

REPORT NUMBER: SideNCAPPole-MGA-22-033

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

**MAZDA TOYOTA MANUFACTURING U.S.A. INC.
2022 Toyota Corolla Cross LE 5-Door SUV
NHTSA No.: O20225101**

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



Test Date: November 3, 2022

Final Report Date: September 18, 2023

FINAL REPORT

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

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Approval Date: September 18, 2023

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. SideNCAPPole-MGA-22-033	2. Government Accession No.	3. Recipient's Catalog No.																											
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2022 Toyota Corolla Cross LE 5-Door SUV NHTSA No.: O20225101		5. Report Date September 18, 2023																											
7. Author(s) Ben Fischer, Program Manager		6. Performing Organization Code MGA																											
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		8. Performing Organization Report No. SideNCAPPole-MGA-22-033																											
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		10. Work Unit No.																											
		11. Contract or Grant No. 693JJ920D000017																											
15. Supplementary Notes		13. Type of Report and Period Covered: Final Test Report November 3, 2022 to September 18, 2023																											
		14. Sponsoring Agency Code NRM-100																											
16. Abstract A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2022 Toyota Corolla Cross LE 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 November 3, 2022. The impact velocity was 32.17 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 22.2°C. The test vehicle post-test maximum crush was 345 mm at level 2 and 3. The test vehicle's performance was as follows:																													
<table border="1" style="width: 100%; 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;">299.729</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;">41.596</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;">3432.246</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;">13.306</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;">24.132</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD (SID-IIs)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	299.729	Resultant Lower Spine Acceleration	g	82	41.596	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3432.246	Maximum Thoracic Rib Deflection	mm	38*	13.306	Maximum Abdomen Rib Deflection	mm	45*	24.132
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*Proposed IARV																													
The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door(s) did not open during the side impact event.																													
17. Key Words 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 139	22. Price																										

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**SECTION 1
PURPOSE AND SUMMARY OF TEST**

PURPOSE

This side pole impact test is part of the MY 2022 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 2022 Toyota Corolla Cross LE 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 2022 Toyota Corolla Cross LE 5-Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.17 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on November 3, 2022. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

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

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

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

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

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

Measurement Description	Units	Driver ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC36)		1000	299.729
Resultant Lower Spine Acceleration	g	82	41.596
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3432.246
Maximum Thoracic Rib Deflection	mm	38*	13.306
Maximum Abdomen Rib Deflection	mm	45*	24.132

*Proposed IARV

Supplemental restraint information is given below:

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

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

GENERAL COMMENTS

Load Cell Pole #8 Fy recorded no valid data.

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: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20225101	Traction Control System (TCS)	Yes
Model Year	2022	Auto-Leveling System	Yes
Make	Toyota	Automatic Door Locks (ADL)	Yes
Model	Corolla Cross LE	Power Window Auto-Reverse	Yes
Body Style	5-Door SUV	Other Optional Feature	No
VIN	7MUCAAAG9NV019460	Driver Front Airbag	Yes
Body Color	Sonic Silver	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	103 km / 64 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.0 L	Driver Torso Airbag	No
Type/No. Cylinders	Inline 4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	CVT	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	FWD	Rear Pass. Torso Airbag	No
Roof Rack	Yes	Rear Pass. Torso/Pelvis Airbag	Yes
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	Yes
		Other Safety Restraint	N/A

Does owner's manual provide instruction to turn off automatic door locks?	Yes
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DATA FROM CERTIFICATION LABEL

Manufactured By	MAZDA TOYOTA MANUFACTURING U.S.A. INC.	GVWR (kg)	1945
Date of Manufacture	06/22	GAWR Front (kg)	1150
Vehicle Type	MPV	GAWR Rear (kg)	1060

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				425	(A)
DSC x 68 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				85	(A-B)

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	220	220	230	220
Tire Placard	kPa	230	230	200	200
Owner's Manual	kPa	230	230	200	200
As Tested	kPa	230	230	200	200

TEST AXLE VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	452.5	264.5		473.5	324.5		466.5	333.5	
Right	kg	416.0	269.5		418.0	316.5		413.5	326.5	
Ratio	%	61.9%	38.1%		58.2%	41.8%		57.1%	42.9%	
Totals	kg	868.5	534.0	1402.5	891.5	641.0	1532.5	880.0	660.0	1540.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1402.5	(A)
Actual Weight of 1 P572 ATD (SID-IIs) Used	kg	52	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	85	(C)
Calculated Test Vehicle Target Weight (TVTWT)	kg	1539.5	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement
Driver Door Sill Angle (front-to-back)*	deg	-0.5	-0.2	-0.2	Yes
Front Pass. Door Sill Angle (front-to-back)*	deg	-0.5	-0.3	-0.2	Yes
Front Bumper Angle (left-to-right)**	deg	-0.5	-0.5	-0.5	Yes
Rear Bumper Angle (left-to-right)**	deg	-0.6	-0.5	-0.5	Yes
Vehicle CG (Aft of Front Axle)	mm	1010	1109	1137	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	18	32	30	

* 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 TVTWT

Component Description	Units	Weight
Weight of Ballast Added	kg	47
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: 2022 Toyota Corolla Cross LE 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
Test Date: 11/3/2022

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm Target	900
Aft 25 mm Target	903

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	17.8	12.3	15.1
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As-Tested SCRL Angle (Mid) (°)	As-Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rear-Most	Mid	Forward-Most
Driver Seat	15.1	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

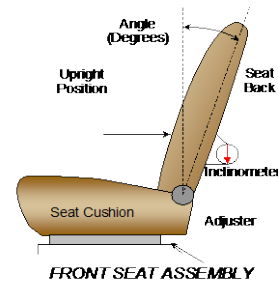
NHTSA No.: O20225101
 Test Date: 11/3/2022

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1 st as 1)	mm	Detent (1 st as 0)
Driver Seat	260	27	0	0
Front Passenger Seat	260	27	0	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	52.3	27	-4.3	1
Front Passenger Seat	52.0	27	-3.5	2
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	Fixed		Fixed	

All seat back angles measured on outboard headrest post.

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4	0 (Uppermost as 0)

HEAD RESTRAINT ADJUSTMENT

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

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

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

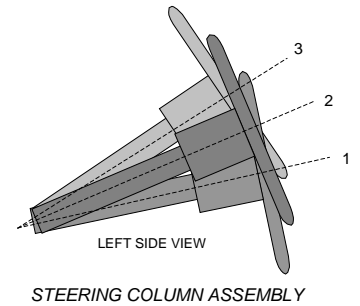
Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

STEERING COLUMN ADJUSTMENT

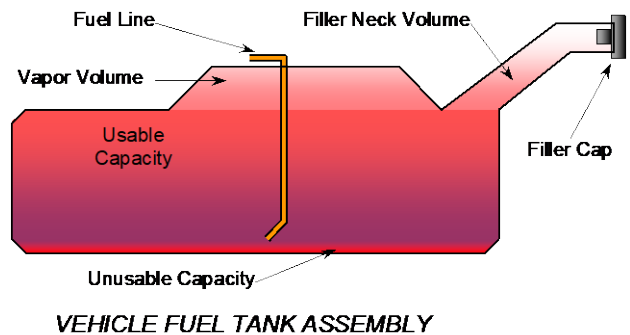
Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	68.4	
Geometric Center, Position 2	66.4	
Uppermost, Position 3	64.3	
Telescoping Steering Wheel Travel		47
Test Position	66.4	24



FUEL PUMP

The vehicle is equipped with an electronic fuel pump. The fuel pump is activated when the ignition is turned on. The filler neck is located on the driver's side.



FUEL TANK CAPACITY DATA

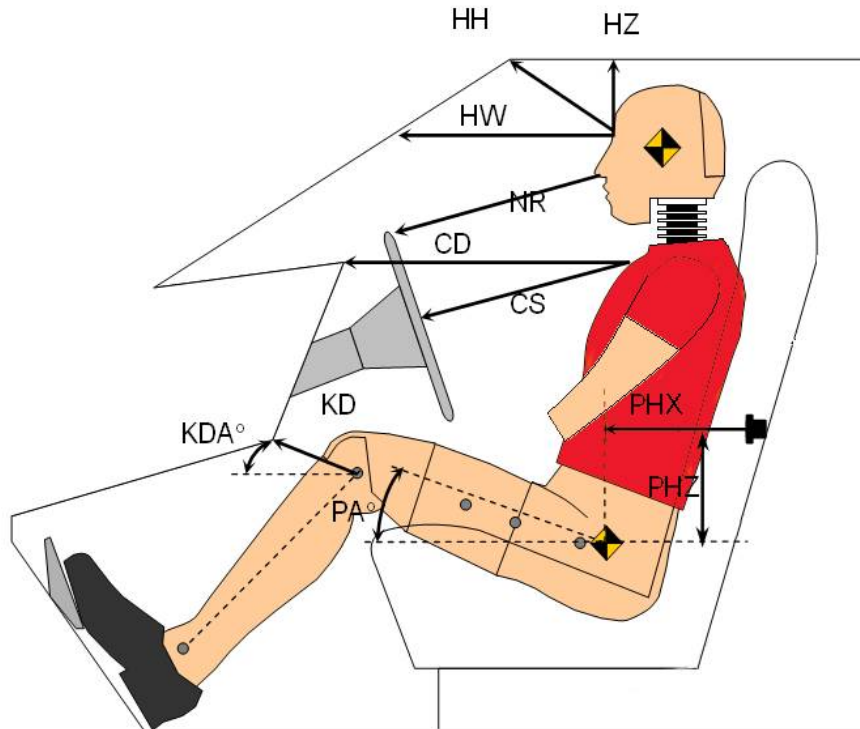
	Liters
Usable Capacity of Standard Tank (see S1 – Vehicle Setup Information)	47.0
Usable Capacity of Optional Tank (see S1 – Vehicle Setup Information)	50.0
Usable Capacity of Standard Tank as Specified in Owner's Manual	46.9
Usable Capacity of Optional Tank as Specified in Owner's Manual	50.0
93% of Usable Capacity	43.7
Actual Amount of Solvent Used	43.7
1/3 of Usable Capacity	15.7

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
Test Date: 11/3/2022



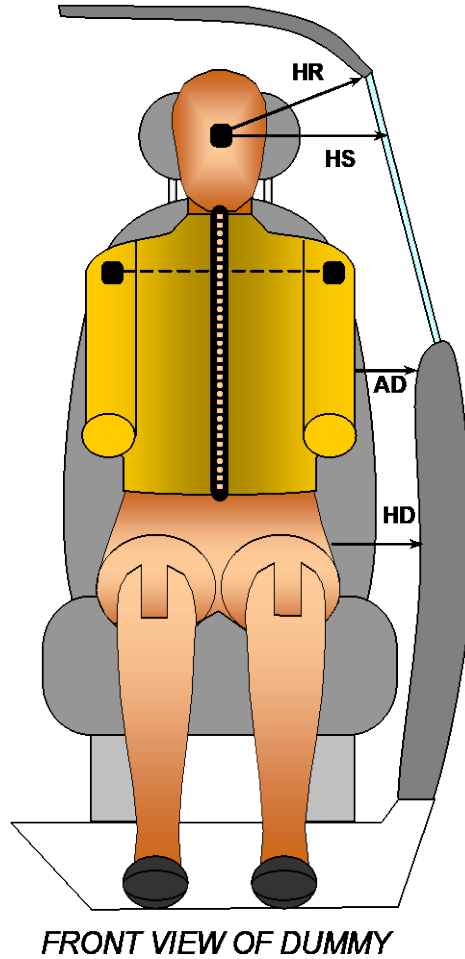
LEFT SIDE VIEW

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	296	
HW	Head to Windshield	607	
HZ	Head to Roof Liner	184	
NR	Nose to Rim/Seat Back	228	
CD	Chest to Dashboard/Seat Back	386	
CS	Chest to Steering Wheel	150	
KDL / KDAL	Left Knee to Dash/Seat Back	115	33.9
KDR / KDAL	Right Knee to Dash/Seat Back	108	32.6
PAX	Pelvic Tilt Angle X		19.0
PAY	Pelvic Tilt Angle Y		-0.2
PHX	Hip Point to Striker (X-Axis)	340	
PHZ	Hip Point to Striker (Z-Axis)	236	

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

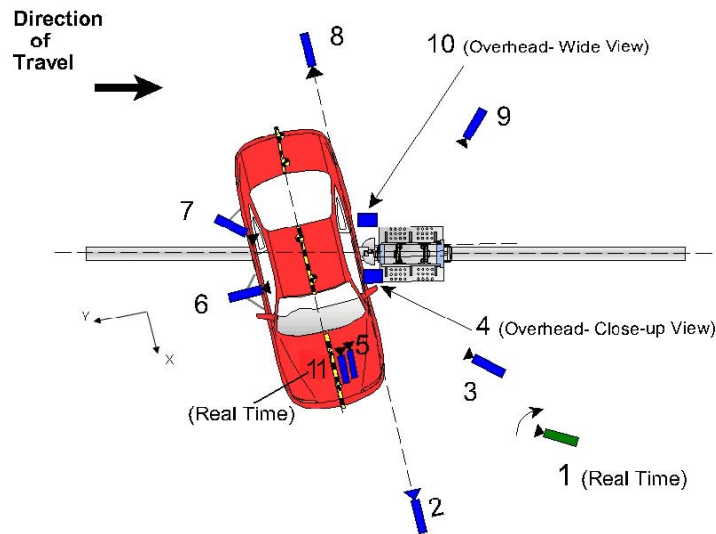


Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	225
HS	Head to Side Window	345
AD	Arm to Door	178
HD	Hip Point to Door	161

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
Test Date: 11/3/2022



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

No.	Camera View	Coordinates* (mm)			Lens (mm)	Frame Rate (fps)
		X	Y	Z		
1	Real-Time Pan View					30
2	Front Ground Level	8080	-140	-1580	35	1000
3	Impact Side 45° Forward	4480	-1940	-1580	12	1000
4	Overhead Closeup	0	0	-6700	85	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8.5	1000
7	Onboard – Driver Rear				8.5	1000
8	Rear Ground Level	-6680	-270	-1590	24	1000
9	Impact Side 45° Rearward	-3040	-3480	-1580	12	1000
10	Overhead Wide View	100	870	-6540	12	1000
11	Real-Time Dummy Front View					30

*All measurements accurate to ±6 mm

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

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

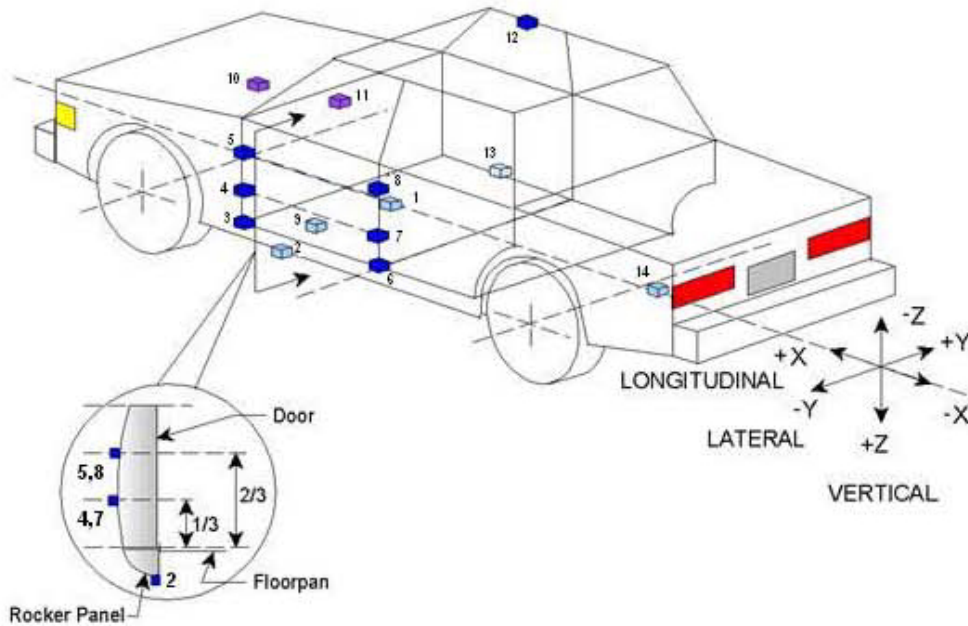
INSTRUMENTATION

	Number of Channels
Driver Dummy	19
Vehicle Structure	18
Pole Load Cells	8
Total	45

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
Test Date: 11/3/2022



TEST VEHICLE ACCELEROMETER LOCATIONS

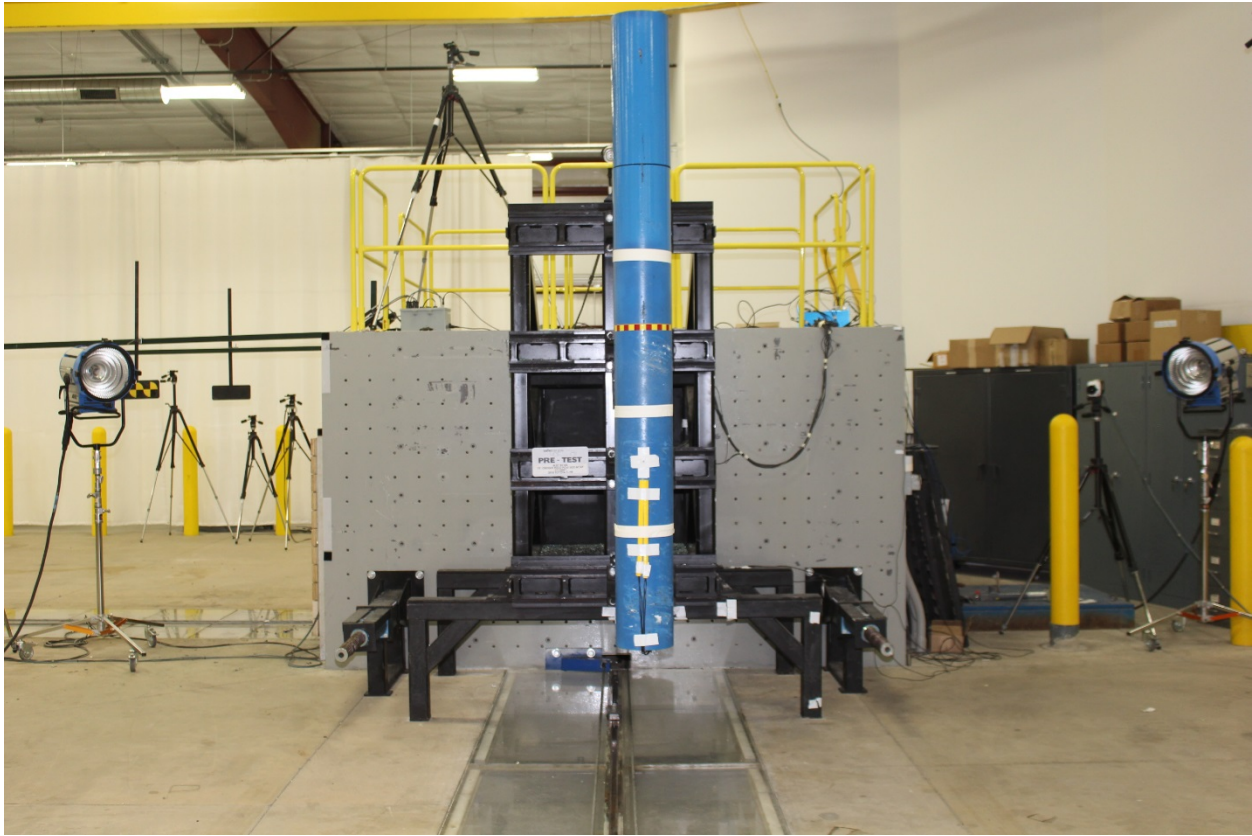
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2392	196	-282
2	Left Floor Sill	2910	-715	-275
3	A Pillar Sill	2982	-715	-275
4	A Pillar Low	2964	-833	-607
5	A Pillar Mid	2964	-833	-855
6	B Pillar Sill	1967	-715	-272
7	B Pillar Low	1829	-720	-658
8	B Pillar Mid	1829	-720	-832
9	Driver Seat Track	1886	-396	-312
10	Engine Top	3672	0	-887
11	Firewall	3245	27	-918
12	Right Roof	1854	427	-1613
13	Right Floor Sill	2910	715	-273
14	Rear Floorpan	881	0	-597

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: 2022 Toyota Corolla Cross LE 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
Test Date: 11/3/2022



254 mm Diameter Rigid Pole

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

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Driver Dummy (SID-IIs)
Face	Curtain Airbag, Seatback
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, 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	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

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

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

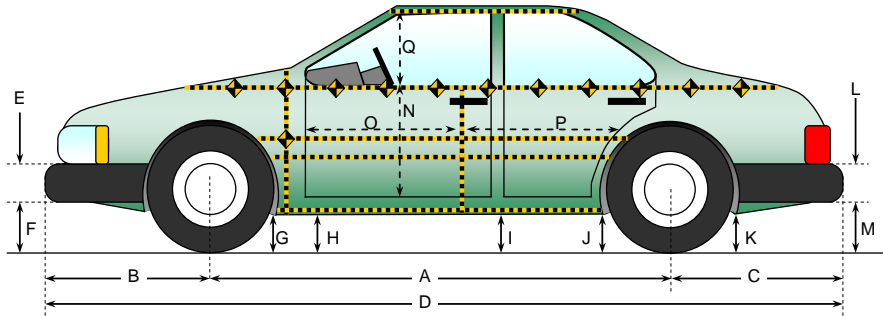
SPEED, ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1080
Actual Impact Point (Aft of Front Axle)	mm		1083
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	-3
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	74.7
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.17
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.14

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
Test Date: 11/3/2022



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

LEFT SIDE VIEW

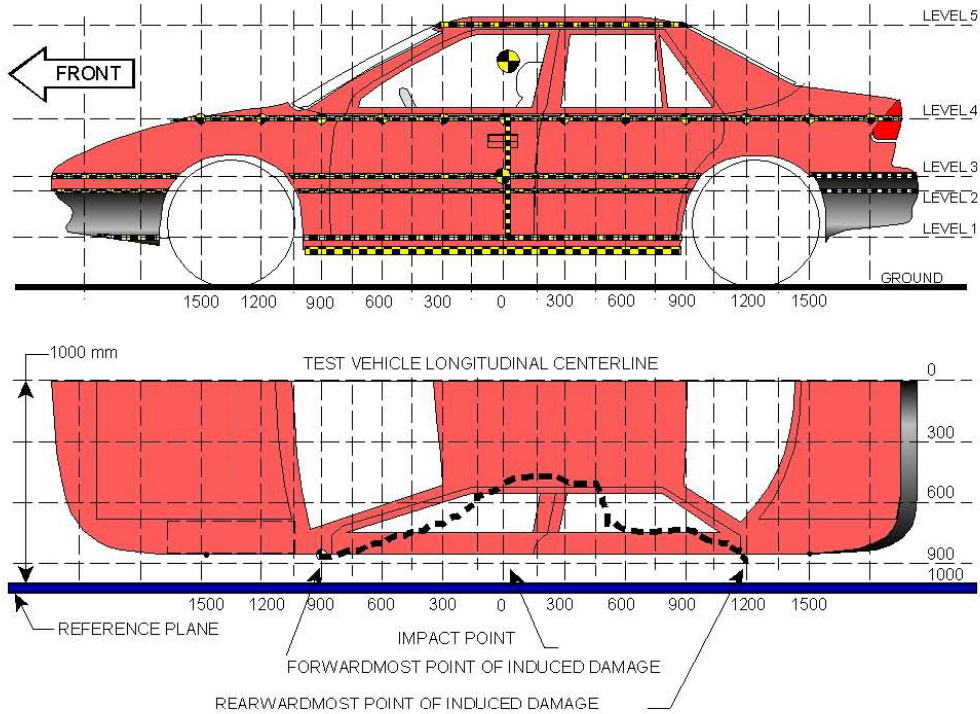
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2652	2606	-46
B	Front Axle to FSOV	928	963	35
C	Rear Axle to RSOV	870	849	-21
D	Total Vehicle Length at Centerline	4450	4418	-32
E	Front Bumper Thickness	114	114	0
F	Front Bumper Bottom to Ground	276	301	25
G	Sill Height at Front Wheel Well	253	240	-13
H	Sill Height at Front Door Leading Edge	255	242	-13
I	Sill Height at B-Pillar	278	281	3
J1	Sill Height at Rear Wheel Well	265	269	4
J2	Pinch Weld Height at Rear Wheel Well	272	264	-8
K	Sill Height Aft of Rear Wheel Well	337	304	-33
L	Rear Bumper Thickness	106	106	0
M	Rear Bumper Bottom to Ground	400	353	-47
N	Sill Height to Bottom of Front Window Sill	676	670	-6
O	Front Door Leading Edge to Impact CL	669	664	-5
P	Rear Door Trailing Edge to Impact CL	1132	1120	-12
Q	Front Window Opening	454	419	-35
R	Right Side Length	3176	3185	9
S	Left Side Length	3176	3154	-22
T	Vehicle Width at B-Pillars	1823	1848	25
U	Front Wheel Track Width	1565		
V	Rear Wheel Track Width	1573		

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022



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

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	493	342	0
2	Occupant H-Point	663	345	0
3	Mid Door	700	345	0
4	Window Sill	1080	292	0
5	Window Top	1562	88	0

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022

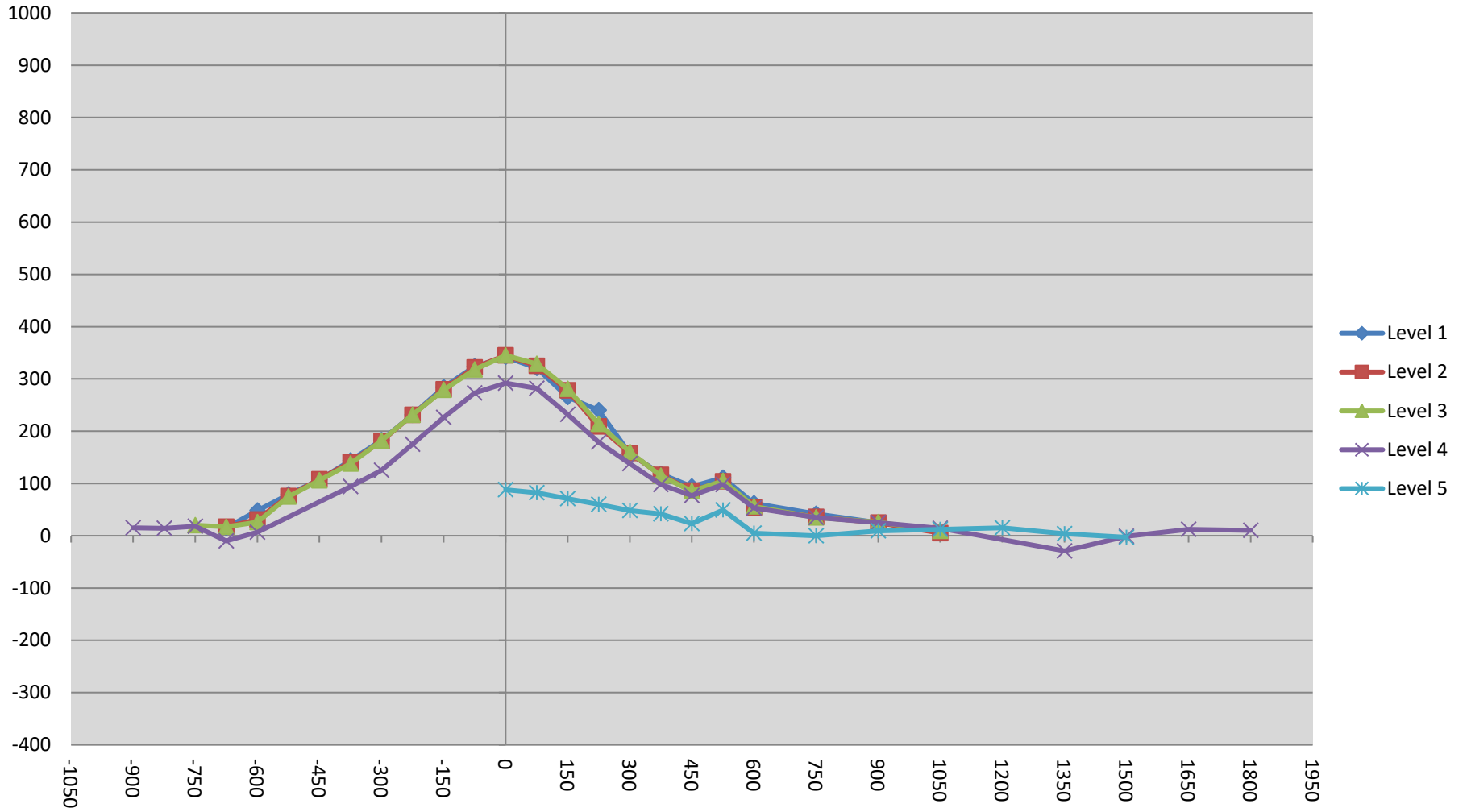
Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

	Pre-Test					Post-Test					Exterior Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2700															
-2550															
-2400															
-2250															
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900				305					320					15	
-825				300					314					14	
-750			198	294				218	312				20	18	
-675	207	204	205	290		222	221	222	280		15	17	17	-10	
-600	210	207	209	290		258	238	235	297		48	31	26	7	
-525	212	210	209			291	286	284			79	76	75		
-450	212	210	210			319	318	316			107	108	106		
-375	211	210	209	290		355	351	347	384		144	141	138	94	
-300	210	210	209	284		393	391	391	409		183	181	182	125	
-225	209	209	210	280		440	440	441	455		231	231	231	175	
-150	208	210	210	276		492	490	489	502		284	280	279	226	
-75	209	209	210	270		533	531	528	543		324	322	318	273	
0	210	210	210	266	517	552	555	555	558	605	342	345	345	292	88
75	209	210	210	262	514	530	535	539	544	596	321	325	329	282	82
150	209	210	210	260	510	474	488	491	492	581	265	278	281	232	71
225	210	210	210	255	506	450	419	424	434	566	240	209	214	179	60
300	210	212	212	254	505	367	370	372	392	553	157	158	160	138	48
375	211	214	214	252	506	329	330	329	350	548	118	116	115	98	42
450	211	215	215	251	510	305	301	300	328	533	94	86	85	77	23
525	215	218	216	252	508	326	322	321	350	557	111	104	105	98	49
600	217	220	217	252	508	279	274	273	305	513	62	54	56	53	5
675															
750	220	220	220	255	514	262	256	255	290	514	42	36	35	35	0
825															
900	220	214	212	258	517	245	239	238	283	526	25	25	26	25	9
1050	210	201	200	262	523	218	206	209	276	535	8	5	9	14	12
1200					540					555					15
1350				264	555				235	559				-29	4
1500				265	575				264	572				-1	-3
1650				270					282					12	
1800				280					290					10	
1950															
2100															
2250															
2400															
2550															
2700															

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

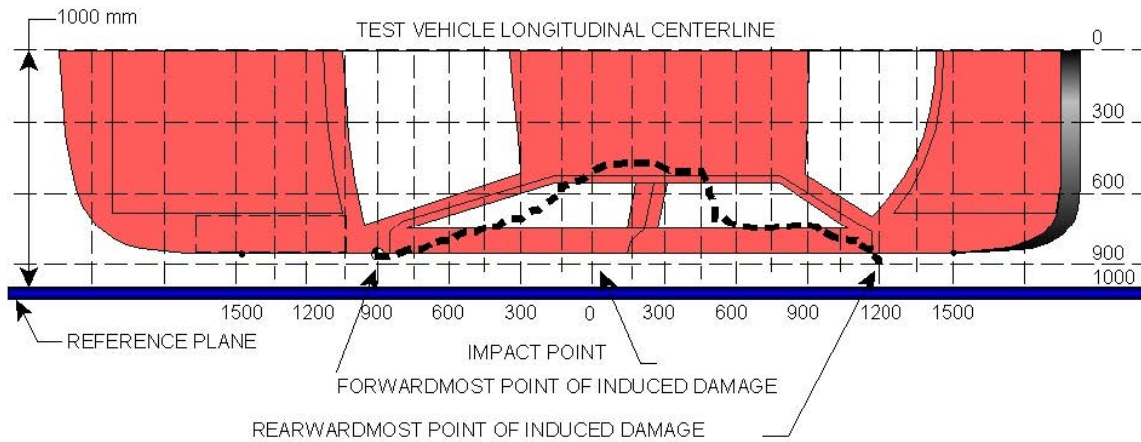
NHTSA No.: O20225101
 Test Date: 11/3/2022



