REPORT NUMBER: SideNCAPPole-MGA-23-003

NEW CAR ASSESSMENT PROGRAM (NCAP)
Side Impact Pole Test

HONDA DEVELOPMENT & MANUFACTURING OF AMERICA, LLC
2023 Acura Integra A-Spec Tech 5-Door Hatchback
NHTSA No.: O20235301

MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105

Test Date: November 18, 2022

Final Report Date: December 20, 2023

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
Washington, DC 20590

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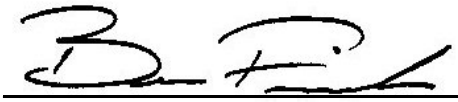
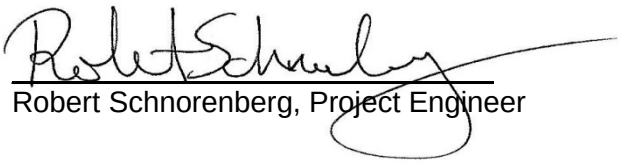
Prepared by: 
Ben Fischer, Program Manager

Approved by: 
Robert Schnorenberg, Project Engineer

Approval Date: December 20, 2023

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

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SideNCAPPole-MGA-23-003		

4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2023 Acura Integra A-Spec Tech 5-Door Hatchback, NHTSA No.: O20235301	**5. Report Date** December 20, 2023
	6. Performing Organization Code MGA
7. Author(s) Ben Fischer, Program Manager	**8. Performing Organization Report No.** SideNCAPPole-MGA-23-003
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105	**10. Work Unit No.**
	11. Contract or Grant No. 693JJ920D000017
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 Washington, DC 20590	**13. Type of Report and Period Covered:** Final Test Report November 18, 2022 to December 20, 2023
	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 2023 Acura Integra A-Spec Tech 5-Door Hatchback 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 November 18, 2022.

The impact velocity was 32.15 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.4°C. The test vehicle post-test maximum crush was 293 mm at level 3. The test vehicle's performance was as follows:

Measurement Description	Units	Driver ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	235.989
Resultant Lower Spine Acceleration	g	82	45.486
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2871.974
Maximum Thoracic Rib Deflection	mm	38*	19.187
Maximum Abdomen Rib Deflection	mm	45*	21.615

*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.

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590

19. Security Classification of Report	20. Security Classification of Page	21. No. of Pages	22. Price
Unclassified	Unclassified	139	

TABLE OF CONTENTS

SECTION 1
PURPOSE AND SUMMARY OF TEST

PURPOSE

This side pole impact test is part of the MY 2023 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. 693JJ920D000017. The purpose of this test is to generate comparative side impact performance in a 2023 Acura Integra A-Spec Tech 5-Door Hatchback. 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 2023 Acura Integra A-Spec Tech 5-Door Hatchback. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.15 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on November 18, 2022. 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	235.989
Resultant Lower Spine Acceleration	g	82	45.486
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2871.974
Maximum Thoracic Rib Deflection	mm	38*	19.187
Maximum Abdomen Rib Deflection	mm	45*	21.615

*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	Yes		
Knee Airbag	Yes	Yes		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	Yes	Yes
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 A-Post @ Sill Y recorded no valid data.
Left B-Post @ Sill Y recorded no valid data after 30 ms.
Load Cell Pole #8 Fy recorded no valid data.

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20235301	Traction Control System (TCS)	Yes
Model Year	2023	Auto-Leveling System	No
Make	Acura	Automatic Door Locks (ADL)	Yes
Model	Integra A-Spec Tech	Power Window Auto-Reverse	Yes
Body Style	5-Door Hatchback	Other Optional Feature	No
VIN	19UDE4G74PA005267	Driver Front Airbag	Yes
Body Color	Performance Red Pearl	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	138 km / 86 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	1.5 L	Driver Torso Airbag	No
Type/No. Cylinders	Inline 4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Manual	Driver Knee Airbag	Yes
Transmission Speeds	6	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	Yes
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

DATA FROM CERTIFICATION LABEL

Manufactured By	HONDA DEVELOPMENT &
Date of Manufacture	08/'22
Vehicle Type	Passenger Car

GVWR (kg)	1820
GAWR Front (kg)	965
GAWR Rear (kg)	860

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				385	(A)
DSC x 68 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				45	(A-B)

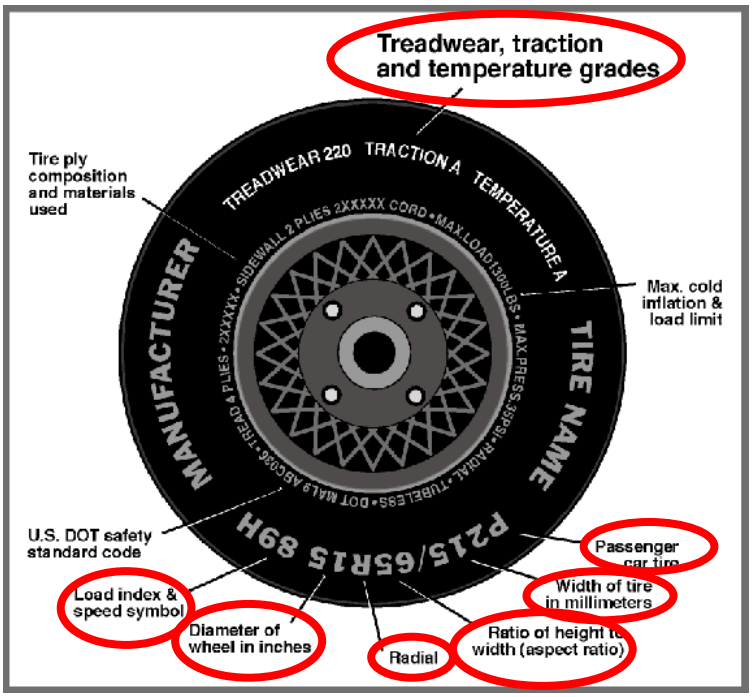
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test
NHTSA No.: O20235301
Test Date: 11/18/2022

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	230
Recommended Tire Size	235/40R18	235/40R18
Tire Size on Vehicle	235/40R18	235/40R18
Tire Manufacturer	Continental	Continental
Tire Model	Conti ProContact	Conti ProContact
Treadwear	400	400
Traction	AA	AA
Temperature Grade	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	1 Rayon, 2 Steel, 2 Polyamide	1 Rayon, 2 Steel, 2 Polyamide
Load Index/Speed Symbol	91W	91W
Tire Material	Rubber	Rubber
DOT Safety Code Left	1VYOF BEKL 1622	1VYOF BEKL 1622
DOT Safety Code Right	1VYOF BEKL 1622	1VYOF BEKL 1622

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	215	205	220	205
Tire Placard	kPa	240	240	230	230
Owner's Manual	kPa	240	240	230	230
As Tested	kPa	240	240	230	230

TEST AXLE VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	412.0	289.5		434.5	324.5		431.0	331.5	
Right	kg	417.0	273.5		426.5	297.5		422.0	304.5	
Ratio	%	59.6%	40.4%		58.1%	41.9%		57.3%	42.7%	
Totals	kg	829.0	563.0	1392.0	861.0	622.0	1483.0	853.0	636.0	1489.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1392.0	(A)
Actual Weight of 1 P572 ATD (SID-IIs) Used	kg	52	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	45	(C)
Calculated Test Vehicle Target Weight (TVTW)	kg	1489.0	(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-back)*	deg	-0.3	0.1	0.2	Yes
Front Pass. Door Sill Angle (front-to-back)*	deg	-0.3	0.1	0.2	Yes
Front Bumper Angle (left-to-right)**	deg	-0.4	-0.2	-0.1	Yes
Rear Bumper Angle (left-to-right)**	deg	-0.1	0.2	0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1107	1148	1169	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	6	18	19	

* 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	0
Components Removed: Additional cargo area trim	kg	2

Test height adjustable suspension setting, if applicable:	Not Applicable

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm Target	910
Aft 25 mm Target	924

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

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	31.5	18.9	25.2
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 SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rear-Most	Mid	Forward-Most
Driver Seat	25.2	29	Max	58	58	58
			Mid	29	29	29
			Min	0	0	0
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

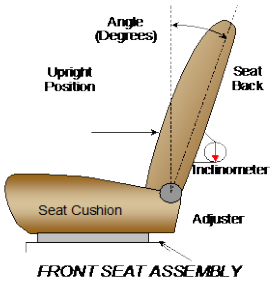
Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1st as 1)	mm	Detent (1st as 0)
Driver Seat	240		0	
Front Passenger Seat	210		0	
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	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 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 (1st as 1)	Degrees	Detent (1st as 0)
Driver Seat	73.7		-7.7	
Front Passenger Seat	77.8		-7.7	
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	Fixed		Fixed	

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	5	0 (Lowest as 0) / Fixed Fore-Aft

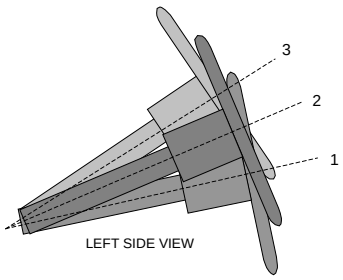
DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

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.

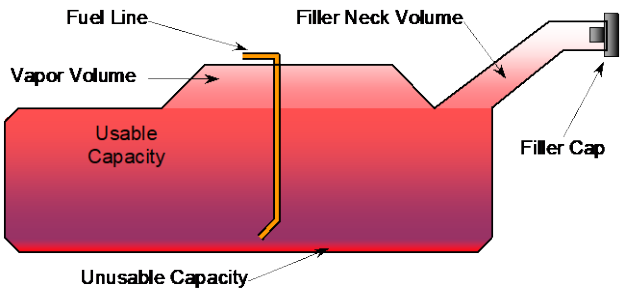
	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	73.5	
Geometric Center, Position 2	70.7	
Uppermost, Position 3	67.8	
Telescoping Steering Wheel Travel		39
Test Position	70.7	20



STEERING COLUMN ASSEMBLY

FUEL PUMP

The vehicle is equipped with an electronic fuel pump. The fuel pump will run when the Engine Start/Stop Switch is pushed two times (ignition ON position). The pump will be filled for two seconds, after which pressure is maintained. The filler neck is located on the driver's side.



VEHICLE FUEL TANK ASSEMBLY

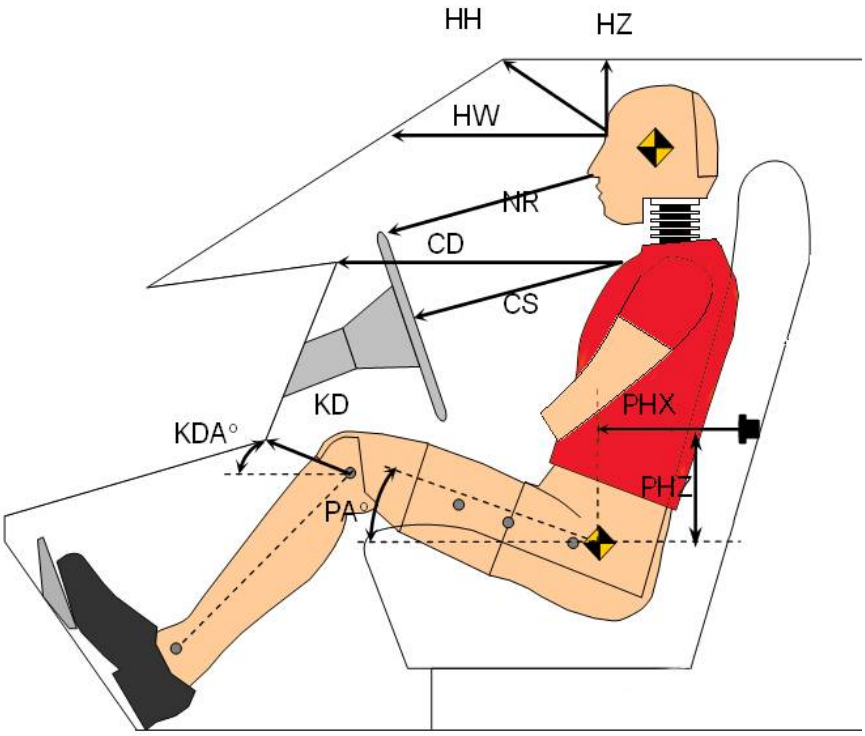
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of Standard Tank (see S1 – Vehicle Setup Information)	46.9
Usable Capacity of Optional Tank (see S1 – Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	46.9
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	43.7
Actual Amount of Solvent Used	43.6
1/3 of Usable Capacity	15.6

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

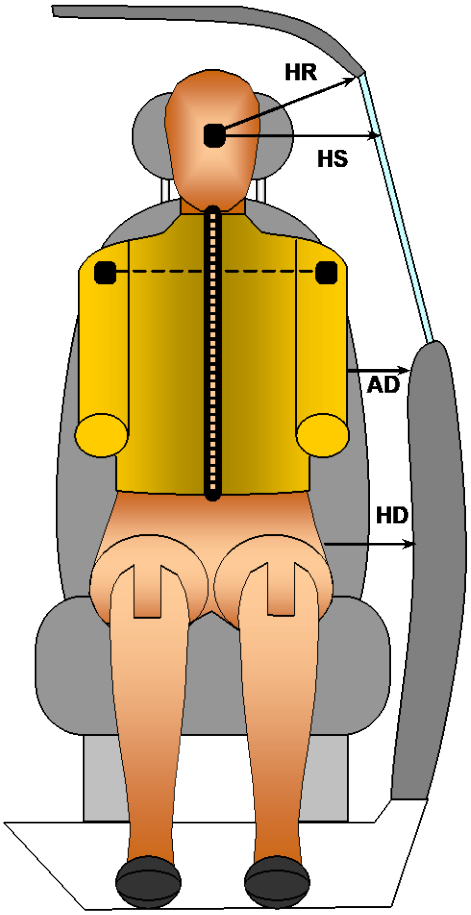


LEFT SIDE VIEW

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	253	
HW	Head to Windshield	532	
HZ	Head to Roof Liner	171	
NR	Nose to Rim/Seat Back	195	
CD	Chest to Dashboard/Seat Back	386	
CS	Chest to Steering Wheel	142	
KDL / KDAL	Left Knee to Dash/Seat Back	155	41.9
KDR / KDAL	Right Knee to Dash/Seat Back	145	40.1
PAX	Pelvic Tilt Angle X		21.5
PAY	Pelvic Tilt Angle Y		0.1
PHX	Hip Point to Striker (X-Axis)	361	
PHZ	Hip Point to Striker (Z-Axis)	224	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback
NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test
Test Date: 11/18/2022

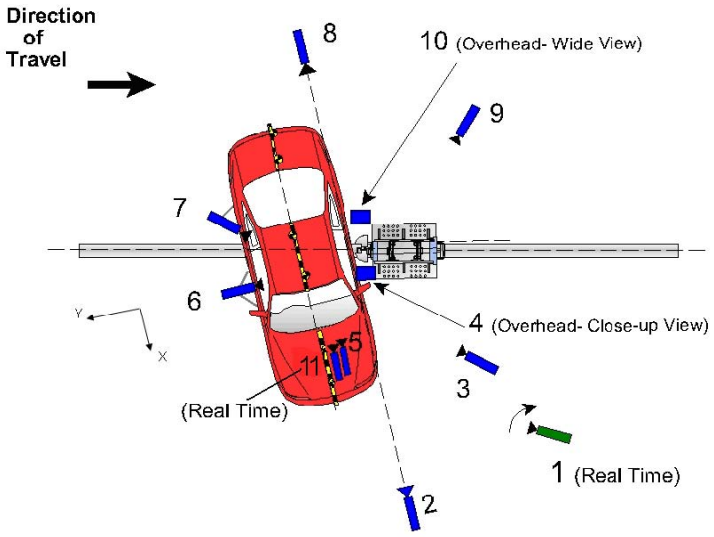


FRONT VIEW OF DUMMY

Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	225
HS	Head to Side Window	347
AD	Arm to Door	190
HD	Hip Point to Door	160

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022



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	6155	-5	-1295	24	1000
3	Impact Side 45° Forward	4060	-1880	-1310	12	1000
4	Overhead Closeup	0	0	-6670	85	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	-6995	-95	-1400	24	1000
9	Impact Side 45° Rearward	-2410	-3755	-1405	12	1000
10	Overhead Wide View	-25	705	-6650	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.

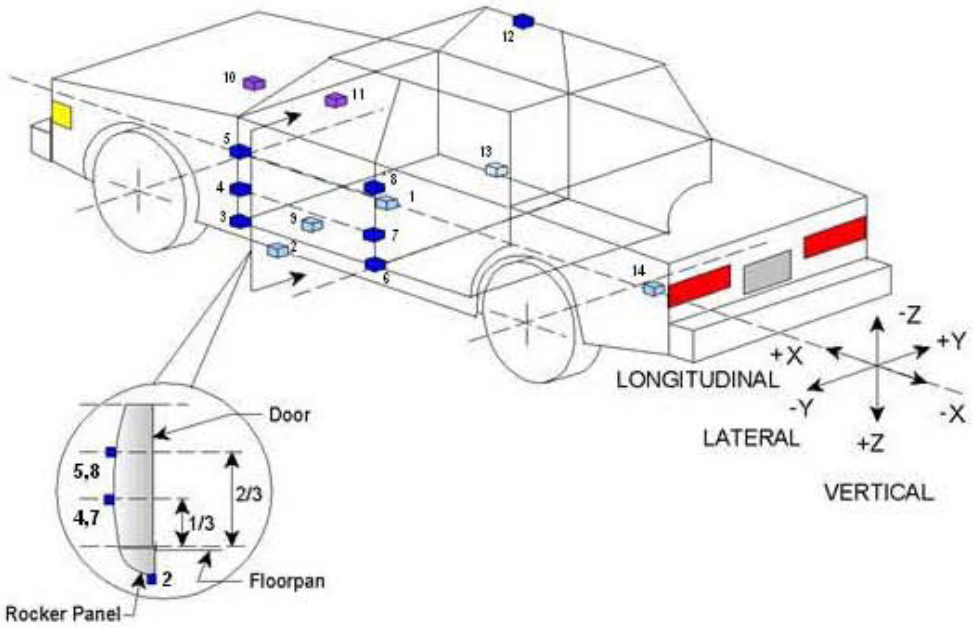
Explain why camera(s) did not operate as intended: None

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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022



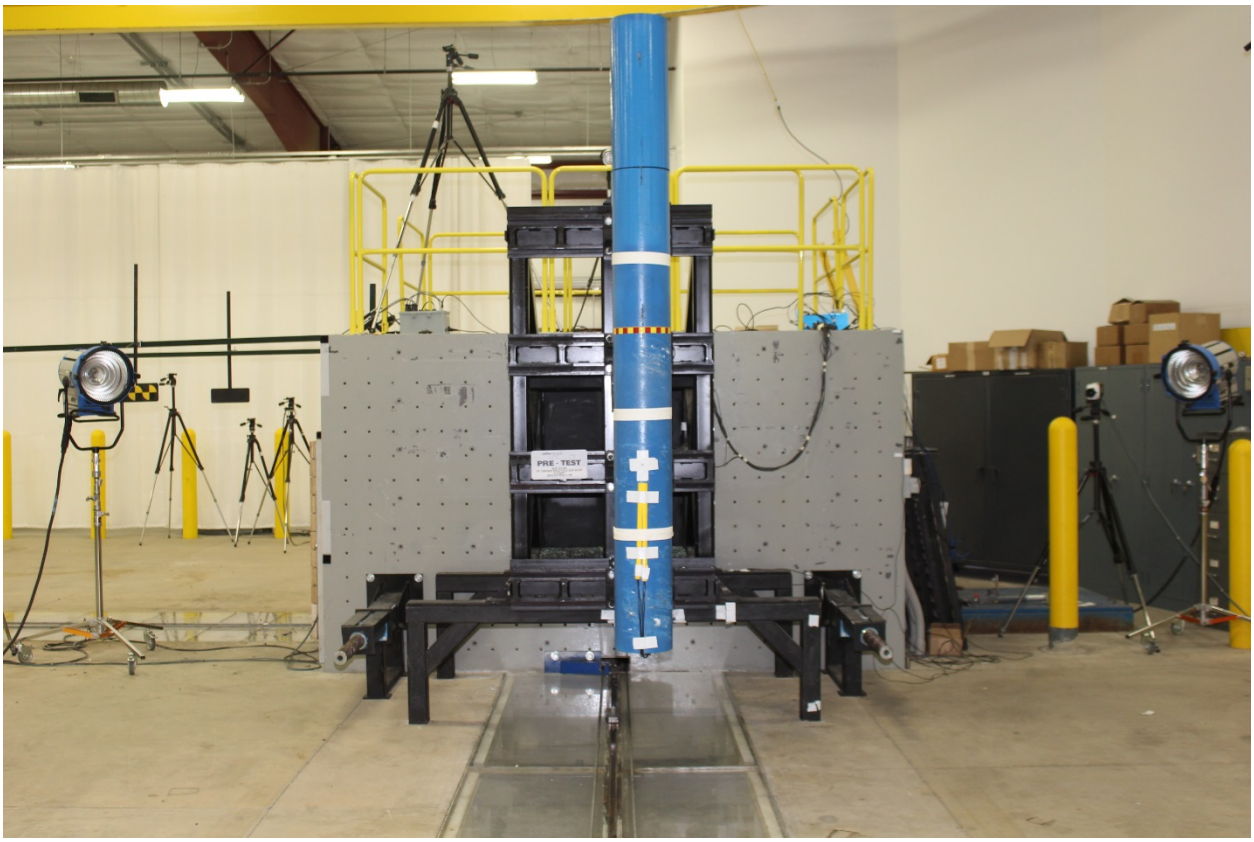
TEST VEHICLE ACCELEROMETER LOCATIONS

No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2564	0	-255
2	Left Floor Sill	3166	-754	-176
3	A Pillar Sill	3306	-754	-176
4	A Pillar Low	3207	-820	-474
5	A Pillar Mid	3207	-820	-696
6	B Pillar Sill	2133	-754	-176
7	B Pillar Low	2039	-722	-511
8	B Pillar Mid	2039	-722	-683
9	Driver Seat Track	2276	-399	-207
10	Engine Top	3393	35	-759
11	Firewall	3608	85	-821
12	Right Roof	2088	510	-1405
13	Right Floor Sill	3166	754	-186
14	Rear Floorpan	954	0	-479

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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback
NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test
Test Date: 11/18/2022



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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Driver Dummy (SID-IIs)
Face	Curtain Airbag, Frontal Airbag
Top of Head	Curtain Airbag, Frontal Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest, Seatback
Left Shoulder	Side Torso/Pelvis Airbag, Seatback
Upper Torso	Seatback
Lower Torso	Side Torso/Pelvis Airbag, Seatback
Left Hip	Side Torso/Pelvis Airbag, 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	
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	
Disengaged from Latched Position	No	No	No	No	
Latch Separated from Striker	No	No	No	No	
Jammed Shut	Yes	Yes	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	No	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	No Separation
Windshield Damage	Cracked
Side Window Damage	LF window broken
Other Notable Effects	None

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

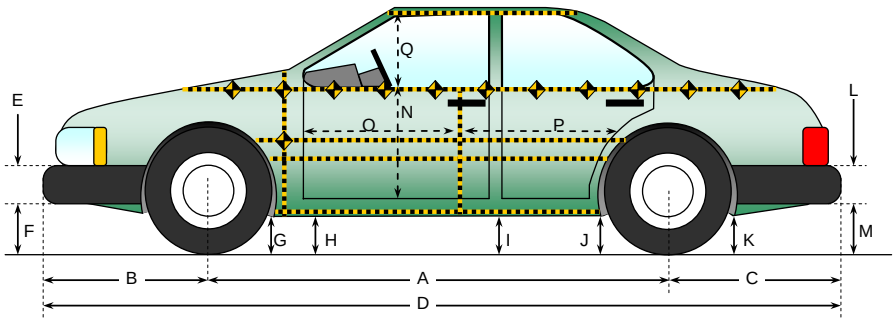
Restraint Type	Struck Side Driver		Struck Side Left Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes		
Knee Airbag	Yes	Yes		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	Yes	Yes
Side Airbag (Other)				
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load 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		1083
Actual Impact Point (Aft of Front Axle)	mm		1083
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	0
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	74.7
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.15
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.18

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback
NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test
Test Date: 11/18/2022



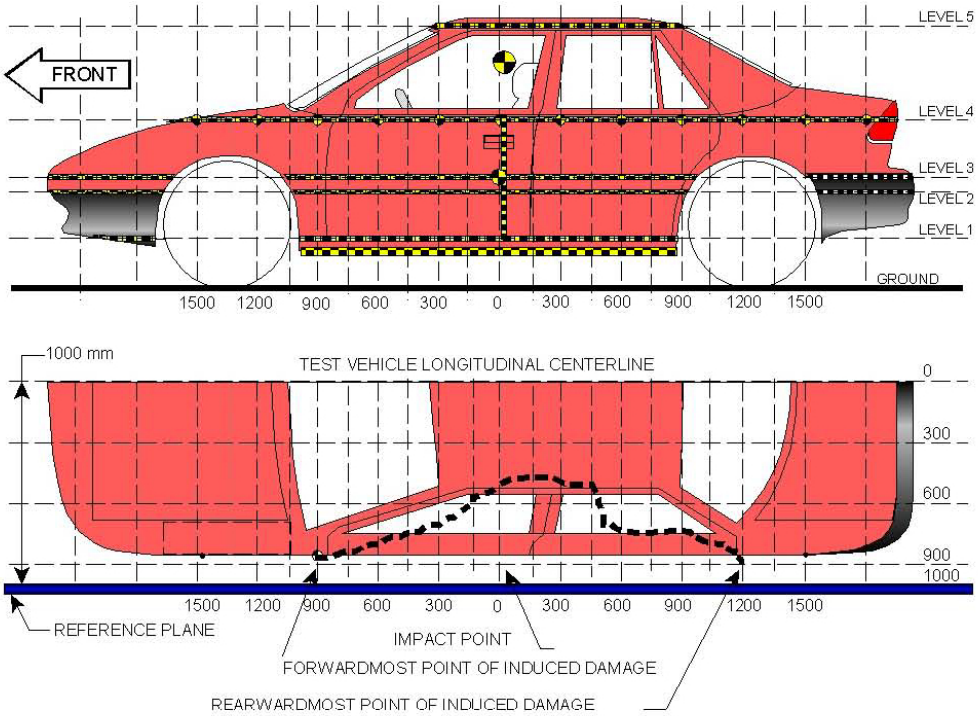
All measurements in (mm) with tolerance of ± 3 mm
LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2736	2707	-29
B	Front Axle to FSOV	988	967	-21
C	Rear Axle to RSOV	987	1025	38
D	Total Vehicle Length at Centerline	4711	4699	-12
E	Front Bumper Thickness	98	98	0
F	Front Bumper Bottom to Ground	200	217	17
G	Sill Height at Front Wheel Well	163	159	-4
H	Sill Height at Front Door Leading Edge	154	150	-4
I	Sill Height at B-Pillar	168	141	-27
J1	Sill Height at Rear Wheel Well	178	189	11
J2	Pinch Weld Height at Rear Wheel Well	164	174	10
K	Sill Height Aft of Rear Wheel Well	239	238	-1
L	Rear Bumper Thickness	128	128	0
M	Rear Bumper Bottom to Ground	275	273	-2
N	Sill Height to Bottom of Front Window Sill	712	702	-10
O	Front Door Leading Edge to Impact CL	721	598	-123
P	Rear Door Trailing Edge to Impact CL	1246	1252	6
Q	Front Window Opening	413	376	-37
R	Right Side Length	3374	3390	16
S	Left Side Length	3374	3394	20
T	Vehicle Width at B-Pillars	1821	1746	-75
U	Front Wheel Track Width	1537		
V	Rear Wheel Track Width	1563		

DATA SHEET NO. 10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022



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 MEAUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	301	263	-75
2	Occupant H-Point	491	287	-75
3	Mid Door	588	293	-75
4	Window Sill	896	244	-75
5	Window Top	1330	62	-75

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

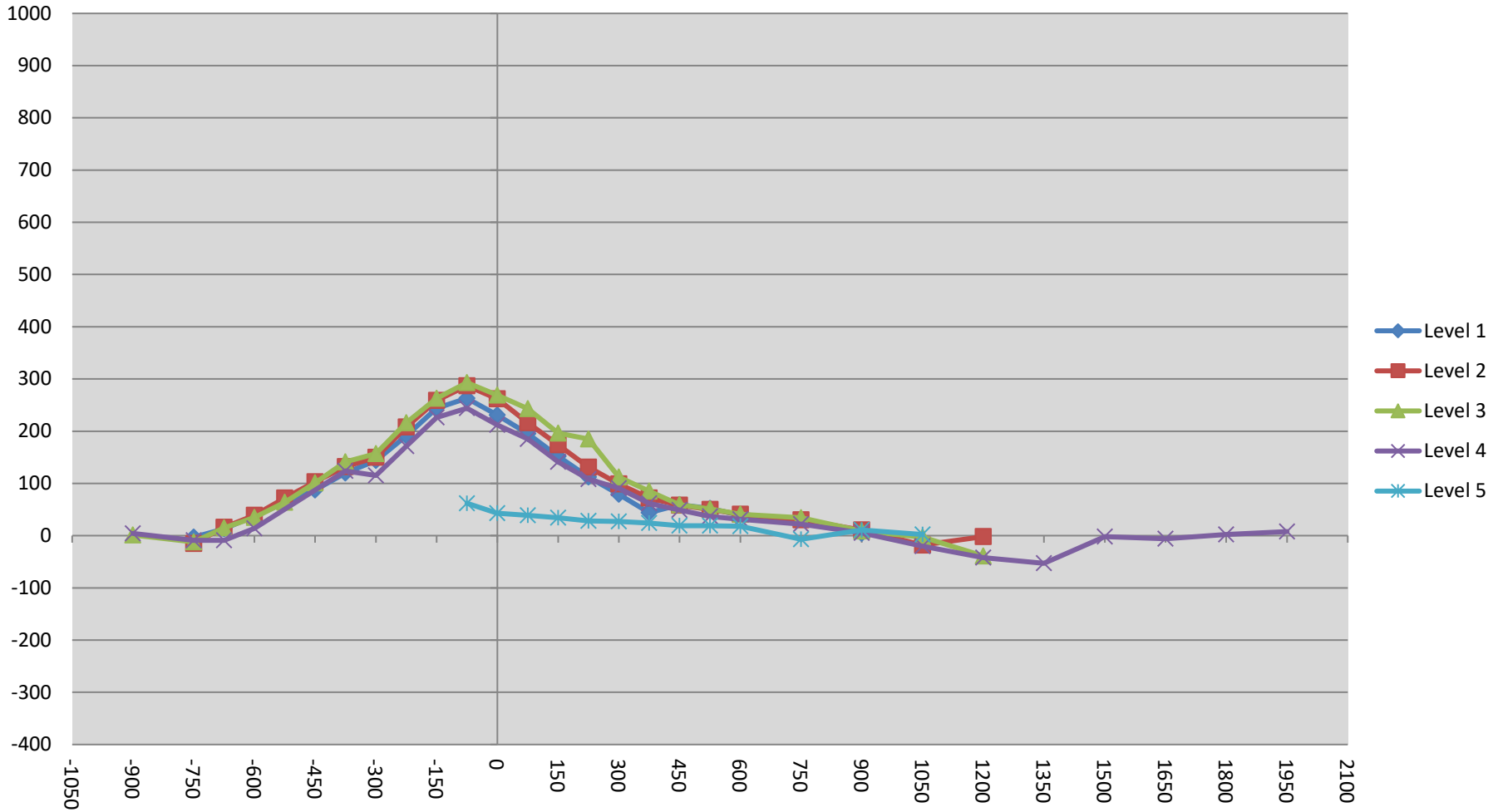
Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022

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					Exterior Crush				
	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			195	316				196	320				1	4	
-825															
-750	226	204	203	302		223	189	191	293		-3	-15	-12	-9	
-675	229	208	205	291		242	224	220	282		13	16	15	-9	
-600	229	210	205	290		267	249	240	304		38	39	35	14	
-525	226	210	205			289	282	269			63	72	64		
-450	222	209	204			309	312	305			87	103	101		
-375	220	209	202	272		340	341	343	396		120	132	141	124	
-300	215	207	201	267		359	357	358	382		144	150	157	115	
-225	212	205	200	260		403	413	416	431		191	208	216	171	
-150	210	204	199	258		454	463	462	484		244	259	263	226	
-75	209	202	198	255	520	472	489	491	499	582	263	287	293	244	62
0	205	201	197	250	508	436	463	466	462	551	231	262	269	212	43
75	205	200	196	250	496	400	416	439	435	535	195	216	243	185	39
150	203	200	195	245	492	355	374	391	386	526	152	174	196	141	34
225	201	200	195	245	488	313	331	380	353	516	112	131	185	108	28
300	204	198	195	243	488	283	297	307	334	515	79	99	112	91	27
375	203	198	195	242	488	247	270	280	304	512	44	72	85	62	24
450	204	200	197	244	487	263	258	256	293	506	59	58	59	49	19
525	204	200	199	245	483	256	250	250	282	502	52	50	51	37	19
600	202	200	200	244	483	241	241	241	275	501	39	41	41	31	18
675															
750	210	200	200	246	487	241	230	234	268	480	31	30	34	22	-7
825															
900	215	196	198	245	502	219	207	207	250	513	4	11	9	5	11
1050		194	192	250	537		176	189	230	539		-18	-3	-20	2
1200		190	186	257			188	147	215			-2	-39	-42	
1350				252					199					-53	
1500				254					252					-2	
1650				257					251					-6	
1800				268					270					2	
1950				280					288					8	
2100															
2250															
2400															
2550															
2700															

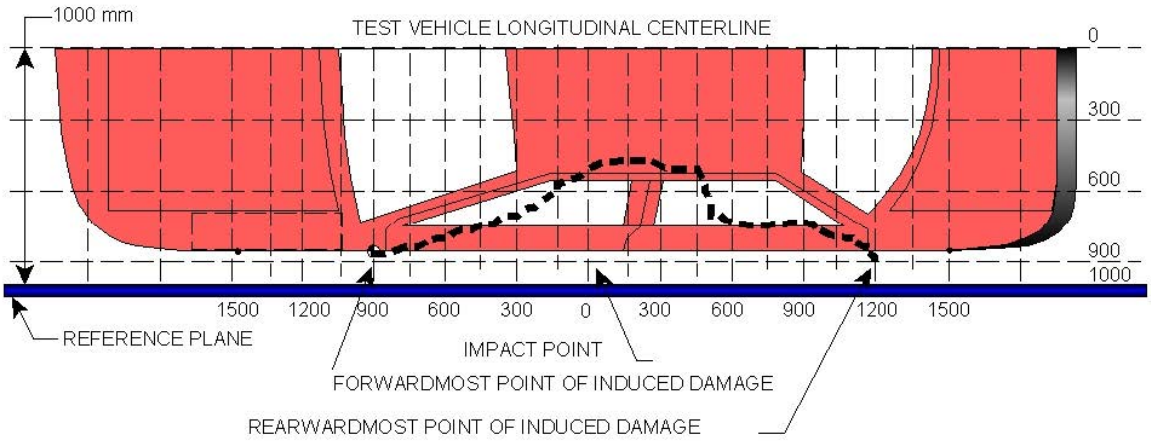
DATA SHEET NO. 10 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022



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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	400	3	196	261	65
2	170	3	195	362	167
3	-60	3	198	482	284
4	-290	3	201	367	166
5	-520	3	205	285	80
6	-750	3	203	191	-12

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback
NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test
Test Date: 11/18/2022

Test Time: 11:18 am
Temperature: 21.4°C

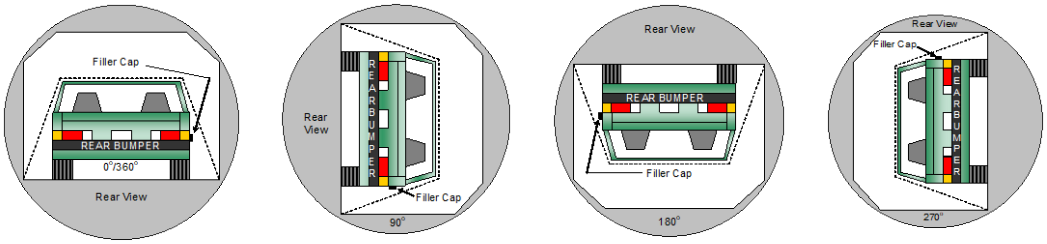
A. From impact until vehicle motion ceases: (Maximum Allowable = 1 ounce) 0.0 oz.

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



0°/360° 90° 180° 270°

ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS 301 ROLLOVER SPILLAGE TABLE (UNITS IN OUNCES)

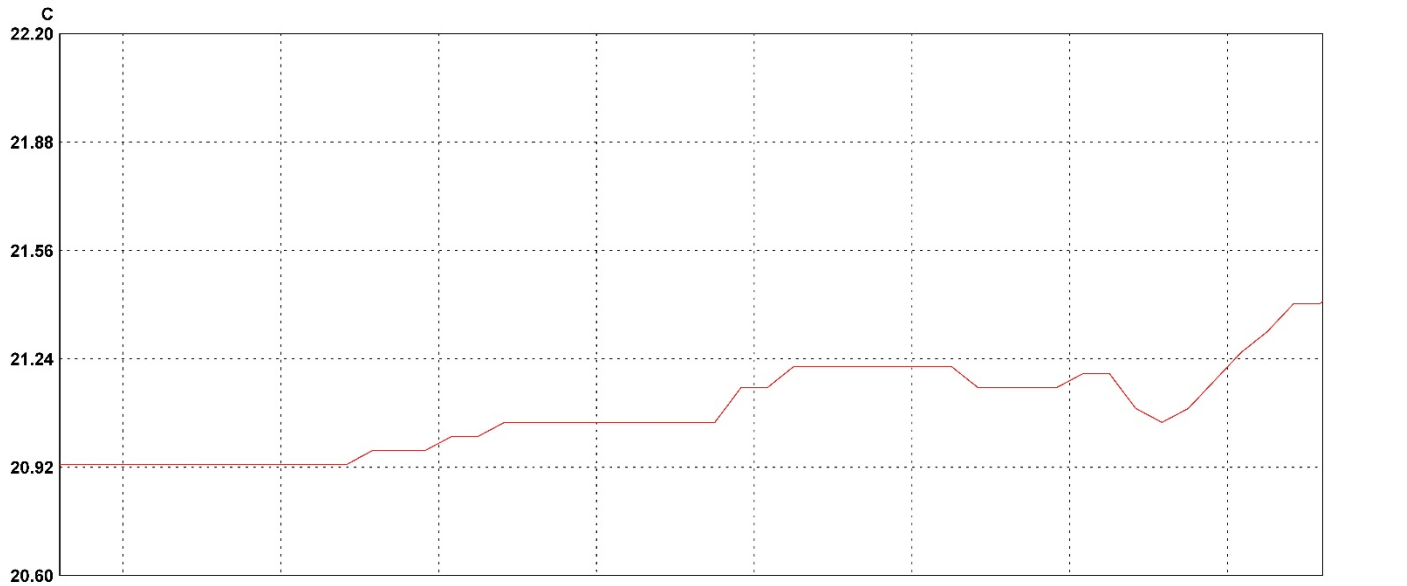
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0.0	0.0	0.0	
90° to 180°	0.0	0.0	0.0	
180° to 270°	0.0	0.0	0.0	
270° to 360°	0.0	0.0	0.0	

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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback NHTSA No.: O20235301
Test Program: NCAP Side Pole Impact Test Test Date: 11/18/2022



30 minutes/div 4 hours (M/d/yyyy h:mm:ss tt) Central Time Graph file (truncated): O20235301 2023 Acura Integra A-Spec Tech 4-Door Sedan Side NCAP Pole.spg

LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	18352041	VSC_South_Hall	1		21.40	21.09	20.93	C	Temperature	18352041_VSC_South_Hall.spl

