

REPORT NUMBER: SideNCAPMDB-MGA-23-042

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

**TOYOTA MOTOR CORPORATION
2023 Toyota Prius LE HEV 5-Door Hatchback
NHTSA No.: O20235110**

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



Test Date: September 26, 2023

Final Report Date: October 1, 2024

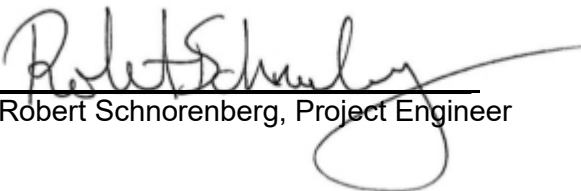
FINAL REPORT

**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: October 1, 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-23-042	2. Government Accession No.	3. Recipient's Catalog No.																																																					
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing and FMVSS No. 305 Indicant Testing of 2023 Toyota Prius LE HEV 5-Door Hatchback, NHTSA No.: O20235110		5. Report Date October 1, 2024																																																					
7. Author(s) Ben Fischer, Program Manager		6. Performing Organization Code MGA																																																					
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		8. Performing Organization Report No. SideNCAPMDB-MGA-23-042																																																					
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		10. Work Unit No.																																																					
		11. Contract or Grant No. 693JJ920D000017																																																					
		13. Type of Report and Period Covered: Final Test Report September 26, 2023 to October 1, 2024																																																					
15. Supplementary Notes		14. Sponsoring Agency Code NRM-100																																																					
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2023 Toyota Prius LE HEV 5-Door Hatchback in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP MDB Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at the MGA Research Corporation facility in Burlington, Wisconsin on September 26, 2023. The impact velocity of the Moving Deformable Barrier (MDB) was 61.85 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 22.0°C. The target vehicle post-test maximum crush was 186 mm at level 3. 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>166.756</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>22.717</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>569.016</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1289.475</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82*</td> <td>32.074</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>467.306</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>49.904</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3134.363</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>21.114</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>21.901</td> </tr> </tbody> </table> *Proposed IARV The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door(s) did not open during the side impact event.				Measurement Description	Units	Driver ATD (ES-2re)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	166.756	Maximum Thorax Rib Deflection	mm	44	22.717	Total Abdominal Force	N	2500	569.016	Pubic Symphysis Force	N	6000	1289.475	Resultant Lower Spine Acceleration	g	82*	32.074	Measurement Description	Units	Passenger ATD (SID-IIs)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	467.306	Resultant Lower Spine Acceleration	g	82	49.904	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3134.363	Maximum Thoracic Rib Deflection	mm	38*	21.114	Maximum Abdomen Rib Deflection	mm	45*	21.901
Measurement Description	Units	Driver ATD (ES-2re)																																																					
		Threshold	Result																																																				
Head Injury Criteria (HIC ₃₆)		1000	166.756																																																				
Maximum Thorax Rib Deflection	mm	44	22.717																																																				
Total Abdominal Force	N	2500	569.016																																																				
Pubic Symphysis Force	N	6000	1289.475																																																				
Resultant Lower Spine Acceleration	g	82*	32.074																																																				
Measurement Description	Units	Passenger ATD (SID-IIs)																																																					
		Threshold	Result																																																				
Head Injury Criteria (HIC ₃₆)		1000	467.306																																																				
Resultant Lower Spine Acceleration	g	82	49.904																																																				
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3134.363																																																				
Maximum Thoracic Rib Deflection	mm	38*	21.114																																																				
Maximum Abdomen Rib Deflection	mm	45*	21.901																																																				
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 260	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
305-1	General Test and Vehicle Parameter Data for Indicant FMVSS No. 305 Testing	28
305-2	Pre-Impact Data for Indicant FMVSS No. 305 Testing	29
305-3	Pre-Impact Electrical Isolation Measurements and Calculations for Indicant FMVSS No. 305 Testing	30
305-4	Post-Impact Data for Indicant FMVSS No. 305 Testing	32
305-5	Static Rollover Test Data for Indicant FMVSS No. 305 Testing	35
 <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 Toyota Prius LE HEV 5-Door Hatchback. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated March 2020.

SUMMARY

A 2023 Toyota Prius LE HEV 5-Door Hatchback was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.85 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 September 26, 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	166.756
Maximum Thorax Rib Deflection	mm	44	22.717
Total Abdominal Force	N	2500	569.016
Pubic Symphysis Force	N	6000	1289.475
Resultant Lower Spine Acceleration	g	82*	32.074

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	467.306
Resultant Lower Spine Acceleration	g	82	49.904
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3134.363
Maximum Thoracic Rib Deflection	mm	38*	21.114
Maximum Abdomen Rib Deflection	mm	45*	21.901

*Proposed IARV

Supplemental restraint information is given below:

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

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

GENERAL COMMENTS

None.

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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20235110	Traction Control System (TCS)	Yes
Model Year	2023	Auto-Leveling System	No
Make	Toyota	Automatic Door Locks (ADL)	Yes
Model	Prius LE HEV	Power Window Auto-Reverse	Yes
Body Style	5-Door Hatchback	Other Optional Feature	No
VIN	JTDACAAU0P3002570	Driver Front Airbag	Yes
Body Color	Guardian Gray	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	26 km / 16 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.0 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	No
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	Yes
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	Yes
		Other Safety Restraint	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	TOYOTA MOTOR CORPORATION	GVWR (kg)	1880
Date of Manufacture	02/23	GAWR Front (kg)	1064
Vehicle Type	Passenger Car	GAWR Rear (kg)	1030

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				390	(A)
DSC x 68 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				44	(A-B)

* Rated Cargo and Luggage Weight (RCLW) reduced by 6 kg to account for Load Carrying Capacity Reduction Label.

VEHICLE SEAT TYPE

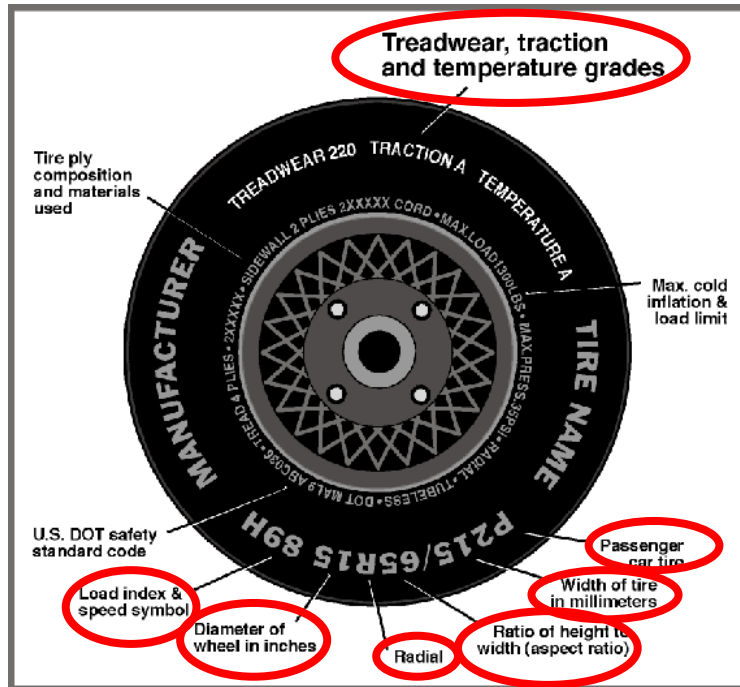
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	X					X	
Rear or Second Row				X	X		
Third Row Seat							

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

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	250	240
Recommended Tire Size	195/60R17	195/60R17
Tire Size on Vehicle	195/60R17	195/60R17
Tire Manufacturer	Toyo Tires	Toyo Tires
Tire Model	Extensa A/S	Extensa A/S
Treadwear	300	300
Traction	B	B
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	2 Steel, 1 Polyester, 1 Nylon	2 Steel, 1 Polyester, 1 Nylon
Load Index/Speed Symbol	90H	90H
Tire Material	Rubber	Rubber
DOT Safety Code Left	1N3UK 2282 0223	1N3UK 2282 0223
DOT Safety Code Right	1N3UK 2282 0223	1N3UK 2282 0223

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

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

TEST VEHICLE TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	230	240	230	230
Tire Placard	kPa	250	250	240	240
Owner's Manual	kPa	250	250	240	240
As Tested	kPa	250	250	240	240

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 $\pm$ 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	418.5	294.0		464.0	359.5		448.5	378.0	
Right	kg	423.0	271.0		426.5	321.0		433.0	320.0	
Ratio	%	59.8%	40.2%		56.7%	43.3%		55.8%	44.2%	
Totals	kg	841.5	565.0	1406.5	890.5	680.5	1571.0	881.5	698.0	1579.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1406.5	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	44	(C)
Calculated Test Vehicle Target Weight (TVTW)	kg	1579.5	(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	702	694	Yes
Right Front	mm	708	698	Yes
Right Rear	mm	689	696	Yes
Left Rear	mm	673	675	Yes
Vehicle CG (Aft of Front Axle)	mm	1214	1190	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	36	38	

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

*** The "As Tested" vehicle attitude measurements must be equal to or within $\pm$ 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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Units	Weight
Weight of Ballast Added	kg	0
Components Removed: Rear taillights, Cargo area trim, Rear bumper cover	kg	12

TEST SURFACE MARKINGS

	Units	Distance from 63° Impact Angle Line
Fore 25 mm Target	mm	892
Aft 25 mm Target	mm	899
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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

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	21.5	16.1	18.8
Front Passenger Seat	22.2	16.6	19.4
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As-Tested SCRL Angle (Mid) (°)	As-Tested SCRIP Height (mm)	SCRIP Height Position	SCRIP Height (mm)		
				Rear-Most	Mid	Forward-Most
Driver Seat	18.8	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Passenger Seat	19.4	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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

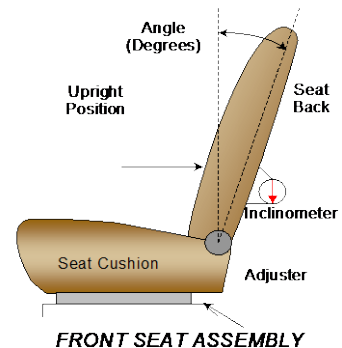
NHTSA No.: O20235110
 Test Date: 9/26/2023

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	260	27	130	13
Front Passenger Seat	260	27	130	13
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	53.6	25	2.9	4
Front Passenger Seat	53.7	28	3.1	4
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	Fixed		Fixed	

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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

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

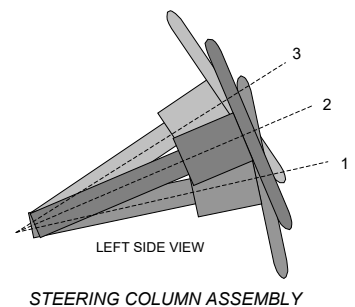
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	3	2 (Lowest as 0) / Fixed Fore-Aft
Rear Seat	2	0 (Lowest as 0) / Fixed Fore-Aft

STEERING COLUMN ADJUSTMENT

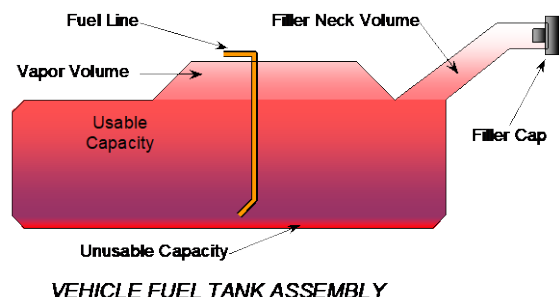
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.

	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	72.1	
Geometric Center, Position 2	70.1	
Uppermost, Position 3	68.0	
Telescoping Steering Wheel Travel		47
Test Position	70.1	24



FUEL PUMP

The vehicle is equipped with an electronic fuel pump. The fuel pump will run when the engine is running. The pump will also briefly run when the ignition key is turned to the "on" position. 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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

FUEL TANK CAPACITY DATA

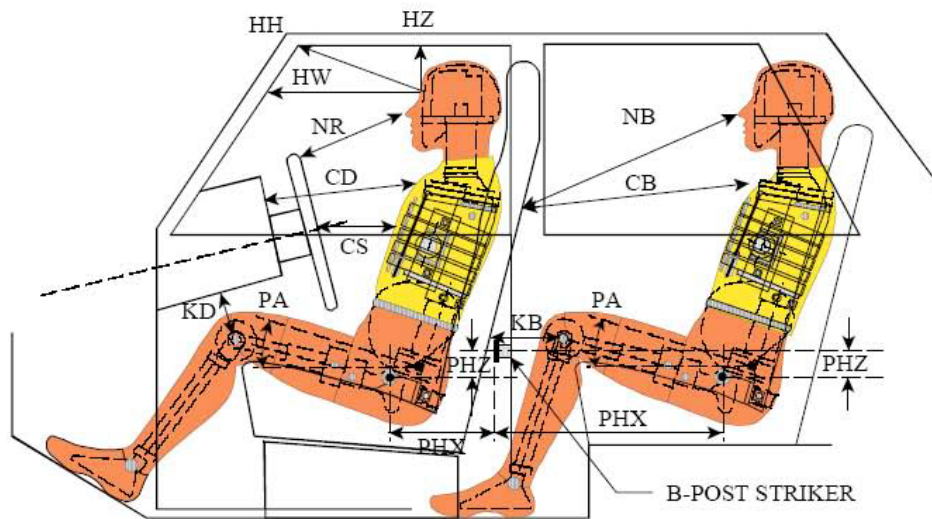
	Liters
Usable Capacity of Standard Tank (see S1 - Vehicle Setup Information)	42.4
Usable Capacity of Optional Tank (see S1 - Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	43.2
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	39.4
Actual Amount of Solvent Used	39.4
1/3 of Usable Capacity	14.1

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 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023



LEFT SIDE VIEW

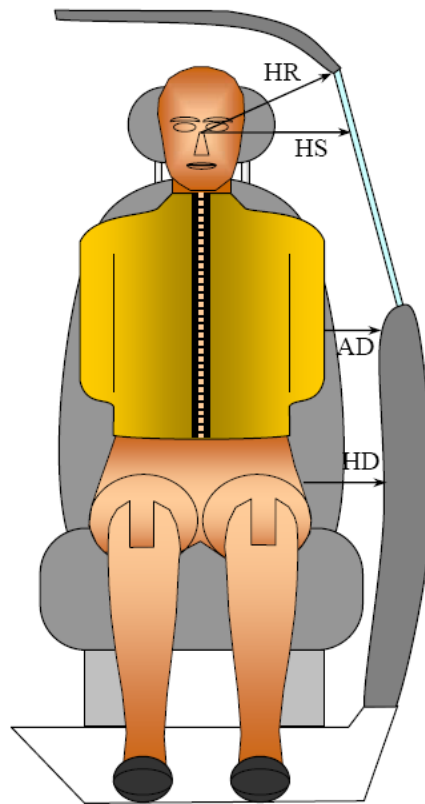
NOTE: 2-DOOR VEHICLE SHOWN.
REAR DUMMY PHX & PHZ
MEASUREMENTS FOR A 4-DOOR
VEHICLE WOULD USE THE C-POST
STRIKER AS A REFERENCE POINT

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	313	12.5		
HW		Head to Windshield	586	0		
HZ	HZ	Head to Roof Liner	103	90	228	90
NR	NB	Nose to Rim/Seat Back	408	16.2	617	7.0
CD	CB	Chest to Dashboard/Seat Back	775	2.2	590	8.5
CS		Chest to Steering Wheel	353	6.0		
KDL	KBL	Left Knee to Dash/Seat Back	154	52.4	294	25.0
KDR	KBR	Right Knee to Dash/Seat Back	160	50.0	297	25.0
PAX	PAX	Pelvic Tilt Angle X		18.7		30.3
PAY	PAY	Pelvic Tilt Angle Y		-1.5		-0.4
PHX	PHX	Hip Point to Striker (X-Axis)	199		356	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	229		366	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

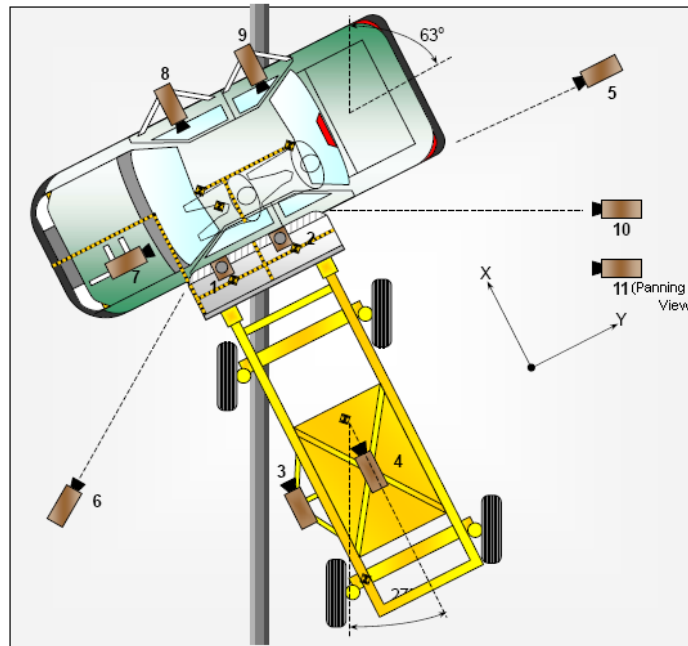


Code	Measurement Description	Driver	Passenger
		Length (mm)	
HR	Head to Side Header	207	244
HS	Head to Side Window	325	377
AD	Arm to Door	77	159
HD	Hip Point to Door	170	187

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates* (mm)			Lens (mm)	Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	880	1325	-4775	8.5	1000
2	Overhead Close-Up	290	830	-4815	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	-25	6920	-1460	24	1000
6	Left Front	2100	-5140	-1475	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

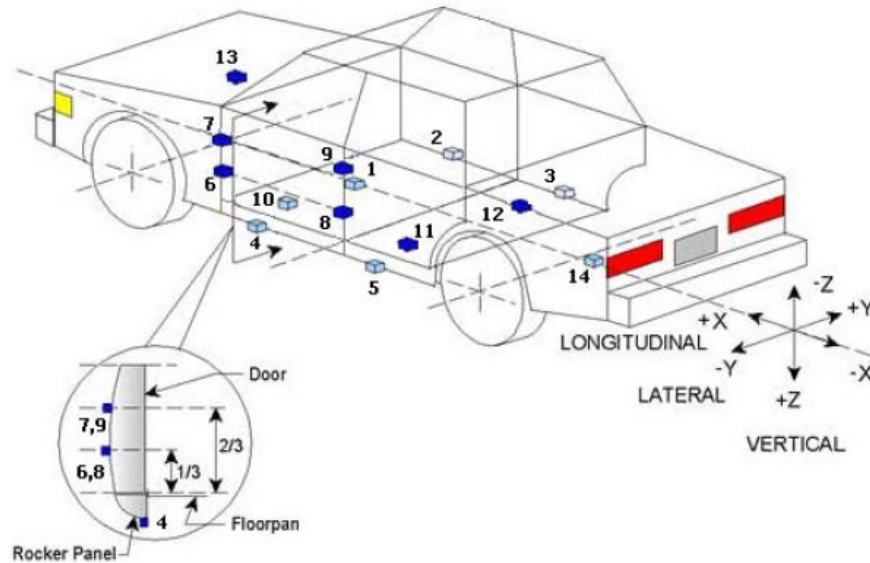
INSTRUMENTATION

	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 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023



TEST VEHICLE ACCELEROMETER LOCATIONS

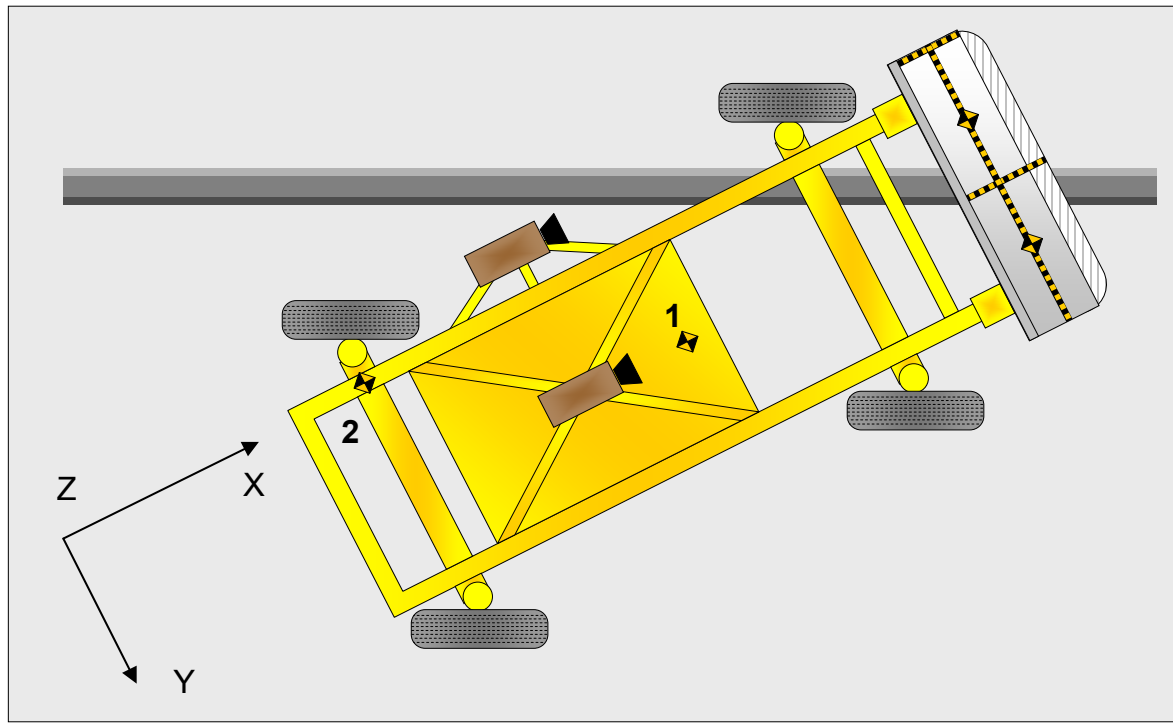
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2320	0	-178
2	Right Sill at Front Seat	2464	728	-191
3	Right Sill at Rear Seat	2315	728	-192
4	Left Sill at Front Door	2464	-728	-186
5	Left Sill at Rear Door	1315	-728	-186
6	Left Lower A-Post	3052	-786	-412
7	Left Middle A-Post	3052	-786	-644
8	Left Lower B-Post	1838	-688	-523
9	Left Middle B-Post	1838	-688	-715
10	Front Seat Track	2108	-348	-231
11	Rear Seat Structure	1668	-323	-217
12	Rt. Rear Occ. Compartment	1668	323	-217
13	Engine Block	3671	0	-818
14	Rear Above Axle	793	-25	-549

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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023



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	1405
---	----	------

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023

TEST DUMMY INFORMATION AND CONTACT POINTS

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

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

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheelbase	mm		2747
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		434
Actual Impact Point (Aft of Front Axle)	mm		428
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	6
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	2

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023

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

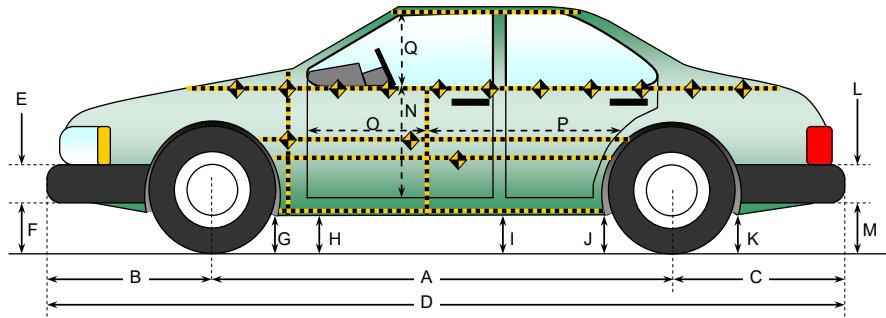
SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.85
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.03
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	26.5

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023



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

LEFT SIDE VIEW

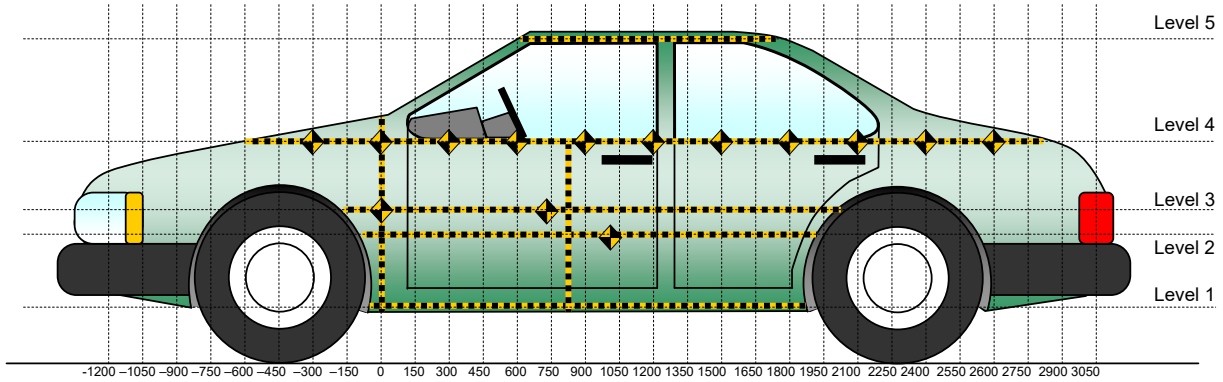
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2747	2739	-8
B	Front Axle to FSOV	1026	985	-41
C	Rear Axle to RSOV	756	799	43
D	Total Length at Centerline	4529	4523	-6
E	Front Bumper Thickness	96	96	0
F	Front Bumper Bottom to Ground	201	207	6
G	Sill Height at Front Wheel Well	163	170	7
H	Sill Height at Front Door Leading Edge	165	167	2
I	Sill Height at B Pillar	169	176	7
J1	Sill Height at Rear Wheel Well	144	142	-2
J2	Pinch Weld Height at Rear Wheel Well	161	159	-2
K	Sill Height Aft of Rear Wheel Well	355	365	10
L	Rear Bumper Thickness	111	111	0
M	Rear Bumper Bottom to Ground	363	379	16
N	Sill Height to Window Bottom Sill	716	615	-101
O	Front Door Leading Edge to Impact CL	819	767	-52
P	Rear Door Trailing Edge to Impact CL	1131	1146	15
Q	Front Window Opening	380	383	3
R	Right Side Length	3911	3903	-8
S	Left Side Length	3911	3896	-15
T	Vehicle Width at B Post	1716	1721	5
U	Front Wheel Track Width	1560		
V	Rear Wheel Track Width	1567		

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023



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	259	40	1650
2	Occupant H-Point	517	179	750
3	Mid Door	574	186	750
4	Window Sill	885	143	1800
5	Window Top	1310	11	1650

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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

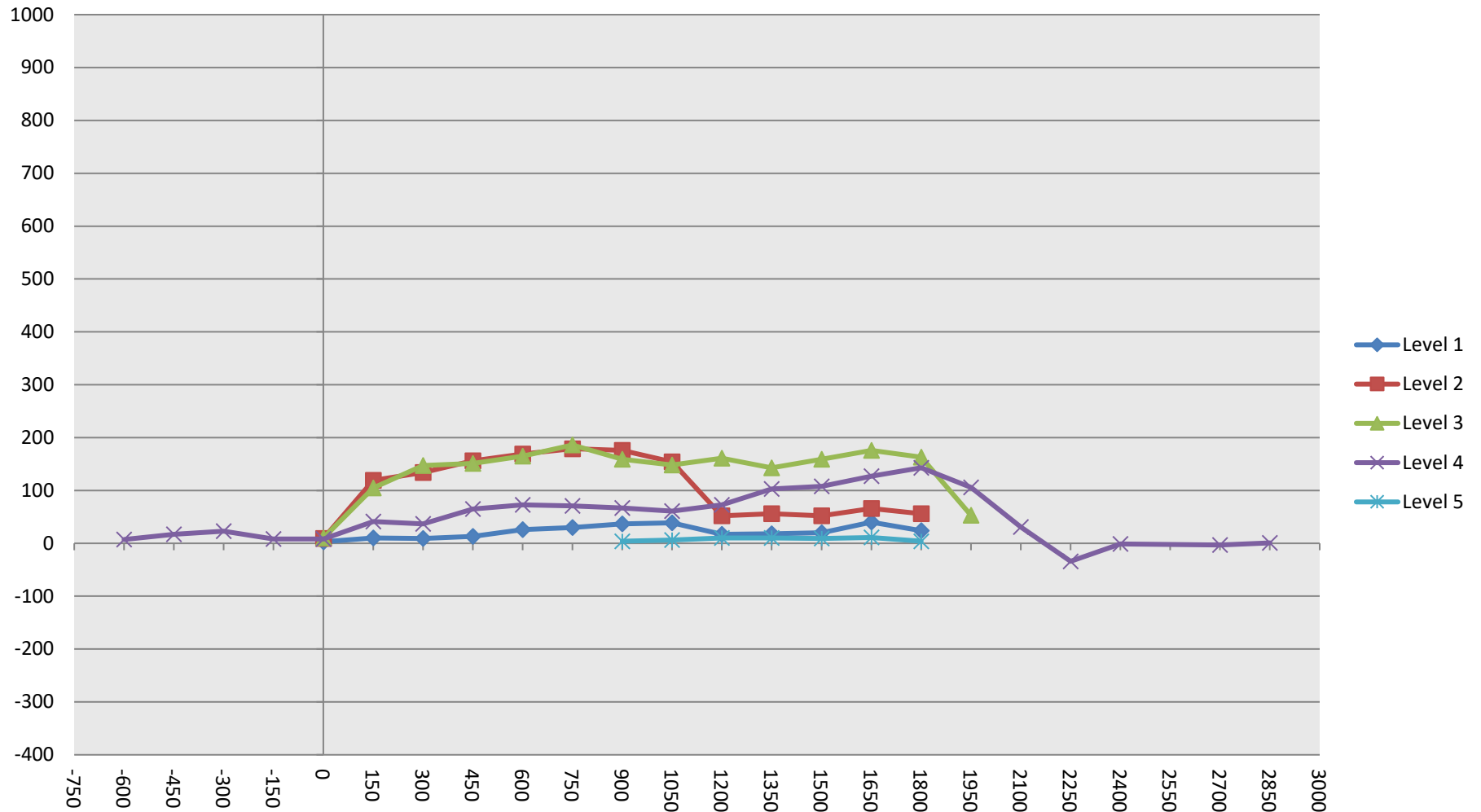
	Pre-Test					Post-Test					Exterior Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900															
-750															
-600				336					343					7	
-450				295					312					17	
-300				278					301					23	
-150				270					278					8	
0	235	214	212	264		238	223	222	272		3	9	10	8	
150	240	215	212	265		250	334	317	306		10	119	105	41	
300	242	215	212	270		251	349	359	307		9	134	147	37	
450	242	215	213	259		255	371	364	324		13	156	151	65	
600	242	217	213	250		268	386	378	323		26	169	165	73	
750	242	218	215	246		272	397	401	317		30	179	186	71	
900	243	220	217	242	470	280	396	376	309	474	37	176	159	67	4
1050	255	224	220	245	472	294	378	368	306	478	39	154	148	61	6
1200	266	230	225	242	475	283	282	386	315	485	17	52	161	73	10
1350	269	230	229	244	486	287	286	372	347	496	18	56	143	103	10
1500	262	230	227	247	494	282	282	386	355	503	20	52	159	108	9
1650	248	221	220	251	505	288	287	396	378	516	40	66	176	127	11
1800	230	211	210	254	534	254	267	373	397	538	24	56	163	143	4
1950			209	256				262	362				53	106	
2100				258					289					31	
2250				258					224					-34	
2400				260					259					-1	
2550															
2700				290					287					-3	
2850				320					321					1	
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 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

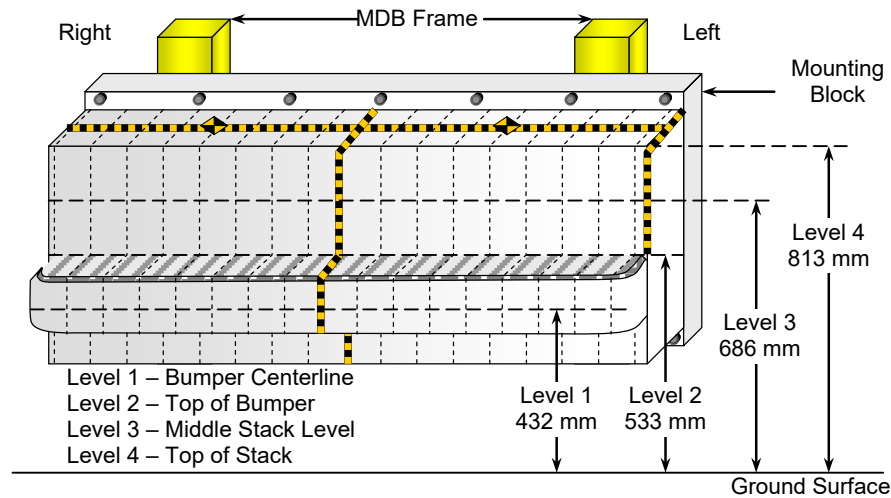
NHTSA No.: O20235110
Test Date: 9/26/2023



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023



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	432	800	Right
B	Top of Bumper	533	533	700	Right
C	Mid-Level	686	686	800	Left
D	Top of Stack	813	813	200	Right

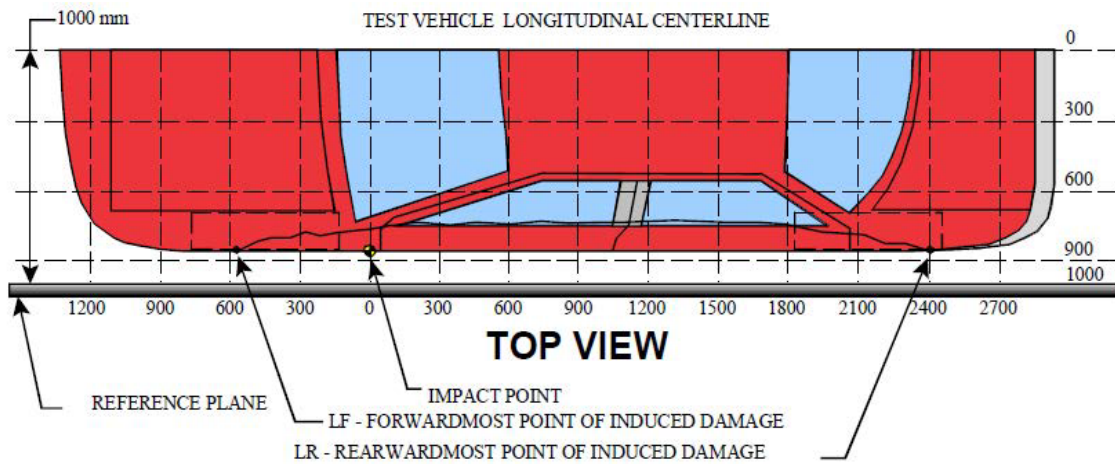
DEFORMABLE BARRIER STATIC CRUSH

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	6	19	35	46	63	102	130	120	99	70	75	77	79	71	79	85	90
3	22	17	18	25	44	53	77	66	45	30	25	21	21	27	38	47	87
2	115	125	112	96	84	77	82	80	73	76	82	88	90	88	93	85	106
1	200	188	175	172	171	170	166	162	162	163	162	156	155	157	156	172	195

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Max. Static Crush (mm)
1	1950	3	262	220	42
2	1555	3	392	224	168
3	1060	3	371	220	151
4	765	3	394	215	179
5	370	3	369	212	157
6	-25	3	220	213	7

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	676	476	200
2	480 mm right of center	1	642	463	179
3	160 mm right of center	1	623	463	160
4	160 mm left of center	1	616	463	153
5	480 mm left of center	1	630	463	167
6	800 mm left of center	1	671	476	195

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

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

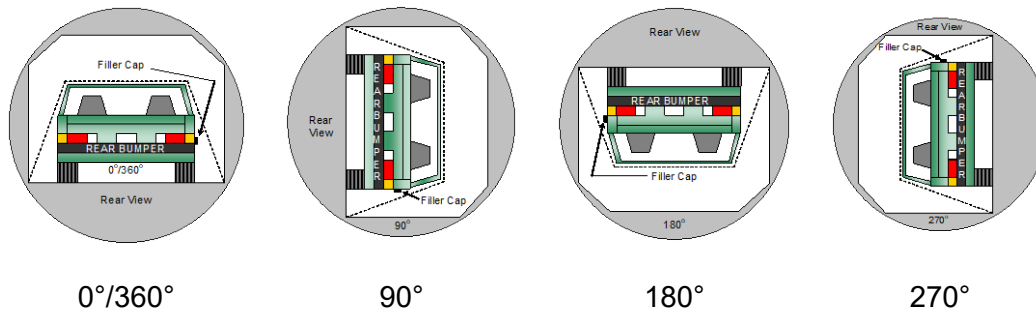
NHTSA No.: O20235110
 Test Date: 9/26/2023

Test Time: 11:54 am

Temperature: 22.0°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°	90	300	390
90° to 180°	92	300	392
180° to 270°	85	300	385
270° to 360°	89	300	389

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	

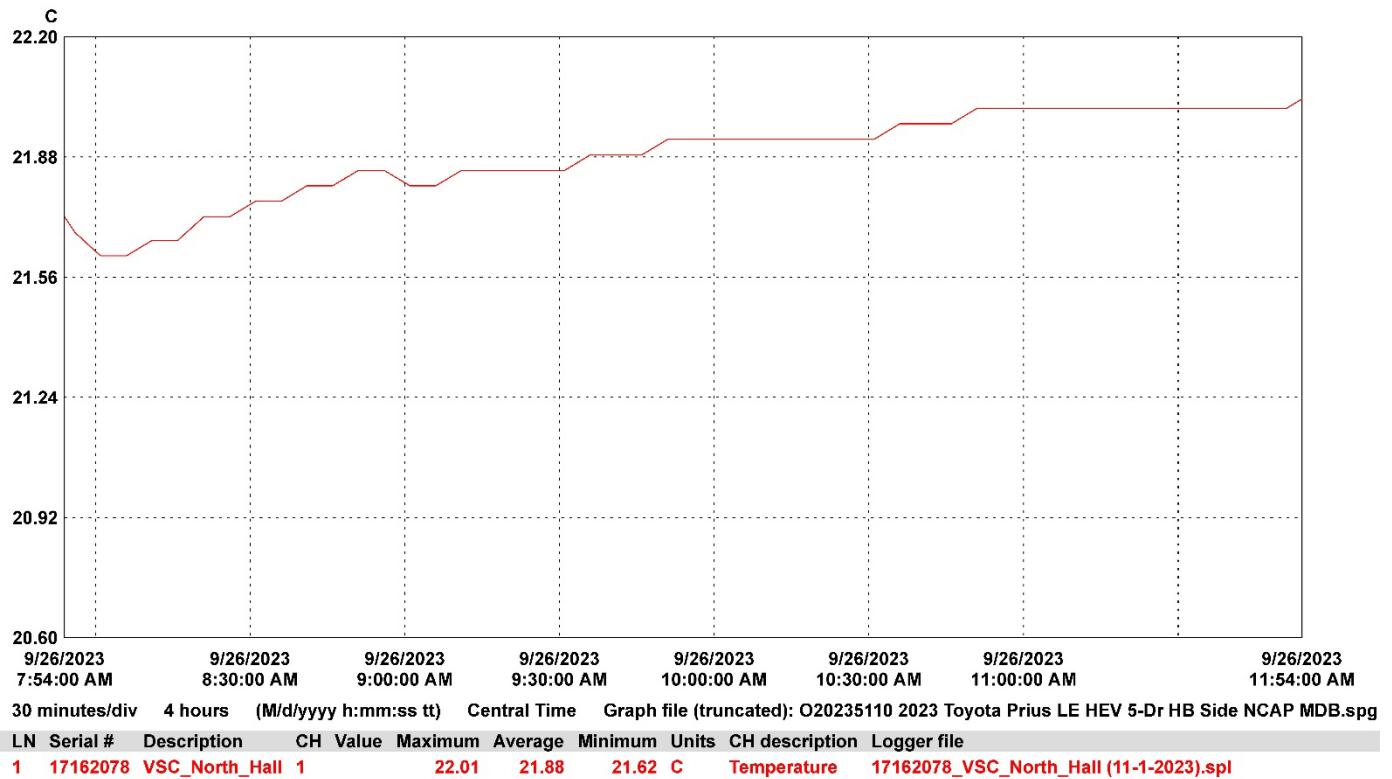
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023



DATA SHEET NO. 305-1
GENERAL TEST AND VEHICLE PARAMETER DATA
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

ELECTRIC VEHICLE PROPULSION SYSTEM

	Units	Observations and Conclusions
Type of Electric Vehicle		Gas-Electric Hybrid
Propulsion Battery Type		Li-ion battery
Nominal Voltage	V	222
Physical Location of Automatic Propulsion Battery Disconnect		Physically contained within the Hybrid Battery system.
Auxiliary Battery Type		Lead-acid Battery

PROPULSION BATTERY SYSTEM DATA

	Units	Observations and Conclusions
Electrolyte Fluid Type		Organic Electrolyte
Electrolyte Fluid Specific Gravity	g/cm ³	1.232
Electrolyte Fluid Kinematic Viscosity	mPa·s	3.6
Electrolyte Fluid Color		Clear
Propulsion Battery Coolant Type, Color, Specific Gravity (if applicable)		Air-Cooled
Location of Battery Modules		X Inside Passenger Compartment
		Outside Passenger Compartment
		The high-voltage battery is located below the 2 nd row seat cushion.

PROPULSION BATTERY STATE OF CHARGE

<i>For all battery types:</i>	
Voltage range corresponding to useable energy of the battery:	
Minimum State of Charge	
Maximum State of Charge	
95% of Maximum State of Charge	
Test Voltage - No less than 95% of maximum State of Charge	
<i>For batteries that are rechargeable ONLY by an energy source on the vehicle:</i>	
Voltage range corresponding to useable energy of the battery:	
Minimum State of Charge	162 V
Maximum State of Charge	250.5 V
Test Voltage – Maximum practicable State of Charge within Normal Operating Range	225.7 V

**DATA SHEET NO. 305-2
PRE-IMPACT DATA
FOR INDICANT FMVSS NO. 305 TESTING**

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023

VEHICLE CHASSIS GROUND POINT(S) LOCATION(S)

Details of Vehicle Chassis Ground Point(s) & Location(s)	High-voltage battery case mounting point
---	--

PROPULSION BATTERY SYSTEM

Details of Electric Energy Storage/Conversion System Test Points	Connected at + and – terminal ends of propulsion system
Additional Comments	None

DATA SHEET NO. 305-3
PRE-IMPACT ELECTRICAL ISOLATION MEASUREMENTS AND CALCULATIONS
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		
Model		
Serial Number		
Internal Impedance Value	MΩ	
Resolution	V	
Last Calibration Date		

PROPULSION BATTERY VOLTAGE

Measurement shall be made with Energy Storage/Conversion System connected to the vehicle propulsion system, and the vehicle in the "ready-to-drive" (propulsion system energized) position.

NOTE: If voltage measurement is not at the voltage or within the normal operating voltage range specified by the manufacturer, the battery must be charged.

Vb	V	
----	---	--

ELECTRIC ISOLATION MEASUREMENTS
PROPULSION BATTERY TO VEHICLE CHASSIS

Vehicle chassis point(s) determined and supplied to contractor by COTR.

V1	V	
V2	V	

PROPULSION BATTERY TO VEHICLE CHASSIS ACROSS RESISTOR

The known resistance Ro (in ohms) should be approximately 500 times the normal operating voltage of the vehicle (in volts) per SAE J1766.

Ro	Ω	
V1' Pre-Impact	V	
V2' Pre-Impact	V	

DATA SHEET NO. 305-3 (CONTINUED)
PRE-IMPACT ELECTRICAL ISOLATION MEASUREMENTS AND CALCULATIONS
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

ELECTRICAL ISOLATION CALCULATIONS

NOTE: If measured voltage is zero and results in a division by zero, record "Zero Volts".
 This "zero voltage" condition is considered as being compliant.

$R_{i1} = R_o (1 + V_2/V_1) [(V_1 - V_1')/V_1']$		
Ri1 Pre-Impact	Ω	
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$		
Ri2 Pre-Impact	Ω	
$R_i = \text{The lesser of } R_{i1} \text{ and } R_{i2}$		
Ri Pre-Impact	Ω	
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$		
Ri / Vb Pre-Impact	Ω	

NOTE: The minimum Electrical Isolation Value is 500 Ω/V .

	Yes	No (Fail)
Is the measured Electrical Isolation Value $\geq 500 \Omega/V$?		
Additional Comments	Not Applicable, vehicle was certified to FMVSS No. 305 S5.3(c).	

DATA SHEET NO. 305-4
POST-IMPACT DATA
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		
Model		
Serial Number		
Internal Impedance Value	MΩ	
Resolution	V	
Last Calibration Date		

ELECTRICAL ISOLATION MEASUREMENTS

Vb Post-Impact	V	
----------------	---	--

V1 Post-Impact	V		Impact Time		Minutes		Seconds
V2 Post-Impact	V				Minutes		Seconds
V1' Post-Impact	V				Minutes		Seconds
V2' Post-Impact	V				Minutes		Seconds

DATA SHEET NO. 305-4 (CONTINUED)
POST-IMPACT DATA
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

ELECTRICAL ISOLATION CALCULATIONS

NOTE: If measured voltage is zero and results in a division by zero, record "Zero Volts".
 This "zero voltage" condition is considered as being compliant.

$R_{i1} = R_o (1 + V_2/V_1) [(V_1 - V_1')/V_1']$							
Ri1 Post-Impact	Ω		Impact Time		Minutes		Seconds
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$							
Ri2 Post-Impact	Ω		Impact Time		Minutes		Seconds
$R_i = \text{The lesser of } R_{i1} \text{ and } R_{i2}$							
Ri Post-Impact	Ω		Impact Time		Minutes		Seconds
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$							
Ri / Vb Post-Impact	Ω		Impact Time		Minutes		Seconds

NOTE: The minimum Electrical Isolation Value is 500 Ω/V.

	Yes	No (Fail)
Is the measured Electrical Isolation Value $\geq 500 \Omega/V$?		
Additional Comments	Not Applicable, vehicle was certified to FMVSS No. 305 S5.3(c).	

DATA SHEET NO. 305-4 (CONTINUED)
POST-IMPACT DATA
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

PROPULSION BATTERY SYSTEM COMPONENTS

Describe any Propulsion Battery Module movement within the passenger compartment [Supply photographs as appropriate]:
Not Applicable

	Yes (Fail)	No
Has the Propulsion Battery Module moved within the passenger compartment?		X

Describe intrusion of an outside Propulsion Battery Component into the passenger compartment [Supply photographs as appropriate]:
No Intrusion

	Yes (Fail)	No
Has an outside Propulsion Battery Component intruded into the passenger compartment?		X

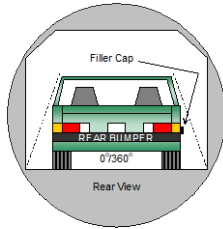
	Yes (Fail)	No
Is the Propulsion Battery Electrolyte Spillage visible in the passenger compartment?		X

DATA SHEET NO. 305-5
STATIC ROLLOVER TEST DATA
FOR INDICANT FMVSS NO. 305 TESTING

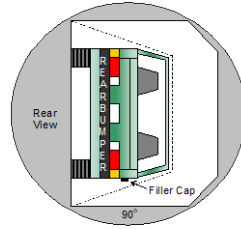
Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

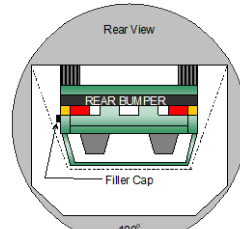
PROPULSION BATTERY SYSTEM COMPONENTS



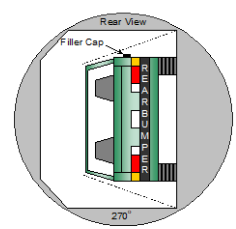
0°/360°



90°



180°



270°

PROPULSION BATTERY ELECTROLYTE COLLECTION TIME PERIOD

Test Phase	Rotation Time (spec. 1-3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	min	30	sec	5	min	6	min	30	sec	7	min
90° - 180°	1	min	32	sec	5	min	6	min	32	sec	7	min
180° - 270°	1	min	25	sec	5	min	6	min	25	sec	7	min
270° - 360°	1	min	29	sec	5	min	6	min	29	sec	7	min

TEST VEHICLE PROPULSION BATTERY ELECTROLYTE SPILLAGE

NOTE: The maximum allowable Propulsion Battery Electrolyte Spillage is 5.0 Liters.

Test Phase	Propulsion Battery Electrolyte Spillage (L)	Spillage Location
0° to 90°	0	Not Applicable
90° to 180°	0	Not Applicable
180° to 270°	0	Not Applicable
270° to 360°	0	Not Applicable
Total Spillage	0	

	Yes (Fail)	No
Is the total Propulsion Battery Electrolyte Spillage greater than 5.0 Liters?		X
Is the Propulsion Battery Electrolyte Spillage visible in the passenger compartment?		X

DATA SHEET NO. 305-5 (CONTINUED)
STATIC ROLLOVER TEST DATA
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		
Model		
Serial Number		
Internal Impedance Value	MΩ	
Resolution	V	
Last Calibration Date		

ELECTRICAL ISOLATION MEASUREMENTS

Vb Post-Impact	V	
----------------	---	--

Record V1, V2, V1', V2' voltage measurements at the start of each successive increment of 90°, 180°, 270°, and 360° of the static rollover test.

	Voltage	Units	Test Phase	Time			
V1		V	0°	min		sec	
			90°				
			180°				
			270°				
			360°				
V2		V	0°	min		sec	
			90°				
			180°				
			270°				
			360°				
V1'		V	0°	min		sec	
			90°				
			180°				
			270°				
			360°				
V2'		V	0°	min		sec	
			90°				
			180°				
			270°				
			360°				

DATA SHEET NO. 305-5 (CONTINUED)
STATIC ROLLOVER TEST DATA
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

ELECTRICAL ISOLATION CALCULATIONS

NOTE: If measured voltage is zero and results in a division by zero, record "Zero Volts".
 This "zero voltage" condition is considered as being compliant.

	Voltage	Units	Test Phase	Time			
Ri1 = Ro (1 + V2/V1) [(V1-V1')/V1']							
Ri1		Ω	0°		min		sec
			90°				
			180°				
			270°				
			360°				
Ri2 = Ro (1 + V1/V2) [(V2-V2')/V2']							
Ri2		Ω	0°		min		sec
			90°				
			180°				
			270°				
			360°				
Ri = The lesser of Ri1 and Ri2							
Ri		Ω	0°		min		sec
			90°				
			180°				
			270°				
			360°				
Ri / Vb = Electrical Isolation Value / Nominal Battery Voltage							
Ri / Vb		Ω/V	0°		min		sec
			90°				
			180°				
			270°				
			360°				

NOTE: The minimum Electrical Isolation Value is 500 Ω/V .

	Yes	No (Fail)
Is the measured Electrical Isolation Value $\geq 500 \Omega/V$?		
Additional Comments	Not Applicable, vehicle was certified to FMVSS No. 305 S5.3(c).	

DATA SHEET NO. 305A-1
EVALUATE PROTECTION FROM DIRECT CONTACT WITH HIGH VOLTAGES SOURCES
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

For each data point where the IPXXB probe is used to evaluate electrical protection from direct contact with high voltage sources, provide a thumbnail photo and be as descriptive of the locations as possible. If an apparent failure is detected, include a photograph showing the direct contact between probe and the high voltage source and/or the probe lamp being illuminated.

POST-CRASH / PRE-ROLLOVER

Description of Evaluated Location	Probe Contact with High Voltage Source		Probe Lamp Illuminated	
	Yes, Fail	No, Pass	Yes, Fail	No, Pass
Front Drive Unit / Transmission Assembly to Electrical Ground		X		X
High-Voltage Battery Case to Electrical Ground		X		X
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case		X		X

STATIC ROLLOVER

Description of Evaluated Location	Probe Contact with High Voltage Source		Probe Lamp Illuminated	
	Yes, Fail	No, Pass	Yes, Fail	No, Pass
Front Drive Unit / Transmission Assembly to Electrical Ground		X		X
High-Voltage Battery Case to Electrical Ground		X		X
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case		X		X

POST-ROLLOVER

Description of Evaluated Location	Probe Contact with High Voltage Source		Probe Lamp Illuminated	
	Yes, Fail	No, Pass	Yes, Fail	No, Pass
Front Drive Unit / Transmission Assembly to Electrical Ground		X		X
High-Voltage Battery Case to Electrical Ground		X		X
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case		X		X

DATA SHEET NO. 305A-2
EVALUATE PROTECTION AGAINST INDIRECT CONTACT WITH HIGH VOLTAGE SOURCES
USING A RESISTANCE TESTER OR DC POWER SUPPLY, VOLTMETER AND AMMETER
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

For any measuring points where protection against indirect contact with high voltage sources is evaluated, provide a thumbnail photo and be as descriptive of the locations as possible. If an apparent failure is detected, include a photograph showing the locations in question and the related measured values. If the resistance is calculated using separately measured resistances, describe each measurement and the final calculation as separate entries in the table below.

Measuring Path	Pass	Fail
BC: Between exposed conductive parts of the electrical protection barrier of the high voltage source and the electrical chassis.	< 0.1 Ω	$\geq$ 0.1 Ω
BB: Between exposed conductive parts of the electrical protection barrier of the high voltage source and any other simultaneously reachable exposed conductive parts of the electrical protection barriers withing 2.5 meters.	< 0.2 Ω	$\geq$ 0.2 Ω

POST-CRASH / PRE-ROLLOVER

Description of Evaluated Location	Measuring Path	Method 2 ONLY		Methods 1 & 2	Pass or Fail
	BC or BB	Voltage (V) Volts	Current (I) Amps	Resistance (R=V/I) Ω	
Front Drive Unit / Transmission Assembly to Electrical Ground	BC			0.03	Pass
High-Voltage Battery Case to Electrical Ground	BC			0.02	Pass
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case	BB			0.02	Pass

STATIC ROLLOVER

Description of Evaluated Location	Measuring Path	Method 2 ONLY		Methods 1 & 2	Pass or Fail
	BC or BB	Voltage (V) Volts	Current (I) Amps	Resistance (R=V/I) Ω	
Front Drive Unit / Transmission Assembly to Electrical Ground	BC			0.01	Pass
High-Voltage Battery Case to Electrical Ground	BC			0.01	Pass
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case	BB			0.01	Pass

* Final resistance values reported after subtracting the resistance of the measurement device extensions.

DATA SHEET NO. 305A-2 (CONTINUED)
EVALUATE PROTECTION AGAINST INDIRECT CONTACT WITH HIGH VOLTAGE SOURCES
USING A RESISTANCE TESTER OR DC POWER SUPPLY, VOLTMETER AND AMMETER
FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
 Test Date: 9/26/2023

For any measuring points where protection against indirect contact with high voltage sources is evaluated, provide a thumbnail photo and be as descriptive of the locations as possible. If an apparent failure is detected, include a photograph showing the locations in question and the related measured values. If the resistance is calculated using separately measured resistances, describe each measurement and the final calculation as separate entries in the table below.

Measuring Path	Pass	Fail
BC: Between exposed conductive parts of the electrical protection barrier of the high voltage source and the electrical chassis.	< 0.1 Ω	$\geq$ 0.1 Ω
BB: Between exposed conductive parts of the electrical protection barrier of the high voltage source and any other simultaneously reachable exposed conductive parts of the electrical protection barriers withing 2.5 meters.	< 0.2 Ω	$\geq$ 0.2 Ω

POST-ROLLOVER

Description of Evaluated Location	Measuring Path	Method 2 ONLY		Methods 1 & 2	Pass or Fail
	BC or BB	Voltage (V) Volts	Current (I) Amps	Resistance (R=V/I) Ω	
Front Drive Unit / Transmission Assembly to Electrical Ground	BC			0.01	Pass
High-Voltage Battery Case to Electrical Ground	BC			0.01	Pass
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case	BB			0.01	Pass

* Final resistance values reported after subtracting the resistance of the measurement device extensions.

DATA SHEET NO. 305A-3
DETERMINE VOLTAGE BETWEEN EXPOSED CONDUCTIVE PARTS
OF ELECTRICAL PROTECTION BARRIERS AND THE ELECTRICAL CHASSIS
AND BETWEEN EXPOSED PARTS OF ELECTRICAL PROTECTION BARRIERS

Test Vehicle: 2023 Toyota Prius LE HEV 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No.: O20235110
Test Date: 9/26/2023

For each data point where the voltage between exposed conductive parts of electrical protection barriers and the electrical chassis and between exposed conductive parts of electrical protection barriers is determined, provide a thumbnail photo and be as descriptive of the locations as possible. If an apparent failure is detected, include a photograph showing the locations in question and the related measured values.

Measuring Path	Pass	Fail
BC: Between exposed conductive parts of the electrical protection barrier of the high voltage source and the electrical chassis.	≤ 30 VAC ≤ 60 VDC	> 30 VAC > 60 VDC
BB: Between exposed conductive parts of the electrical protection barrier of the high voltage source and any other simultaneously reachable exposed conductive parts of the electrical protection barriers within 2.5 meters.	≤ 30 VAC ≤ 60 VDC	> 30 VAC > 60 VDC

POST-CRASH / PRE-ROLLOVER

Description of Evaluated Location	Measuring Path	Measured Voltage		Pass or Fail
	BC or BB	VAC (V) Volts	VDC (V) Volts	
Front Drive Unit / Transmission Assembly to Electrical Ground	BC	0.0	0.0	Pass
High-Voltage Battery Case to Electrical Ground	BC	0.0	0.0	Pass
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case	BB	0.0	0.0	Pass

STATIC ROLLOVER

Description of Evaluated Location	Measuring Path	Measured Voltage		Pass or Fail
	BC or BB	VAC (V) Volts	VDC (V) Volts	
Front Drive Unit / Transmission Assembly to Electrical Ground	BC	0.0	0.0	Pass
High-Voltage Battery Case to Electrical Ground	BC	0.0	0.0	Pass
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case	BB	0.0	0.0	Pass

POST-ROLLOVER

Description of Evaluated Location	Measuring Path	Measured Voltage		Pass or Fail
	BC or BB	VAC (V) Volts	VDC (V) Volts	
Front Drive Unit / Transmission Assembly to Electrical Ground	BC	0.0	0.0	Pass
High-Voltage Battery Case to Electrical Ground	BC	0.0	0.0	Pass
Front Drive Unit / Transmission Assembly to High-Voltage Battery Case	BB	0.0	0.0	Pass

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
Photo No. 058	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-29

		<u>Page No.</u>
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
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

		<u>Page No.</u>
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. 093a	Close-Up View of Vehicle Load Carrying Capacity Reduction Label	A-47
Photo No. 094	Pre-Test Ballast View	A-48
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-49
Photo No. 097	FMVSS No. 301 Static Rollover 90 Degrees	A-49
Photo No. 098	FMVSS No. 301 Static Rollover 180 Degrees	A-50
Photo No. 099	FMVSS No. 301 Static Rollover 270 Degrees	A-50
Photo No. 100	FMVSS No. 301 Static Rollover 360 Degrees	A-51
Photo No. 101	Impact Event	A-51
Photo No. 102	Monroney Label	A-52
Photo No. 103	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-53
Photo No. 305-01	Auxiliary Power Module Warning Label	A-53
Photo No. 305-02	Power Inverter Warning Label	A-54
Photo No. 305-03	First Responder Warning Label	A-54
Photo No. 305-04	First Responder Warning Location	A-55
Photo No. 305-05	Other Vehicle Label(s) Related to Electrical Propulsion System	A-55
Photo No. 305-06	Manual High Voltage Service Disconnect in Place	A-56
Photo No. 305-07	Manual High Voltage Service Disconnect Removed	A-56
Photo No. 305-08	Manual High Voltage Service Disconnect Removed	A-57
Photo No. 305-09	Pre-Impact View of Propulsion Battery	A-57
Photo No. 305-10	Post-Impact Front View of Propulsion Battery	A-58

		<u>Page No.</u>
Photo No. 305-11	Post-Impact Rear View of Propulsion Battery	A-58
Photo No. 305-12	Pre-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules	A-59
Photo No. 305-13	Post-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules	A-59
Photo No. 305-14	Pre-Impact View of Propulsion Battery Module(s)	A-60
Photo No. 305-15	Post-Impact View of Propulsion Battery Module(s)	A-60
Photo No. 305-16	Pre-Impact View of Electric Propulsion Drive	A-61
Photo No. 305-17	Post-Impact View of Electric Propulsion Drive	A-61
Photo No. 305-18	Pre-Impact View of High Voltage Interconnect(s)	A-62
Photo No. 305-19	Pre-Impact View Propulsion Battery Venting System(s)	A-62
Photo No. 305-20	Pre-Impact View of Other Visible Electric Propulsion Components	A-63
Photo No. 305-21	Pre-Impact View of Ground Lead Attached	A-63
Photo No. 305-22	Pre-Impact View of High Voltage Leads Attached	A-64
Photo No. 305-23	Pre-Impact Close-Up View of High Voltage Leads Attached	A-64
Photo No. 305-24	Pre-Impact View of Installed Test Interface Port	A-65
Photo No. 305-25	Post-Impact View of Installed Test Interface Port	A-65
Photo No. 305-26	Pre-Impact View of Other Test Devices	A-66
Photo No. 305-27	Post-Impact View of Other Test Devices	A-66
Photo No. 305-28	FMVSS No. 305 Static Rollover at 90 Degrees	A-67
Photo No. 305-29	FMVSS No. 305 Static Rollover at 180 Degrees	A-67
Photo No. 305-30	FMVSS No. 305 Static Rollover at 270 Degrees	A-68
Photo No. 305-31	FMVSS No. 305 Static Rollover at 360 Degrees	A-68
Photo No. 305-32	Pre-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery	A-69
Photo No. 305-33	Post-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery	A-69
Photo No. 305-34	Post-Impact Propulsion Battery System Mounting and/or Intrusion Failure(s)	A-70
Photo No. 305-35	Post-Impact View of Battery Component Intrusion	A-70
Photo No. 305-36	Post-Impact View of Battery Module Movement or Retention Loss	A-71
Photo No. 305-37	Post-Impact View of Propulsion Battery Electrolyte Spillage Location	A-71
Photo No. 305-38	Post-Test View of Propulsion Battery Electrolyte Spillage Location	A-72



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

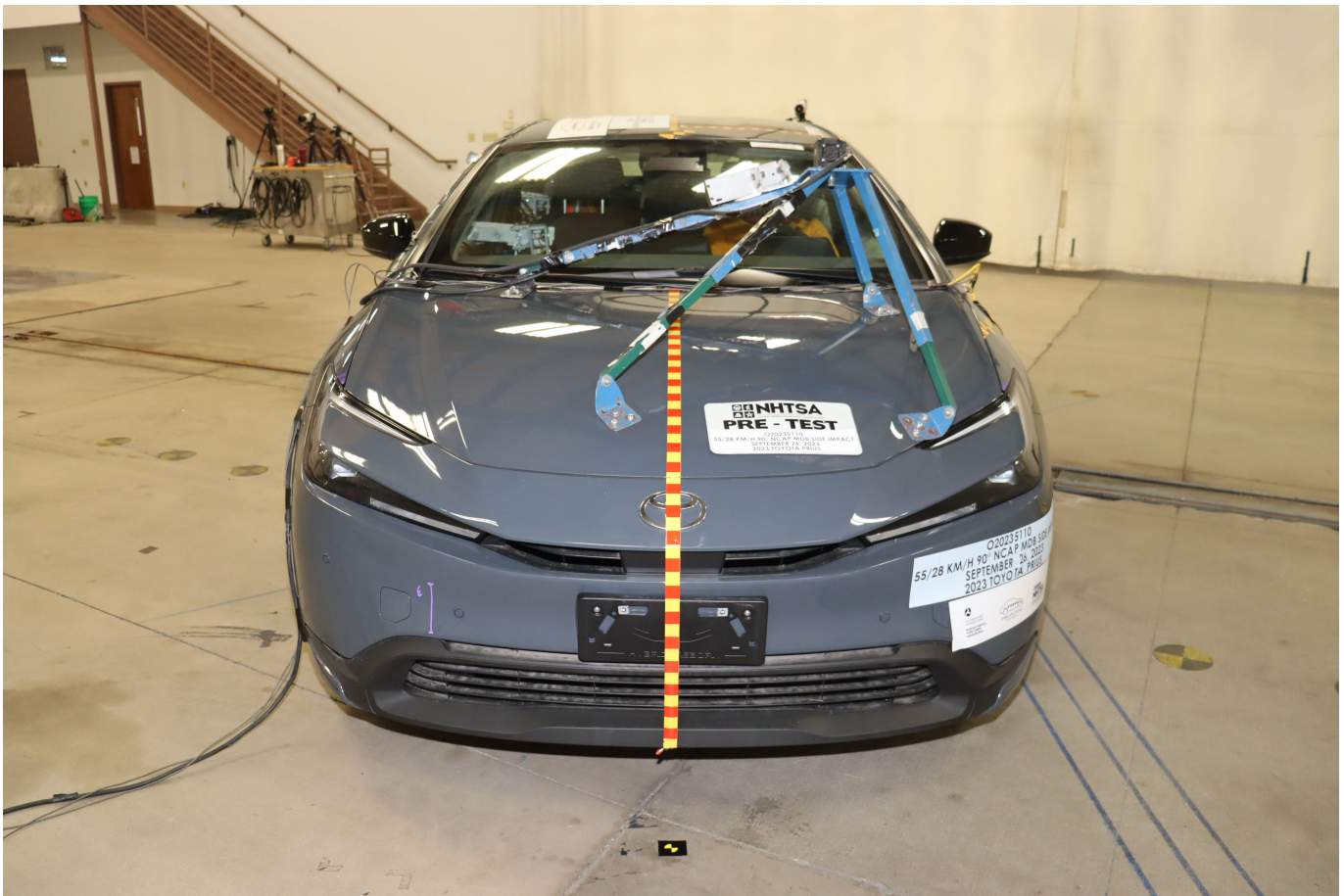


Photo No. 003 - Pre-Test Frontal View of Test Vehicle

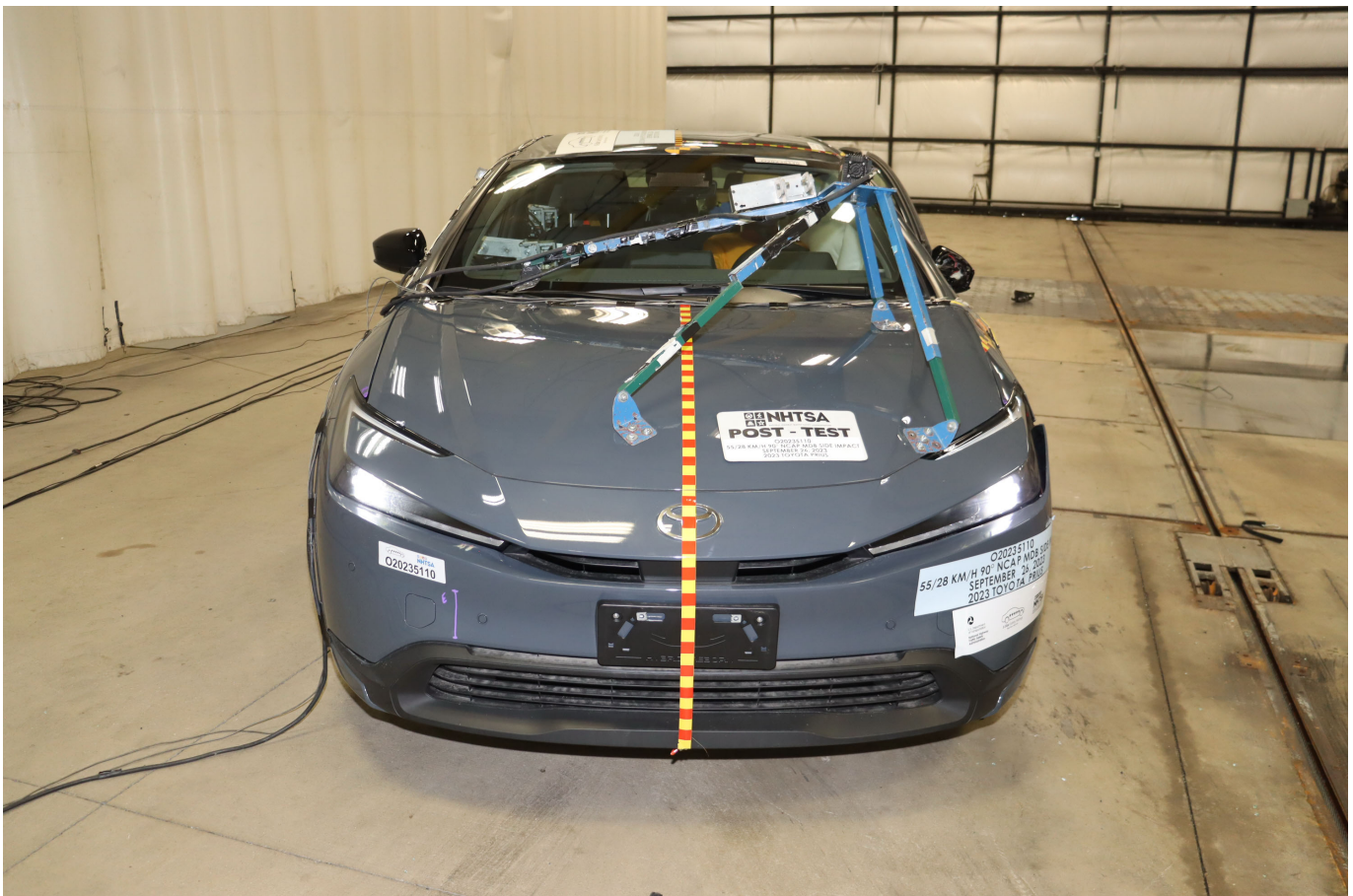


Photo No. 004 - Post-Test Frontal View of Test Vehicle



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

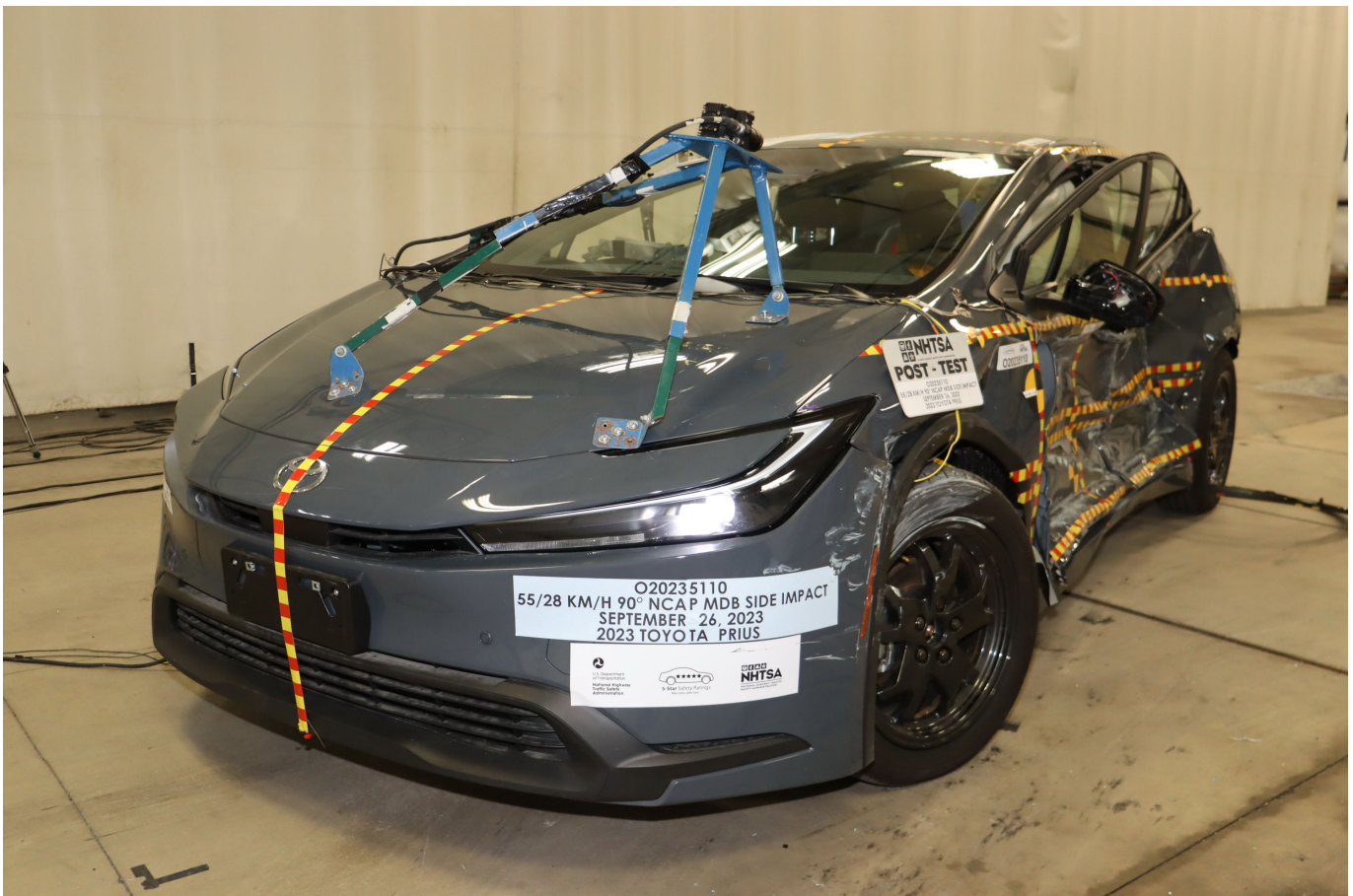


Photo No. 006 - Post-Test Left Front Three-Quarter View of Test Vehicle



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

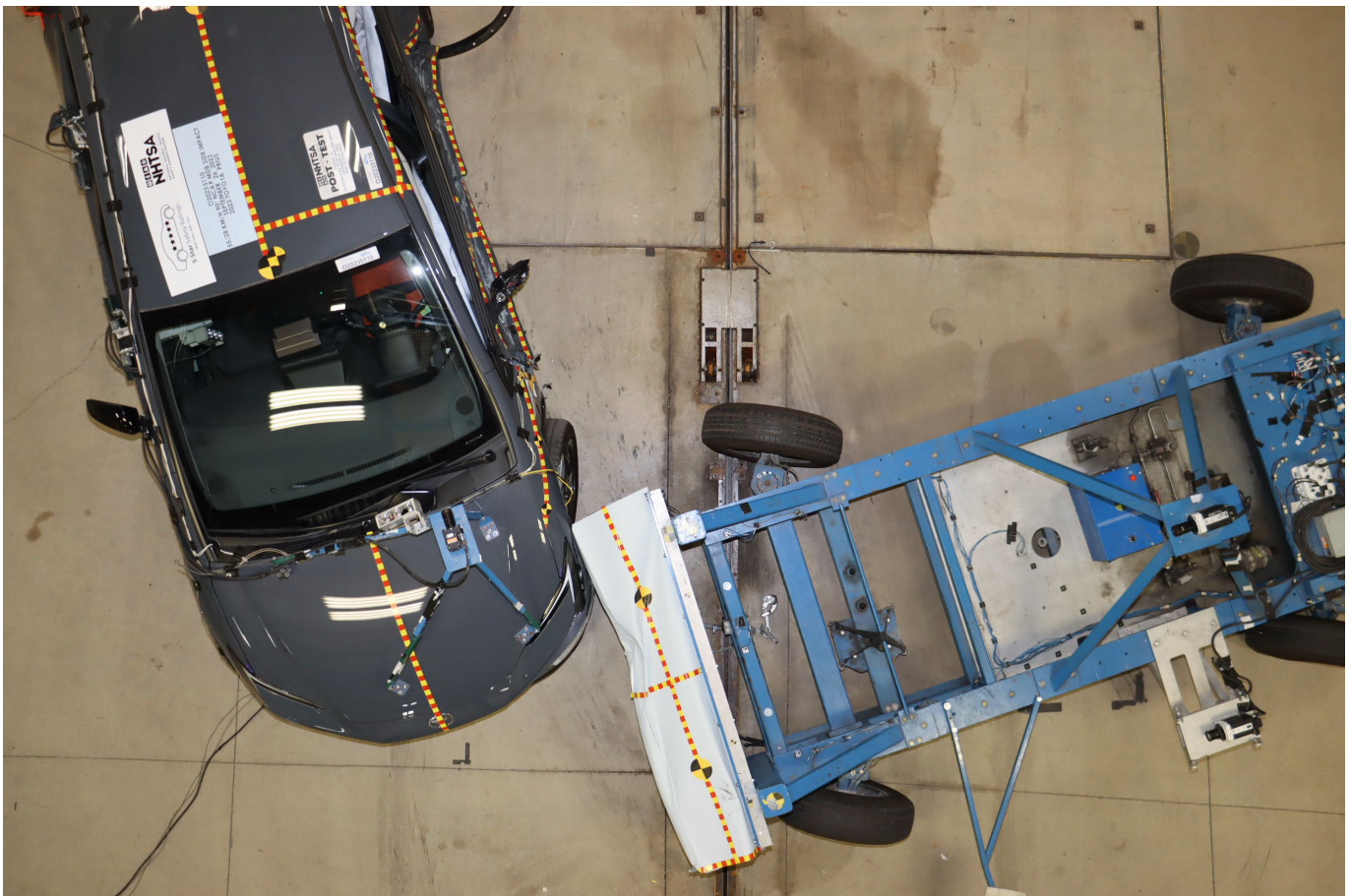


Photo No. 016 - Post-Test Overhead View of Test Area



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT AVAILABLE

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

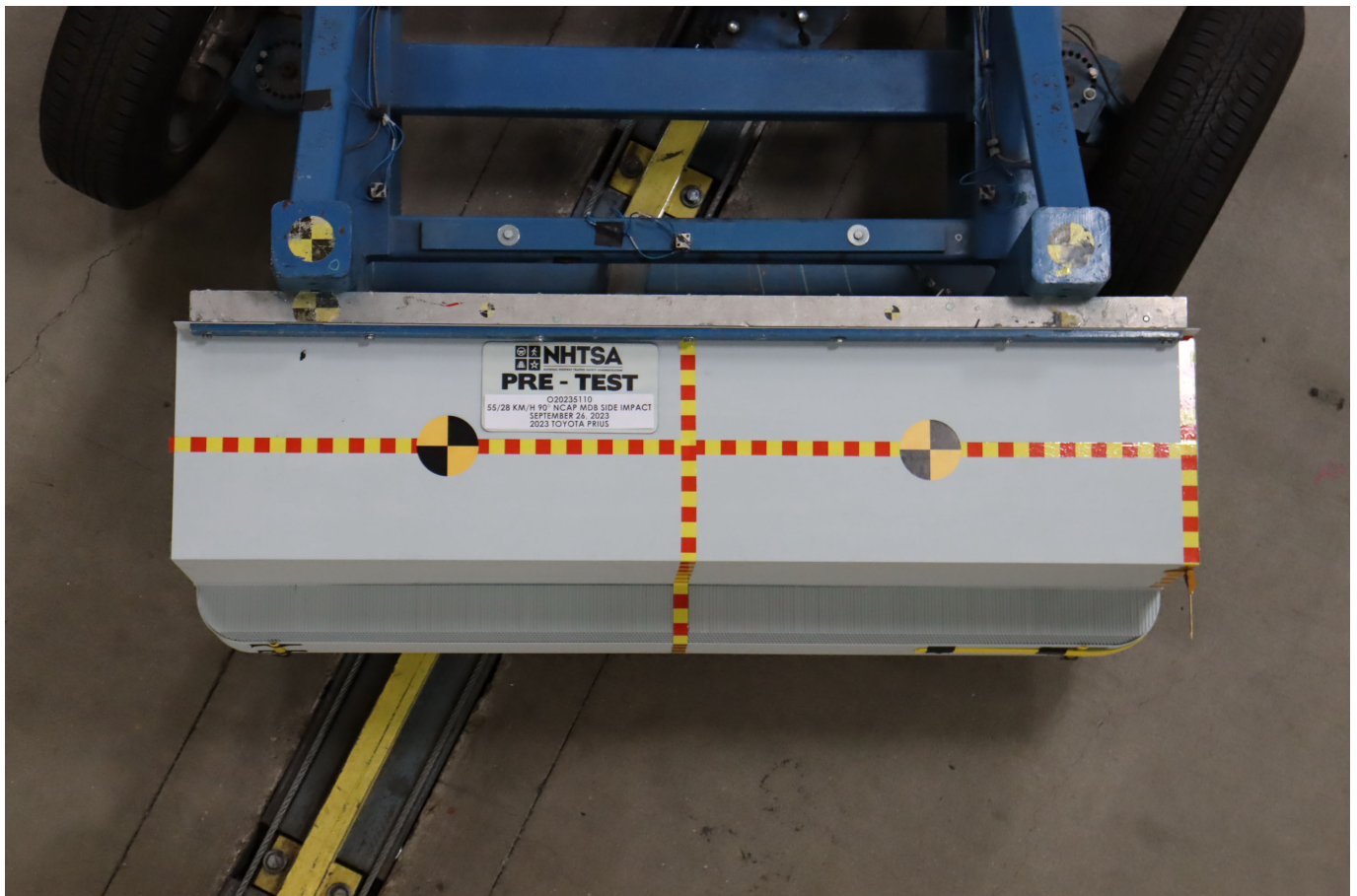


Photo No. 086 - Pre-Test Top View of MDB Impactor Face

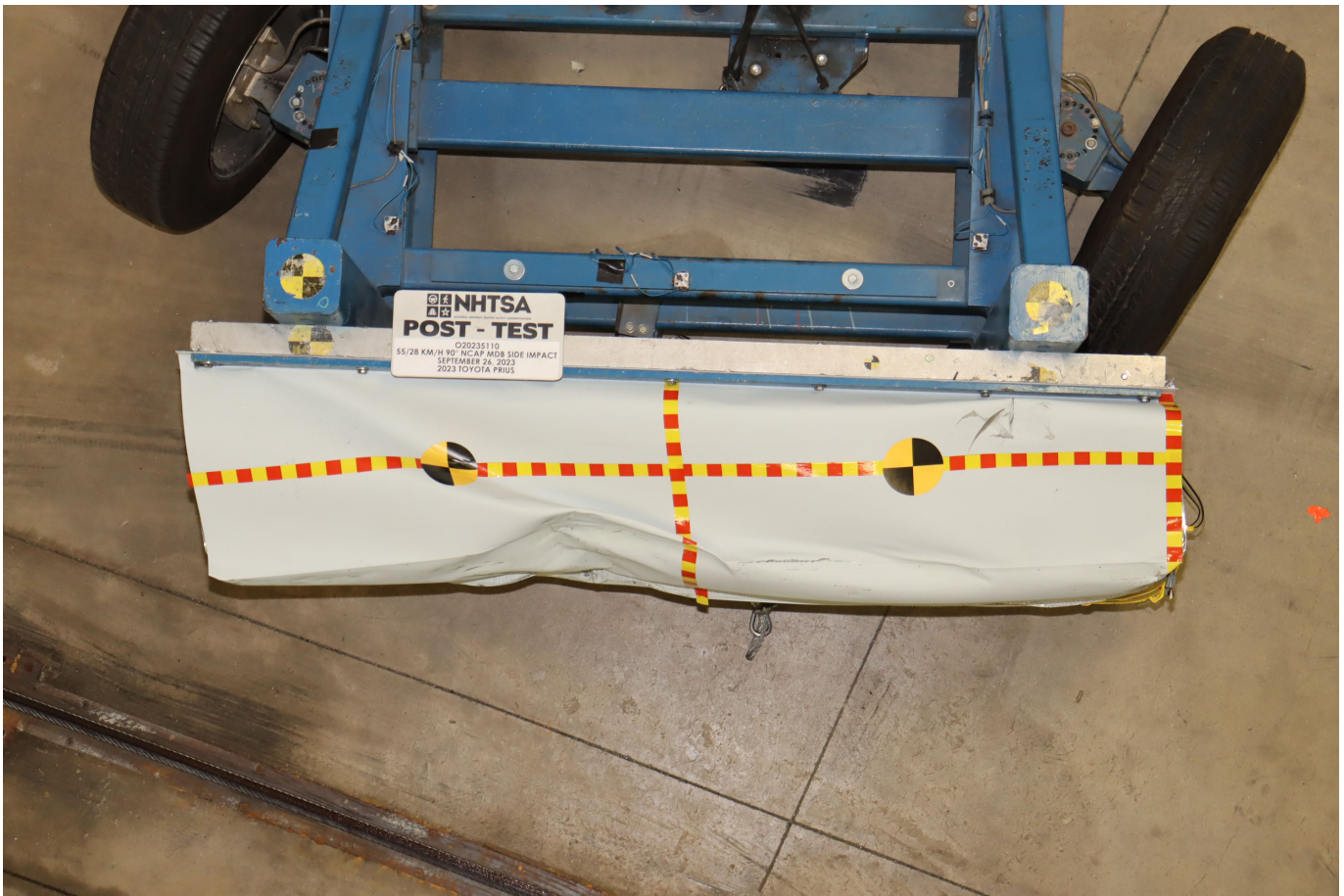


Photo No. 087 - Post-Test Top View of MDB Impactor Face



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

PHOTOGRAPH NOT AVAILABLE

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



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

PHOTOGRAPH NOT AVAILABLE

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. 093a - Close-Up View of Vehicle Load Carrying Capacity Reduction 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

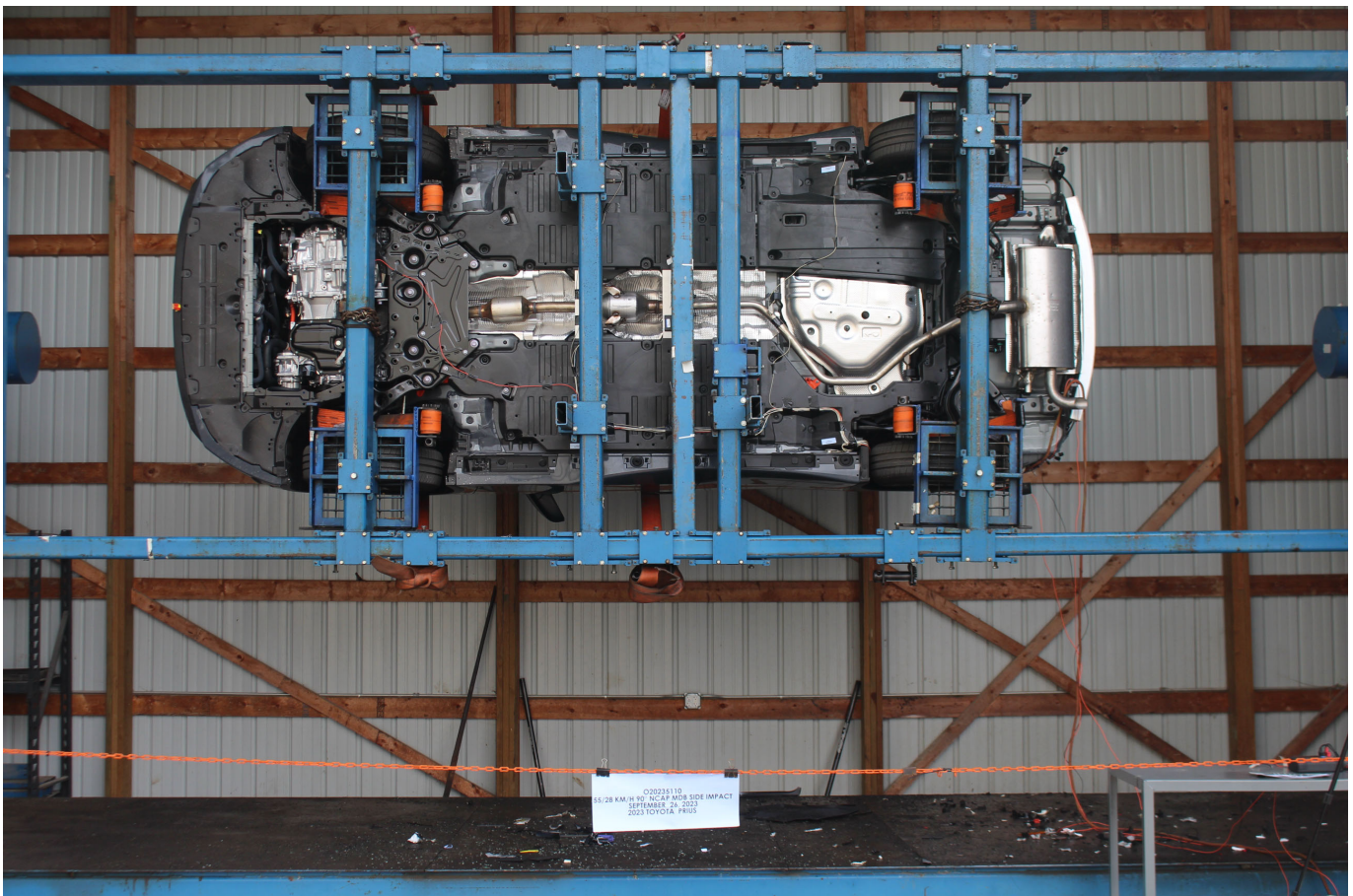


Photo No. 099 - FMVSS Photo No. 301 Static Rollover 270 Degrees



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



Photo No. 101 - Impact Event

TOYOTA

DESC: **PRIUS** LE
VIN: **JTDACAAU0P3002570**
YR/MDL: 2023/1223A
CLR: GUARDIAN GRAY/F820 (01M2/20)
FINAL ASSEMBLY POINT: TOYOTA, AICHI, JAPAN

GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

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

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy
57 MPG combined city/hwy
57 city
56 highway
1.8 gallons per 100 miles

You save \$4,000 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$800

Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only)
1 9 10 1 10 Best Best

This vehicle emits 155 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs \$8,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.95 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

STANDARD EQUIPMENT
UNLESS REPLACED BY OPTIONAL EQUIPMENT

MECHANICAL & PERFORMANCE
- Hybrid Synergy Drive System, 194 net HP
- 2.0L DOHC 16V VVT-i 4-Cylinder Engine

SAFETY & CONVENIENCE
- Toyota Safety Sense 3.0 w/Pre-Collision
- Safe Exit Assist
- Blind Spot Monitor w/Rear Cross-Traffic Alert
- Connected Services Capable, 4G network dependent. See Toyota.com for details.