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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	400	3	214	304	90
2	185	3	210	443	233
3	-30	3	210	549	339
4	-245	3	210	414	204
5	-460	3	210	309	99
6	-675	3	205	222	17

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
Test Program: NCAP Side Pole Impact Test

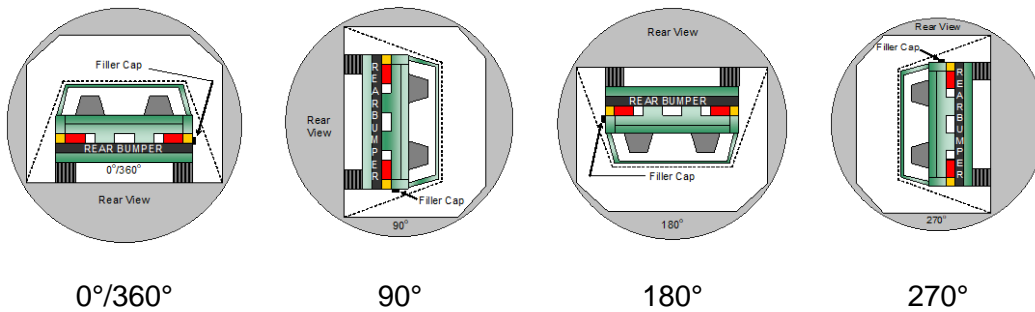
NHTSA No.: O20225101
Test Date: 11/3/2022

Test Time: 11:13 am

Temperature: 22.2°C

- A. From impact until vehicle motion ceases: (Maximum Allowable = 1 ounce) 0.0 oz.
B. For the 5 minute period after motion ceases: (Maximum Allowable = 5 ounces) 0.0 oz.
C. For the following 25 minutes: (Maximum Allowable = 1 ounce / minute) None
D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	116	300	416
90° to 180°	115	300	415
180° to 270°	113	300	413
270° to 360°	113	300	413

FMVSS 301 ROLLOVER SPILLAGE TABLE (UNITS IN OUNCES)

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

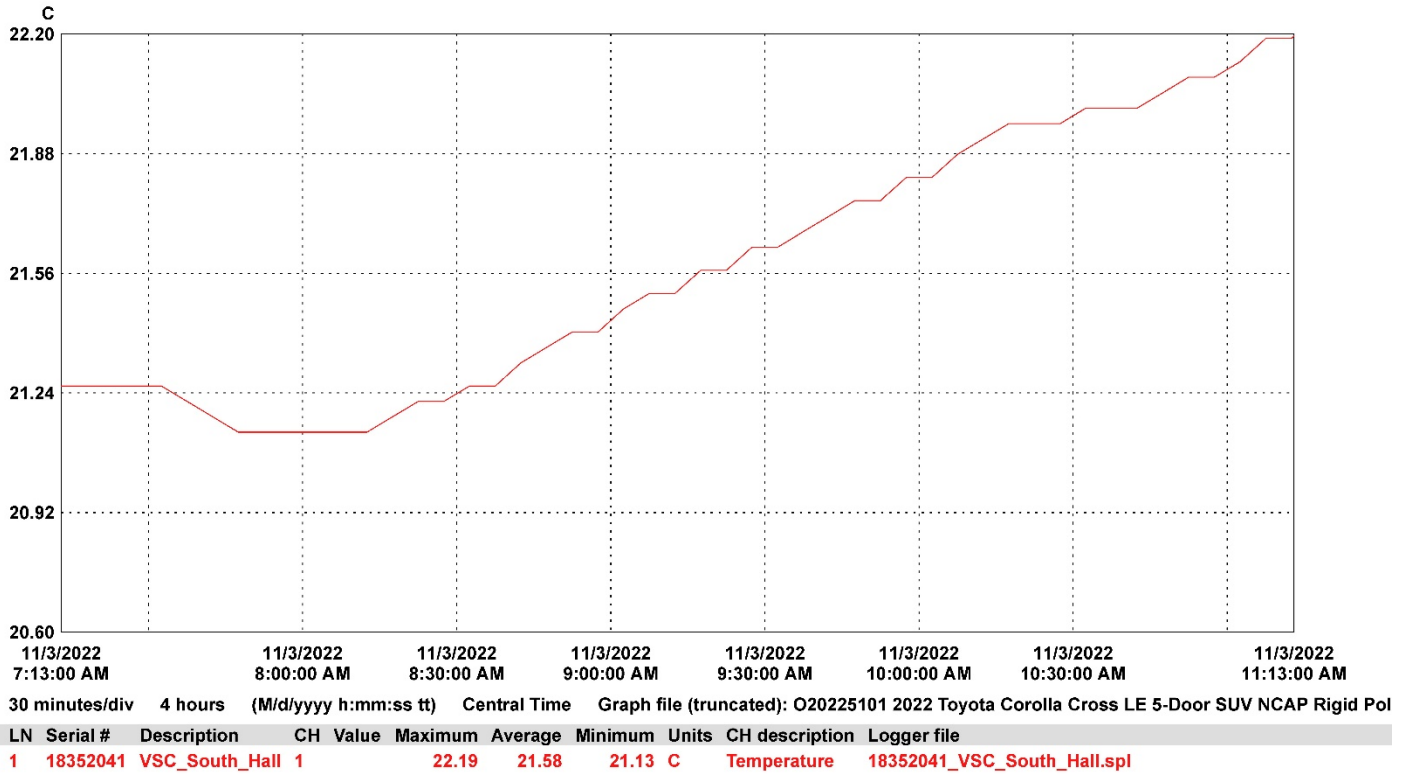
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

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

Test Vehicle: 2022 Toyota Corolla Cross LE 5-Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20225101
 Test Date: 11/3/2022



**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

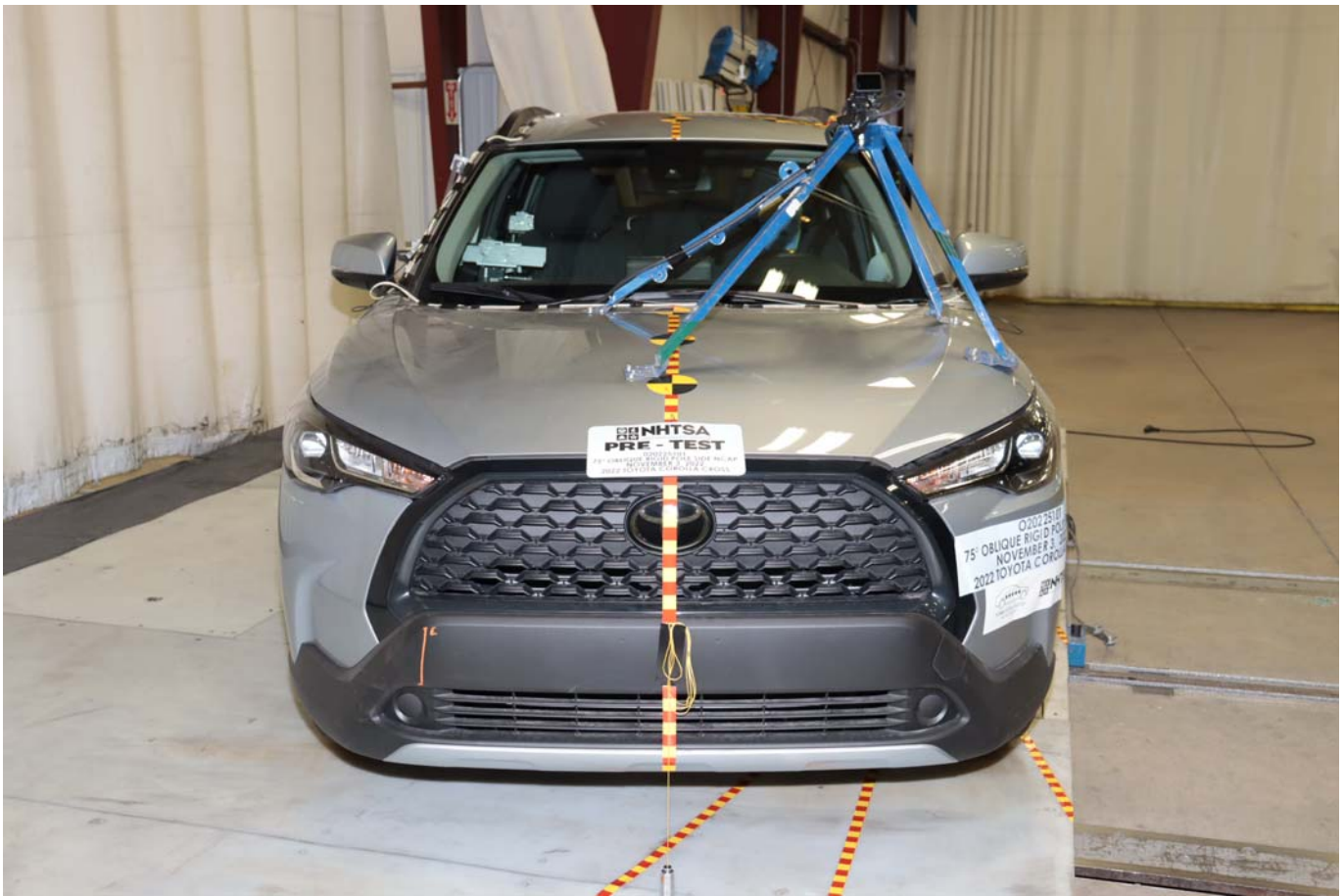


Photo No. 003 - Pre-Test Frontal View of Test Vehicle

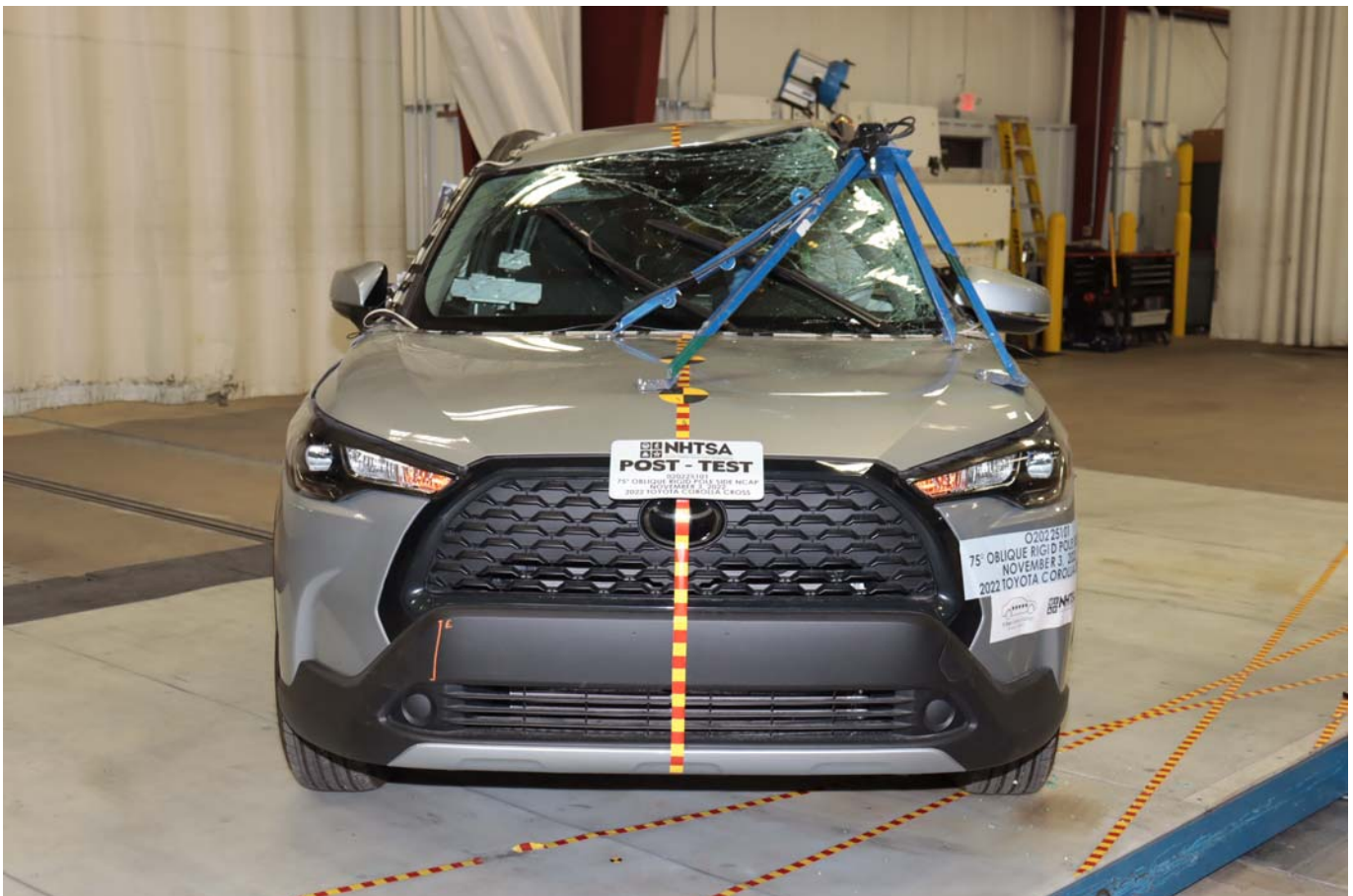


Photo No. 004 - Post-Test Frontal View of Test Vehicle



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

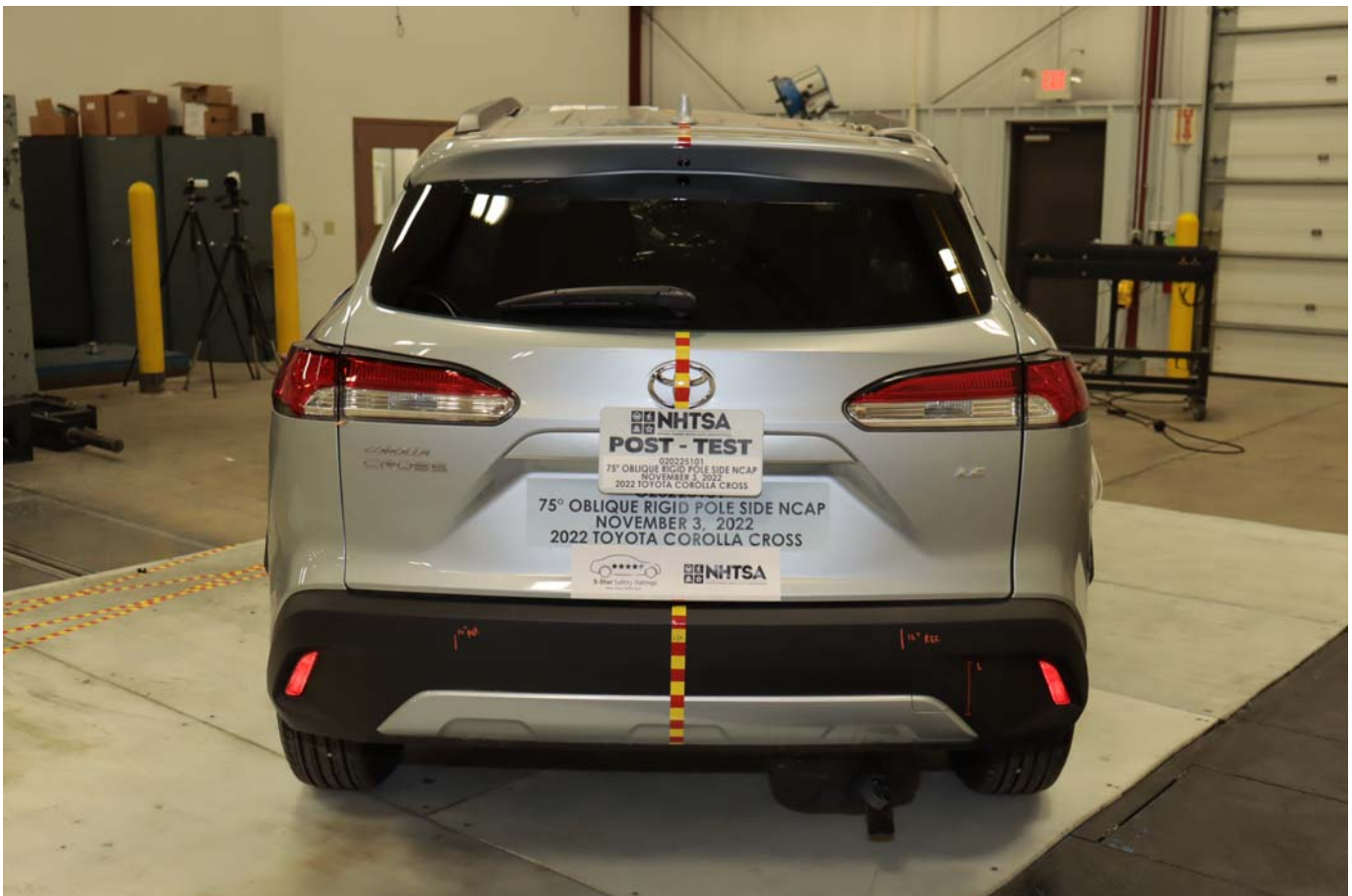


Photo No. 012 - Post-Test Rear View of Test Vehicle

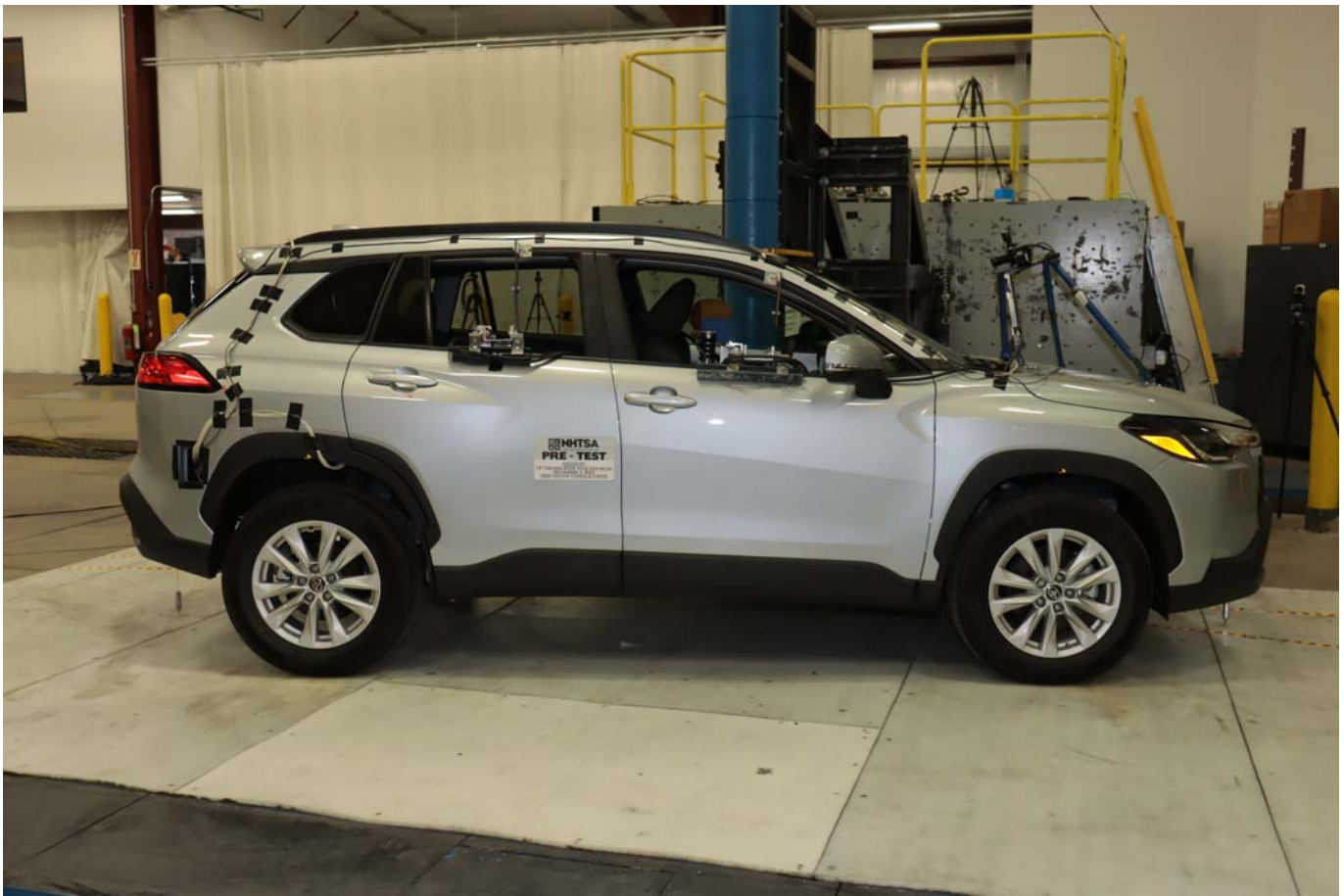


Photo No. 013 - Pre-Test Right Side View of Test Vehicle



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

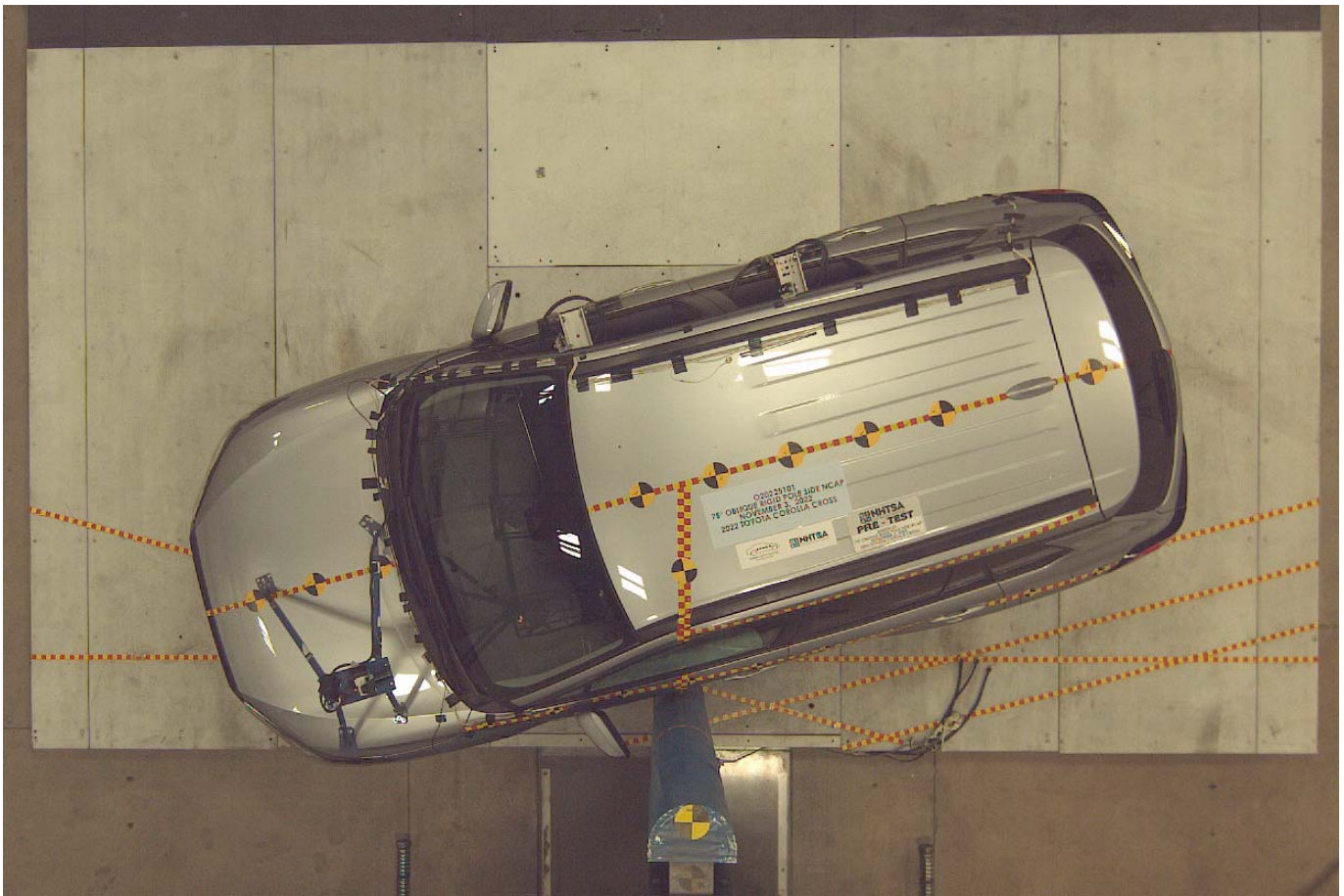


Photo No. 015 - Pre-Test Overhead View of Test Area

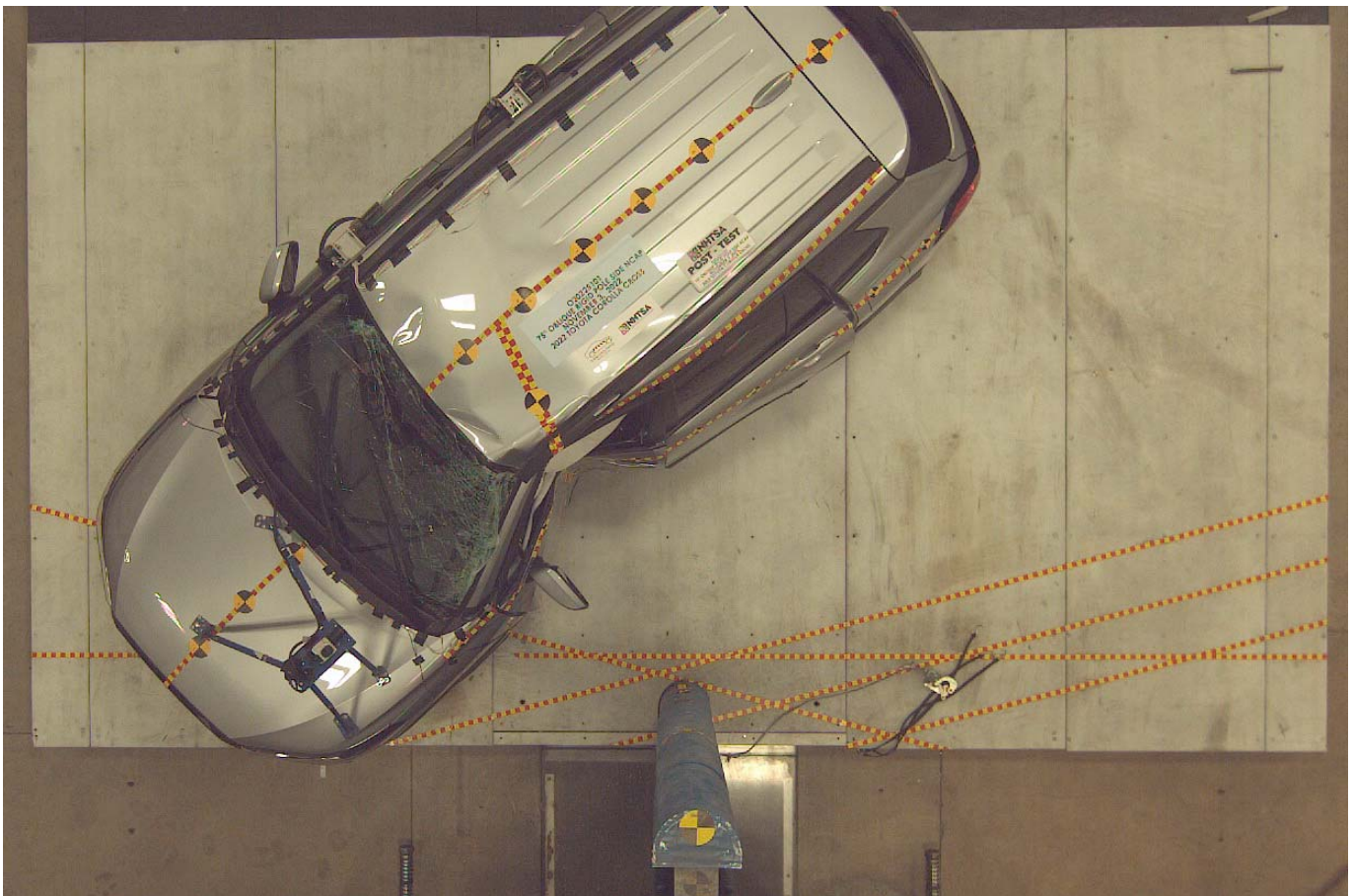


Photo No. 016 - Post-Test Overhead View of Test Area

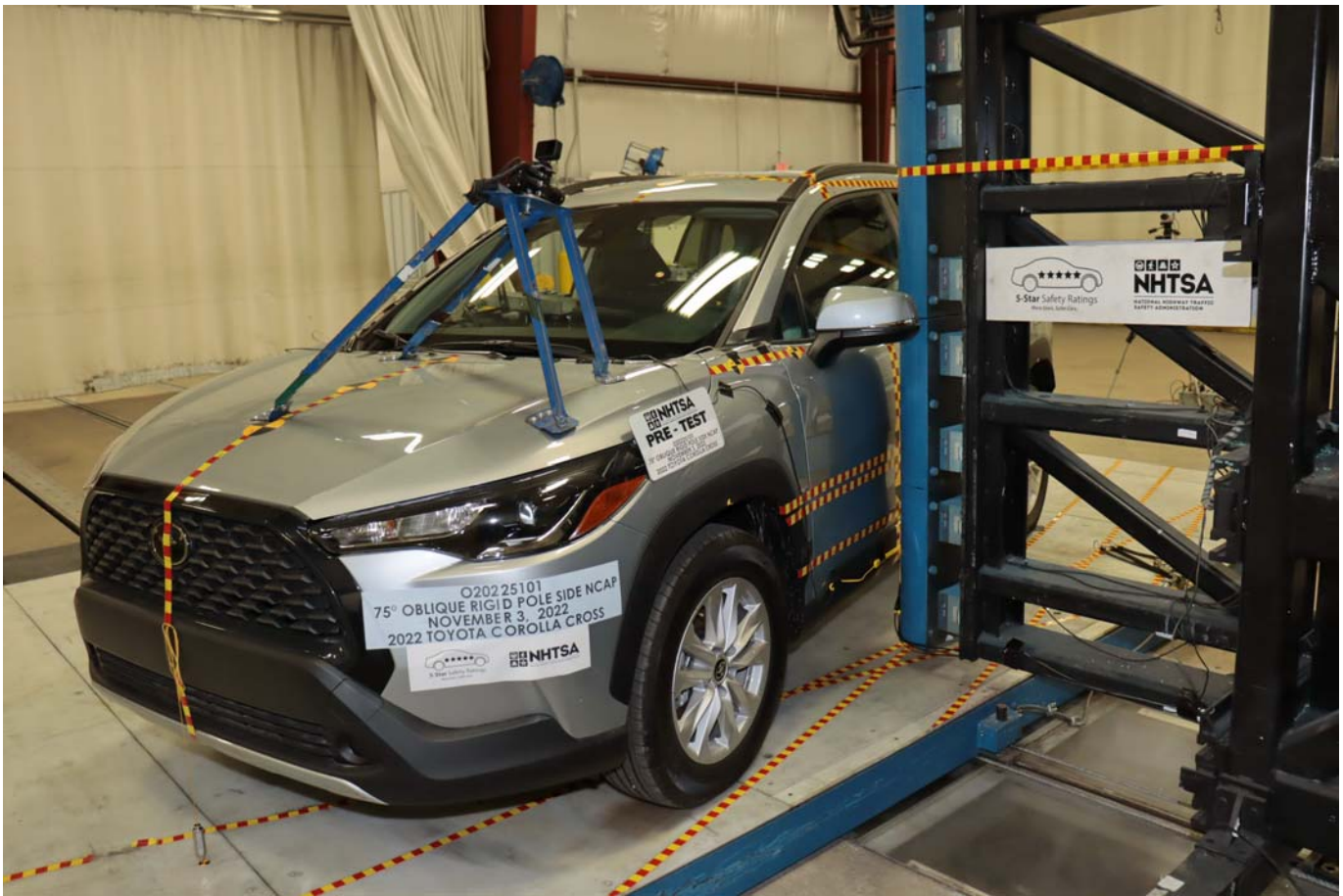


Photo No. 017 - Pre-Test Left Side View of Pole Positioned Against Side of Vehicle

