

REPORT NUMBER: SideNCAPPole-MGA-24-029

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

**GENERAL MOTORS LLC
2024 Acura ZDX A-Spec 5-Door SUV
NHTSA No.: O20245301**

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



Test Date: August 30, 2024

Final Report Date: January 2, 2025

FINAL REPORT

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

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Approval Date: January 2, 2025

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. SideNCAPPole-MGA-24-029	2. Government Accession No.	3. Recipient's Catalog No.																											
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing and FMVSS No. 305 Indicant Testing of a 2024 Acura ZDX A-Spec 5-Door SUV, NHTSA No.: O20245301		5. Report Date January 2, 2025																											
		6. Performing Organization Code MGA																											
7. Author(s) Ben Fischer, Program Manager		8. Performing Organization Report No. SideNCAPPole-MGA-24-029																											
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																											
		11. Contract or Grant No. 693JJ920D000017																											
12. Sponsoring Agency Name and Address United States Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NRM-100 1200 New Jersey Ave, SE Washington, DC 20590		13. Type of Report and Period Covered: Final Test Report August 30, 2024 to January 2, 2025																											
		14. Sponsoring Agency Code NRM-100																											
15. Supplementary Notes																													
16. Abstract <p>A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2024 Acura ZDX A-Spec 5-Door SUV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the MGA Research Corporation facility in Burlington, Wisconsin on August 30, 2024.</p> <p>The impact velocity was 32.24 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 22.1°C. The test vehicle post-test maximum crush was 178 mm at level 1. The test vehicle's performance was as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Measurement Description</th> <th rowspan="2" style="text-align: center;">Units</th> <th colspan="2" style="text-align: center;">Driver ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td style="text-align: center;">1000</td> <td style="text-align: center;">402.044</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">g</td> <td style="text-align: center;">82</td> <td style="text-align: center;">41.393</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">2887.050</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38*</td> <td style="text-align: center;">27.152</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45*</td> <td style="text-align: center;">23.848</td> </tr> </tbody> </table> <p style="text-align: center;">*Proposed IARV</p> <p>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.</p>				Measurement Description	Units	Driver ATD (SID-IIs)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	402.044	Resultant Lower Spine Acceleration	g	82	41.393	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2887.050	Maximum Thoracic Rib Deflection	mm	38*	27.152	Maximum Abdomen Rib Deflection	mm	45*	23.848
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																											
19. Security Classification of Report Unclassified	20. Security Classification of Page Unclassified	21. No. of Pages 169	22. Price																										

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**SECTION 1
PURPOSE AND SUMMARY OF TEST**

PURPOSE

This side pole impact test is part of the MY 2024 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 2024 Acura ZDX A-Spec 5-Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated March 2020.

SUMMARY

A rigid pole side impact test was conducted on a 2024 Acura ZDX A-Spec 5-Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.24 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on August 30, 2024. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure dated March 2020. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

- Primary and Redundant Head CG Triaxial Accelerometers
- Head Triaxial Angular Rate Sensors
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper Rib and Lower Rib Displacement Potentiometers
- Lower Spine (T12) Triaxial Accelerometers
- Iliac Load Cell
- Acetabulum Load Cell

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D contains the test equipment and instrumentation calibration data.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Units	Driver ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	402.044
Resultant Lower Spine Acceleration	g	82	41.393
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2887.050
Maximum Thoracic Rib Deflection	mm	38*	27.152
Maximum Abdomen Rib Deflection	mm	45*	23.848

*Proposed IARV

Supplemental restraint information is given below:

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

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: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20245301	Traction Control System (TCS)	Yes
Model Year	2024	Auto-Leveling System	No
Make	Acura	Automatic Door Locks (ADL)	Yes
Model	ZDX A-Spec	Power Window Auto-Reverse	Yes
Body Style	5-Door SUV	Other Optional Feature	No
VIN	4W5KHM6RZ501497	Driver Front Airbag	Yes
Body Color	Scarlet Red Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	14 km / 9 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	0	Driver Torso Airbag	No
Type/No. Cylinders	Electric	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	1	Rear Pass. Curtain Airbag	Yes
Overdrive	No	Rear Pass. Head/Torso Airbag	No
Final Drive	RWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	Yes	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	Driver	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	Yes
		Other Safety Restraint	N/A

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

DATA FROM CERTIFICATION LABEL

Manufactured By	GENERAL MOTORS LLC	GVWR (kg)	3100
Date of Manufacture	04/24	GAWR Front (kg)	1550
Vehicle Type	MPV	GAWR Rear (kg)	1700

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				544	(A)
DSC x 68 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				136	(A-B)

* Rated Cargo and Luggage Weight (RCLW) limited to maximum of 300 lbs (136 kg).

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: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	290	290
Recommended Tire Size	265/50R20	265/50R20
Tire Size on Vehicle	265/50R20	265/50R20
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy A/S	Primacy A/S
Treadwear	540	540
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	107H	107H
Tire Material	Rubber	Rubber
DOT Safety Code Left	03L UR 01AX 0424	03L UR 01AX 0524
DOT Safety Code Right	03L UR 01AX 0624	03L UR 01AX 0624

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	275	275	275	275
Tire Placard	kPa	290	290	290	290
Owner's Manual	kPa	290	290	290	290
As Tested	kPa	290	290	290	290

TEST AXLE VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	622.5	642.0		645.5	718.5		633.5	738.0	
Right	kg	588.0	660.5		600.5	729.5		582.5	747.0	
Ratio	%	48.2%	51.8%		46.3%	53.7%		45.0%	55.0%	
Totals	kg	1210.5	1302.5	2513.0	1246.0	1448.0	2694.0	1216.0	1485.0	2701.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2513.0	(A)
Actual Weight of 1 P572 ATD (SID-IIs) Used	kg	52	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136	(C)
Calculated Test Vehicle Target Weight (TVTWTW)	kg	2701.0	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement
Driver Door Sill Angle (front-to-back)*	deg	-0.1	0.5	0.6	Yes
Front Pass. Door Sill Angle (front-to-back)*	deg	0.0	0.3	0.4	Yes
Front Bumper Angle (left-to-right)**	deg	0.1	0.1	0.1	Yes
Rear Bumper Angle (left-to-right)**	deg	0.1	0.1	0.1	Yes
Vehicle CG (Aft of Front Axle)	mm	1605	1664	1702	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	5	11	13	

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

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements.

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTWTW

Component Description	Units	Weight
Weight of Ballast Added	kg	70
Components Removed: none	kg	

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
Test Date: 8/30/2024

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm Target	989
Aft 25 mm Target	983

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	19.9	11.7	15.8
Front Passenger Seat	19.6	11.1	15.4
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 SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rear-Most	Mid	Forward-Most
Driver Seat	15.8	33	Max	66	66	66
			Mid	33	33	33
			Min	0	0	0
Front Passenger Seat	15.4	33	Max	66	66	66
			Mid	33	33	33
			Min	0	0	0
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

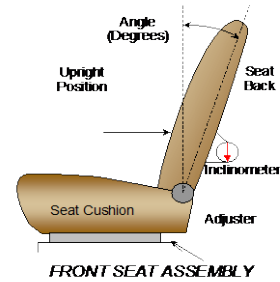
NHTSA No.: O20245301
 Test Date: 8/30/2024

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		0	
Front Passenger Seat	260		0	
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	Fixed		Fixed	

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on S1 – Vehicle Setup Information for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents (1 st as 1)	Degrees	Detent (1 st as 0)
Driver Seat	55.4		-19.2	
Front Passenger Seat	56.5		-19.2	
Front Center Seat				
Struck Side Rear Seat	4.2	2	21.3	0
Non-Struck Side Rear Seat	4.2	2	21.3	0
Rear Center Seat	4.2	2	21.3	0

All seat back angles measured on outboard headrest post.

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	0	0 (Uppermost as 0)

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the lowest and most full forward in-use position.

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

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

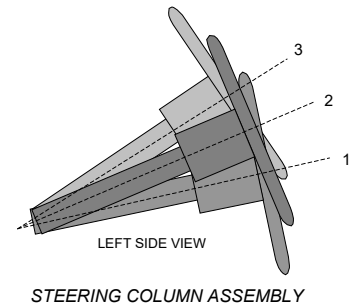
Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

STEERING COLUMN ADJUSTMENT

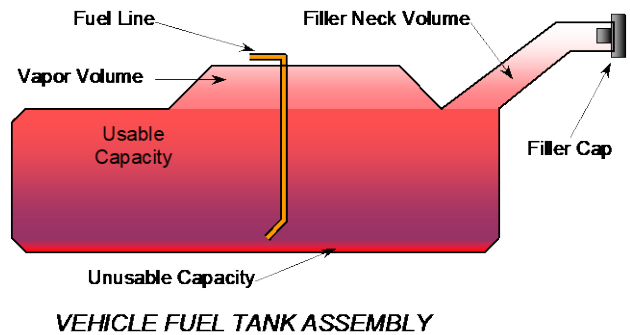
Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	72.0	
Geometric Center, Position 2	70.0	
Uppermost, Position 3	68.0	
Telescoping Steering Wheel Travel		51
Test Position	70.0	26



FUEL PUMP

Electric vehicle.



FUEL TANK CAPACITY DATA

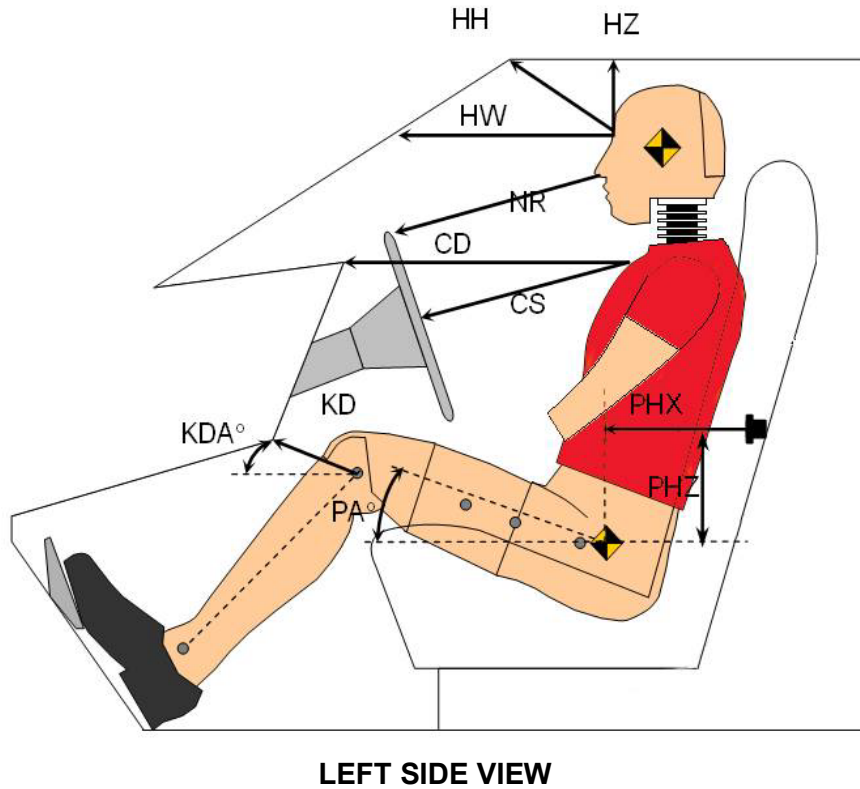
	Liters
Usable Capacity of Standard Tank (see S1 – Vehicle Setup Information)	
Usable Capacity of Optional Tank (see S1 – Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner’s Manual	
Usable Capacity of Optional Tank as Specified in Owner’s Manual	
93% of Usable Capacity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

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: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

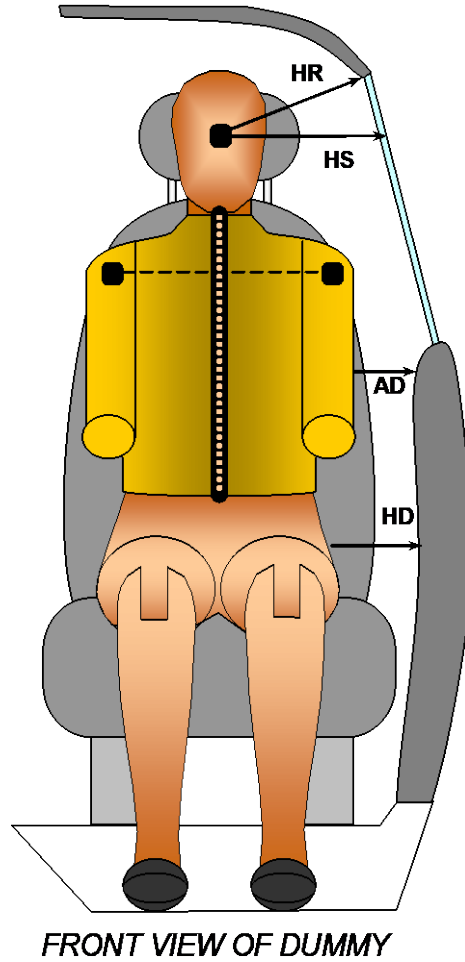


Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	243	
HW	Head to Windshield	593	
HZ	Head to Roof Liner	163	
NR	Nose to Rim/Seat Back	232	
CD	Chest to Dashboard/Seat Back	390	
CS	Chest to Steering Wheel	171	
KDL / KDAL	Left Knee to Dash/Seat Back	158	45.4
KDR / KDAL	Right Knee to Dash/Seat Back	157	47.1
PAX	Pelvic Tilt Angle X		20.5
PAY	Pelvic Tilt Angle Y		-0.4
PHX	Hip Point to Striker (X-Axis)	363	
PHZ	Hip Point to Striker (Z-Axis)	109	

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

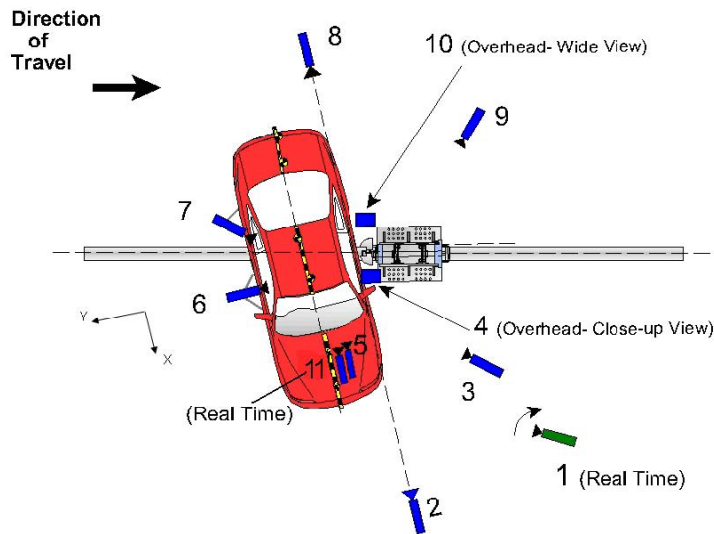


Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	287
HS	Head to Side Window	384
AD	Arm to Door	188
HD	Hip Point to Door	188

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024



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

No.	Camera View	Coordinates* (mm)			Lens (mm)	Frame Rate (fps)
		X	Y	Z		
1	Real-Time Pan View					30
2	Front Ground Level	5745	-15	-1680	24	1000
3	Impact Side 45° Forward	4480	-1925	-1695	12	1000
4	Overhead Closeup	0	0	-6700	85	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	-6705	-20	-1705	24	1000
9	Impact Side 45° Rearward	-2870	-3635	-1720	12	1000
10	Overhead Wide View	65	505	-6700	12	1000
11	Real-Time Dummy Front View					30

*All measurements accurate to ±6 mm

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

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

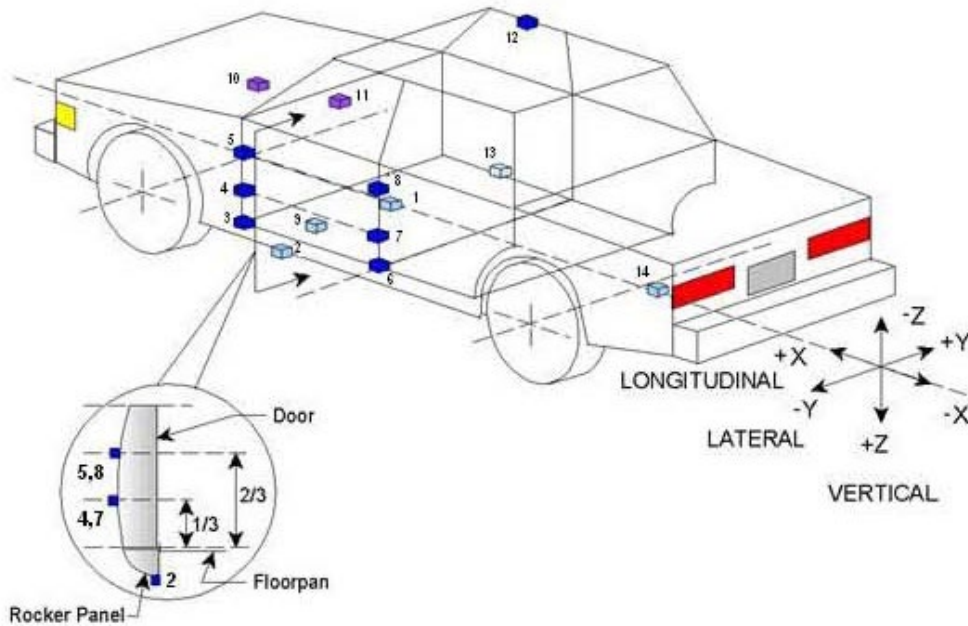
INSTRUMENTATION

	Number of Channels
Driver Dummy	19
Vehicle Structure	16
Pole Load Cells	8
Total	43

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
Test Date: 8/30/2024



TEST VEHICLE ACCELEROMETER LOCATIONS

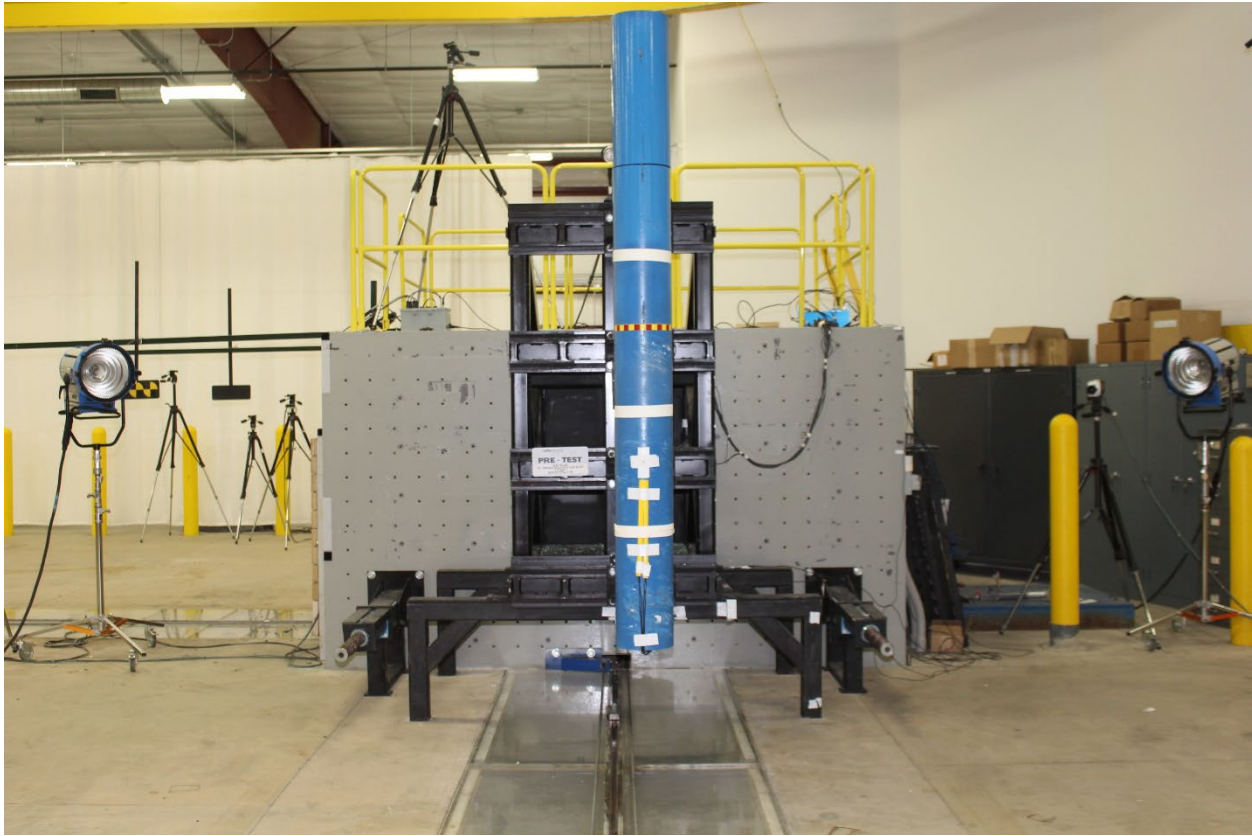
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2414	-6	-178
2	Left Floor Sill	3436	-791	-232
3	A Pillar Sill	3542	-794	-229
4	A Pillar Low	3406	-903	-487
5	A Pillar Mid	3427	-885	-841
6	B Pillar Sill	2249	-790	-241
7	B Pillar Low			
8	B Pillar Mid			
9	Driver Seat Track	2438	-354	-405
10	Engine Top	4310	-29	-621
11	Firewall	3916	20	-964
12	Right Roof	2234	514	-1618
13	Right Sill	3441	789	-229
14	Rear Floorpan	1106	2	-653

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

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
Test Date: 8/30/2024



254 mm Diameter Rigid Pole

Load Cell Locations	
ID	Height from Test Surface (mm)
1	182
2	470
3	698
4	986
5	1212
6	1641
7	1854
8	2053

**DATA SHEET NO. 8
POST-TEST OBSERVATIONS**

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	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	47.1°	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	No Separation
Windshield Damage	None
Side Window Damage	LF window cracked
Other Notable Effects	None

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

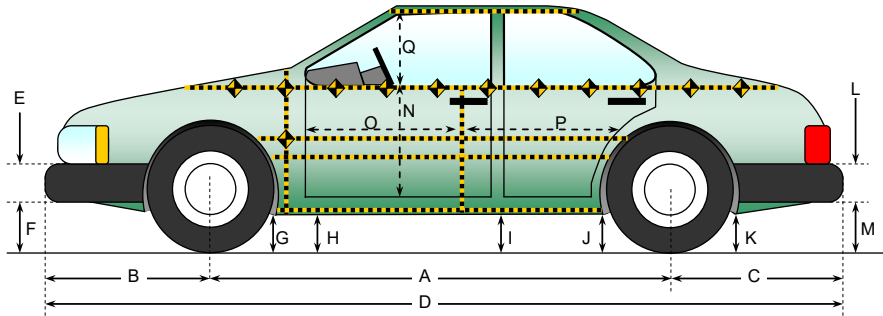
SPEED, ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1311
Actual Impact Point (Aft of Front Axle)	mm		1318
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	-7
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	74.6
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.24
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.25

**DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
Test Date: 8/30/2024



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

LEFT SIDE VIEW

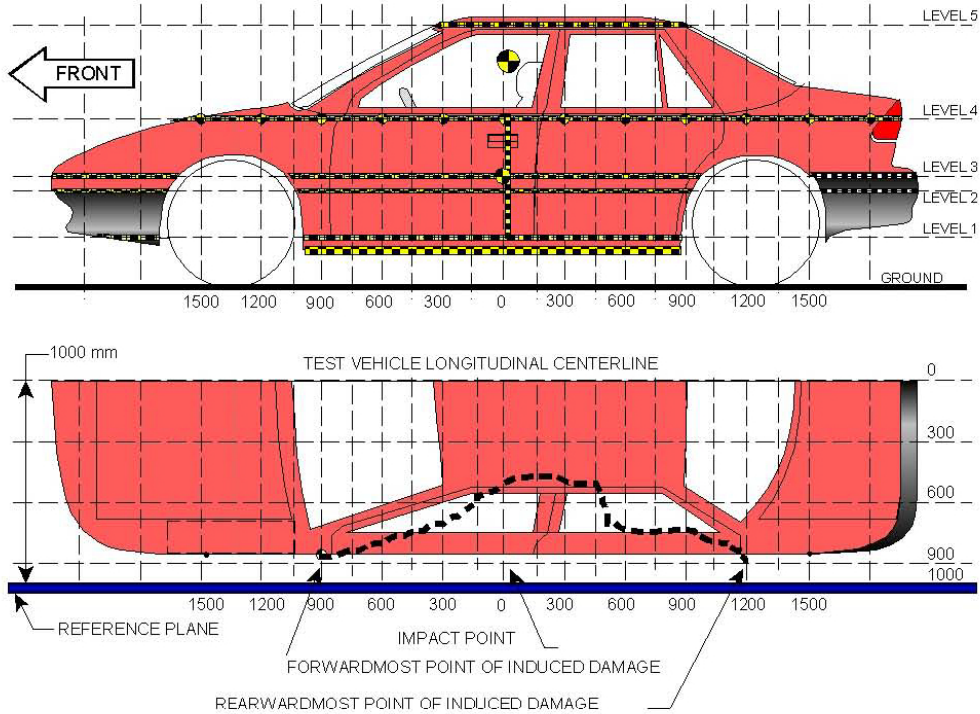
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	3096	3098	2
B	Front Axle to FSOV	903	901	-2
C	Rear Axle to RSOV	1009	1009	0
D	Total Vehicle Length at Centerline	5007	5008	1
E	Front Bumper Thickness	117	117	0
F	Front Bumper Bottom to Ground	453	456	3
G	Sill Height at Front Wheel Well	219	214	-5
H	Sill Height at Front Door Leading Edge	223	215	-8
I	Sill Height at B-Pillar	227	221	-6
J1	Sill Height at Rear Wheel Well	230	230	0
J2	Pinch Weld Height at Rear Wheel Well	230	228	-2
K	Sill Height Aft of Rear Wheel Well	292	284	-8
L	Rear Bumper Thickness	102	95	-7
M	Rear Bumper Bottom to Ground	493	486	-7
N	Sill Height to Bottom of Front Window Sill	688	709	21
O	Front Door Leading Edge to Impact CL	694	651	-43
P	Rear Door Trailing Edge to Impact CL	1335	1322	-13
Q	Front Window Opening	349	371	22
R	Right Side Length	4547	4547	0
S	Left Side Length	4546	4554	8
T	Vehicle Width at B-Pillars	1926	1944	18
U	Front Wheel Track Width	1710		
V	Rear Wheel Track Width	1670		

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024



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

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	499	178	0
2	Mid Door	662	166	0
3	Occupant H-Point	684	169	0
4	Window Sill	1102	152	75
5	Window Top	1560	5	1350

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

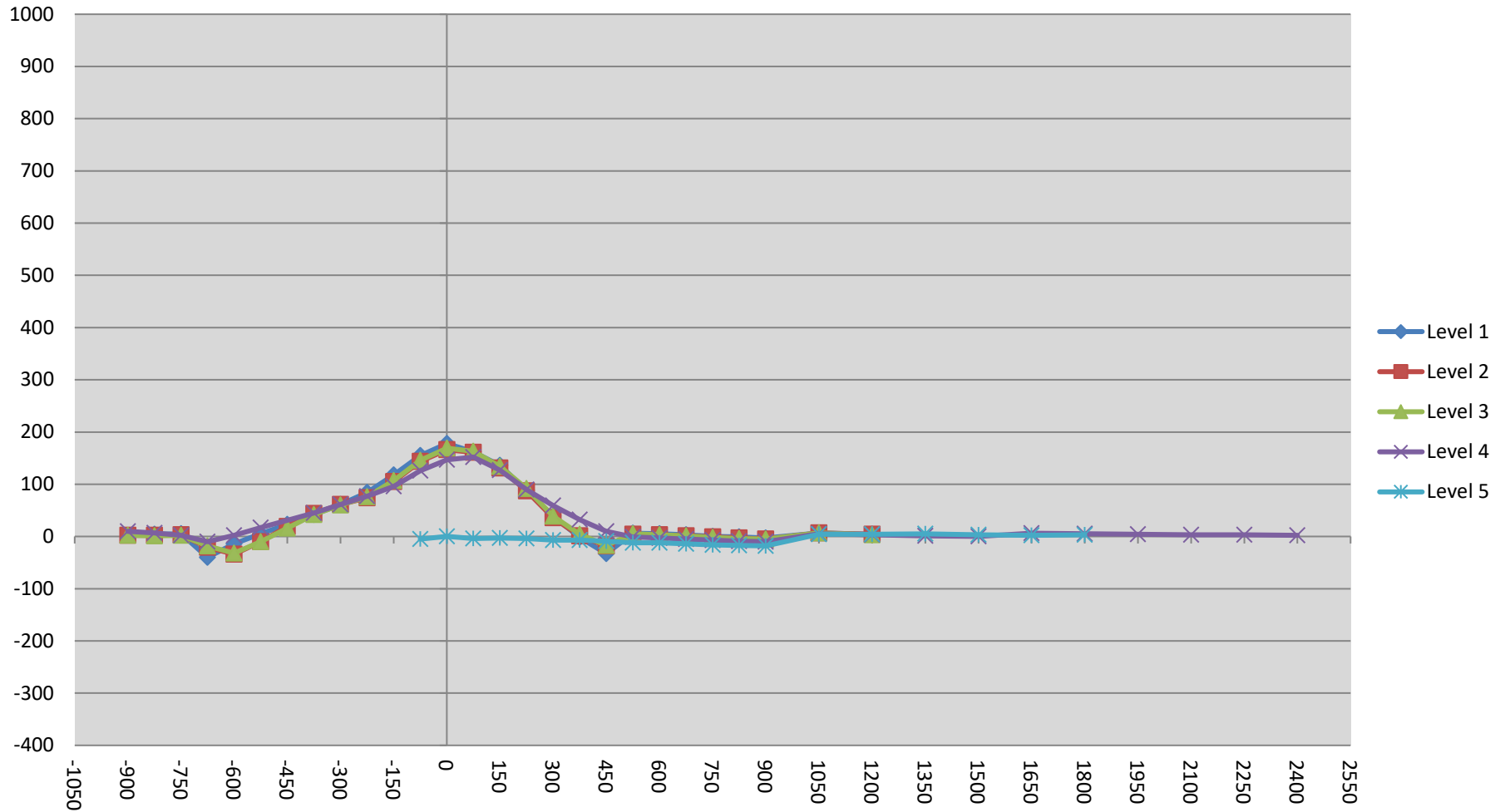
Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

	Pre-Test					Post-Test					Exterior Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2700															
-2550															
-2400															
-2250															
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900		978	980	851			976	978	841			2	2	10	
-825	971	980	980	858		967	978	979	851		4	2	1	7	
-750	971	979	979	864		966	976	977	862		5	3	2	2	
-675	971	976	977	871		1011	997	995	881		-40	-21	-18	-10	
-600	971	974	975	877		985	1008	1007	875		-14	-34	-32	2	
-525	971	971	972	882		966	981	982	865		5	-10	-10	17	
-450	972	968	969			949	949	953			23	19	16		
-375	973	965	966	890		931	921	924	845		42	44	42	45	
-300	974	962	962	894		913	901	902	833		61	61	60	61	
-225	975	959	960	897		891	885	884	820		84	74	76	77	
-150	976	957	958	902		858	852	851	806		118	105	107	96	
-75	977	956	957	904	615	822	812	811	778	620	155	144	146	126	-5
0	978	956	957	907	637	800	790	788	760	637	178	166	169	147	0
75	978	957	957	909	648	816	796	794	757	652	162	161	163	152	-4
150	979	957	958	912	656	843	826	824	785	659	136	131	134	127	-3
225	980	959	959	914	659	892	872	867	824	663	88	87	92	90	-4
300	980	960	960	916	660	941	924	921	857	667	39	36	39	59	-7
375	981	961	962	918	661	983	960	958	886	668	-2	1	4	32	-7
450	982	963	963	920	661	1015	981	980	910	670	-33	-18	-17	10	-9
525	982	964	965	921	660	976	960	960	922	672	6	4	5	-1	-12
600	982	966	967	922	659	977	963	964	925	671	5	3	3	-3	-12
675	982	968	969	924	657	979	967	968	929	671	3	1	1	-5	-14
750	981	970	970	925	656	981	971	972	932	672	0	-1	-2	-7	-16
825	981	972	972	926	654	982	975	976	935	671	-1	-3	-4	-9	-17
900	980	973	974	929	652	983	978	979	939	670	-3	-5	-5	-10	-18
1050	978	977	978	930	642	971	970	971	925	638	7	7	7	5	4
1200	974	980	980	930	632	970	976	977	927	628	4	4	3	3	4
1350				930	619				929	614				1	5
1500				928	601				928	598				0	3
1650				925	580				919	578				6	2
1800				921	553				916	550				5	3
1950				909					905					4	
2100				893					890					3	
2250				870					867					3	
2400				833					831					2	
2550															
2700															

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
Test Program: NCAP Side Pole Impact Test

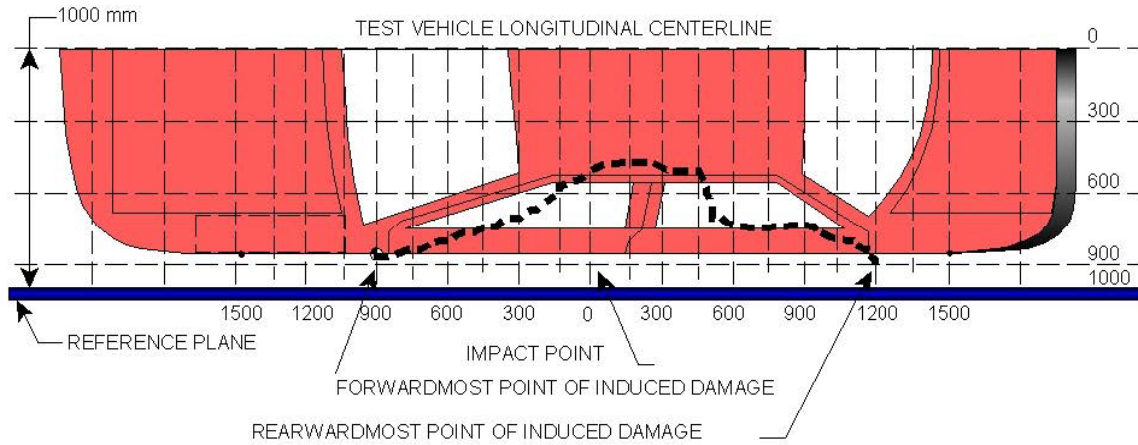
NHTSA No.: O20245301
Test Date: 8/30/2024



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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024



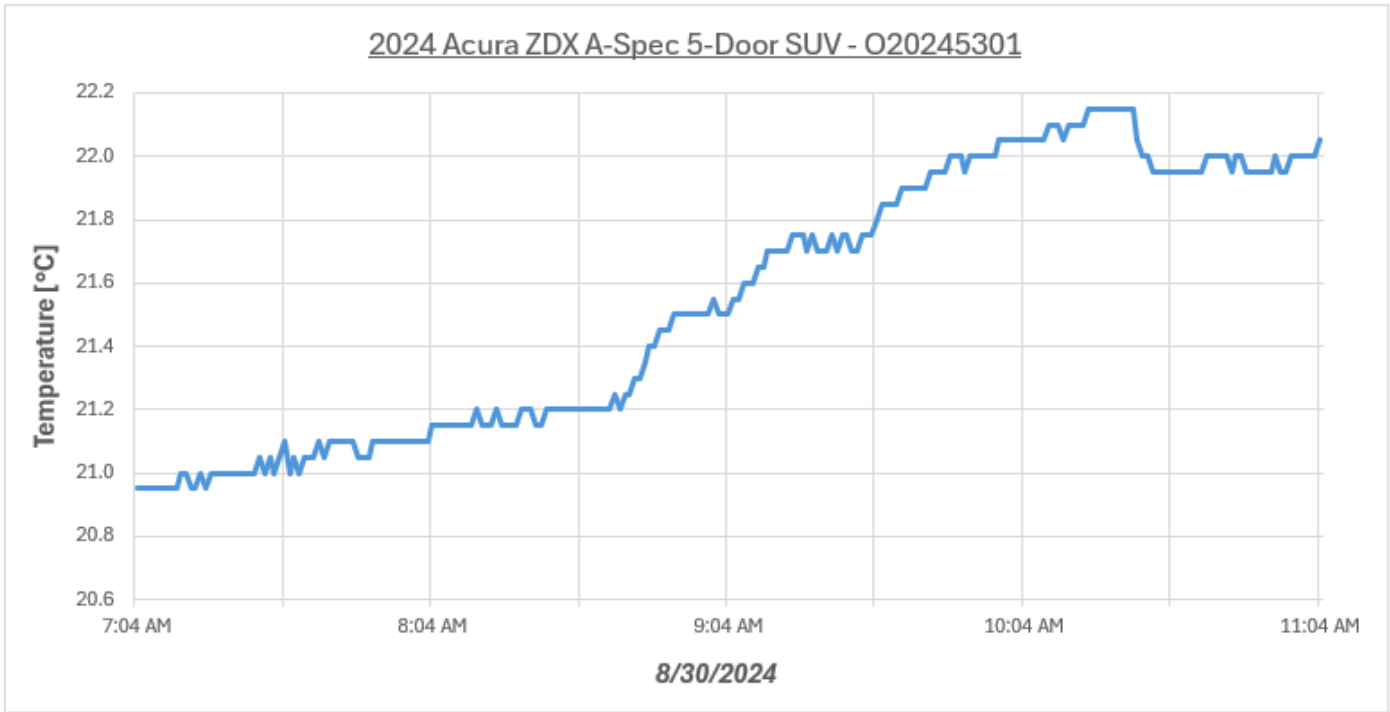
VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	1200	3	23	20	3
2	876	3	22	27	-5
3	441	3	19	37	-18
4	75	3	206	43	163
5	-458	3	43	31	12
6	-825	3	21	20	1

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024



Serial #	Description	Maximum	Average	Minimum	Units
W2922089	VSC South Hall - Temp (3018)	22.15	21.54	20.95	°C

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
Test Date: 8/30/2024

ELECTRIC VEHICLE PROPULSION SYSTEM

	Units	Observations and Conclusions
Type of Electric Vehicle		Electric
Propulsion Battery Type		High Voltage Li-Ion Battery
Nominal Voltage	V	350
Physical Location of Automatic Propulsion Battery Disconnect		The high voltage switches (i.e. contactors) are located in the RESS BDU
Auxiliary Battery Type		AGM – Absorbent Glass Material (12V Battery)

PROPULSION BATTERY SYSTEM DATA

	Units	Observations and Conclusions
Electrolyte Fluid Type		Liquid
Electrolyte Fluid Specific Gravity	g/L	1200
Electrolyte Fluid Kinematic Viscosity	cSt	3.333
Electrolyte Fluid Color		Colorless / very light yellow
Propulsion Battery Coolant Type, Color, Specific Gravity (if applicable)		50/50 Deionized water, Dexcool mix
Location of Battery Modules		Inside Passenger Compartment
		X Outside Passenger Compartment
		The high-voltage battery is located below the occupant compartment

PROPULSION BATTERY STATE OF CHARGE

<i>For all battery types:</i>	
Voltage range corresponding to useable energy of the battery:	
Minimum State of Charge	289
Maximum State of Charge	398
95% of Maximum State of Charge	378.1
Test Voltage - No less than 95% of maximum State of Charge	396.7
<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	
Maximum State of Charge	
Test Voltage – Maximum practicable State of Charge within Normal Operating Range	

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

VEHICLE CHASSIS GROUND POINT(S) LOCATION(S)

Details of Vehicle Chassis Ground Point(s) & Location(s)	Vehicle body at front of high voltage battery
--	---

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: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		66160495
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		2/14/2024

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	396.7
----	---	-------

ELECTRIC ISOLATION MEASUREMENTS
PROPULSION BATTERY TO VEHICLE CHASSIS

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

V1	V	257.7
V2	V	131.0

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	226,100
----	---	---------

V1' Pre-Impact	V	59.7
V2' Pre-Impact	V	29.1

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

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	1,131,075
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$		
Ri2 Pre-Impact	Ω	2,349,227
Ri = The lesser of Ri1 and Ri2		
Ri Pre-Impact	Ω	1,131,075
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$		
Ri / Vb Pre-Impact	Ω/V	2,851

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

	Yes	No (Fail)
Is the measured Electrical Isolation Value ≥ 500 Ω/V?	X	
Additional Comments	None	

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		66160495
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		2/14/2024

ELECTRICAL ISOLATION MEASUREMENTS

Vb Post-Impact	V	3.8
----------------	---	-----

V1 Post-Impact	V	4.2	Impact Time	2	Minutes	21	Seconds
V2 Post-Impact	V	0.4		2	Minutes	25	Seconds
V1' Post-Impact	V	0.7		2	Minutes	34	Seconds
V2' Post-Impact	V	0.1		2	Minutes	29	Seconds

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

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	1,238,167	Impact Time	2	Minutes	34	Seconds
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$							
Ri2 Post-Impact	Ω	7,800,450	Impact Time	2	Minutes	29	Seconds
Ri = The lesser of Ri1 and Ri2							
Ri Post-Impact	Ω	1,238,167	Impact Time	2	Minutes	34	Seconds
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$							
Ri / Vb Post-Impact	Ω/V	325,833	Impact Time	2	Minutes	34	Seconds

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

	Yes	No (Fail)
Is the measured Electrical Isolation Value ≥ 500 Ω/V?	X	
Additional Comments	None	

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

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

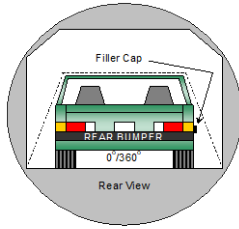
	Yes (Fail)	No
Is the Propulsion Battery Electrolyte Spillage visible in the passenger compartment?		X

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

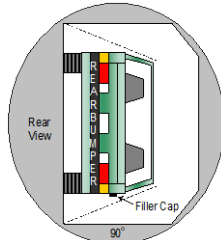
Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

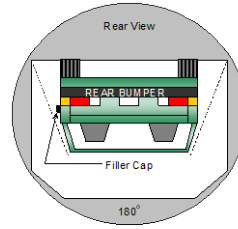
PROPULSION BATTERY SYSTEM COMPONENTS



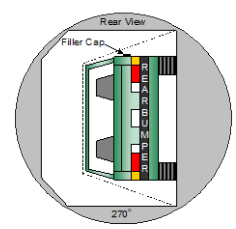
0°/360°



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	
	1	min	52	sec	5	min	6	min	52	sec	7	min
0° - 90°	1	min	52	sec	5	min	6	min	52	sec	7	min
90° - 180°	1	min	50	sec	5	min	6	min	50	sec	7	min
180° - 270°	1	min	47	sec	5	min	6	min	47	sec	7	min
270° - 360°	1	min	51	sec	5	min	6	min	51	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: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		66160495
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		2/14/2024

ELECTRICAL ISOLATION MEASUREMENTS

Vb Post-Impact	V	3.8
----------------	---	-----

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	4.1	V	0°				
	4.2		90°	2	min	34	sec
	4.2		180°	2		43	
	4.2		270°	2		34	
	4.1		360°	2		18	
V2	0.4	V	0°				
	0.4		90°	2	min	38	sec
	0.4		180°	2		46	
	0.4		270°	2		38	
	0.4		360°	2		22	
V1'	0.7	V	0°				
	0.7		90°	2	min	47	sec
	0.7		180°	2		57	
	0.7		270°	2		47	
	0.7		360°	2		31	
V2'	0.1	V	0°				
	0.1		90°	2	min	41	sec
	0.1		180°	2		50	
	0.1		270°	2		42	
	0.1		360°	2		26	

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

Test Vehicle: 2024 Acura ZDX A-Spec 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20245301
 Test Date: 8/30/2024

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		
$R_{i1} = R_o (1 + V_2/V_1) [(V_1 - V_1')/V_1']$						
Ri1	1,205,341	Ω	0°		min	
	1,238,167		90°	2		47
	1,238,167		180°	2		57
	1,238,167		270°	2		47
	1,205,341		360°	2		31
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$						
Ri2	7,630,875	Ω	0°		min	
	7,800,450		90°	2		41
	7,800,450		180°	2		50
	7,800,450		270°	2		42
	7,630,875		360°	2		26
$R_i = \text{The lesser of } R_{i1} \text{ and } R_{i2}$						
Ri	1,205,341	Ω	0°		min	
	1,238,167		90°	2		47
	1,238,167		180°	2		57
	1,238,167		270°	2		47
	1,205,341		360°	2		31
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$						
Ri / Vb	317,195	Ω/V	0°		min	
	325,833		90°	2		47
	325,833		180°	2		57
	325,833		270°	2		47
	317,195		360°	2		31

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

	Yes	No (Fail)
Is the measured Electrical Isolation Value ≥ 500 Ω/V?	X	
Additional Comments	None	

