

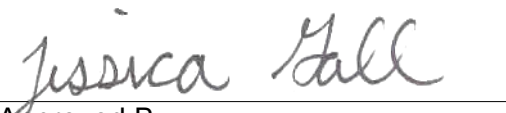
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	26	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	34	Pass
Shoulder Displacement	mm	31 to 40	34	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	34	Pass
Overall Test Results				Pass



Laboratory Technician

02/26/2015

Test Date

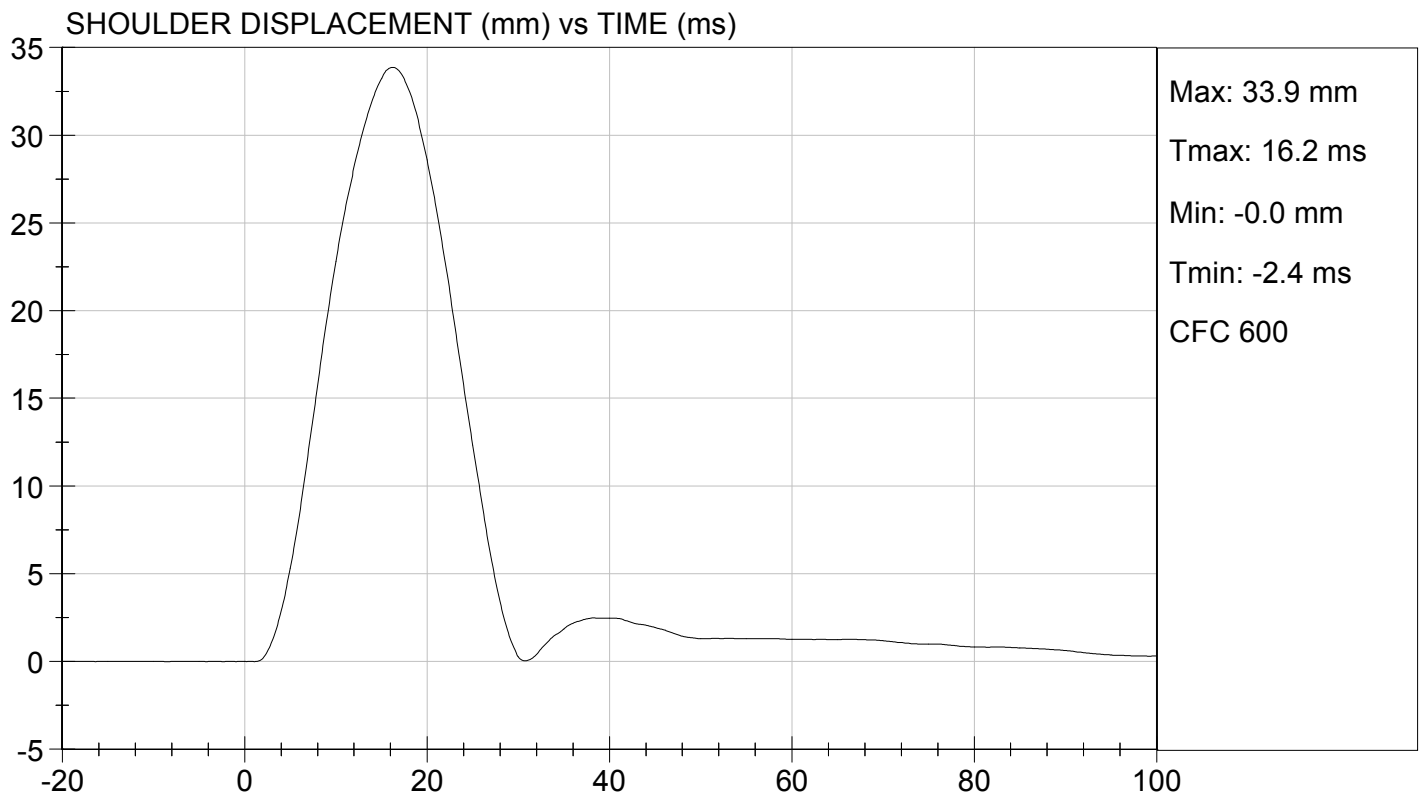
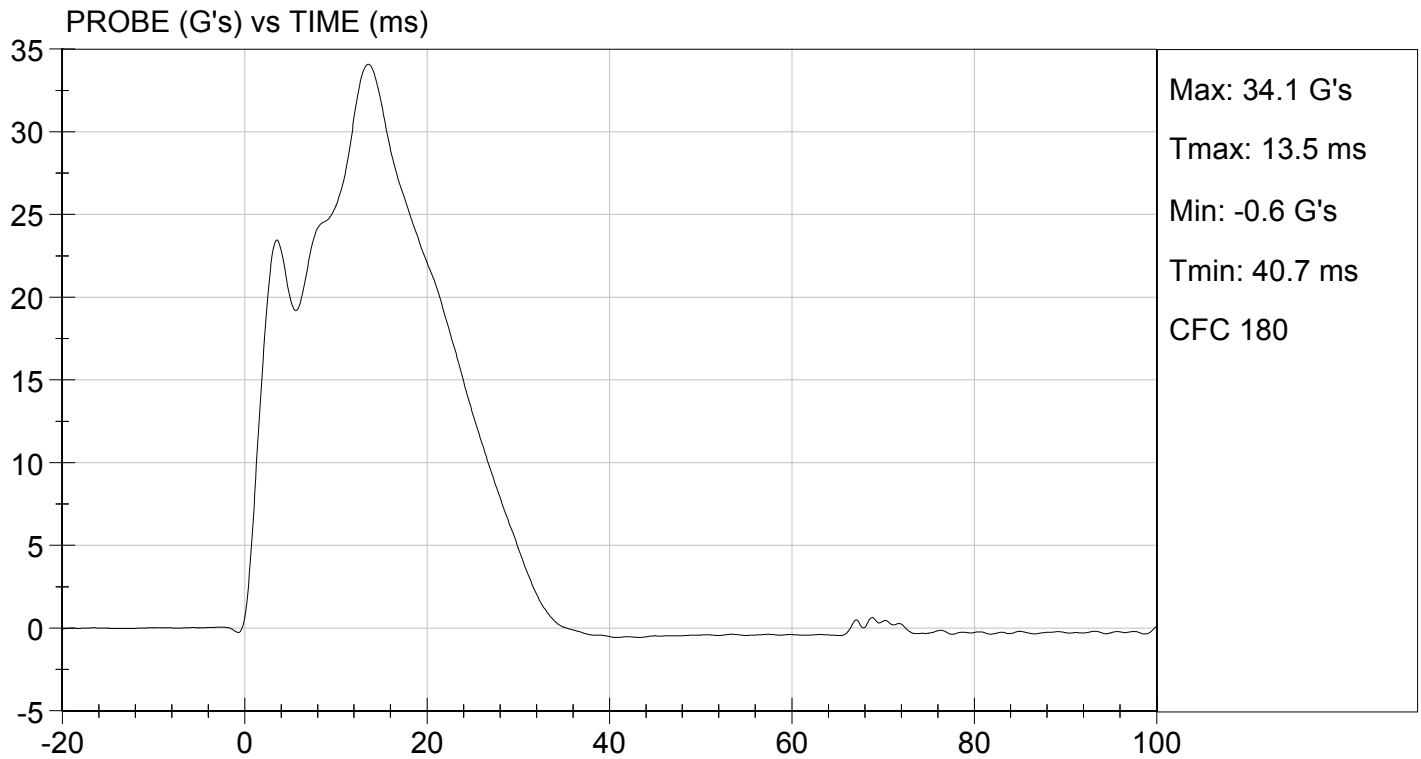


Approved By



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

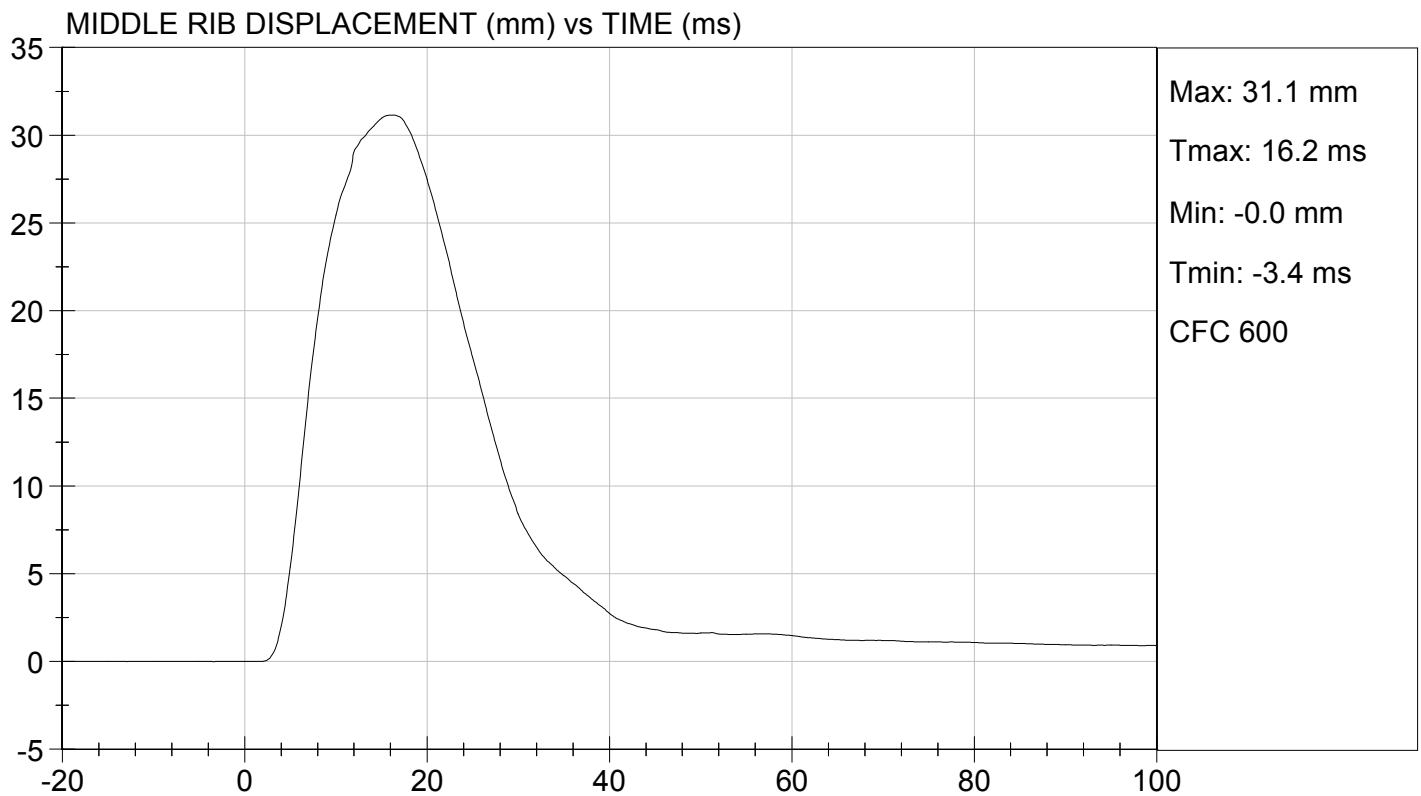
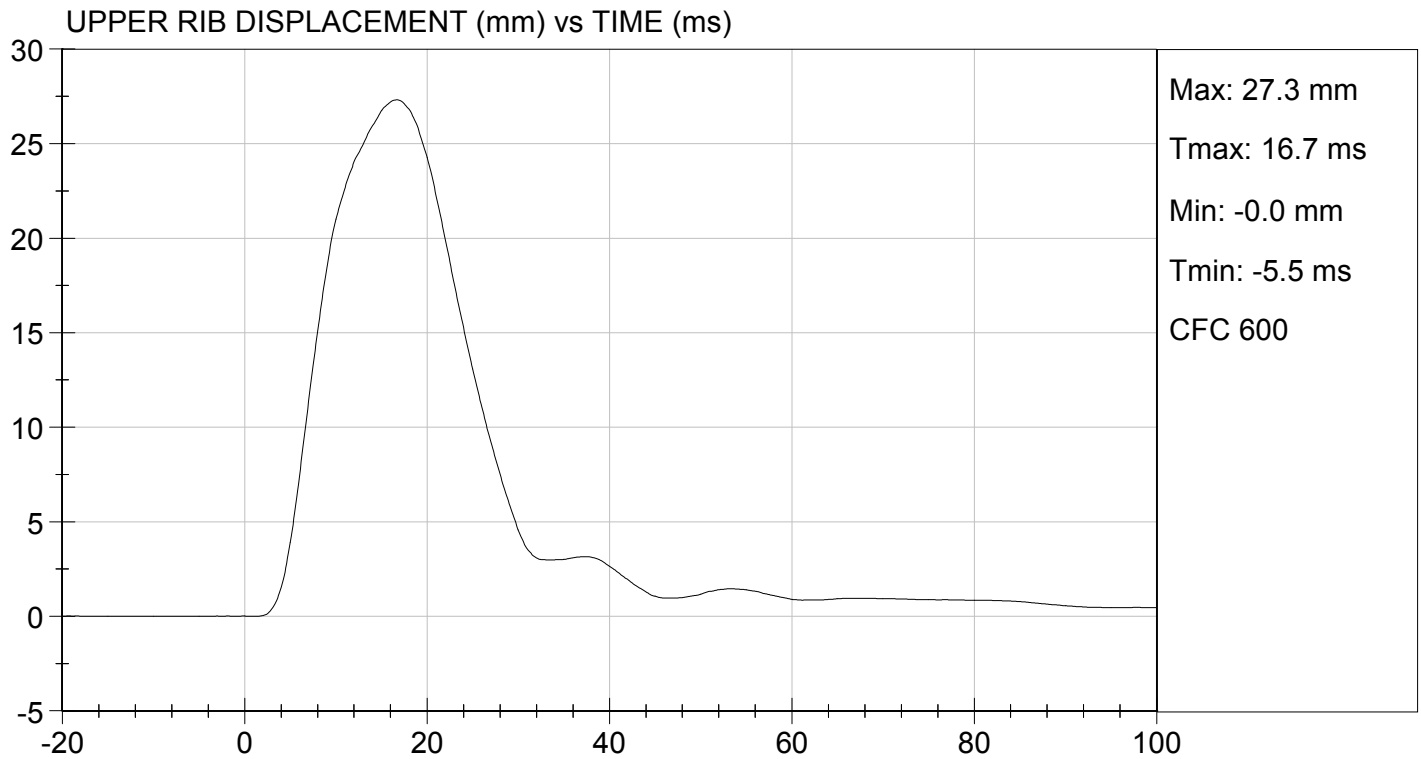
TEST DATE: 02/26/2015
TEST #: D15584





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

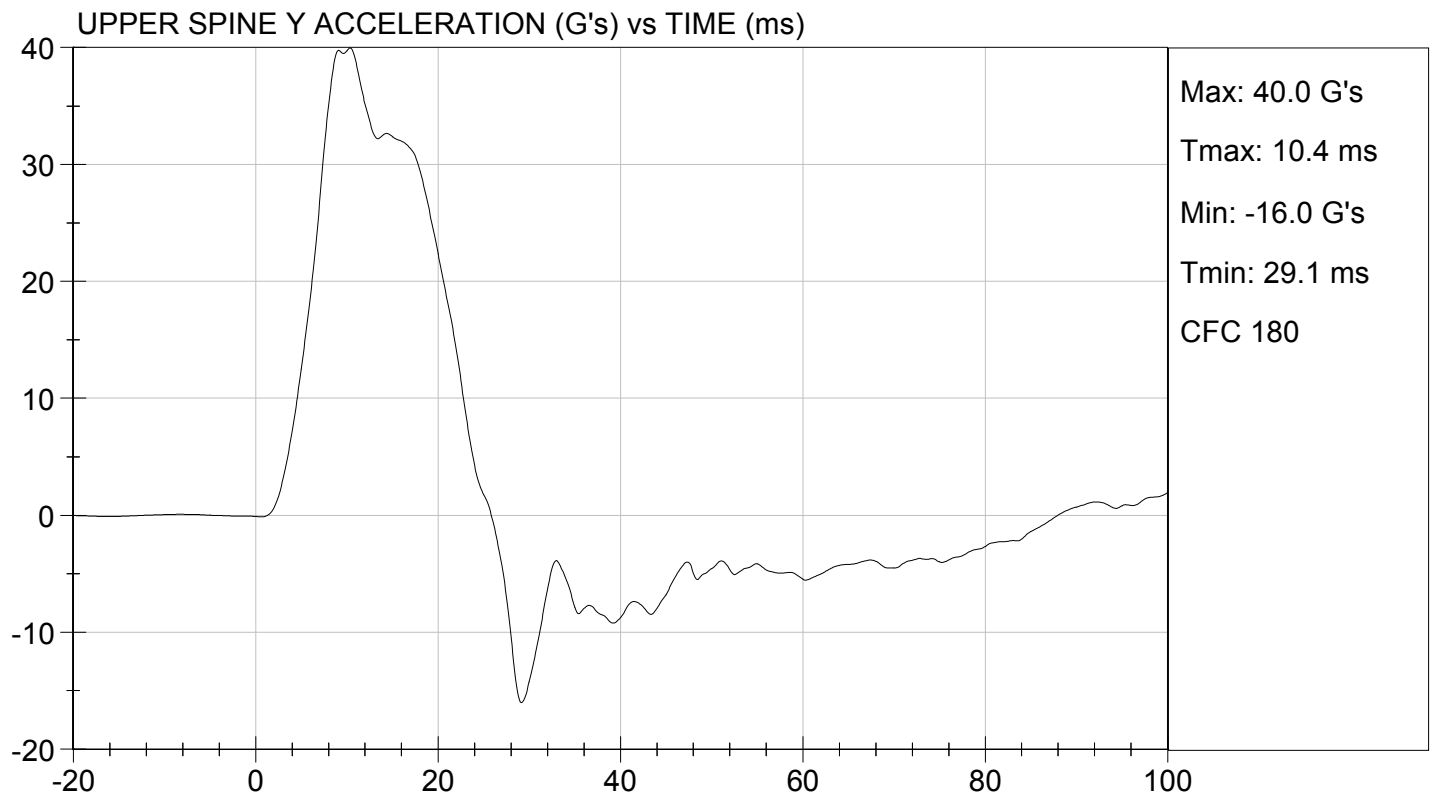
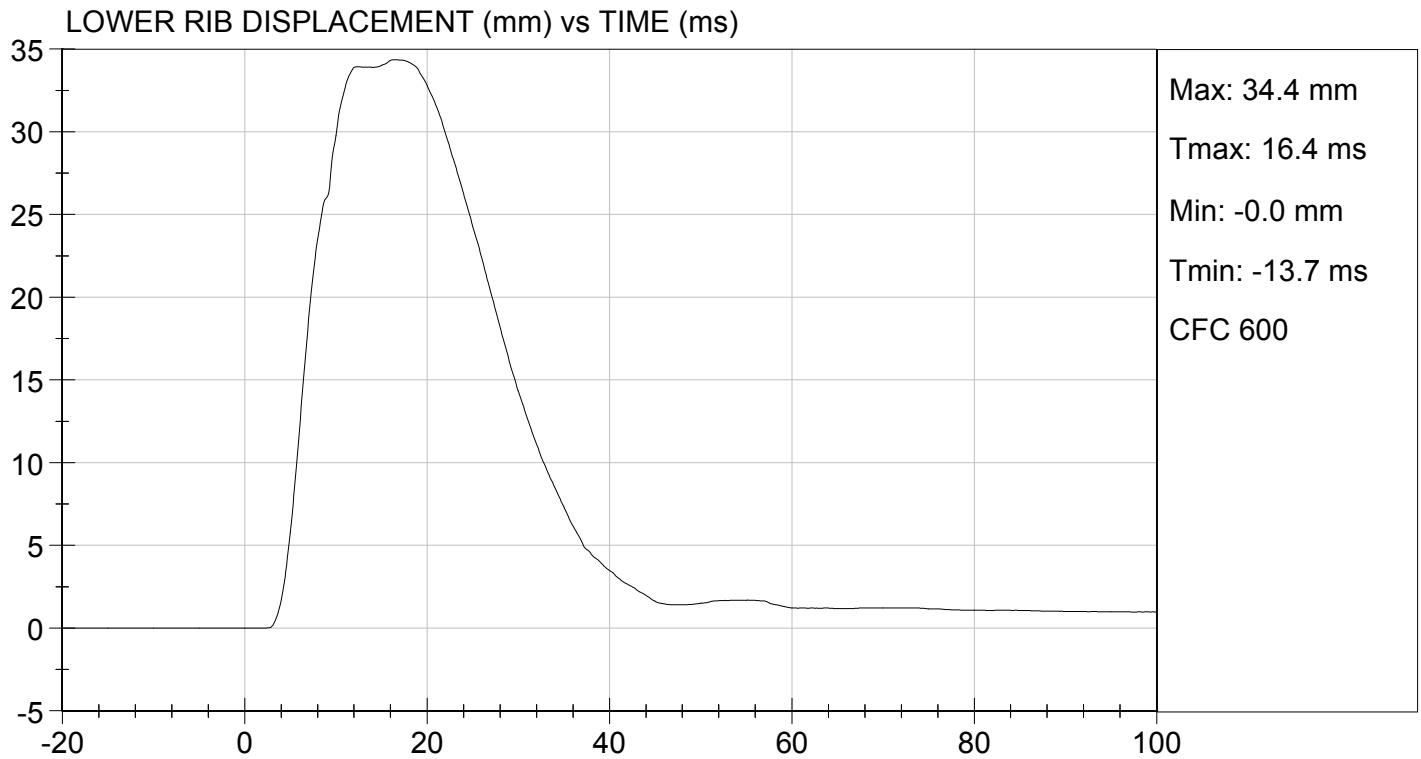
TEST DATE: 02/26/2015
TEST #: D15584





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

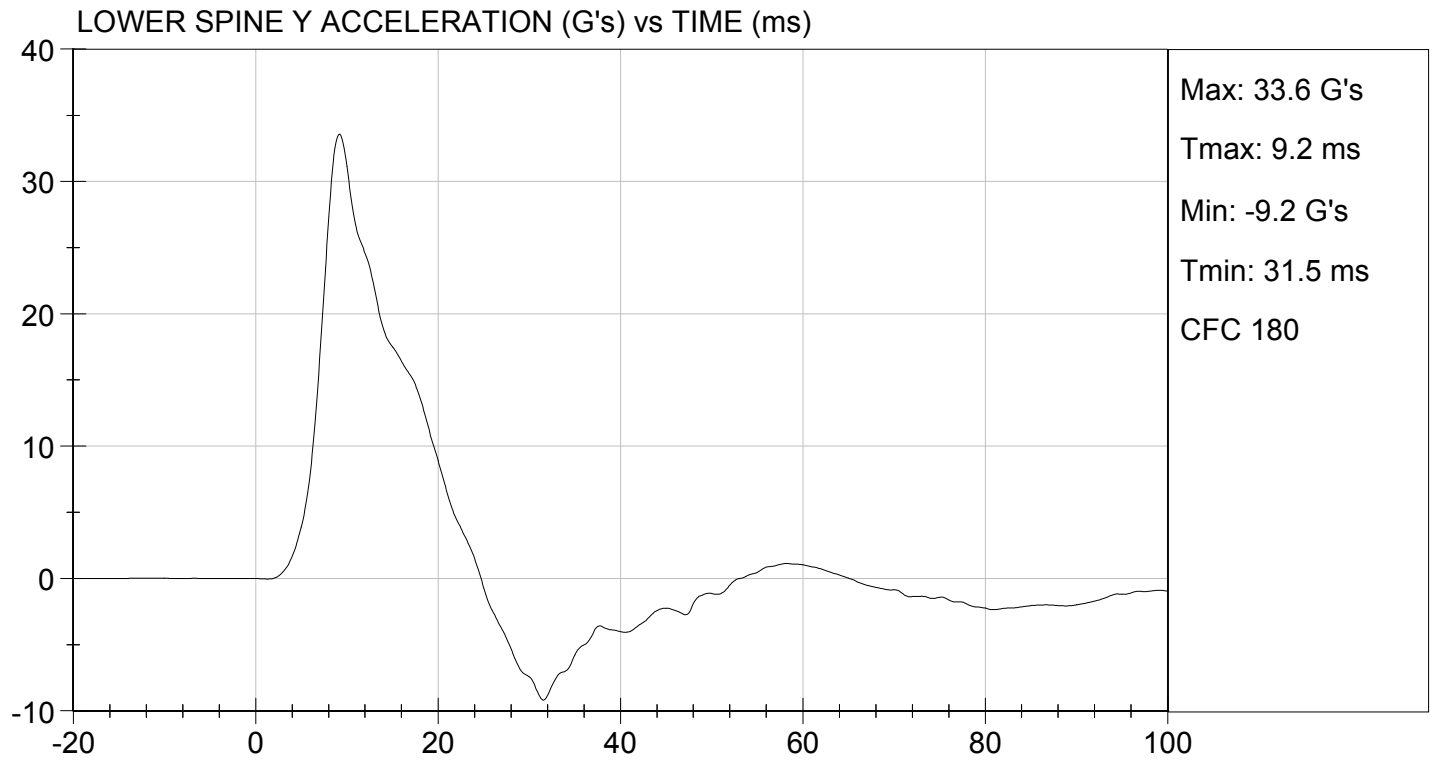
TEST DATE: 02/26/2015
TEST #: D15584





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 02/26/2015
TEST #: D15584



MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15585

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	26	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	34	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	43	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	10	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

