

REPORT NUMBER: SideNCAPPole-MGA-22-002

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

**HONDA DEVELOPMENT & MANUFACTURING OF AMERICA, LLC
2022 Acura MDX 5-Door SUV
NHTSA No.: O20225301**

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



Test Date: October 7, 2021

Final Report Date: November 29, 2021

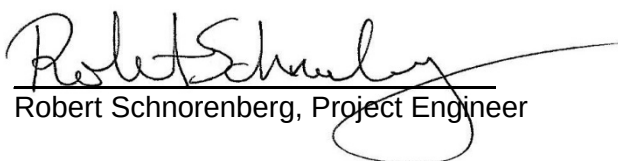
FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NRM-100
1200 New Jersey Ave, SE
Room W43-410
Washington, DC 20590**

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Approval Date: November 29, 2021

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

TECHNICAL REPORT DOCUMENTATION PAGE

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12. Sponsoring Agency Name and Address United States Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NRM-100 1200 New Jersey Ave, SE, Room W43-410 Washington, DC 20590				13. Type of Report and Period Covered: Final Test Report October 7, 2021 to November 29, 2021																											
				14. Sponsoring Agency Code NRM-100																											
15. Supplementary Notes																															
16. Abstract A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2022 Acura MDX 5-Door 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 the MGA Research Corporation facility in Burlington, Wisconsin on October 7, 2021. The impact velocity was 32.21 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.9°C. The test vehicle post-test maximum crush was 296 mm at level 3. The test vehicle's performance was as follows: <table border="1" data-bbox="175 1121 1443 1411"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>549</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>40</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>1887</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>24</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>24</td> </tr> </tbody> </table> *Proposed IARV The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door(s) did not open during the side impact event.						Measurement Description	Units	Driver ATD (SID-IIs)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	549	Resultant Lower Spine Acceleration	g	82	40	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1887	Maximum Thoracic Rib Deflection	mm	38*	24	Maximum Abdomen Rib Deflection	mm	45*	24
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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 1200 New Jersey Ave, SE Washington, DC 20590																											
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SECTION 1 PURPOSE AND SUMMARY OF TEST

PURPOSE

This side pole impact test is part of the MY 2022 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 2022 Acura MDX 5-Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated March 2020.

SUMMARY

A rigid pole side impact test was conducted on a 2022 Acura MDX 5-Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.21 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on October 7, 2021. 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 March 2020. 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
- Head Triaxial Angular Rate Sensors
- 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	Units	Driver ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC36)		1000	549
Resultant Lower Spine Acceleration	g	82	40
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1887
Maximum Thoracic Rib Deflection	mm	38*	24
Maximum Abdomen Rib Deflection	mm	45*	24

*Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	
Side Airbag (Other)				
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	
Other:	No		No	

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

GENERAL COMMENTS

Left Floor Sill Y recorded no valid data after 50 ms.

Left B-Post @ Sill Y recorded no valid data after 37 ms.

Load Cell Pole #8 Fy recorded no valid data.

Low level cyclical noise observed throughout many of the data curves.

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

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20225301	Traction Control System (TCS)	Yes
Model Year	2022	Auto-Leveling System	No
Make	Acura	Automatic Door Locks (ADL)	Yes
Model	MDX	Power Window Auto-Reverse	Yes
Body Style	5-Door SUV	Other Optional Feature	No
VIN	5J8YD9H39NL006252	Driver Front Airbag	Yes
Body Color	Platinum White Pearl	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	19 km / 12 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.5 L	Driver Torso Airbag	No
Type/No. Cylinders	V6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	10	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	FWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	Yes	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	Yes
		Other Safety Restraint	N/A

Does owner's manual provide instruction to turn off automatic door locks?	Yes
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DATA FROM CERTIFICATION LABEL

Manufactured By	HONDA DEVELOPMENT & MANUFACTURING OF AMERICA, LLC	GVWR (kg)	2540
Date of Manufacture	08/21	GAWR Front (kg)	1325
Vehicle Type	MPV	GAWR Rear (kg)	1255

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	2	7	
Capacity Weight (VCW) (kg)				532	(A)
DSC x 68.04 kg				476	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				56	(A-B)

VEHICLE SEAT TYPE

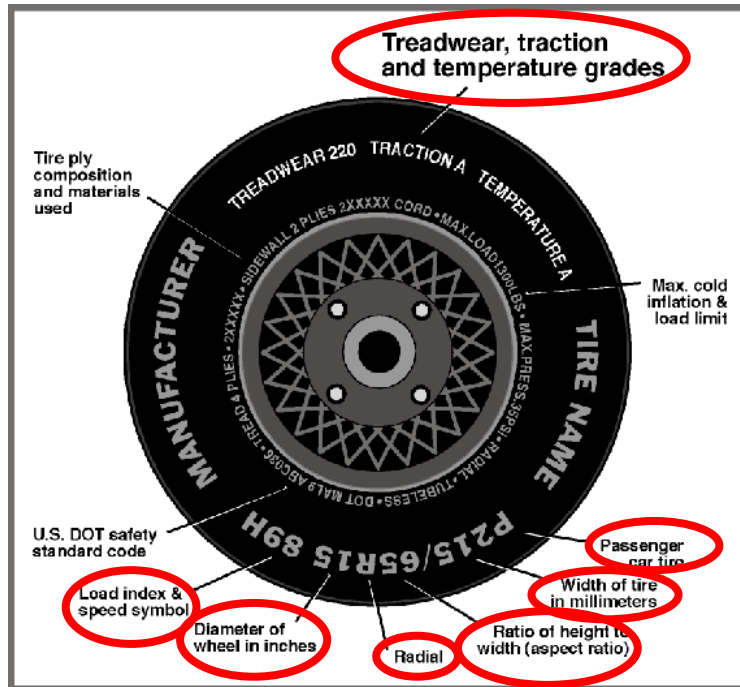
Seating Location	Type of Seat Pan				Type of Seat Back	
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable
						w/ Lever w/ Knob
Front Seat	X					X
Rear or Second Row			X			X
Third Row Seat			X		X	

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

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
 Test Date: 10/7/2021

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	255/55R19	255/55R19
Tire Size on Vehicle	255/55R19	255/55R19
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Alenza Sport	Alenza Sport
Treadwear	700	700
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	107H	107H
Tire Material	Rubber	Rubber
DOT Safety Code Left	1W2 P6ALB1 1021	1W2 P6ALB1 1021
DOT Safety Code Right	1W2 P6ALB1 1021	1W2 P6ALB1 1021

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

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
 Test Date: 10/7/2021

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	220	220	220	220
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

TEST AXLE VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	575.5	407.0		596.0	452.5		593.5	458.0	
Right	kg	573.0	374.0		572.5	409.5		571.5	414.5	
Ratio	%	59.5%	40.5%		57.5%	42.5%		57.2%	42.8%	
Totals	kg	1148.5	781.0	1929.5	1168.5	862.0	2030.5	1165.0	872.5	2037.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1929.5	(A)
Actual Weight of 1 P572 ATD (SID-IIs) Used	kg	52	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	56	(C)
Calculated Test Vehicle Target Weight (TVTW)	kg	2037.5	(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-back)*	deg	-1.0	-0.7	-0.6	Yes
Front Pass. Door Sill Angle (front-to-back)*	deg	-0.5	-0.6	-0.6	Yes
Front Bumper Angle (left-to-right)**	deg	0.1	0.0	0.0	Yes
Rear Bumper Angle (left-to-right)**	deg	0.3	-0.2	-0.4	Yes
Vehicle CG (Aft of Front Axle)	mm	1170	1227	1238	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	16	28	28	

* 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	Units	Weight
Weight of Ballast Added	kg	10
Components Removed: none	kg	

Test height adjustable suspension setting, if applicable:	Not Applicable
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DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm Target	1022
Aft 25 mm Target	1015

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

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
 Test Date: 10/7/2021

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	27.0	15.2	21.1
Front Passenger Seat	26.6	15.0	20.8
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 SCRIP Height (mm)	SCRIP Height Position	SCRIP Height (mm)		
				Rear-Most	Mid	Forward-Most
Driver Seat	21.1	26	Max	52	52	52
			Mid	26	26	26
			Min	0	0	0
Front Passenger Seat	20.8	26	Max	52	52	52
			Mid	26	26	26
			Min	0	0	0
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: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

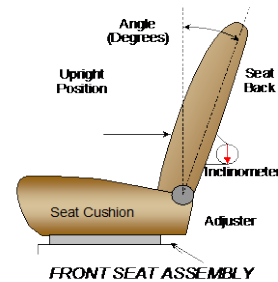
NHTSA No.: O20225301
 Test Date: 10/7/2021

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1 st as 1)	mm	Detent (1 st as 0)
Driver Seat	240		0	
Front Passenger Seat	200		0	
Front Center Seat				
Struck Side Rear Seat	150	16	150	15
Non-Struck Side Rear Seat	150	16	150	15
Rear Center Seat	150	16	150	15

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 S1 – Vehicle Setup Information 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 (1 st as 1)	Degrees	Detent (1 st as 0)
Driver Seat	70.6		-3.5	
Front Passenger Seat	61.4		-3.5	
Front Center Seat				
Struck Side Rear Seat	13.9	8	5.2	0
Non-Struck Side Rear Seat	13.9	8	5.2	0
Rear Center Seat	13.9	8	5.2	0

All seat back angles measured on outboard headrest post.

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on S1 – Vehicle Setup Information.

	Total # of Positions	Placed in Position #
Driver Seat	4	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	6	0 (Lowest as 0) / Forward

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

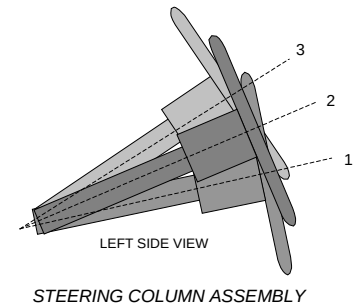
Test Vehicle: 2022 Acura MDX 5-Door SUV
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NHTSA No.: O20225301
 Test Date: 10/7/2021

STEERING COLUMN ADJUSTMENT

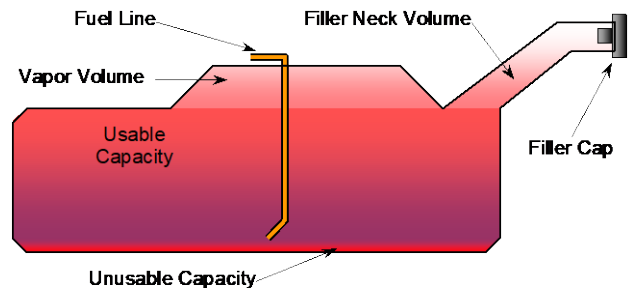
Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	70.6	
Geometric Center, Position 2	67.7	
Uppermost, Position 3	64.7	
Telescoping Steering Wheel Travel		63
Test Position	67.7	32



FUEL PUMP

The vehicle is equipped with an electronic fuel pump. With IG2 ignition position, the fuel pump will run for less than 5 seconds. With vehicle running, the fuel pump will continue to run. The filler neck is located on the driver's side.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY DATA

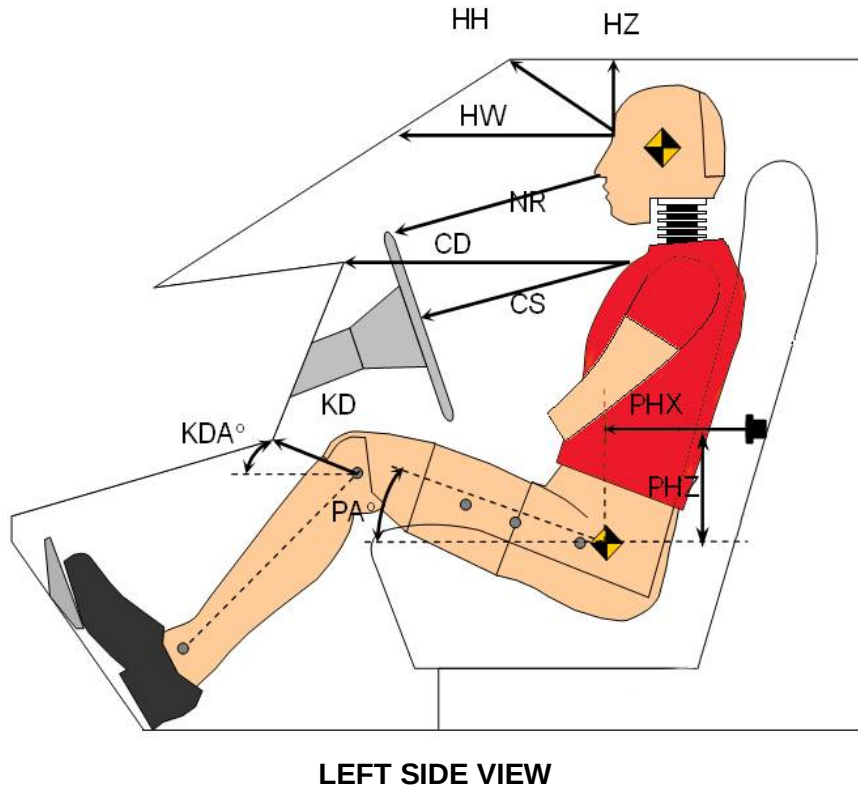
	Liters
Usable Capacity of Standard Tank (see S1 – Vehicle Setup Information)	70.0
Usable Capacity of Optional Tank (see S1 – Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	70.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	65.1
Actual Amount of Solvent Used	65.1
1/3 of Usable Capacity	23.3

Is the actual amount of solvent used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in S1 – Vehicle Setup Information? **YES**

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

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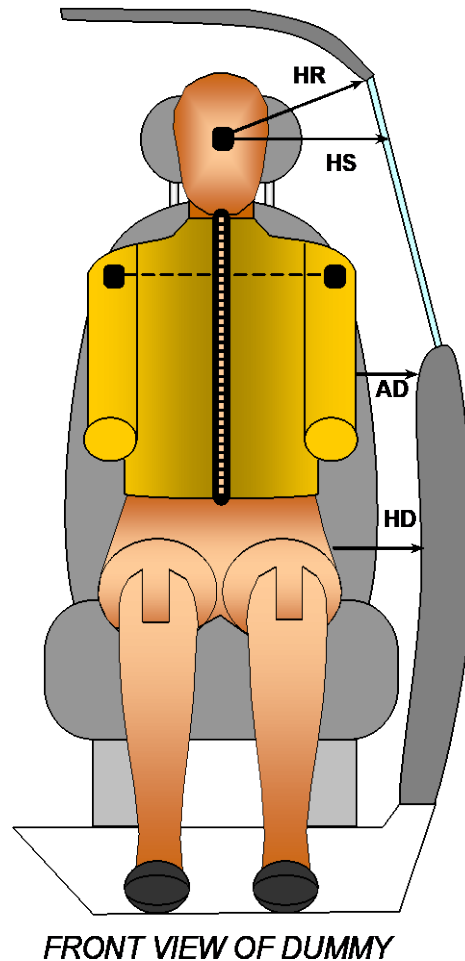


Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	252	
HW	Head to Windshield	545	
HZ	Head to Roof Liner	160	
NR	Nose to Rim/Seat Back	226	
CD	Chest to Dashboard/Seat Back	413	
CS	Chest to Steering Wheel	175	
KDL / KDAL	Left Knee to Dash/Seat Back	127	39.5
KDR / KDAL	Right Knee to Dash/Seat Back	124	37.2
PAX	Pelvic Tilt Angle X		21.1
PAY	Pelvic Tilt Angle Y		-0.6
PHX	Hip Point to Striker (X-Axis)	326	
PHZ	Hip Point to Striker (Z-Axis)	177	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

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 Test Date: 10/7/2021

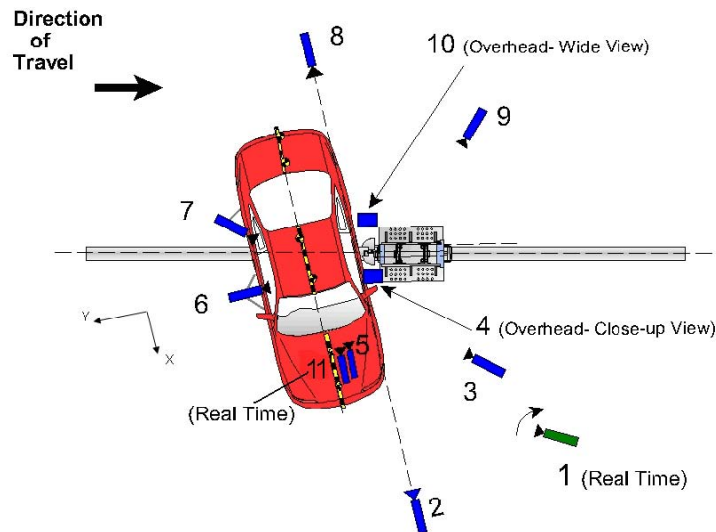


Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	233
HS	Head to Side Window	370
AD	Arm to Door	177
HD	Hip Point to Door	234

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021



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

No.	Camera View	Coordinates* (mm)			Lens (mm)	Frame Rate (fps)
		X	Y	Z		
1	Real-Time Pan View					30
2	Front Ground Level	5990	-45	-1850	24	1000
3	Impact Side 45° Forward	4165	-1790	-1835	12	1000
4	Overhead Closeup	0	0	-6700	85	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	-6405	-30	-1880	24	1000
9	Impact Side 45° Rearward	-2880	-3240	-1905	12	1000
10	Overhead Wide View	-300	495	-6540	12	1000
11	Real-Time Dummy Front View					30

*All measurements accurate to ± 6 mm

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

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

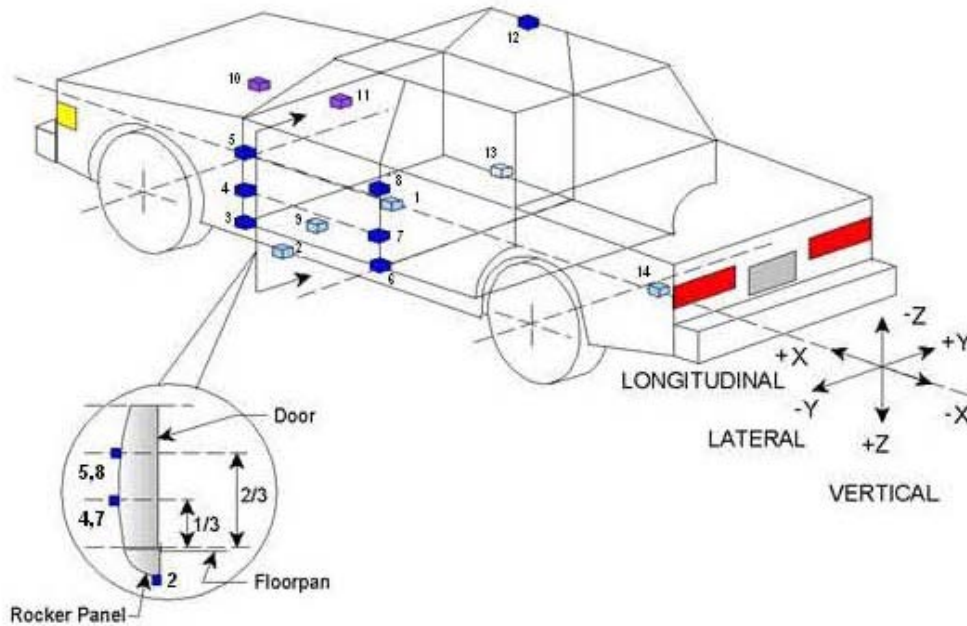
INSTRUMENTATION

	Number of Channels
Driver Dummy	19
Vehicle Structure	18
Pole Load Cells	8
Total	45

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021



TEST VEHICLE ACCELEROMETER LOCATIONS

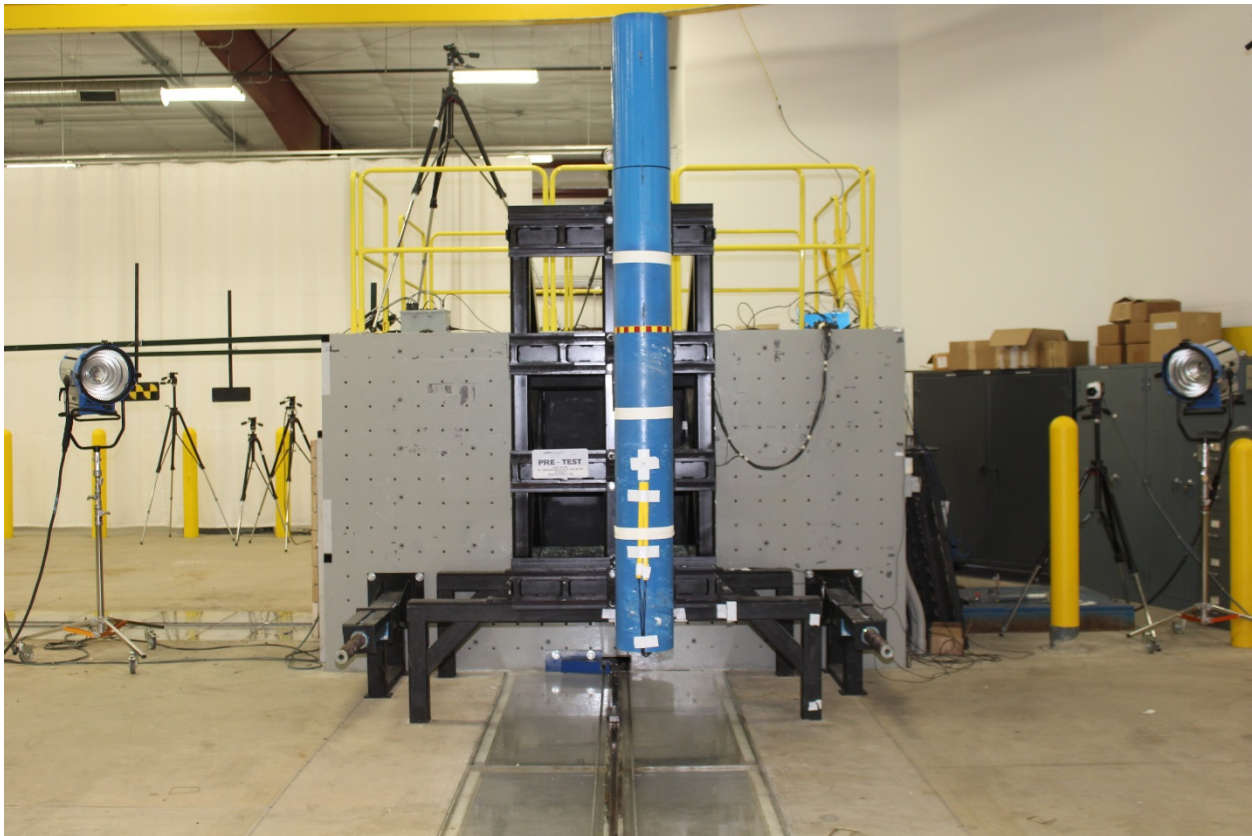
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2711	0	-395
2	Left Floor Sill	3151	800	-291
3	A Pillar Sill	3456	800	-290
4	A Pillar Low	3407	910	-660
5	A Pillar Mid	3405	910	-882
6	B Pillar Sill	2366	800	-292
7	B Pillar Low	2338	768	-680
8	B Pillar Mid	2338	768	-890
9	Driver Seat Track	2430	406	-395
10	Engine Top	4253	40	-1049
11	Firewall	3903	50	-1021
12	Right Roof	2456	520	-1665
13	Right Floor Sill	3149	800	-280
14	Rear Floorpan	1158	10	-564

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: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021



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: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Driver Dummy (SID-IIs)
Face	Curtain Airbag, Headrest
Top of Head	Curtain Airbag, Headrest
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Side Torso/Pelvis Airbag
Upper Torso	Seatback
Lower Torso	Side Torso/Pelvis Airbag, Seatback
Left Hip	Side Torso/Pelvis Airbag, Seatback, Seat Cushion
Left Knee	None

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch
	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)					

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	Cracked
Side Window Damage	LF window cracked
Other Notable Effects	Driver seatback reclined during/after event

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

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

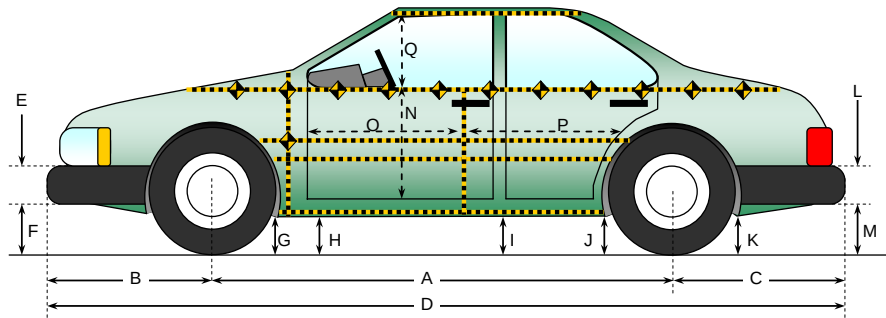
SPEED, ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1120
Actual Impact Point (Aft of Front Axle)	mm		1126
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	-6
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	75.1
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.21
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.16

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
Test Date: 10/7/2021



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

LEFT SIDE VIEW

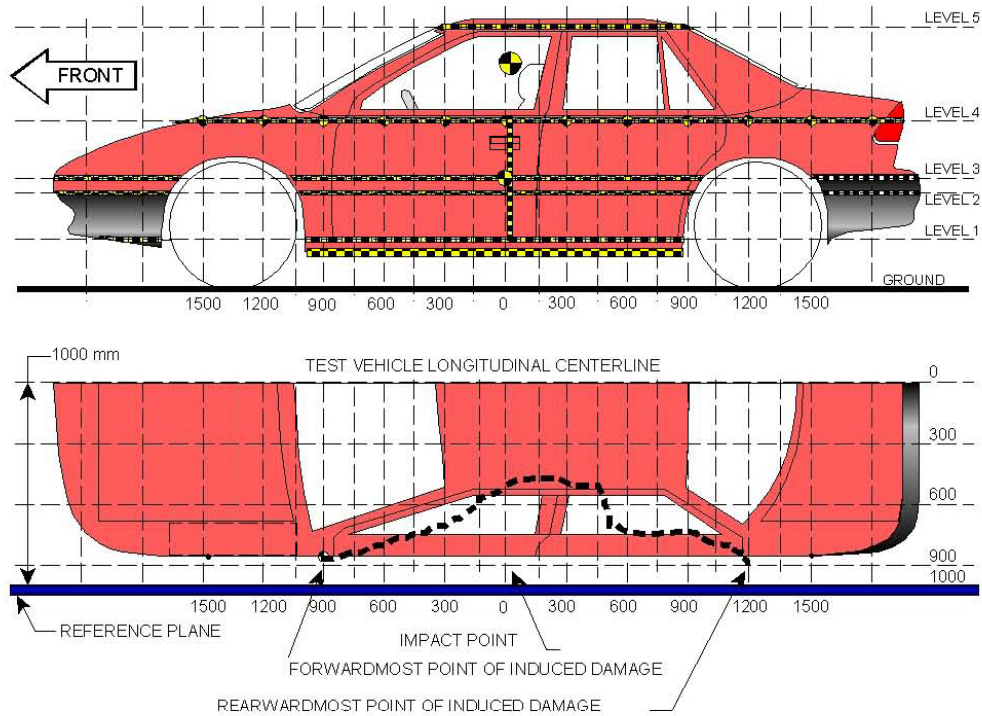
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2890	2840	50
B	Front Axle to FSOV	1007	1074	-67
C	Rear Axle to RSOV	1097	1038	59
D	Total Vehicle Length at Centerline	4994	4952	42
E	Front Bumper Thickness	131	131	0
F	Front Bumper Bottom to Ground	276	283	-7
G	Sill Height at Front Wheel Well	260	265	-5
H	Sill Height at Front Door Leading Edge	254	260	-6
I	Sill Height at B-Pillar	270	282	-12
J1	Sill Height at Rear Wheel Well	277	288	-11
J2	Pinch Weld Height at Rear Wheel Well	258	272	-14
K	Sill Height Aft of Rear Wheel Well	304	298	6
L	Rear Bumper Thickness	90	90	0
M	Rear Bumper Bottom to Ground	370	348	22
N	Sill Height to Bottom of Front Window Sill	821	818	3
O	Front Door Leading Edge to Impact CL	619	605	14
P	Rear Door Trailing Edge to Impact CL	1422	1411	11
Q	Front Window Opening	420	389	31
R	Right Side Length	4127	4135	-8
S	Left Side Length	4127	4060	67
T	Vehicle Width at B-Pillars	2008	1989	19
U	Front Wheel Track Width	1714		
V	Rear Wheel Track Width	1724		

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

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
 Test Date: 10/7/2021



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	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	389	264	0
2	Mid Door	708	288	75
3	Occupant H-Point	734	289	75
4	Window Sill	1091	273	75
5	Window Top	1600	79	75

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

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
 Test Date: 10/7/2021

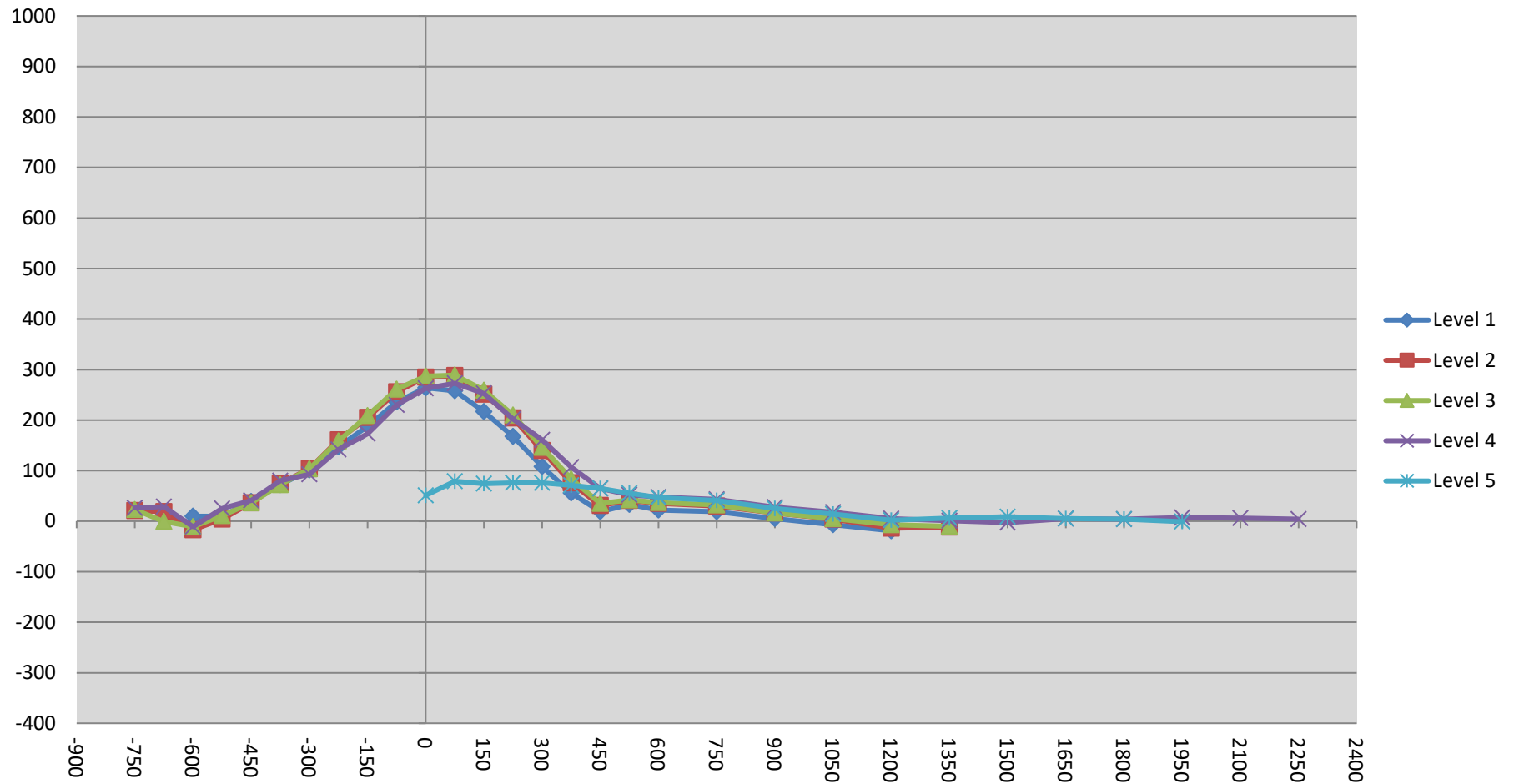
Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2700															
-2550															
-2400															
-2250															
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900															
-825															
-750		103	102	215			124	125	241			21	23	26	
-675		104	104	210			123	103	239			19	-1	29	
-600	129	106	106	217		139	89	95	206		10	-17	-11	-11	
-525	128	109	109	200		138	113	120	225		10	4	11	25	
-450	128	112	112	196		167	148	148	237		39	36	36	41	
-375	128	115	115	192		200	189	187	272		72	74	72	80	
-300	129	118	119	187		230	222	223	280		101	104	104	93	
-225	129	120	120	182		276	281	279	324		147	161	159	142	
-150	129	123	123	179		317	328	332	352		188	205	209	173	
-75	129	125	124	173		365	381	385	403		236	256	261	230	
0	130	127	126	168	446	394	412	413	431	497	264	285	287	263	51
75	131	128	127	162	429	389	416	416	435	508	258	288	289	273	79
150	132	129	128	158	418	349	380	387	411	492	217	251	259	253	74
225	132	130	128	155	414	300	334	338	357	490	168	204	210	202	76
300	133	130	128	152	412	241	270	274	313	488	108	140	146	161	76
375	133	129	128	149	410	189	205	212	256	481	56	76	84	107	71
450	133	128	127	147	412	152	159	162	212	477	19	31	35	65	65
525	133	128	126	144	412	166	169	168	196	467	33	41	42	52	55
600	135	126	124	144	412	157	161	161	192	459	22	35	37	48	47
675															
750	137	122	120	144	413	156	152	152	187	454	19	30	32	43	41
825															
900	135	115	115	146	413	140	131	131	174	438	5	16	16	28	25
1050	130	110	110	148	415	123	114	115	166	429	-7	4	5	18	14
1200	124	104	104	152	420	105	90	97	157	422	-19	-14	-7	5	2
1350		100	99	158	426		88	89	159	432		-12	-10	1	6
1500				164	439				161	448				-3	9
1650				169	456				174	461				5	5
1800				178	486				182	490				4	4
1950				187	530				194	529				7	-1
2100				196					202					6	
2250				211					215					4	
2400															
2550															
2700															

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

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

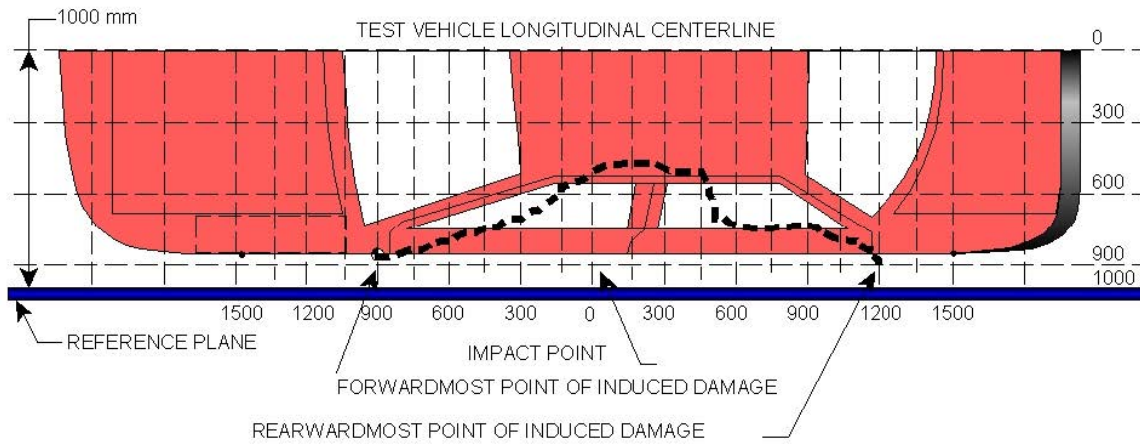
NHTSA No.: O20225301
Test Date: 10/7/2021



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

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
 Test Date: 10/7/2021



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	470	3	127	180	53
2	251	3	128	315	187
3	32	3	126	422	296
4	-187	3	122	303	181
5	-406	3	114	171	57
6	-625	3	105	125	20

DATA SHEET NO. 11
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2022 Acura MDX 5-Door SUV
Test Program: NCAP Side Pole Impact Test

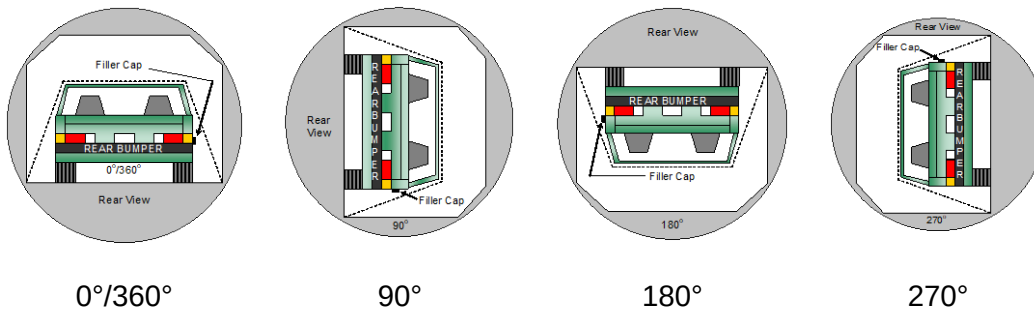
NHTSA No.: O20225301
Test Date: 10/7/2021

Test Time: 11:27 am

Temperature: 21.9°C

- A. From impact until vehicle motion ceases: (Maximum Allowable = 1 ounce) 0.0 oz.
B. For the 5 minute period after motion ceases: (Maximum Allowable = 5 ounces) 0.0 oz.
C. For the following 25 minutes: (Maximum Allowable = 1 ounce / minute) None
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°	110	300	410
90° to 180°	112	300	412
180° to 270°	107	300	407
270° to 360°	112	300	412

FMVSS 301 ROLLOVER SPILLAGE TABLE (UNITS IN OUNCES)

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0.0	0.0	0.0	
90° to 180°	0.0	0.0	0.0	
180° to 270°	0.0	0.0	0.0	
270° to 360°	0.0	0.0	0.0	

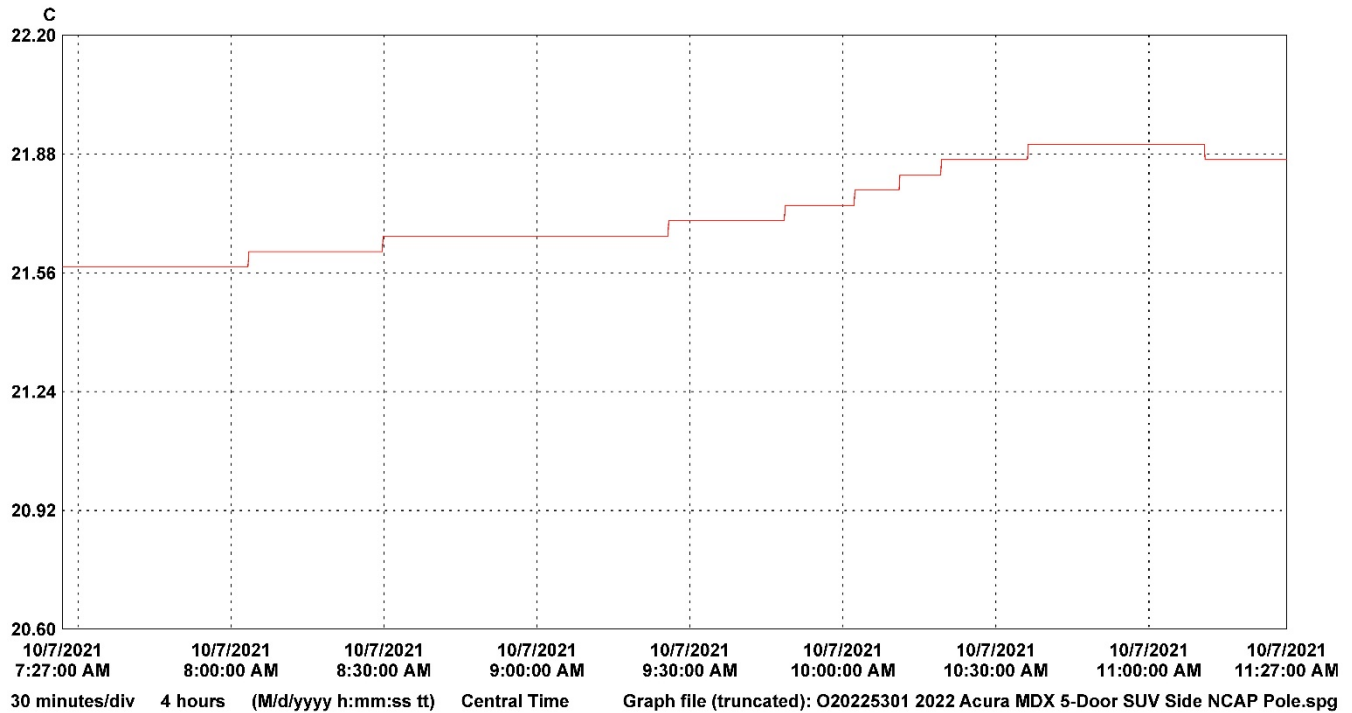
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 12
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2022 Acura MDX 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225301
 Test Date: 10/7/2021



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	17012040	VSC_South_Hall	1		21.91	21.72	21.58	C	Temperature	17012040_VSC_South_Hall.spl

**APPENDIX A
PHOTOGRAPHS**

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Photo No. 001 - As Delivered Right Front Three-Quarter View of Test Vehicle