**APPENDIX A
PHOTOGRAPHS**

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



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



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



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



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



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



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



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



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



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



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



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



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



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

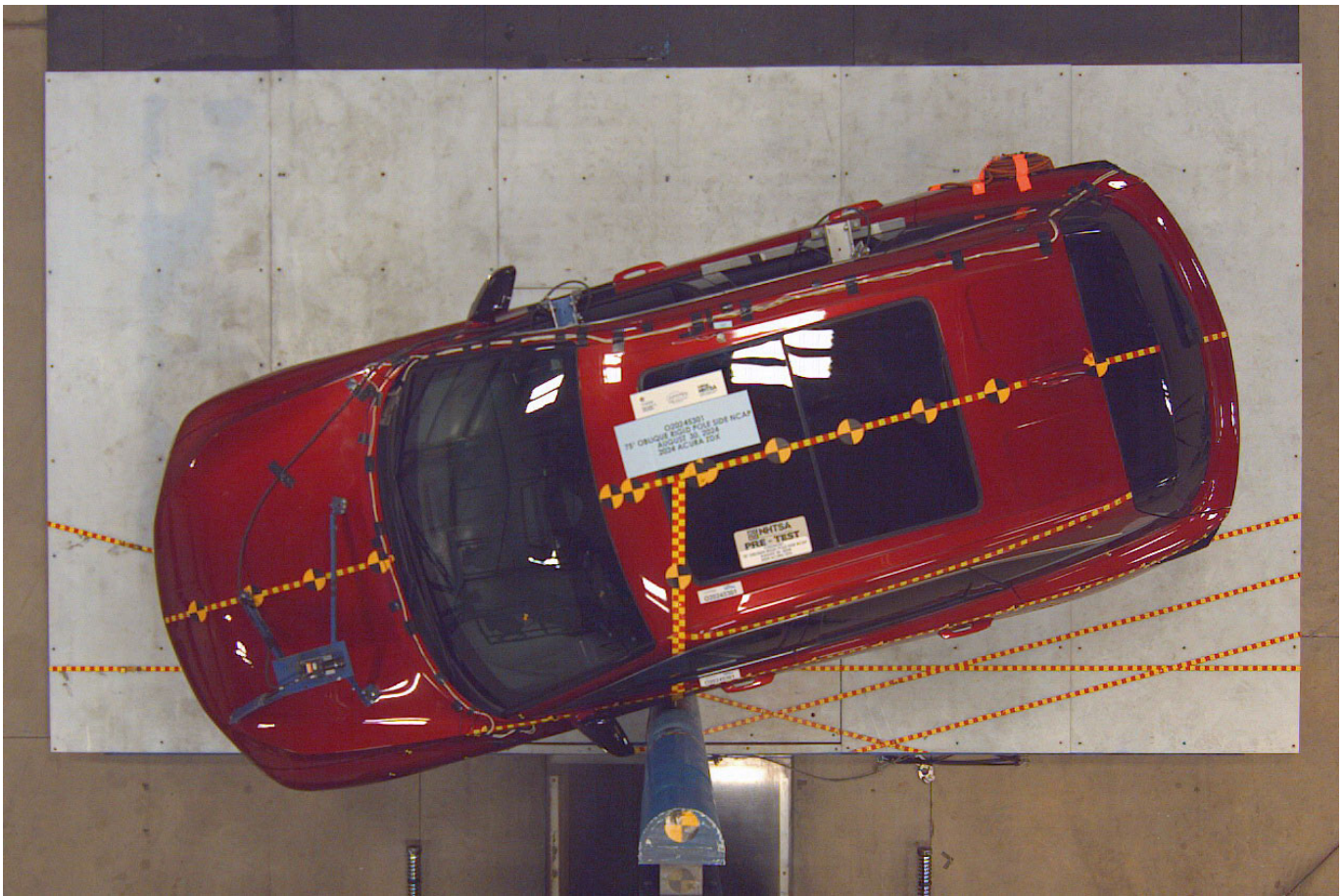


Photo No. 015 - Pre-Test Overhead View of Test Area

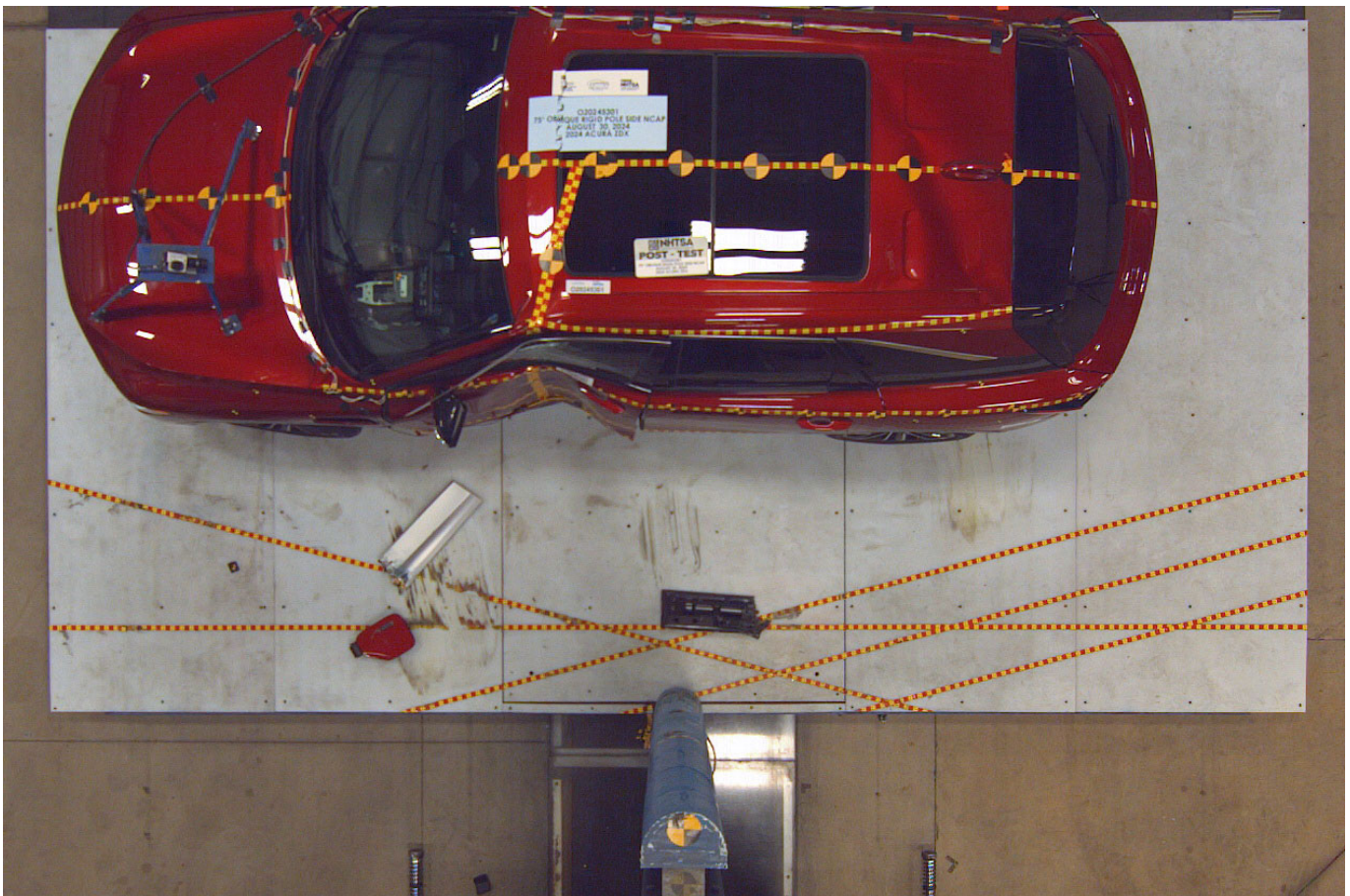


Photo No. 016 - Post-Test Overhead View of Test Area



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

PHOTOGRAPH NOT APPLICABLE

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



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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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



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



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



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



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



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



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

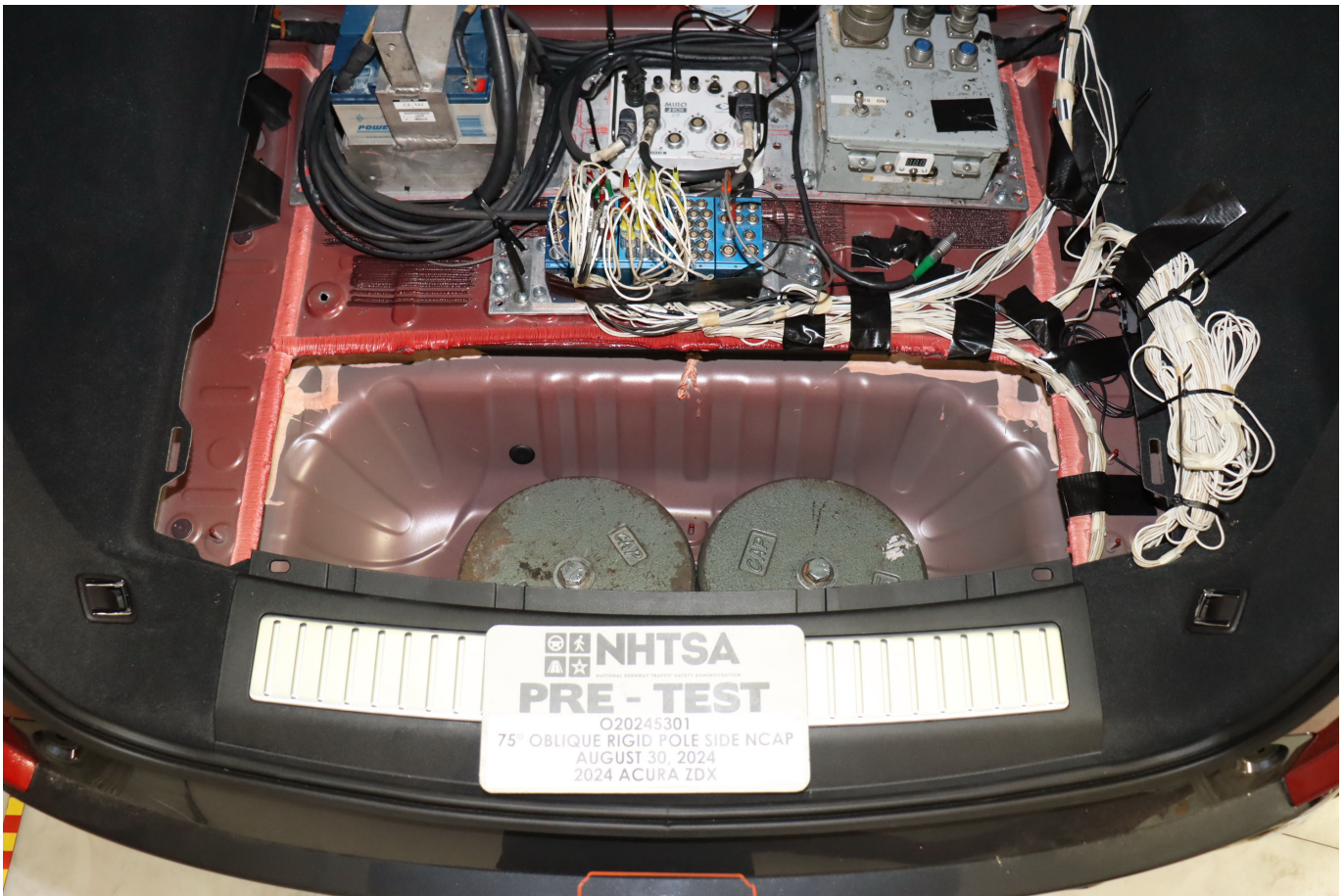


Photo No. 063 - Pre-Test Ballast View

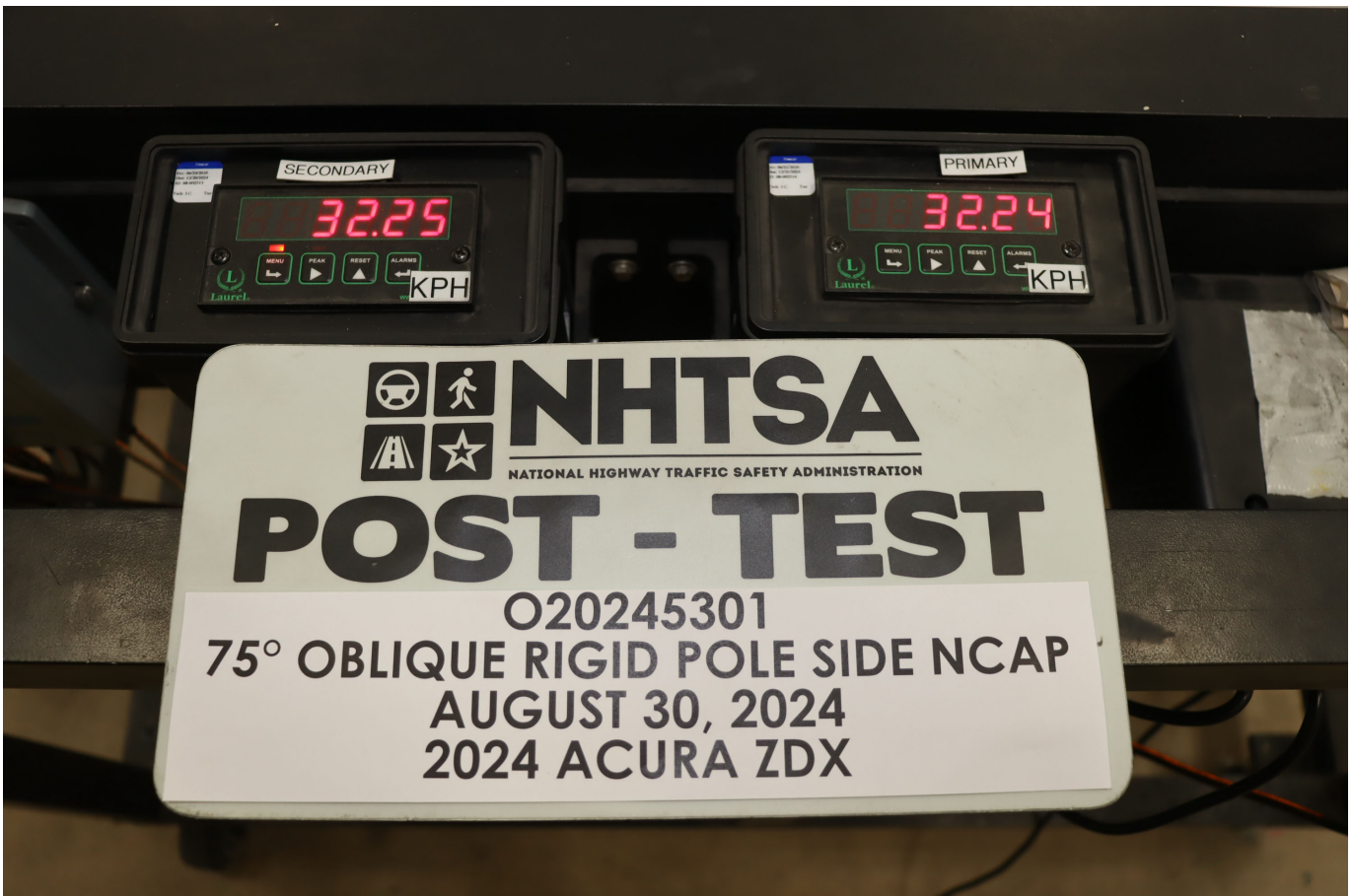


Photo No. 064 - Post-Test Primary and Redundant Speed Trap Read-Out

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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



Photo No. 070 - Impact Event



2024 ZDX A-SPEC

EXT: SCARLET RED M MOTOR NUMBER: X0D-000000
INT: EBONY

STANDARD EQUIPMENT AT NO EXTRA COST

TECHNICAL FEATURES*

- Single Electric Motor Rear Wheel Drive
- 102 kWh Battery Rated Energy
- 190 kW DC Fast Charging Capability (requires compatible charging station)
- 11.5 kW AC Onboard Charger
- Regenerative Braking & One Pedal Driving
- Drive Mode Selector (Normal, Sport, Snow, Individual)
- Multi-Link Suspension

SAFETY & ASSIST FEATURES*

- Driver's and Front Passenger's Airbags
- Side Curtain Airbags
- Driver's and Front Passenger's Side Airbags
- Driver's and Front Passenger's Knee Airbags
- Anti-Lock Braking System (ABS)
- Electronic Brake Distribution (EBD)
- Electronic Stability Control (ESC)
- Tire Pressure Monitoring System
- LED Day Time Running Lights
- LATCH System to Child Seats
- Automatic Emergency Braking
- Forward Collision Aler
- Front Pedestrian Brakin
- Adaptive Cruise Control (ACC)
- Lane Keep Assist
- Lane Change Alert
- Side Blind Zone Alert
- Blind Zone Steering Assist
- Rear Cross Traffic Alert
- Rear Cross Traffic Braking
- Reverse Automatic Braking

INTERIOR FEATURES*

- 11.3-inch Color Touchscreen Display
- 11-inch Digital Instrument Cluster
- Google built-in with 36 Months of Connectivity to support Services
- OnStar Services Equipped
- 36 Months Remote Services
- 36 Months Safety & Security
- 96 Months EV & Connected Access
- See onstar.com/zdx
- Universal Home Remote System
- Bang & Olufsen Premium Audio System with 18 Speakers
- SiriusXM Satellite Radio

- Wireless Apple CarPlay / Android Auto Compatibility
- Wireless Phone Charger
- USB-C Charging Ports
- Dual-Zone Automatic Climate Control with Air Filtration System
- Heated Sport Steering Wheel
- Perforated Milano Leather Seats
- Auto Dimming Rearview Mirror
- Driver's and Front Passenger's 12-Way Power Seats
- Heated and Ventilated Front Seats
- Auto Dimming Rearview Mirror
- Ambient Cabin Lighting Control

EXTERIOR FEATURES*

- Panoramic Moonroof with Tilt and Slide Feature
- Front and Rear Parking Sensors
- Rain Sensing Wipers
- Power Tailgate
- Jewel Eye LED Headlights
- Heated Power Folding Door Mirrors with Turn Indicators
- 20" Alloy Wheels
- 265 / 50 R20 Self Sealing All-Season Tires
- Remote Start Key Fob
- Key Card

Manufacturer's Suggested Retail Price **\$64,500.00**

MSPR Includes: 4YR/50K Mile Ltd Vehicle Warranty

-Choice of Complimentary Charging Pkg. See website and dealer for details.

-SiriusXM: 3 Months Trial Subscription Included (excl. AK & HI)

SCARLET RED M 600.00

Destination and Handling 1,350.00

TOTAL VEHICLE PRICE (includes Pre-Delivery Service) **\$66,450.00**

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

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

PORT OF ENTRY: SPRINGHILL
DELIVERY POINT: HOUSTON
SHIP ROWSPACE: 319-010
TRANS.METHOD: L32 NASHVILLE SOUTH
J10 ALLIANCE

ORIG. DLR: 251470
REF. NO.: 41989
HV CODE: AL-4479
EMISSION: 50 STATE
CONTROL NO: 564600
DEALER: 251470



EPA DOT Fuel Economy and Environment Electric Vehicle

Fuel Economy

90 MPGe Standard SUVs range from 11 to 100 MPGe. The best vehicle rates 140 MPGe.

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

96 city 83 highway 37 kW-hrs per 100 miles

When fully charged, vehicle can travel about... **313 miles**

Charge Time: 11 hours (240V)

Annual fuel cost \$850

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **10** Best

Smog Rating (tailpipe only) **10** Best

This vehicle emits 0 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Does not include emissions from generating electricity; learn more at fuelconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPGe and costs \$9,750 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$0.15 per kWh. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE U.S./Canadian Parts Content: **63%**

Major Sources of Foreign Parts Content: **CHINA 16%**
MEXICO 19%

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

FOR THIS VEHICLE
Final Assembly Point: **SPRING HILL, TENNESSEE USA**
Country of Origin: Motor: **MEXICO**
Transmission: **CHINA**

GOVERNMENT 5-STAR SAFETY RATING

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

Frontal Crash Not Rated
Driver Passenger **Not Rated**
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash Not Rated
Front seat Rear seat **Not Rated**
Based on the risk of injury in a side impact.

Rollover Not Rated
Based on the risk of rollover in a single vehicle crash.

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

Photo No. 071 - Monroney Label

Seats and Restraints 33

Head Restraints

Front Seats

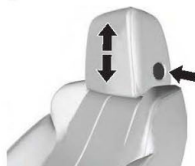


With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.

The vehicle's front seats have adjustable head restraints in the outboard seating positions.



Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chance of a neck injury in a crash. The height of the head restraint can be adjusted.



To raise or lower the head restraint, press the button located on the side of the head restraint, and pull up or push the head restraint down, and release the button. Pull and push on the head restraint after the button is released to make sure that it is locked in place. The front seat outboard head restraints are not removable.

Rear Seats

Adjusting the Rear Head Restraint

The vehicle's rear seats have adjustable head restraints in all the seating positions.

The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure that it is locked in place.

When you use the head restraint in the rear center seating position, pull up the head restraint to its highest position. Do not use it in any lower position.



34 Seats and Restraints

To lower the head restraint, press the button, located on the top of the seatback, and push the head restraint down. Try to move the head restraint after the button is released to make sure that it is locked in place.

Always adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head.

Rear head restraints are not removable. If you are installing a child restraint in the rear seat, see "Securing a Child Restraint Designed for the LATCH System" under Lower Anchors and Tethers for Children (LATCH System) > 66.

Front Seats

Power Seat Adjustment



Do not adjust driver seat while the vehicle is moving. Doing so could result in a crash causing death or serious injury. Only adjust driver seat when vehicle is not moving. You can lose control of the vehicle and be seriously hurt or killed if you try to adjust the driver's seat while the vehicle is moving. Adjust the driver seat only when the vehicle is not moving.



The power seats will work with the vehicle off. Children could operate the power seats and be injured or killed. Never leave children alone in the vehicle.



To adjust the seat:

- Move the seat forward or rearward by sliding the control forward or rearward.
- Raise or lower the front part of the seat cushion by moving the front of the control up or down.
- Raise or lower the entire seat by moving the rear of the control up or down.
- To adjust the seatback, see Reclining Seatbacks > 35.
- To adjust the lumbar support, see Lumbar Adjustment > 35.

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



Photo No. 073 - Post-Test View of Shattered Vehicle Inner Door Panel

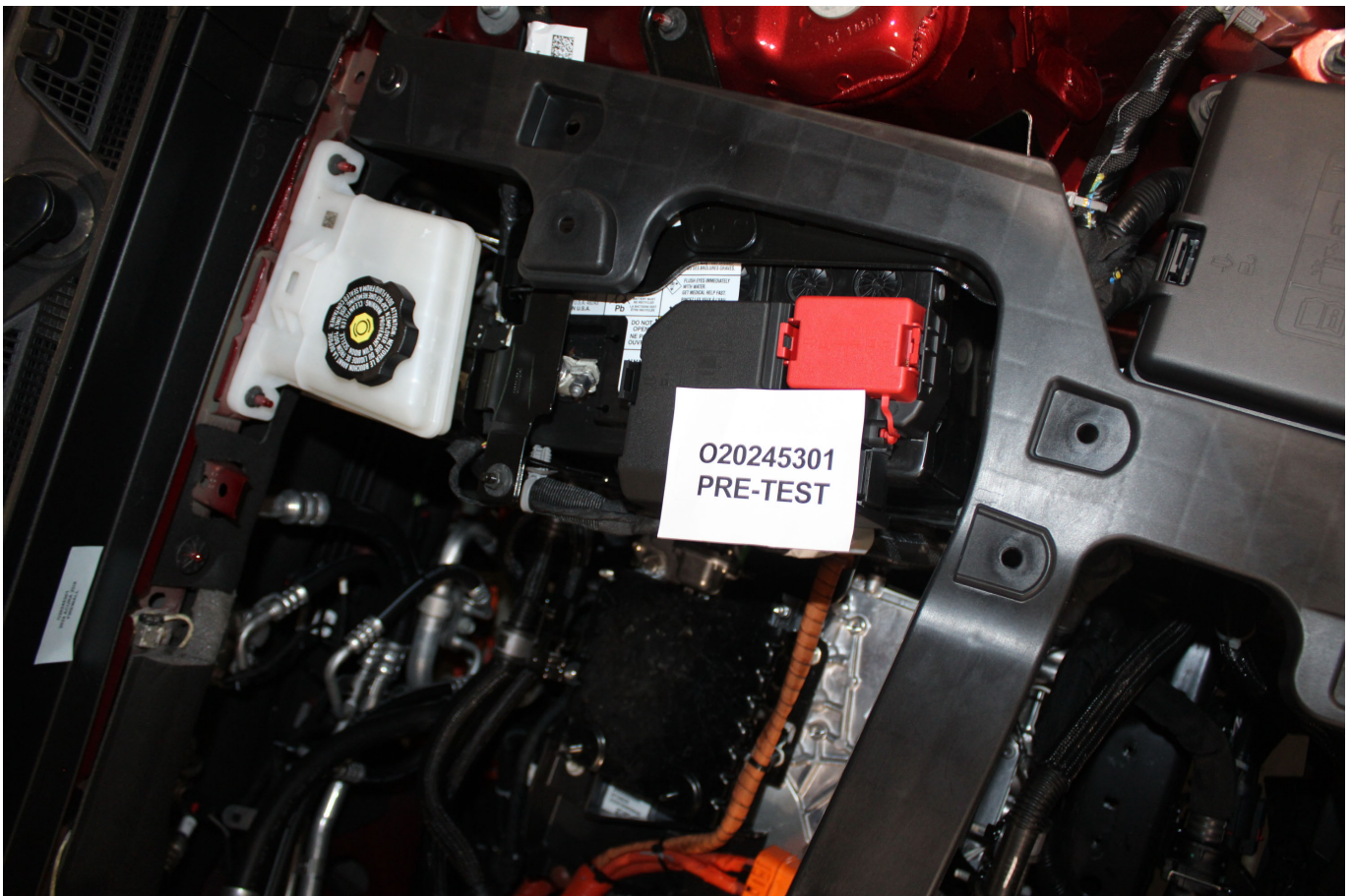


Photo No. 305-01 - Auxiliary Power Module Warning Label

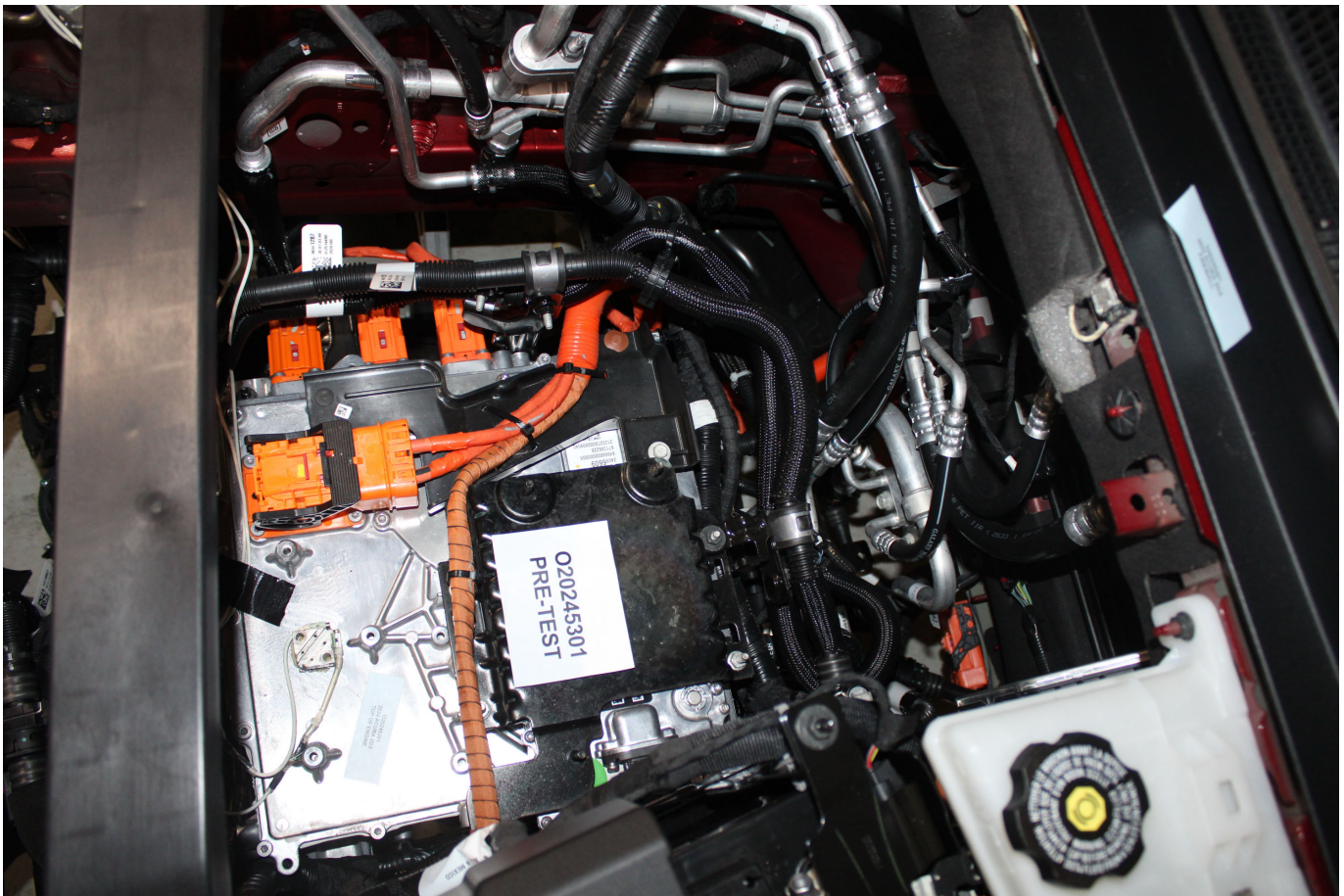


Photo No. 305-02 - Power Inverter Warning Label



Photo No. 305-03 - First Responder Warning Label



Photo No. 305-04 - First Responder Warning Location

PHOTOGRAPH NOT APPLICABLE

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

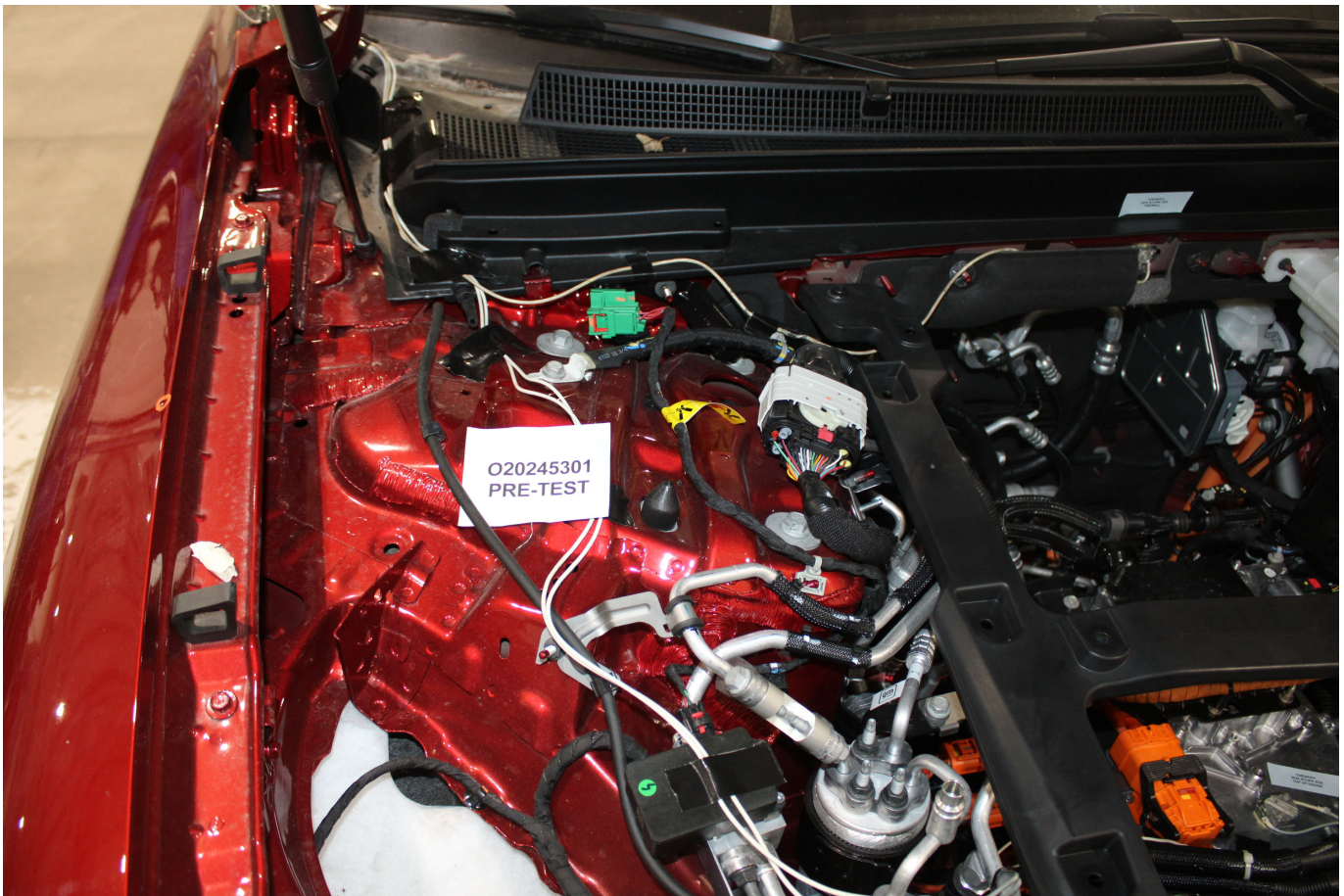


Photo No. 305-06 - Manual High Voltage Service Disconnect in Place



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



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



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

PHOTOGRAPH NOT AVAILABLE

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

PHOTOGRAPH NOT AVAILABLE

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

PHOTOGRAPH NOT AVAILABLE

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

PHOTOGRAPH NOT AVAILABLE

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

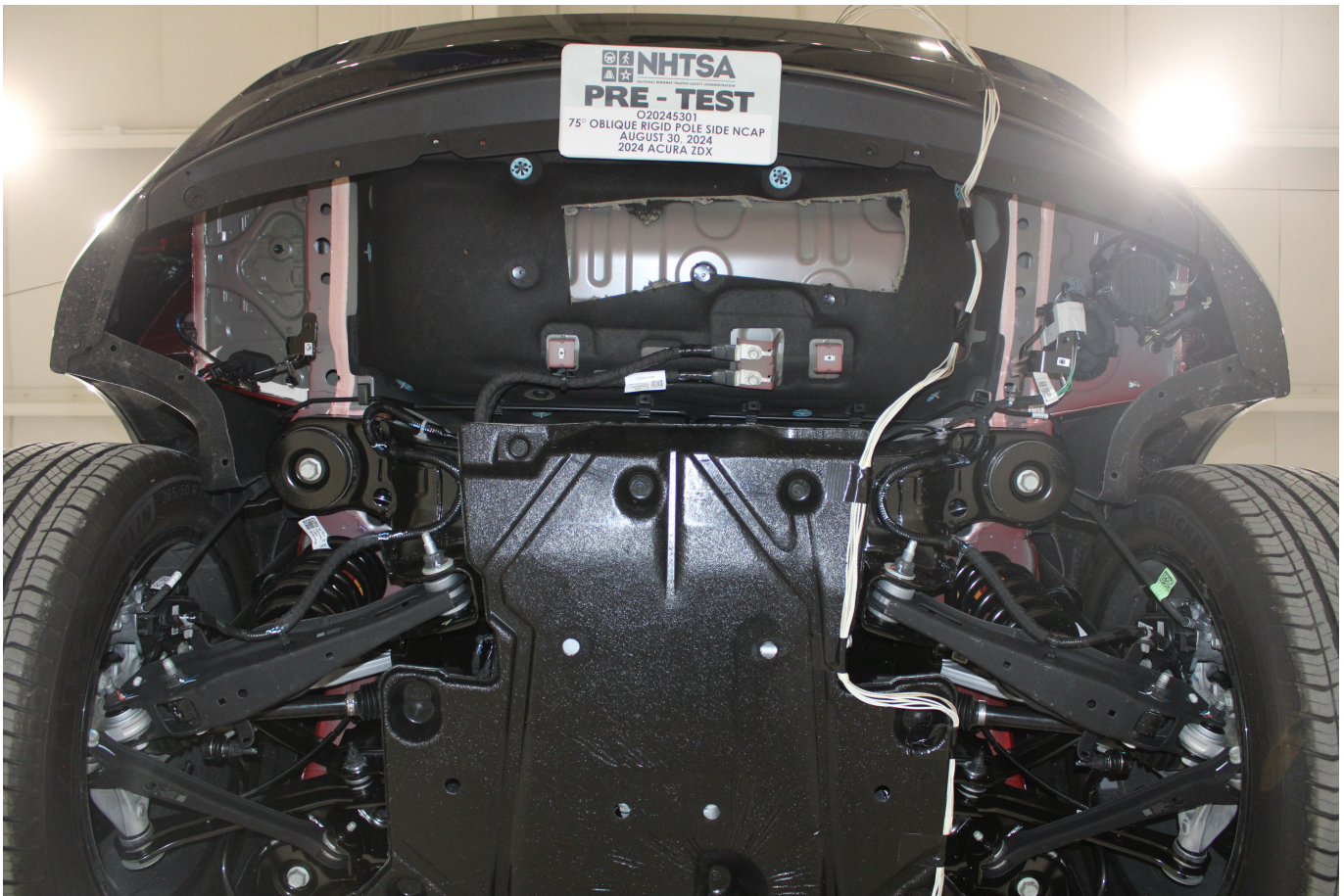


Photo No. 305-16 - Pre-Impact View of Electric Propulsion Drive

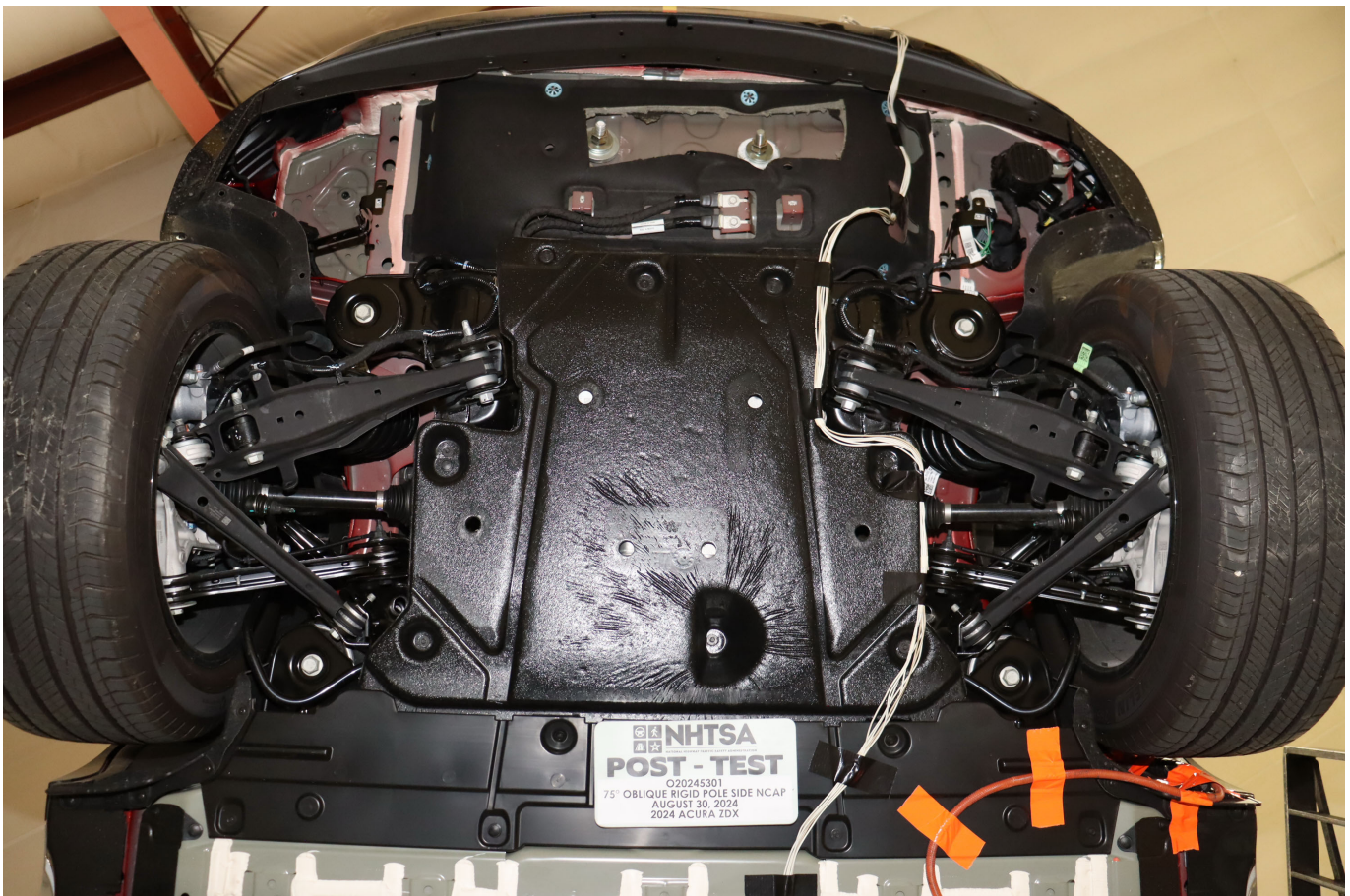


Photo No. 305-17 - Post-Impact View of Electric Propulsion Drive

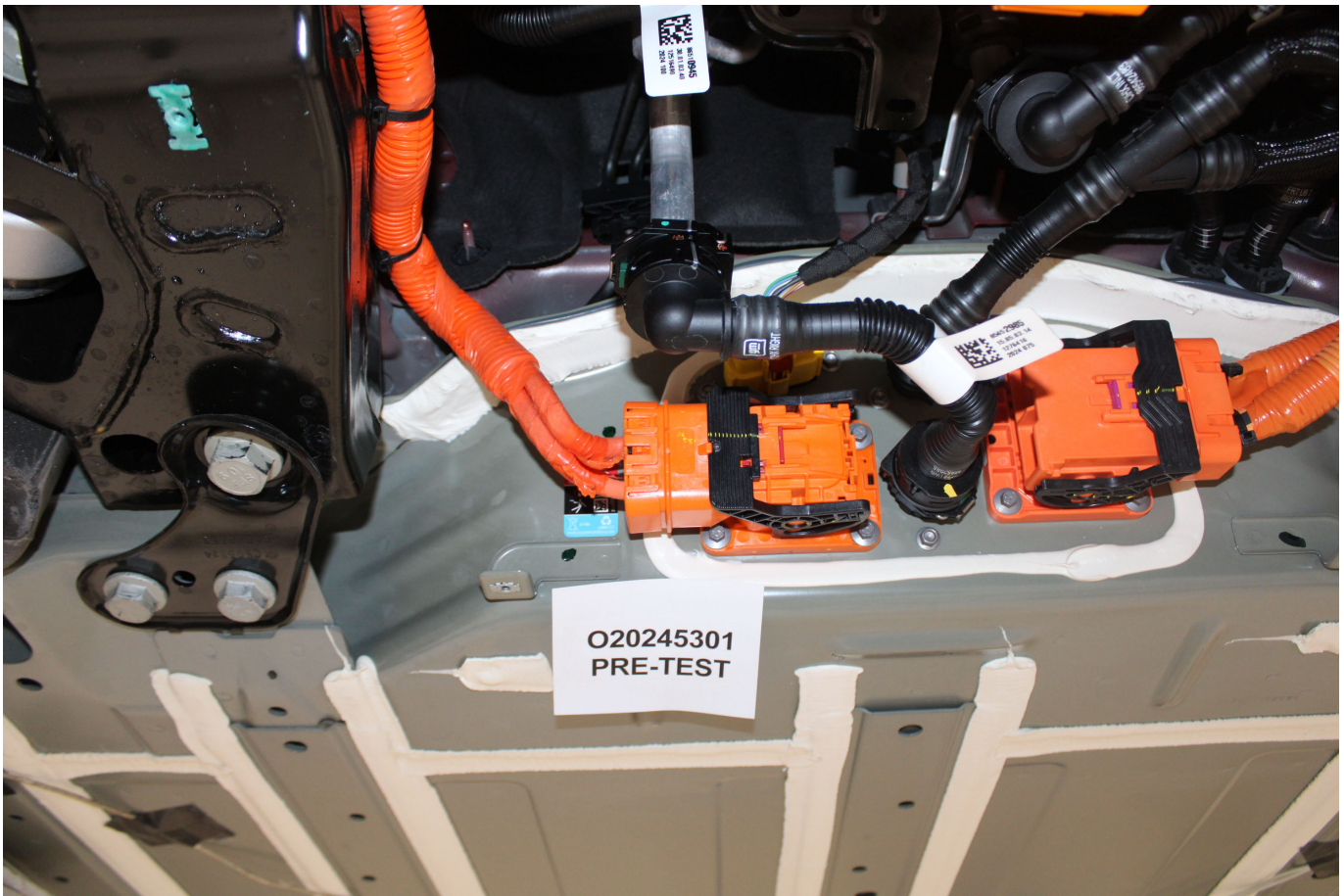


Photo No. 305-18 - Pre-Impact View of High Voltage Interconnect(s)

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

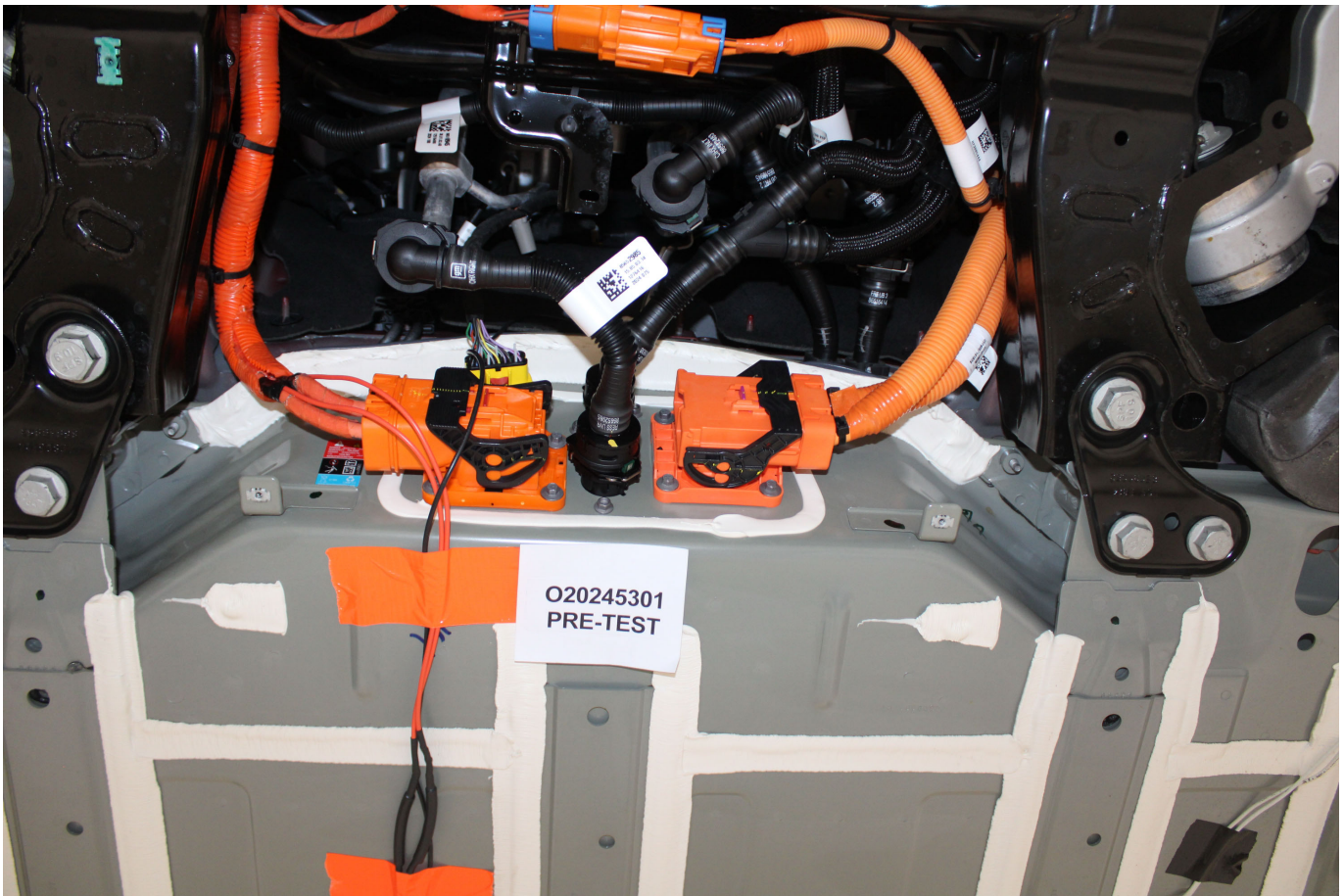


Photo No. 305-22 - Pre-Impact View of High Voltage Leads Attached



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

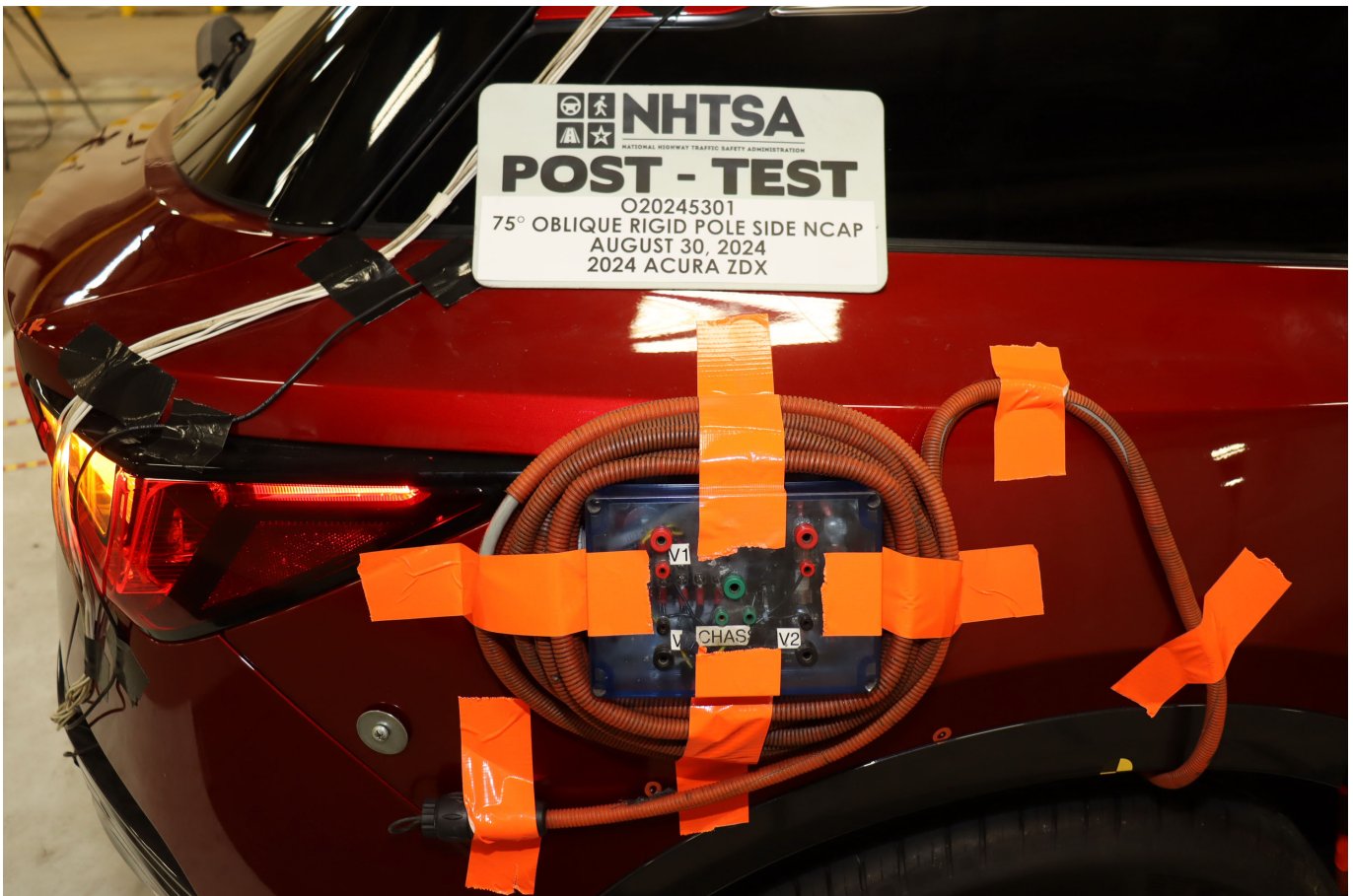


Photo No. 305-25 - Post-Impact View of Installed Test Interface Port



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

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Figure No. 1.	Driver Head CG Acceleration (X) vs. Time	B-1
Figure No. 2.	Driver Head CG Acceleration (Y) vs. Time	B-1
Figure No. 3.	Driver Head CG Acceleration (Z) vs. Time	B-1
Figure No. 4.	Driver Head CG Resultant Acceleration (X) vs. Time	B-1
Figure No. 5.	Driver Lower Spine T12 Acceleration (X) vs. Time	B-2
Figure No. 6.	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-2
Figure No. 7.	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-2
Figure No. 8.	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-2
Figure No. 9.	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-3
Figure No. 10.	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-3
Figure No. 11.	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-3

