

REPORT NUMBER: SideNCAPMDB-MGA-23-020

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

**NISSAN MOTOR CO., LTD.
2023 Nissan Kicks S 5-Door SUV
NHTSA No.: O20235200**

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



Test Date: May 9, 2023

Final Report Date: January 31, 2024

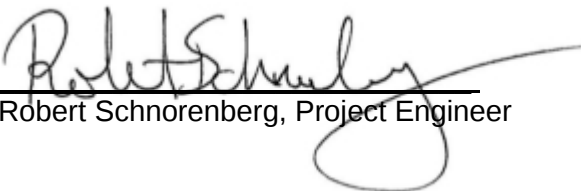
FINAL REPORT

**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**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement.

Prepared by: 
Ben Fischer, Program Manager

Approved by: 
Robert Schnorenberg, Project Engineer

Approval Date: January 31, 2024

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

1. Report No. SideNCAPMDB-MGA-23-020	2. Government Accession No.	3. Recipient's Catalog No.																																																					
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of 2023 Nissan Kicks S 5-Door SUV, NHTSA No.: O20235200		5. Report Date January 31, 2024																																																					
		6. Performing Organization Code MGA																																																					
7. Author(s) Ben Fischer, Program Manager		8. Performing Organization Report No. SideNCAPMDB-MGA-23-020																																																					
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																																																					
		11. Contract or Grant No. 693JJ920D000017																																																					
12. Sponsoring Agency Name and Address 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		13. Type of Report and Period Covered: Final Test Report May 9, 2023 to January 31, 2024																																																					
		14. Sponsoring Agency Code NRM-100																																																					
15. Supplementary Notes																																																							
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2023 Nissan Kicks S 5-Door SUV 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 May 9, 2023. The impact velocity of the Moving Deformable Barrier (MDB) was 61.92 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 22.1°C. The target vehicle post-test maximum crush was 209 mm at level X. The test vehicle's performance was as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD (ES-2re)</th> </tr> <tr> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>163.036</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>25.229</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>668.432</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1788.140</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82*</td> <td>30.998</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>306.887**</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>50.814</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>1576.197</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>21.511</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>16.808</td> </tr> </tbody> </table> *Proposed IARV **Passenger HIC₃₆ calculated using Passenger Head Yr (redundant) channel The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door(s) did not open during the side impact event.				Measurement Description	Units	Driver ATD (ES-2re)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	163.036	Maximum Thorax Rib Deflection	mm	44	25.229	Total Abdominal Force	N	2500	668.432	Pubic Symphysis Force	N	6000	1788.140	Resultant Lower Spine Acceleration	g	82*	30.998	Measurement Description	Units	Passenger ATD (SID-IIs)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	306.887**	Resultant Lower Spine Acceleration	g	82	50.814	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1576.197	Maximum Thoracic Rib Deflection	mm	38*	21.511	Maximum Abdomen Rib Deflection	mm	45*	16.808
Measurement Description	Units	Driver ATD (ES-2re)																																																					
		Threshold	Result																																																				
Head Injury Criteria (HIC ₃₆)		1000	163.036																																																				
Maximum Thorax Rib Deflection	mm	44	25.229																																																				
Total Abdominal Force	N	2500	668.432																																																				
Pubic Symphysis Force	N	6000	1788.140																																																				
Resultant Lower Spine Acceleration	g	82*	30.998																																																				
Measurement Description	Units	Passenger ATD (SID-IIs)																																																					
		Threshold	Result																																																				
Head Injury Criteria (HIC ₃₆)		1000	306.887**																																																				
Resultant Lower Spine Acceleration	g	82	50.814																																																				
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1576.197																																																				
Maximum Thoracic Rib Deflection	mm	38*	21.511																																																				
Maximum Abdomen Rib Deflection	mm	45*	16.808																																																				
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																																																					
19. Security Classification of Report Unclassified	20. Security Classification of Page Unclassified	21. No. of Pages 225	22. Price																																																				

TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat, Seat Belt, Steering Wheel Adjustment and Fuel System Data	8
3	Dummy Longitudinal Clearance Dimensions	12
4	Dummy Lateral Clearance Dimensions	13
5	Camera and Instrumentation Data	14
6	Test Vehicle Accelerometer Locations	15
7	MDB Accelerometer Locations	16
8	Post-Test Observations	17
9	MDB Summary of Results	19
10	Test Vehicle Profile Measurements	20
11	Test Vehicle Exterior Crush Measurements	21
12	MDB Exterior Static Crush Measurements	24
13	Vehicle and MDB Damage Profile Distances	25
14	FMVSS No. 301 Static Rollover Results	26
15	Dummy/Vehicle Temperature and Humidity Stabilization Data	27
<u>Appendix</u>		
A	Photographs	A
B	Dummy Response Data Plots	B
C	Dummy Qualification and Performance Verification	C
D	Test Equipment and Instrumentation Calibration	D

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 Nissan Kicks S 5-Door SUV. 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 Nissan Kicks S 5-Door SUV 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 61.92 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 May 9, 2023. 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 ₃₆)		1000	163.036
Maximum Thorax Rib Deflection	mm	44	25.229
Total Abdominal Force	N	2500	668.432
Pubic Symphysis Force	N	6000	1788.140
Resultant Lower Spine Acceleration	g	82*	30.998

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	306.887**
Resultant Lower Spine Acceleration	g	82	50.814
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1576.197
Maximum Thoracic Rib Deflection	mm	38*	21.511
Maximum Abdomen Rib Deflection	mm	45*	16.808

*Proposed IARV

**Passenger HIC₃₆ calculated using Passenger Head Yr (redundant) channel

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			
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:				

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

GENERAL COMMENTS

Passenger Head Y recorded no valid data after 27 ms.

Passenger Head Angular Velocity X recorded no valid data after 11 ms.

Left Rear Seat Y recorded no valid data after 6 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 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
Test Date: 5/9/2023

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20235200	Traction Control System (TCS)	Yes
Model Year	2023	Auto-Leveling System	No
Make	Nissan	Automatic Door Locks (ADL)	Yes
Model	Kicks S	Power Window Auto-Reverse	Yes
Body Style	5-Door SUV	Other Optional Feature	No
VIN	3N1CP5BV6PL505510	Driver Front Airbag	Yes
Body Color	Gun Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	92 km / 57 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	1.6 L	Driver Torso Airbag	No
Type/No. Cylinders	Inline 4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	CVT	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	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	No	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?	No
---	----

DATA FROM CERTIFICATION LABEL

Manufactured By	NISSAN MOTOR CO., LTD.	GVWR (kg)	1660
Date of Manufacture	02/23	GAWR Front (kg)	875
Vehicle Type	Passenger Car	GAWR Rear (kg)	785

VEHICLE SEATING AND WEIGHT CAPACITY DATA

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

VEHICLE SEAT TYPE

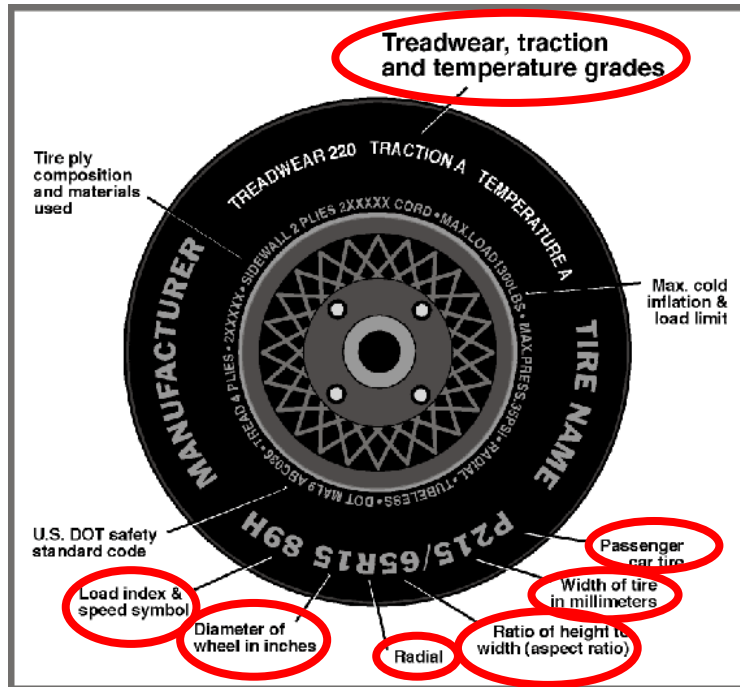
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	X					X	
Rear or Second Row				X	X		
Third Row Seat							

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

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	205/60R16	205/60R16
Tire Size on Vehicle	205/60R16	205/60R16
Tire Manufacturer	Firestone	Firestone
Tire Model	FT 140	FT 140
Treadwear	560	560
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	92H	92H
Tire Material	Rubber	Rubber
DOT Safety Code Left	V6XW FTO 4022	V6XW FTO 0223
DOT Safety Code Right	V6XW FTO 0223	V6XW FTO 4022

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

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

TEST VEHICLE TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	310	310	310	310
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

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	373.5	254.0		415.0	326.0		409.0	335.5	
Right	kg	371.0	230.0		380.0	274.0		374.5	283.5	
Ratio	%	60.6%	39.4%		57.0%	43.0%		55.9%	44.1%	
Totals	kg	744.5	484.0	1228.5	795.0	600.0	1395.0	783.5	619.0	1402.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1228.5	(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 (TVTW)	kg	1402.5	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

	Units	Fully Loaded	As Tested	Meets Requirement*
Left Front	mm	700	692	Yes
Right Front	mm	708	698	Yes
Right Rear	mm	703	711	Yes
Left Rear	mm	684	686	Yes
Vehicle CG (Aft of Front Axle)	mm	1159	1129	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	47	47	

* 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
---	----------------

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

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Units	Weight
Weight of Ballast Added	kg	2
Components Removed: none	kg	

TEST SURFACE MARKINGS

	Units	Distance from 63° Impact Angle Line
Fore 25 mm Target	mm	870
Aft 25 mm Target	mm	874
Pre-Impact Angle Line	mm	100

Parallel Track Target	Units	X Location	Y Location
A	mm	0	0
B	mm	1520	3085
C	mm		
D	mm	3500	0

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

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

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	20.2	16.9	18.6
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As-Tested SCRL Angle (Mid) (°)	As-Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear-Most	Mid	Forward- Most
Driver Seat	18.6	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

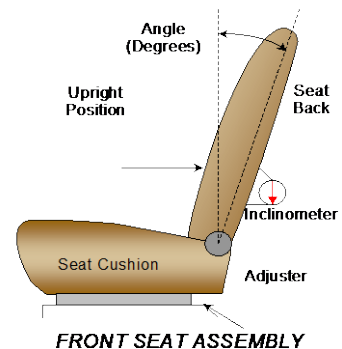
NHTSA No.: O20235200
 Test Date: 5/9/2023

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1 st as 1)	mm	Detent (1 st as 0)
Driver Seat	240	25	120	12
Front Passenger Seat	240	25	120	12
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 st as 1)	Degrees	Detent (1 st as 0)
Driver Seat	59.7	31	3.1	4
Front Passenger Seat	55.9	28	4.3	4
Front Center Seat				
Struck Side Rear Seat	Fixed		16.1	
Non-Struck Side Rear Seat	Fixed		16.1	
Rear Center Seat	Fixed		16.1	

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 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

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

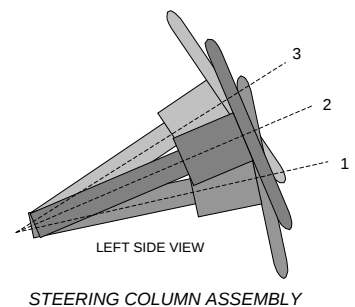
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	4 (Lowest as 0) / Fixed Fore-Aft
Rear Seat	2	0 (Lowest as 0) / Fixed Fore-Aft

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	65.7	
Geometric Center, Position 2	63.7	
Uppermost, Position 3	61.7	
Telescoping Steering Wheel Travel		38
Test Position	63.7	19

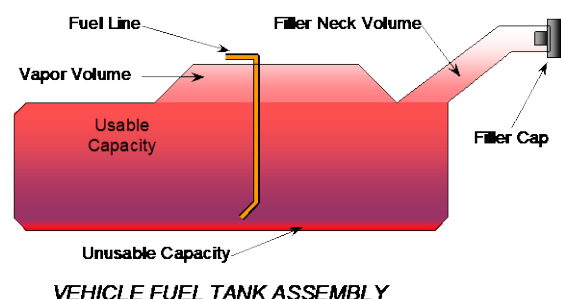


FUEL PUMP

The vehicle is equipped with an electronic fuel pump. The fuel pump will run:

1. For approximately 1 second after the ignition is switch to "ON".
2. While the engine is running
3. For approximately 1.5 seconds after the engine stops running.

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 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

FUEL TANK CAPACITY DATA

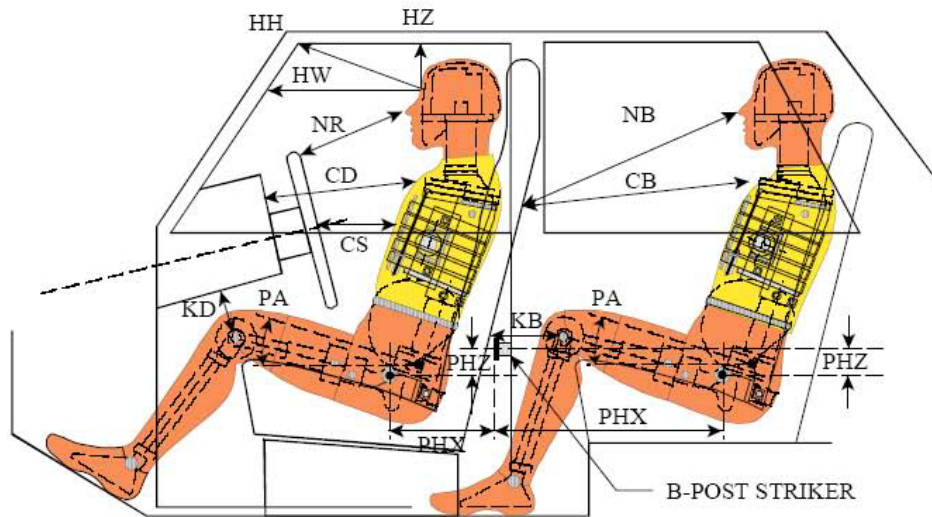
	Liters
Usable Capacity of Standard Tank (see S1 - Vehicle Setup Information)	40.9
Usable Capacity of Optional Tank (see S1 - Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	40.9
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	38.0
Actual Amount of Solvent Used	37.9
1/3 of Usable Capacity	13.6

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 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023



LEFT SIDE VIEW

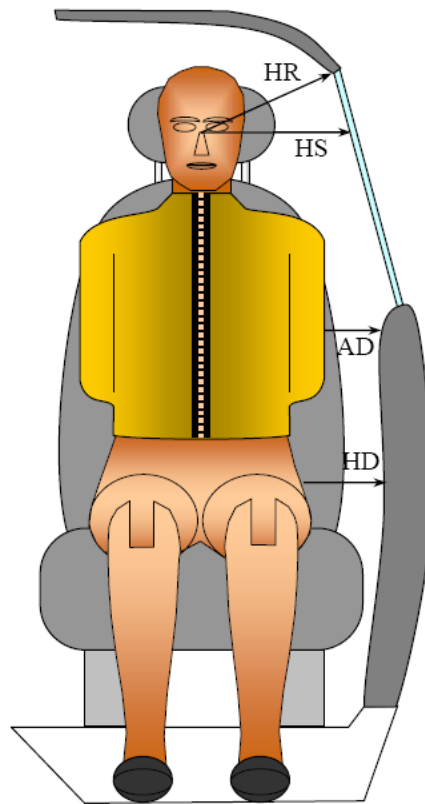
NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	387	13.0		
HW		Head to Windshield	588	0		
HZ	HZ	Head to Roof Liner	162	90	262	90
NR	NB	Nose to Rim/Seat Back	478	19.7	566	15.1
CD	CB	Chest to Dashboard/Seat Back	595	1.5	545	5.5
CS		Chest to Steering Wheel	404	15.3		
KDL	KBL	Left Knee to Dash/Seat Back	153	29.5	250	20.0
KDR	KBR	Right Knee to Dash/Seat Back	128	33.1	250	20.0
PAX	PAX	Pelvic Tilt Angle X		23.3		25.1
PAY	PAY	Pelvic Tilt Angle Y		-1.4		-0.8
PHX	PHX	Hip Point to Striker (X-Axis)	167		302	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	64		240	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

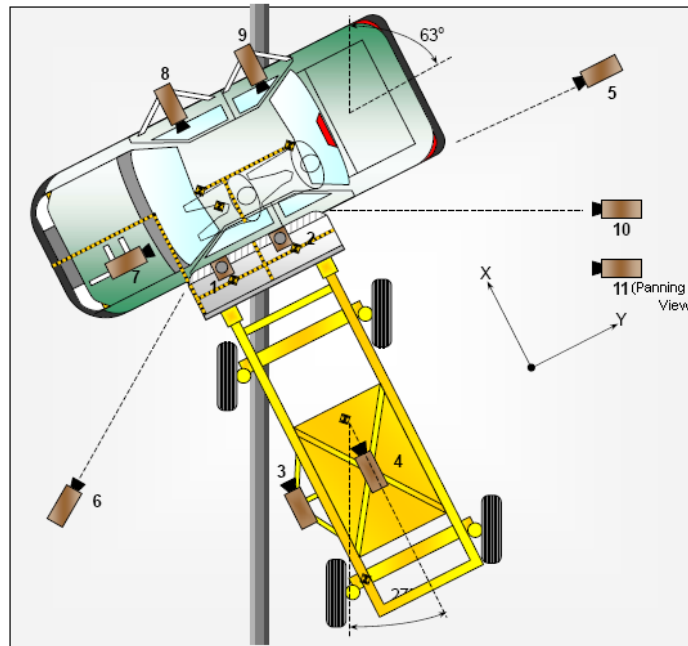


Code	Measurement Description	Driver	Passenger
		Length (mm)	
HR	Head to Side Header	186	247
HS	Head to Side Window	318	361
AD	Arm to Door	75	158
HD	Hip Point to Door	134	163

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
Test Date: 5/9/2023



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates* (mm)			Lens (mm)	Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	600	1335	-4995	8.5	1000
2	Overhead Close-Up	0	840	-4895	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	-70	7090	-1480	24	1000
6	Left Front	-1440	-4985	-1505	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

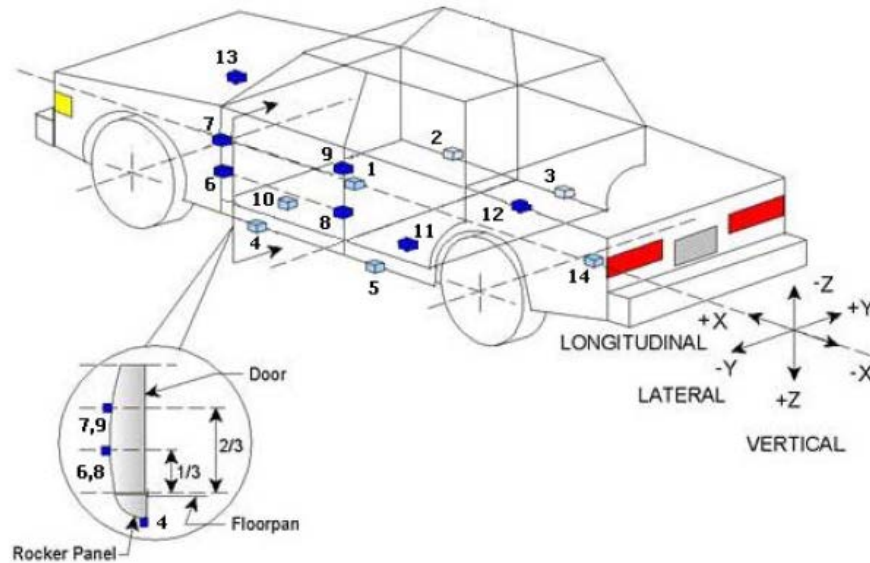
INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
Test Date: 5/9/2023



TEST VEHICLE ACCELEROMETER LOCATIONS

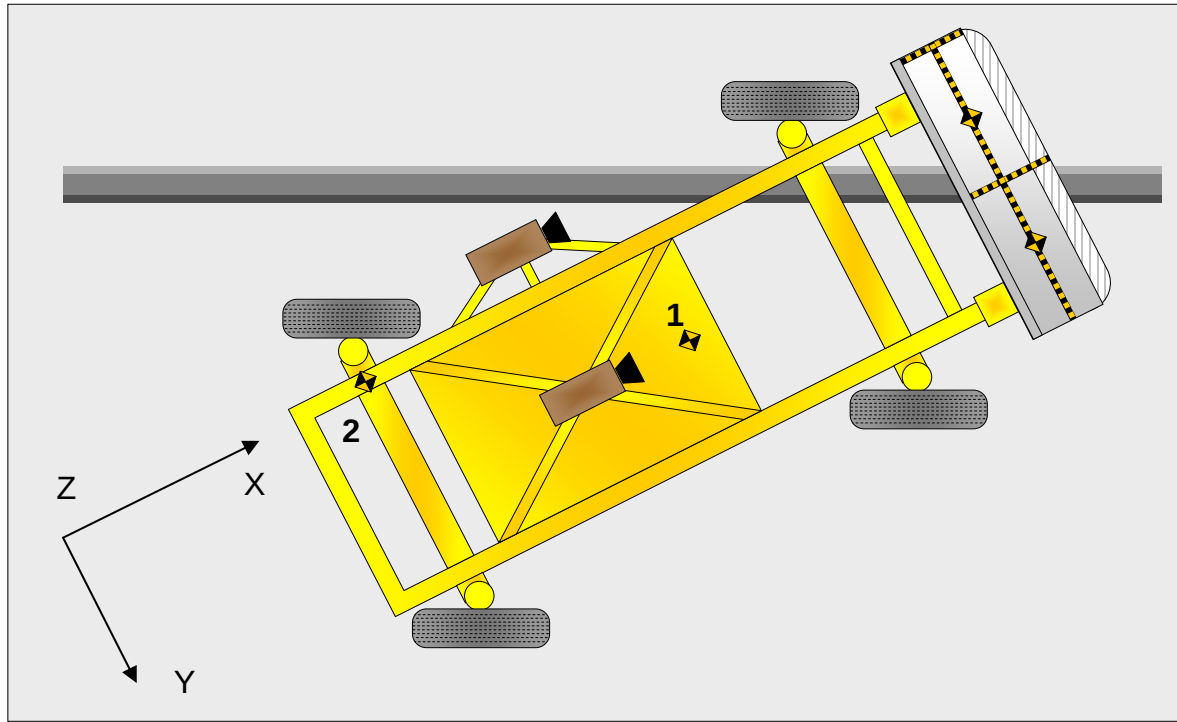
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2278	0	-340
2	Right Sill at Front Seat	2421	698	-216
3	Right Sill at Rear Seat	1336	698	-238
4	Left Sill at Front Door	2421	-698	-216
5	Left Sill at Rear Door	1336	-698	-238
6	Left Lower A-Post	2987	-765	-515
7	Left Middle A-Post	2987	-765	-722
8	Left Lower B-Post	1782	-678	-595
9	Left Middle B-Post	1782	-678	-811
10	Front Seat Track	2048	-357	-278
11	Rear Seat Structure	1586	-345	-323
12	Rt. Rear Occ. Compartment	1586	345	-323
13	Engine Block	3479	61	-796
14	Rear Above Axle	771	0	-498

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 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023



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	1415
---	----	------

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
Test Date: 5/9/2023

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	Curtain Airbag, Seatback
Top of Head	Curtain Airbag, Headliner	Curtain Airbag, Center Headrest
Left Side of Head	Curtain Airbag	Curtain Airbag
Back of Head	Curtain Airbag, Headliner, Headrest	Headrest, Seatback
Left Shoulder	None	Curtain Airbag
Upper Torso	Side Torso/Pelvis Airbag, Seatback	Side Torso/Pelvis Airbag, Seatback
Lower Torso	Side Torso/Pelvis Airbag, Seatback	Side Torso/Pelvis Airbag, Seatback
Left Hip	Side Torso/Pelvis Airbag	Side Torso/Pelvis Airbag
Left Knee	Door Panel	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	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)					

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	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	None
Other Notable Effects	LF tire deflated after impact

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

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
Test Date: 5/9/2023

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side		Struck Side	
	Driver		Left Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	Yes			
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:				

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheelbase	mm		2625
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		373
Actual Impact Point (Aft of Front Axle)	mm		369
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	4
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	7

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
Test Date: 5/9/2023

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

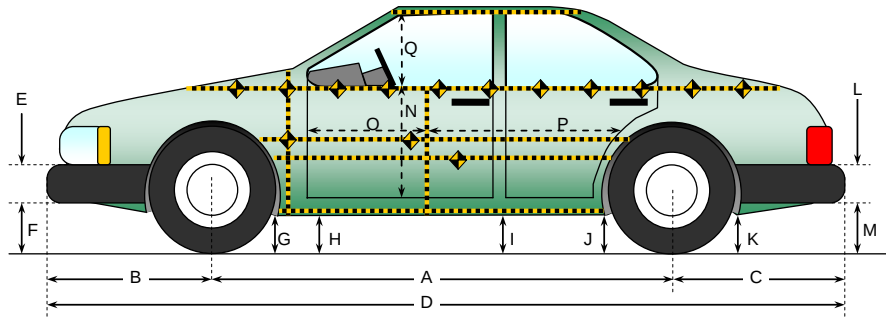
SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.92
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.87
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.9
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	26.8

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
Test Date: 5/9/2023



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

LEFT SIDE VIEW

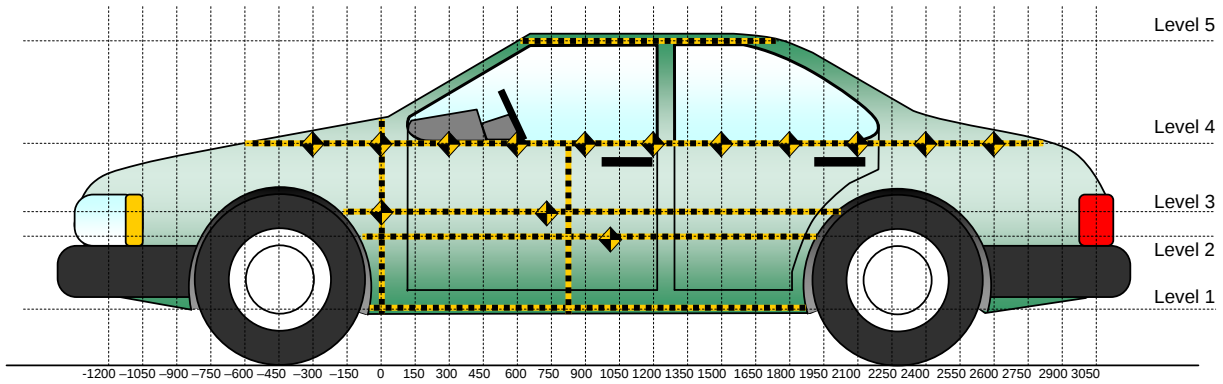
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2625	2620	-5
B	Front Axle to FSOV	901	883	-18
C	Rear Axle to RSOV	781	801	20
D	Total Length at Centerline	4307	4304	-3
E	Front Bumper Thickness	83	83	0
F	Front Bumper Bottom to Ground	231	199	-32
G	Sill Height at Front Wheel Well	193	152	-41
H	Sill Height at Front Door Leading Edge	193	156	-37
I	Sill Height at B Pillar	199	175	-24
J1	Sill Height at Rear Wheel Well	194	184	-10
J2	Pinch Weld Height at Rear Wheel Well	200	190	-10
K	Sill Height Aft of Rear Wheel Well	234	226	-8
L	Rear Bumper Thickness	90	90	0
M	Rear Bumper Bottom to Ground	289	298	9
N	Sill Height to Window Bottom Sill	676	600	-76
O	Front Door Leading Edge to Impact CL	805	717	-88
P	Rear Door Trailing Edge to Impact CL	1098	1072	-26
Q	Front Window Opening	462	456	-6
R	Right Side Length	2943	2945	2
S	Left Side Length	2943	2930	-13
T	Vehicle Width at B Post	1781	1716	-65
U	Front Wheel Track Width	1516		
V	Rear Wheel Track Width	1530		

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023



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	456	182	600
2	Occupant H-Point	601	197	600
3	Mid Door	660	209	450
4	Window Sill	987	41	1650
5	Window Top	1480	-24	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 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023

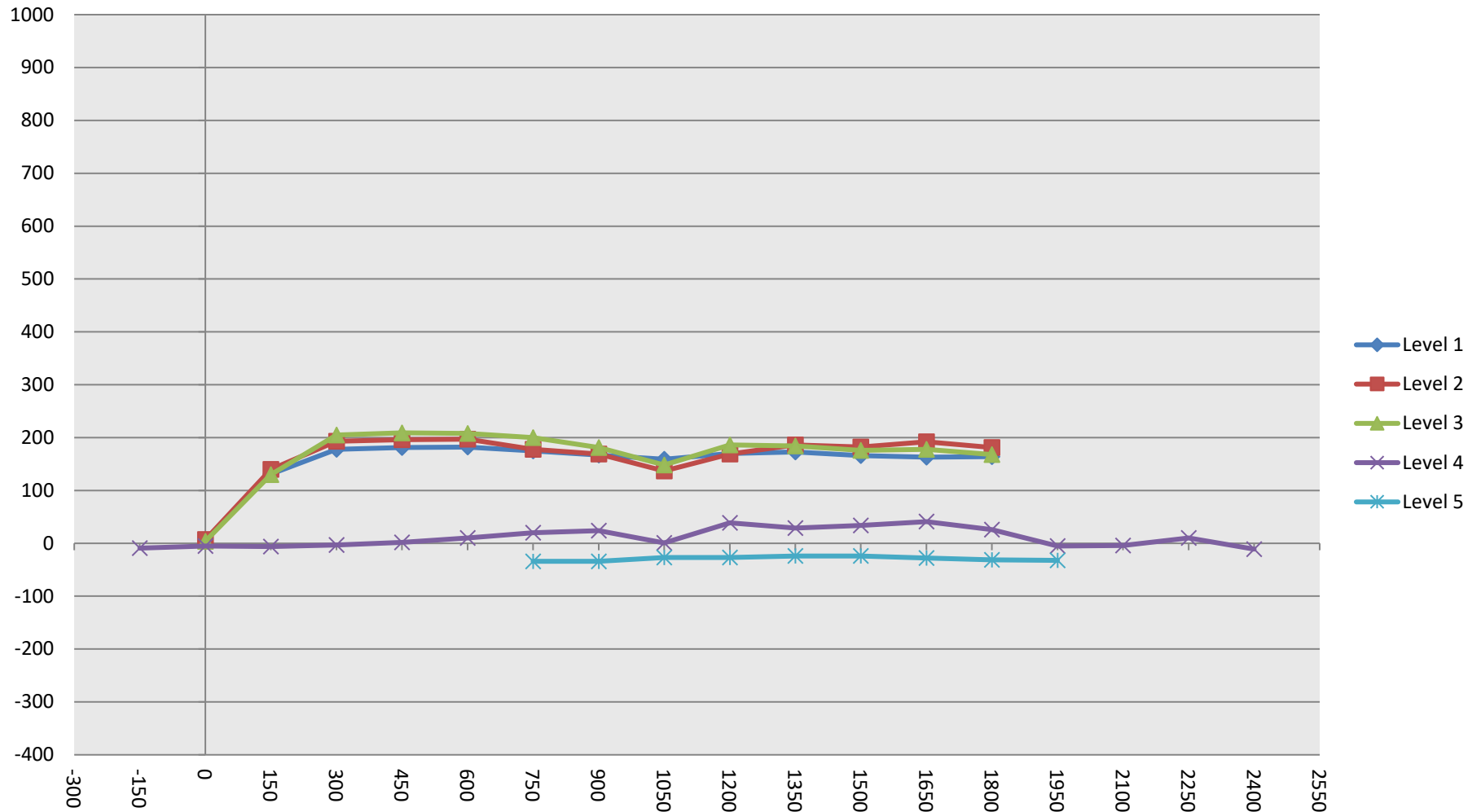
	Pre-Test					Post-Test					Exterior Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900															
-750															
-600															
-450															
-300															
-150				344					335					-9	
0		228	227	323			235	231	318			7	4	-5	
150	237	229	230	310		368	369	360	304		131	140	130	-6	
300	237	229	228	303		415	422	433	300		178	193	205	-3	
450	237	230	228	300		418	426	437	302		181	196	209	2	
600	237	231	229	302		419	428	437	312		182	197	208	10	
750	234	235	230	302	543	409	413	430	322	509	175	178	200	20	-34
900	230	235	234	300	528	397	404	415	324	494	167	169	181	24	-34
1050	232	240	237	298	523	391	377	385	299	496	159	137	148	1	-27
1200	235	245	242	292	523	405	414	428	331	496	170	169	186	39	-27
1350	237	250	246	286	524	410	436	430	315	500	173	186	184	29	-24
1500	240	243	242	280	530	406	425	418	314	506	166	182	176	34	-24
1650	238	230	232	280	542	401	422	410	321	514	163	192	178	41	-28
1800	231	220	220	278	554	395	401	388	304	523	164	181	168	26	-31
1950				284	570				279	538				-5	-32
2100				290					286					-4	
2250				298					308					10	
2400				310					299					-11	
2550															
2700															
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 Nissan Kicks S 5-Door SUV
Test Program: NCAP Side MDB Impact Test

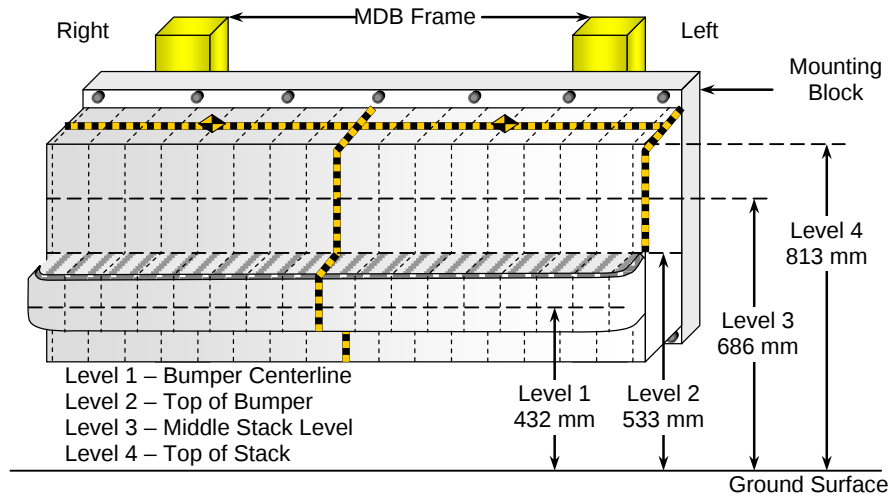
NHTSA No.: O20235200
Test Date: 5/9/2023



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023



FRONT VIEW

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Left	202
B	Top of Bumper	533	800	Left	98
C	Mid-Level	686	800	Right	85
D	Top of Stack	813	800	Left	128

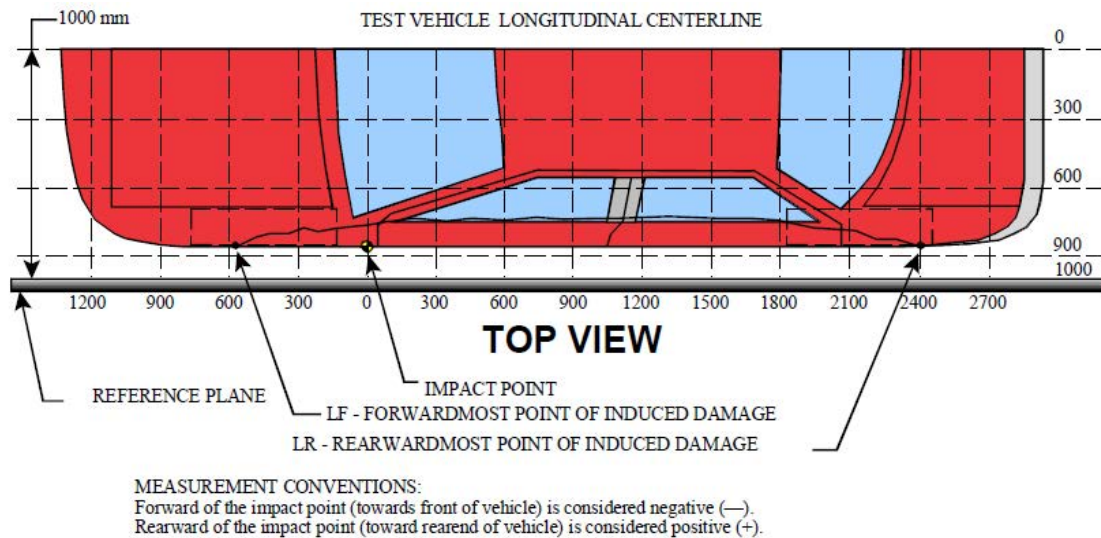
DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C _L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
4	111	59	43	40	55	79	103	88	72	65	58	59	63	77	87	100	128
3	85	55	42	31	25	32	54	76	59	39	30	27	29	36	39	59	82
2	97	84	79	75	71	68	73	78	72	69	72	78	84	89	88	93	98
1	194	195	192	190	188	190	190	187	186	187	185	181	182	182	182	188	202

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Max. Static Crush (mm)
1	1900	3	320	237	83
2	1525	3	414	240	174
3	1150	3	420	240	180
4	775	3	427	231	196
5	400	3	436	228	208
6	25	3	231	228	3

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	670	476	194
2	480 mm right of center	1	656	463	193
3	160 mm right of center	1	649	463	186
4	160 mm left of center	1	643	463	180
5	480 mm left of center	1	652	463	189
6	800 mm left of center	1	678	476	202

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

Test Vehicle: 2023 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

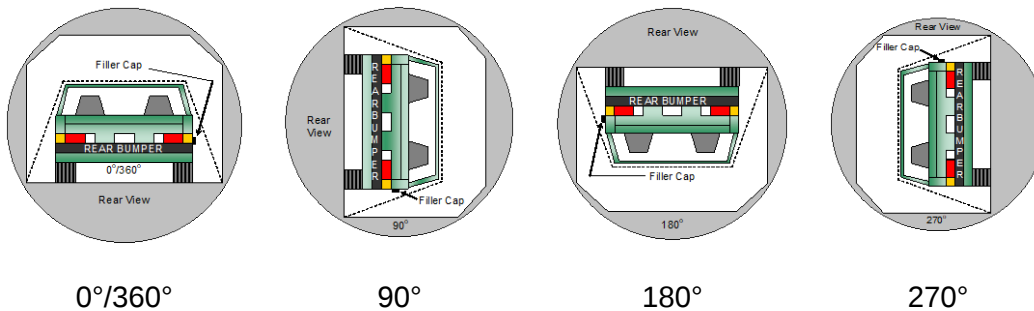
NHTSA No.: O20235200
 Test Date: 5/9/2023

Test Time: 11:47 am

Temperature: 22.1°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°	93	300	393
90° to 180°	93	300	393
180° to 270°	79	300	379
270° to 360°	86	300	386

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	

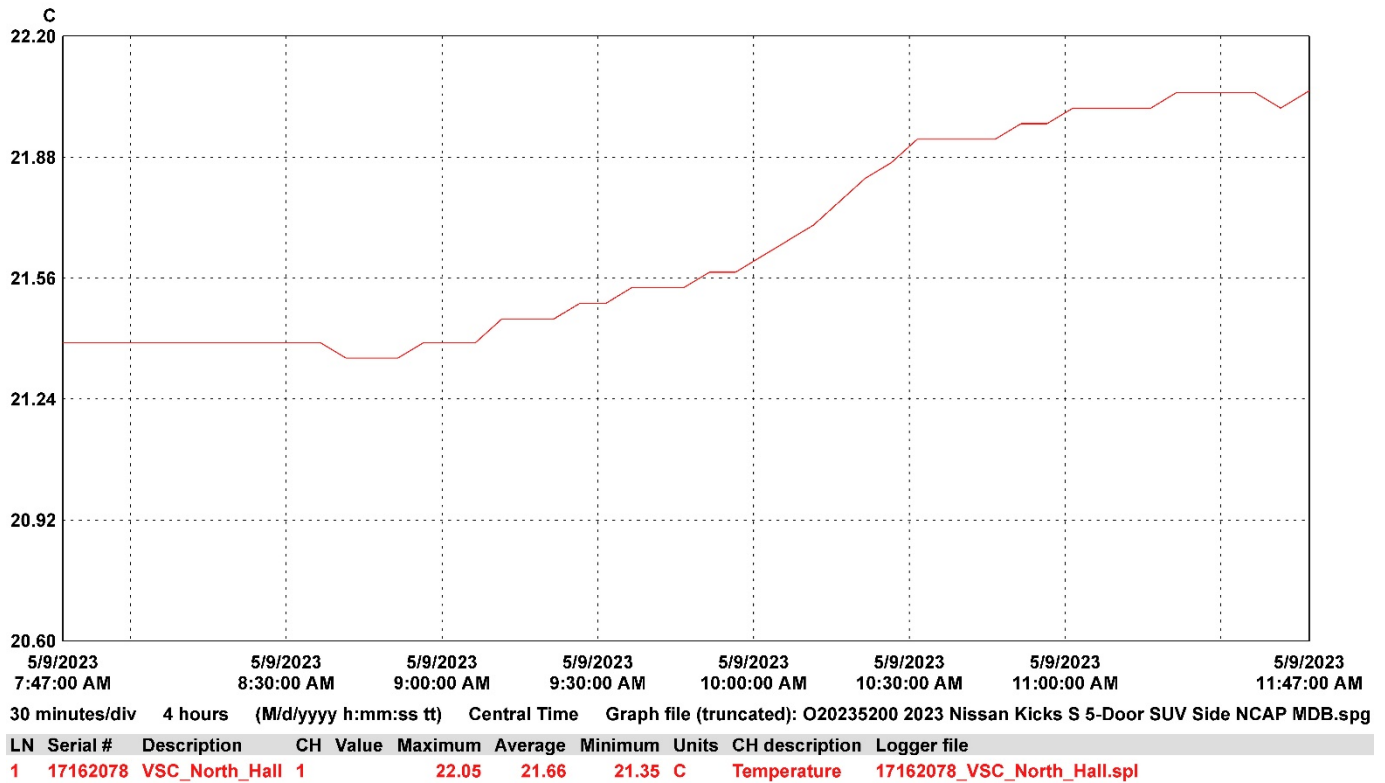
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Nissan Kicks S 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235200
 Test Date: 5/9/2023



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

		<u>Page No.</u>
Photo No. 001	As Delivered Right Front Three-Quarter View of Test Vehicle	A-1
Photo No. 002	As Delivered Left Rear Three-Quarter View of Test Vehicle	A-1
Photo No. 003	Pre-Test Frontal View of Test Vehicle	A-2
Photo No. 004	Post-Test Frontal View of Test Vehicle	A-2
Photo No. 005	Pre-Test Left Front Three-Quarter View of Test Vehicle	A-3
Photo No. 006	Post-Test Left Front Three-Quarter View of Test Vehicle	A-3
Photo No. 007	Pre-Test Left Side View of Test Vehicle	A-4
Photo No. 008	Post-Test Left Side View of Test Vehicle	A-4
Photo No. 009	Pre-Test Left Three-Quarter Rear View of Test Vehicle	A-5
Photo No. 010	Post-Test Left Three-Quarter Rear View of Test Vehicle	A-5
Photo No. 011	Pre-Test Rear View of Test Vehicle	A-6
Photo No. 012	Post-Test Rear View of Test Vehicle	A-6
Photo No. 013	Pre-Test Right Side View of Test Vehicle	A-7
Photo No. 014	Post-Test Right Side View of Test Vehicle	A-7
Photo No. 015	Pre-Test Overhead View of Test Area	A-8
Photo No. 016	Post-Test Overhead View of Test Area	A-8
Photo No. 017	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	A-9
Photo No. 018	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	A-9
Photo No. 019	Pre-Test Close-Up View of Impact Point Target	A-10
Photo No. 020	Post-Test Close-Up View of Impact Point Target	A-10
Photo No. 021	Pre-Test Left Front Door Latch Close-Up	A-11
Photo No. 022	Post-Test Left Front Door Latch Close-Up	A-11
Photo No. 023	Pre-Test Left Rear Door Latch Close-Up	A-12
Photo No. 024	Post-Test Left Rear Door Latch Close-Up	A-12
Photo No. 025	Pre-Test Front Close-Up View of Driver Dummy	A-13
Photo No. 026	Post-Test Front Close-Up View of Driver Dummy	A-13
Photo No. 027	Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking	A-14
Photo No. 028	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-14
Photo No. 029	Post-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-15
Photo No. 030	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	A-15

		<u>Page No.</u>
Photo No. 031	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-16
Photo No. 032	Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning	A-16
Photo No. 033	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-17
Photo No. 034	Pre-Test Placement of Driver Dummy's Feet	A-17
Photo No. 035	Pre-Test View of Belt Anchorage for Driver Dummy	A-18
Photo No. 036	Pre-Test Left Side View of Steering Wheel	A-18
Photo No. 037	Pre-Test View of Disengaged Parking Brake	A-19
Photo No. 038	Pre-Test View of Parking Brake	A-19
Photo No. 039	Pre-Test Close-Up Left Side View of Driver Seat Track	A-20
Photo No. 040	Pre-Test Close-Up Left Side View of Driver Seat Back	A-20
Photo No. 041	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-21
Photo No. 042	Pre-Test Driver Dummy and Door Clearance View	A-21
Photo No. 043	Post-Test Driver Dummy and Door Clearance View	A-22
Photo No. 044	Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-22
Photo No. 045	Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-23
Photo No. 046	Pre-Test Driver Inner Door Panel View	A-23
Photo No. 047	Post-Test Driver Inner Door Panel View	A-24
Photo No. 048	Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View	A-24
Photo No. 049	Post-Test Driver Dummy Close-up Head Contact with Side Airbag View	A-25
Photo No. 050	Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View	A-25
Photo No. 051	Post-Test Driver Dummy Close-up Torso Contact with Side Airbag View	A-26
Photo No. 052	Post-Test Driver Dummy Close-up Pelvis Contact with Vehicle Interior View	A-26
Photo No. 053	Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View	A-27
Photo No. 054	Post-Test Driver Dummy Close-up Knee Contact View	A-27
Photo No. 055	Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking	A-28
Photo No. 056	Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-28
Photo No. 057	Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-29

		<u>Page No.</u>
Photo No. 058	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-29
Photo No. 059	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-30
Photo No. 060	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-30
Photo No. 061	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-31
Photo No. 062	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-31
Photo No. 063	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-32
Photo No. 064	Pre-Test Placement of Rear Passenger Dummy's Feet	A-32
Photo No. 065	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-33
Photo No. 066	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-33
Photo No. 067	Pre-Test Close-Up Left Side View of Rear Passenger Seat Back	A-34
Photo No. 068	Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint	A-34
Photo No. 069	Pre-Test Rear Passenger Dummy and Door Clearance View	A-35
Photo No. 070	Post-Test Rear Passenger Dummy and Door Clearance View	A-35
Photo No. 071	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-36
Photo No. 072	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-36
Photo No. 073	Pre-Test Rear Passenger Inner Door Panel View	A-37
Photo No. 074	Post-Test Rear Passenger Inner Door Panel View	A-37
Photo No. 075	Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View	A-38
Photo No. 076	Post-Test Rear Passenger Dummy Close-up Head Contact with Side Airbag View	A-38
Photo No. 077	Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View	A-39
Photo No. 078	Post-Test Rear Passenger Dummy Close-up Torso Contact with Side Airbag View	A-39
Photo No. 079	Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Vehicle Interior View	A-40
Photo No. 080	Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Side Airbag View	A-40
Photo No. 081	Post-Test Rear Passenger Dummy Close-up Knee Contact View	A-41
Photo No. 082	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-41
Photo No. 083	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-42

		<u>Page No.</u>
Photo No. 084	Pre-Test Front View of MDB Impactor Face	A-42
Photo No. 085	Post-Test Front View of MDB Impactor Face	A-43
Photo No. 086	Pre-Test Top View of MDB Impactor Face	A-43
Photo No. 087	Post-Test Top View of MDB Impactor Face	A-44
Photo No. 088	Pre-Test Left Side View of MDB Impactor Face	A-44
Photo No. 089	Post-Test Left Side View of MDB Impactor Face	A-45
Photo No. 090	Pre-Test Right Side View of MDB Impactor Face	A-45
Photo No. 091	Post-Test Right Side View of MDB Impactor Face	A-46
Photo No. 092	Close-Up View of Vehicle's Certification Label	A-46
Photo No. 093	Close-Up View of Vehicle's Tire Information Placard or Label	A-47
Photo No. 094	Pre-Test Ballast View	A-47
Photo No. 095	Post-Test Primary and Redundant Speed Trap Read-Out	A-48
Photo No. 096	FMVSS No. 301 Static Rollover 0 Degrees	A-48
Photo No. 097	FMVSS No. 301 Static Rollover 90 Degrees	A-49
Photo No. 098	FMVSS No. 301 Static Rollover 180 Degrees	A-49
Photo No. 099	FMVSS No. 301 Static Rollover 270 Degrees	A-50
Photo No. 100	FMVSS No. 301 Static Rollover 360 Degrees	A-50
Photo No. 101	Impact Event	A-51
Photo No. 102	Monroney Label	A-51
Photo No. 103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52
Photo No. 104	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52



