

**REPORT NUMBER: SideNCAPMDB-MGA-23-002**

**NEW CAR ASSESSMENT PROGRAM (NCAP)  
Moving Deformable Barrier Side Impact Test**

**HONDA DEVELOPMENT & MANUFACTURING OF AMERICA, LLC  
2023 Acura Integra A-Spec Tech 5-Door Hatchback  
NHTSA No.: O20235302**

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



**Test Date: November 17, 2022**

**Final Report Date: November 22, 2023**

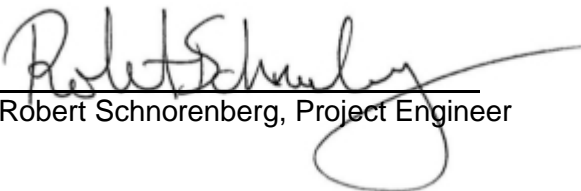
**FINAL REPORT**

**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: November 22, 2023

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: \_\_\_\_\_

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

Date: \_\_\_\_\_

## TECHNICAL REPORT DOCUMENTATION PAGE

<b>1. Report No.</b> SideNCAPMDB-MGA-23-002	<b>2. Government Accession No.</b>	<b>3. Recipient's Catalog No.</b>																																																					
<b>4. Title and Subtitle</b> Final Report of New Car Assessment Program Side Impact MDB Testing of 2023 Acura Integra A-Spec Tech 5-Door Hatchback, NHTSA No.: O20235302		<b>5. Report Date</b> November 22, 2023																																																					
<b>7. Author(s)</b> Ben Fischer, Program Manager		<b>6. Performing Organization Code</b> MGA																																																					
<b>9. Performing Organization Name and Address</b> MGA Research Corporation 5000 Warren Road Burlington, WI 53105		<b>8. Performing Organization Report No.</b> SideNCAPMDB-MGA-23-002																																																					
<b>12. Sponsoring Agency Name and Address</b> U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-100) 1200 New Jersey Ave, SE Washington, D.C. 20590		<b>10. Work Unit No.</b>																																																					
<b>15. Supplementary Notes</b>		<b>11. Contract or Grant No.</b> 693JJ920D000017																																																					
<b>16. Abstract</b> A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact 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 MDB Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at the MGA Research Corporation facility in Burlington, Wisconsin on November 17, 2022.  The impact velocity of the Moving Deformable Barrier (MDB) was 61.82 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 target vehicle post-test maximum crush was 176 mm at level 2. The test vehicle's performance was as follows:		<b>13. Type of Report and Period Covered:</b> Final Test Report November 17, 2022 to November 22, 2023																																																					
		<b>14. Sponsoring Agency Code</b> NRM-100																																																					
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<b>17. Key Words</b> New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		<b>18. Distribution Statement</b> 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 moving deformable barrier side 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 Laboratory Test Procedure dated March 2020.

### **SUMMARY**

A 2023 Acura Integra A-Spec Tech 5-Door Hatchback was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.82 km/h. The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin on November 17, 2022. Pre-test and post-test photographs of the test vehicle, the MDB, and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS NCAP Side Laboratory Test Procedure dated March 2020. The side impact event was documented by eleven (11) cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

#### **DRIVER ATD (ES-2re)**

- Primary and Redundant Head CG Triaxial Accelerometers
- Chest Upper Rib, Middle Rib, and Lower Rib Y-Axis Displacement Potentiometers
- Abdomen Forward, Middle, and Rear Y-Axis Load Cells
- Lower Spine (T12) Triaxial Accelerometers
- Pubic Symphysis Y-Axis Load Cell

#### **PASSENGER ATD (SID-IIs)**

- Primary and Redundant Head CG Triaxial Accelerometers
- Head Triaxial Angular Rate Sensors
- Chest Upper Rib, Middle Rib, and Lower Rib Y-Axis Displacement Potentiometers
- Abdomen Upper Rib and Lower Rib Y-Axis Displacement Potentiometers
- Lower Spine (T12) Triaxial Accelerometers
- Acetabulum and Iliac Wing Y-Axis Load Cells

Appendix B contains the 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.

Dummy Injury readings were recorded as follows:

### DUMMY INJURY VALUES

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC <sub>36</sub> )		1000	144.976
Maximum Thorax Rib Deflection	mm	44	23.877
Total Abdominal Force	N	2500	1007.451
Pubic Symphysis Force	N	6000	1336.931
Resultant Lower Spine Acceleration	g	82*	37.934

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC <sub>36</sub> )		1000	239.346
Resultant Lower Spine Acceleration	g	82	60.372
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2363.039
Maximum Thoracic Rib Deflection	mm	38*	26.091
Maximum Abdomen Rib Deflection	mm	45*	21.830

\*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	Yes	Yes
Side Airbag (Other)				
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other:	No		No	

The test data can be found on the NHTSA website at [www.nhtsa.gov](http://www.nhtsa.gov)

### GENERAL COMMENTS

Right Front Sill X recorded no valid data after 7 ms.

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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	O20235302	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	19UDE4G71PA004819	Driver Front Airbag	Yes
Body Color	Performance Red Pearl	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	140 km / 87 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	No
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		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)	1820
Date of Manufacture	08/'22	GAWR Front (kg)	965
Vehicle Type	Passenger Car	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 68.04 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	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 MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**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 1422	1VYOF BEKL 1422
DOT Safety Code Right	1VYOF BEKL 1422	1VYOF BEKL 1422

**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 MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**TEST VEHICLE TIRE PRESSURES**

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

**MDB TIRE SPECIFICATIONS**

	Requirement	Units	LF	RF	LR	RR
Tire Size	P205/75R15	N/A	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	200 ± 21	kPa	200	200	200	200

**TEST VEHICLE AXLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	411.5	288.5		457.5	362.0		451.5	369.0	
Right	kg	417.0	274.0		419.0	319.5		417.5	327.0	
Ratio	%	59.6%	40.4%		56.3%	43.7%		55.5%	44.5%	
Totals	kg	828.5	562.5	1391.0	876.5	681.5	1558.0	869.0	696.0	1565.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1391.0	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	45	(C)
Calculated Test Vehicle Target Weight (TVTWTW)	kg	1565.0	(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	Fully Loaded	As Tested	Meets Requirement*
Left Front	mm	671	672	Yes
Right Front	mm	679	673	Yes
Right Rear	mm	667	667	Yes
Left Rear	mm	651	648	Yes
Vehicle CG (Aft of Front Axle)	mm	1217	1197	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	37	40	

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

\*\*\* The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well.

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: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**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	4

**TEST SURFACE MARKINGS**

	Units	Distance from 63° Impact Angle Line
Fore 25 mm Target	mm	880
Aft 25 mm Target	mm	905
Pre-Impact Angle Line	mm	100

Parallel Track Target	Units	X Location	Y Location
A	mm	0	0
B	mm		
C	mm		
D	mm		

**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  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**SEAT POSITIONING**

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, 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	31.7	19.3	25.5
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	25.5	0	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  
 Test Program: NCAP Side MDB Impact Test

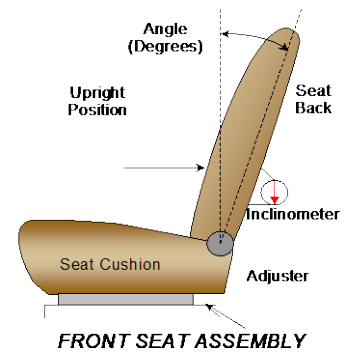
NHTSA No.: O20235302  
 Test Date: 11/17/2022

**SEAT FORE/AFT POSITIONS**

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1 <sup>st</sup> as 1)	mm	Detent (1 <sup>st</sup> as 0)
Driver Seat	240		120	
Front Passenger Seat	210		105	
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 to the manufacturer's designated design angle. 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 seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents (1 <sup>st</sup> as 1)	Degrees	Detent (1 <sup>st</sup> as 0)
Driver Seat	69.3		3.5	
Front Passenger Seat	76.2		2.7	
Front Center Seat				
Struck Side Rear Seat	Fixed		25.8	
Non-Struck Side Rear Seat	Fixed		25.8	
Rear Center Seat	Fixed		25.8	

Seat back angles measured on outboard headrest post.

**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  
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**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)
Rear Seat	Fixed	

**HEAD RESTRAINT ADJUSTMENT**

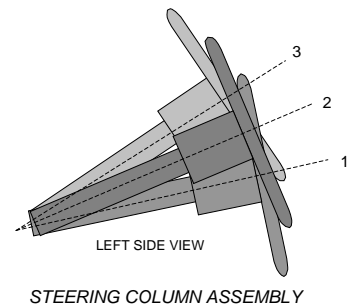
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	4 (Lowest as 0) / Fixed Fore-Aft
Rear Seat	Fixed	

**STEERING COLUMN ADJUSTMENT**

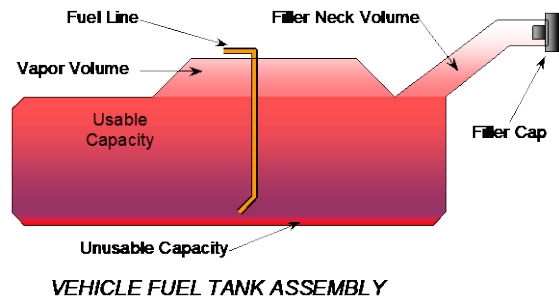
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.

	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	73.2	
Geometric Center, Position 2	70.4	
Uppermost, Position 3	67.5	
Telescoping Steering Wheel Travel		40
Test Position	70.4	20



**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.



**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  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**FUEL TANK CAPACITY DATA**

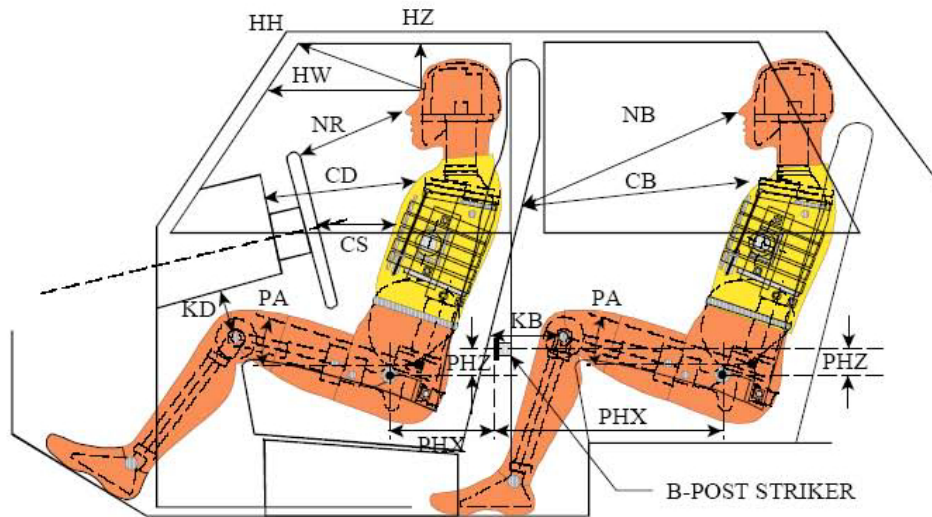
	<b>Liters</b>
Usable Capacity of Standard Tank (see S1 - Vehicle Setup Information)	46.9
Usable Capacity of Optional Tank (see S1 - Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	46.9
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of 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%  $\pm$  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  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022



**LEFT SIDE VIEW**

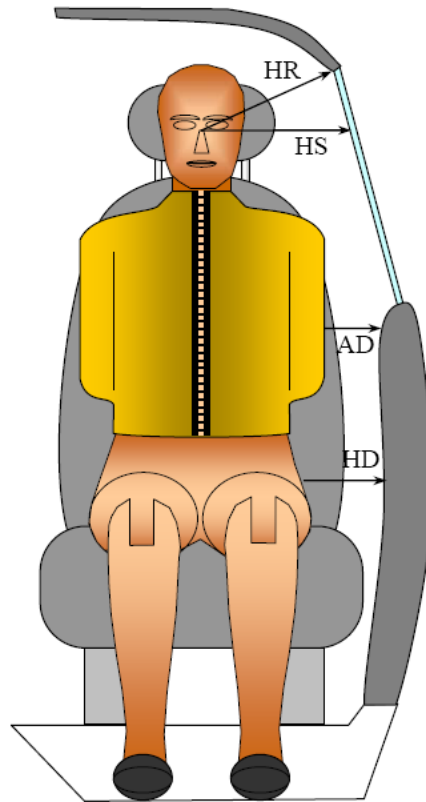
NOTE: 2-DOOR VEHICLE SHOWN.  
 REAR DUMMY PHX & PHZ  
 MEASUREMENTS FOR A 4-DOOR  
 VEHICLE WOULD USE THE C-POST  
 STRIKER AS A REFERENCE POINT

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	404	13.5		
HW		Head to Windshield	654	0		
HZ	HZ	Head to Roof Liner	142	90	219	90
NR	NB	Nose to Rim/Seat Back	457	17.3	570	14.6
CD	CB	Chest to Dashboard/Seat Back	569	6.0	546	6.9
CS		Chest to Steering Wheel	371	12.0		
KDL	KBL	Left Knee to Dash/Seat Back	219	34.2	253	28.0
KDR	KBR	Right Knee to Dash/Seat Back	205	37.8	259	28.5
PAX	PAX	Pelvic Tilt Angle X		24.0		30.4
PAY	PAY	Pelvic Tilt Angle Y		-1.4		-1.6
PHX	PHX	Hip Point to Striker (X-Axis)	205		219	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	260		258	

**DATA SHEET NO. 4**  
**DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

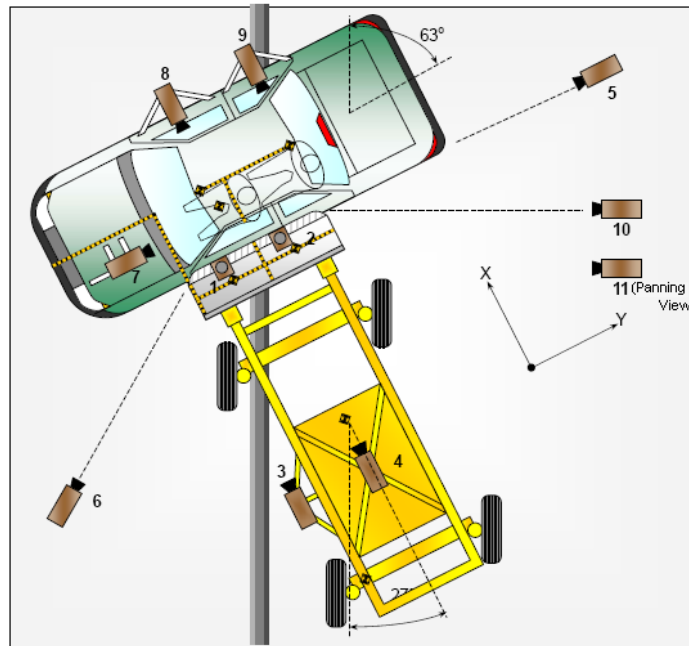


Code	Measurement Description	Driver	Passenger
		Length (mm)	
HR	Head to Side Header	179	227
HS	Head to Side Window	290	393
AD	Arm to Door	98	182
HD	Hip Point to Door	153	194

**DATA SHEET NO. 5  
CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022



**CAMERA LOCATIONS AND DATA**

No.	Camera View	Coordinates* (mm)			Lens (mm)	Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	810	515	-4775	8.5	1000
2	Overhead Close-Up	255	0	-4815	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	-10	6110	-1435	24	1000
6	Left Front	2085	-5920	-1460	24	1000
7	Driver Front (OB)				16	1000
8	Driver Side (OB)				8	1000
9	Passenger Side (OB)				8	1000
10	Real Time Left Rear					30
11	Real Time Inrun					30

Reference: Impact Point projected to Ground; +X = To Front of MDB, +Y = To Right of MDB, +Z = Down

\*All measurements accurate to ±6 mm

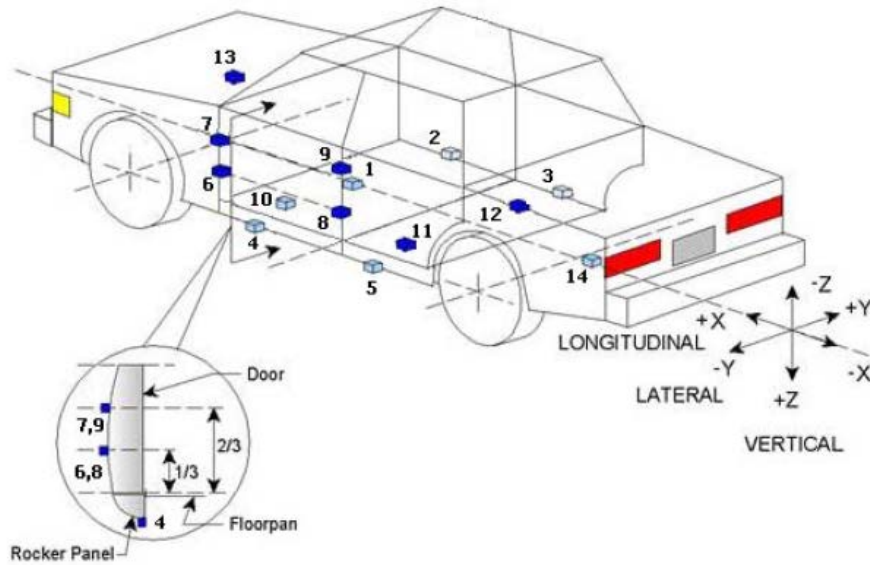
**INSTRUMENTATION**

	Number of Channels
Driver Dummy	16
Passenger Dummy	19
Vehicle Structure	23
MDB Accelerometers	5
<b>Total</b>	<b>63</b>

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

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022



**TEST VEHICLE ACCELEROMETER LOCATIONS**

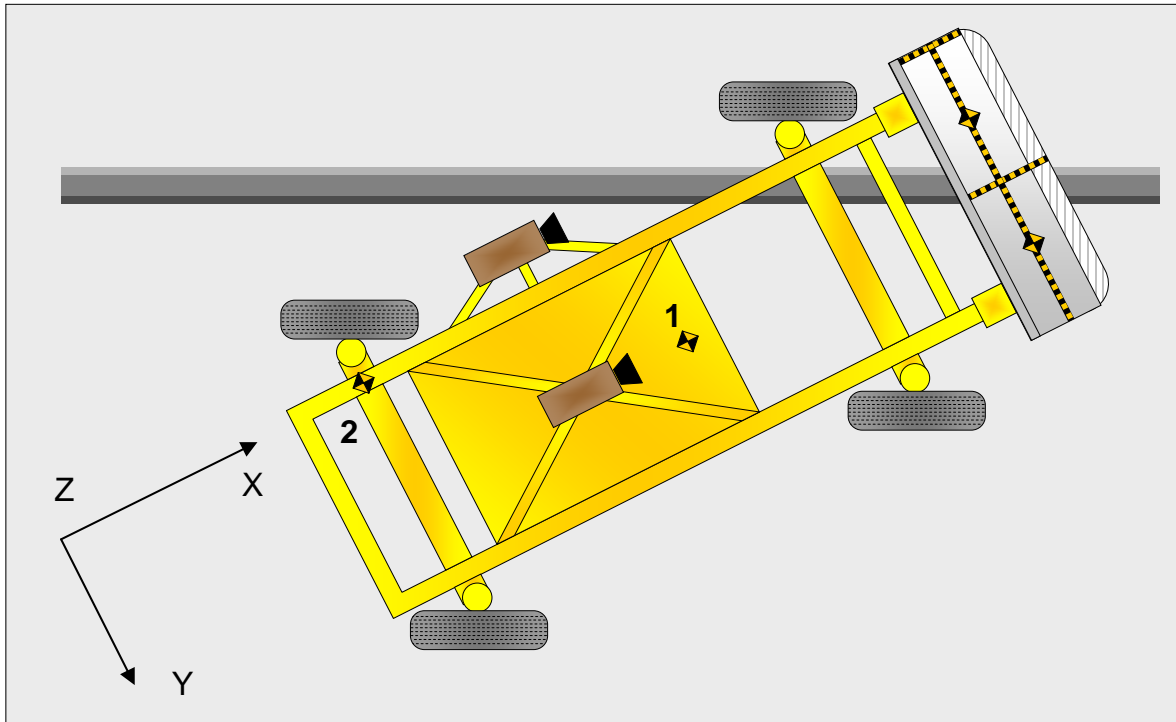
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2523	0	-255
2	Right Sill at Front Seat	2659	754	-178
3	Right Sill at Rear Seat	1606	754	-178
4	Left Sill at Front Door	2659	-754	-178
5	Left Sill at Rear Door	1606	-754	-178
6	Left Lower A-Post	3207	-820	-492
7	Left Middle A-Post	3207	-820	-702
8	Left Lower B-Post	2039	-722	-494
9	Left Middle B-Post	2039	-722	-652
10	Front Seat Track	2276	-399	-209
11	Rear Seat Structure	1847	-336	-270
12	Rt. Rear Occ. Compartment	1847	336	-270
13	Engine Block	3993	35	-776
14	Rear Above Axle	954	0	-489

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

**DATA SHEET NO. 7  
MDB ACCELEROMETER LOCATIONS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022



**MDB ACCELEROMETER LOCATIONS**

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-1105	0	-330
2	MDB Rear	-2580	-650	-625

Reference: X – MDB Face (+ forward)  
 Y – MDB Centerline (+ to right)  
 Z – Ground Plane (+ down)

Width between left and right MDB contact switches	mm	1405
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**DATA SHEET NO. 8  
POST-TEST OBSERVATIONS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**TEST DUMMY INFORMATION AND CONTACT POINTS**

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	Curtain Airbag
Top of Head	Curtain Airbag, Headliner	Curtain Airbag, Headliner, Center Headrest
Left Side of Head	Curtain Airbag, Headliner	Curtain Airbag, Headliner
Back of Head	Headliner, Headrest	Headrest, Seatback
Left Shoulder	None	Side Torso/Pelvis Airbag, Seatback
Upper Torso	Side Torso/Pelvis Airbag, Seatback	Seatback
Lower Torso	Side Torso/Pelvis Airbag, Seatback	Side Torso/Pelvis Airbag, Seatback
Left Hip	Side Torso/Pelvis Airbag, Seat Cushion	Side Torso/Pelvis Airbag, Seat Cushion
Left Knee	None	Door Panel

**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	None
Windshield Damage	None
Side Window Damage	LR 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  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Struck Side Driver		Struck Side 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	Yes	Yes
Side Airbag (Other)				
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other:	No		No	

**IMPACT POINT LOCATION DATA**

Measured Parameter	Units	Tolerance	Value
Vehicle Wheelbase	mm		2736
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		428
Actual Impact Point (Aft of Front Axle)	mm		440
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	-12
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	5

**DATA SHEET NO. 9  
MDB SUMMARY OF RESULTS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

**MDB SPECIFICATIONS**

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1250
Overall Length Including Honeycomb Face	4119
Wheelbase of Framework Carriage	2591
CG Location aft of Front Axle	1127

**MDB WEIGHTS**

	Units	Front Axle	Rear Axle	Total
Left	kg	368.2	320.6	
Right	kg	400.7	271.4	
Ratio	%	56.5	43.5	
Totals	kg	768.9	592.0	1360.9

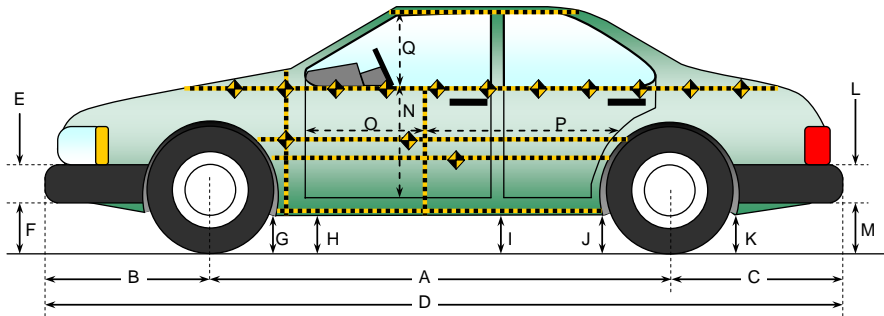
**SPEED AND ANGLE AT IMPACT DATA**

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.82
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.98
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.3
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.7
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27.0

**DATA SHEET NO. 10**  
**TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
Test Date: 11/17/2022



All measurements in (mm) with tolerance of  $\pm 3$  mm

**LEFT SIDE VIEW**

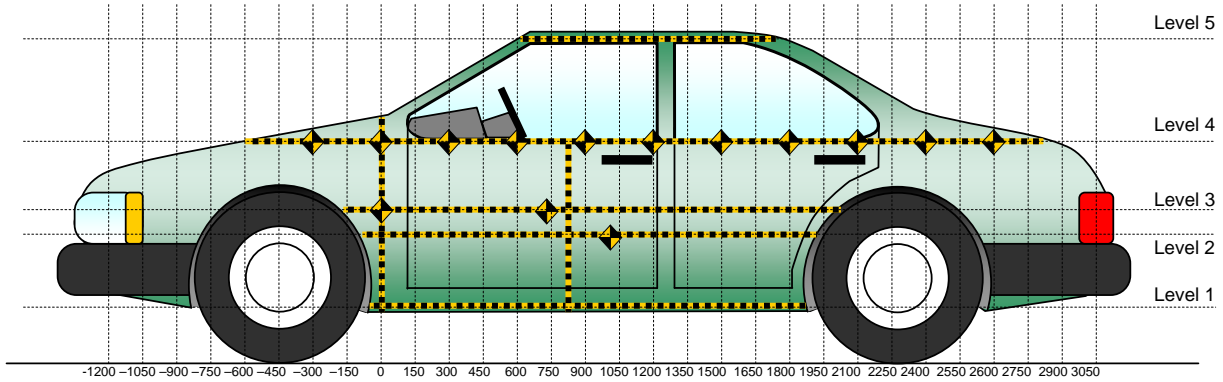
**VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION**

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2736	2738	2
B	Front Axle to FSOV	988	963	-25
C	Rear Axle to RSOV	987	1024	37
D	Total Length at Centerline	4711	4725	14
E	Front Bumper Thickness	93	93	0
F	Front Bumper Bottom to Ground	205	207	2
G	Sill Height at Front Wheel Well	161	162	1
H	Sill Height at Front Door Leading Edge	150	155	5
I	Sill Height at B Pillar	157	160	3
J1	Sill Height at Rear Wheel Well	162	157	-5
J2	Pinch Weld Height at Rear Wheel Well	152	157	5
K	Sill Height Aft of Rear Wheel Well	210	221	11
L	Rear Bumper Thickness	142	142	0
M	Rear Bumper Bottom to Ground	261	269	8
N	Sill Height to Window Bottom Sill	709	618	-91
O	Front Door Leading Edge to Impact CL	805	724	-81
P	Rear Door Trailing Edge to Impact CL	1169	1108	-61
Q	Front Window Opening	425	410	-15
R	Right Side Length	3374	3376	2
S	Left Side Length	3374	3374	0
T	Vehicle Width at B Post	1821	1768	-53
U	Front Wheel Track Width	1537		
V	Rear Wheel Track Width	1563		

**DATA SHEET NO. 11**  
**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022



All Measurements Shown in mm

**LEFT SIDE VIEW**

**MAXIMUM EXTERIOR CRUSH MEASUREMENTS**

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	283	75	600
2	Occupant H-Point	457	176	600
3	Mid Door	590	168	1350
4	Window Sill	896	133	1800
5	Window Top	1330	2	1350

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

**DATA SHEET NO. 11 (CONTINUED)**  
**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022

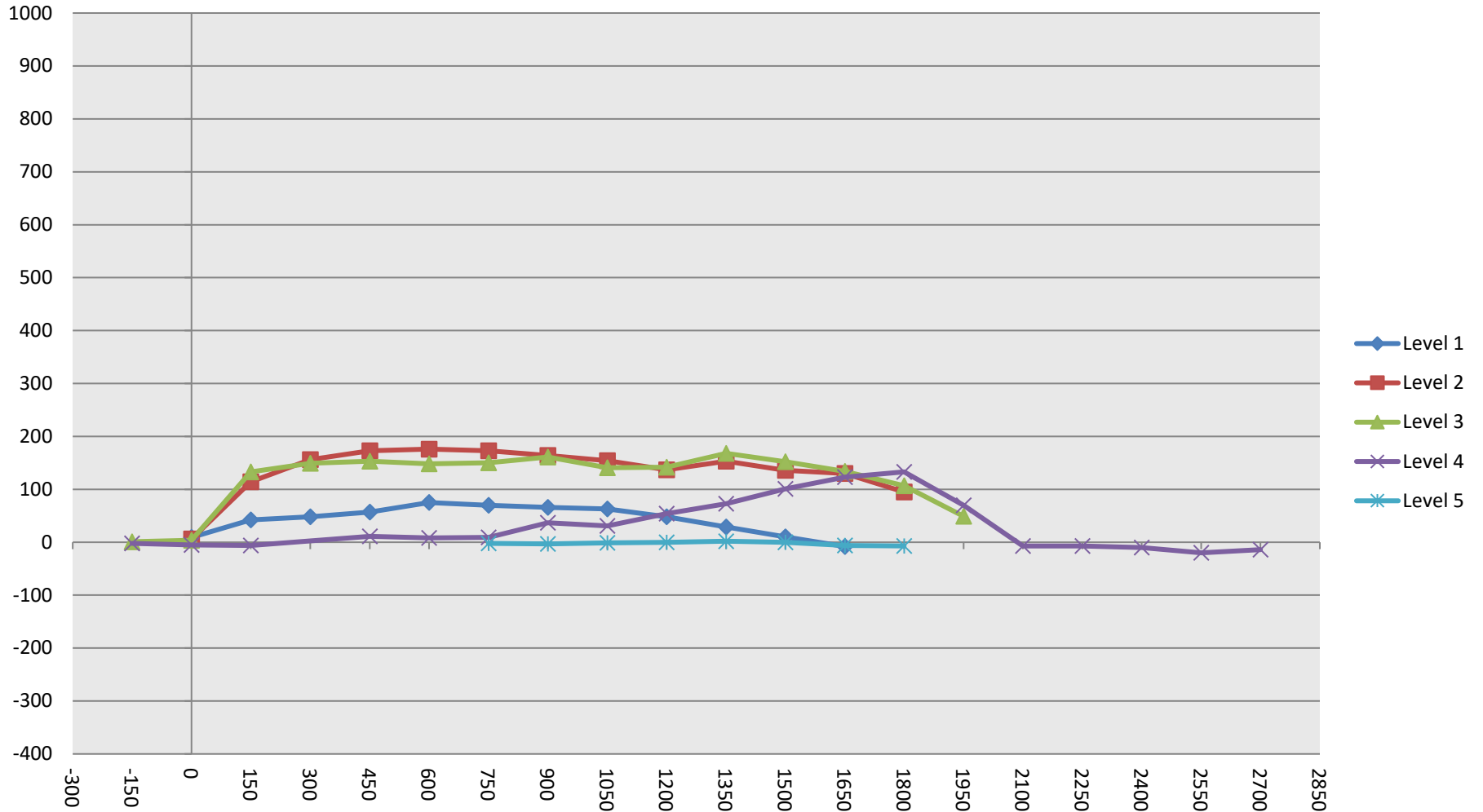
	Pre-Test					Post-Test					Exterior Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900															
-750															
-600															
-450															
-300															
-150			199	330				200	328				1	-2	
0	231	209	207	313		240	215	211	308		9	6	4	-5	
150	232	215	210	299		274	329	343	293		42	114	133	-6	
300	225	214	208			273	370	357			48	156	149		
450	220	212	205	280		277	385	358	291		57	173	153	11	
600	214	210	203	271		289	386	351	279		75	176	148	8	
750	210	208	201	264	528	280	381	351	273	526	70	173	150	9	-2
900	209	206	200	259	503	275	370	361	296	500	66	164	161	37	-3
1050	207	204	200	255	495	270	358	341	286	494	63	154	141	31	-1
1200	207	205	201	250	492	255	342	343	304	492	48	137	142	54	0
1350	209	205	205	250	489	238	358	373	323	491	29	153	168	73	2
1500	215	202	205	251	494	225	338	357	352	494	10	136	152	101	0
1650	219	201	202	252	507	211	331	336	375	501	-8	130	134	123	-6
1800		198	196	253	541		293	303	386	534		95	107	133	-7
1950			190	260				239	330				49	70	
2100				260					253					-7	
2250				263					256					-7	
2400				269					259					-10	
2550				277					257					-20	
2700				290					276					-14	
2850															
3000															
3150															
3300															
3450															
3600															
3750															
3900															

NOTE: 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.

**DATA SHEET NO. 11 (CONTINUED)**  
**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

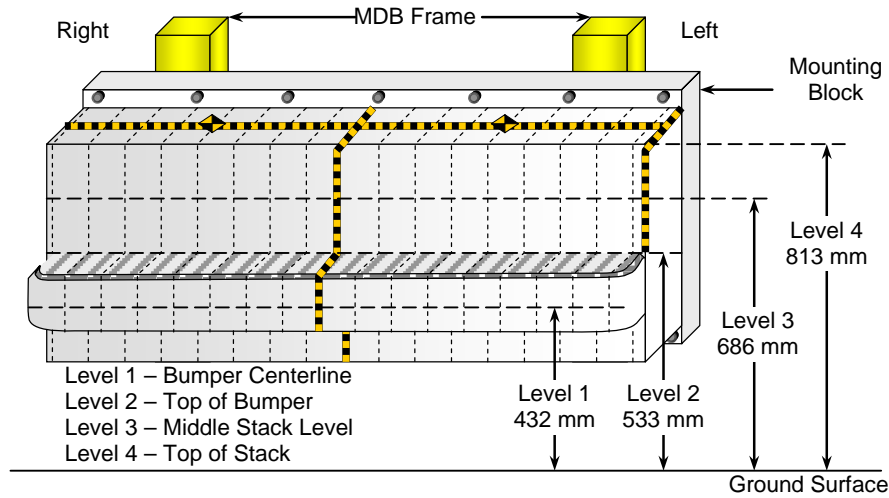
NHTSA No.: O20235302  
 Test Date: 11/17/2022



**DATA SHEET NO. 12**  
**MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022



**FRONT VIEW**

**MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE**

Row	Vertical Location		From Centerline		Maximum Crush (mm)
	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Left	208
B	Top of Bumper	533	800	Left	133
C	Mid-Level	686	800	Left	132
D	Top of Stack	813	800	Left	170

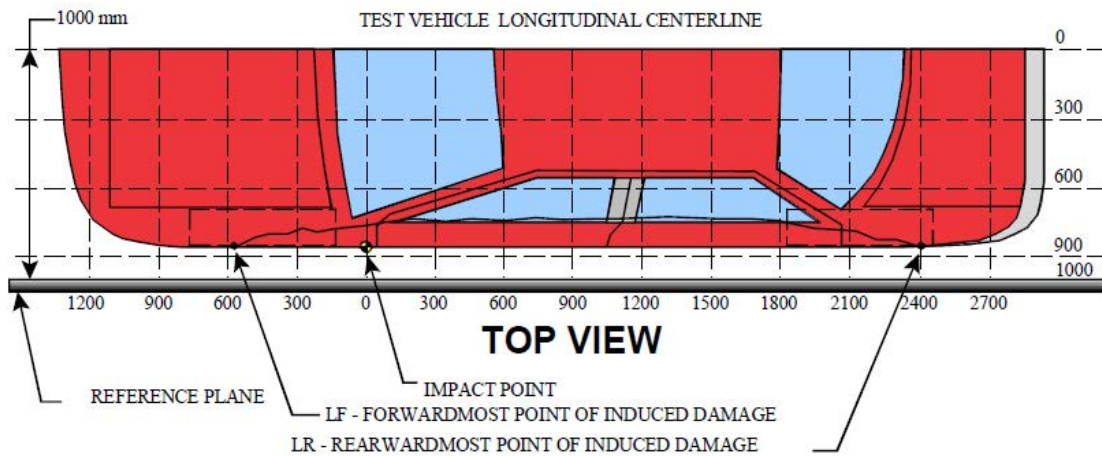
**DEFORMABLE BARRIER STATIC CRUSH**

Stack Level	Distance Right of Center (mm)								C <sub>L</sub>	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
4	6	8	27	47	66	96	138	118	102	109	111	115	124	137	149	160	170
3	50	30	22	28	37	68	84	72	48	44	40	42	48	63	79	103	132
2	98	86	87	80	73	84	82	90	88	78	76	78	85	91	104	124	133
1	170	168	167	167	171	186	182	173	166	155	153	151	152	155	160	180	208

**DATA SHEET NO. 13  
VEHICLE AND MDB DAMAGE PROFILE DISTANCES**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
Test Date: 11/17/2022



**VEHICLE DAMAGE PROFILE DISTANCES**

DPD	Distance from Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Max. Static Crush (mm)
1	2000	3	190	197	-7
2	1580	3	347	203	144
3	1160	3	344	201	143
4	740	3	351	201	150
5	320	3	359	208	151
6	-100	3	203	202	1

**MDB DAMAGE PROFILE DISTANCES**

DPD	Distance from Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Max. Static Crush (mm)
1	800 mm right of center	1	646	476	170
2	480 mm right of center	1	637	463	174
3	160 mm right of center	1	640	463	177
4	160 mm left of center	1	607	463	144
5	480 mm left of center	1	631	463	168
6	800 mm left of center	1	684	476	208

**DATA SHEET NO. 14  
FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

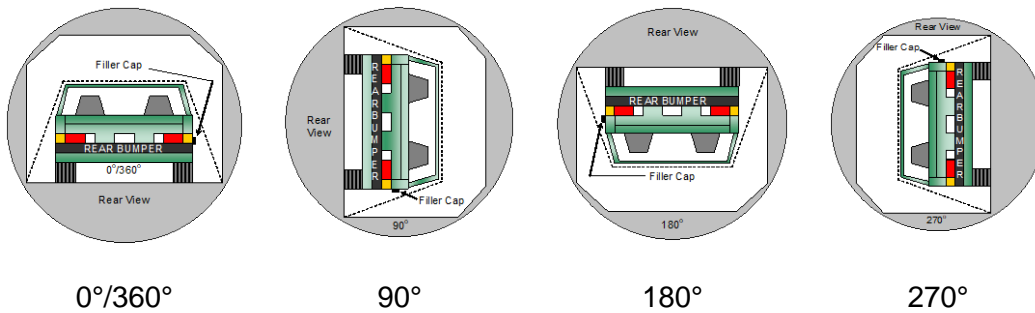
NHTSA No.: O20235302  
 Test Date: 11/17/2022

Test Time: 11:46 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**



**ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	113	300	413
90° to 180°	111	300	411
180° to 270°	107	300	407
270° to 360°	111	300	411

**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	

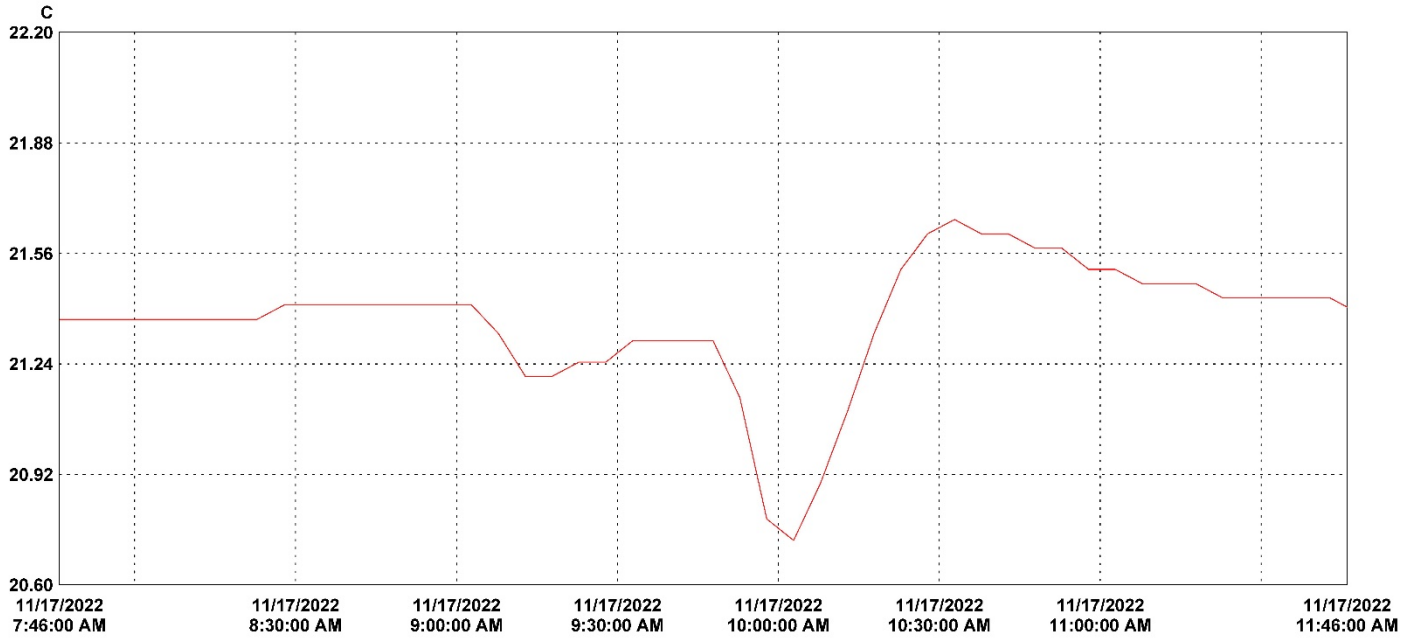
**ROLLOVER SOLVENT SPILLAGE LOCATION TABLE**

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

**DATA SHEET NO. 15**  
**DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA**

Test Vehicle: 2023 Acura Integra A-Spec Tech 5-Door Hatchback  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235302  
 Test Date: 11/17/2022



30 minutes/div 4 hours (M/d/yyyy h:mm:ss tt) Central Time Graph file (truncated): O20235302 2023 Acura Integra A-Spec Tech 4-Door Sedan Side NCAP MDB.

LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	17162078	VSC_North_Hall	1	21.66	21.66	21.36	20.73	C	Temperature	17162078_VSC_North_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

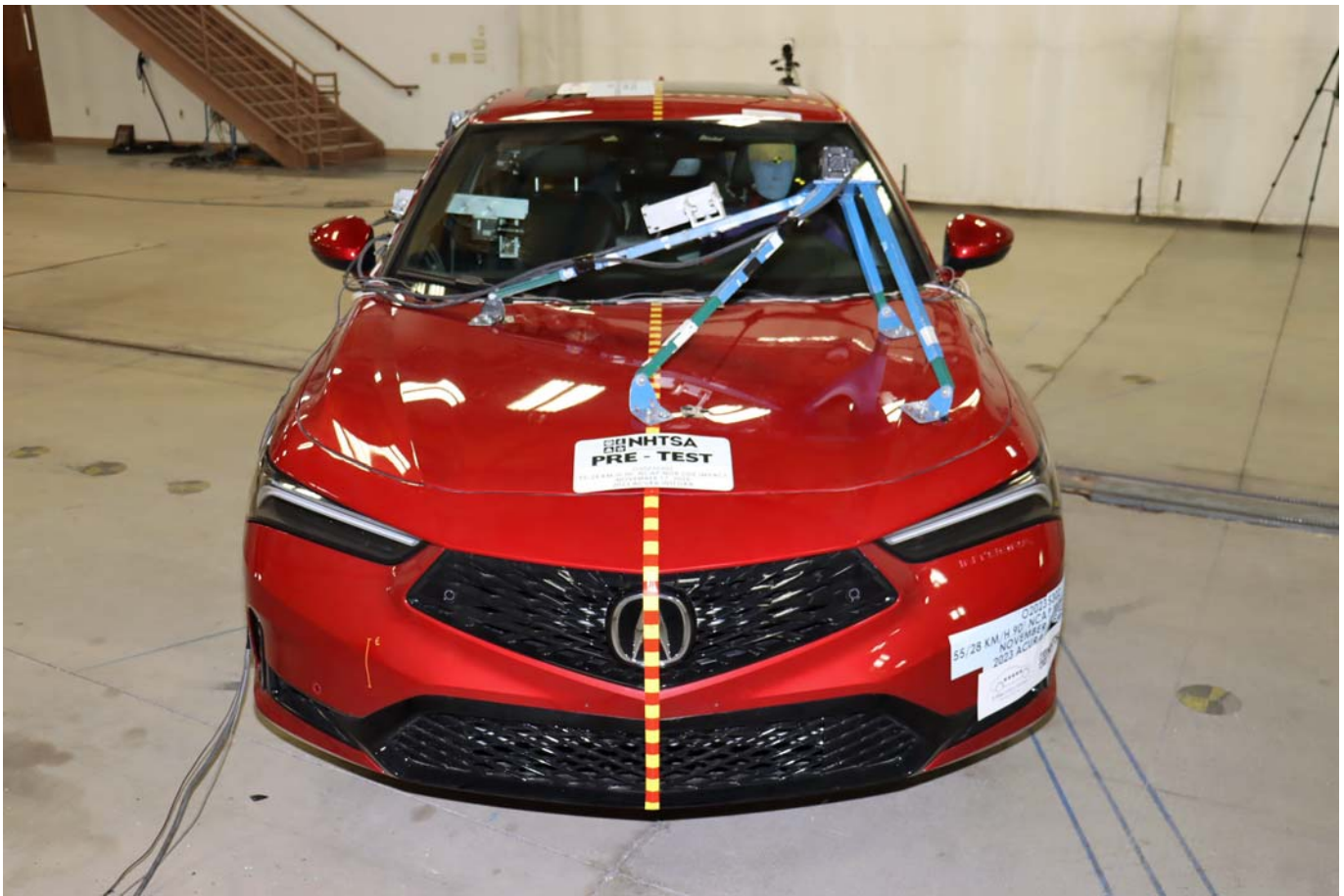


Photo No. 003 - Pre-Test Frontal View of Test Vehicle



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

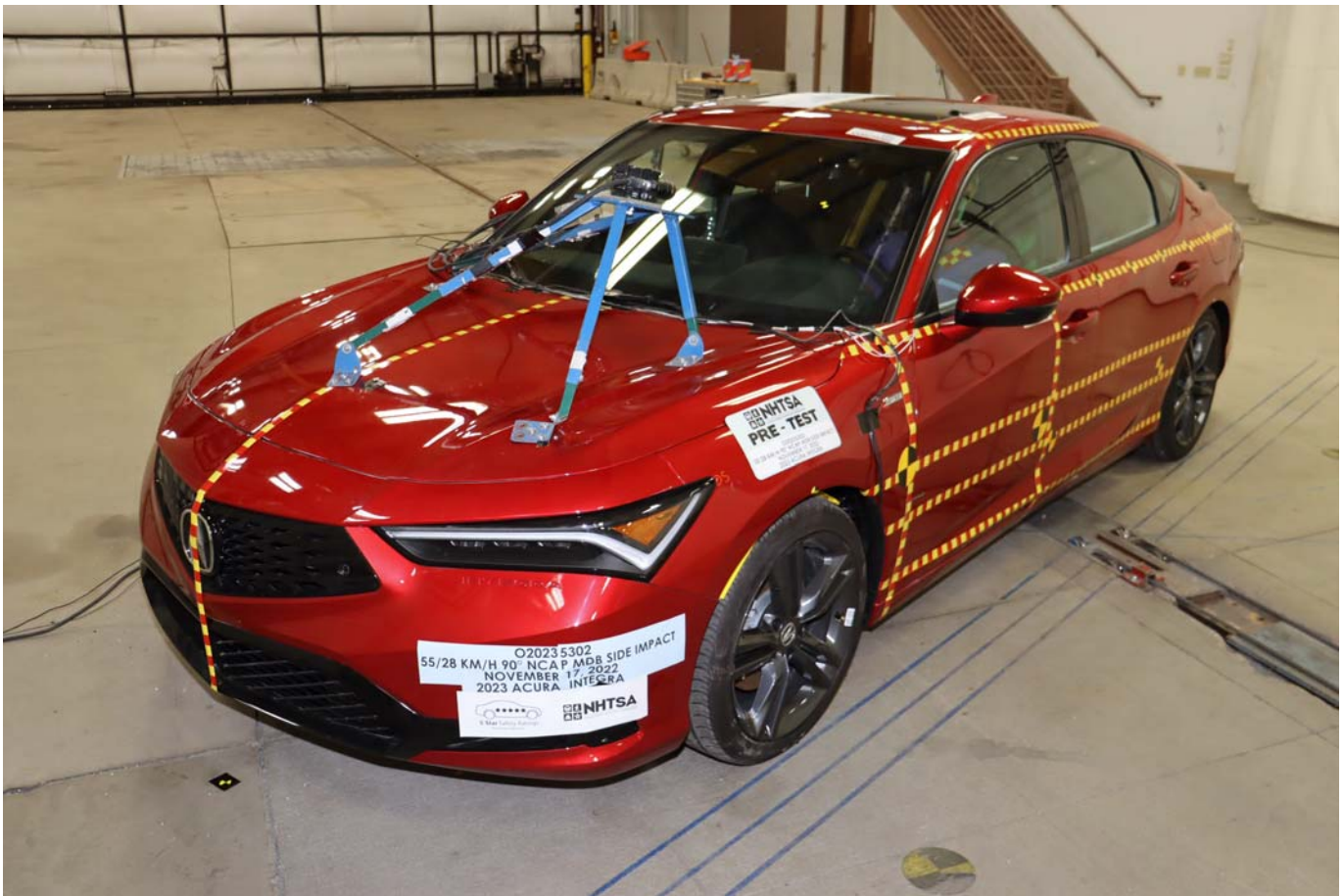


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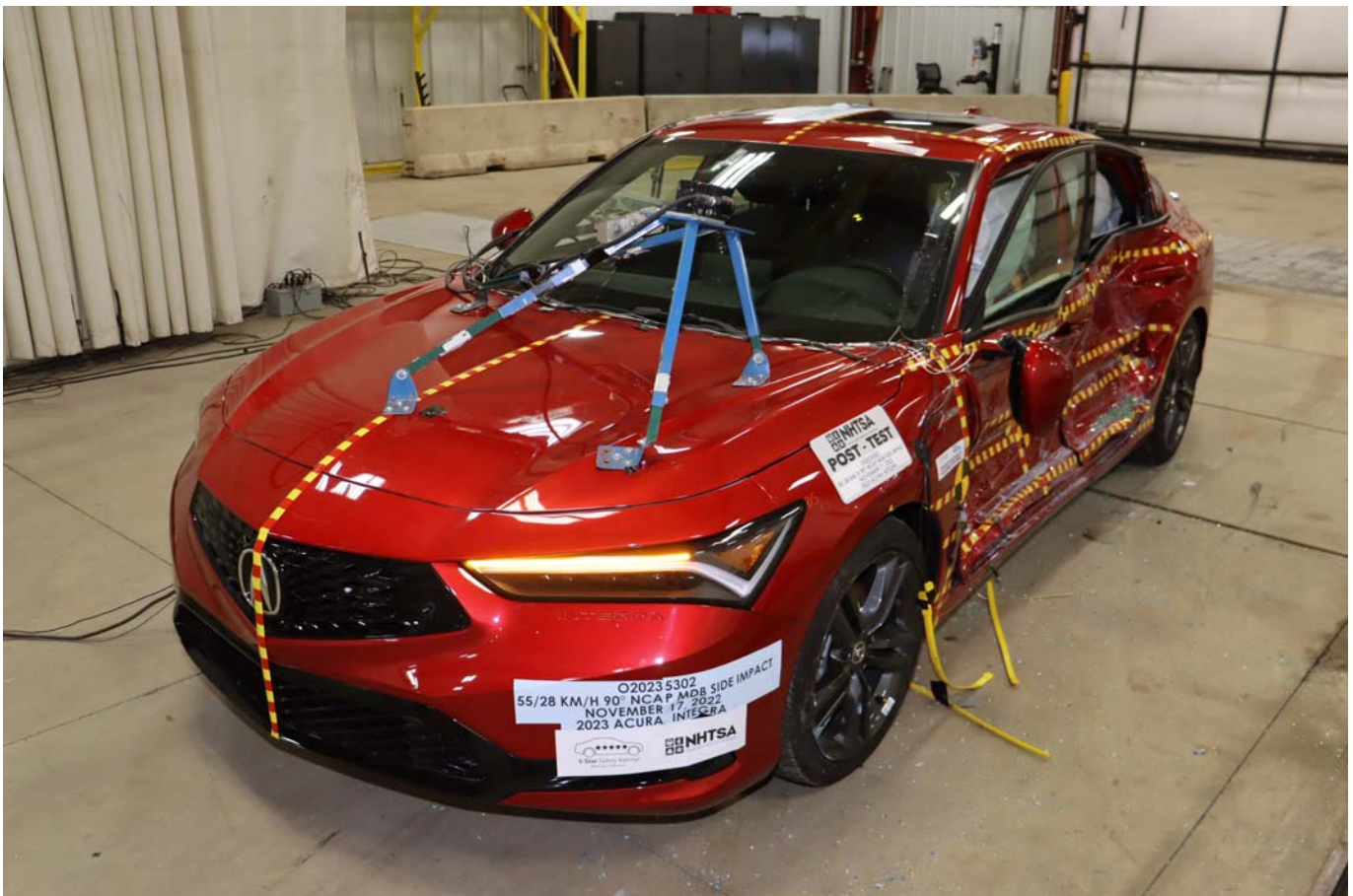


Photo No. 006 - Post-Test Left Front Three-Quarter View of Test Vehicle



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

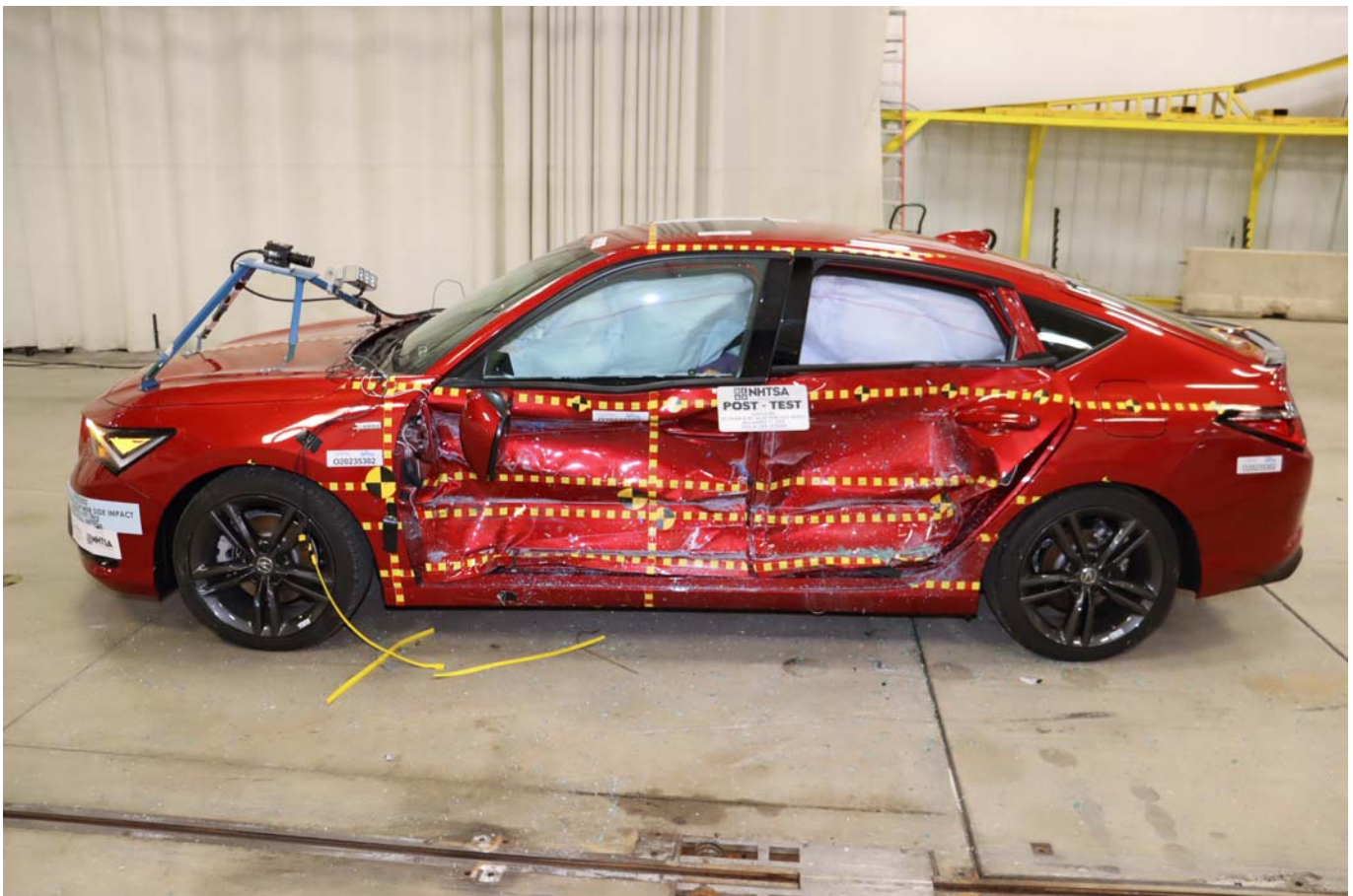


Photo No. 008 - Post-Test Left Side View of Test Vehicle



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



Photo No. 010 - Post-Test Left Three-Quarter Rear 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 MDB Positioned Against Side of Test Vehicle



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



Photo No. 021 - Pre-Test Left Front Door Latch Close-Up

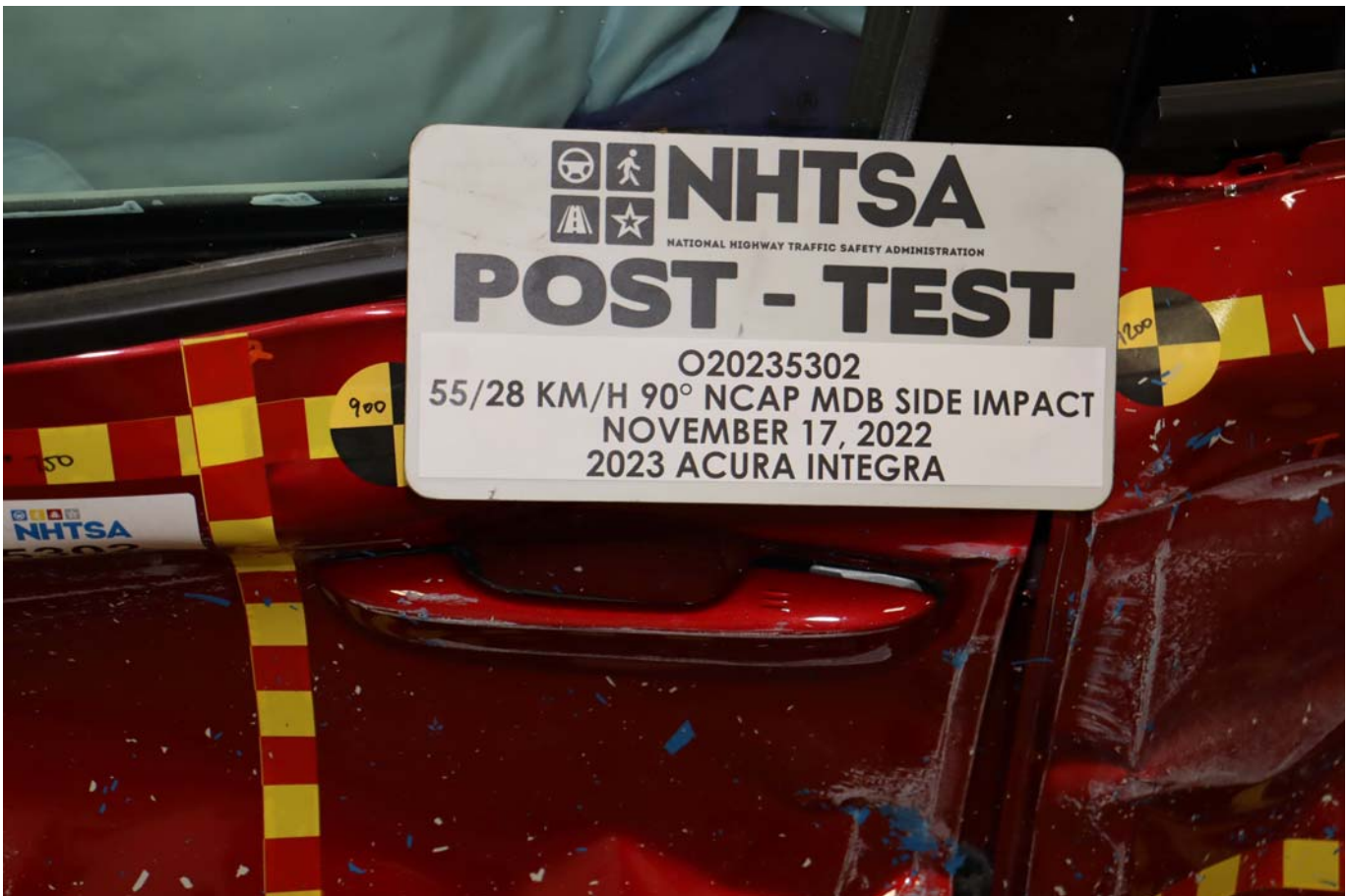


Photo No. 022 - Post-Test Left Front Door Latch Close-Up



Photo No. 023 - Pre-Test Left Rear Door Latch Close-Up

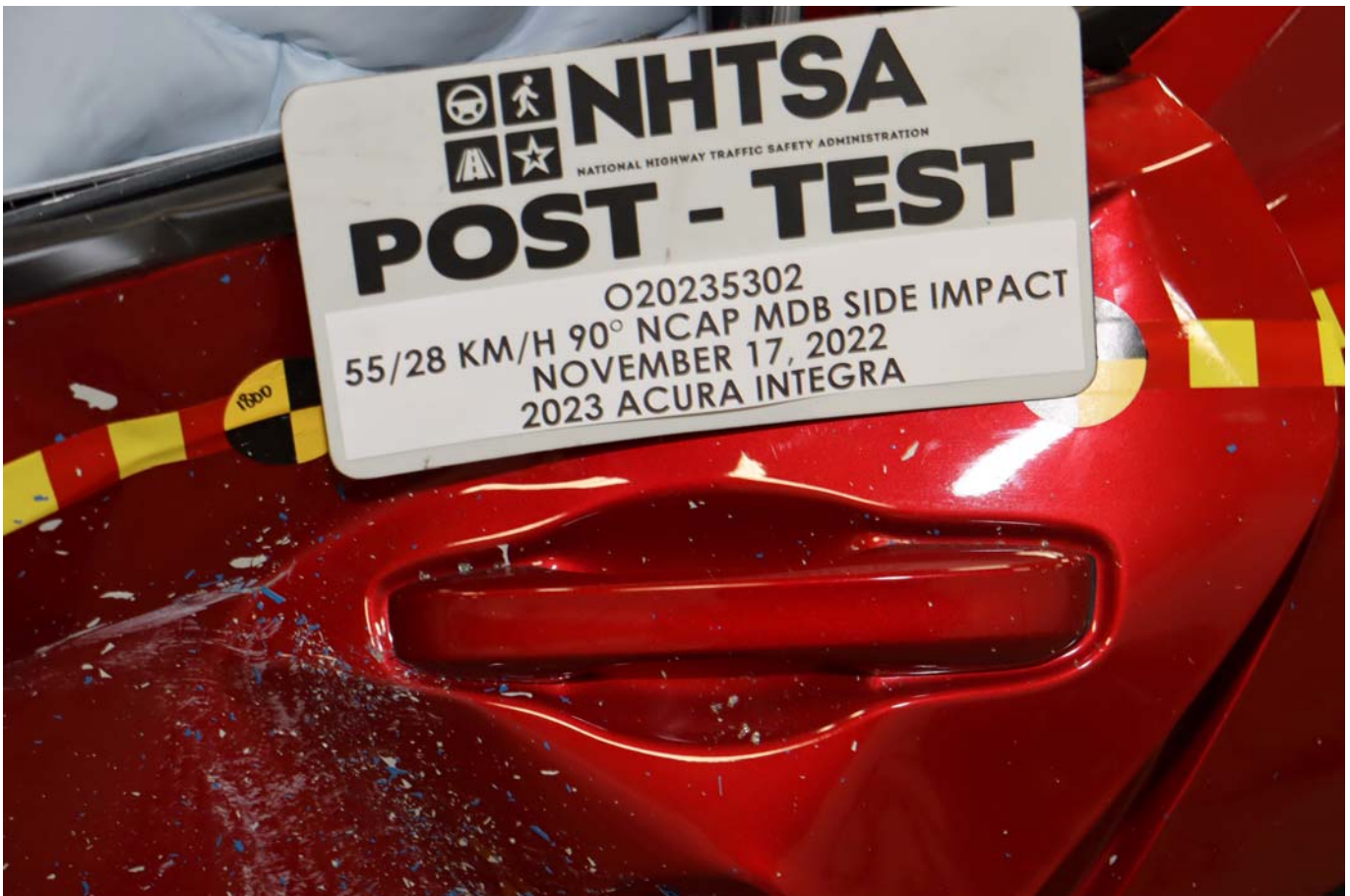


Photo No. 024 - Post-Test Left Rear Door Latch Close-Up



Photo No. 025 - Pre-Test Front Close-Up View of Driver Dummy

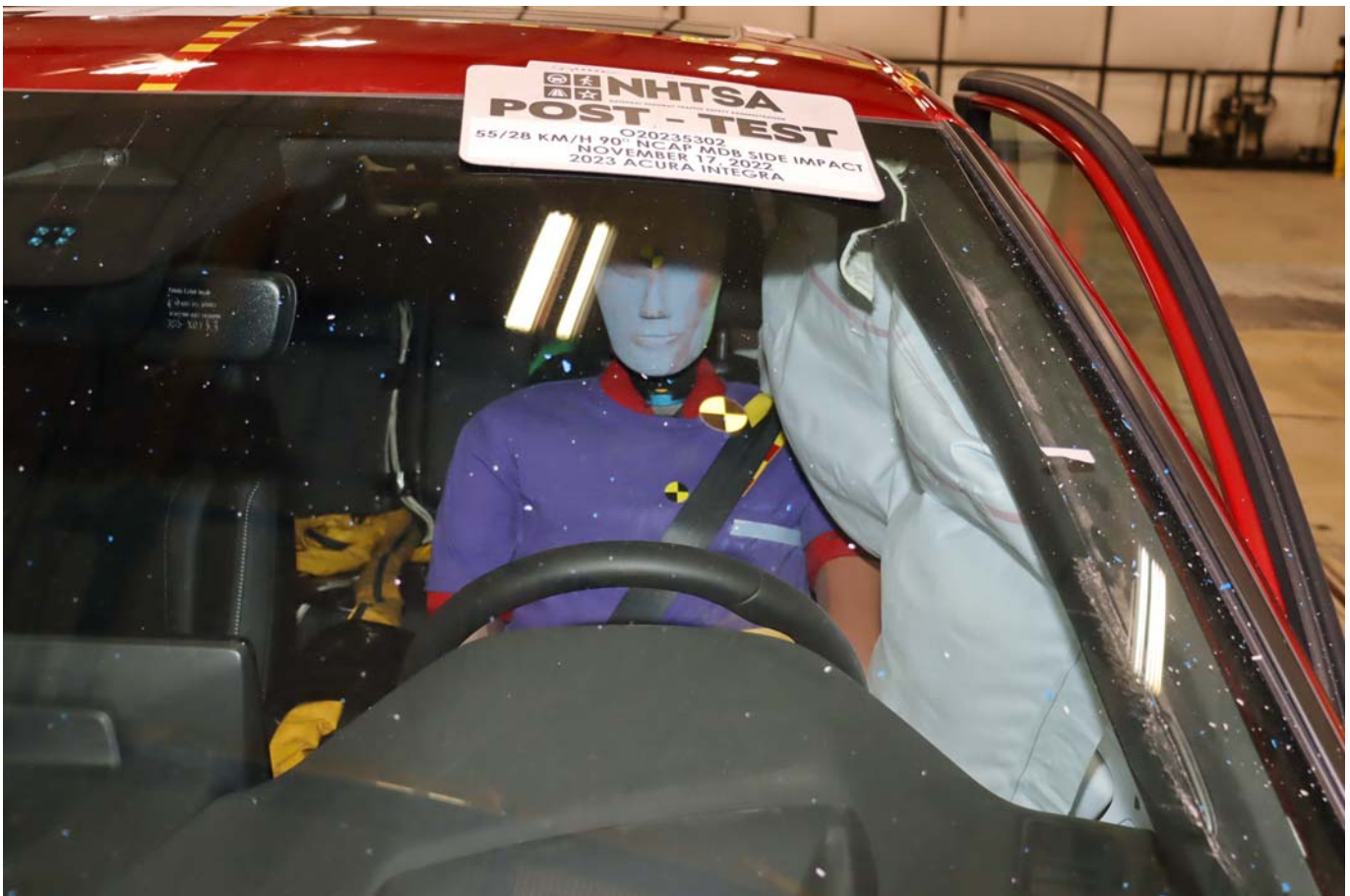


Photo No. 026 - Post-Test Front Close-Up View of Driver Dummy



Photo No. 027 - Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking



Photo No. 028 - Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View

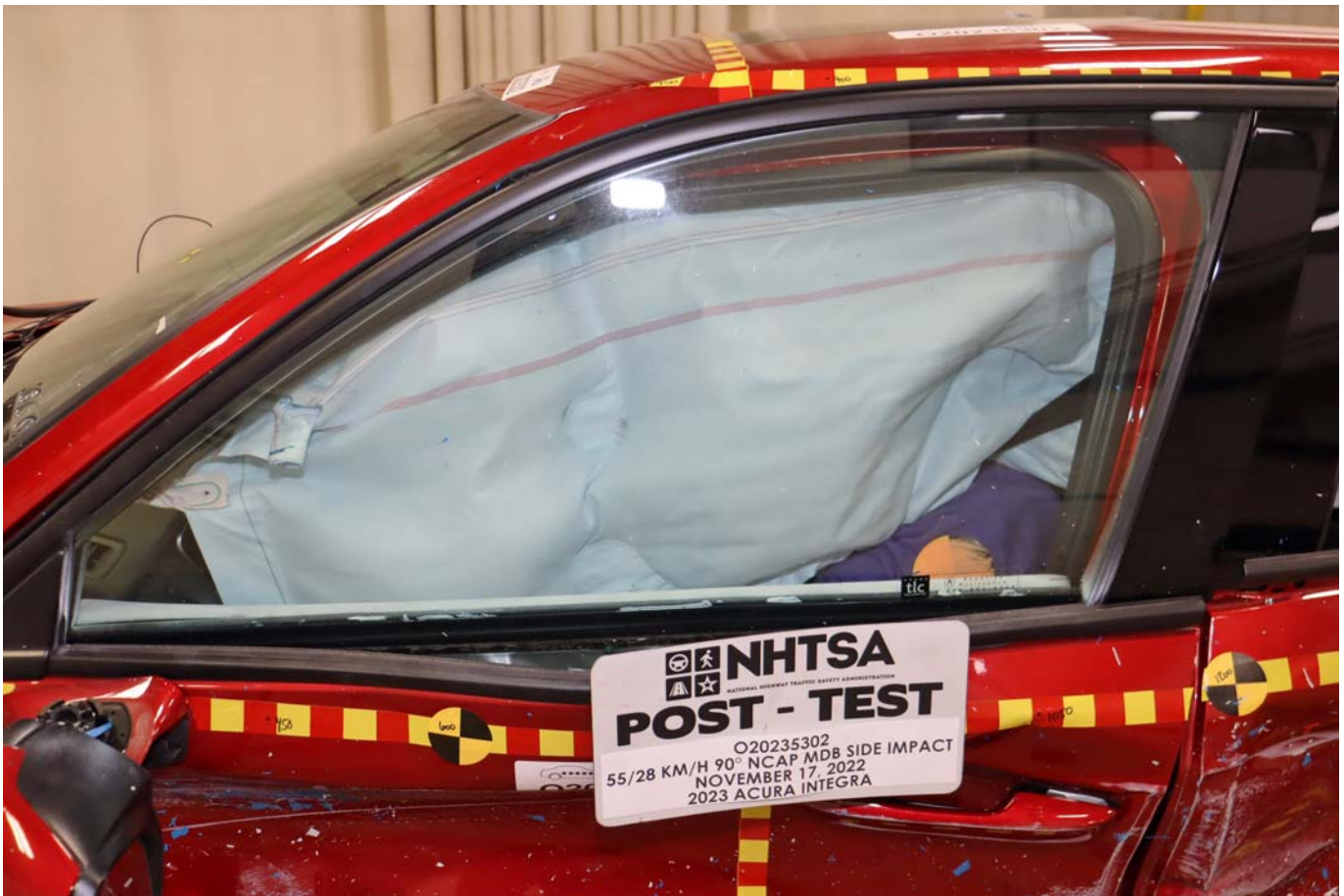


Photo No. 029 - Post-Test Left Side View of Driver Dummy Shoulder and Door Top View



Photo No. 030 - Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



Photo No. 031 - Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



Photo No. 032 - Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning

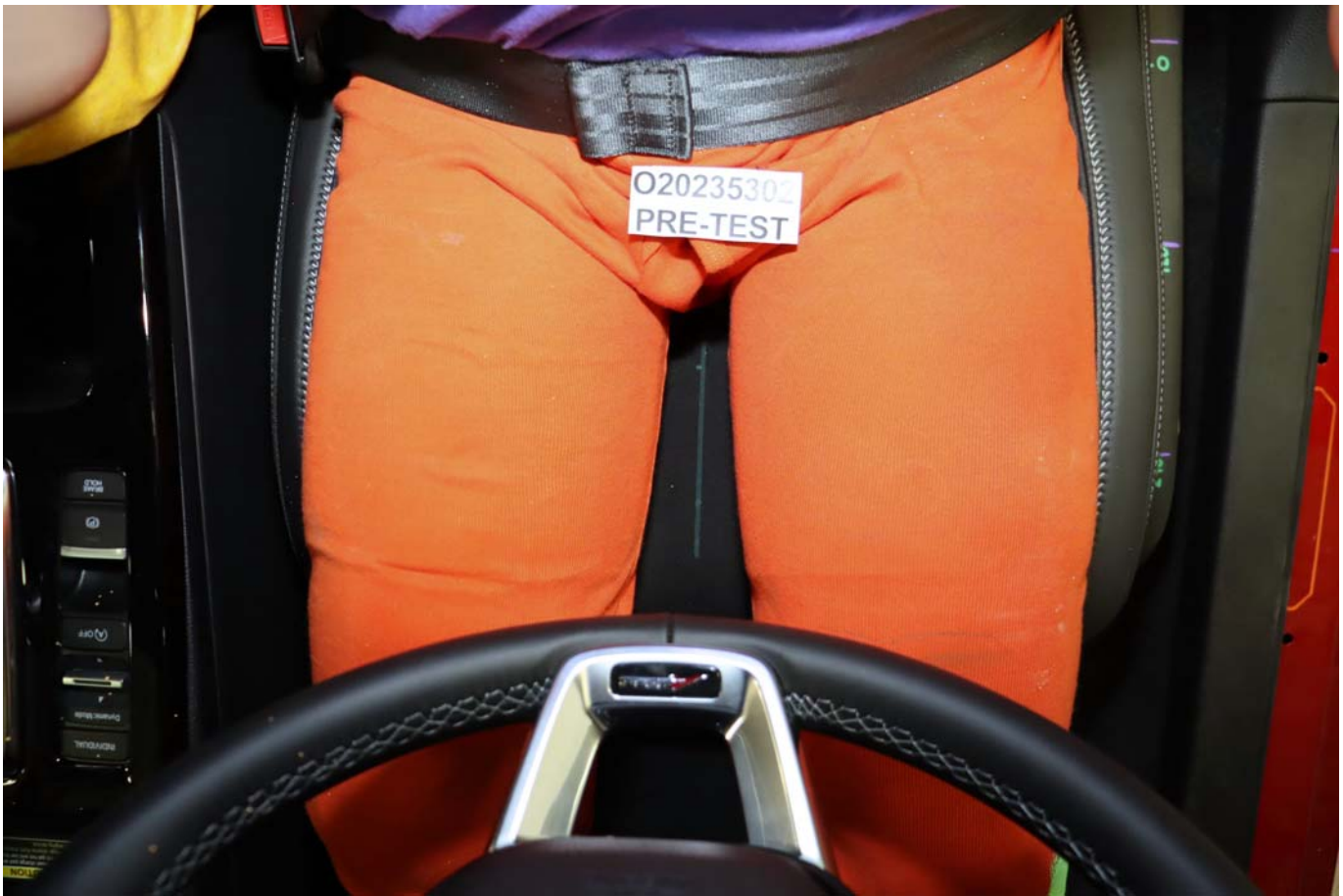


Photo No. 033 - Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



Photo No. 034 - Pre-Test Placement of Driver Dummy's Feet

**PHOTOGRAPH NOT AVAILABLE**

Photo No. 035 - Pre-Test View of Belt Anchorage for Driver Dummy



Photo No. 036 - Pre-Test Left Side View of Steering Wheel



Photo No. 037 - Pre-Test View of Disengaged Parking Brake



Photo No. 038 - Pre-Test View of Parking Brake



Photo No. 039 - Pre-Test Close-Up Left Side View of Driver Seat Track



Photo No. 040 - Pre-Test Close-Up Left Side View of Driver Seat Back



Photo No. 041 - Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Photo No. 042 - Pre-Test Driver Dummy and Door Clearance View

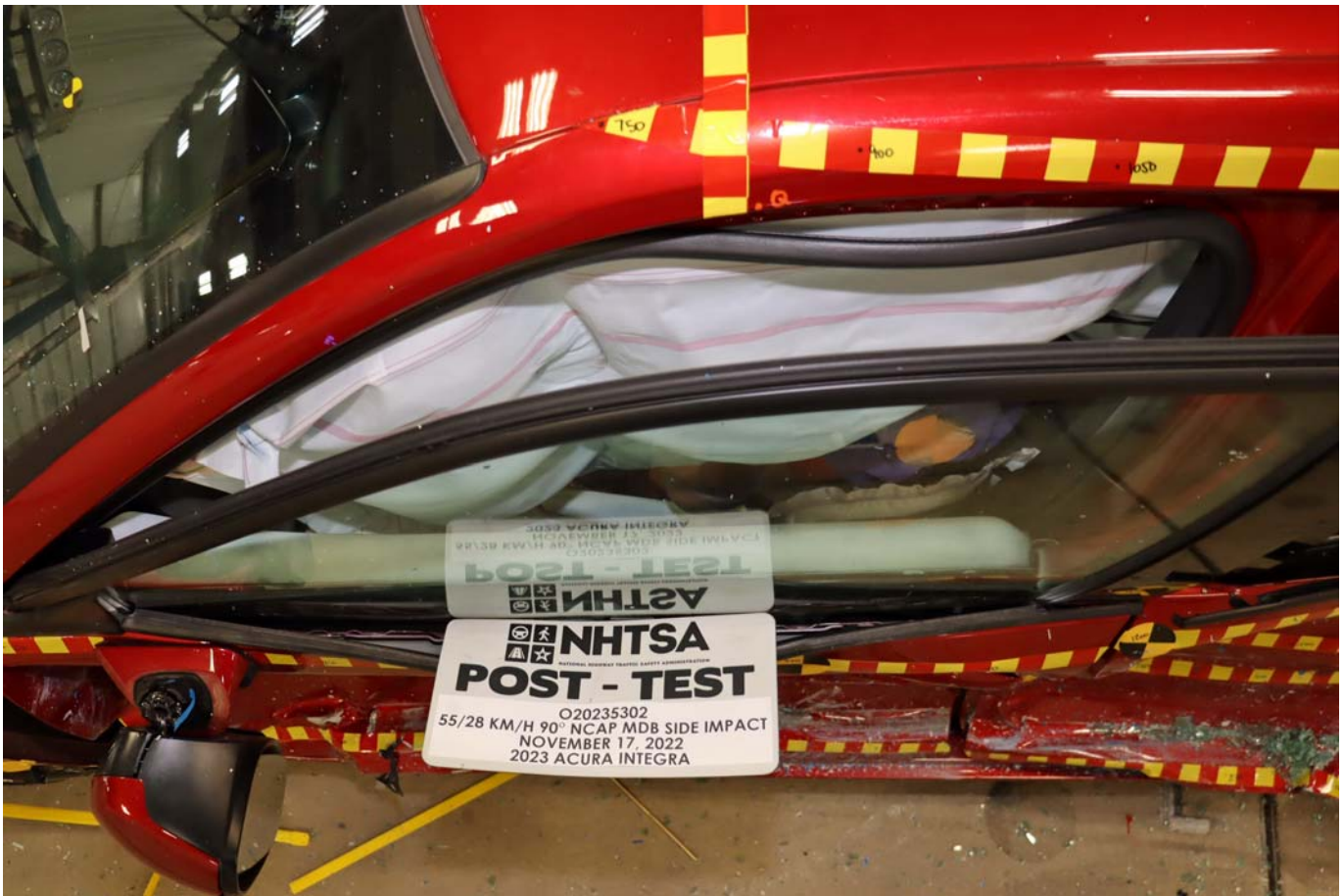


Photo No. 043 - Post-Test Driver Dummy and Door Clearance View



Photo No. 044 - Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Photo No. 045 - Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Photo No. 046 - Pre-Test Driver Inner Door Panel View