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

Additional Driver Dummy Instrumentation Data

Driver Head CG Redundant Acceleration (X) vs. Time
 Driver Head CG Redundant Acceleration (Y) vs. Time
 Driver Head CG Redundant Acceleration (Z) vs. Time
 Driver Head Angular Velocity X (Deg/Sec) vs. Time
 Driver Head Angular Velocity Y (Deg/Sec) vs. Time
 Driver Head Angular Velocity Z (Deg/Sec) vs. Time
 Driver Upper Thorax Rib Deflection (Y)
 Driver Middle Thorax Rib Deflection (Y)
 Driver Lower Thorax Rib Deflection (Y)
 Driver Upper Abdomen Rib Deflection (Y)
 Driver Lower Abdomen Rib Deflection (Y)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)

Vehicle Center of Gravity Acceleration (Y)

Vehicle Center of Gravity Acceleration (Z)

Left Floor Sill Acceleration (Y)

Left A-Pillar Sill Acceleration (Y)

Left Lower A-Pillar Acceleration (Y)

Left Mid A-Pillar Acceleration (Y)

Left B-Pillar Sill Acceleration (Y)

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

Load Cell Pole Barrier #4 Force (Y)

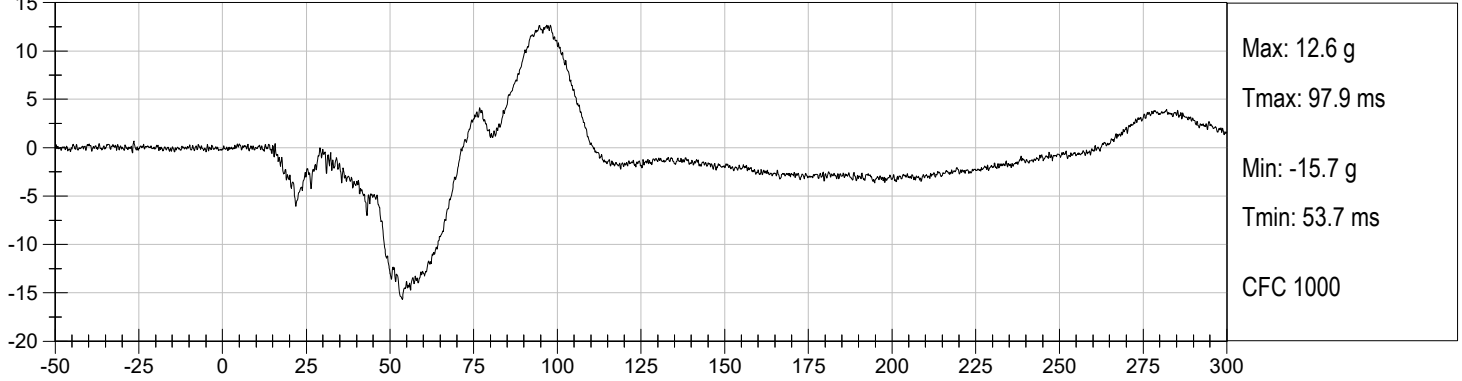
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

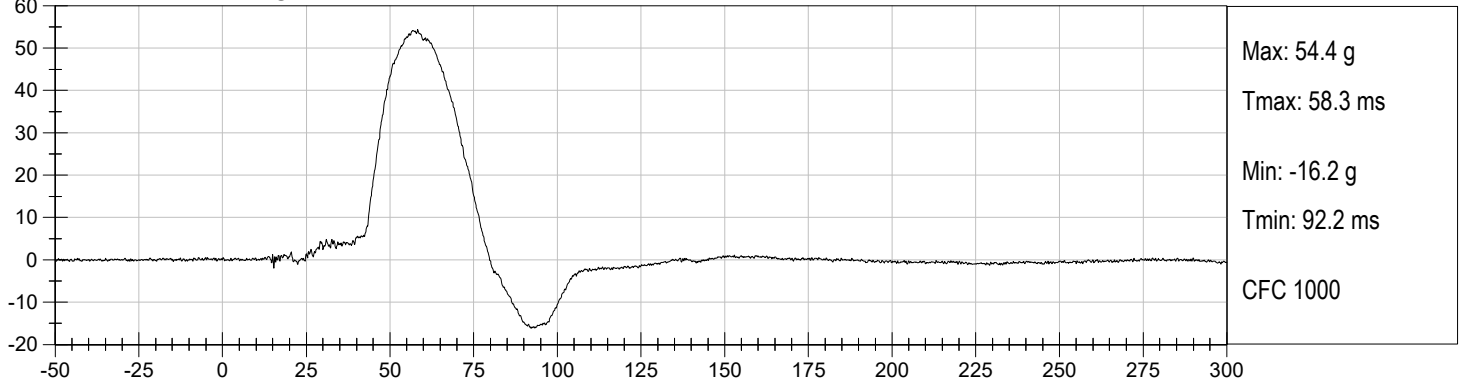
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

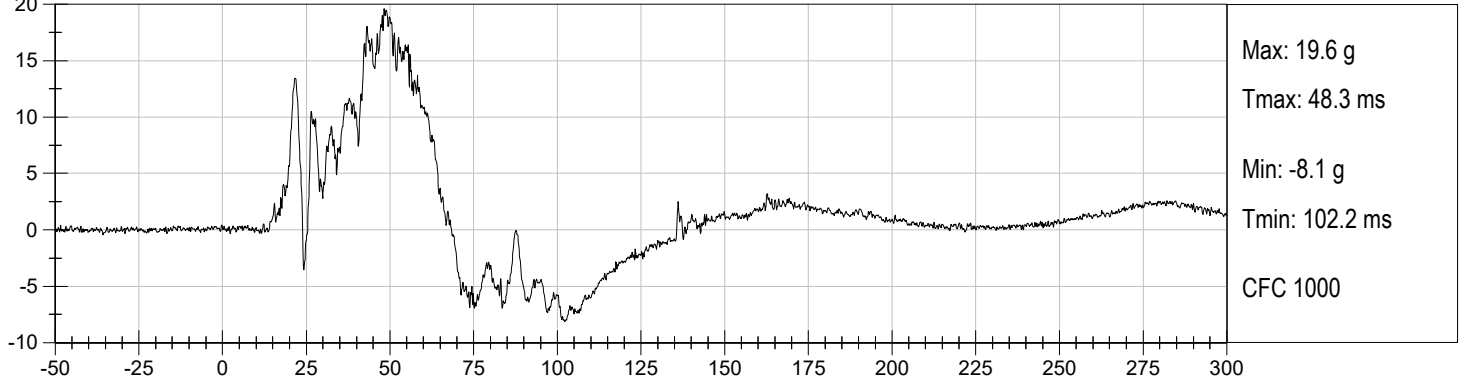
DRIVER HEAD X (g) vs Time (ms)



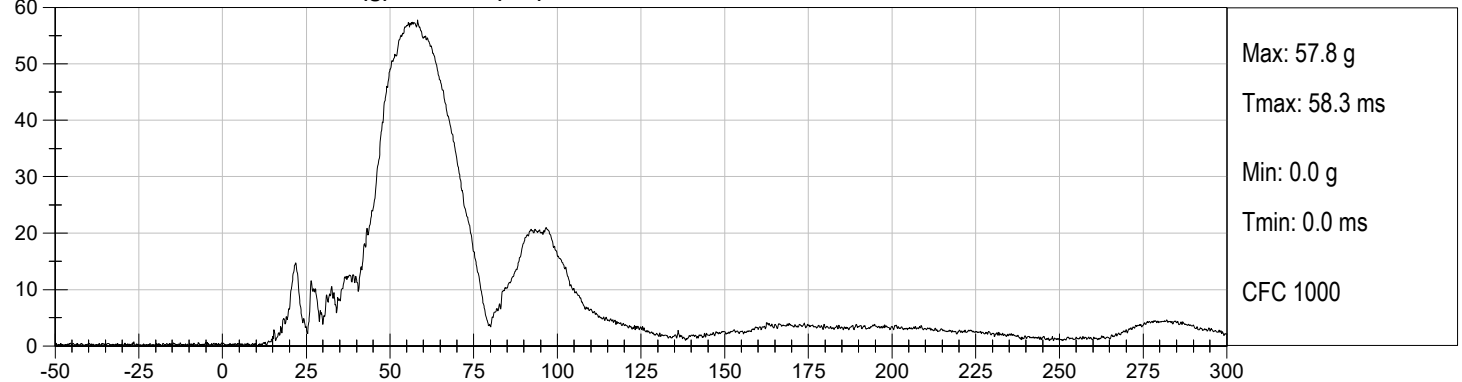
DRIVER HEAD Y (g) vs Time (ms)



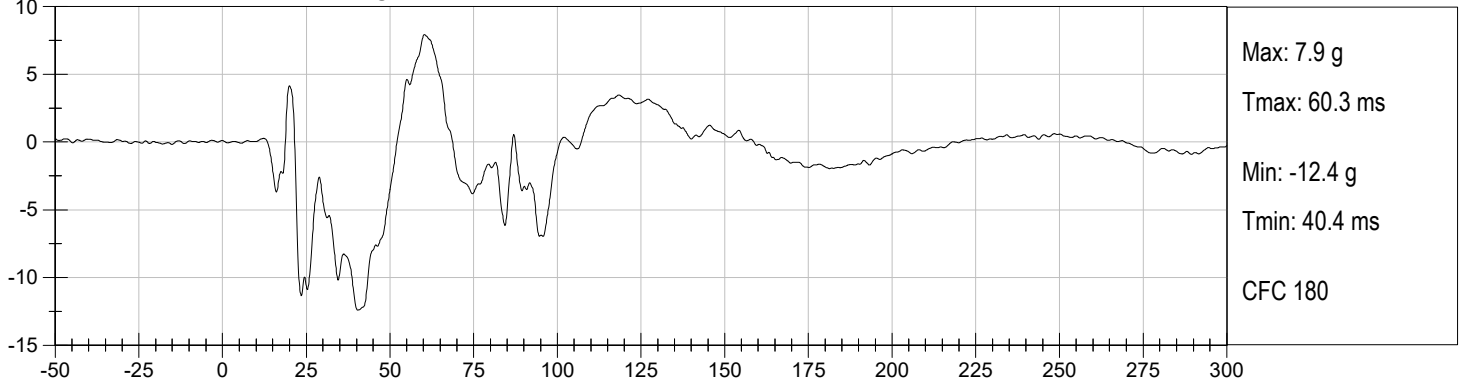
DRIVER HEAD Z (g) vs Time (ms)



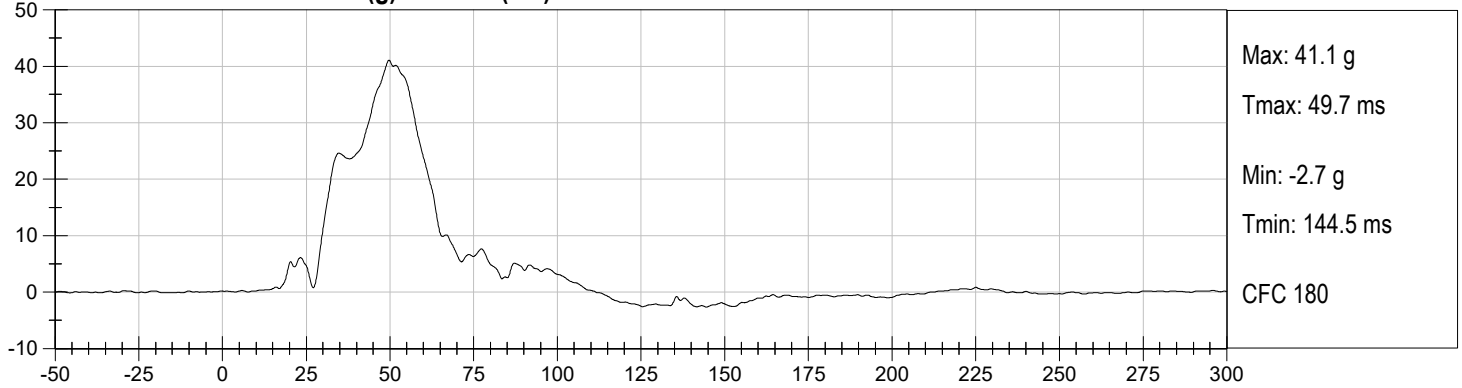
DRIVER HEAD Resultant (g) vs Time (ms)



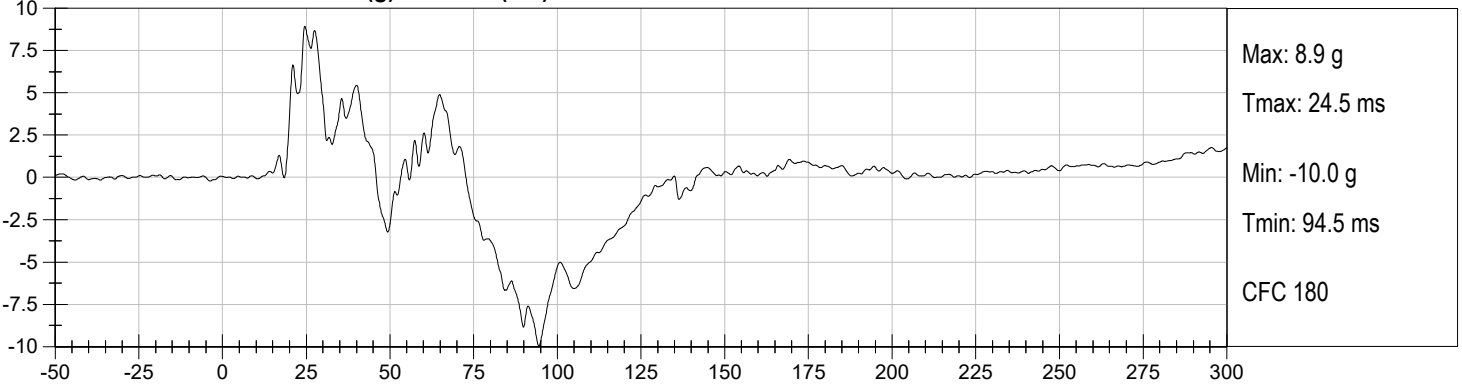
DRIVER LOWER SPINE X (g) vs Time (ms)



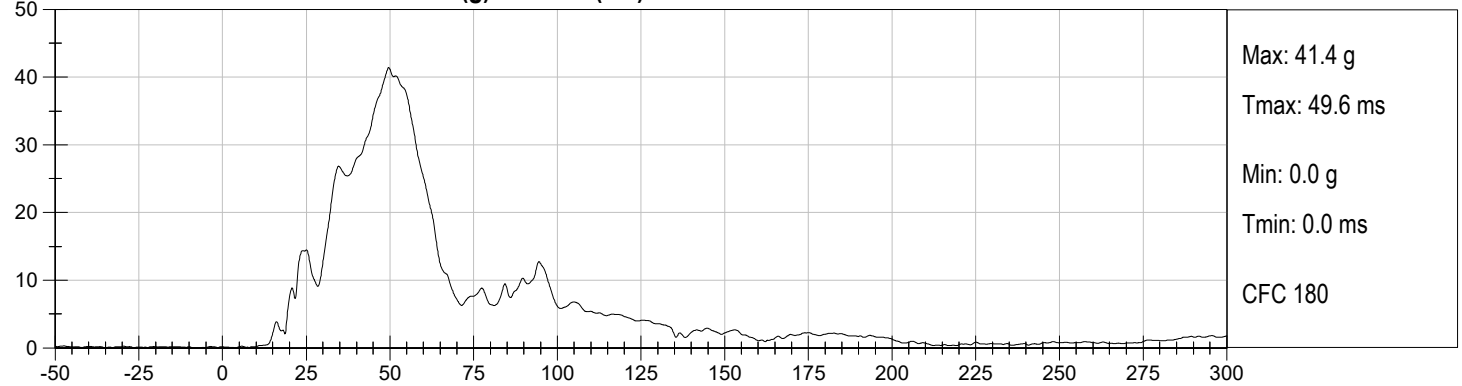
DRIVER LOWER SPINE Y (g) vs Time (ms)



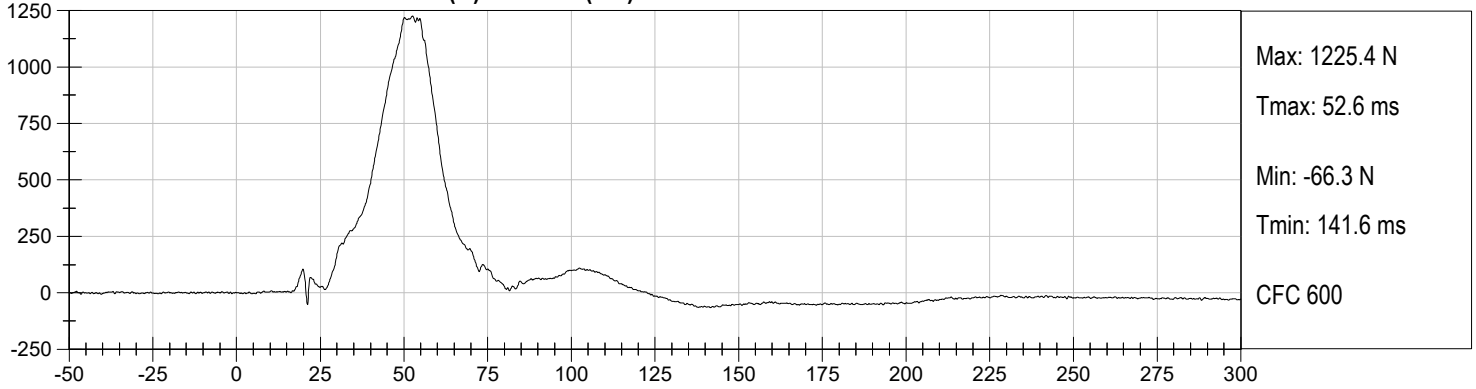
DRIVER LOWER SPINE Z (g) vs Time (ms)



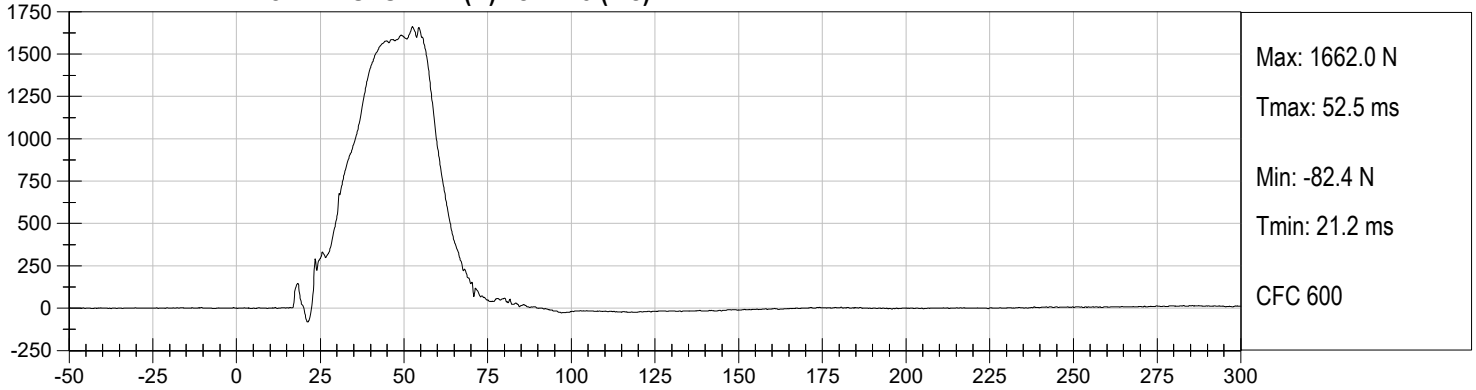
DRIVER LOWER SPINE Resultant (g) vs Time (ms)



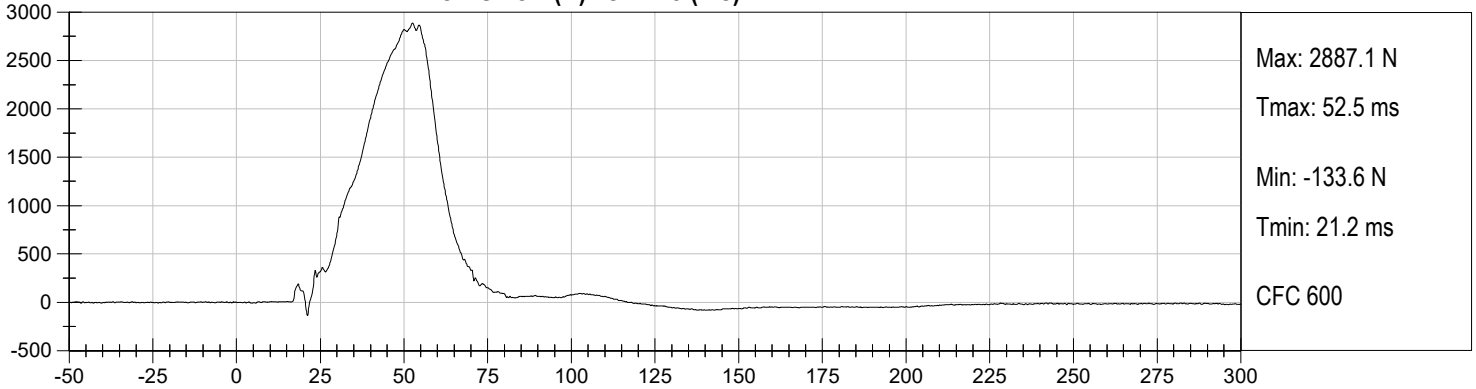
DRIVER LEFT ILIUM CREST FY (N) vs Time (ms)



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



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



APPENDIX C
DUMMY QUALIFICATION AND PERFORMANCE VERIFICATION

QUALIFICATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 306

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

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

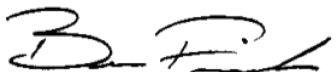
ATD Serial No: 306

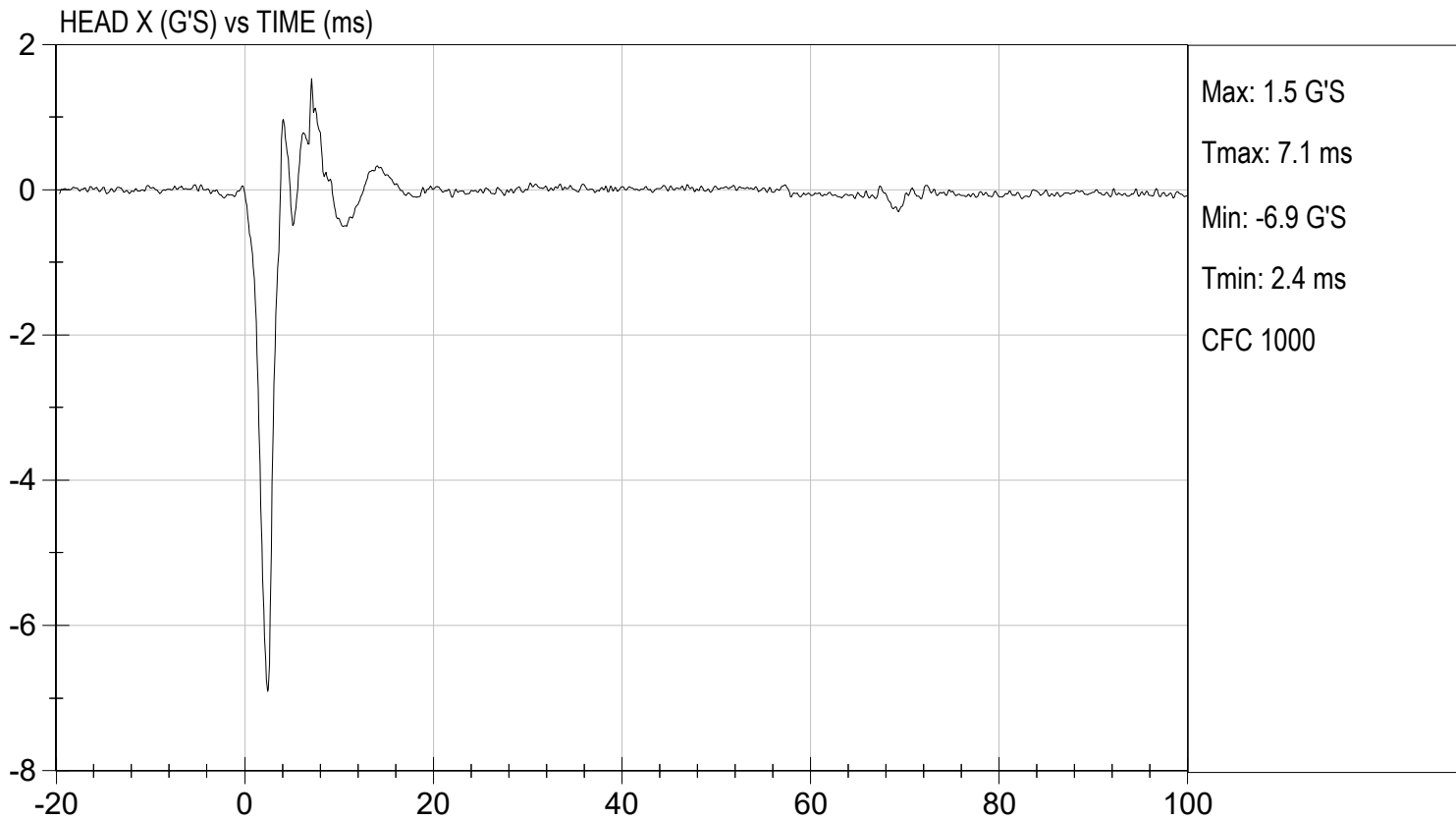
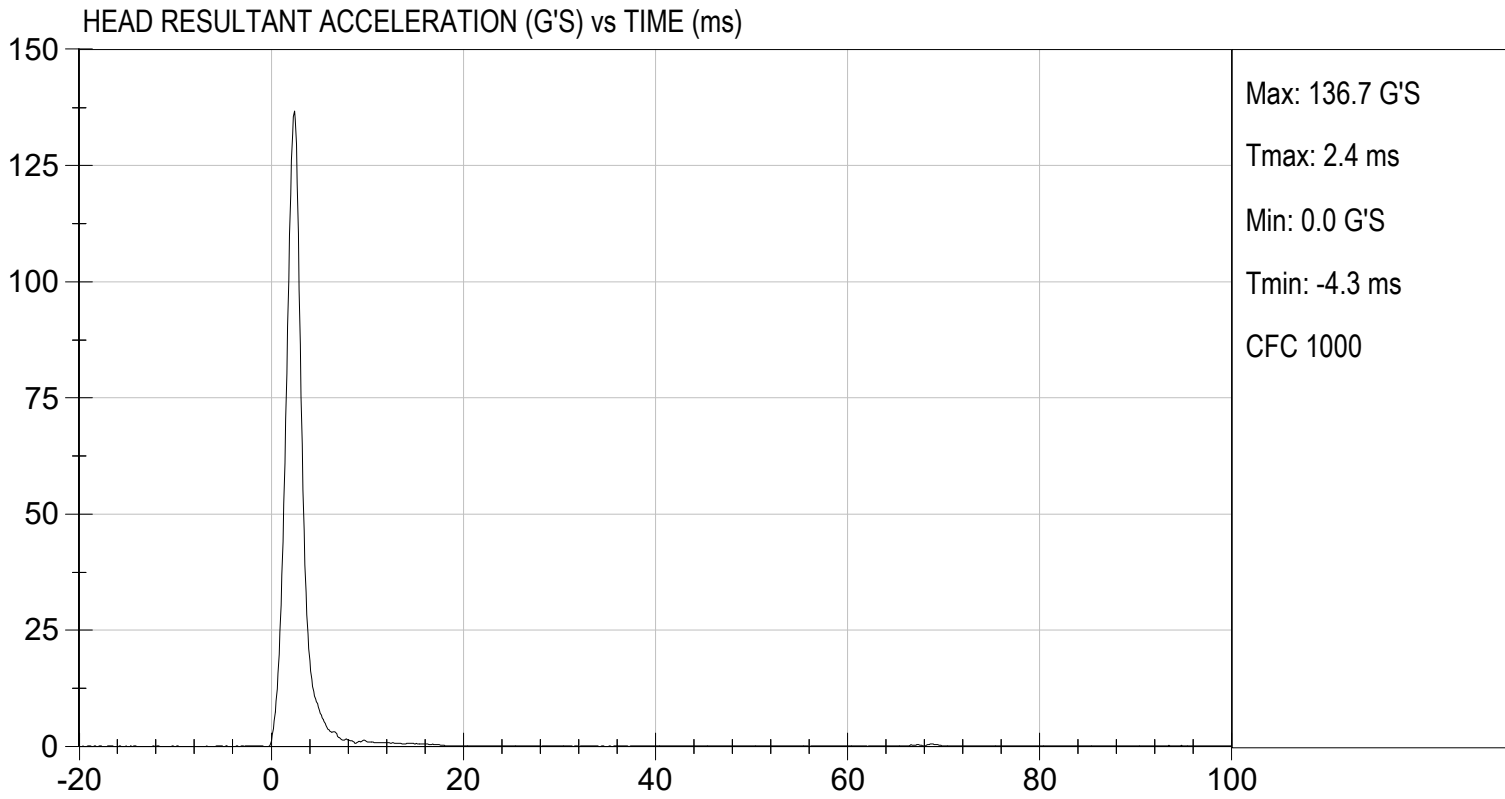
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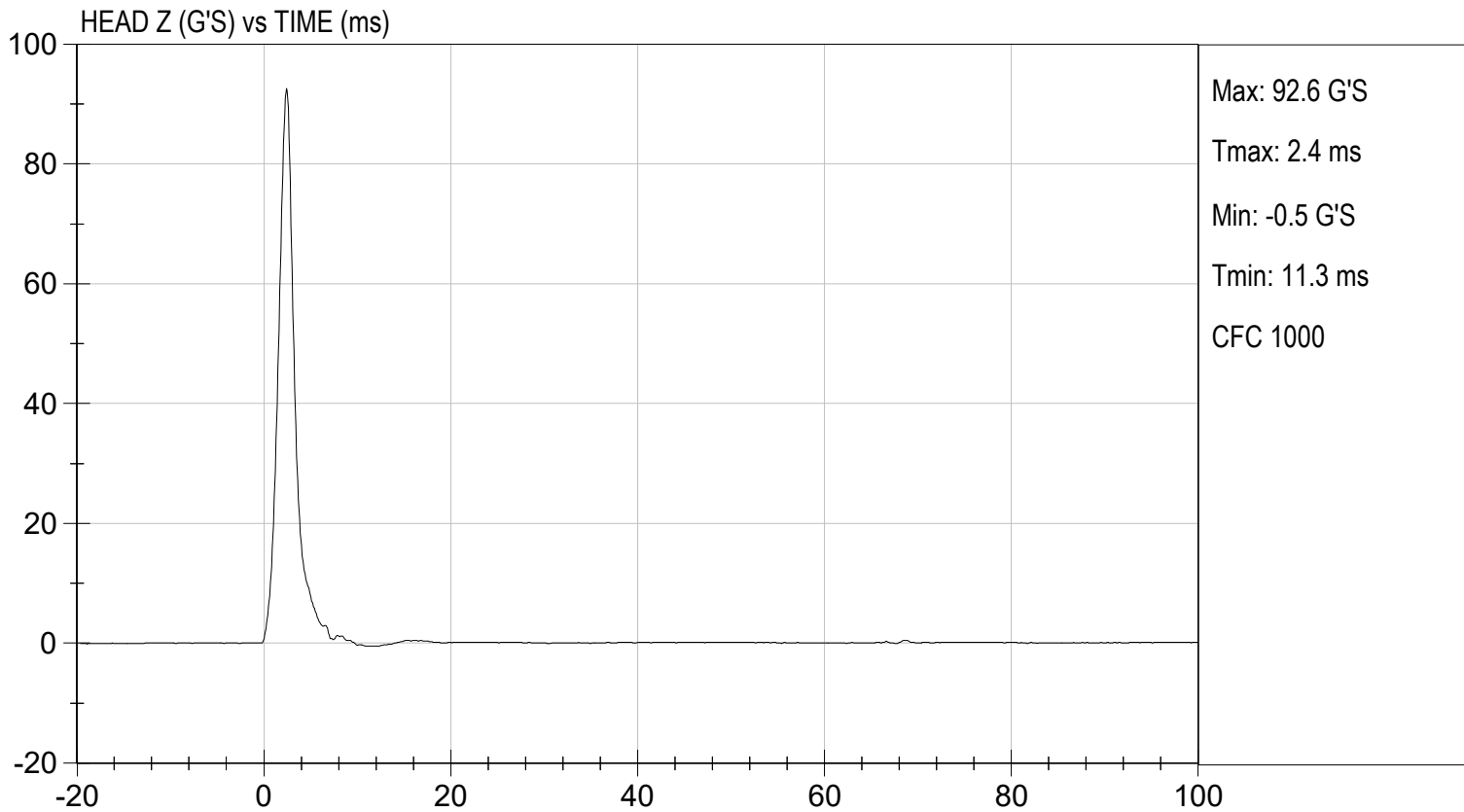
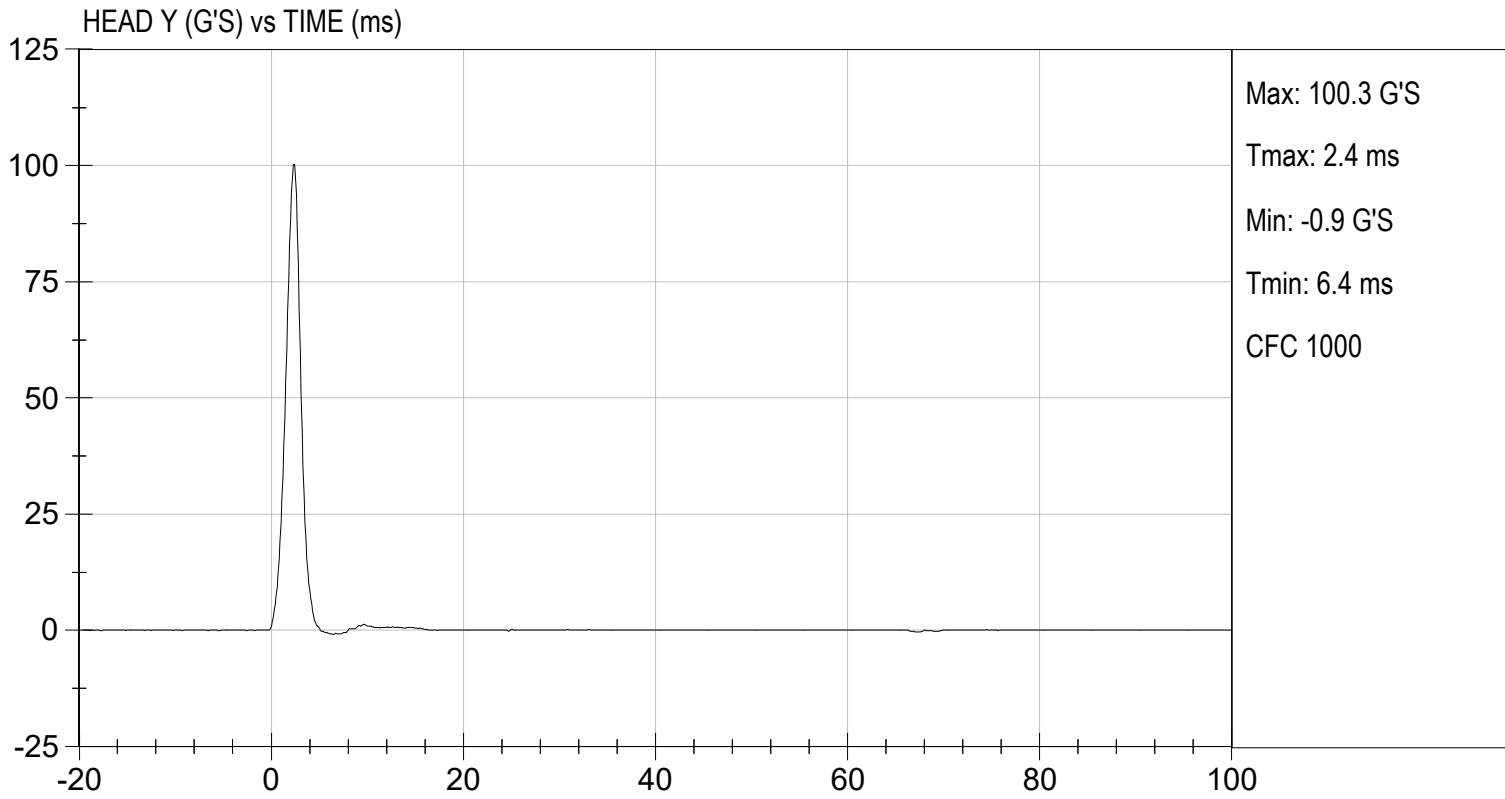
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	115 to 137	137	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-6.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass


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08/14/2024
 Test Date


 Approved By





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

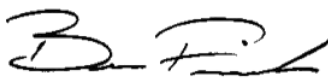
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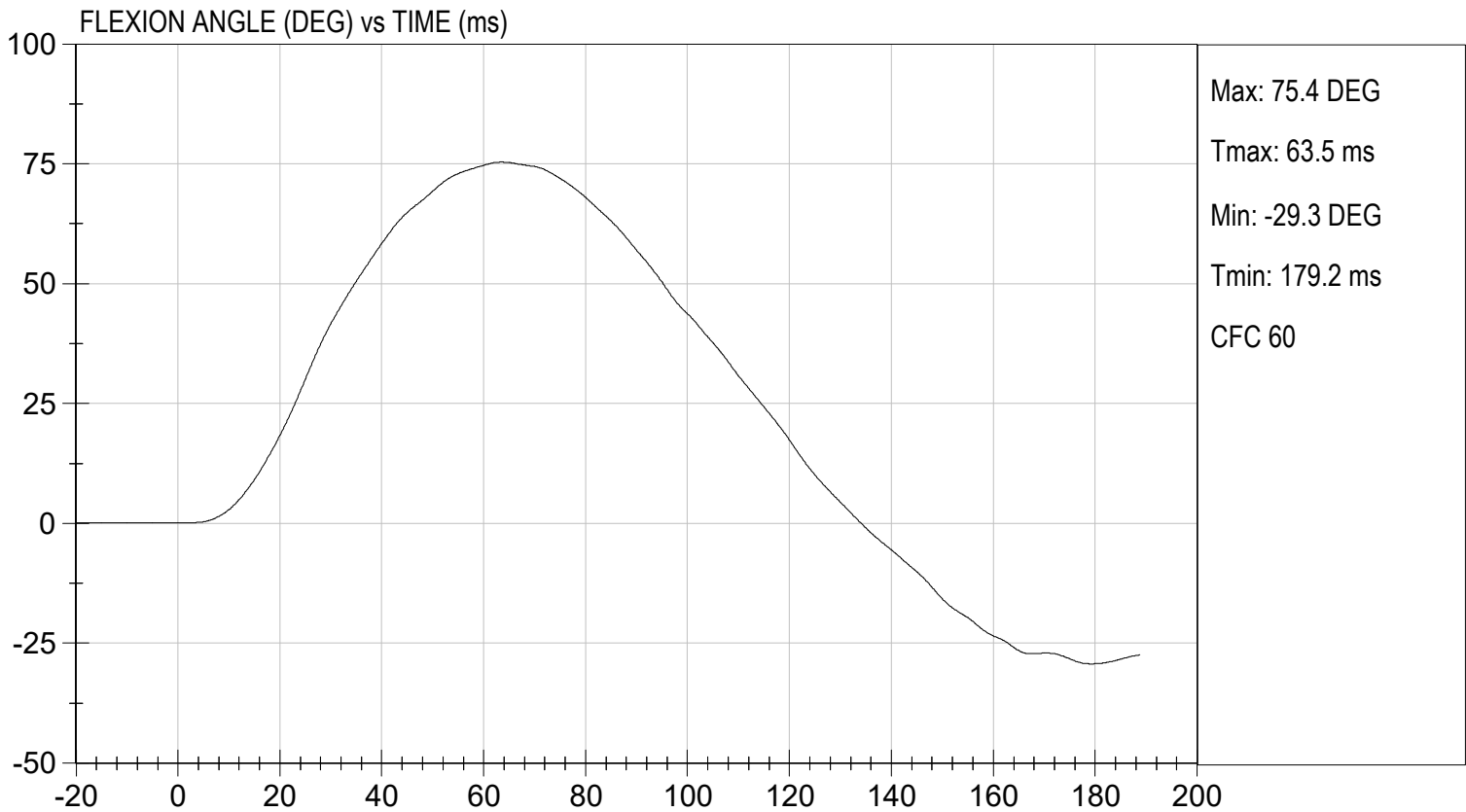
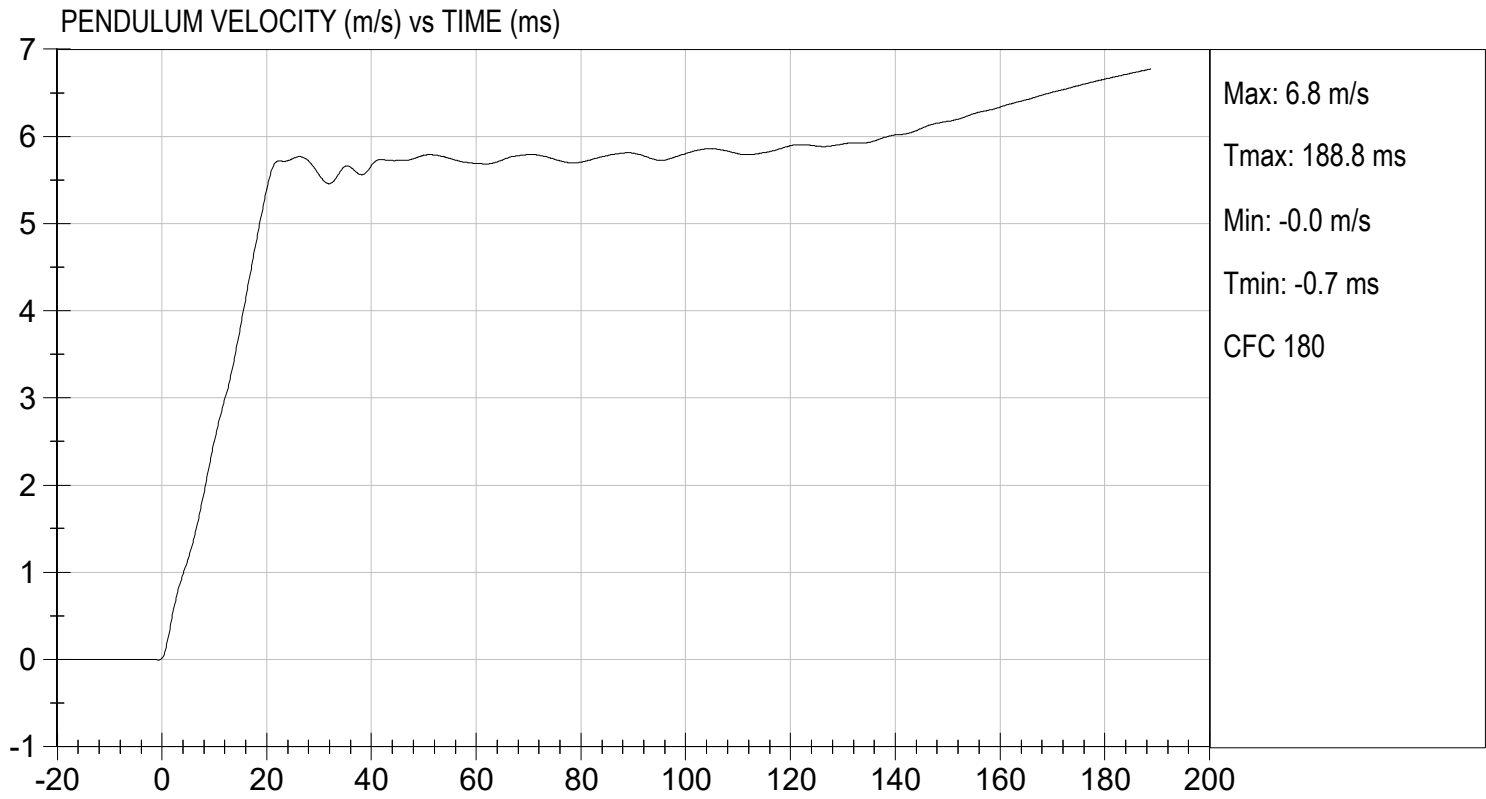
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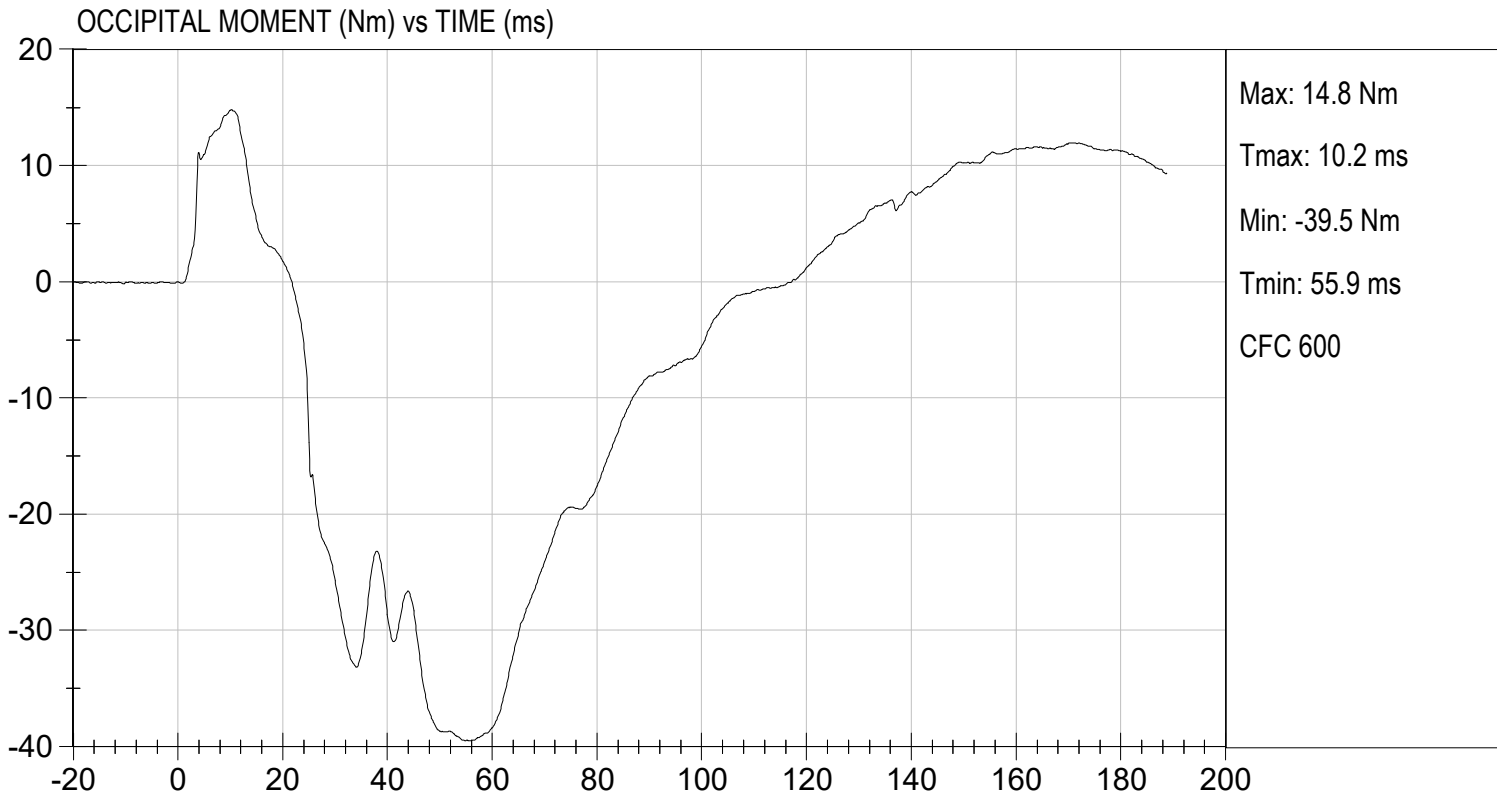
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.3	Pass	
Humidity	%	10 to 70	43	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.53	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.51	Pass
	15 ms	m/s	3.30 to 4.10	3.83	Pass
	20 ms	m/s	4.40 to 5.40	5.40	Pass
	25 ms	m/s	5.40 to 6.10	5.75	Pass
	25-100 ms	m/s	5.50 to 6.20	5.81	Pass
Maximum D-Plane Rotation	deg	71 to 81	75	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	64	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-40	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	117	Pass	
Overall Test Results				Pass	