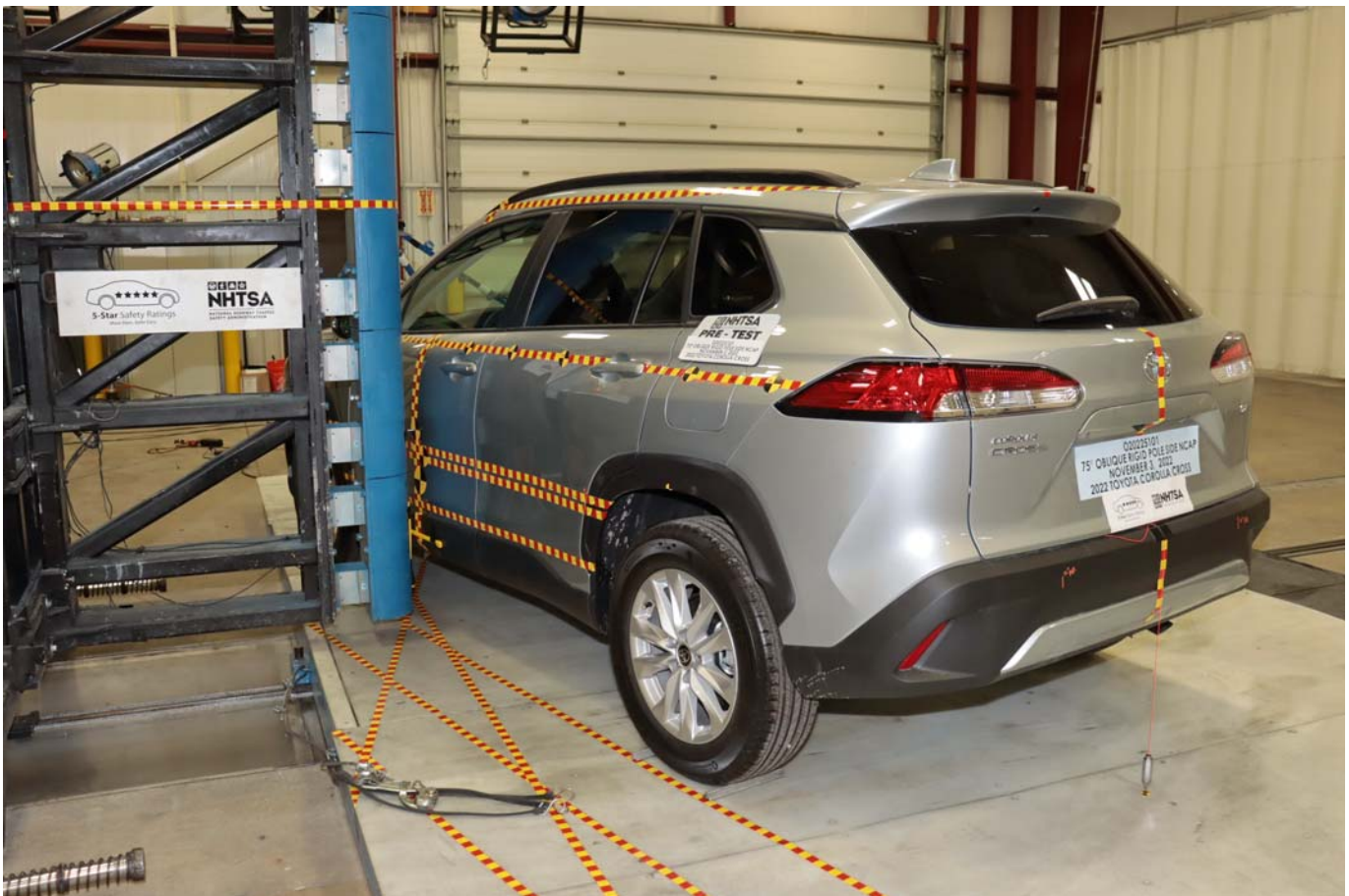


Photo No. 018 - Pre-Test Right Side View of Pole Positioned Against Side of Vehicle



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



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



Photo No. 023 - Pre-Test Left Side View of Dummy Showing Belt and Chalking



Photo No. 024 - Pre-Test Left Side View of Dummy Shoulder and Door Top View



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



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

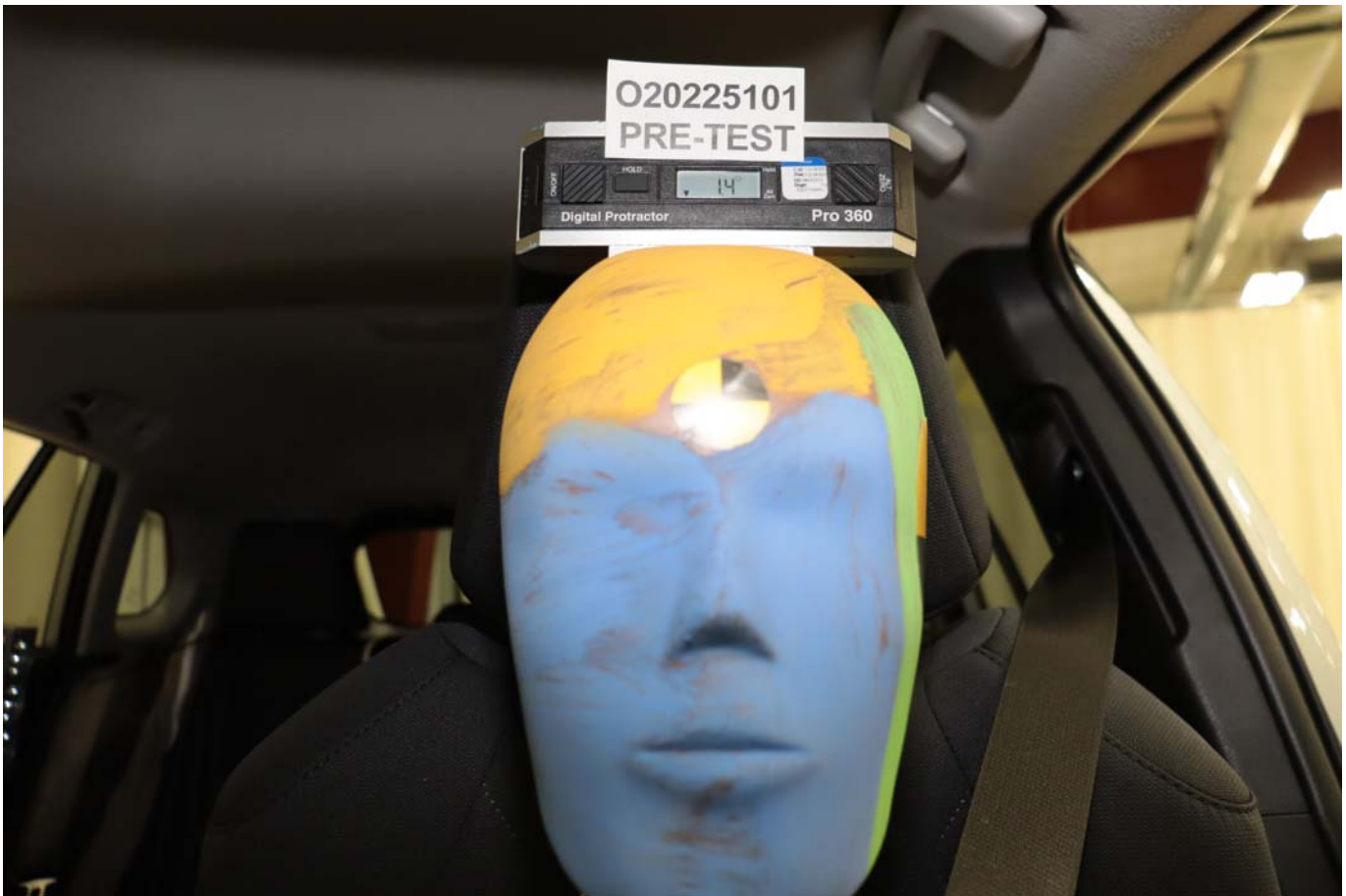


Photo No. 027 - Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



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



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



Photo No. 030 - Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket



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



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



Photo No. 033 - Pre-Test View of Belt Anchorage for Dummy



Photo No. 034 - Pre-Test Left Side View of Steering Wheel



Photo No. 035 - Pre-Test View of Disengaged Parking Brake



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



Photo No. 037 - Pre-Test Close-Up Left Side View of Driver Seat Track



Photo No. 038 - Pre-Test Close-Up Left Side View of Driver Seat Back



Photo No. 039 - Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Photo No. 040 - Pre-Test Dummy and Door Clearance View