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



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

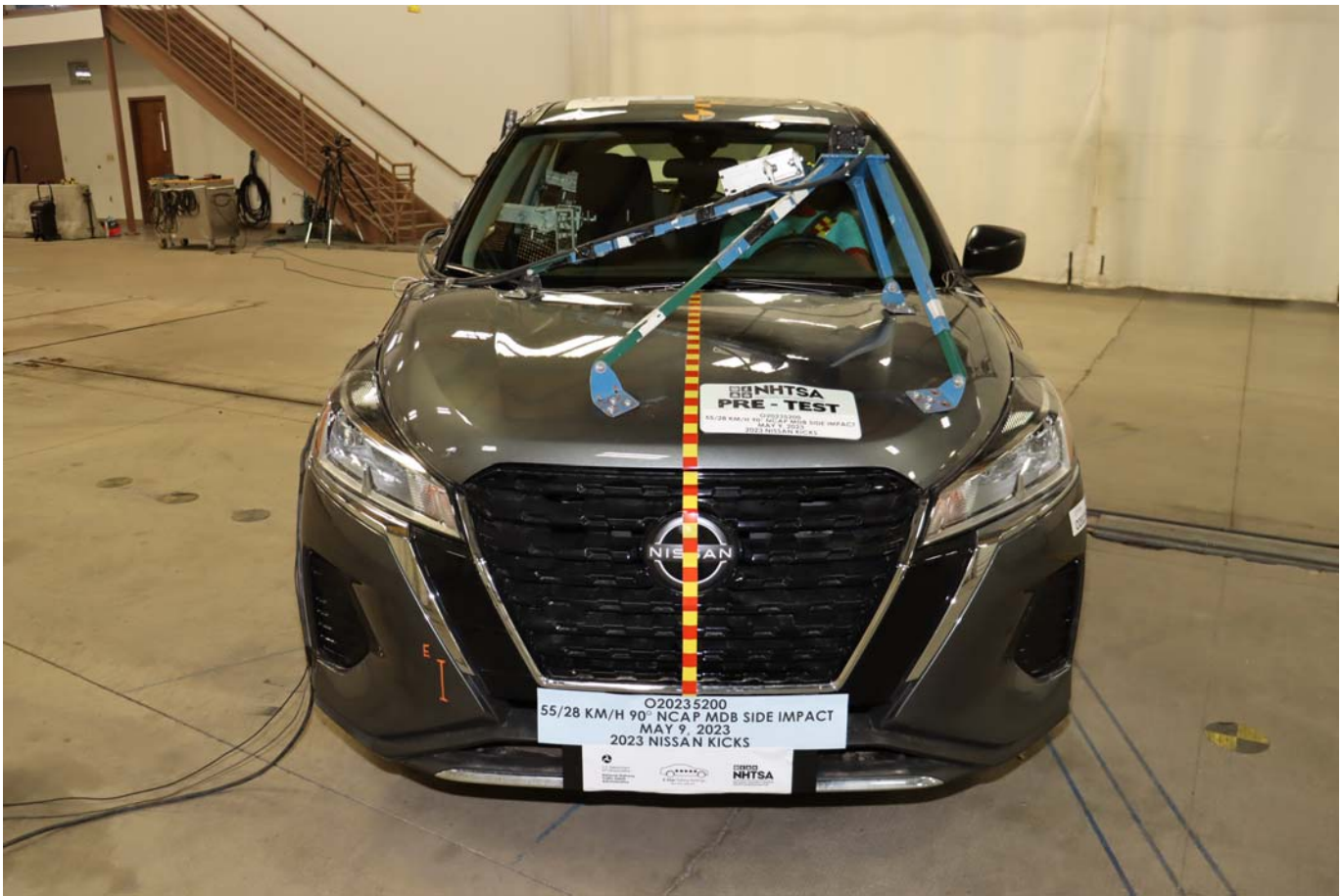


Photo No. 003 - Pre-Test Frontal View of Test Vehicle

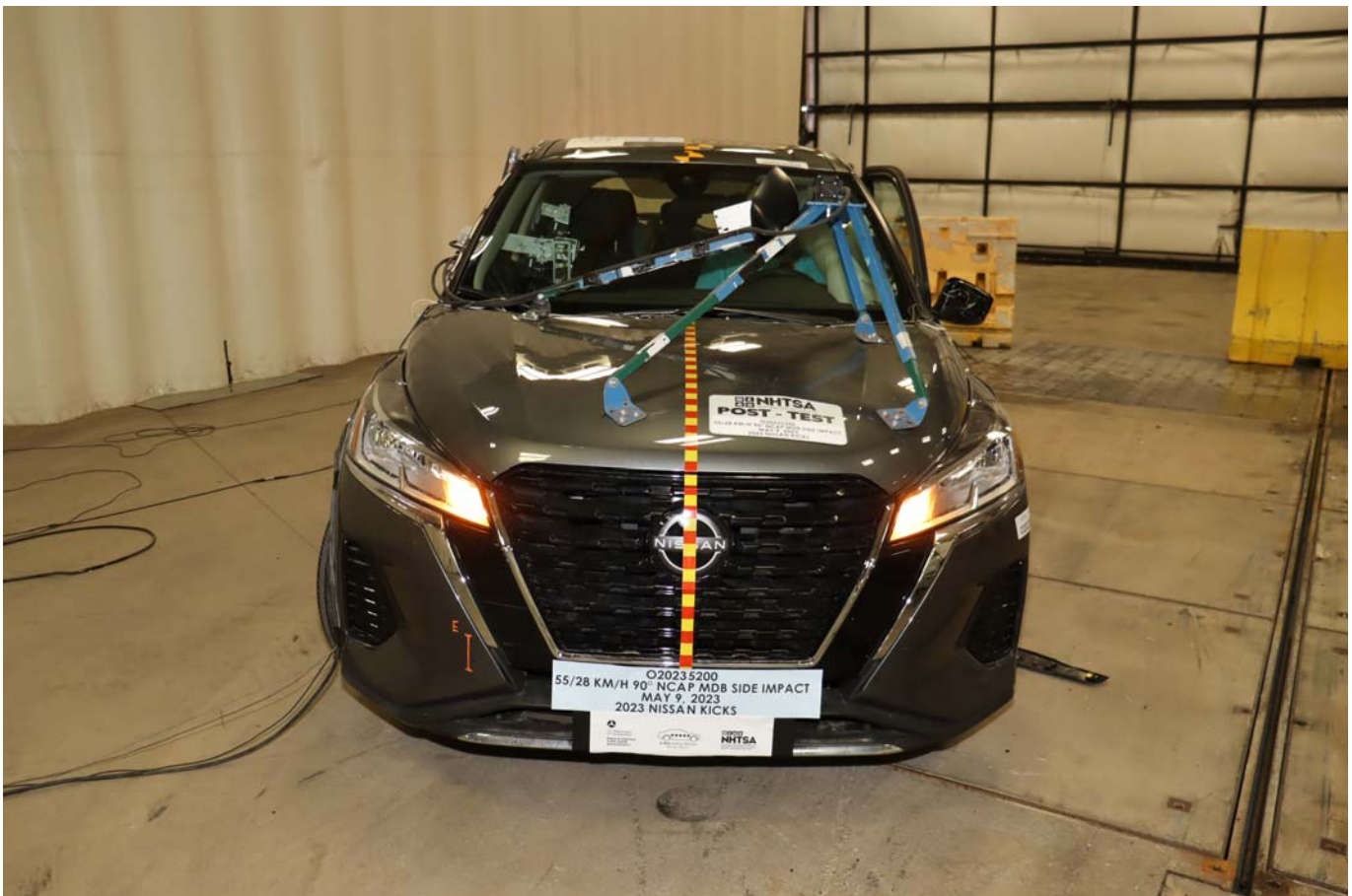


Photo No. 004 - Post-Test Frontal View of Test Vehicle



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



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



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



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



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

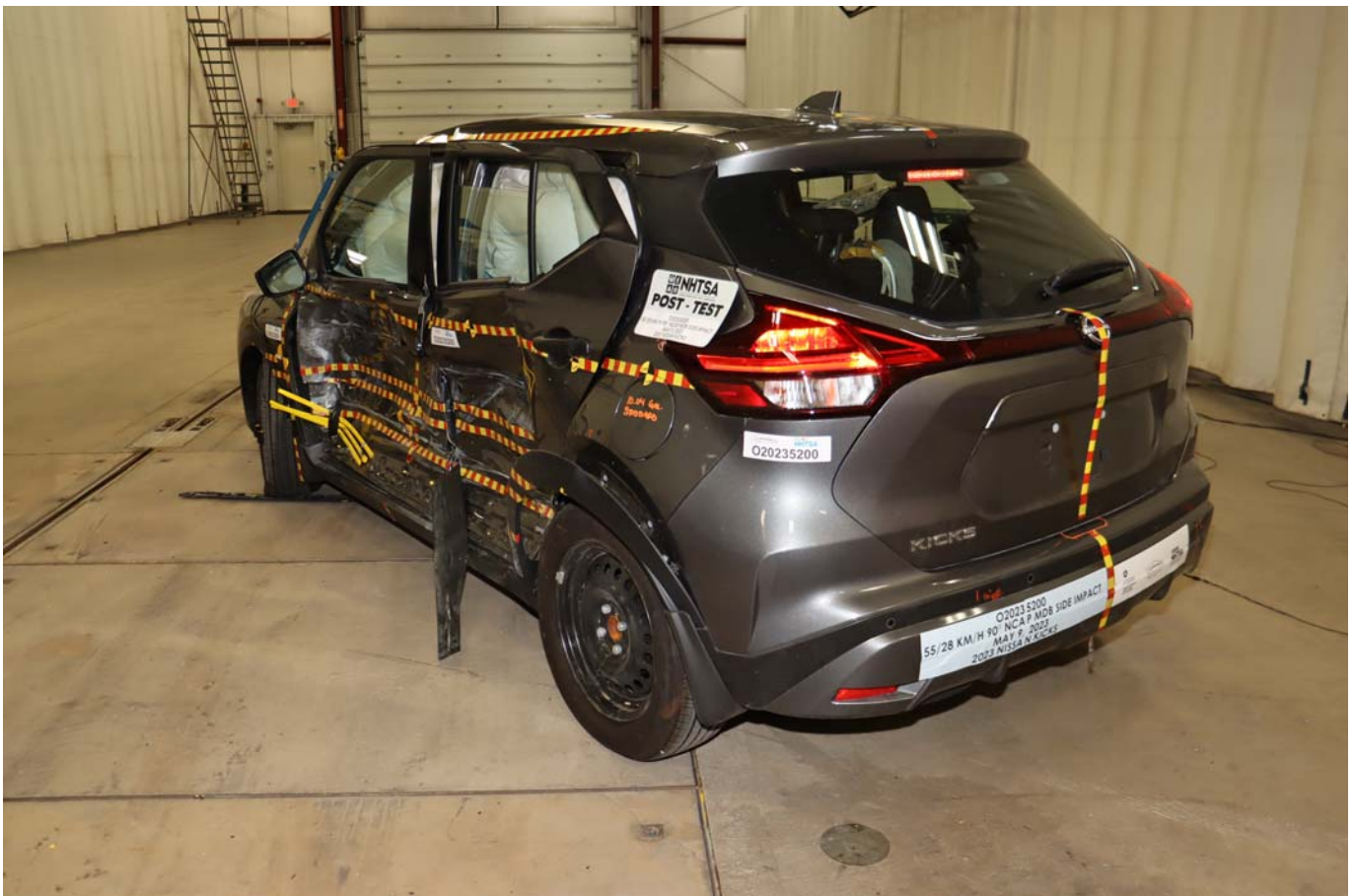


Photo No. 010 - Post-Test Left Three-Quarter Rear View of Test Vehicle

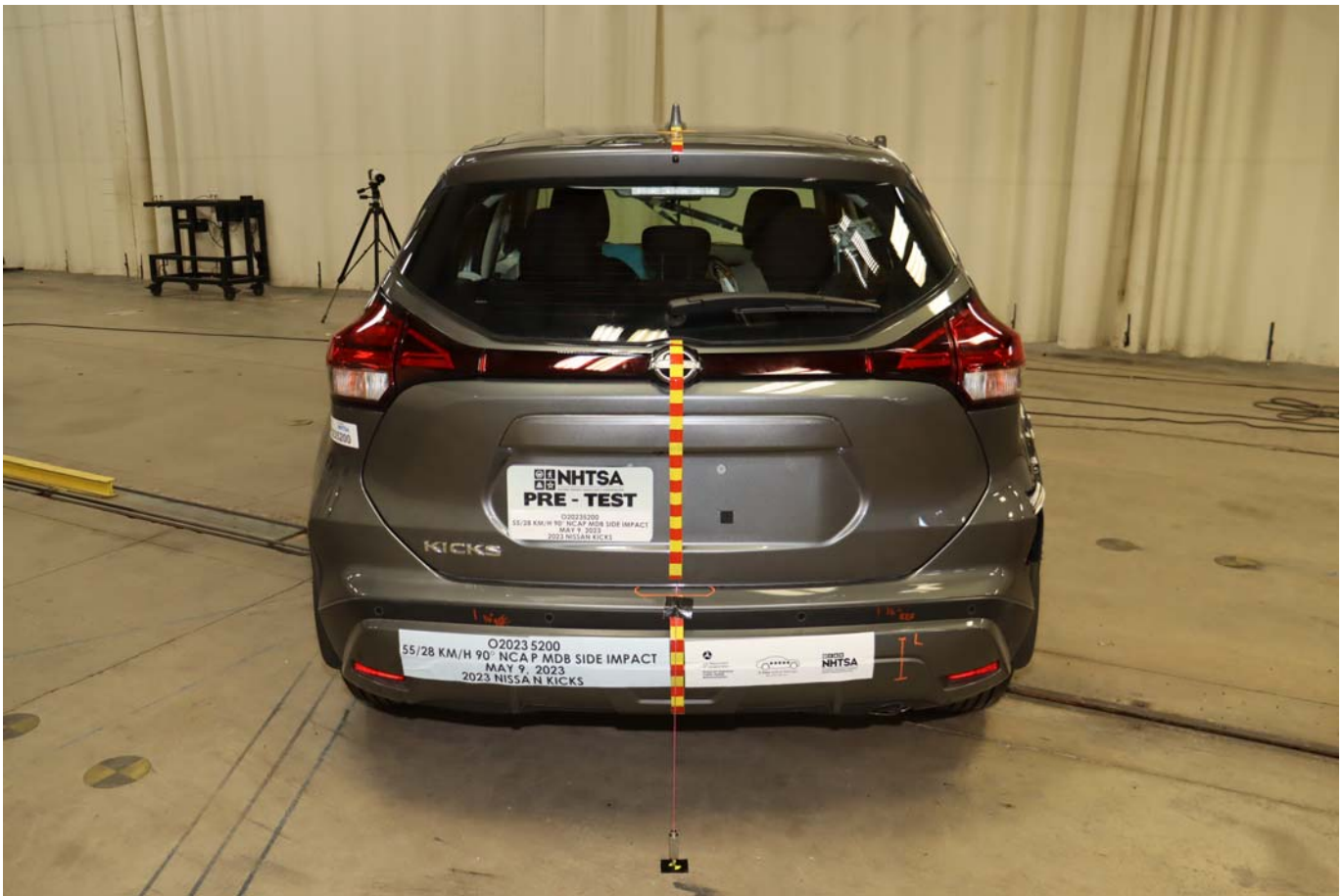


Photo No. 011 - Pre-Test Rear View of Test Vehicle

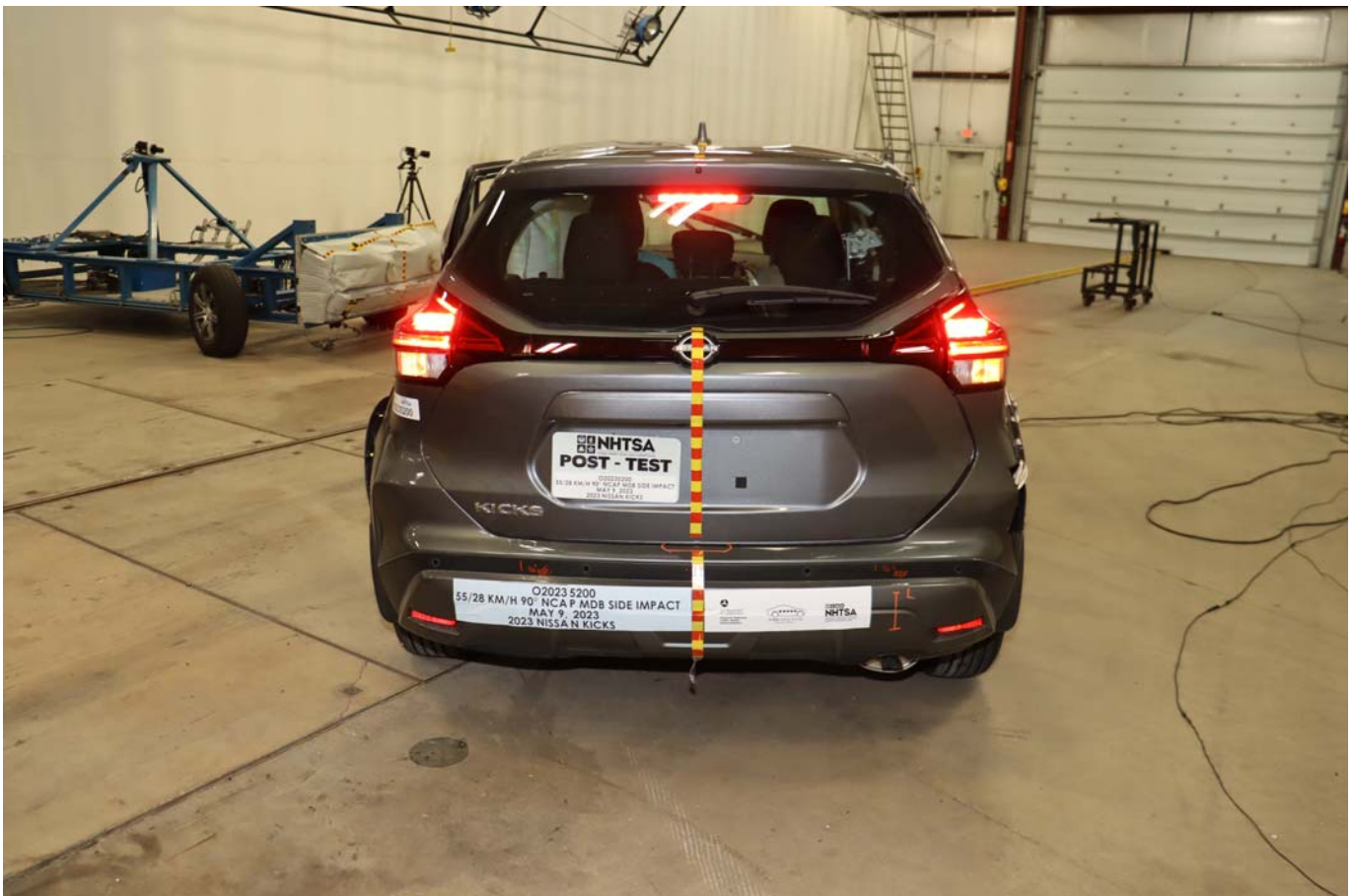


Photo No. 012 - Post-Test Rear View of Test Vehicle



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

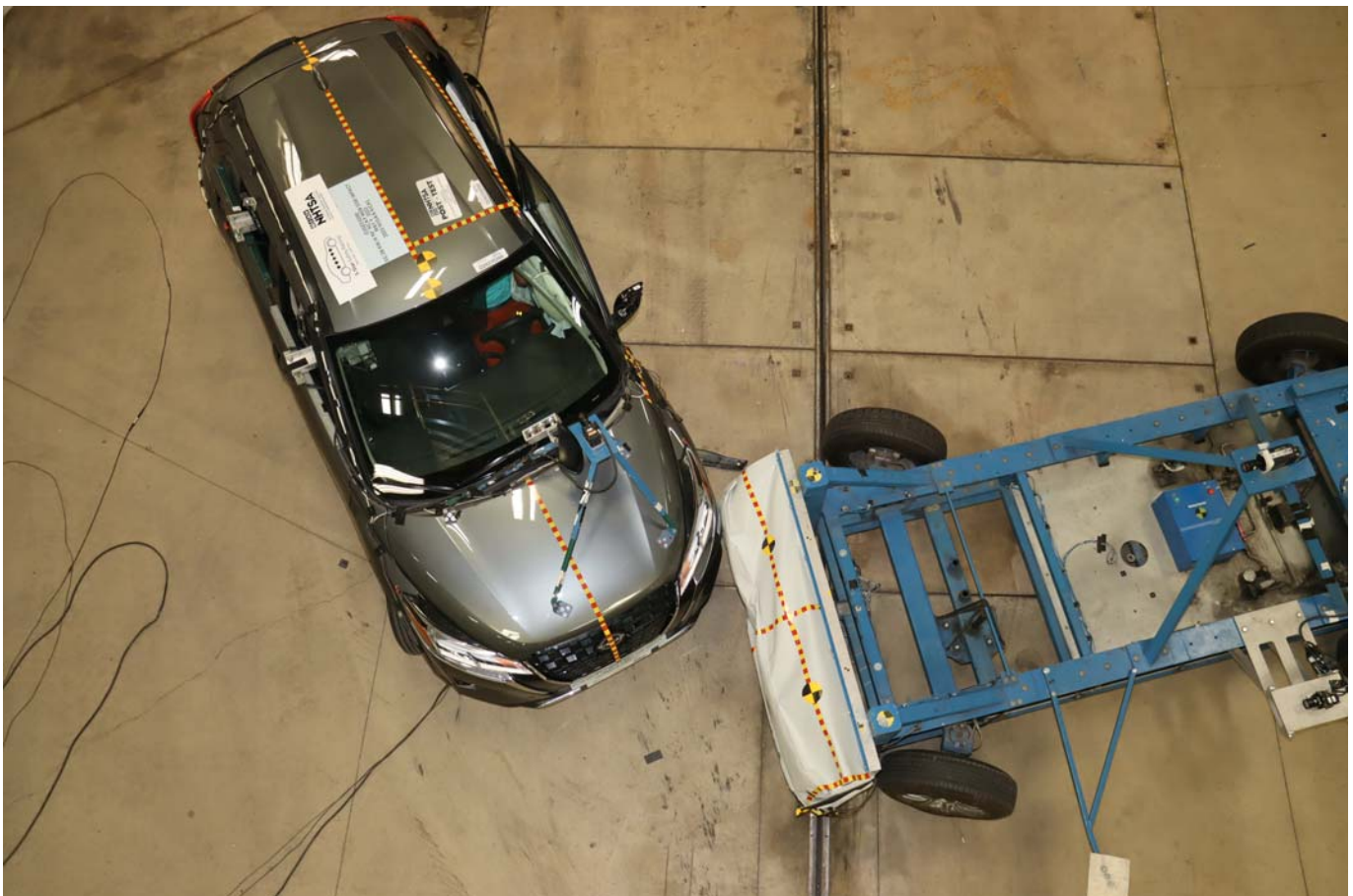


Photo No. 016 - Post-Test Overhead View of Test Area



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



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

PHOTOGRAPH NOT AVAILABLE

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

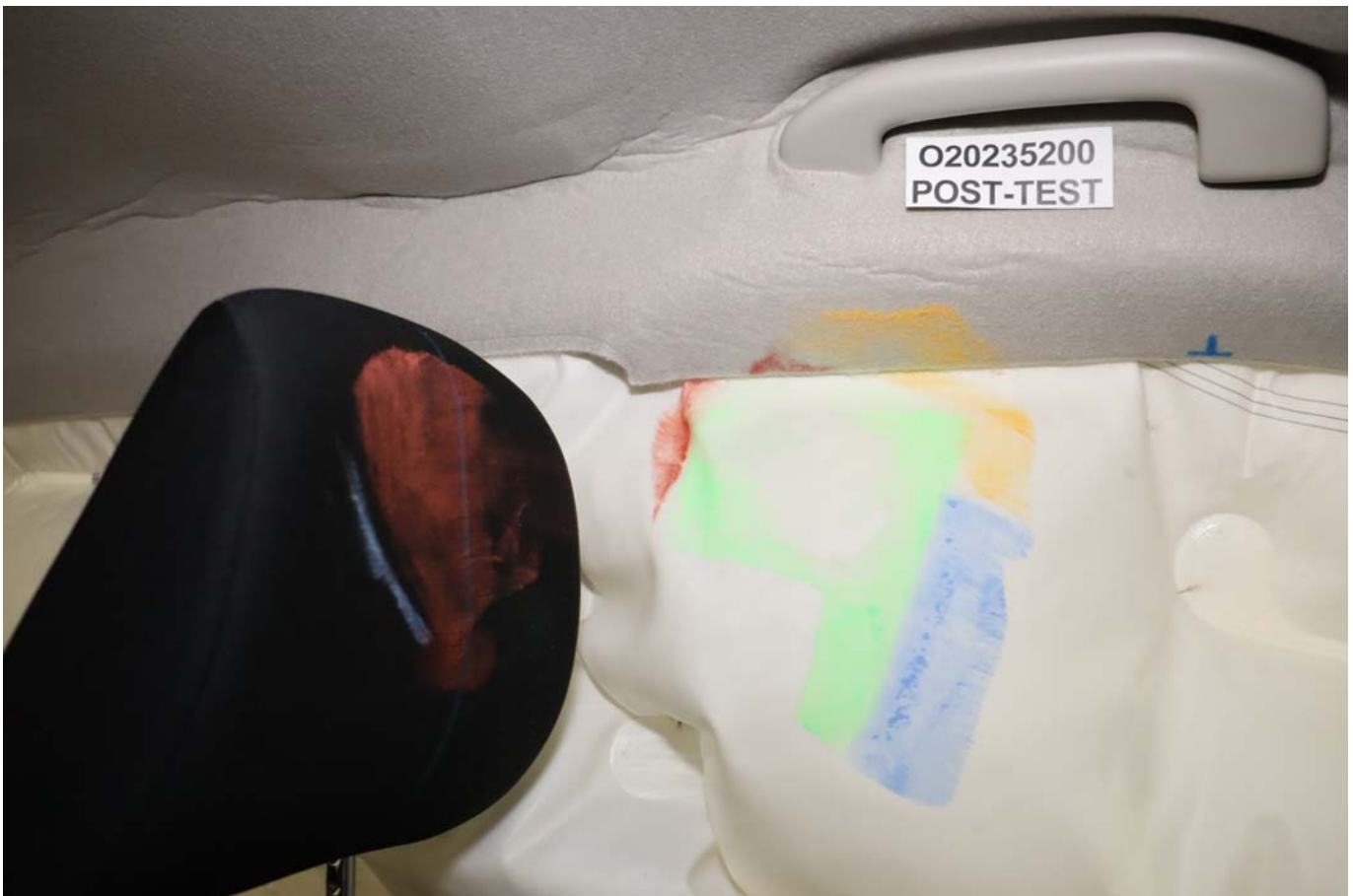


Photo No. 048 - Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View



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

PHOTOGRAPH NOT APPLICABLE

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



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

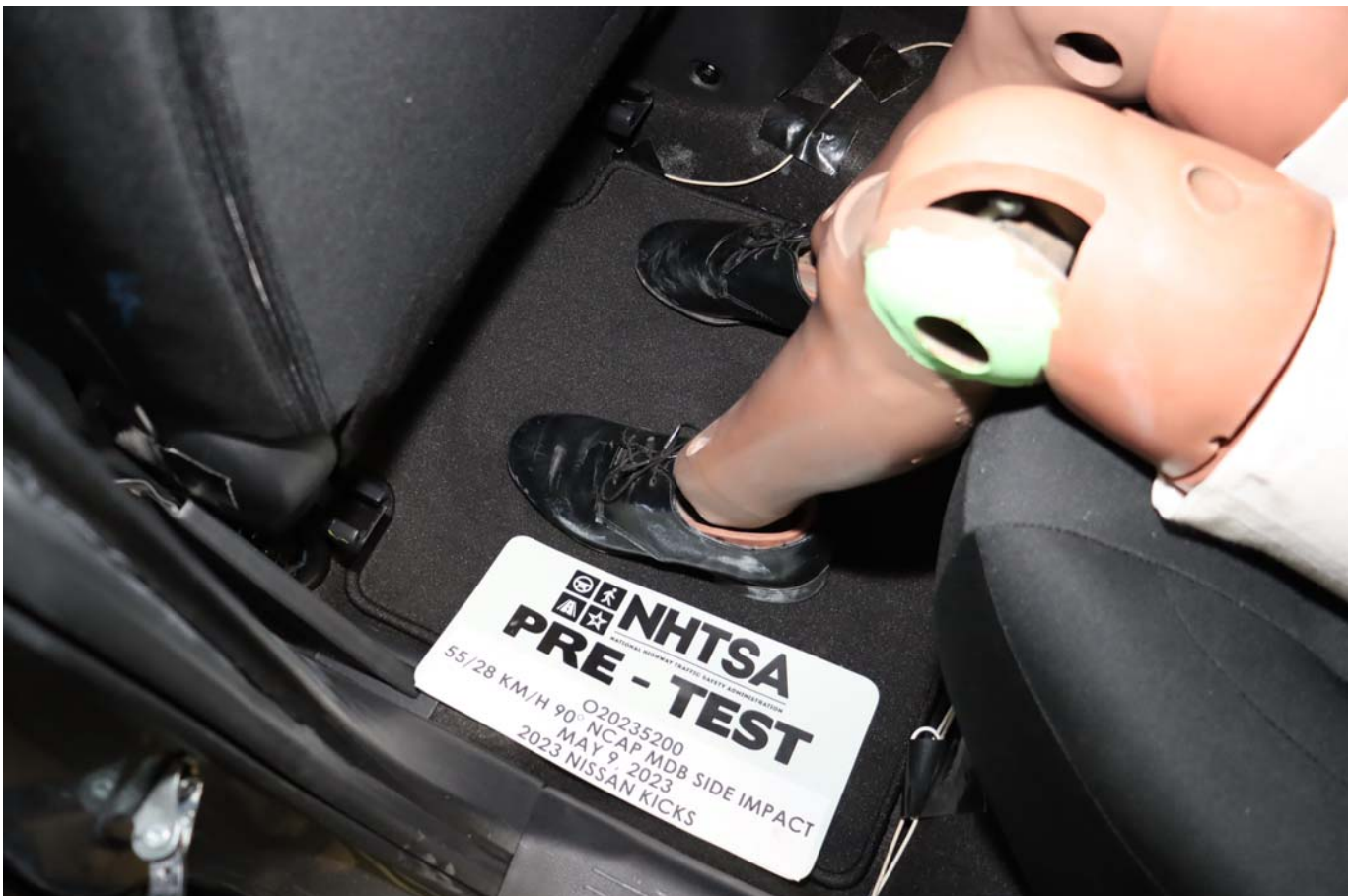


Photo No. 064 - Pre-Test Placement of Rear Passenger Dummy's Feet



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

PHOTOGRAPH NOT APPLICABLE

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

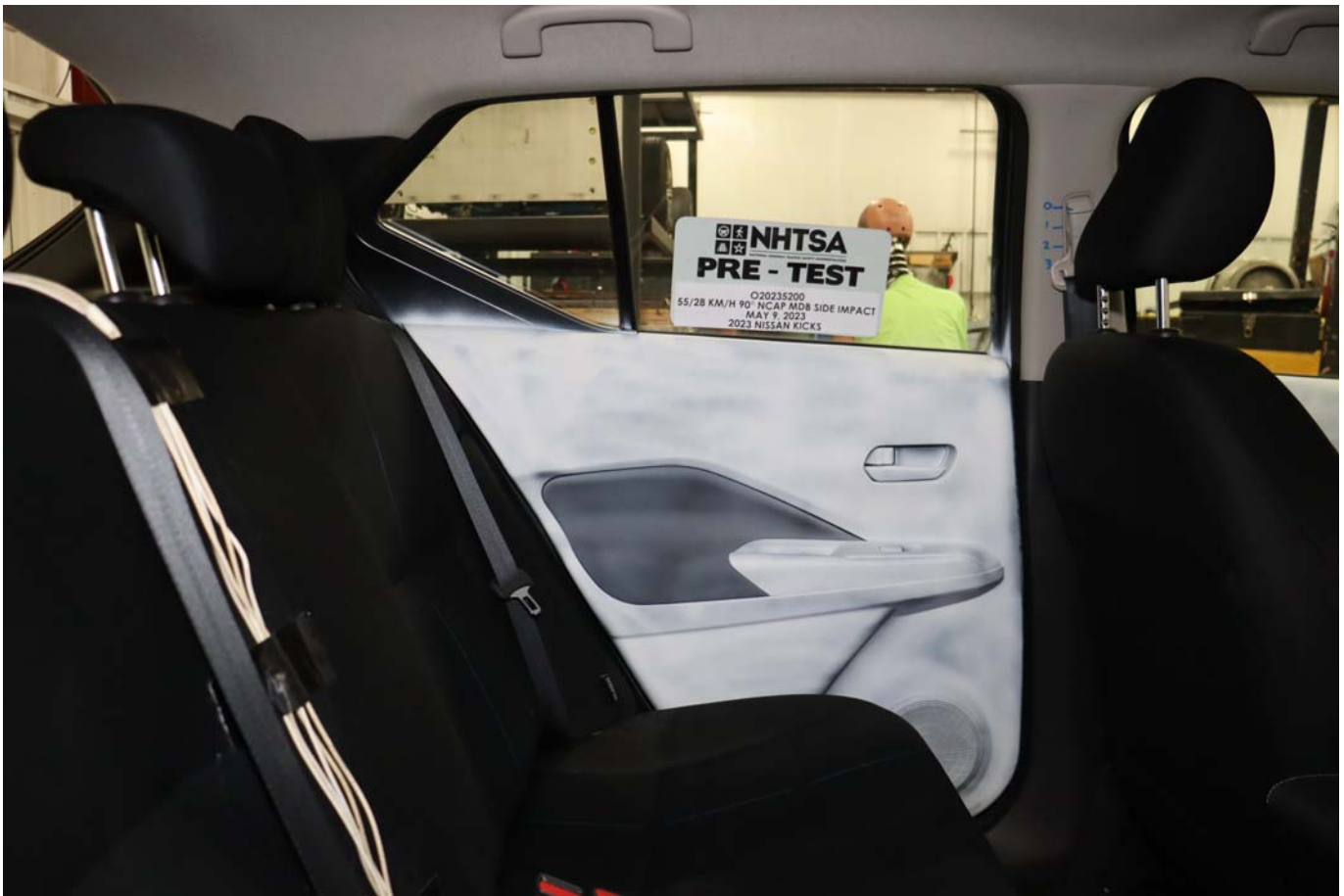


Photo No. 073 - Pre-Test Rear Passenger Inner Door Panel View



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

PHOTOGRAPH NOT APPLICABLE

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

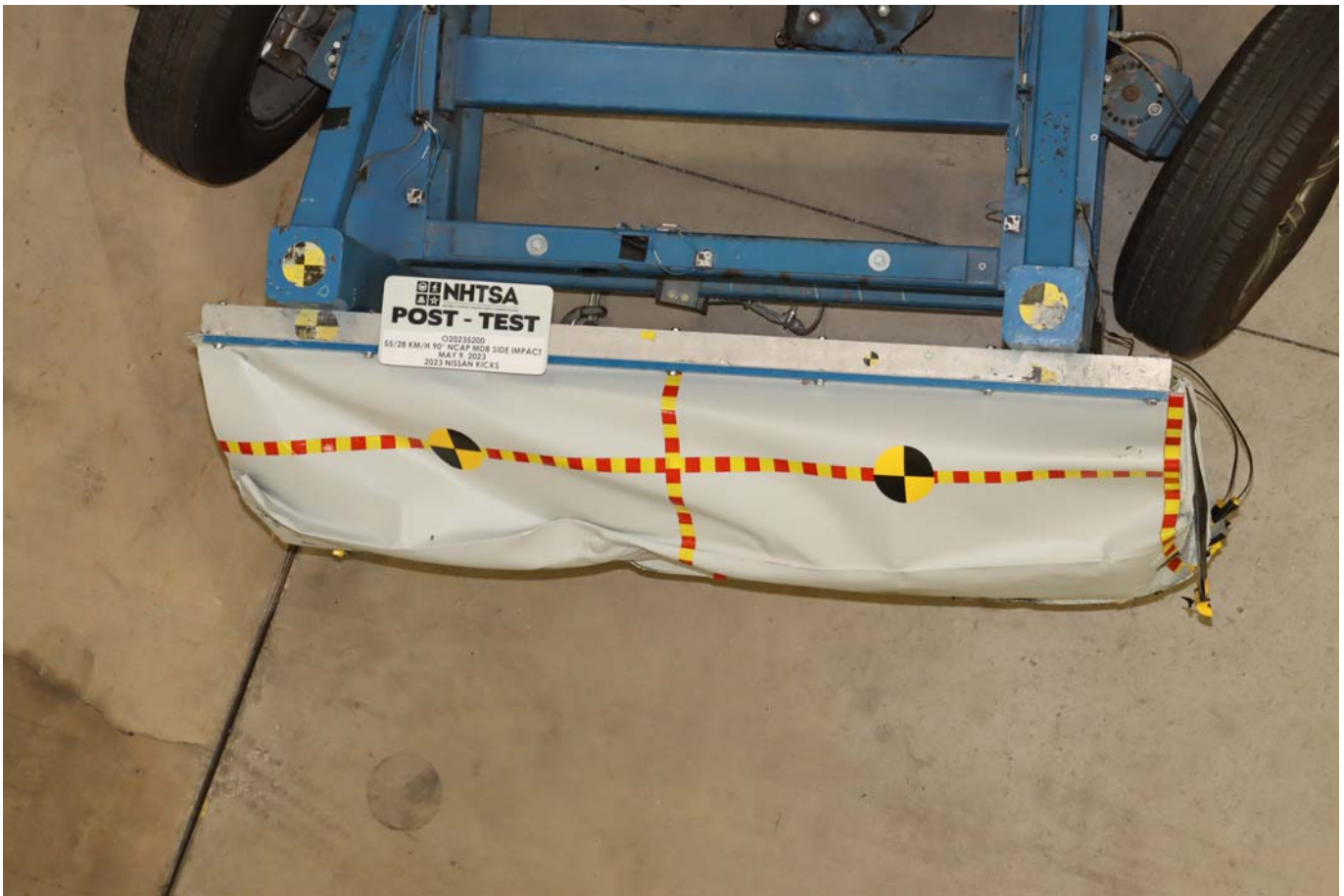


Photo No. 087 - Post-Test Top View of MDB Impactor Face



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

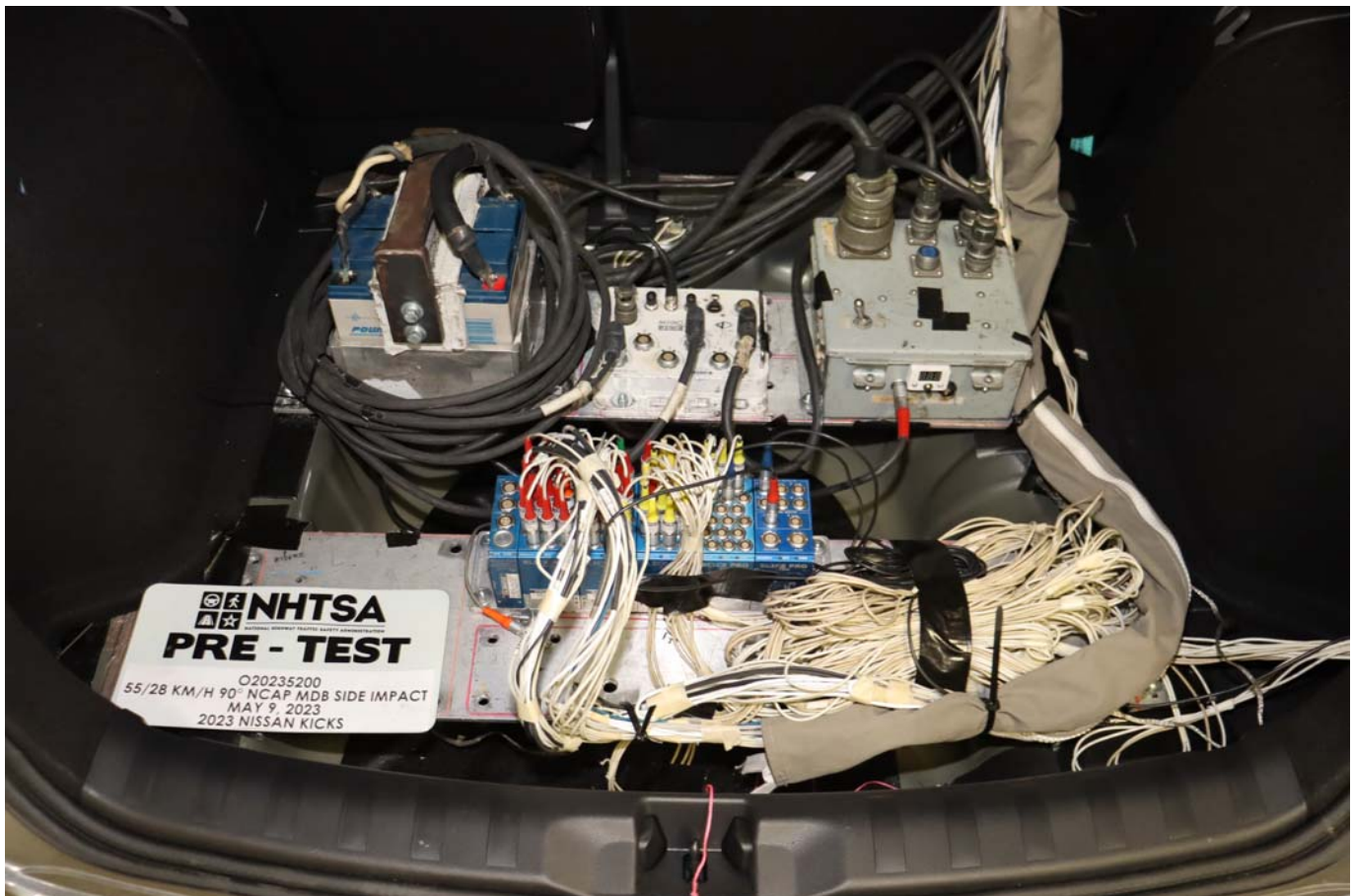


Photo No. 094 - Pre-Test Ballast View



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 NISSAN KICKS
S CVT



Scan QR code for general model information & options

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
1.6 L DOHC 16-Valve 4-Cylinder Engine
Xtronic CVT (Continuously Variable Transmission)

SAFETY & SECURITY
Nissan Advanced Air Bag System
Automatic Emergency Braking (AEB) w/Pedestrian Detection
Forward Collision Warning (FCW)
Rear Automatic Braking (RAB)
Blind Spot Warning (BSW)
Rear Cross Traffic Alert (RCTA)
Lane Departure Warning (LDW)
Haptic Steering Wheel
High Beam Assist (HBA)
Rear Sonar

COMFORT & CONVENIENCE
3 USB Ports (2 charge only)
4-Way Adjustable Cloth Front Bucket Seats
Easy Fill Tire Alert
Cruise Control with Steering Wheel Mounted Controls

AUDIO & INFOTAINMENT
7" Color Touchscreen Display Audio System w/ 6 Speakers
Apple CarPlay®+
Android Auto™+
Sirius Eyes Free+

EXTERIOR
16" Steel Wheels w/ Full Wheel Covers
Intelligent Auto Headlights

+For more information, see dealer, see dealer, owner's manual, or www.NissanUSA.com/connect/legal

++Optional equipment replaces standard equipment where applicable

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

Manufacturer's Suggested Retail Base Price: \$20,290.00

Options Included by Manufacturer

SPLASH GUARDS	205.00
CENTER ARMREST W/STORAGE	320.00
CARPETED FLOOR MATS W/CARGO MAT	225.00

DESTINATION CHARGES 1,295.00

Total* **\$22,335.00**

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy MIDSIZE CARS range from 15 to 132 MPG. The best vehicle rates 132 MPG.

33 MPG
combined city/hwy

31 city 36 highway *56 mi*

3.0 gallons per 100 miles

You save \$1,250 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,350

Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only)

1 6 10 7 10
Worst Best Worst Best

This vehicle emits 269 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fuelconomy.gov

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 \$2.95 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 RATINGS

Overall Vehicle Score ★★★★★
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 ★★★★★
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 ★★★★★
Based on the risk of injury in a side impact.	
Rollover	★★★★★
Based on the risk of rollover in a single-vehicle crash.	

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

DELIVERY

VEHICLE COLORS:
EXT: GUN METALLIC
INT: CHARCOAL

FINAL ASSEMBLY POINT:
AGUAS/ABV/MEX

TRANSPORT METHOD:
TRUCK

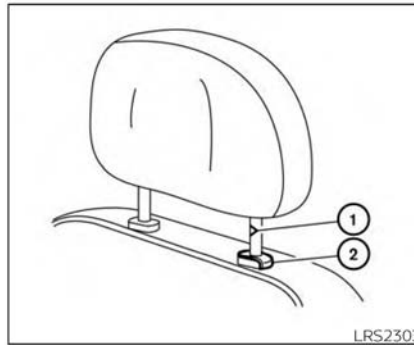
DEALER:
GORDIE BOUCHER NISSAN
4141 S. 108TH STREET
GREENFIELD WI 53228

VIN: 3N1CP5B6VPL505510
EMS: 50 STATE EMISSIONS
MDL: 21013-505510 KAD-G
OPT: E-892N95L92C03

20230124235807A53070

Photo No. 102 - Monroney Label

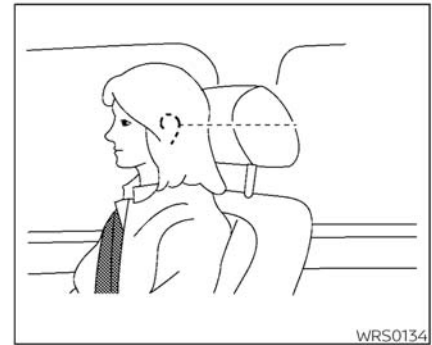
3. Remove the head restraint/headrest from the seat.
4. Store the head restraint/headrest properly in a secure place so it is not loose in the vehicle.
5. Reinstall and properly adjust the head restraint/headrest before an occupant uses the seating position.



LRS2303

INSTALL

1. Align the head restraint/headrest stalks with the holes in the seat. Make sure that the head restraint/headrest is facing the correct direction. The stalk with the notch (notches) ① must be installed in the hole with the lock knob ②.
2. Push and hold the lock knob and push the head restraint/headrest down.
3. Properly adjust the head restraint/headrest before an occupant uses the seating position.



WRS0134

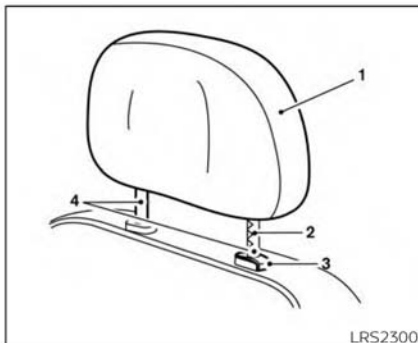
ADJUST

For adjustable head restraint/headrest

Adjust the head restraint/headrest so the center is level with the center of your ears. If your ear position is still higher than the recommended alignment, place the head restraint/headrest at the highest position.

1-8 Safety-Seats, seat belts and supplemental restraint system

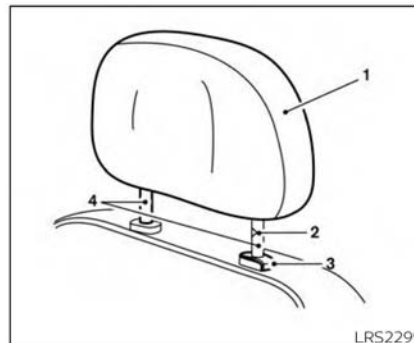
Photo No. 103 - Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



LRS2300

ADJUSTABLE HEAD RESTRAINT/ HEADREST COMPONENTS

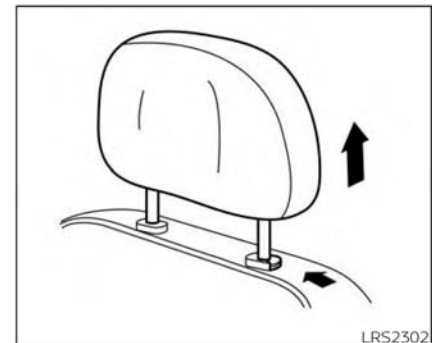
1. Removable head restraint/headrest
2. Multiple notches
3. Lock knob
4. Stalks



LRS2299

NON-ADJUSTABLE HEAD RESTRAINT/HEADREST COMPONENTS

1. Removable head restraint/headrest
2. Single notch
3. Lock knob
4. Stalks



LRS2302

REMOVE

CAUTION

Do not remove head restraint/headrest from vehicles equipped with a Bose head restraint/headrest speaker system. Removal will damage the system wiring.

Use the following procedure to remove the head restraint/headrest:

1. Pull the head restraint/headrest up to the highest position.
2. Push and hold the lock knob.

Safety-Seats, seat belts and supplemental restraint system 1-7

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

APPENDIX B
DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

<u>No.</u>	<u>Description</u>	<u>Page No.</u>
Figure No. 1.	Driver Head Acceleration (X) Primary vs. Time	B-1
Figure No. 2.	Driver Head Acceleration (Y) Primary vs. Time	B-1
Figure No. 3.	Driver Head Acceleration (Z) Primary vs. Time	B-1
Figure No. 4.	Driver Head Resultant Acceleration Primary vs. Time	B-1
Figure No. 5.	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 6.	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 7.	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 8.	Driver Thorax Rib Deflection Maximum vs. Time	B-2
Figure No. 9.	Driver Anterior Abdomen Force (Y) vs. Time	B-3
Figure No. 10.	Driver Middle Abdomen Force (Y) vs. Time	B-3
Figure No. 11.	Driver Posterior Abdomen Force (Y) vs. Time	B-3
Figure No. 12.	Driver Total Abdominal Force (Y) vs. Time	B-3
Figure No. 13.	Driver Pubic Symphysis Force (Y) vs. Time	B-4
Figure No. 14.	Passenger Head Acceleration (X) Primary vs. Time	B-5
Figure No. 15.	Passenger Head Acceleration (Y) Primary vs. Time	B-5
Figure No. 16.	Passenger Head Acceleration (Z) Primary vs. Time	B-5
Figure No. 17.	Passenger Head Resultant Acceleration Primary vs. Time	B-5
Figure No. 18.	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
Figure No. 19.	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
Figure No. 20.	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
Figure No. 21.	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
Figure No. 22.	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
Figure No. 23.	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
Figure No. 24.	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

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

Additional Driver & 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)

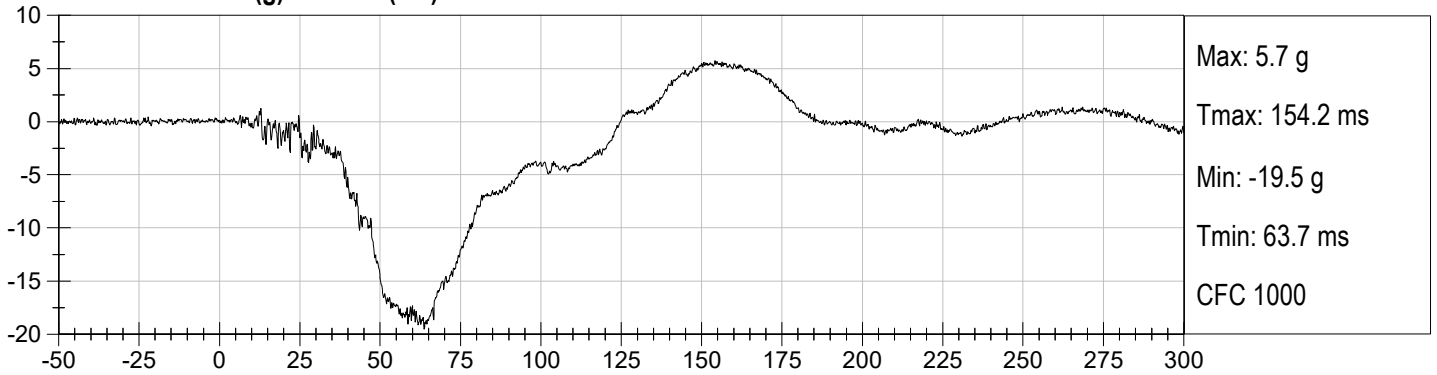
MDB Rear Acceleration (X)

MDB Rear Acceleration (Y)

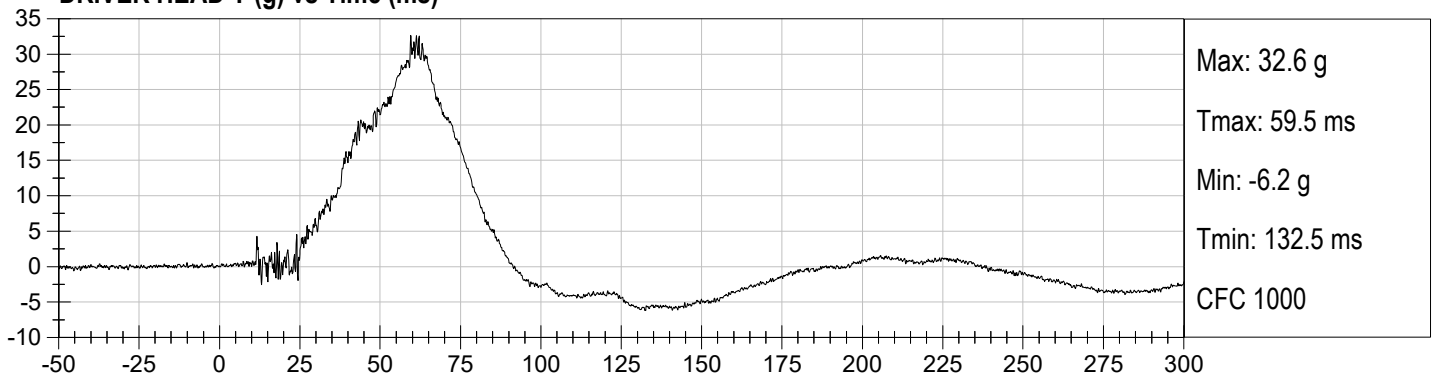
Left MDB Contact Switch

Right MDB Contact Switch

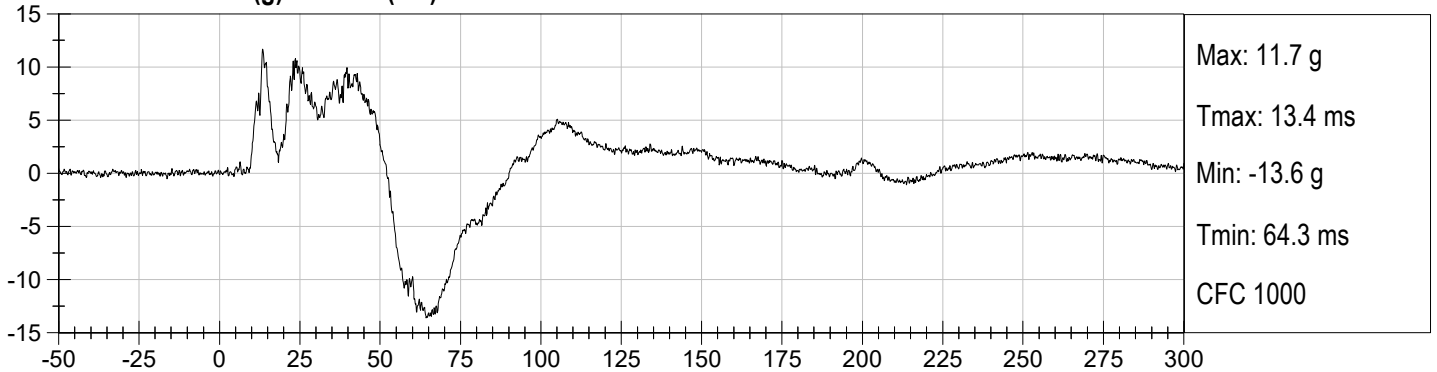
DRIVER HEAD X (g) vs Time (ms)



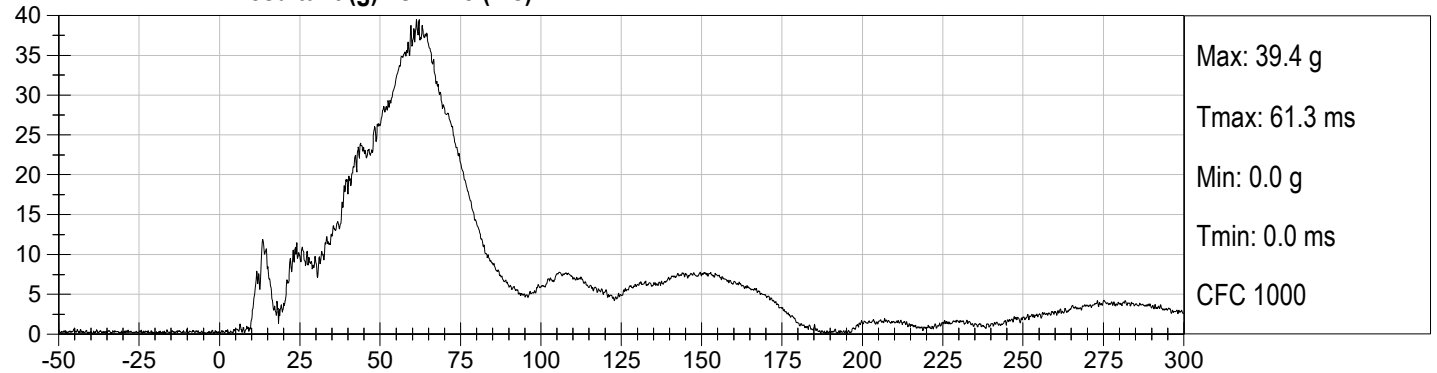
DRIVER HEAD Y (g) vs Time (ms)



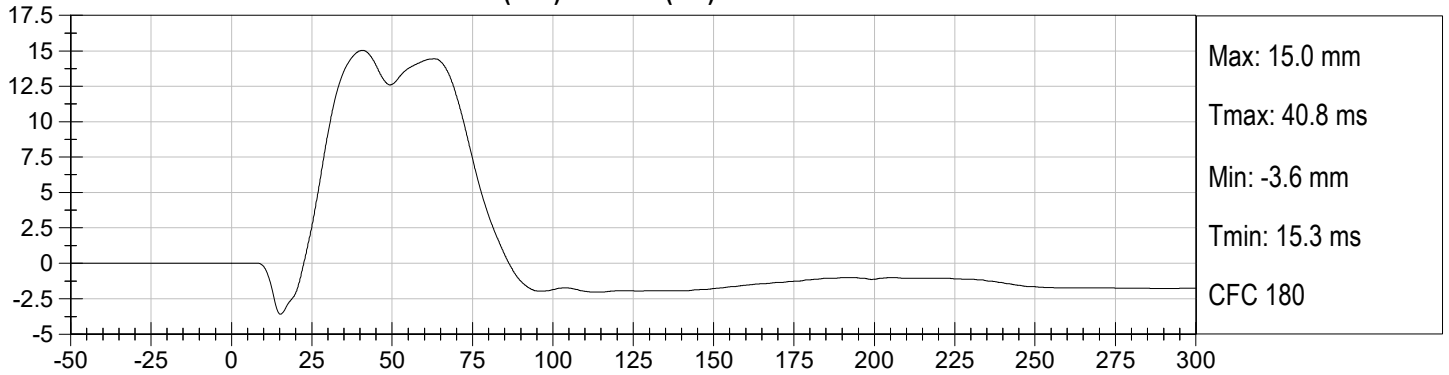
DRIVER HEAD Z (g) vs Time (ms)



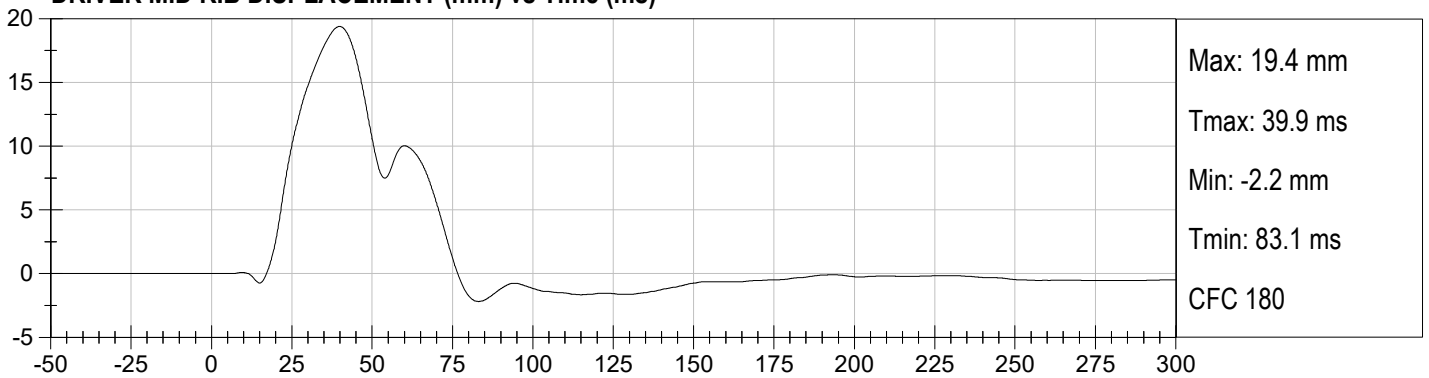
DRIVER HEAD Resultant (g) vs Time (ms)



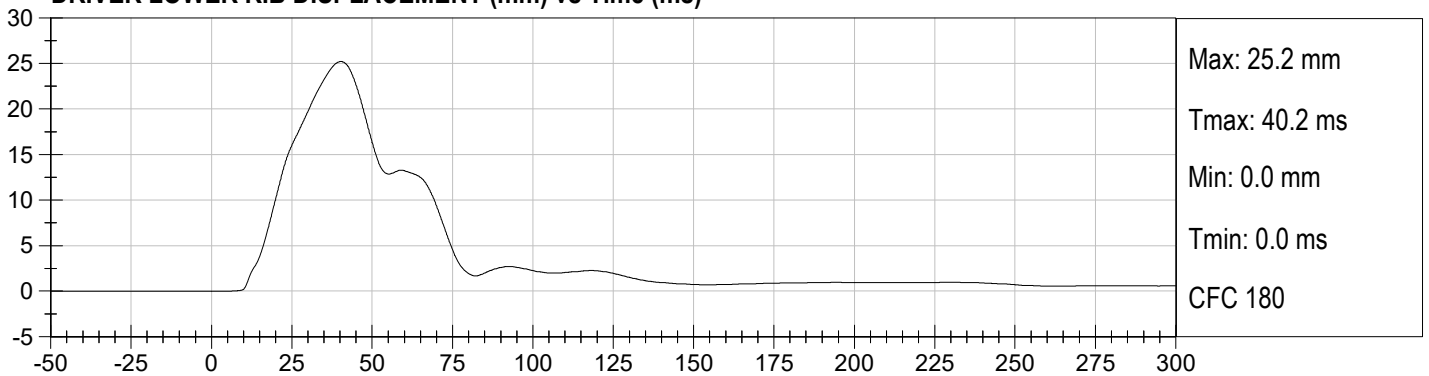
DRIVER UPPER RIB DISPLACEMENT (mm) vs Time (ms)



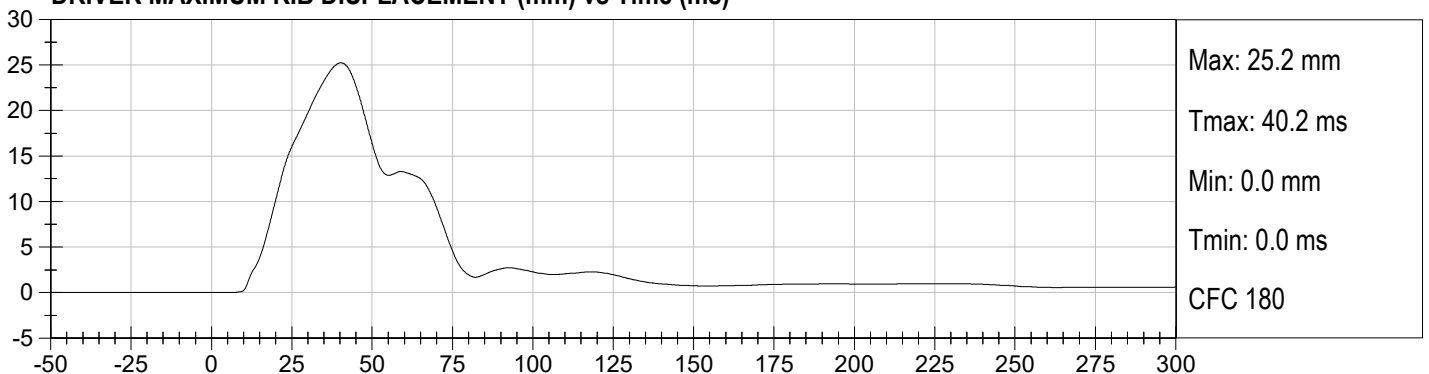
DRIVER MID RIB DISPLACEMENT (mm) vs Time (ms)



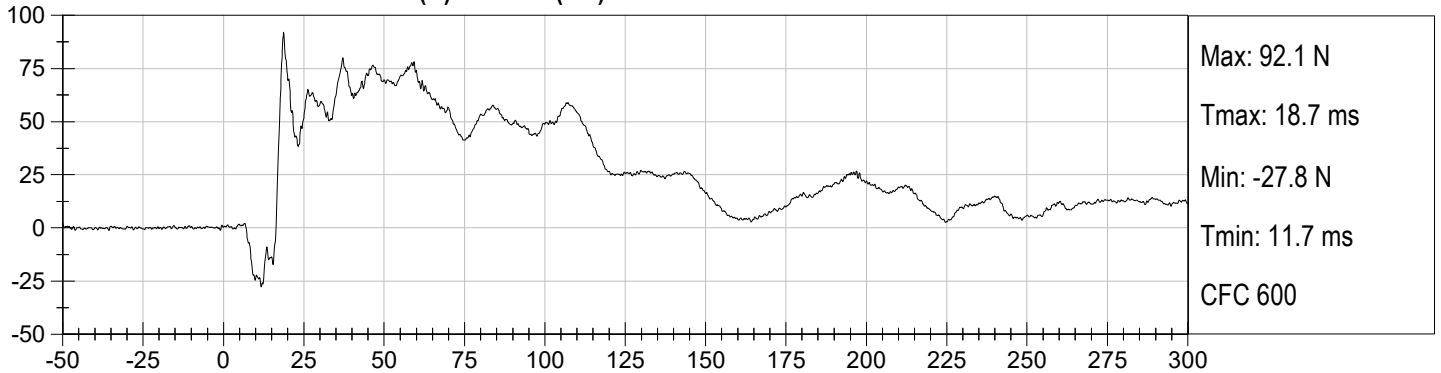
DRIVER LOWER RIB DISPLACEMENT (mm) vs Time (ms)



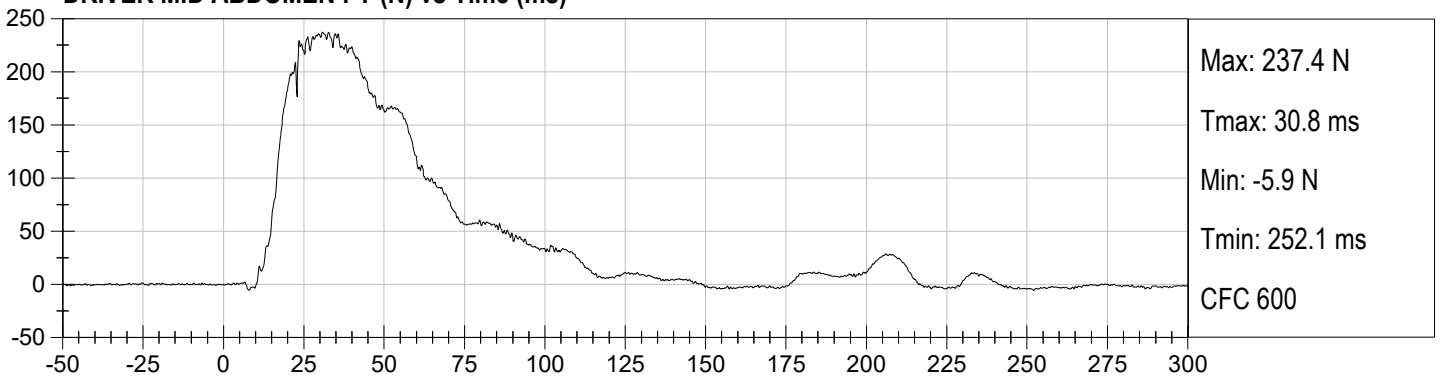
DRIVER MAXIMUM RIB DISPLACEMENT (mm) vs Time (ms)



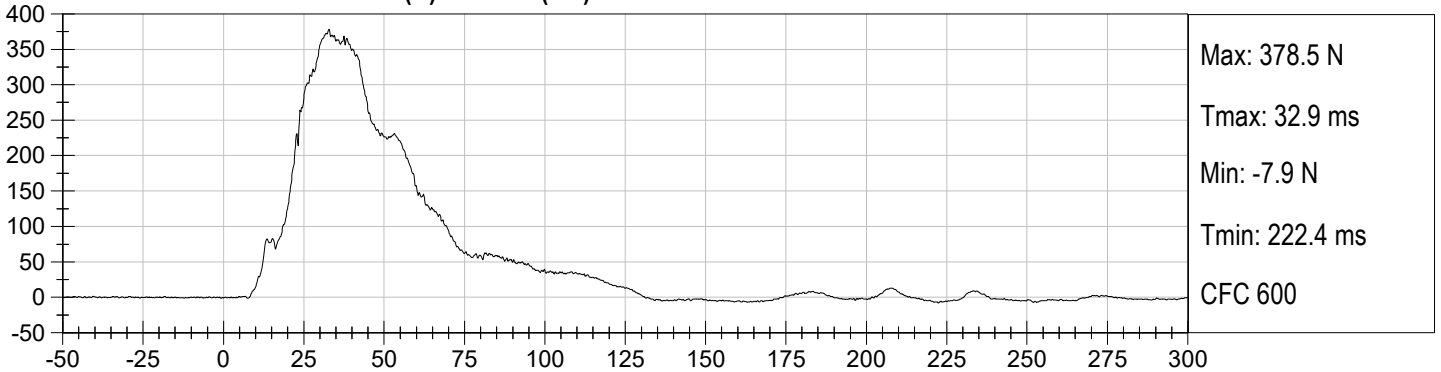
DRIVER FRONT ABDOMEN FY (N) vs Time (ms)



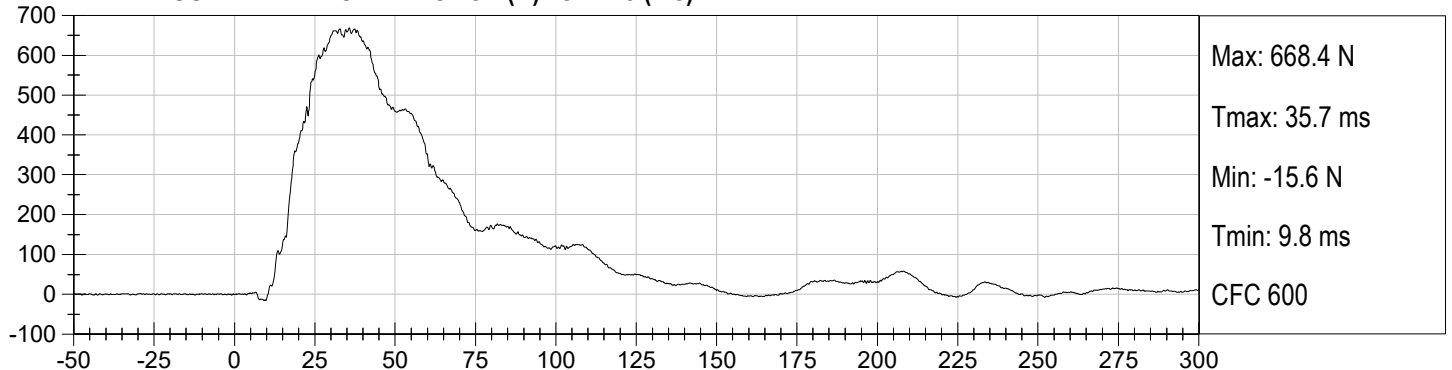
DRIVER MID ABDOMEN FY (N) vs Time (ms)

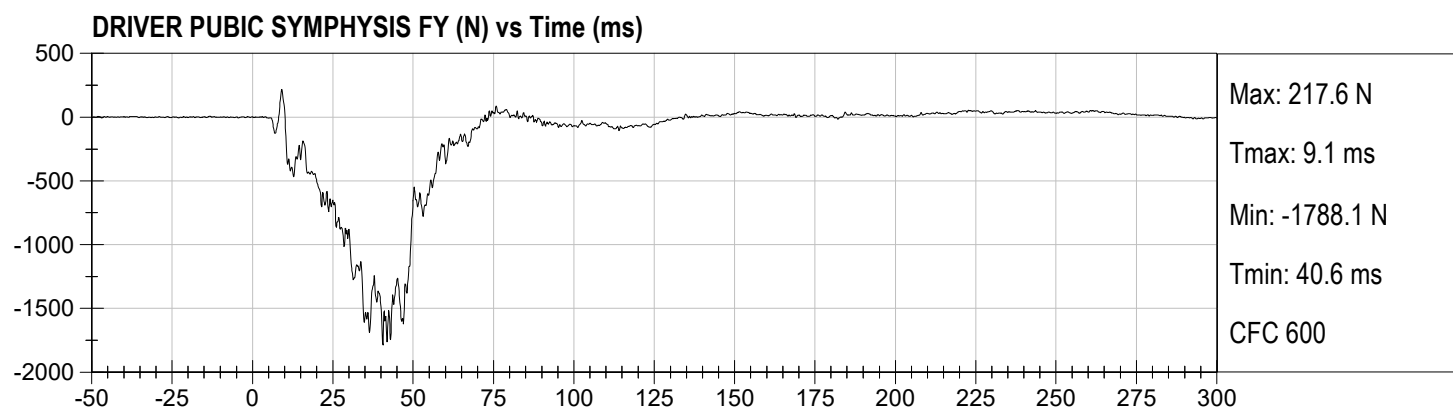


DRIVER REAR ABDOMEN FY (N) vs Time (ms)

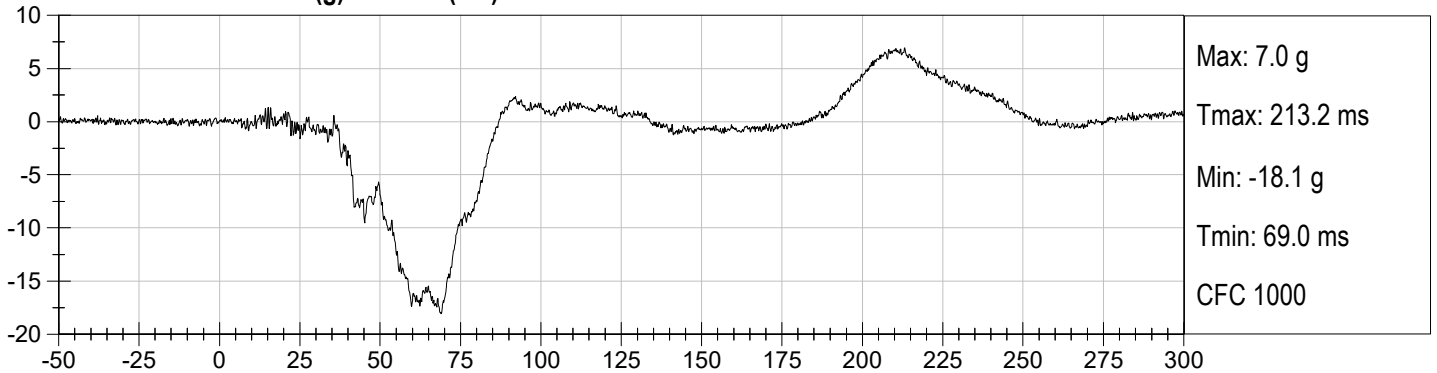


DRIVER SUMMED ABDOMEN FORCE (N) vs Time (ms)

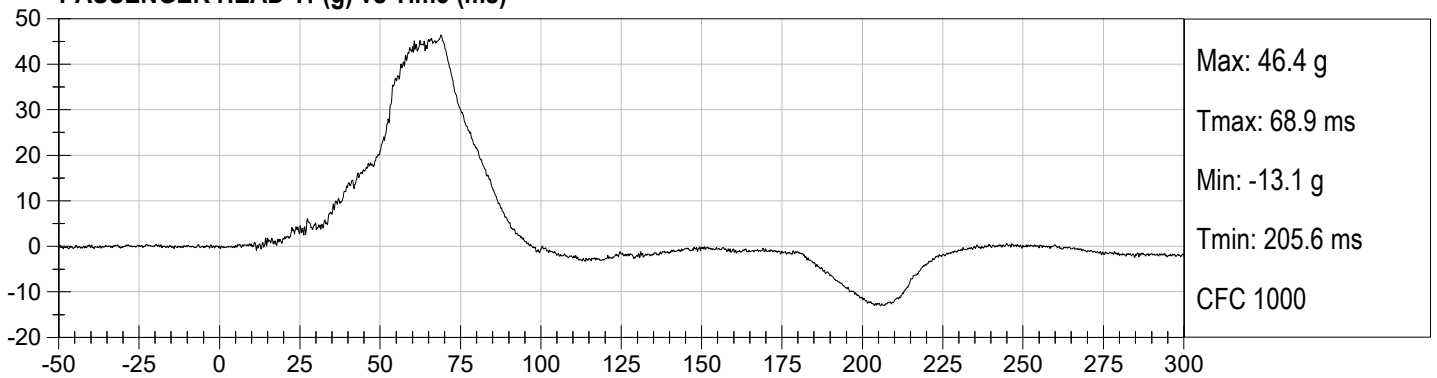




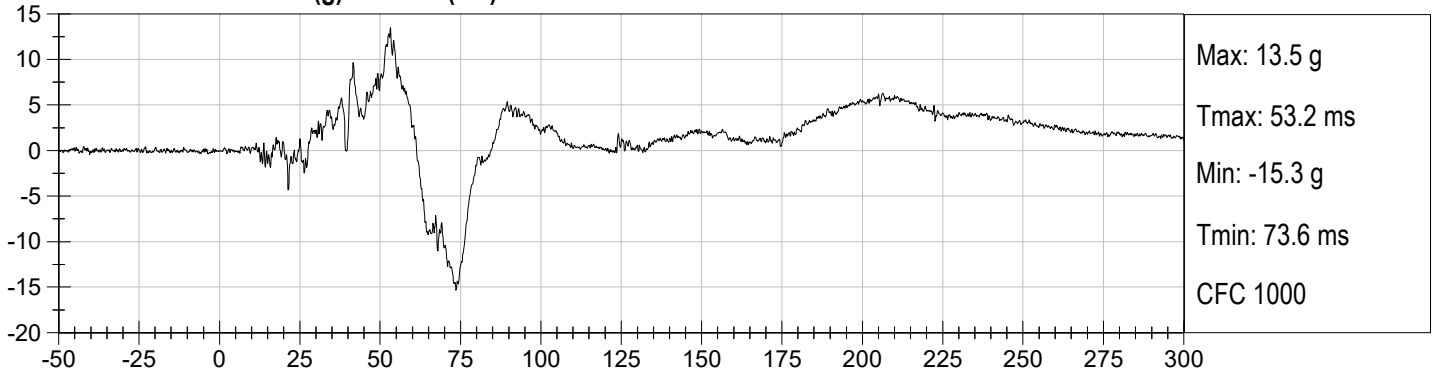
PASSENGER HEAD X (g) vs Time (ms)



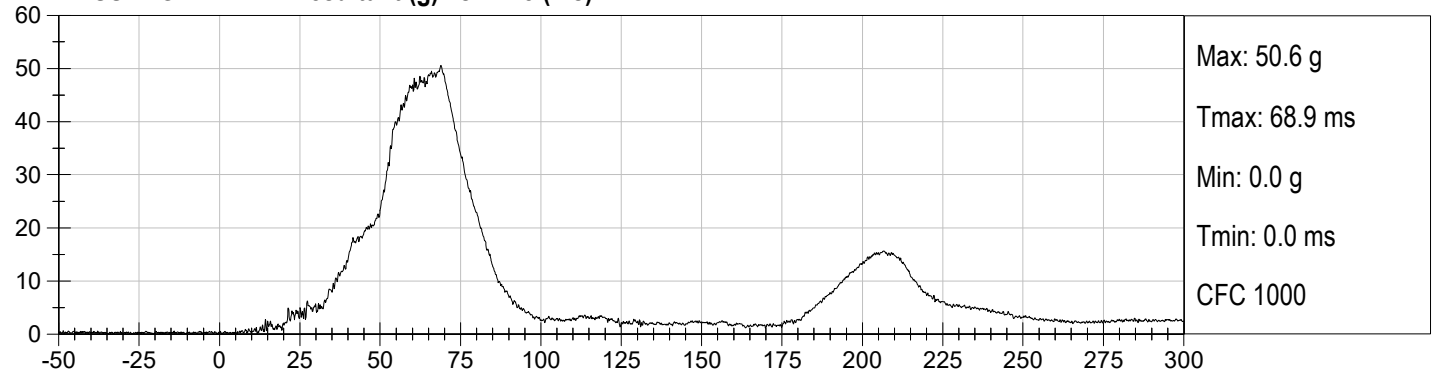
PASSENGER HEAD Yr (g) vs Time (ms)



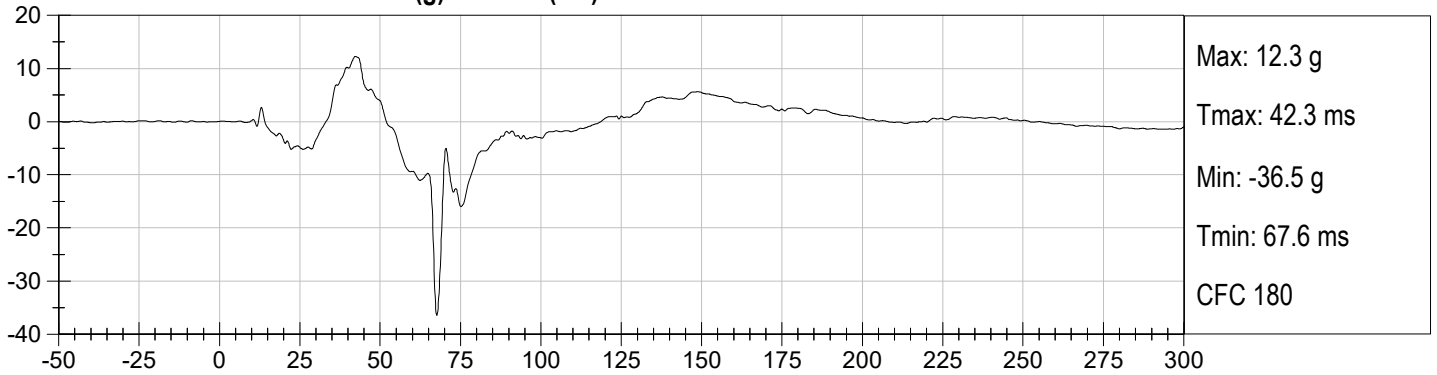
PASSENGER HEAD Z (g) vs Time (ms)



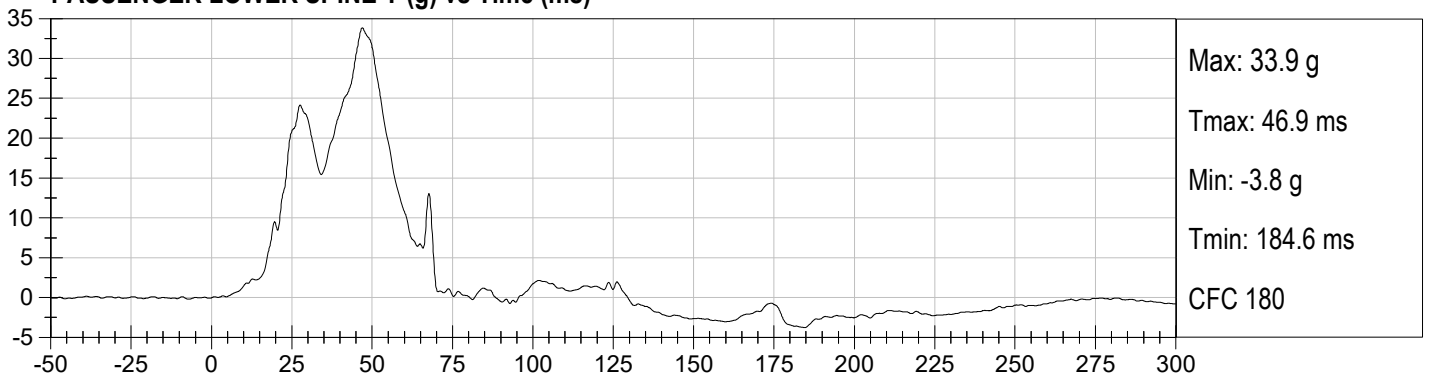
PASSENGER HEAD Resultant (g) vs Time (ms)



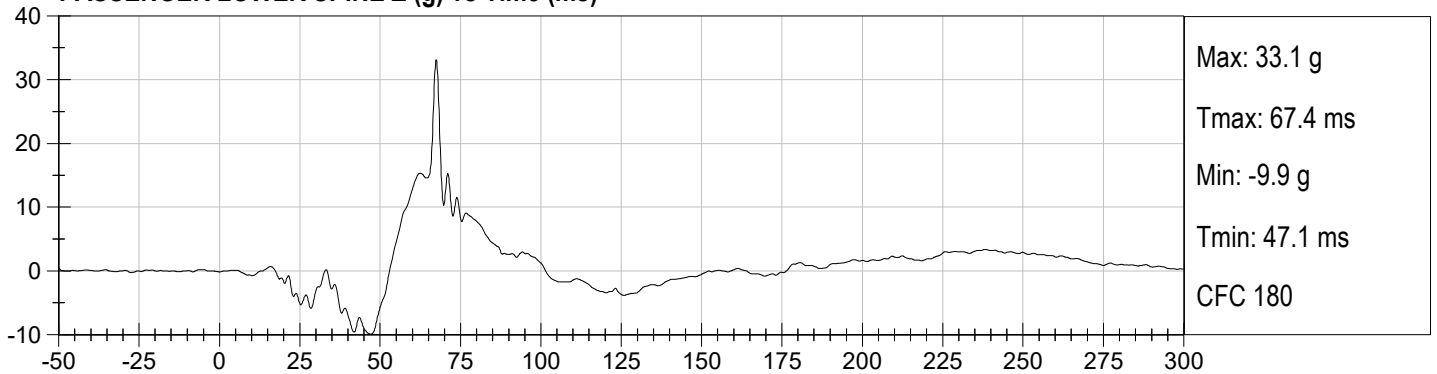
PASSENGER LOWER SPINE X (g) vs Time (ms)



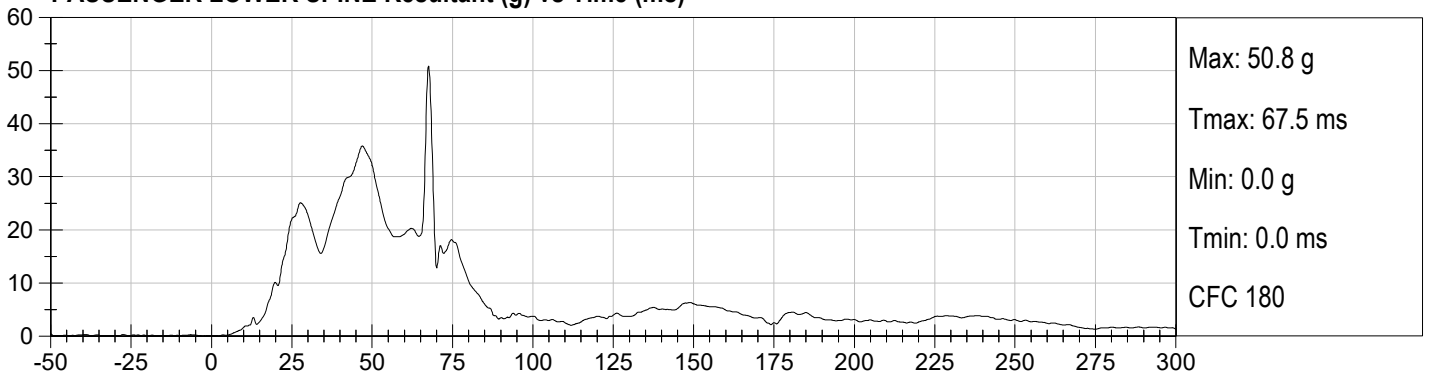
PASSENGER LOWER SPINE Y (g) vs Time (ms)



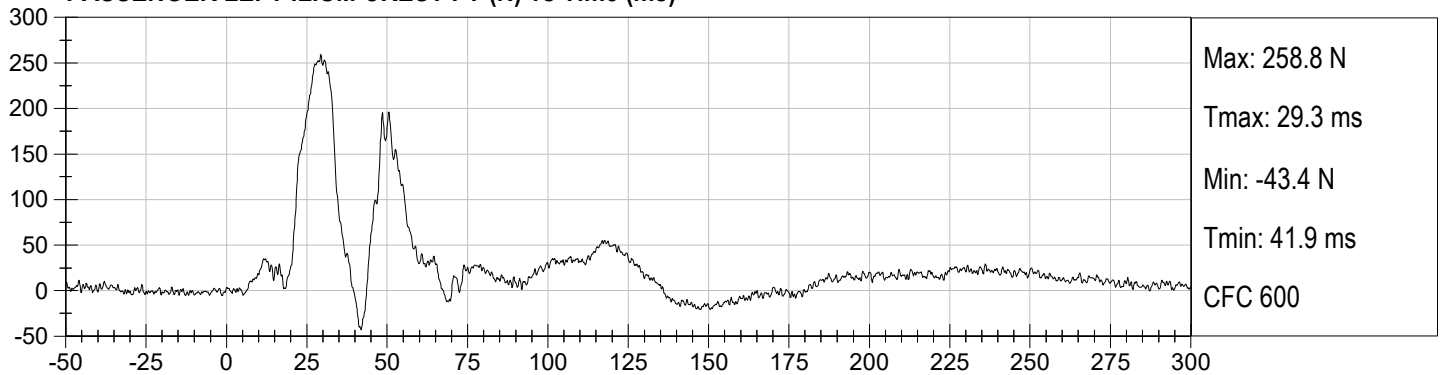
PASSENGER LOWER SPINE Z (g) vs Time (ms)



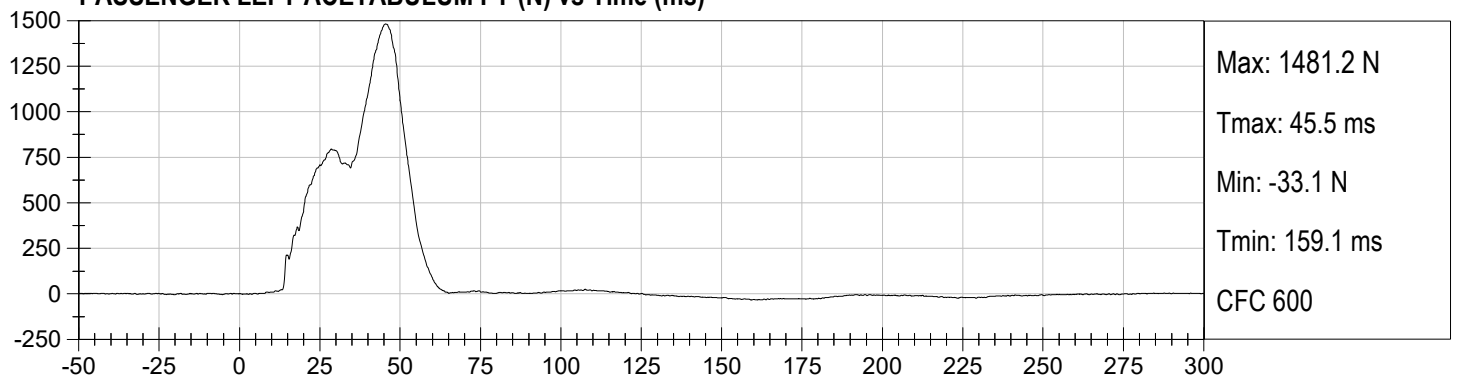
PASSENGER LOWER SPINE Resultant (g) vs Time (ms)



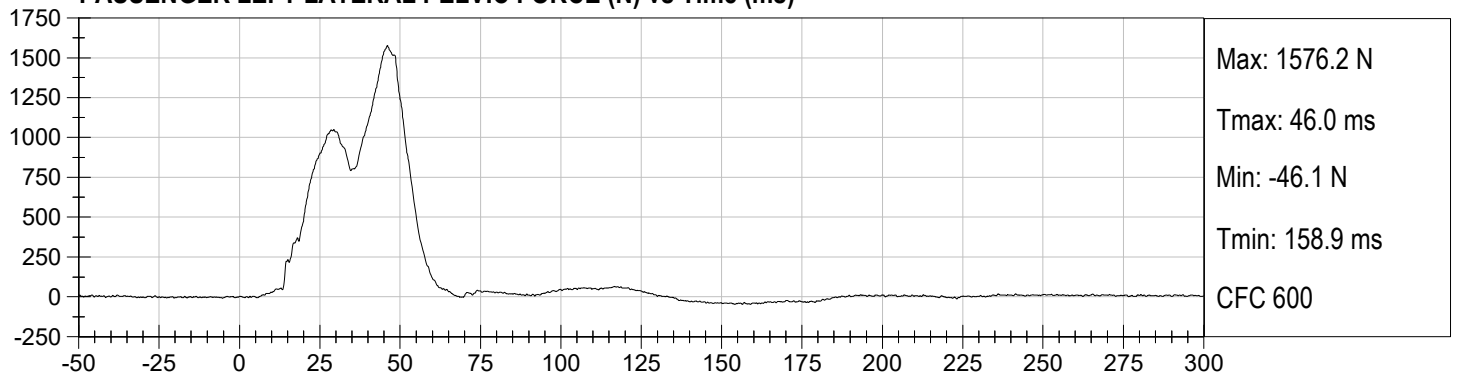
PASSENGER LEFT ILIUM CREST FY (N) vs Time (ms)



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



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



APPENDIX C
DUMMY QUALIFICATION AND PERFORMANCE VERIFICATION

QUALIFICATION TEST RESULTS

PRE-TEST

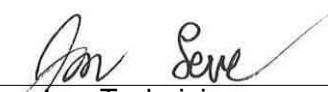
EUROSID 2 (ES-2RE) MALE – DRIVER ATD

ES-2re External Measurements
SN: F032

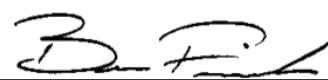
No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	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

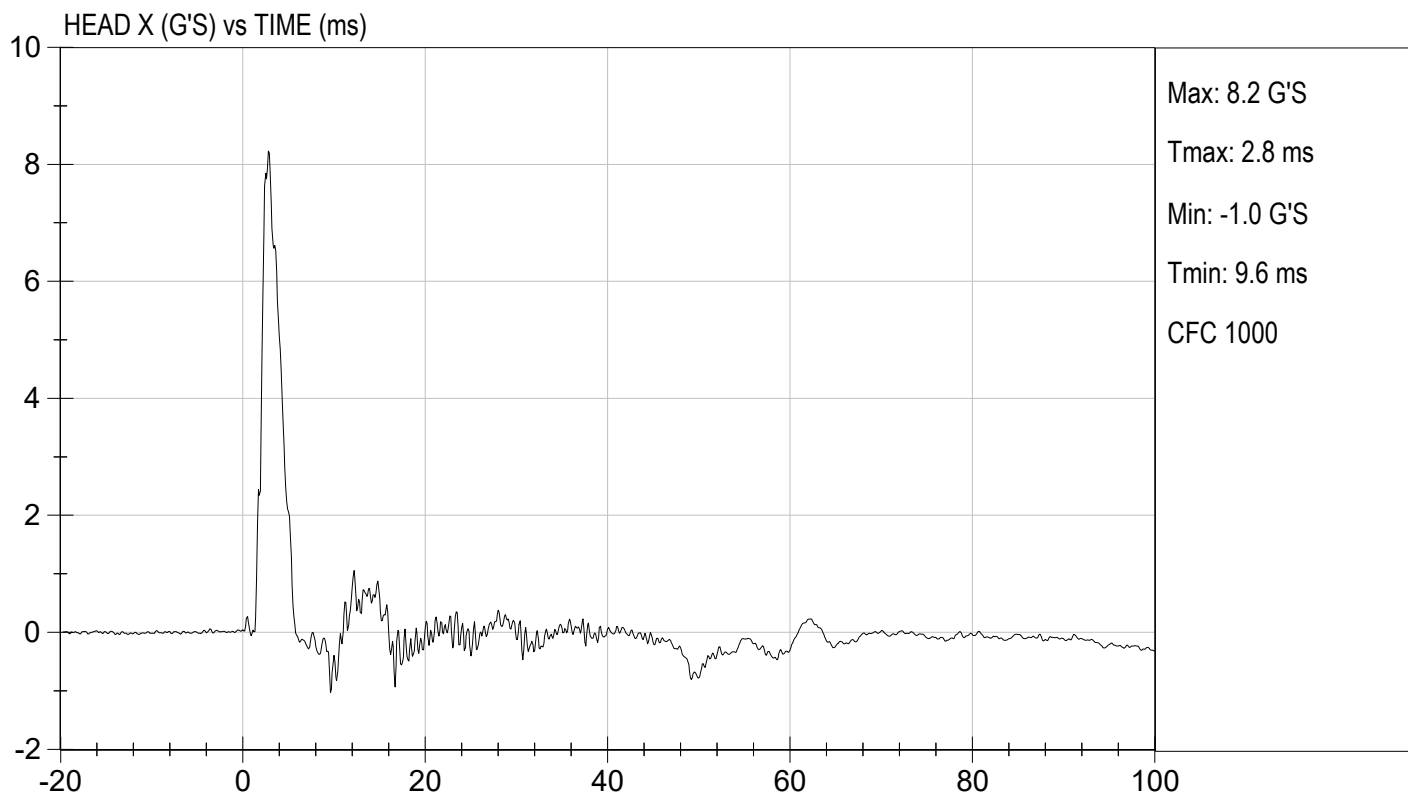
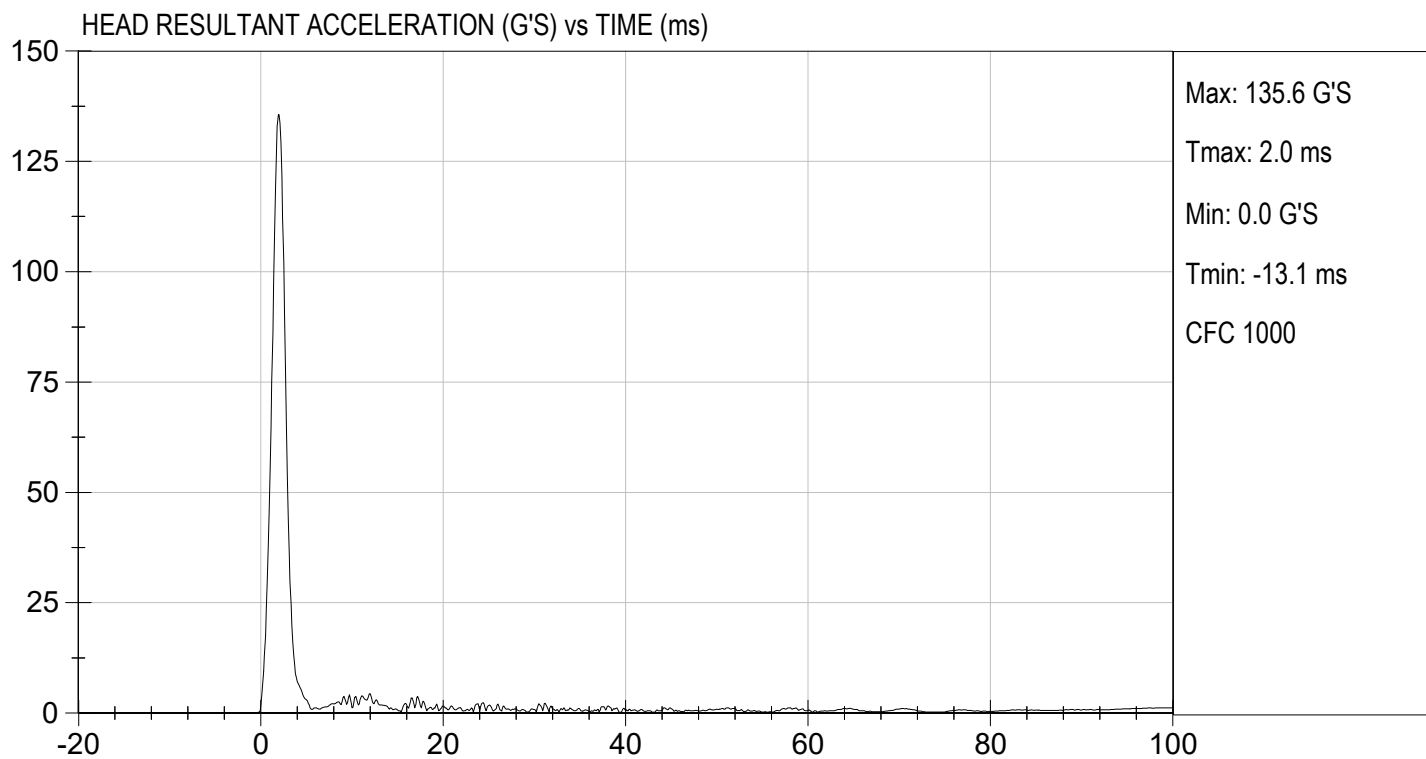
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY**ATD Serial No: F032Test ID: D231121

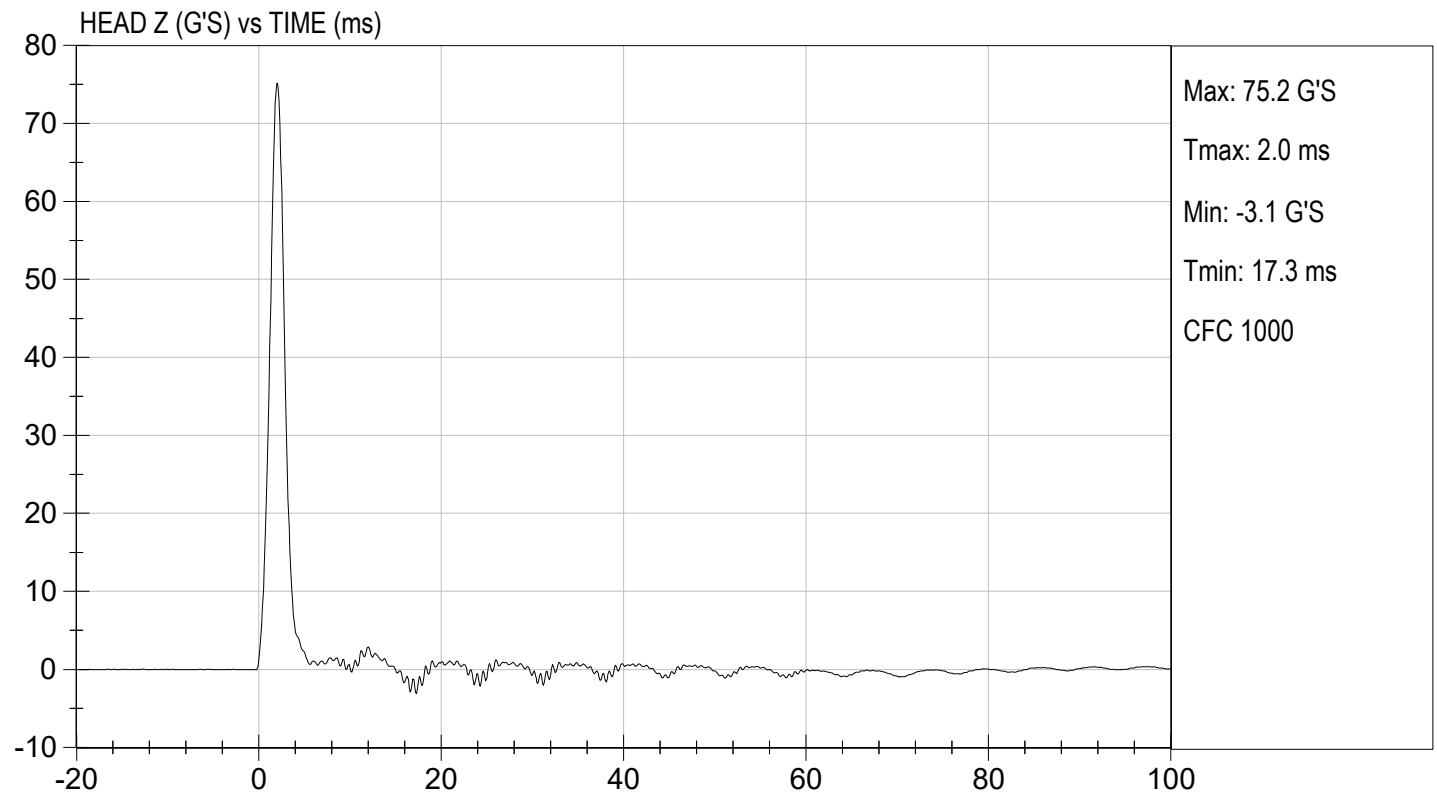
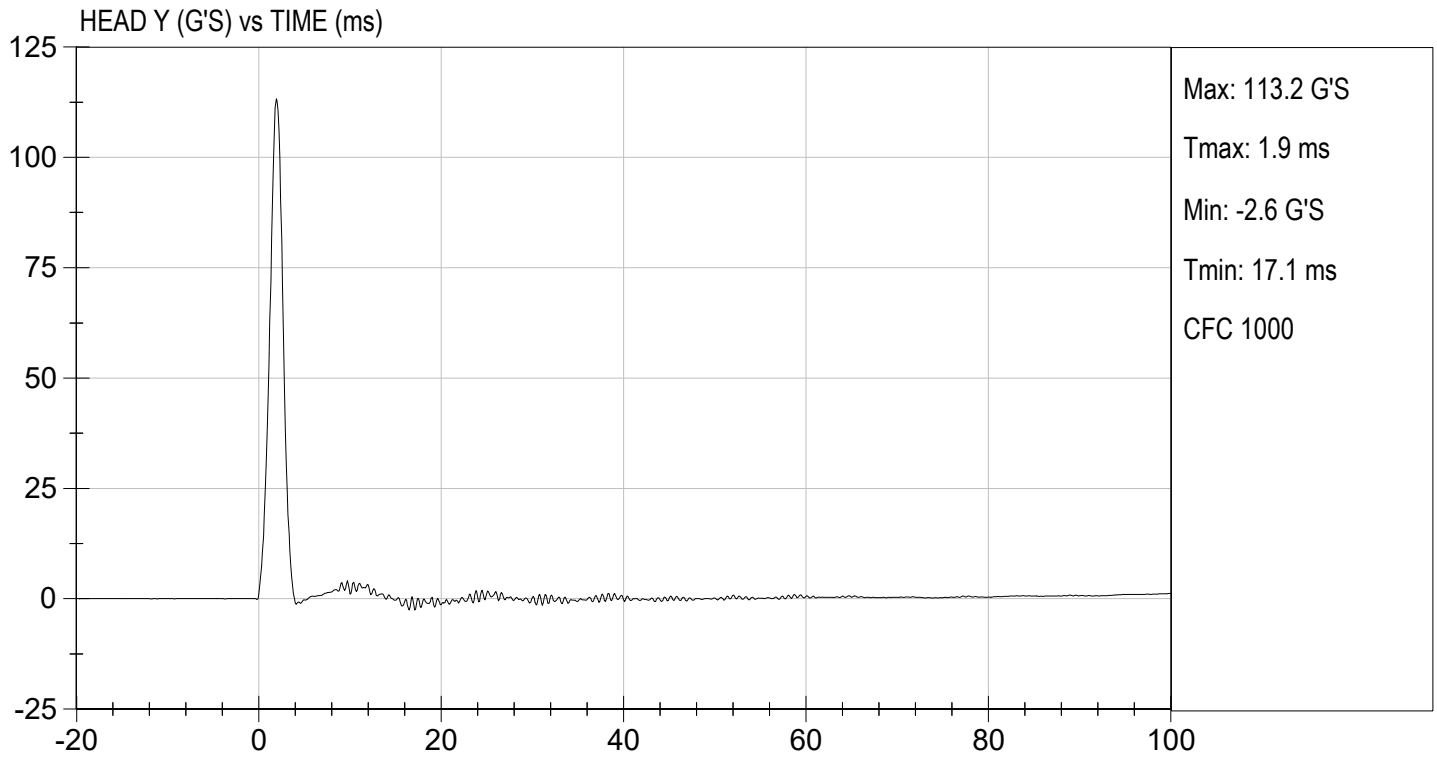
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Peak Resultant Acceleration	G's	125 to 155	136	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	8.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