Photo No. 002 - As Delivered Left Rear Three-Quarter View of Test Vehicle

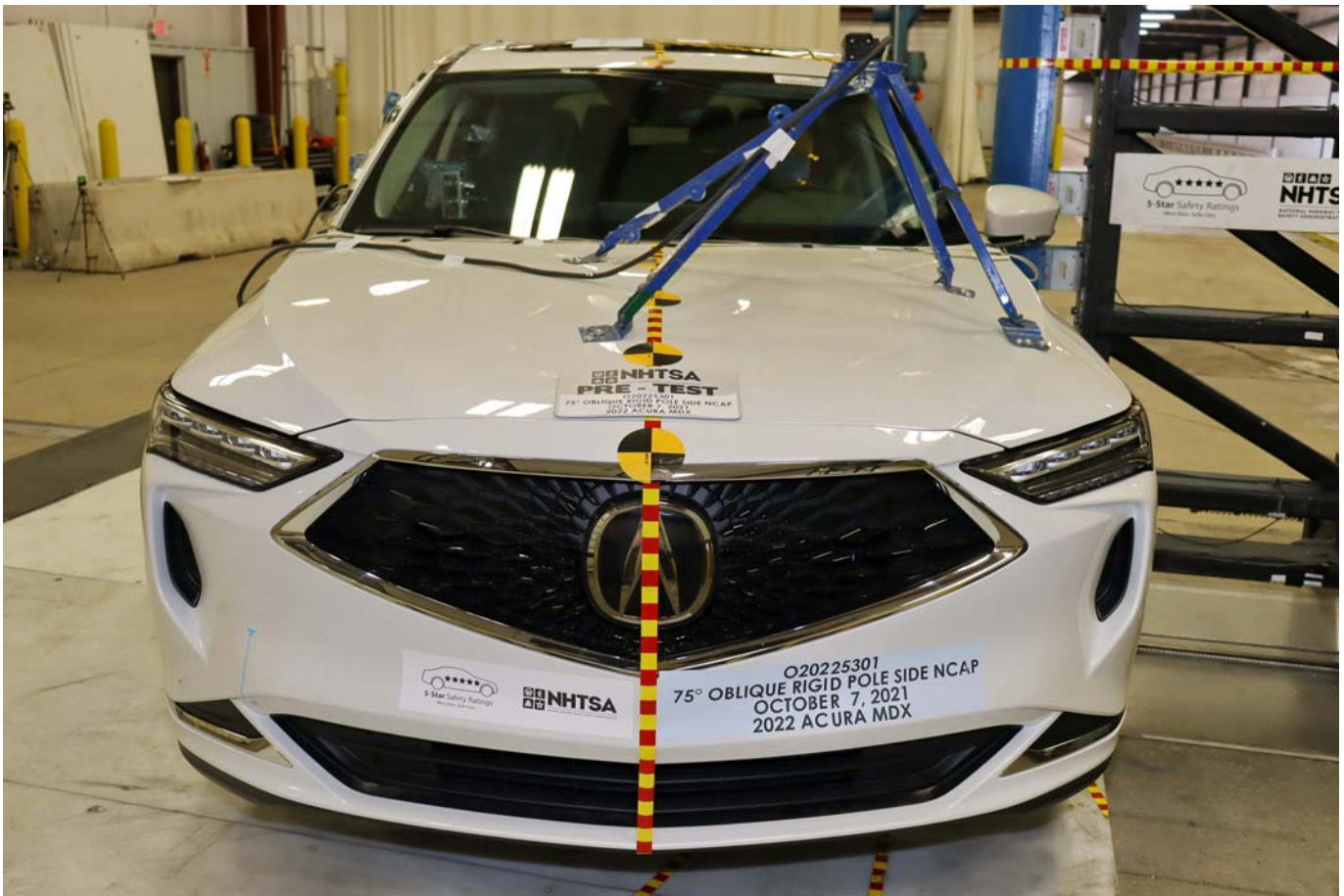


Photo No. 003 - Pre-Test Frontal View of Test Vehicle

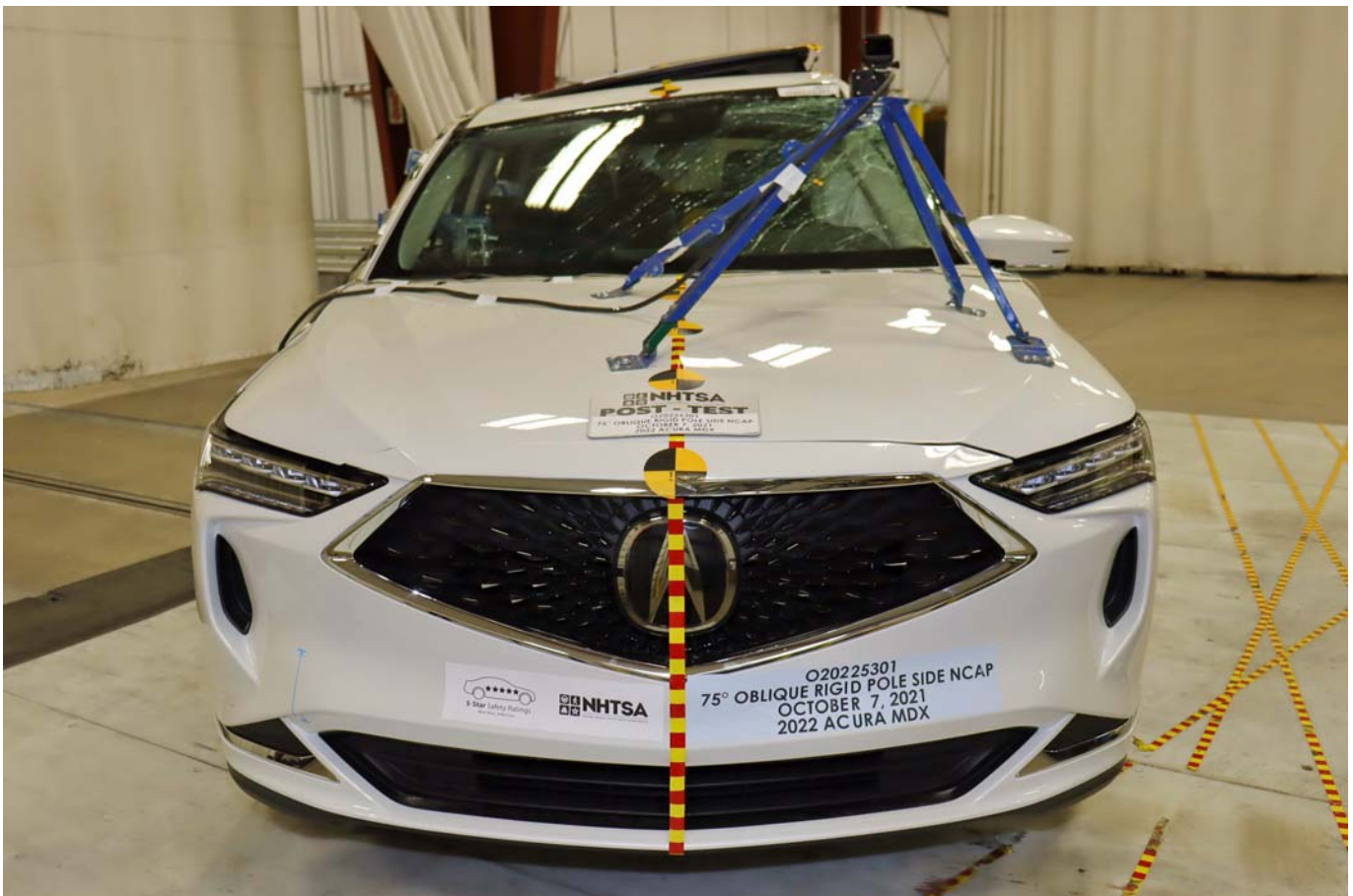


Photo No. 004 - Post-Test Frontal View of Test Vehicle



Photo No. 005 - Pre-Test Left Front Three-Quarter View of Test Vehicle



Photo No. 006 - Post-Test Left Front Three-Quarter View of Test Vehicle

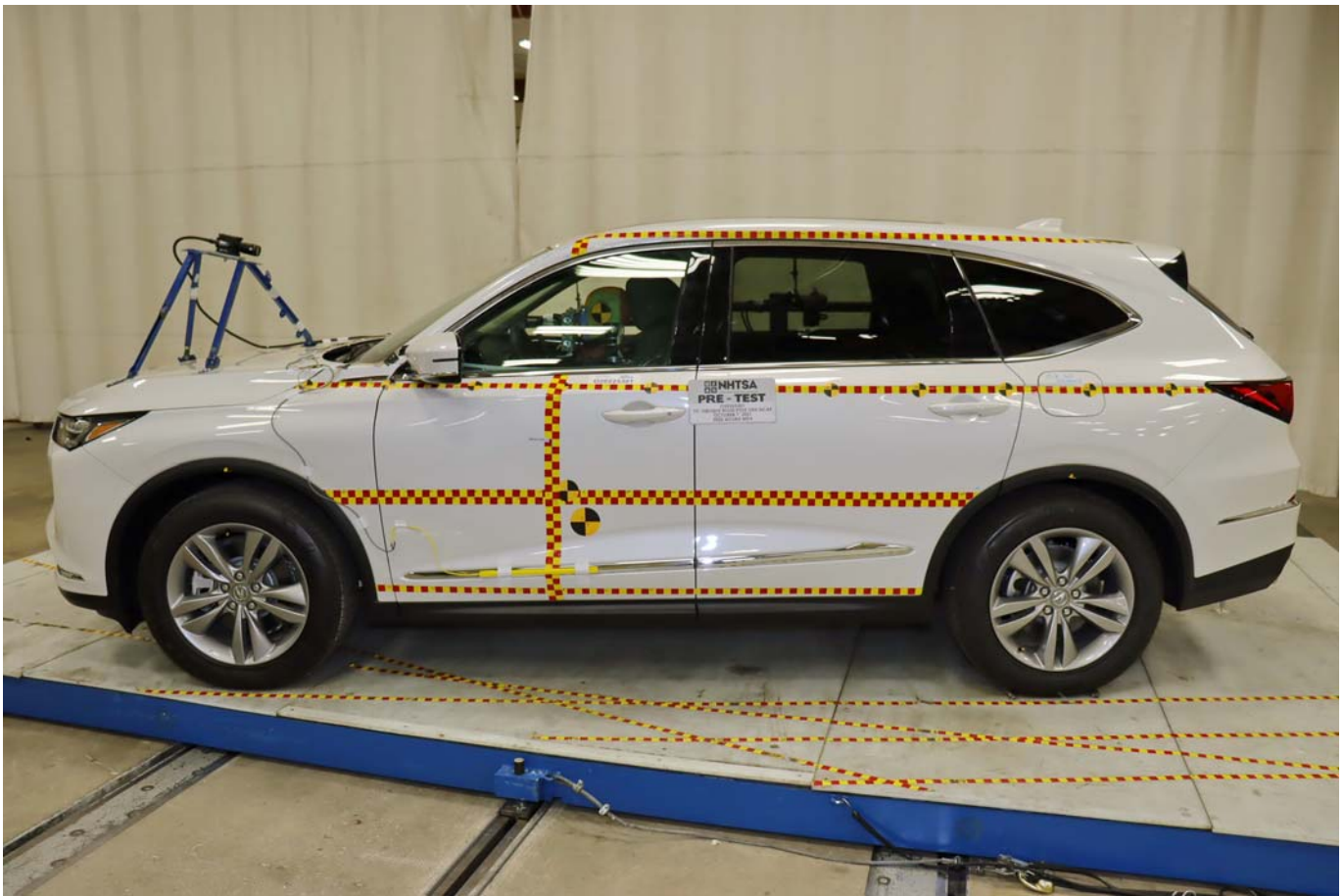


Photo No. 007 - Pre-Test Left Side View of Test Vehicle



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



Photo No. 009 - Pre-Test Left Rear Three-Quarter View of Test Vehicle



Photo No. 010 - Post-Test Left Rear Three-Quarter View of Test Vehicle

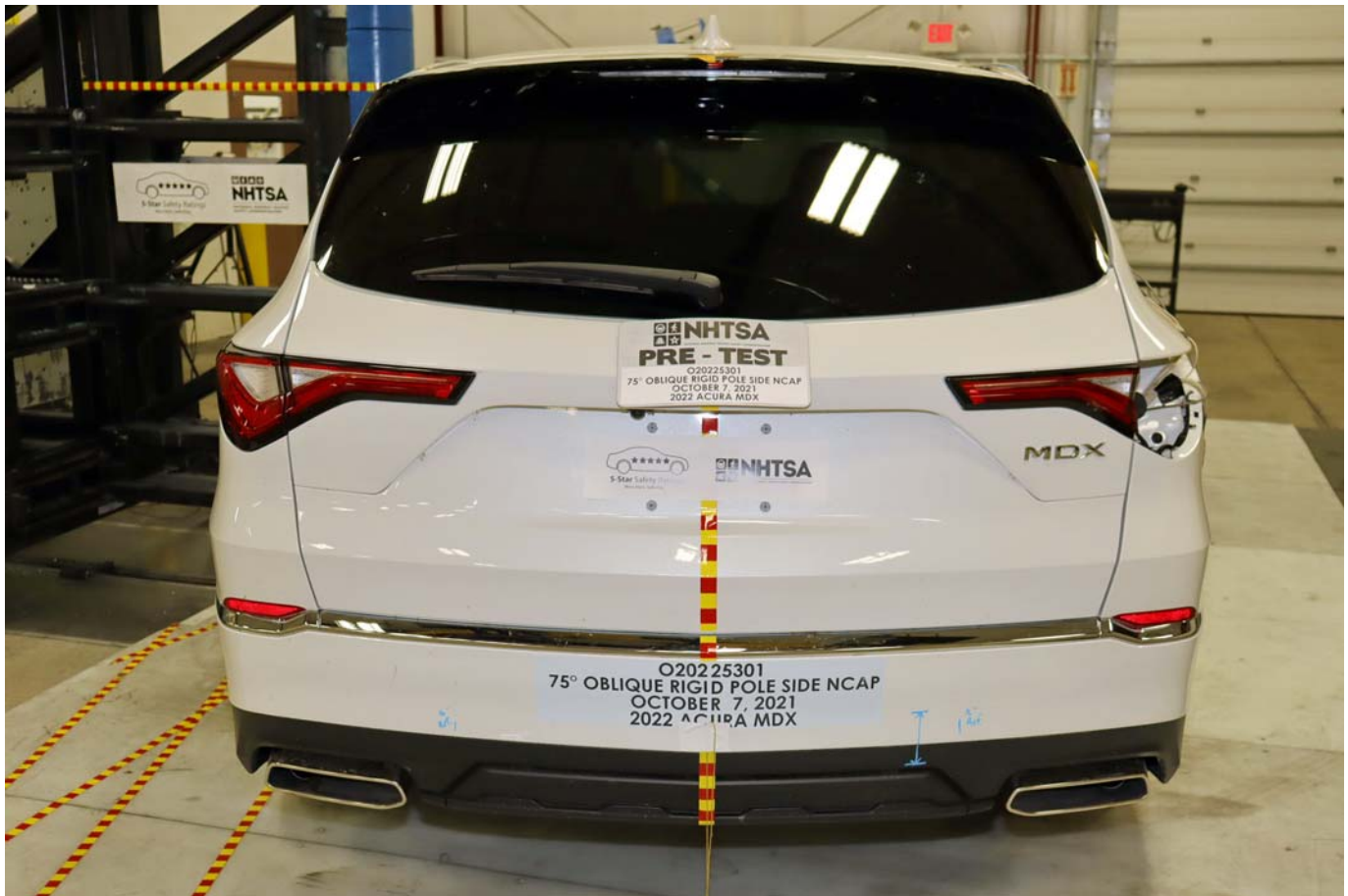


Photo No. 011 - Pre-Test Rear View of Test Vehicle



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

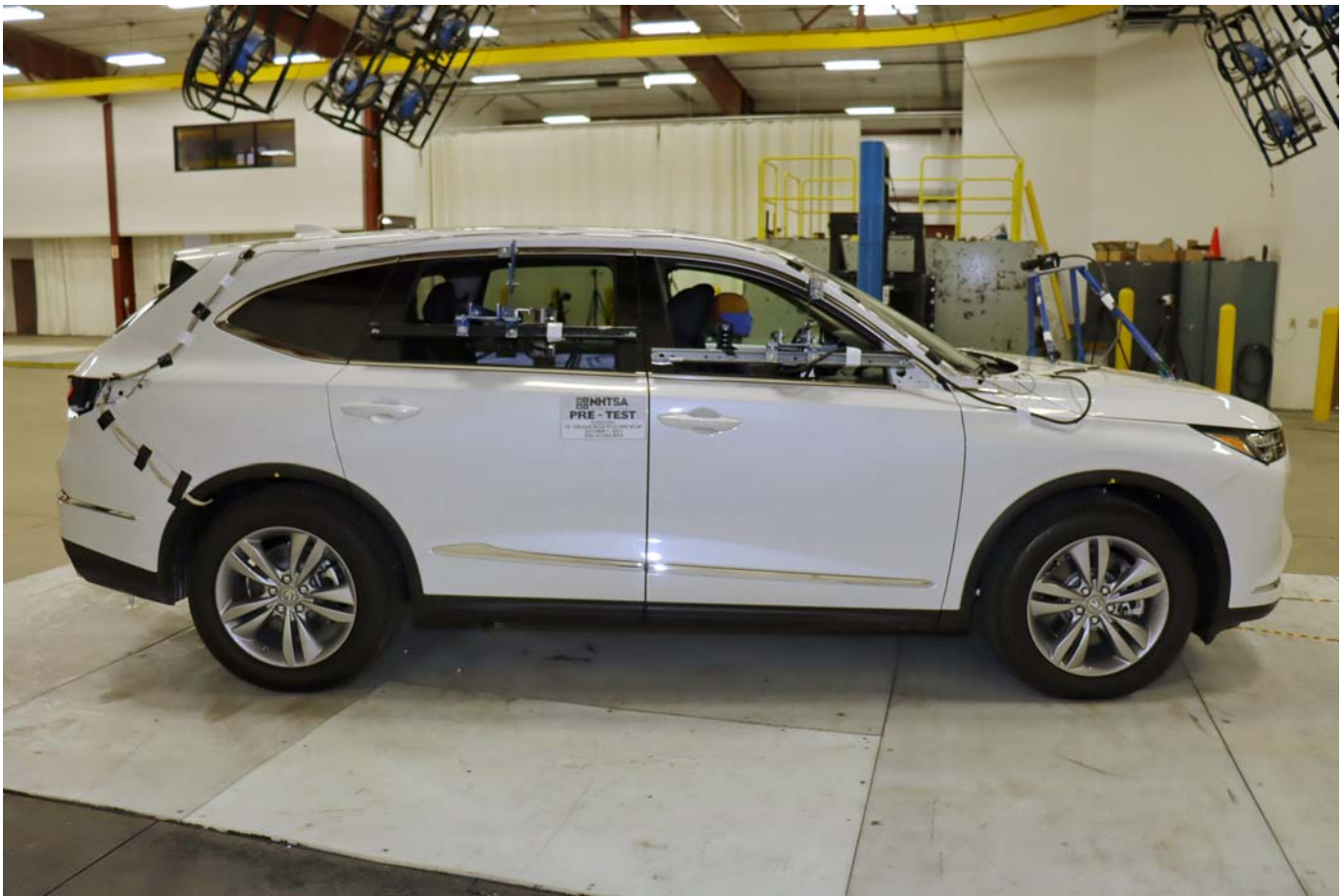


Photo No. 013 - Pre-Test Right Side View of Test Vehicle



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

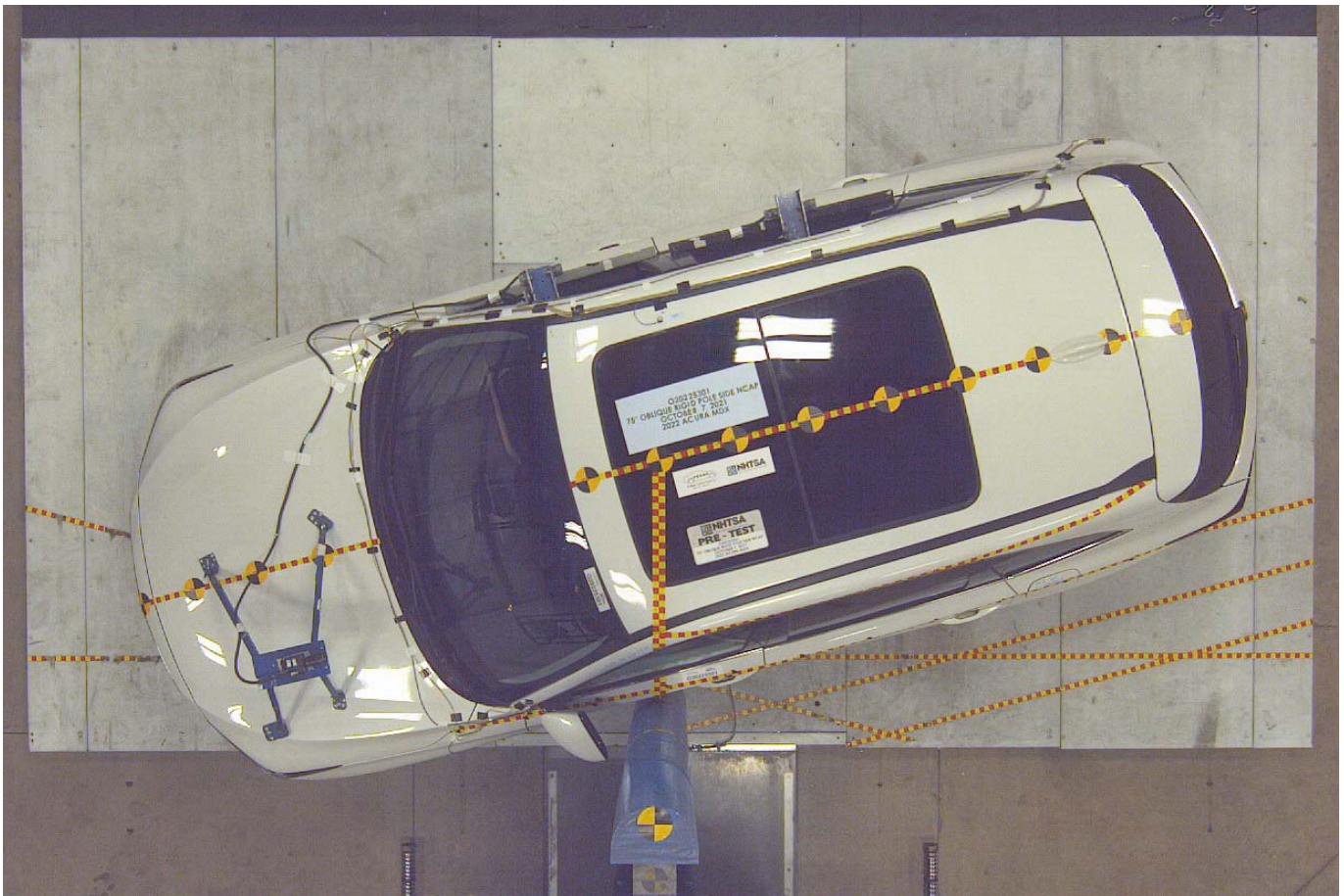


Photo No. 015 - Pre-Test Overhead View of Test Area

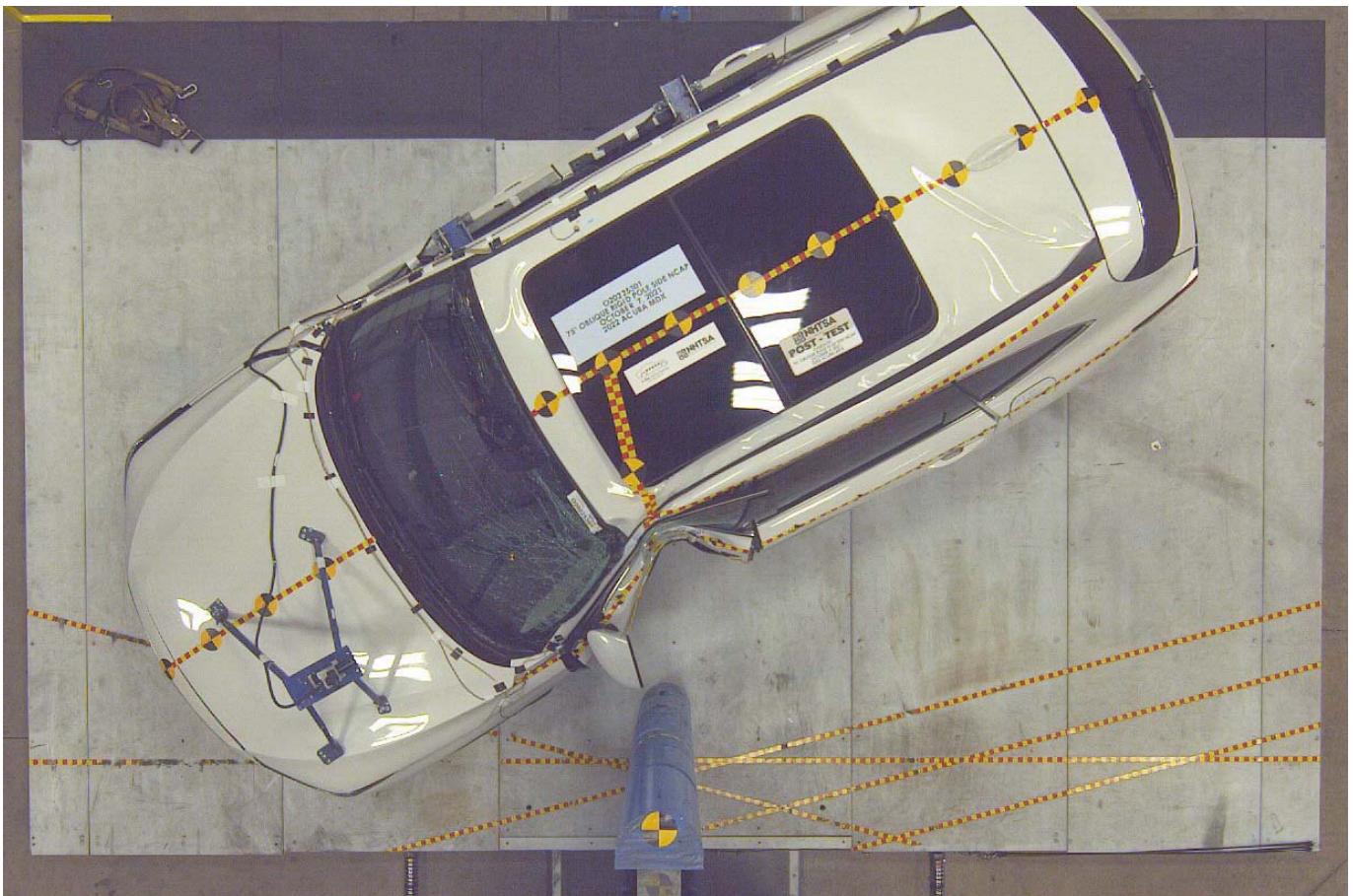


Photo No. 016 - Post-Test Overhead View of Test Area

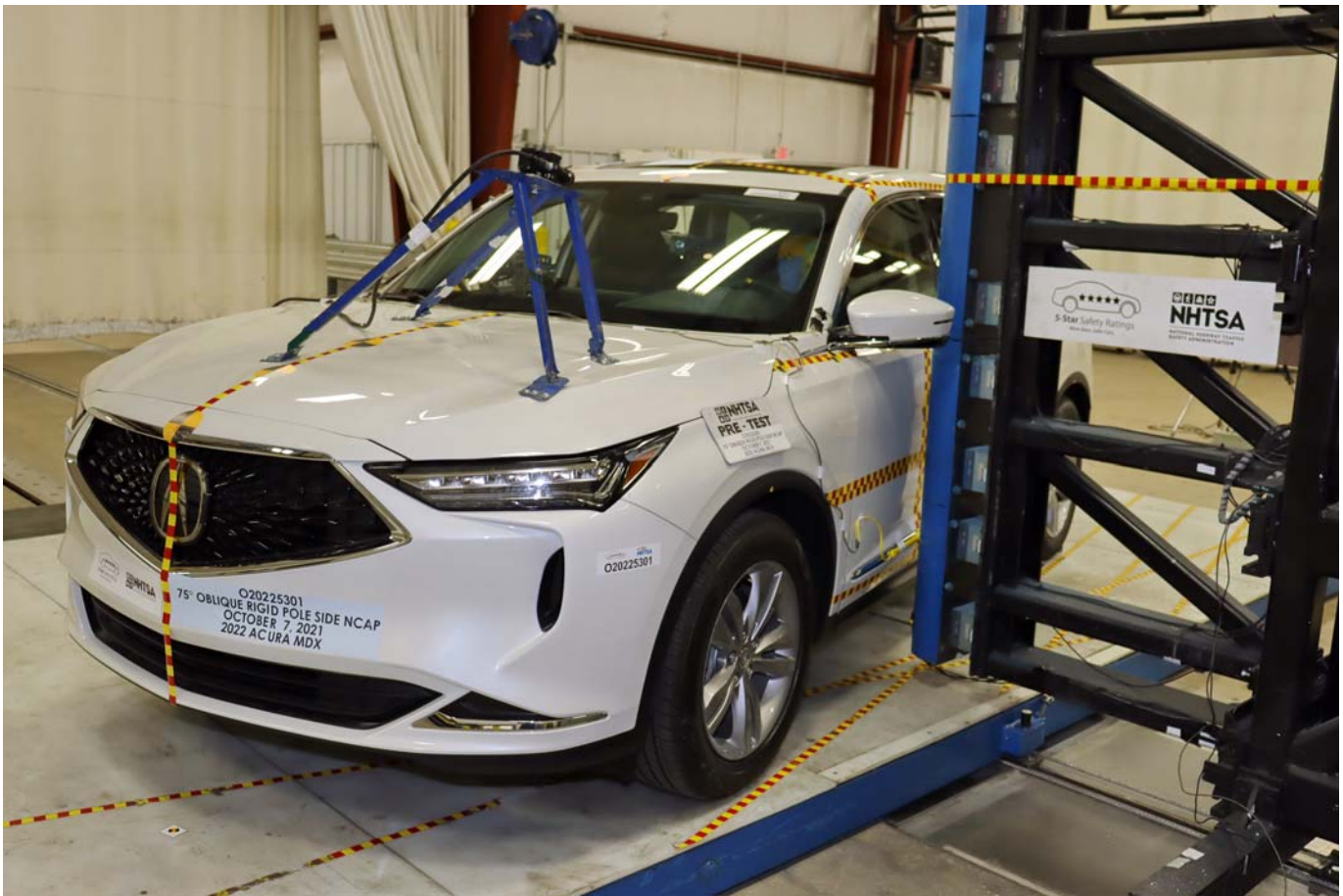


Photo No. 017 - Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



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



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



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



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



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



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



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



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



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



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



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



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



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



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



Photo No. 032 - Pre-Test Placement of Dummy Feet



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



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



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



Photo No. 036 - Pre-Test View of Parking Brake



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

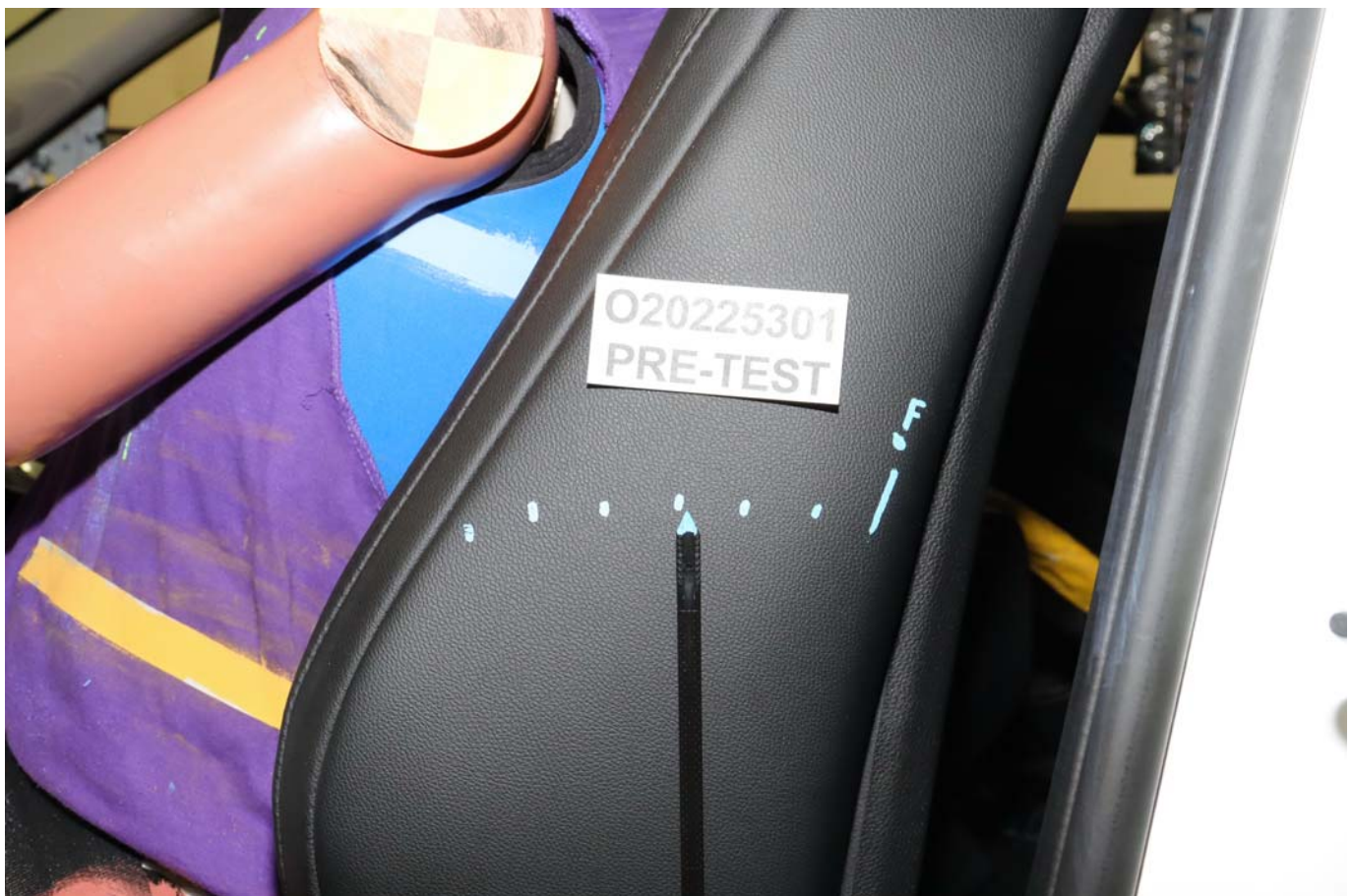


Photo No. 038 - Pre-Test Close-Up Left Side View of Driver Seat Back



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



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



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



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



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

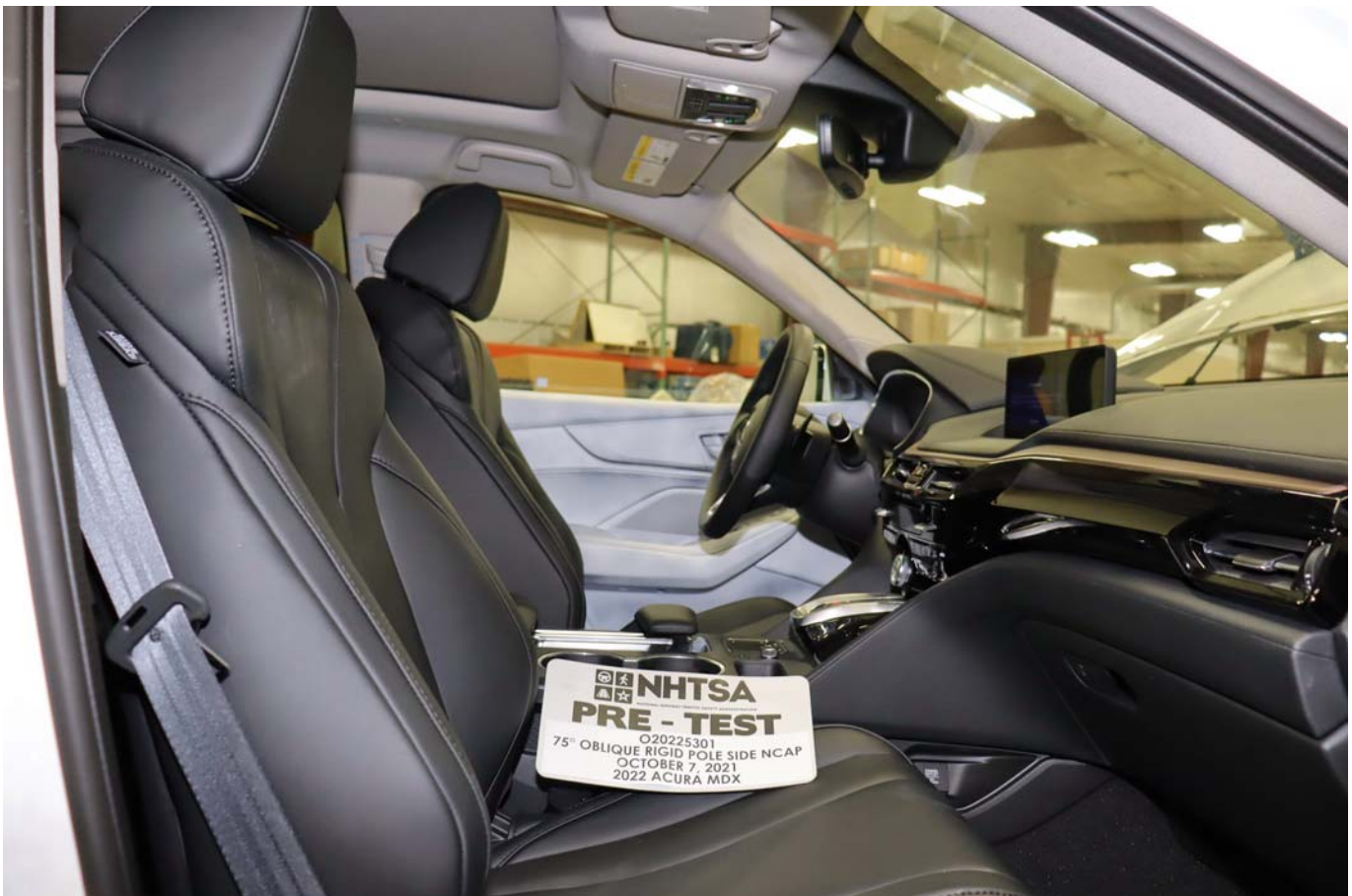


Photo No. 044 - Pre-Test Inner Door Panel View



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



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

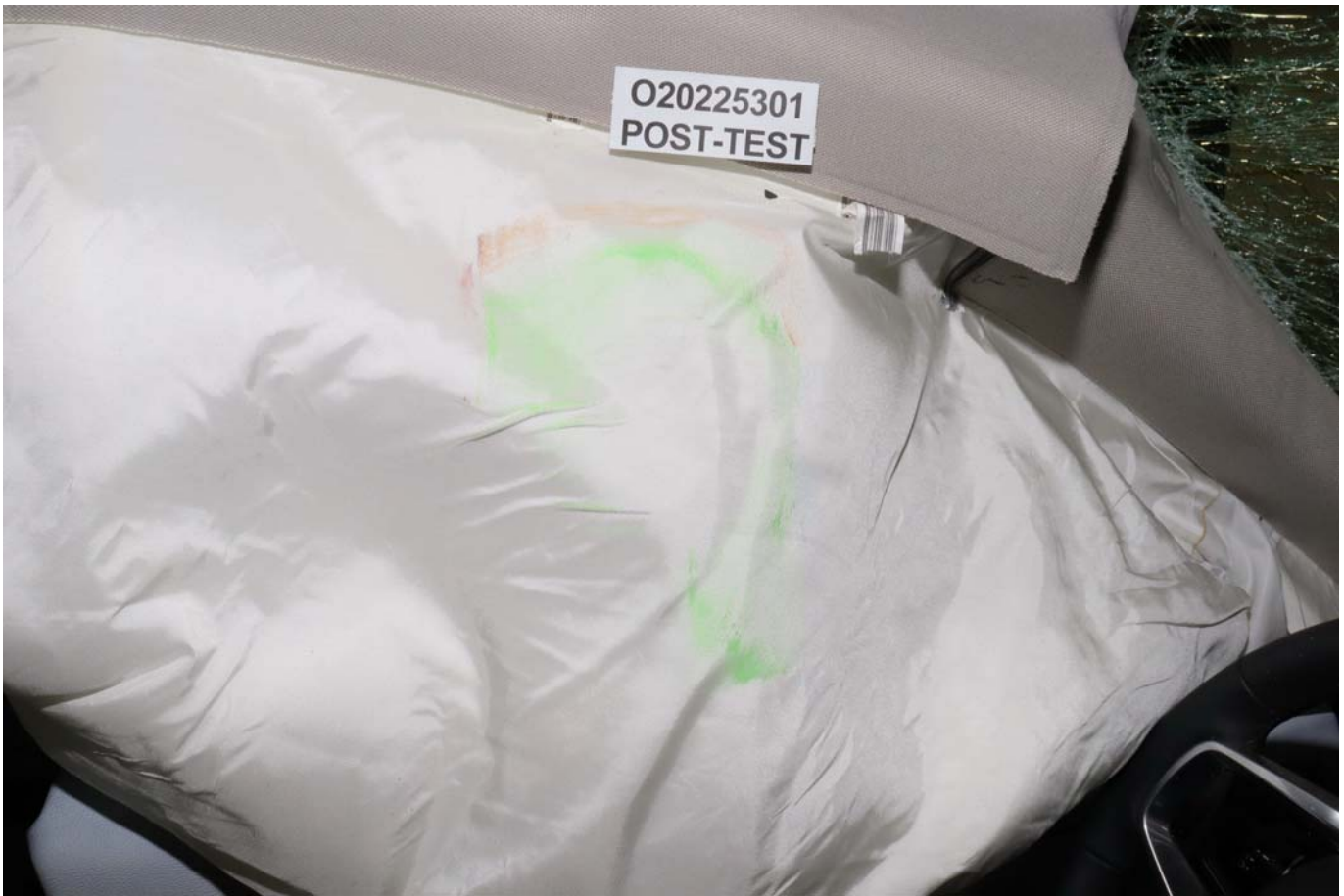


Photo No. 047 - Post-Test Dummy Close-Up Head Contact with Side Air Bag View



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



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



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



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

PHOTOGRAPH NOT APPLICABLE

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



Photo No. 053 - Post-Test Right Side View of Dummy and Rear Seat of Occupant Compartment

PHOTOGRAPH NOT APPLICABLE

Photo No. 054 - Post-Test Inner Rear Passenger Torso Air Bag Deployment View



Photo No. 055 - Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Photo No. 056 - Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Photo No. 057 - Close-Up View of Vehicle Certification Label

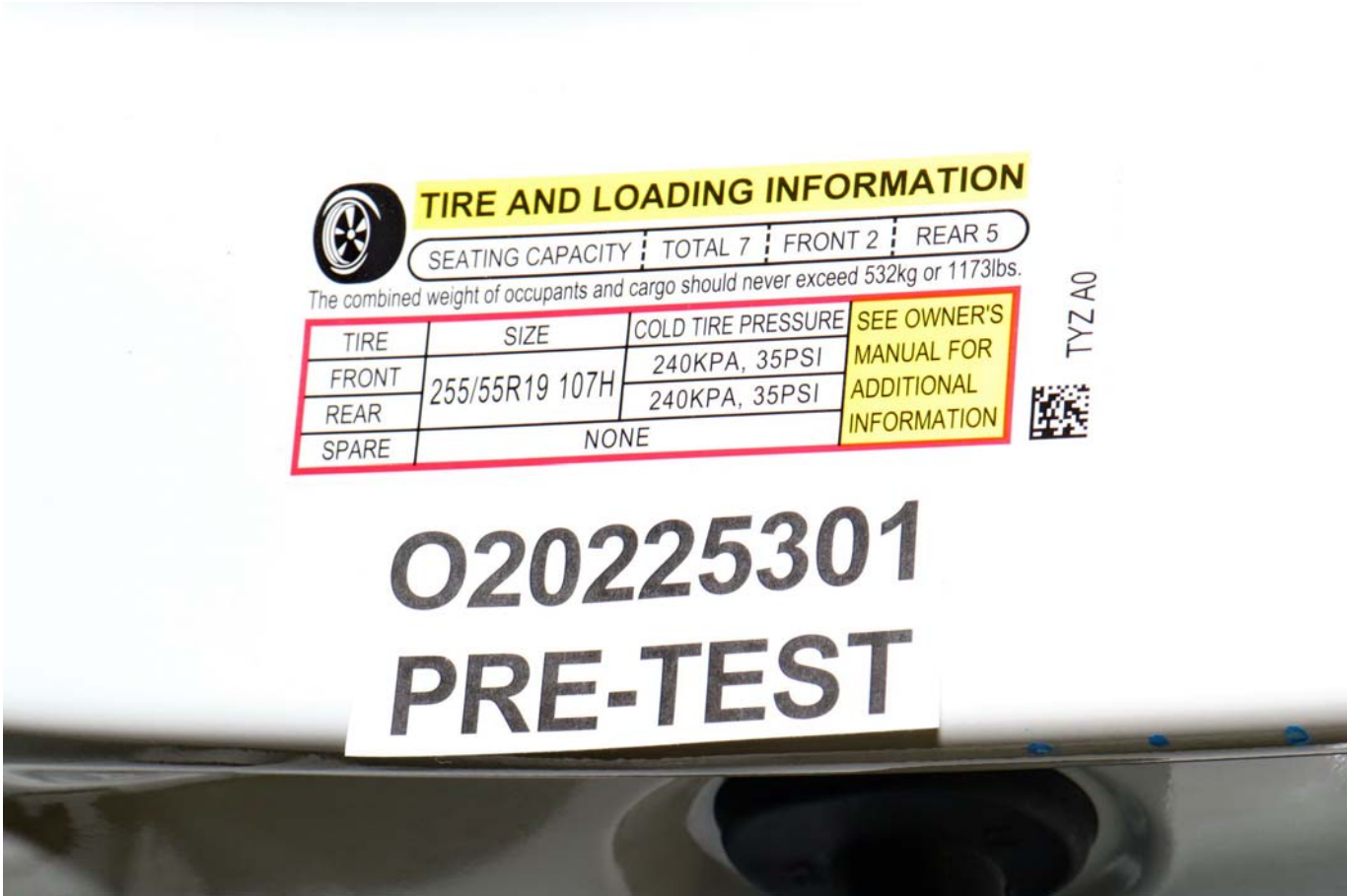


Photo No. 058 - Close-Up View of Vehicle Tire Information Placard or Label



Photo No. 059 - Pre-Test Pole Barrier Front View



Photo No. 060 - Post-Test Pole Barrier Front View



Photo No. 061 - Pre-Test Pole Barrier Side View



Photo No. 062 - Post-Test Pole Barrier Side View



Photo No. 063 - Pre-Test Ballast View

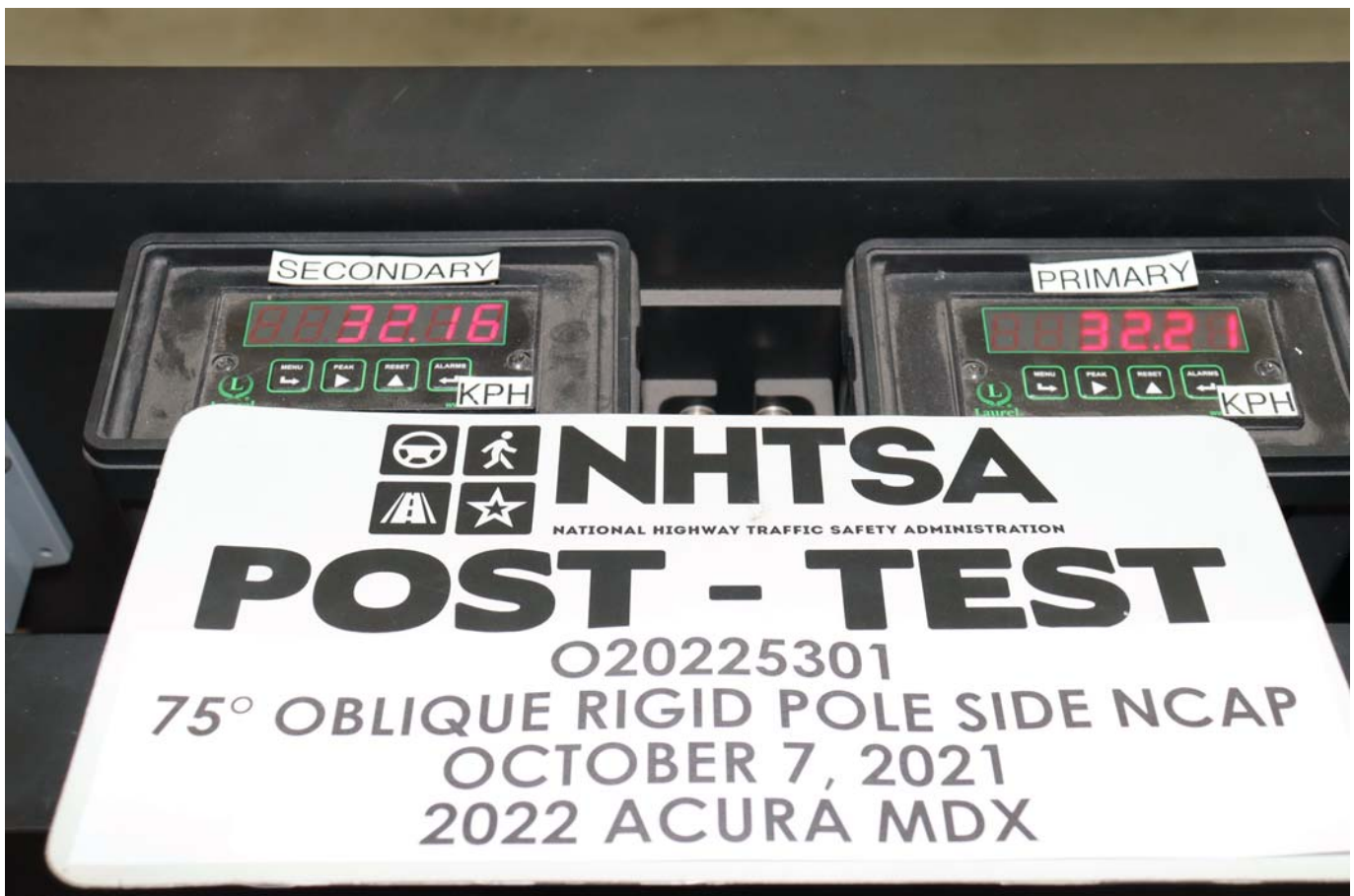


Photo No. 064 - Post-Test Primary and Redundant Speed Trap Read-Out



Photo No. 065 - FMVSS Photo No. 301 Static Rollover 0 Degrees



Photo No. 066 - FMVSS Photo No. 301 Static Rollover 90 Degrees



Photo No. 067 - FMVSS Photo No. 301 Static Rollover 180 Degrees



Photo No. 068 - FMVSS Photo No. 301 Static Rollover 270 Degrees



Photo No. 069 - FMVSS Photo No. 301 Static Rollover 360 Degrees



Photo No. 070 - Impact Event

2022 MDX
EXT: PLATINUM WHITE P
INT: EBONY

ENGINE NUMBER: J35Y5-7682356

STANDARD EQUIPMENT AT NO EXTRA COST

*** TECHNICAL FEATURES ***

- 290hp 3.5-Liter VTEC V6 Engine with Variable Cylinder Management
- 10-Speed Automatic Transmission
- Paddle Shifters
- Electric Power Steering

*** SAFETY FEATURES ***

- Driver's and Front Passenger's Airbags
- Driver's and Front Passenger's Side Airbags
- Side Curtain Airbags with Rollover Sensor
- Driver's and Front Passenger's Knee Airbags
- Vehicle Stability Assist (VSA)
- Anti-Lock Braking System (ABS)
- Electric Parking Brake
- Tire Pressure Monitoring System
- LED Day Time Running Lights
- LATCH System for Child Seats

*** INTERIOR FEATURES ***

- Precision Cockpit - Digital Instrument Panel
- High Resolution Center Display with True Touchpad Interface
- AcuraLink Communication System
- Multi-View Rear Camera
- Acura Premium Sound System with 9 Speakers
- HD Radio
- SiriusXM Satellite Radio
- Bluetooth HandsFreeLink
- WiFi Hotspot
- Alexa Built-In
- Wireless CarPlay / Android Auto Integration
- Wireless Phone Charging
- Driver's and Front Passenger's 12-Way Power Seats
- Heated Front Seats
- Tri-Zone Automatic Climate Control with Air Filtration System

*** EXTERIOR FEATURES ***

- Panoramic Moonroof with Tilt and Slide Feature
- Power Tailgate
- 19" Alloy Wheels
- P255/55 R19 All-Season Tires
- Tire Sealant and Inflator Kit (in place of spare tire)
- Jewel Eye LED Headlights
- LED Tail Lights
- Blind Spot Information
- Heated Power Door Mirrors with Turn Indicators
- Keyless Access System with Smart Entry

*** ACURAWATCH FEATURES ***

- Adaptive Cruise Control
- Collision Mitigation Braking
- Forward Collision Warning
- Lane Keeping Assist System
- Road Departure Mitigation
- Traffic Jam Assist
- Auto High-Beam Assist

Manufacturer's Suggested Retail Price **\$47,200.00**

MSRP Includes:
-6YR/70K Mile Powertrain Warranty
-4YR/50K Mile Ltd Vehicle Warranty
-Full Tank of Fuel

SiriusXM Includes:
Free Activation and 3 Months Free Service (excl. AK & HI)

PLATINUM WHITE P 500.00

Destination and Handling 1,045.00

TOTAL VEHICLE PRICE
(Includes Pre-Delivery Service)
\$48,745.00

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

VANDERGRIFF ACURA
1100 W. I-20
ARLINGTON, TX 76017

PORT OF ENTRY: EAST LIBERTY
DELIVERY POINT: HOUSTON
SHIP#:
ROW/SPACE: 745-004
TRANS.METHOD: J10 ALLIANCE

ORIG. DLR: 251470
REF.NO: 41046
HN CODE: AL-1450
EMISSION: 50 STATE
CONTROL NO: 654153
DEALER: 251470

VIN: 5J8YD9H39NL006252

Fuel Economy and Environment

Gasoline Vehicle

Fuel Economy

22 MPG
combined city/hwy

19 city
26 highway

4.5 gallons per 100 miles

Small SUVs range from 16 to 125 MPG. The best vehicle rates 142 MPG.