Photo No. 047 - Post-Test Driver Inner Door Panel View



Photo No. 048 - Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View



Photo No. 049 - Post-Test Driver Dummy Close-up Head Contact with Side Airbag View



Photo No. 050 - Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View



Photo No. 051 - Post-Test Driver Dummy Close-up Torso Contact with Side Airbag View



Photo No. 052 - Post-Test Driver Dummy Close-up Pelvis Contact with Vehicle Interior View



Photo No. 053 - Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View

**PHOTOGRAPH NOT APPLICABLE**

Photo No. 054 - Post-Test Driver Dummy Close-up Knee Contact View



Photo No. 055 - Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking



Photo No. 056 - Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View

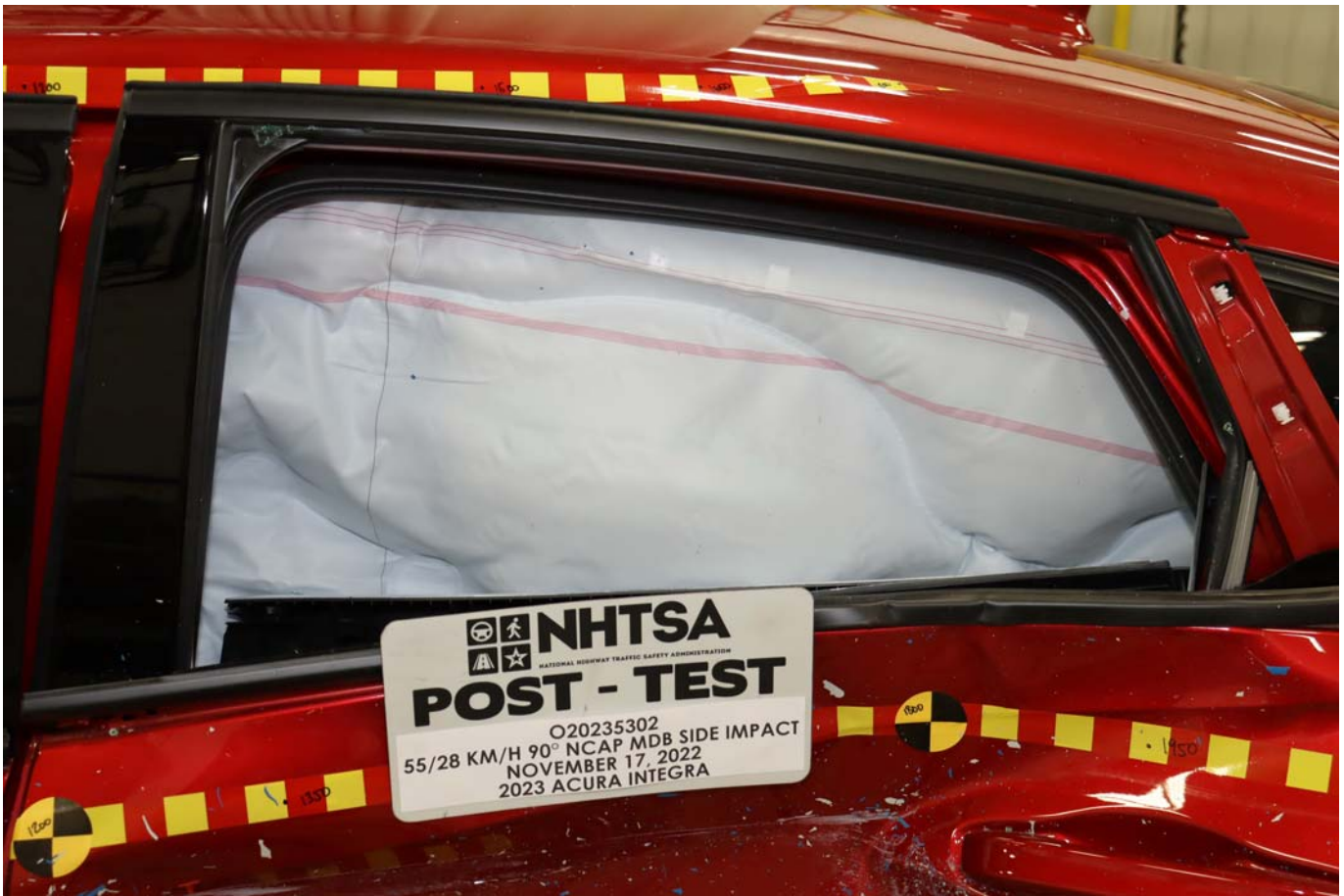


Photo No. 057 - Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



Photo No. 058 - Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



Photo No. 059 - Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Photo No. 060 - Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



Photo No. 061 - Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



Photo No. 062 - Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket

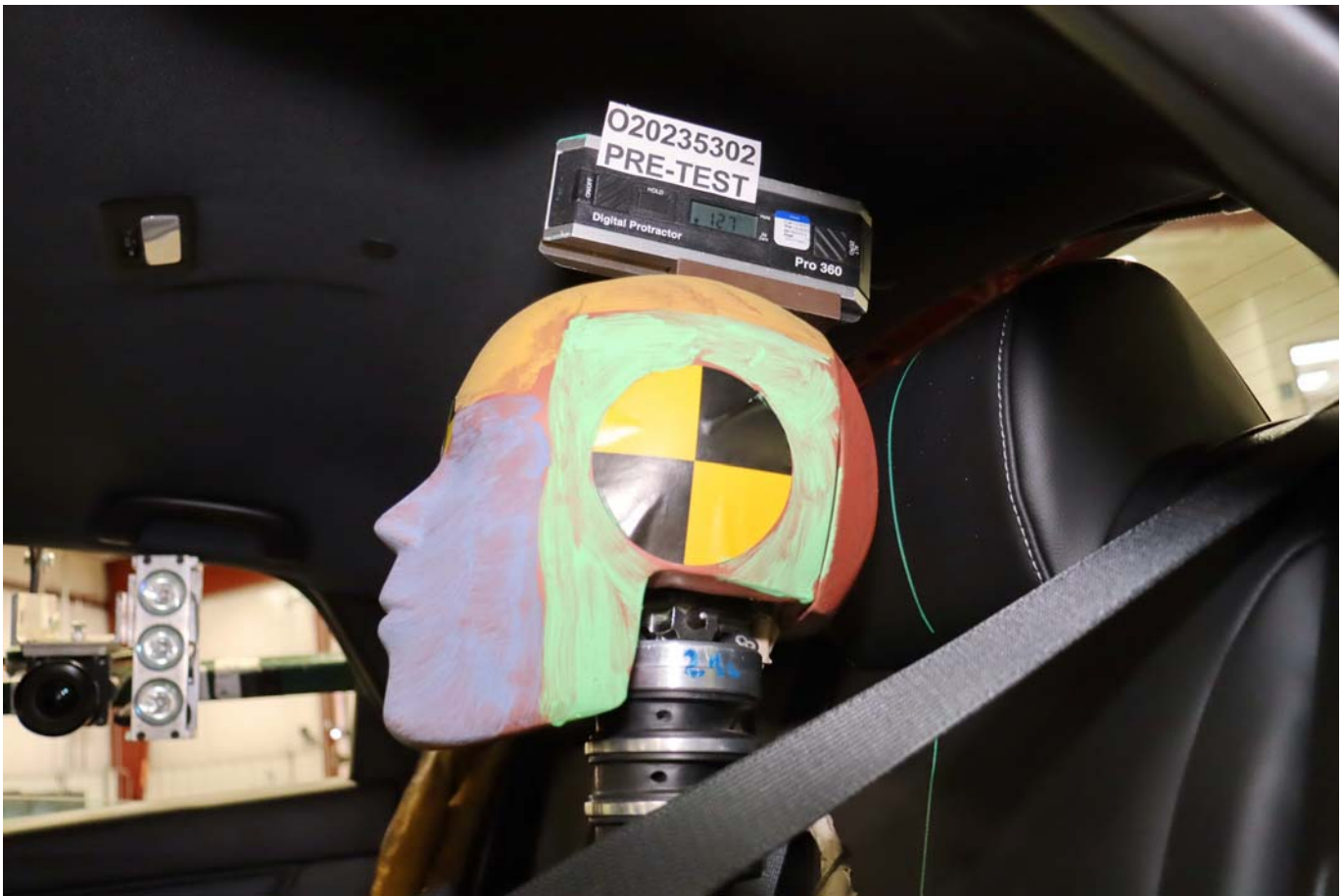


Photo No. 063 - Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



Photo No. 064 - Pre-Test Placement of Rear Passenger Dummy's Feet



Photo No. 065 - Pre-Test View of Belt Anchorage for Rear Passenger Dummy



Photo No. 066 - Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



Photo No. 067 - Pre-Test Close-Up Left Side View of Rear Passenger Seat Back



Photo No. 068 - Pre-Test Close-up View of Rear Passenger Seat Back or Head Restraint



Photo No. 069 - Pre-Test Rear Passenger Dummy and Door Clearance View



Photo No. 070 - Post-Test Rear Passenger Dummy and Door Clearance View



Photo No. 071 - Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Photo No. 072 - Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Photo No. 073 - Pre-Test Rear Passenger Inner Door Panel View



Photo No. 074 - Post-Test Rear Passenger Inner Door Panel View



Photo No. 075 - Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View



Photo No. 076 - Post-Test Rear Passenger Dummy Close-up Head Contact with Side Airbag View



Photo No. 077 - Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View



Photo No. 078 - Post-Test Rear Passenger Dummy Close-up Torso Contact with Side Airbag View



Photo No. 079 - Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Vehicle Interior View



Photo No. 080 - Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Side Airbag View



Photo No. 081 - Post-Test Rear Passenger Dummy Close-up Knee Contact View



Photo No. 082 - Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Photo No. 083 - Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Photo No. 084 - Pre-Test Front View of MDB Impactor Face



Photo No. 085 - Post-Test Front View of MDB Impactor Face



Photo No. 086 - Pre-Test Top View of MDB Impactor Face



Photo No. 087 - Post-Test Top View of MDB Impactor Face



Photo No. 088 - Pre-Test Left Side View of MDB Impactor Face



Photo No. 089 - Post-Test Left Side View of MDB Impactor Face



Photo No. 090 - Pre-Test Right Side View of MDB Impactor Face



Photo No. 091 - Post-Test Right Side View of MDB Impactor Face



Photo No. 092 - Close-Up View of Vehicle's Certification Label



Photo No. 093 - Close-Up View of Vehicle's Tire Information Placard or Label



Photo No. 094 - Pre-Test Ballast View



Photo No. 095 - Post-Test Primary and Redundant Speed Trap Read-Out



Photo No. 096 - FMVSS Photo No. 301 Static Rollover 0 Degrees

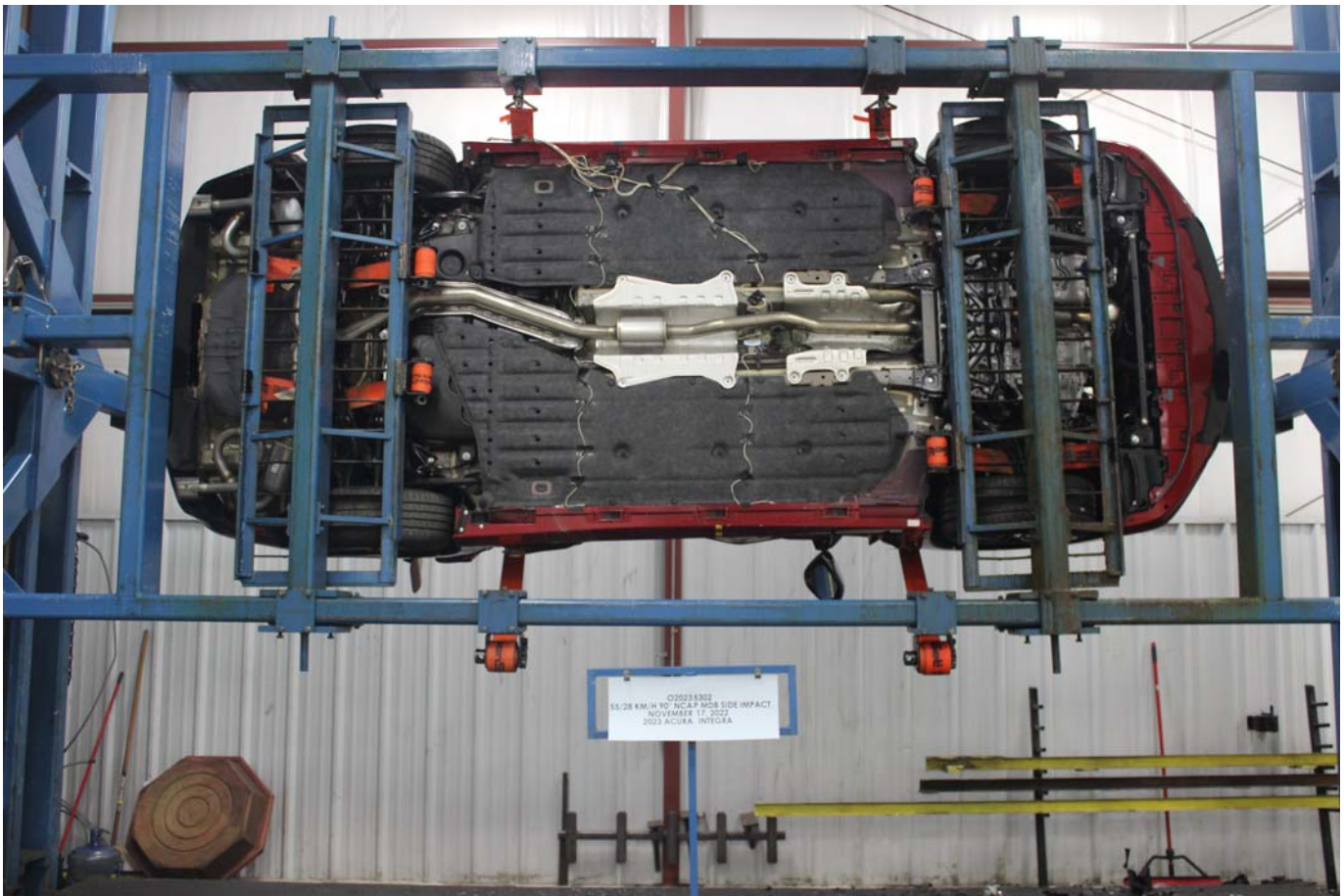


Photo No. 097 - FMVSS Photo No. 301 Static Rollover 90 Degrees



Photo No. 098 - FMVSS Photo No. 301 Static Rollover 180 Degrees



Photo No. 099 - FMVSS Photo No. 301 Static Rollover 270 Degrees

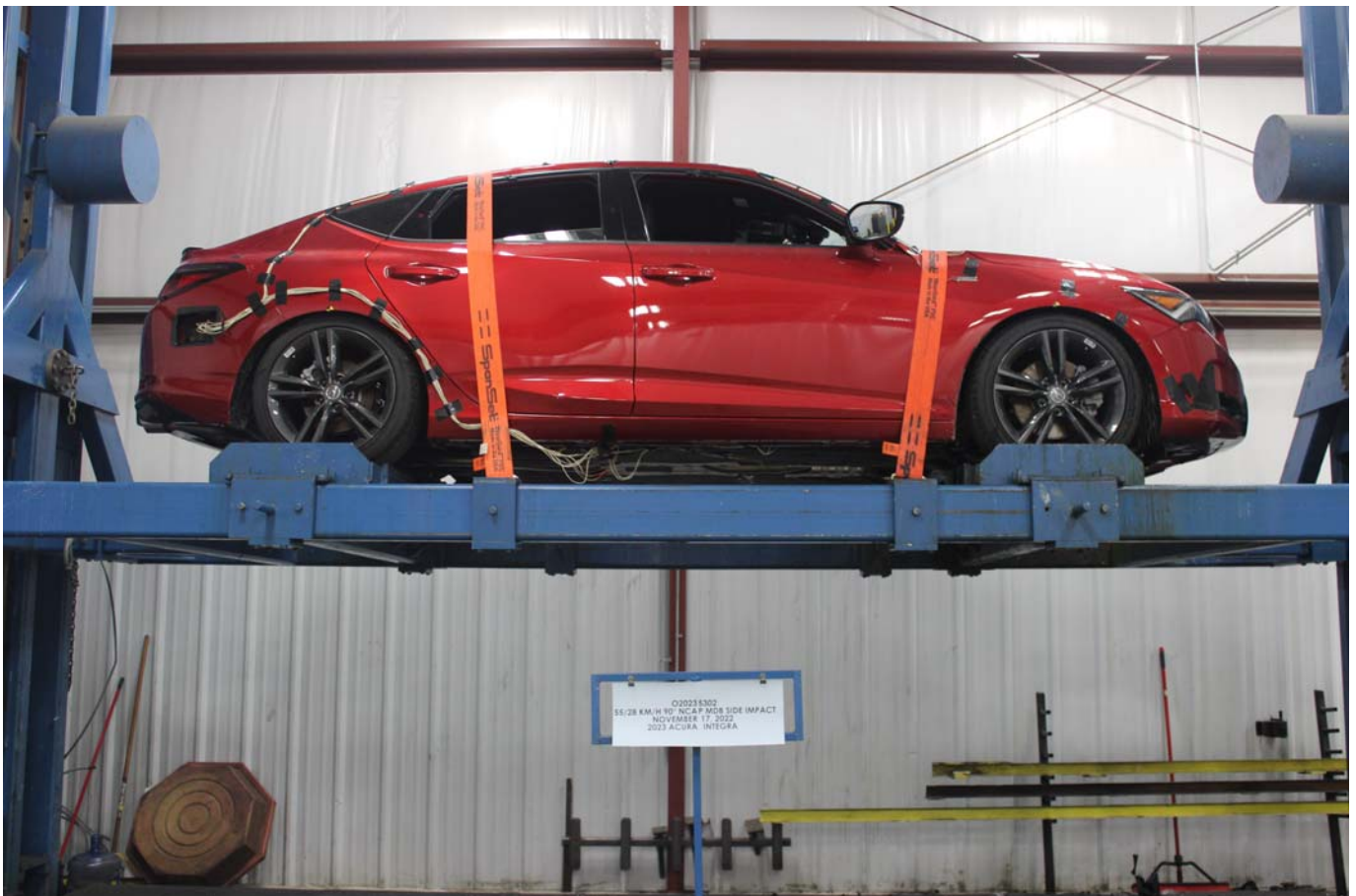


Photo No. 100 - FMVSS Photo No. 301 Static Rollover 360 Degrees



Photo No. 101 - Impact Event

## 2023 INTEGRA A-SPEC TECH

EXT: PERFORMANCE RED P ENGINE NUMBER: L15CA-1105290  
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 Roll-over 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

**Manufacturer's Suggested Retail Price** **\$35,800.00**

**MSPR Includes:**

- 4YR/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.

### EPA DOT Fuel Economy and Environment

Gasoline Vehicle

**Fuel Economy**

**30** **26** **36** **MPG**

combined city/hwy city highway

3.3 gallons per 100 miles

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

**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) **Smog Rating** (tailpipe only)

1 6 10 Best

This vehicle emits 293 grams CO<sub>2</sub> per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at [fuelconomy.gov](http://fuelconomy.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. MPG 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

### 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 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 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](http://www.safercar.gov) or 1-888-327-4236

### 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**

MULLER'S WOODFIELD ACURA  
1099 W. HIGGINS ROAD  
HOFFMAN ESTATES, IL 60106

PORT OF ENTRY: MARYSVILLE  
DELIVERY POINT: CHICAGO  
SHIP#: \_\_\_\_\_  
ROW/SPACE: 521-006  
TRANS.METHOD: TRUCK

ORIG. DLR: 251115  
REF.NO: 41157  
HN CODE: AL-5632  
EMISSION: 50 STATE  
CONTROL NO: 047451  
DEALER: 251115

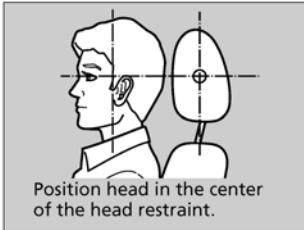
VIN: 19UDE4G71PA004819

Photo No. 102 - Monroney Label

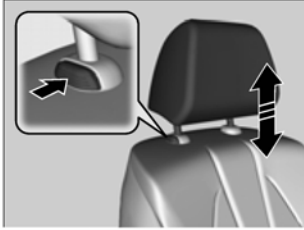
## Head Restraints

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

### Adjusting the Front 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.



**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.

Controls

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Photo No. 103 - Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

**PHOTOGRAPH NOT APPLICABLE**

Photo No. 104 - Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

**APPENDIX B**  
**DUMMY RESPONSE DATA PLOTS**

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**Driver Dummy Instrumentation Plots**

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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](http://www.nhtsa.gov)

**Additional Driver & Passenger Dummy Instrumentation Data**

Passenger Head Angular Velocity (X)  
Passenger Head Angular Velocity (Y)  
Passenger Head Angular Velocity (Z)  
Driver Lower Spine T12 Acceleration (X)  
Driver Lower Spine T12 Acceleration (Y)  
Driver Lower Spine T12 Acceleration (Z)  
Passenger Upper Thorax Rib Deflection (Y)  
Passenger Middle Thorax Rib Deflection (Y)  
Passenger Lower Thorax Rib Deflection (Y)  
Passenger Upper Abdomen Rib Deflection (Y)  
Passenger Lower Abdomen Rib Deflection (Y)  
Driver Head Acceleration Redundant (X)  
Driver Head Acceleration Redundant (Y)  
Driver Head Acceleration Redundant (Z)  
Passenger Head Acceleration Redundant (X)  
Passenger Head Acceleration Redundant (Y)  
Passenger Head Acceleration Redundant (Z)

### **Vehicle Instrumentation Data**

Vehicle Center of Gravity Acceleration (X)  
Vehicle Center of Gravity Acceleration (Y)  
Vehicle Center of Gravity Acceleration (Z)  
Right Side Sill at Front Seat Acceleration (X)  
Right Side Sill at Front Seat Acceleration (Y)  
Right Side Sill at Front Seat Acceleration (Z)  
Right Side Sill at Rear Seat Acceleration (X)  
Right Side Sill at Rear Seat Acceleration (Y)  
Right Side Sill at Rear Seat Acceleration (Z)  
Left Side Sill at Front Seat Acceleration (Y)  
Left Side Sill at Rear Seat Acceleration (Y)  
Lower A-Post Acceleration (Y)  
Middle A-Post Acceleration (Y)  
Lower B-Post Acceleration (Y)  
Middle B-Post Acceleration (Y)  
Front Seat Track Acceleration (Y)  
Rear Seat Track Acceleration (Y)  
Right Rear Occupant Compartment Acceleration (Y)  
Engine Block (X)  
Engine Block (Y)  
Rear Floorpan Above Axle Acceleration (X)  
Rear Floorpan Above Axle Acceleration (Y)  
Rear Floorpan Above Axle Acceleration (Z)

### **MDB Instrumentation Data**

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

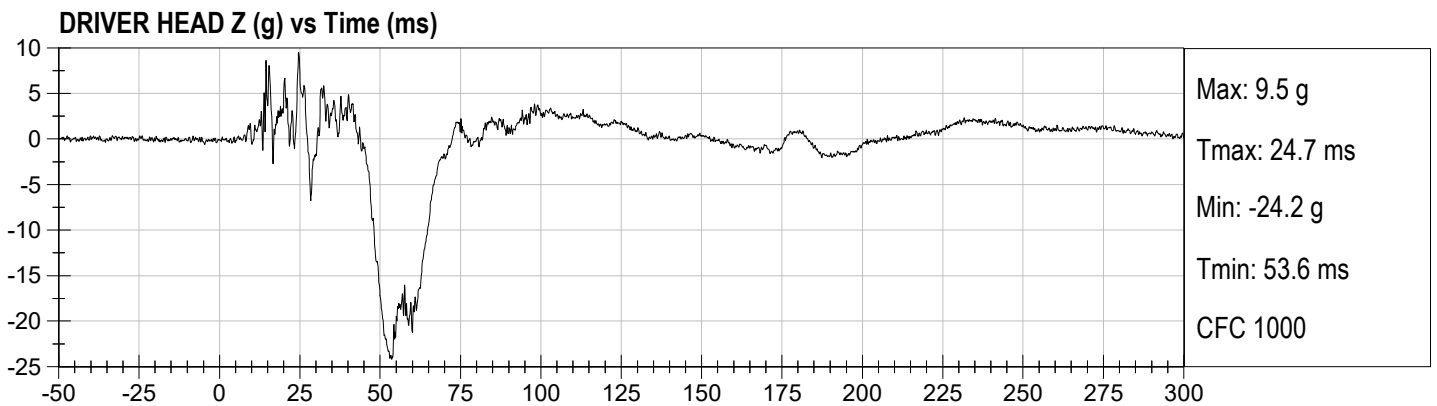
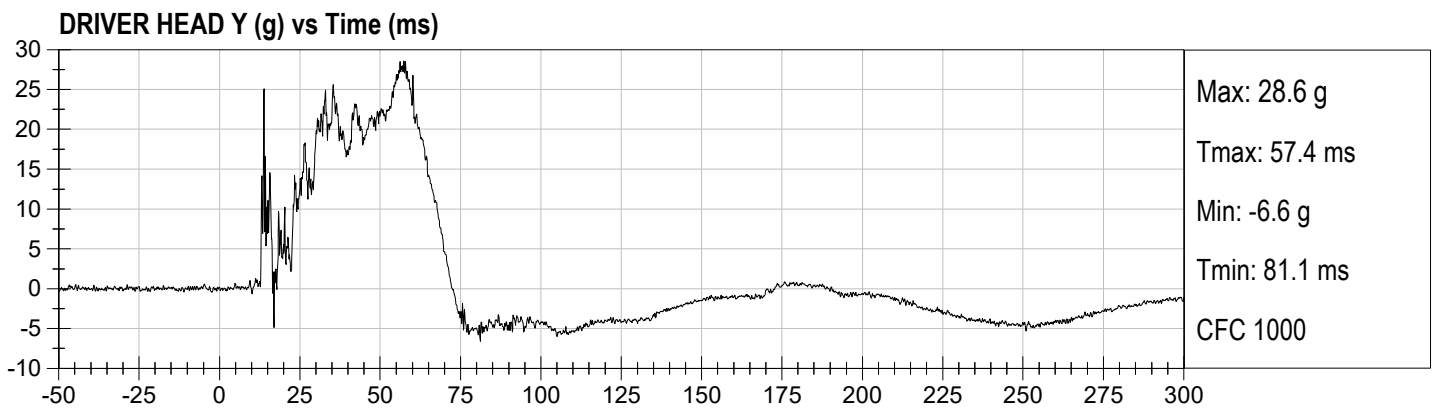
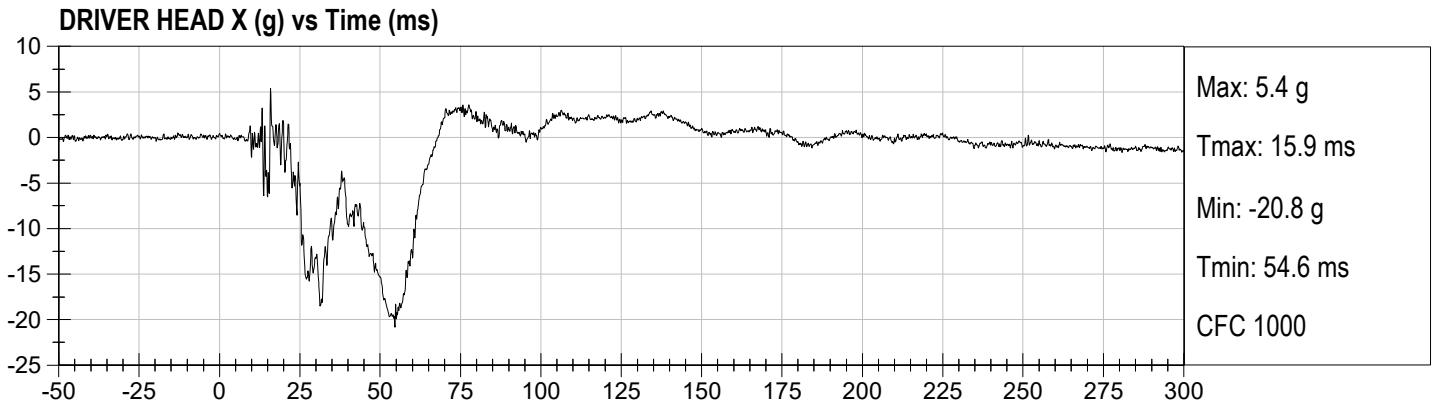
MDB Center of Gravity Acceleration (Z)

MDB Rear Acceleration (X)

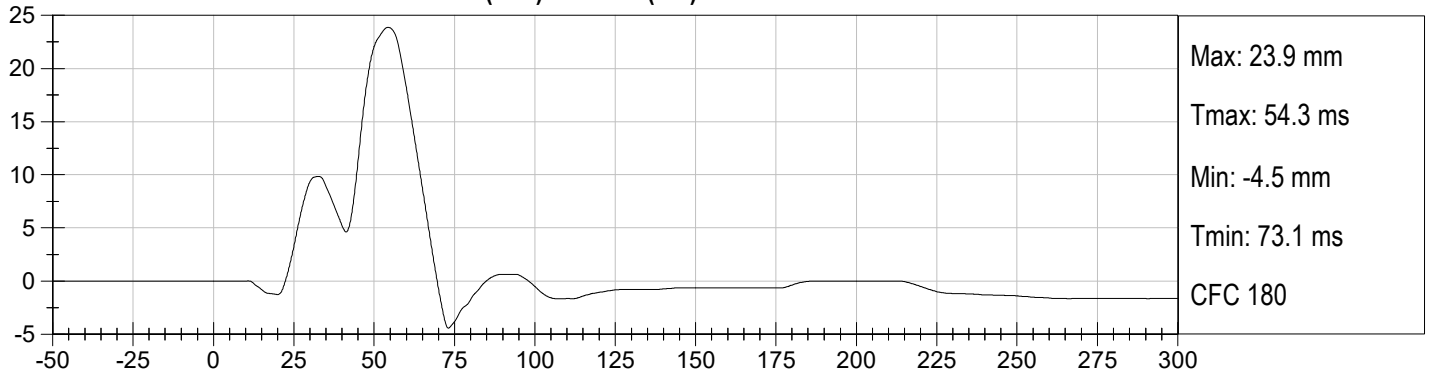
MDB Rear Acceleration (Y)

Left MDB Contact Switch

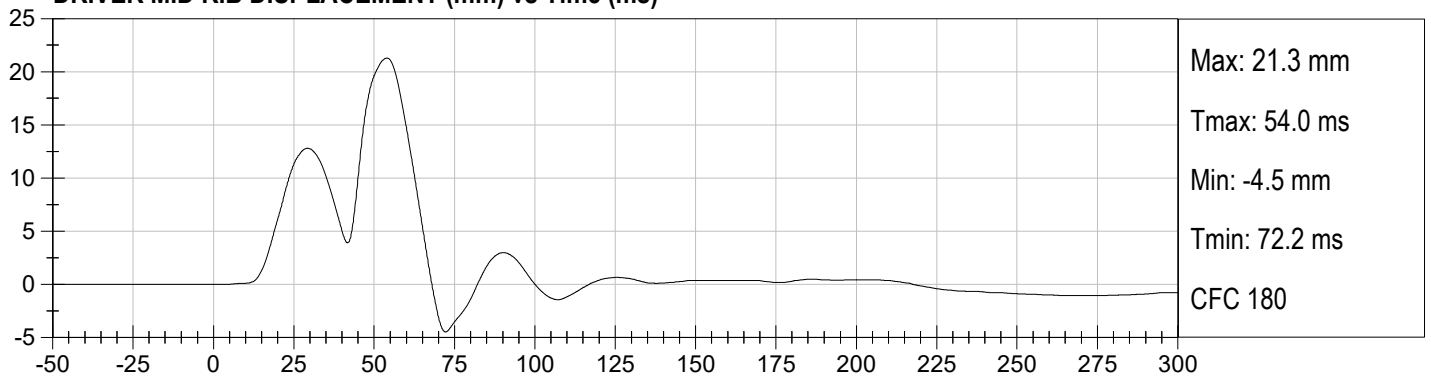
Right MDB Contact Switch



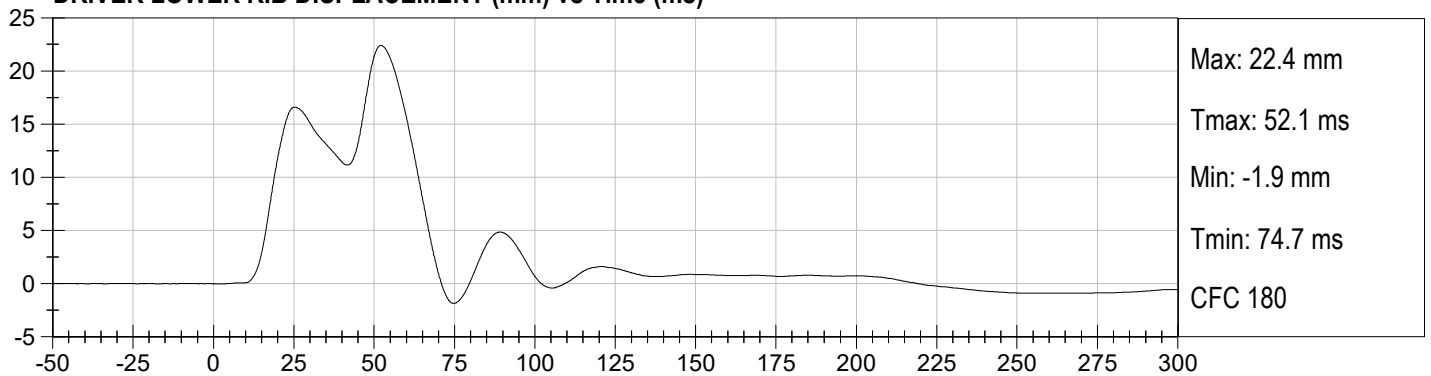
**DRIVER UPPER RIB DISPLACEMENT (mm) vs Time (ms)**



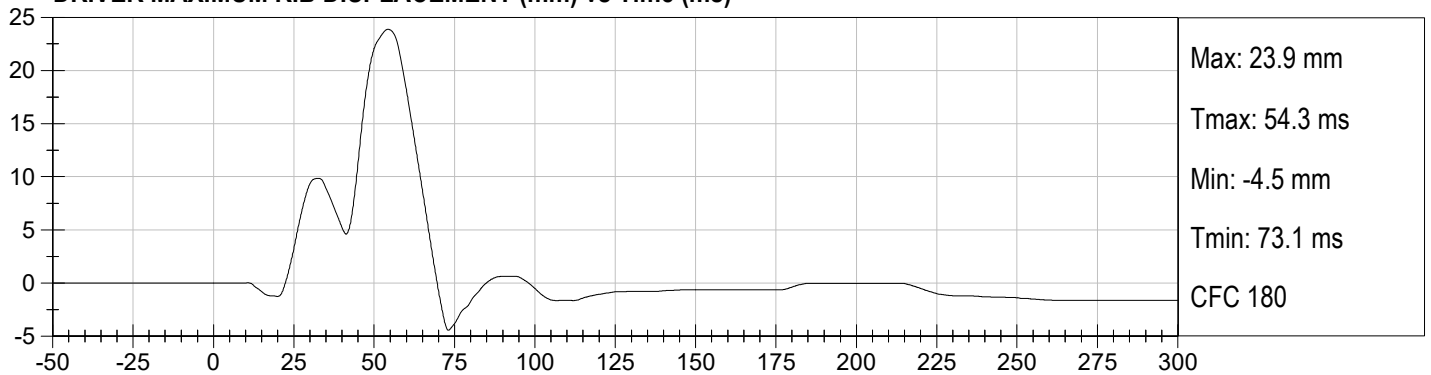
**DRIVER MID RIB DISPLACEMENT (mm) vs Time (ms)**



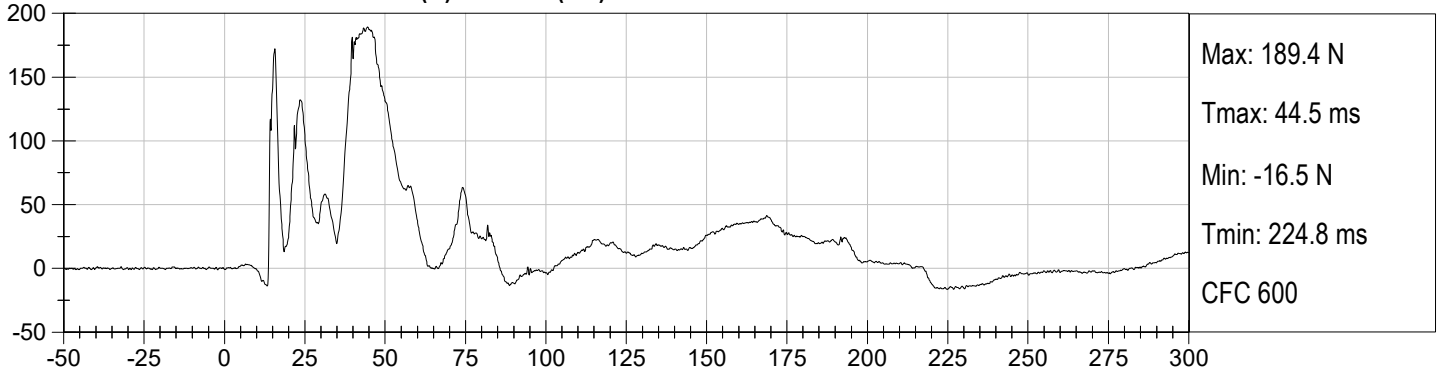
**DRIVER LOWER RIB DISPLACEMENT (mm) vs Time (ms)**



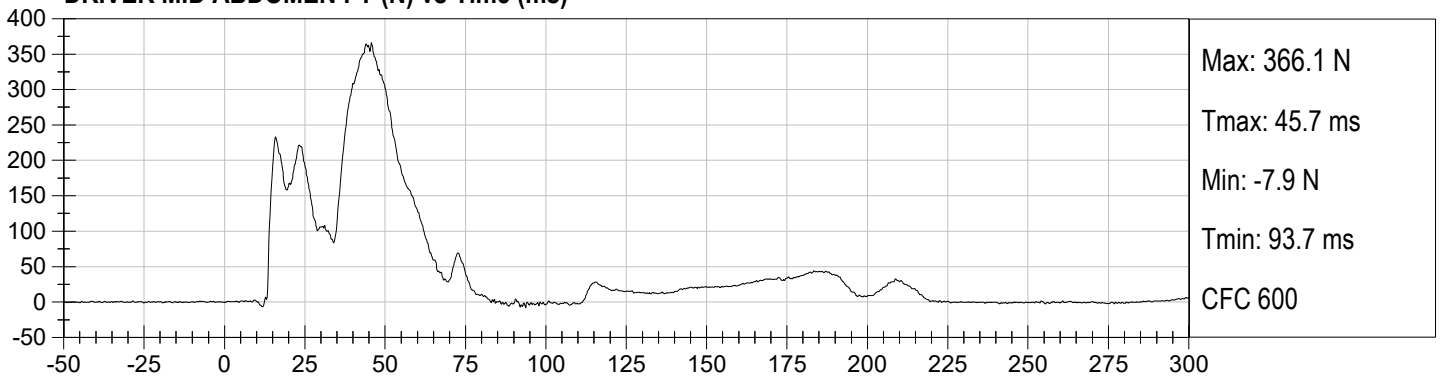
**DRIVER MAXIMUM RIB DISPLACEMENT (mm) vs Time (ms)**



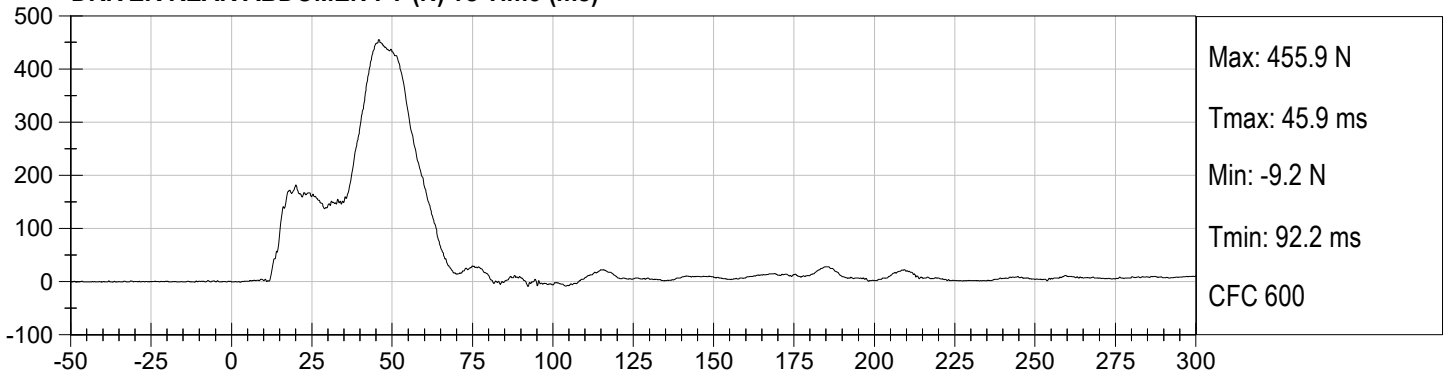
**DRIVER FRONT ABDOMEN FY (N) vs Time (ms)**



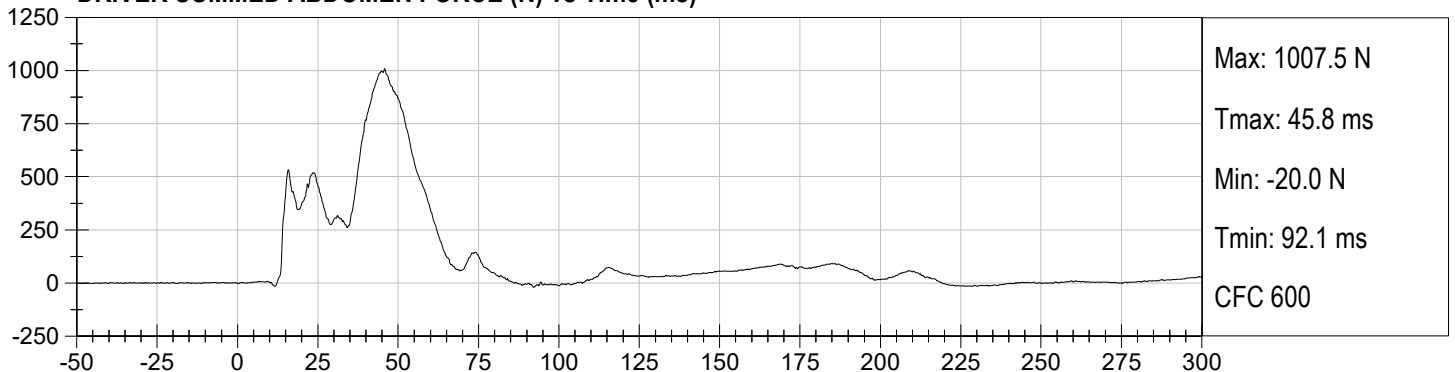
**DRIVER MID ABDOMEN FY (N) vs Time (ms)**

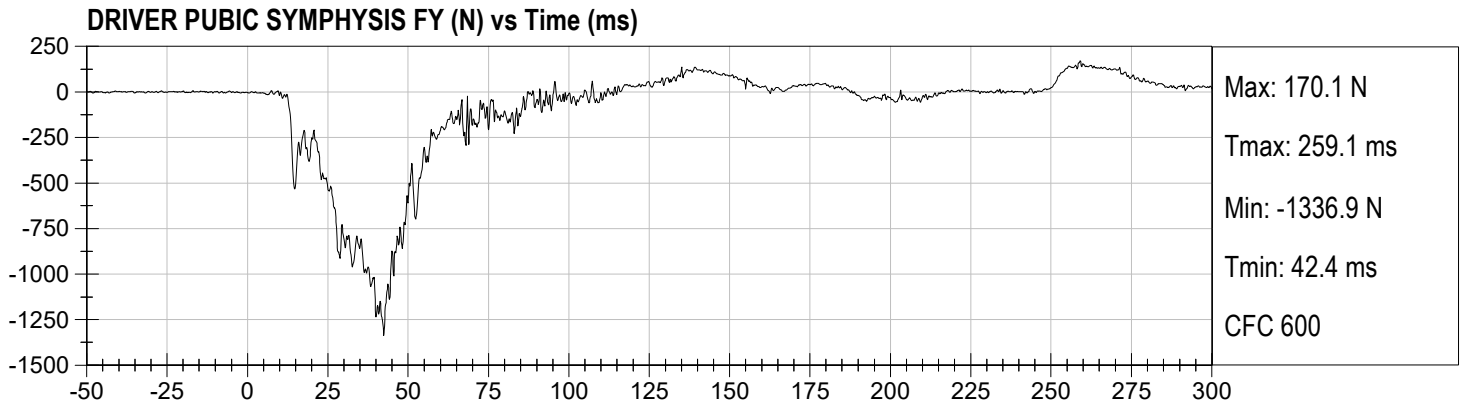


**DRIVER REAR ABDOMEN FY (N) vs Time (ms)**

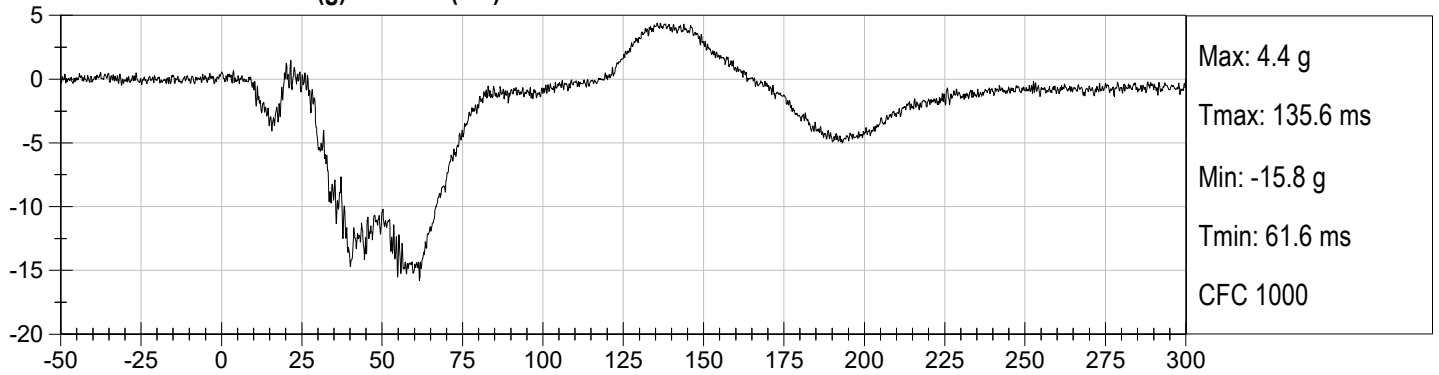


**DRIVER SUMMED ABDOMEN FORCE (N) vs Time (ms)**

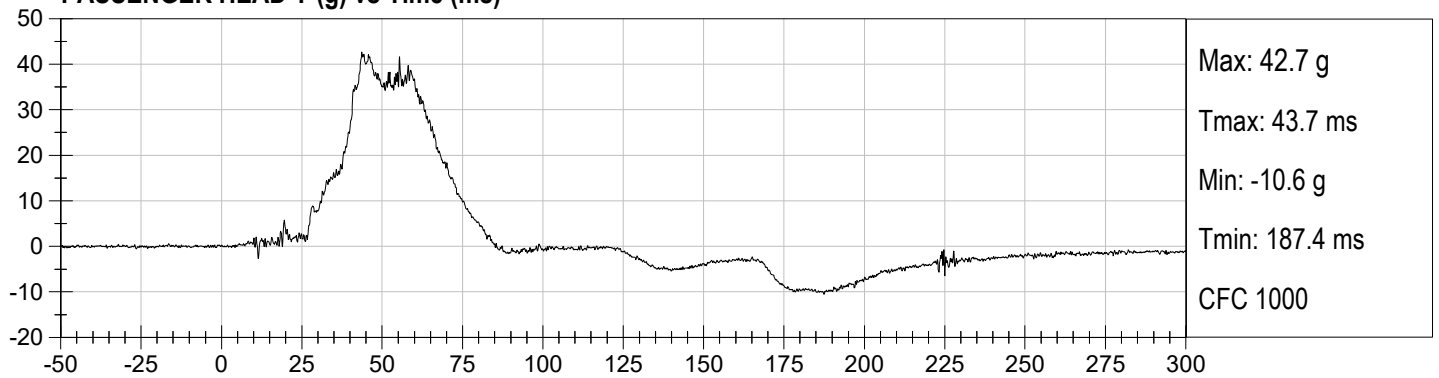




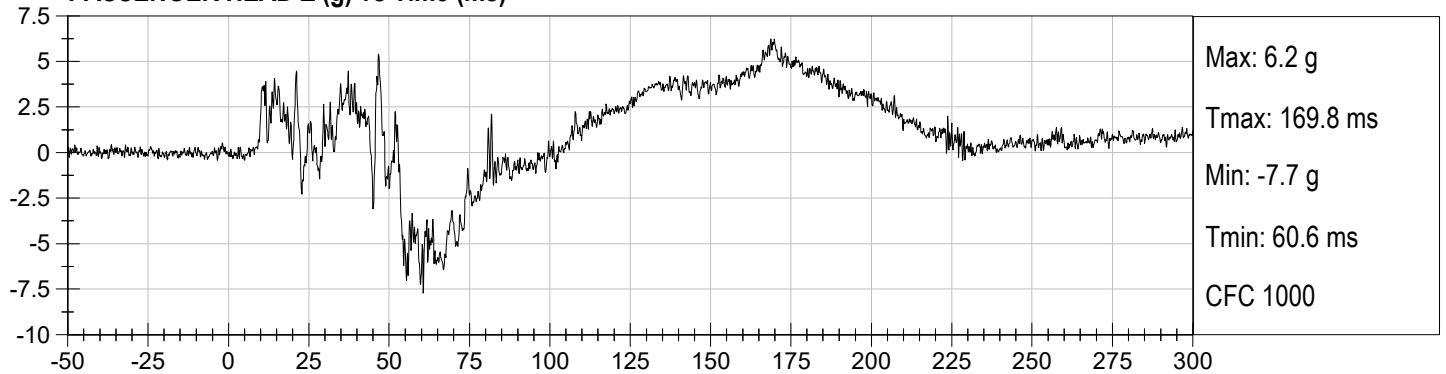
**PASSENGER HEAD X (g) vs Time (ms)**



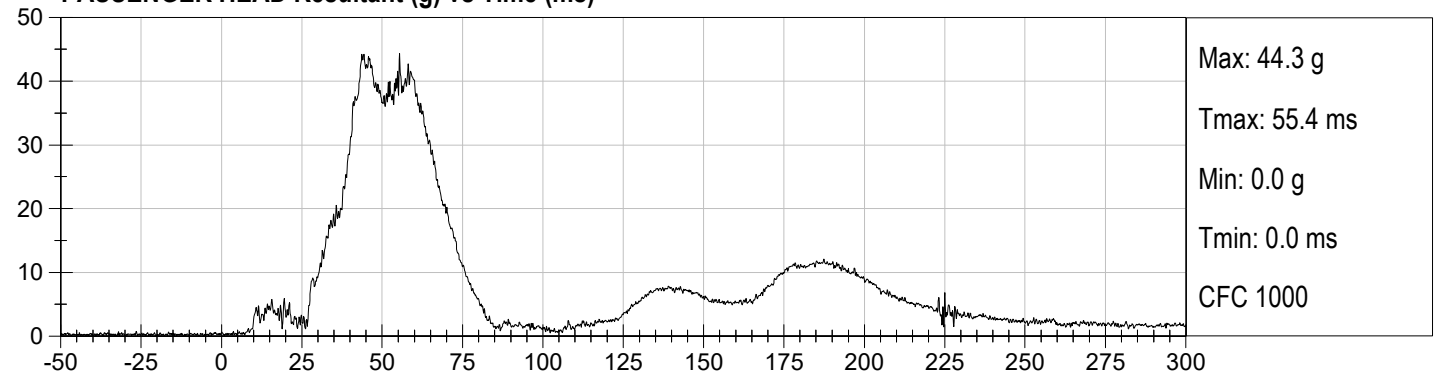
**PASSENGER HEAD Y (g) vs Time (ms)**

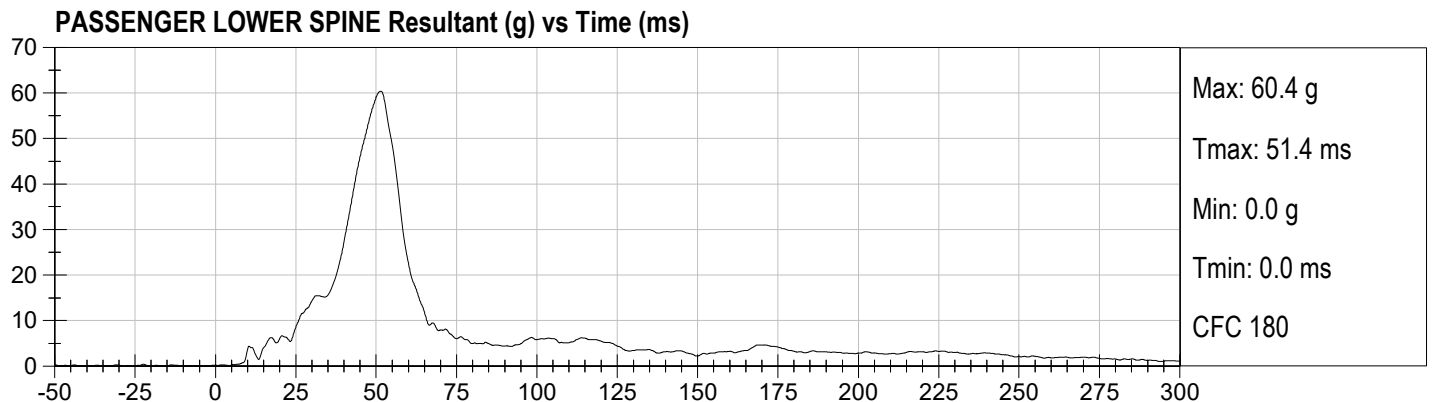
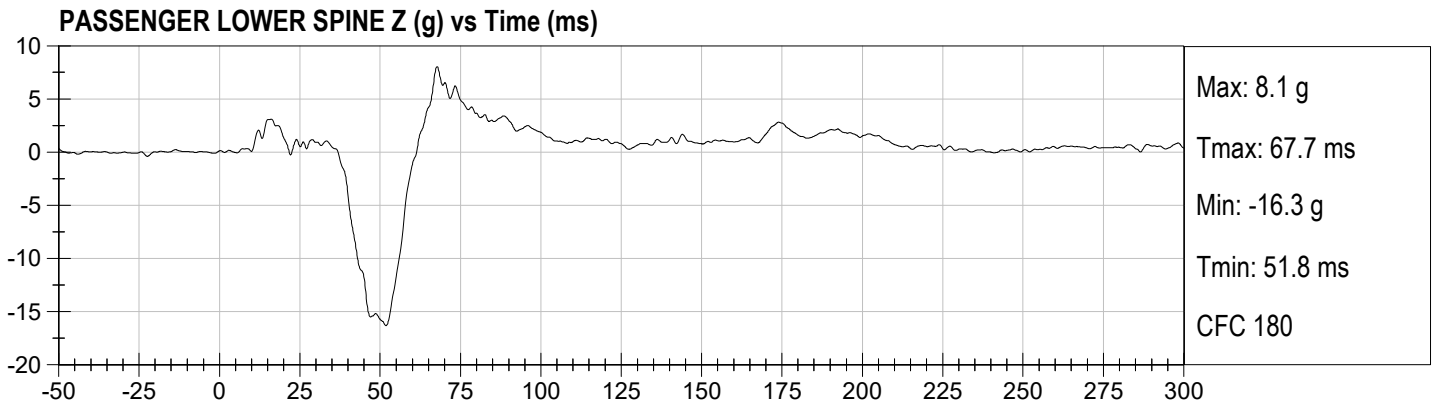
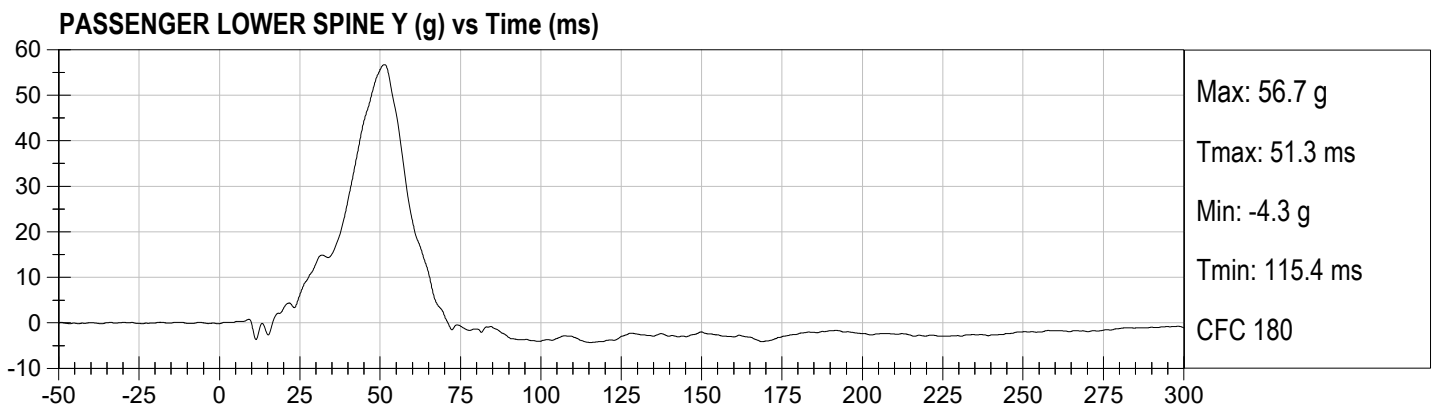
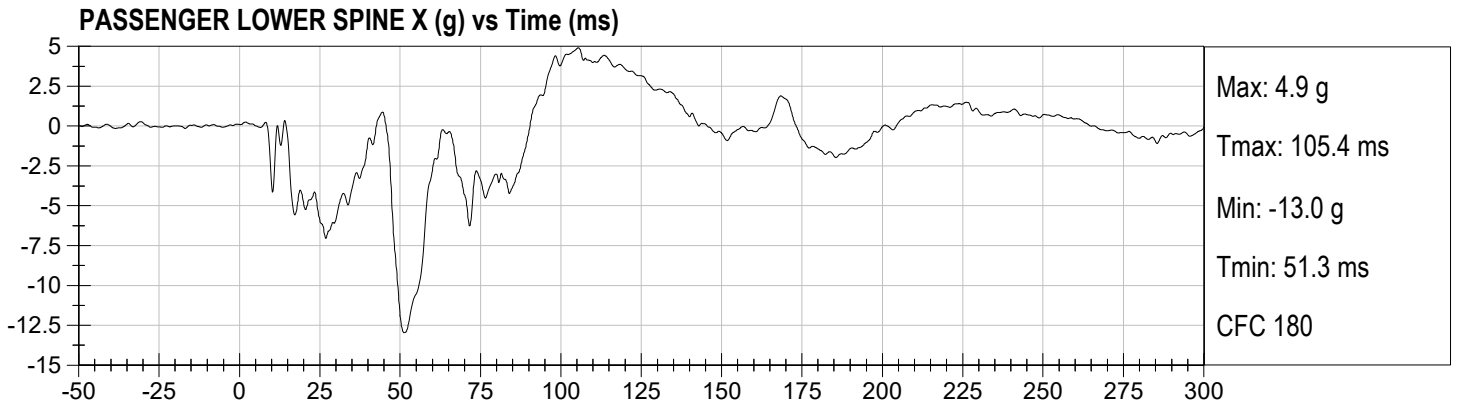


**PASSENGER HEAD Z (g) vs Time (ms)**

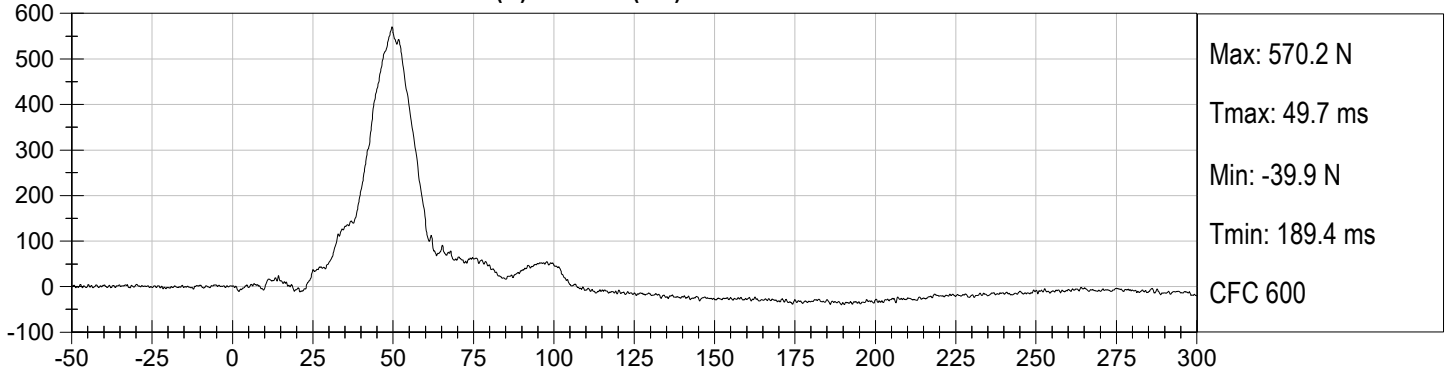


**PASSENGER HEAD Resultant (g) vs Time (ms)**

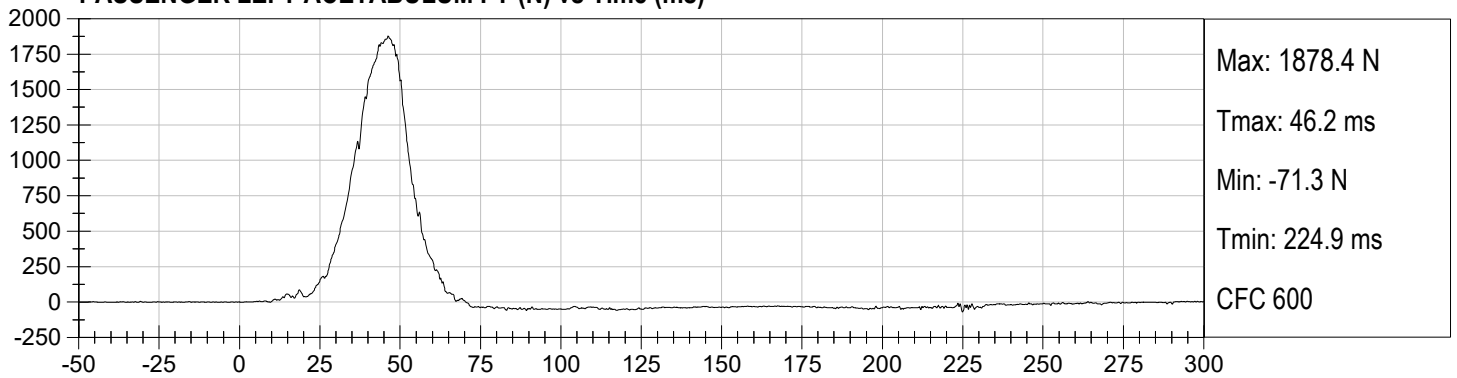




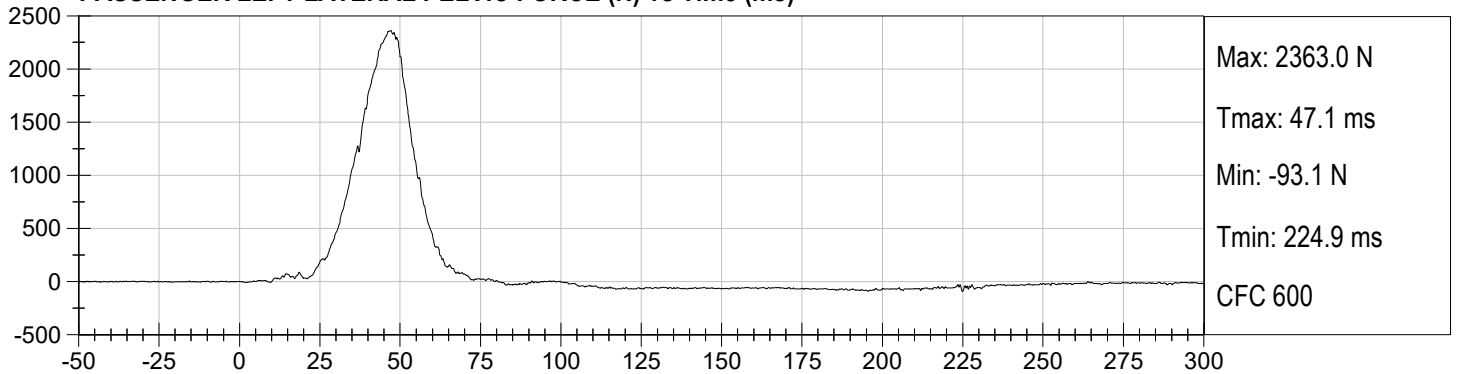
**PASSENGER LEFT ILIUM CREST FY (N) vs Time (ms)**



**PASSENGER LEFT ACETABULUM FY (N) vs Time (ms)**



**PASSENGER LEFT LATERAL PELVIC FORCE (N) vs Time (ms)**



**APPENDIX C**  
**DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**EUROSID 2 (ES-2RE) MALE – DRIVER ATD**

**ES-2re External Measurements  
SN: F032**

<b>No.</b>	<b>Name</b>	<b>Spec. (mm)</b>	<b>Result</b>	<b>Pass/Fail</b>
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	Pass
7	Shoulder/Arm Width	461 - 479	464	Pass
8	Thorax Width	322 - 332	323	Pass
9	Abdomen Width	273 - 287	281	Pass
10	Pelvis Lap Width	359 - 373	370	Pass
11	Head Depth	196 - 206	203	Pass
12	Thorax Depth	262 - 272	264	Pass
13	Abdomen Depth	194 - 204	196	Pass
14	Pelvis Depth	235 - 245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150 - 160	151	Pass
16	Back of Buttocks to Front Knee	597 - 615	607	Pass

**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**ES-2re DUMMY**

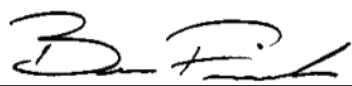
ATD Serial No:       F032      

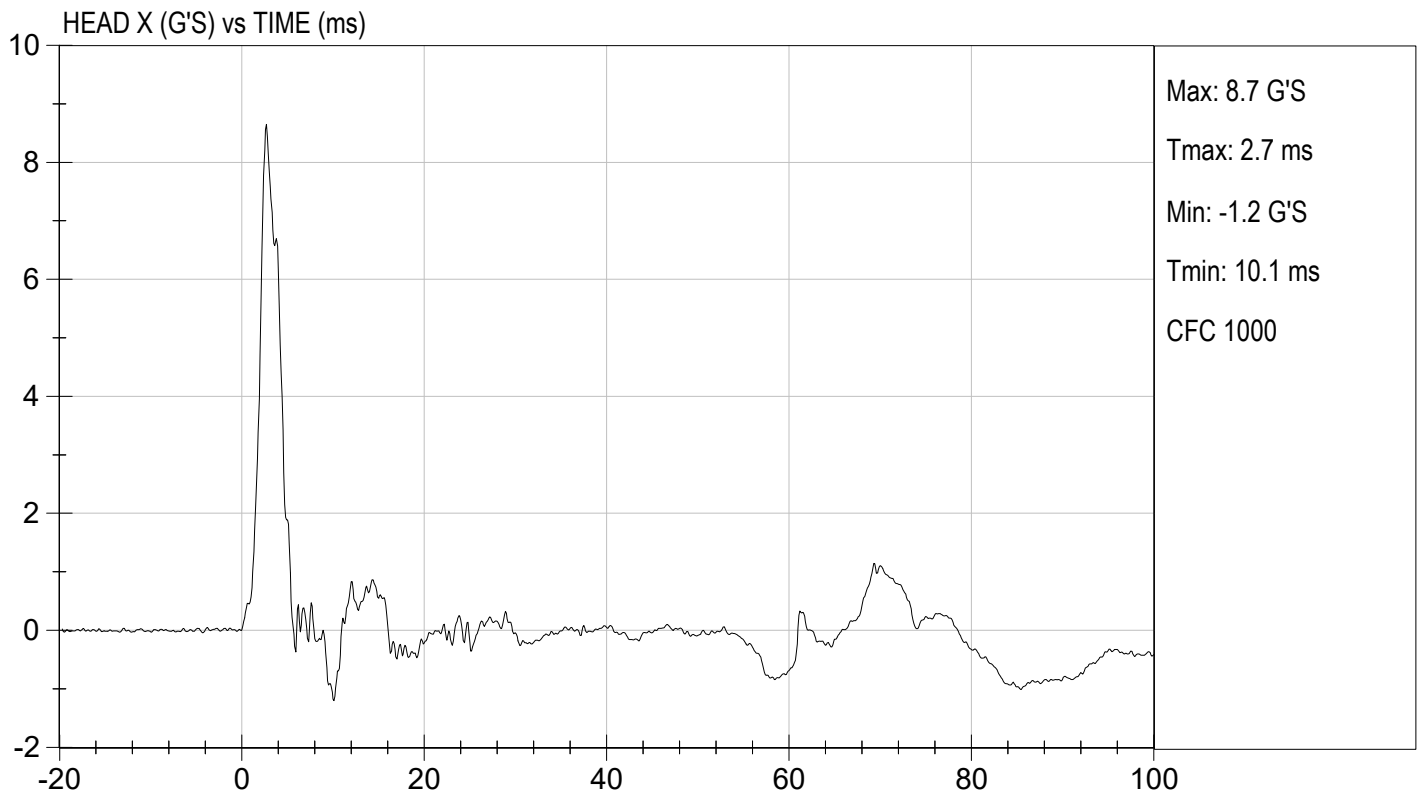
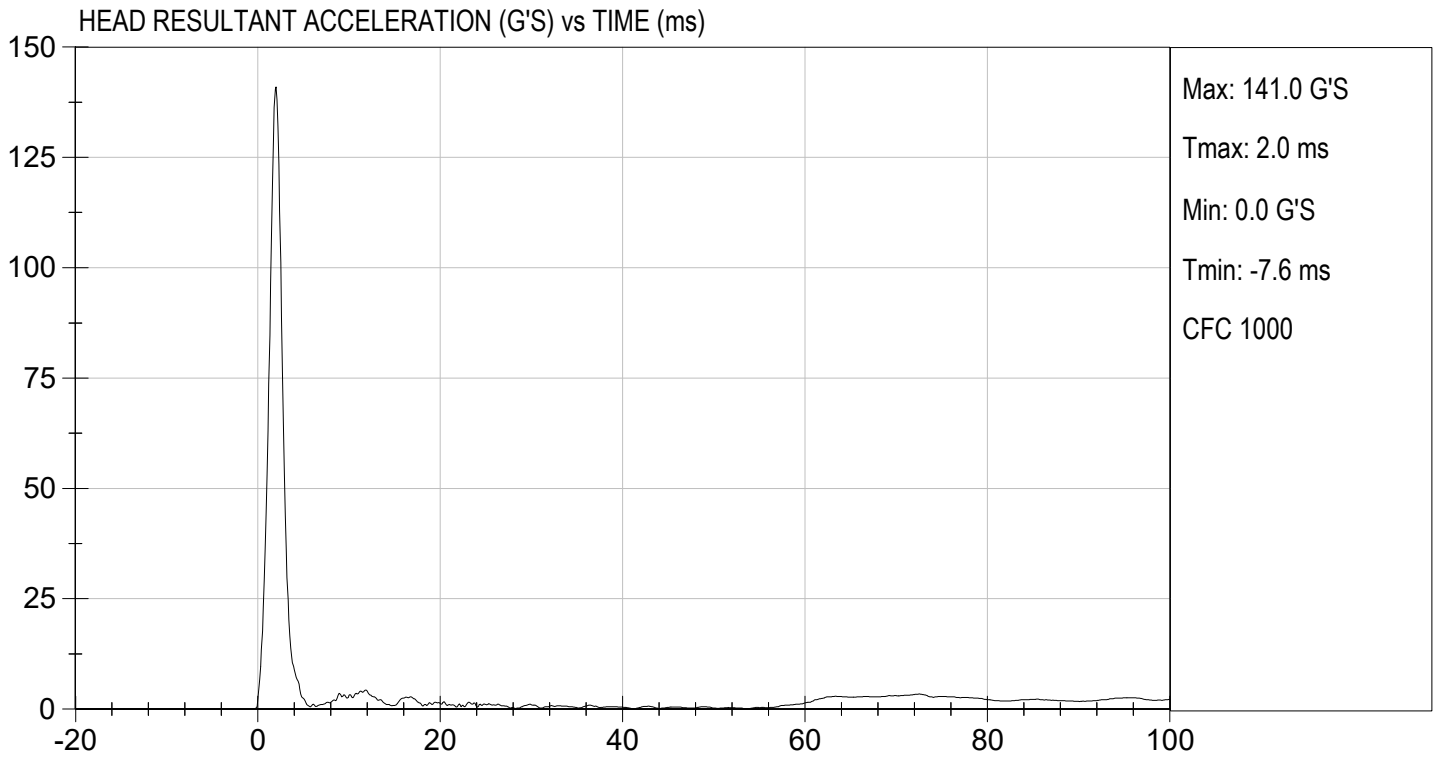
Test ID:       D222561      

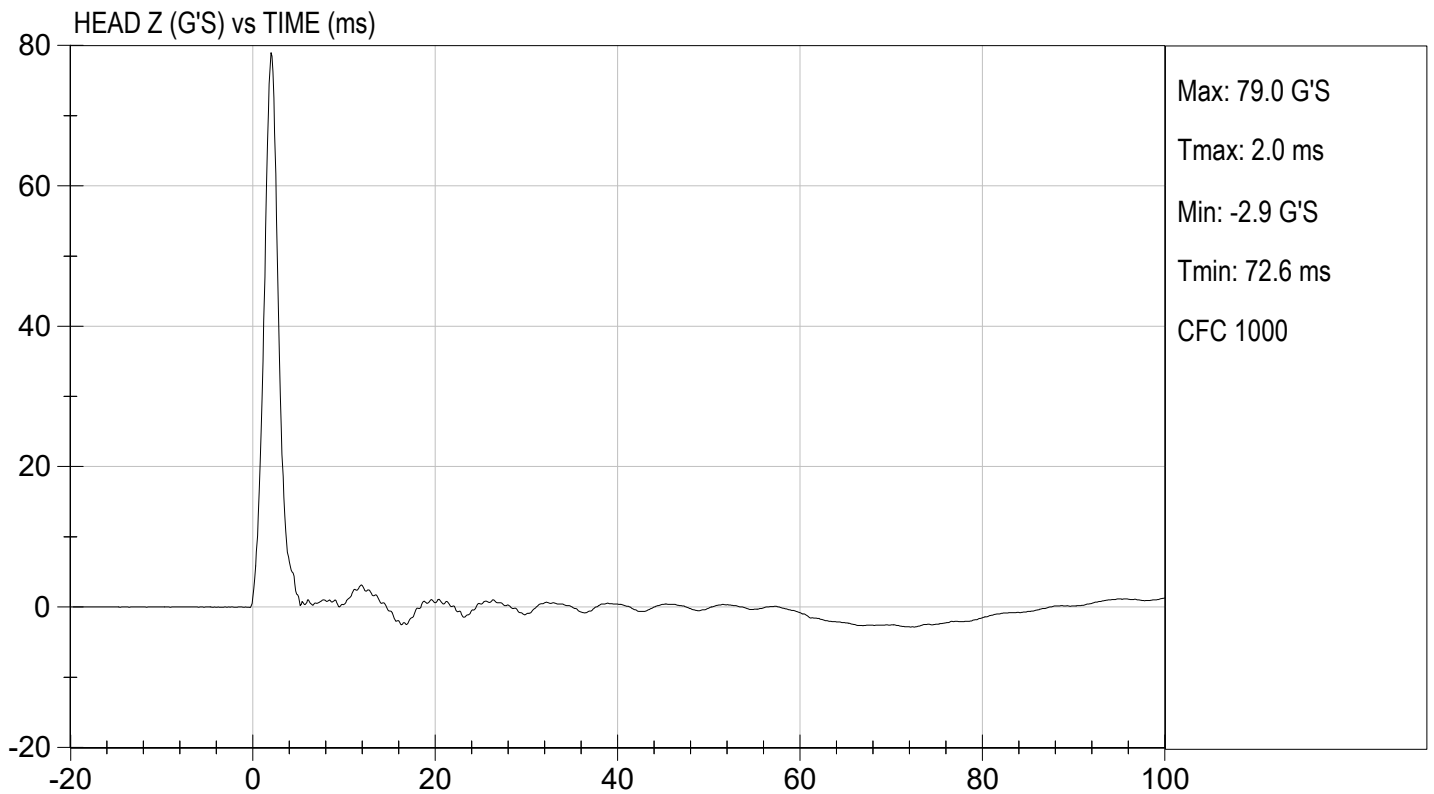
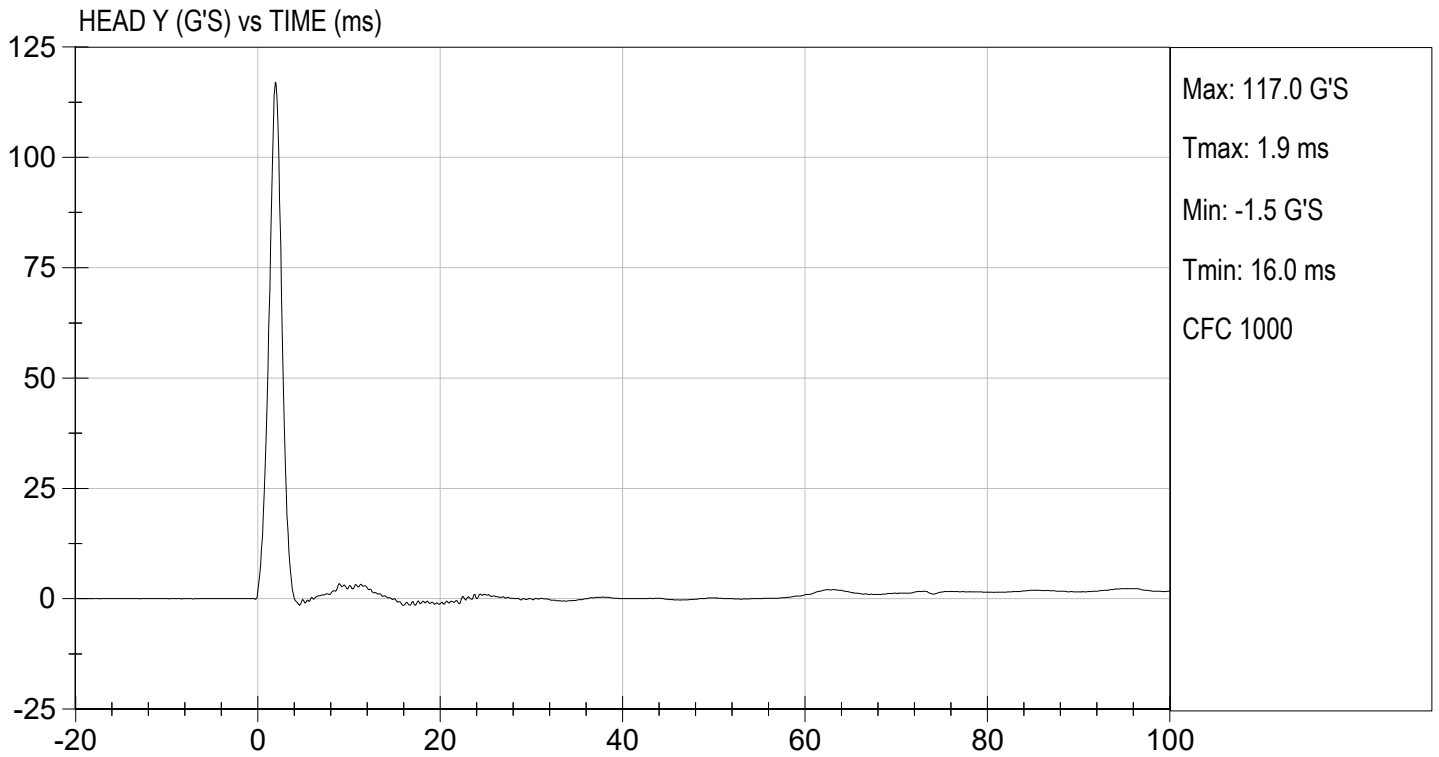
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	125 to 155	141	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	8.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
			Overall Test Results	Pass