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



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



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



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



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

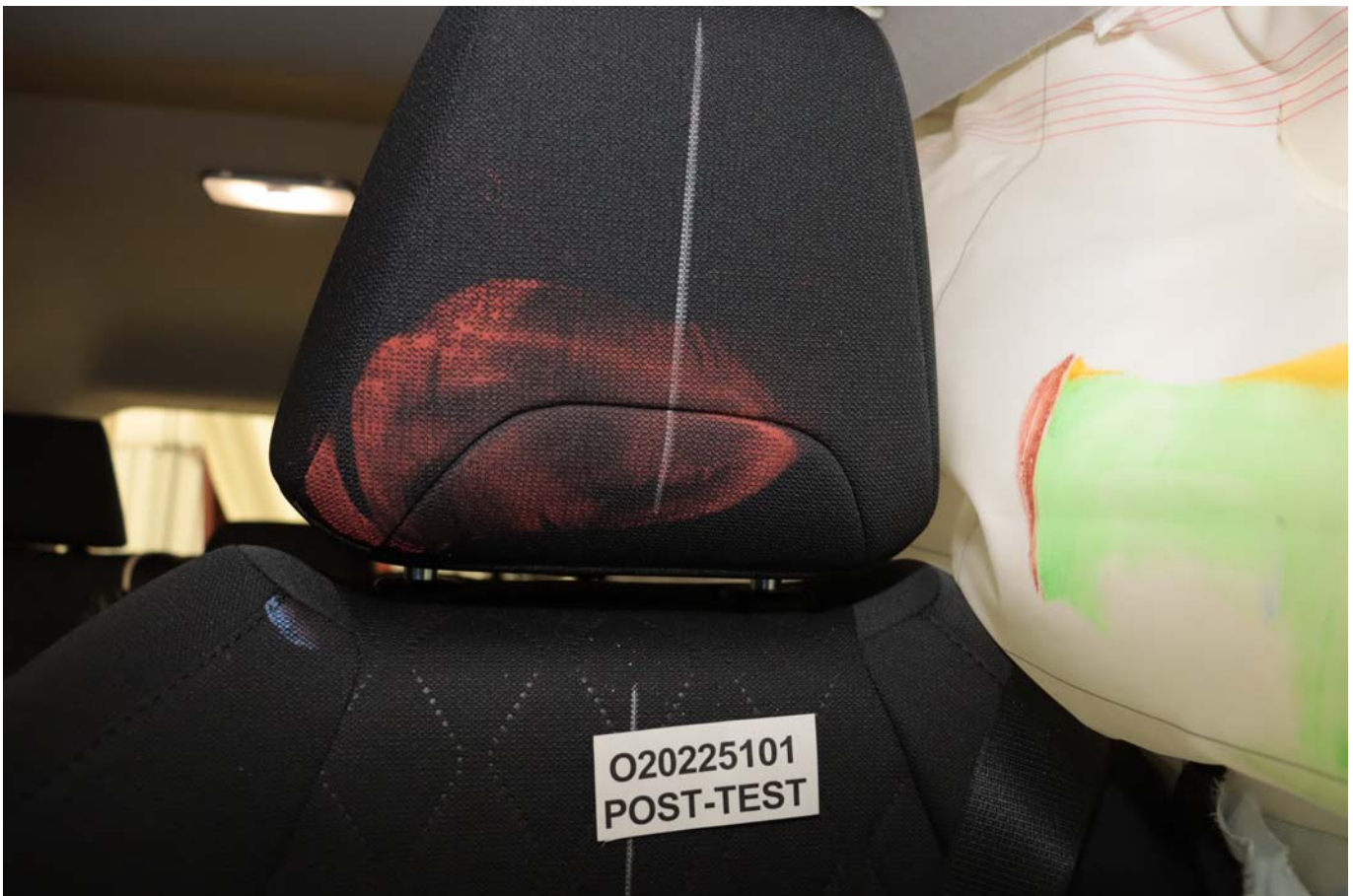


Photo No. 046 - Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



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



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



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



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



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

PHOTOGRAPH NOT APPLICABLE

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



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

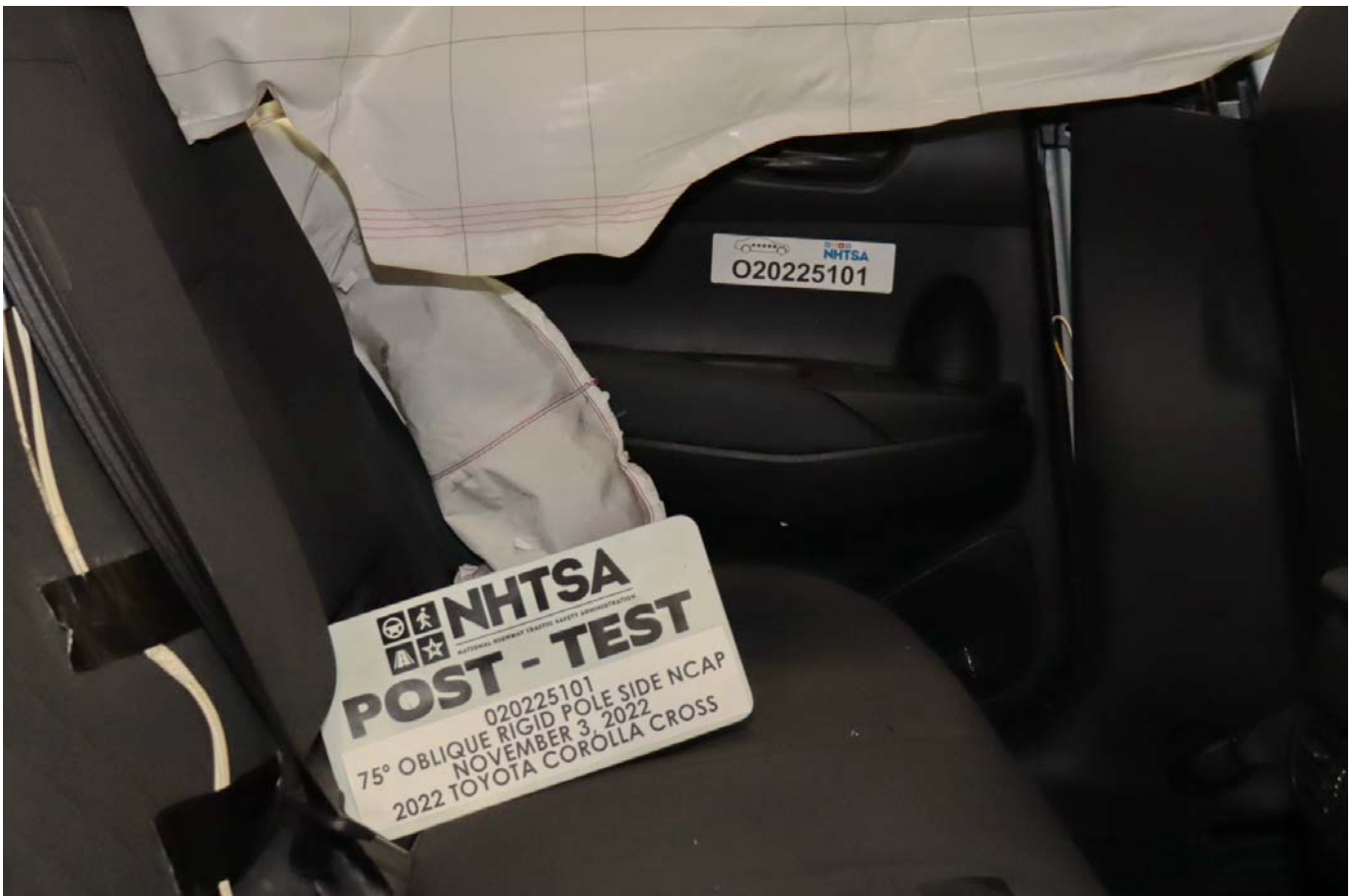


Photo No. 054 - Post-Test Inner Rear Passenger Torso Air Bag Deployment View



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



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



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

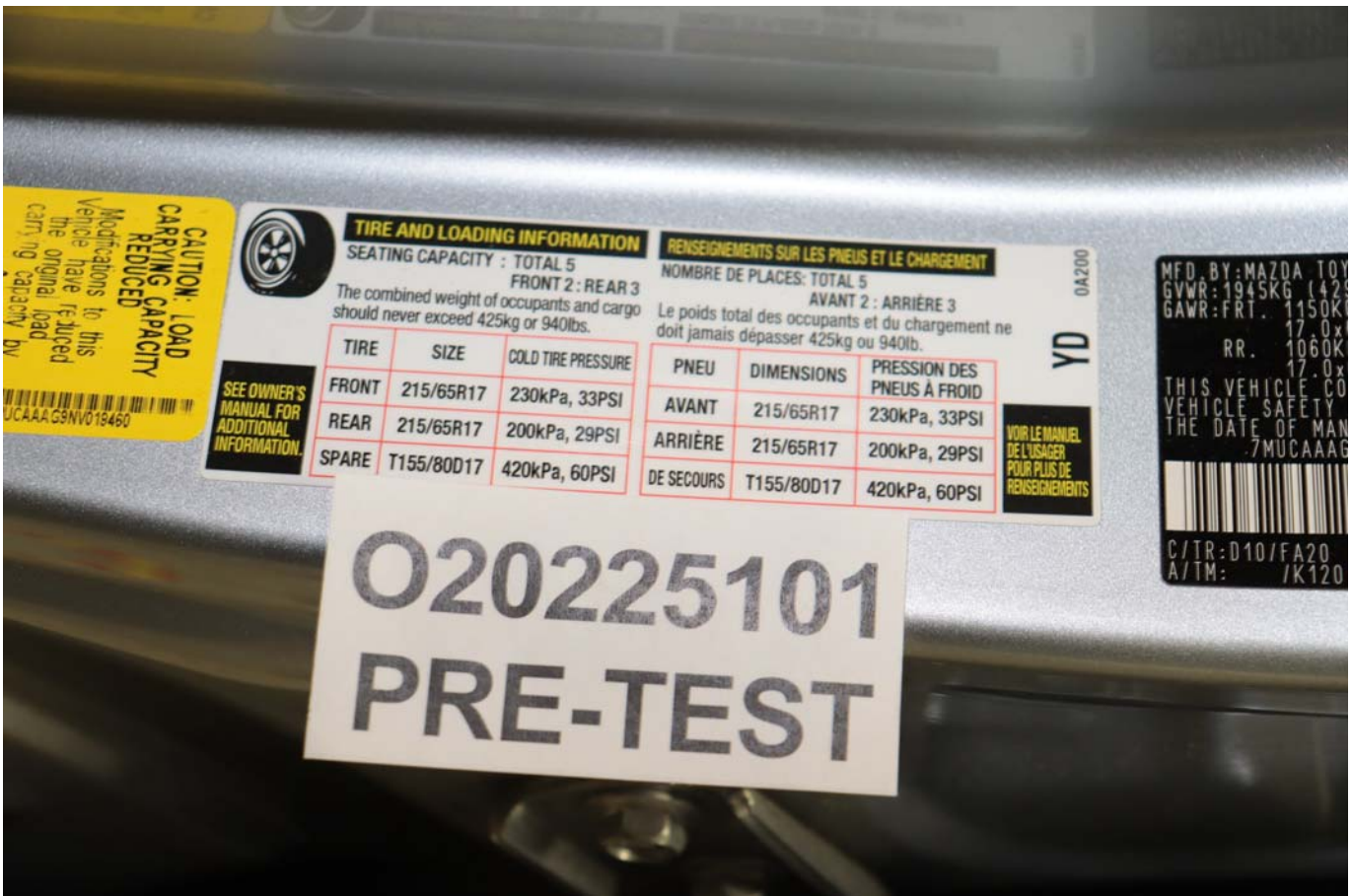


Photo No. 058 - Close-Up View of Vehicle's Tire Information Placard or Label

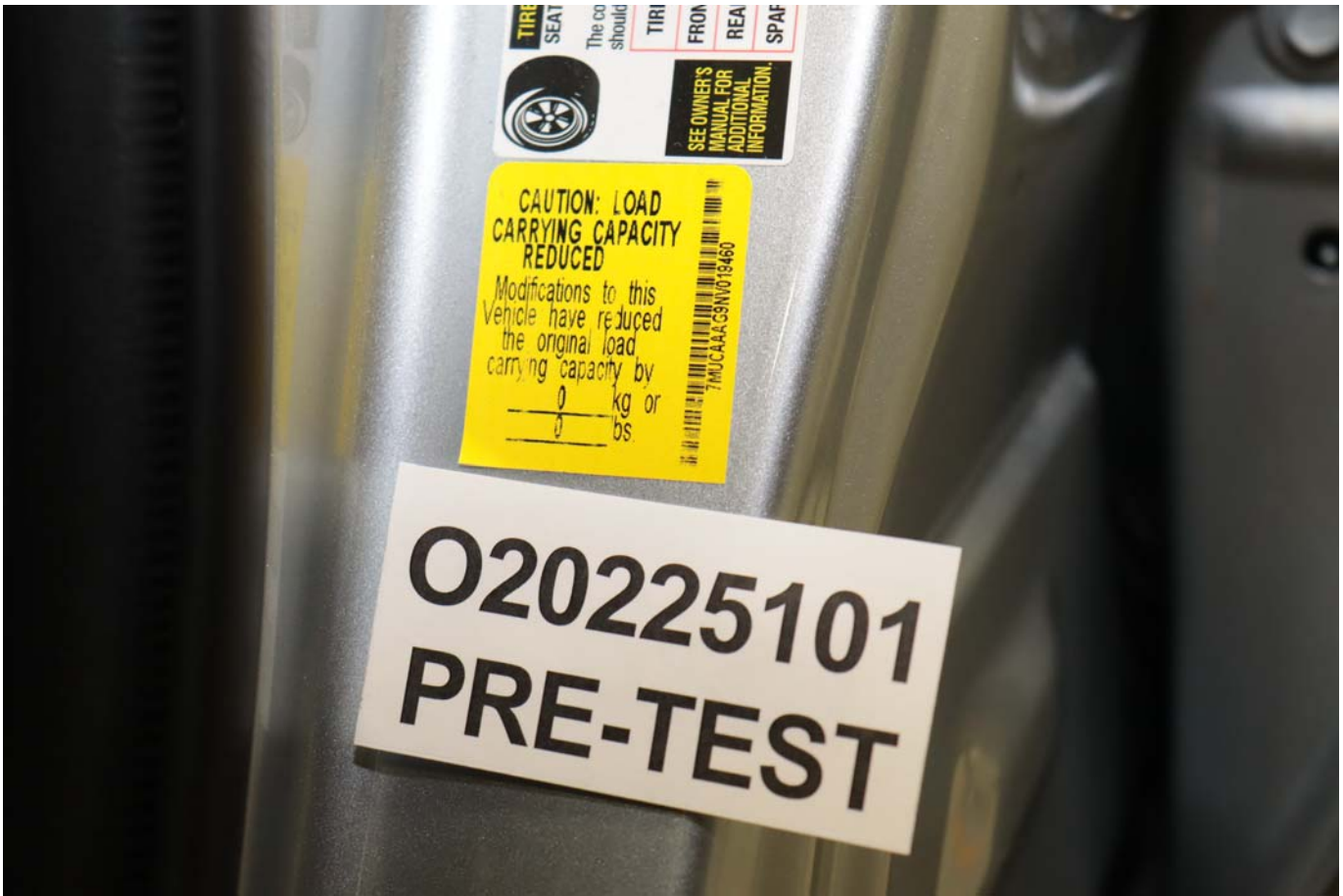


Photo No. 058a - Close-Up View of Vehicle Load Carrying Capacity Reduction Label



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



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



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

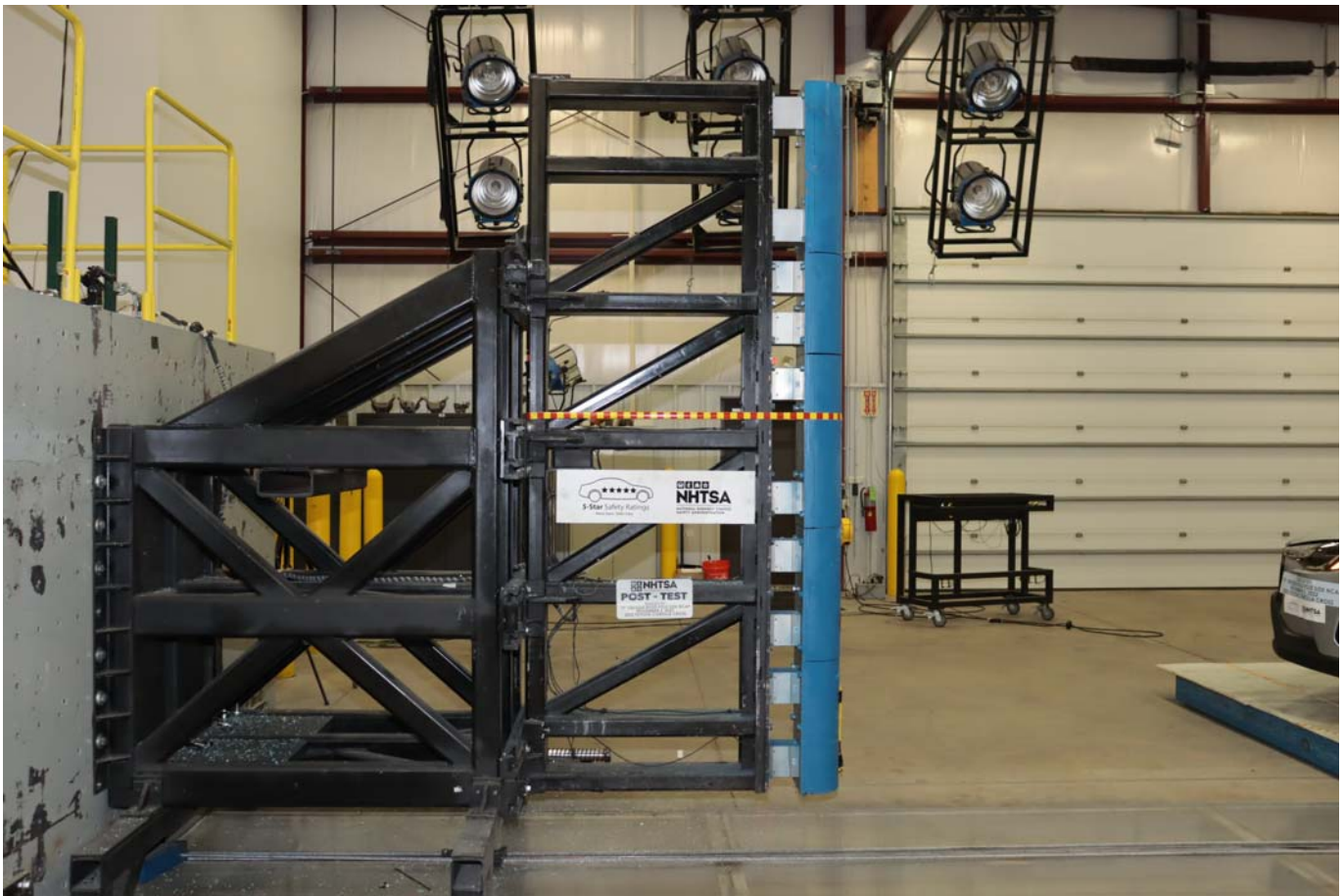


Photo No. 062 - Post-Test Pole Barrier Side View

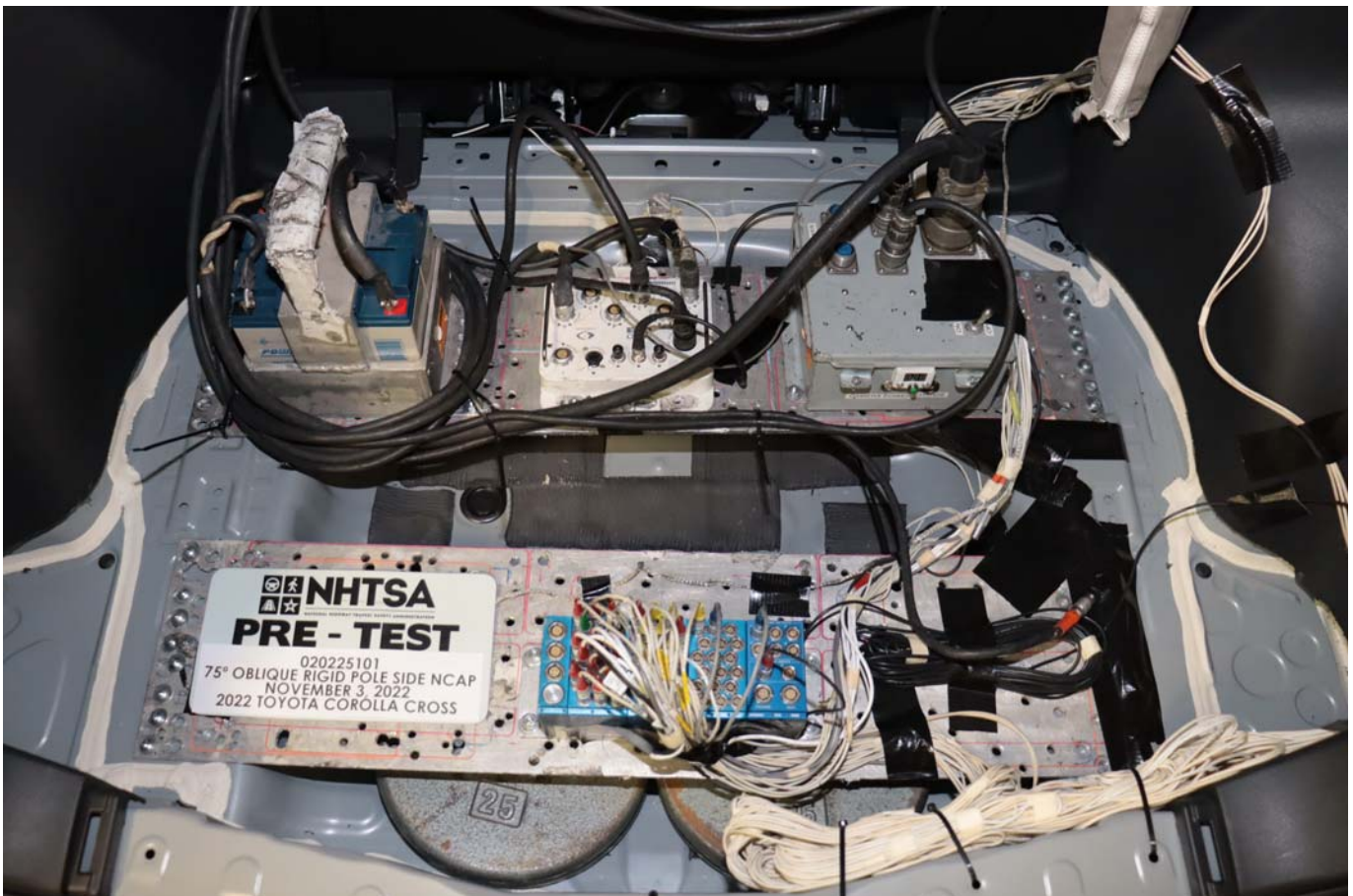


Photo No. 063 - Pre-Test Ballast View

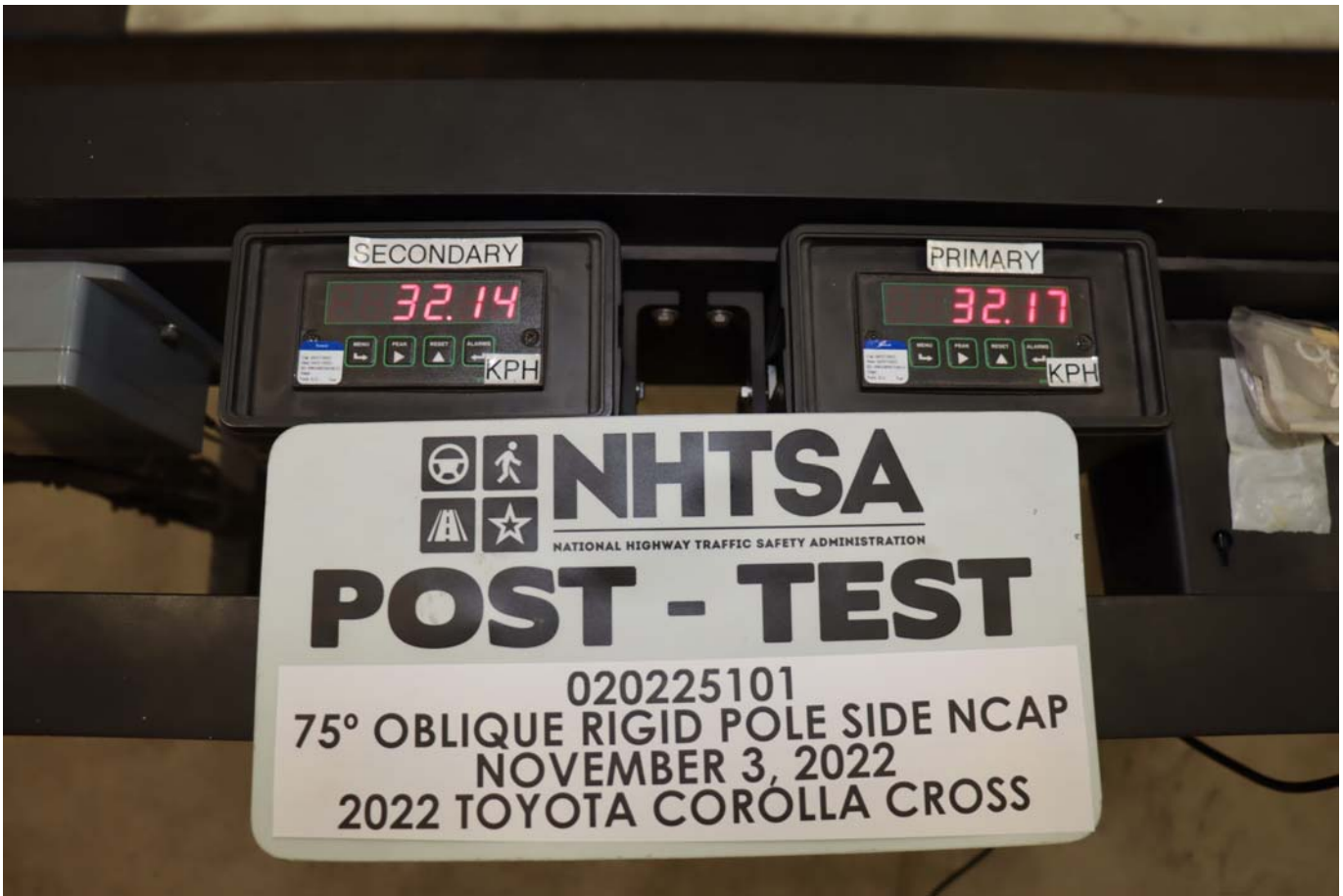


Photo No. 064 - Post-Test Primary and Redundant Speed Trap Read-Out

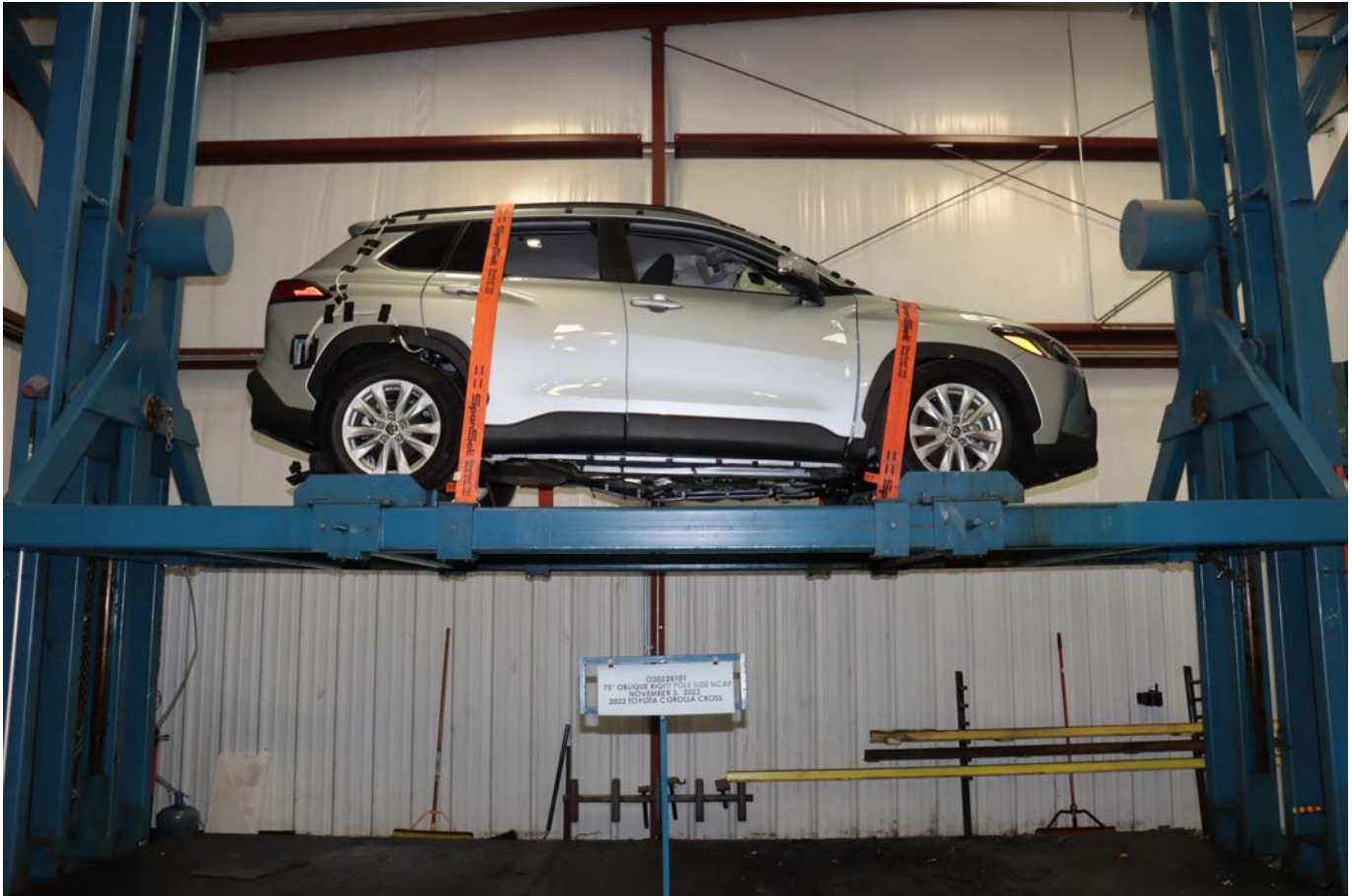


Photo No. 065 - FMVSS Photo No. 301 Static Rollover 0 Degrees

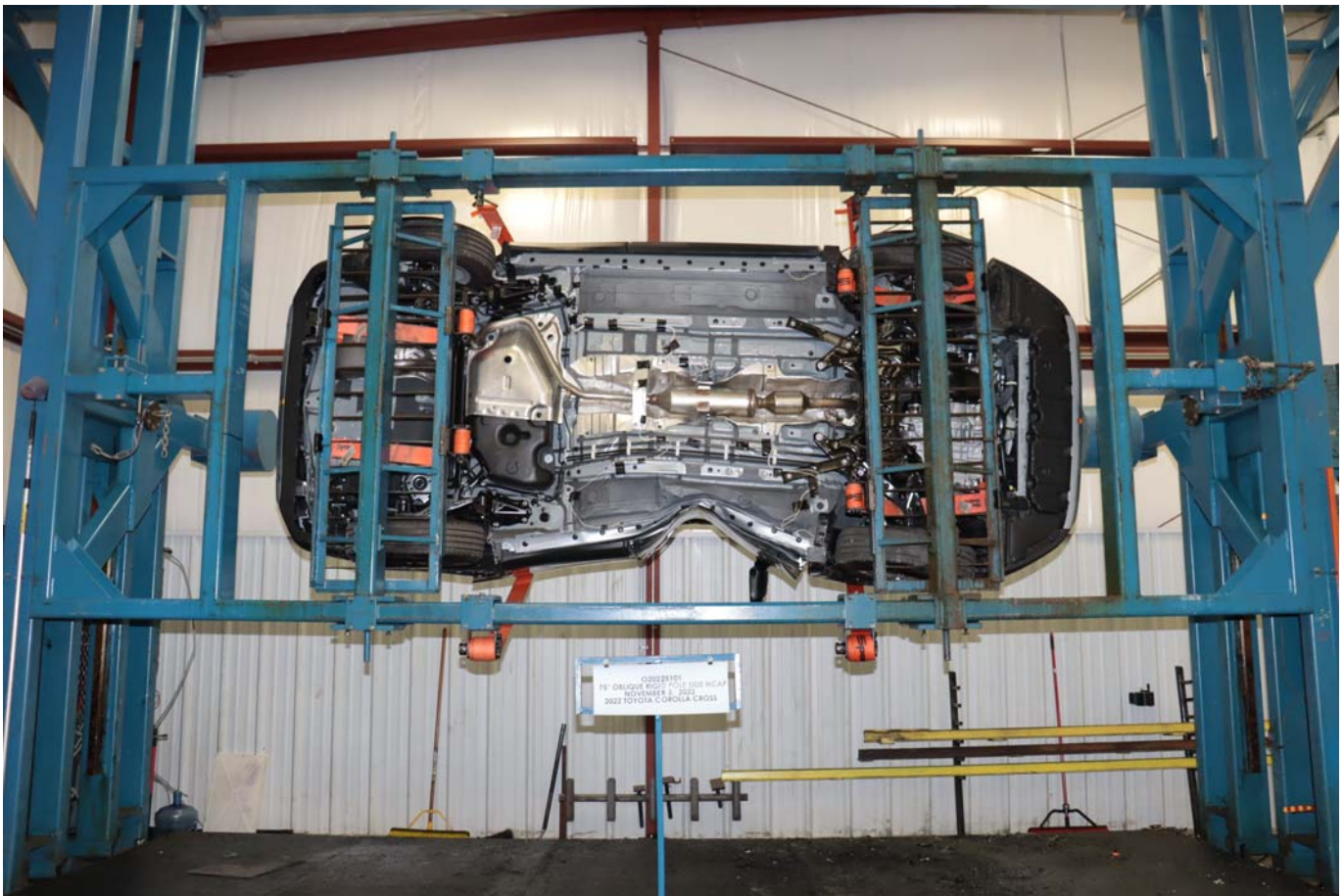


Photo No. 066 - FMVSS Photo No. 301 Static Rollover 90 Degrees



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



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

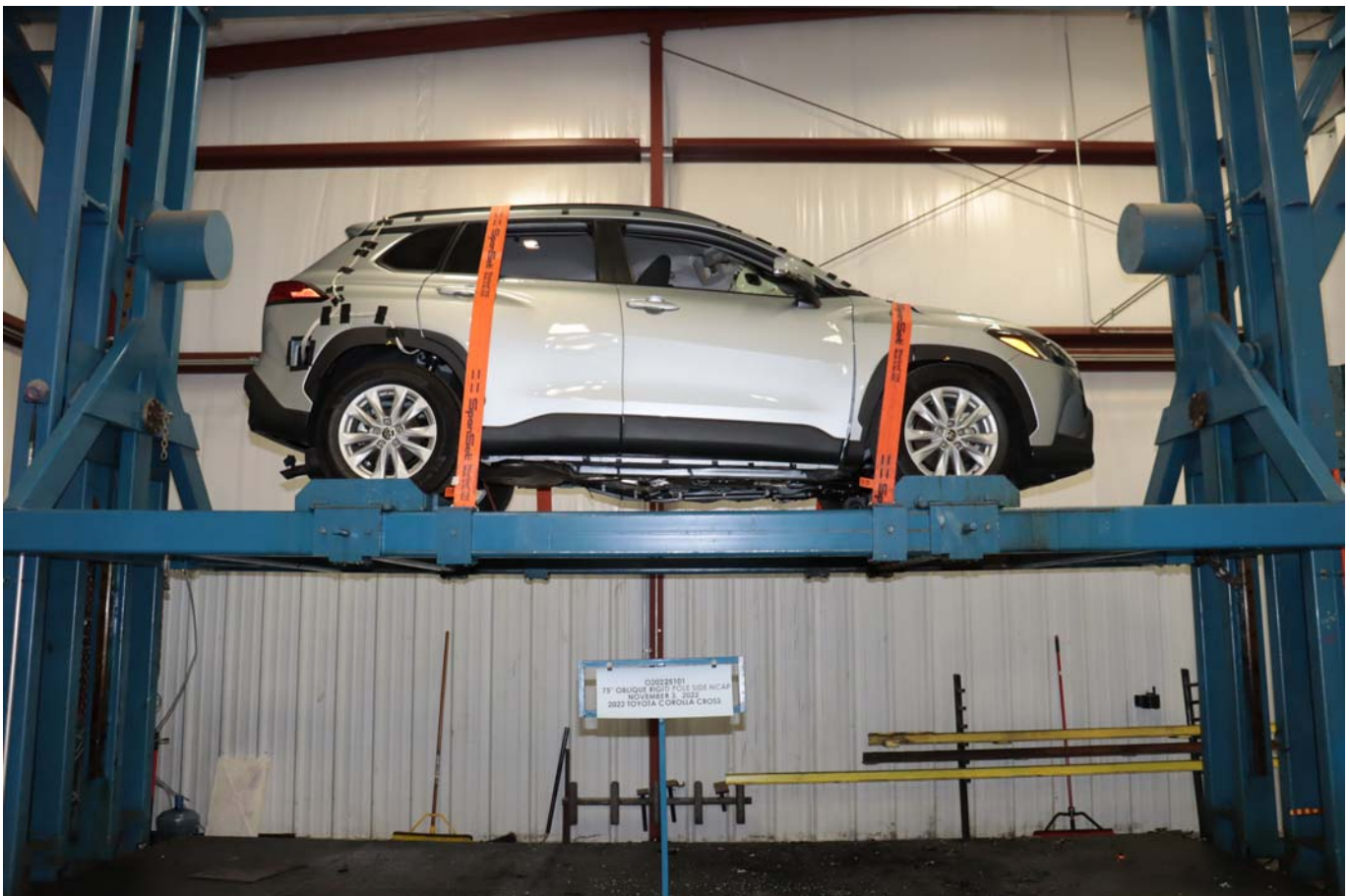


Photo No. 069 - FMVSS Photo No. 301 Static Rollover 360 Degrees



Photo No. 070 - Impact Event

TOYOTA		STANDARD EQUIPMENT <small>UNLESS REPLACED BY OPTIONAL EQUIPMENT</small>	MANUFACTURER'S SUGGESTED RETAIL PRICE \$24,795.00
DESC: Corolla Cross LE VIN: 7MUCAAAG9NV019460 YR/MDL: 2022/6303C CLR: SONIC SILVER/FA20 (0D10/20) FINAL ASSEMBLY POINT: HUNTSVILLE, ALABAMA, U.S.A.	MECHANICAL & PERFORMANCE - 2.5L 4-cyl Engine w/ Dual Variable Valve Timing, CVT - 17-in Alloy Wheels SAFETY & CONVENIENCE - Toyota Safety Sense 2.0: Pre-Collision Sys w/ Pedestrian Detection, Full-Speed Range Dynamic Radar Cruise Control, Lane Departure Alert w/ Steering Assist, Lane Tracing Assist, Automatic High Beams, Road Sign Assist - Star Safety System - Smart Key System w/ Push Button Start - Blind Spot Monitor w/ Rear Cross-Traffic Alert EXTERIOR - Black Roof Rails - Heated Outside Mirrors - LED Headlights w/ DRLs - LED Stoplights - Rear Windshield Wiper INTERIOR - Audio - 8-in Touchscreen, 6 Speakers, Android Auto & Apple CarPlay Compatible, SiriusXM w/ 3-Month Platinum Trial - Wireless Smartphone Charging - 3 USB Ports - Front Auto Single Zone Air Conditioning & Rear-Seat Vents - Fabric-Trimmed Seats - 60/40 Split Fold-Down Rear Seat - Leather-Trimmed Steering Wheel For Full Product Details: - Please Visit Toyota.com/CorollaCross - **Full Tank of Gas**	OPTIONAL EQUIPMENT FE 50 State Emissions	
GOVERNMENT 5-STAR SAFETY RATINGS This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.			
Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4236			
EPA DOT Fuel Economy and Environment Gasoline Vehicle			
Fuel Economy 32 MPG <small>Small SUVs range from 14 to 128 MPG. The best vehicle rates 142 MPG.</small> combined city/hwy 3.1 gallons per 100 miles		You save \$1,000 in fuel costs over 5 years compared to the average new vehicle.	
Annual fuel cost \$1,100		Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only) 	
Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$6,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.25 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.		DELIVERY, PROCESSING AND HANDLING FEE 1,215.00	
fuelconomy.gov Calculate personalized estimates and compare vehicles		TOTAL \$26,010.00	
		The New Vehicle Limited Warranty provides 3-year/36,000-mile basic coverage, 5-year/100,000-mile powertrain coverage, plus 3-year/unlimited-mile corrosion/perforation coverage. See Warranty and Maintenance Guide for details. An extended service contract may be available for the vehicle. Ask dealer for details. Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Gasoline, license and title fees, applicable federal, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price.	
		Delivered by Truck to: 48065 TOYOTA OF BROOKFIELD 20655 WEST CAPITOL DR BROOKFIELD WI 53045	
		TML1E2N150F0W	

Photo No. 071 - Monroney Label

3-3. Adjusting the seats 127

Head restraints

Head restraints are provided for all seats.

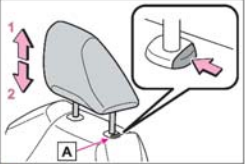
WARNING

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

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

Adjusting a head restraint

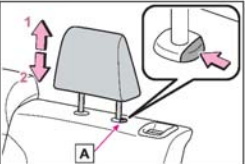
■ **Front seats**



1 Up
Pull the head restraints up.

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


■ **Rear outside seats**



1 Up
Pull the head restraints up.

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

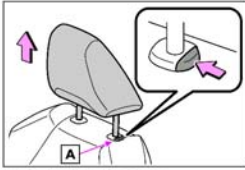
■ **Adjusting the height of the head restraints (front seats)**
Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.



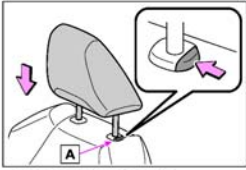
Removing the head restraints

■ **Front seats**
Pull the head restraint up while pressing the lock release button **A**.

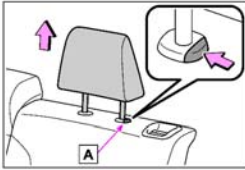
128 3-3. Adjusting the seats



■ **Rear outside seats**
Pull the head restraint up while pressing the lock release button **A**.

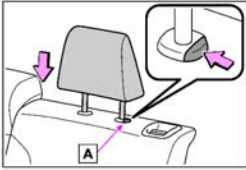


■ **Rear outside seats**
Align the head restraint with the installation holes and push it down to the lock position.
Press and hold the lock release button **A** when lowering the head restraint.



■ **Installing the head restraints**

■ **Front seats**
Align the head restraint with the installation holes and push it down to the lock position.
Press and hold the lock release button **A** when lowering the head restraint.



3 Before driving

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



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

APPENDIX B
DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

		<u>Page No.</u>
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)

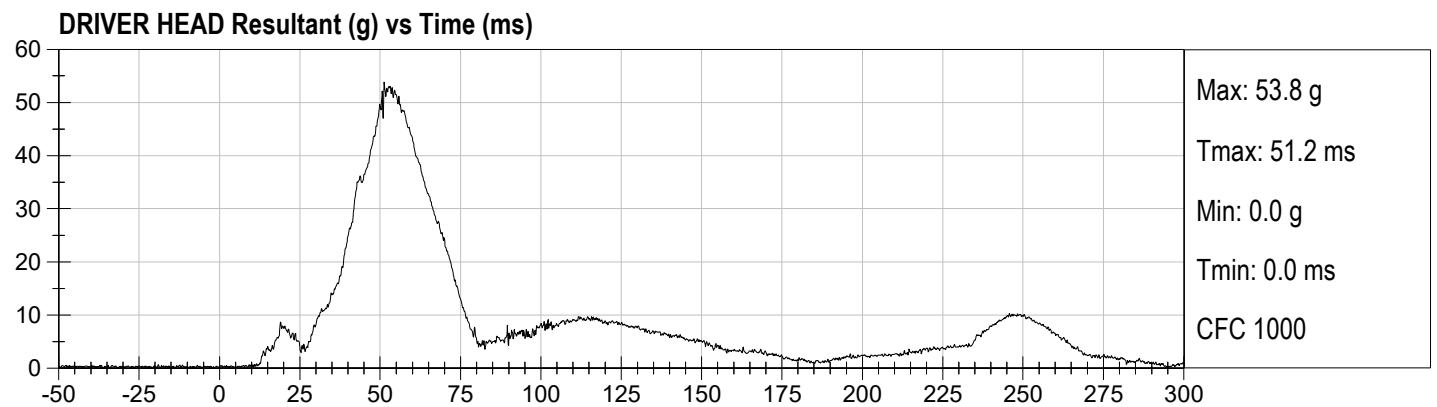
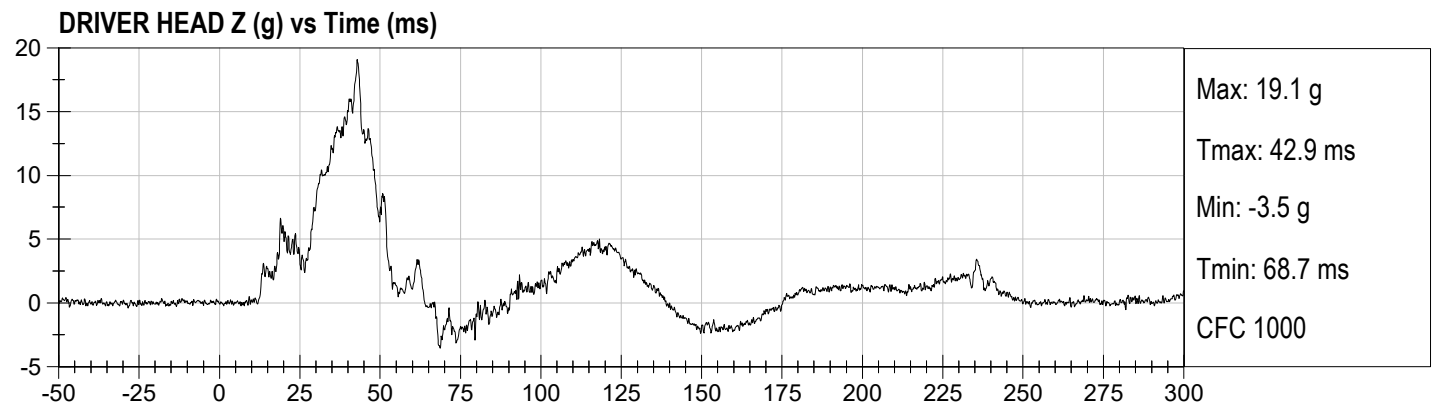
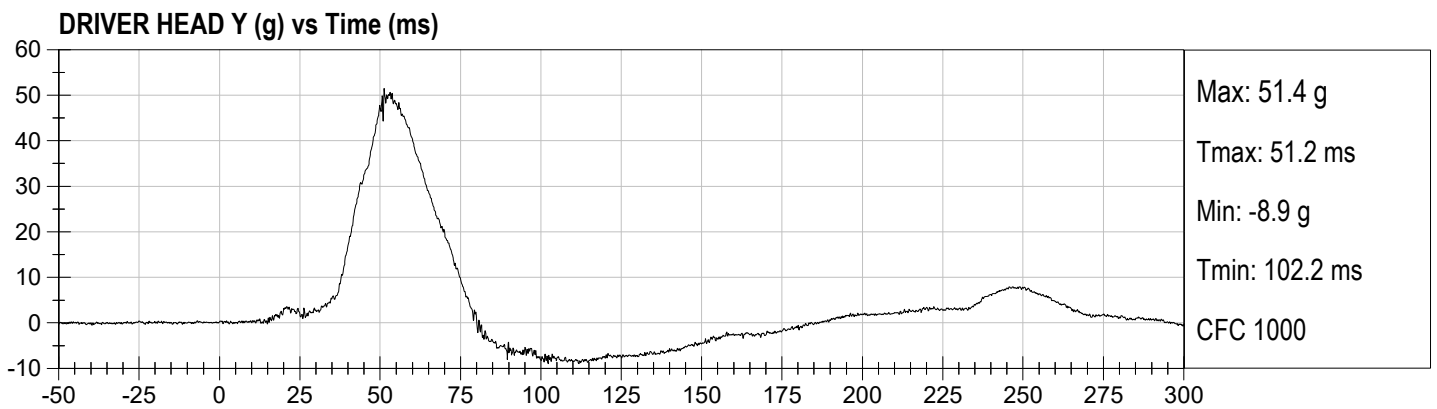
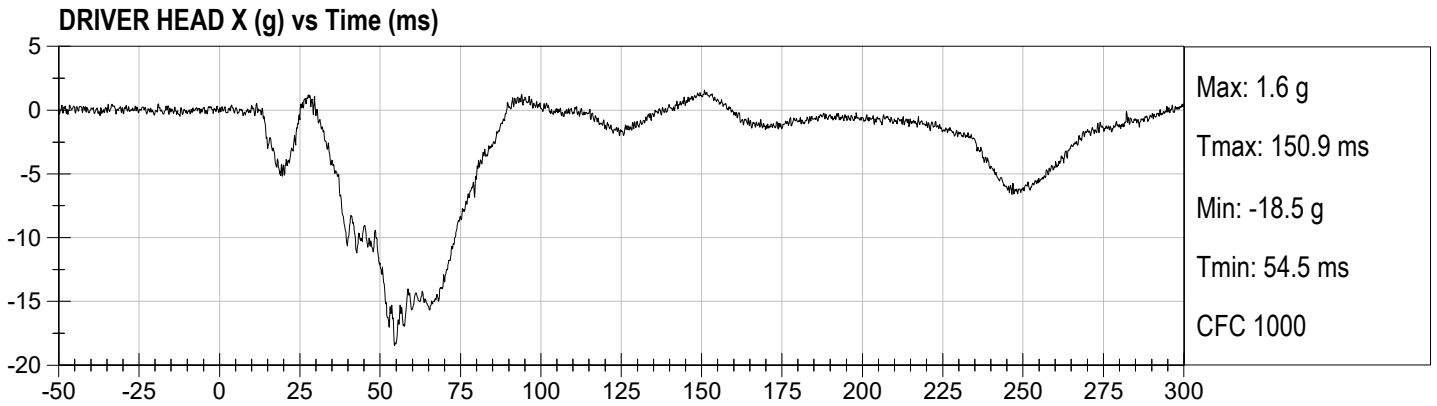
Load Cell Pole Barrier #4 Force (Y)

Load Cell Pole Barrier #5 Force (Y)

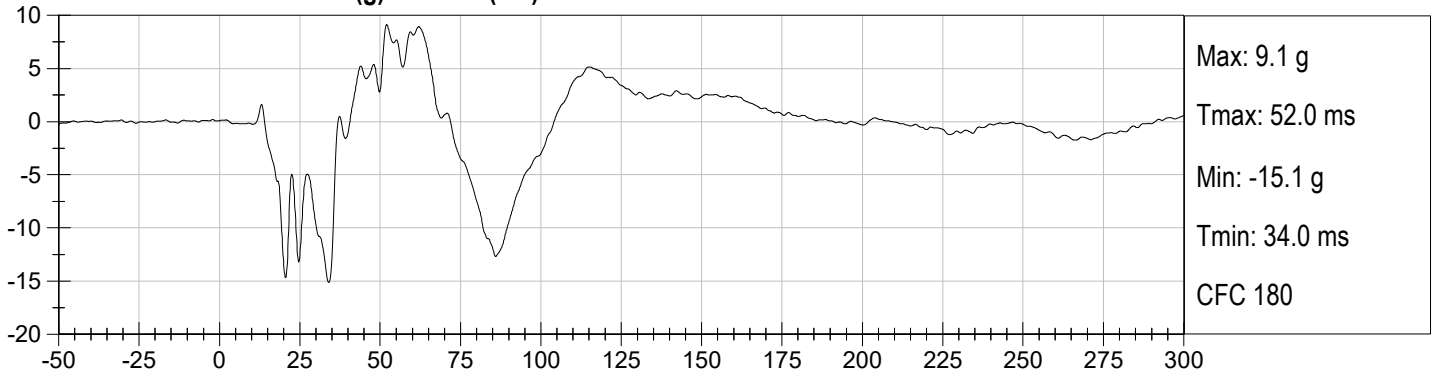
Load Cell Pole Barrier #6 Force (Y)

Load Cell Pole Barrier #7 Force (Y)

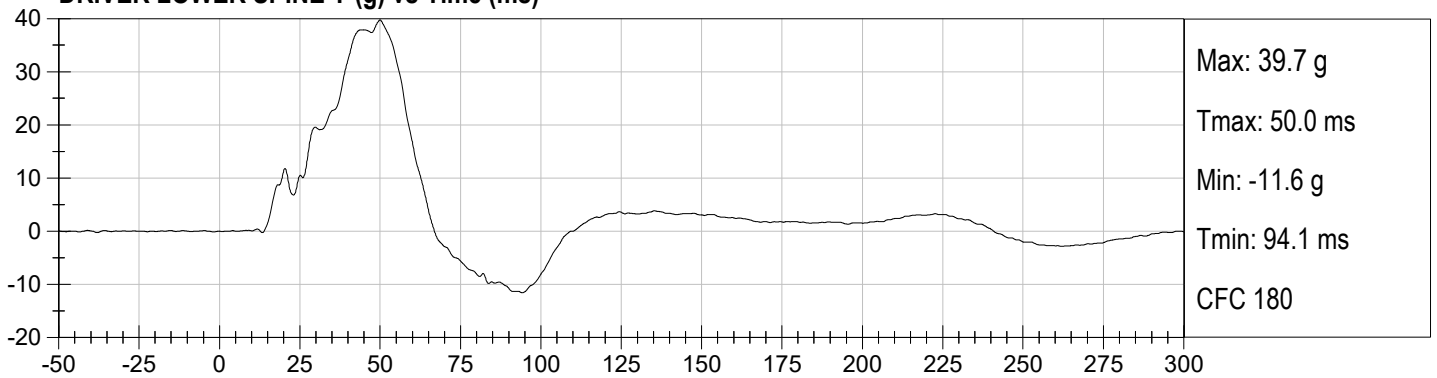
Load Cell Pole Barrier #8 Force (Y)