You spend \$3,500 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$2,000

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

1 5 10 Best

This vehicle emits 411 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fuelconomy.gov.

Smog Rating (tailpipe only)

1 5 10 Best

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$6,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.95 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: **60 %**

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

GOVERNMENT 5-STAR SAFETY RATING

Overall Vehicle Score Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Crash	Driver Passenger	Not Rated
Frontal	Not Rated	Not Rated
Side	Front seat Rear seat	Not Rated Not Rated
Rollover	Not Rated	Not Rated

Star Ratings range from 1 to 5 stars (*****), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4238

FOR THIS VEHICLE
Final Assembly Point:
EAST LIBERTY, OHIO USA
Country of Origin: Engine:
U.S.A
Transmission:
U.S.A

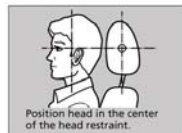
Photo No. 071 - Monroney Label

►► Seats ► Head Restraints

Head Restraints

Your vehicle is equipped with head restraints in all seating positions.

Adjusting the Front and Second Row Outer Head Restraint Positions



Head restraints are most effective for protection against whiplash and other rear-impact crash injuries when the center of the back of the occupant's head rests against the center of the restraint. The tops of the occupant's ears should be level with the center height of the restraint.

Head Restraints

WARNING

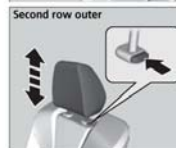
Improperly positioning head restraints reduces their effectiveness and increases the likelihood of serious injury in a crash.

Make sure head restraints are in place and positioned properly before driving.

- In order for the head restraint system to work properly:
- Do not hang any items on the head restraints, or from the restraint legs.
 - Do not place any objects between an occupant and the seat-back.
 - Install each restraint in its proper location.



To raise the head restraint: Pull it upward.
To lower the head restraint: Push it down while pressing the release button.



To adjust the front head restraint forward: Push the back of it forward.
To return the front head restraint to the original position: Press the release button.

Continued

Photo No. 072 - Head Restraint Use and Adjustment Information from Vehicle Owners Manual



Photo No. 073 - 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.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 Head Angular Velocity X (Deg/Sec) vs. Time
Driver Head Angular Velocity Y (Deg/Sec) vs. Time
Driver Head Angular Velocity Z (Deg/Sec) 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)

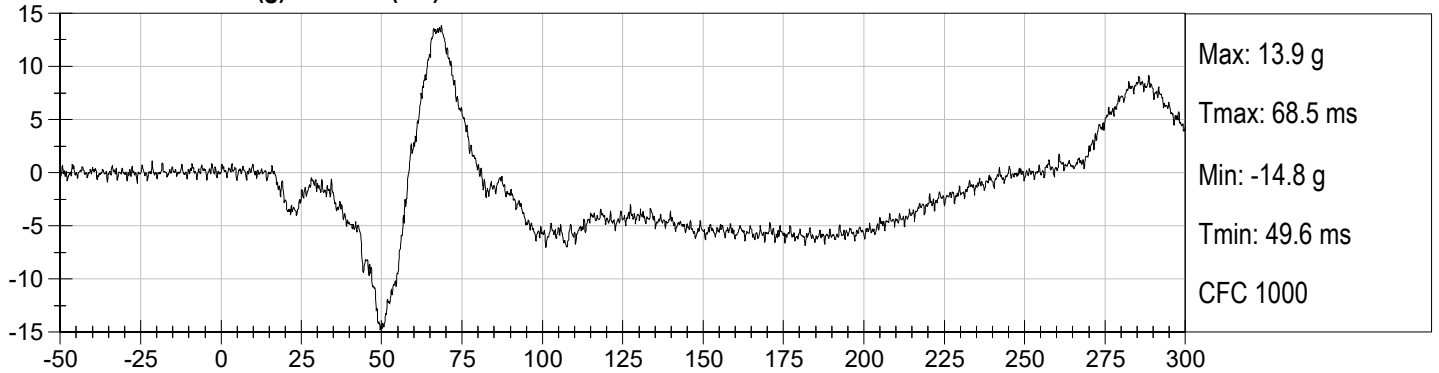
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

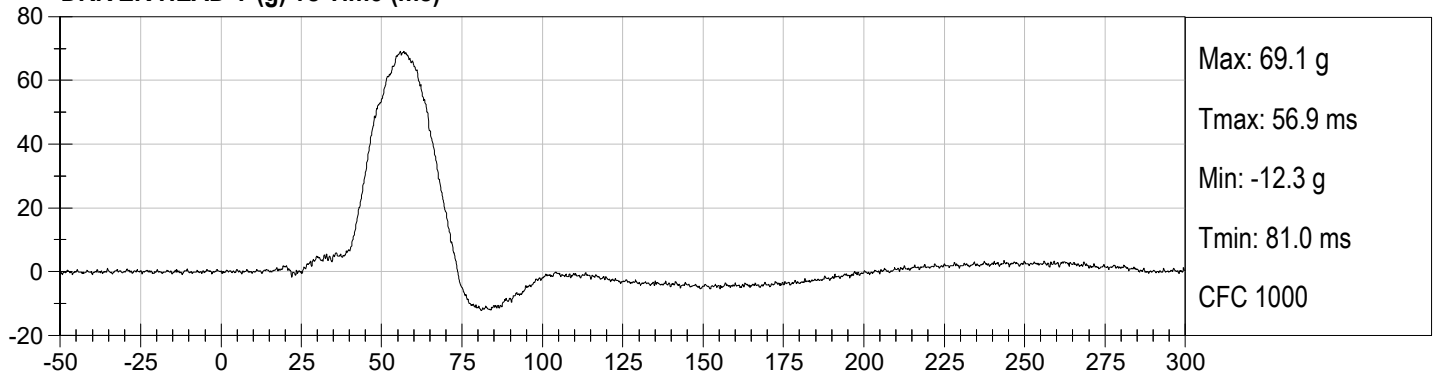
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

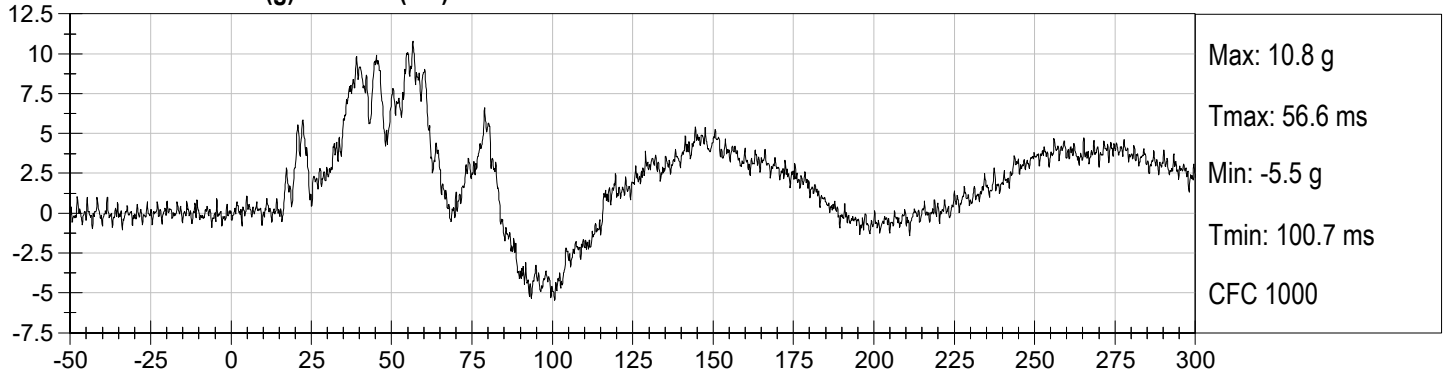
DRIVER HEAD X (g) vs Time (ms)



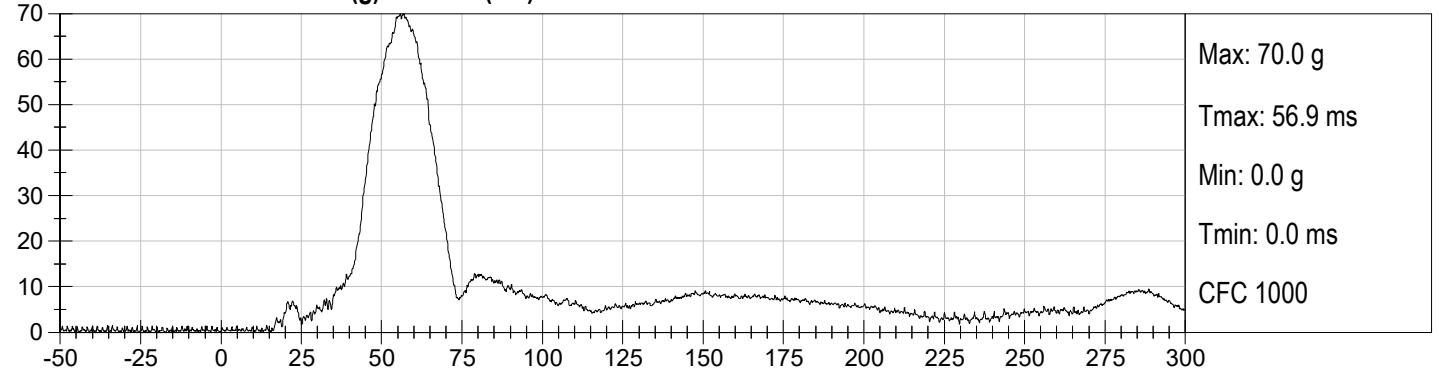
DRIVER HEAD Y (g) vs Time (ms)



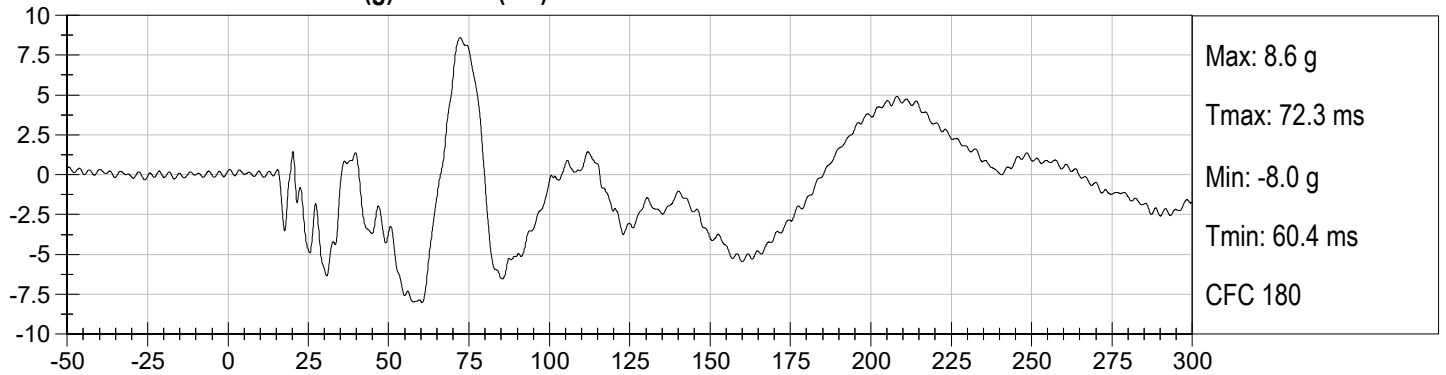
DRIVER HEAD Z (g) vs Time (ms)



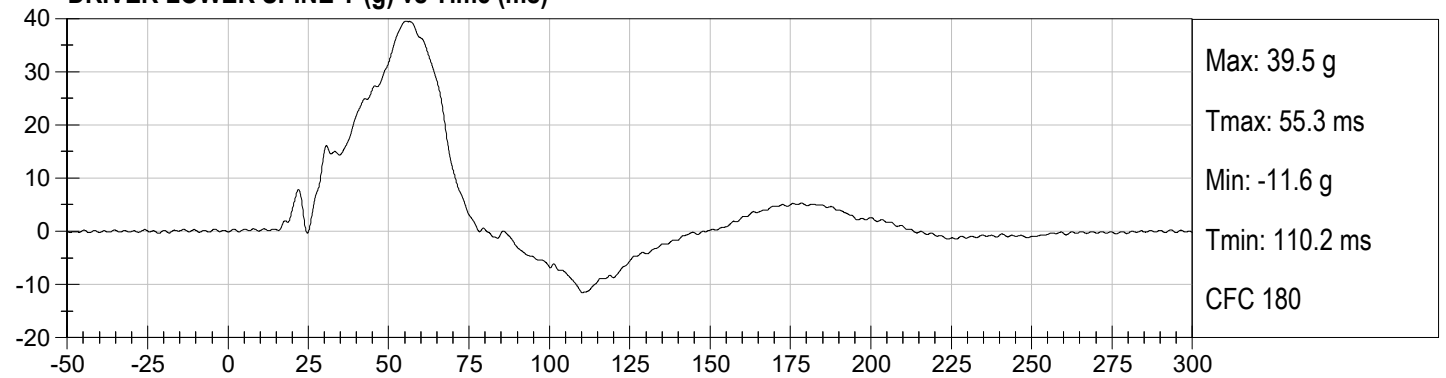
DRIVER HEAD Resultant (g) vs Time (ms)



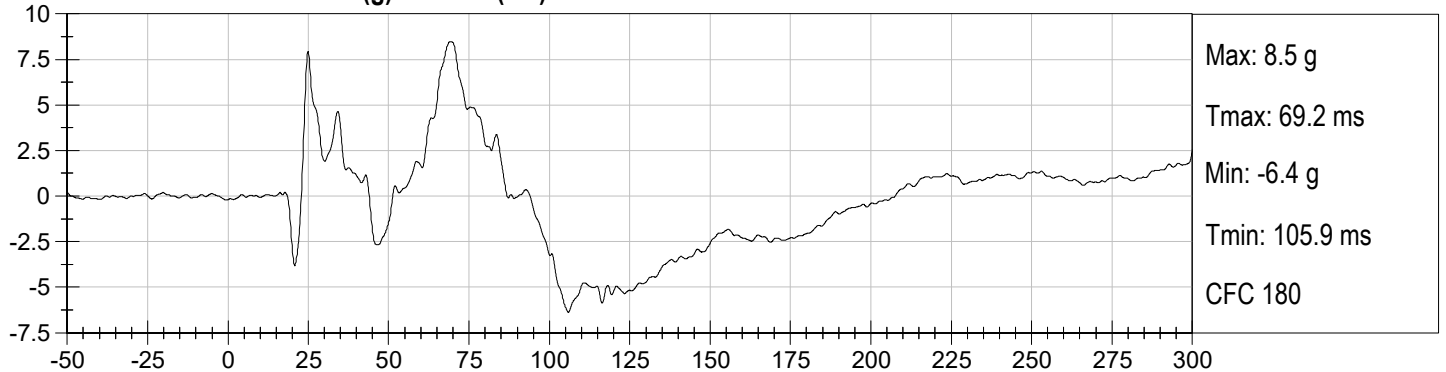
DRIVER LOWER SPINE X (g) vs Time (ms)



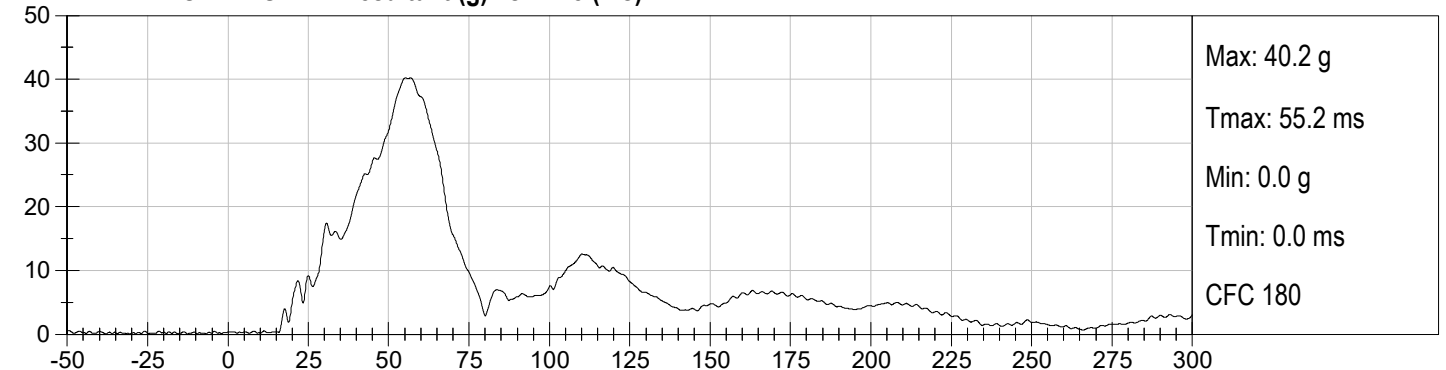
DRIVER LOWER SPINE Y (g) vs Time (ms)



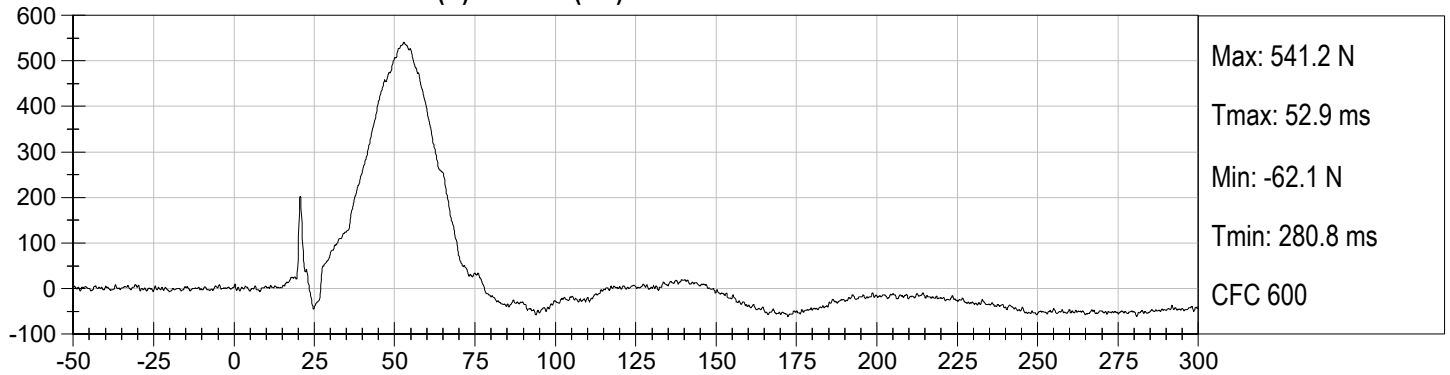
DRIVER LOWER SPINE Z (g) vs Time (ms)



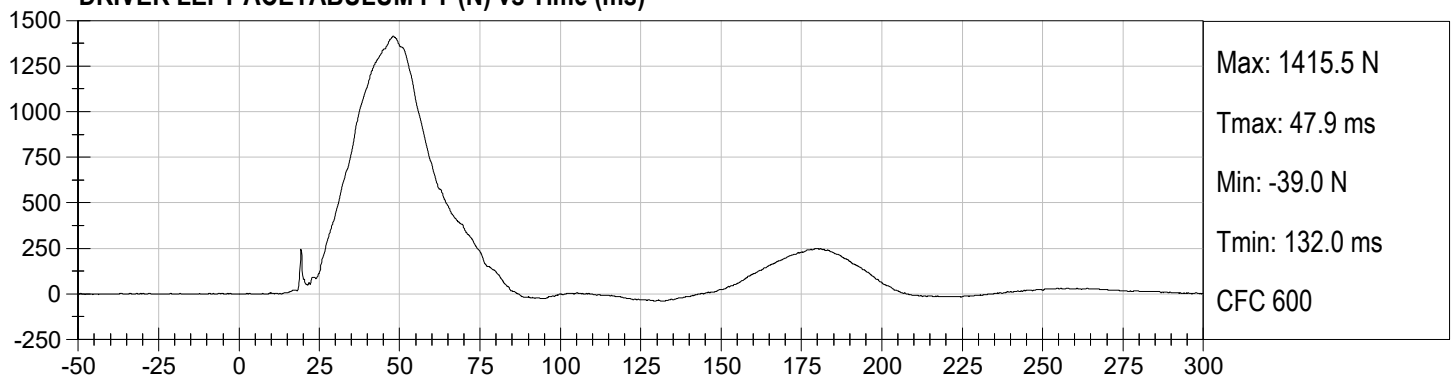
DRIVER LOWER SPINE Resultant (g) vs Time (ms)



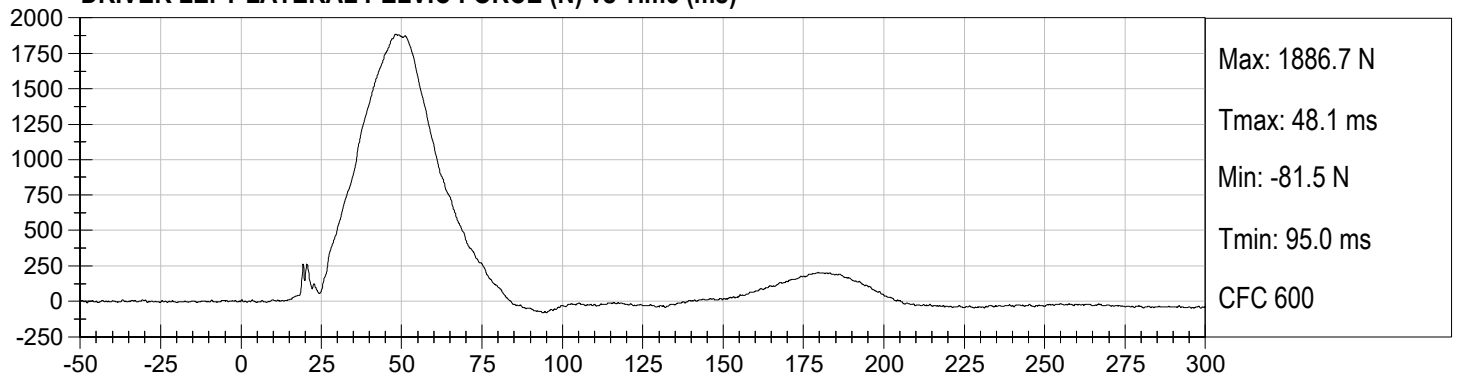
DRIVER LEFT ILIUM CREST FY (N) vs Time (ms)



DRIVER LEFT ACETABULUM FY (N) vs Time (ms)



DRIVER LEFT LATERAL PELVIC FORCE (N) vs Time (ms)



APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 296

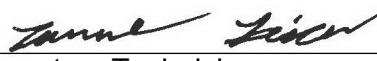
No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	784	Pass
B	Shoulder Pivot Height	437 - 453	442	Pass
C	H-point Height	79 - 89	83	Pass
D	H-point from Seatback	141 - 151	145	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	121	Pass
G	Head Breadth	140 - 148	142	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	180	Pass
J	Head Circumference	541 - 551	548	Pass
K	Buttock to Knee Length	514 - 540	535	Pass
L	Popliteal Height	343 - 369	358	Pass
M	Knee Pivot to Floor Height	392 - 409	404	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	206	Pass
P	Foot Length	216 - 232	219	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	316	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	481	Pass
V	Shoulder Width	341 - 357	346	Pass
W	Foot Width	78 - 94	85	Pass
Y	Chest Circumference w/ jacket	851 - 881	870	Pass
Z	Waist Circumference	761 - 791	772	Pass

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

ATD Serial No: 296

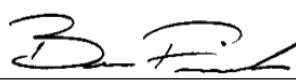
Test ID: D212281

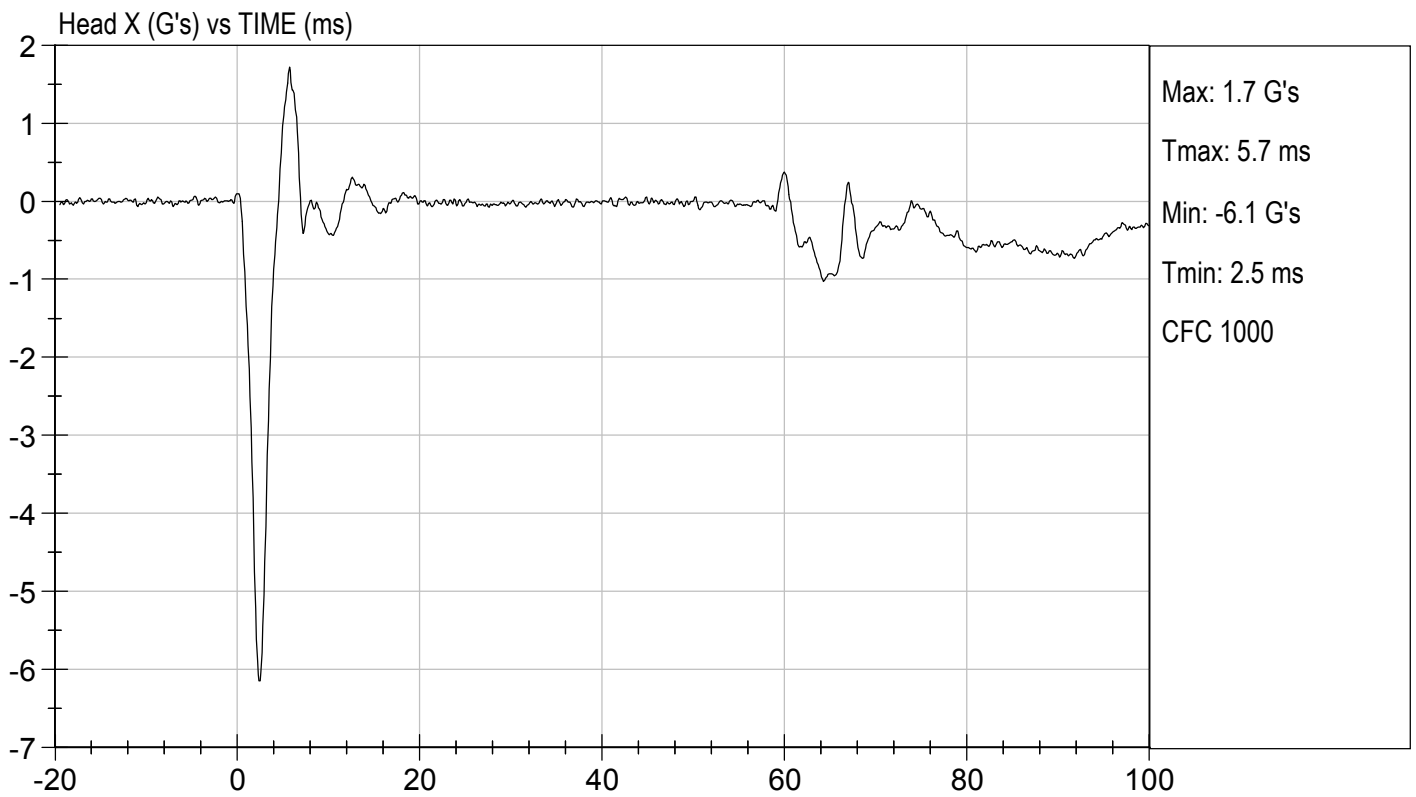
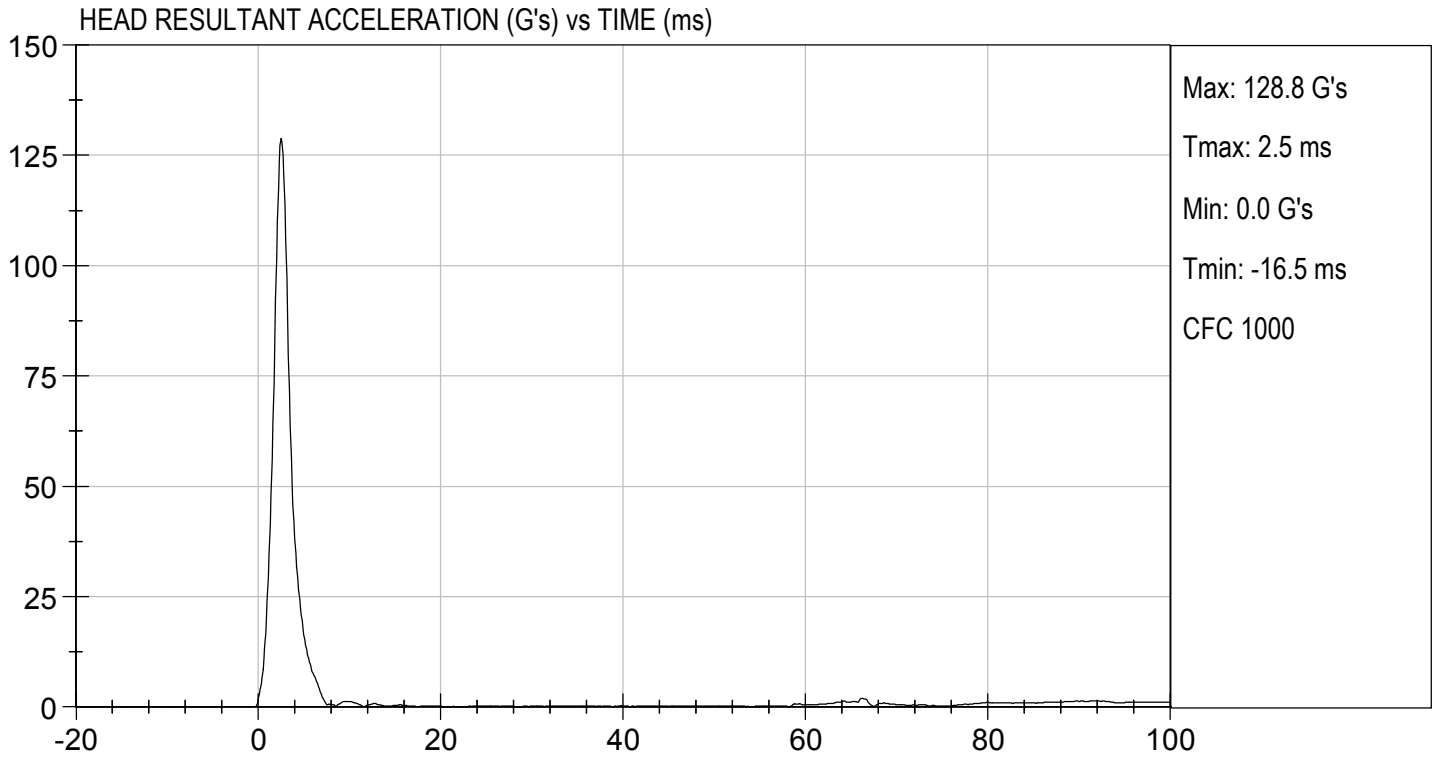
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	115 to 137	129	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-6.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass

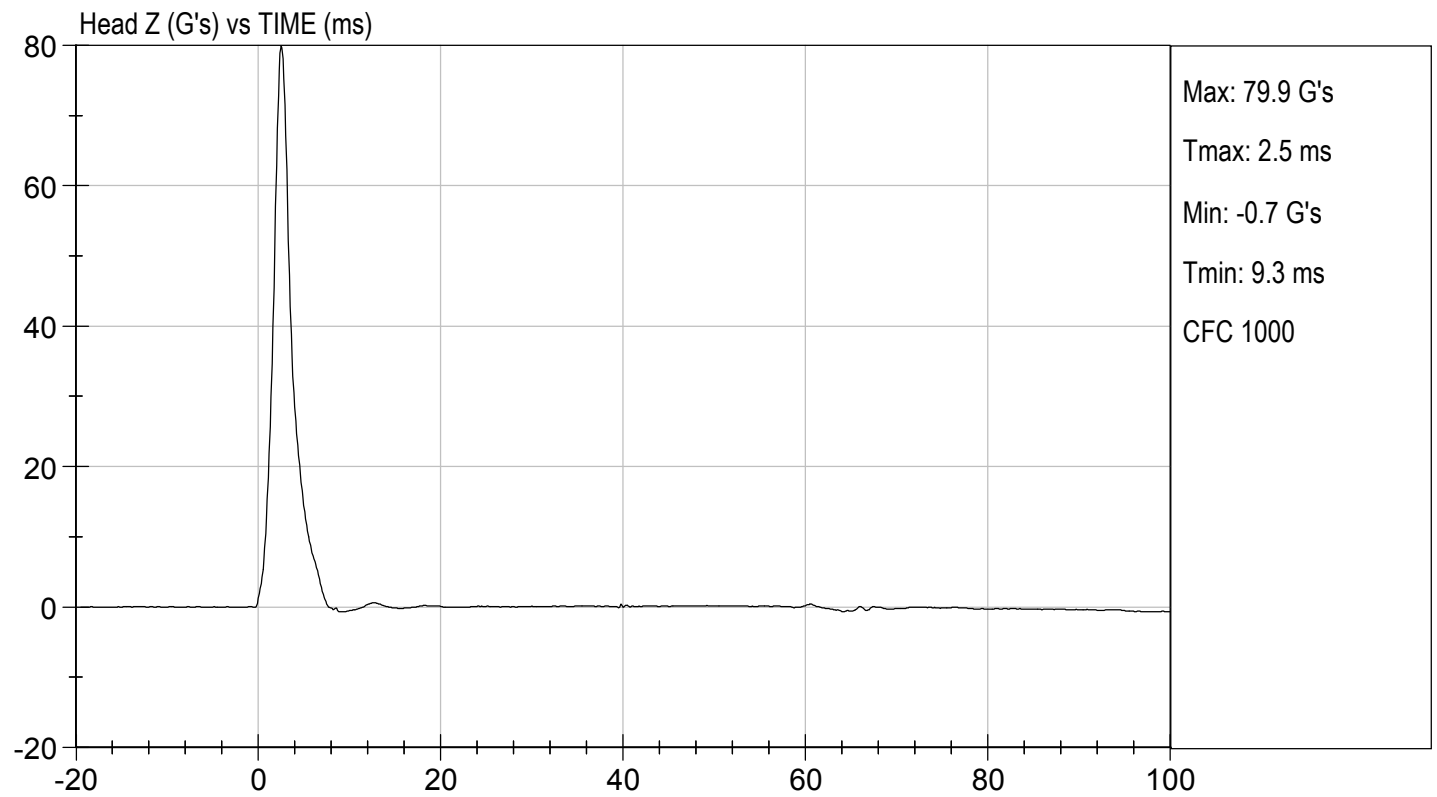
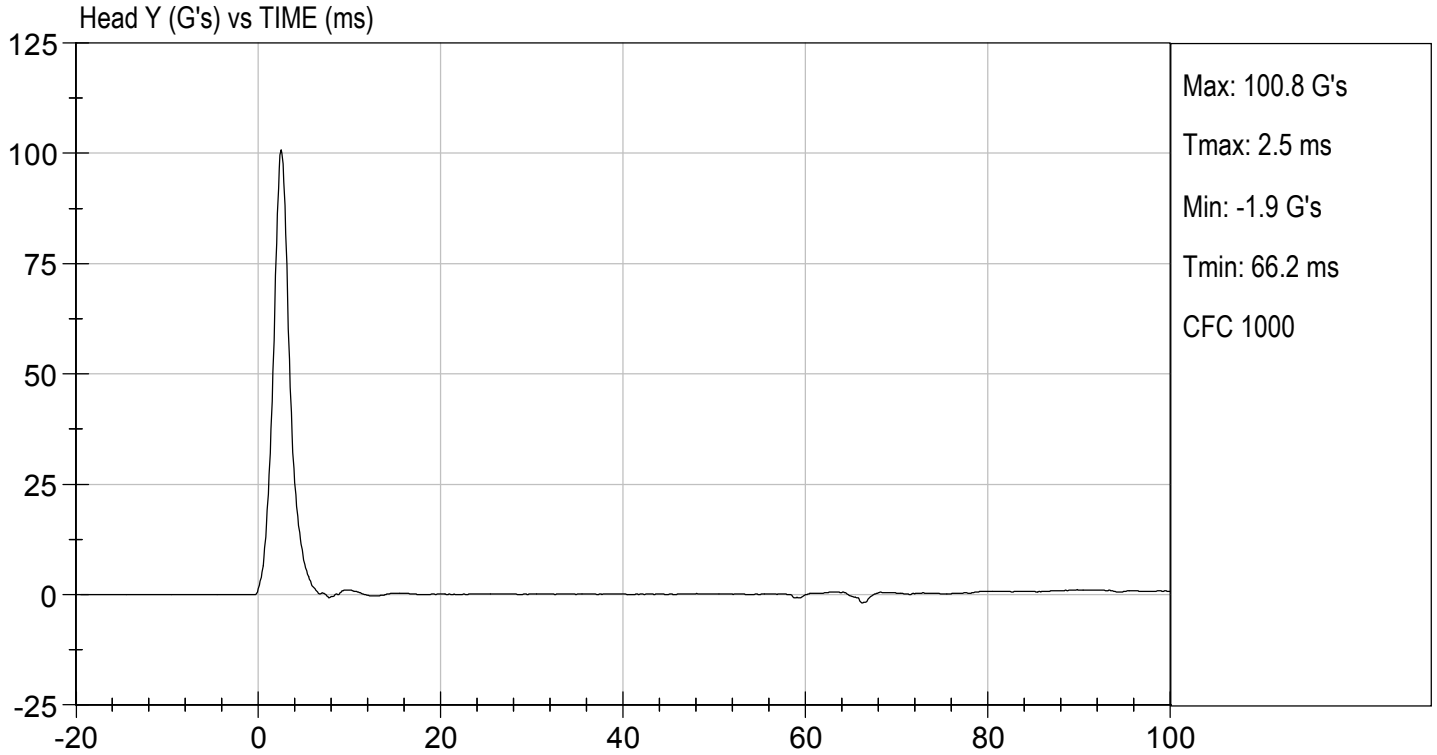

Laboratory Technician

09/07/2021

Test Date


Approved By





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

ATD Serial No: 296

Test I.D: D212282

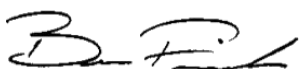
Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.3	Pass
Humidity		%	10 to 70	38	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.66	Pass
	15 ms	m/s	3.30 to 4.10	3.87	Pass
	20 ms	m/s	4.40 to 5.40	5.38	Pass
	25 ms	m/s	5.40 to 6.10	5.69	Pass
	25-100 ms	m/s	5.50 to 6.20	5.72	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	62	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-38	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	111	Pass
Overall Test Results					Pass



Laboratory Technician

09/24/2021

Test Date

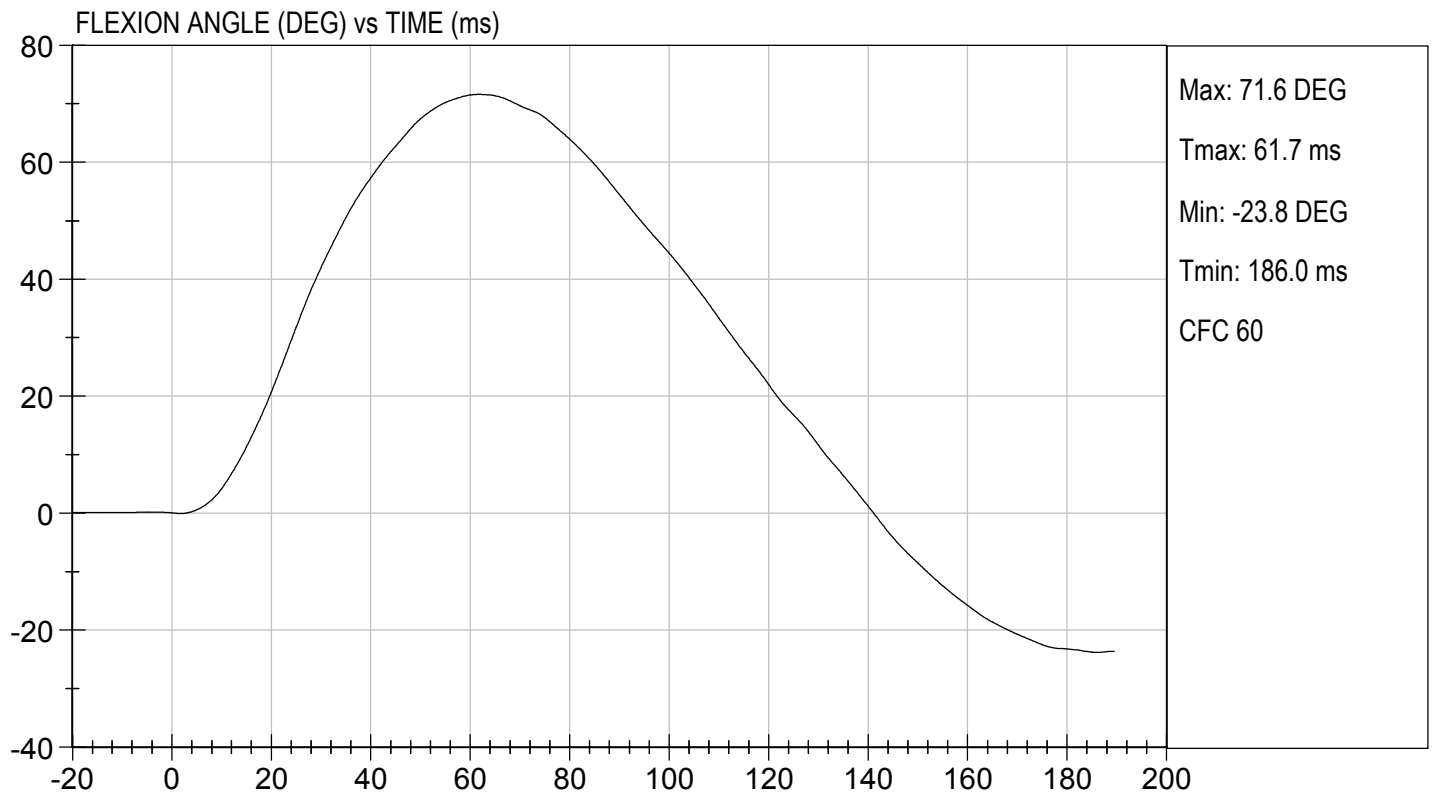
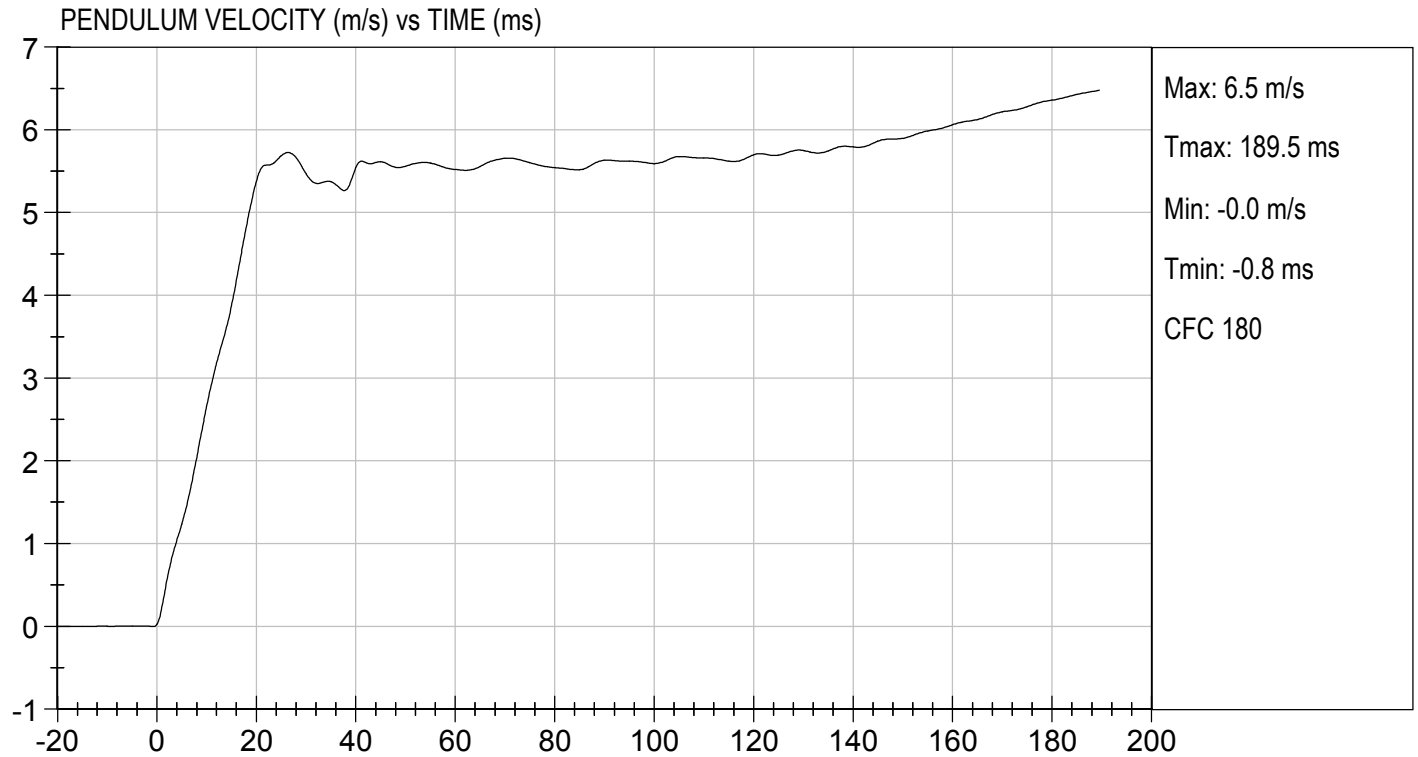