EXTERIOR
- Bi-LED Headlights, LED DRLs
- 17-inch alloy wheels with wheel covers

INTERIOR
- 7-in. Multi-Information Display
- 8-in. Toyota Audio Multimedia w/6-Speakers, Wireless Apple CarPlay and Android Auto Compatibility
- SiriusXM w/3-Month Platinum Plan Trial
- Fabric-Trimmed Seats
- Manual 6-way adjustable front seats
- 60/40 Split Folding Rear Seat
- Six USB-C ports

FOR FULL PRODUCT DETAILS:
Please Visit Toyota.com/Prius

Full Tank of Gas

BASE MANUFACTURER'S SUGGESTED RETAIL PRICE \$27,450.00

OPTIONAL EQUIPMENT	
FE 50 State Emissions	
2T All Weather Floor Liners/Cargo Liner	299.00
D5 Door Edge Guards	150.00
WL Alloy Wheel Locks	80.00

MANUFACTURER'S SUGGESTED RETAIL PRICE \$27,979.00
DELIVERY, PROCESSING AND HANDLING FEE 1,095.00

TOTAL \$29,074.00

Delivered by Truck to: 19037
JERRY'S TOYOTA
8001 BELAIR RD
BALTIMORE MD21236



TML1E2N150F0W0

Photo No. 102 - Monroney Label

140 3-3. Adjusting the seats

Head restraints

Head restraints are provided for all seats.

WARNING

Head restraint precautions
Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.

Vertical adjustment

Front seats

1 Up
Pull the head restraints up.

2 Down
Push the head restraint down while pressing the lock release button [A].

Rear outboard seats

1 Up
Pull the head restraints up.

2 Down
Push the head restraint down while pressing the lock release button [A].

Rear center seat

Head restraints cannot be adjusted.

Adjusting the height of the head restraints

Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.

Removing the head restraints

Front seats

Pull the head restraint up while pressing the lock release button [A].

3-3. Adjusting the seats 141

1 Pull the head restraint up while pressing the lock release button [A].

If the head restraint touches the ceiling, making the removal difficult, change the seat height or angle. (→P.137)

Rear outboard seats

1 Pull the seatback lock release lever and fold down the seatback until it reaches the position where the head restraints can be removed.

Installing the head restraints

Front seats

Align the head restraint with the installation holes and push it down to the lock position. Press and hold the lock release button [A] when lowering the head restraint.

Rear outboard seats

1 Pull the seatback lock release lever and fold down the seatback until it reaches

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

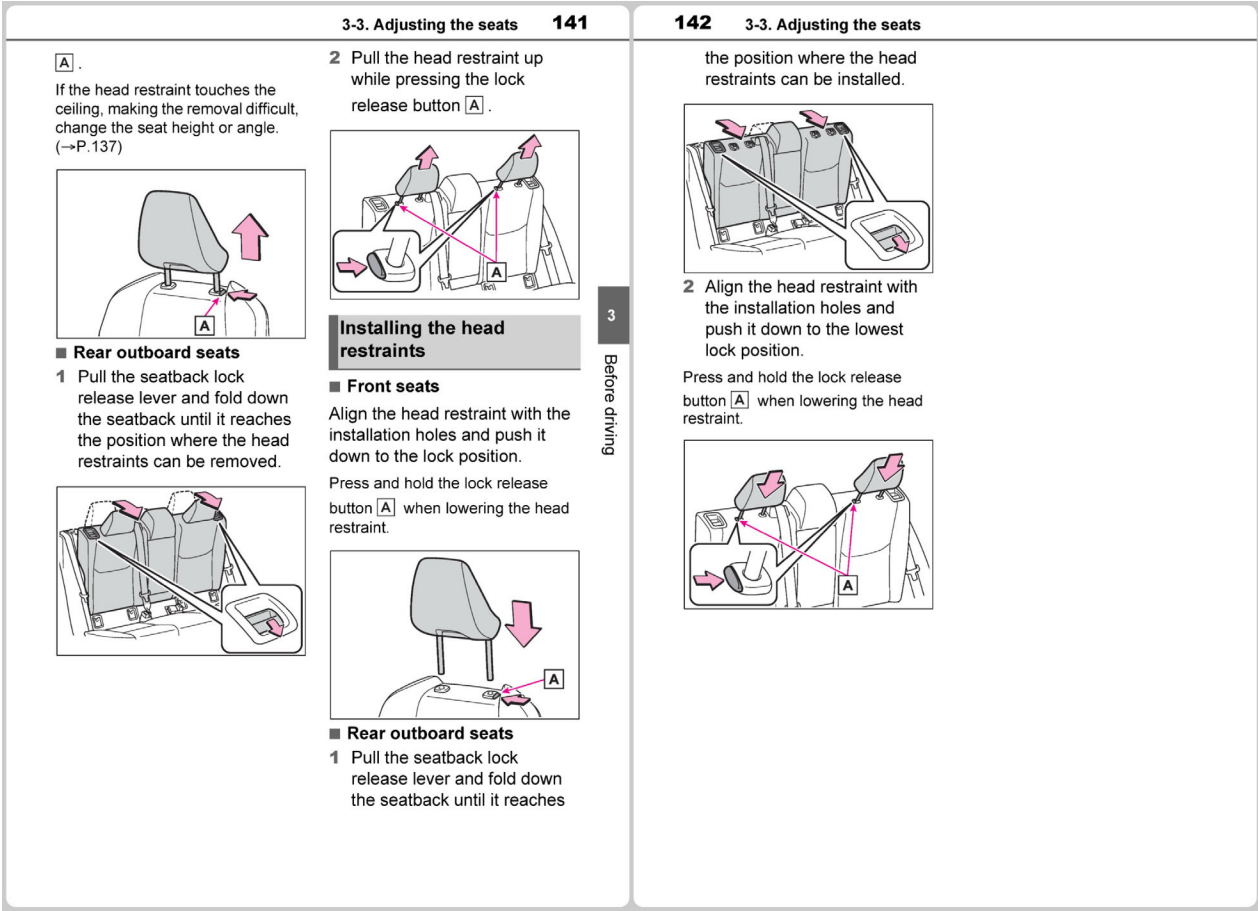


Photo No. 104 - Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

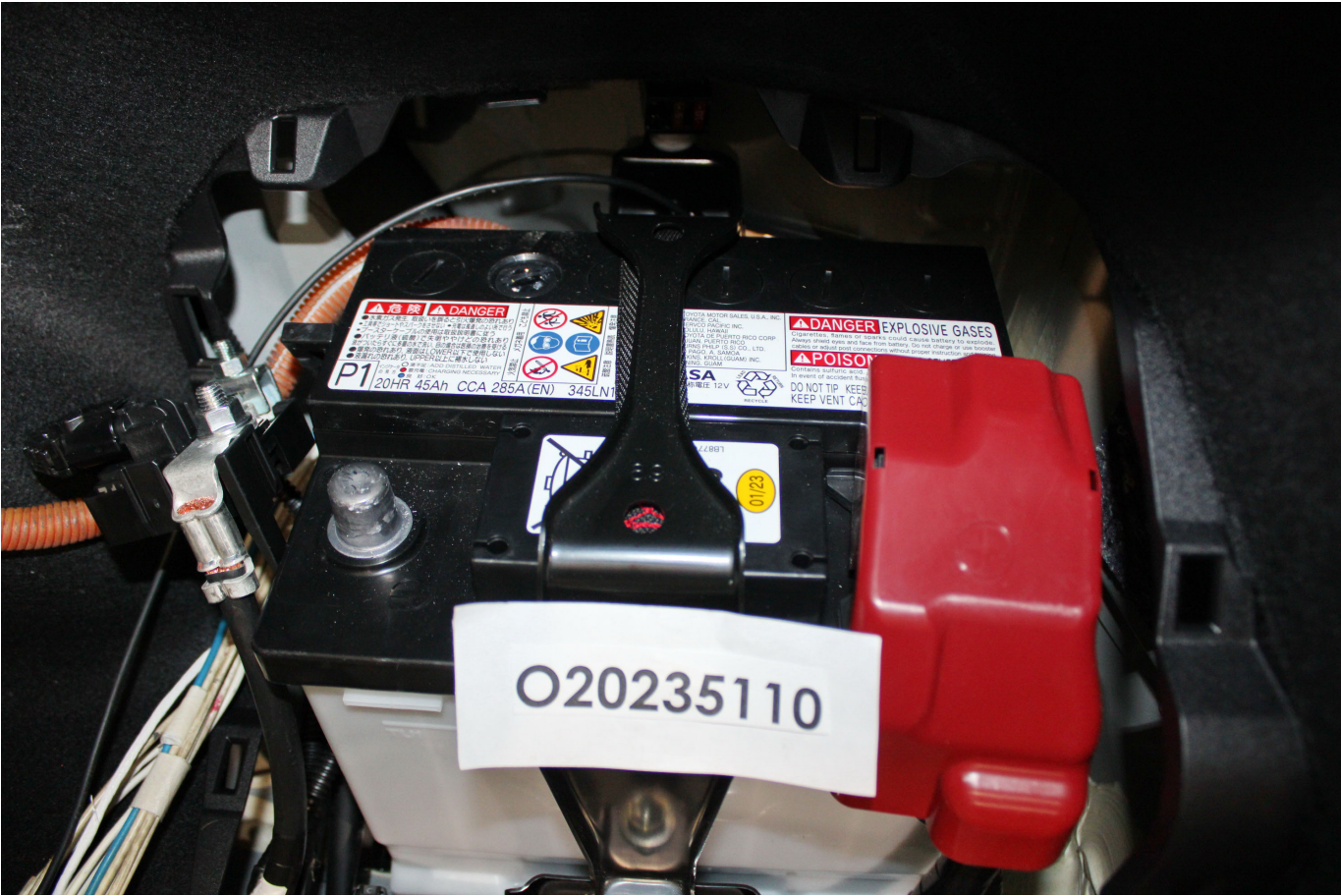


Photo No. 305-01 - Auxiliary Power Module Warning Label



Photo No. 305-02 - Power Inverter Warning Label



Photo No. 305-03 - First Responder Warning Label



Photo No. 305-04 - First Responder Warning Location



Photo No. 305-05 - Other Vehicle Label(s) Related to Electrical Propulsion System



Photo No. 305-06 - Manual High Voltage Service Disconnect in Place



Photo No. 305-07 - Manual High Voltage Service Disconnect Removed



Photo No. 305-08 - Manual High Voltage Service Disconnect Removed

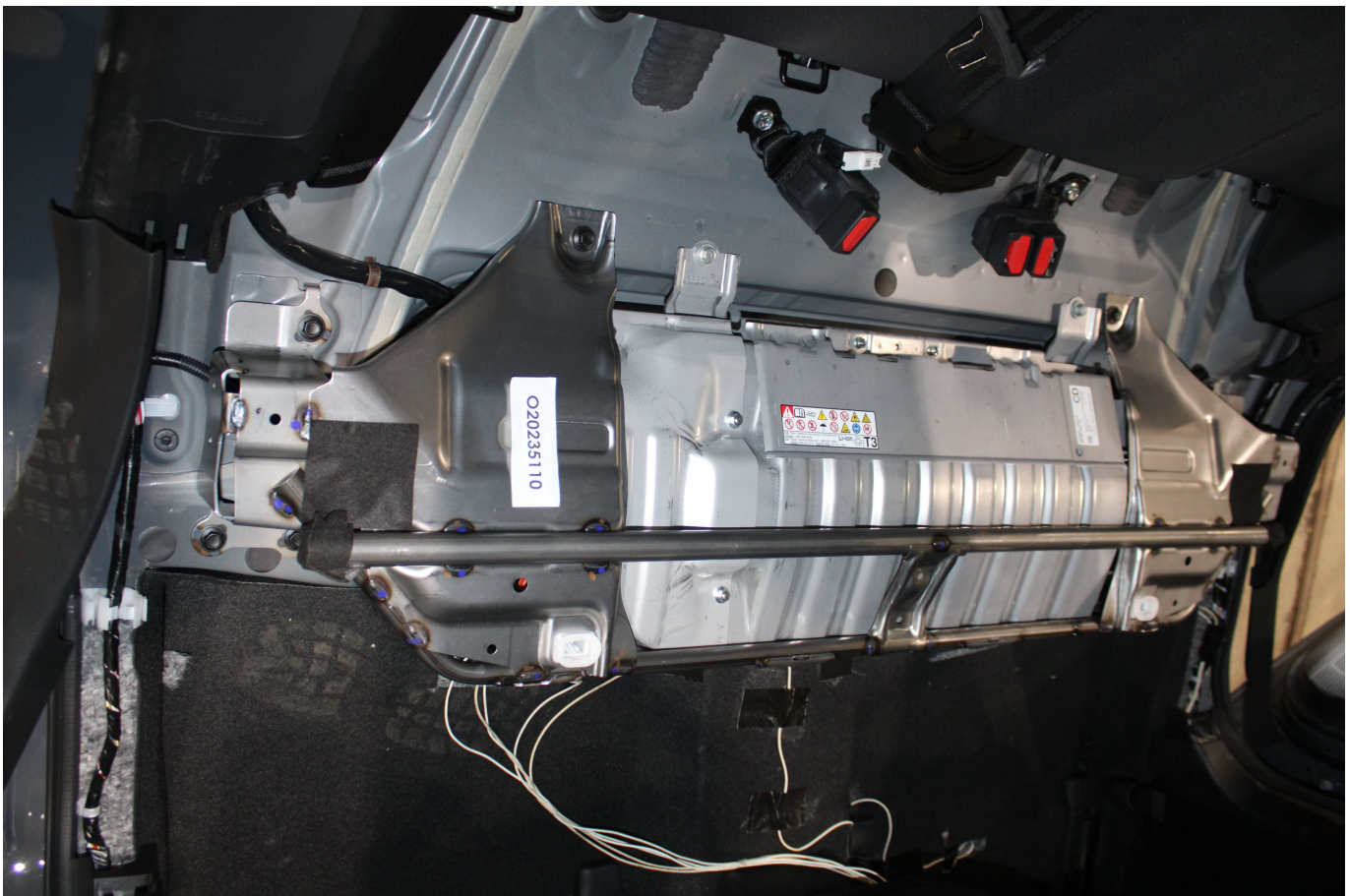


Photo No. 305-09 - Pre-Impact View of Propulsion Battery

PHOTOGRAPH NOT AVAILABLE

Photo No. 305-10 - Post-Impact Front View of Propulsion Battery

PHOTOGRAPH NOT AVAILABLE

Photo No. 305-11 - Post-Impact Rear View of Propulsion Battery

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-12 - Pre-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-13 - Post-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-14 - Pre-Impact View of Propulsion Battery Module(s)

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-15 - Post-Impact View of Propulsion Battery Module(s)

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-16 - Pre-Impact View of Electric Propulsion Drive

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-17 - Post-Impact View of Electric Propulsion Drive

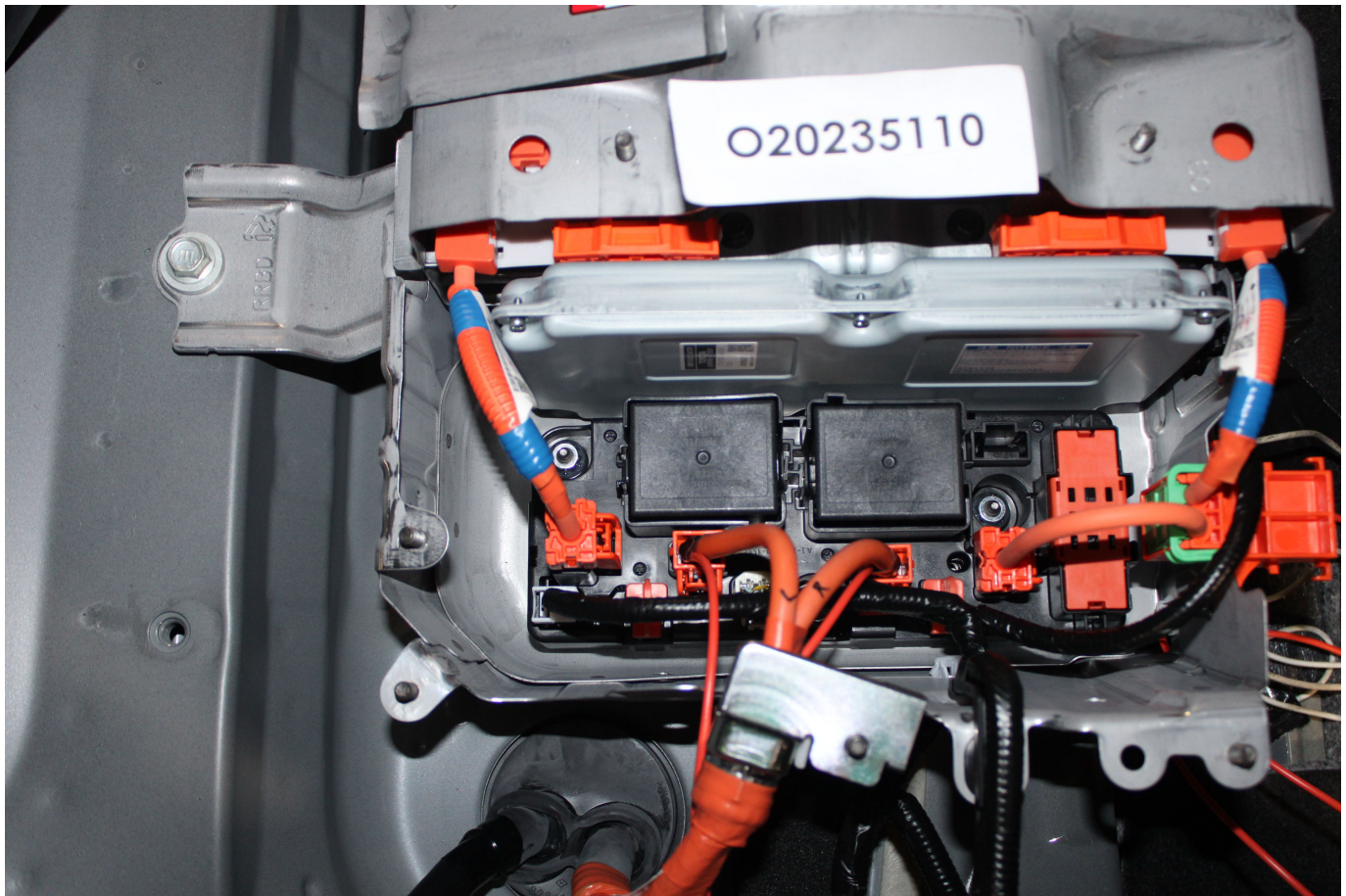


Photo No. 305-18 - Pre-Impact View of High Voltage Interconnect(s)

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-19 - Pre-Impact View Propulsion Battery Venting System(s)

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-20 - Pre-Impact View of Other Visible Electric Propulsion Components

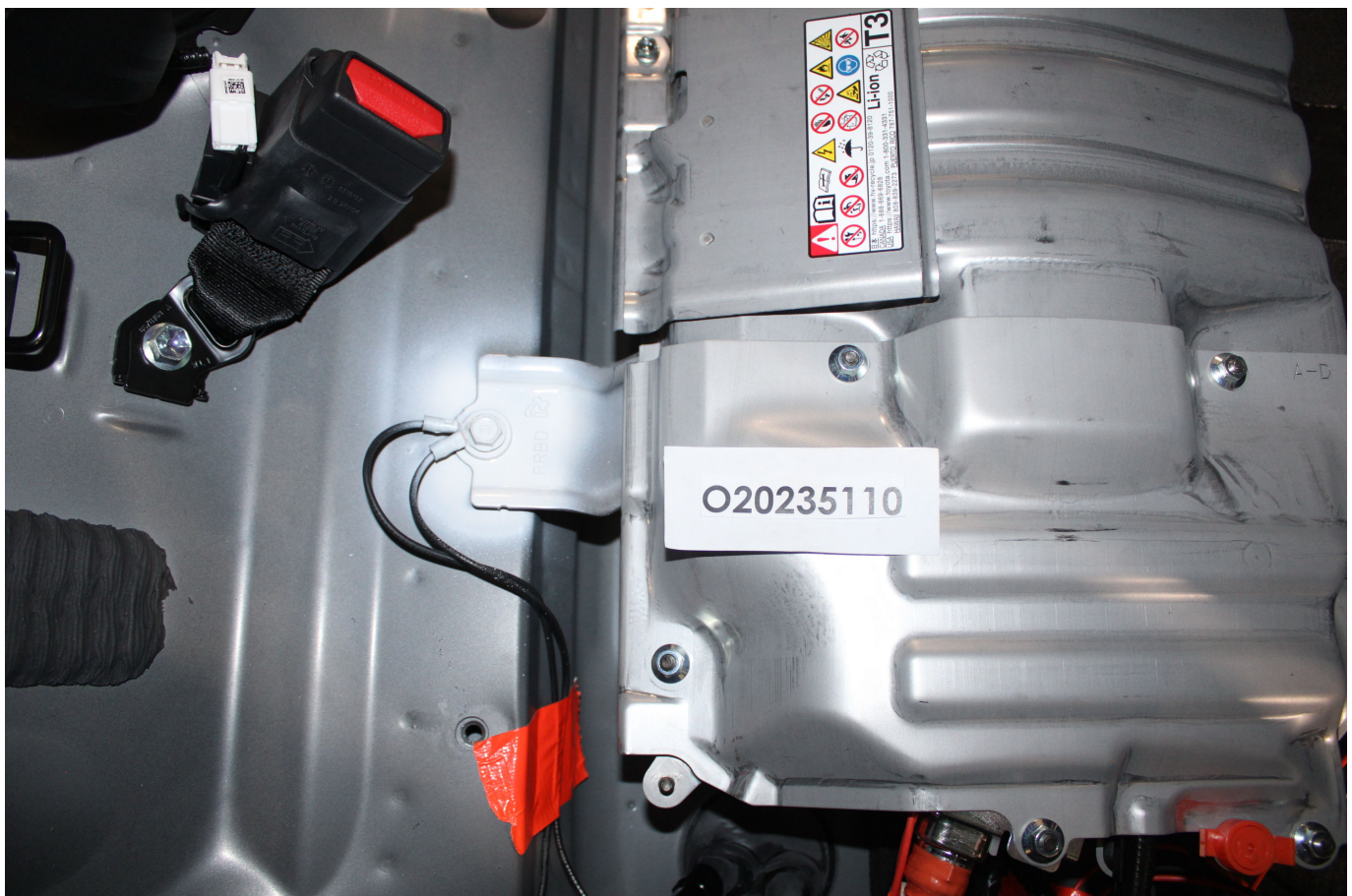


Photo No. 305-21 - Pre-Impact View of Ground Lead Attached

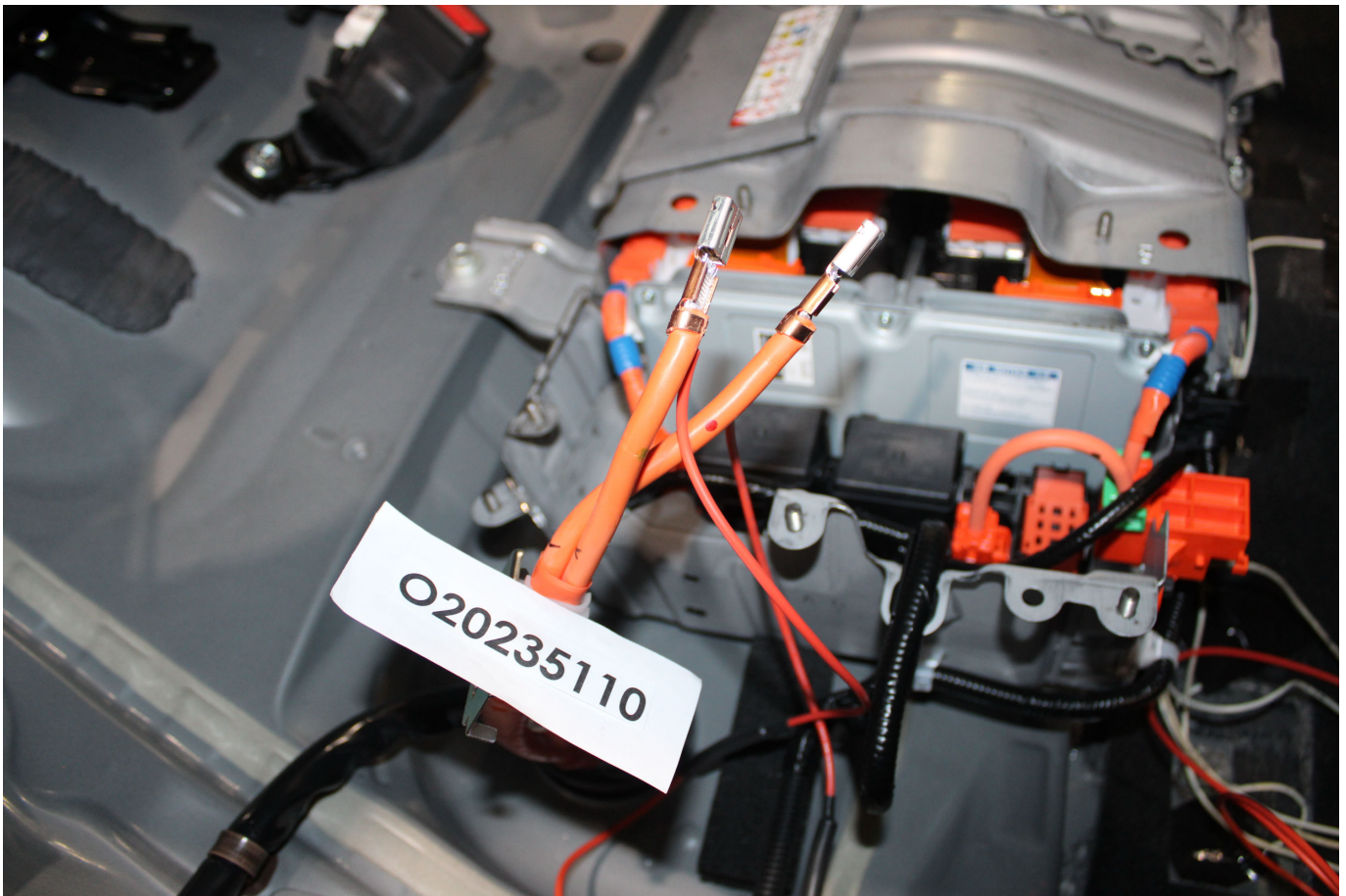


Photo No. 305-22 - Pre-Impact View of High Voltage Leads Attached

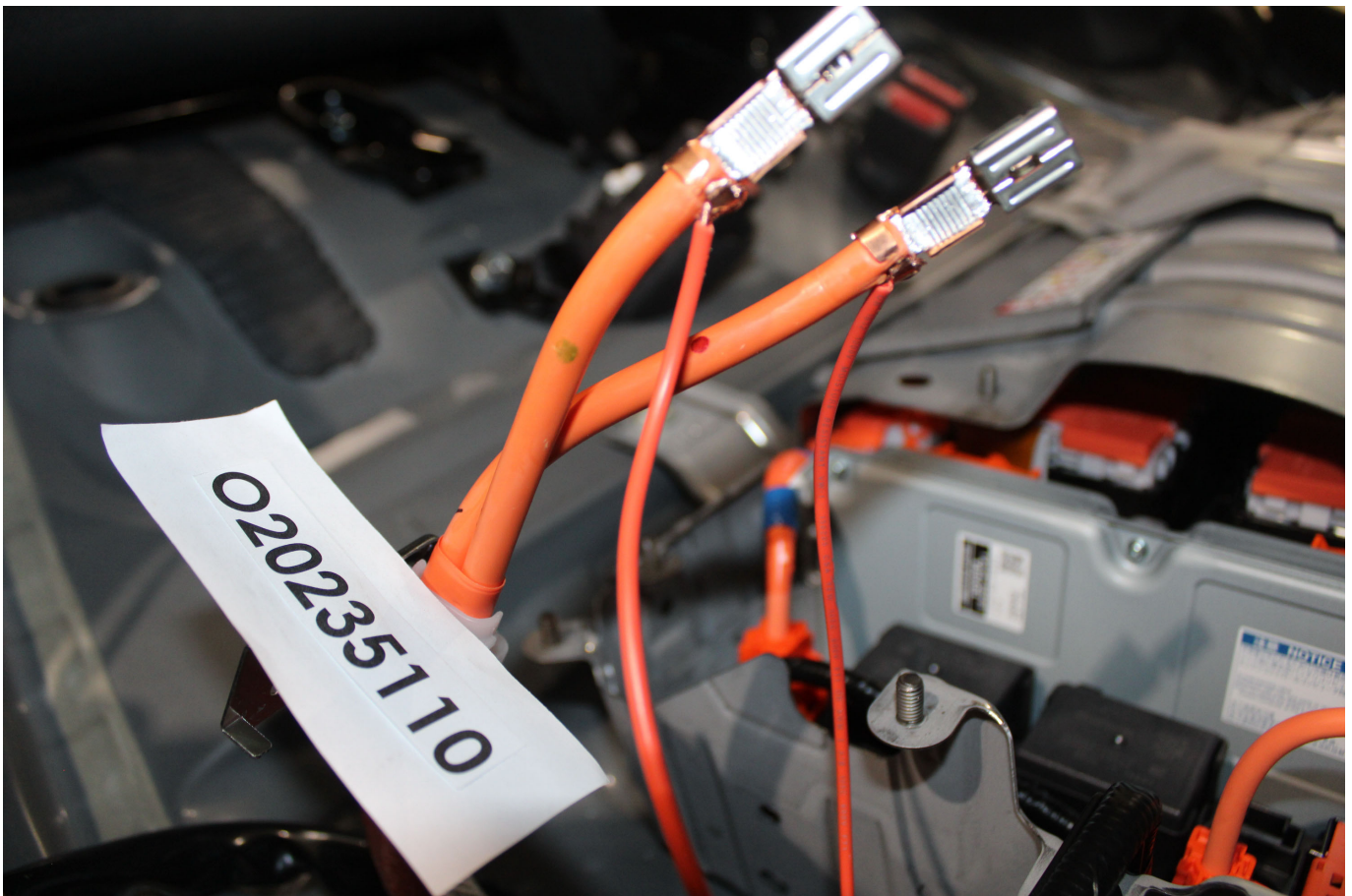


Photo No. 305-23 - Pre-Impact Close-Up View of High Voltage Leads Attached



Photo No. 305-24 - Pre-Impact View of Installed Test Interface Port

PHOTOGRAPH NOT AVAILABLE

Photo No. 305-25 - Post-Impact View of Installed Test Interface Port



Photo No. 305-26 - Pre-Impact View of Other Test Devices



Photo No. 305-27 - Post-Impact View of Other Test Devices



Photo No. 305-28 - FMVSS No. 305 Static Rollover at 90 Degrees



Photo No. 305-29 - FMVSS No. 305 Static Rollover at 180 Degrees

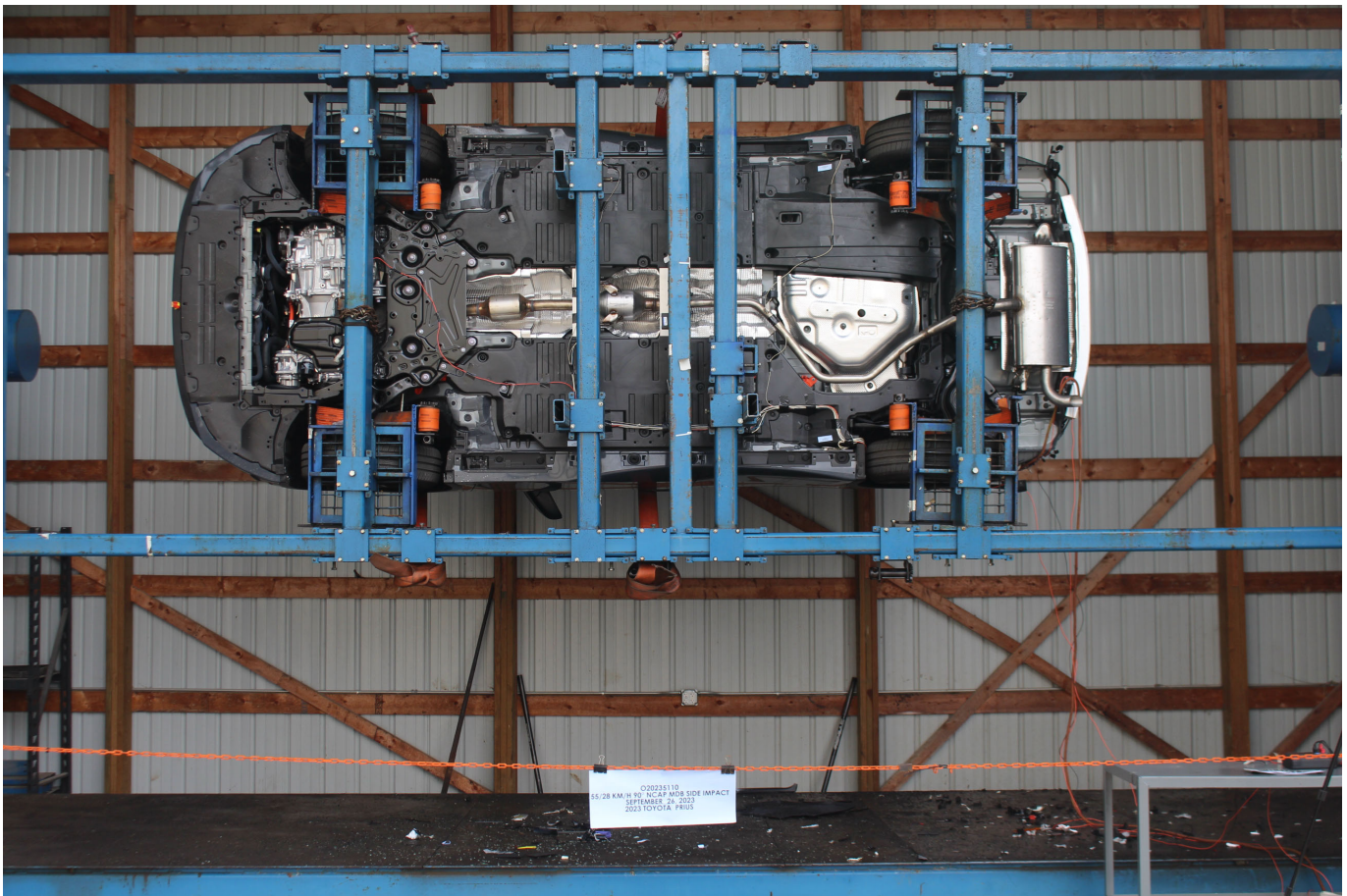


Photo No. 305-30 - FMVSS No. 305 Static Rollover at 270 Degrees



Photo No. 305-31 - FMVSS No. 305 Static Rollover at 360 Degrees



Photo No. 305-32 - Pre-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery



Photo No. 305-33 - Post-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-34 - Post-Impact Propulsion Battery System Mounting and-or Intrusion Failure(s)

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-35 - Post-Impact View of Battery Component Intrusion

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-36 - Post-Impact View of Battery Module Movement or Retention Loss

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-37 - Post-Impact View of Propulsion Battery Electrolyte Spillage Location

PHOTOGRAPH NOT APPLICABLE

Photo No. 305-38 - Post-Test View of Propulsion Battery Electrolyte Spillage Location

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)

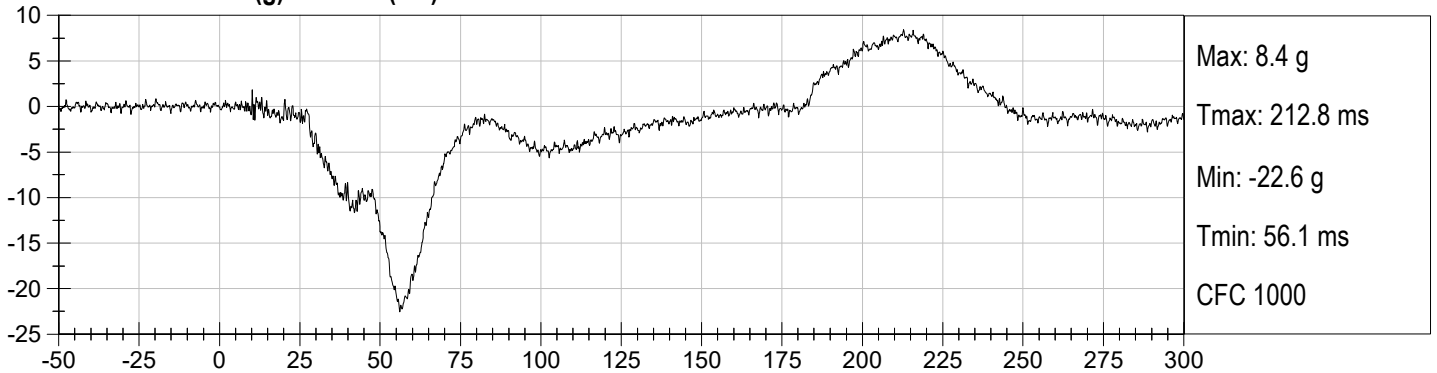
MDB Rear Acceleration (X)

MDB Rear Acceleration (Y)

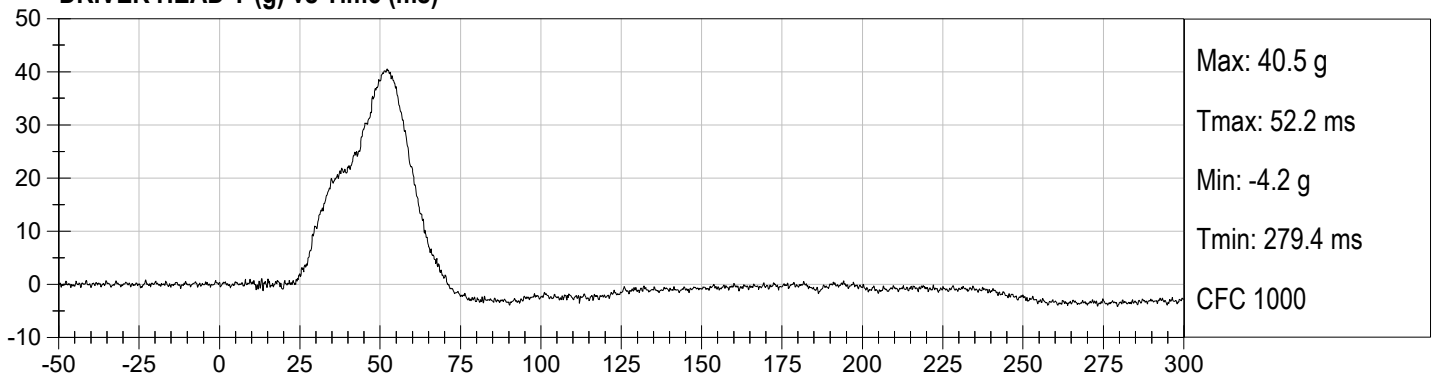
Left MDB Contact Switch

Right MDB Contact Switch

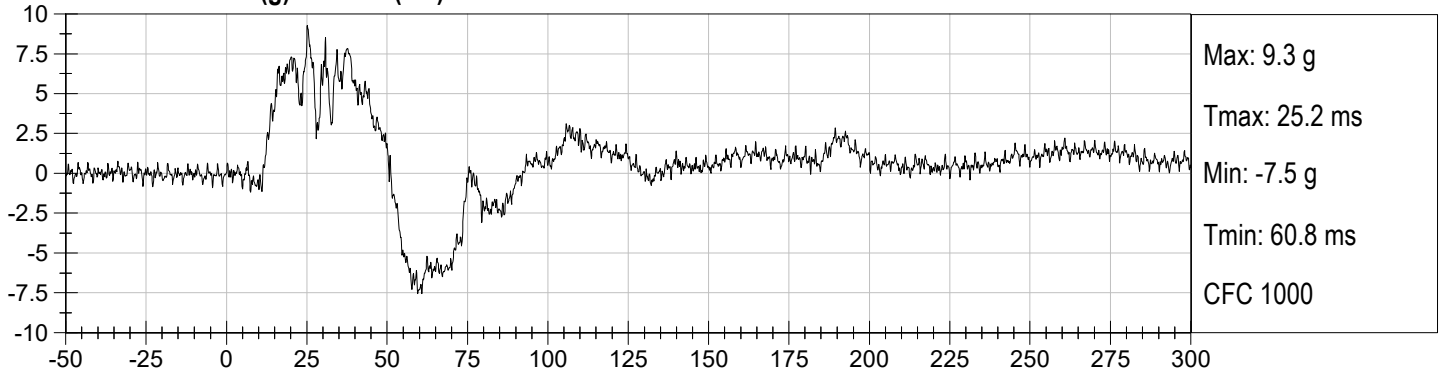
DRIVER HEAD X (g) vs Time (ms)



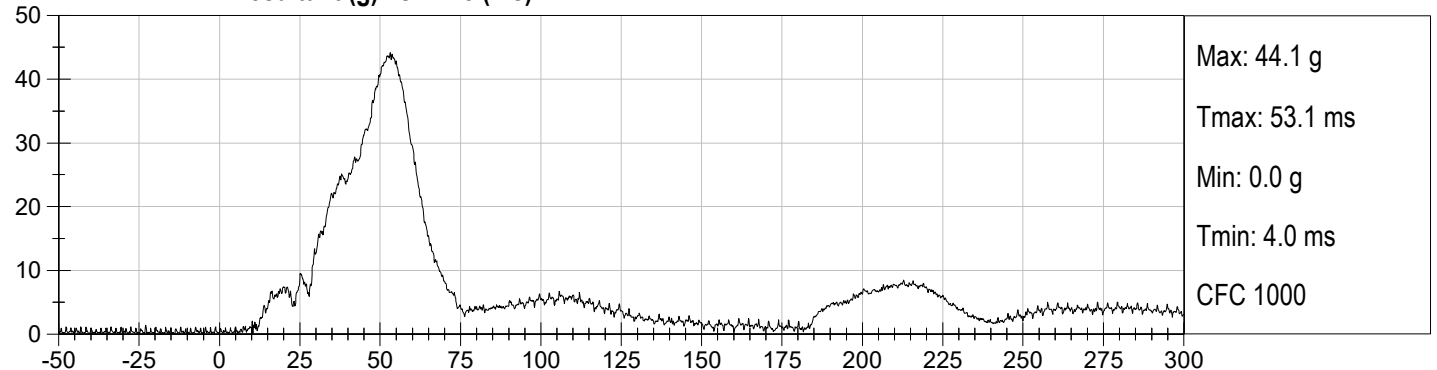
DRIVER HEAD Y (g) vs Time (ms)



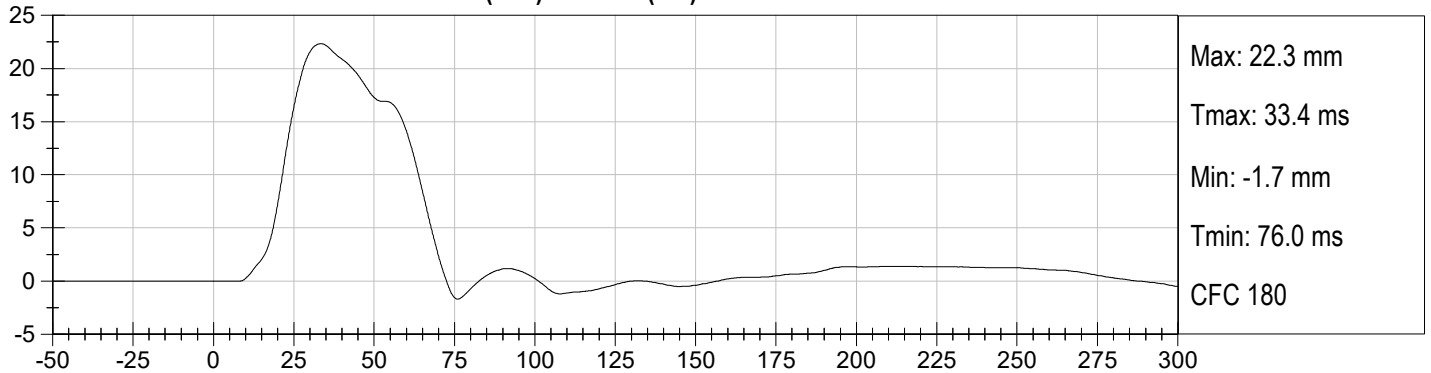
DRIVER HEAD Z (g) vs Time (ms)



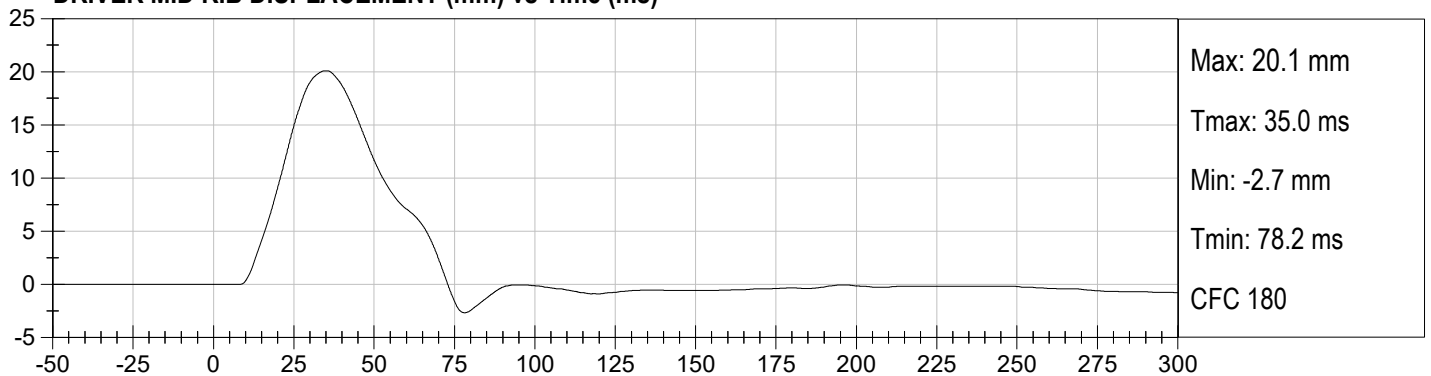
DRIVER HEAD Resultant (g) vs Time (ms)



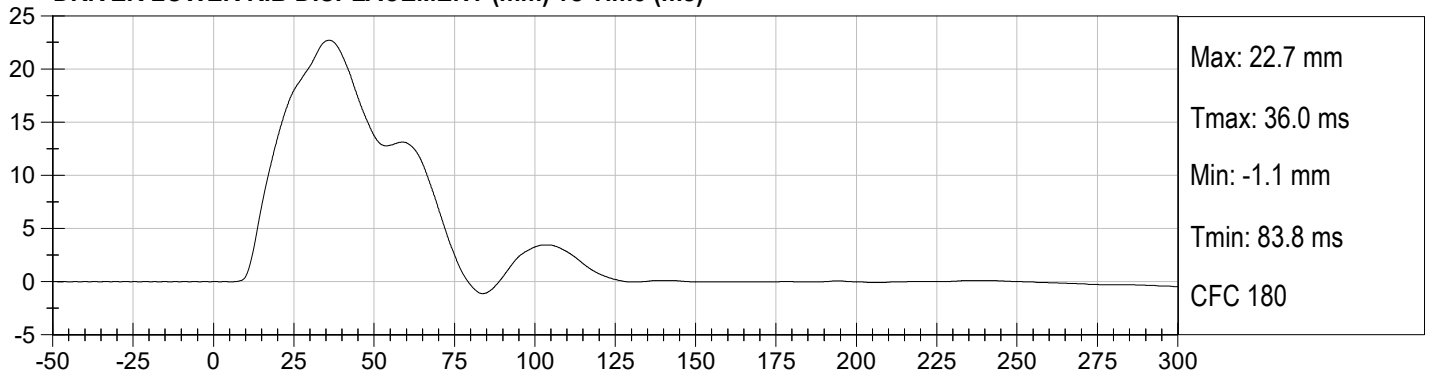
DRIVER UPPER RIB DISPLACEMENT (mm) vs Time (ms)



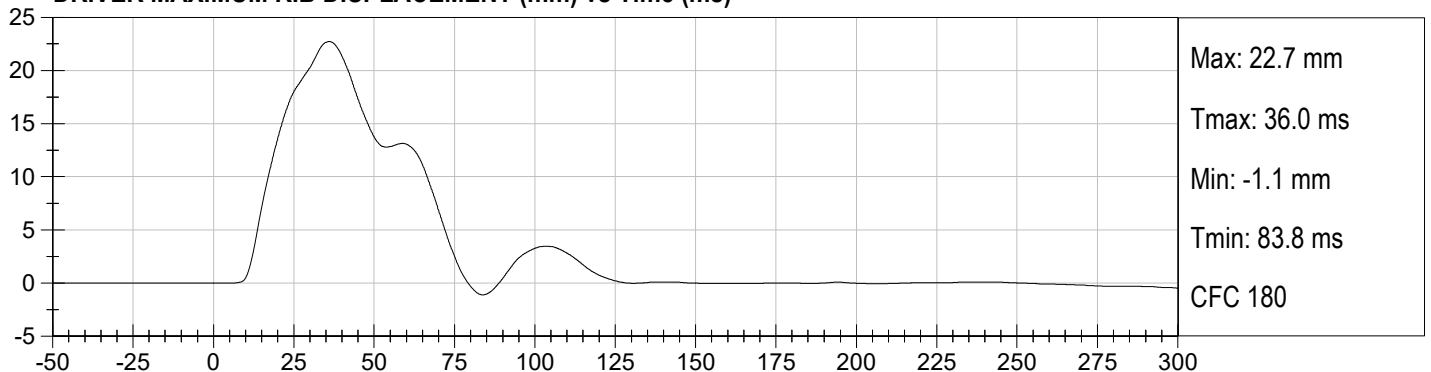
DRIVER MID RIB DISPLACEMENT (mm) vs Time (ms)



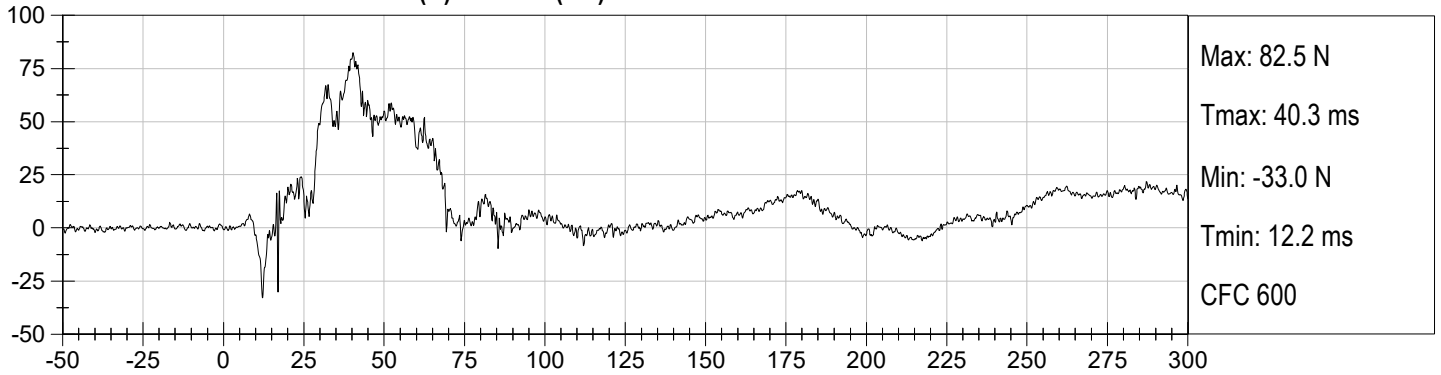
DRIVER LOWER RIB DISPLACEMENT (mm) vs Time (ms)



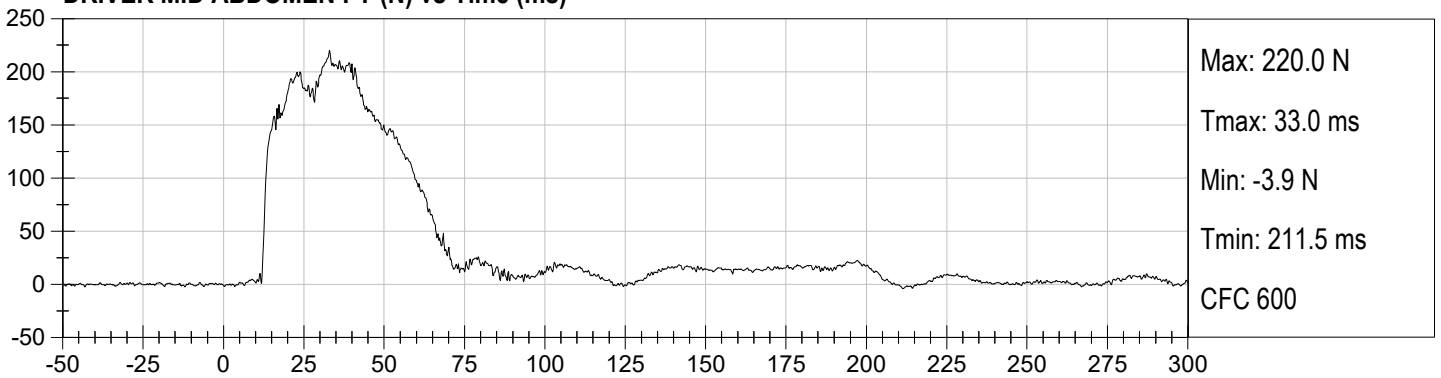
DRIVER MAXIMUM RIB DISPLACEMENT (mm) vs Time (ms)



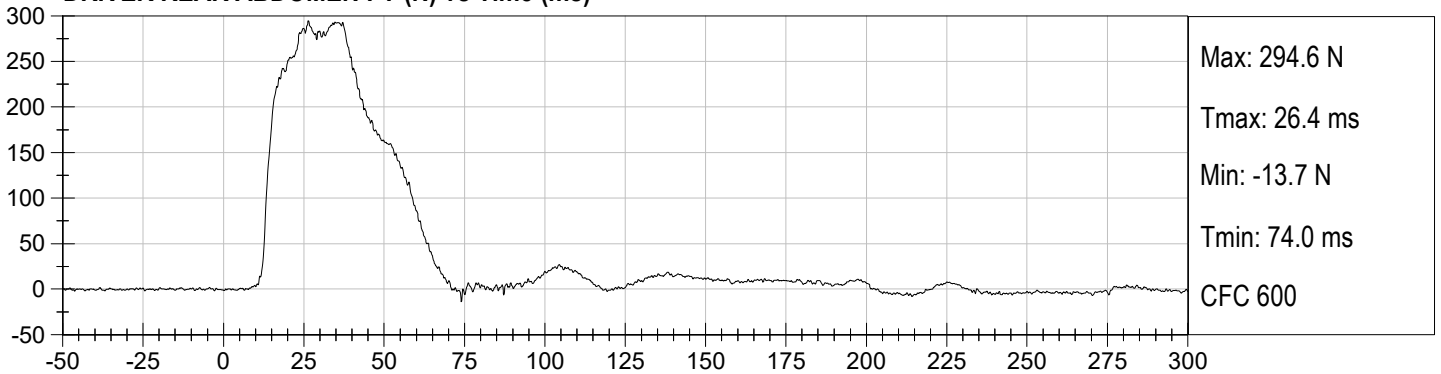
DRIVER FRONT ABDOMEN FY (N) vs Time (ms)



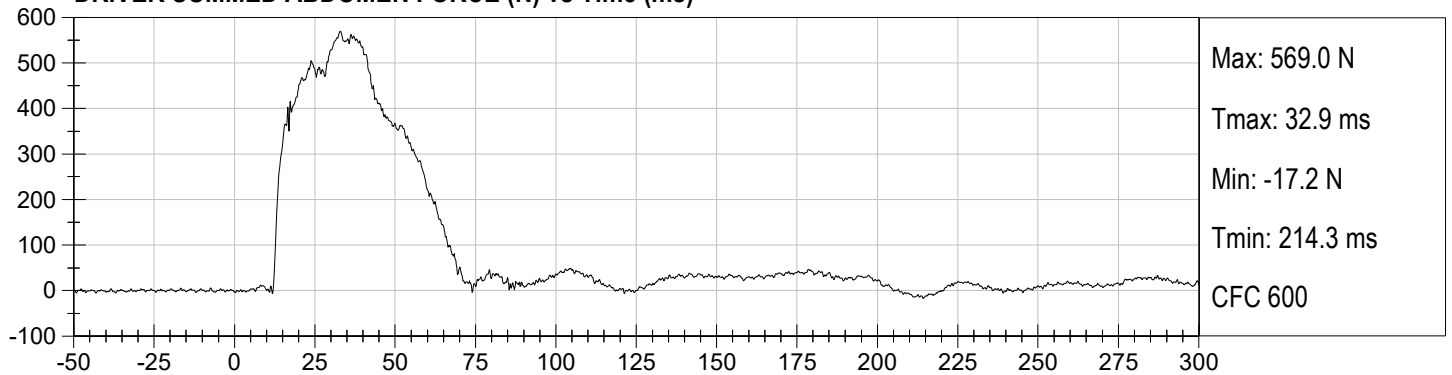
DRIVER MID ABDOMEN FY (N) vs Time (ms)

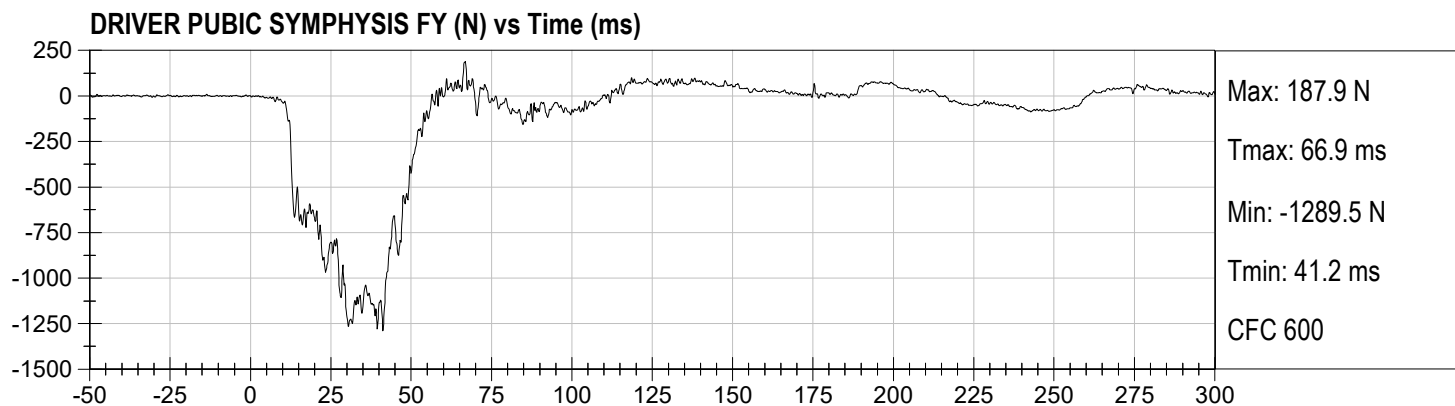


DRIVER REAR ABDOMEN FY (N) vs Time (ms)

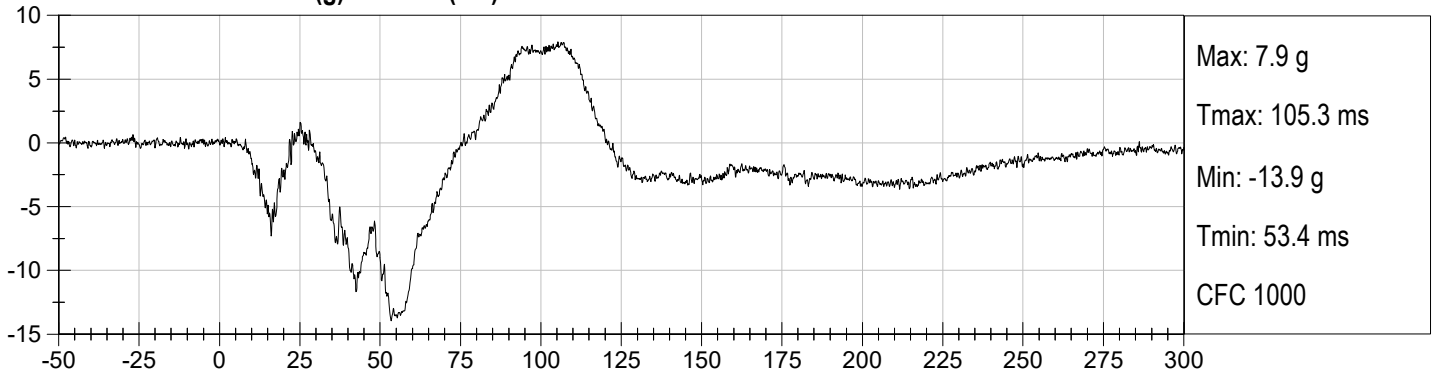


DRIVER SUMMED ABDOMEN FORCE (N) vs Time (ms)

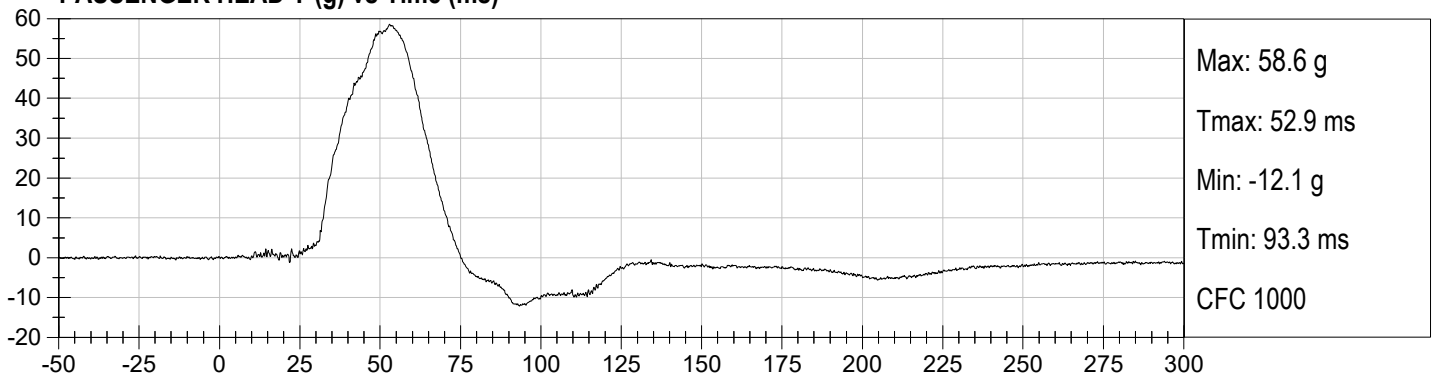




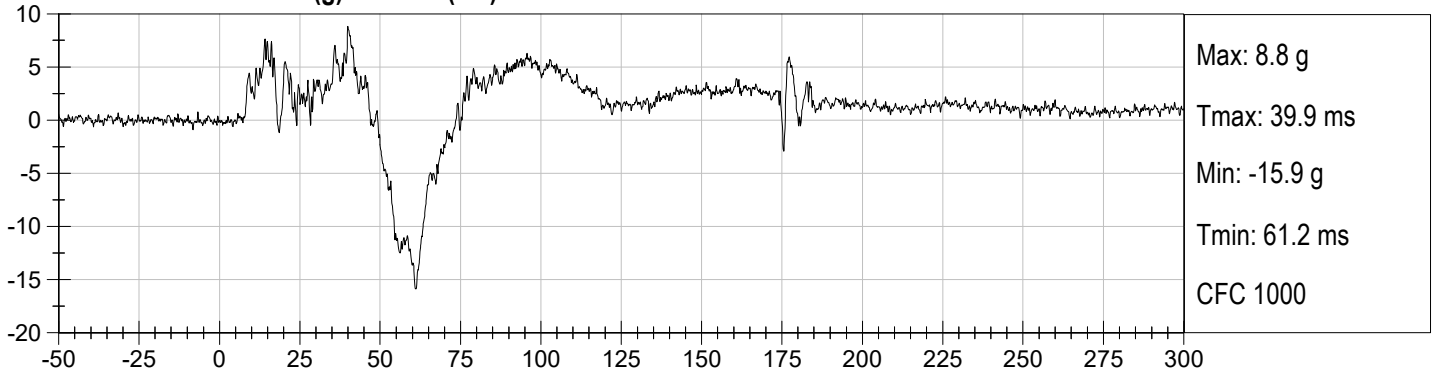
PASSENGER HEAD X (g) vs Time (ms)



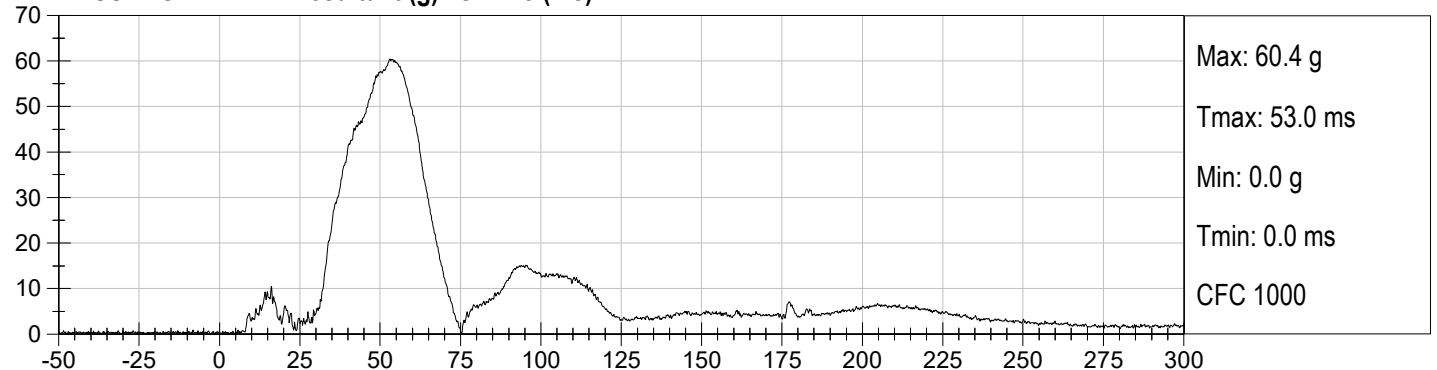
PASSENGER HEAD Y (g) vs Time (ms)

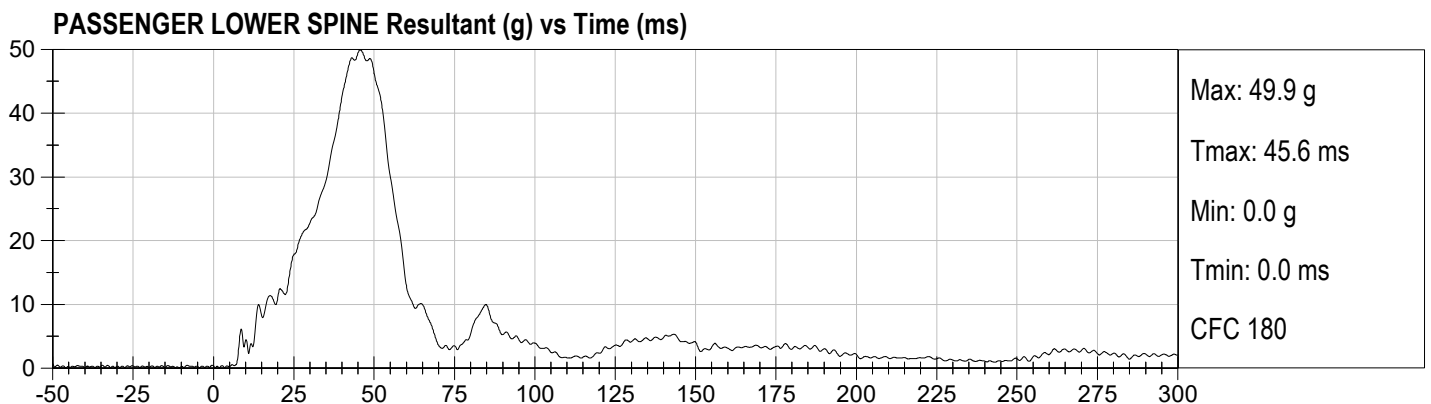
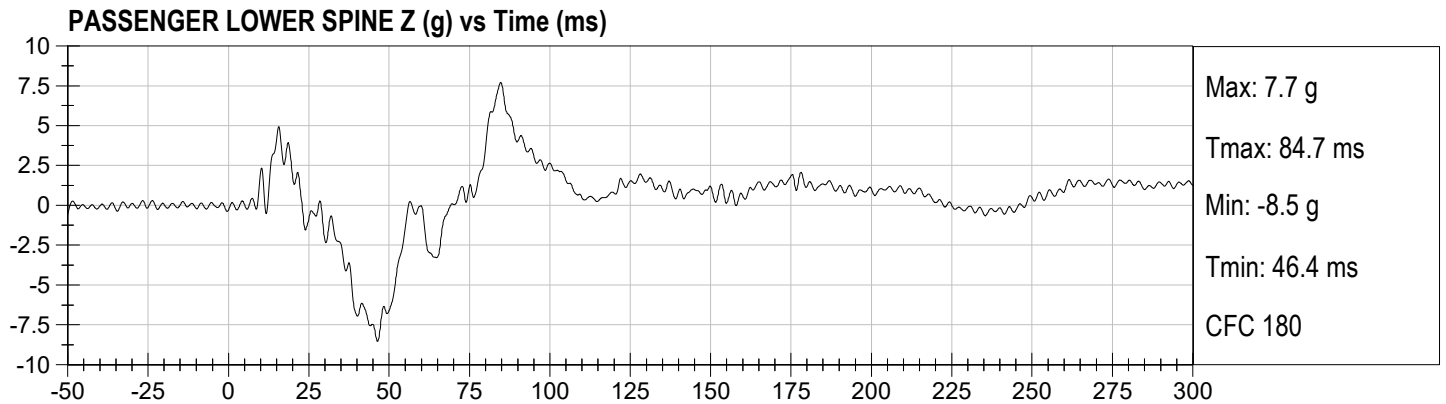
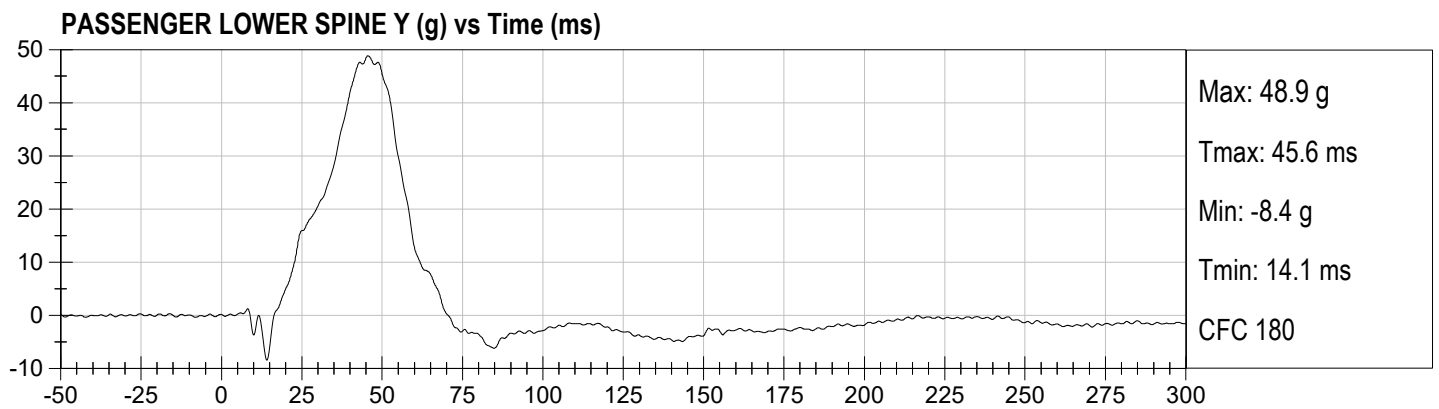
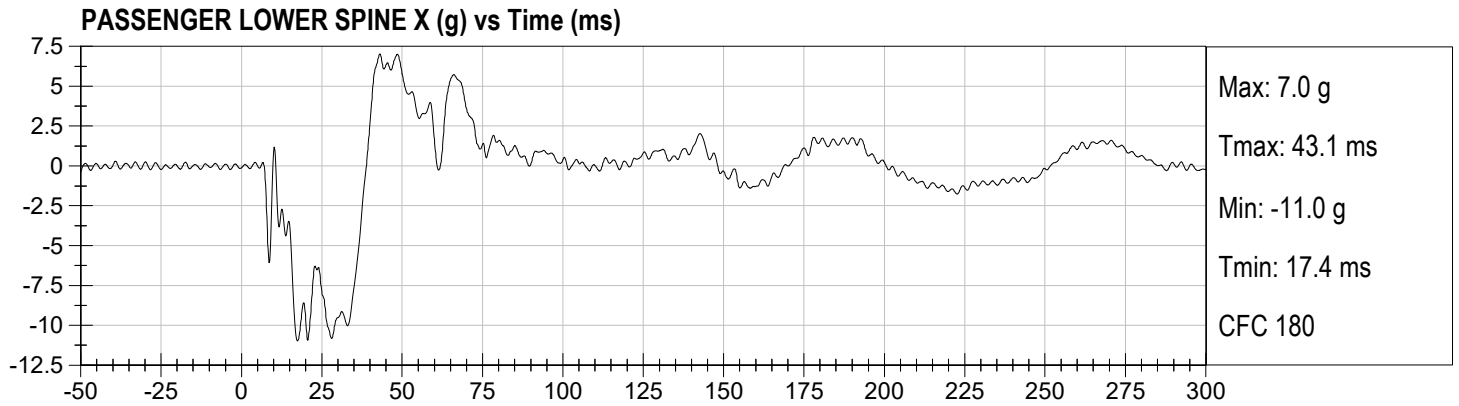