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

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

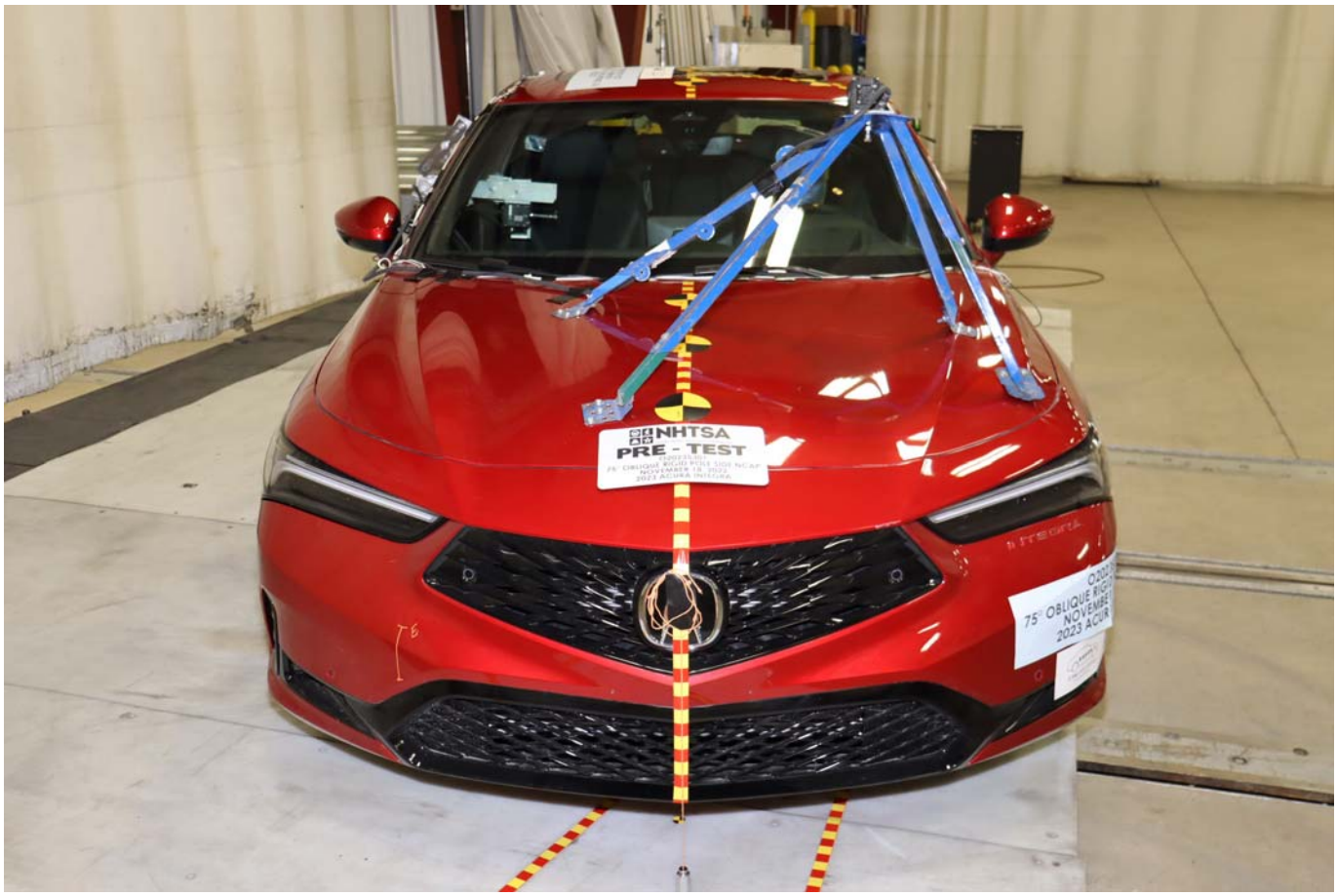


Photo No. 003 - Pre-Test Frontal View of Test Vehicle

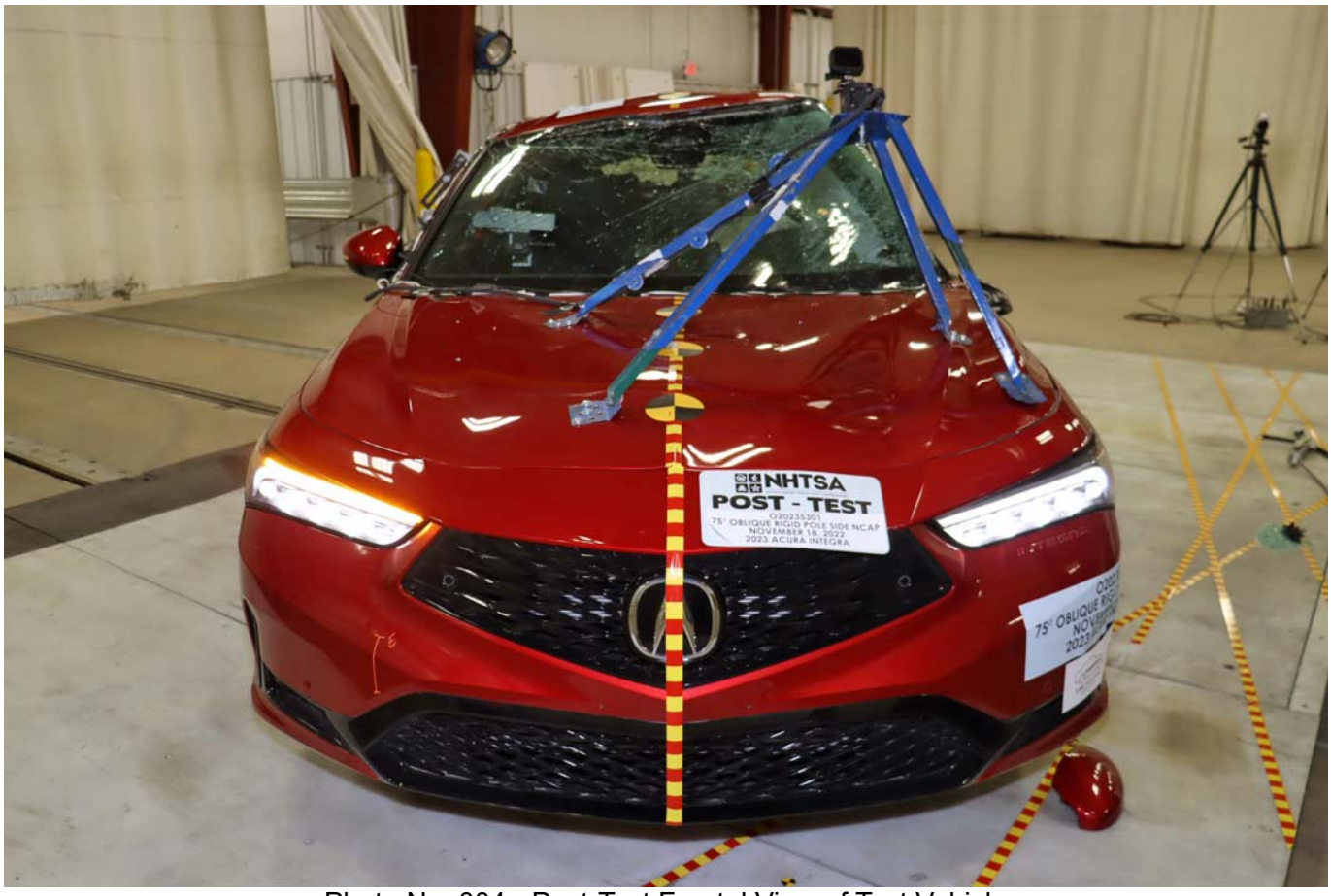


Photo No. 004 - Post-Test Frontal View of Test Vehicle

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

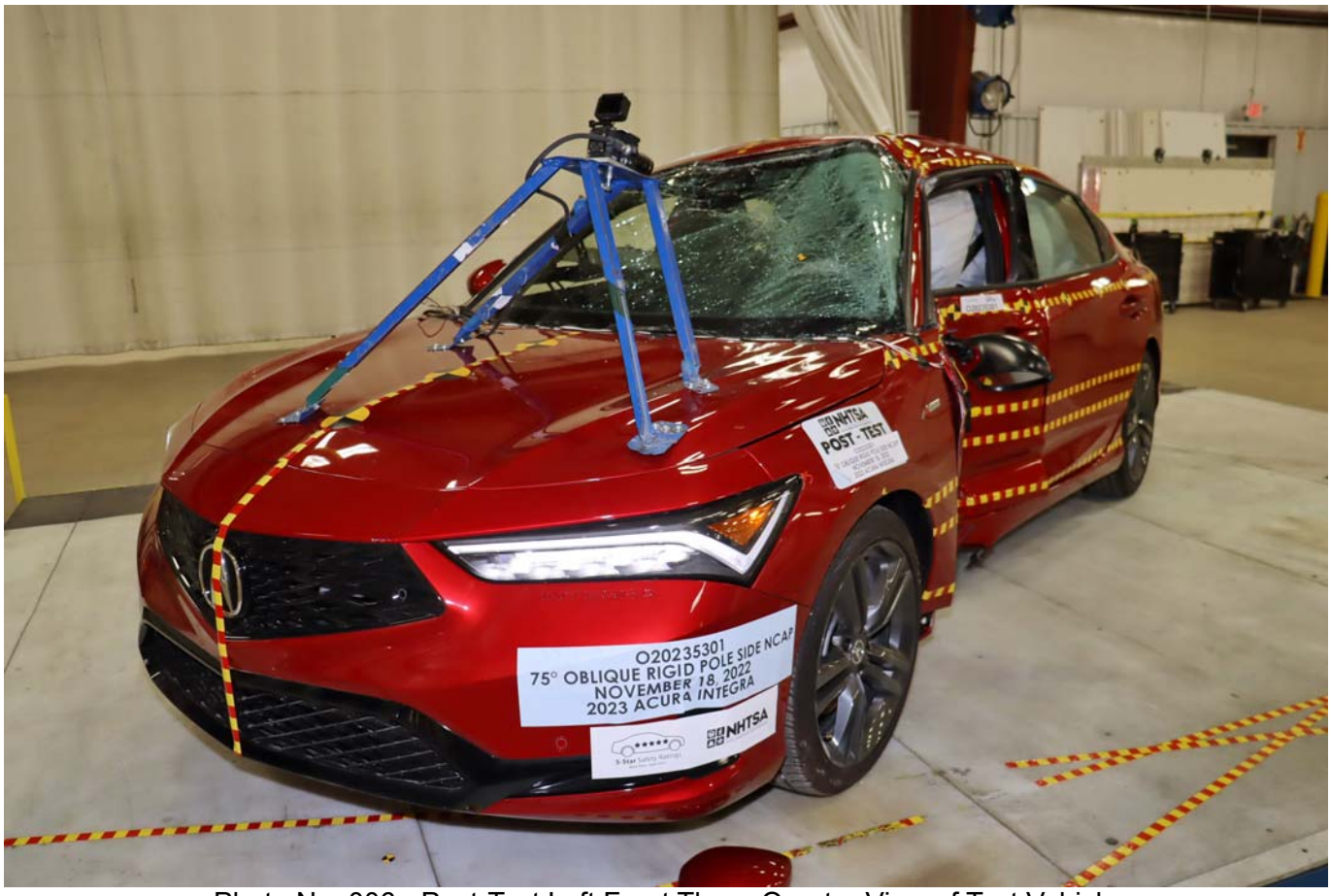


Photo No. 006 - Post-Test Left Front Three-Quarter View of Test Vehicle

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

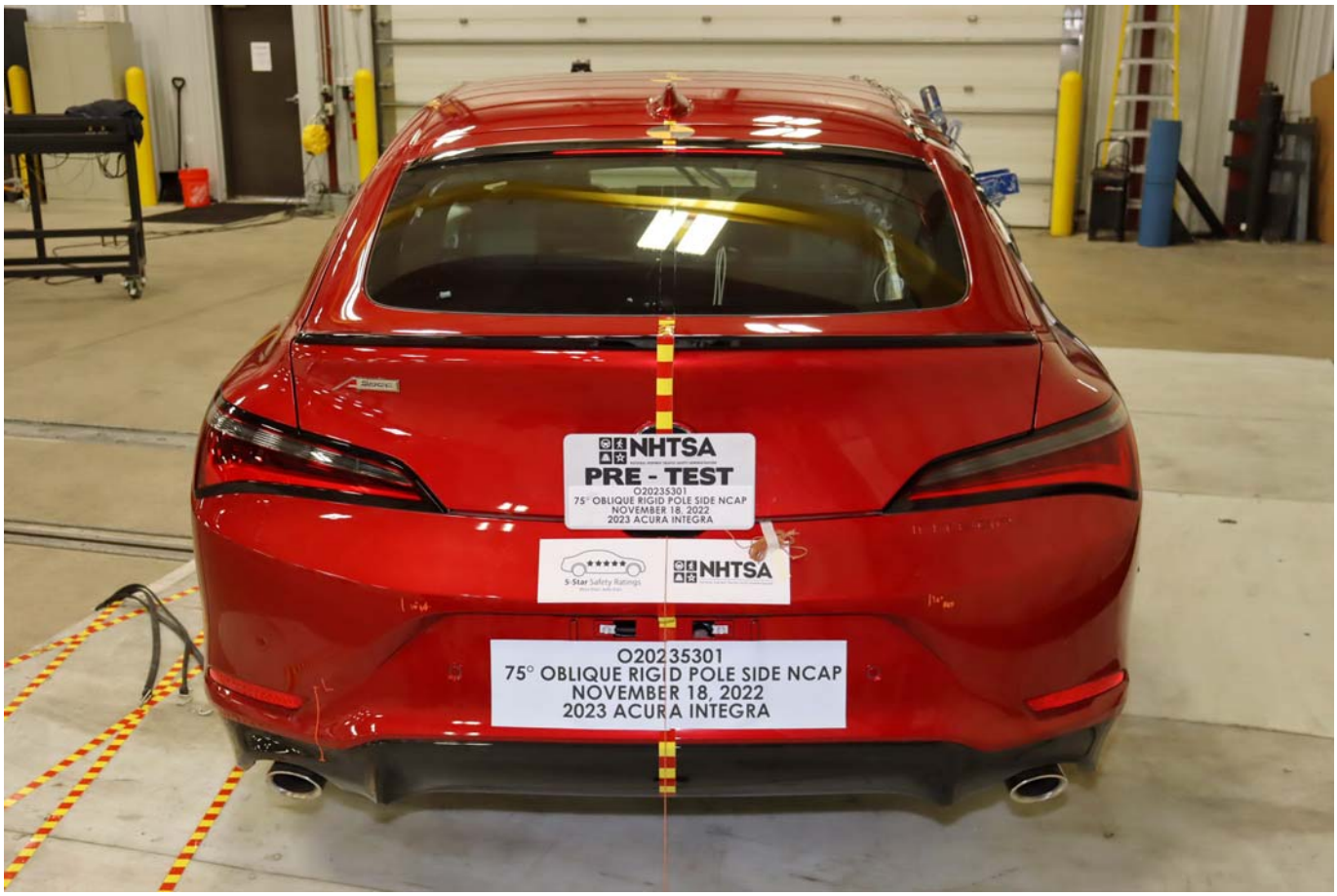


Photo No. 011 - Pre-Test Rear View of Test Vehicle

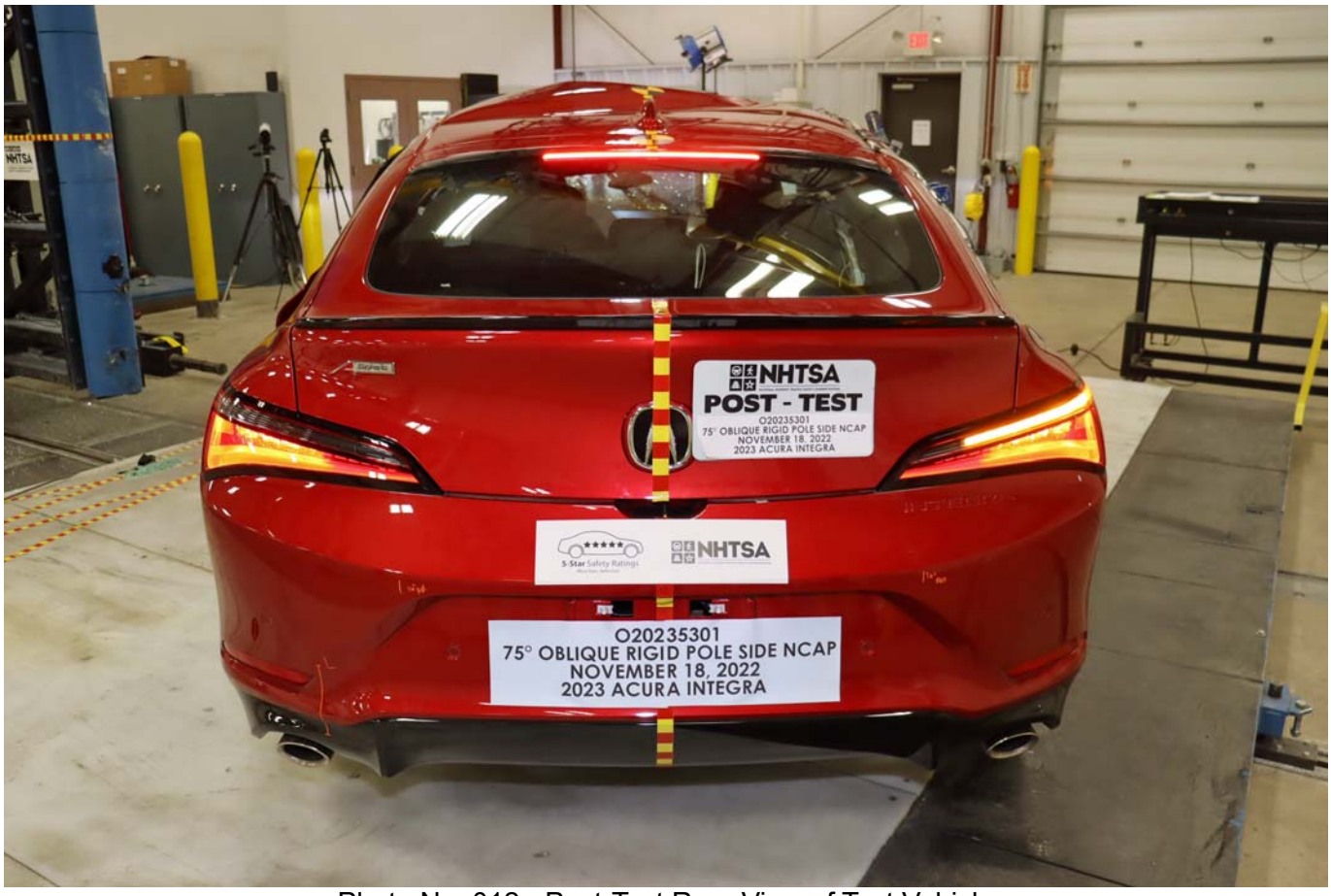


Photo No. 012 - Post-Test Rear View of Test Vehicle

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

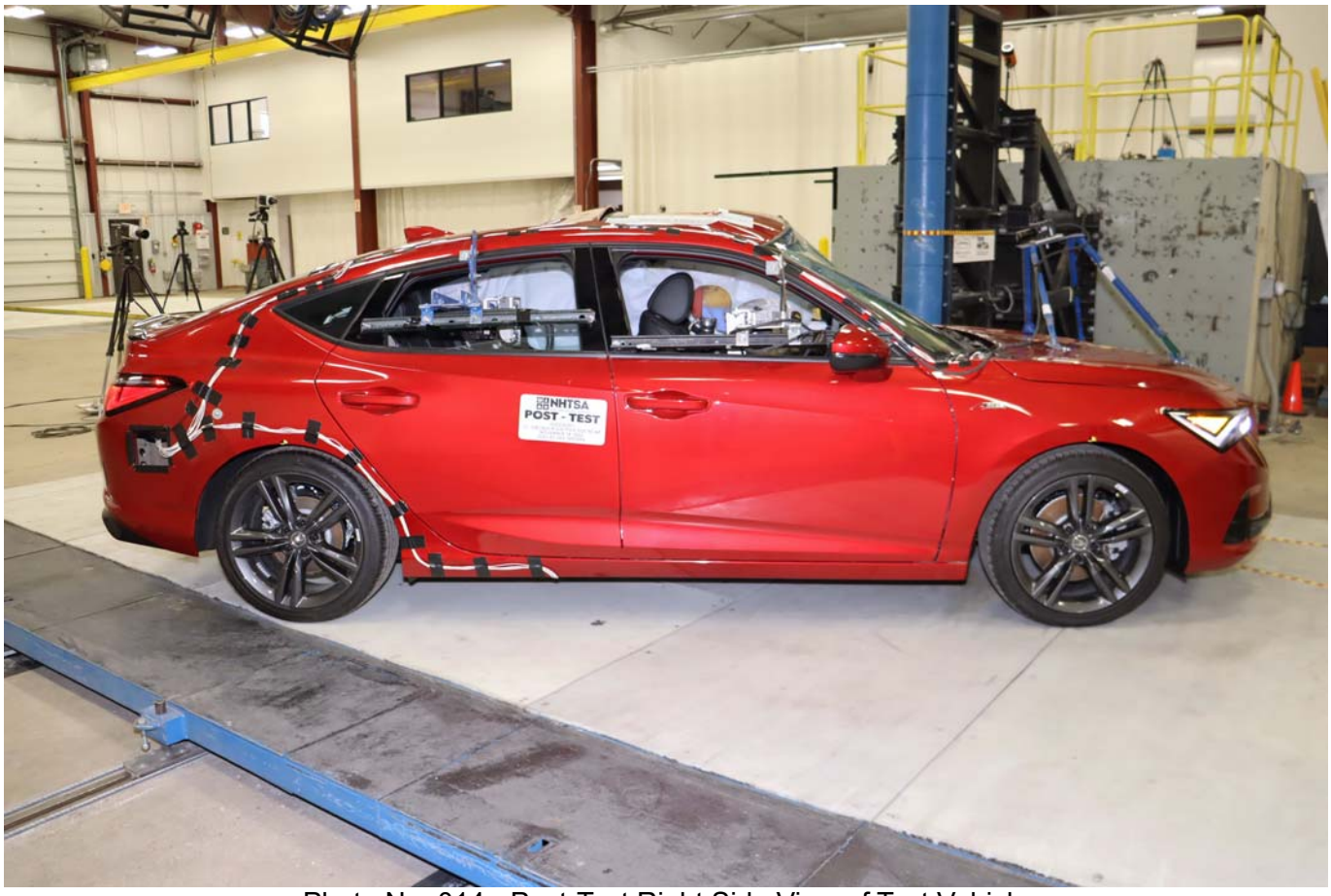


Photo No. 014 - Post-Test Right Side View of Test Vehicle

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

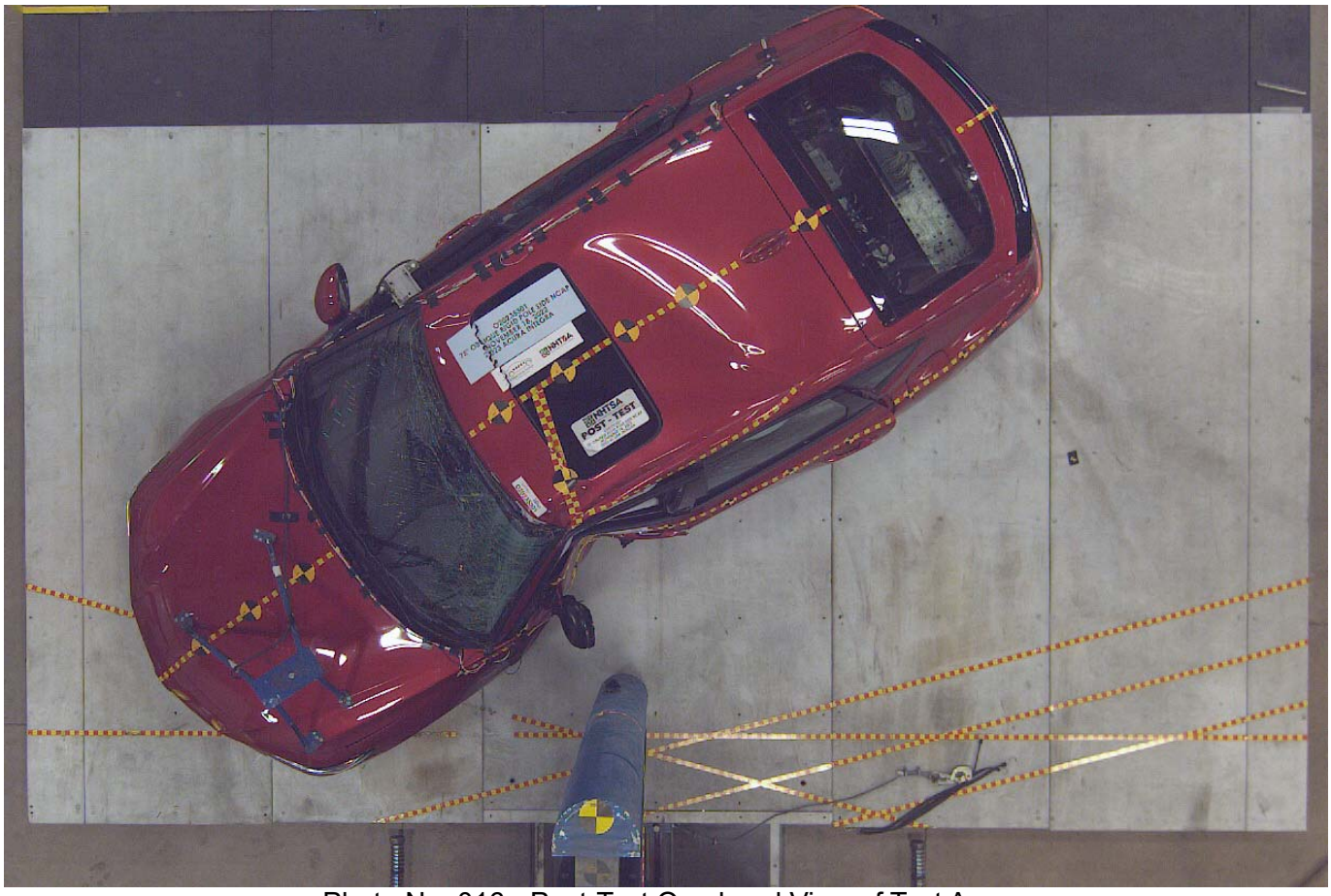


Photo No. 016 - Post-Test Overhead View of Test Area

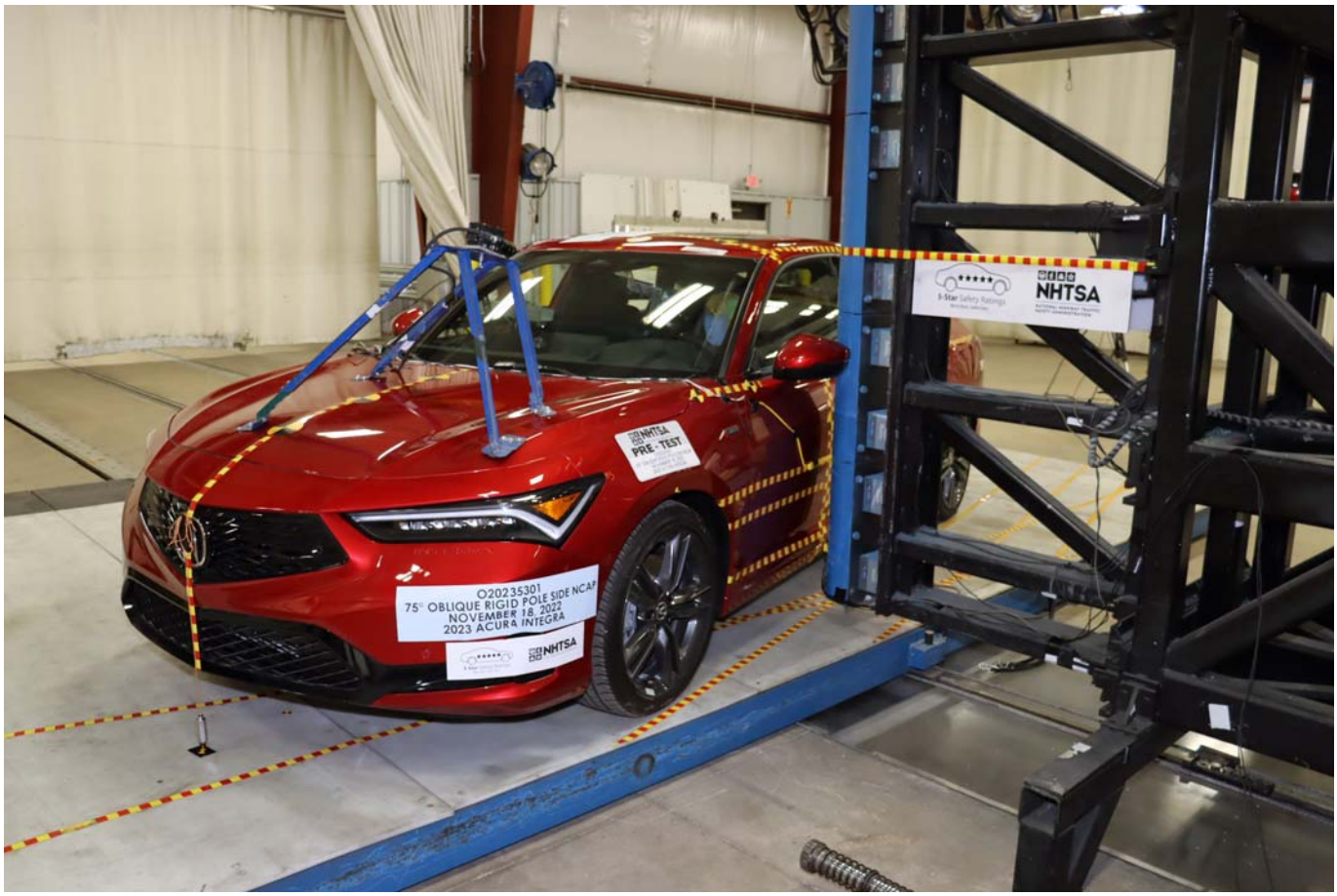


Photo No. 017 - Pre-Test Left Side View of Pole Positioned Against Side of Vehicle

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

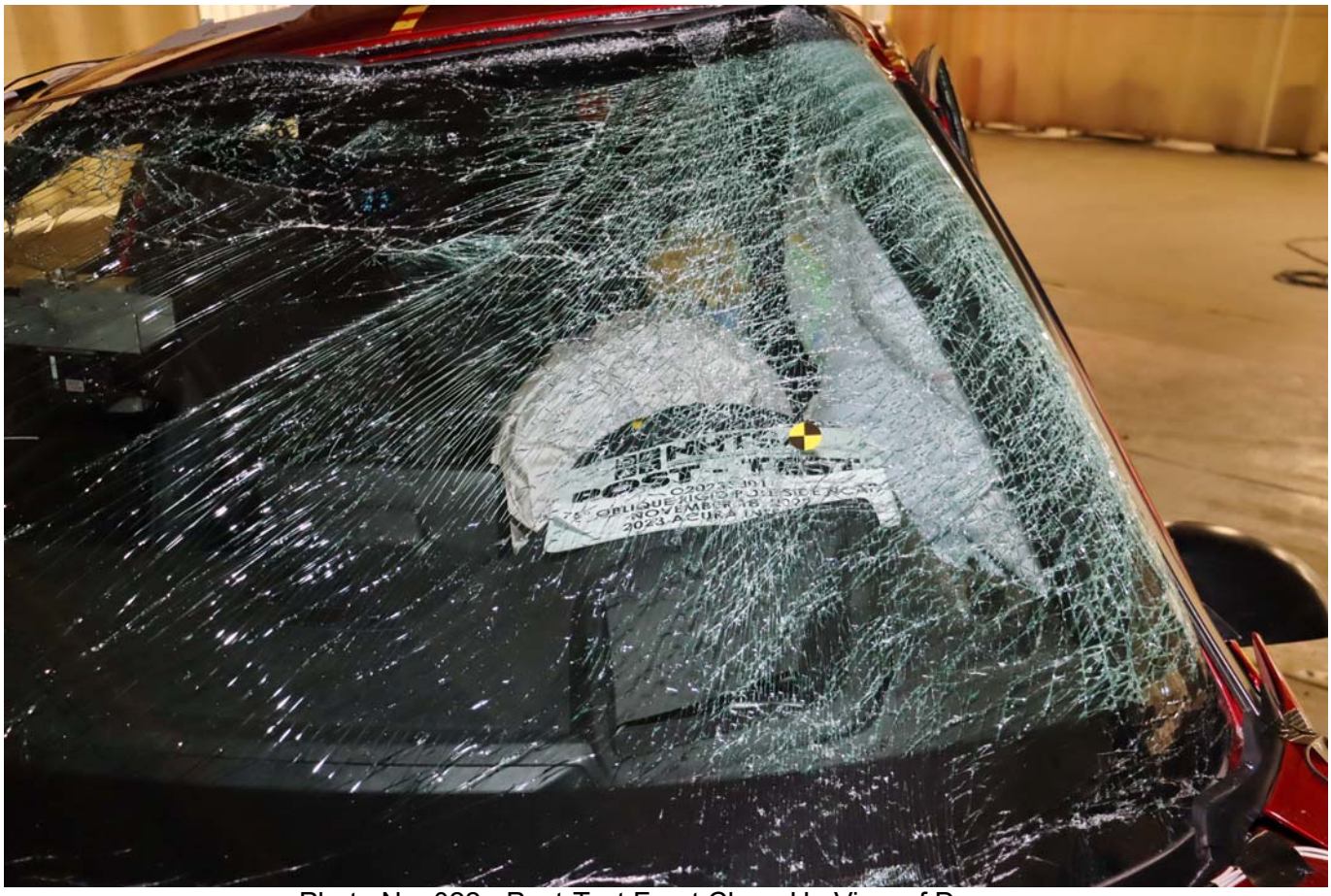


Photo No. 022 - Post-Test Front Close-Up View of Dummy

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's Neck Showing Position of Adjustable Neck Bracket

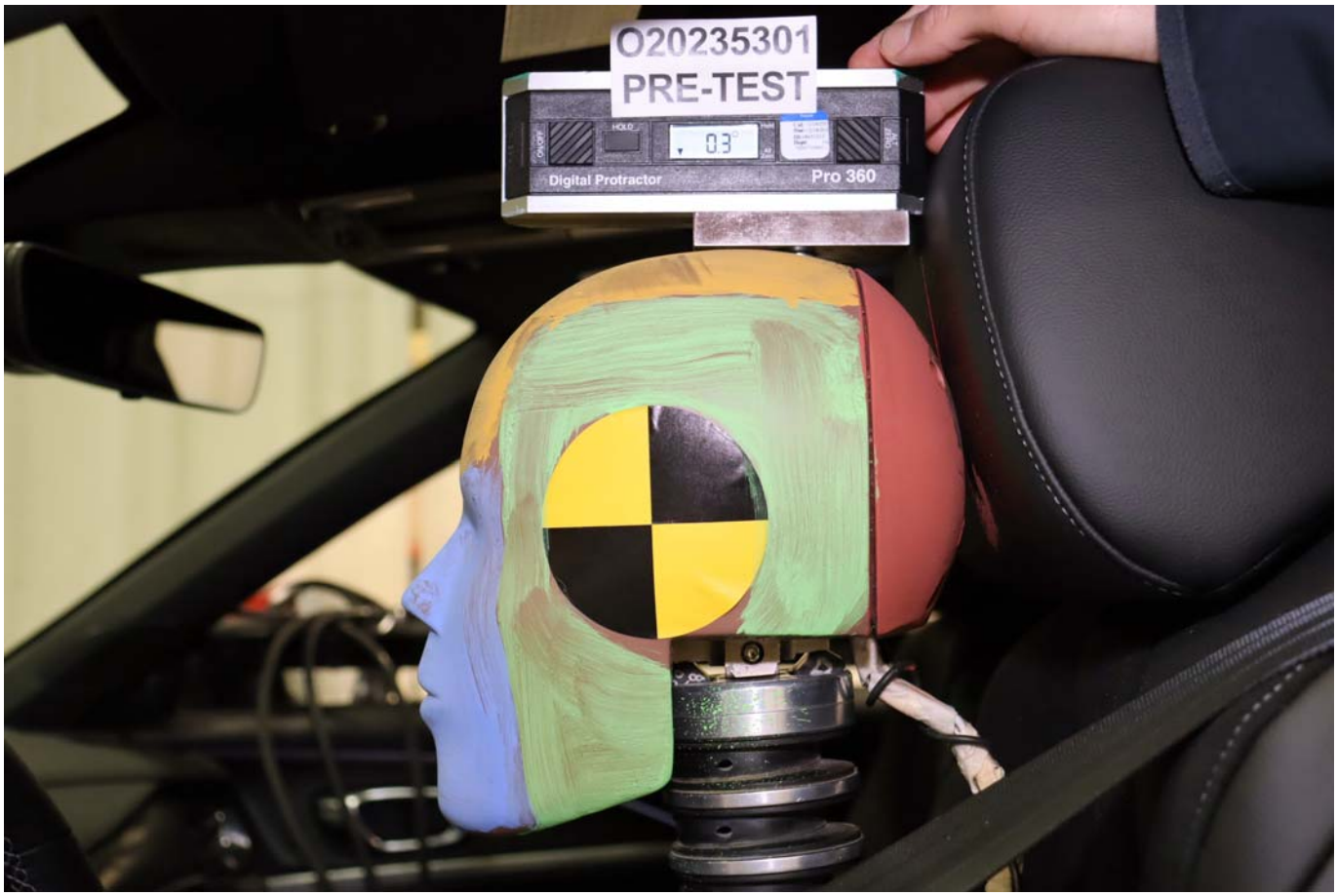


Photo No. 031 - Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level

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

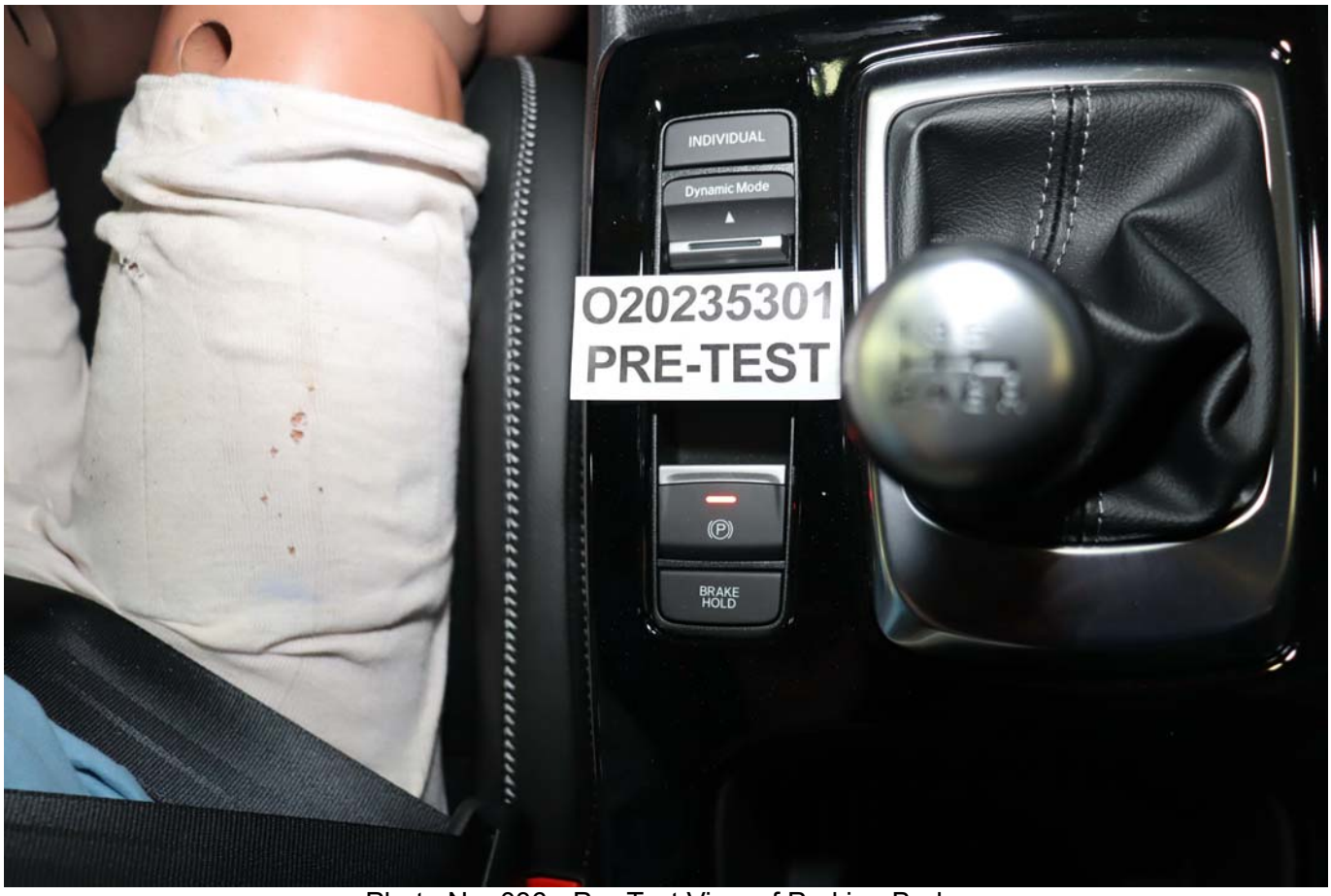


Photo No. 036 - Pre-Test View of Parking Brake

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

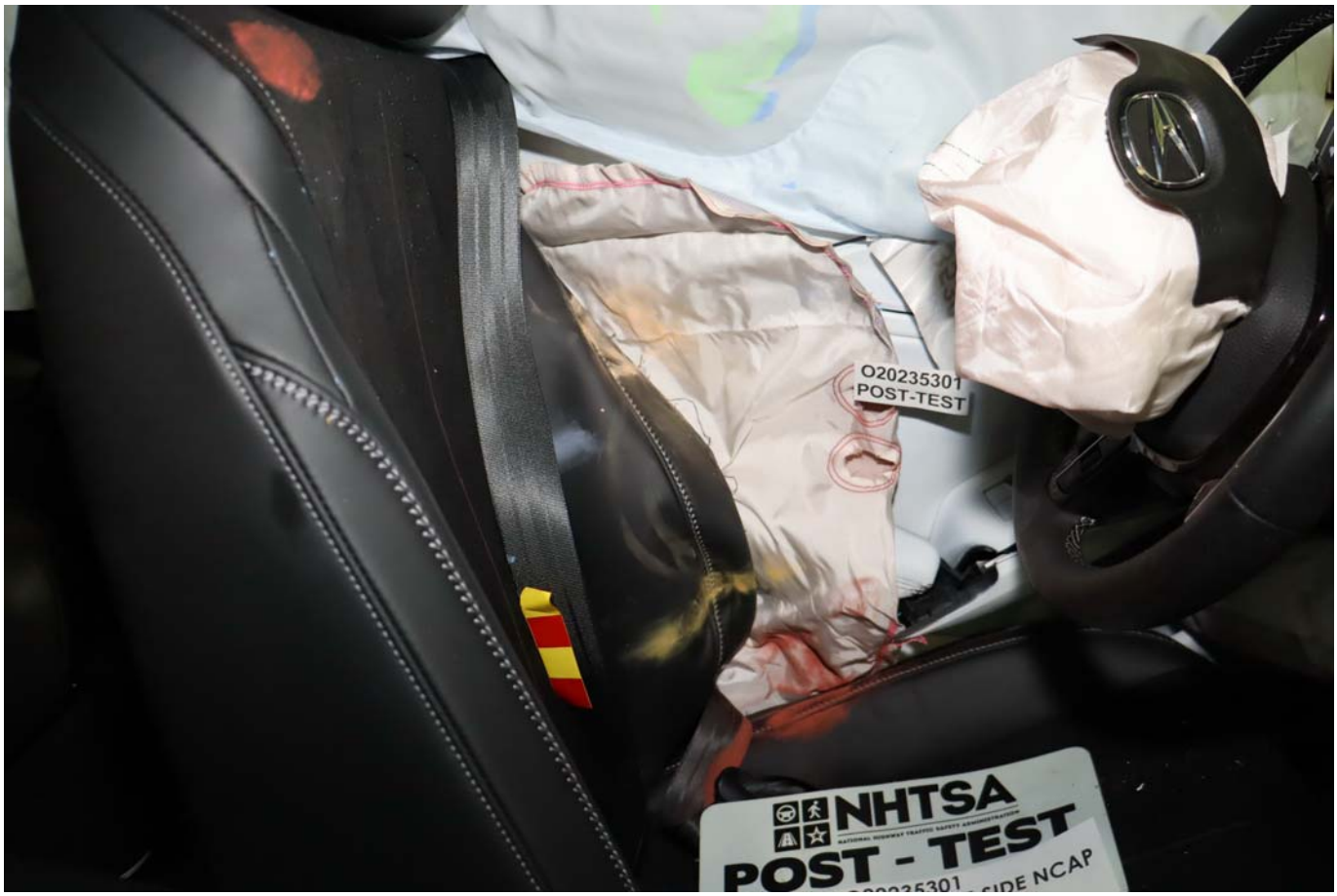


Photo No. 049 - Post-Test Dummy Close-Up Torso Contact with Side Air Bag View

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

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's Certification Label

Photo No. 058 - Close-Up View of Vehicle's 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

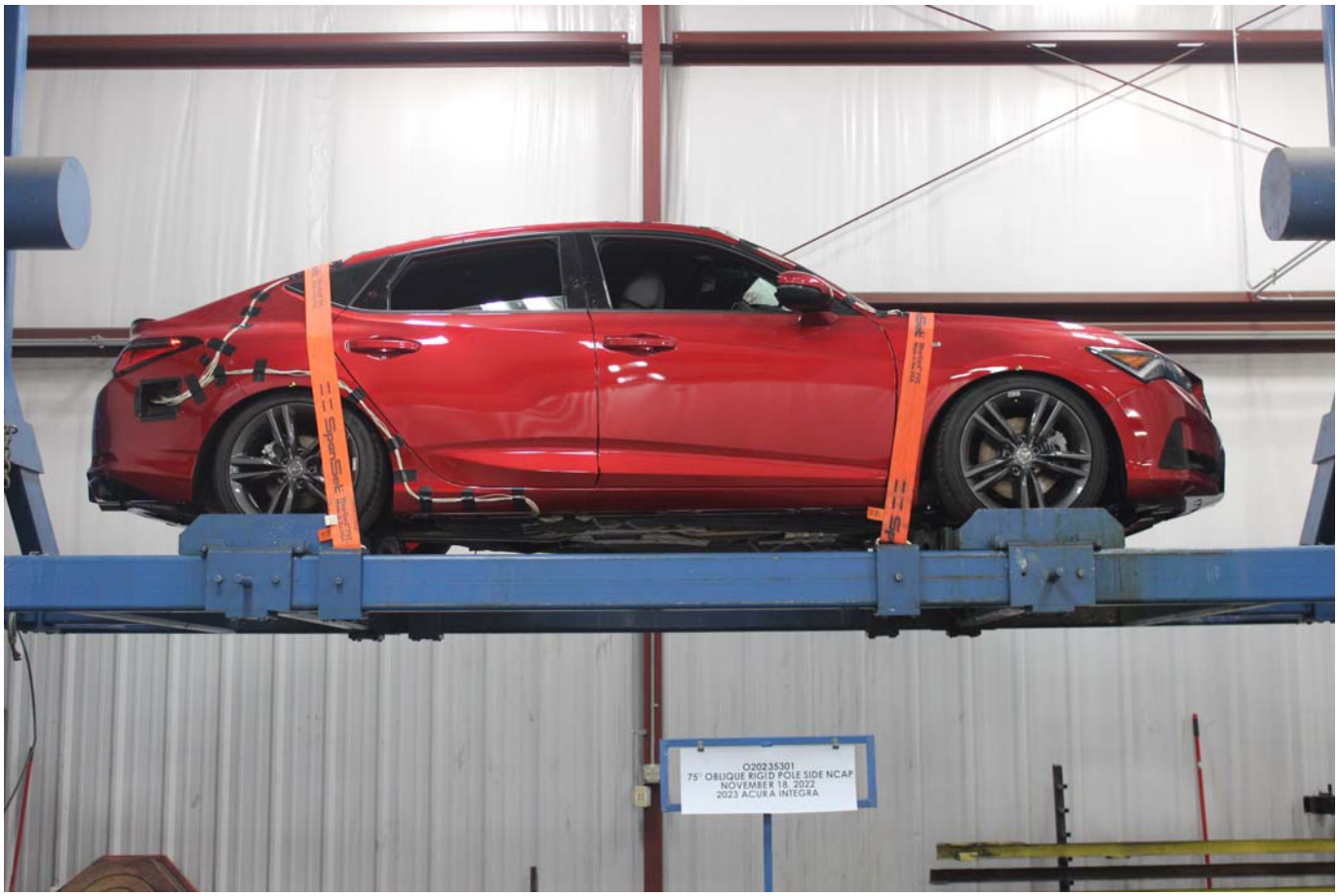


Photo No. 065 - FMVSS Photo No. 301 Static Rollover 0 Degrees

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

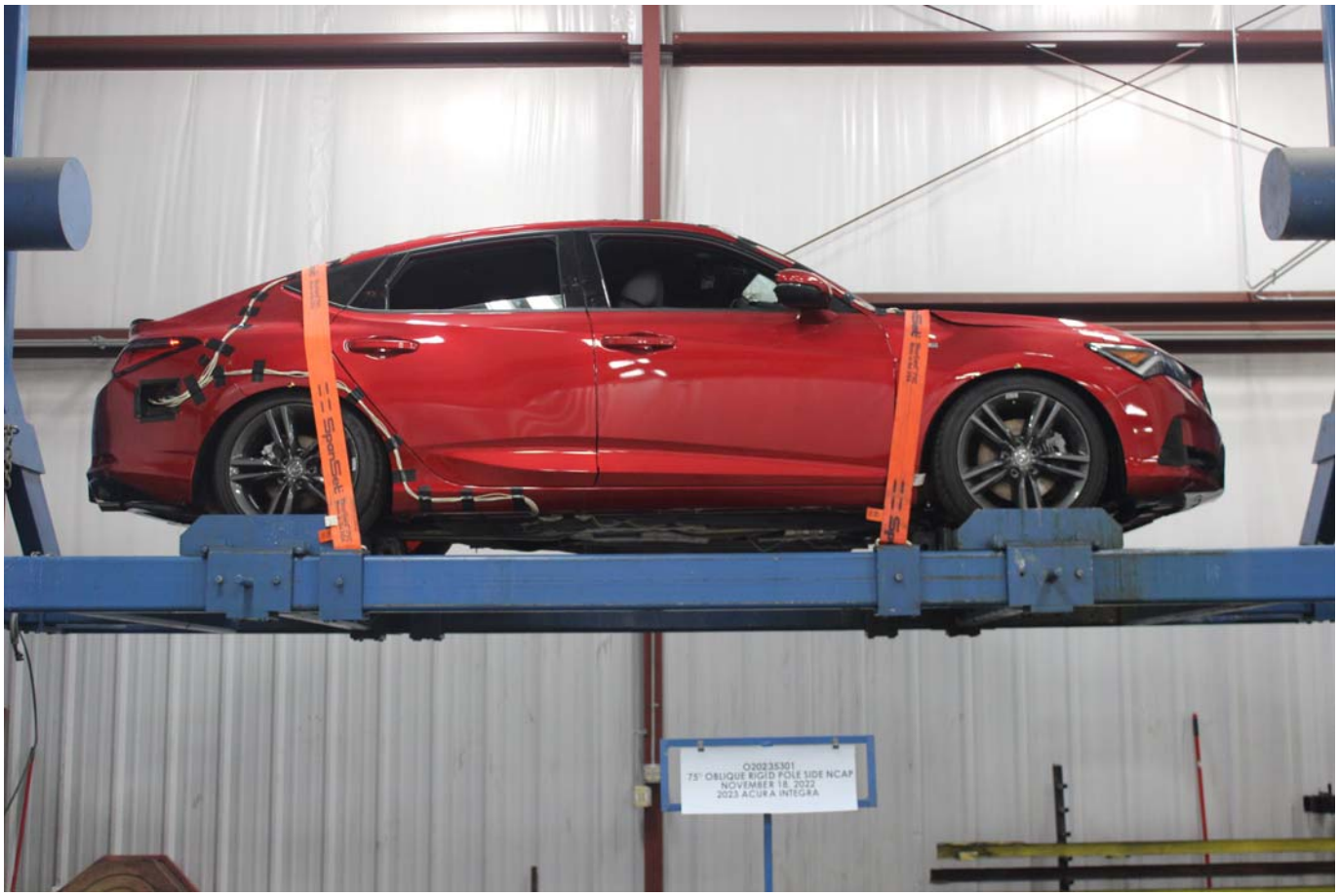


Photo No. 069 - FMVSS Photo No. 301 Static Rollover 360 Degrees

Photo No. 070 - Impact Event

ACURA

2023 INTEGRA A-SPEC TECH

EXT: PERFORMANCE RED P ENGINE NUMBER: L15CA-1105825

INT: EBONY

STANDARD EQUIPMENT AT NO EXTRA COST

* TECHNICAL FEATURES *
- 200hp 1.5-Liter Direct Injection VTEC Turbo 4-Cylinder Engine
- 6-Speed Manual Transmission
- Limited Slip Differential
- Integrated Dynamics System (IDS) w/ Individual Mode
- Adaptive Damper System (ADS)
- 4-Wheel Disc Brakes
- Front MacPherson Strut Suspension
- Rear Multi-Link Suspension
- Electric Power Steering

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

* INTERIOR FEATURES *
- Driver's 12-Way Power Seat
- Driver Recognition Memory System
- Front Passenger's 4-Way Power Seat
- Heated Front Seats
- 9" Color Touchscreen with Multi-View Rear Camera
- Precision Cockpit - Digital Instrument Panel
- Wireless Apple Carplay / Android Auto Integration
- Bluetooth HandsFreeLink
- WiFi Hotspot
- Alexa Built-In
- HD Radio
- SiriusXM Satellite Radio
- Blind Spot Information (BSI) w/ Rear Cross Traffic Monitor
- Driver Attention Monitor
- Traffic Sign Recognition
- Dual-Zone Automatic Climate Control with Air Filtration System
- Push-Button Ignition
- Auto Dimming Rearview Mirror
- Cargo Area Cover

* EXTERIOR FEATURES *
- Power Moonroof with Tilt Feature
- Jewel Eye LED Headlights
- Heated Power Door Mirrors with Turn Indicators
- Keyless Access System with Smart Entry
- Tire Sealant and Inflator Kit (in place of spare tire)

* TECH PACKAGE *
- Acura ELS Studio Premium Audio System with 16 Speakers
- Sport Seats with Microsuede Inserts
- AcuraLink Communication System
- Head-Up Display
- Wireless Phone Charger
- Front and Rear Parking Sensors
- Low Speed Braking Control
- Rain Sensing Wipers

* A-SPEC PACKAGE *
- A-Spec Exclusive Styling
- 18" Alloy Wheels
- 235/40 R18 All-Season Tires
- LED Fog Lights
- Rear Decklid Spoiler
- Sport Pedals

* ACURAWATCH FEATURES*
- Adaptive Cruise Control
- Collision Mitigation Braking
- Forward Collision Warning
- Lane Departure Warning
- Lane Keeping Assist System
- Road Departure Mitigation

Manufacturer's Suggested Retail Price	$35,800.00

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)

PERFORMANCE RED P	500.00
Destination and Handling	1,095.00
TOTAL VEHICLE PRICE (includes Pre-Delivery Service)	**$37,395.00**

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

MULLER'S WOODFIELD ACURA
1099 W. HIGGINS ROAD
HOFFMAN ESTATES, IL 60195

VIN: 19UDE4G74PA005267

PORT OF ENTRY: MARYSVILLE
DELIVERY POINT: CHICAGO
SHIP#:
ROW/SPACE: 525-020
TRANS.METHOD: TRUCK

ORIG. DLR: 251115
REF.NO: 41157
HN CODE: AL-1710
EMISSION: 50 STATE
CONTROL NO: 054347
DEALER: 251115

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy
30 MPG
combined city/hwy
26 city
36 highway
3.3 gallons per100 miles

Large Cars range from 14 to 131 MPG. The best vehicle rates 132 MPGe.