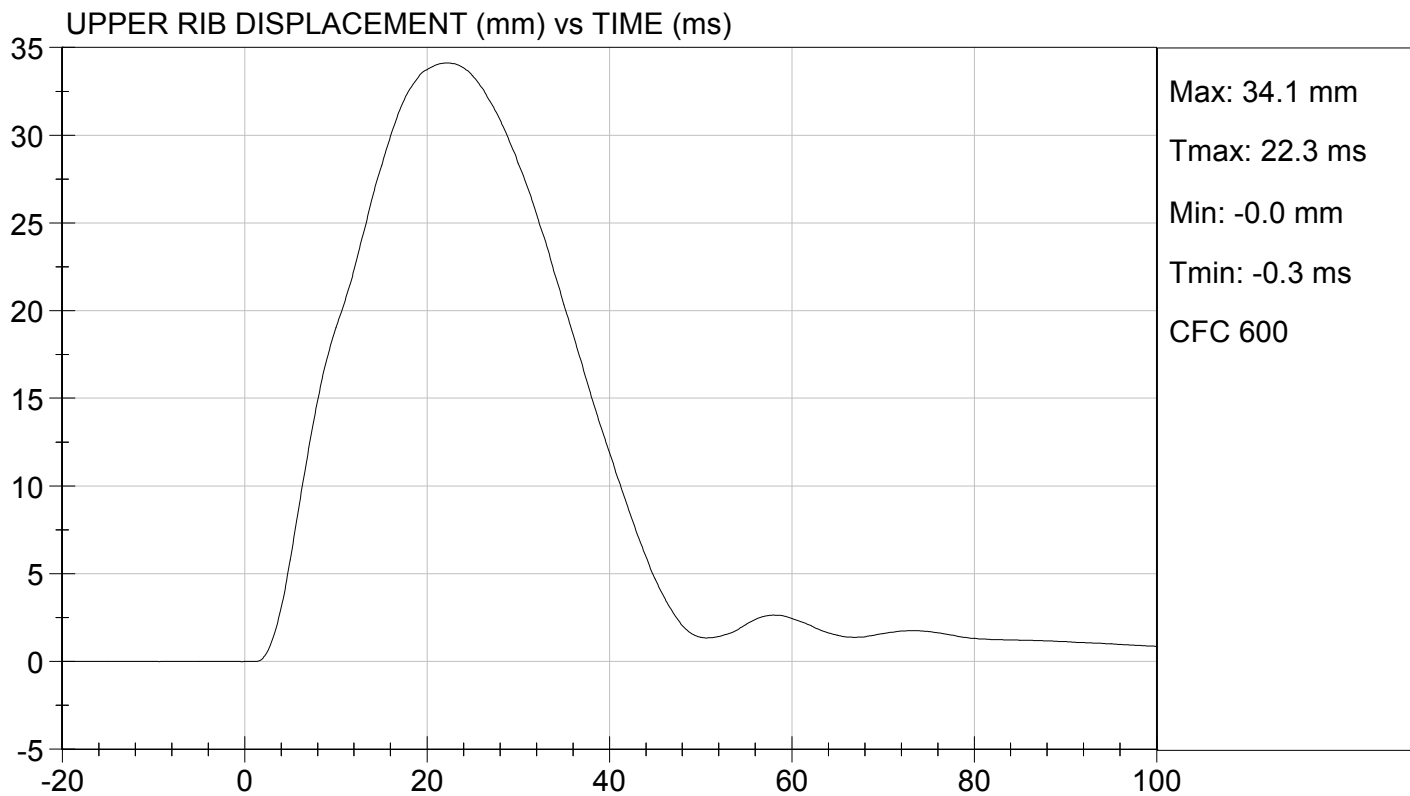
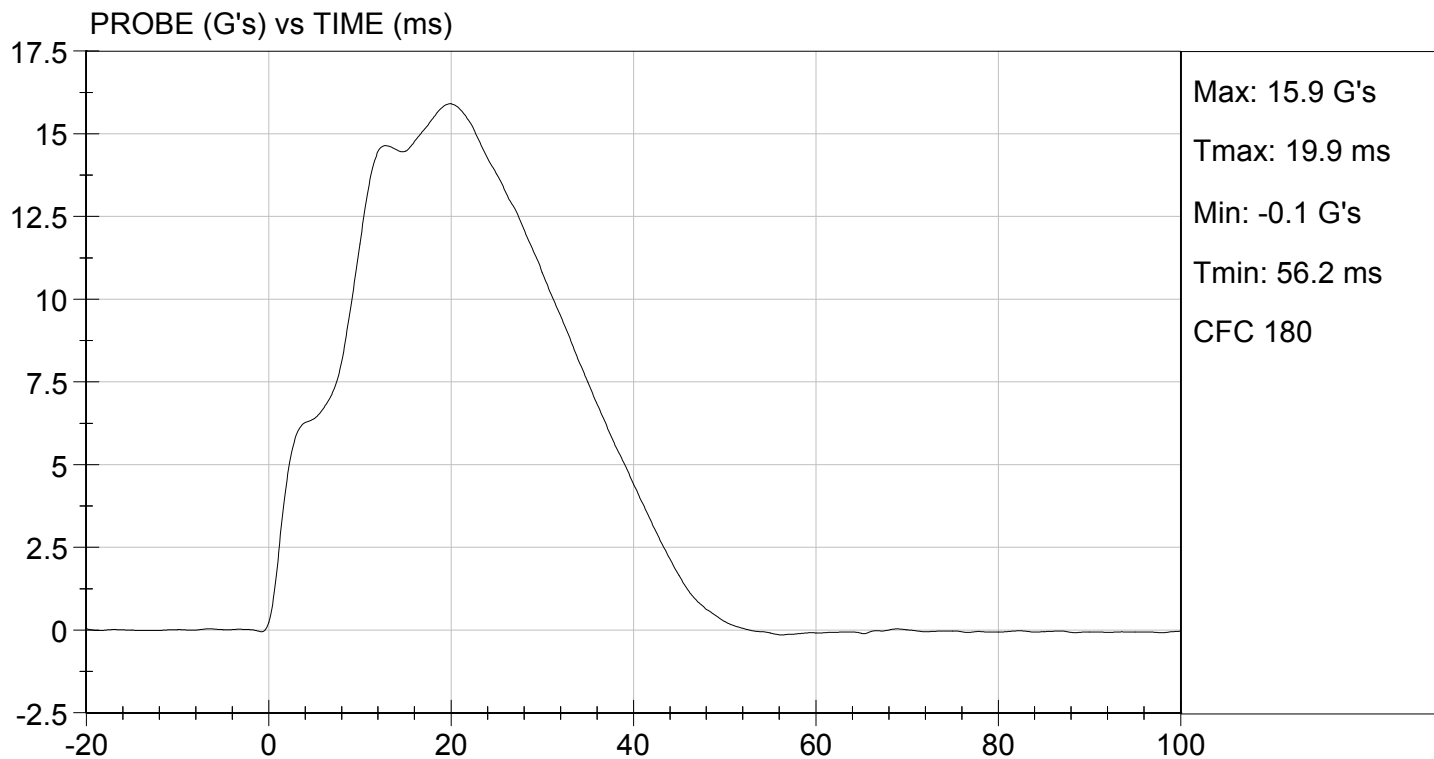
02/26/2015
Test Date

Jessica Hall
Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 02/26/2015
TEST #: D15585

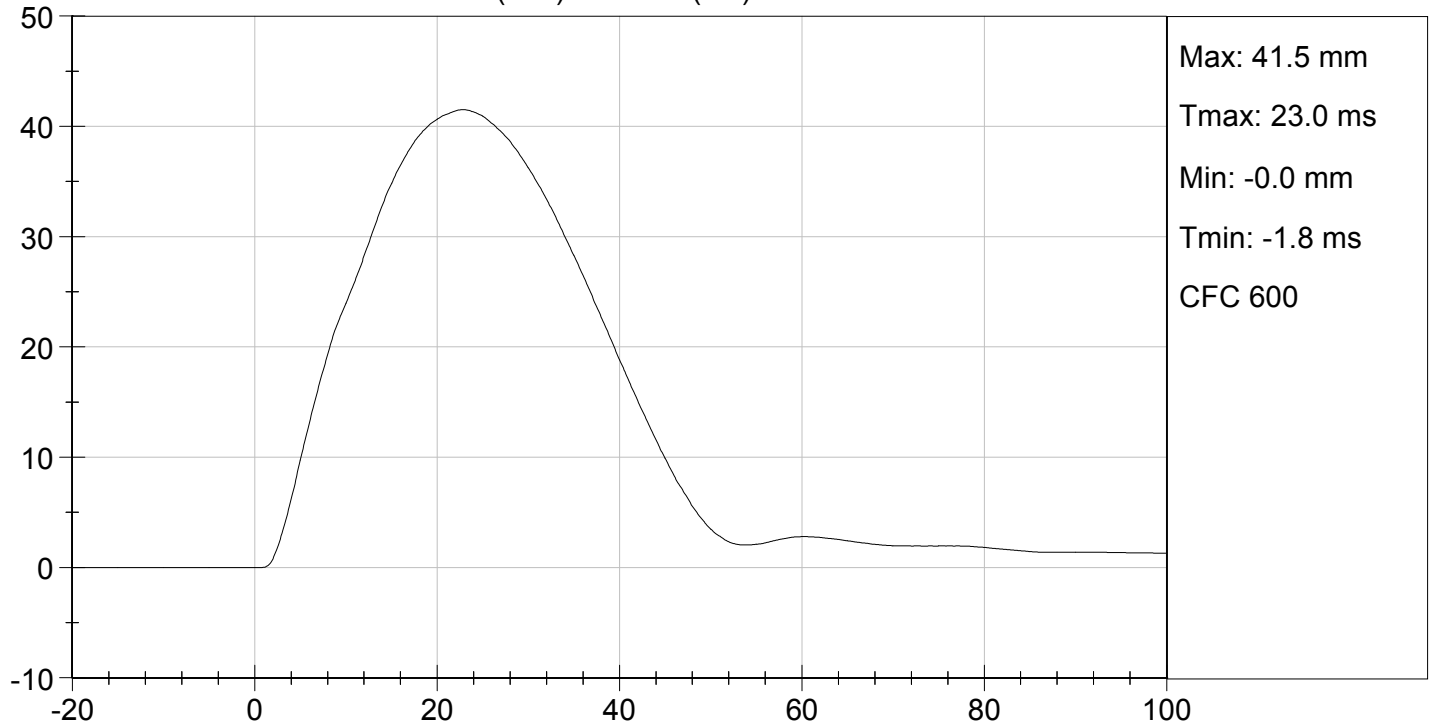




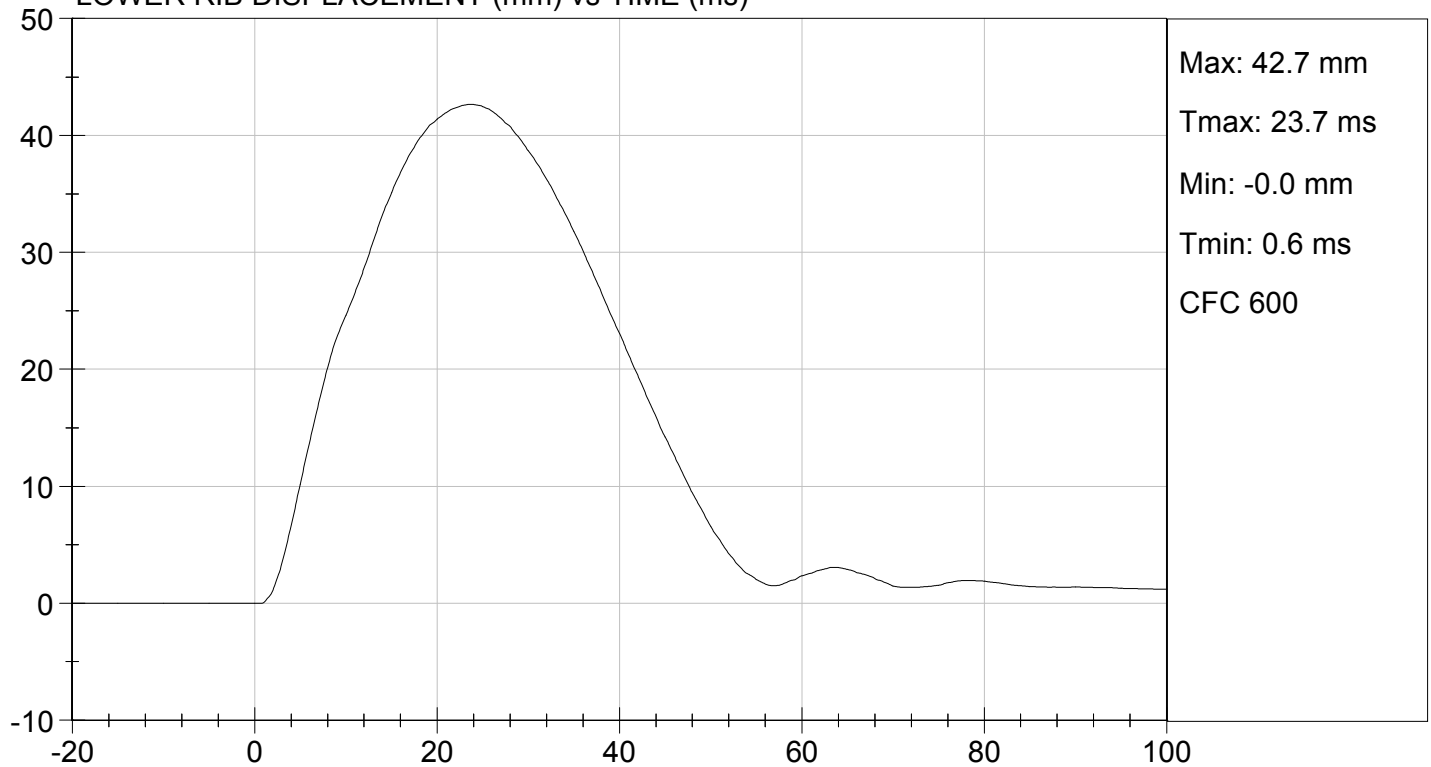
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 02/26/2015
TEST #: D15585

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

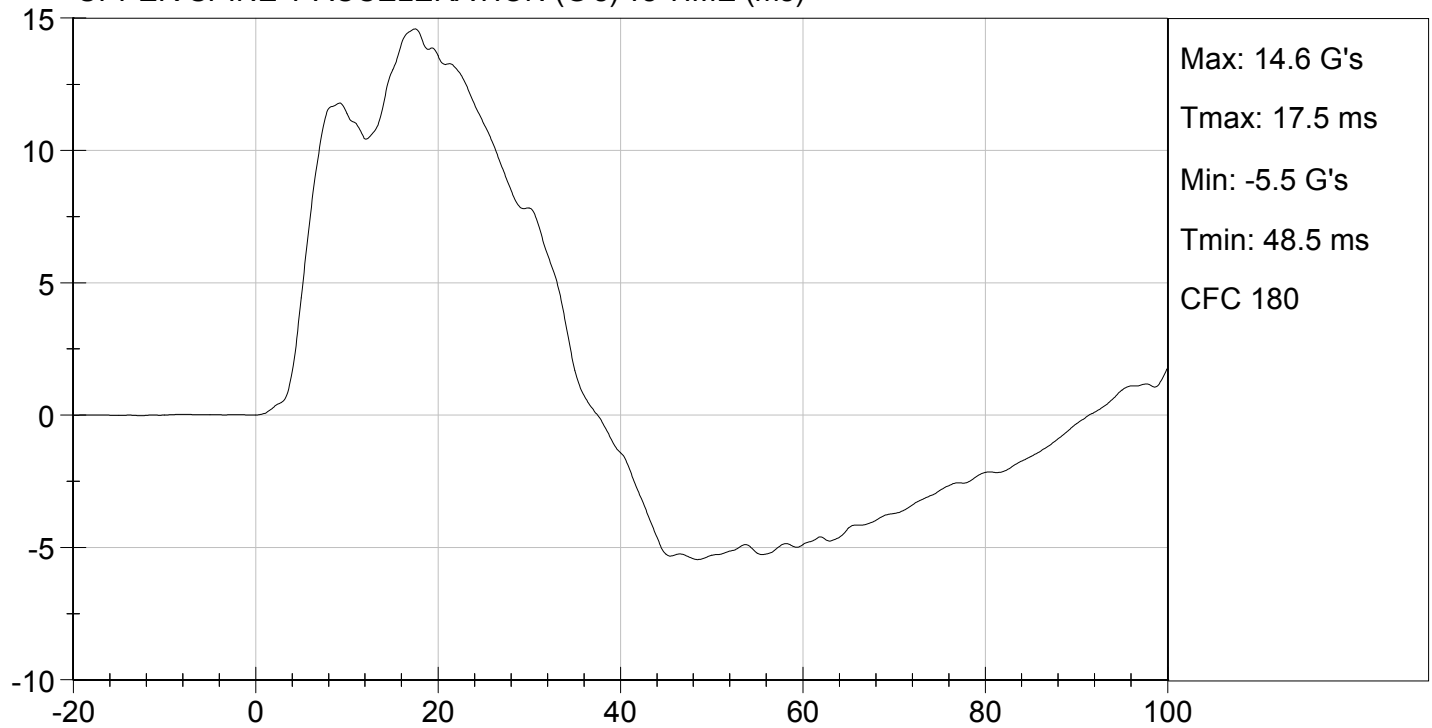




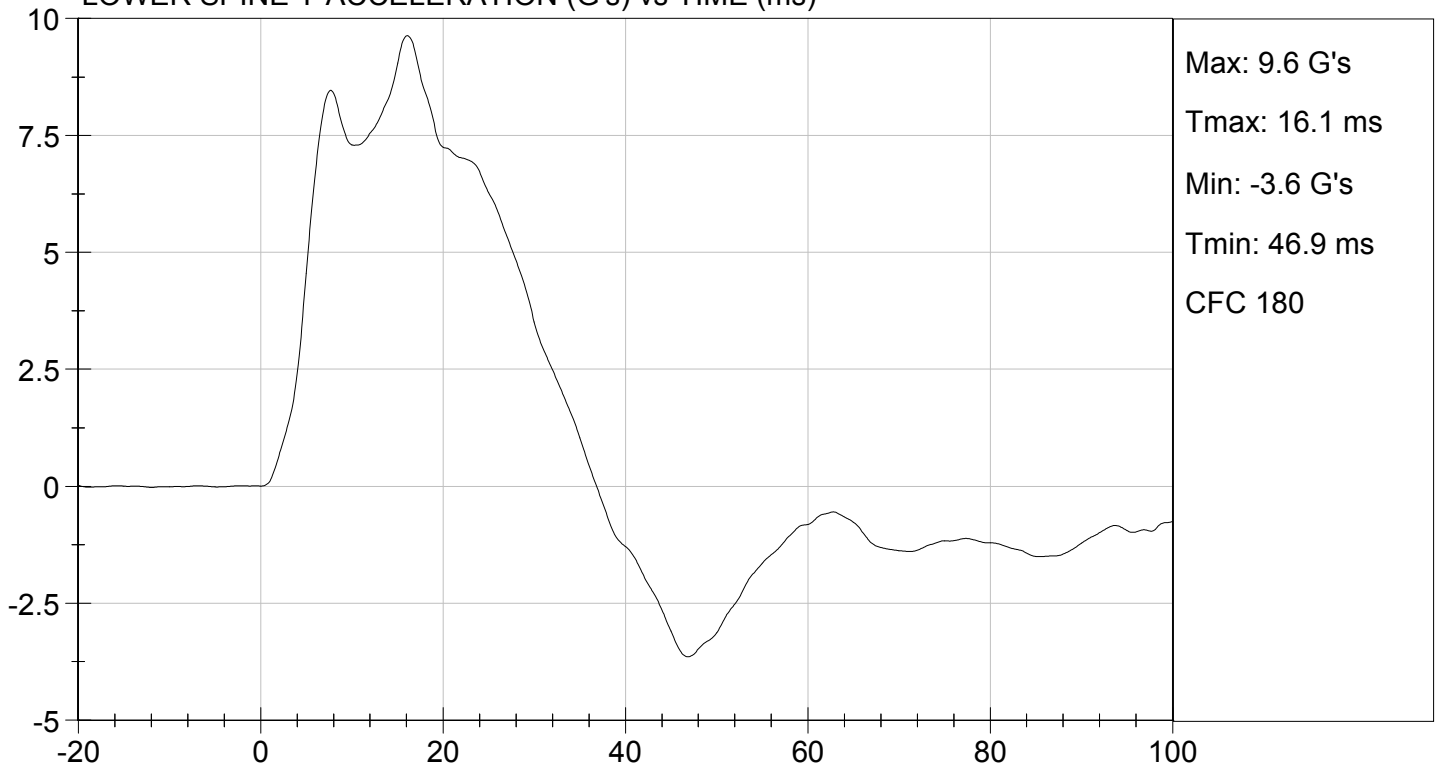
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 02/26/2015
TEST #: D15585

UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



LOWER SPINE Y ACCELERATION (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15586

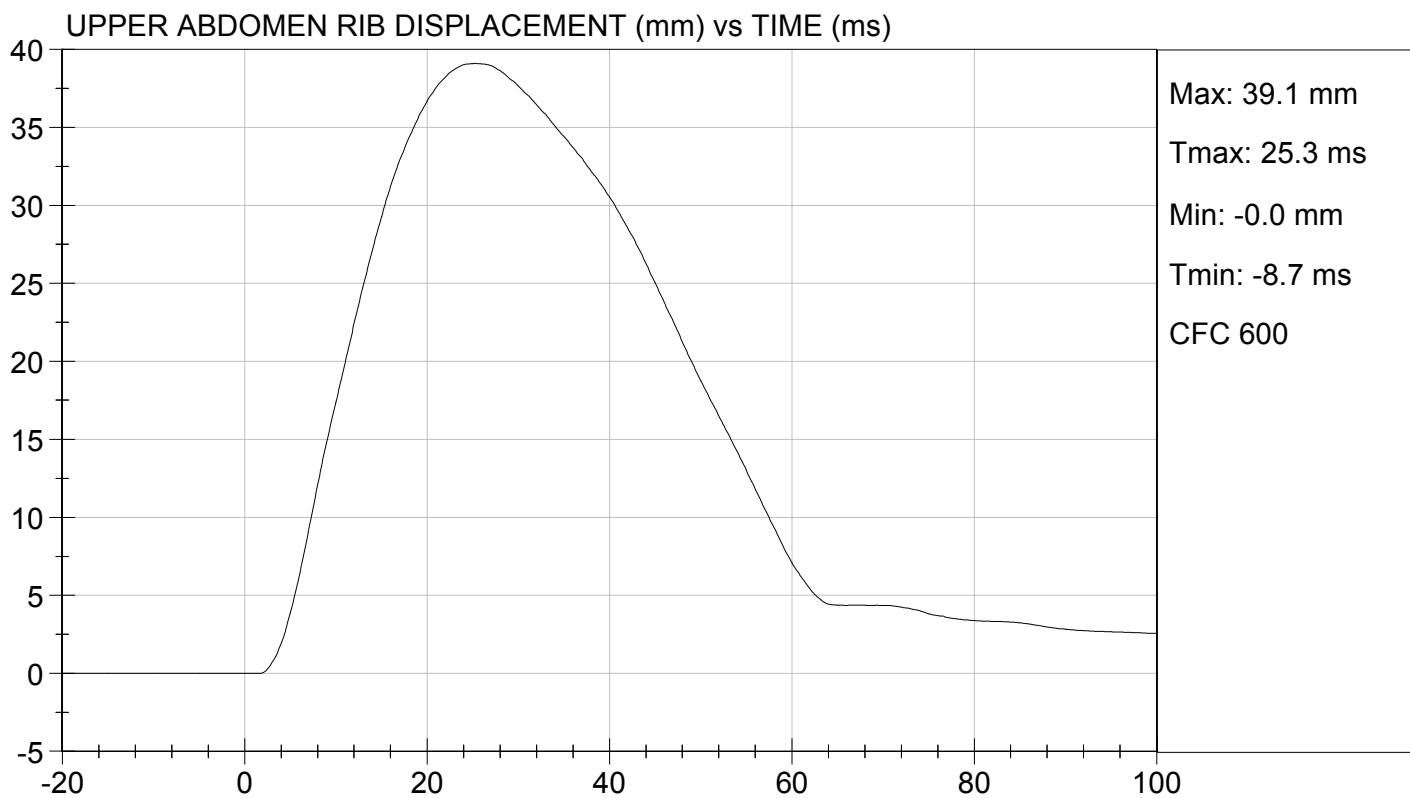
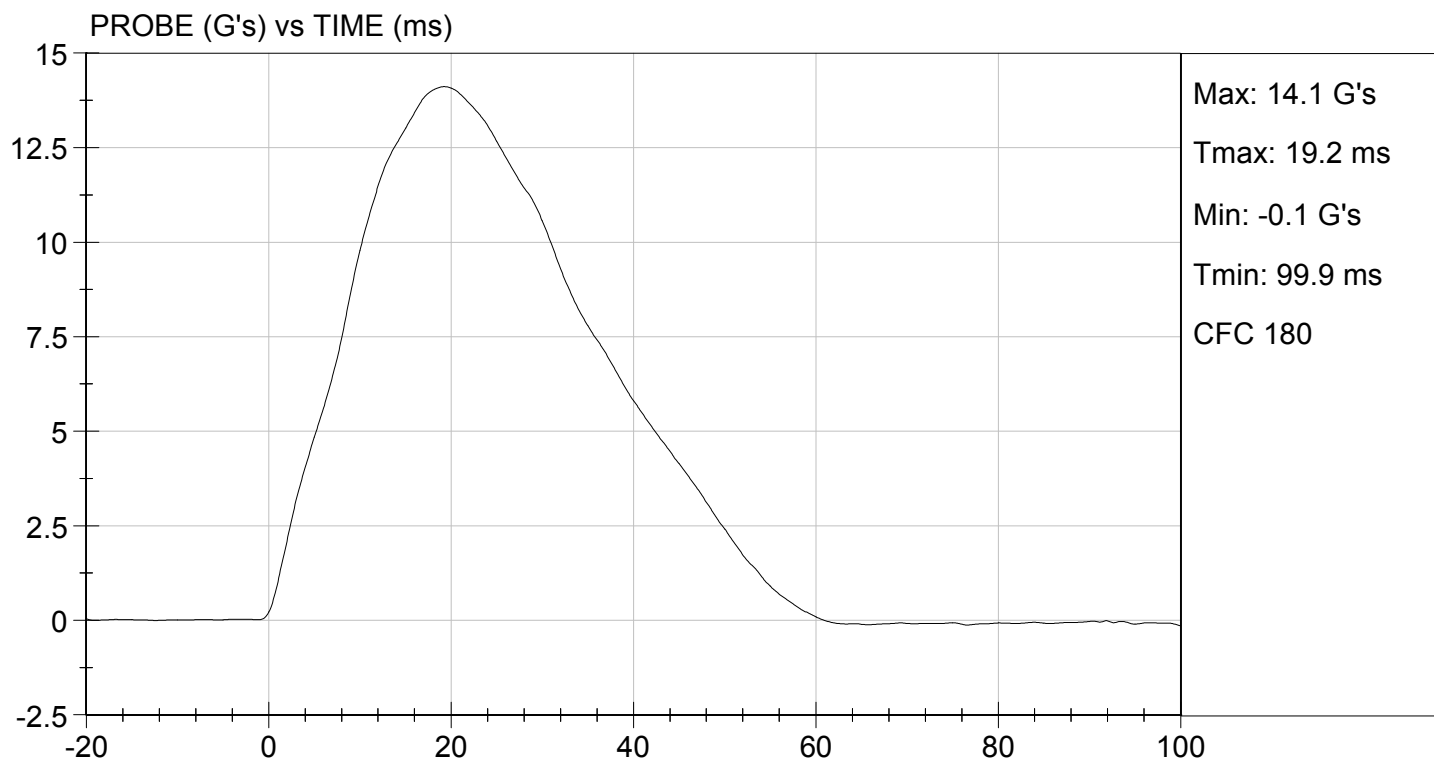
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	26	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	39	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	43	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