Approved By



TEST DESC: NECK BENDING
VELOCITY: 18.31 ft/s, 5.58 m/s

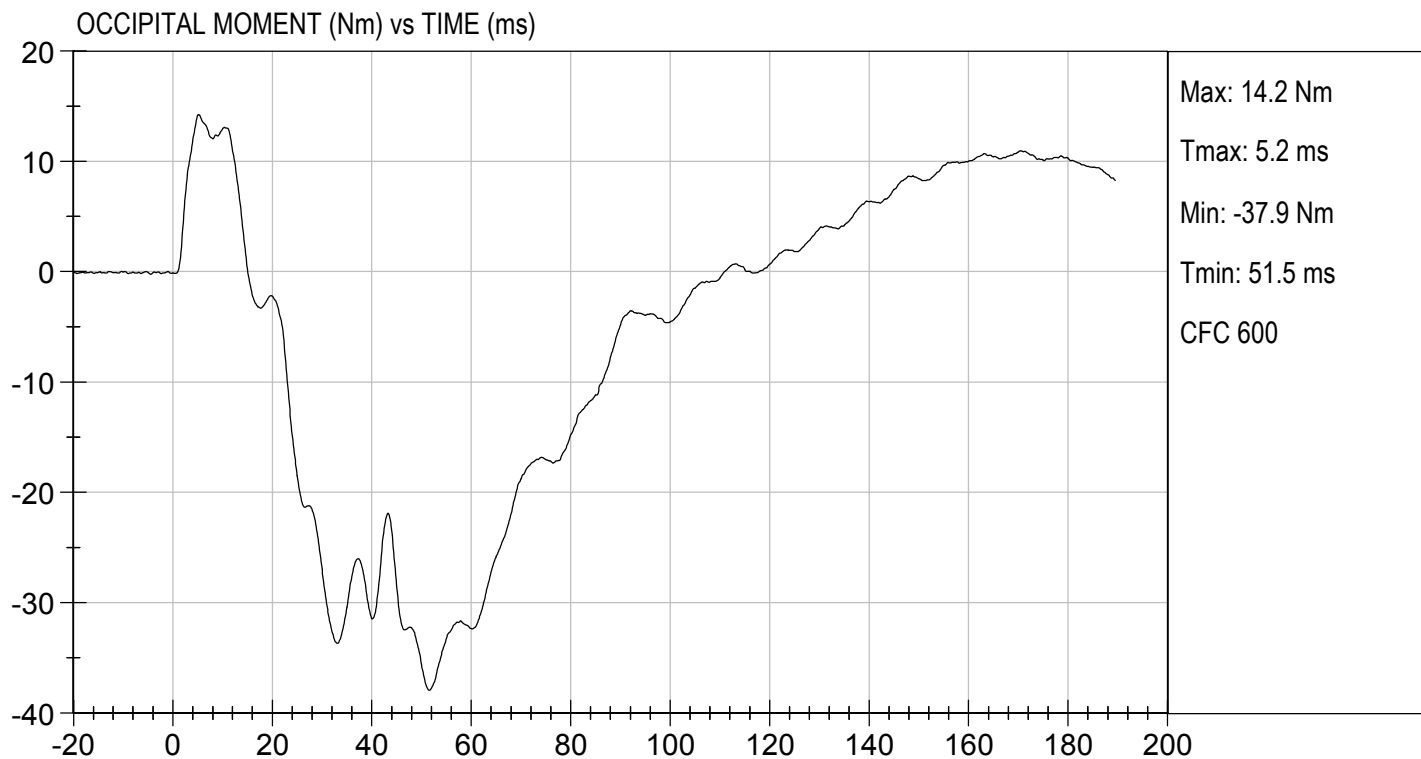
TEST DATE: 09/24/2021
TEST #: D212282





TEST DESC: NECK BENDING
VELOCITY: 18.31 ft/s, 5.58 m/s

TEST DATE: 09/24/2021
TEST #: D212282



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

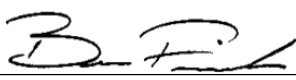
ATD Serial No: 296

Test ID: D212283

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	42	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	20	Pass
Overall Test Results				Pass


Laboratory Technician

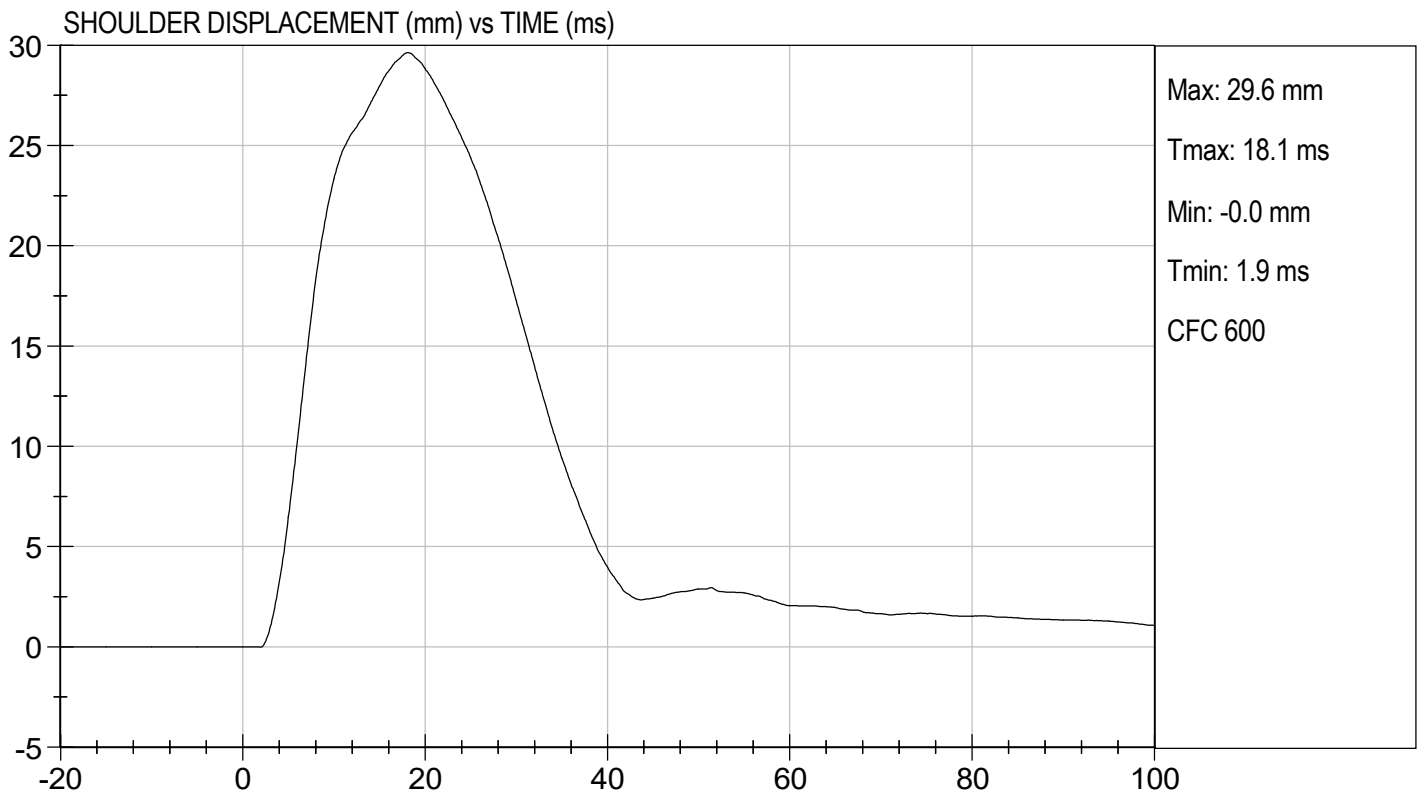
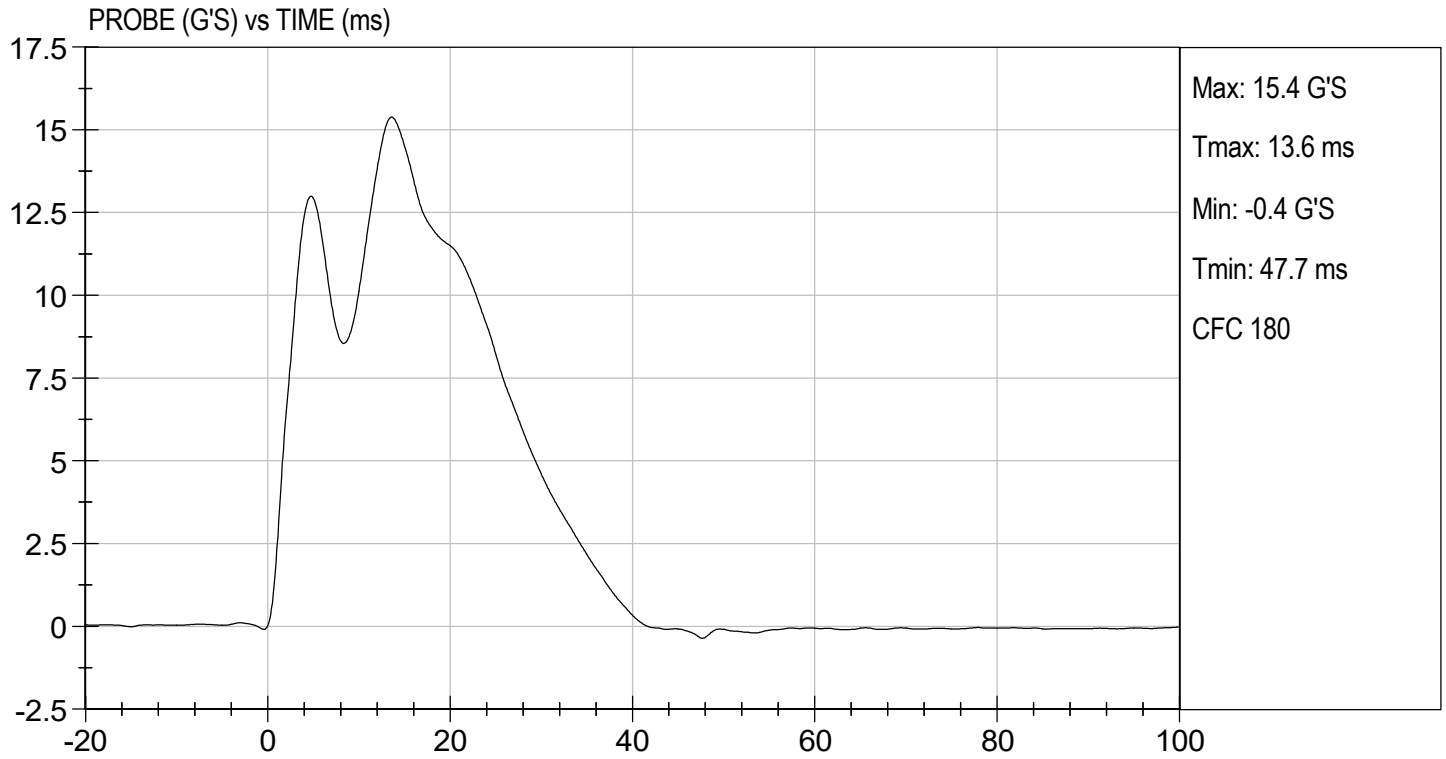
09/08/2021
Test Date


Approved By



TEST DESC: SHOULDER IMPACT
VELOCITY: 13.89 ft/s, 4.23 m/s

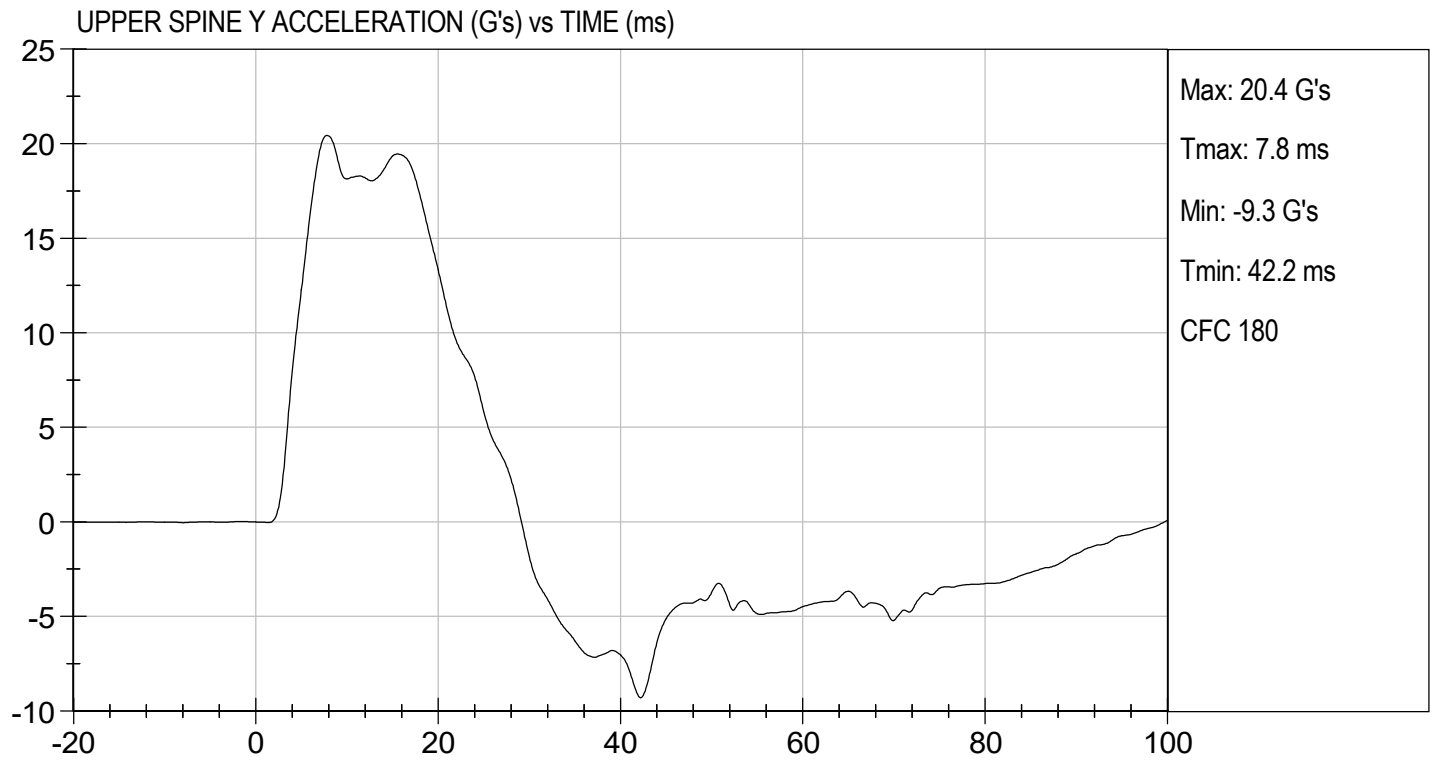
TEST DATE: 09/08/2021
TEST #: D212283





TEST DESC: SHOULDER IMPACT
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 09/08/2021
TEST #: D212283



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

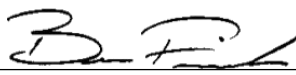
ATD Serial No: 296

Test I.D: D212284

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	42.8	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	36	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	33	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	34	Pass
Overall Test Results				Pass


Laboratory Technician

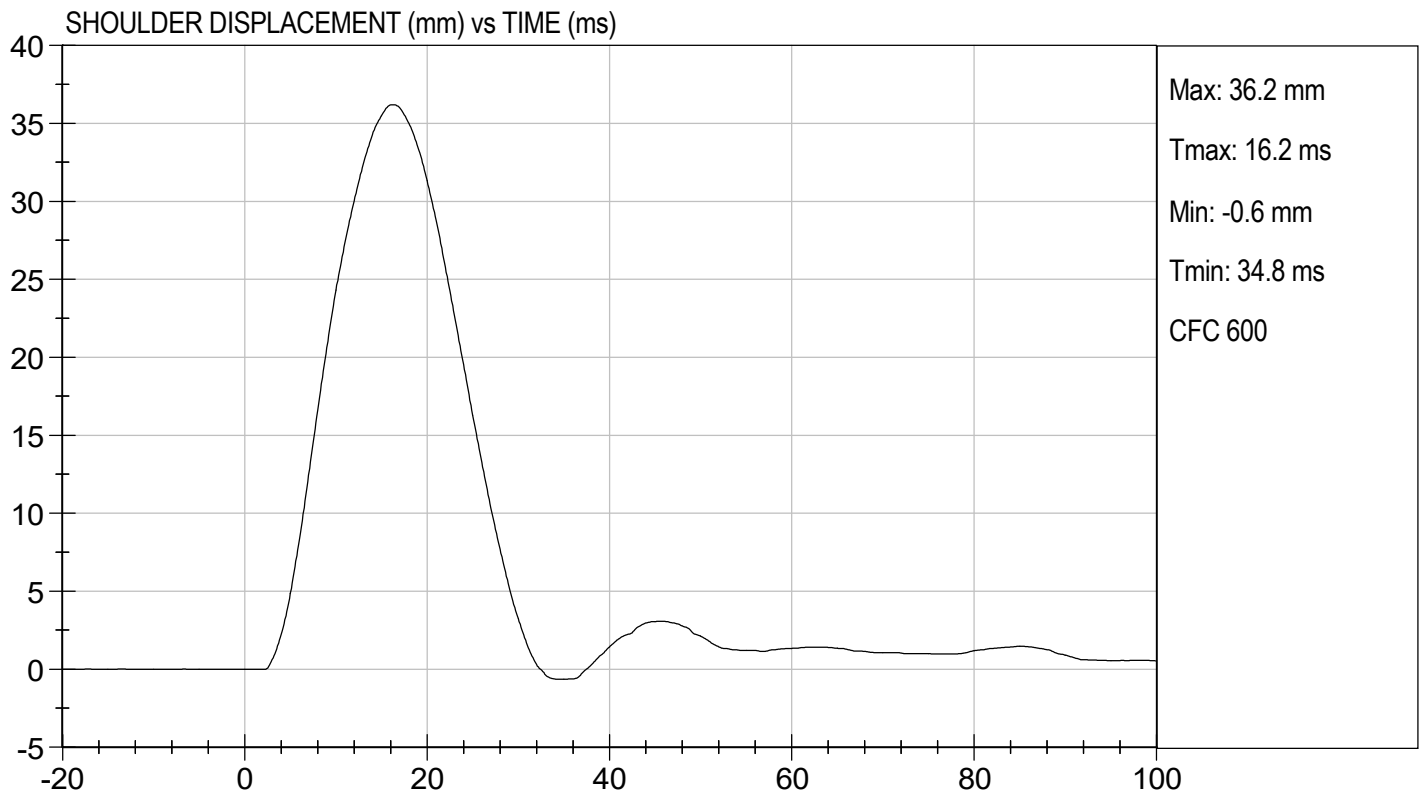
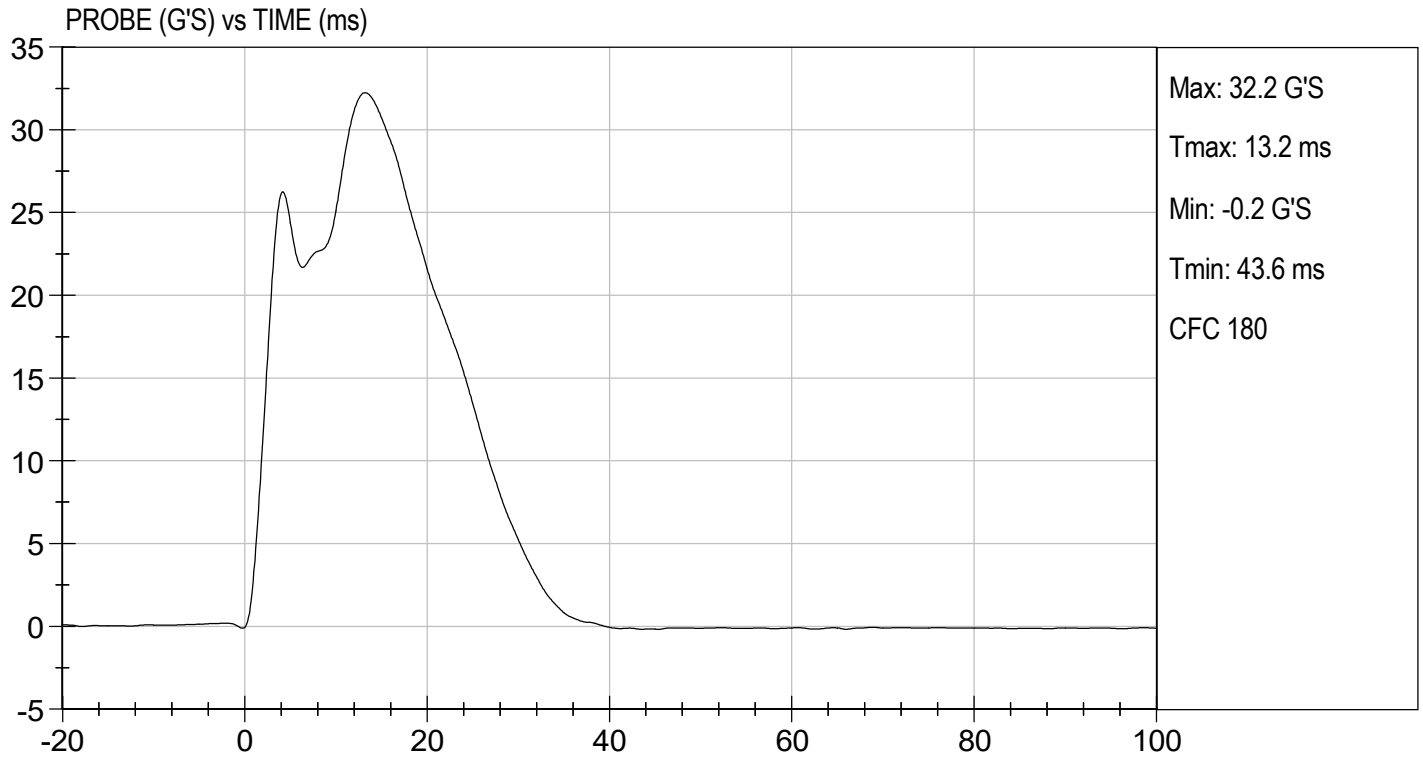
09/09/2021
Test Date


Approved By



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

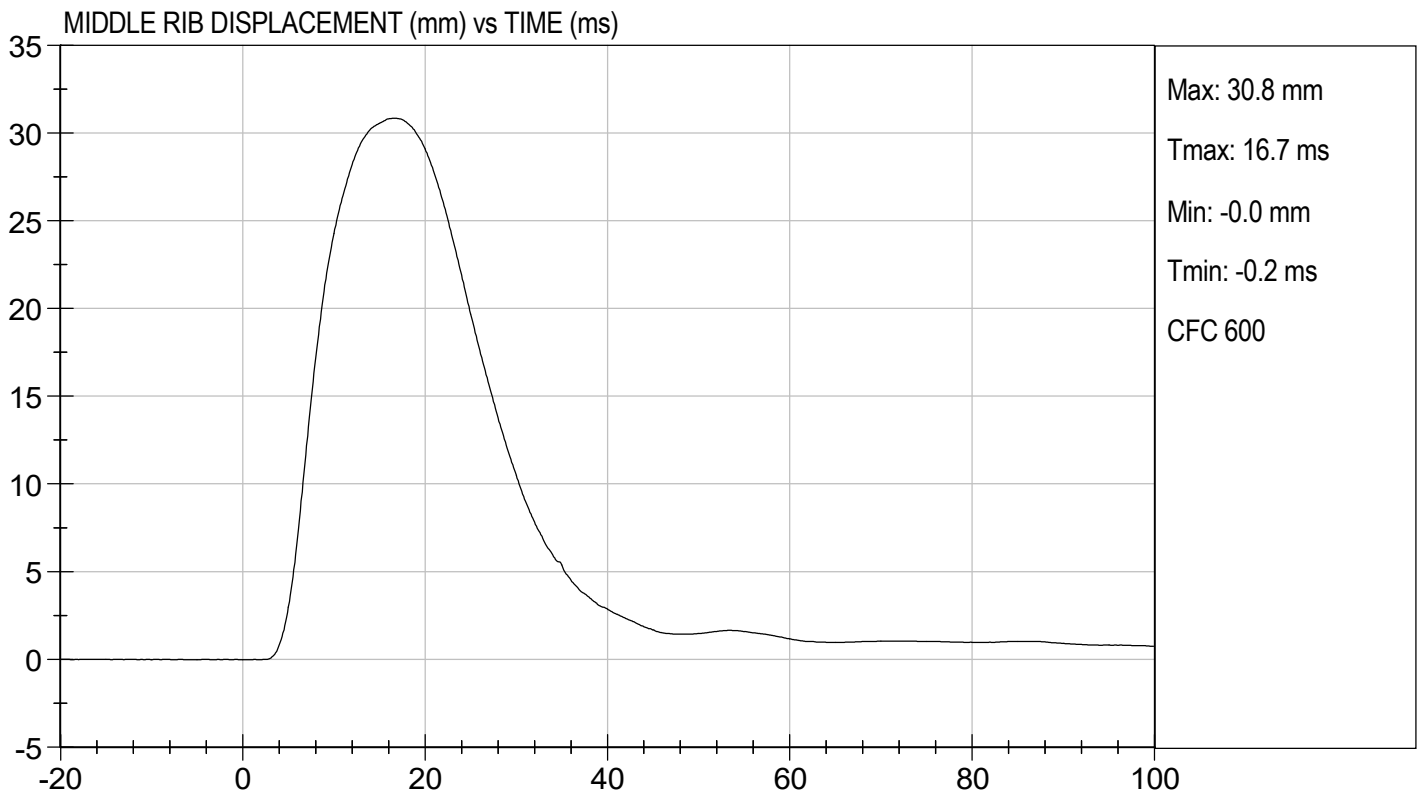
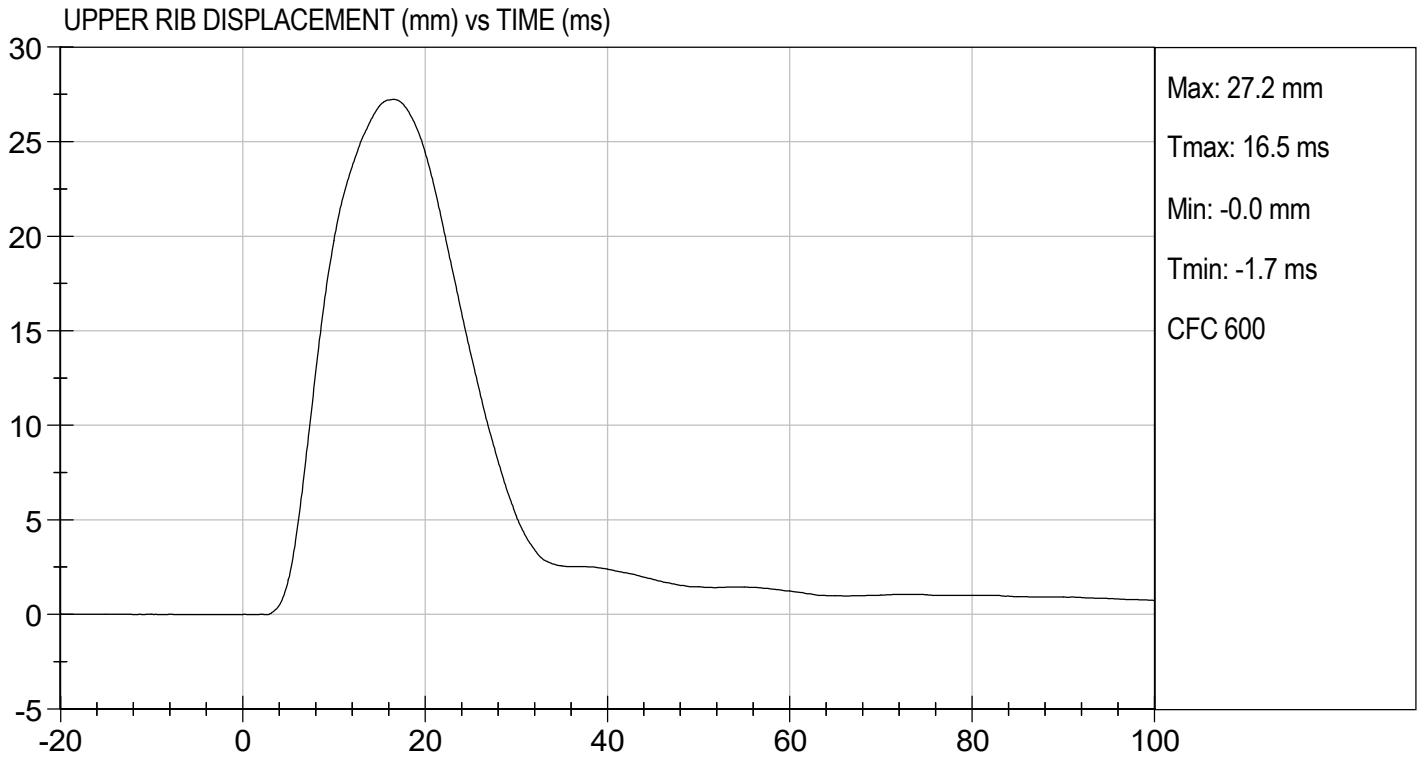
TEST DATE: 09/09/2021
TEST #: D212284





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

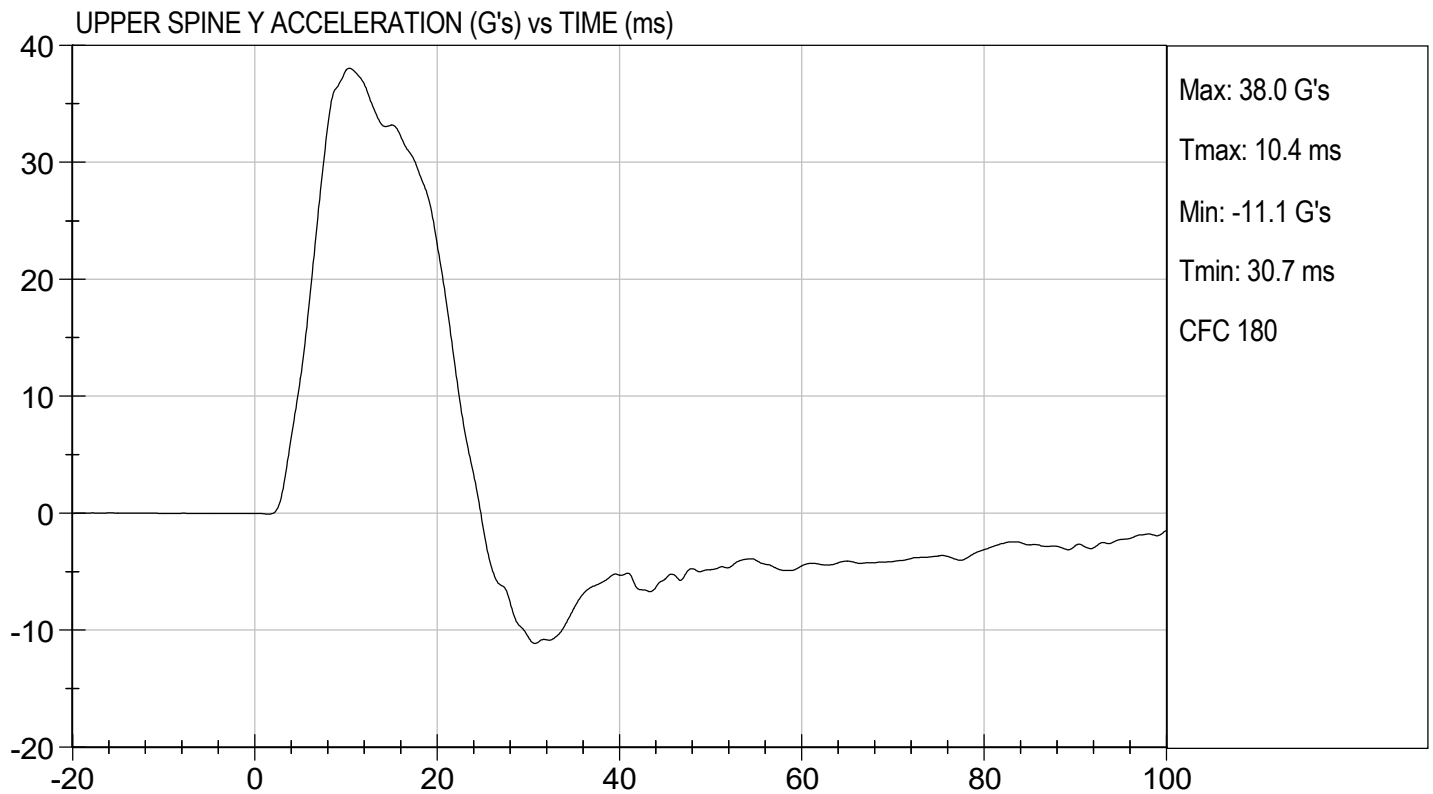
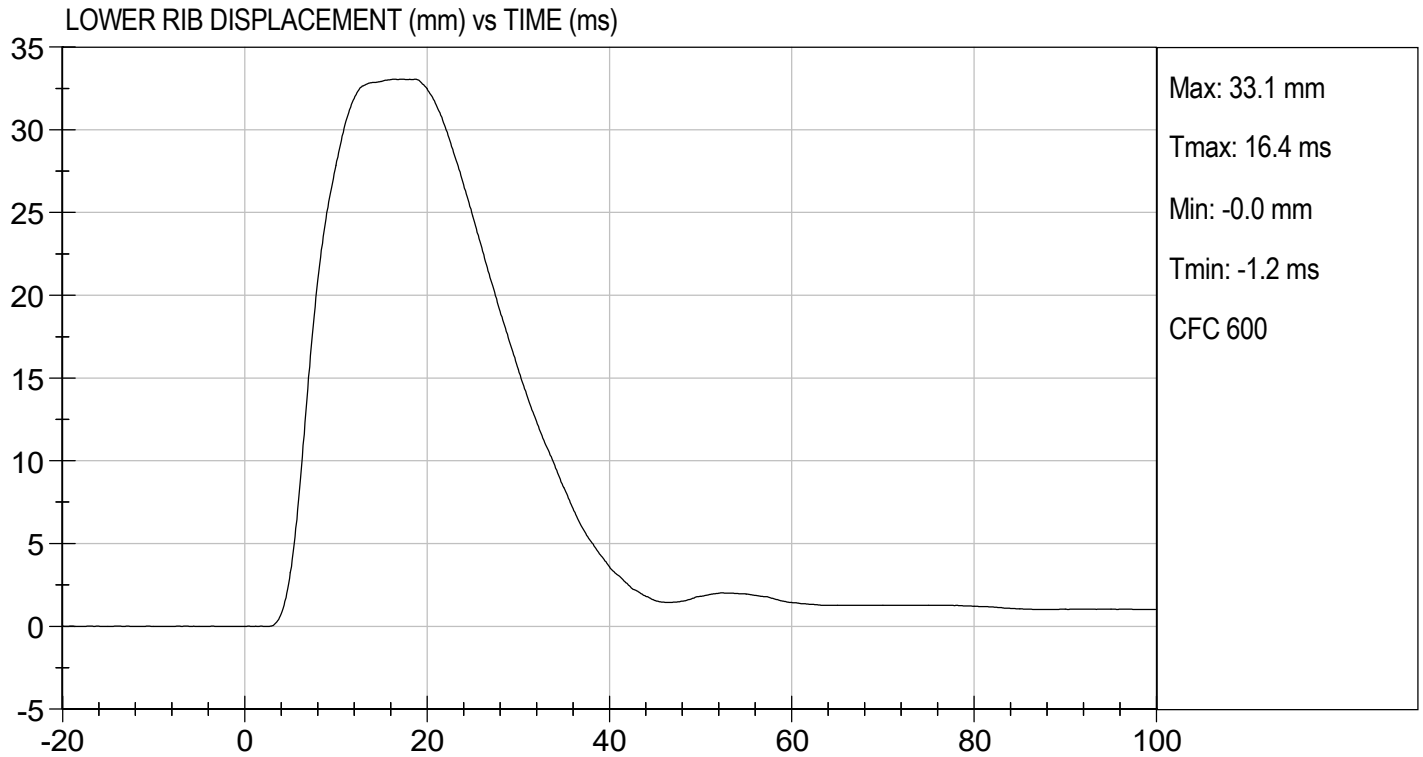
TEST DATE: 09/09/2021
TEST #: D212284





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

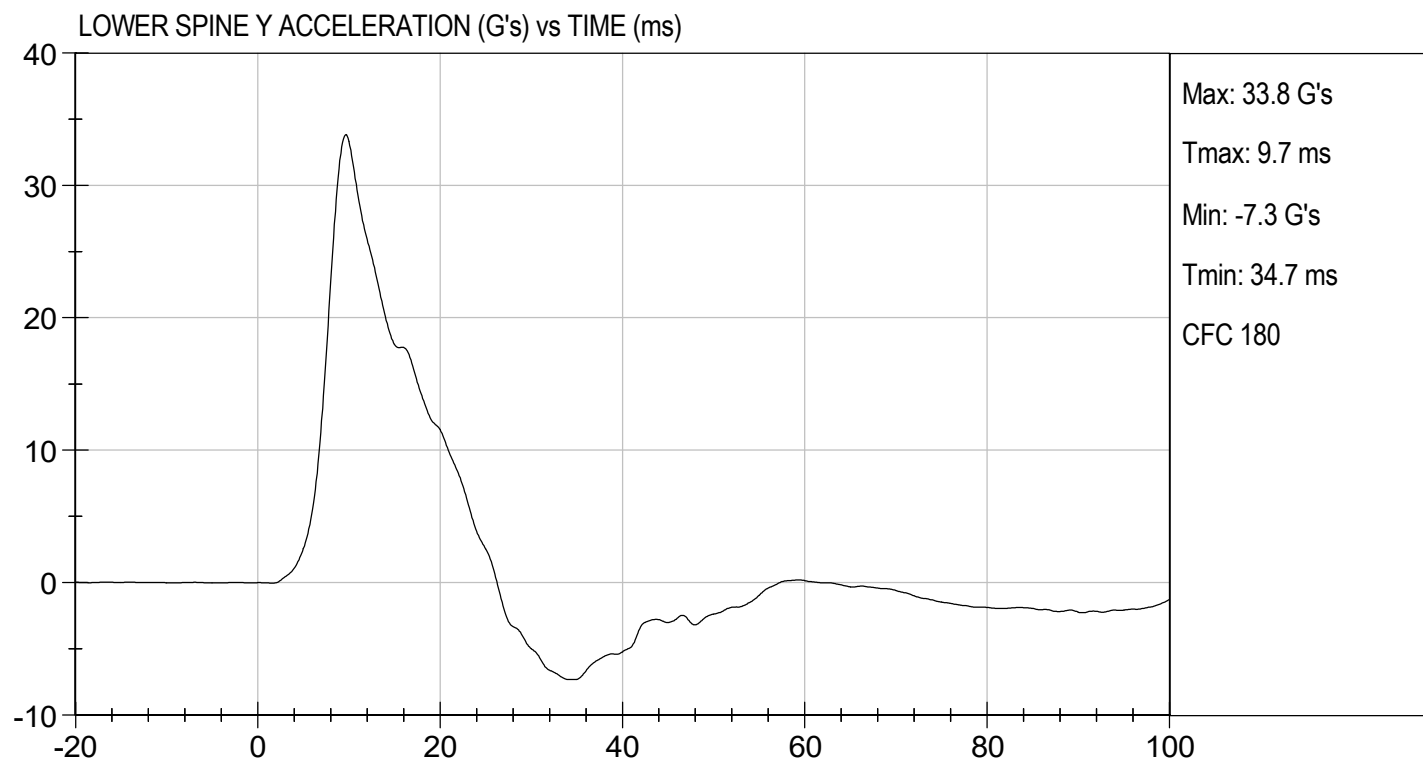
TEST DATE: 09/09/2021
TEST #: D212284





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

TEST DATE: 09/09/2021
TEST #: D212284



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

ATD Serial No: 296

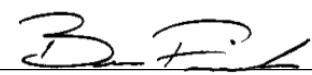
Test I.D: D212285

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	42.8	Pass
Impact Velocity	m/s	4.20 to 4.40	4.24	Pass
Maximum Probe Acceleration	G's	14 to 18	14	Pass
Upper Rib Displacement	mm	32 to 40	36	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
			Overall Test Results	Pass


Laboratory Technician

09/09/2021

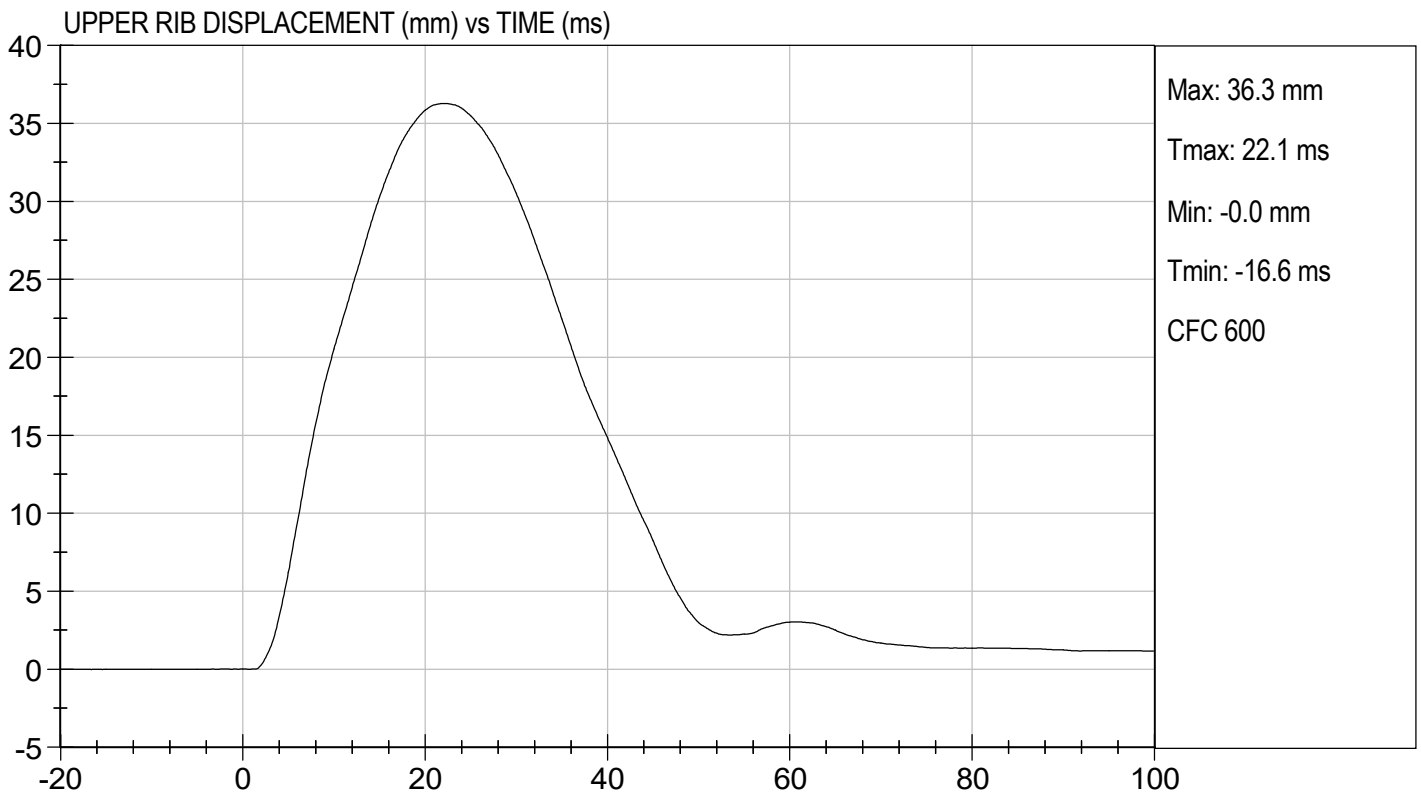
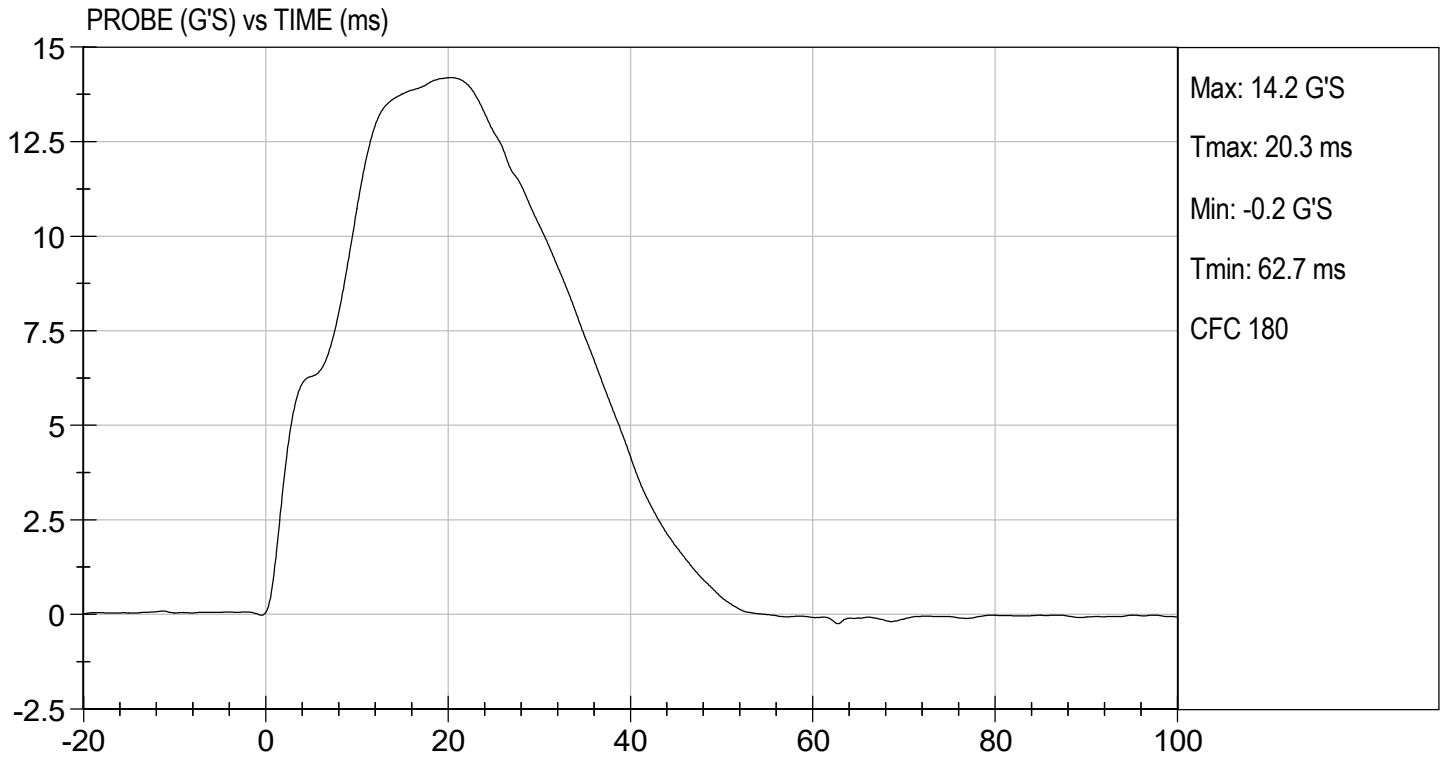
Test Date


Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.92 ft/s, 4.24 m/s

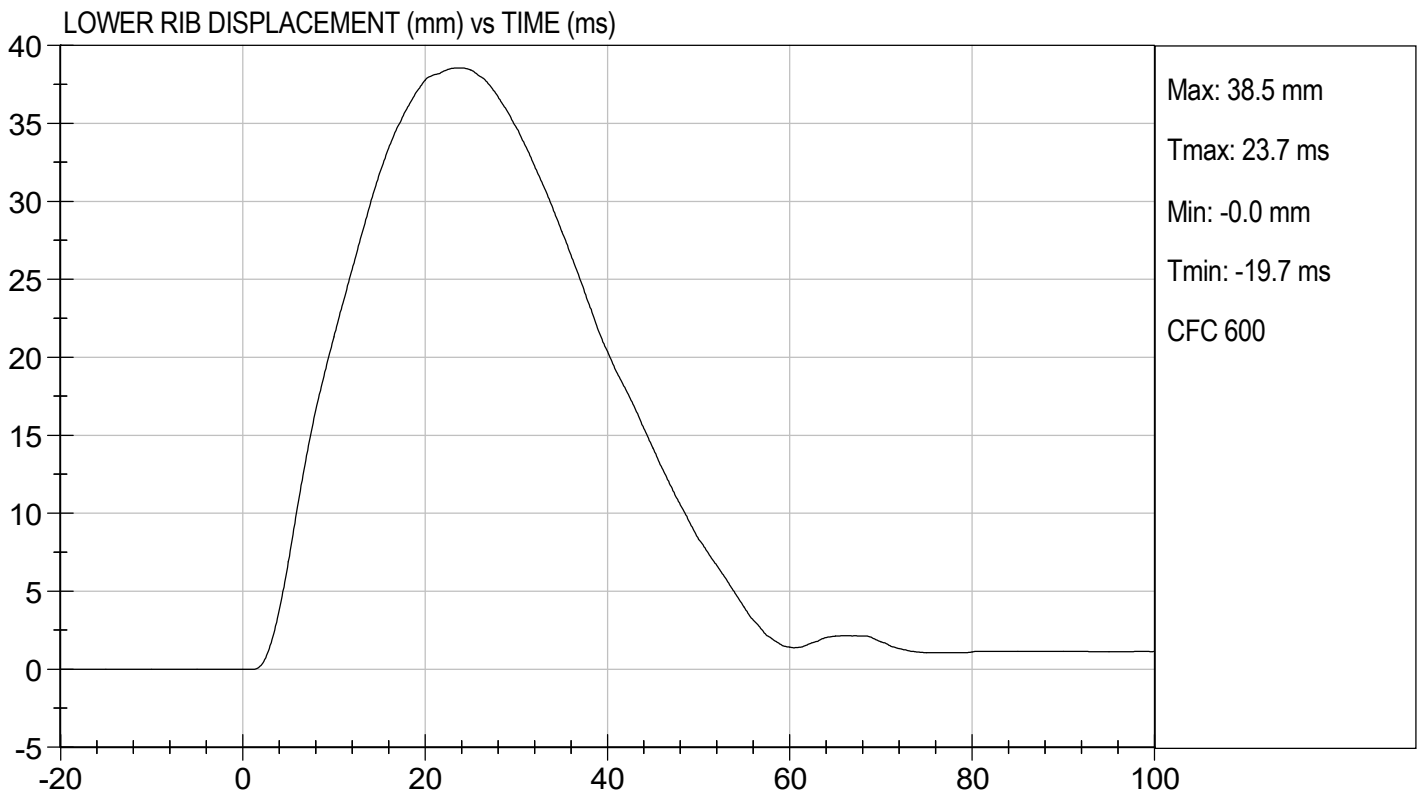
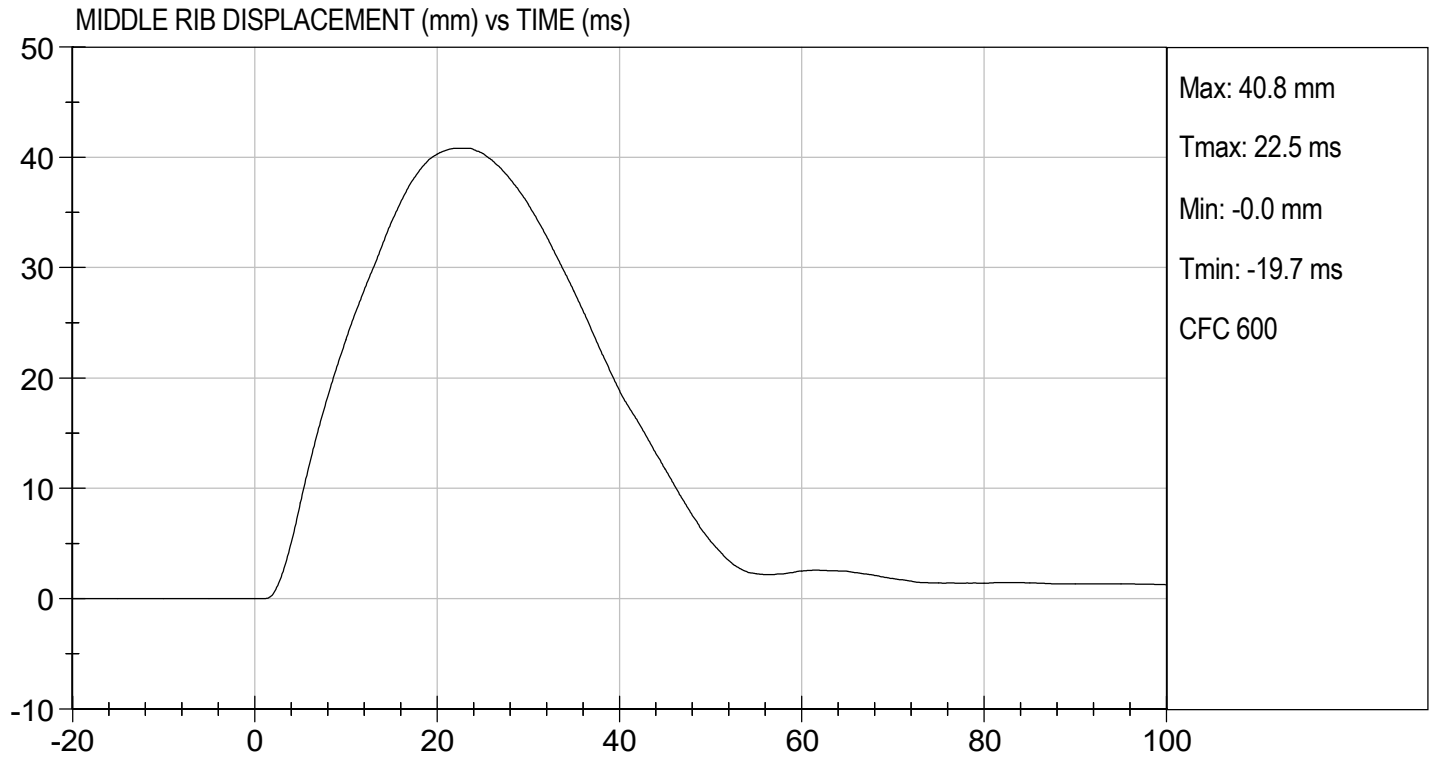
TEST DATE: 09/09/2021
TEST #: D212285





TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.92 ft/s, 4.24 m/s

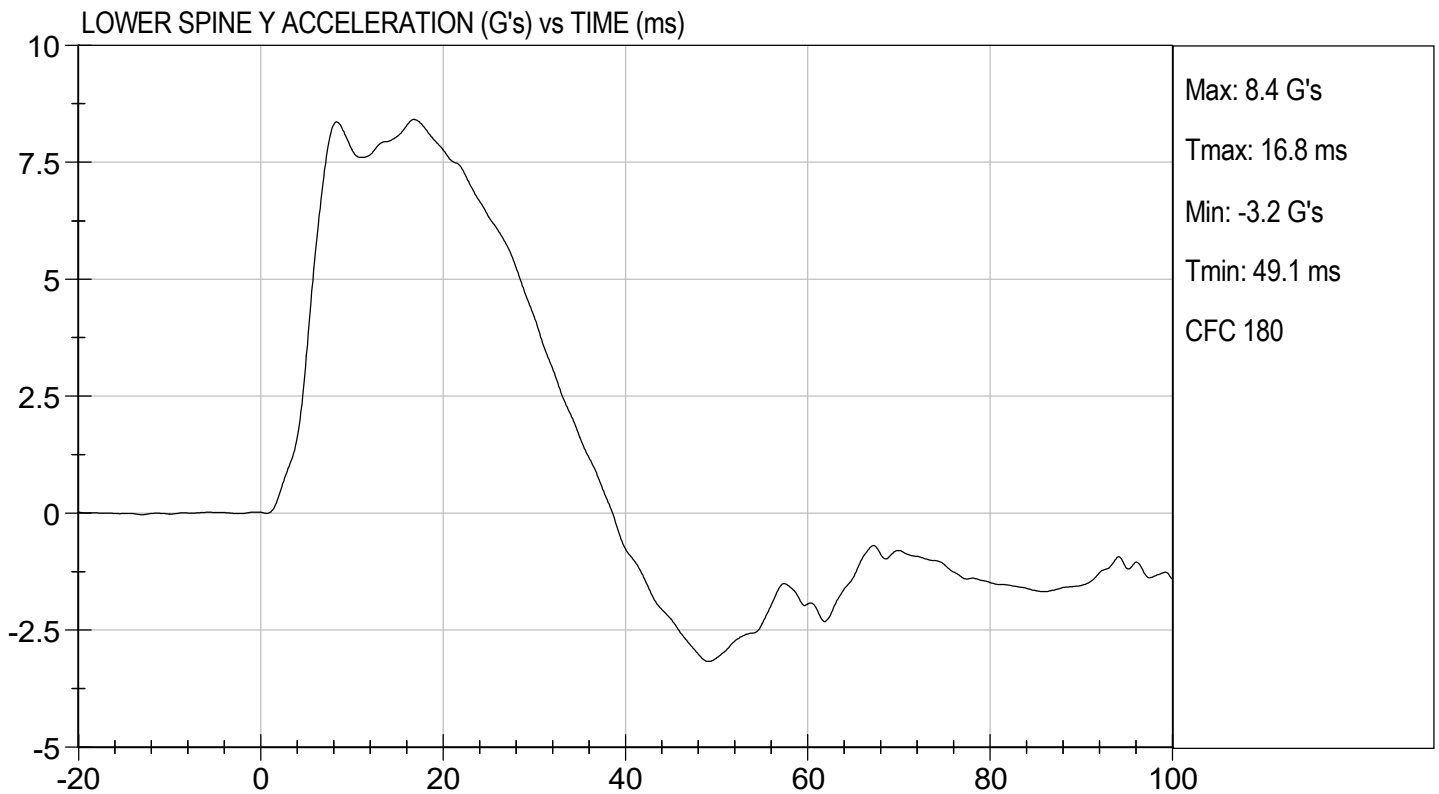
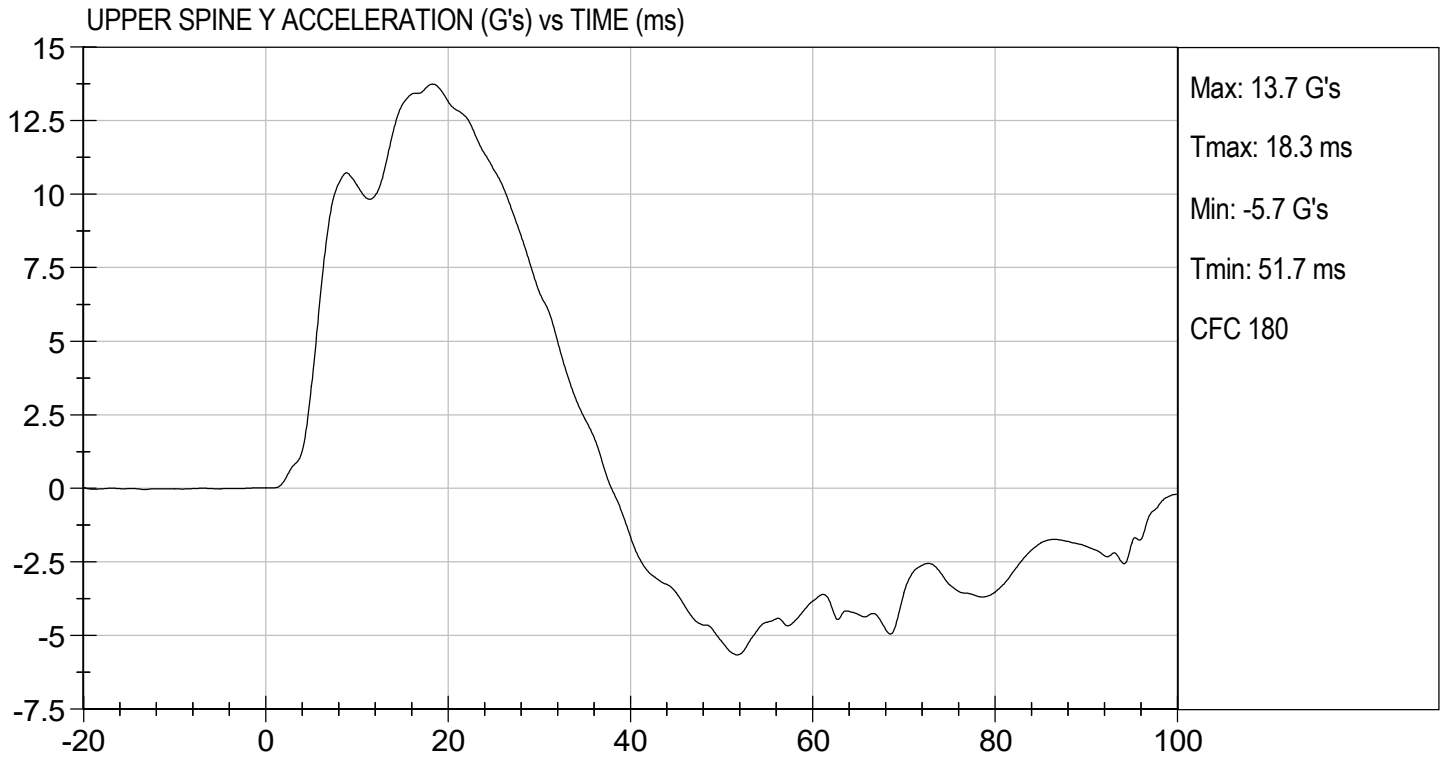
TEST DATE: 09/09/2021
TEST #: D212285





TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.92 ft/s, 4.24 m/s

TEST DATE: 09/09/2021
TEST #: D212285



MGA RESEARCH CORPORATION
ABDOMINAL IMPACT TEST
SID-III BUILD LEVEL D DUMMY

ATD Serial No: 296

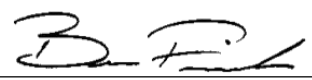
Test I.D: D212286

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	42.8	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	38	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

09/09/2021

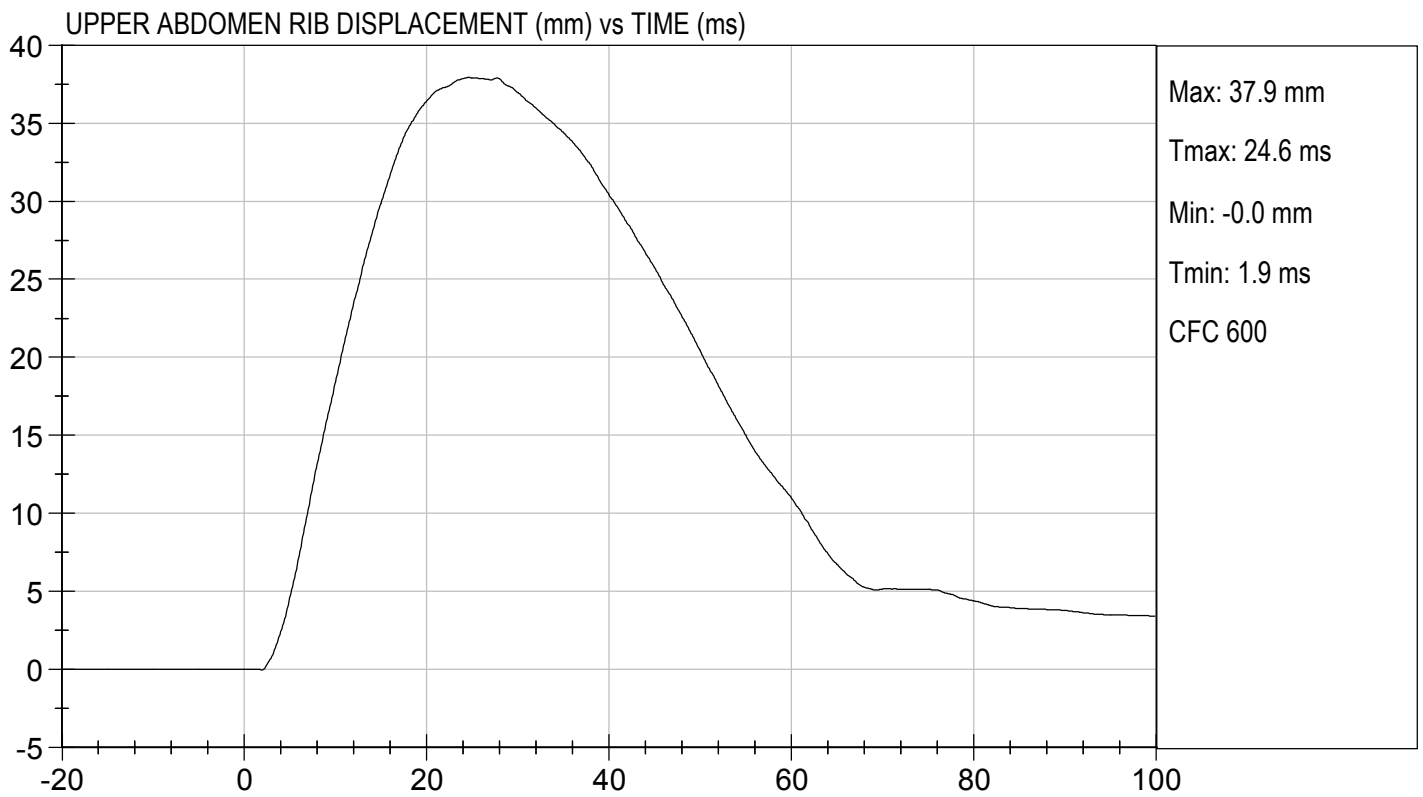
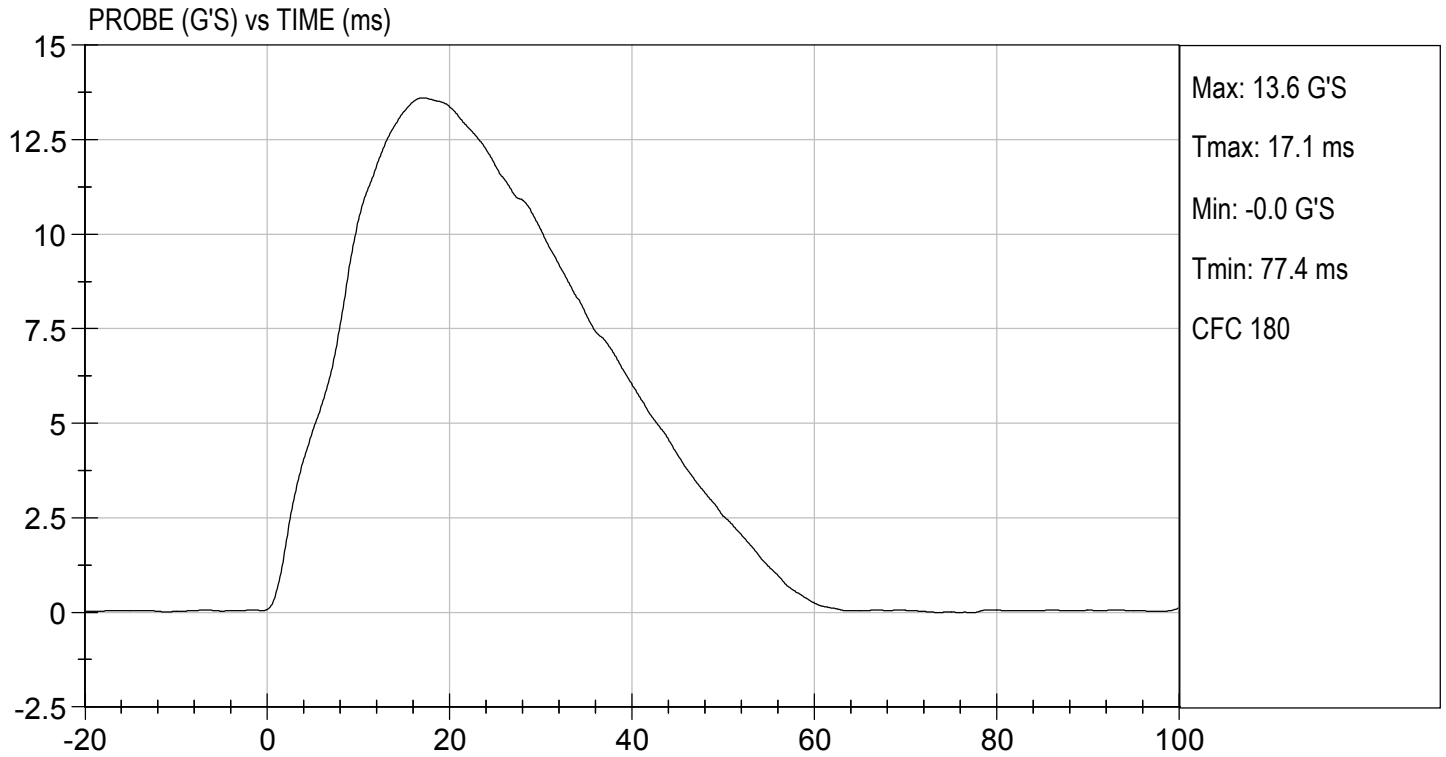
Test Date


Approved By



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

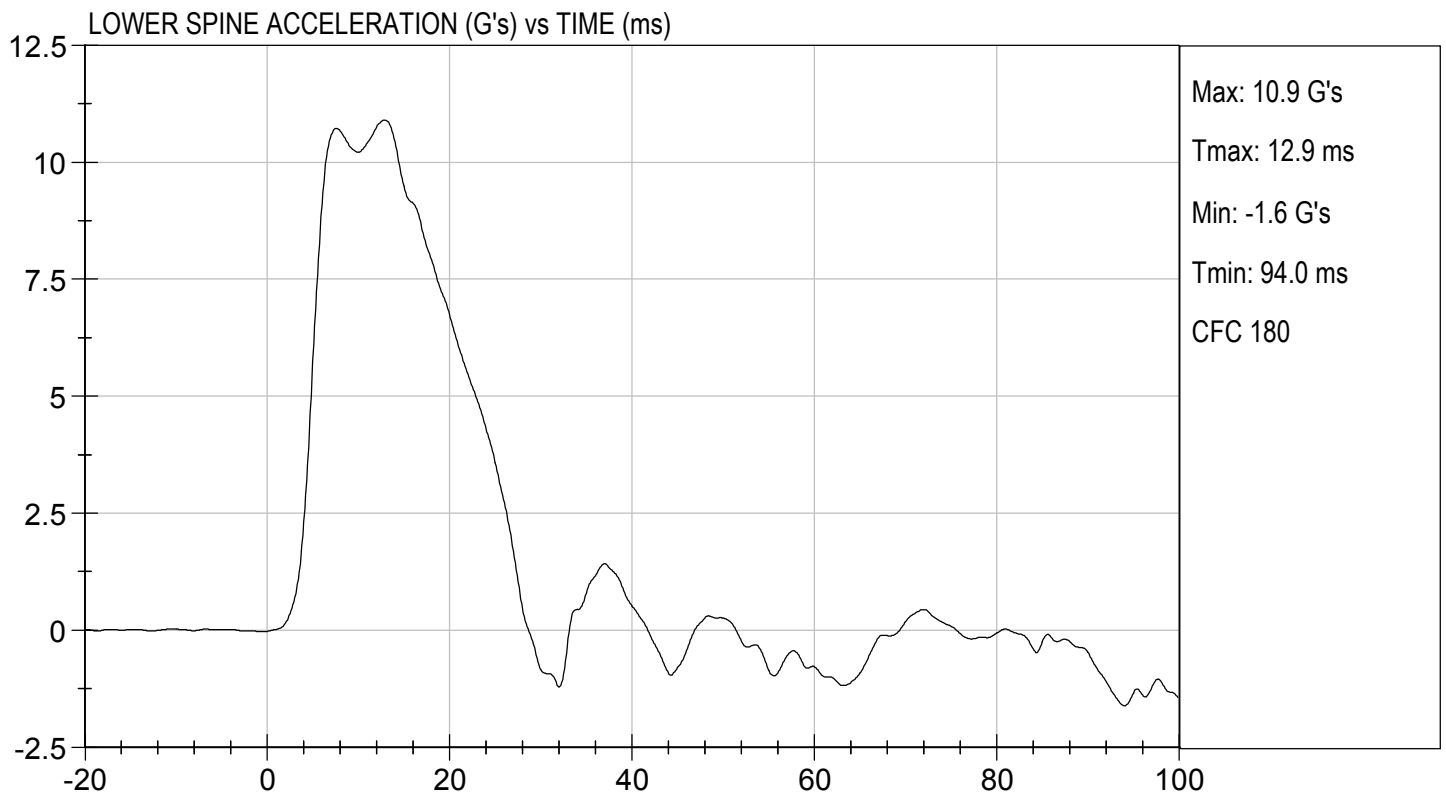
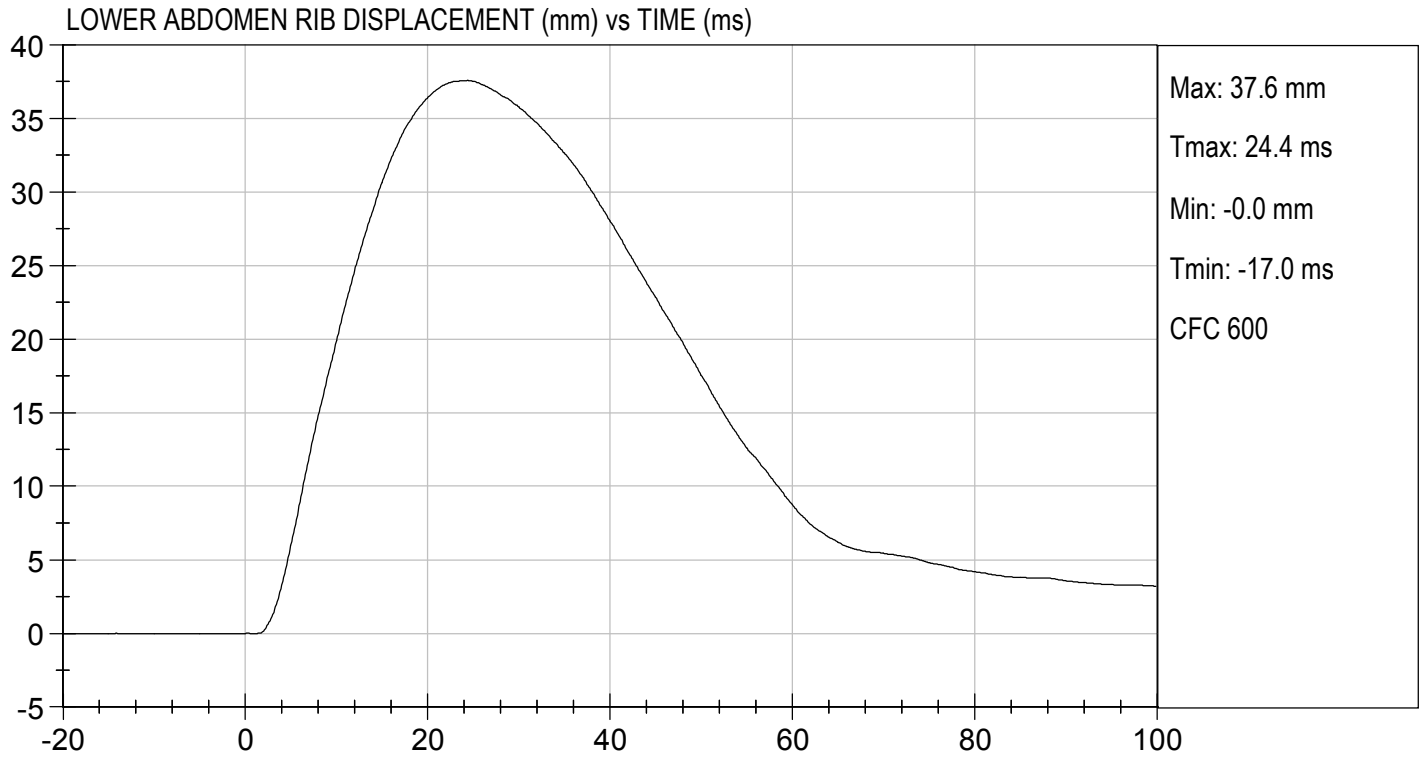
TEST DATE: 09/09/2021
TEST #: D212286





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

TEST DATE: 09/09/2021
TEST #: D212286



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D212287

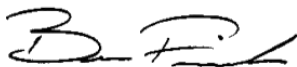
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	42.8	Pass
Impact Velocity	m/s	6.60 to 6.80	6.64	Pass
Maximum Probe Acceleration	G's	38 to 47	40	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	38	Pass
Peak Acetabulum Force	N	3600 to 4300	3,848	Pass
Overall Test Results				Pass



Laboratory Technician

09/09/2021

Test Date

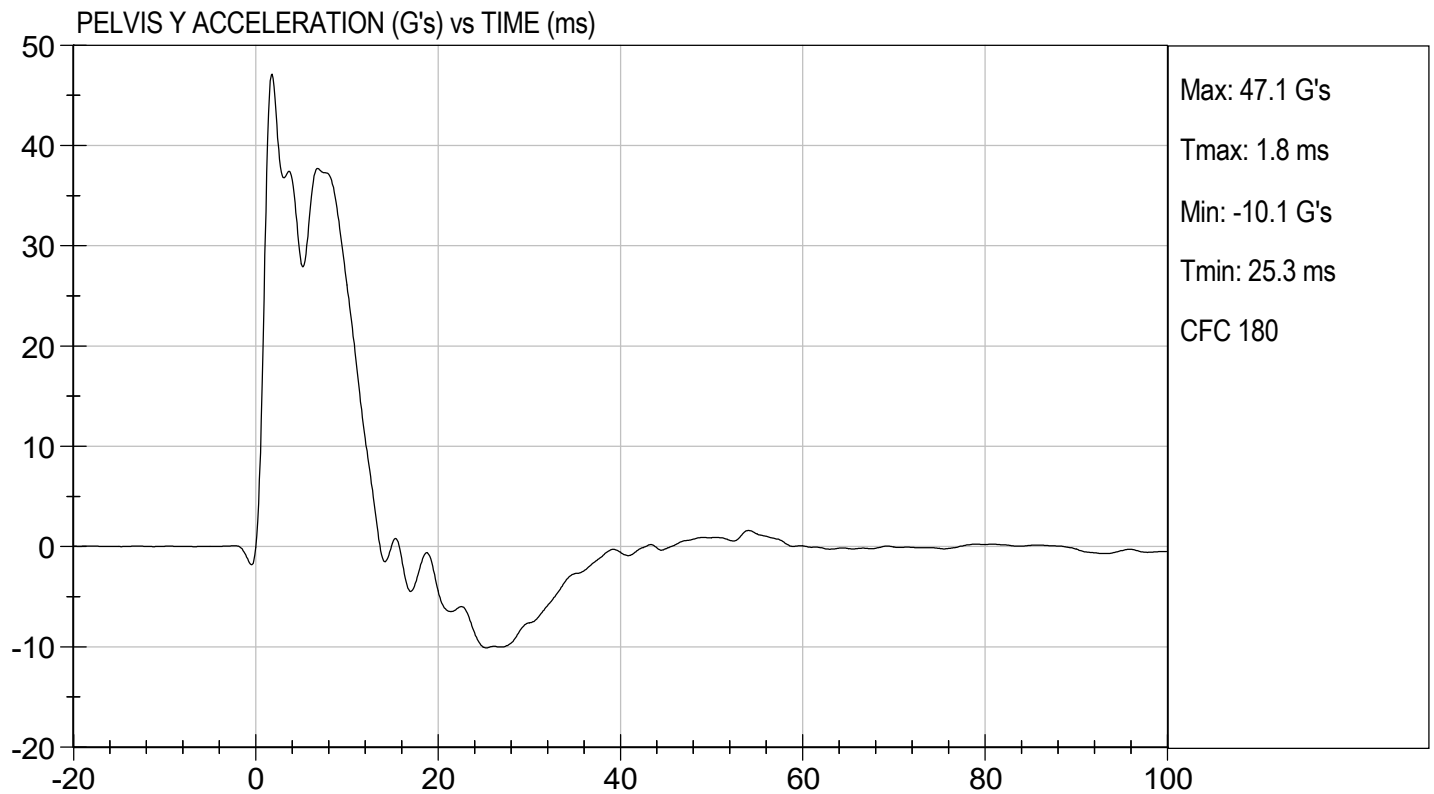
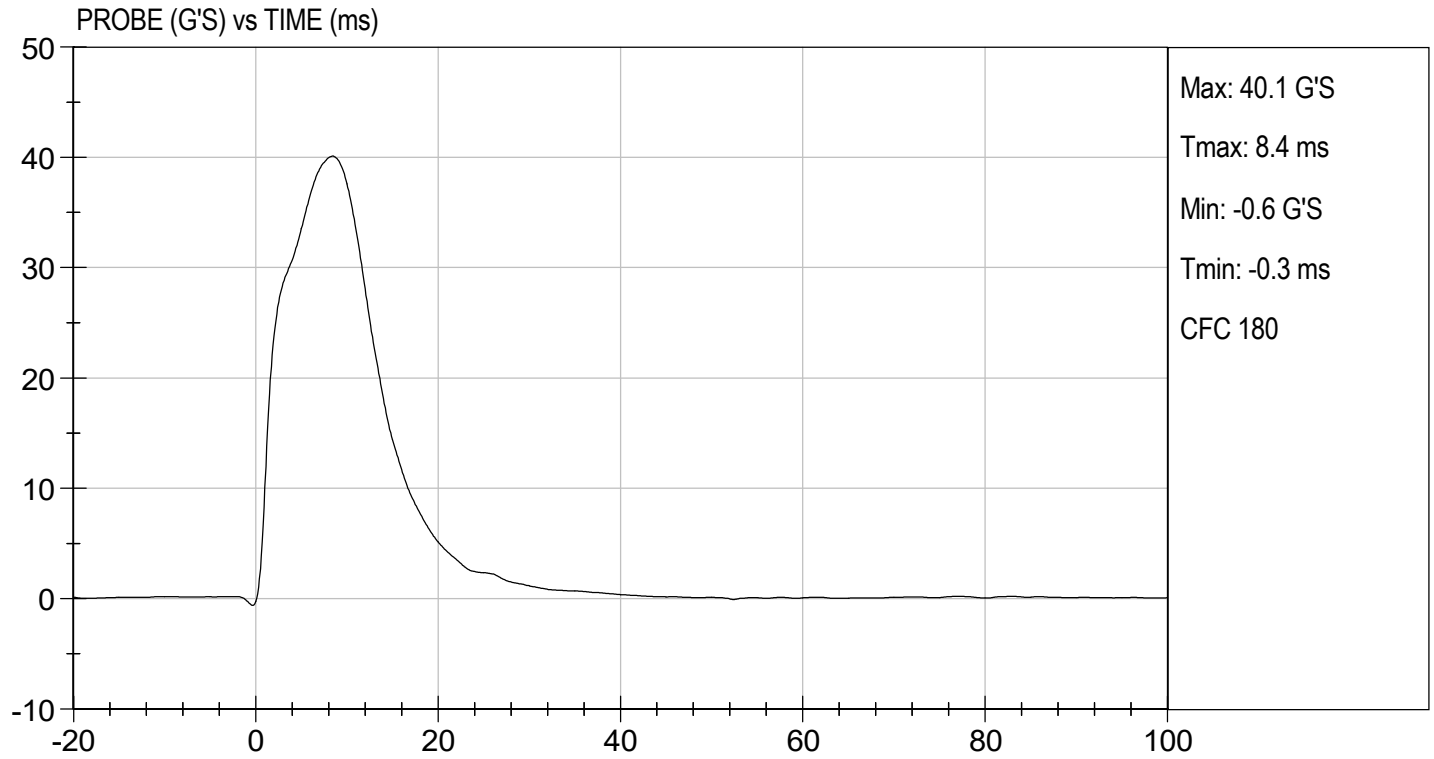


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 21.80 ft/s, 6.64 m/s

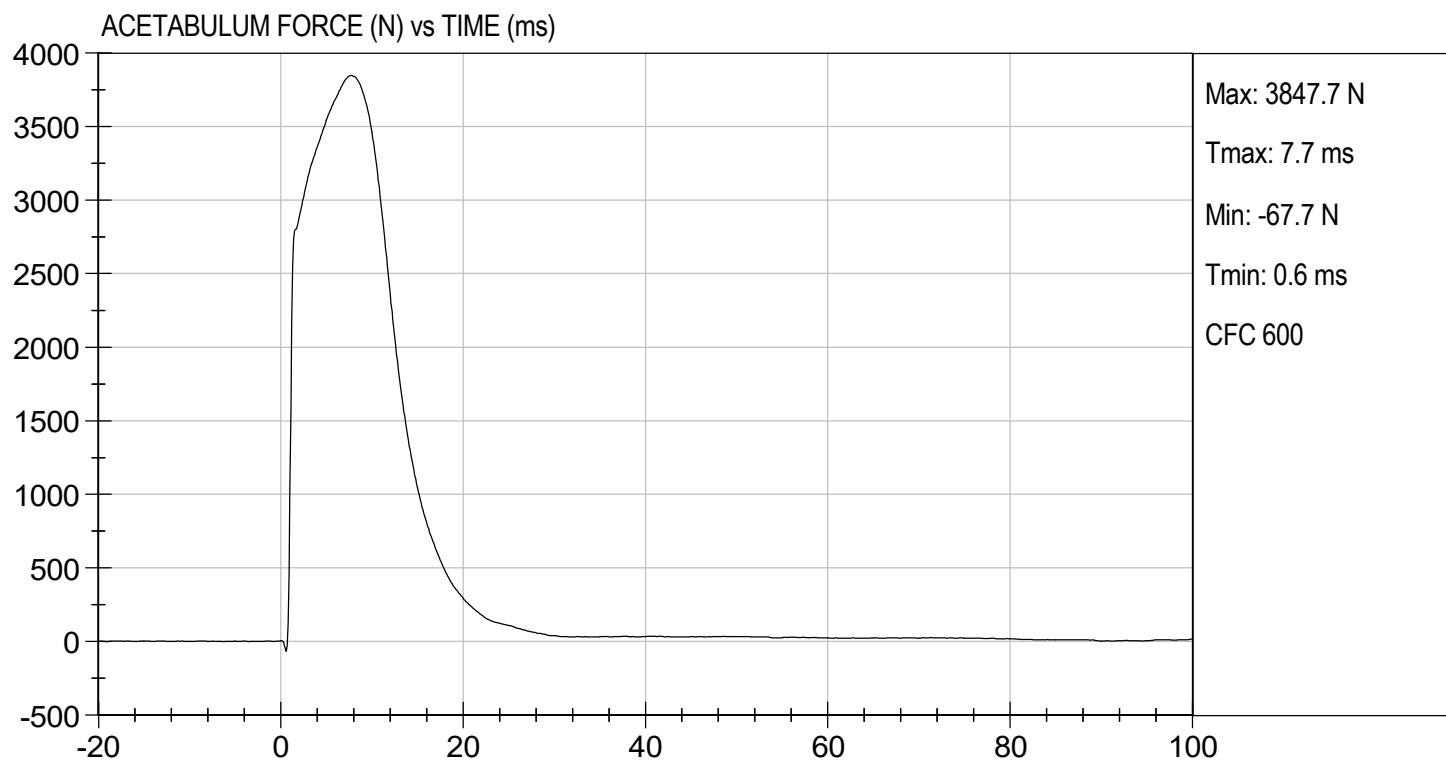
TEST DATE: 09/09/2021
TEST #: D212287





TEST DESC: PELVIS IMPACT
VELOCITY: 21.80 ft/s, 6.64 m/s

TEST DATE: 09/09/2021
TEST #: D212287



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

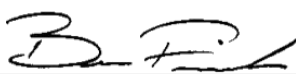
Test I.D: D212288

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	42.8	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	31	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,686	Pass
Overall Test Results				Pass


Laboratory Technician

09/09/2021

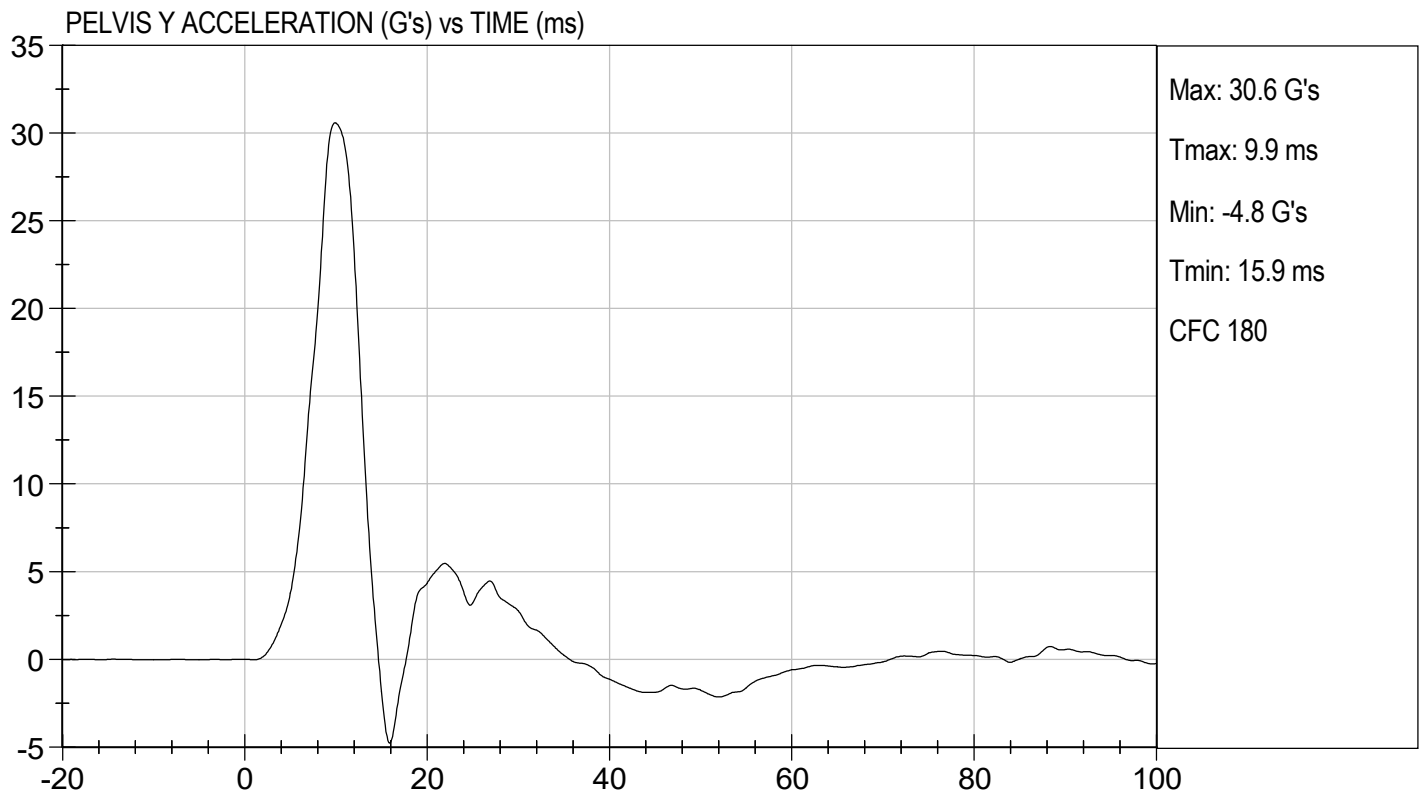
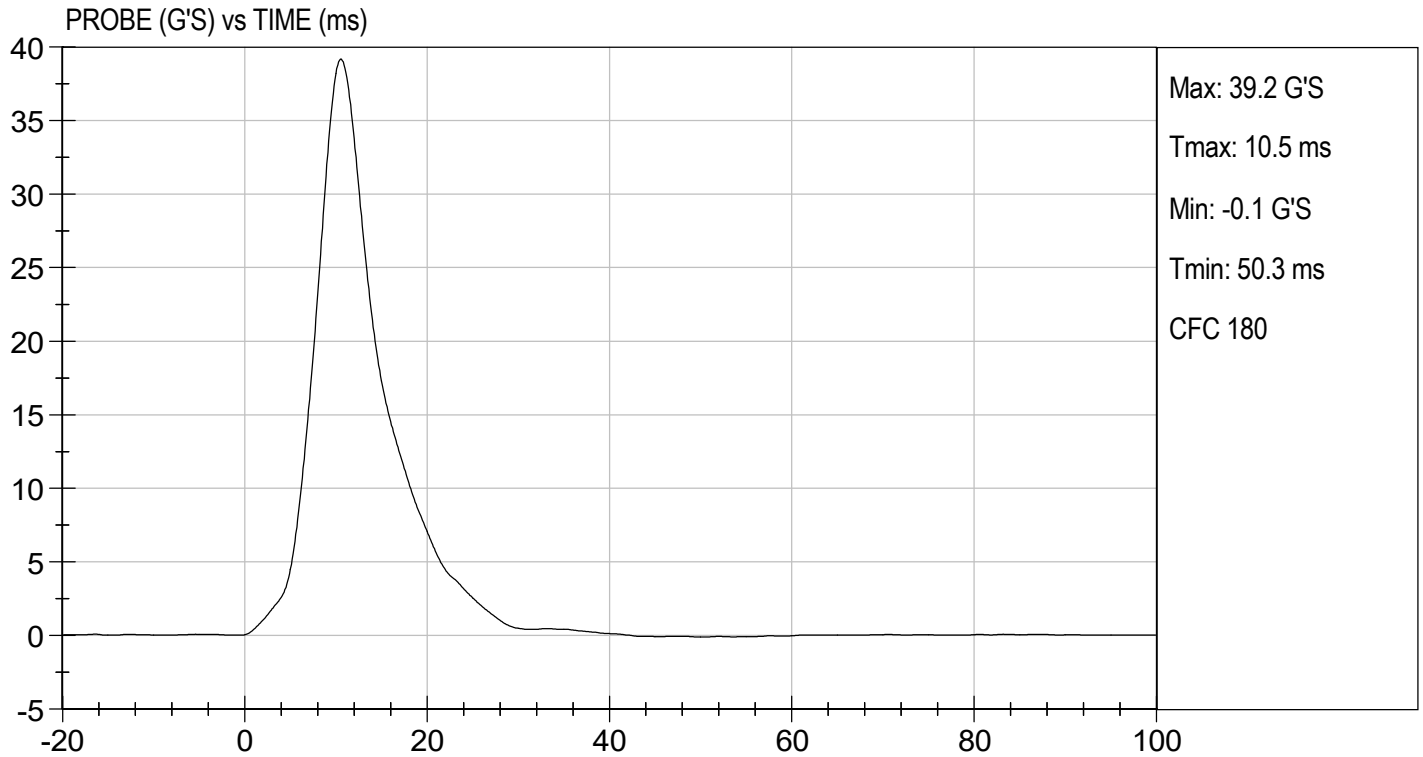
Test Date