You spend **$1,000** in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost **$1,800**

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 6 (1 – 10 Best)
Smog Rating (tailpipe only): 6 (1 – 10 Best)

This vehicle emits 293 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs $8,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.65 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code ™

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: 65 %

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

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

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.

Frontal Crash	Driver	Not Rated
	Passenger	Not Rated

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat	Not Rated
	Rear seat	Not Rated

Based on the risk of injury in a side impact.

Rollover: ★★★★★
Based on the risk of rollover in a single vehicle crash.

Star Ratings range from 1 to 5 stars (*****) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

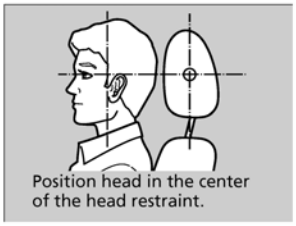
This vehicle is equipped with bumpers that can withstand an impact of 2.5 miles per hour with no damage to the vehicle's body and safety systems, although the bumper and related components may sustain damage. The bumper system on this vehicle conforms to the current federal bumper standard of 2.5 miles per hour.

Photo No. 071 - Monroney Label

Head Restraints

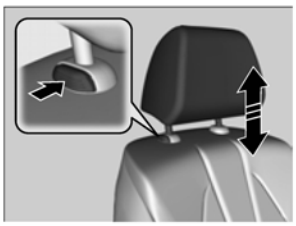
Your vehicle is equipped with head restraints in all seating positions.

Adjusting the Front Head Restraint Positions



Position head in the center of the head restraint.

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.



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

Adjusting the Front Head Restraint Positions

⚠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.

Photo No. 072 - Head Restraint Use and Adjustment Information from Vehicle Owner's 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

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)

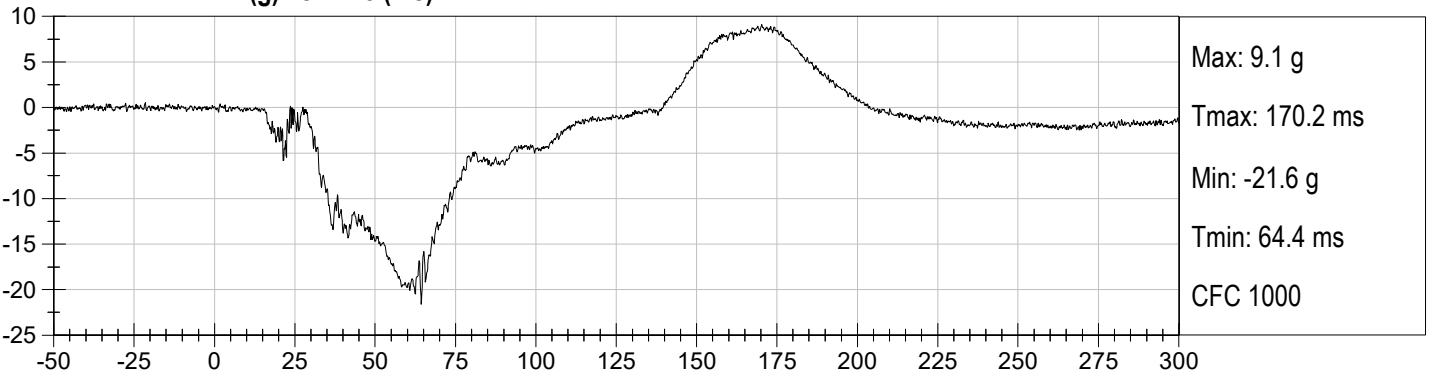
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

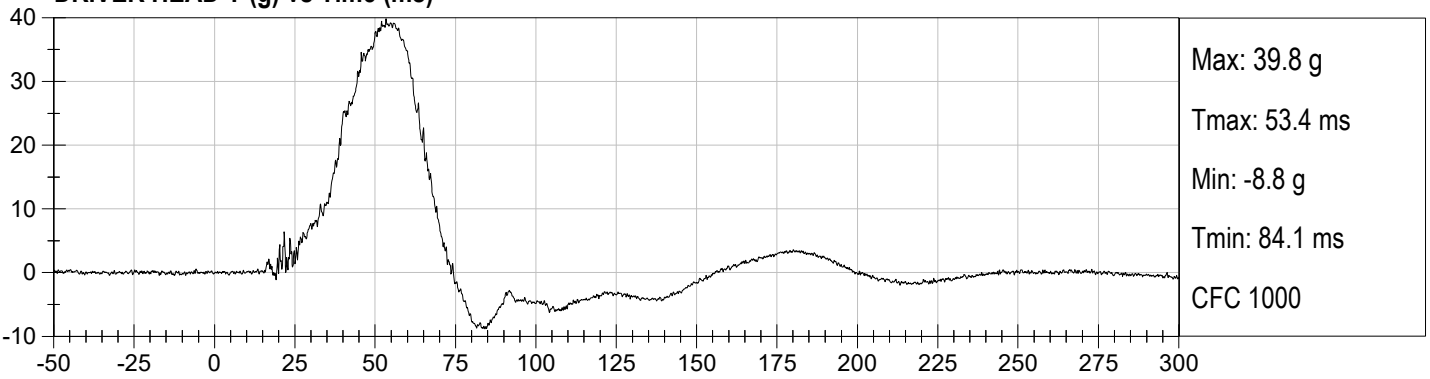
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

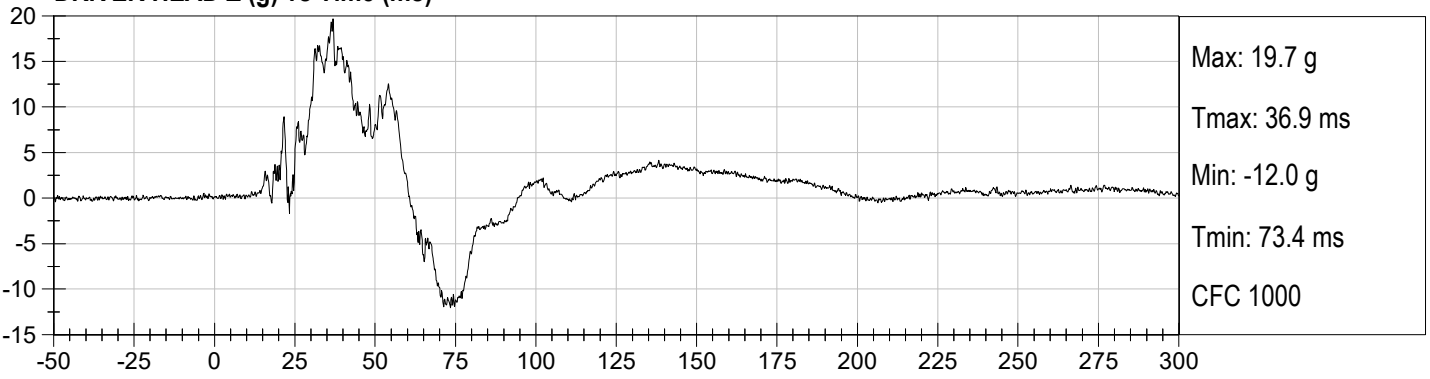
DRIVER HEAD X (g) vs Time (ms)



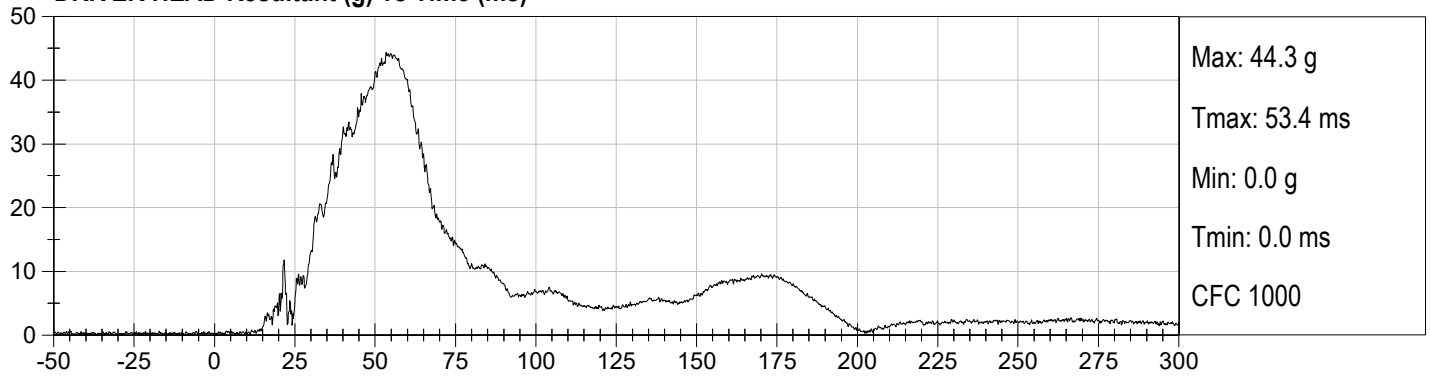
DRIVER HEAD Y (g) vs Time (ms)



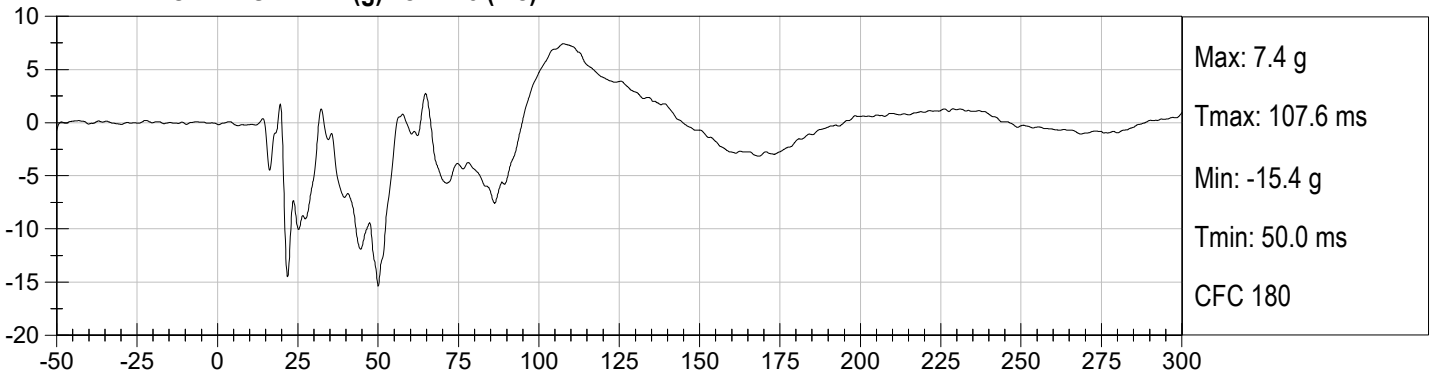
DRIVER HEAD Z (g) vs Time (ms)



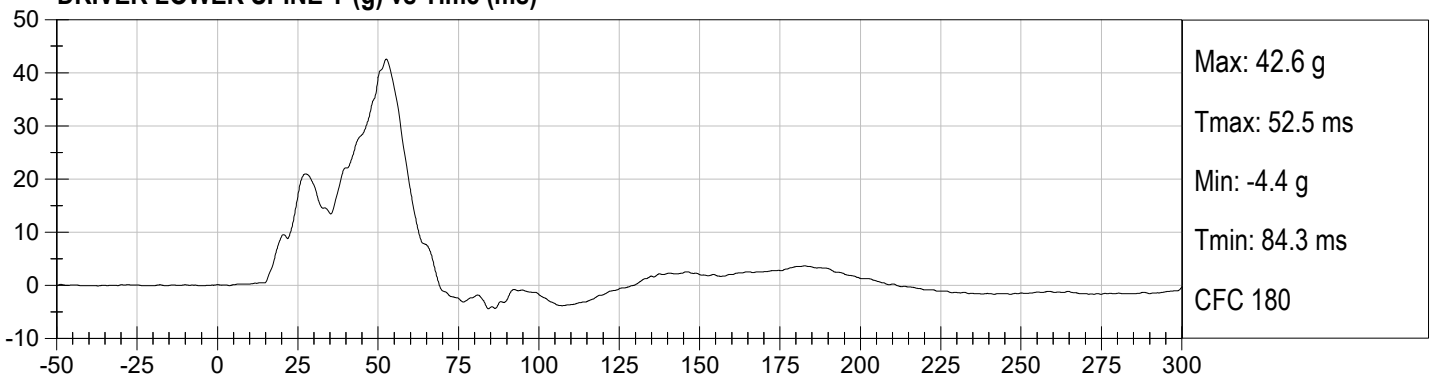
DRIVER HEAD Resultant (g) vs Time (ms)



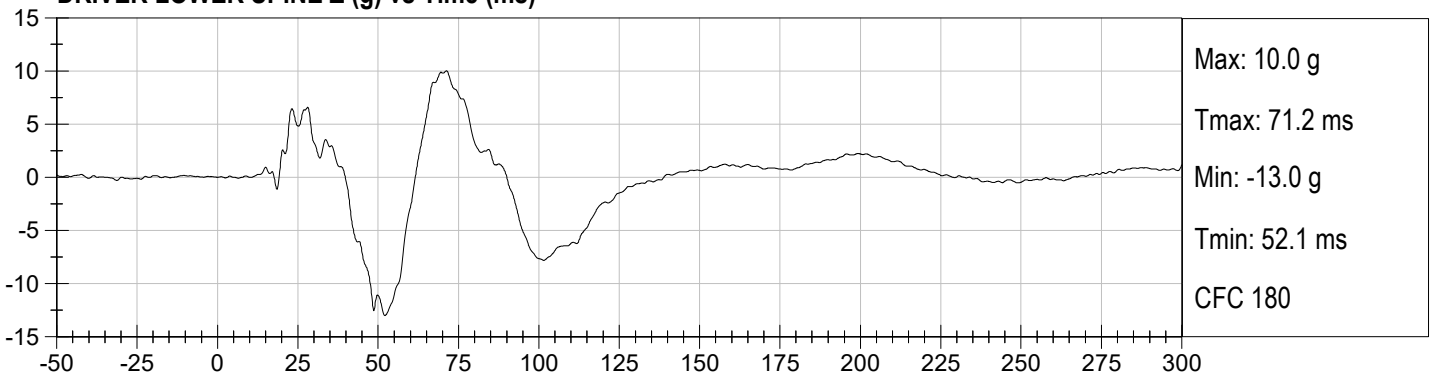
DRIVER LOWER SPINE X (g) vs Time (ms)



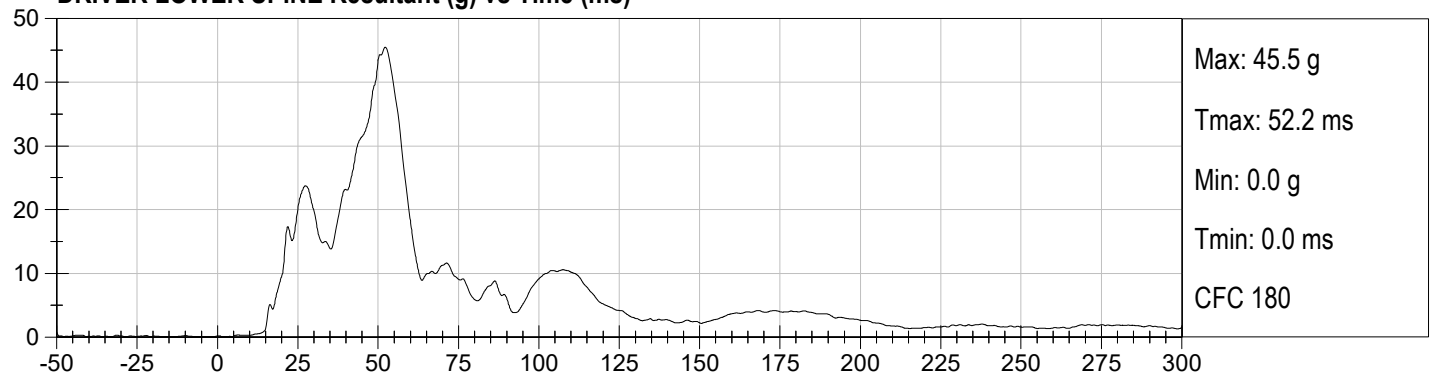
DRIVER LOWER SPINE Y (g) vs Time (ms)



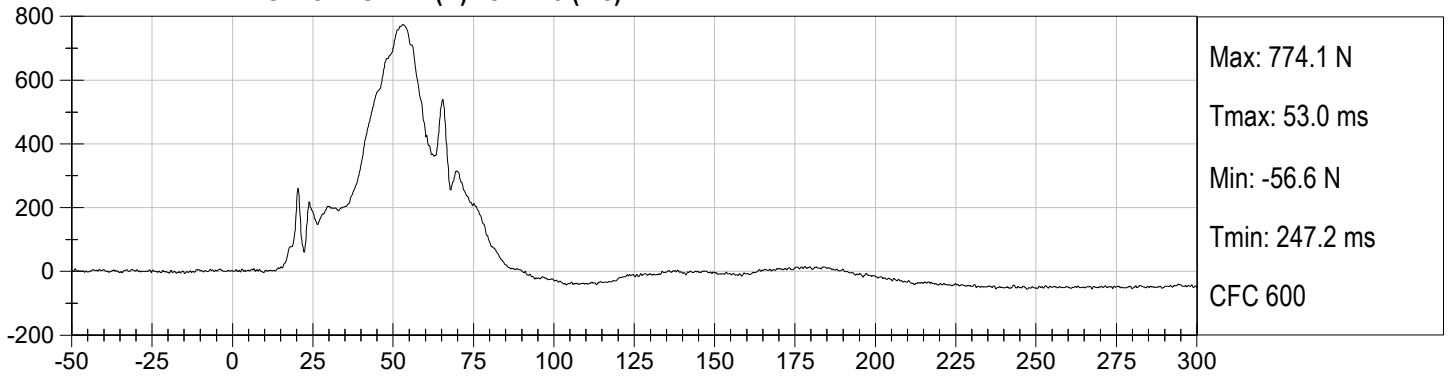
DRIVER LOWER SPINE Z (g) vs Time (ms)



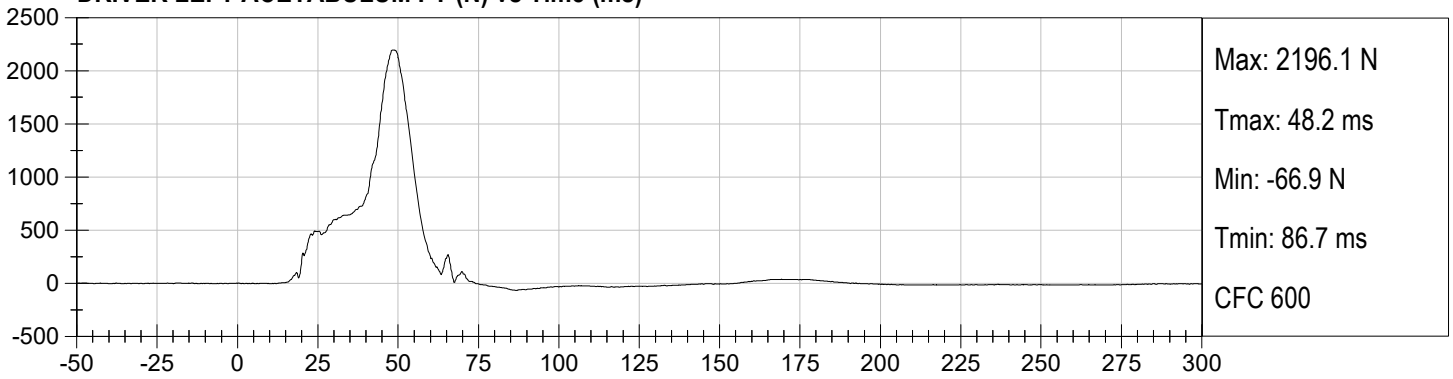
DRIVER LOWER SPINE Resultant (g) vs Time (ms)



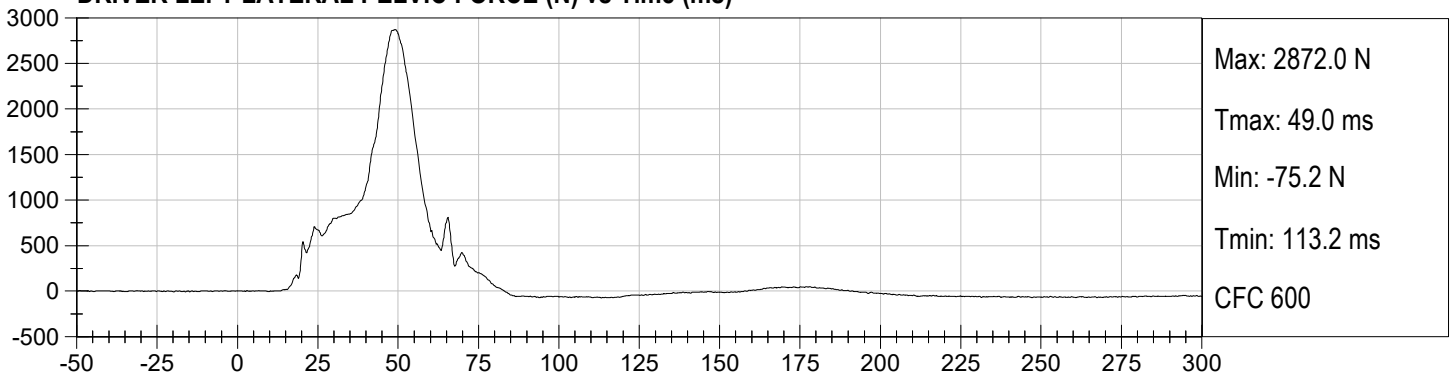
DRIVER LEFT ILIUM CREST FY (N) vs Time (ms)



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: 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:** D222581

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Peak Resultant Acceleration	G's	115 to 137	131	Pass
Peak Longitudinal Acceleration	G's	+/- 15	5.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

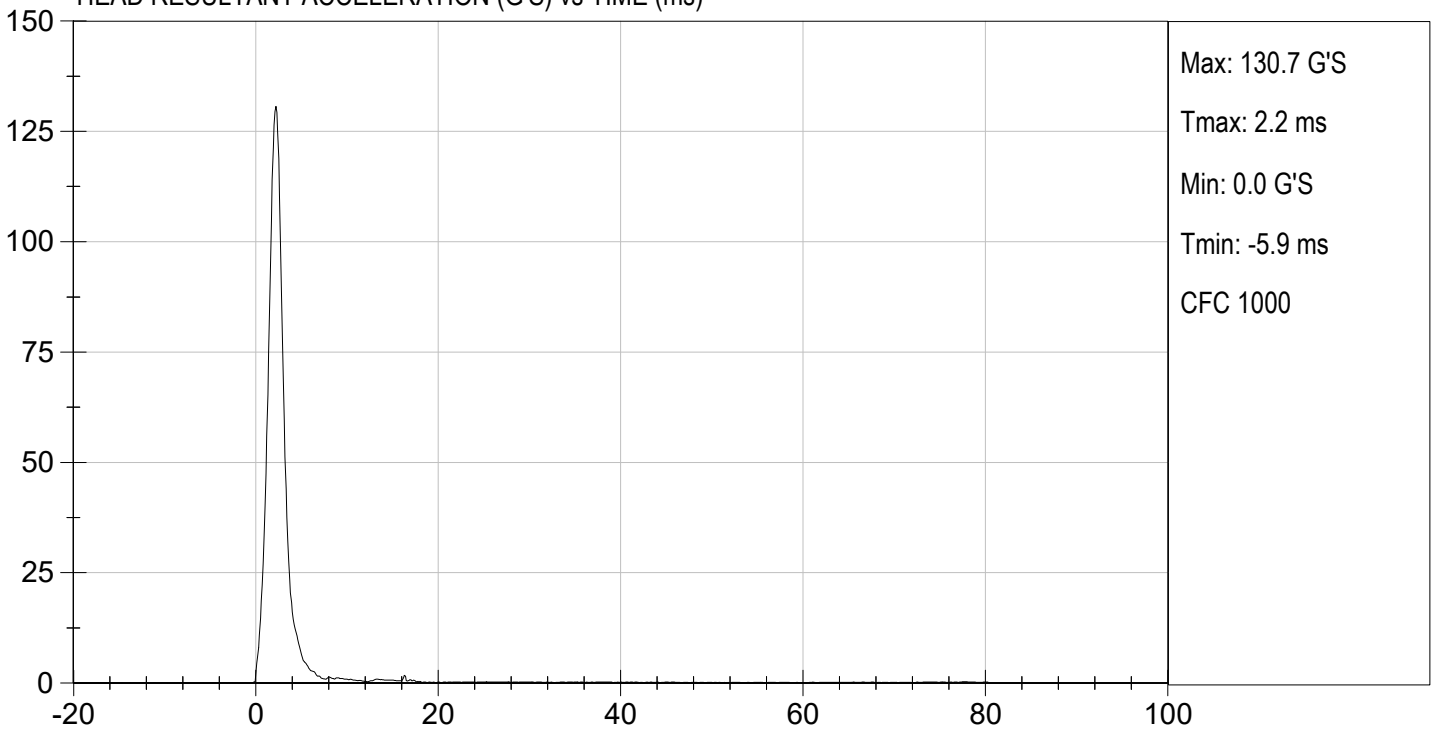
11/07/2022
Test Date

Approved By

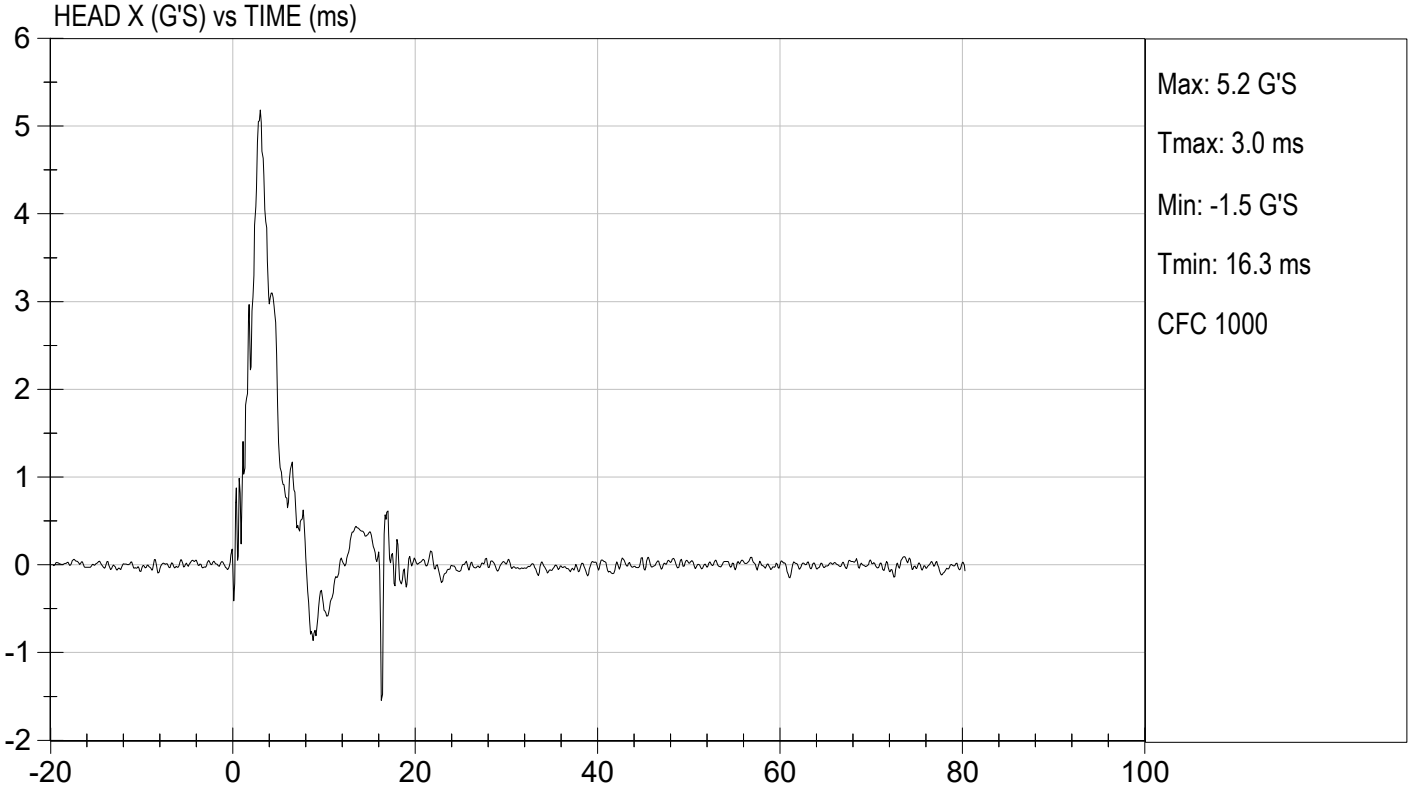
TEST DESC: HEAD DROP

TEST DATE: 11/07/2022
TEST #: D222581

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

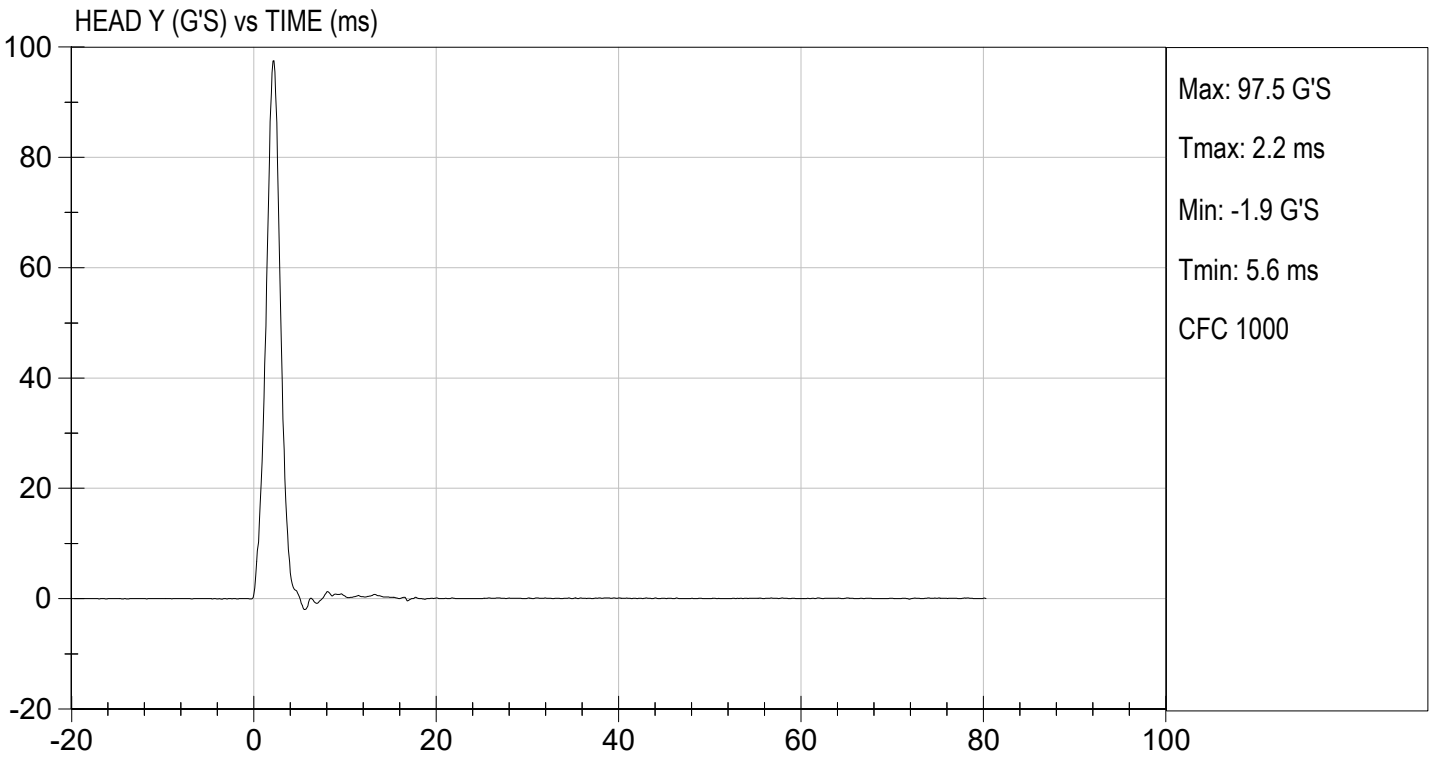


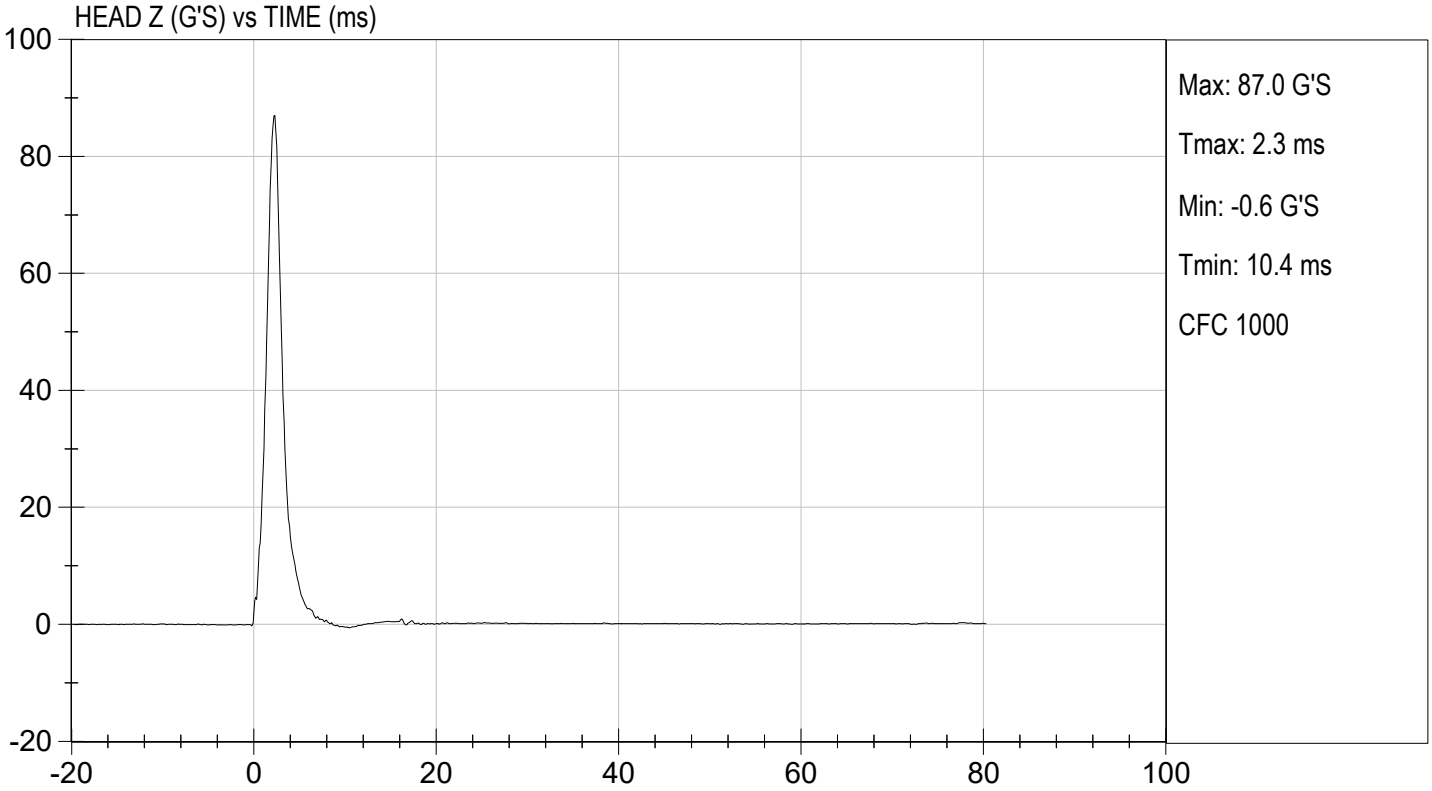
HEAD X (G'S) vs TIME (ms)



TEST DESC: HEAD DROP

TEST DATE: 11/07/2022
TEST #: D222581





MGA RESEARCH CORPORATION

LATERAL NECK PENDULUM TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296 **Test I.D:** D222582

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	22.0	Pass
Humidity		%	10 to 70	48	Pass
Impact Velocity		m/s	5.51 to 5.63	5.52	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.43	Pass
	15 ms	m/s	3.30 to 4.10	3.73	Pass
	20 ms	m/s	4.40 to 5.40	5.23	Pass
	25 ms	m/s	5.40 to 6.10	5.68	Pass
	25-100 ms	m/s	5.50 to 6.20	5.70	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	-38	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	119	Pass
			Overall Test Results		Pass

Laboratory Technician

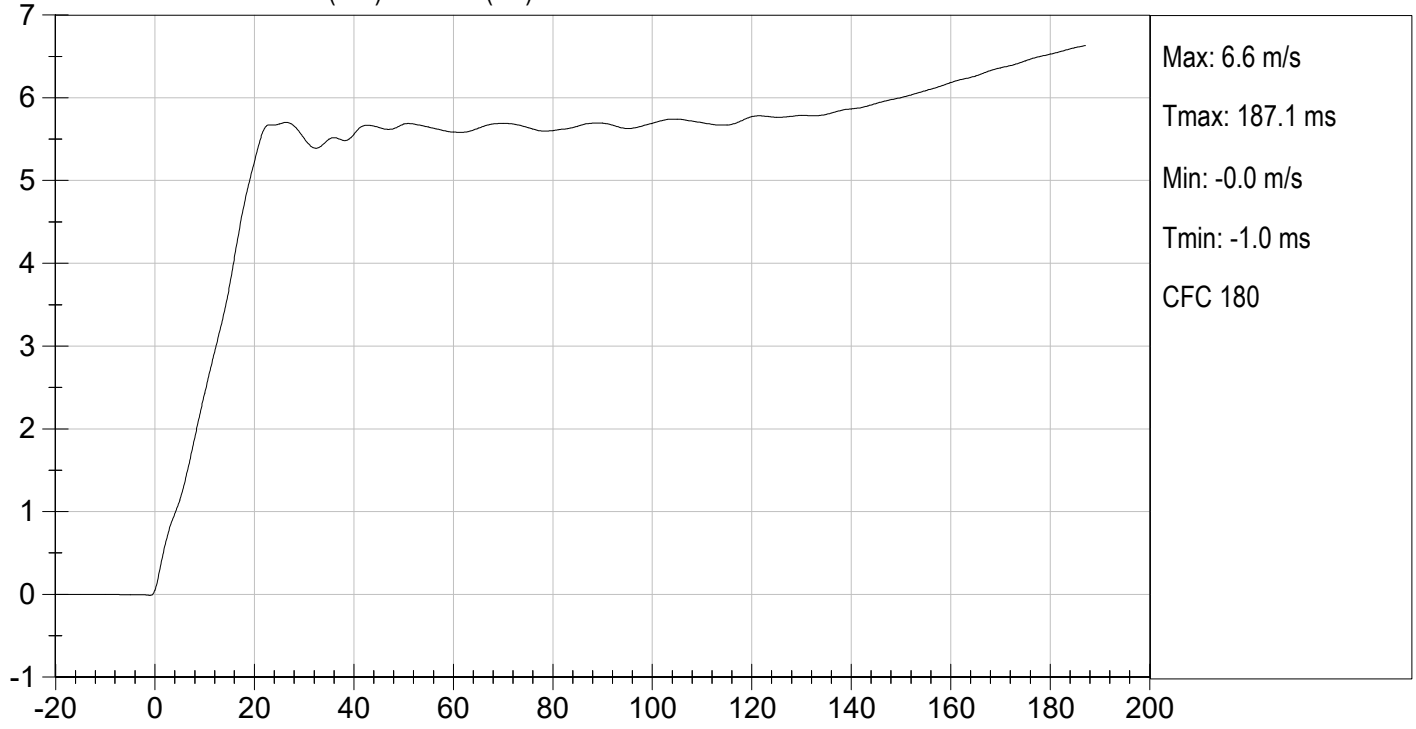
11/04/2022
Test Date

Approved By

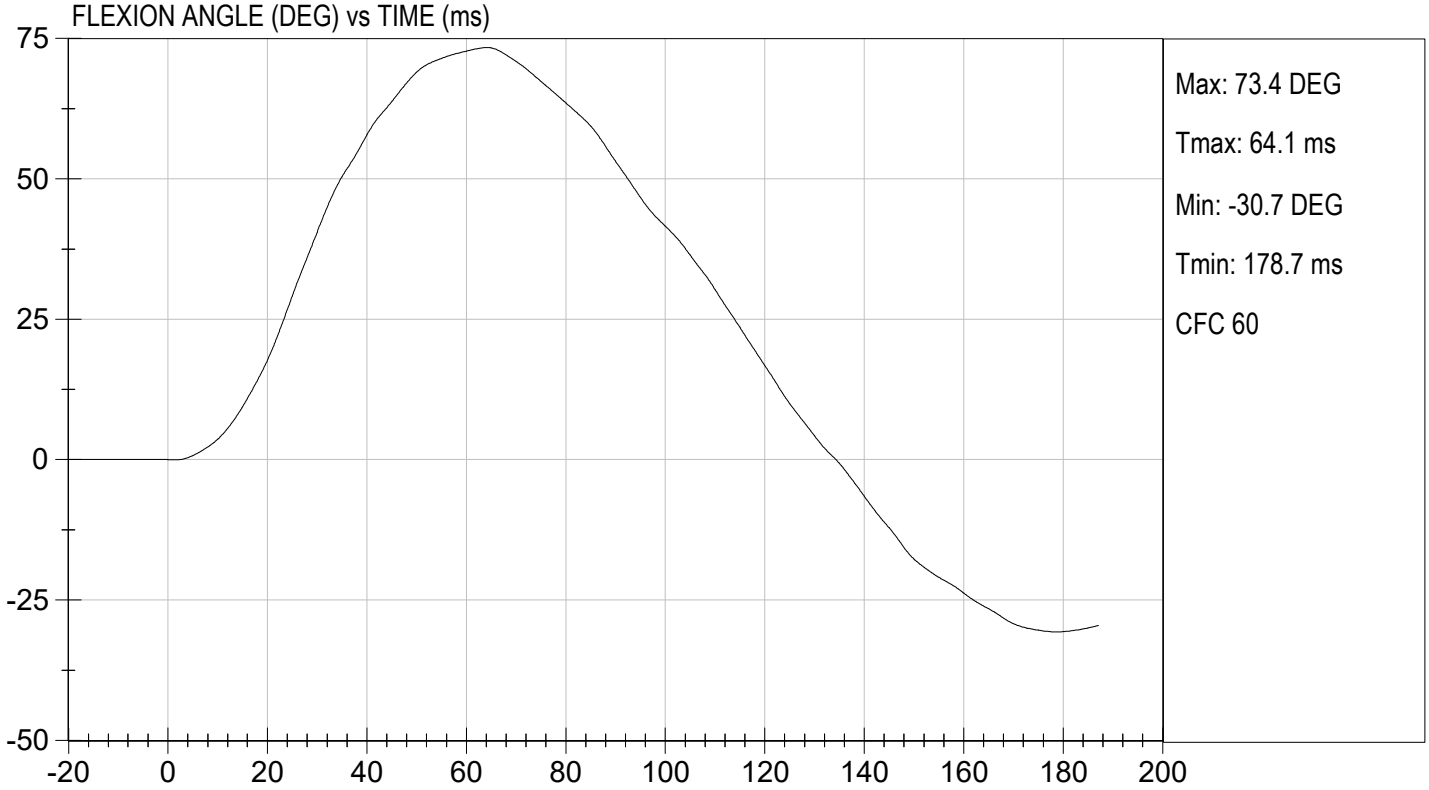
TEST DESC: NECK BENDING
VELOCITY: 18.12 ft/s, 5.52 m/s