05/05/2023
Test Date


Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

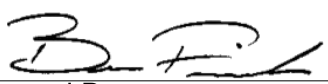
ATD Serial No: F032

Test I.D: D231122

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	34	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.46	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3 ms	m/s	-0.25 to -0.375	-0.34	Pass
	14 ms	m/s	-3.20 to -3.70	-3.49	Pass
	17 ms	m/s	>= -3.70	-3.54	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	49.5	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	56.6	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	61.7	Pass
Overall Results					Pass


 Laboratory Technician

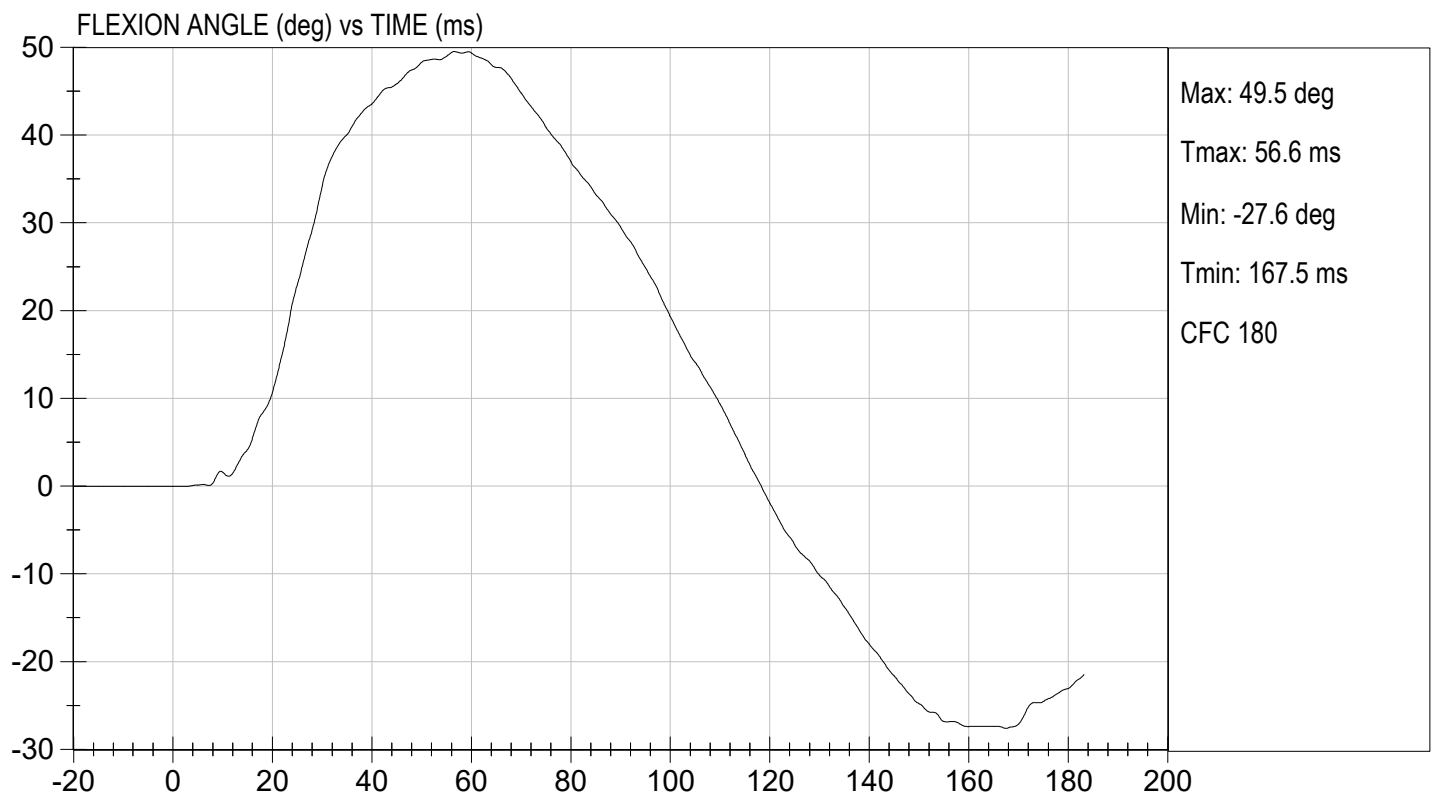
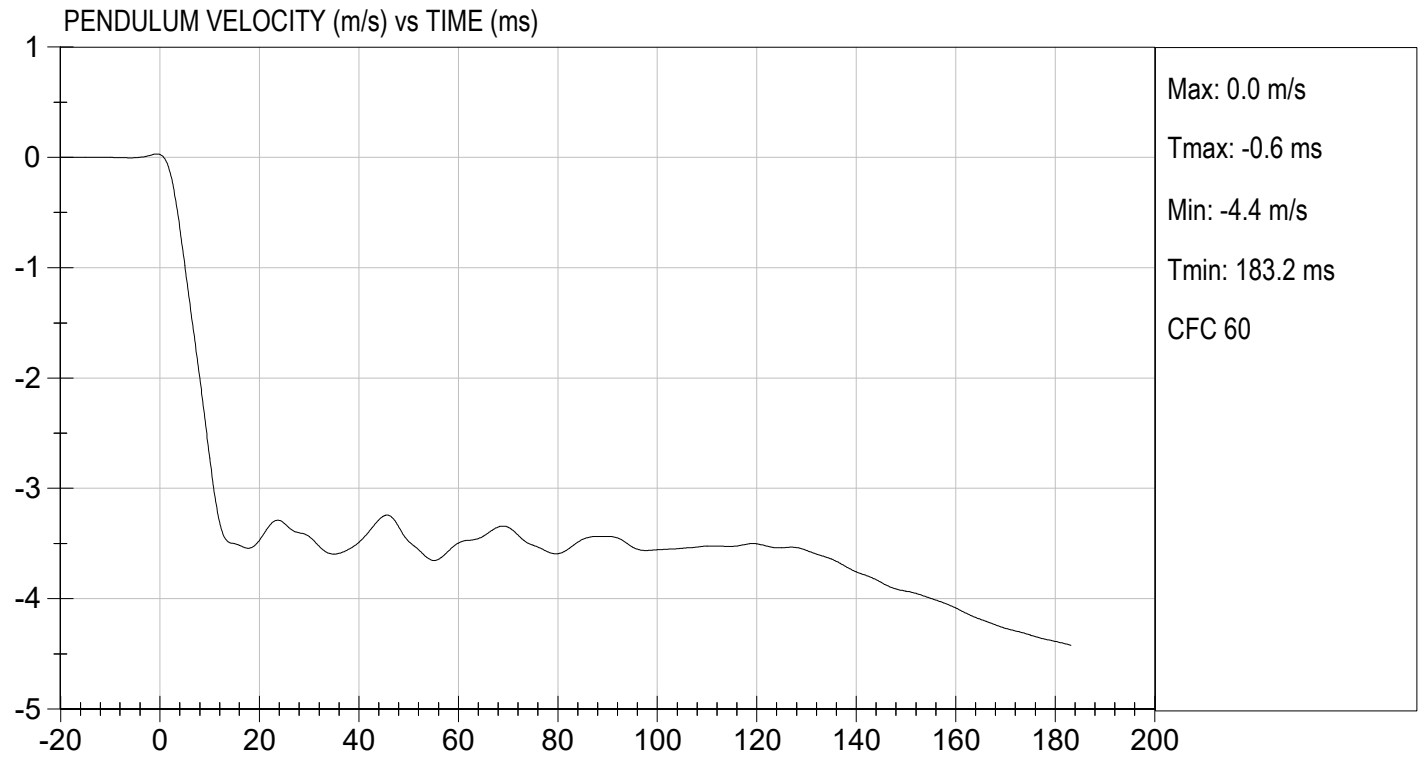
05/05/2023
 Test Date


 Approved By



TEST DESC: NECK BENDING
VELOCITY: 11.34 ft/s, 3.46 m/s

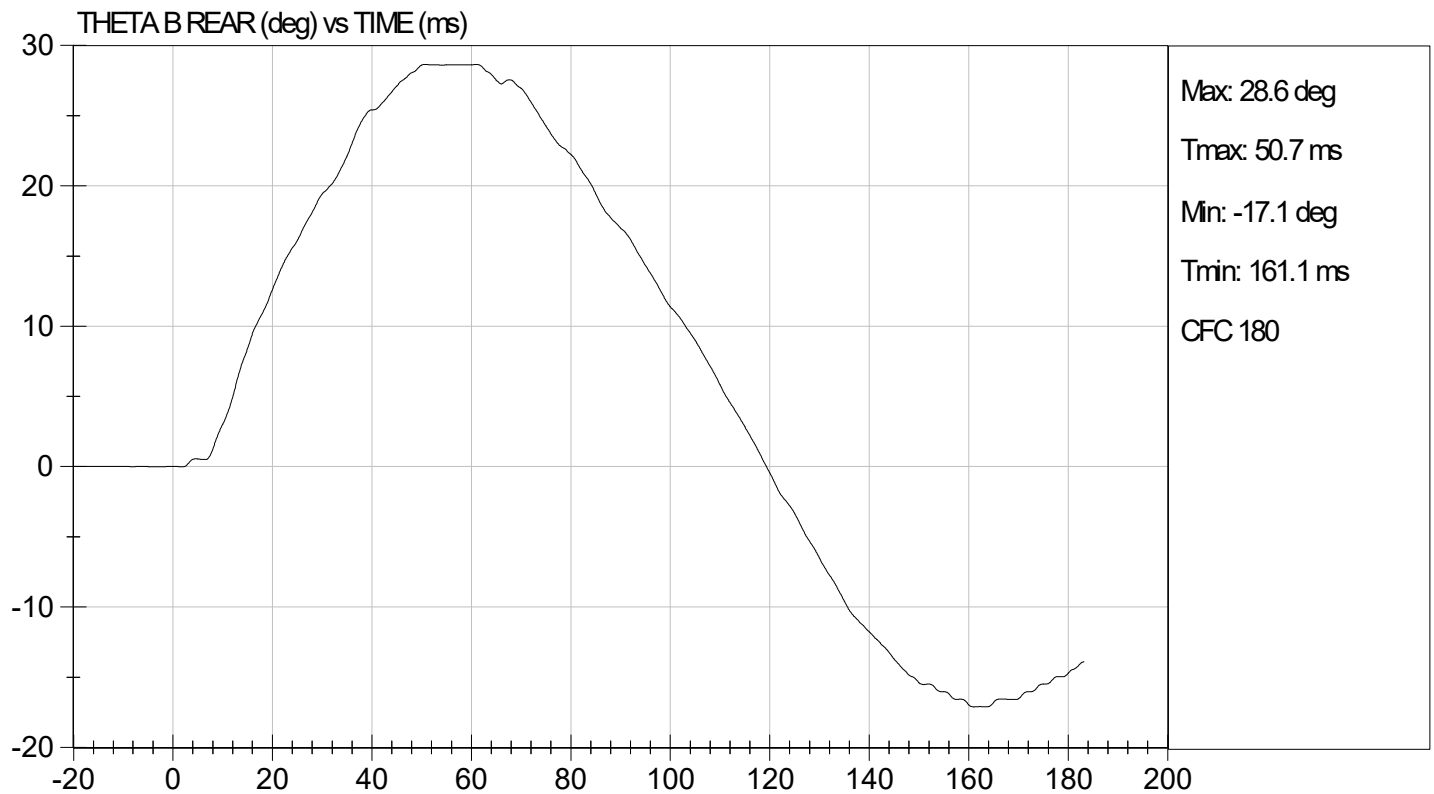
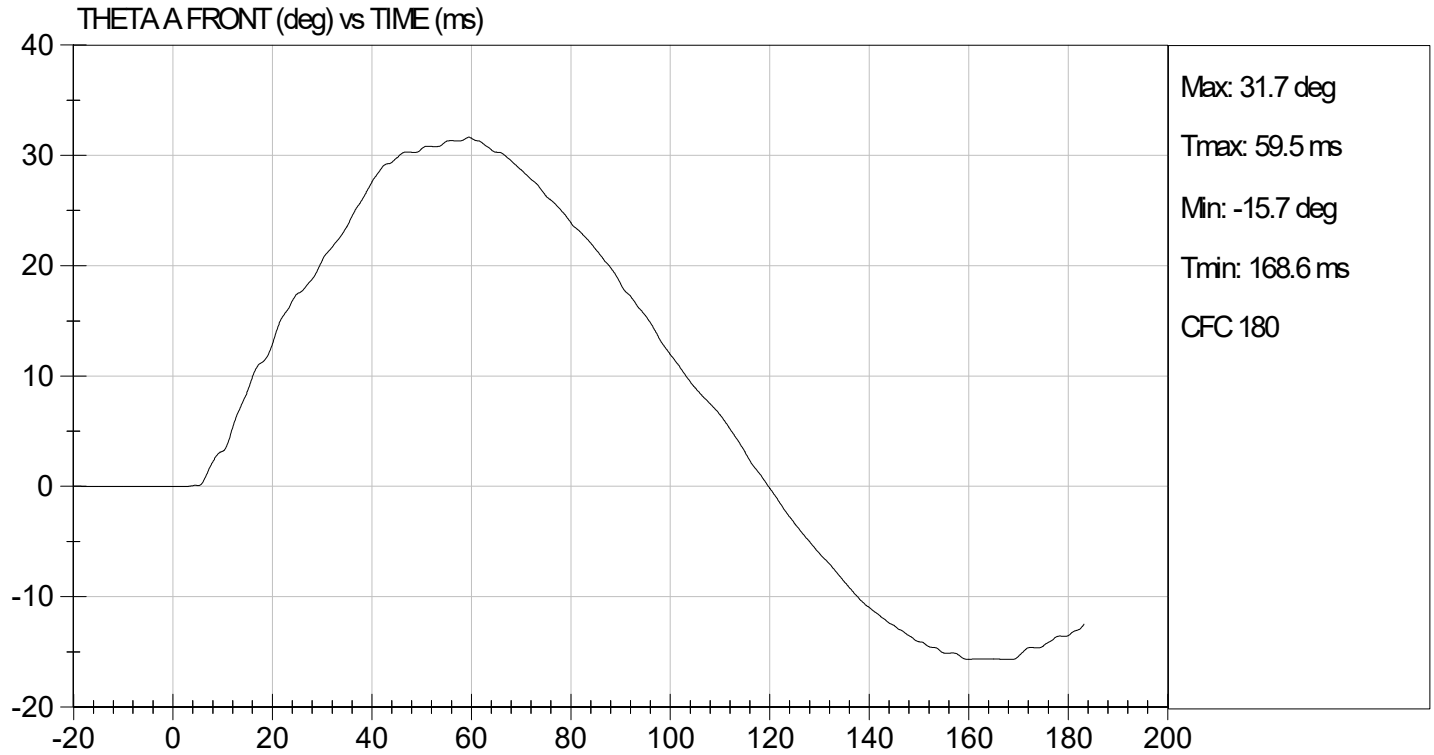
TEST DATE: 05/05/2023
TEST #: D231122





TEST DESC: NECK BENDING
VELOCITY: 11.34 ft/s, 3.46 m/s

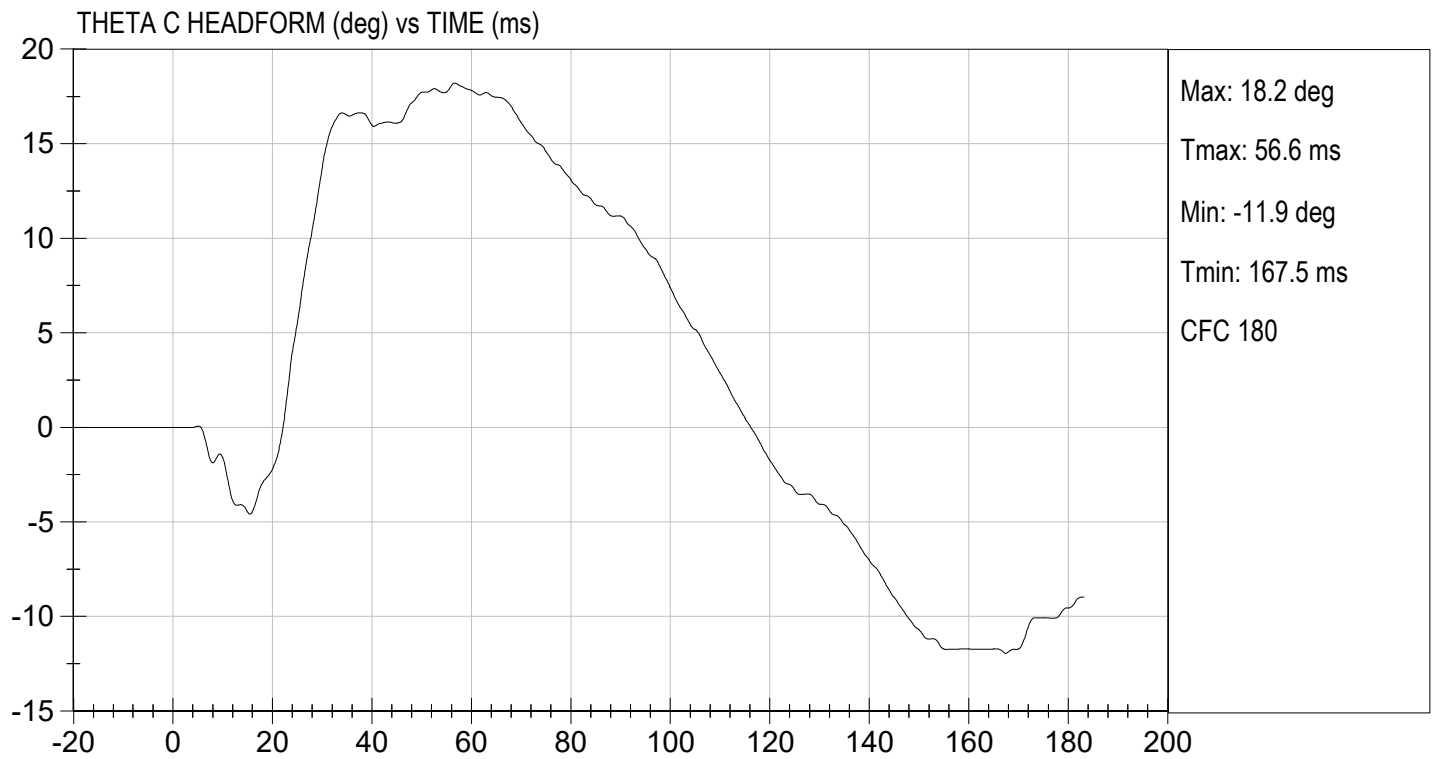
TEST DATE: 05/05/2023
TEST #: D231122





TEST DESC: NECK BENDING
VELOCITY: 11.34 ft/s, 3.46 m/s

TEST DATE: 05/05/2023
TEST #: D231122



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

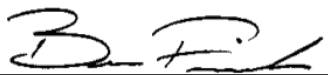
ATD Serial No: F032

Test I.D: D231123

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.27	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	8.5	Pass
Overall Test Results				Pass


Laboratory Technician

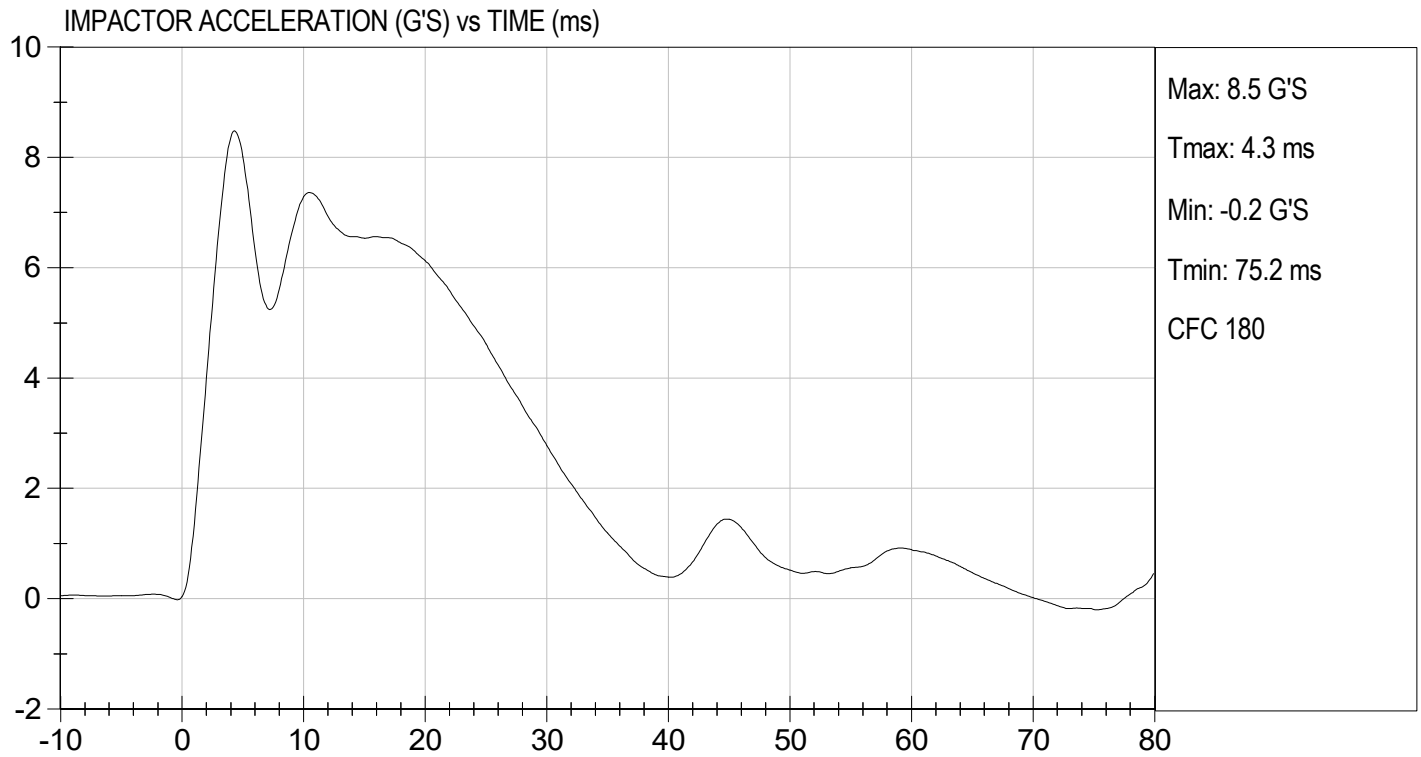
05/05/2023
Test Date


Approved By



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

TEST DATE: 05/05/2023
TEST #: D231123



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

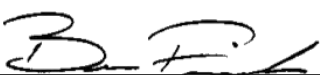
ATD Serial No: F032

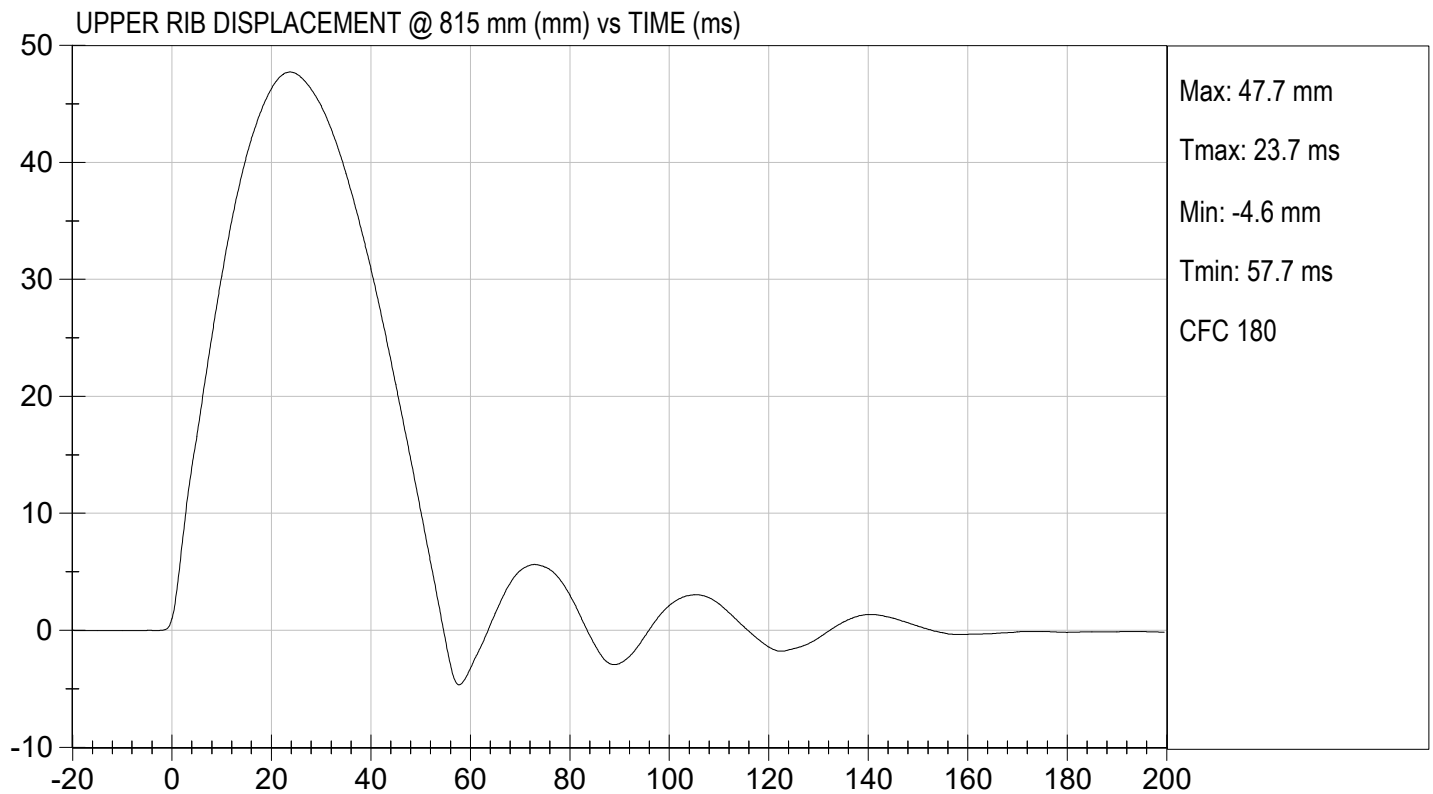
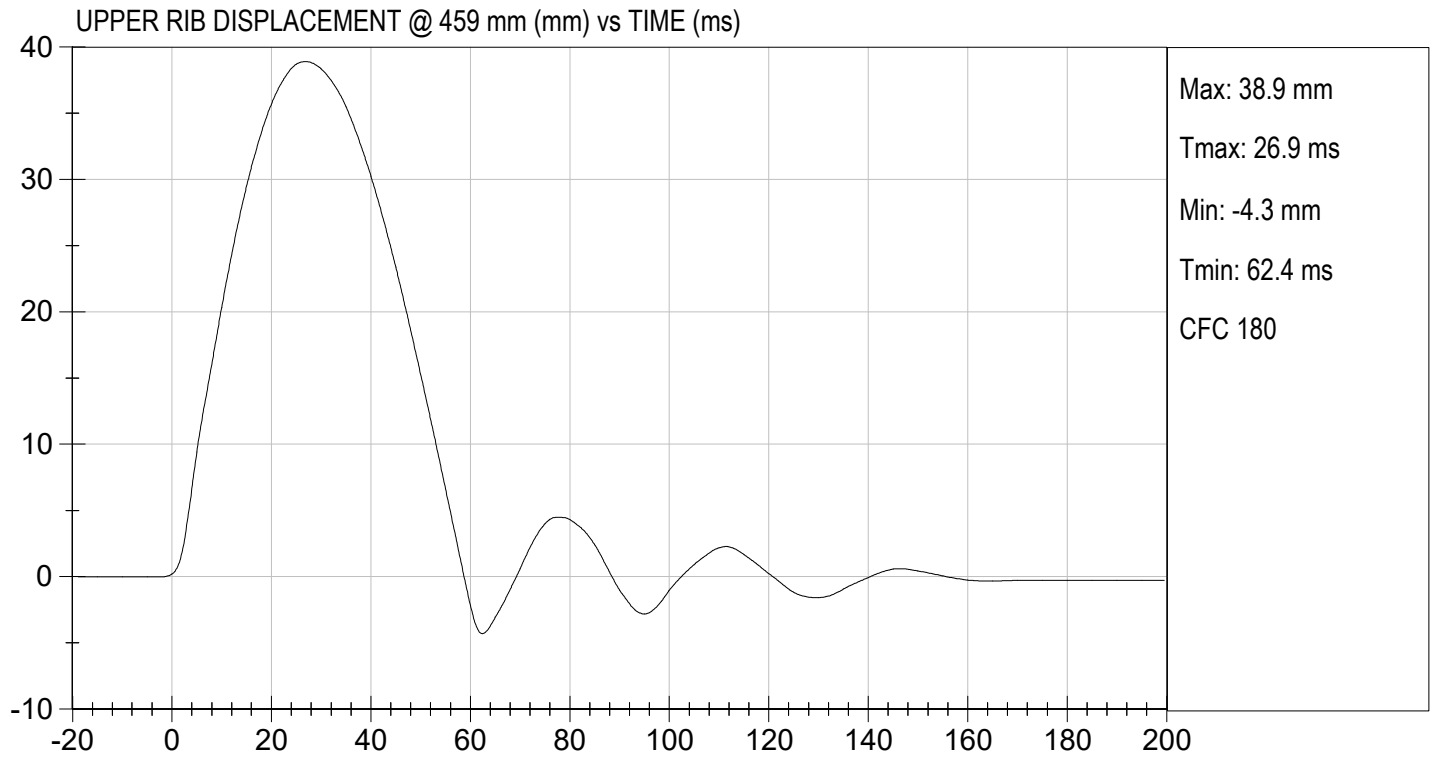
Test I.D: D231124

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.9	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.7	Pass
Overall Test Results				Pass


Laboratory Technician

05/05/2023
Test Date


Approved By



MGA RESEARCH CORPORATION

MID RIB TEST

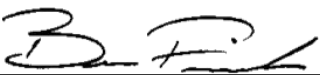
ES-2re DUMMY

ATD Serial No: F032

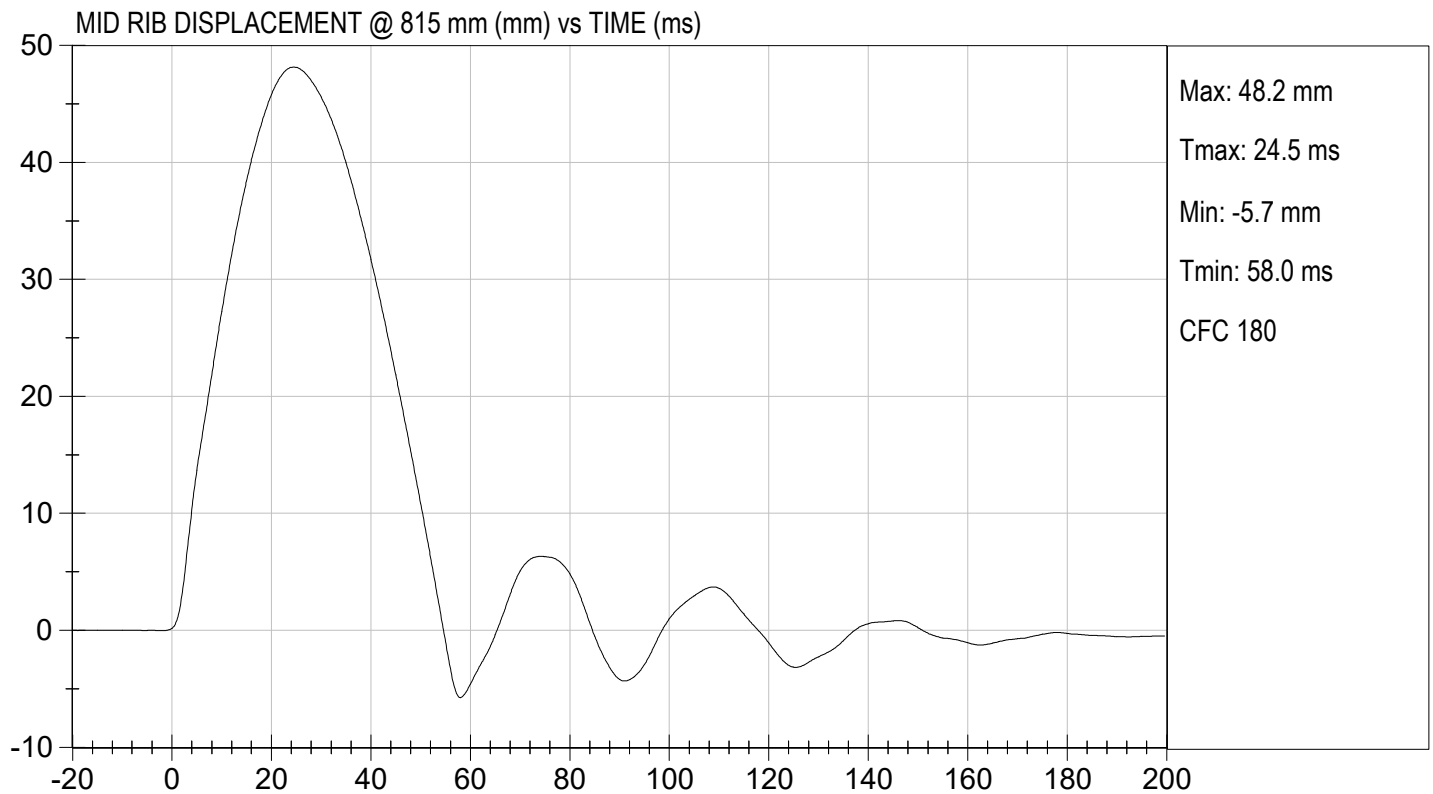
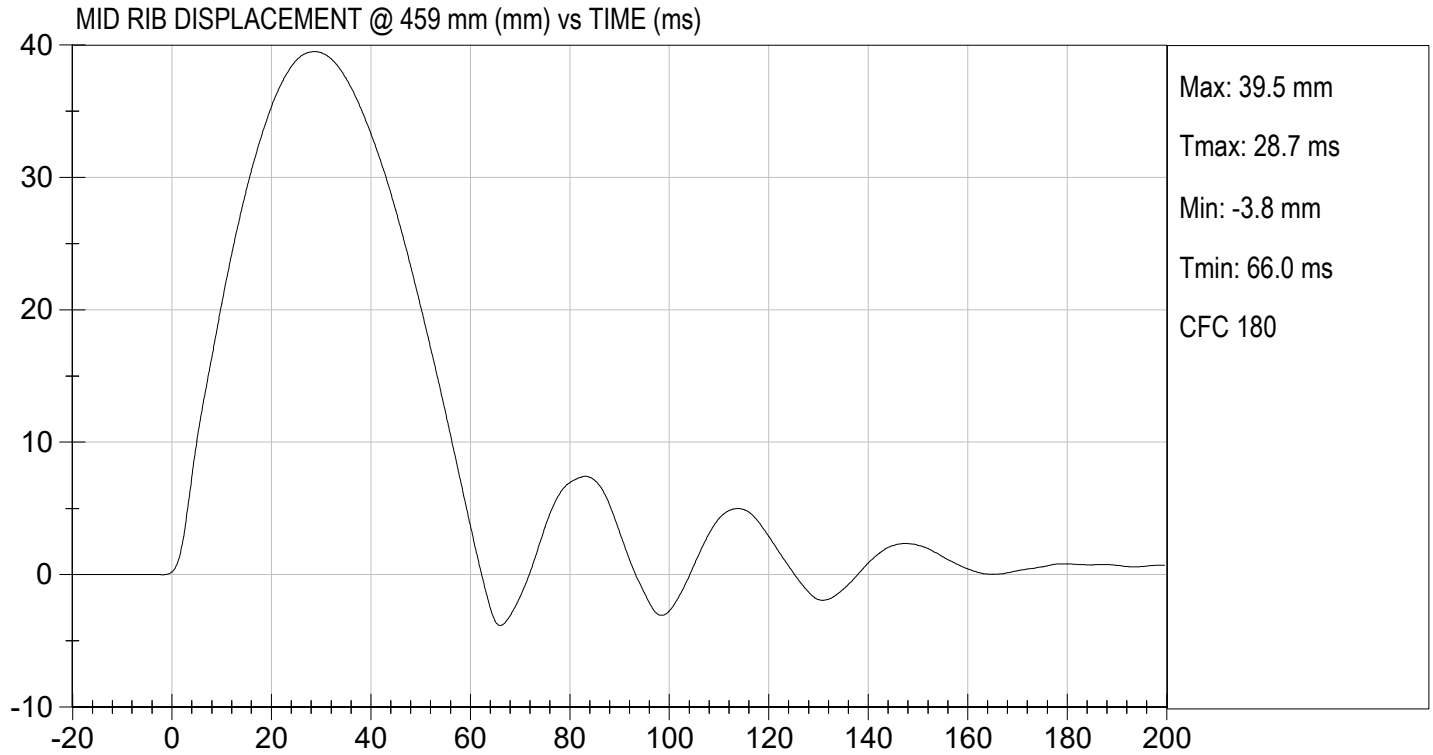
Test I.D: D231125

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.5	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.1	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

05/05/2023
Test Date



MGA RESEARCH CORPORATION

LOWER RIB TEST

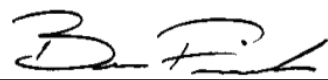
ES-2re DUMMY

ATD Serial No: F032

Test I.D: D231126

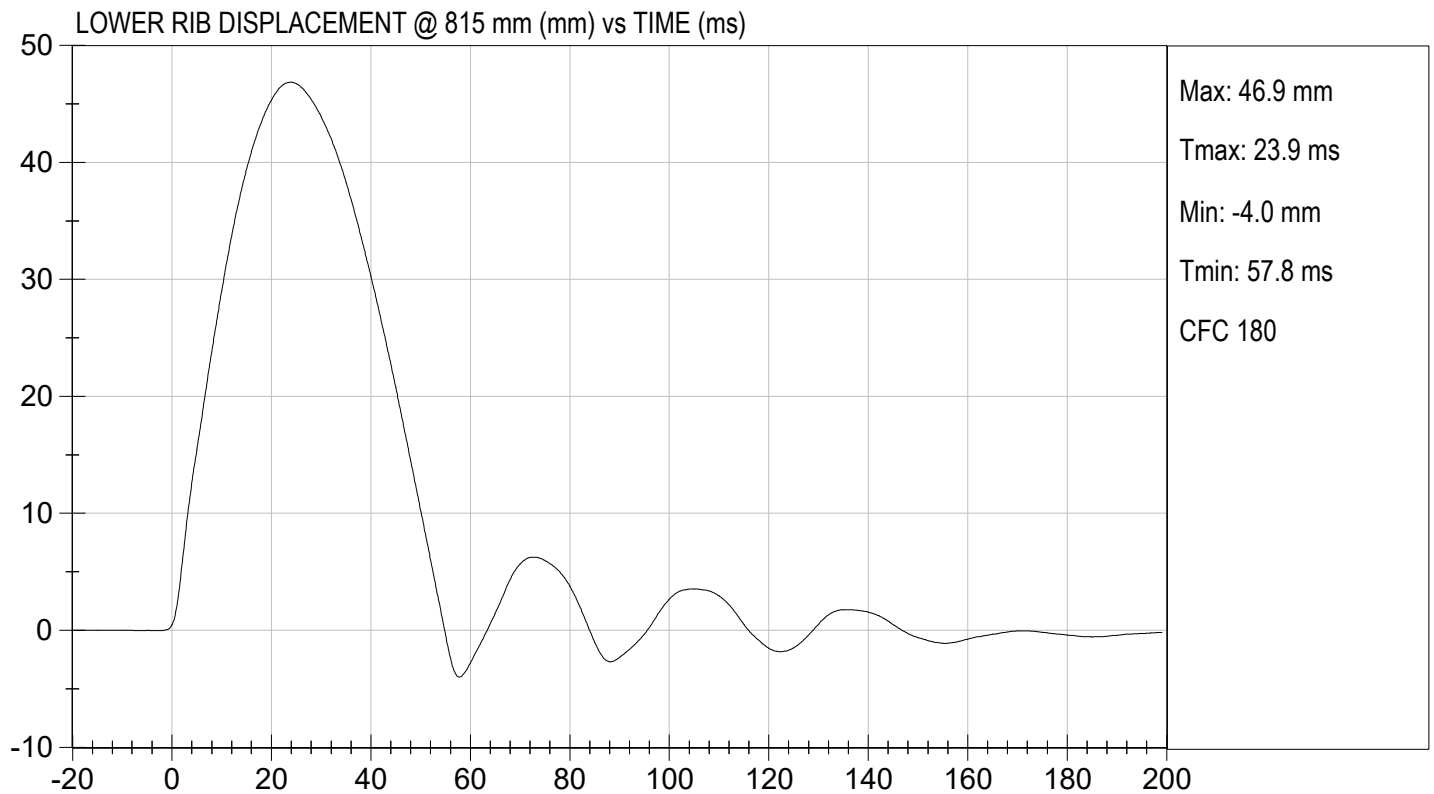
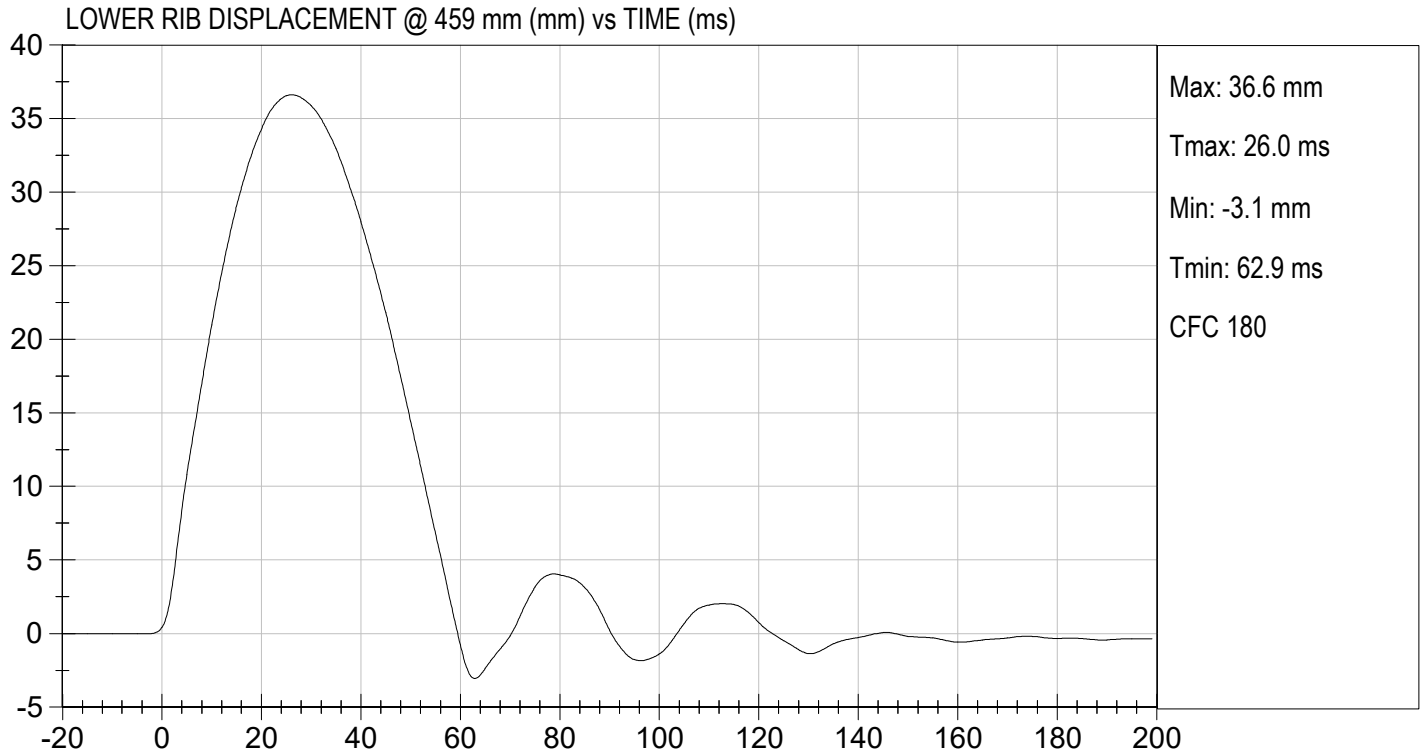
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Displacement at 459 mm	mm	36.0 to 40.0	36.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	46.9	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

05/05/2023

Test Date

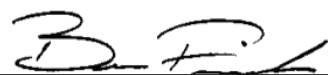


MGA RESEARCH CORPORATION**ABDOMEN TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D231127

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4181	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.3	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2295	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	10.7	Pass
Overall Test Results				Pass


Laboratory Technician

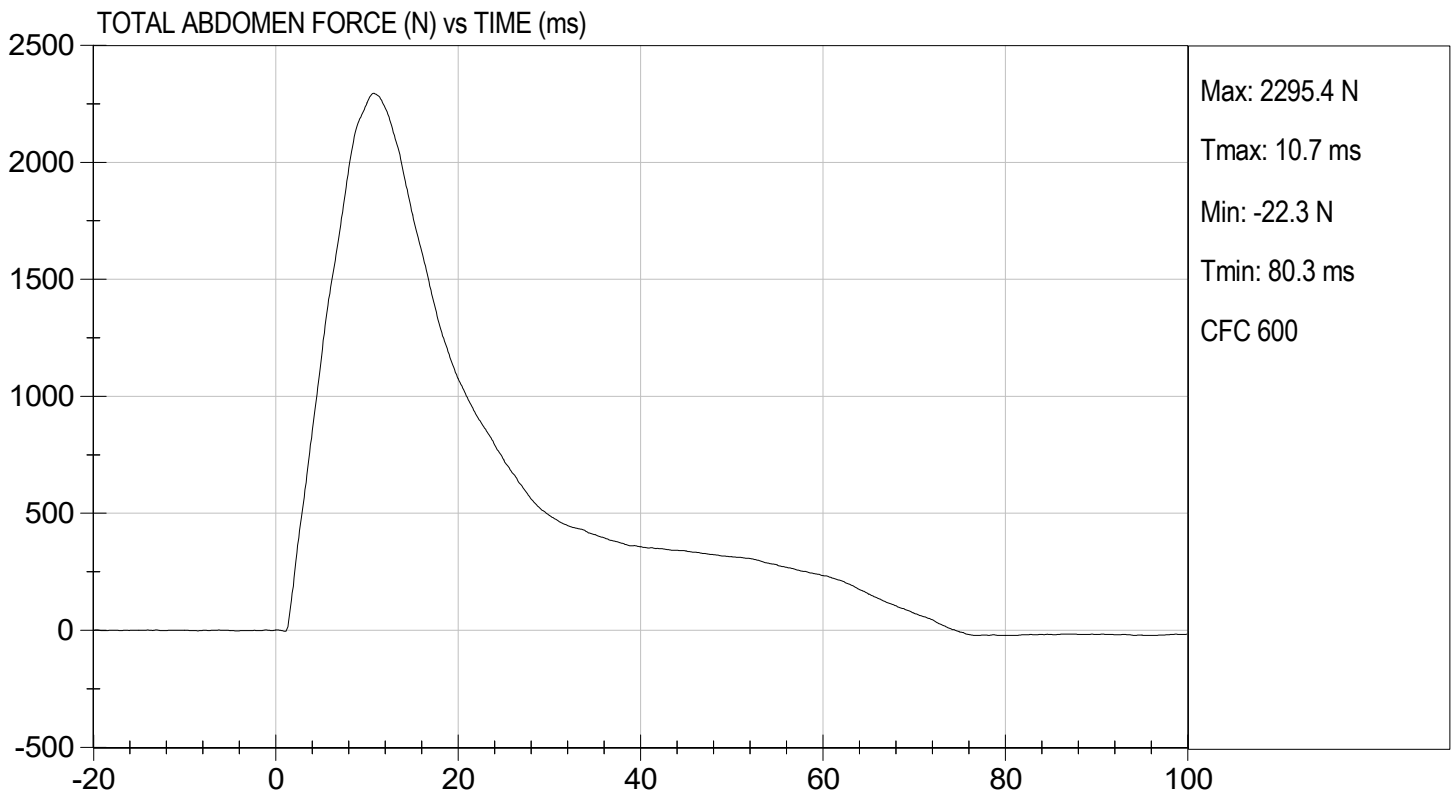
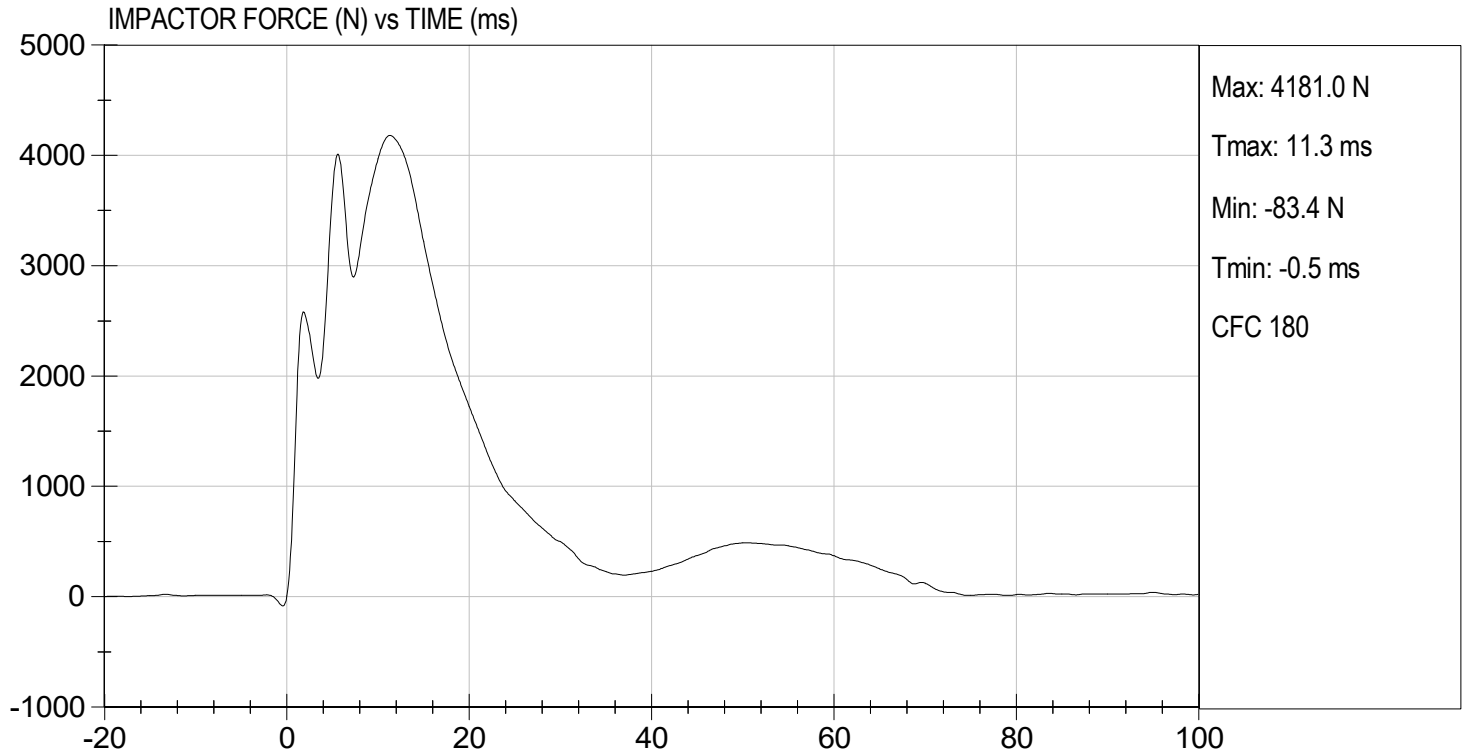
05/05/2023
Test Date


Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

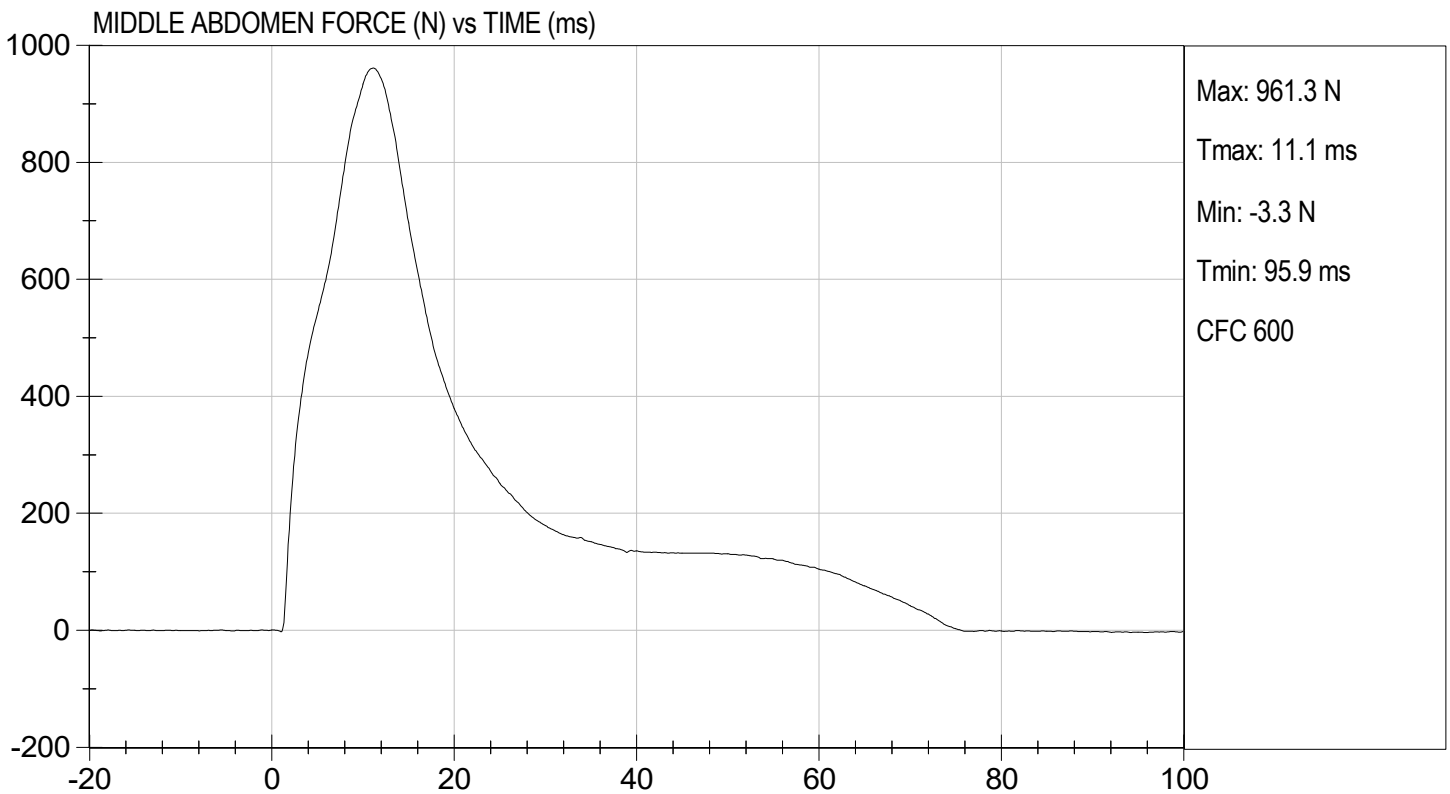
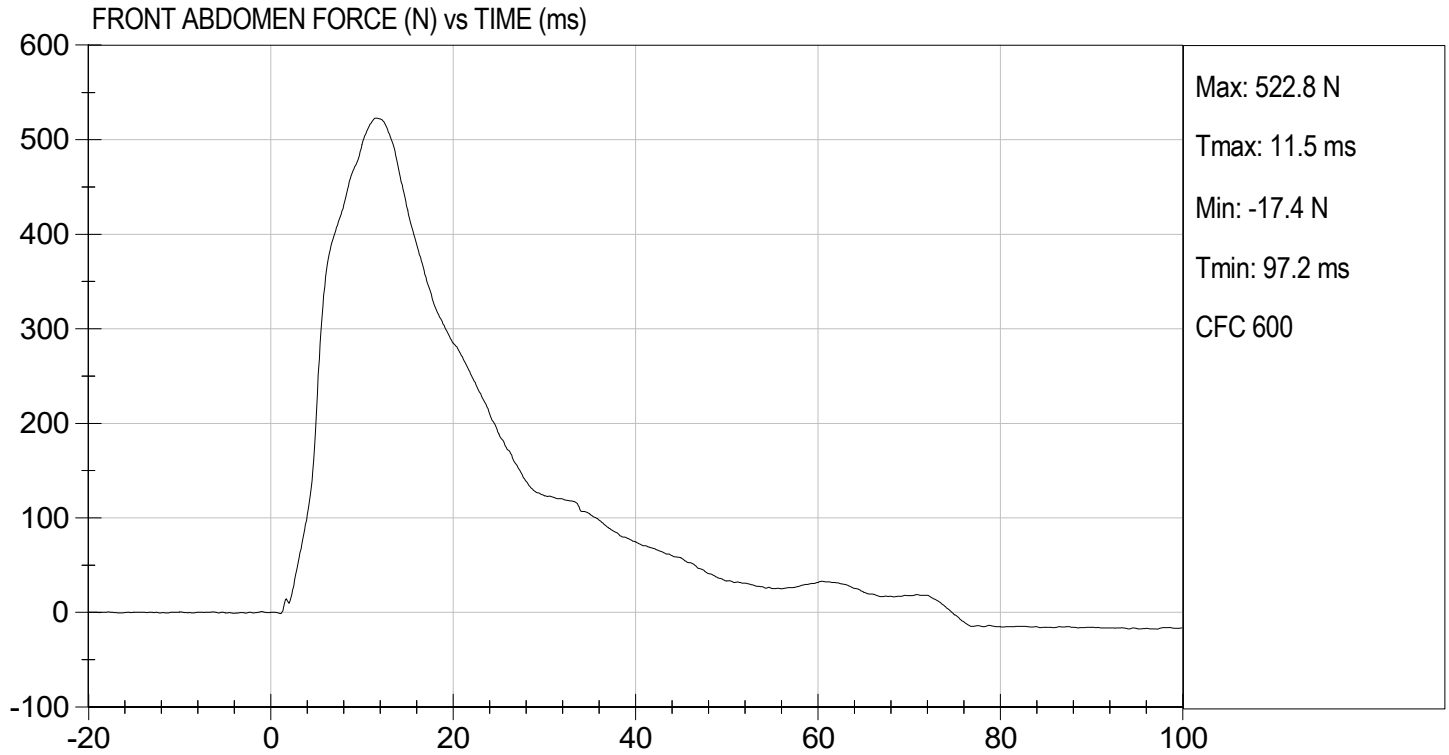
TEST DATE: 05/05/2023
TEST #: D231127





TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

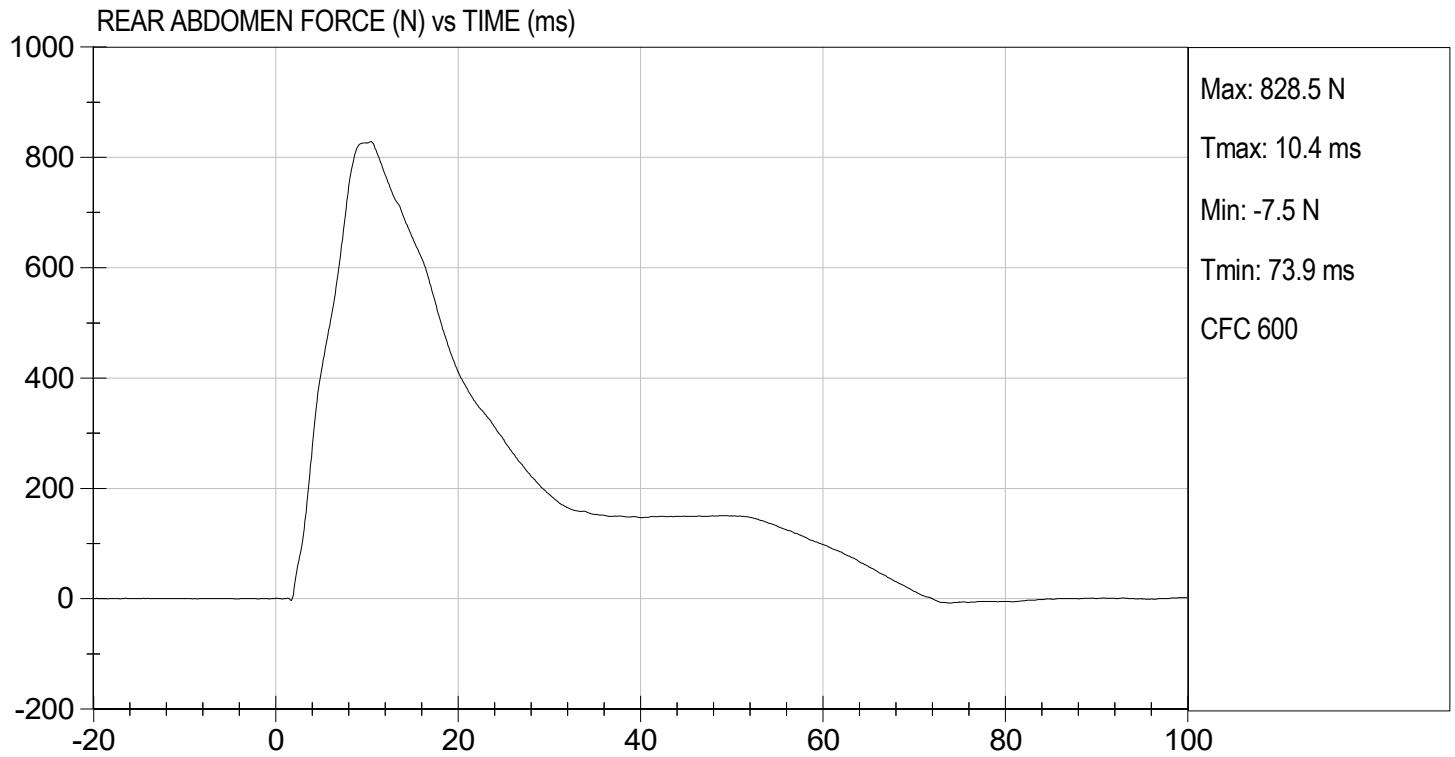
TEST DATE: 05/05/2023
TEST #: D231127





TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

TEST DATE: 05/05/2023
TEST #: D231127



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

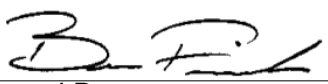
ATD Serial No: F032

Test I.D: D231128

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	34	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	-0.402	Pass
	27 ms	m/s	-6.50 to -5.80	-5.90	Pass
	30 ms	m/s	>= -6.50	-6.09	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	47.1	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	46.7	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	40	Pass
Overall Results					Pass


 Laboratory Technician

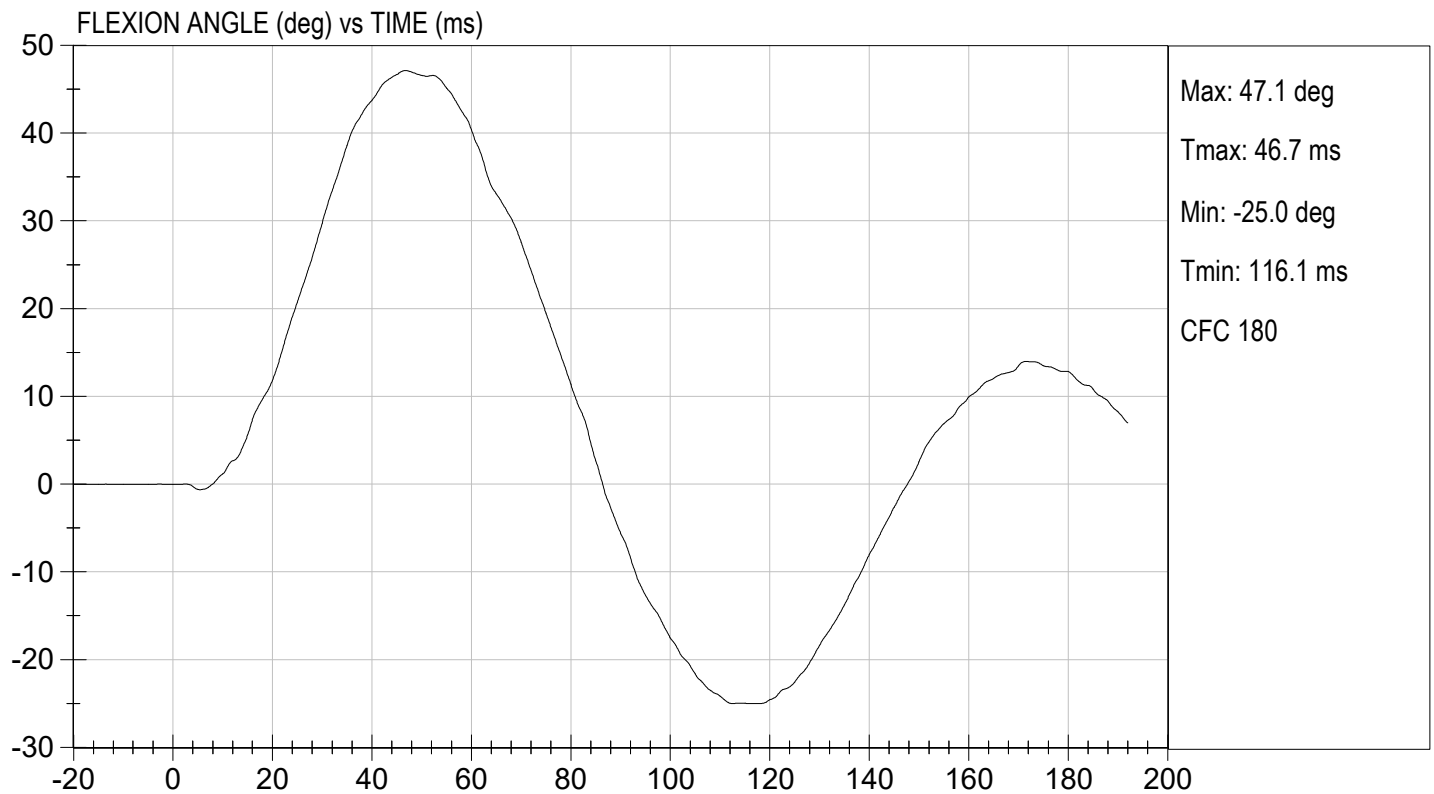
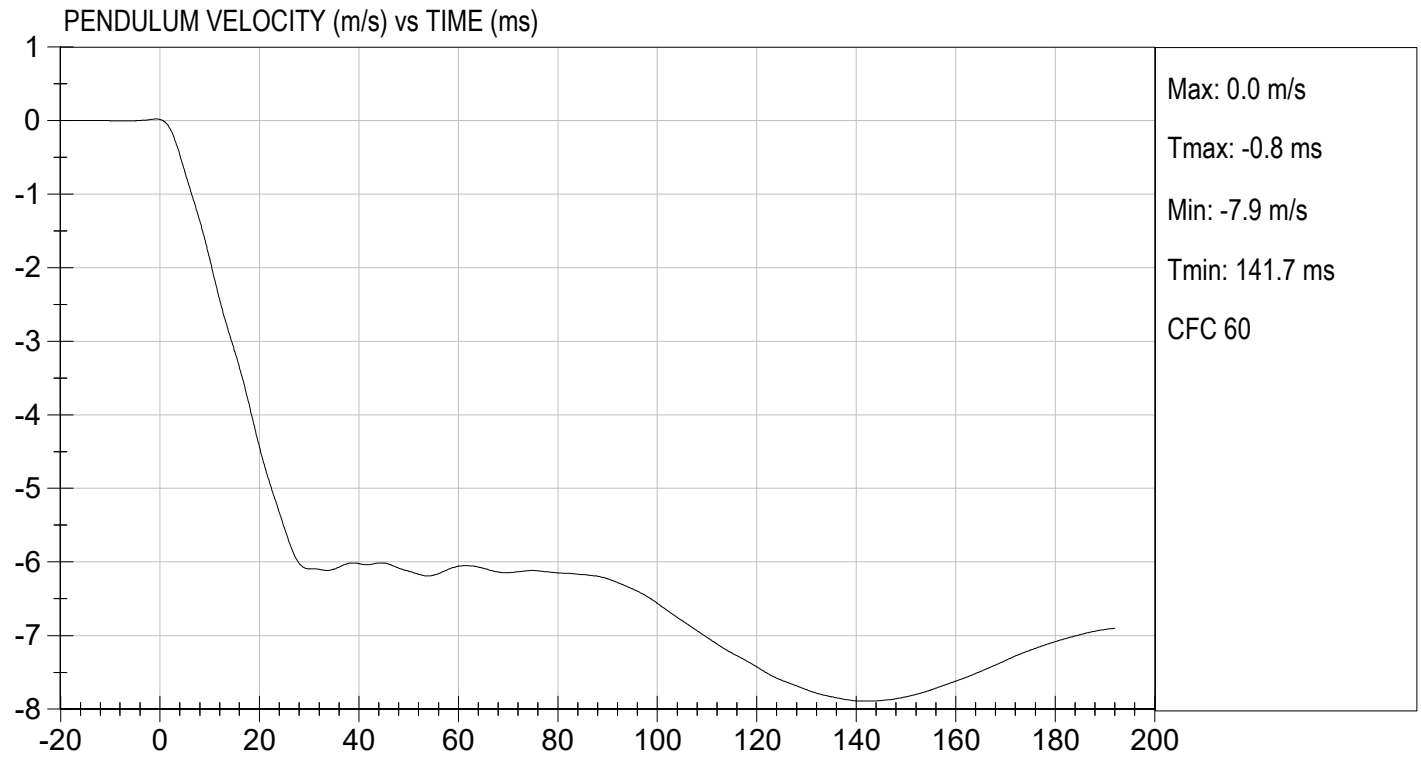
05/05/2023
 Test Date


 Approved By



TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

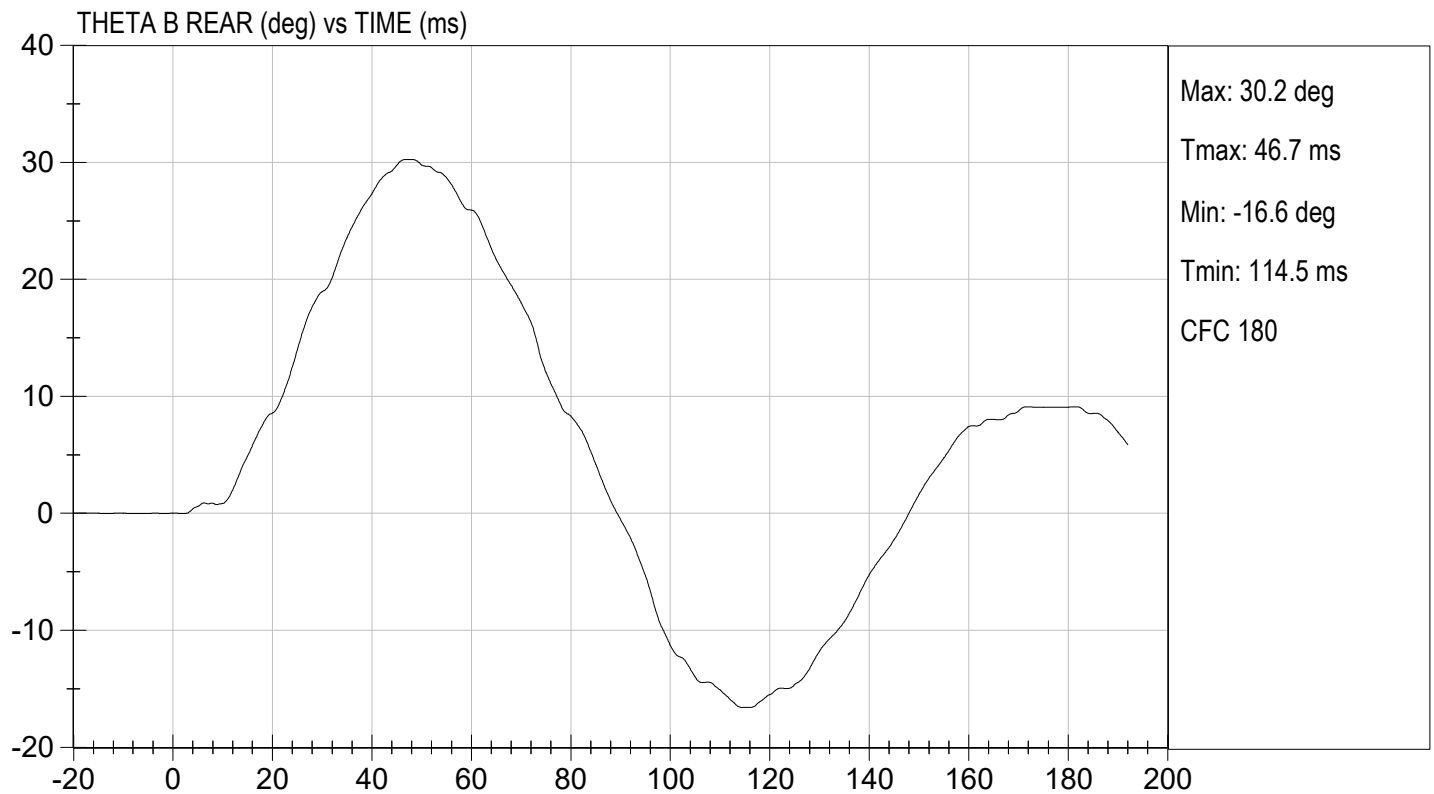
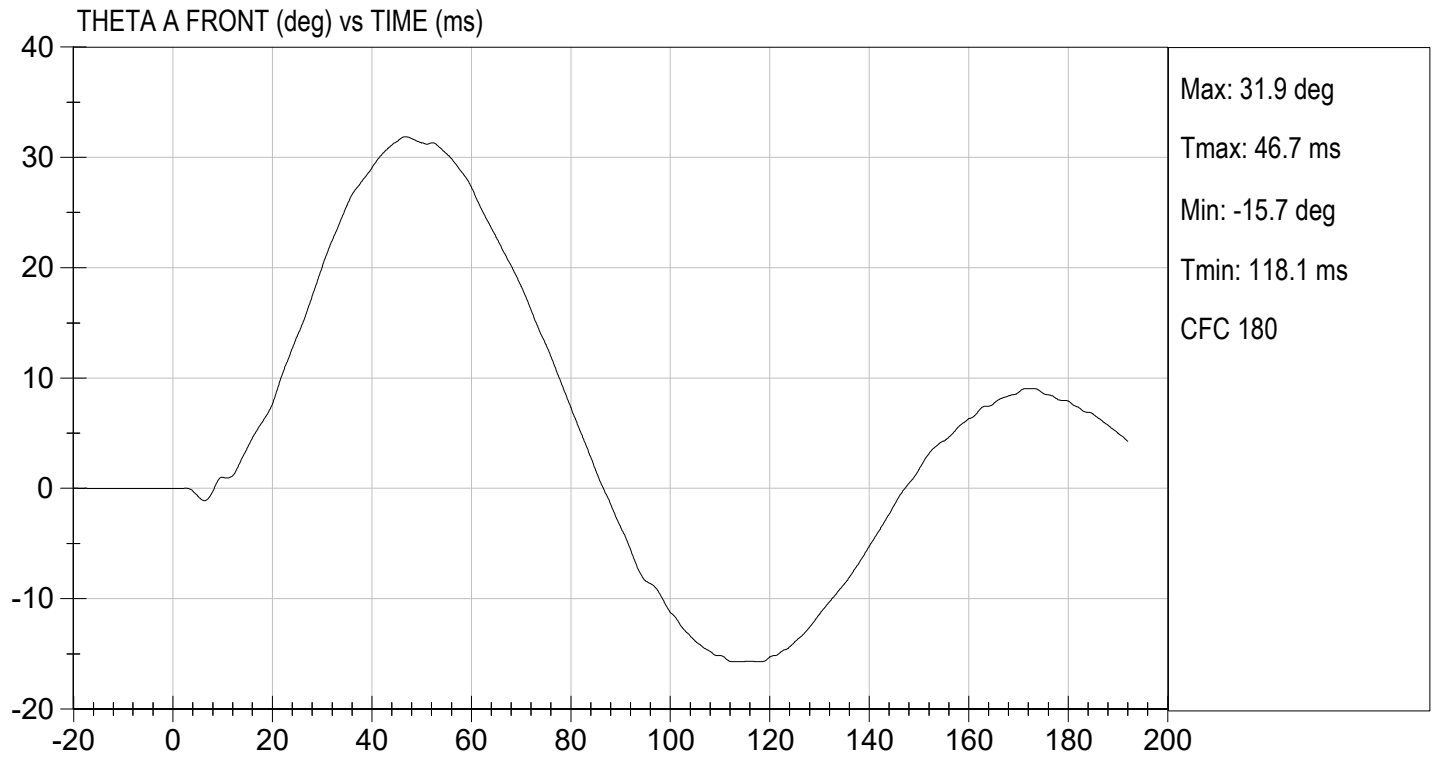
TEST DATE: 05/05/2023
TEST #: D231128





TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

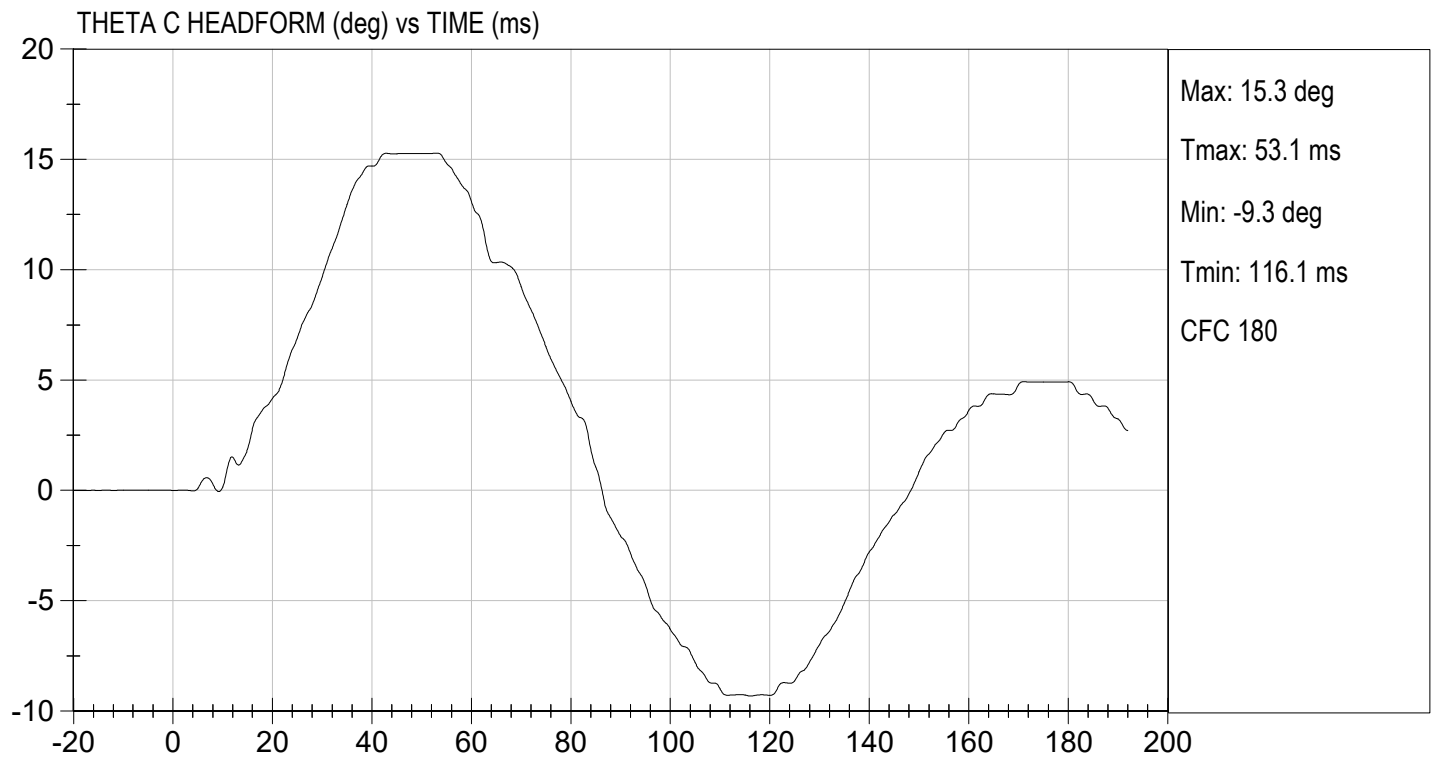
TEST DATE: 05/05/2023
TEST #: D231128





TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 05/05/2023
TEST #: D231128

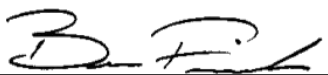


MGA RESEARCH CORPORATION**PELVIS TEST
ES-2re DUMMY****ATD Serial No:** F032**Test I.D:** D231129

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Probe Speed	m/s	4.20 to 4.40	4.34	Pass
Maximum Impactor Force	N	4700 to 5400	5049	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	12.6	Pass
Maximum Pubic Force	N	1230 to 1590	1298	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	13.6	Pass
Overall Test Results				Pass


Laboratory Technician

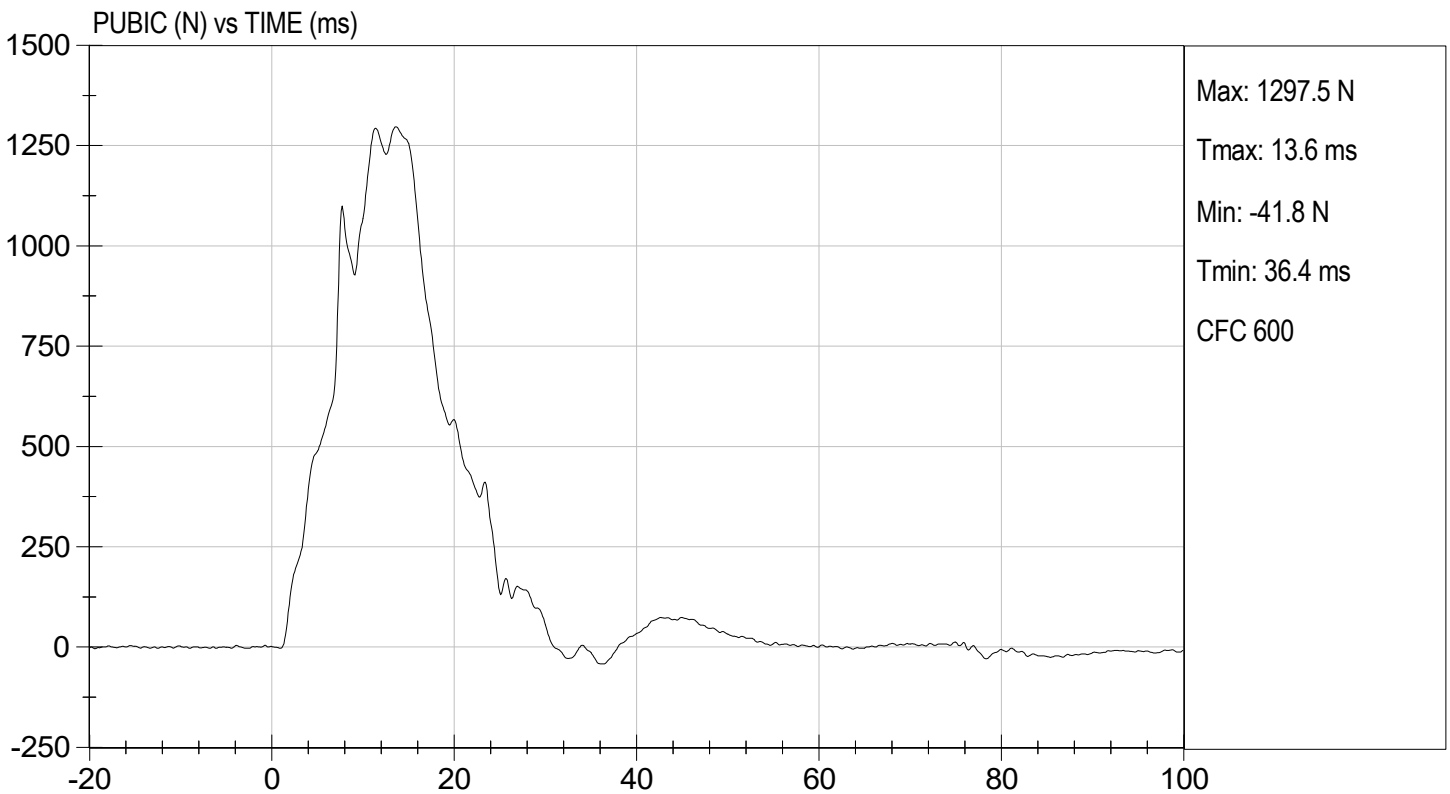
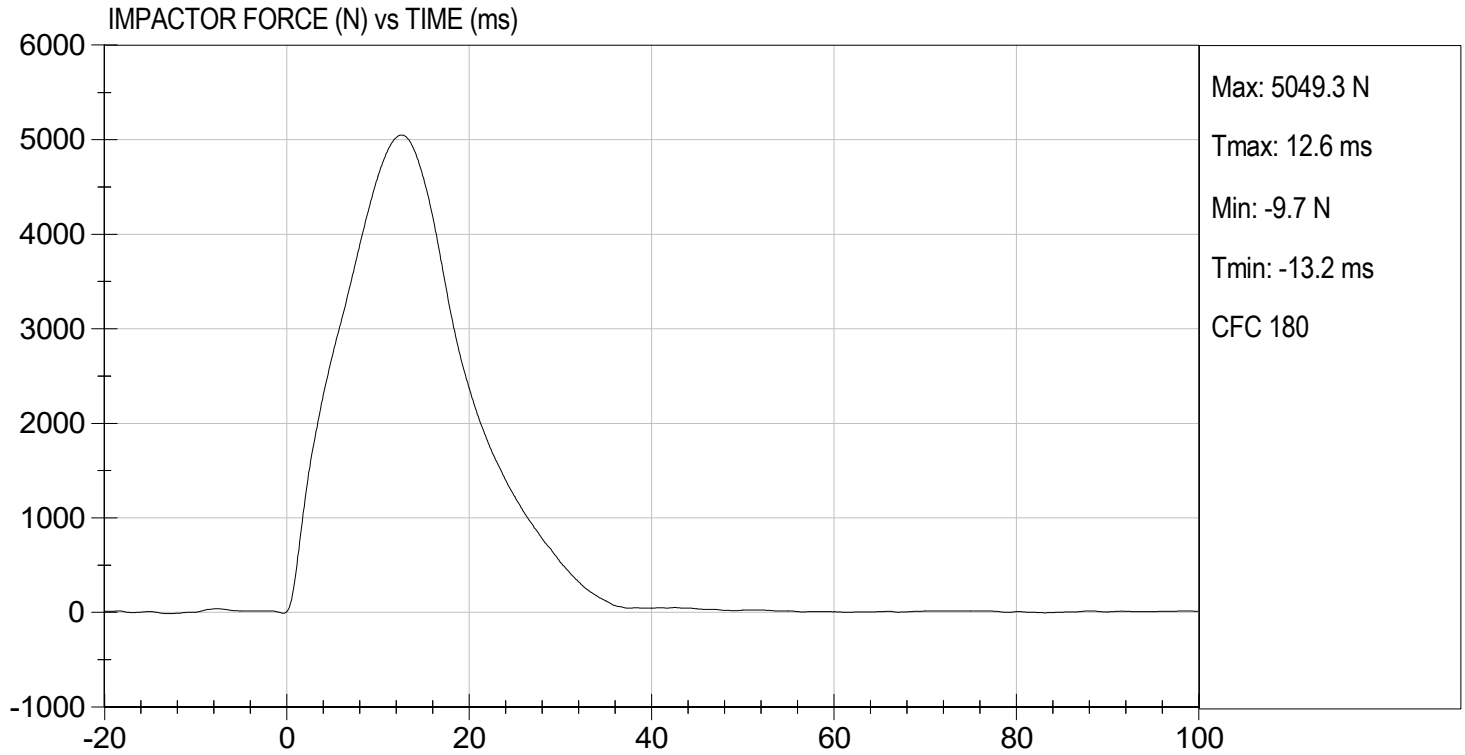
05/05/2023
Test Date


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 05/05/2023
TEST #: D231129

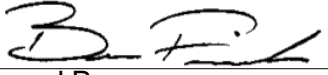


MGA RESEARCH CORPORATION**THORAX IMPACT TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D231120

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	34	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5740	Pass
Upper Rib Displacement	mm	34.0 to 41.0	39.3	Pass
Middle Rib Displacement	mm	37.0 to 45.0	41.8	Pass
Lower Rib Displacement	mm	37.0 to 44.0	41.5	Pass
Overall Test Results				Pass


Laboratory Technician

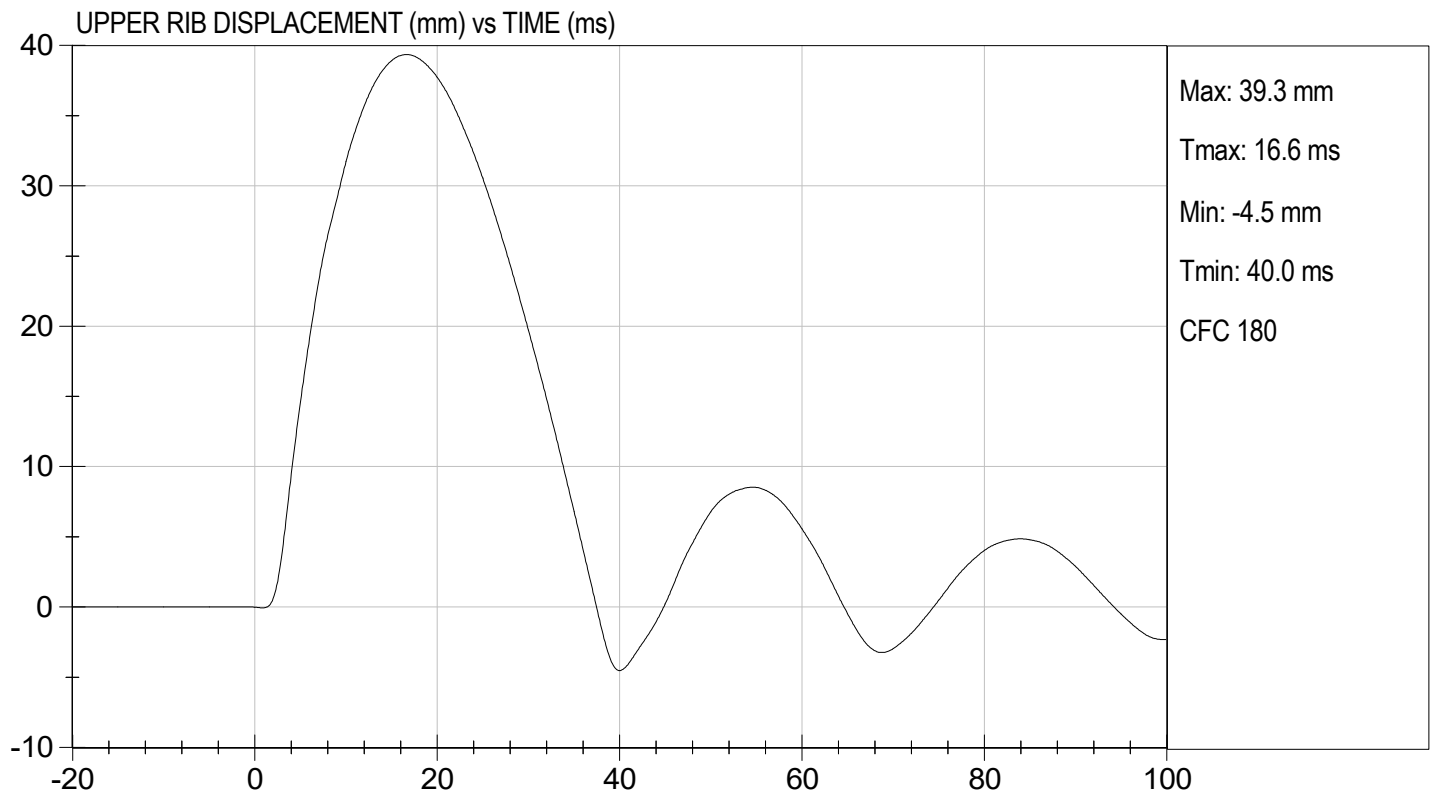
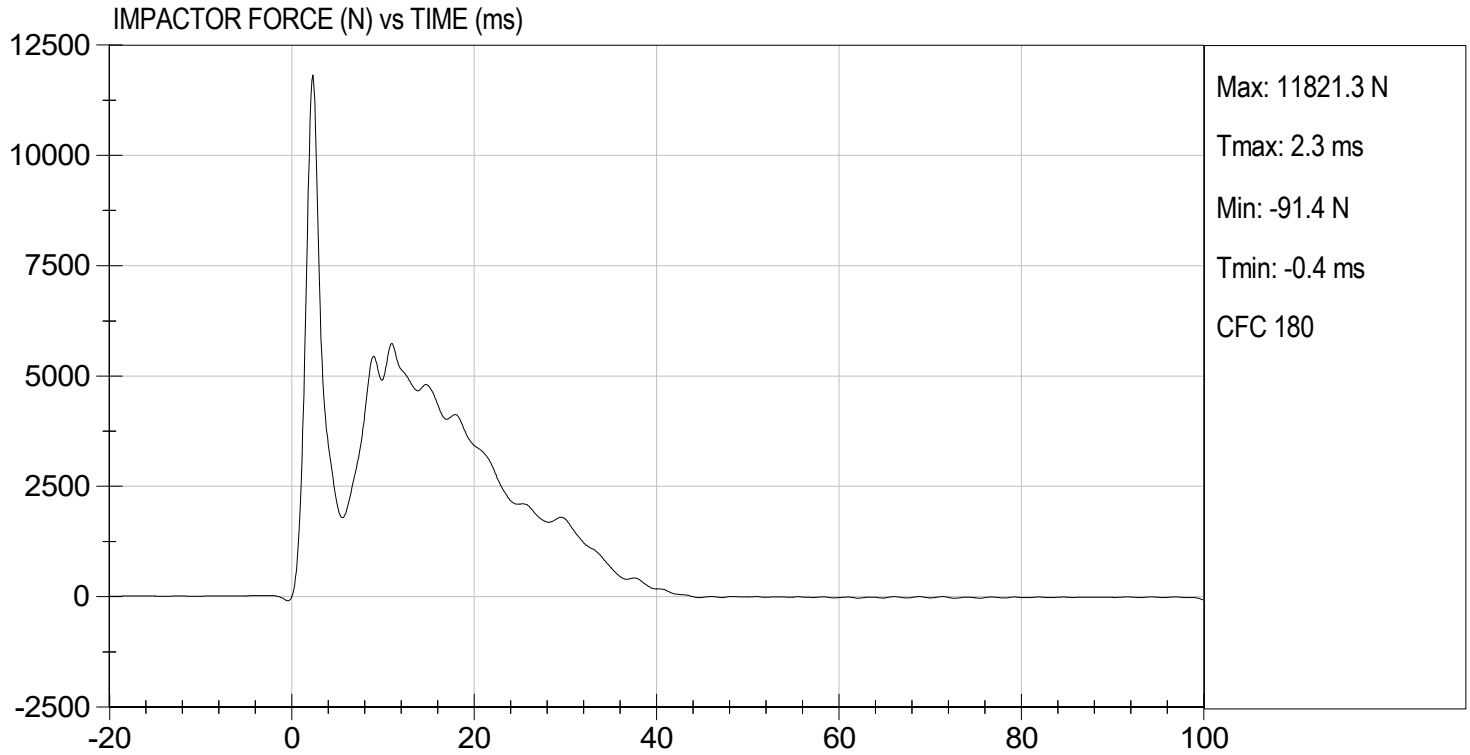
05/05/2023
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 18.32 ft/s, 5.58 m/s

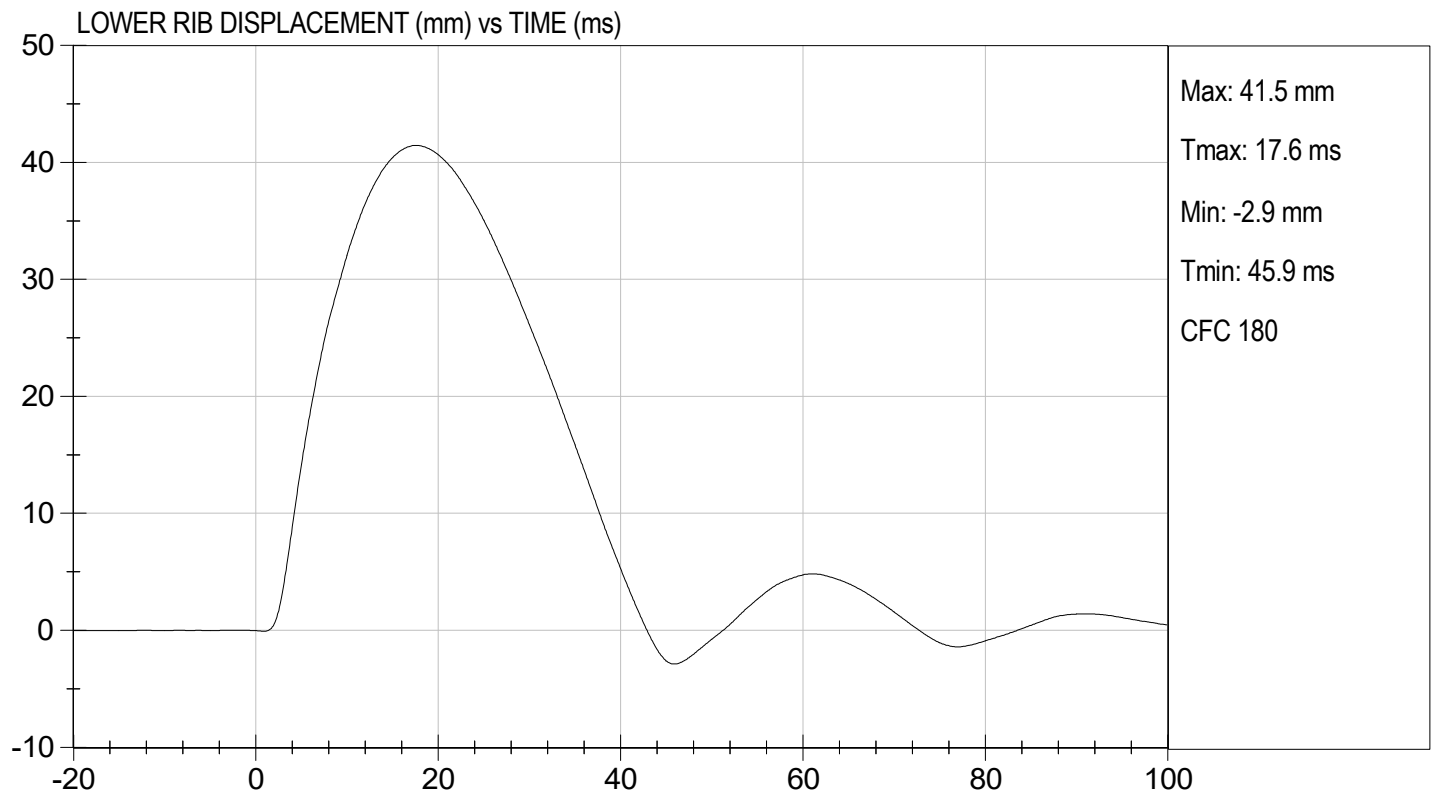
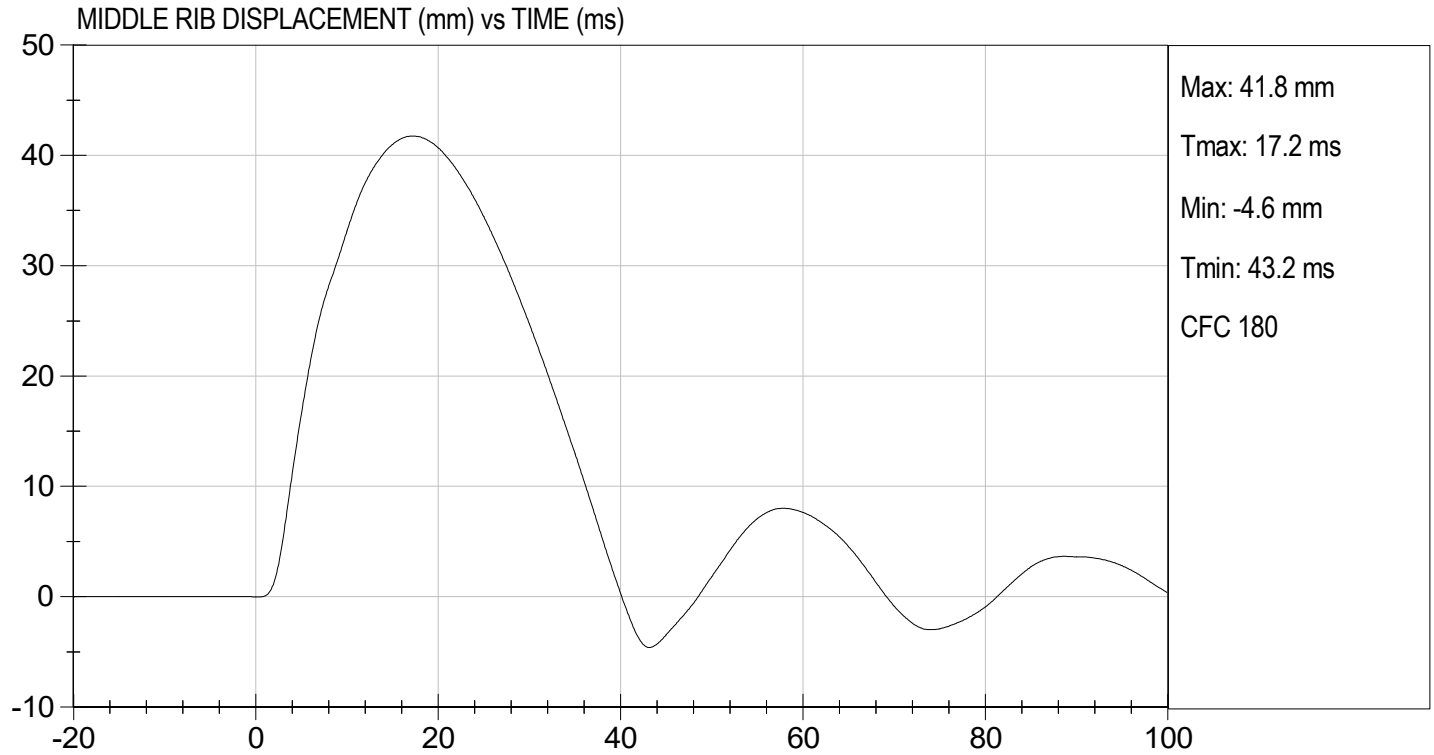
TEST DATE: 05/05/2023
TEST #: D231120





TEST DESC: THORAX IMPACT
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 05/05/2023
TEST #: D231120



QUALIFICATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

ES-2re External Measurements
SN: F032

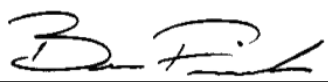
No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	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

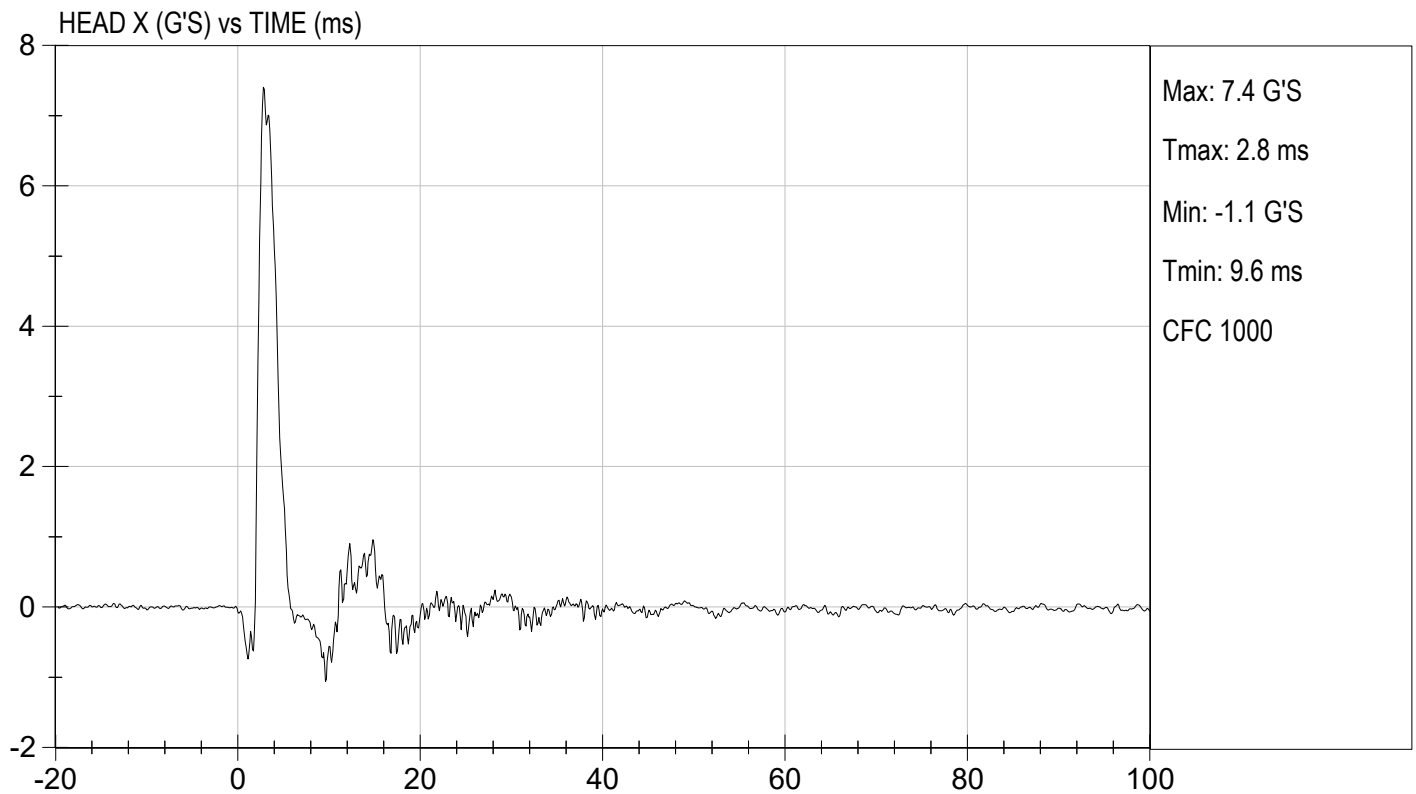
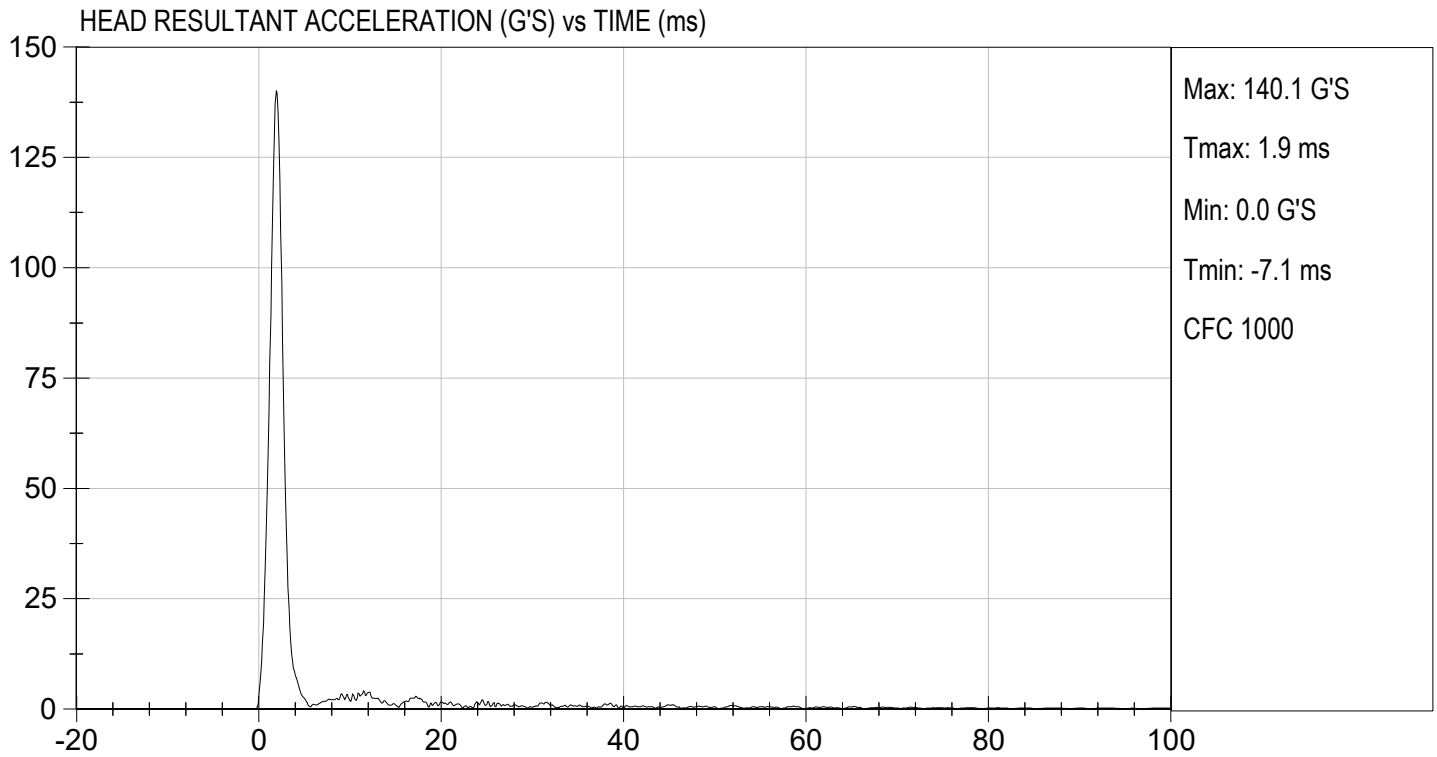
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY**ATD Serial No: F032Test ID: D231181

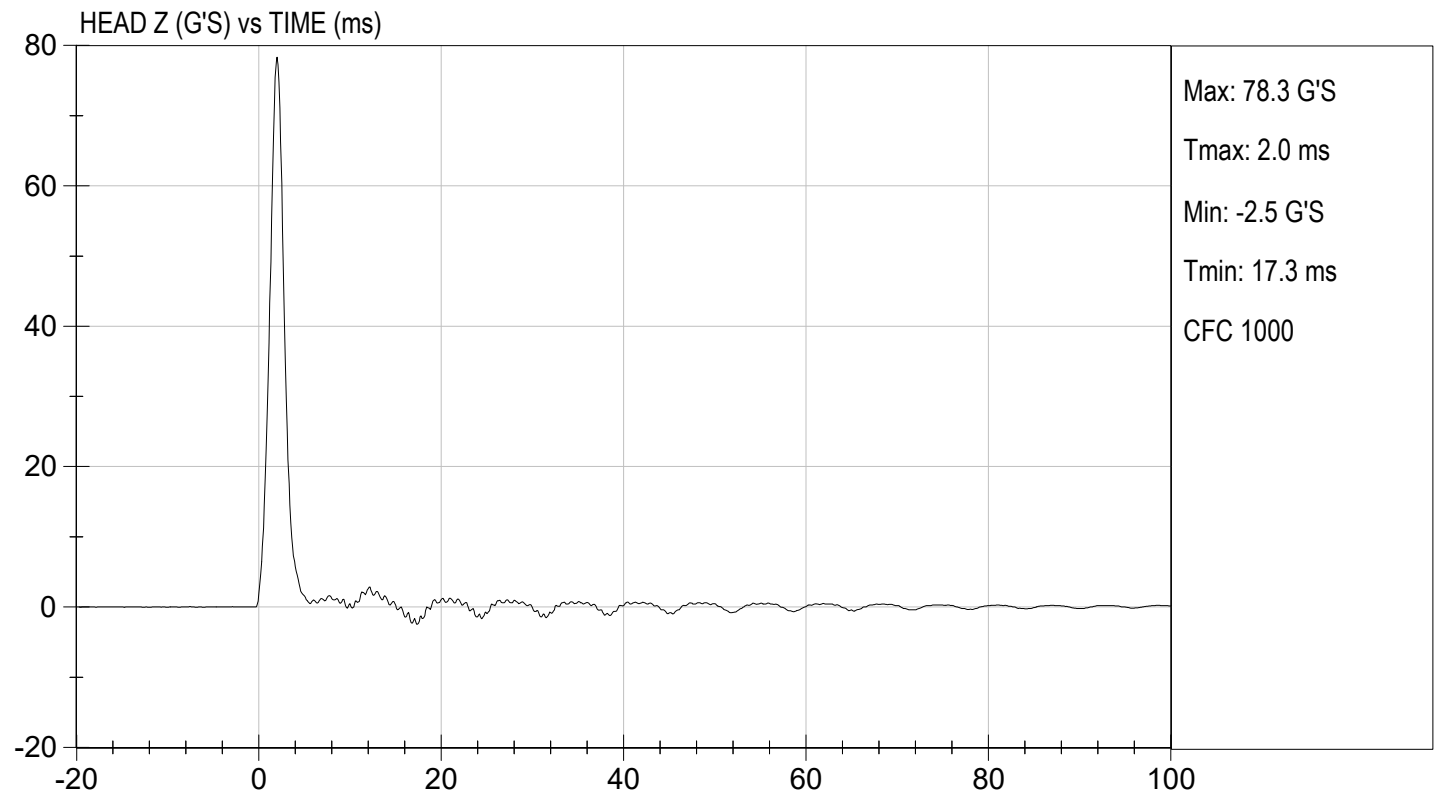
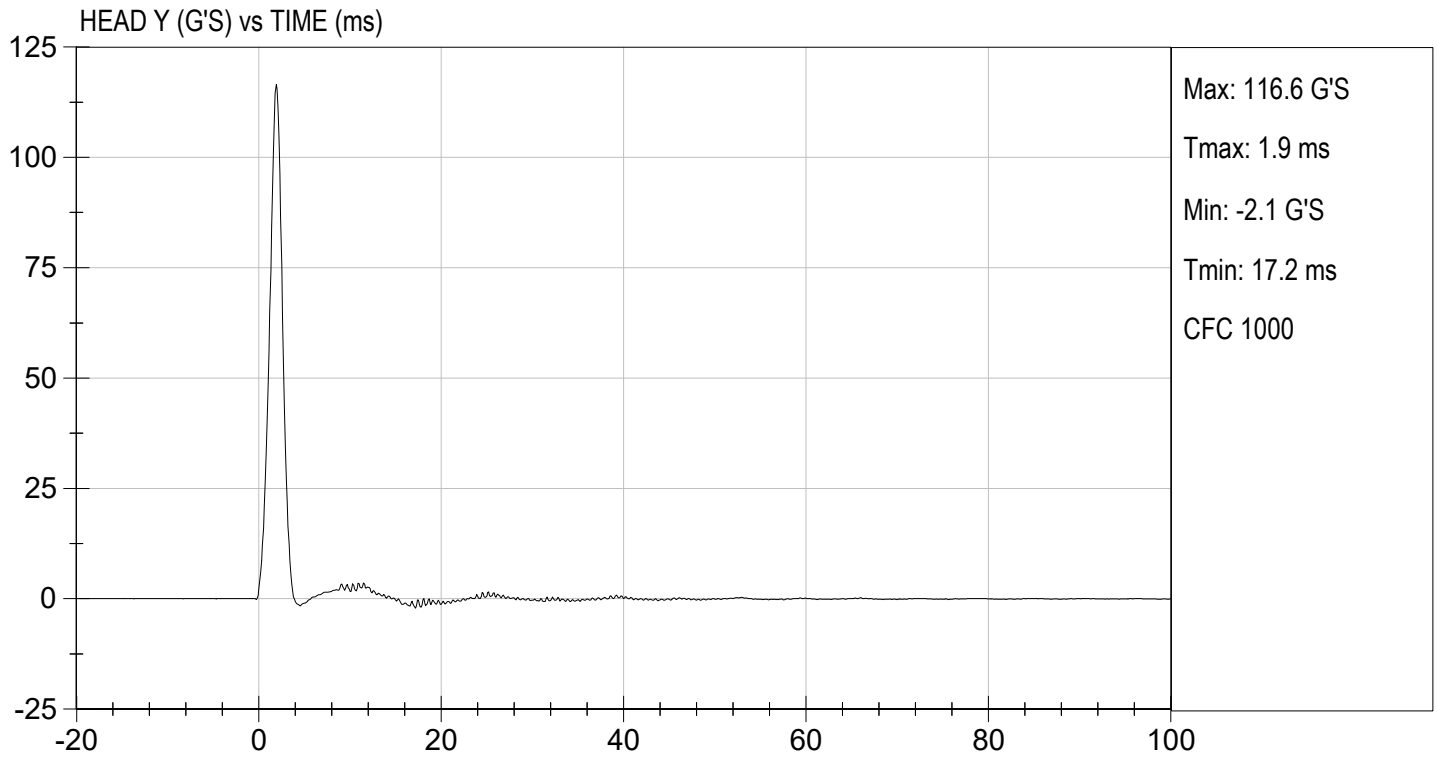
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Peak Resultant Acceleration	G's	125 to 155	140	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	7.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results			Pass	


Laboratory Technician

05/12/2023
Test Date


Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

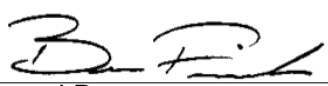
ATD Serial No: F032

Test I.D: D231182

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.43	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3 ms	m/s	-0.25 to -0.375	-0.35	Pass
	14 ms	m/s	-3.20 to -3.70	-3.48	Pass
	17 ms	m/s	>= -3.70	-3.43	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	51.2	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	58.9	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	61.0	Pass
Overall Results					Pass


 Laboratory Technician

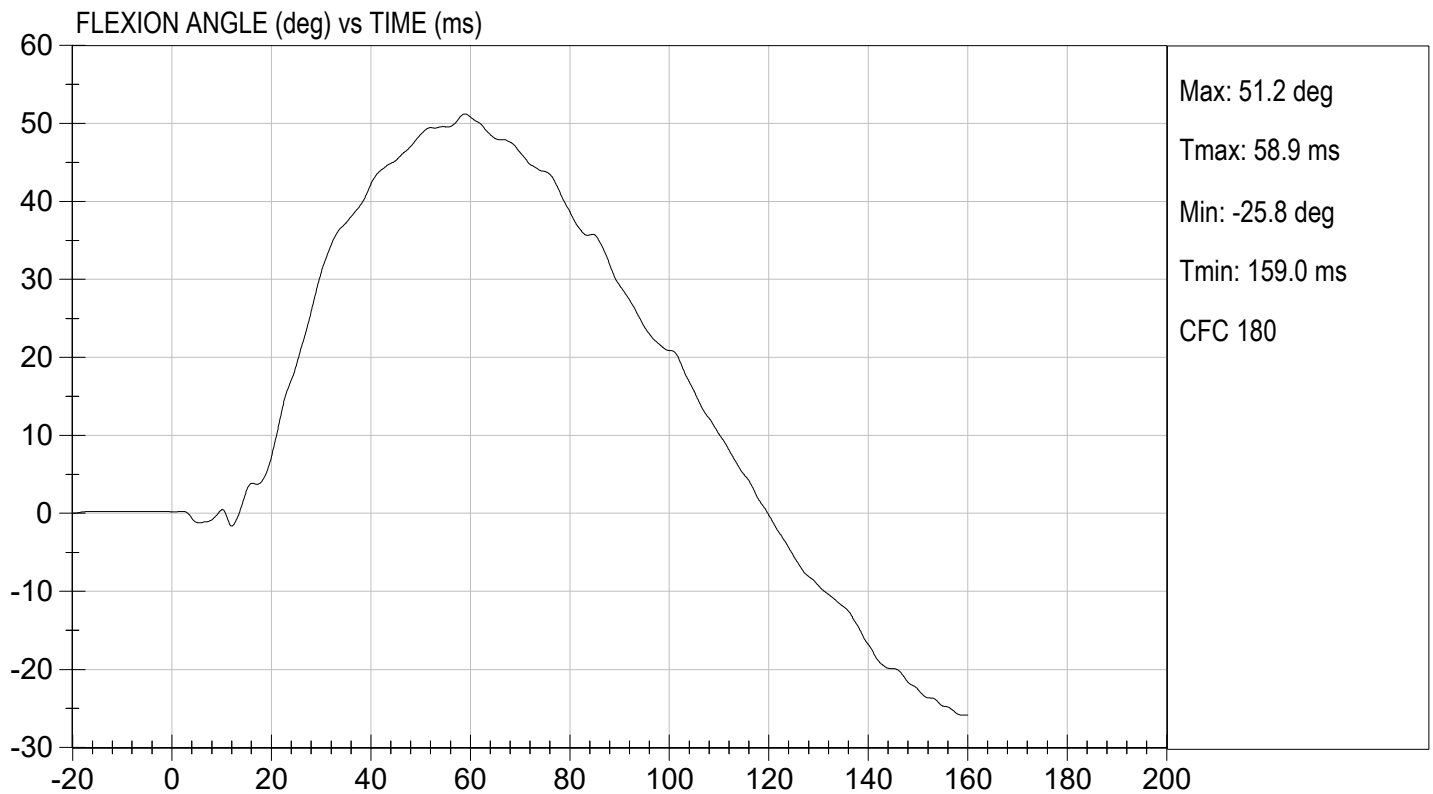
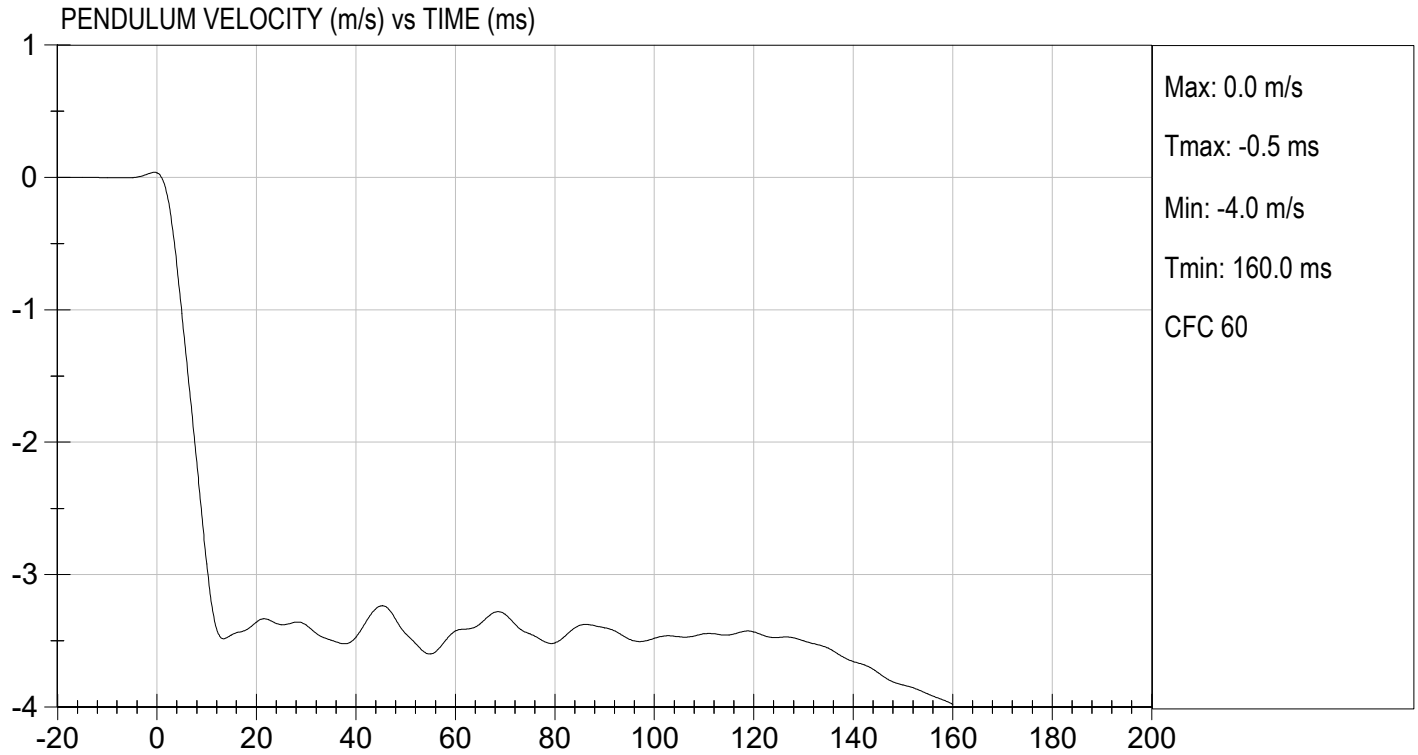
05/12/2023
 Test Date


 Approved By



TEST DESC: NECK BENDING
VELOCITY: 11.26 ft/s, 3.43 m/s

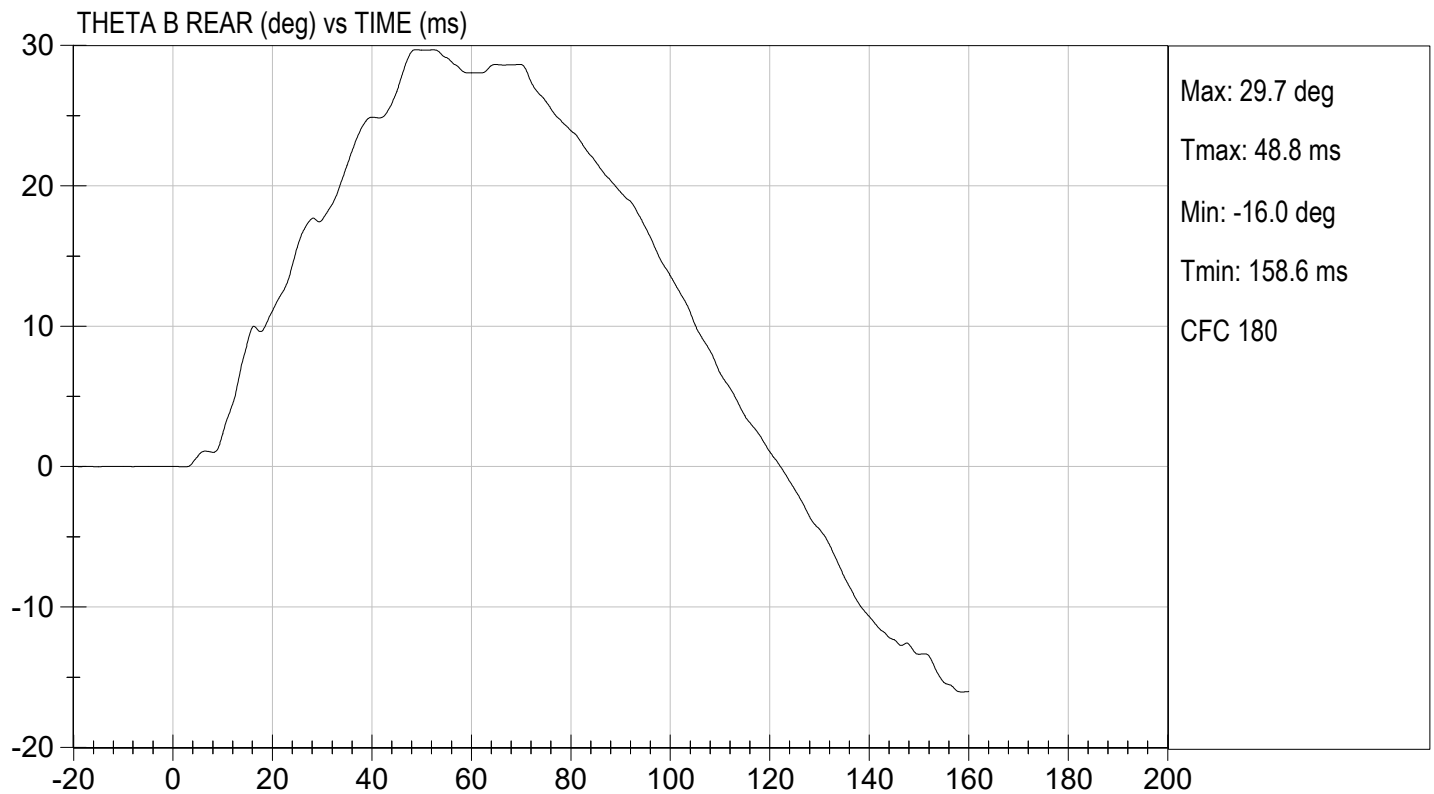
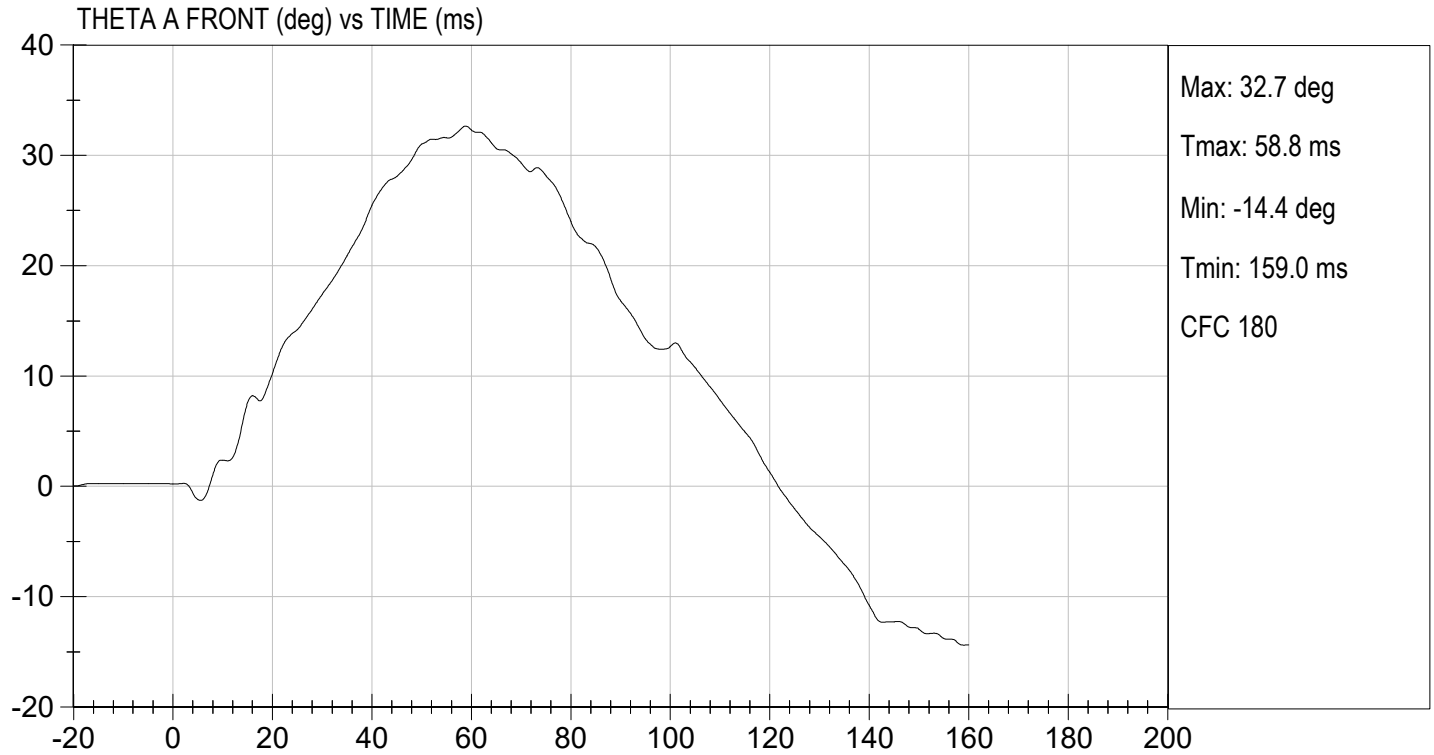
TEST DATE: 05/12/2023
TEST #: D231182





TEST DESC: NECK BENDING
VELOCITY: 11.26 ft/s, 3.43 m/s

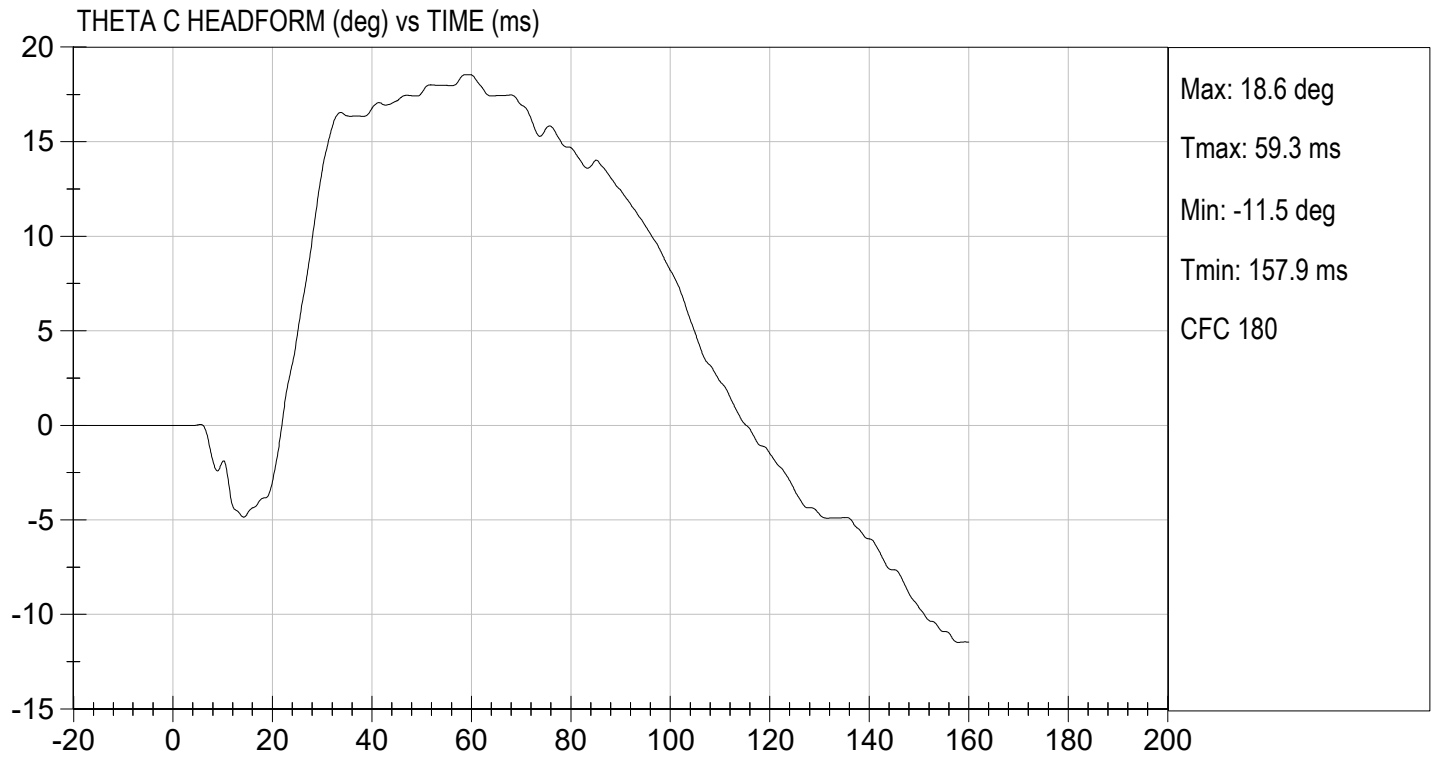
TEST DATE: 05/12/2023
TEST #: D231182





TEST DESC: NECK BENDING
VELOCITY: 11.26 ft/s, 3.43 m/s

TEST DATE: 05/12/2023
TEST #: D231182



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

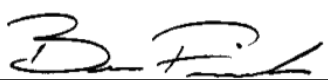
ATD Serial No: F032

Test I.D: D231183

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.3	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	8.2	Pass
Overall Test Results				Pass


Laboratory Technician

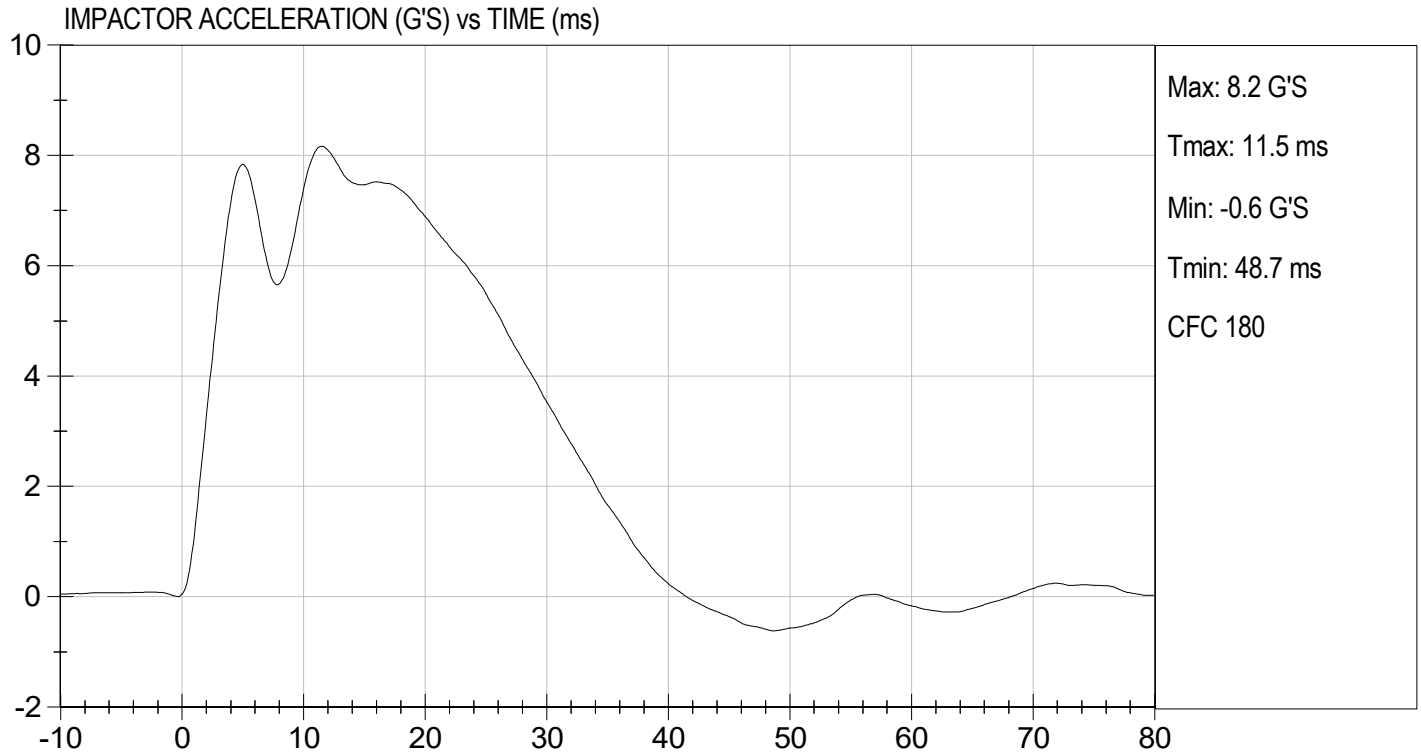
05/12/2023
Test Date


Approved By



TEST DESC: SHOULDER IMPACT
VELOCITY: 14.12 ft/s, 4.3 m/s

TEST DATE: 05/12/2023
TEST #: D231183



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

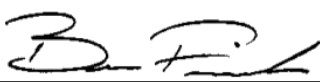
ATD Serial No: F032

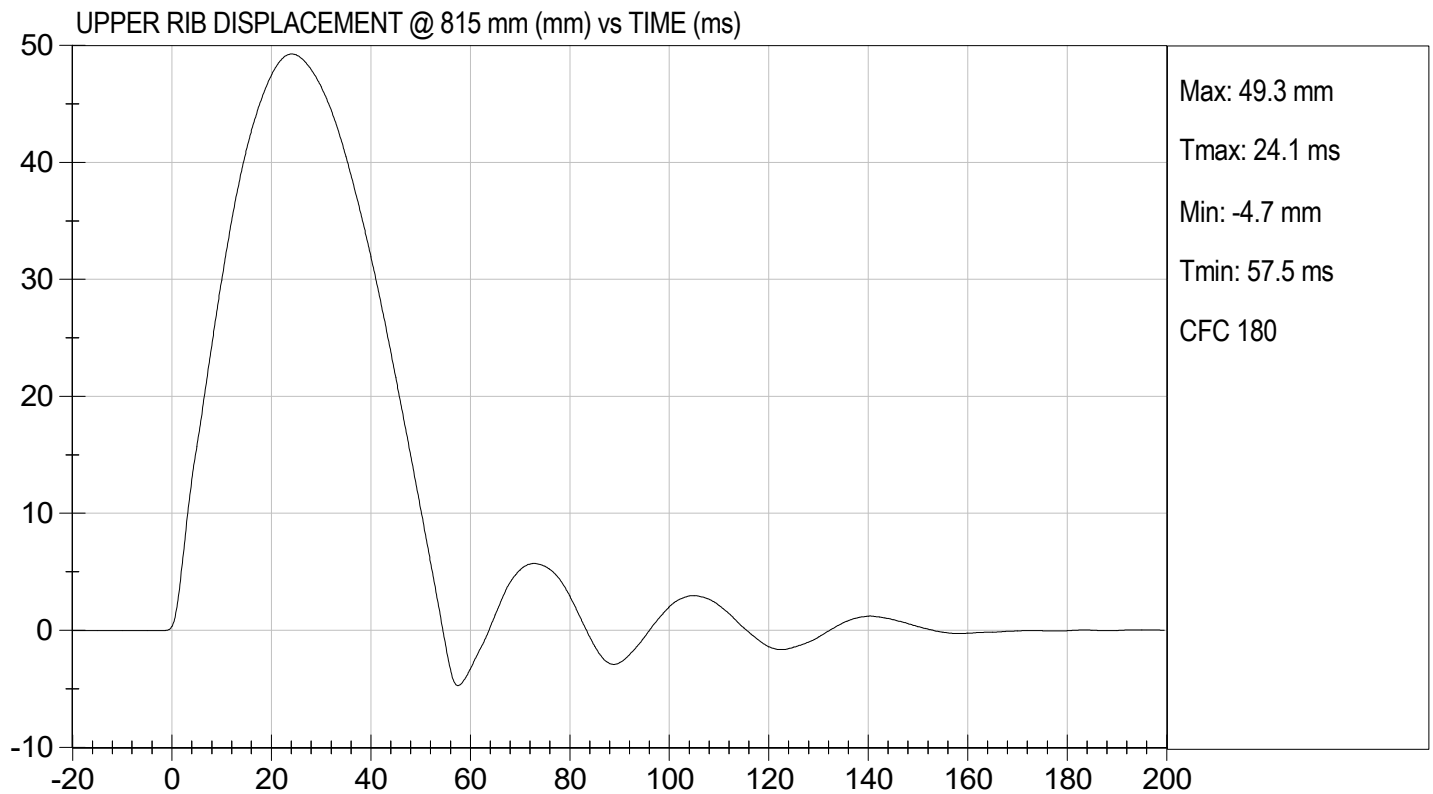
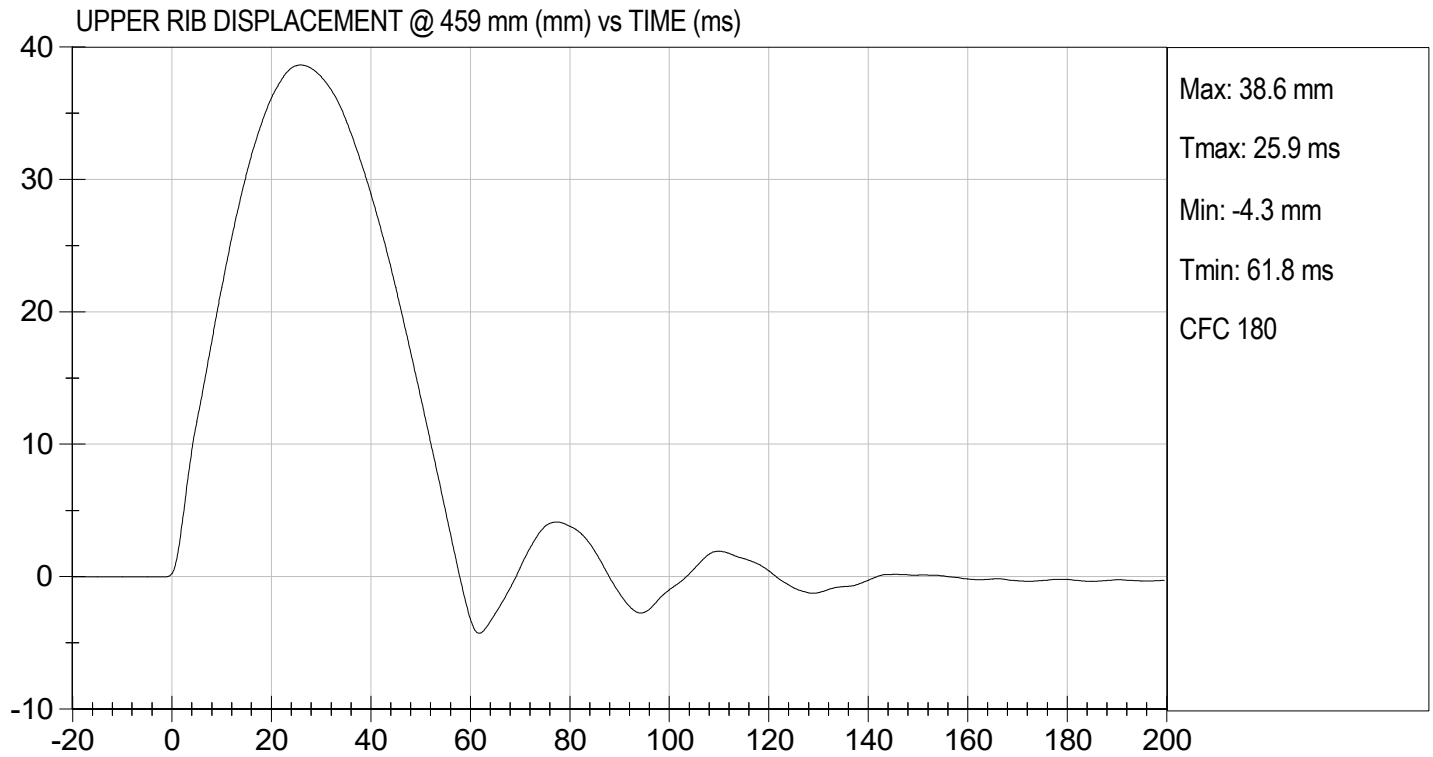
Test I.D: D231184

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.3	Pass
			Overall Test Results	Pass


Laboratory Technician

05/12/2023
Test Date


Approved By



MGA RESEARCH CORPORATION

MID RIB TEST

ES-2re DUMMY

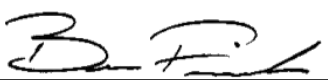
ATD Serial No: F032

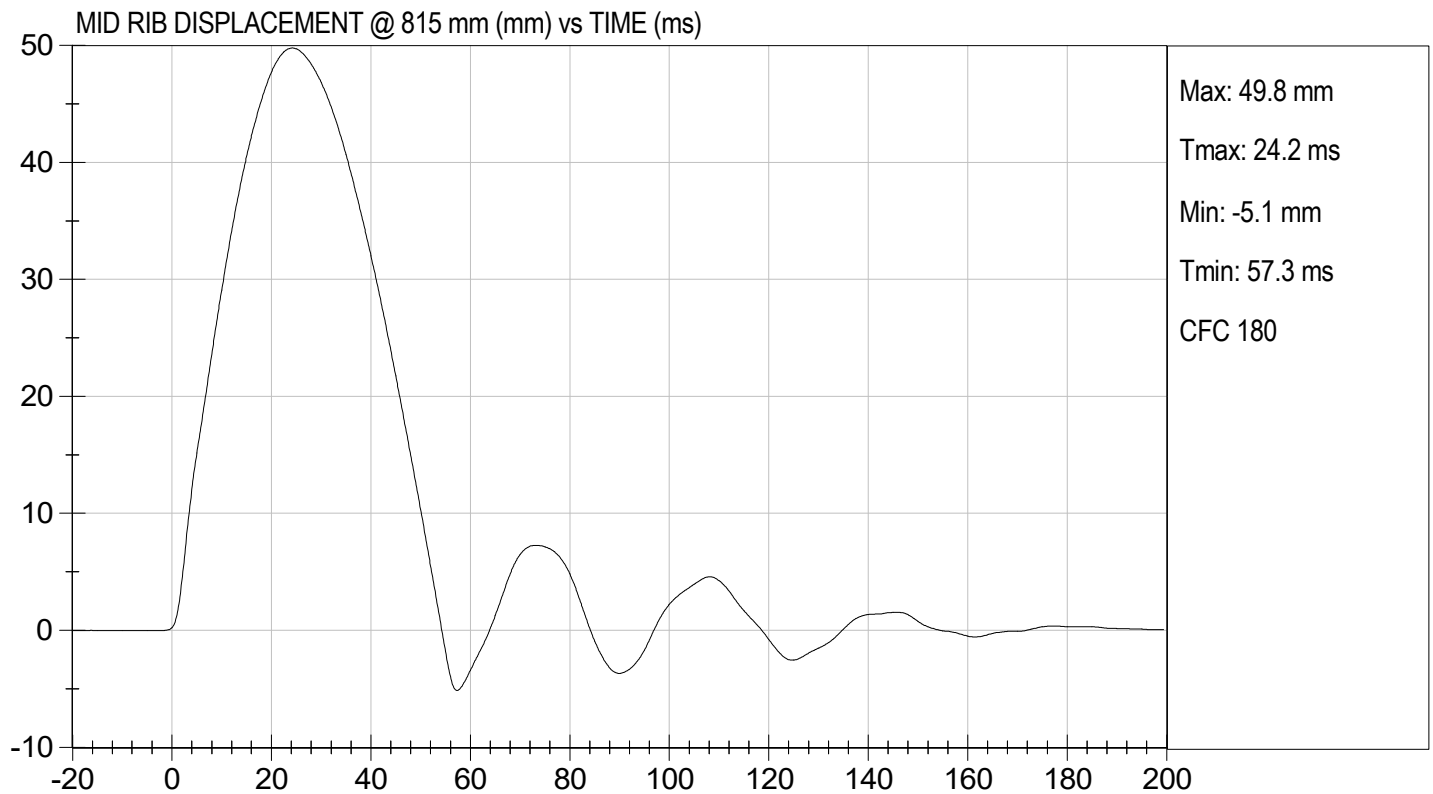
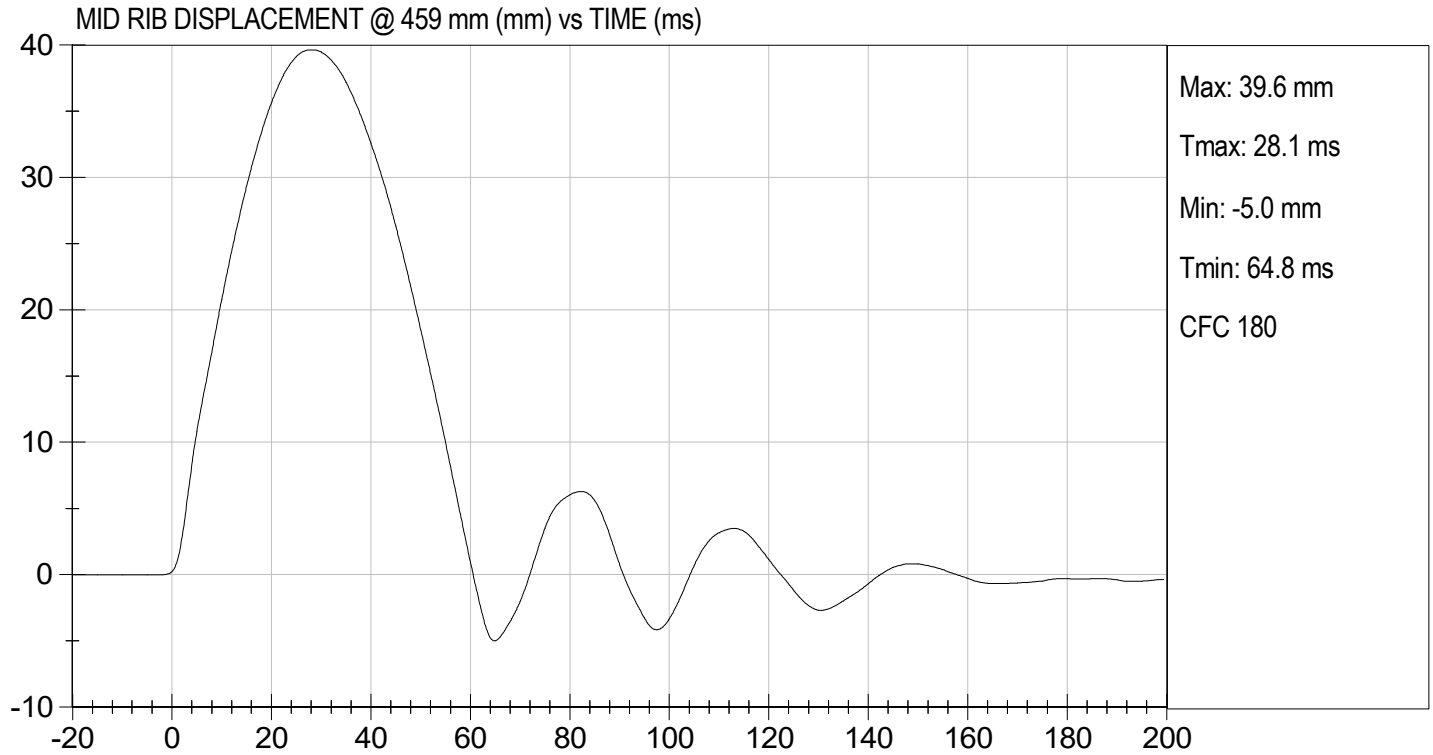
Test I.D: D231185

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.8	Pass
			Overall Test Results	Pass