02/26/2015

Test Date

Jessica Hall
Approved By

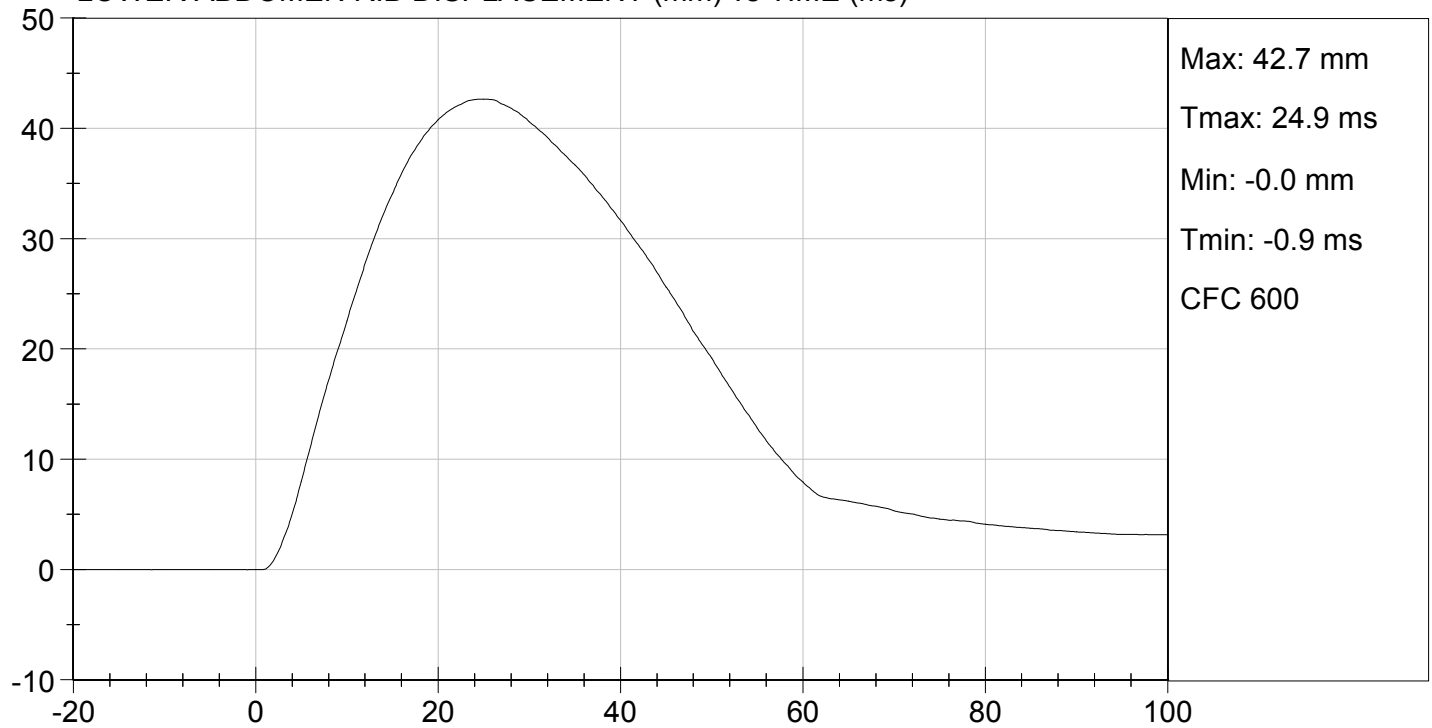




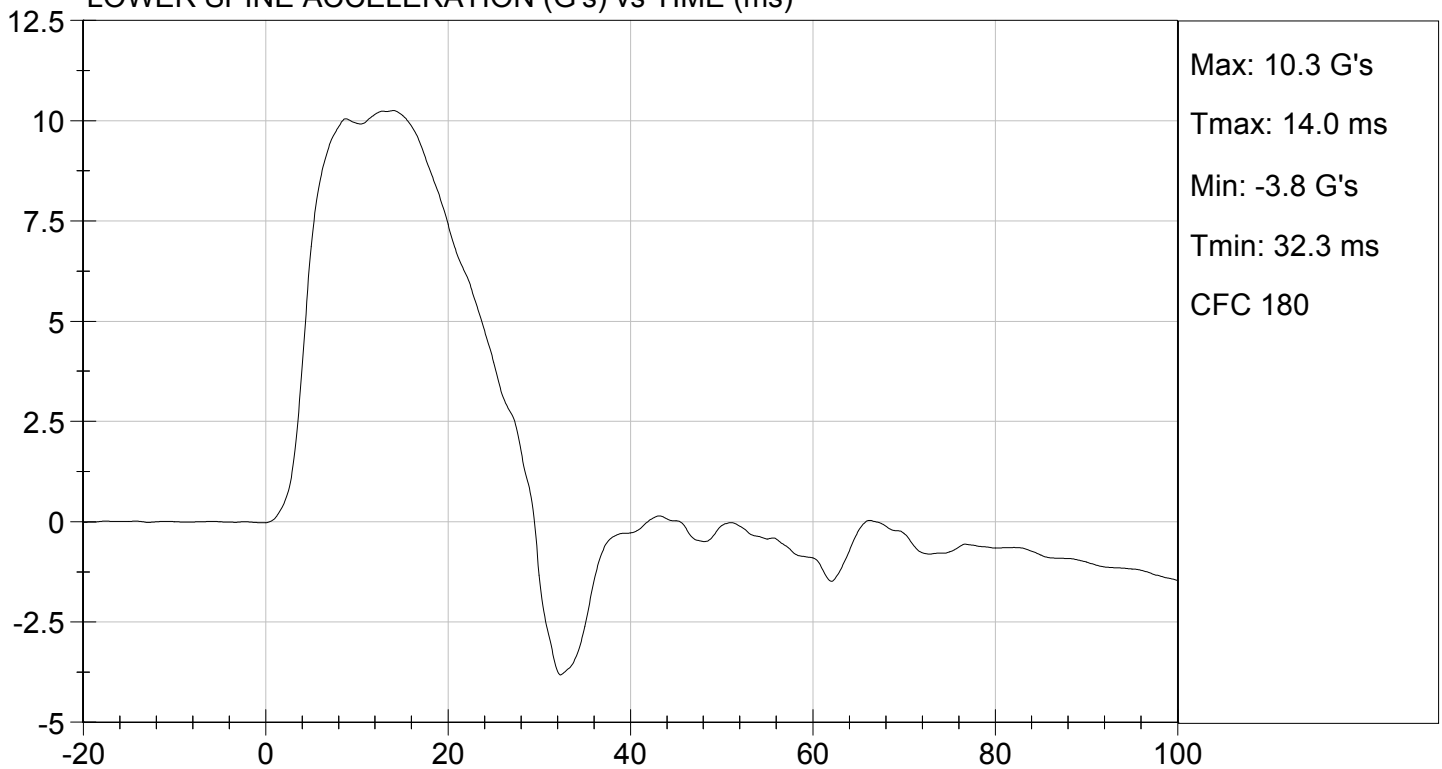
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/26/2015
TEST #: D15586

LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15587

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	26	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	44	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	4,083	Pass
Overall Test Results				Pass

David Schoedel

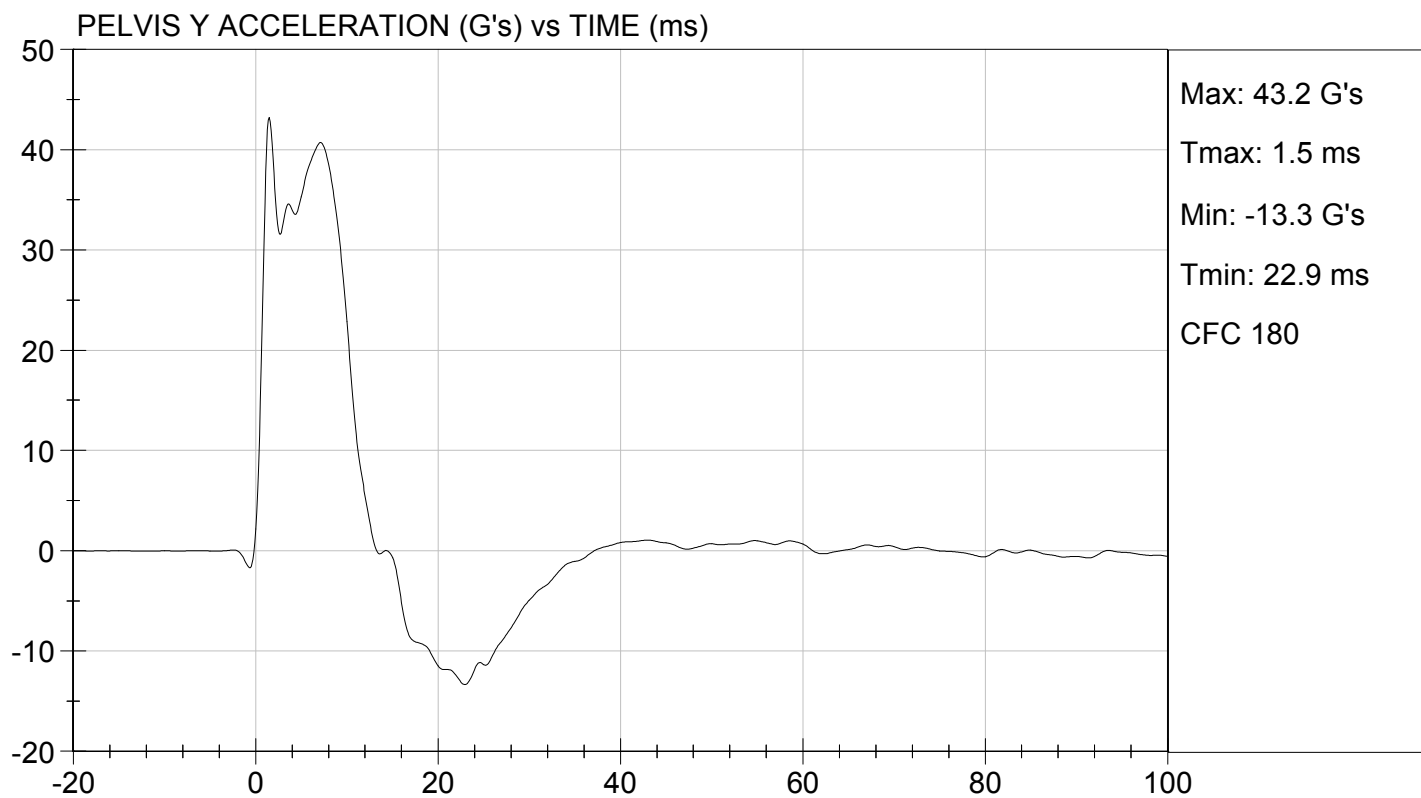
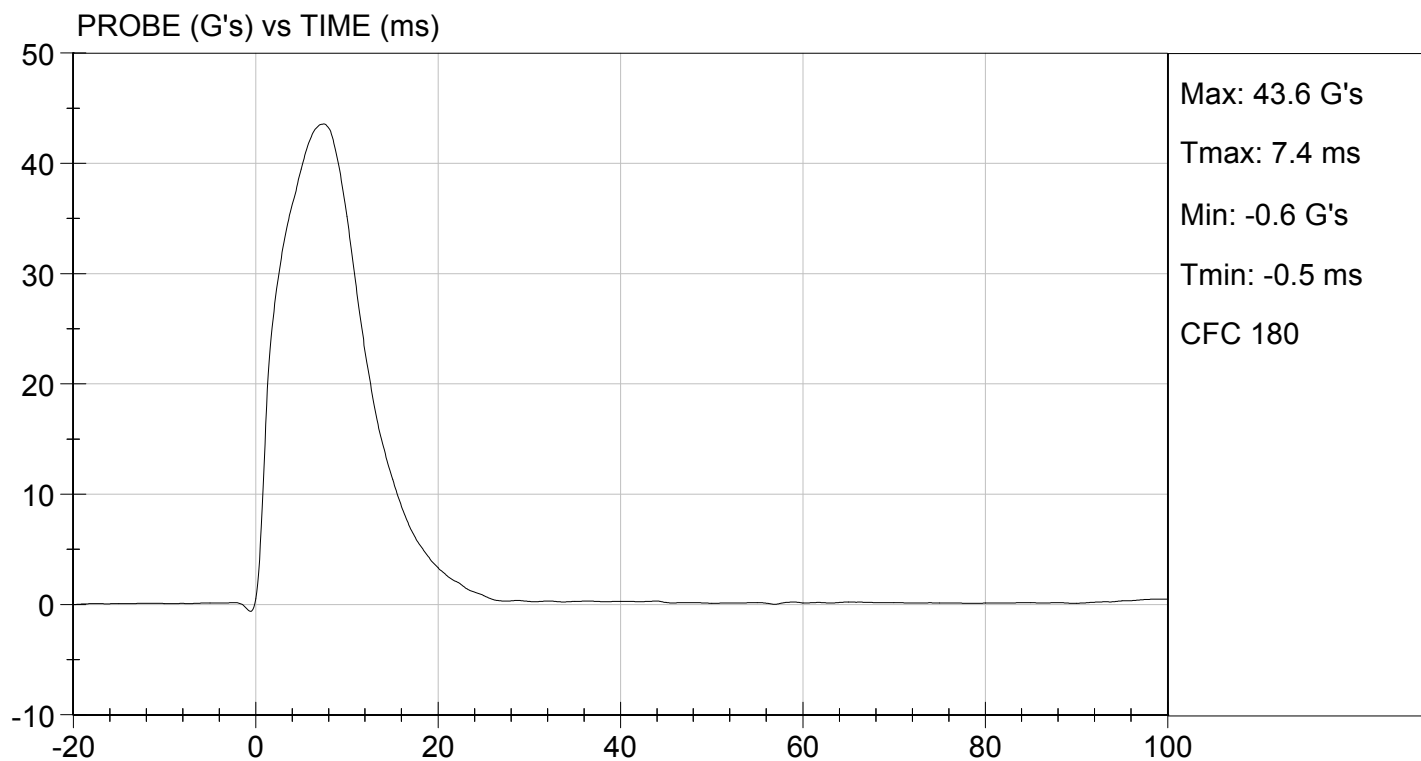
Laboratory Technician

02/26/2015

Test Date

Jessica Hall

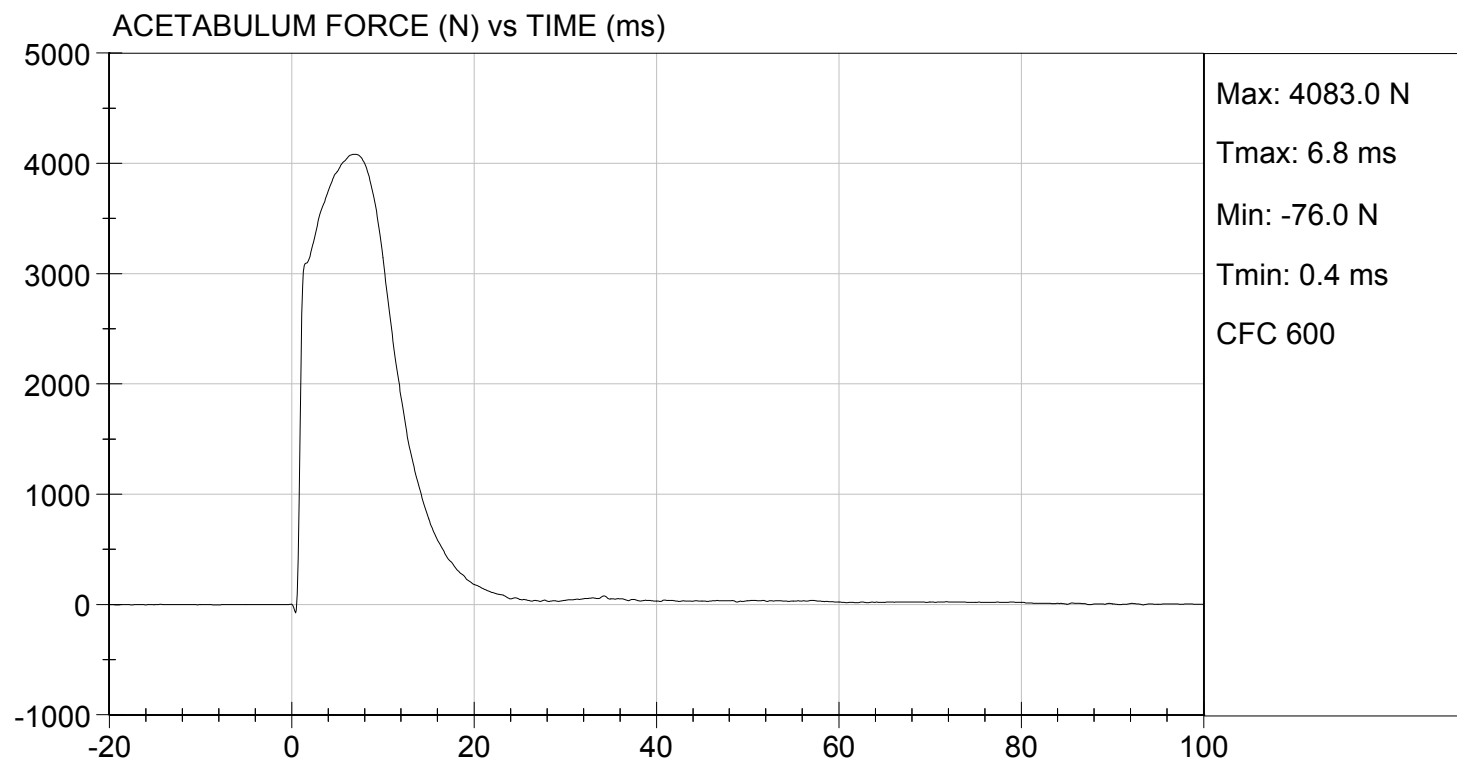
Approved By





TEST DESC: PELVIS IMPACT
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 02/26/2015
TEST #: D15587



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15588

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	26	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	42	Pass
Pelvis Y Acceleration	G's	28 to 39	34	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,778	Pass
			Overall Test Results	Pass

David Schoedel

Laboratory Technician

02/26/2015

Test Date

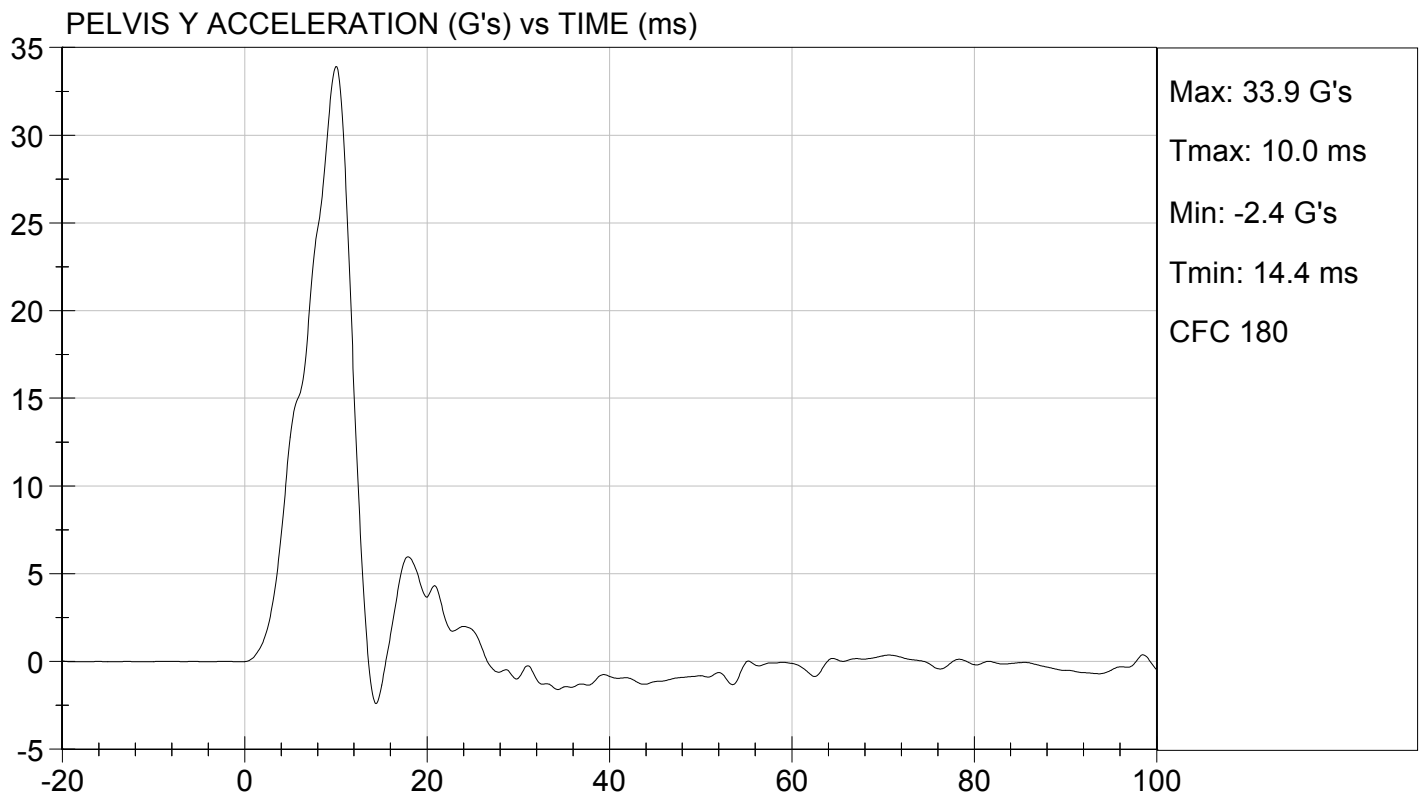
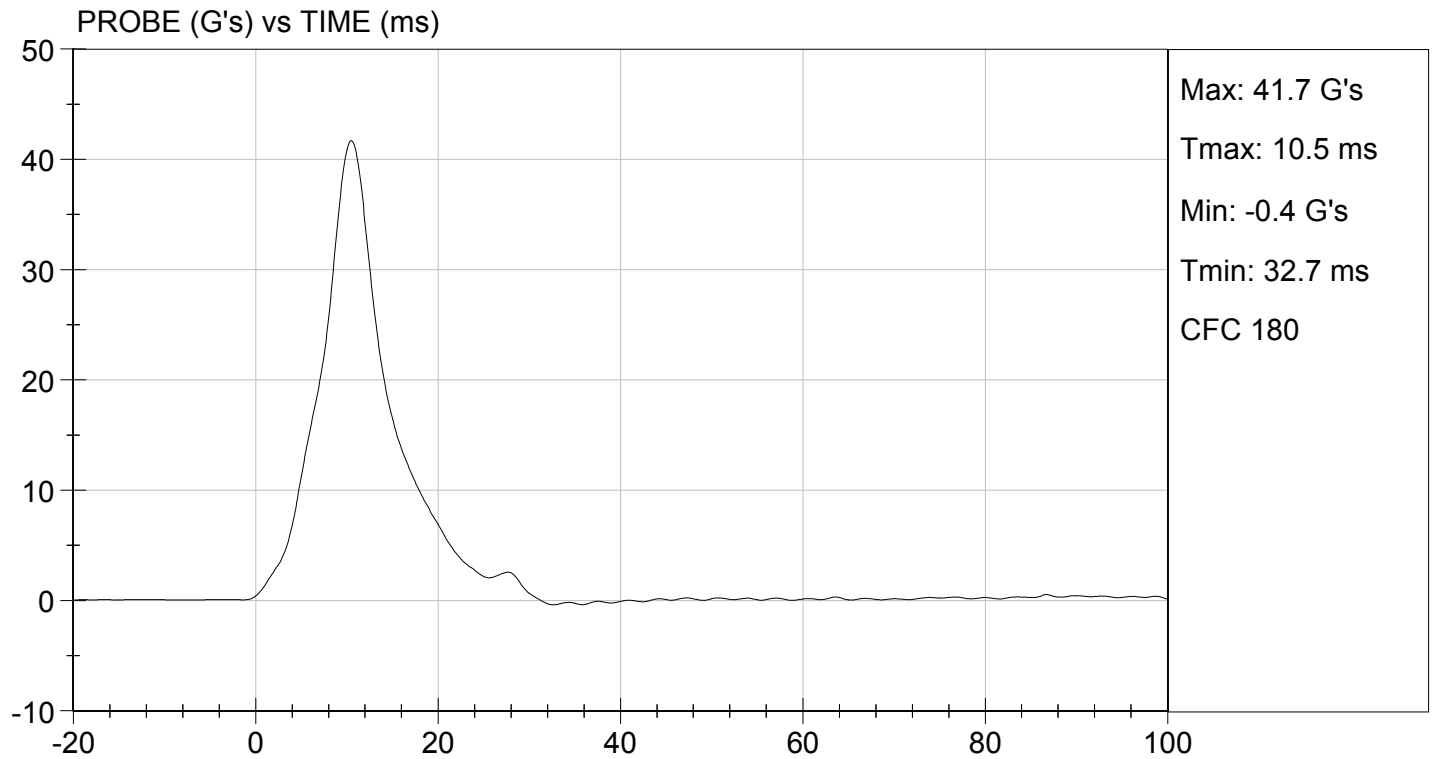
Jessica Hall