PASSENGER HEAD Z (g) vs Time (ms)

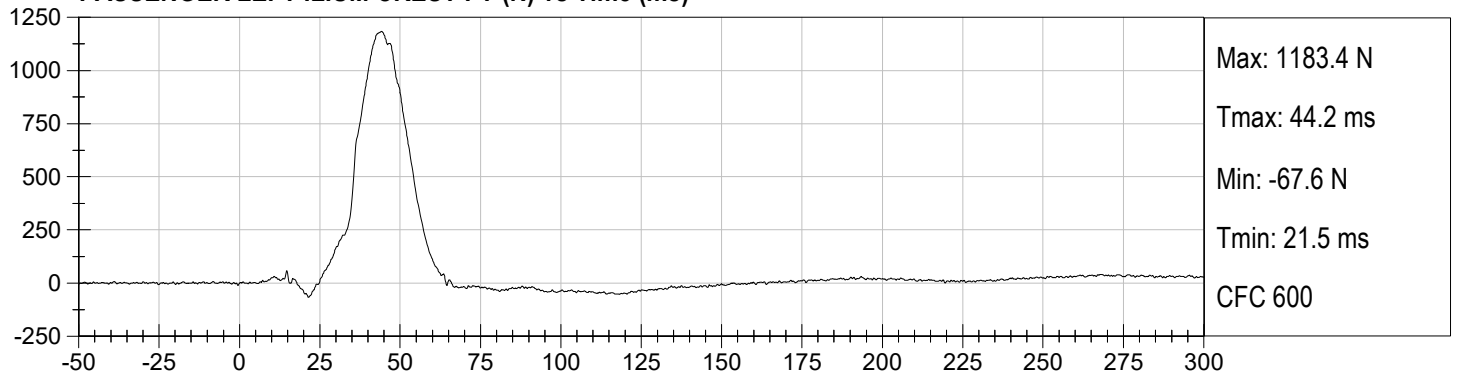


PASSENGER HEAD Resultant (g) vs Time (ms)

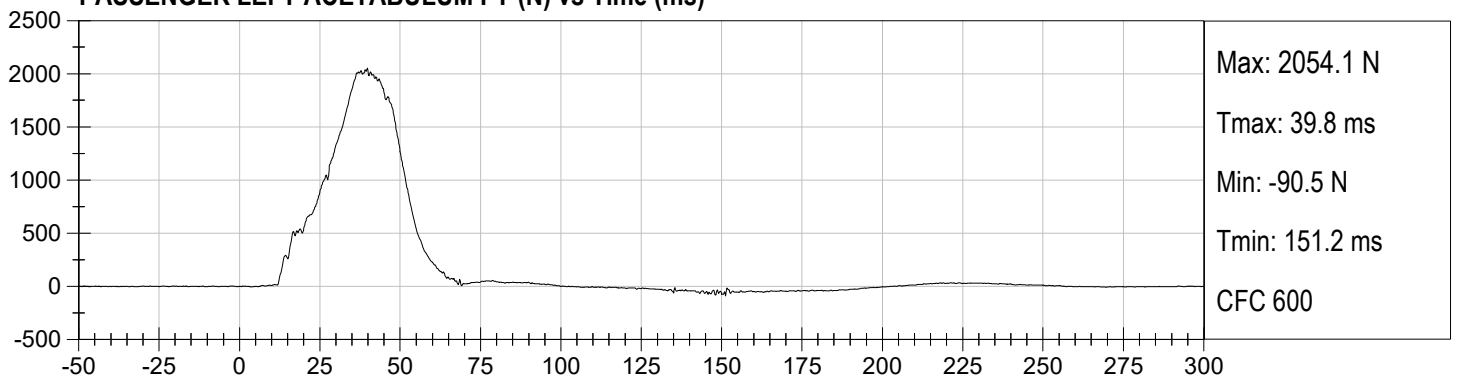




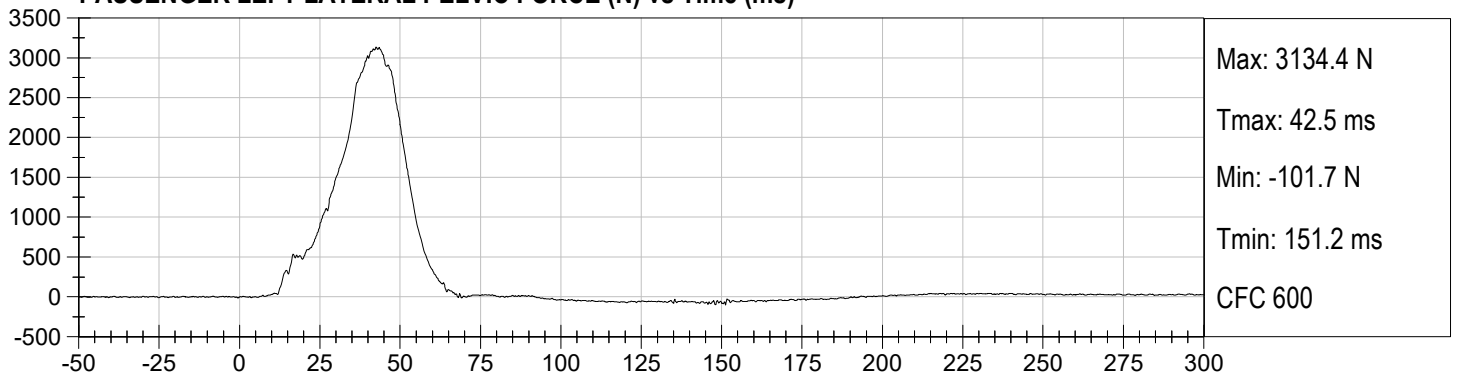
PASSENGER LEFT ILIUM CREST FY (N) vs Time (ms)



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



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



APPENDIX C
DUMMY QUALIFICATION AND PERFORMANCE VERIFICATION

QUALIFICATION TEST RESULTS

PRE-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

ES-2re External Measurements
SN: F032

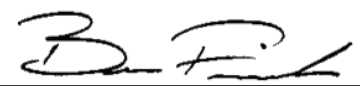
No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157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

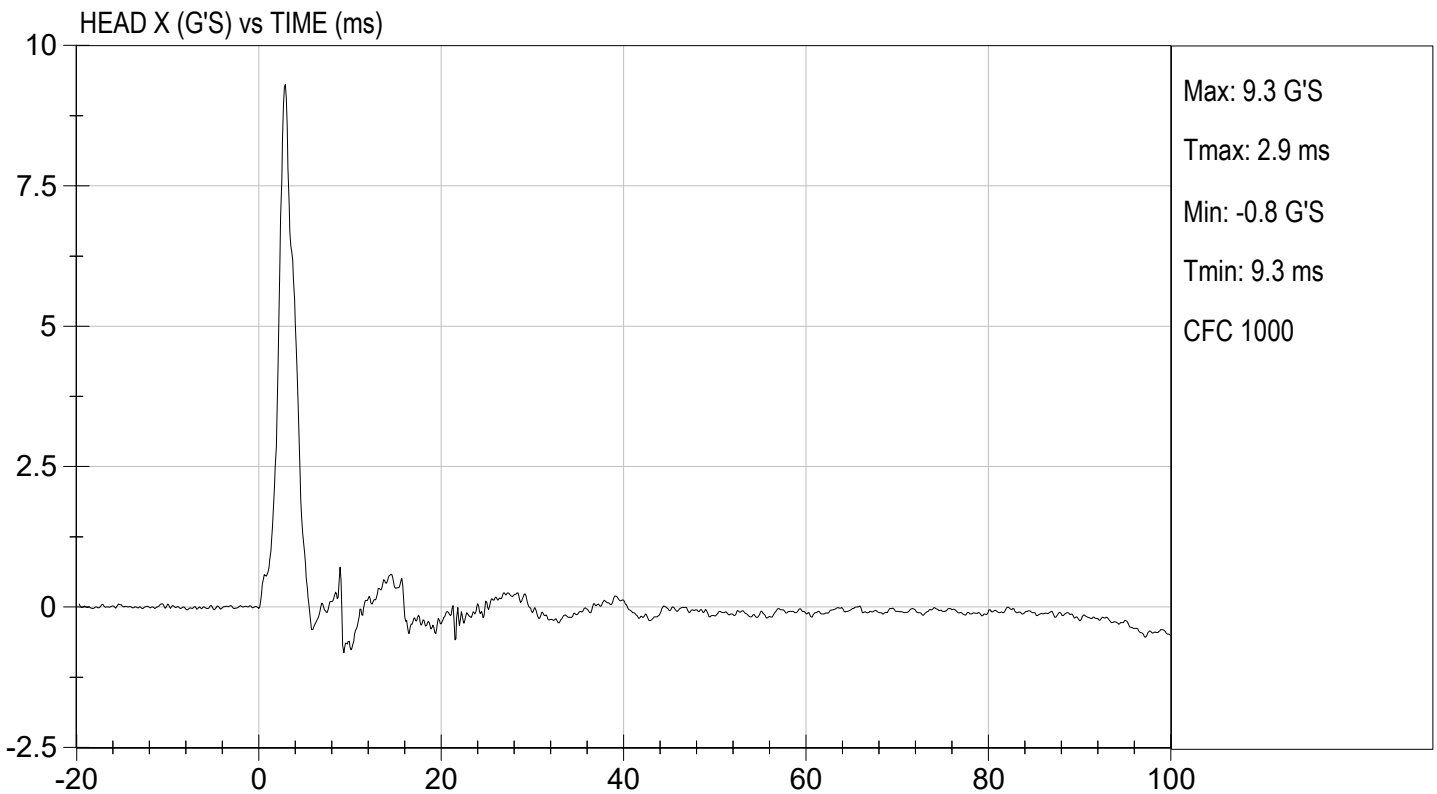
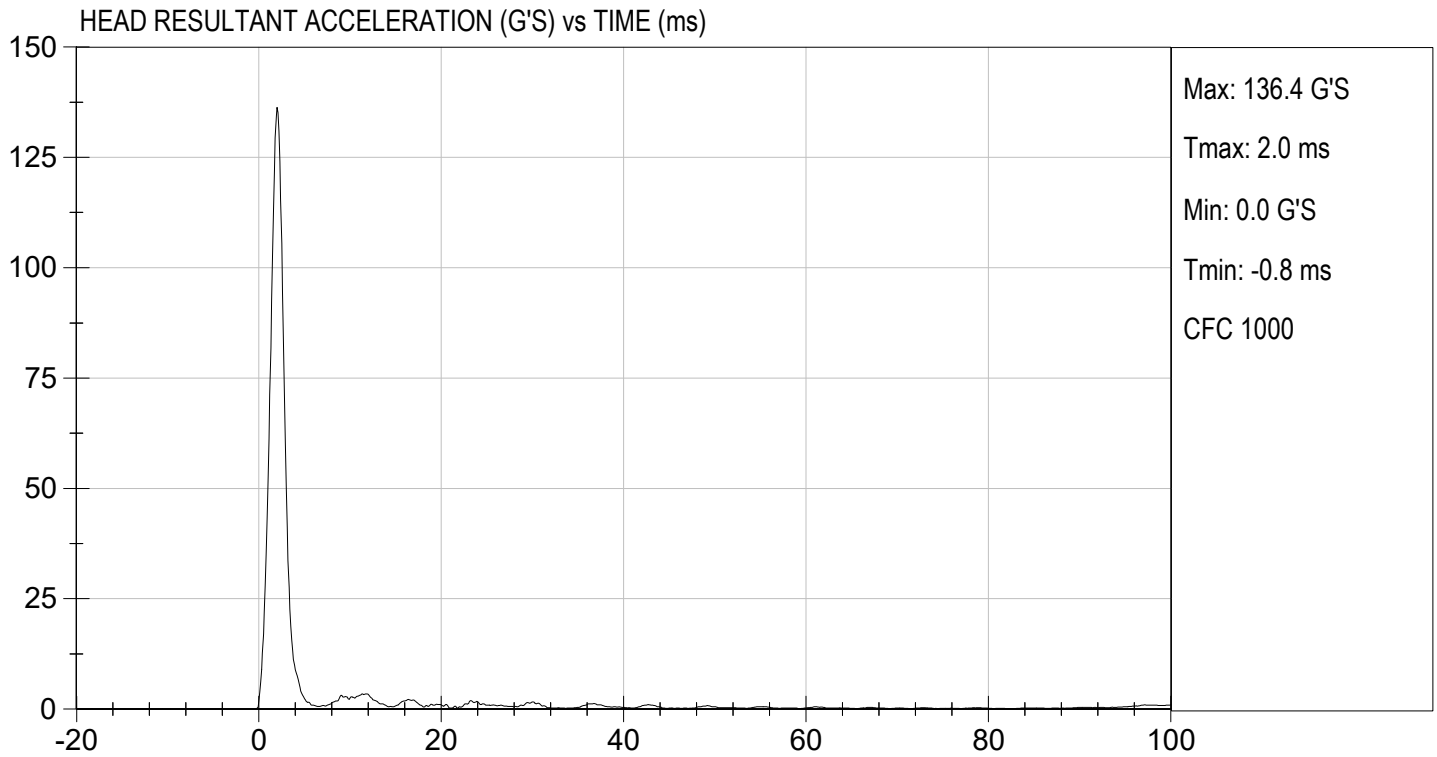
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY**ATD Serial No: F032Test ID: D232491

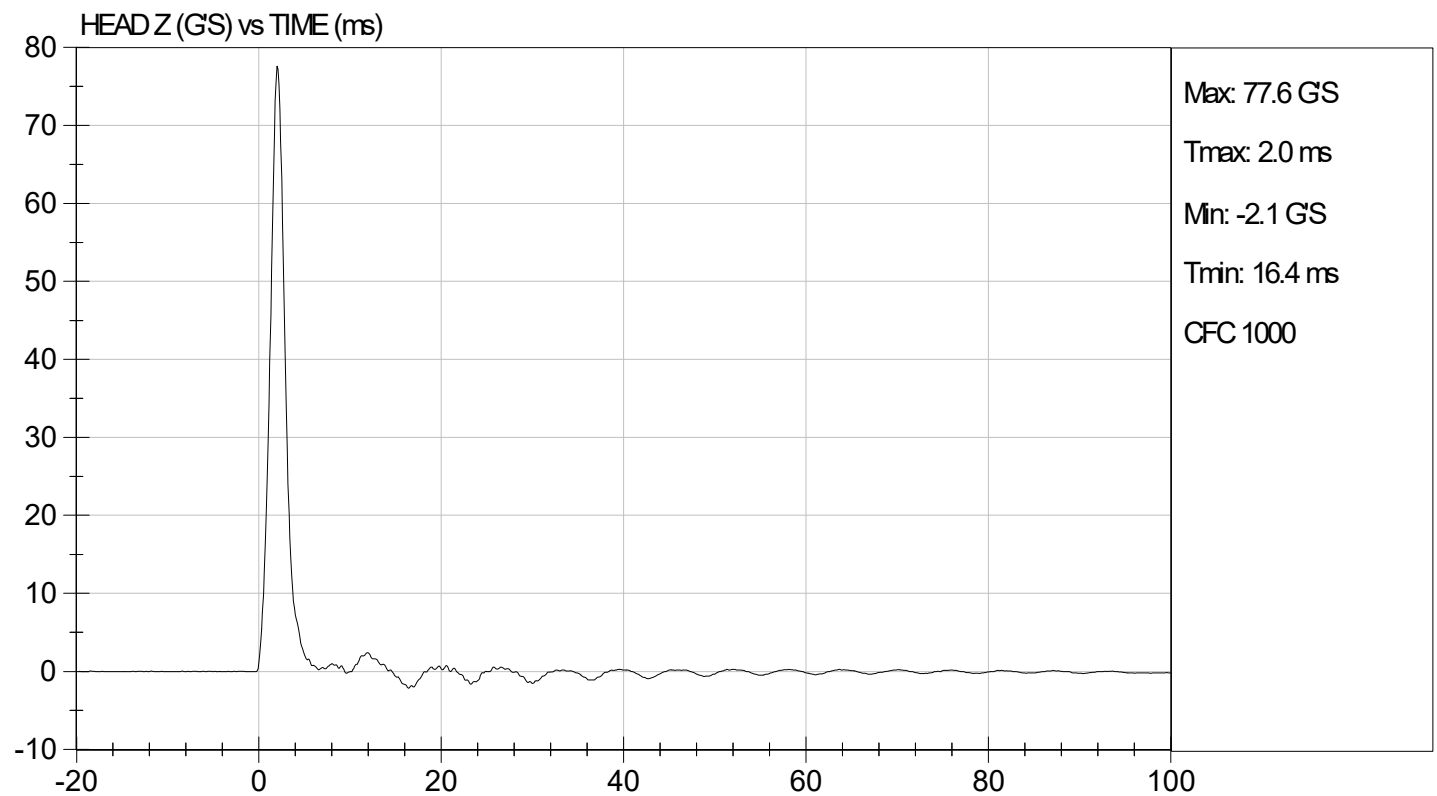
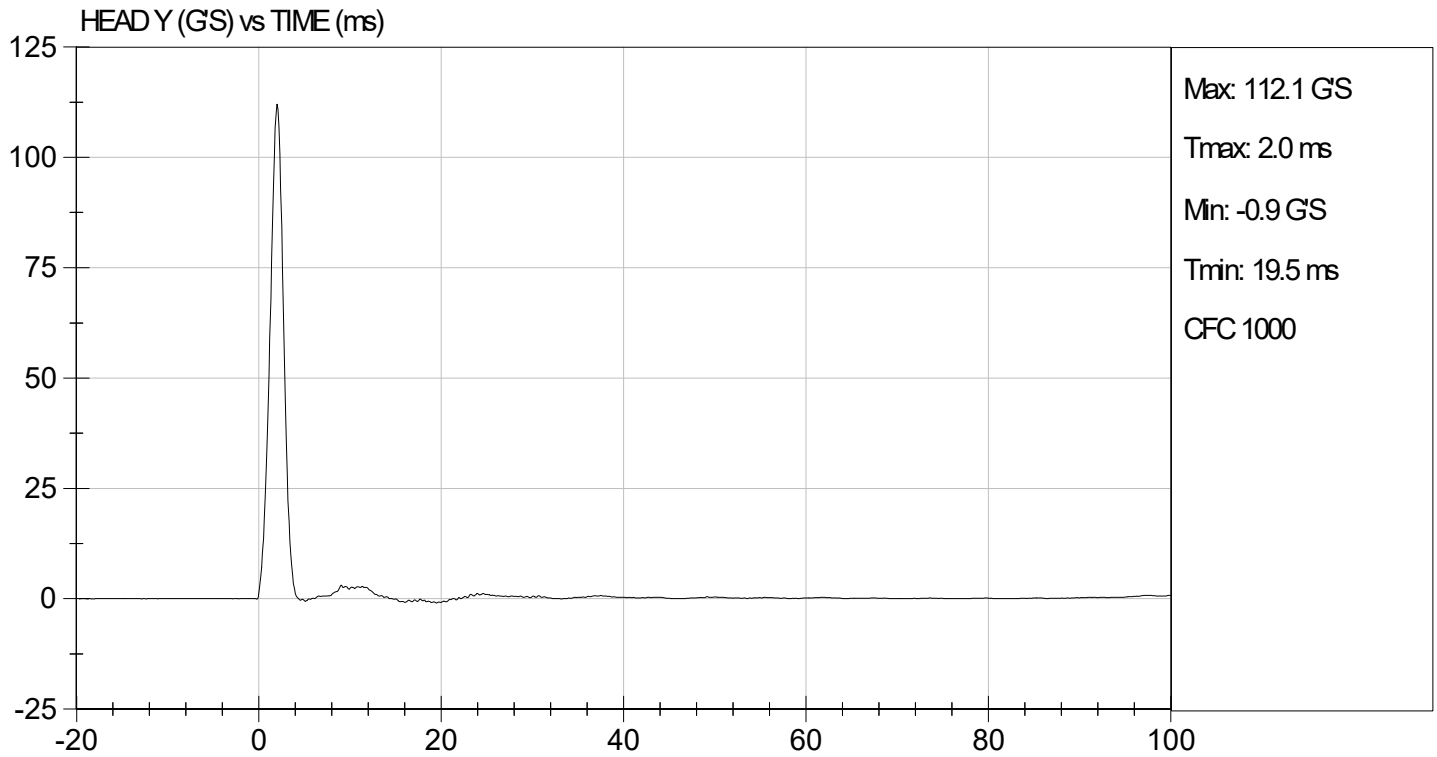
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Peak Resultant Acceleration	G's	125 to 155	136	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	9.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
			Overall Test Results	Pass


Laboratory Technician

09/15/2023
Test Date


Approved By





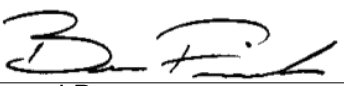
MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: F032

Test I.D: D232492

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	44	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	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.56	Pass
	17 ms	m/s	>= -3.70	-3.56	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	50.3	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	59.5	Pass
Overall Results					Pass


 Laboratory Technician

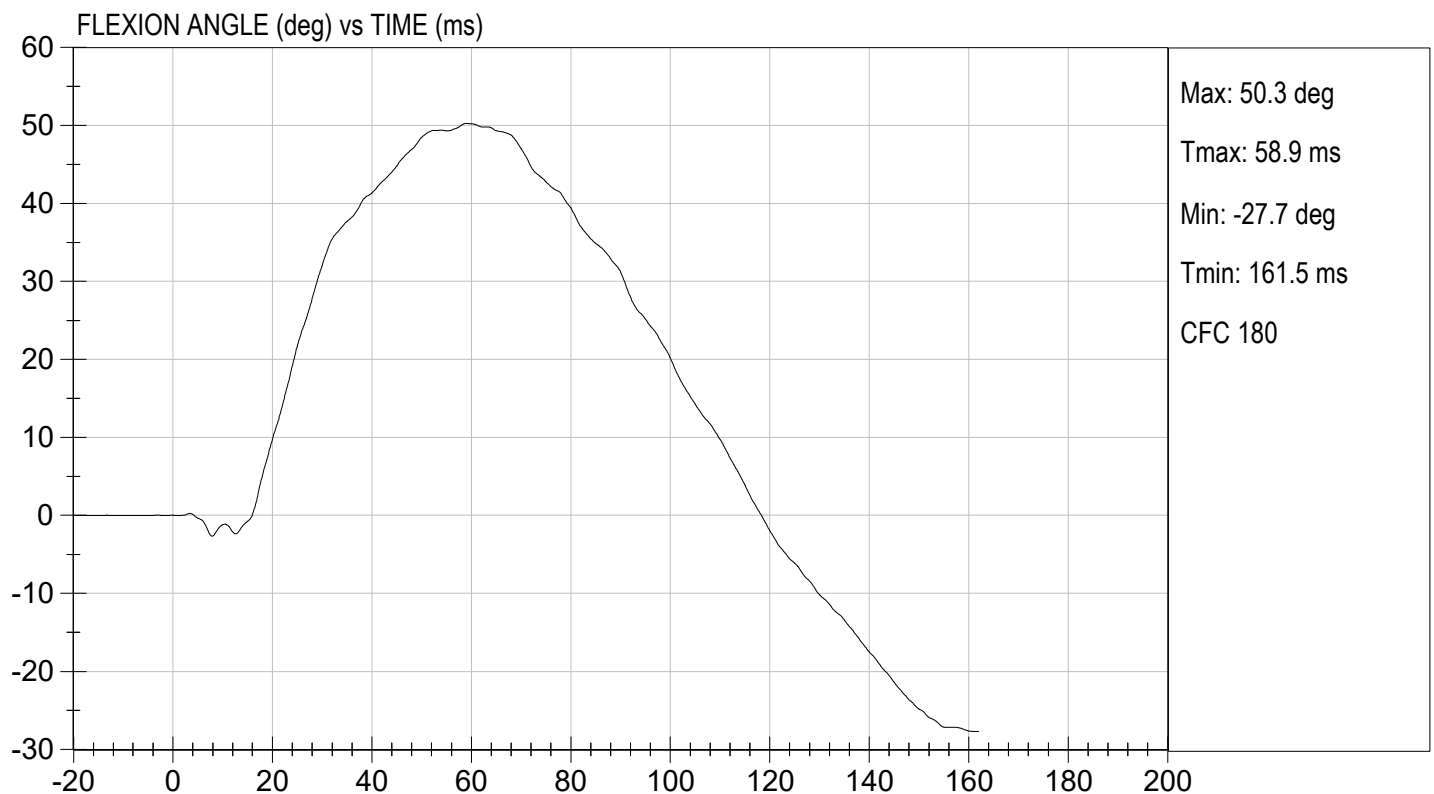
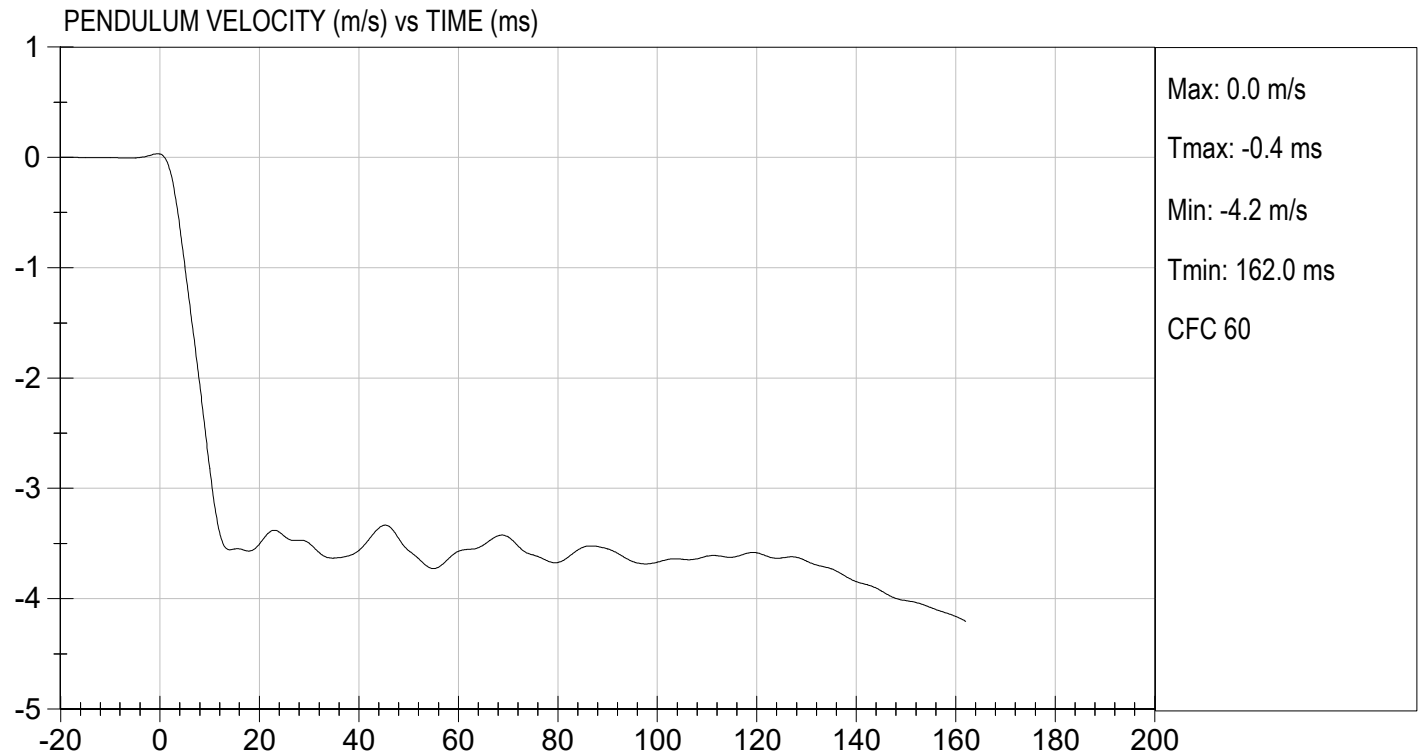

 Approved By

09/15/2023
 Test Date



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

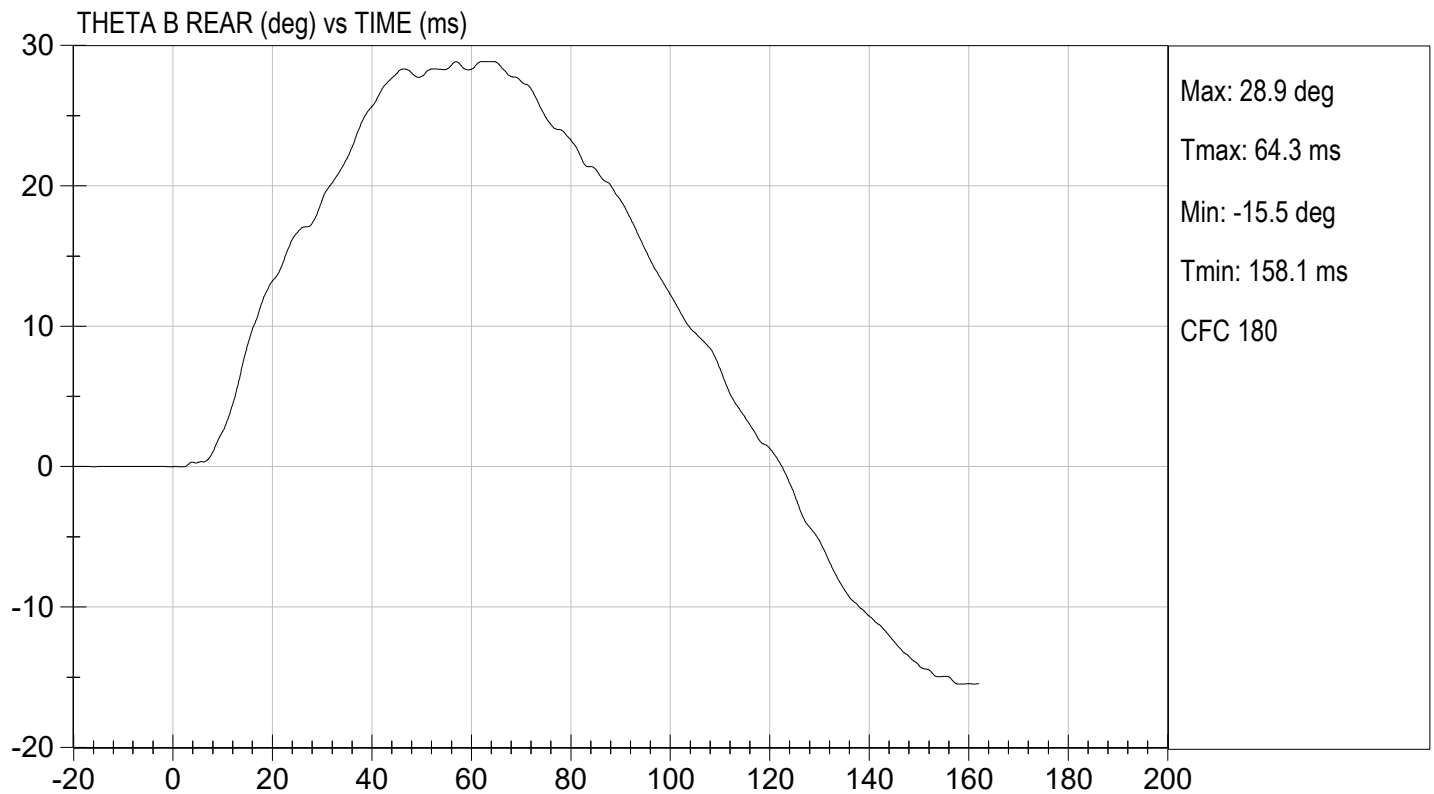
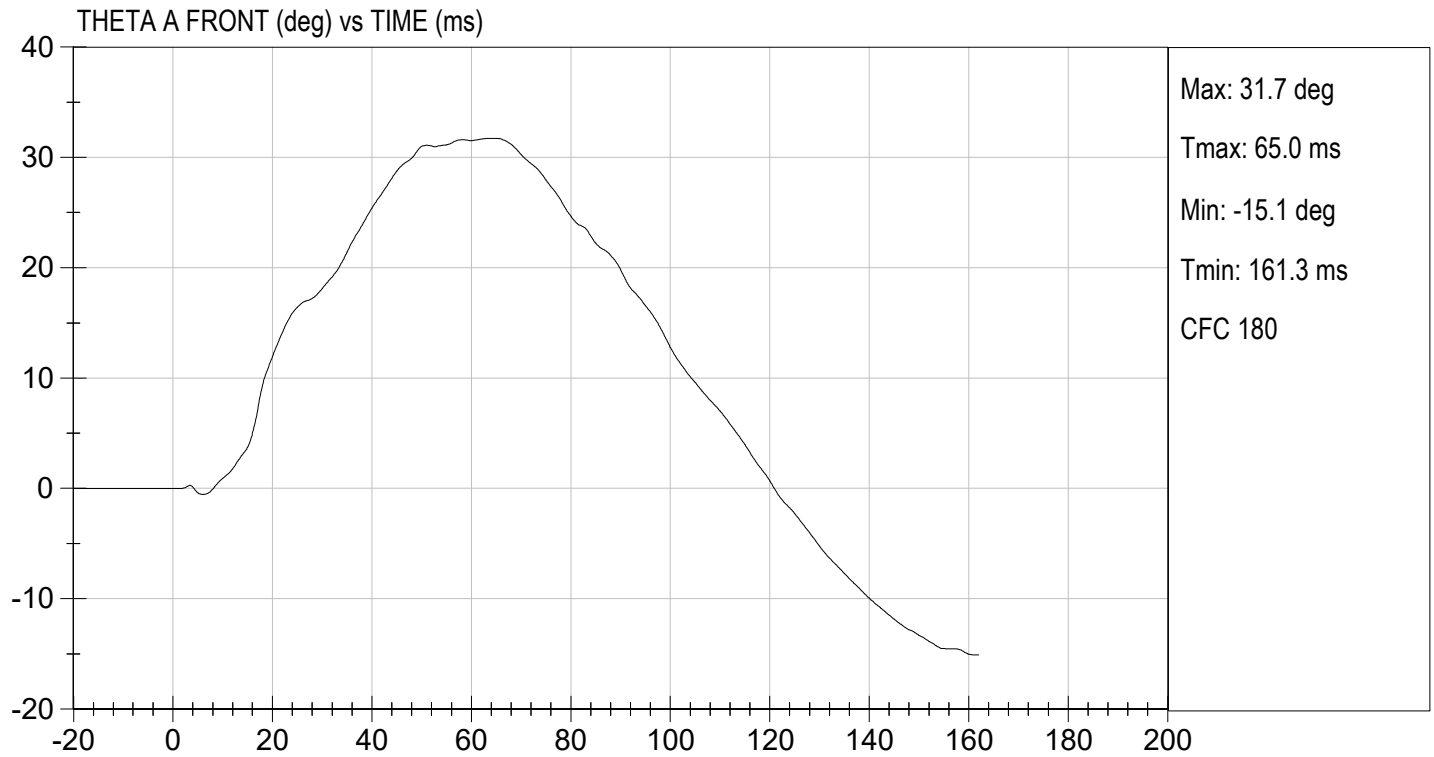
TEST DATE: 09/15/2023
TEST #: D232492





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

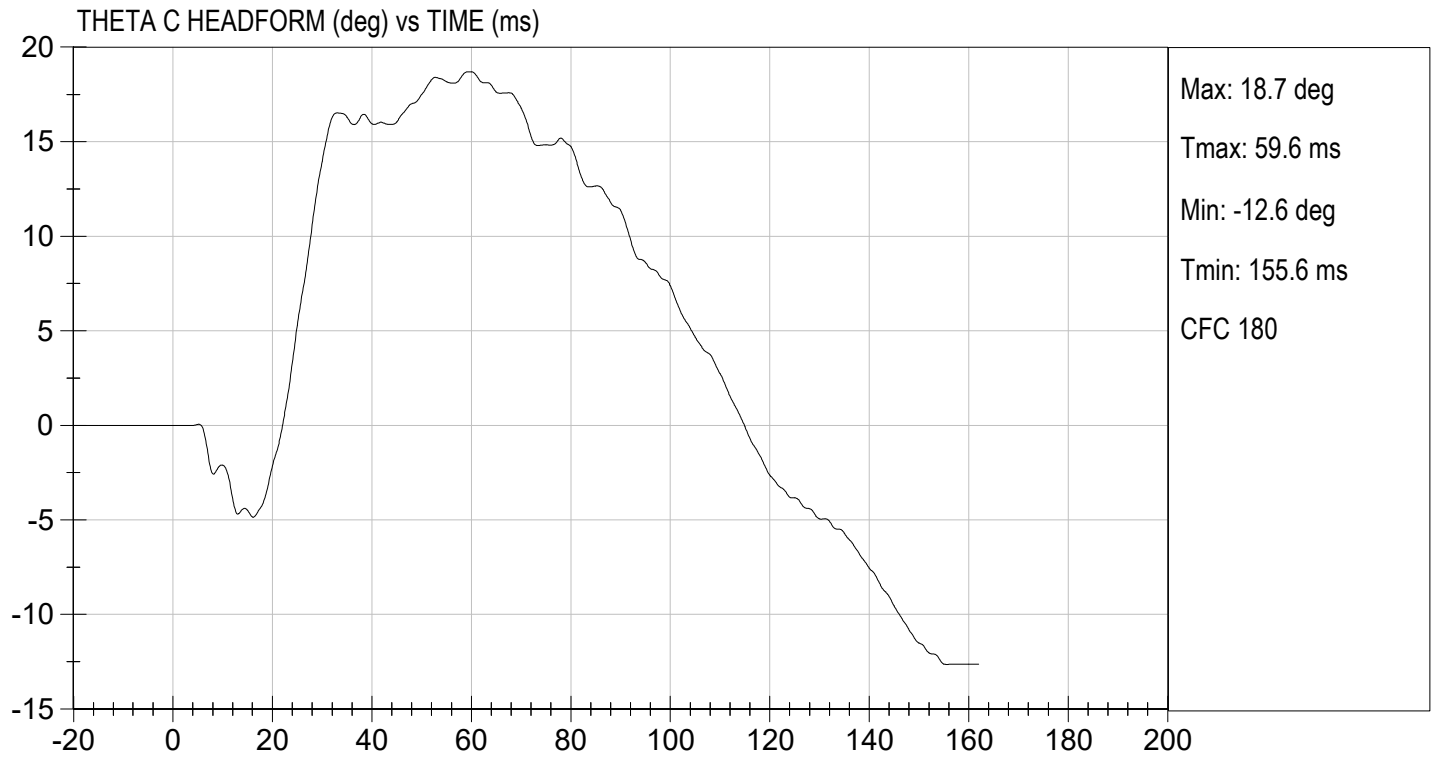
TEST DATE: 09/15/2023
TEST #: D232492





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

TEST DATE: 09/15/2023
TEST #: D232492



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

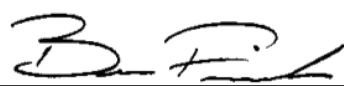
ATD Serial No: F032

Test I.D: D232493

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.2	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.5	Pass
Overall Test Results				Pass


Laboratory Technician

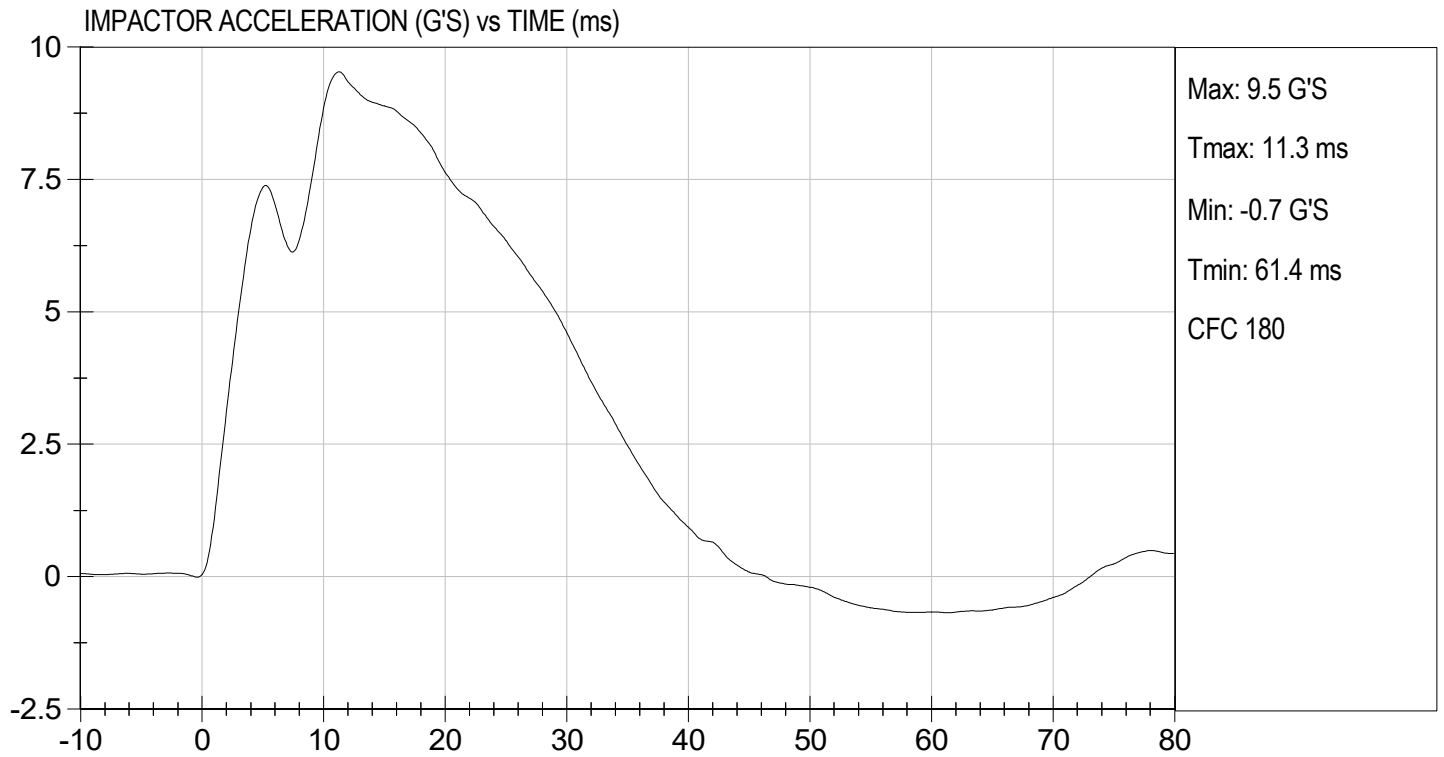
09/15/2023
Test Date


Approved By



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

TEST DATE: 09/15/2023
TEST #: D232493



MGA RESEARCH CORPORATION

UPPER RIB TEST

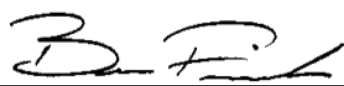
ES-2re DUMMY

ATD Serial No: F032

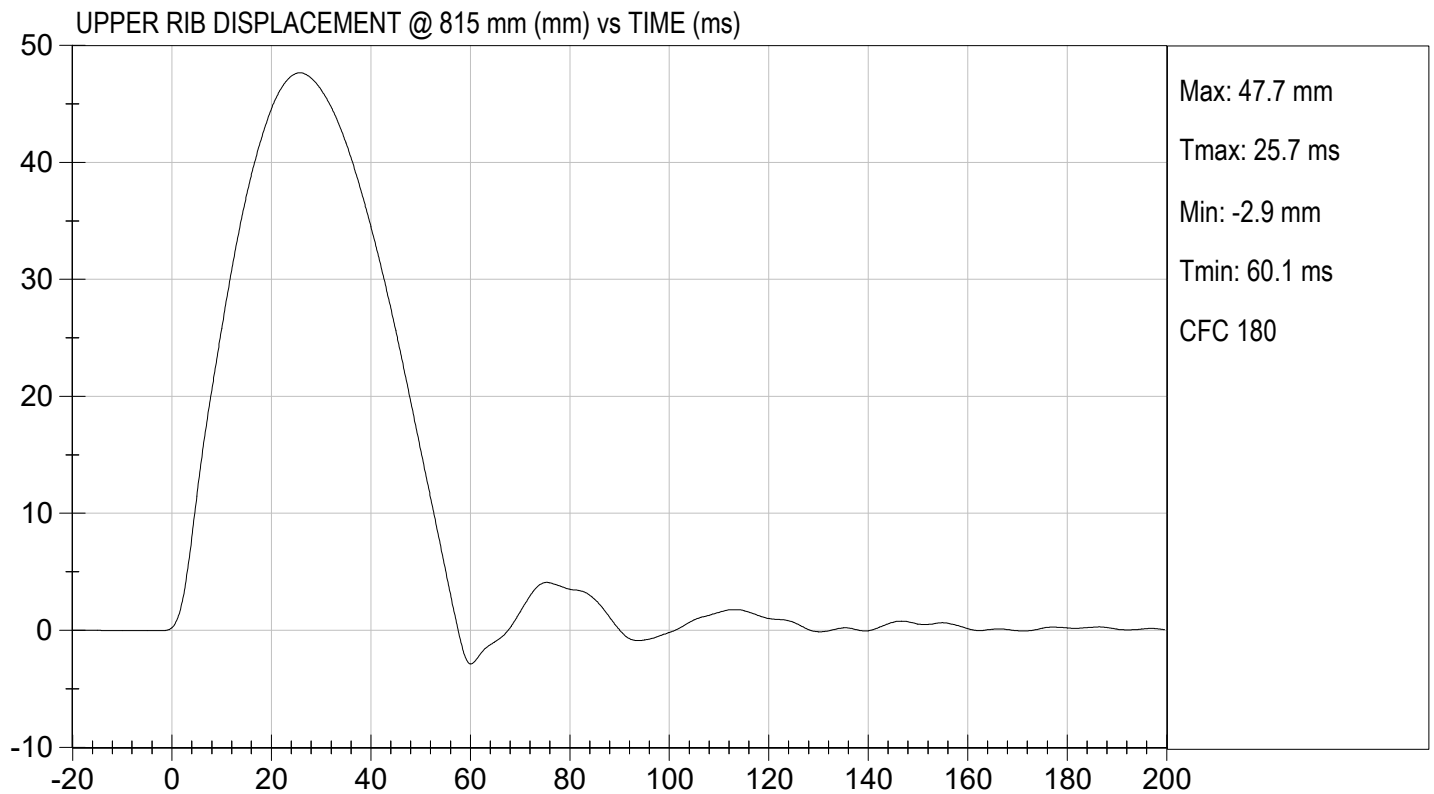
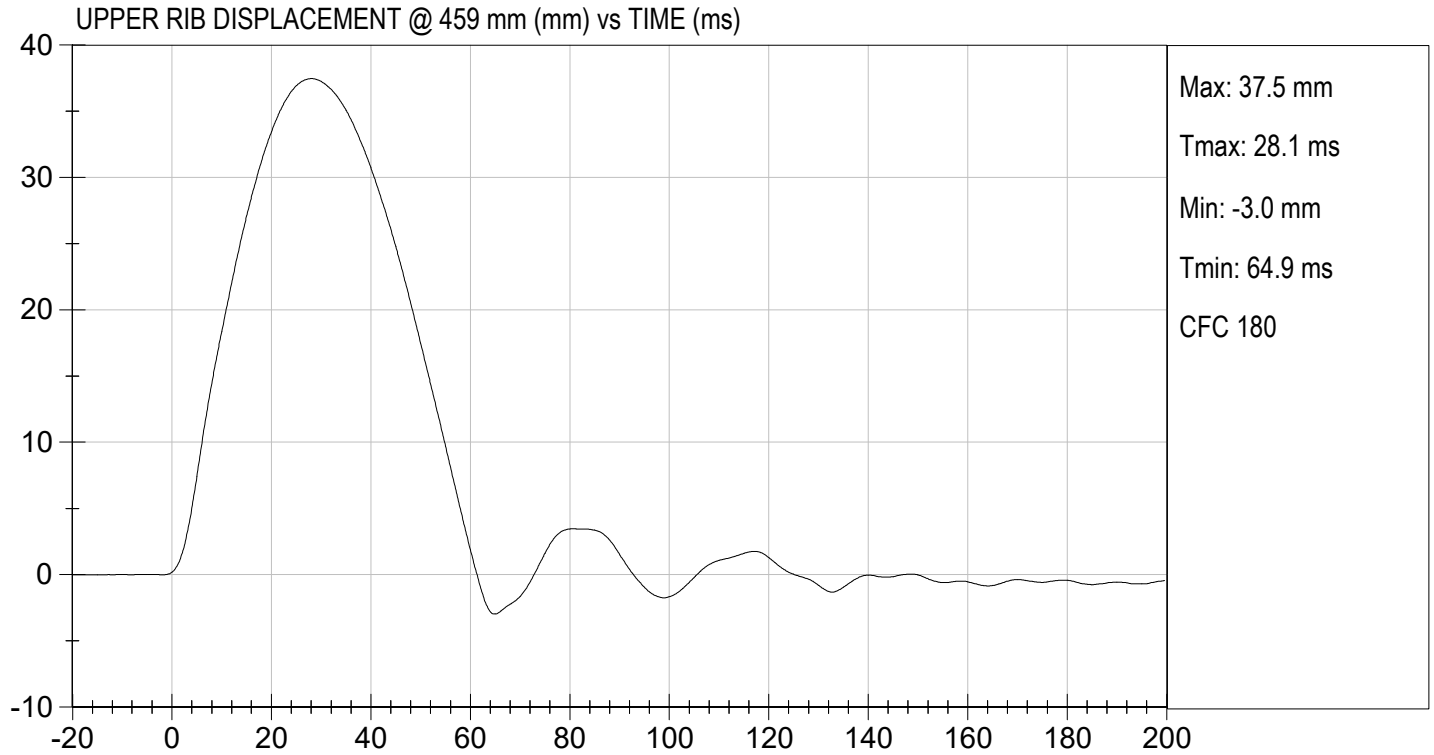
Test I.D: D232494

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.5	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.7	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/15/2023
Test Date



MGA RESEARCH CORPORATION

MID RIB TEST

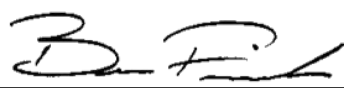
ES-2re DUMMY

ATD Serial No: F032

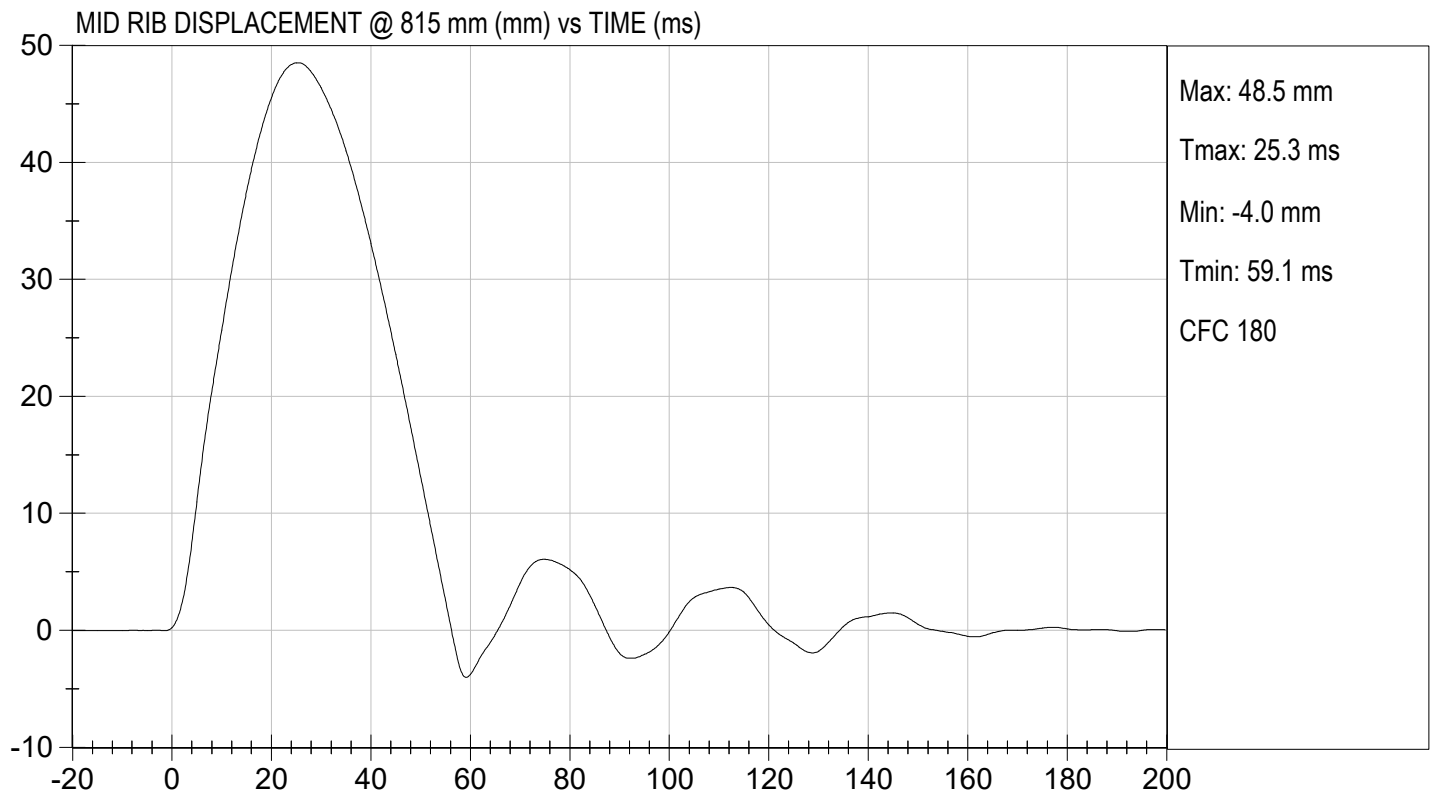
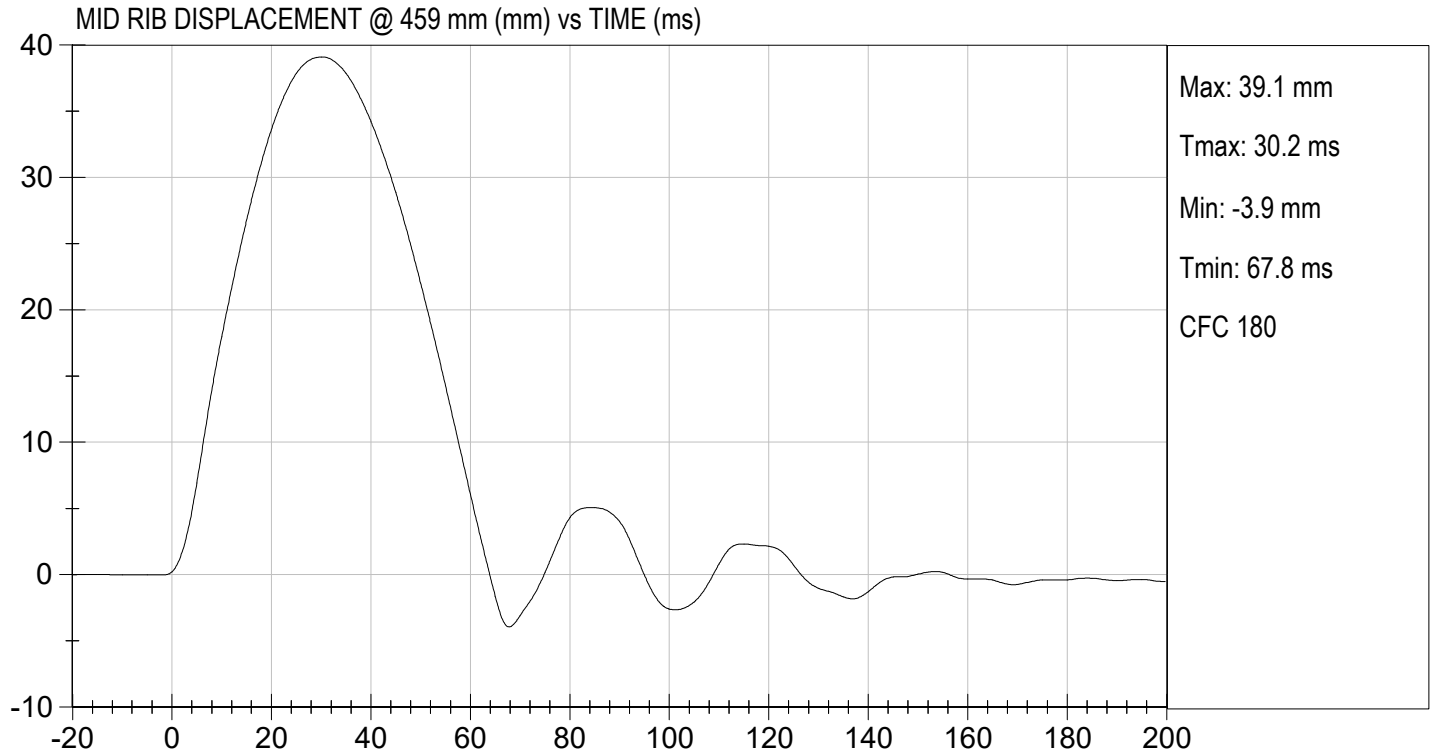
Test I.D: D232495

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.1	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.5	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/15/2023
Test Date



MGA RESEARCH CORPORATION

LOWER RIB TEST

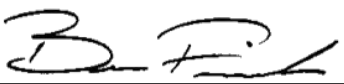
ES-2re DUMMY

ATD Serial No: F032

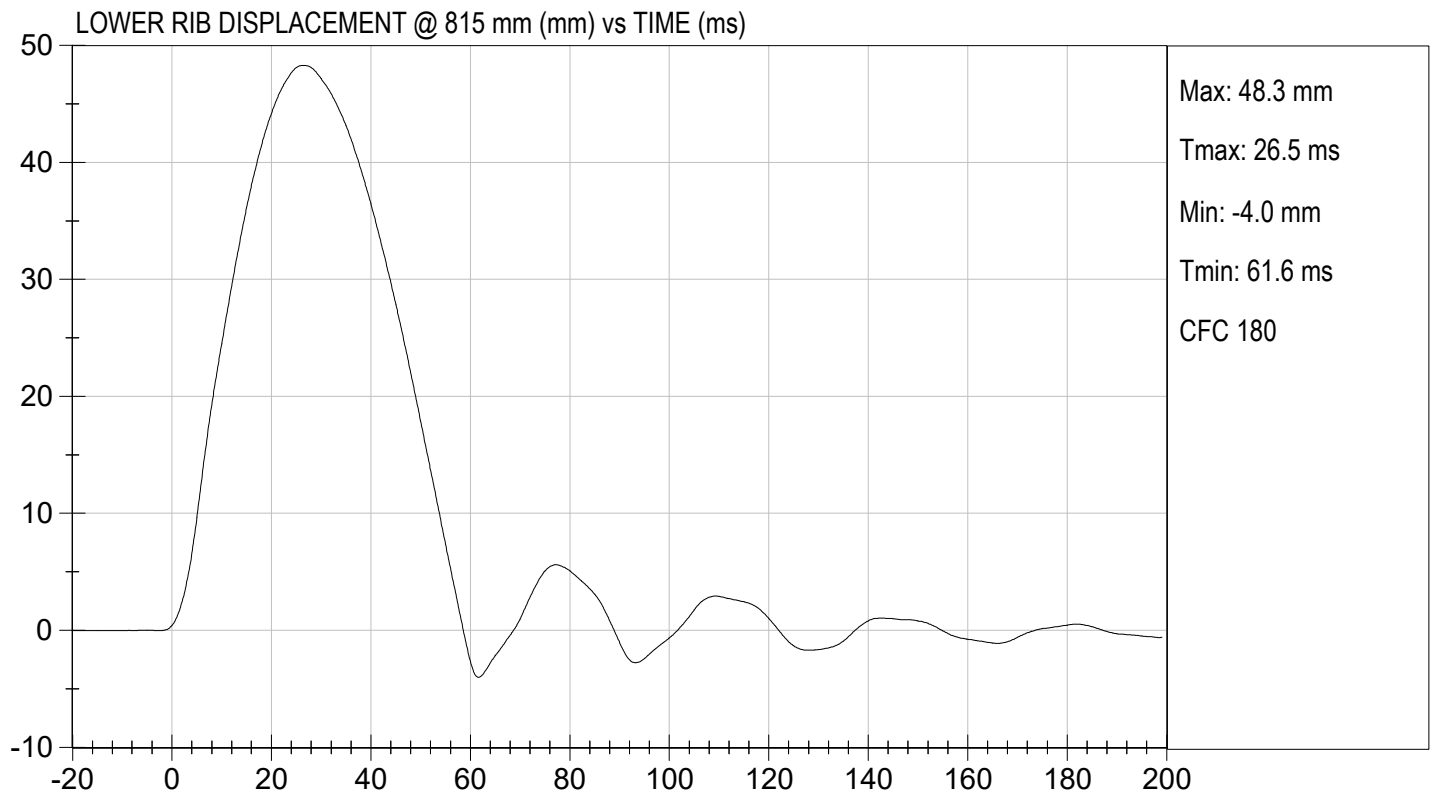
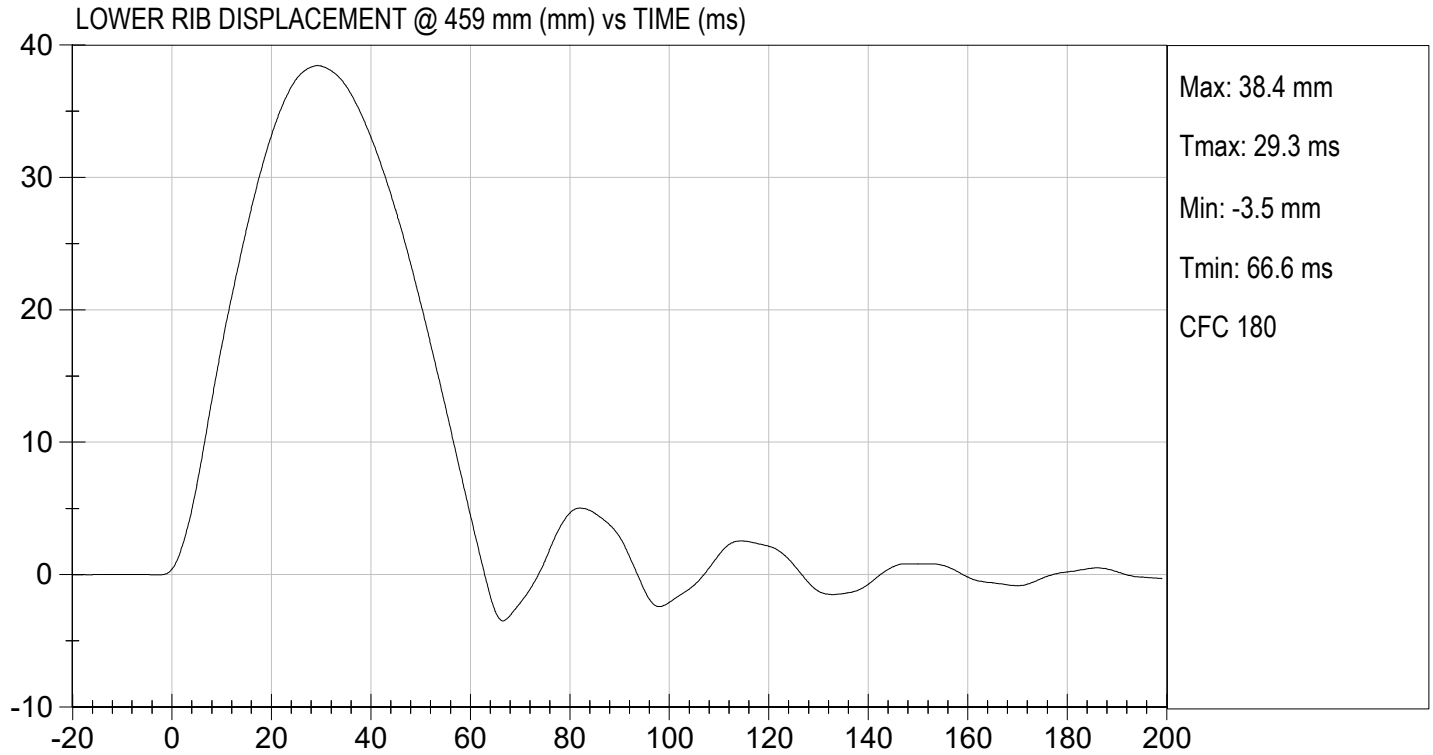
Test I.D: D232496

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.5	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.3	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/15/2023
Test Date

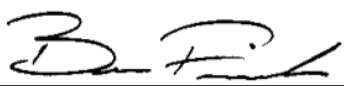


MGA RESEARCH CORPORATION**ABDOMEN TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D232497

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	4.00	Pass
Maximum Impactor Force	N	4000 to 4800	4064	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	11.9	Pass
Overall Test Results				Pass


Laboratory Technician

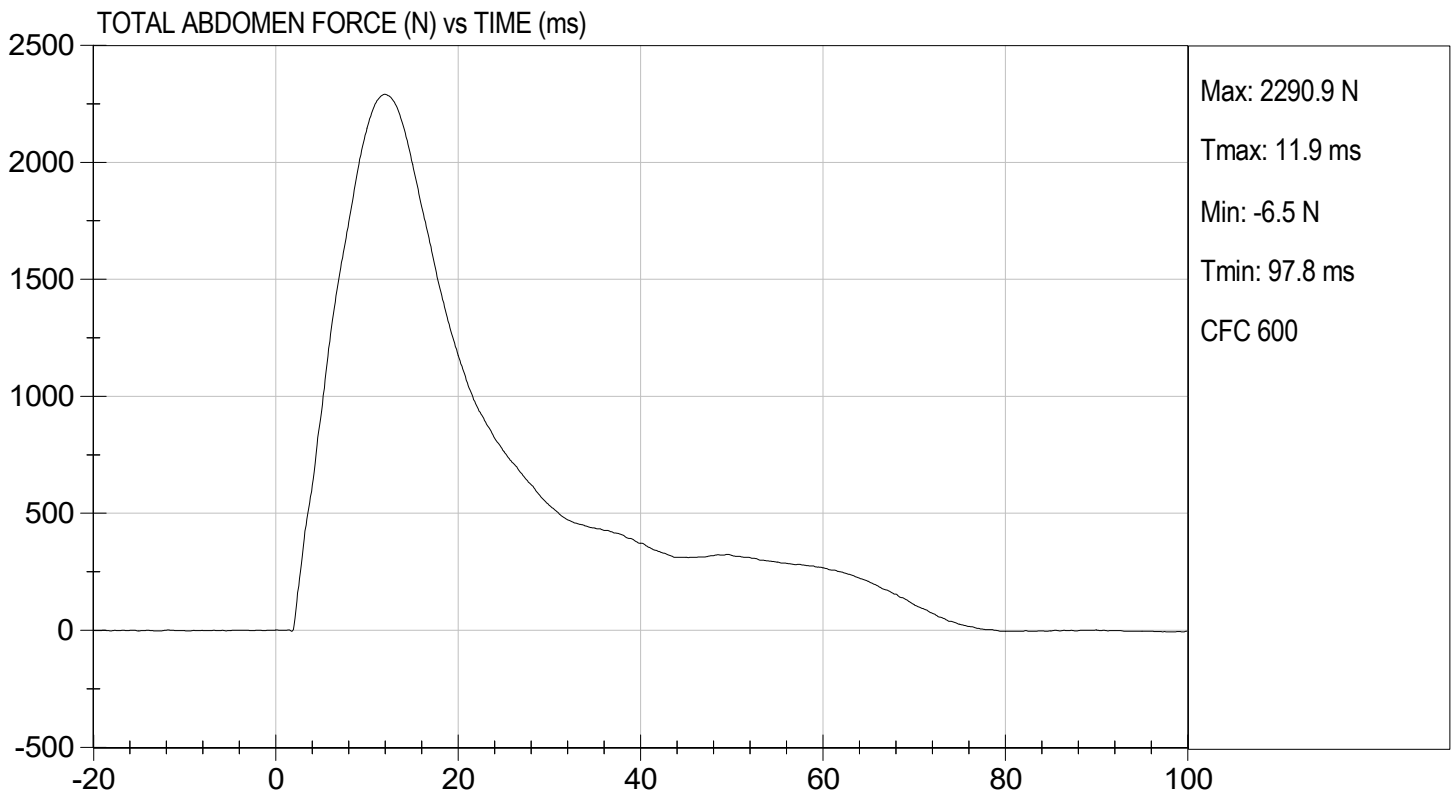
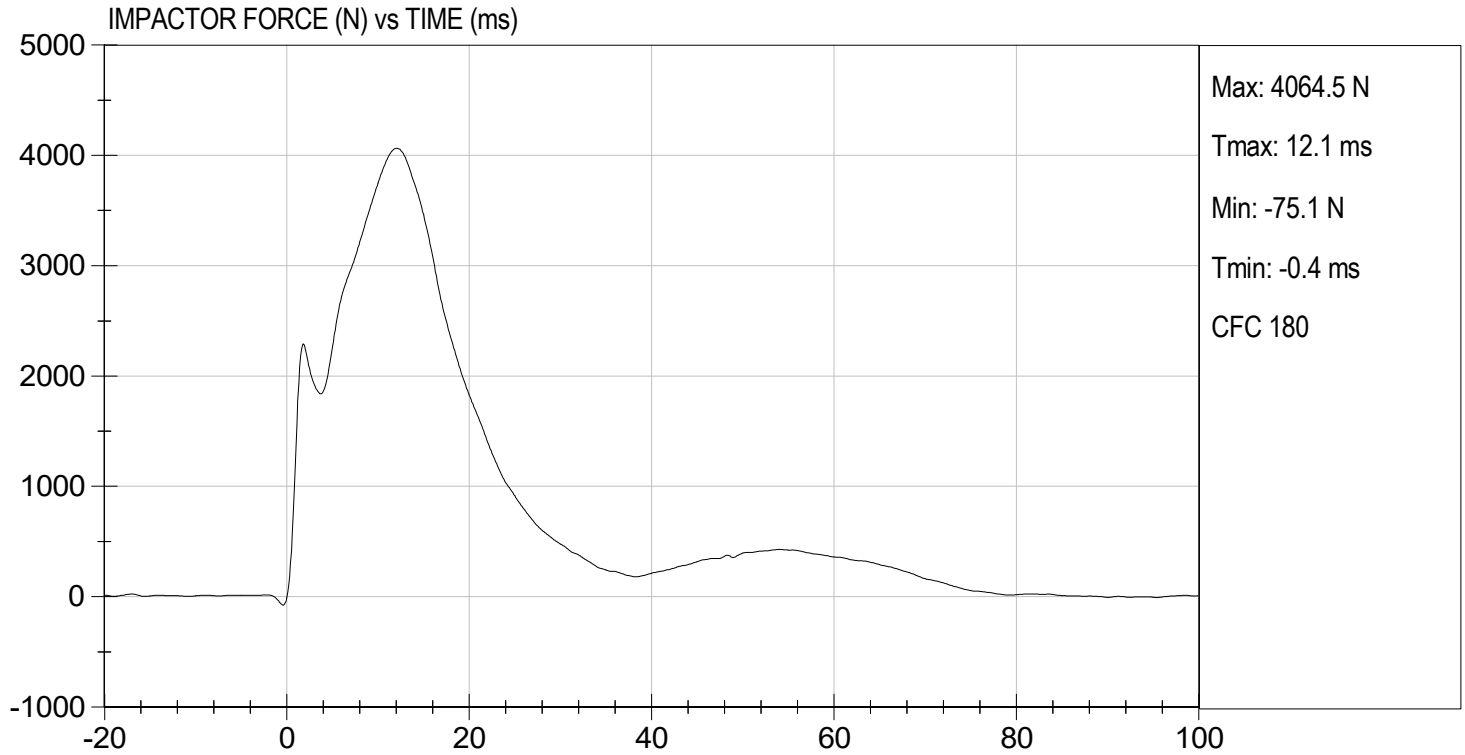
09/15/2023
Test Date


Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.12 ft/s, 4.00 m/s

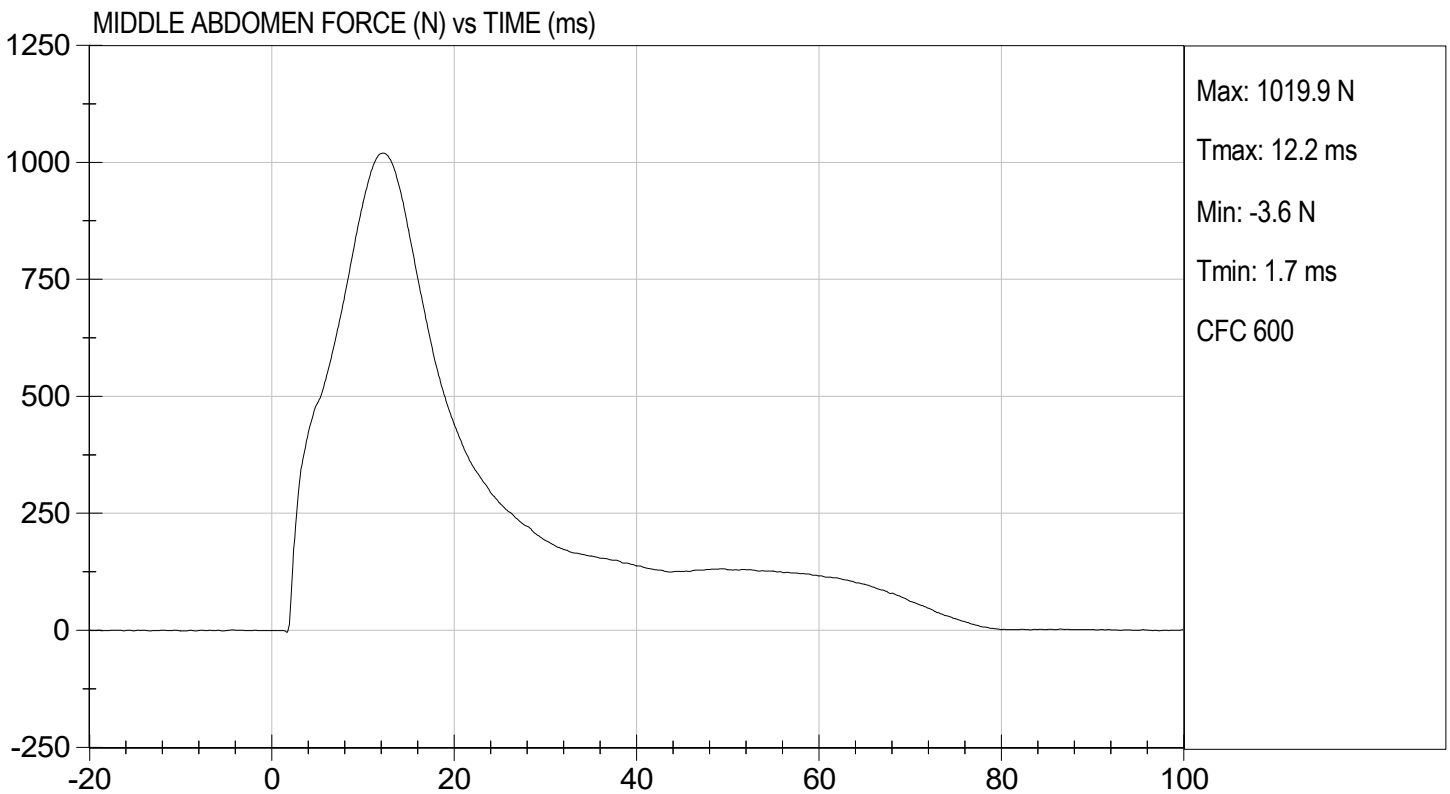
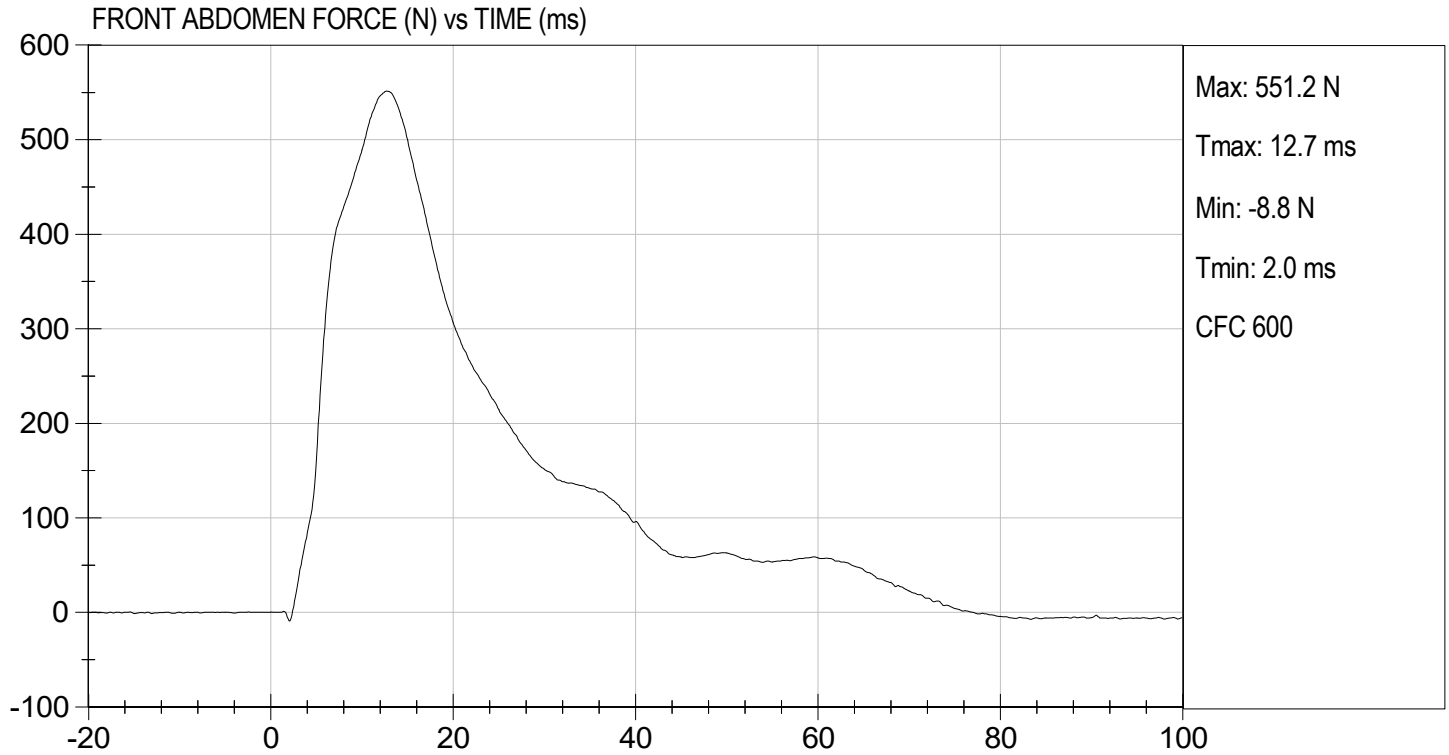
TEST DATE: 09/15/2023
TEST #: D232497





TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.12 ft/s, 4.00 m/s

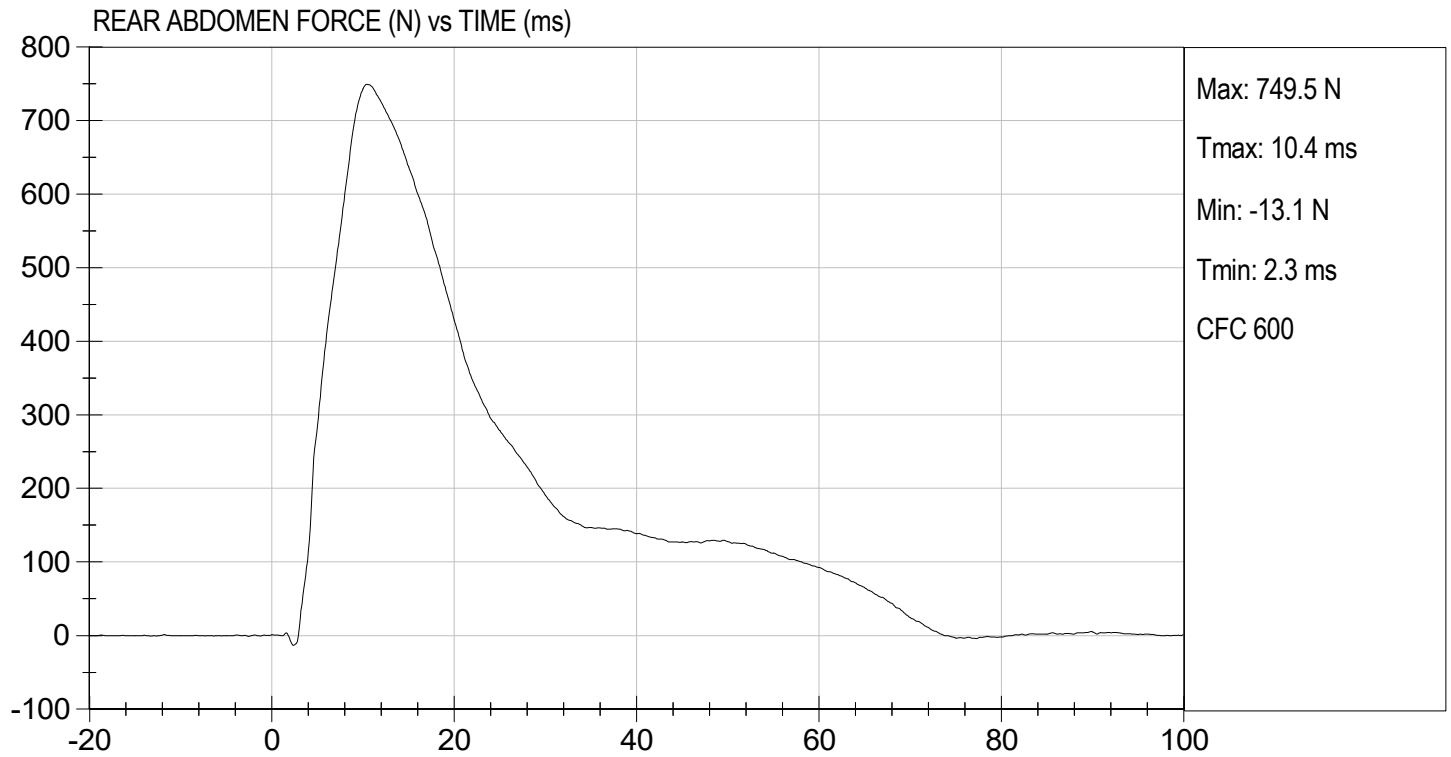
TEST DATE: 09/15/2023
TEST #: D232497





TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.12 ft/s, 4.00 m/s

TEST DATE: 09/15/2023
TEST #: D232497



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

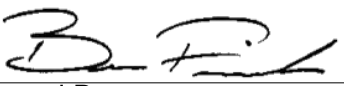
ATD Serial No: F032

Test I.D: D232498

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	44	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	-0.412	Pass
	27 ms	m/s	-6.50 to -5.80	-5.82	Pass
	30 ms	m/s	>= -6.50	-6.25	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	49.5	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	47.9	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	41	Pass
Overall Results					Pass


 Laboratory Technician

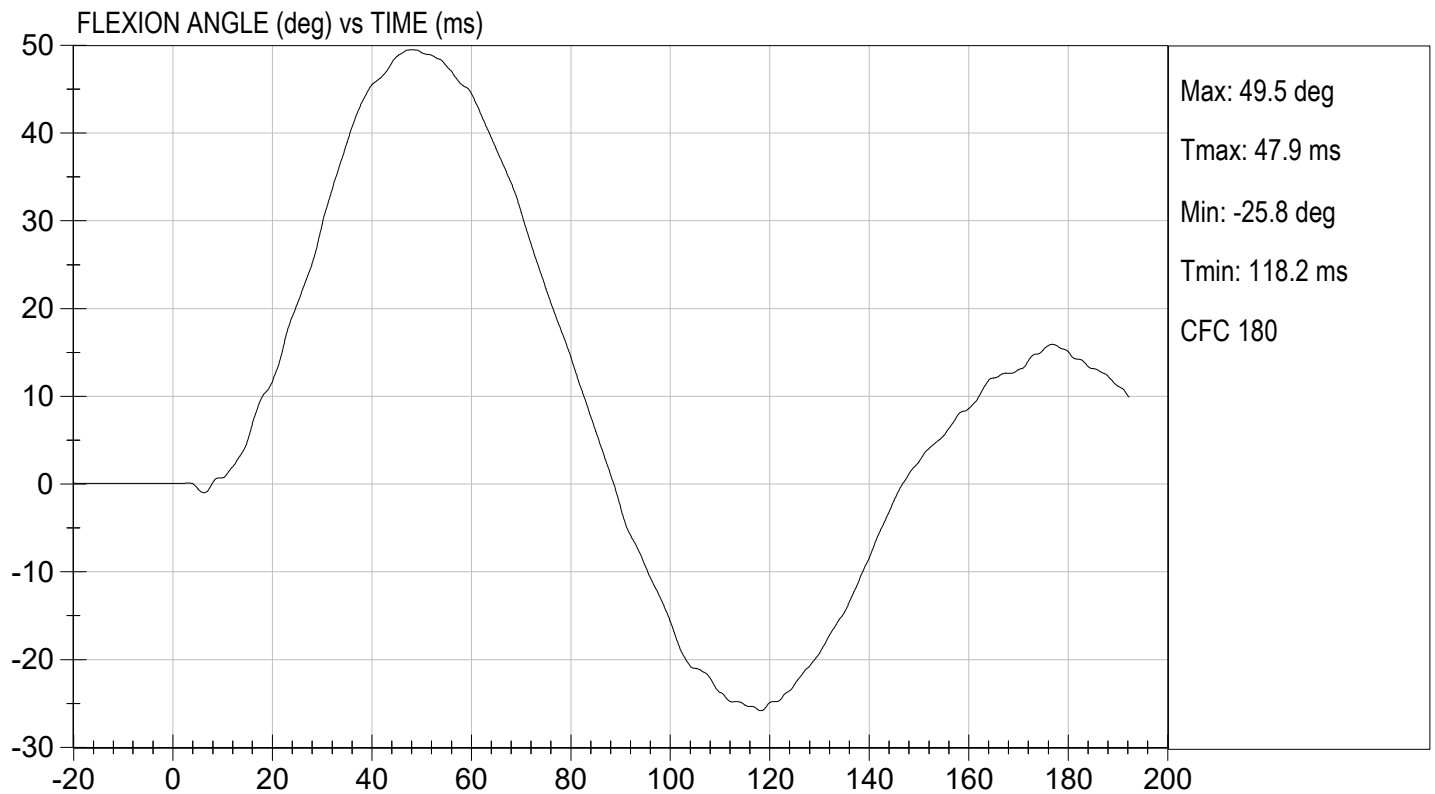
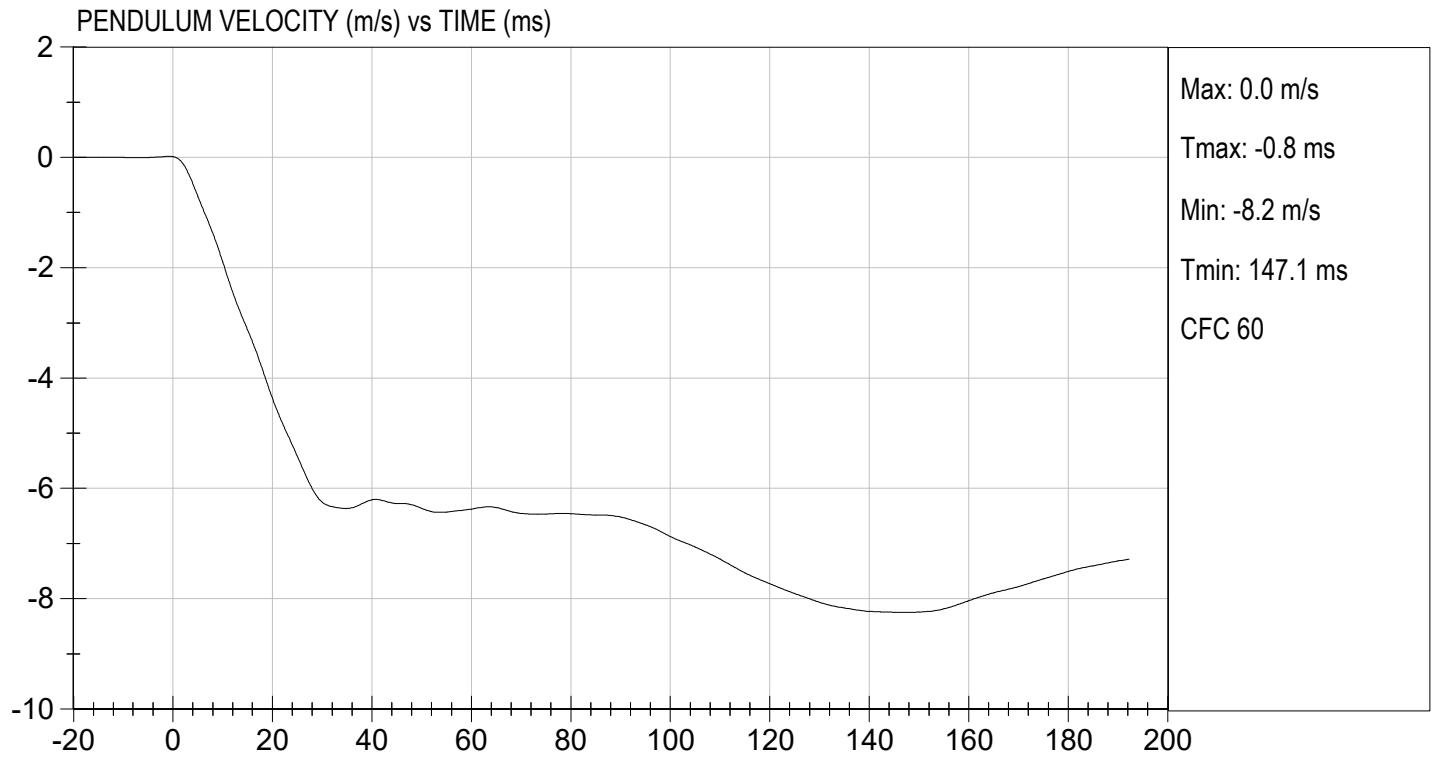
09/15/2023
 Test Date


 Approved By



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

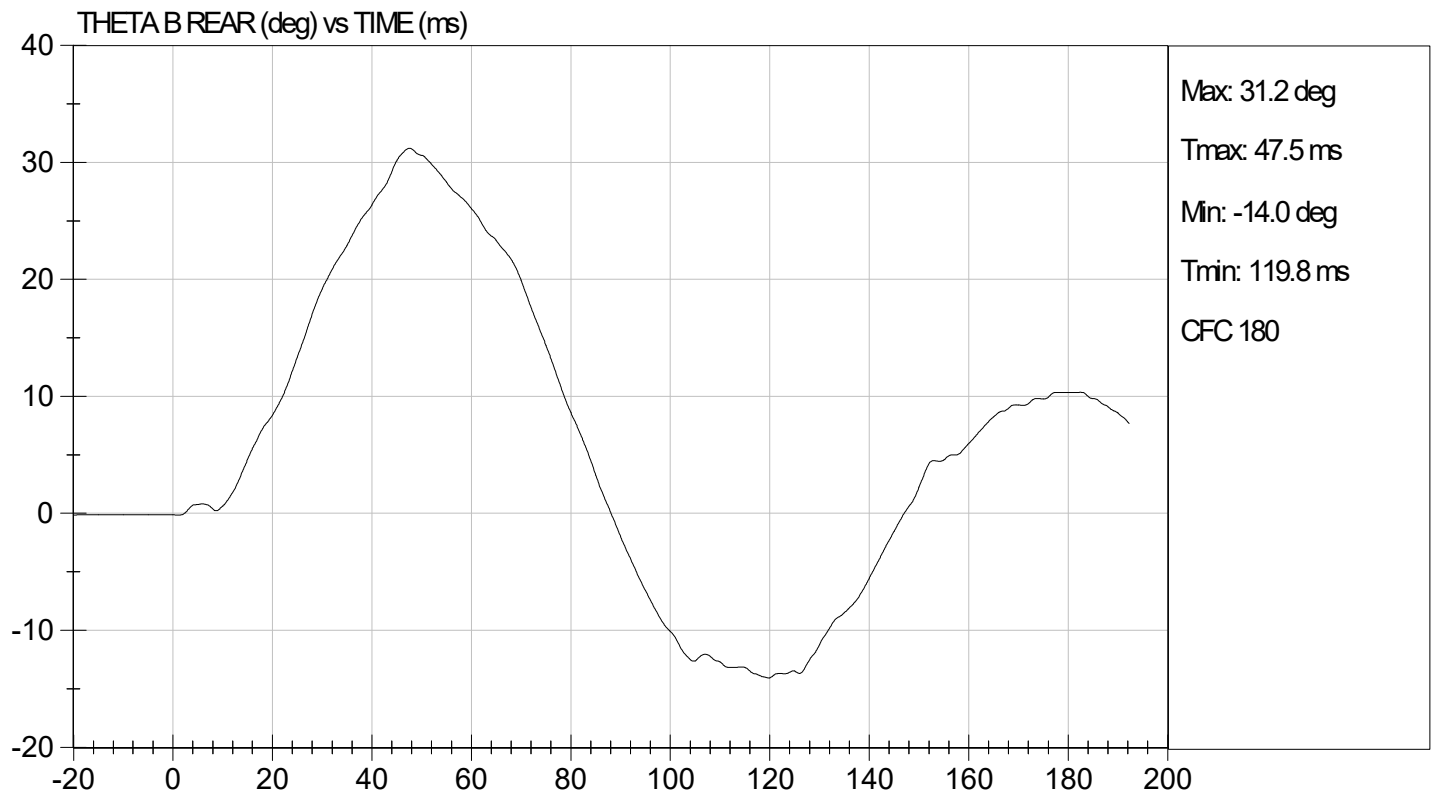
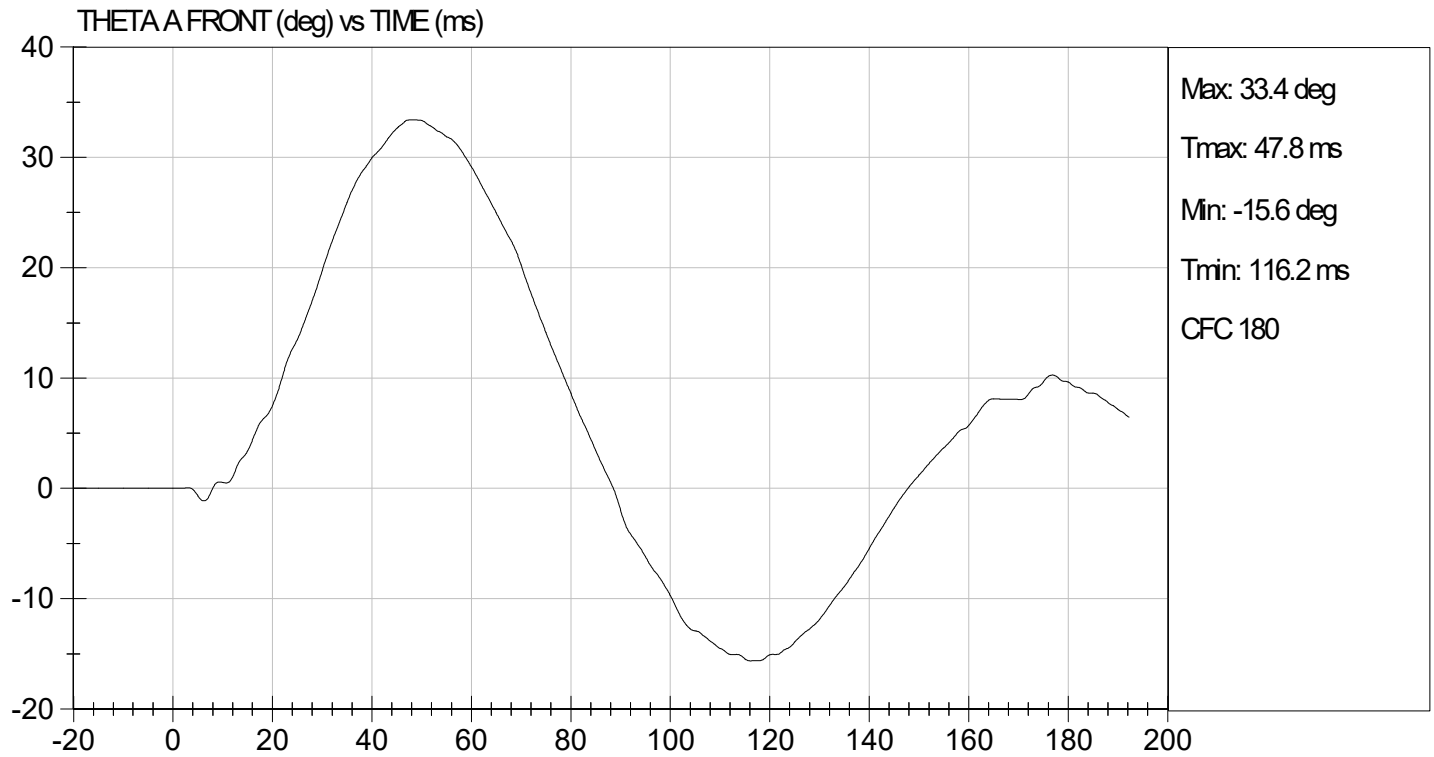
TEST DATE: 09/15/2023
TEST #: D232498





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

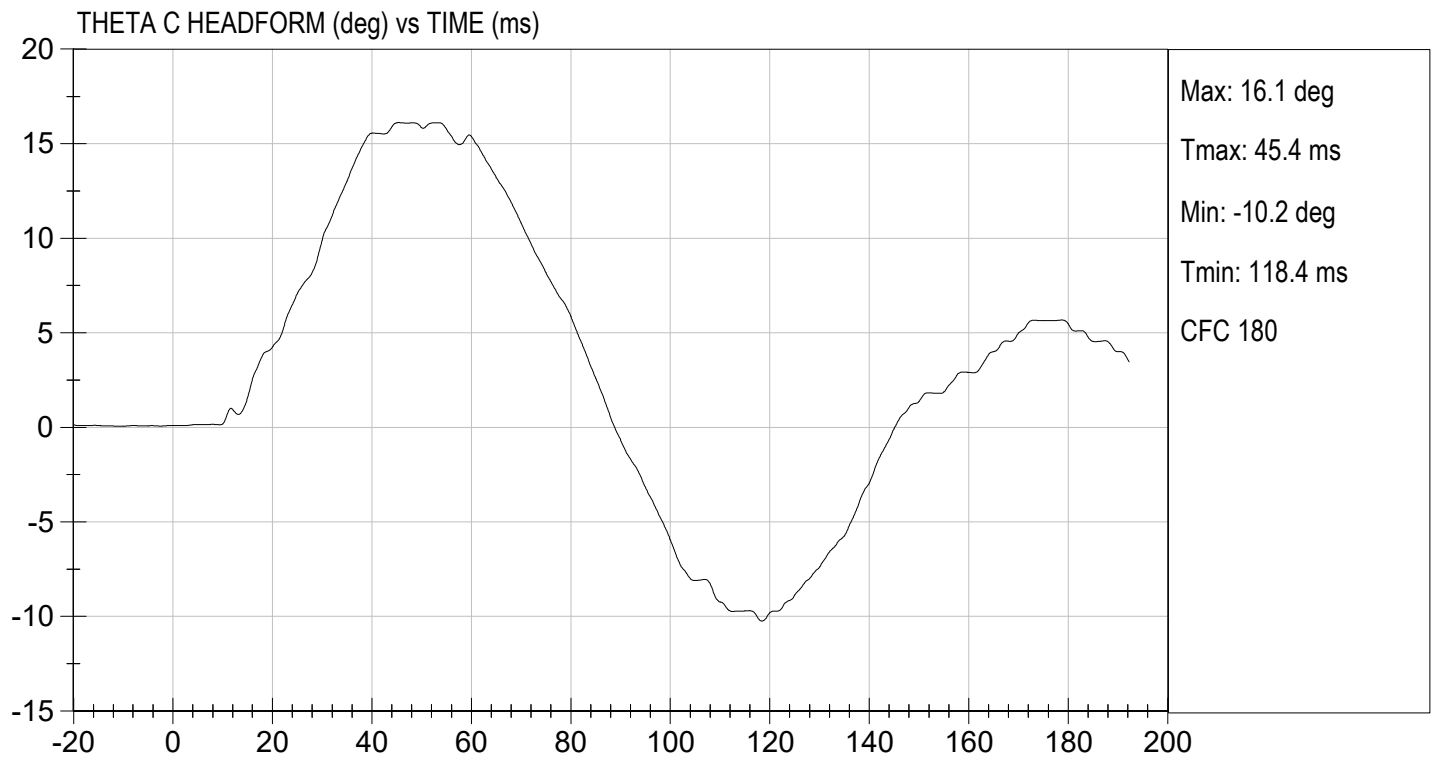
TEST DATE: 09/15/2023
TEST #: D232498





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

TEST DATE: 09/15/2023
TEST #: D232498

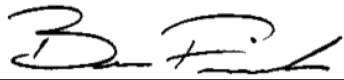


MGA RESEARCH CORPORATION**PELVIS TEST
ES-2re DUMMY****ATD Serial No:** F032**Test I.D:** D232499

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	4.20 to 4.40	4.27	Pass
Maximum Impactor Force	N	4700 to 5400	4873	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	12.9	Pass
Maximum Pubic Force	N	1230 to 1590	1292	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	13.0	Pass
Overall Test Results				Pass


Laboratory Technician

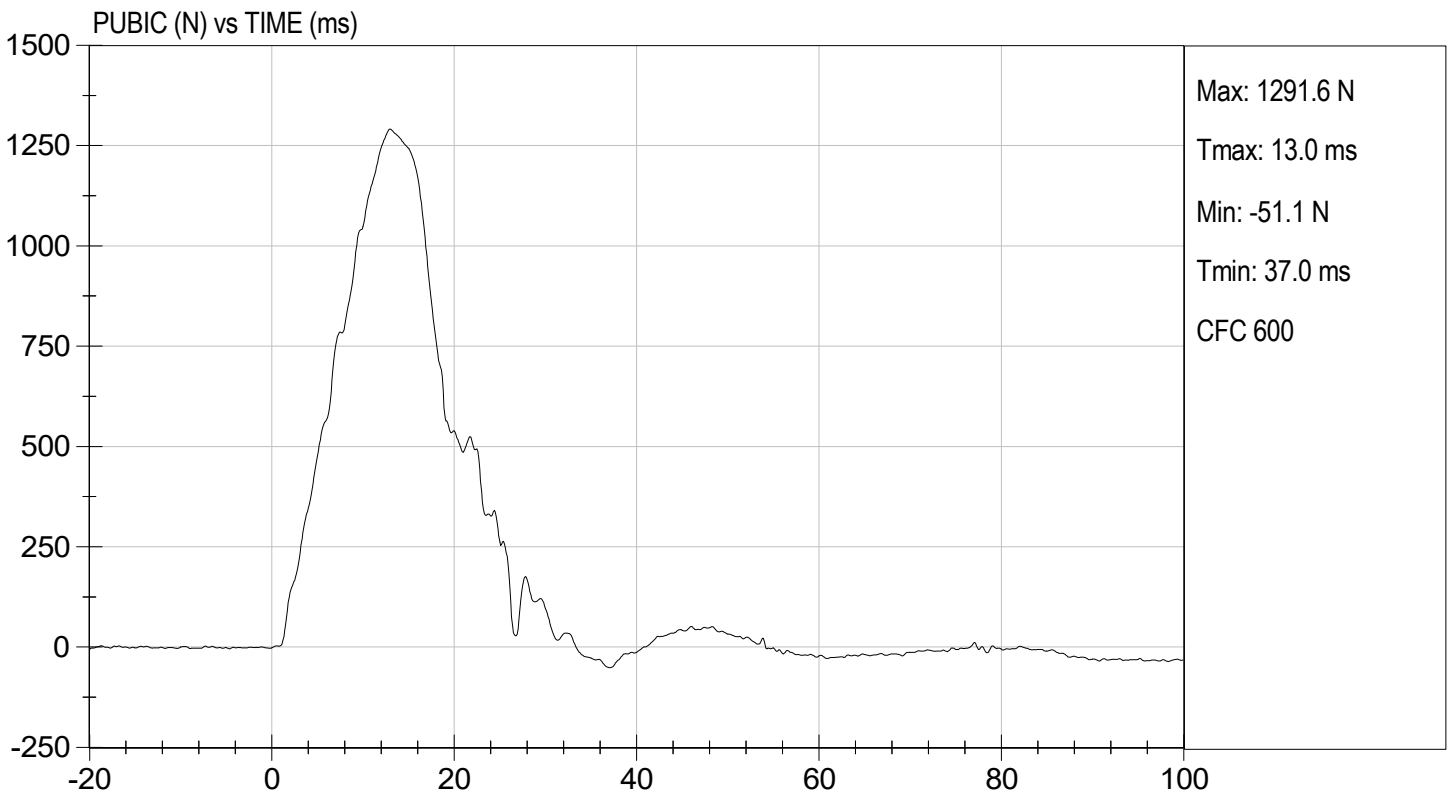
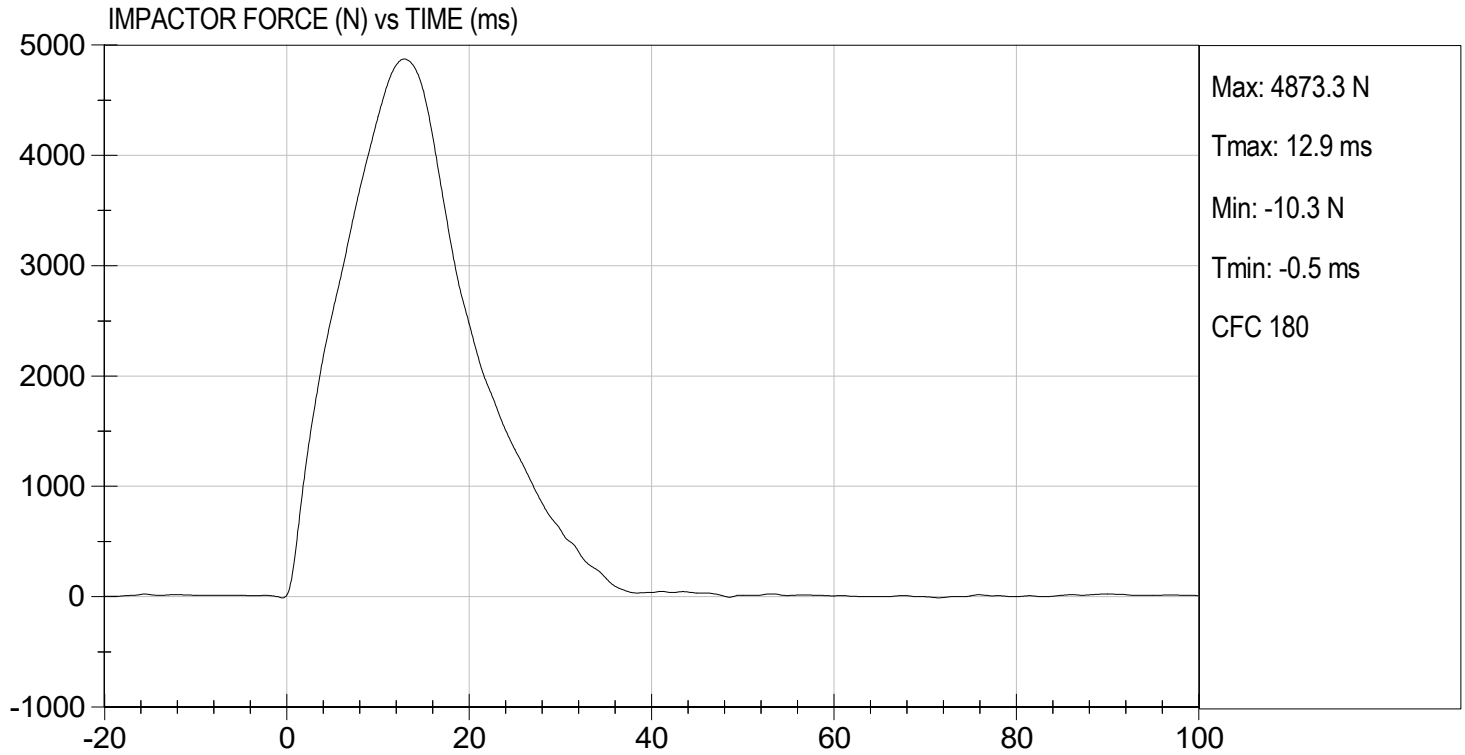
09/15/2023
Test Date


Approved By



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

TEST DATE: 09/15/2023
TEST #: D232499

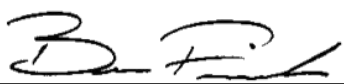


MGA RESEARCH CORPORATION**THORAX IMPACT TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D232490

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	44	Pass
Probe Speed	m/s	5.40 to 5.60	5.44	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5621	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.7	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.6	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.3	Pass
Overall Test Results				Pass


Laboratory Technician

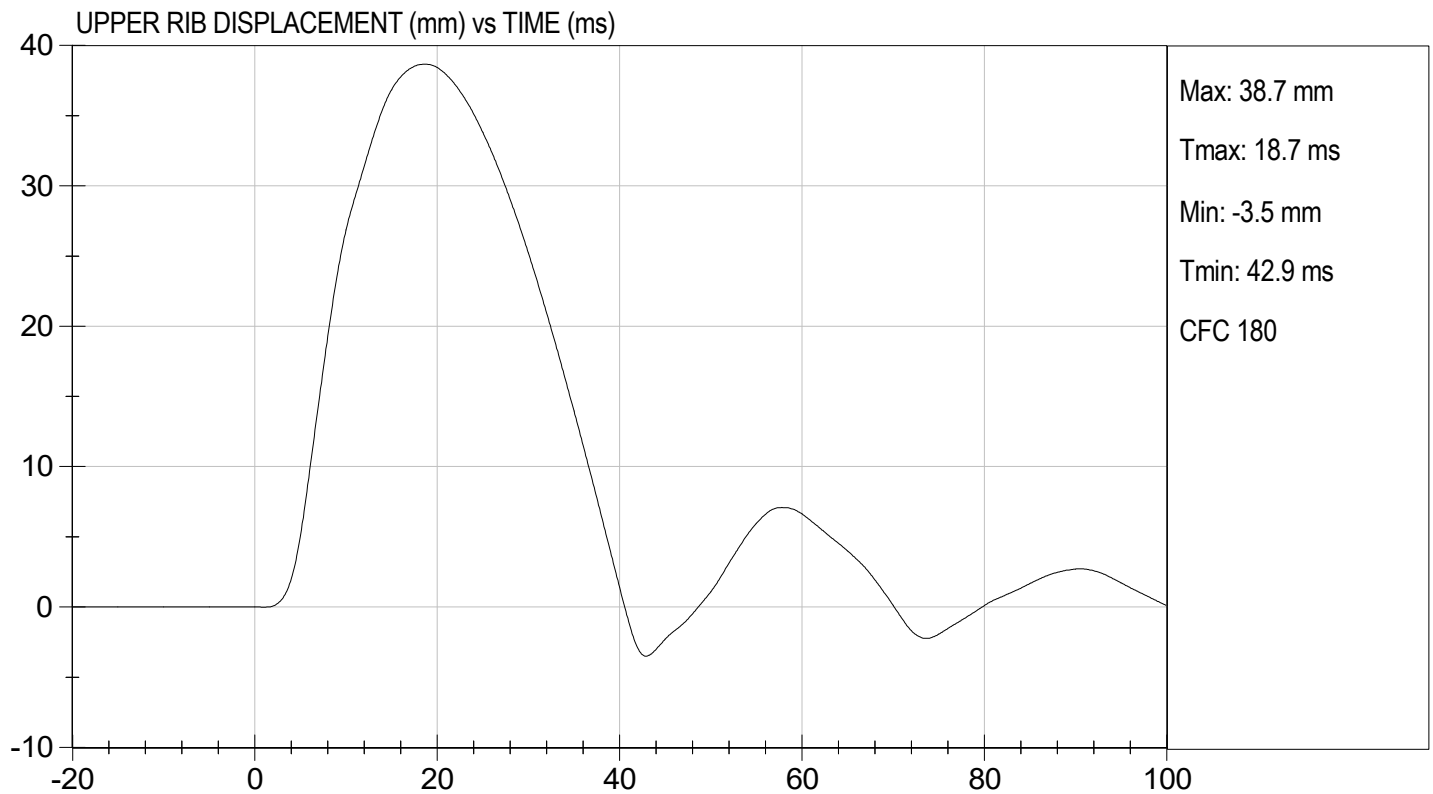
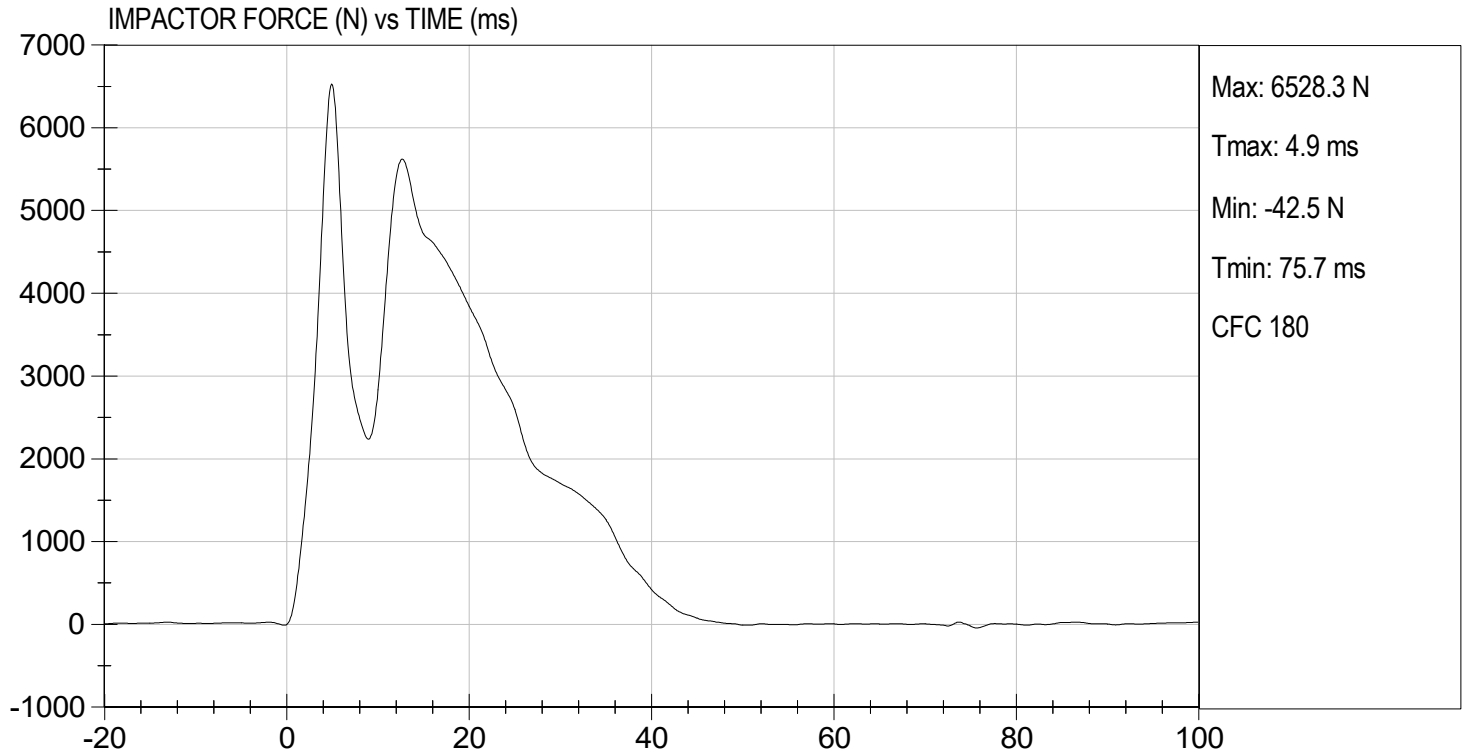
09/15/2023
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 17.86 ft/s, 5.44 m/s

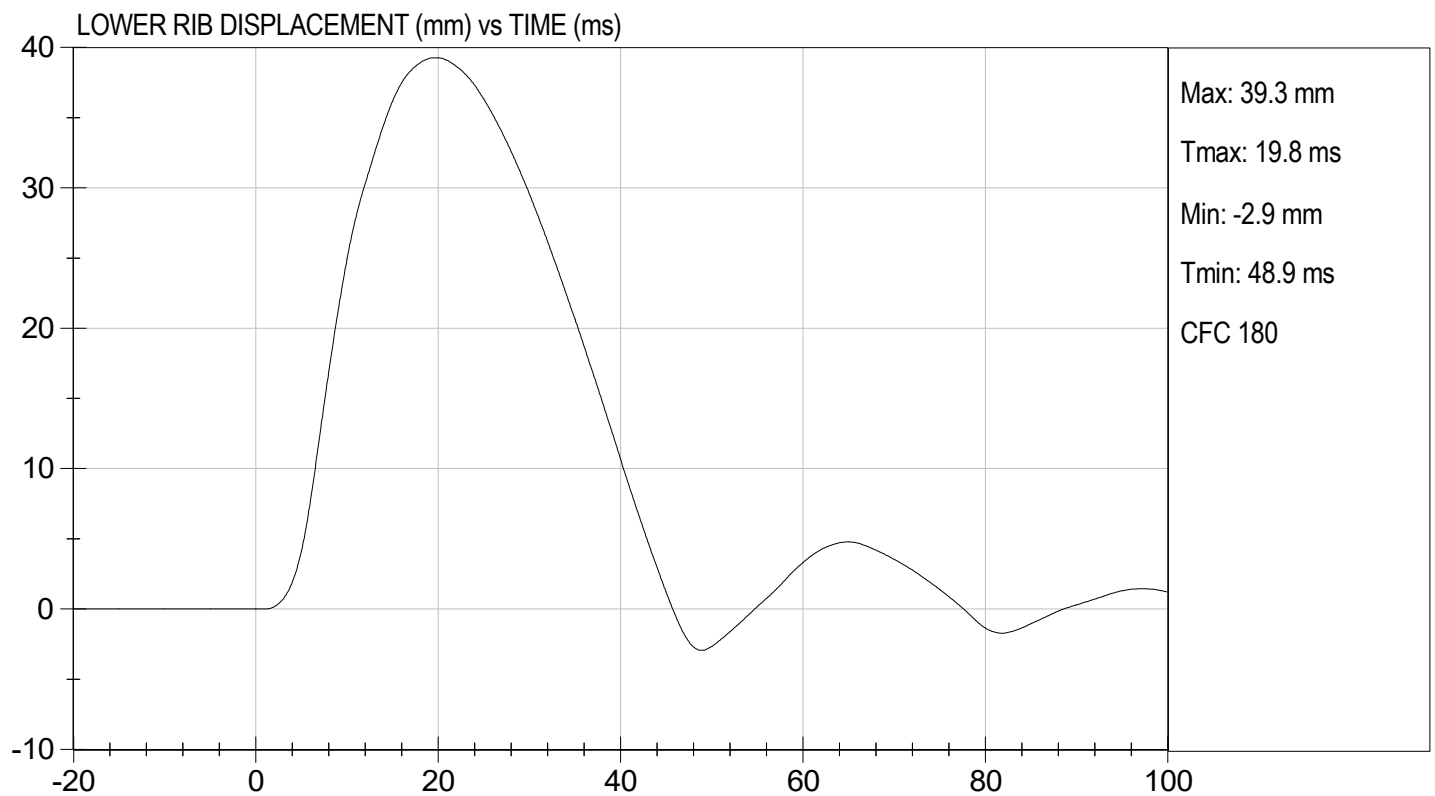
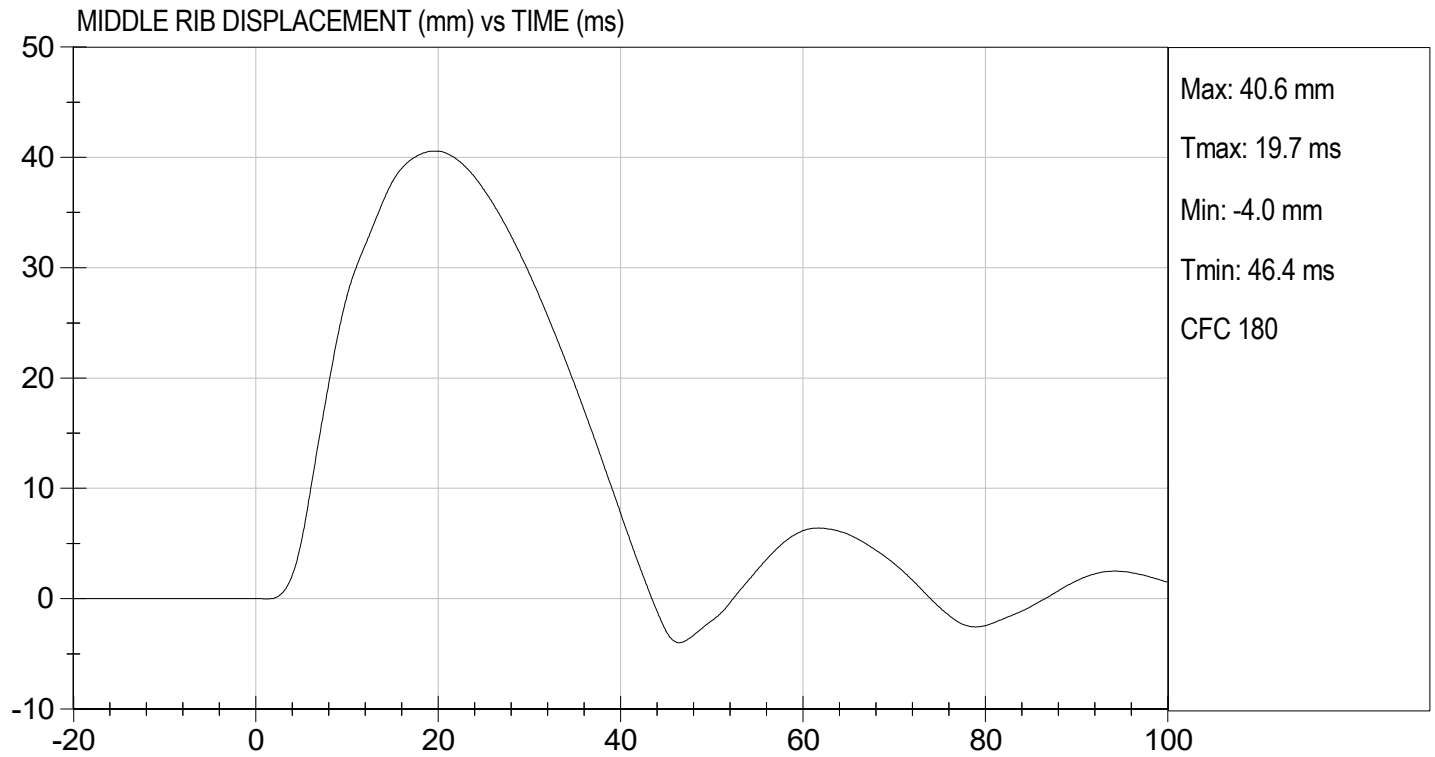
TEST DATE: 09/15/2023
TEST #: D232490





TEST DESC: THORAX IMPACT
VELOCITY: 17.86 ft/s, 5.44 m/s

TEST DATE: 09/15/2023
TEST #: D232490



QUALIFICATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

ES-2re External Measurements
SN: F032

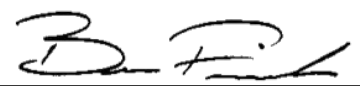
No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157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

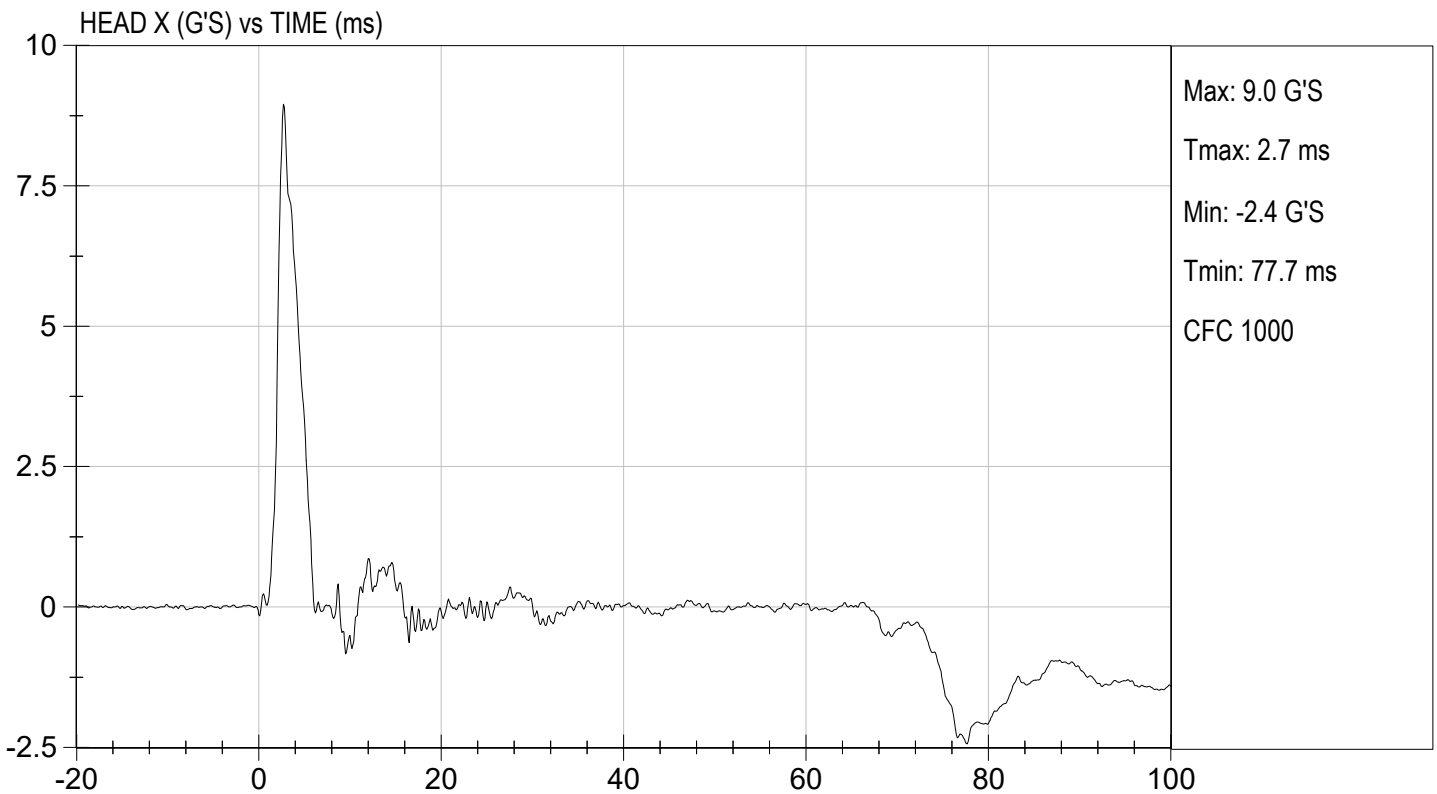
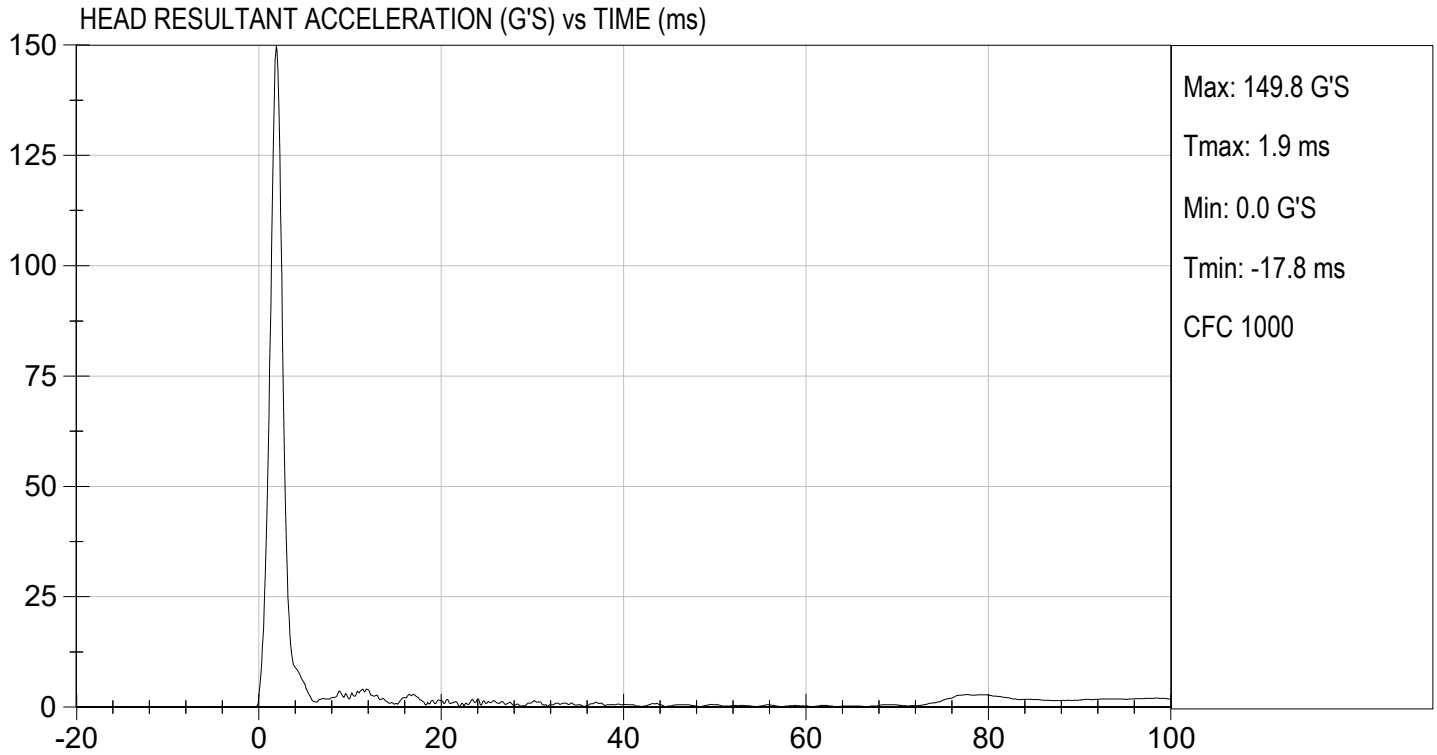
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY**ATD Serial No: F032Test ID: D232651

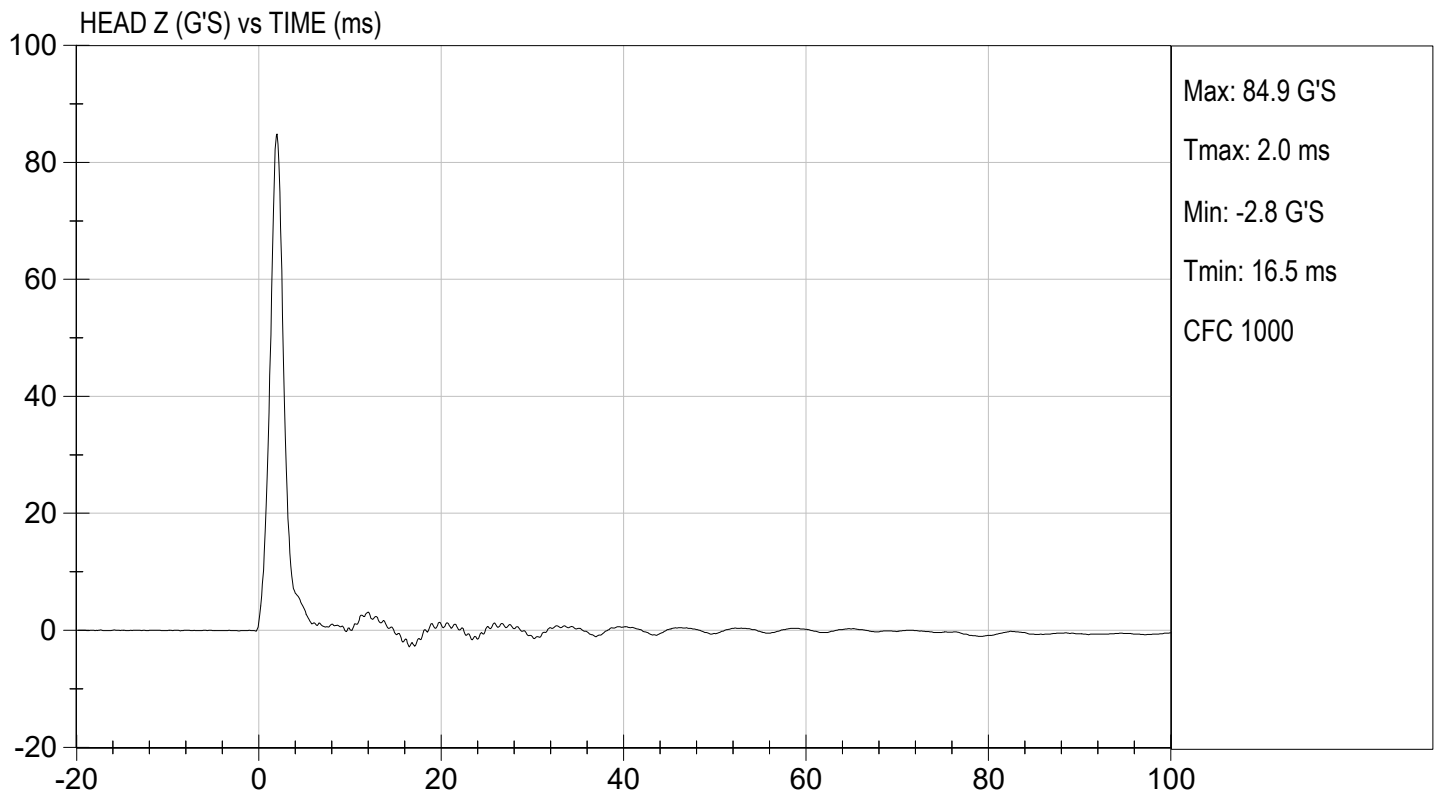
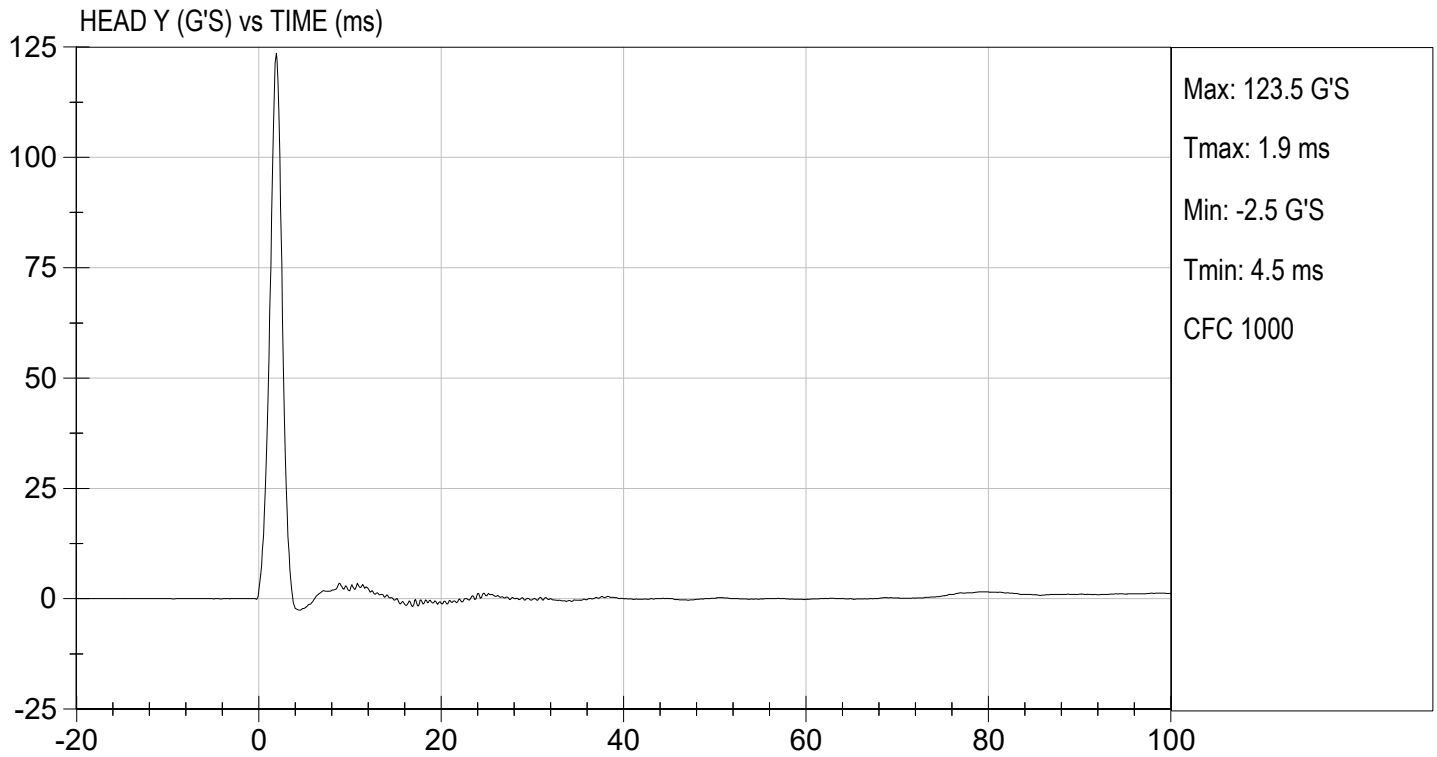
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	125 to 155	150	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	9.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results			Pass	


Laboratory Technician

09/27/2023
Test Date


Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

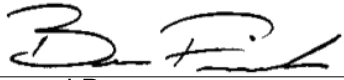
ATD Serial No: F032

Test I.D: D232652

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	44	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	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.55	Pass
	17 ms	m/s	>= -3.70	-3.58	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.1	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	58.4	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	61.4	Pass
Overall Results					Pass


 Laboratory Technician

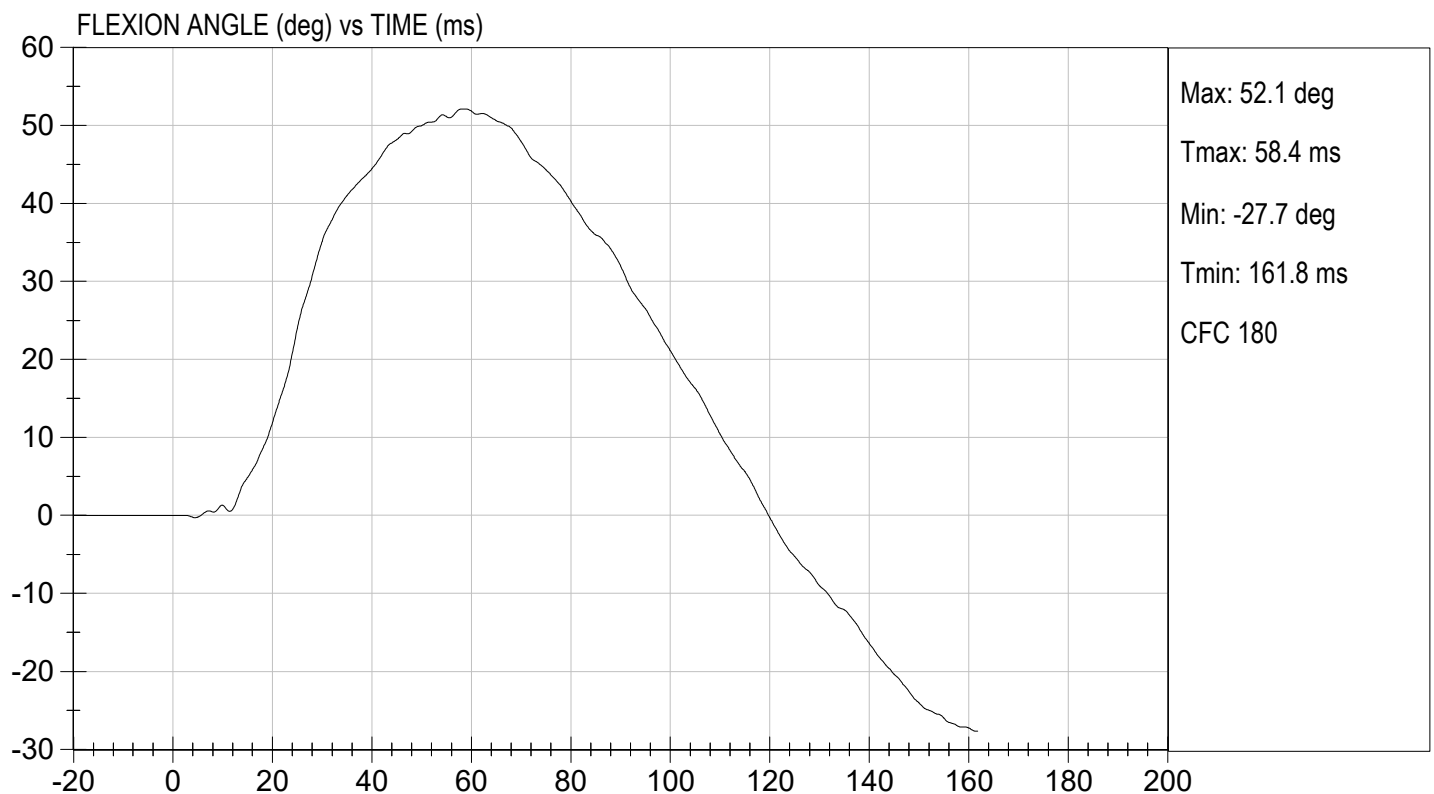
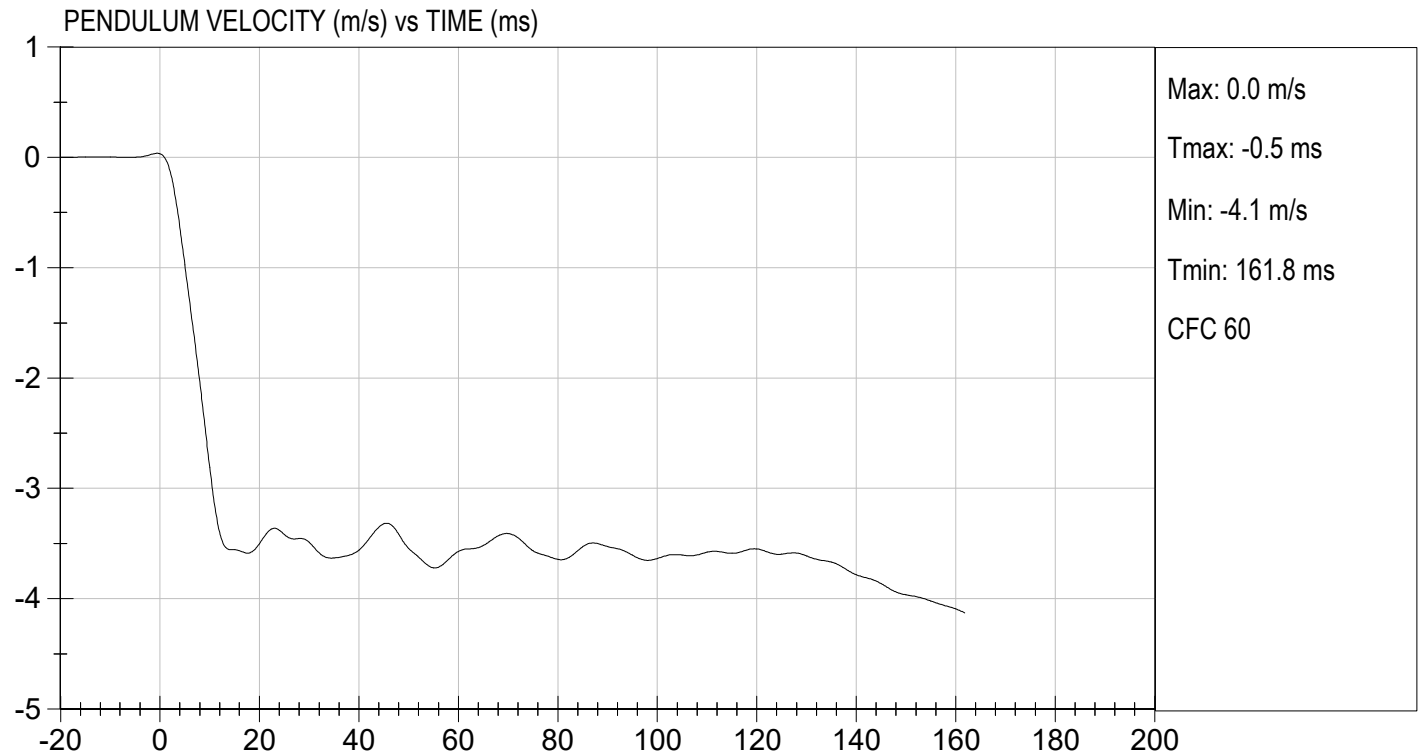
09/27/2023
 Test Date


 Approved By



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

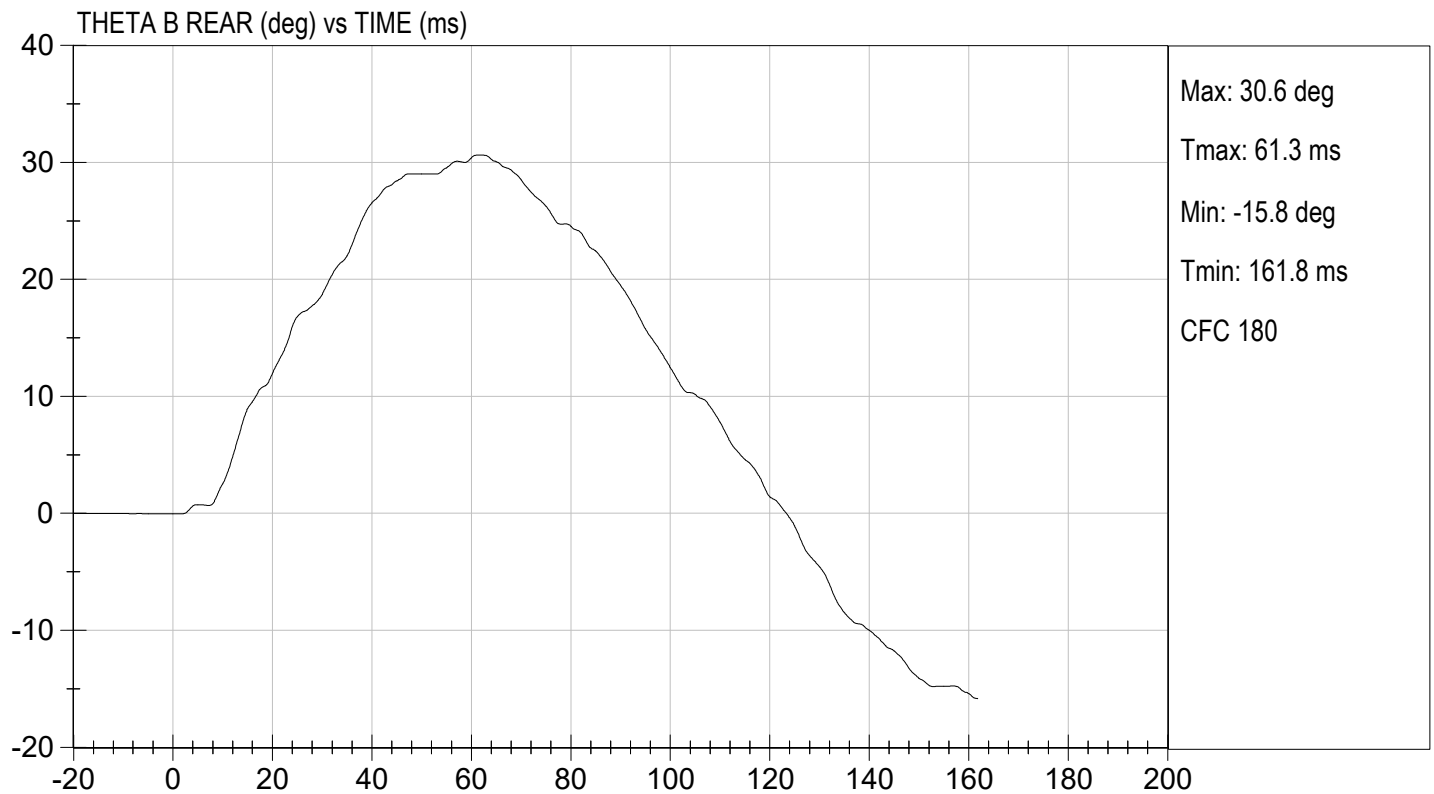
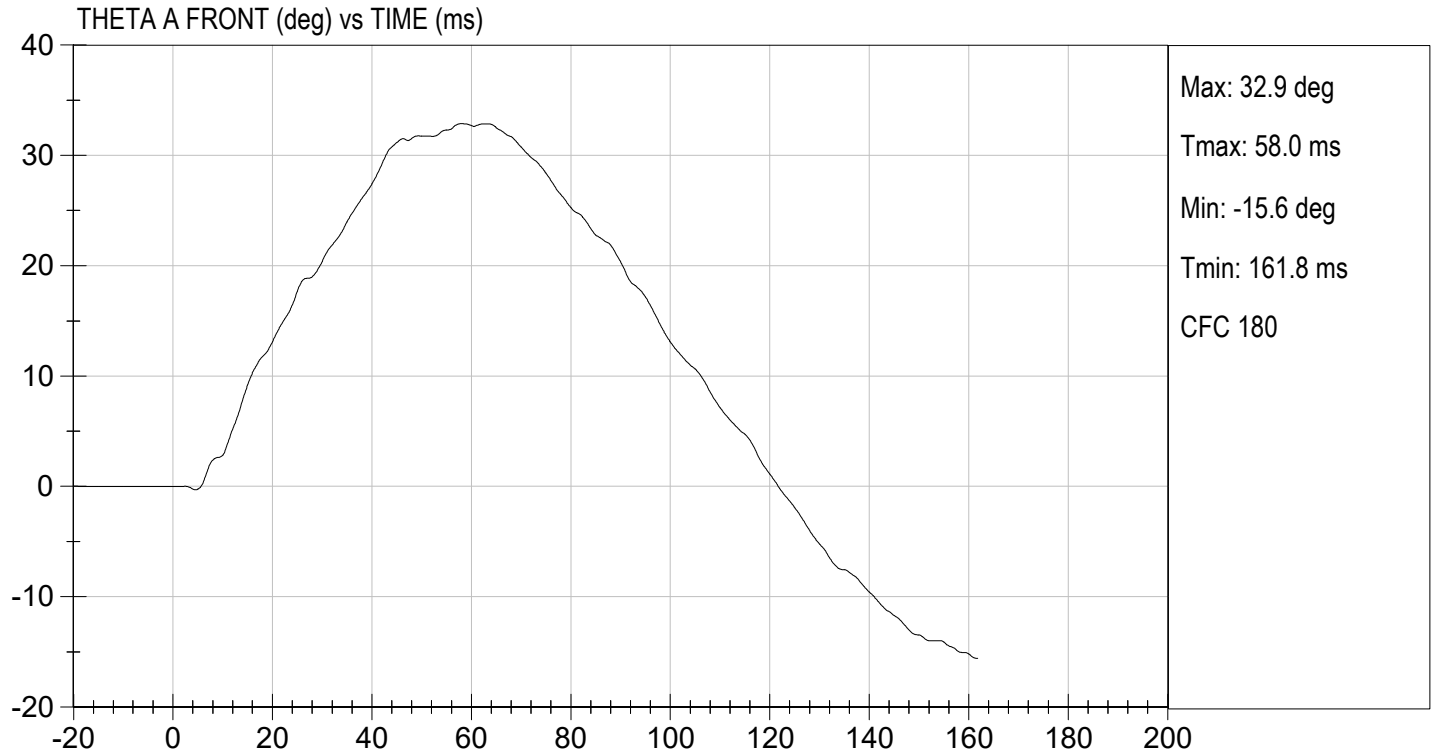
TEST DATE: 09/27/2023
TEST #: D232652





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

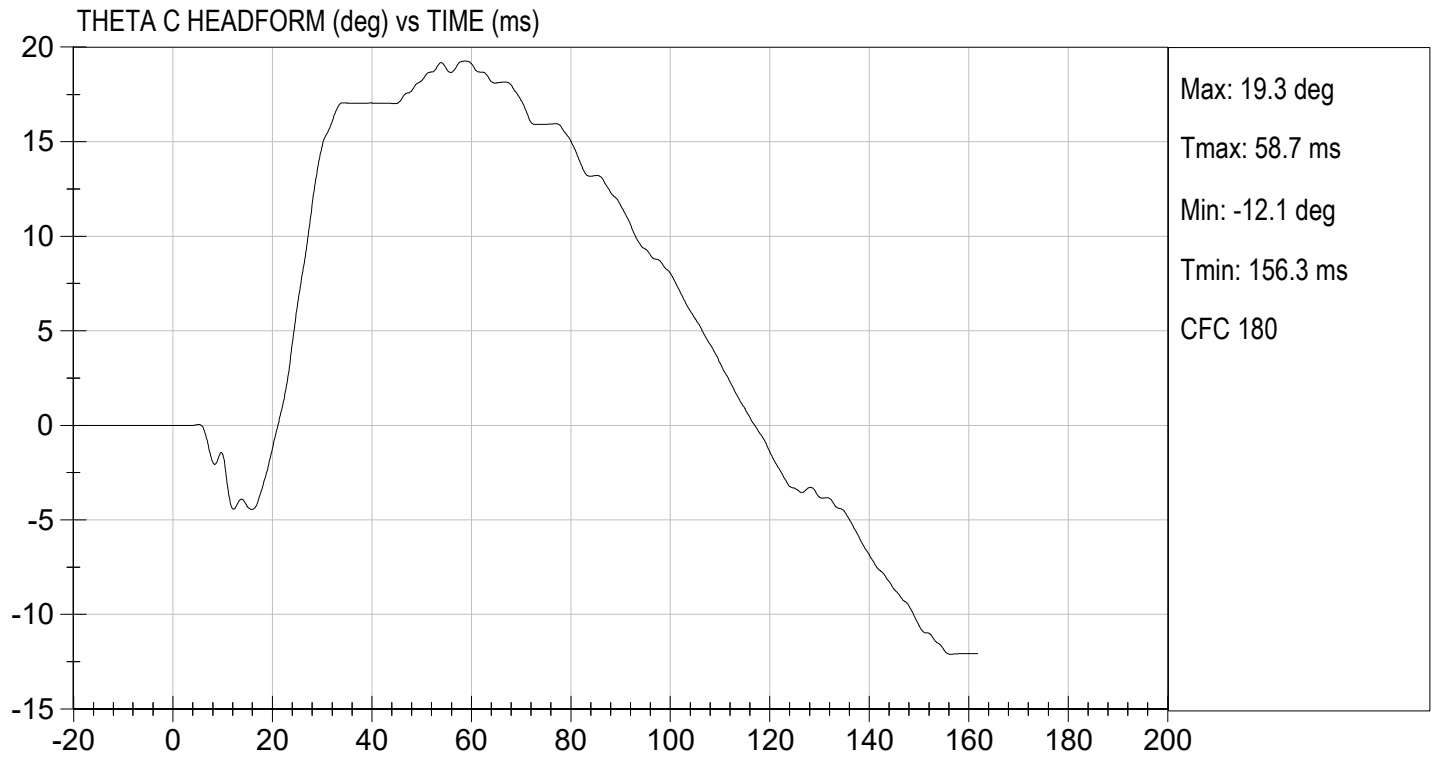
TEST DATE: 09/27/2023
TEST #: D232652





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

TEST DATE: 09/27/2023
TEST #: D232652



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

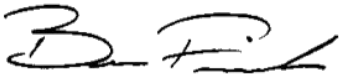
ATD Serial No: F032

Test I.D: D232653

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.23	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.0	Pass
Overall Test Results				Pass


Laboratory Technician

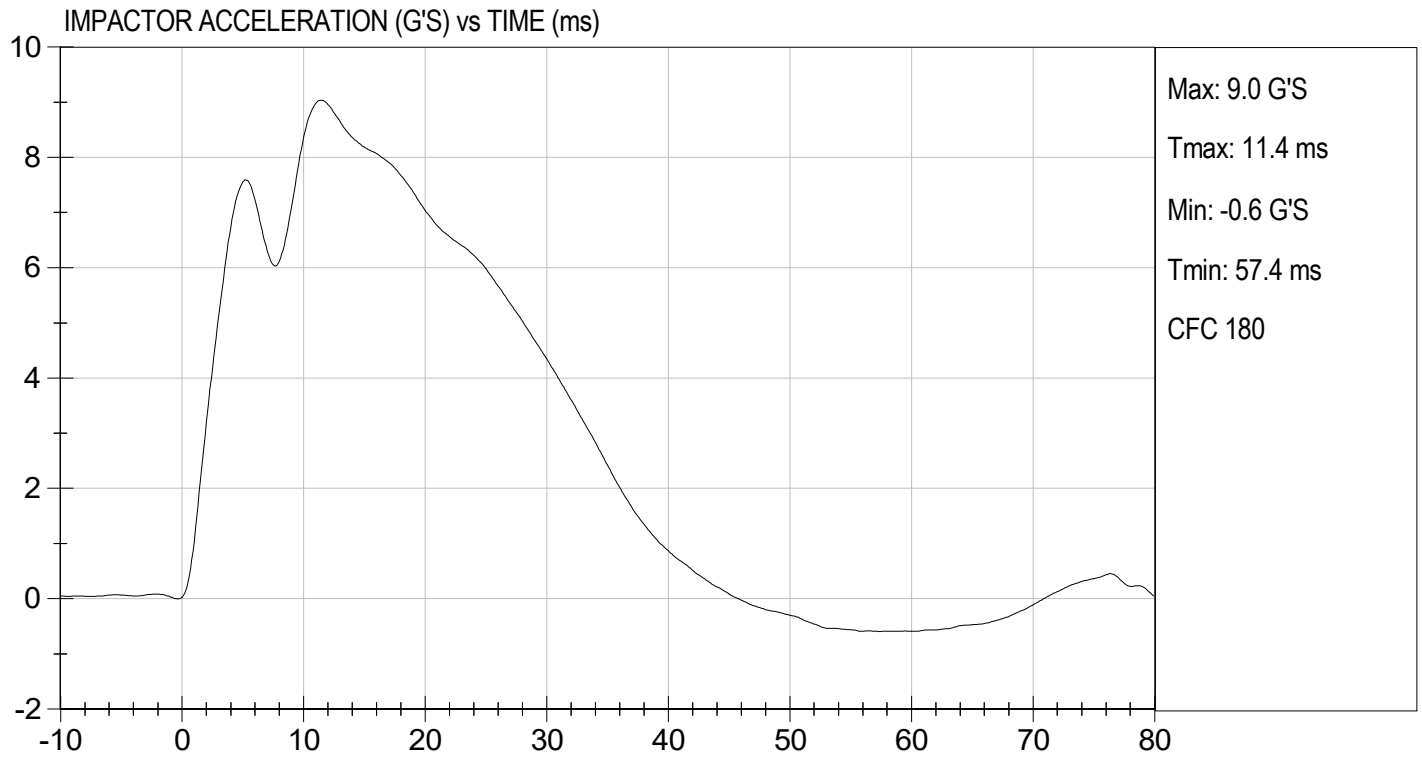
09/27/2023
Test Date


Approved By



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

TEST DATE: 09/27/2023
TEST #: D232653



MGA RESEARCH CORPORATION

UPPER RIB TEST

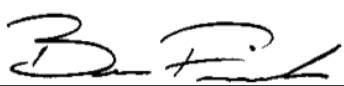
ES-2re DUMMY

ATD Serial No: F032

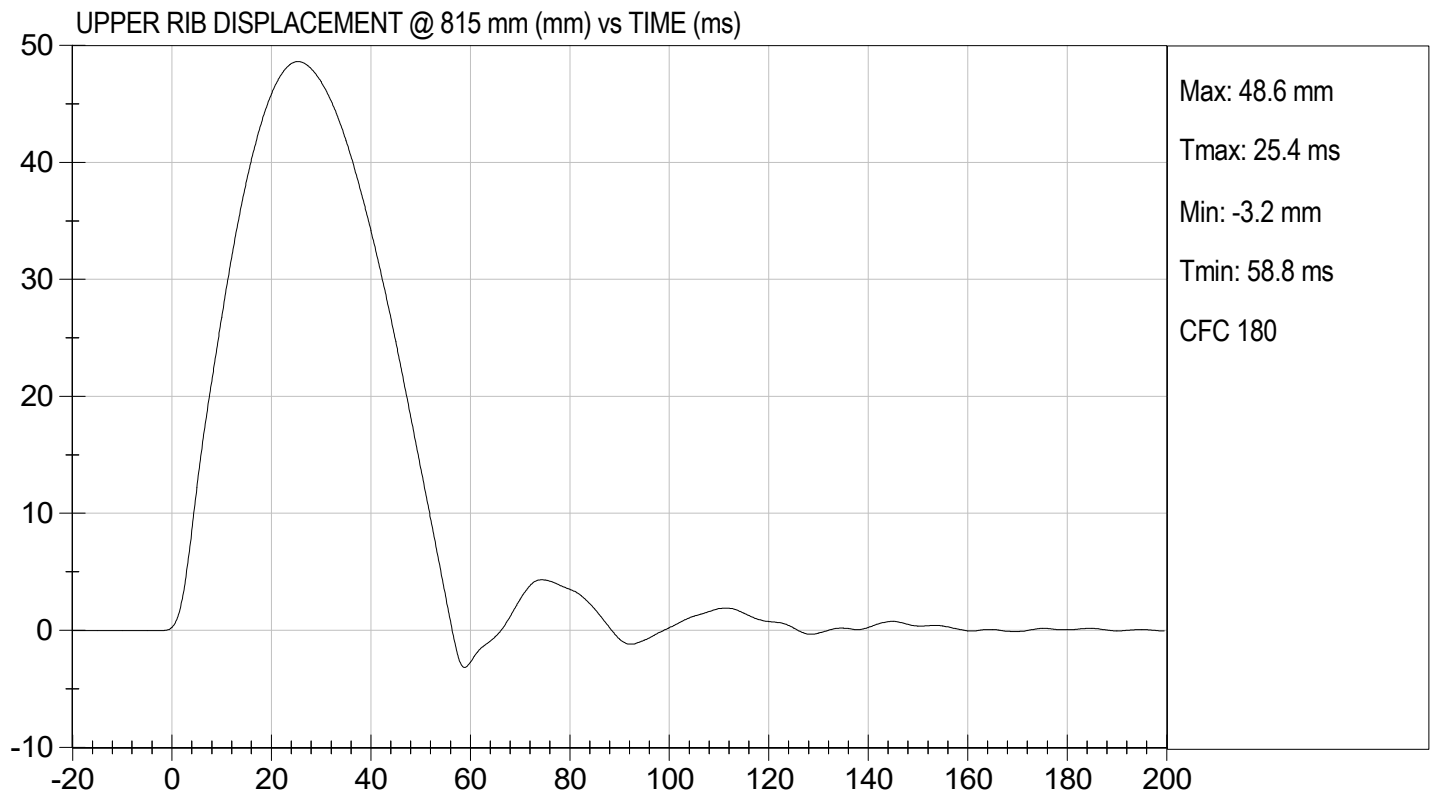
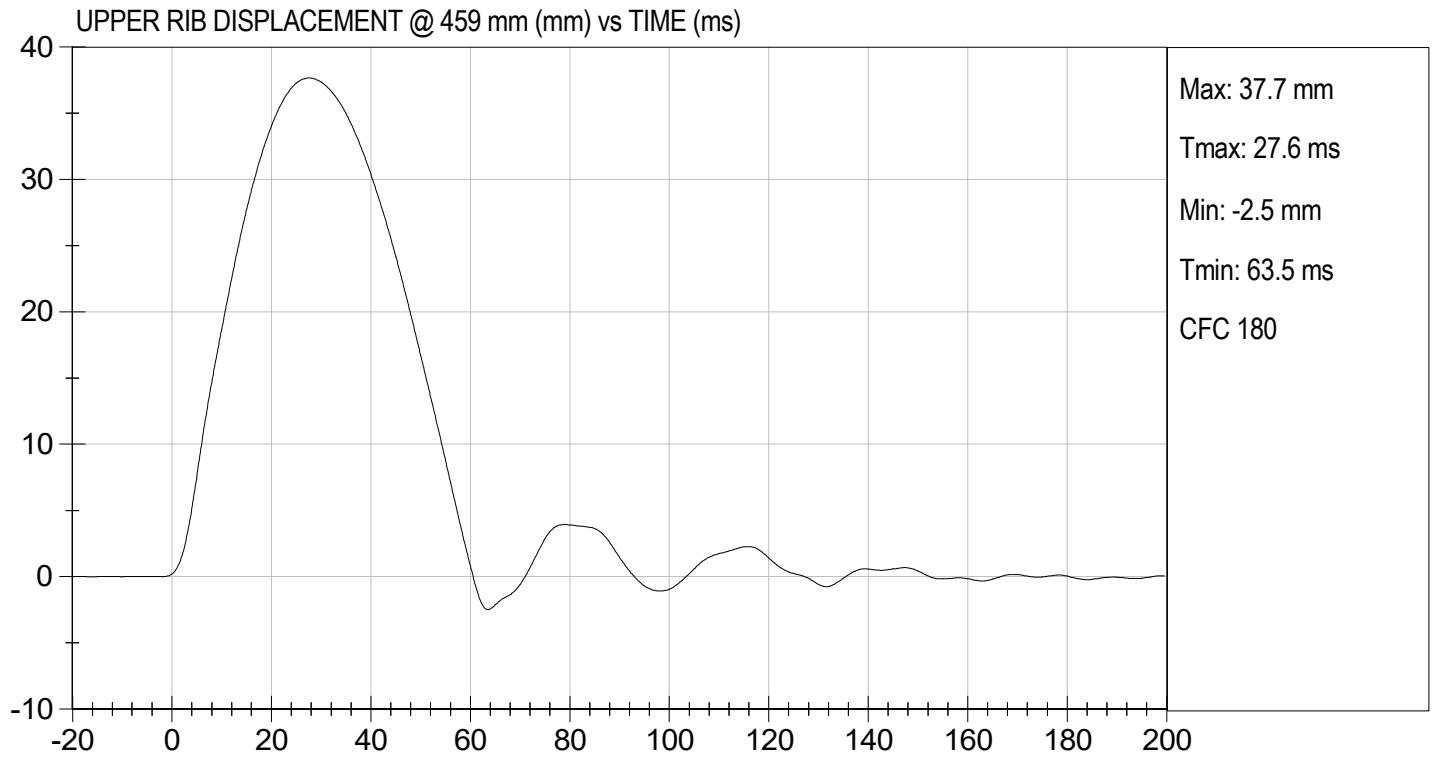
Test I.D: D232654