TEST DATE: 11/04/2022
TEST #: D222582

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

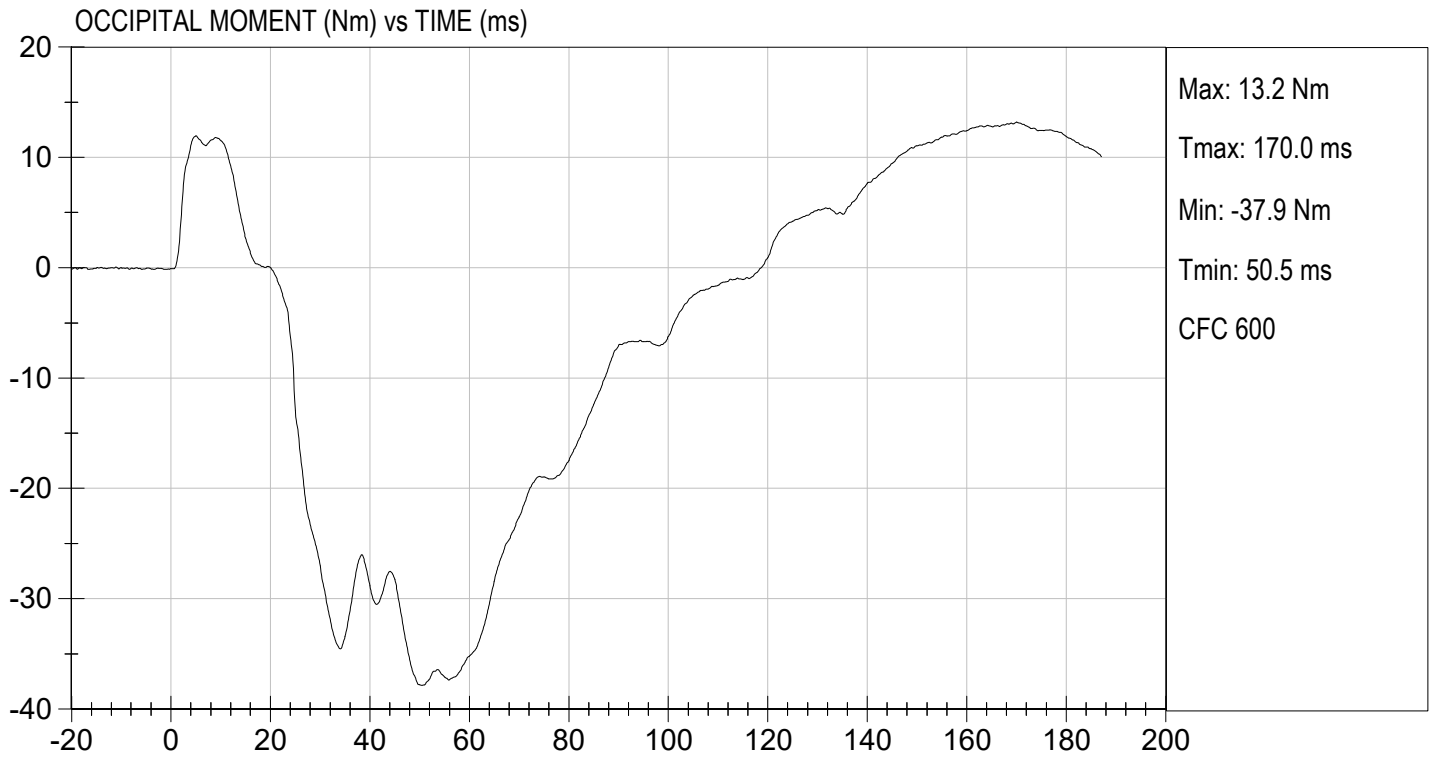


FLEXION ANGLE (DEG) vs TIME (ms)



TEST DESC: NECK BENDING
VELOCITY: 18.12 ft/s, 5.52 m/s

TEST DATE: 11/04/2022
TEST #: D222582



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D222583

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	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	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
		Overall Test Results		Pass

Jonah Pulokas

Laboratory Technician

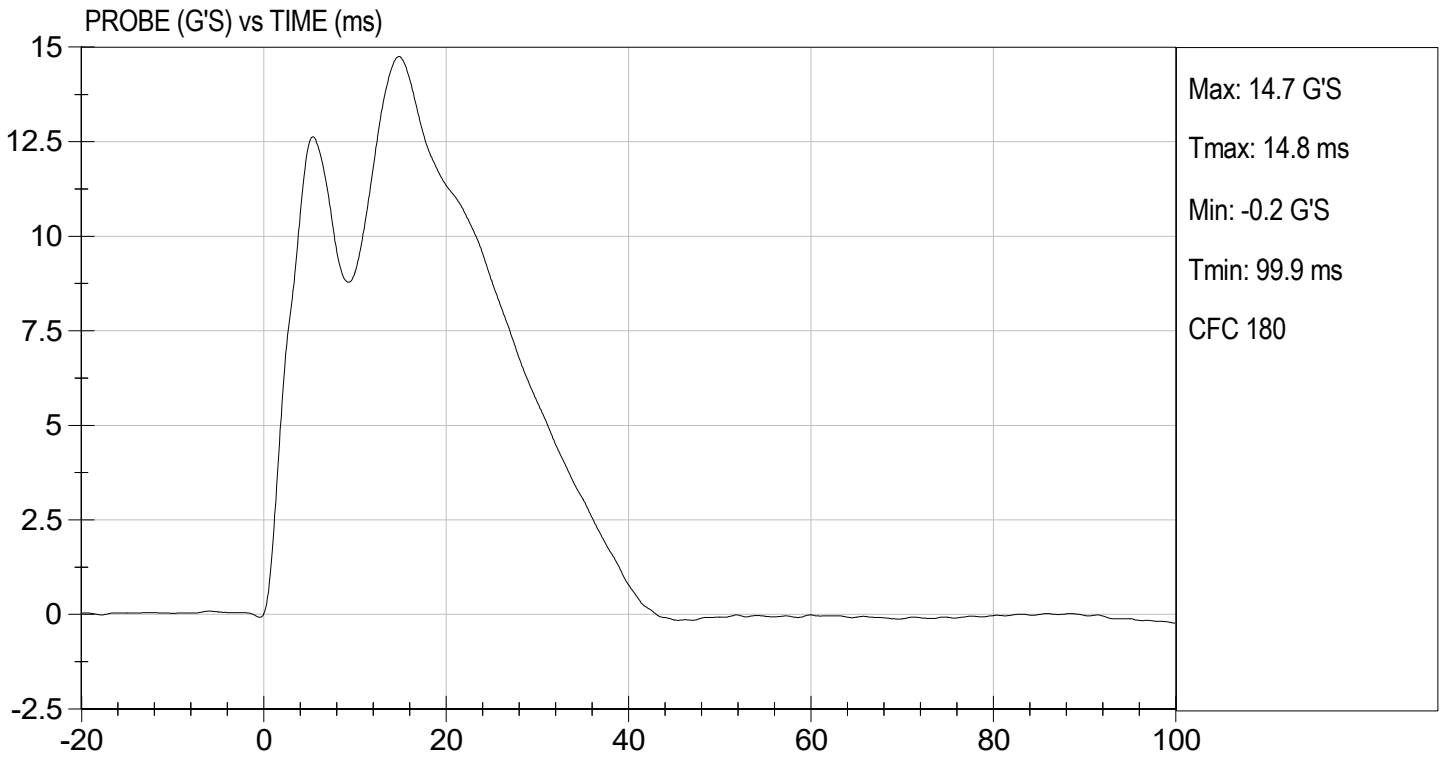
11/03/2022

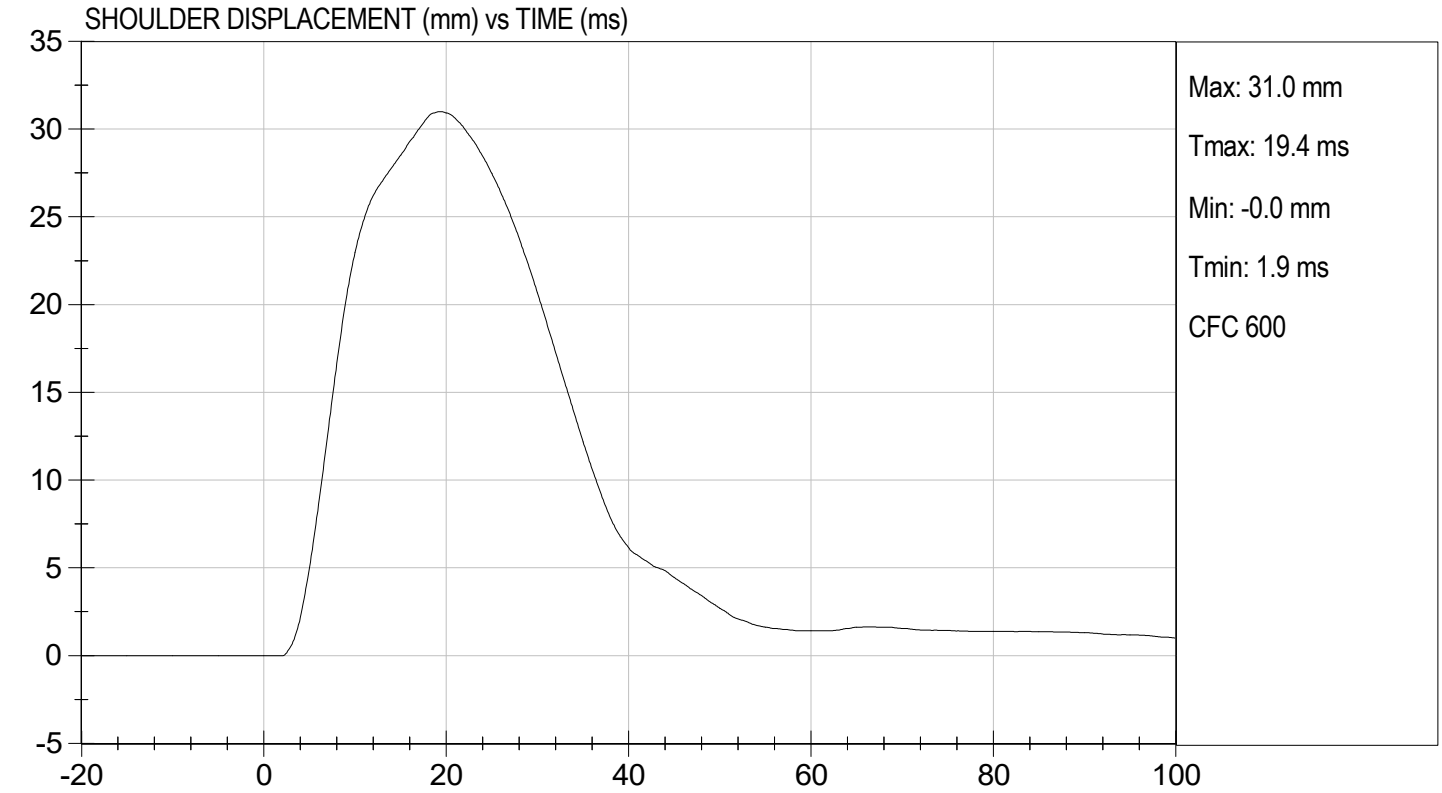
Test Date

Approved By

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

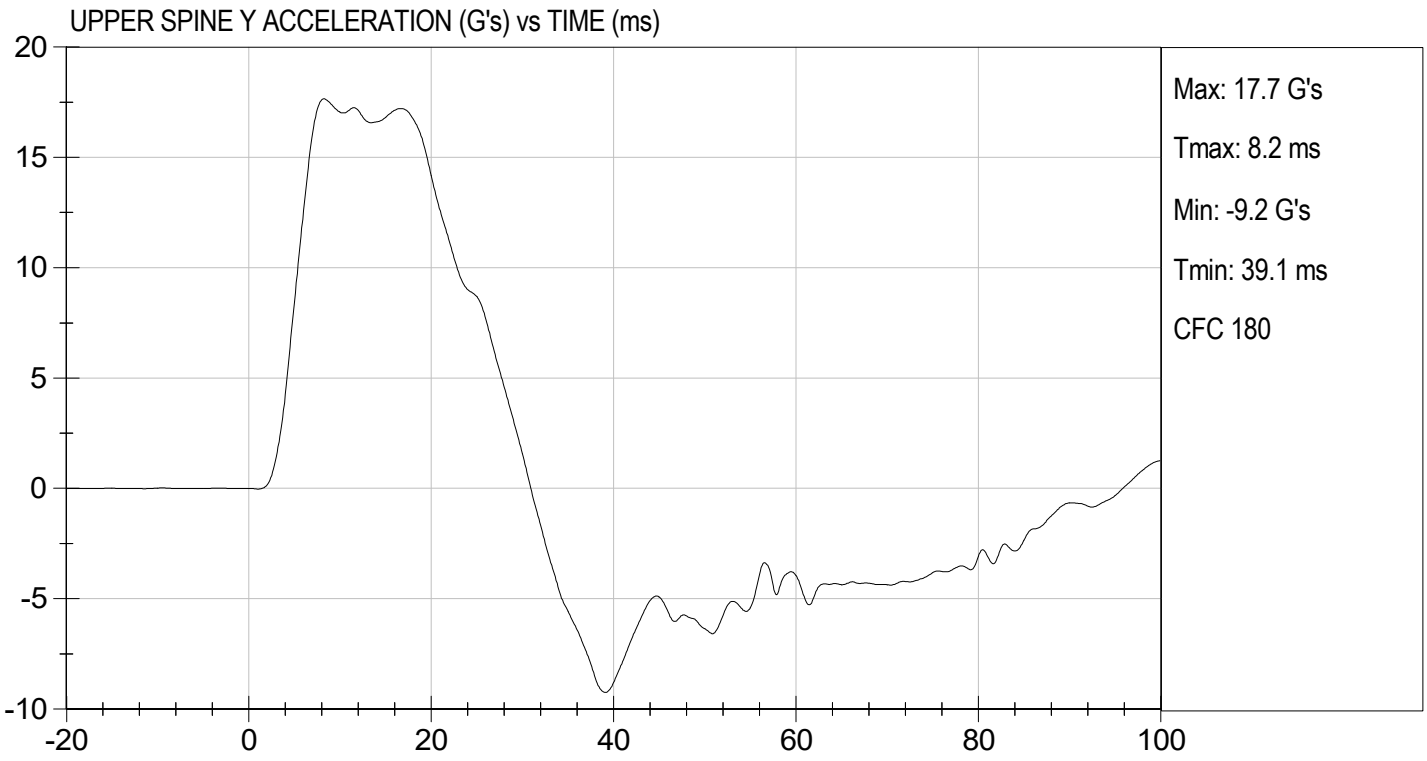
TEST DATE: 11/03/2022
TEST #: D222583





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

TEST DATE: 11/03/2022
TEST #: D222583



MGA RESEARCH CORPORATION

THORAX (WITH ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D222584

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	33	Pass
Lower Rib Displacement	mm	32 to 38	36	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	30	Pass
		Overall Test Results		Pass

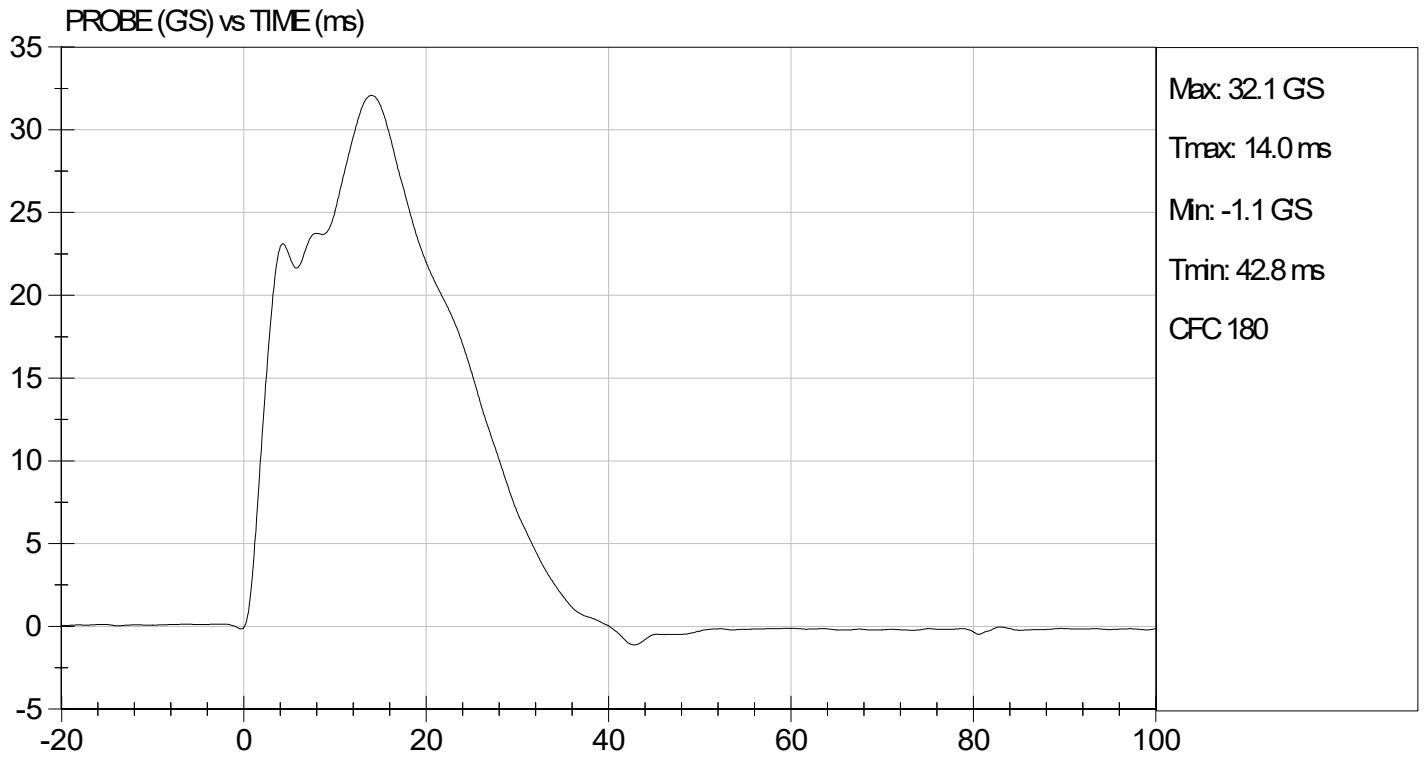
Laboratory Technician

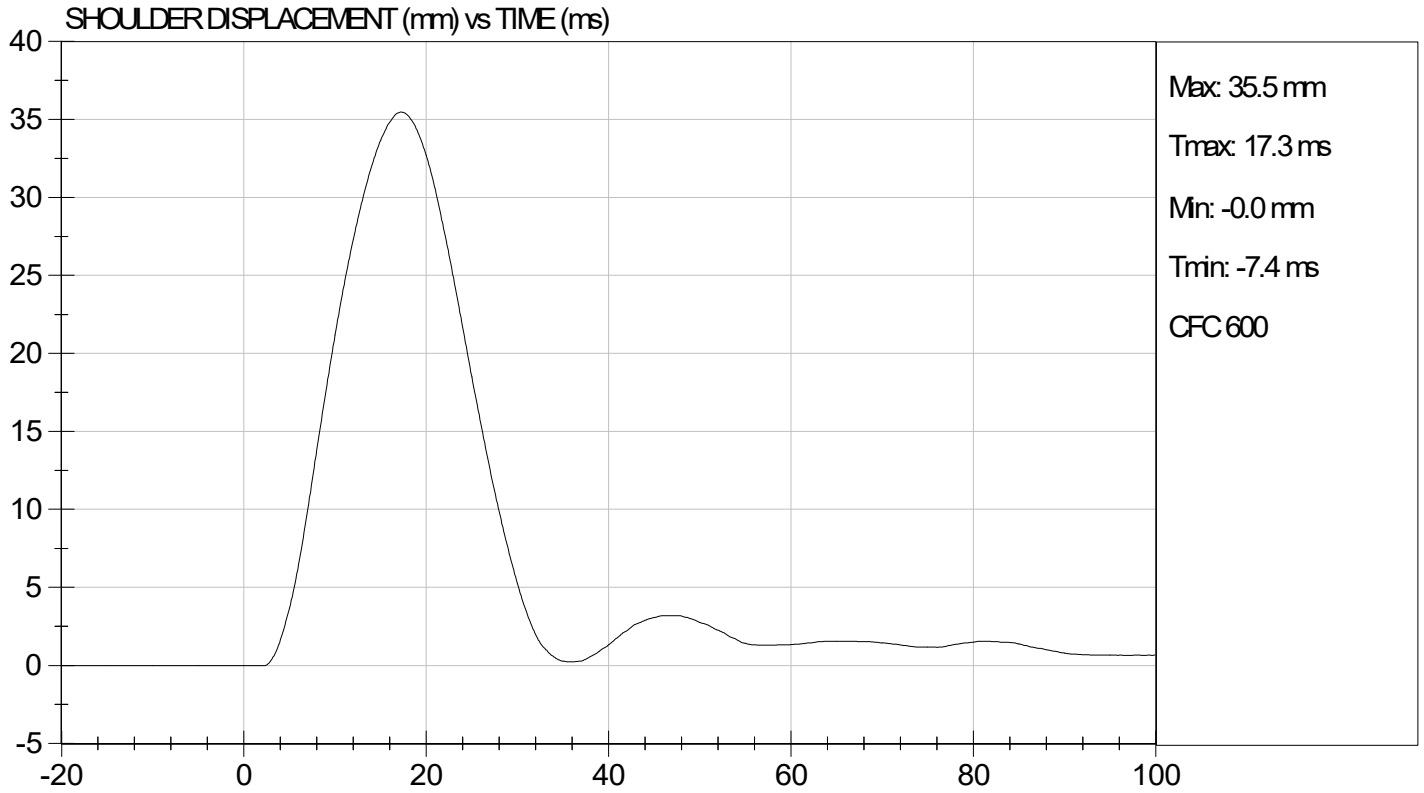
11/04/2022
Test Date

Approved By

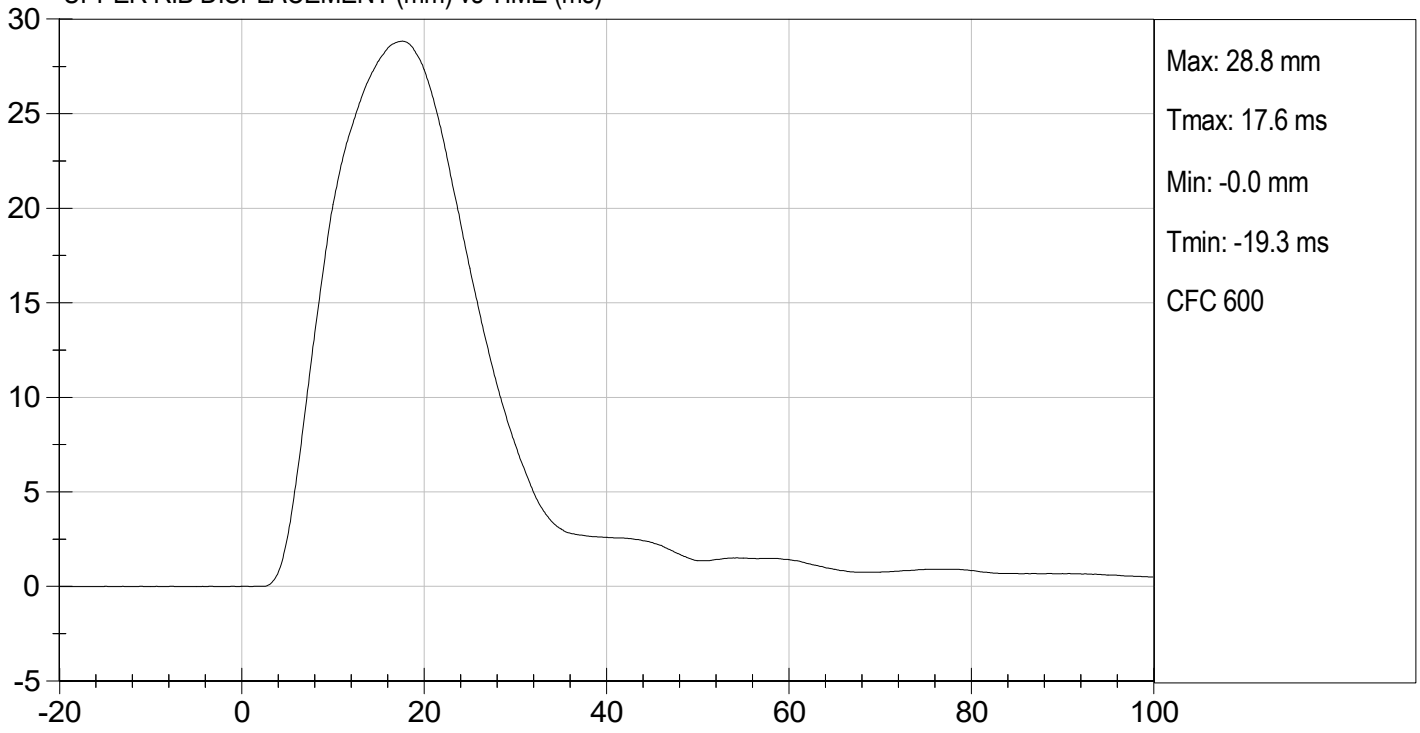
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/04/2022
TEST #: D222584

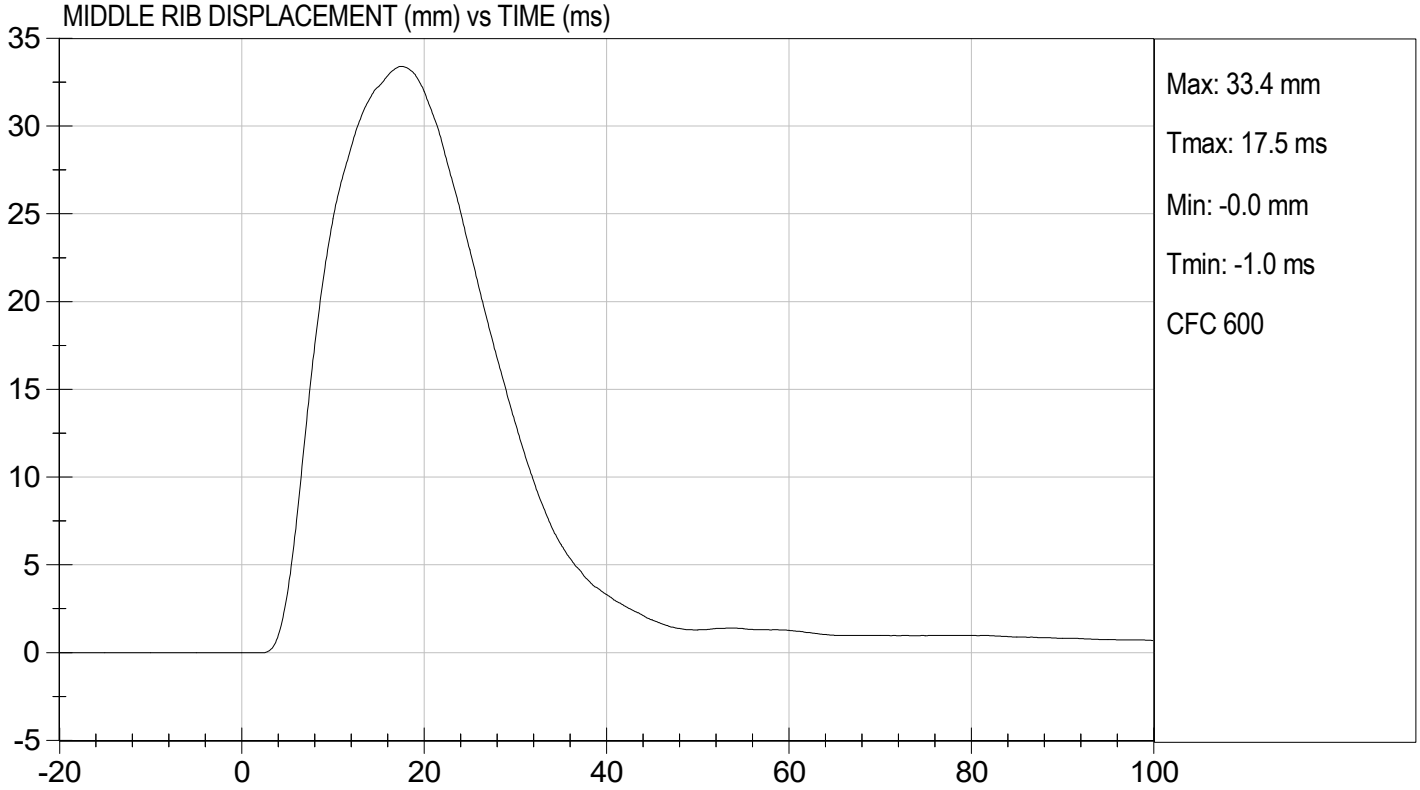




UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



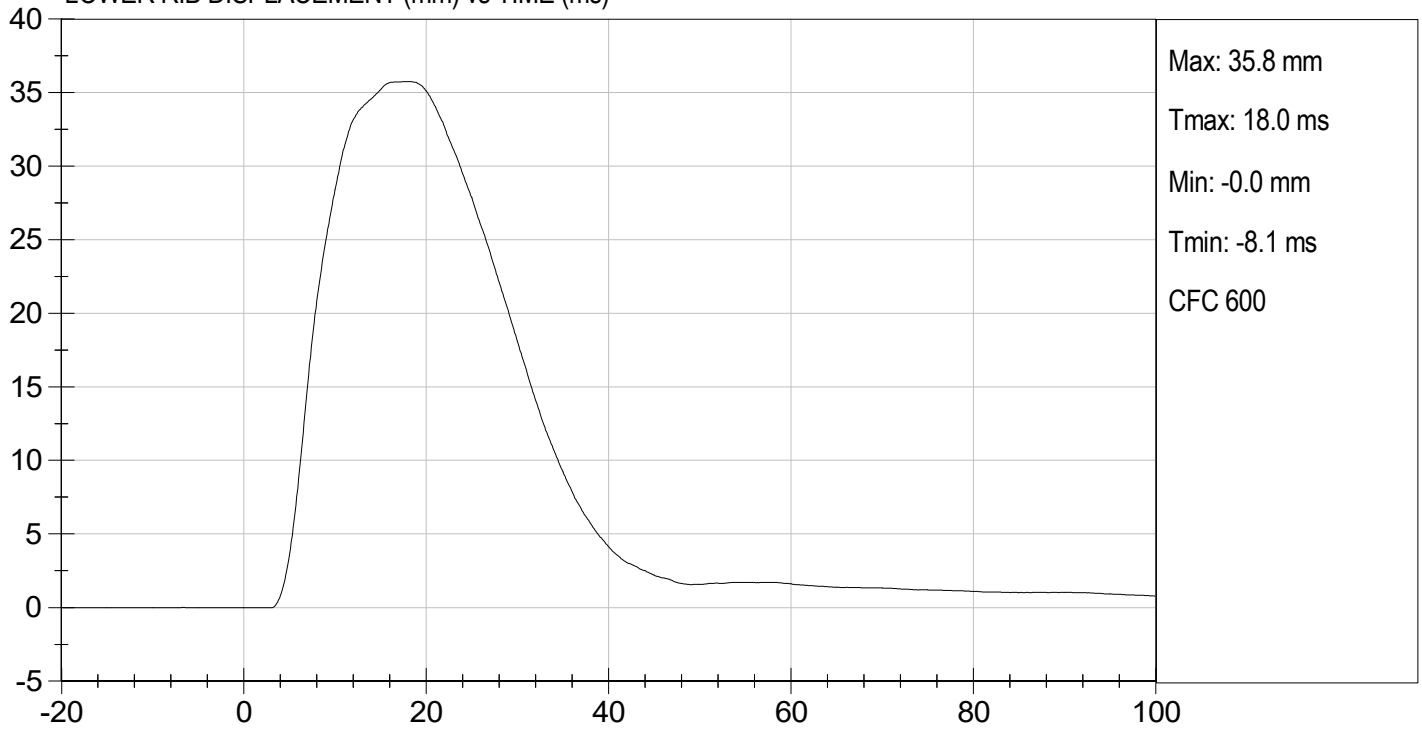
MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



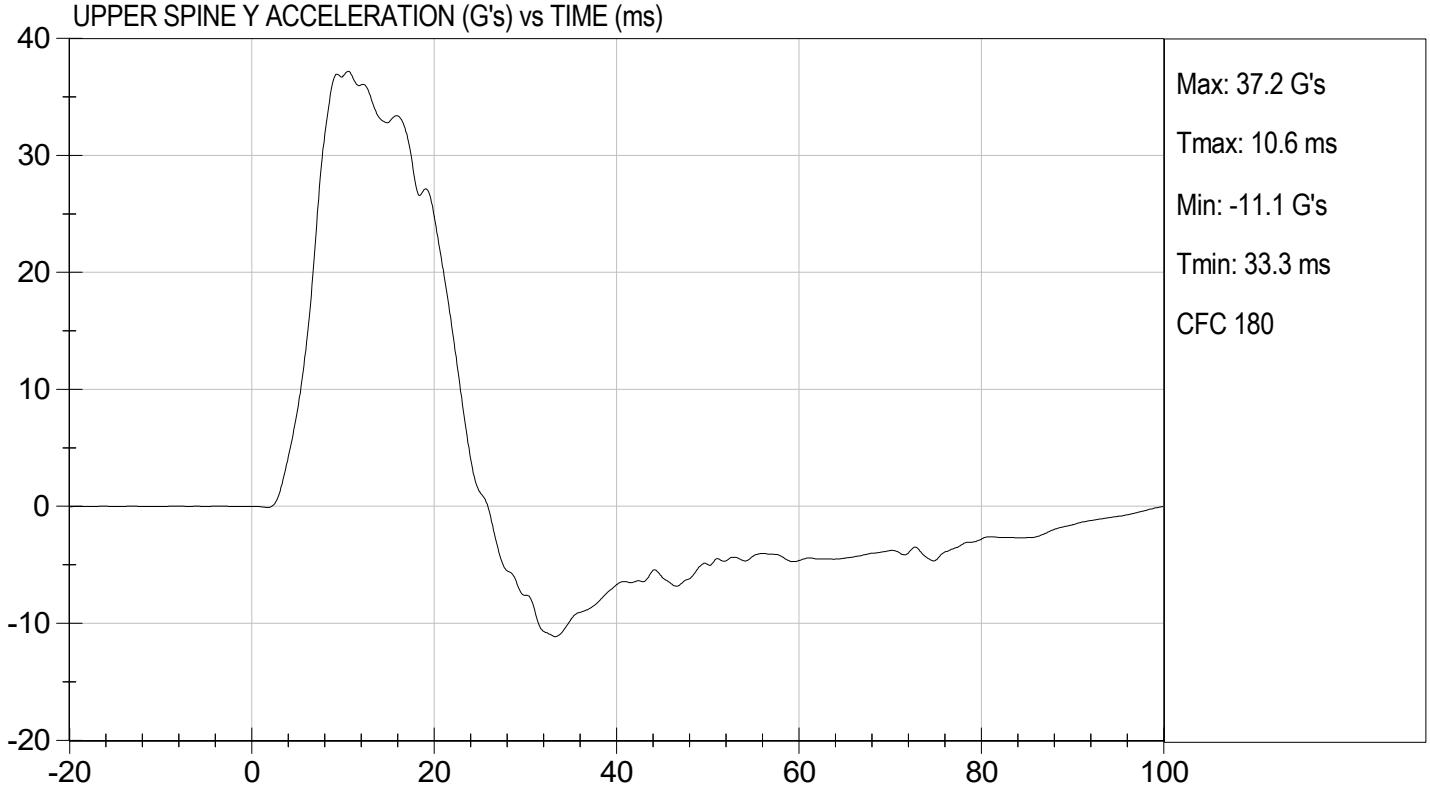
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/04/2022
TEST #: D222584

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



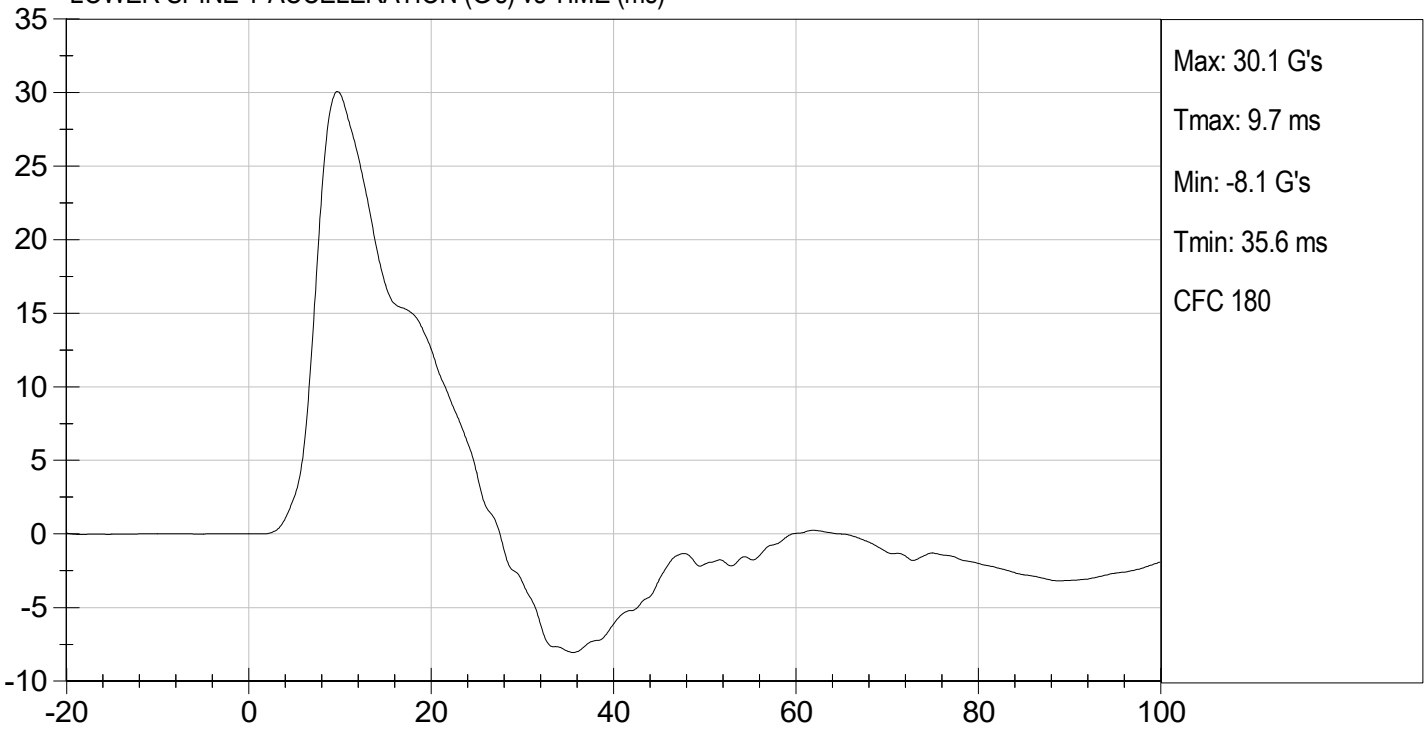
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/04/2022
TEST #: D222584

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



MGA RESEARCH CORPORATION

THORAX (WITHOUT ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D222585

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	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	43	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	16	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
		Overall Test Results		Pass