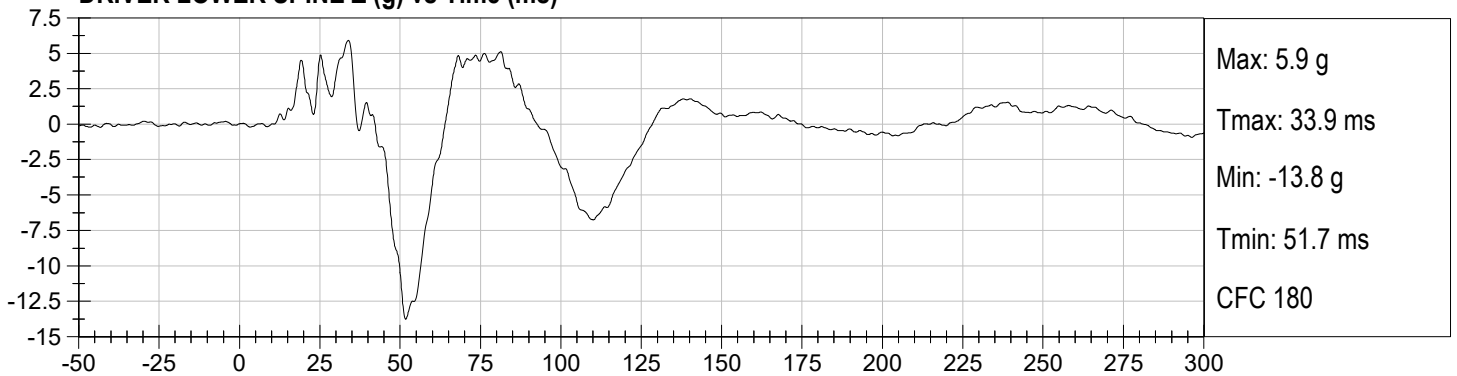
DRIVER LOWER SPINE X (g) vs Time (ms)



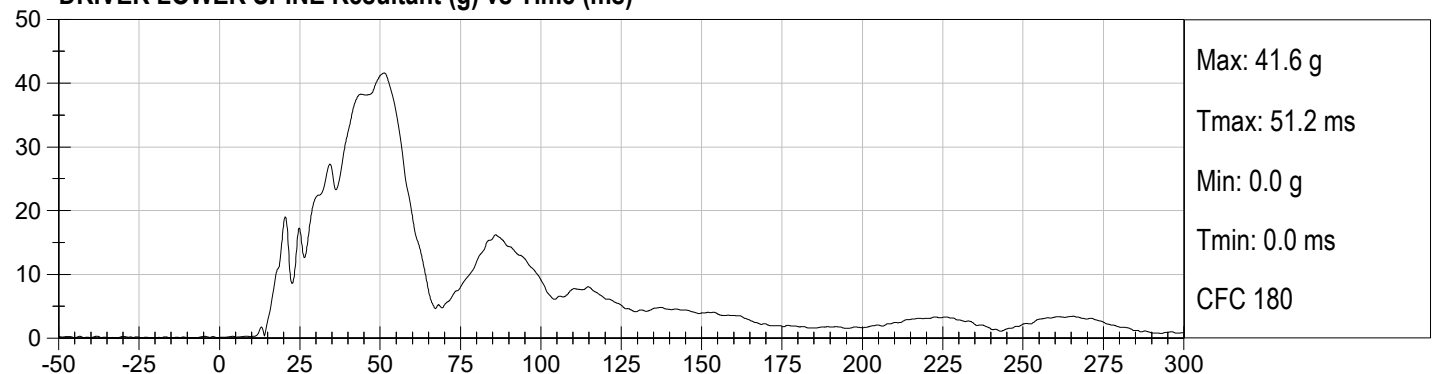
DRIVER LOWER SPINE Y (g) vs Time (ms)



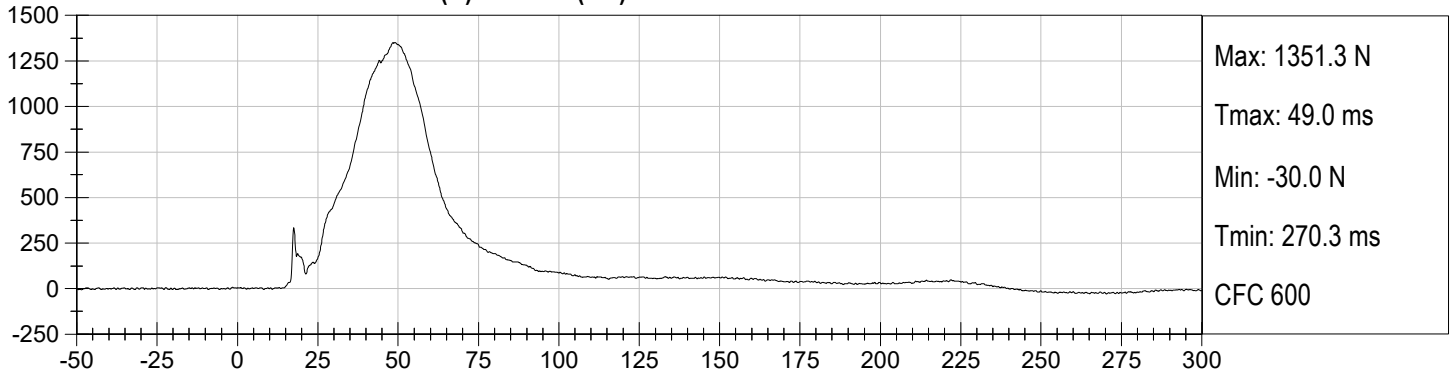
DRIVER LOWER SPINE Z (g) vs Time (ms)



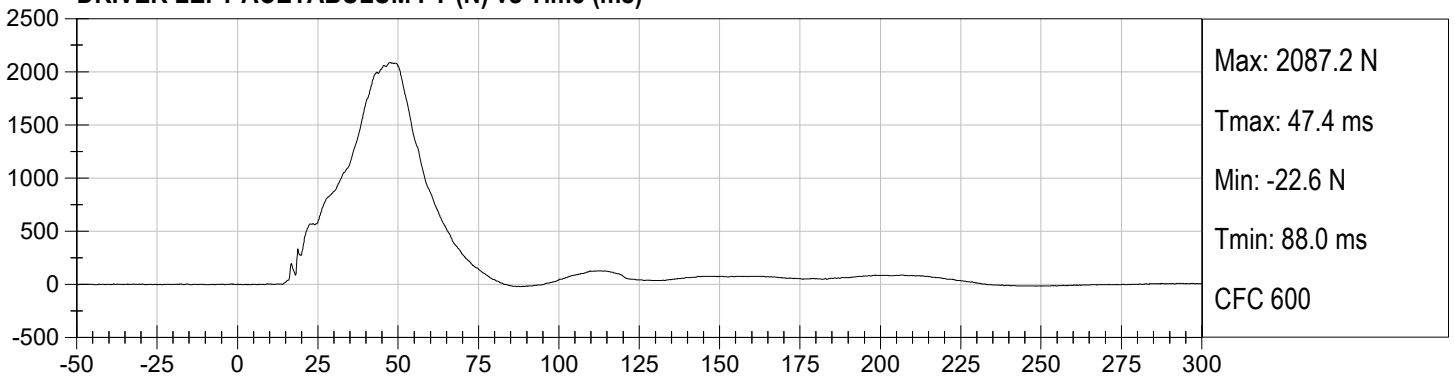
DRIVER LOWER SPINE Resultant (g) vs Time (ms)



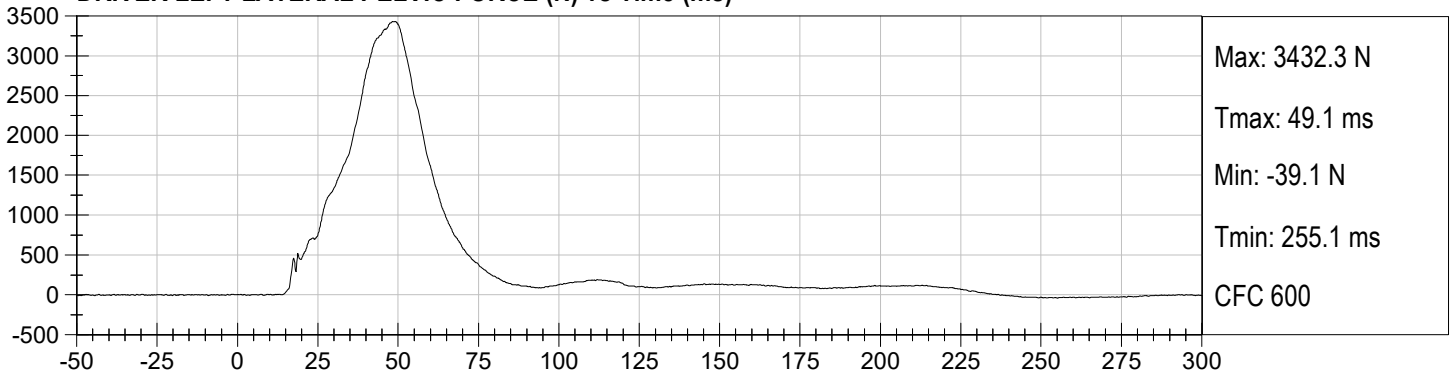
DRIVER LEFT ILIUM CREST FY (N) vs Time (ms)



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



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



APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 306

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

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

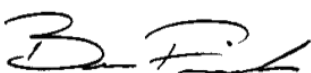
ATD Serial No: 306

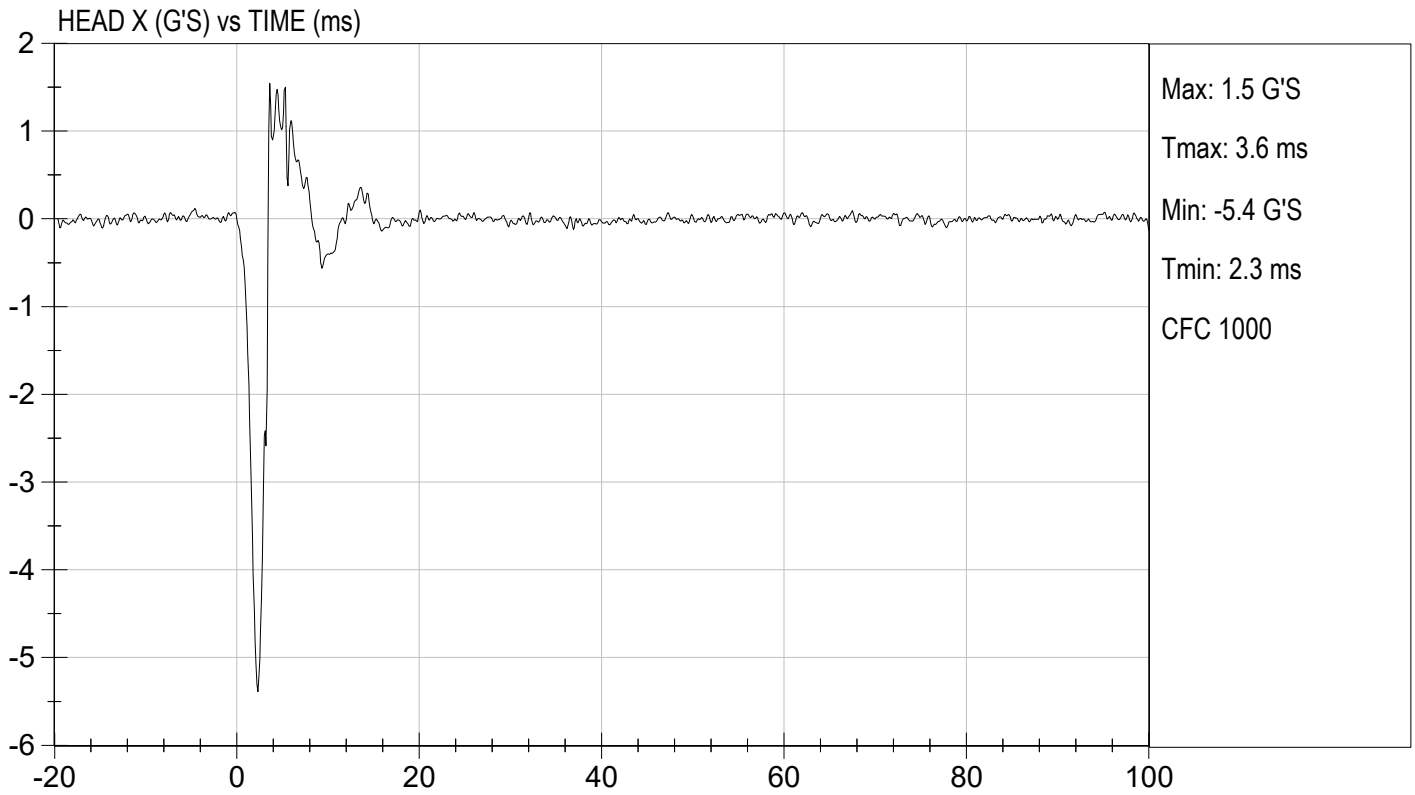
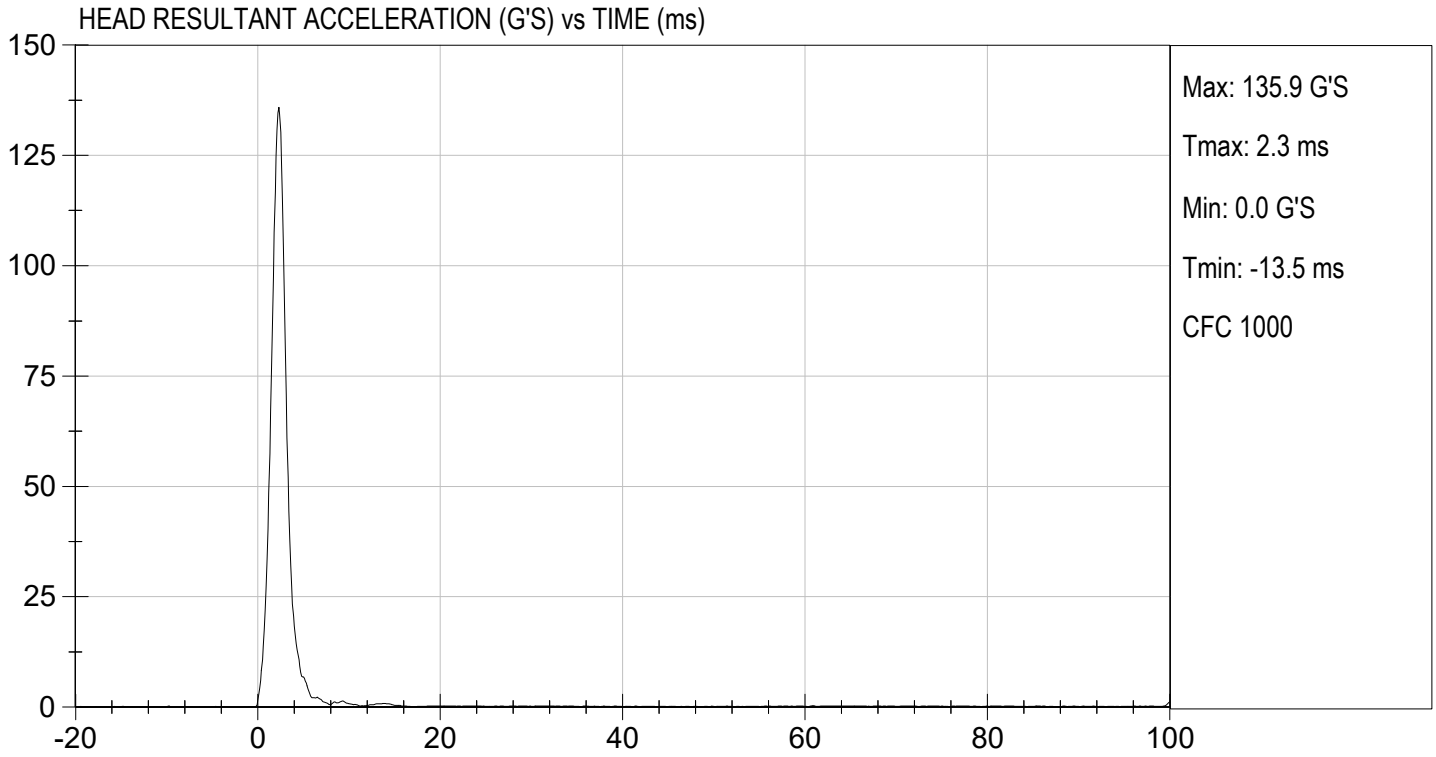
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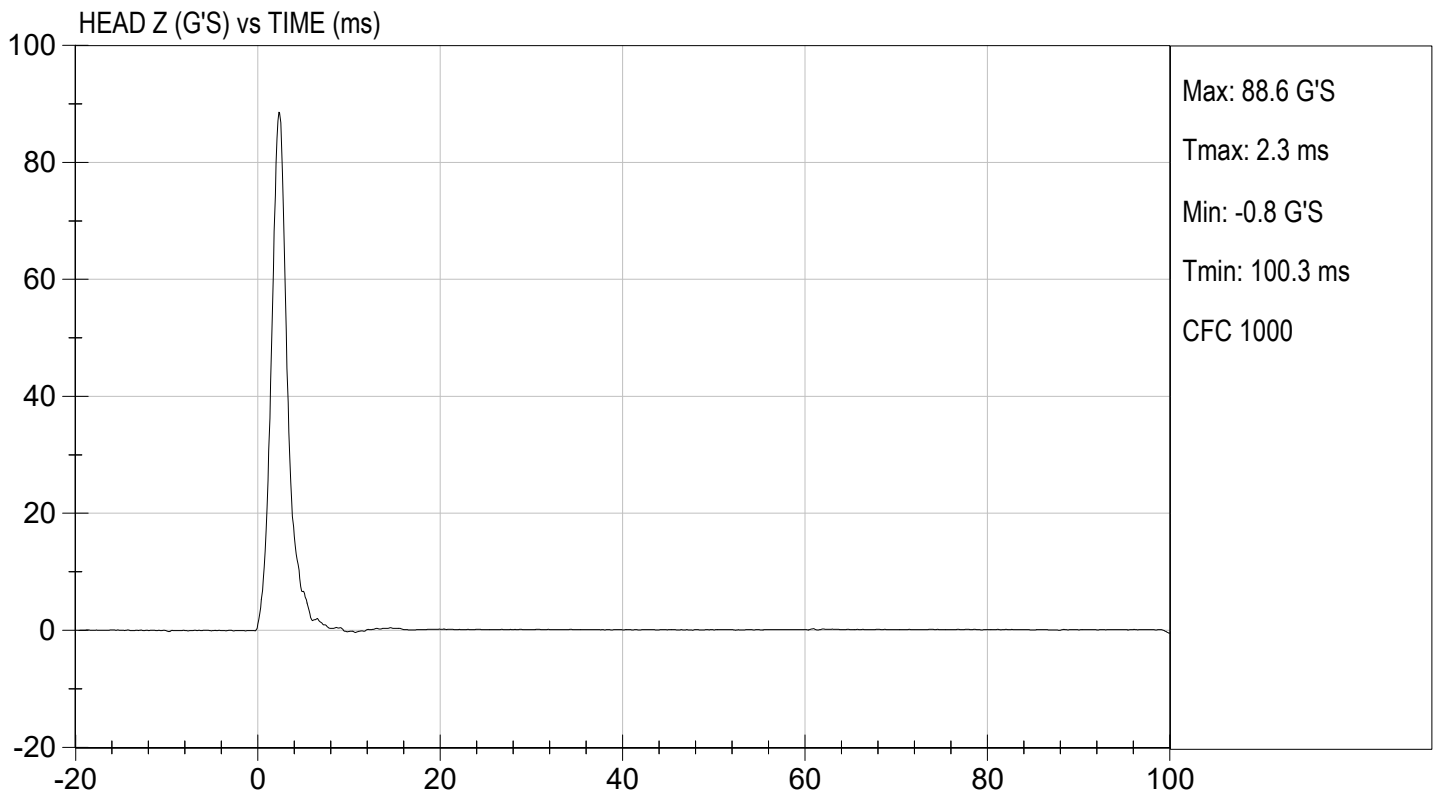
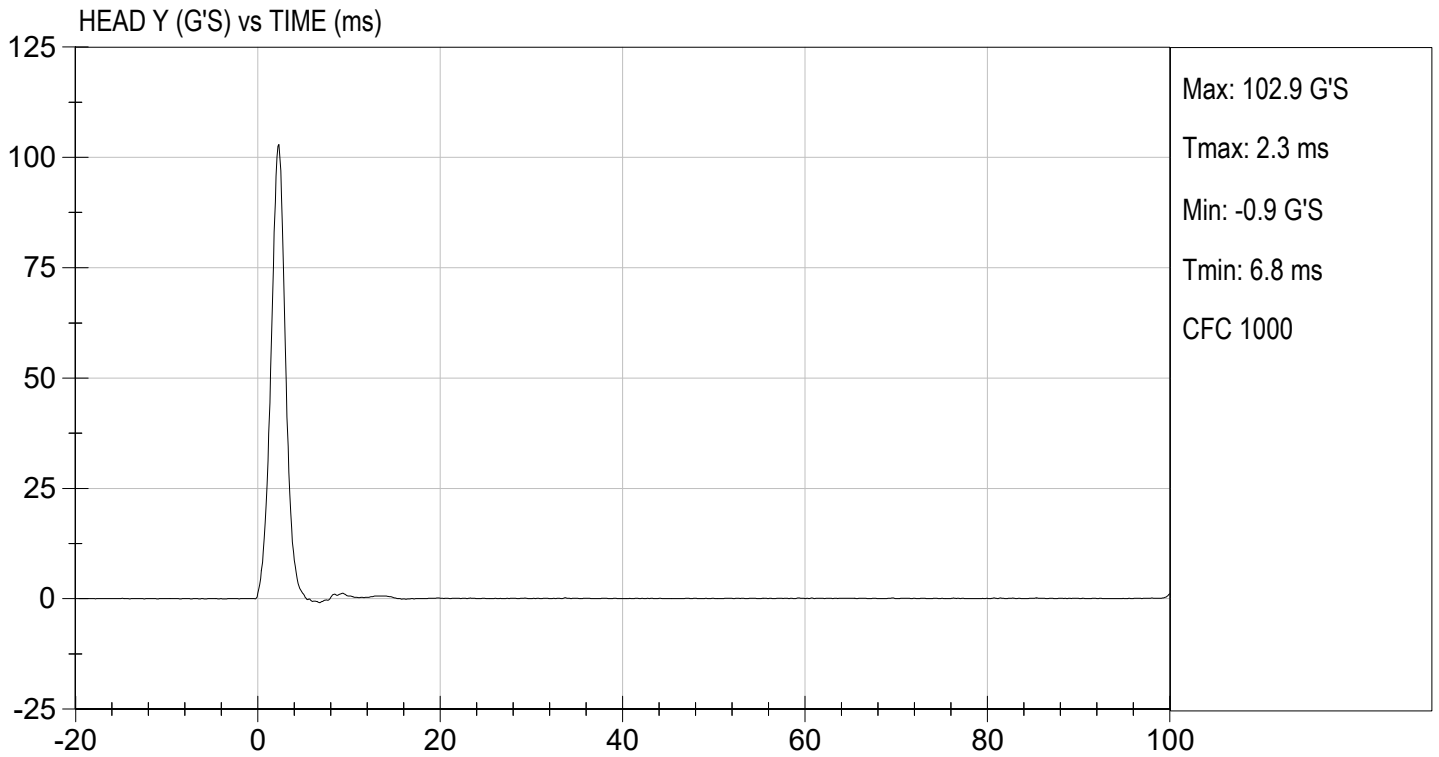
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Peak Resultant Acceleration	G's	115 to 137	136	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-5.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

10/17/2022
 Test Date


 Approved By





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

ATD Serial No: 306

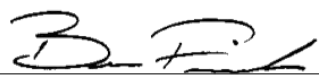
Test I.D.: D222442

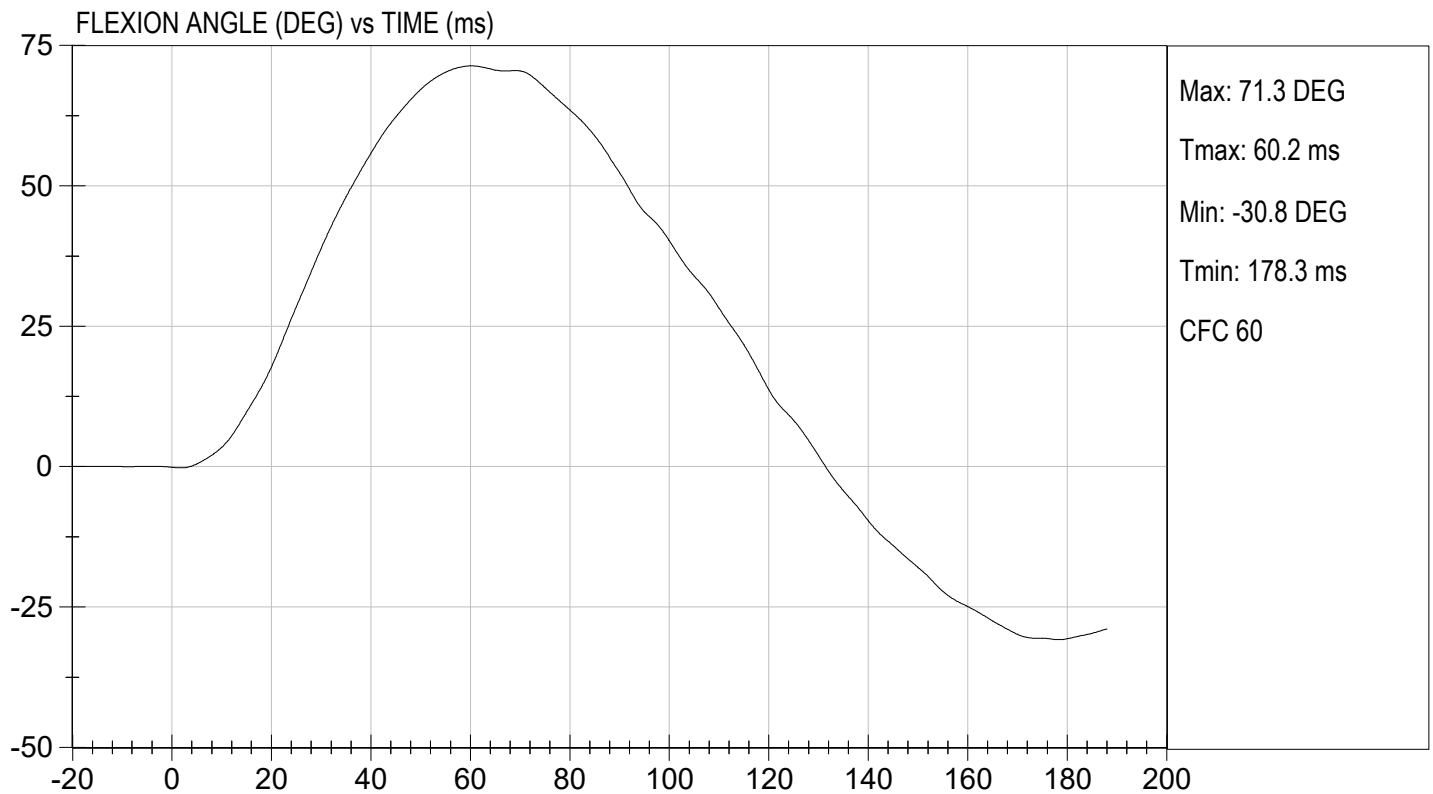
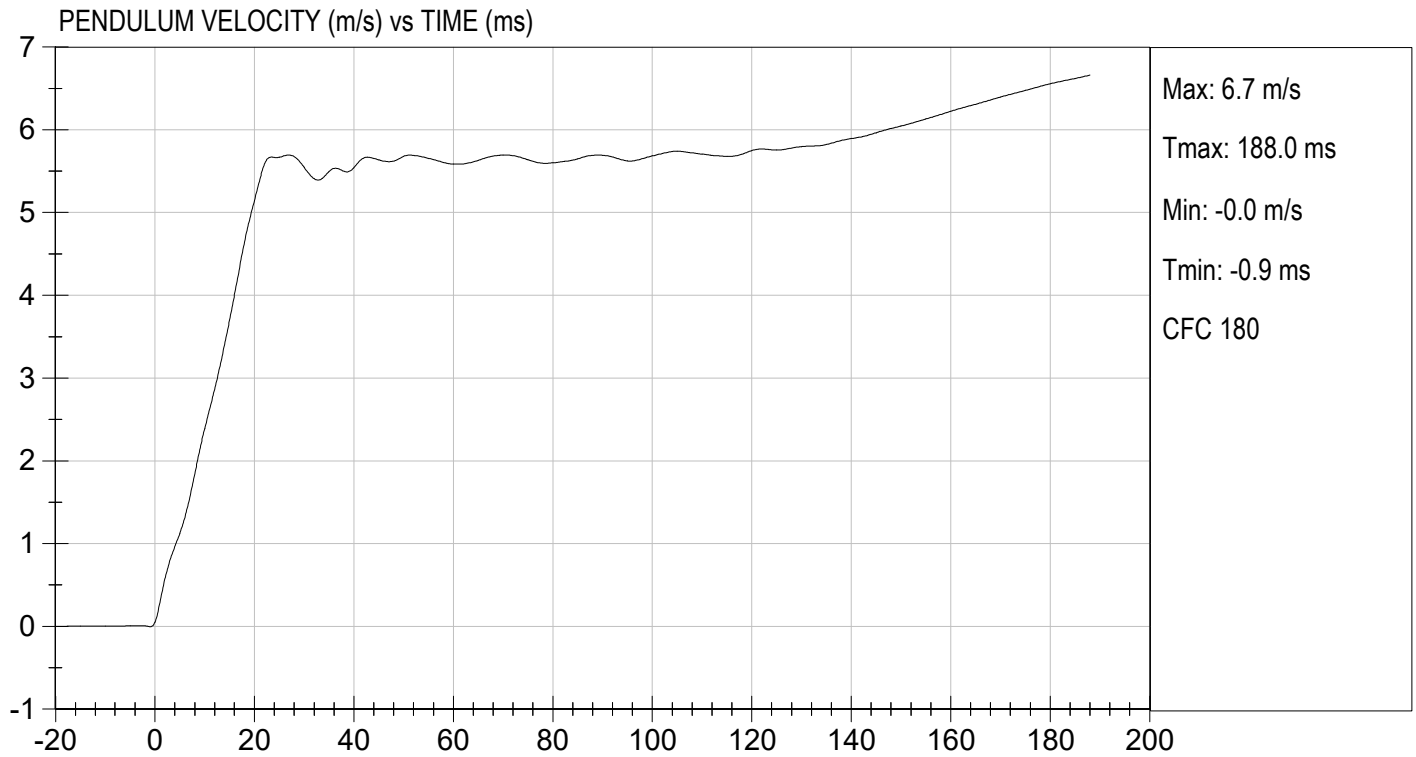
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.8	Pass	
Humidity	%	10 to 70	30	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.62	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.39	Pass
	15 ms	m/s	3.30 to 4.10	3.70	Pass
	20 ms	m/s	4.40 to 5.40	5.14	Pass
	25 ms	m/s	5.40 to 6.10	5.67	Pass
	25-100 ms	m/s	5.50 to 6.20	5.70	Pass
Maximum D-Plane Rotation	deg	71 to 81	71	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	60	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-37	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	116	Pass	
Overall Test Results				Pass	