Approved By



TEST DESC: ILLIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

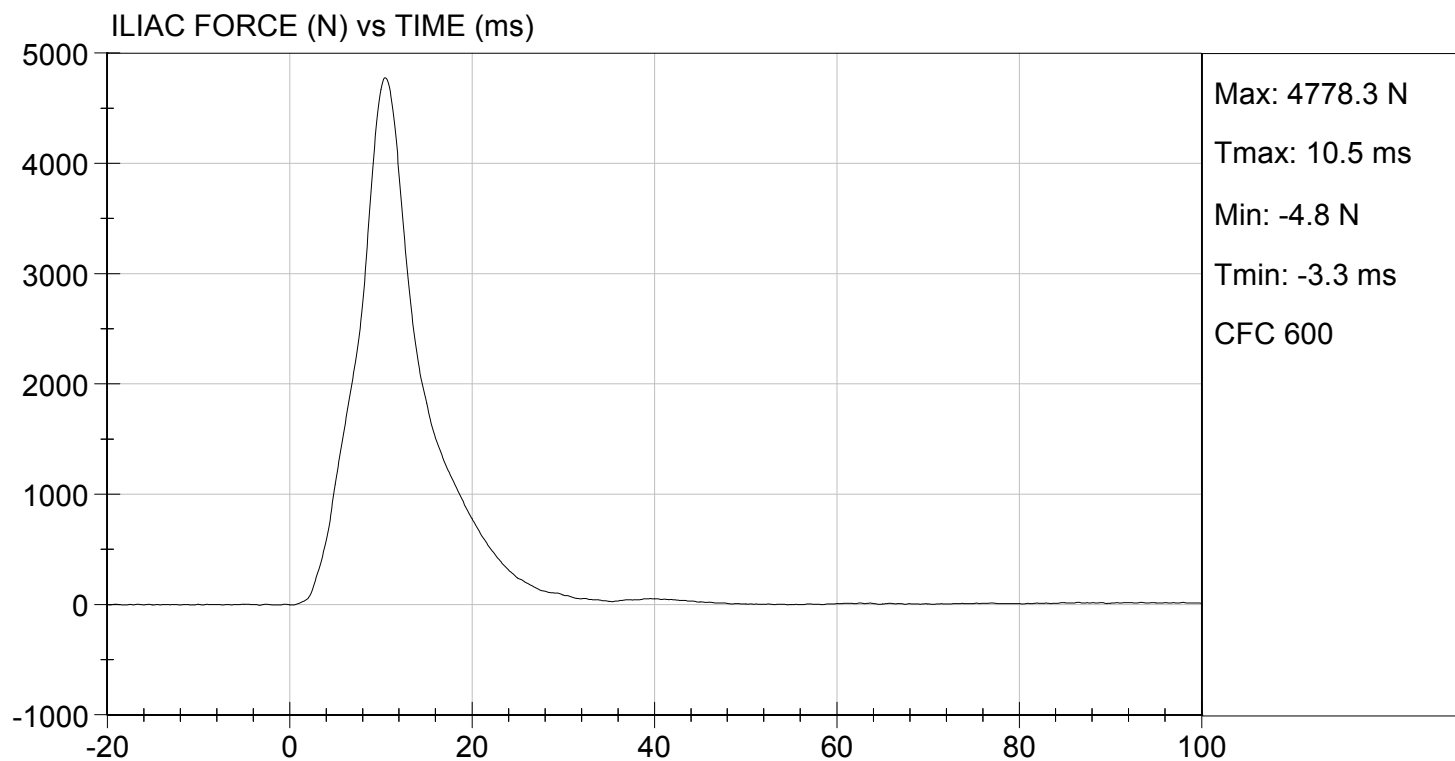
TEST DATE: 02/26/2015
TEST #: D15588





TEST DESC: ILLIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/26/2015
TEST #: D15588



SID-IIsD External Measurements
SN: 306

No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	785	Pass
B	Shoulder Pivot Height	437 - 453	449	Pass
C	H-point Height	79 - 89	86	Pass
D	H-point from Seatback	141 - 151	147	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	120	Pass
G	Head Breadth	140 - 148	141	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	182	Pass
J	Head Circumference	541 - 551	550	Pass
K	Buttock to Knee Length	514 - 540	538	Pass
L	Popliteal Height	343 - 369	349	Pass
M	Knee Pivot to Floor Height	392 - 409	394	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	198	Pass
P	Foot Length	216 - 232	222	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	317	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	483	Pass
V	Shoulder Width	341 - 357	351	Pass
W	Foot Width	78 - 94	82	Pass
Y	Chest Circumference w/ jacket	851 - 881	863	Pass
Z	Waist Circumference	761 - 791	782	Pass

MGA RESEARCH CORPORATION
HEAD DROP TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

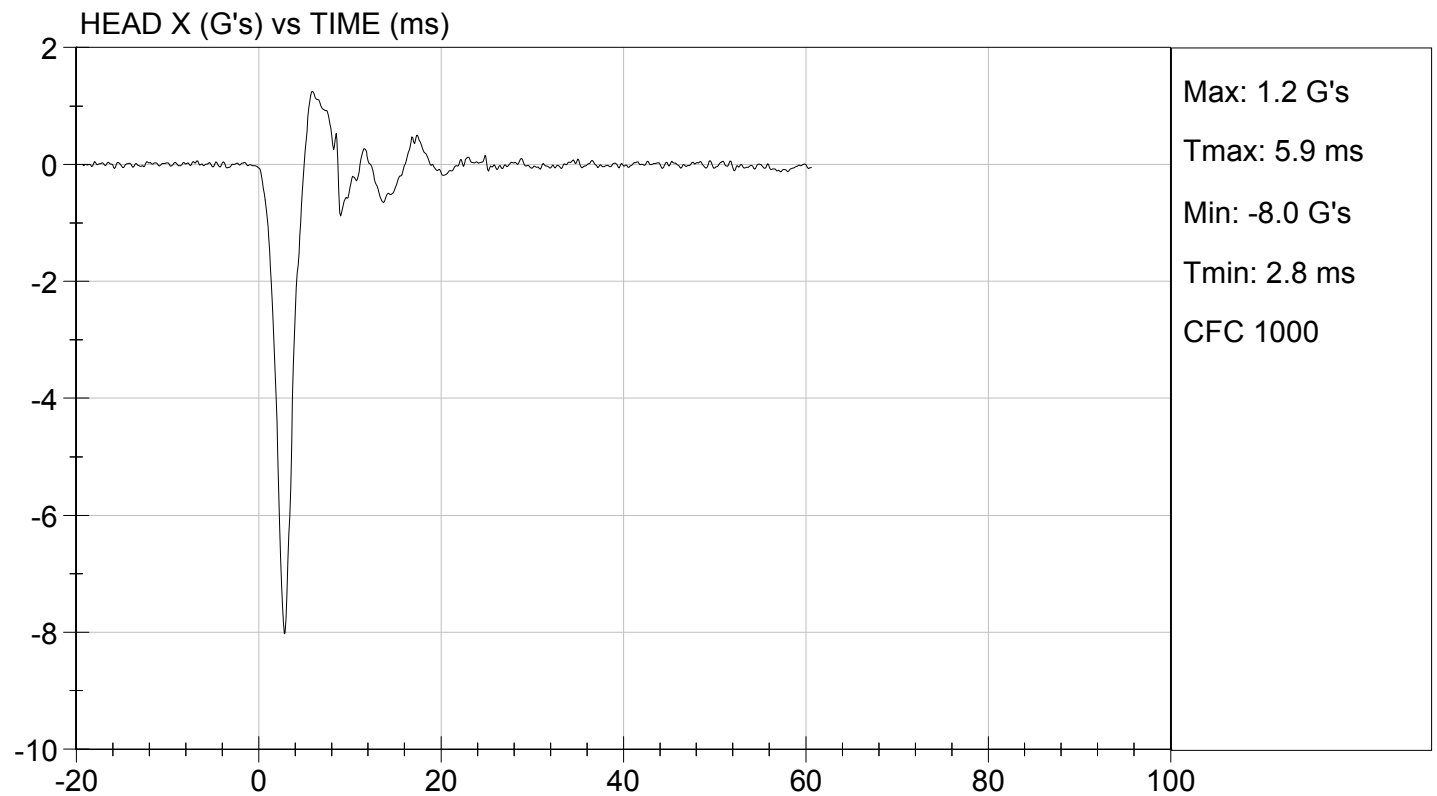
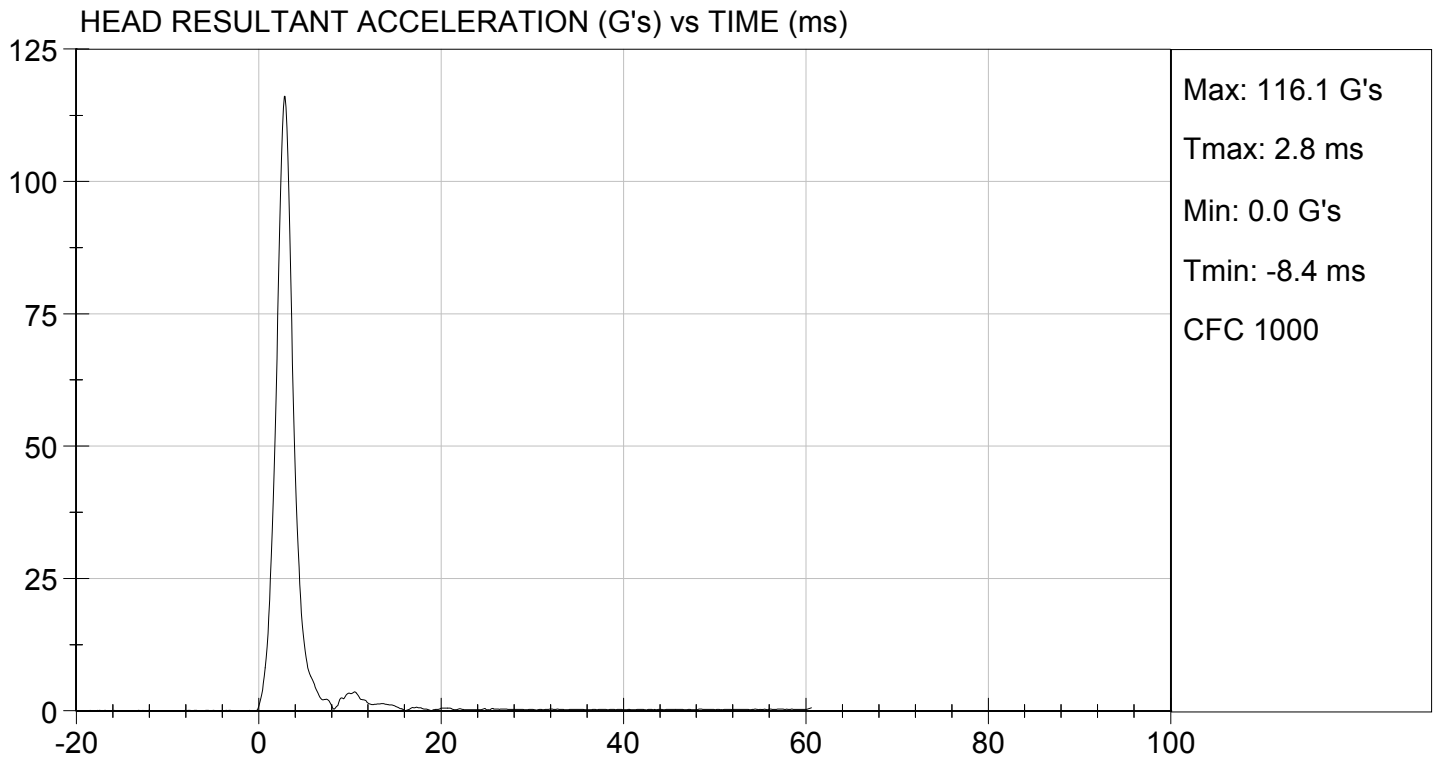
Test ID: D15791

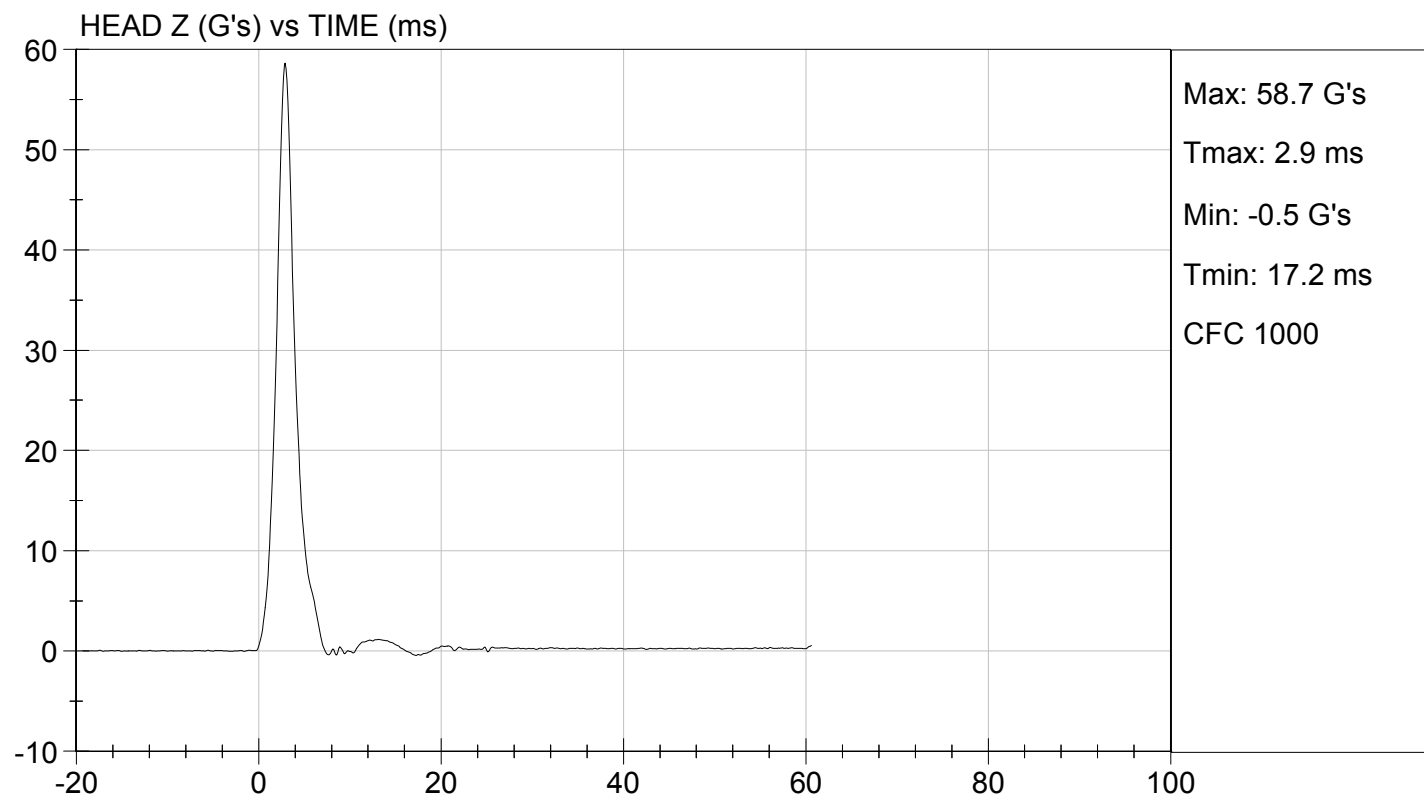
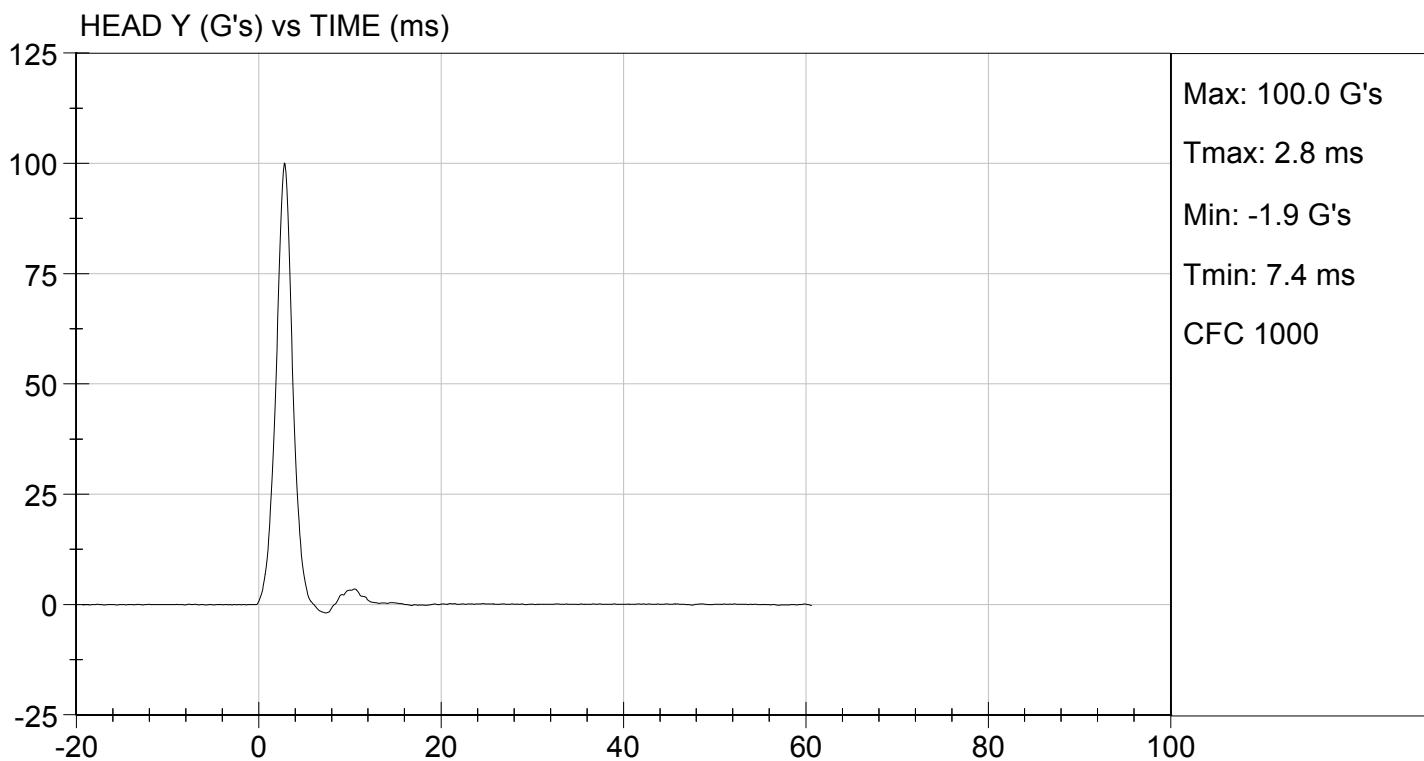
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Peak Resultant Acceleration	G's	115 to 137	116	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-8.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

03/24/2015
Test Date

Jessica Hall
Approved By





MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15792

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.2	Pass
Humidity		%	10 to 70	18	Pass
Impact Velocity		m/s	5.51 to 5.63	5.63	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.54	Pass
	15 ms	m/s	3.30 to 4.10	3.60	Pass
	20 ms	m/s	4.40 to 5.40	4.77	Pass
	25 ms	m/s	5.40 to 6.10	5.70	Pass
	25-100 ms	m/s	5.50 to 6.20	5.77	Pass
Maximum D-Plane Rotation		deg	71 to 81	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	61	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-42	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	116	Pass
Overall Test Results				Pass	

David Schoedel

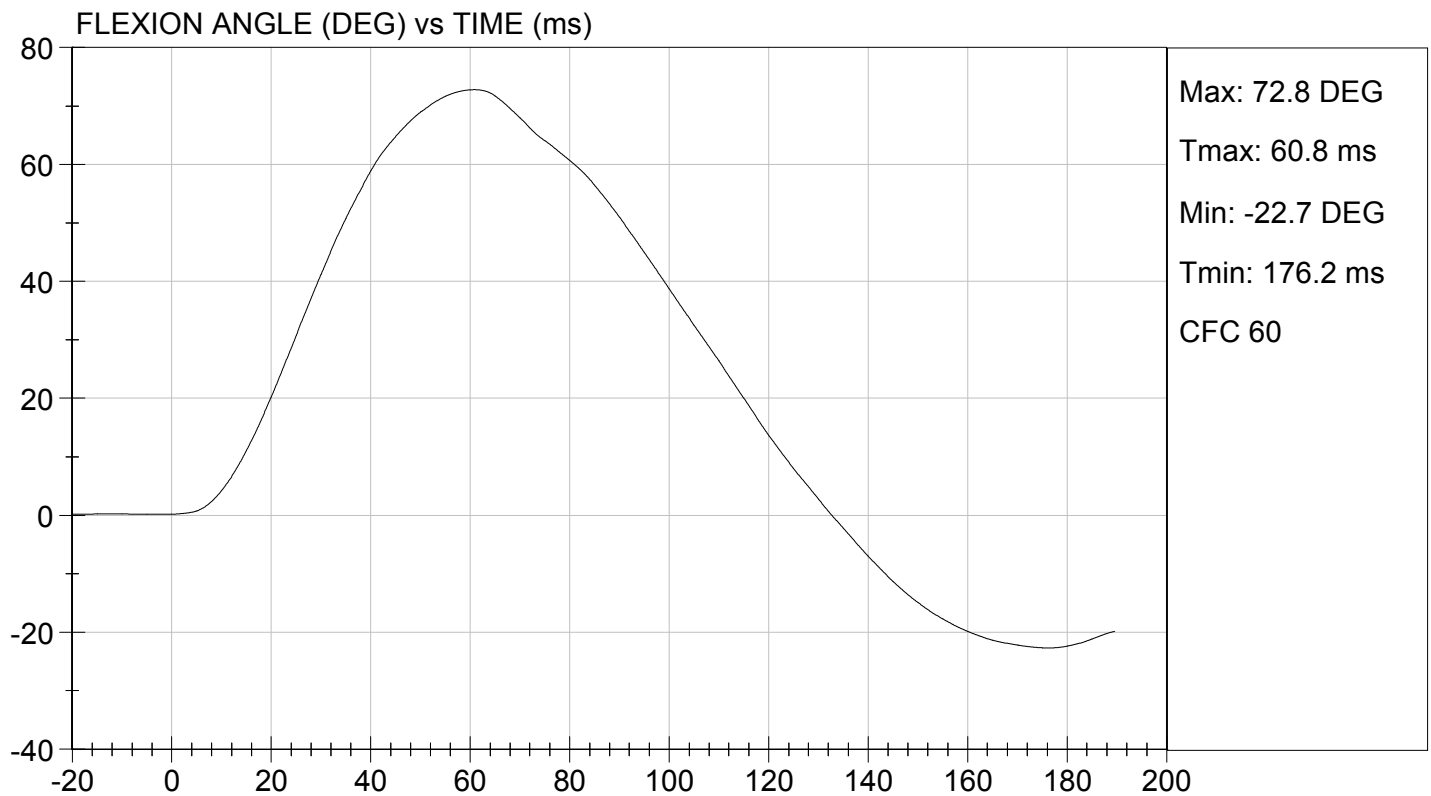
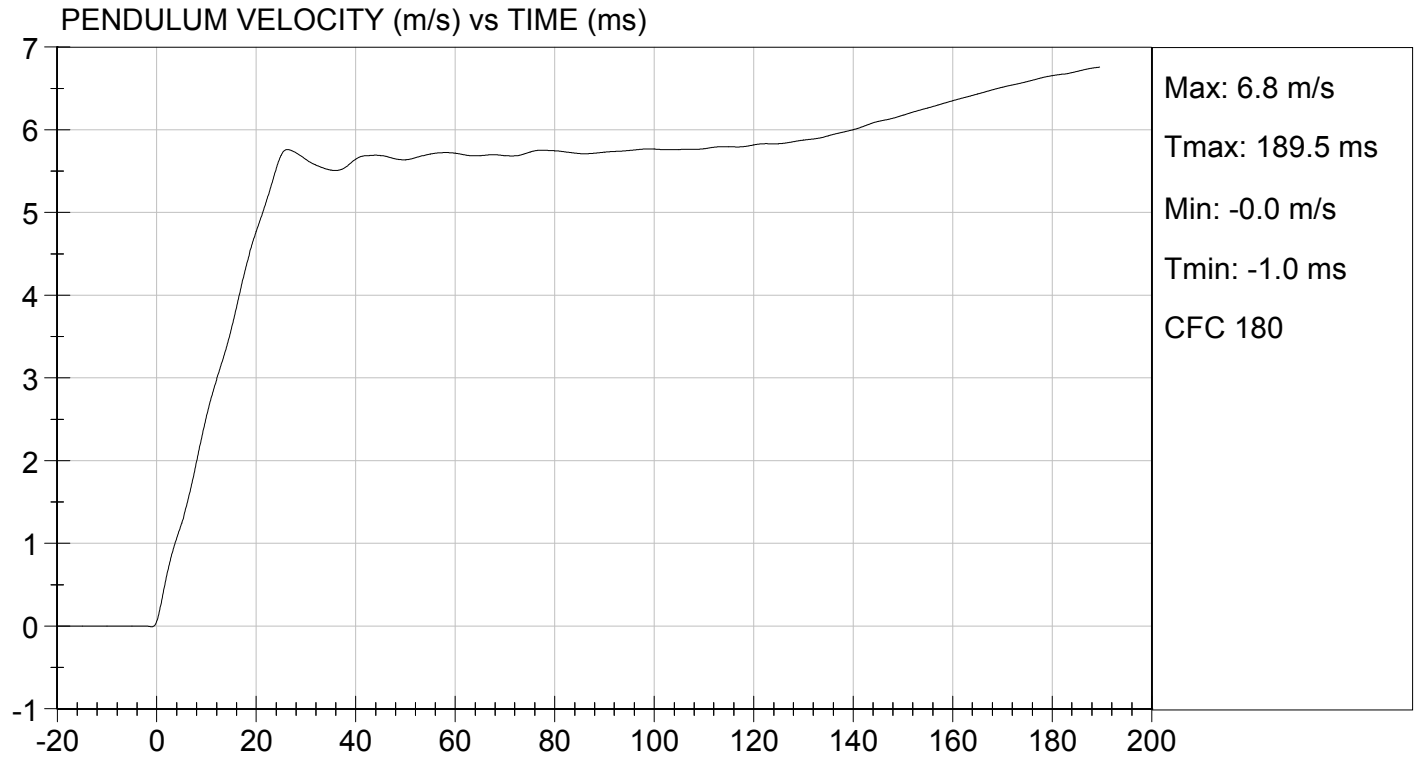
Laboratory Technician