Laboratory Technician

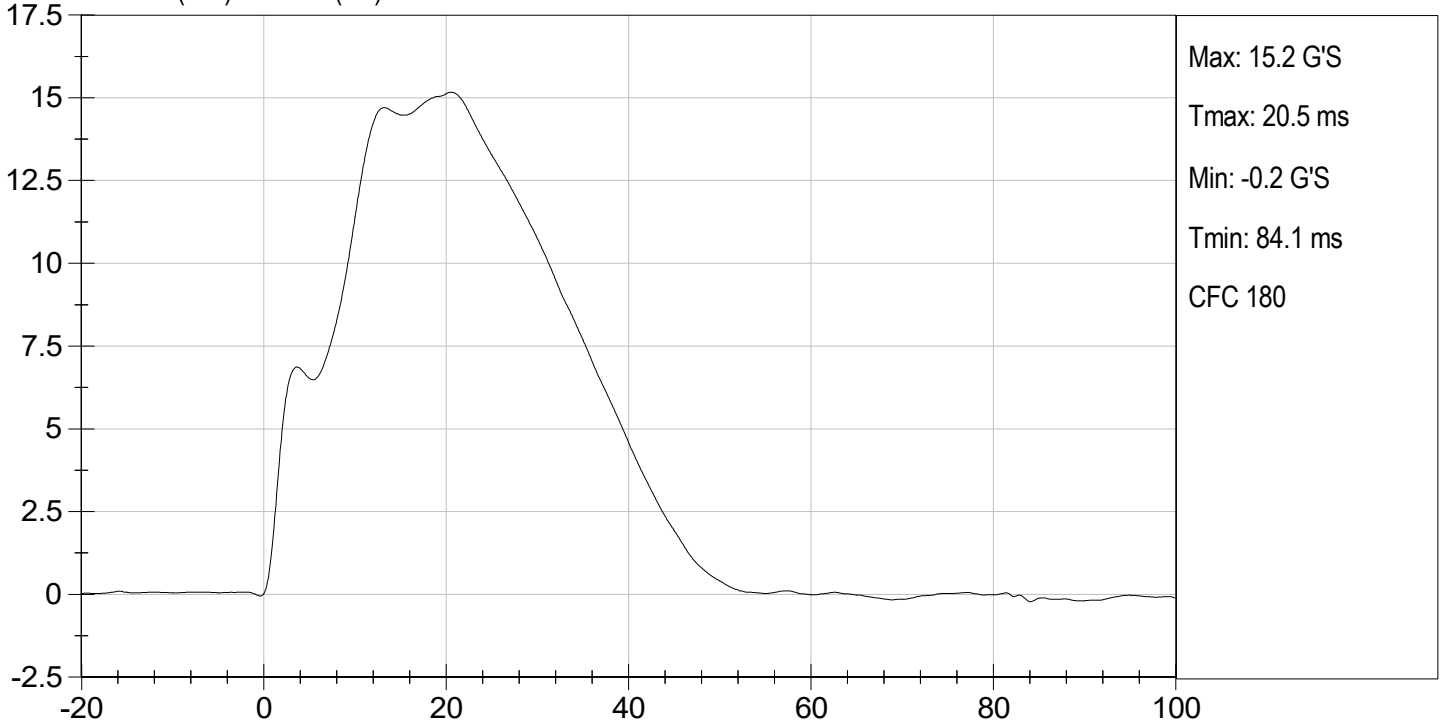
11/03/2022
Test Date

Approved By

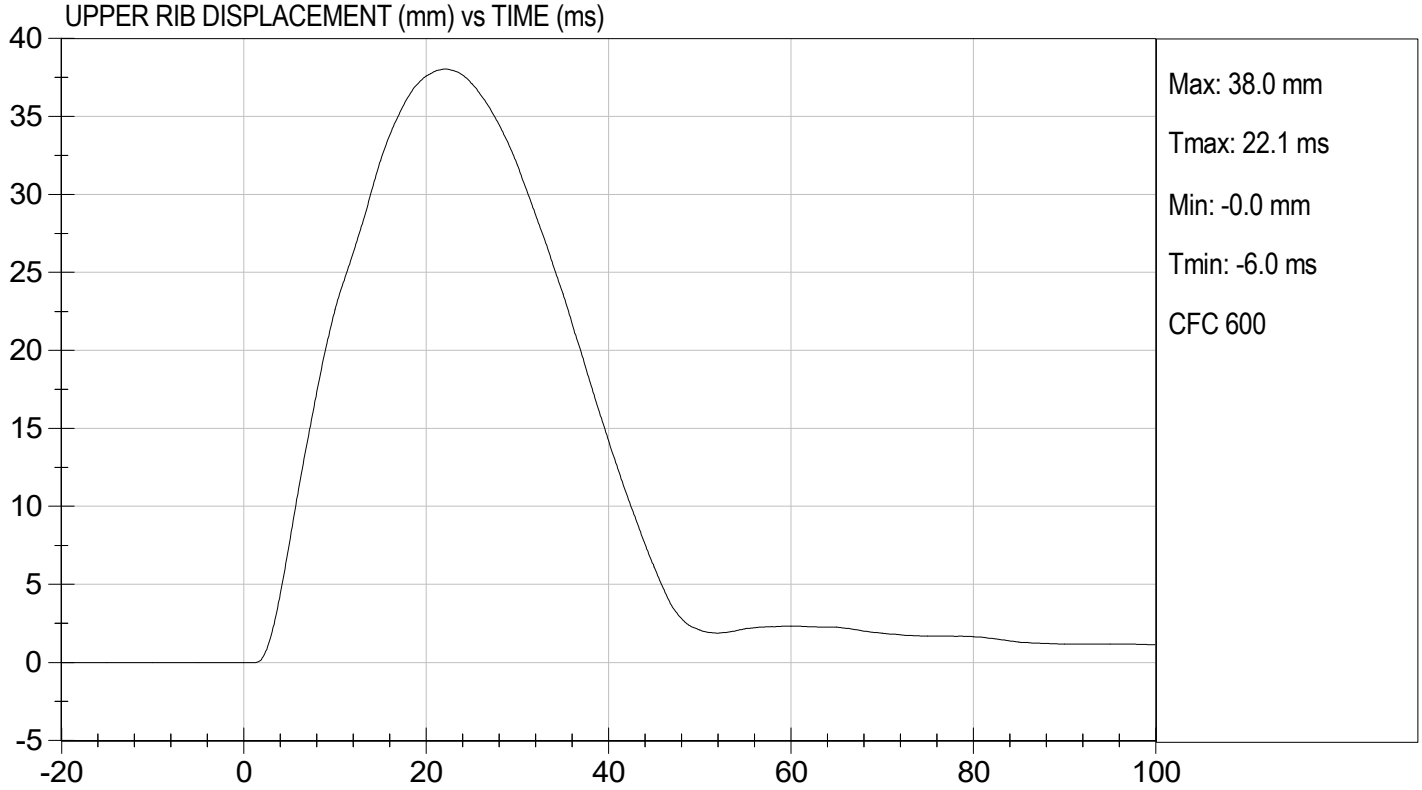
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 11/03/2022
TEST #: D222585

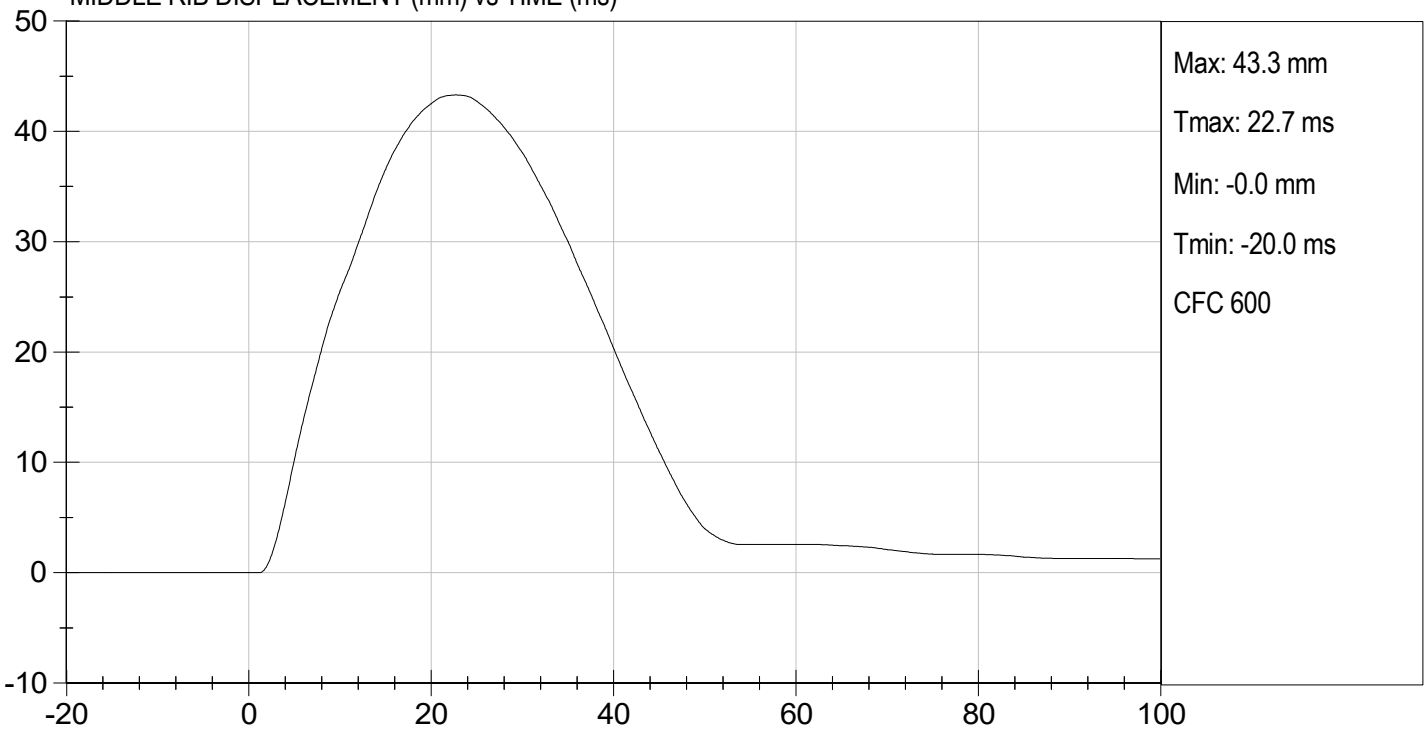
PROBE (G'S) vs TIME (ms)



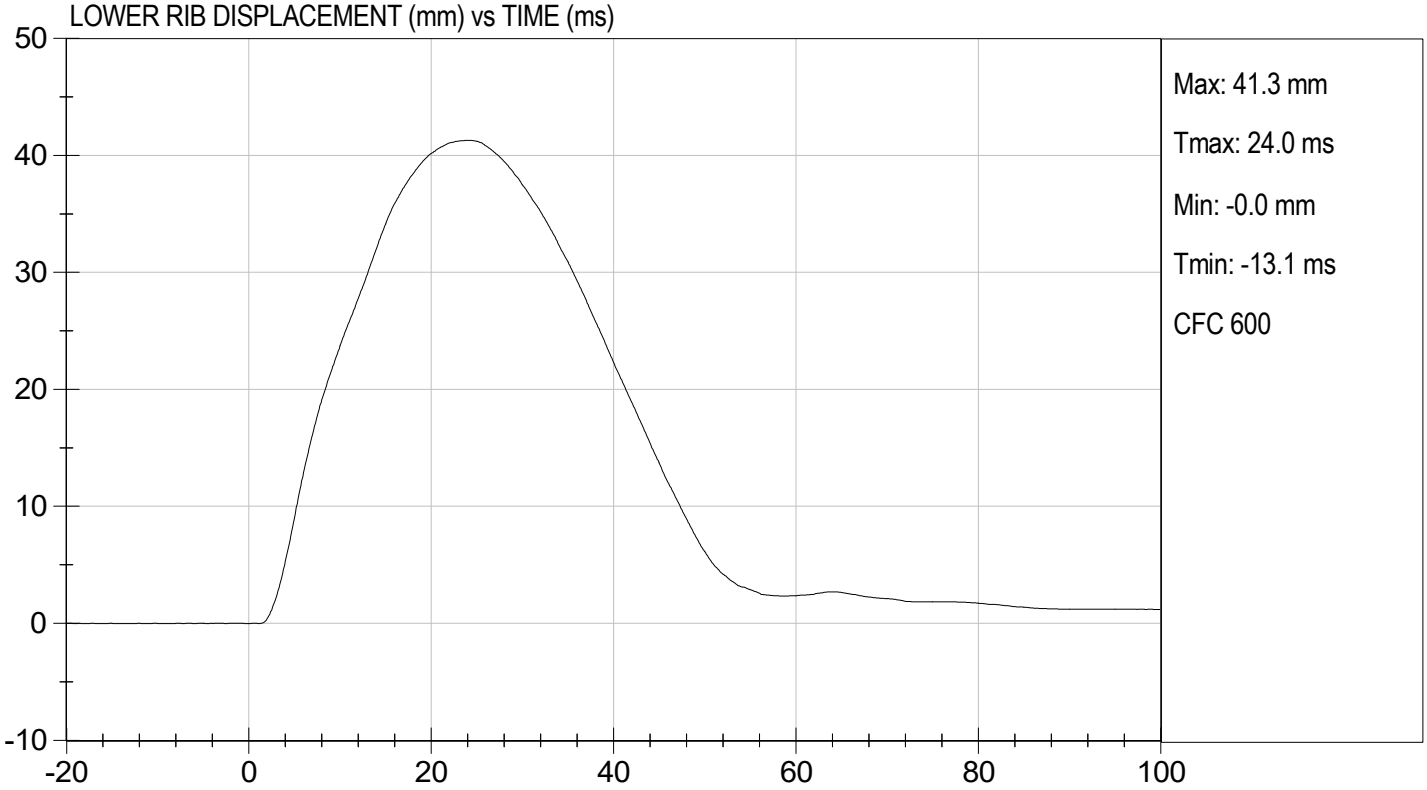
UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



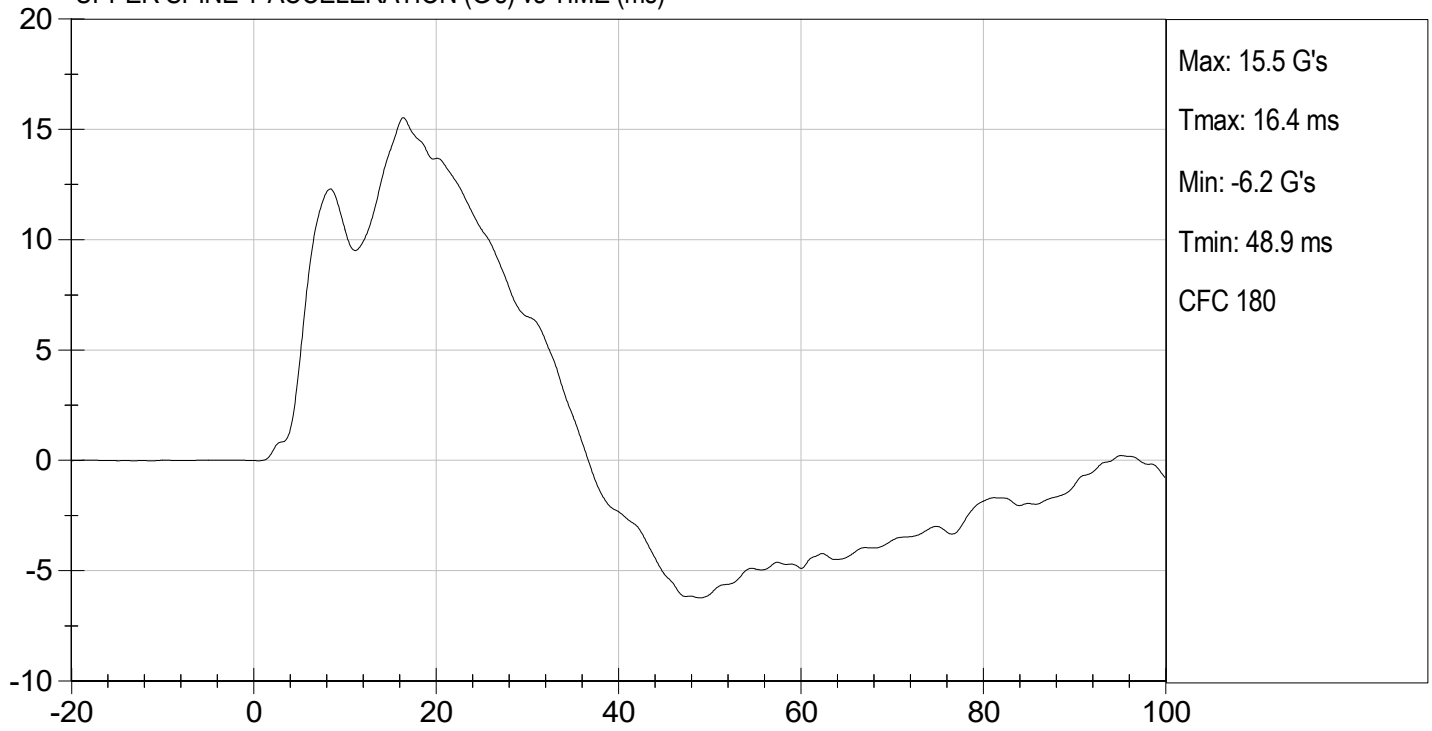
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



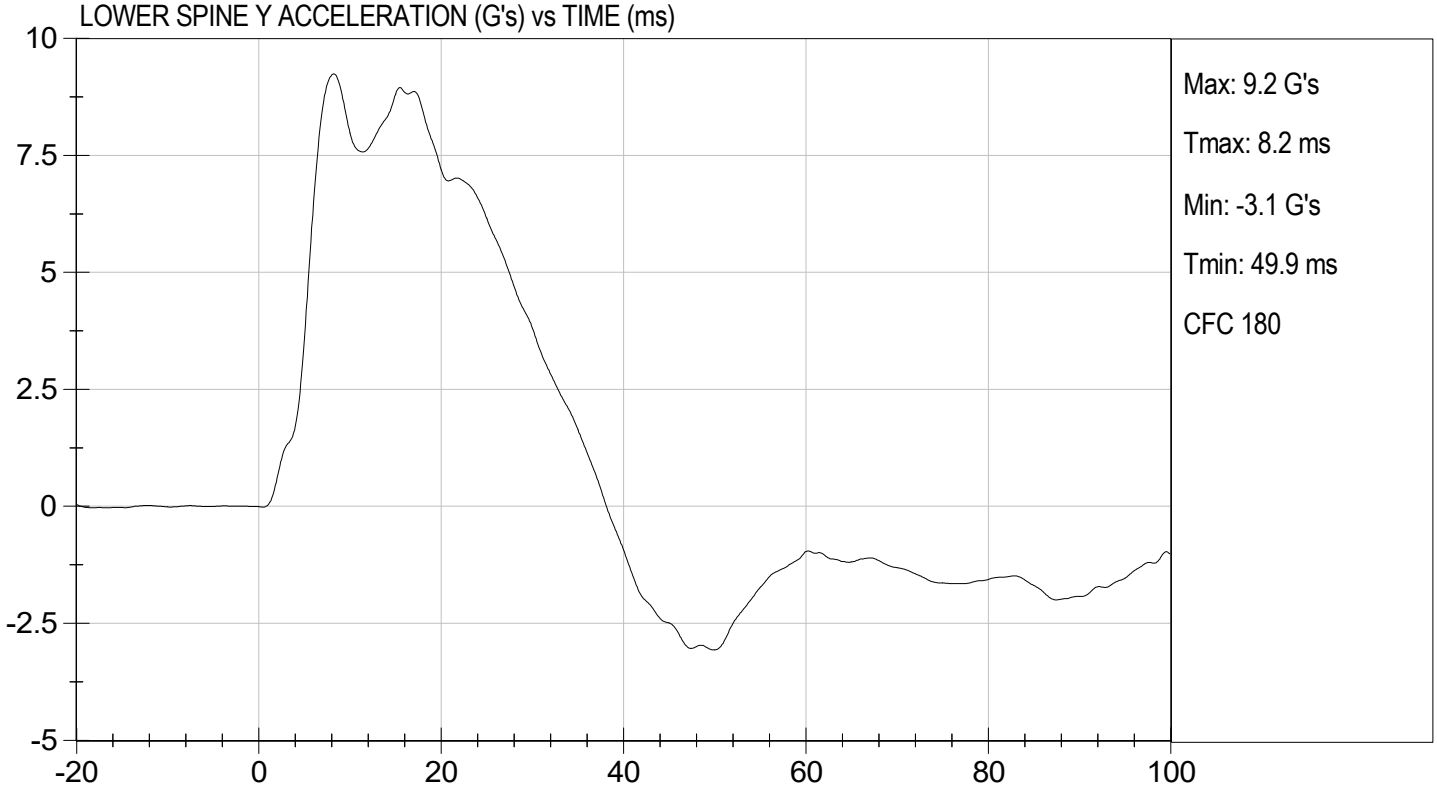
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 11/03/2022
TEST #: D222585

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:** D222586

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	39	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
		Overall Test Results		Pass

Laboratory Technician

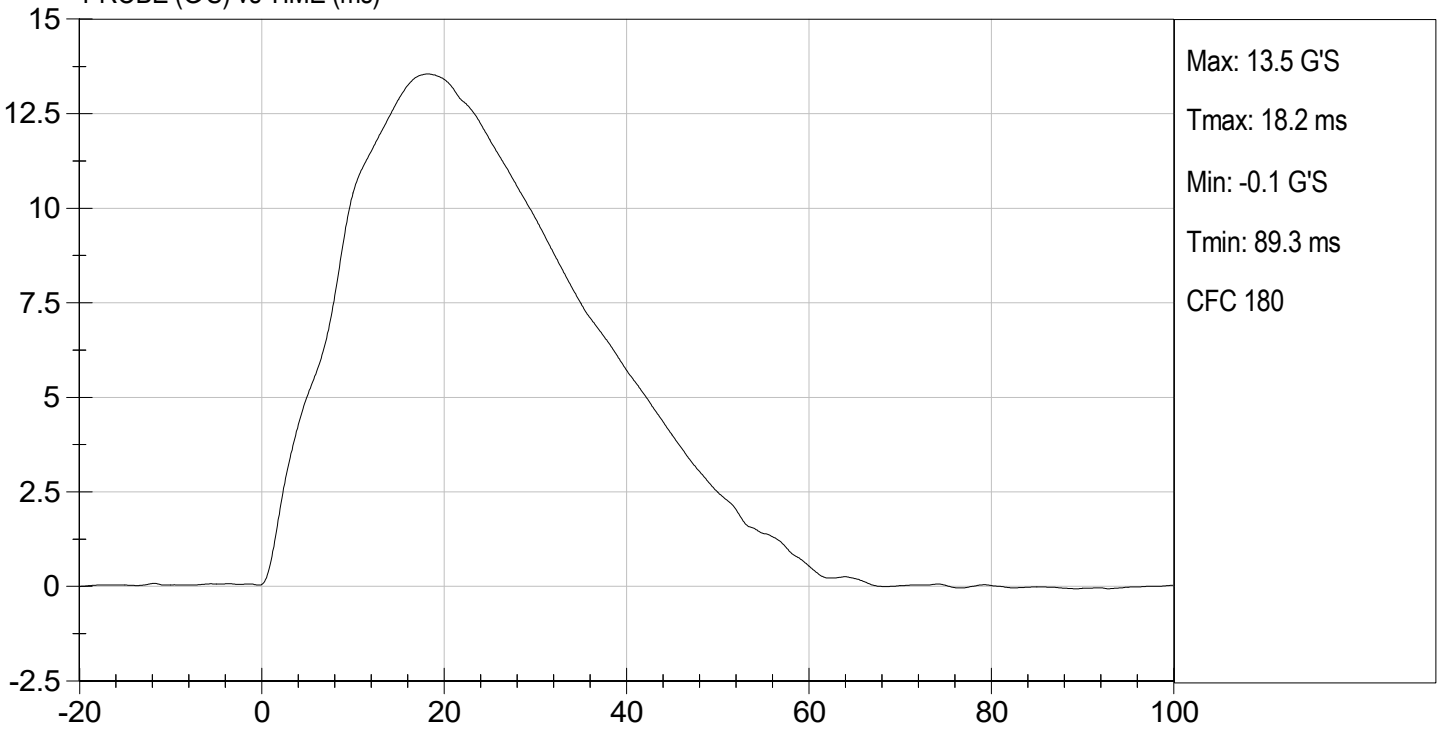
11/04/2022
Test Date

Approved By

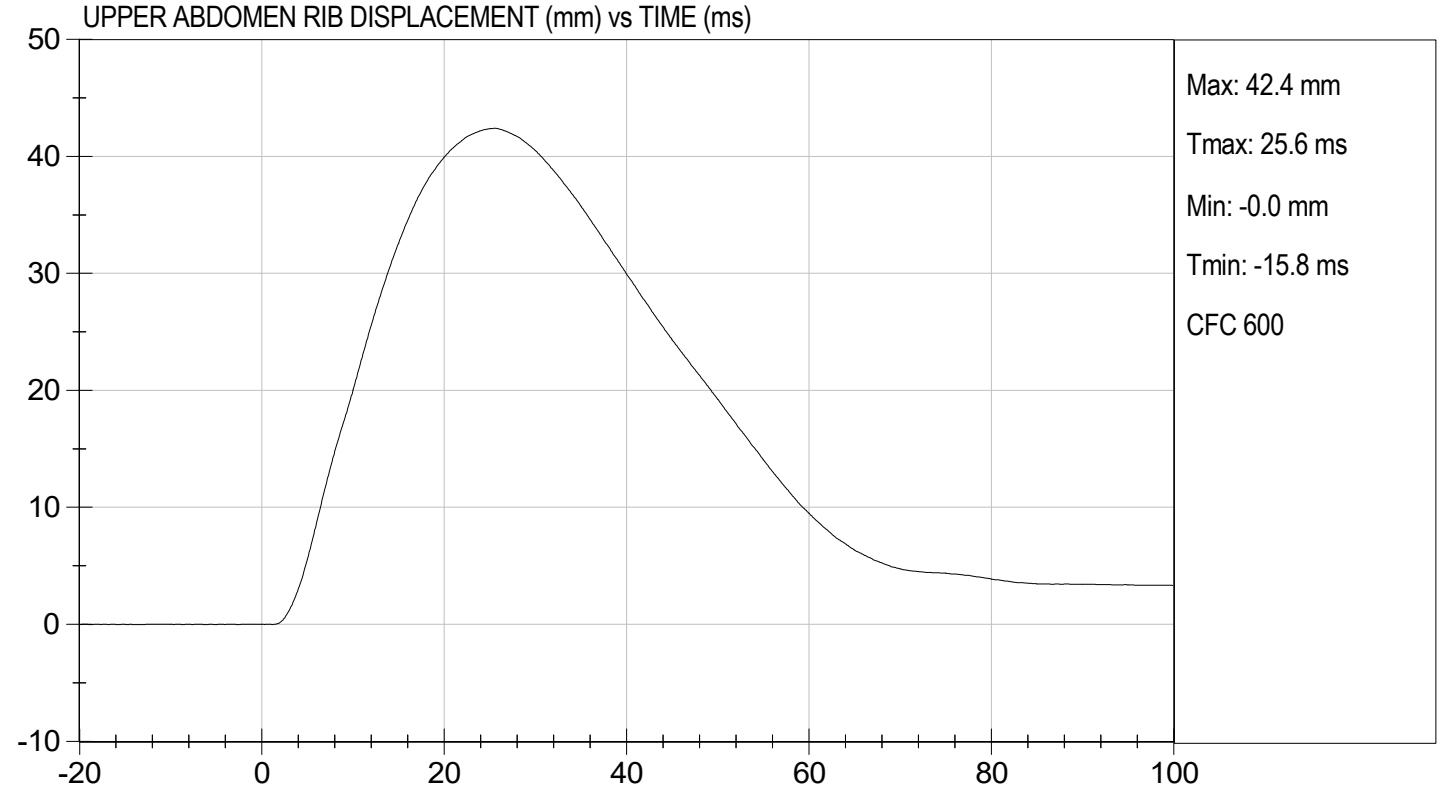
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 11/04/2022
TEST #: D222586

PROBE (G'S) vs TIME (ms)



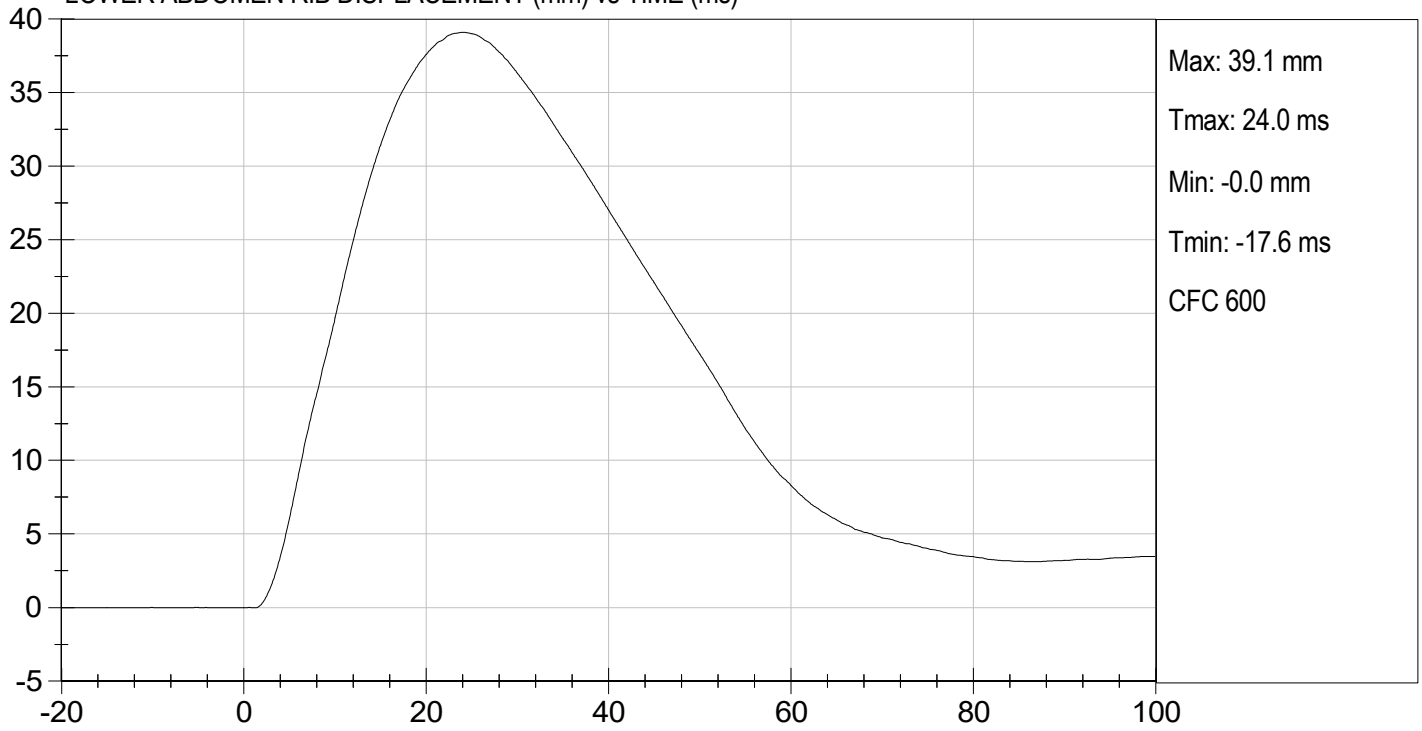
UPPER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



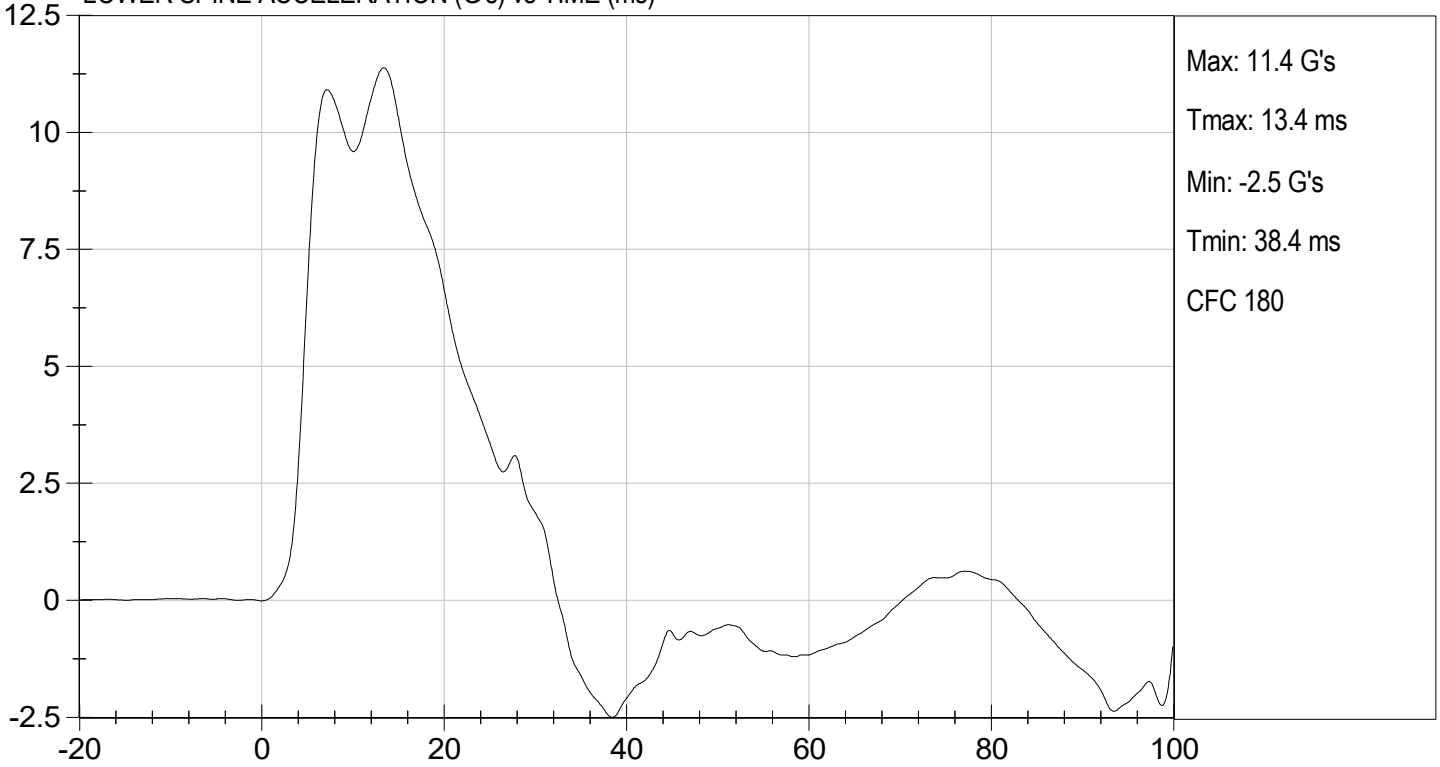
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 11/04/2022
TEST #: D222586

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:** D222587

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	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	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	42	Pass
Peak Acetabulum Force	N	3600 to 4300	3,718	Pass
		Overall Test Results		Pass

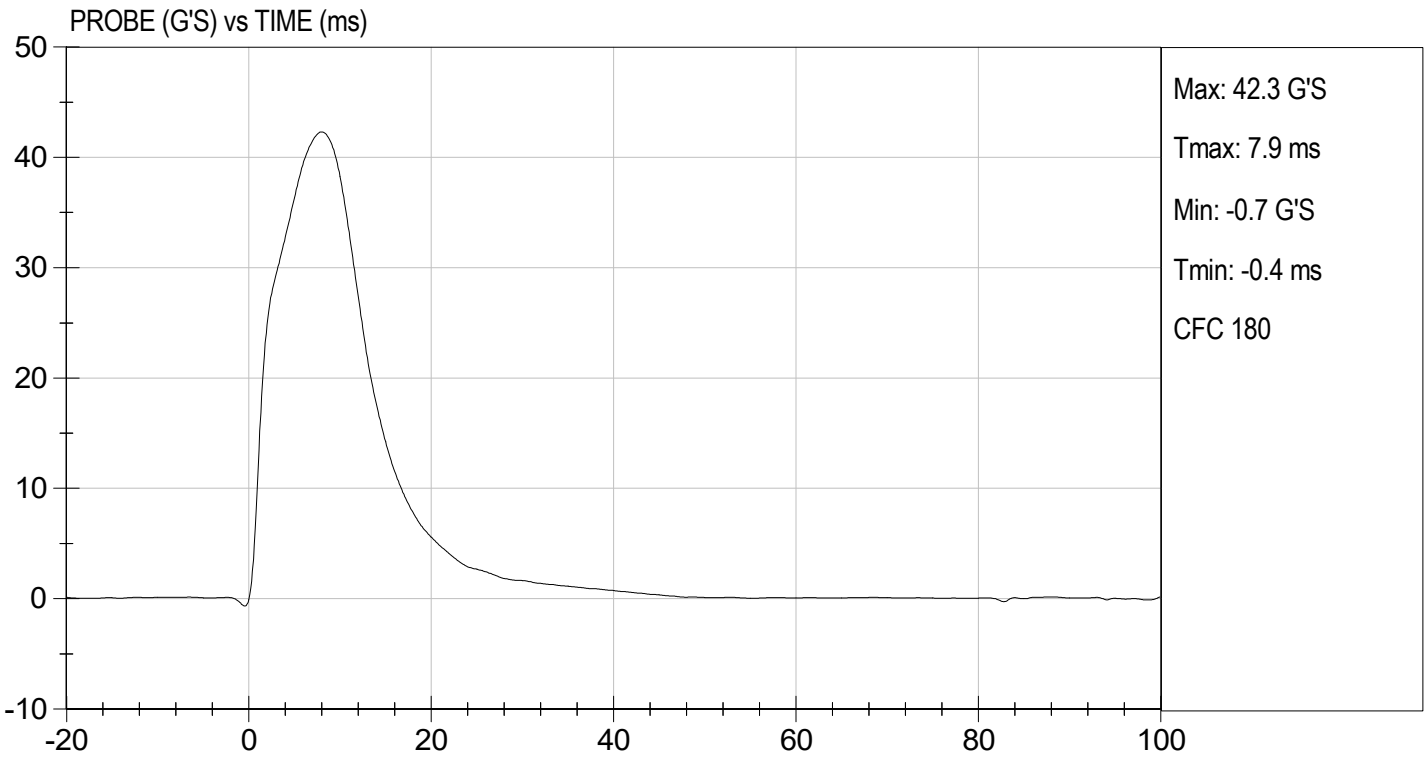
Laboratory Technician

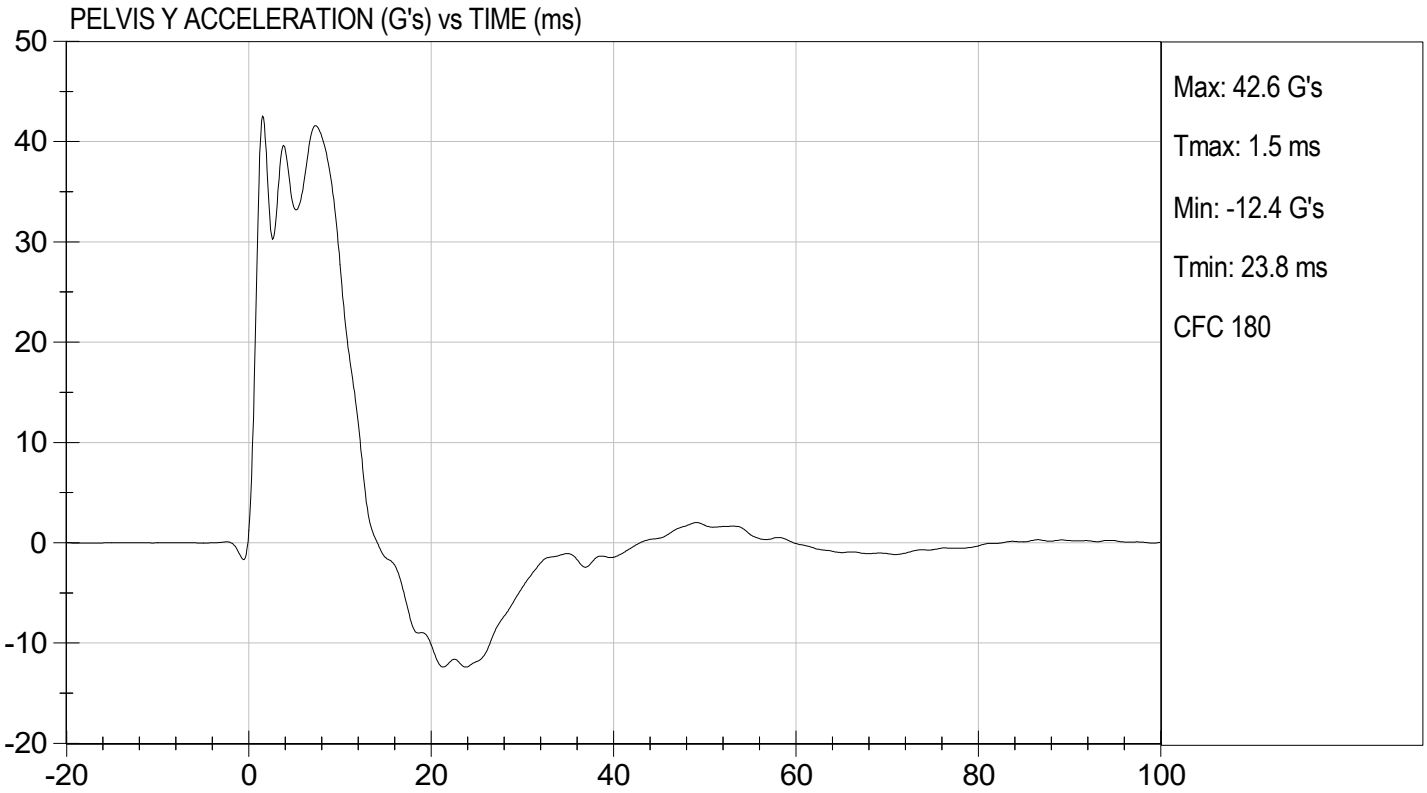
11/04/2022
Test Date

Approved By

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

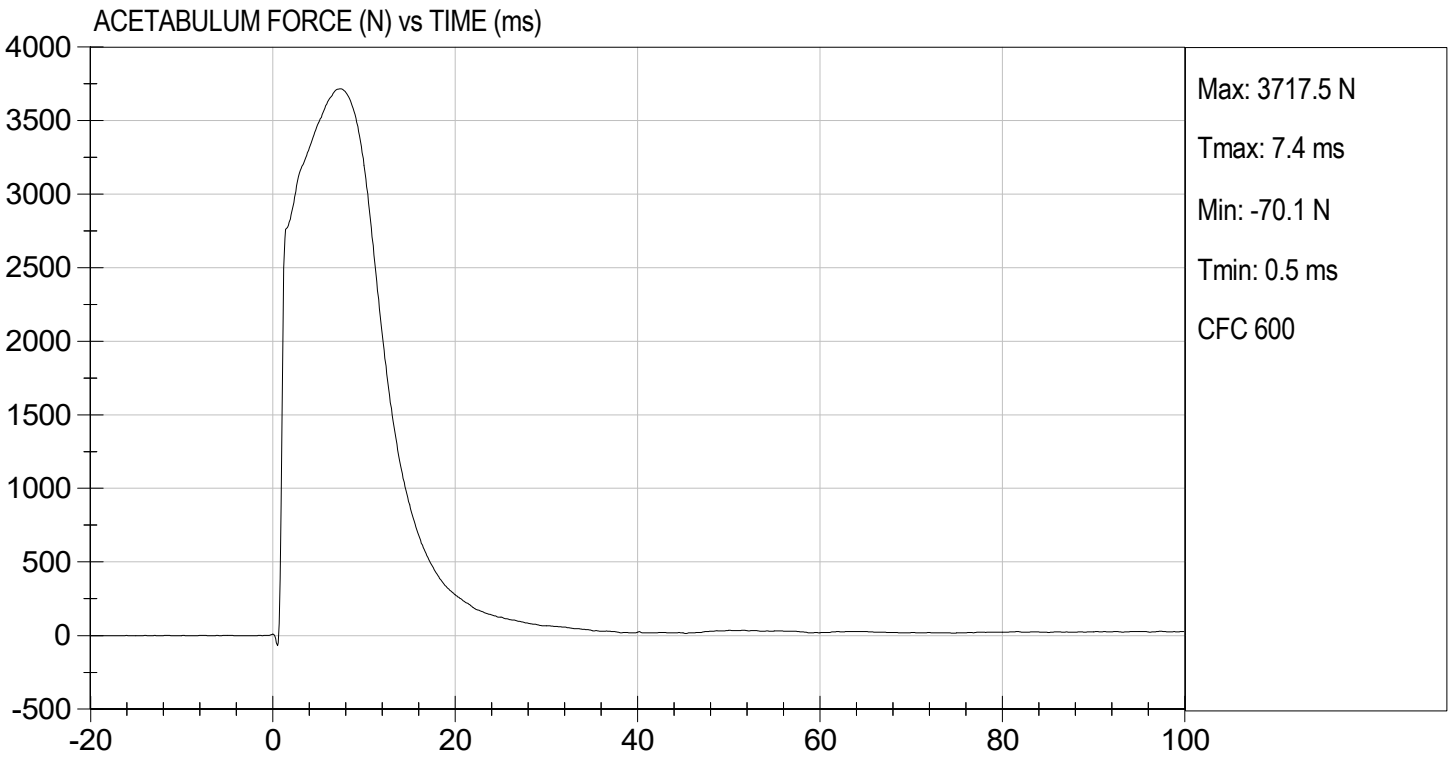
TEST DATE: 11/04/2022
TEST #: D222587





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

TEST DATE: 11/04/2022
TEST #: D222587



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D222588

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	42	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,797	Pass
		Overall Test Results		Pass