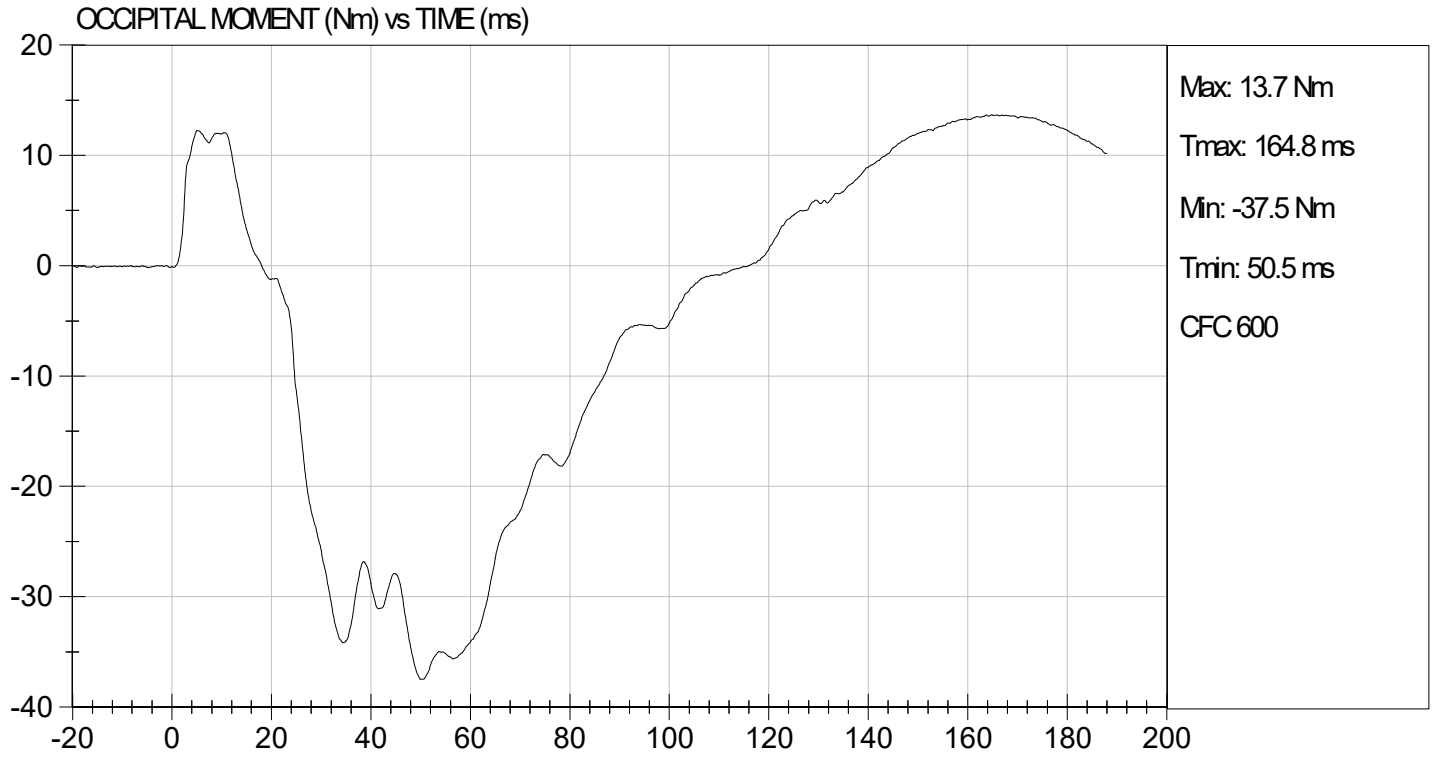

 Laboratory Technician

10/14/2022

Test Date


 Approved By





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

ATD Serial No: 306

Test ID: D222443

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	13 to 18	14	Pass
Shoulder Displacement	mm	28 to 37	32	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass



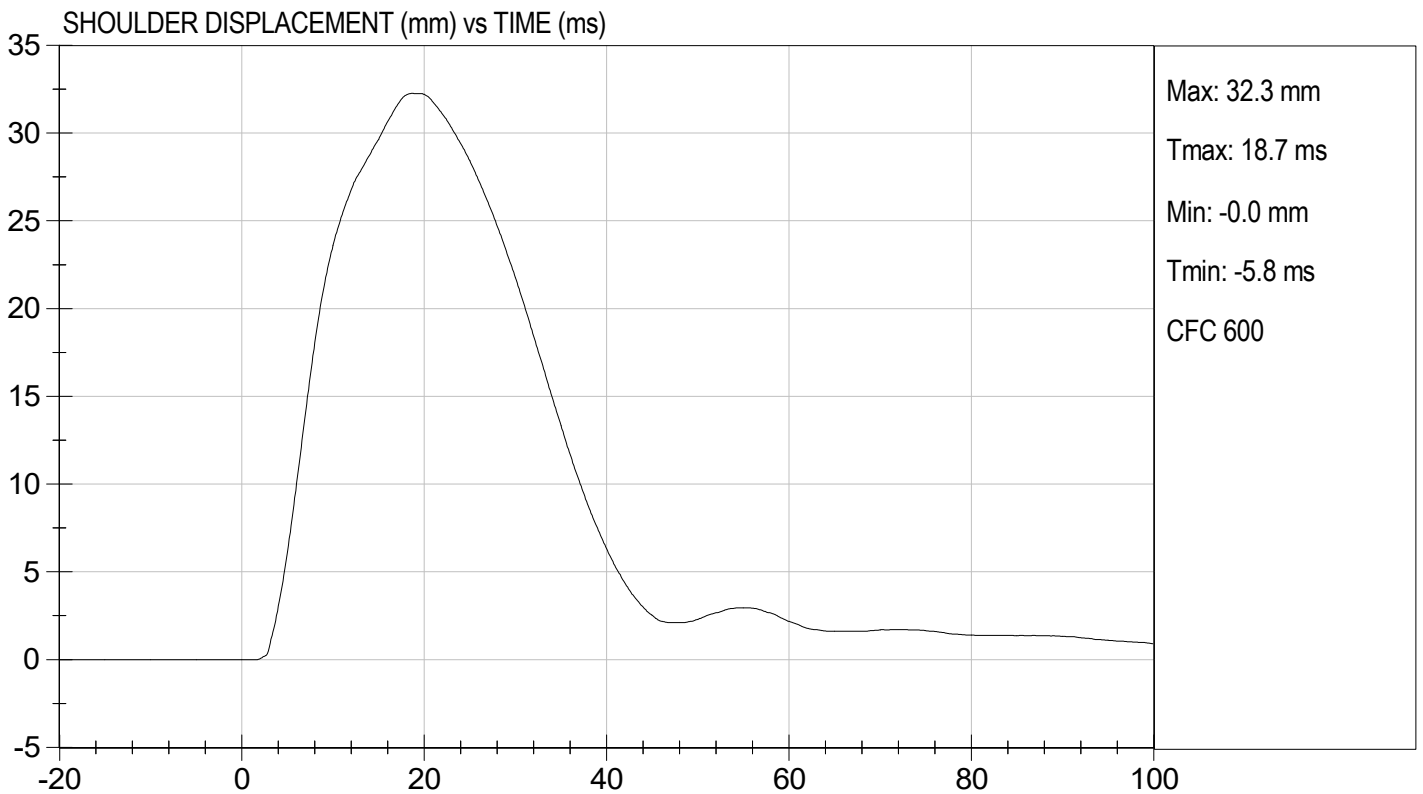
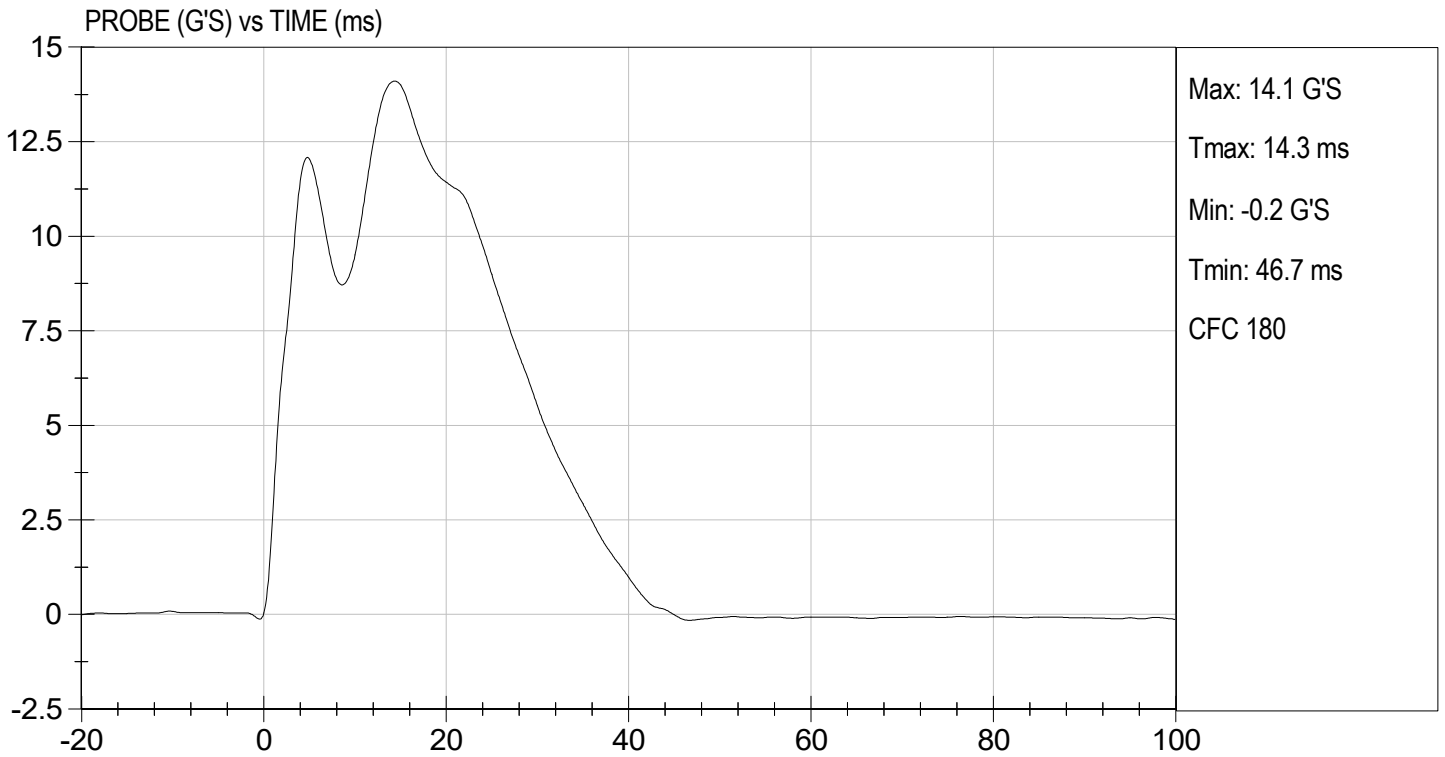
 Laboratory Technician

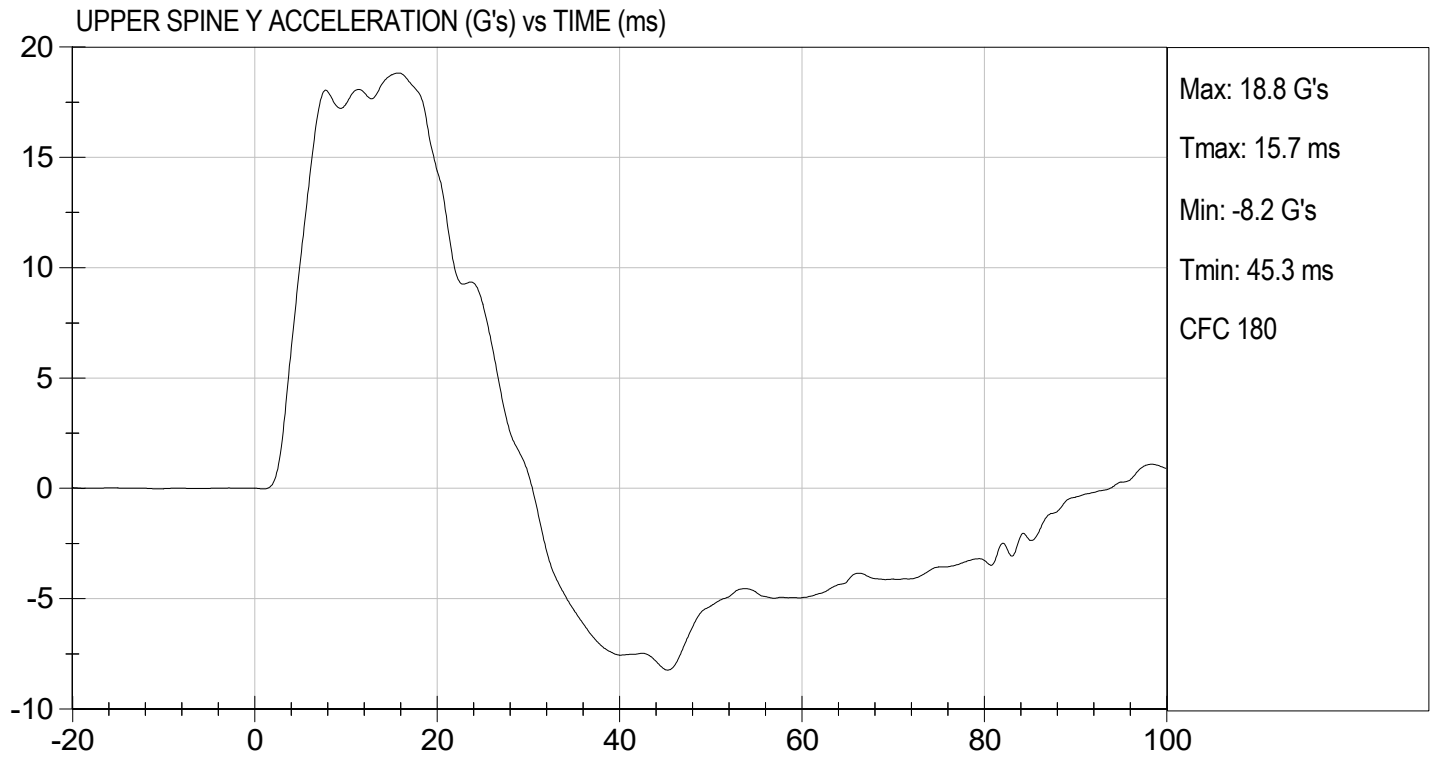
10/10/2022

 Test Date



 Approved By





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

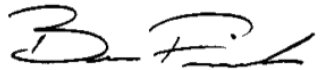
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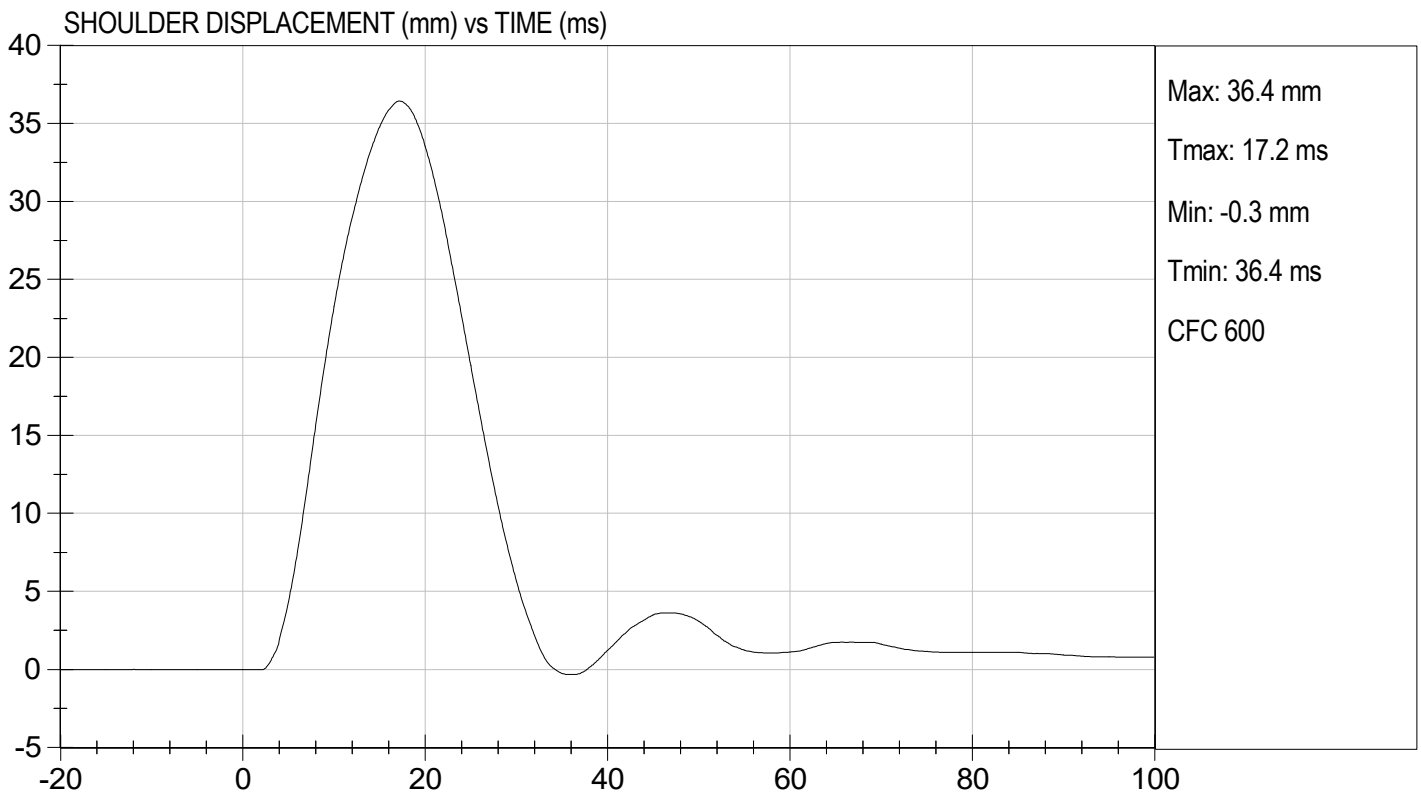
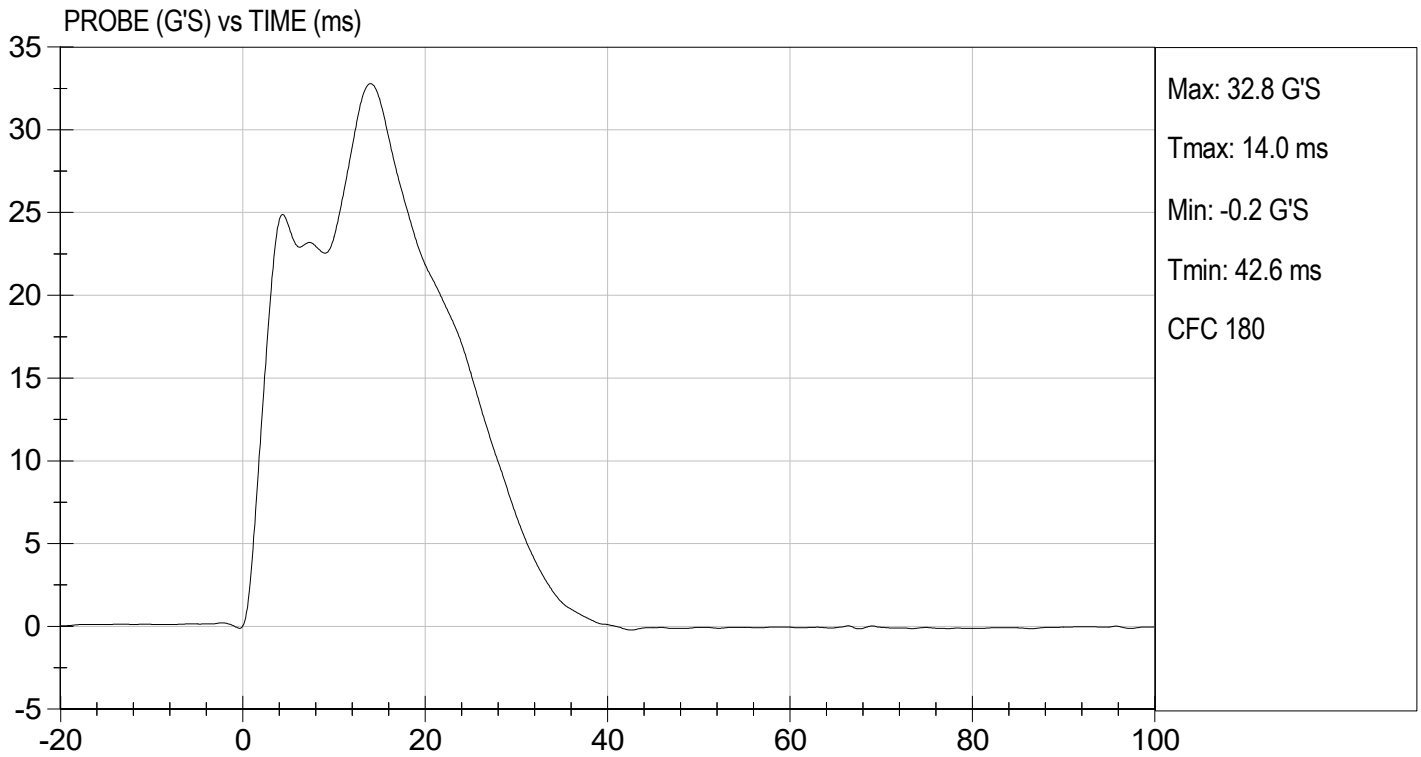
Test I.D: D222444

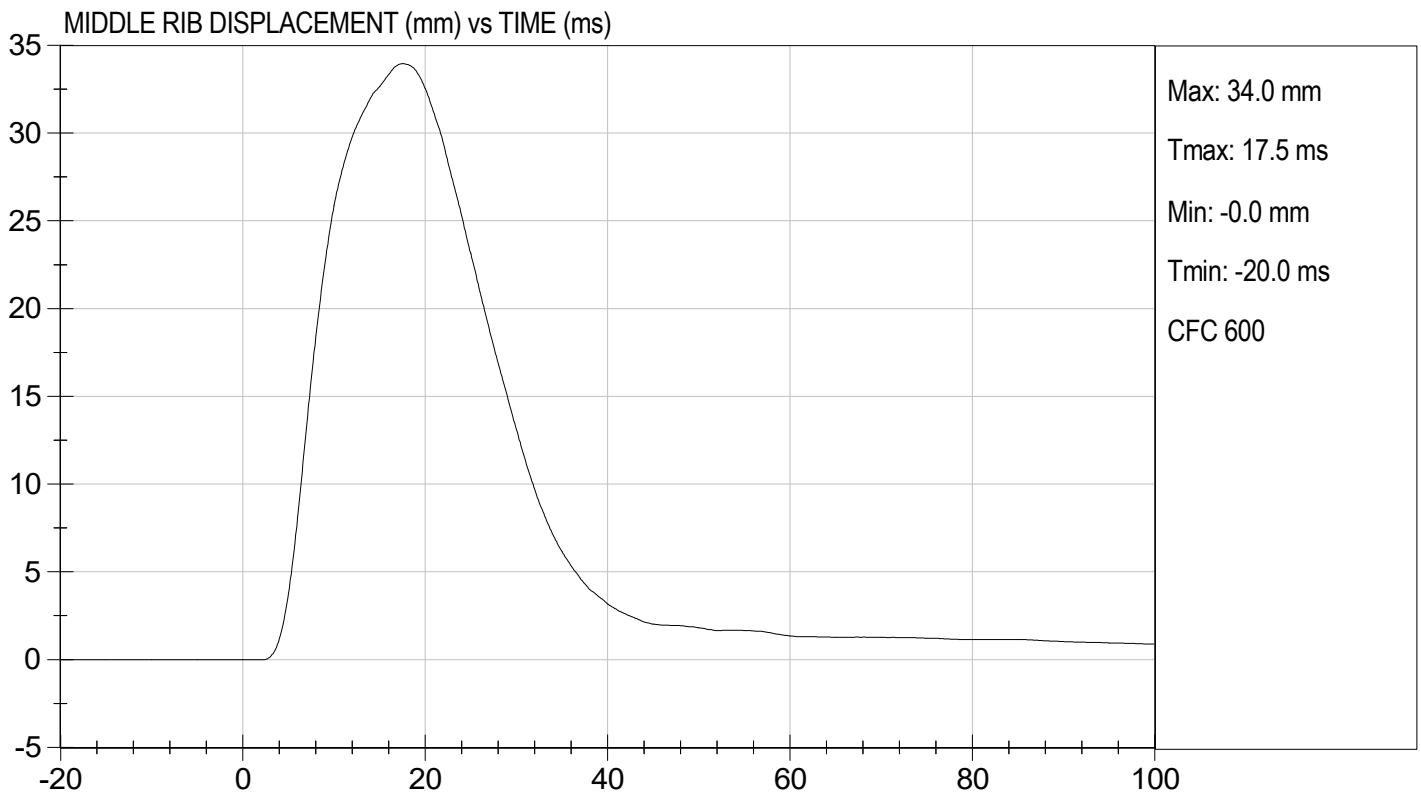
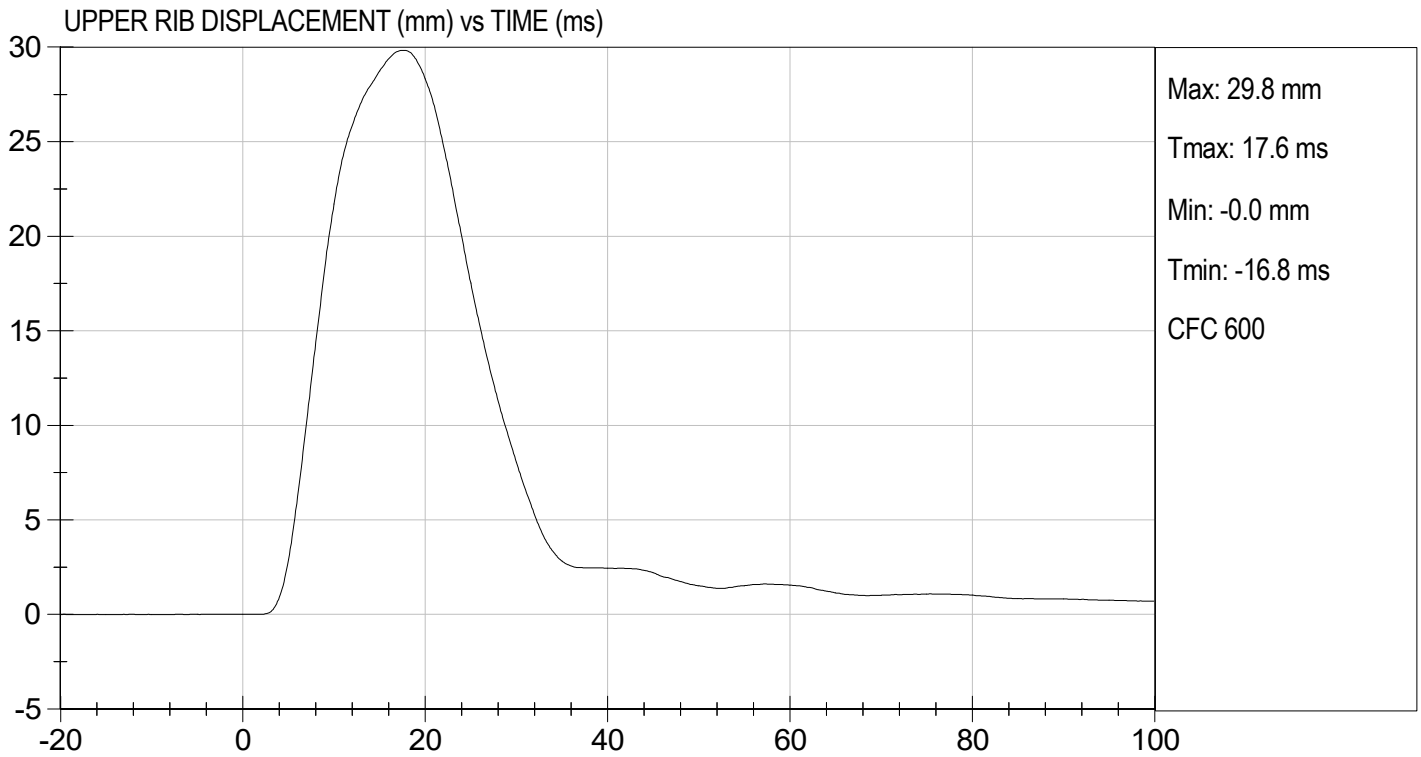
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	39	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	36	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle Rib Displacement	mm	30 to 36	34	Pass
Lower Rib Displacement	mm	32 to 38	36	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass

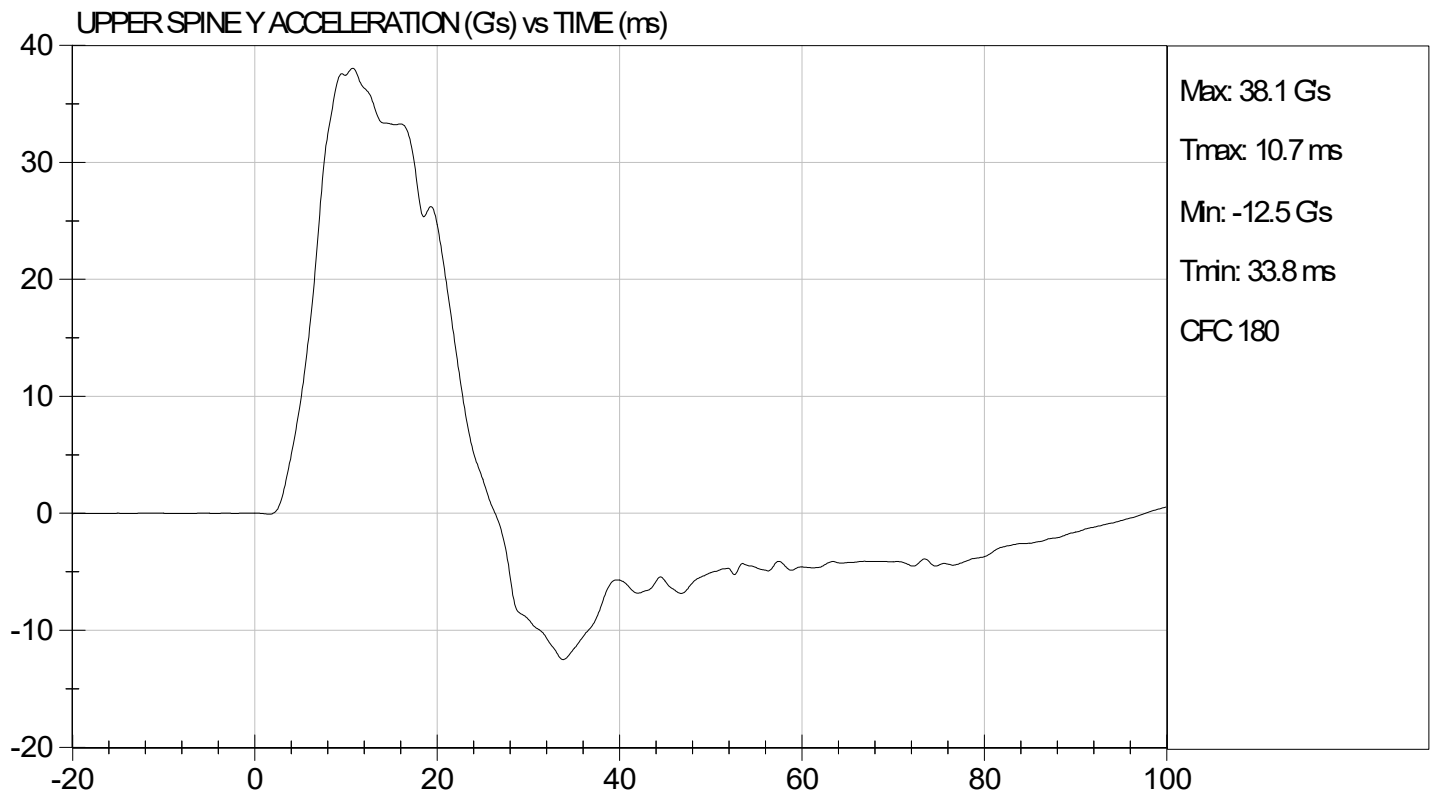
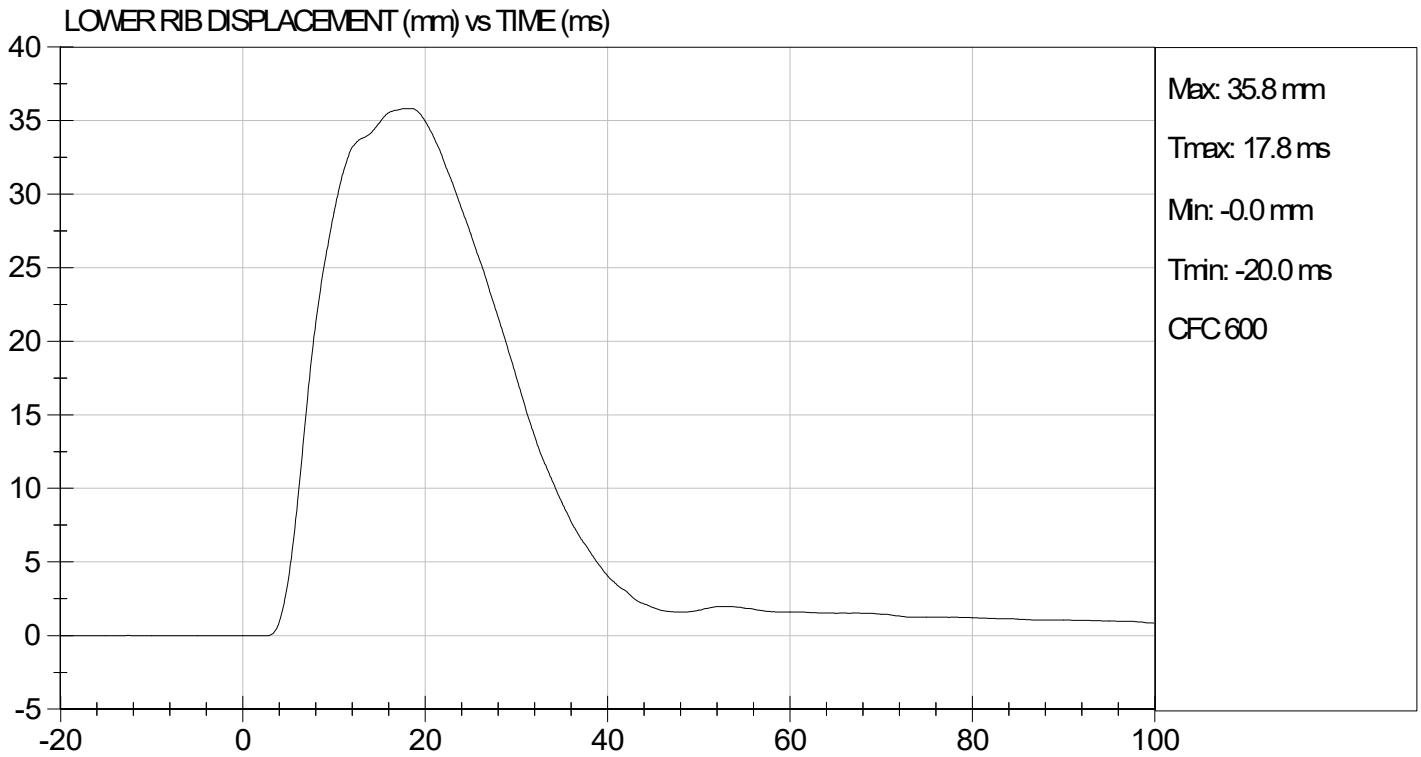