Laboratory Technician

05/12/2023
Test Date


Approved By



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

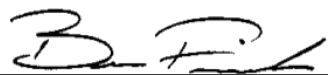
ATD Serial No: F032

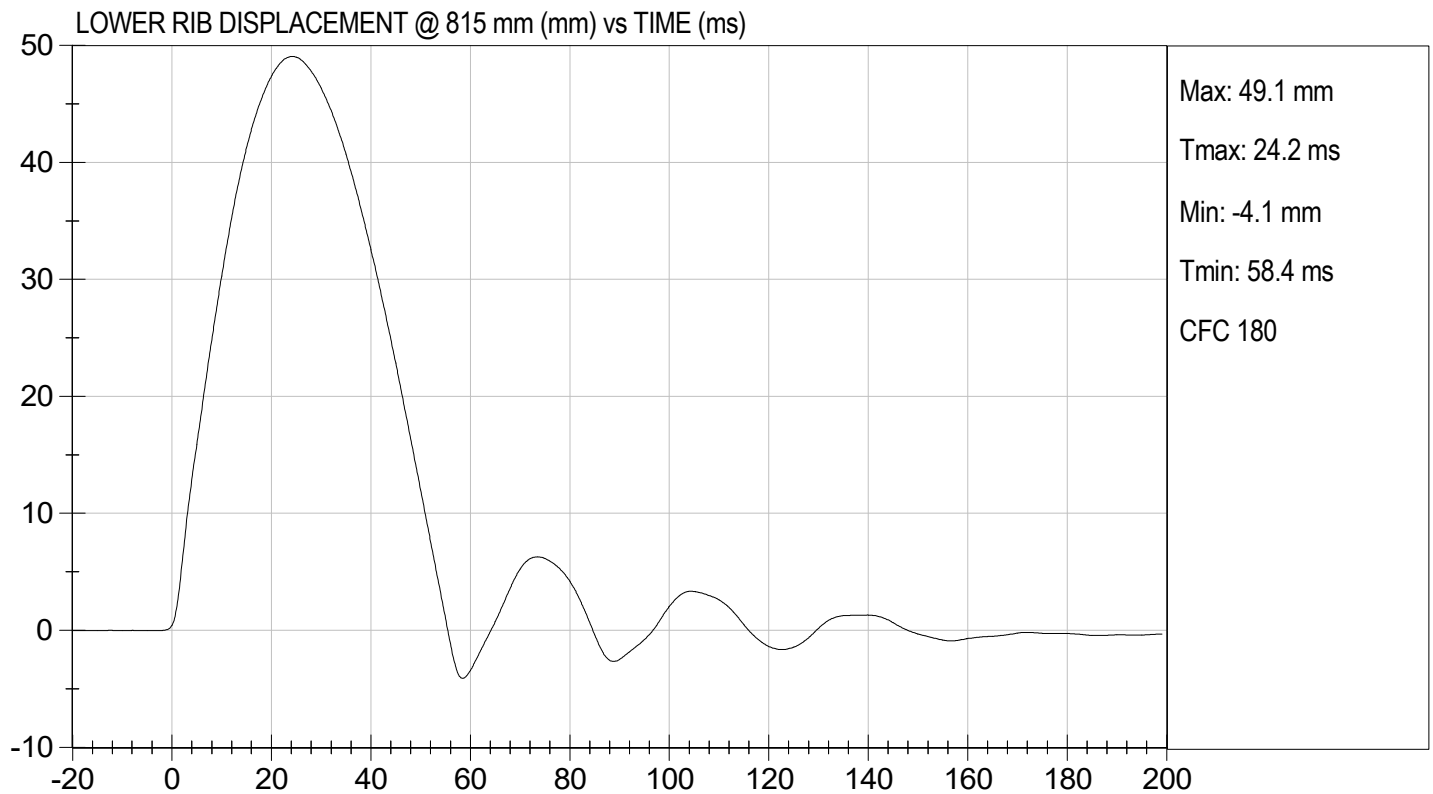
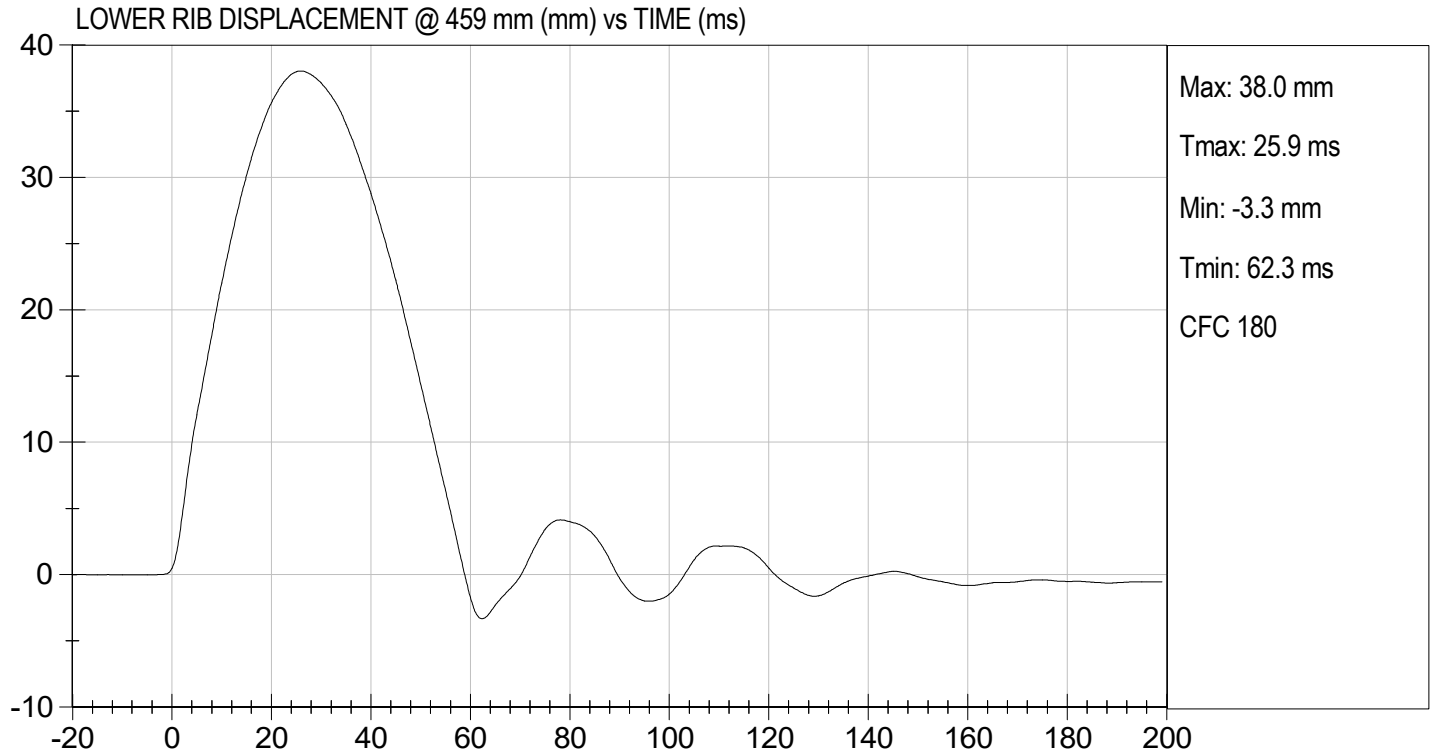
Test I.D: D231186

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.0	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.1	Pass
			Overall Test Results	Pass


Laboratory Technician

05/12/2023
Test Date


Approved By

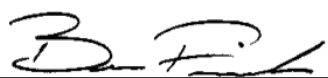


MGA RESEARCH CORPORATION**ABDOMEN TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D231187

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Speed	m/s	3.90 to 4.10	4.08	Pass
Maximum Impactor Force	N	4000 to 4800	4052	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	12.1	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2291	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	11.8	Pass
Overall Test Results				Pass


Laboratory Technician

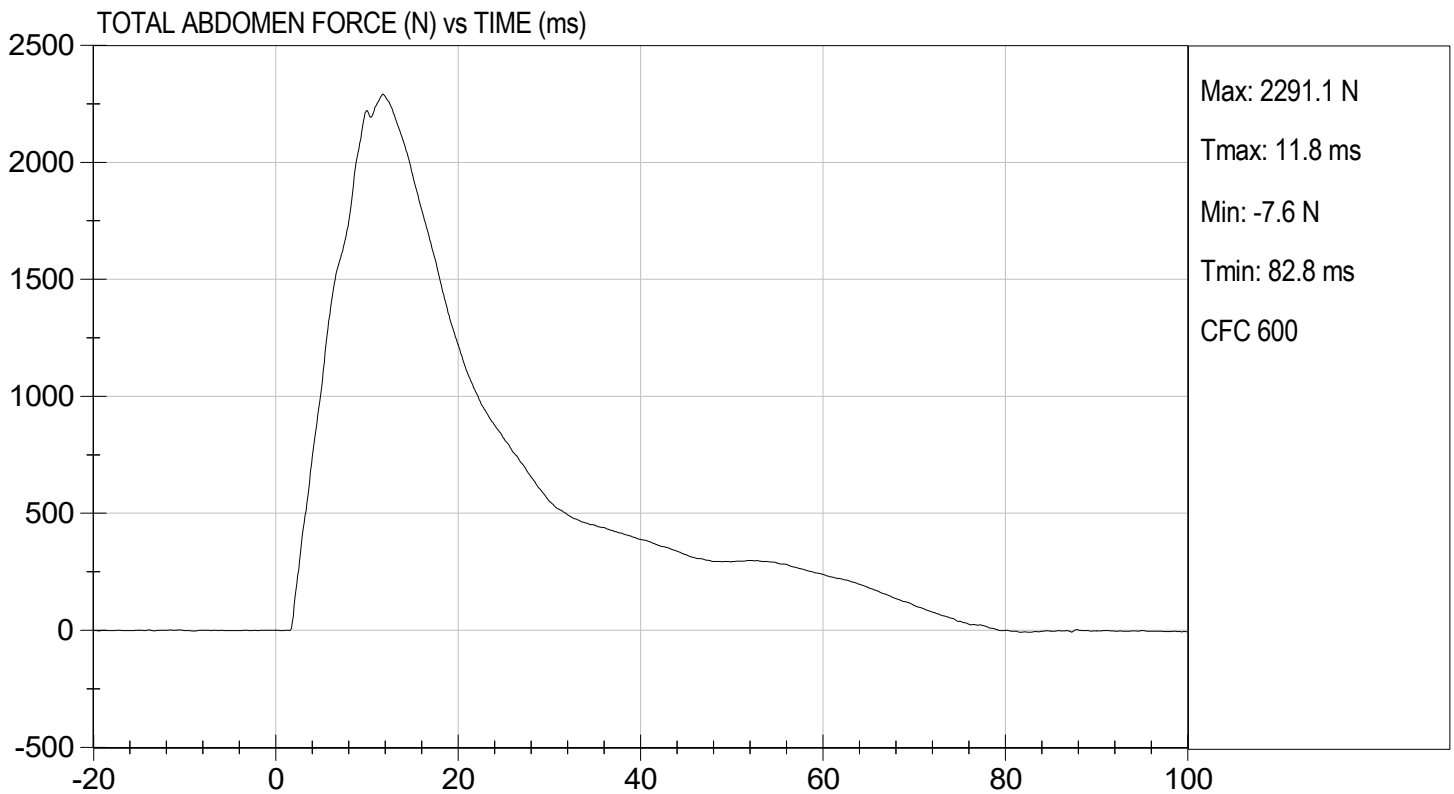
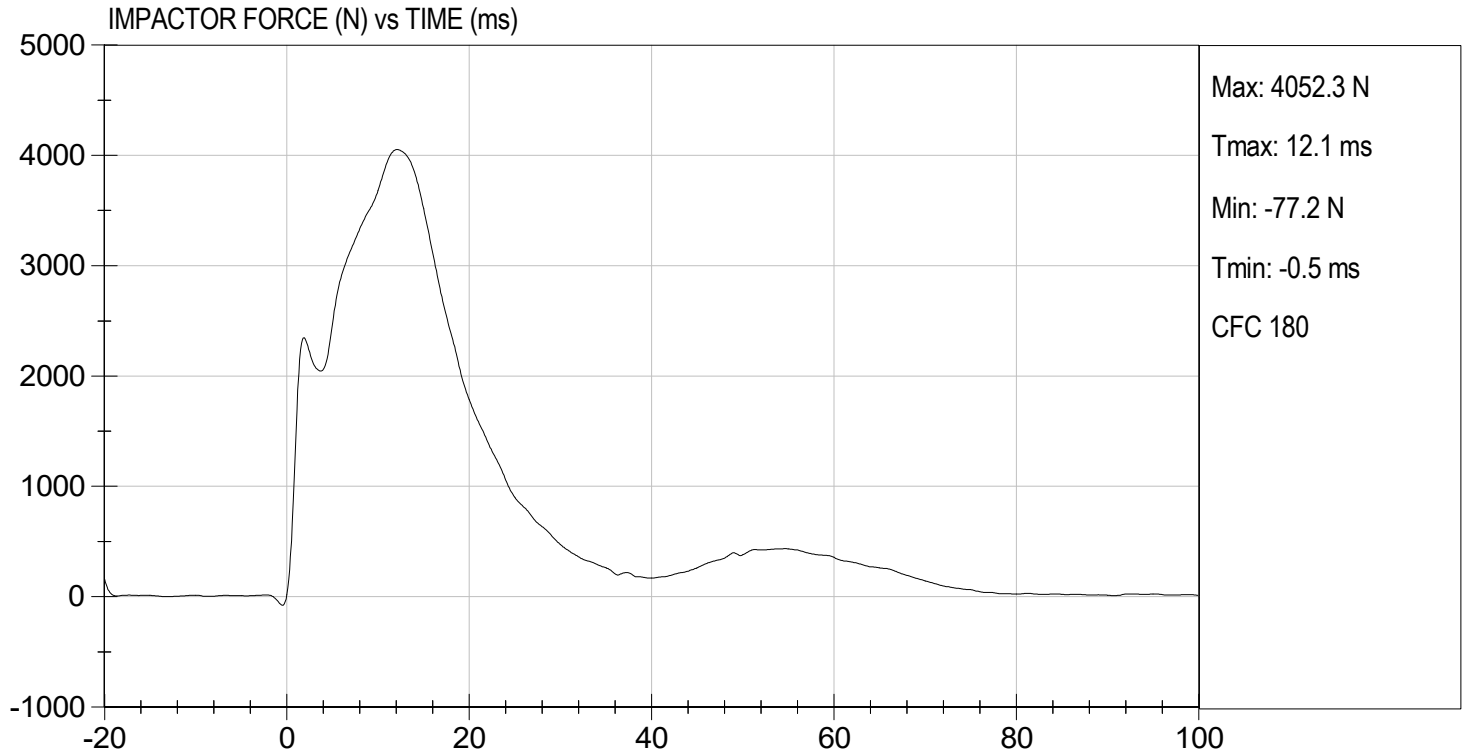
05/12/2023
Test Date


Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.40 ft/s, 4.08 m/s

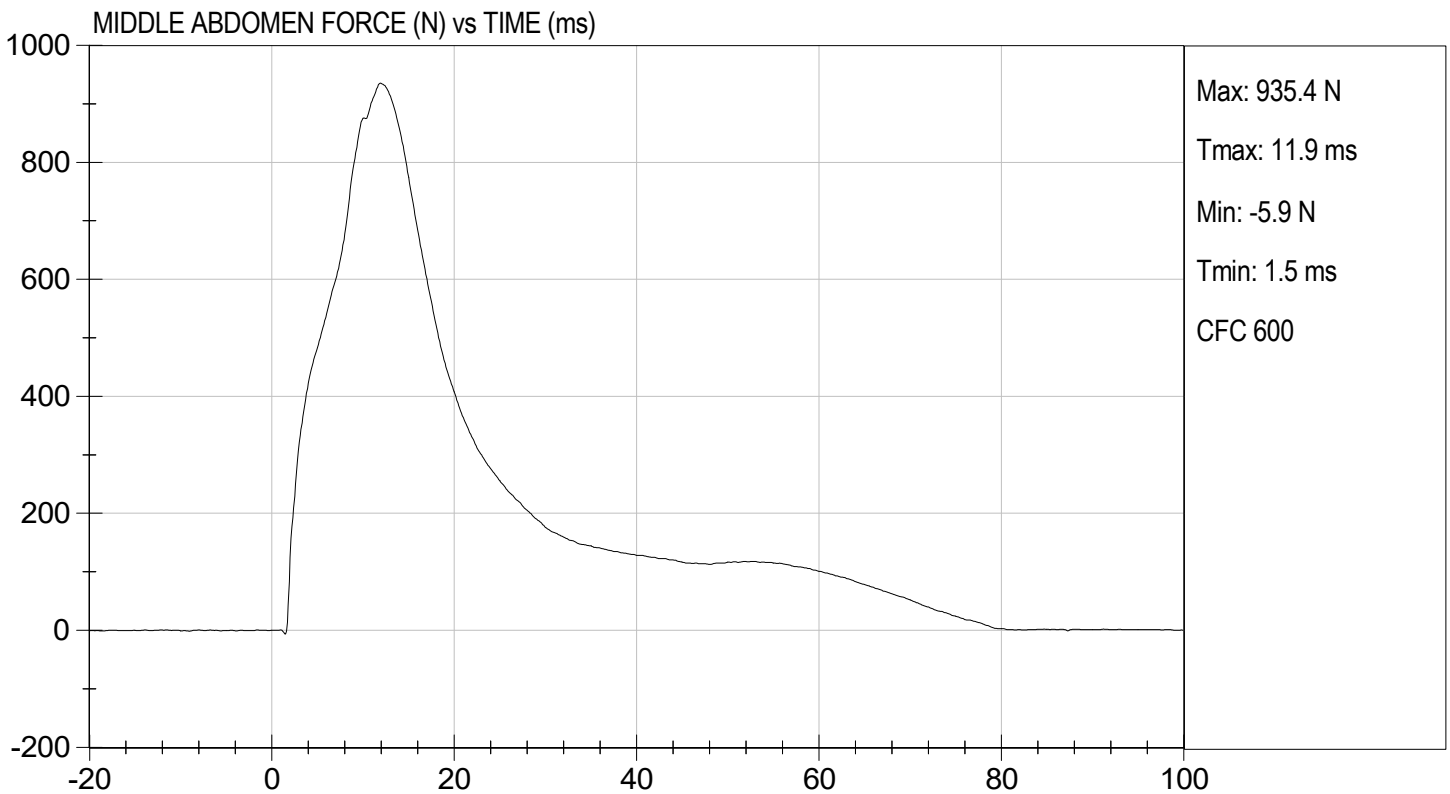
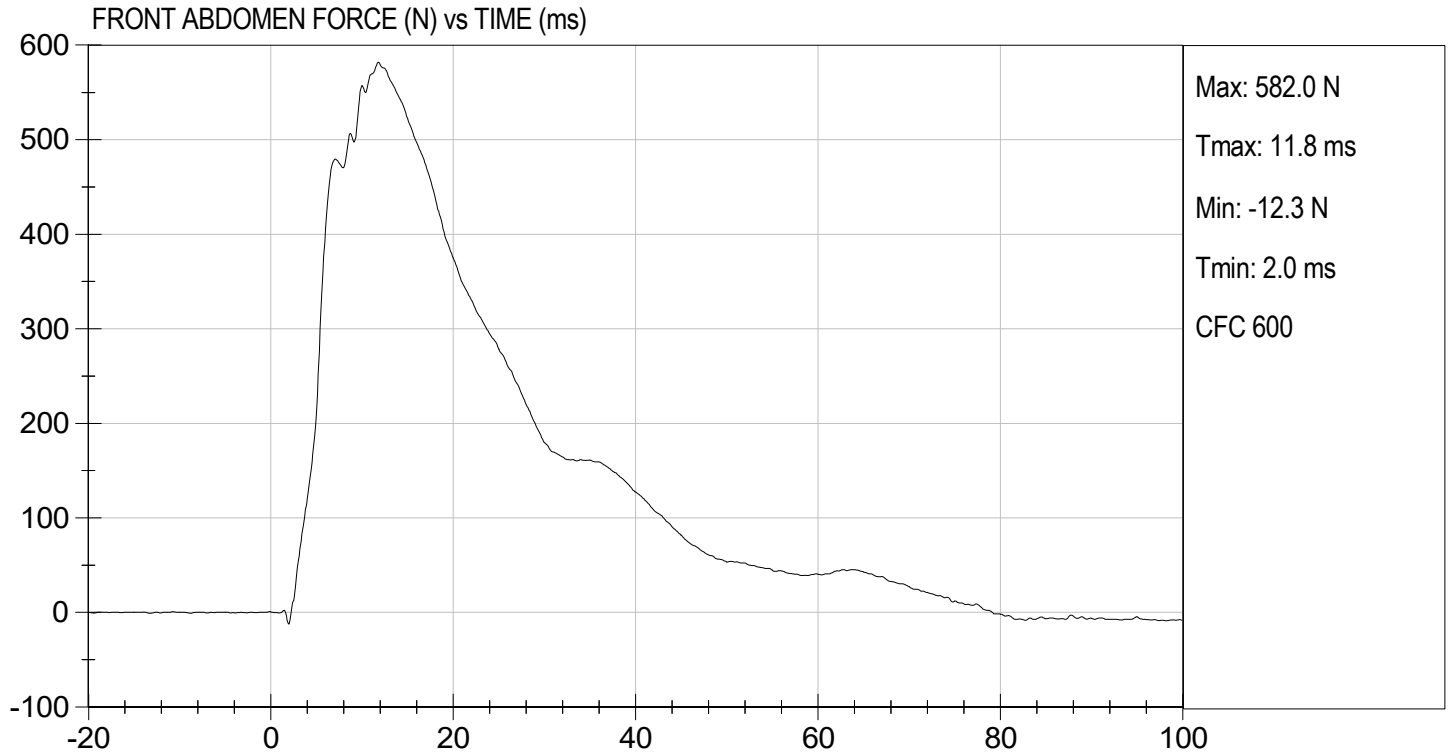
TEST DATE: 05/12/2023
TEST #: D231187





TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.40 ft/s, 4.08 m/s

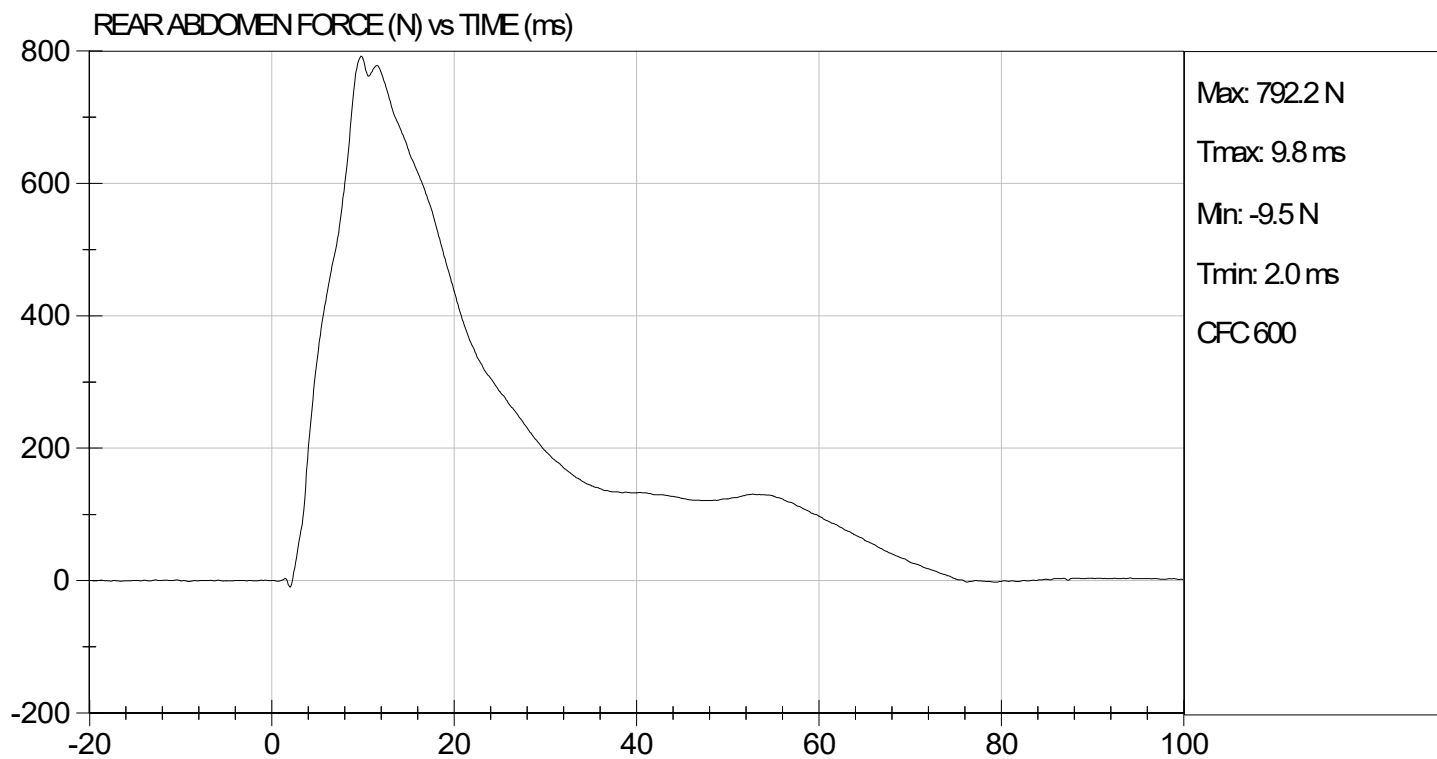
TEST DATE: 05/12/2023
TEST #: D231187





TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.40 ft/s, 4.08 m/s

TEST DATE: 05/12/2023
TEST #: D231187



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

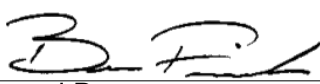
ATD Serial No: F032

Test I.D: D231188

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	43	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	-0.403	Pass
	27 ms	m/s	-6.50 to -5.80	-6.03	Pass
	30 ms	m/s	>= -6.50	-6.13	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	49.6	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	51.0	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	38	Pass
Overall Results					Pass


 Laboratory Technician

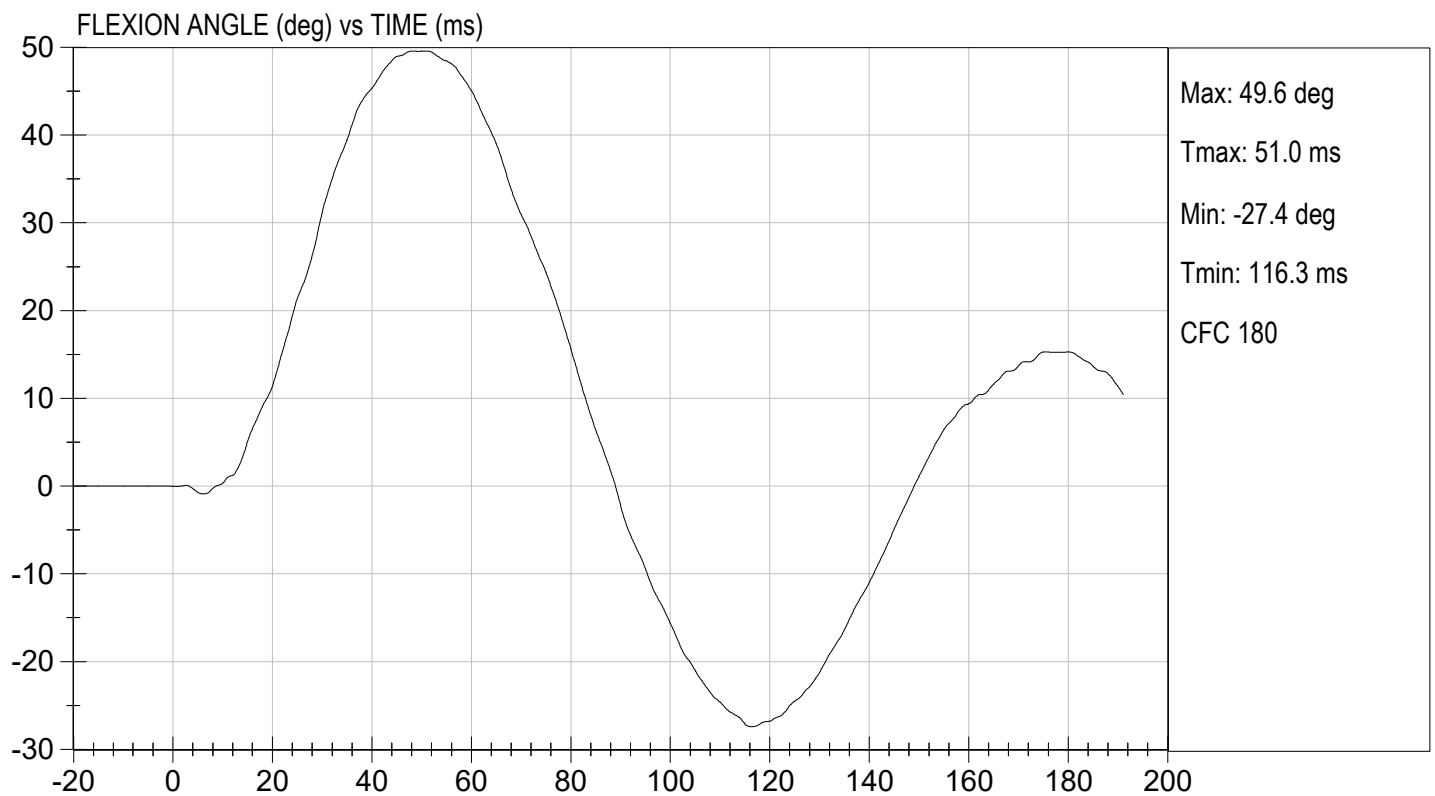
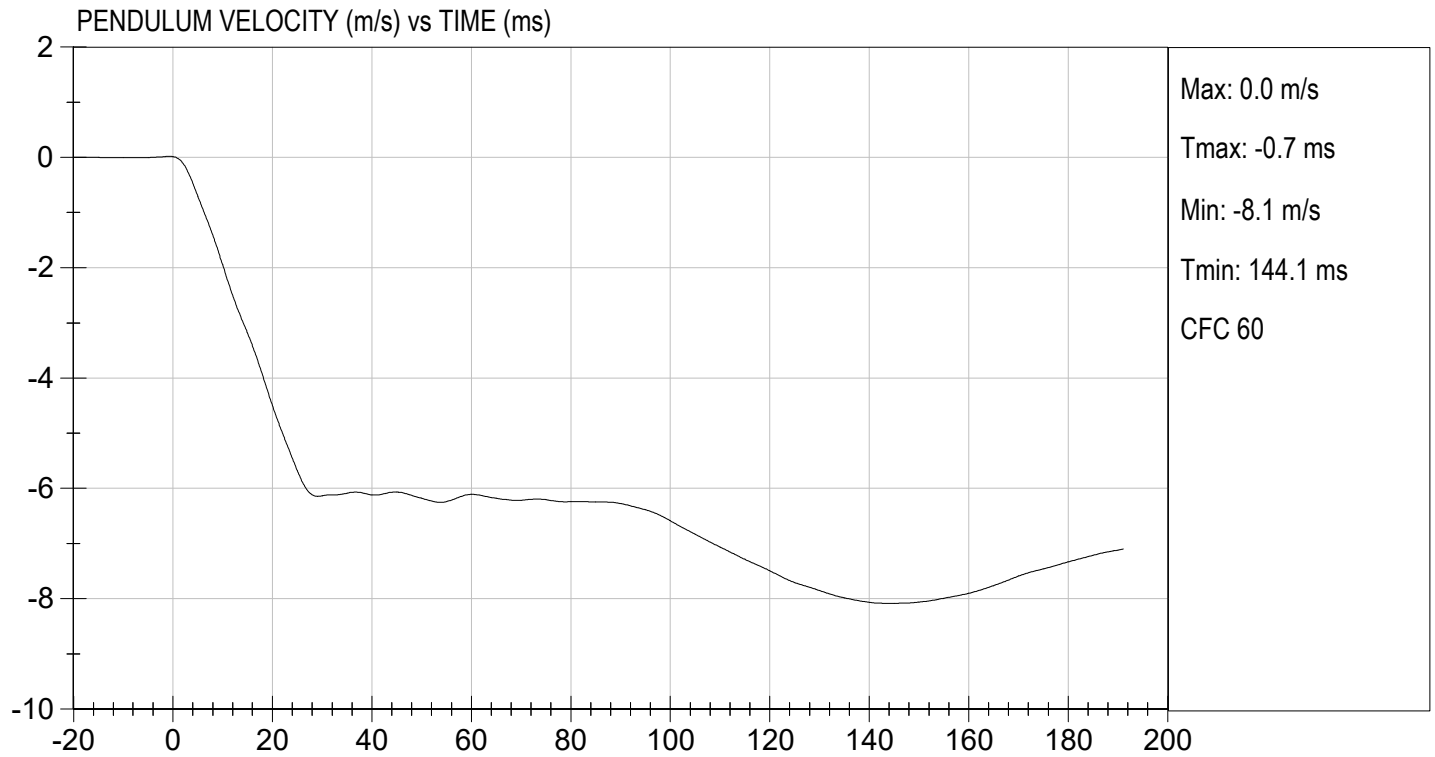
05/12/2023
 Test Date


 Approved By



TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

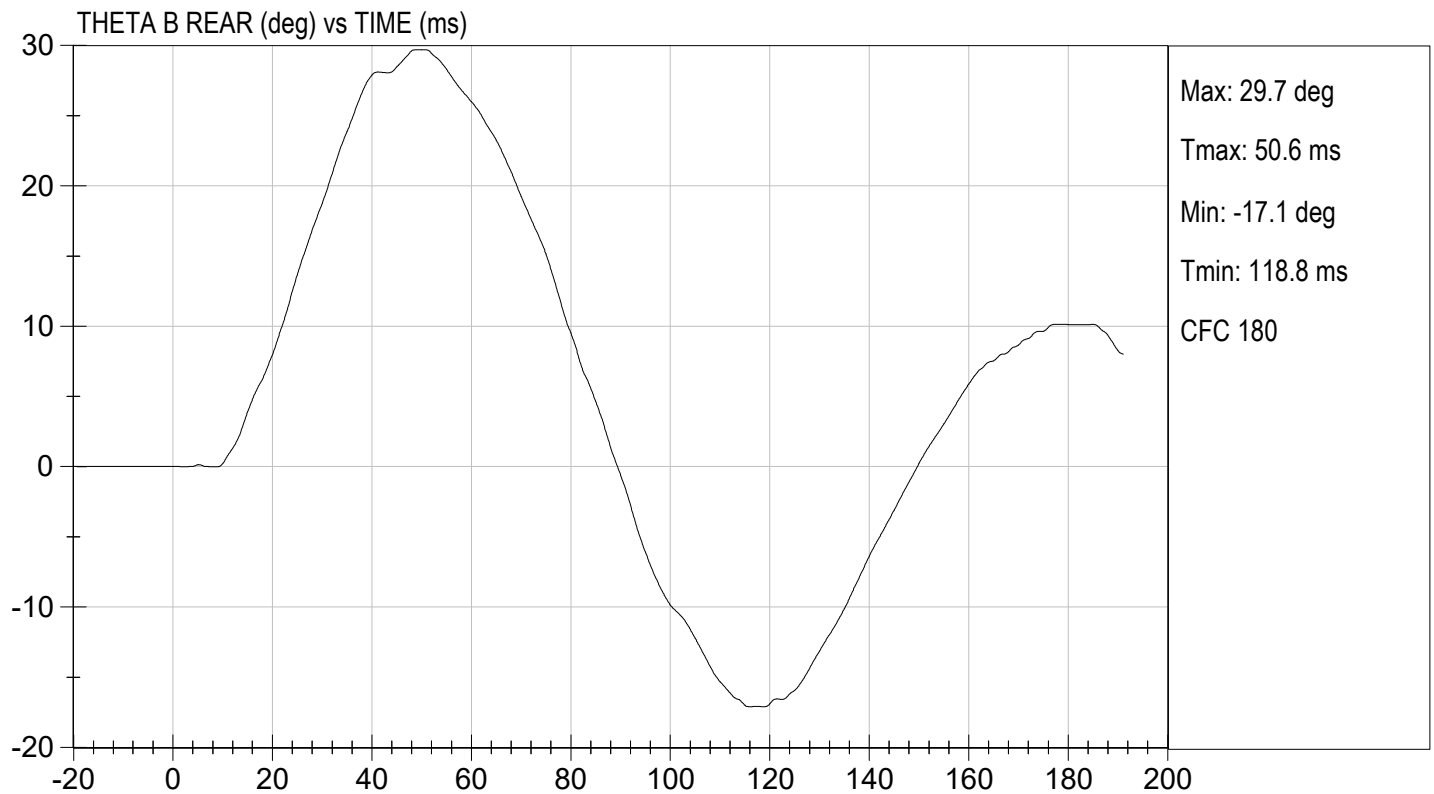
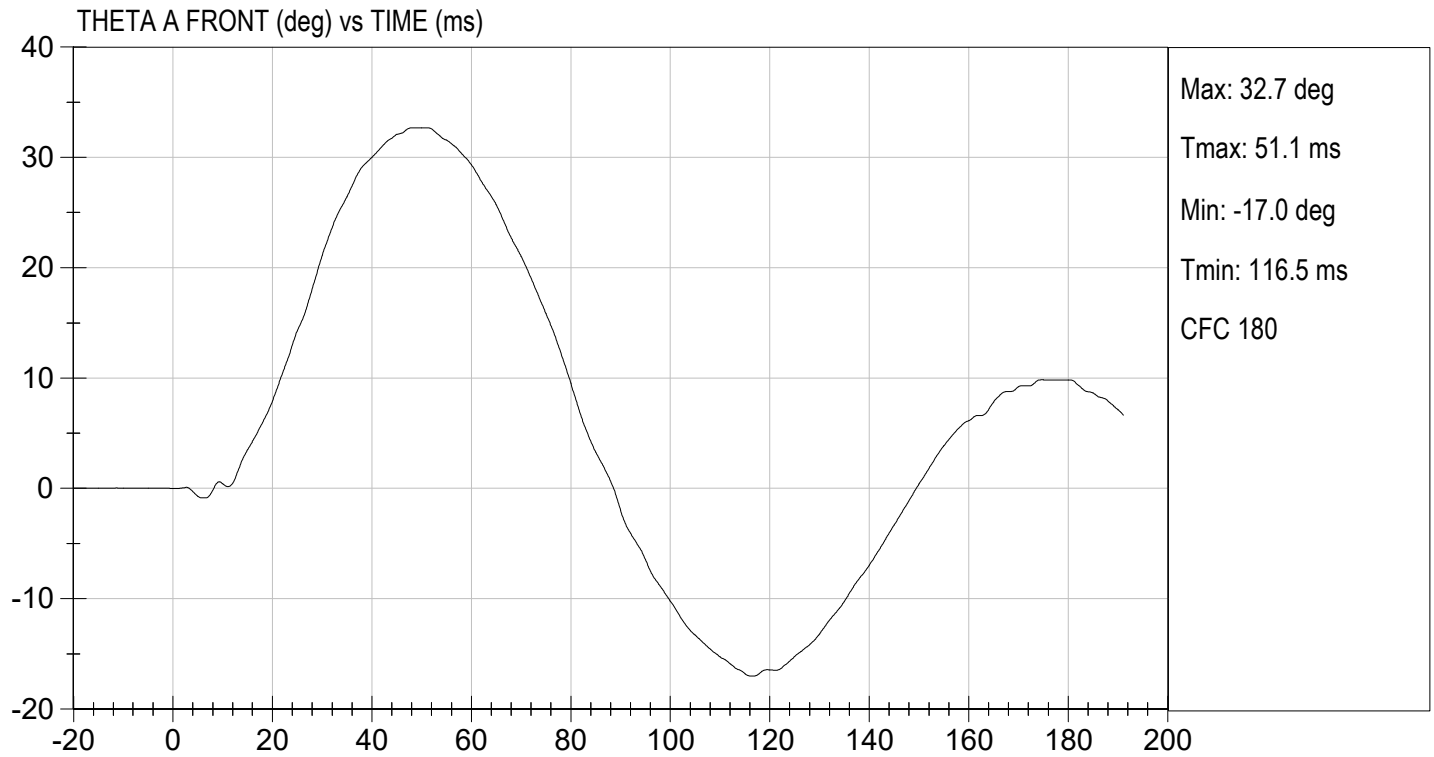
TEST DATE: 05/12/2023
TEST #: D231188





TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

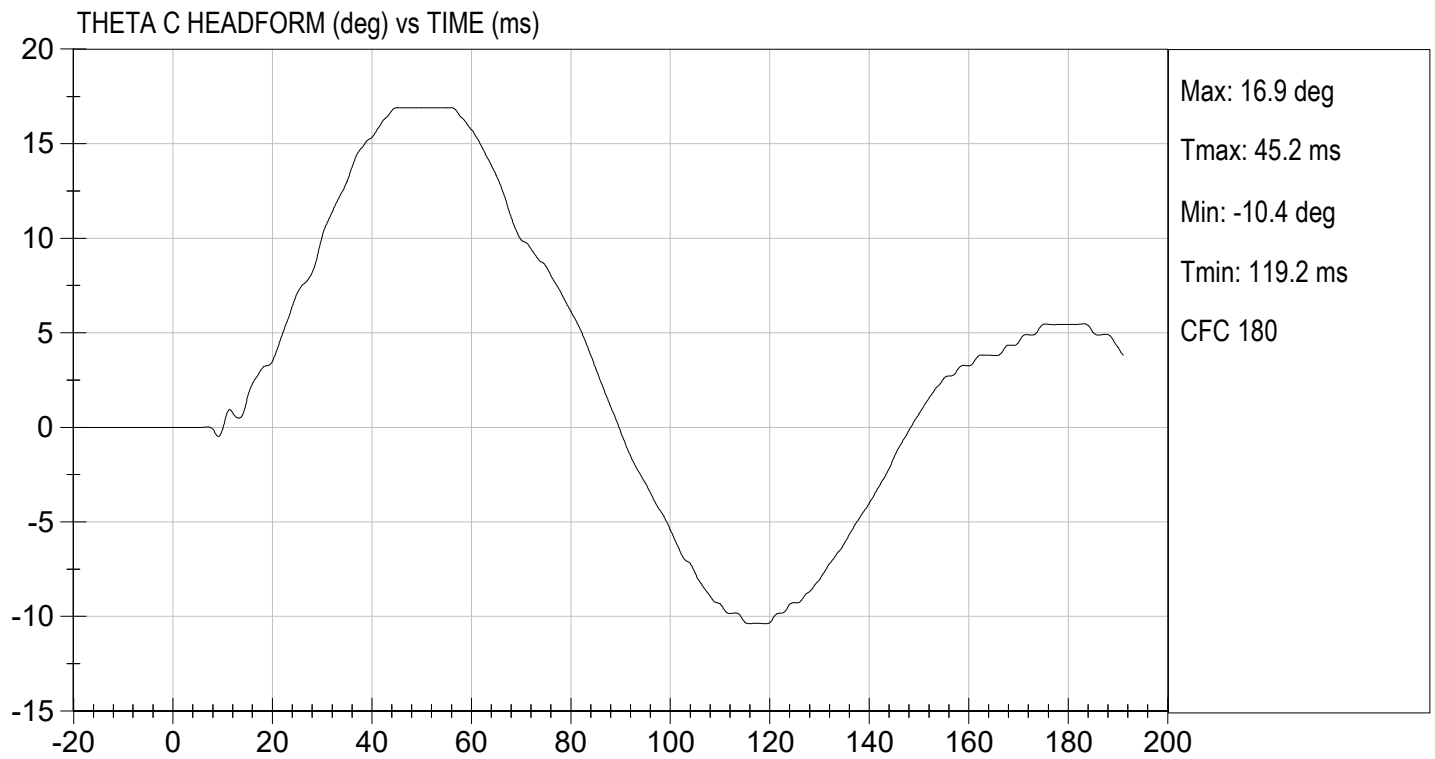
TEST DATE: 05/12/2023
TEST #: D231188





TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 05/12/2023
TEST #: D231188

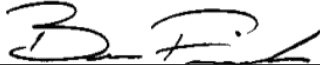


MGA RESEARCH CORPORATION**PELVIS TEST
ES-2re DUMMY****ATD Serial No:** F032**Test I.D:** D231189

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/s	4.20 to 4.40	4.34	Pass
Maximum Impactor Force	N	4700 to 5400	4955	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.1	Pass
Maximum Pubic Force	N	1230 to 1590	1234	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	14.6	Pass
Overall Test Results				Pass


Laboratory Technician

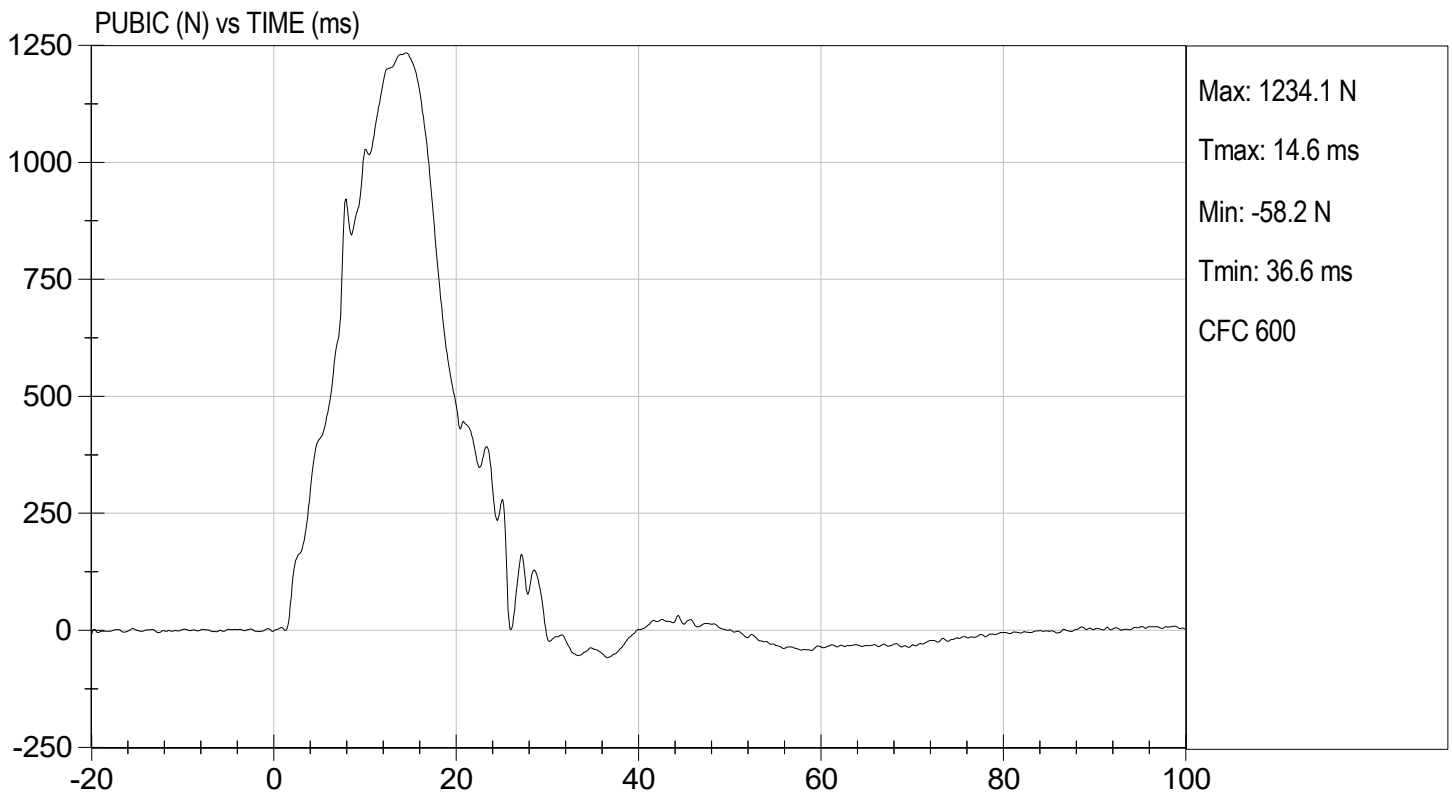
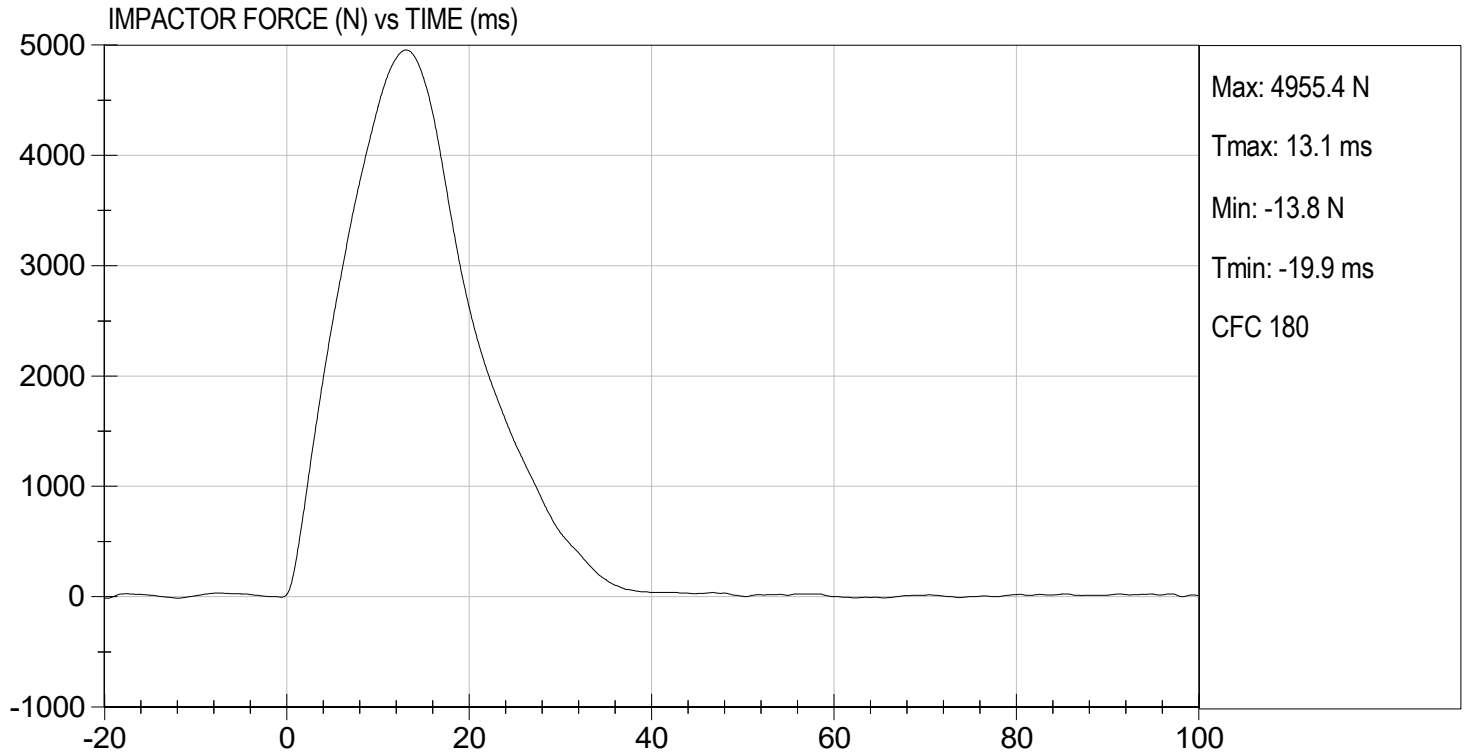
05/12/2023
Test Date


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 05/12/2023
TEST #: D231189

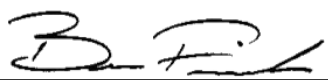


MGA RESEARCH CORPORATION**THORAX IMPACT TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D231180

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	44	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5972	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.3	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.6	Pass
Lower Rib Displacement	mm	37.0 to 44.0	40.5	Pass
Overall Test Results				Pass


Laboratory Technician

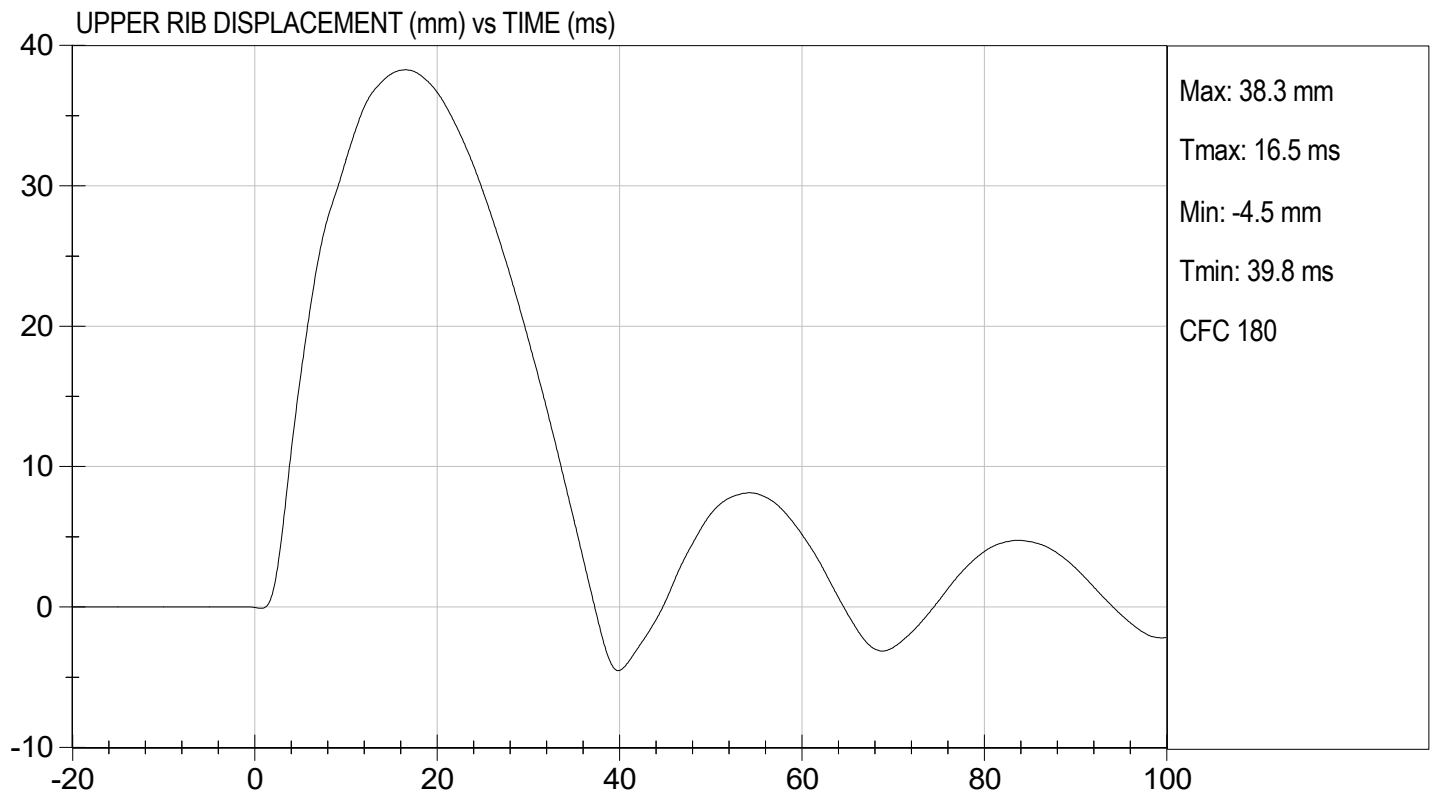
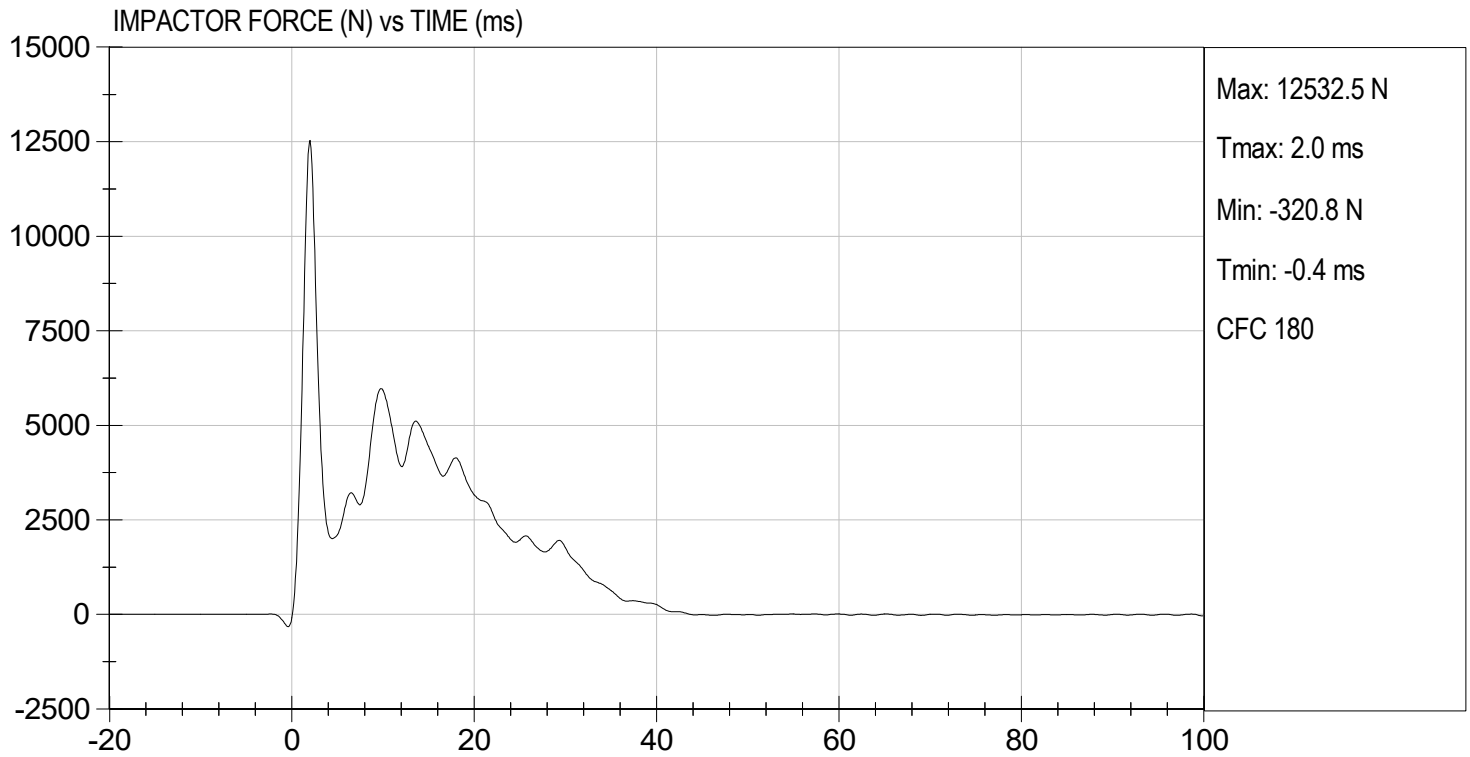
05/12/2023
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 18.31 ft/s, 5.58 m/s

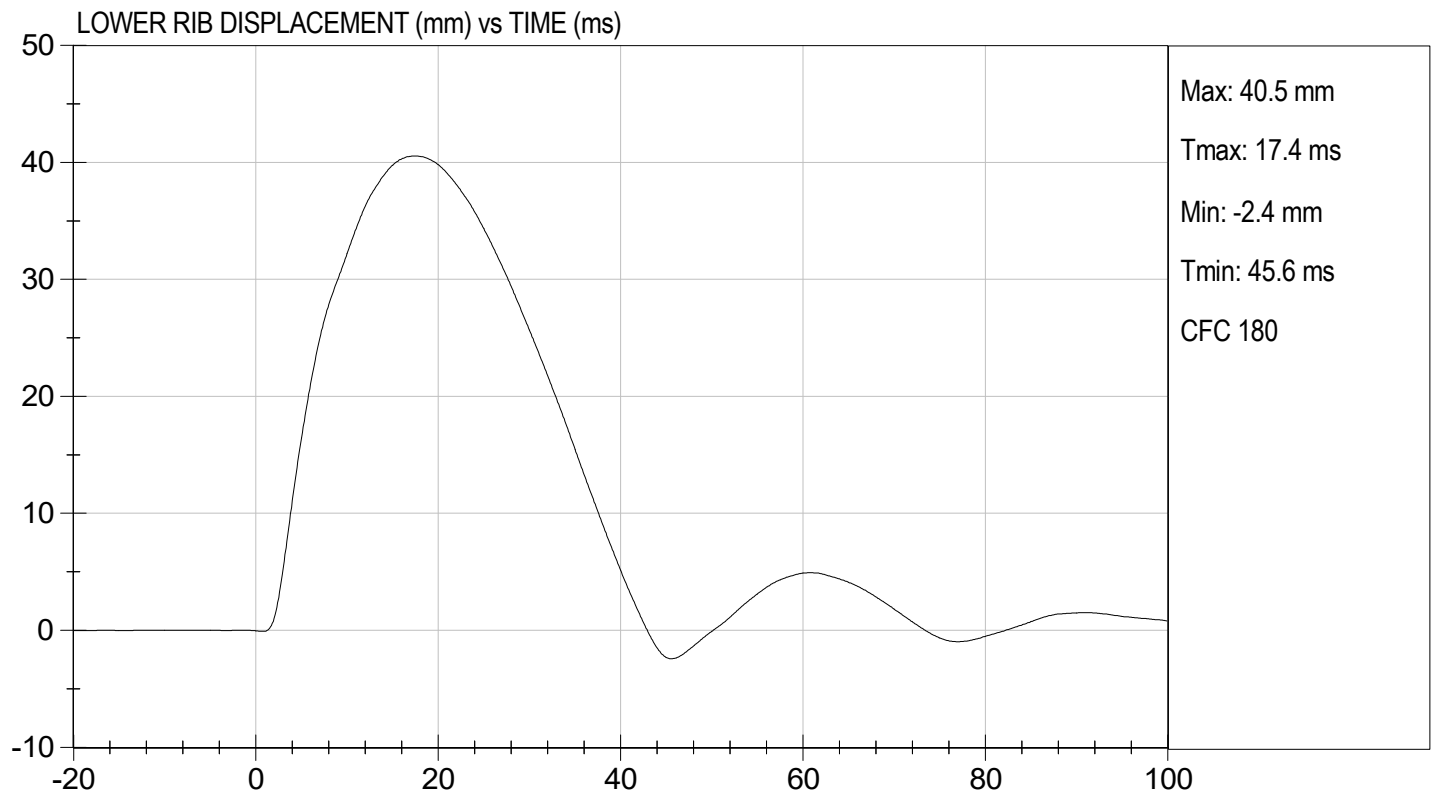
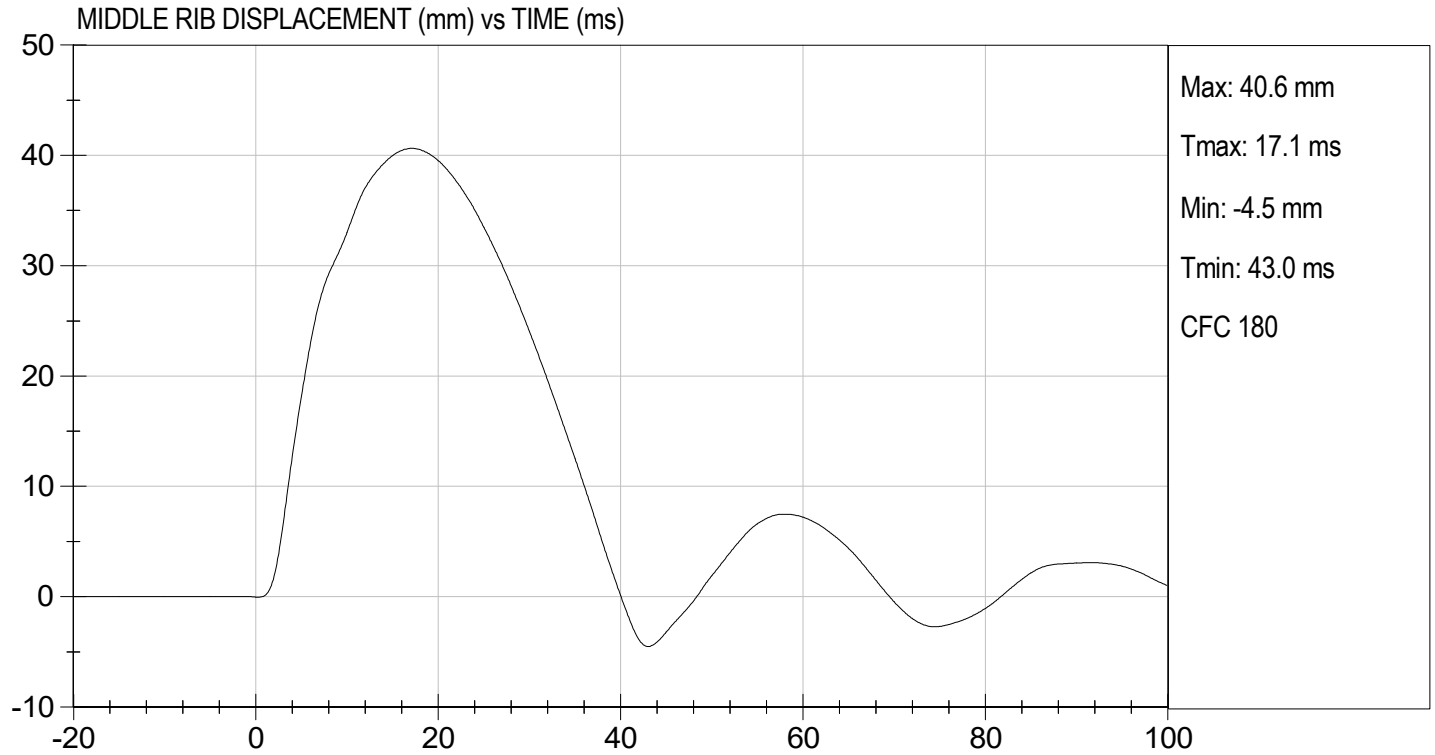
TEST DATE: 05/12/2023
TEST #: D231180





TEST DESC: THORAX IMPACT
VELOCITY: 18.31 ft/s, 5.58 m/s

TEST DATE: 05/12/2023
TEST #: D231180



QUALIFICATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SID-IIsD External Measurements
SN: 306

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

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

ATD Serial No: 306

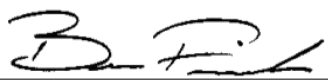
Test ID: D231111

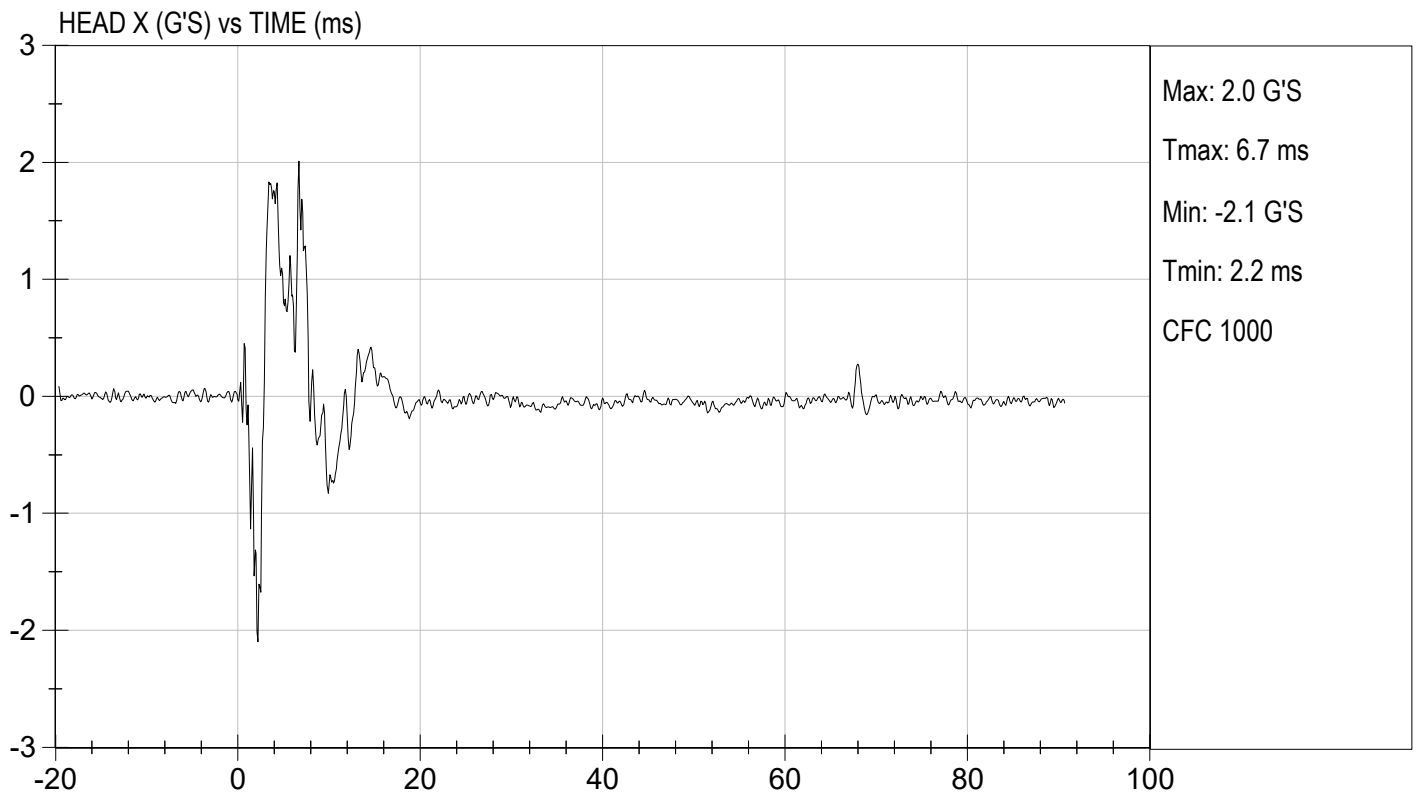
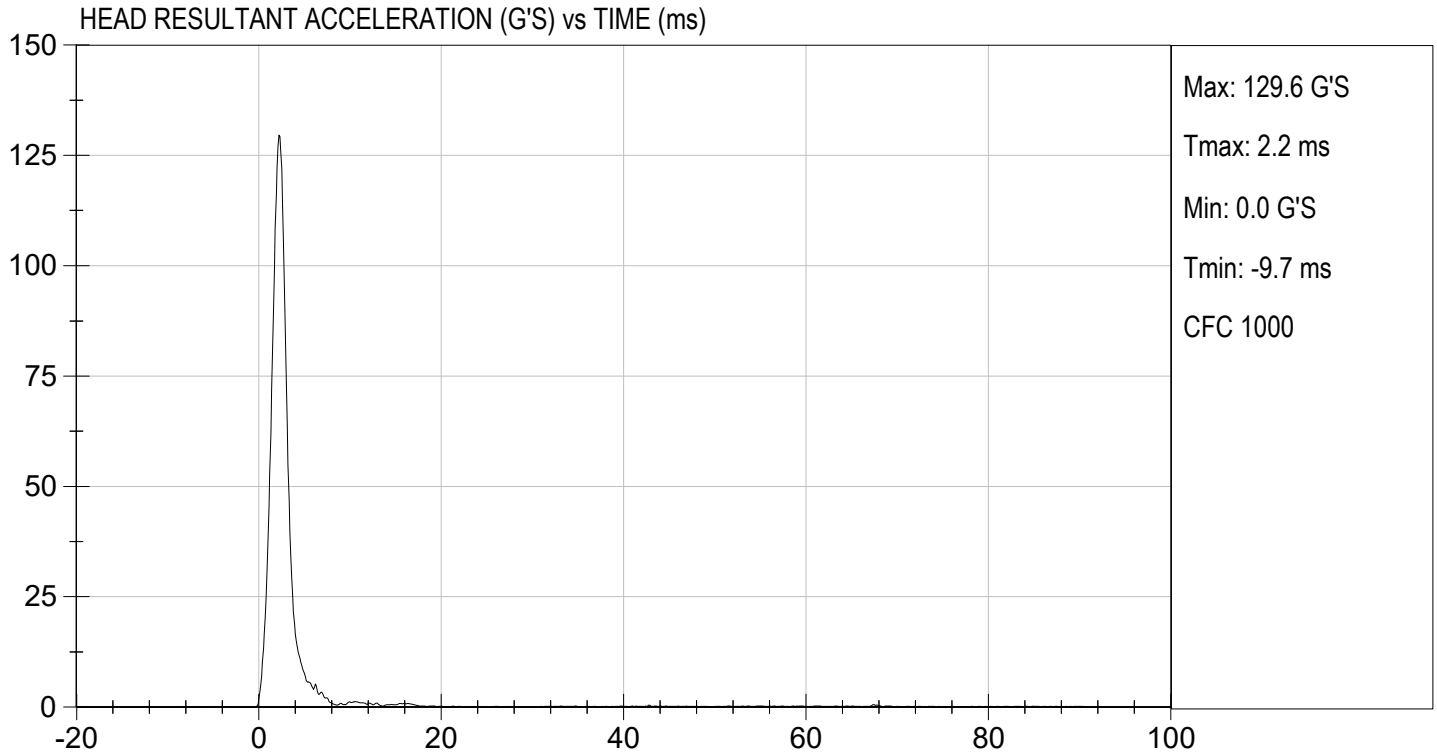
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Peak Resultant Acceleration	G's	115 to 137	130	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-2.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass

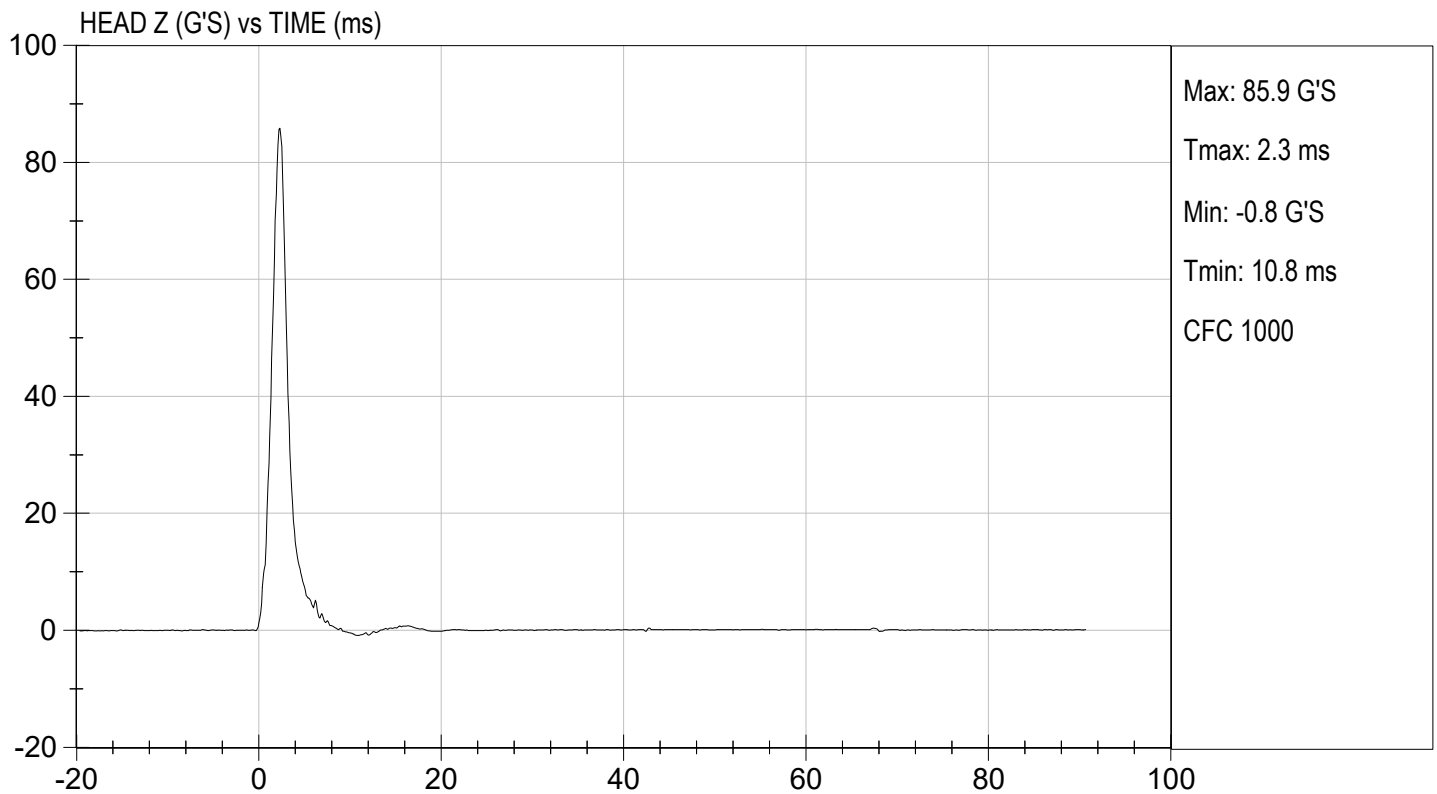
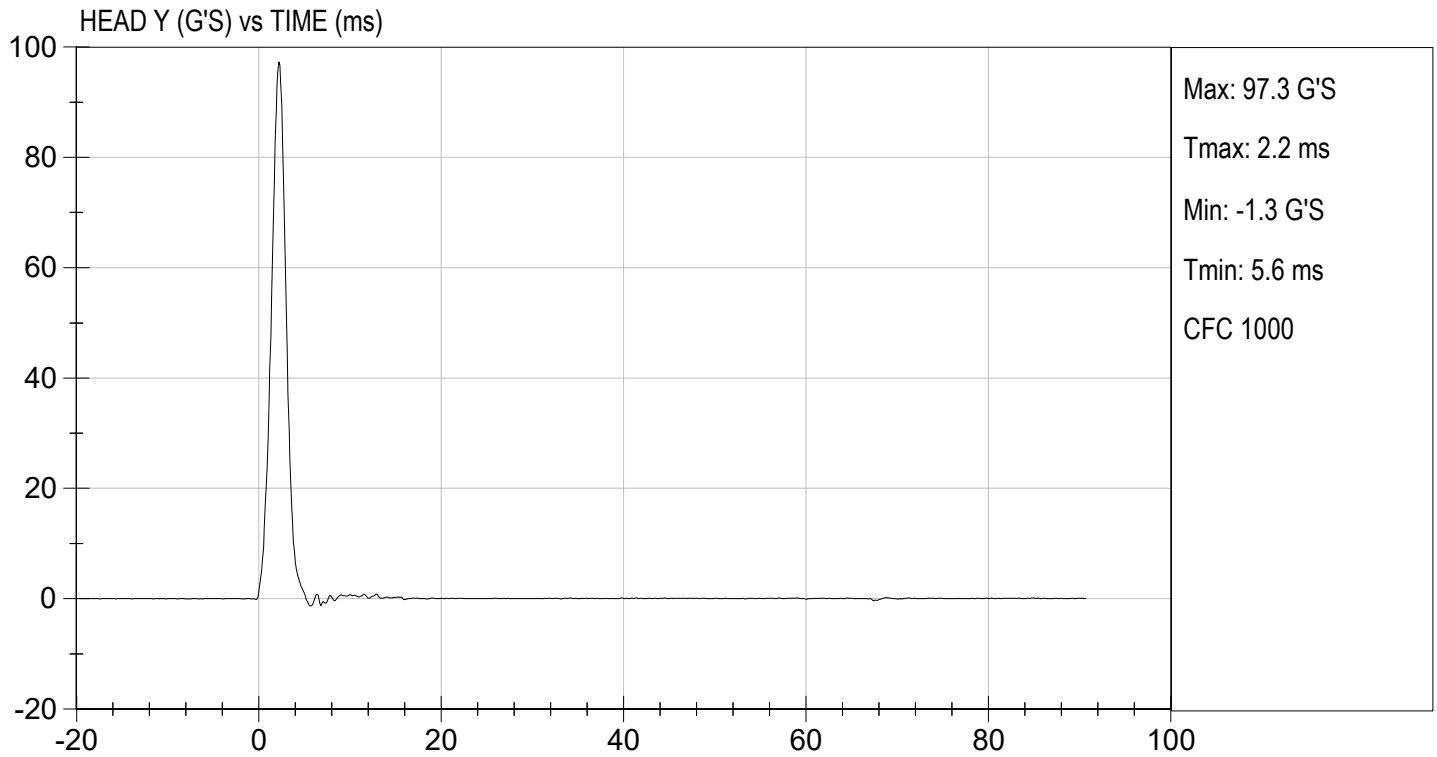