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08/14/2024
 Test Date


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SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

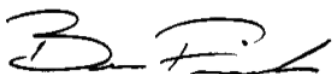
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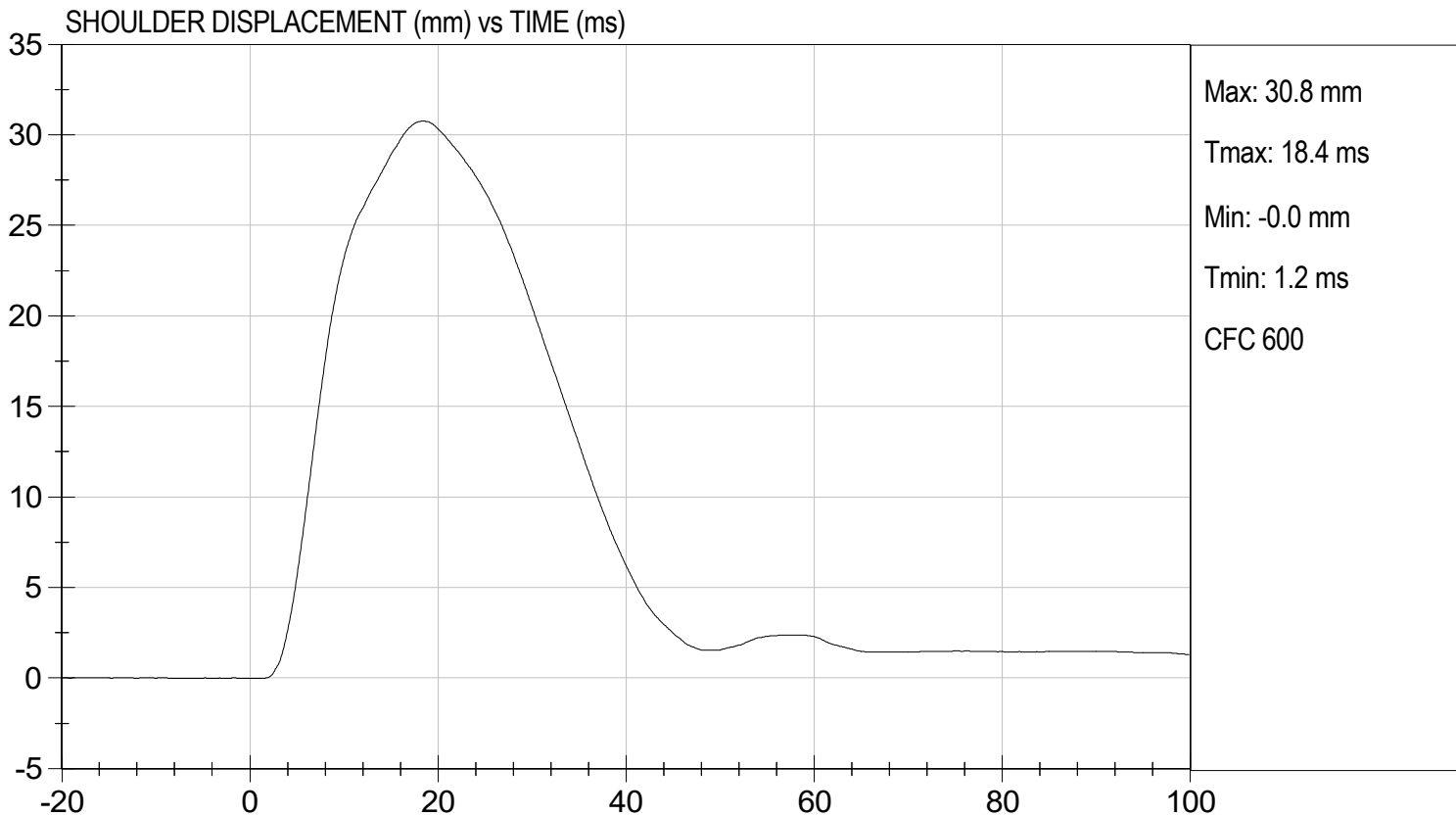
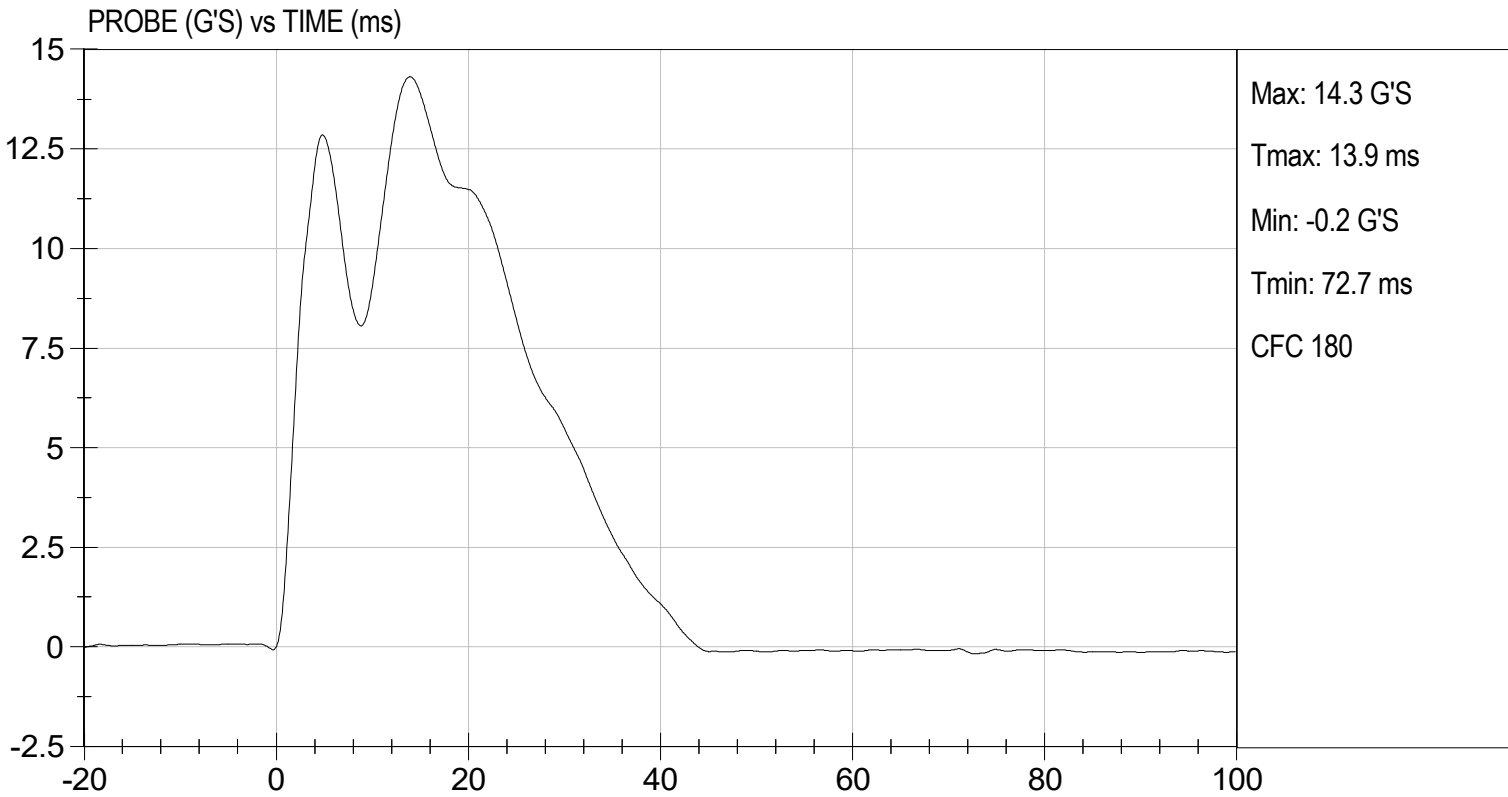
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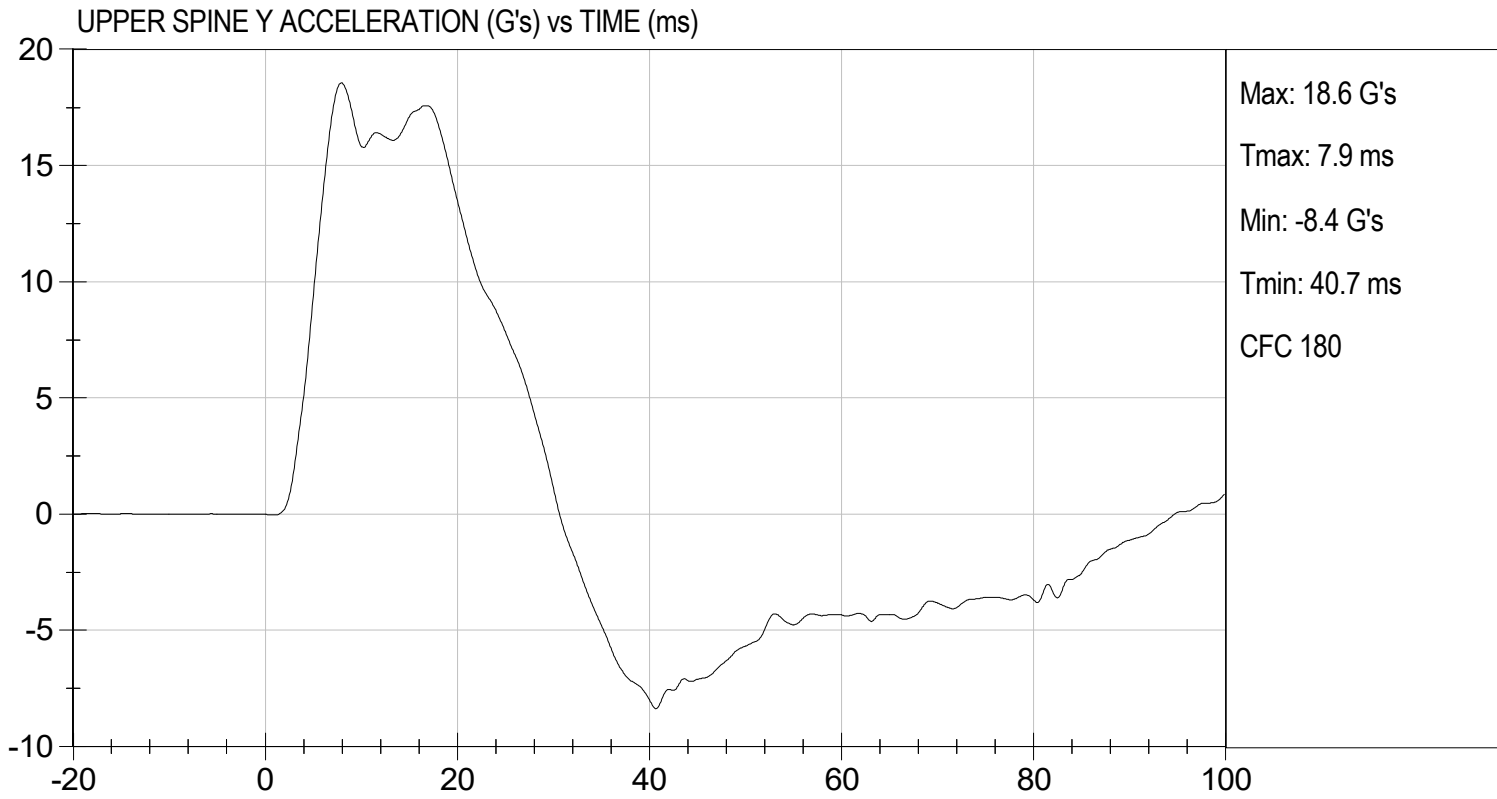
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	14	Pass
Shoulder Displacement	mm	28 to 37	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass


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

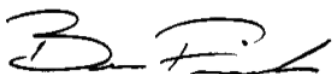
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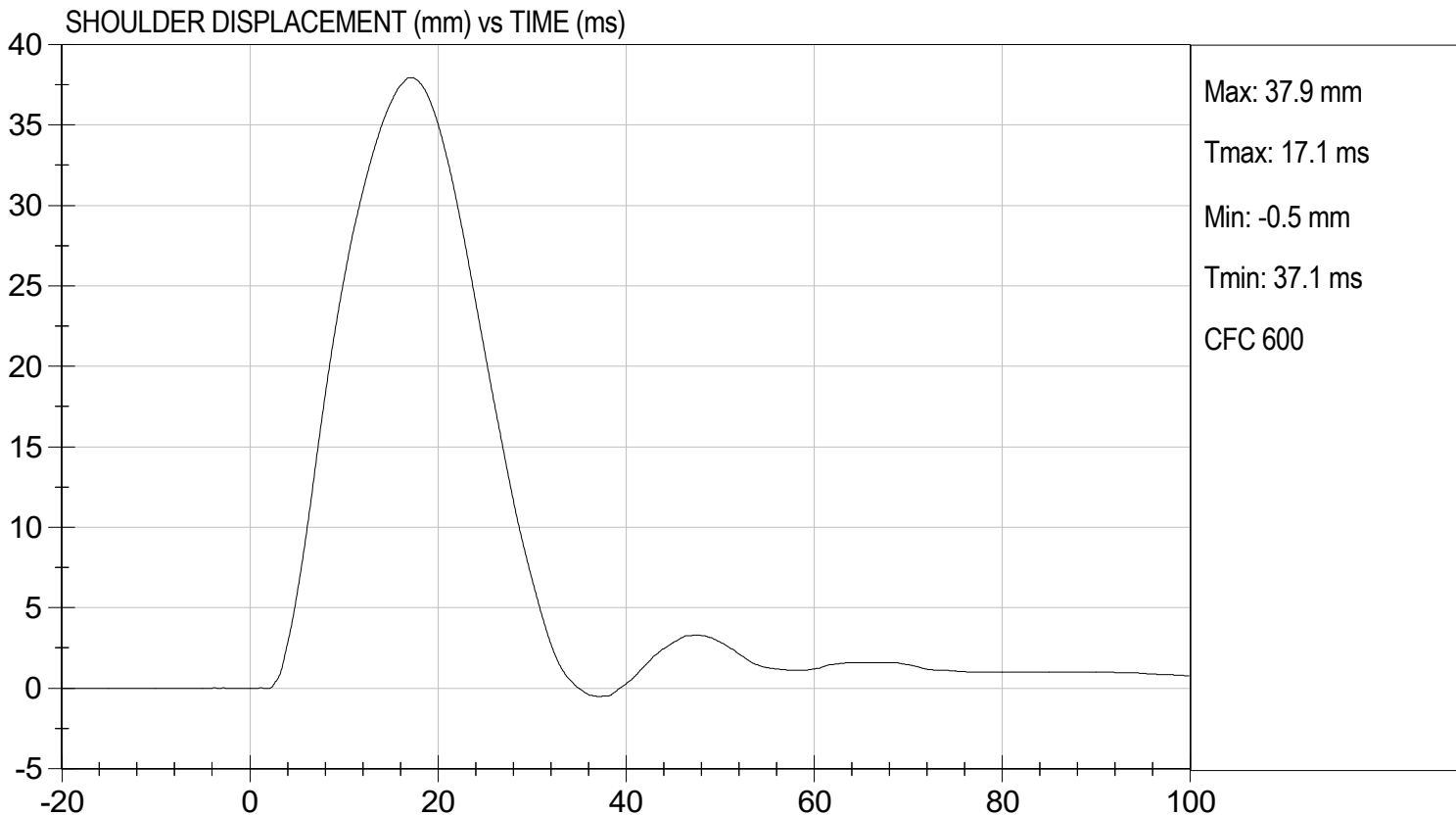
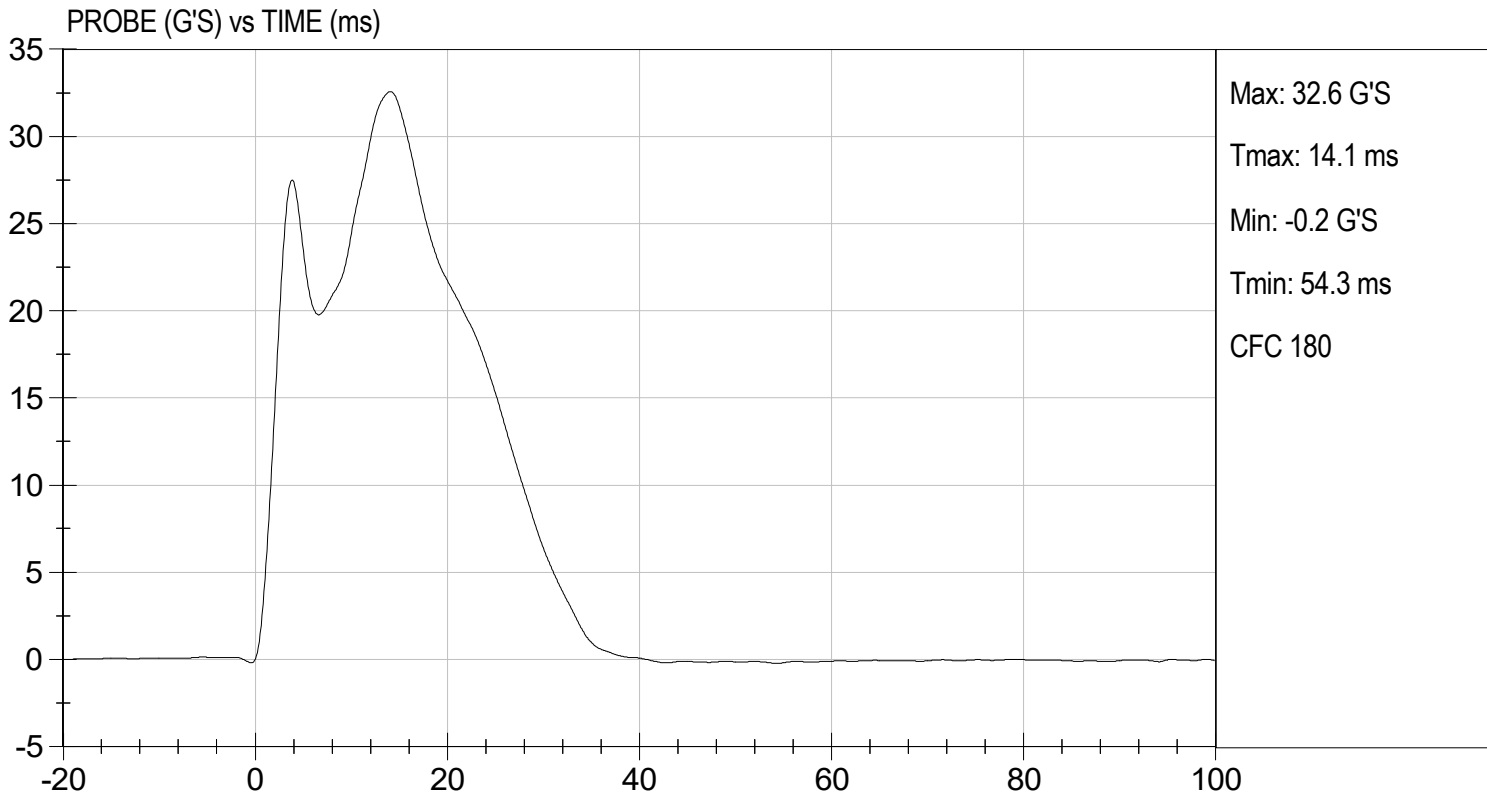
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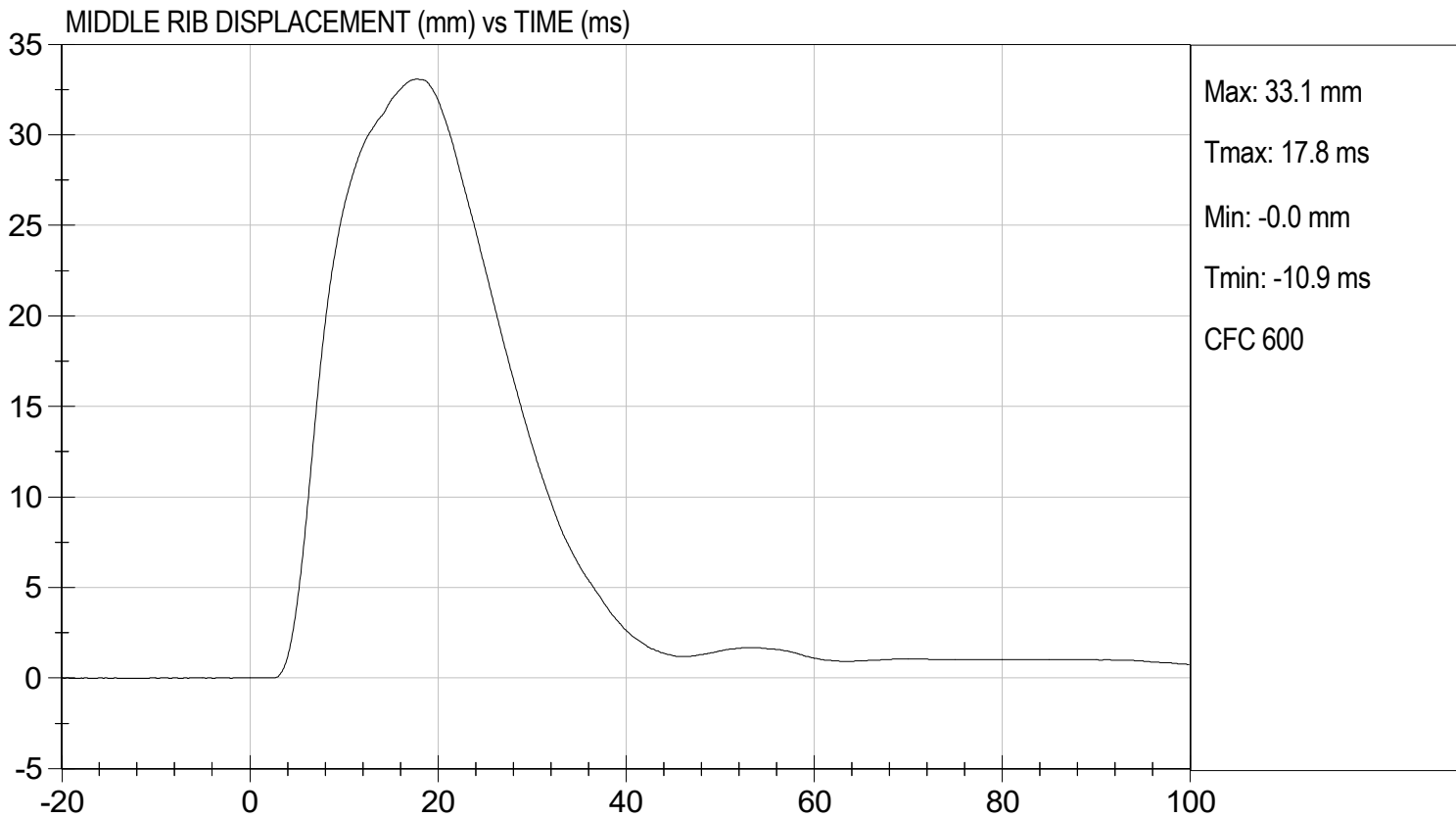
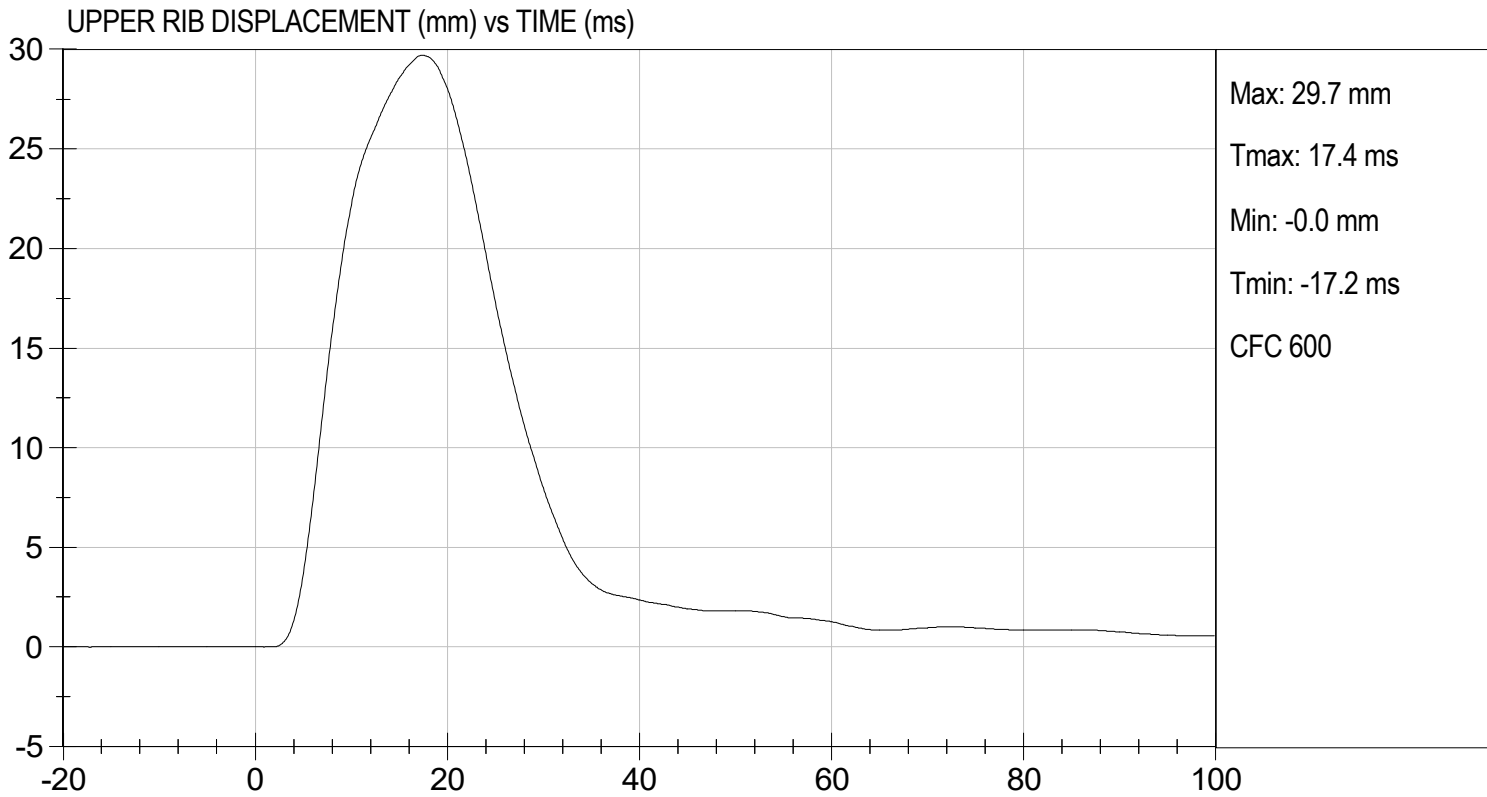
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	38	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle 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	35	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass


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08/14/2024
Test Date

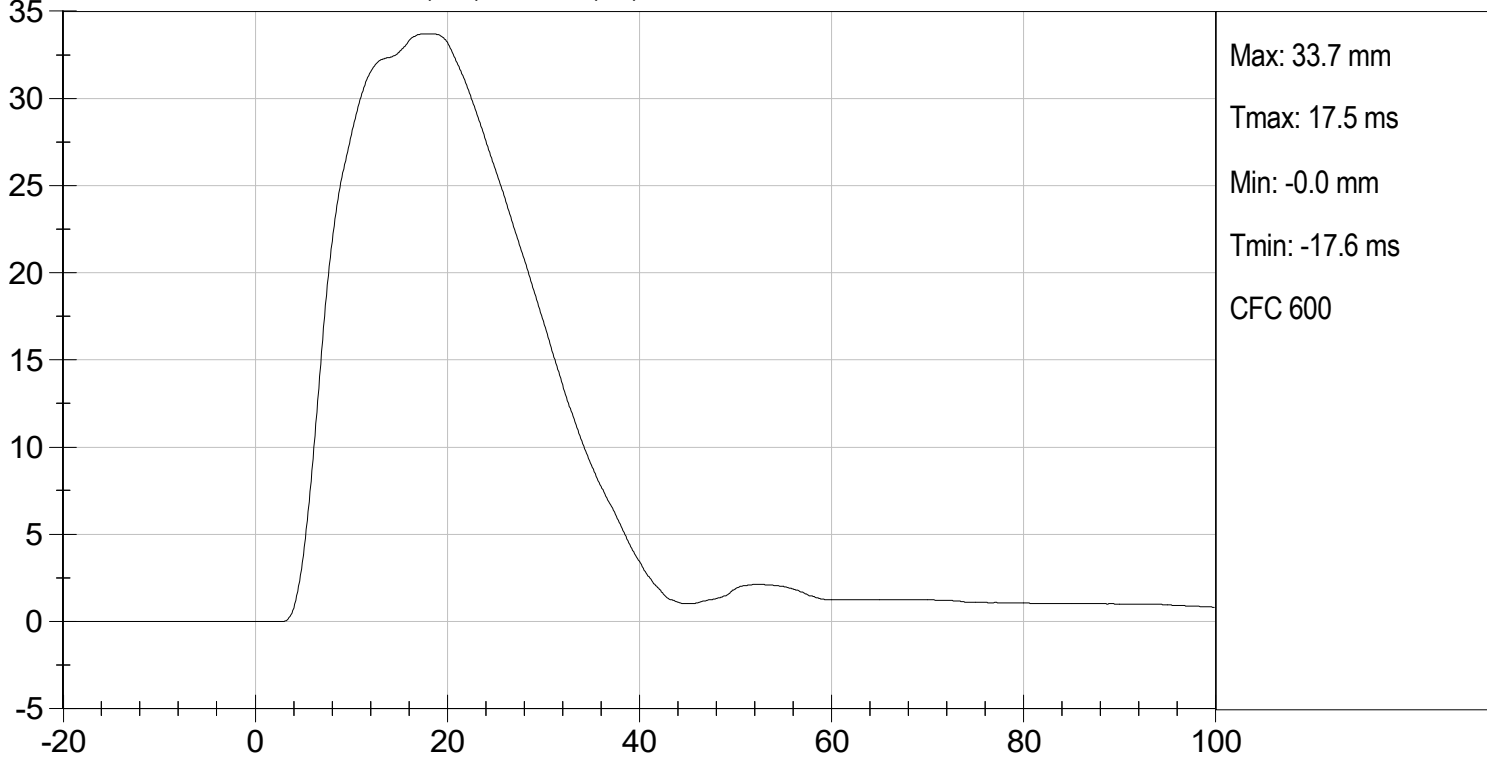

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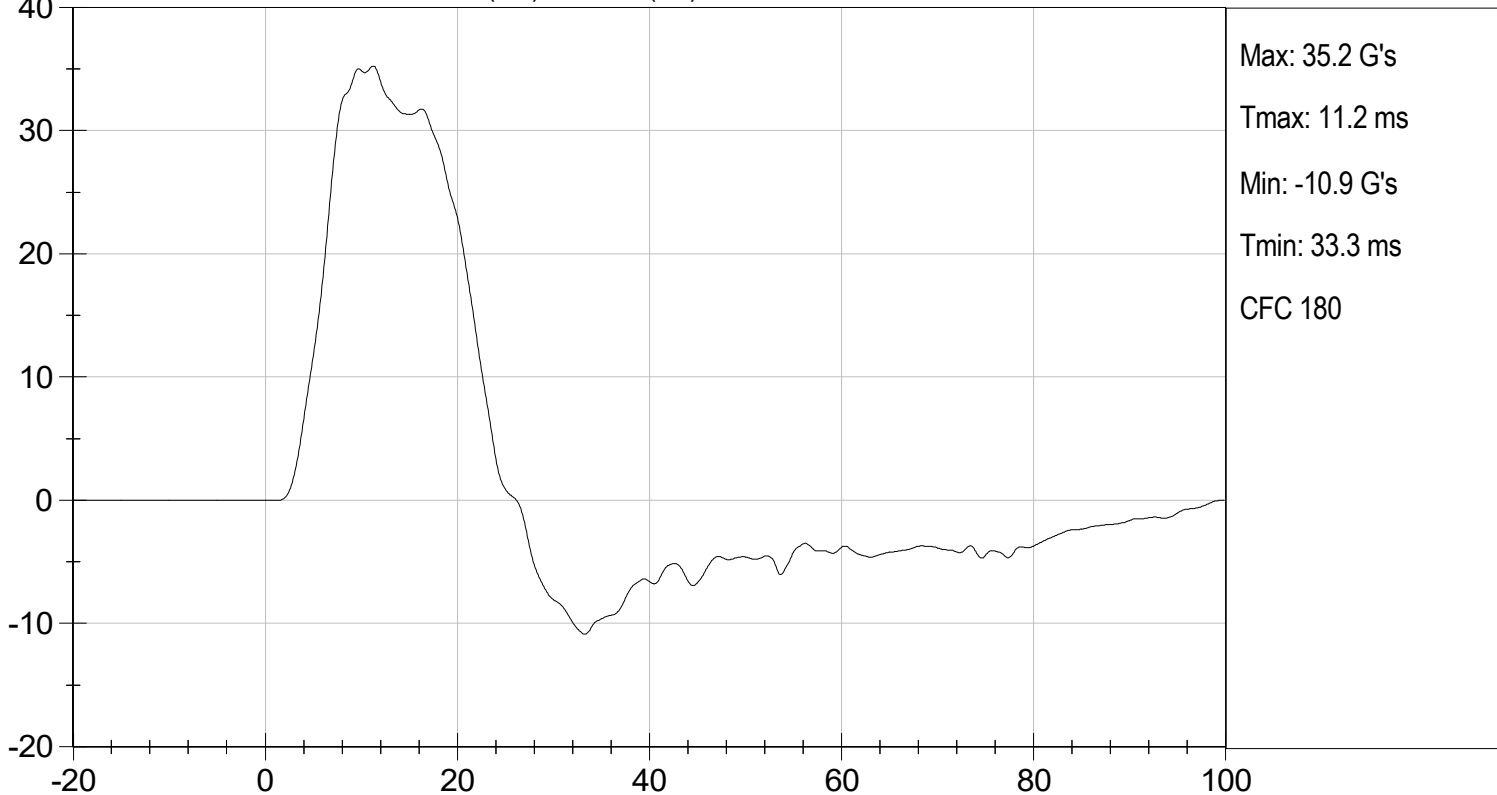