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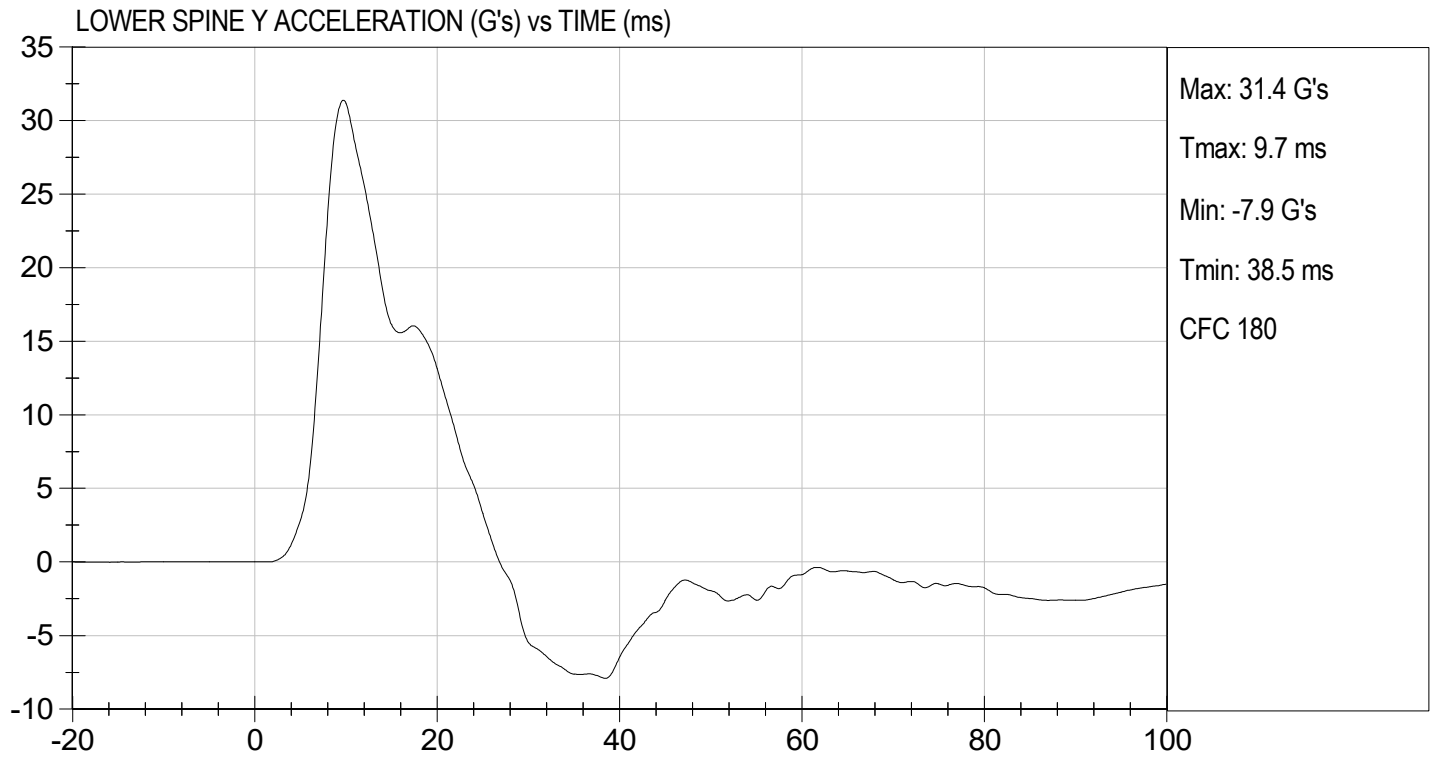
10/10/2022
 Test Date


 Approved By









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

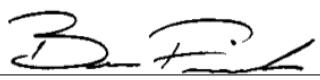
ATD Serial No: 306

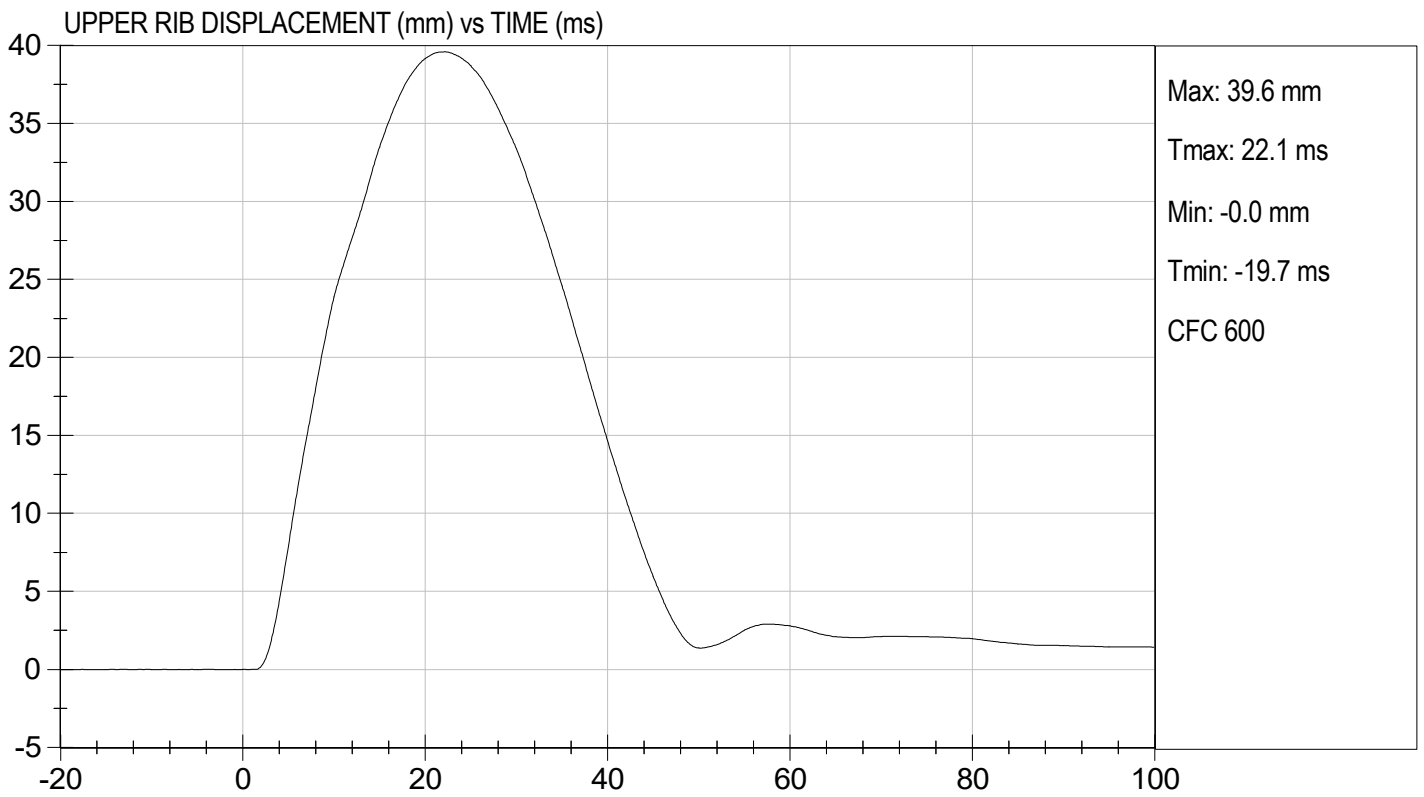
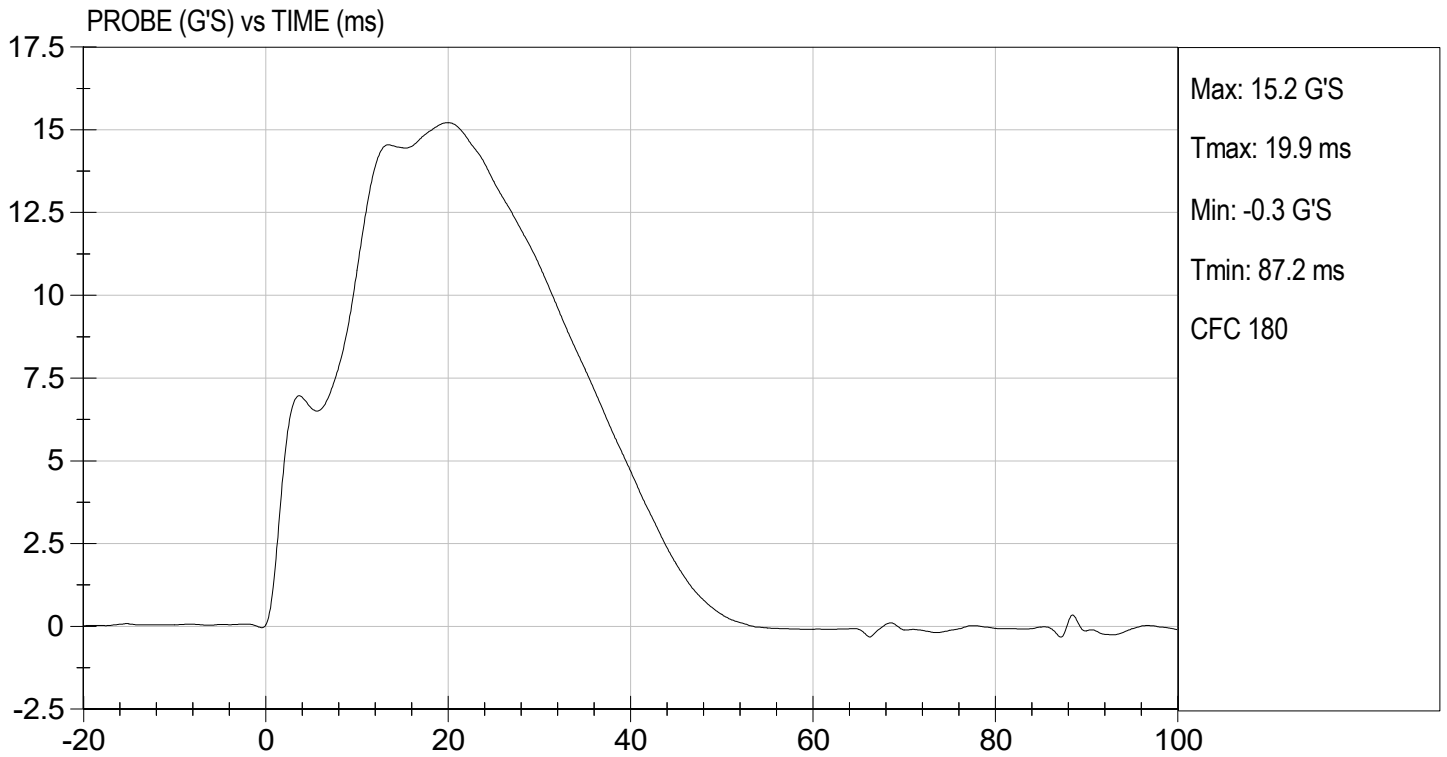
Test I.D: D222445

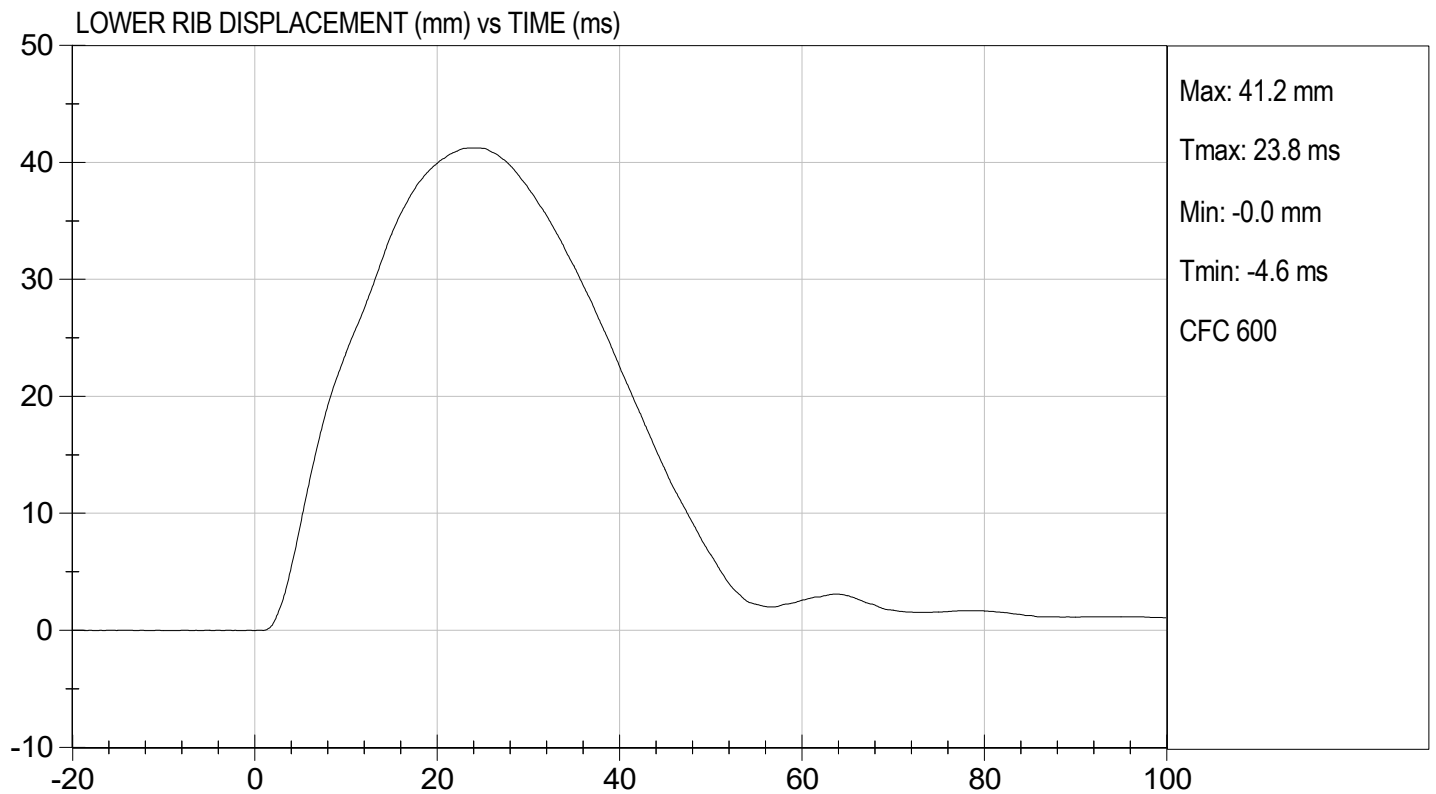
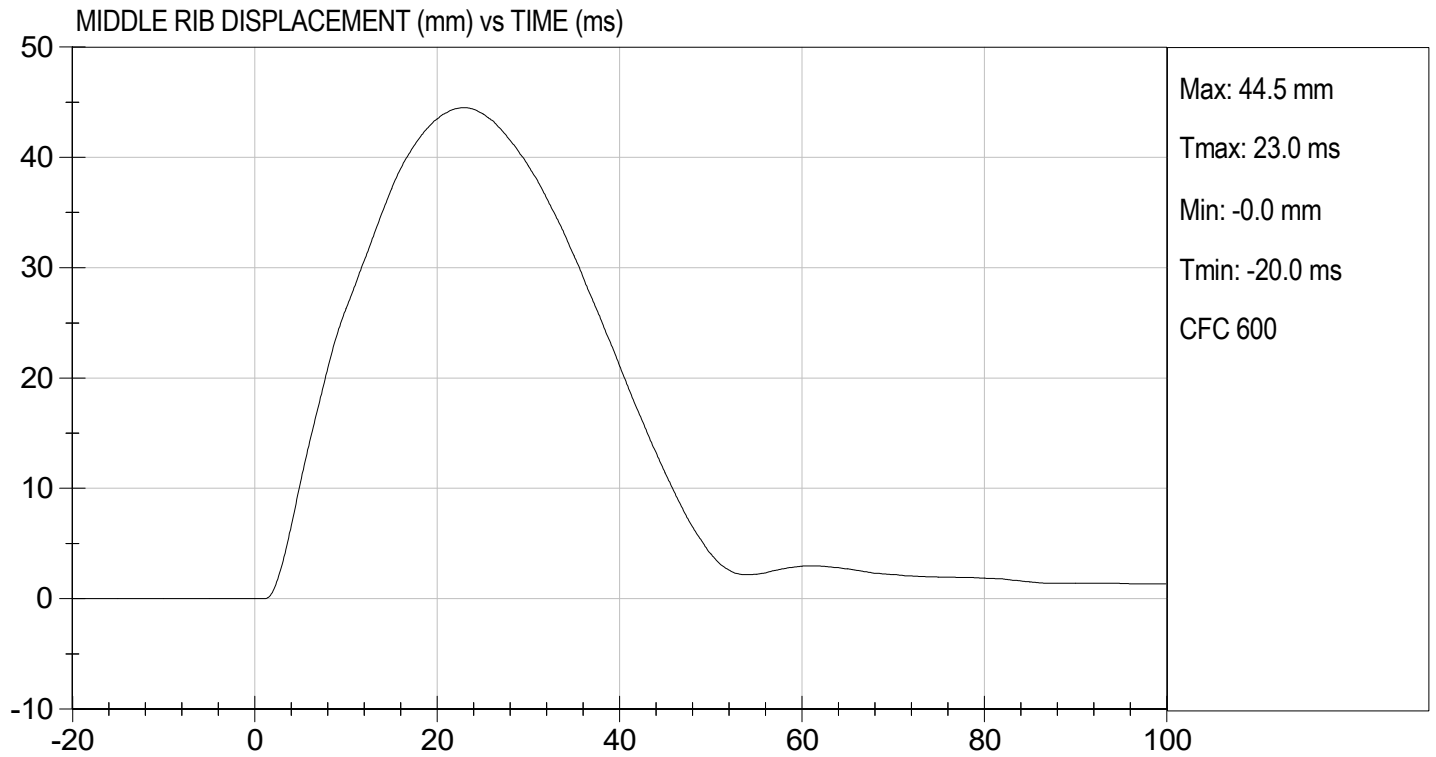
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	40	Pass
Middle Rib Displacement	mm	39 to 45	45	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	16	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass

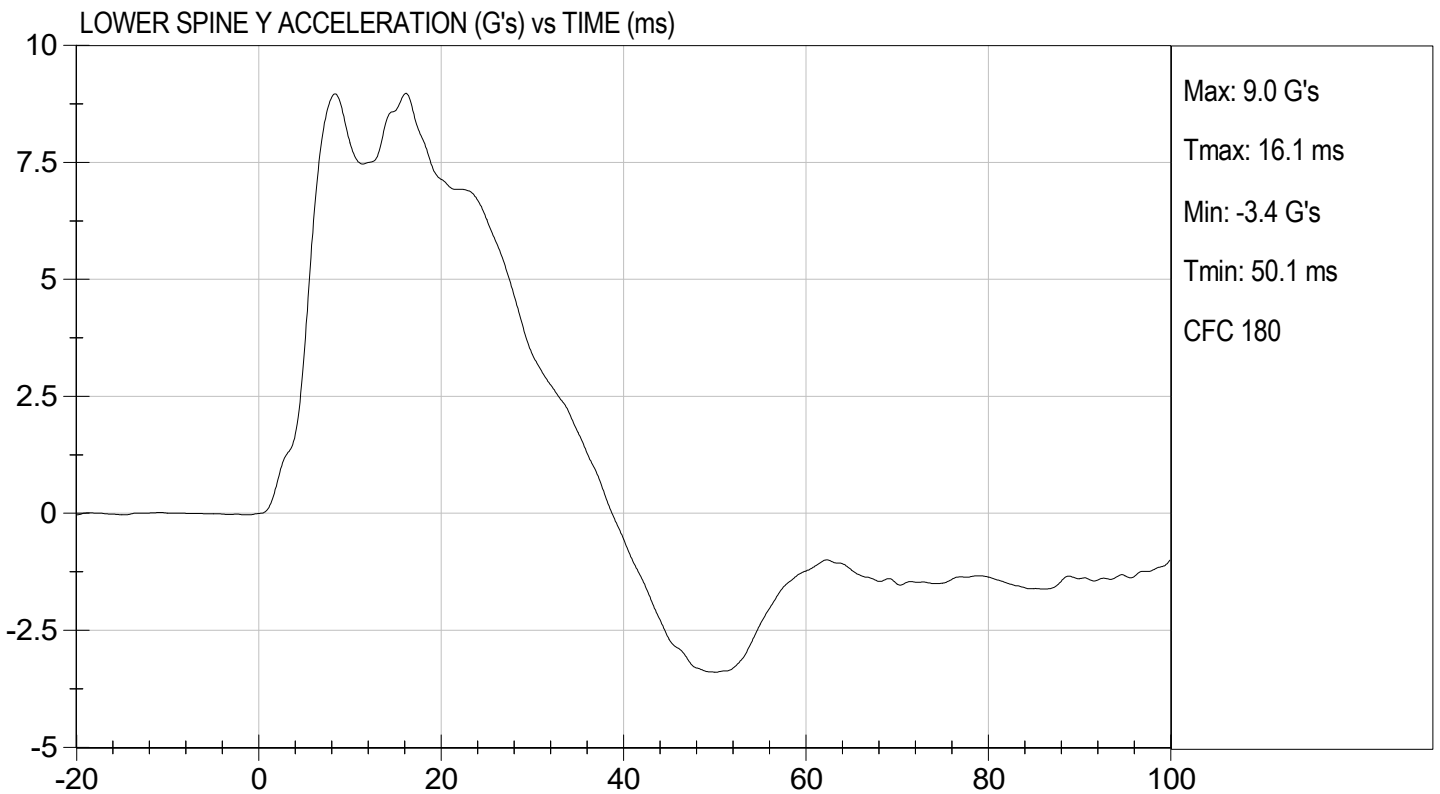
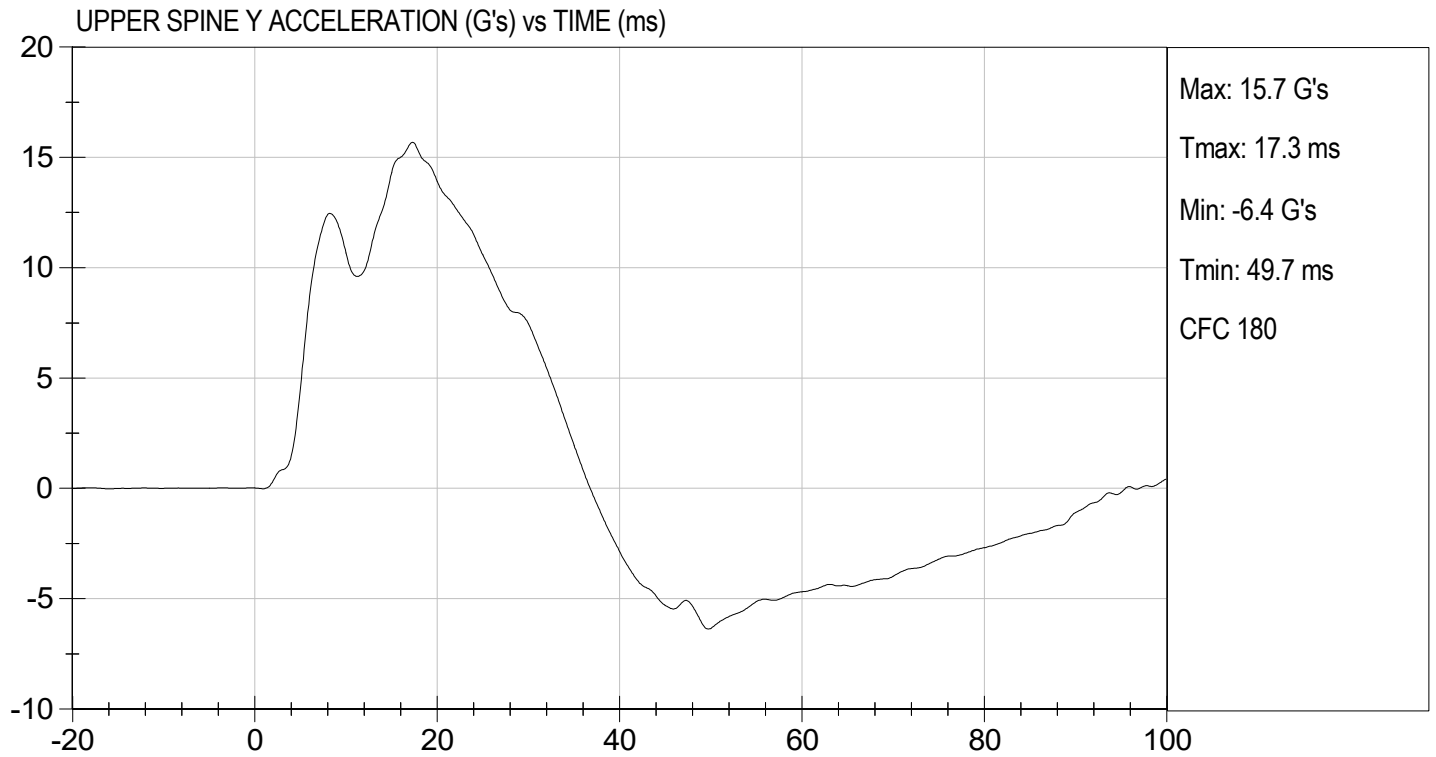

 Laboratory Technician

10/10/2022
 Test Date


 Approved By







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

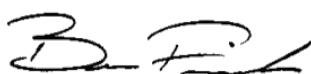
ATD Serial No: 306

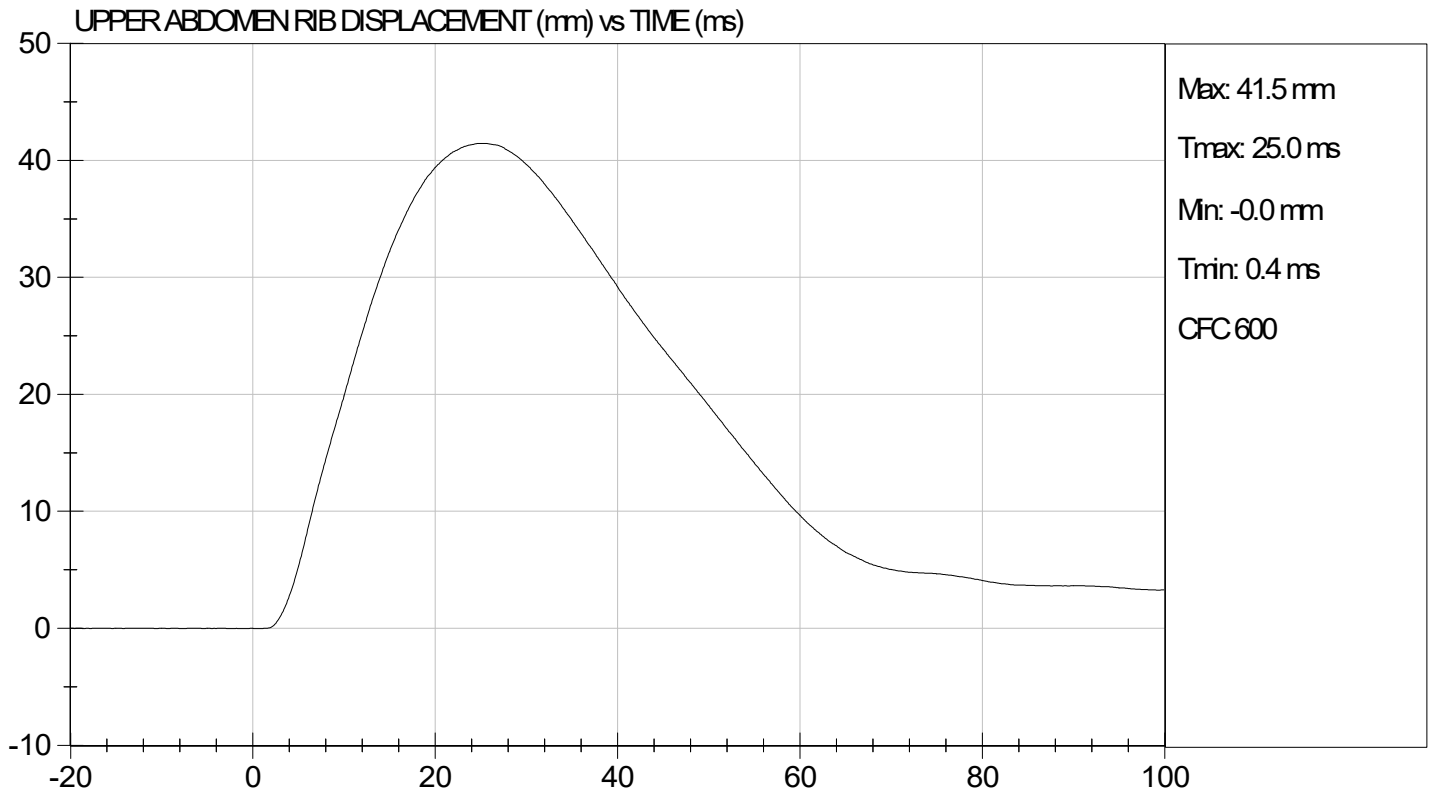
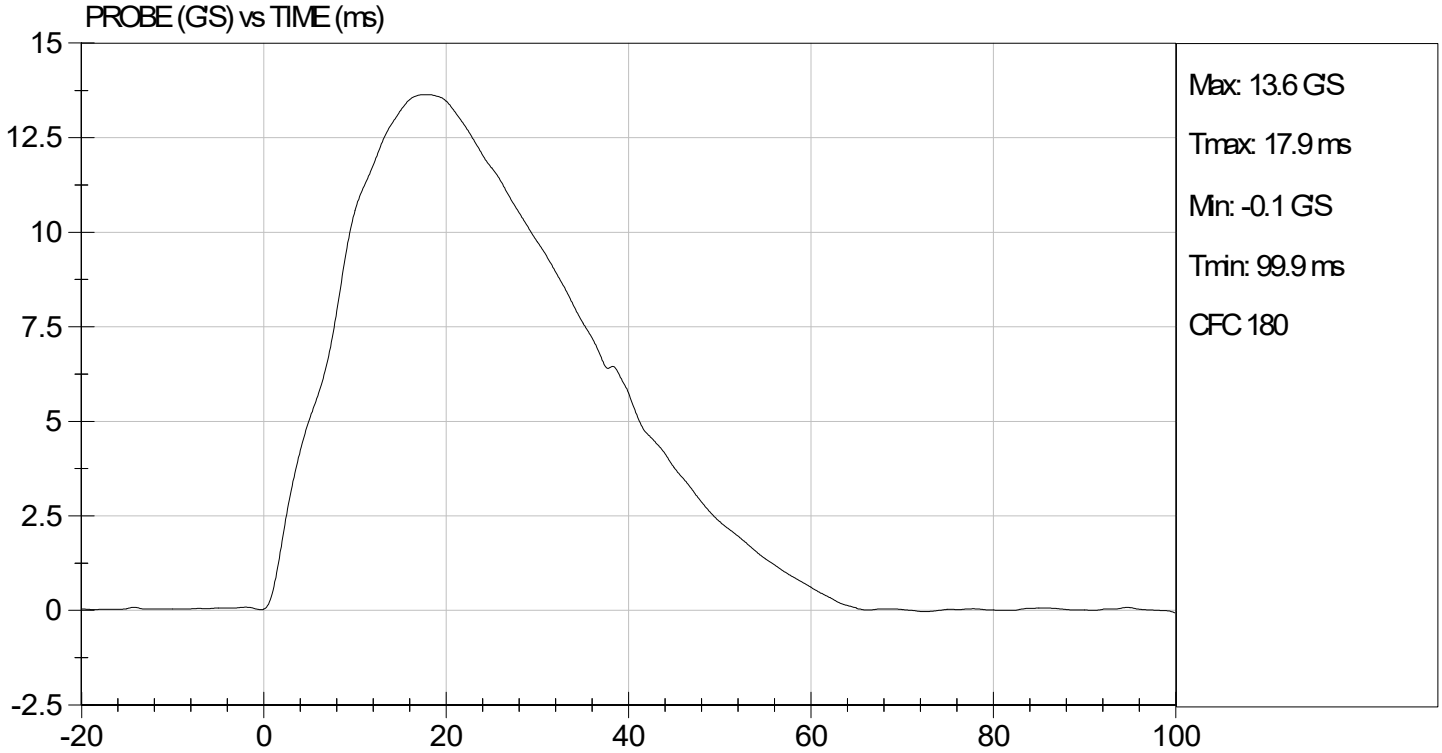
Test I.D: D222446