  
 \_\_\_\_\_  
 Laboratory Technician

11/03/2022  
 \_\_\_\_\_  
 Test Date

  
 \_\_\_\_\_  
 Approved By





**MGA RESEARCH CORPORATION**  
**NECK PENDULUM TEST**  
**ES-2re DUMMY**

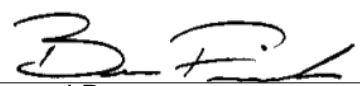
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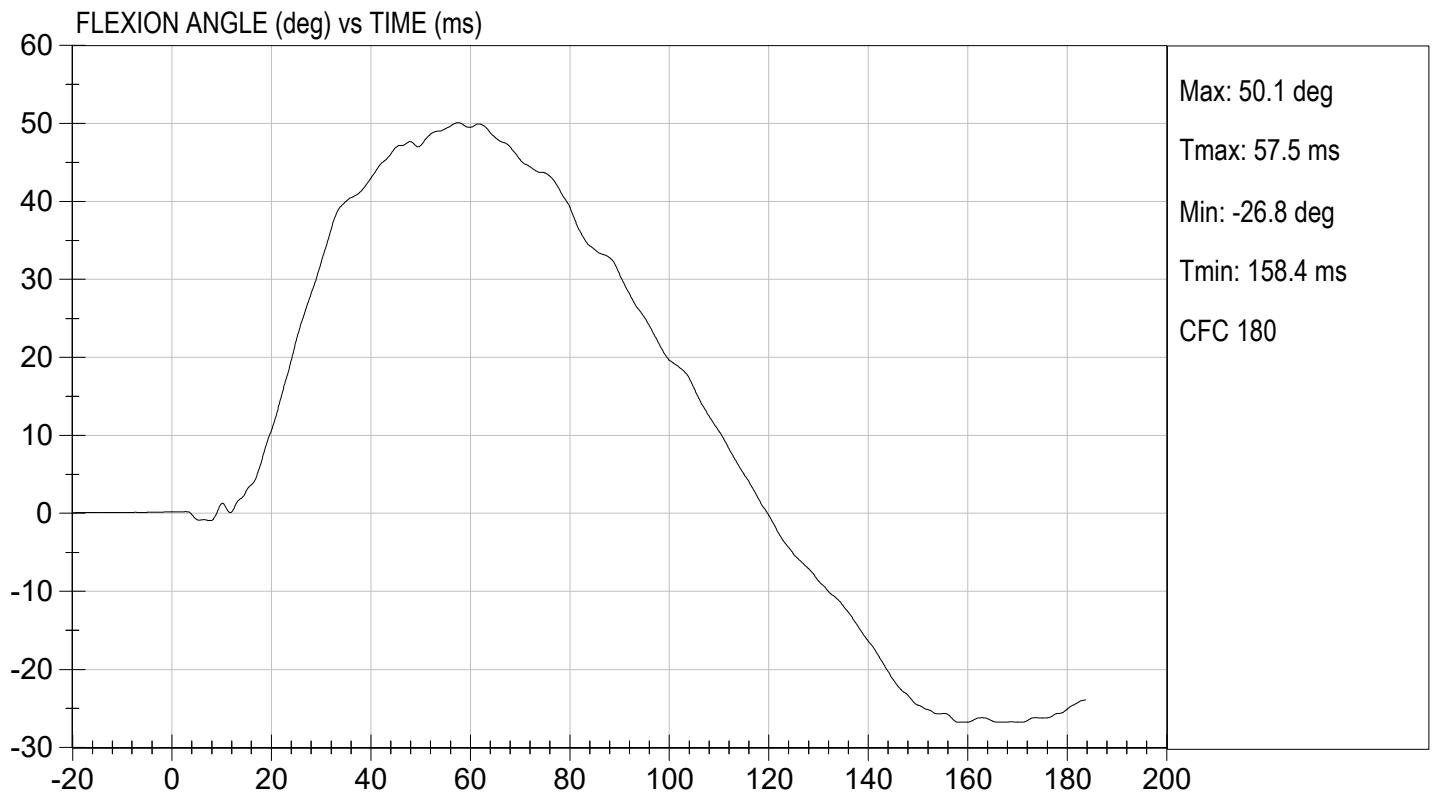
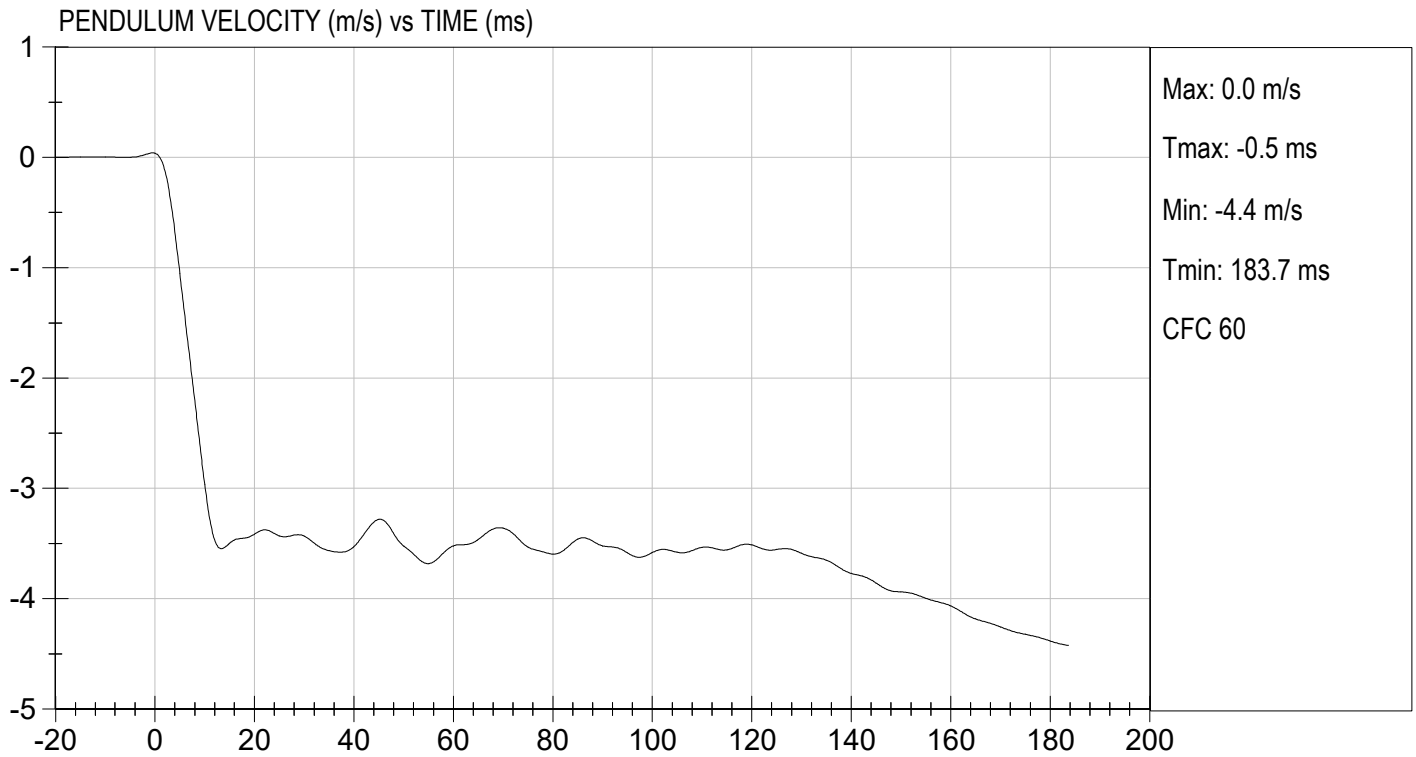
Test I.D.:           D222562          

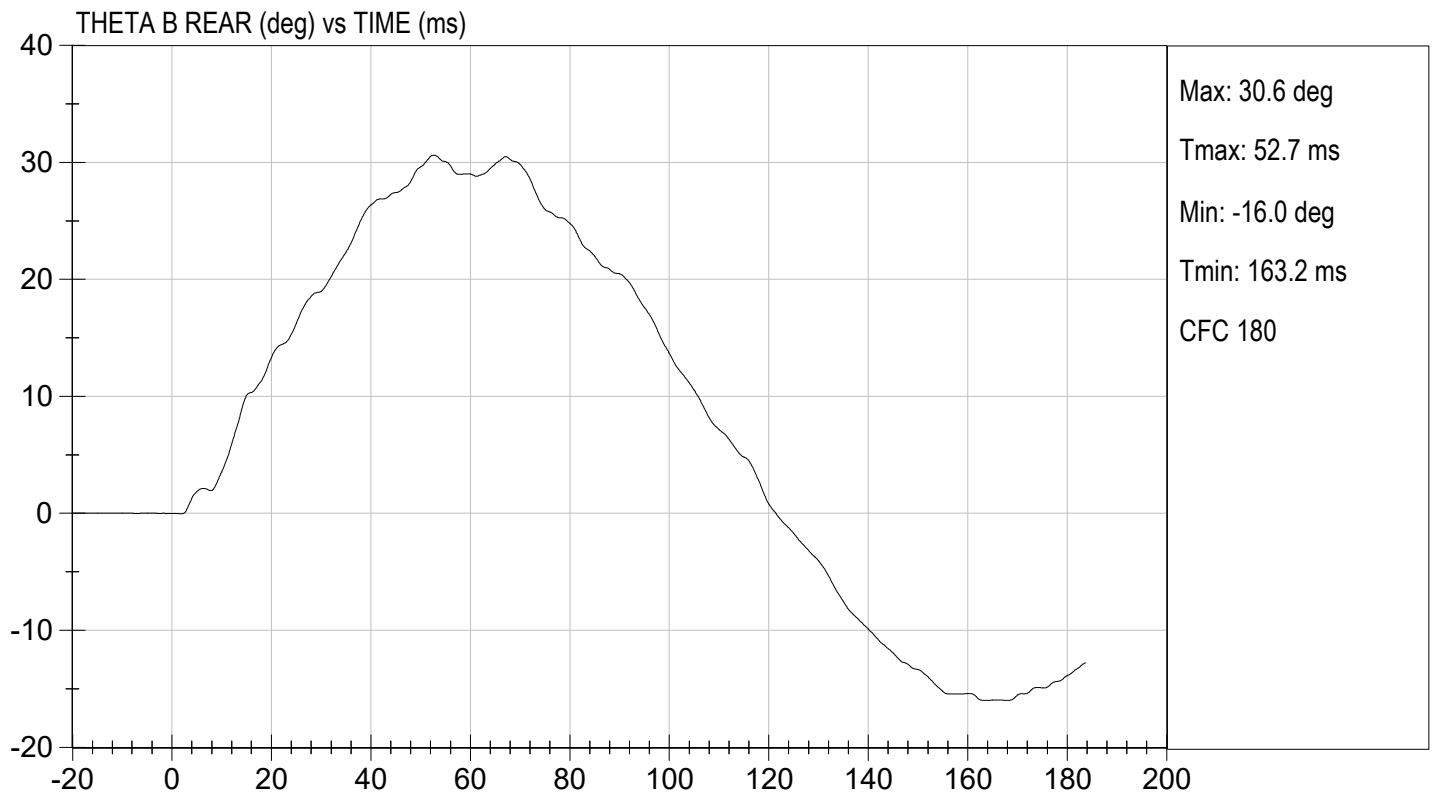
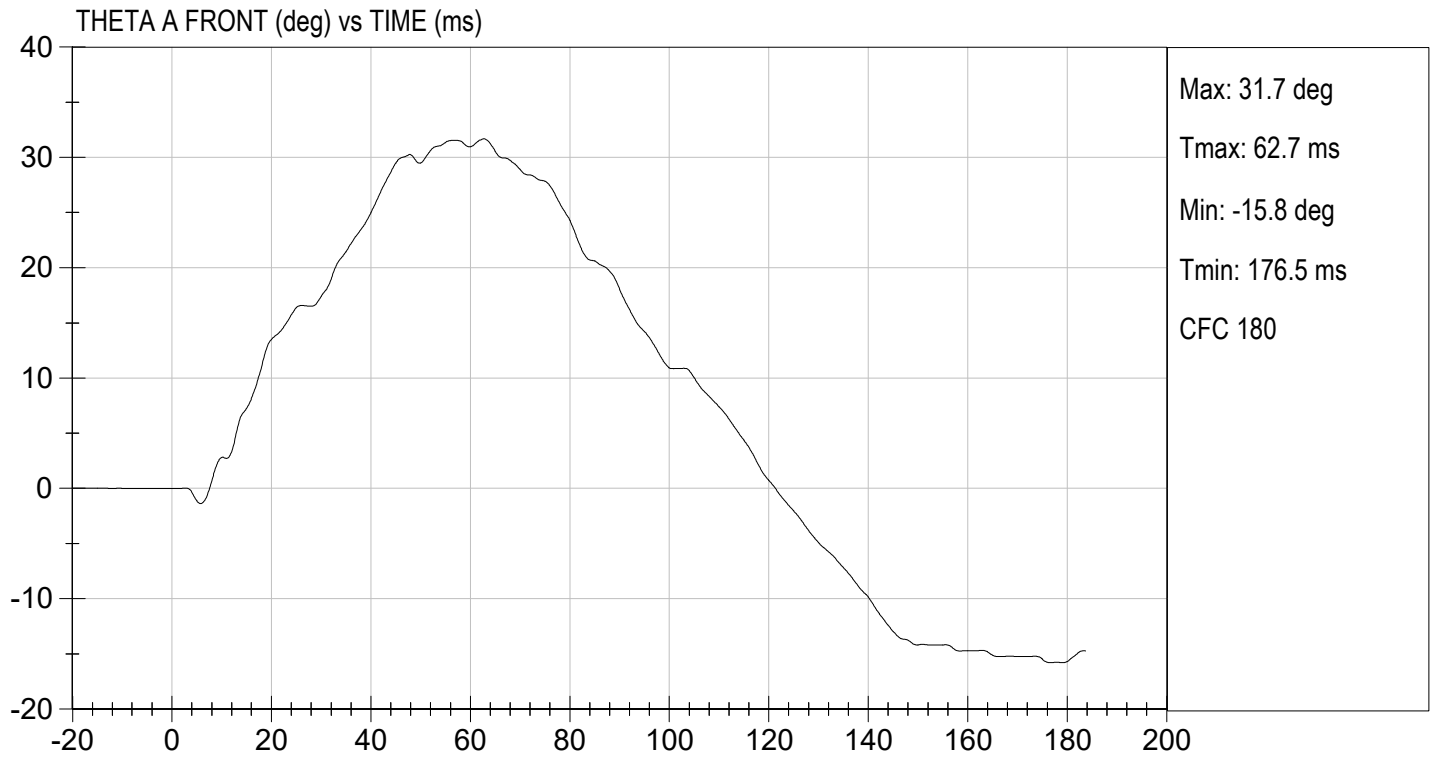
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.48	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3 ms	m/s	-0.25 to -0.375	-0.35	Pass
	14 ms	m/s	-3.20 to -3.70	-3.53	Pass
	17 ms	m/s	>= -3.70	-3.45	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	50.1	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	57.5	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	62.3	Pass
Overall Results					Pass

  
 Laboratory Technician

          11/03/2022            
 Test Date

  
 Approved By

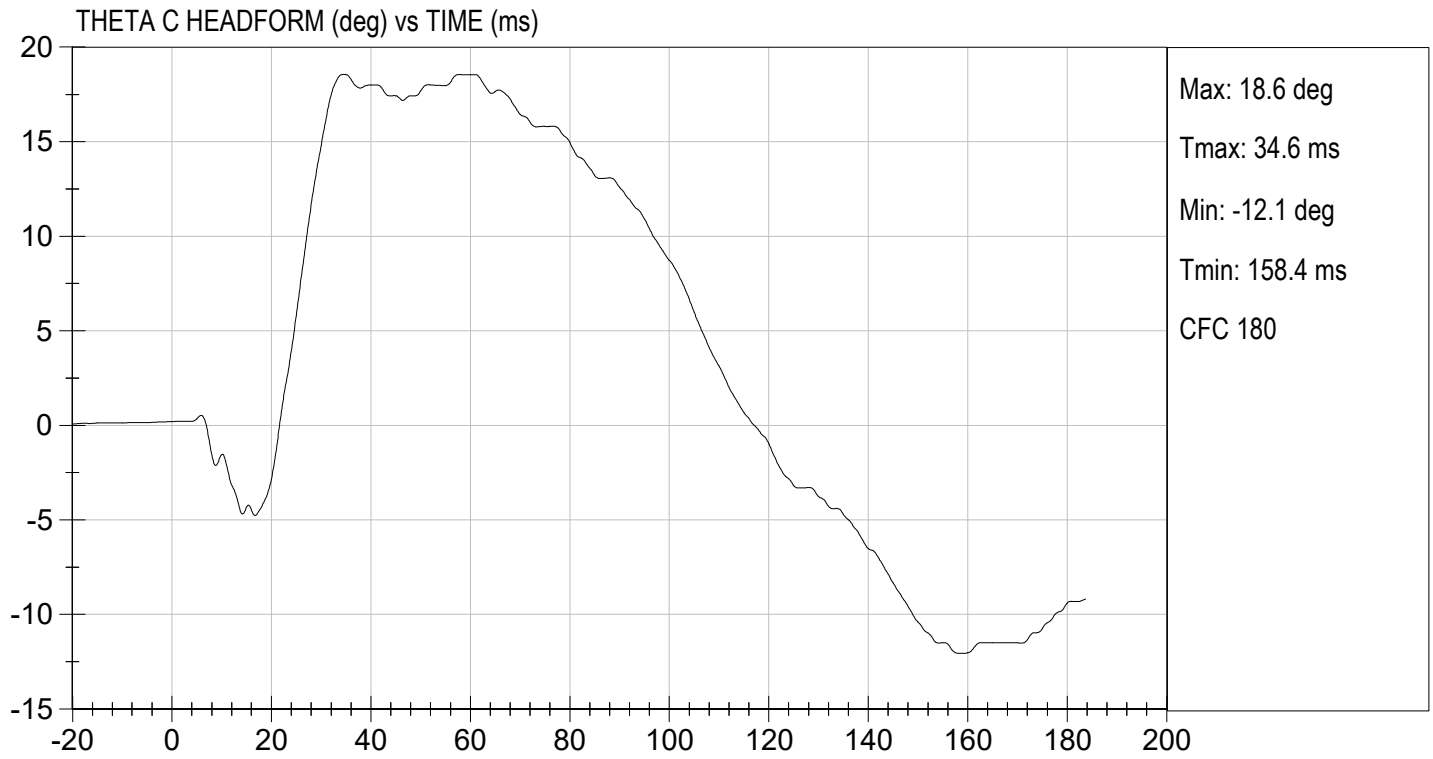






TEST DESC: NECK BENDING  
VELOCITY: 11.42 ft/s, 3.48 m/s

TEST DATE: 11/03/2022  
TEST #: D222562



**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**ES-2re DUMMY**

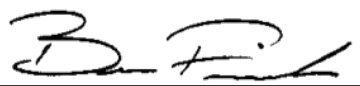
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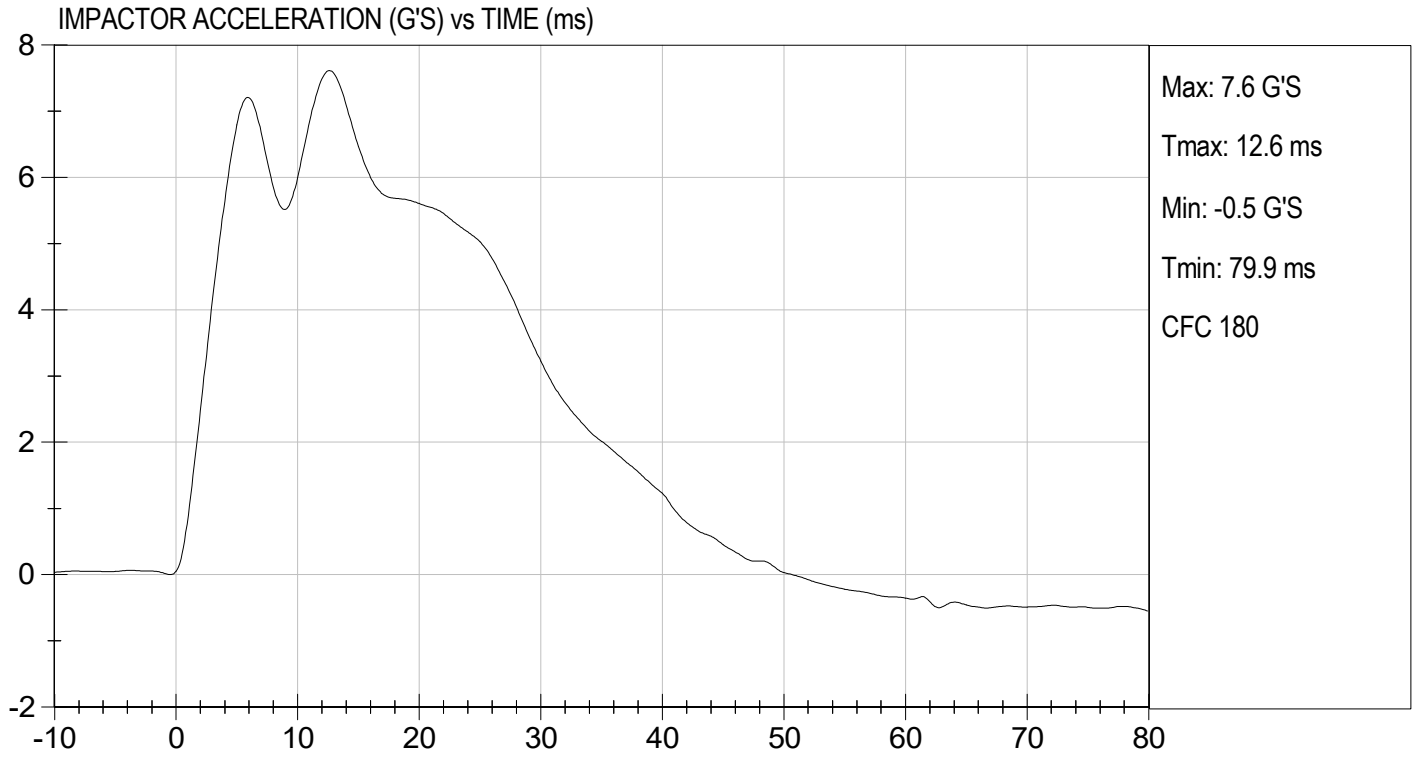
Test I.D:           D222563          

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	48	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.2	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	7.6	Pass
Overall Test Results				Pass

  
 Laboratory Technician

          11/04/2022            
 Test Date

  
 Approved By



**MGA RESEARCH CORPORATION**

**UPPER RIB TEST**

**ES-2re DUMMY**

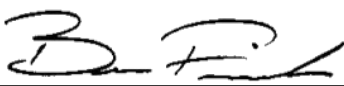
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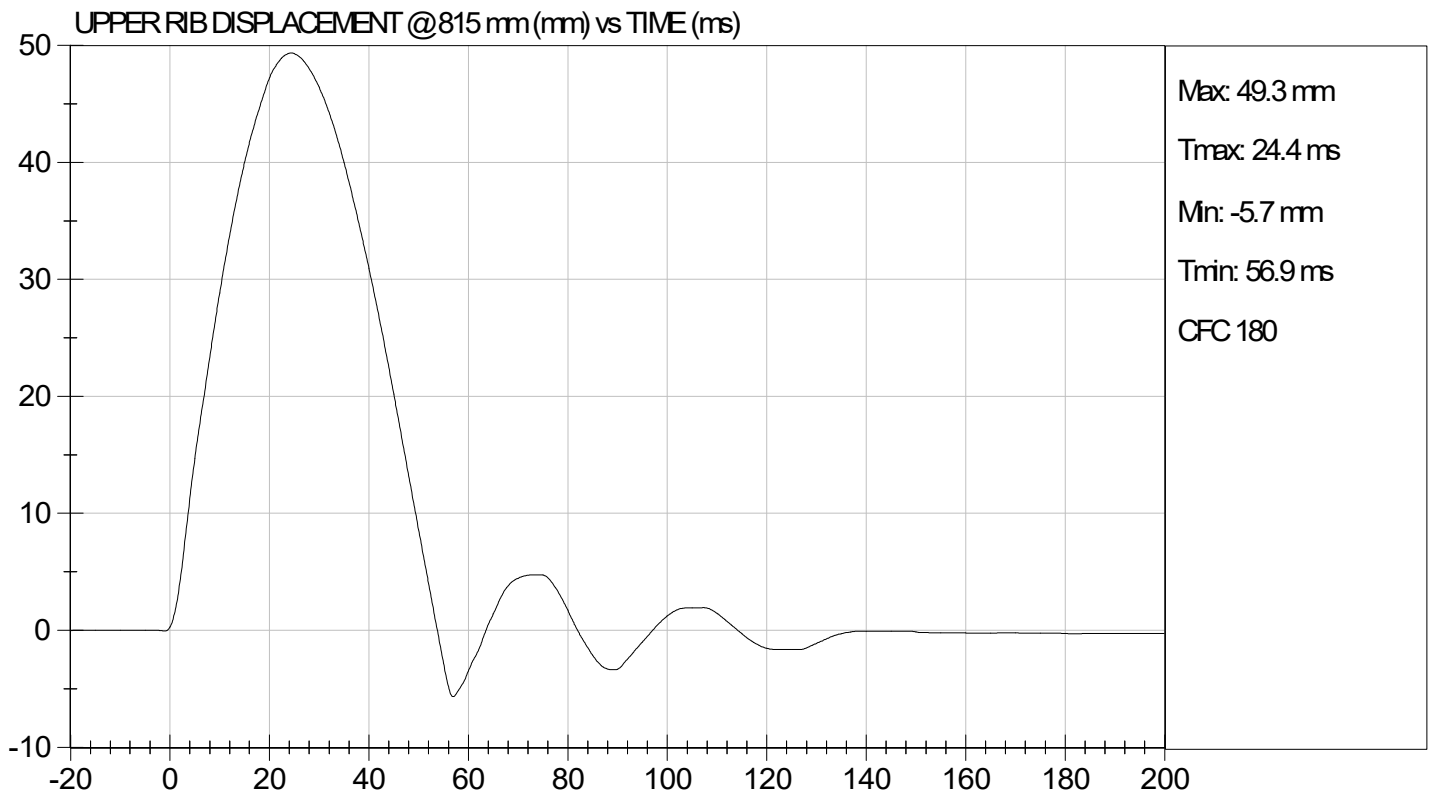
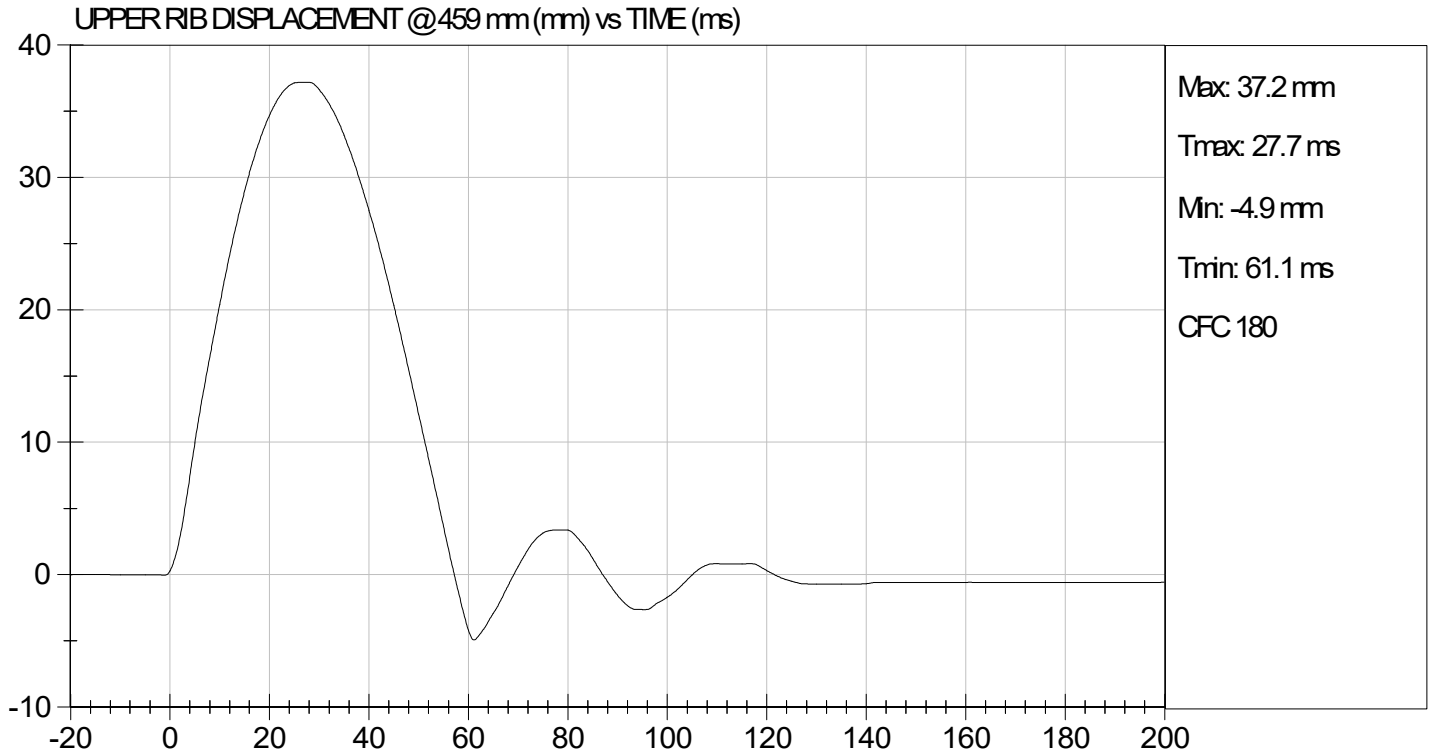
**Test I.D:**       D222564      

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	43	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.2	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.3	Pass
			Overall Test Results	Pass

  
\_\_\_\_\_  
Laboratory Technician

11/03/2022  
Test Date

  
\_\_\_\_\_  
Approved By



**MGA RESEARCH CORPORATION**

**MID RIB TEST**

**ES-2re DUMMY**

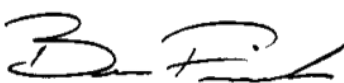
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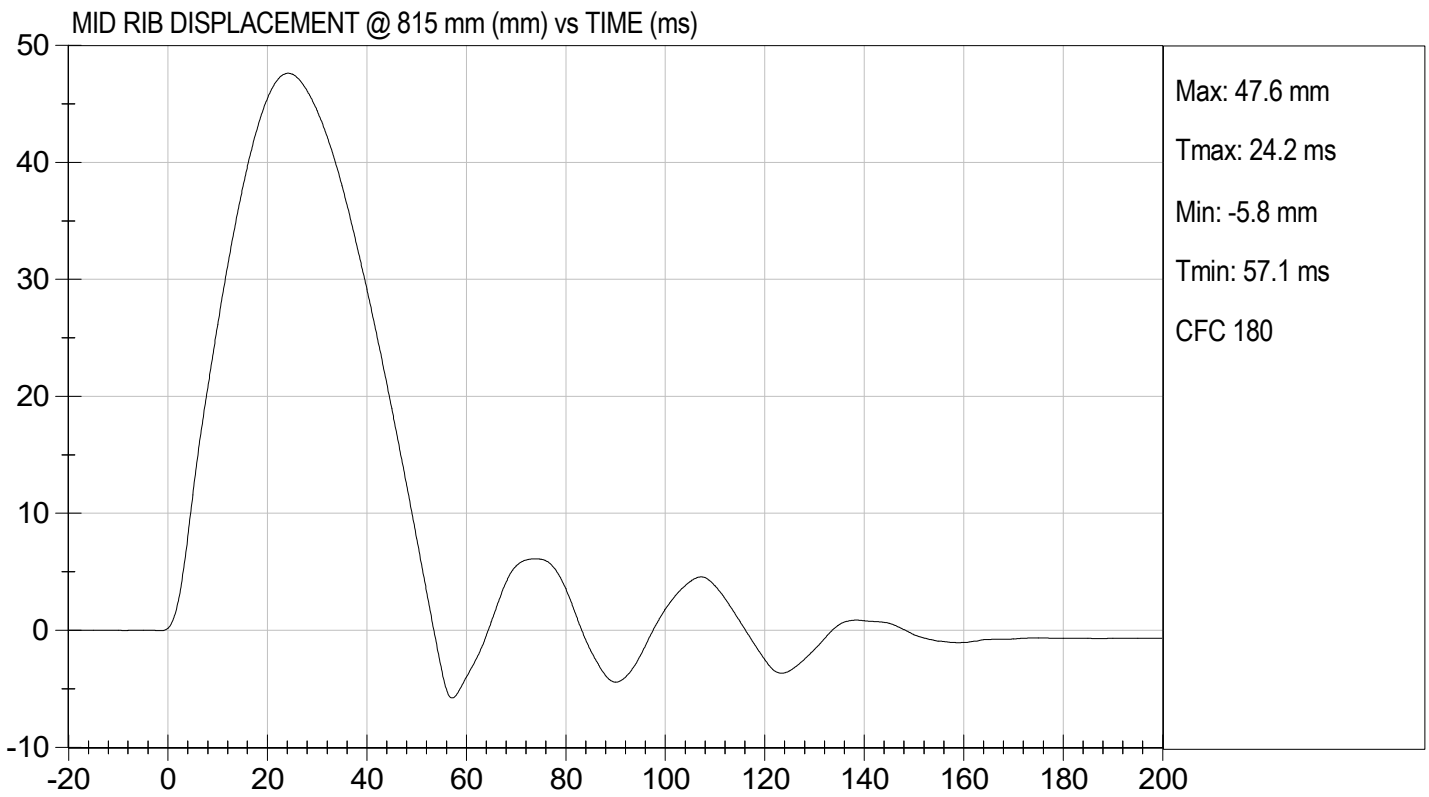
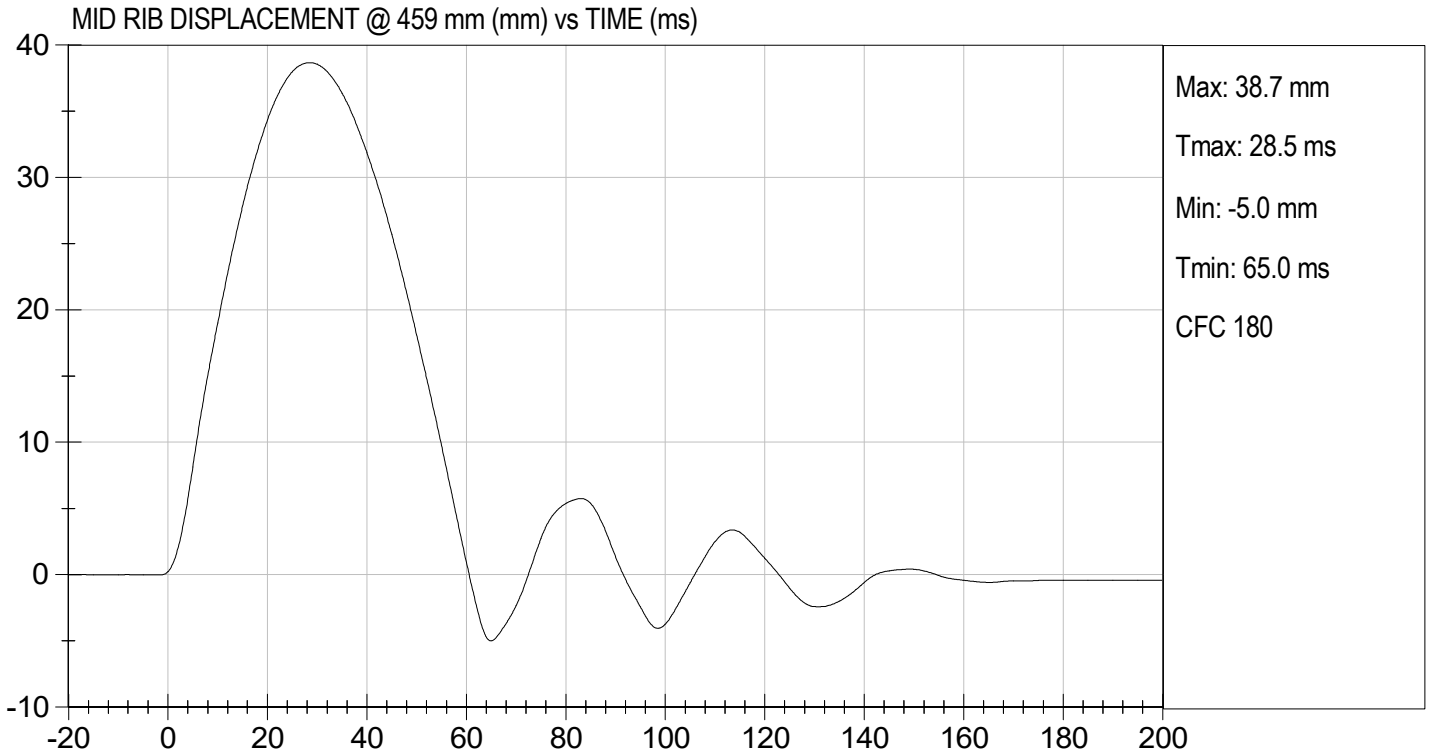
**Test I.D.:**       D222565      

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	43	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.7	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.6	Pass
Overall Test Results				Pass

  
\_\_\_\_\_  
Laboratory Technician

      11/03/2022        
Test Date

  
\_\_\_\_\_  
Approved By



**MGA RESEARCH CORPORATION**

**LOWER RIB TEST**

**ES-2re DUMMY**

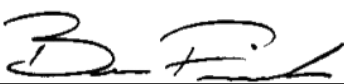
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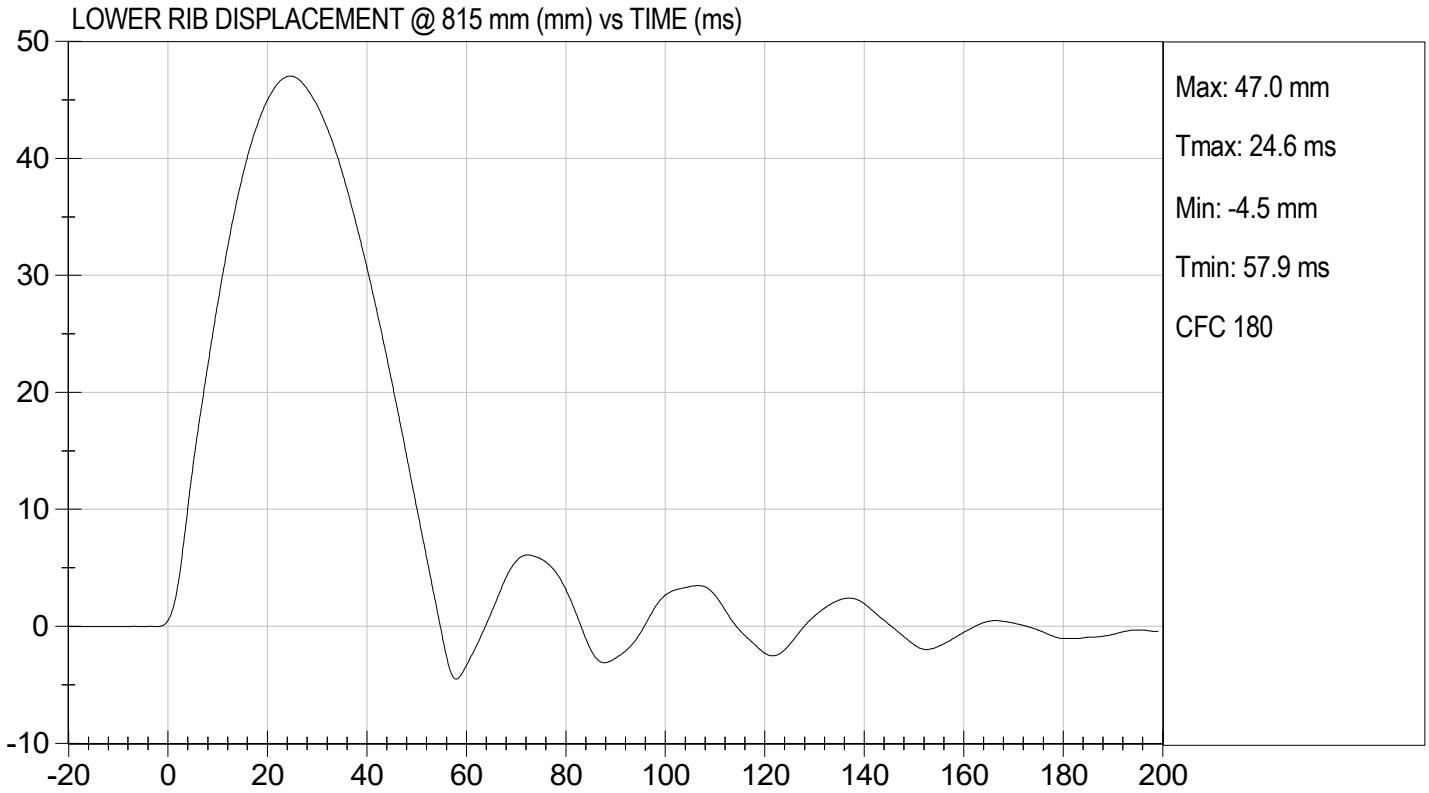
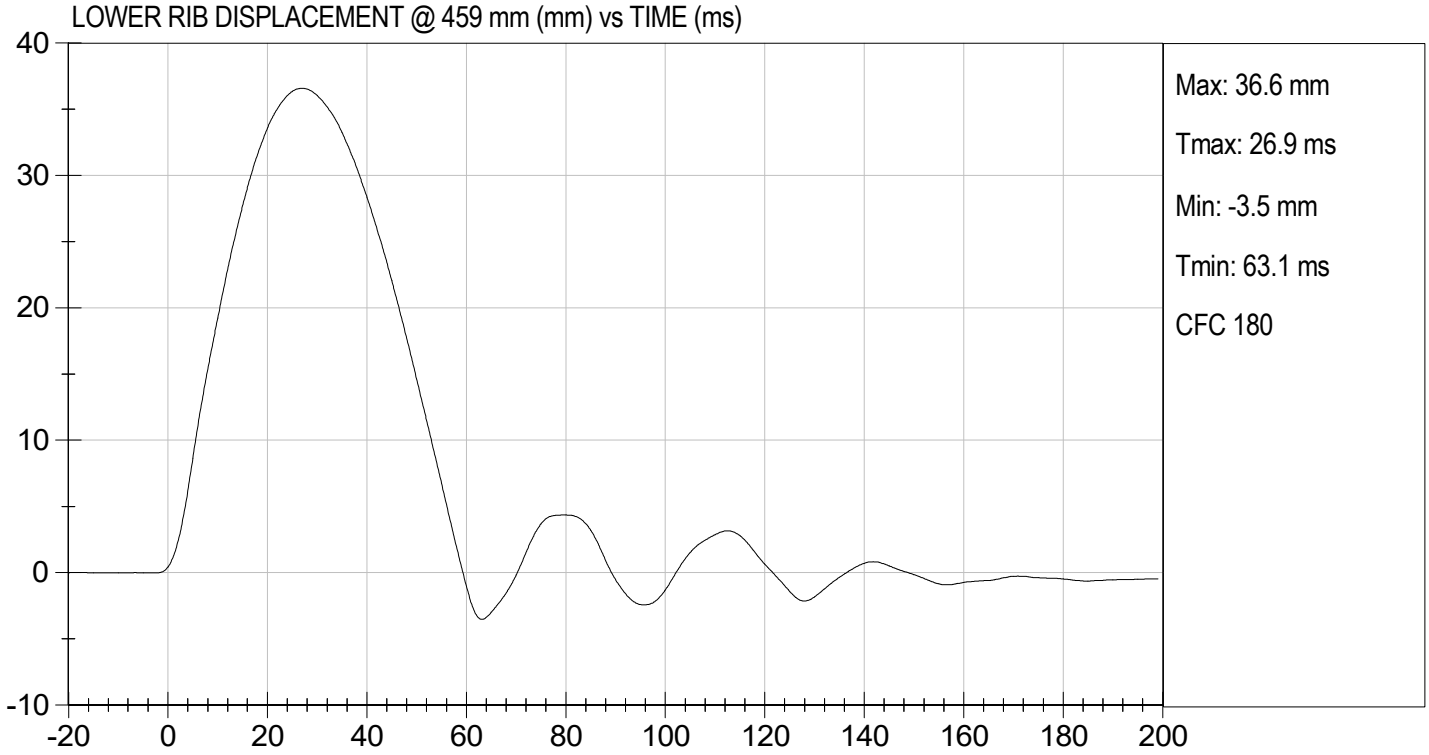
**Test I.D:**       D222566      

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	43	Pass
Displacement at 459 mm	mm	36.0 to 40.0	36.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.0	Pass
Overall Test Results				Pass

  
\_\_\_\_\_  
Laboratory Technician

11/03/2022  
Test Date

  
\_\_\_\_\_  
Approved By



**MGA RESEARCH CORPORATION**

**ABDOMEN TEST**

**ES-2re DUMMY**

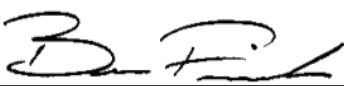
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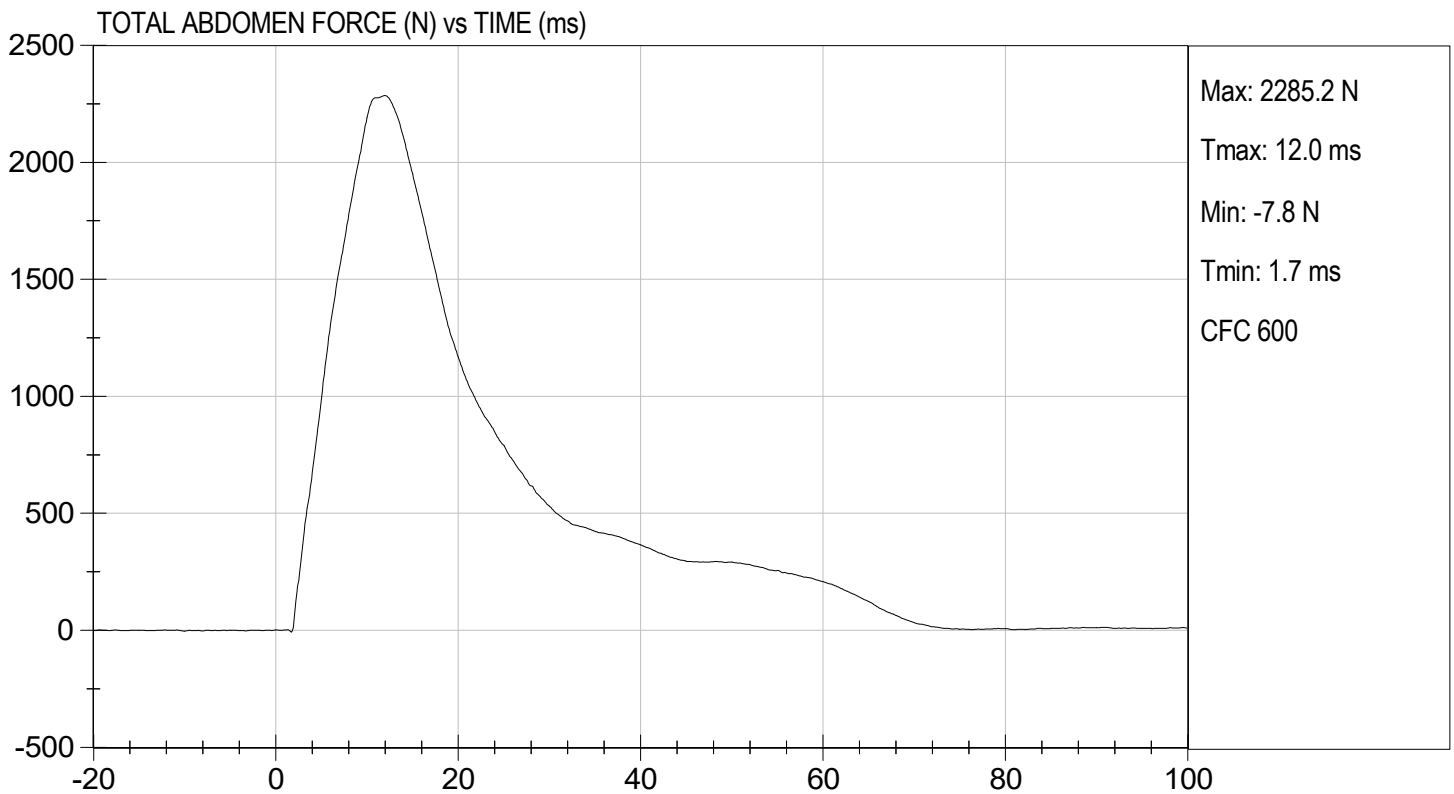
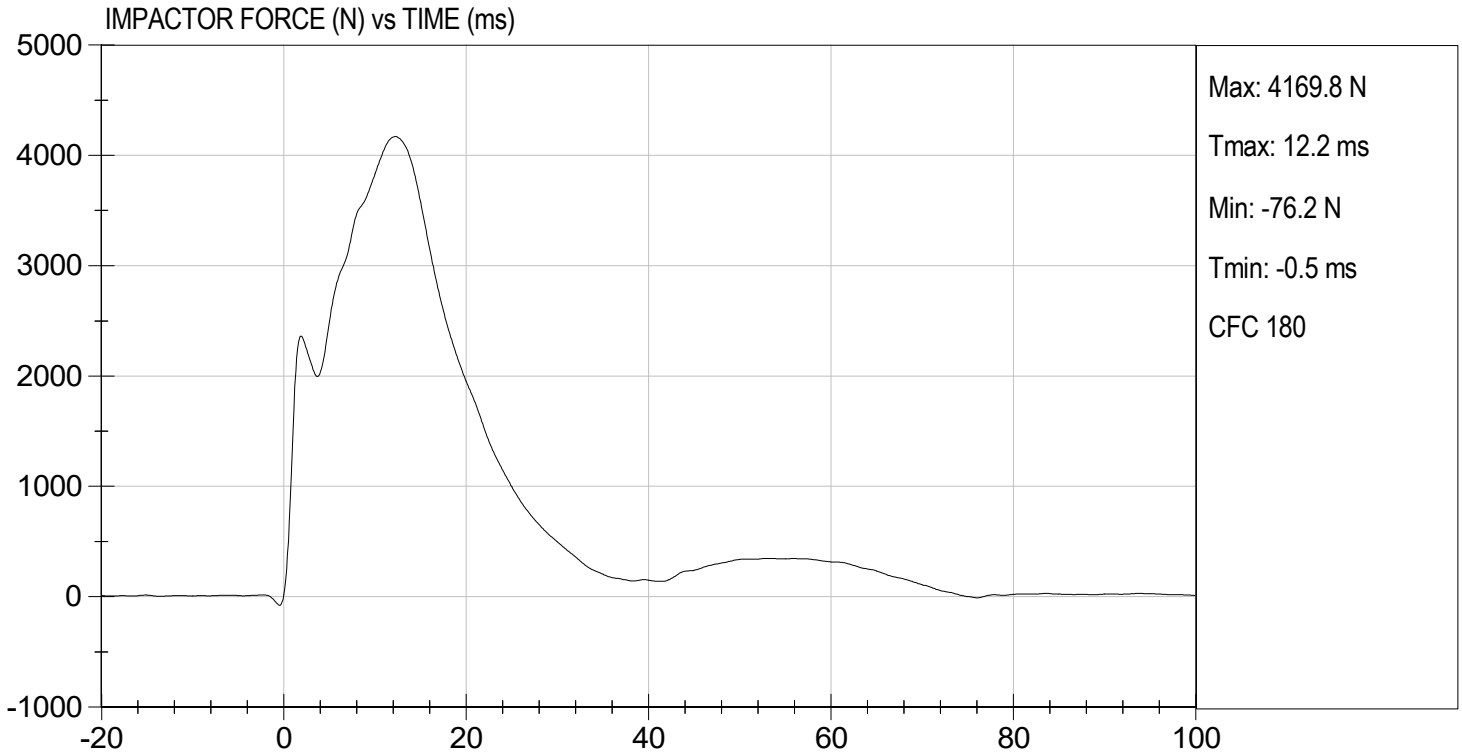
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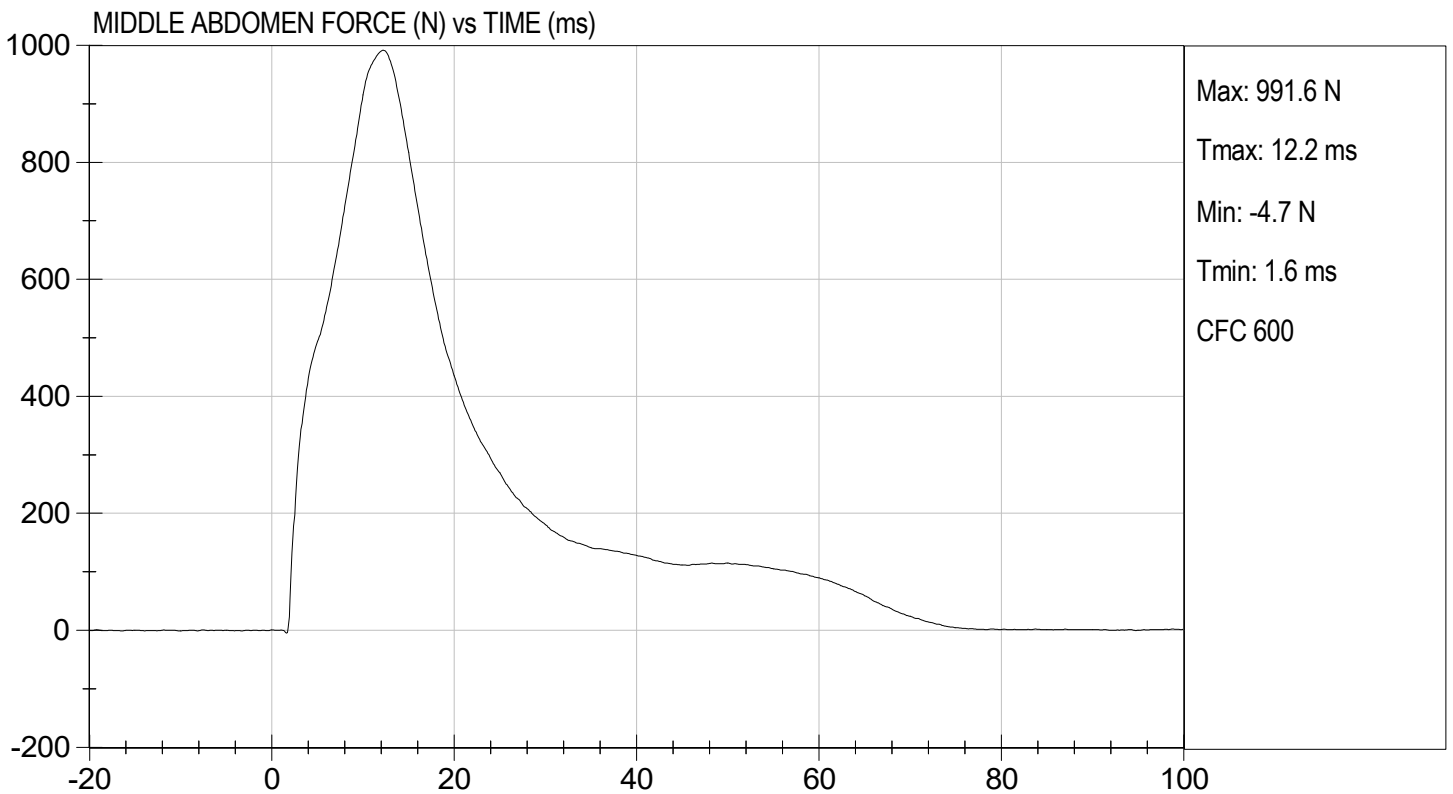
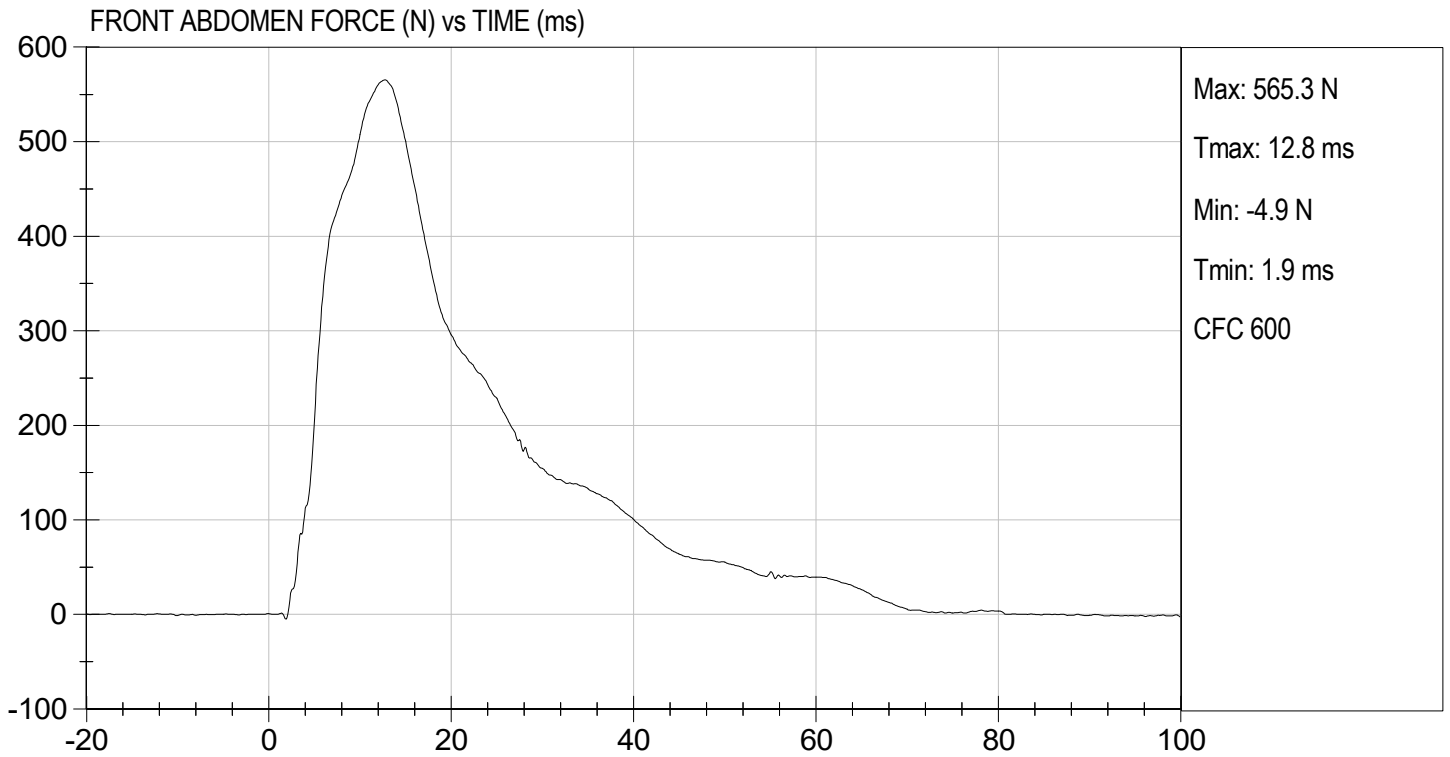
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impactor Force	N	4000 to 4800	4170	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	12.2	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2285	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	12.0	Pass
Overall Test Results				Pass

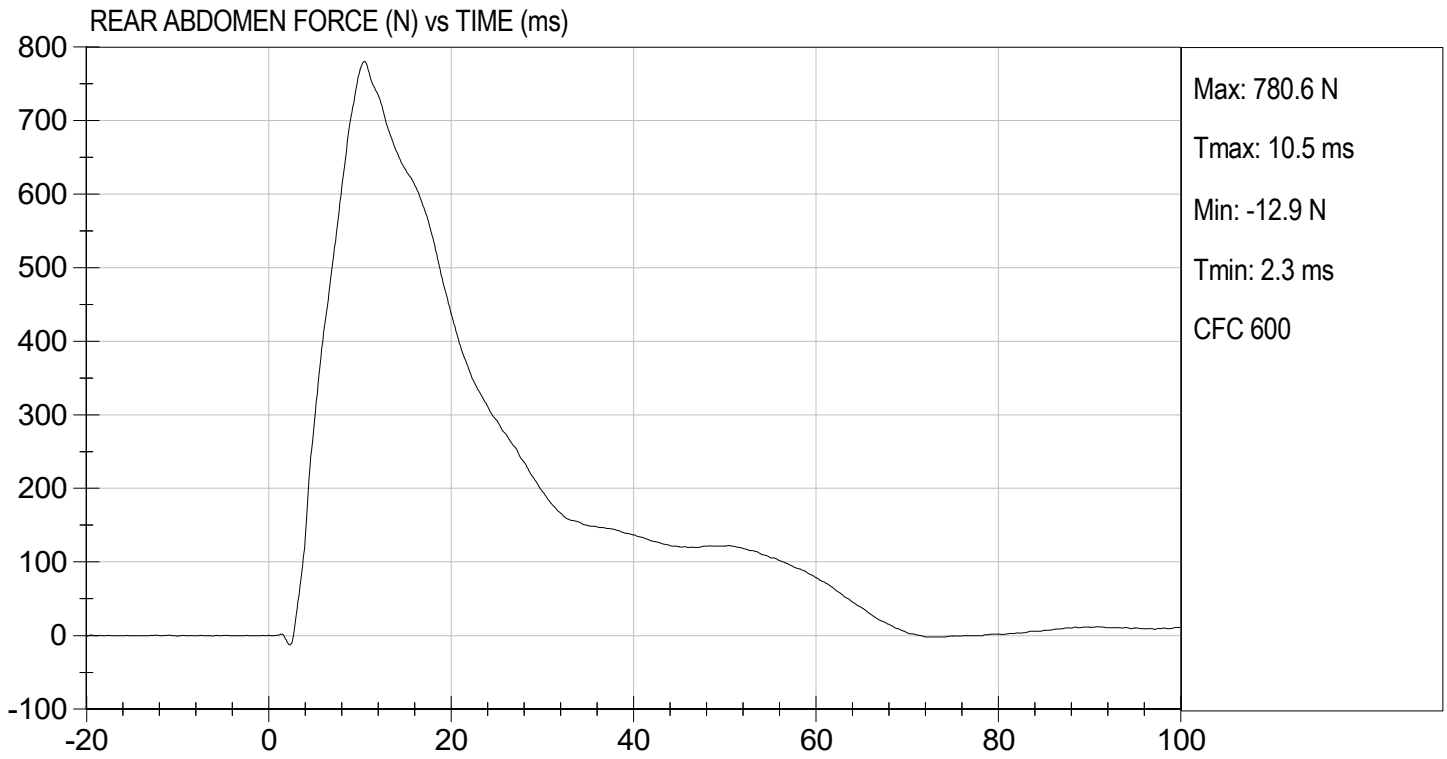
  
\_\_\_\_\_  
Laboratory Technician

          11/04/2022            
Test Date

  
\_\_\_\_\_  
Approved By







**MGA RESEARCH CORPORATION**  
**LUMBAR SPINE TEST**  
**ES-2re DUMMY**

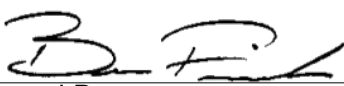
ATD Serial No:           F032          

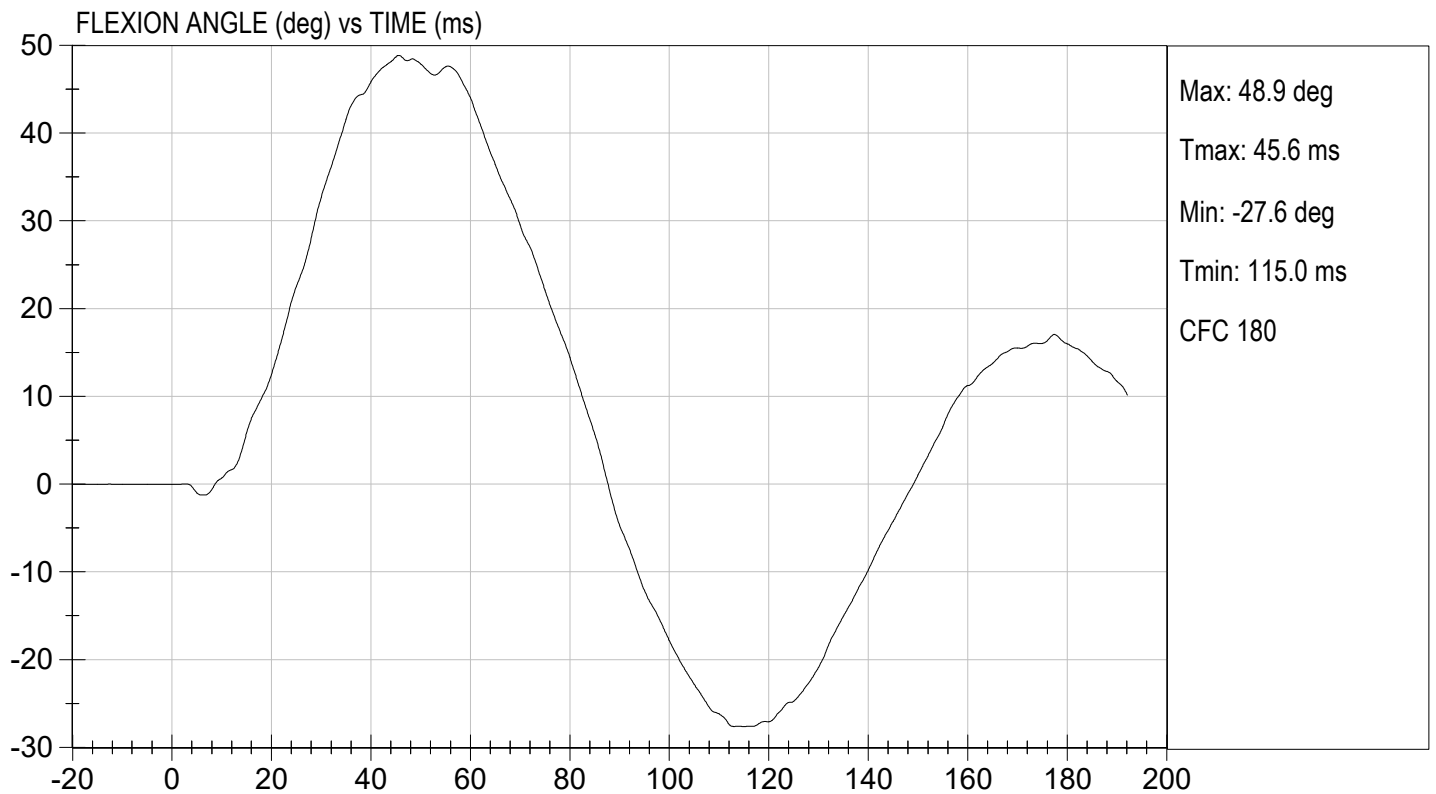
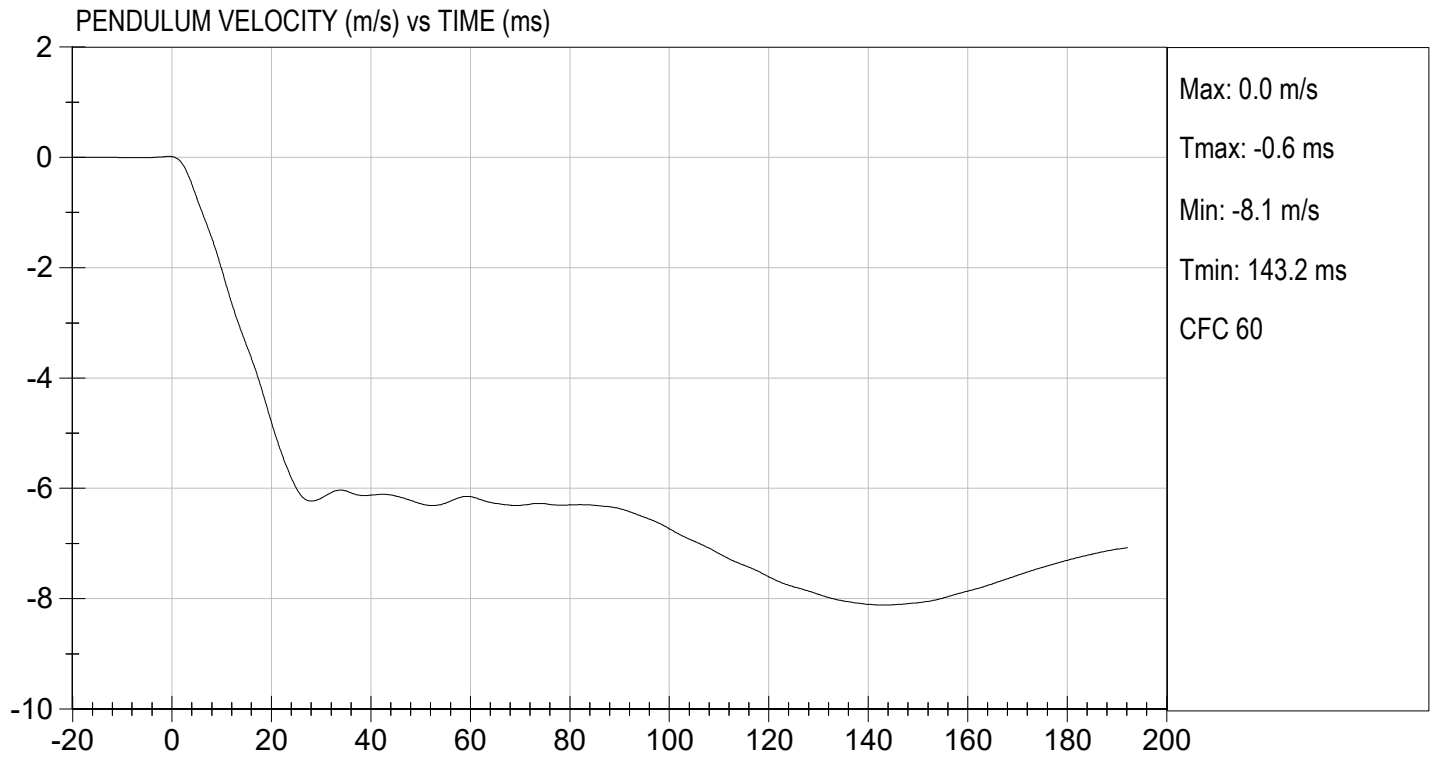
Test I.D.:           D222568          

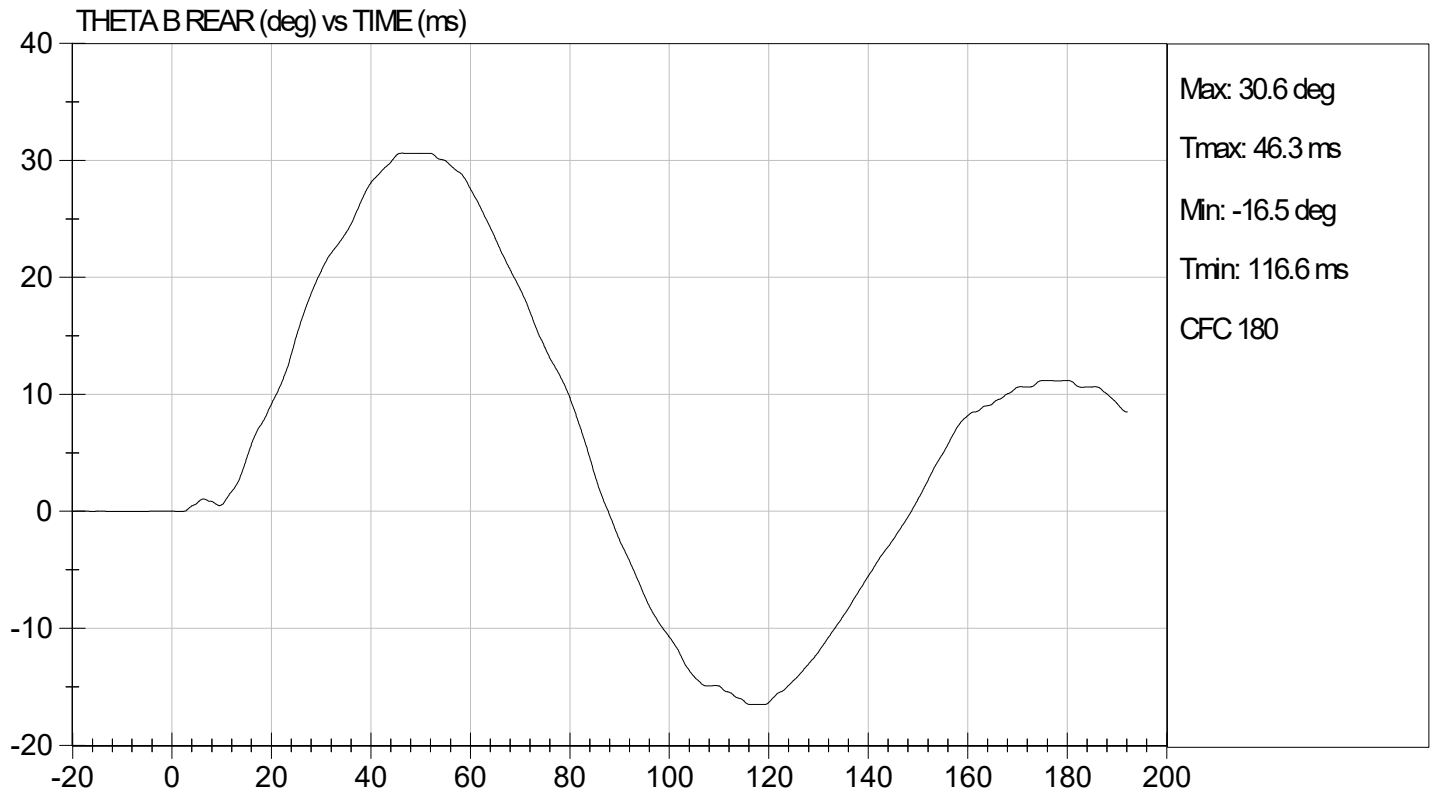
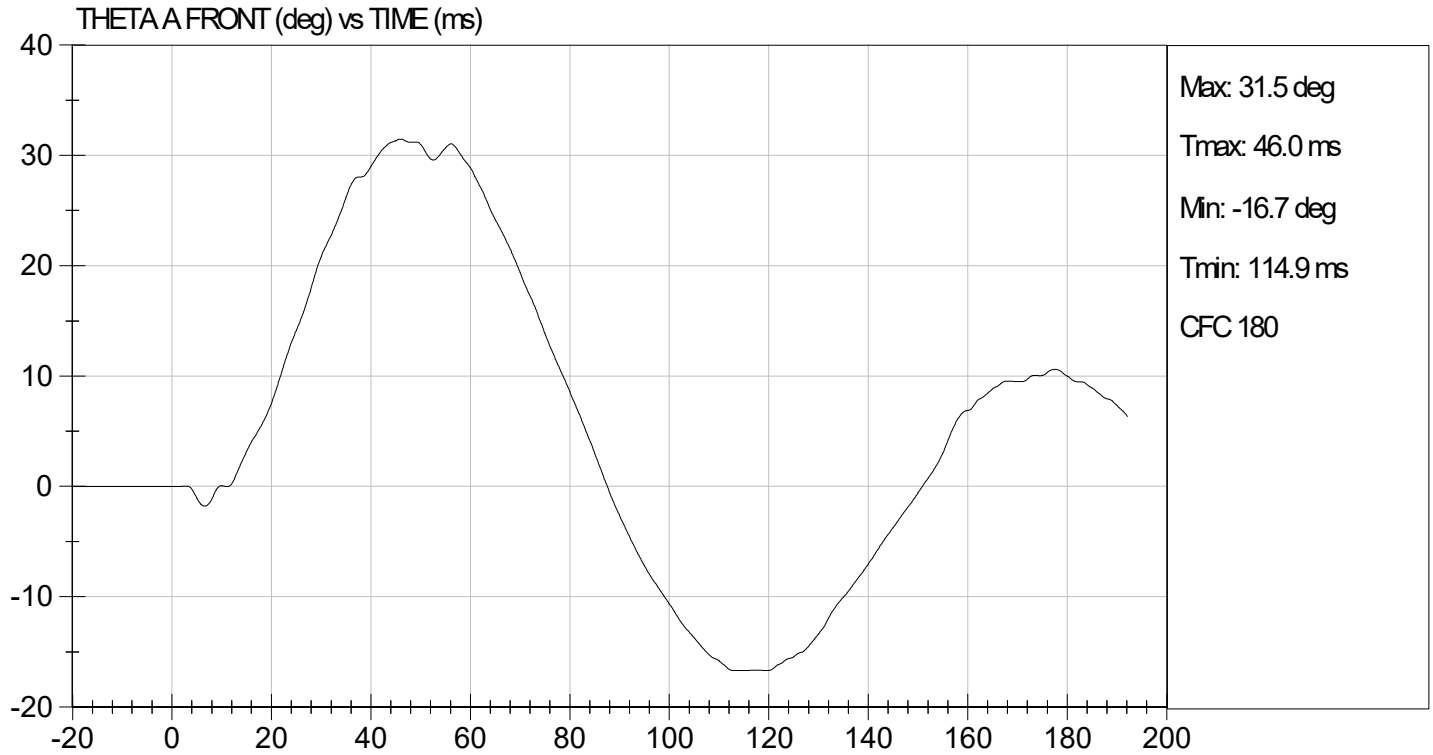
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	44	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.14	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.417	Pass
	27 ms	m/s	-6.50 to -5.80	-6.21	Pass
	30 ms	m/s	>= -6.50	-6.18	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	48.9	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	45.6	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	42	Pass
<b>Overall Results</b>					<b>Pass</b>