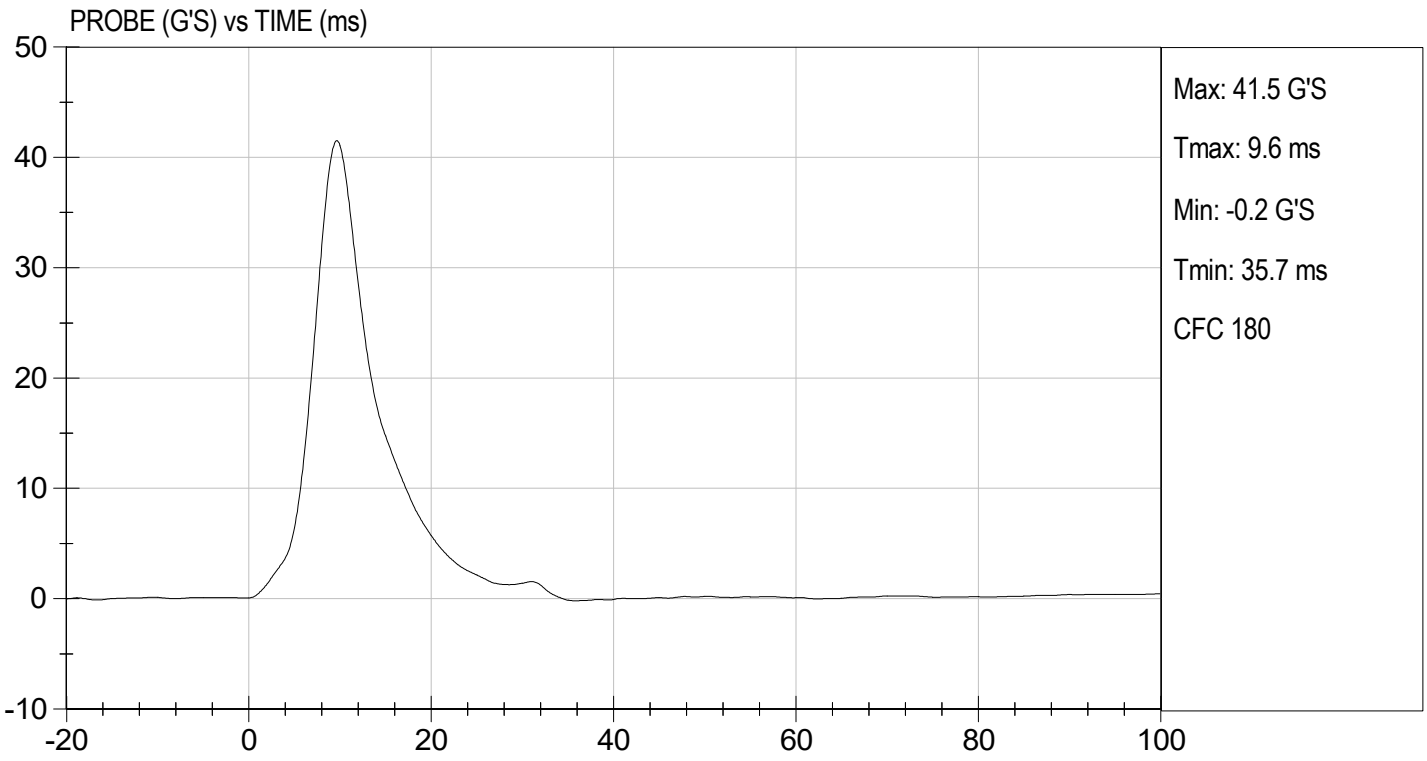
Laboratory Technician

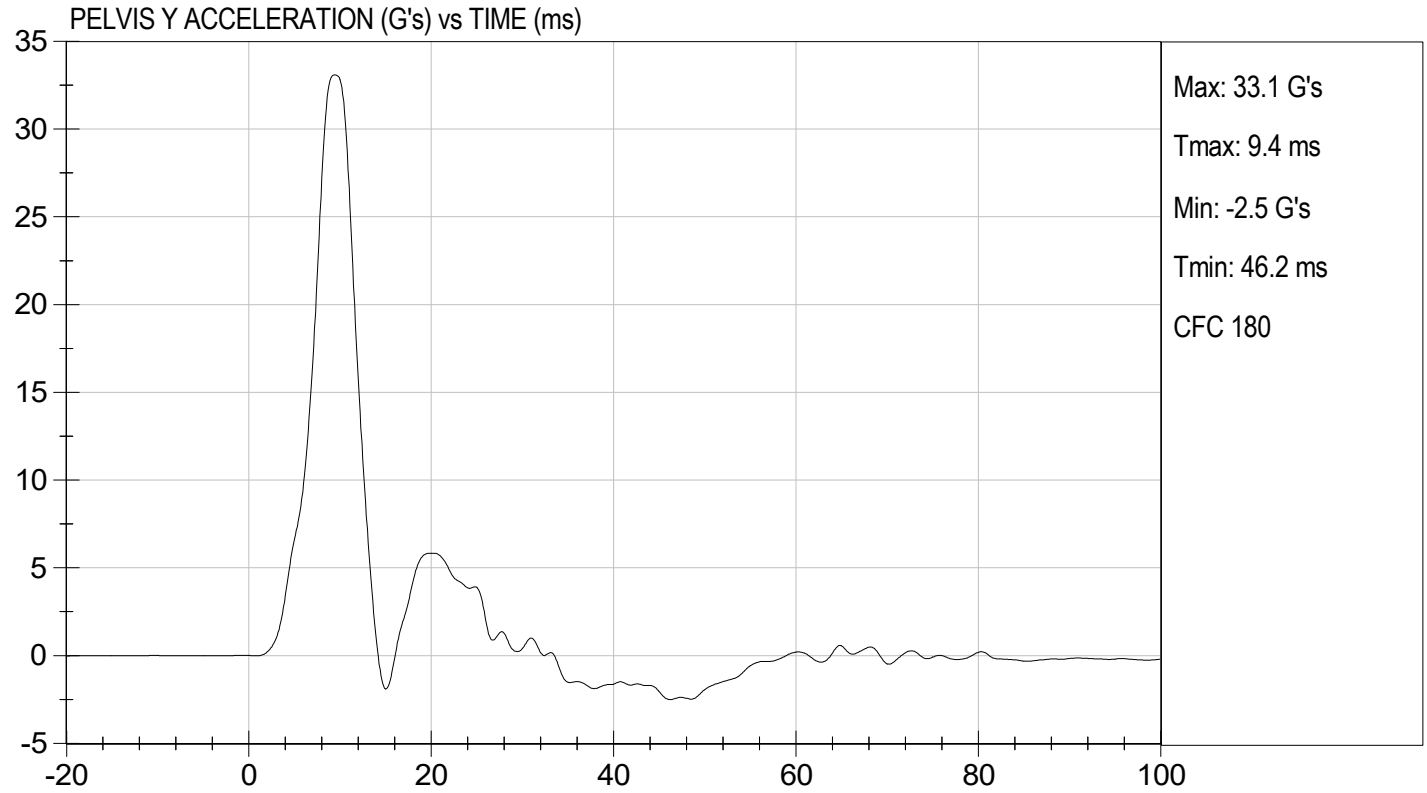
11/04/2022
Test Date

Approved By

TEST DESC: ILLIAC
VELOCITY: 13.89 ft/s, 4.23 m/s

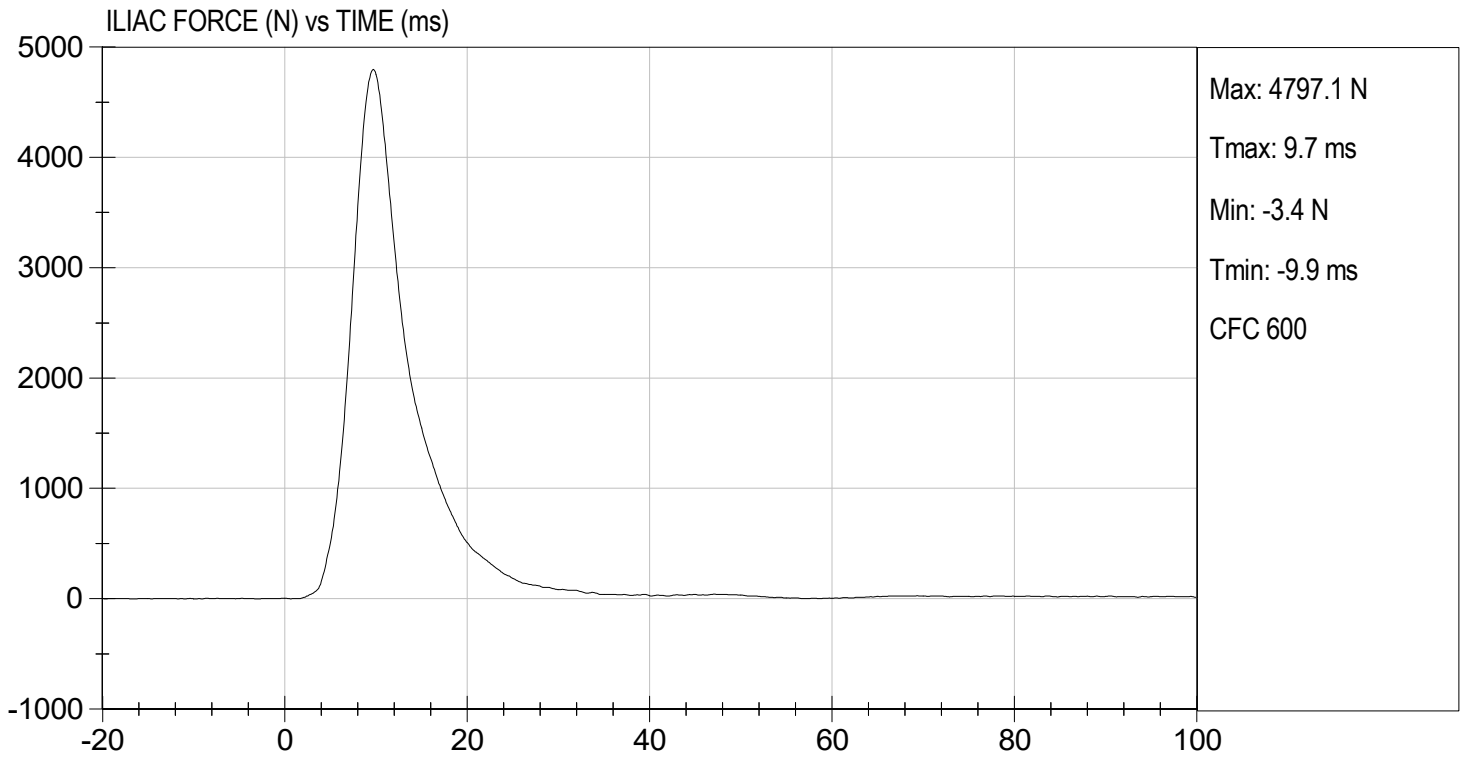
TEST DATE: 11/04/2022
TEST #: D222588





TEST DESC: ILLIAC
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 11/04/2022
TEST #: D222588



CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

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:** D222681

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Peak Resultant Acceleration	G's	115 to 137	128	Pass
Peak Longitudinal Acceleration	G's	+/- 15	5.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

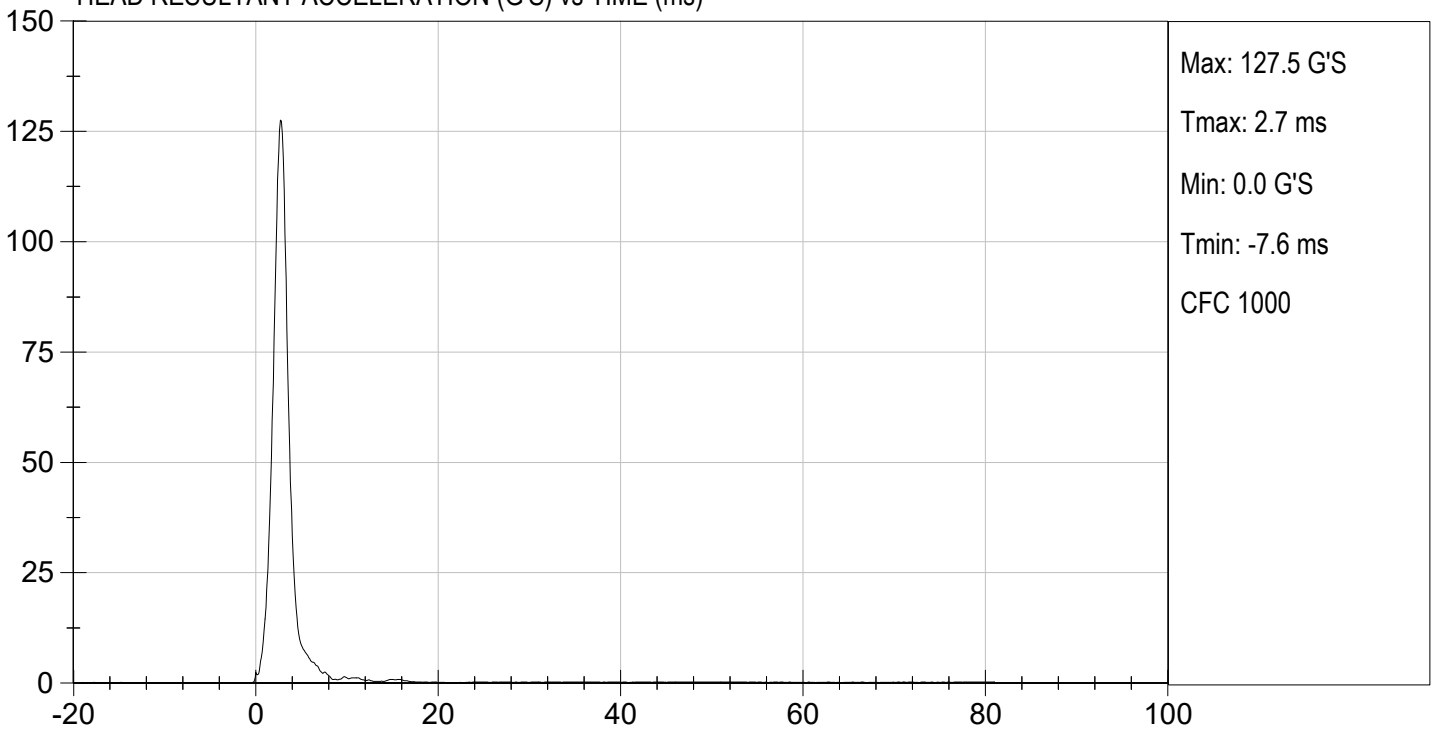
11/21/2022
Test Date

Approved By

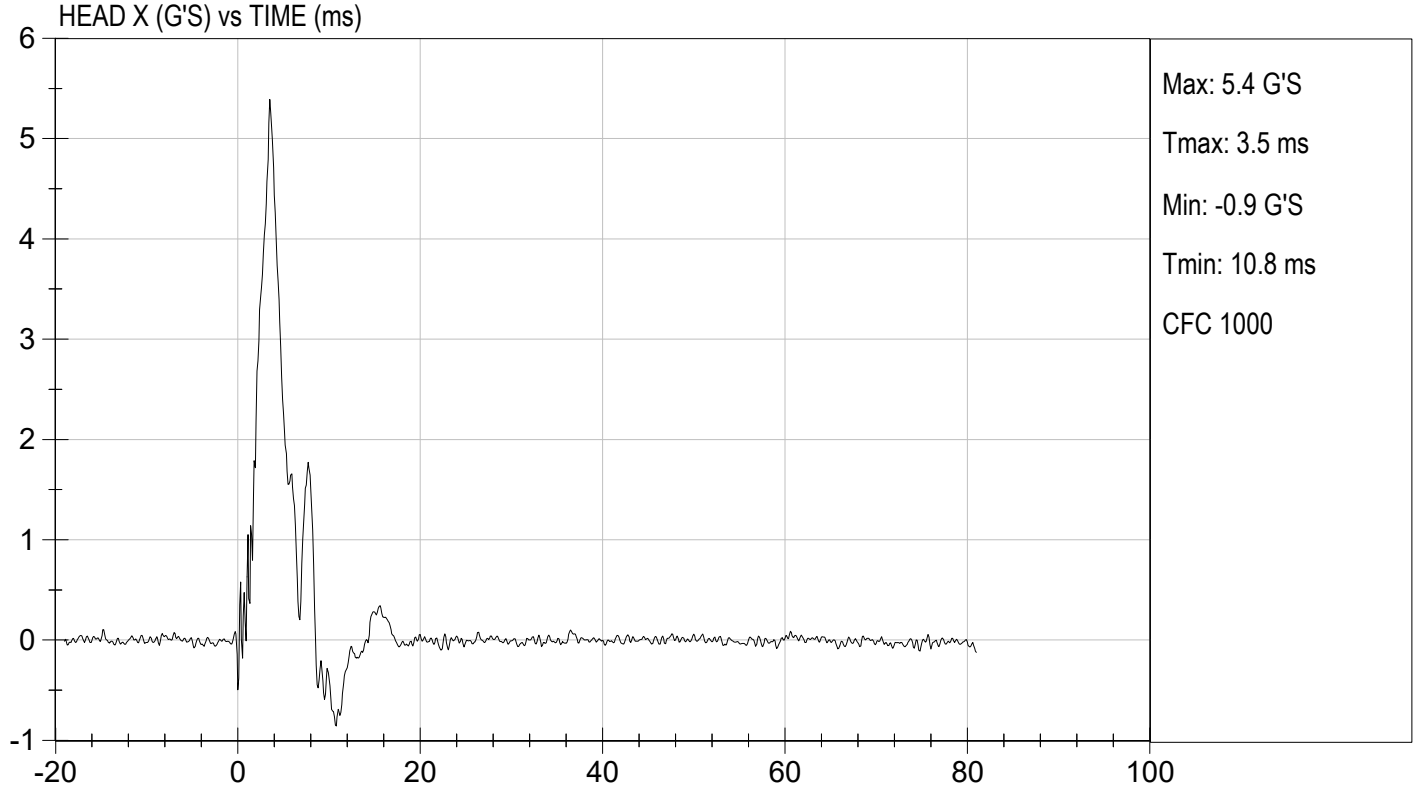
TEST DESC: HEAD DROP

TEST DATE: 11/21/2022
TEST #: D222681

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

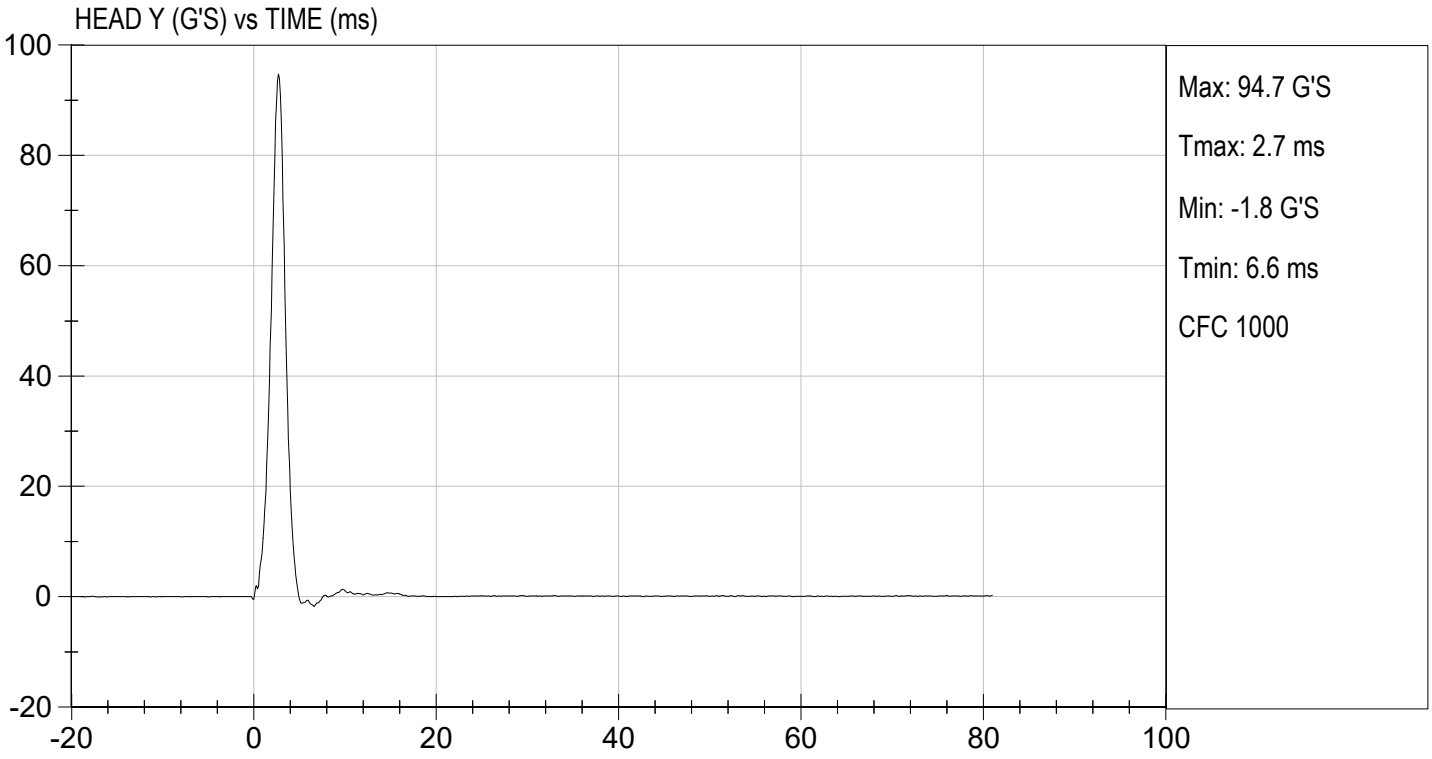


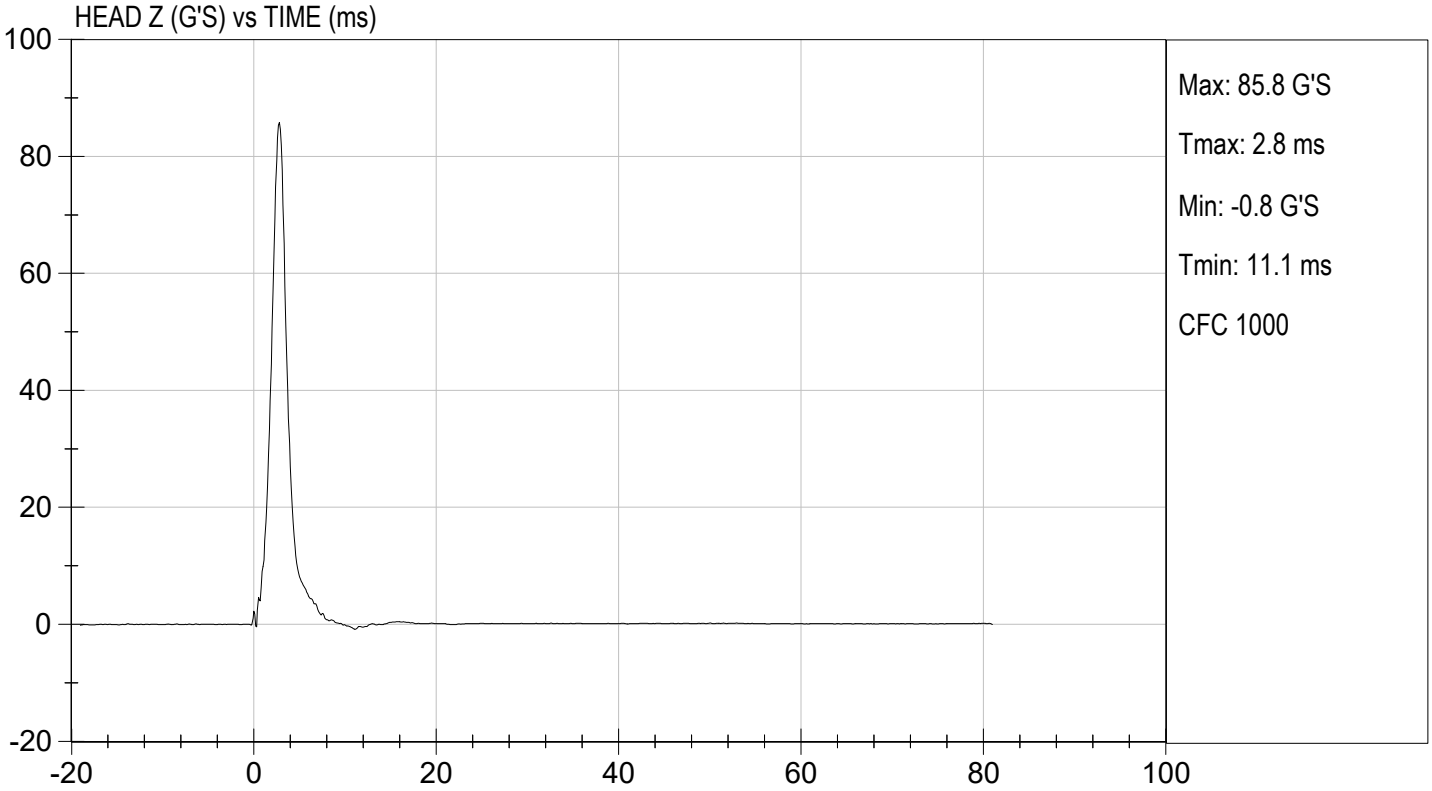
HEAD X (G'S) vs TIME (ms)



TEST DESC: HEAD DROP

TEST DATE: 11/21/2022
TEST #: D222681





MGA RESEARCH CORPORATION

LATERAL NECK PENDULUM TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D222682

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	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.39	Pass
	15 ms	m/s	3.30 to 4.10	3.67	Pass
	20 ms	m/s	4.40 to 5.40	5.22	Pass
	25 ms	m/s	5.40 to 6.10	5.71	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	60	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-40	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	112	Pass
			Overall Test Results		Pass

Laboratory Technician

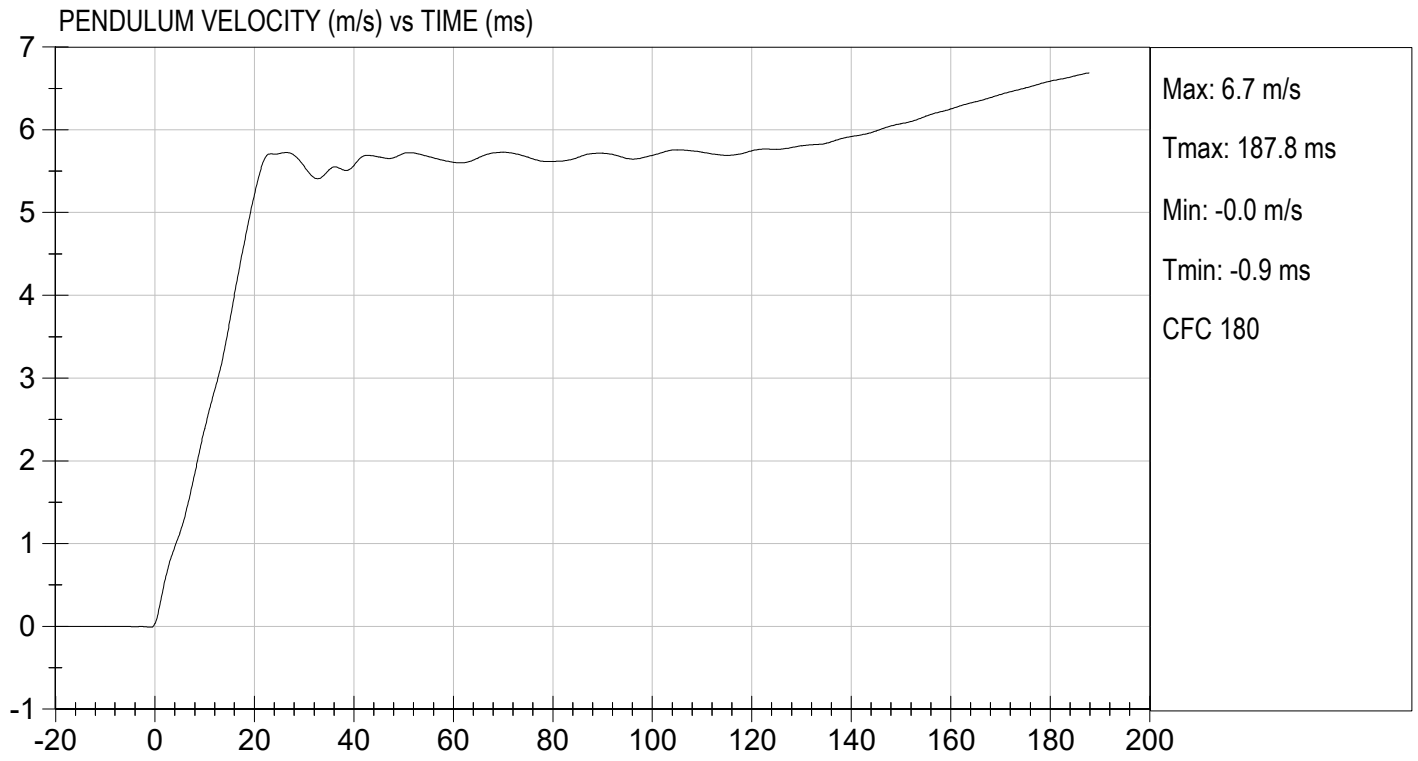
11/22/2022

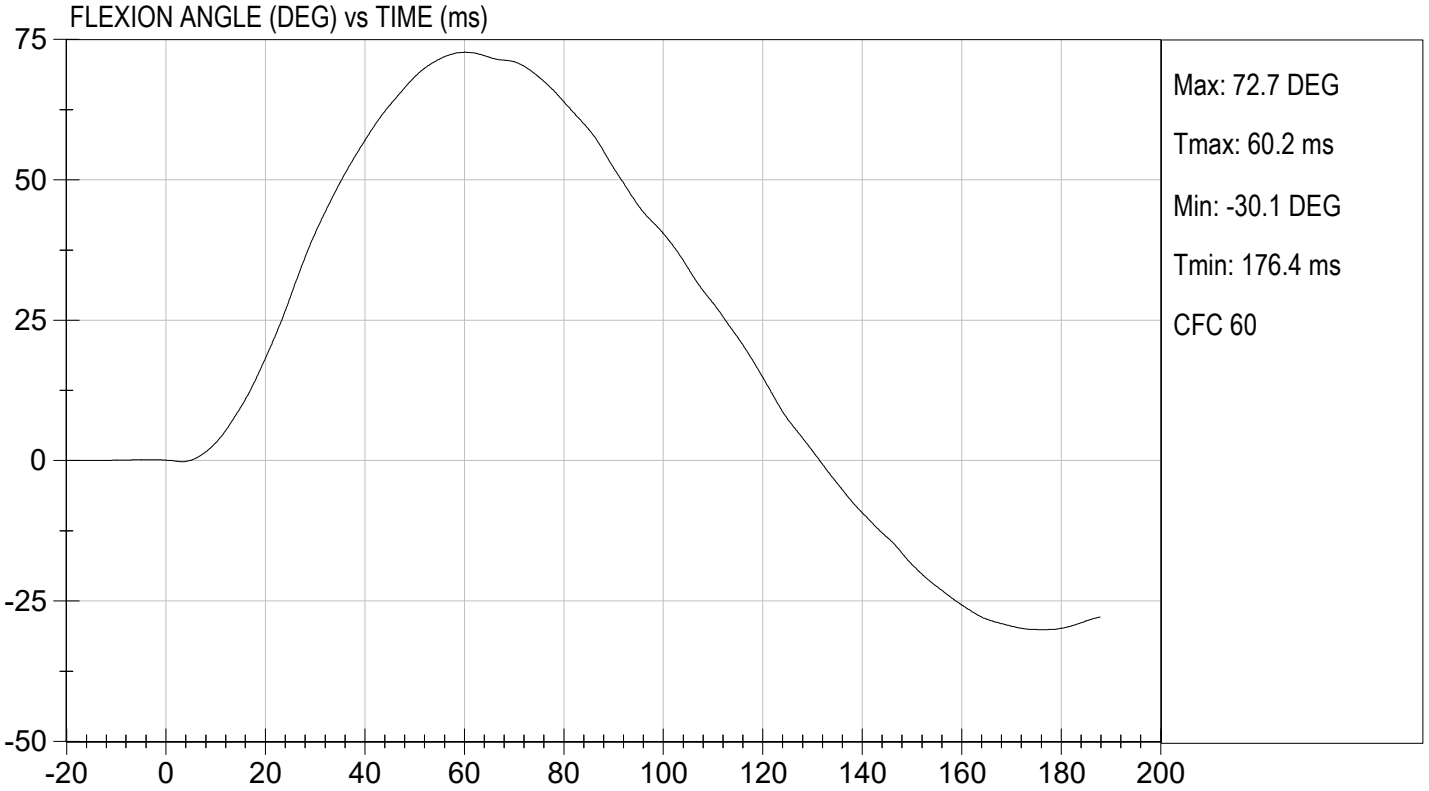
Test Date

Approved By

TEST DESC: NECK BENDING
VELOCITY: 18.32 ft/s, 5.58 m/s

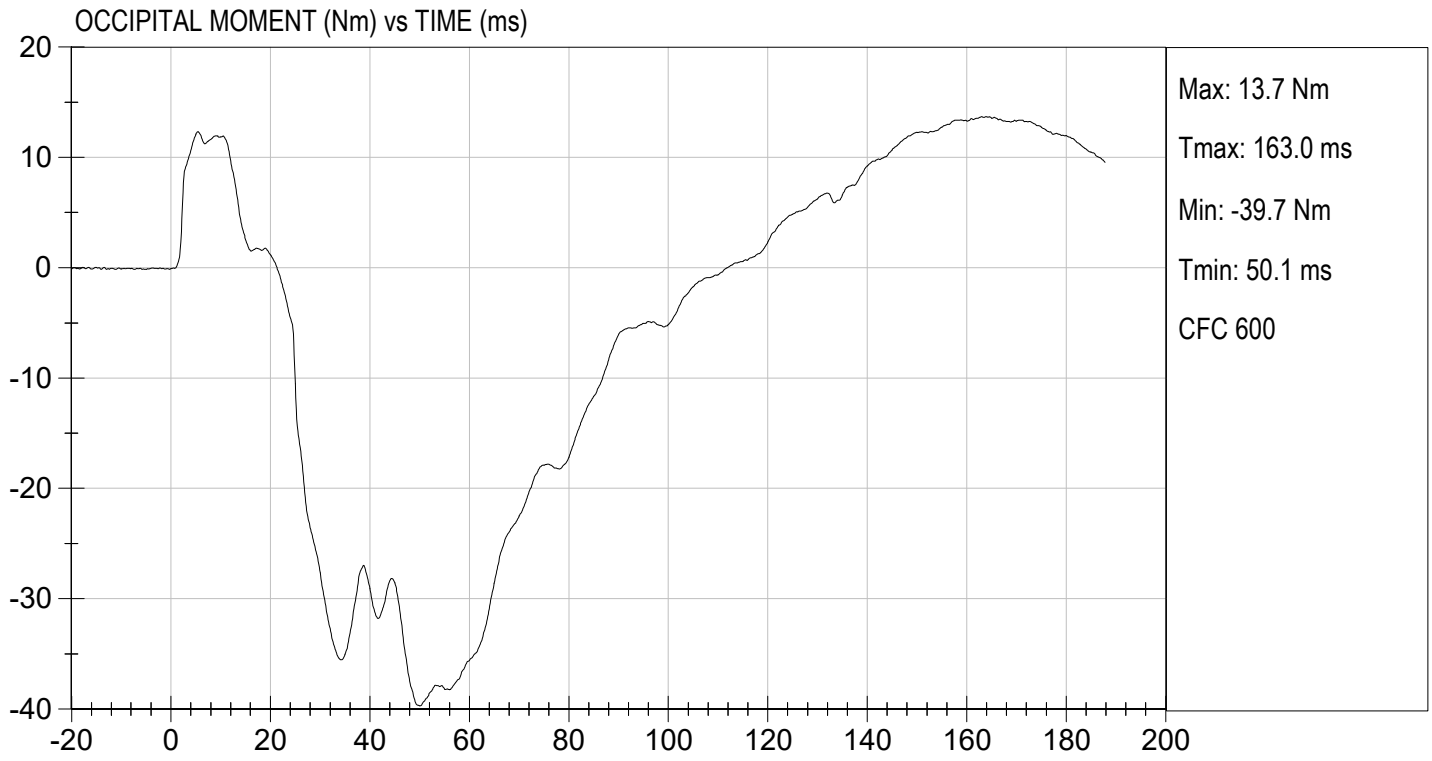
TEST DATE: 11/22/2022
TEST #: D222682





TEST DESC: NECK BENDING
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 11/22/2022
TEST #: D222682



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D222683

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	15	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	32	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
		Overall Test Results		Pass

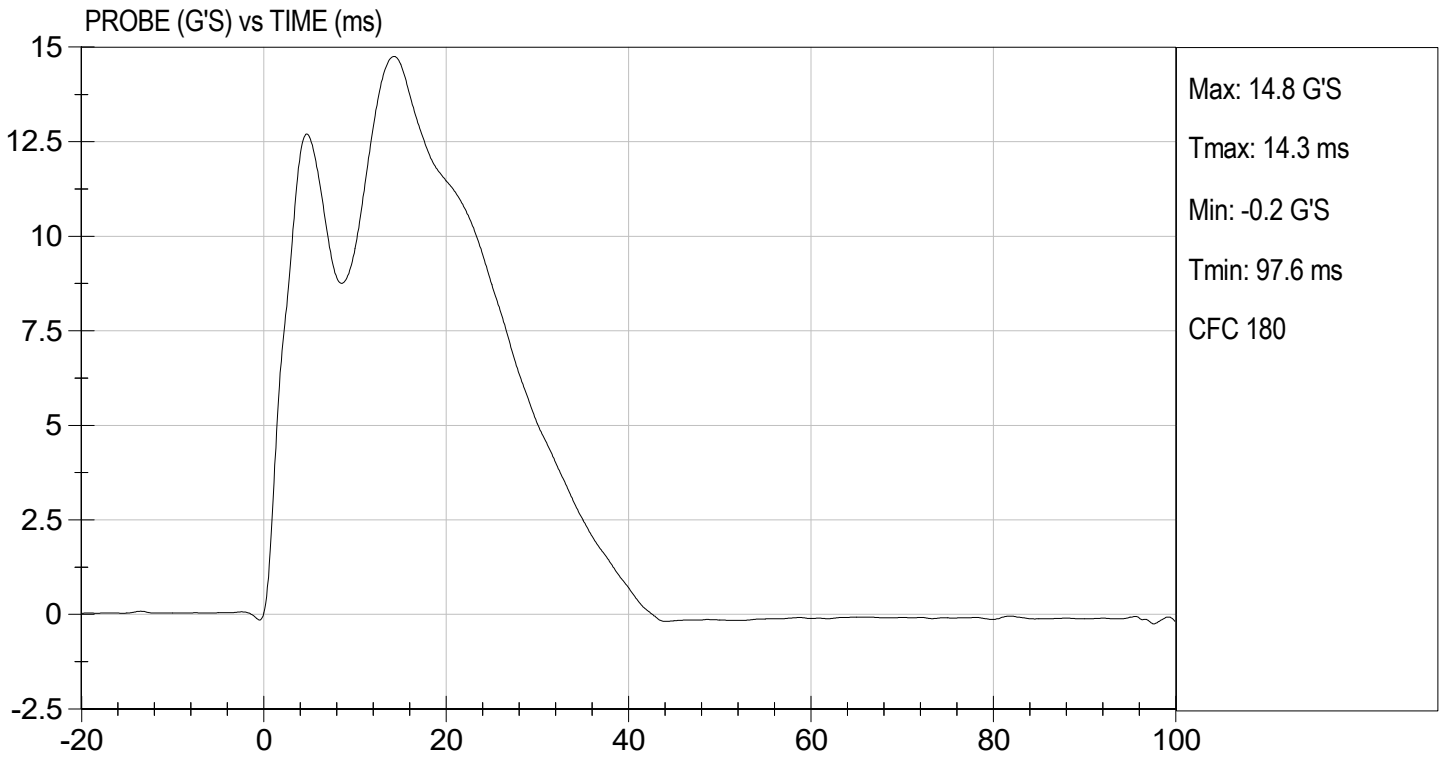
Laboratory Technician

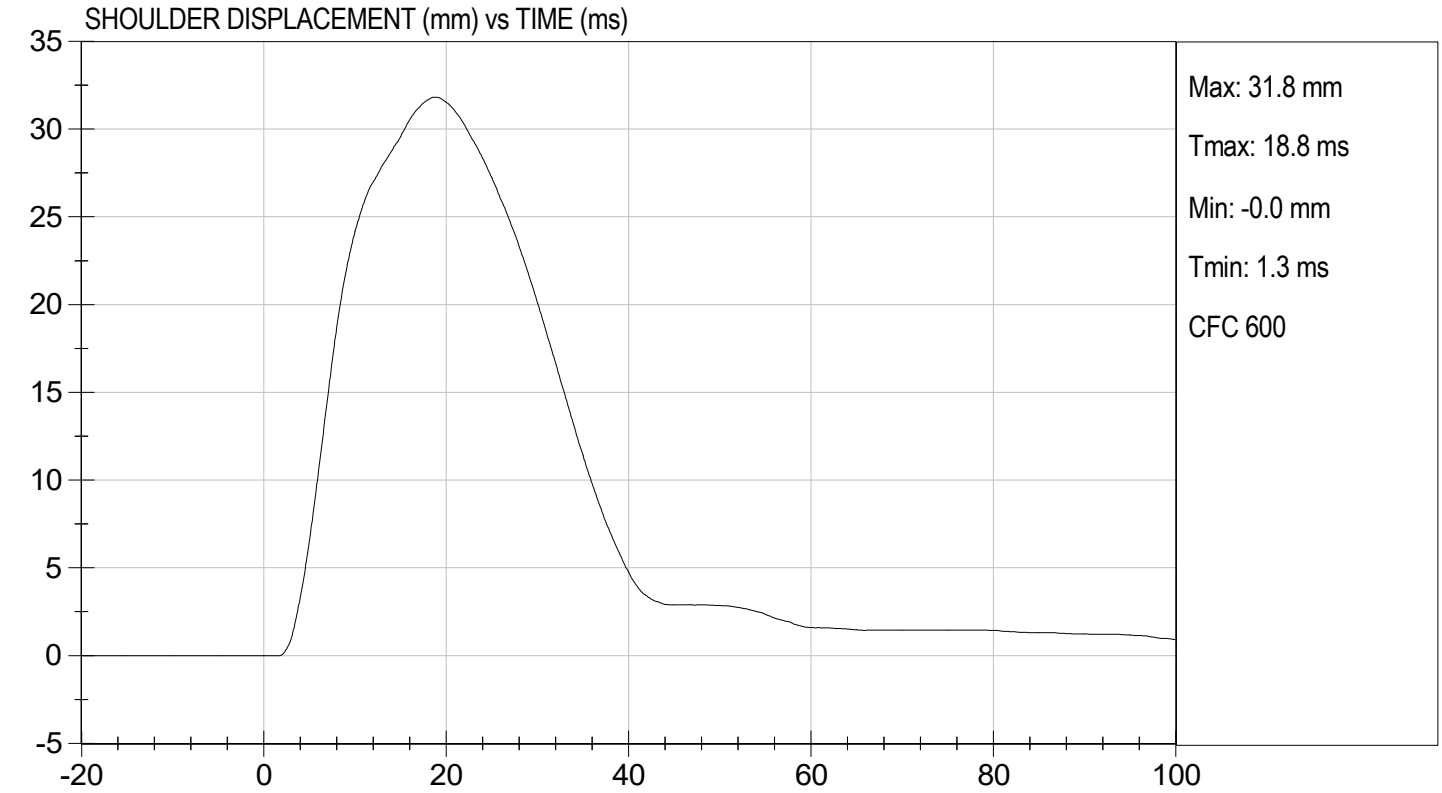
11/21/2022
Test Date

Approved By

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

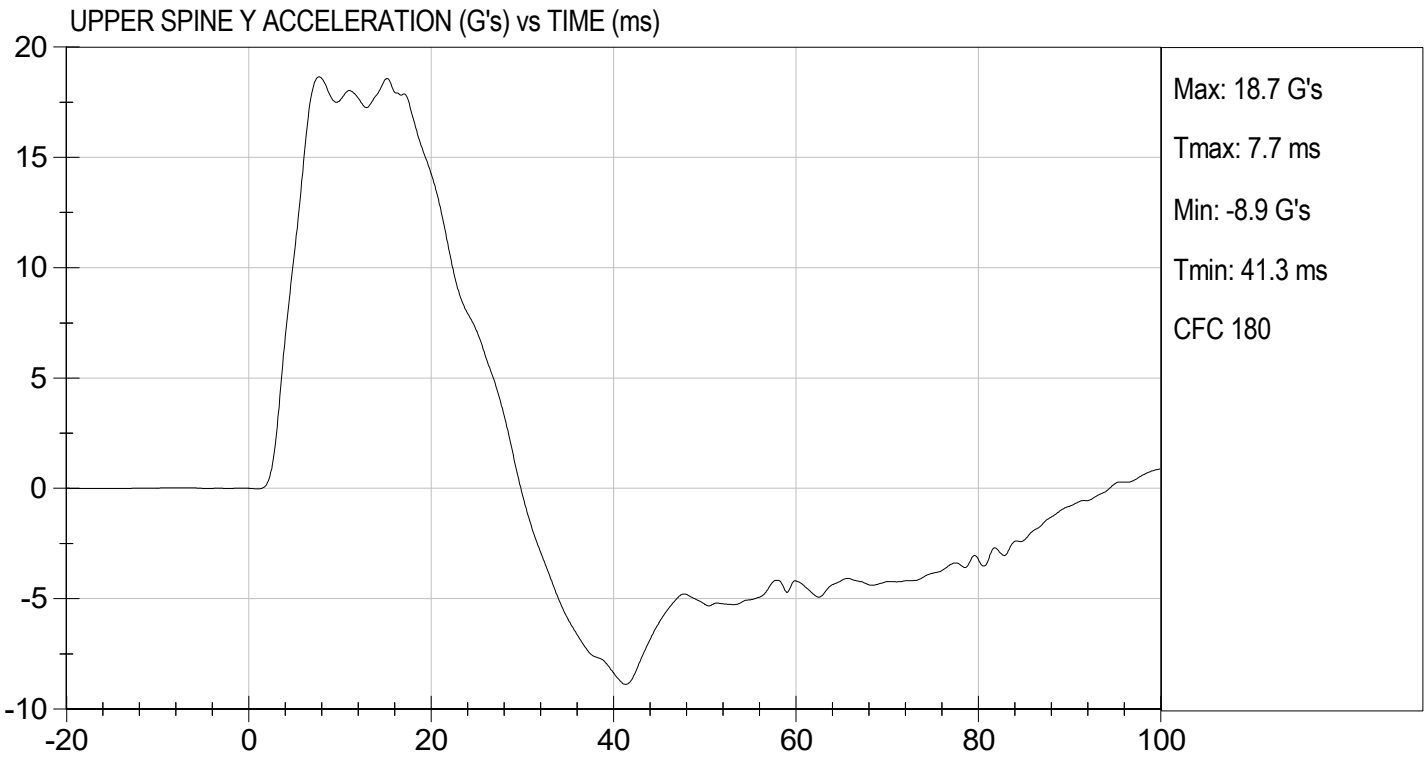
TEST DATE: 11/21/2022
TEST #: D222683





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

TEST DATE: 11/21/2022
TEST #: D222683



MGA RESEARCH CORPORATION

THORAX (WITH ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D222684

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	16	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	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	29	Pass
Middle Rib Displacement	mm	30 to 36	33	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
		Overall Test Results		Pass