Approved By



TEST DESC: ILLIAC
VELOCITY: 14.25 ft/s, 4.34 m/s

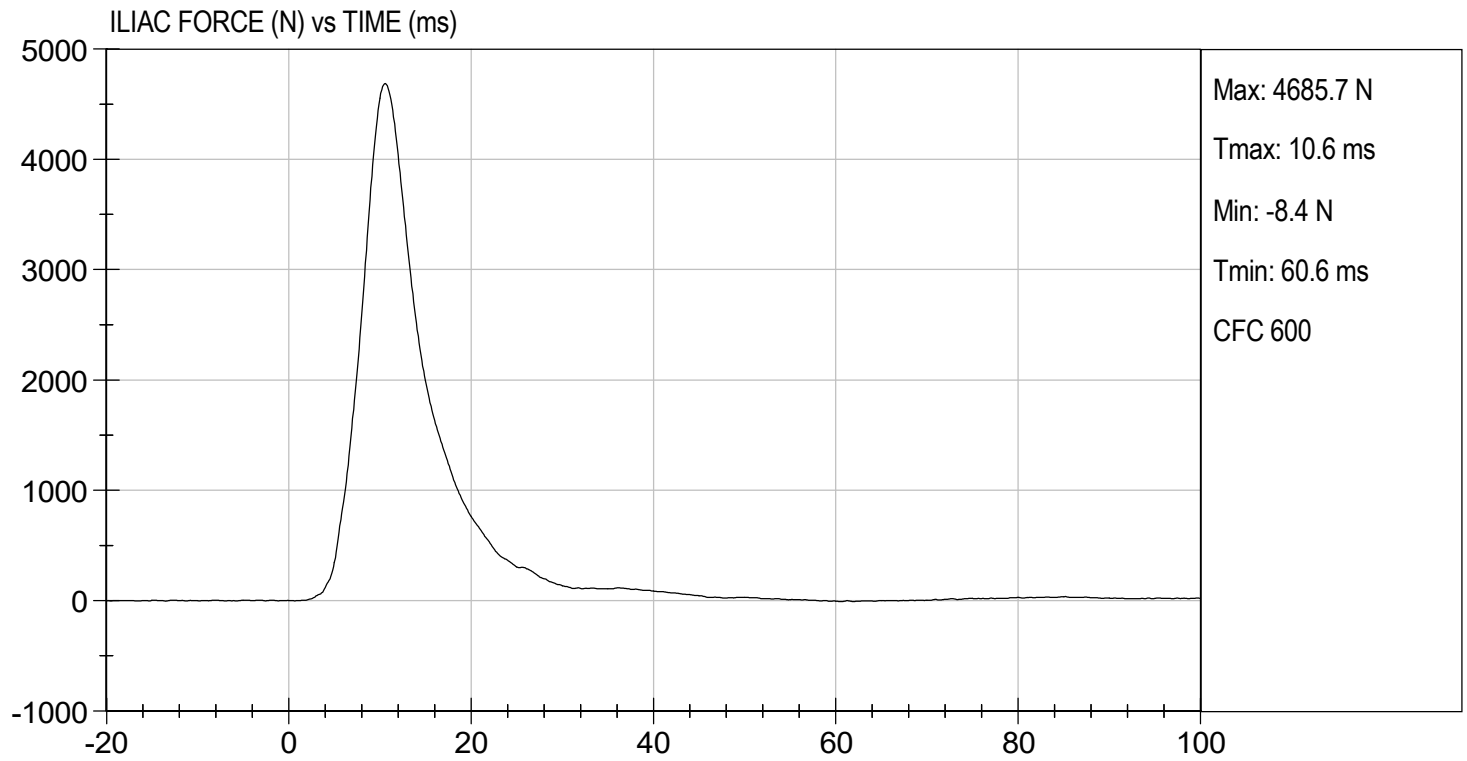
TEST DATE: 09/09/2021
TEST #: D212288





TEST DESC: ILLIAC
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 09/09/2021
TEST #: D212288



CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 296

No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	784	Pass
B	Shoulder Pivot Height	437 - 453	442	Pass
C	H-point Height	79 - 89	83	Pass
D	H-point from Seatback	141 - 151	145	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	121	Pass
G	Head Breadth	140 - 148	142	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	180	Pass
J	Head Circumference	541 - 551	548	Pass
K	Buttock to Knee Length	514 - 540	535	Pass
L	Popliteal Height	343 - 369	358	Pass
M	Knee Pivot to Floor Height	392 - 409	404	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	206	Pass
P	Foot Length	216 - 232	219	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	316	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	481	Pass
V	Shoulder Width	341 - 357	346	Pass
W	Foot Width	78 - 94	85	Pass
Y	Chest Circumference w/ jacket	851 - 881	870	Pass
Z	Waist Circumference	761 - 791	772	Pass

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

ATD Serial No: 296

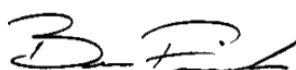
Test ID: D213211

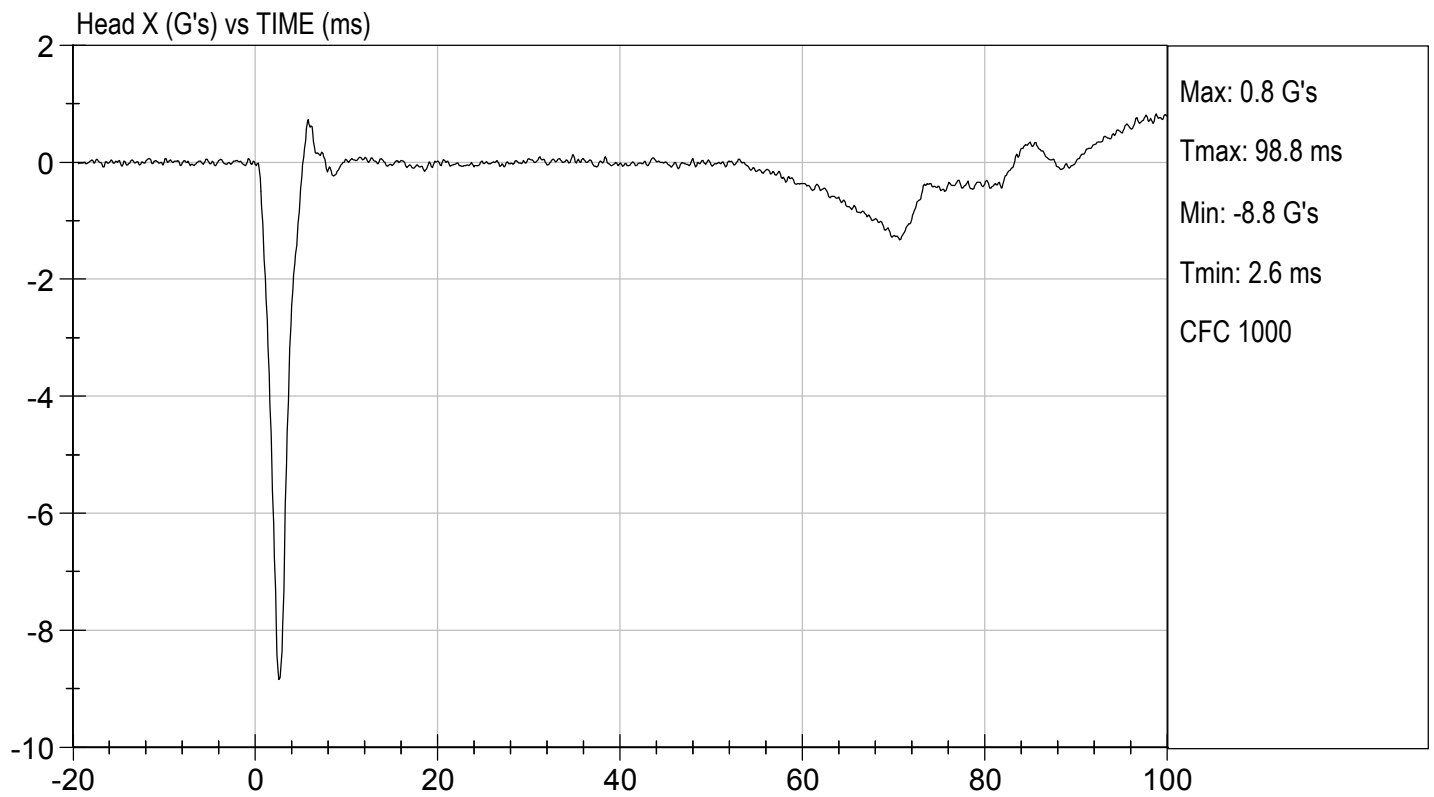
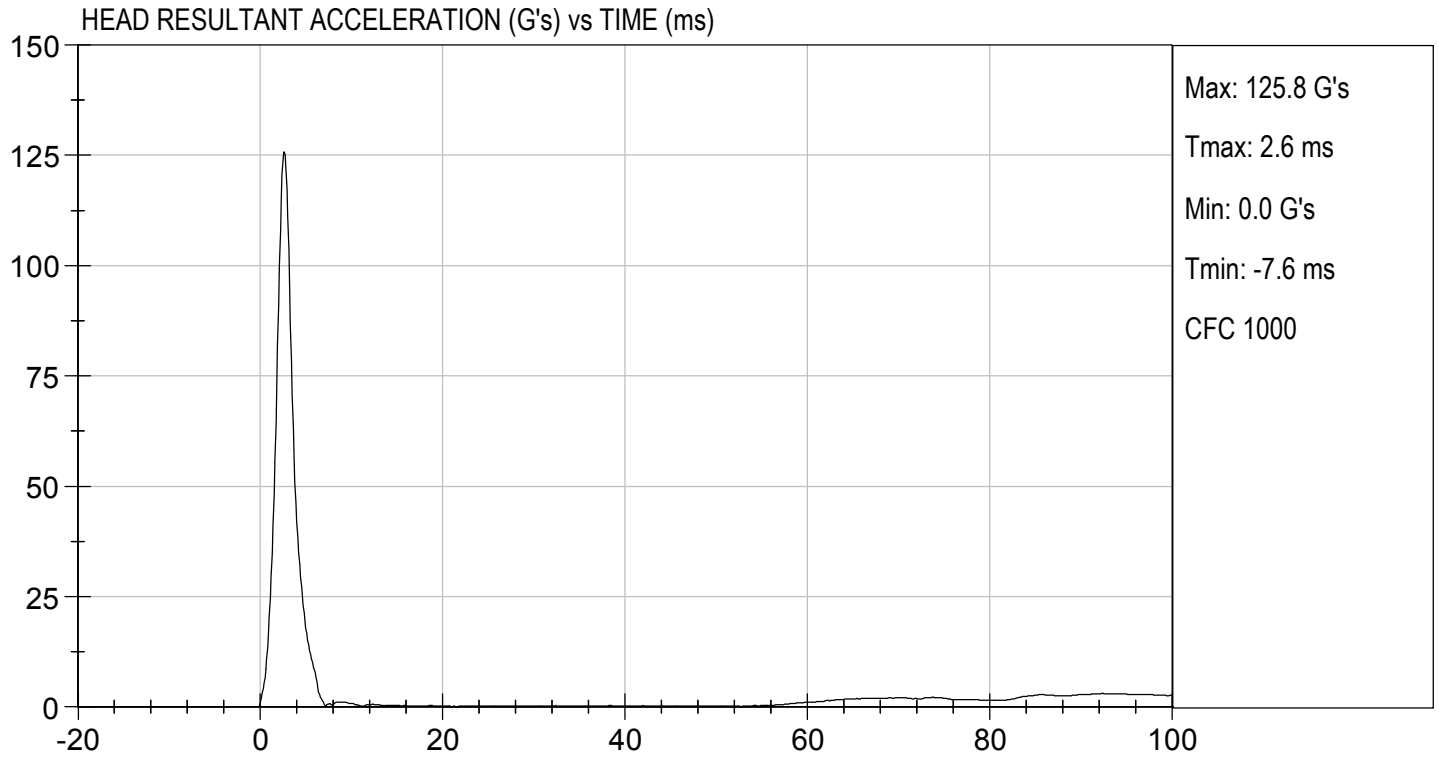
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	115 to 137	126	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-8.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass

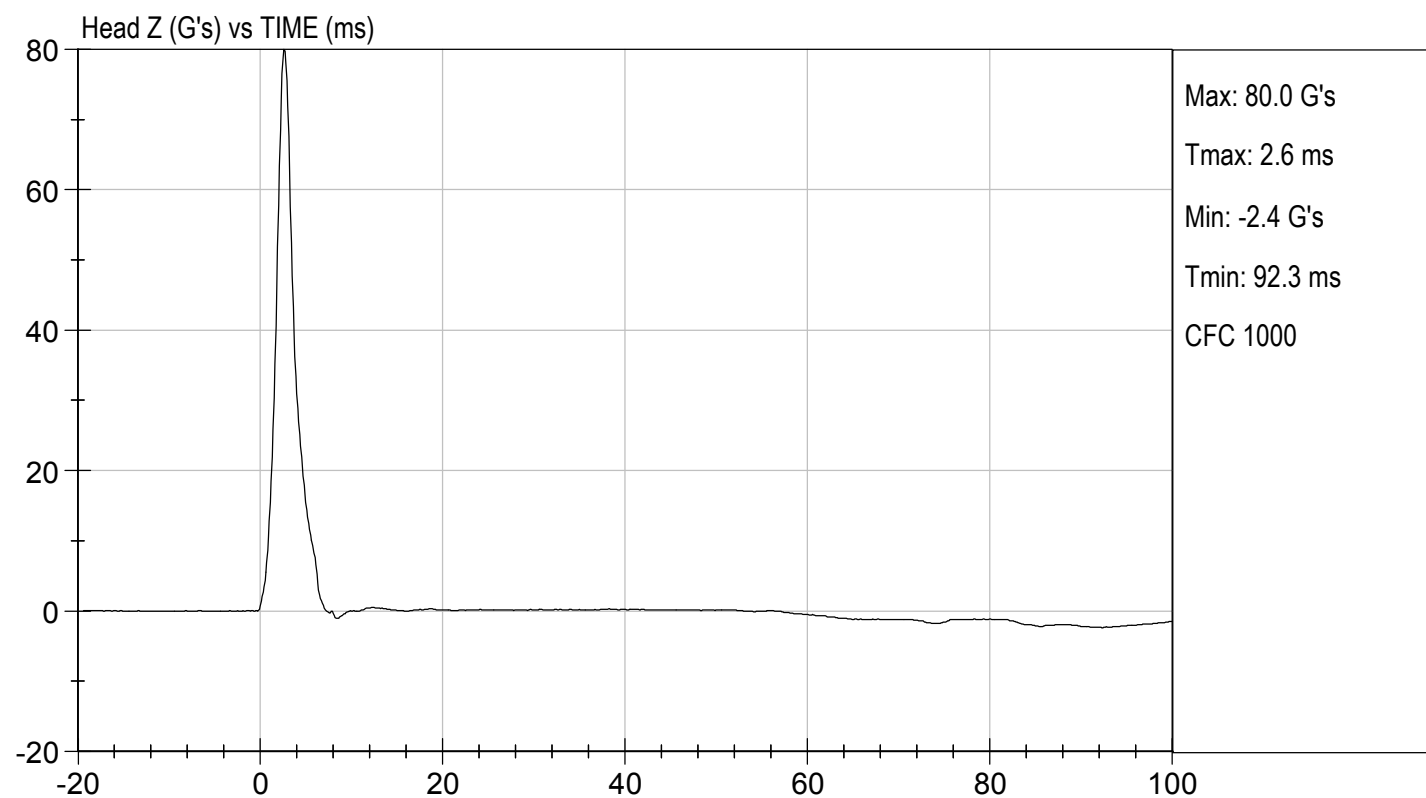
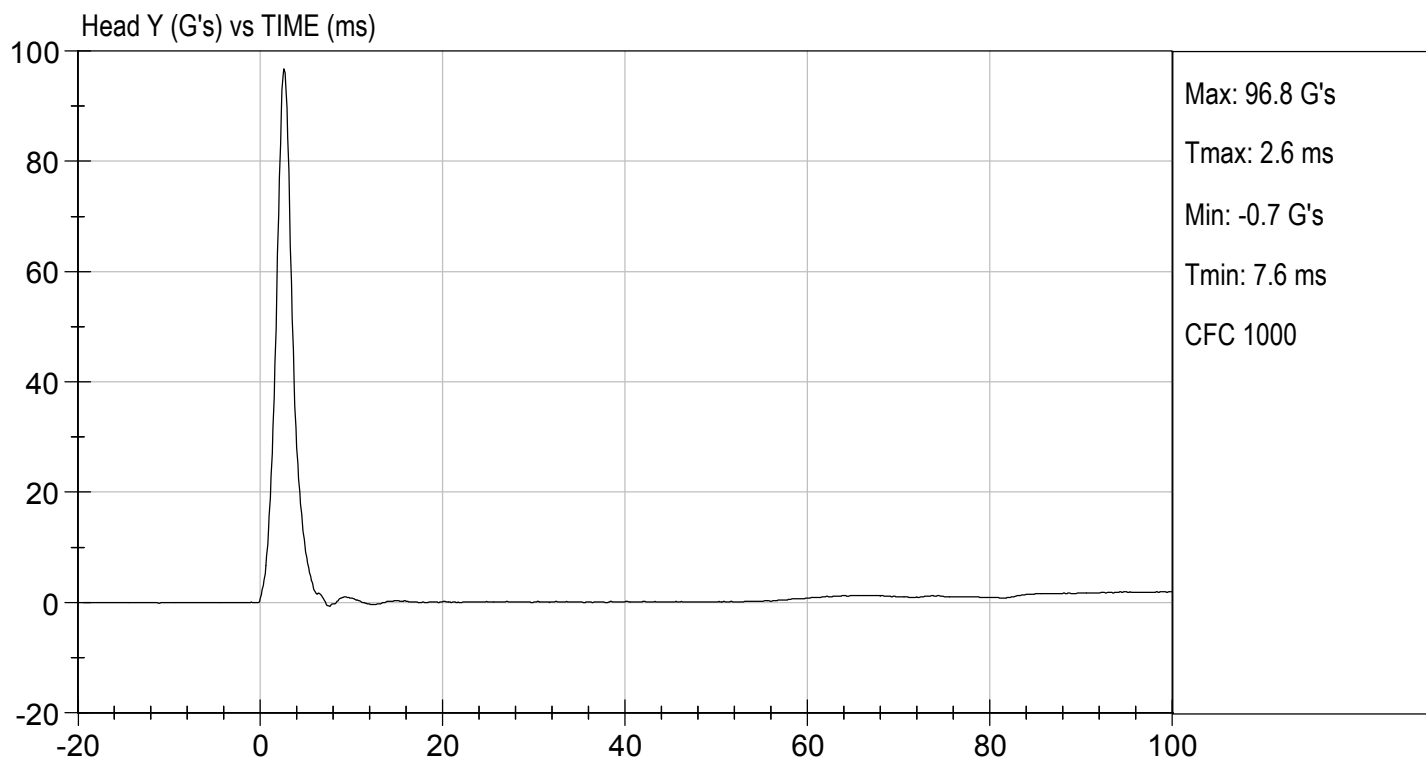

Laboratory Technician

10/08/2021

Test Date


Approved By





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

ATD Serial No: 296

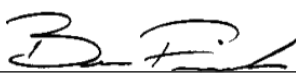
Test I.D: D213212

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.5	Pass
Humidity		%	10 to 70	45	Pass
Impact Velocity		m/s	5.51 to 5.63	5.63	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.43	Pass
	15 ms	m/s	3.30 to 4.10	3.67	Pass
	20 ms	m/s	4.40 to 5.40	5.24	Pass
	25 ms	m/s	5.40 to 6.10	5.68	Pass
	25-100 ms	m/s	5.50 to 6.20	5.73	Pass
Maximum D-Plane Rotation		deg	71 to 81	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	64	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-37	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	112	Pass
Overall Test Results					Pass


 Laboratory Technician

10/08/2021

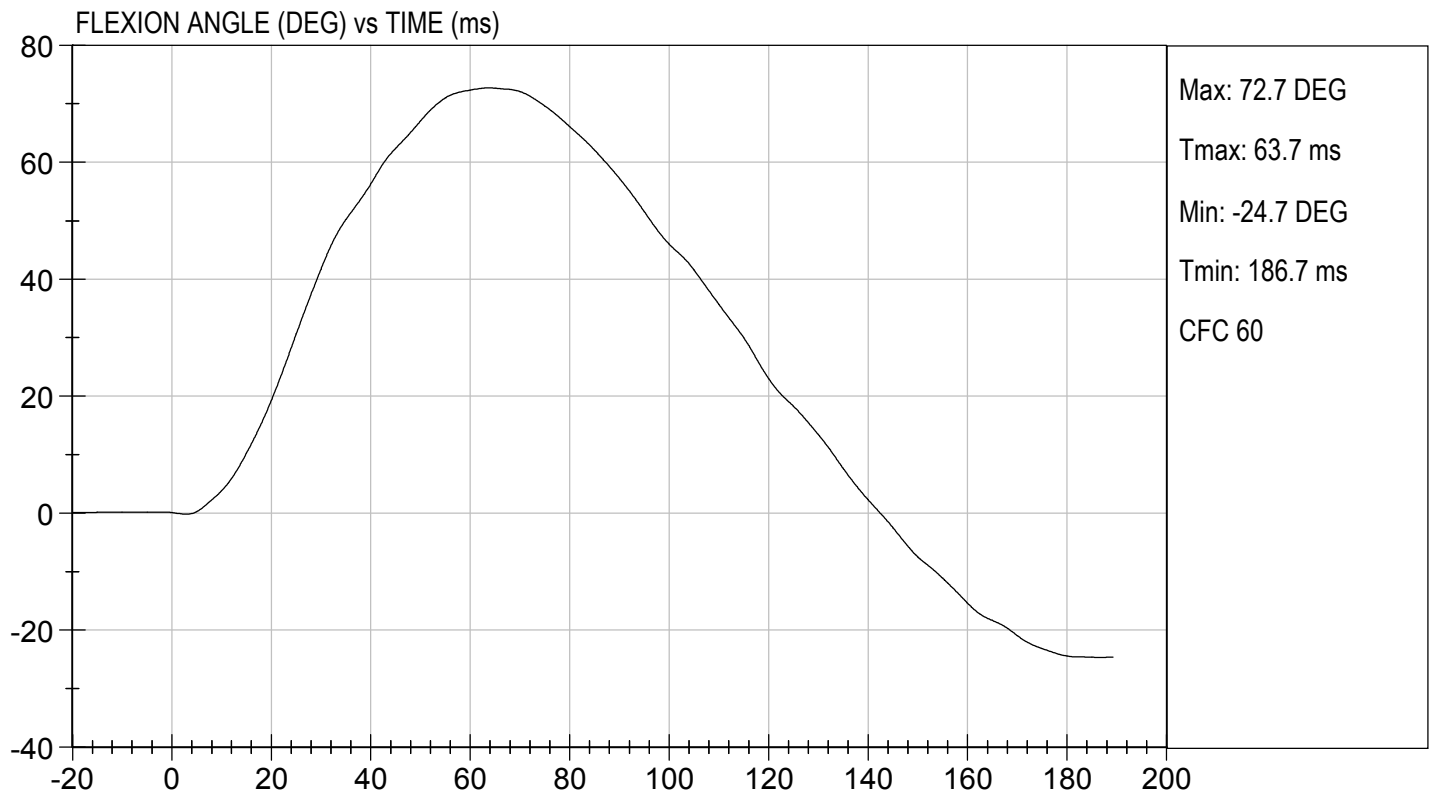
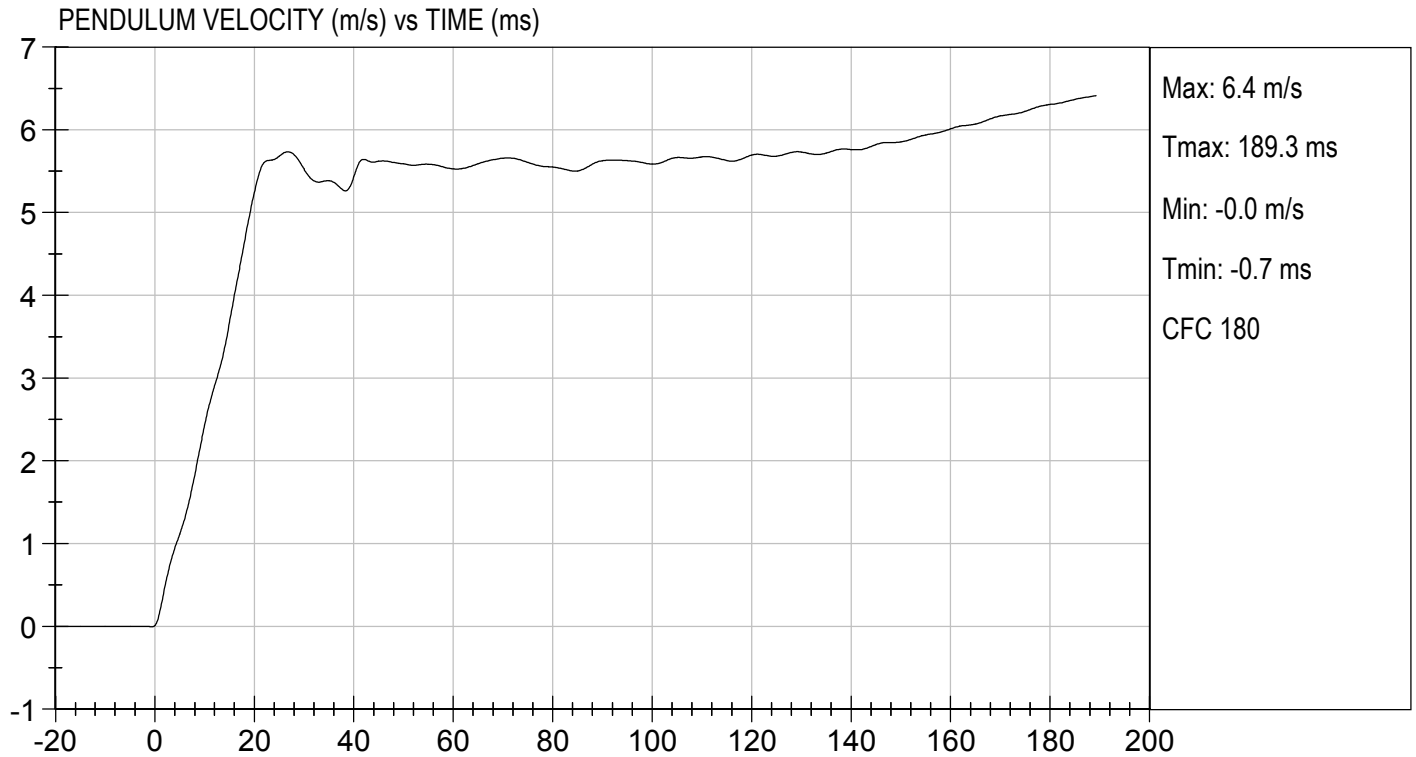
Test Date


 Approved By



TEST DESC: NECK BENDING
VELOCITY: 18.48 ft/s, 5.63 m/s

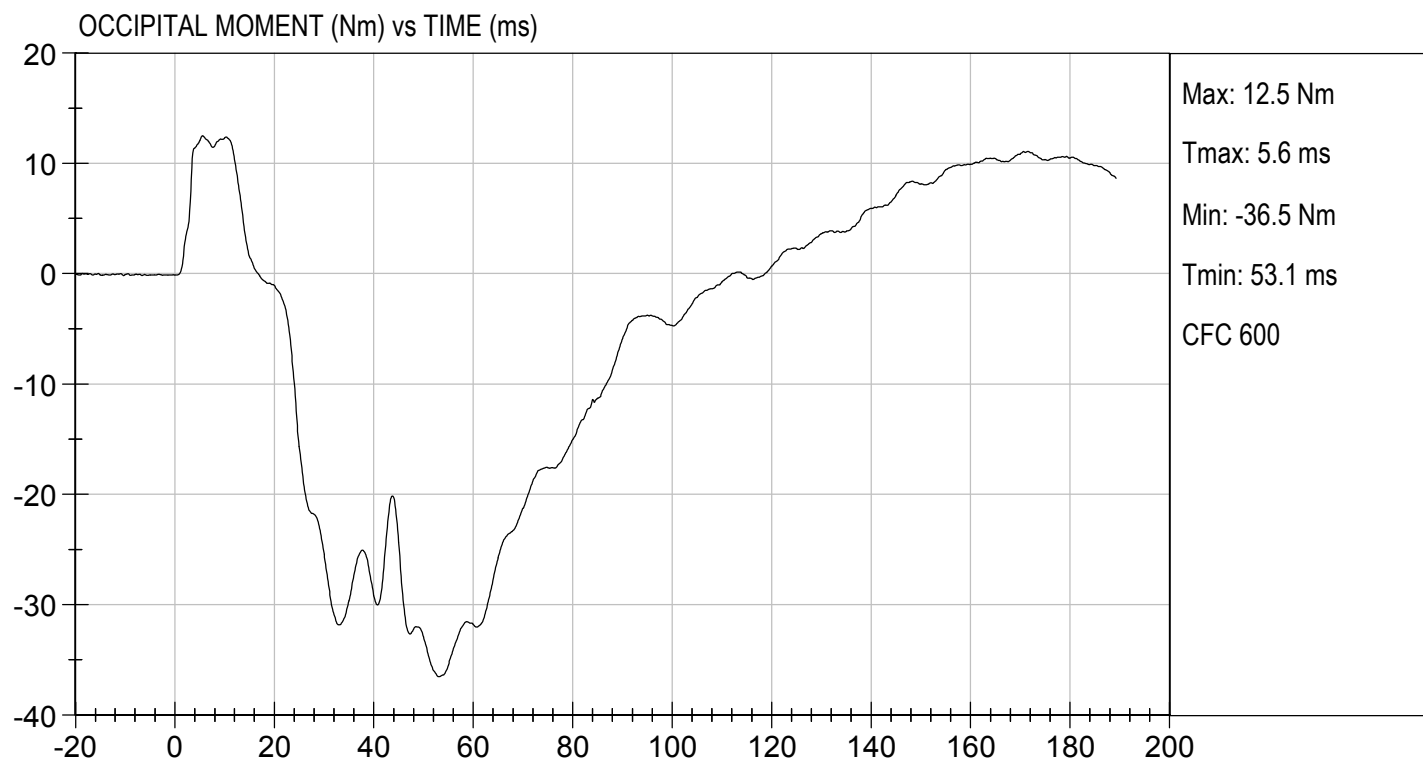
TEST DATE: 10/08/2021
TEST #: D213212





TEST DESC: NECK BENDING
VELOCITY: 18.48 ft/s, 5.63 m/s

TEST DATE: 10/08/2021
TEST #: D213212



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

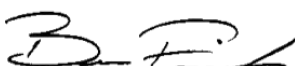
ATD Serial No: 296

Test ID: D213213

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	46	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


Laboratory Technician

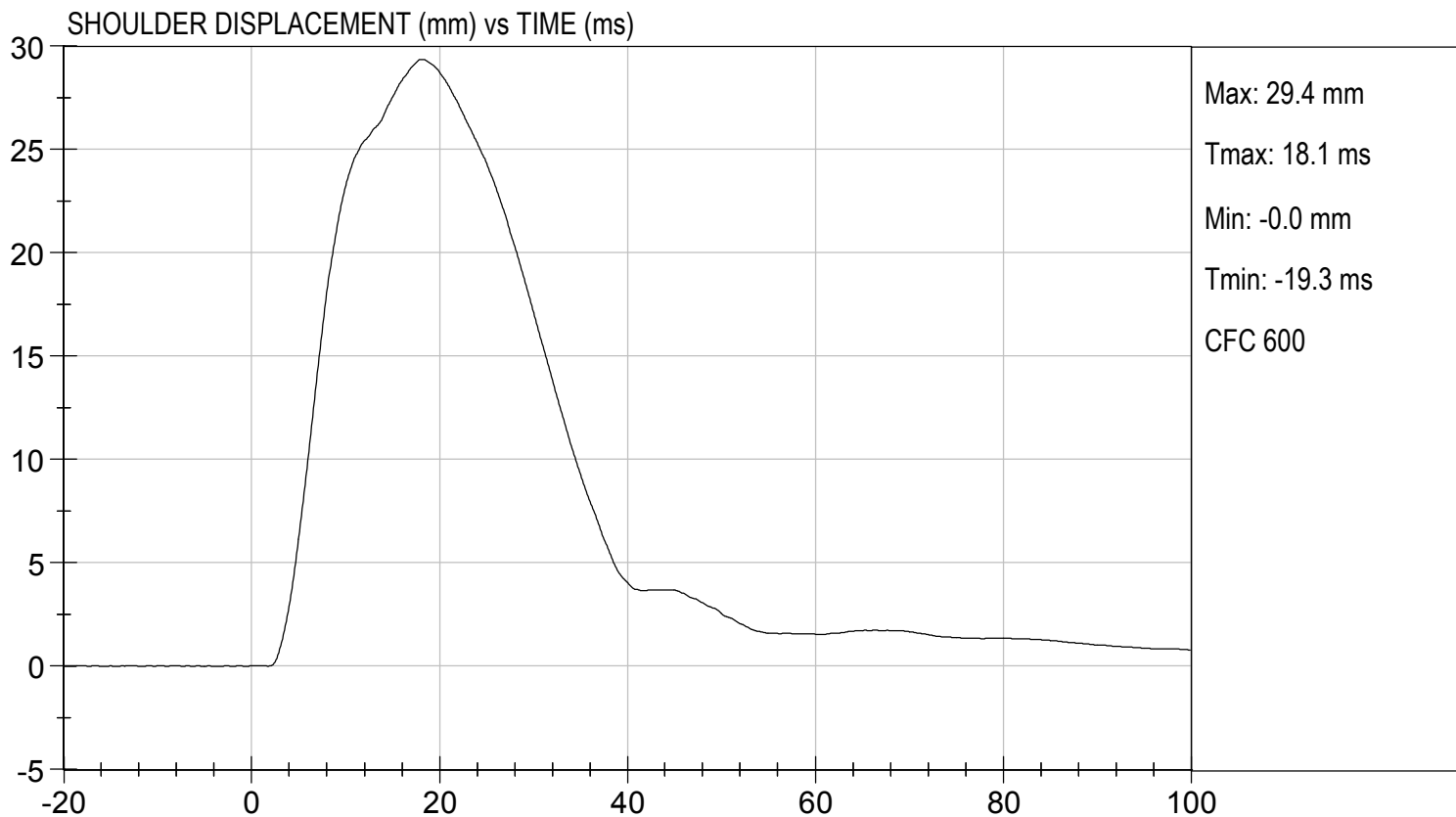
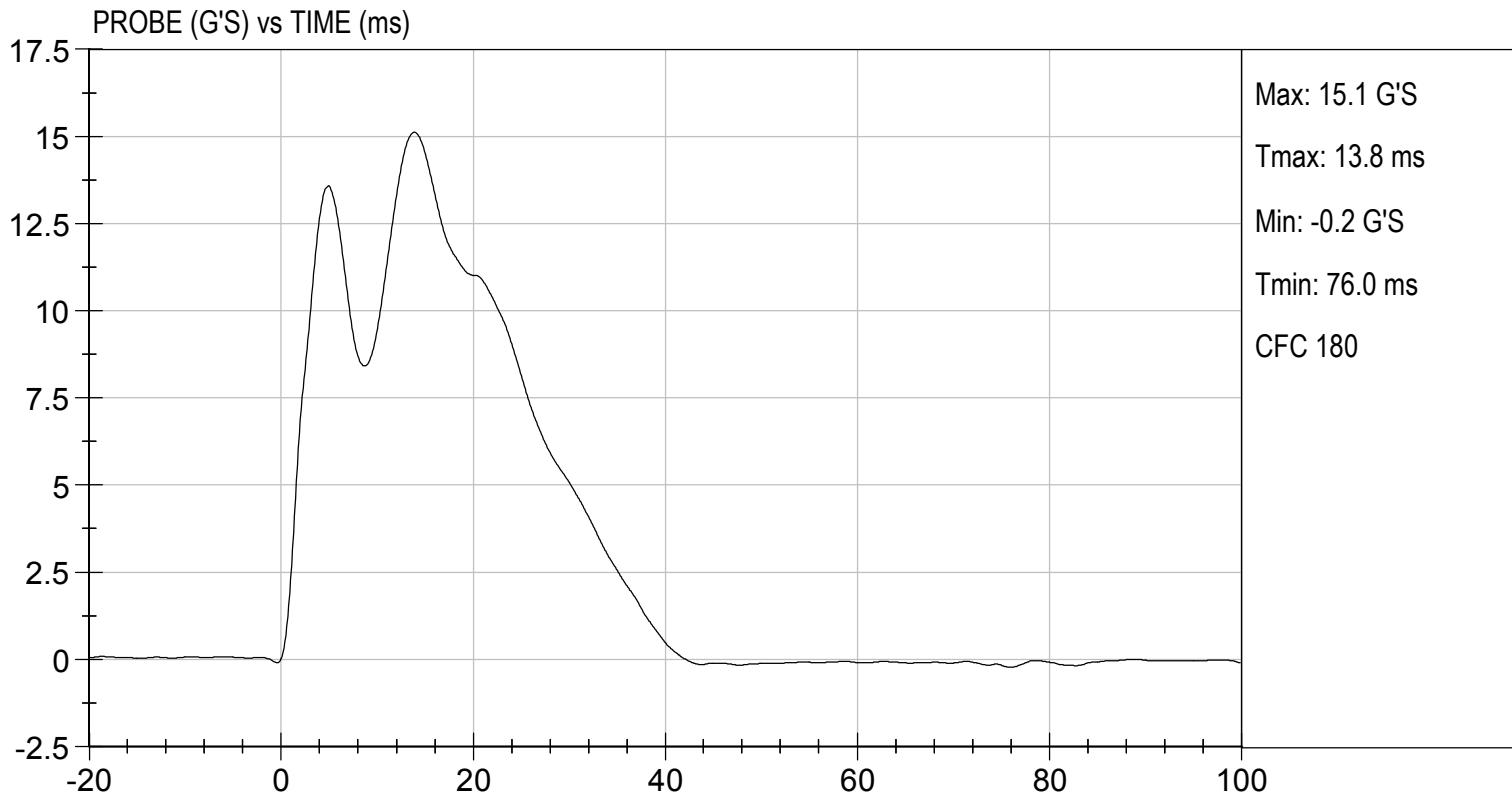
10/07/2021
Test Date