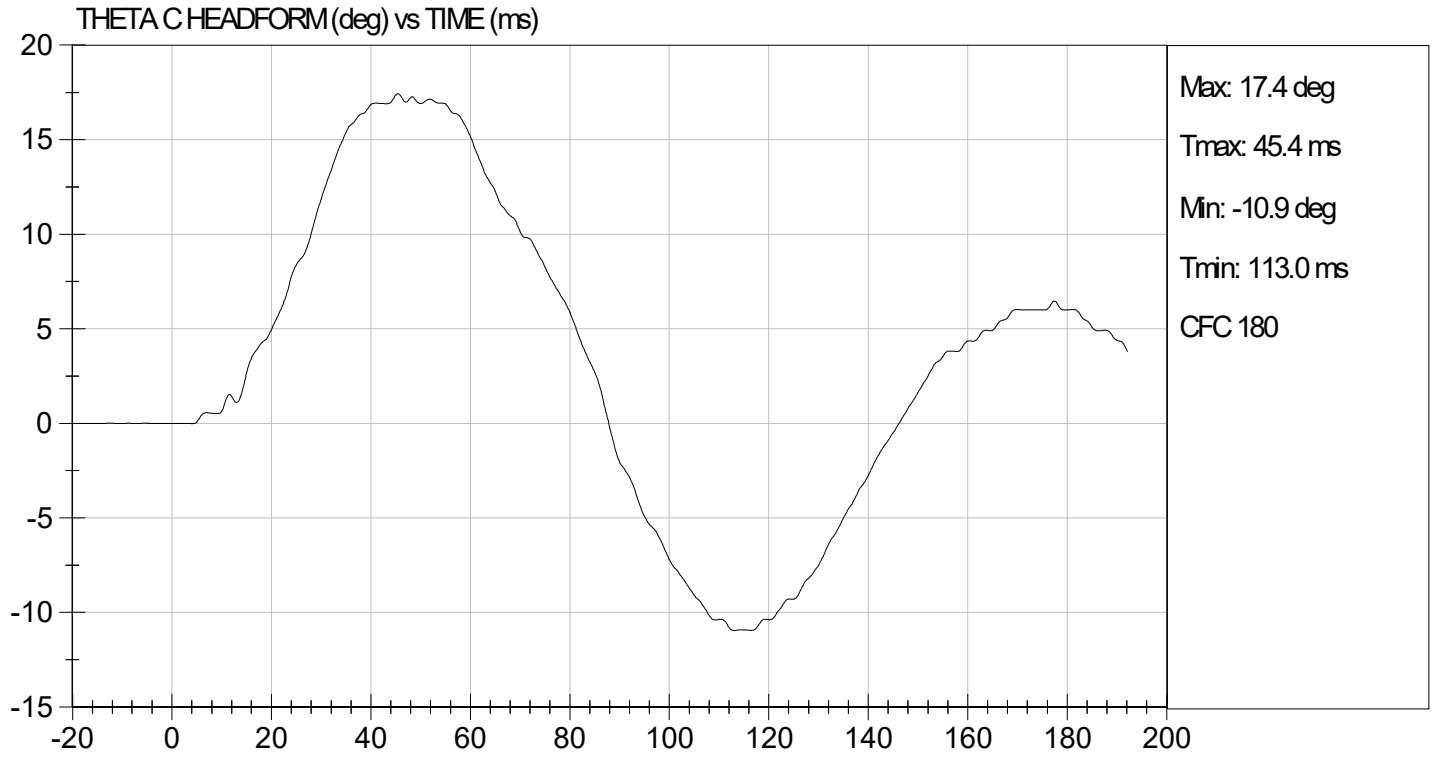
  
 Laboratory Technician

          11/03/2022            
 Test Date

  
 Approved By







**MGA RESEARCH CORPORATION**

**PELVIS TEST  
ES-2re DUMMY**

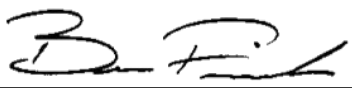
**ATD Serial No:**       F032      

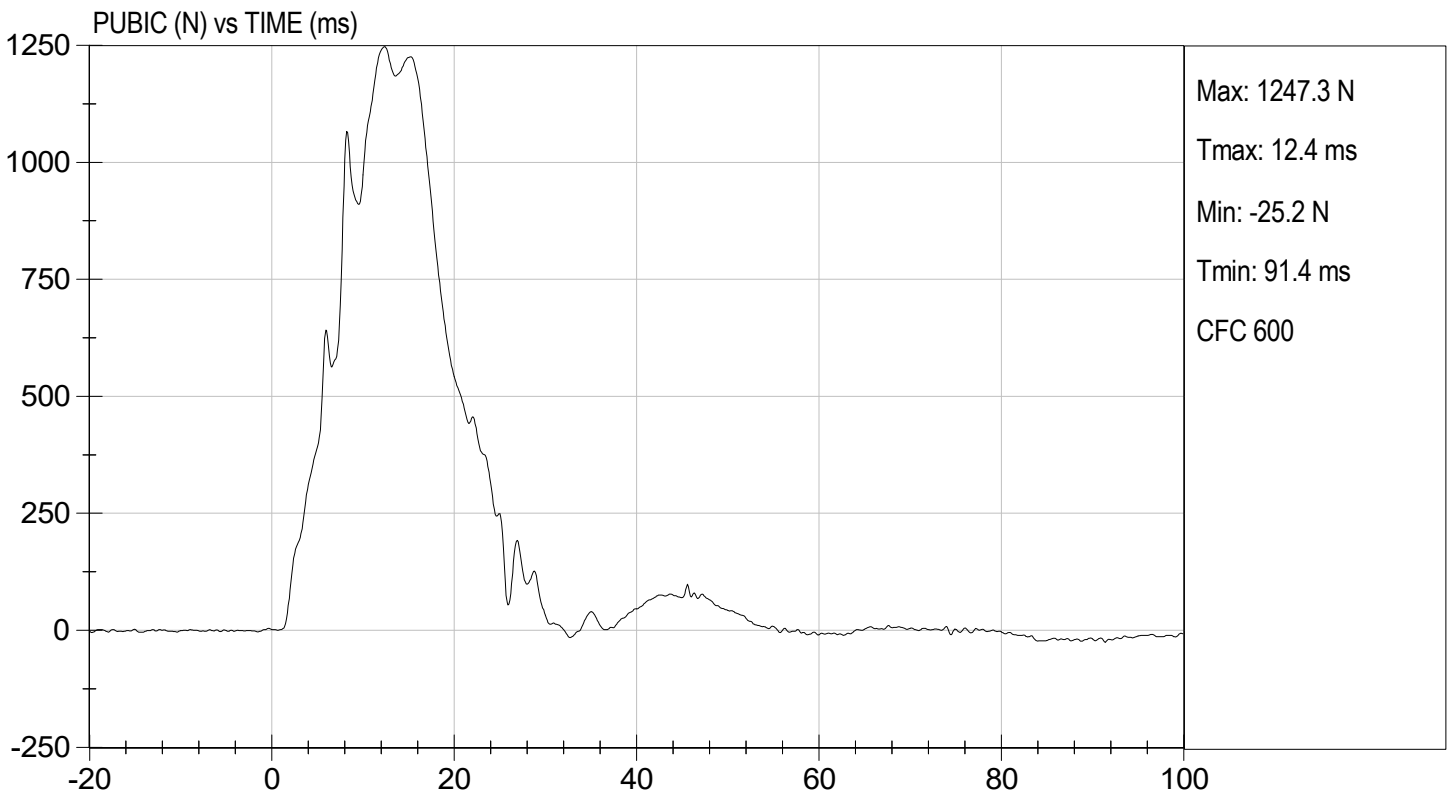
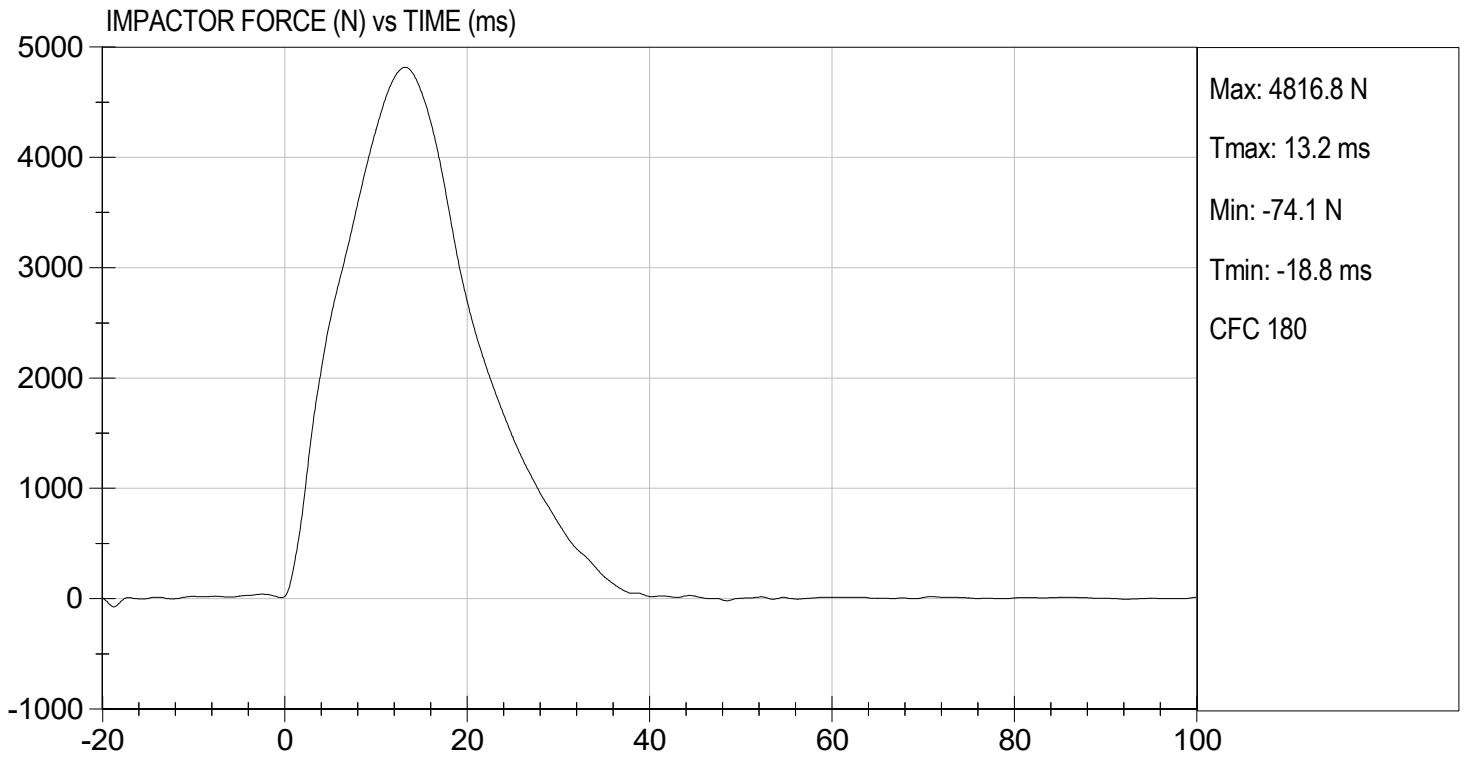
**Test I.D:**       D222569      

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	45	Pass
Probe Speed	m/s	4.20 to 4.40	4.27	Pass
Maximum Impactor Force	N	4700 to 5400	4817	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.2	Pass
Maximum Pubic Force	N	1230 to 1590	1247	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	12.4	Pass
Overall Test Results				Pass

  
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Laboratory Technician

11/04/2022  
Test Date

  
\_\_\_\_\_  
Approved By



**MGA RESEARCH CORPORATION**  
**THORAX IMPACT TEST**  
**ES-2re DUMMY**

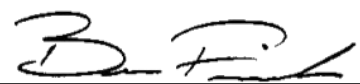
ATD Serial No:           F032          

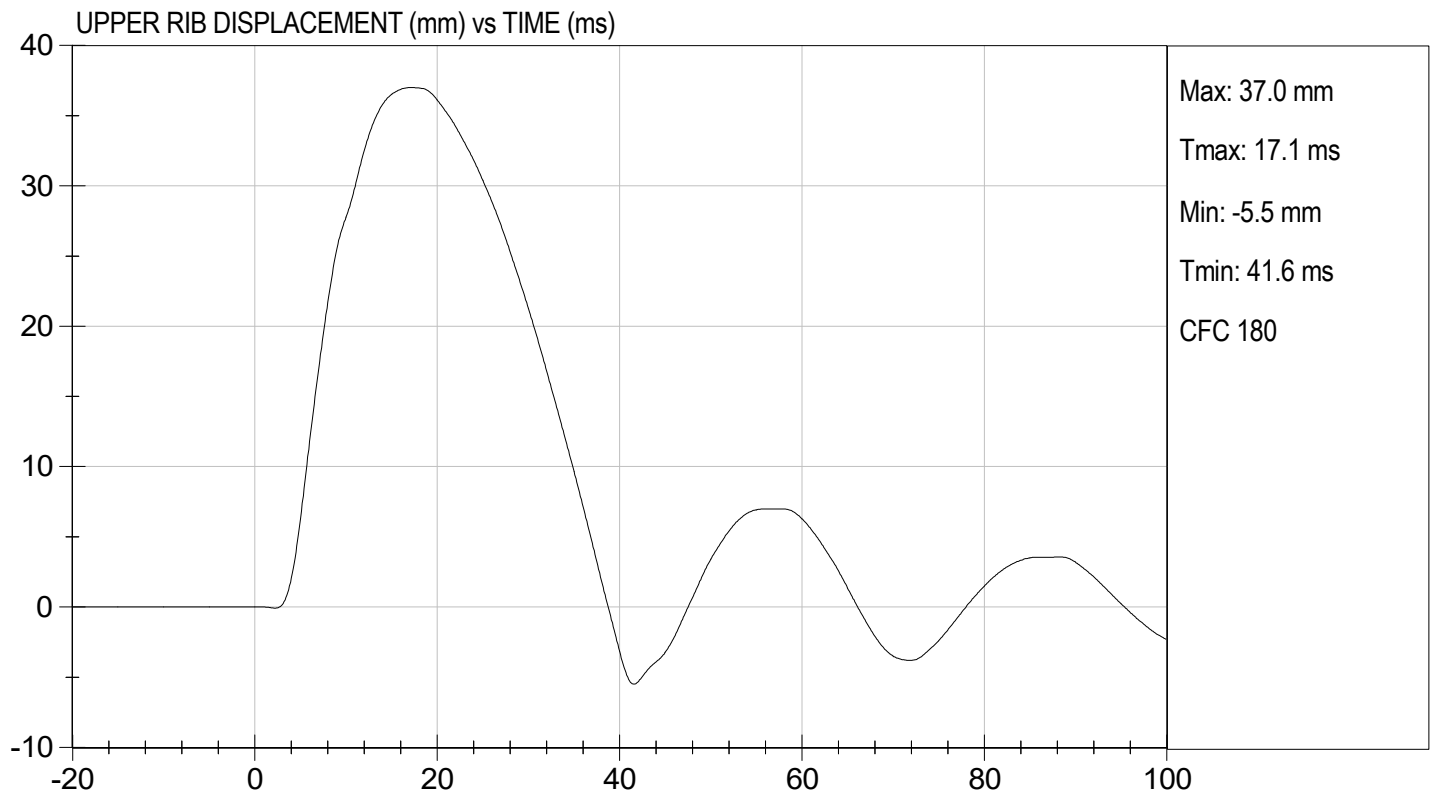
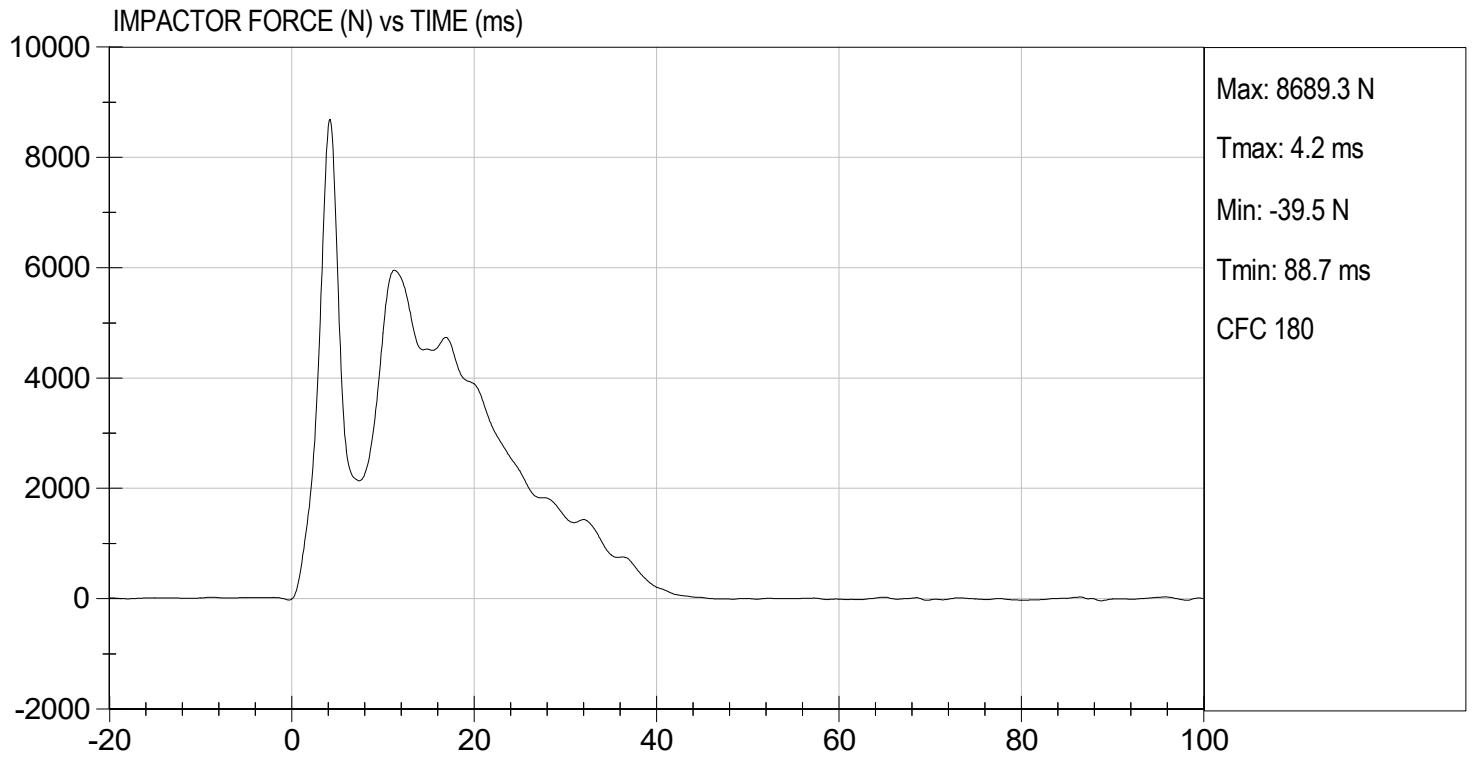
Test I.D:           D222560          

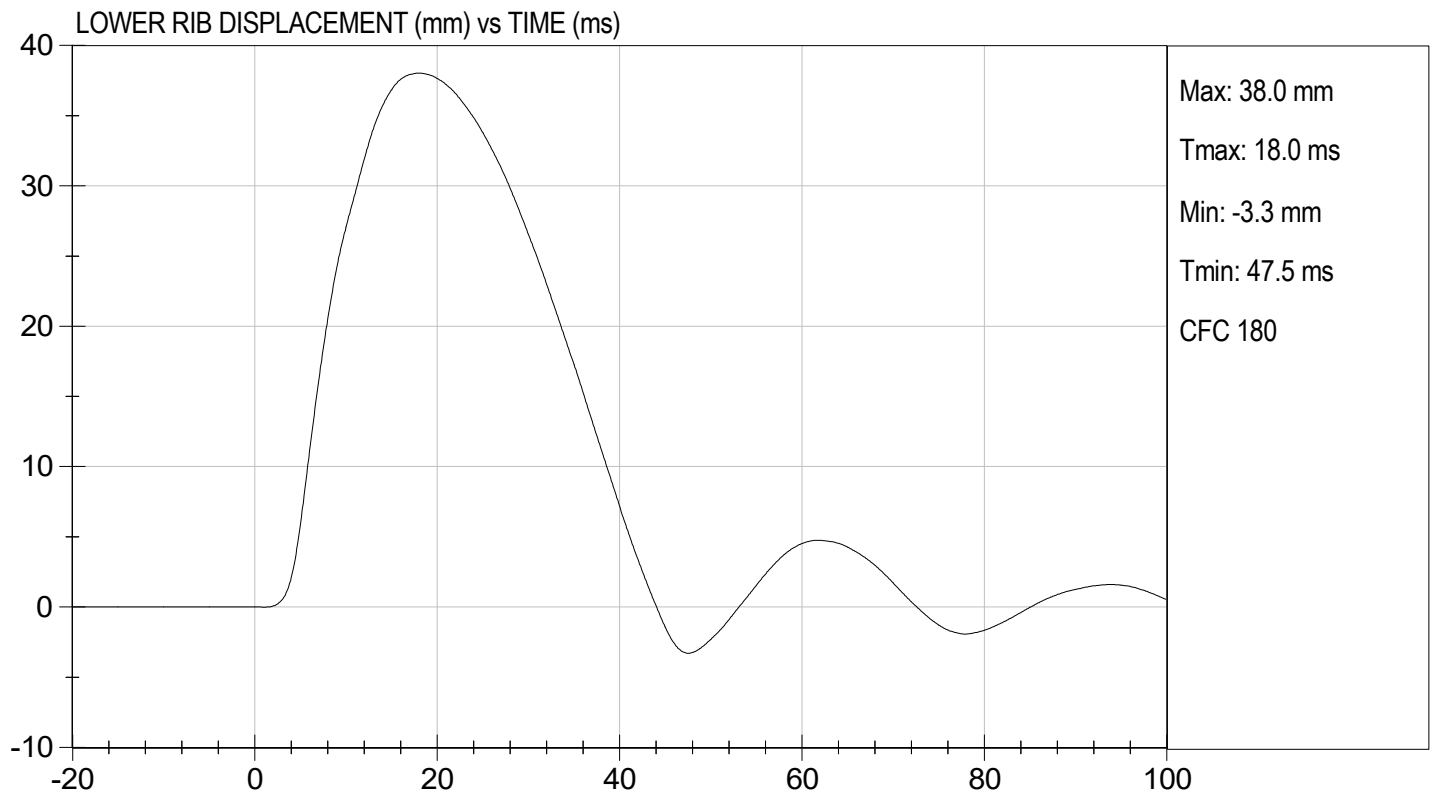
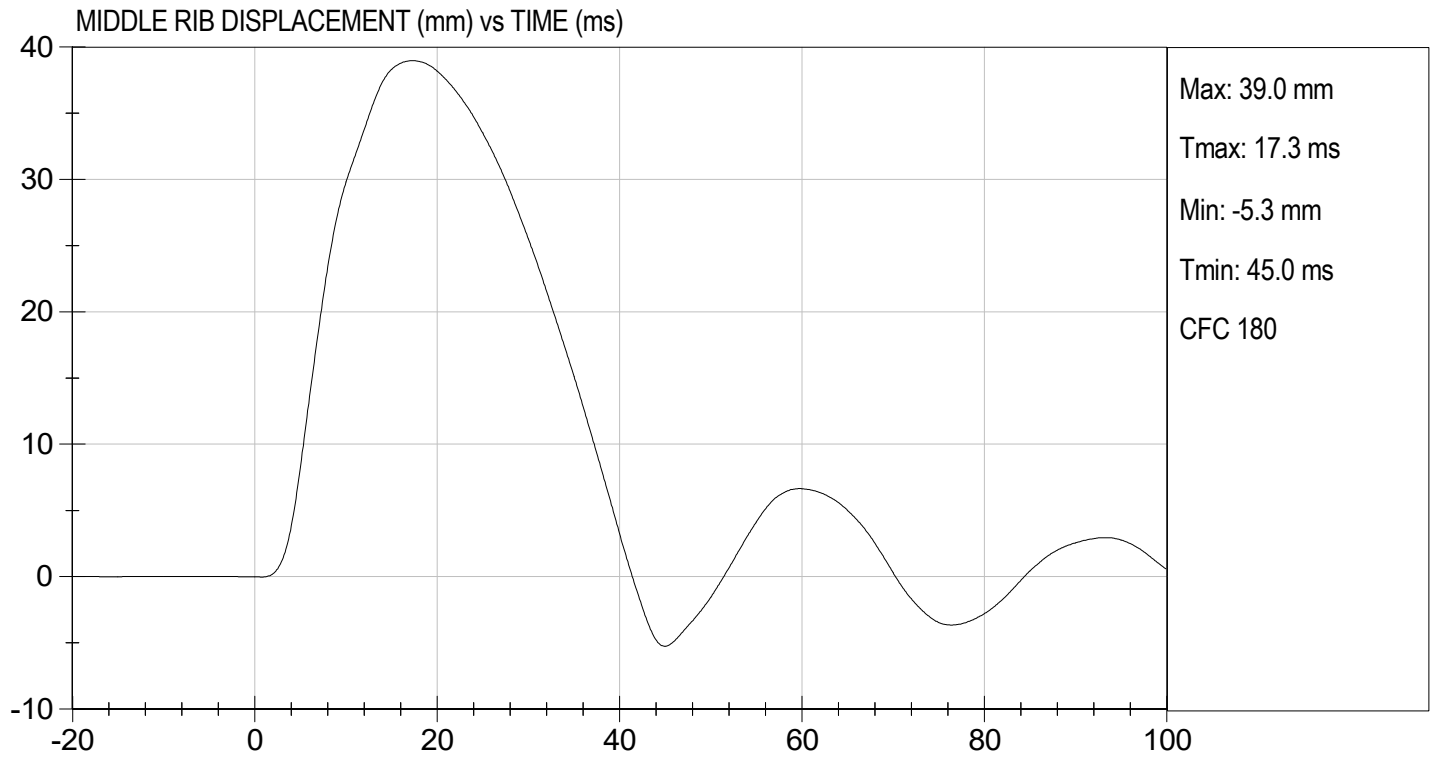
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	49	Pass
Probe Speed	m/s	5.40 to 5.60	5.46	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5954	Pass
Upper Rib Displacement	mm	34.0 to 41.0	37.0	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.0	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.0	Pass
Overall Test Results				Pass

  
 Laboratory Technician

          11/04/2022            
 Test Date

  
 Approved By





**CALIBRATION TEST RESULTS**

**POST-TEST**

**EUROSID 2 (ES-2RE) MALE – DRIVER ATD**

**ES-2re External Measurements  
SN: F032**

<b>No.</b>	<b>Name</b>	<b>Spec. (mm)</b>	<b>Result</b>	<b>Pass/Fail</b>
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	Pass
7	Shoulder/Arm Width	461 - 479	464	Pass
8	Thorax Width	322 - 332	323	Pass
9	Abdomen Width	273 - 287	281	Pass
10	Pelvis Lap Width	359 - 373	370	Pass
11	Head Depth	196 - 206	203	Pass
12	Thorax Depth	262 - 272	264	Pass
13	Abdomen Depth	194 - 204	196	Pass
14	Pelvis Depth	235 - 245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150 - 160	151	Pass
16	Back of Buttocks to Front Knee	597 - 615	607	Pass

**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**ES-2re DUMMY**

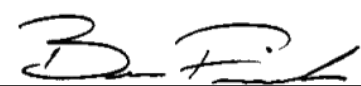
ATD Serial No:       F032      

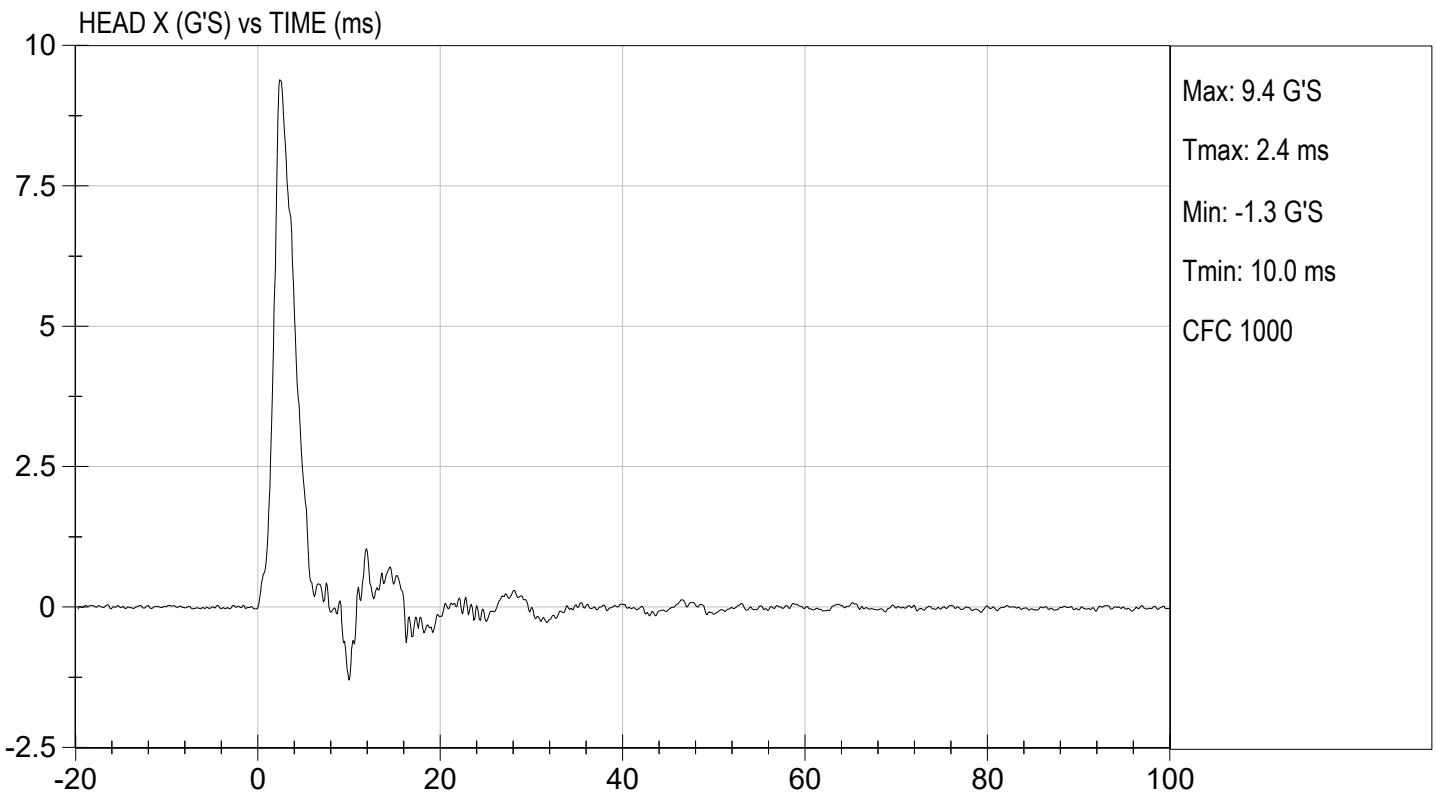
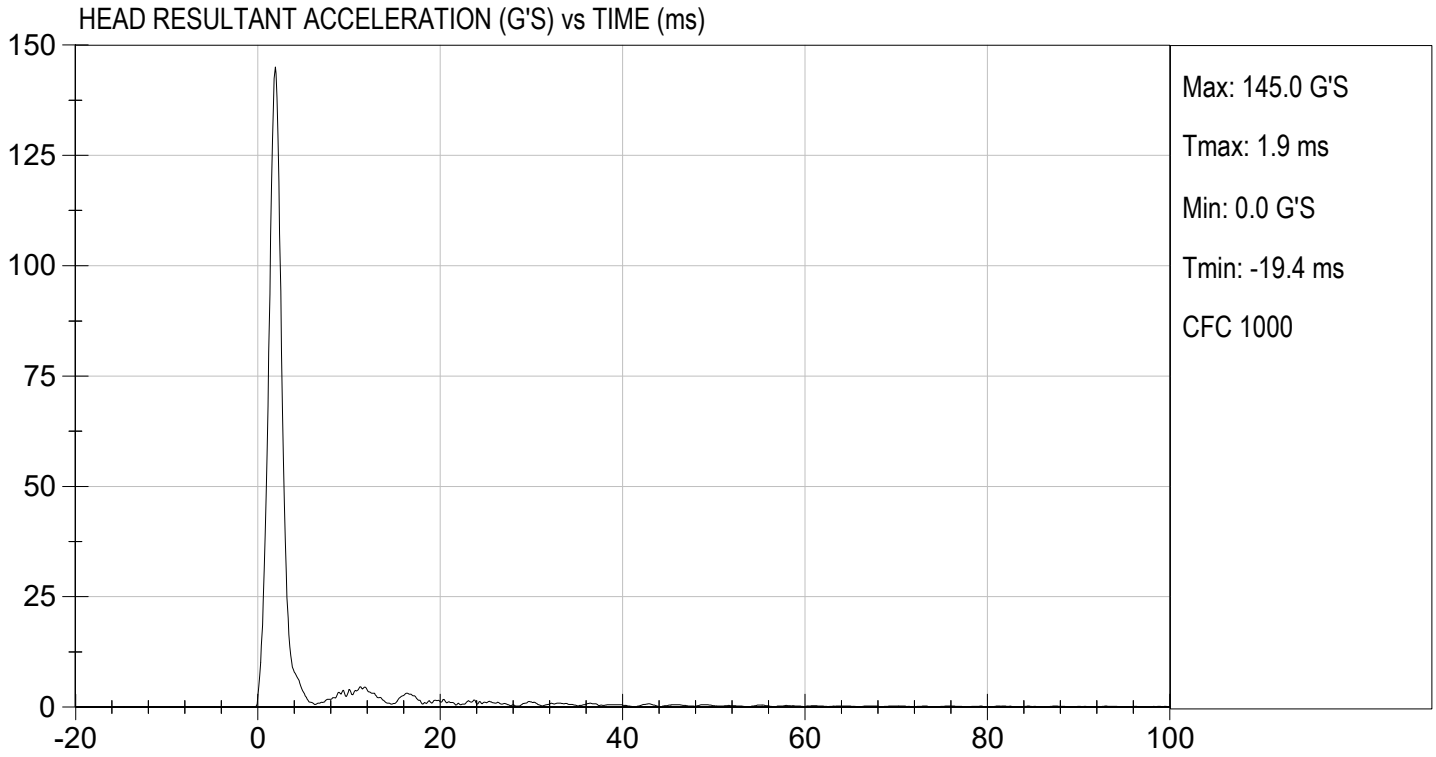
Test ID:       D222661      

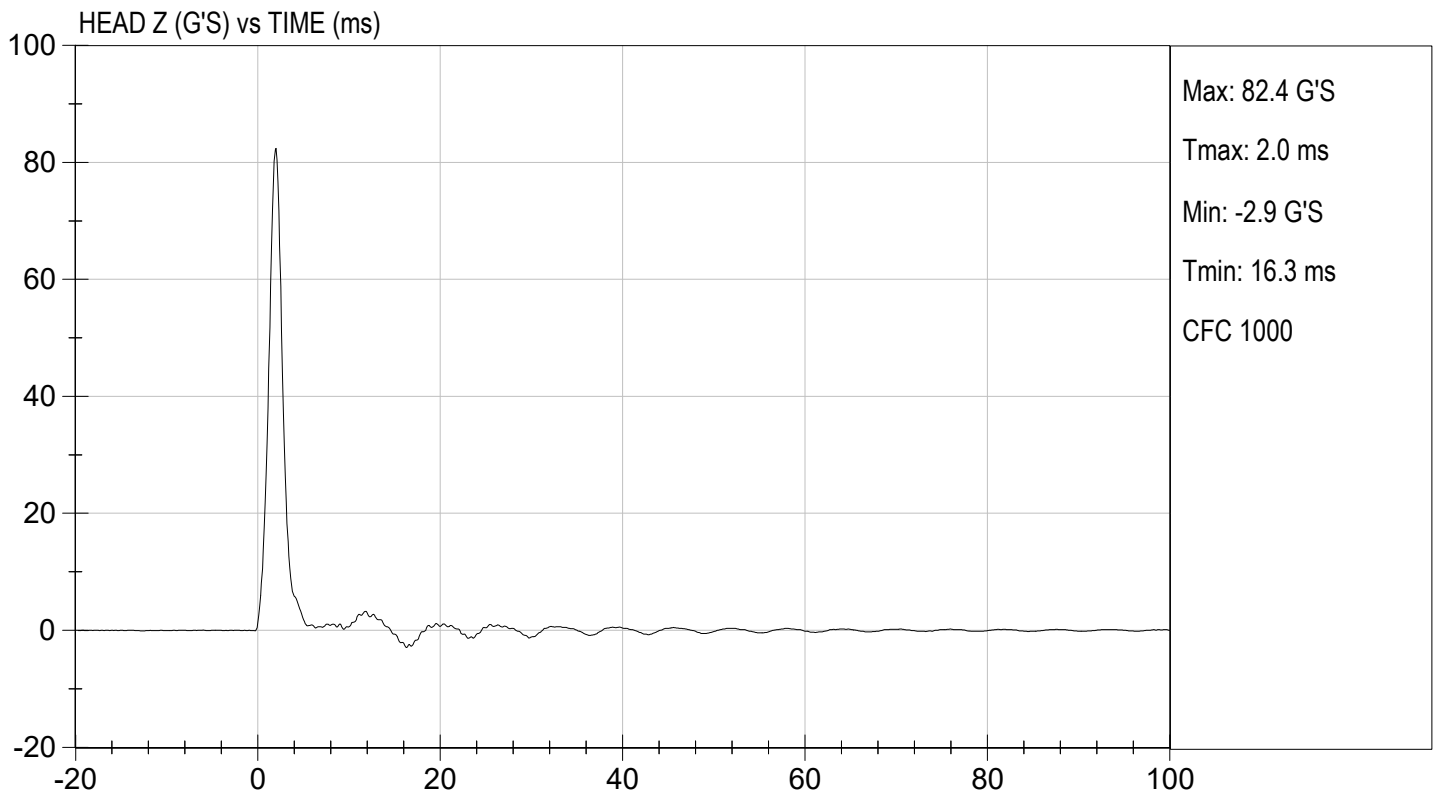
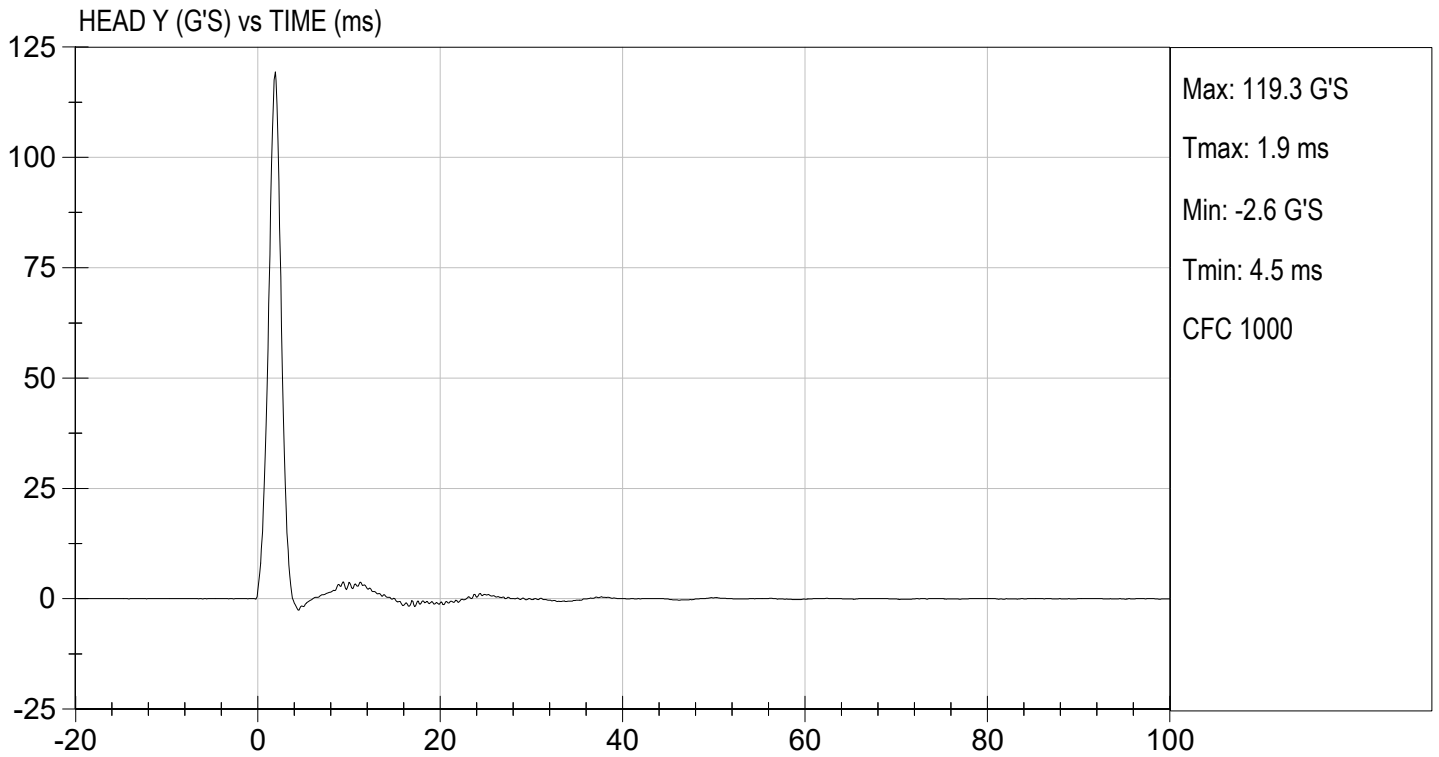
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	125 to 155	145	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	9.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
			Overall Test Results	Pass

  
 \_\_\_\_\_  
 Laboratory Technician

11/18/2022  
 \_\_\_\_\_  
 Test Date

  
 \_\_\_\_\_  
 Approved By





**MGA RESEARCH CORPORATION**  
**NECK PENDULUM TEST**  
**ES-2re DUMMY**

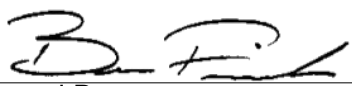
ATD Serial No:           F032          

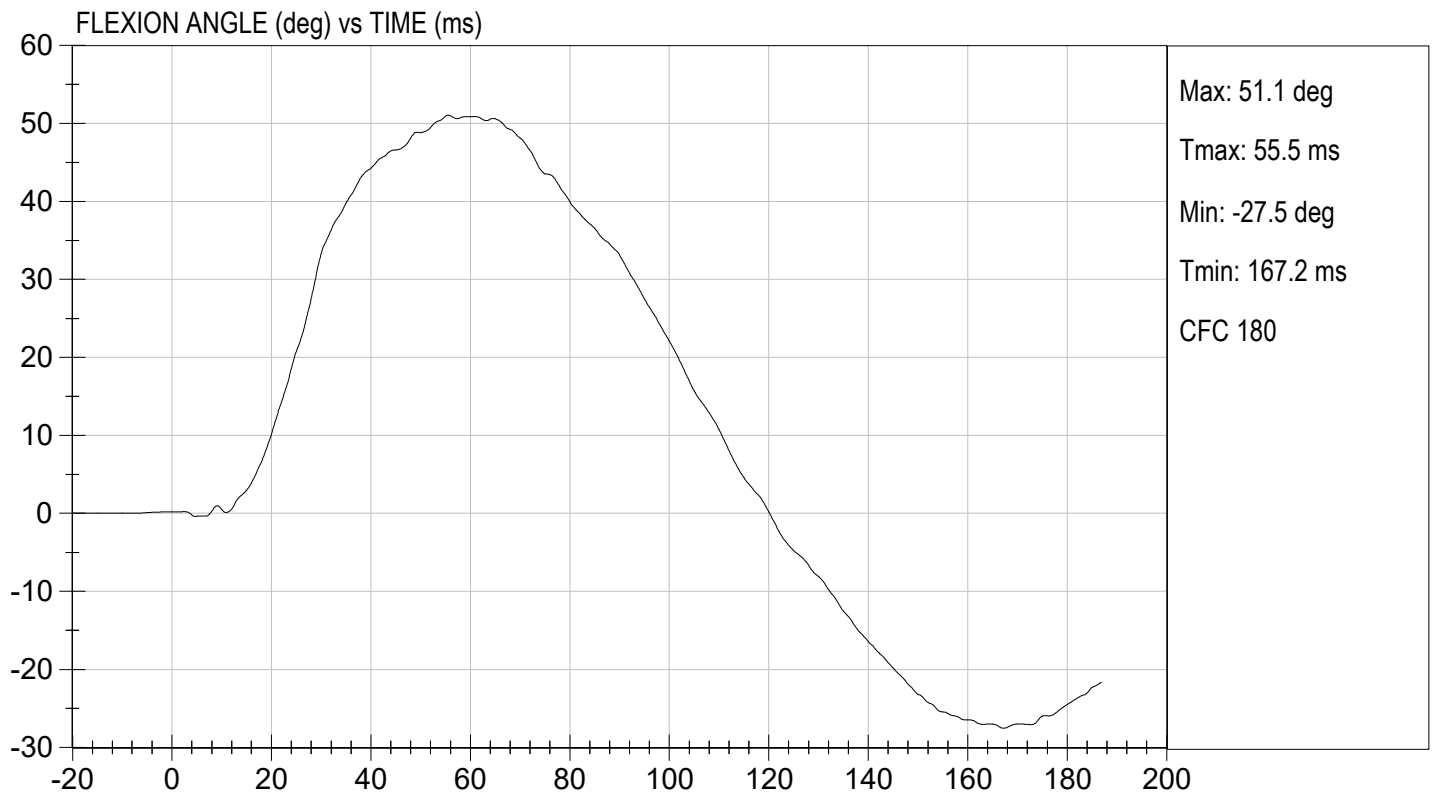
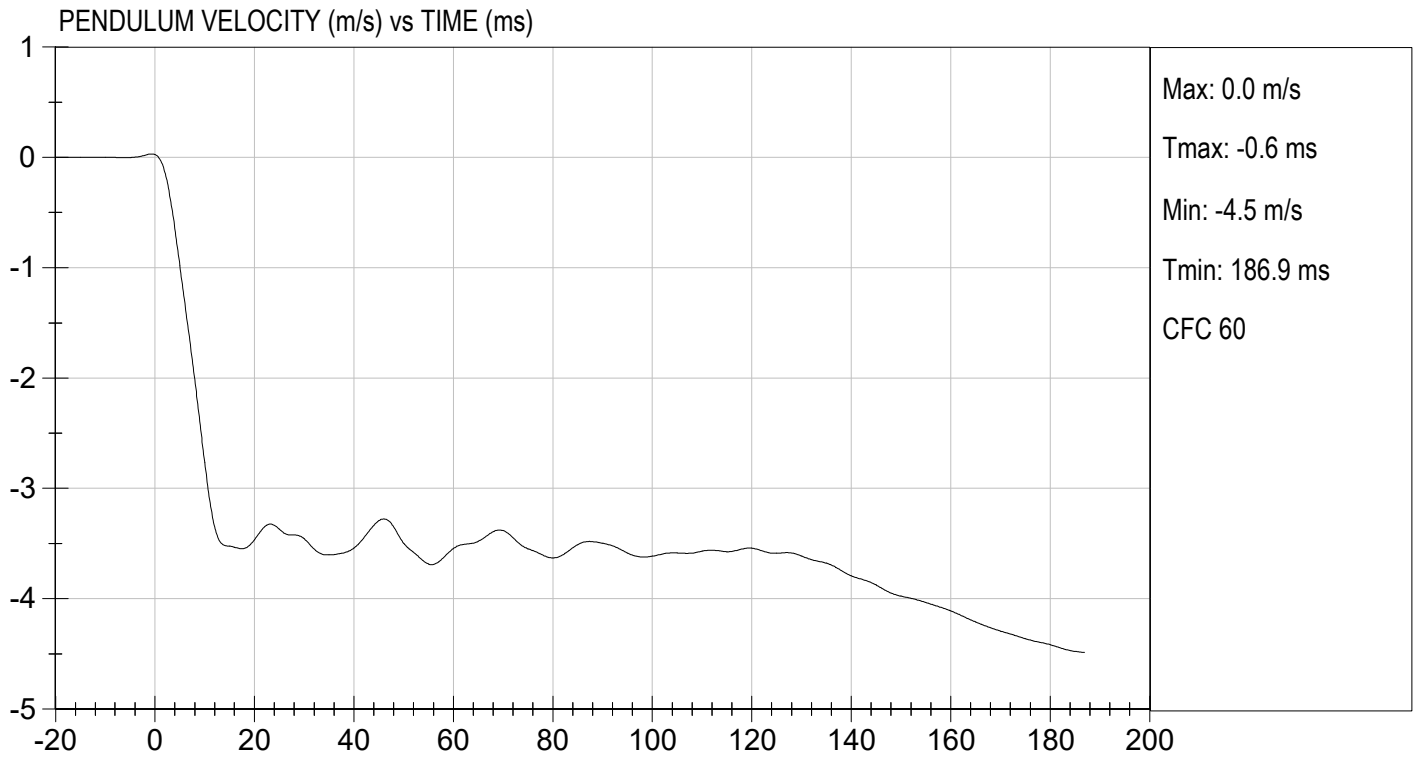
Test I.D.:           D222662          

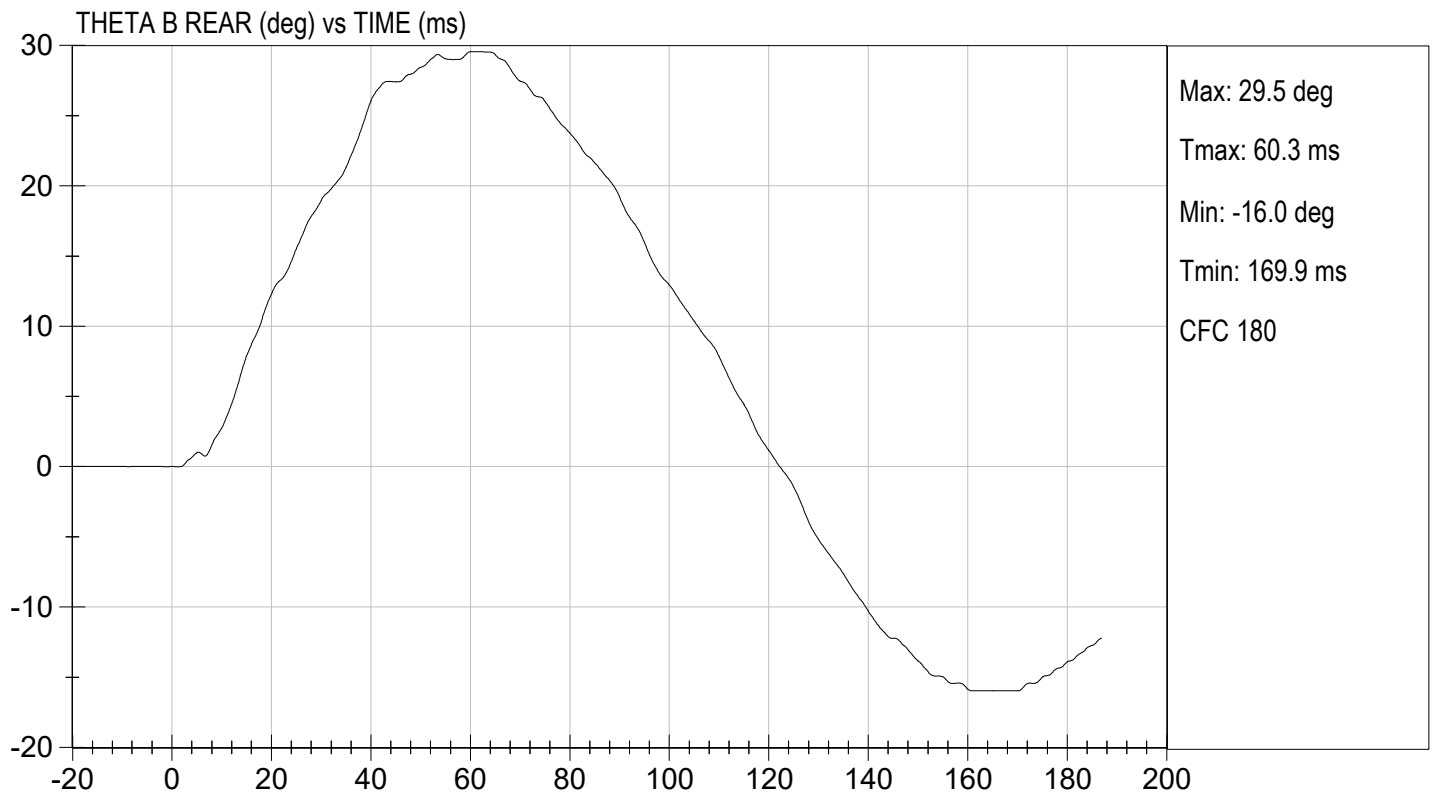
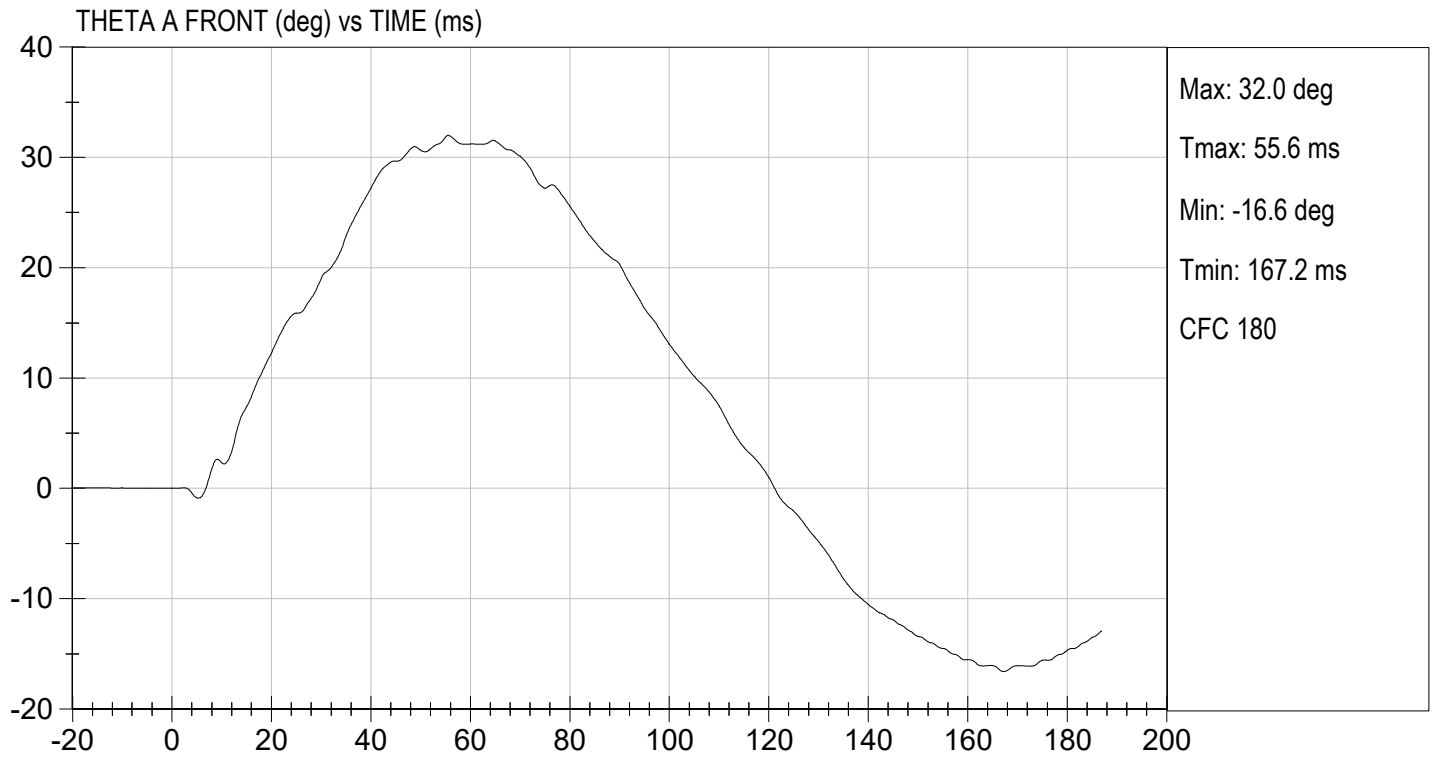
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	26	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.49	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3 ms	m/s	-0.25 to -0.375	-0.35	Pass
	14 ms	m/s	-3.20 to -3.70	-3.52	Pass
	17 ms	m/s	>= -3.70	-3.54	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	51.1	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	55.5	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	64.7	Pass
Overall Results					Pass

  
 Laboratory Technician

          11/18/2022            
 Test Date

  
 Approved By

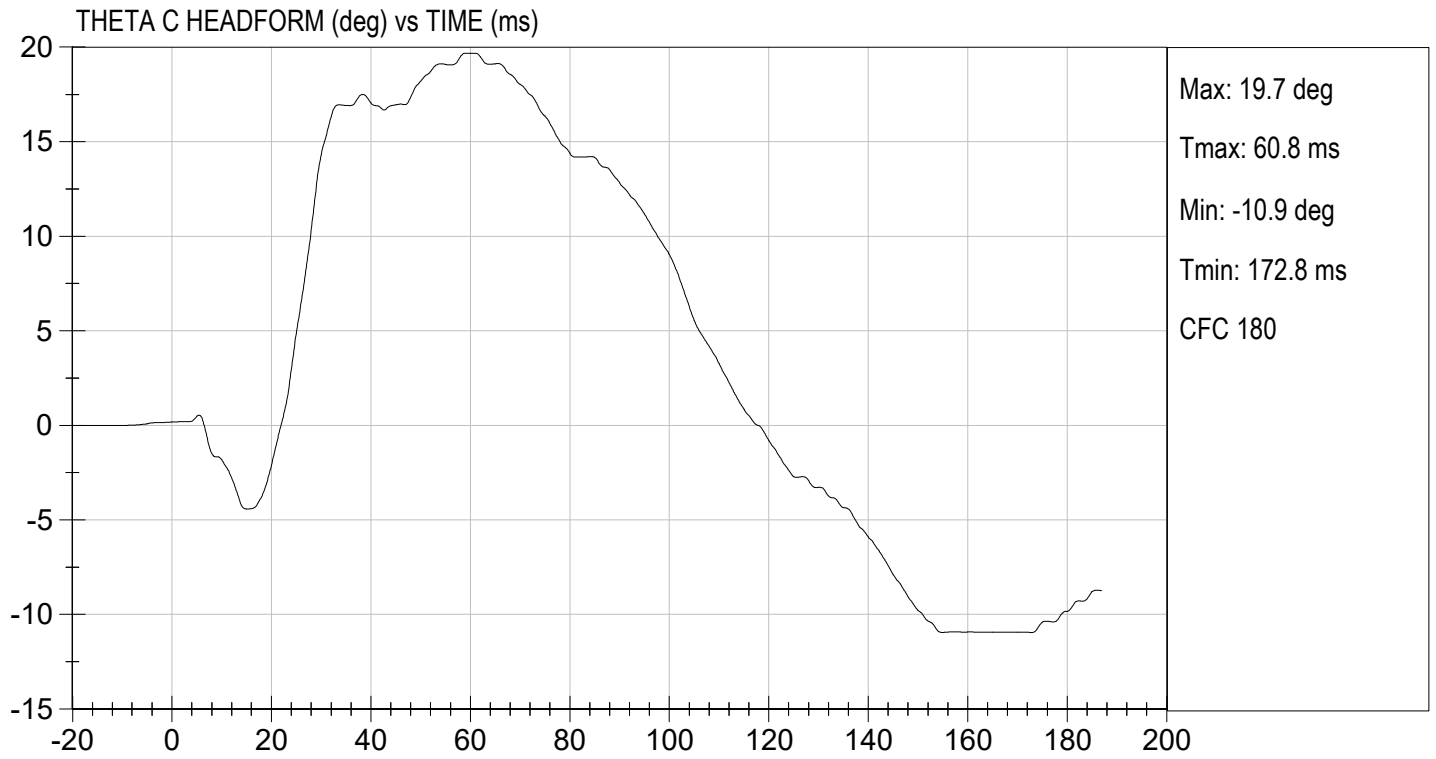






TEST DESC: NECK BENDING  
VELOCITY: 11.45 ft/s, 3.49 m/s

TEST DATE: 11/18/2022  
TEST #: D222662



**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**ES-2re DUMMY**

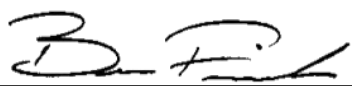
ATD Serial No:           F032          

Test I.D:           D222663          

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	27	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.2	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	7.9	Pass
Overall Test Results				Pass

  
 Laboratory Technician

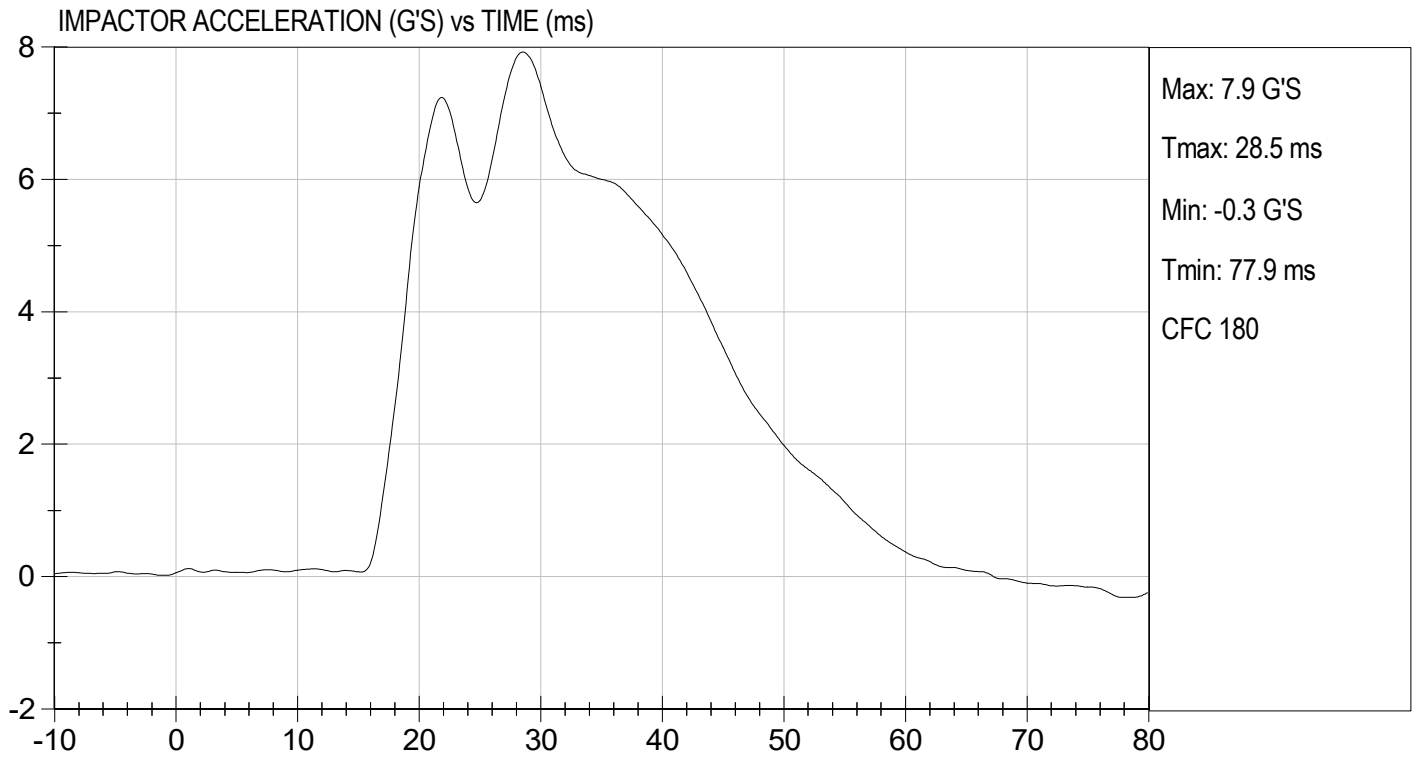
          11/18/2022            
 Test Date

  
 Approved By



TEST DESC: SHOULDER IMPACT  
VELOCITY: 13.77 ft/s, 4.2 m/s

TEST DATE: 11/18/2022  
TEST #: D222663



**MGA RESEARCH CORPORATION**

**UPPER RIB TEST**

**ES-2re DUMMY**

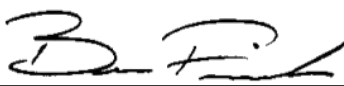
**ATD Serial No:**       F032      

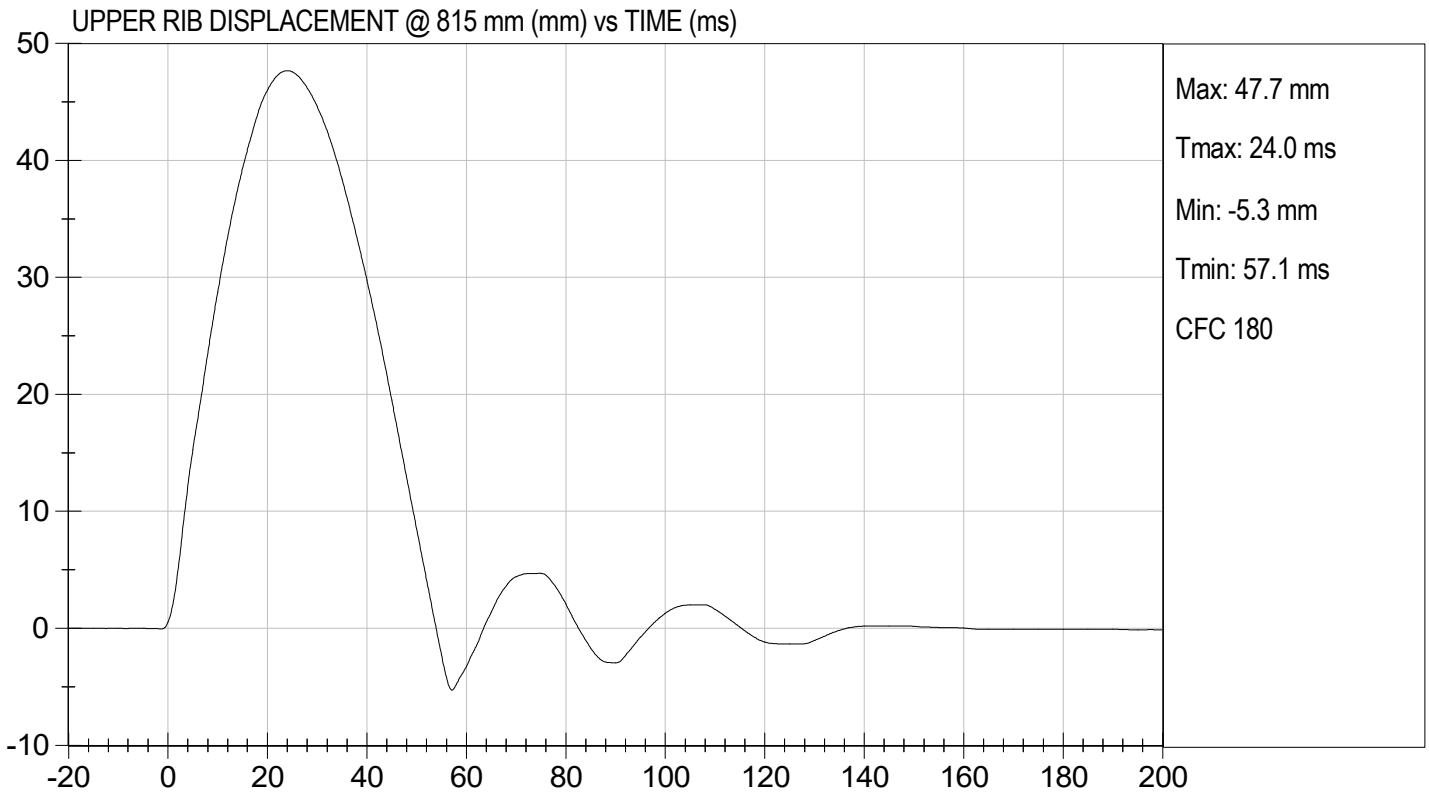
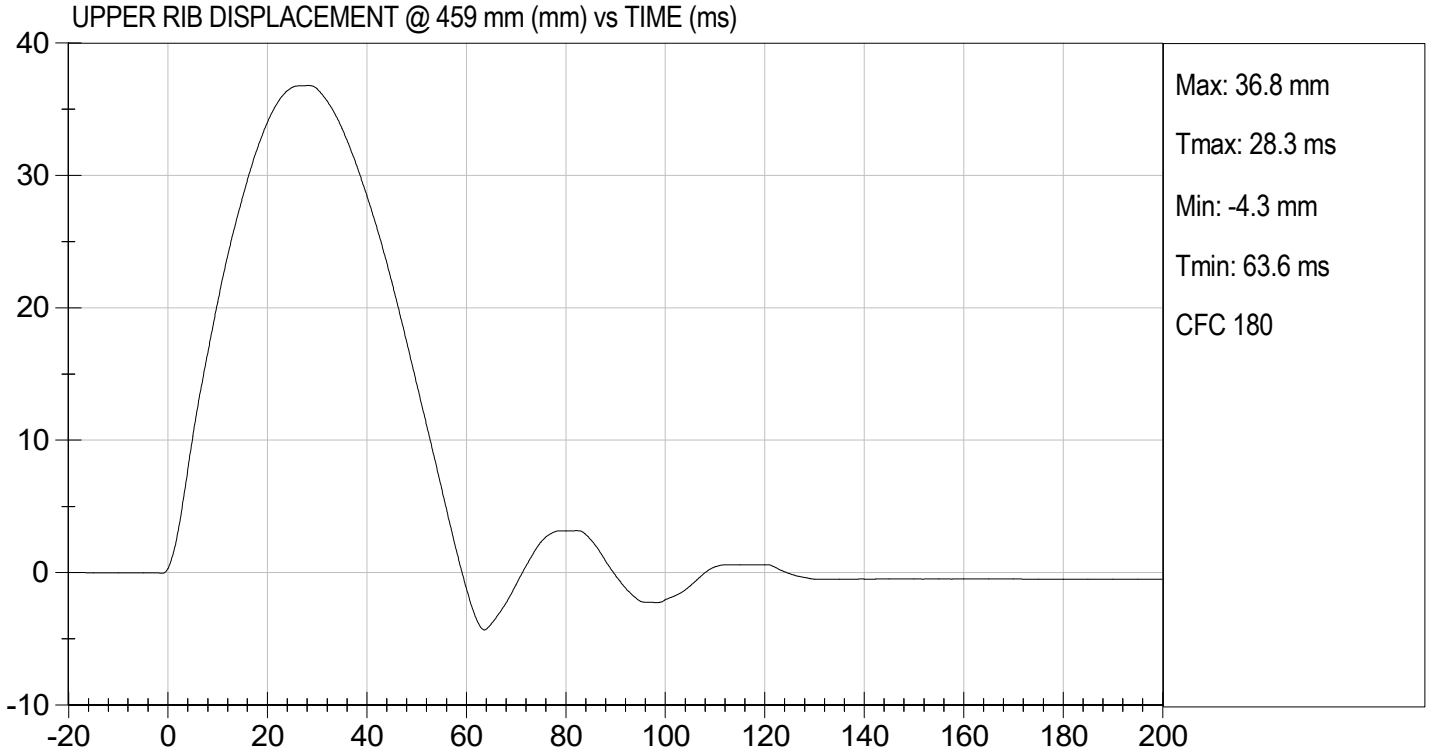
**Test I.D.:**       D222664      

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	26	Pass
Displacement at 459 mm	mm	36.0 to 40.0	36.8	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.7	Pass
			Overall Test Results	Pass

  
\_\_\_\_\_  
Laboratory Technician

11/18/2022  
Test Date

  
\_\_\_\_\_  
Approved By



**MGA RESEARCH CORPORATION**

**MID RIB TEST**

**ES-2re DUMMY**

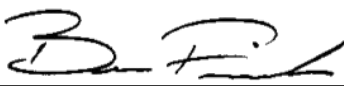
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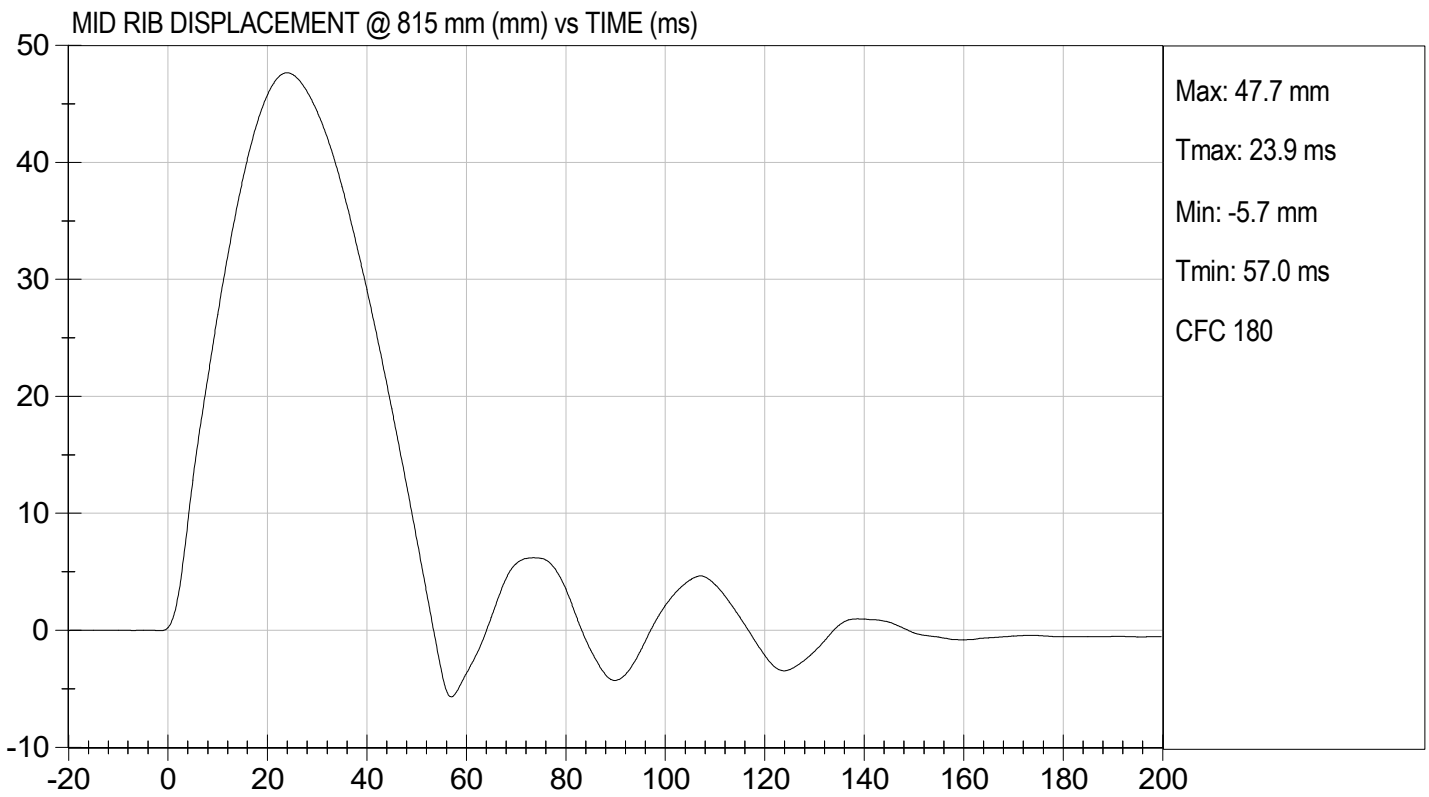
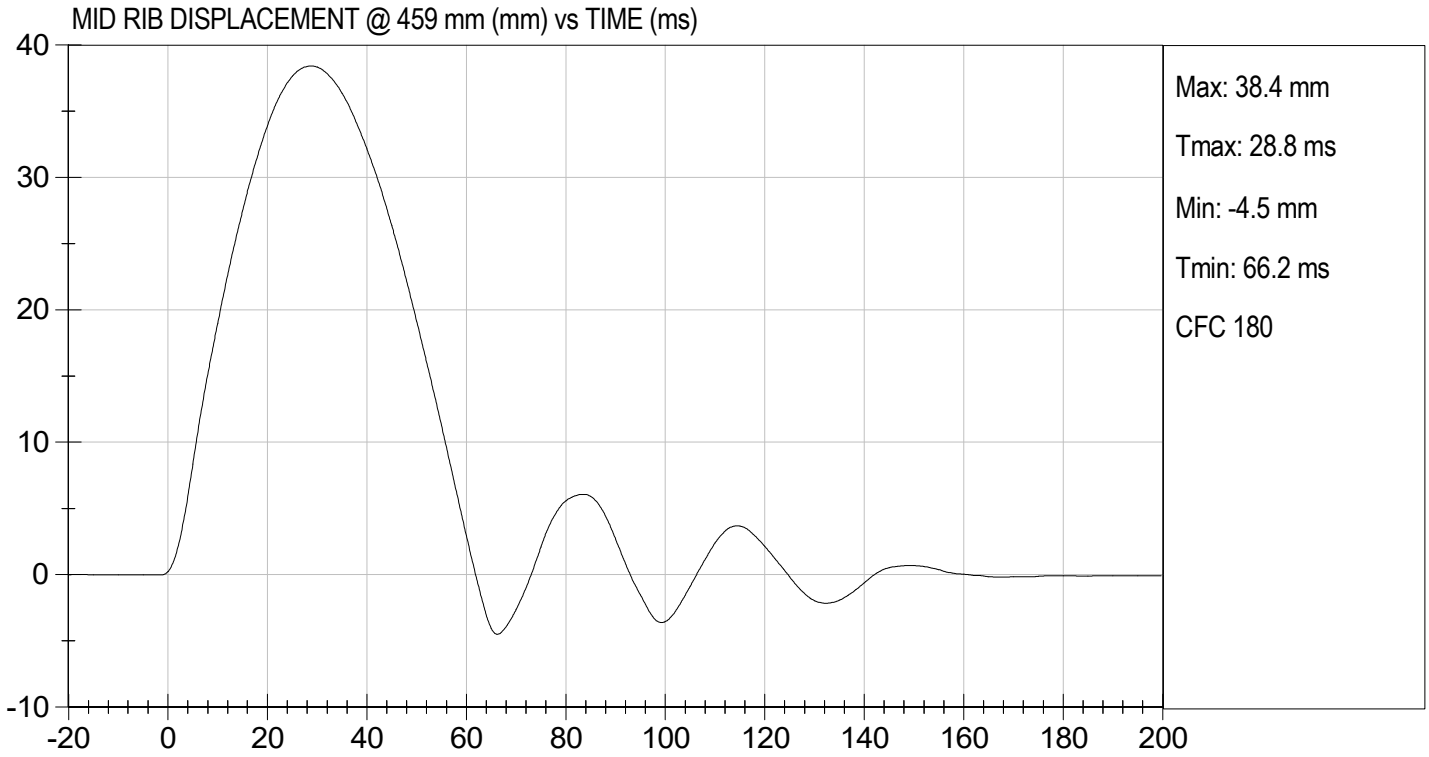
**Test I.D.:**       D222665      