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.7	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.6	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/27/2023
Test Date



MGA RESEARCH CORPORATION

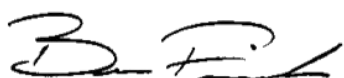
**MID RIB TEST
ES-2re DUMMY**

ATD Serial No: F032

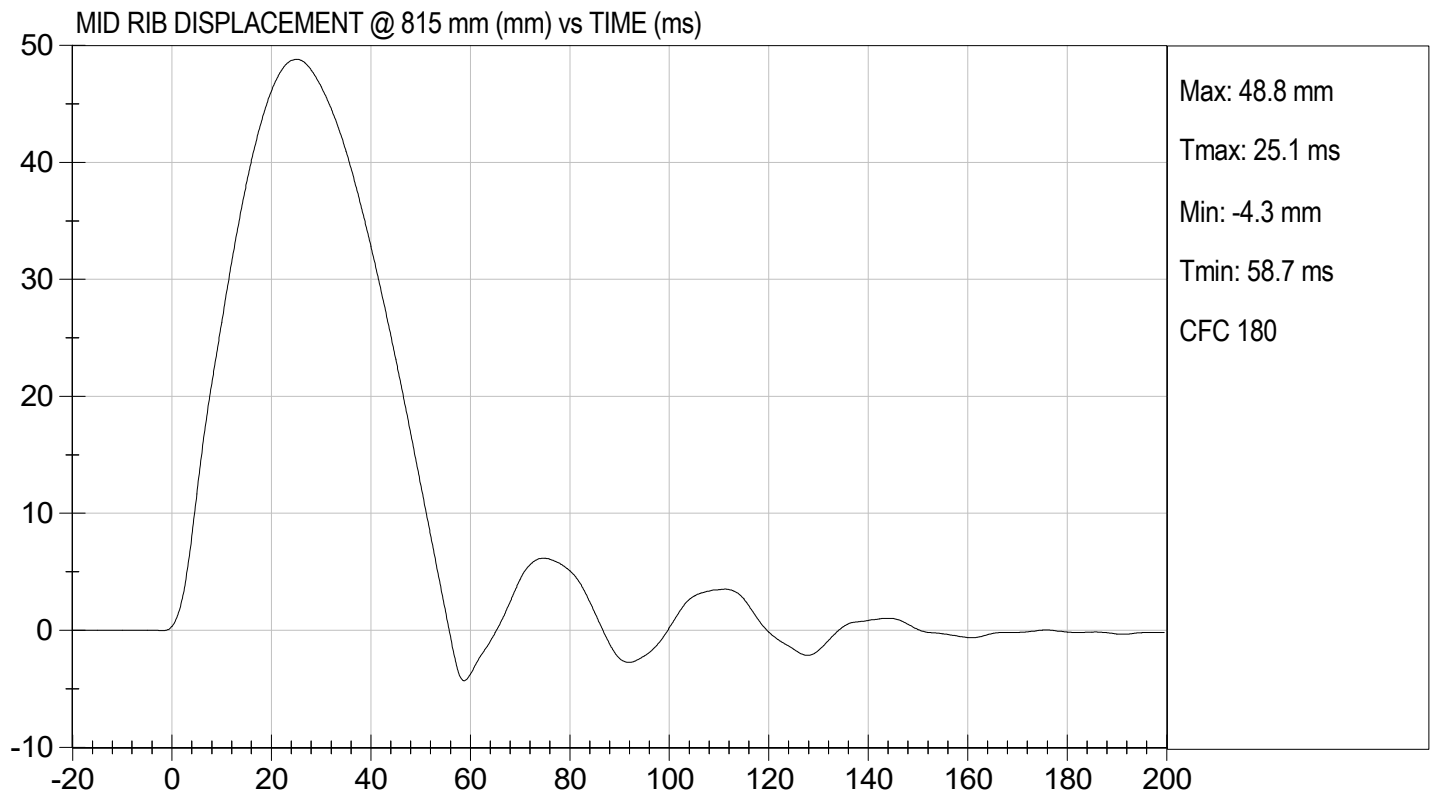
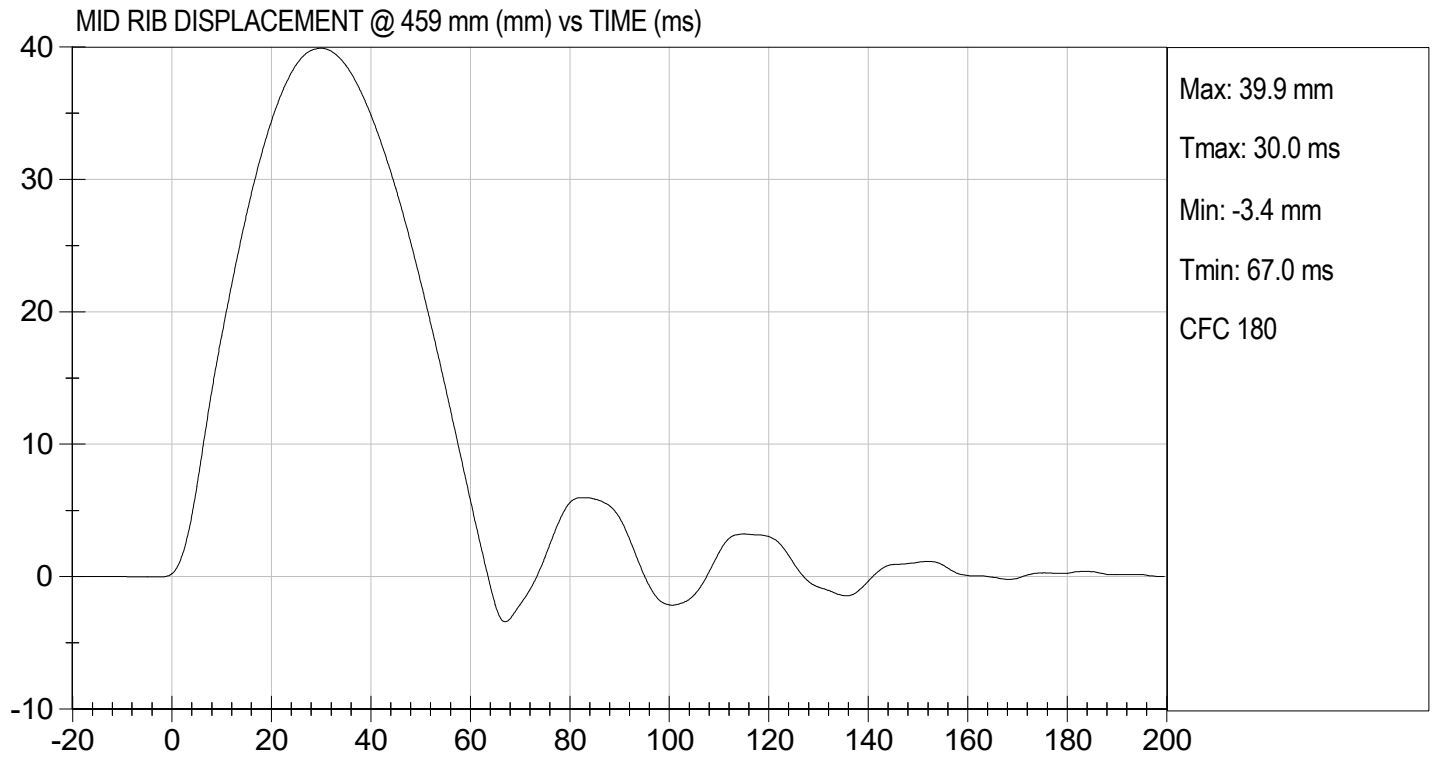
Test I.D: D232655

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.9	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.8	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/27/2023
Test Date



MGA RESEARCH CORPORATION

LOWER RIB TEST

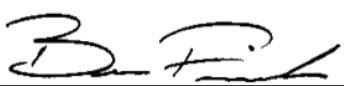
ES-2re DUMMY

ATD Serial No: F032

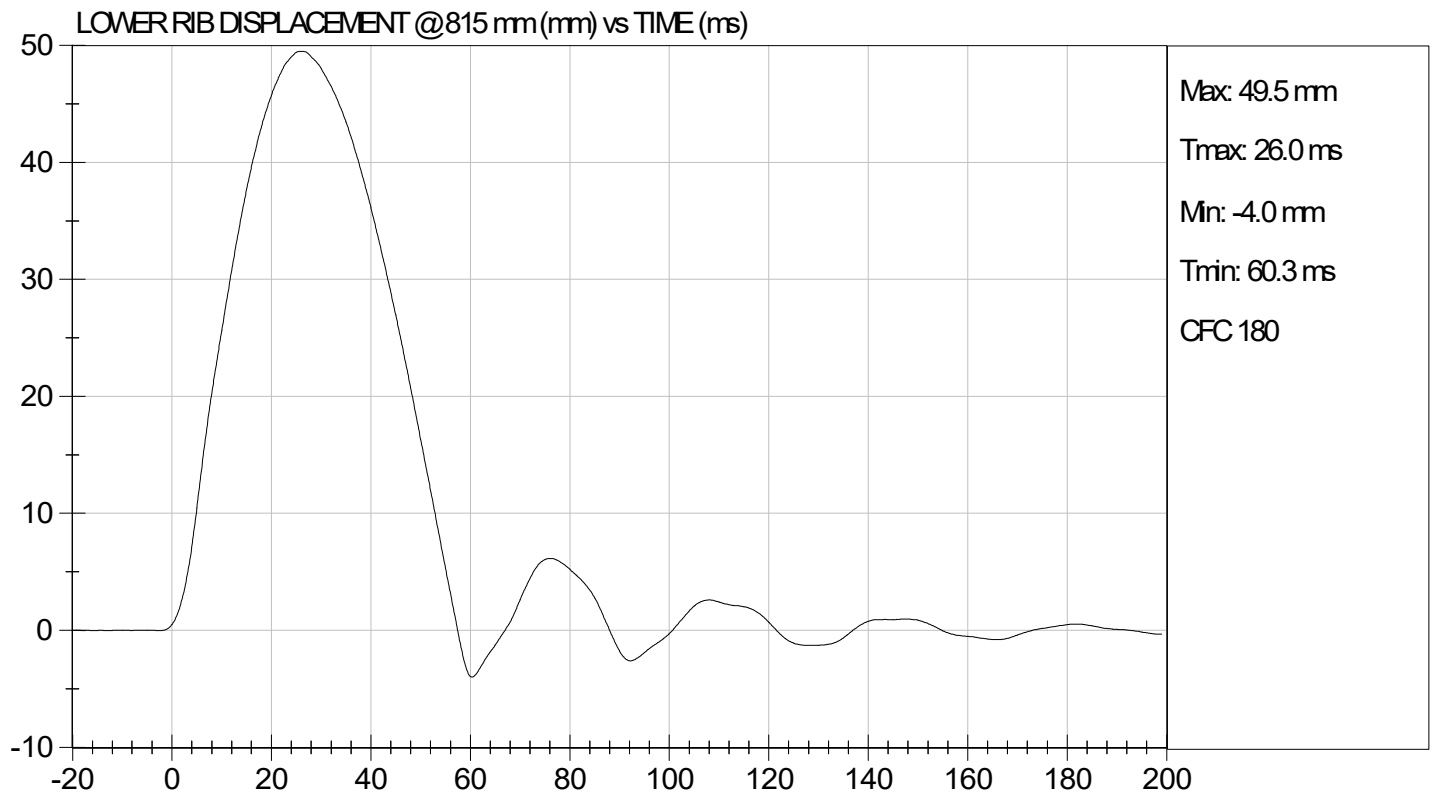
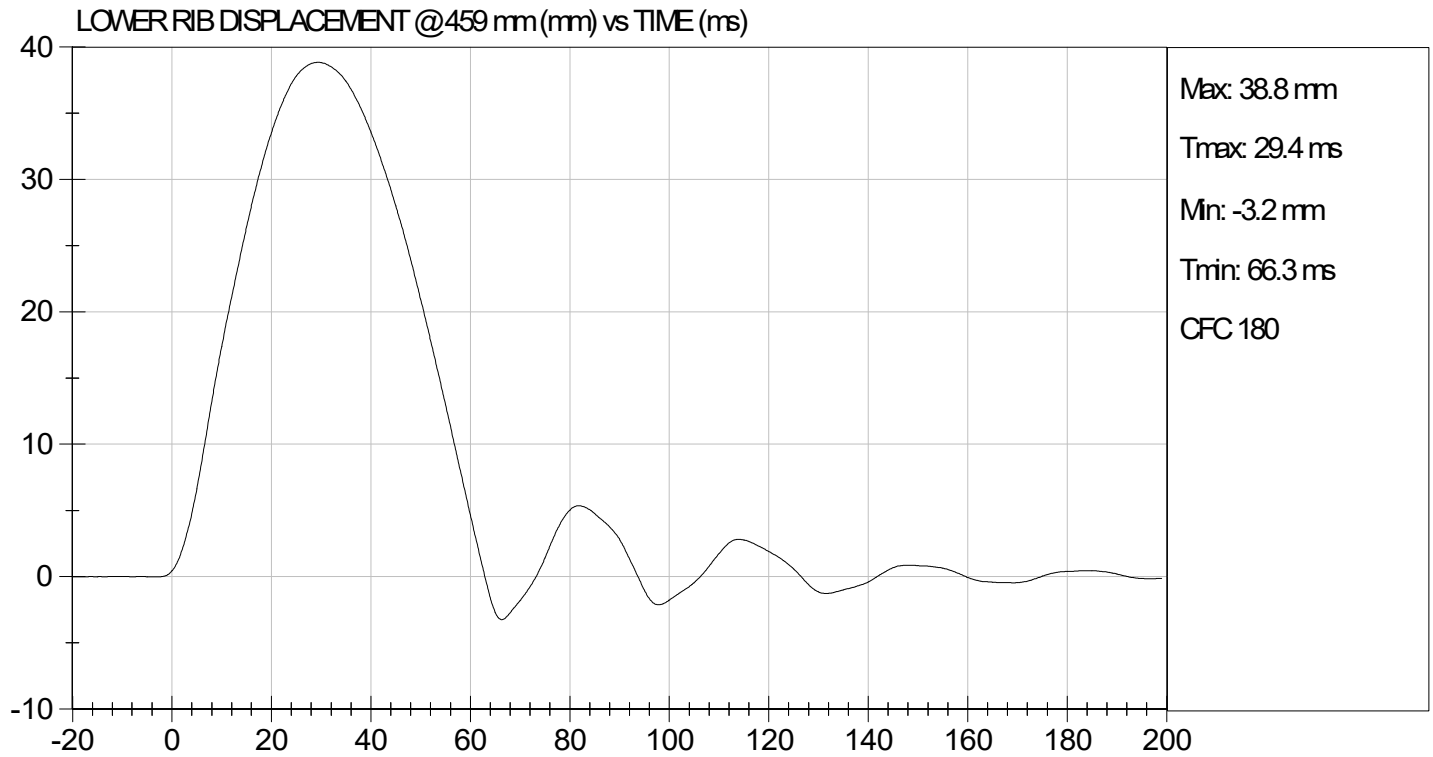
Test I.D: D232656

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.8	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.5	Pass
			Overall Test Results	Pass


Laboratory Technician


Approved By

09/27/2023
Test Date

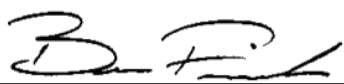


MGA RESEARCH CORPORATION**ABDOMEN TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D232657

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4068	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	12.1	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2365	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	12.1	Pass
Overall Test Results				Pass


Laboratory Technician

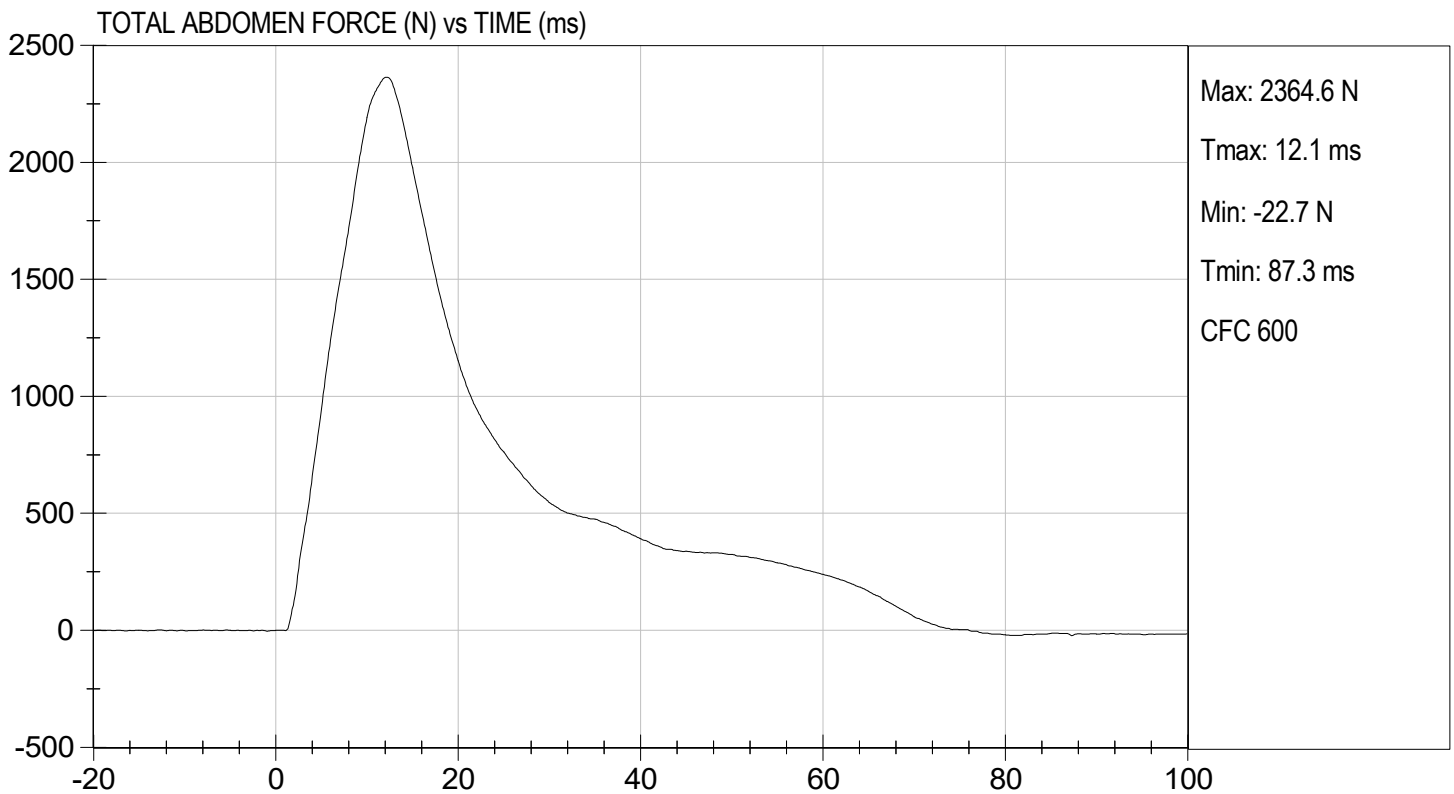
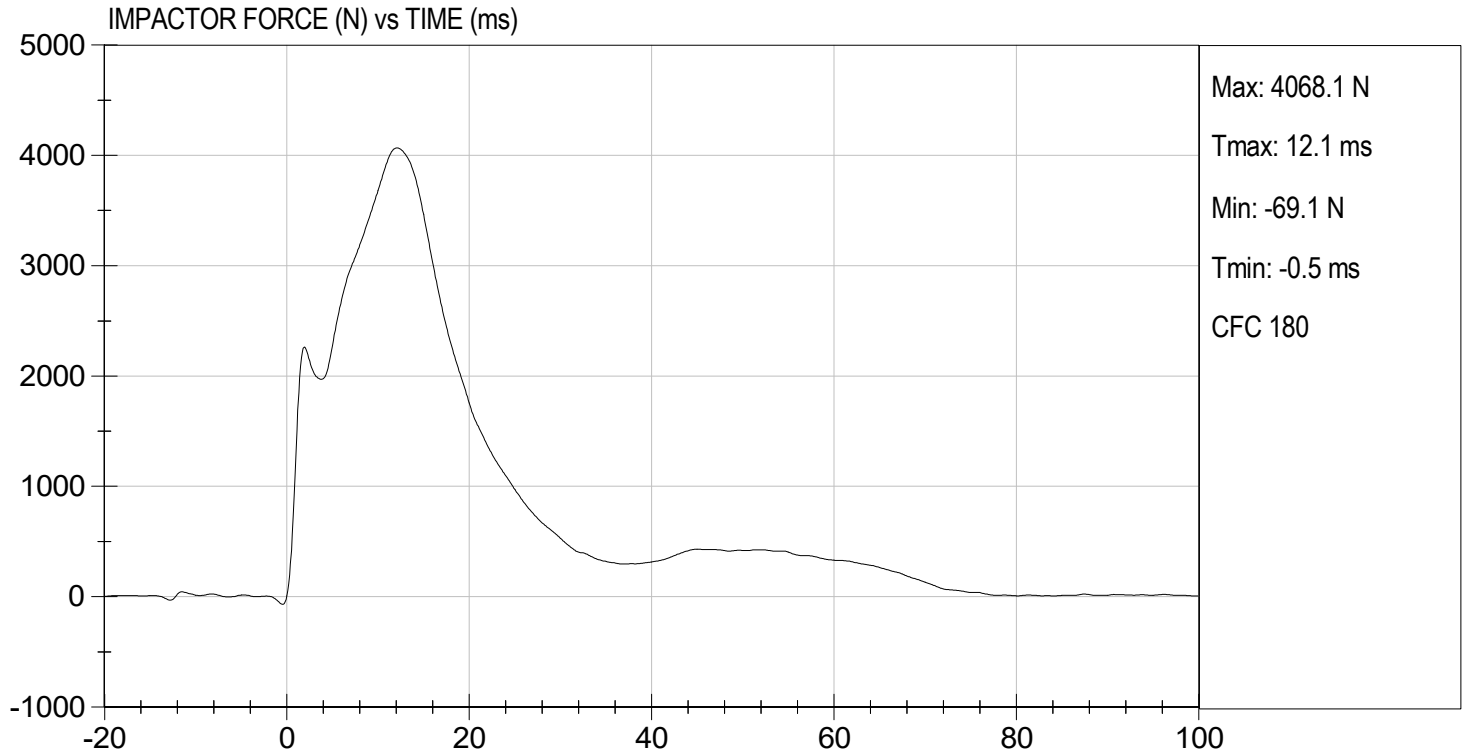
09/27/2023
Test Date


Approved By



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

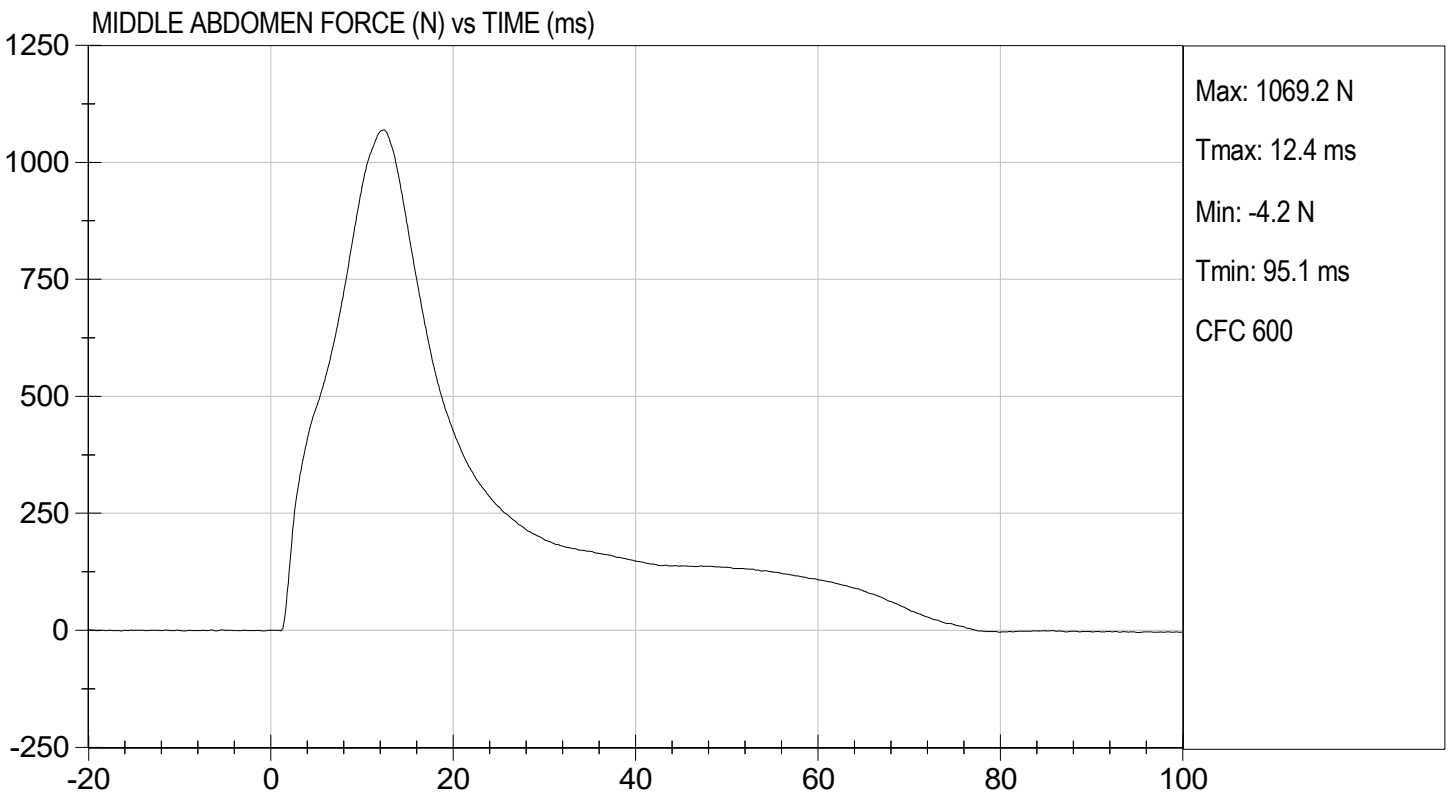
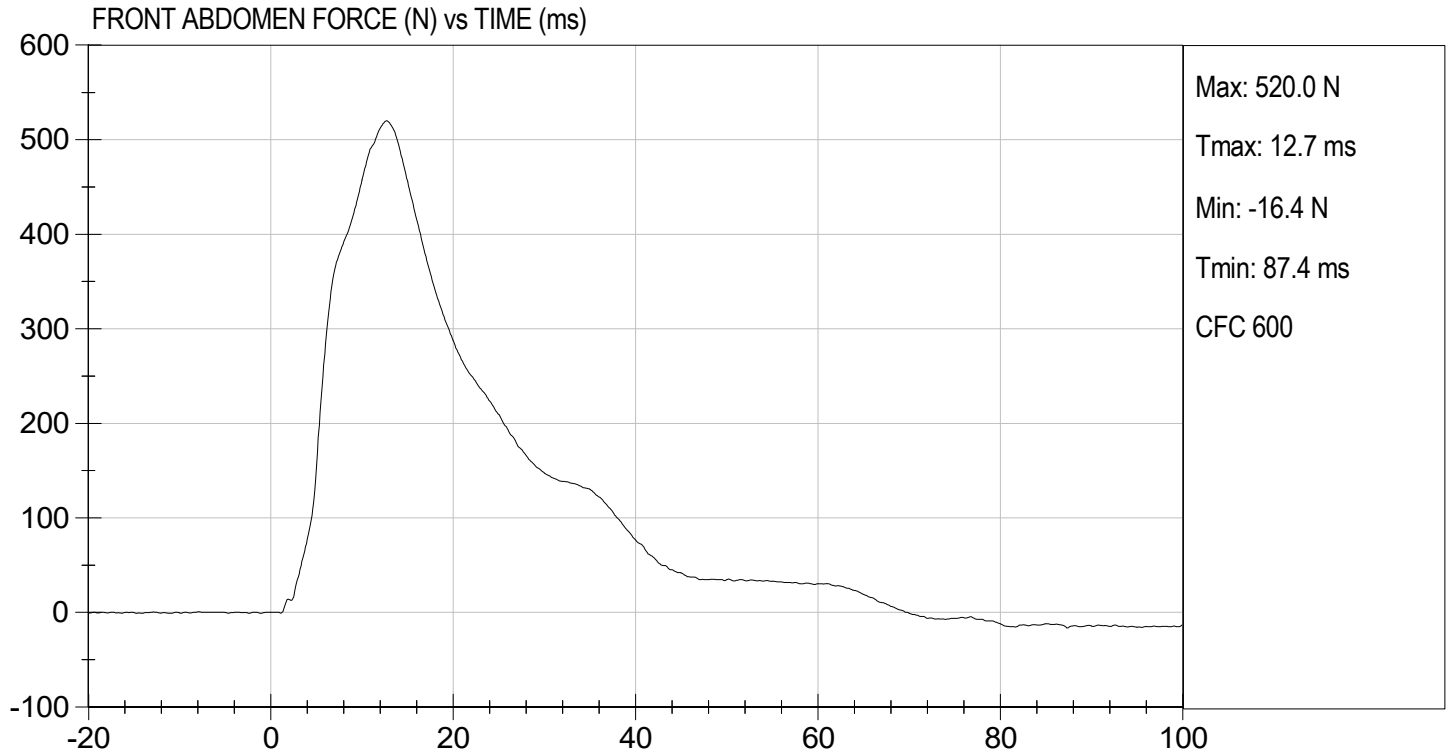
TEST DATE: 09/27/2023
TEST #: D232657





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

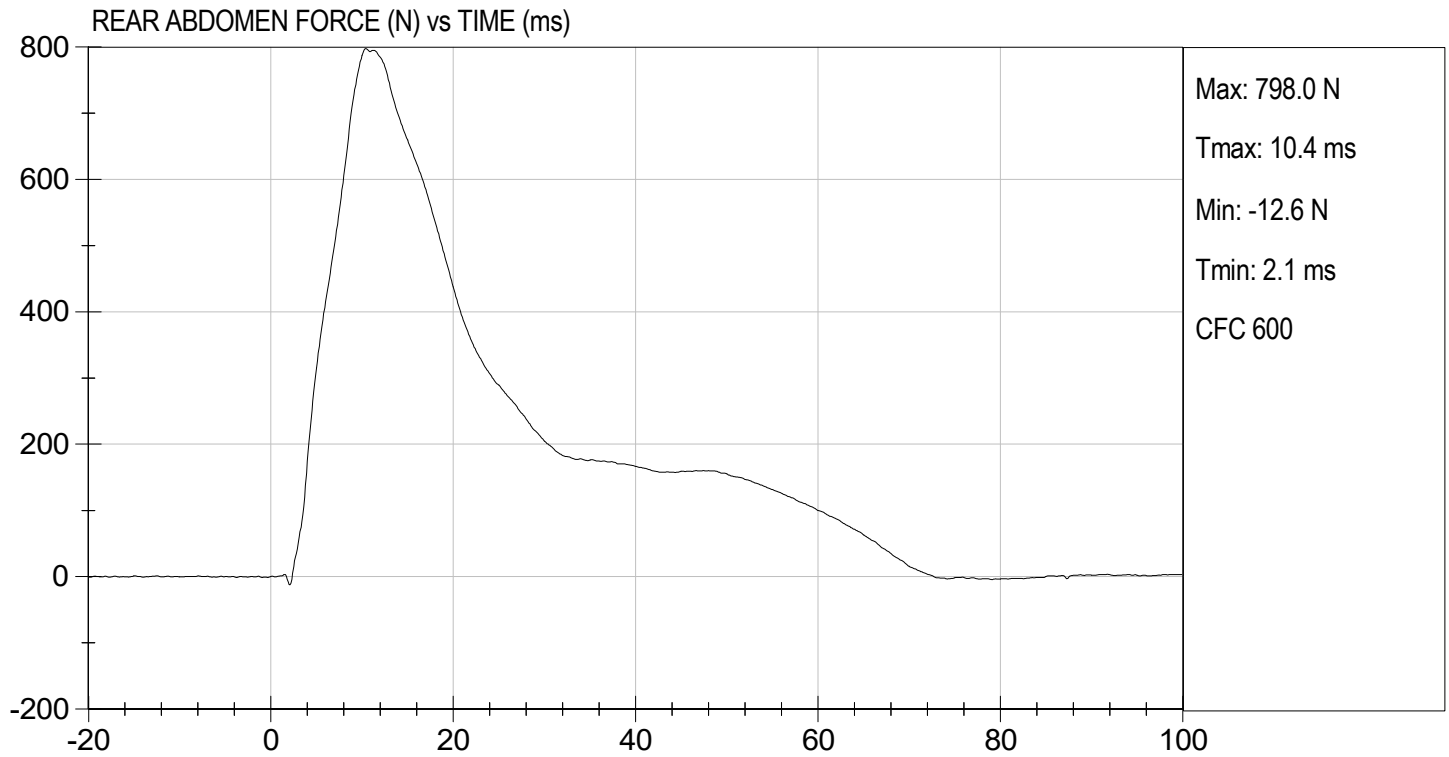
TEST DATE: 09/27/2023
TEST #: D232657





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

TEST DATE: 09/27/2023
TEST #: D232657



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

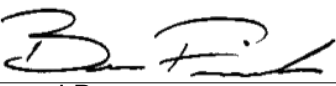
ATD Serial No: F032

Test I.D: D232658

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	47	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.407	Pass
	27 ms	m/s	-6.50 to -5.80	-6.00	Pass
	30 ms	m/s	>= -6.50	-6.31	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	50.5	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	49.1	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	40	Pass
Overall Results					Pass


 Laboratory Technician

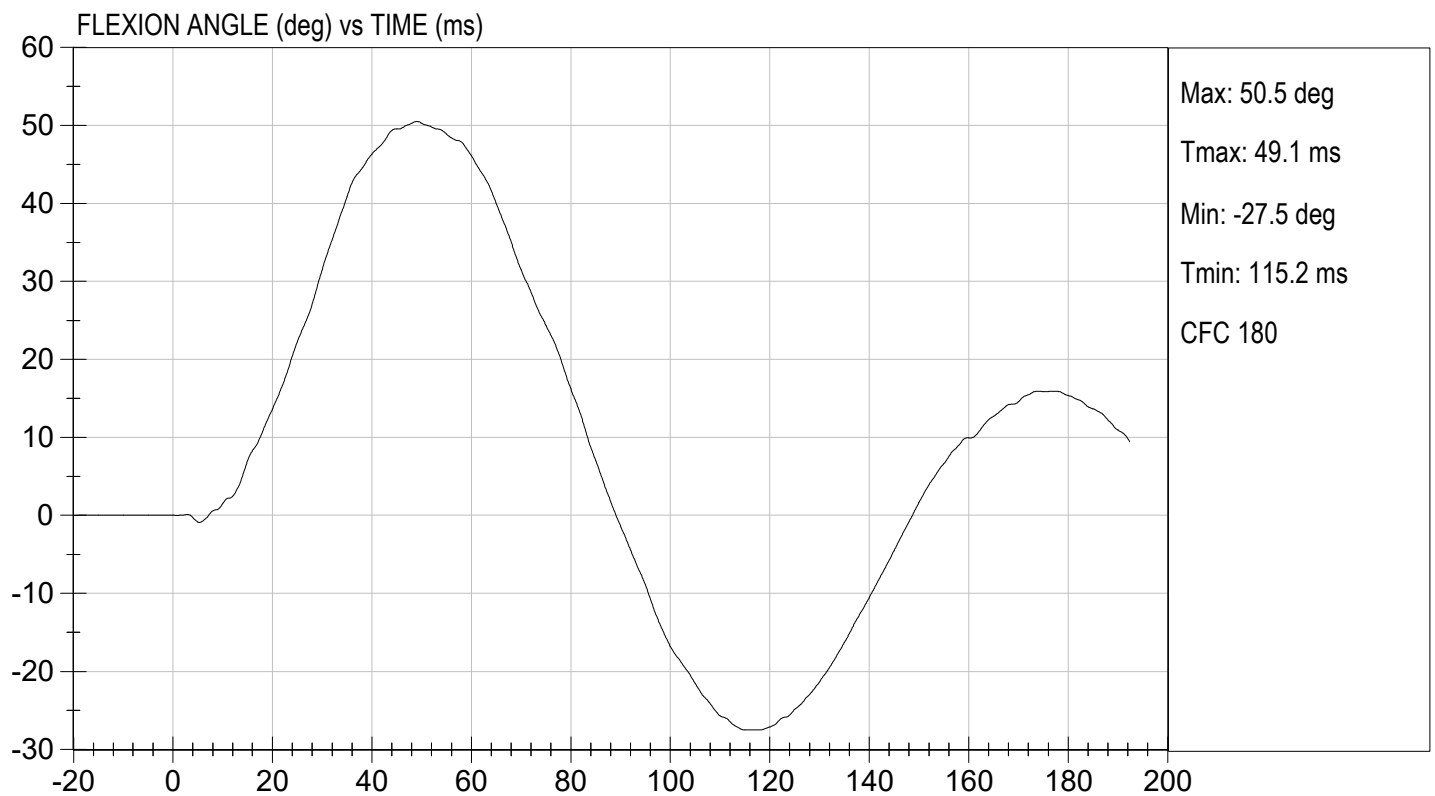
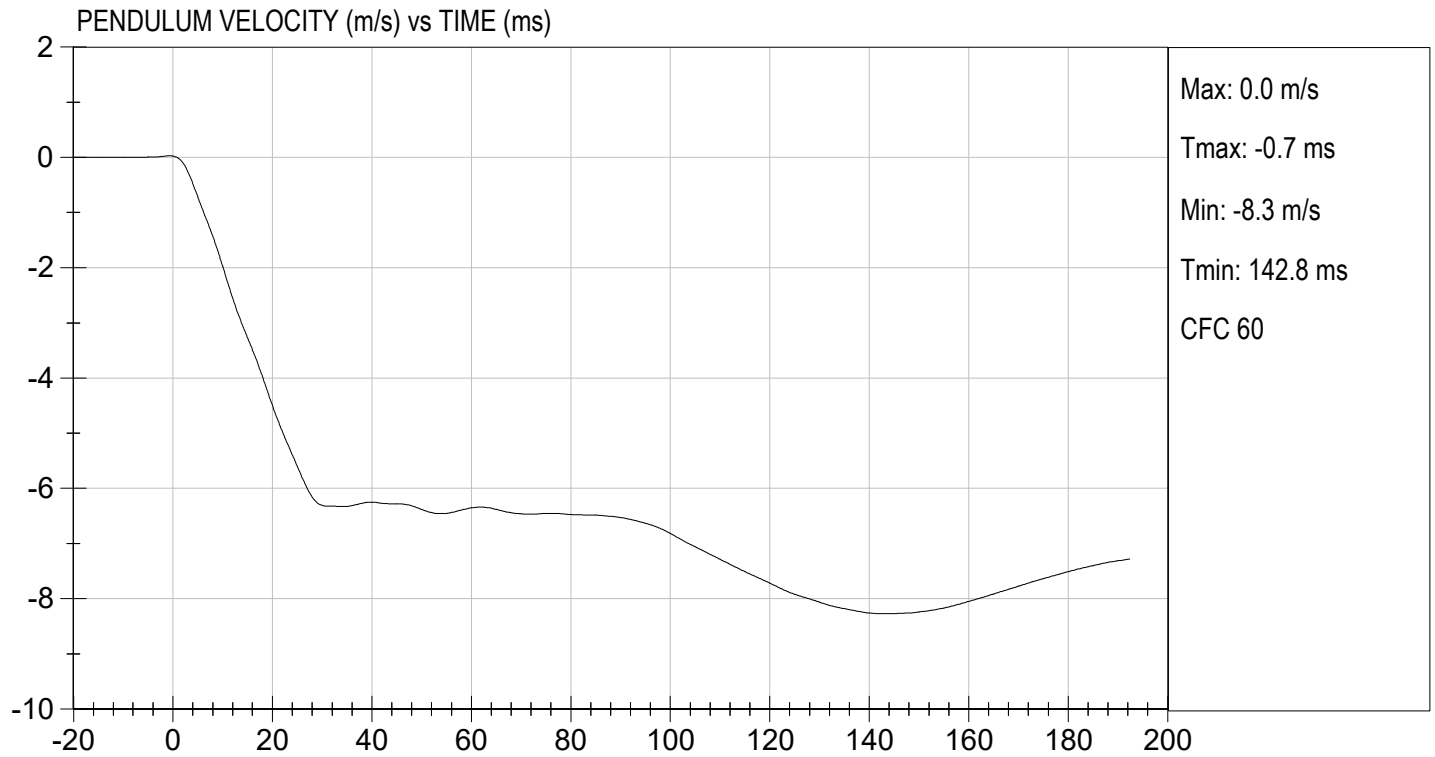
09/27/2023
 Test Date


 Approved By



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

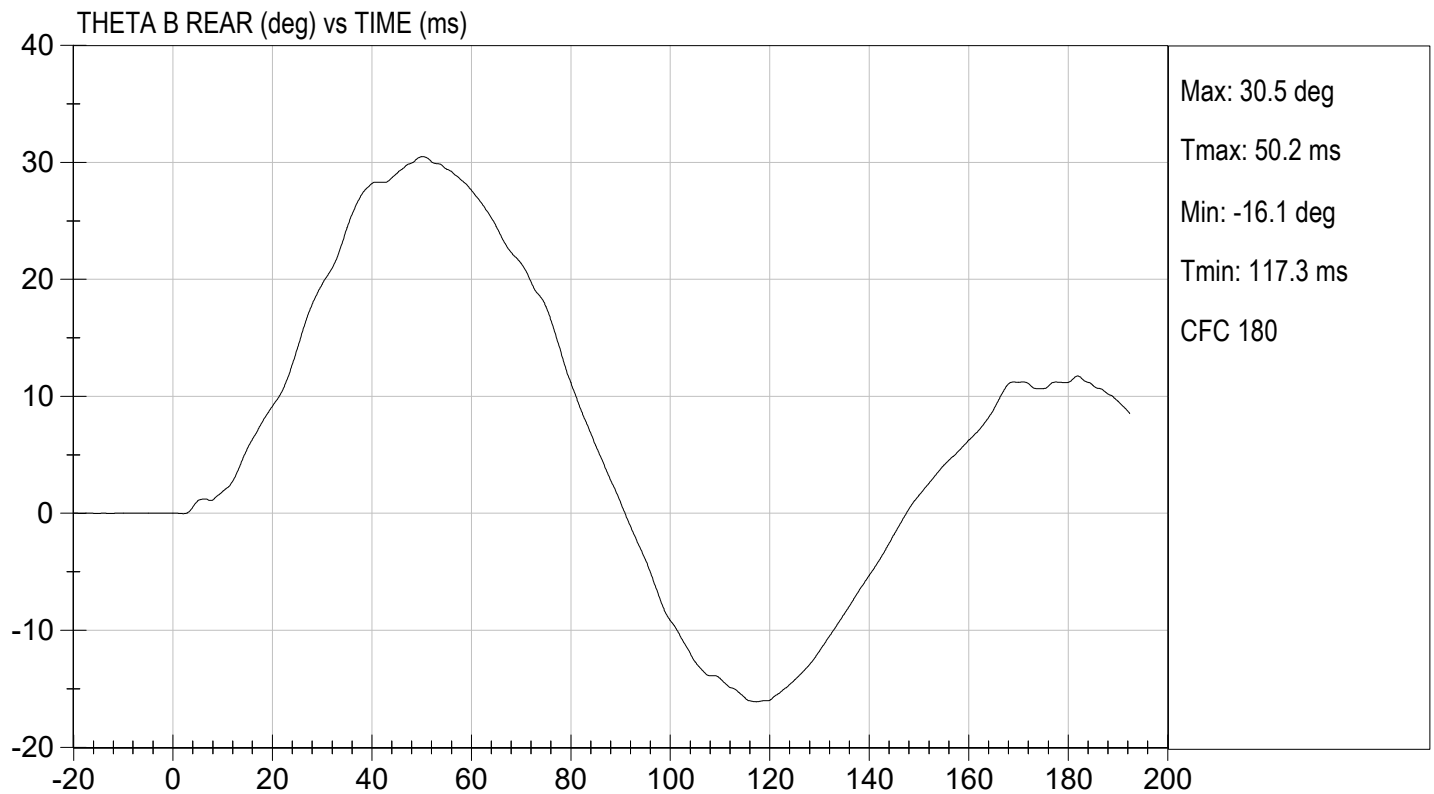
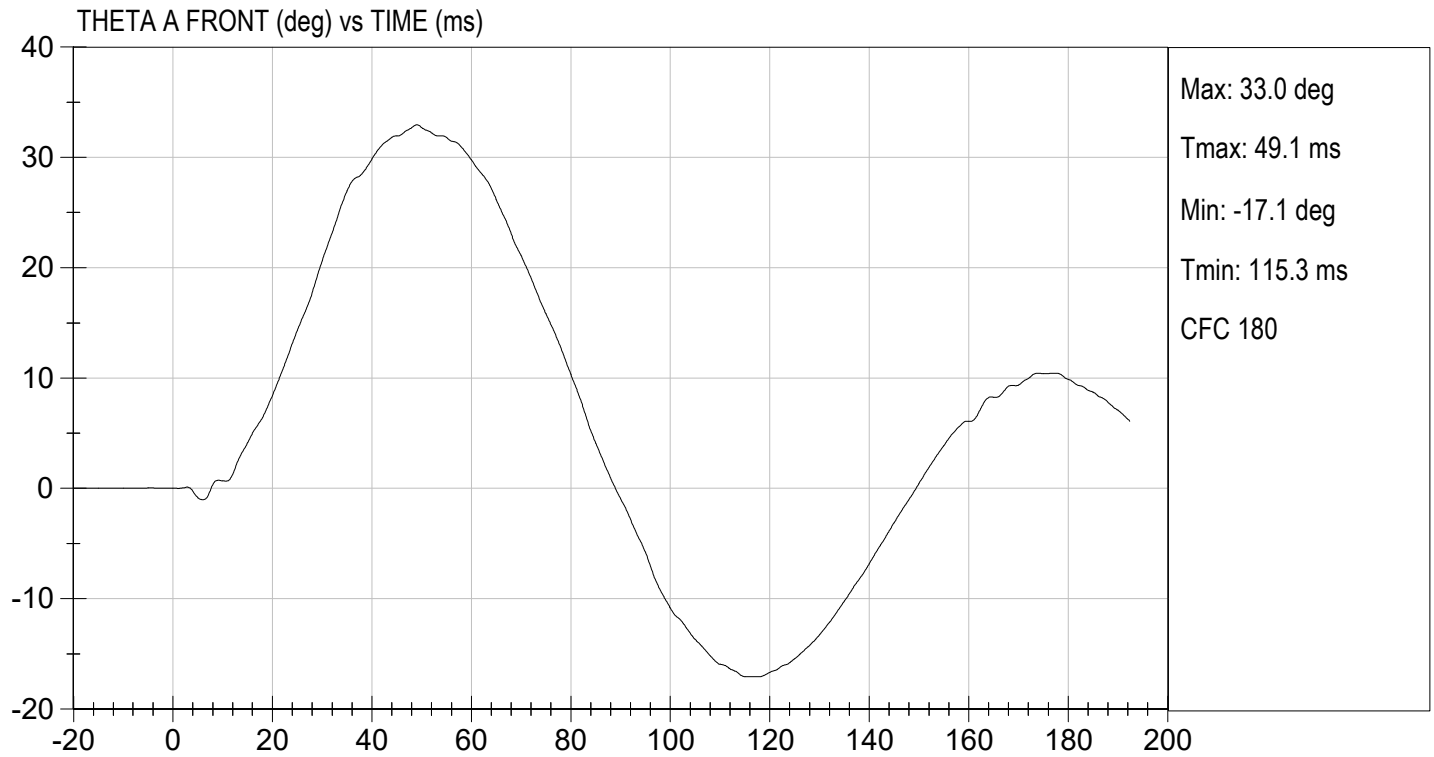
TEST DATE: 09/27/2023
TEST #: D232658





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

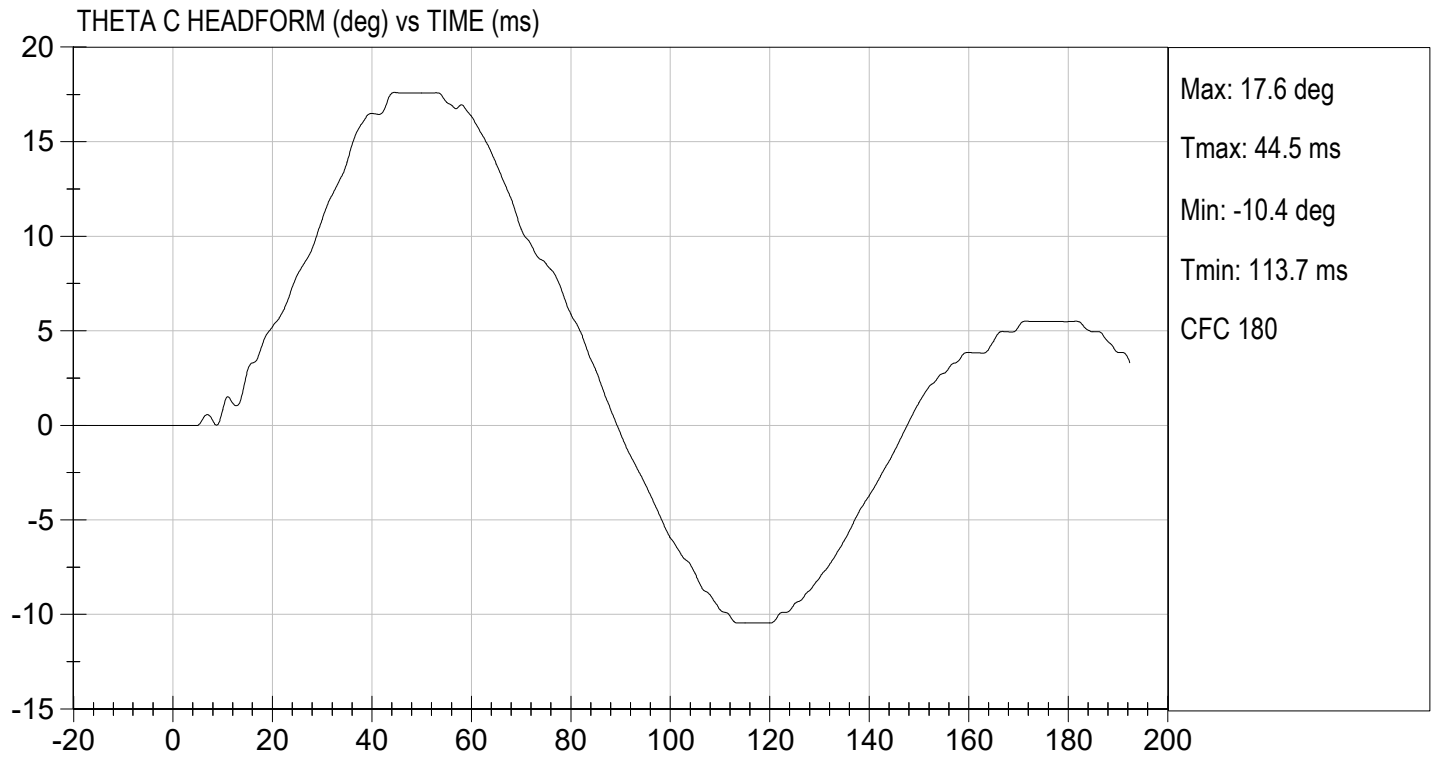
TEST DATE: 09/27/2023
TEST #: D232658





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

TEST DATE: 09/27/2023
TEST #: D232658

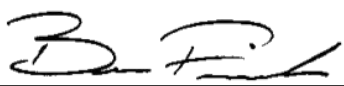


MGA RESEARCH CORPORATION**PELVIS TEST
ES-2re DUMMY****ATD Serial No:** F032**Test I.D:** D232659

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	N	4700 to 5400	4994	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.7	Pass
Maximum Pubic Force	N	1230 to 1590	1272	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	14.8	Pass
Overall Test Results				Pass


Laboratory Technician

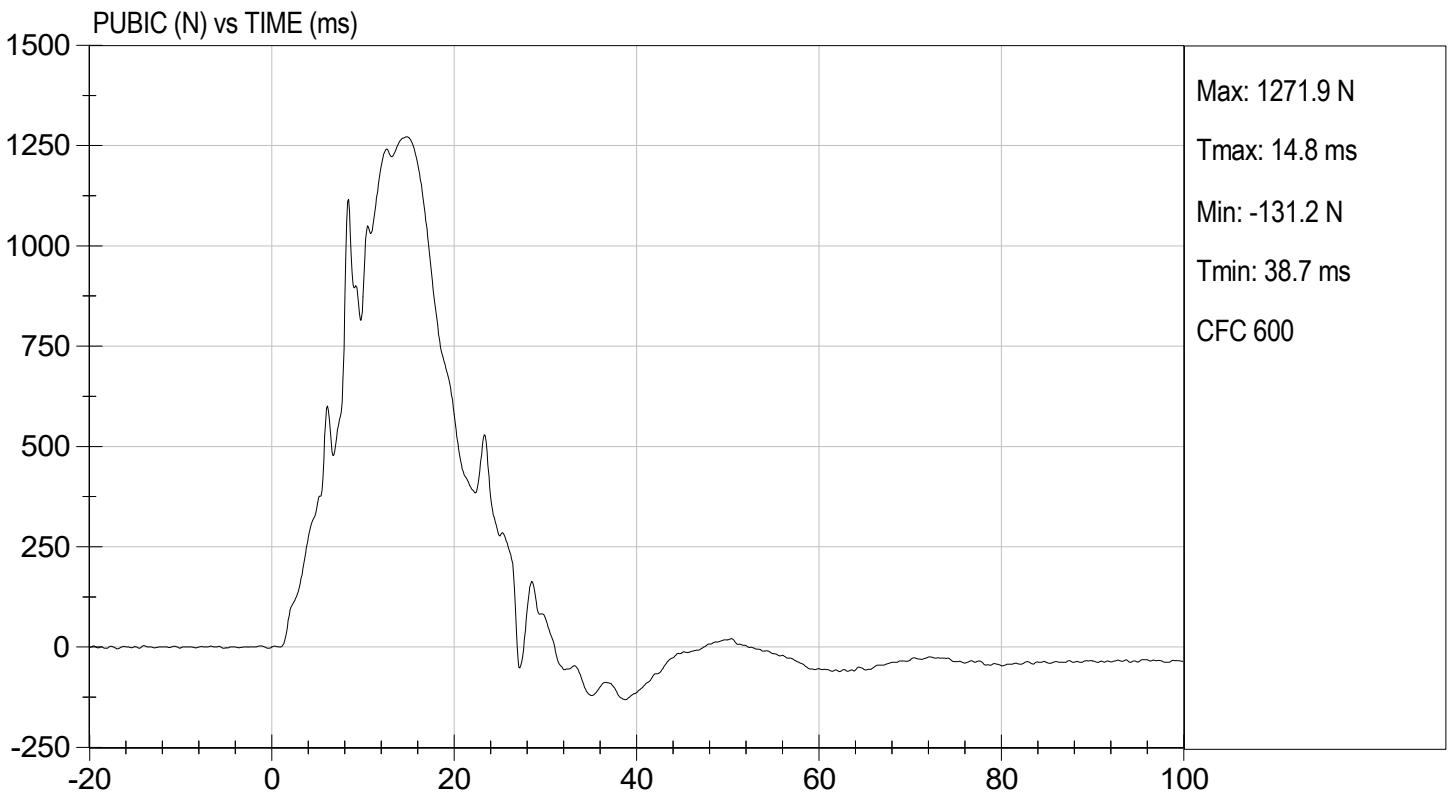
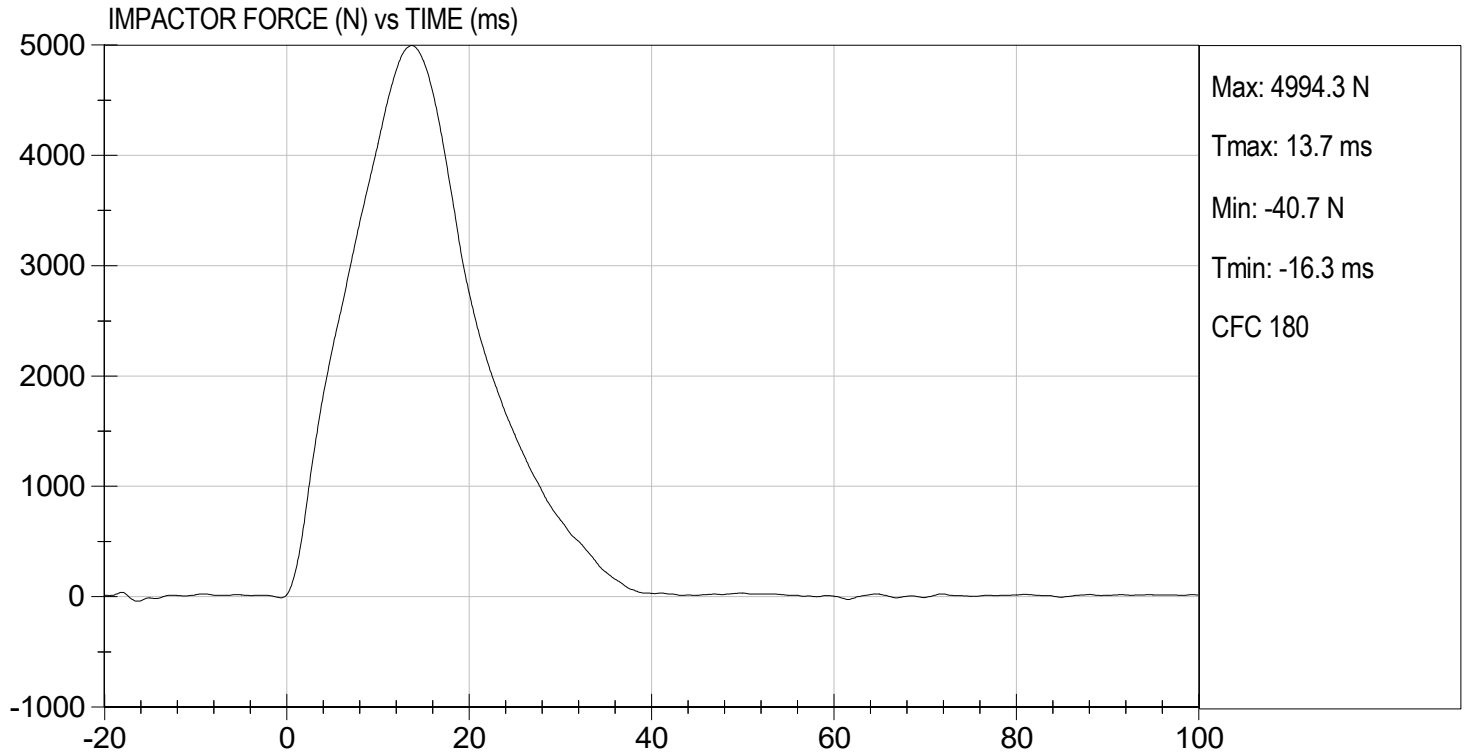
09/27/2023
Test Date


Approved By



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

TEST DATE: 09/27/2023
TEST #: D232659

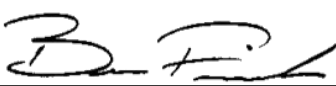


MGA RESEARCH CORPORATION**THORAX IMPACT TEST****ES-2re DUMMY**ATD Serial No: F032Test I.D: D232650

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	49	Pass
Probe Speed	m/s	5.40 to 5.60	5.40	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5729	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.7	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.9	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.4	Pass
Overall Test Results				Pass


Laboratory Technician

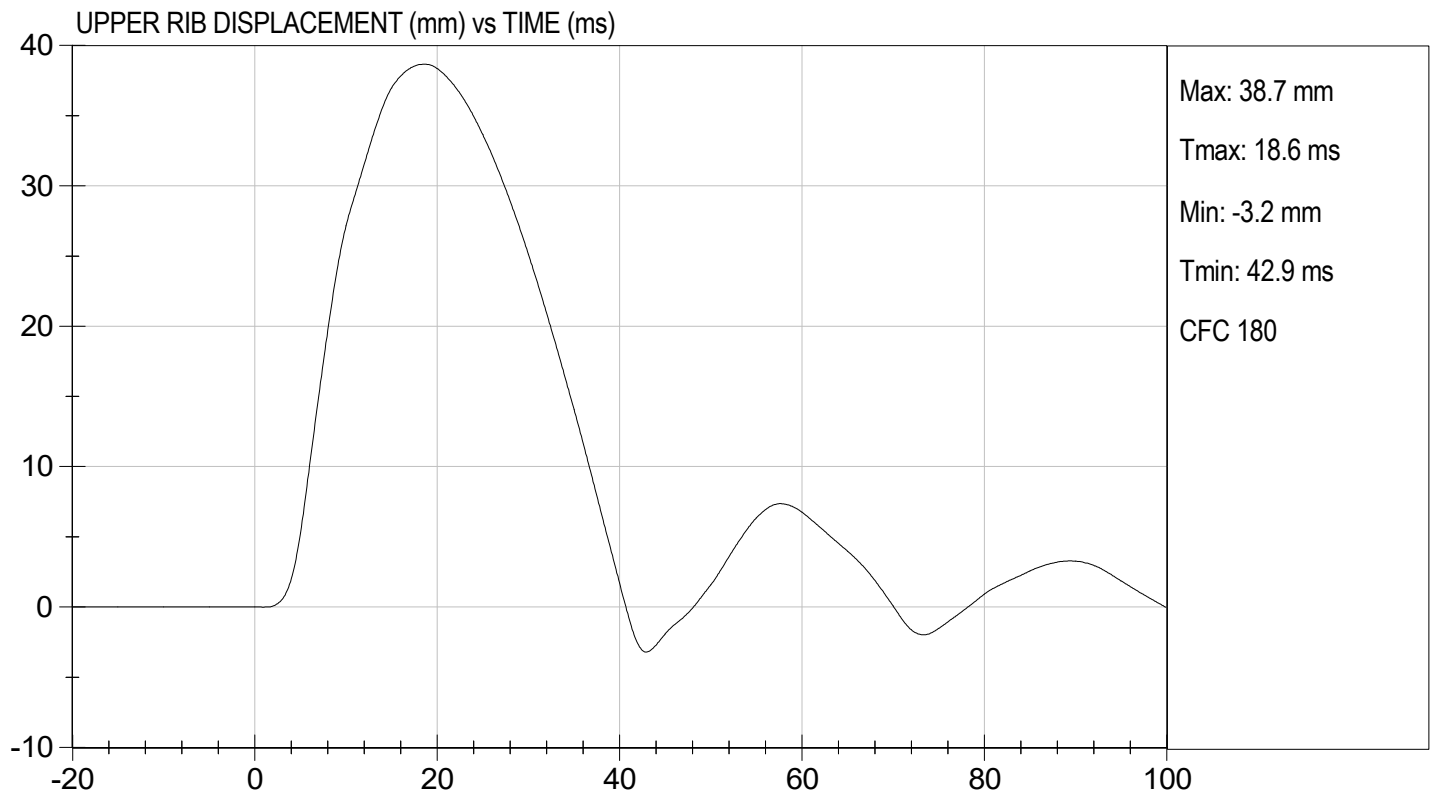
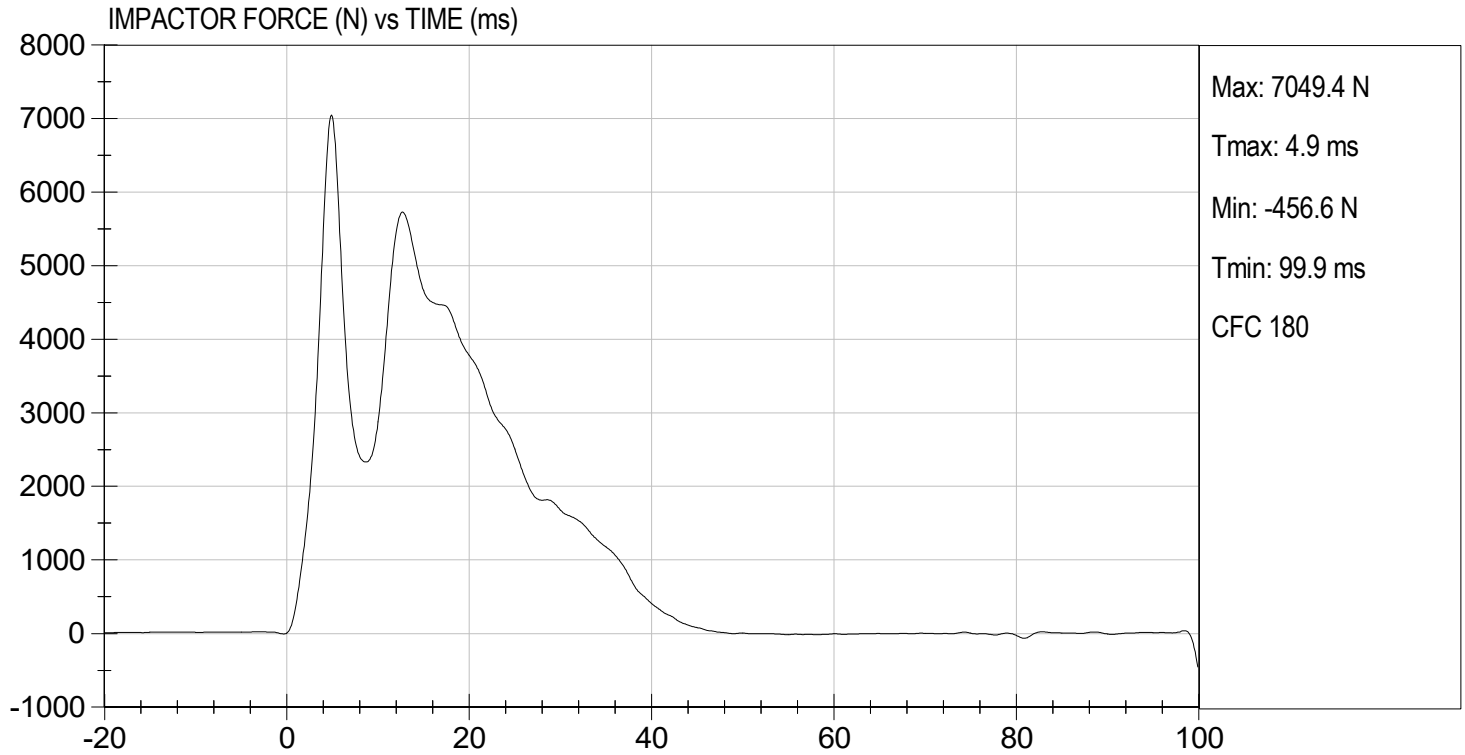
09/27/2023
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 17.73 ft/s, 5.40 m/s

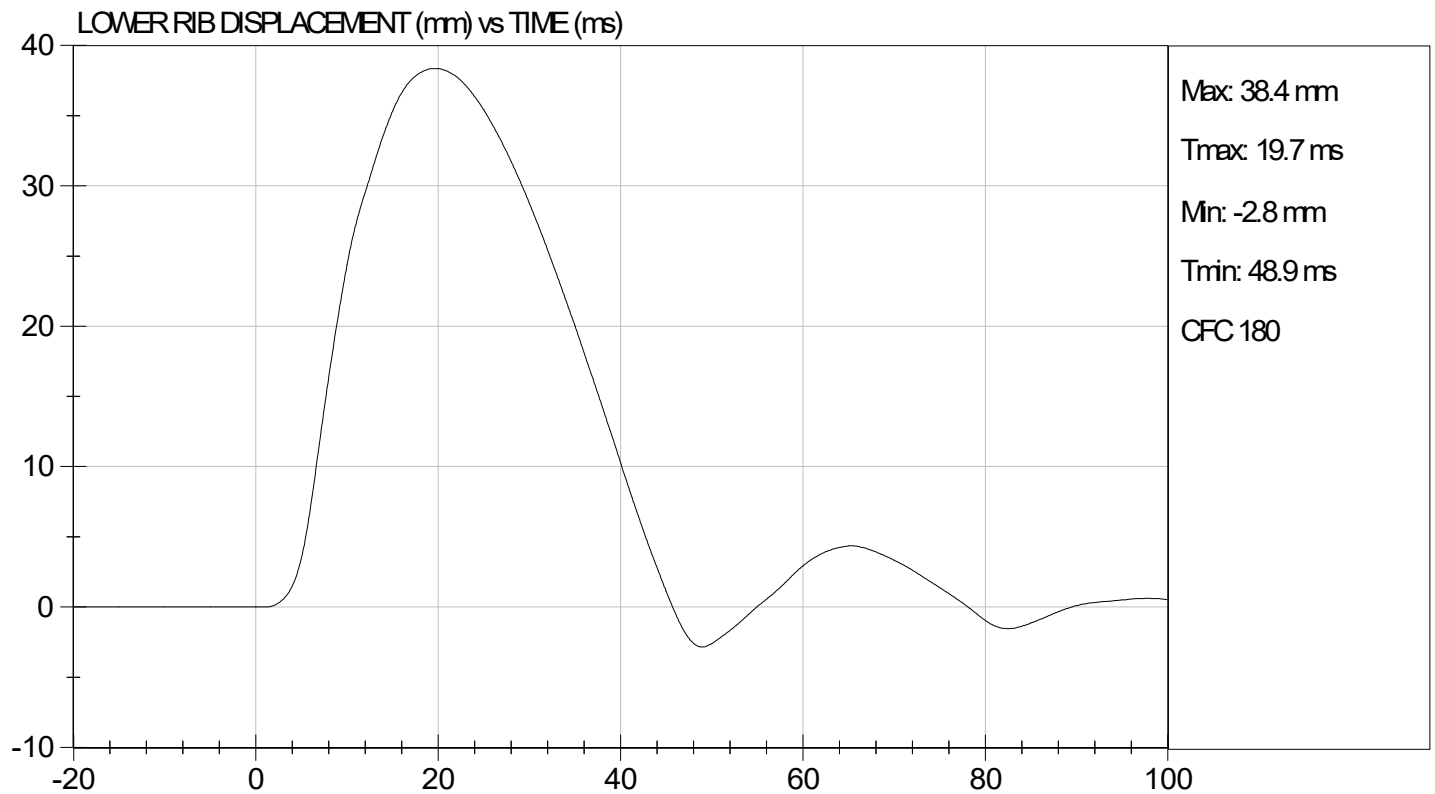
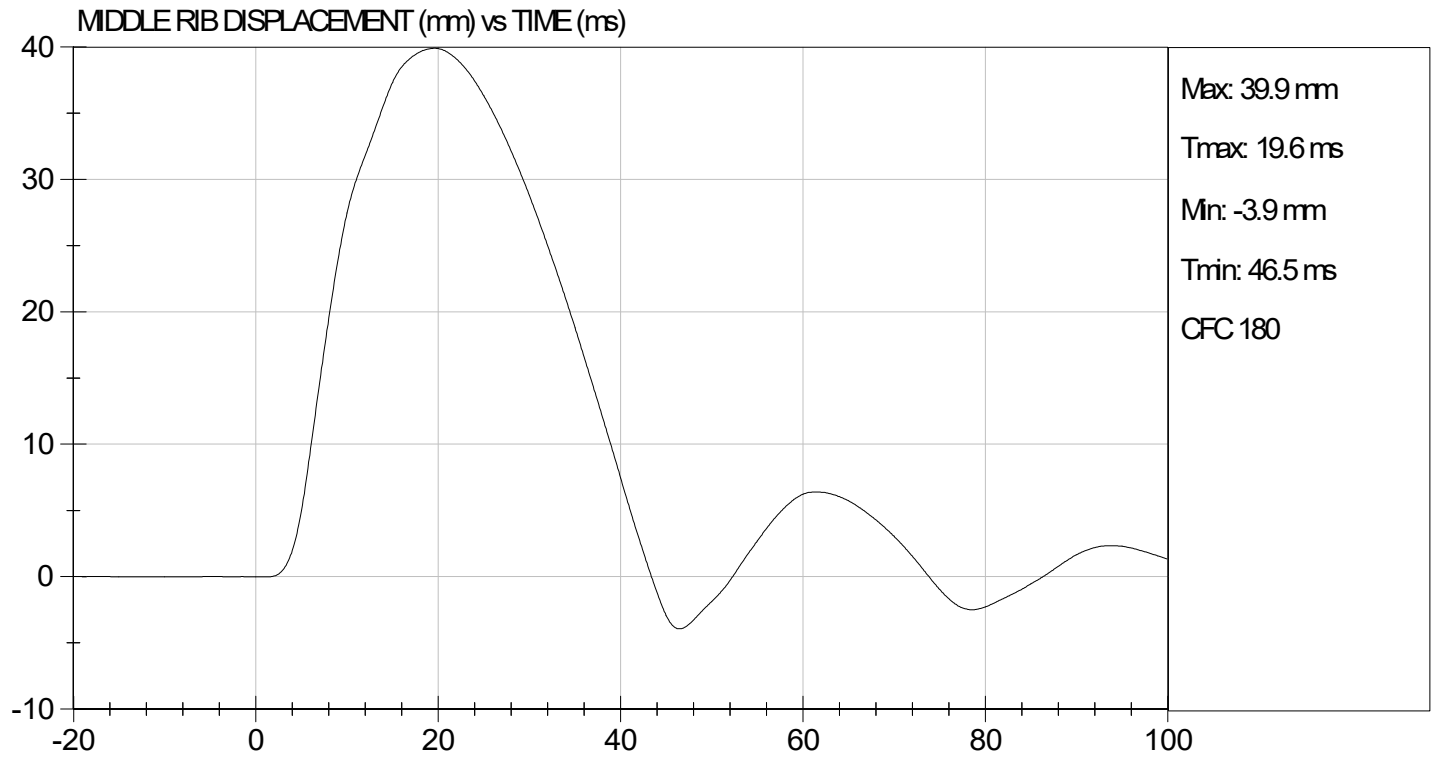
TEST DATE: 09/27/2023
TEST #: D232650