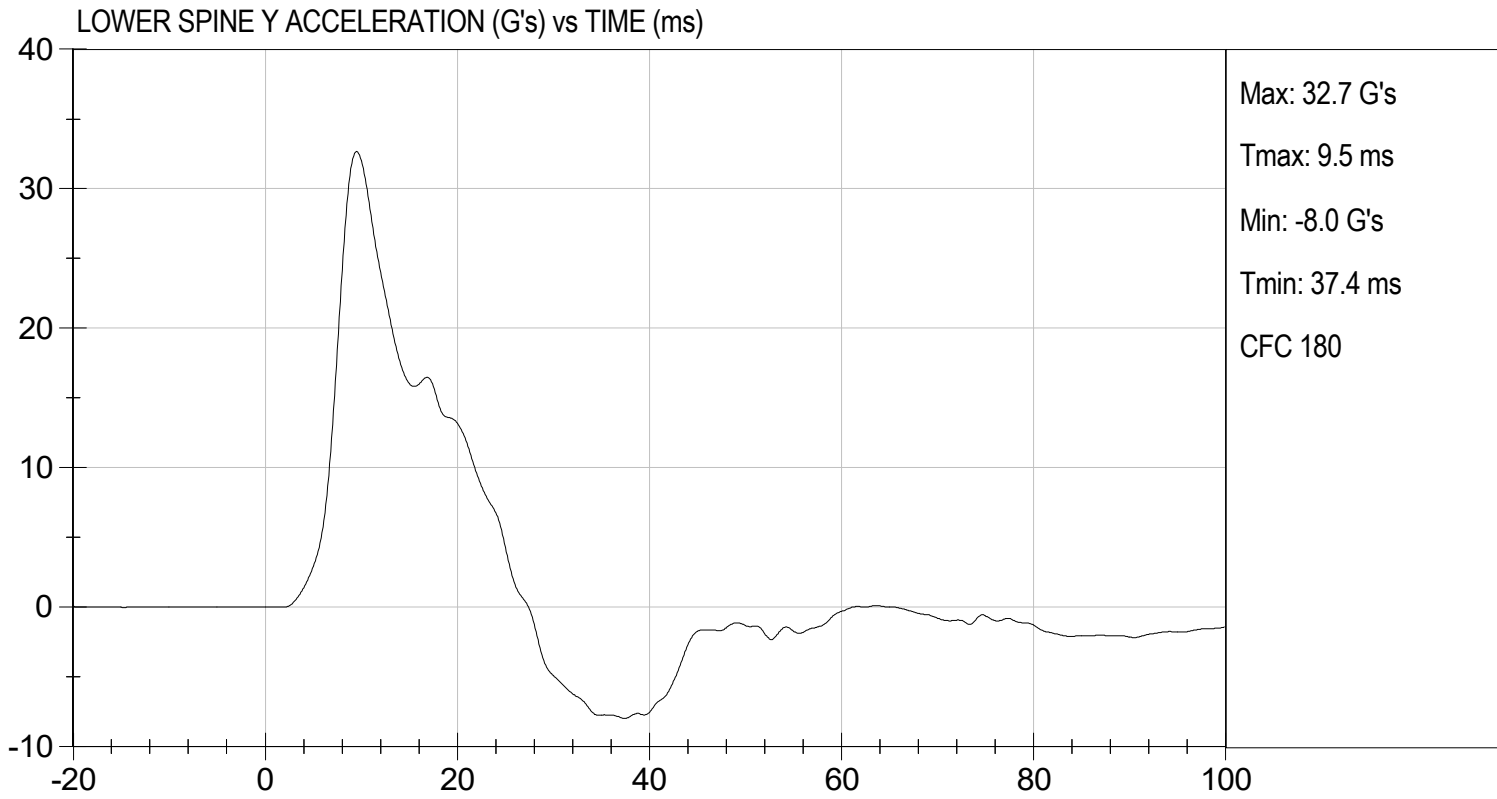


LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



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





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

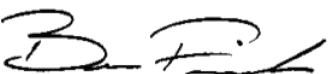
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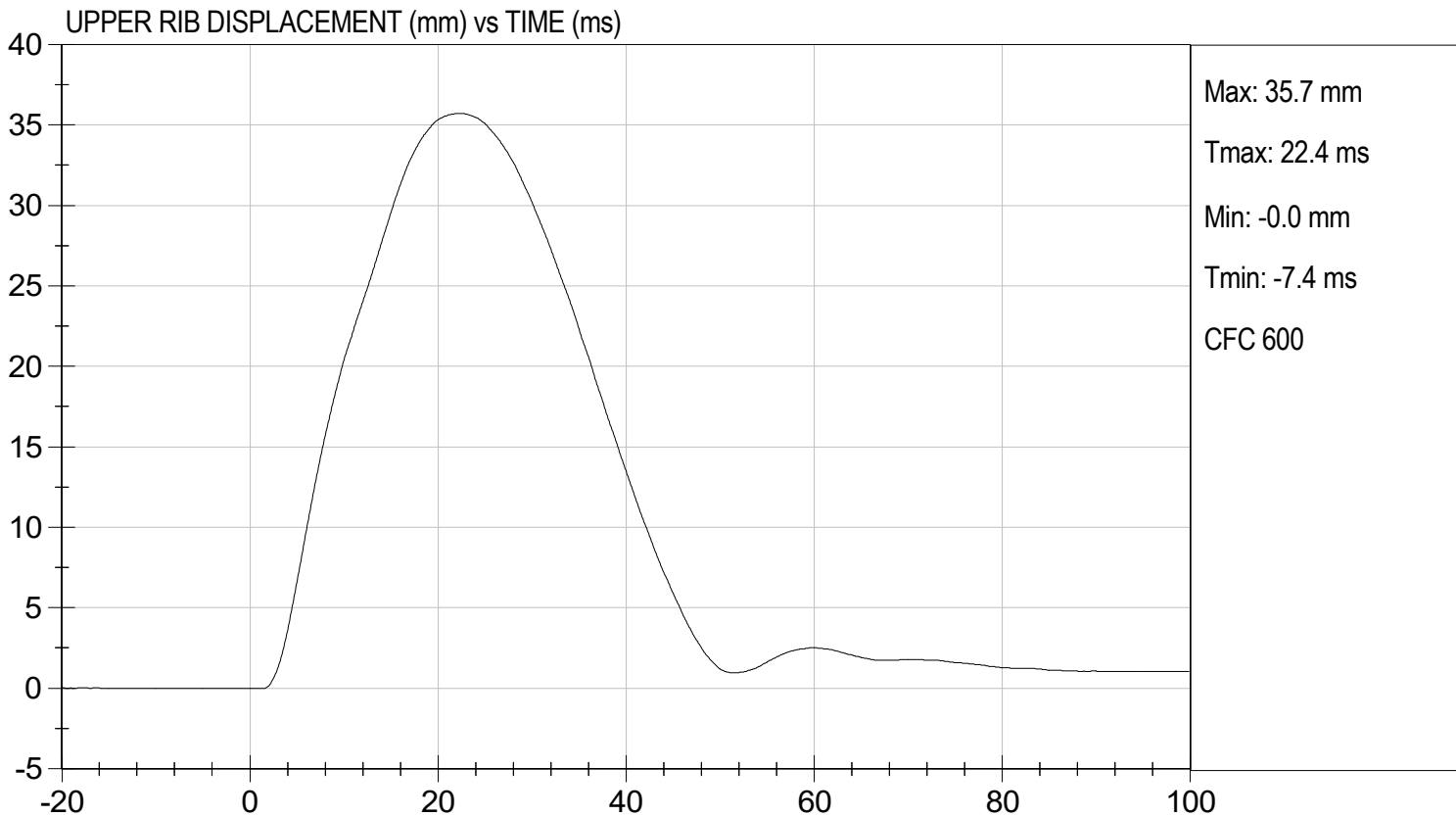
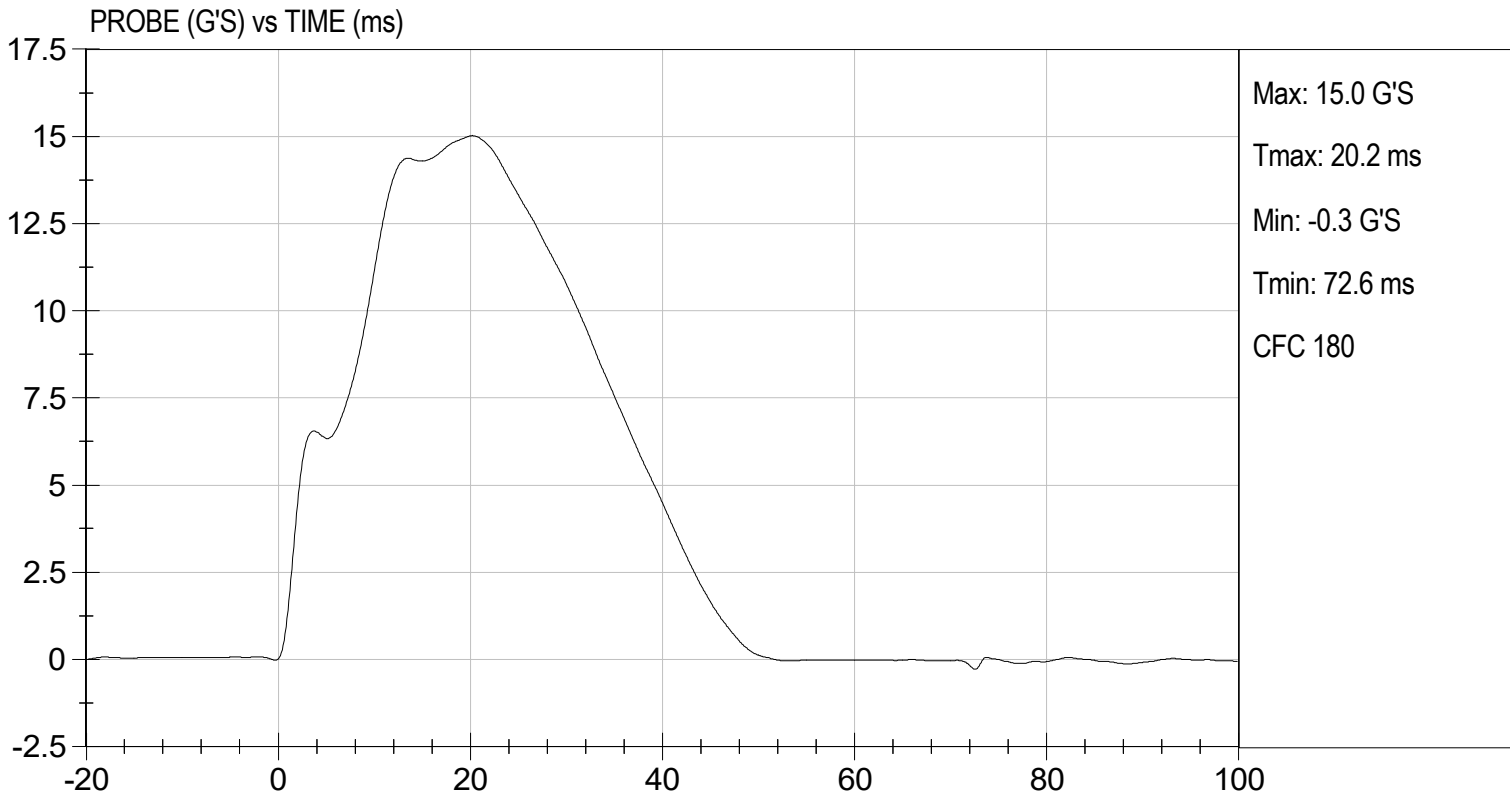
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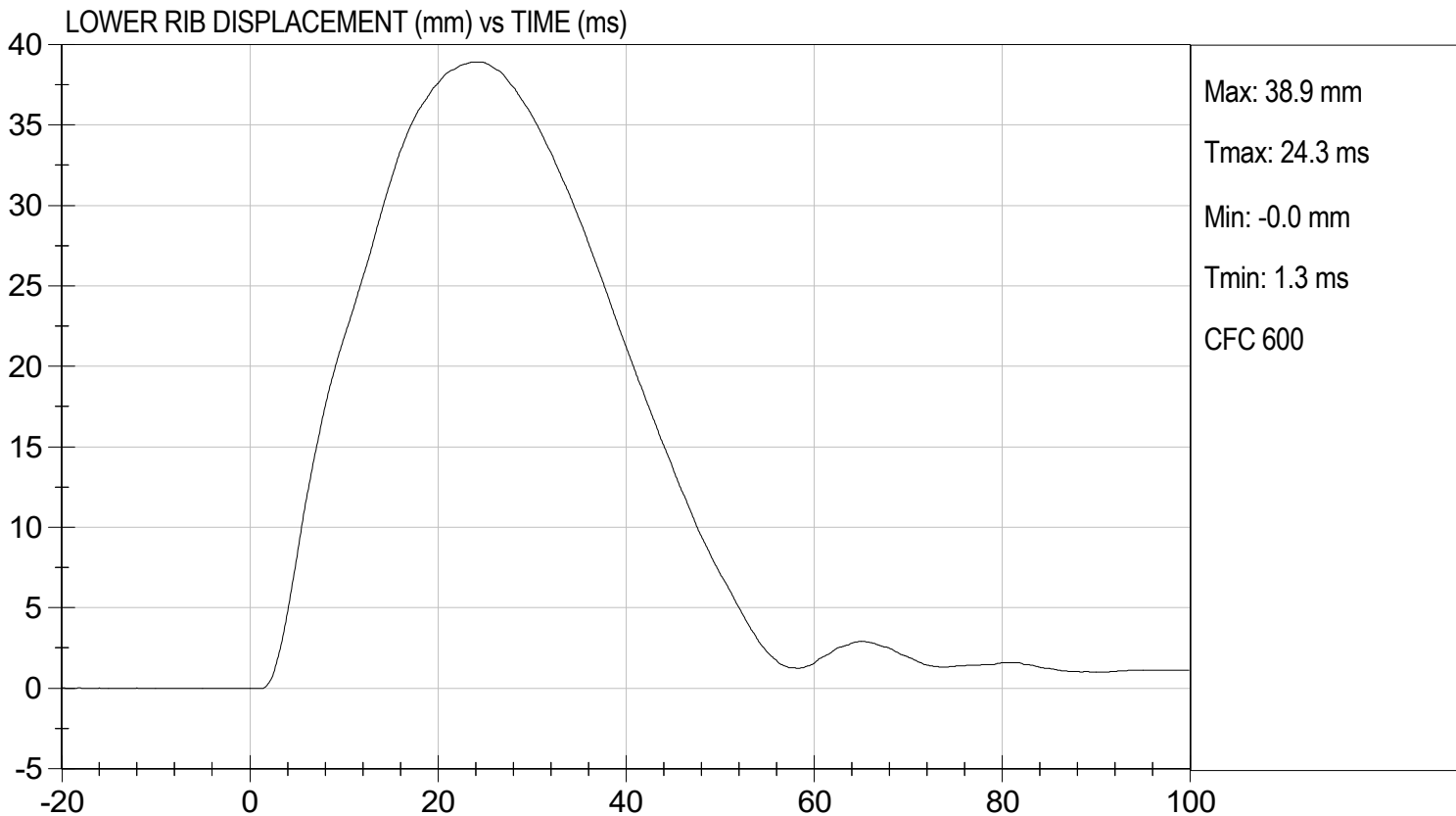
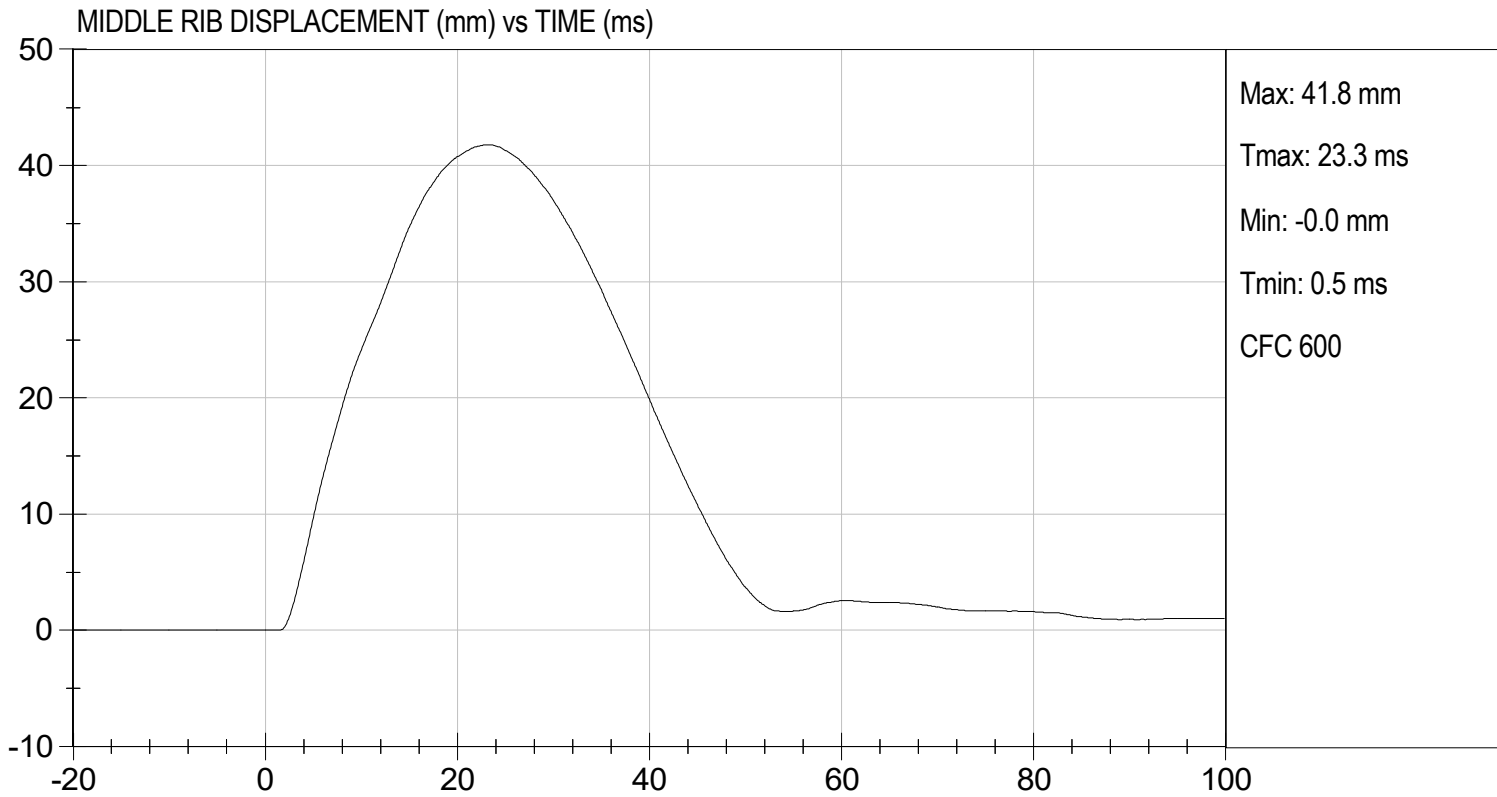
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	36	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
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

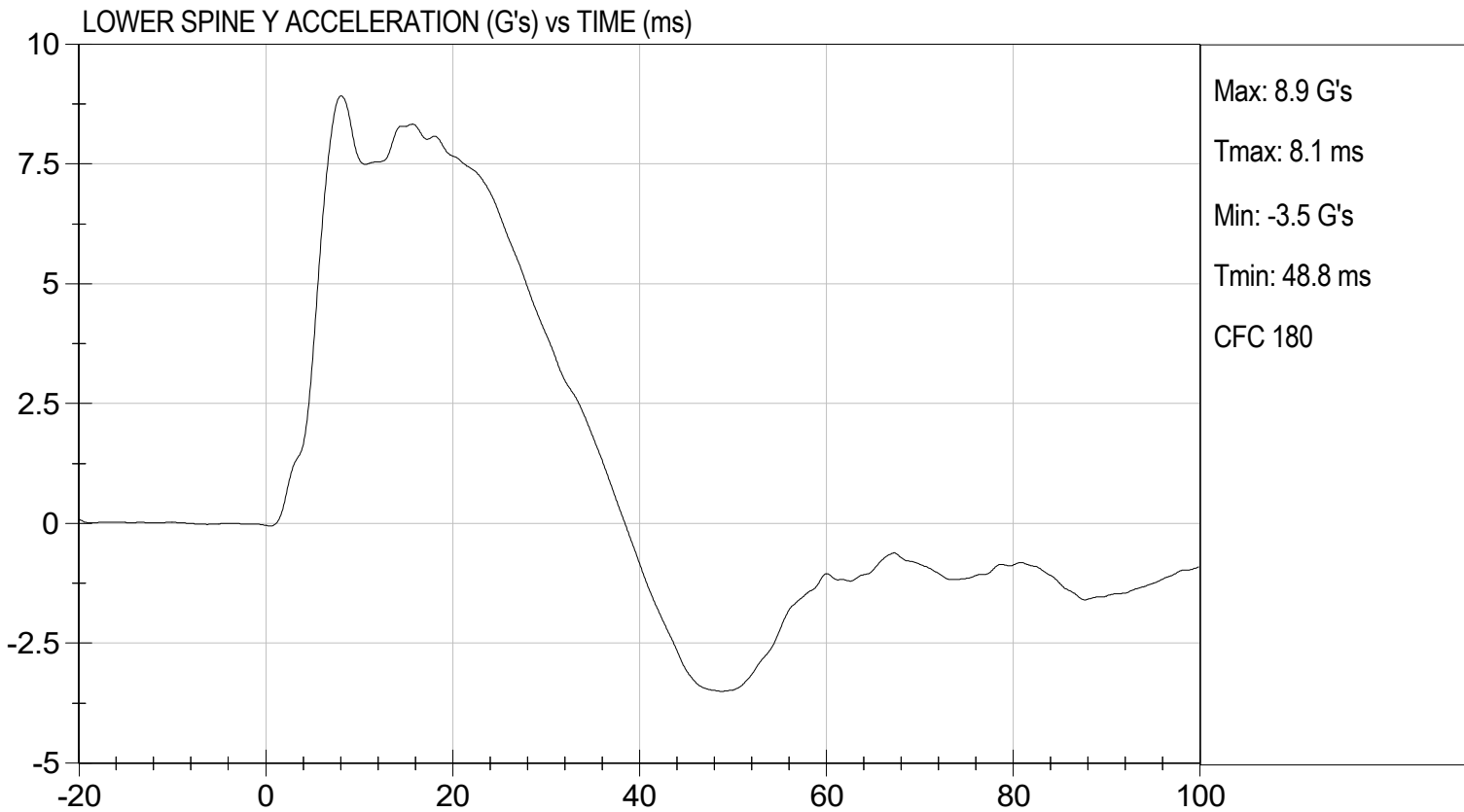
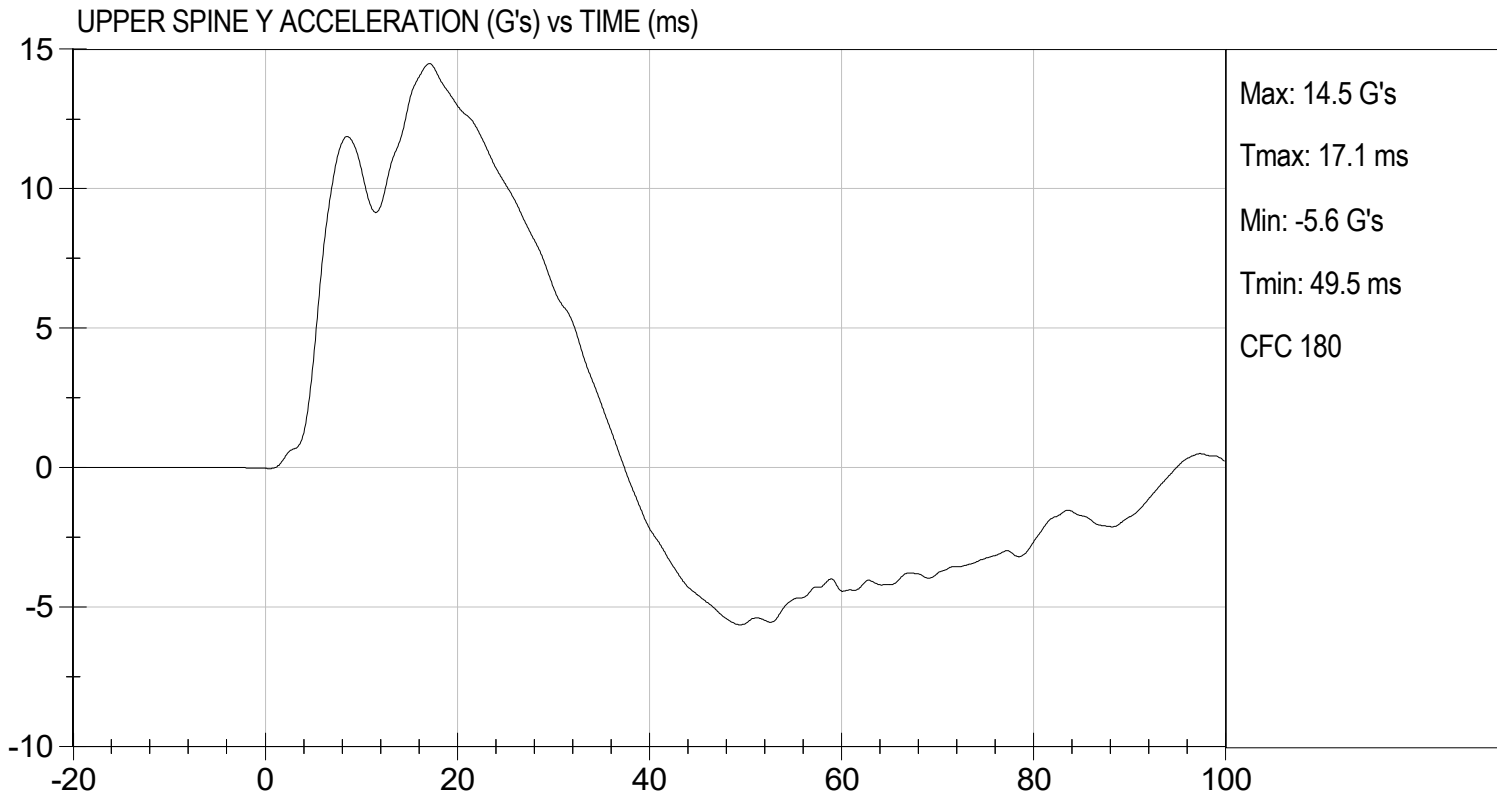

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ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

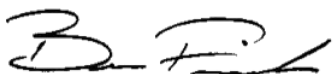
ATD Serial No: 306

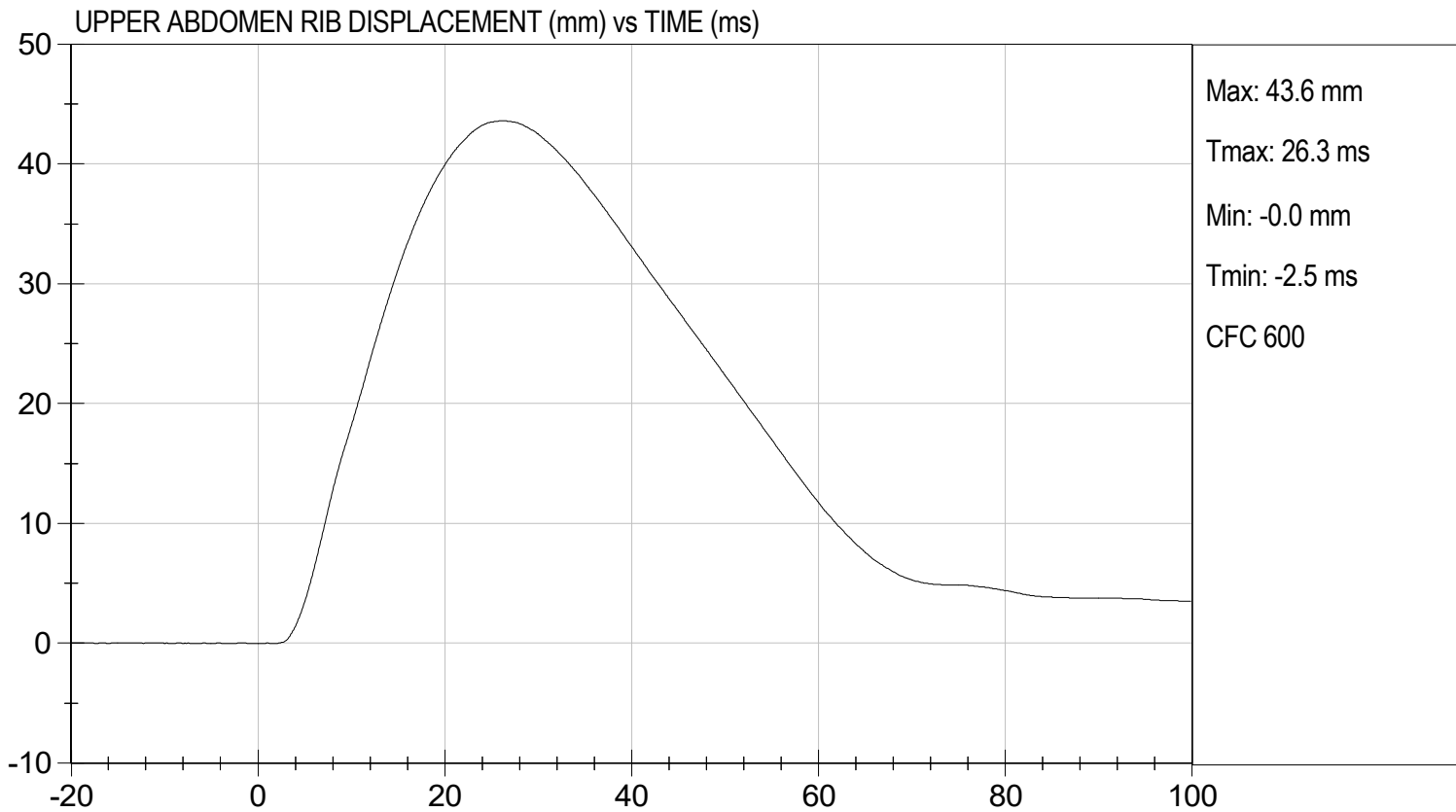
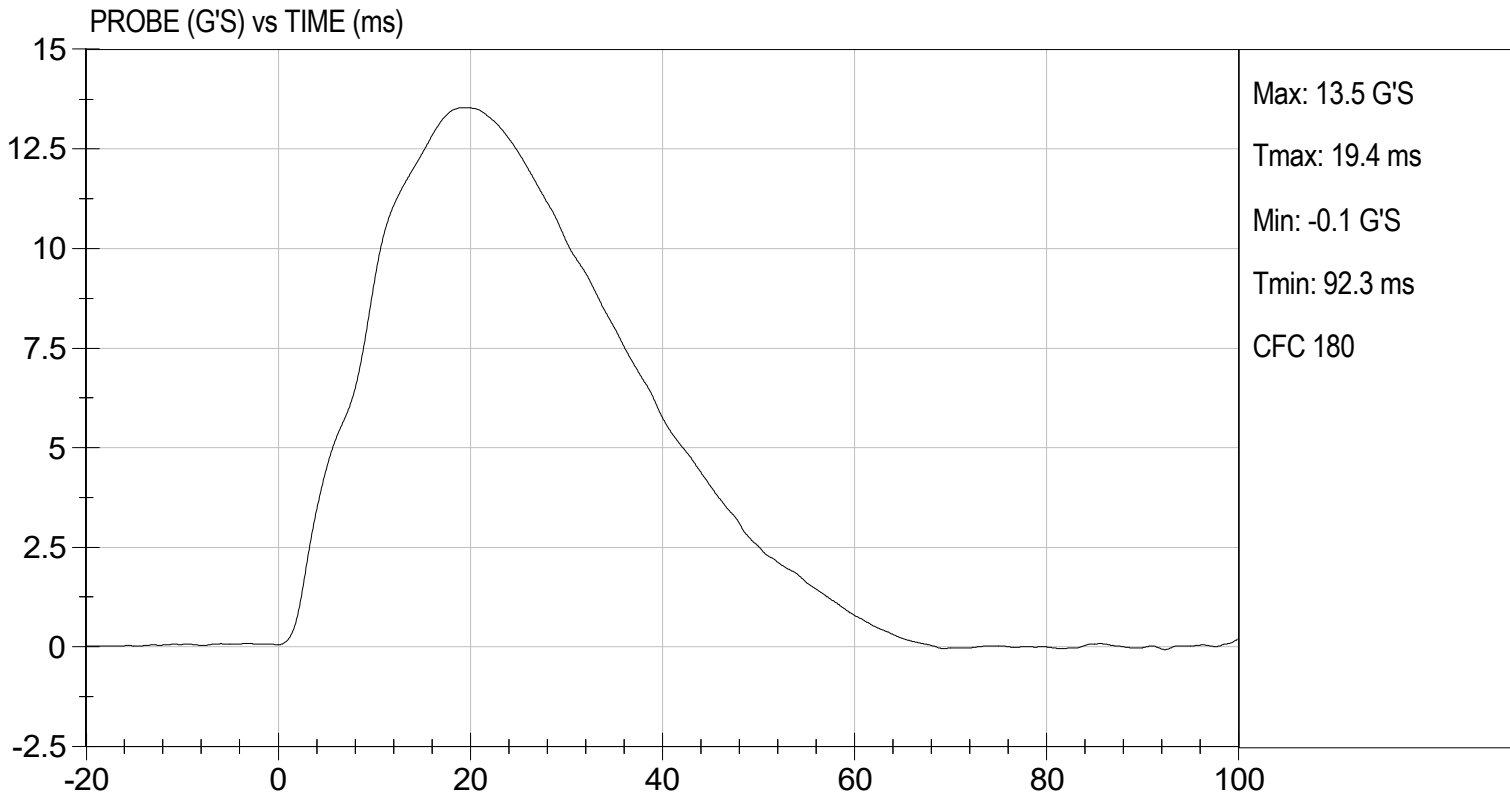
Test I.D: D242076

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	44	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

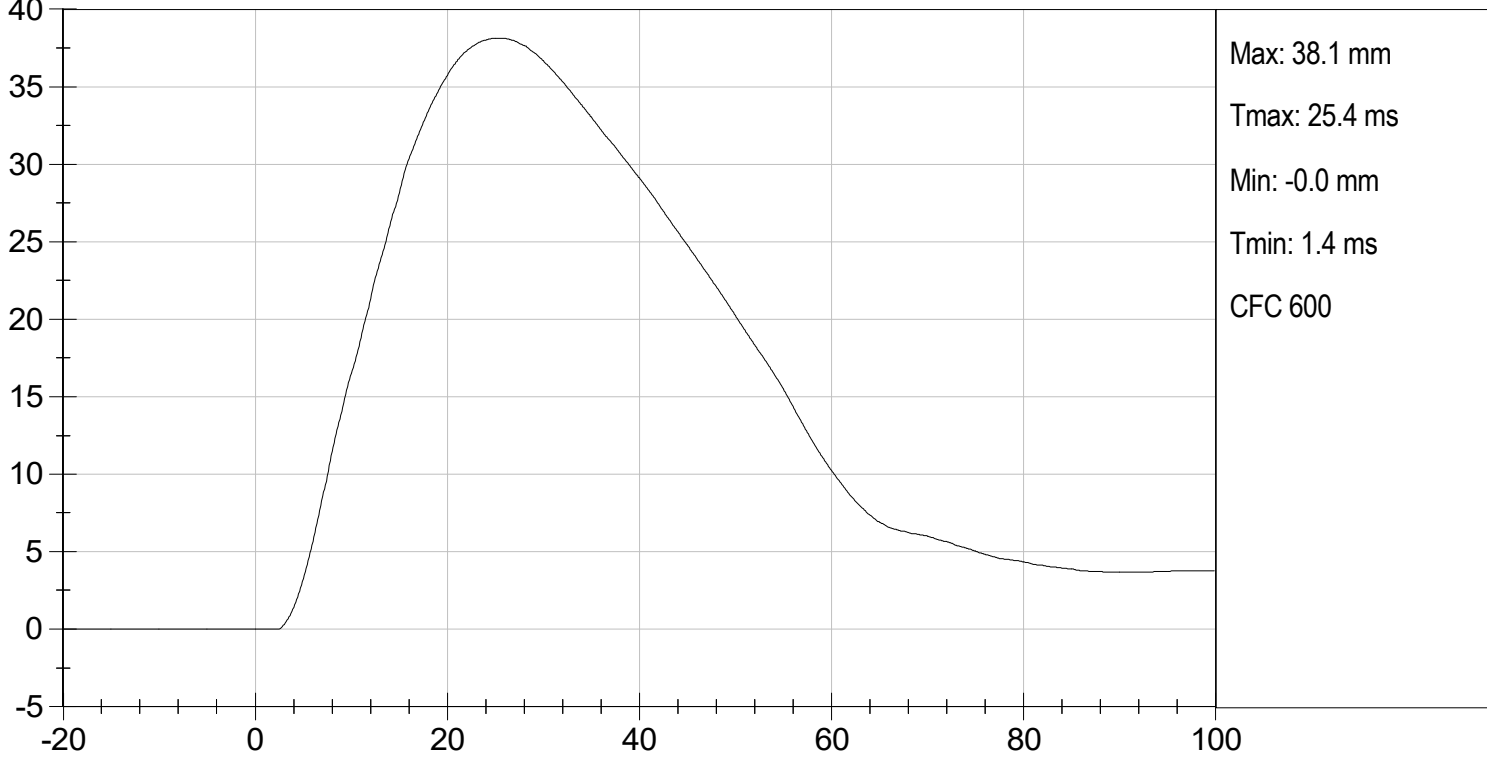
08/14/2024
Test Date


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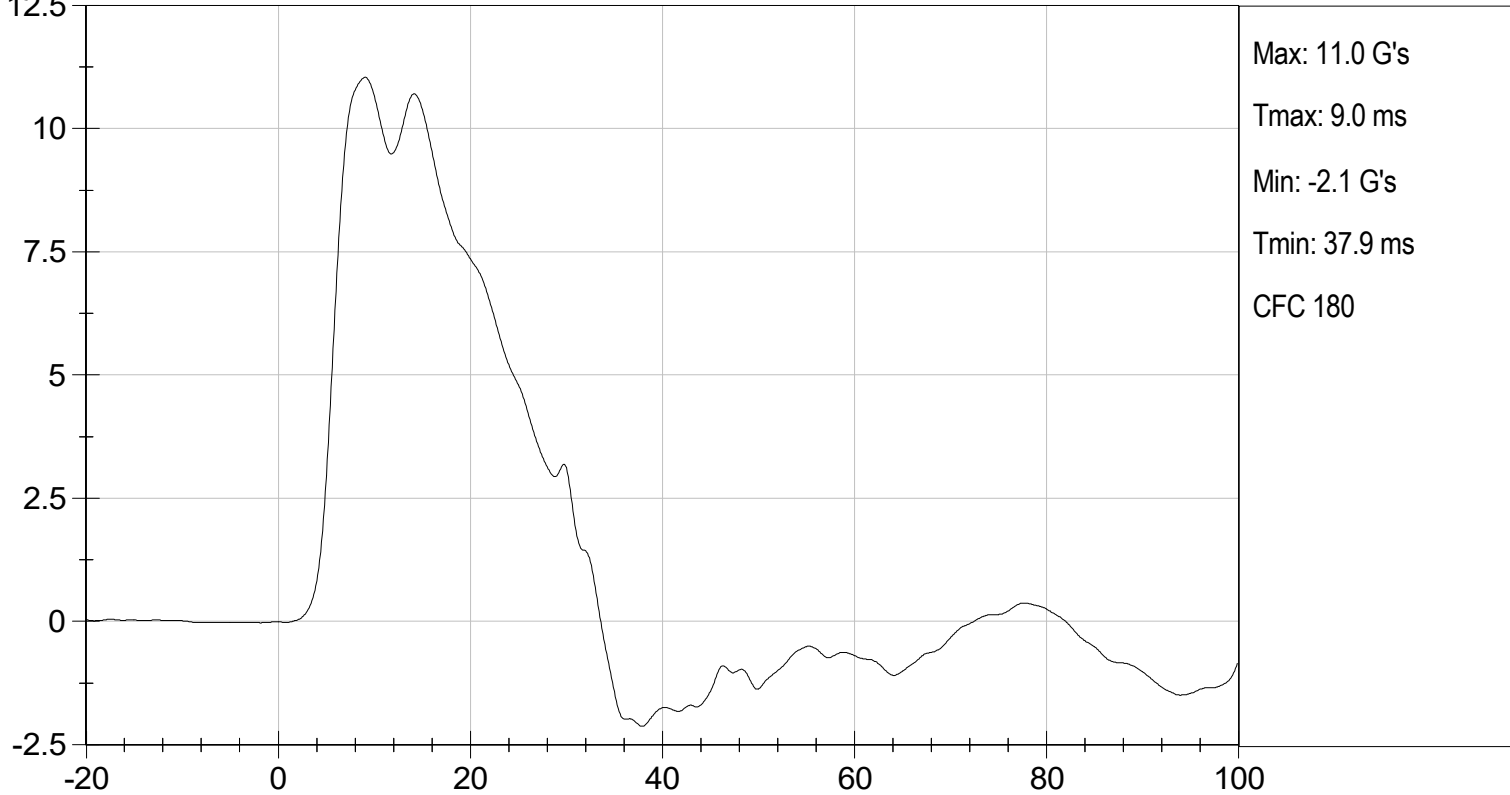




LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



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



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

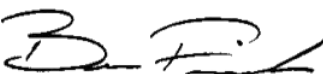
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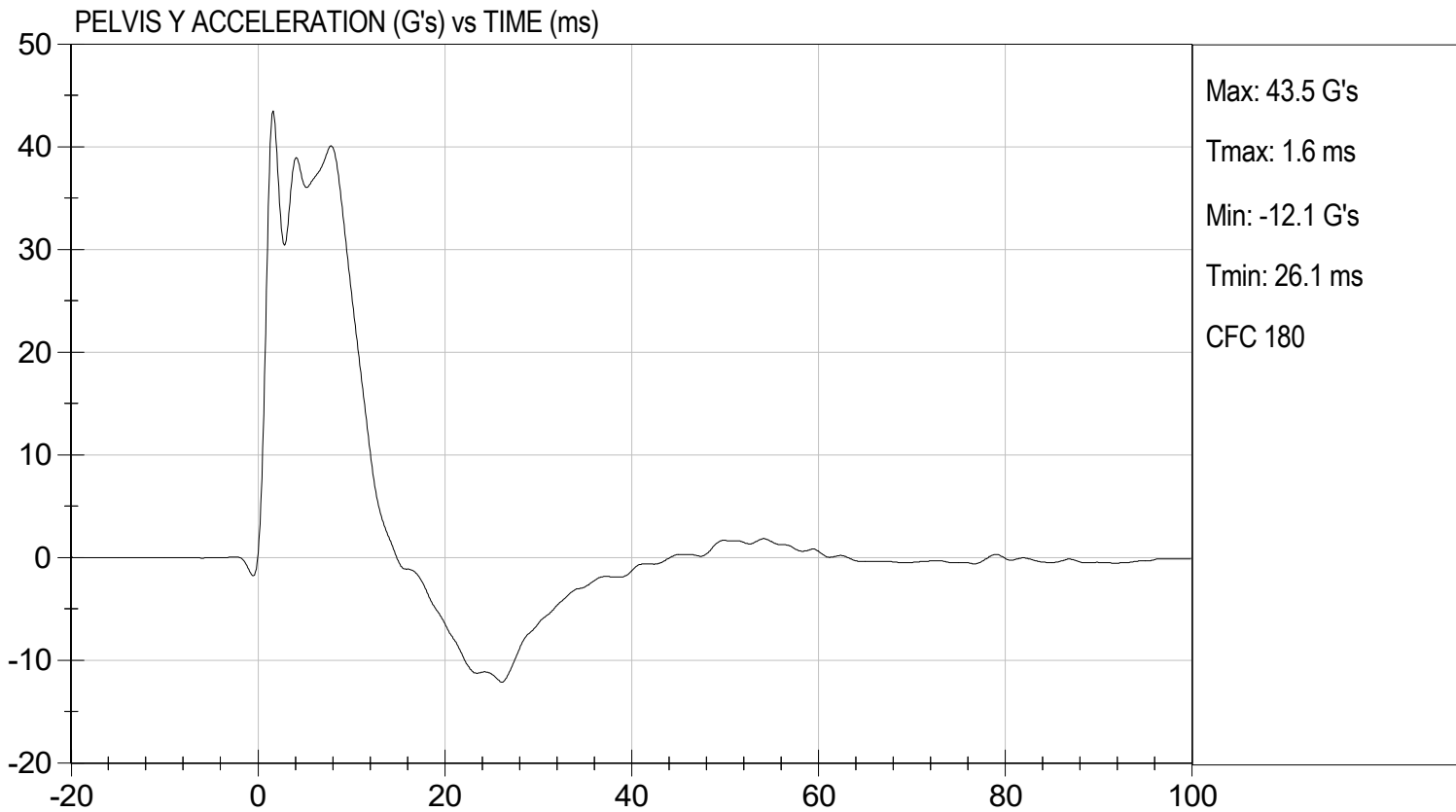
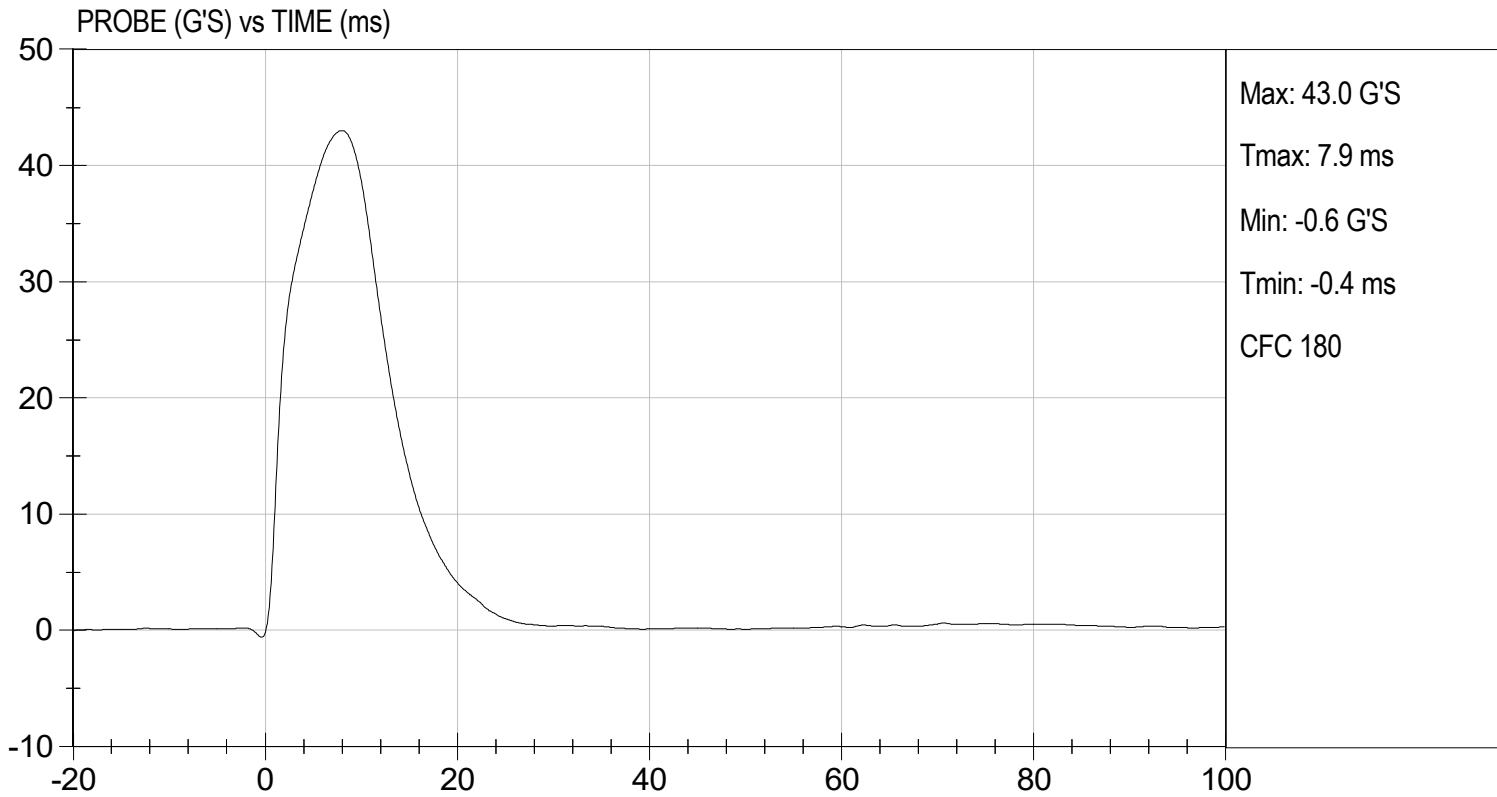
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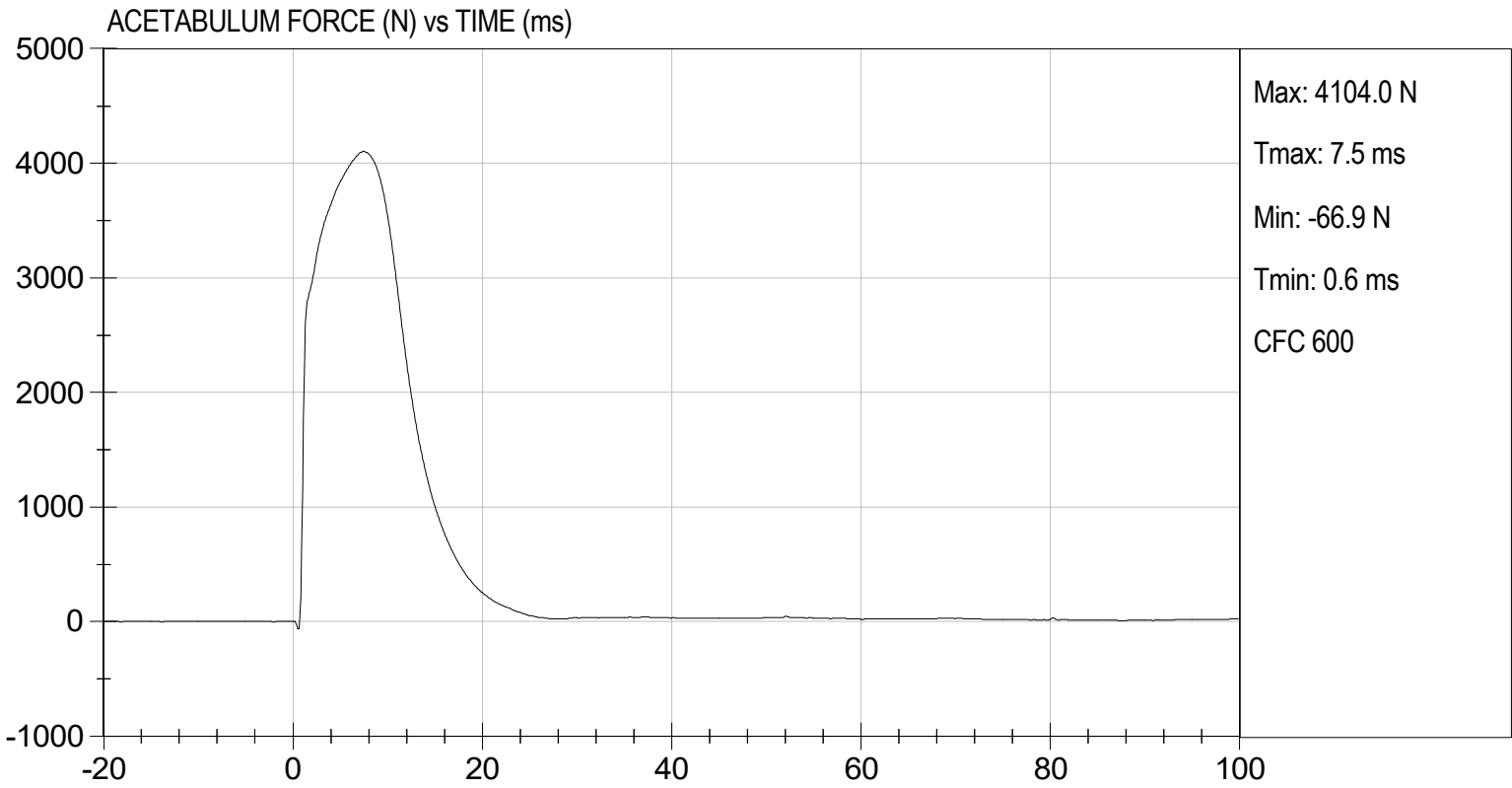
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40.1	Pass
Peak Acetabulum Force	N	3600 to 4300	4,104	Pass
Overall Test Results				Pass