03/24/2015

Test Date

Jessica Hall

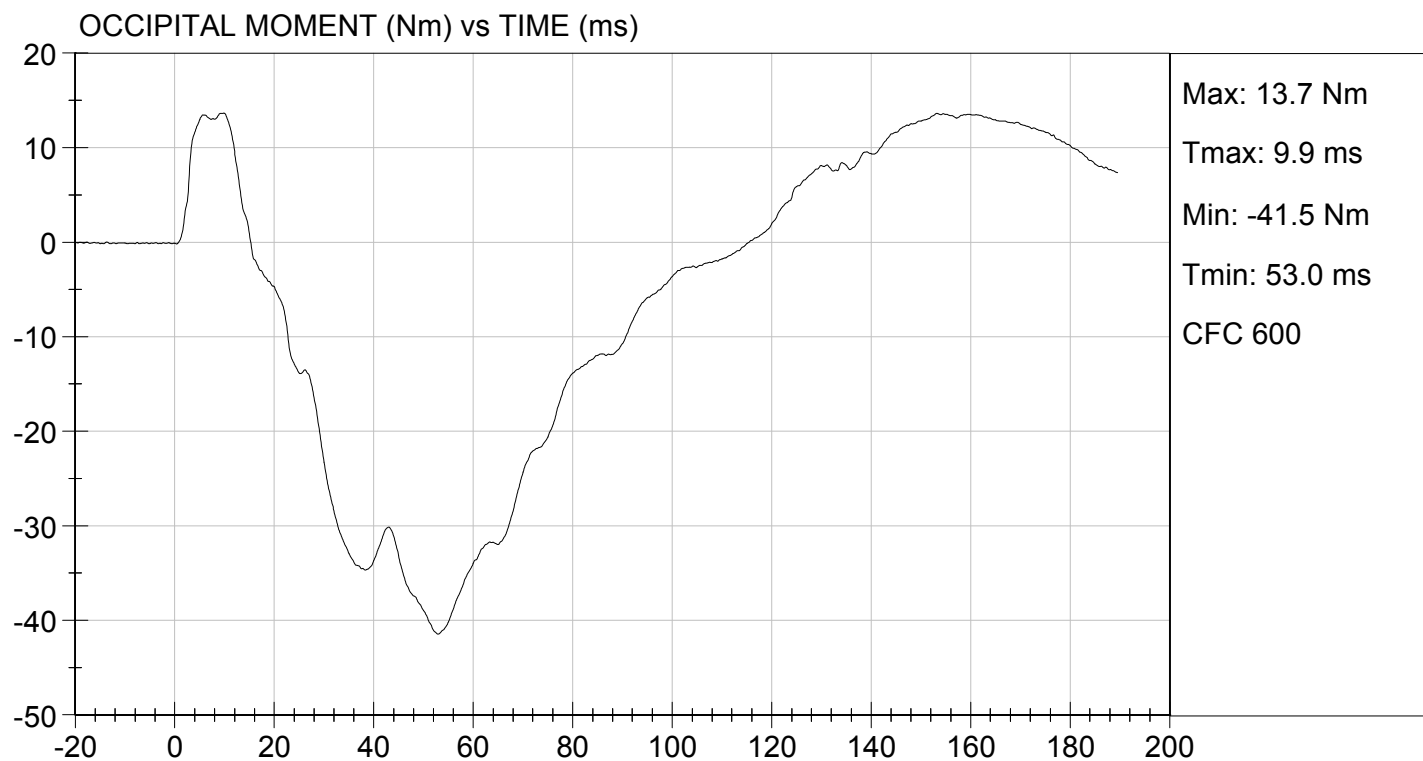
Approved By





TEST DESC: NECK BENDING
VELOCITY: 18.47 ft/s, 5.63 m/s

TEST DATE: 03/24/2015
TEST #: D15792



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D15793

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
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

03/24/2015

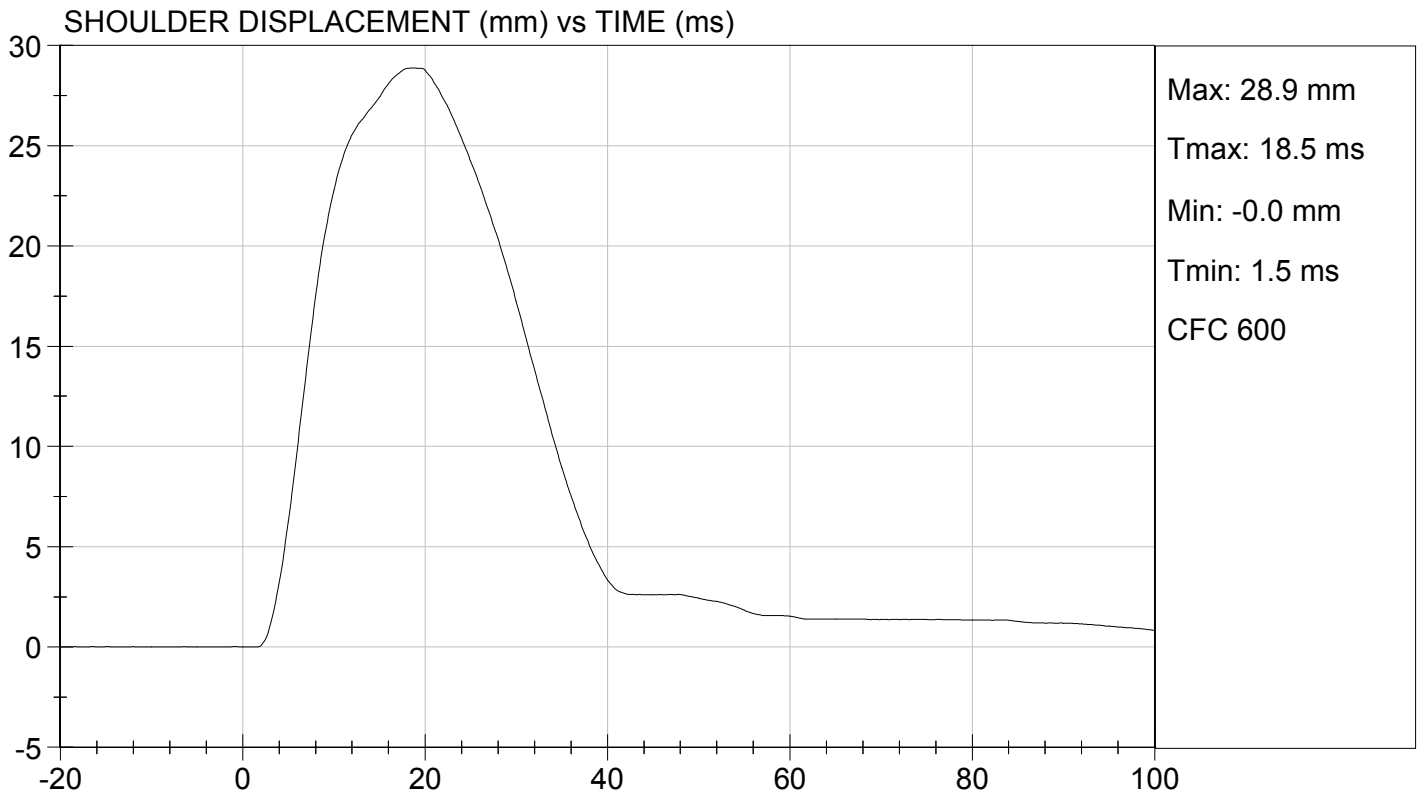
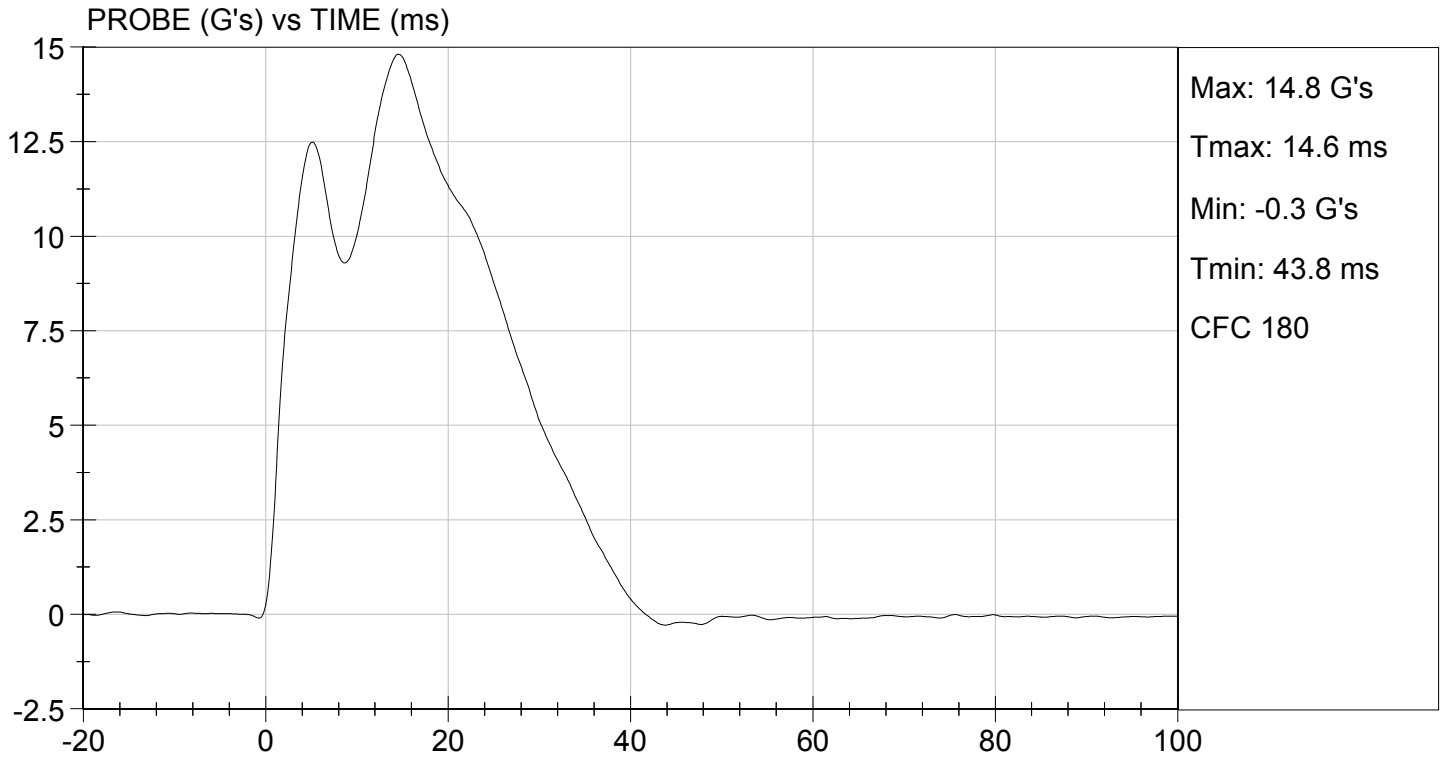
Test Date

Jessica Hall
Approved By



TEST DESC: SHOULDER IMPACT
VELOCITY: 14.37 ft/s, 4.38 m/s

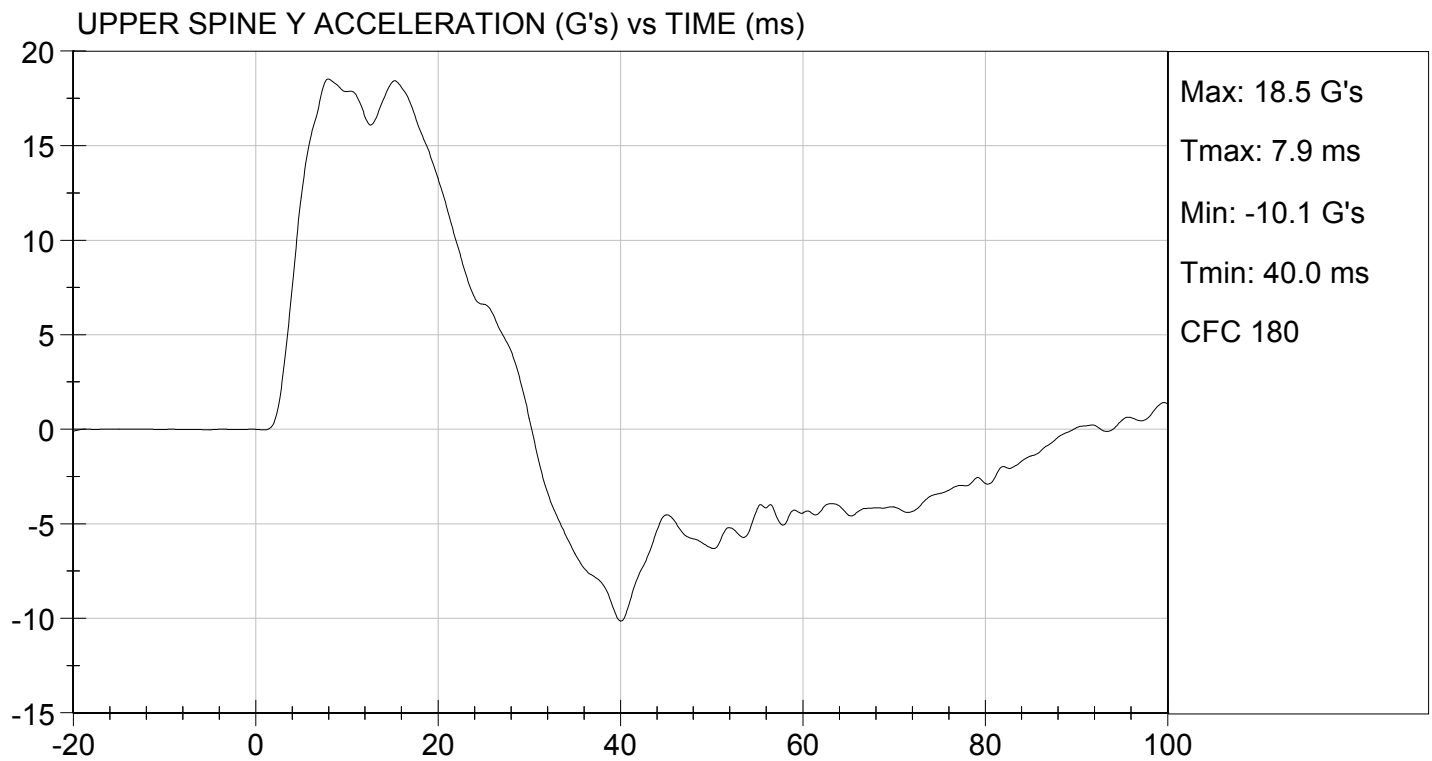
TEST DATE: 03/24/2015
TEST #: D15793





TEST DESC: SHOULDER IMPACT
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 03/24/2015
TEST #: D15793



MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15794

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	34	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	28	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	35	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	34	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

03/24/2015

Test Date

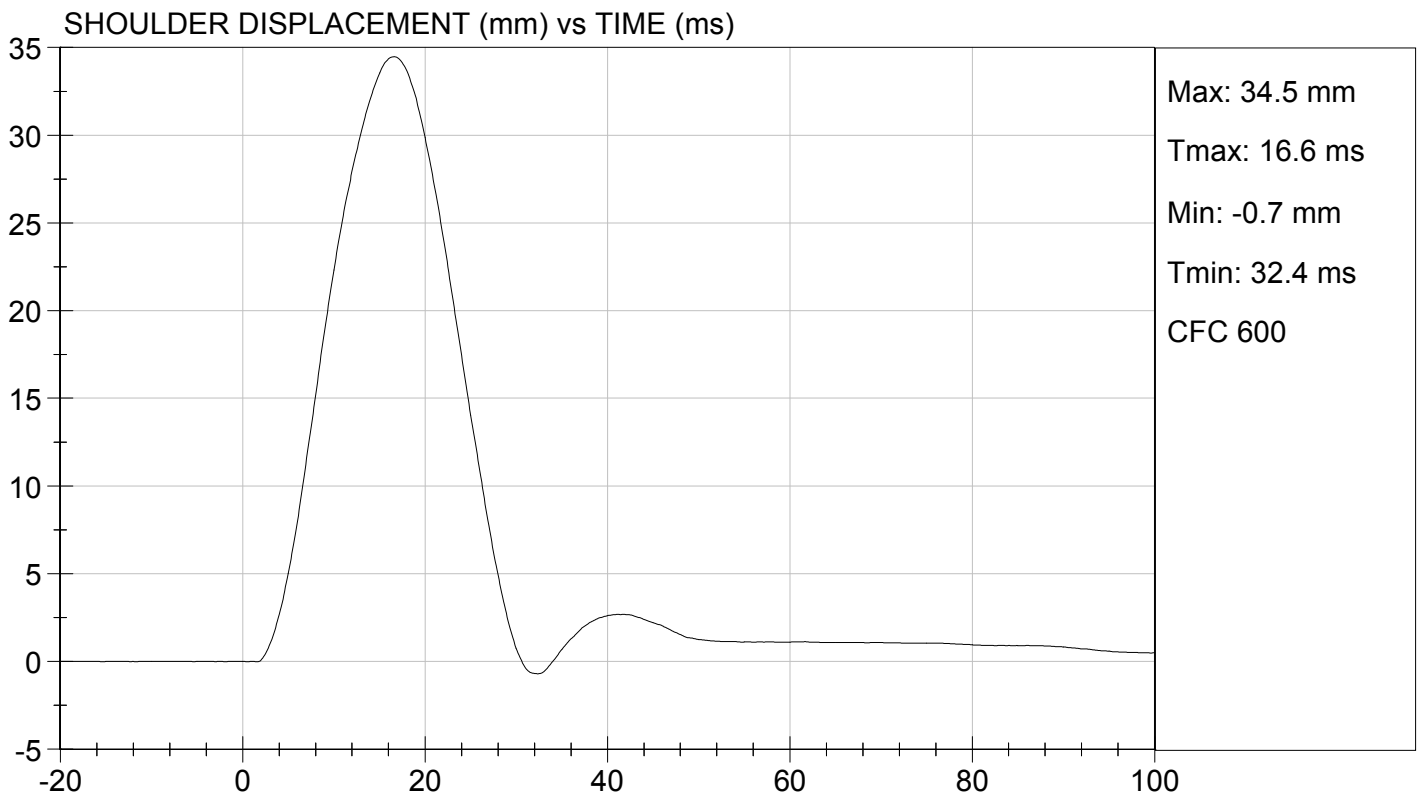
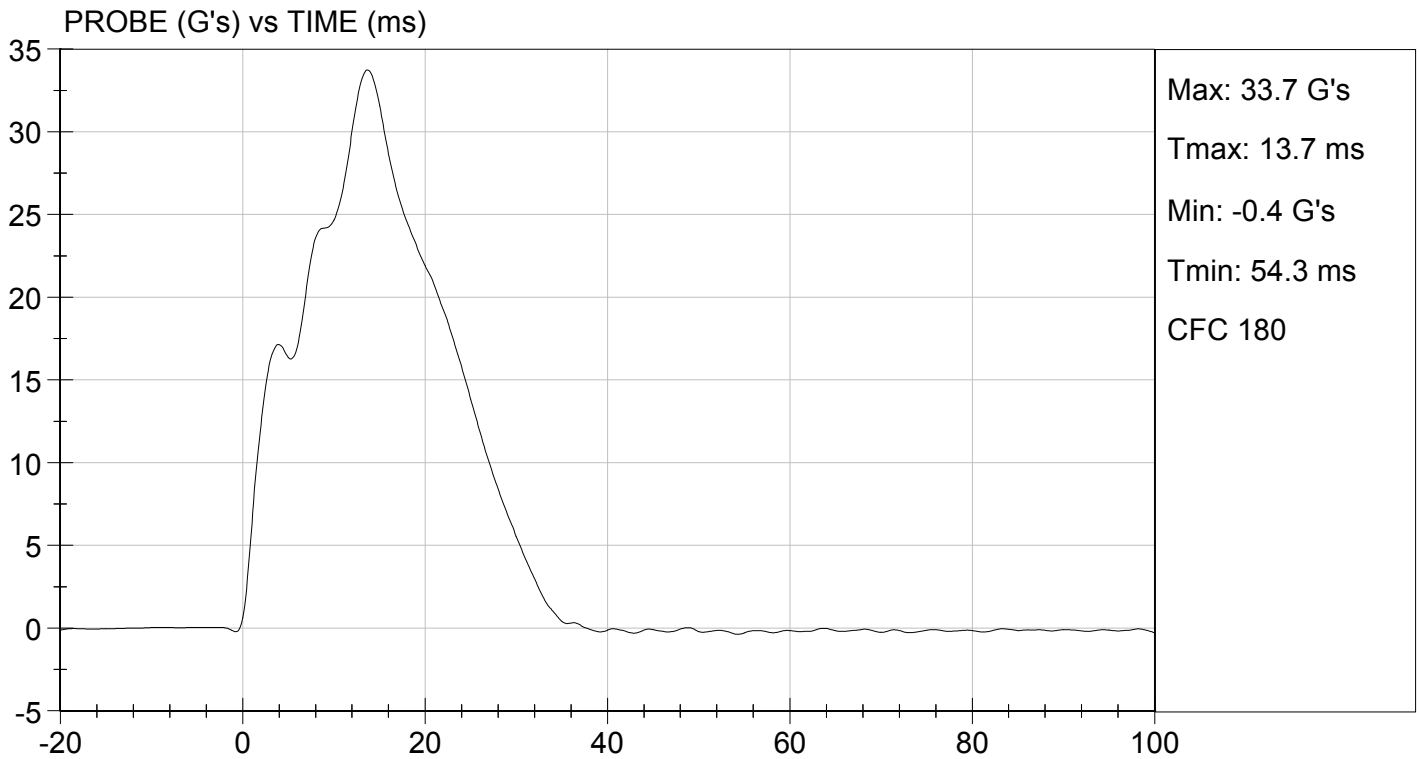
Jessica Hall

Approved By



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

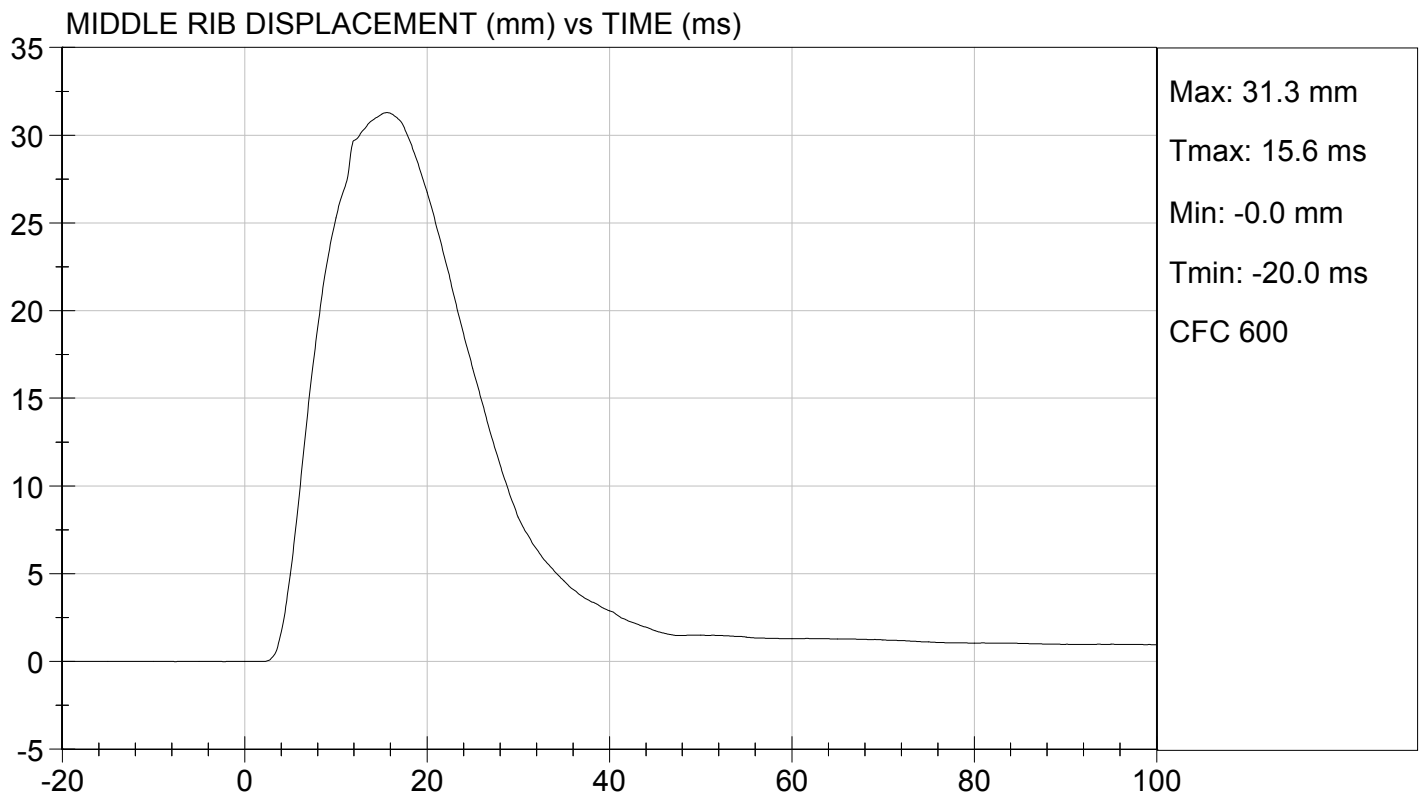
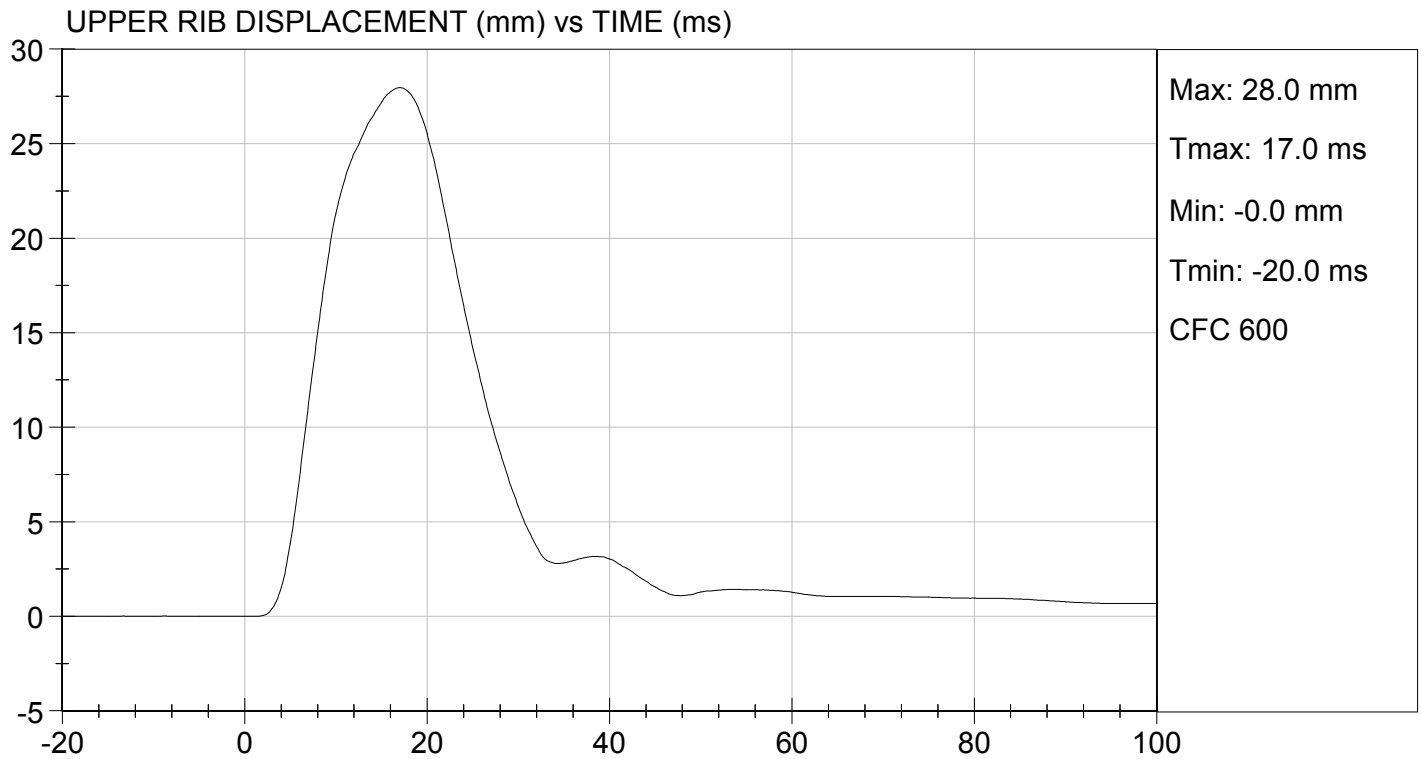
TEST DATE: 03/24/2015
TEST #: D15794