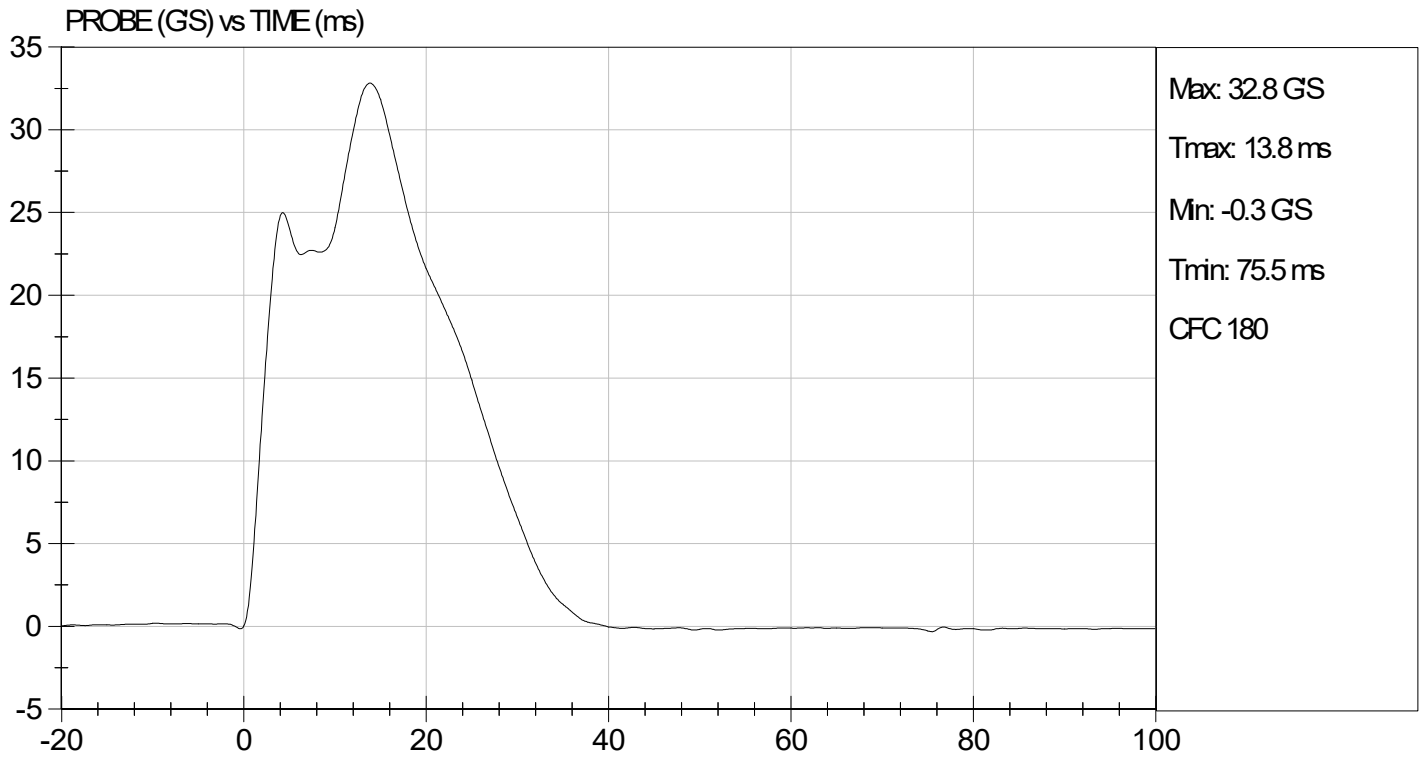
Laboratory Technician

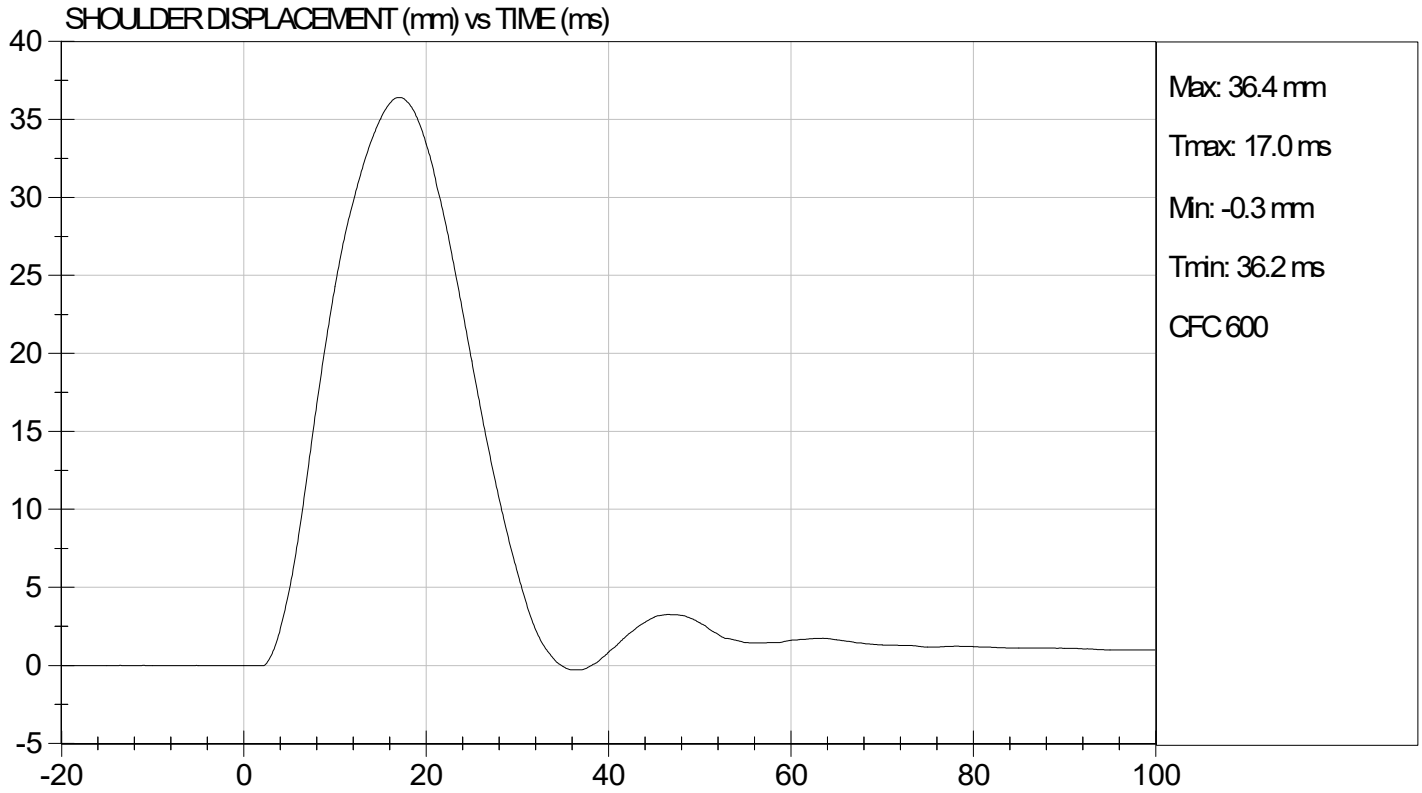
11/21/2022
Test Date

Approved By

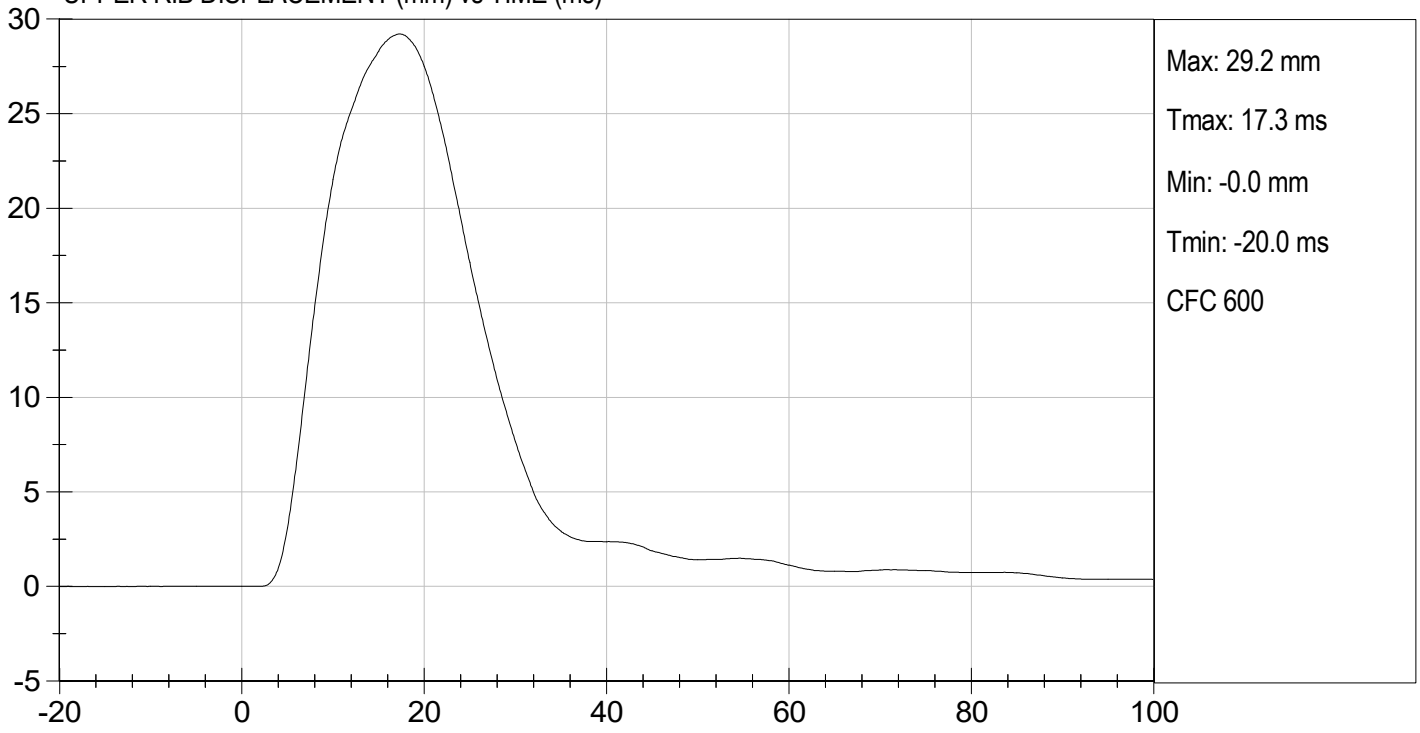
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/21/2022
TEST #: D222684

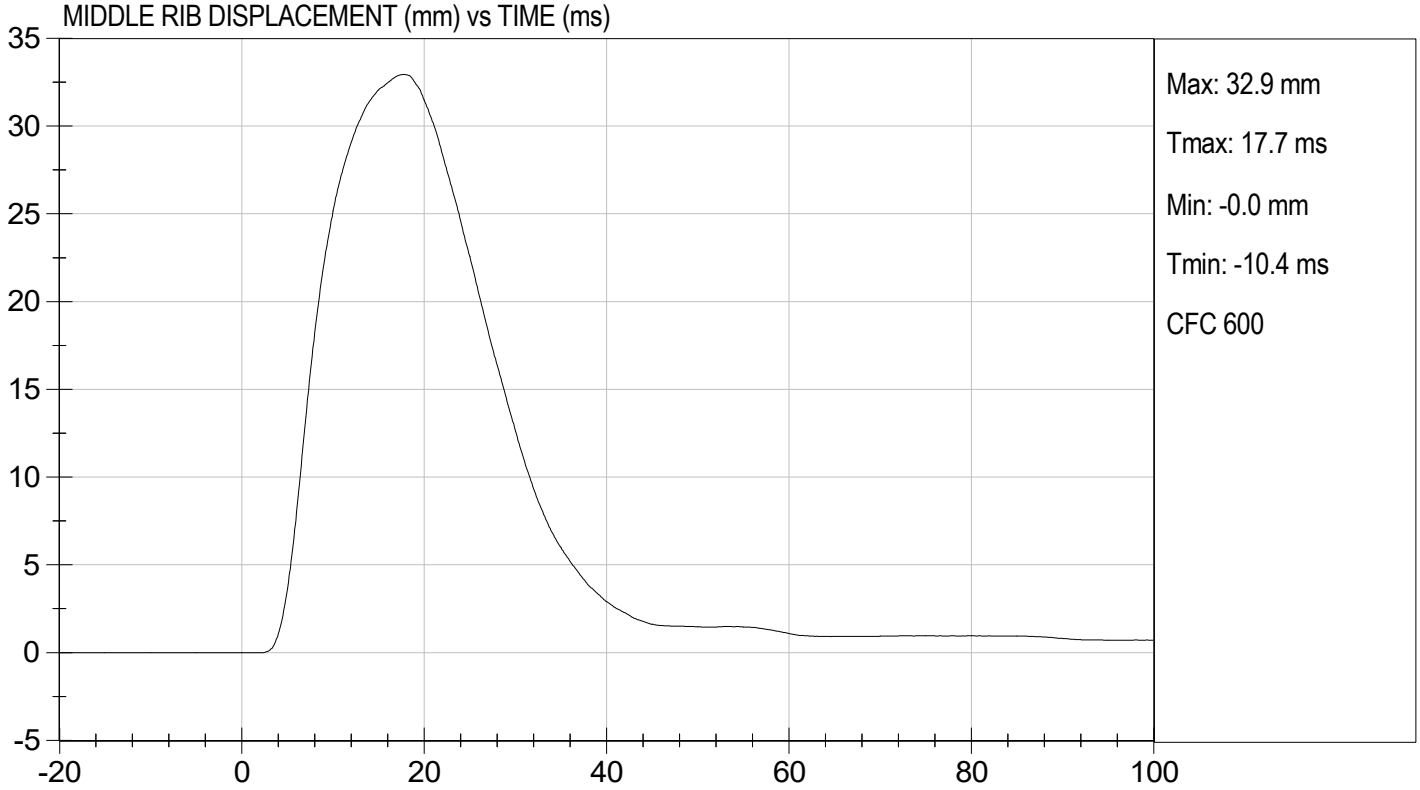




UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



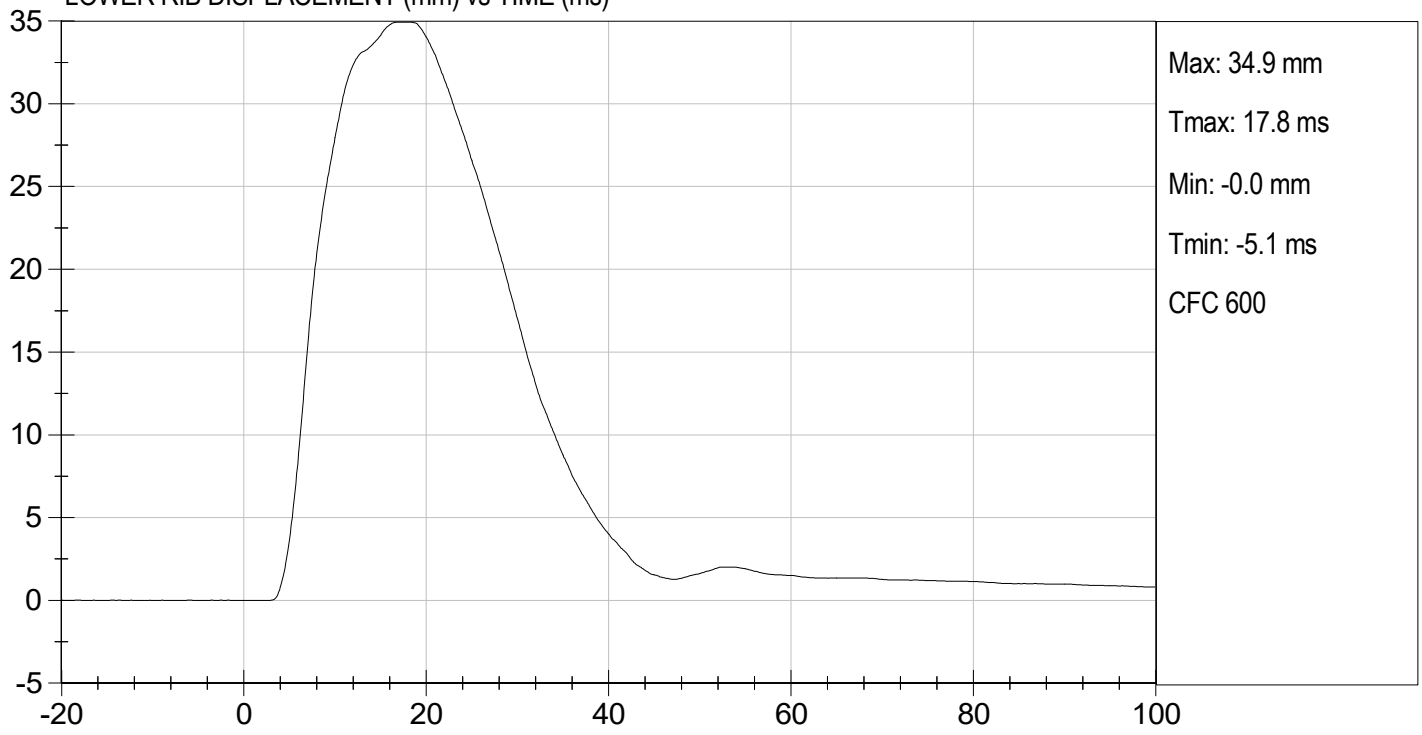
MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



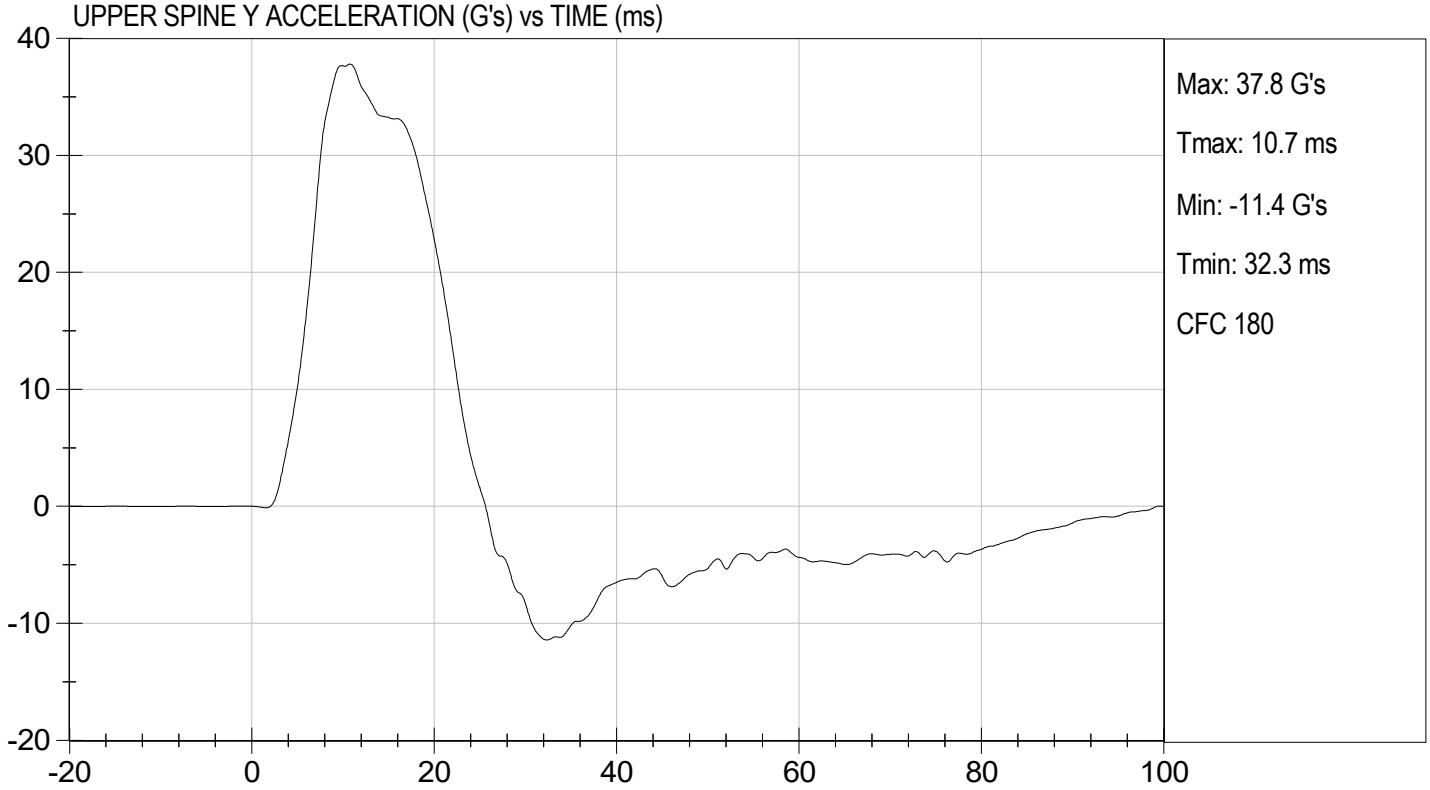
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/21/2022
TEST #: D222684

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

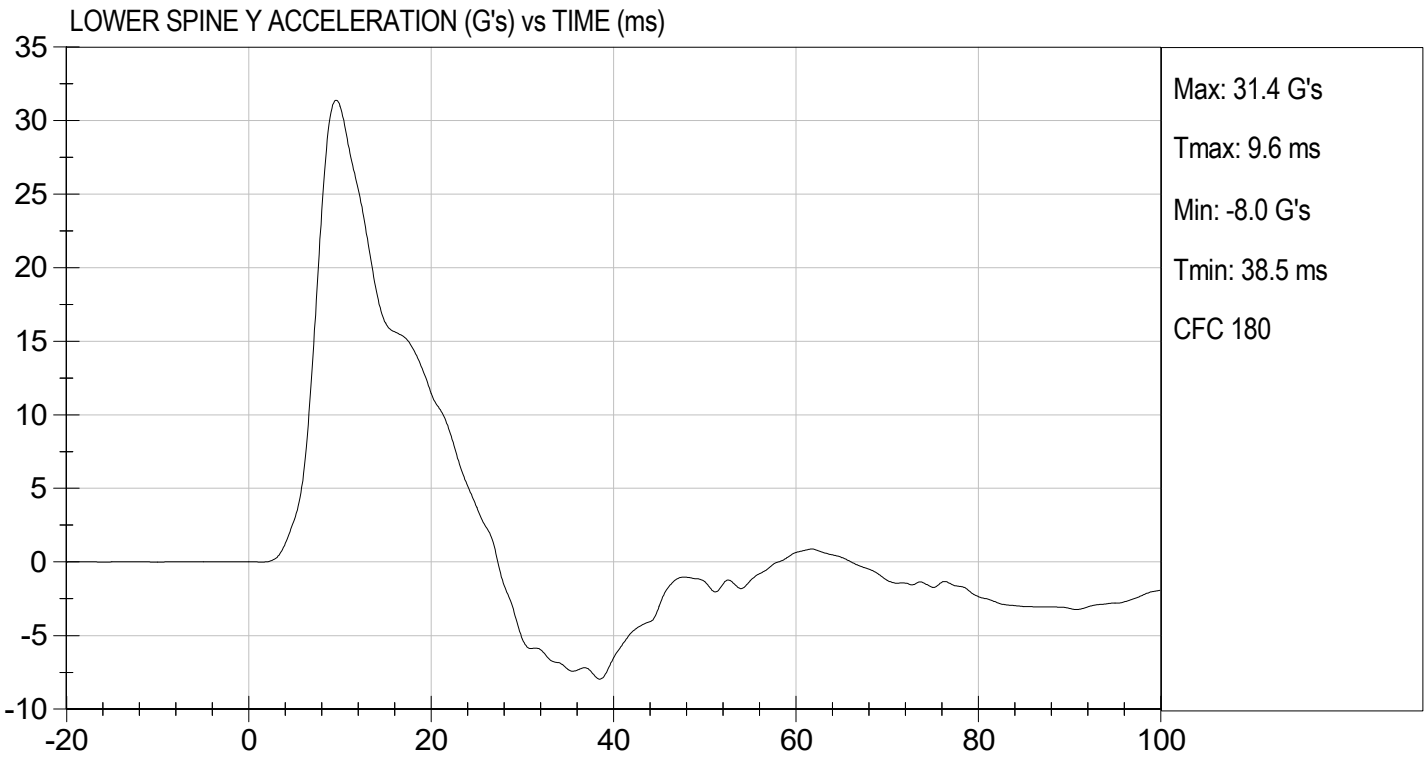


UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/21/2022
TEST #: D222684



MGA RESEARCH CORPORATION

THORAX (WITHOUT ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D222685

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	15	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	37	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	16	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	10	Pass
		Overall Test Results		Pass

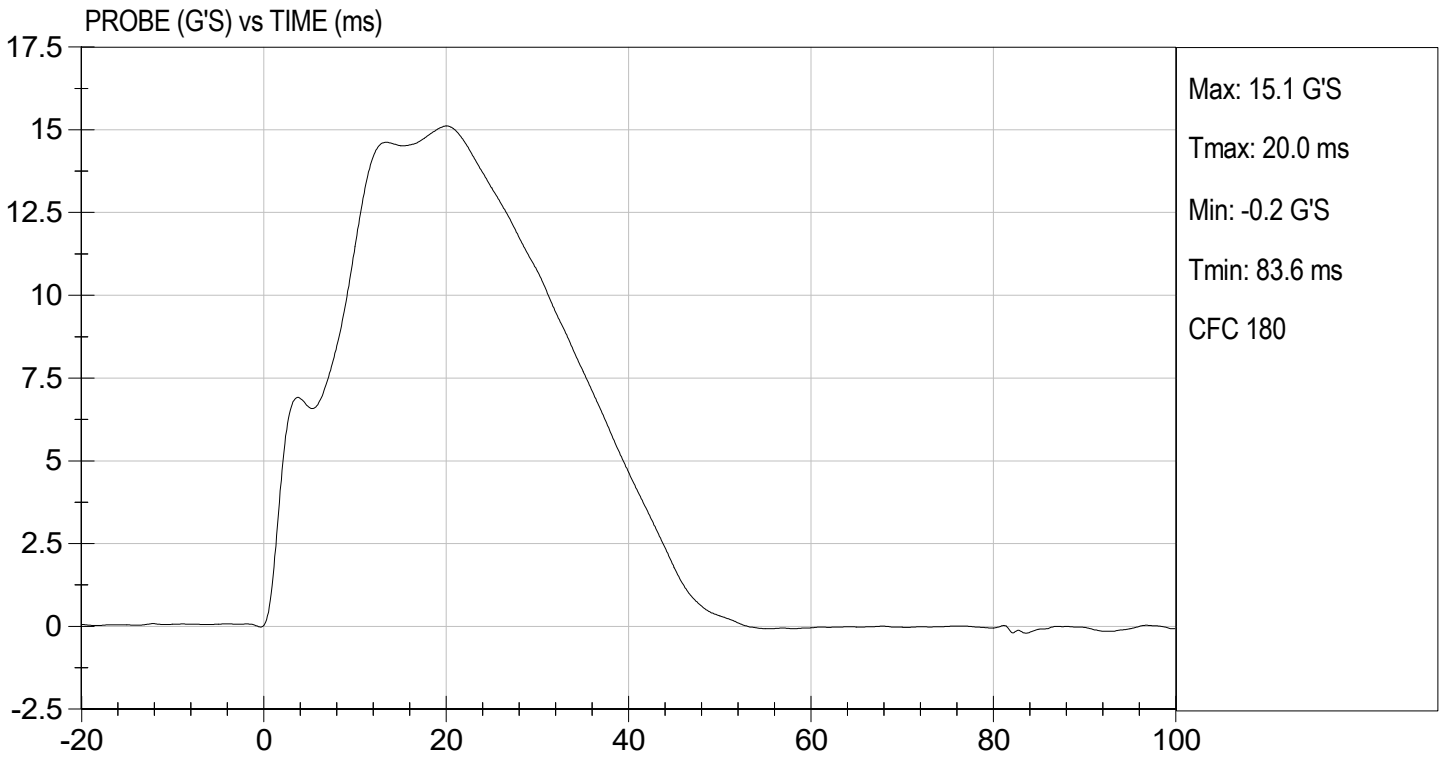
Laboratory Technician

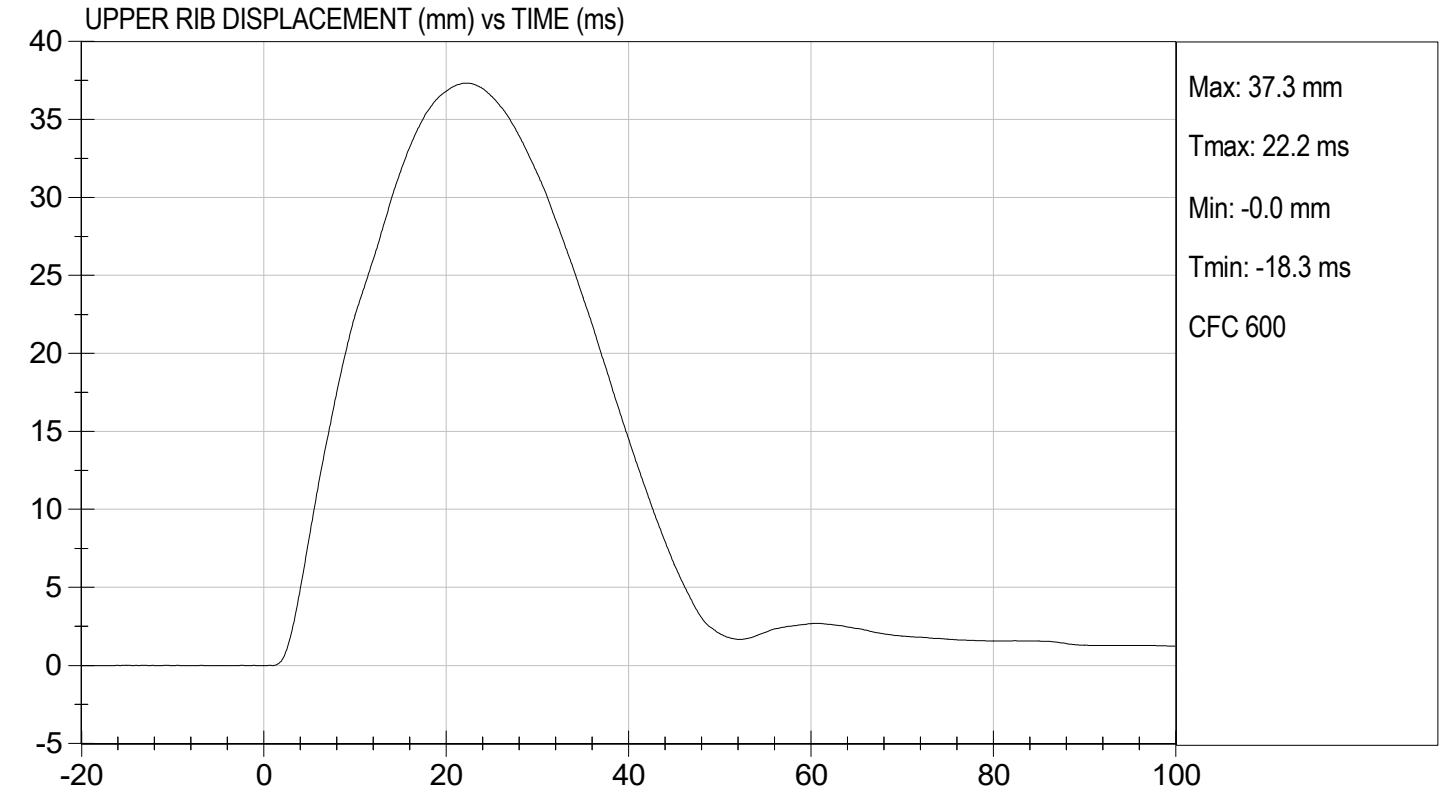
11/21/2022
Test Date

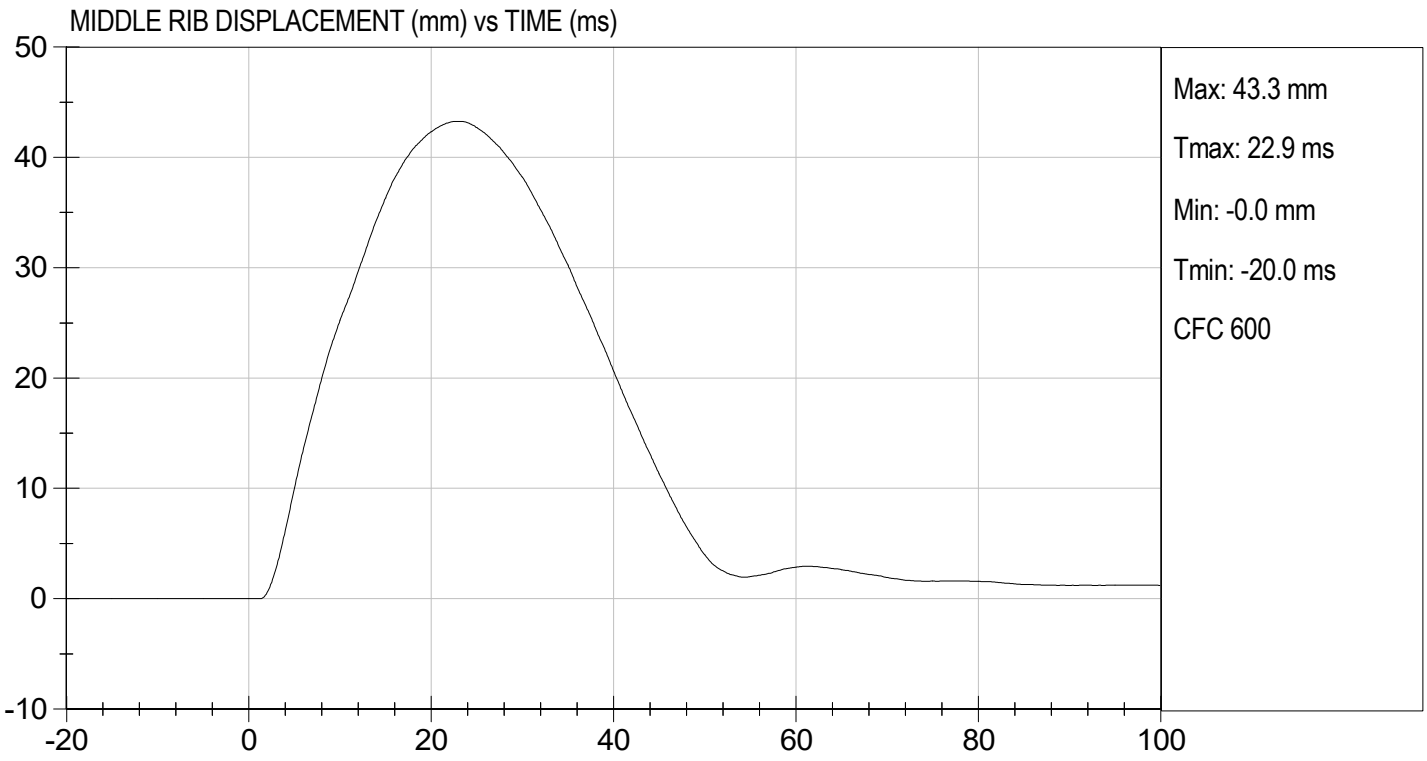
Approved By

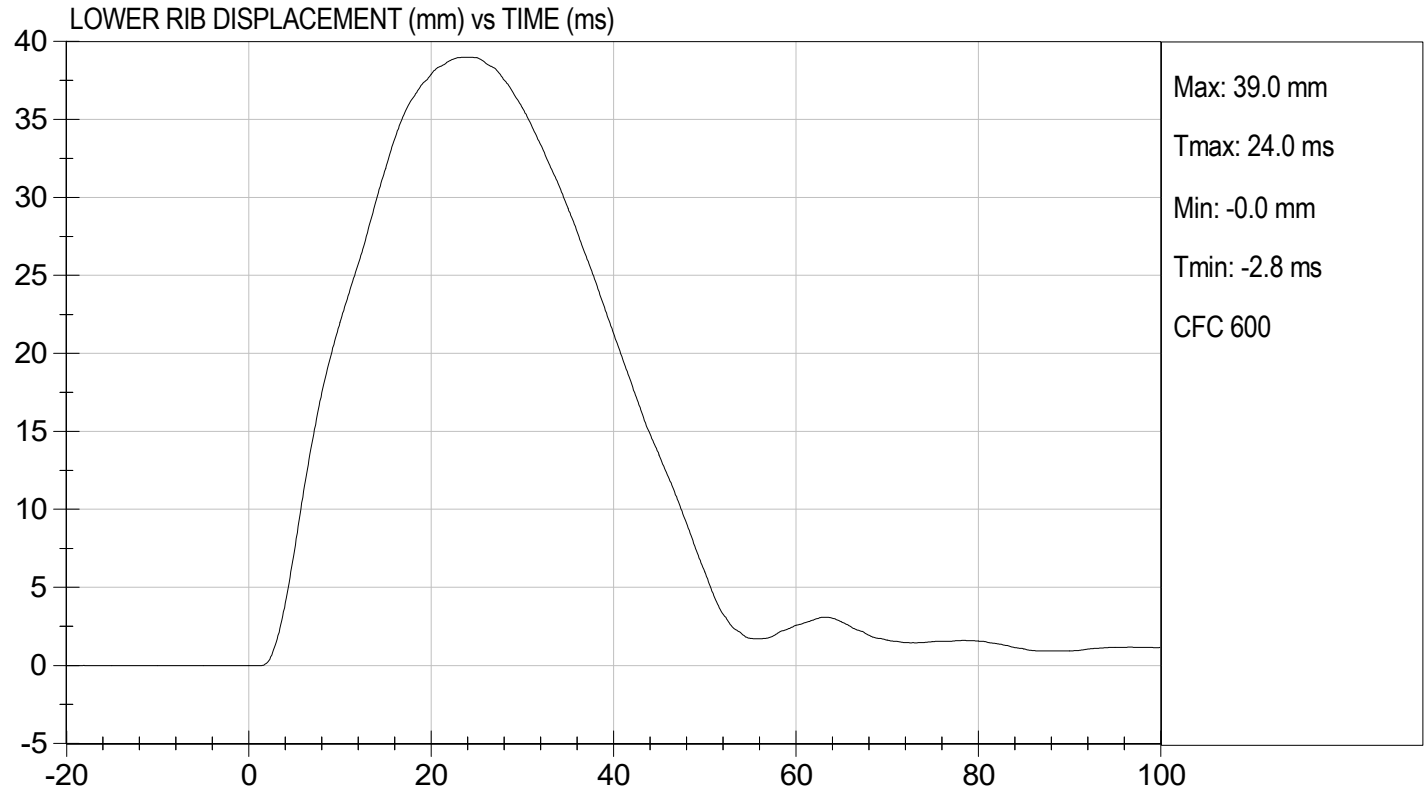
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 11/21/2022
TEST #: D222685





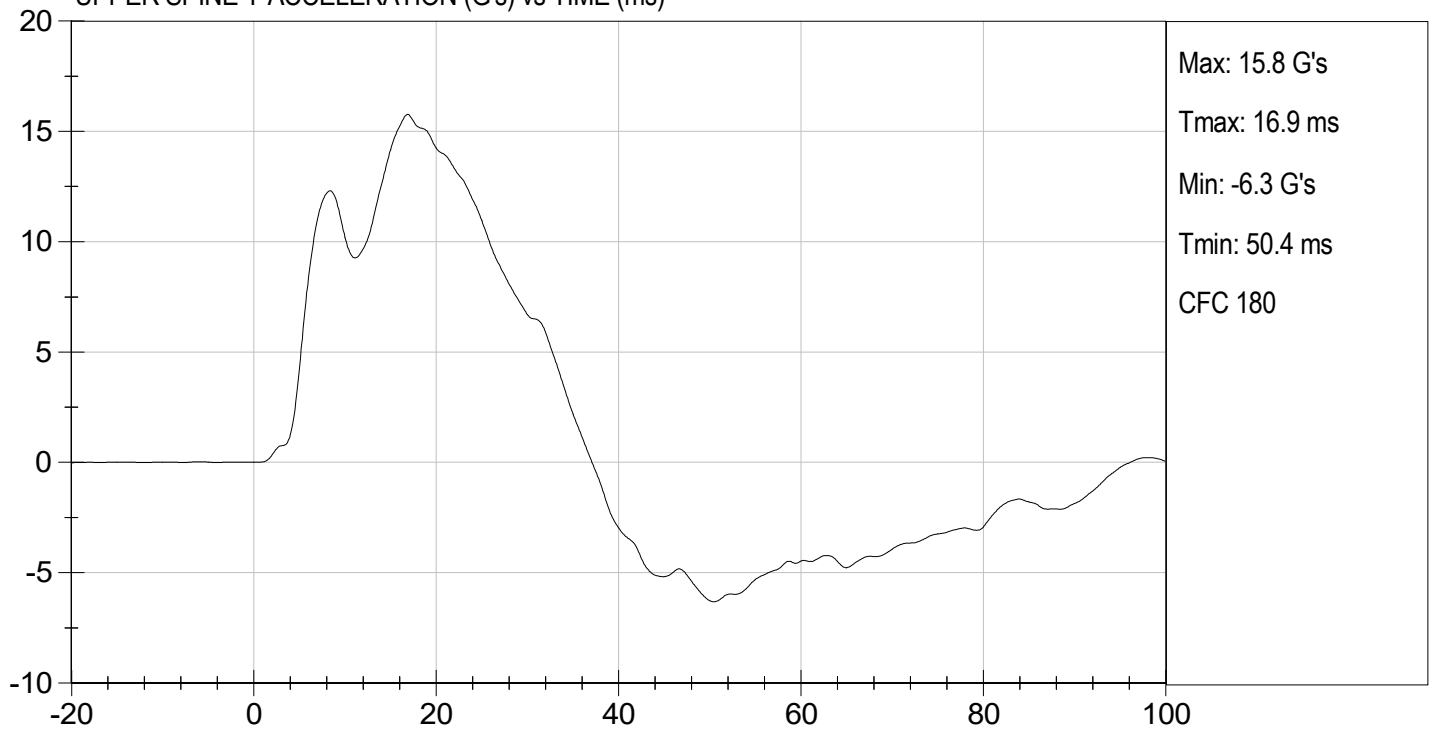

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
Max: 43.3 mm
Tmax: 22.9 ms
Min: -0.0 mm
Tmin: -20.0 ms
CFC 600


LOWER RIB DISPLACEMENT (mm) vs TIME (ms)
40
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
Max: 39.0 mm
Tmax: 24.0 ms
Min: -0.0 mm
Tmin: -2.8 ms
CFC 600

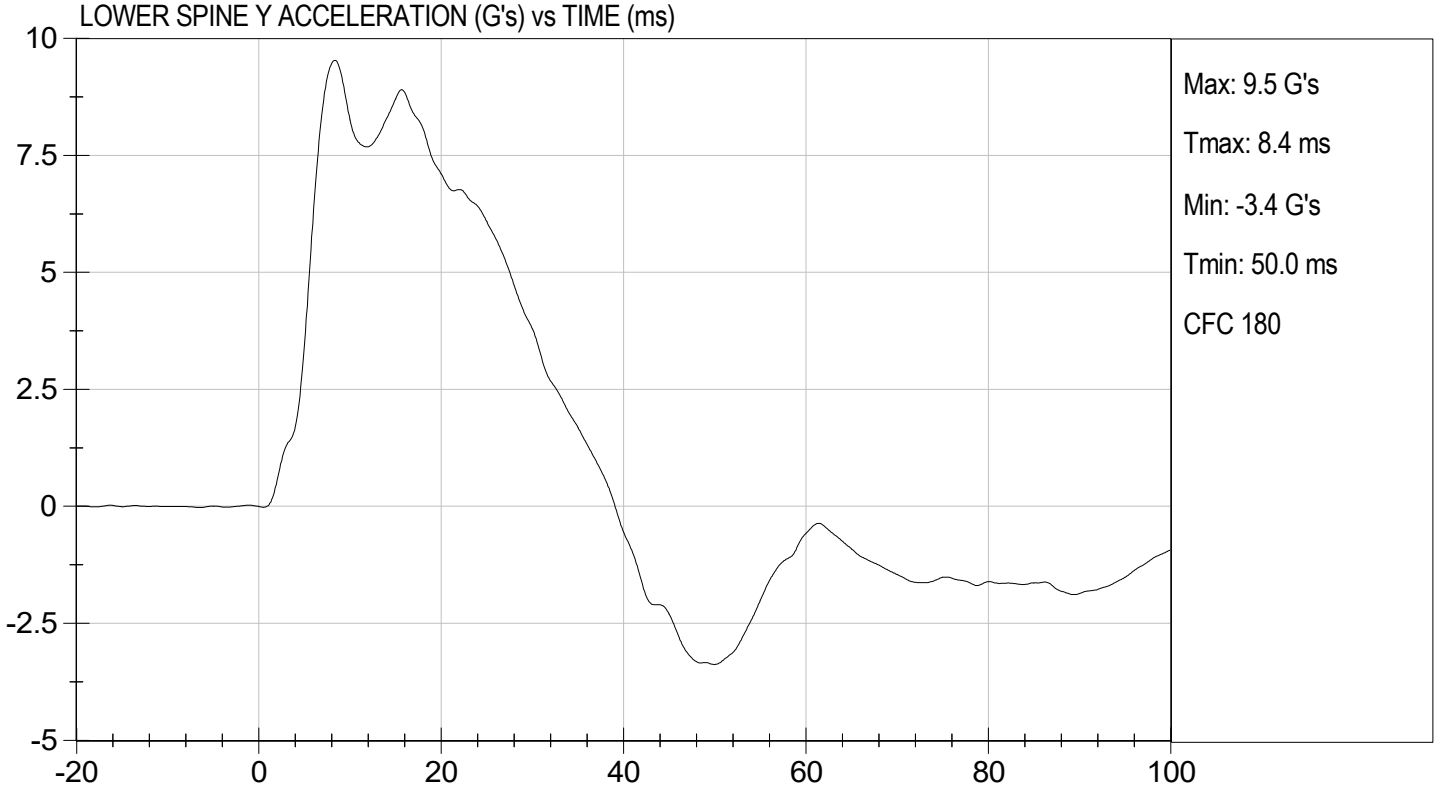
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 11/21/2022
TEST #: D222685