TEST DESC: THORAX IMPACT
VELOCITY: 17.73 ft/s, 5.40 m/s

TEST DATE: 09/27/2023
TEST #: D232650



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

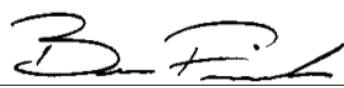
Test ID: D232501

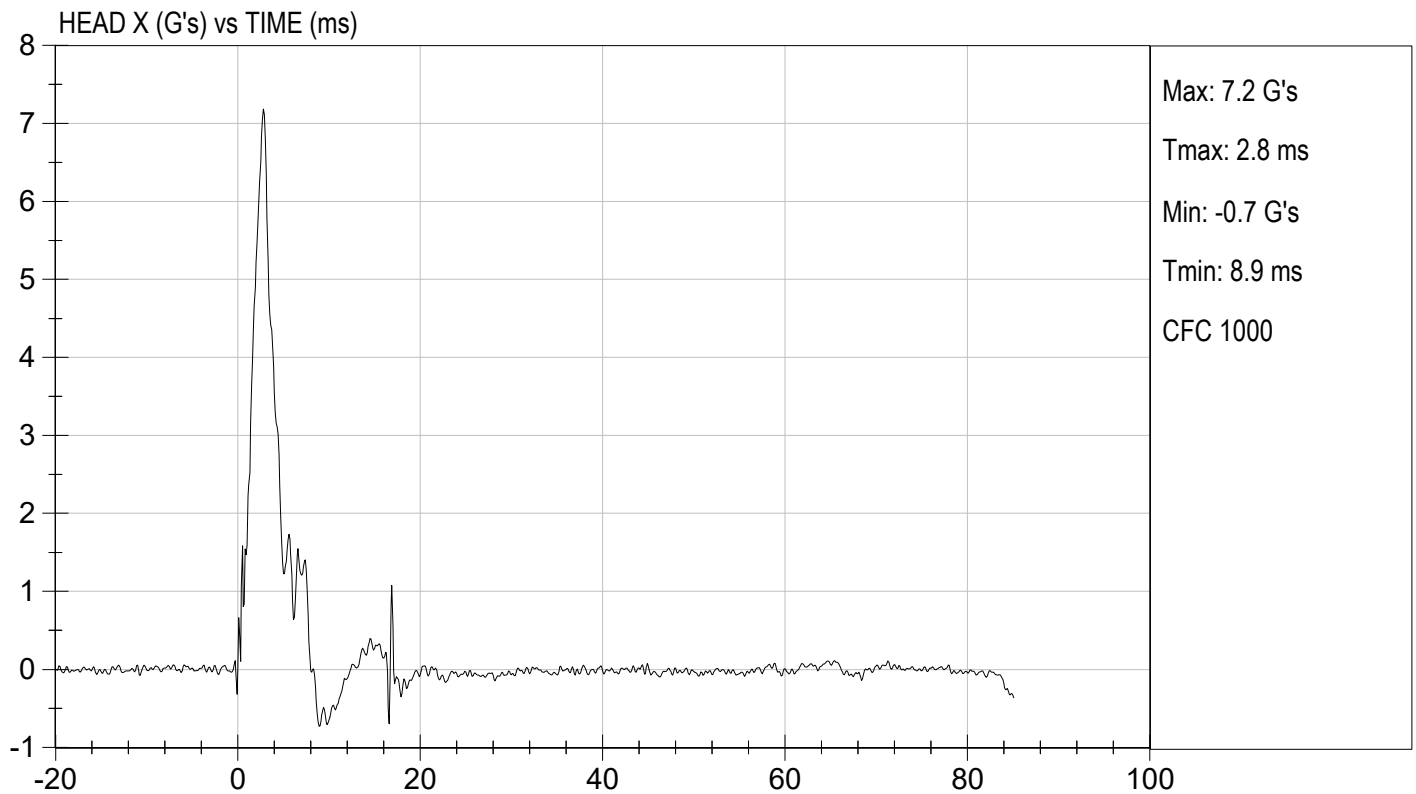
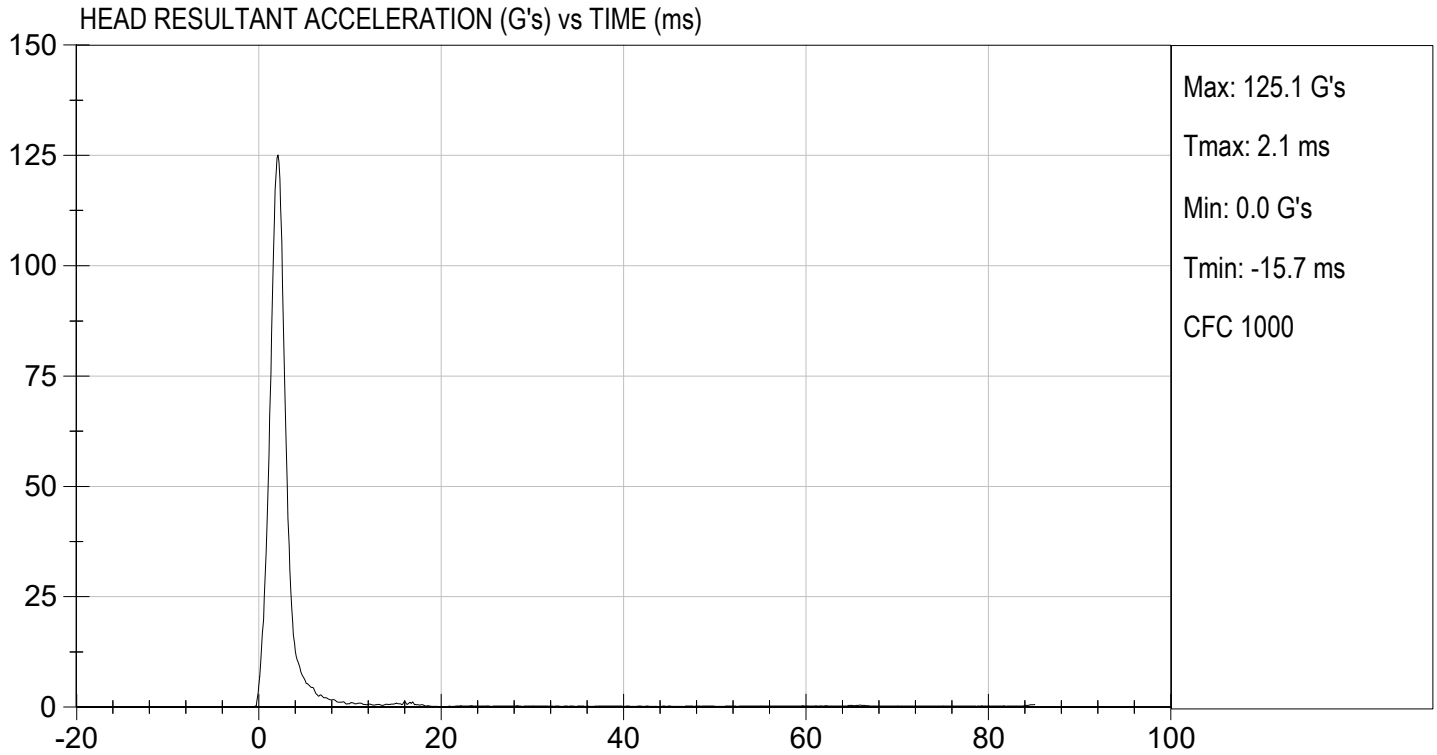
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	115 to 137	125	Pass
Peak Longitudinal Acceleration	G's	+/- 15	7.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results			Pass	

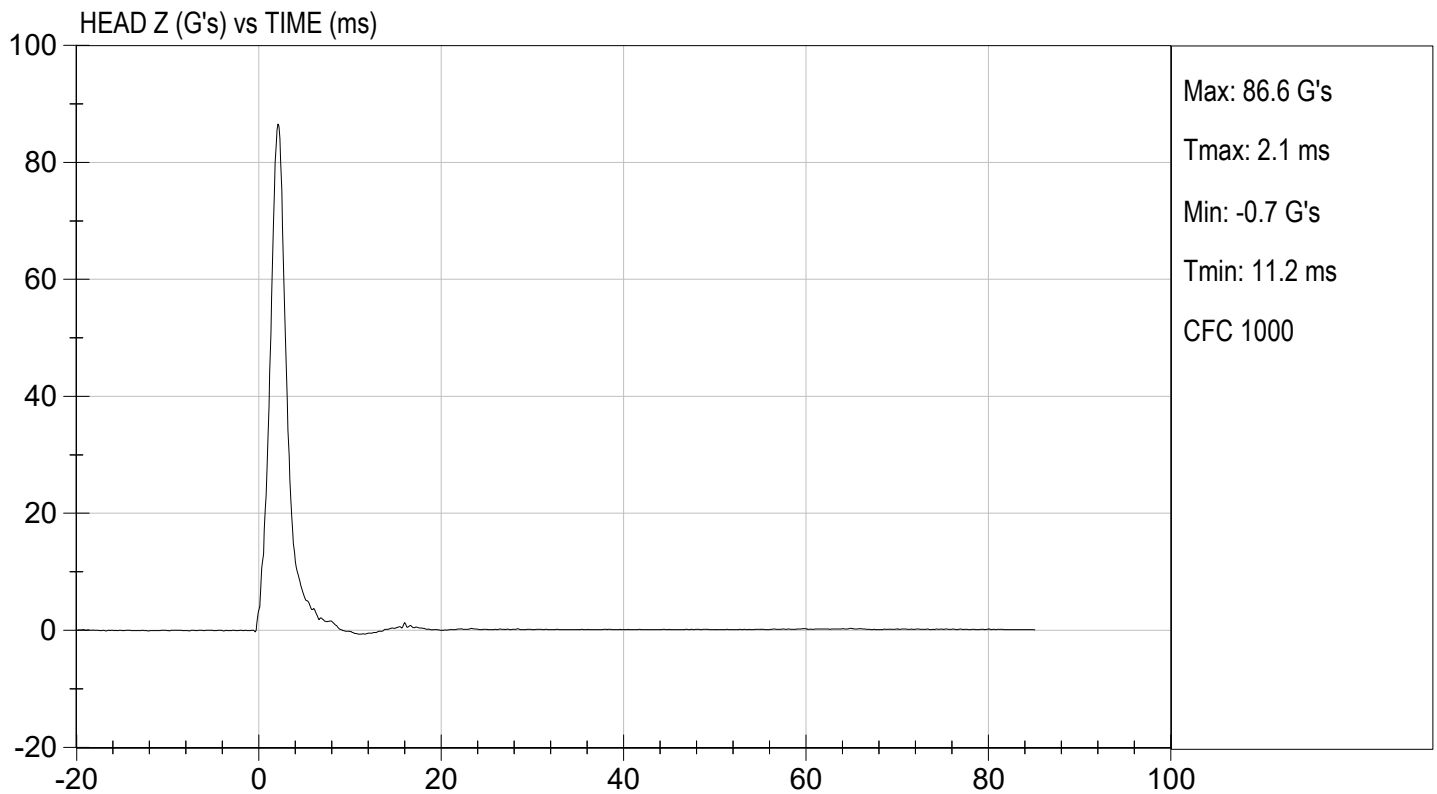
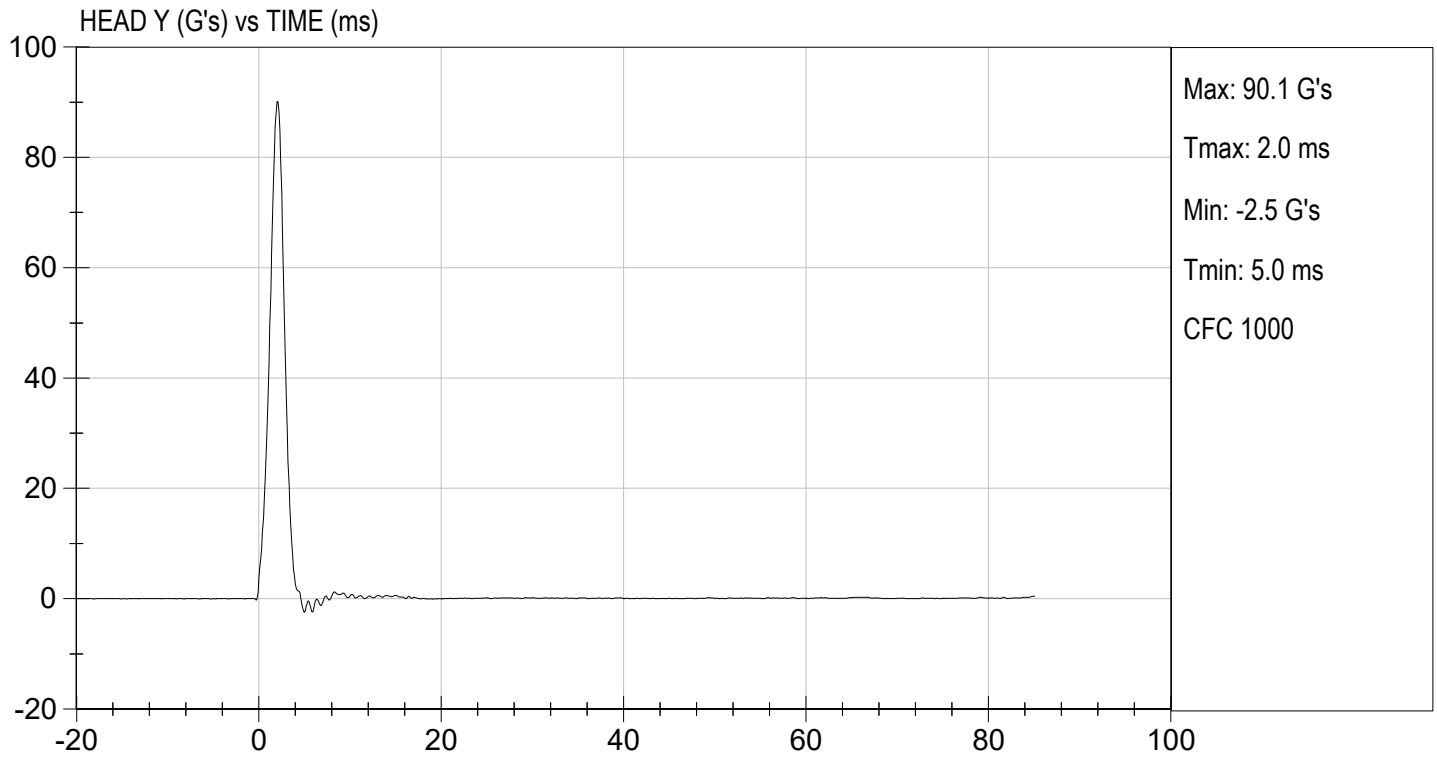

Laboratory Technician

09/15/2023

Test Date


Approved By





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

ATD Serial No: 306

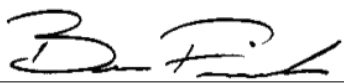
Test I.D: D232502

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.2	Pass
Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	5.51 to 5.63	5.62	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.42	Pass
	15 ms	m/s	3.30 to 4.10	3.75	Pass
	20 ms	m/s	4.40 to 5.40	5.30	Pass
	25 ms	m/s	5.40 to 6.10	5.76	Pass
	25-100 ms	m/s	5.50 to 6.20	5.84	Pass
Maximum D-Plane Rotation		deg	71 to 81	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	63	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-41	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	114	Pass
Overall Test Results				Pass	


 Laboratory Technician

09/15/2023

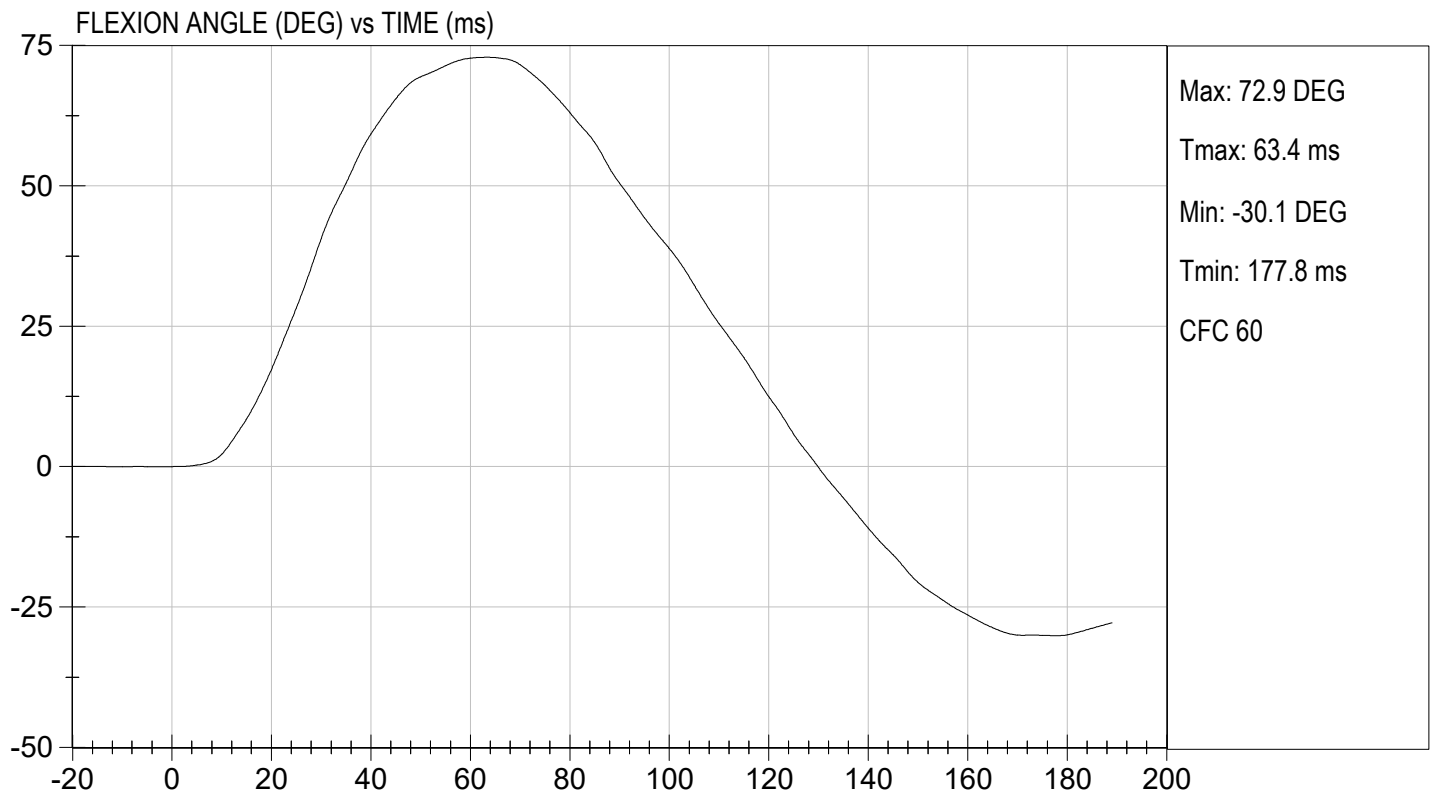
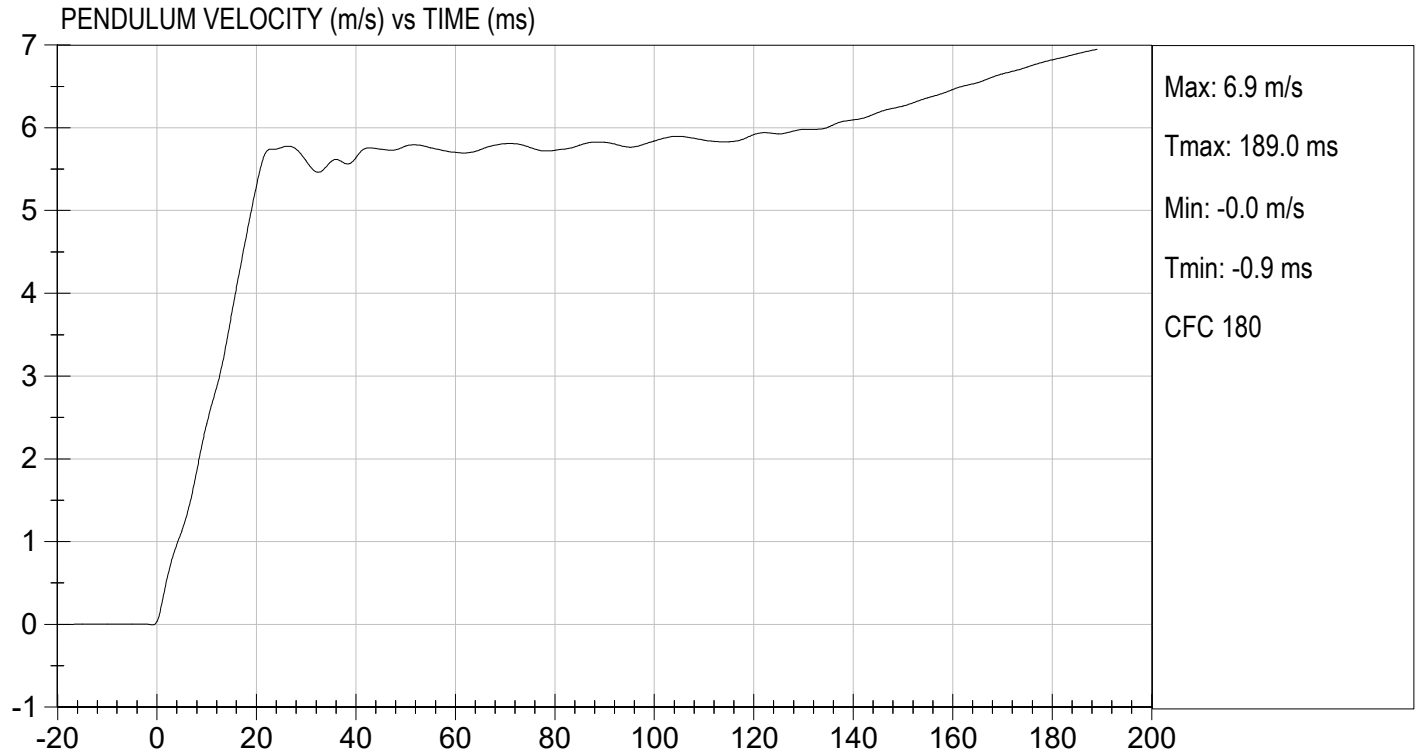
Test Date


 Approved By



TEST DESC: NECK BENDING
VELOCITY: 18.45 ft/s, 5.62 m/s

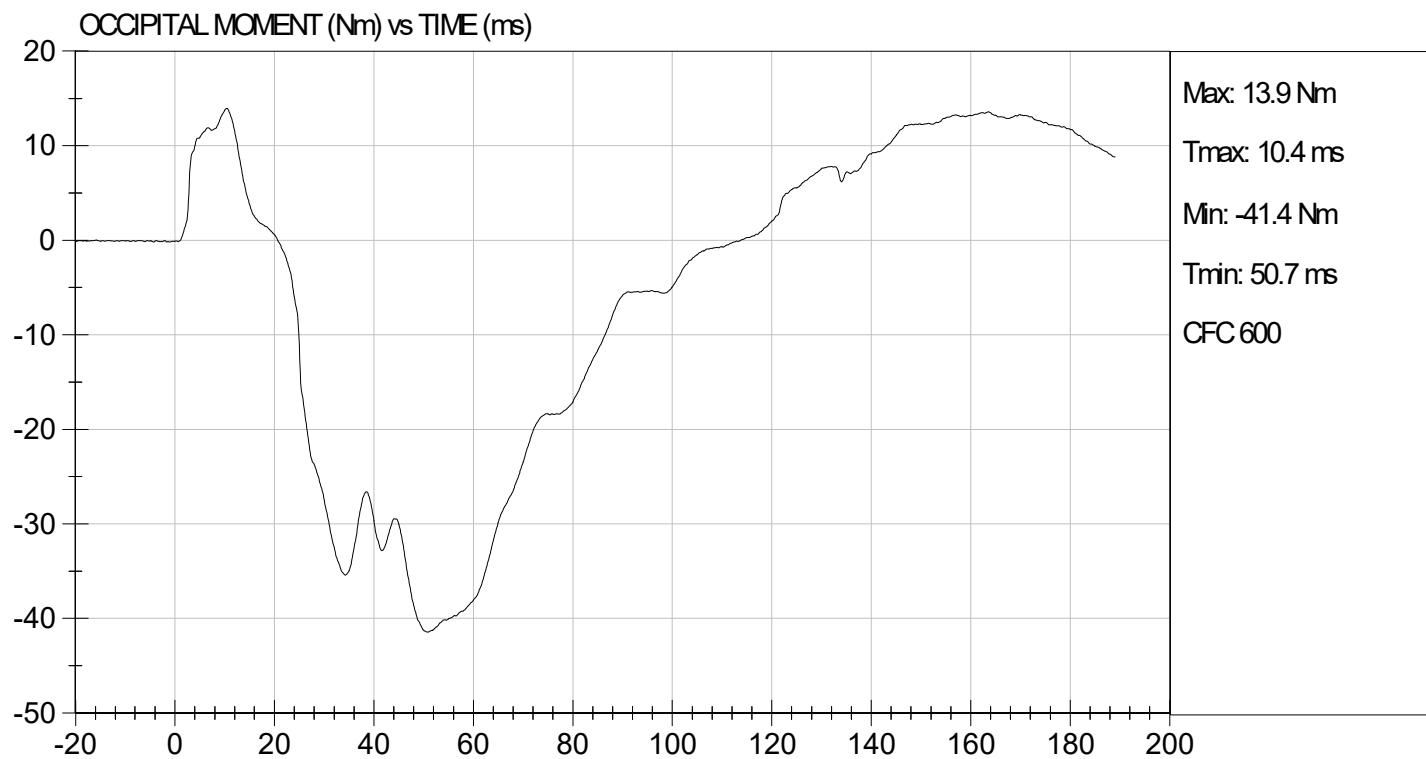
TEST DATE: 09/15/2023
TEST #: D232502





TEST DESC: NECK BENDING
VELOCITY: 18.45 ft/s, 5.62 m/s

TEST DATE: 09/15/2023
TEST #: D232502



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

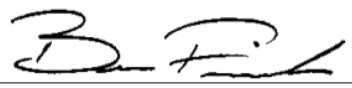
ATD Serial No: 306

Test ID: D232503

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	41	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	32	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results			Pass	


Laboratory Technician

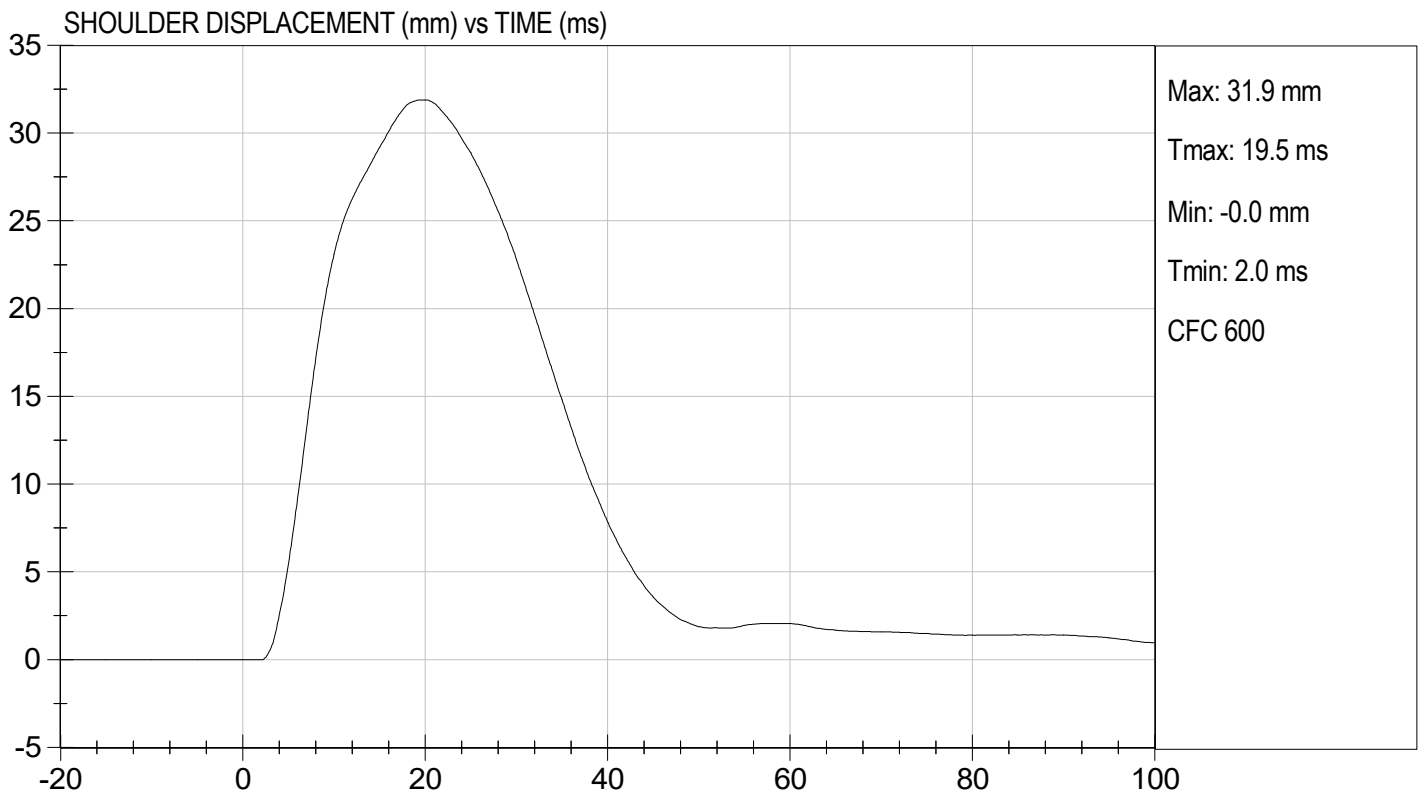
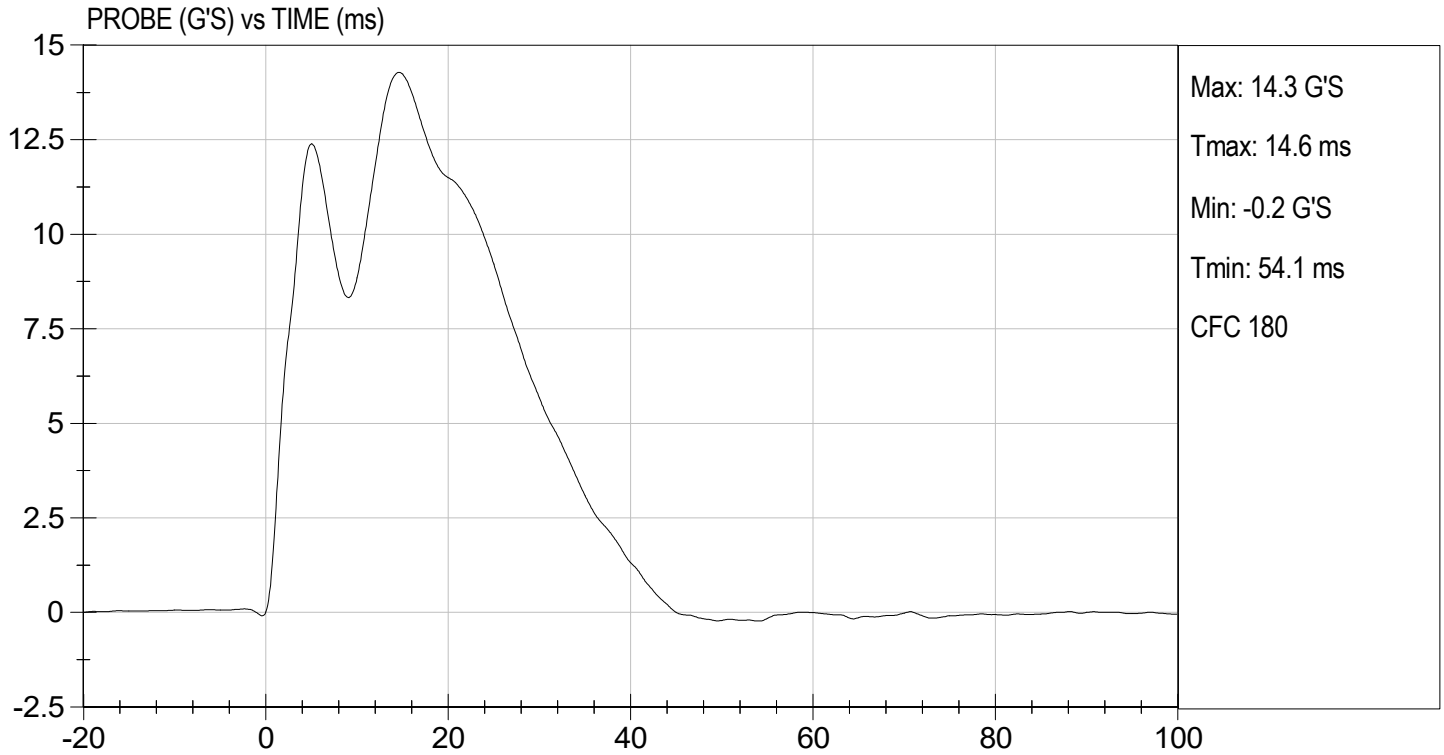
09/15/2023
Test Date


Approved By



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

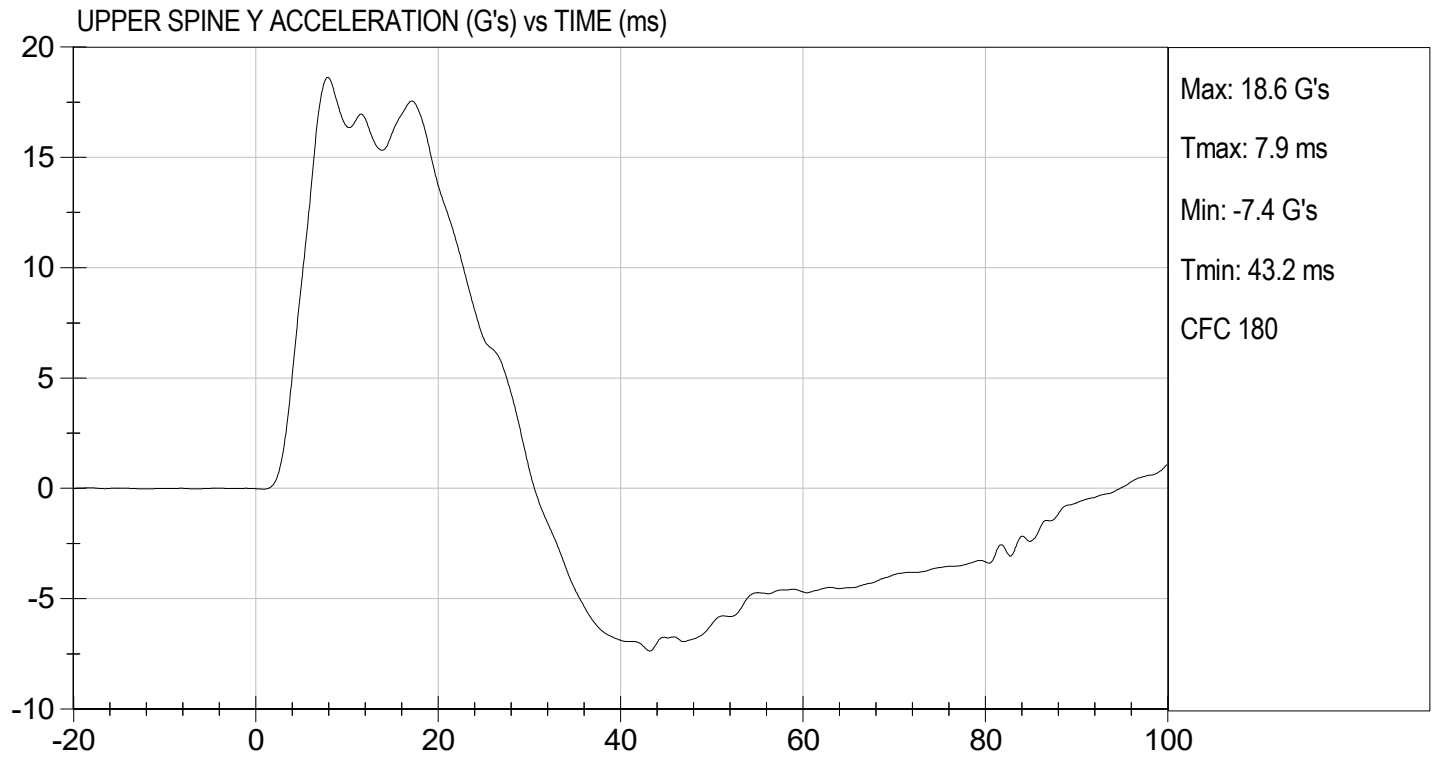
TEST DATE: 09/15/2023
TEST #: D232503





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

TEST DATE: 09/15/2023
TEST #: D232503



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

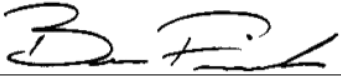
ATD Serial No: 306

Test I.D: D232504

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	31	Pass
Shoulder Displacement	mm	31 to 40	36	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	33	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	35	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	30	Pass
Overall Test Results				Pass


Laboratory Technician

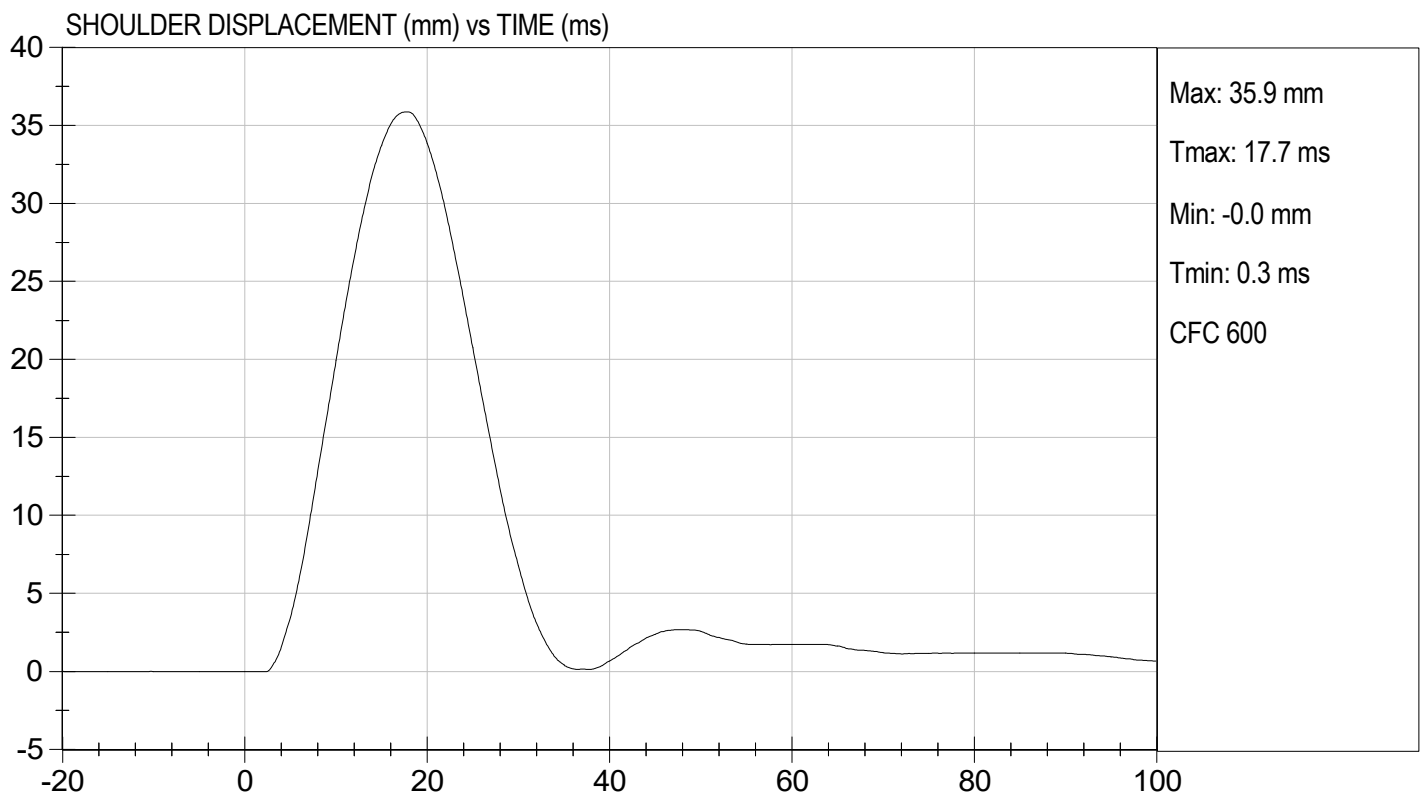
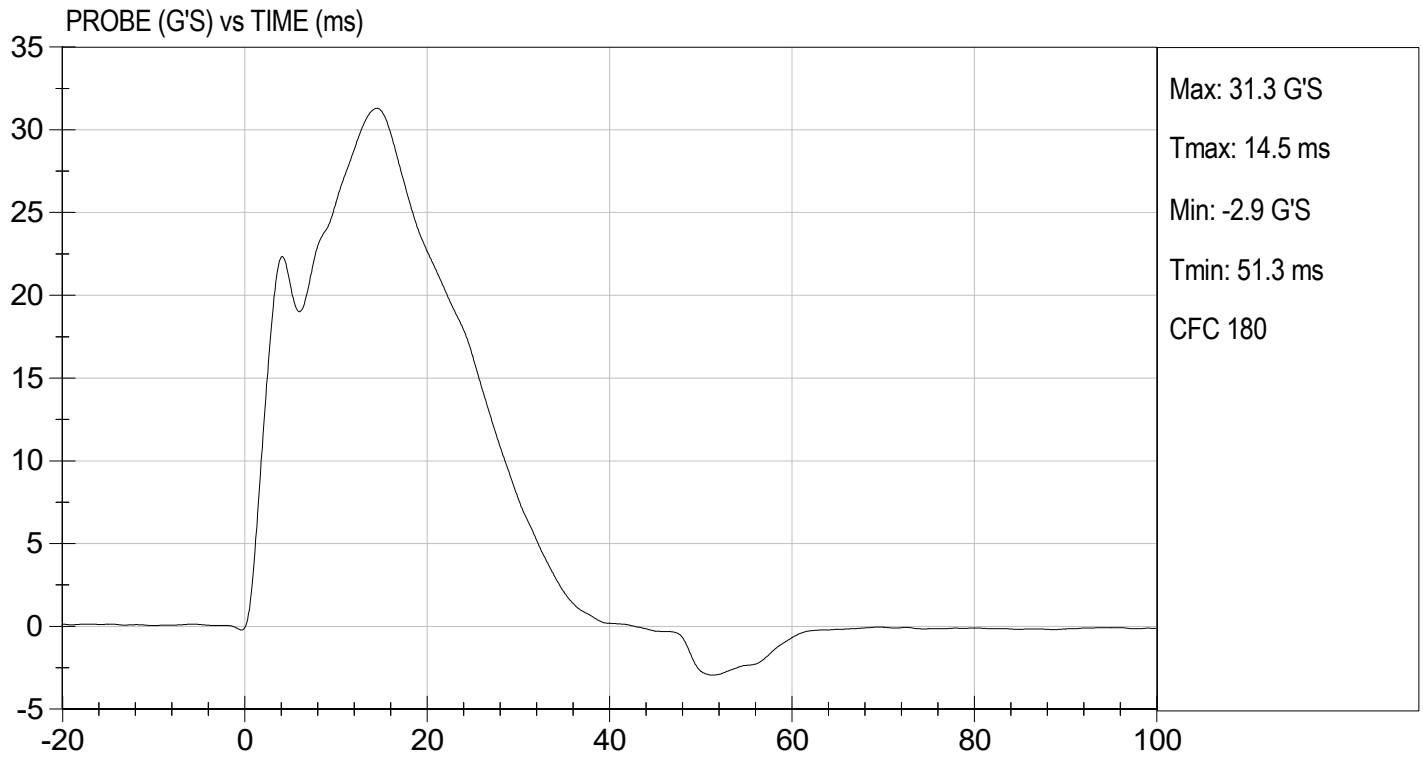
09/15/2023
Test Date


Approved By



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

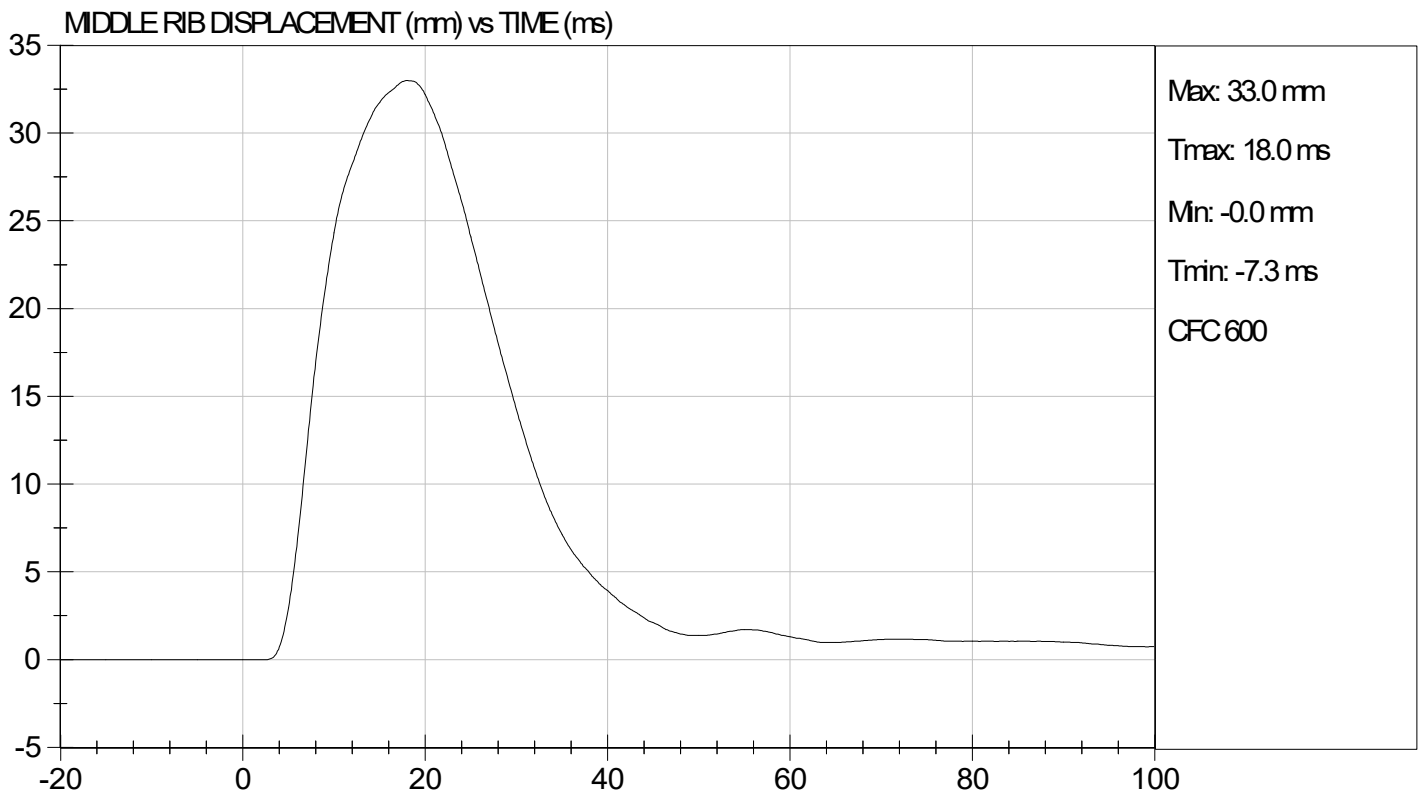
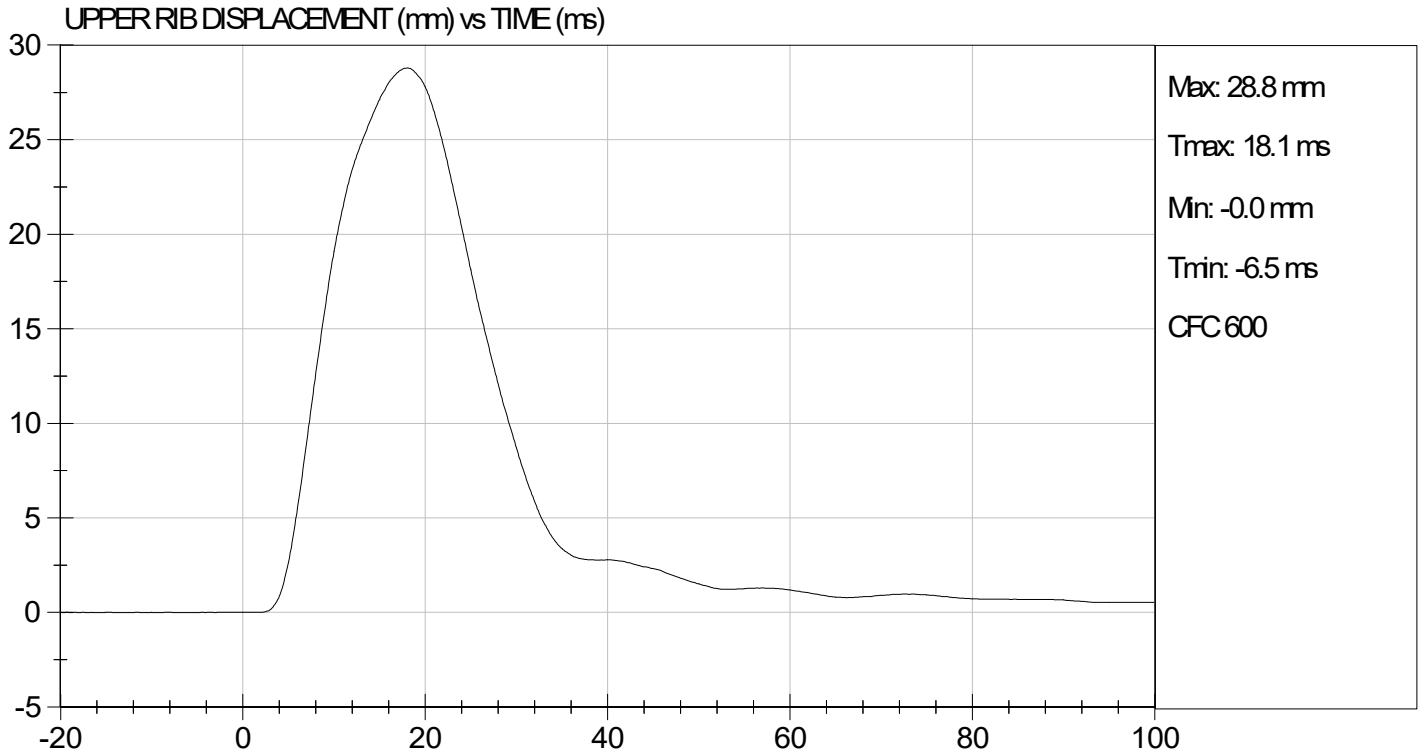
TEST DATE: 09/15/2023
TEST #: D232504





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

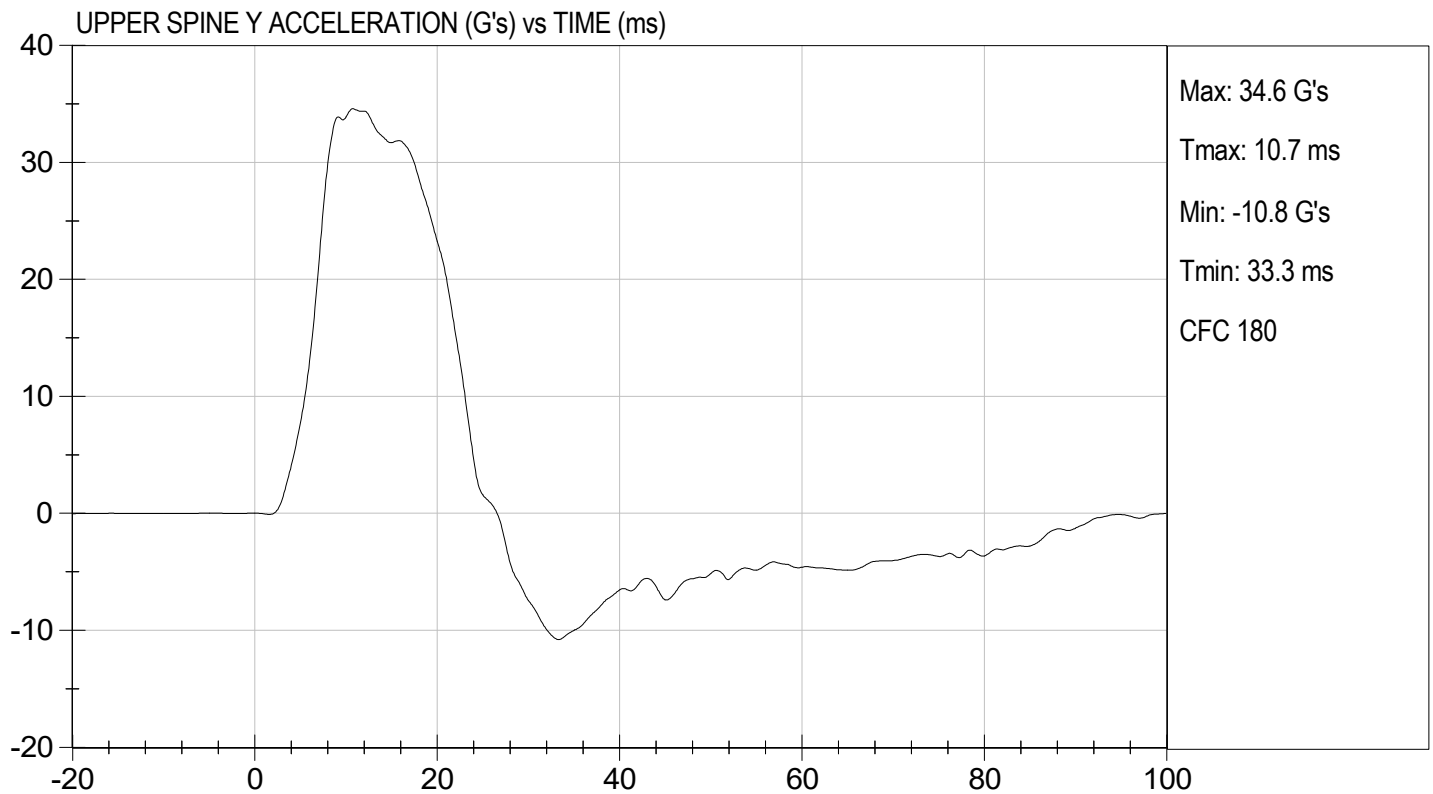
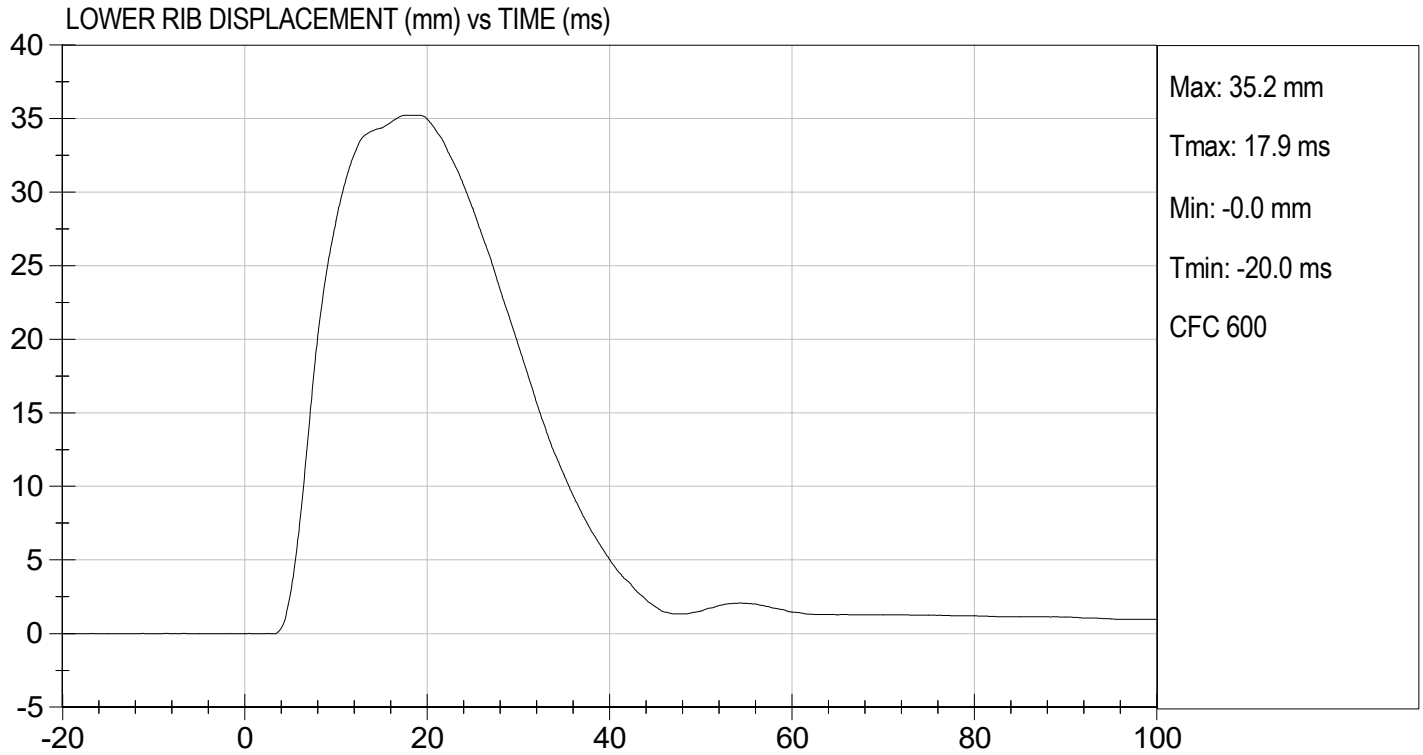
TEST DATE: 09/15/2023
TEST #: D232504





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

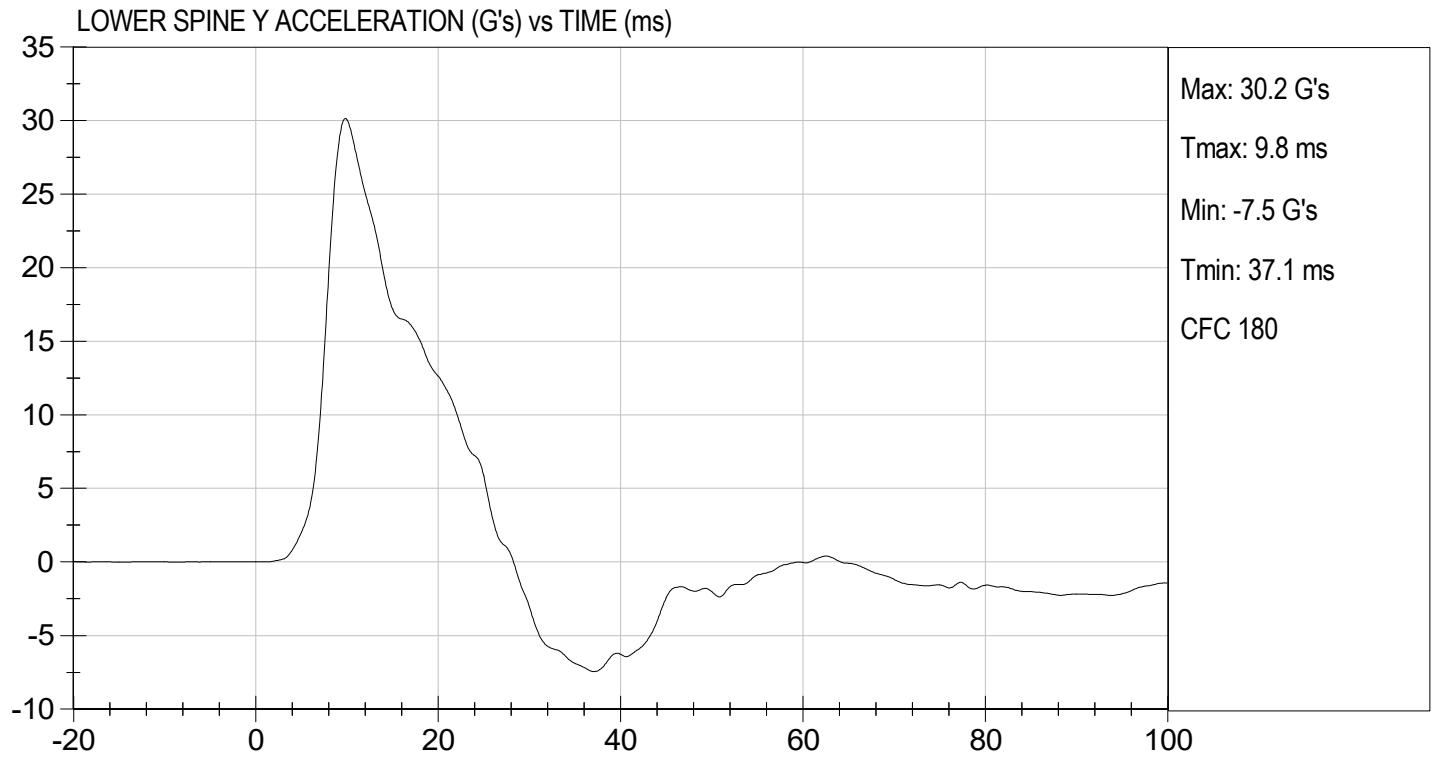
TEST DATE: 09/15/2023
TEST #: D232504





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

TEST DATE: 09/15/2023
TEST #: D232504



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

ATD Serial No: 306

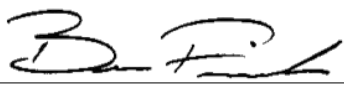
Test I.D: D232505

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass


Laboratory Technician

09/15/2023

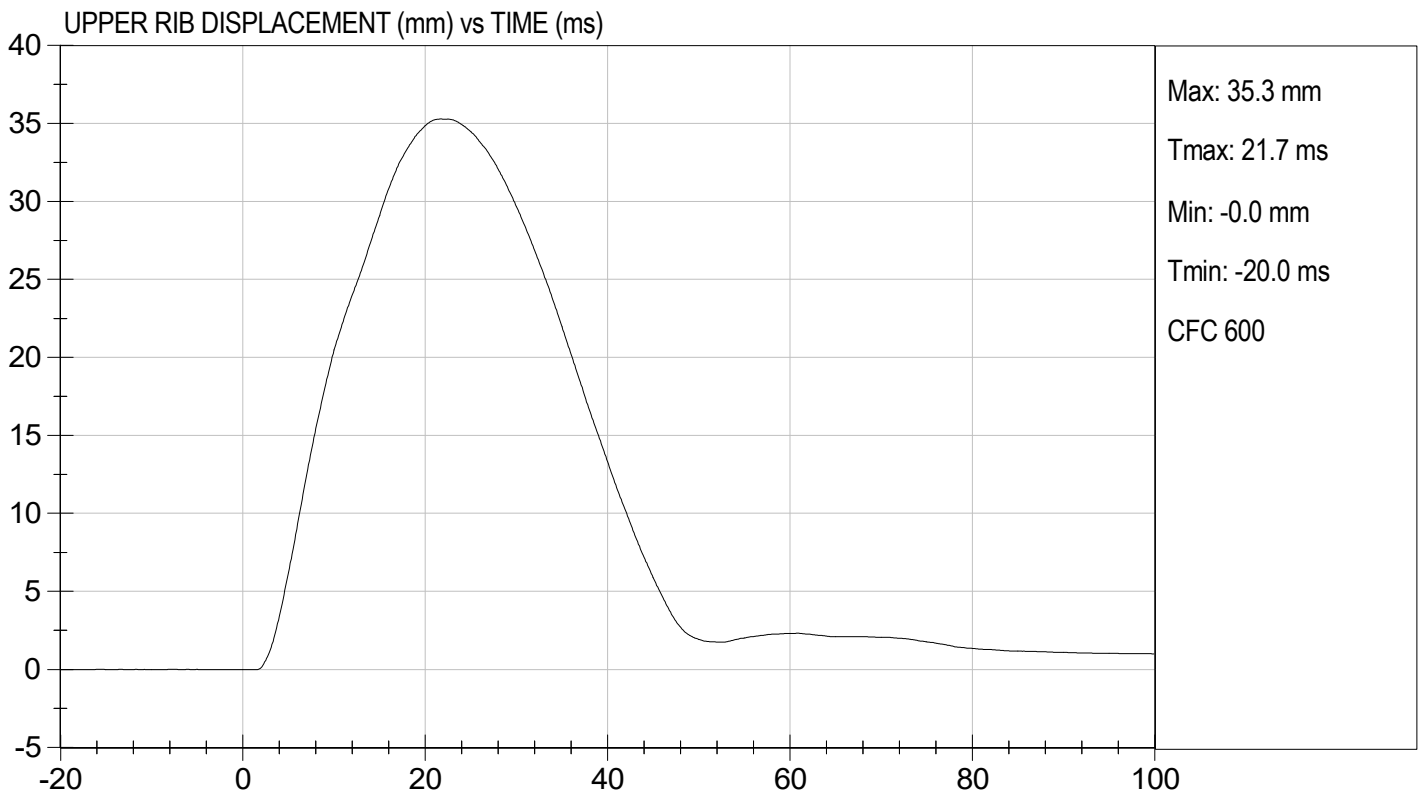
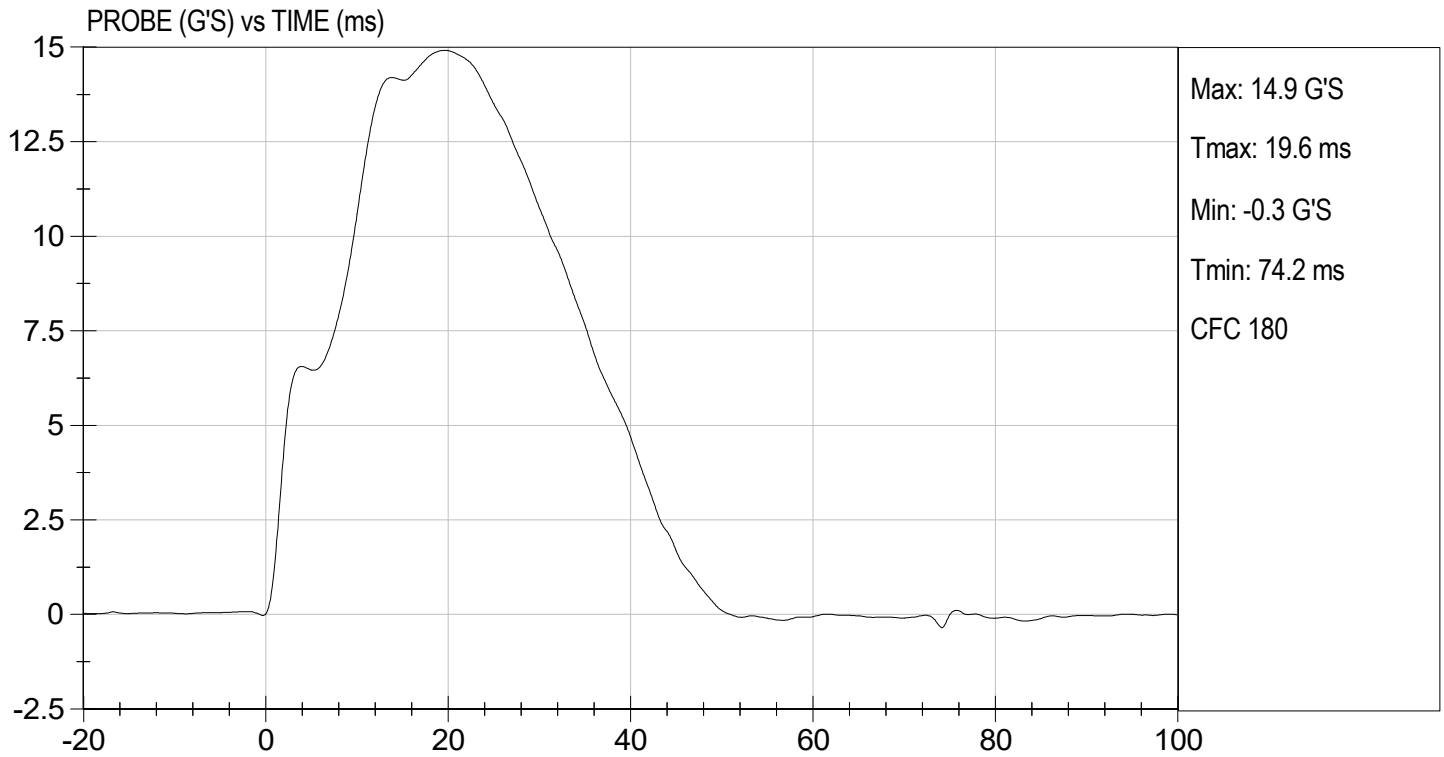
Test Date


Approved By



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

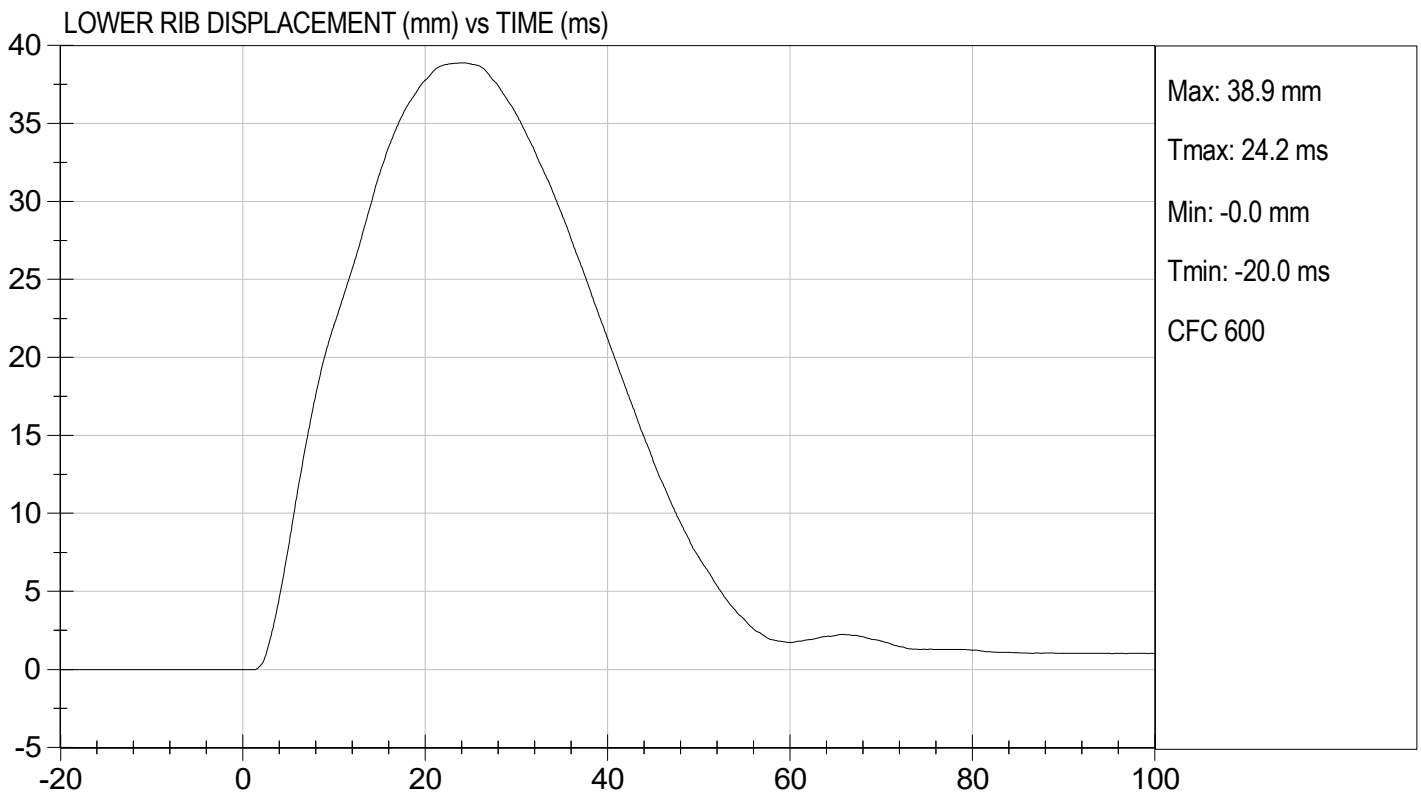
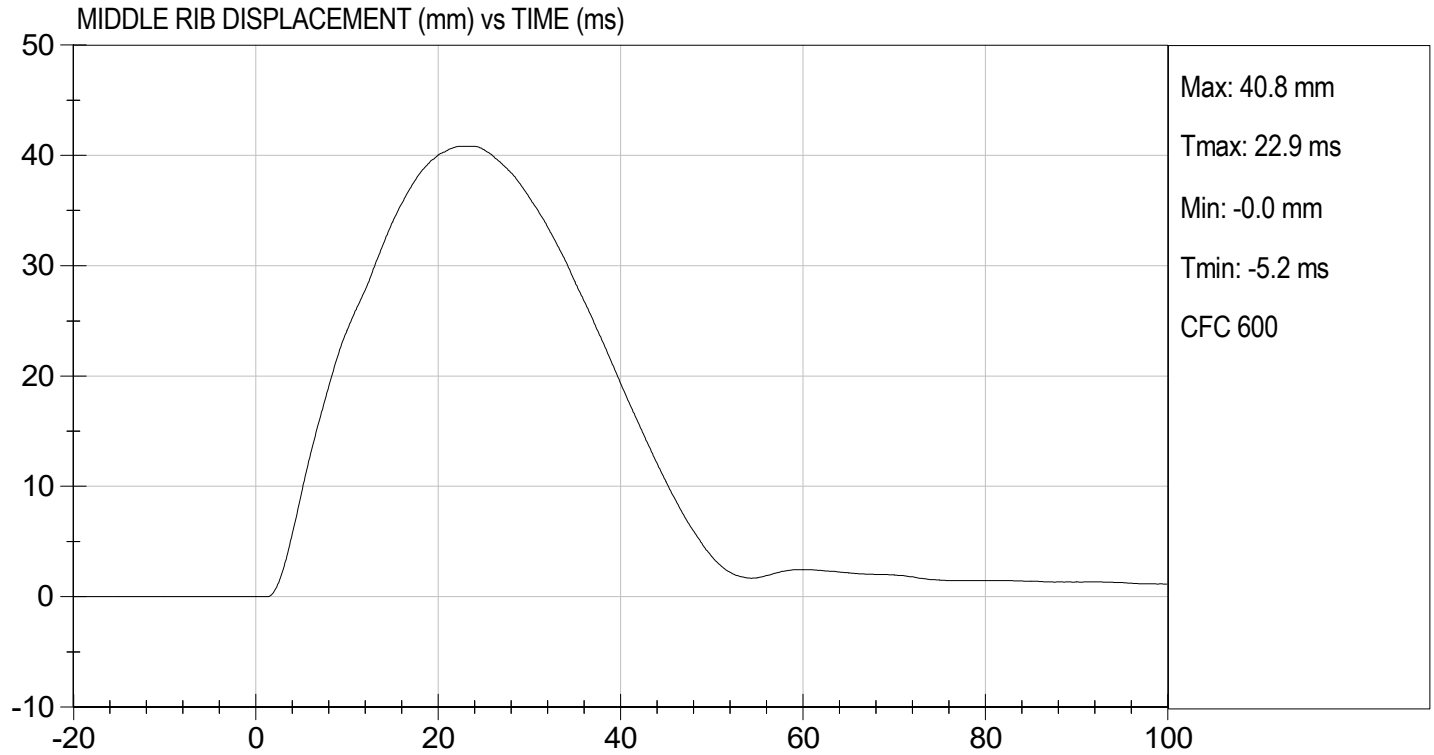
TEST DATE: 09/15/2023
TEST #: D232505





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

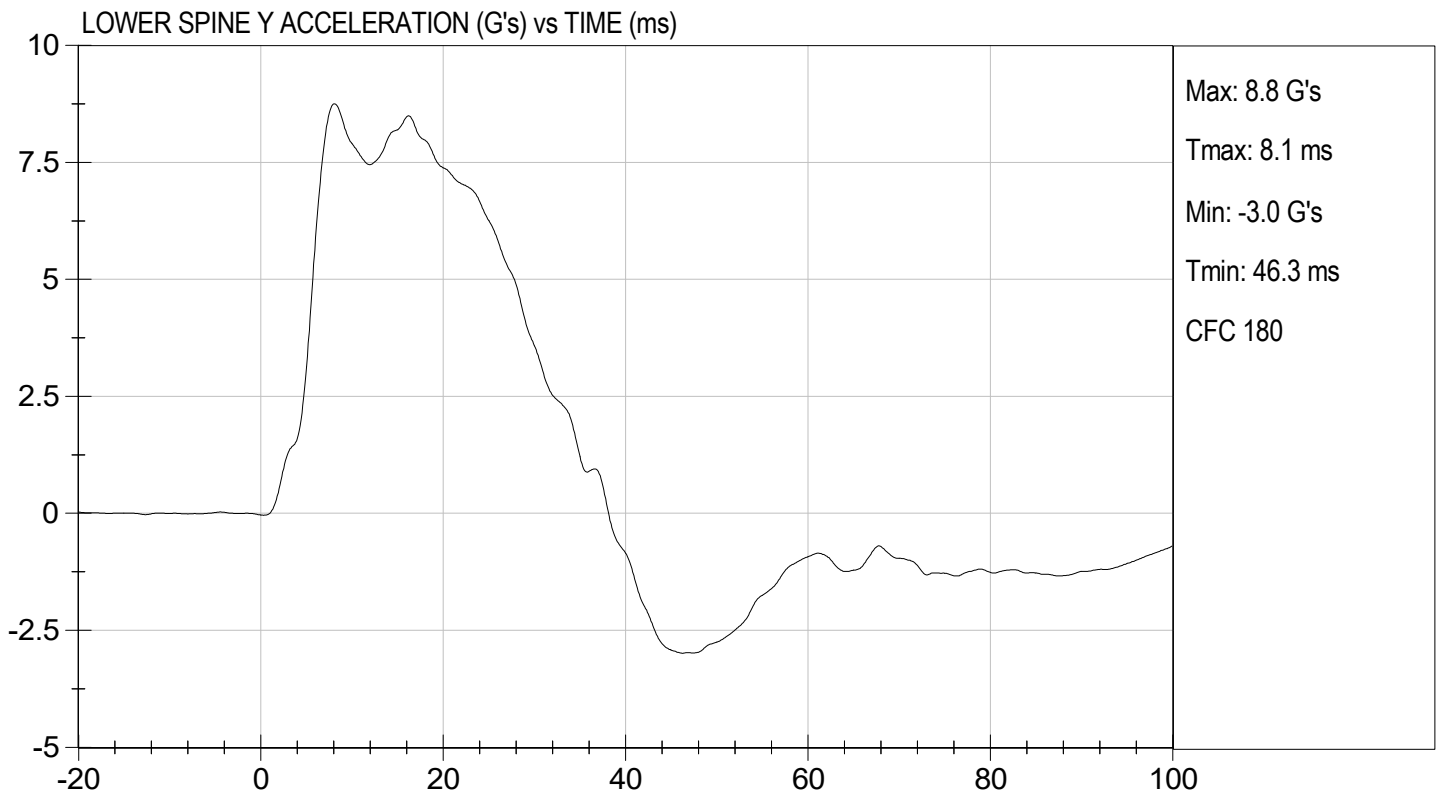
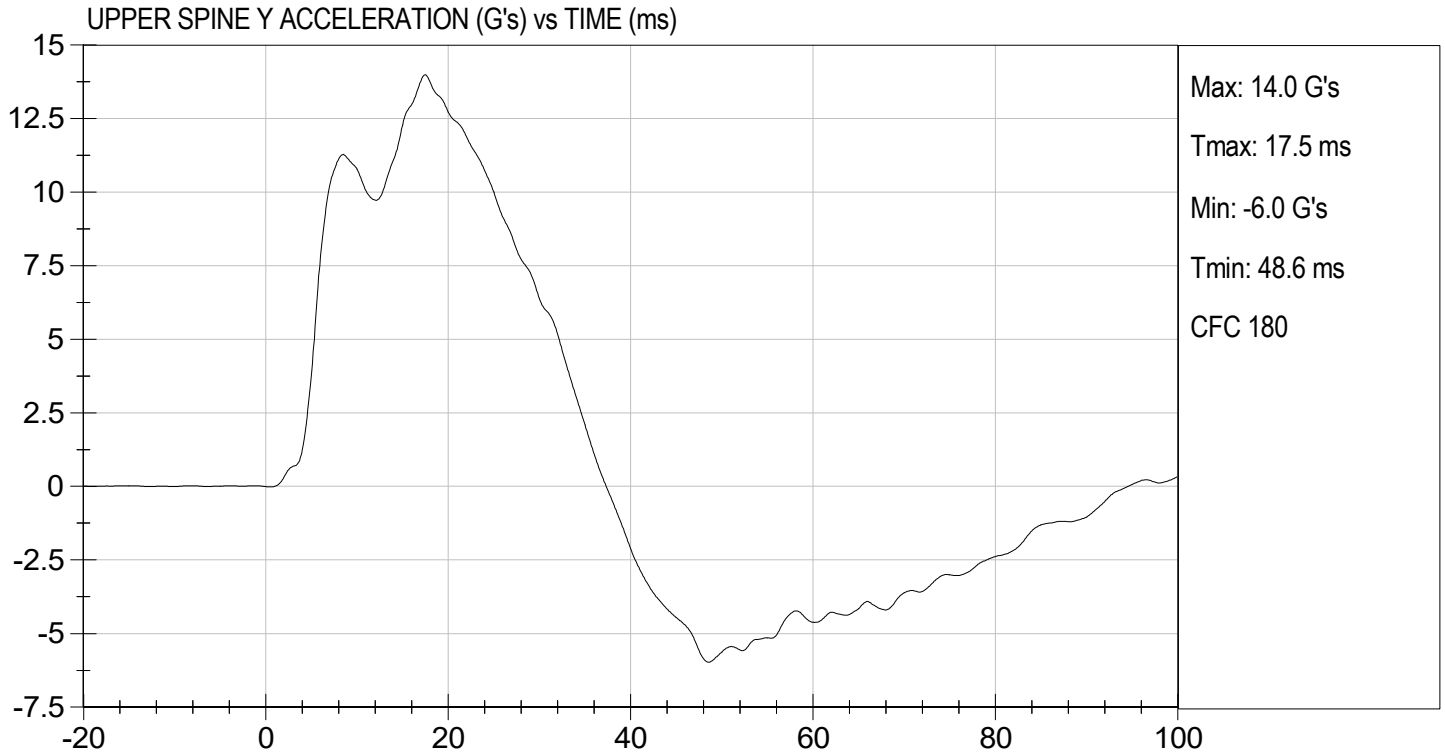
TEST DATE: 09/15/2023
TEST #: D232505





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

TEST DATE: 09/15/2023
TEST #: D232505



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

ATD Serial No: 306

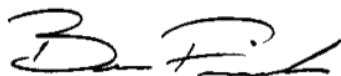
Test I.D: D232506

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	43	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