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

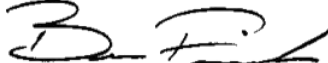
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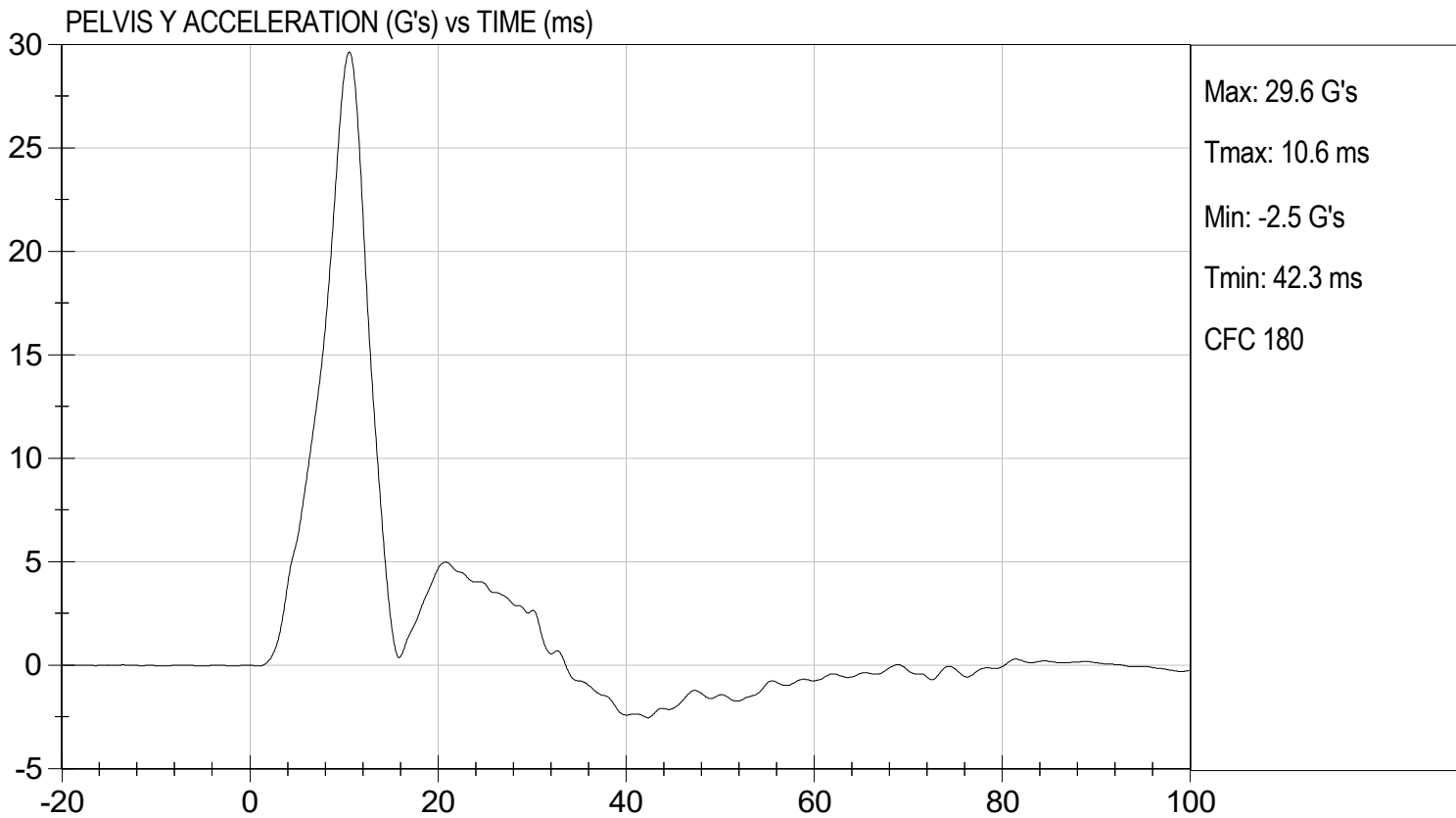
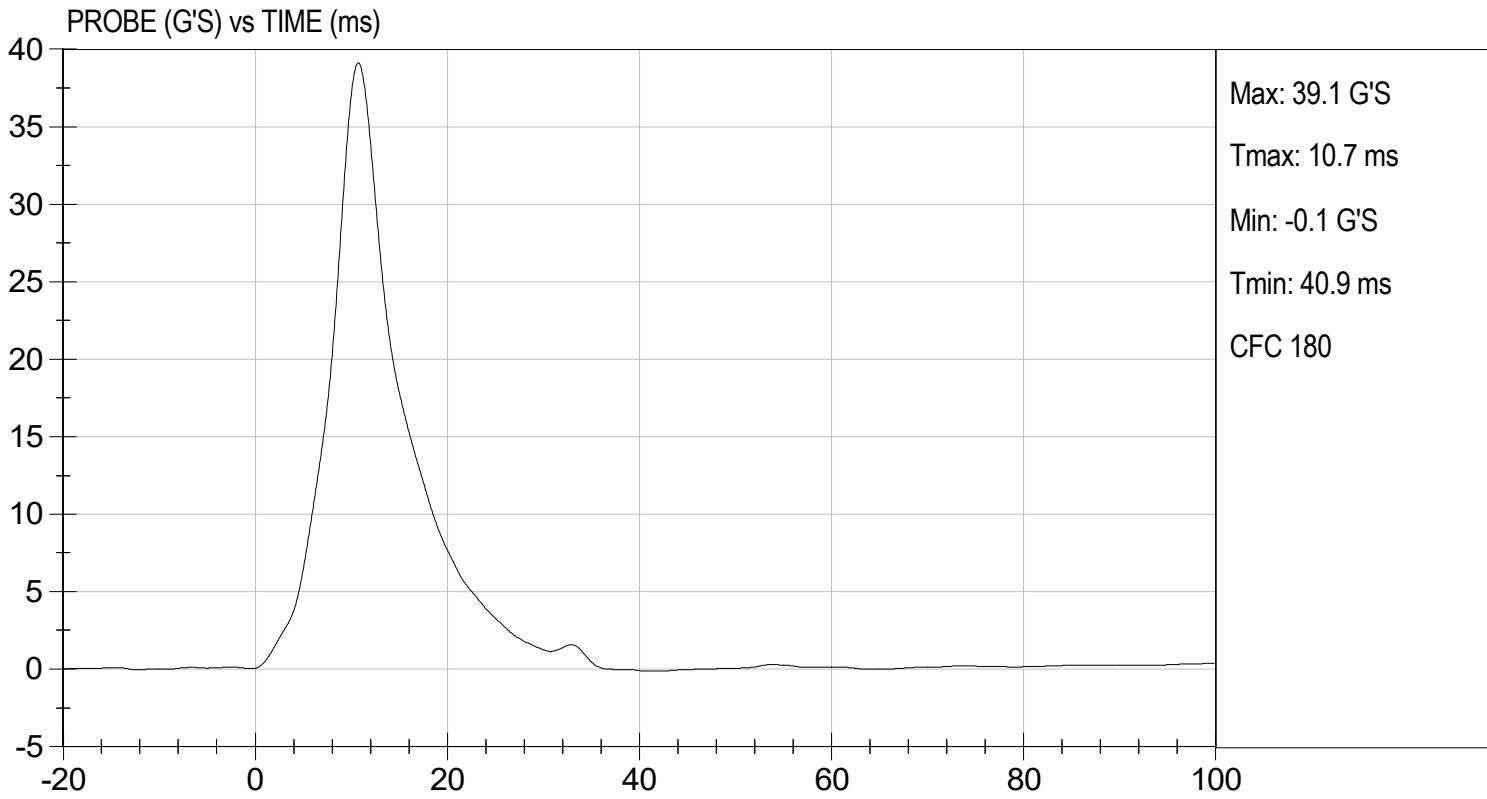
Test I.D: D242078

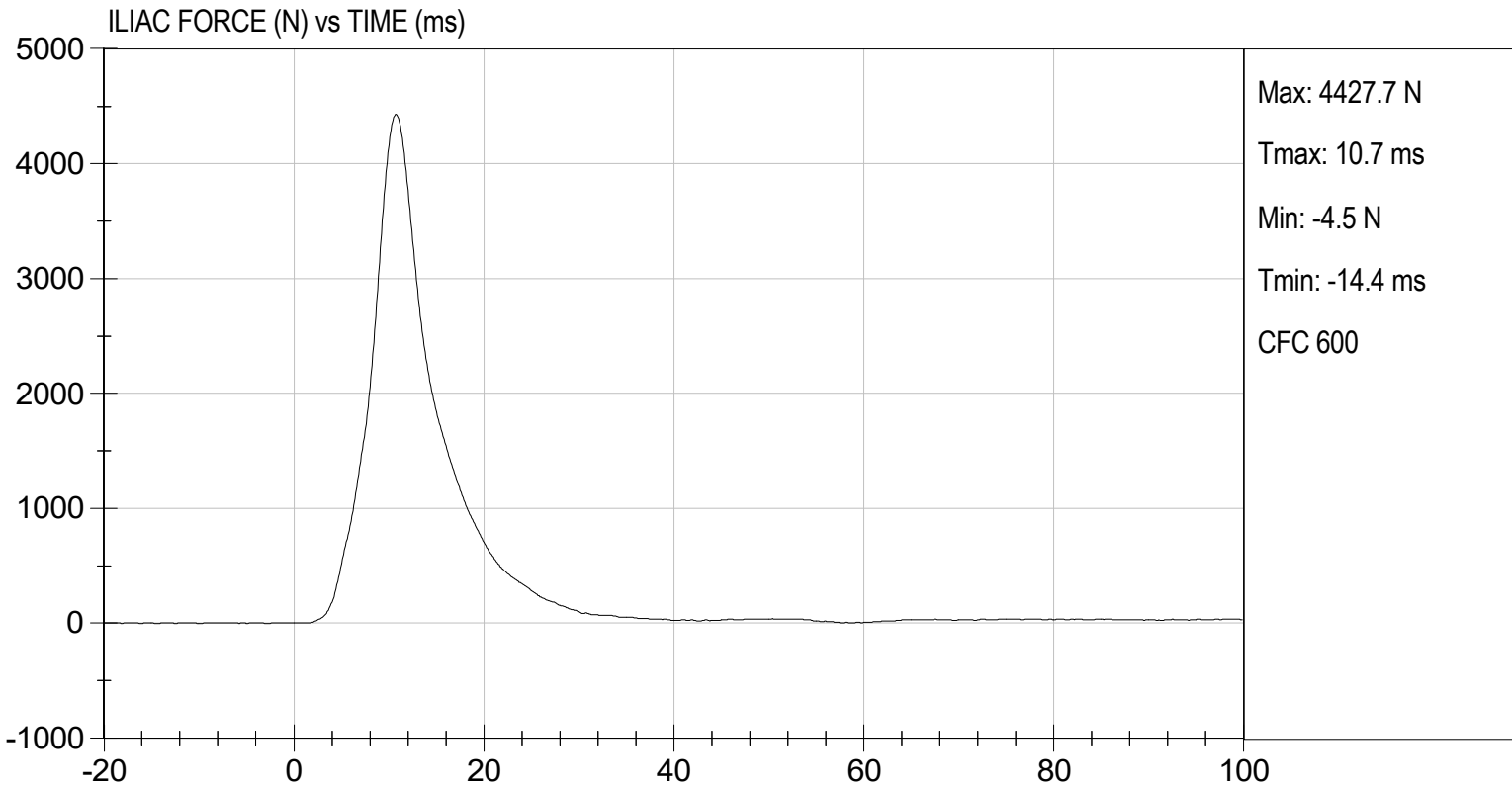
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	30	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,428	Pass
Overall Test Results				Pass


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08/14/2024
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QUALIFICATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 306

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

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

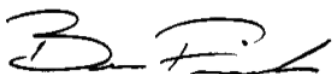
ATD Serial No: 306

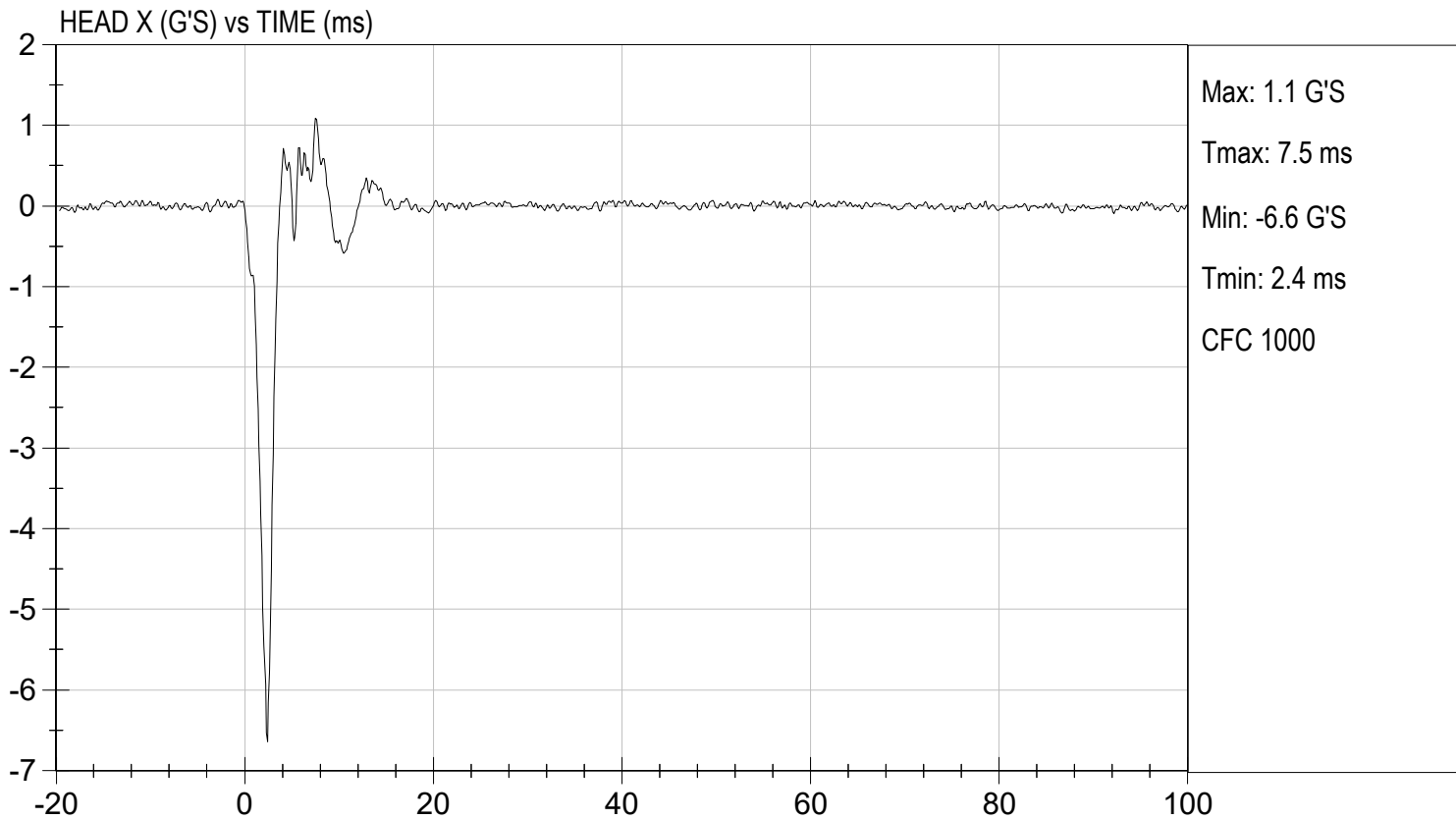
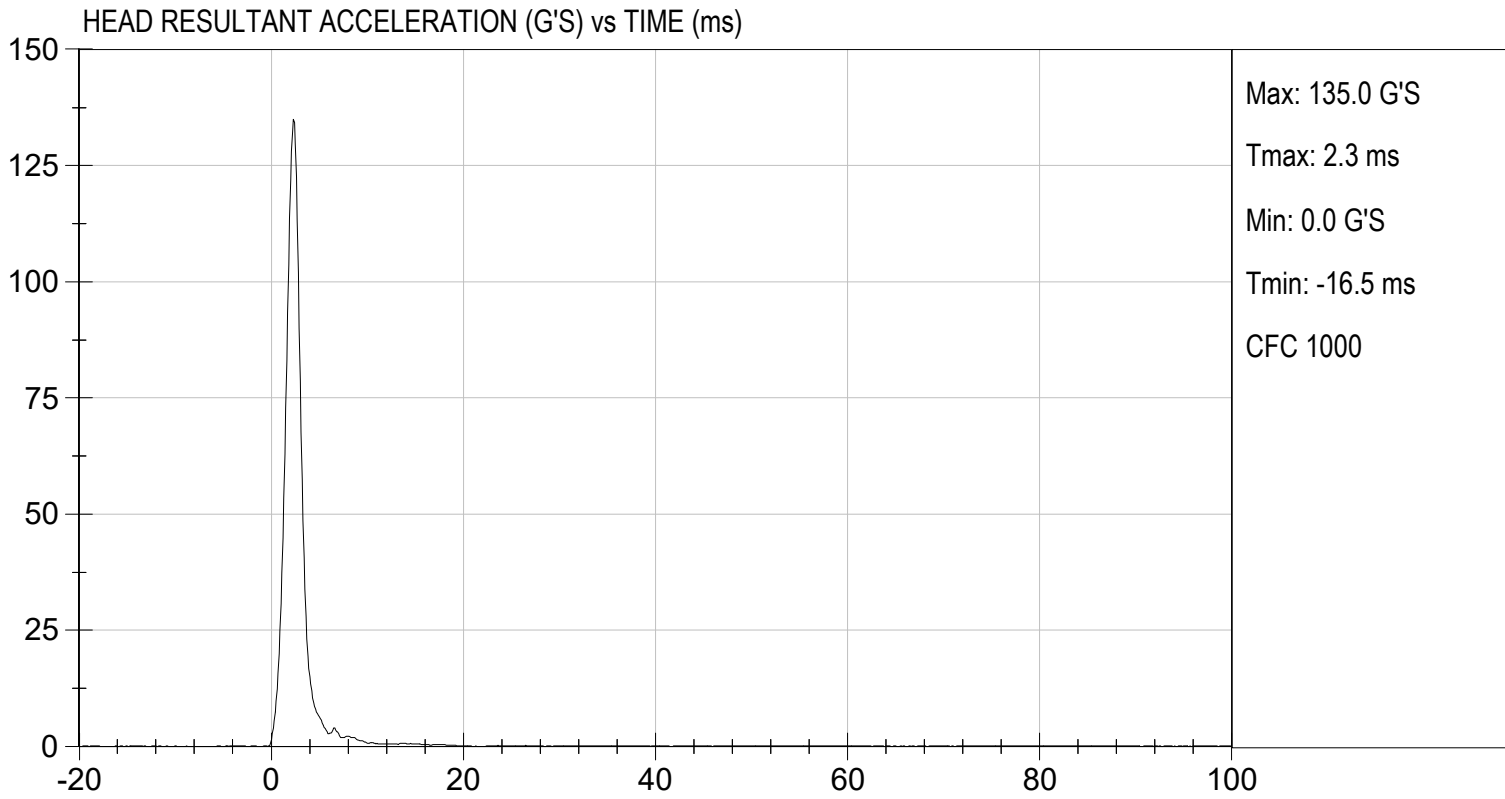
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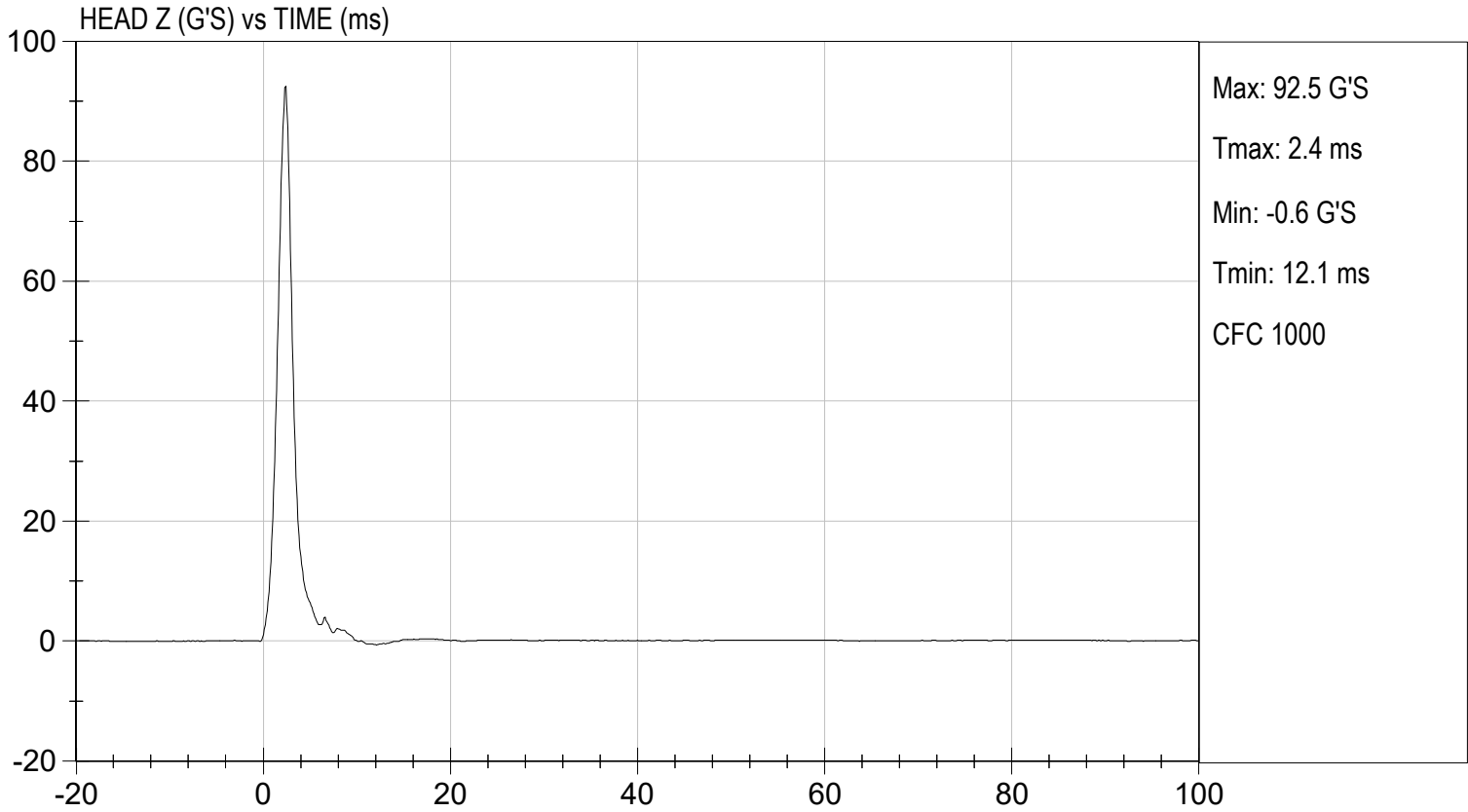
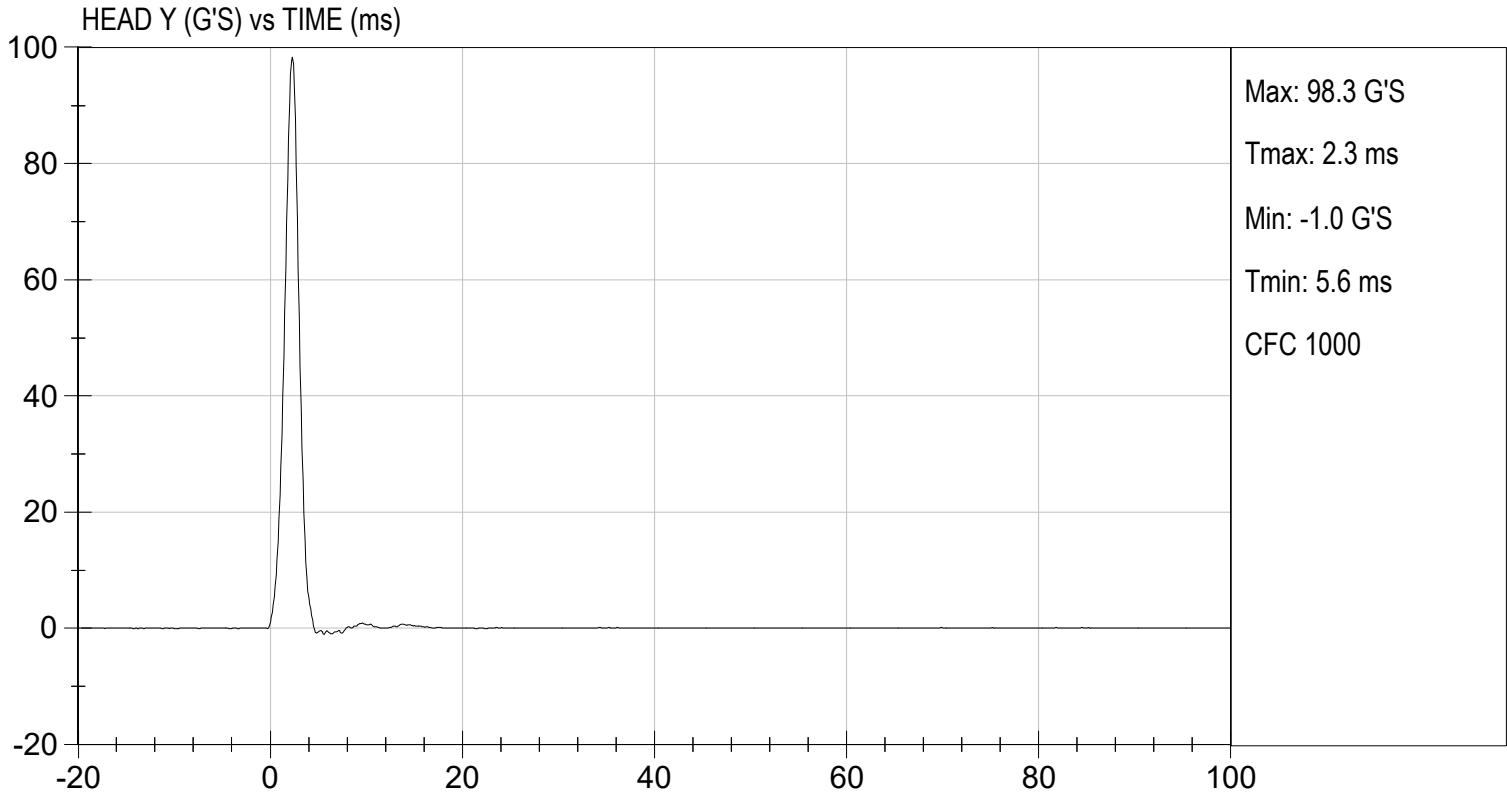
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	115 to 137	135	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-6.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass


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09/03/2024
 Test Date


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

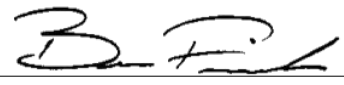
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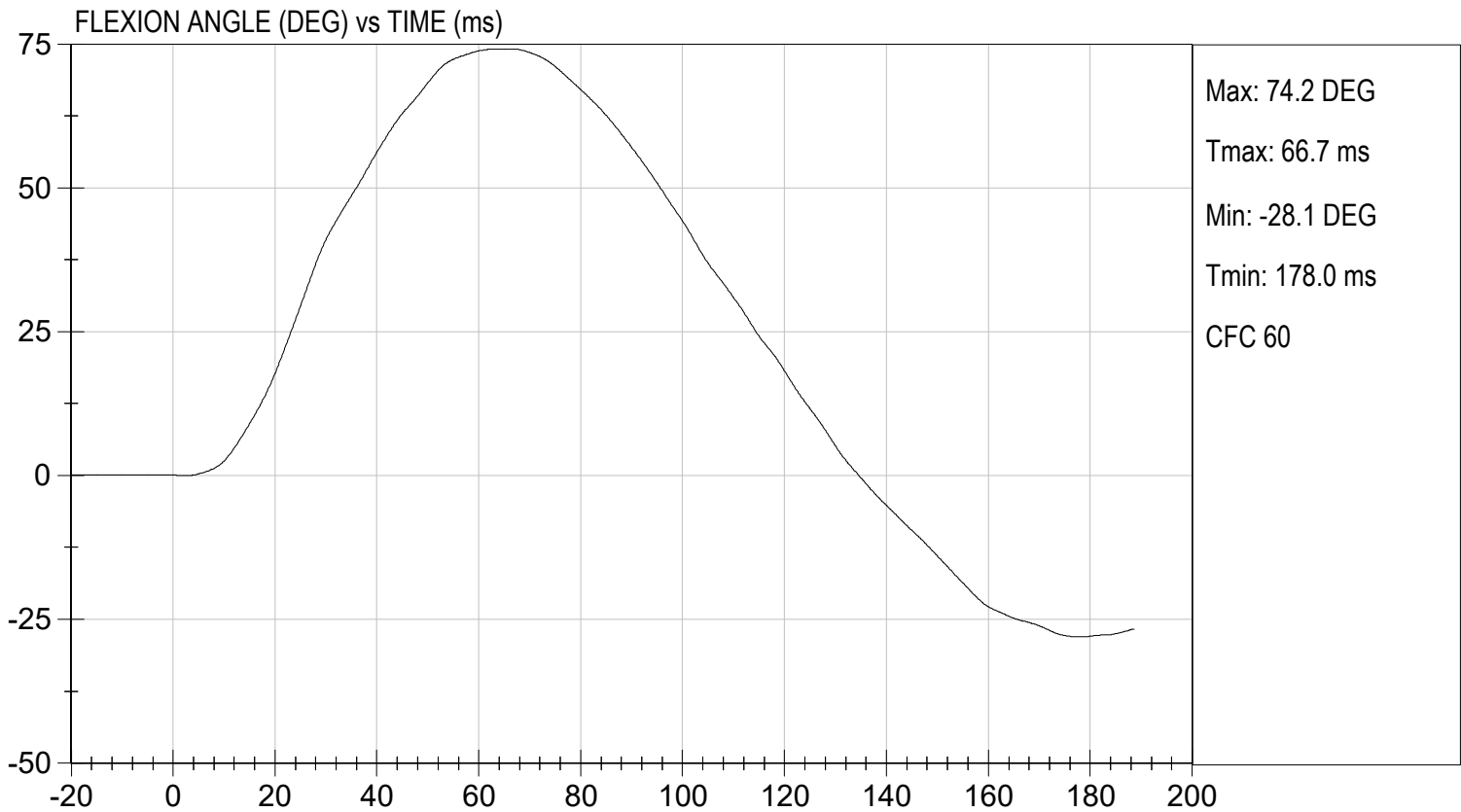
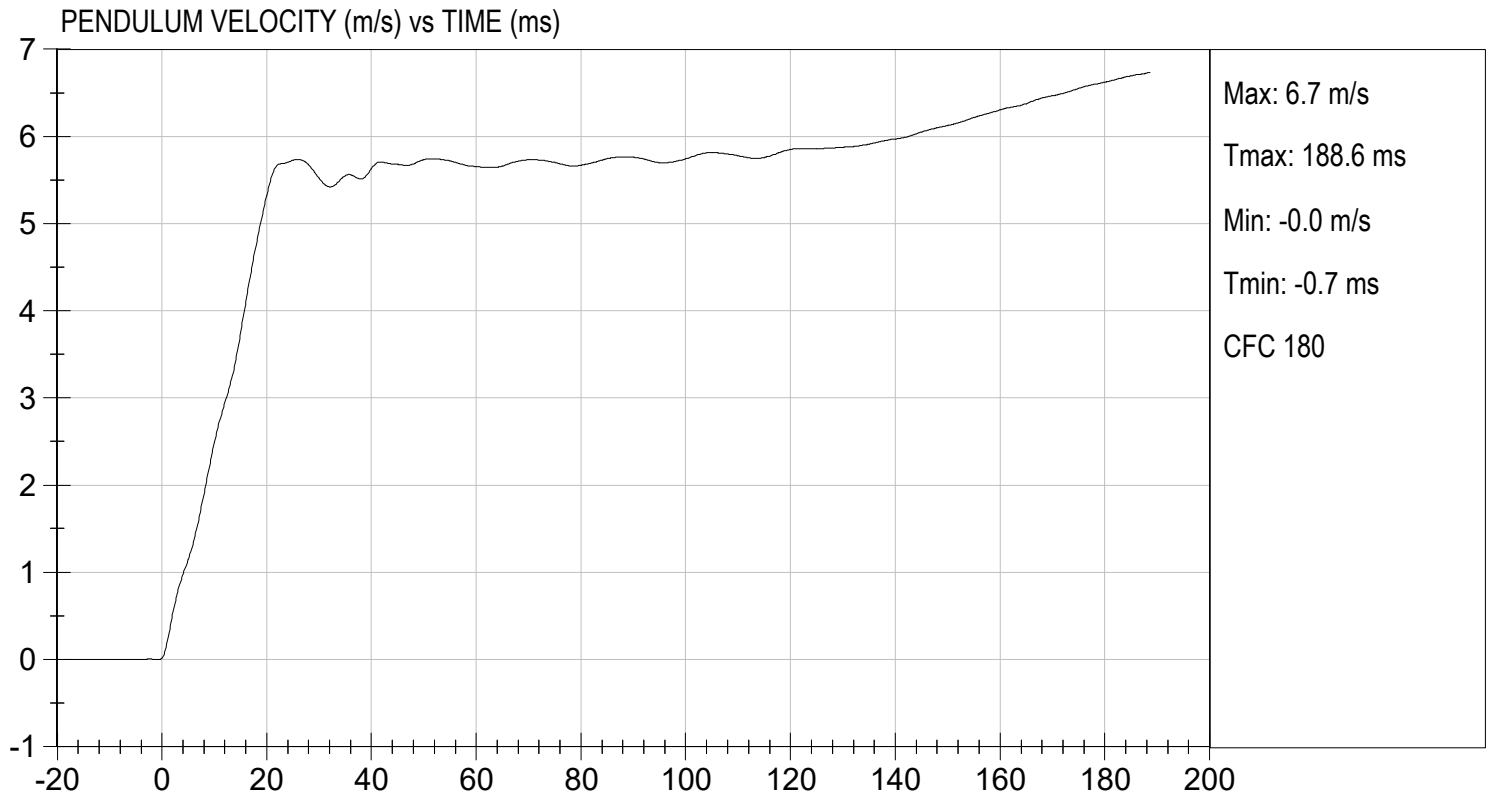
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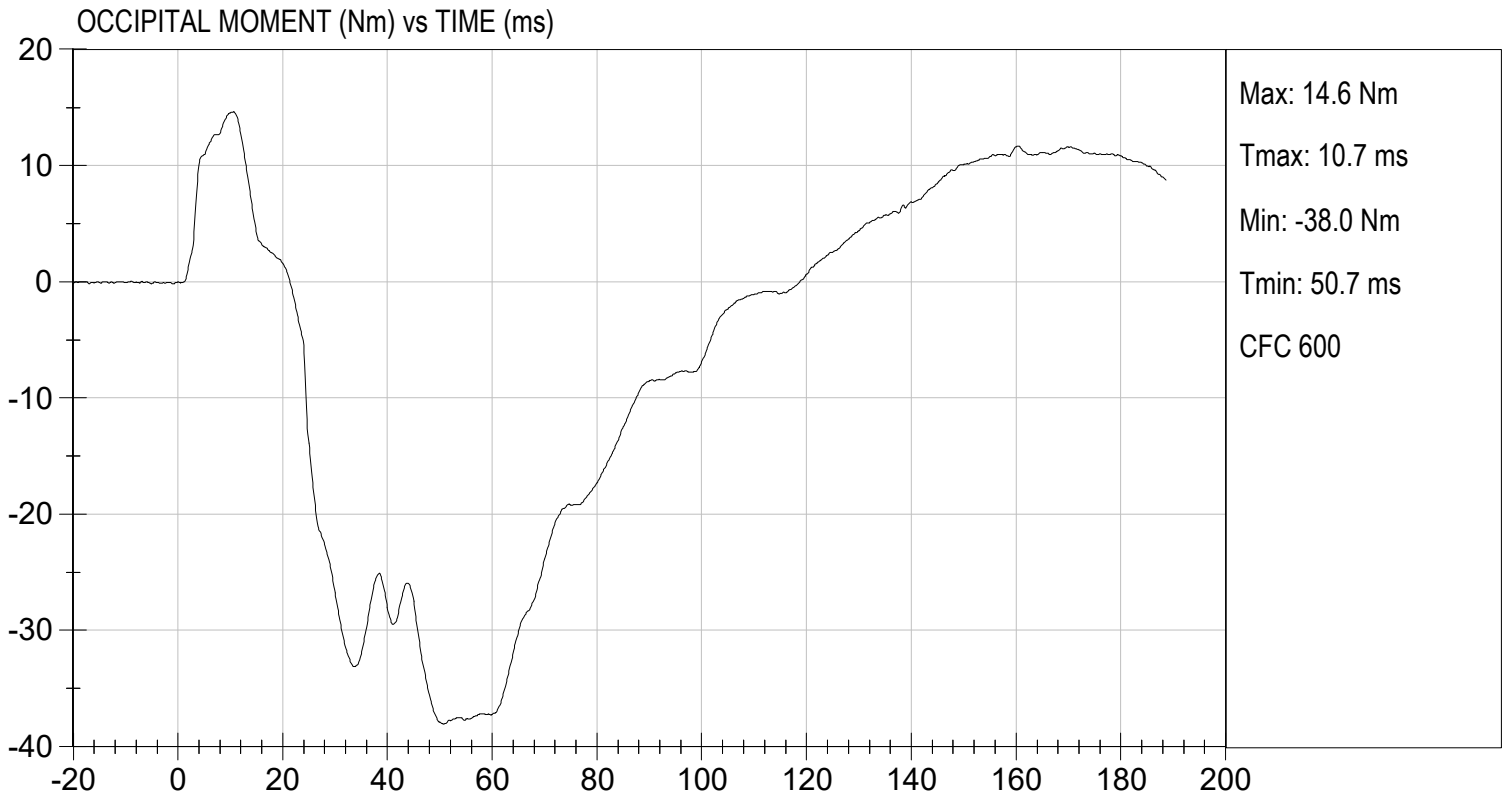
Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.2	Pass
Humidity		%	10 to 70	38	Pass
Impact Velocity		m/s	5.51 to 5.63	5.52	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.49	Pass
	15 ms	m/s	3.30 to 4.10	3.75	Pass
	20 ms	m/s	4.40 to 5.40	5.33	Pass
	25 ms	m/s	5.40 to 6.10	5.73	Pass
	25-100 ms	m/s	5.50 to 6.20	5.76	Pass
Maximum D-Plane Rotation		deg	71 to 81	74	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	67	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-38	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	119	Pass
Overall Test Results					Pass


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09/03/2024
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MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

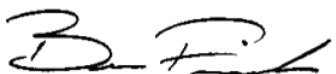
ATD Serial No: 306

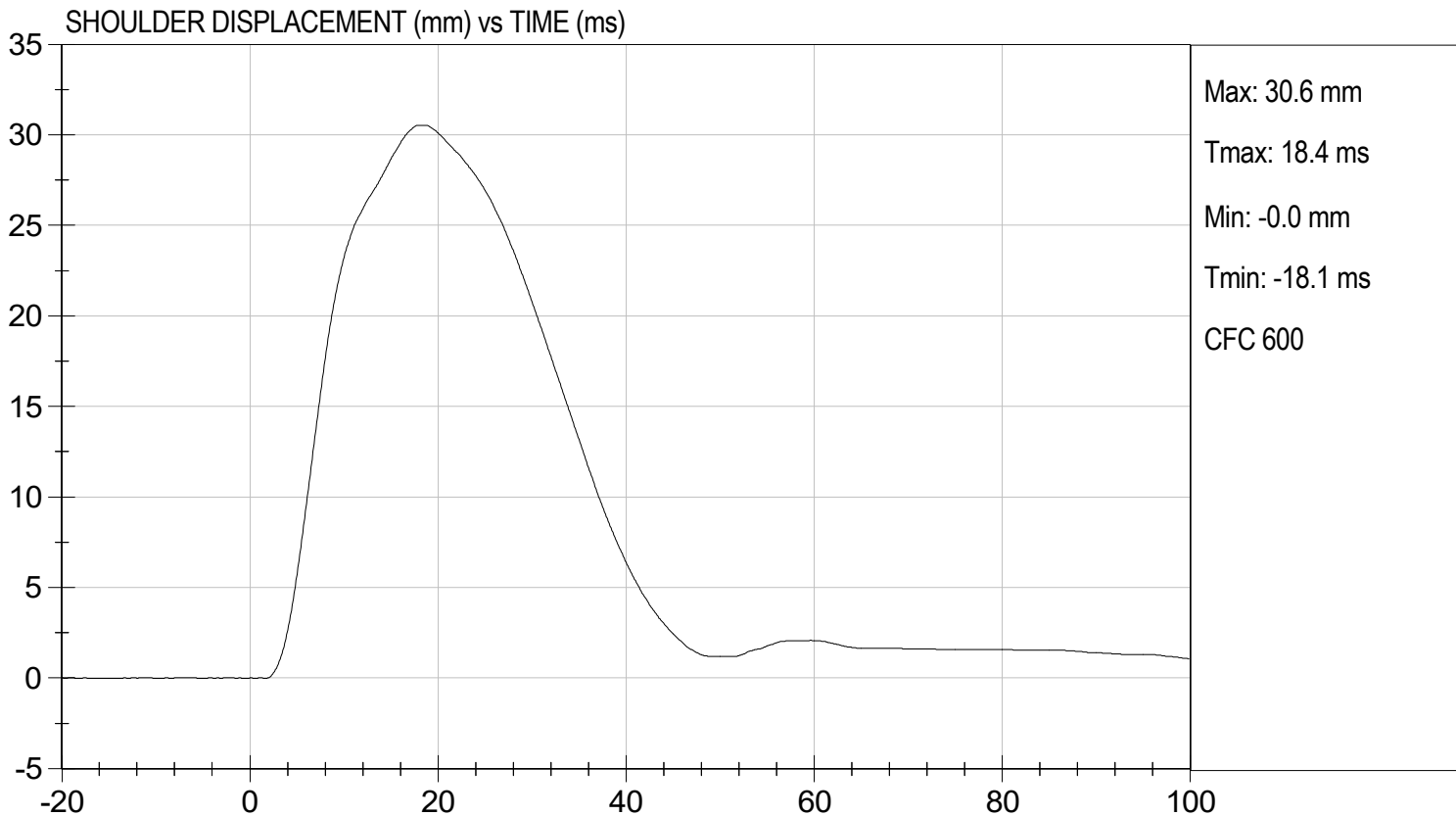
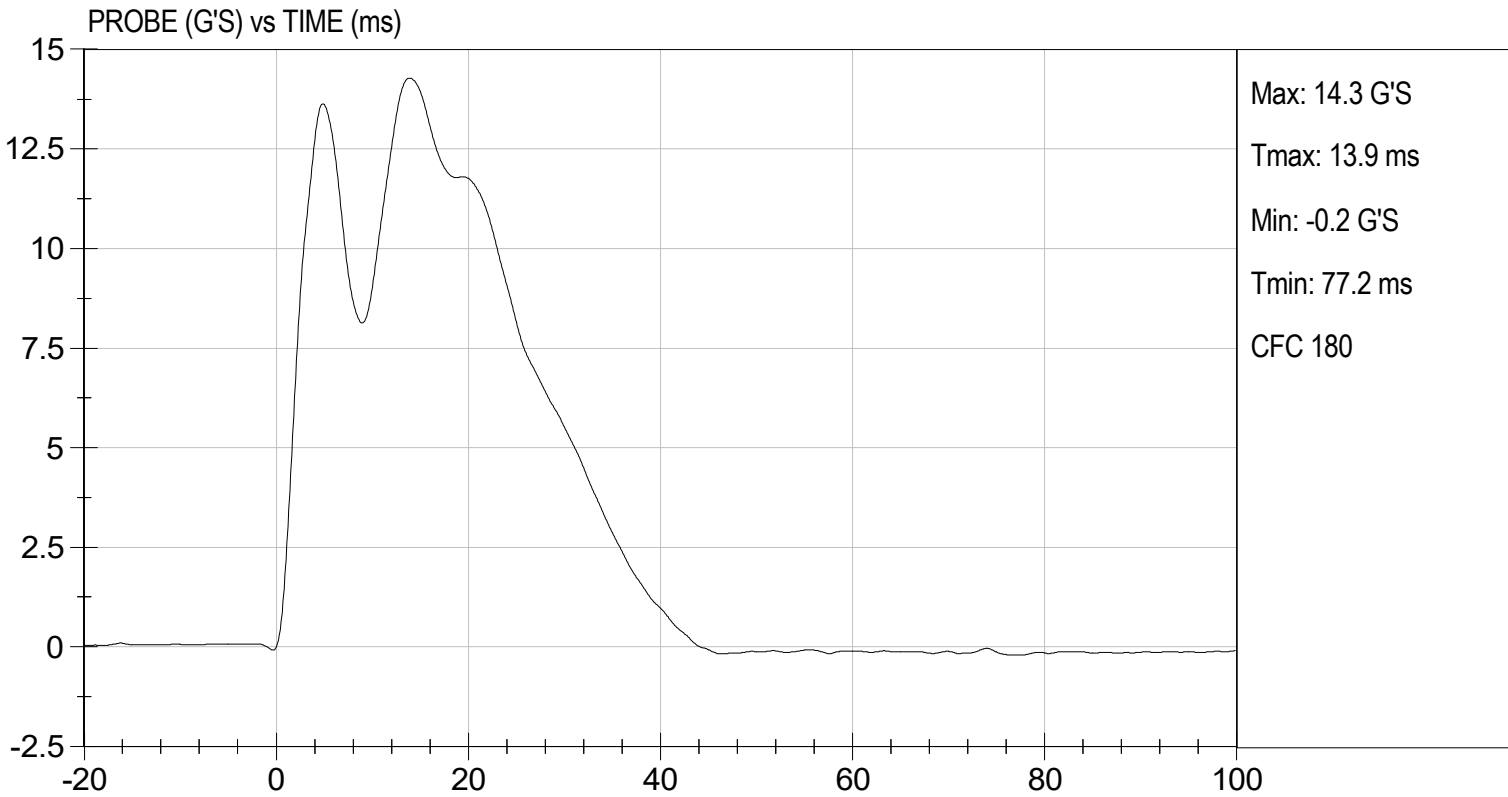
Test ID: D242263

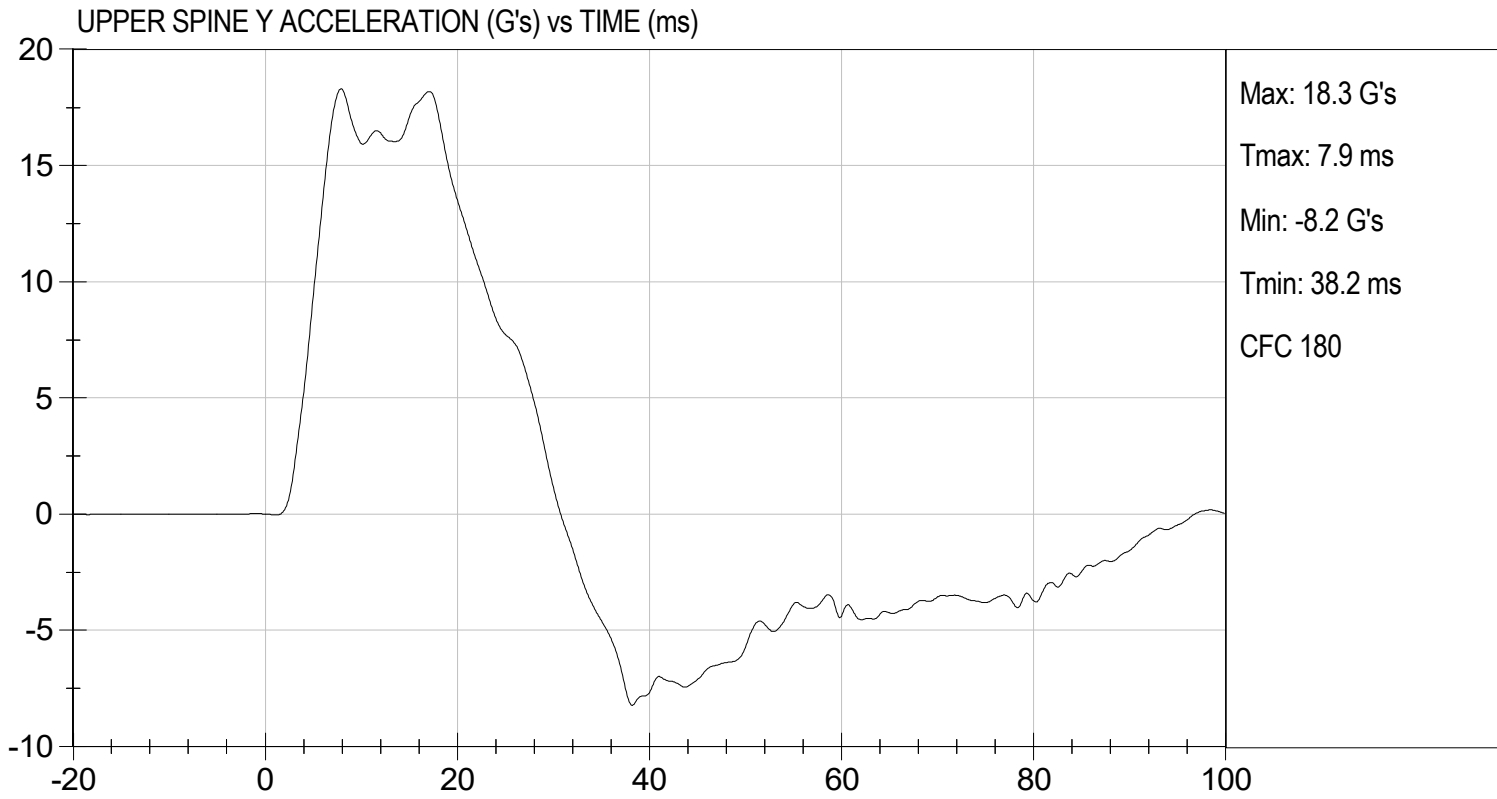
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	14	Pass
Shoulder Displacement	mm	28 to 37	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass


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09/03/2024
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**MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-Its BUILD LEVEL D DUMMY**