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:** D222686

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	16	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	43	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	42	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
		Overall Test Results		Pass

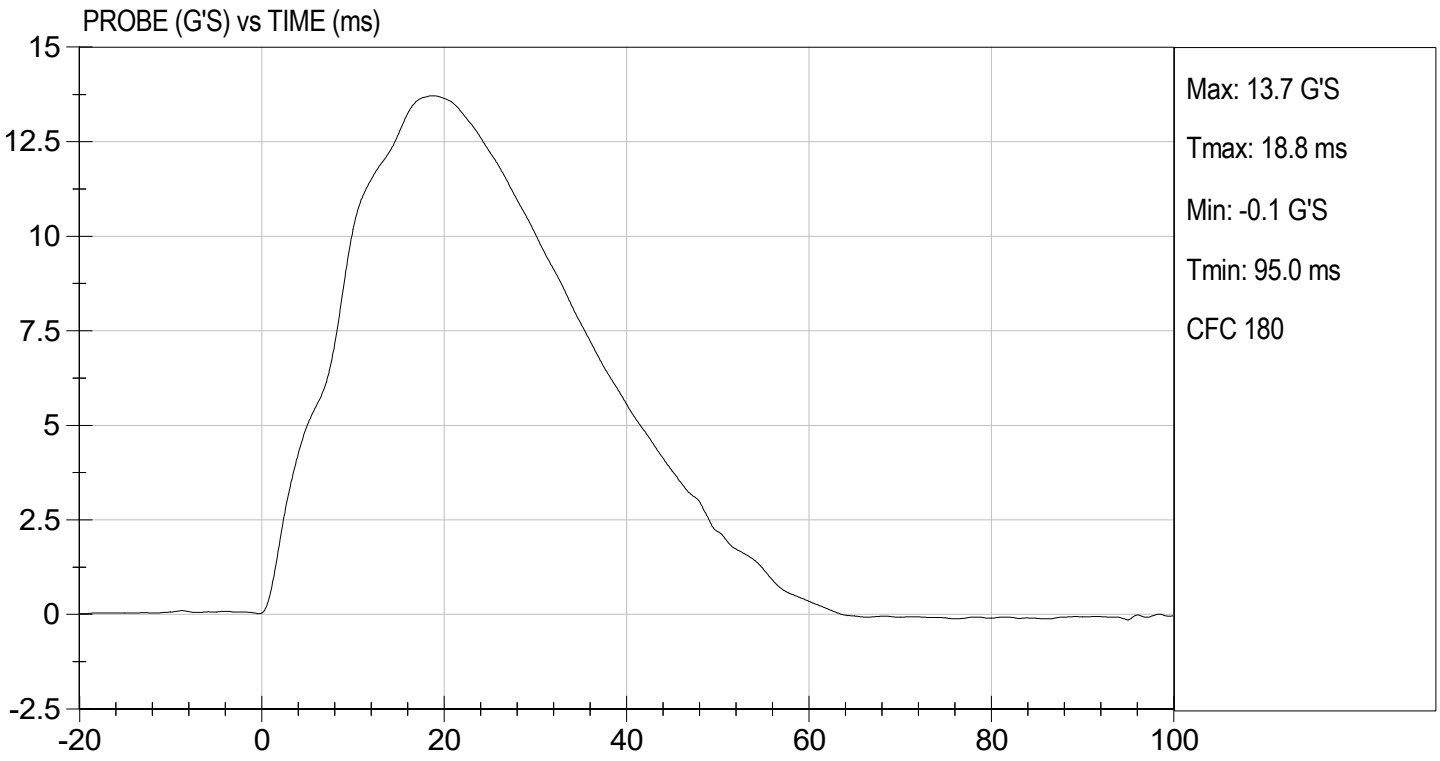
Laboratory Technician

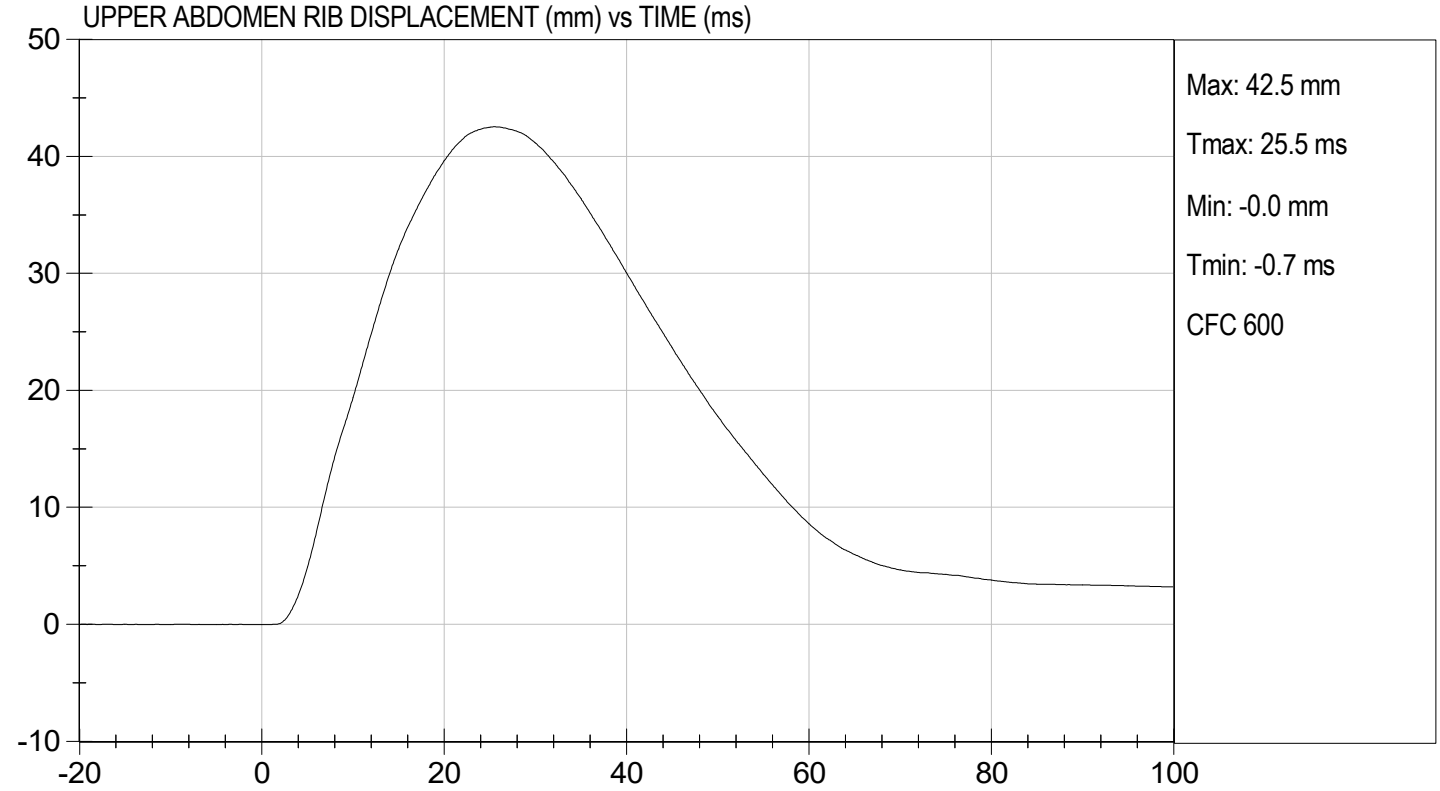
11/21/2022
Test Date

Approved By

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

TEST DATE: 11/21/2022
TEST #: D222686

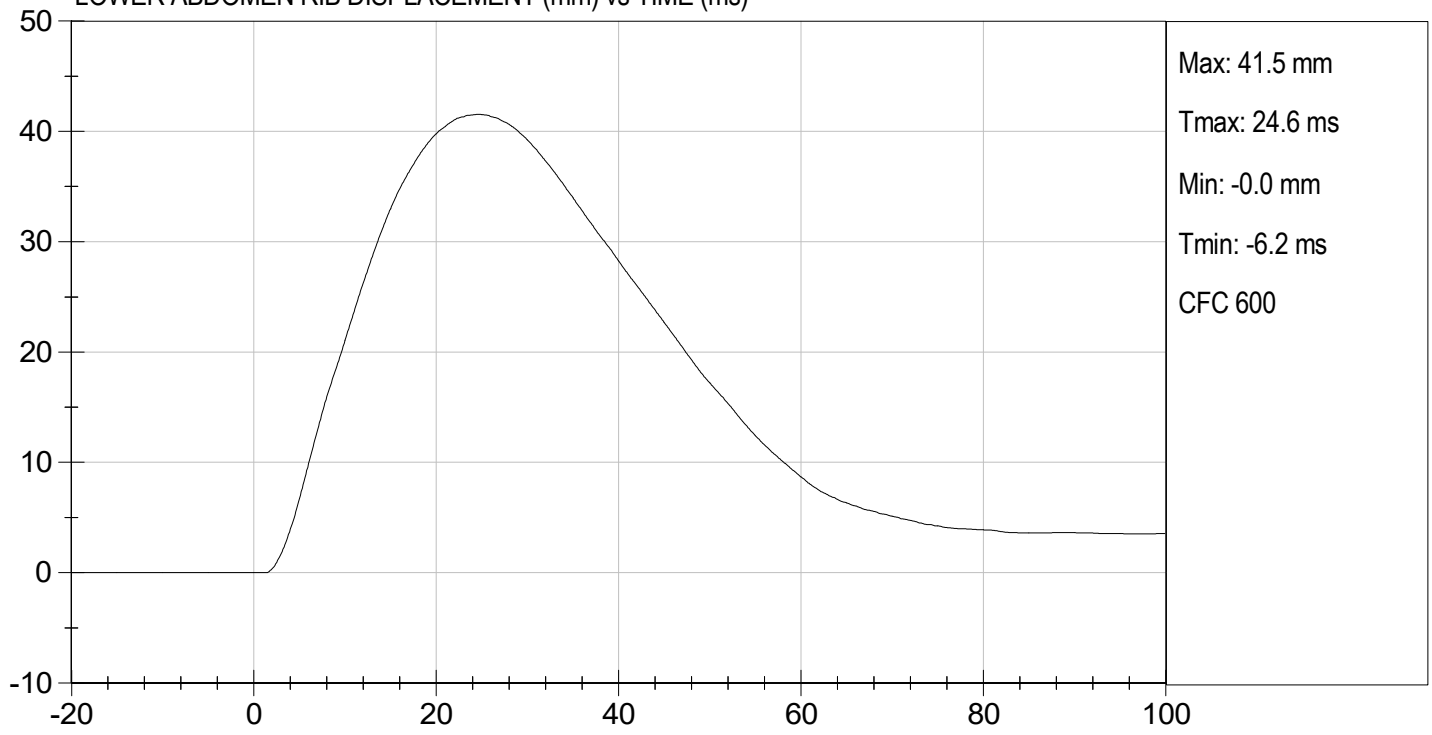




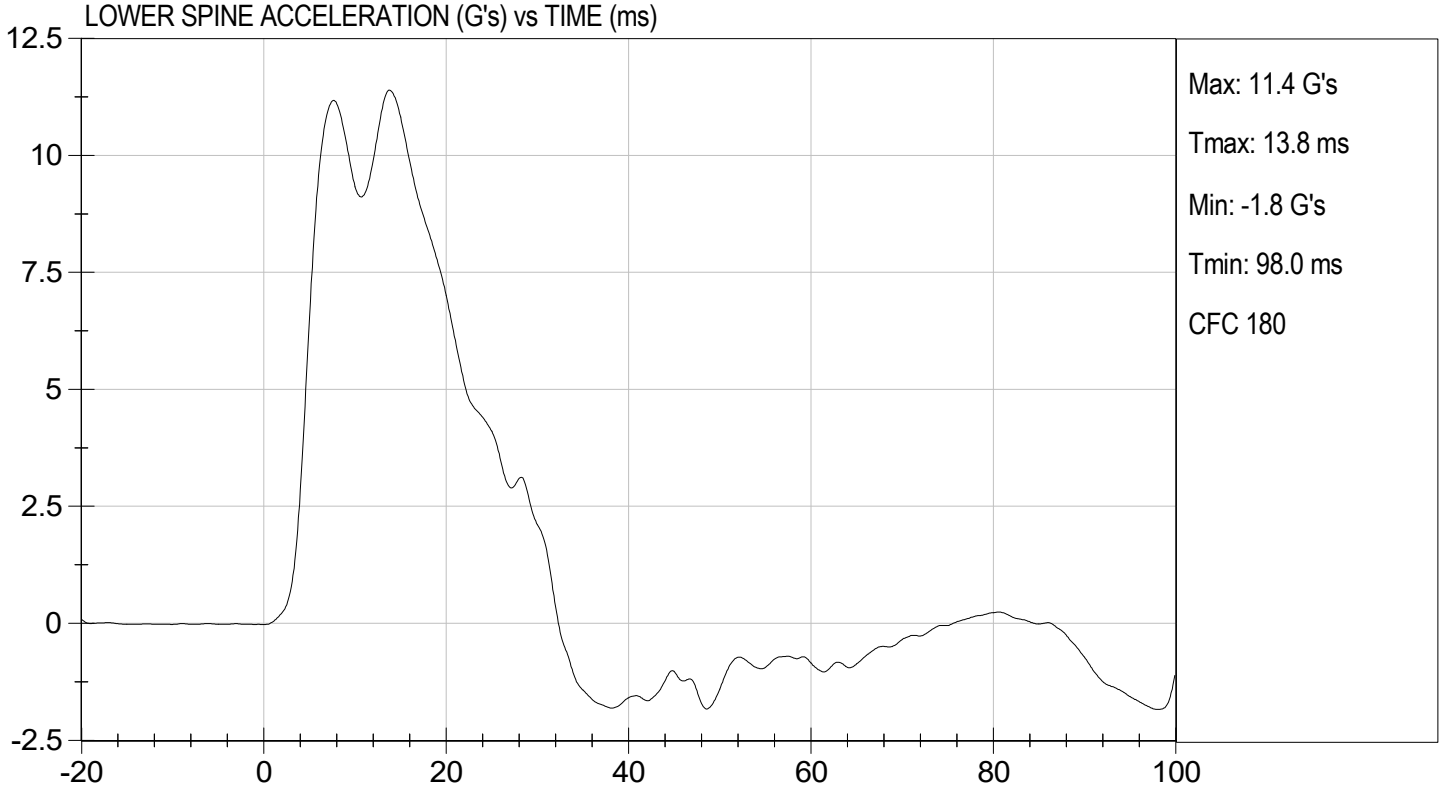
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 11/21/2022
TEST #: D222686

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:** D222687

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	17	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	3,691	Pass
		Overall Test Results		Pass

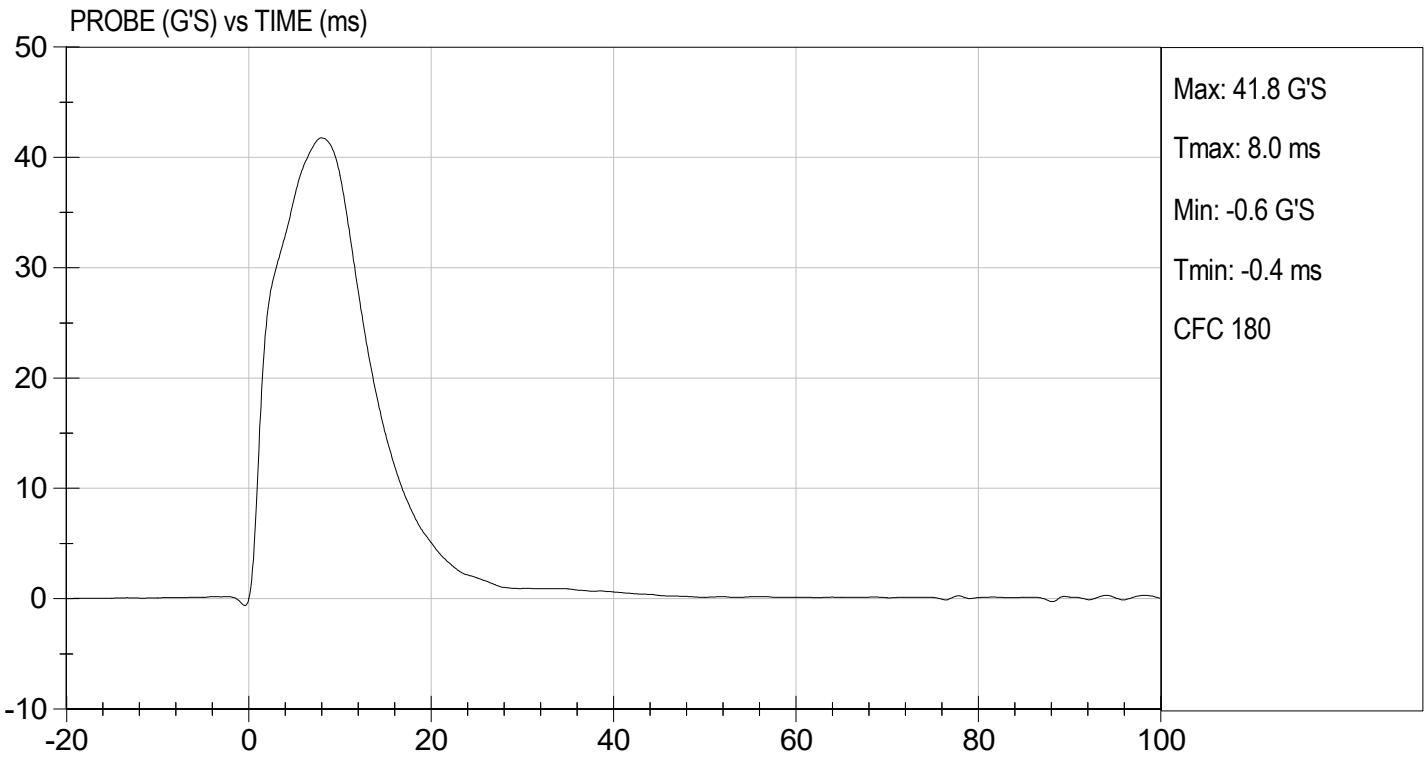
Laboratory Technician

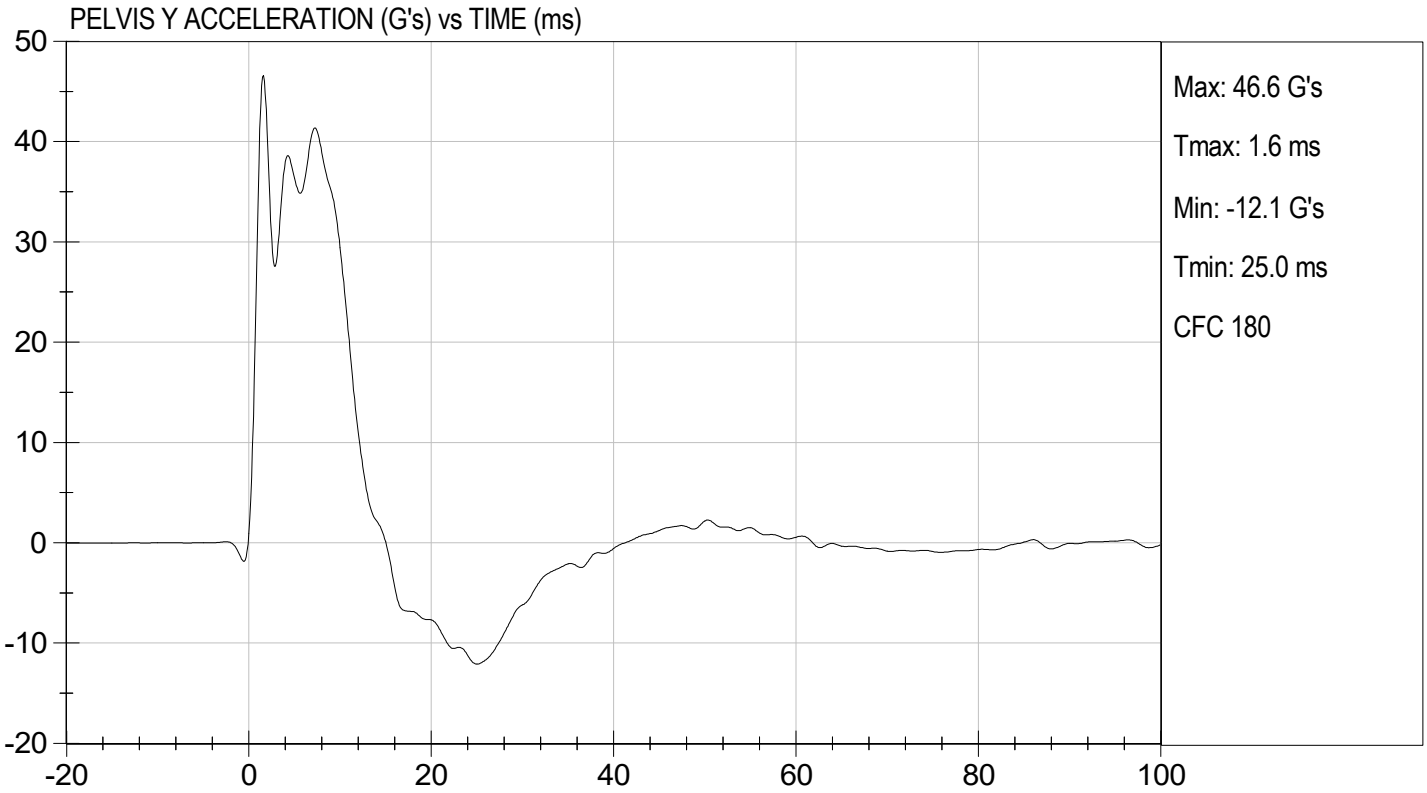
11/21/2022
Test Date

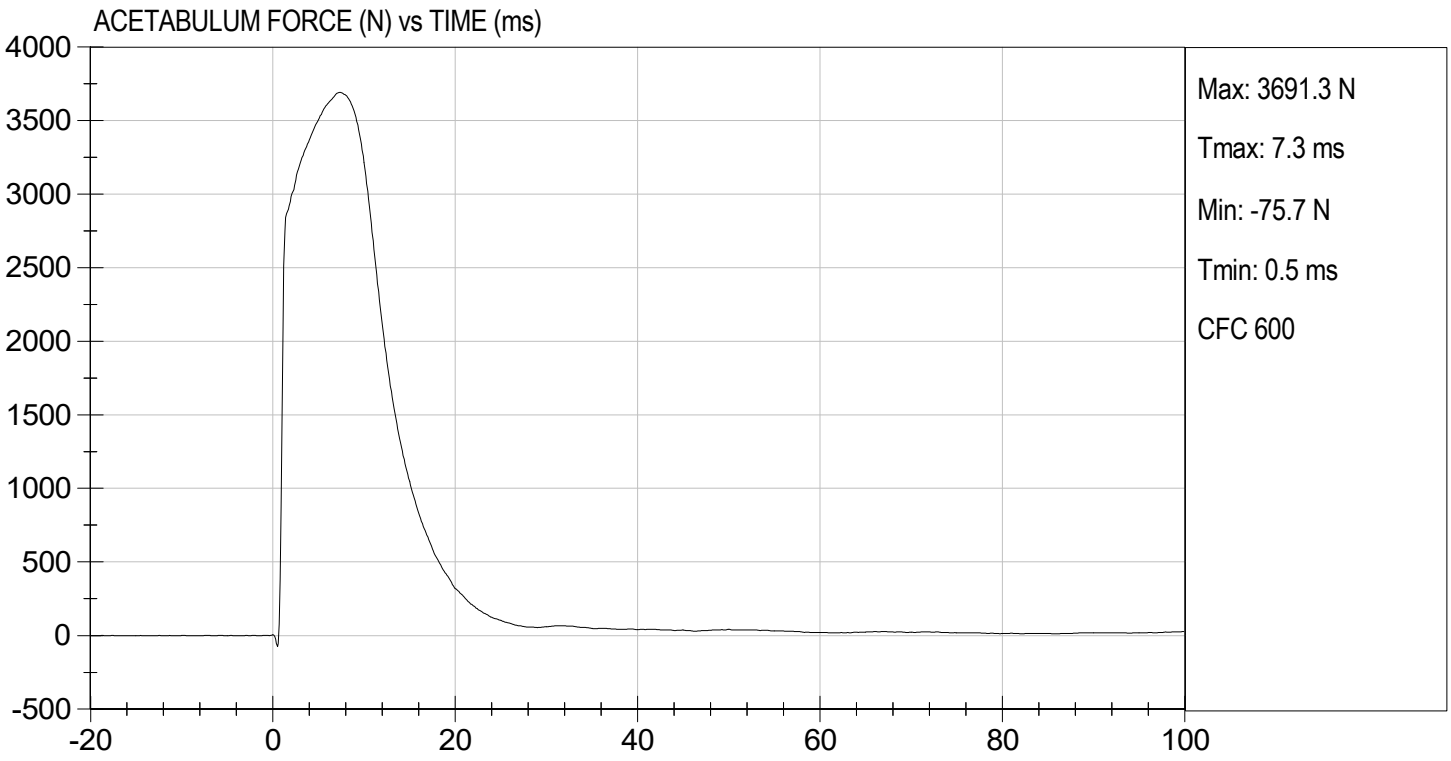
Approved By

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

TEST DATE: 11/21/2022
TEST #: D222687






ACETABULUM FORCE (N) vs TIME (ms)
4000
3500
3000
2500
2000
1500
1000
500
0
-500
-20
0
20
40
60
80
100
Max: 3691.3 N
Tmax: 7.3 ms
Min: -75.7 N
Tmin: 0.5 ms
CFC 600

MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D222688

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	36 to 45	41	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,717	Pass
		Overall Test Results		Pass

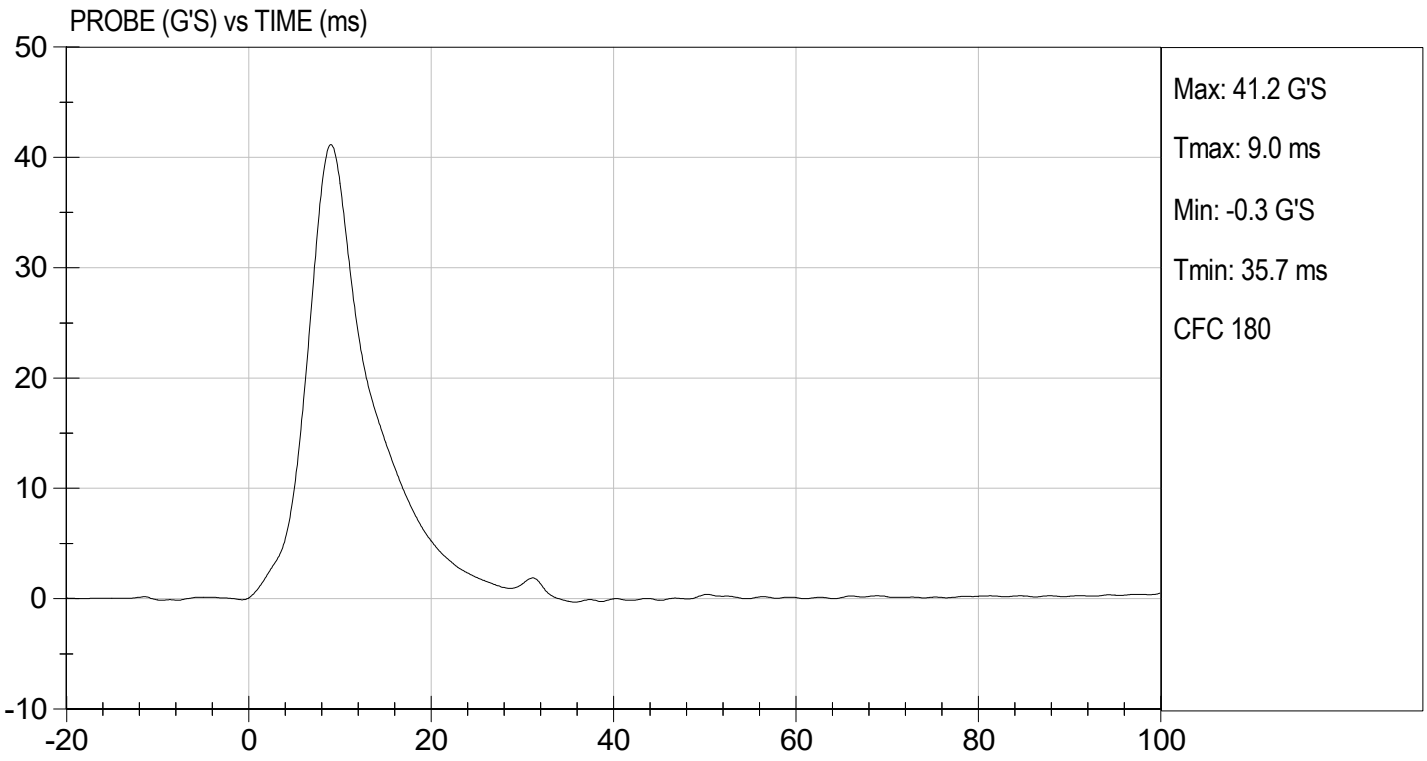
Laboratory Technician

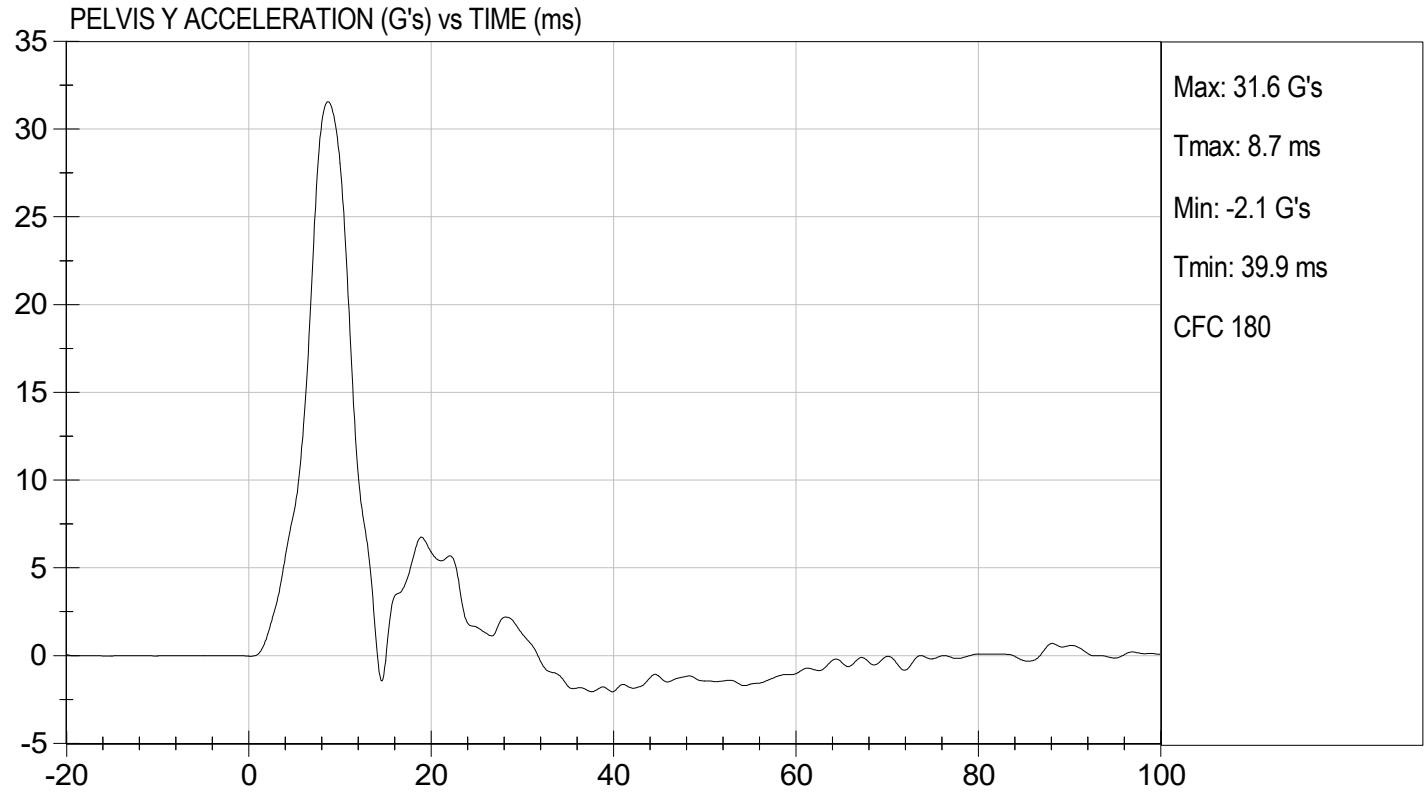
11/18/2022
Test Date

Approved By

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

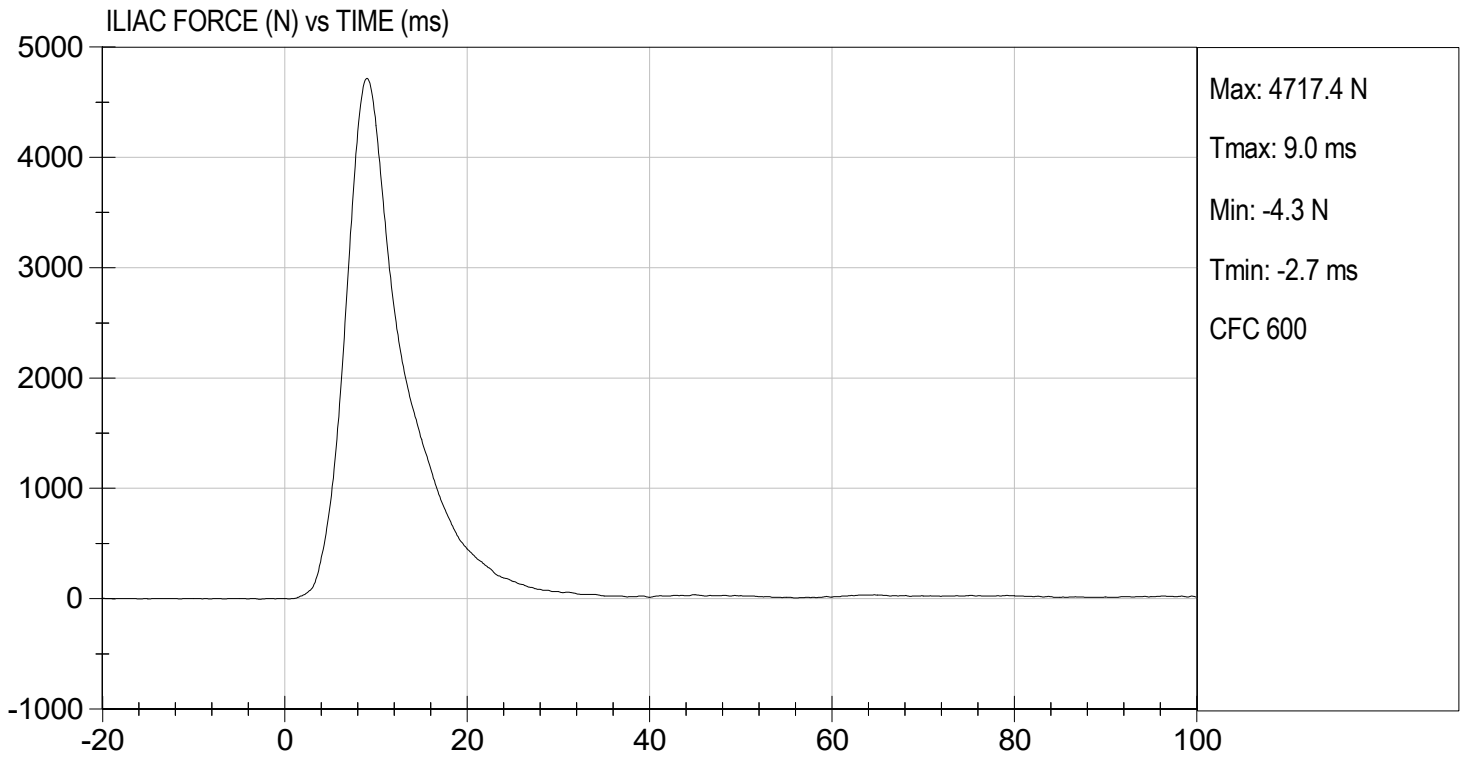
TEST DATE: 11/18/2022
TEST #: D222688





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

TEST DATE: 11/18/2022
TEST #: D222688



SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 15345
Test Number 19692
Report Number 19744
Test Date 7/20/2021 12:21:28 PM

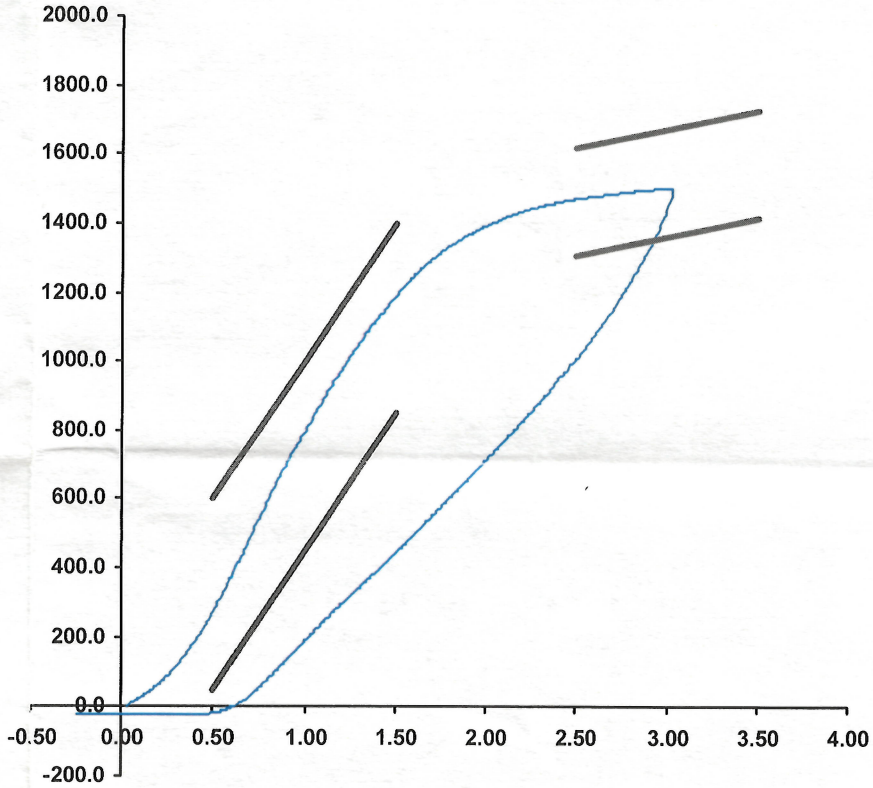
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	283	50	600
Force @ 1.5 mm (N)	1,193	850	1,400
Force @ 2.5 mm (N)	1,473	1,306	1,618
Force @ 3.0 mm (N)	1,505	1,361	1,673

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 20-Jul-21
SACO Research

By : DC Date : 7/20/2021

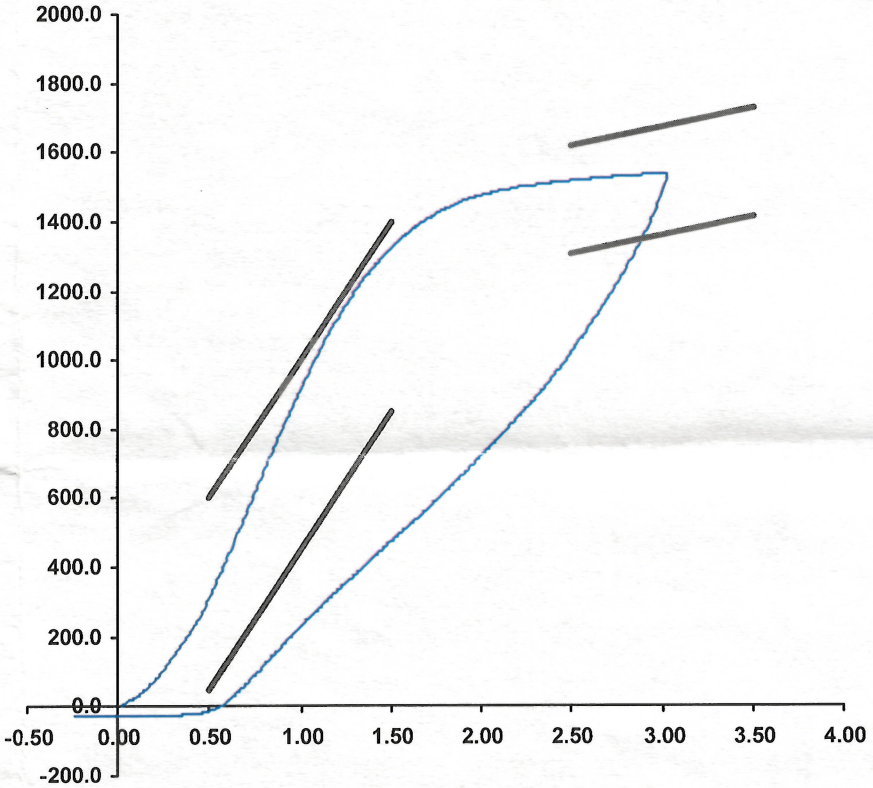
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 15321
Test Number 18196
Report Number 18244
Test Date 3/22/2021 1:02:49 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	317	50	600
Force @ 1.5 mm (N)	1,325	850	1,400
Force @ 2.5 mm (N)	1,519	1,306	1,618
Force @ 3.0 mm (N)	1,540	1,361	1,673

Force (-N) vs Extension (-mm)



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:

Operator

Part Number 180-4450

Template No 107 22-Mar-21
SACO Research

By : DC Date : 3/22/2021

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	P79445	Endevco	07/07/2022
			Y	P79721	Endevco	07/07/2022
			Z	P79724	Endevco	07/07/2022
			Xr	P84999	Endevco	07/07/2022
			Yr	P85000	Endevco	07/07/2022
			Zr	P85001	Endevco	07/07/2022
Head Angular Rate Sensors			X	ARS7423	DTS	03/15/2022
			Y	ARS7547	DTS	03/14/2022
			Z	ARS7586	DTS	03/14/2022
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	07/07/2022
		Middle	Y	G2403	FTSS	07/07/2022
		Lower	Y	G1270	FTSS	07/07/2022
	Abdominal Rib	Upper	Y	G032	FTSS	07/07/2022
		Lower	Y	MJ5171	Medius	07/07/2022
Lower Spine Accelerometers (T12)			X	P96332	Endevco	07/07/2022
			Y	P96335	Endevco	07/07/2022
			Z	P96341	Endevco	07/07/2022
Acetabulum Load Cell			Y	ACG4285	FTSS	08/18/2022
Iliac Wing Load Cell			Y	IWG3023	FTSS	08/18/2022
Pelvis Plug (struck side)				15345	SACO	07/20/2021
Pelvis Plug (non-struck side)				15321	SACO	03/22/2021

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	T32158	Endevco	07/18/2022
Vehicle Center of Gravity	Y	T30591	Endevco	07/15/2022
Vehicle Center of Gravity	Z	T30605	Endevco	07/15/2022
Left Floor Sill	Y	P94812	Endevco	10/26/2022
A-Pillar Sill	Y	A340608	MSI	08/08/2022
A-Pillar Low	Y	T32359	Endevco	11/01/2022
A-Pillar Mid	Y	T32322	Endevco	11/01/2022
B-Pillar Sill	Y	T25667	Endevco	11/10/2022
B-Pillar Low	Y	T30587	Endevco	11/10/2022
B-Pillar Mid	Y	T32204	Endevco	11/01/2022
Driver Seat	Y	T30614	Endevco	07/15/2022
Engine Top	X	T32159	Endevco	11/11/2022
Engine Top	Y	T29884	Endevco	11/11/2022
Firewall	Y	A383139	MSI	06/16/2022
Right Roof	Y	P82614	Endevco	10/20/2022
Right Floor Sill	Y	P88336	Endevco	10/26/2022
Rear Floorpan	X	T30582	Endevco	11/11/2022
Rear Floorpan	Y	T32164	Endevco	11/11/2022

Table 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	DG6277	FTSS	07/30/2018
Load Cell 2	DG6278	FTSS	07/30/2018
Load Cell 3	DG6279	FTSS	07/30/2018
Load Cell 4	DG6280	FTSS	07/30/2018
Load Cell 5	DG6281	FTSS	07/30/2018
Load Cell 6	DG6283	FTSS	07/30/2018
Load Cell 7	DG6284	FTSS	07/30/2018
Load Cell 8	DG6582	FTSS	07/30/2018