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	26	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.4	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.6	Pass
Overall Test Results				Pass

  
\_\_\_\_\_  
Laboratory Technician

11/18/2022  
Test Date

  
\_\_\_\_\_  
Approved By



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

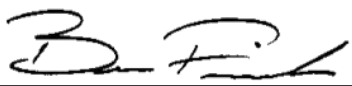
ATD Serial No: F032

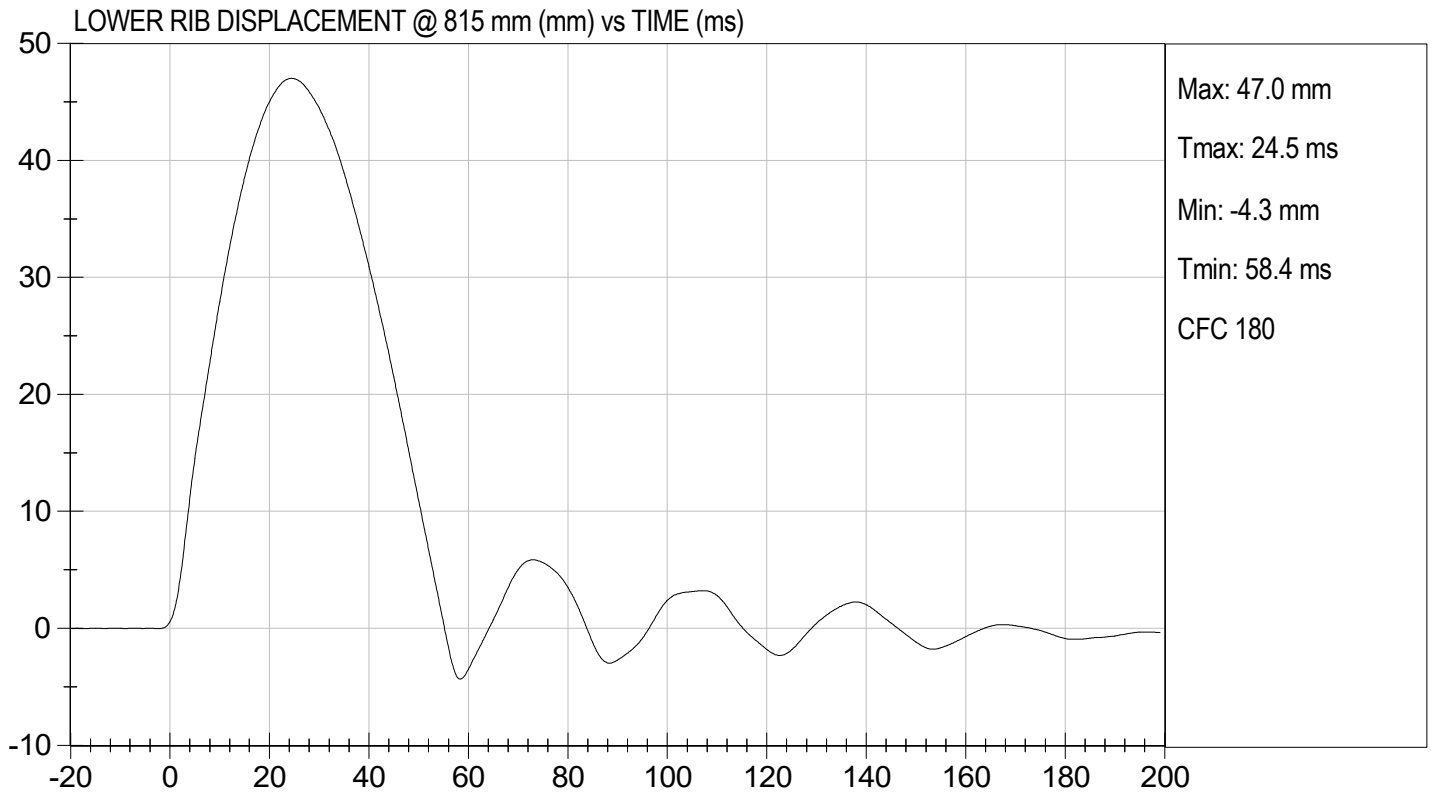
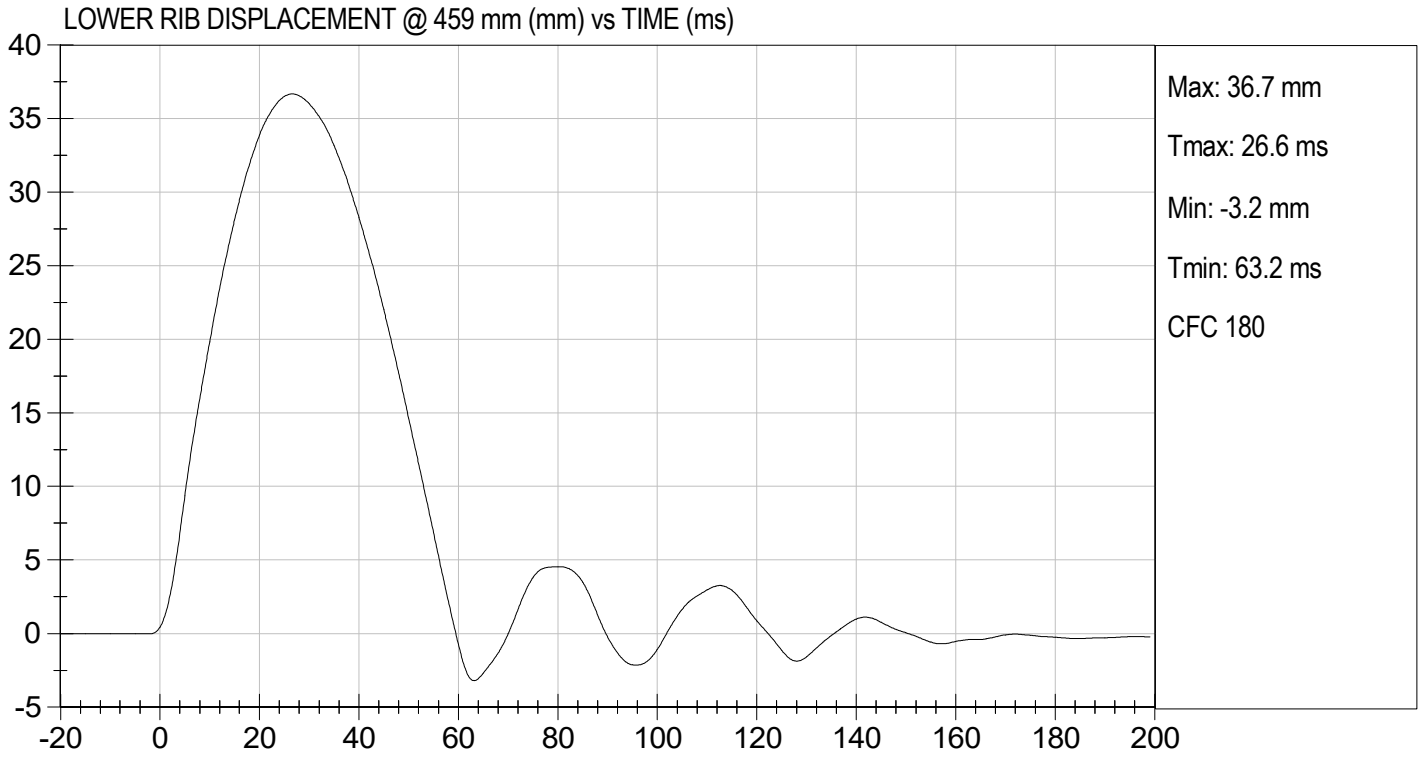
Test I.D: D222666

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	26	Pass
Displacement at 459 mm	mm	36.0 to 40.0	36.7	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.0	Pass
			Overall Test Results	Pass

  
Laboratory Technician

11/18/2022  
Test Date

  
Approved By



**MGA RESEARCH CORPORATION**

**ABDOMEN TEST**

**ES-2re DUMMY**

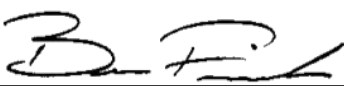
**ATD Serial No:**           F032          

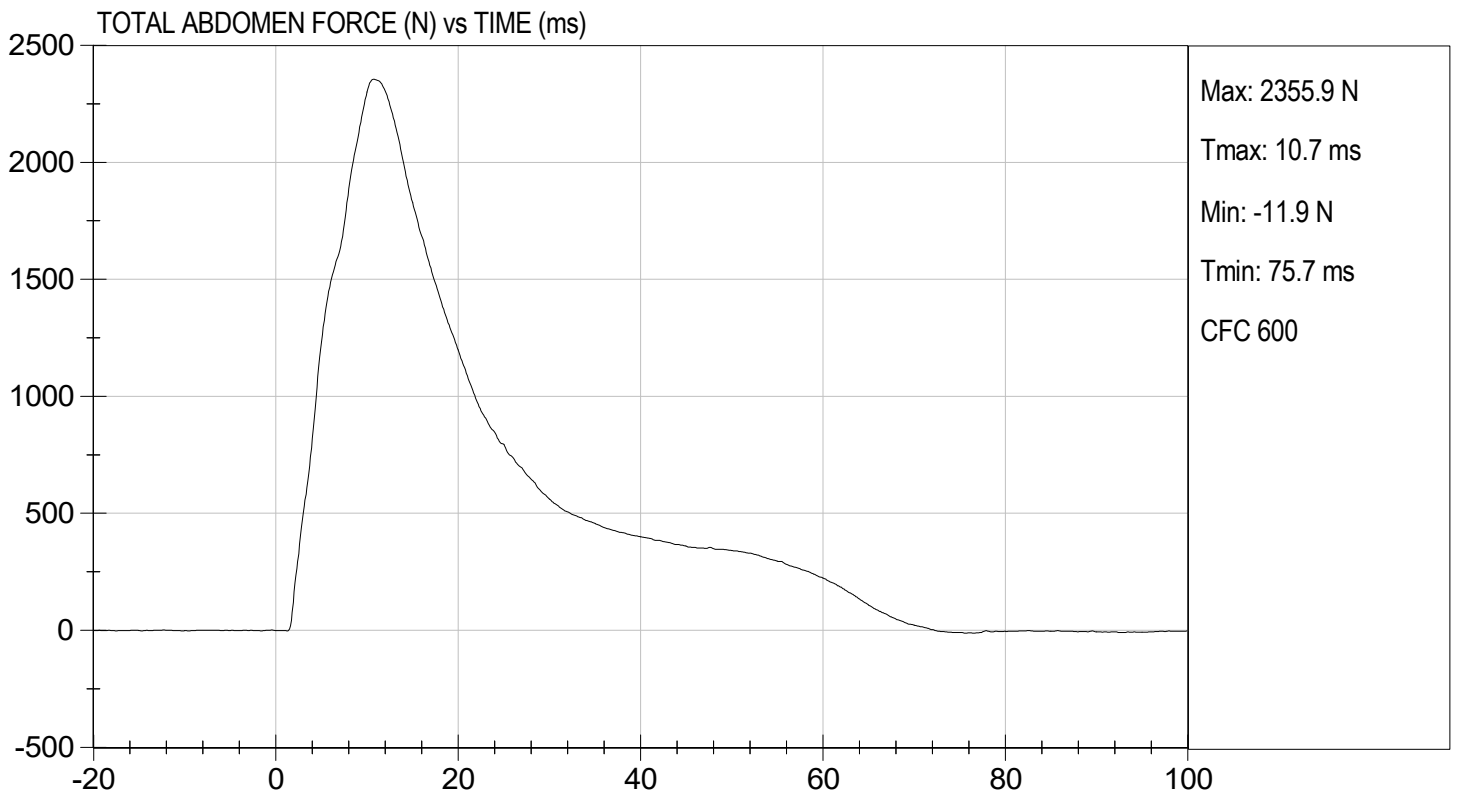
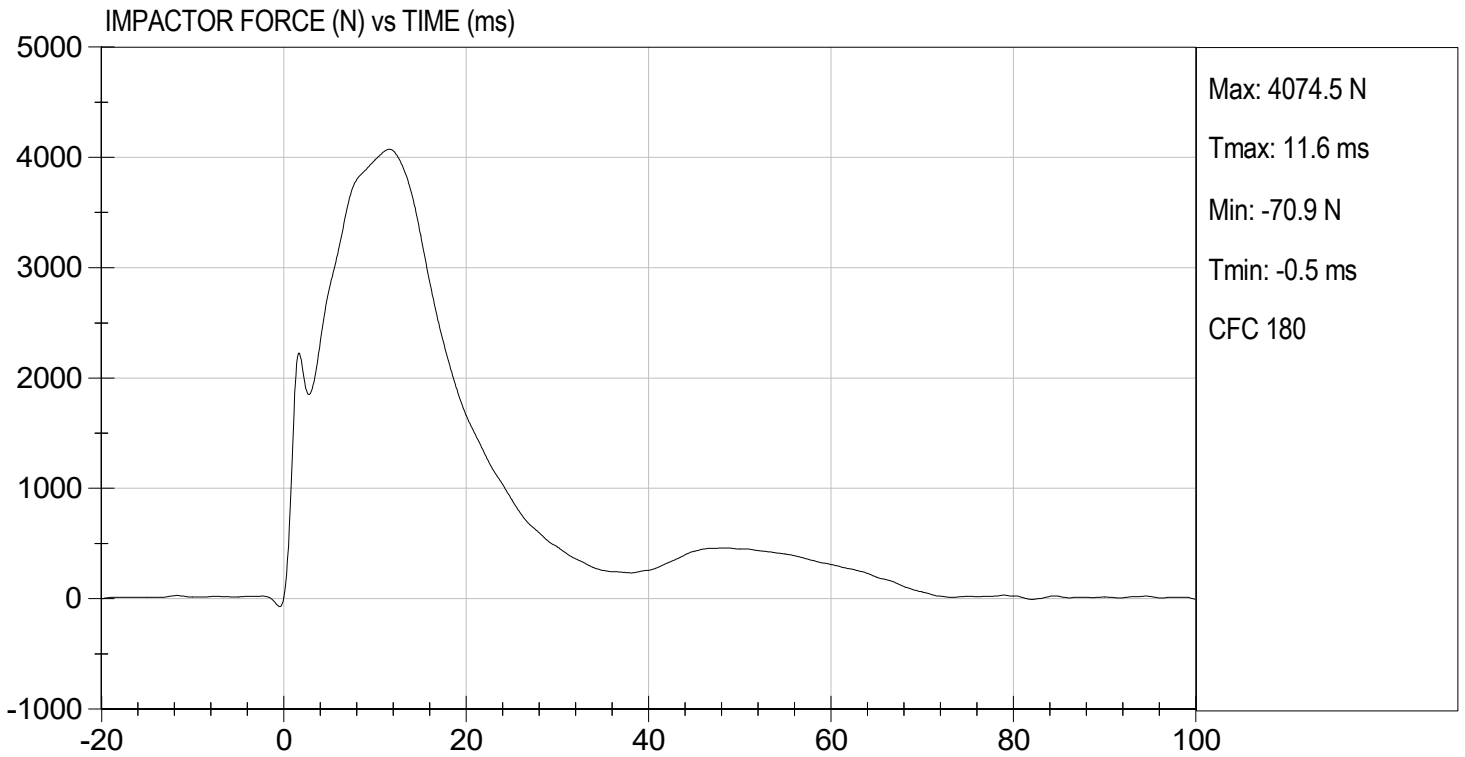
**Test I.D:**           D222667          

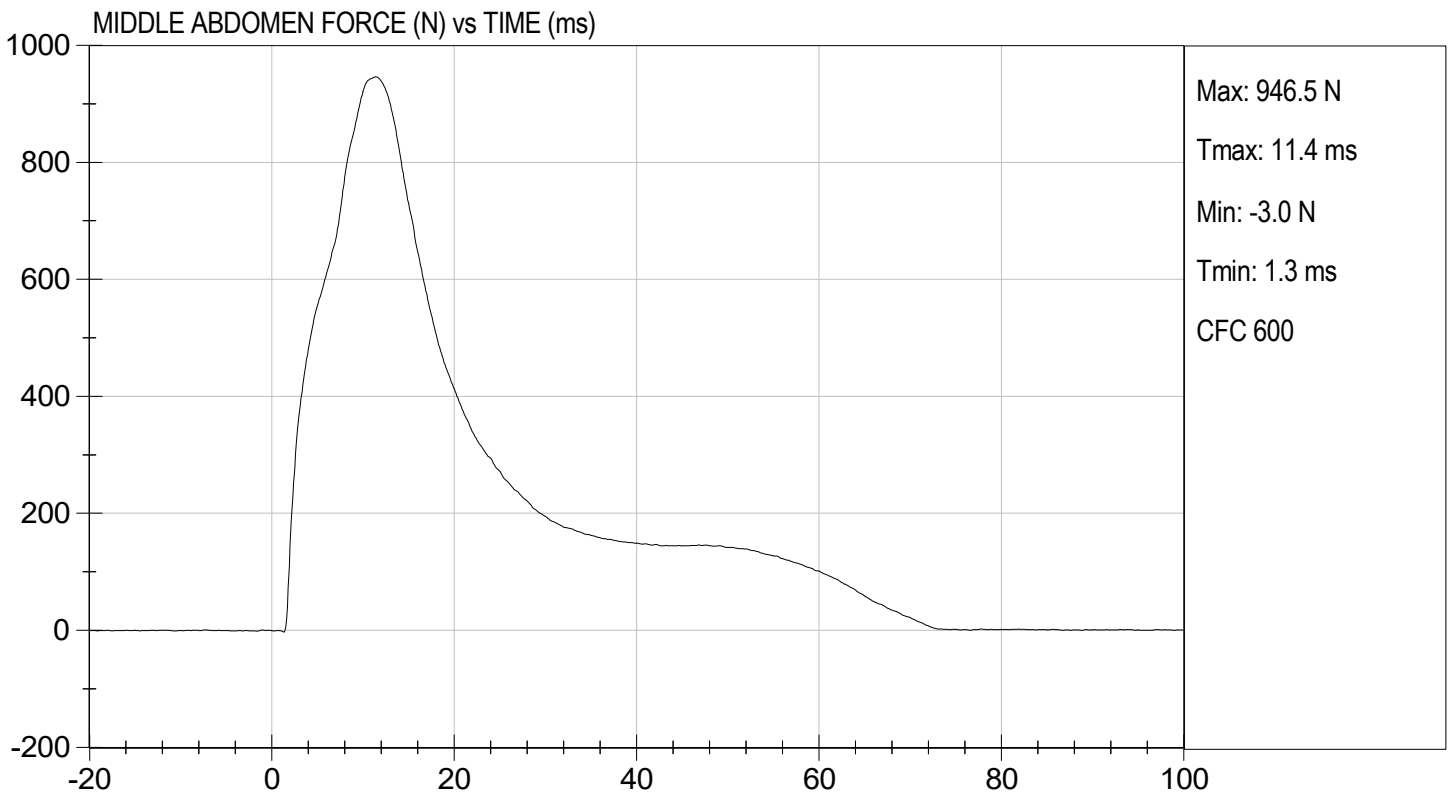
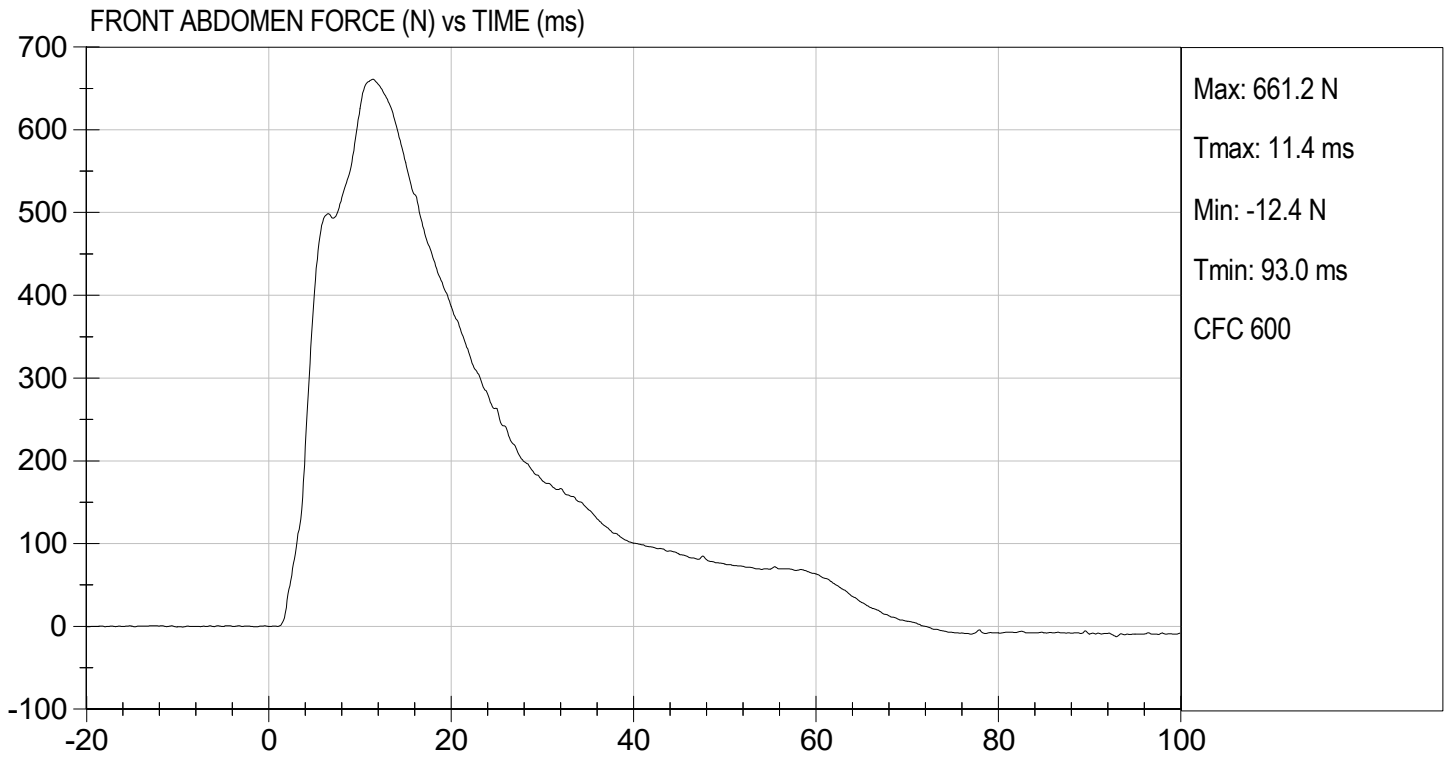
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impactor Force	N	4000 to 4800	4075	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.6	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2356	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	10.7	Pass
Overall Test Results				Pass

  
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Laboratory Technician

          11/18/2022            
Test Date

  
\_\_\_\_\_  
Approved By

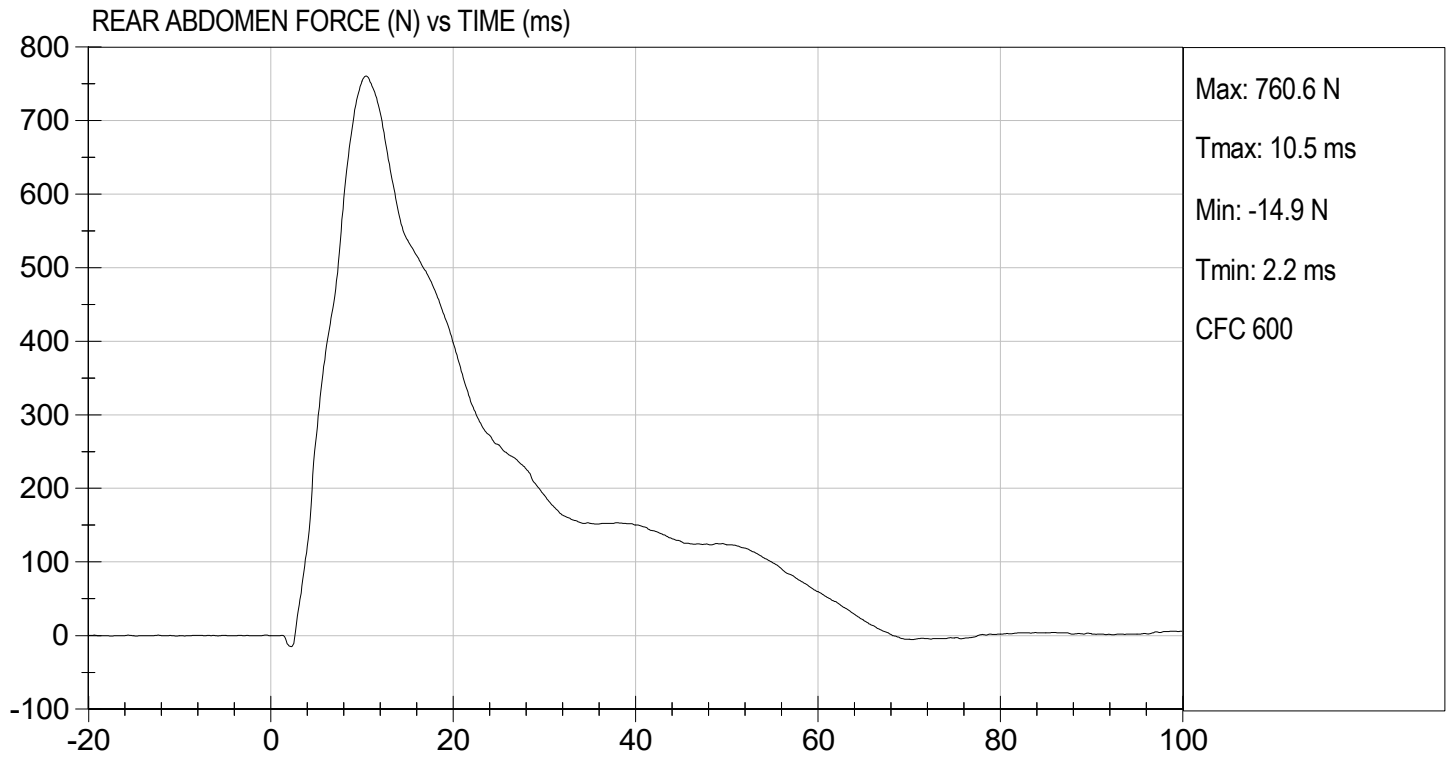






TEST DESC: ABDOMEN IMPACT  
VELOCITY: 13.45 ft/s, 4.10 m/s

TEST DATE: 11/18/2022  
TEST #: D222667



**MGA RESEARCH CORPORATION**  
**LUMBAR SPINE TEST**  
**ES-2re DUMMY**

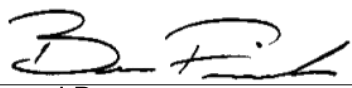
ATD Serial No:           F032          

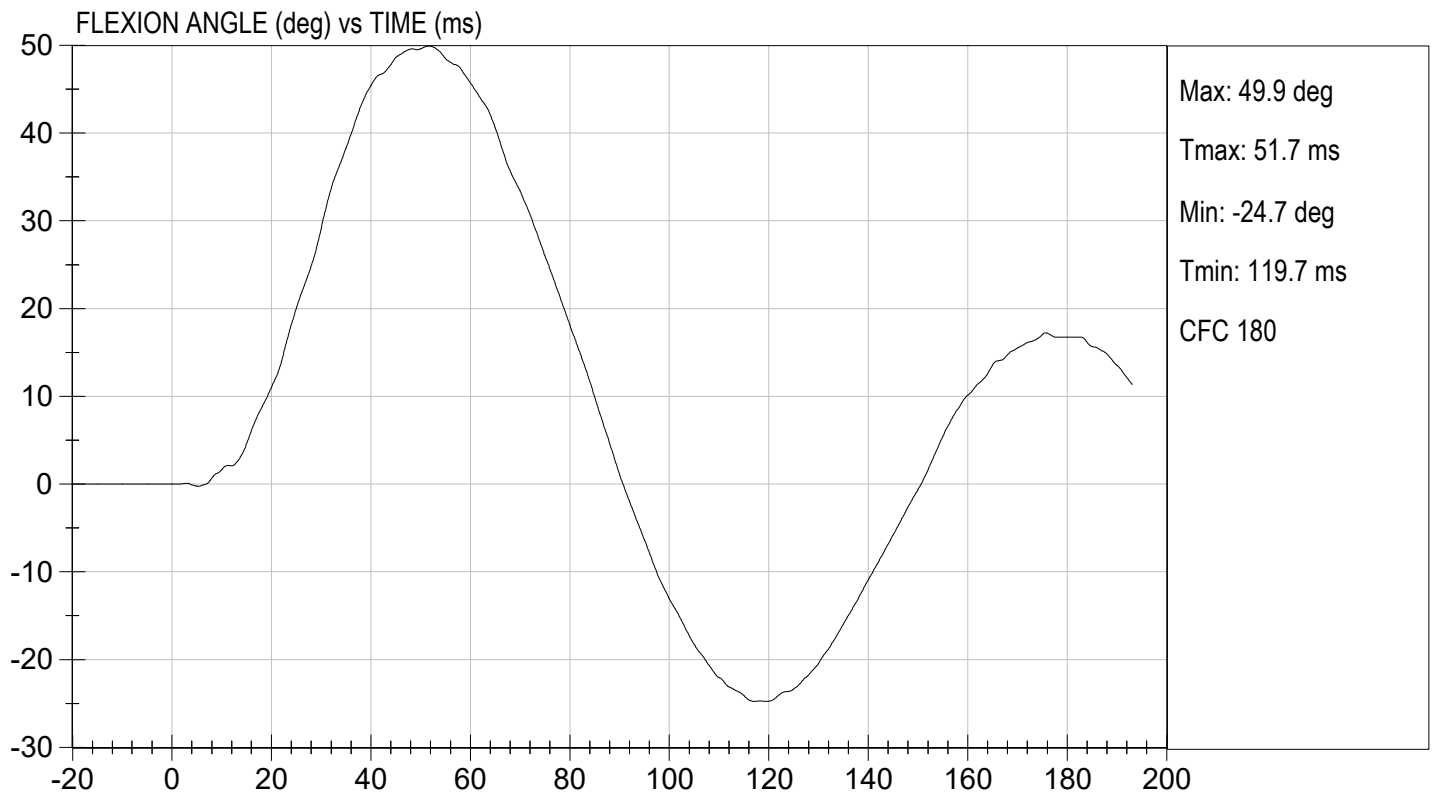
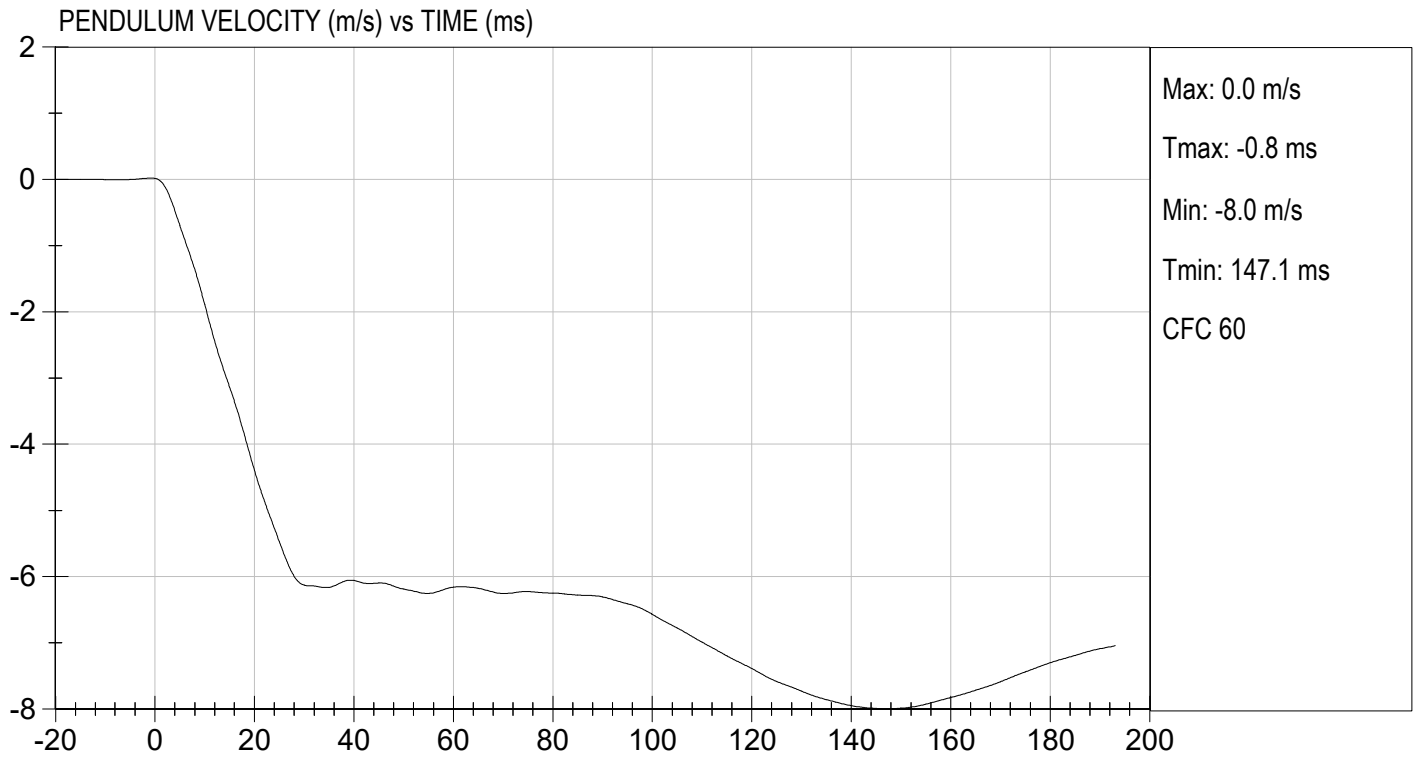
Test I.D.:           D222668          

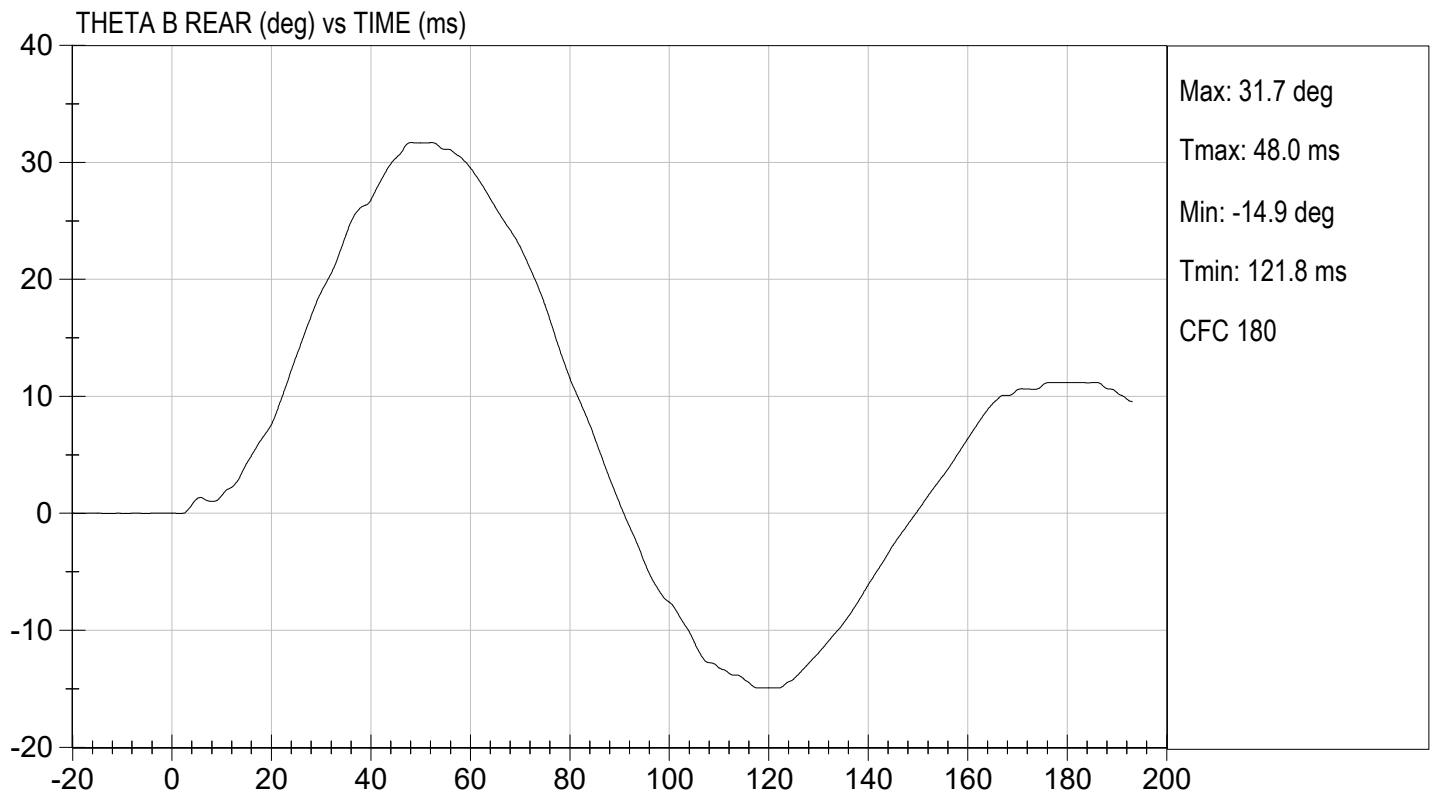
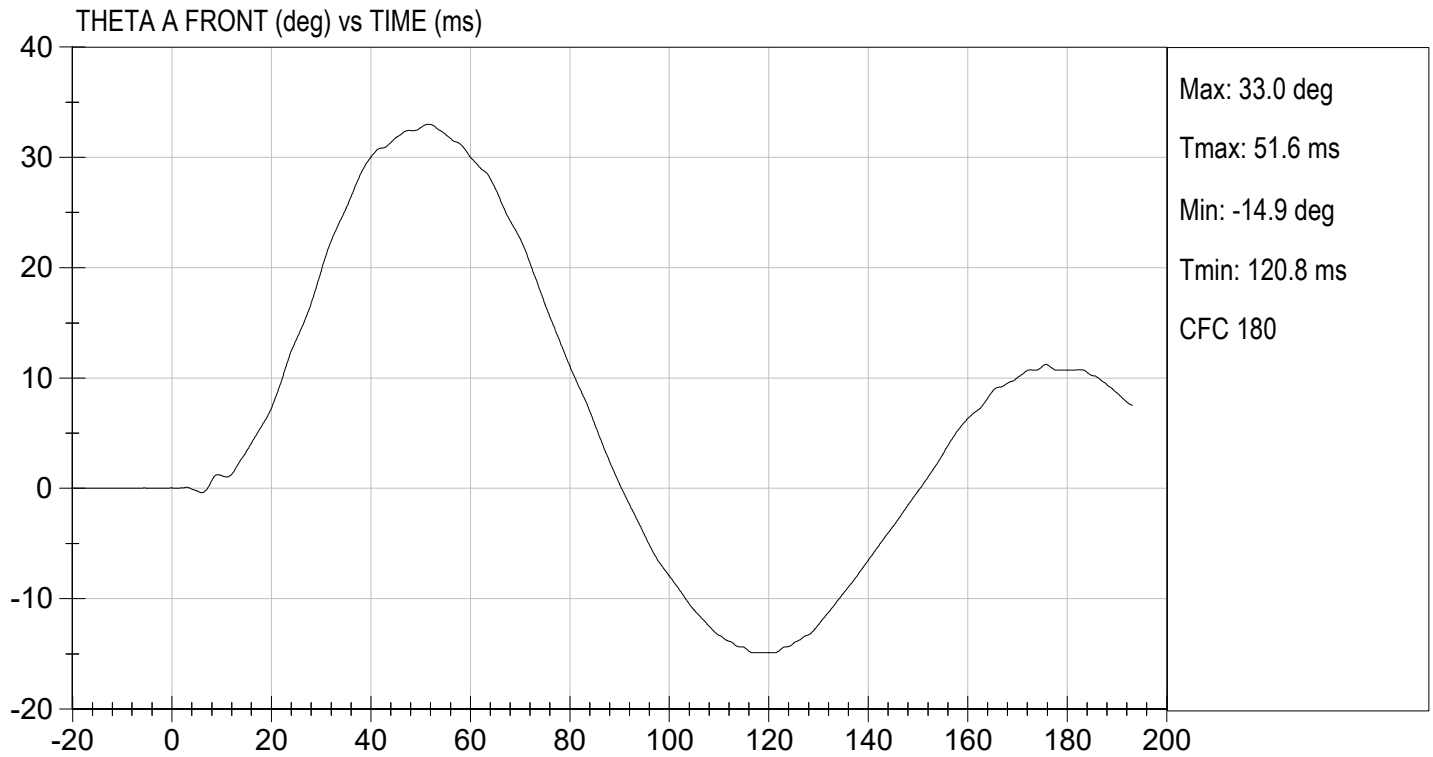
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass	
Laboratory Relative Humidity	%	10 to 70	27	Pass	
Pendulum Speed	m/s	5.95 to 6.15	6.12	Pass	
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.406	Pass
	27 ms	m/s	-6.50 to -5.80	-5.85	Pass
	30 ms	m/s	>= -6.50	-6.13	Pass
Maximum Flexion Angle	deg	45.0 to 55.0	49.9	Pass	
Time of Maximum Flexion Angle	ms	39.0 to 53.0	51.7	Pass	
Headform Rotation Decay to Initial Position	ms	37 to 57	39	Pass	
<b>Overall Results</b>				<b>Pass</b>	

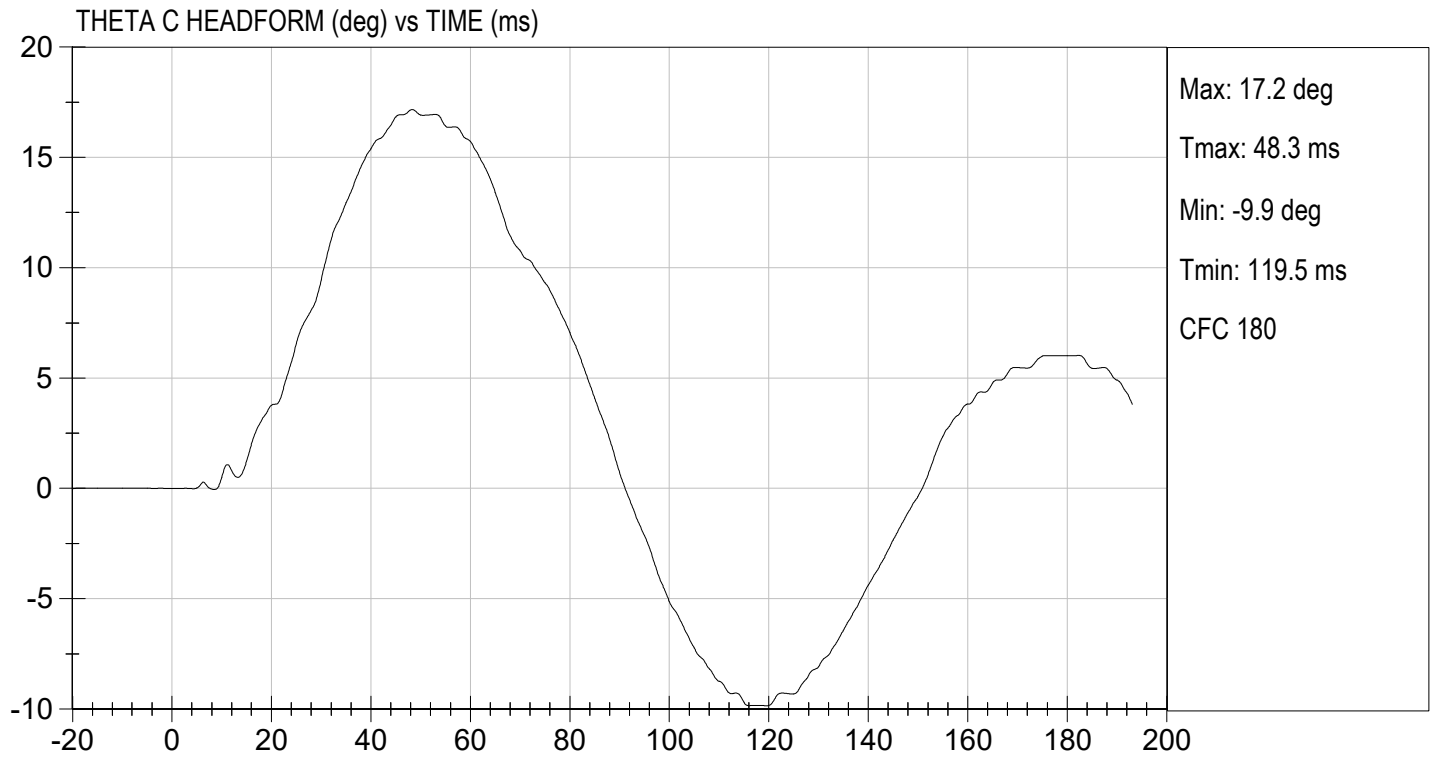
  
 Laboratory Technician

          11/18/2022            
 Test Date

  
 Approved By







**MGA RESEARCH CORPORATION**

**PELVIS TEST  
ES-2re DUMMY**

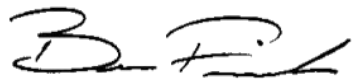
**ATD Serial No:**       F032      

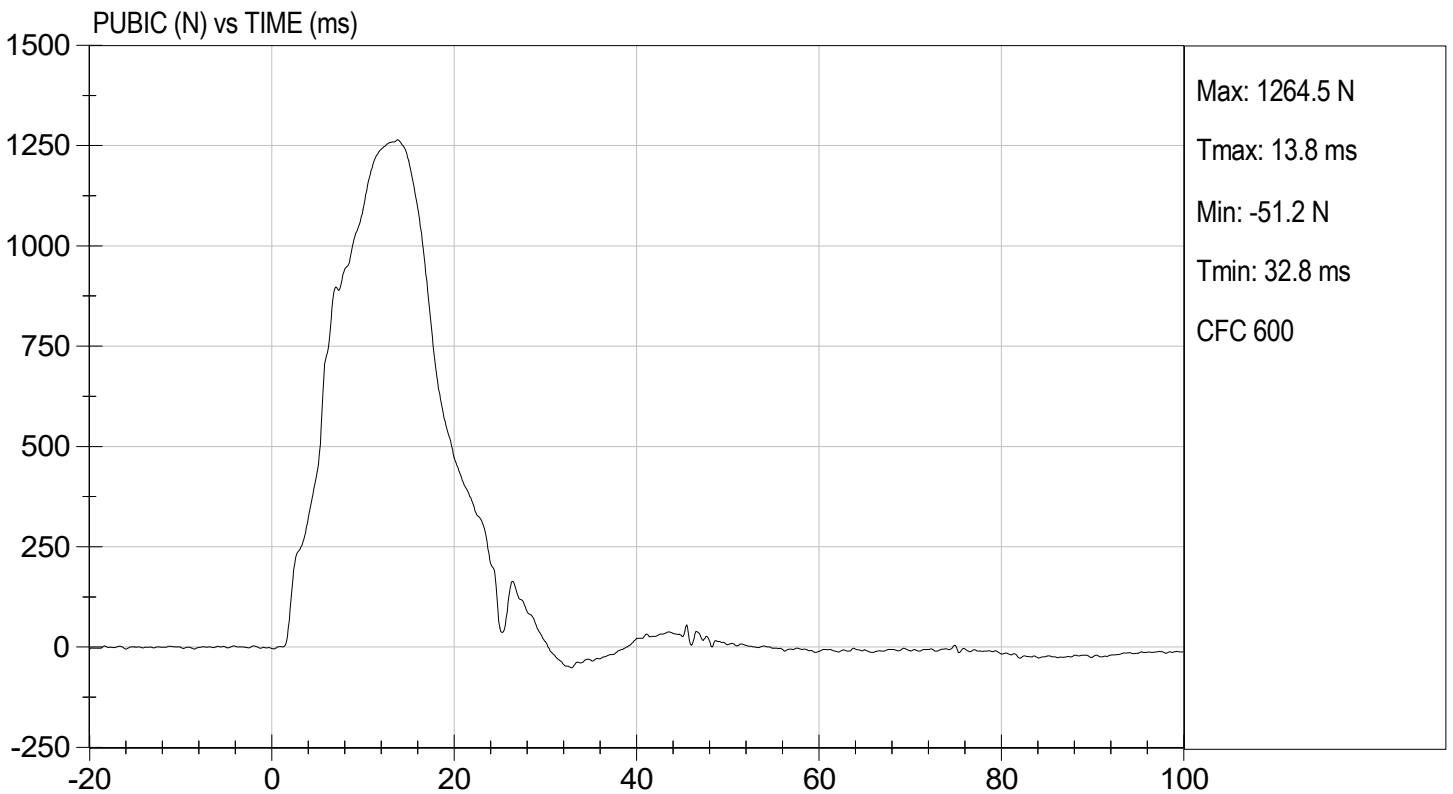
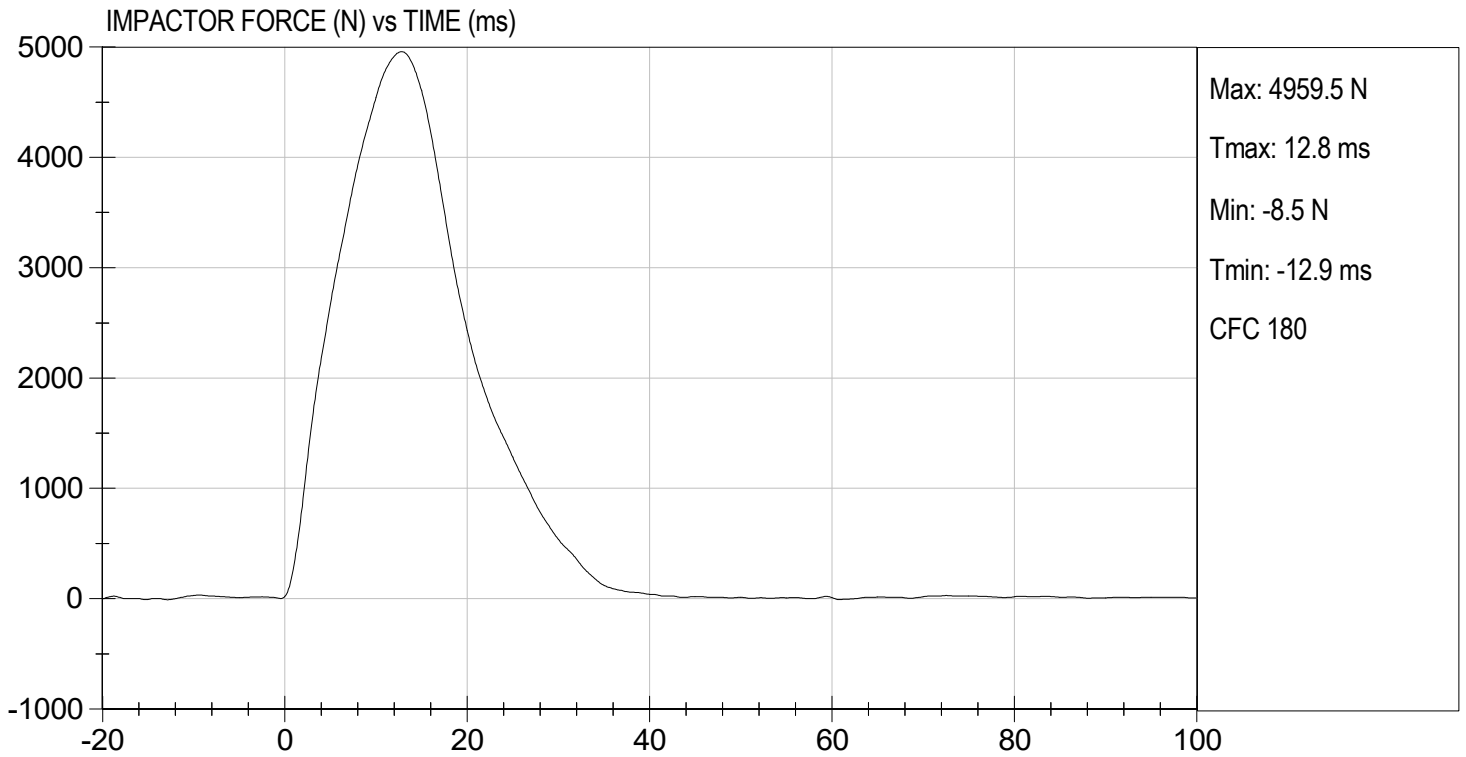
**Test I.D:**       D222669      

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Probe Speed	m/s	4.20 to 4.40	4.38	Pass
Maximum Impactor Force	N	4700 to 5400	4960	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	12.8	Pass
Maximum Pubic Force	N	1230 to 1590	1265	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	13.8	Pass
Overall Test Results				Pass

  
\_\_\_\_\_  
Laboratory Technician

11/18/2022  
Test Date

  
\_\_\_\_\_  
Approved By



**MGA RESEARCH CORPORATION**  
**THORAX IMPACT TEST**  
**ES-2re DUMMY**

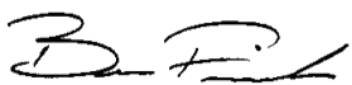
ATD Serial No:           F032          

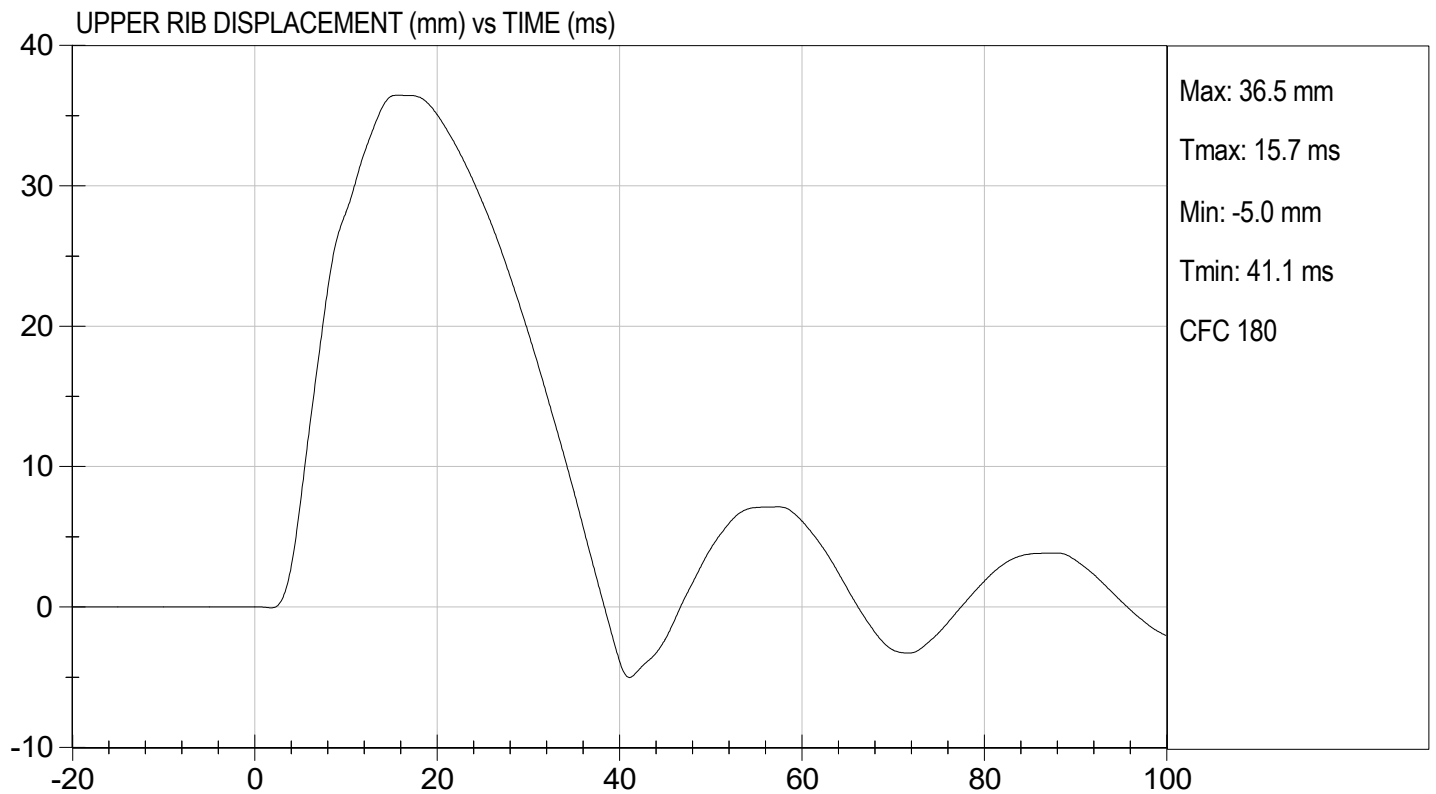
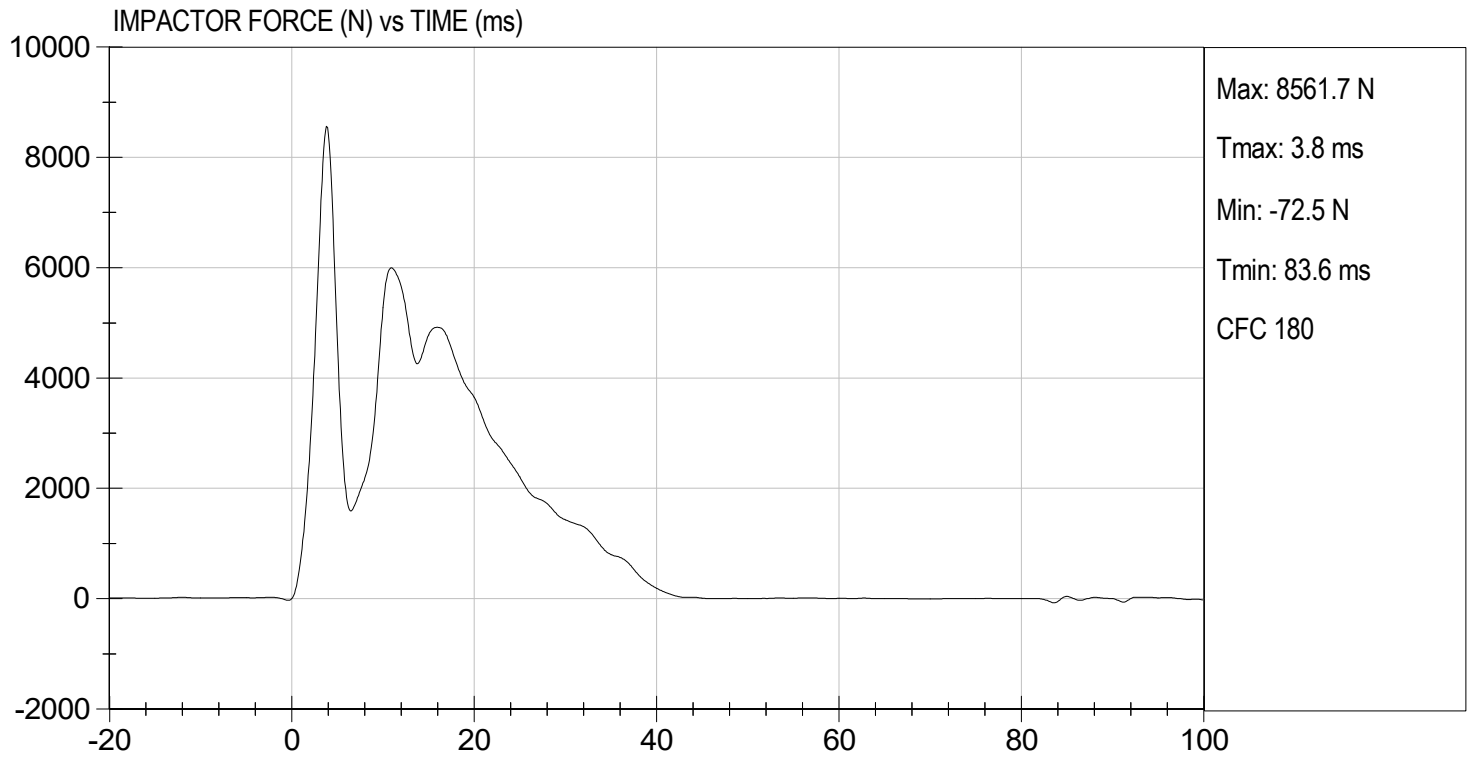
Test I.D:           D222660          

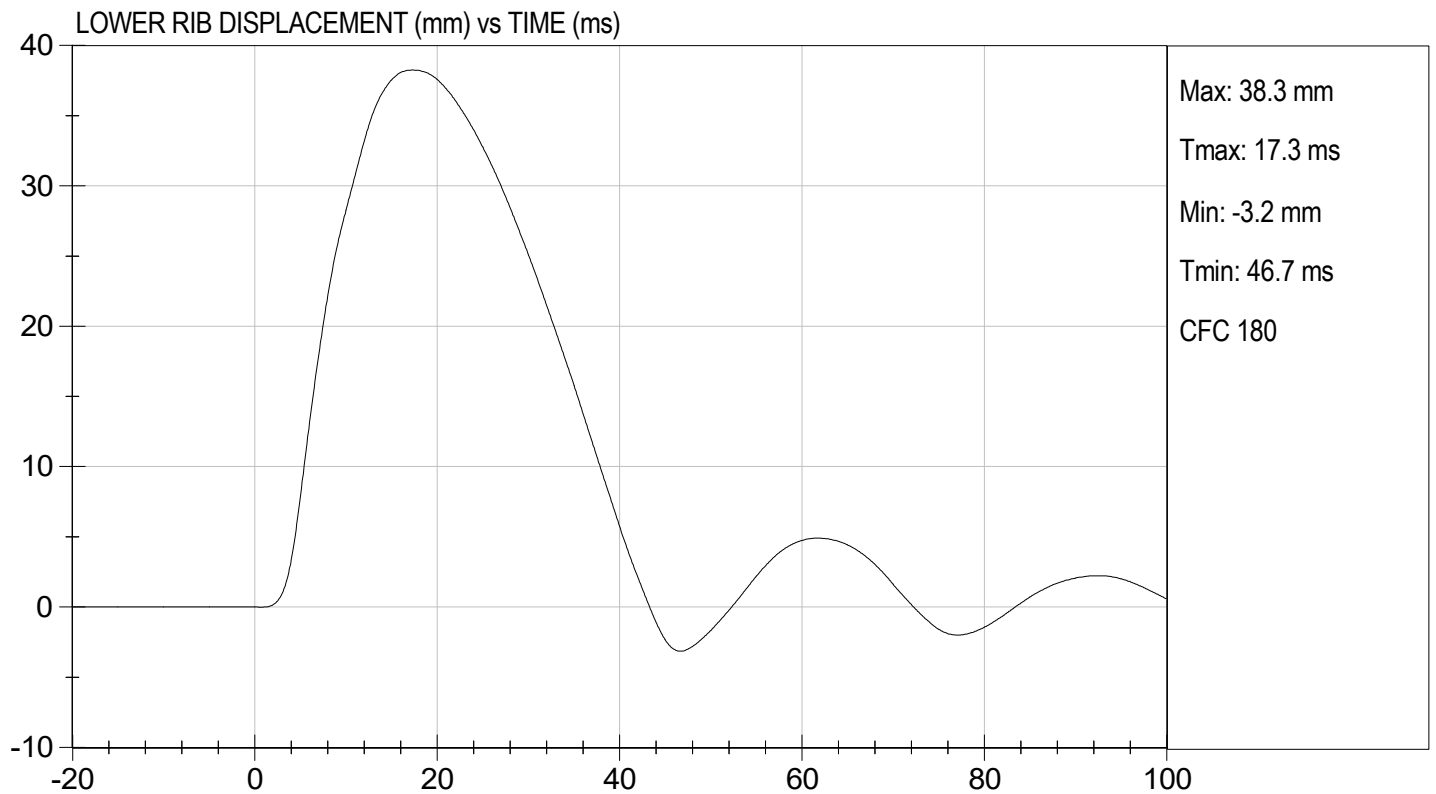
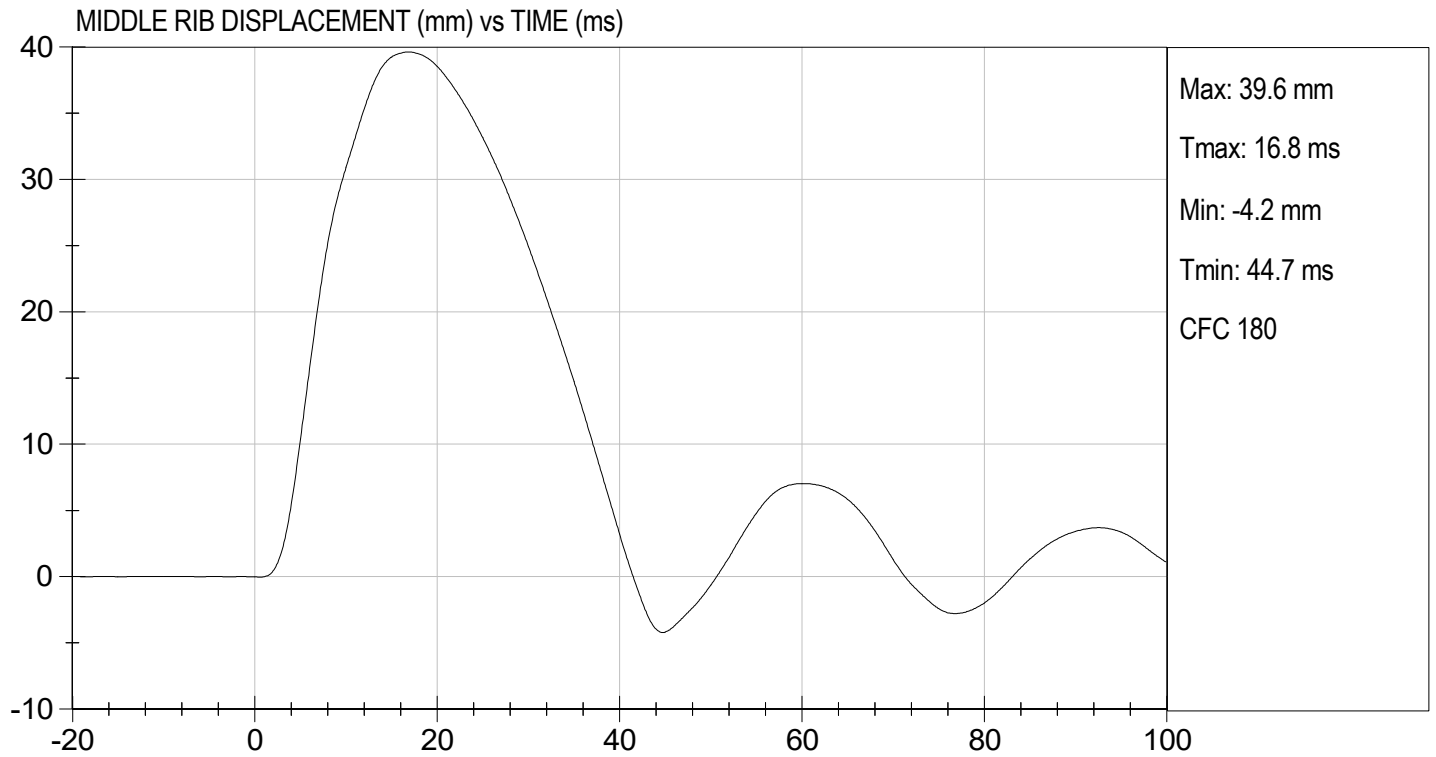
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	27	Pass
Probe Speed	m/s	5.40 to 5.60	5.46	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5997	Pass
Upper Rib Displacement	mm	34.0 to 41.0	36.5	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.6	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.3	Pass
Overall Test Results				Pass

  
 Laboratory Technician

          11/18/2022            
 Test Date

  
 Approved By





**CALIBRATION TEST RESULTS**

**PRE-TEST**

**SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD**

**SID-IIsD External Measurements**  
**SN: 296**

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

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

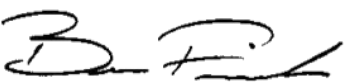
ATD Serial No: 296

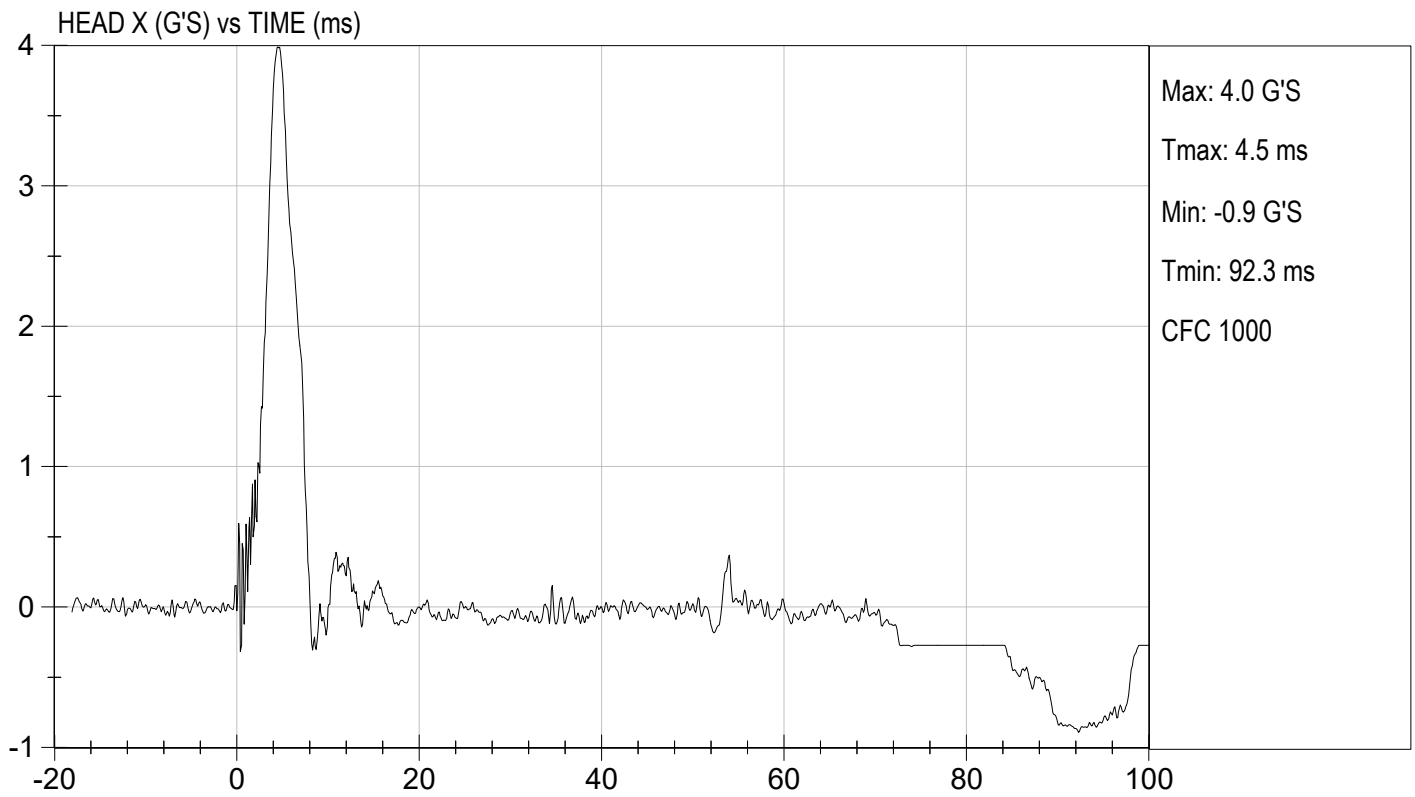
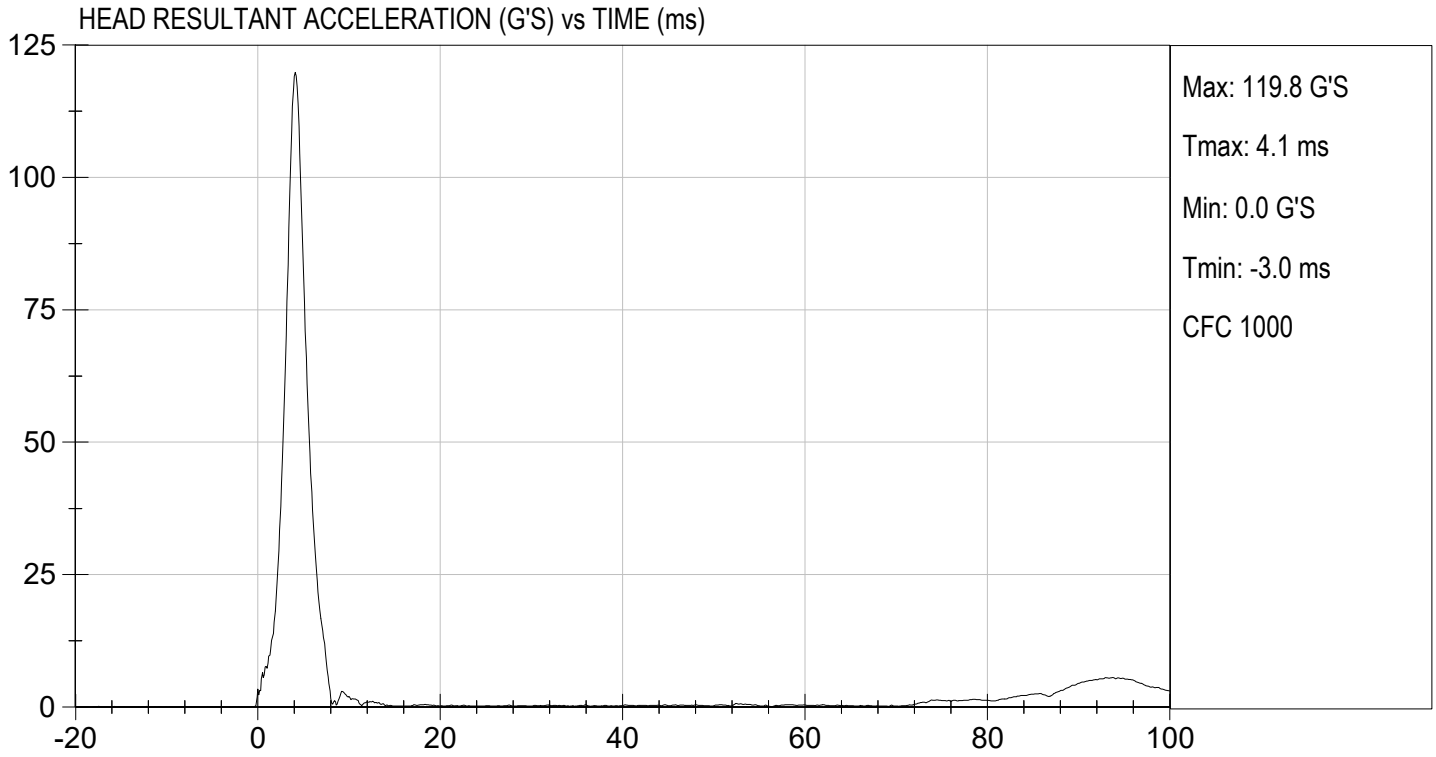
Test ID: D222571