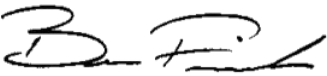
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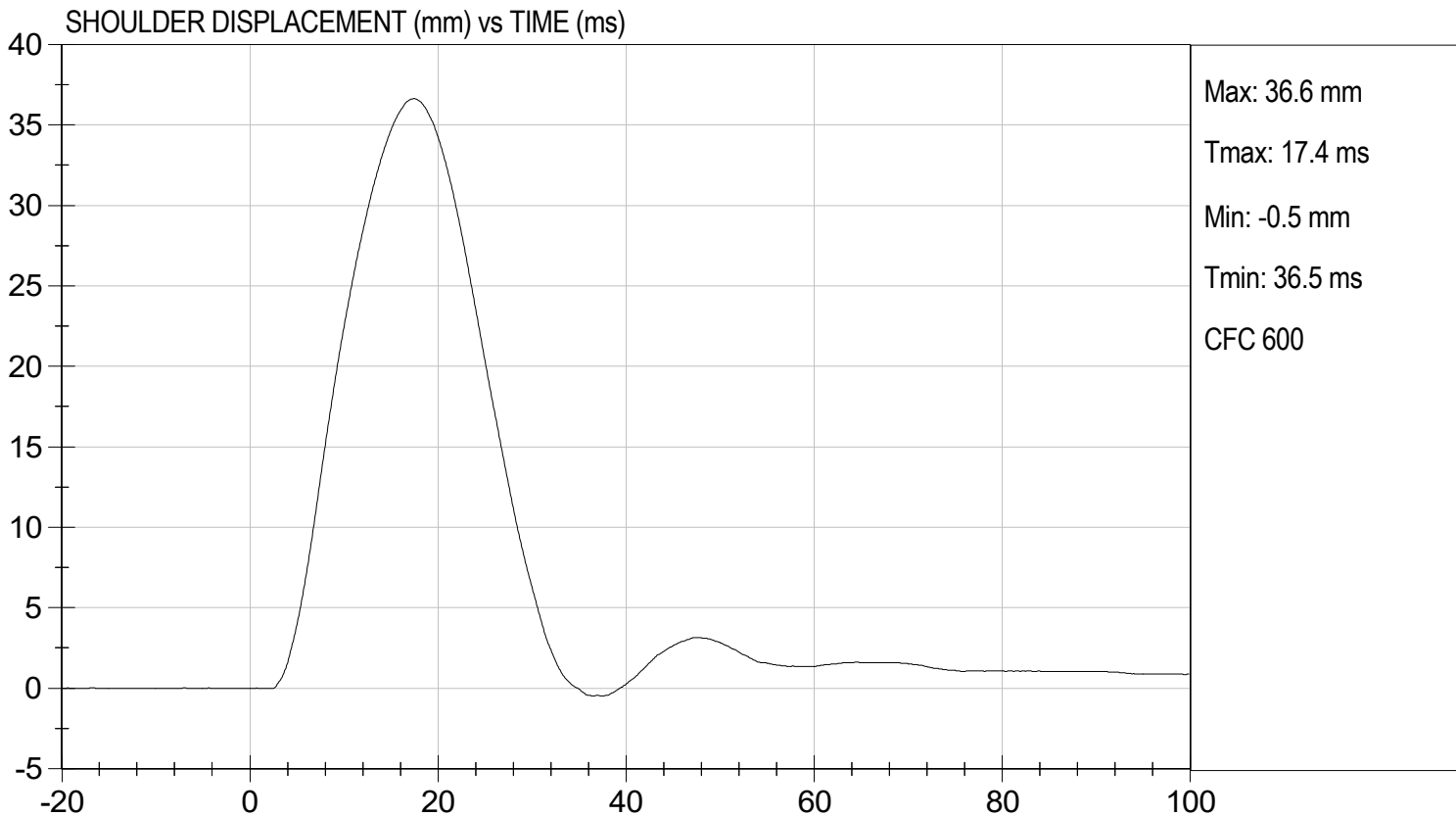
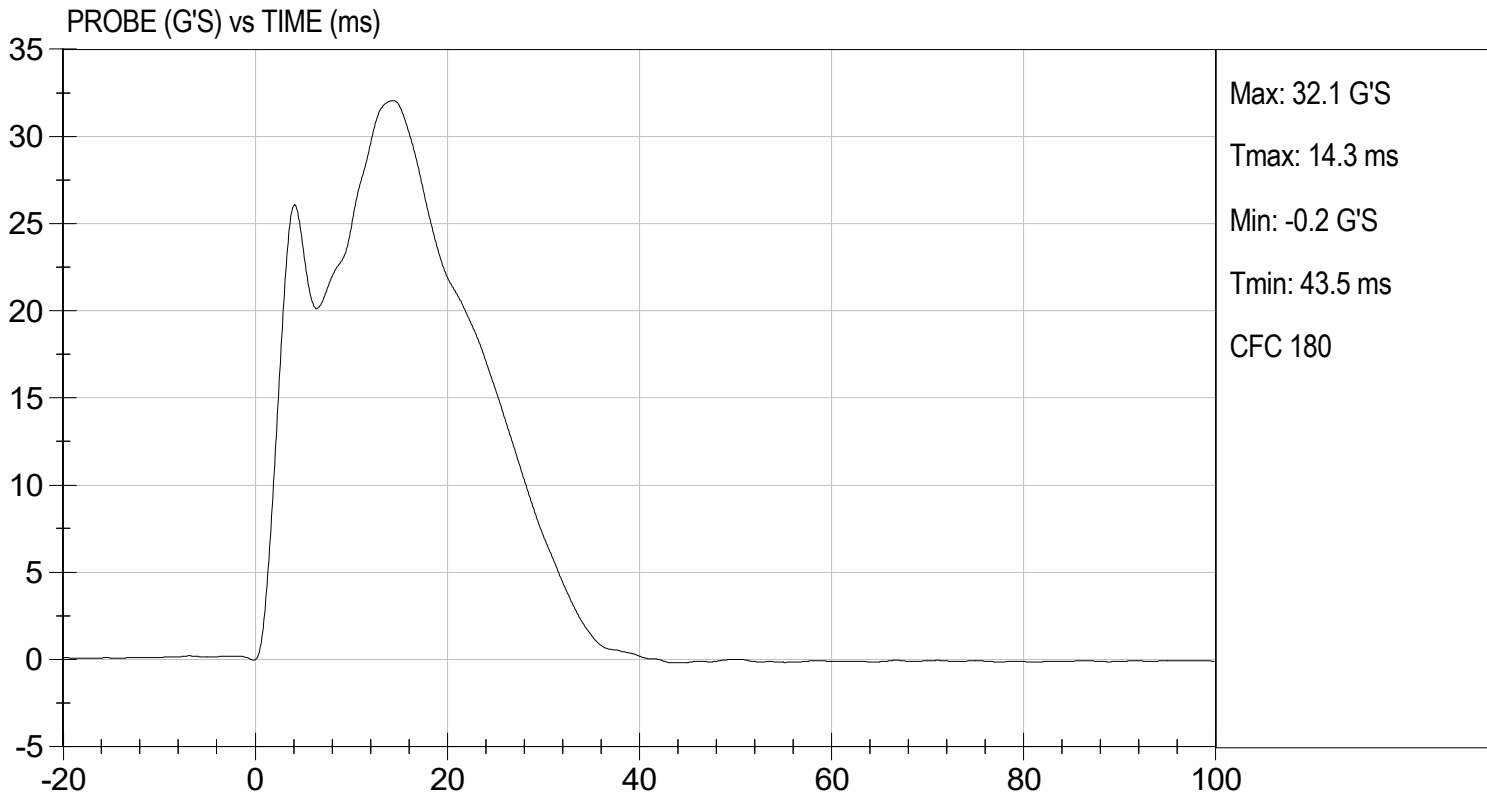
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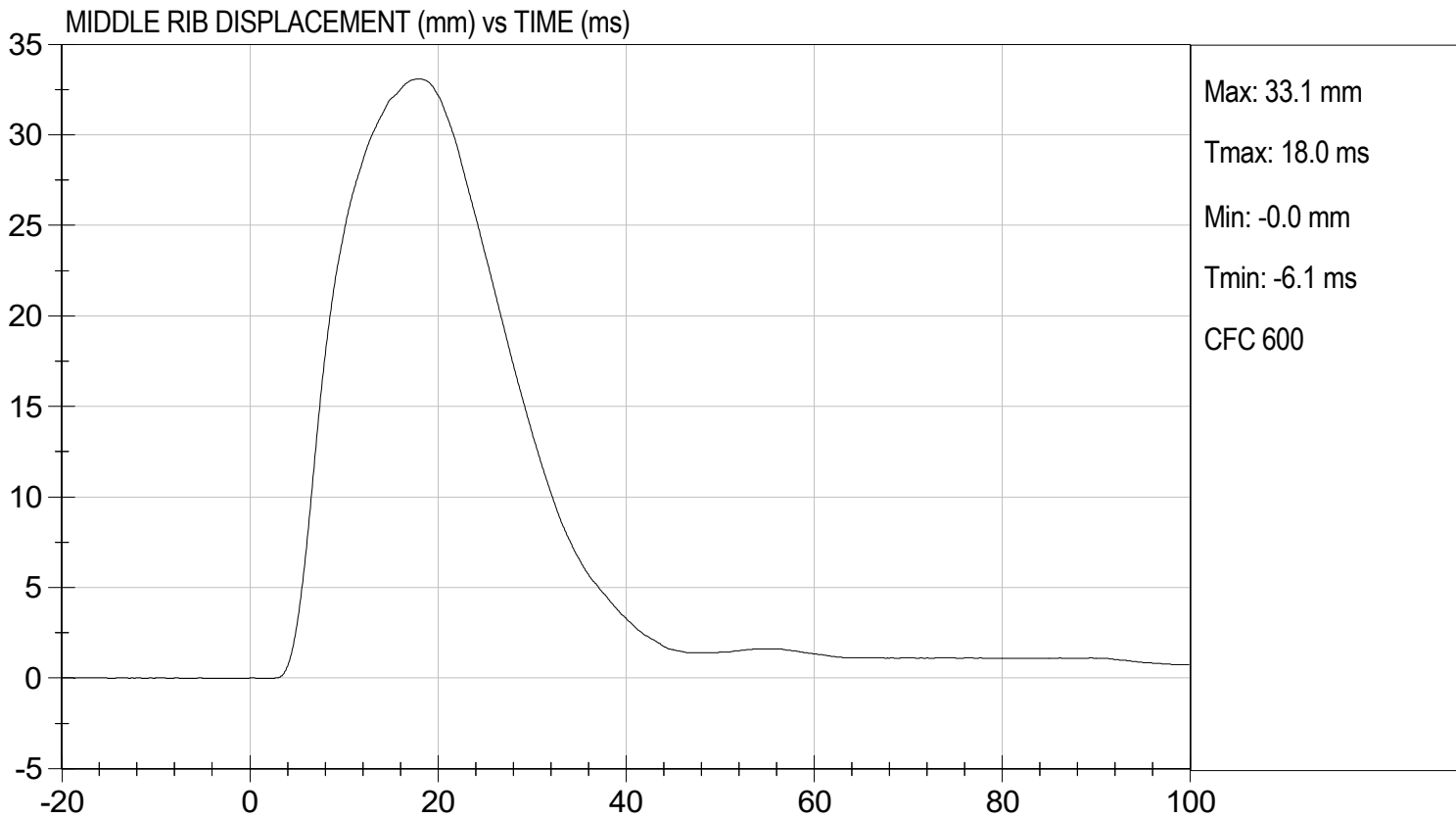
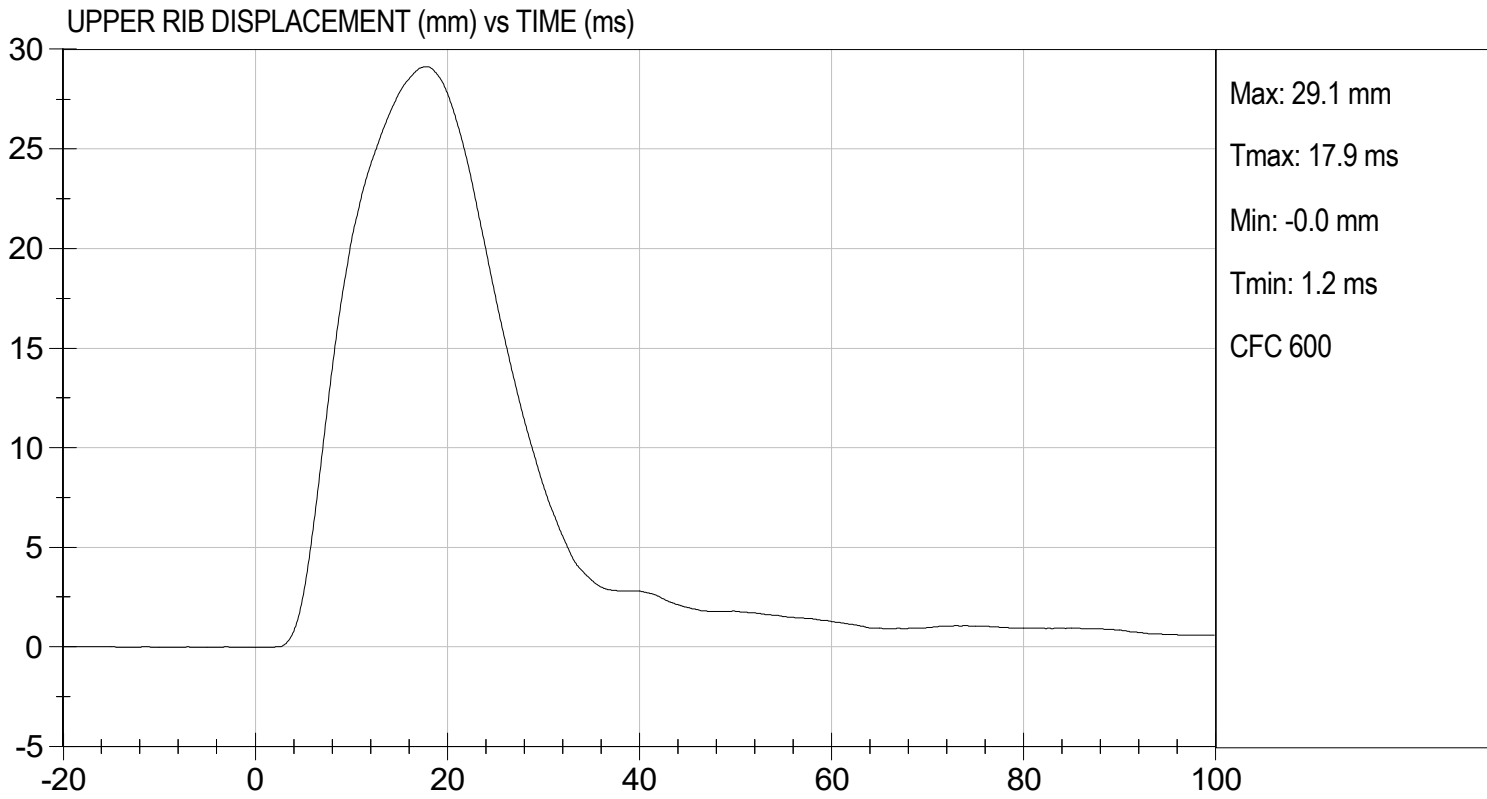
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	37	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle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

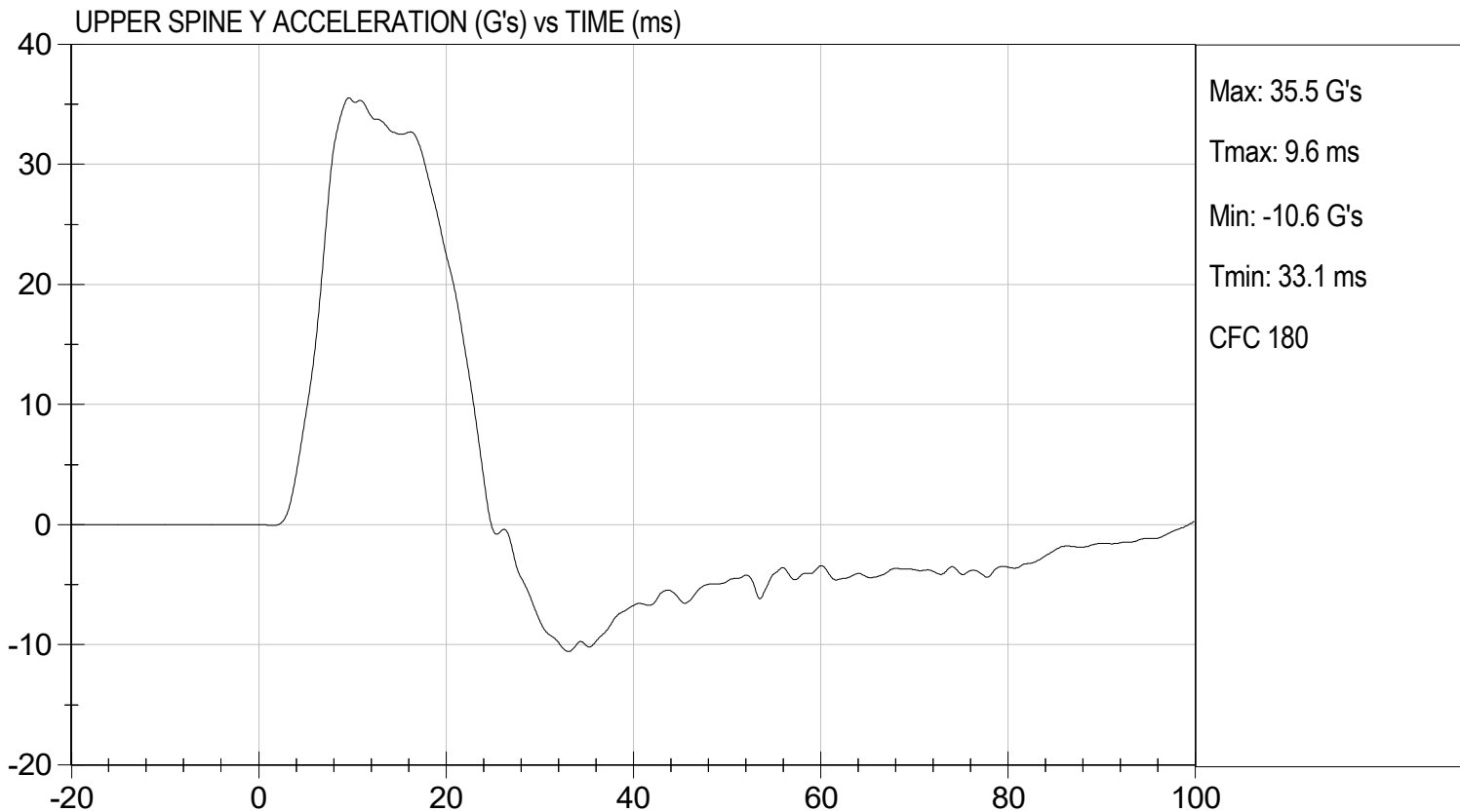
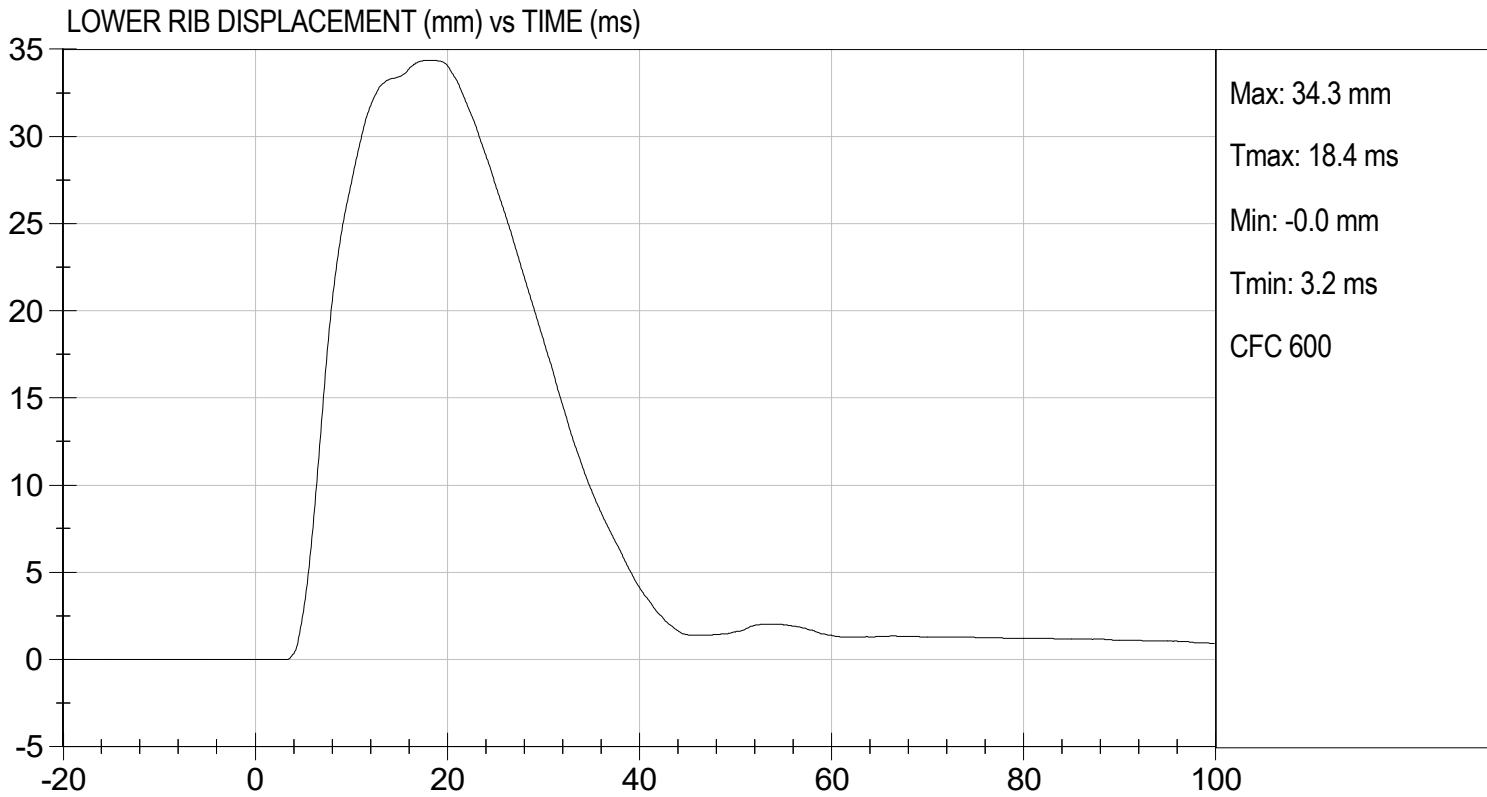

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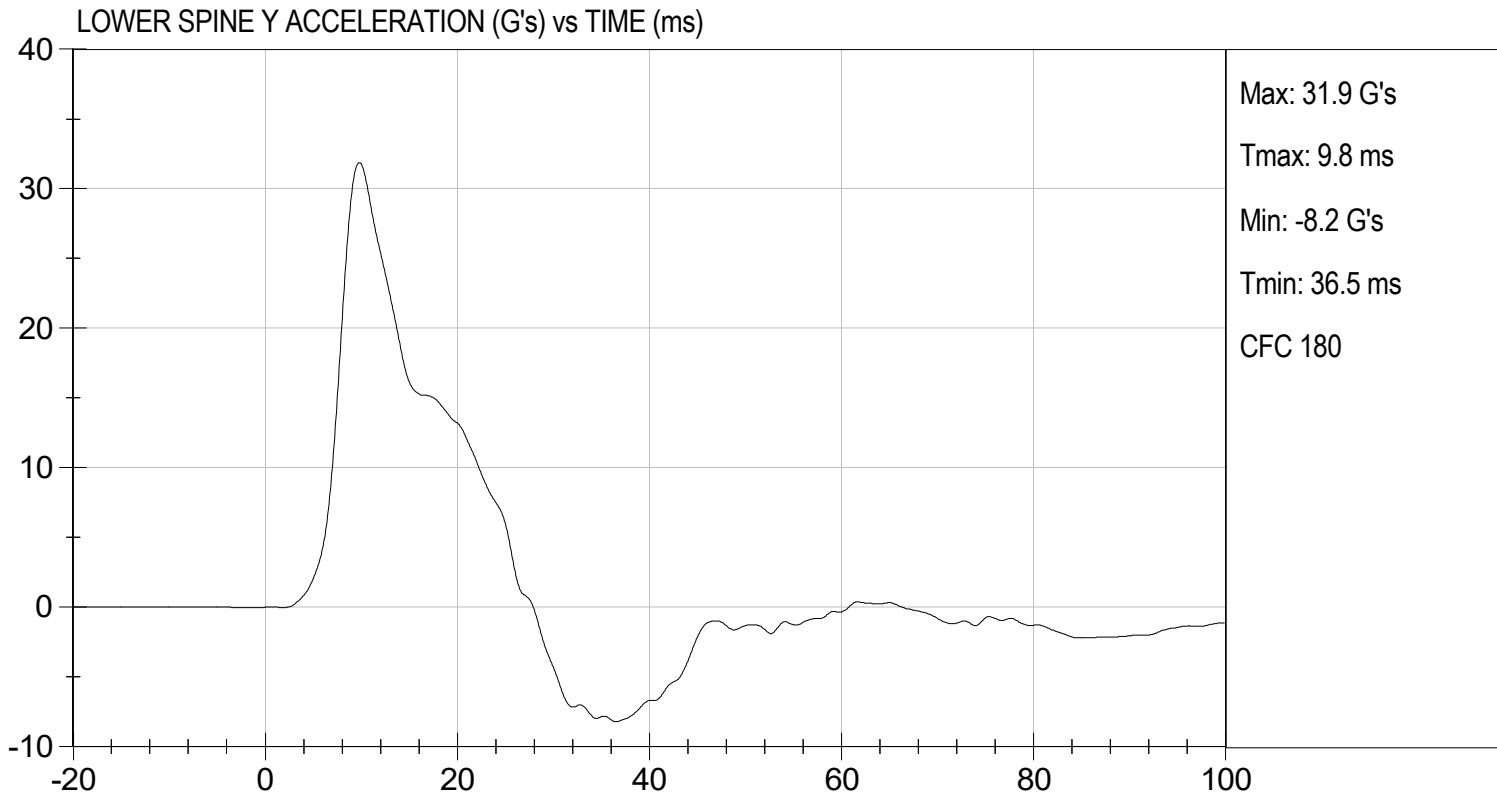
09/03/2024
Test Date


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

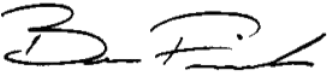
ATD Serial No: 306

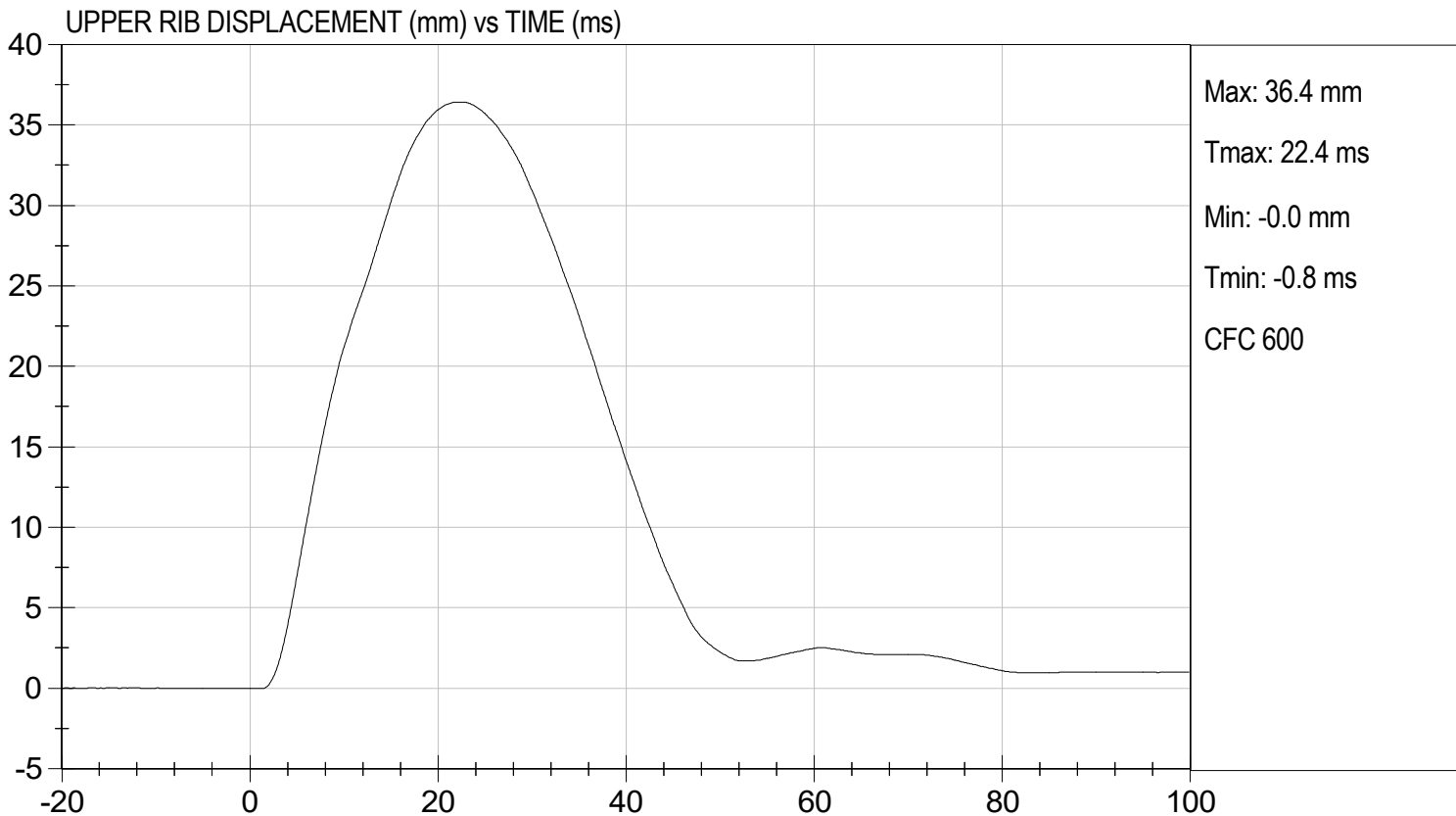
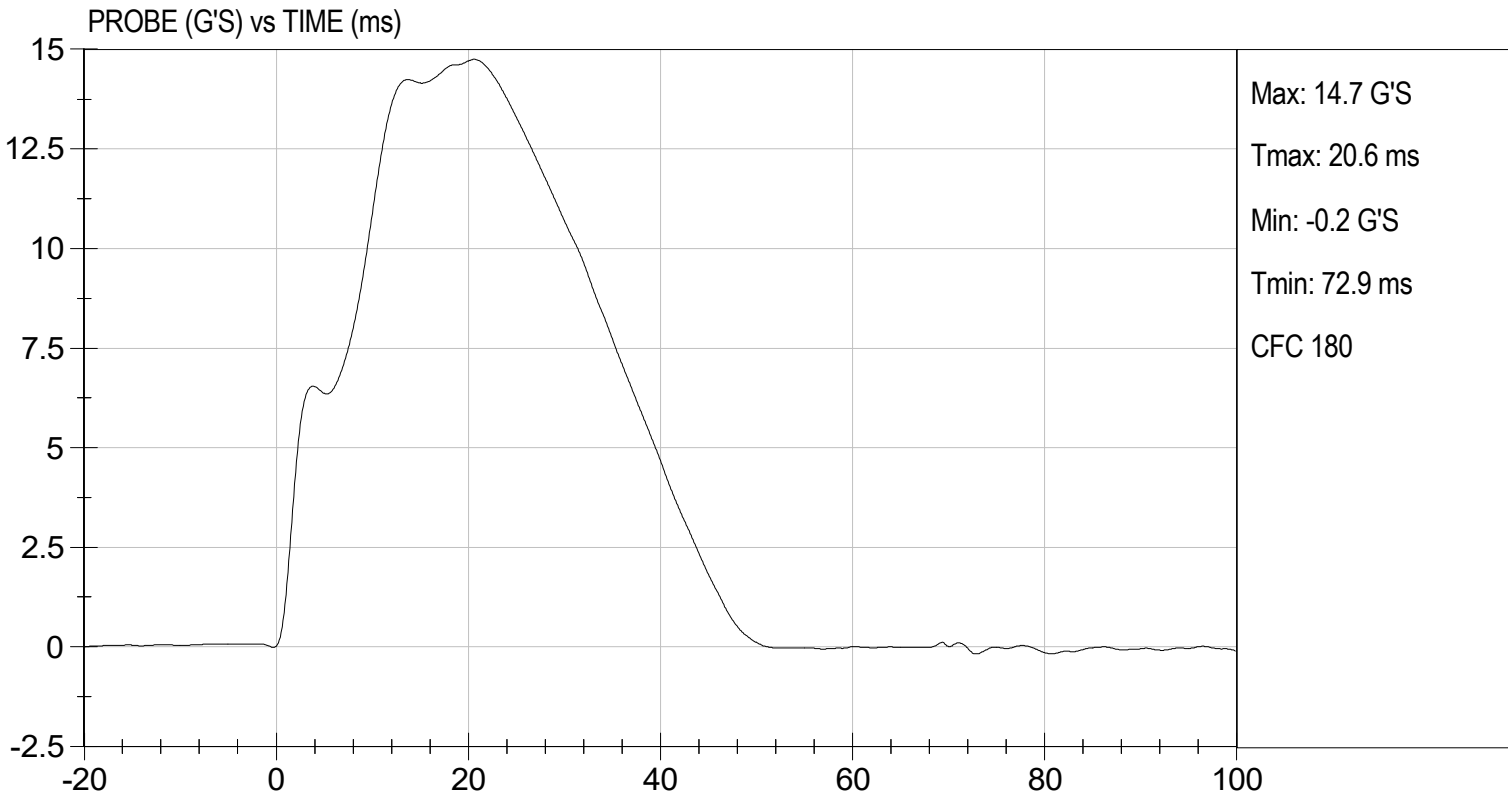
Test I.D: D242265

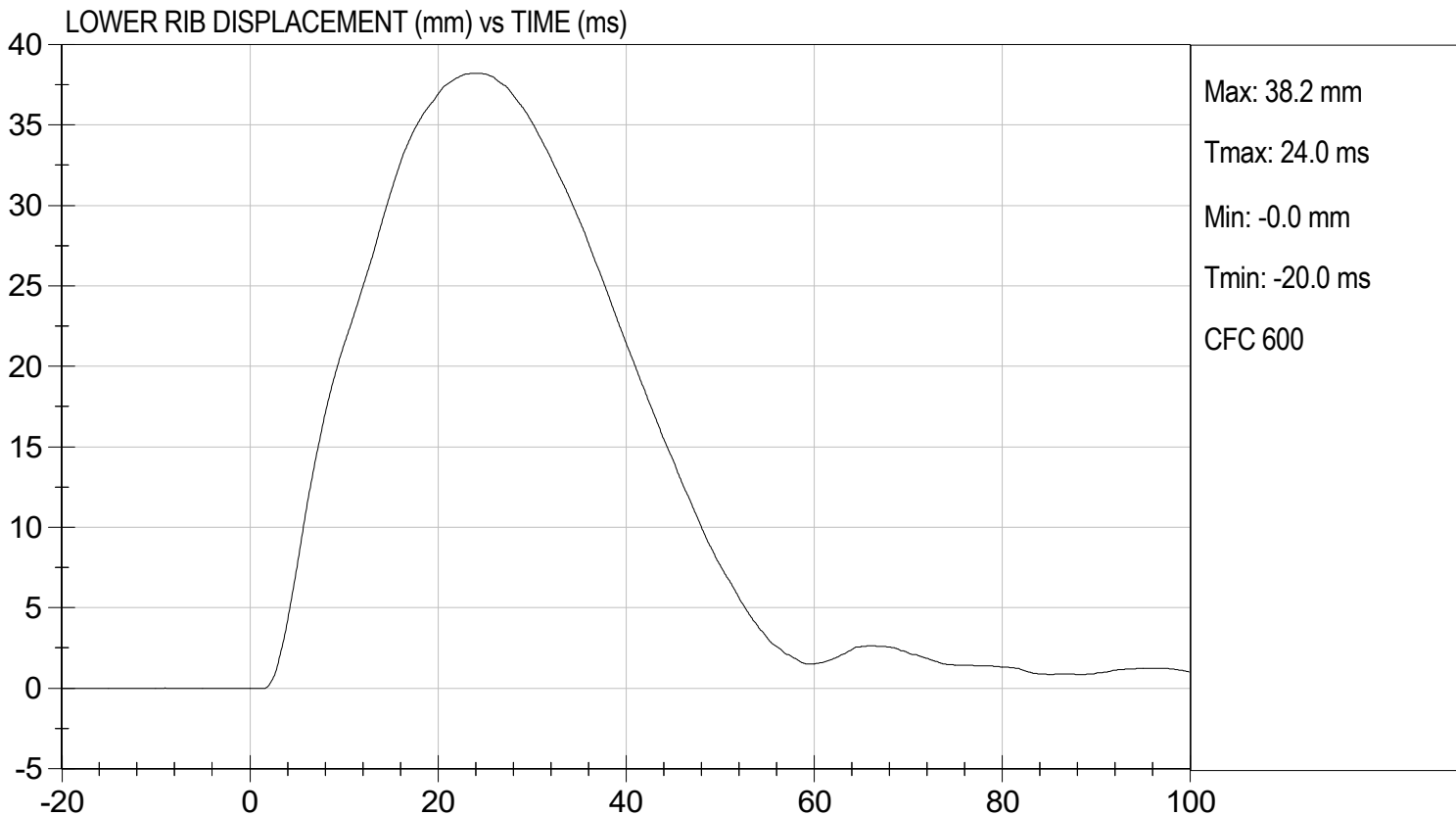
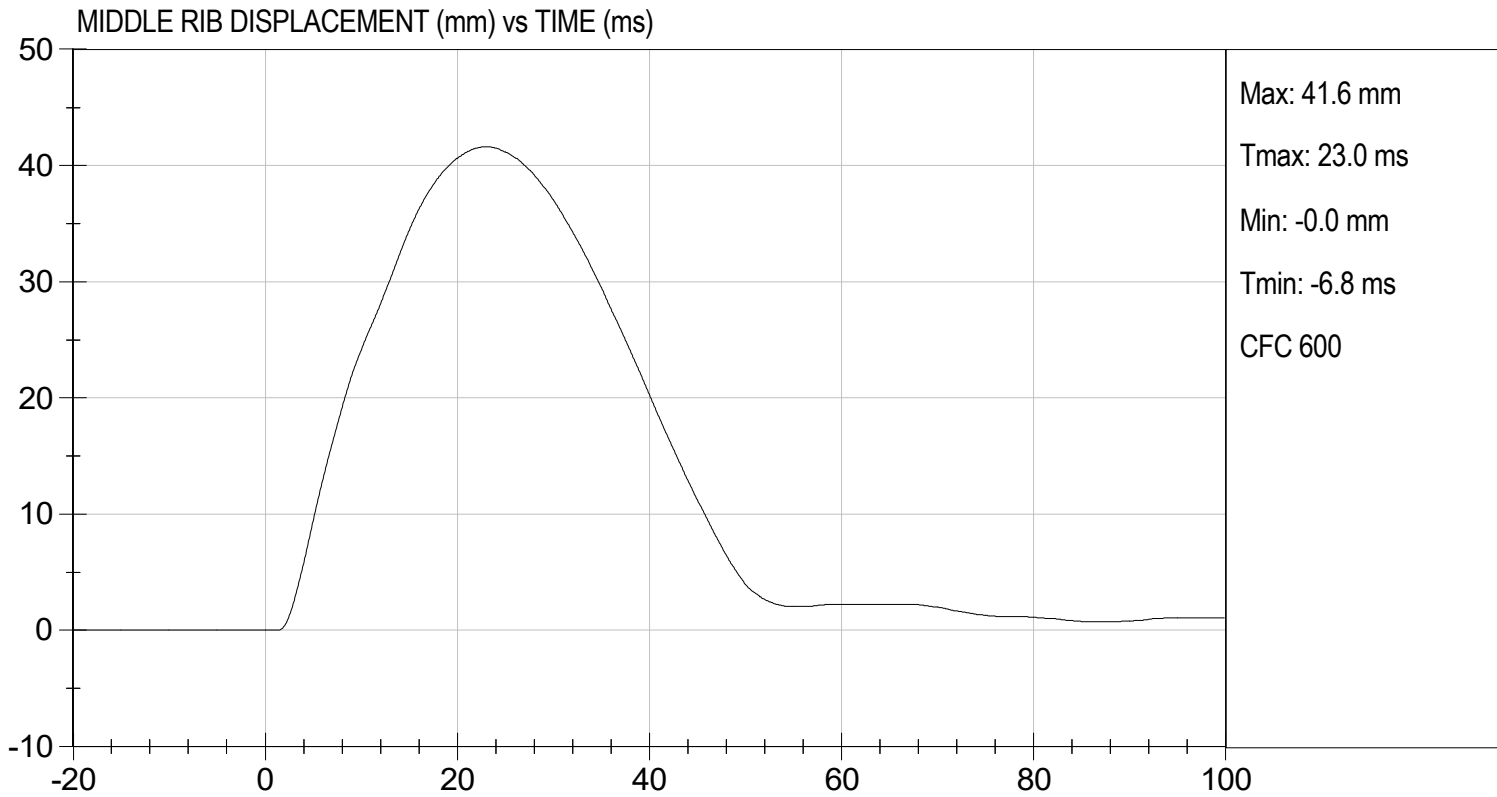
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	36	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	38	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

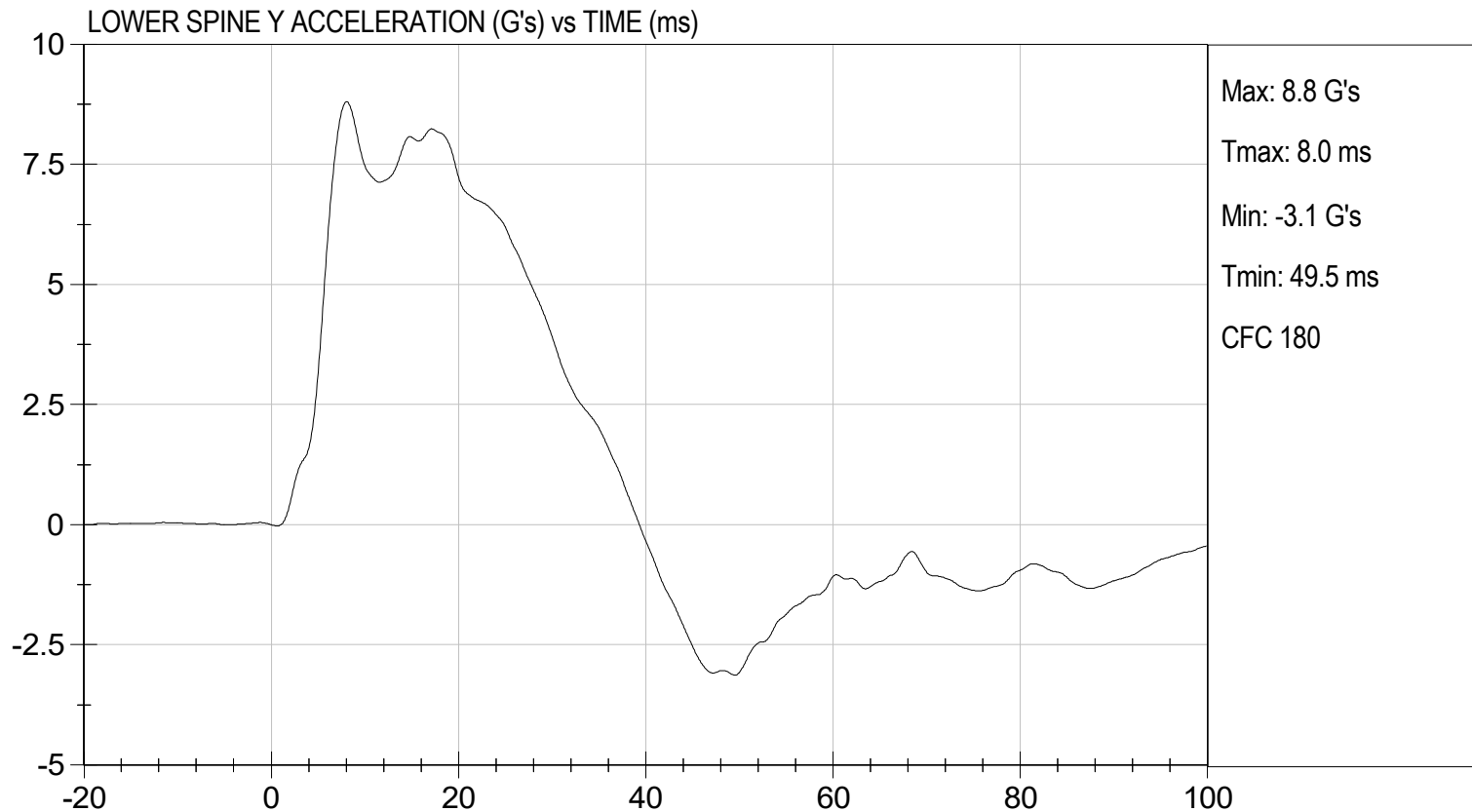
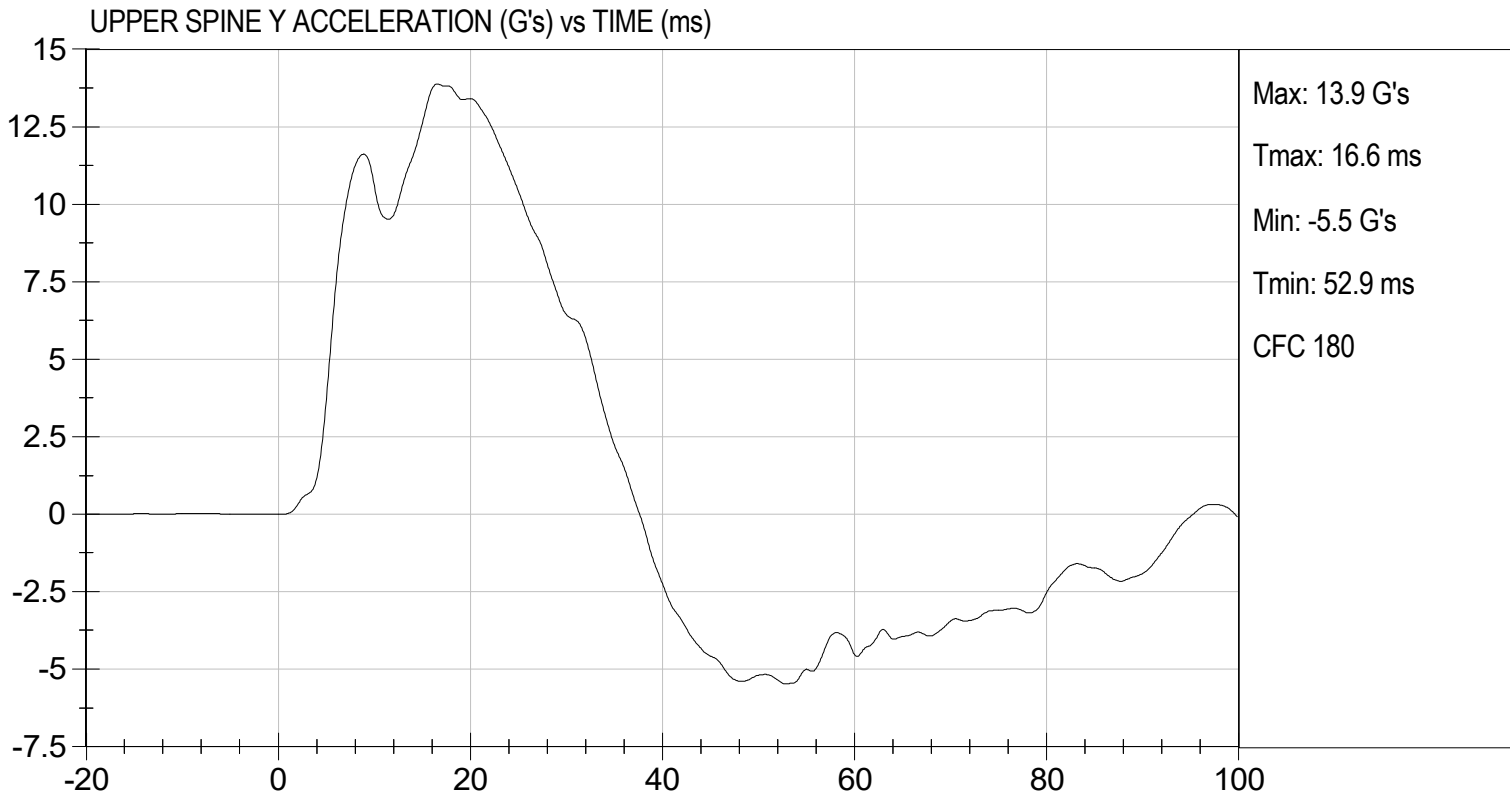