09/15/2023

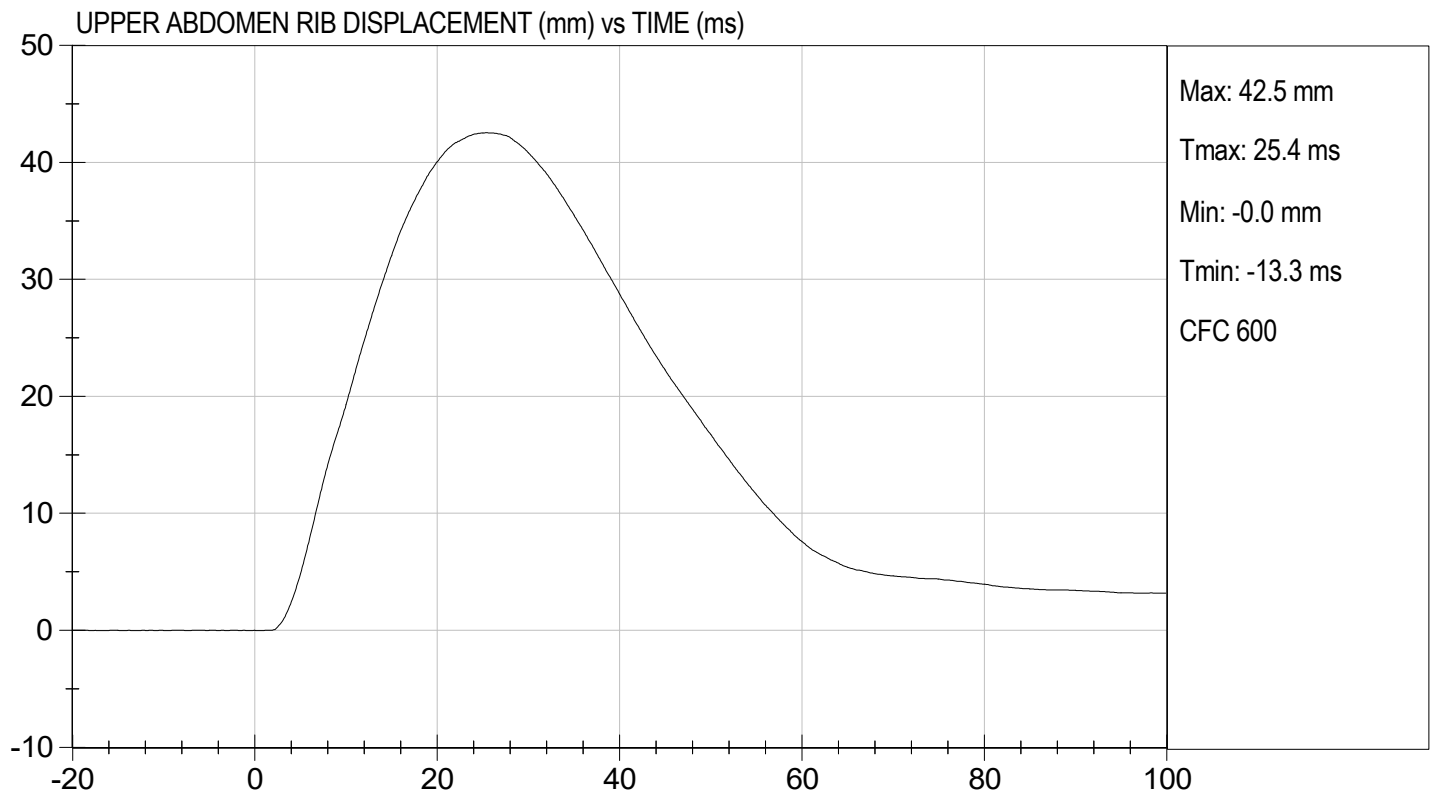
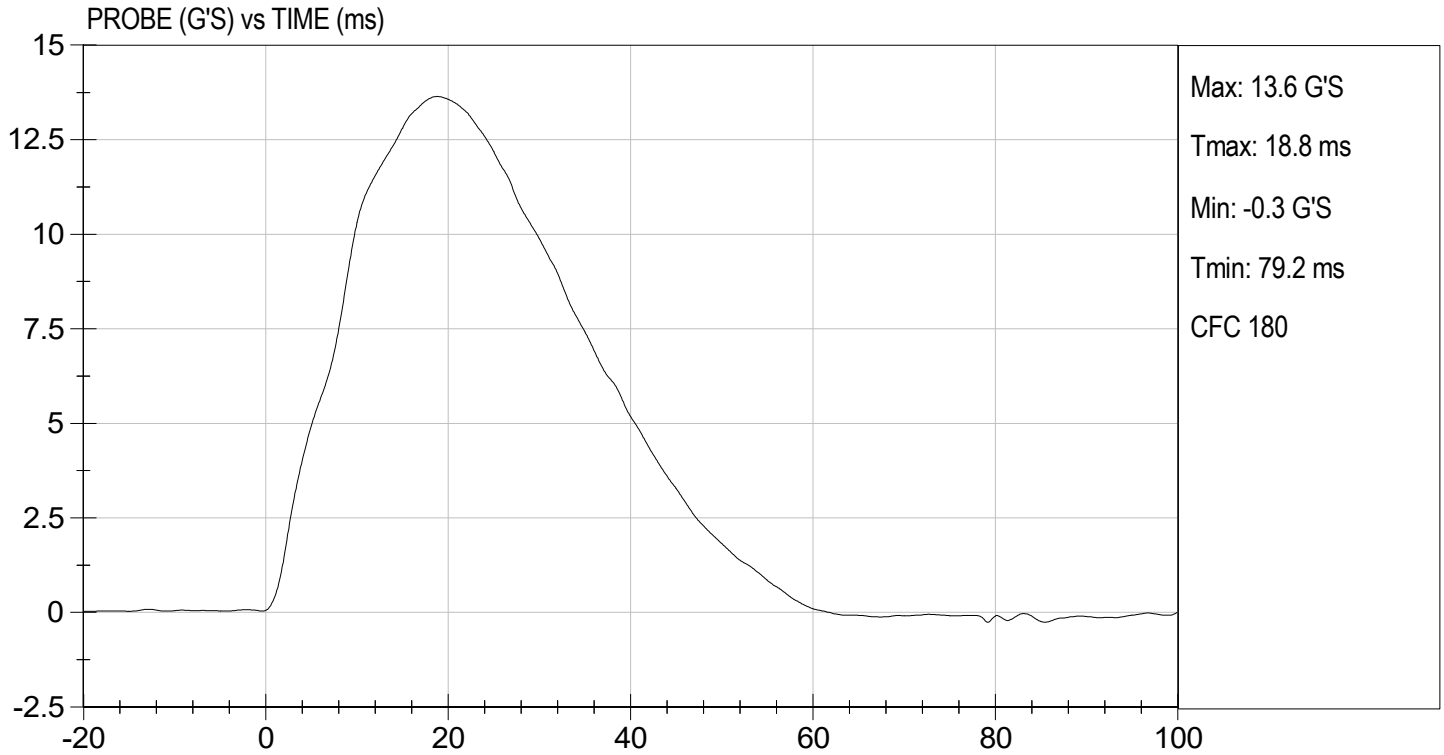
Test Date


Approved By



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

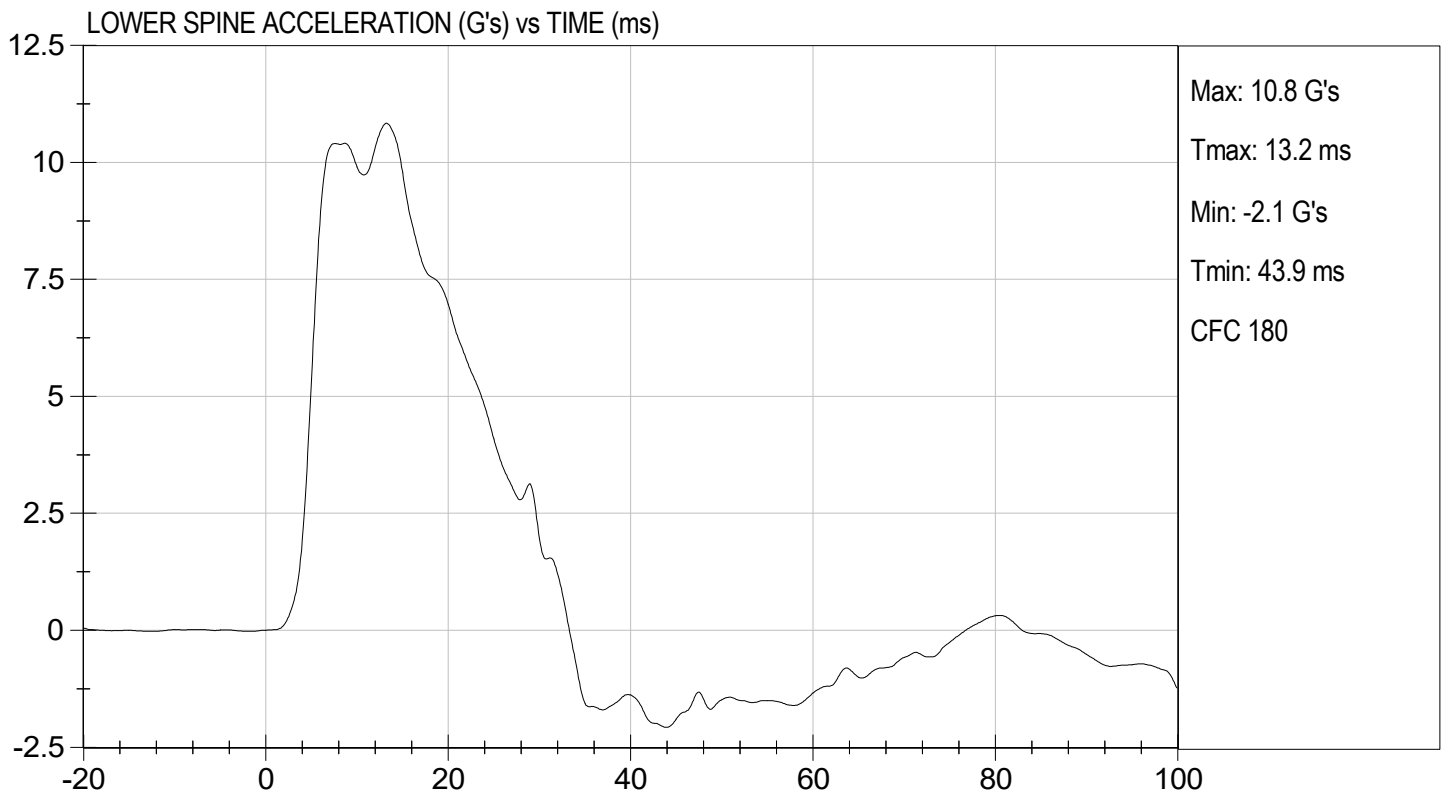
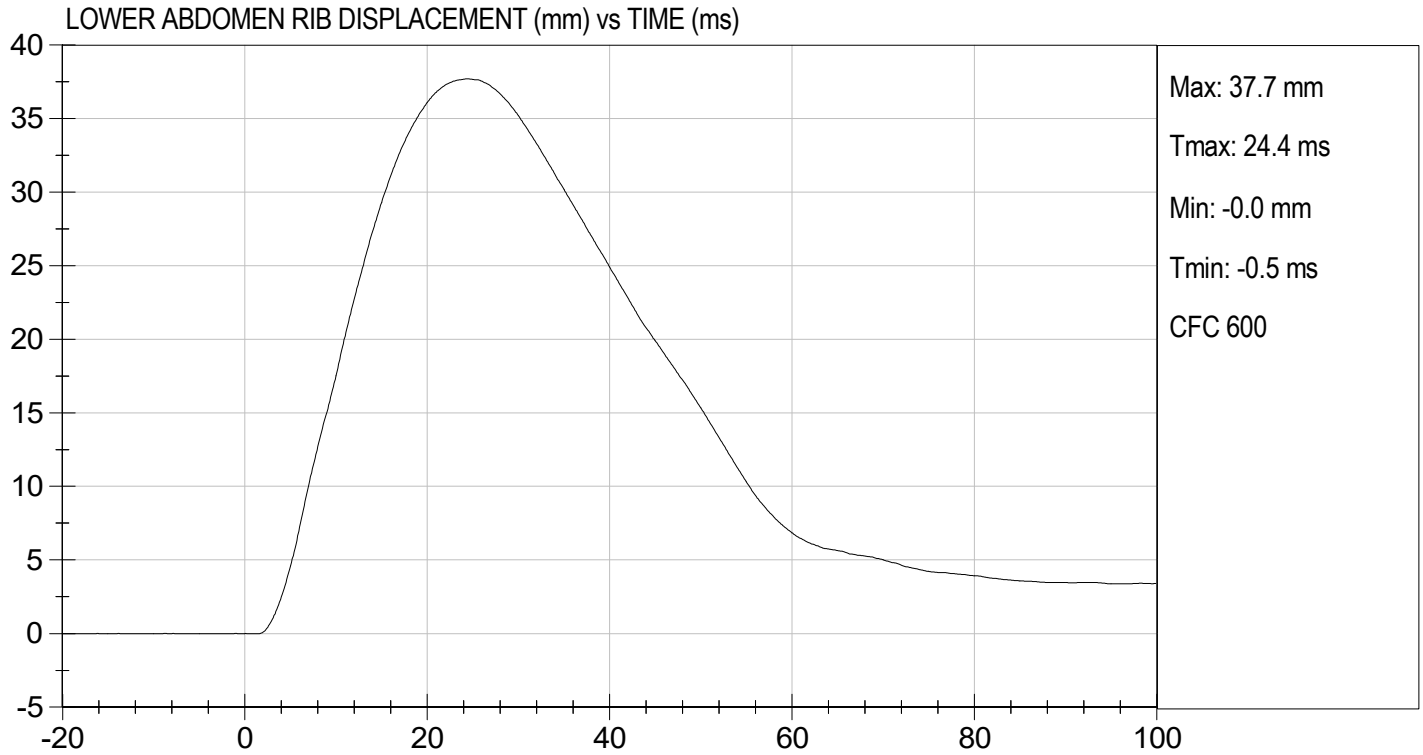
TEST DATE: 09/15/2023
TEST #: D232506





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

TEST DATE: 09/15/2023
TEST #: D232506



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

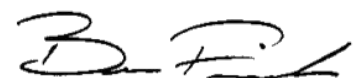
Test I.D: D232507

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	42	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	37.9	Pass
Peak Acetabulum Force	N	3600 to 4300	4,053	Pass
Overall Test Results				Pass


Laboratory Technician

09/15/2023

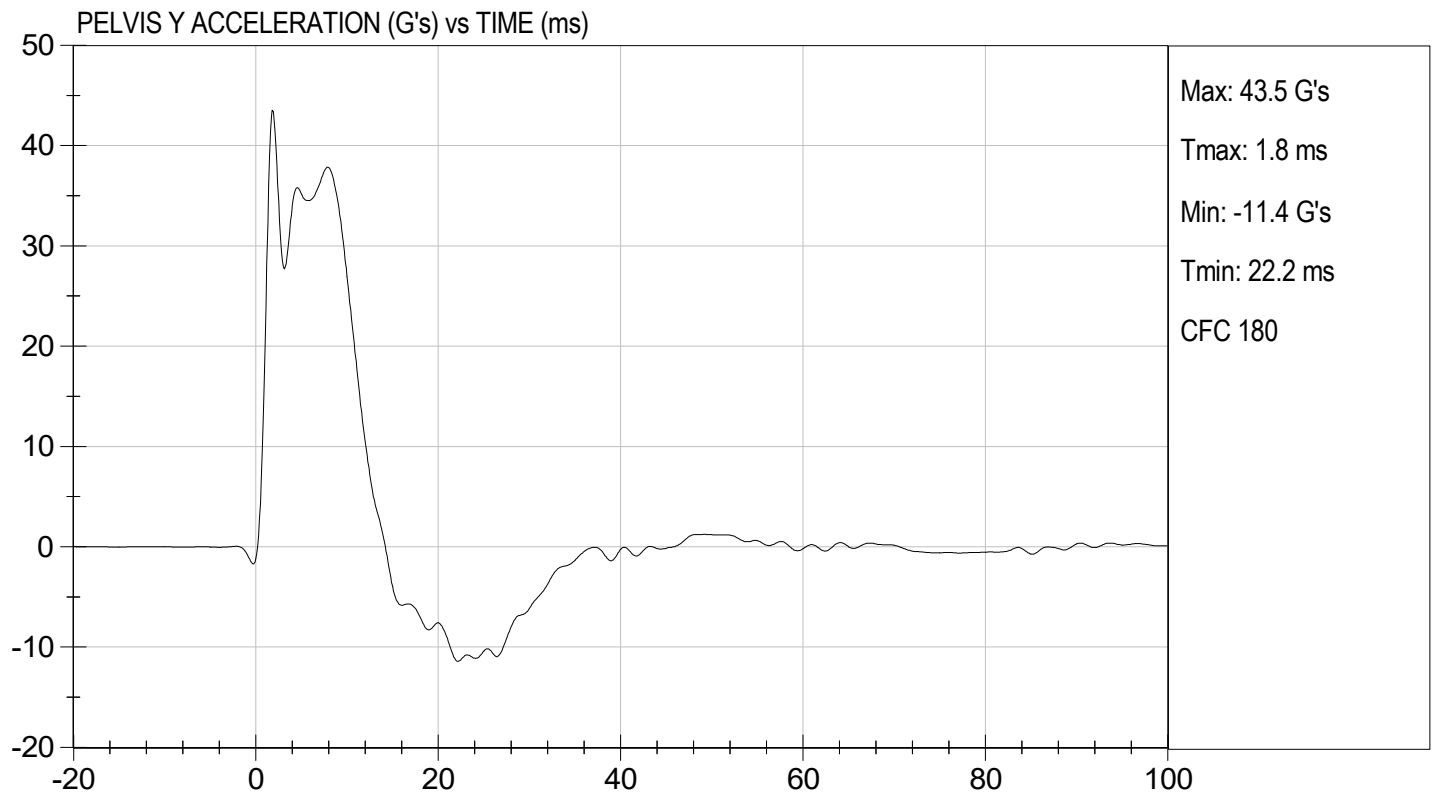
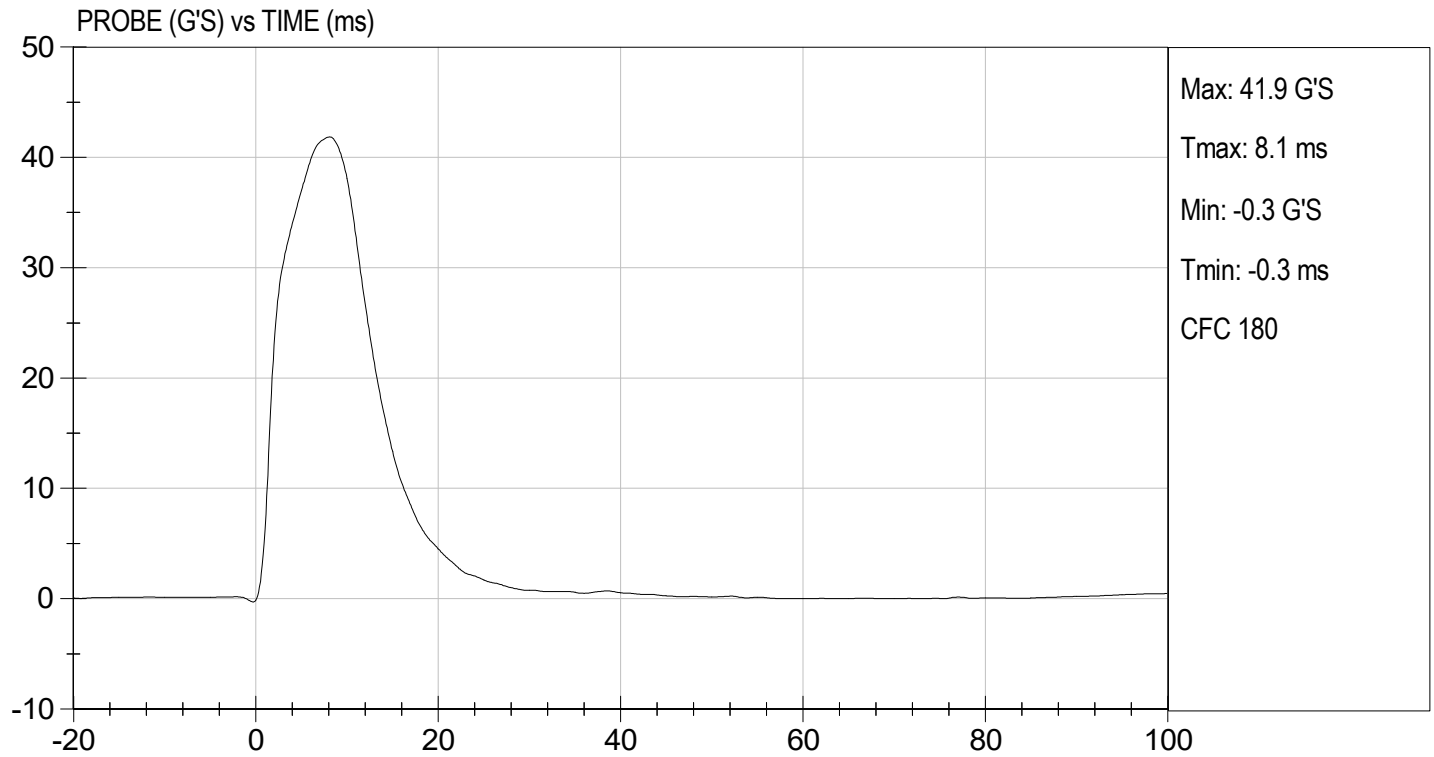
Test Date


Approved By



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

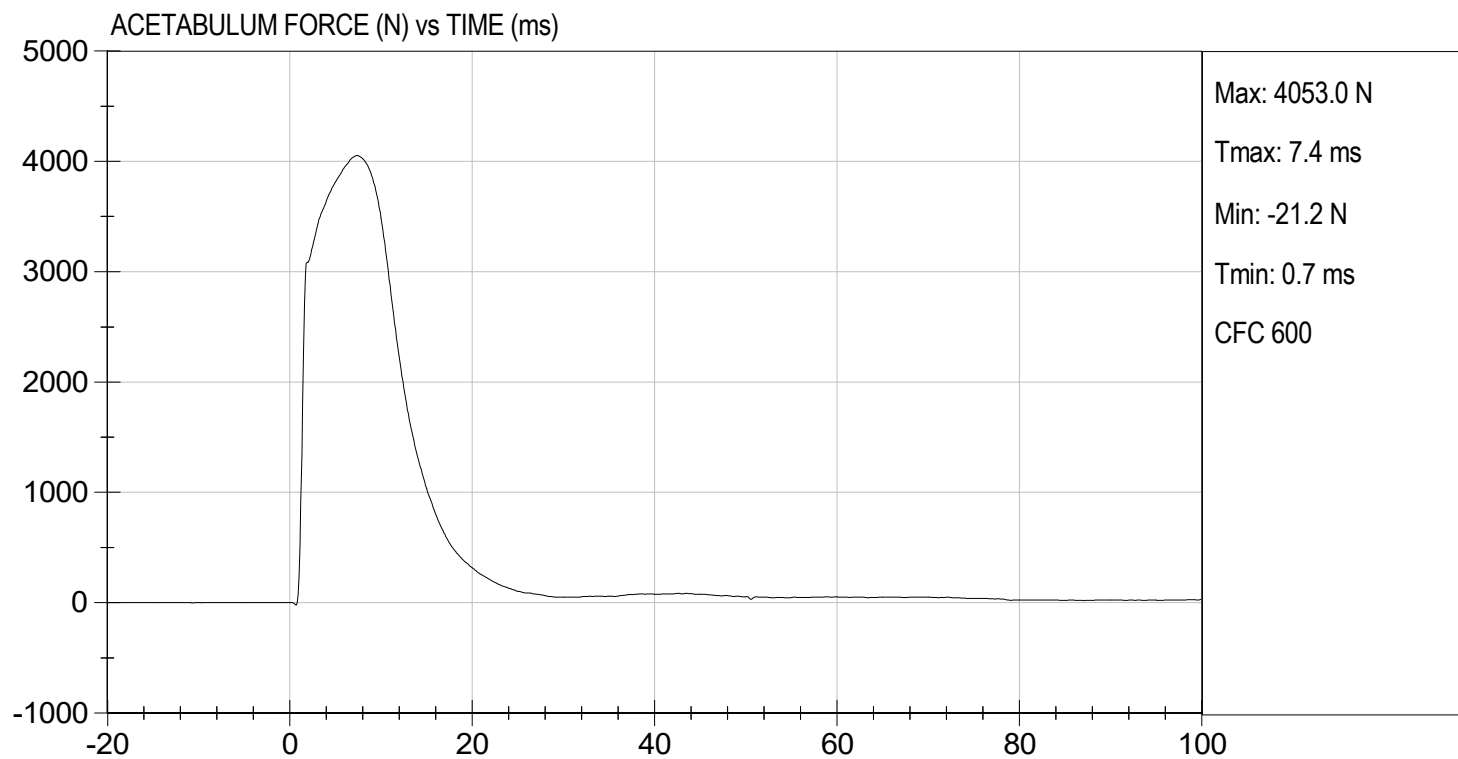
TEST DATE: 09/15/2023
TEST #: D232507





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

TEST DATE: 09/15/2023
TEST #: D232507



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

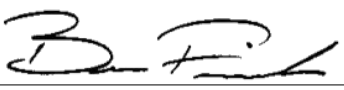
Test I.D: D232508

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	36 to 45	43	Pass
Pelvis Y Acceleration	G's	28 to 39	35	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,931	Pass
Overall Test Results				Pass


Laboratory Technician

09/15/2023

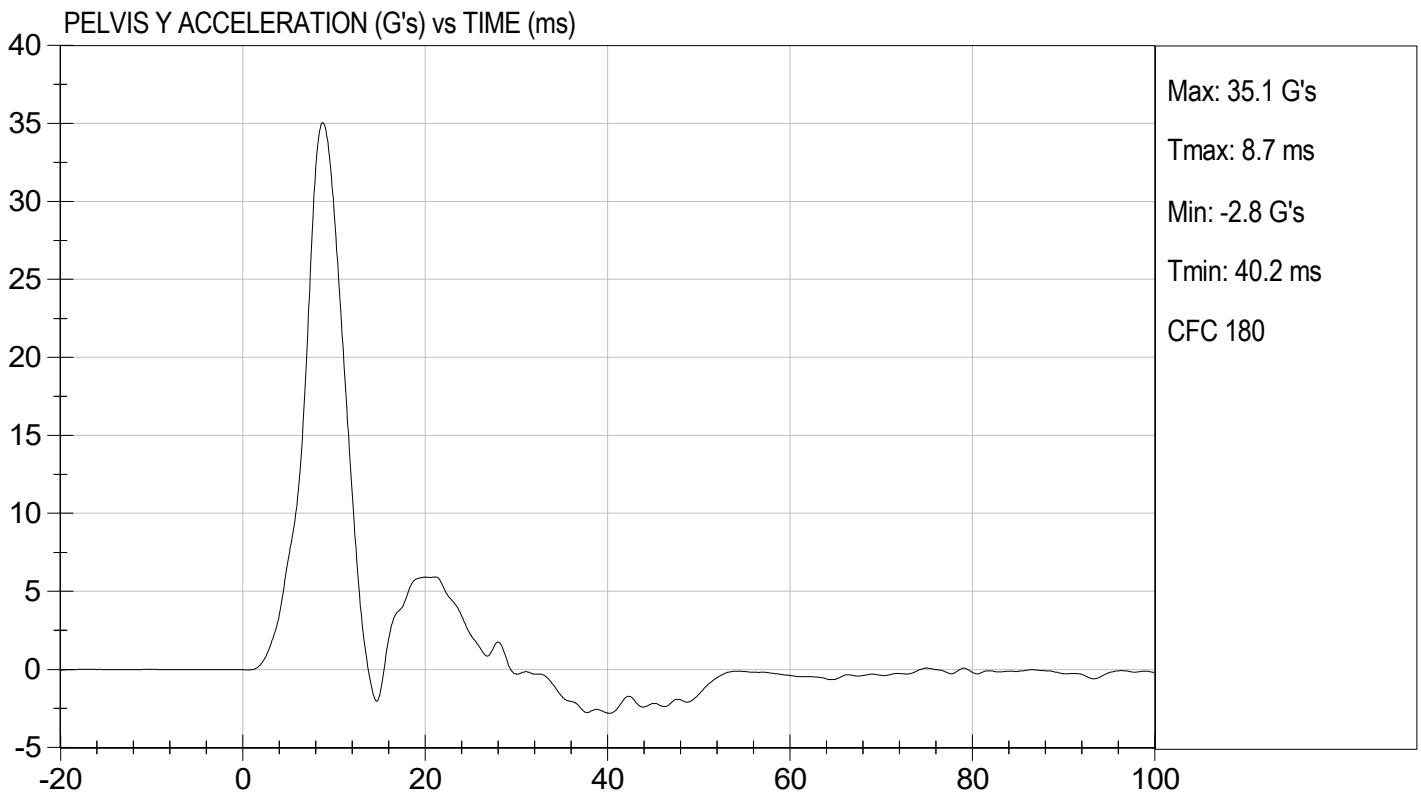
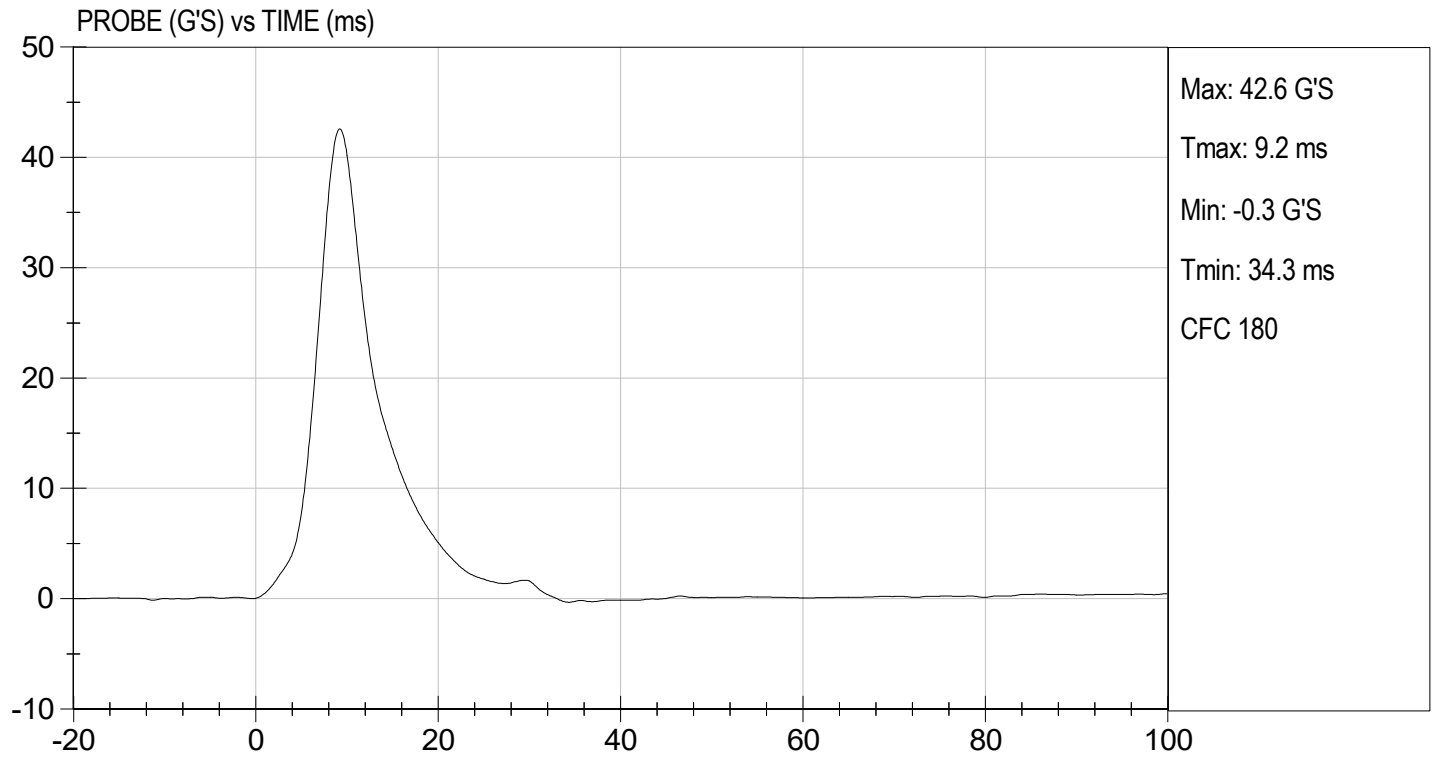
Test Date


Approved By



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

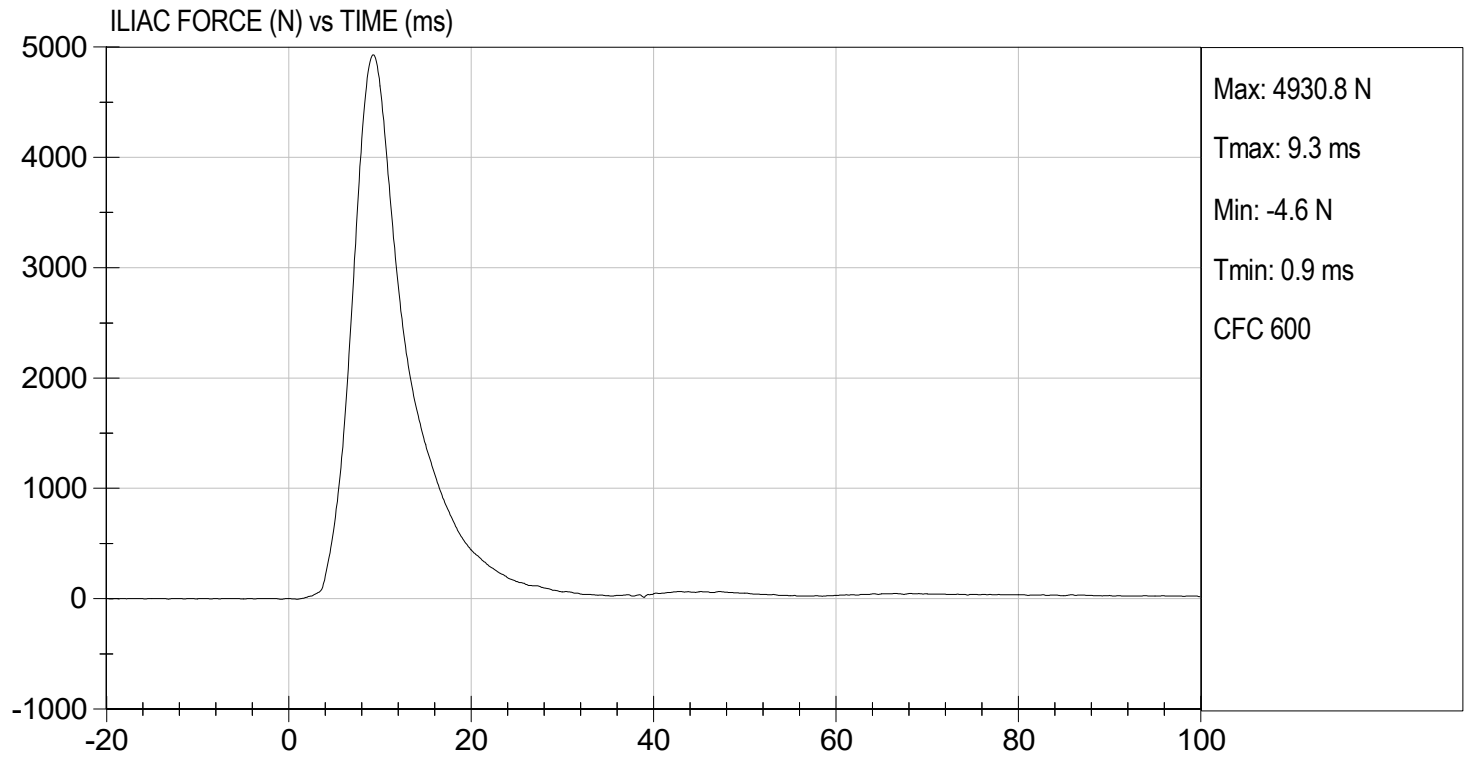
TEST DATE: 09/15/2023
TEST #: D232508





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

TEST DATE: 09/15/2023
TEST #: D232508



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

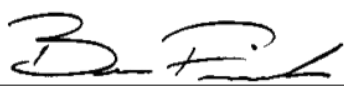
Test ID: D232661

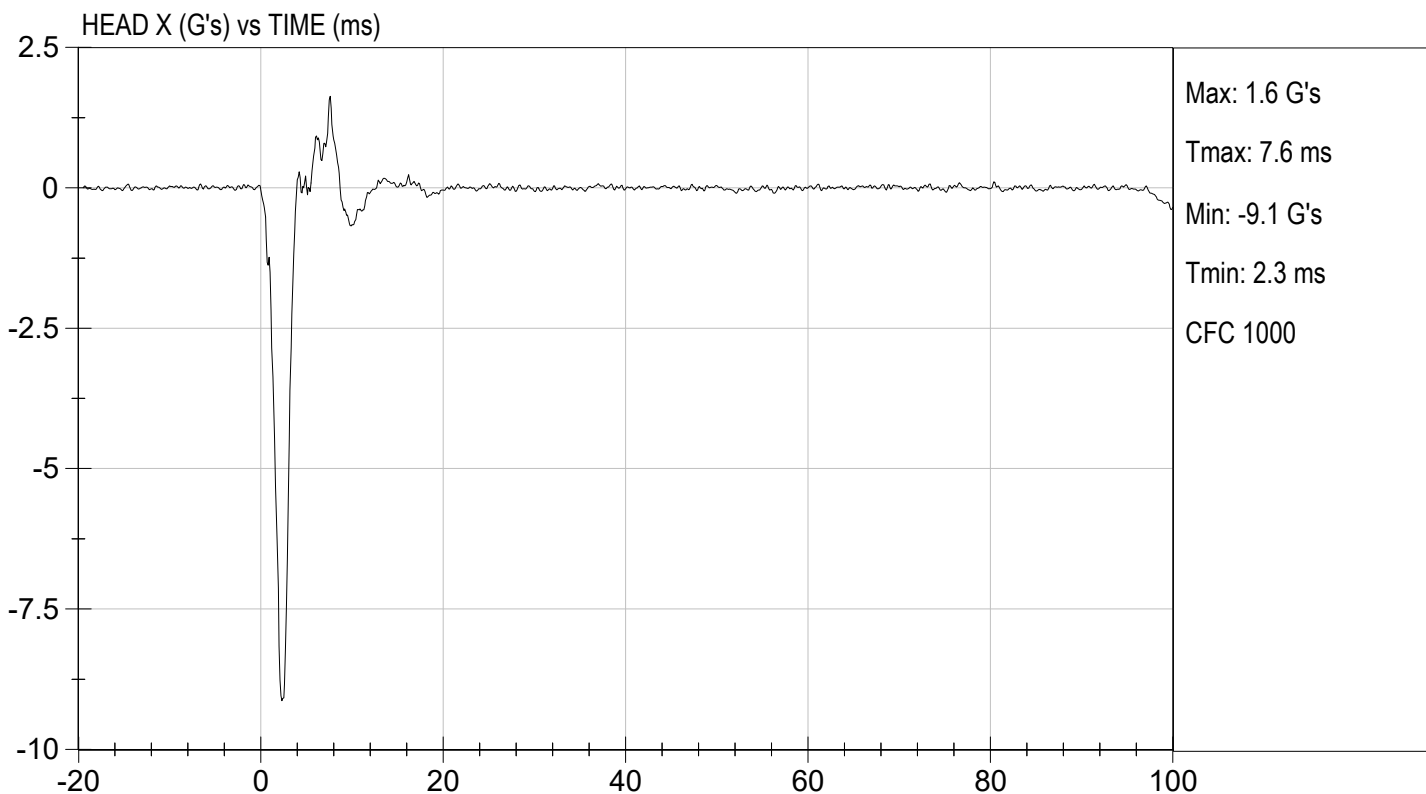
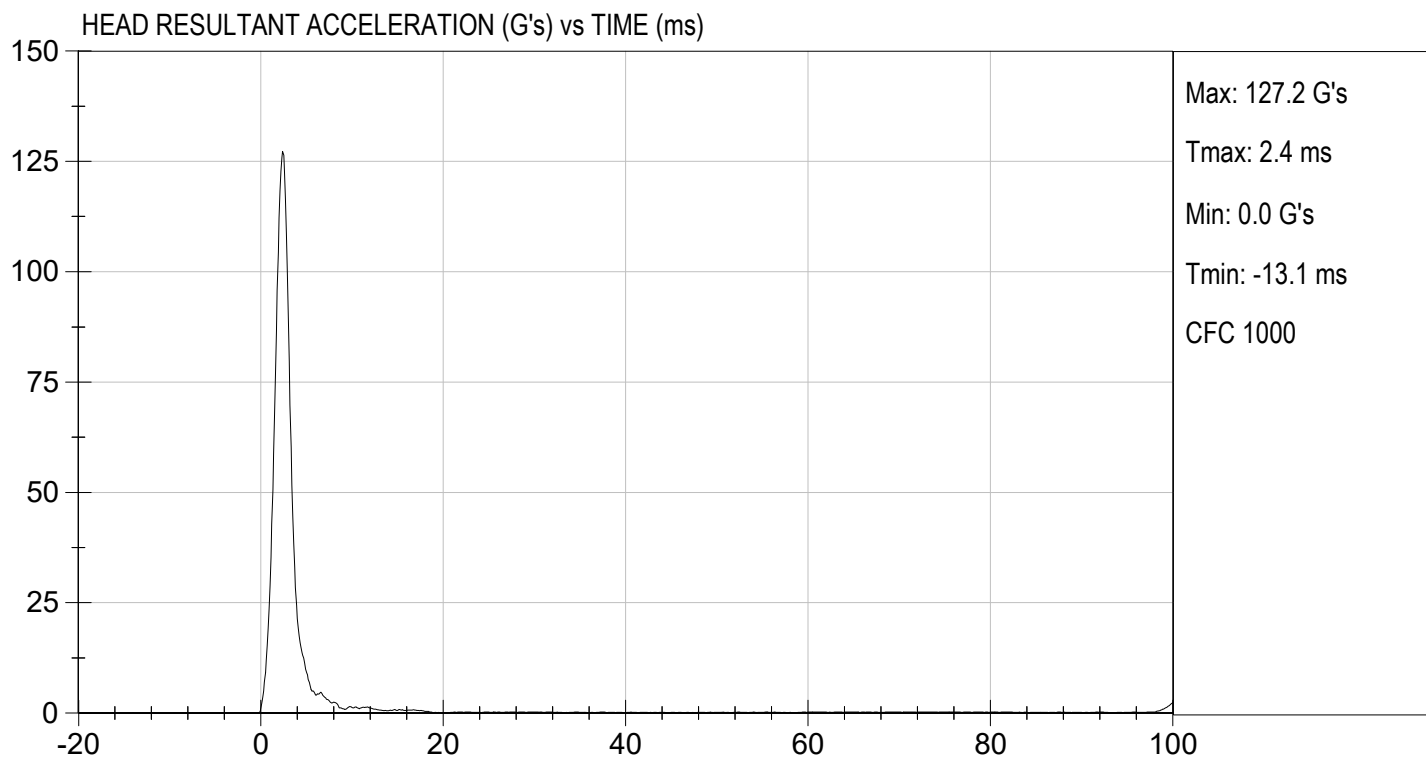
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Peak Resultant Acceleration	G's	115 to 137	127	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-9.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass

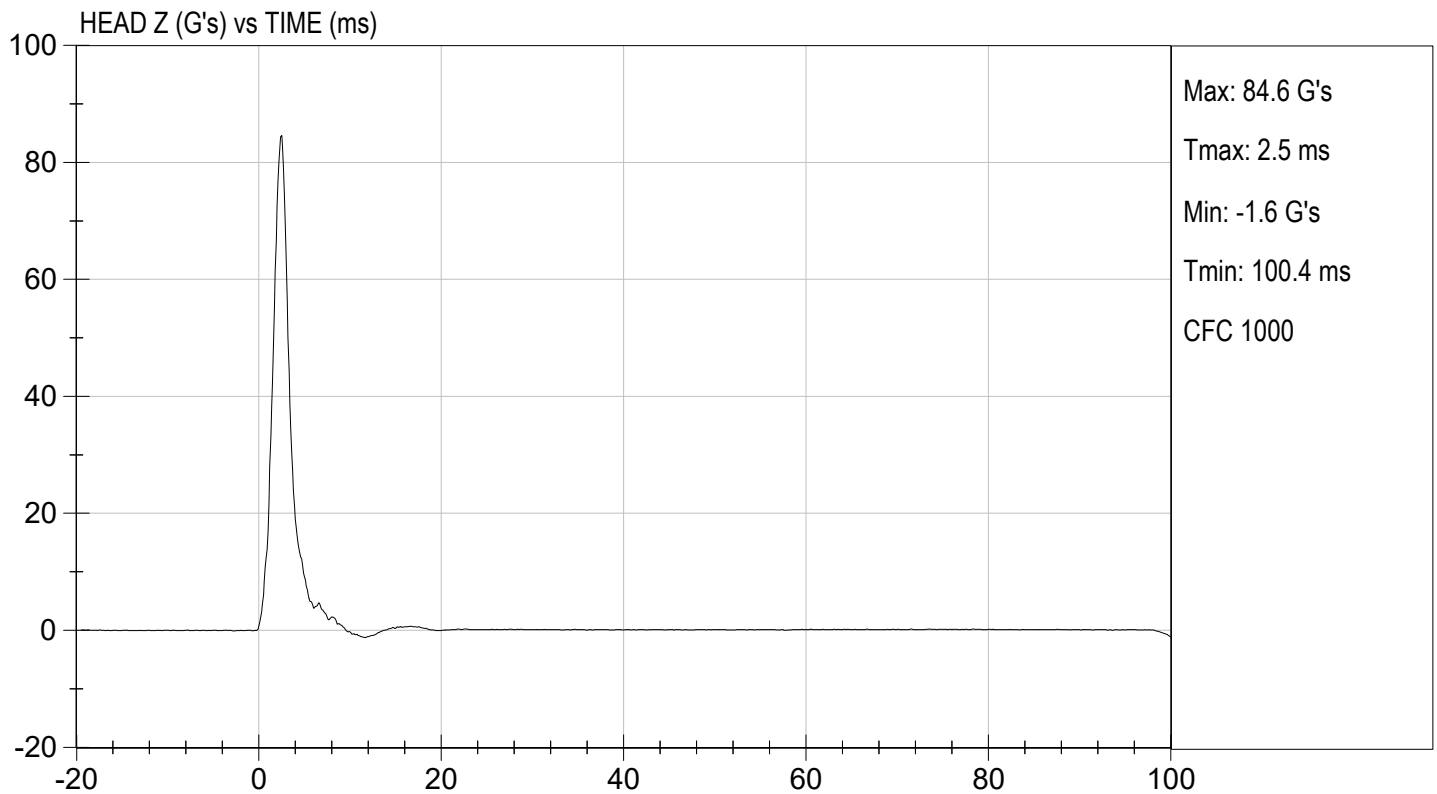
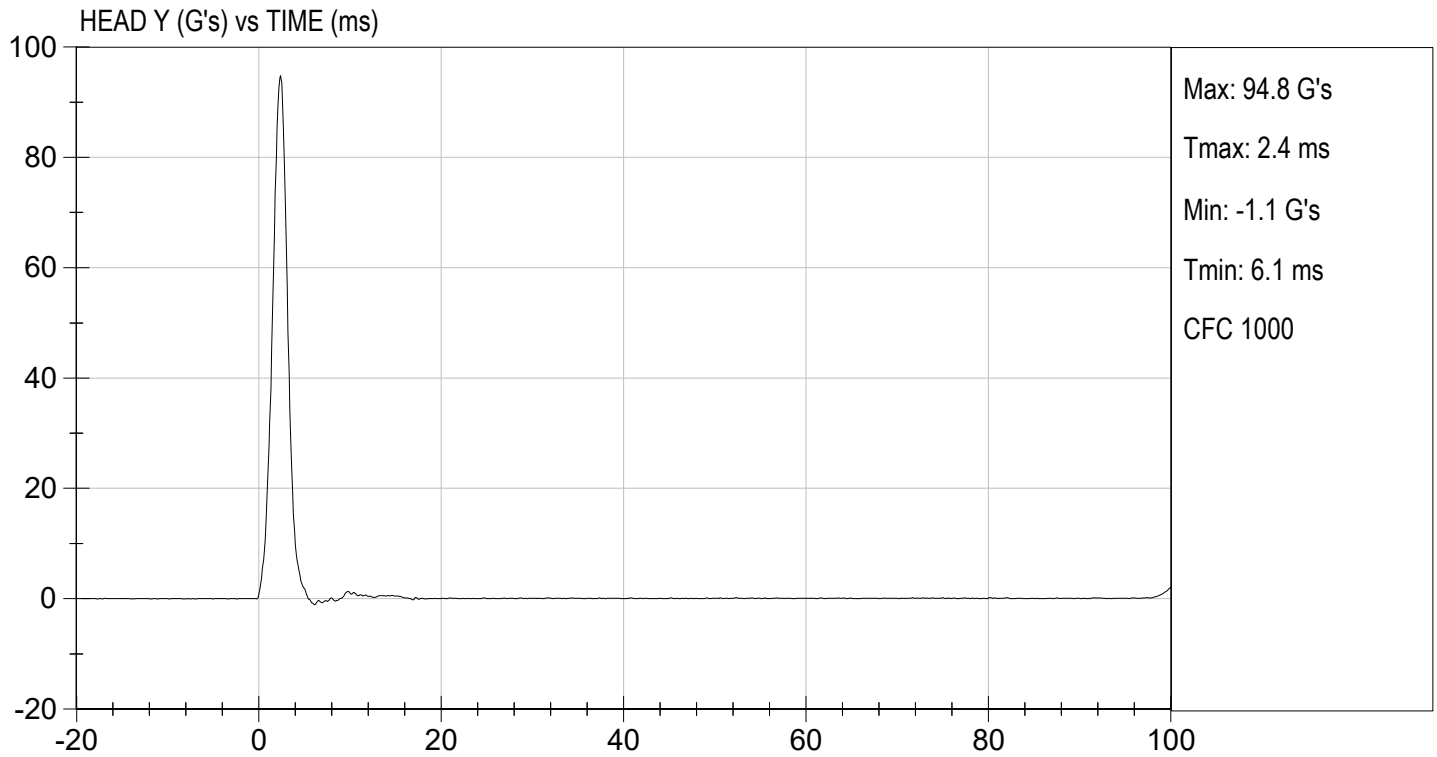

Laboratory Technician

09/27/2023

Test Date


Approved By





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

ATD Serial No: 306

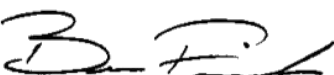
Test I.D: D232662

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.2	Pass
Humidity		%	10 to 70	49	Pass
Impact Velocity		m/s	5.51 to 5.63	5.53	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.40	Pass
	15 ms	m/s	3.30 to 4.10	3.70	Pass
	20 ms	m/s	4.40 to 5.40	5.25	Pass
	25 ms	m/s	5.40 to 6.10	5.78	Pass
	25-100 ms	m/s	5.50 to 6.20	5.84	Pass
Maximum D-Plane Rotation		deg	71 to 81	76	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	63	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-40	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	116	Pass
Overall Test Results				Pass	


 Laboratory Technician

09/27/2023

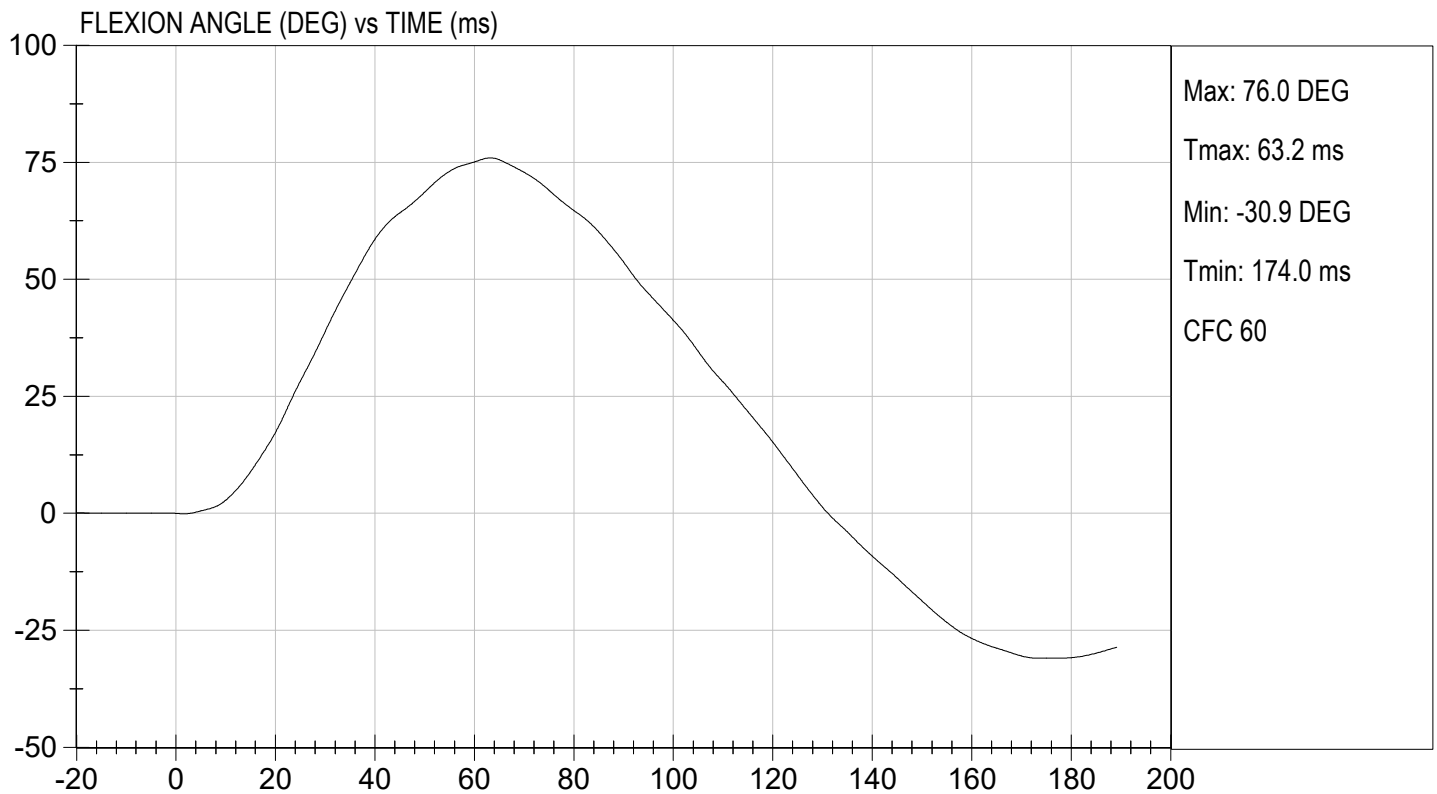
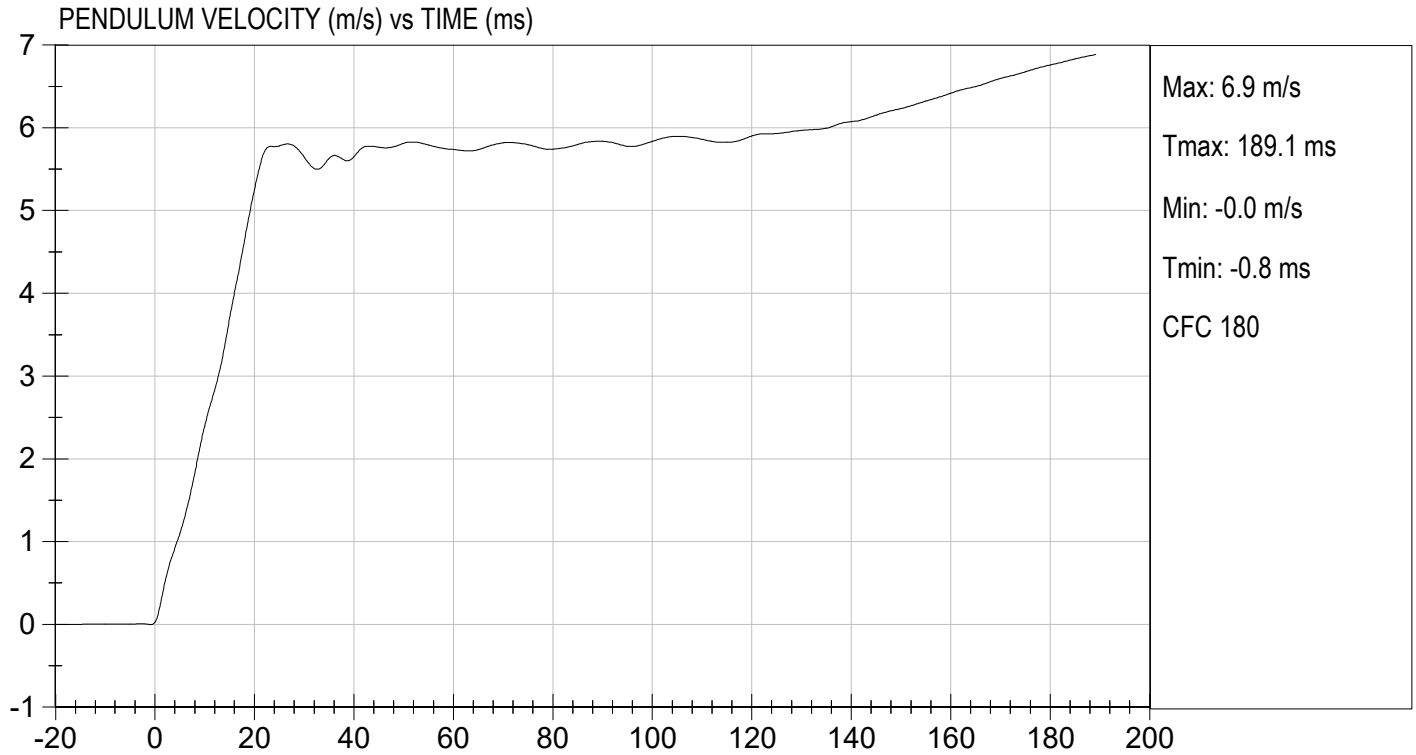
Test Date


 Approved By



TEST DESC: NECK BENDING
VELOCITY: 18.15 ft/s, 5.53 m/s

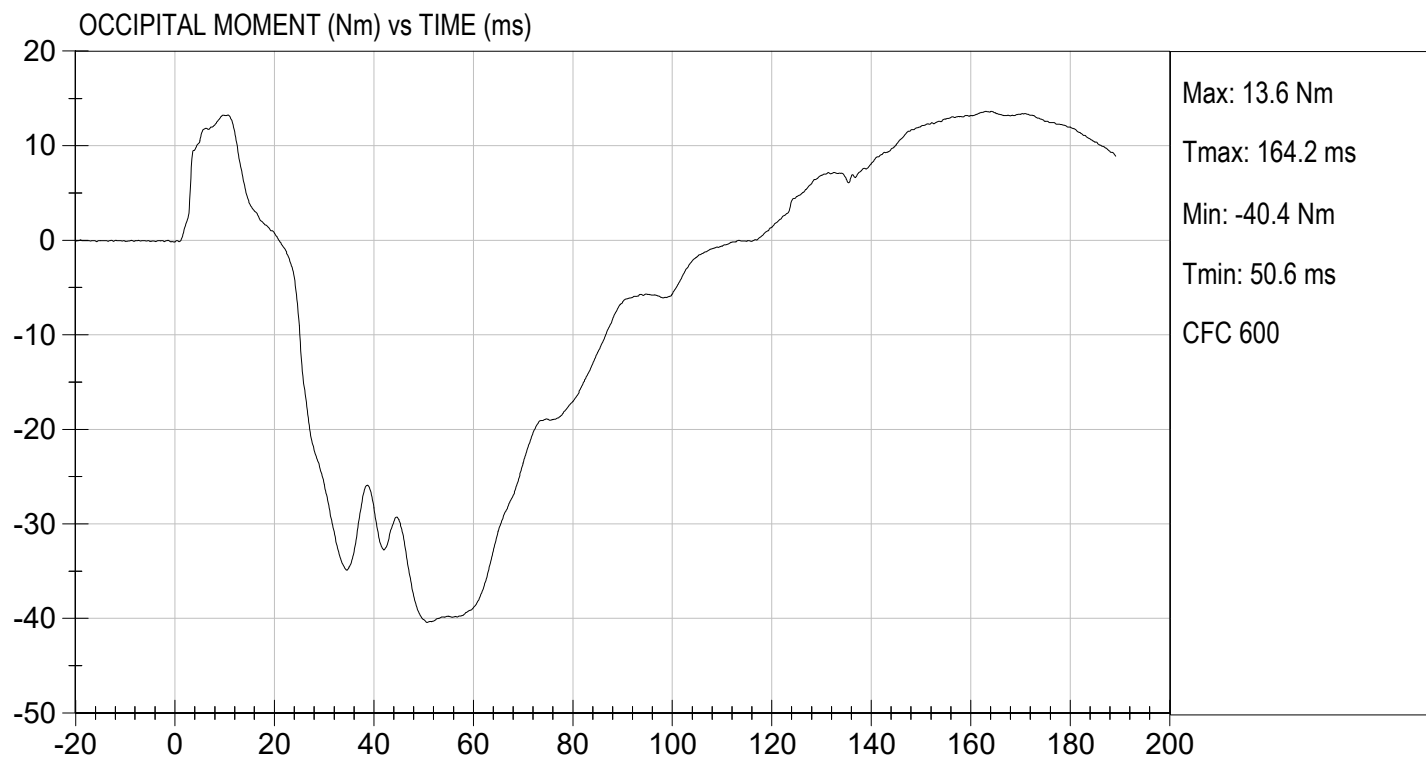
TEST DATE: 09/27/2023
TEST #: D232662





TEST DESC: NECK BENDING
VELOCITY: 18.15 ft/s, 5.53 m/s

TEST DATE: 09/27/2023
TEST #: D232662



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

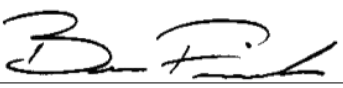
ATD Serial No: 306

Test ID: D232663

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	50	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	32	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results			Pass	


Laboratory Technician

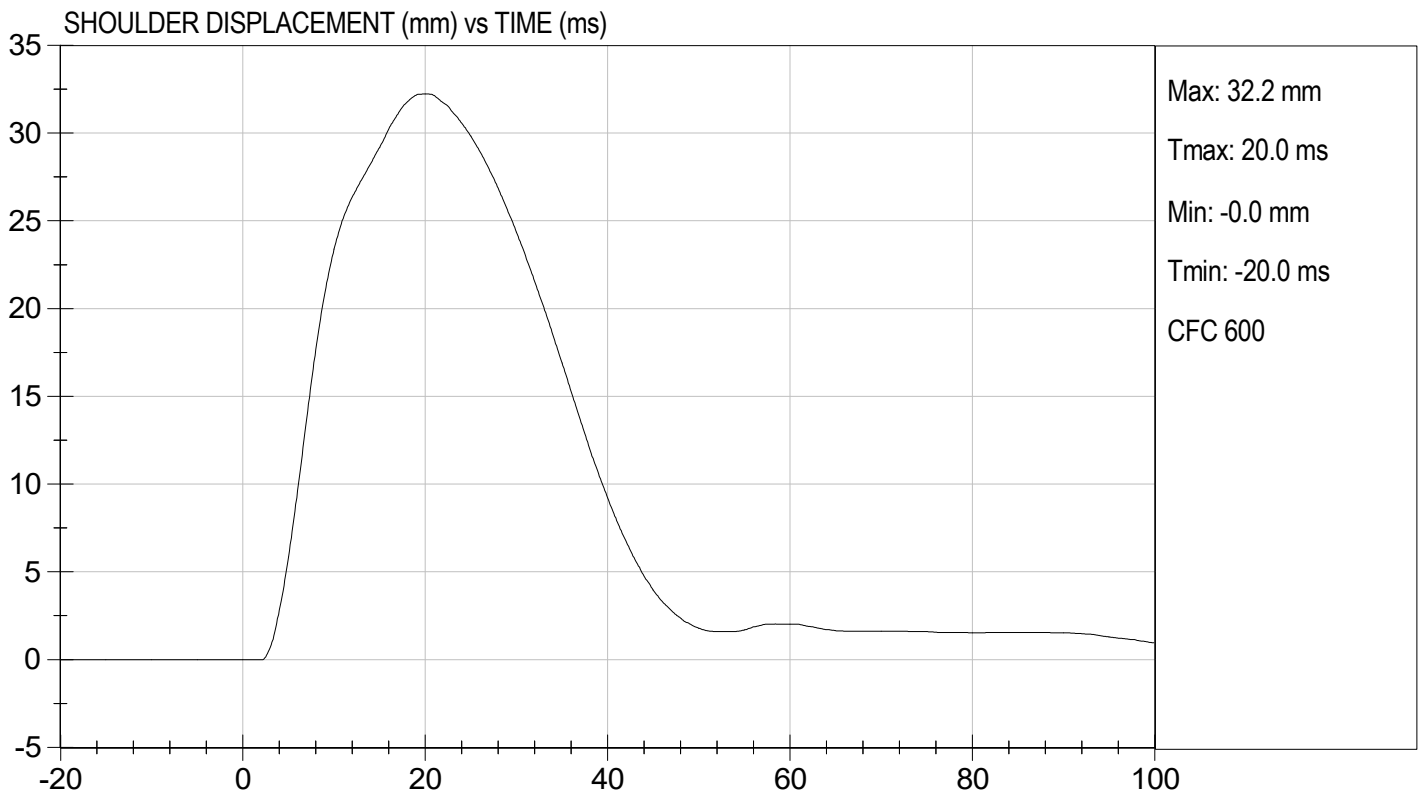
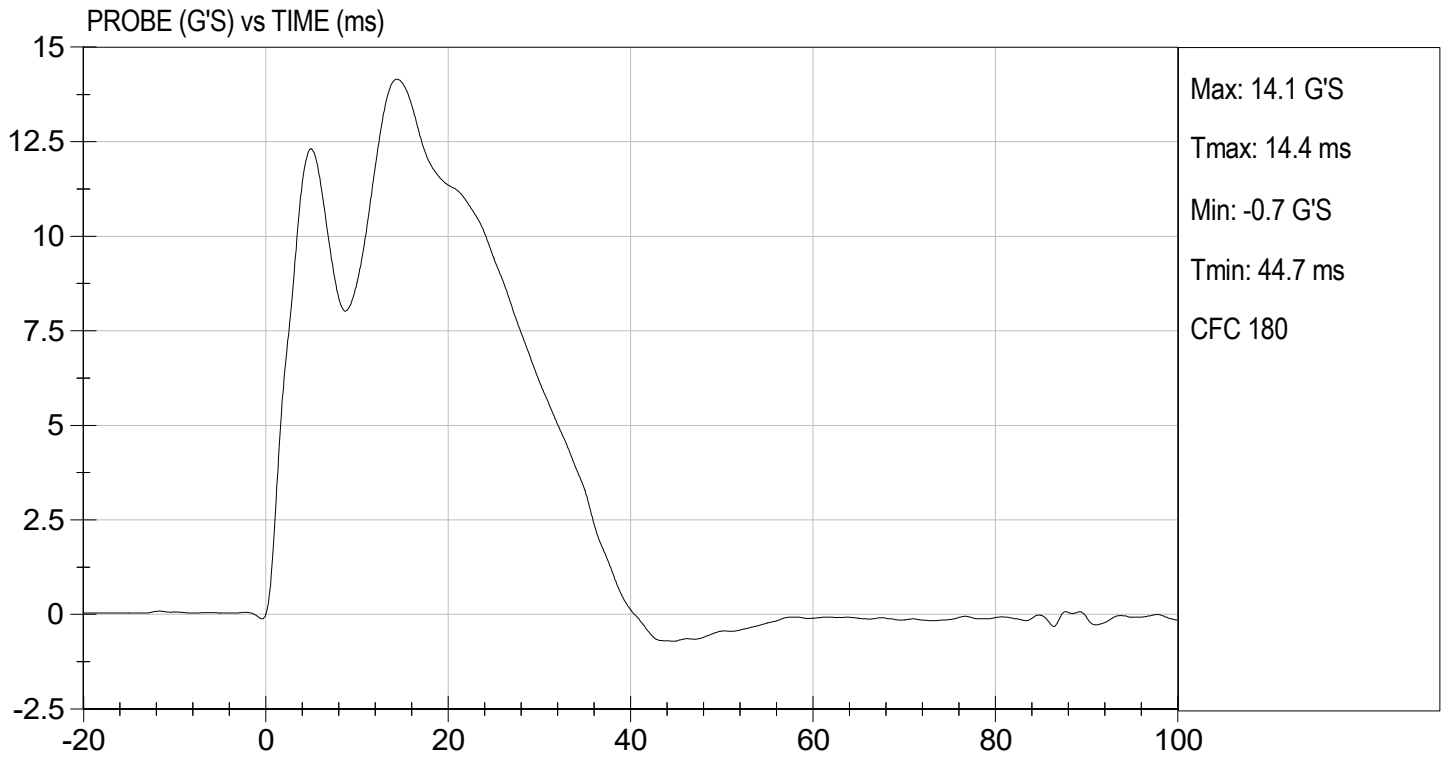
09/27/2023
Test Date


Approved By



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

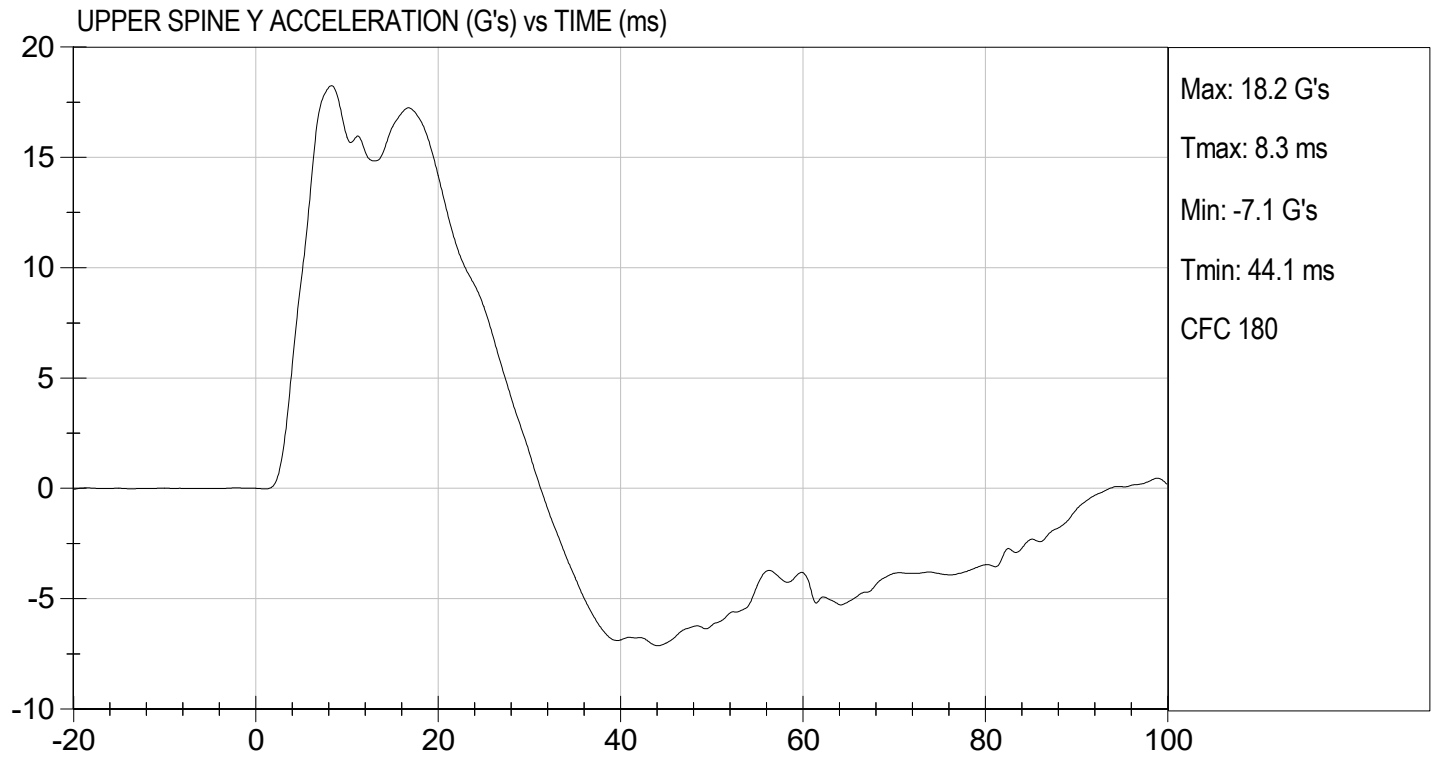
TEST DATE: 09/27/2023
TEST #: D232663





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

TEST DATE: 09/27/2023
TEST #: D232663



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

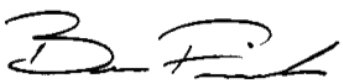
ATD Serial No: 306

Test I.D: D232664

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	31	Pass
Shoulder Displacement	mm	31 to 40	37	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	33	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	34	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass


Laboratory Technician

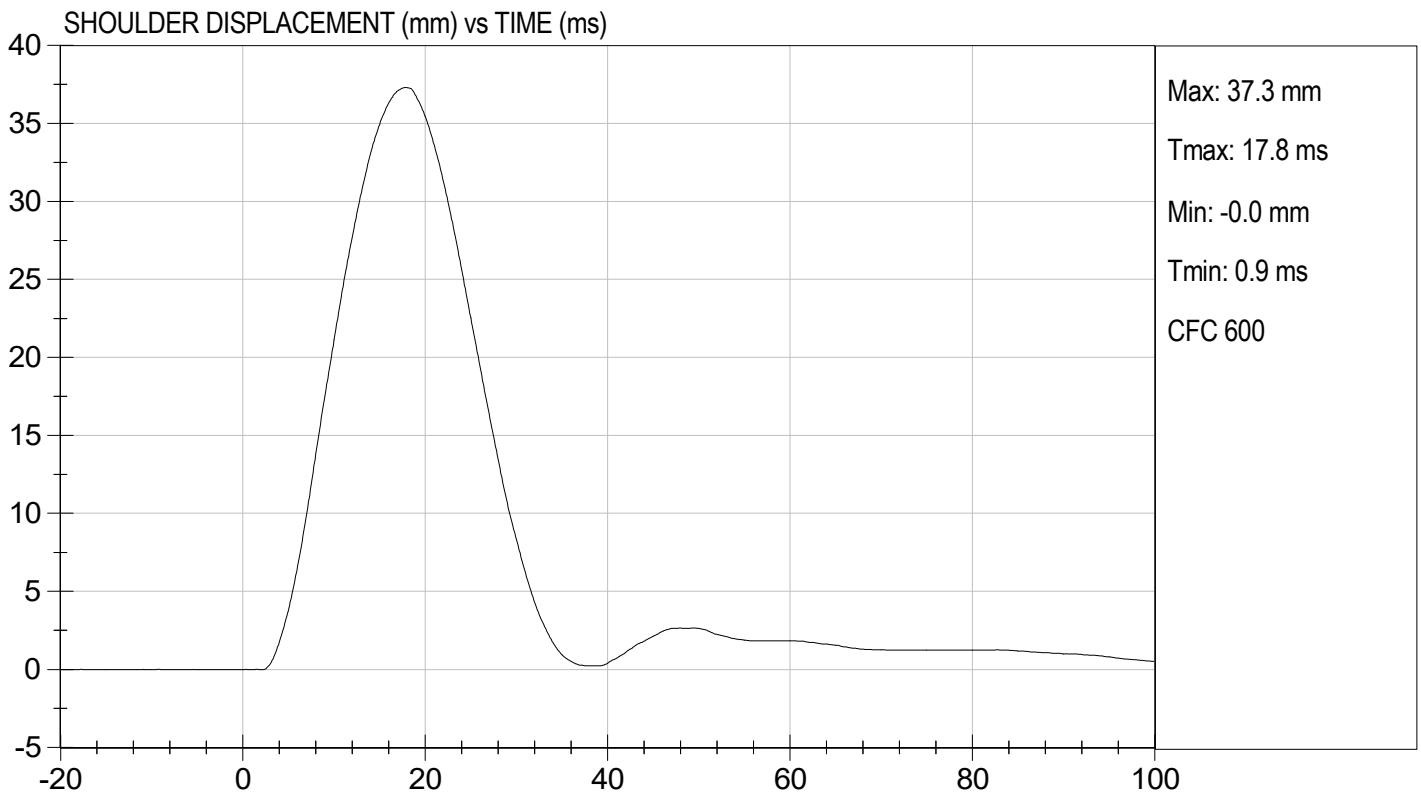
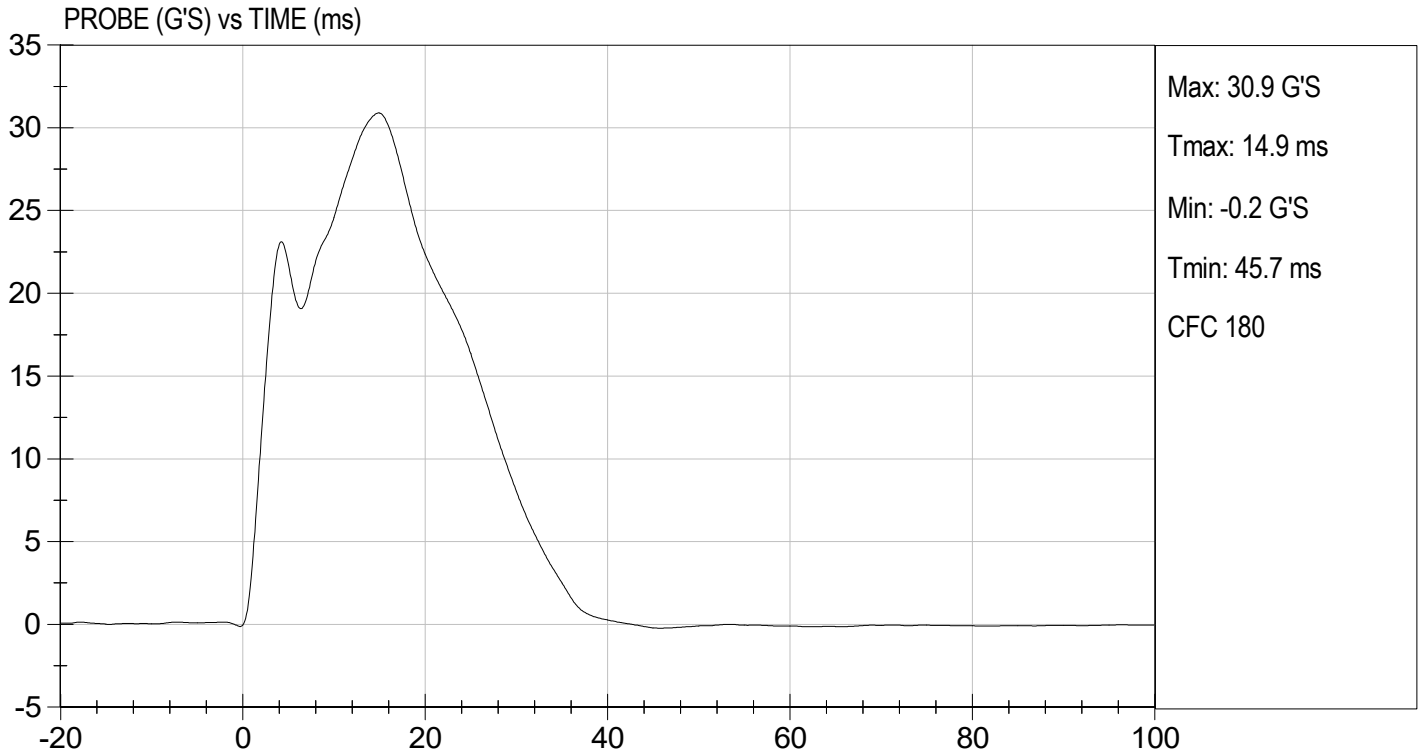
09/27/2023
Test Date