Approved By



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

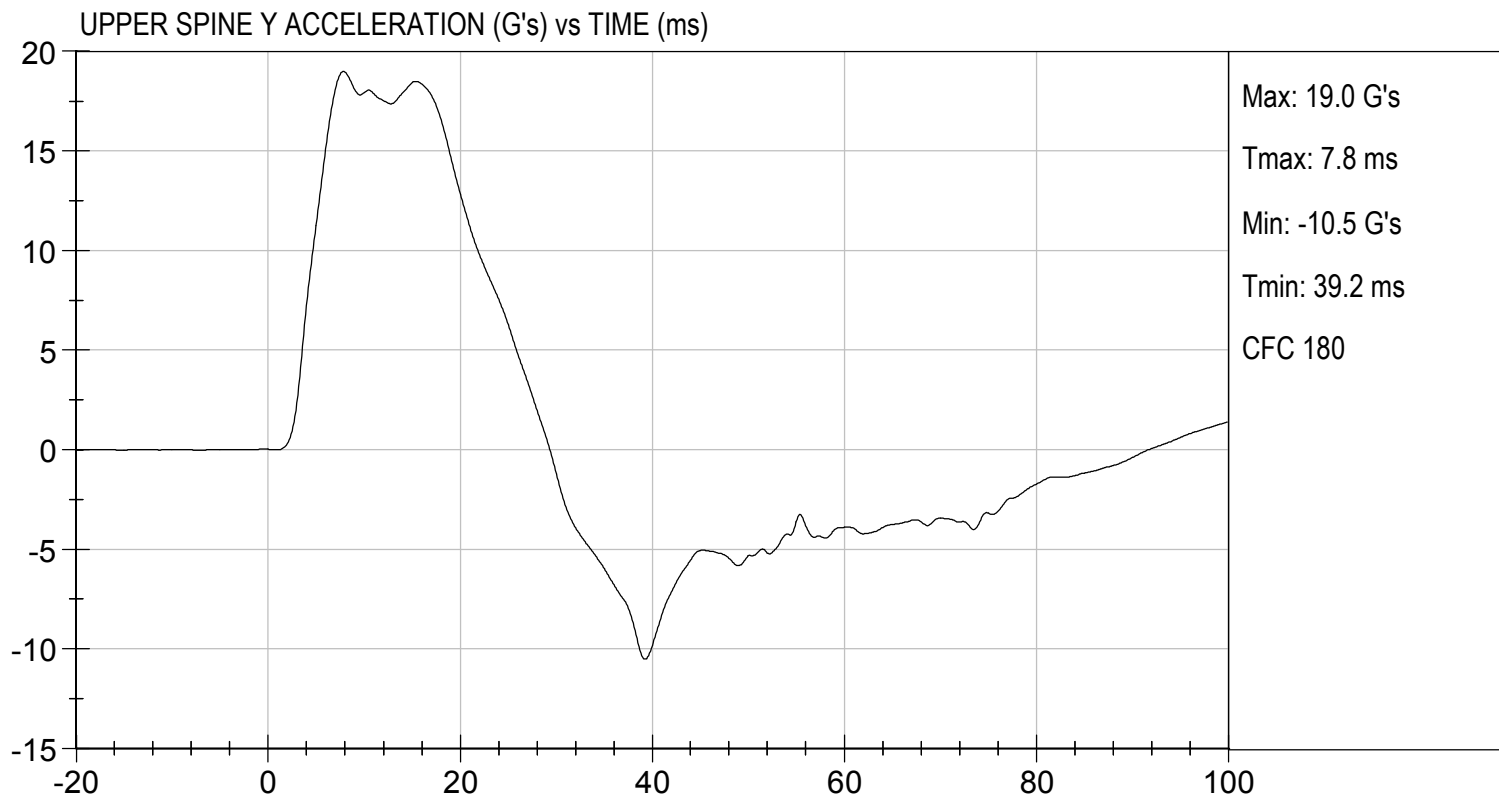
TEST DATE: 10/07/2021
TEST #: D213213





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

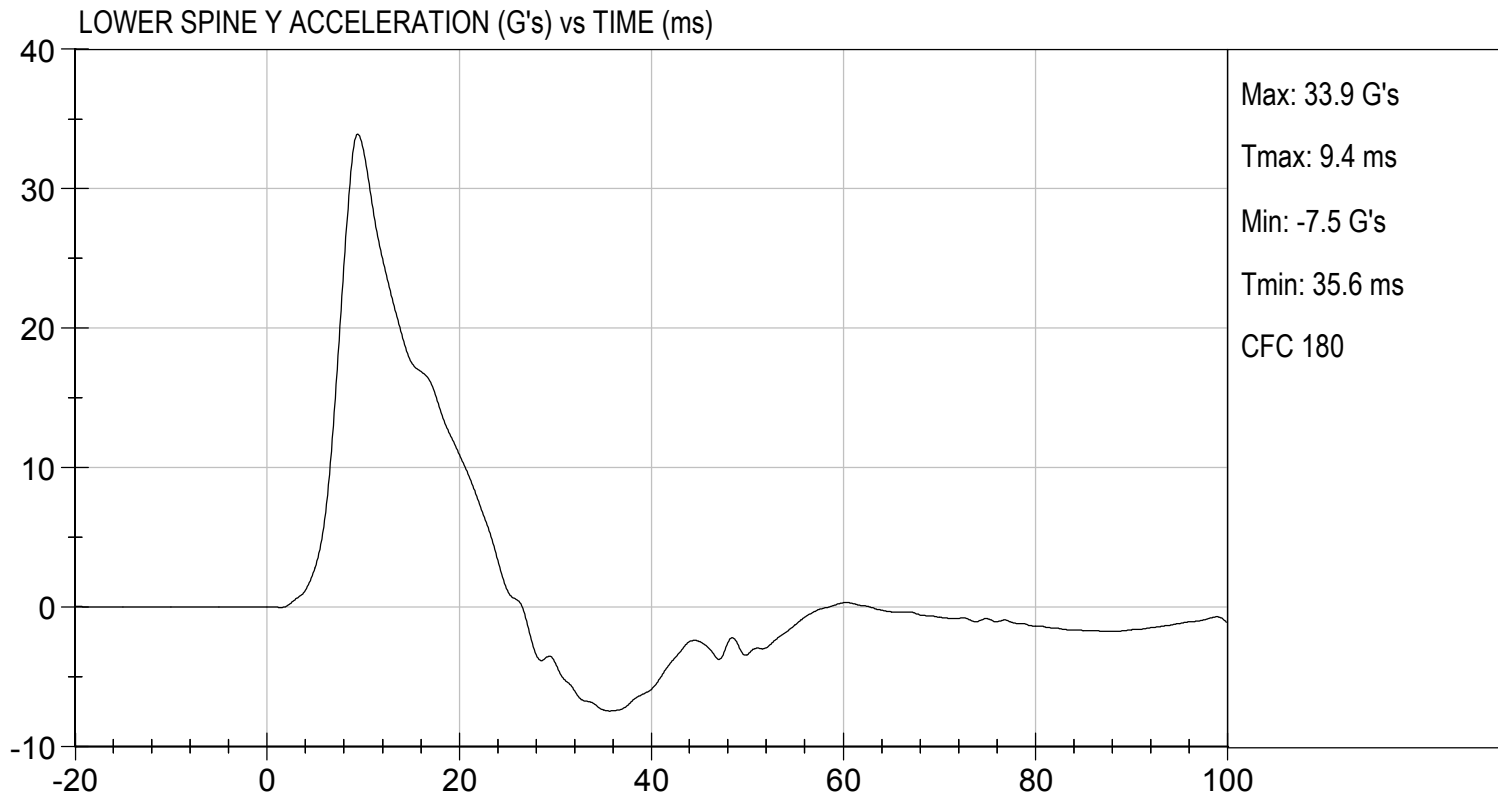
TEST DATE: 10/07/2021
TEST #: D213213





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

TEST DATE: 10/07/2021
TEST #: D213214



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

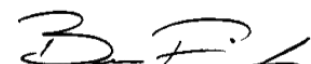
ATD Serial No: 296

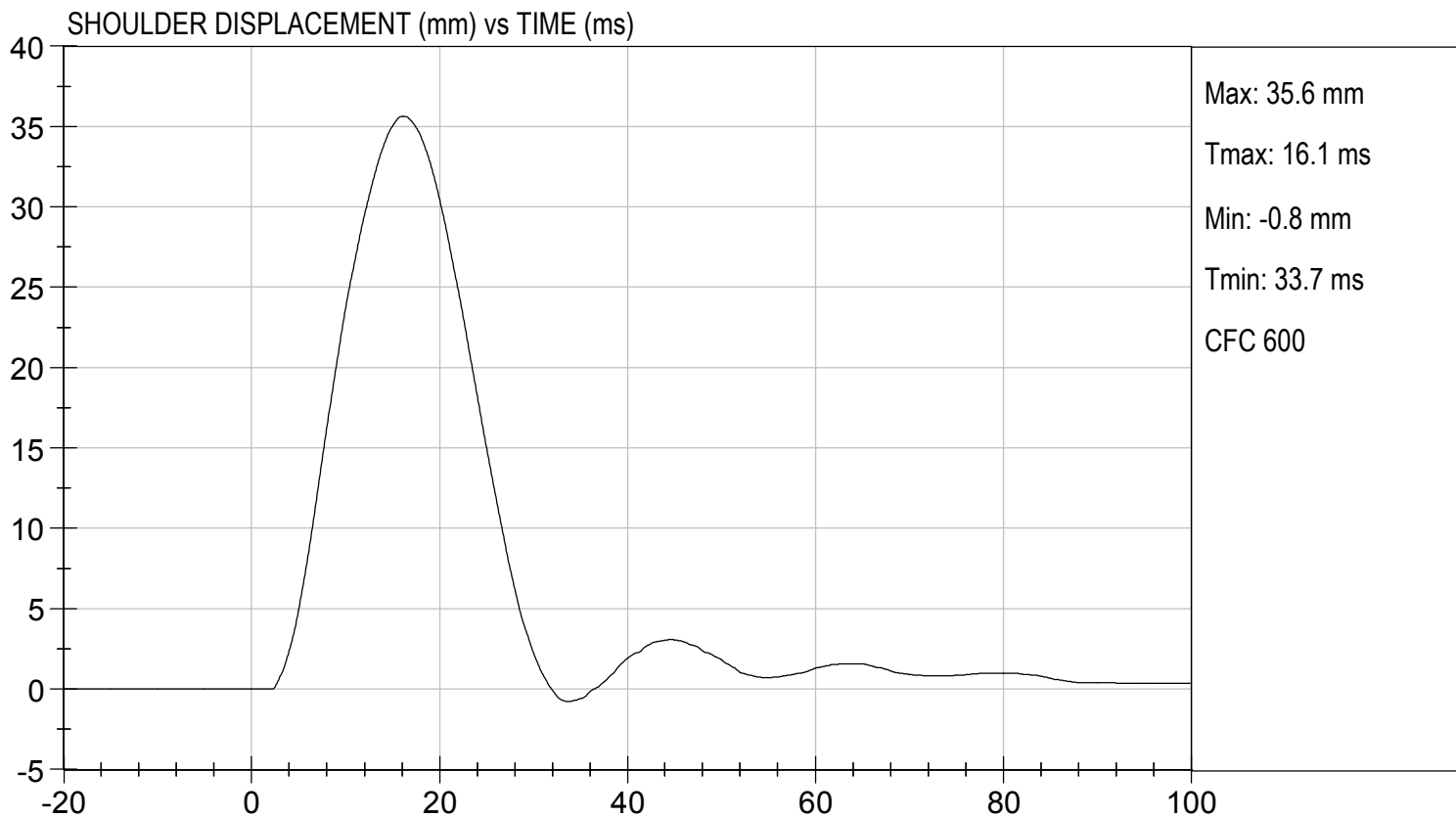
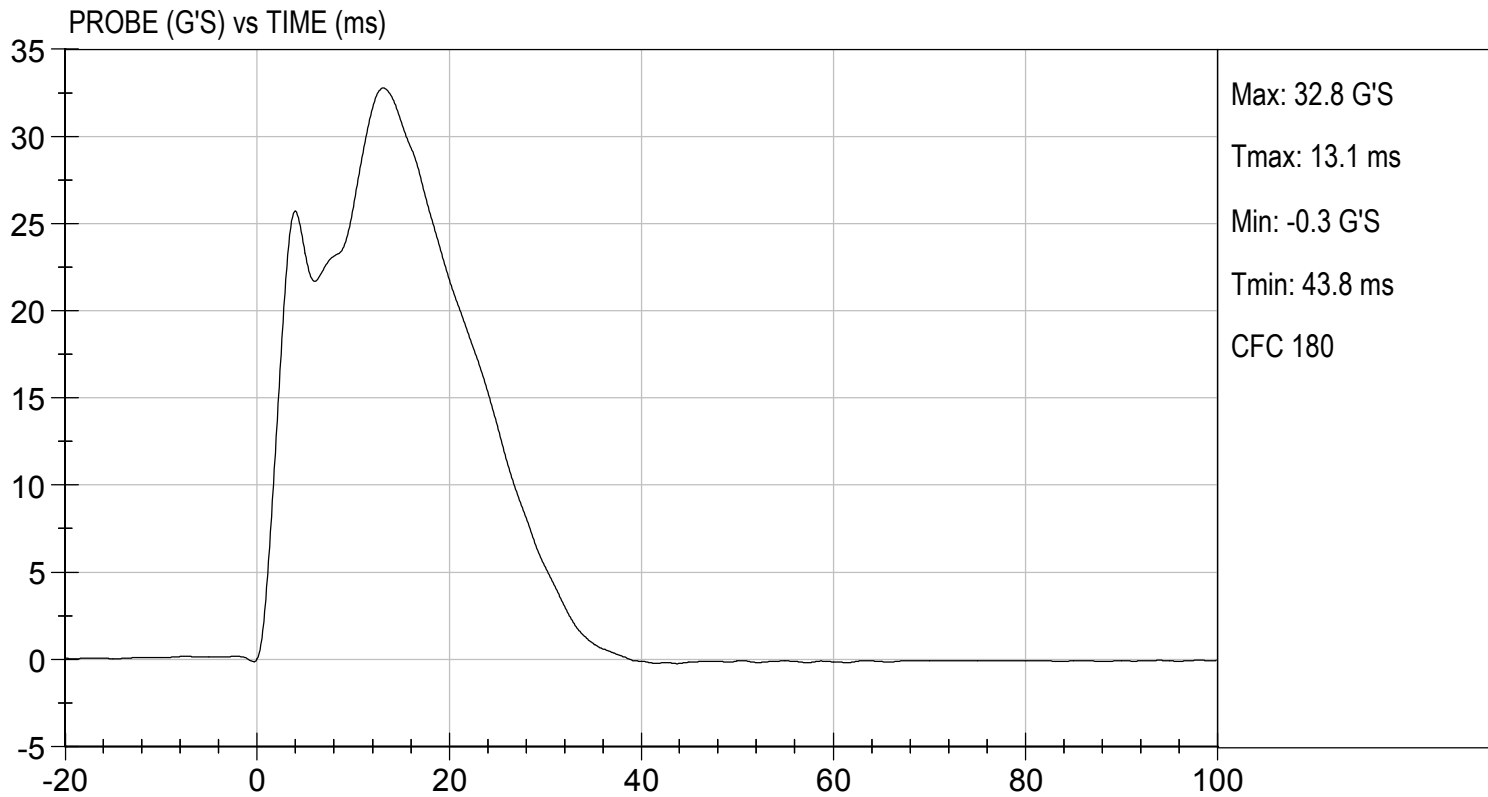
Test I.D: D213214

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	36	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	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	34	Pass
Overall Test Results				Pass


Laboratory Technician

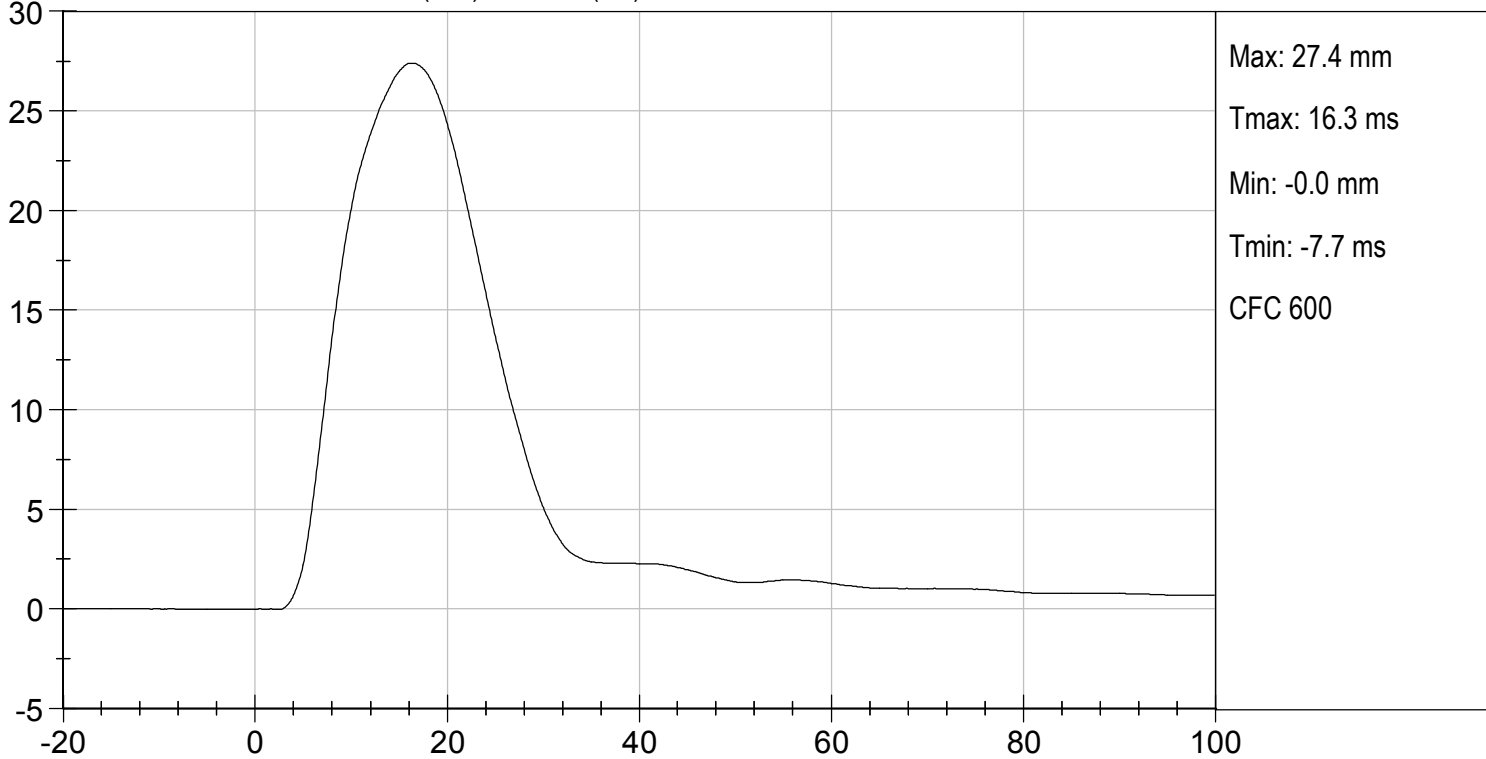
10/07/2021
Test Date


Approved By

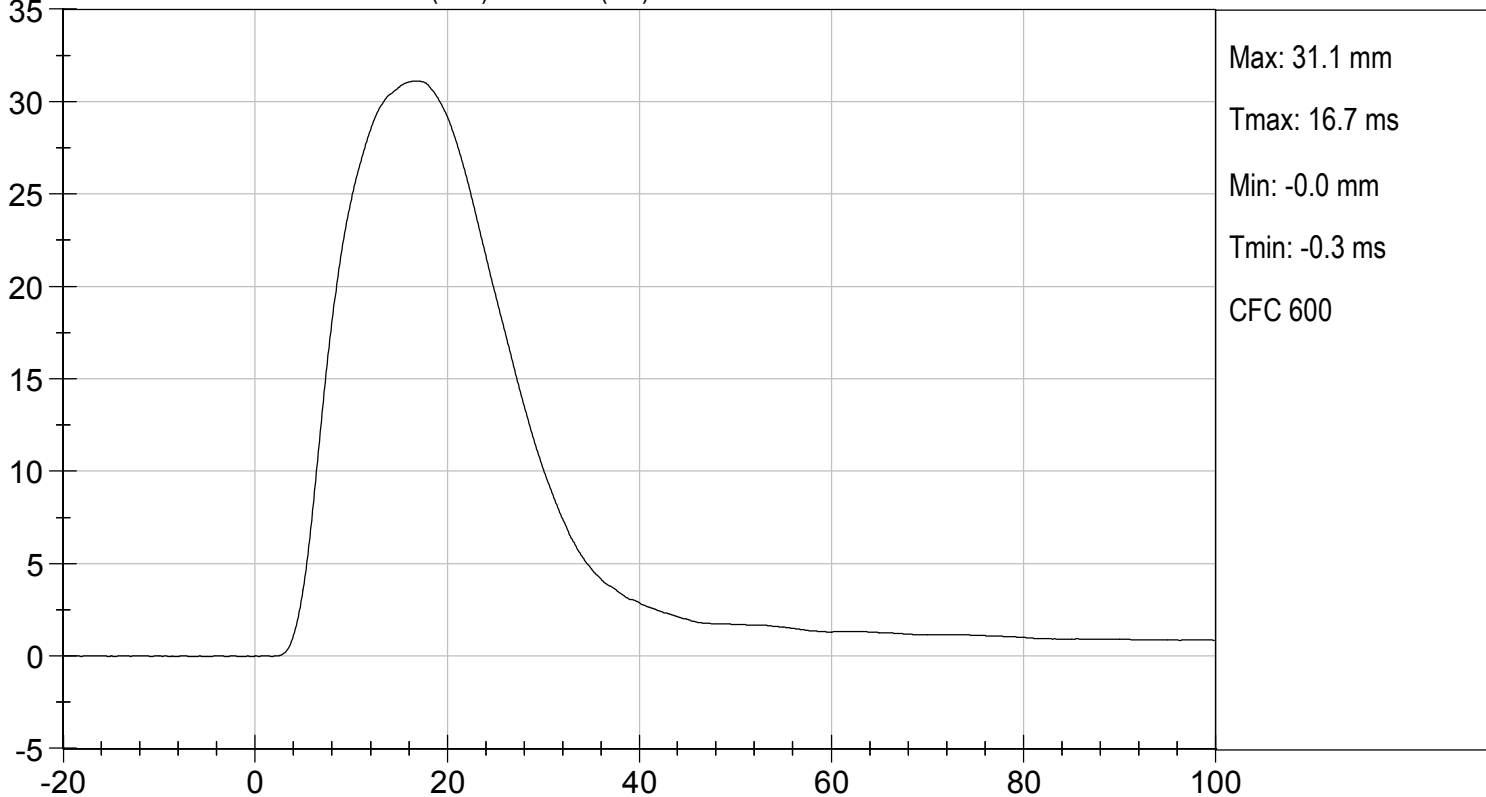




UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)

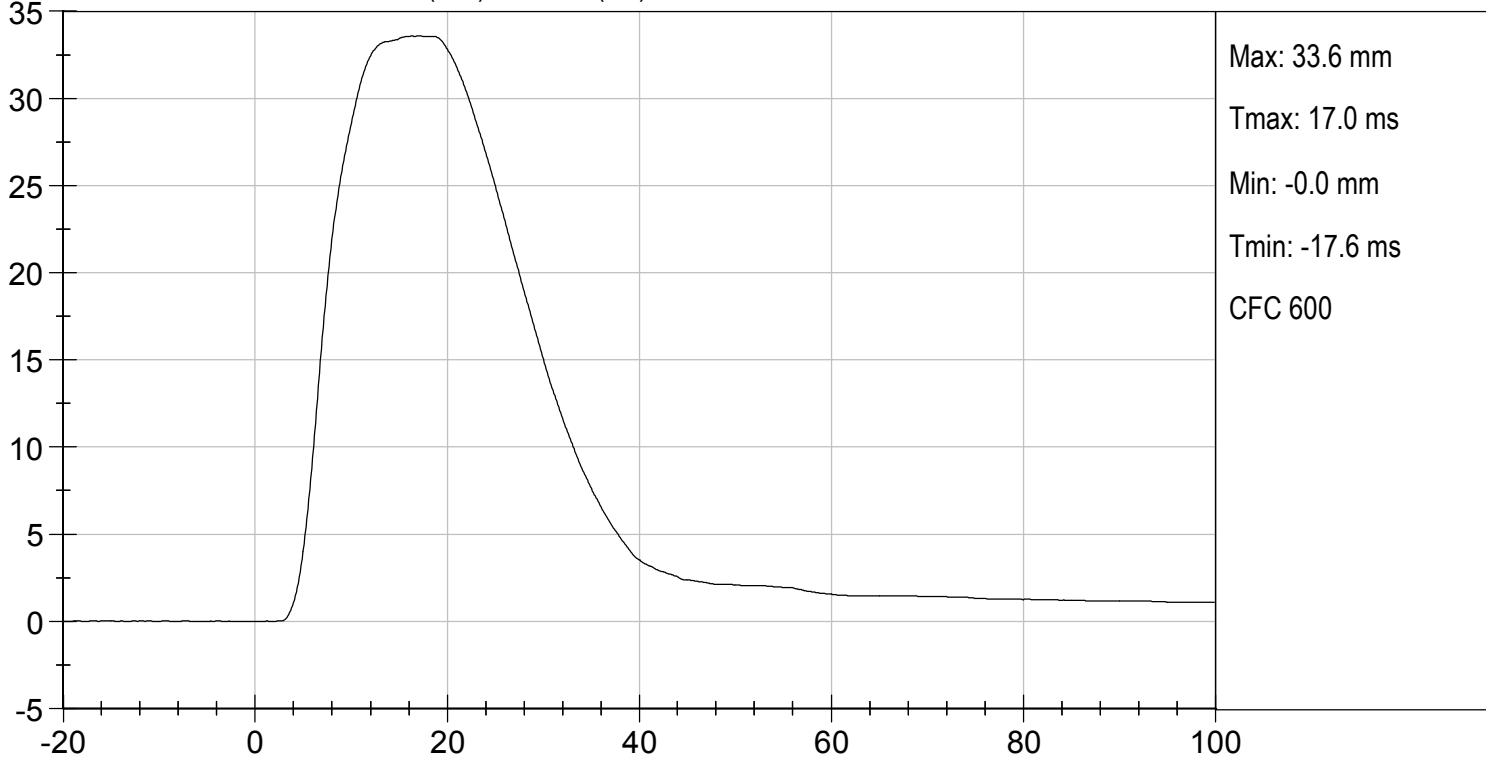




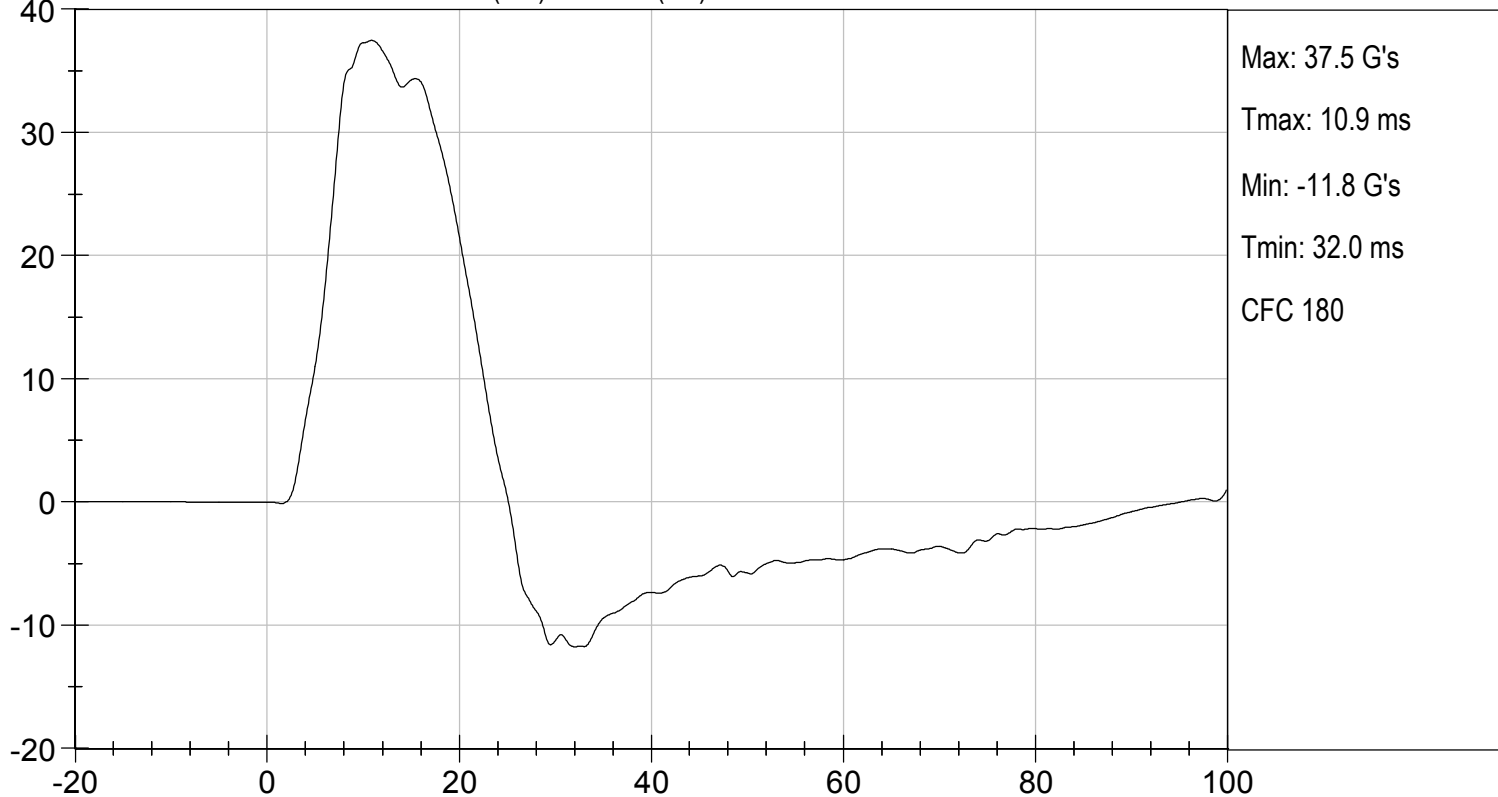
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 10/07/2021
TEST #: D213214

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



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



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

ATD Serial No: 296

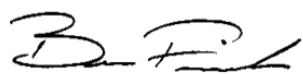
Test I.D: D213125

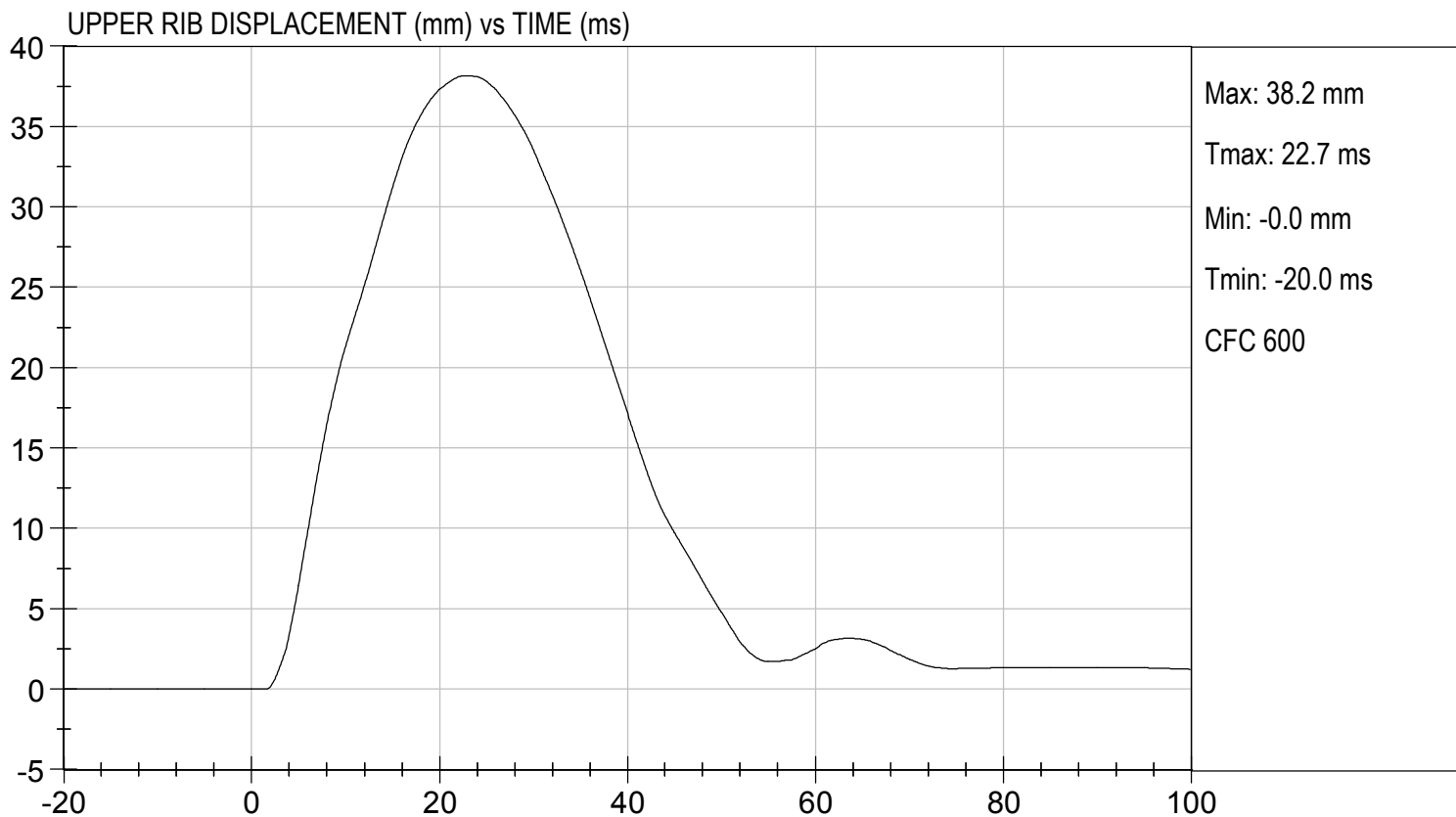
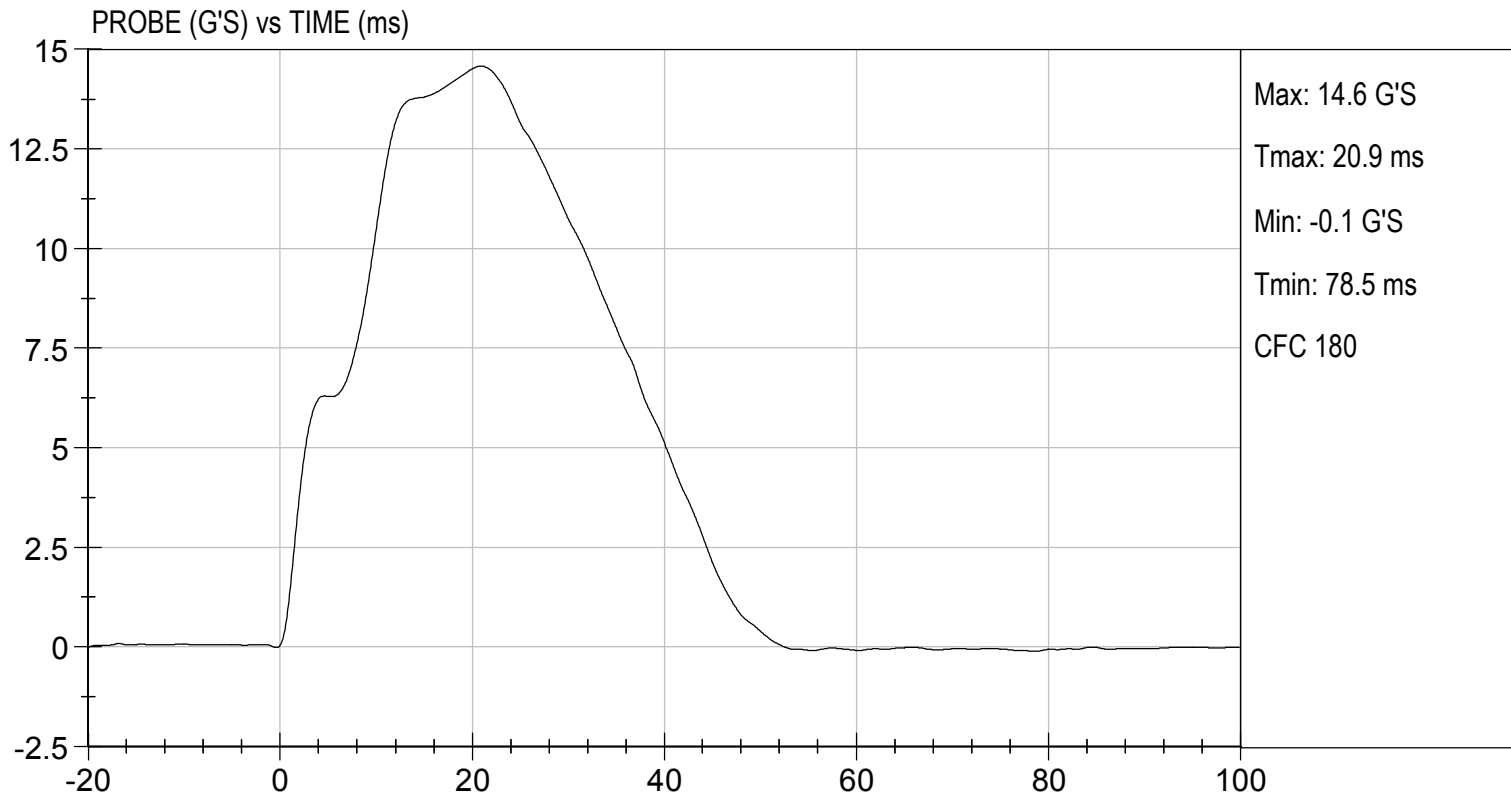
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	38	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	40	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


Laboratory Technician

10/07/2021

Test Date

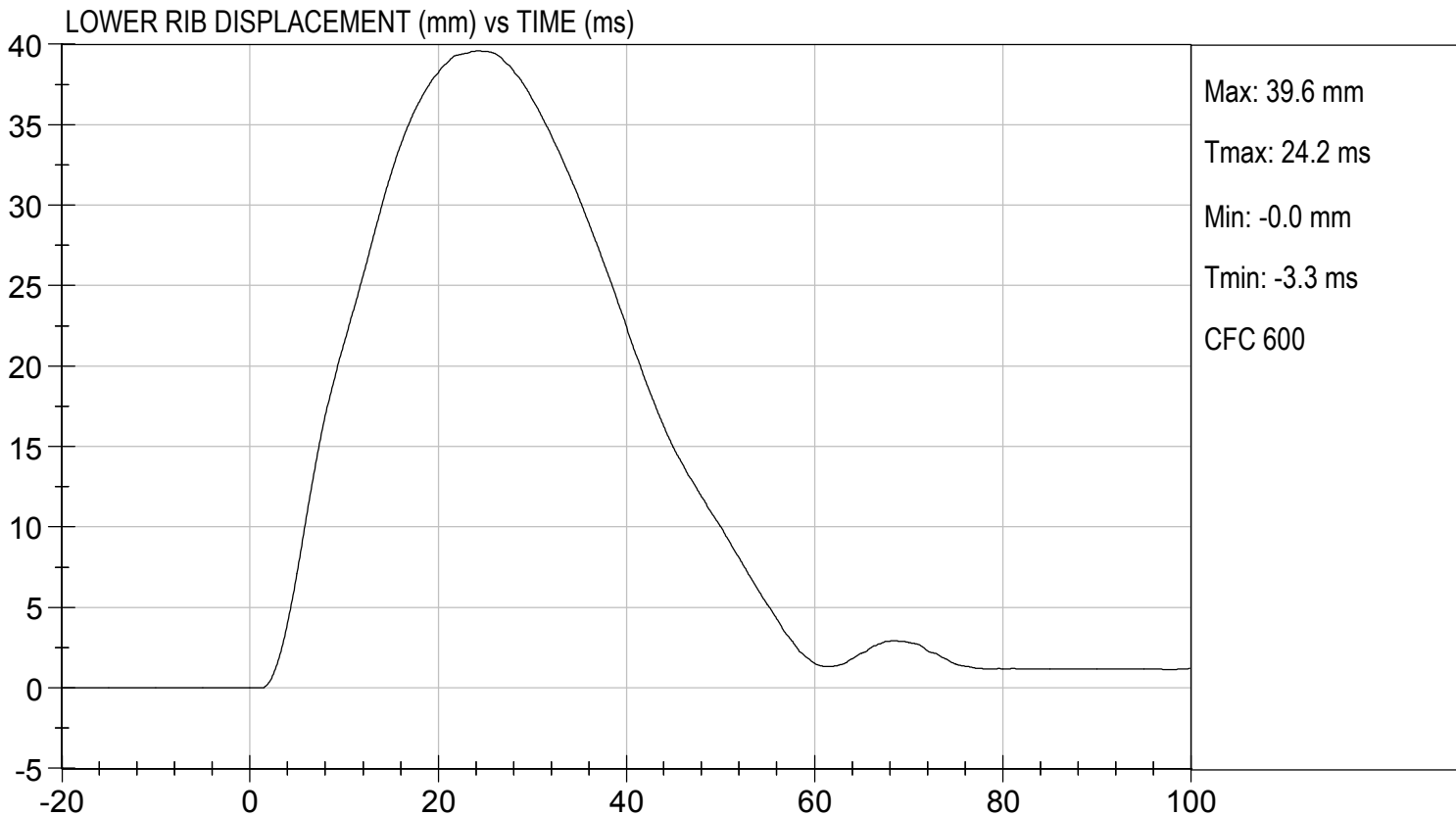
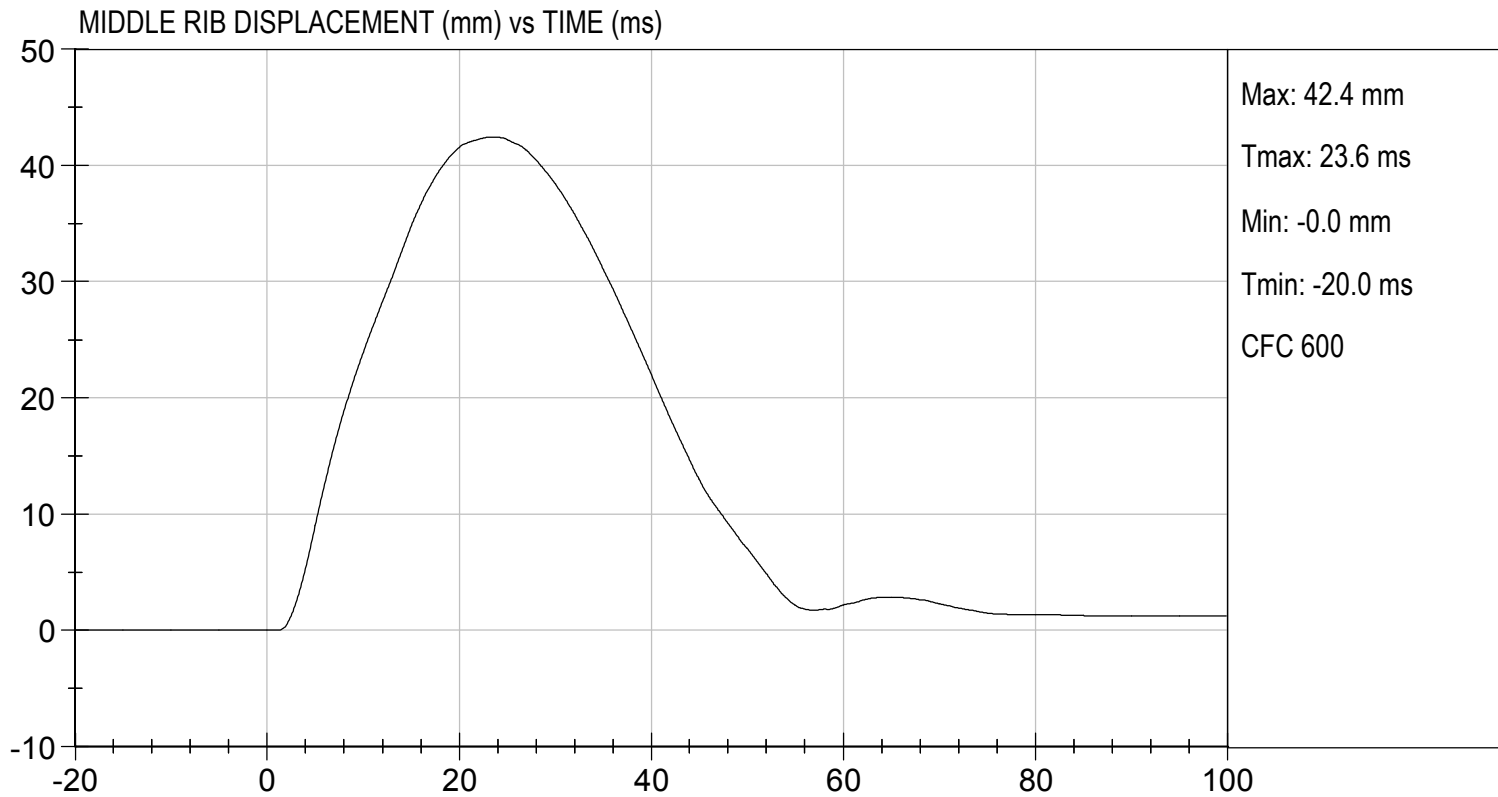

Approved By





TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.77 ft/s, 4.20 m/s

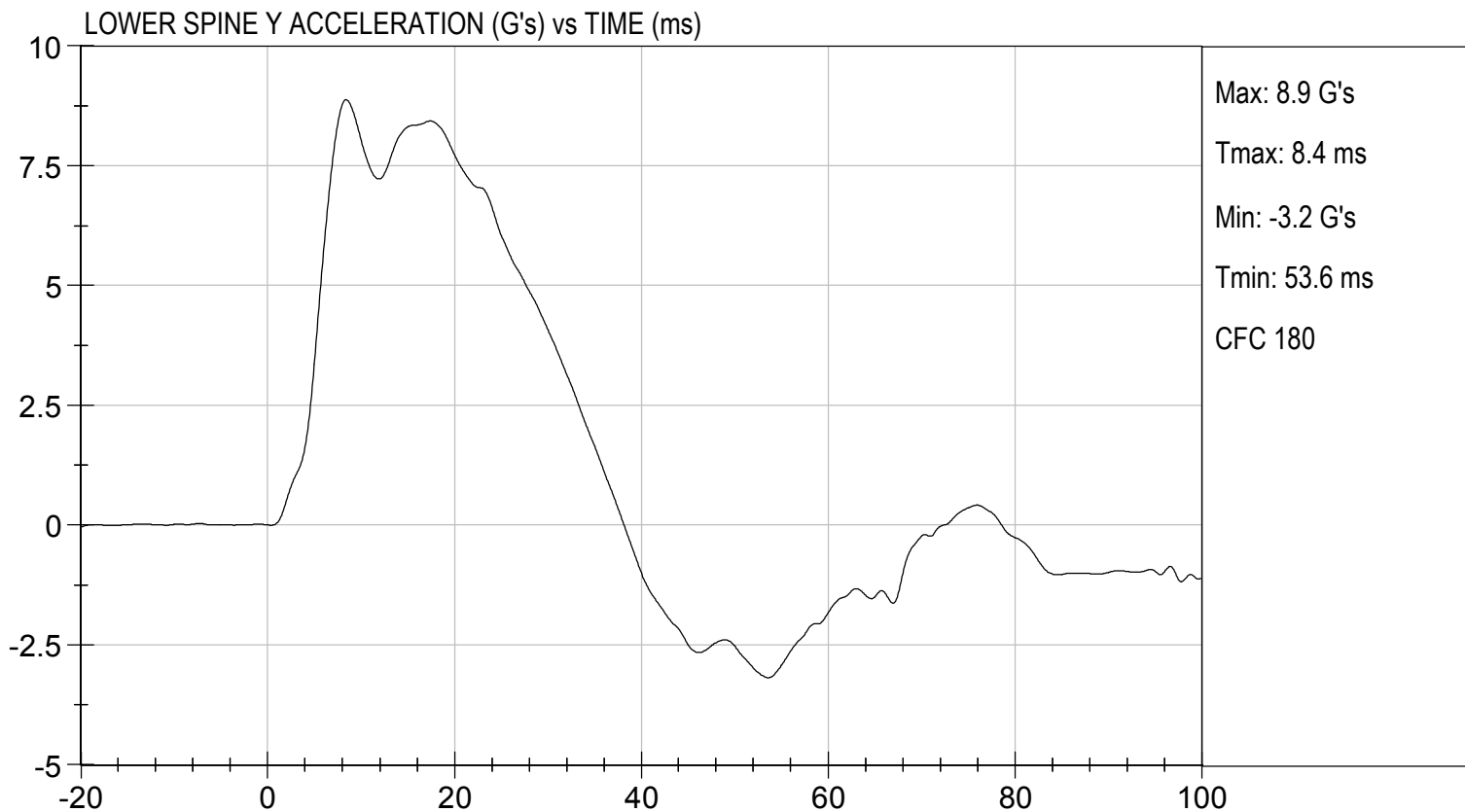
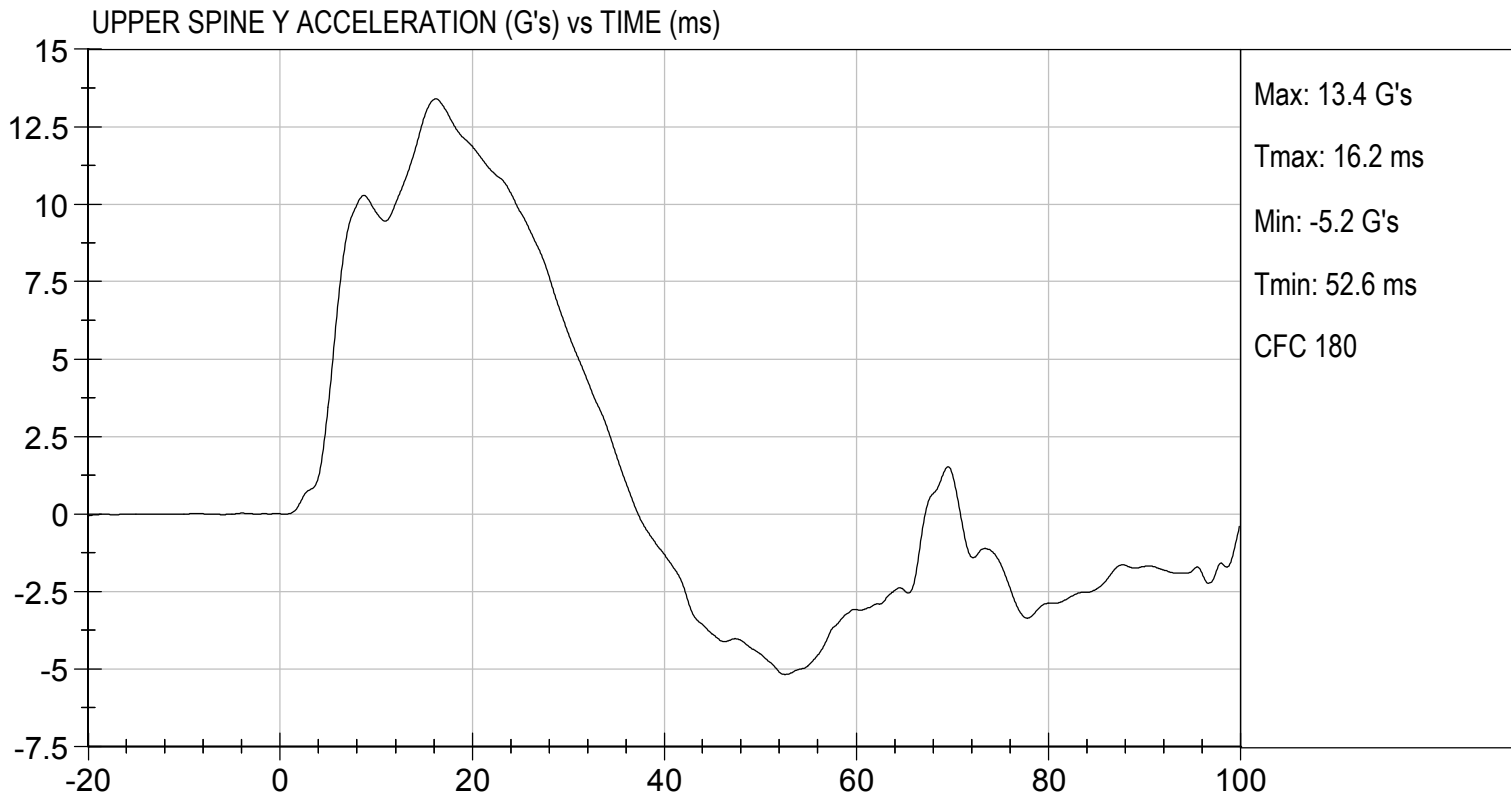
TEST DATE: 10/07/2021
TEST #: D213125





TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.77 ft/s, 4.20 m/s

TEST DATE: 10/07/2021
TEST #: D213125



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

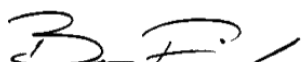
ATD Serial No: 296

Test I.D: D213216

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	46	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	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	12	Pass
			Overall Test Results	Pass


Laboratory Technician

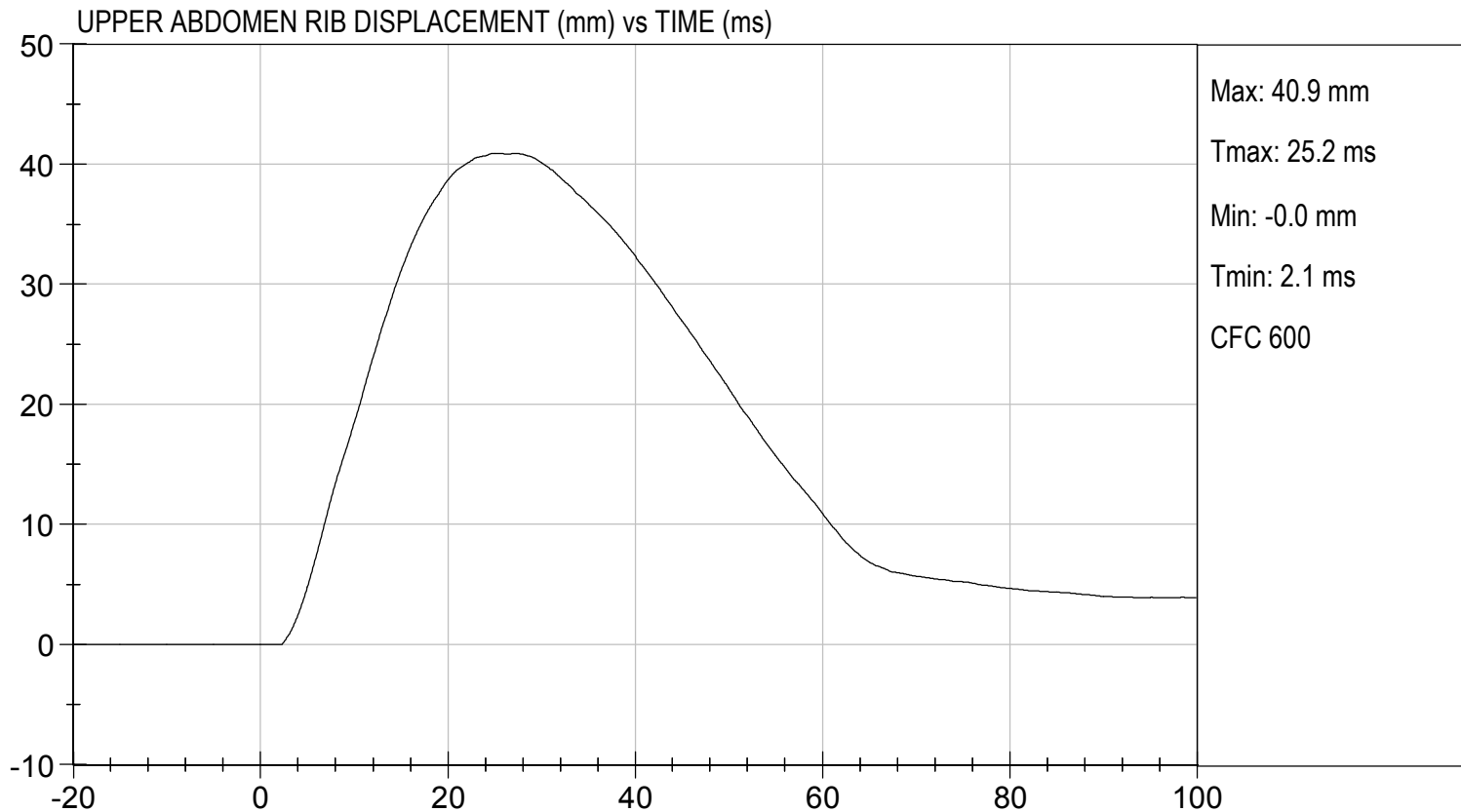
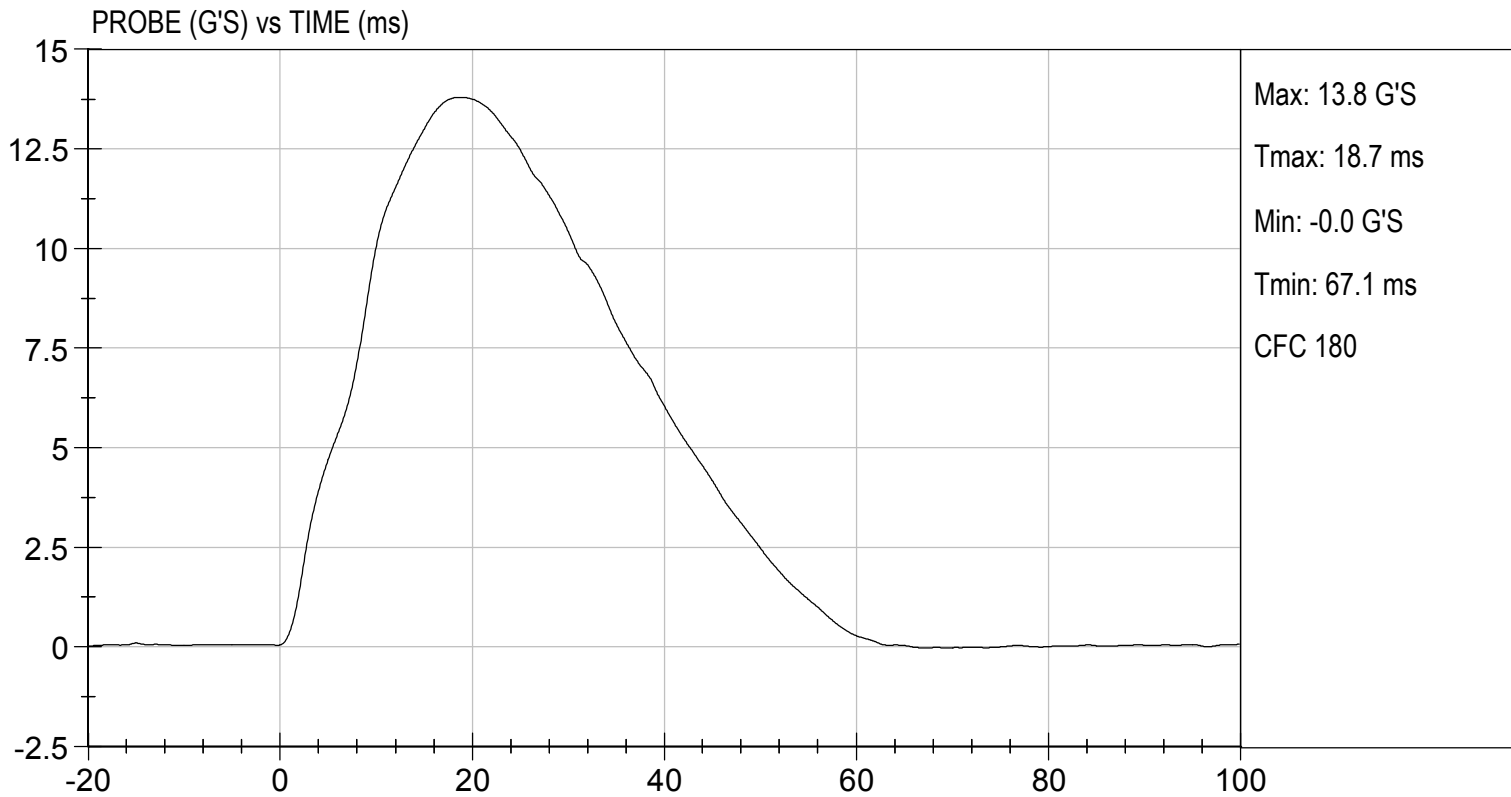
10/07/2021
Test Date


Approved By



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

TEST DATE: 10/07/2021
TEST #: D213216

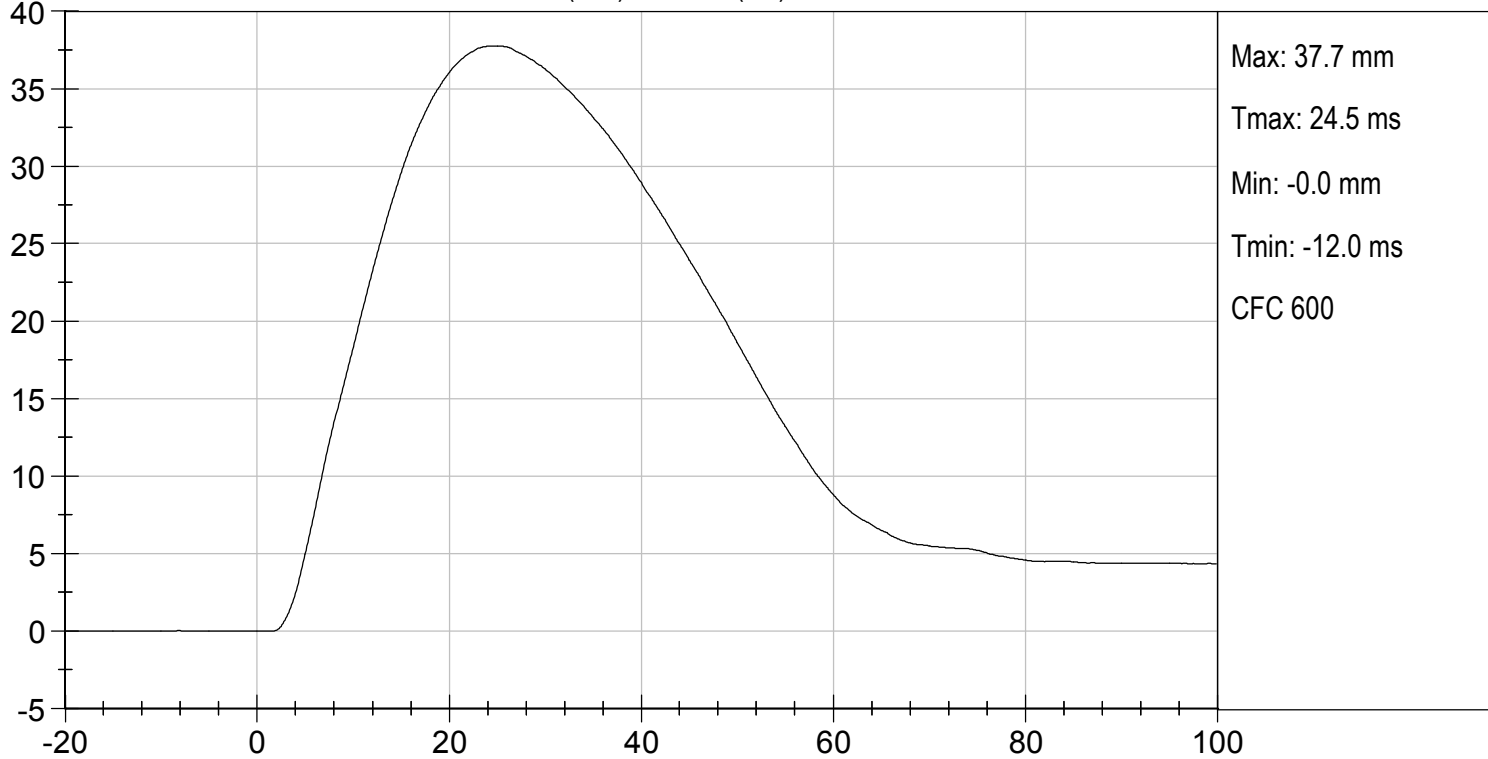




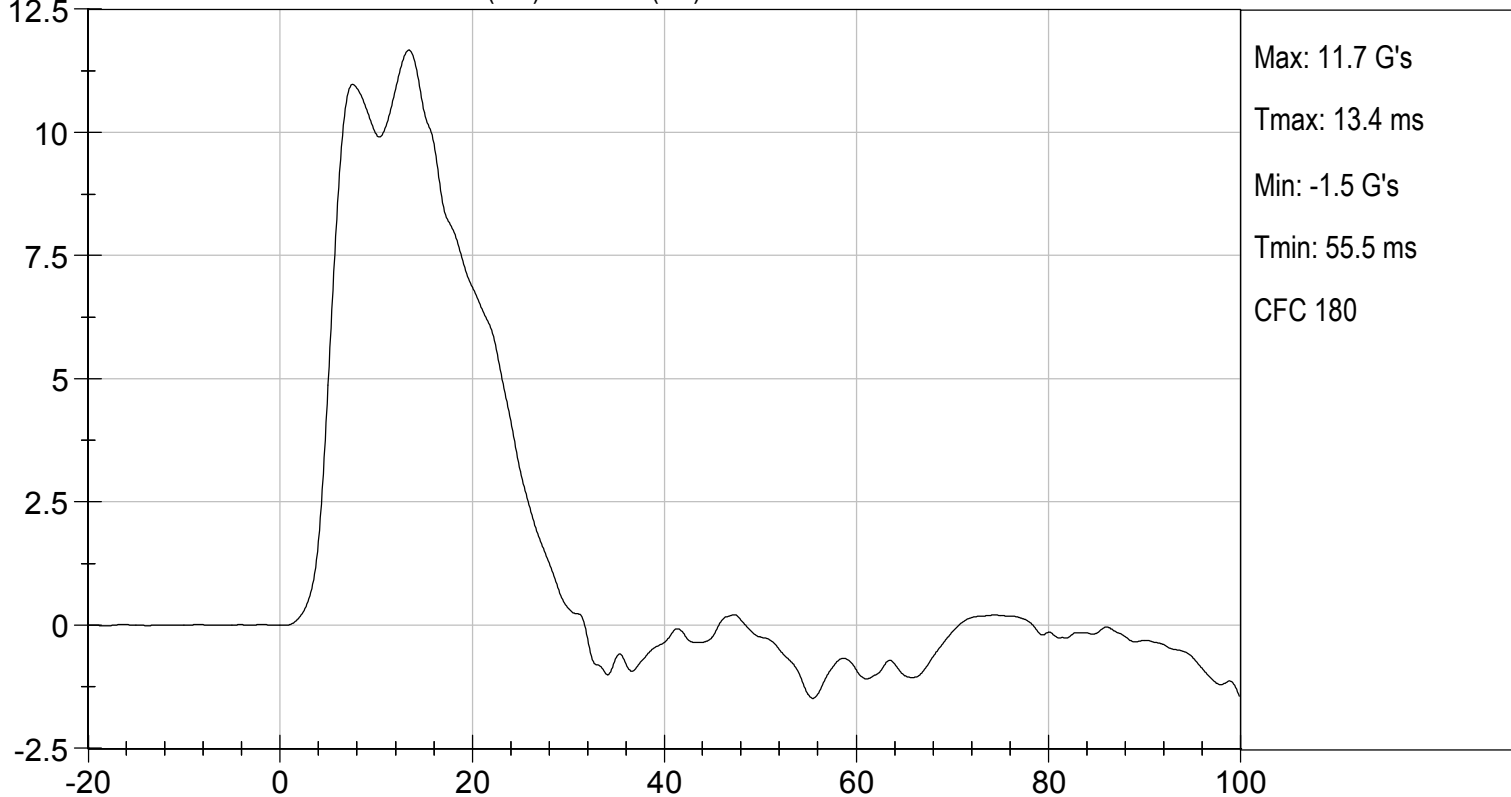
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 10/07/2021
TEST #: D213216

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

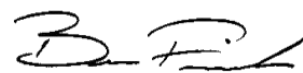
ATD Serial No: 296

Test I.D: D213217

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	40	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	3,752	Pass
Overall Test Results			Pass	


Laboratory Technician

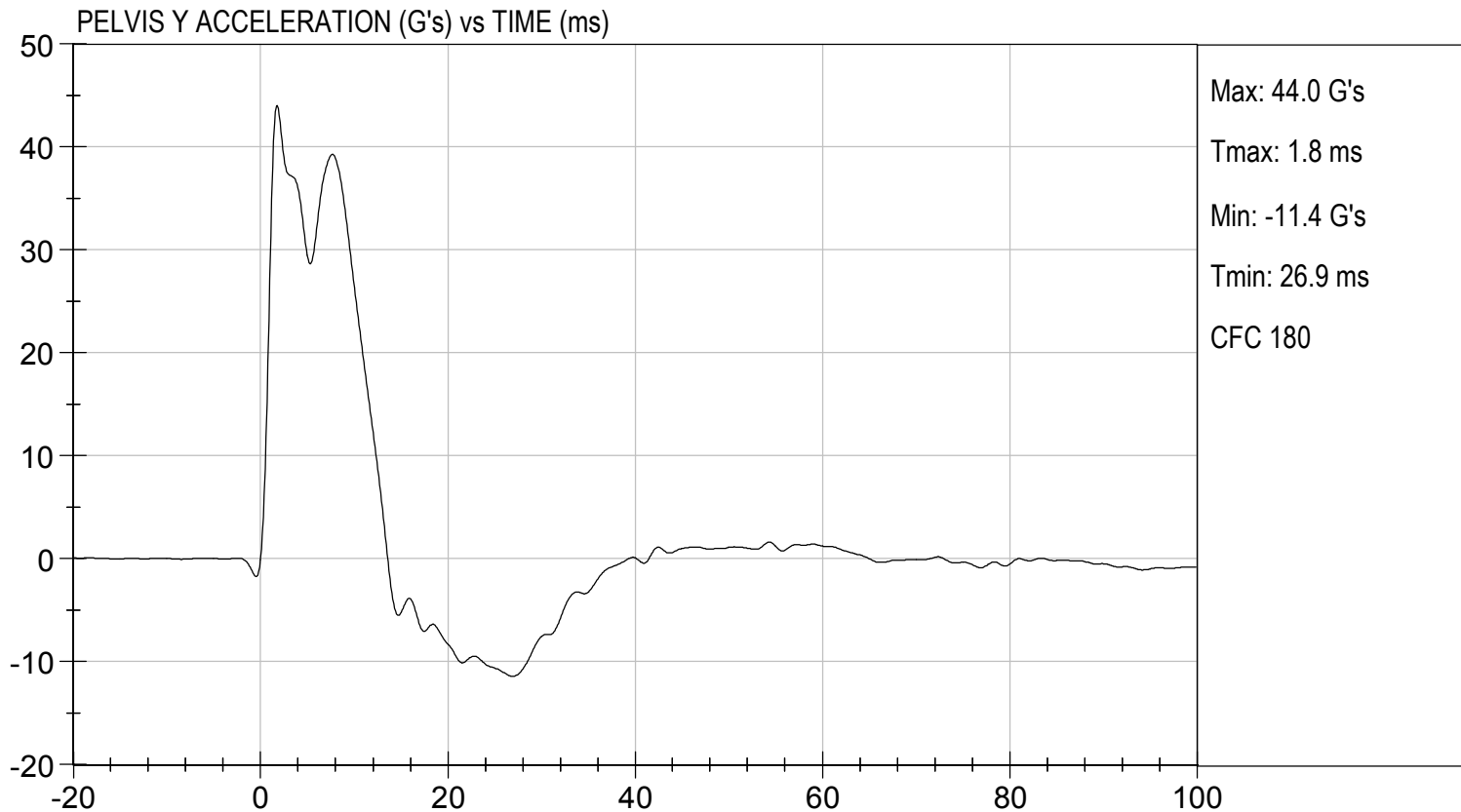
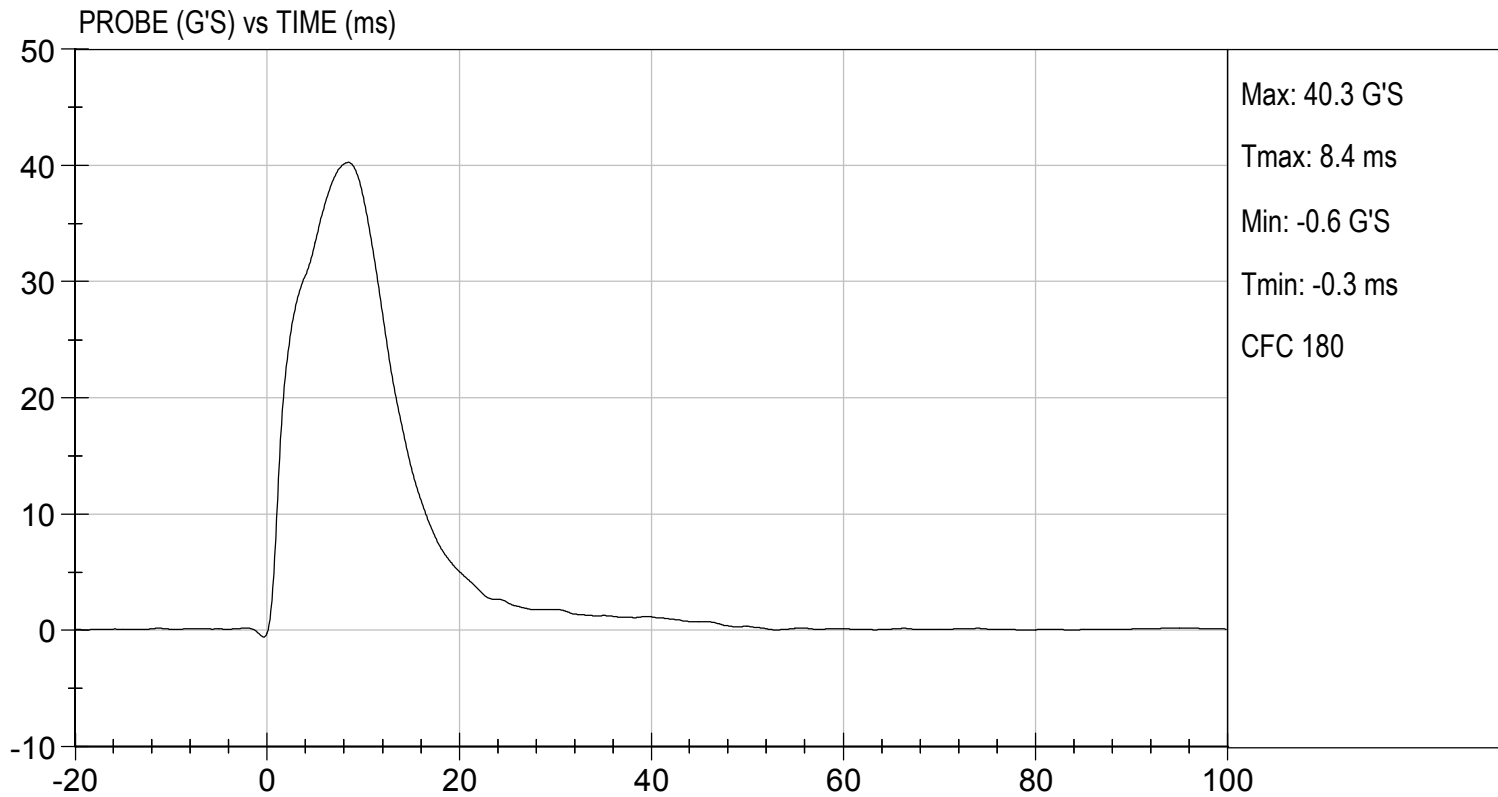
10/07/2021
Test Date


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 21.65 ft/s, 6.60 m/s

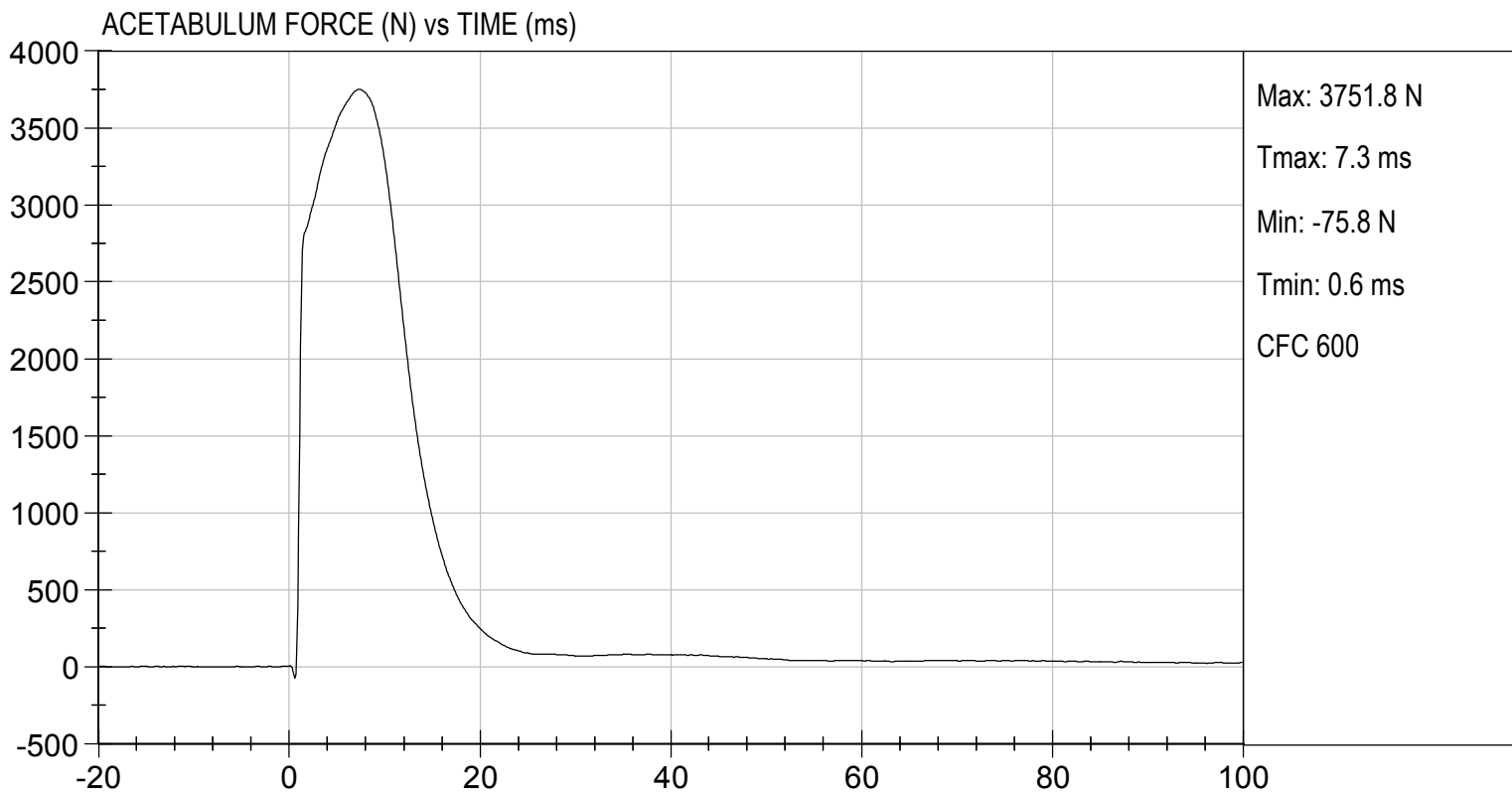
TEST DATE: 10/07/2021
TEST #: D213217





TEST DESC: PELVIS IMPACT
VELOCITY: 21.65 ft/s, 6.60 m/s

TEST DATE: 10/07/2021
TEST #: D213217



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-Its BUILD LEVEL D DUMMY

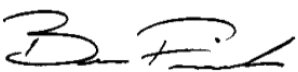
ATD Serial No: 296

Test I.D: D213218

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	36 to 45	42	Pass
Pelvis Y Acceleration	G's	28 to 39	35	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,989	Pass
			Overall Test Results	Pass


Laboratory Technician

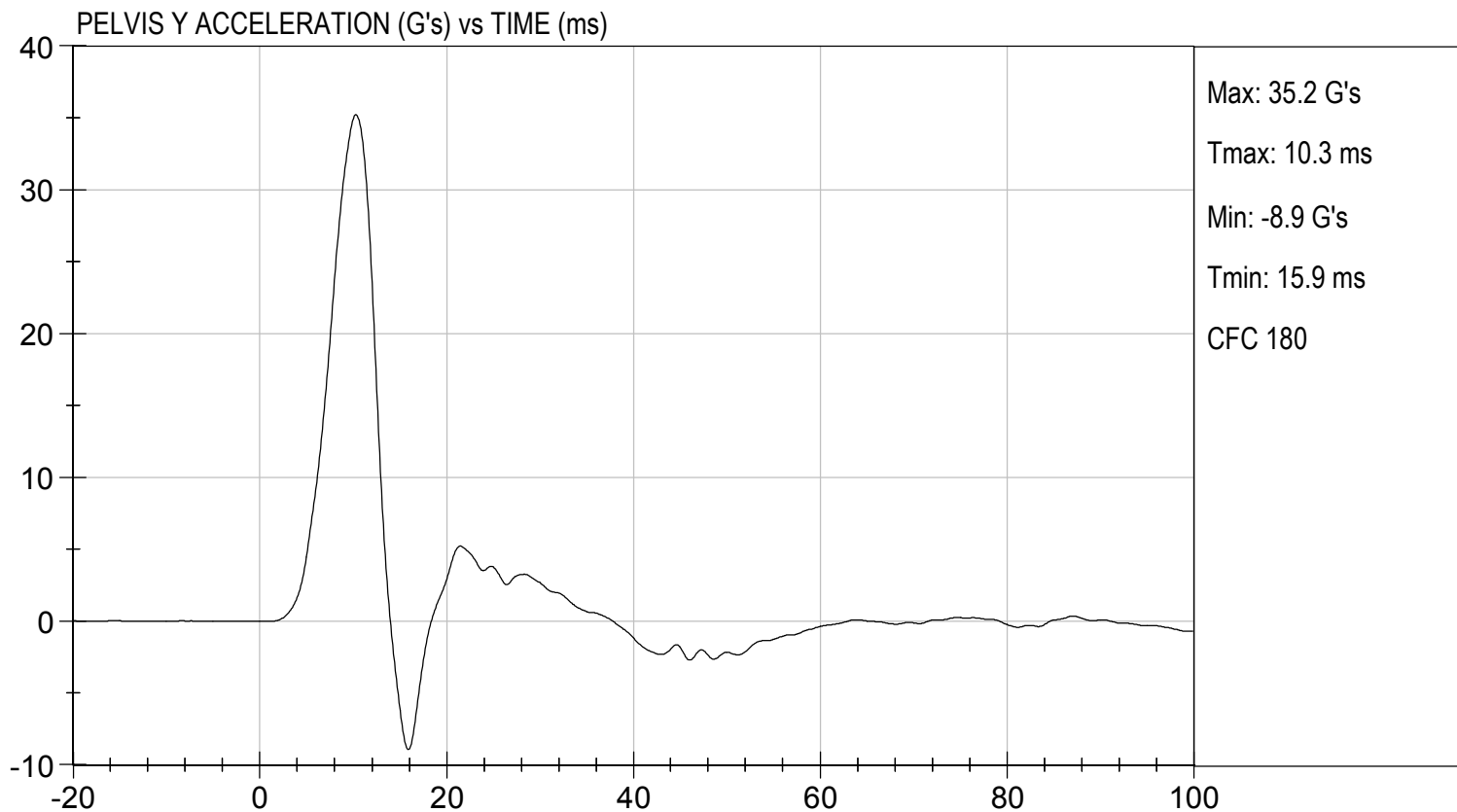
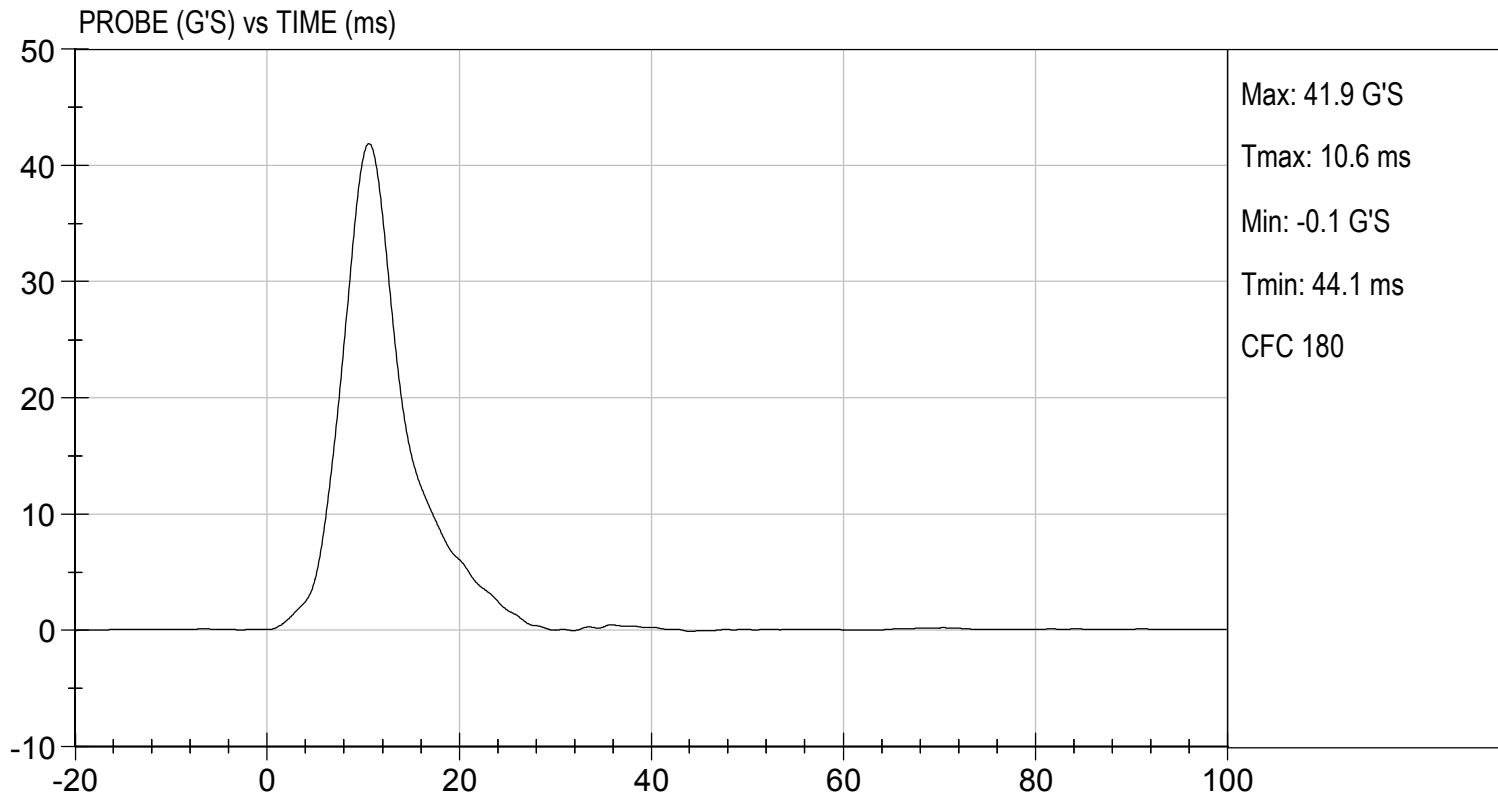
10/07/2021
Test Date


Approved By



TEST DESC: ILLIAC
VELOCITY: 14.01 ft/s, 4.27 m/s

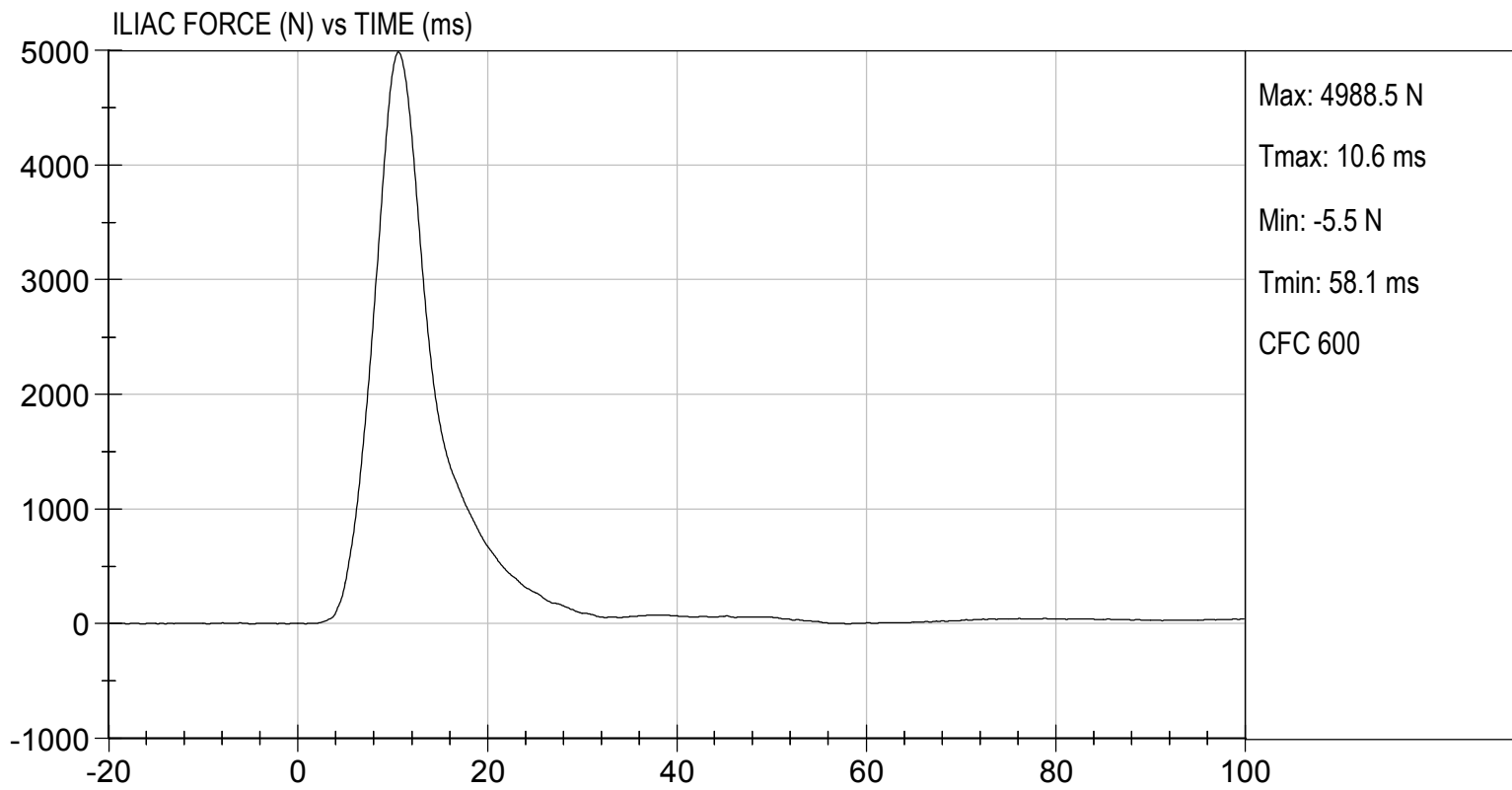
TEST DATE: 10/07/2021
TEST #: D213218





TEST DESC: ILLIAC
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 10/07/2021
TEST #: D213218





SID-IIs Pelvis Plug Certification Test

Plug S/N 14026

Test Number 13500

Report Number 13545

Test Date 5/22/2020 12:49:37 PM

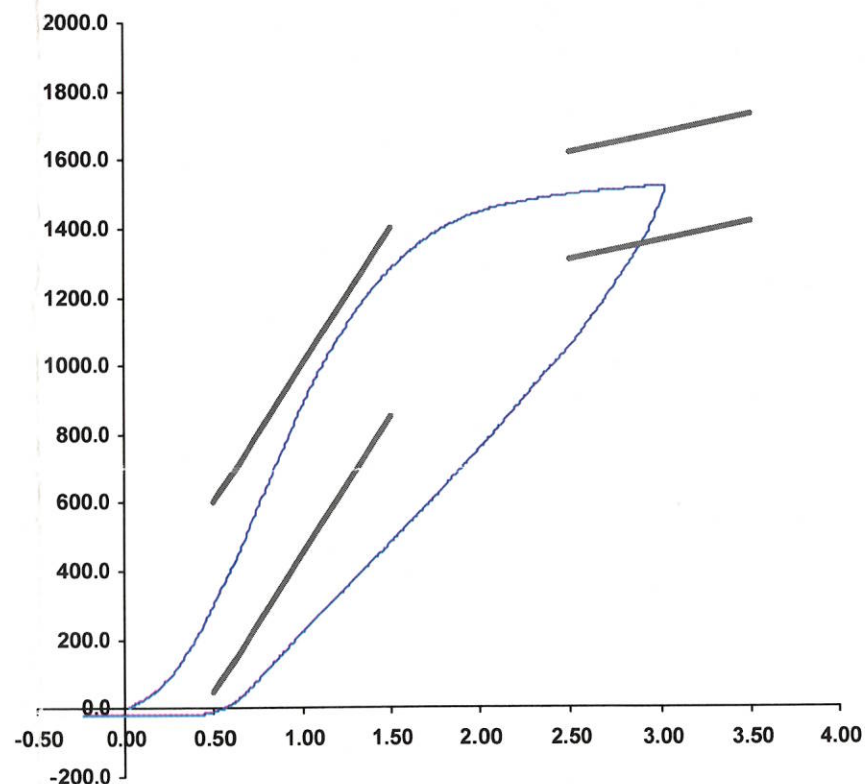
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	307.49	50.00	600.00
Force @ 1.5 mm (N)	1,284.02	850.00	1,400.00
Force @ 2.5 mm (N)	1,496.77	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,521.90	1,361.00	1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107
SACO Research

22-May-20

By :

DC

Date :

5-22-2020



SID-IIs Pelvis Plug Certification Test

Plug S/N 13048

Test Number 10368

Report Number 10403

Test Date 7/30/2019 2:24:28 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	301.28	50.00	600.00
Force @ 1.5 mm (N)	1,234.60	850.00	1,400.00
Force @ 2.5 mm (N)	1,544.77	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,594.68	1,361.00	1,673.00

Testing Machine STM-20 5965542

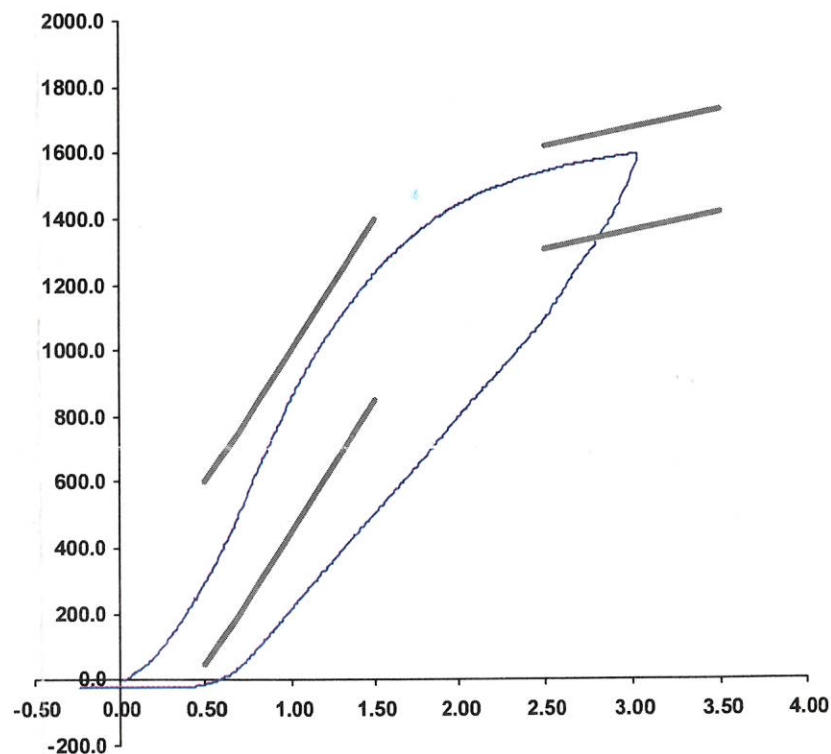
Load Cell S/N (FI360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107

30-Jul-19

SACO Research

By: DC

Date: 7/30/2019

SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation

				SID-IIs S/N 296			
				Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers				X	P85003	Endevco	07/01/2021
				Y	P94783	Endevco	07/01/2021
				Z	P94786	Endevco	07/01/2021
				Xr	P94938	Endevco	07/01/2021
				Yr	P96854	Endevco	07/01/2021
				Zr	P97386	Endevco	07/01/2021
Head Angular Rate Sensors				X	ARS7421	DTS	03/02/2021
				Y	ARS7413	DTS	03/02/2021
				Z	ARS7602	DTS	03/02/2021
Displacement Potentiometers	Thoracic Rib	Upper	Y	G012	Servo	07/01/2021	
		Middle	Y	G1163	FTSS	07/01/2021	
		Lower	Y	G1158	FTSS	07/01/2021	
	Abdominal Rib	Upper	Y	G1146	FTSS	07/01/2021	
		Lower	Y	G1126	FTSS	07/01/2021	
Lower Spine Accelerometers (T12)				X	P79418	Endevco	07/01/2021
				Y	P79439	Endevco	07/01/2021
				Z	P79614	Endevco	07/01/2021
Acetabulum Load Cell				Y	ACG4285	FTSS	02/10/2021
Iliac Wing Load Cell				Y	IWG3023	FTSS	02/10/2021
Pelvis Plug (struck side)					14026	SACO	05/22/2020
Pelvis Plug (non-struck side)					13048	SACO	07/30/2019

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A340264	MSI	04/20/2021
Vehicle Center of Gravity	Y	A340613	MSI	04/21/2021
Vehicle Center of Gravity	Z	A340676	MSI	04/19/2021
Left Floor Sill	Y	A337192	MSI	08/13/2021
A-Pillar Sill	Y	A383742	MSI	06/11/2021
A-Pillar Low	Y	A340246	MSI	05/25/2021
A-Pillar Mid	Y	A338439	MSI	05/25/2021
B-Pillar Sill	Y	A383087	MSI	05/13/2021
B-Pillar Low	Y	PCB1301	PCB	08/25/2021
B-Pillar Mid	Y	PCB1169	PCB	06/30/2021
Driver Seat	Y	T20368	Endevco	09/27/2021
Engine Top	X	A340811	MSI	08/16/2021
Engine Top	Y	A337188	MSI	08/16/2021
Firewall	Y	A370353	MSI	08/16/2021
Right Roof	Y	PCB129	PCB	07/30/2021
Right Floor Sill	Y	A295230	MSI	08/13/2021
Rear Floorpan	X	A340761	MSI	07/30/2021
Rear Floorpan	Y	A360947	MSI	07/30/2021

Table 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	DG6277	FTSS	07/30/18
Load Cell 2	DG6278	FTSS	07/30/18
Load Cell 3	DG6279	FTSS	07/30/18
Load Cell 4	DG6280	FTSS	07/30/18
Load Cell 5	DG6281	FTSS	07/30/18
Load Cell 6	DG6283	FTSS	07/30/18
Load Cell 7	DG6284	FTSS	07/30/18
Load Cell 8	DG6582	FTSS	07/30/18