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 03/24/2015
TEST #: D15794

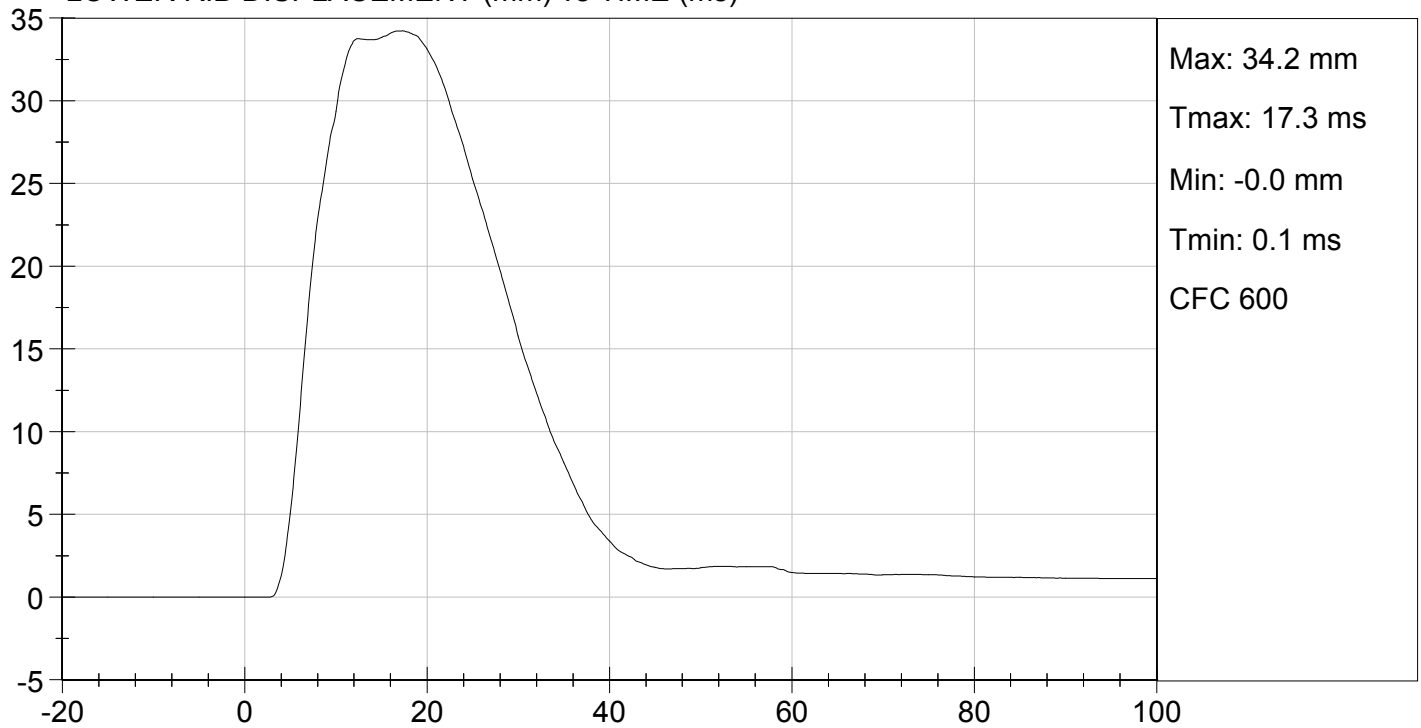




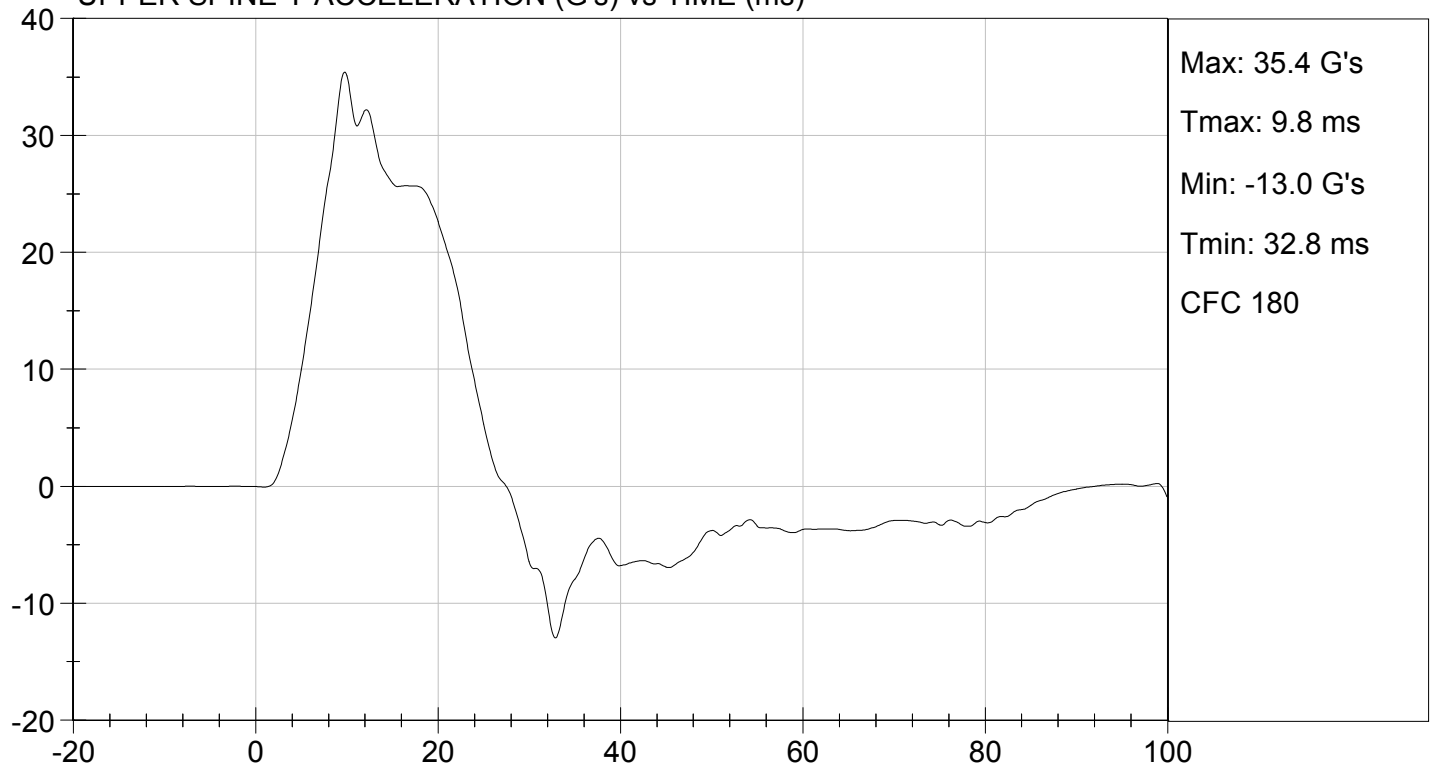
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 03/24/2015
TEST #: D15794

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



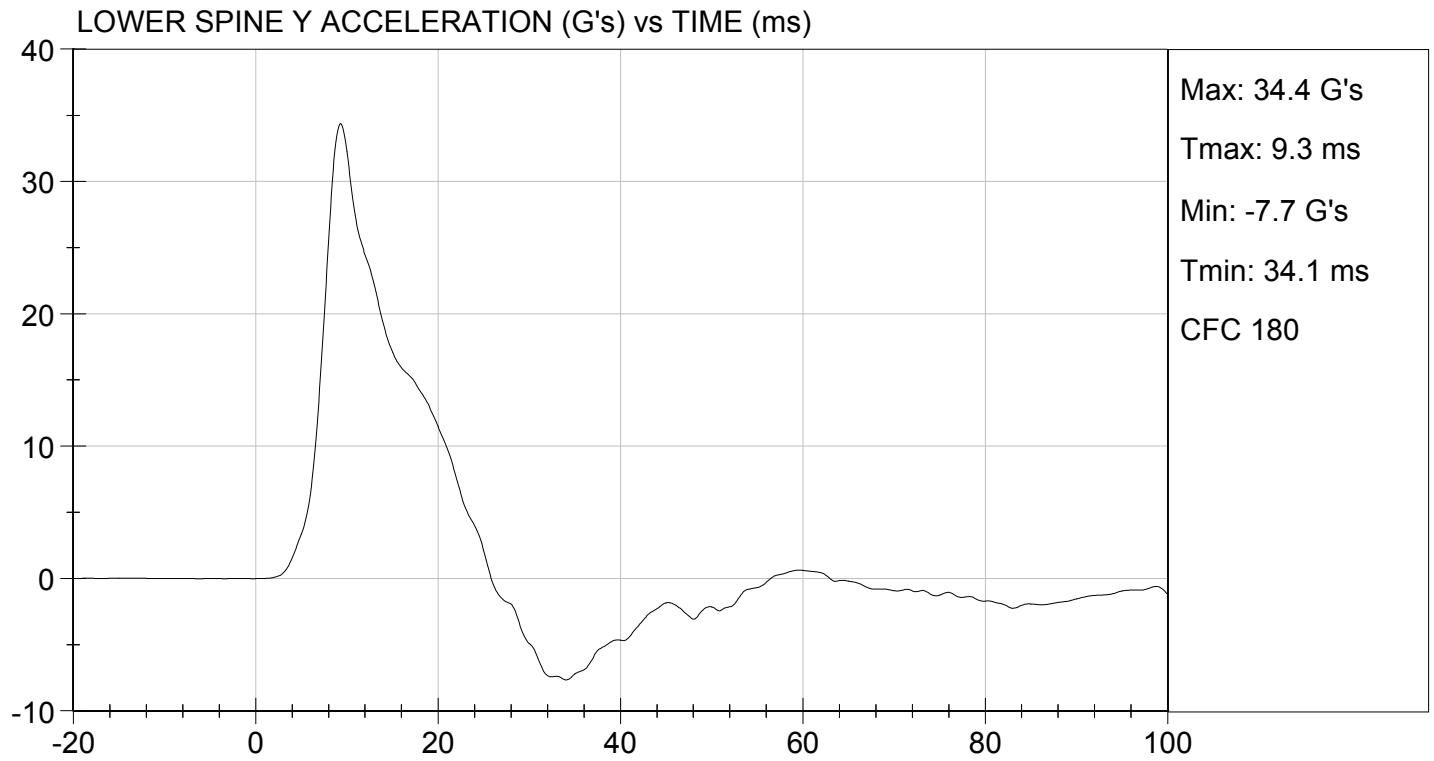
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 03/24/2015
TEST #: D15794



MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15795

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	36	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	13	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

03/24/2015

Test Date

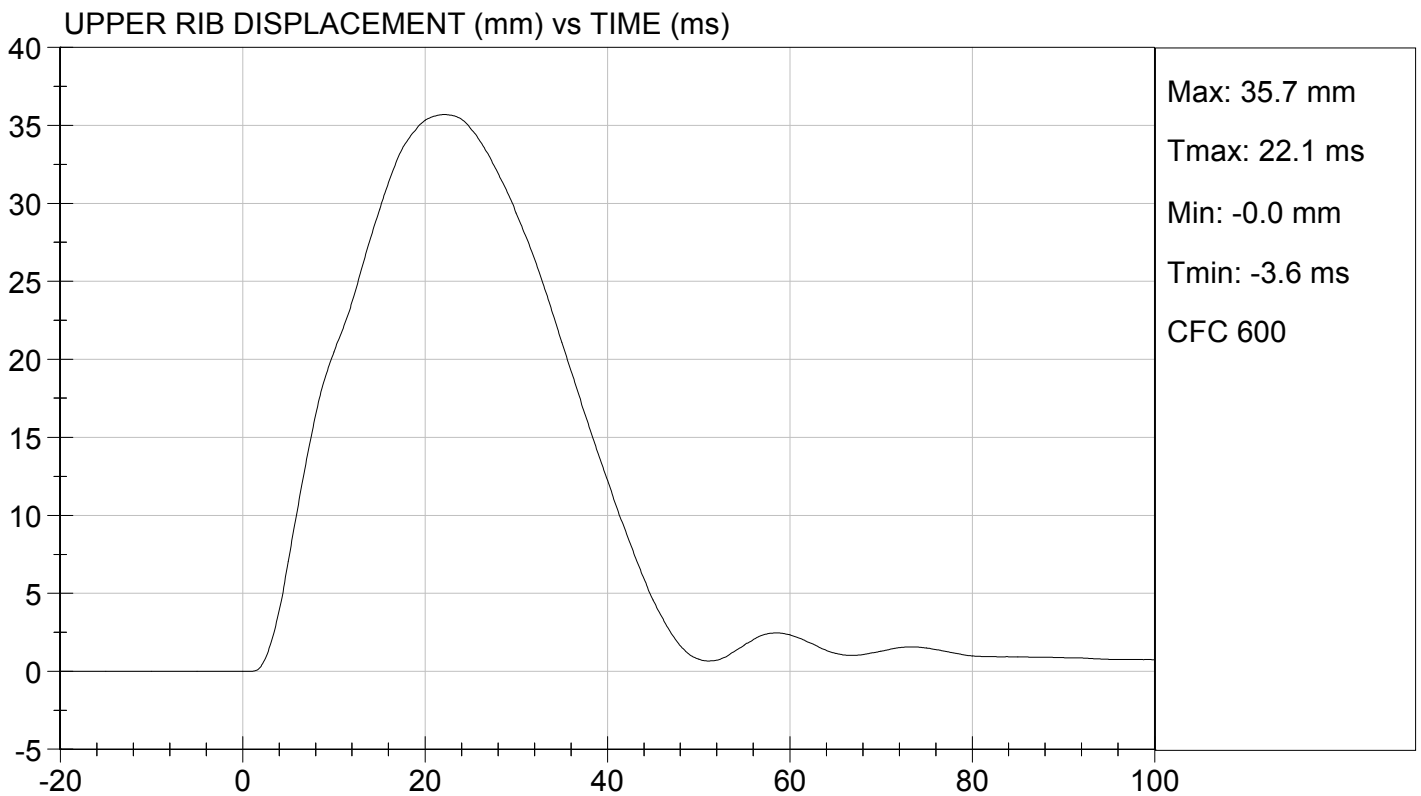
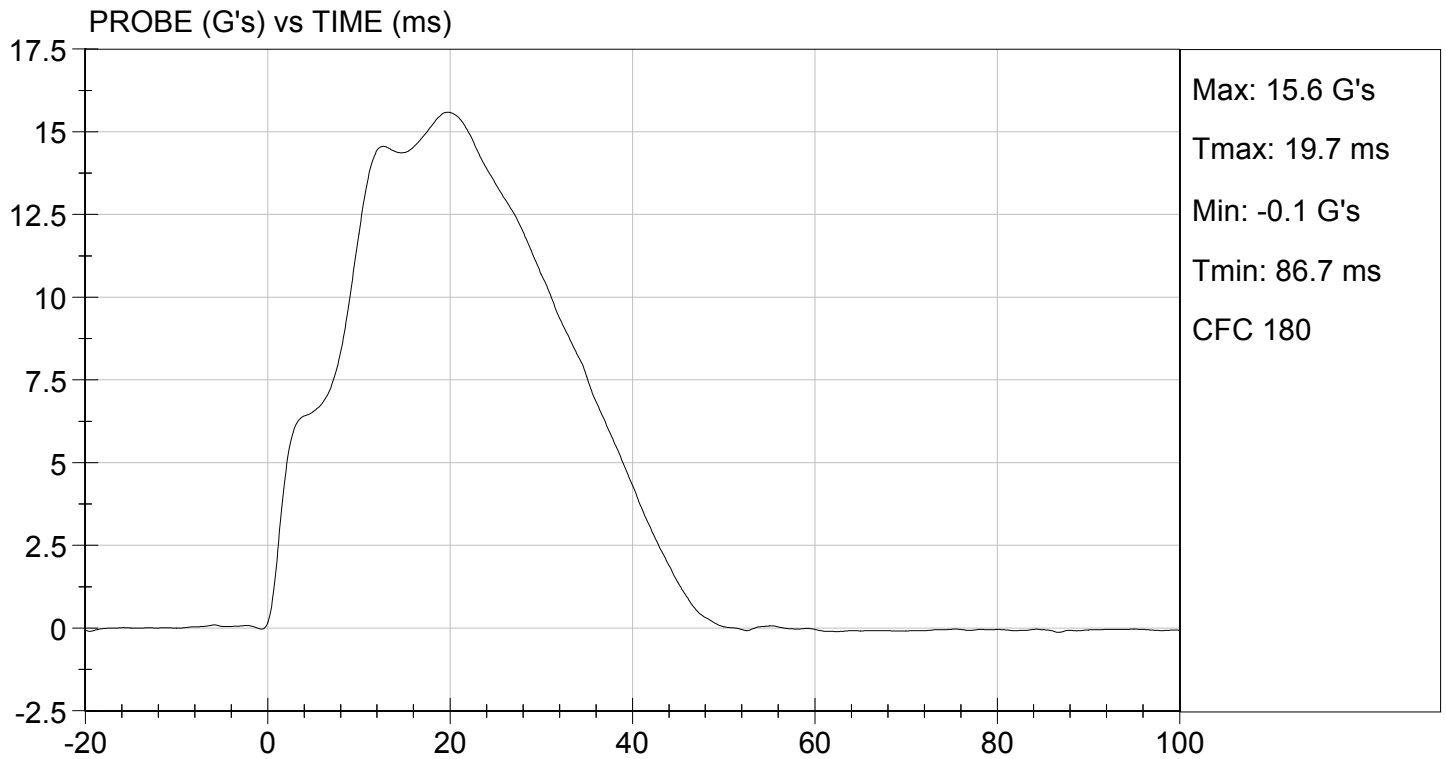
Jessica Hall

Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 03/24/2015
TEST #: D15795

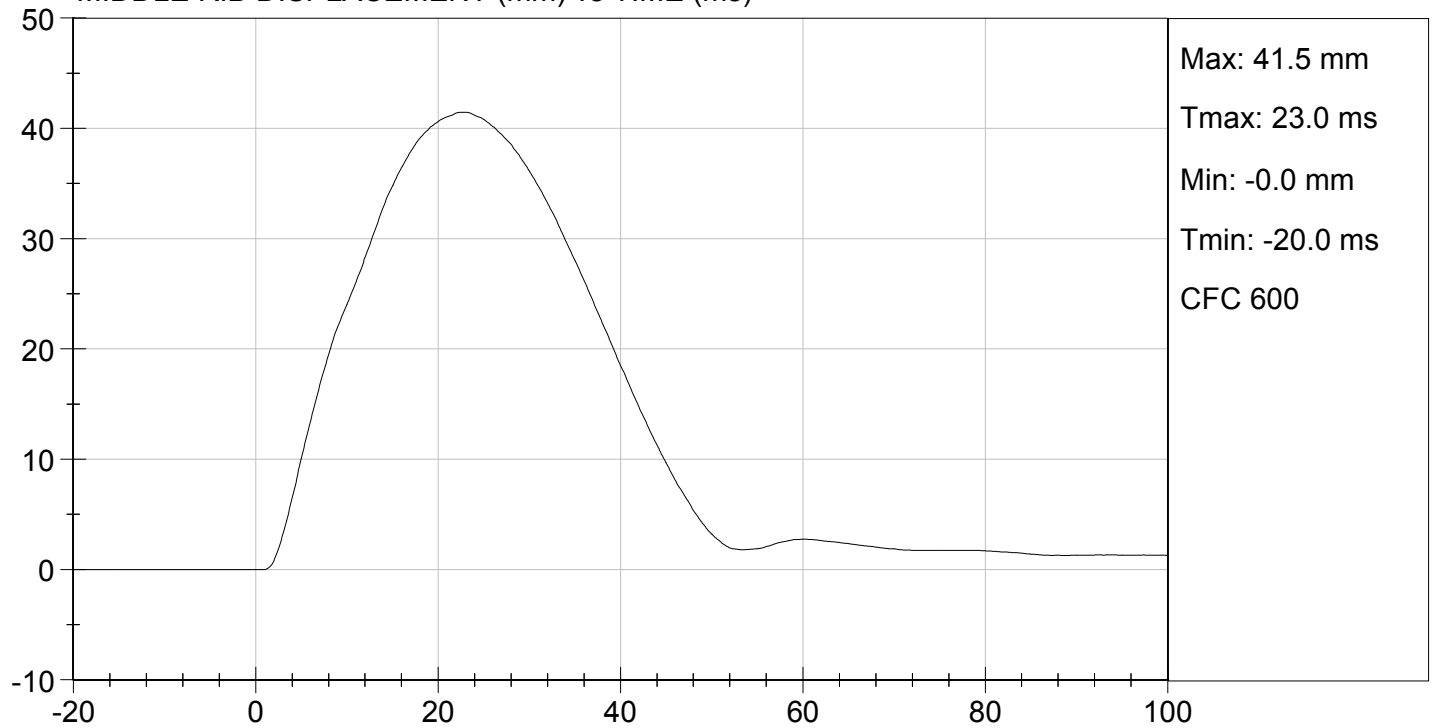




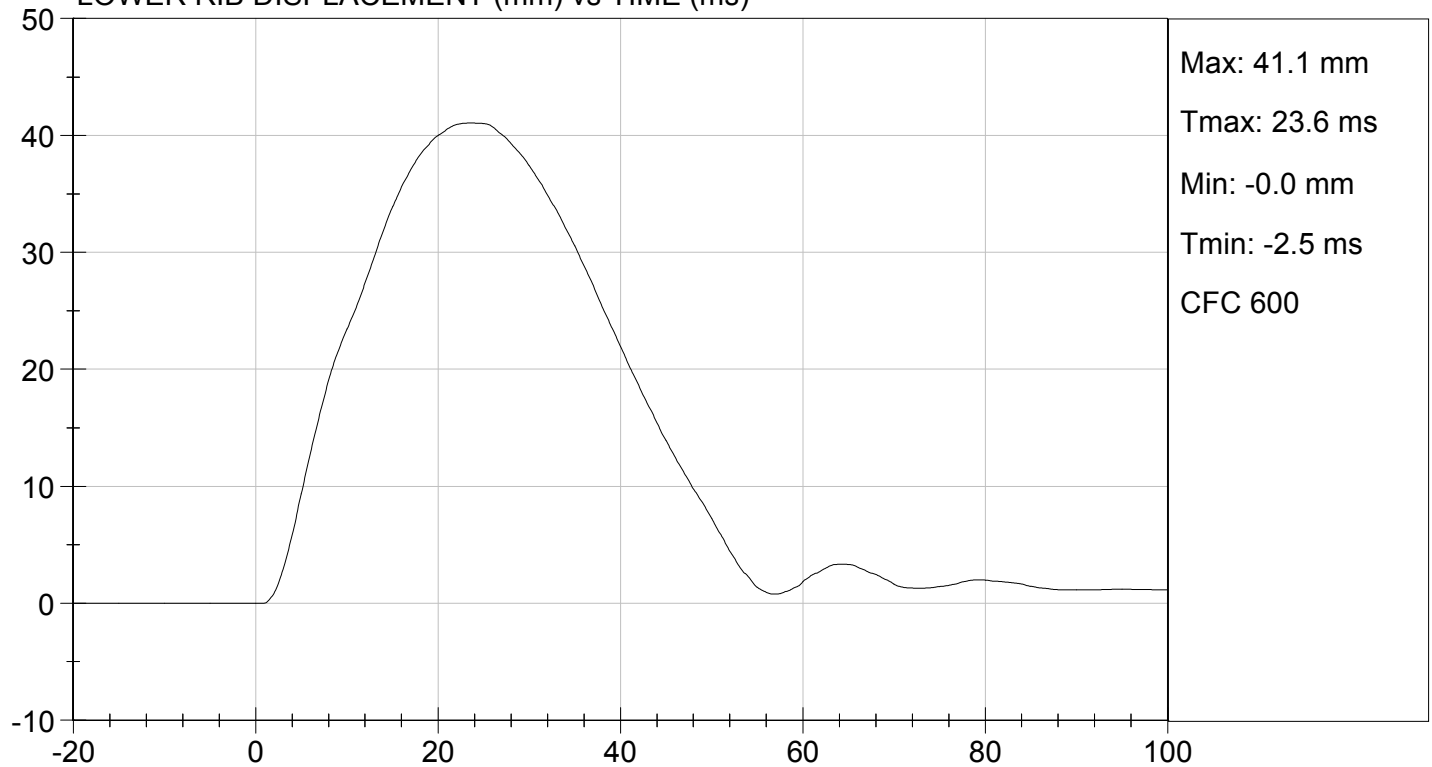
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 03/24/2015
TEST #: D15795

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)