Laboratory Technician

05/05/2023

Test Date


Approved By





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

ATD Serial No: 306

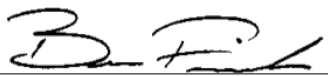
Test I.D: D231112

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.4	Pass
Humidity		%	10 to 70	35	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.39	Pass
	15 ms	m/s	3.30 to 4.10	3.68	Pass
	20 ms	m/s	4.40 to 5.40	5.13	Pass
	25 ms	m/s	5.40 to 6.10	5.68	Pass
	25-100 ms	m/s	5.50 to 6.20	5.70	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	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	113	Pass
Overall Test Results				Pass	


 Laboratory Technician

05/05/2023

Test Date

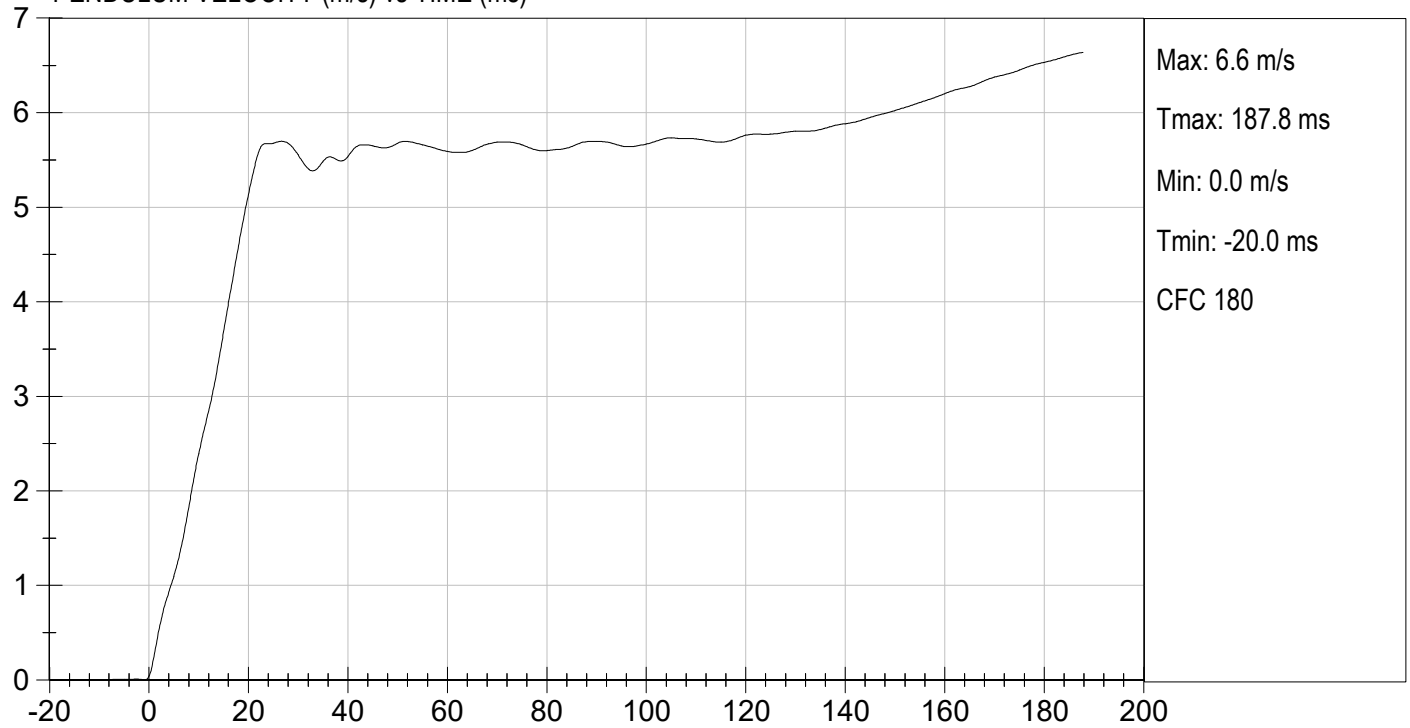

 Approved By



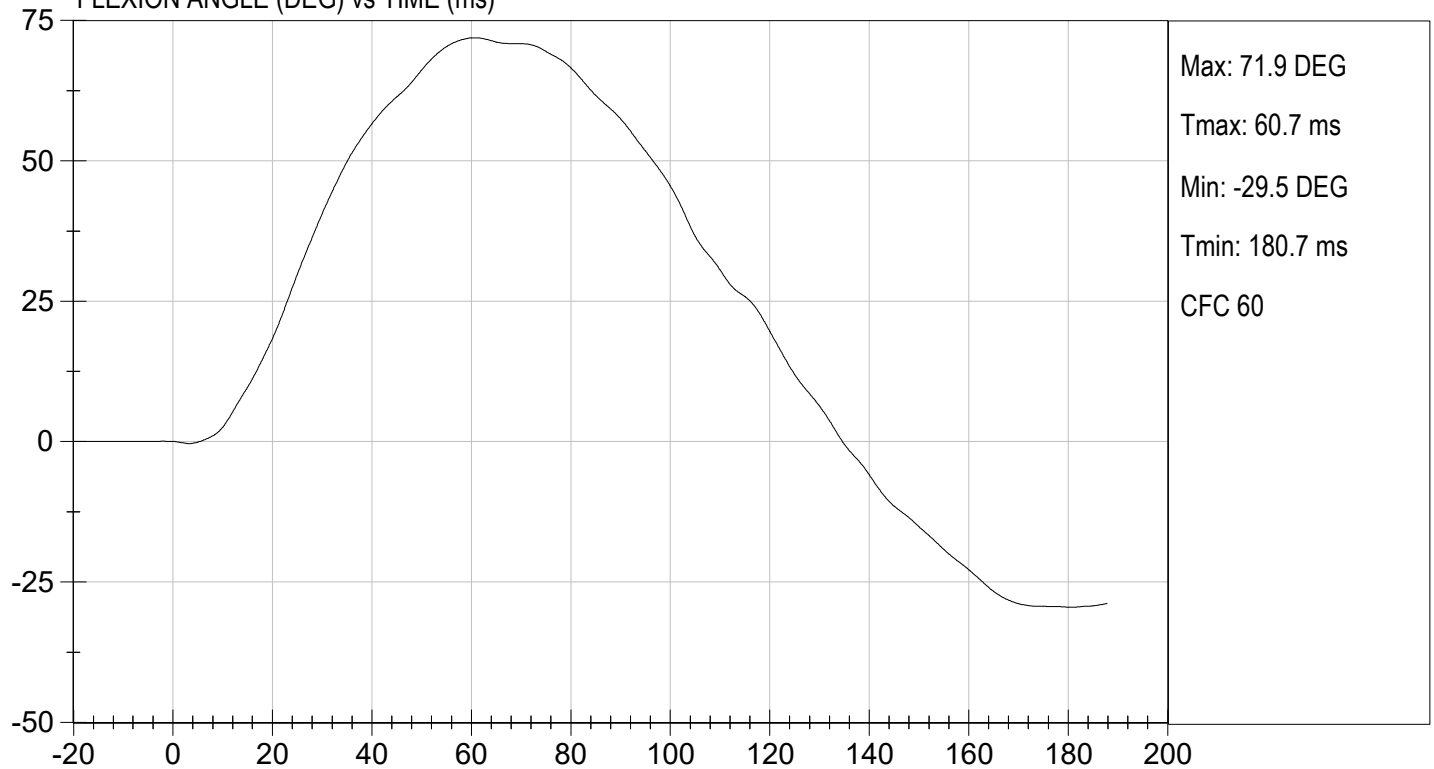
TEST DESC: NECK BENDING
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 05/05/2023
TEST #: D231112

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



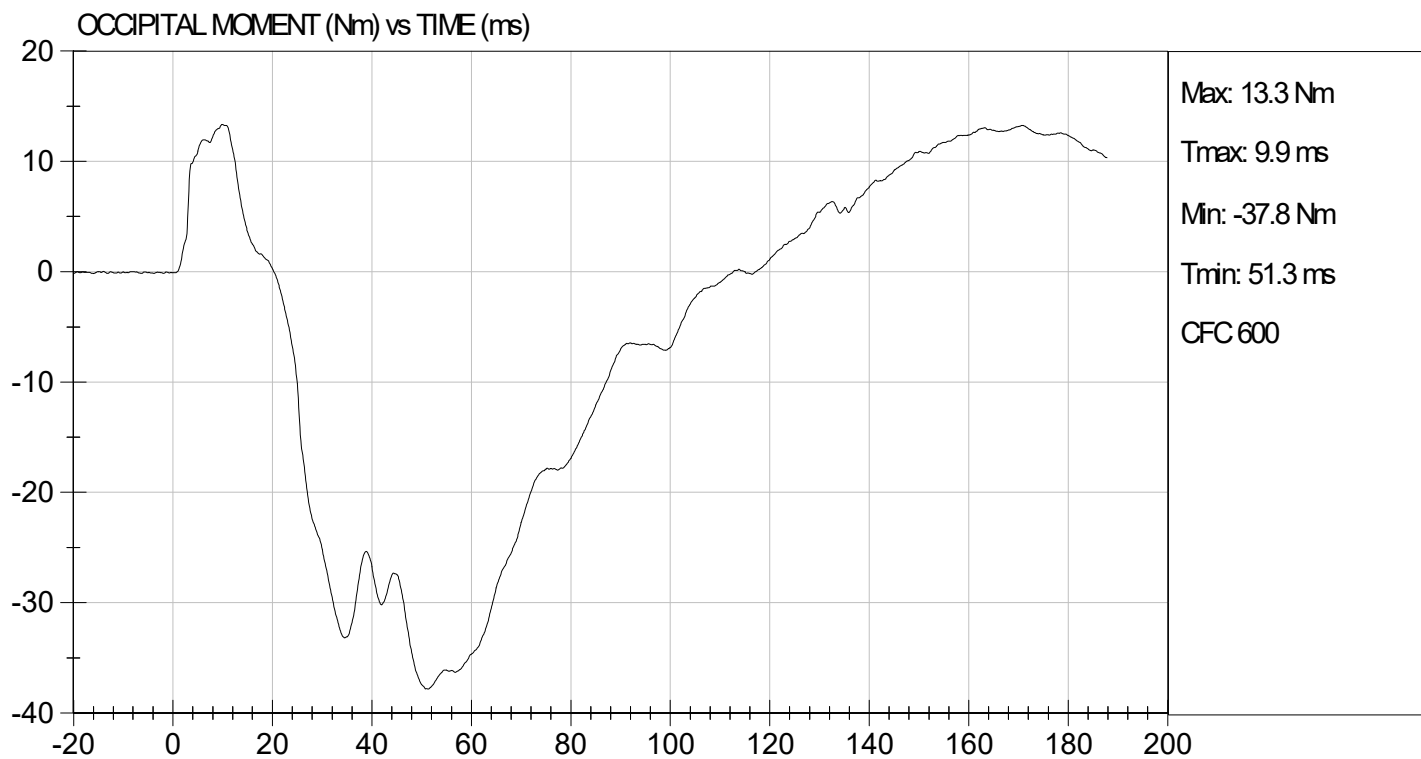
FLEXION ANGLE (DEG) vs TIME (ms)





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

TEST DATE: 05/05/2023
TEST #: D231112



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

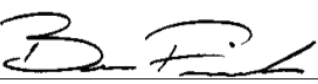
ATD Serial No: 306

Test ID: D231113

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	33	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results			Pass	


Laboratory Technician

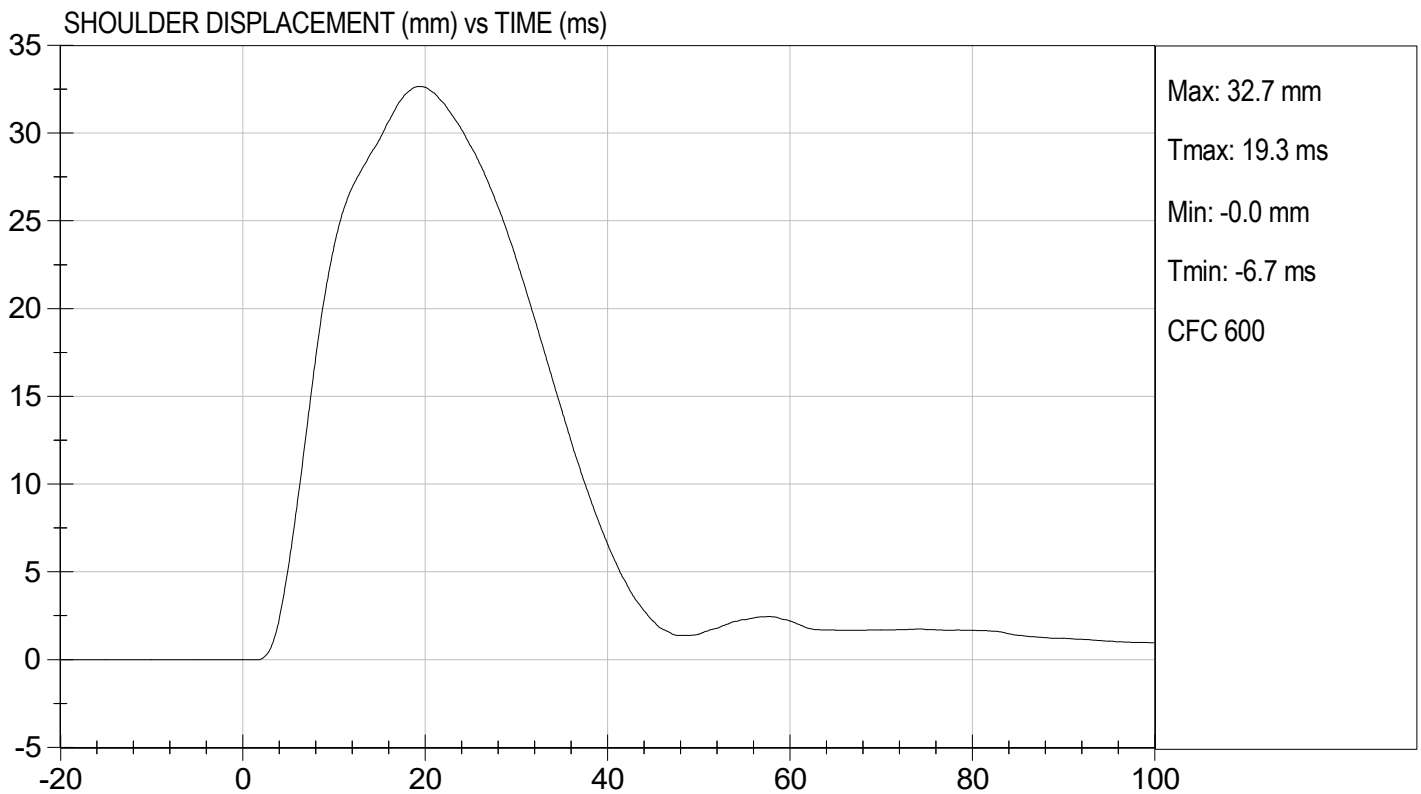
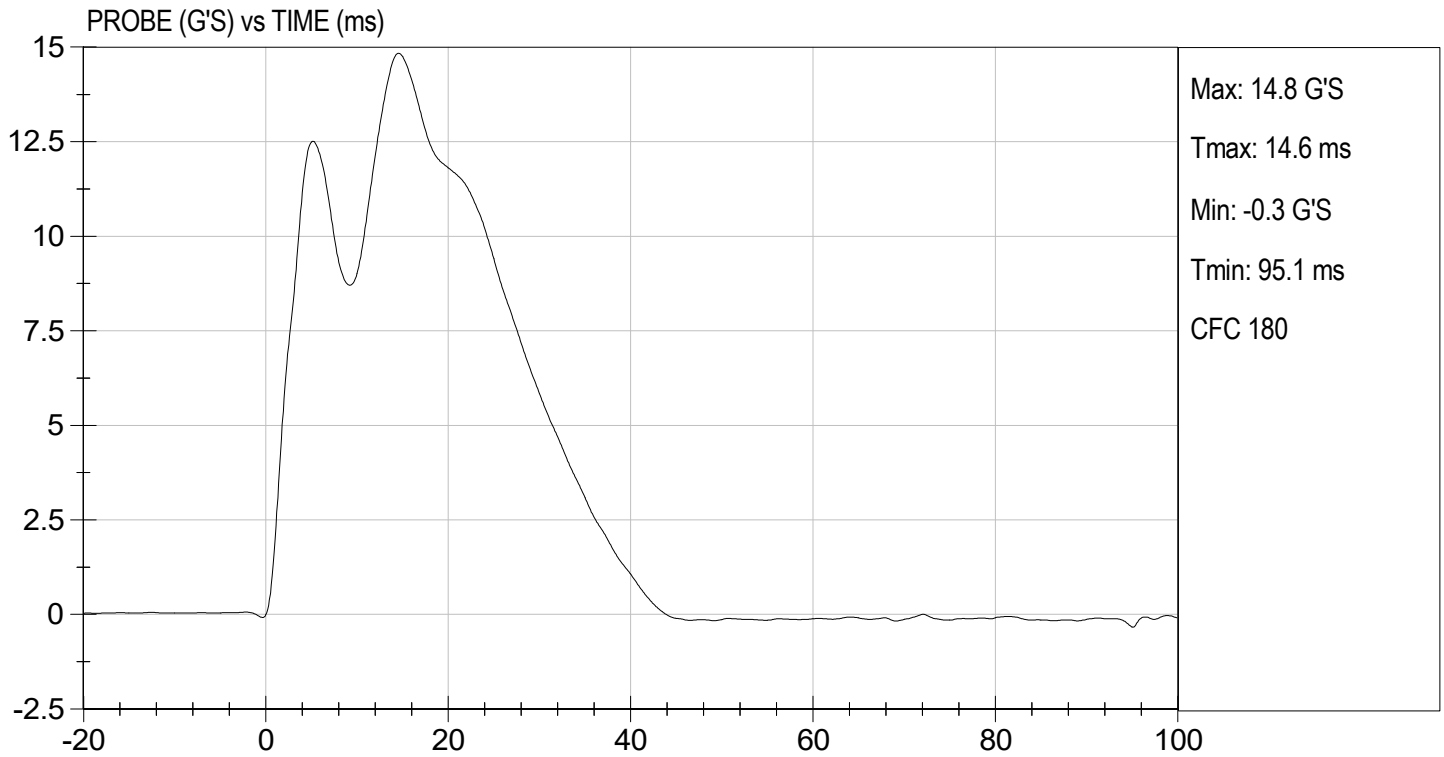
05/05/2023
Test Date


Approved By



TEST DESC: SHOULDER IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

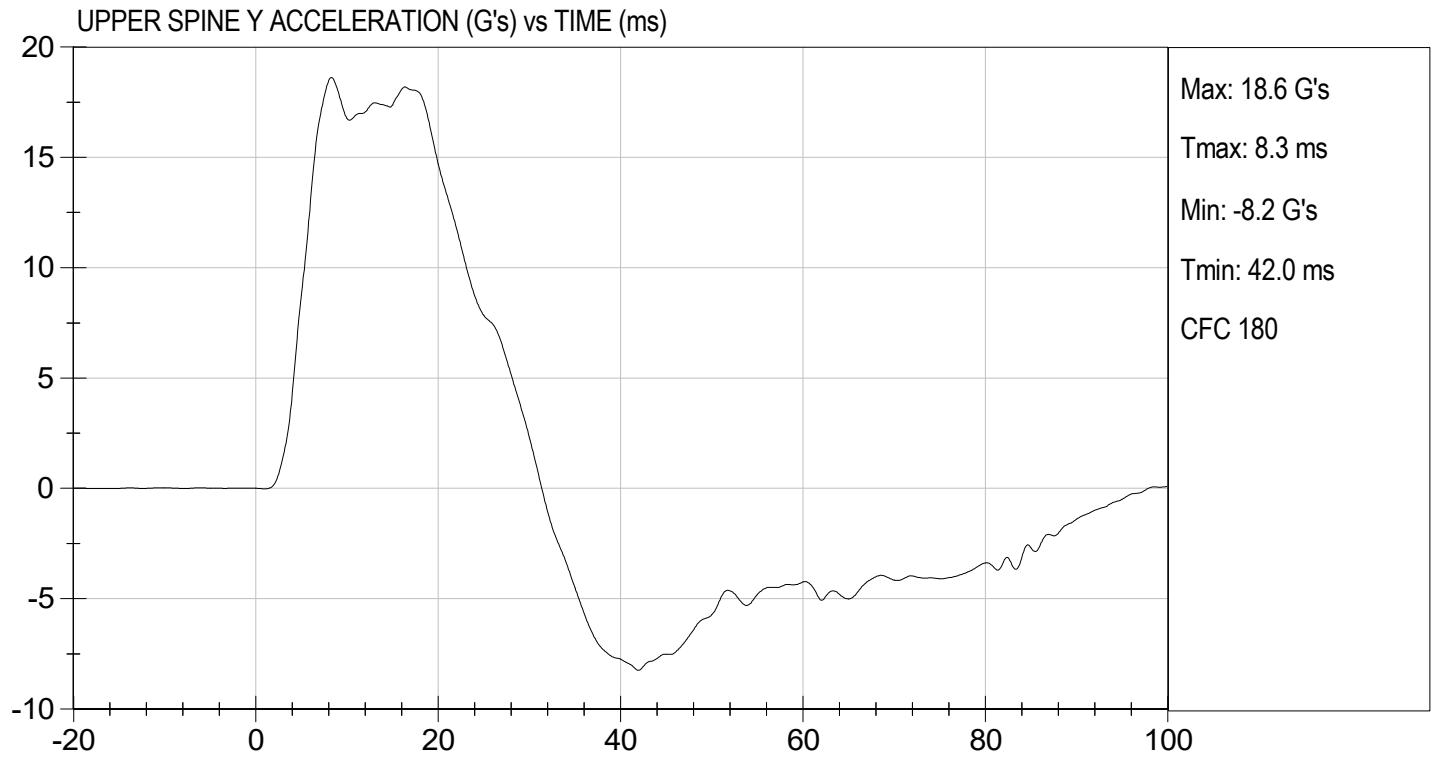
TEST DATE: 05/05/2023
TEST #: D231113





TEST DESC: SHOULDER IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 05/05/2023
TEST #: D231113



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

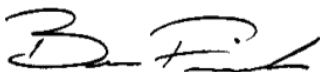
ATD Serial No: 306

Test I.D: D231114

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	33	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	37	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle Rib Displacement	mm	30 to 36	34	Pass
Lower Rib Displacement	mm	32 to 38	36	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass


Laboratory Technician

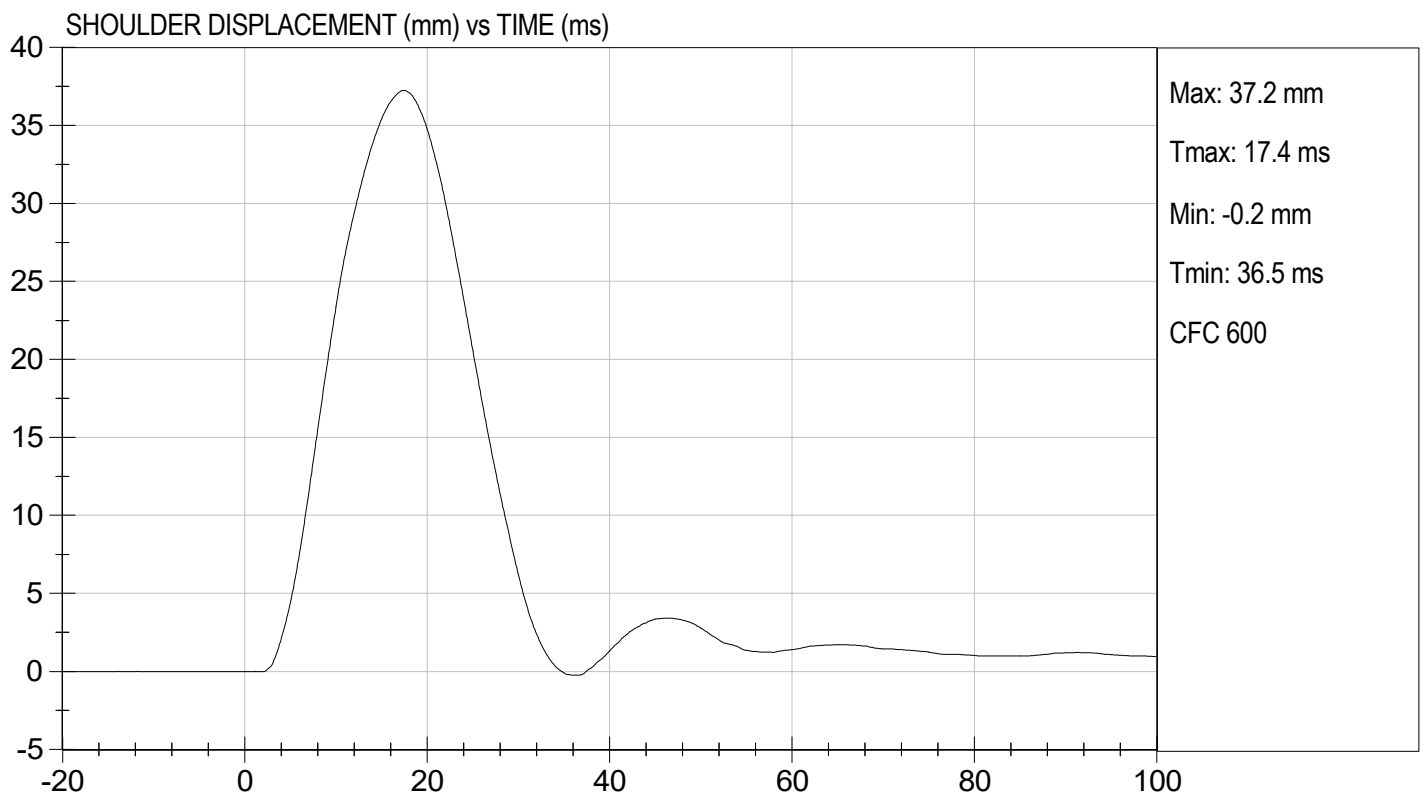
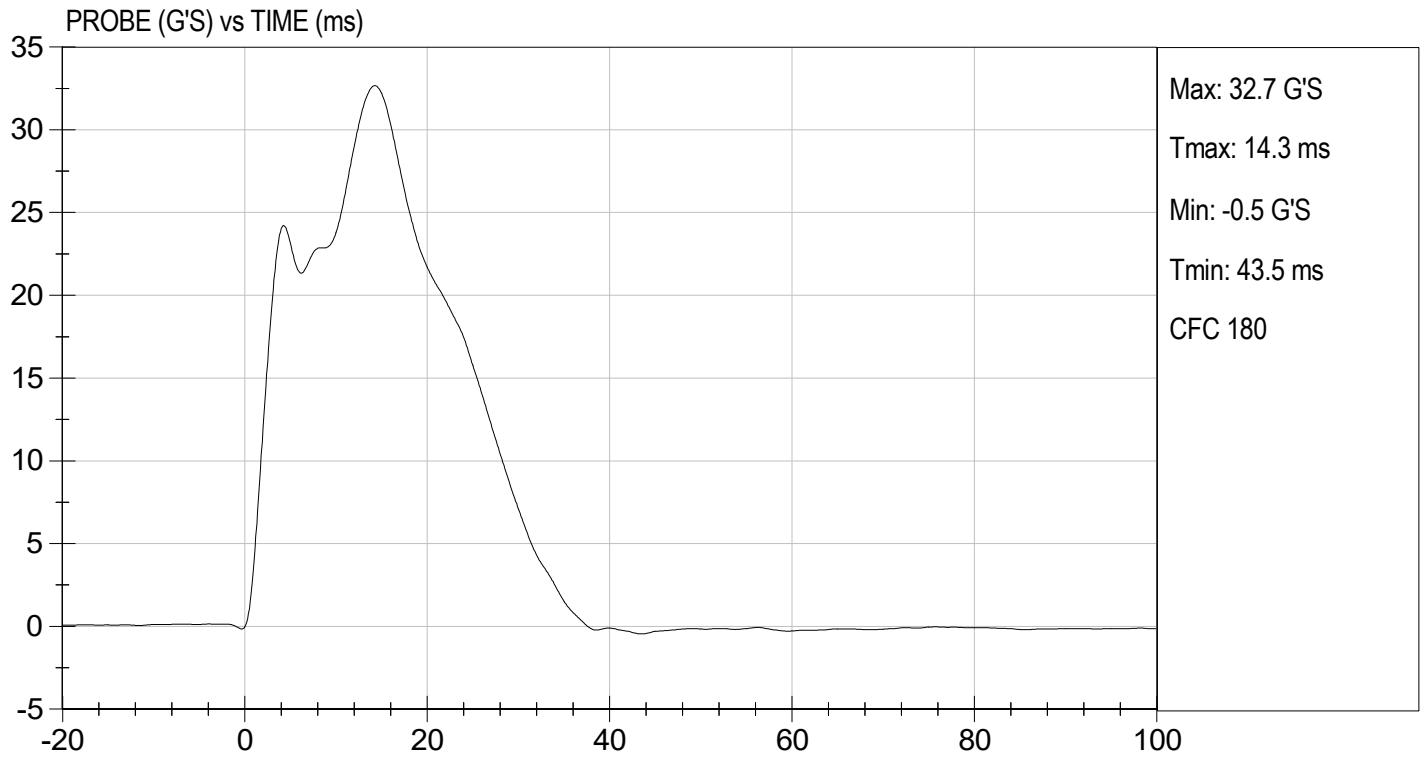
05/05/2023
Test Date


Approved By



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

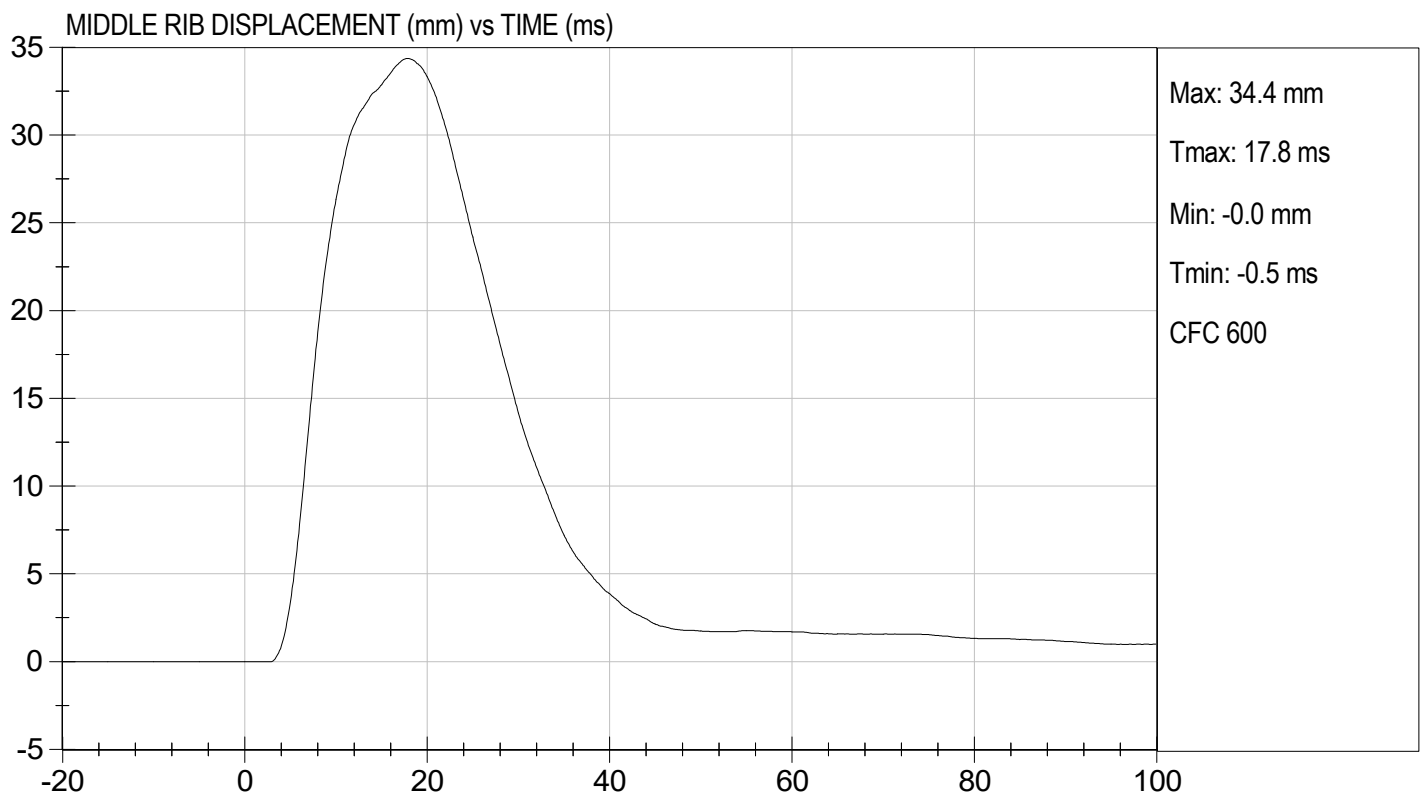
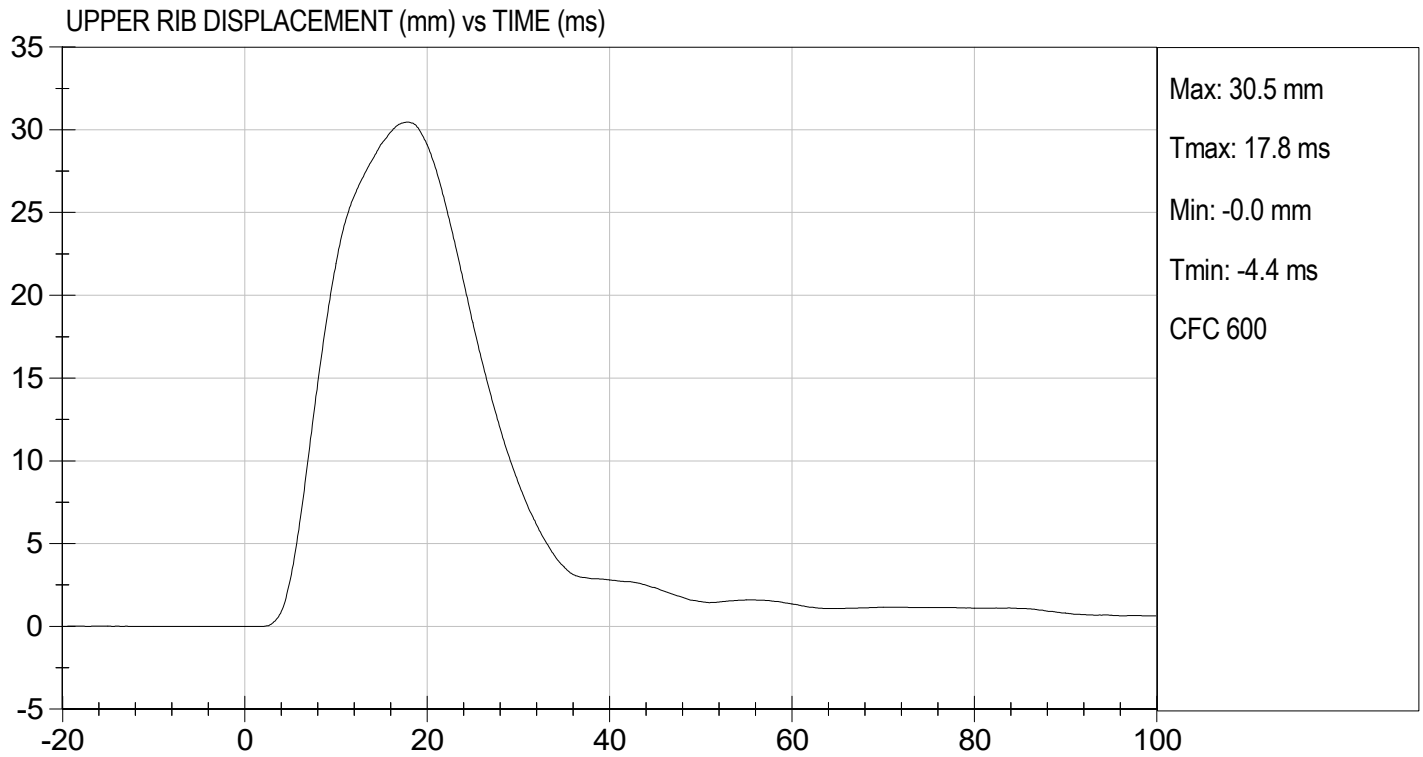
TEST DATE: 05/05/2023
TEST #: D231114





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

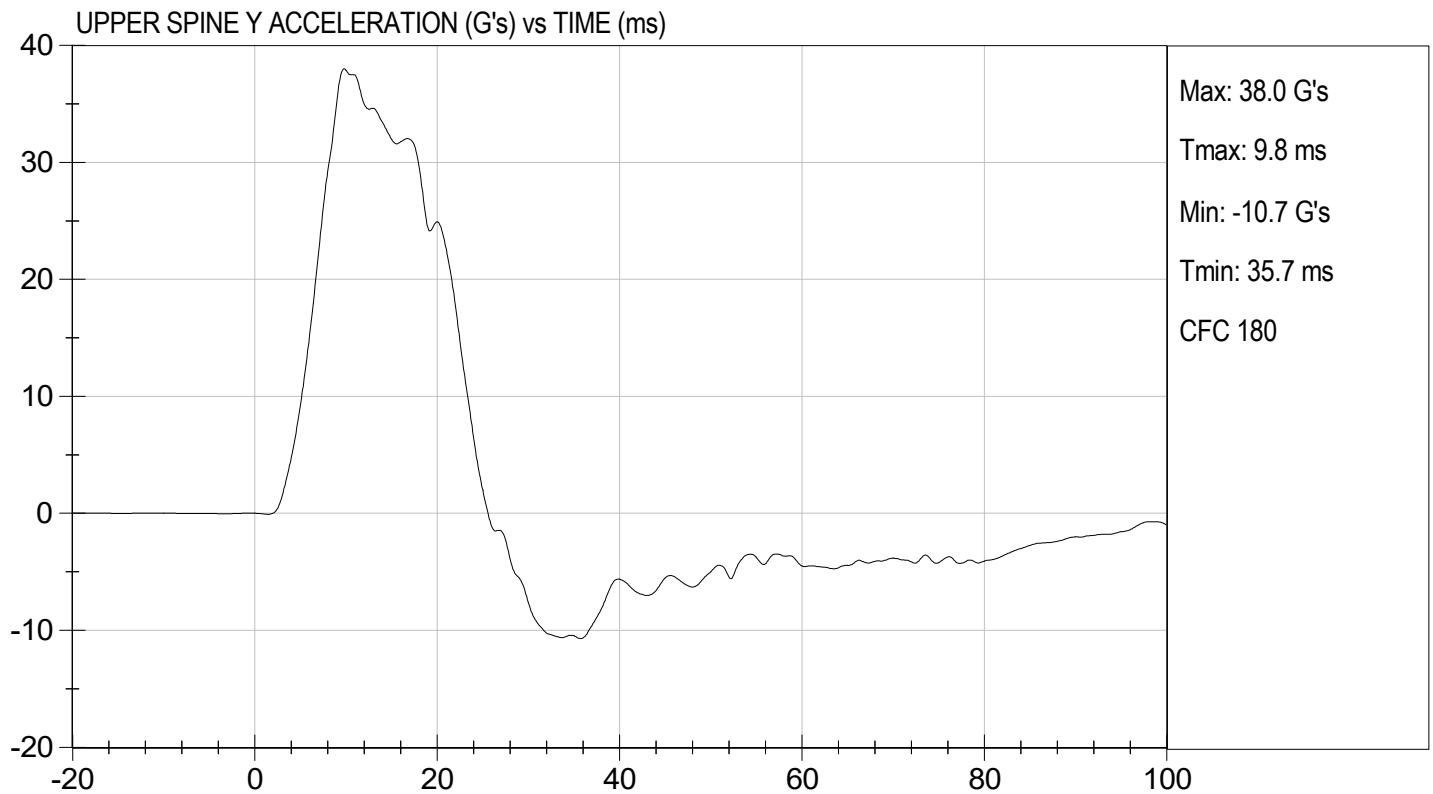
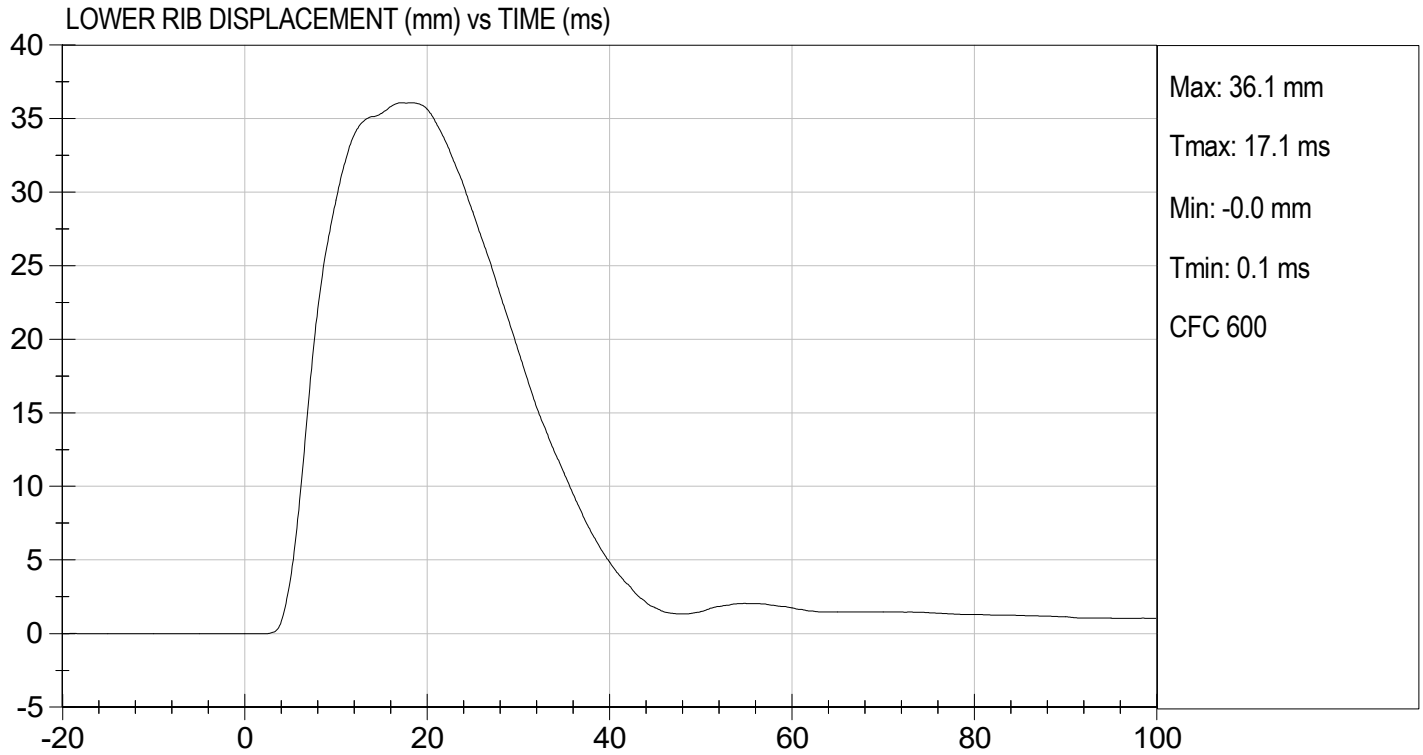
TEST DATE: 05/05/2023
TEST #: D231114





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

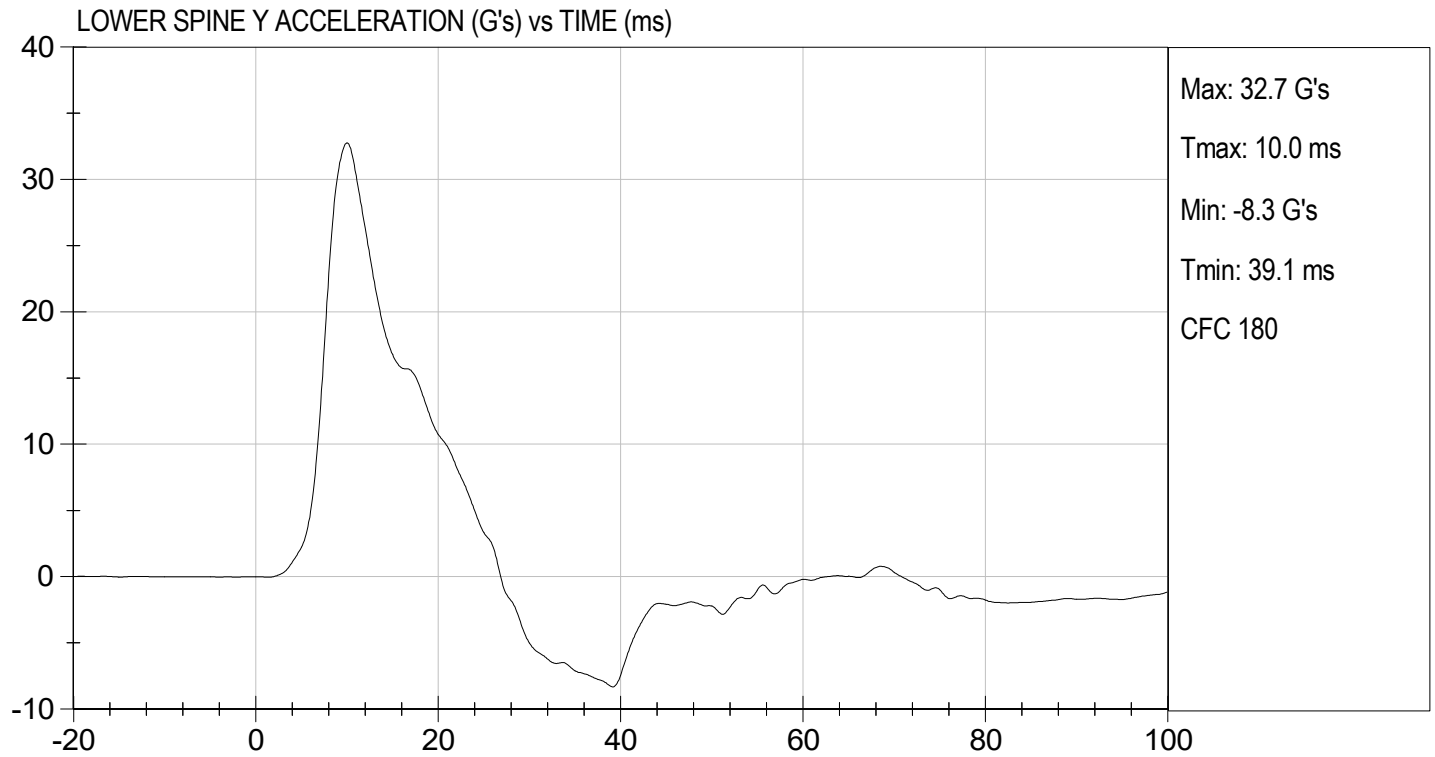
TEST DATE: 05/05/2023
TEST #: D231114





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

TEST DATE: 05/05/2023
TEST #: D231114



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

ATD Serial No: 306

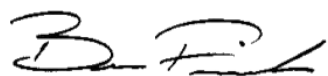
Test I.D: D231115

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	34	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	39	Pass
Middle Rib Displacement	mm	39 to 45	45	Pass
Lower Rib Displacement	mm	35 to 43	43	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass


Laboratory Technician

05/05/2023

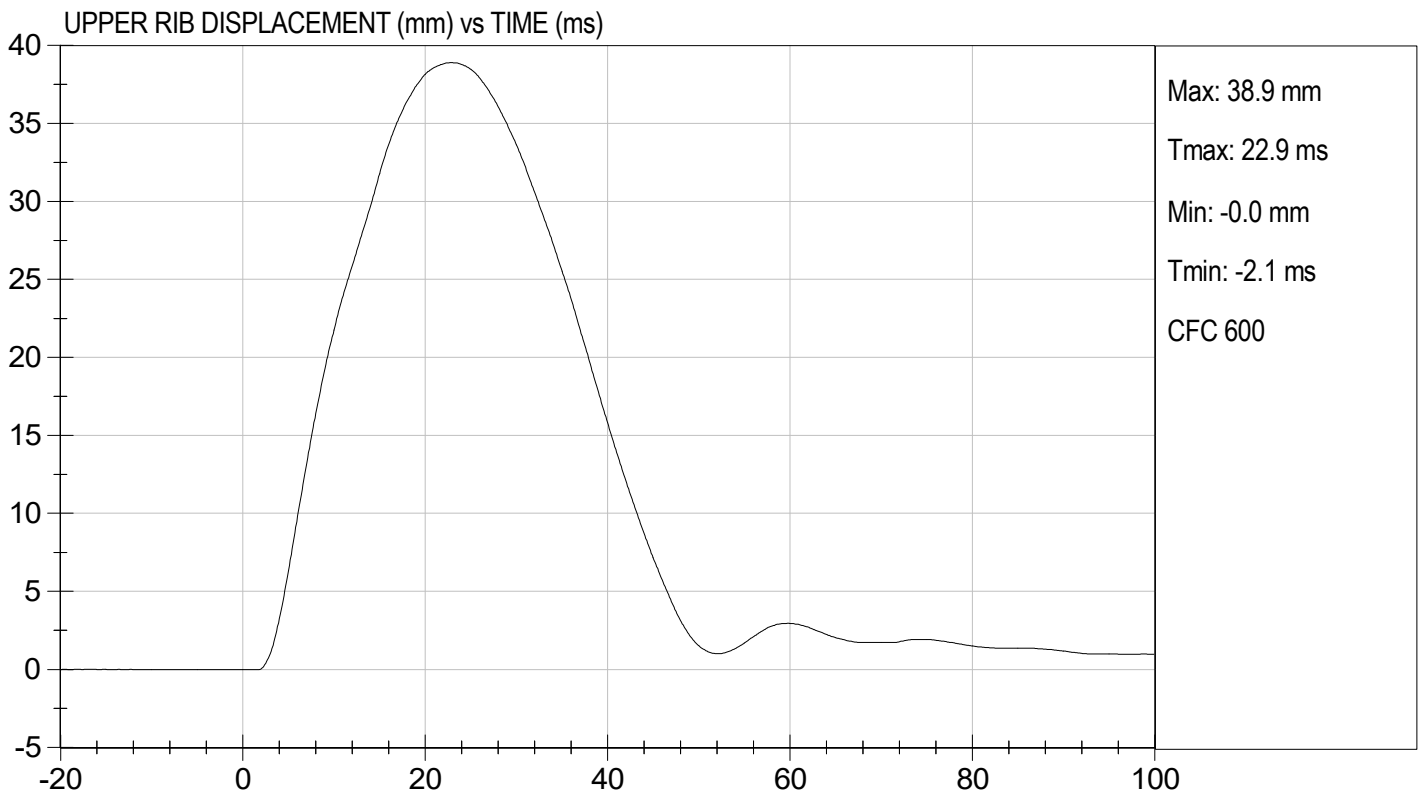
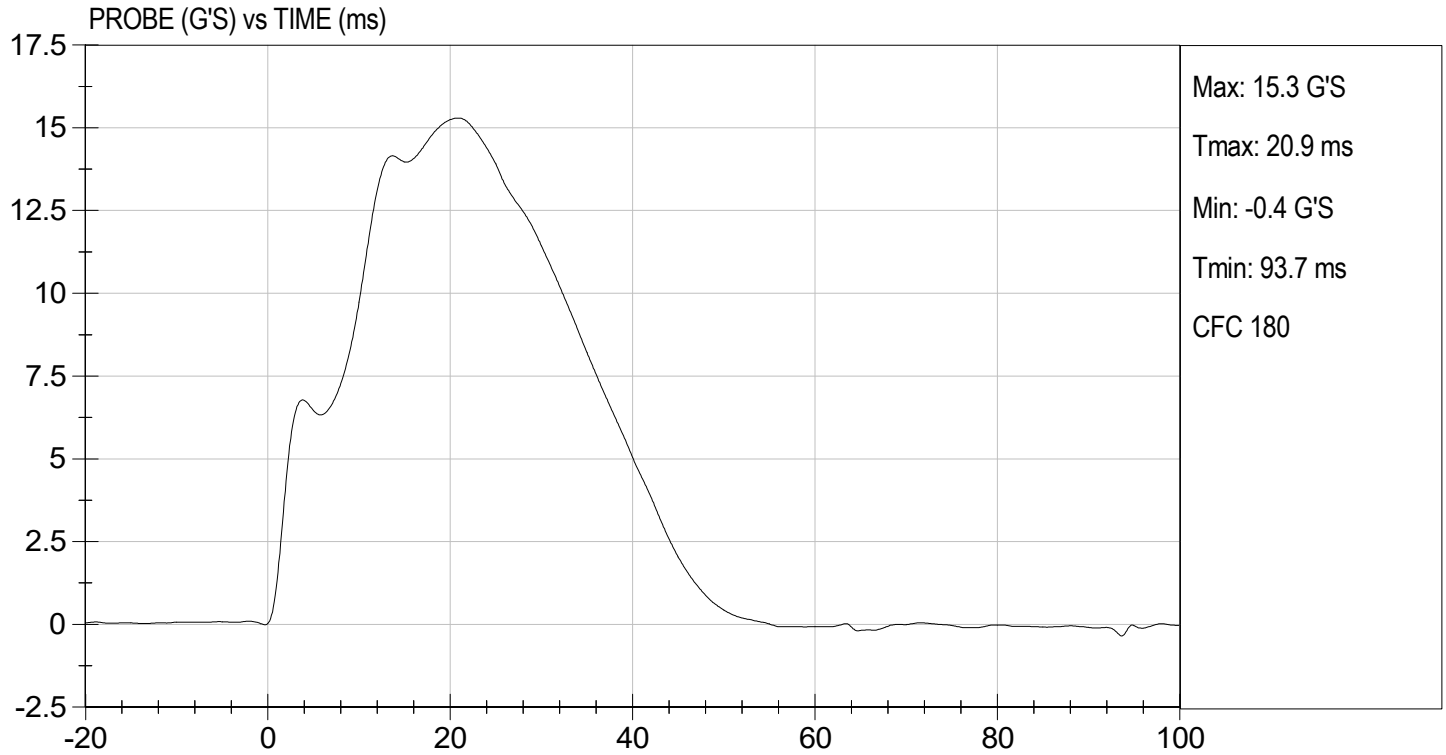
Test Date


Approved By



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

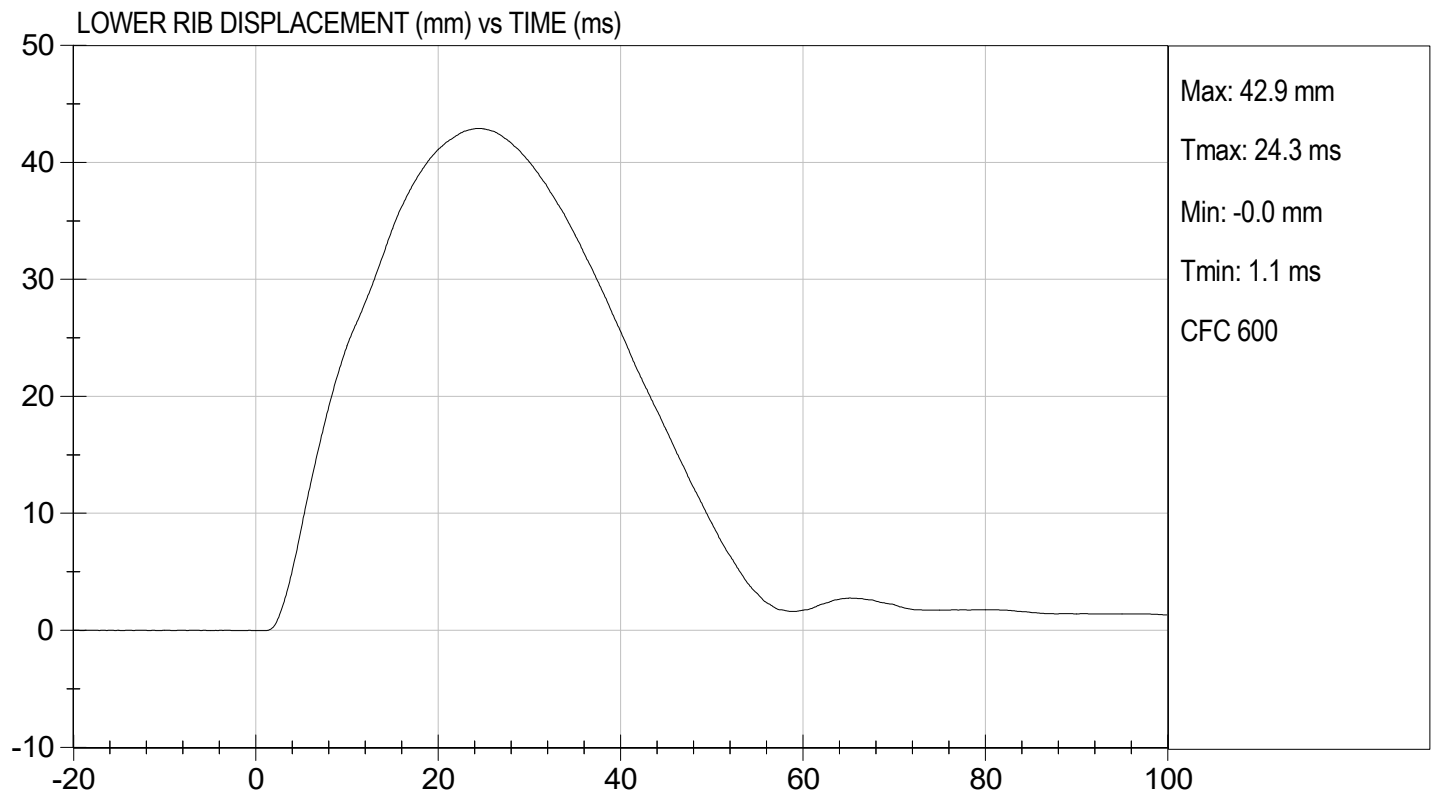
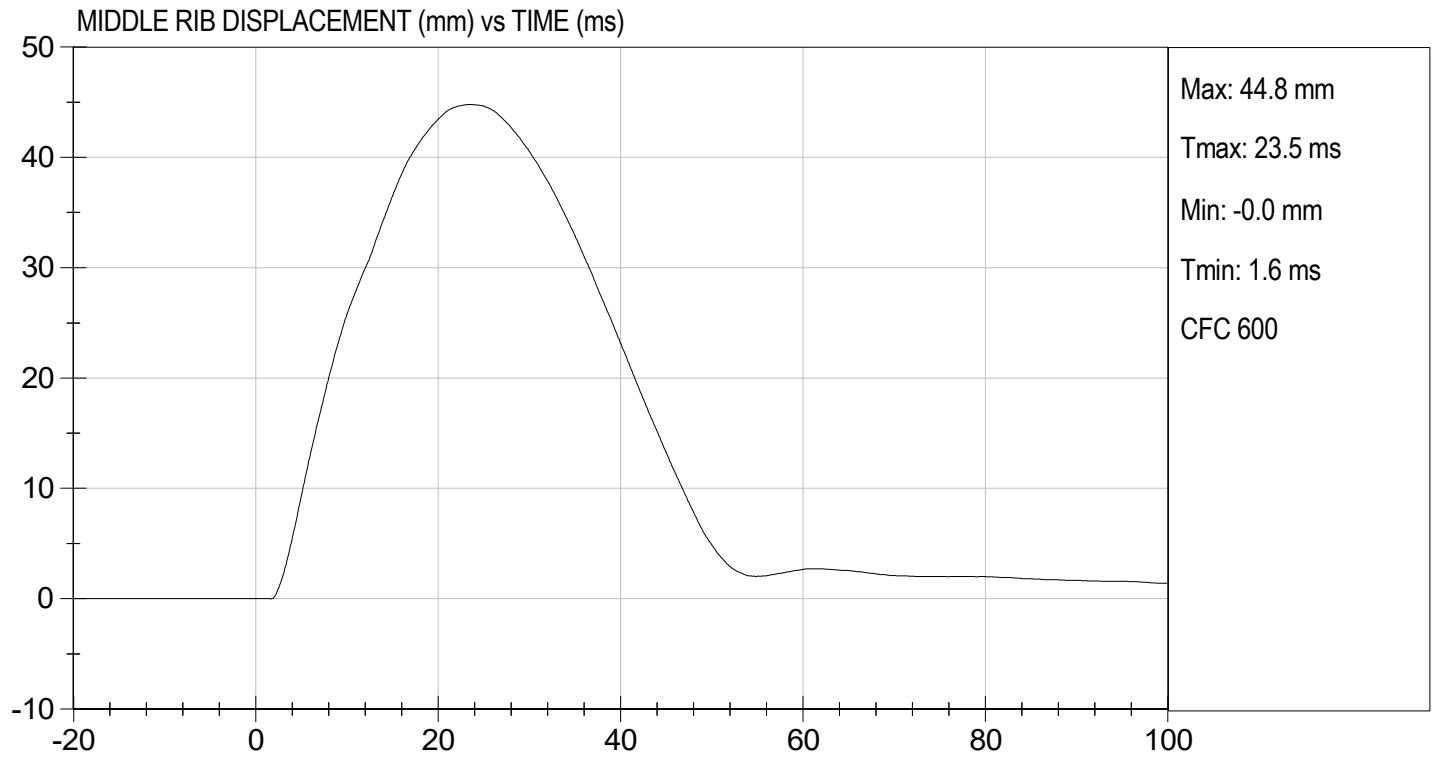
TEST DATE: 05/05/2023
TEST #: D231115





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

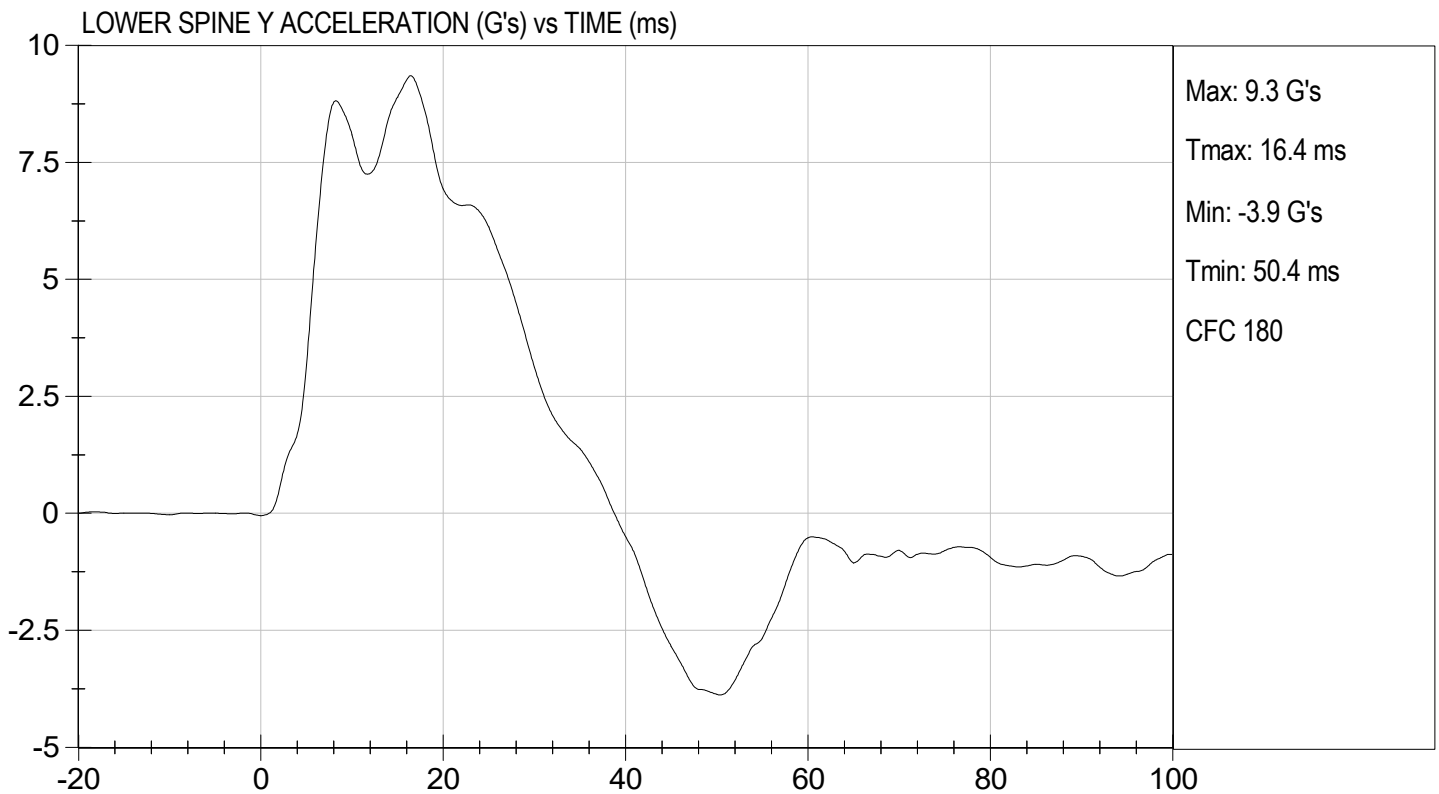
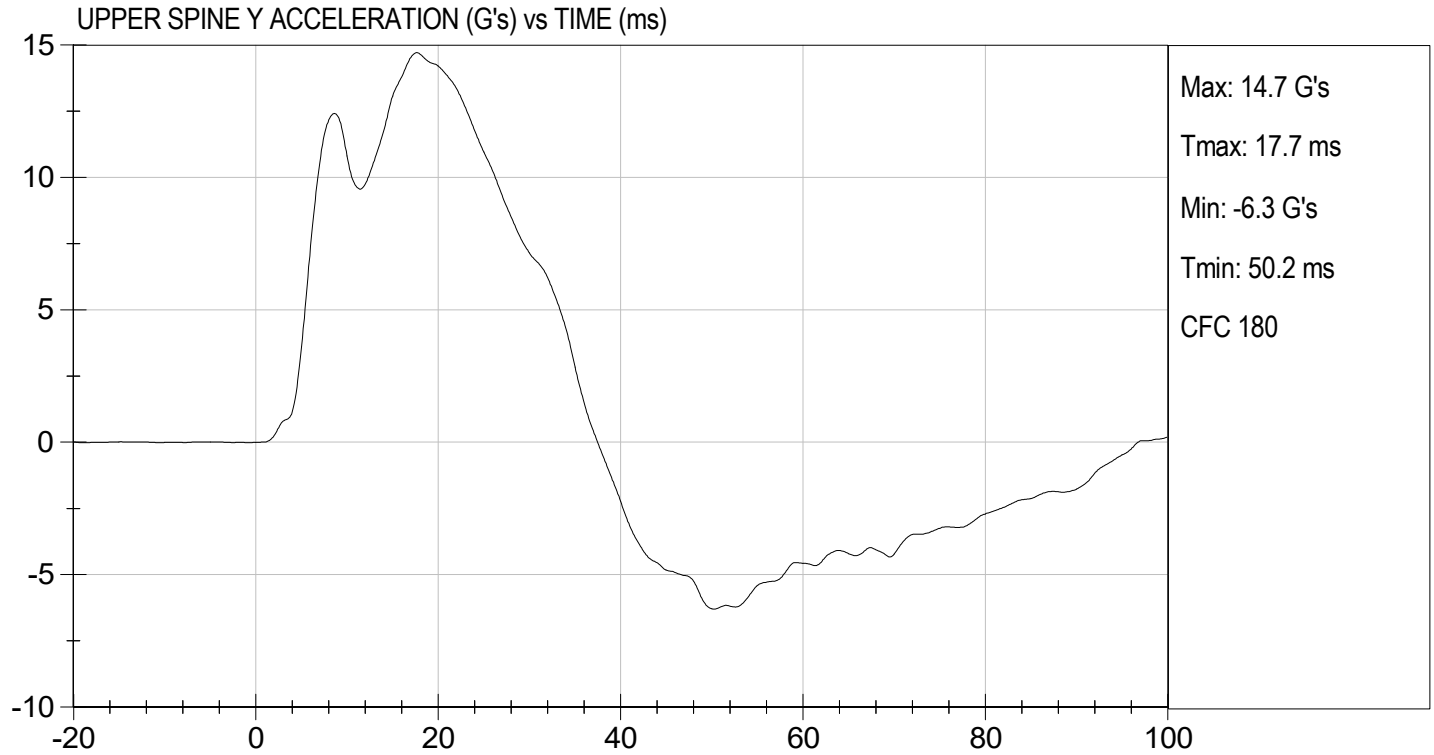
TEST DATE: 05/05/2023
TEST #: D231115





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

TEST DATE: 05/05/2023
TEST #: D231115



MGA RESEARCH CORPORATION
ABDOMINAL IMPACT TEST
SID-11s BUILD LEVEL D DUMMY

ATD Serial No: 306

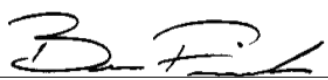
Test I.D: D231116

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	34	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	44	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	40	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

05/05/2023

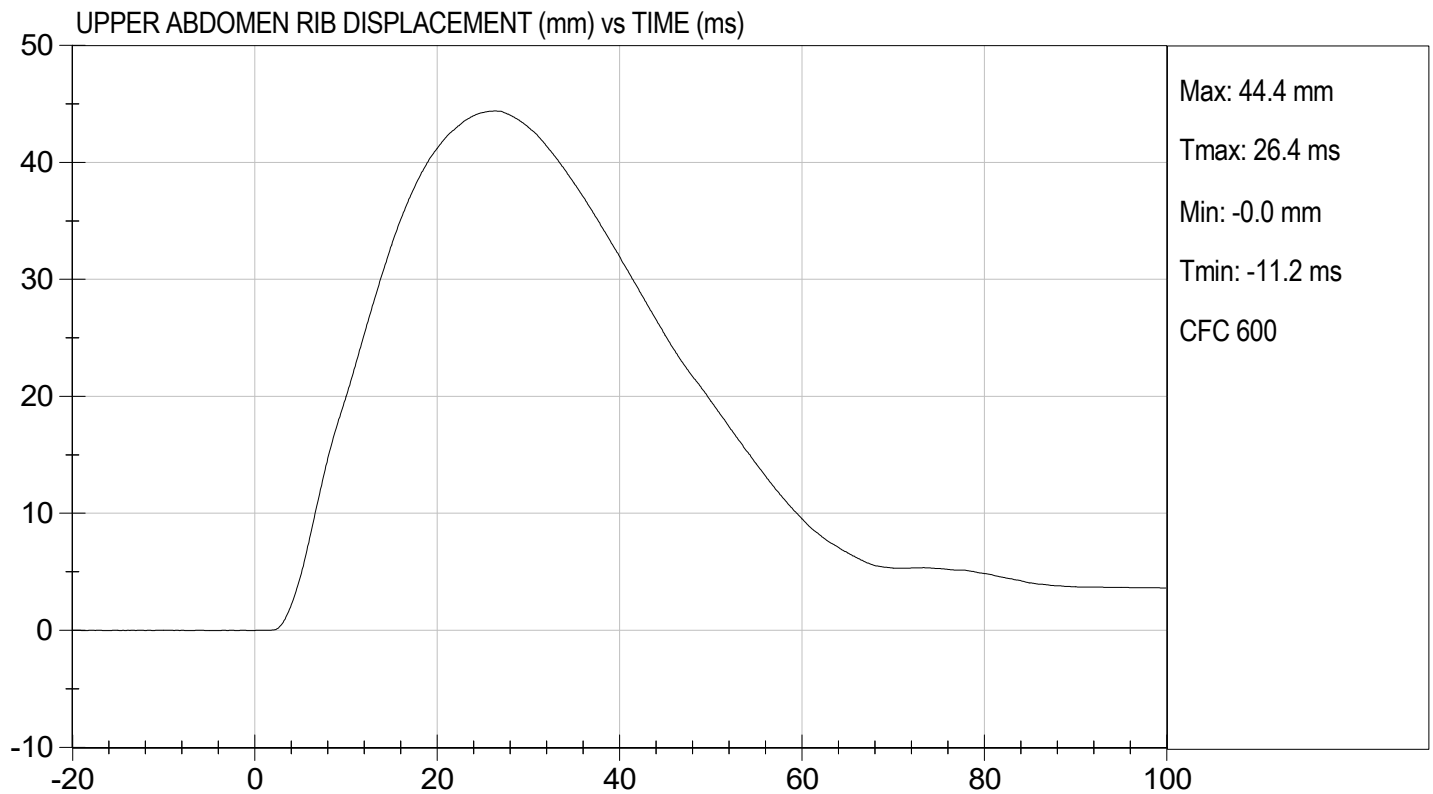
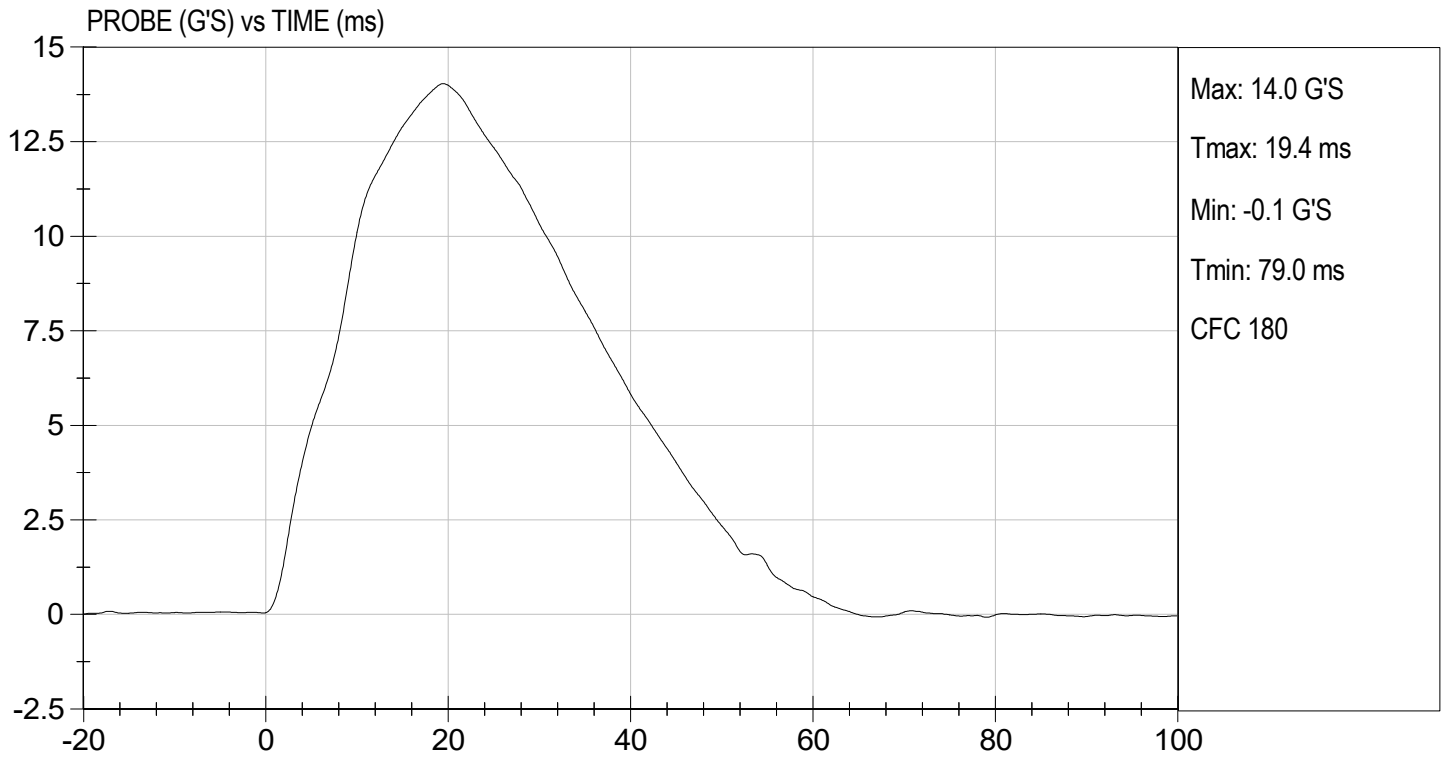
Test Date