Approved By



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

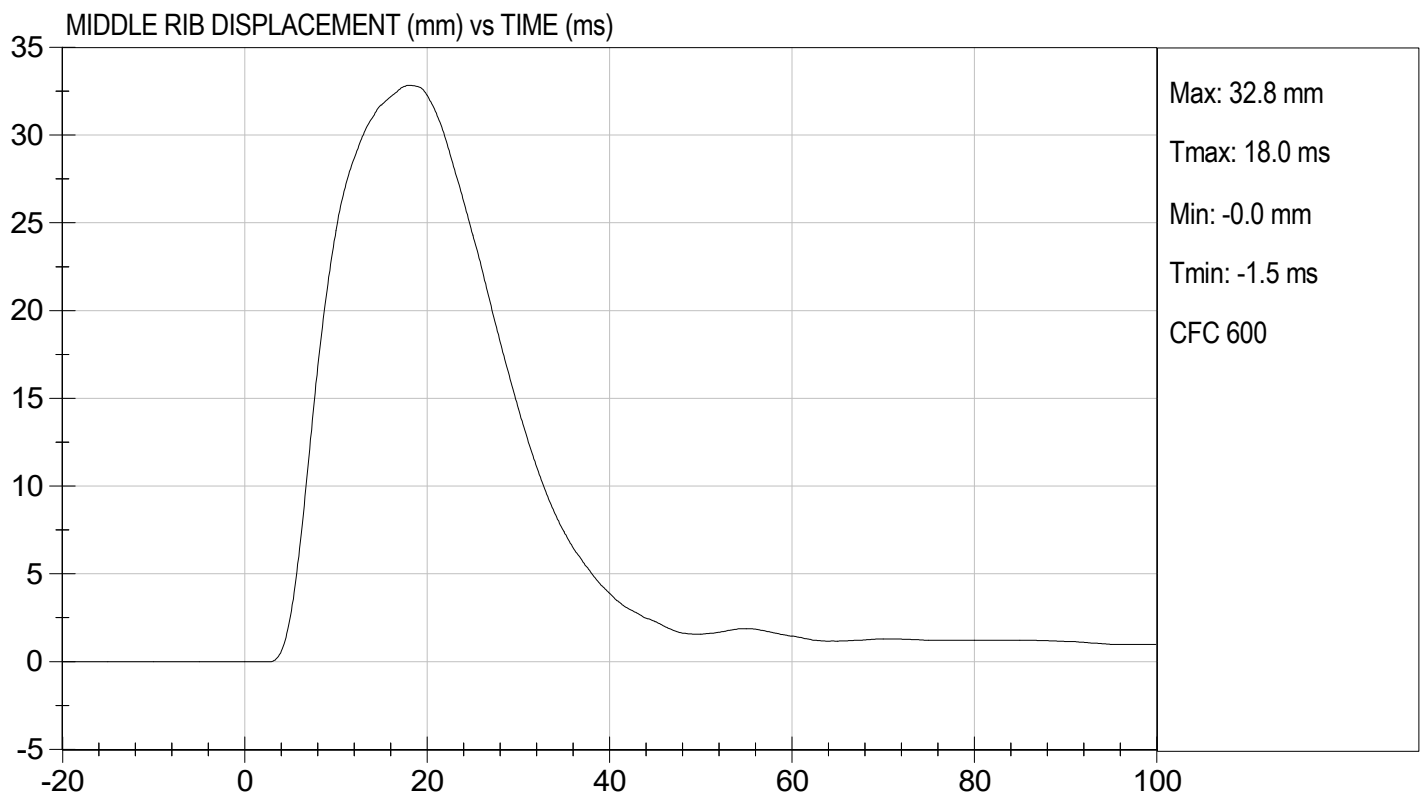
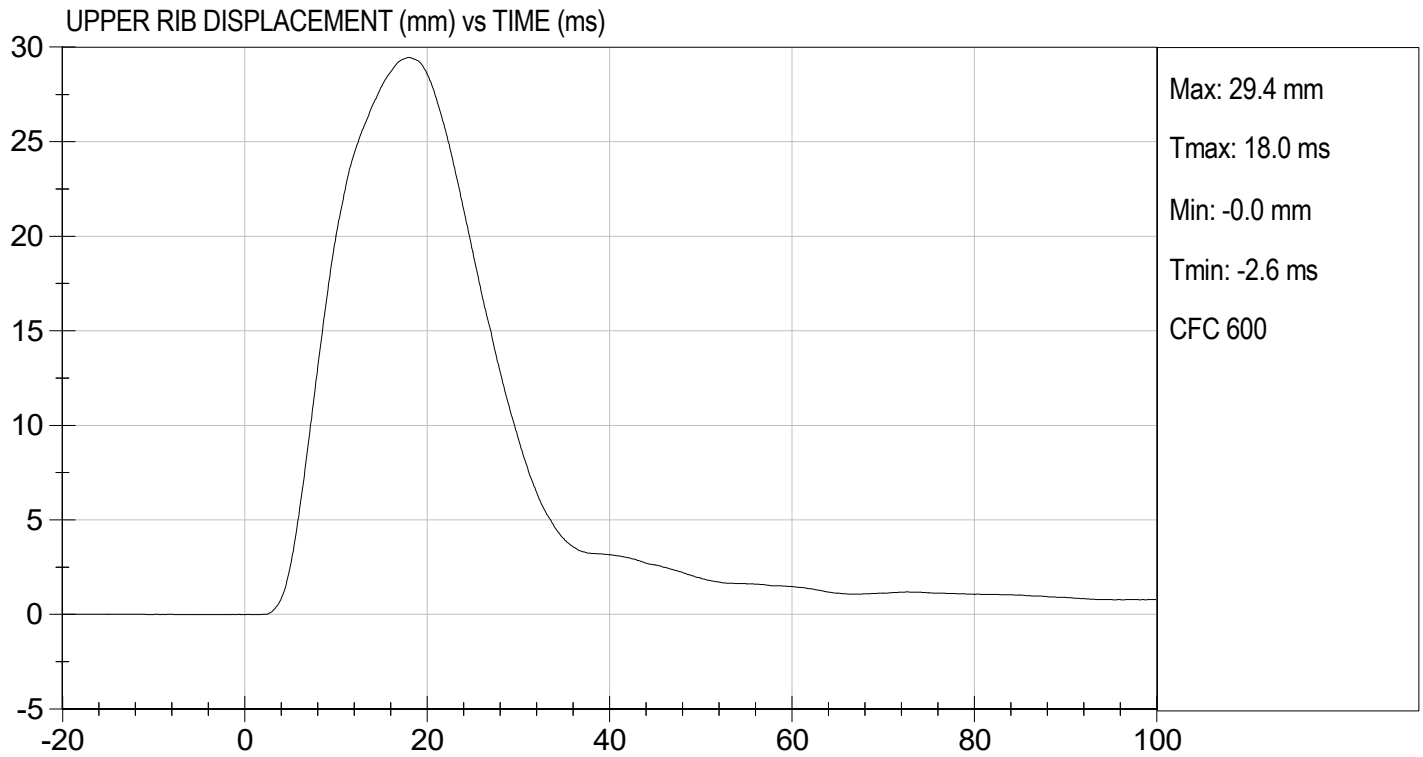
TEST DATE: 09/27/2023
TEST #: D232664





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

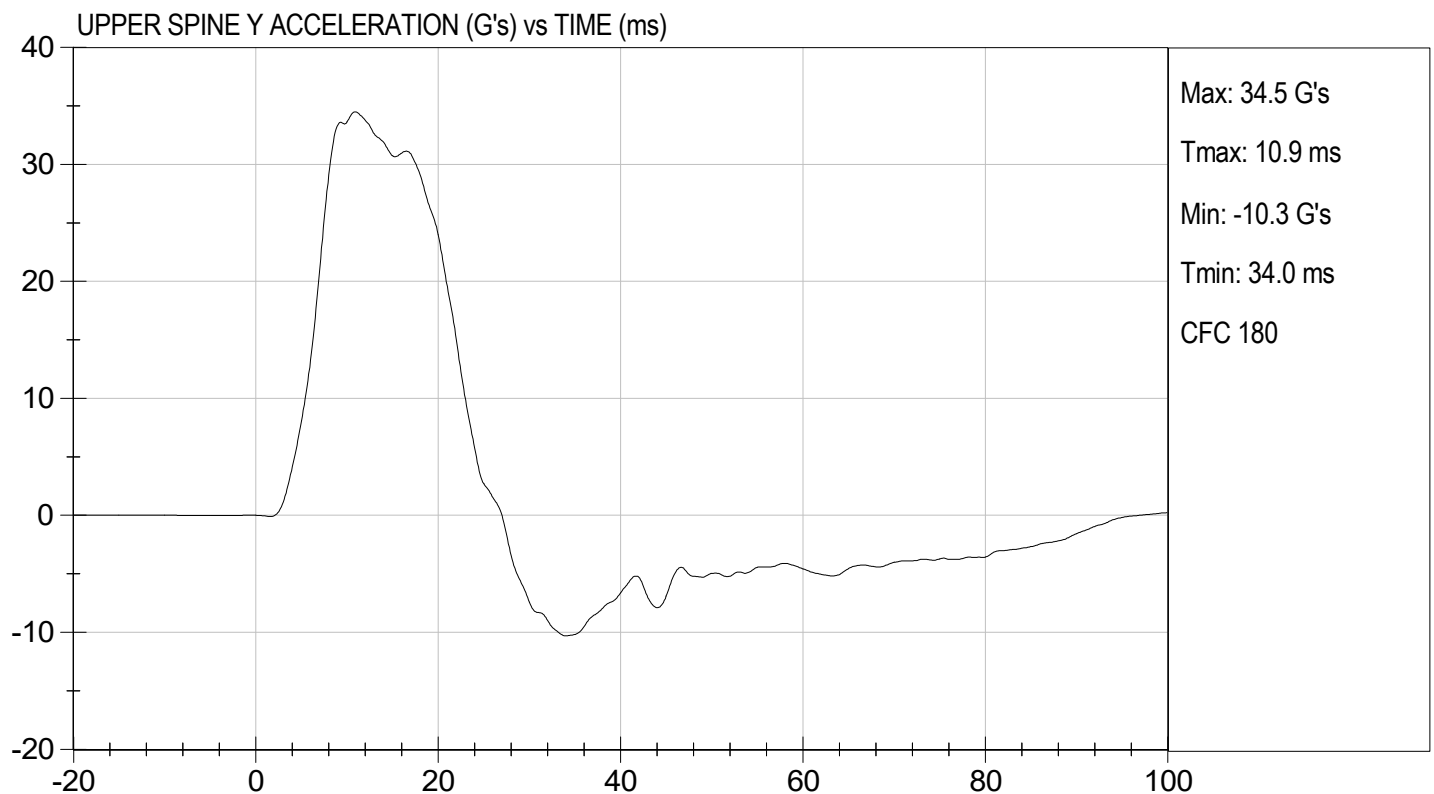
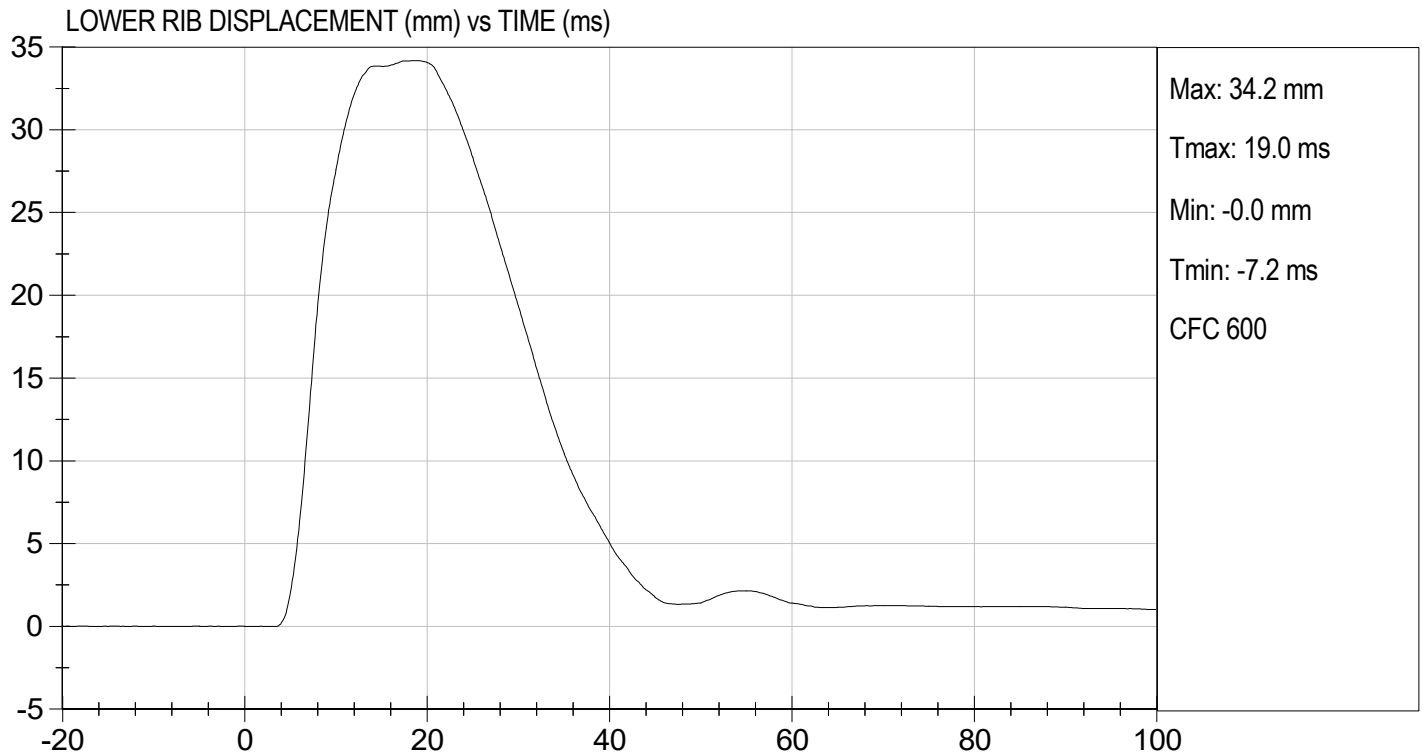
TEST DATE: 09/27/2023
TEST #: D232664





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

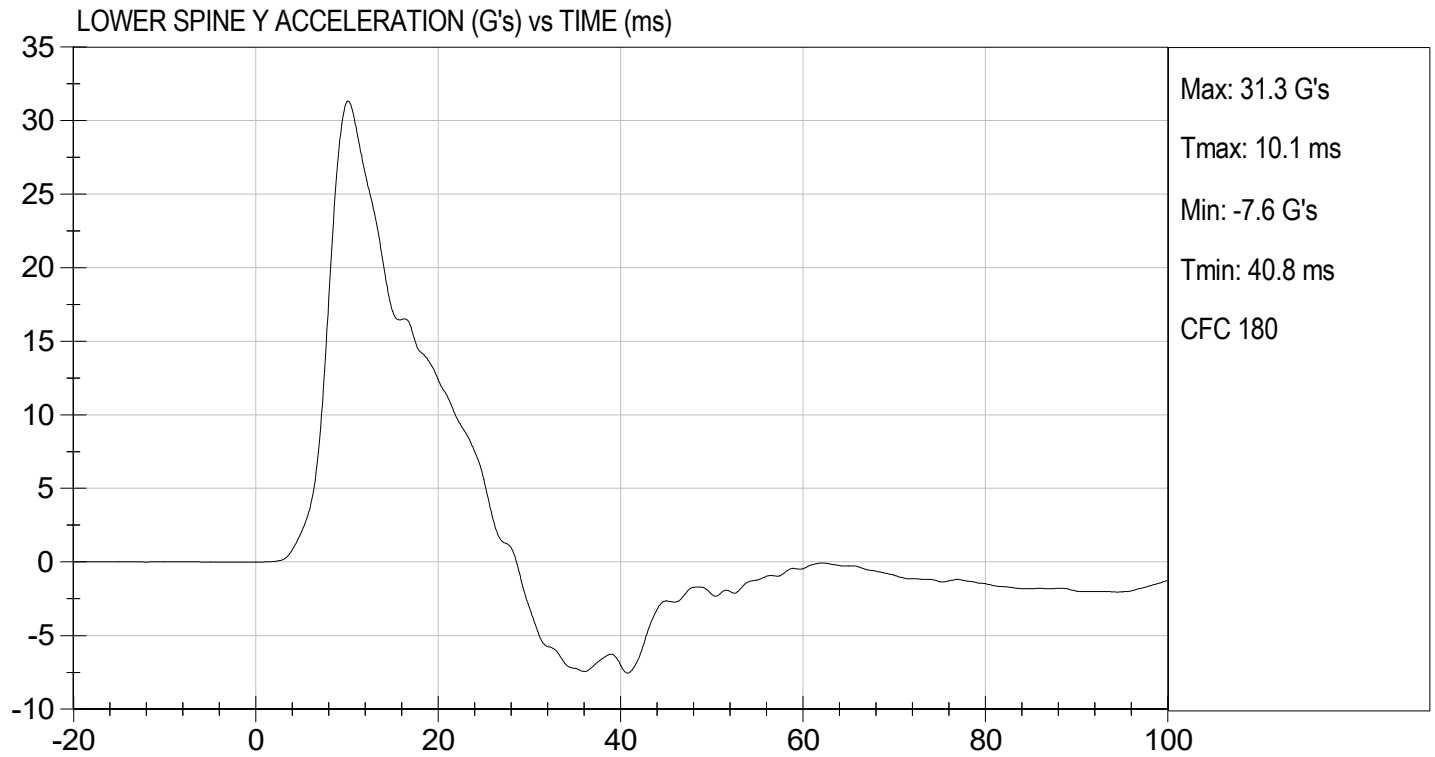
TEST DATE: 09/27/2023
TEST #: D232664





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

TEST DATE: 09/27/2023
TEST #: D232664



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

ATD Serial No: 306

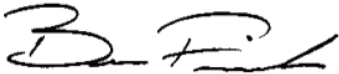
Test I.D: D232665

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass


Laboratory Technician

09/27/2023

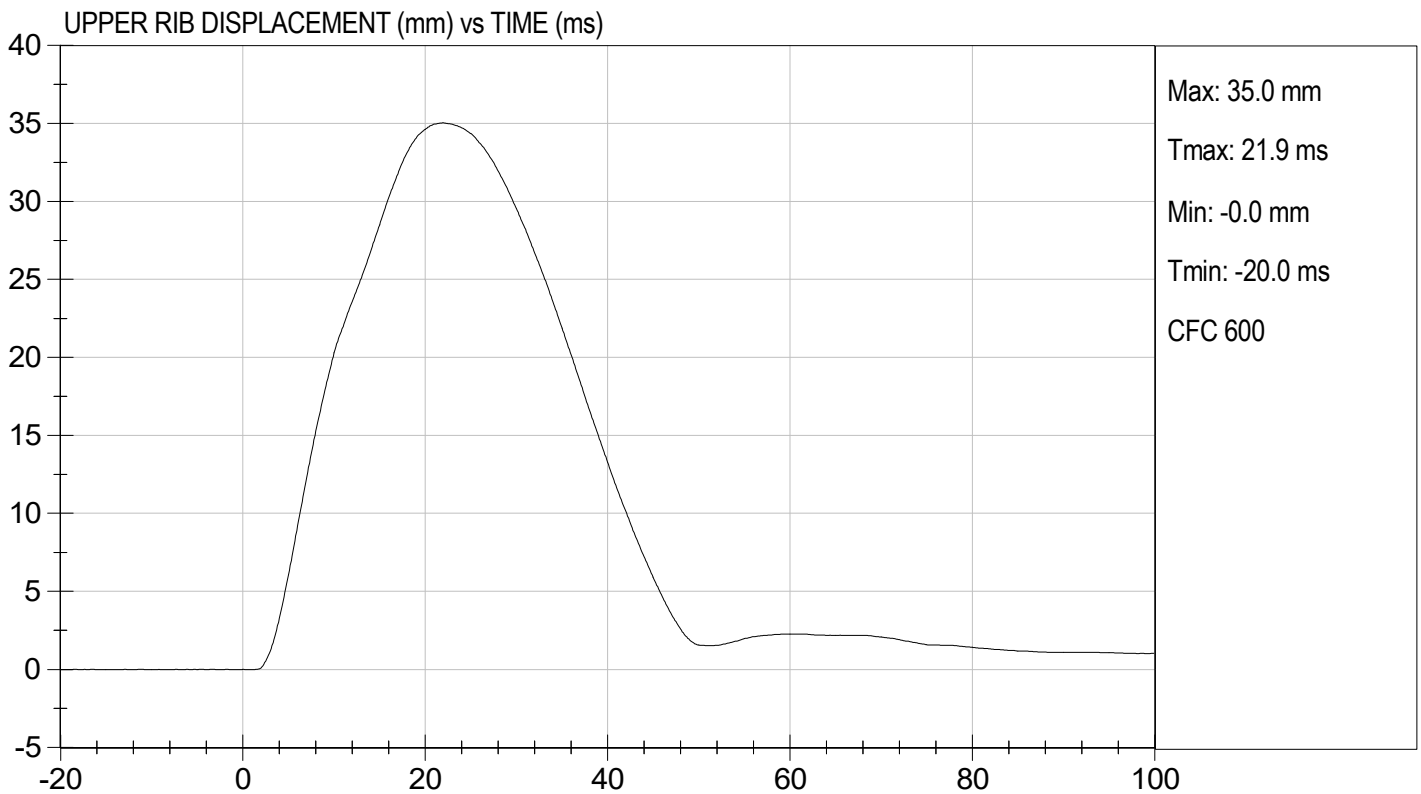
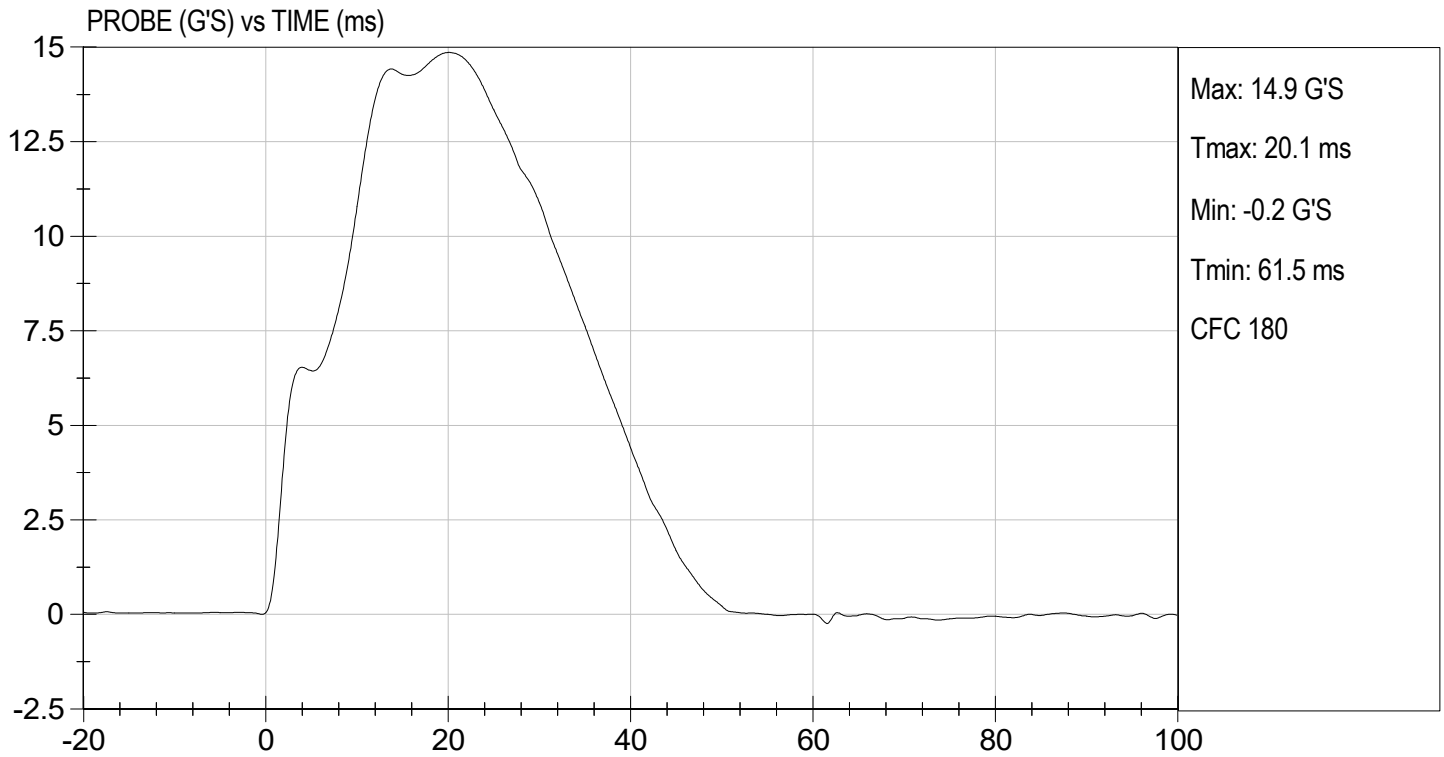
Test Date


Approved By



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

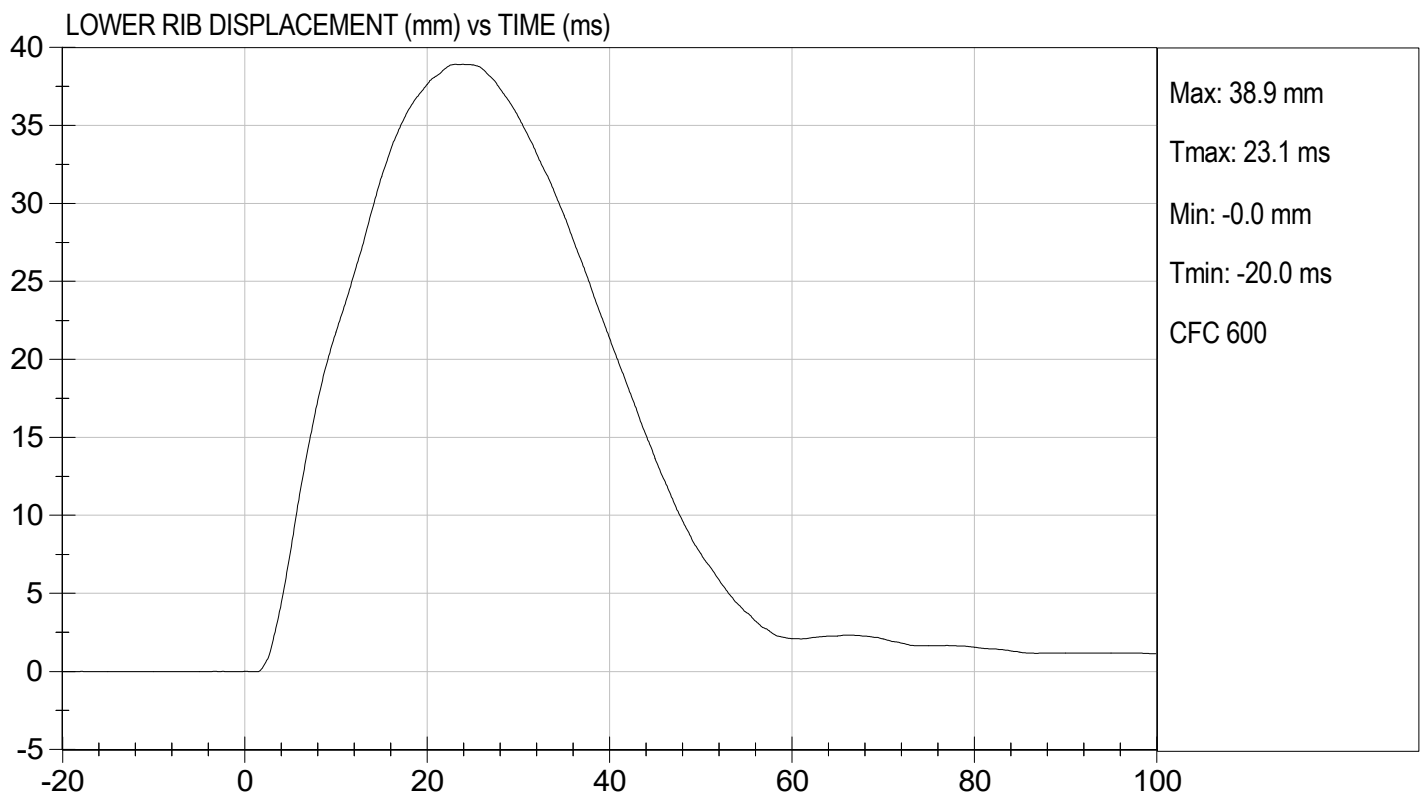
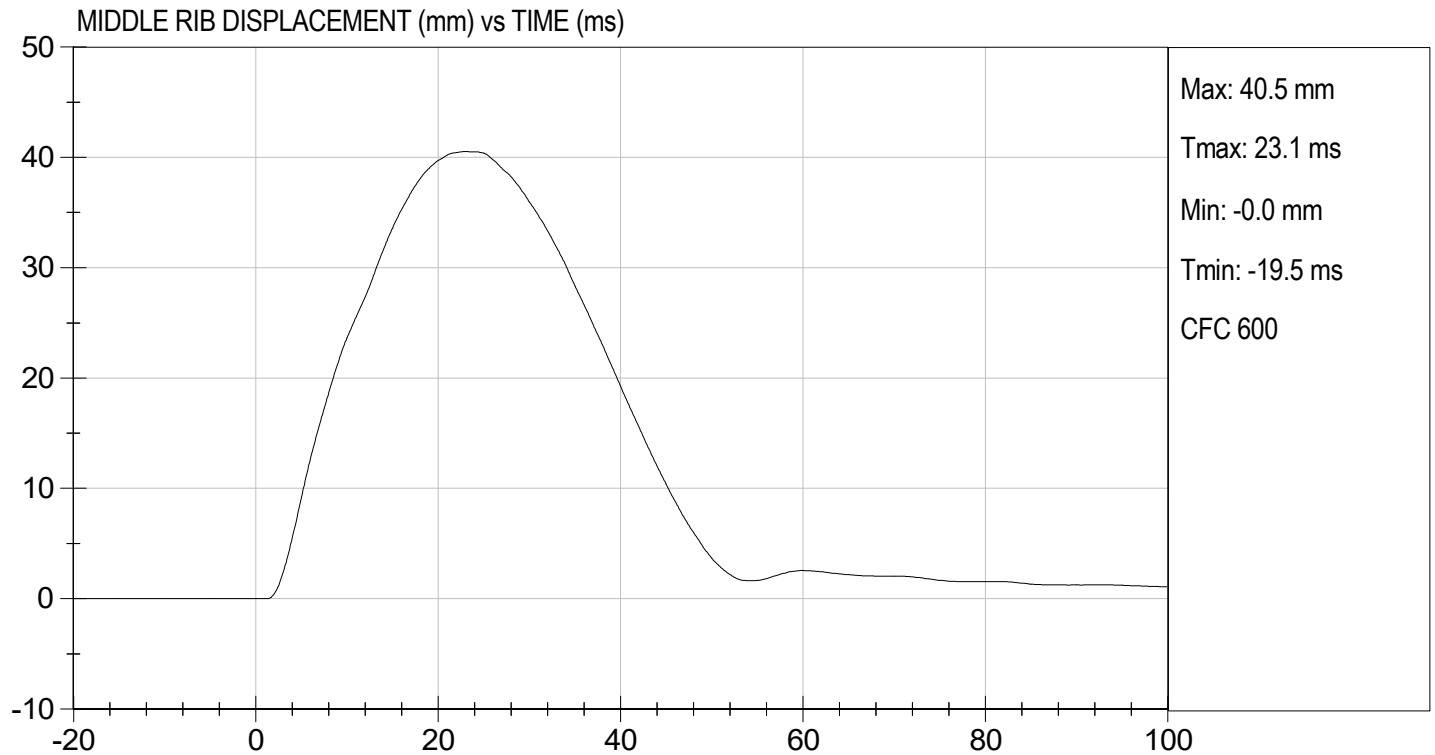
TEST DATE: 09/27/2023
TEST #: D232665





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

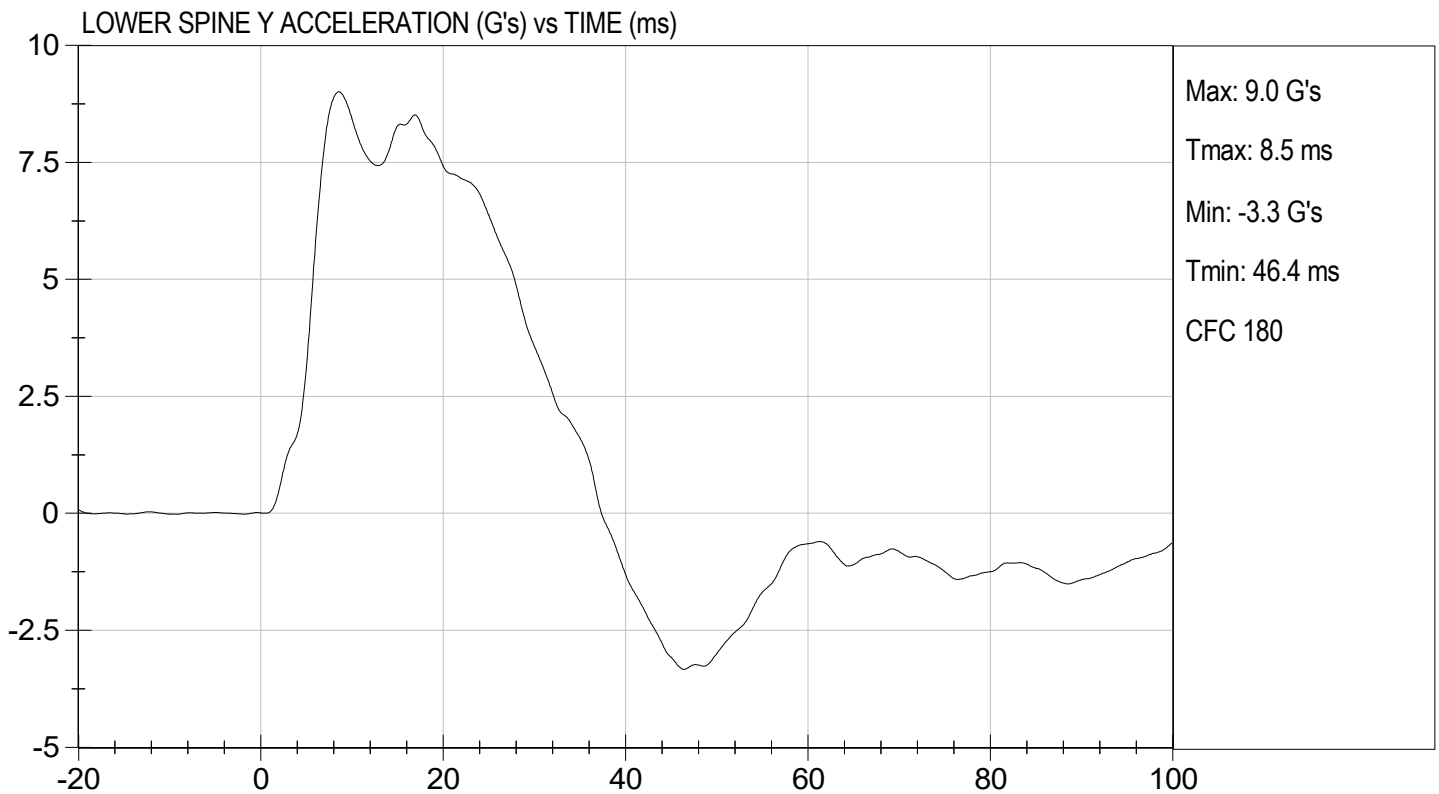
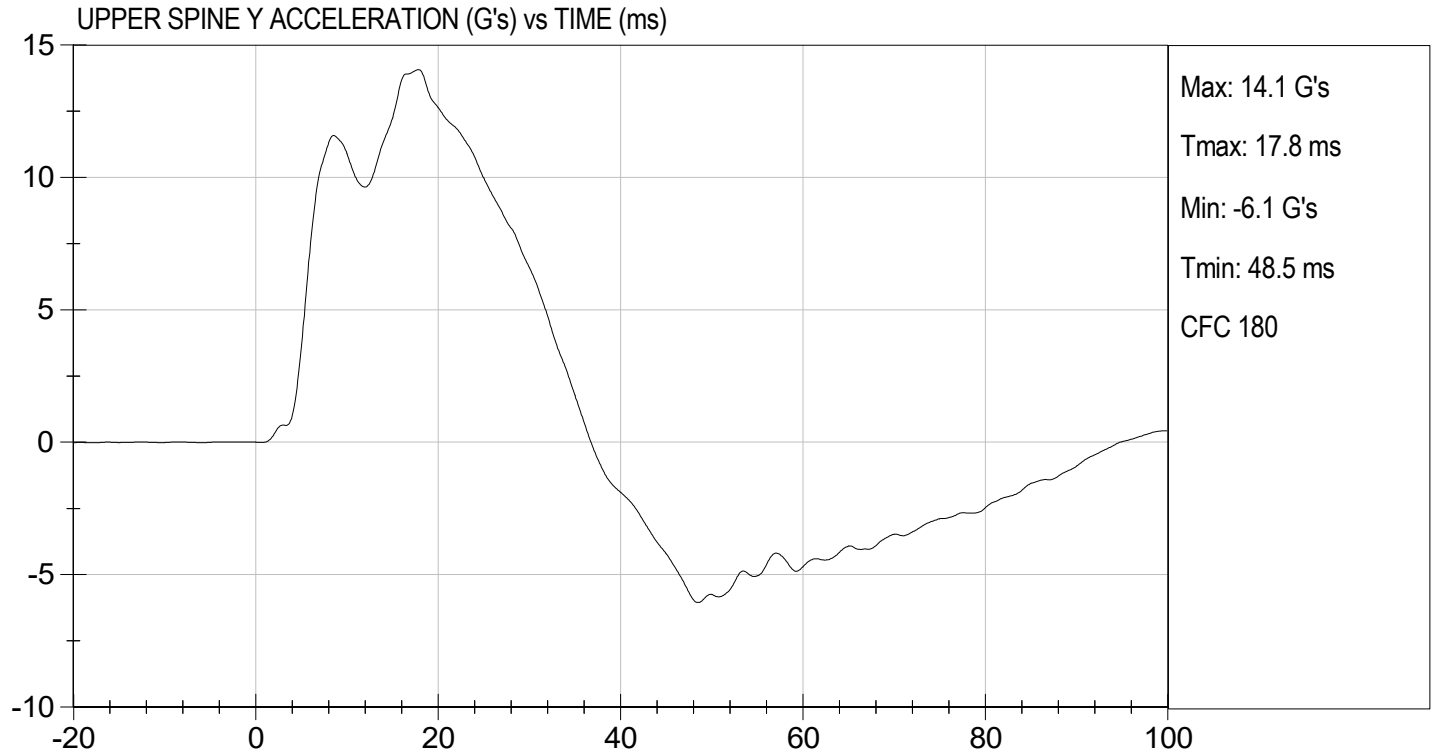
TEST DATE: 09/27/2023
TEST #: D232665





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

TEST DATE: 09/27/2023
TEST #: D232665



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

ATD Serial No: 306

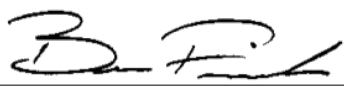
Test I.D: D232666

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	43	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	37	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

09/27/2023

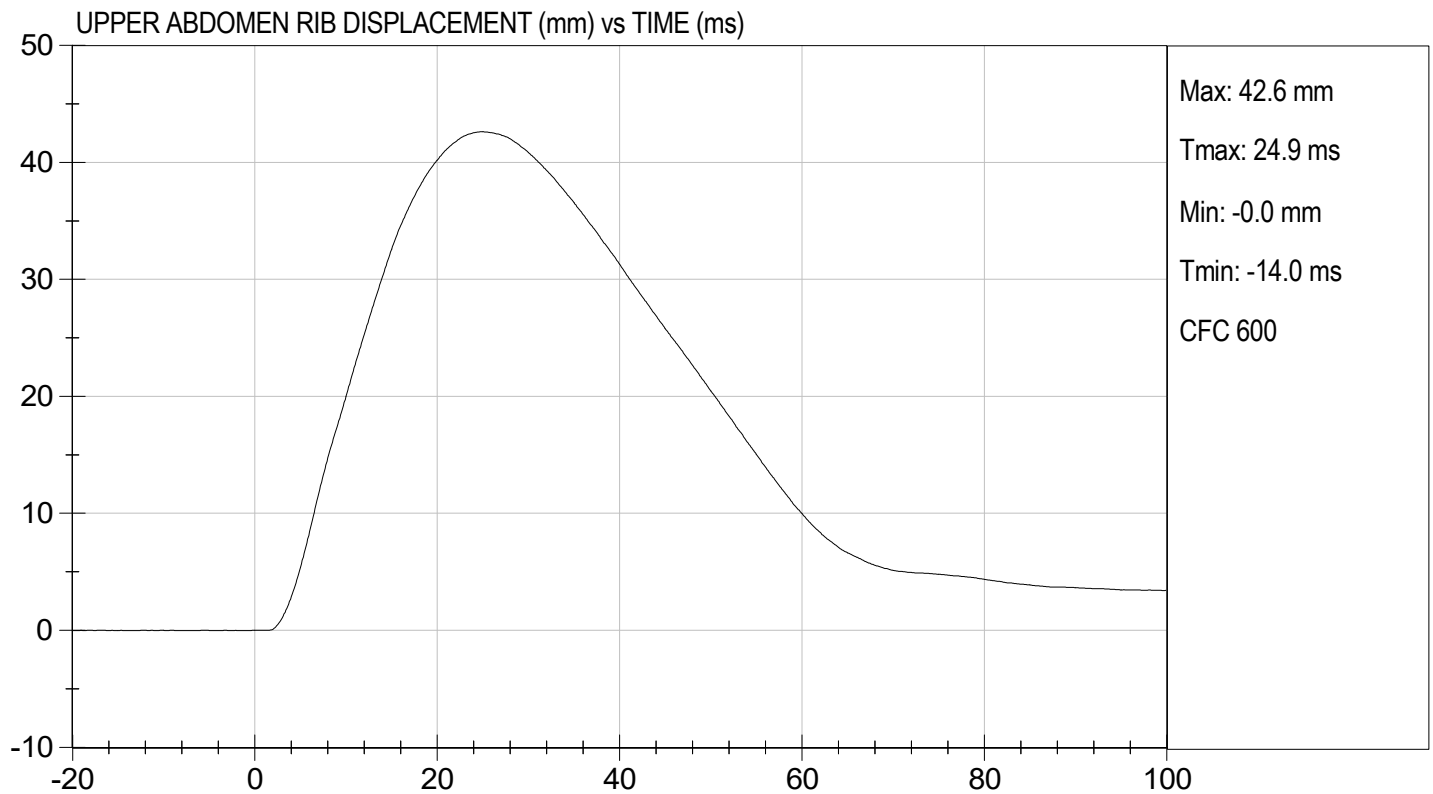
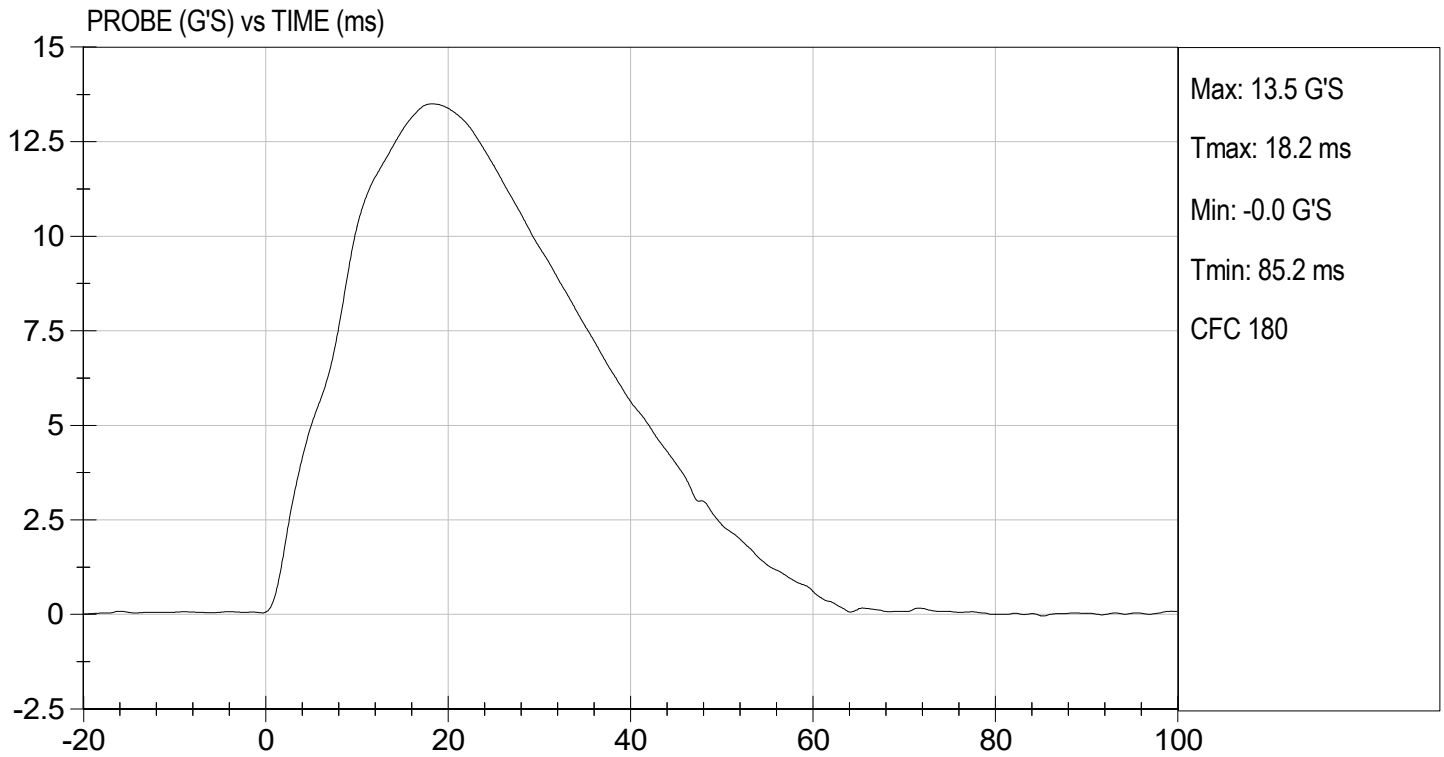
Test Date


Approved By



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

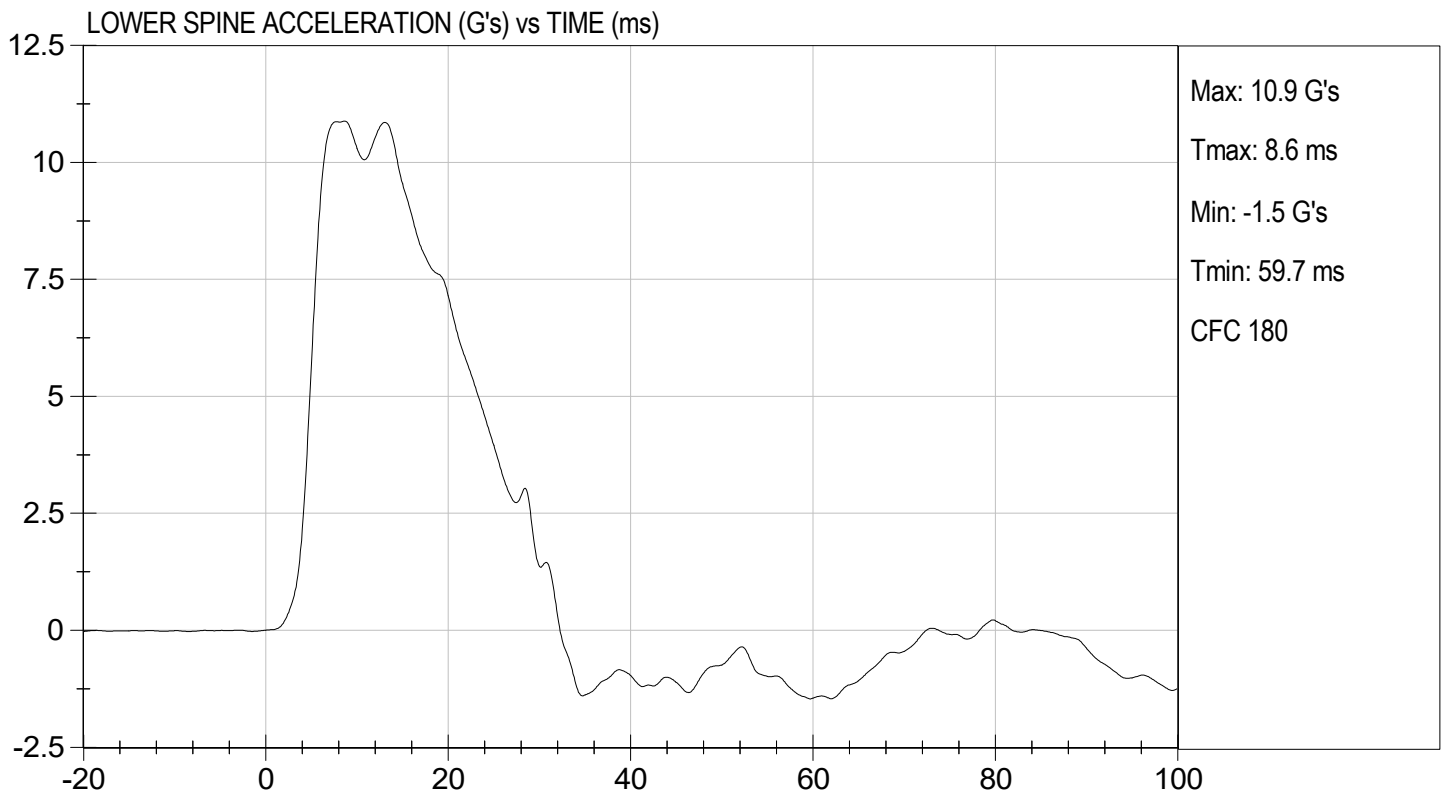
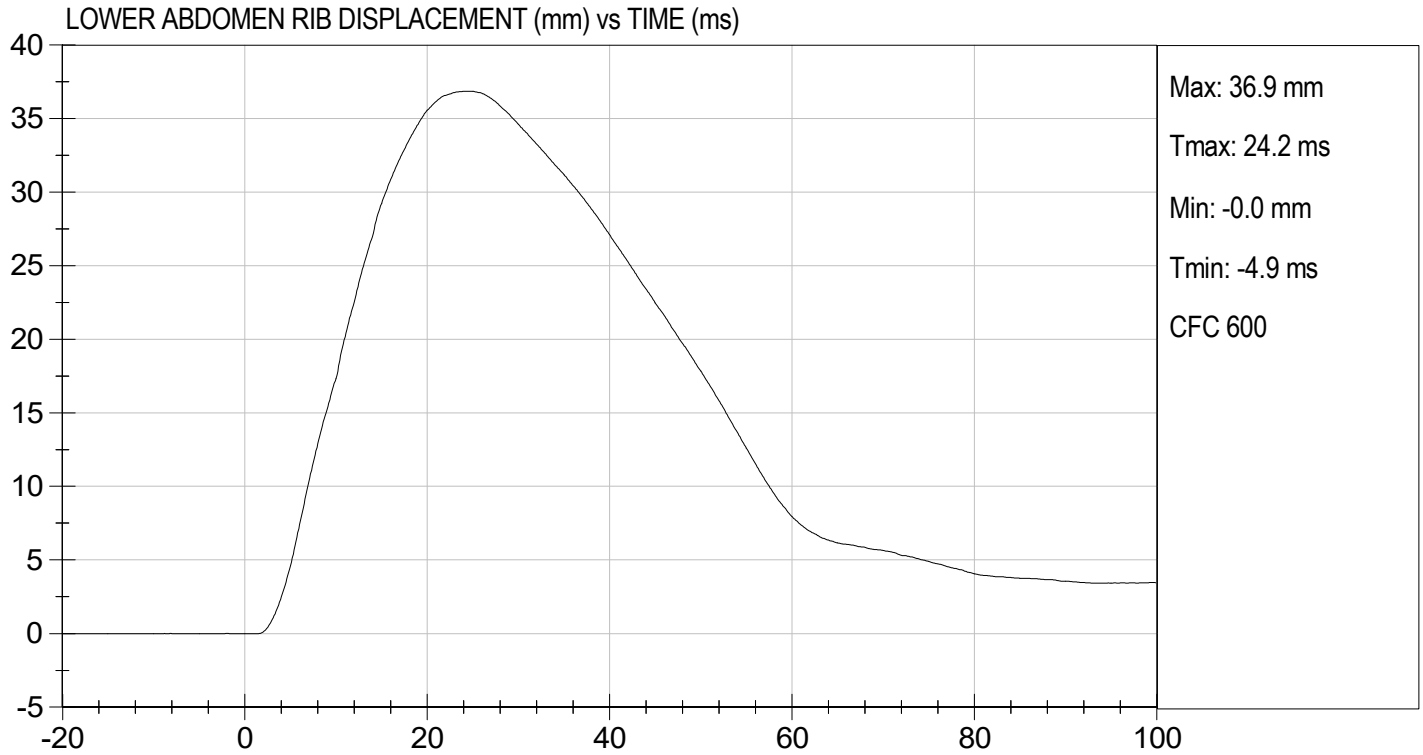
TEST DATE: 09/27/2023
TEST #: D232666





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

TEST DATE: 09/27/2023
TEST #: D232666



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D232667

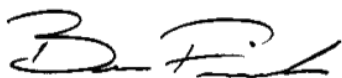
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40.1	Pass
Peak Acetabulum Force	N	3600 to 4300	4,060	Pass
Overall Test Results				Pass



Laboratory Technician

09/27/2023

Test Date

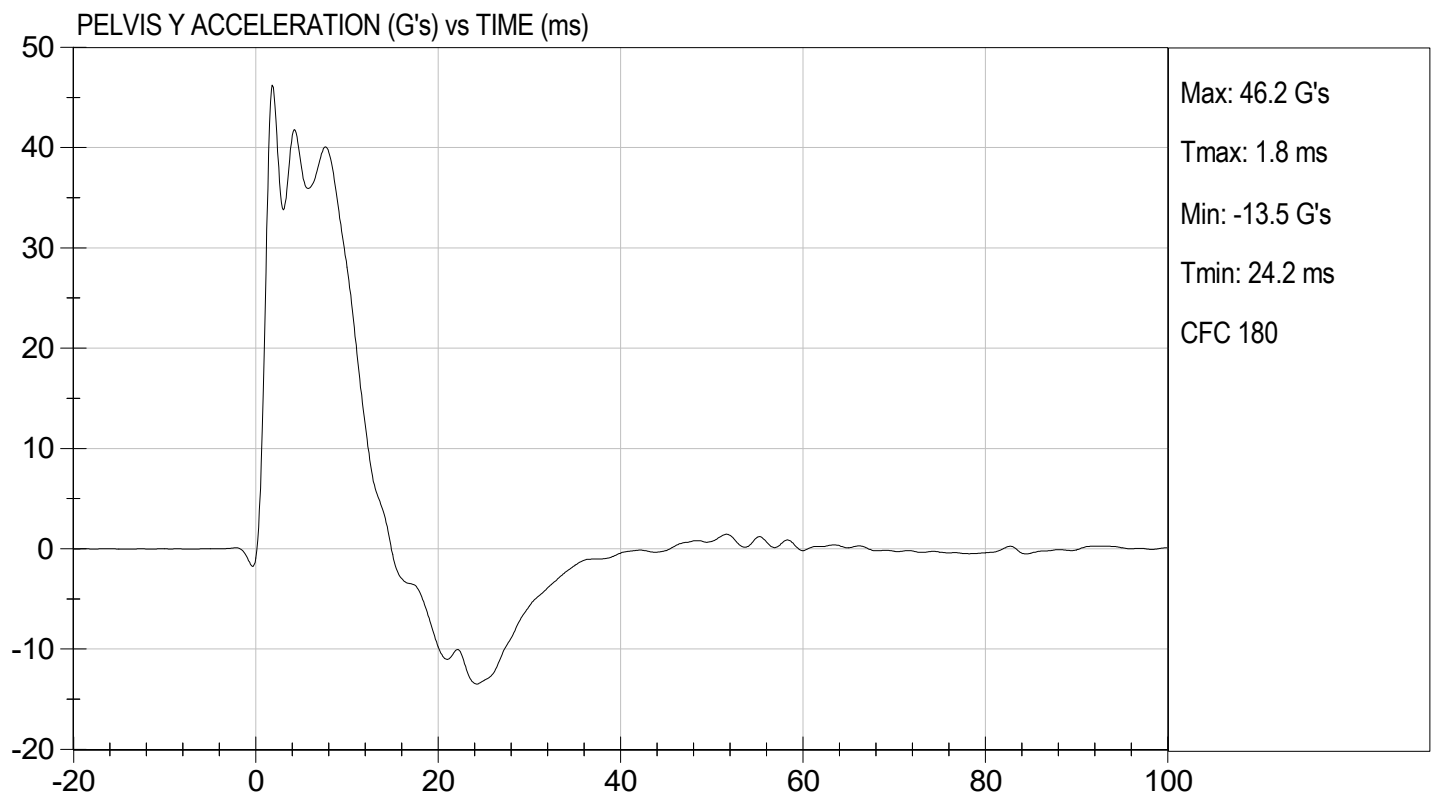
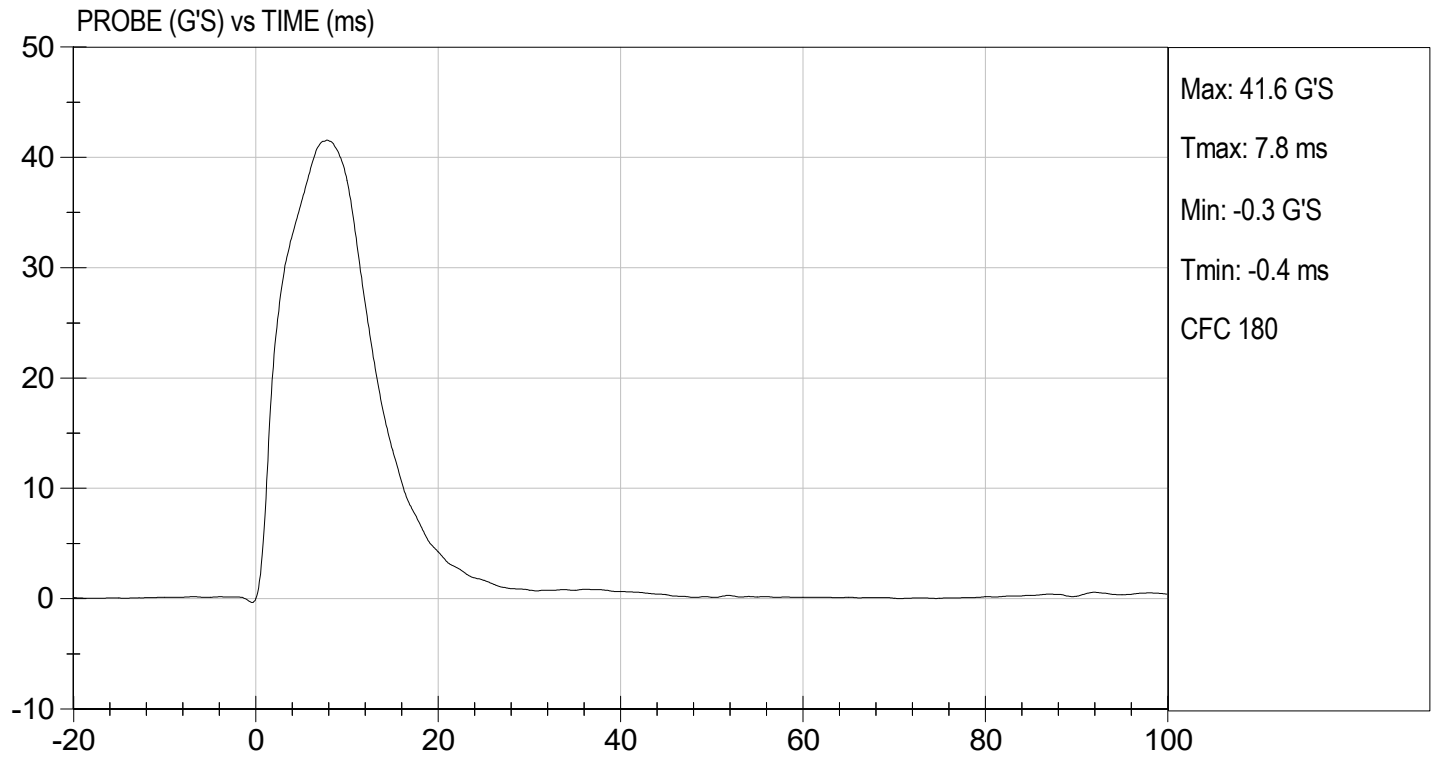


Approved By



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

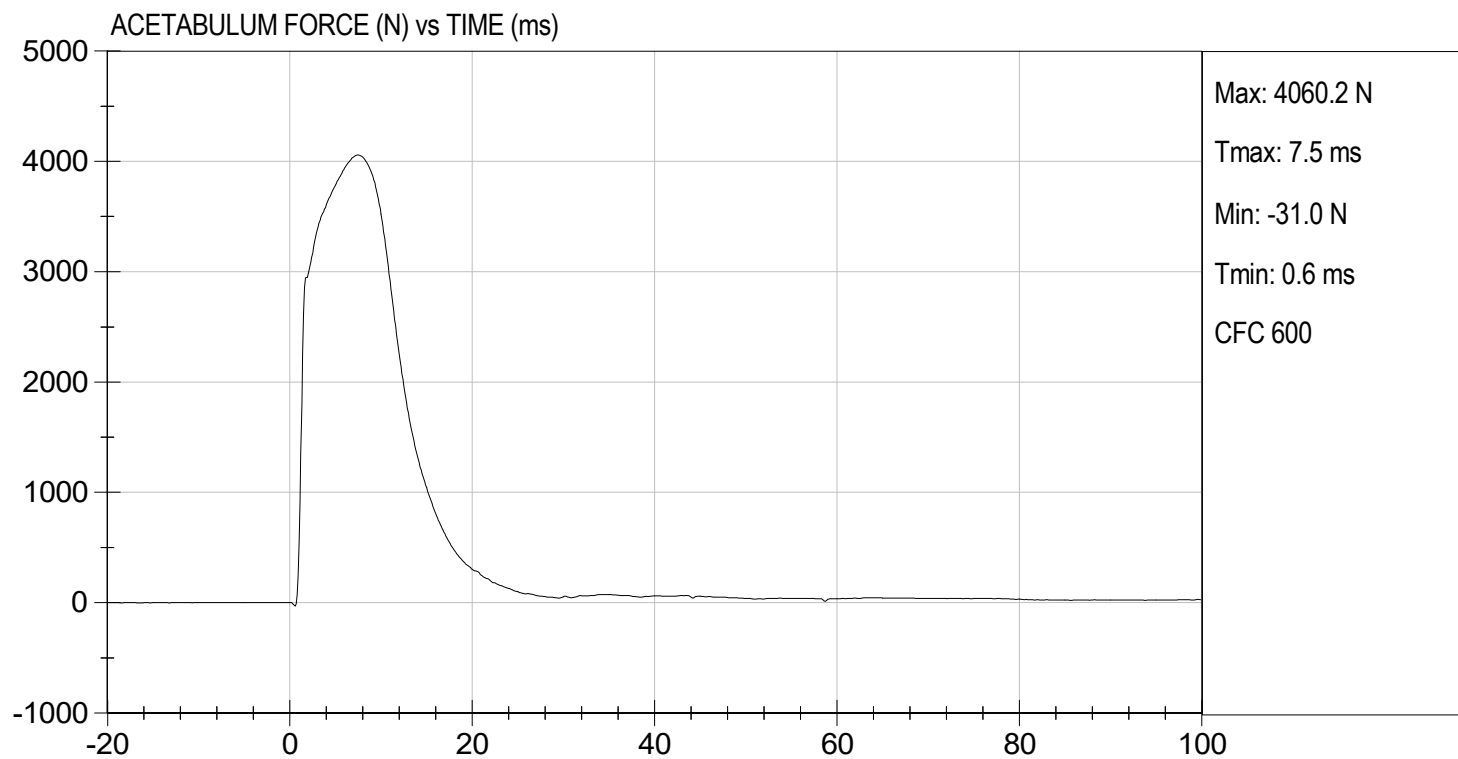
TEST DATE: 09/27/2023
TEST #: D232667





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

TEST DATE: 09/27/2023
TEST #: D232667



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D232668

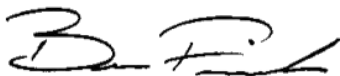
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	43	Pass
Pelvis Y Acceleration	G's	28 to 39	35	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	5,016	Pass
Overall Test Results				Pass



Laboratory Technician

09/27/2023

Test Date

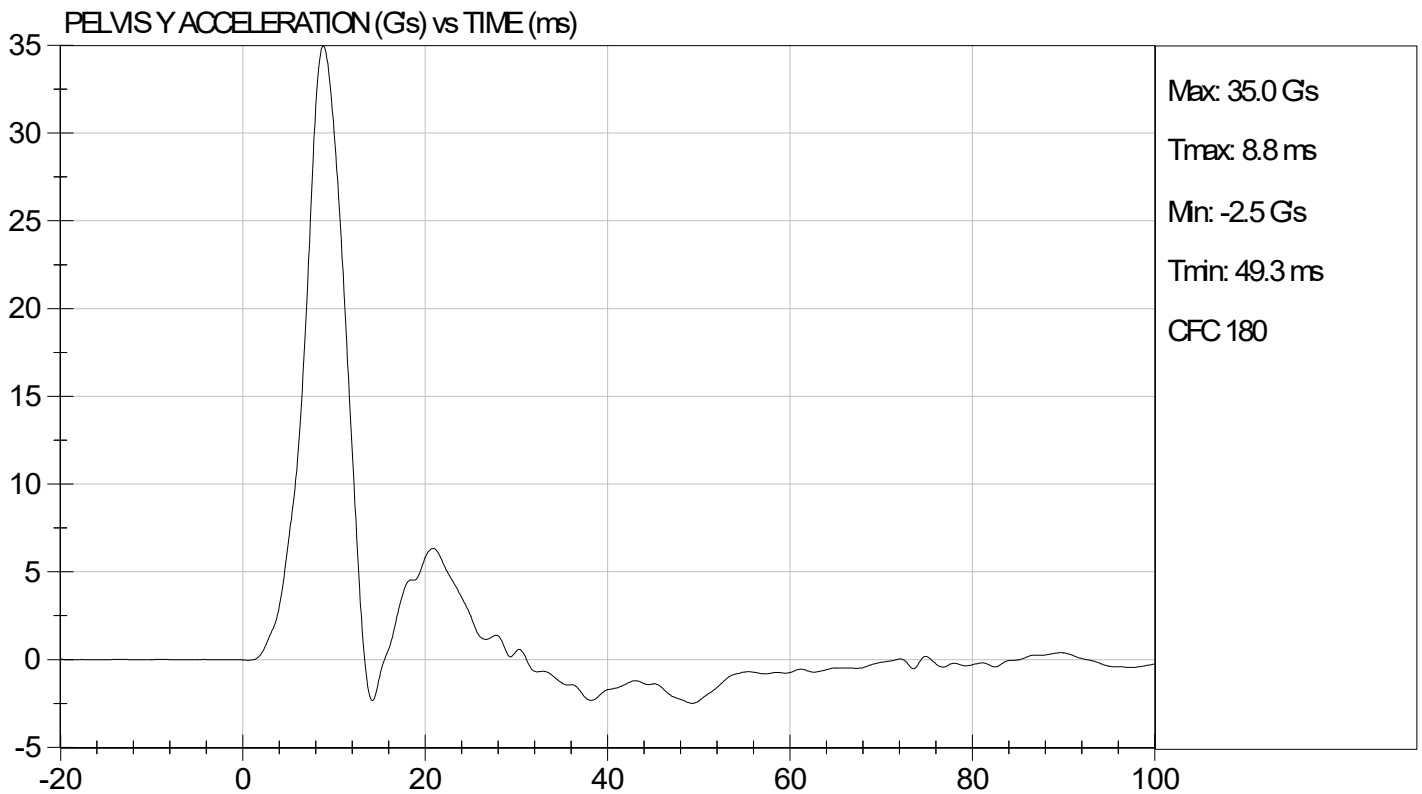
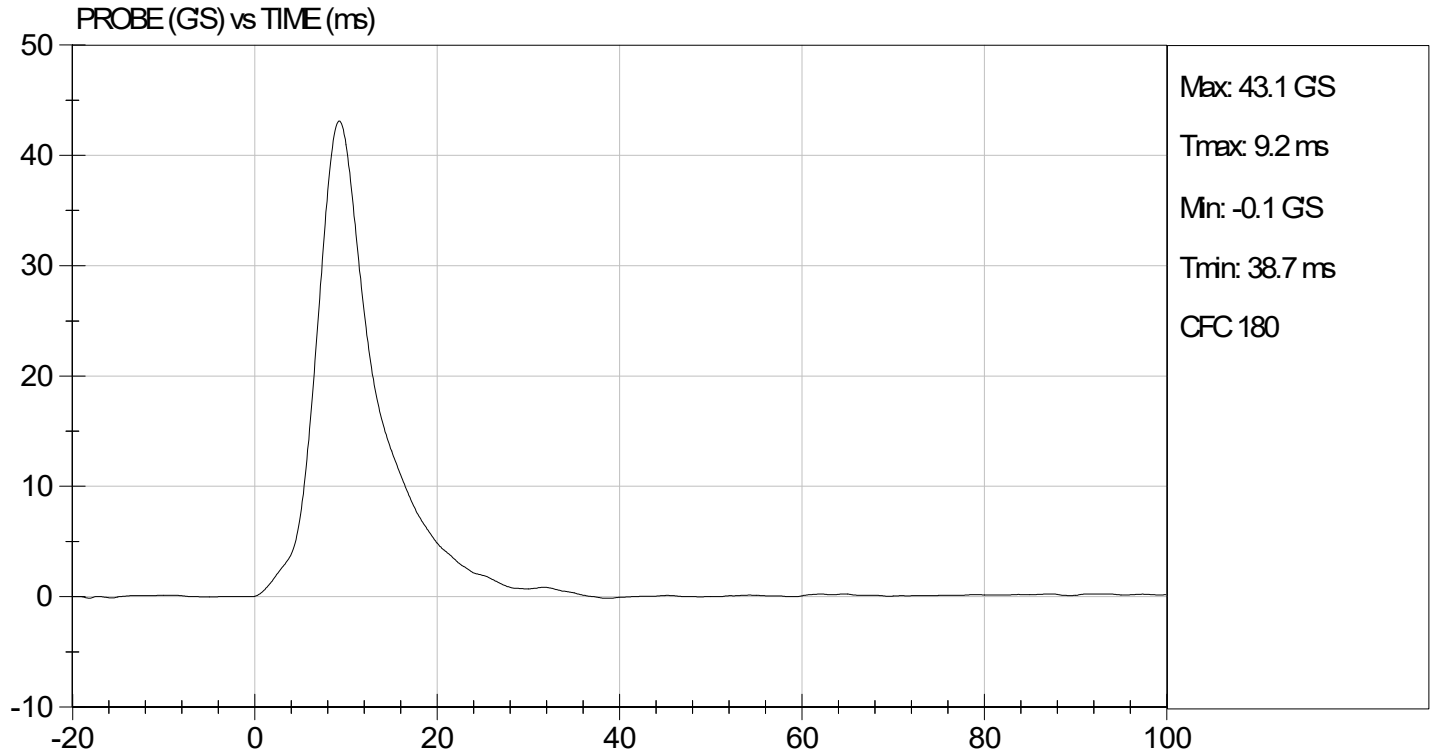


Approved By



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

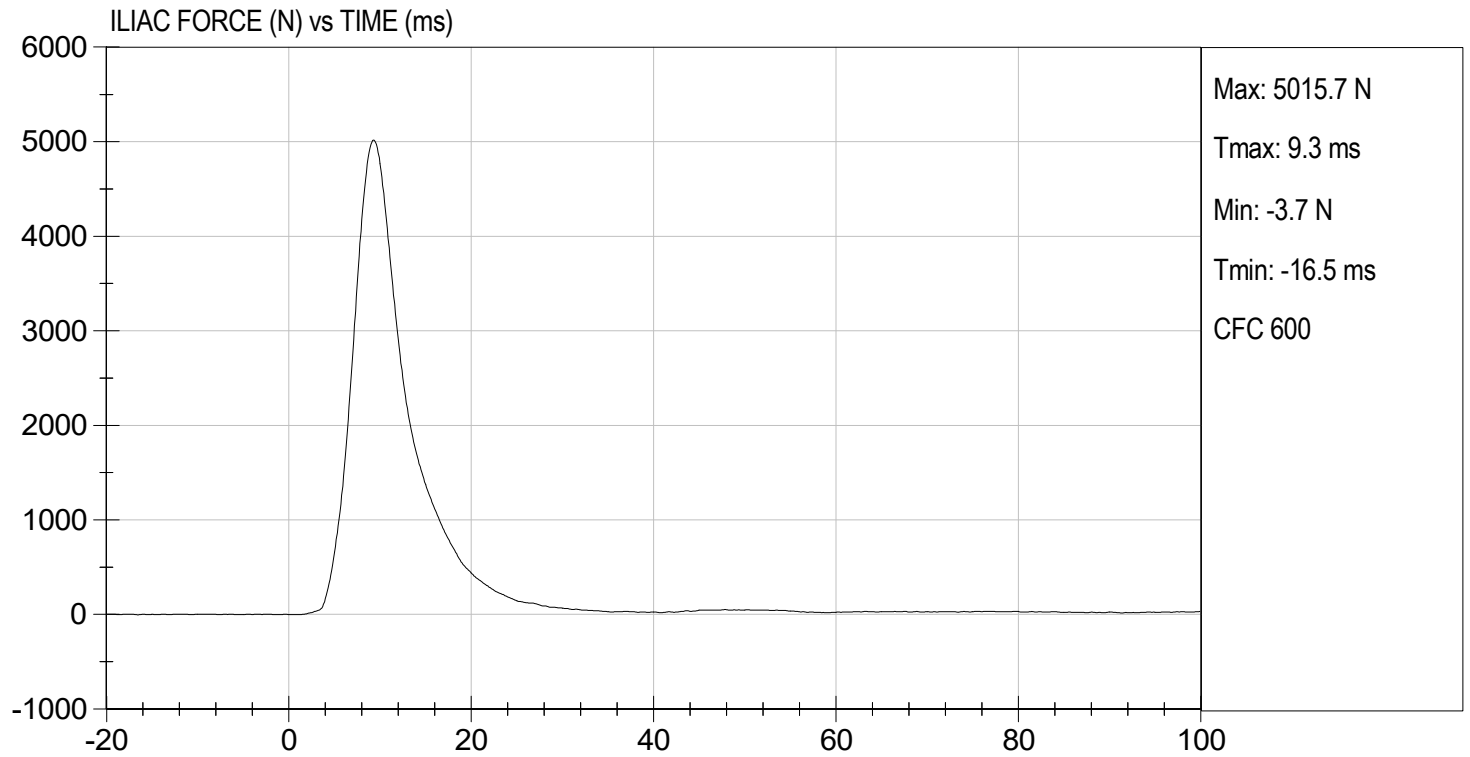
TEST DATE: 09/27/2023
TEST #: D232668





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

TEST DATE: 09/27/2023
TEST #: D232668





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

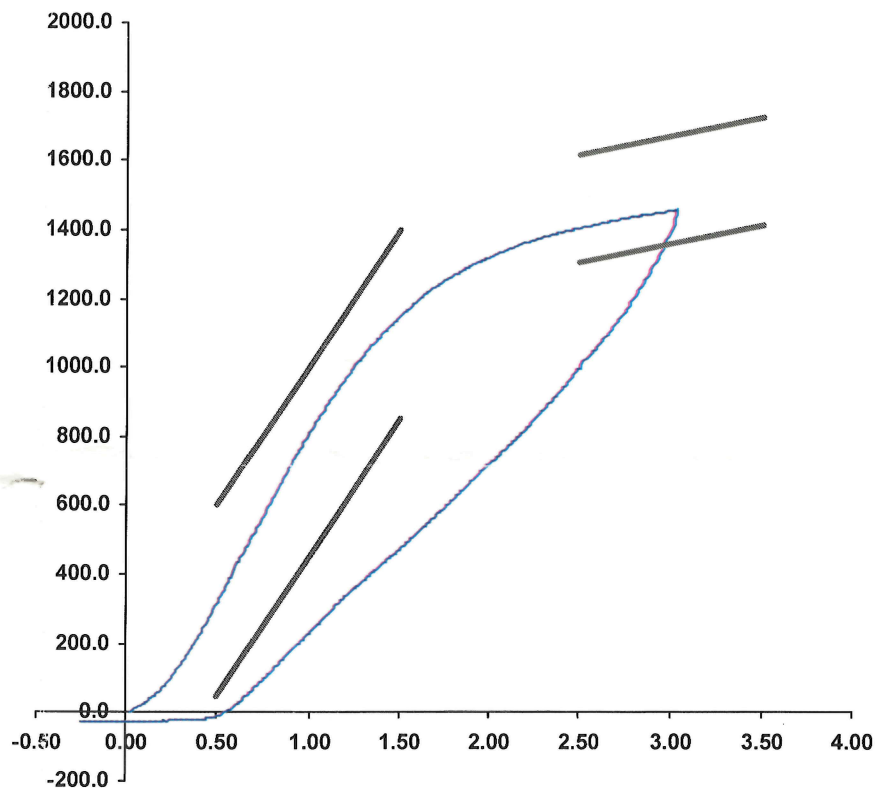
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	321	50	600
Force @ 1.5 mm (N)	1,152	850	1,400
Force @ 2.5 mm (N)	1,408	1,306	1,618
Force @ 3.0 mm (N)	1,459	1,361	1,673

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



SID-IIs Pelvis Plug Certification Test

Plug S/N 13880

Test Number 13354

Report Number 13399

Test Date 5/20/2020 7:55:22 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	231.28	50.00	600.00
Force @ 1.5 mm (N)	1,121.47	850.00	1,400.00
Force @ 2.5 mm (N)	1,407.19	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,449.08	1,361.00	1,673.00

Testing Machine STM-20 5965542

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

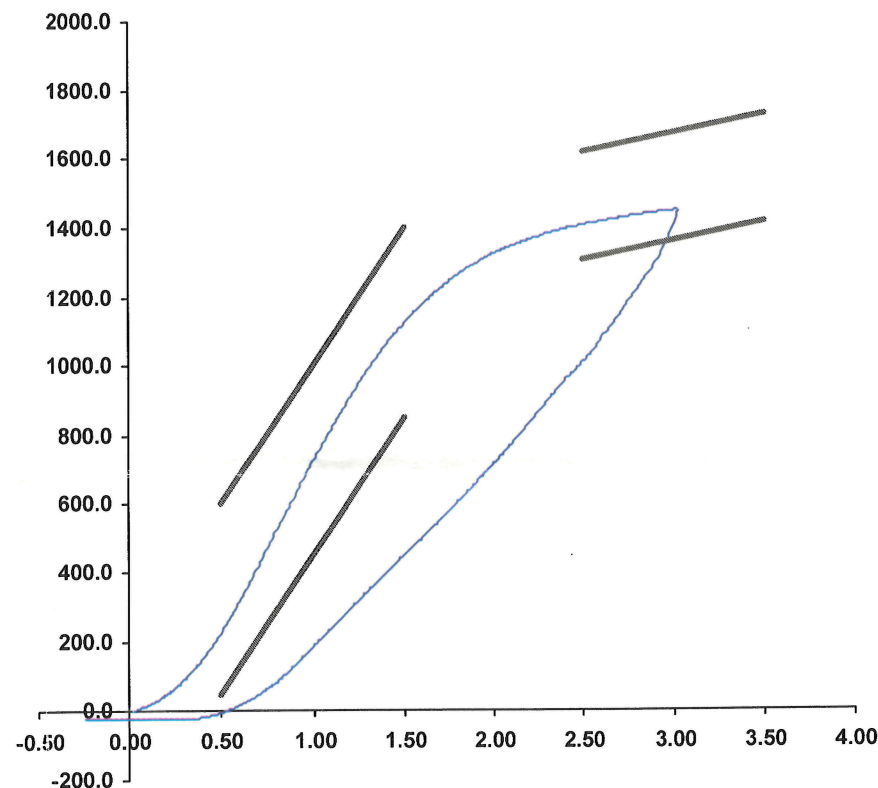
Preload Value (-N) 22.24

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 20-May-20

SACO Research

By : DC Date : 5/20/2020

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	06/09/2023
		Y	P79569	Endevco	06/09/2023
		Z	P79570	Endevco	06/09/2023
		Xr	P86797	Endevco	06/09/2023
		Yr	P94957	Endevco	06/09/2023
		Zr	P97381	Endevco	06/09/2023
Thorax Rib Displacement Potentiometers	Upper	Y	G236	Honeywell	06/13/2023
	Middle	Y	G368	Honeywell	06/16/2023
	Lower	Y	G164	Honeywell	06/13/2023
Abdomen Load Cells	Forward	Y	ABG1532	Denton	04/20/2023
	Middle	Y	ABG1534	Denton	04/20/2023
	Rear	Y	ABG1535	Denton	04/20/2023
Lower Spine Accelerometers (T12)		X	P79574	Endevco	06/09/2023
		Y	T14094	Endevco	06/09/2023
		Z	P82603	Endevco	06/09/2023
Public Symphysis Load Cell		Y	PG461	Denton	04/20/2023

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 306			
				Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers				X	P79003	Endevco	06/22/2023
				Y	P79445	Endevco	06/22/2023
				Z	P79724	Endevco	06/22/2023
				Xr	P84999	Endevco	06/22/2023
				Yr	P85000	Endevco	06/22/2023
				Zr	P85001	Endevco	06/22/2023
Head Angular Rate Sensors				X	ARS7566	DTS	04/07/2023
				Y	ARS7586	DTS	04/07/2023
				Z	ARS7602	DTS	04/07/2023
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	06/22/2023	
		Middle	Y	G2403	Servo	06/22/2023	
		Lower	Y	G1270	FTSS	06/22/2023	
	Abdominal Rib	Upper	Y	G032	FTSS	06/22/2023	
		Lower	Y	MJ5171	Medius	06/22/2023	
Lower Spine Accelerometers (T12)				X	P96332	Endevco	06/22/2023
				Y	P96335	Endevco	06/22/2023
				Z	P96341	Endevco	06/22/2023
Acetabulum Load Cell				Y	ACG259	Denton	08/17/2023
Iliac Wing Load Cell				Y	IWG286	Denton	08/17/2023
Pelvis Plug (struck side)					14881	SACO	01/31/2021
Pelvis Plug (non-struck side)					13880	SACO	05/20/2020

Table 3 – Vehicle Instrumentation

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	T34101	Endevco	04/13/2023
	Vehicle Center of Gravity	Y	PCB399	PCB	07/13/2023
	Vehicle Center of Gravity	Z	A391112	MSI	04/27/2023
2	Right Sill at Front Seat	X	T32351	Endevco	04/14/2023
	Right Sill at Front Seat	Y	T32169	Endevco	06/07/2023
	Right Sill at Front Seat	Z	T33417	Endevco	04/05/2023
3	Right Sill at Rear Seat	X	A416949	MSI	03/30/2023
	Right Sill at Rear Seat	Y	A416936	MSI	03/30/2023
	Right Sill at Rear Seat	Z	A383794	MSI	03/29/2023
4	Left Sill at Front Door	Y	A337234	MSI	04/27/2023
5	Left Sill at Rear Door	Y	A340206	MSI	04/27/2023
6	Left A-Post Lower	Y	A360944	MSI	07/28/2023
7	Left A-Post Middle	Y	A360987	MSI	07/28/2023
8	Left B-Post Lower	Y	T33456	Endevco	07/28/2023
9	Left B-Post Middle	Y	A416947	MSI	07/28/2023
10	Front Seat Track	Y	T32745	Endevco	08/29/2023
11	Rear Seat Track or Structure	Y	A383426	MSI	04/27/2023
12	Right Rear Occ. Compartment	Y	T33134	Endevco	04/18/2023
13	Engine Block	X	T35319	Endevco	04/10/2023
	Engine Block	Y	T35288	Endevco	04/12/2023
14	Rear Floorpan Above Axle	X	A383144	MSI	07/28/2023
	Rear Floorpan Above Axle	Y	A390969	MSI	07/28/2023
	Rear Floorpan Above Axle	Z	A390907	MSI	05/10/2023

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