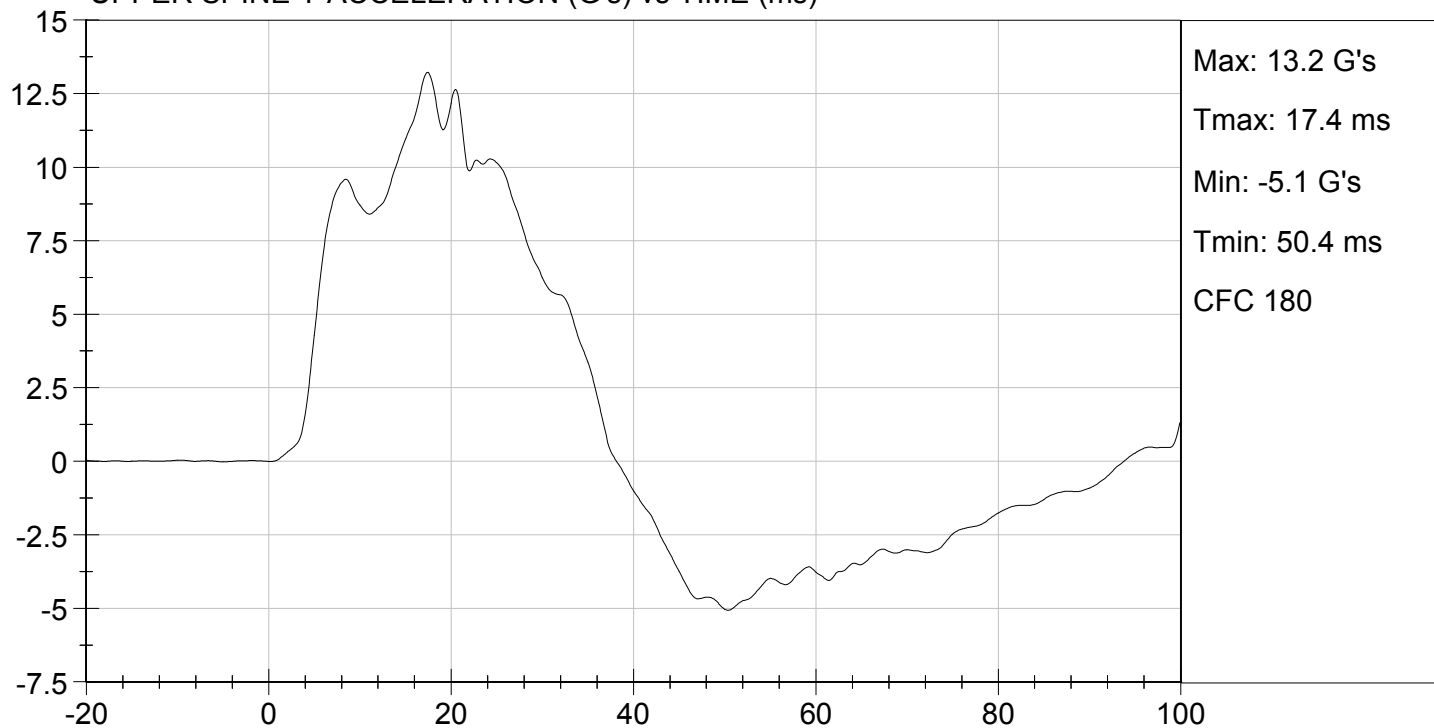


LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

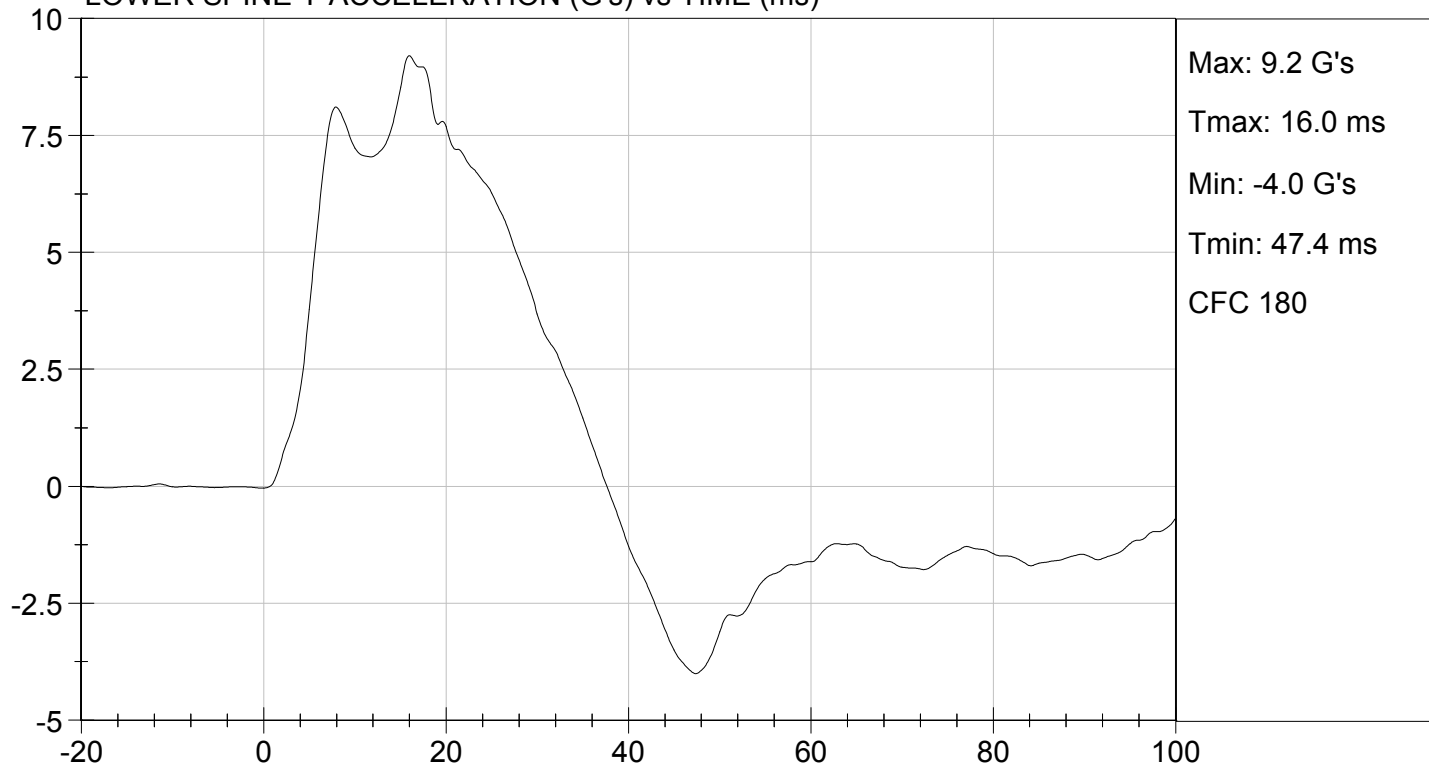




UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



LOWER SPINE Y ACCELERATION (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15796

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	39	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	40	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

03/24/2015

Test Date

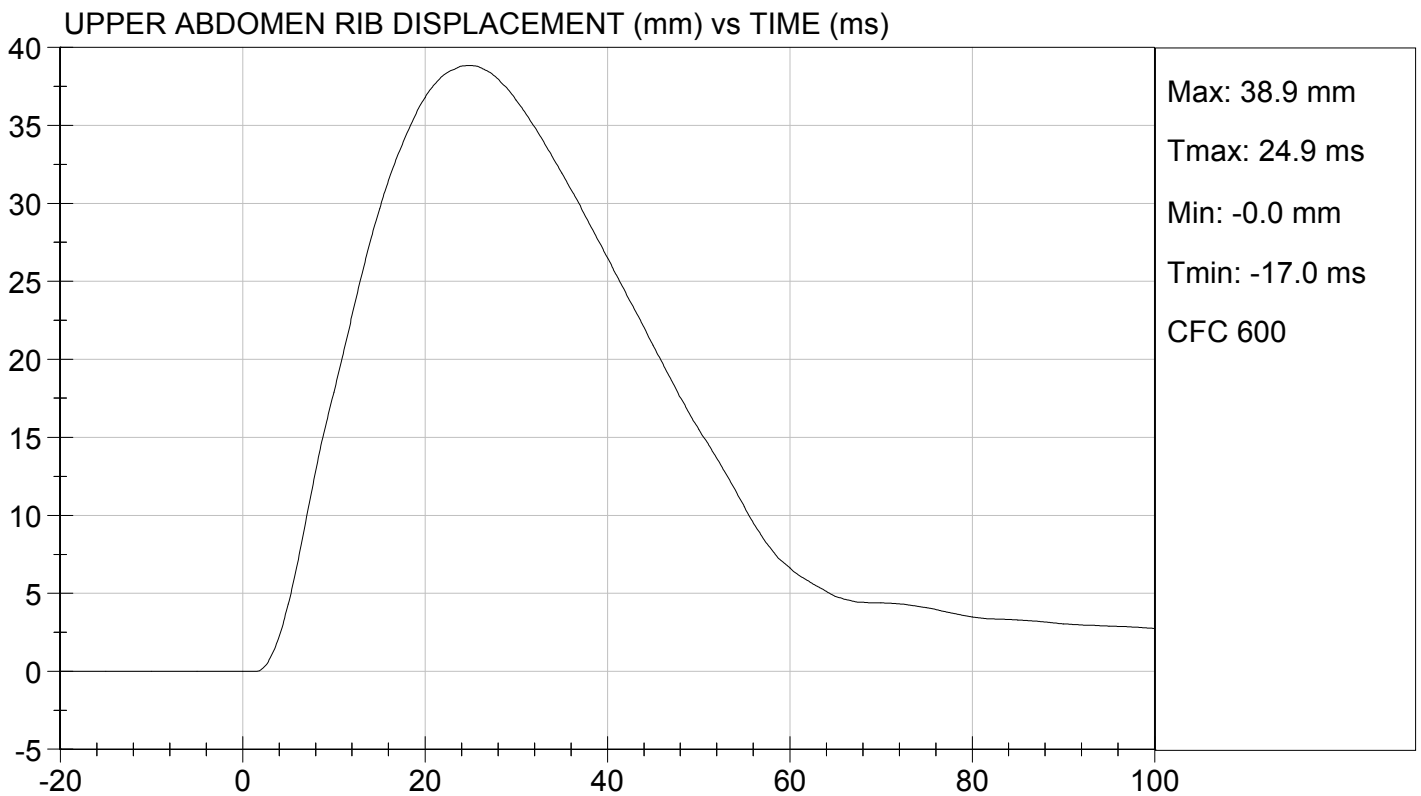
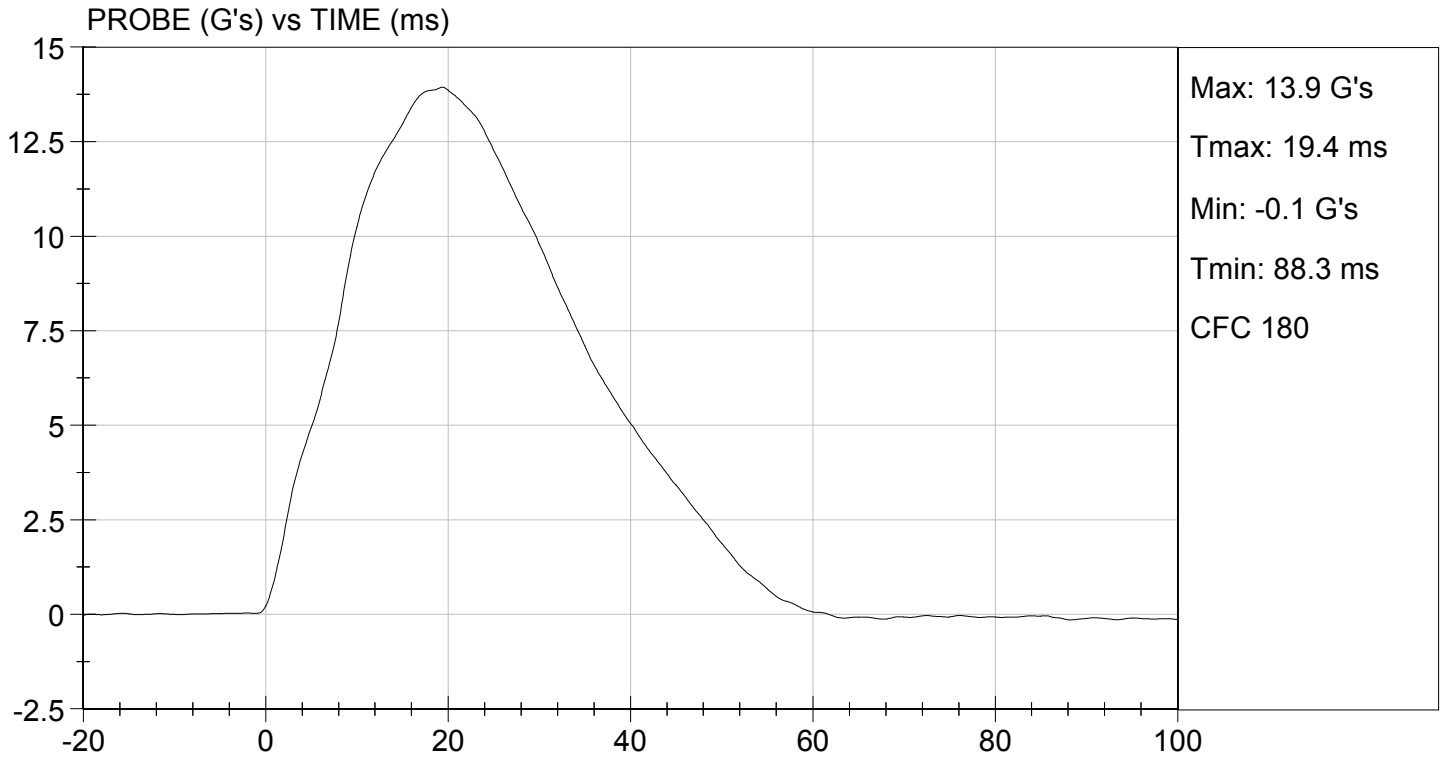
Jessica Hall

Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 03/24/2015
TEST #: D15796

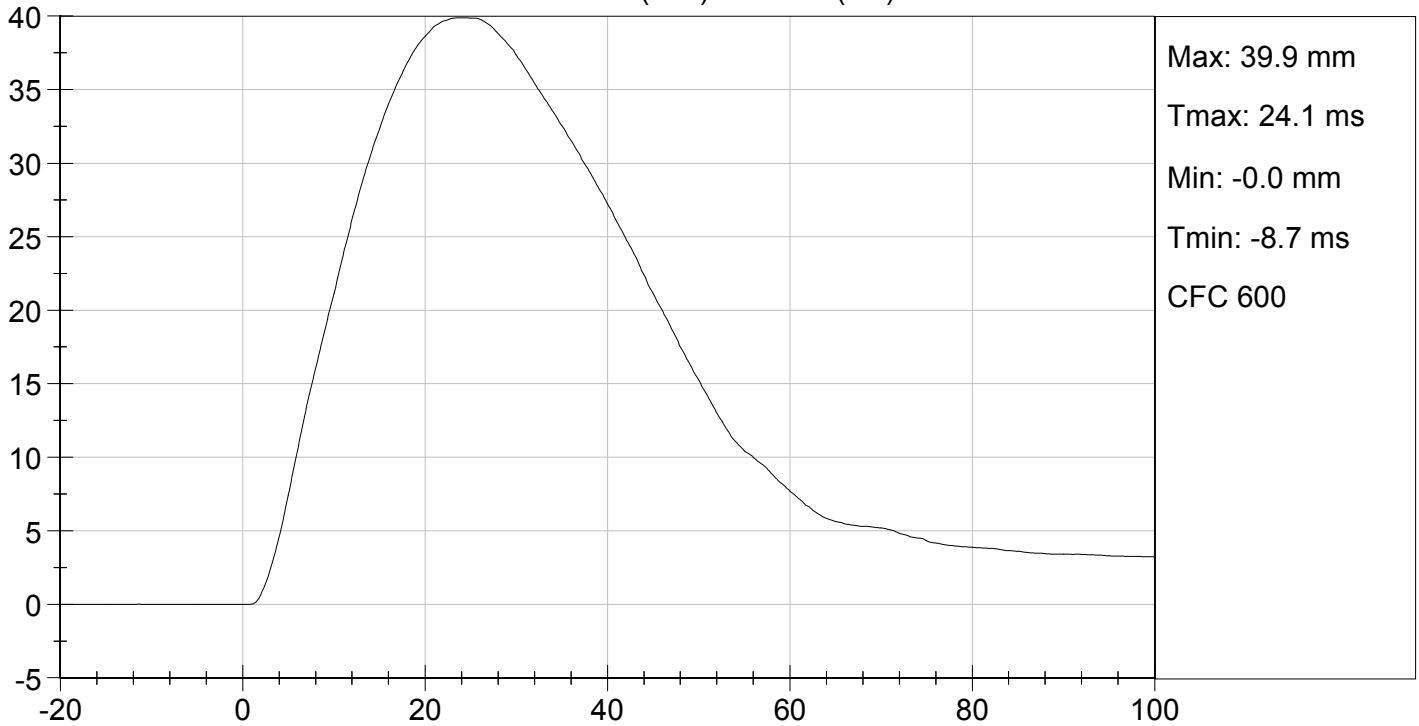




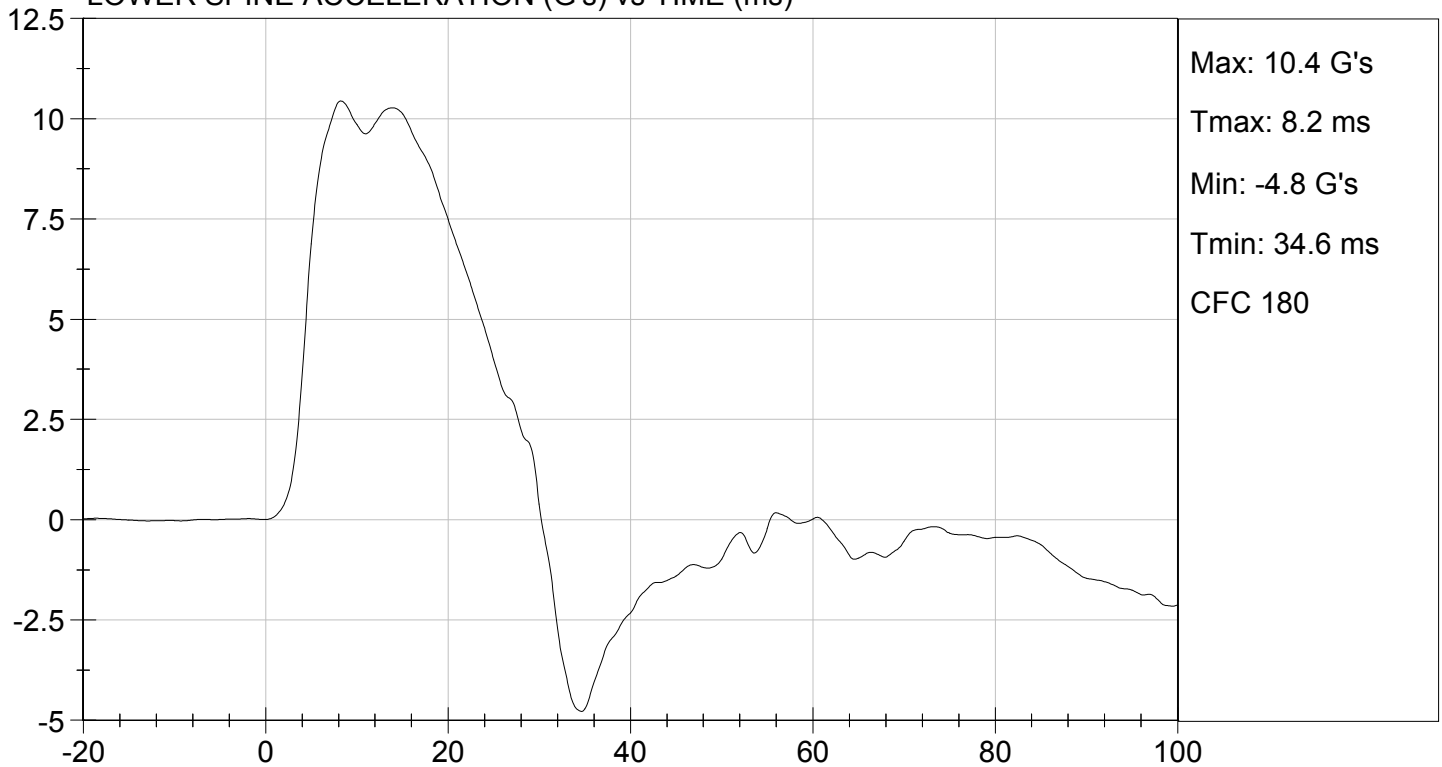
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 03/24/2015
TEST #: D15796

LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15797

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	45	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	4,129	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

03/24/2015

Test Date

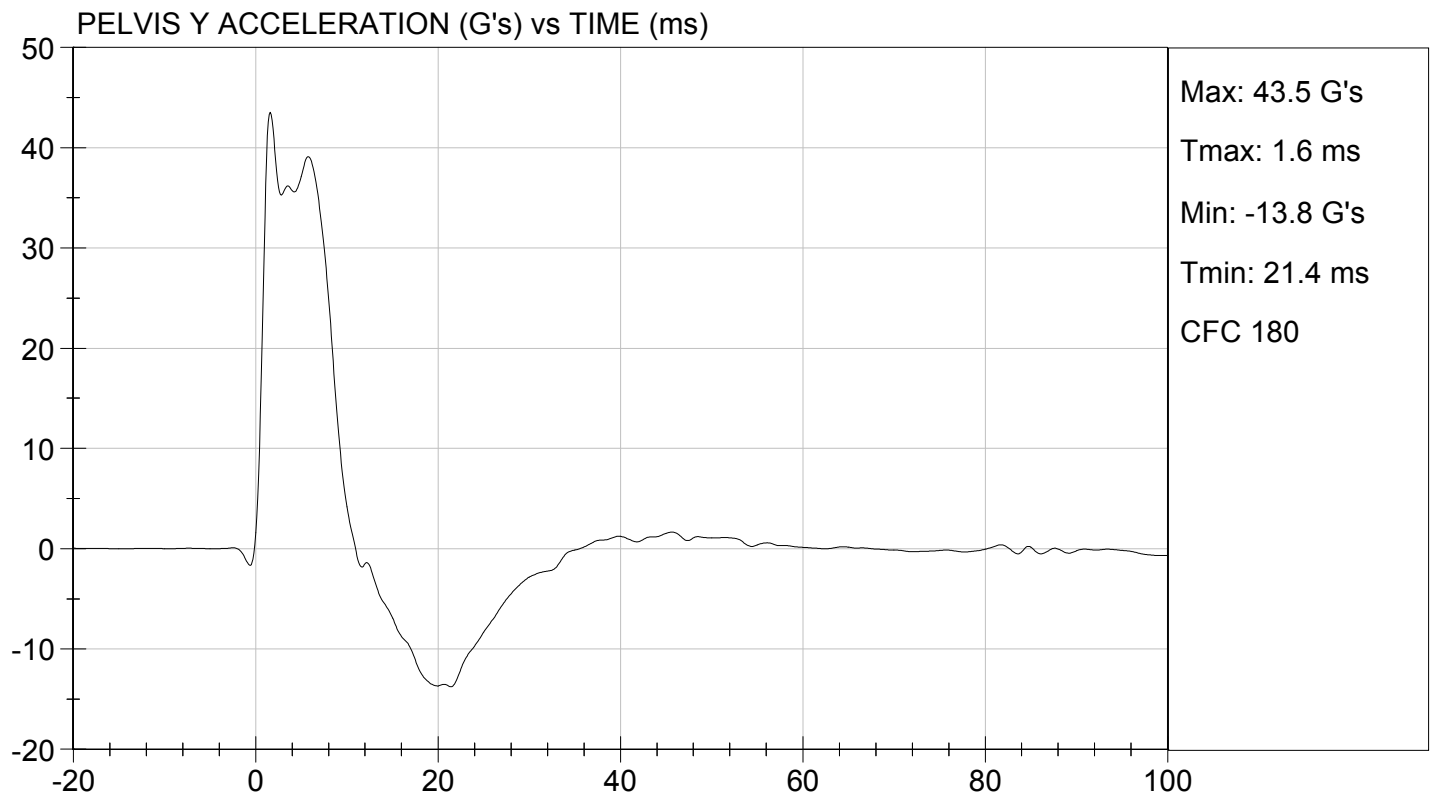
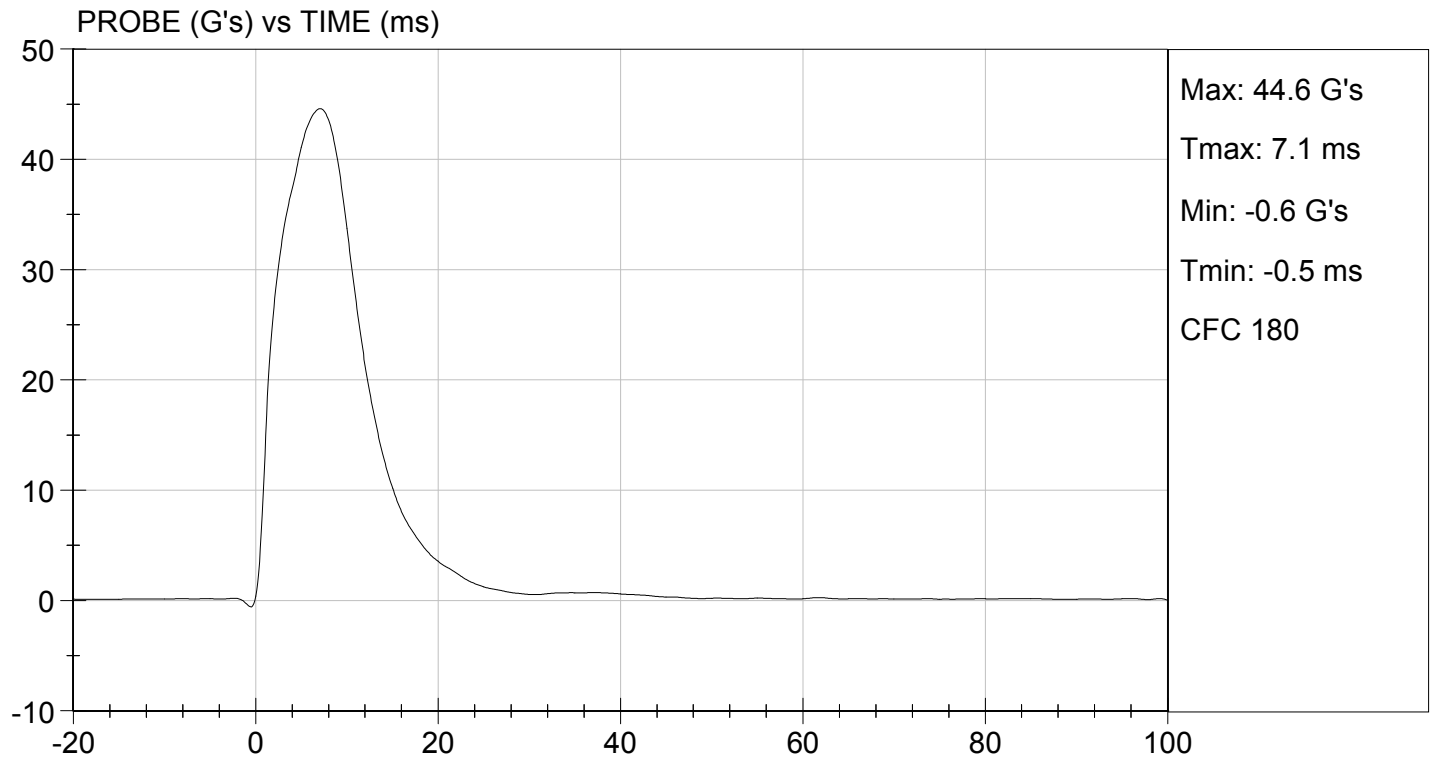
Jessica Hall

Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 21.93 ft/s, 6.68 m/s

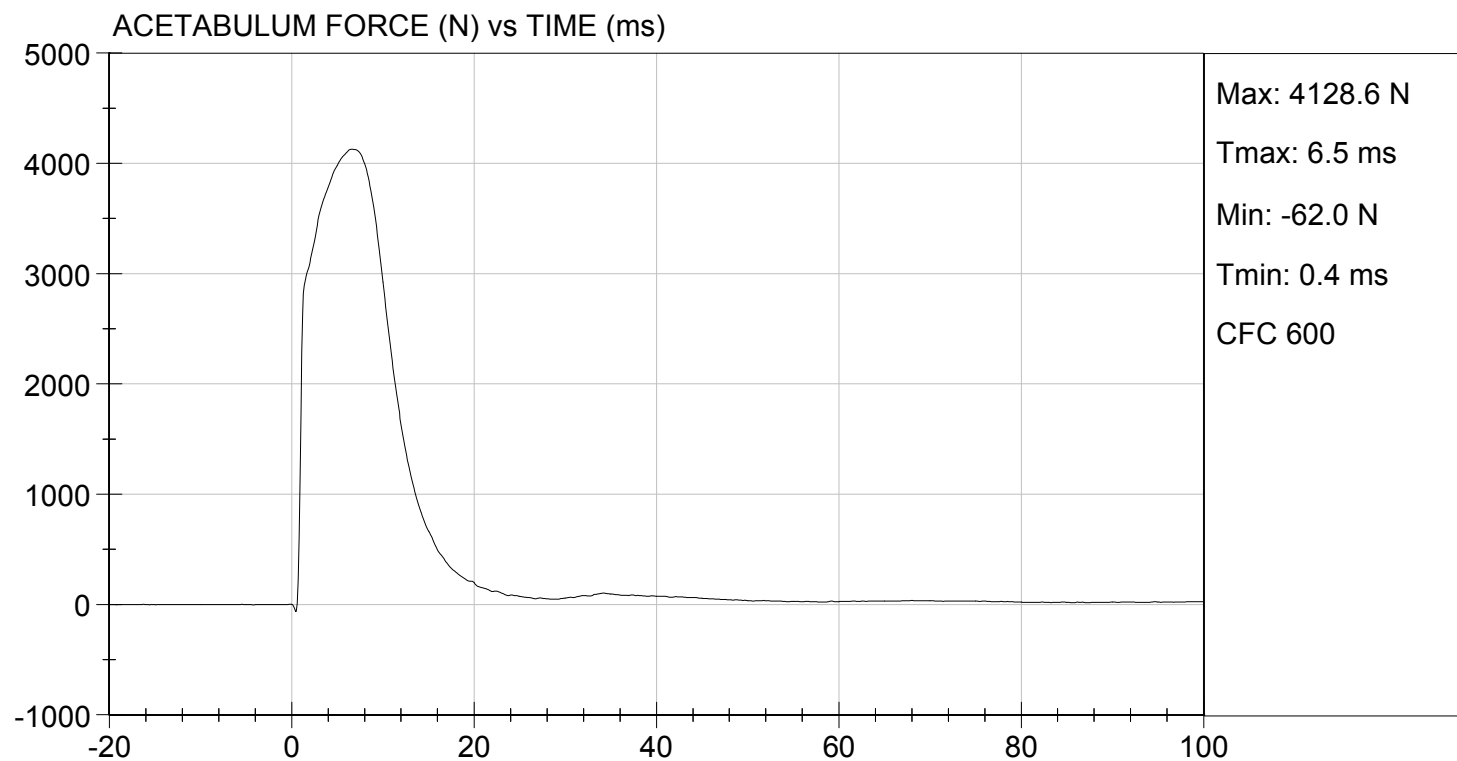
TEST DATE: 03/24/2015
TEST #: D15797





TEST DESC: PELVIS IMPACT
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 03/24/2015
TEST #: D15797



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D15798

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,687	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

03/24/2015

Test Date

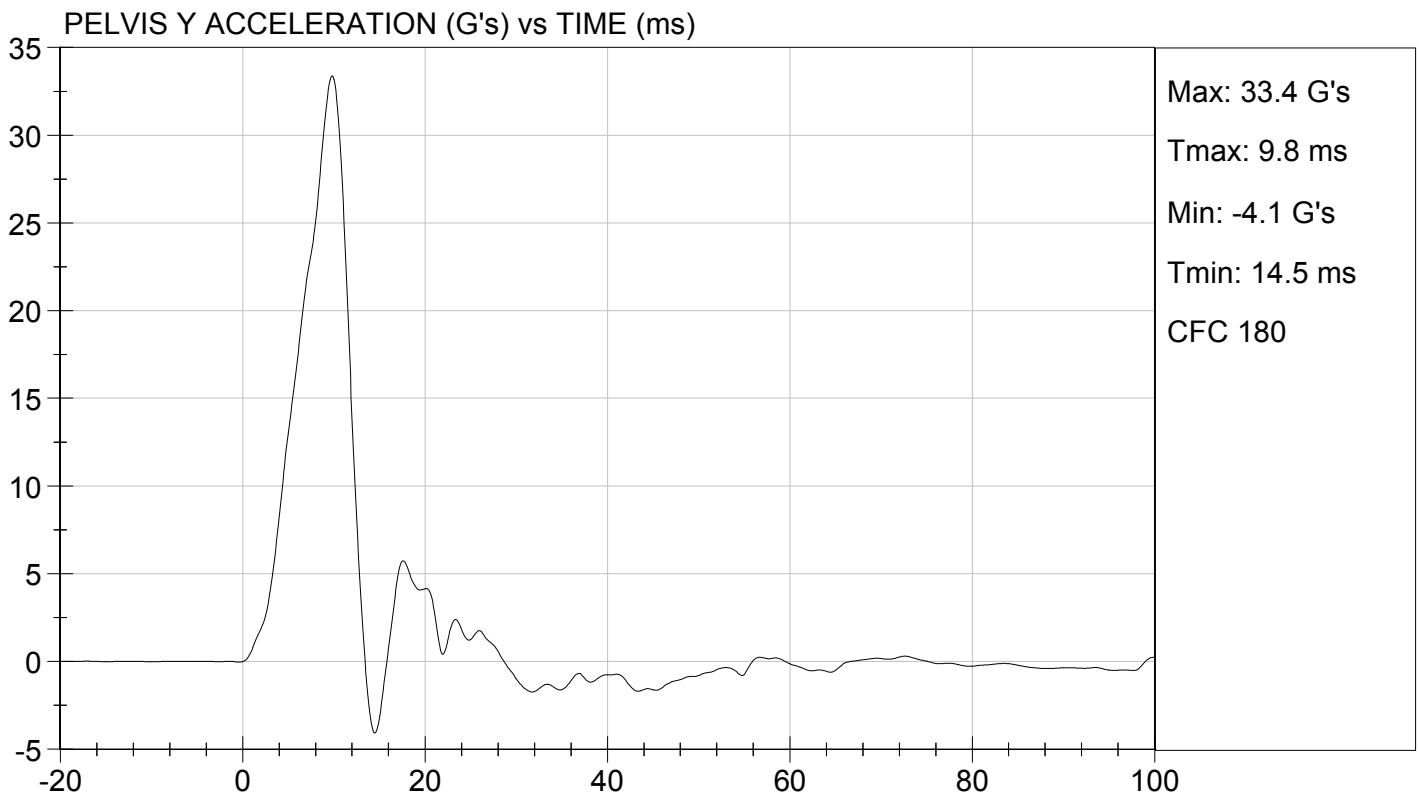
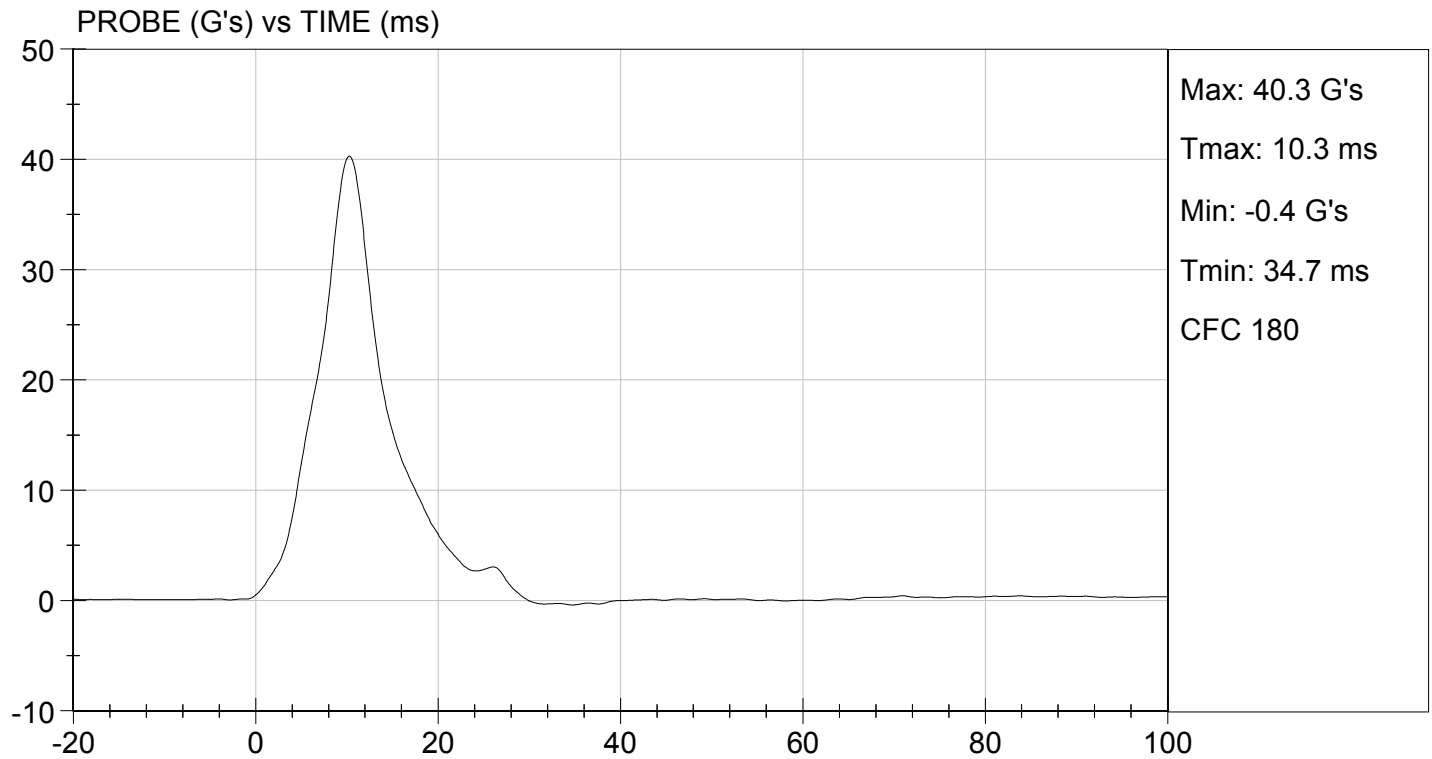
Jessica Hall

Approved By



TEST DESC: ILLIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

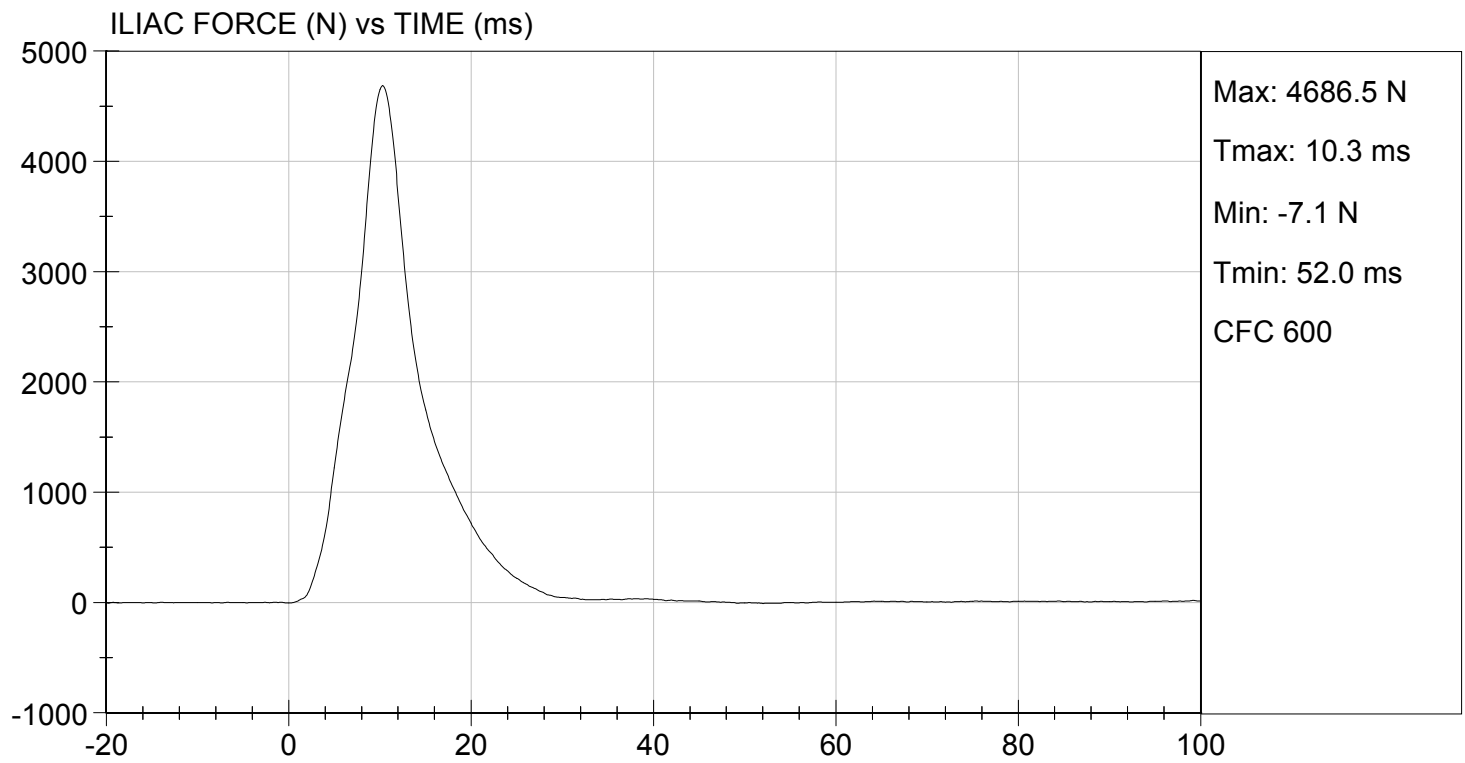
TEST DATE: 03/24/2015
TEST #: D15798



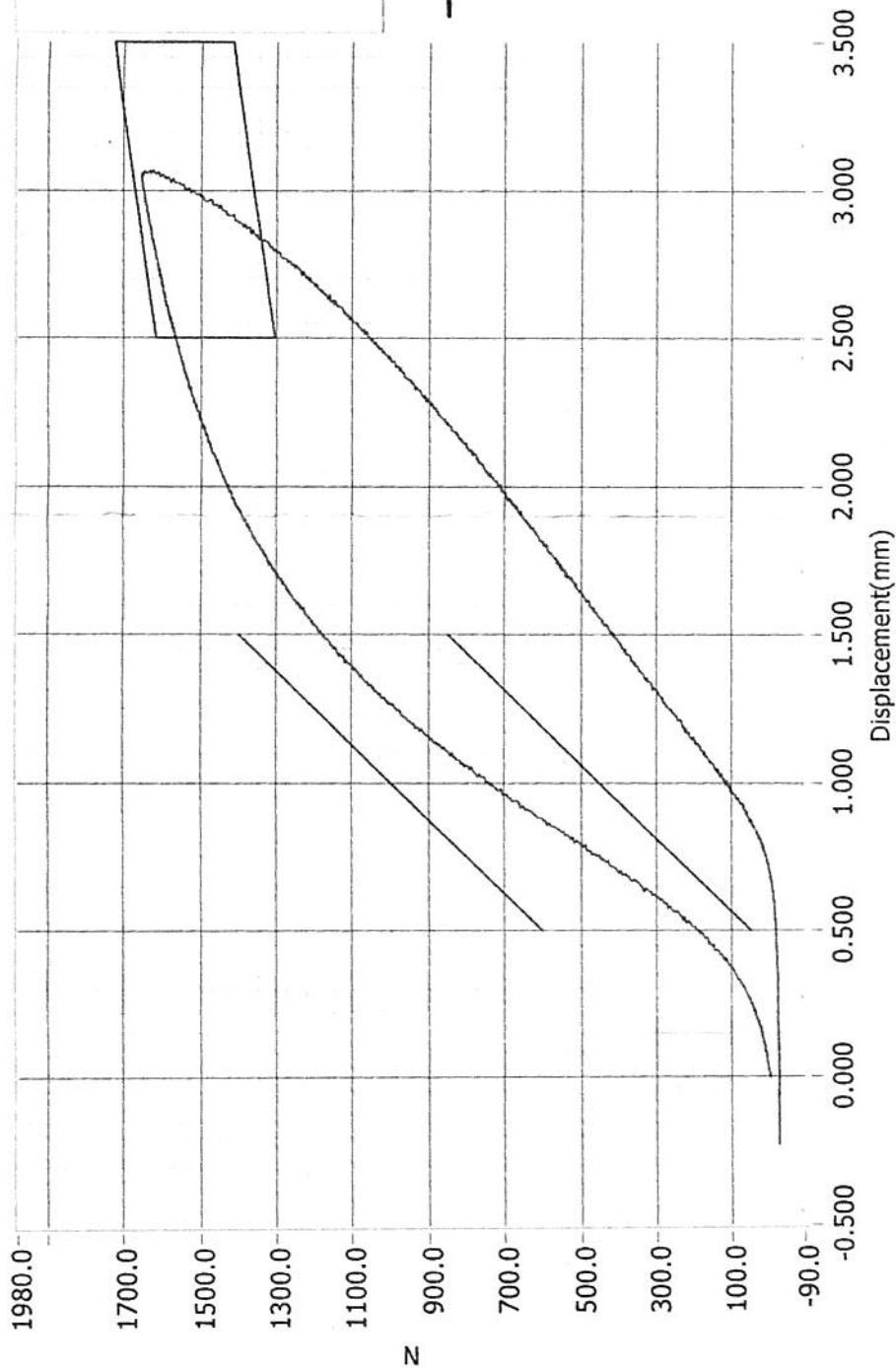


TEST DESC: ILLIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 03/24/2015
TEST #: D15798



Resultant Data - SIDIIs Plug Compression



1650 N

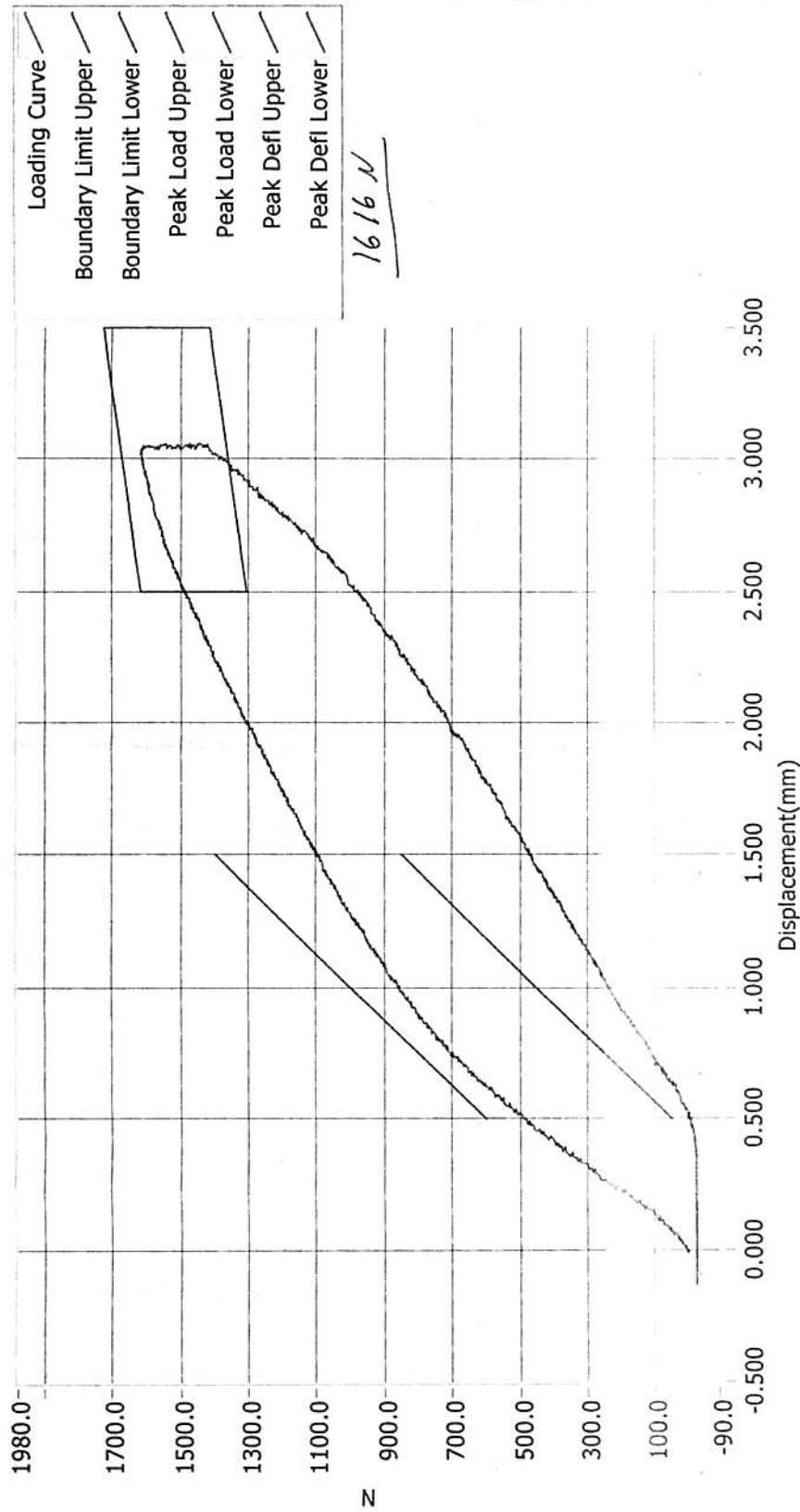
ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
	63090	1/21/2013	7:37 PM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

Current Date : 1/21/2013

Current Time : 19:38:17

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	71383	12/19/2013	10:42 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 12/19/2013

Current Time : 22:42:51

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation

				SID-IIs S/N 306			
				Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers				X	P79684	Endevco	10/21/14
				Y	P79685	Endevco	10/21/14
				Z	P79686	Endevco	10/21/14
				Xr	P79745	Endevco	10/21/14
				Yr	P79746	Endevco	10/21/14
				Zr	P79747	Endevco	10/21/14
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	10/03/14	
		Middle	Y	G1261	FTSS	10/03/14	
		Lower	Y	G1270	FTSS	10/03/14	
	Abdominal Rib	Upper	Y	G032	FTSS	10/03/14	
		Lower	Y	G1304	FTSS	10/03/14	
Lower Spine Accelerometers (T12)				X	P82617	Endevco	02/04/15
				Y	P82619	Endevco	02/04/15
				Z	P82620	Endevco	02/04/15
Acetabulum Load Cell				Y	ACG111	FTSS	04/03/14
Iliac Wing Load Cell				Y	IWG226	FTSS	04/03/14
Pelvis Plug (struck side)					63090	FTSS	01/21/13
Pelvis Plug (non-struck side)					71383	FTSS	12/19/13

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P66795	Endevco	03/06/15
Vehicle Center of Gravity	Y	P66796	Endevco	03/06/15
Vehicle Center of Gravity	Z	P66797	Endevco	03/06/15
Left Floor Sill	Y	P80100	Endevco	01/30/15
A-Pillar Sill	Y	P78945	Endevco	02/05/15
A-Pillar Low	Y	P66612	Endevco	11/11/14
A-Pillar Mid	Y	P66869	Endevco	10/31/14
B-Pillar Sill	Y	P78759	Endevco	10/31/14
B-Pillar Low	Y	P67873	Endevco	10/31/14
B-Pillar Mid	V	P78936	Endevco	02/05/15
Driver Seat	Y	P73734	Endevco	12/02/14
Engine Top	X	P66753	Endevco	01/05/15
Engine Top	Y	P66754	Endevco	01/05/15
Firewall	Y	P73703	Endevco	10/02/14
Right Roof	Y	P79726	Endevco	02/05/15
Right Floor Sill	Y	P72802	Endevco	11/11/14
Rear Floorpan	X	P73142	Endevco	12/09/14
Rear Floorpan	Y	P73141	Endevco	12/09/14

Table 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	DG6277	FTSS	08/12/14
Load Cell 2	DG6278	FTSS	08/12/14
Load Cell 3	DG6279	FTSS	08/12/14
Load Cell 4	DG6280	FTSS	08/12/14
Load Cell 5	DG6281	FTSS	08/12/14
Load Cell 6	DG6283	FTSS	08/12/14
Load Cell 7	DG6284	FTSS	08/12/14
Load Cell 8	DG6582	FTSS	08/12/14