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09/03/2024
 Test Date


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

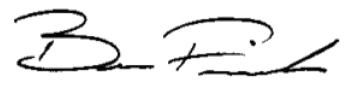
ATD Serial No: 306

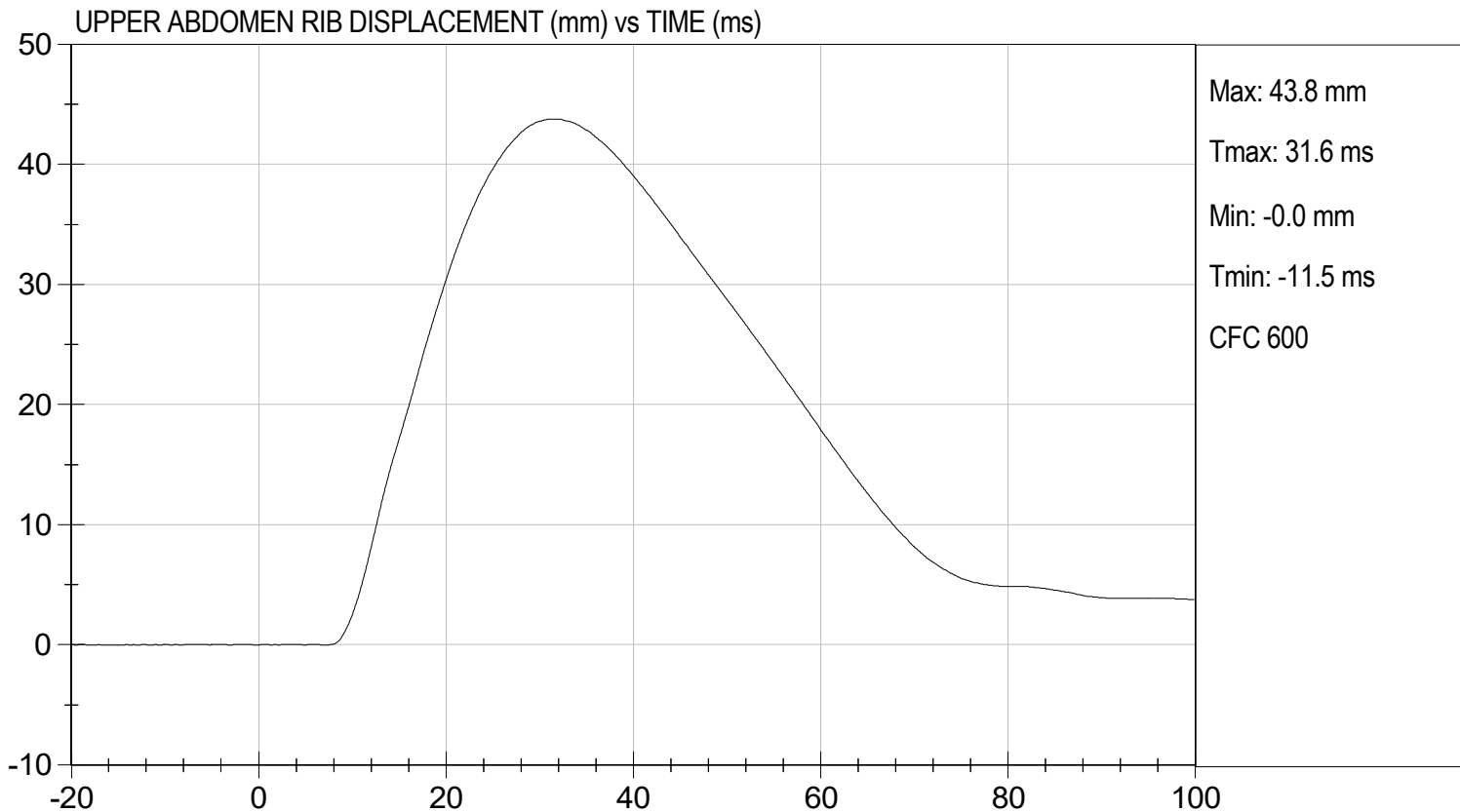
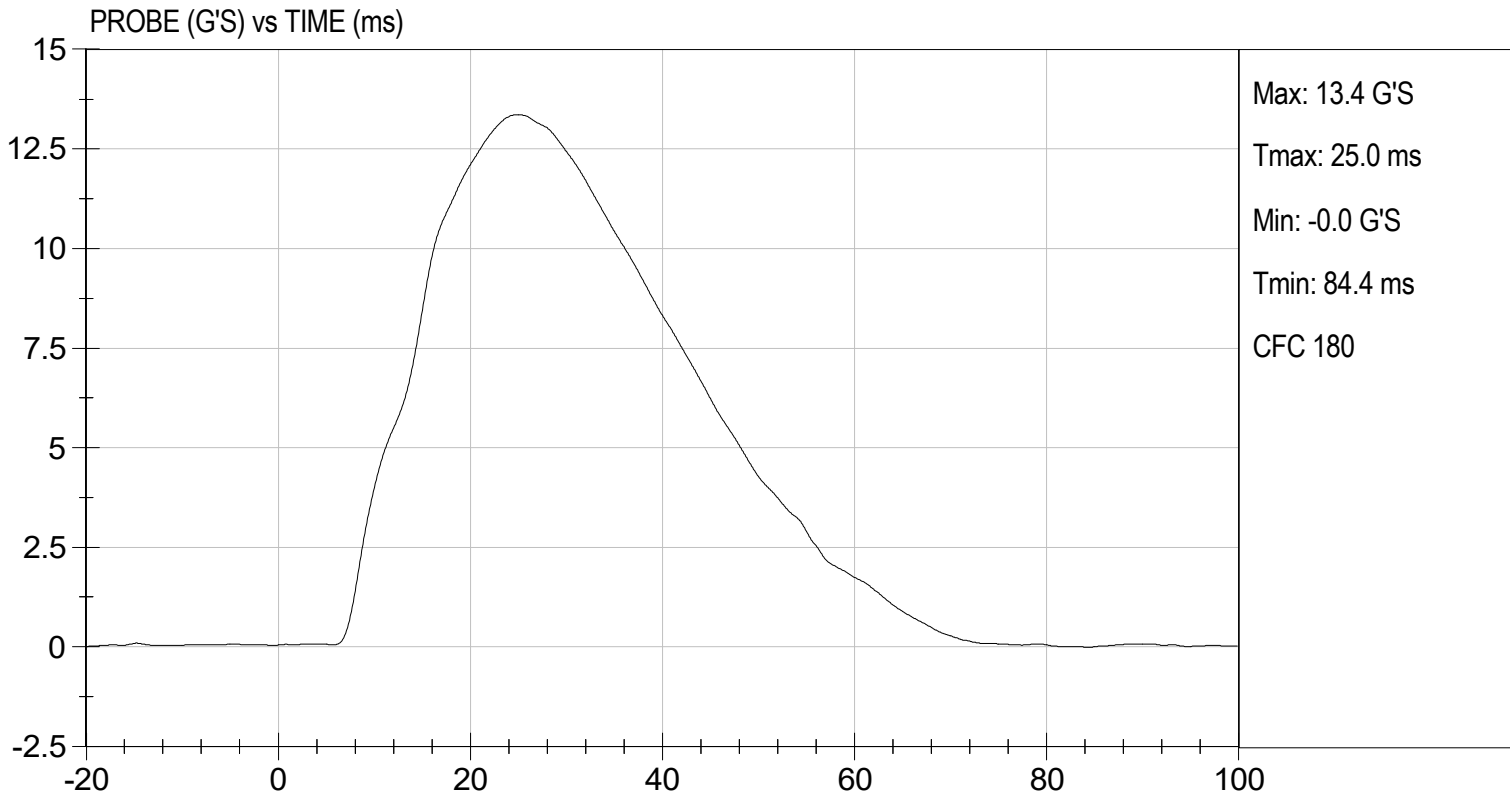
Test I.D: D242266

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	44	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

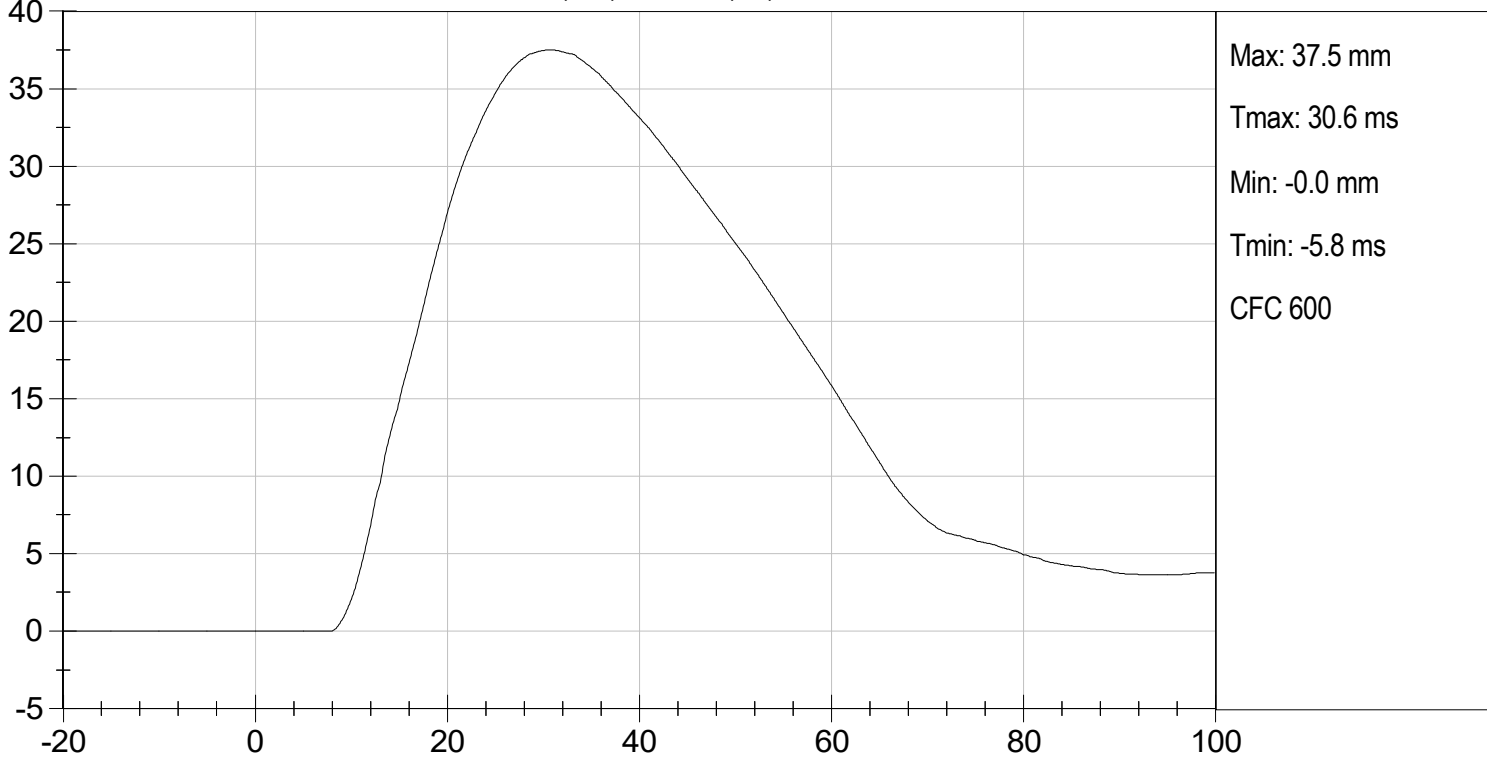
09/03/2024
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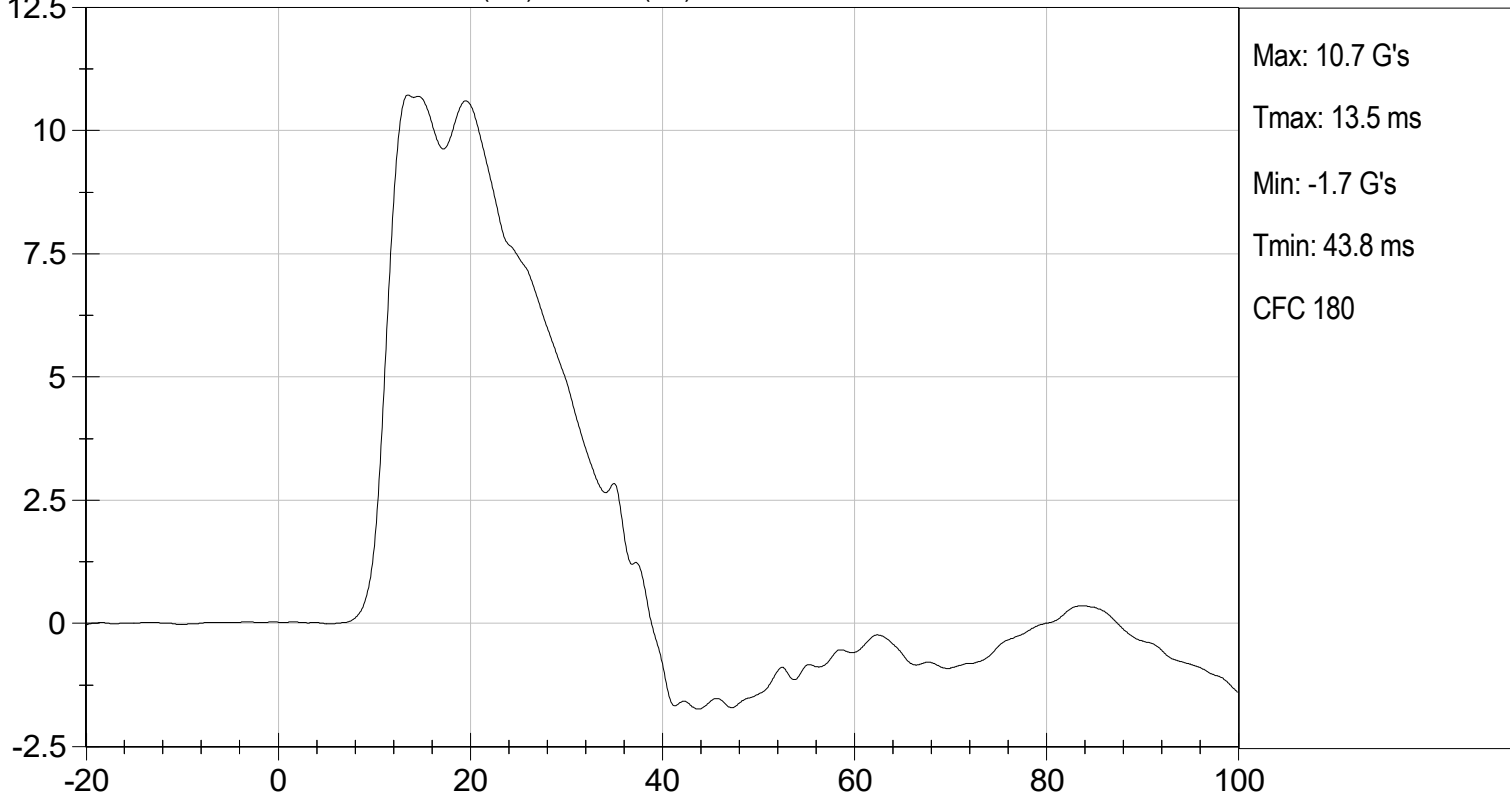




LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



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



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

ATD Serial No: 306

Test I.D: D242267

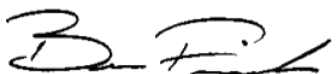
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	37.5	Pass
Peak Acetabulum Force	N	3600 to 4300	4,050	Pass
Overall Test Results				Pass



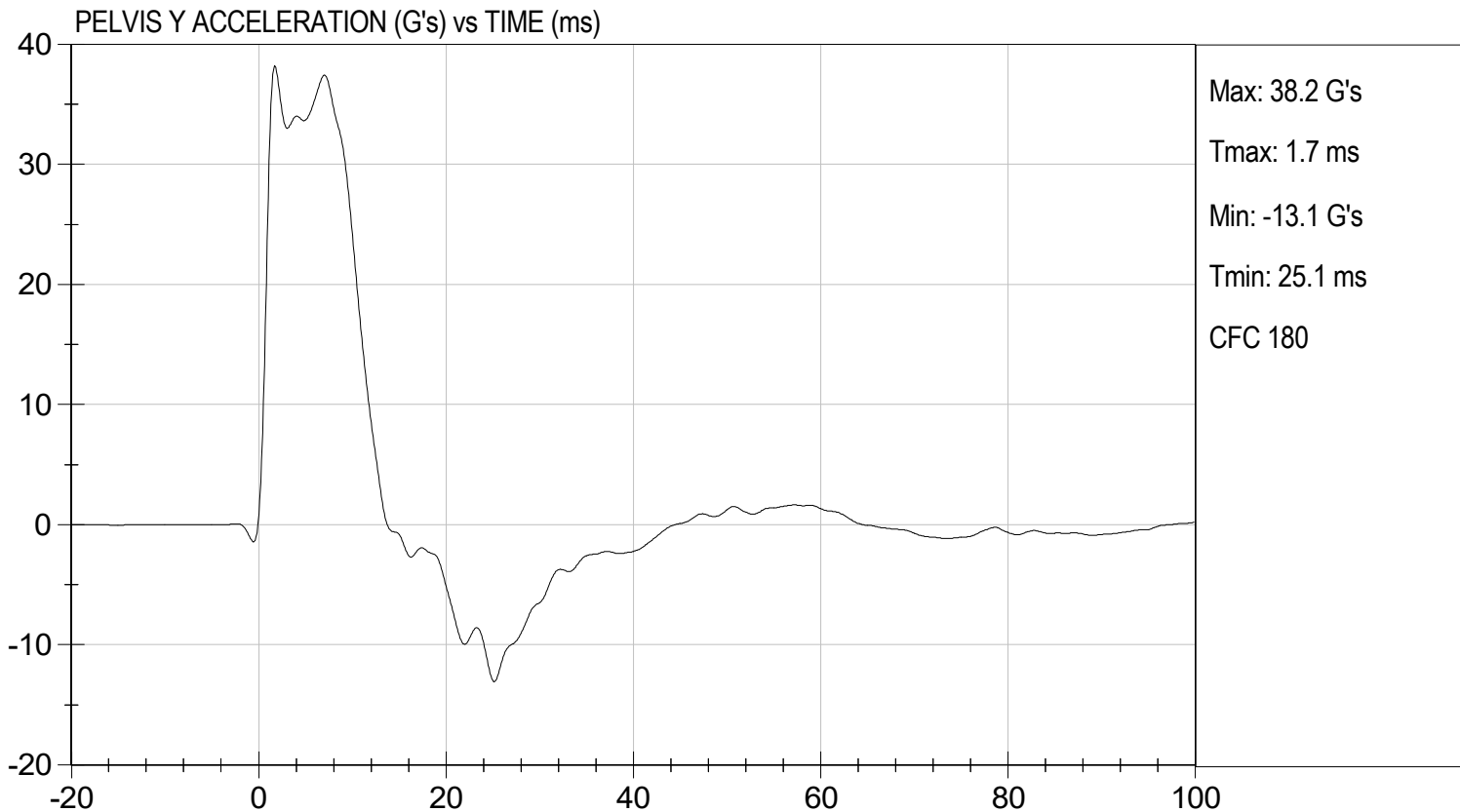
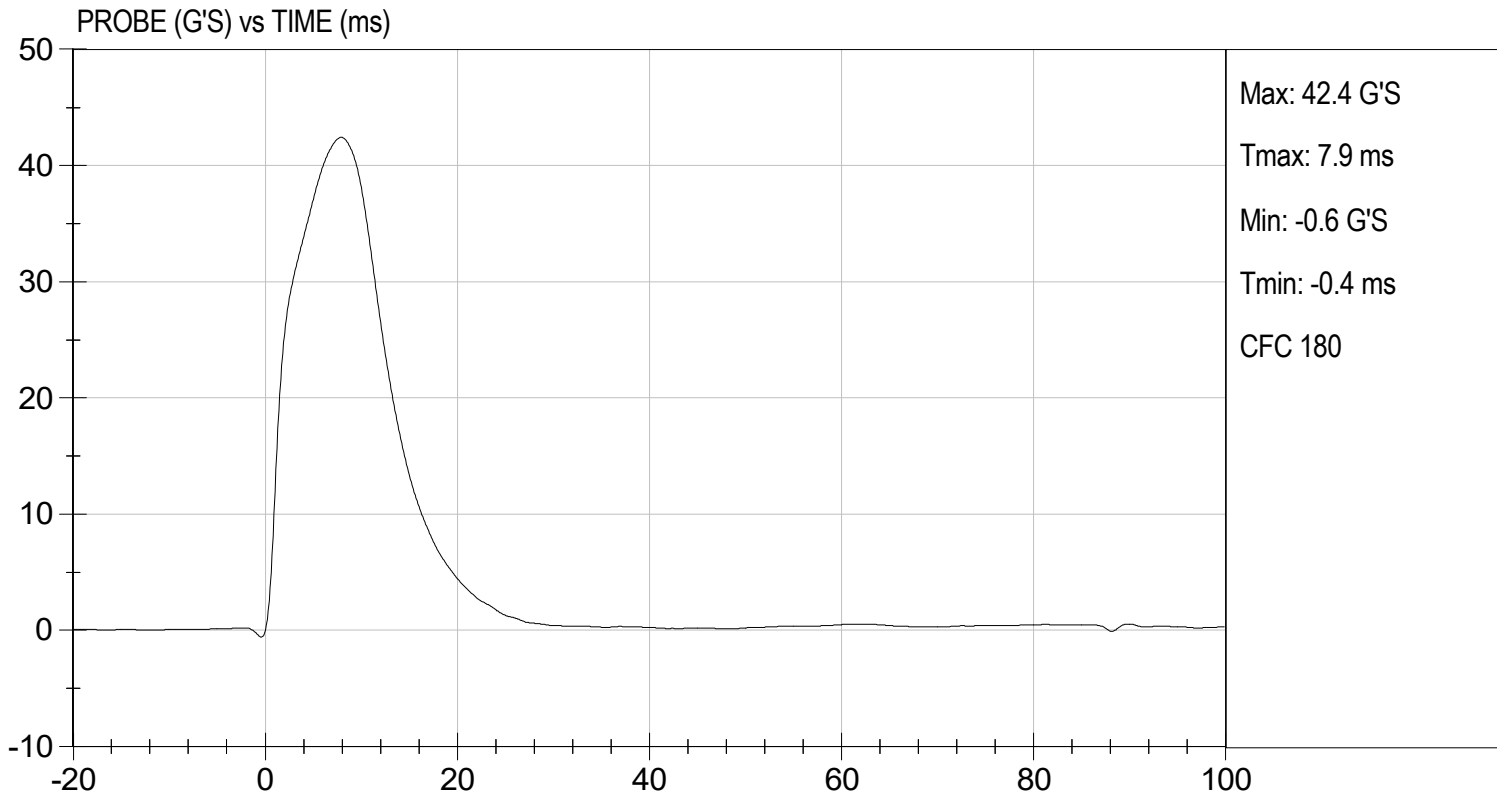
 Laboratory Technician

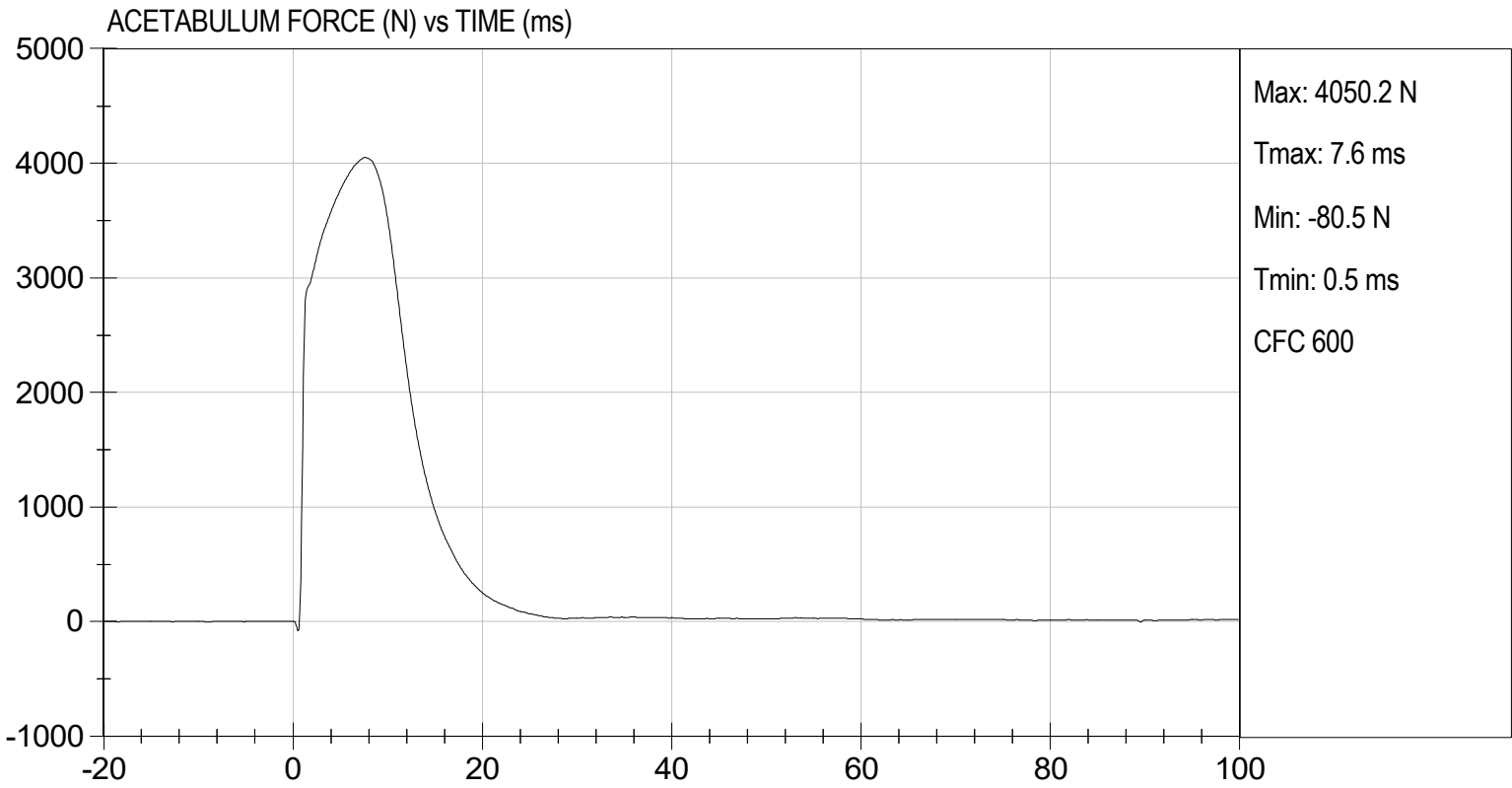
09/03/2024

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

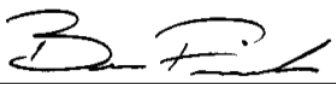
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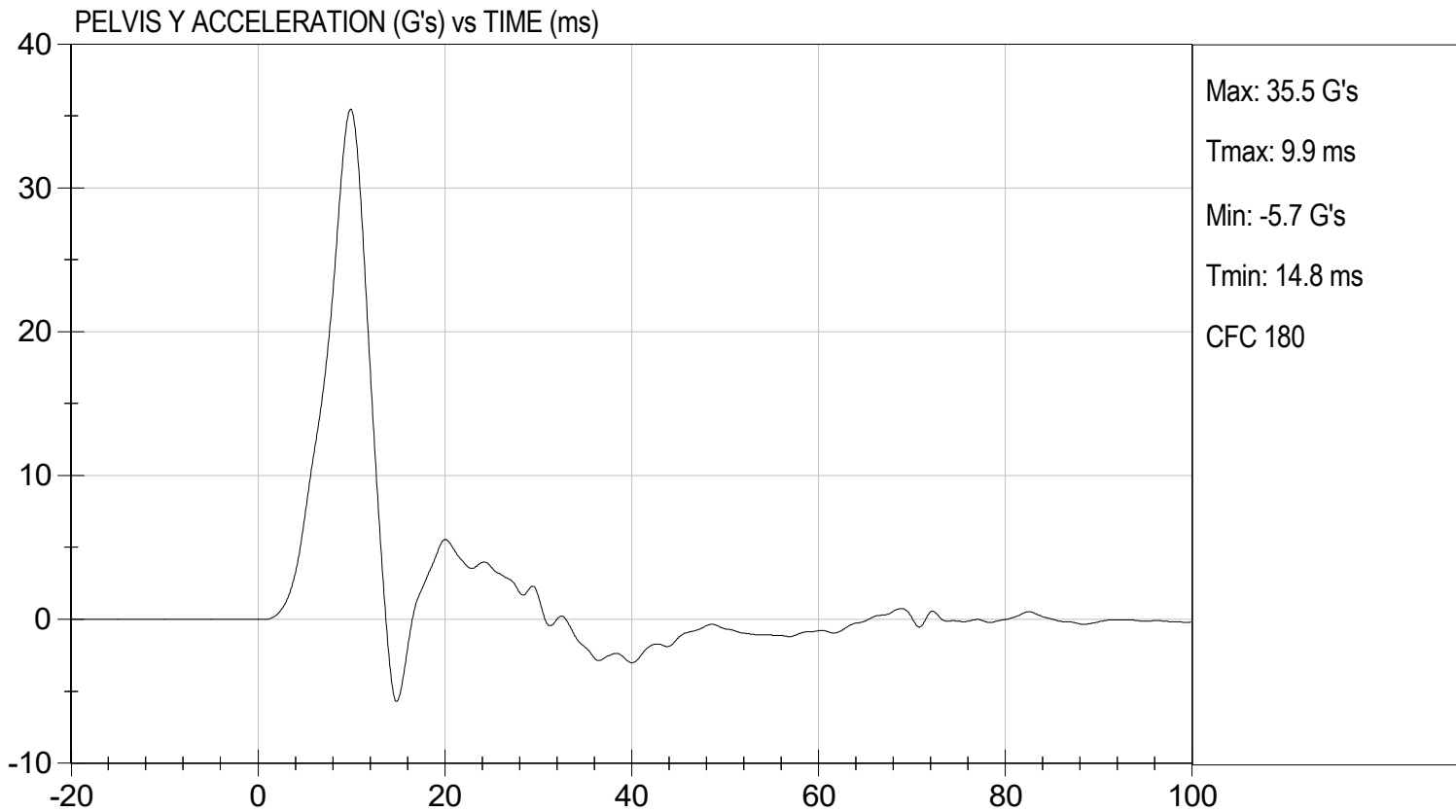
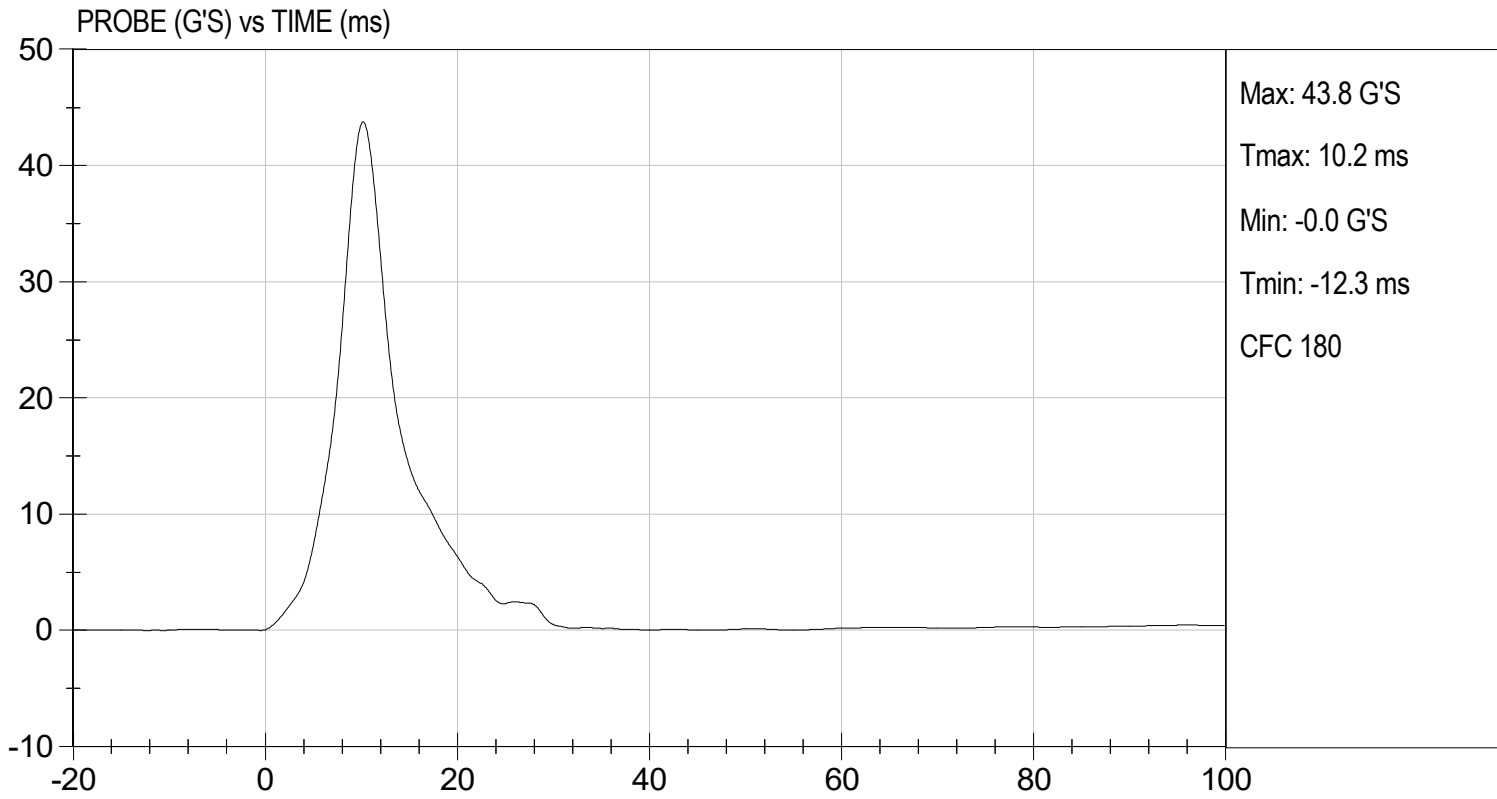
Test I.D: D242268

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	44	Pass
Pelvis Y Acceleration	G's	28 to 39	35	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	5,008	Pass
Overall Test Results				Pass


 Laboratory Technician

09/03/2024
 Test Date

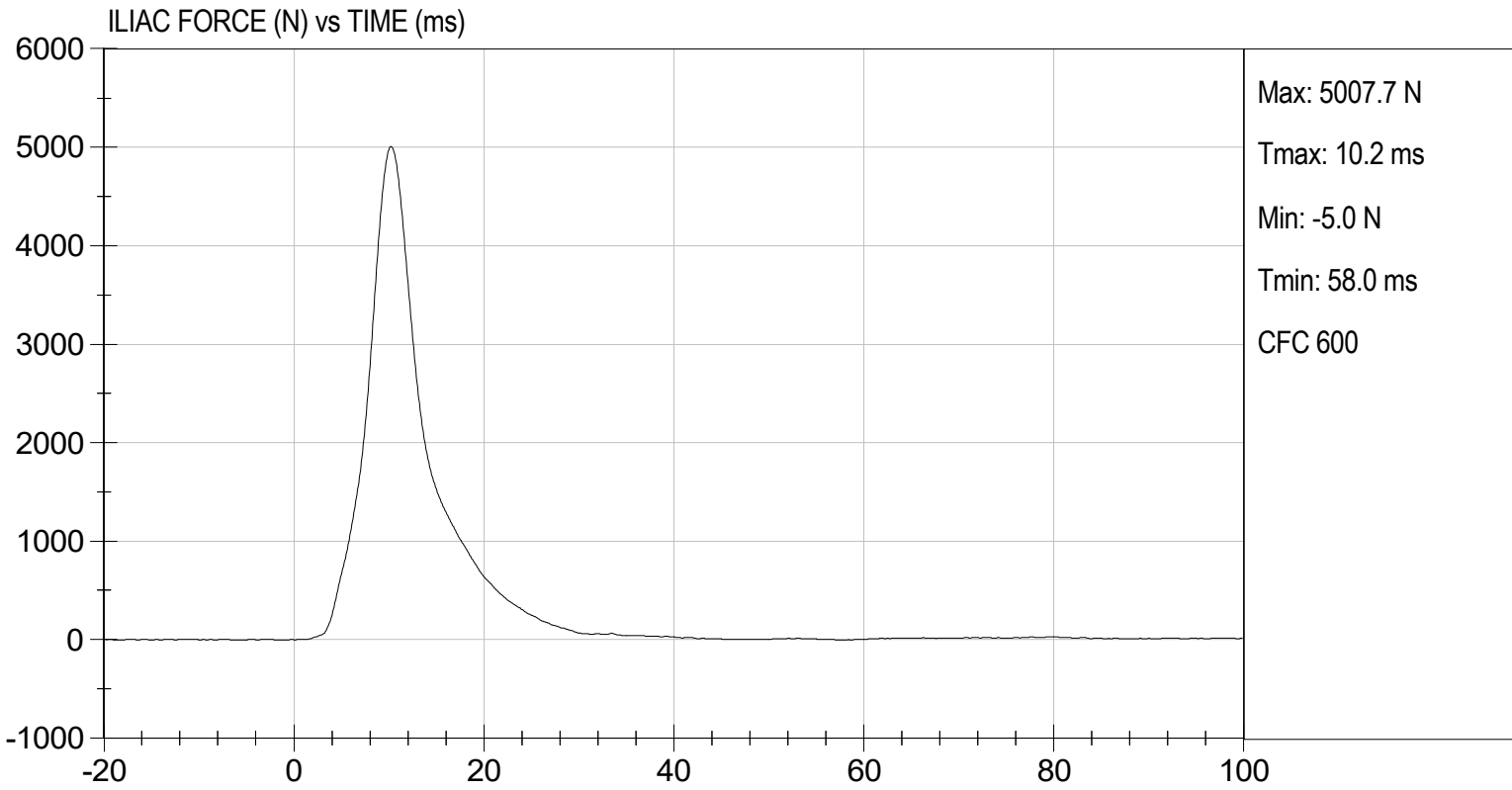

 Approved By





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

TEST DATE: 09/03/2024
TEST #: D242268





SID-IIs Pelvis Plug Certification Test

Plug S/N 17066

Test Number 23964

Report Number 24021

Test Date 8/21/2022 10:18:09 AM

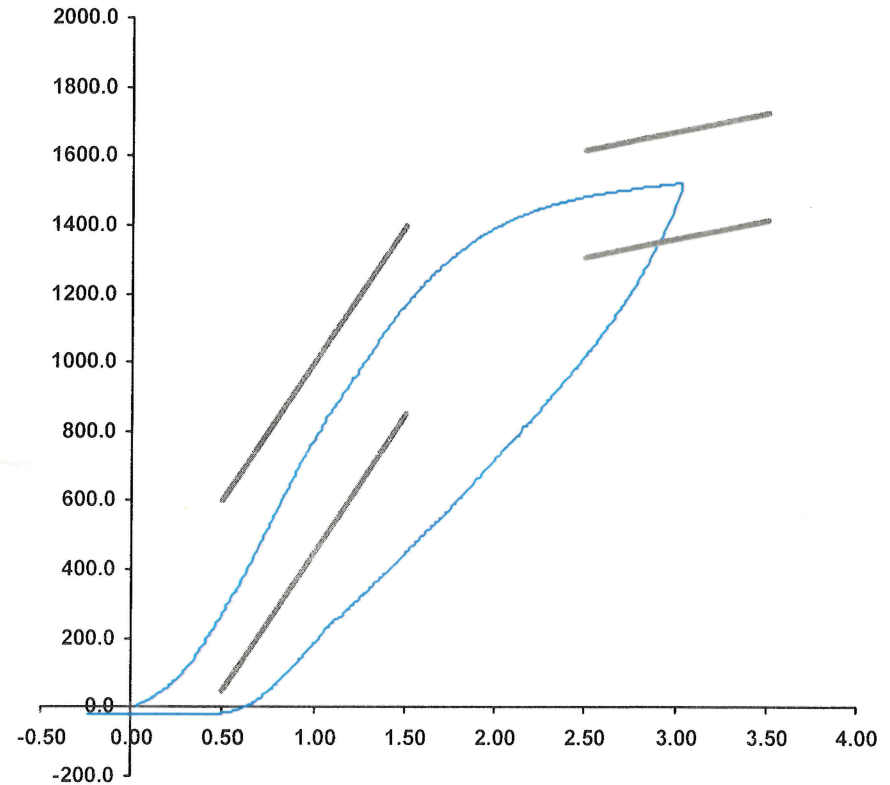
	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	279	50	600
Force @ 1.5 mm (N)	1,168	850	1,400
Force @ 2.5 mm (N)	1,485	1,306	1,618
Force @ 3.0 mm (N)	1,525	1,361	1,673

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 21-Aug-22

SACO Research

By : DC Date : 8/21/22



SID-IIs Pelvis Plug Certification Test

Plug S/N 17062

Test Number 23960

Report Number 24017

Test Date 8/21/2022 10:00:55 AM

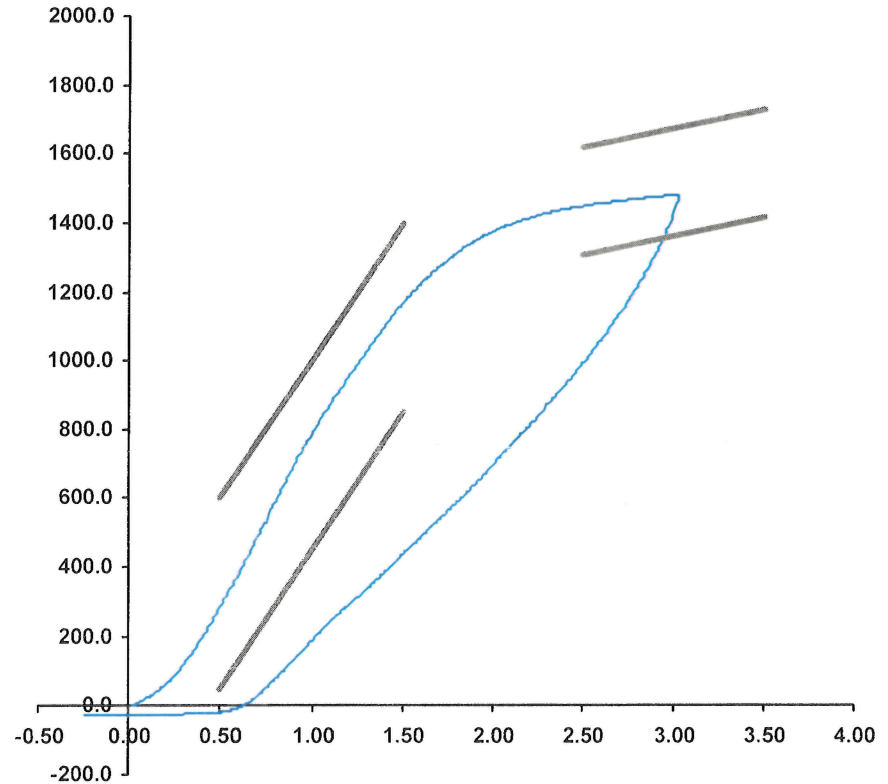
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	292	50	600
Force @ 1.5 mm (N)	1,170	850	1,400
Force @ 2.5 mm (N)	1,449	1,306	1,618
Force @ 3.0 mm (N)	1,481	1,361	1,673

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
SACO Research

21-Aug-22

By: DC Date: 8/21/22

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

Table 1 – Dummy Instrumentation

			SID-IIs S/N 306			
			Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers			X	P79003	Endevco	06/10/2024
			Y	P79445	Endevco	06/10/2024
			Z	P79724	Endevco	06/10/2024
			Xr	P84999	Endevco	06/10/2024
			Yr	P85000	Endevco	06/10/2024
			Zr	P85001	Endevco	06/10/2024
Head Angular Rate Sensors			X	ARS7442	DTS	11/17/2023
			Y	ARS7475	DTS	11/17/2023
			Z	ARS7516	DTS	11/17/2023
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	06/10/2024
		Middle	Y	G2403	Servo	06/10/2024
		Lower	Y	G1270	FTSS	06/10/2024
	Abdominal Rib	Upper	Y	G032	FTSS	06/10/2024
		Lower	Y	MJ5171	Medius	06/10/2024
Lower Spine Accelerometers (T12)			X	P96332	Endevco	06/10/2024
			Y	P96335	Endevco	06/10/2024
			Z	P96341	Endevco	06/10/2024
Acetabulum Load Cell			Y	ACG4285	FTSS	05/24/2024
Iliac Wing Load Cell			Y	IWG3023	FTSS	05/24/2024
Pelvis Plug (struck side)				17066	SACO	08/21/2022
Pelvis Plug (non-struck side)				17062	SACO	08/21/2022

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	T41752	Endevco	06/17/2024
Vehicle Center of Gravity	Y	T39078	Endevco	07/17/2024
Vehicle Center of Gravity	Z	T29887	Endevco	11/16/2023
Left Floor Sill	Y	T33476	Endevco	06/24/2024
A-Pillar Sill	Y	T39754	Endevco	08/08/2024
A-Pillar Low	Y	T39091	Endevco	06/21/2024
A-Pillar Mid	Y	T39228	Endevco	06/21/2024
B-Pillar Sill	Y	A405049	MSI	03/14/2024
B-Pillar Low	Y			
B-Pillar Mid	Y			
Driver Seat	Y	T40728	Endevco	05/08/2024
Engine Top	X	T39330	Endevco	07/30/2024
Engine Top	Y	T39917	Endevco	07/30/2024
Firewall	Y	A393848	MSI	03/15/2024
Right Roof	Y	A395078	MSI	03/15/2024
Right Floor Sill	Y	A411432	MSI	03/15/2024
Rear Floorpan	X	P88318	Endevco	08/08/2024
Rear Floorpan	Y	T39745	Endevco	08/19/2024

Table 3 – Pole Instrumentation

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