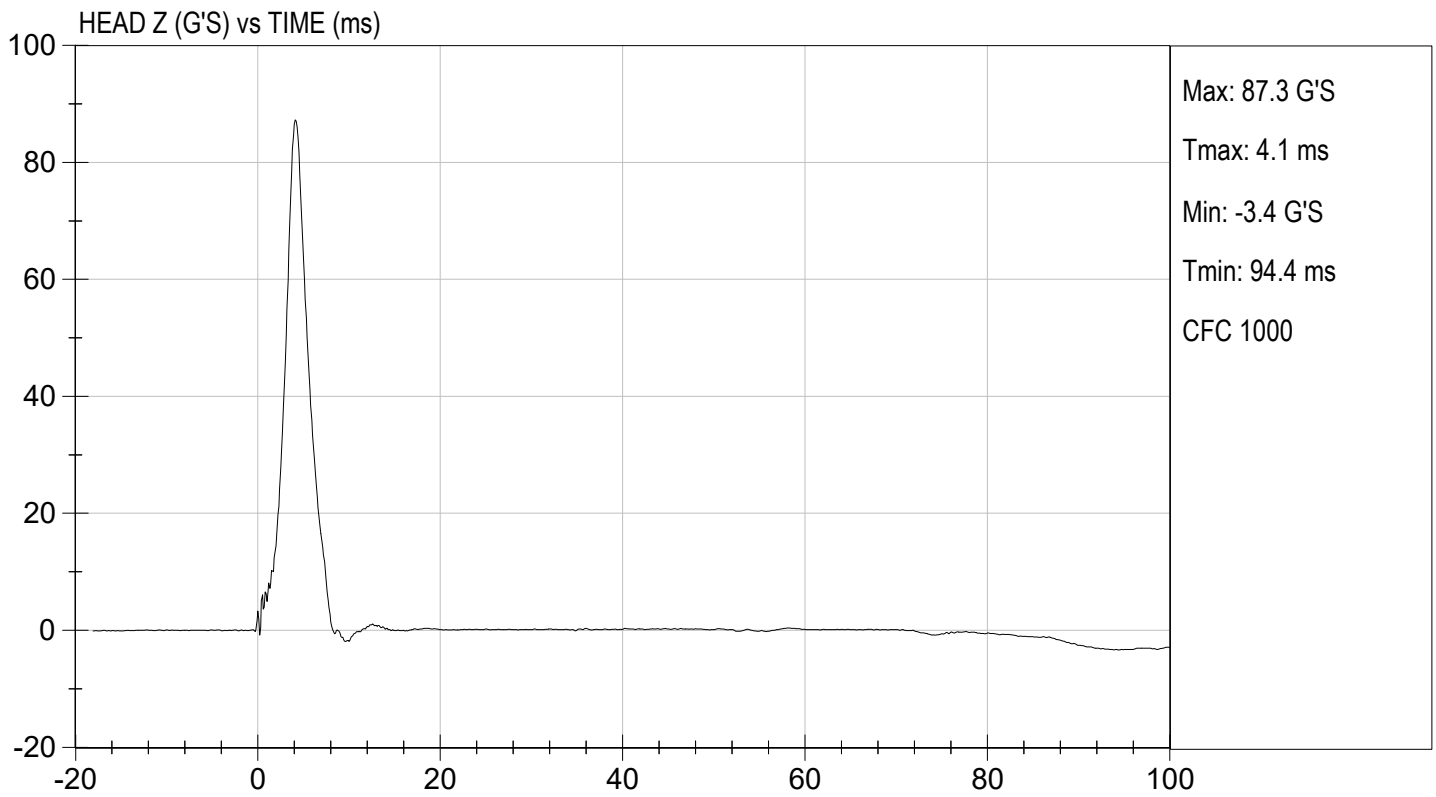
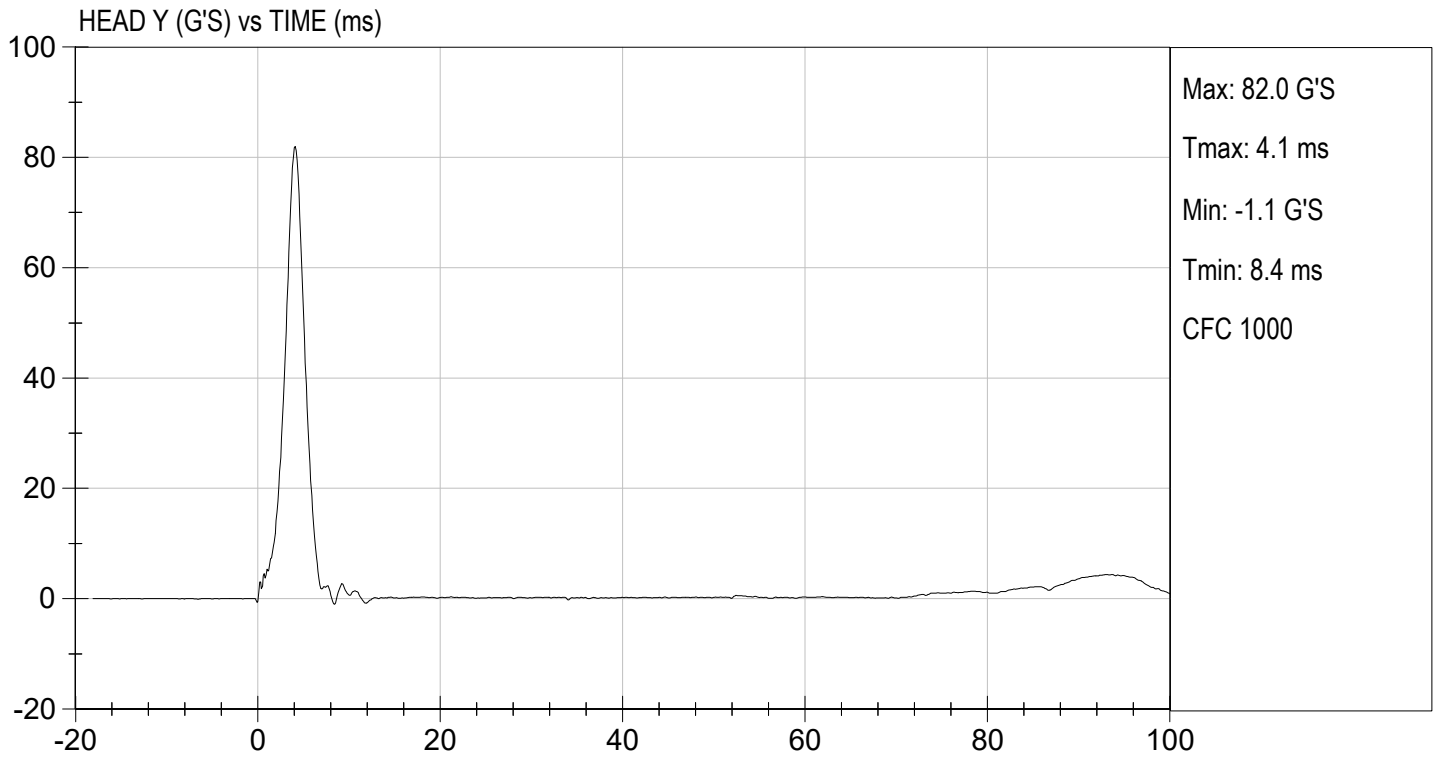
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	115 to 137	120	Pass
Peak Longitudinal Acceleration	G's	+/- 15	4.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/03/2022  
 Test Date

  
 Approved By





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

ATD Serial No: 296

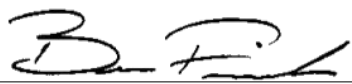
Test I.D.: D222572

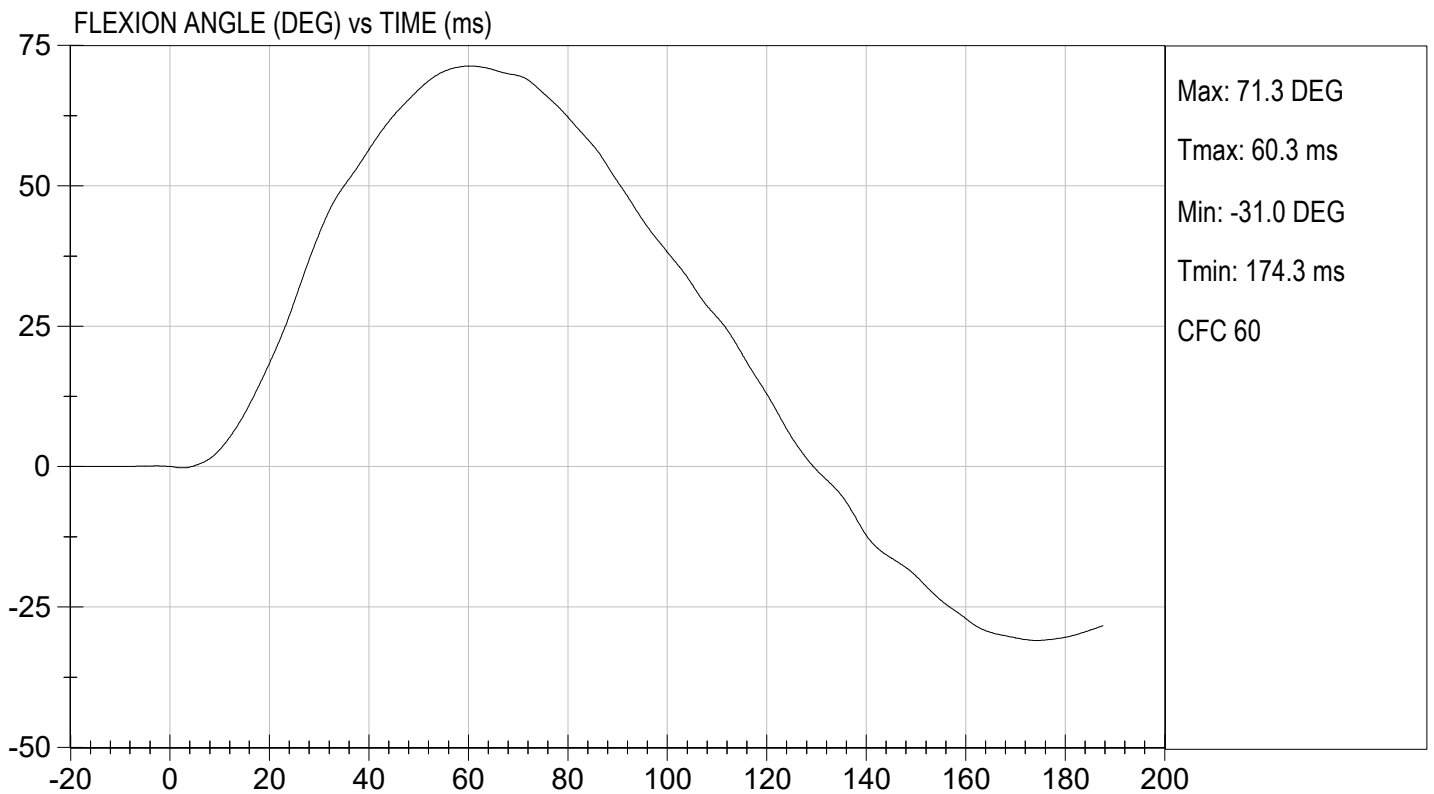
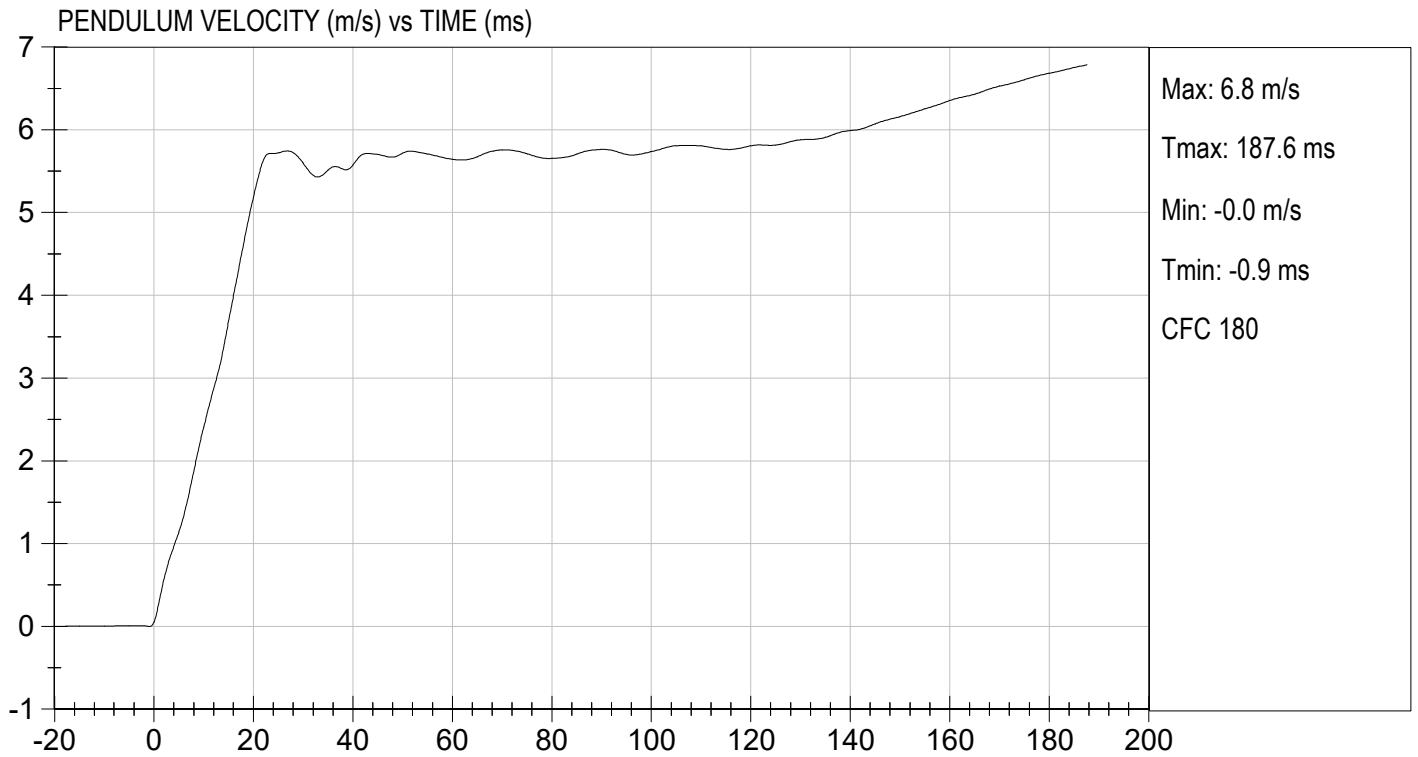
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.9	Pass	
Humidity	%	10 to 70	46	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.58	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.41	Pass
	15 ms	m/s	3.30 to 4.10	3.69	Pass
	20 ms	m/s	4.40 to 5.40	5.19	Pass
	25 ms	m/s	5.40 to 6.10	5.72	Pass
	25-100 ms	m/s	5.50 to 6.20	5.76	Pass
Maximum D-Plane Rotation	deg	71 to 81	71	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	110	Pass	
Overall Test Results				Pass	

  
 Laboratory Technician

11/03/2022

Test Date

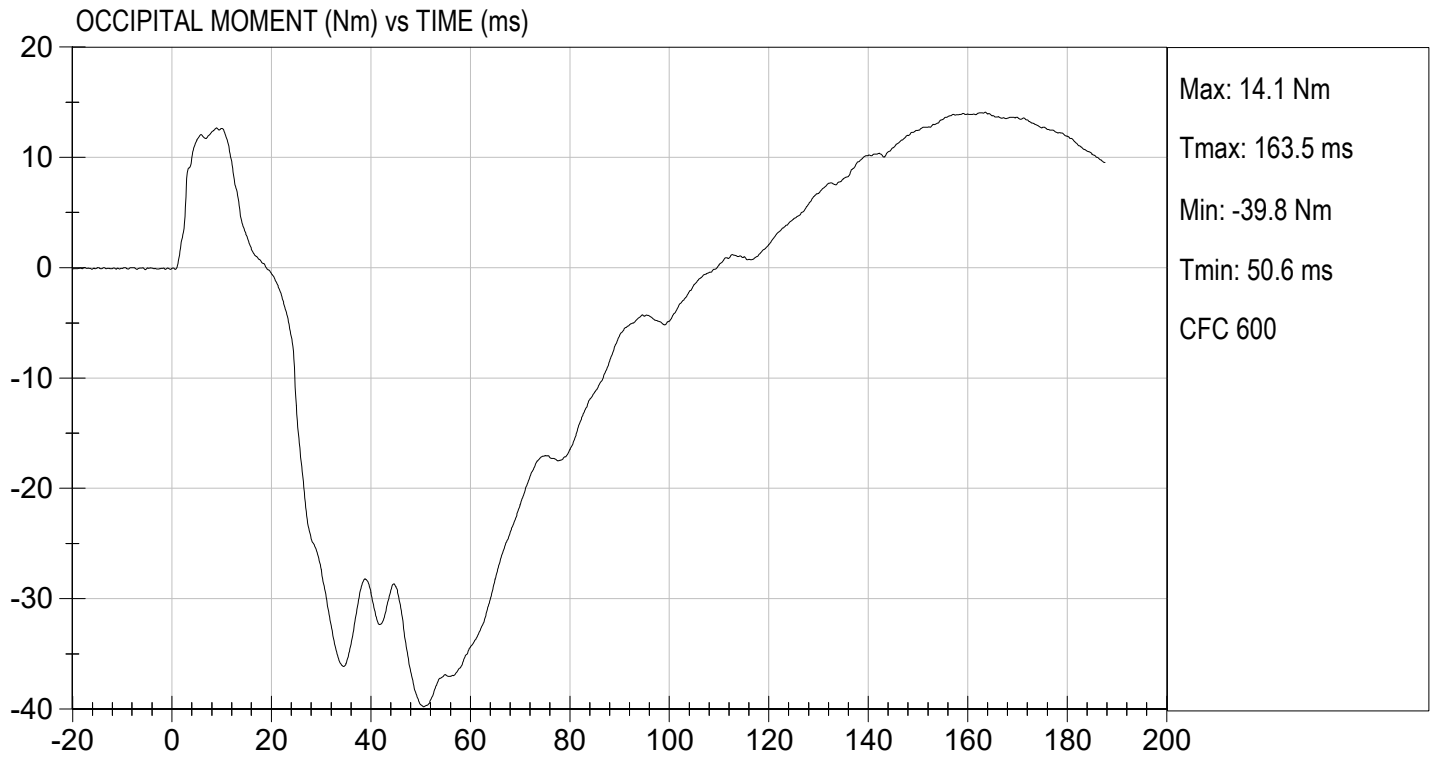
  
 Approved By





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

TEST DATE: 11/03/2022  
TEST #: D222572



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

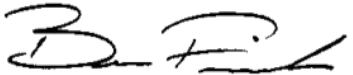
ATD Serial No: 296

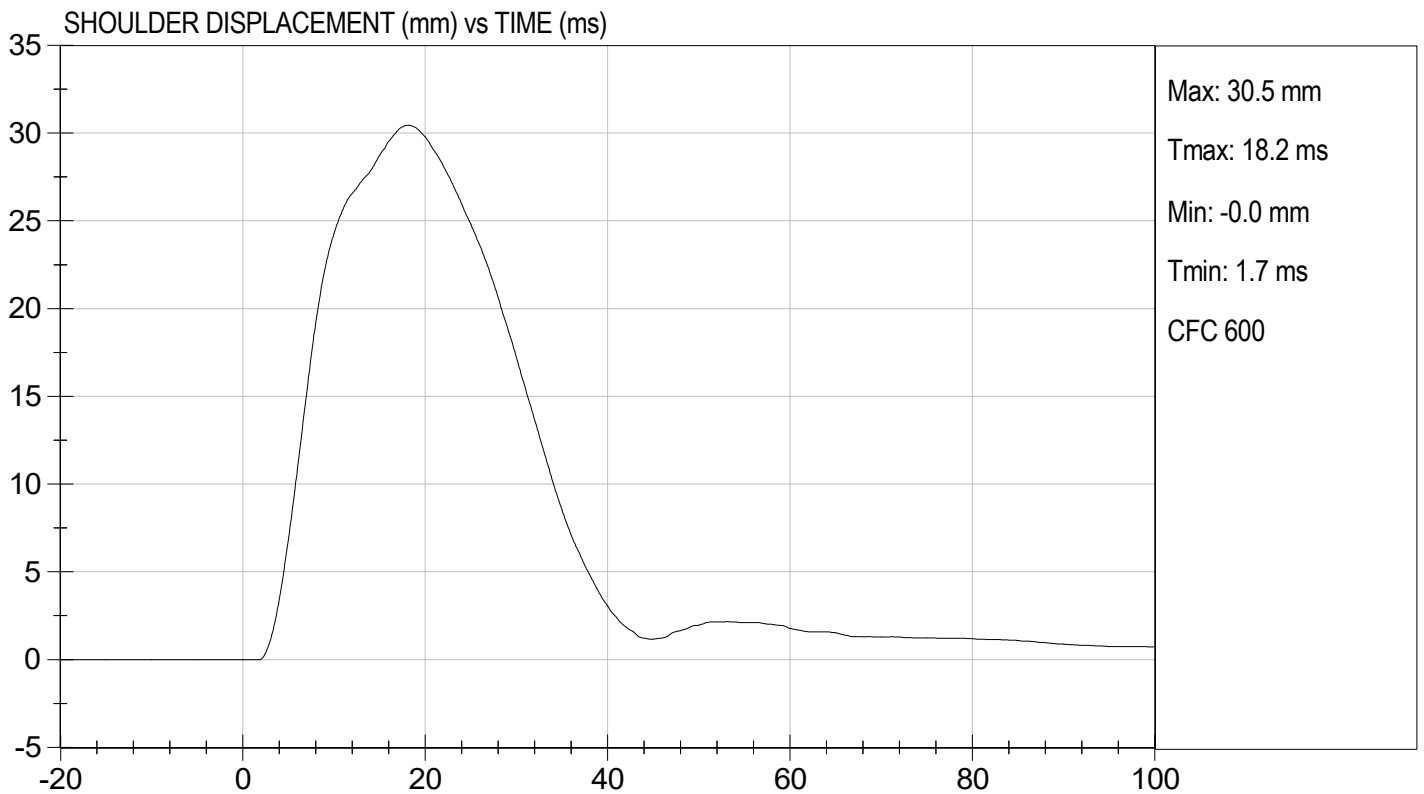
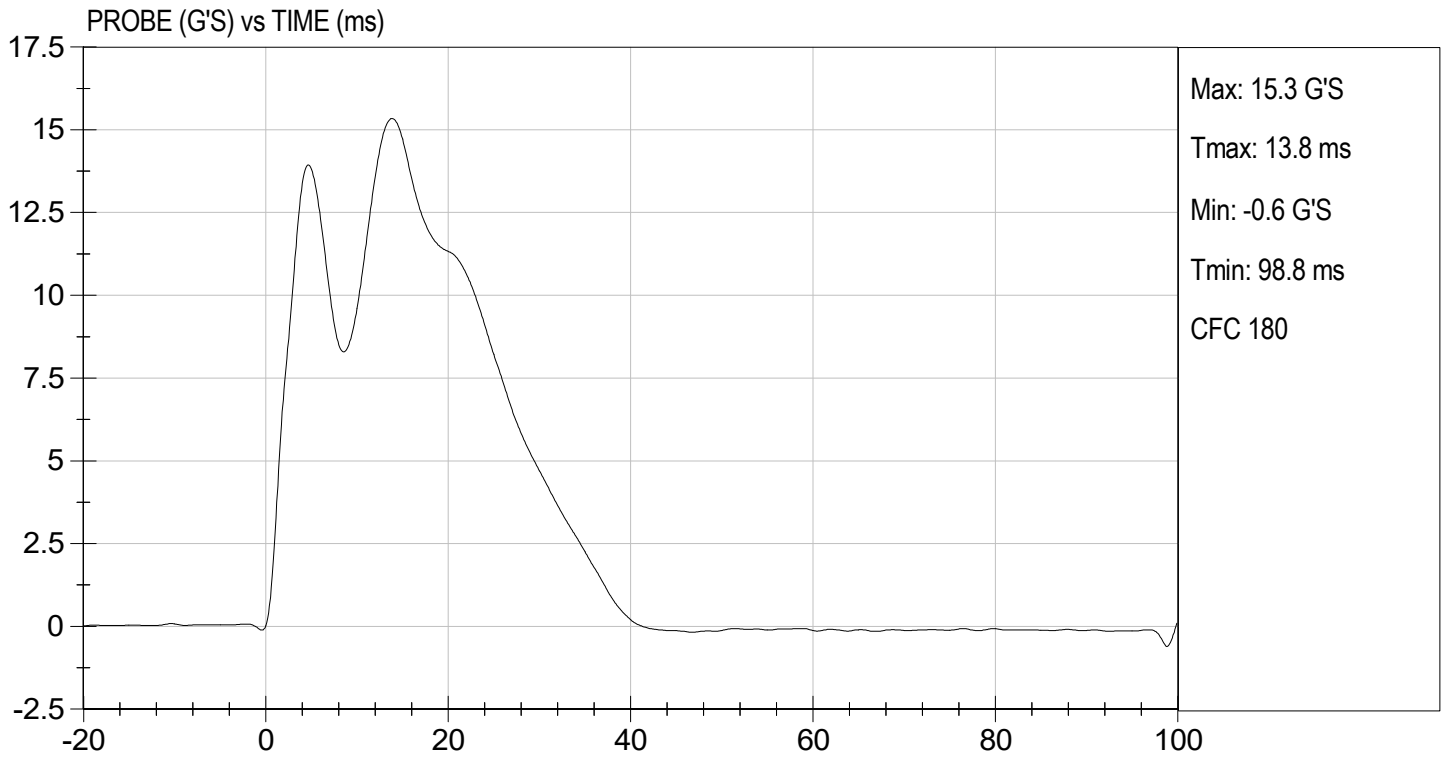
Test ID: D222573

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	42	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	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass

  
Laboratory Technician

11/03/2022  
Test Date

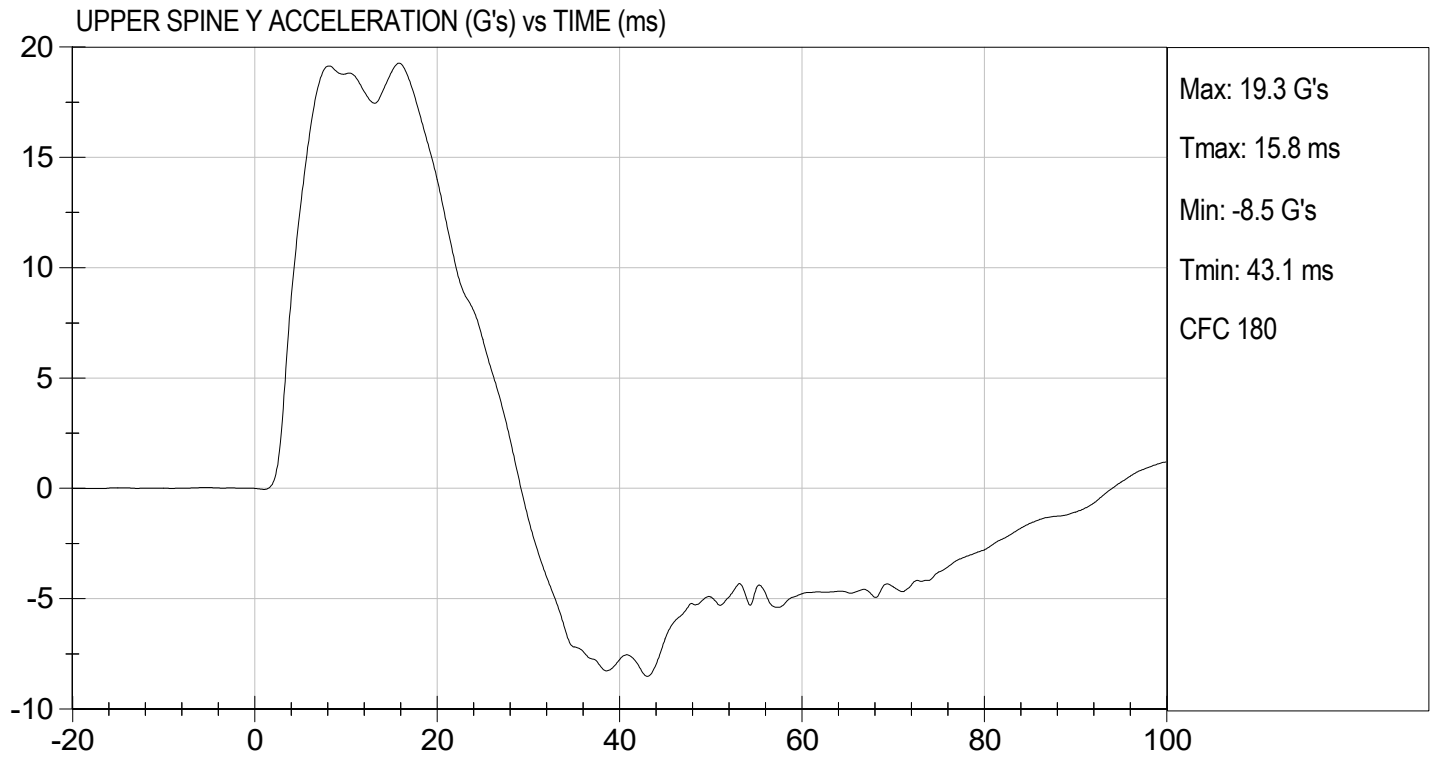
  
Approved By





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

TEST DATE: 11/03/2022  
TEST #: D222573



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

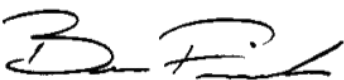
ATD Serial No: 296

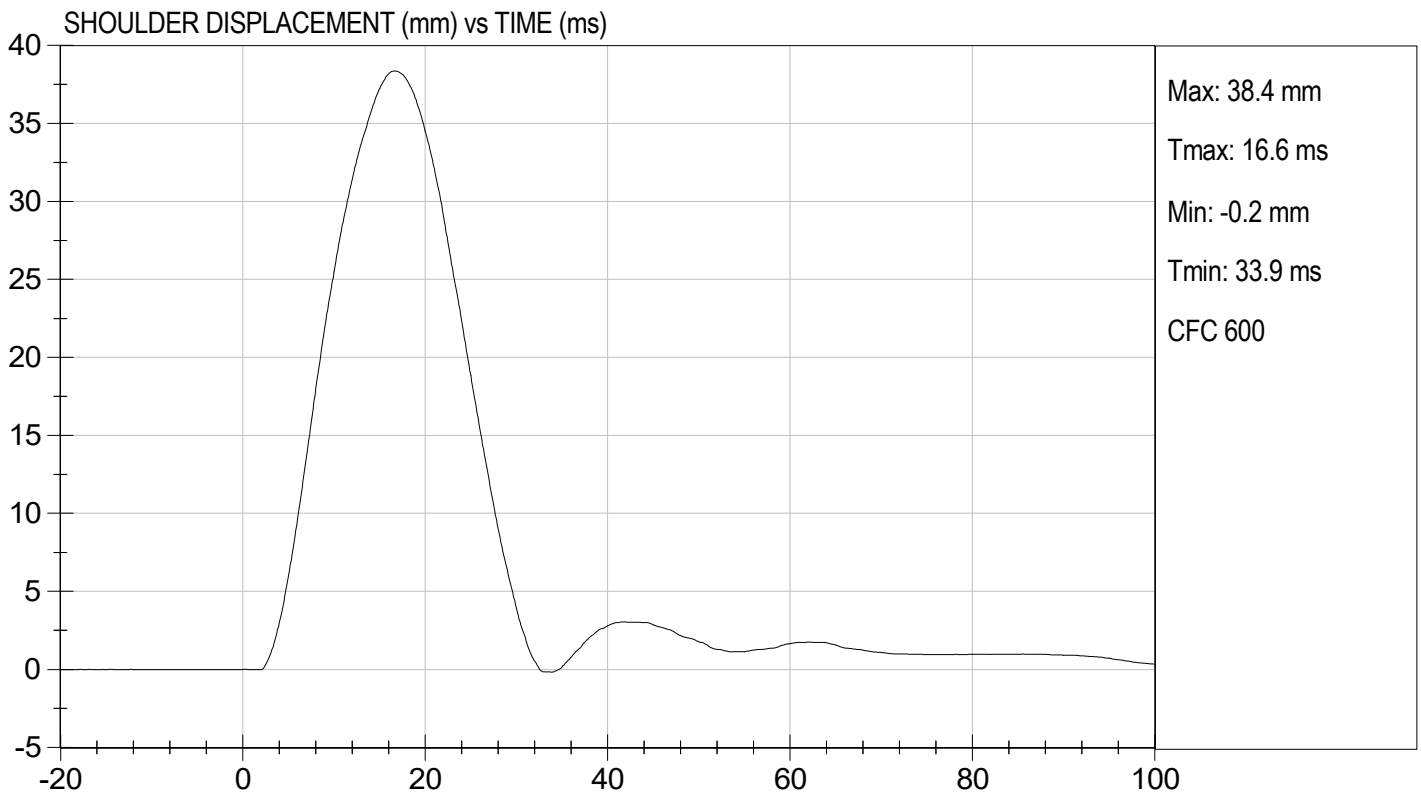
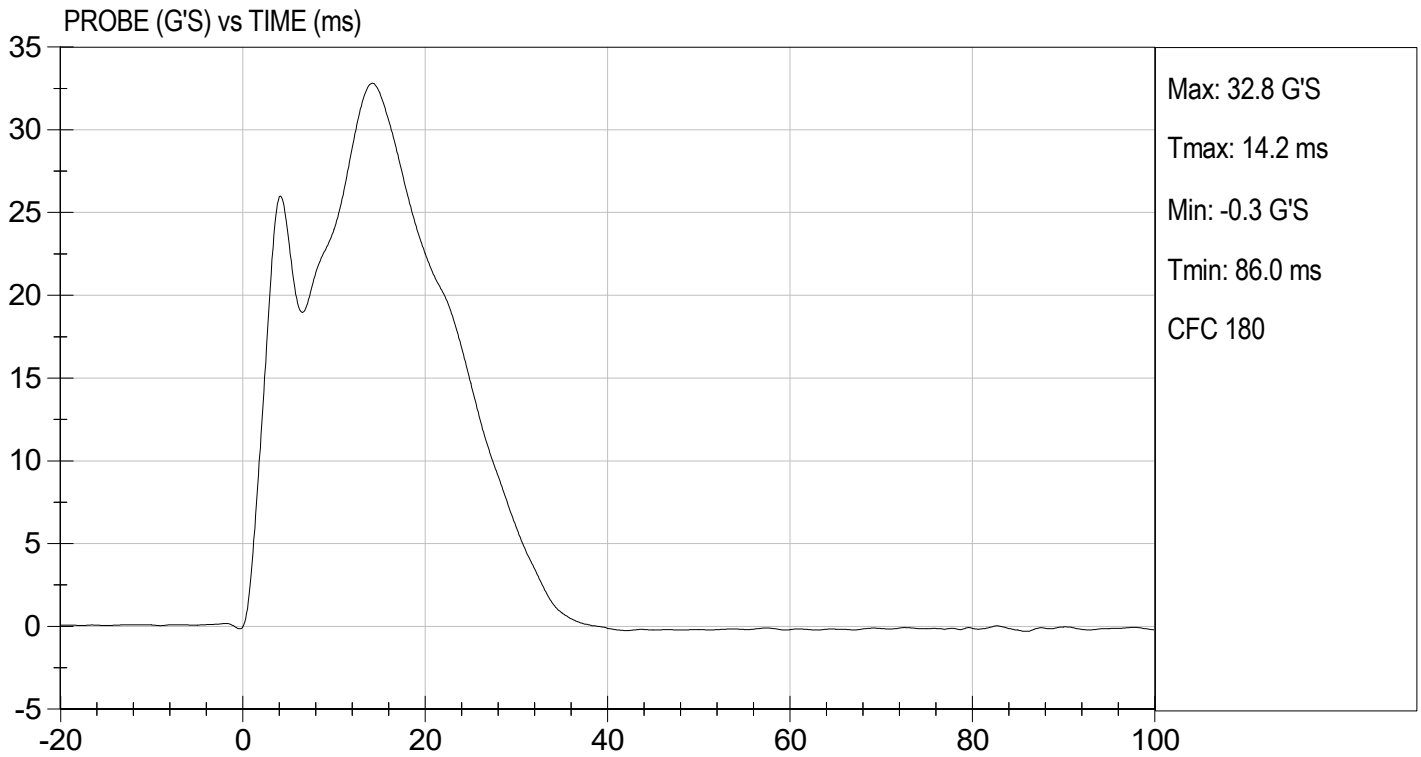
Test I.D: D222574

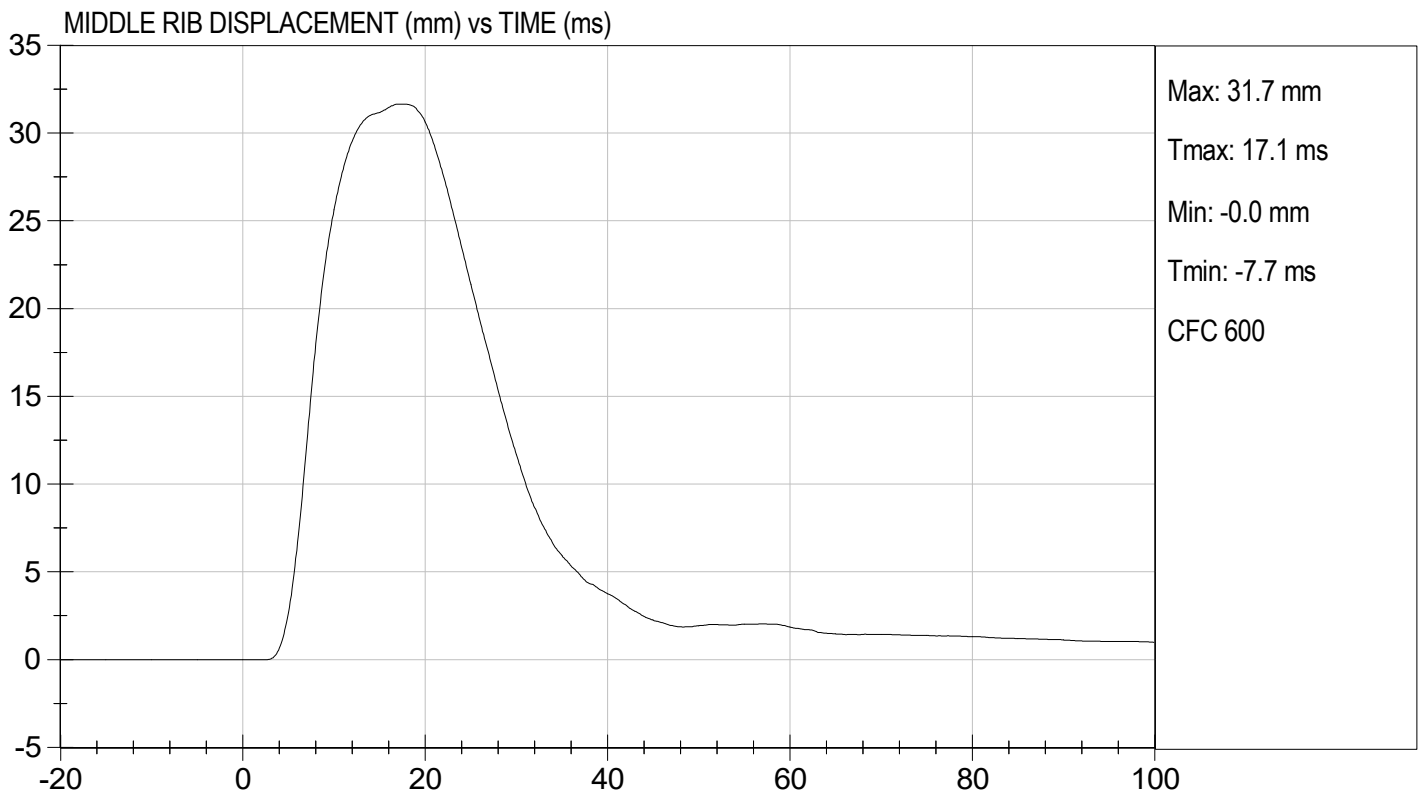
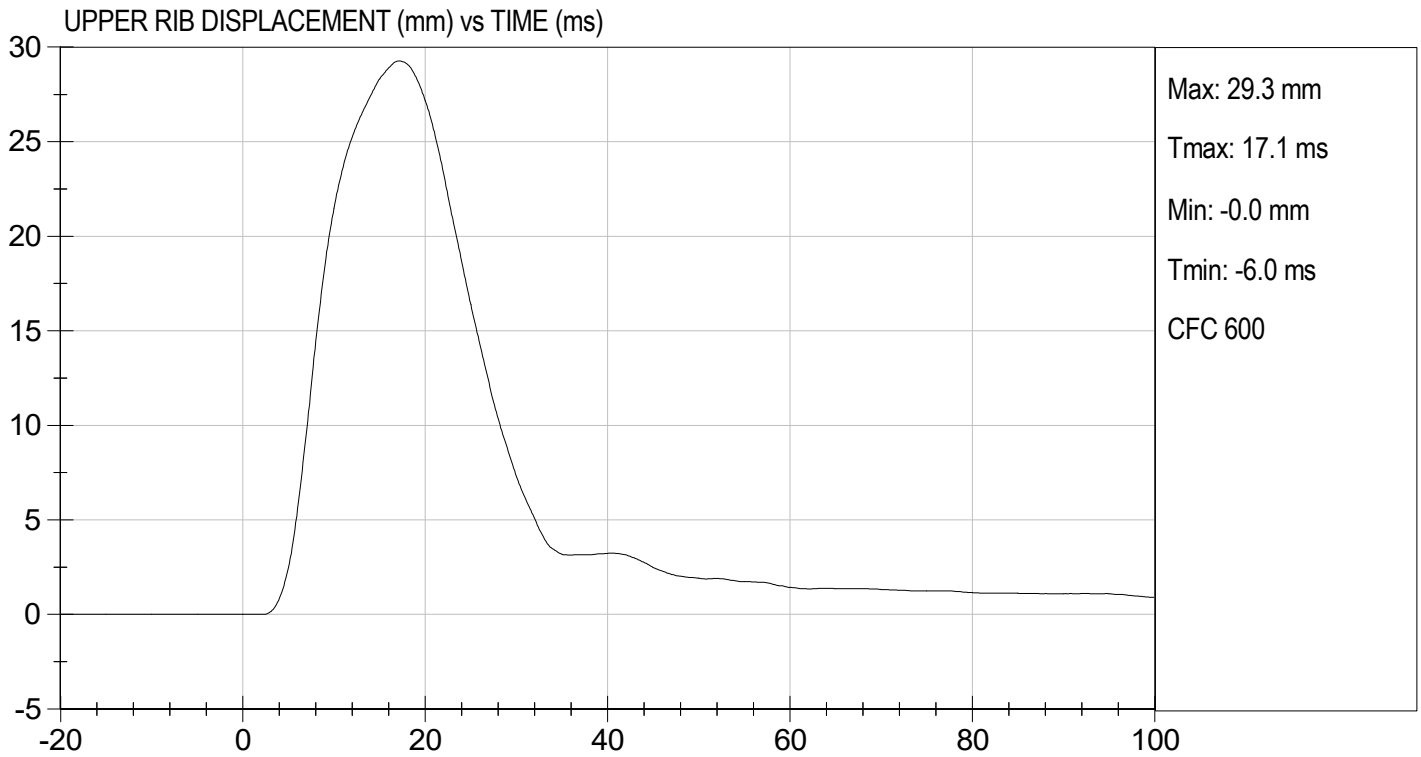
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	42	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	38	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	32	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	36	Pass
Overall Test Results				Pass

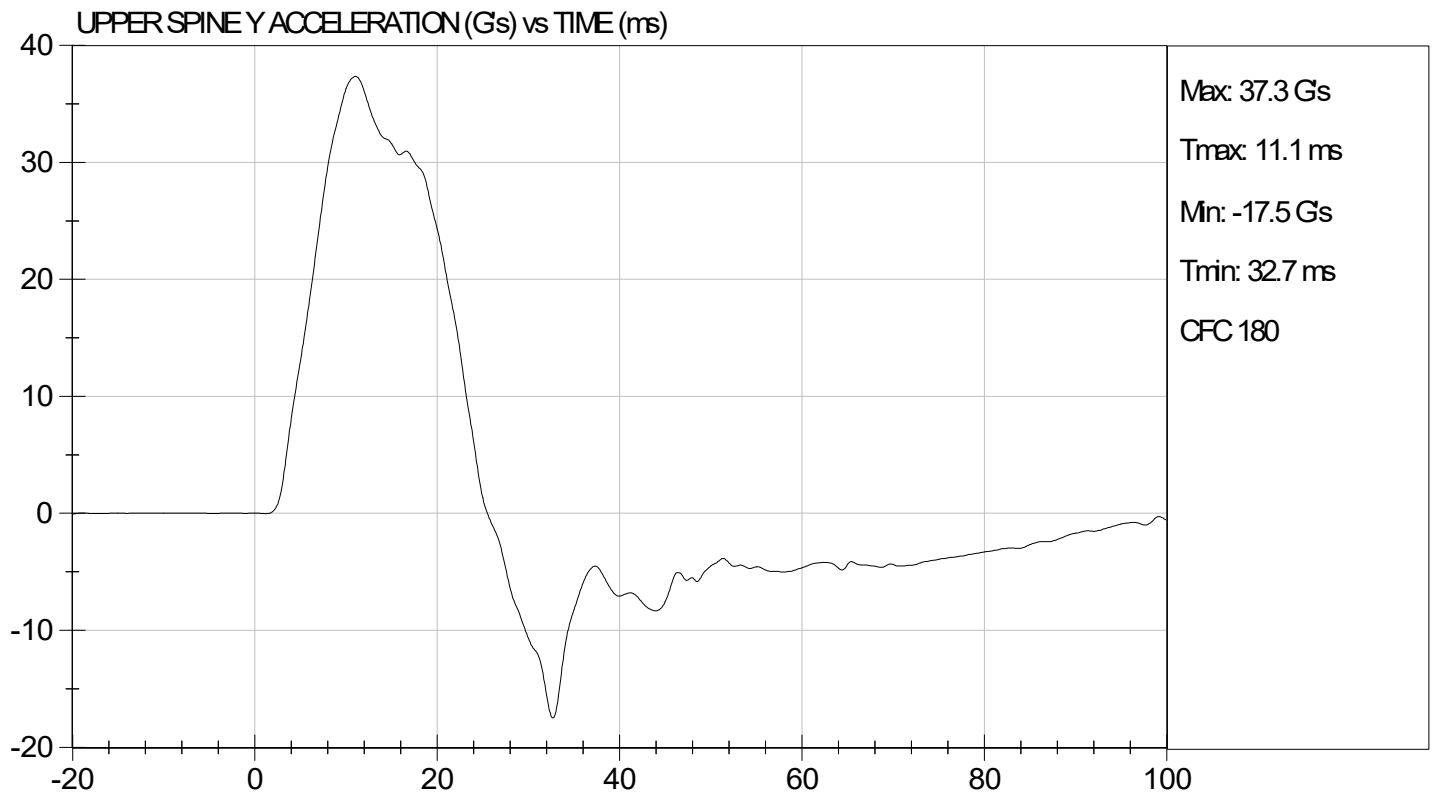
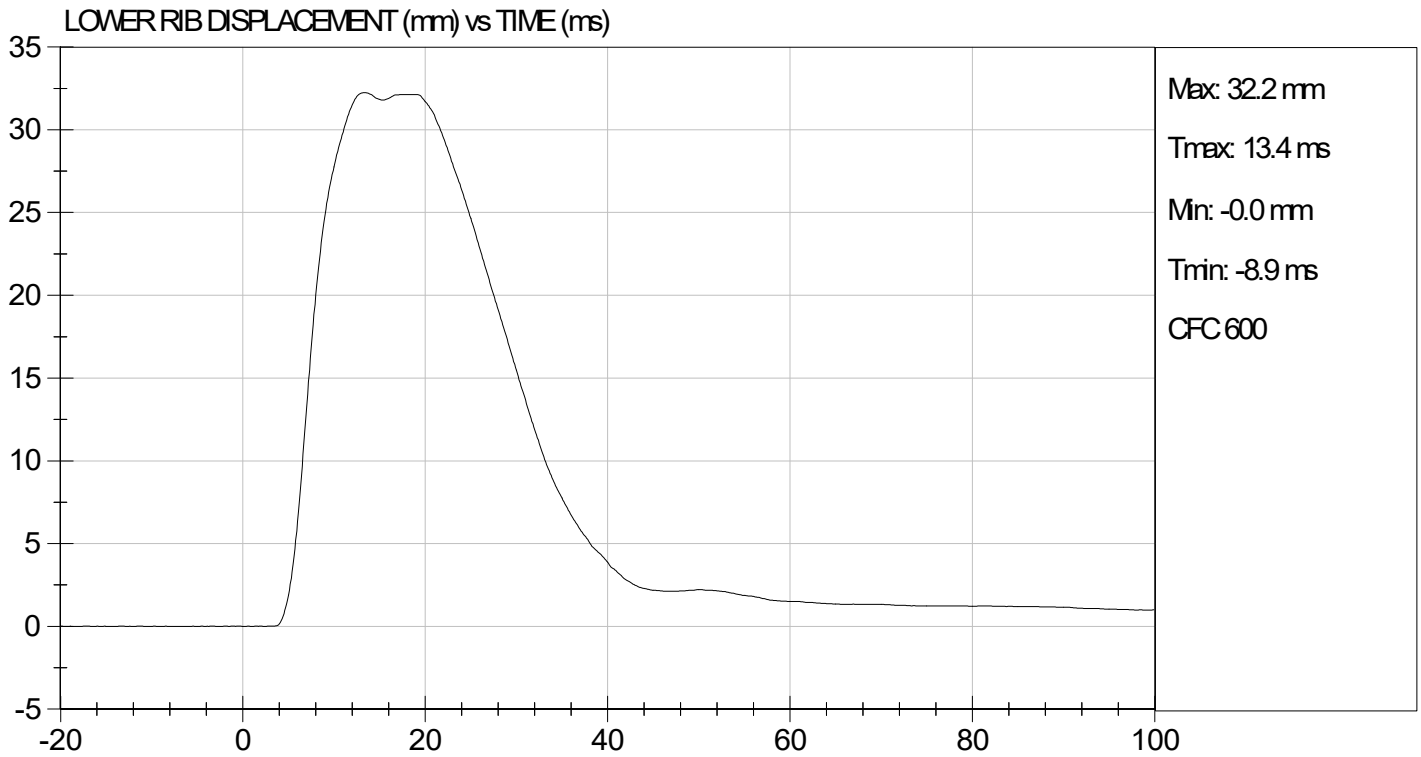
  
 Laboratory Technician

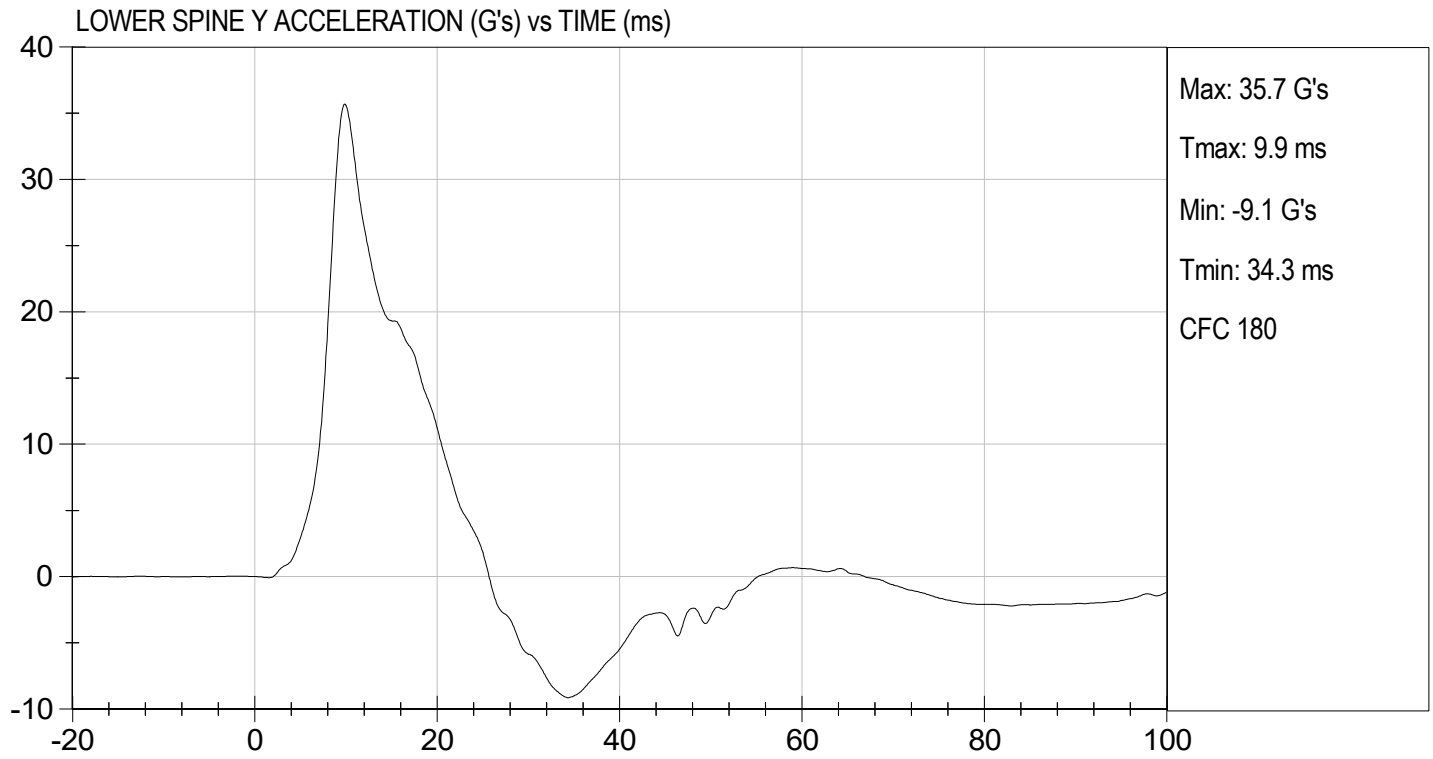
11/03/2022  
 Test Date

  
 Approved By









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

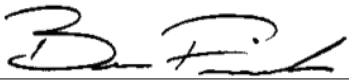
ATD Serial No: 296

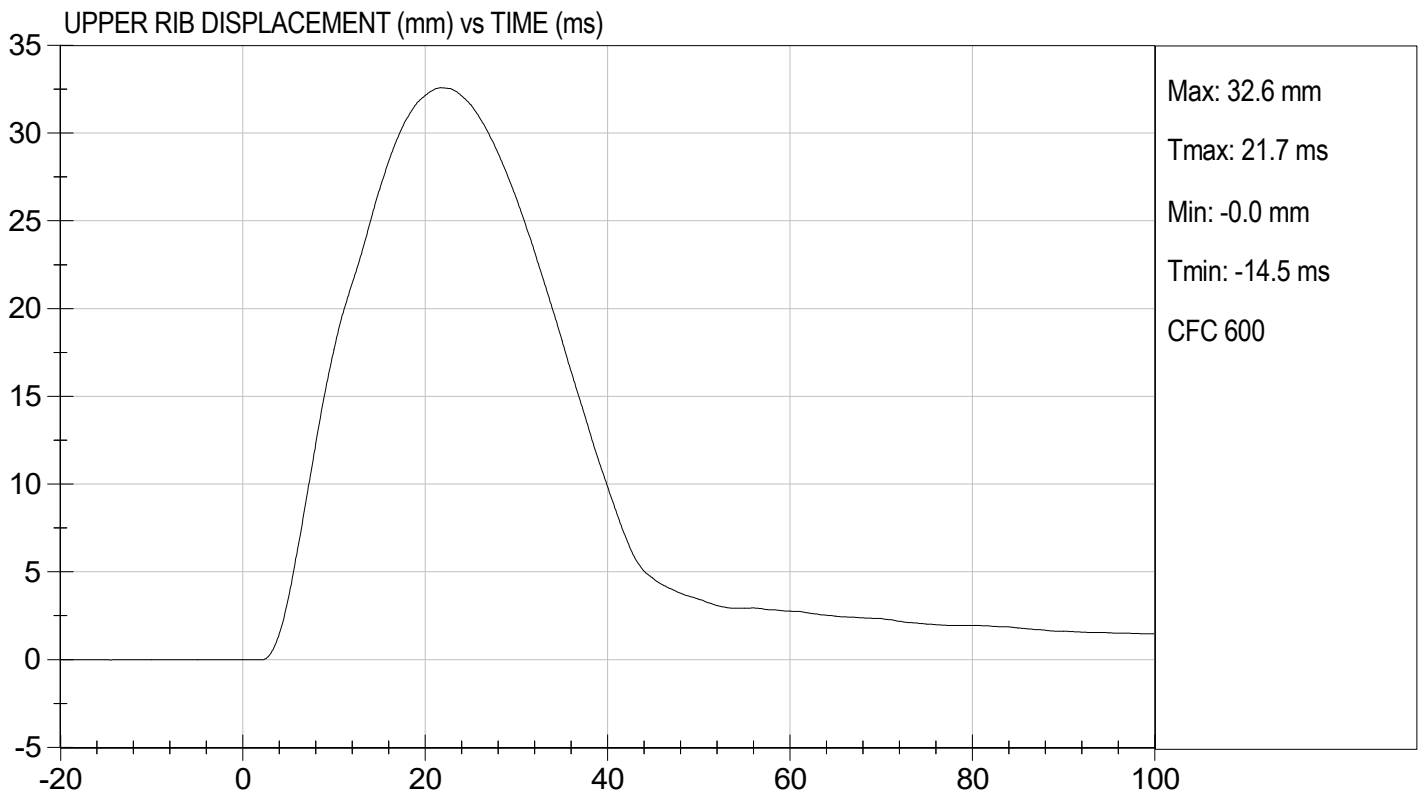
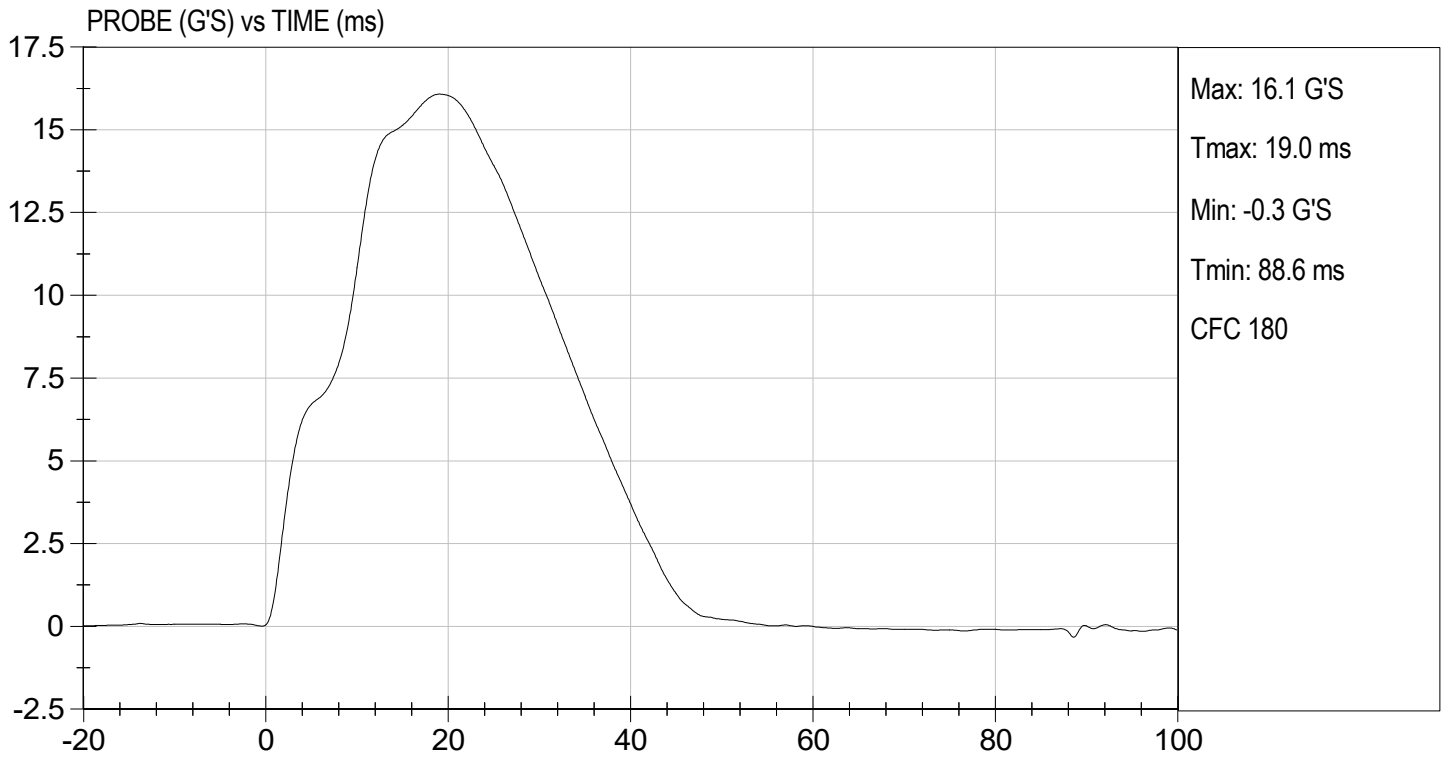
Test I.D: D222575

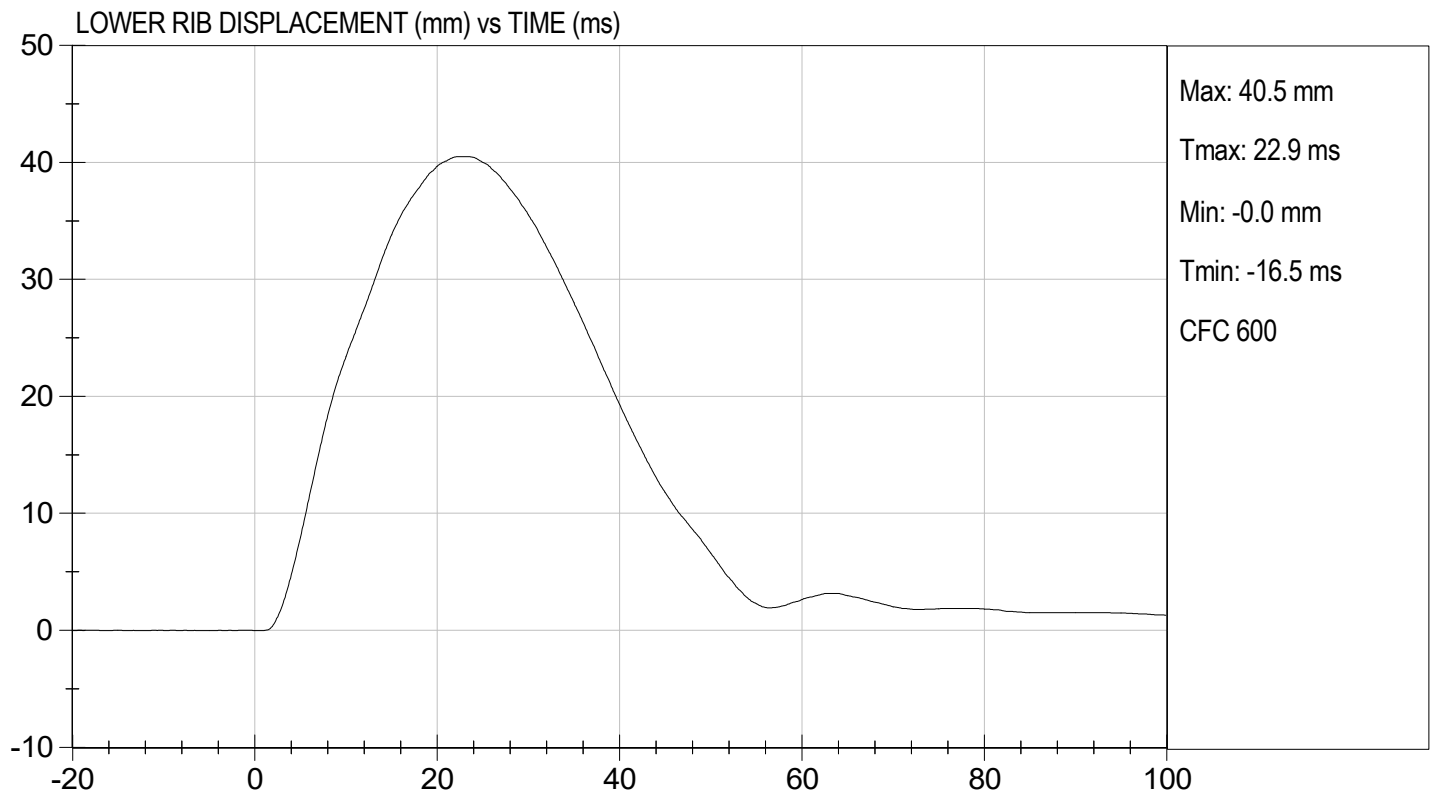
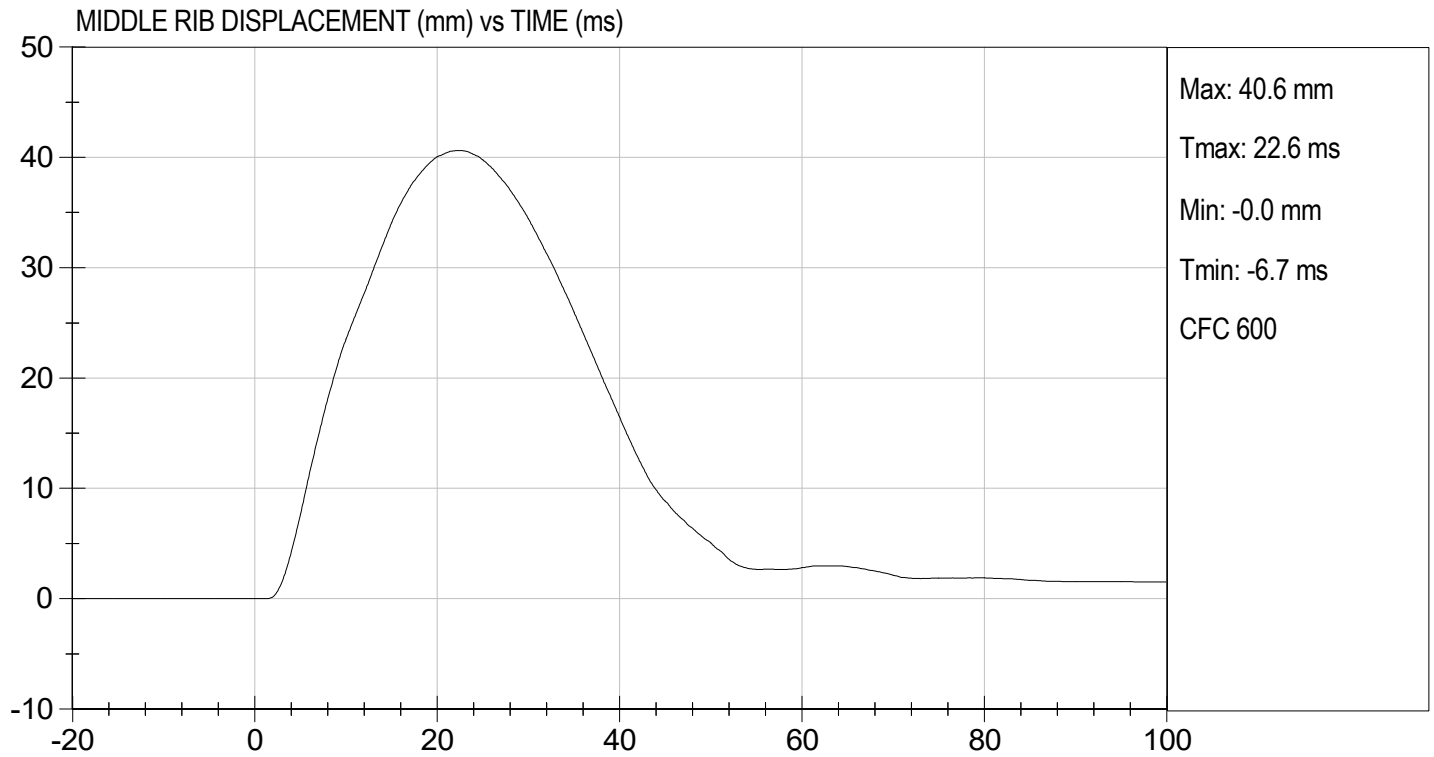
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	33	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	10	Pass
Overall Test Results				Pass

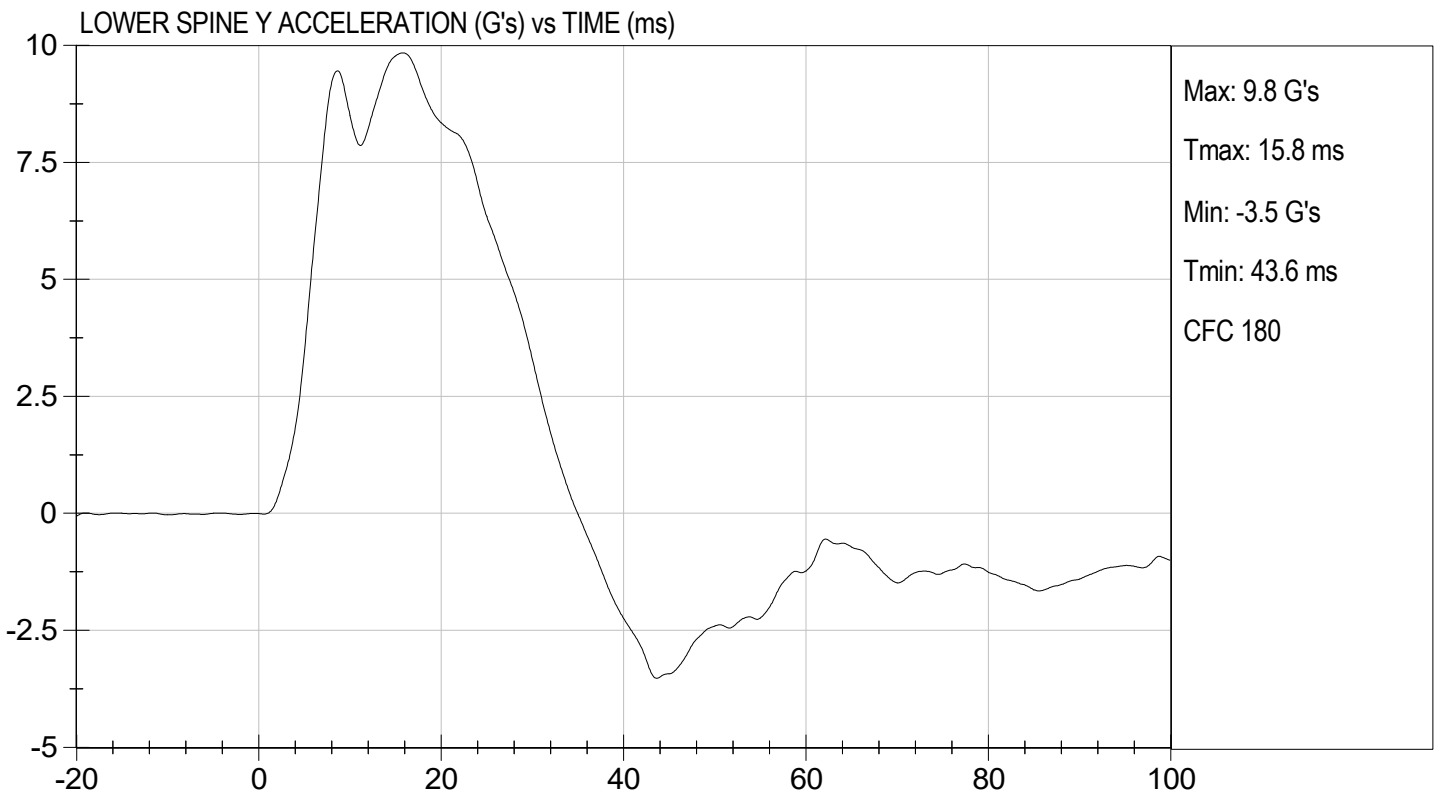
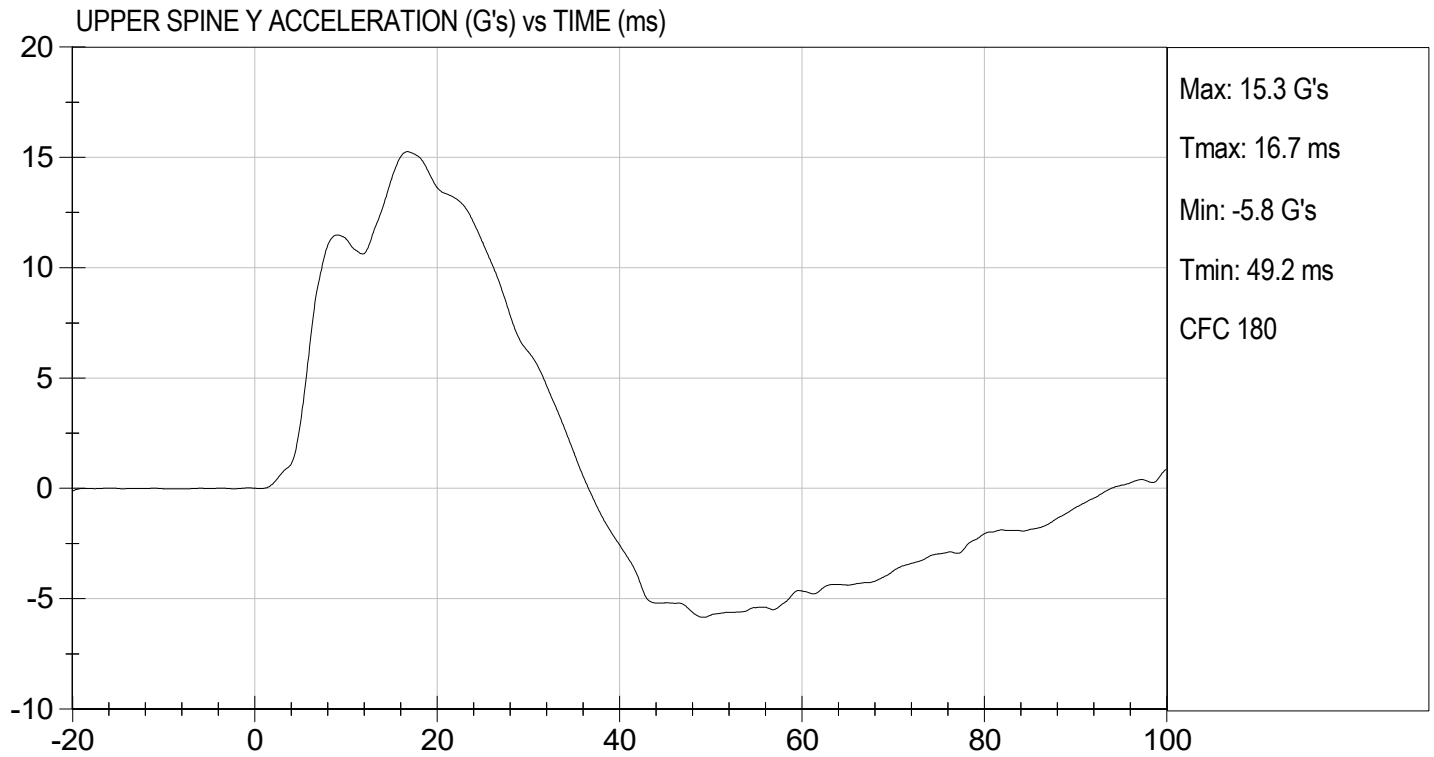
  
 Laboratory Technician

11/03/2022  
 Test Date

  
 Approved By







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

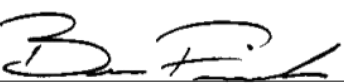
ATD Serial No: 296

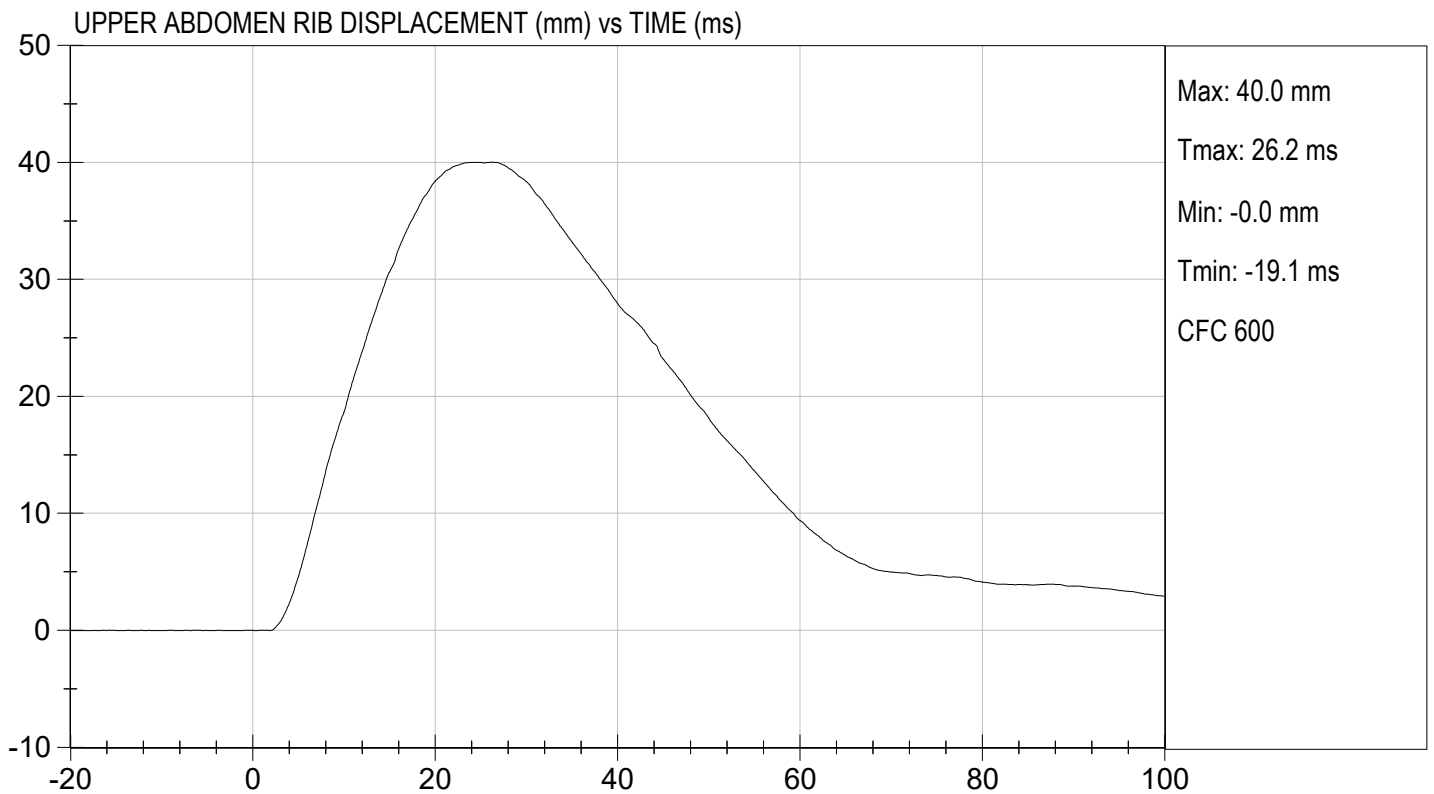
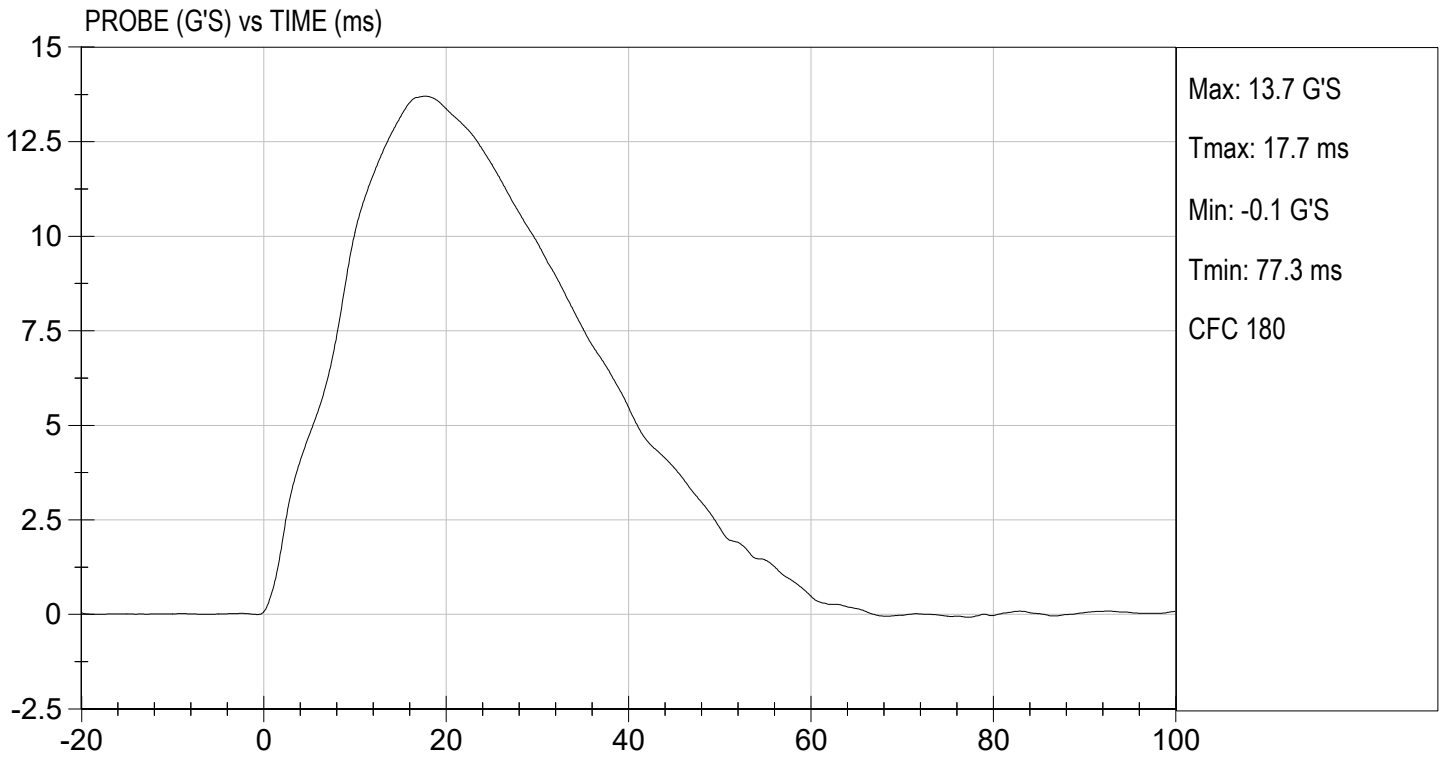
Test I.D: D222576