Approved By



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

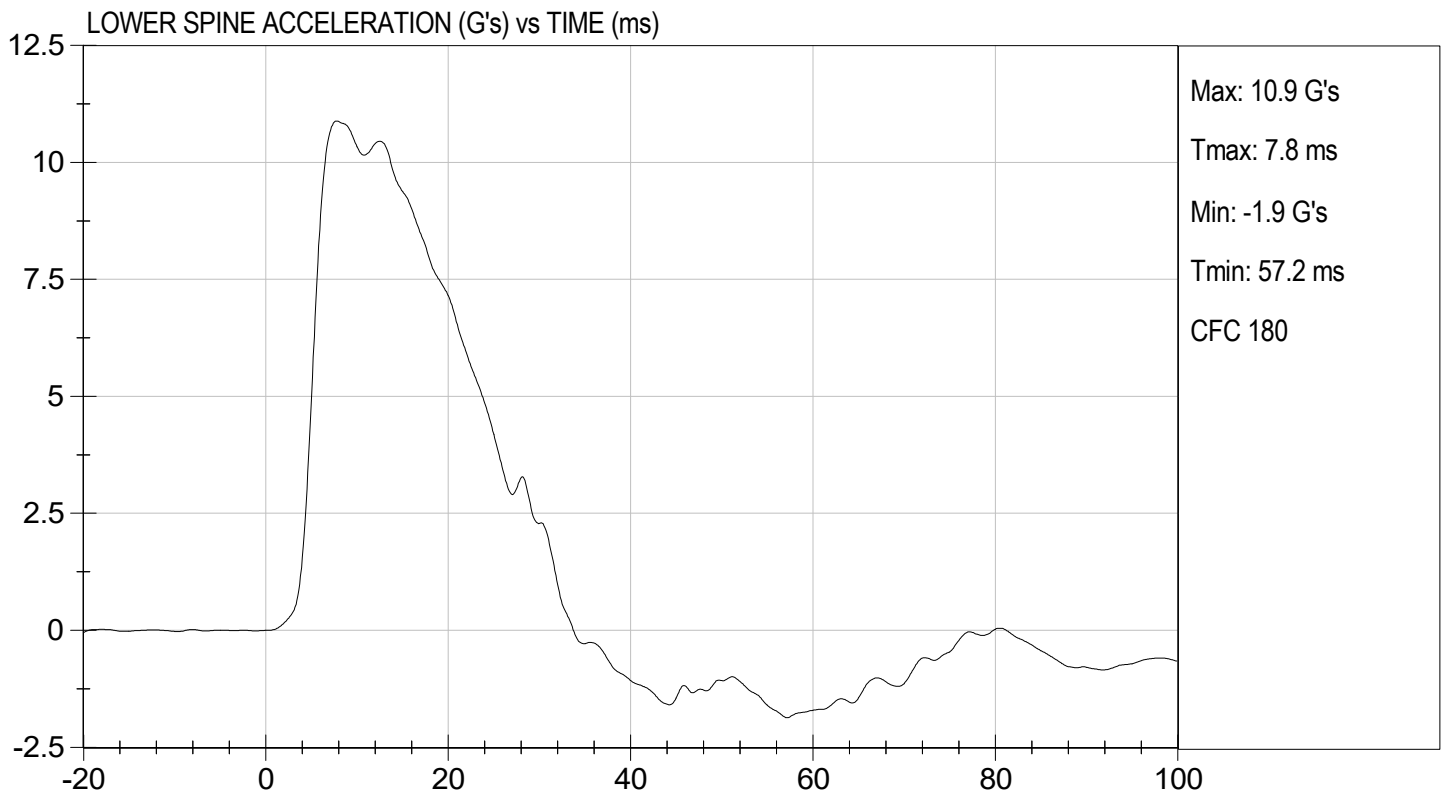
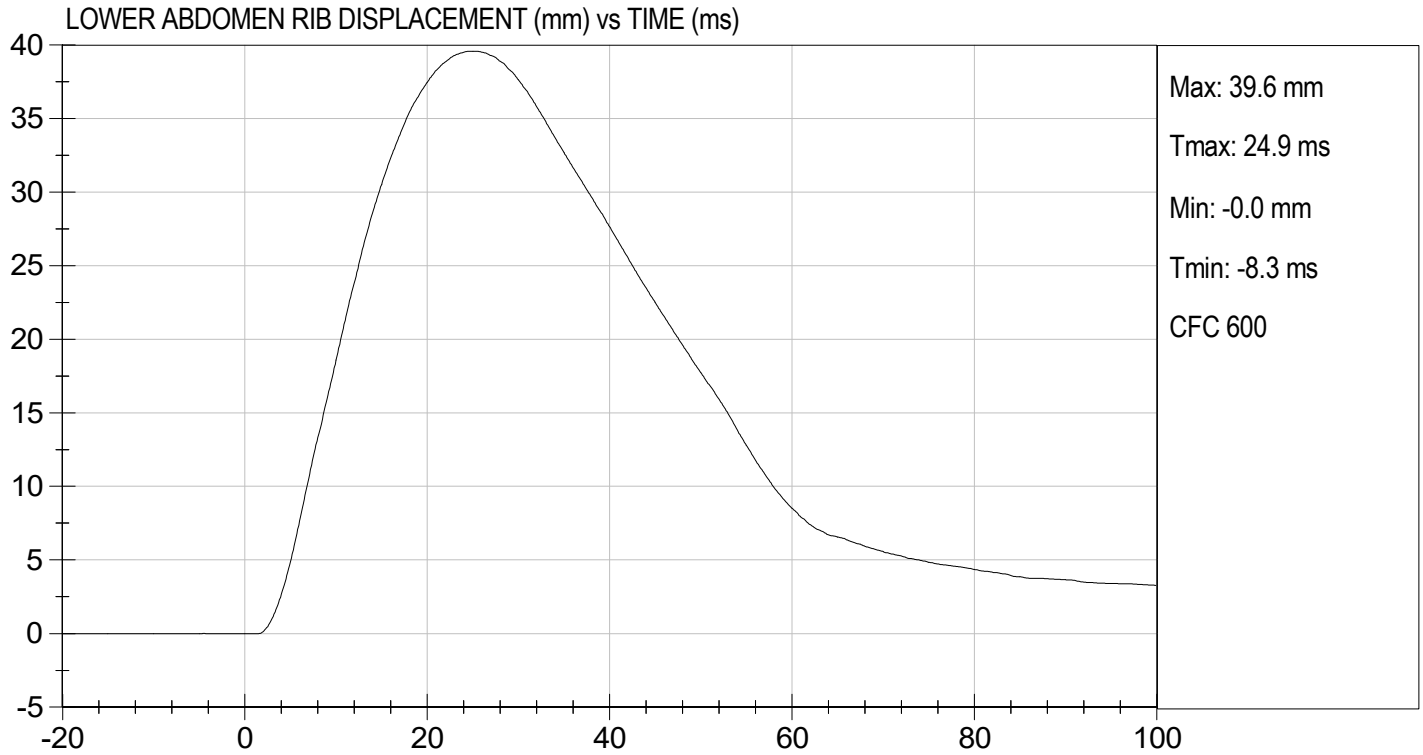
TEST DATE: 05/05/2023
TEST #: D231116





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

TEST DATE: 05/05/2023
TEST #: D231116



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

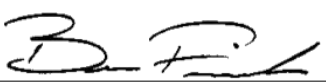
Test I.D: D231117

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	33	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	3,966	Pass
Overall Test Results				Pass


Laboratory Technician

05/05/2023

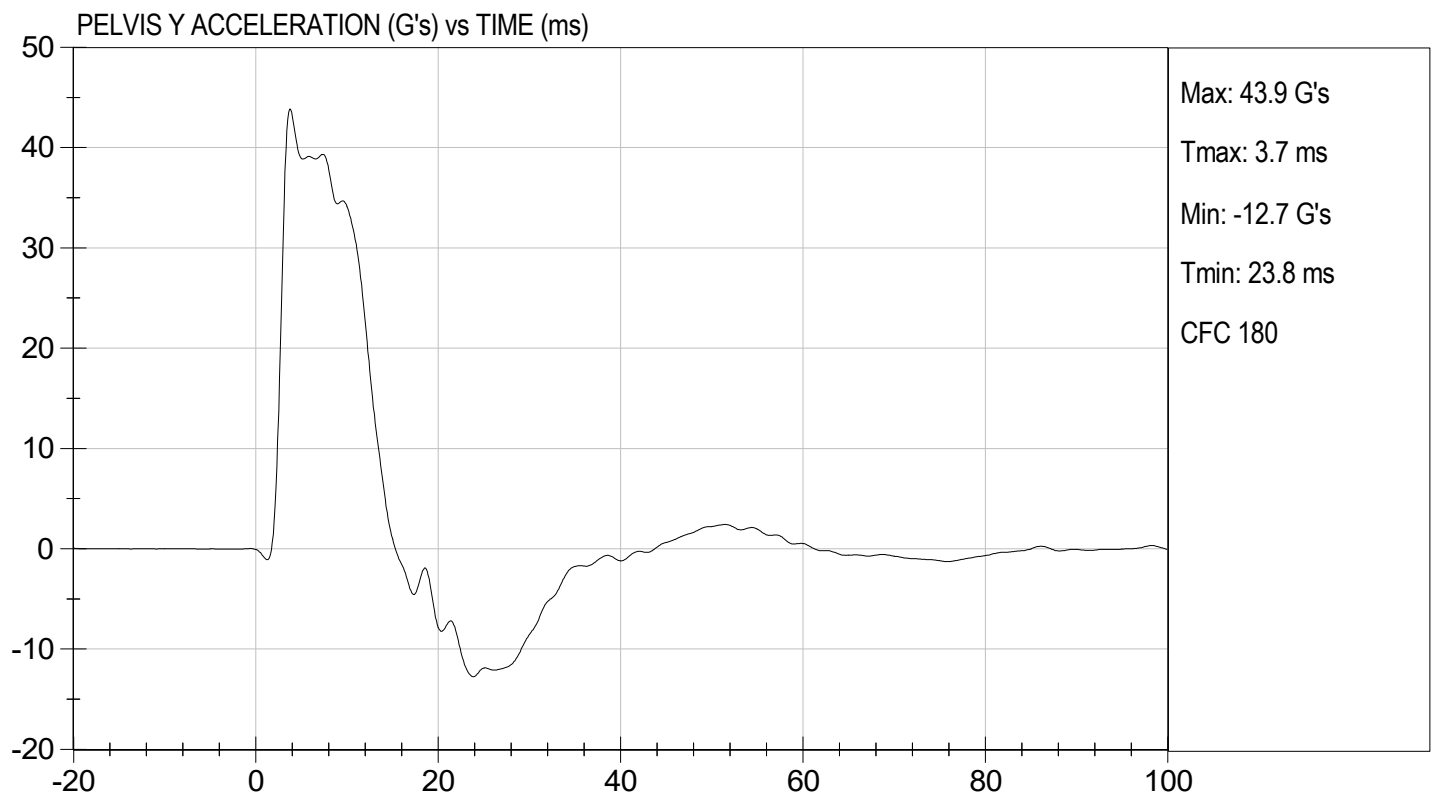
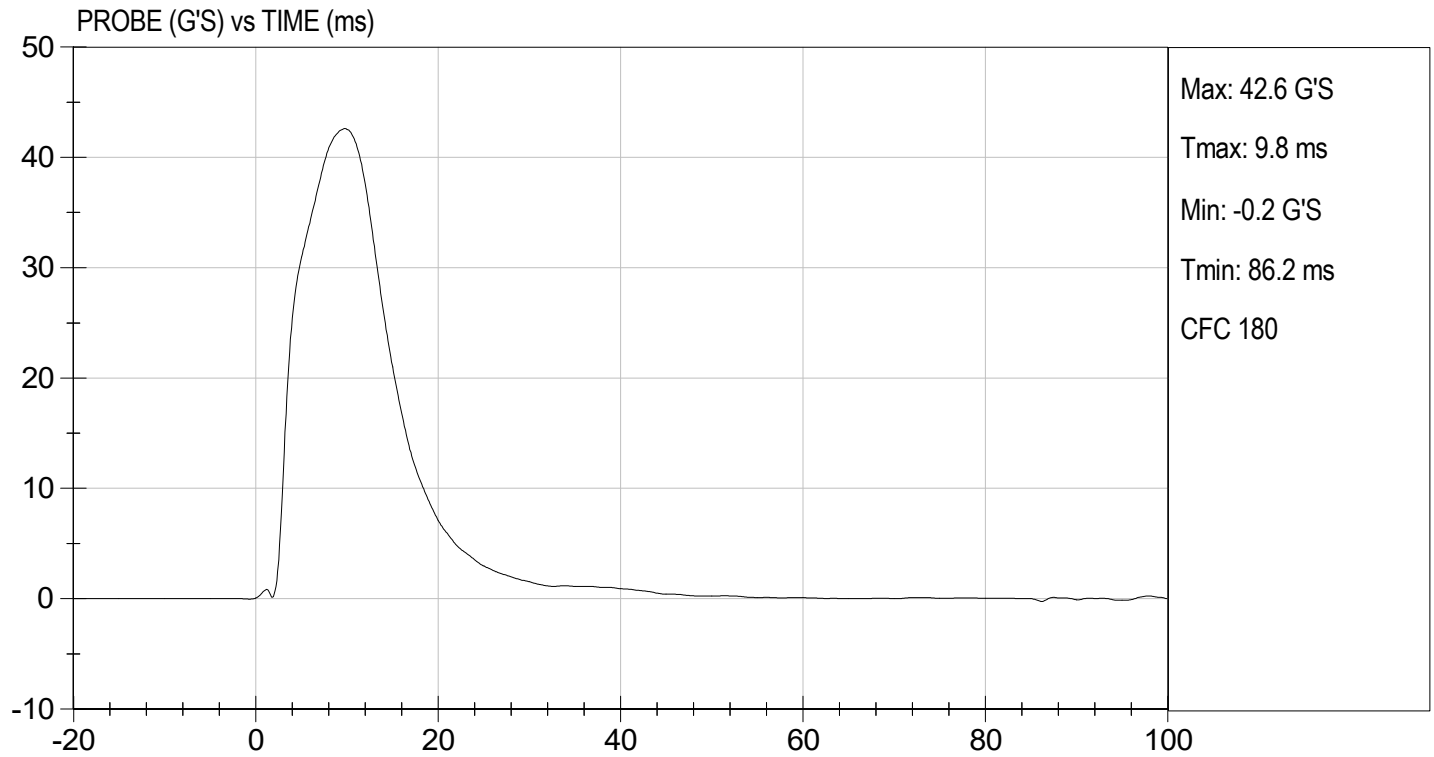
Test Date


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 22.22 ft/s, 6.77 m/s

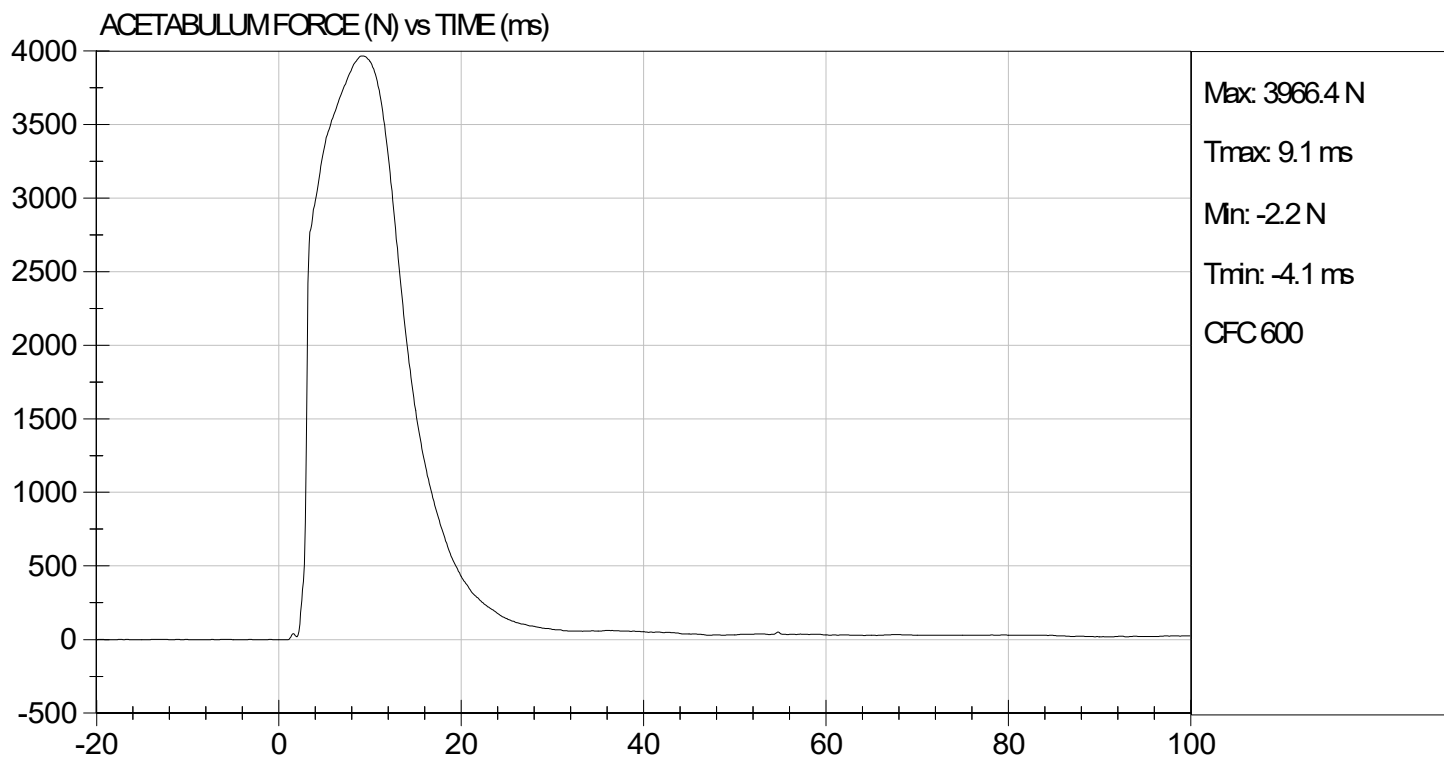
TEST DATE: 05/05/2023
TEST #: D231117





TEST DESC: PELVIS IMPACT
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 05/05/2023
TEST #: D231117



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

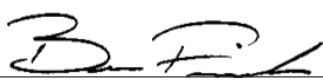
Test I.D: D231118

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	34	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	36 to 45	43	Pass
Pelvis Y Acceleration	G's	28 to 39	34	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	5,011	Pass
Overall Test Results				Pass


Laboratory Technician

05/05/2023

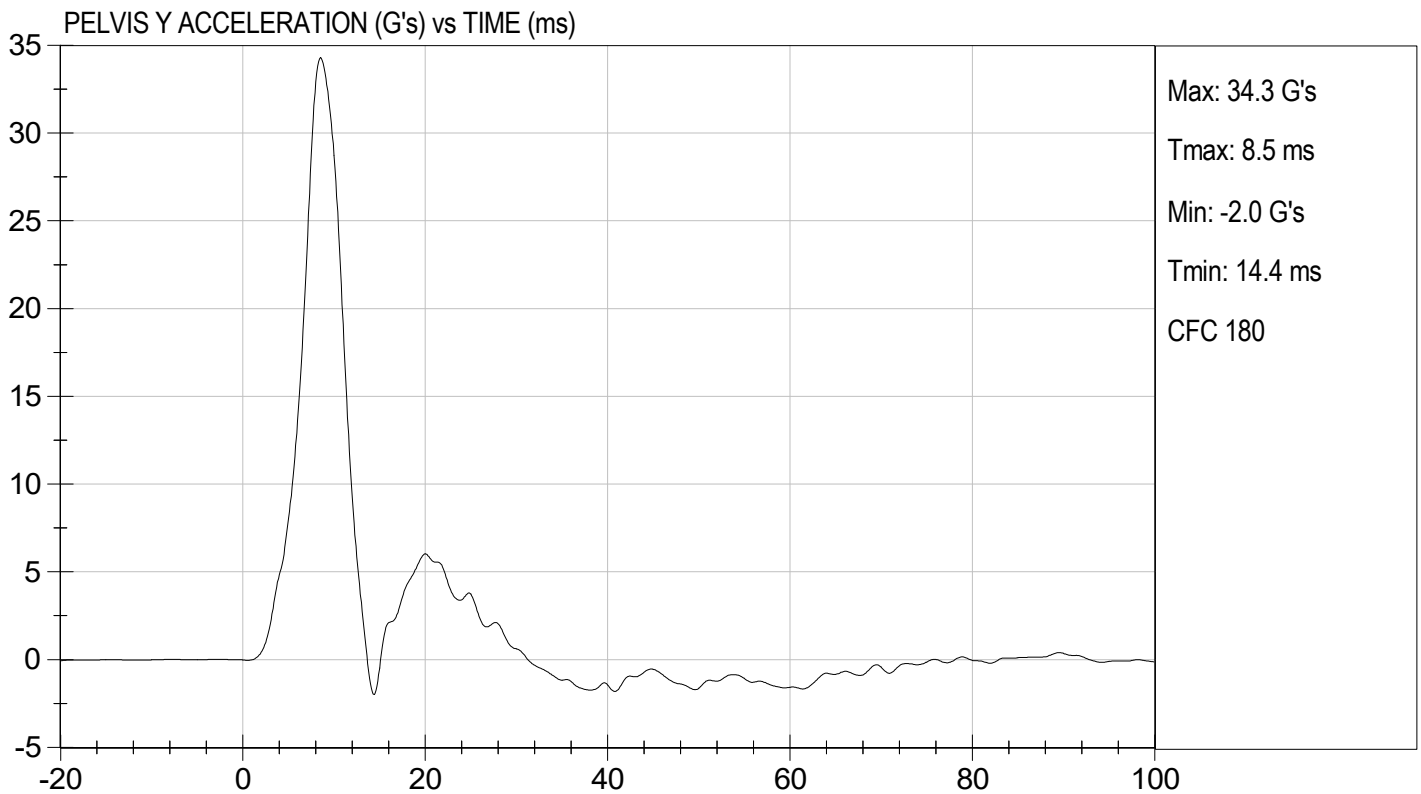
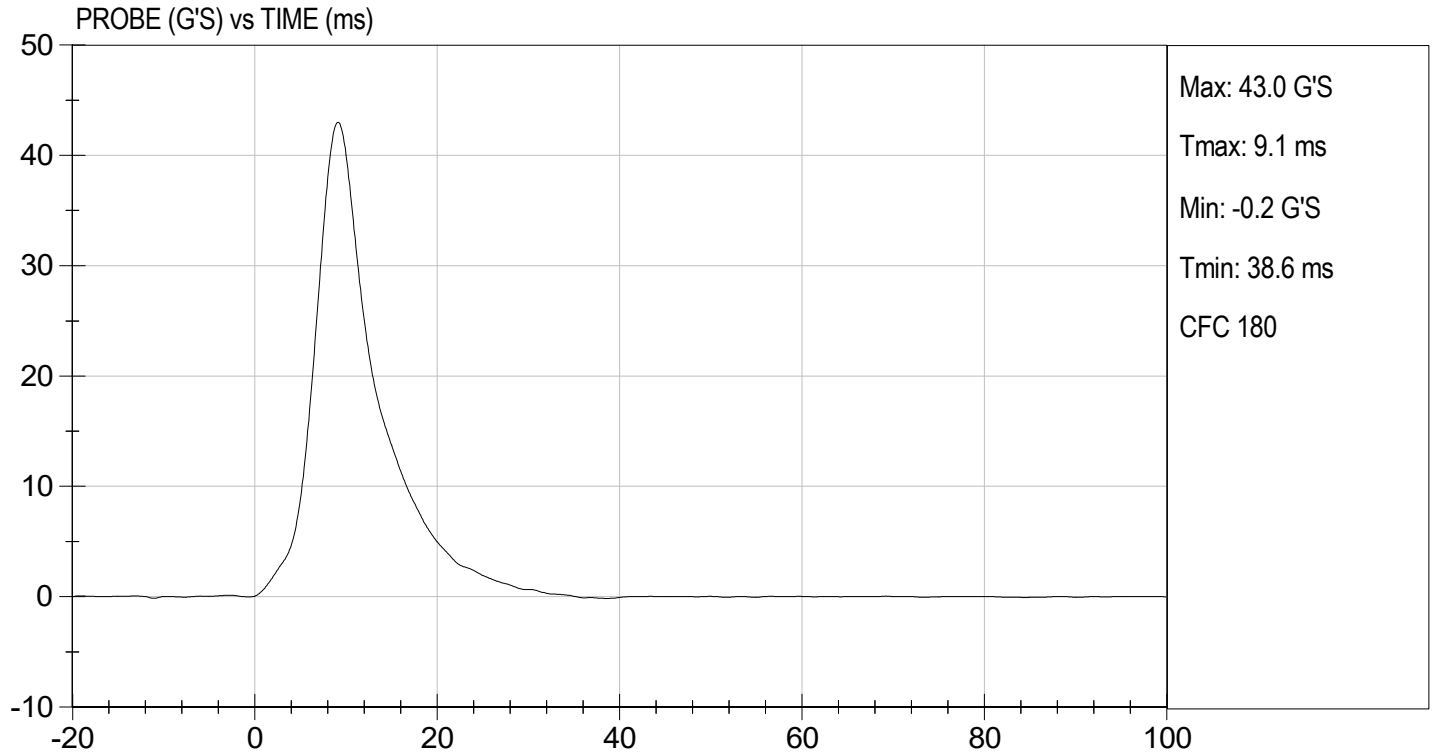
Test Date


Approved By



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

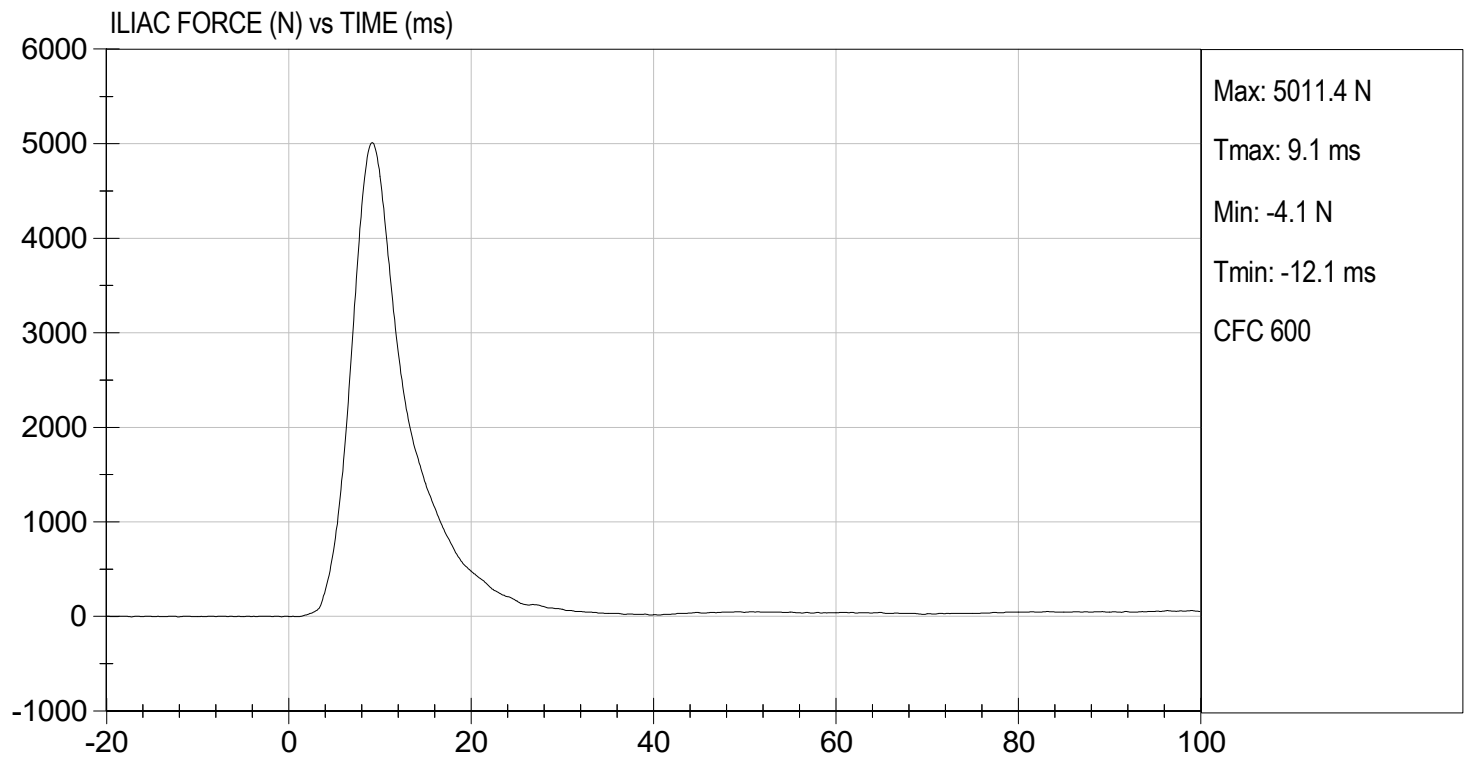
TEST DATE: 05/05/2023
TEST #: D231118





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

TEST DATE: 05/05/2023
TEST #: D231118



QUALIFICATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SID-IIsD External Measurements
SN: 306

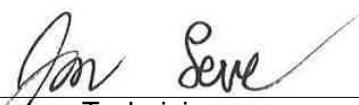
No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	785	Pass
B	Shoulder Pivot Height	437 - 453	449	Pass
C	H-point Height	79 - 89	86	Pass
D	H-point from Seatback	141 - 151	147	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	120	Pass
G	Head Breadth	140 - 148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

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

ATD Serial No: 306

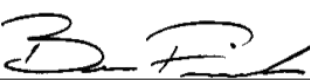
Test ID: D231171

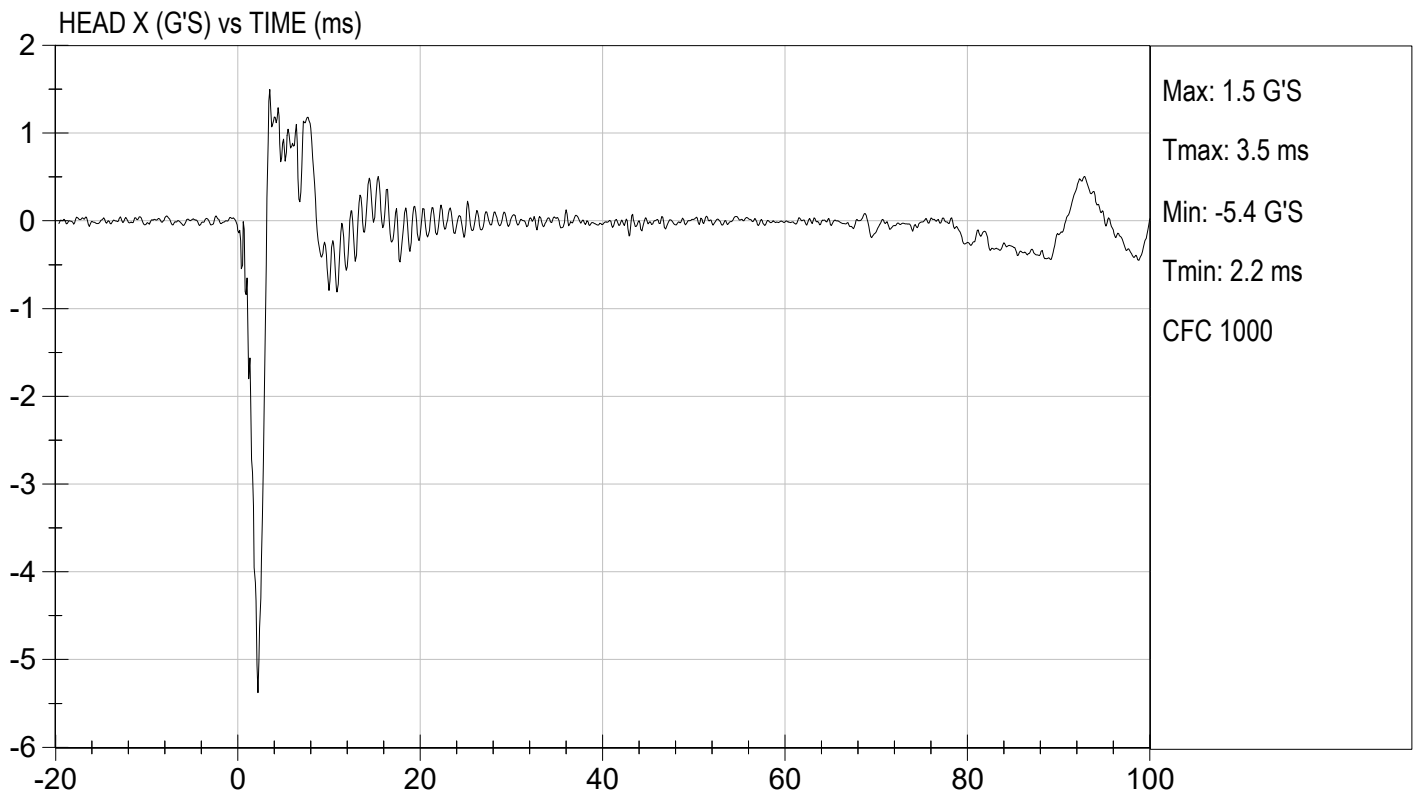
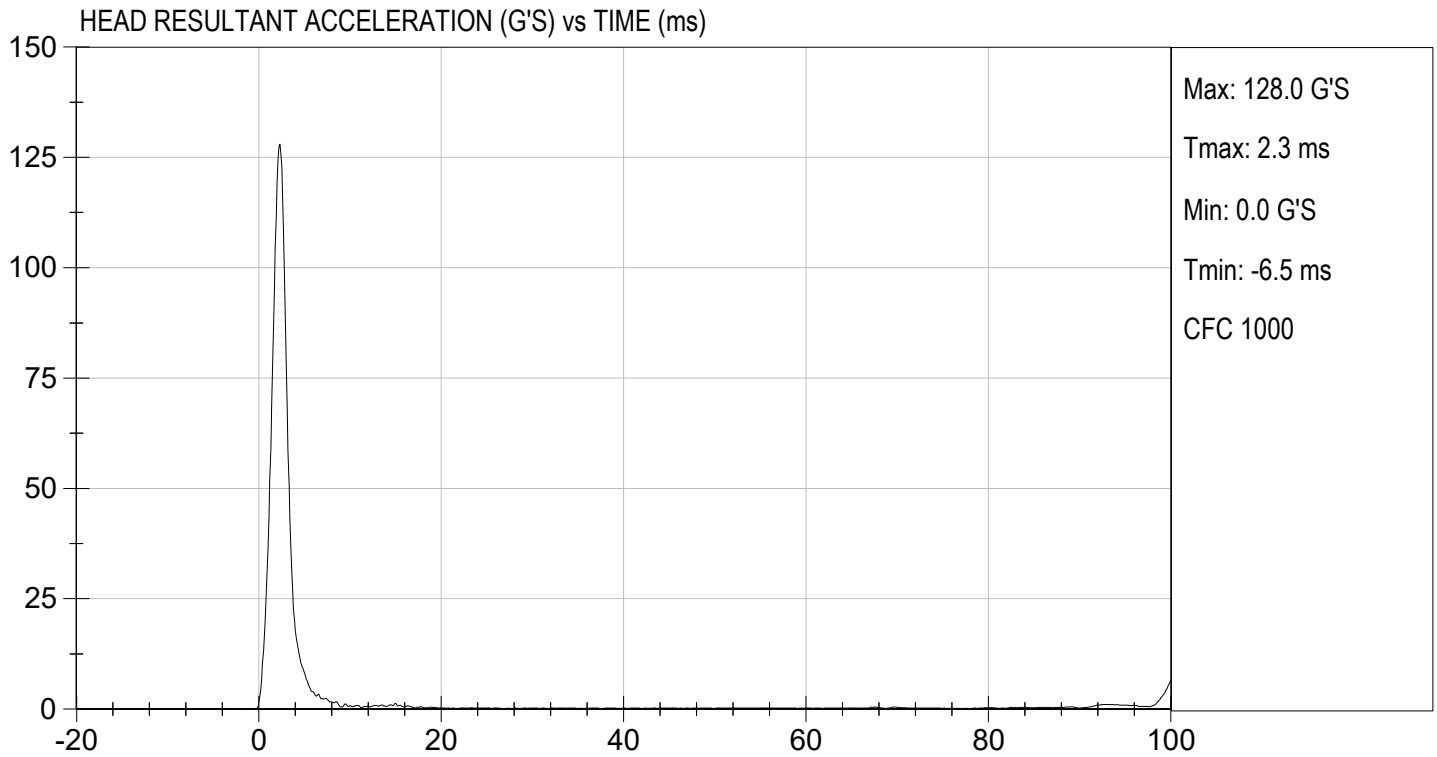
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Peak Resultant Acceleration	G's	115 to 137	128	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-5.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass

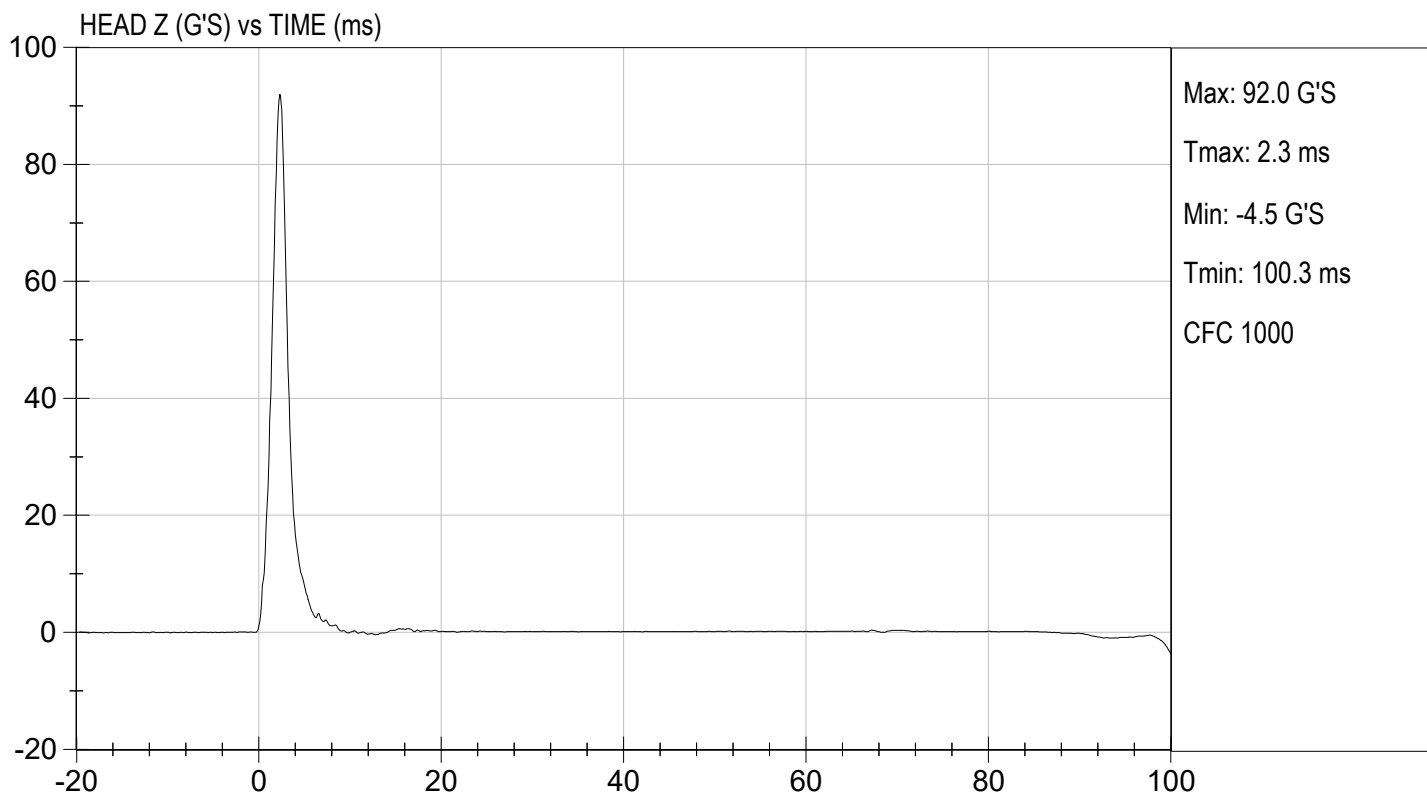
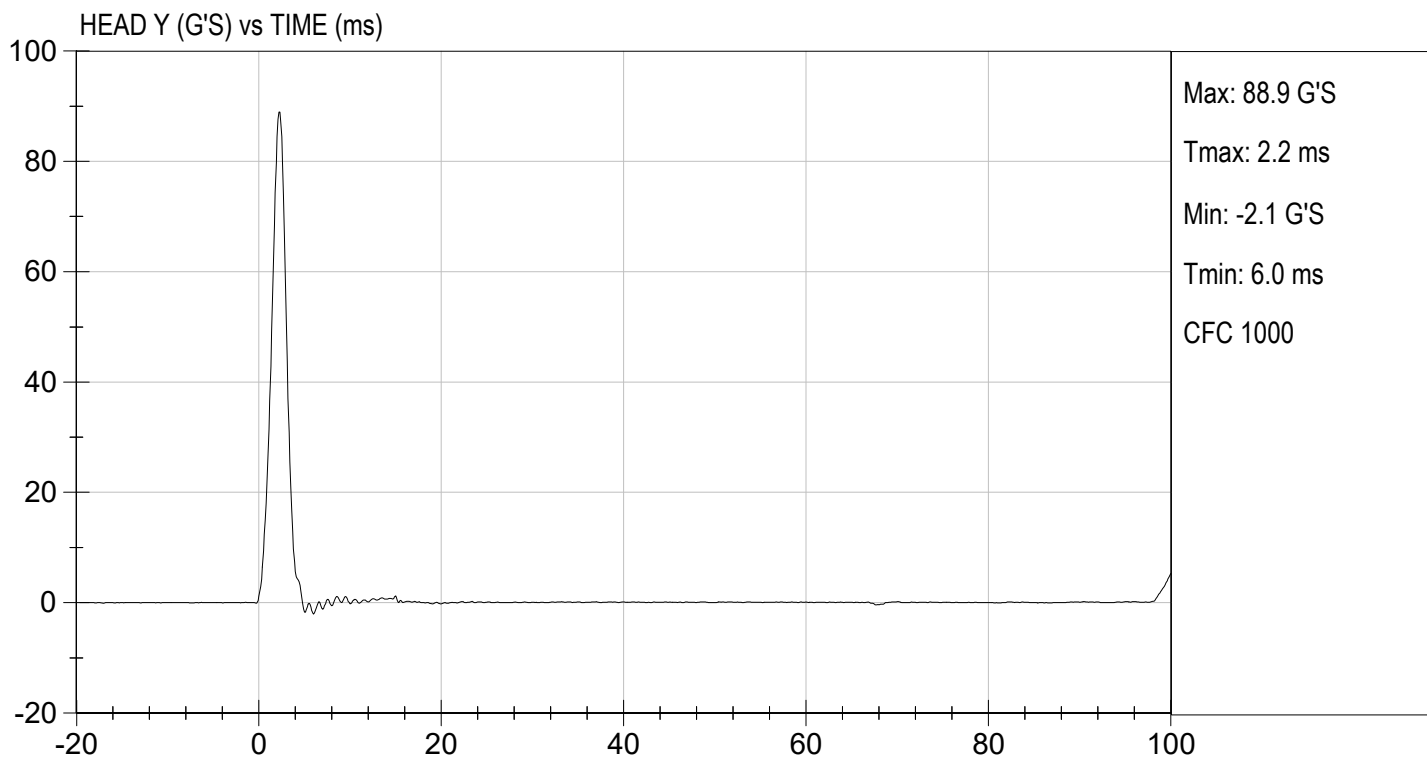

Laboratory Technician

05/12/2023

Test Date


Approved By





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

ATD Serial No: 306

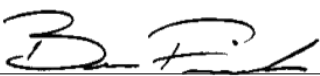
Test I.D: D231172

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.3	Pass
Humidity		%	10 to 70	43	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.28	Pass
	15 ms	m/s	3.30 to 4.10	3.55	Pass
	20 ms	m/s	4.40 to 5.40	5.07	Pass
	25 ms	m/s	5.40 to 6.10	5.65	Pass
	25-100 ms	m/s	5.50 to 6.20	5.68	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	64	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-38	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	112	Pass
Overall Test Results				Pass	


 Laboratory Technician

05/12/2023

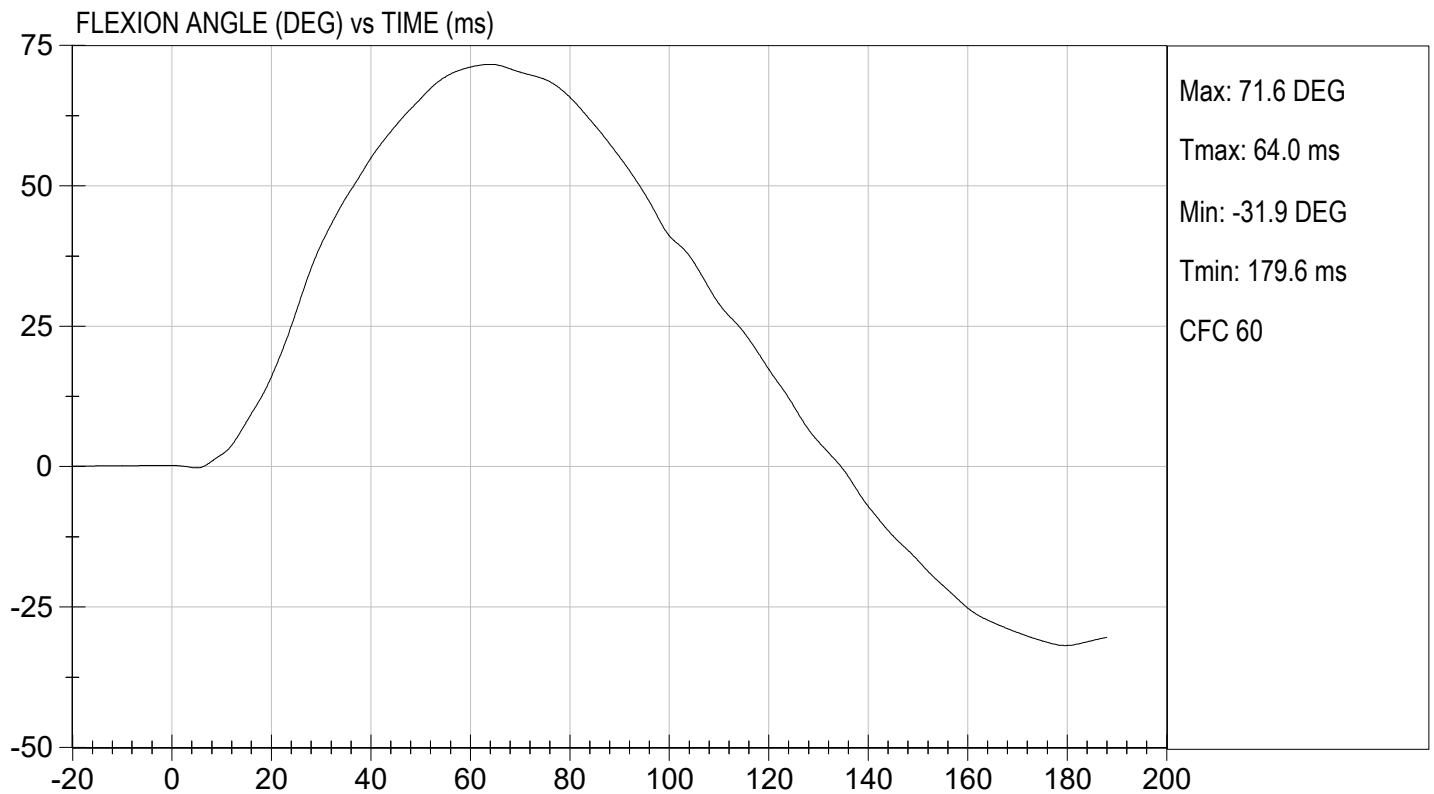
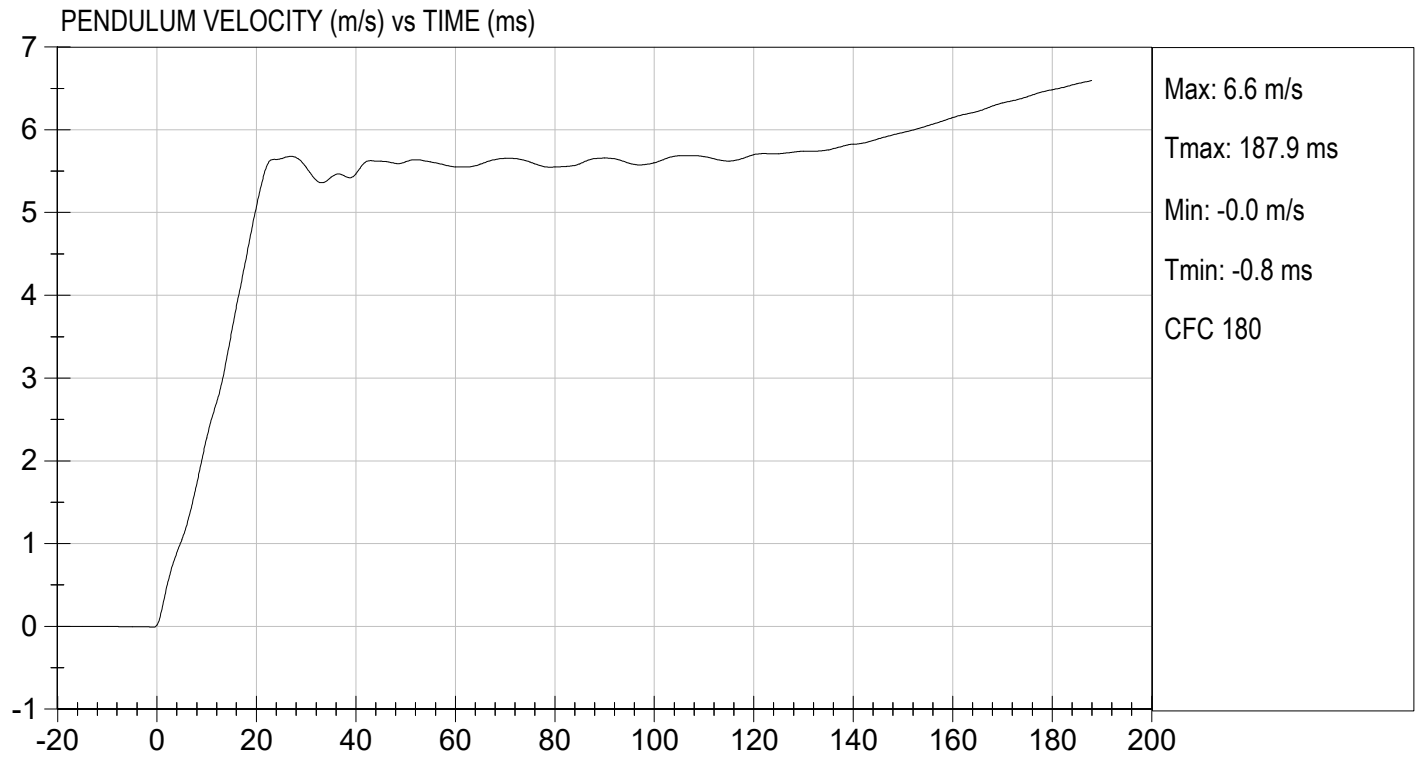
Test Date


 Approved By



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

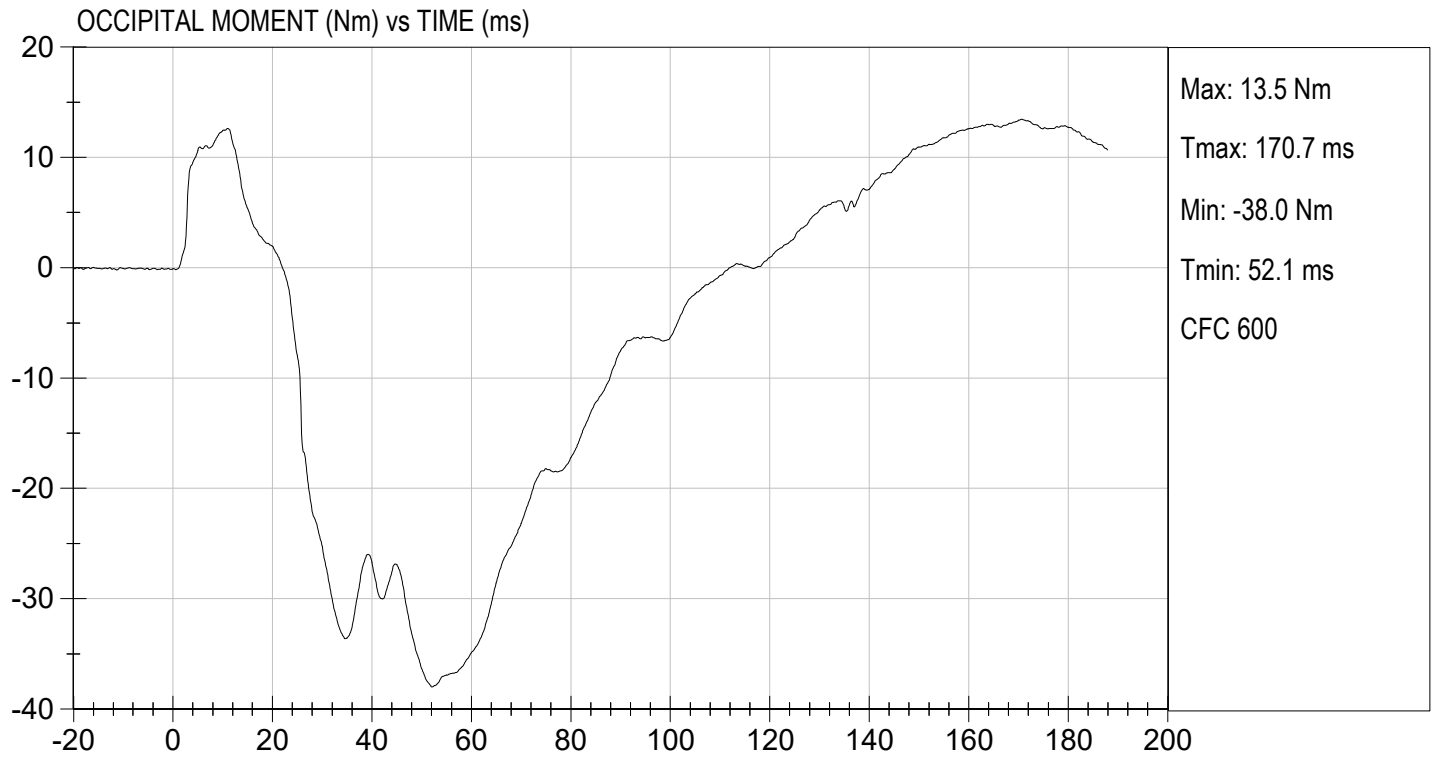
TEST DATE: 05/12/2023
TEST #: D231172





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

TEST DATE: 05/12/2023
TEST #: D231172



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

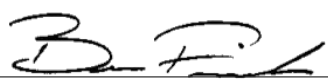
ATD Serial No: 306

Test ID: D231173

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	13 to 18	14	Pass
Shoulder Displacement	mm	28 to 37	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results			Pass	


Laboratory Technician

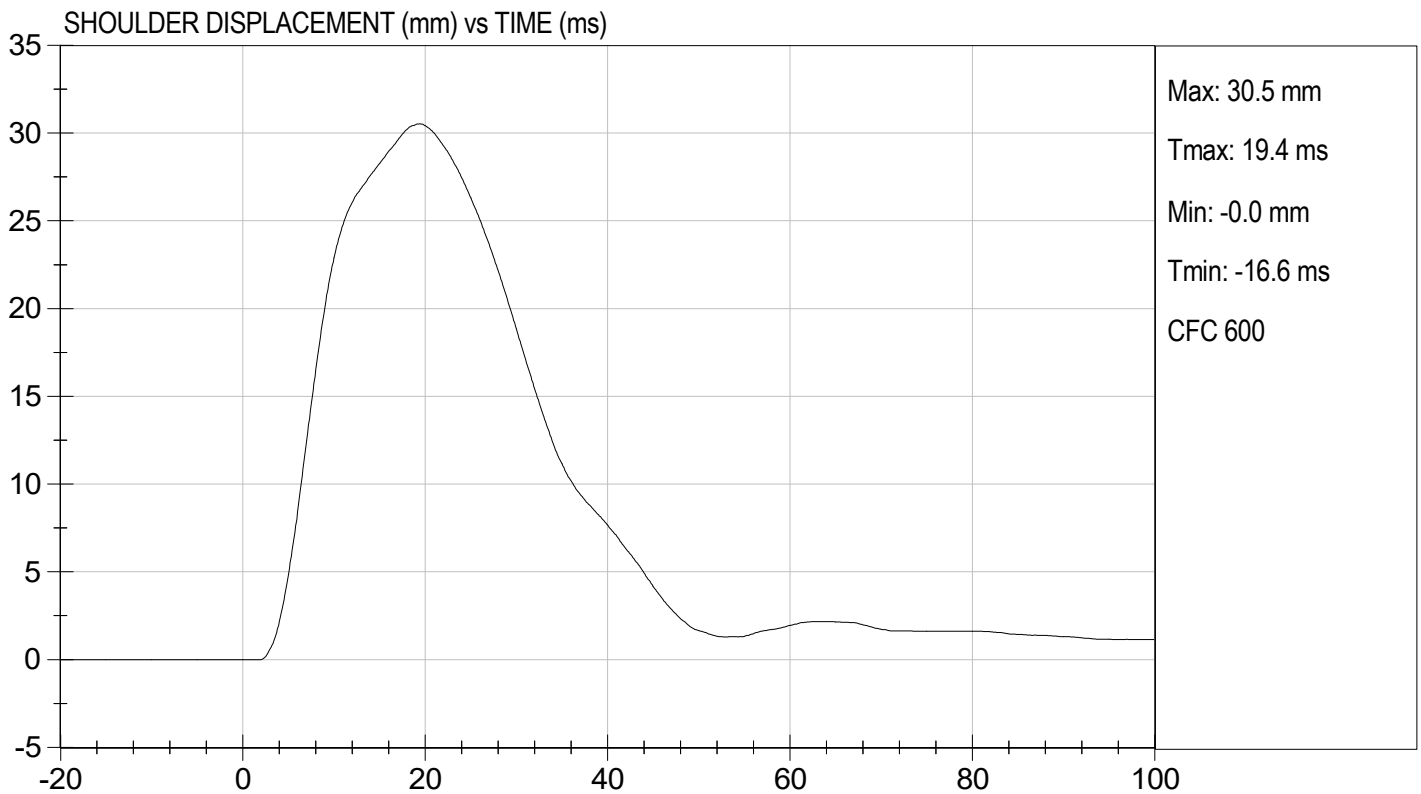
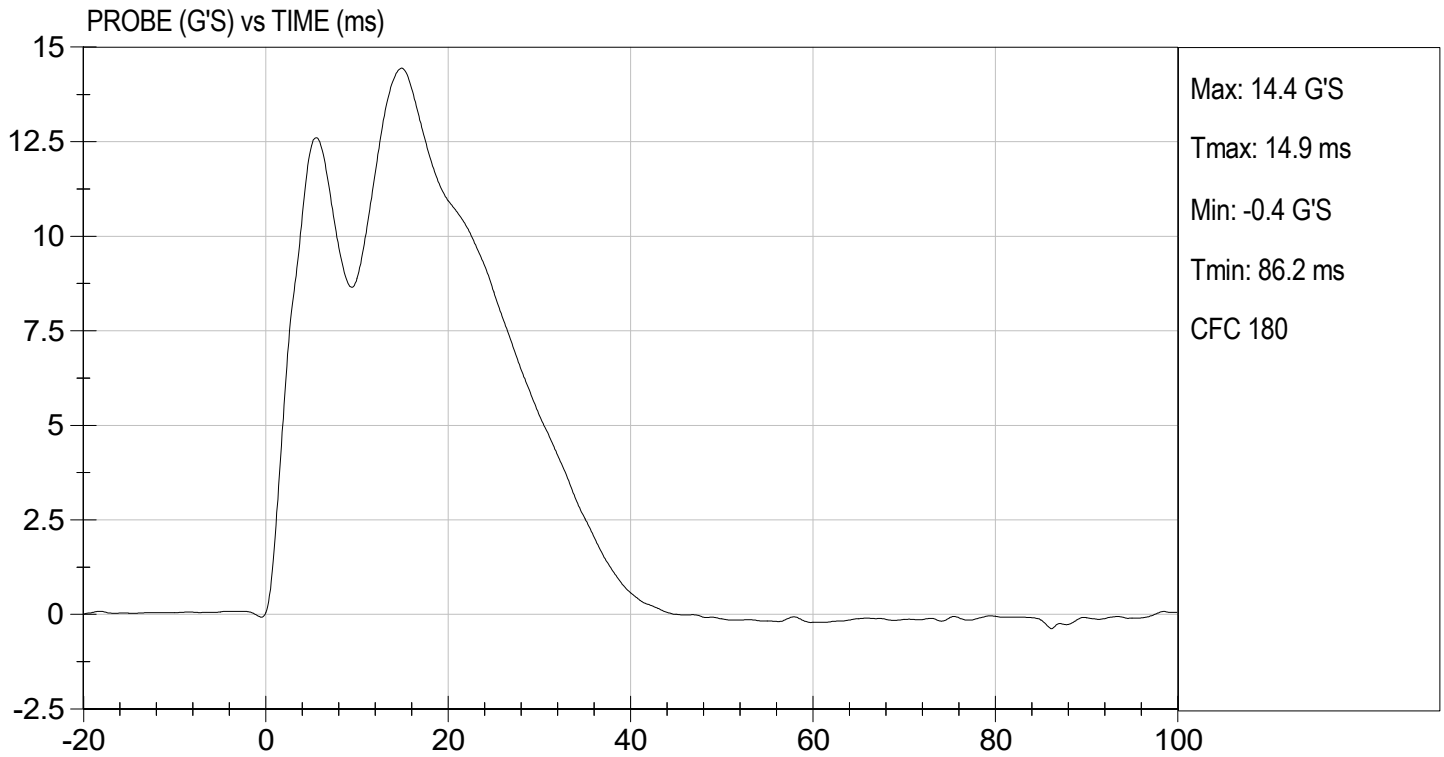
05/12/2023
Test Date


Approved By



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

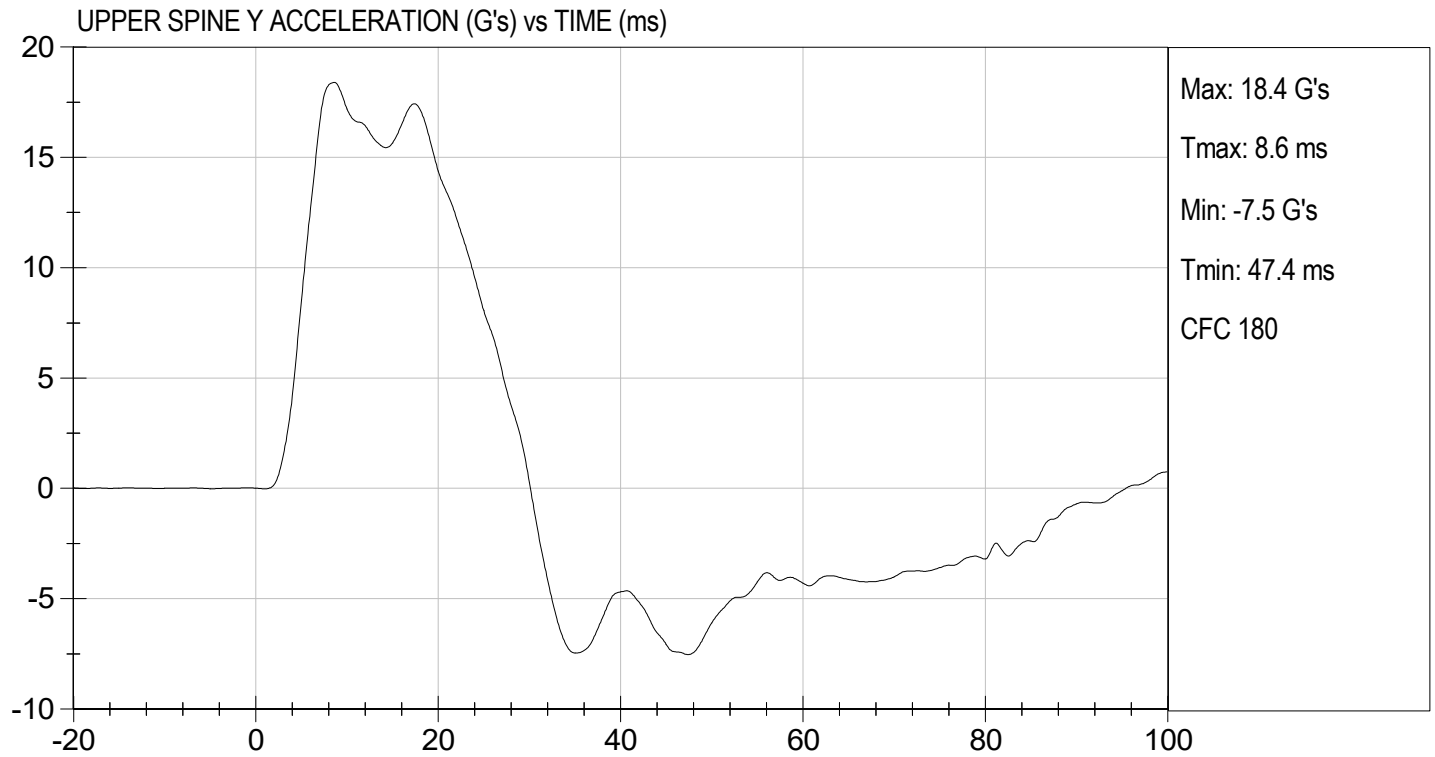
TEST DATE: 05/12/2023
TEST #: D231173





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

TEST DATE: 05/12/2023
TEST #: D231173



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

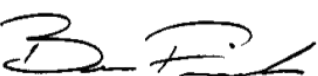
ATD Serial No: 306

Test I.D: D231174

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	34	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	34	Pass
Lower Rib Displacement	mm	32 to 38	37	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass


Laboratory Technician

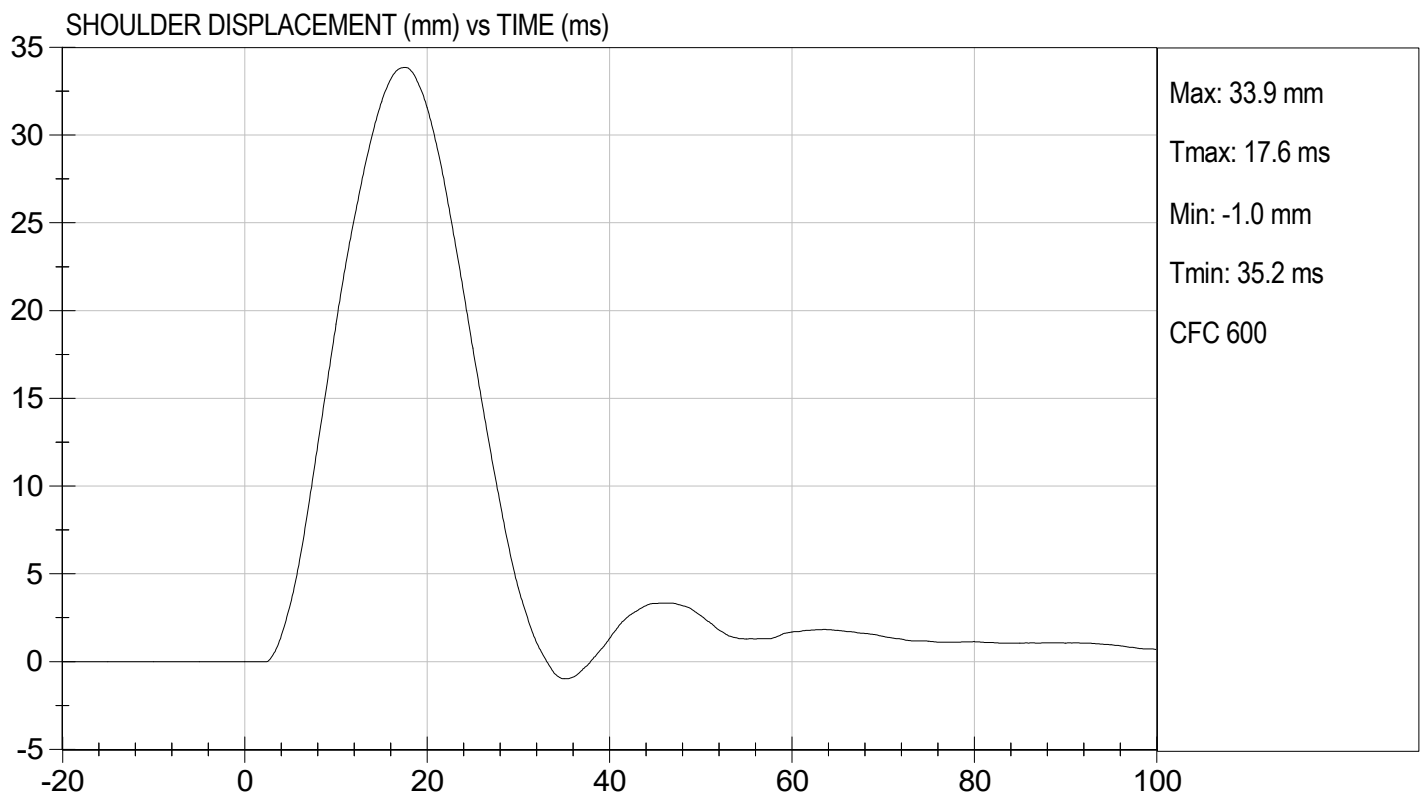
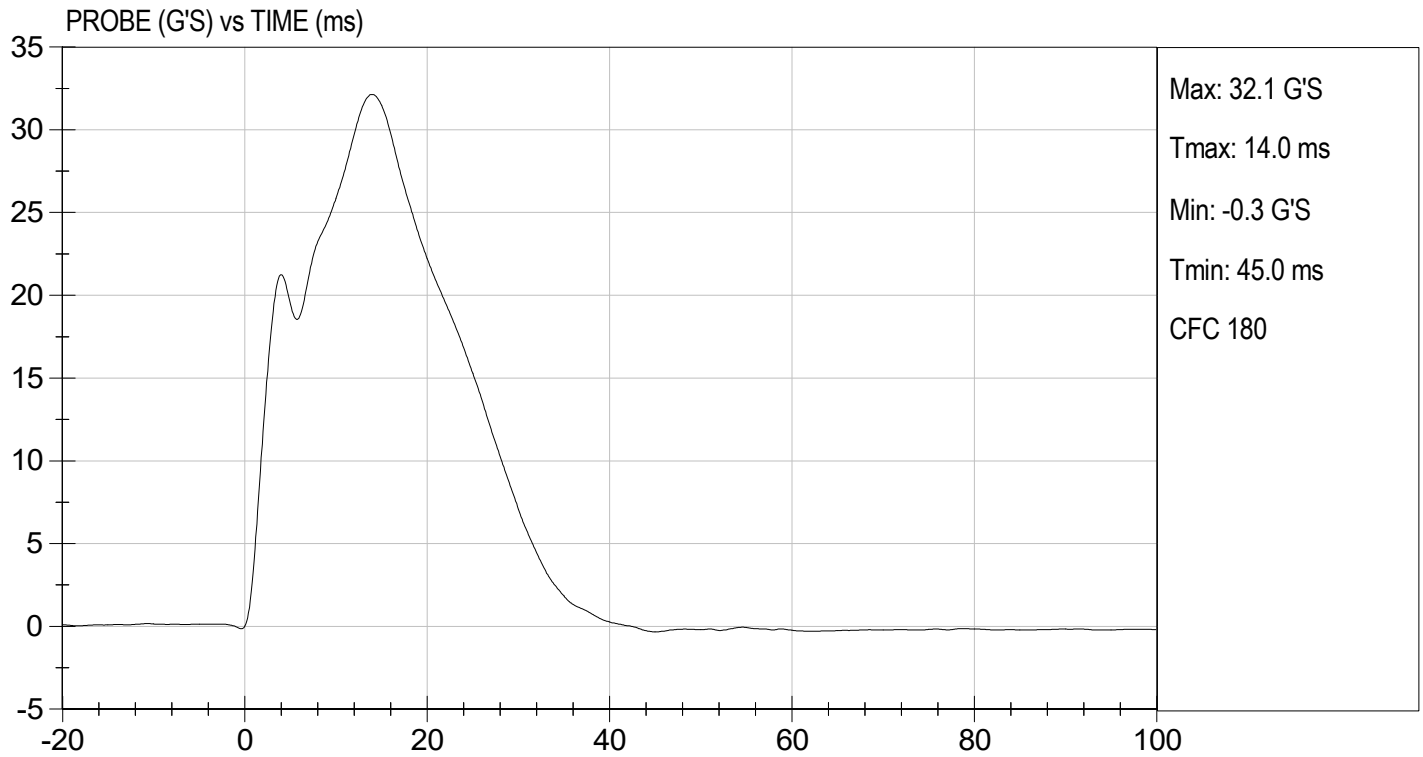
05/12/2023
Test Date


Approved By



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

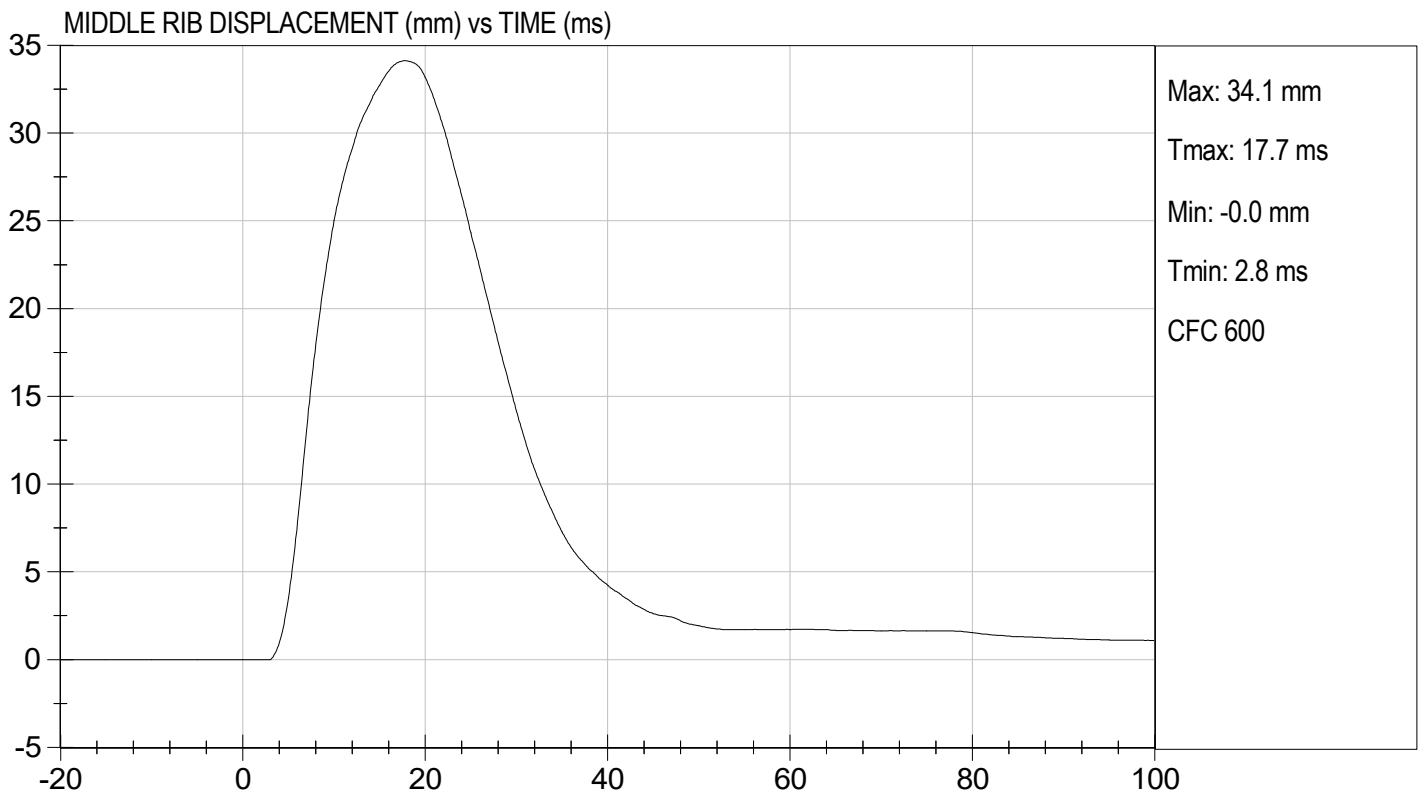
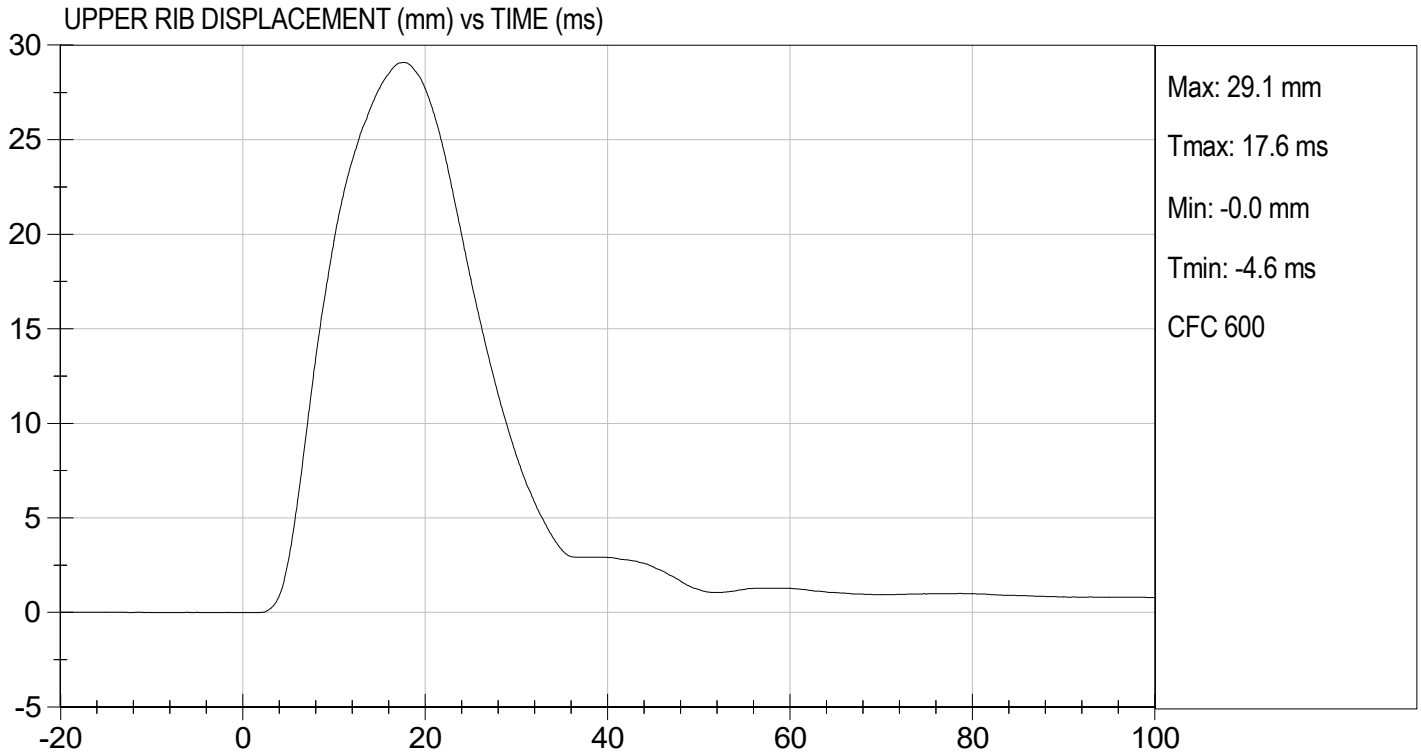
TEST DATE: 05/12/2023
TEST #: D231174





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

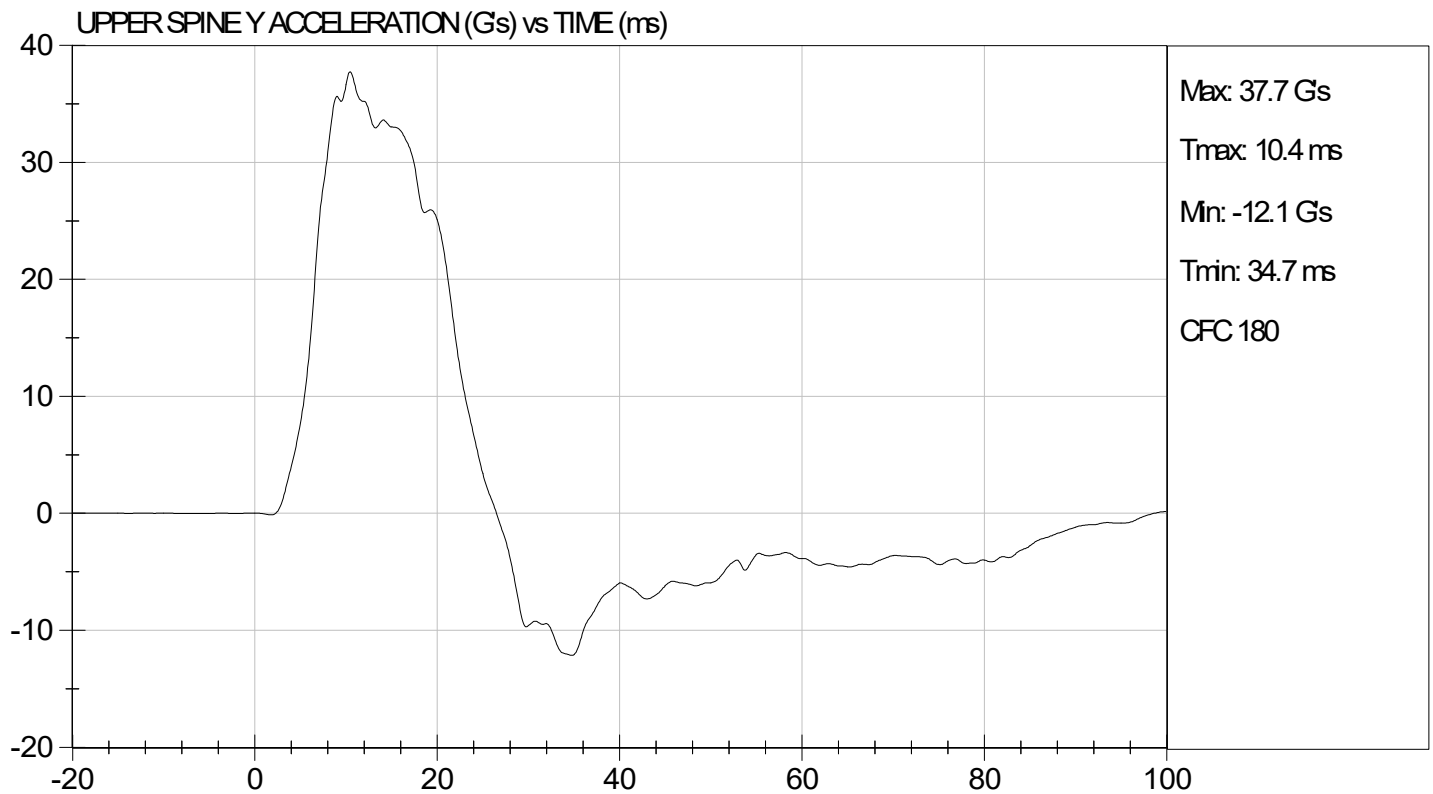
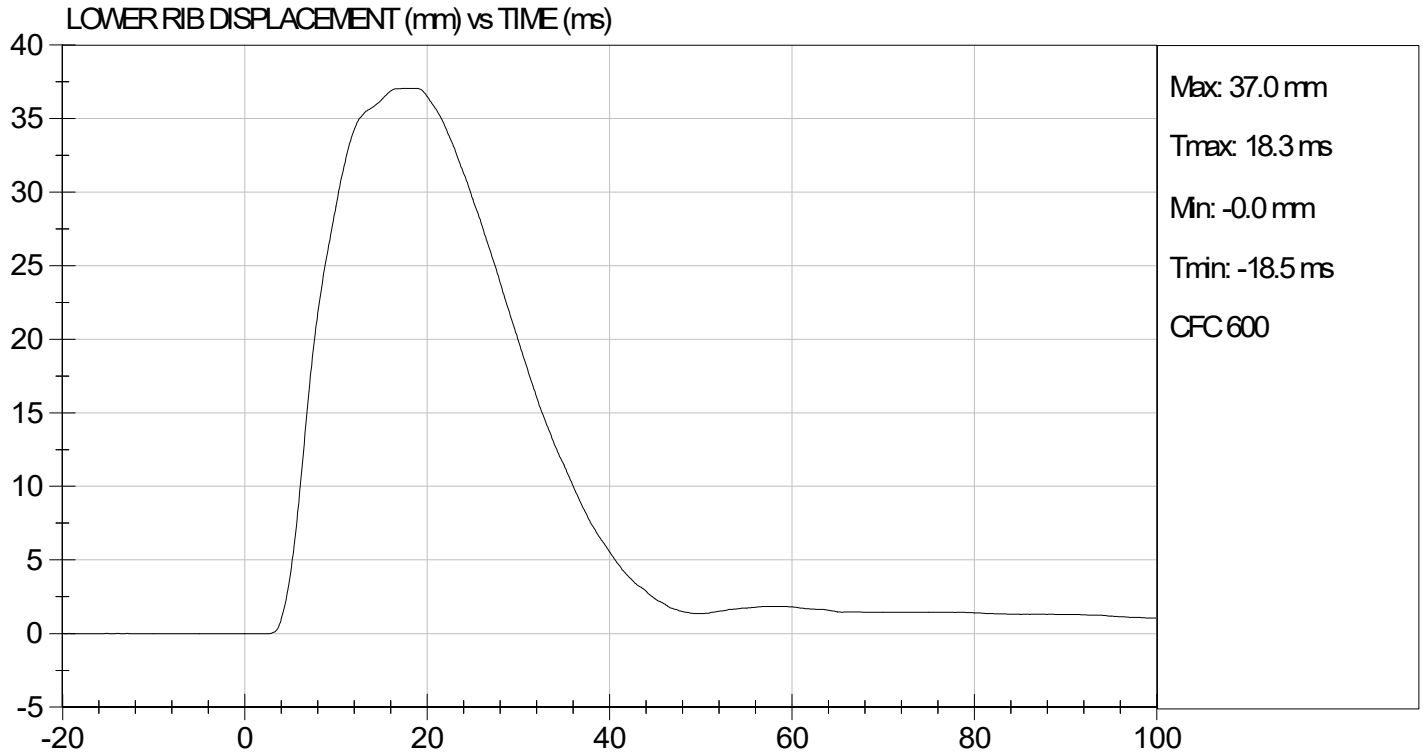
TEST DATE: 05/12/2023
TEST #: D231174





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

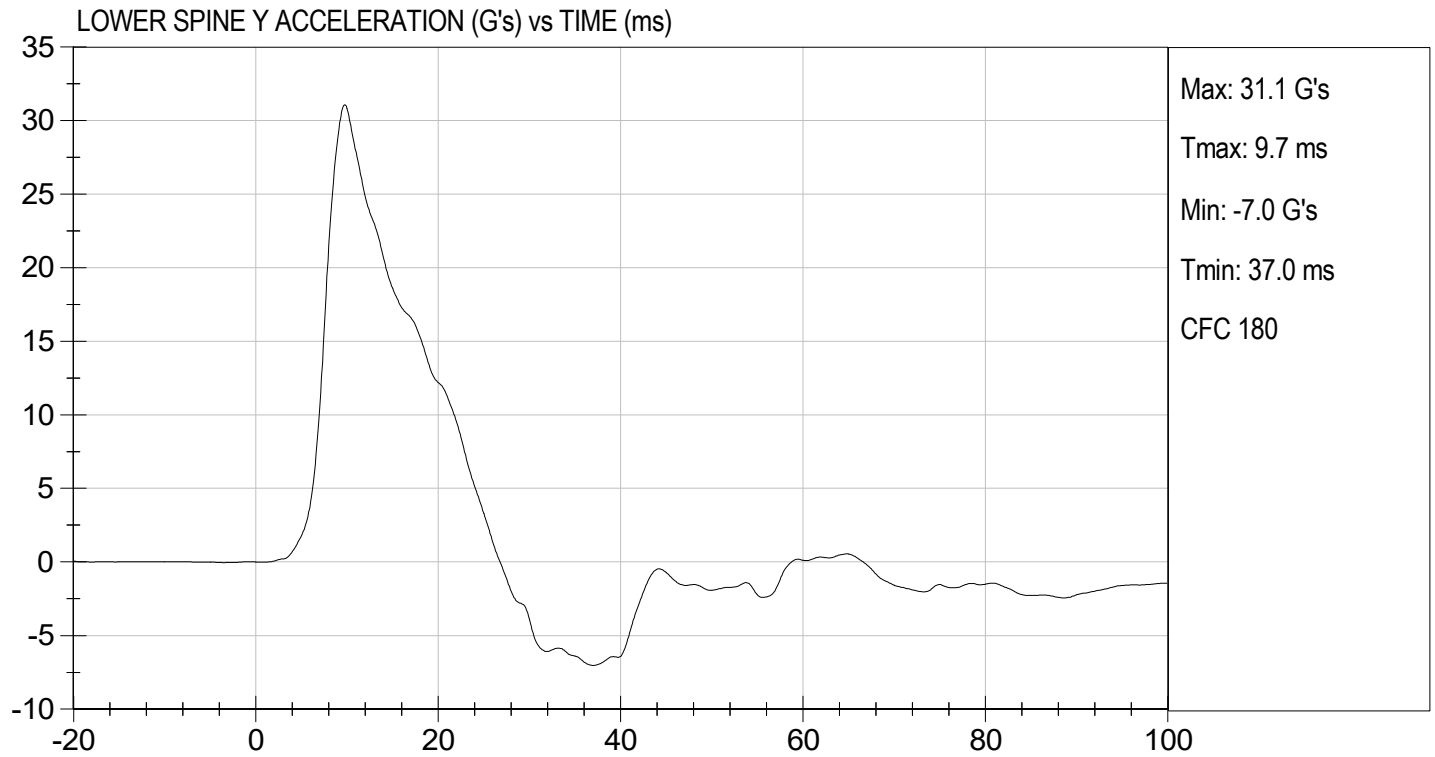
TEST DATE: 05/12/2023
TEST #: D231174





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

TEST DATE: 05/12/2023
TEST #: D231174



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

ATD Serial No: 306

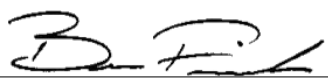
Test I.D: D231175

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	43	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	39	Pass
Middle Rib Displacement	mm	39 to 45	44	Pass
Lower Rib Displacement	mm	35 to 43	42	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

05/12/2023

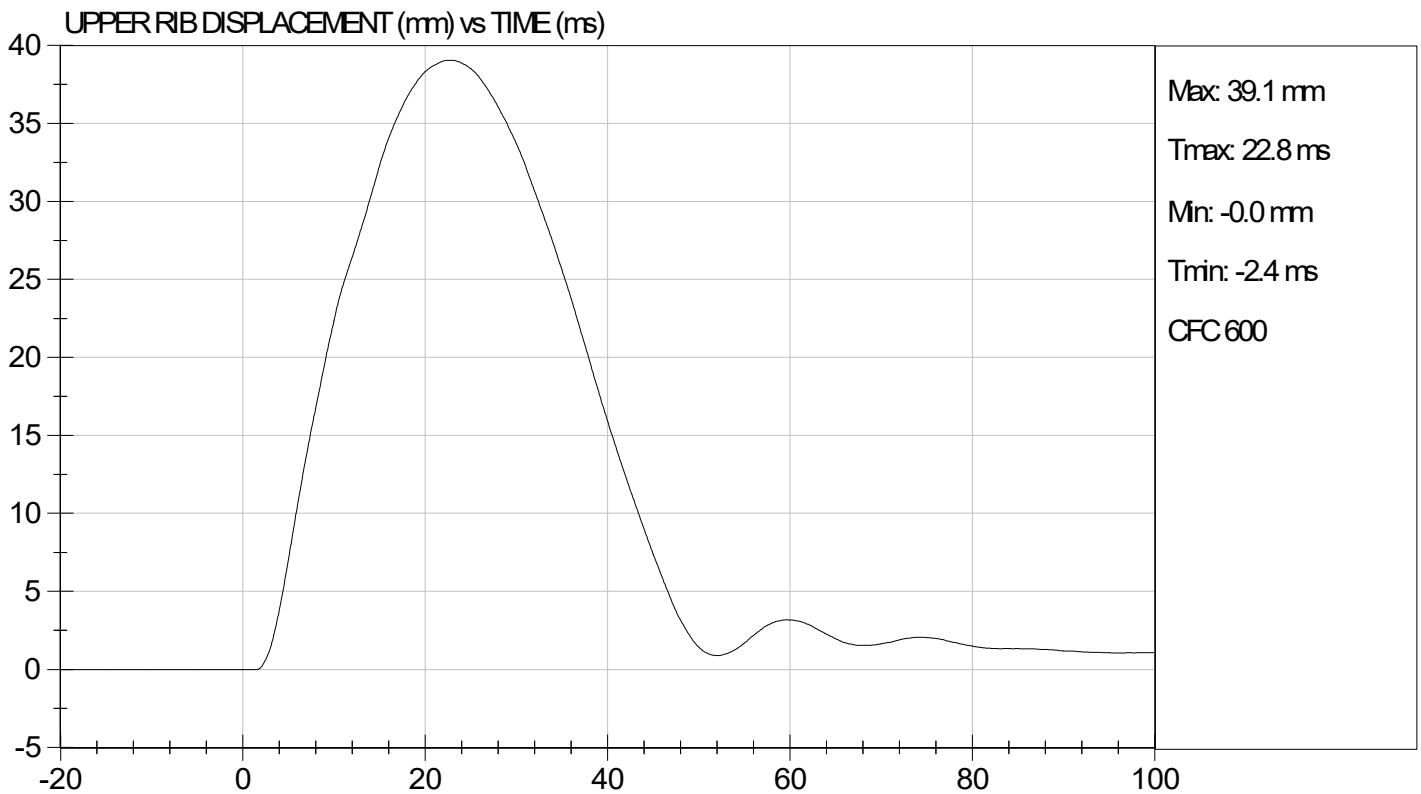
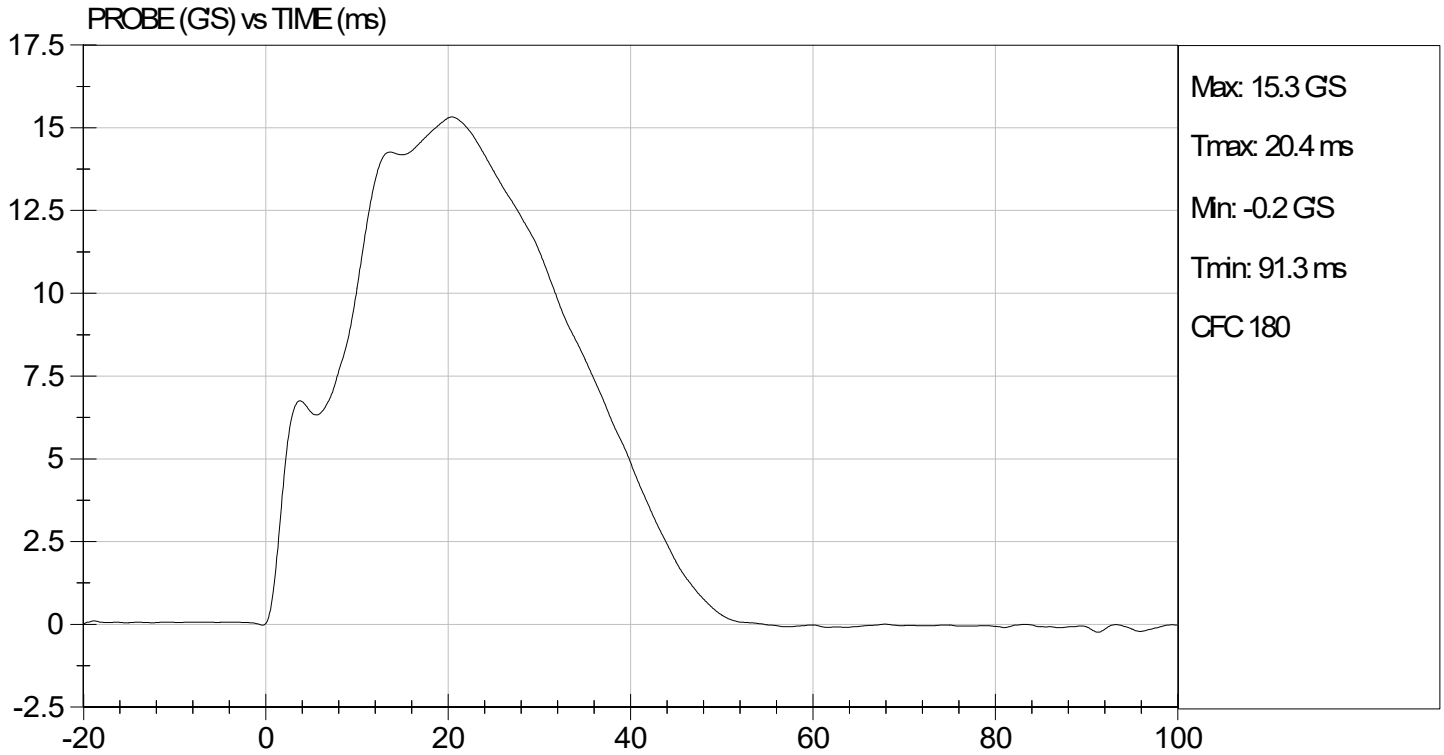
Test Date


Approved By



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

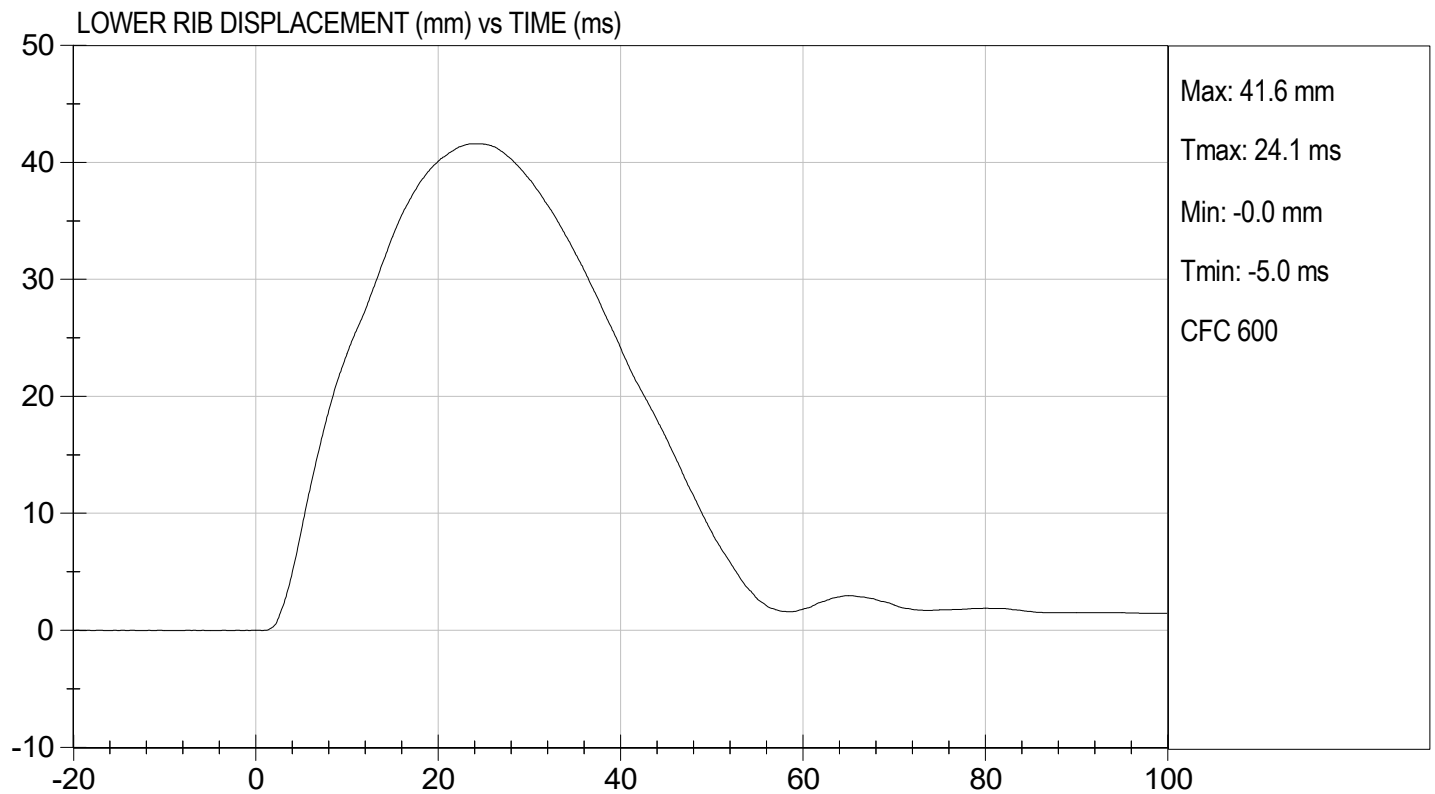
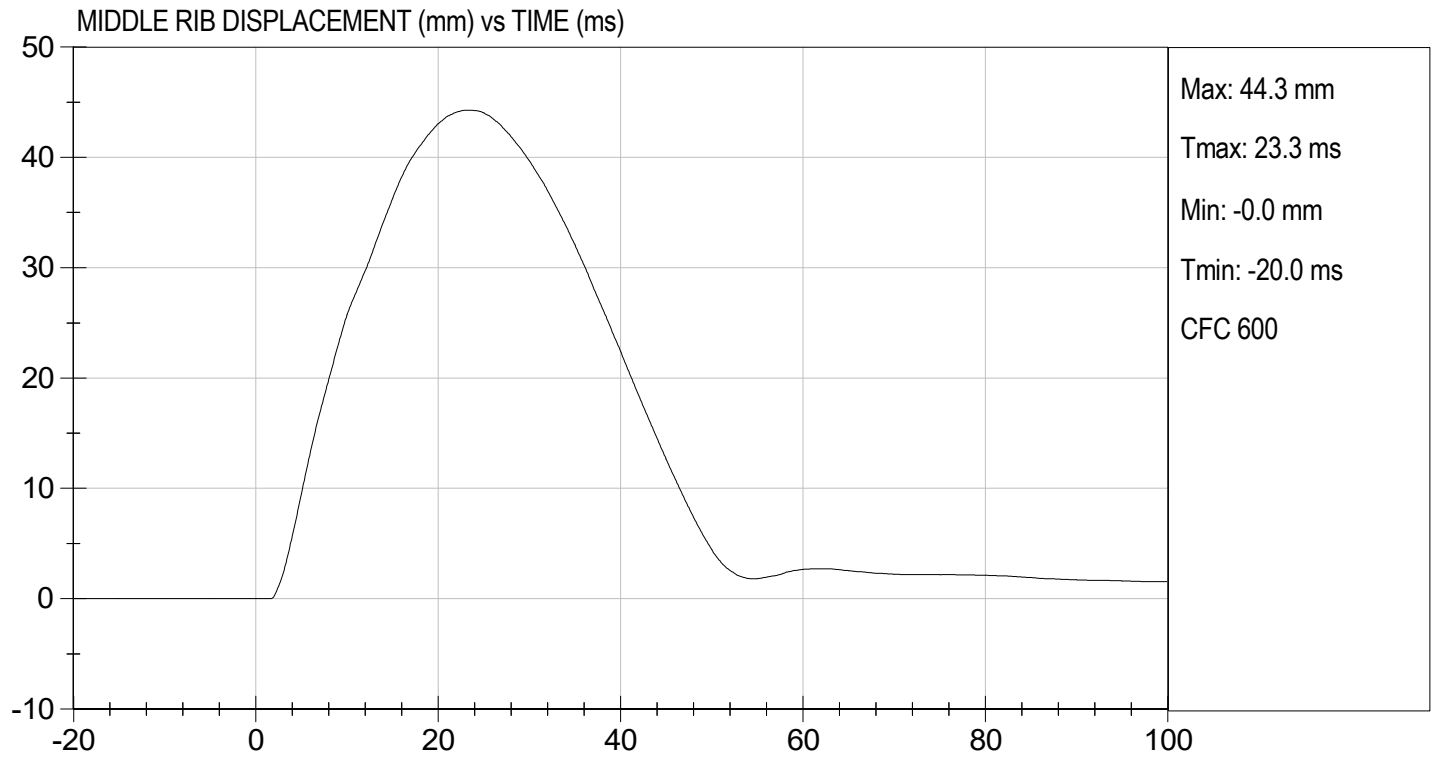
TEST DATE: 05/12/2023
TEST #: D231175





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

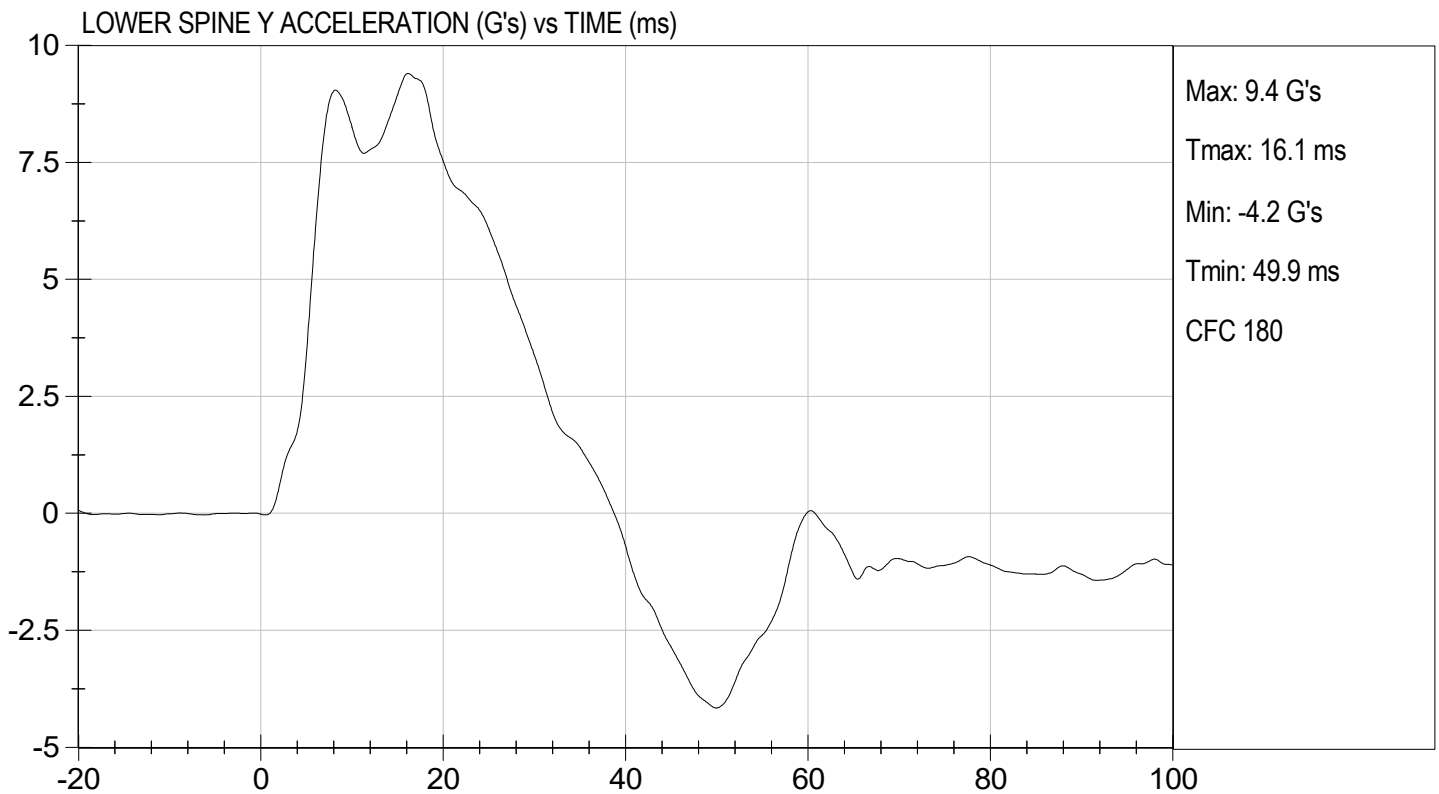
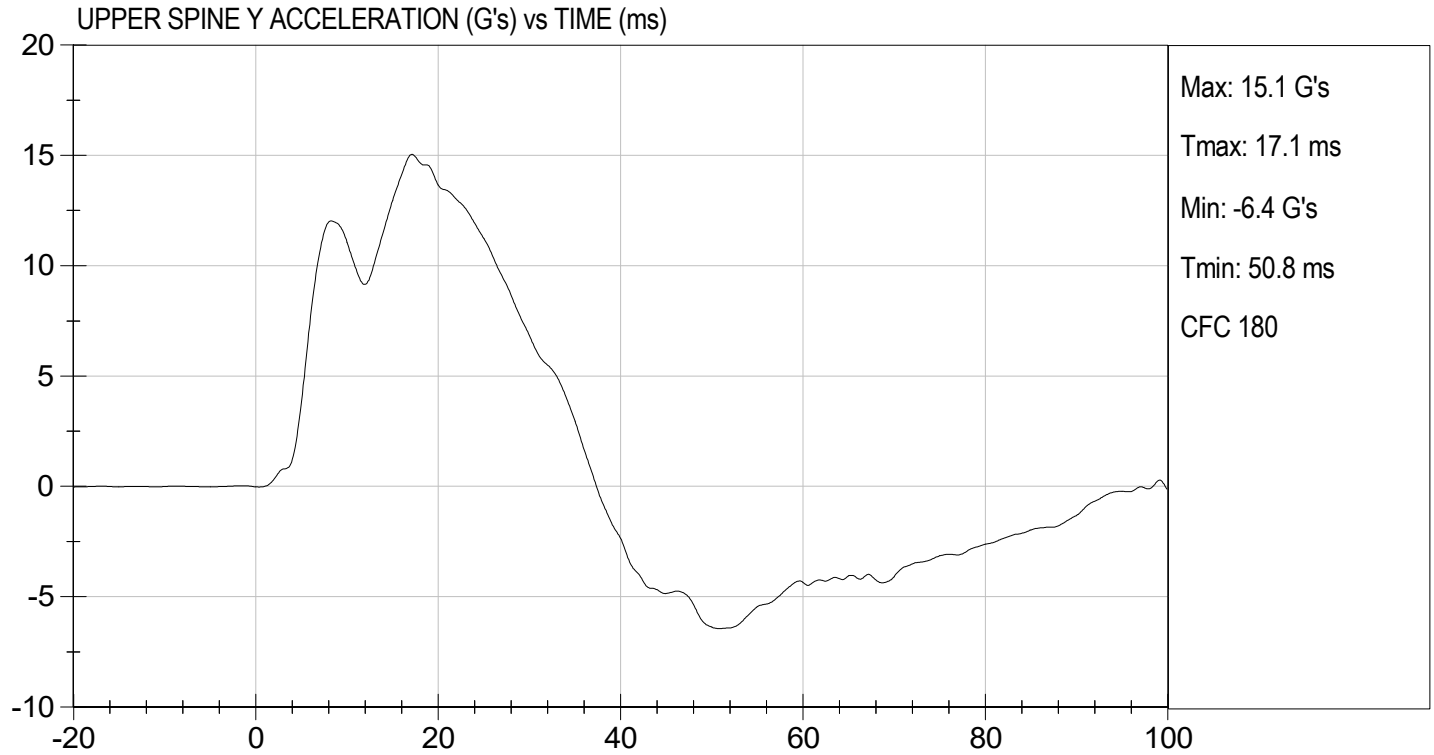
TEST DATE: 05/12/2023
TEST #: D231175





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

TEST DATE: 05/12/2023
TEST #: D231175



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

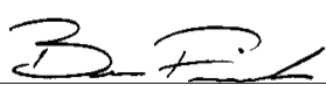
Test I.D: D231176

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	45	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	39	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

05/12/2023

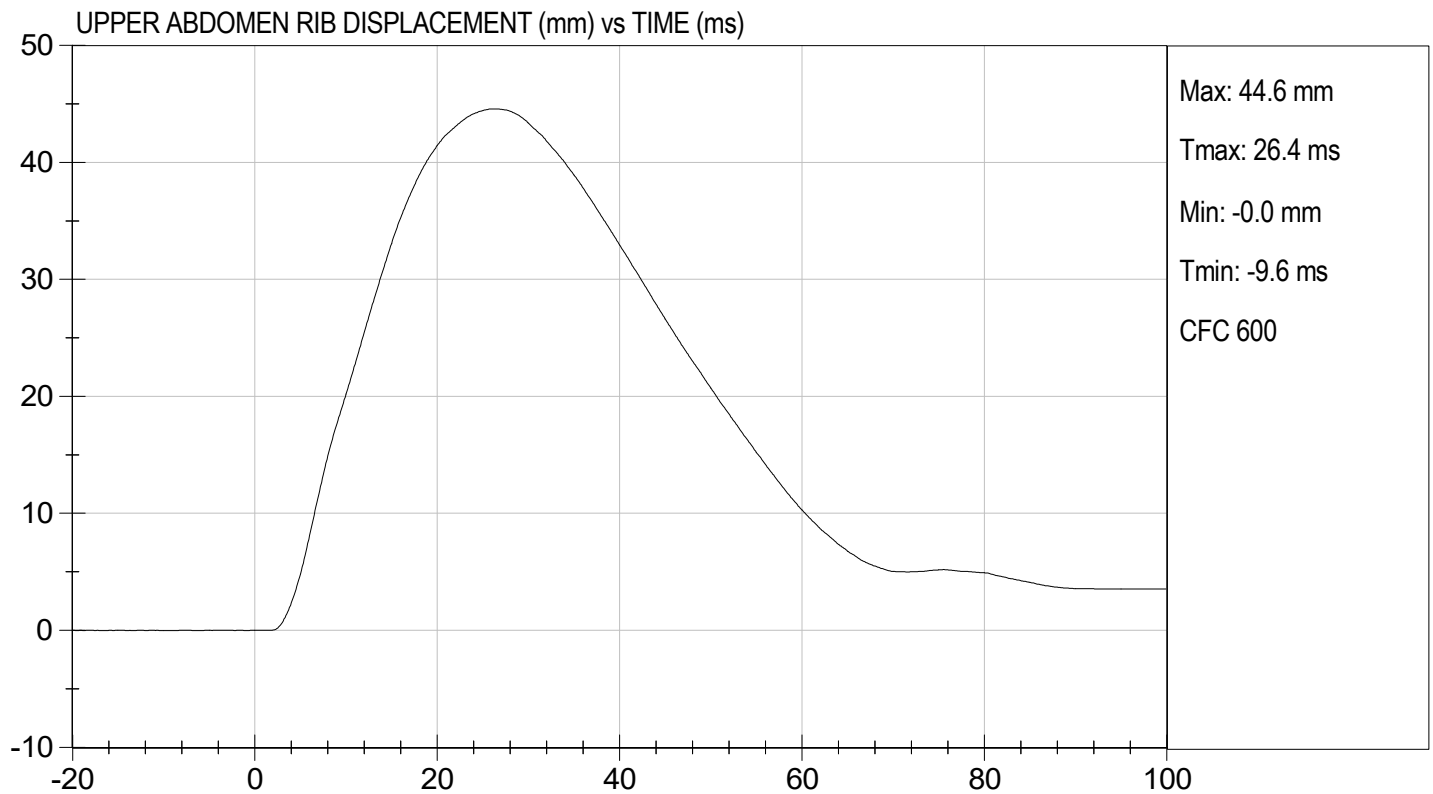
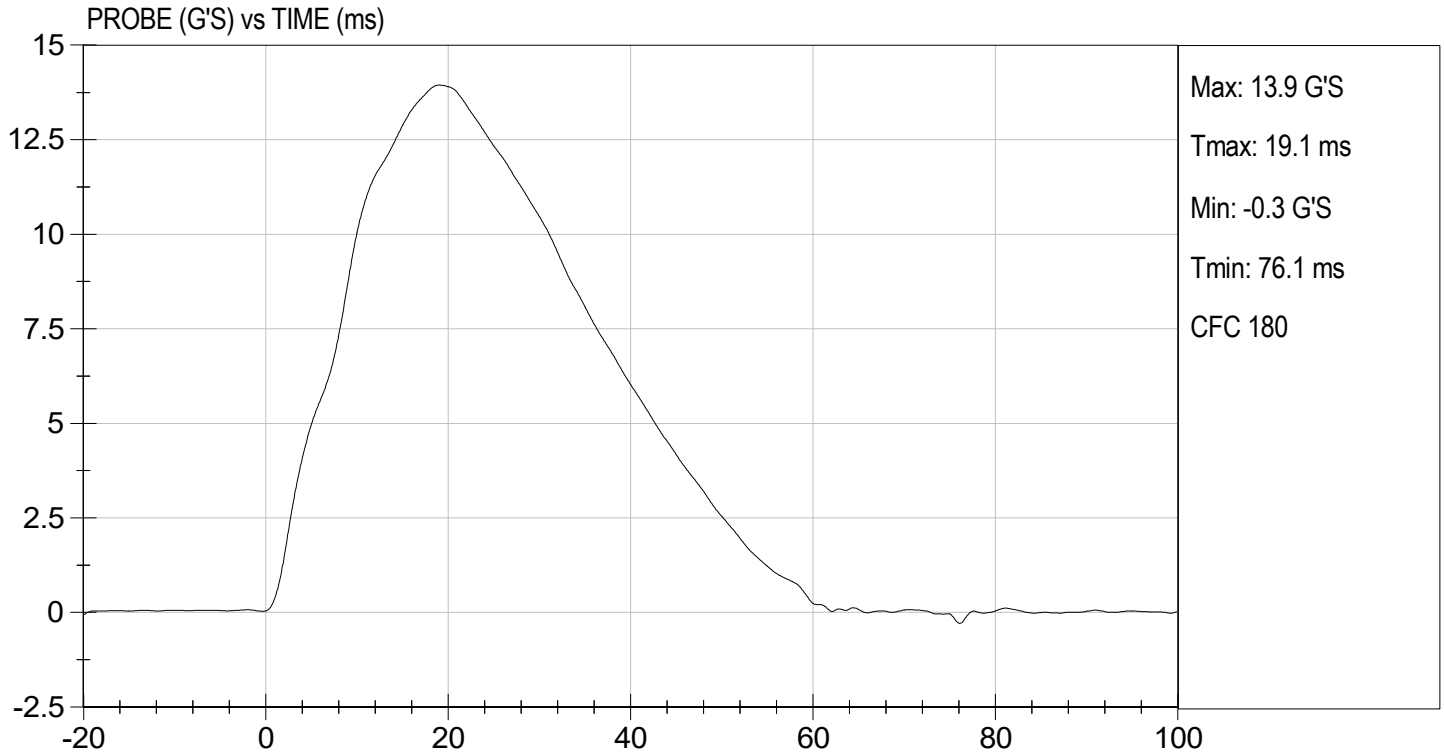
Test Date


Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

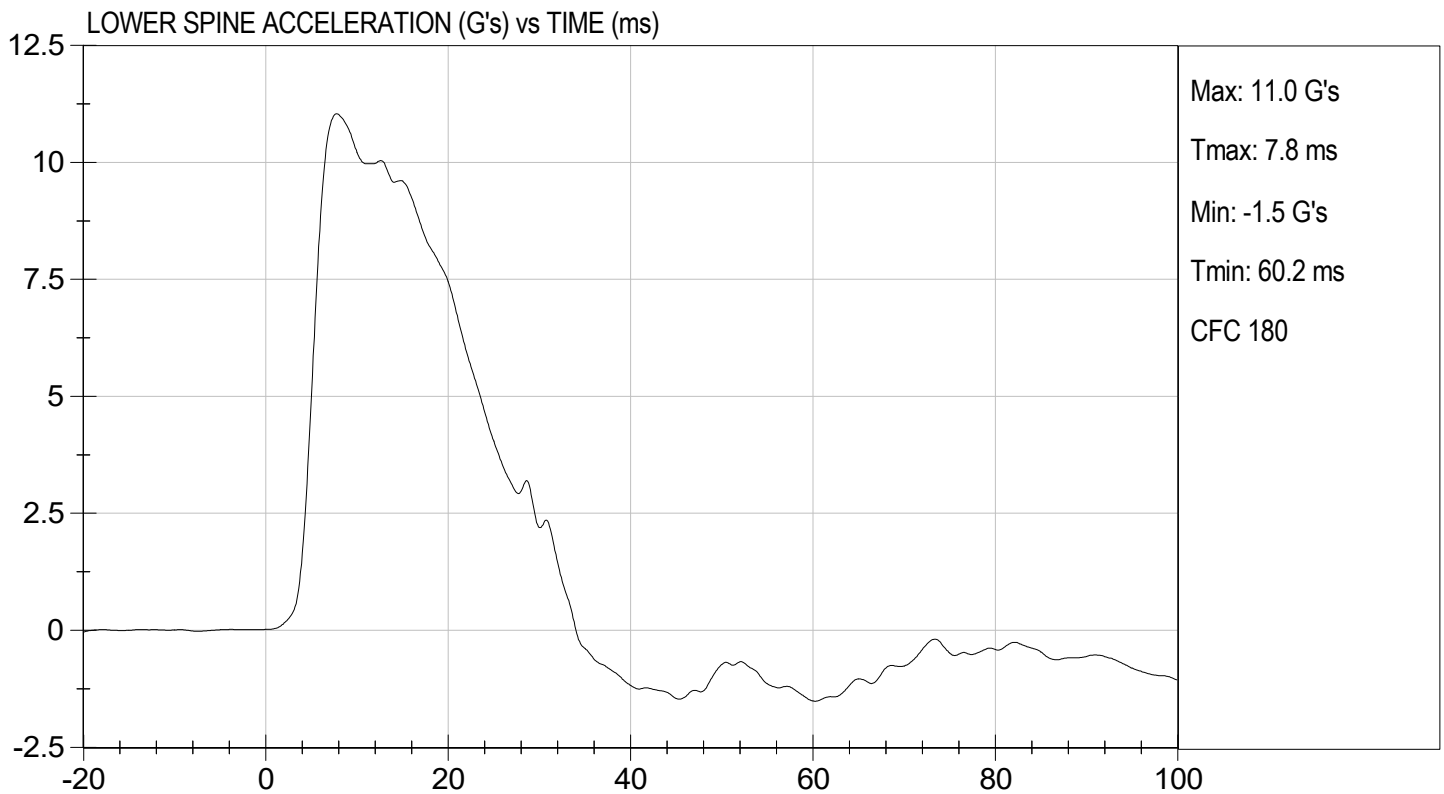
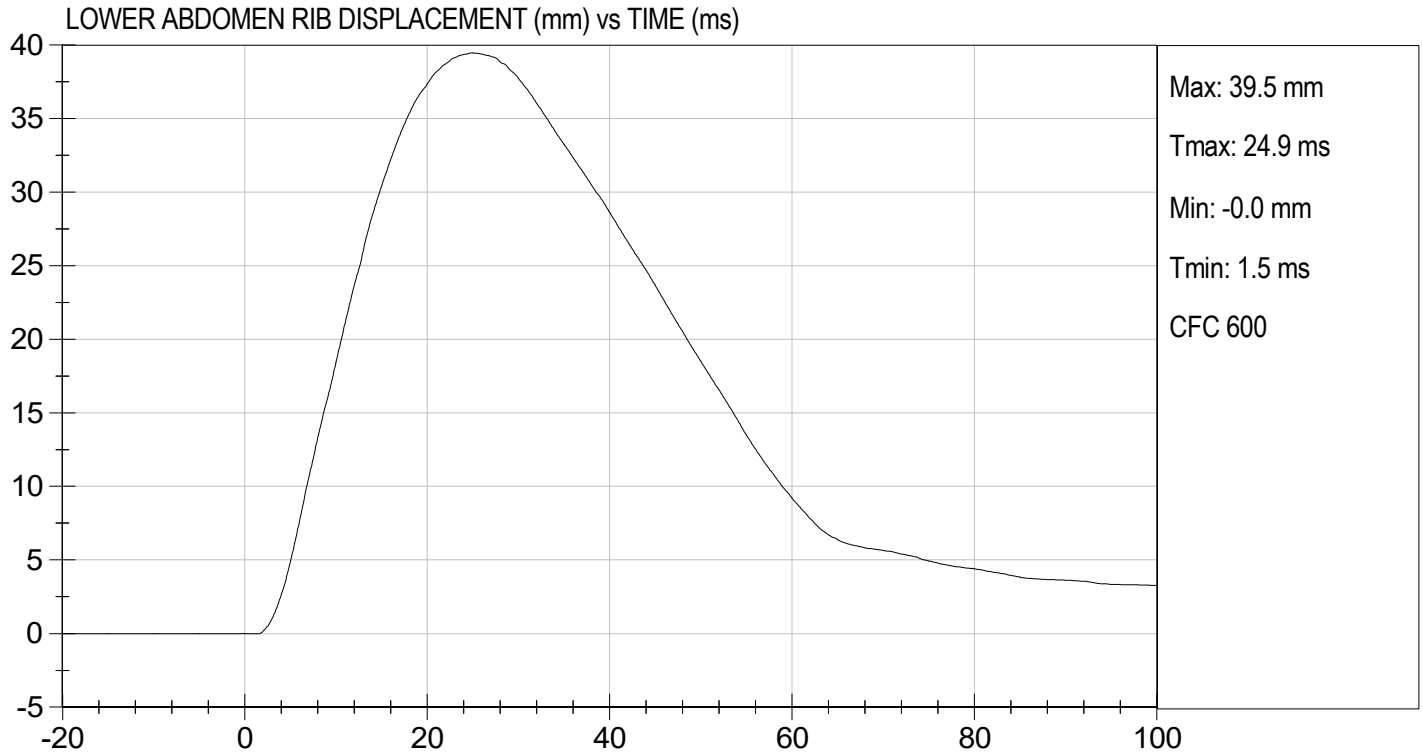
TEST DATE: 05/12/2023
TEST #: D231176





TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 05/12/2023
TEST #: D231176



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

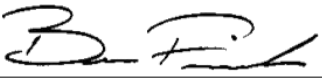
Test I.D: D231177

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	4,024	Pass
Overall Test Results				Pass


Laboratory Technician

05/12/2023

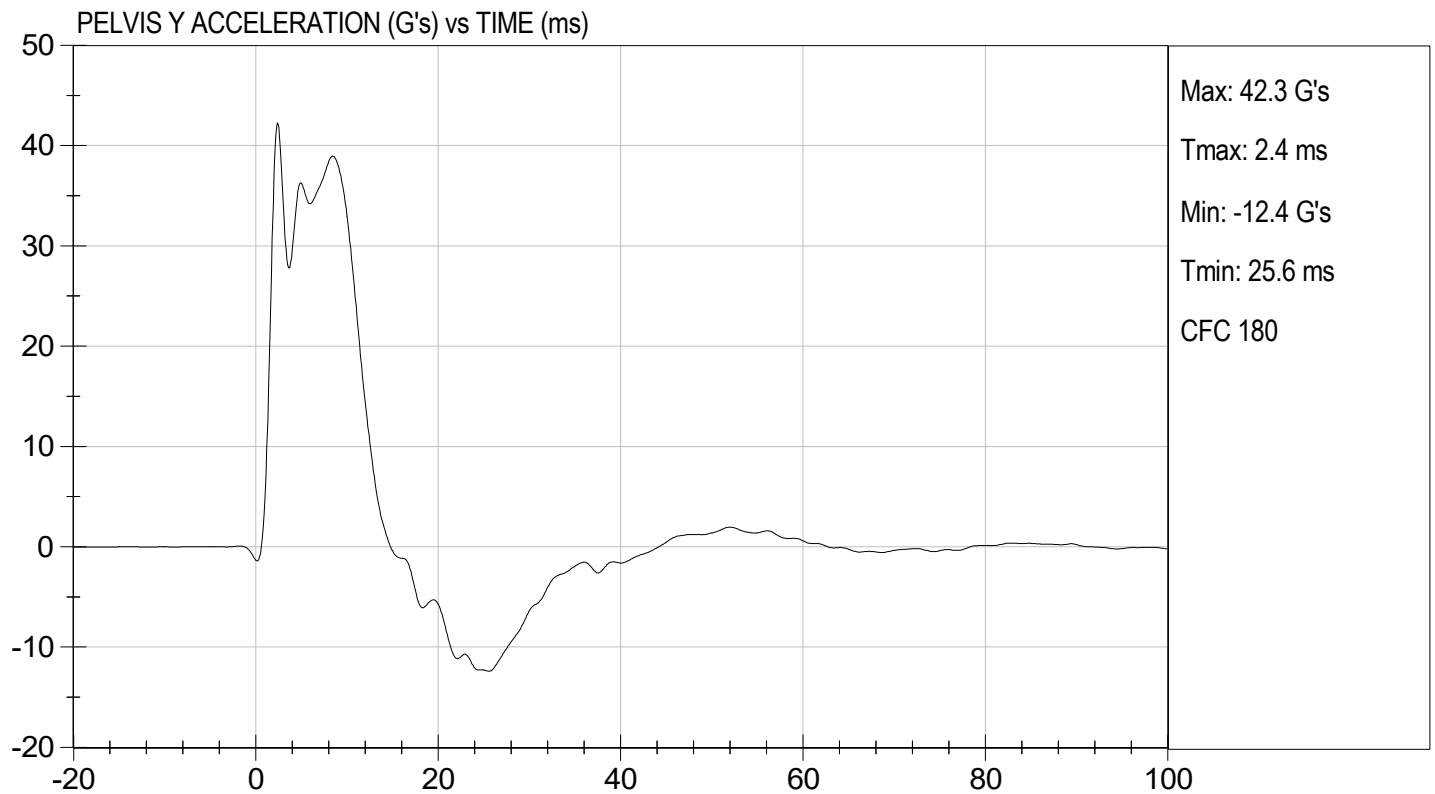
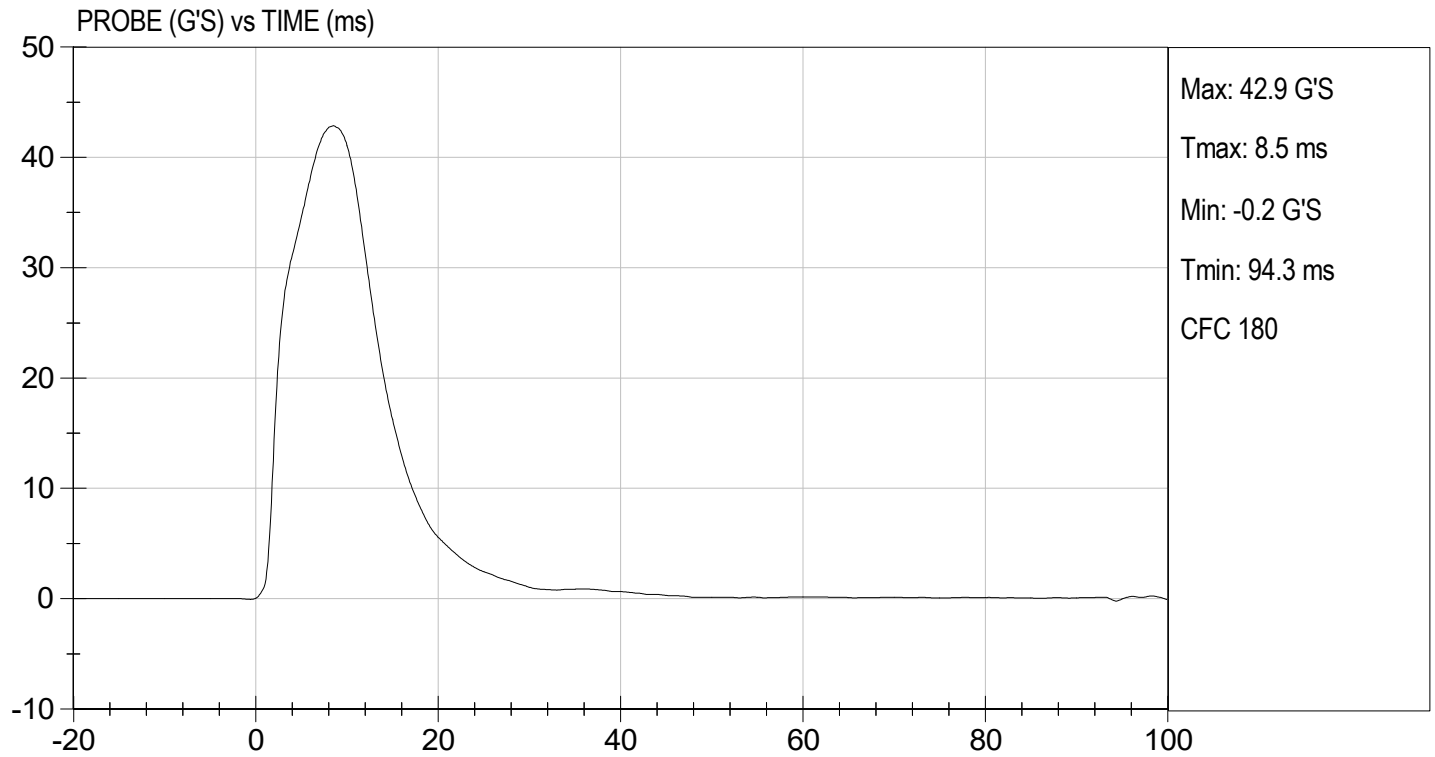
Test Date


Approved By



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

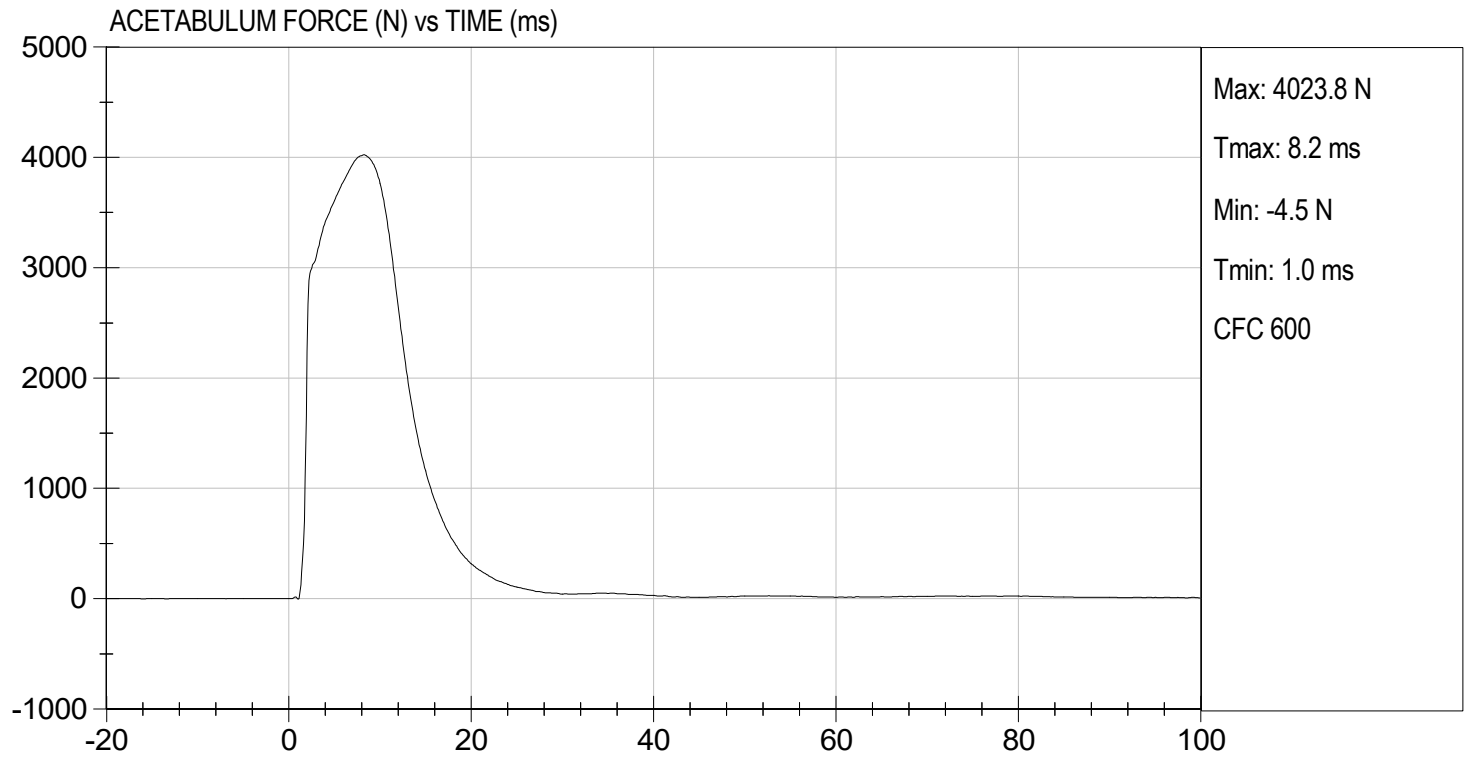
TEST DATE: 05/12/2023
TEST #: D231177





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

TEST DATE: 05/12/2023
TEST #: D231177



MGA RESEARCH CORPORATION

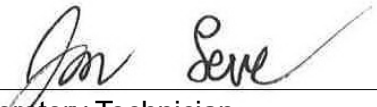
ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D231178

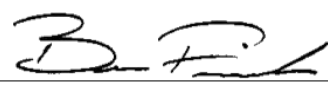
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	36 to 45	43	Pass
Pelvis Y Acceleration	G's	28 to 39	34	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,945	Pass
Overall Test Results				Pass



Laboratory Technician

05/12/2023

Test Date

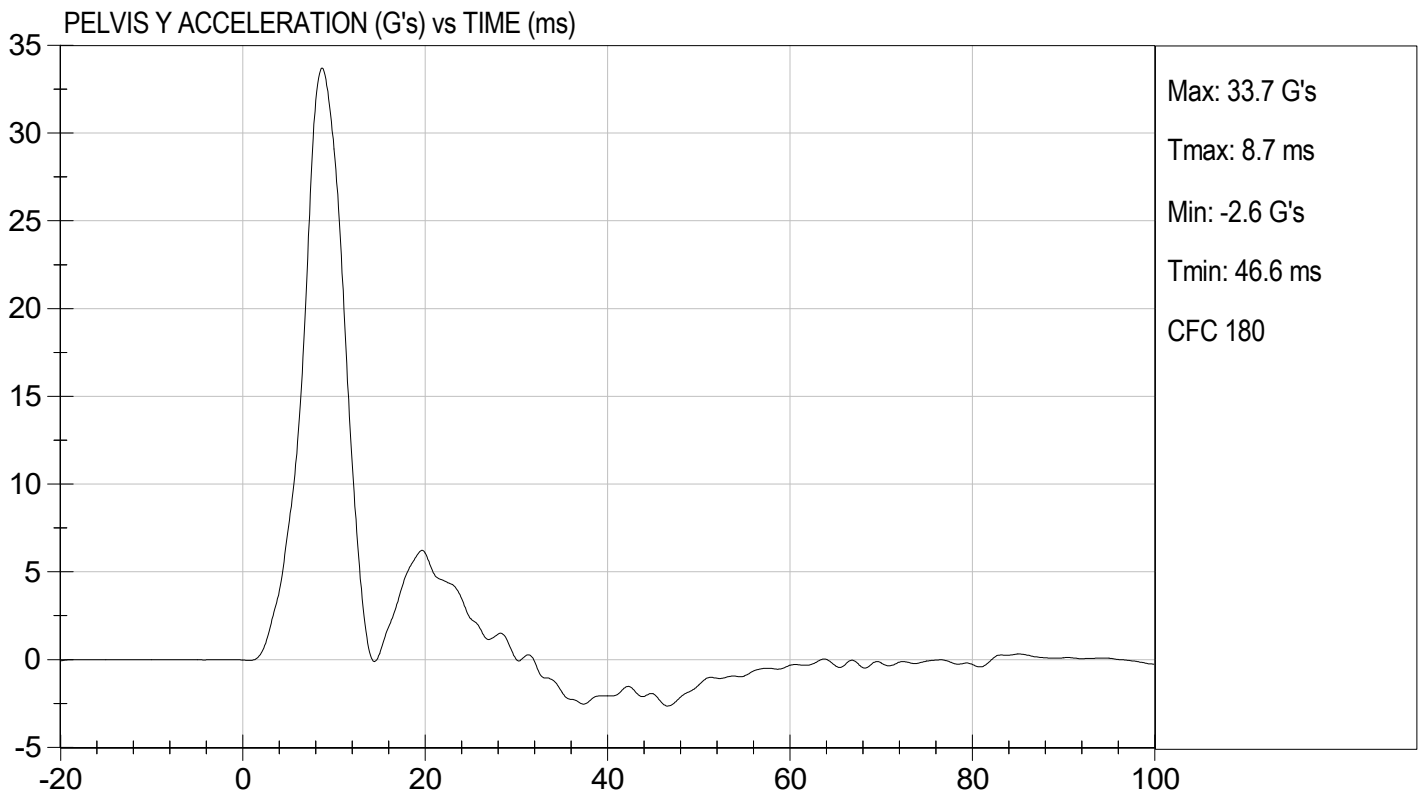
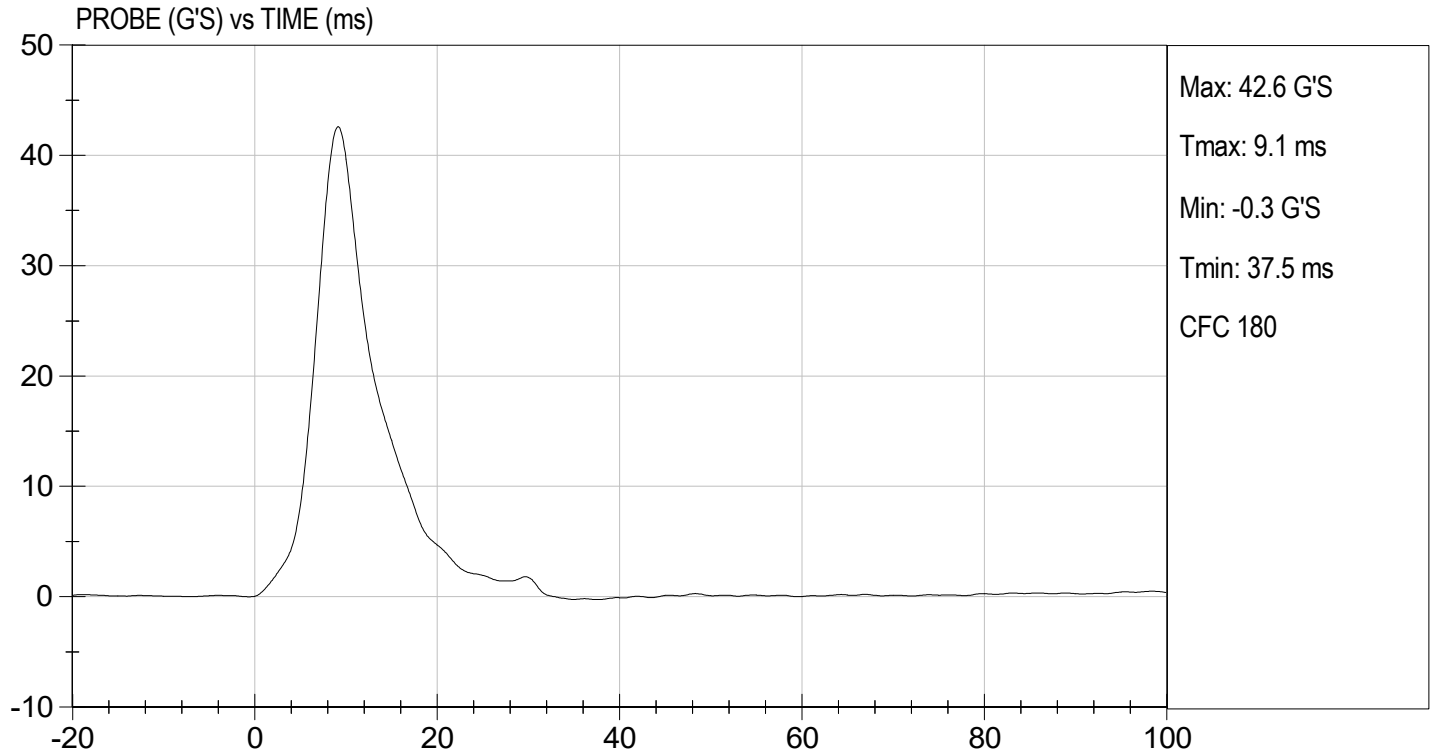


Approved By



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

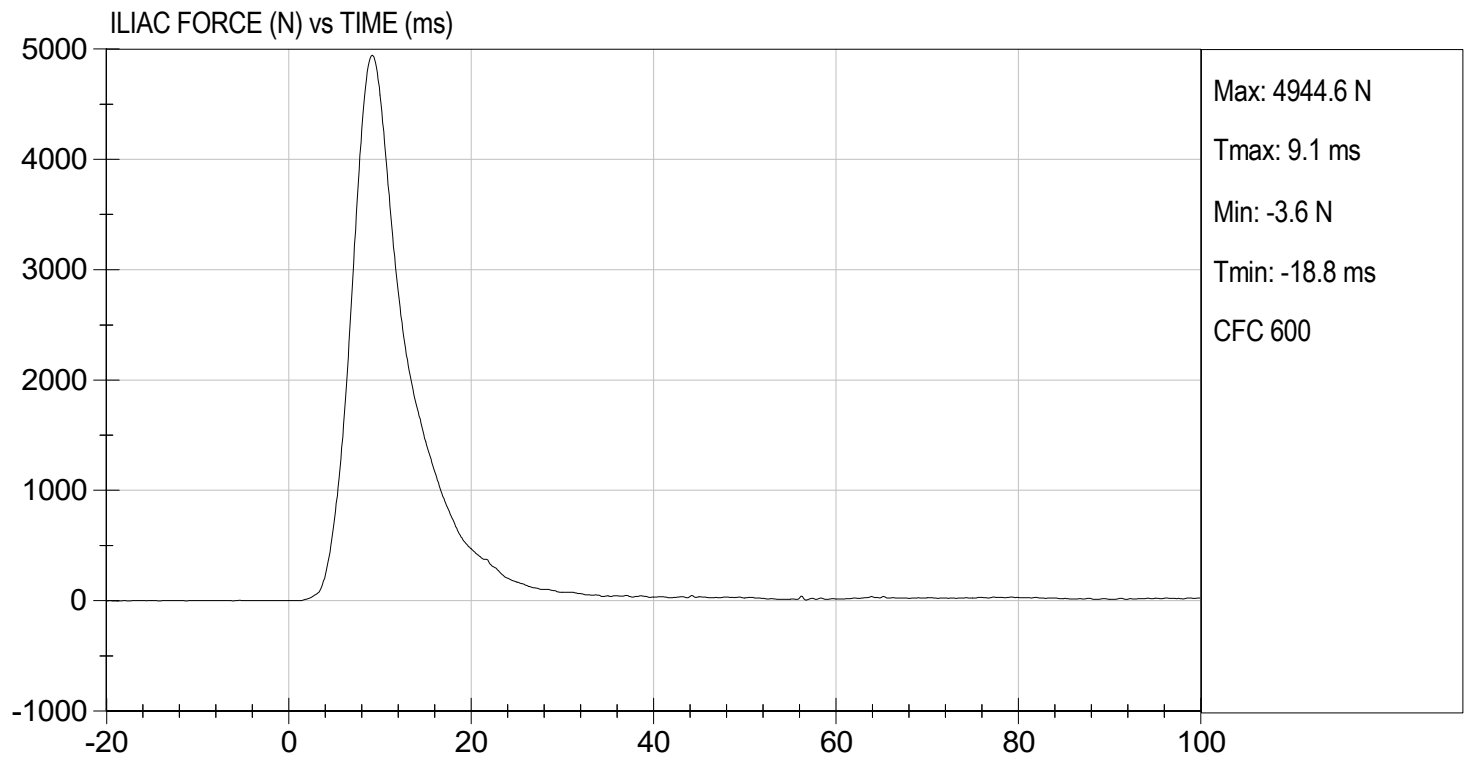
TEST DATE: 05/12/2023
TEST #: D231178





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

TEST DATE: 05/12/2023
TEST #: D231178





SID-IIs Pelvis Plug Certification Test

Plug S/N 14885

Test Number 17354

Report Number 17401

Test Date 1/31/2021 11:33:34 AM

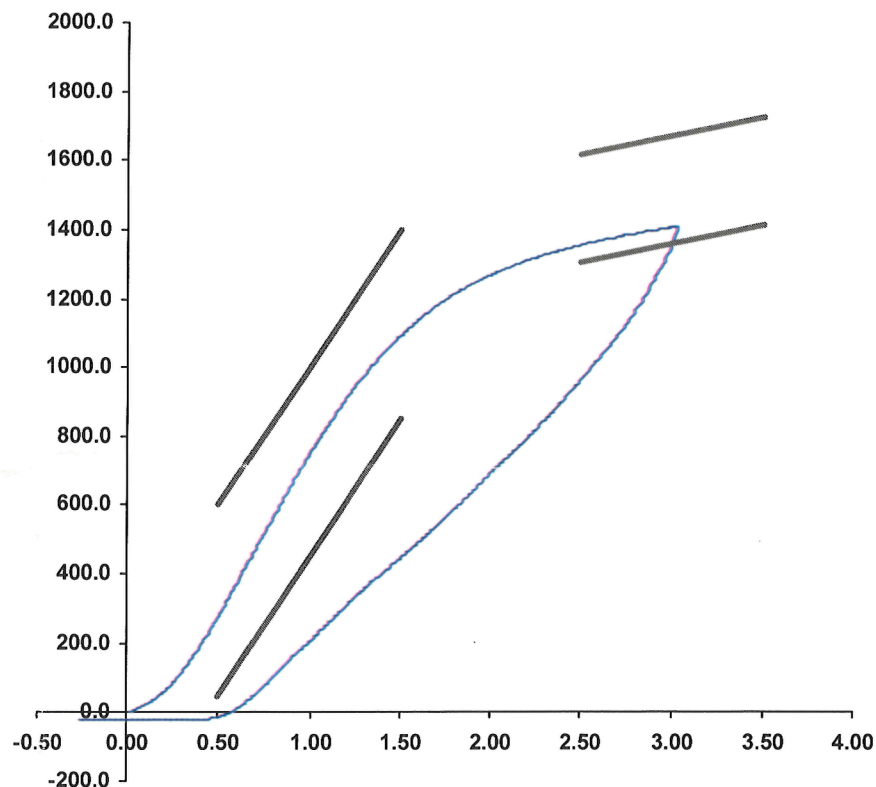
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	279	50	600
Force @ 1.5 mm (N)	1,096	850	1,400
Force @ 2.5 mm (N)	1,359	1,306	1,618
Force @ 3.0 mm (N)	1,410	1,361	1,673

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

31-Jan-21

SACO Research

By : DC Date : 1/31/2021

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

C-119



SID-IIs Pelvis Plug Certification Test

Plug S/N 14881

Test Number 17350

Report Number 17397

Test Date 1/31/2021 11:27:15 AM

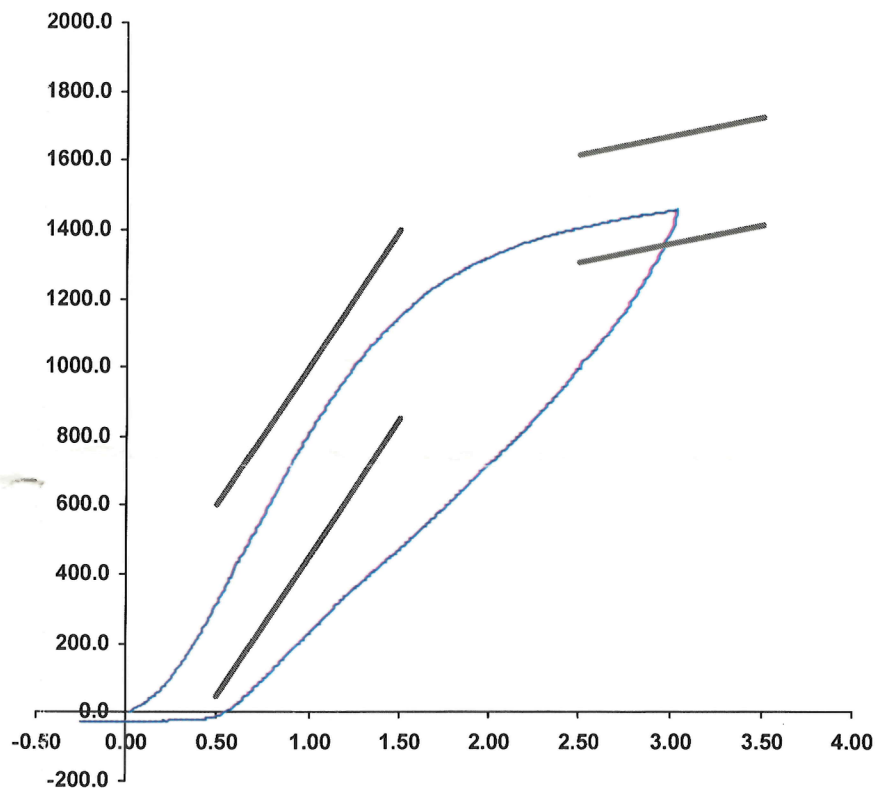
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	321	50	600
Force @ 1.5 mm (N)	1,152	850	1,400
Force @ 2.5 mm (N)	1,408	1,306	1,618
Force @ 3.0 mm (N)	1,459	1,361	1,673

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

31-Jan-21

SACO Research

By: DC

Date: 1/31/2021

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

Table 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F032		
			Serial Number	Manufacturer	Calibration Date
Head CG Accelerometers		X	P79568	Endevco	12/29/2022
		Y	P79569	Endevco	12/29/2022
		Z	P79570	Endevco	12/29/2022
		Xr	P86797	Endevco	12/29/2022
		Yr	P94957	Endevco	12/29/2022
		Zr	P97381	Endevco	12/29/2022
Thorax Rib Displacement Potentiometers	Upper	Y	G236	Honeywell	12/29/2022
	Middle	Y	G169	Honeywell	12/29/2022
	Lower	Y	G164	Honeywell	12/29/2022
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	12/29/2022
		Y	T14094	Endevco	03/21/2023
		Z	P82603	Endevco	12/29/2022
Public Symphysis Load Cell		Y	PG462	Denton	06/14/2022

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 306			
				Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers				X	P79445	Endevco	12/29/2022
				Y	P79721	Endevco	12/29/2022
				Z	P79724	Endevco	12/29/2022
				Xr	P84999	Endevco	12/29/2022
				Yr	P85000	Endevco	12/29/2022
				Zr	P85001	Endevco	12/29/2022
Head Angular Rate Sensors				X	ARS7391	DTS	09/06/2022
				Y	ARS7402	DTS	09/06/2022
				Z	ARS7416	DTS	09/06/2022
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	12/29/2022	
		Middle	Y	G2403	Servo	12/29/2022	
		Lower	Y	G1270	FTSS	12/29/2022	
	Abdominal Rib	Upper	Y	G032	FTSS	12/29/2022	
		Lower	Y	MJ5171	Medius	12/29/2022	
Lower Spine Accelerometers (T12)				X	P96332	Endevco	12/29/2022
				Y	P96335	Endevco	12/29/2022
				Z	P96341	Endevco	12/29/2022
Acetabulum Load Cell				Y	ACG4285	FTSS	08/18/2022
Iliac Wing Load Cell				Y	IWG3023	FTSS	08/18/2022
Pelvis Plug (struck side)					14885	SACO	01/31/2021
Pelvis Plug (non-struck side)					14881	SACO	01/31/2021

Table 3 – Vehicle Instrumentation

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	T33466	Endevco	04/05/2023
	Vehicle Center of Gravity	Y	T33415	Endevco	04/05/2023
	Vehicle Center of Gravity	Z	T32707	Endevco	02/10/2023
2	Right Sill at Front Seat	X	A383106	MSI	11/10/2022
	Right Sill at Front Seat	Y	A414606	MSI	11/10/2022
	Right Sill at Front Seat	Z	A340273	MSI	11/10/2022
3	Right Sill at Rear Seat	X	T33475	Endevco	04/05/2023
	Right Sill at Rear Seat	Y	T33417	Endevco	04/05/2023
	Right Sill at Rear Seat	Z	T33472	Endevco	04/05/2023
4	Left Sill at Front Door	Y	A414587	MSI	02/01/2023
5	Left Sill at Rear Door	Y	P88170	Endevco	12/15/2022
6	Left A-Post Lower	Y	A377283	MSI	02/24/2023
7	Left A-Post Middle	Y	T32734	Endevco	02/10/2023
8	Left B-Post Lower	Y	T25656	Endevco	02/09/2023
9	Left B-Post Middle	Y	A383139	MSI	01/17/2023
10	Front Seat Track	Y	A390894	MSI	01/09/2023
11	Rear Seat Track or Structure	Y	P85152	Endevco	02/22/2023
12	Right Rear Occ. Compartment	Y	T30585	Endevco	01/05/2023
13	Engine Block	X	T33418	Endevco	04/05/2023
	Engine Block	Y	T33445	Endevco	04/05/2023
14	Rear Floorpan Above Axle	X	A390925	MSI	02/08/2023
	Rear Floorpan Above Axle	Y	A391154	MSI	01/09/2023
	Rear Floorpan Above Axle	Z	A383076	MSI	02/08/2023

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	PCB1183D	PCB	01/10/2023
MDB Center of Gravity	Y	PCB1822D	PCB	01/10/2023
MDB Center of Gravity	Z	PCB1753D	PCB	01/10/2023
Left Frame at Rear Axle Centerline	X	PCB1438D	PCB	01/10/2023
Left Frame at Rear Axle Centerline	Y	PCB1653D	PCB	01/10/2023