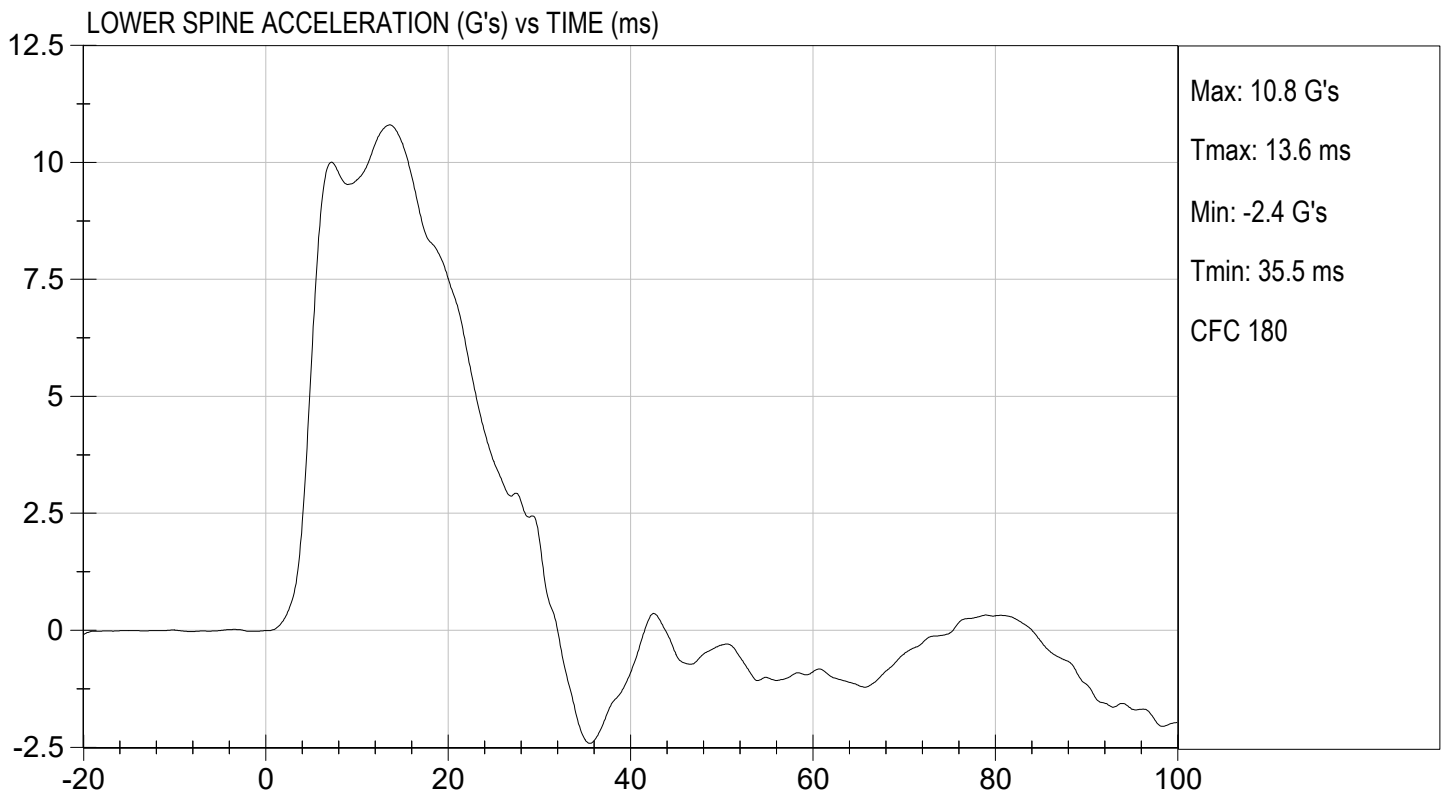
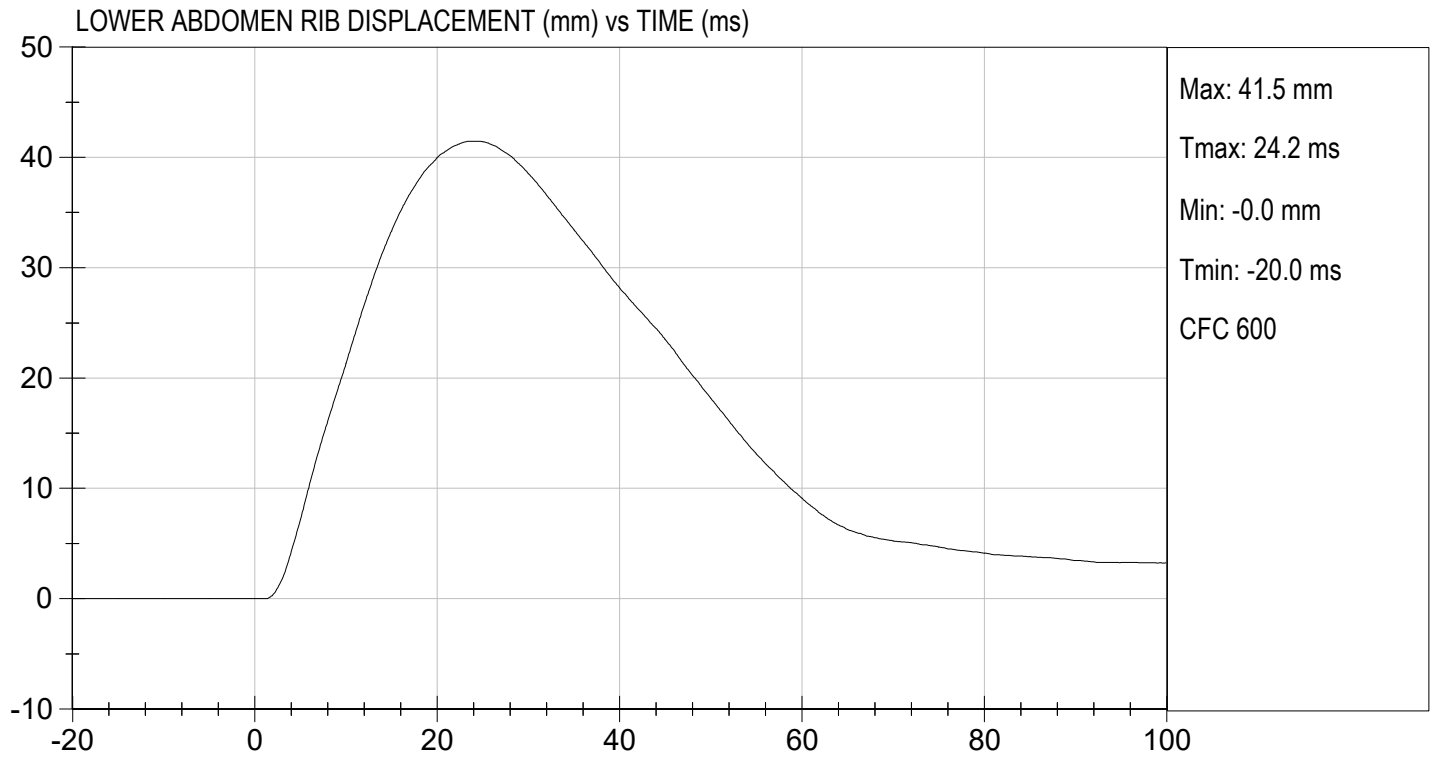
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	42	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	40	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	41	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/03/2022  
 Test Date

  
 Approved By





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

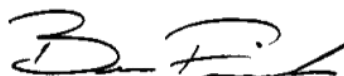
ATD Serial No: 296

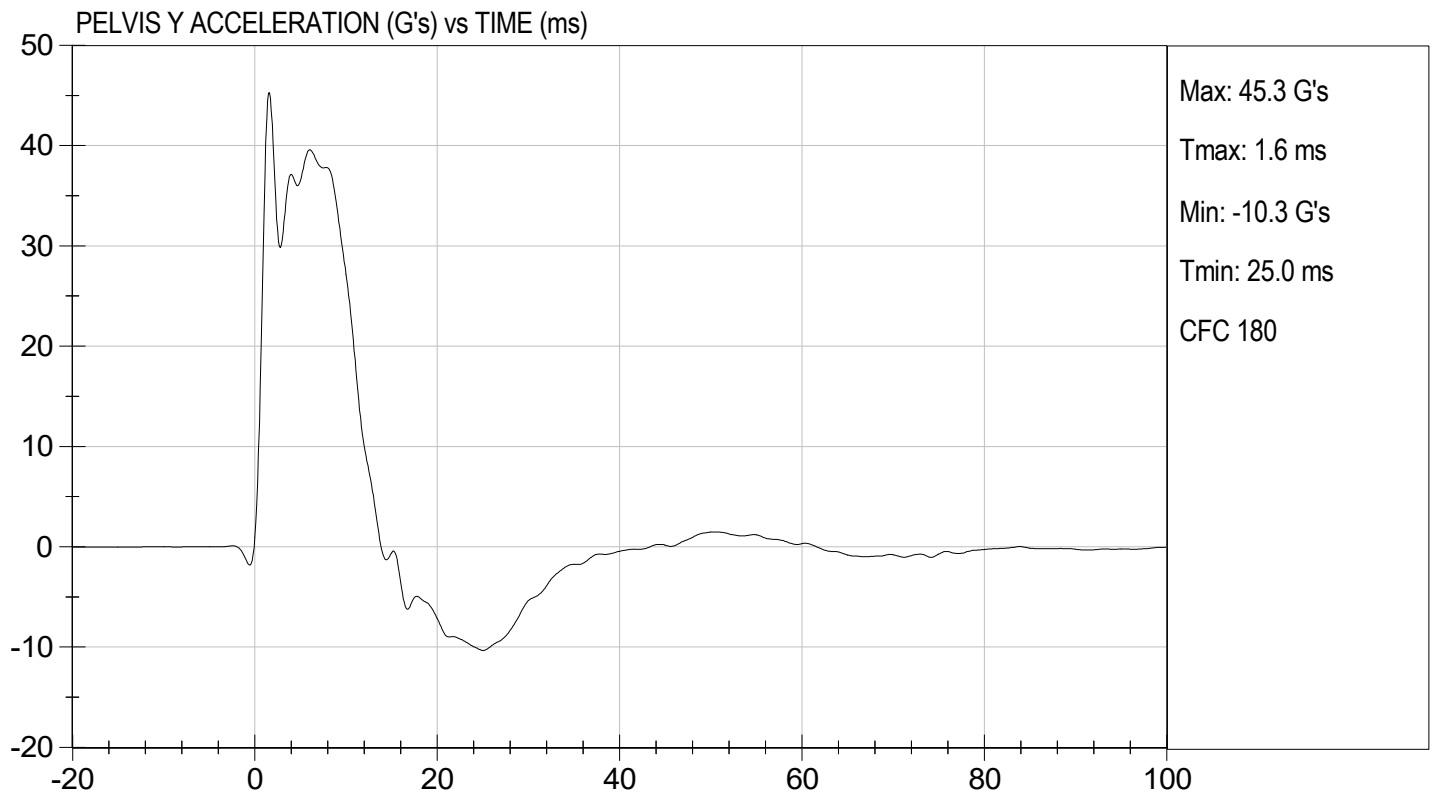
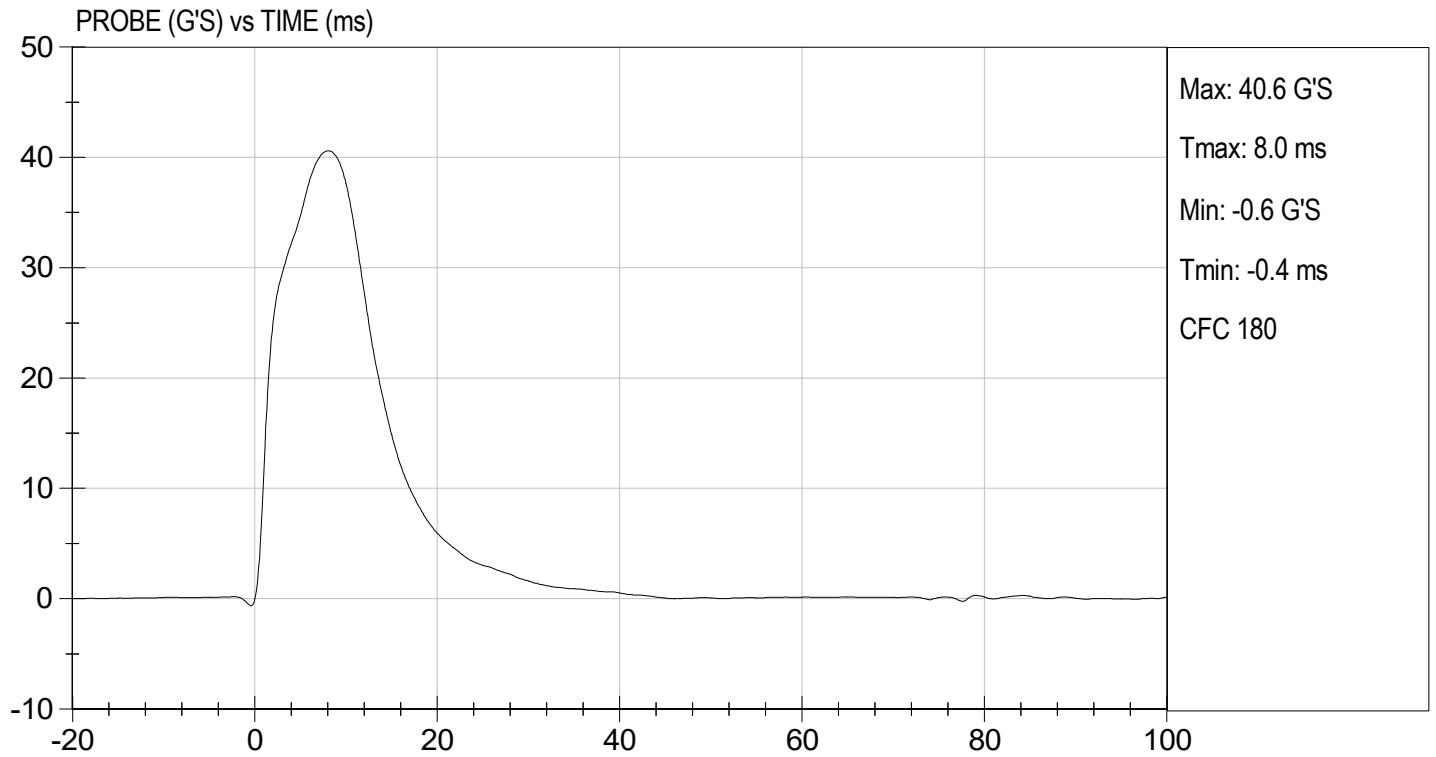
Test I.D: D222577

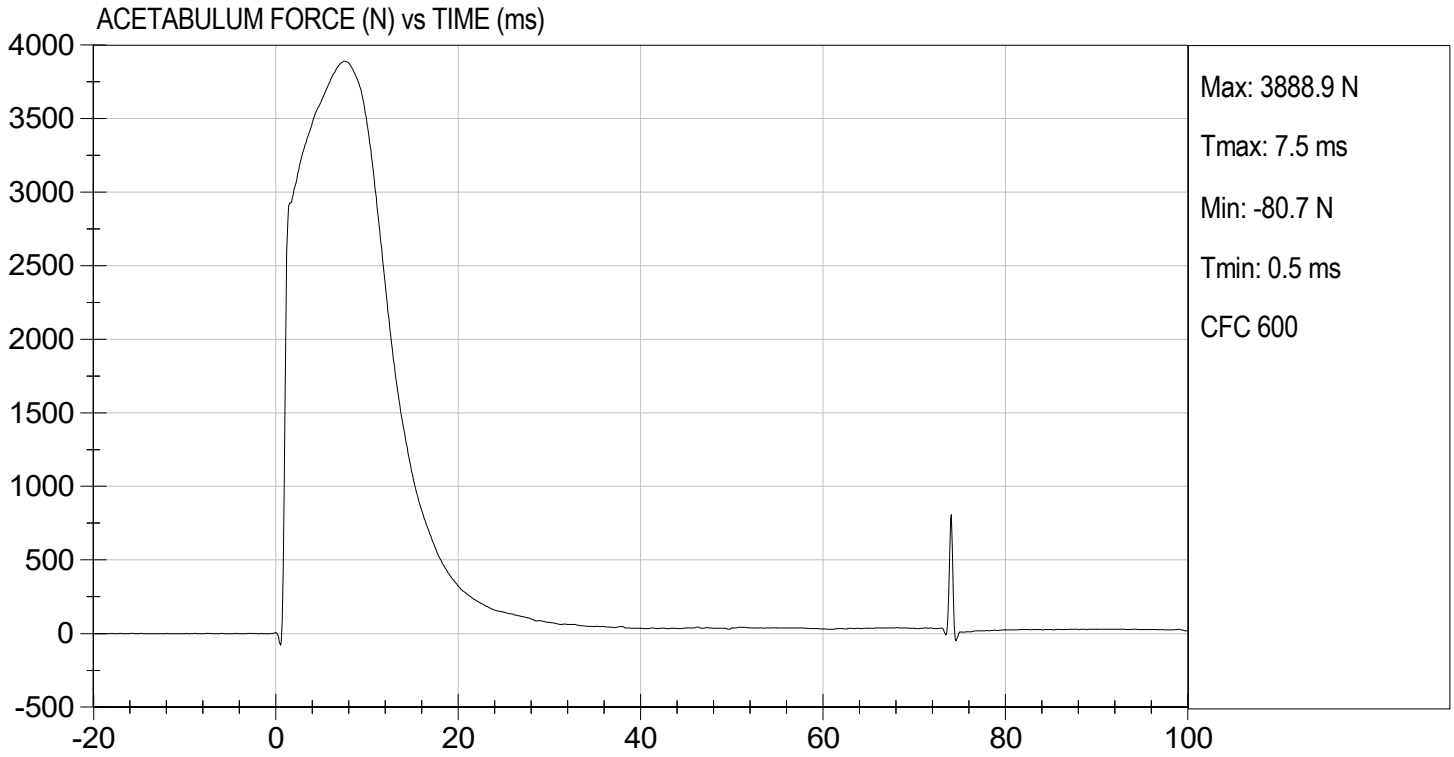
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	42	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3,889	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

11/03/2022  
 Test Date

  
 Approved By





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

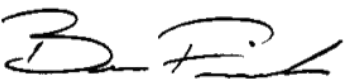
ATD Serial No: 296

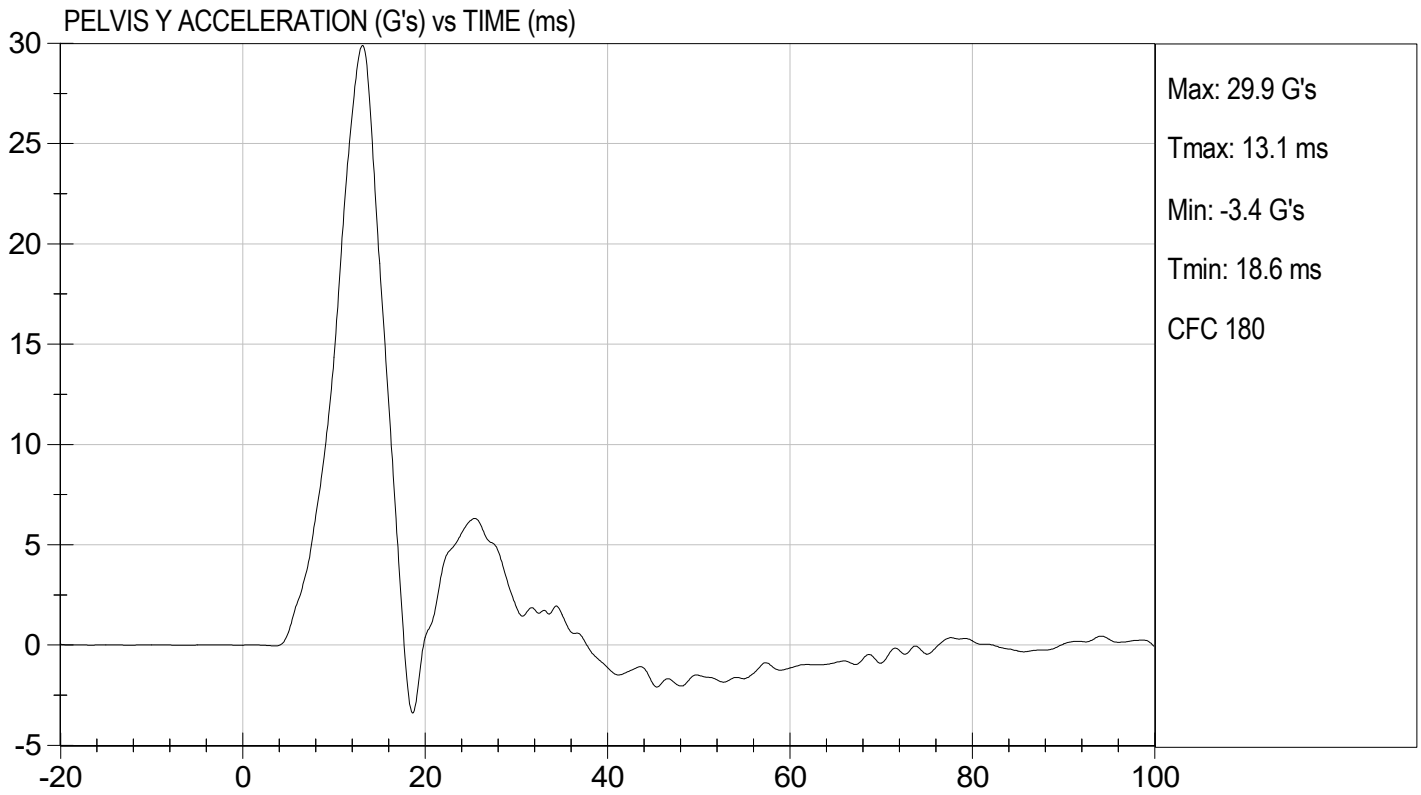
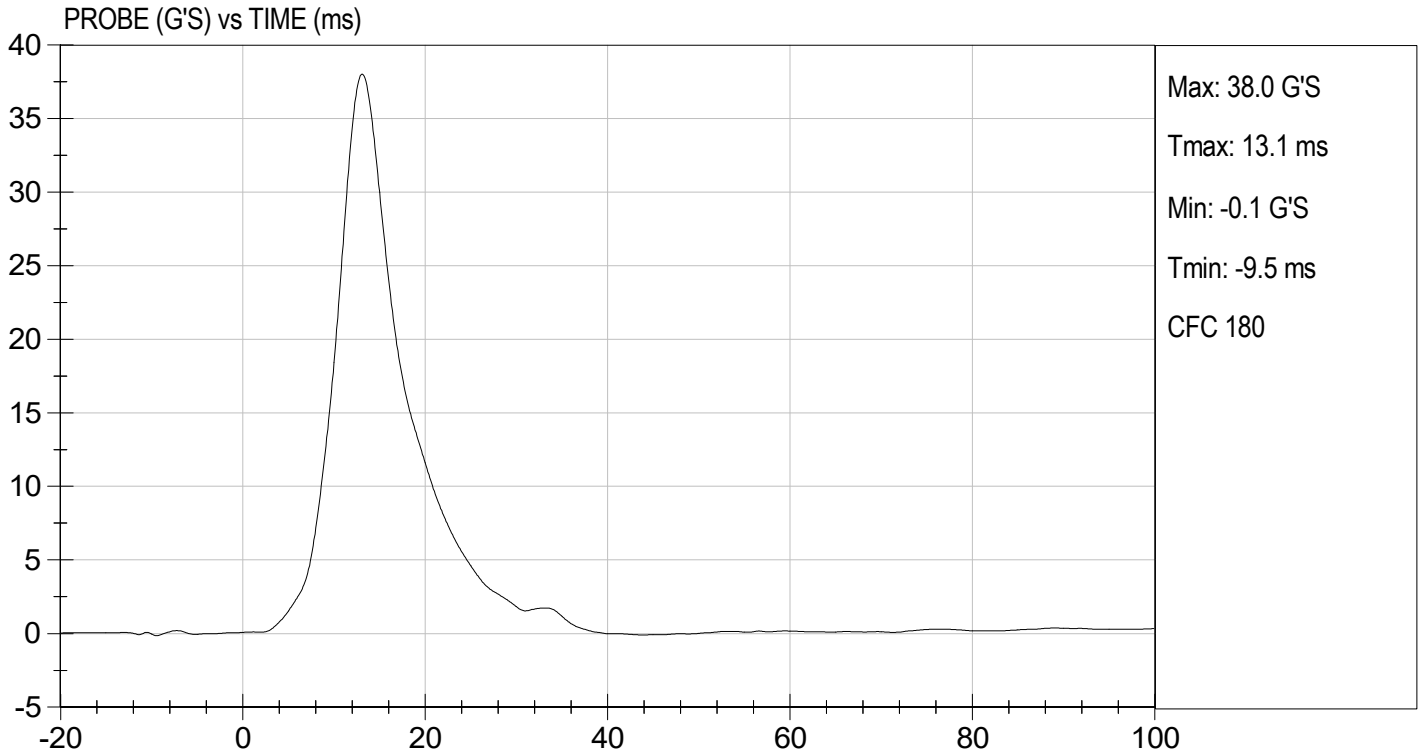
Test I.D: D222578

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	47	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	30	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,428	Pass
Overall Test Results				Pass

  
 \_\_\_\_\_  
 Laboratory Technician

11/04/2022  
 \_\_\_\_\_  
 Test Date

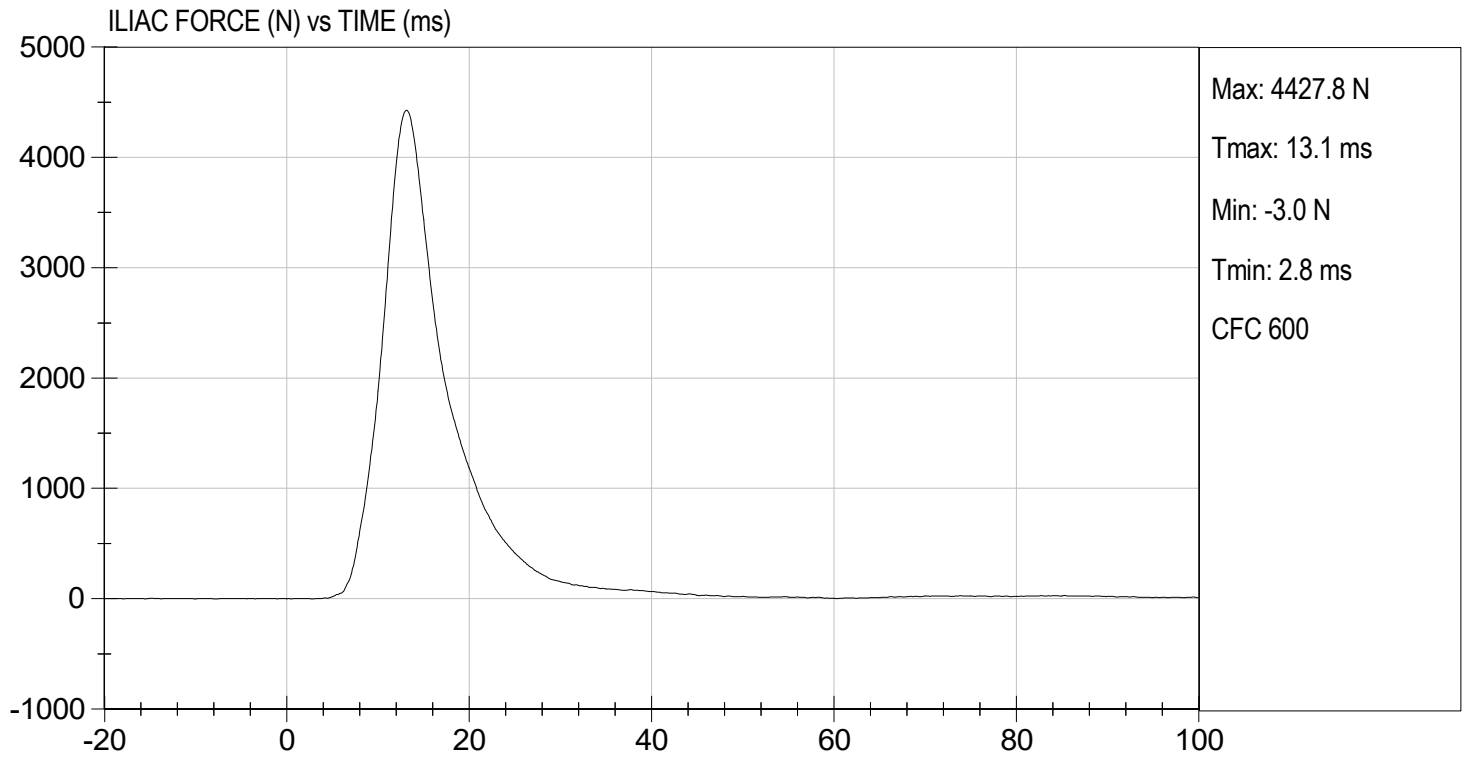
  
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 Approved By





TEST DESC: ILLIAC  
VELOCITY: 13.77 ft/s, 4.20 m/s

TEST DATE: 11/04/2022  
TEST #: D222578



**CALIBRATION TEST RESULTS**

**POST-TEST**

**SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD**

**SID-IIsD External Measurements**  
**SN: 296**

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

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

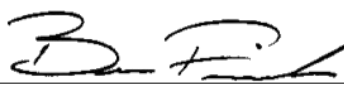
ATD Serial No: 296

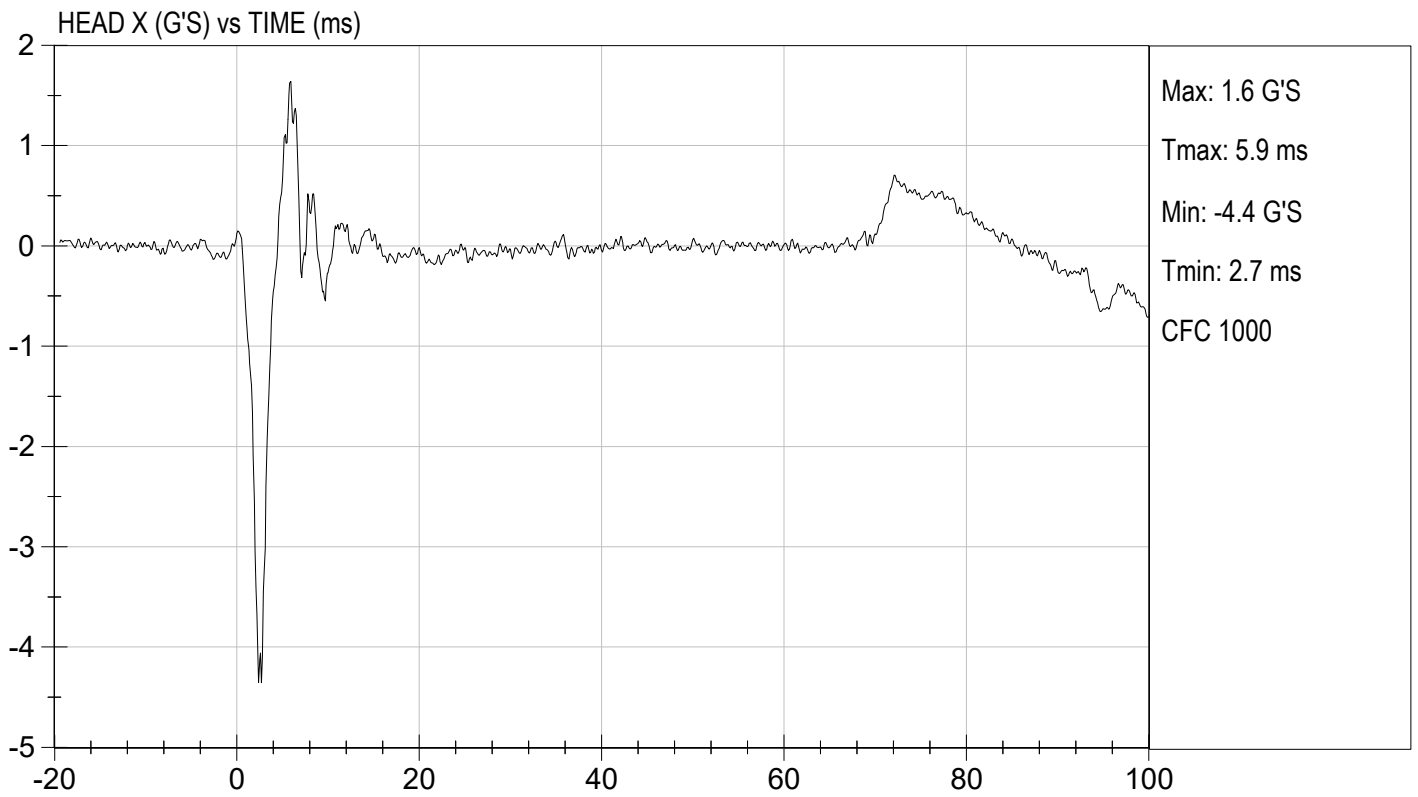
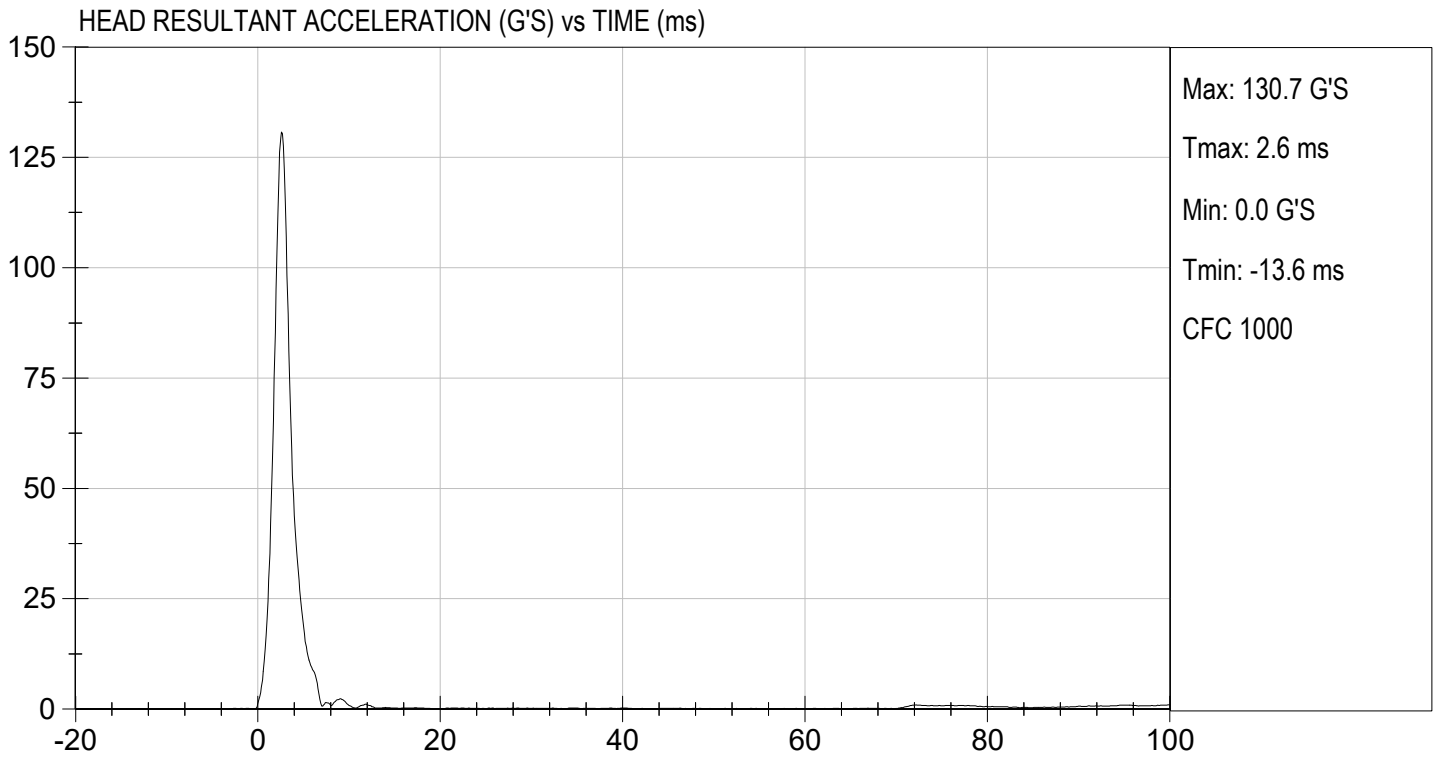
Test ID: D222671

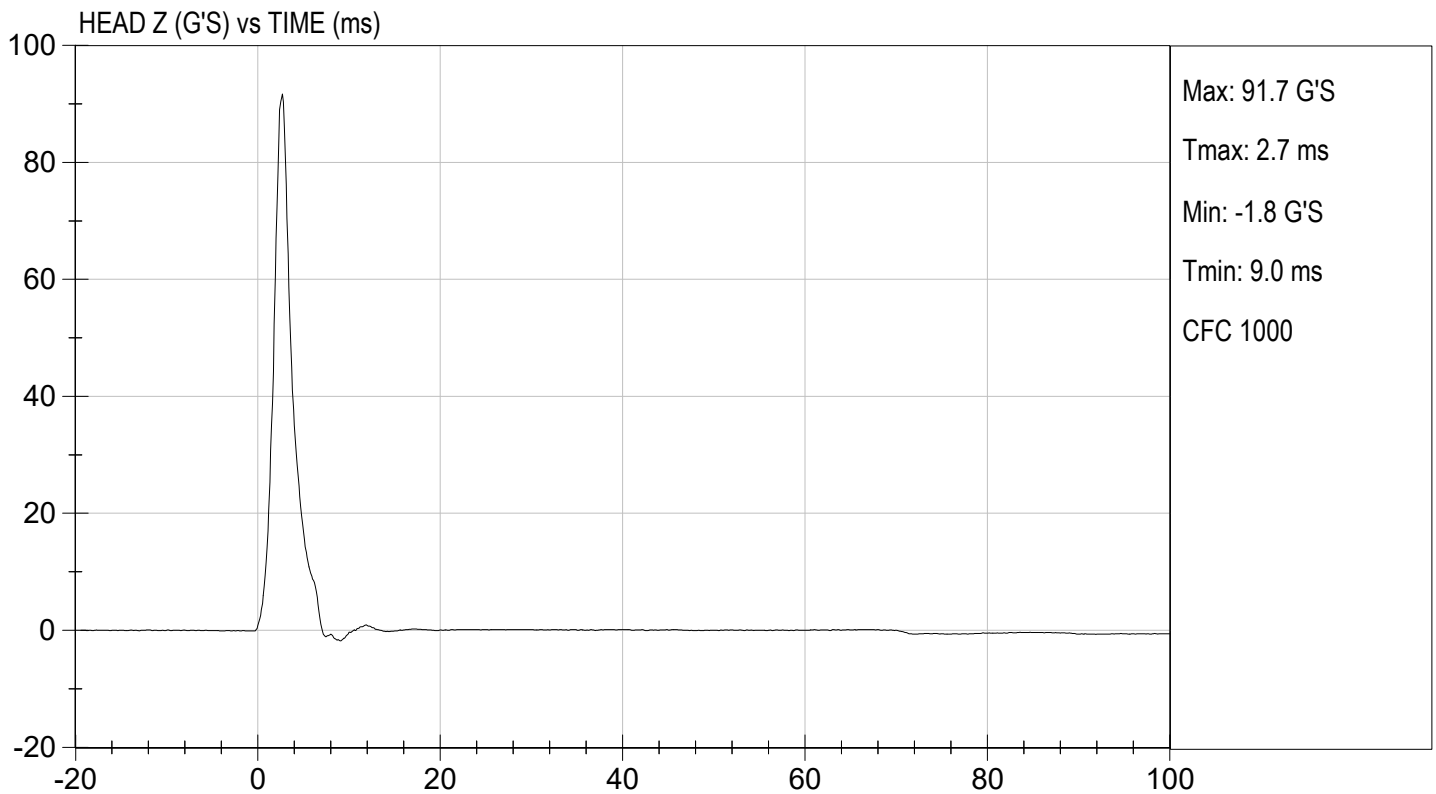
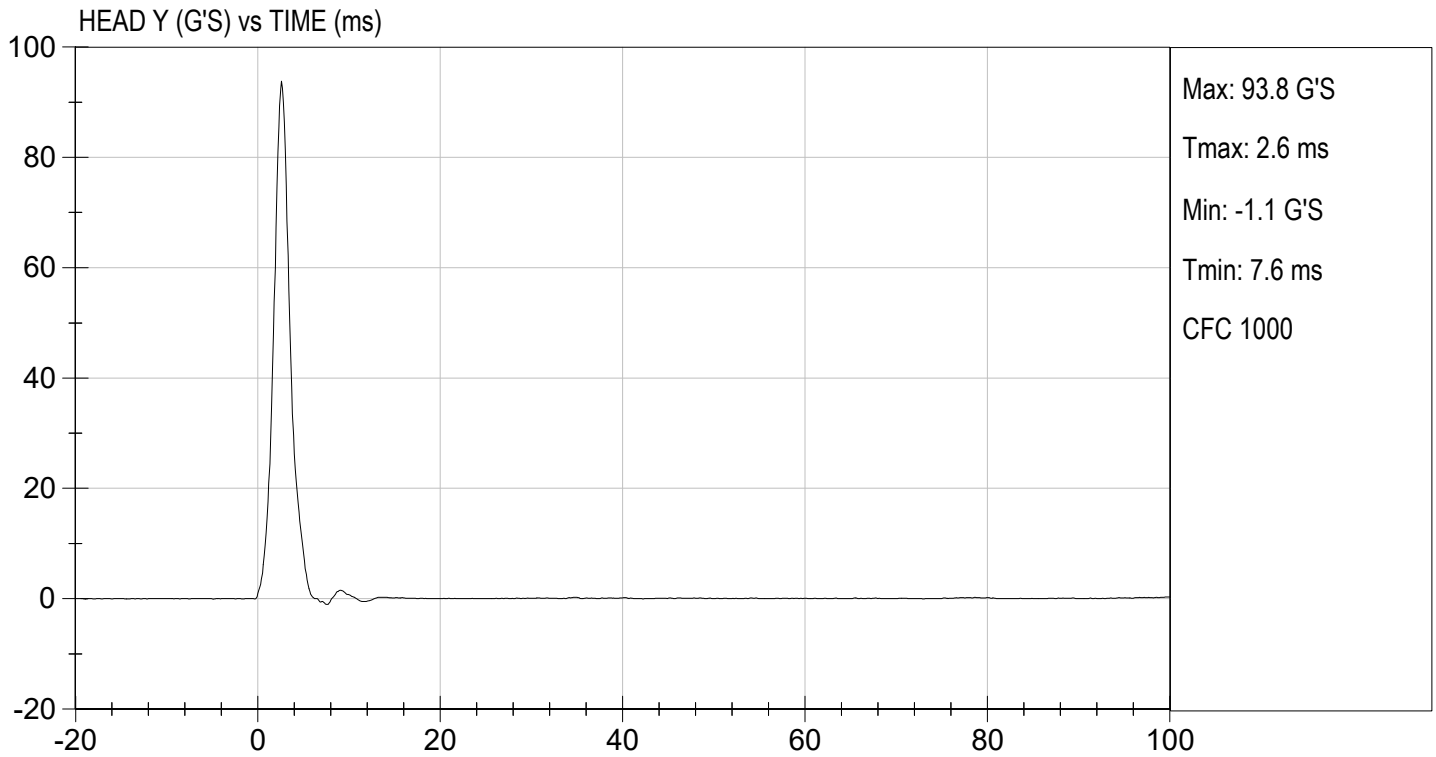
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	115 to 137	131	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-4.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass

  
 \_\_\_\_\_  
 Laboratory Technician

11/18/2022  
 \_\_\_\_\_  
 Test Date

  
 \_\_\_\_\_  
 Approved By





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

ATD Serial No: 296

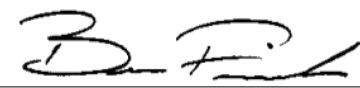
Test I.D.: D222672

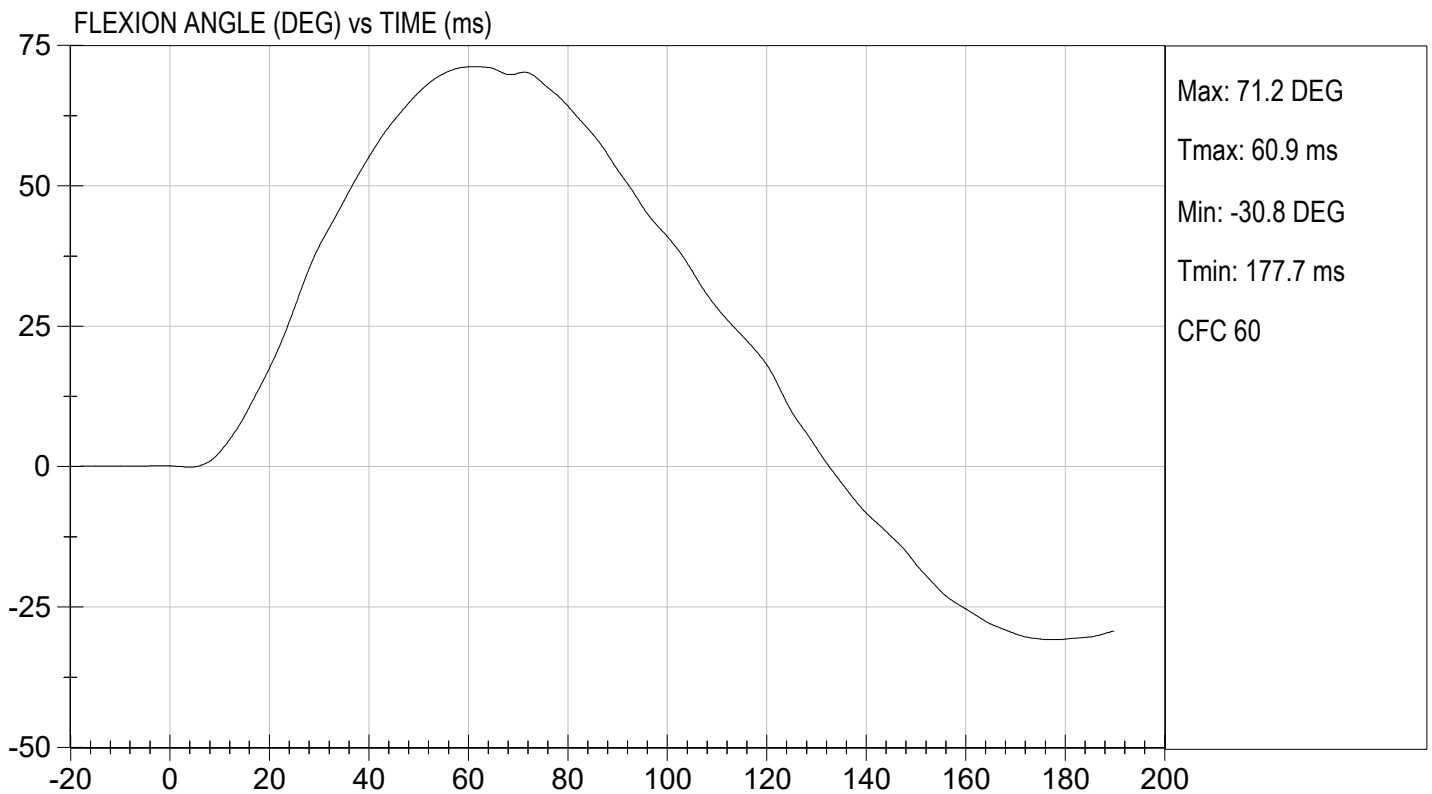
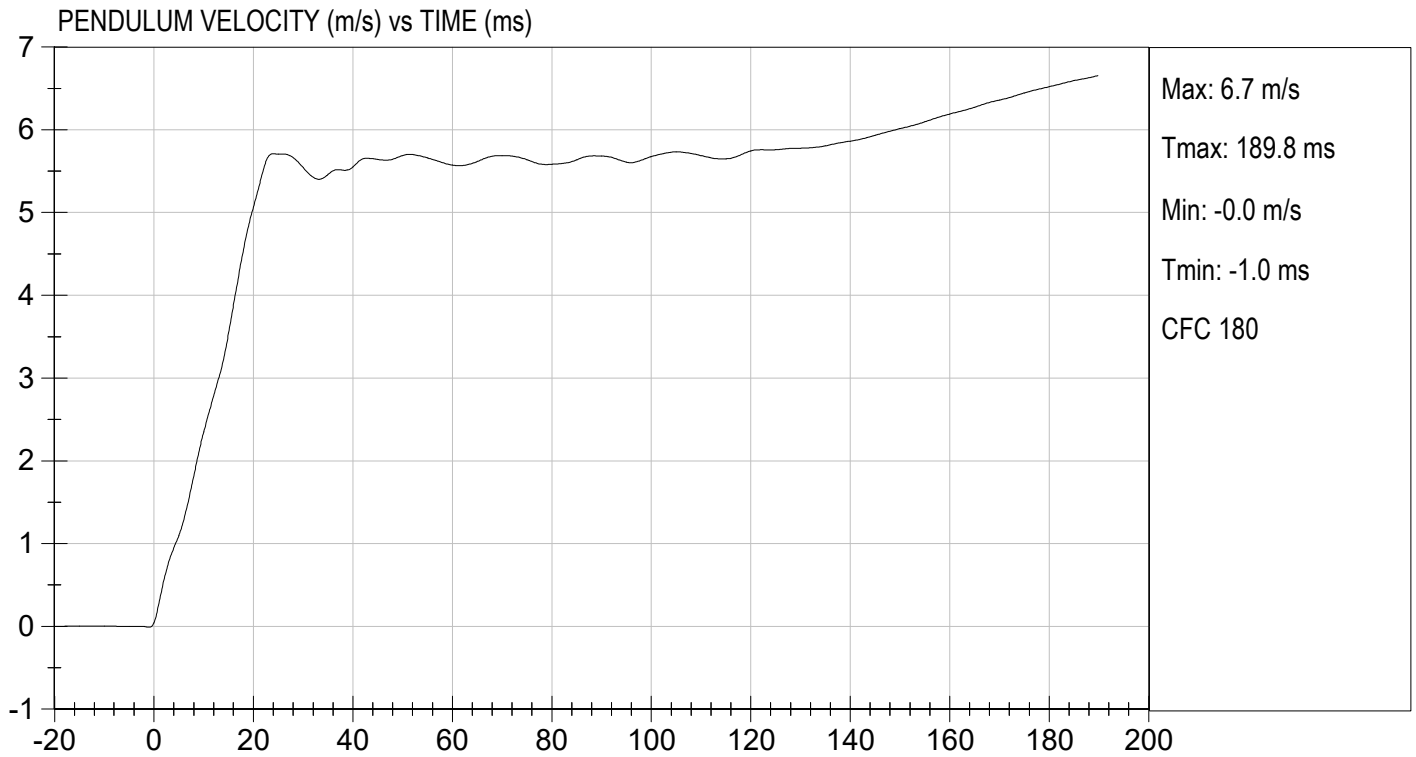
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.8	Pass	
Humidity	%	10 to 70	27	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.58	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.35	Pass
	15 ms	m/s	3.30 to 4.10	3.54	Pass
	20 ms	m/s	4.40 to 5.40	5.07	Pass
	25 ms	m/s	5.40 to 6.10	5.71	Pass
	25-100 ms	m/s	5.50 to 6.20	5.71	Pass
Maximum D-Plane Rotation	deg	71 to 81	71	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	61	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-38	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	118	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	

  
 Laboratory Technician

11/18/2022

Test Date

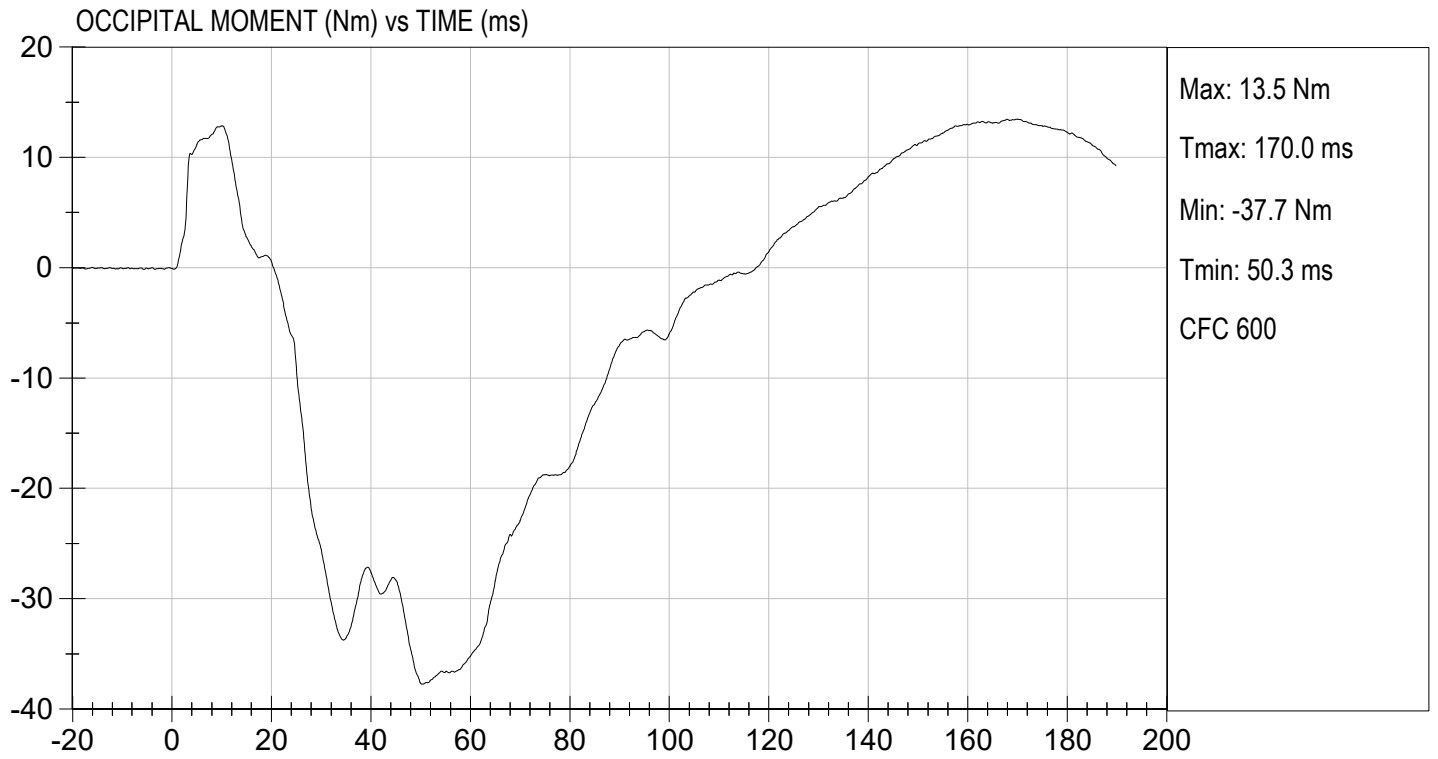
  
 Approved By





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

TEST DATE: 11/18/2022  
TEST #: D222672



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

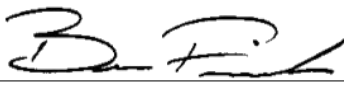
ATD Serial No: 296

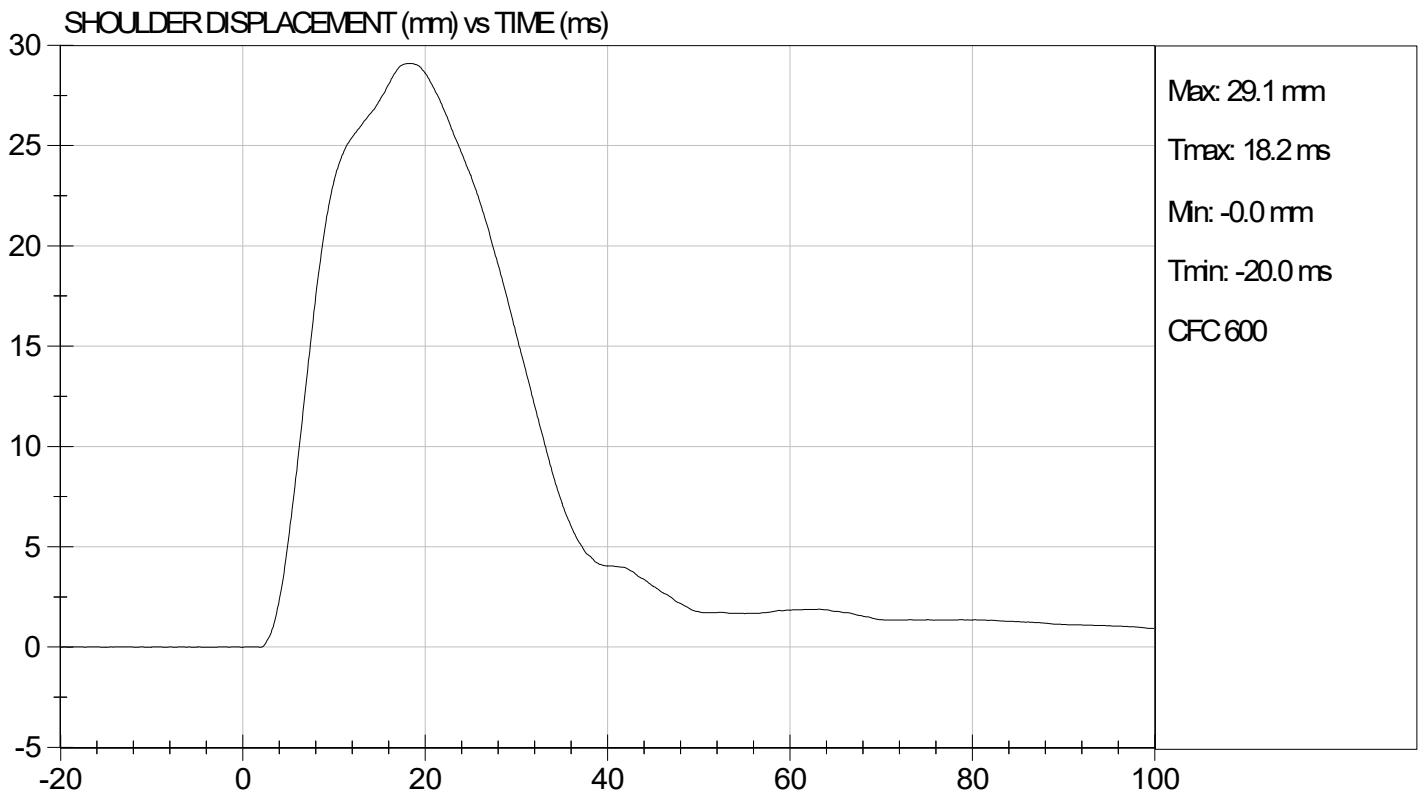
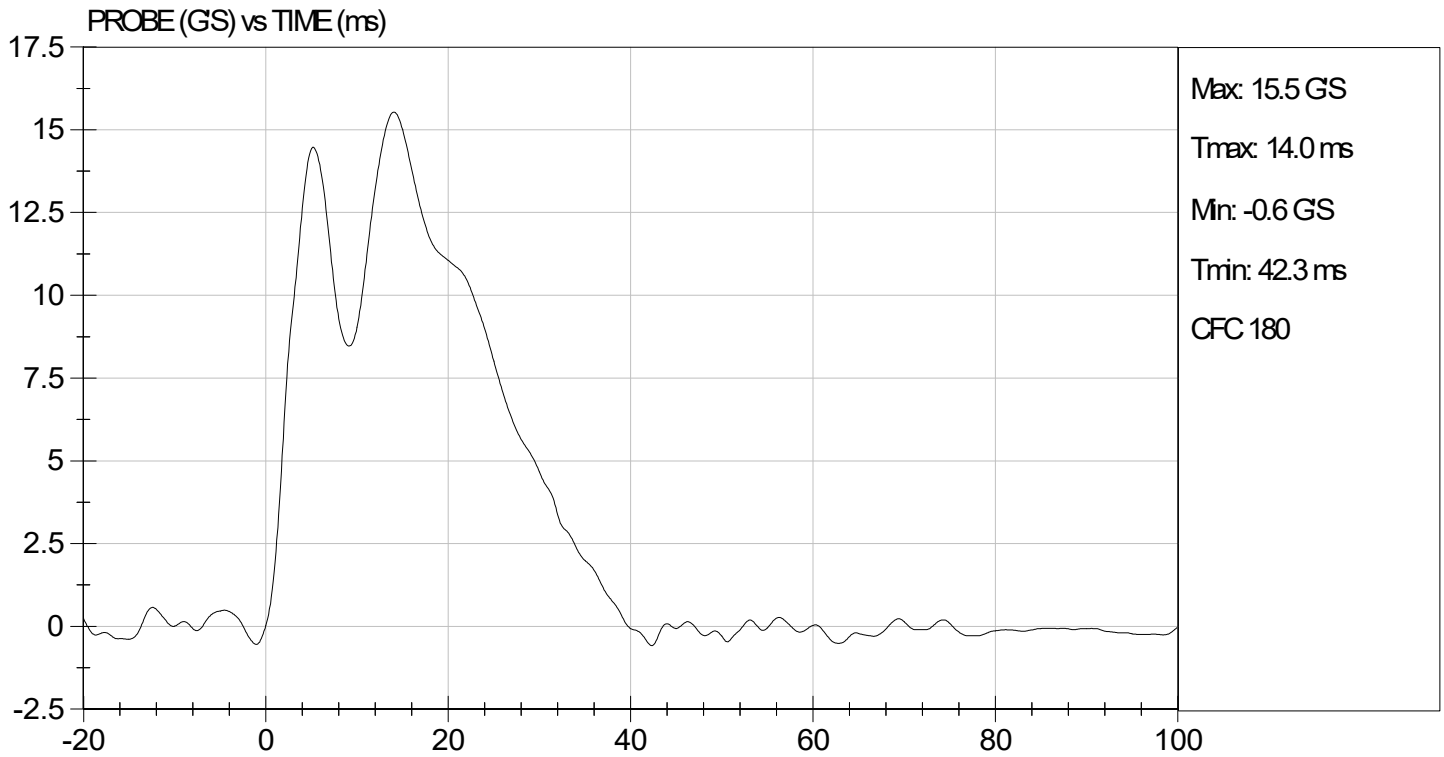
Test ID: D222673

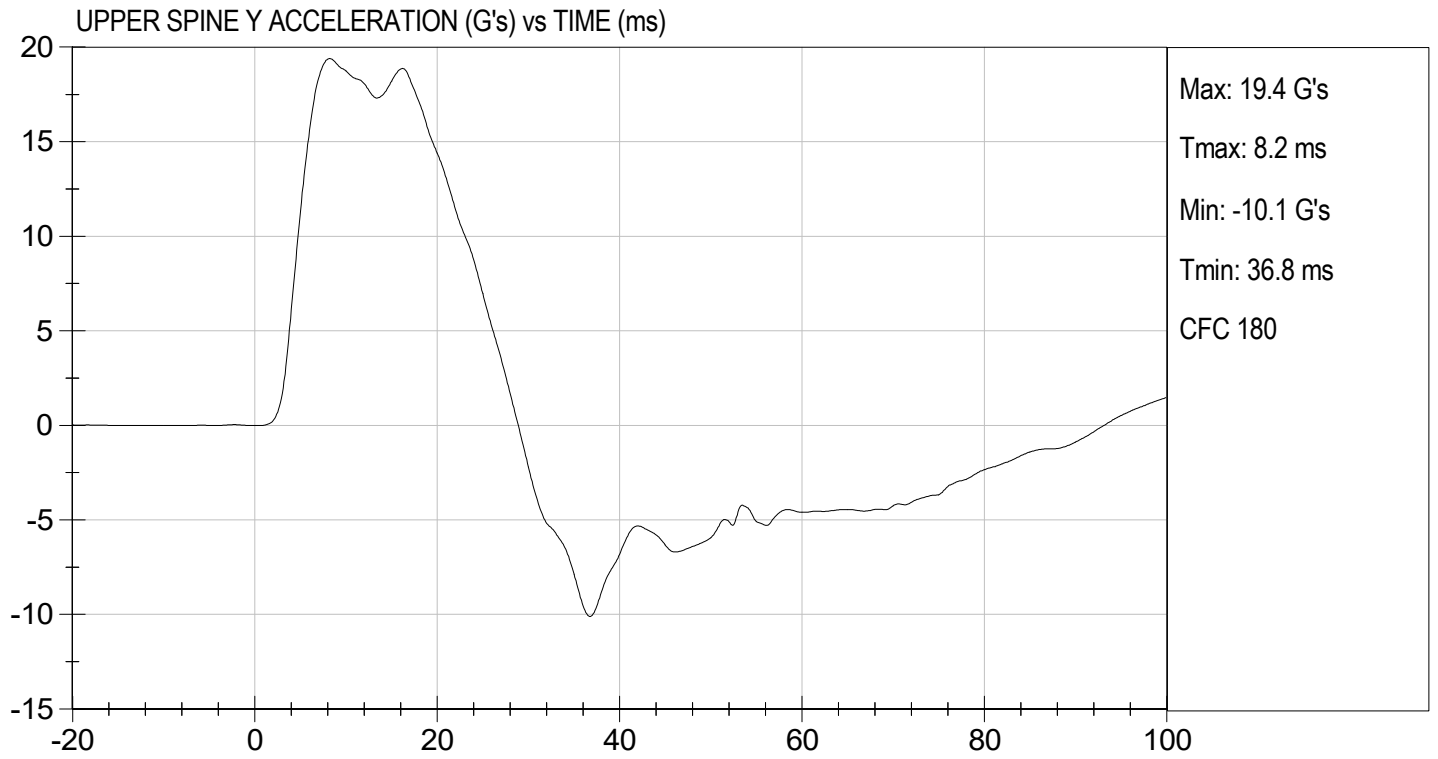
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass

  
Laboratory Technician

11/18/2022  
Test Date

  
Approved By





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

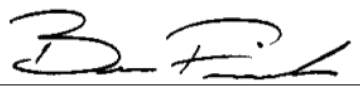
ATD Serial No: 296

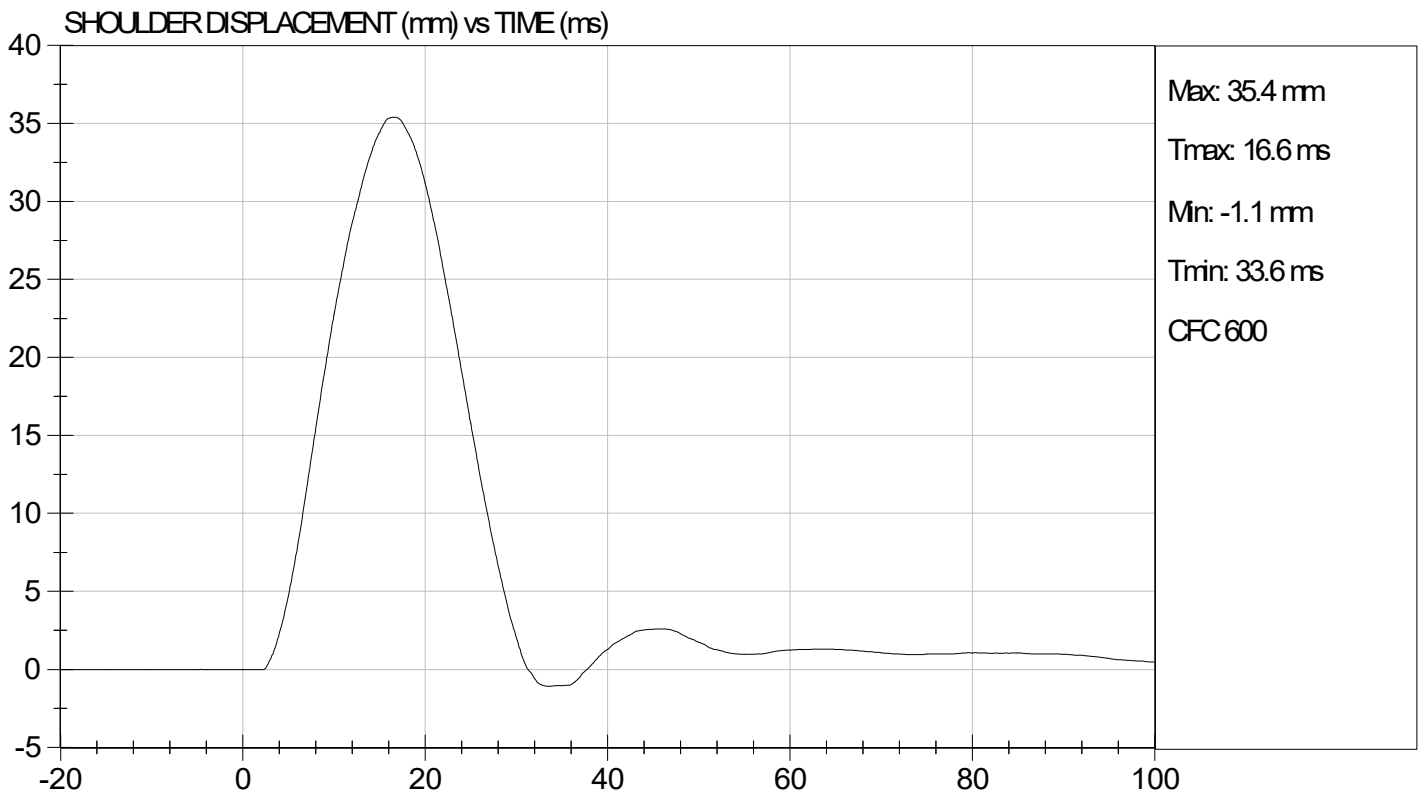
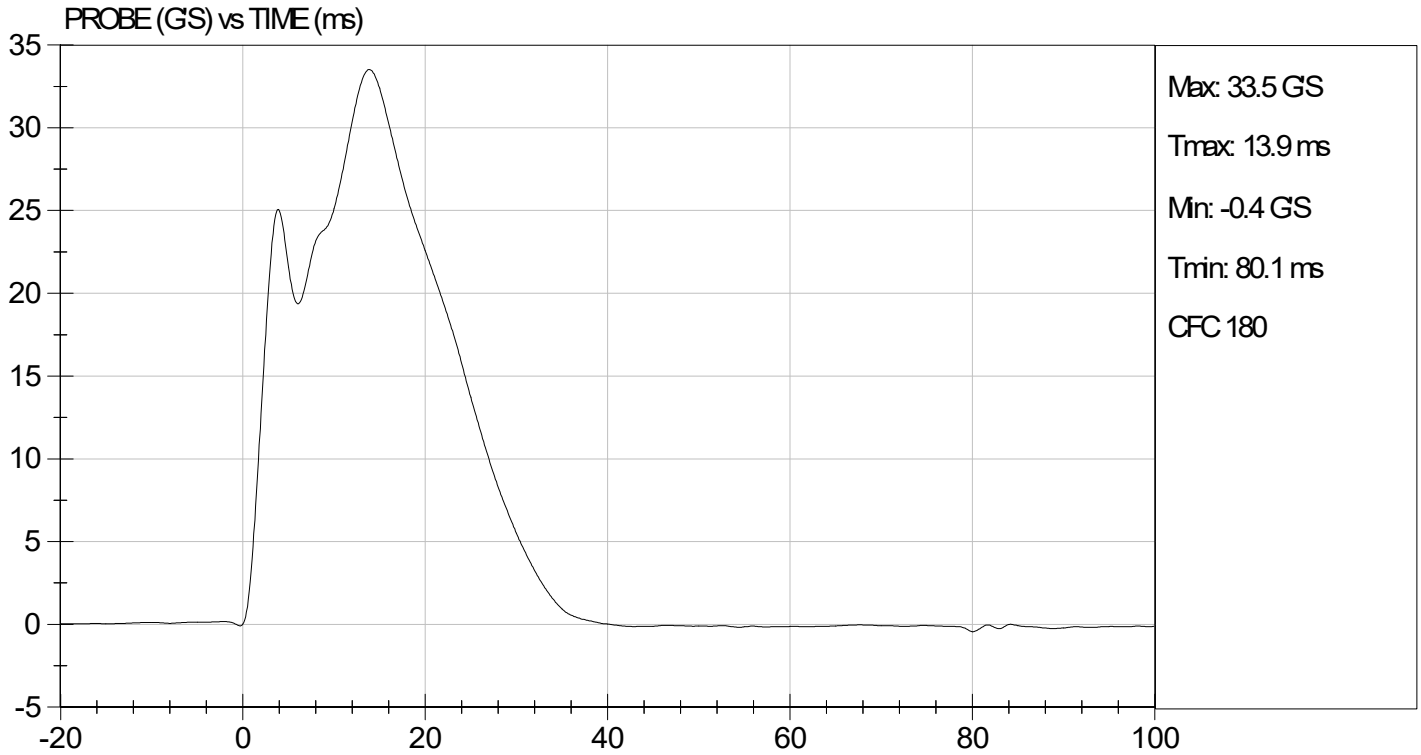
Test I.D: D222674

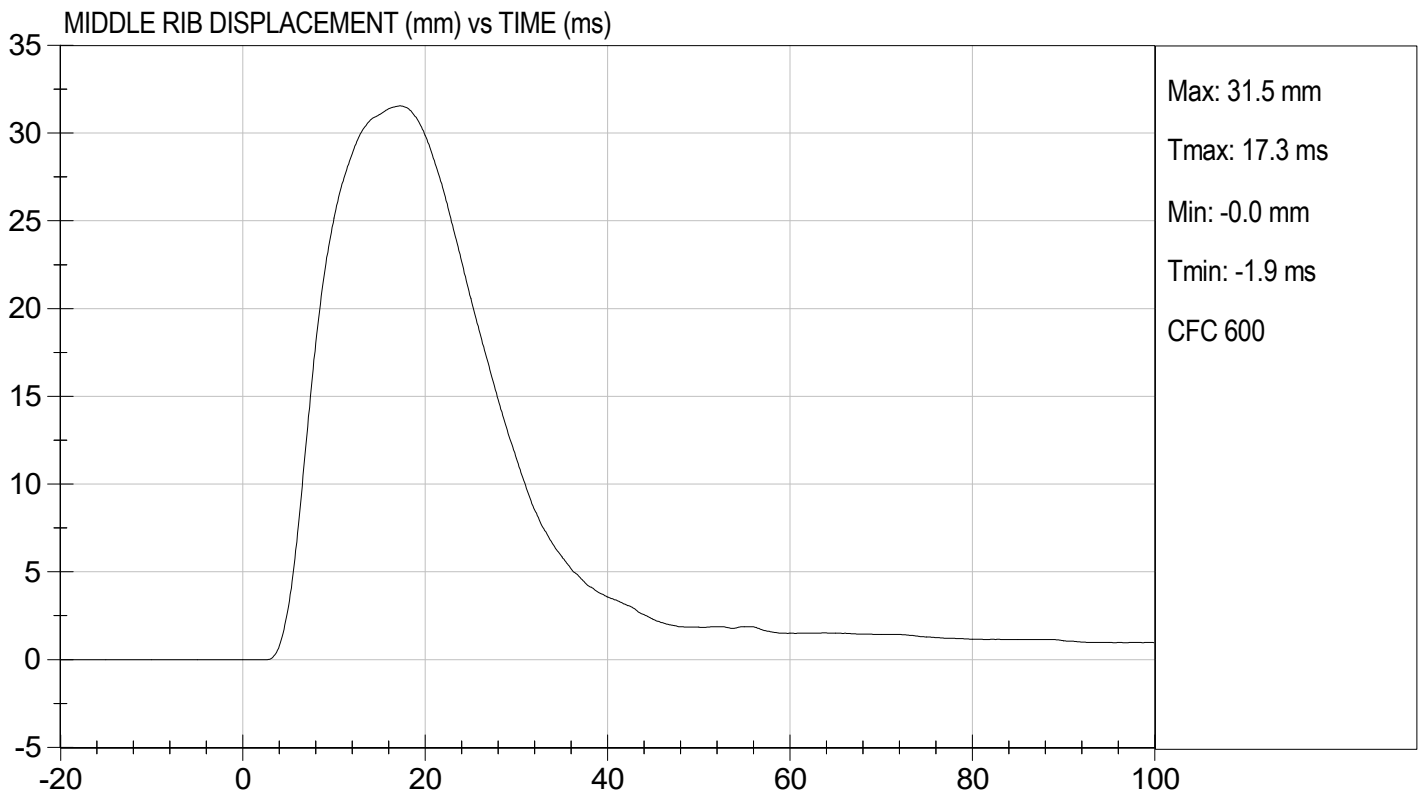
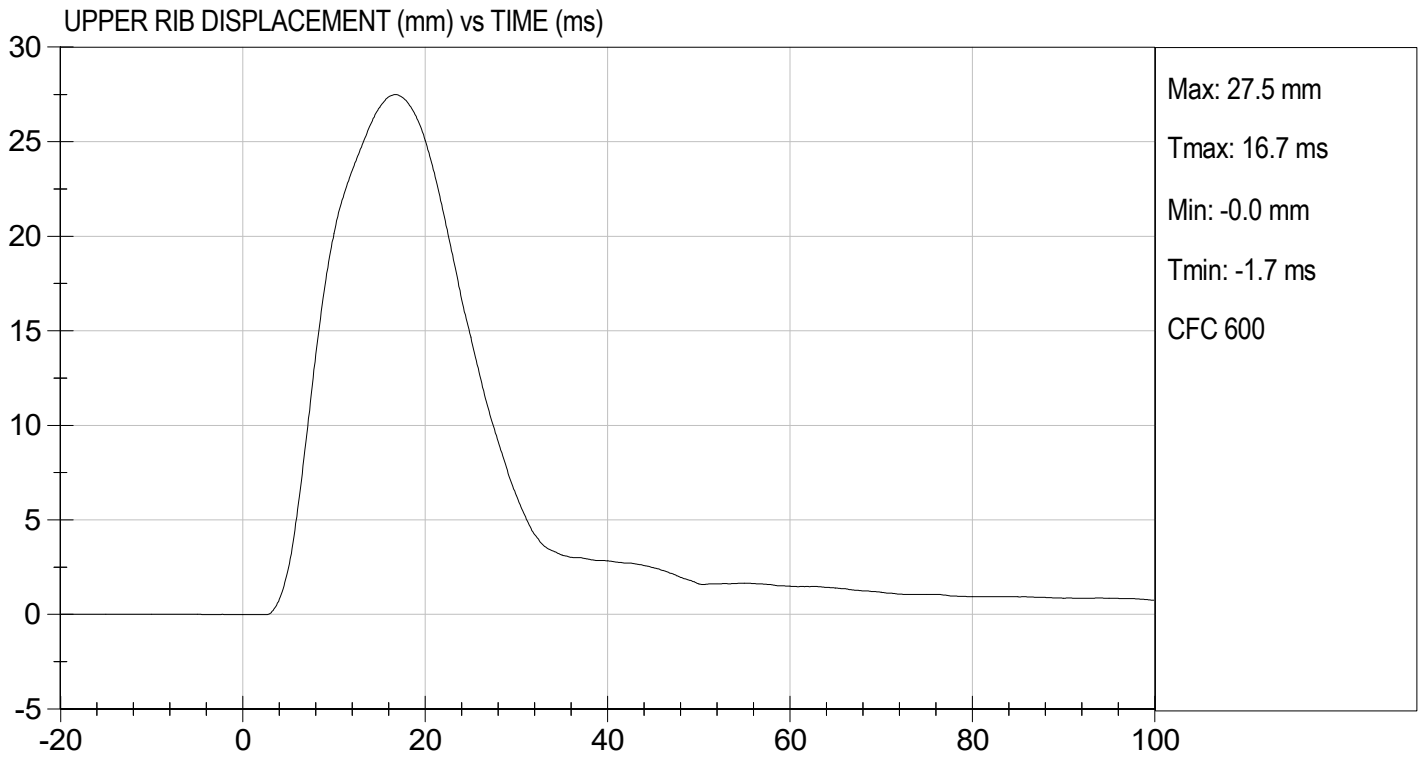
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	34	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	32	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	35	Pass
Overall Test Results				Pass

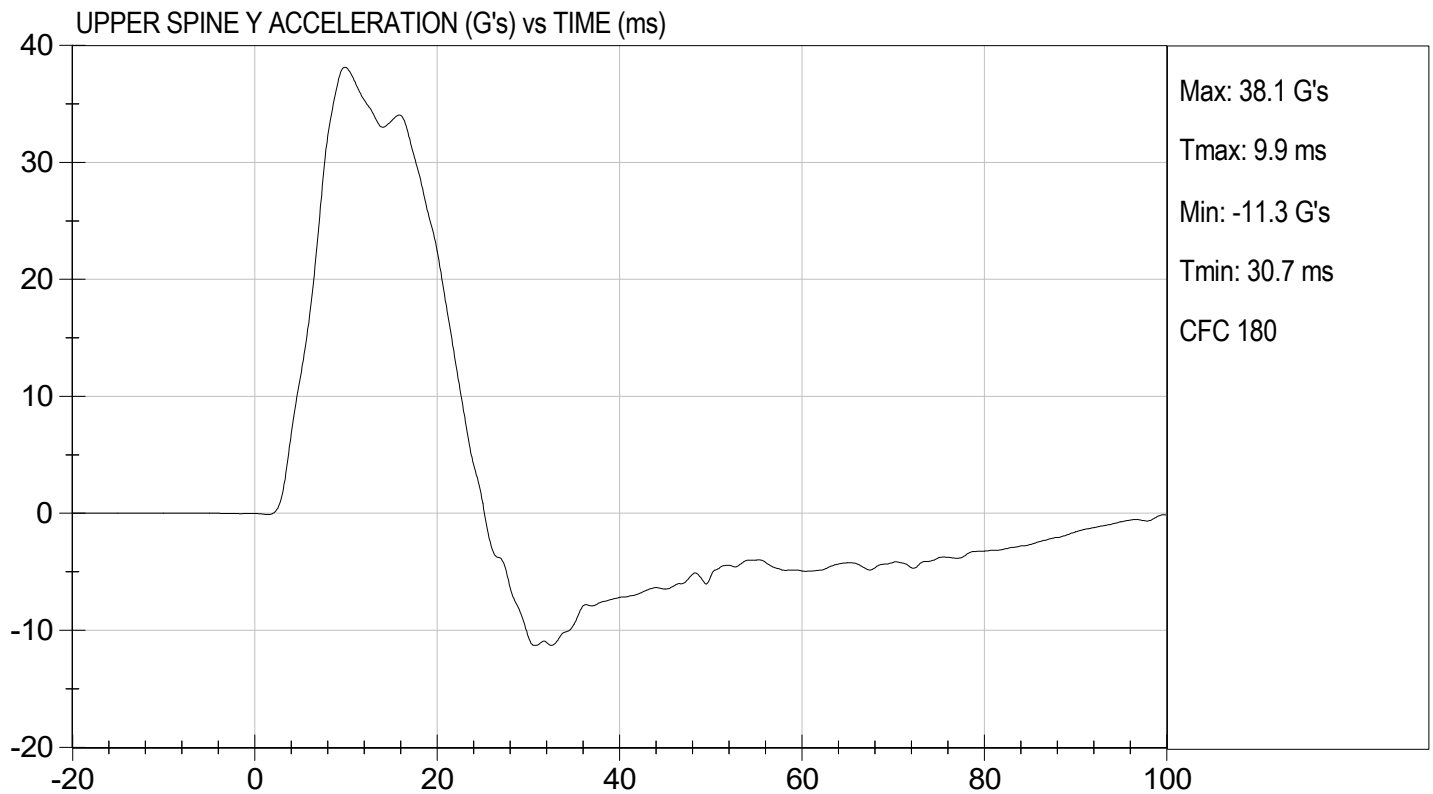
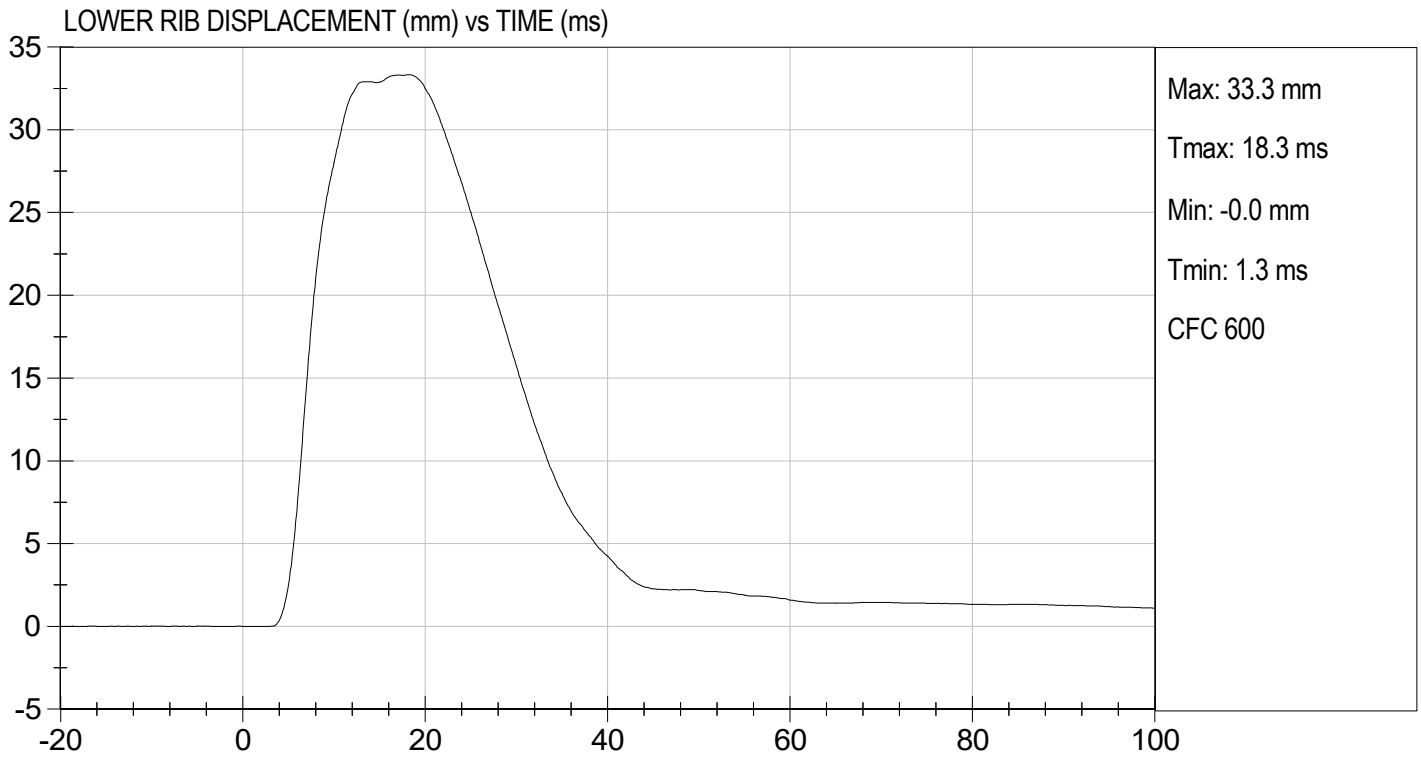
  
 Laboratory Technician

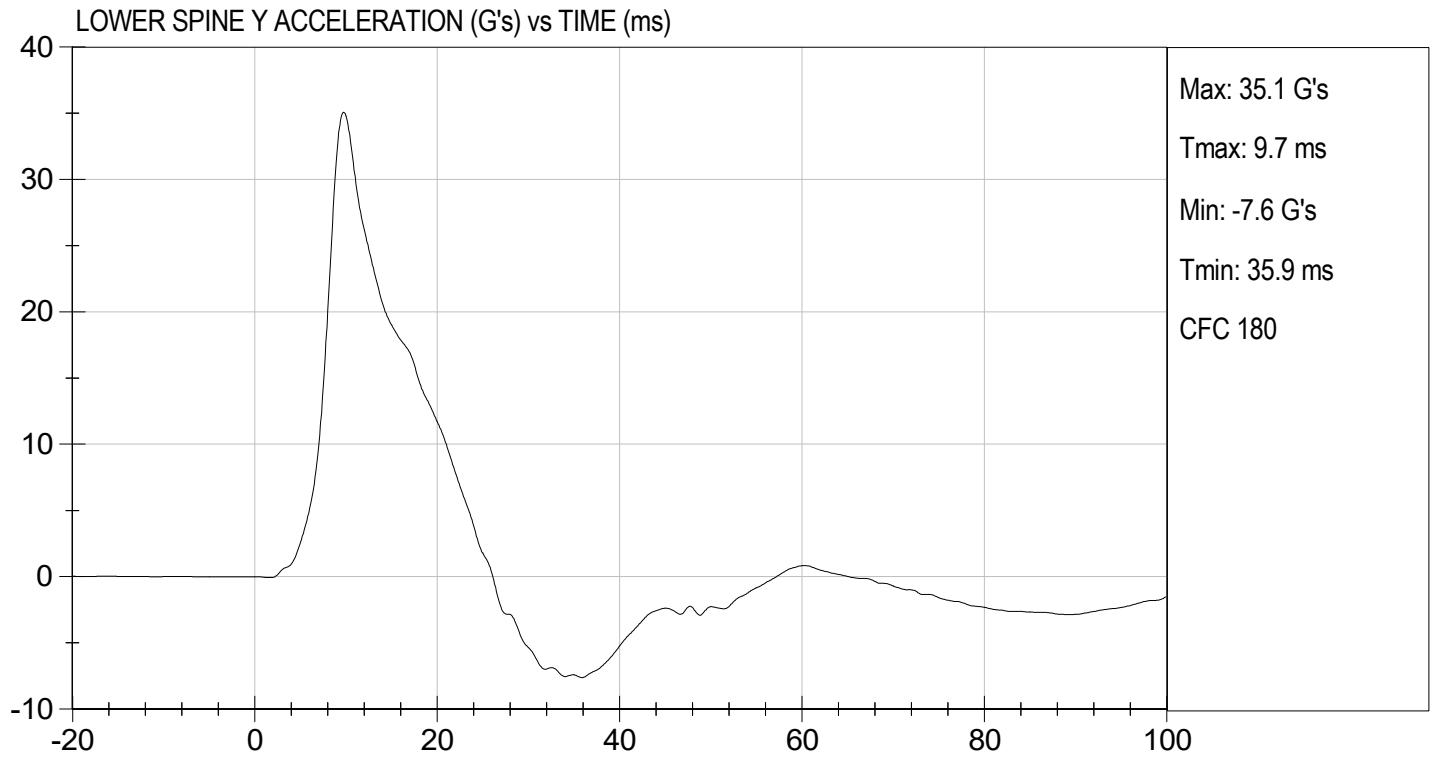
11/18/2022  
 Test Date

  
 Approved By









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

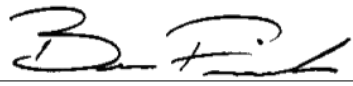
ATD Serial No: 296

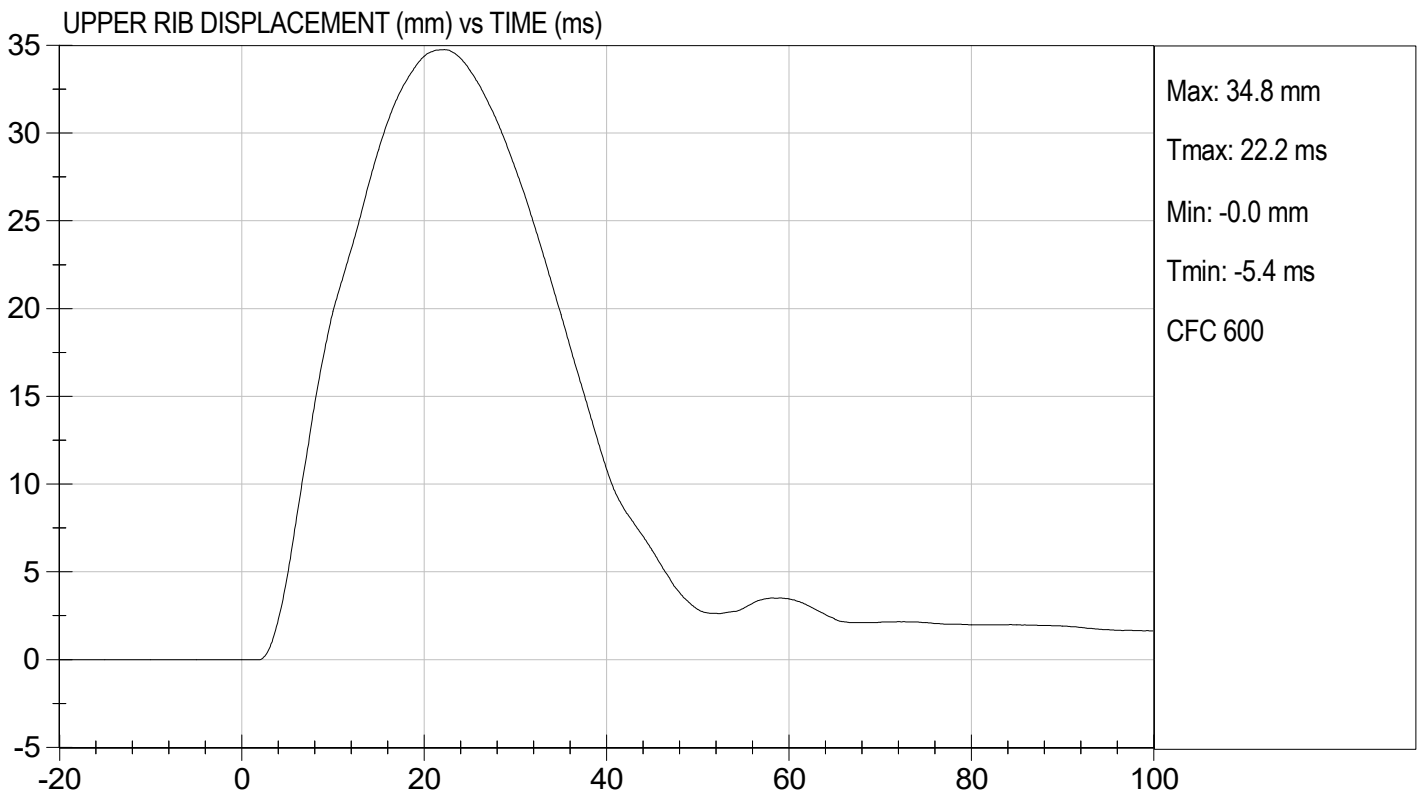
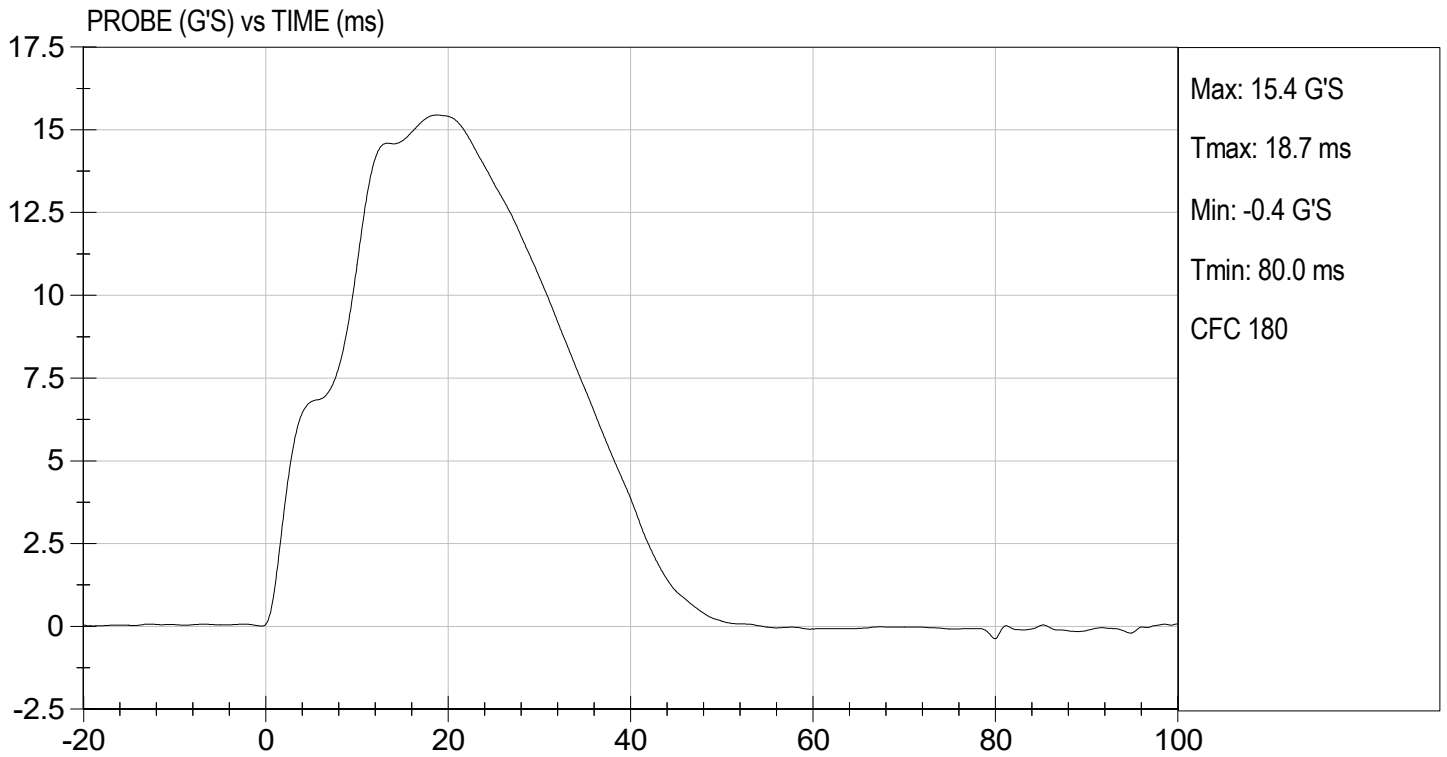
Test I.D: D222675

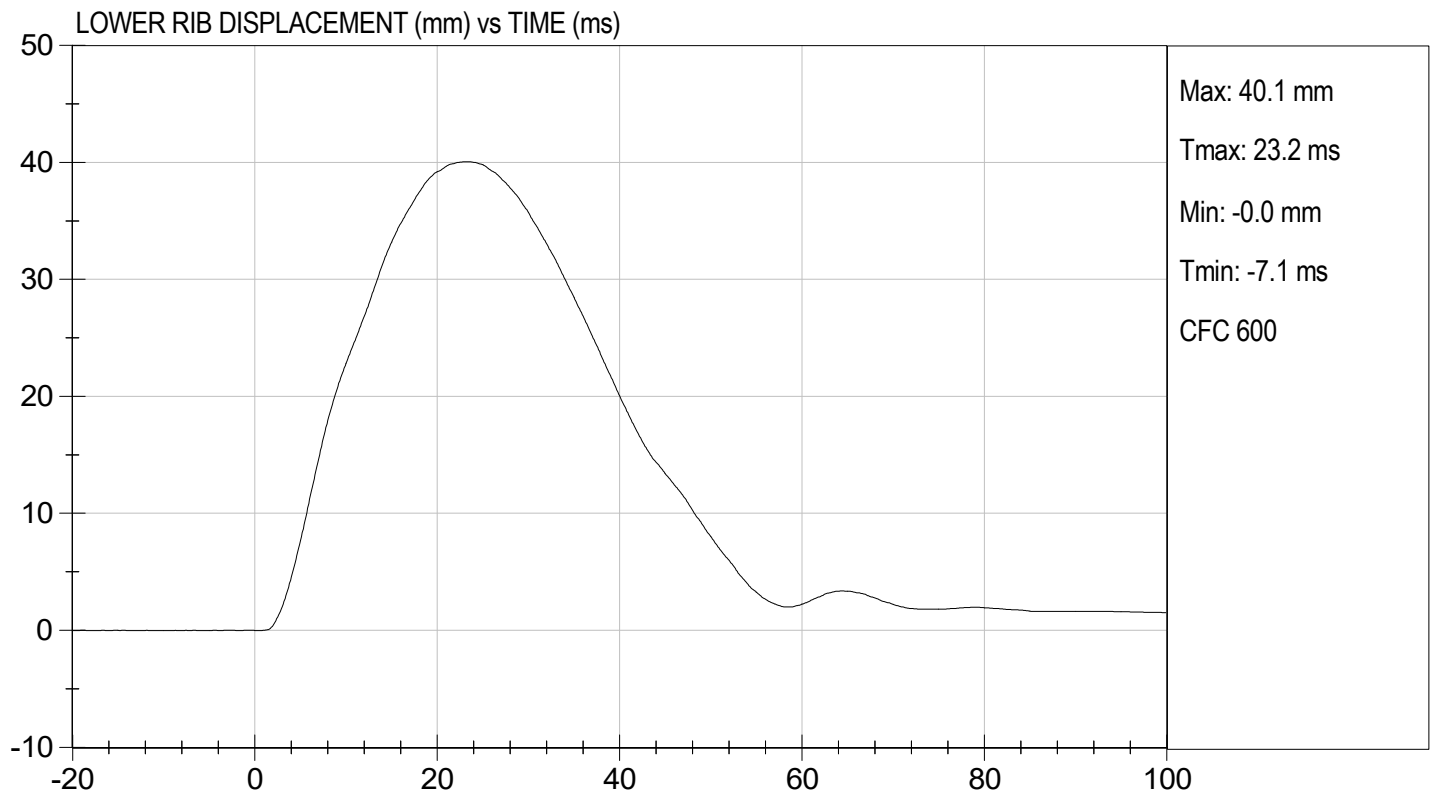
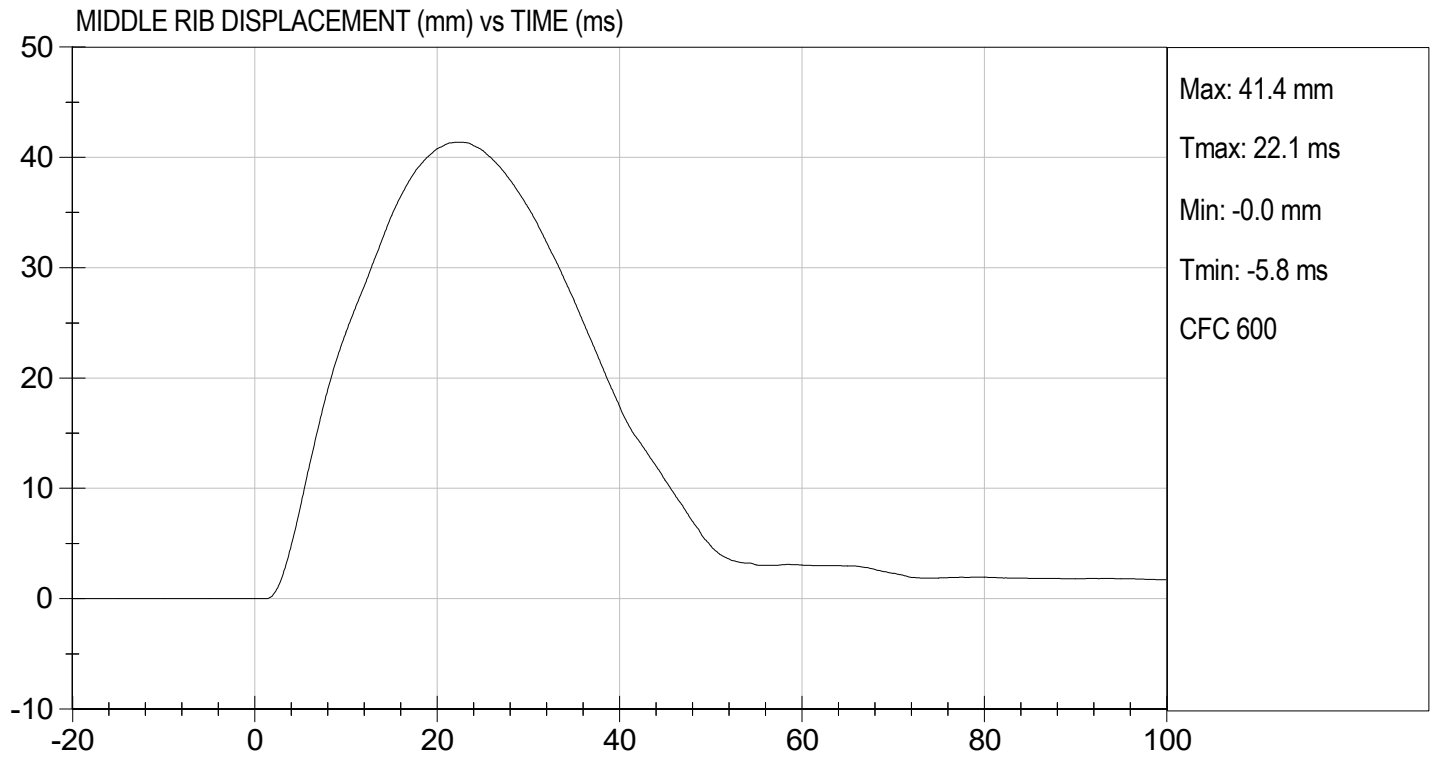
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass

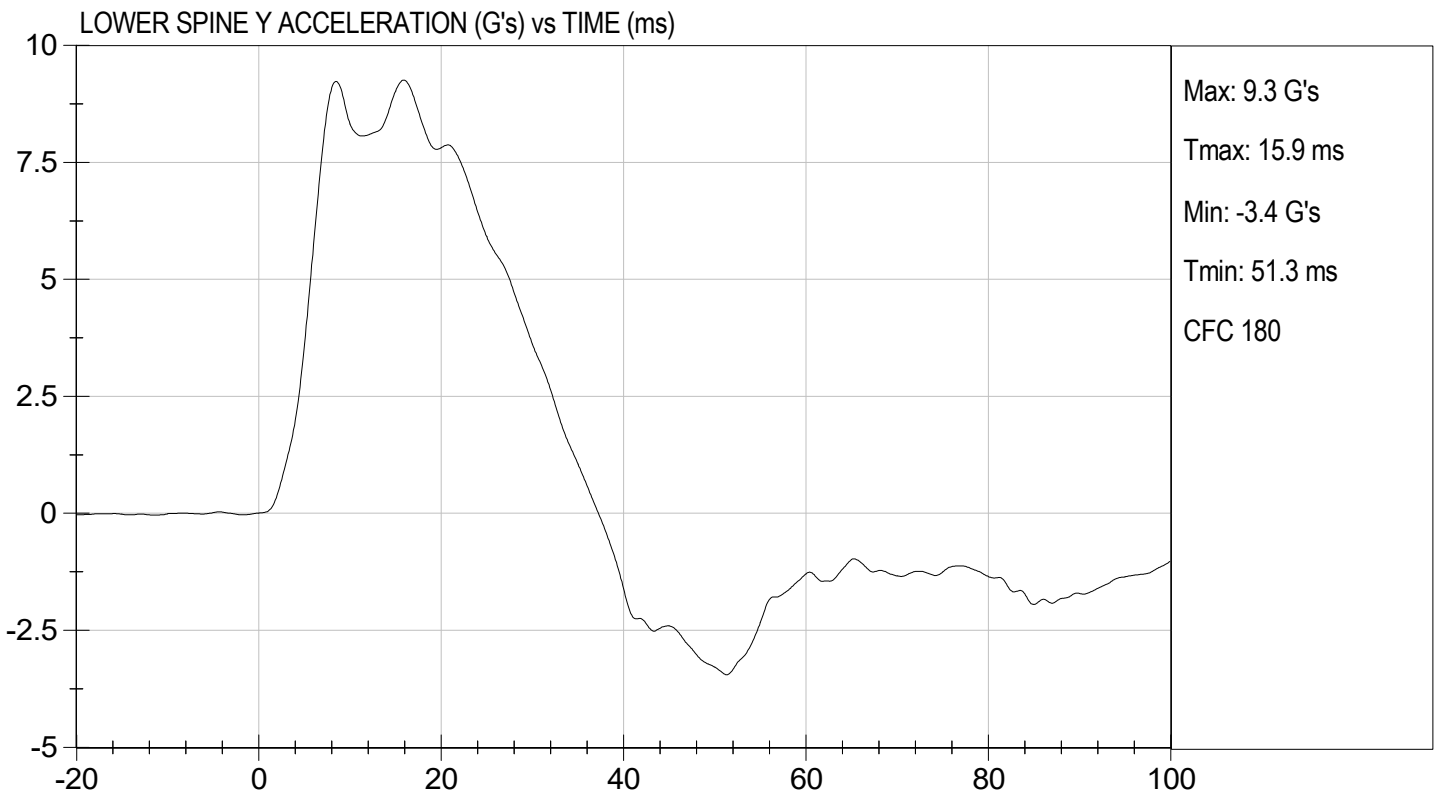
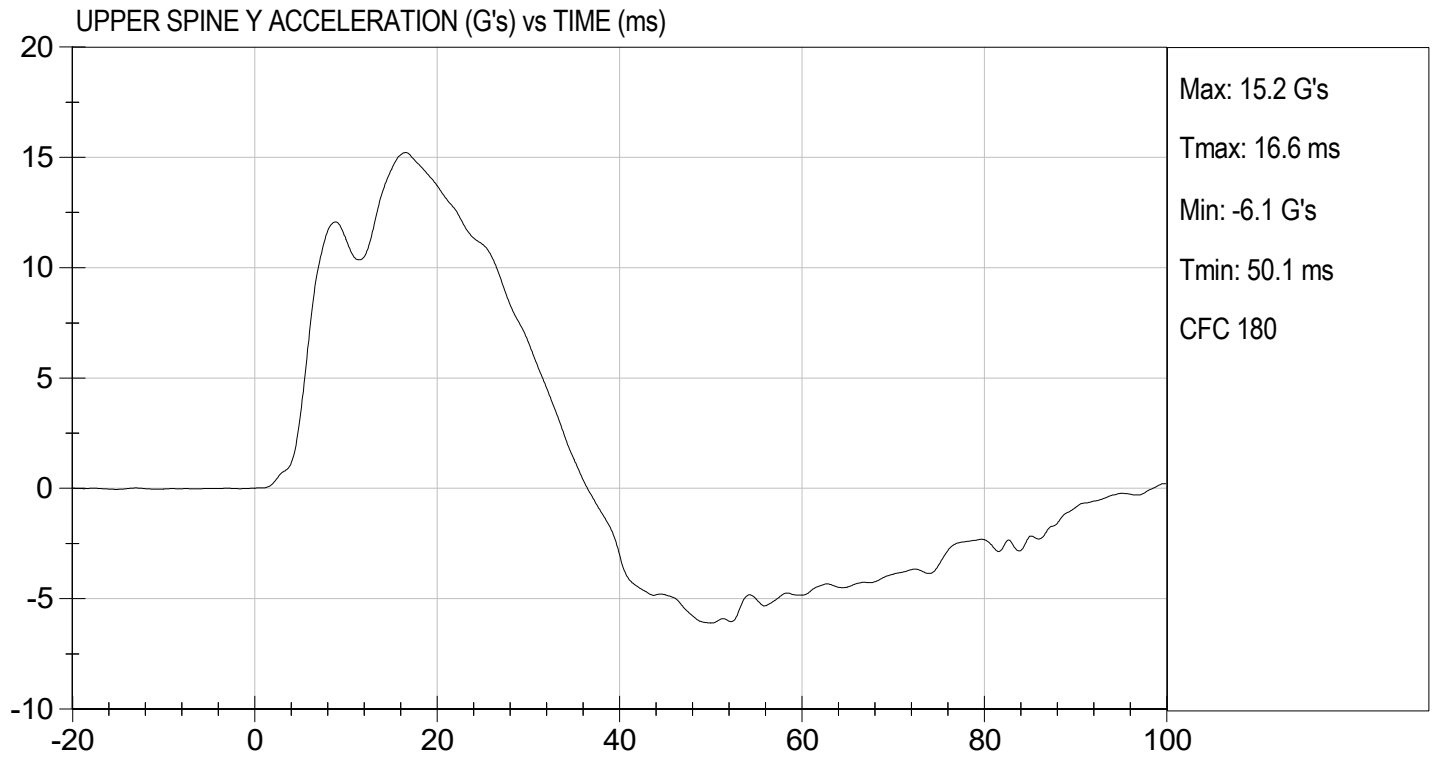
  
 Laboratory Technician

11/18/2022  
 Test Date

  
 Approved By







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

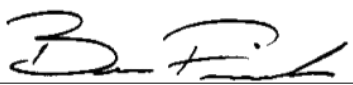
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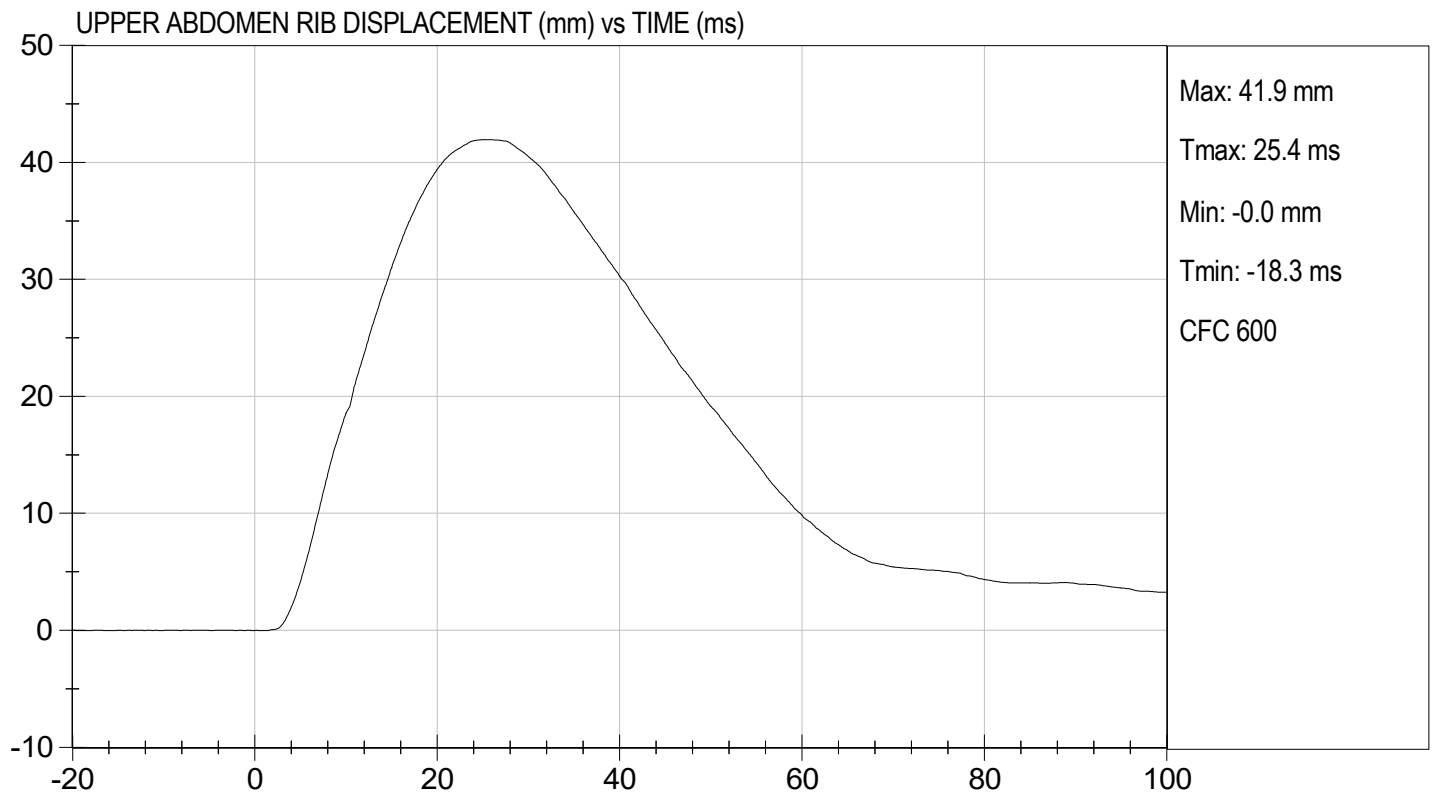
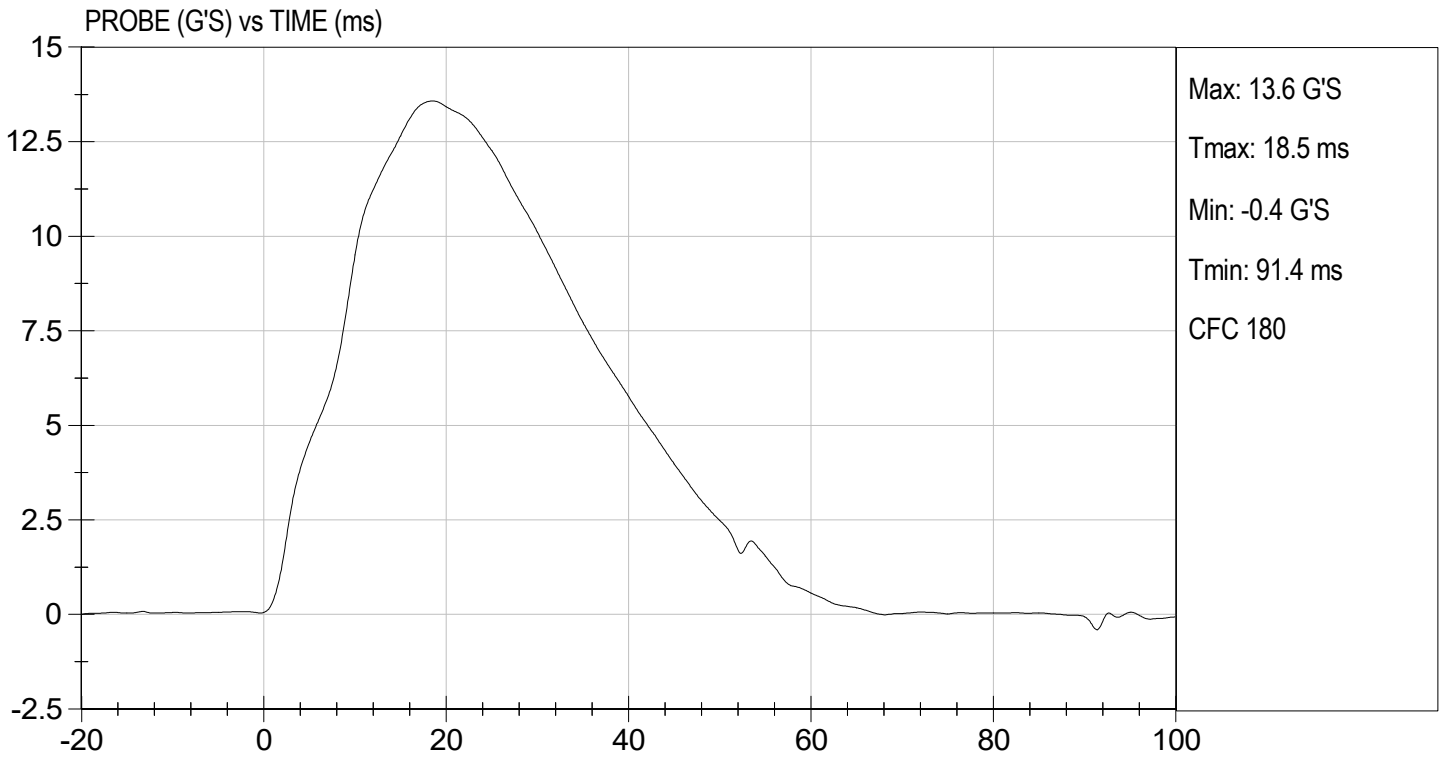
Test I.D: D222676

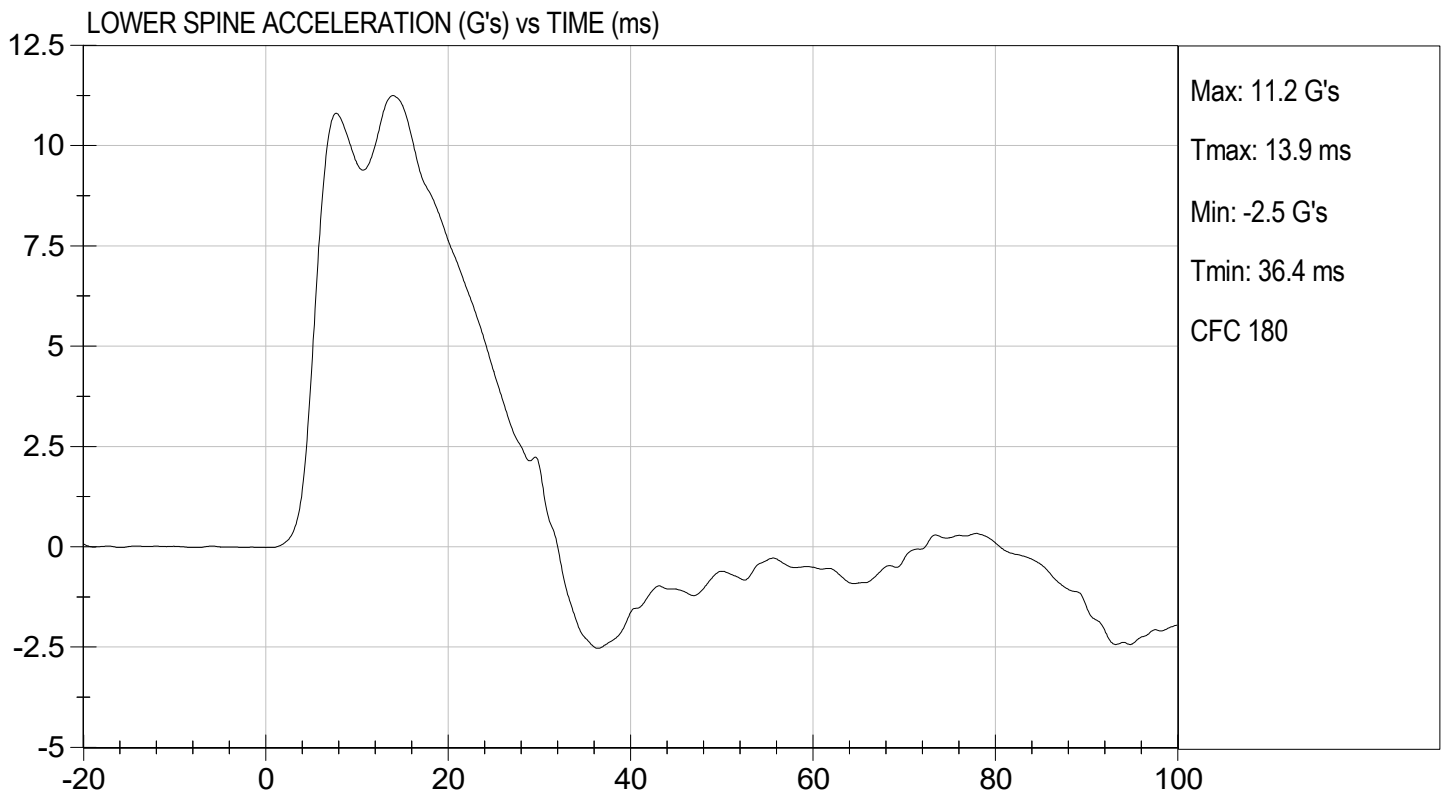
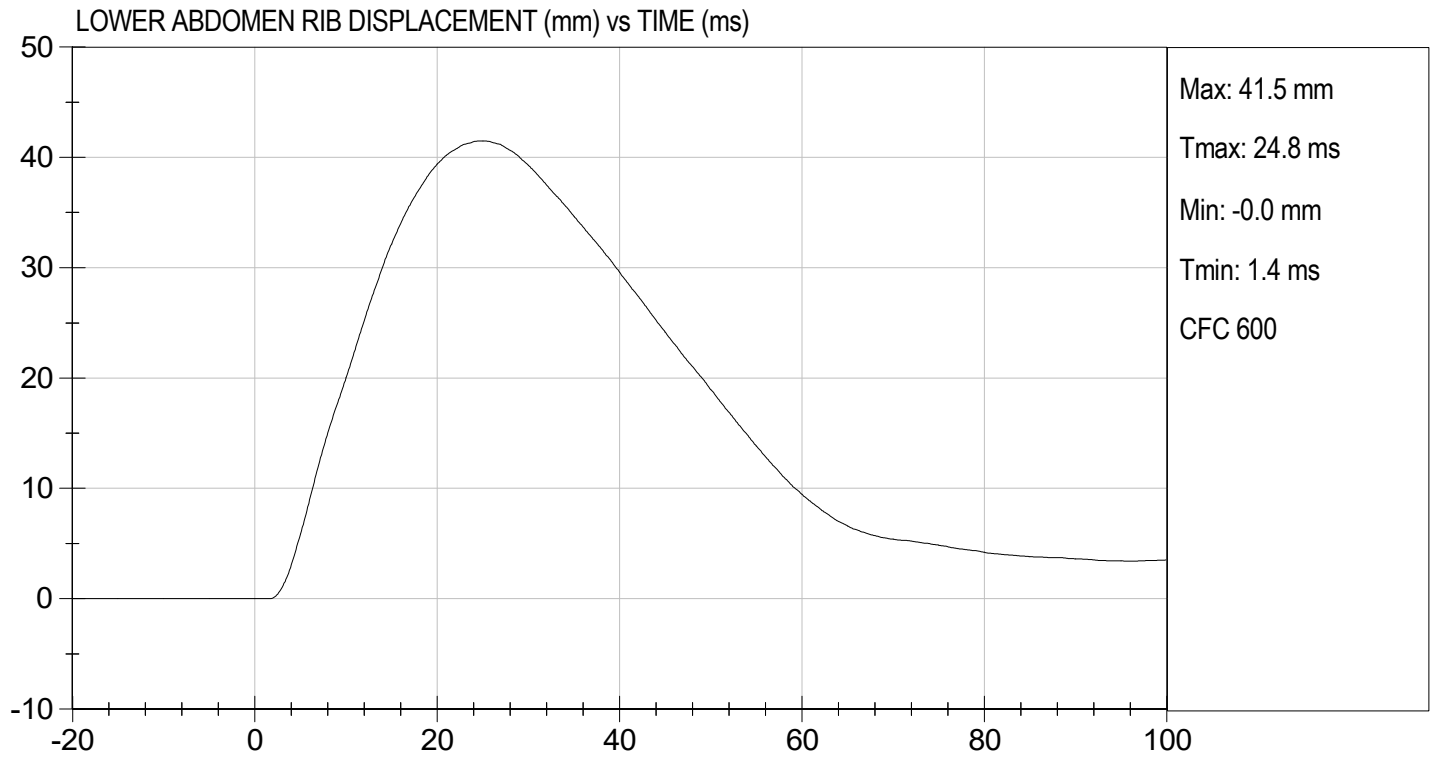
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	41	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/18/2022  
 Test Date

  
 Approved By





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

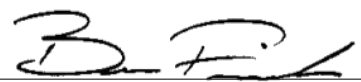
ATD Serial No: 296

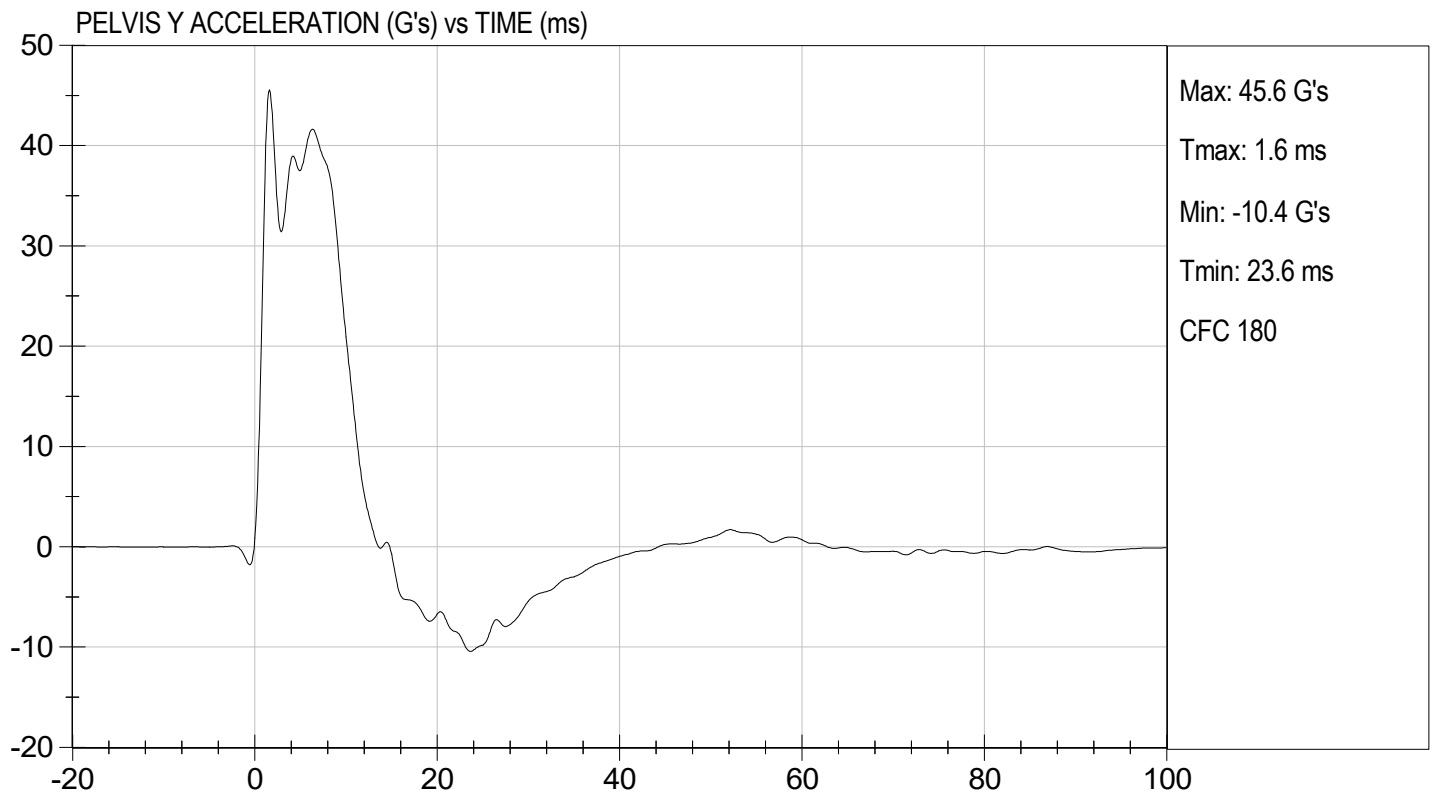
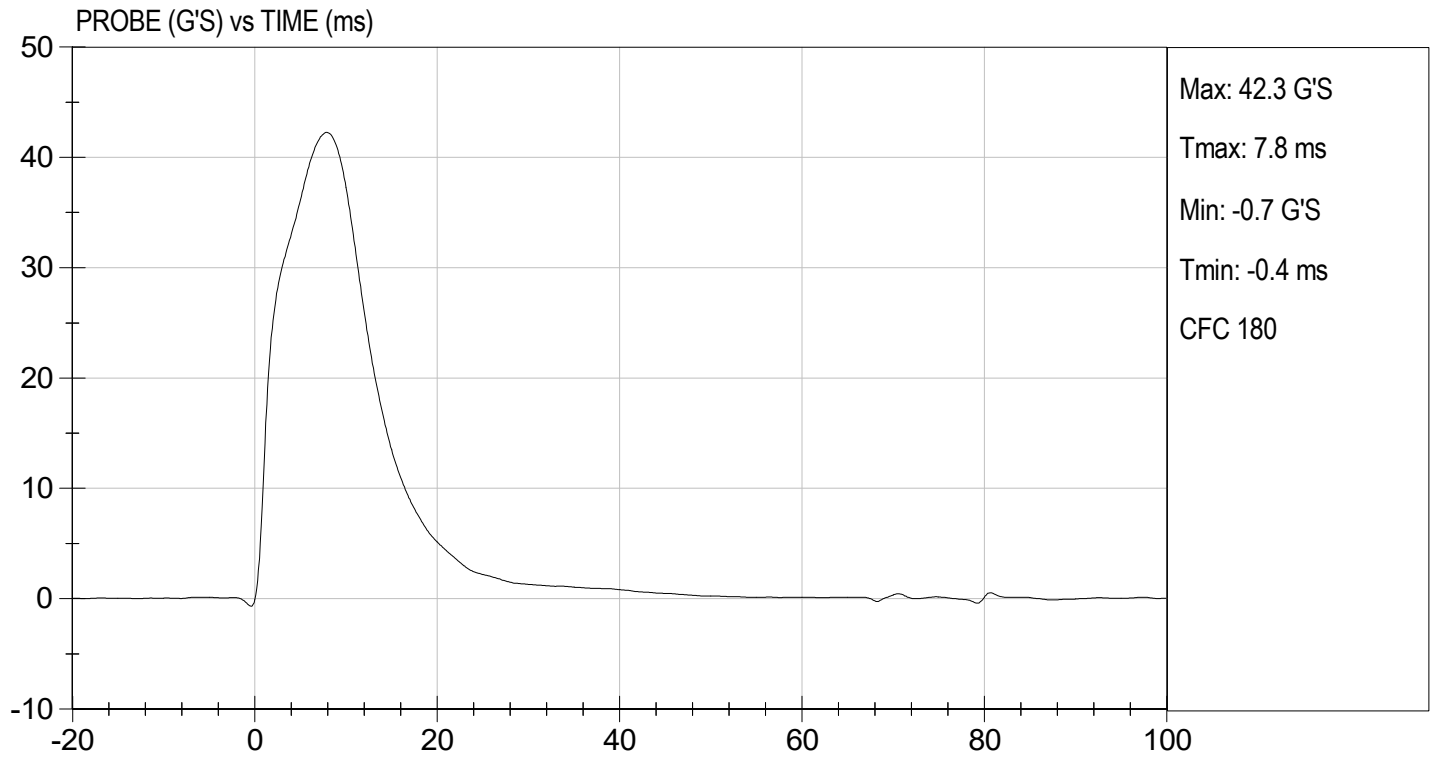
Test I.D: D222677

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	27	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	4,087	Pass
Overall Test Results				Pass

  
 \_\_\_\_\_  
 Laboratory Technician

11/18/2022  
 \_\_\_\_\_  
 Test Date

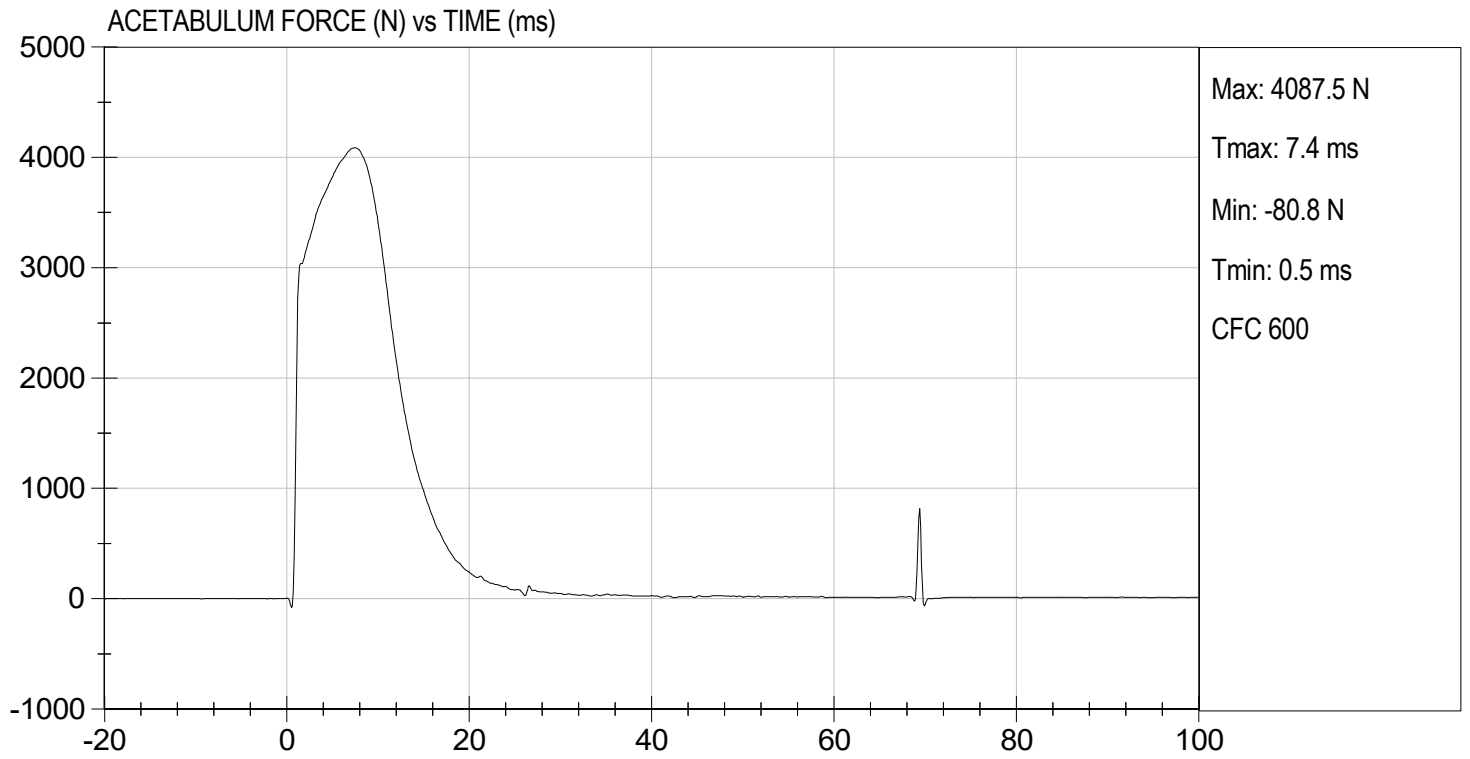
  
 \_\_\_\_\_  
 Approved By





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

TEST DATE: 11/18/2022  
TEST #: D222677



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

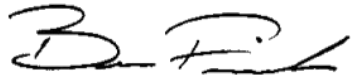
ATD Serial No: 296

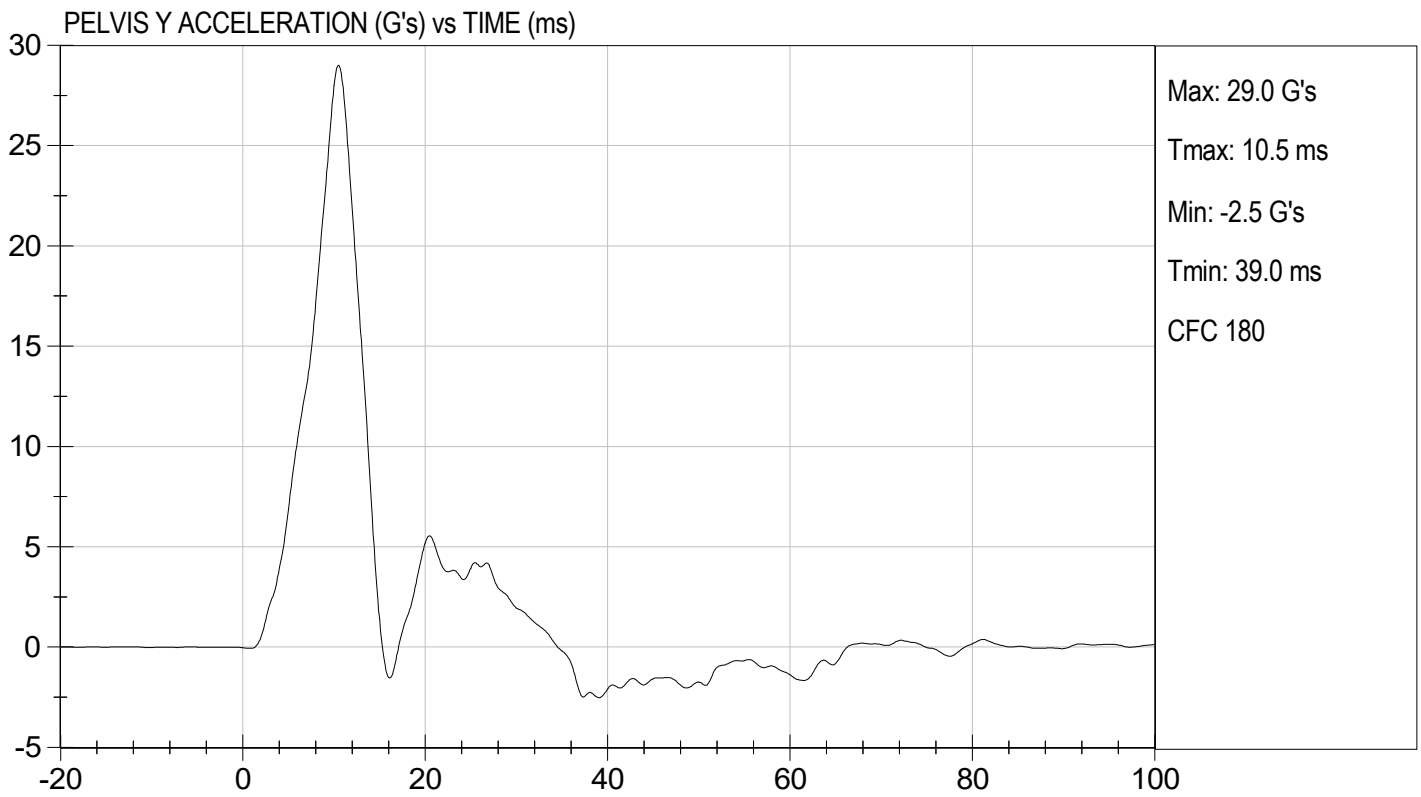
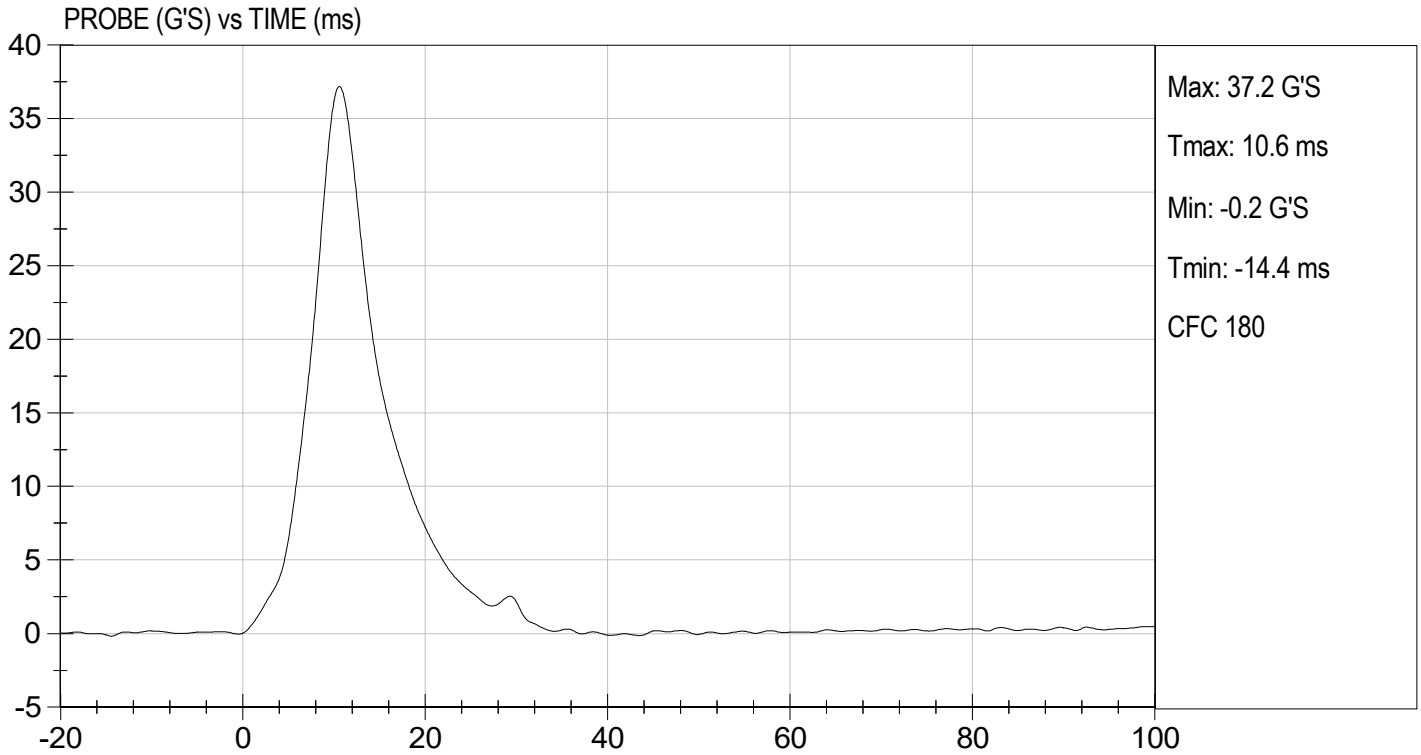
Test I.D: D222678

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	26	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	36 to 45	37	Pass
Pelvis Y Acceleration	G's	28 to 39	29	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,281	Pass
Overall Test Results				Pass

  
 Laboratory Technician

11/18/2022  
 Test Date

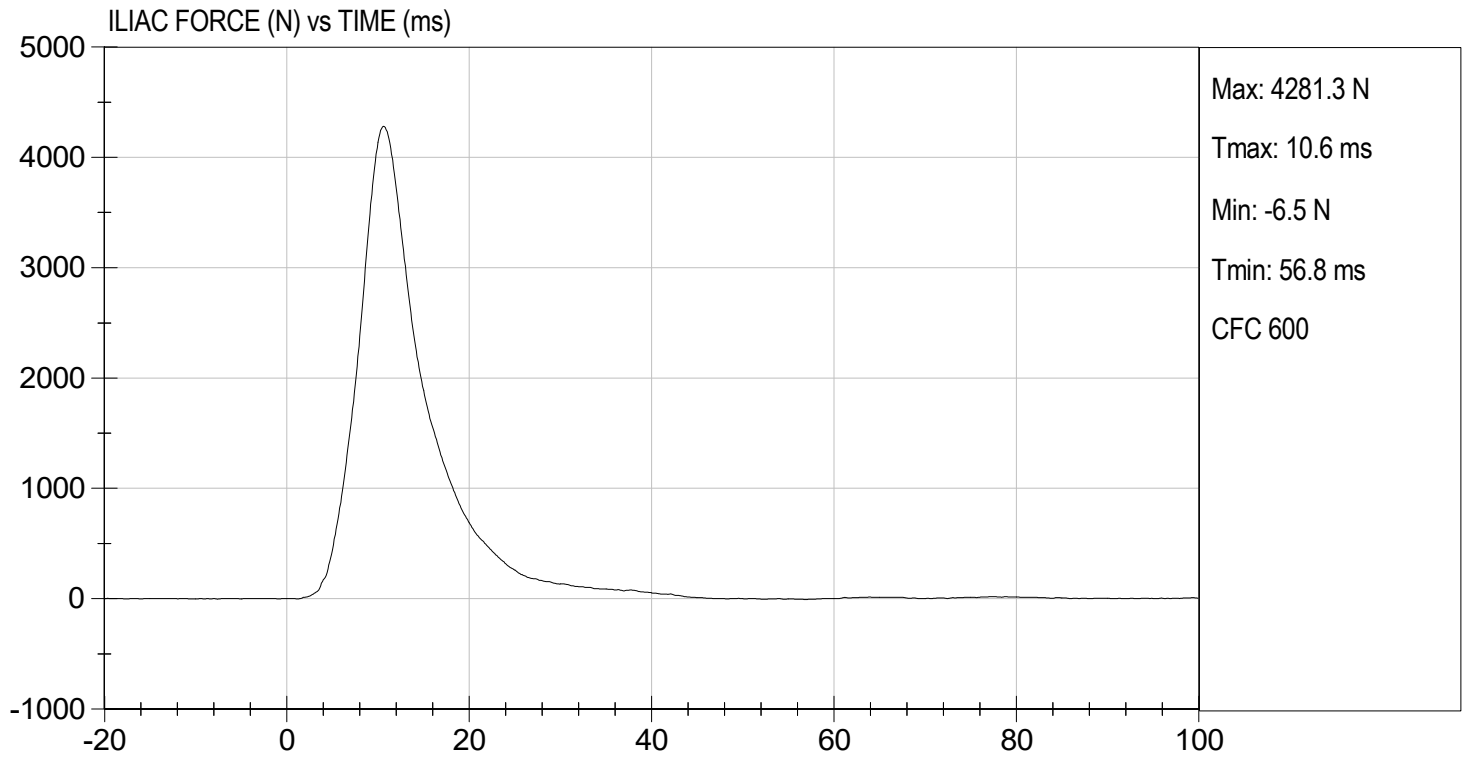
  
 Approved By





TEST DESC: ILLIAC  
VELOCITY: 13.77 ft/s, 4.20 m/s

TEST DATE: 11/18/2022  
TEST #: D222678





**SID-IIs Pelvis Plug Certification Test**

Plug S/N 15340

Test Number 19687

Report Number 19739

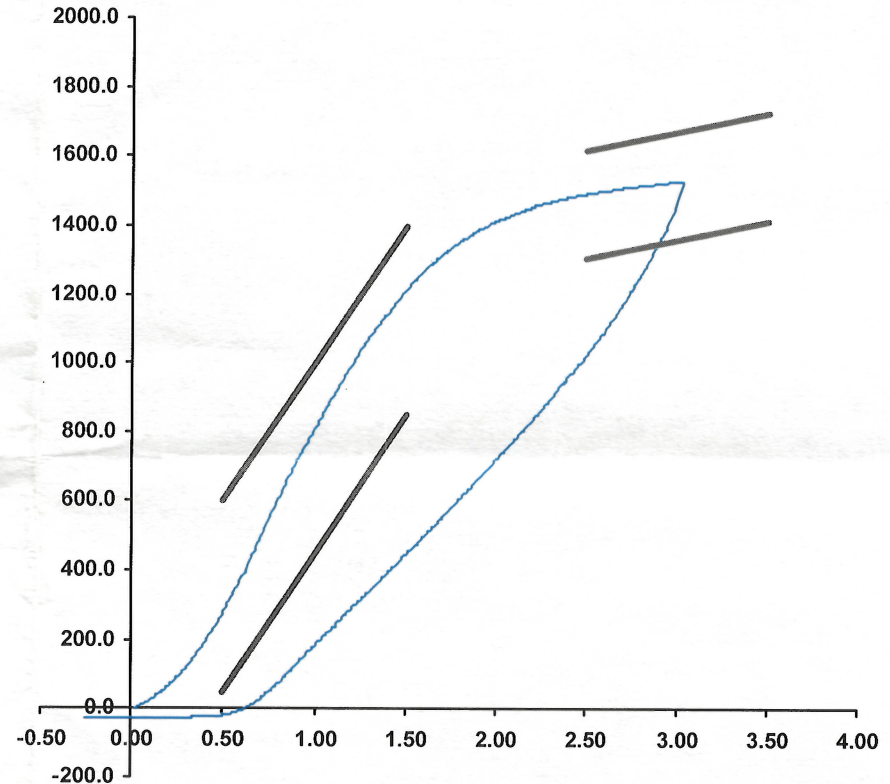
Test Date 7/20/2021 12:13:09 PM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	291	50	600
Force @ 1.5 mm (N)	1,217	850	1,400
Force @ 2.5 mm (N)	1,495	1,306	1,618
Force @ 3.0 mm (N)	1,532	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



**SID-IIs Pelvis Plug Certification Test**

Plug S/N 15299

Test Number 18174

Report Number 18222

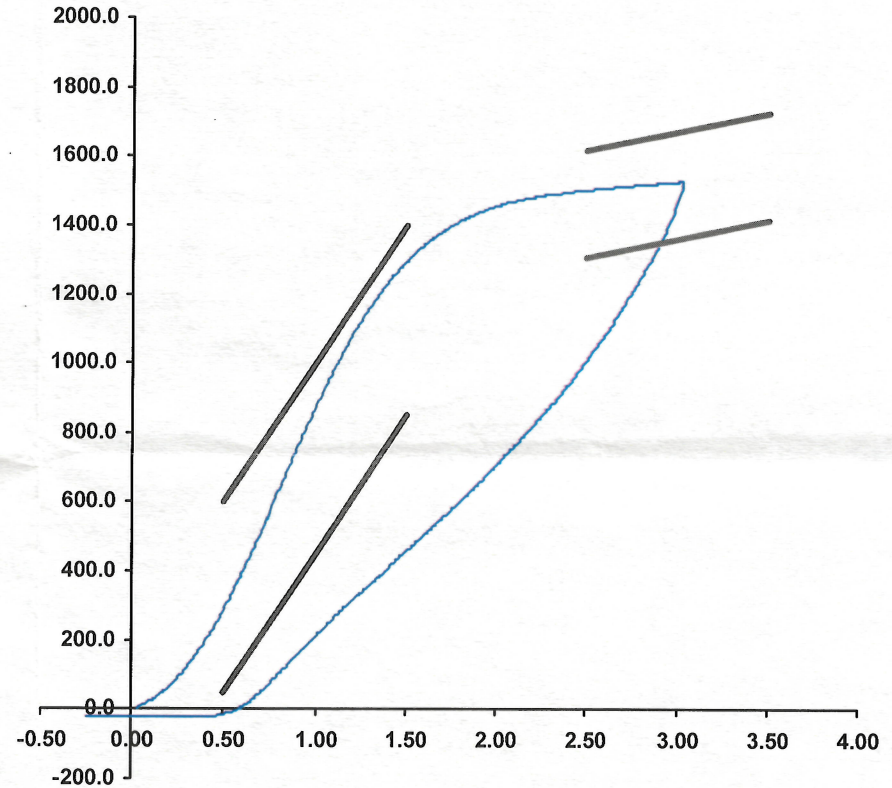
Test Date 3/22/2021 12:26:39 PM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	290	50	600
Force @ 1.5 mm (N)	1,298	850	1,400
Force @ 2.5 mm (N)	1,505	1,306	1,618
Force @ 3.0 mm (N)	1,530	1,361	1,673

Testing Machine STM-20 5965542  
 Load Cell S/N (F1360947), 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 22-Mar-21  
 SACO Research

By : DC Date : 3/22/2021

**APPENDIX D**  
**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA**

**Table 1 – Dummy Instrumentation (ES-2re)**

		ES-2re S/N F032			
		Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers		X	P79568	Endevco	07/01/2022
		Y	P79569	Endevco	07/01/2022
		Z	P79570	Endevco	07/01/2022
		Xr	P86797	Endevco	07/01/2022
		Yr	P94957	Endevco	07/01/2022
		Zr	P97381	Endevco	07/01/2022
Thorax Rib Displacement Potentiometers	Upper	Y	G236	Honeywell	07/07/2022
	Middle	Y	G169	Honeywell	07/07/2022
	Lower	Y	G164	Honeywell	07/07/2022
Abdomen Load Cells	Forward	Y	ABG1513	Denton	06/14/2022
	Middle	Y	ABG1531	Denton	06/14/2022
	Rear	Y	ABG1536	Denton	06/14/2022
Lower Spine Accelerometers (T12)		X	P79574	Endevco	07/01/2022
		Y	T25676	Endevco	07/01/2022
		Z	P82603	Endevco	07/01/2022
Public Symphysis Load Cell		Y	PG462	Denton	06/14/2022

**Table 2 – Dummy Instrumentation (SID-IIs)**

			SID-IIs S/N 296			
			Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers			X	P82109	Endevco	06/07/2022
			Y	P94783	Endevco	06/07/2022
			Z	P94786	Endevco	06/07/2022
			Xr	P94938	Endevco	06/07/2022
			Yr	P96854	Endevco	06/07/2022
			Zr	P97386	Endevco	06/07/2022
Head Angular Rate Sensors			X	ARS7502	DTS	03/14/2022
			Y	ARS7566	DTS	03/14/2022
			Z	ARS15231	DTS	03/15/2022
Displacement Potentiometers	Thoracic Rib	Upper	Y	G012	FTSS	06/08/2022
		Middle	Y	G1163	FTSS	06/08/2022
		Lower	Y	G1158	FTSS	06/08/2022
	Abdominal Rib	Upper	Y	G1146	FTSS	06/08/2022
		Lower	Y	G1126	FTSS	06/08/2022
Lower Spine Accelerometers (T12)			X	P79418	Endevco	06/07/2022
			Y	P79439	Endevco	06/07/2022
			Z	P79614	Endevco	06/07/2022
Acetabulum Load Cell			Y	ACG111	FTSS	06/30/2022
Iliac Wing Load Cell			Y	IWG226	FTSS	06/30/2022
Pelvis Plug (struck side)				15340	SACO	07/20/2021
Pelvis Plug (non-struck side)				15299	SACO	03/22/2021

**Table 3 – Vehicle Instrumentation**

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A405041	MSI	09/27/2022
	Vehicle Center of Gravity	Y	A370352	MSI	08/08/2022
	Vehicle Center of Gravity	Z	T25691	Endevco	09/28/2022
2	Right Sill at Front Seat	X	A385807	MSI	08/03/2022
	Right Sill at Front Seat	Y	A360944	MSI	08/03/2022
	Right Sill at Front Seat	Z	A383174	MSI	08/03/2022
3	Right Sill at Rear Seat	X	A337212	MSI	10/07/2022
	Right Sill at Rear Seat	Y	A370353	MSI	10/07/2022
	Right Sill at Rear Seat	Z	A337194	MSI	10/07/2022
4	Left Sill at Front Door	Y	T30583	Endevco	07/19/2022
5	Left Sill at Rear Door	Y	A340744	MSI	08/11/2022
6	Left A-Post Lower	Y	A393841	MSI	09/20/2022
7	Left A-Post Middle	Y	A383153	MSI	08/15/2022
8	Left B-Post Lower	Y	A390896	MSI	09/27/2022
9	Left B-Post Middle	Y	A340699	MSI	08/05/2022
10	Front Seat Track	Y	T29904	Endevco	07/14/2022
11	Rear Seat Track or Structure	Y	A411439	MSI	07/13/2022
12	Right Rear Occ. Compartment	Y	A395069	MSI	08/05/2022
13	Engine Block	X	A416950	MSI	08/18/2022
	Engine Block	Y	A416919	MSI	08/16/2022
14	Rear Floorpan Above Axle	X	T32184	Endevco	07/18/2022
	Rear Floorpan Above Axle	Y	A416946	MSI	12/23/2021
	Rear Floorpan Above Axle	Z	A416924	MSI	08/16/2022

**Table 4 – MDB Instrumentation**

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	PCB1901D	PCB	12/09/2021
MDB Center of Gravity	Y	PCB224D	PCB	12/09/2021
MDB Center of Gravity	Z	PCB1920D	PCB	12/09/2021
Left Frame at Rear Axle Centerline	X	PCB1705D	PCB	12/09/2021
Left Frame at Rear Axle Centerline	Y	PCB1685D	PCB	12/09/2021