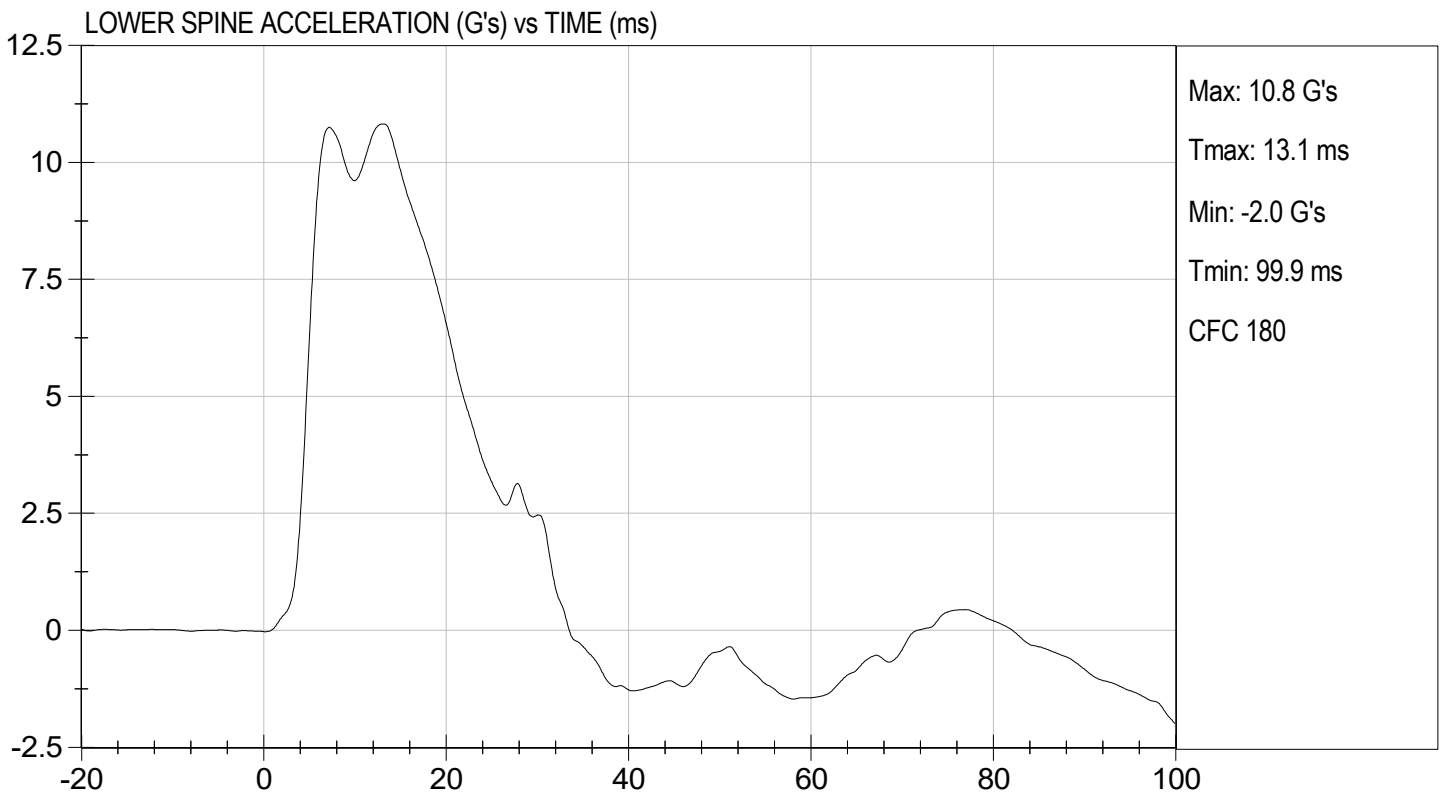
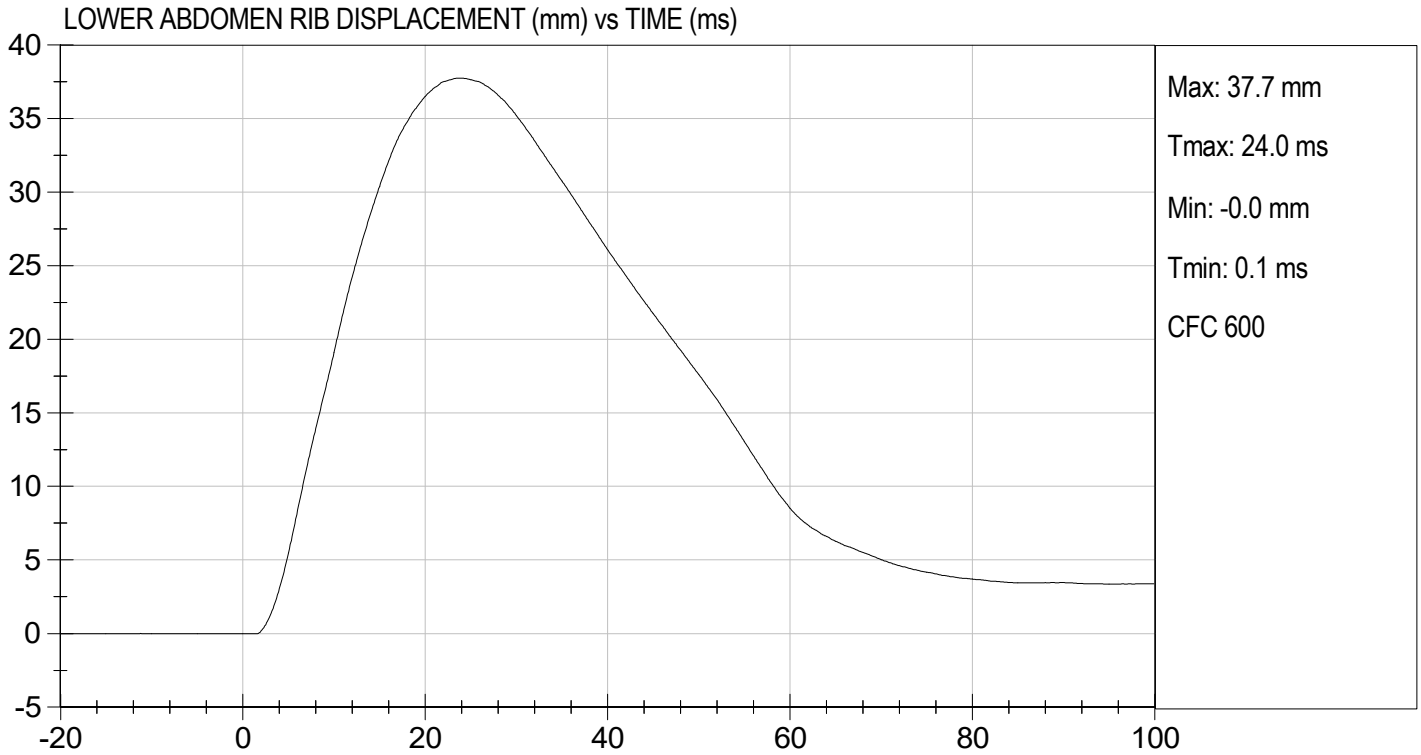
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


 Laboratory Technician

10/10/2022
 Test Date


 Approved By





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

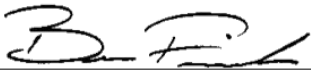
ATD Serial No: 306

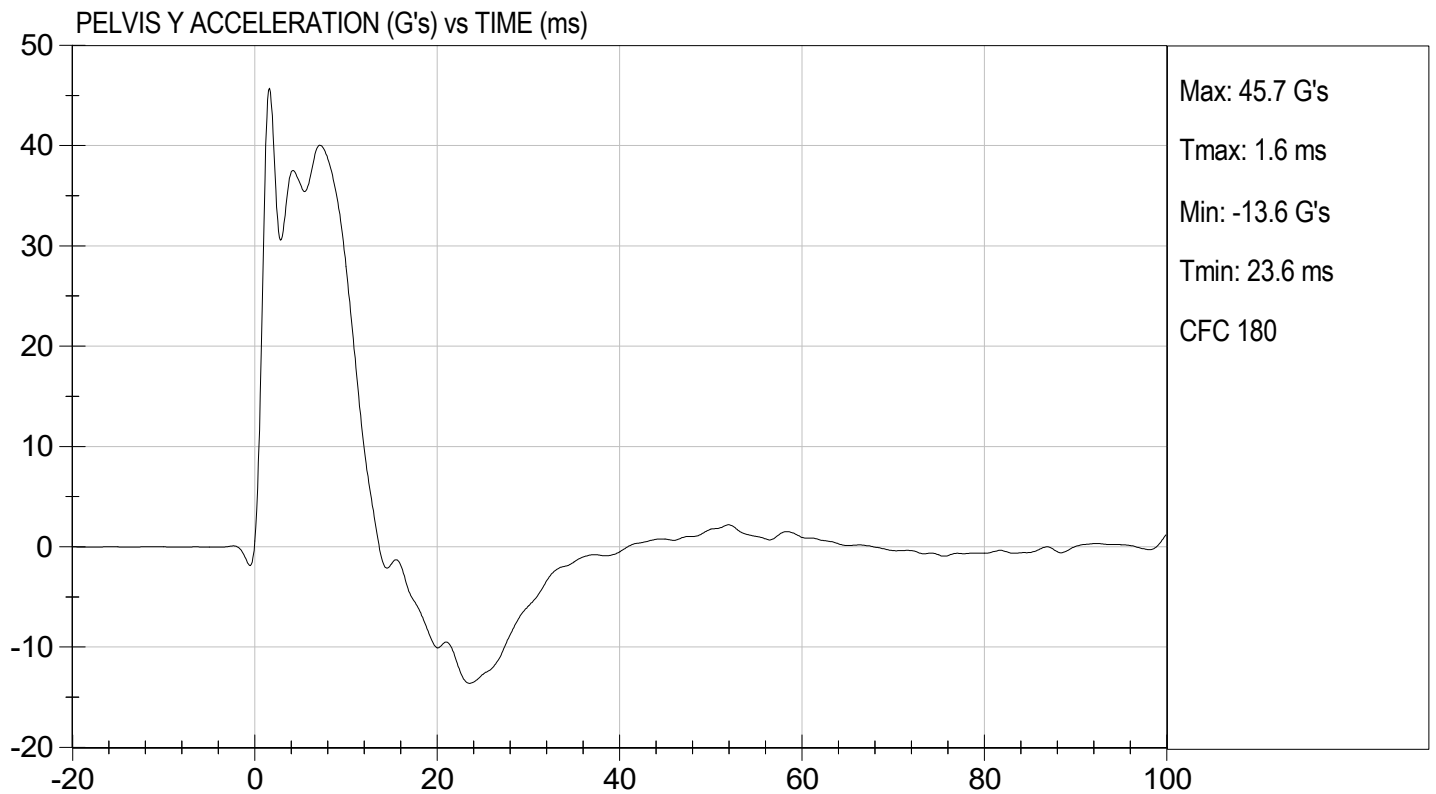
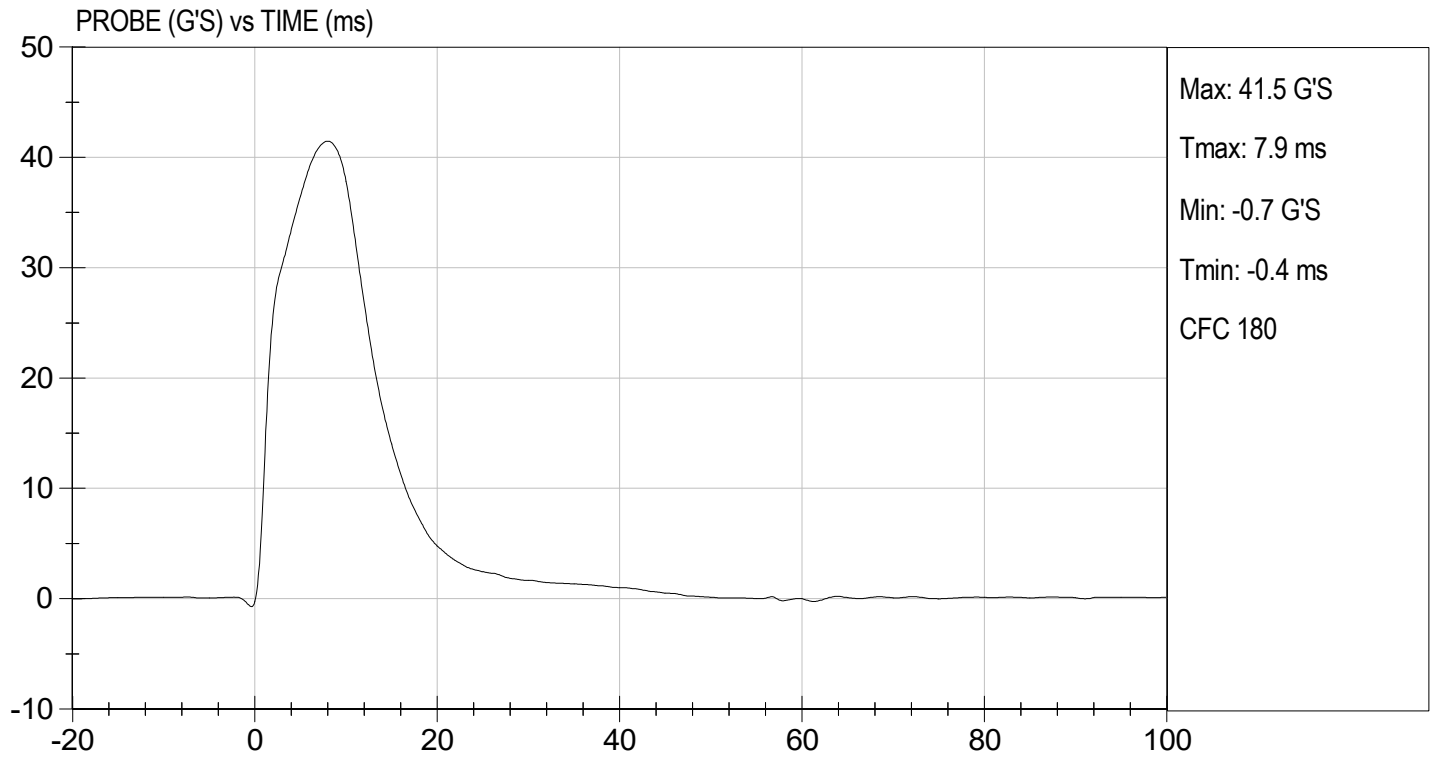
Test I.D: D222447

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	40	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3,872	Pass
Overall Test Results				Pass


 Laboratory Technician

10/10/2022
 Test Date

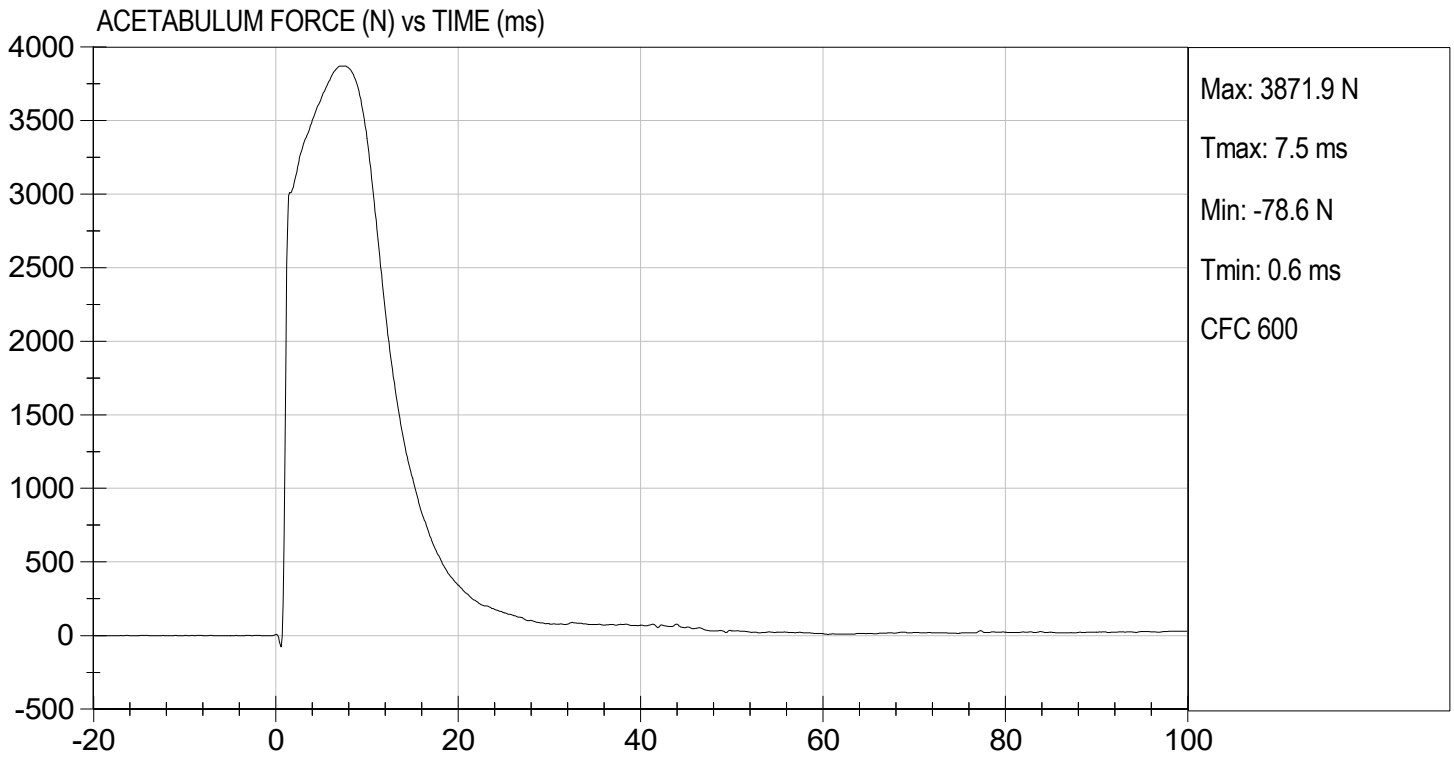

 Approved By





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

TEST DATE: 10/10/2022
TEST #: D222447



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

ATD Serial No: 306

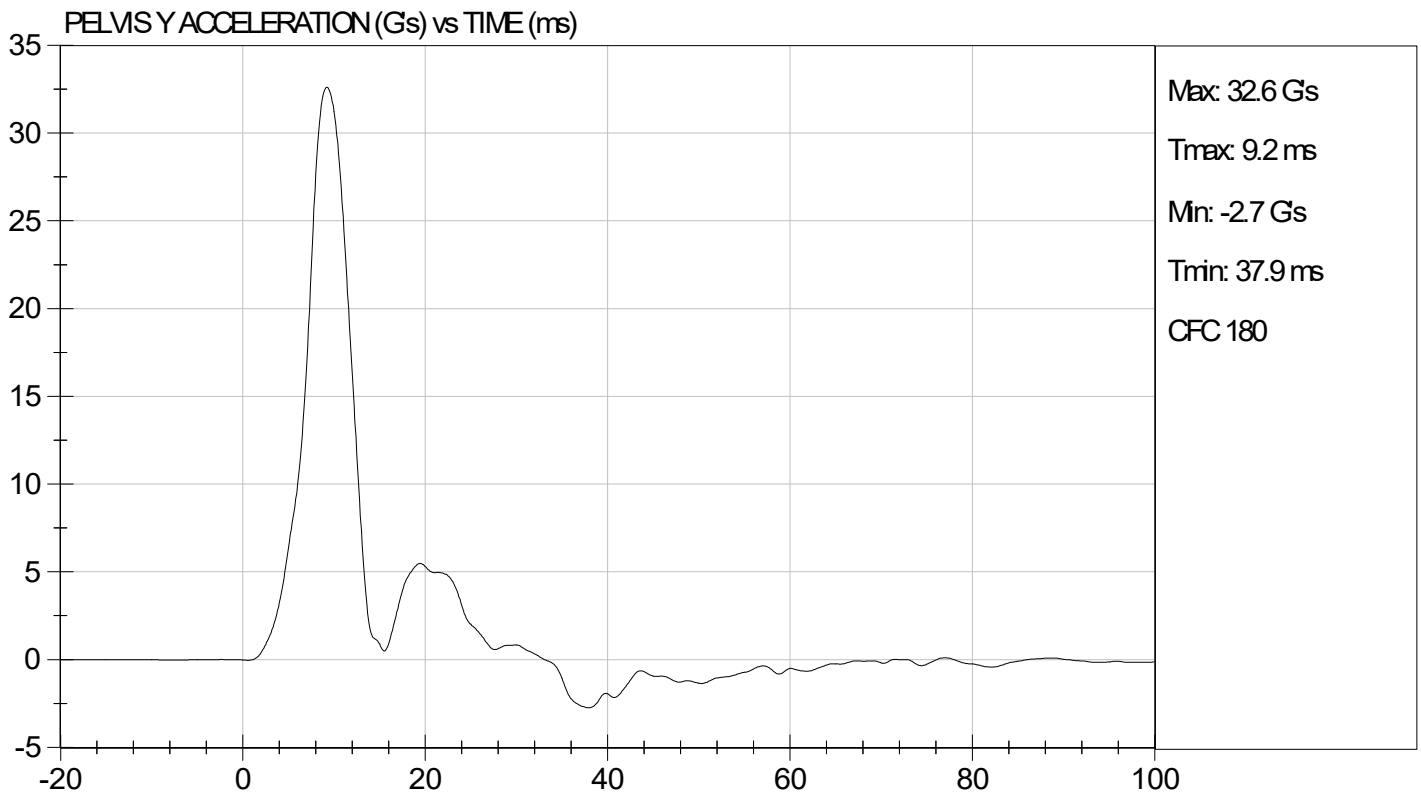
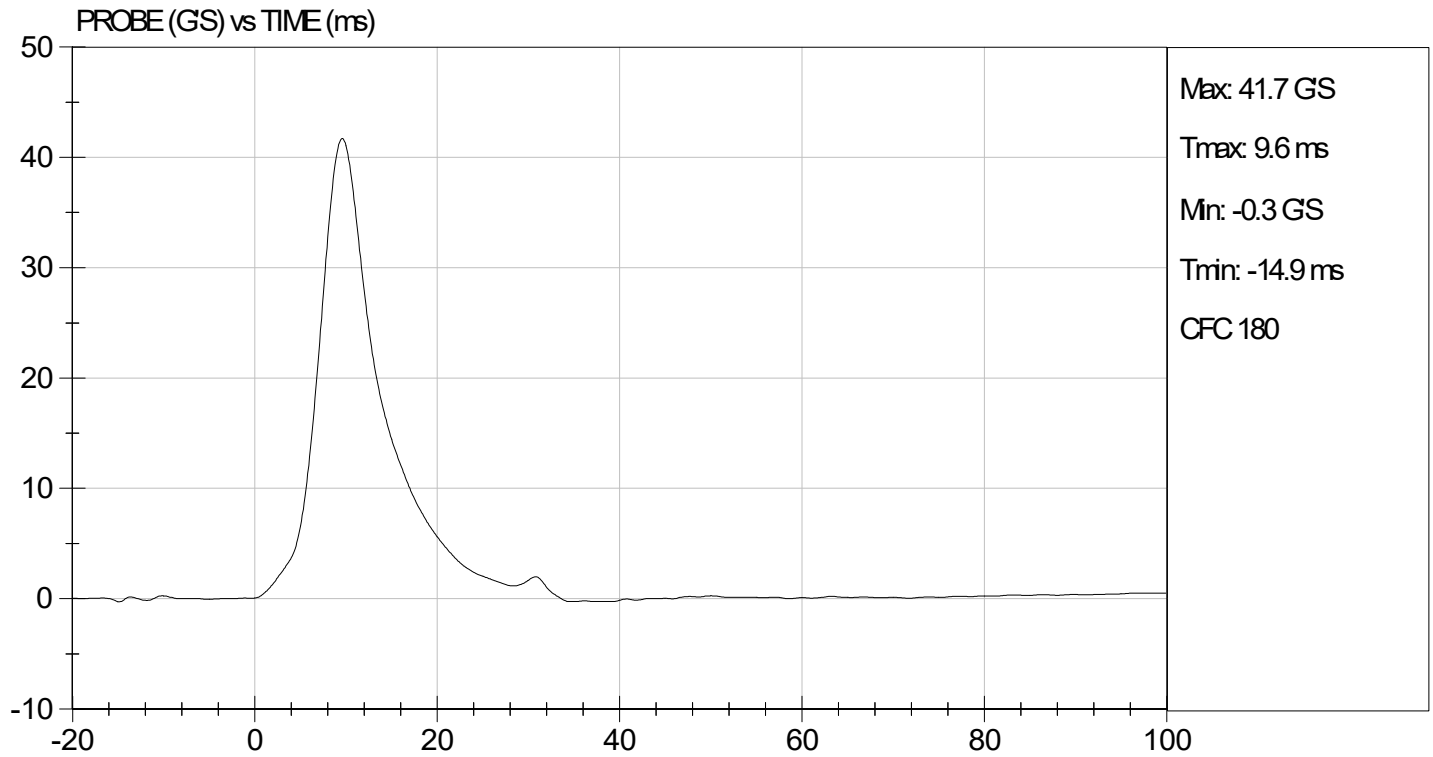
Test I.D: D222448

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	36 to 45	42	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,847	Pass
Overall Test Results				Pass


 Laboratory Technician

10/14/2022
 Test Date

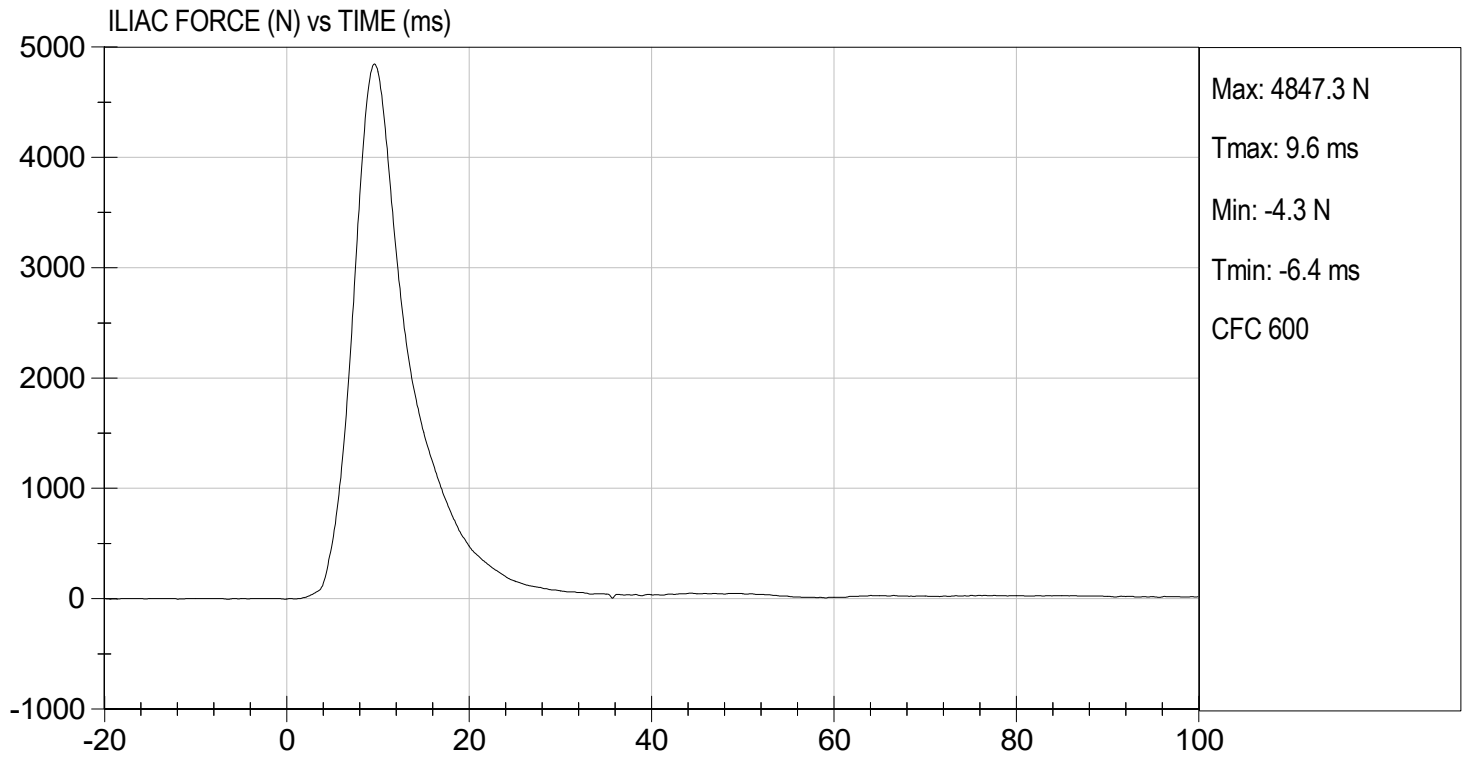

 Approved By





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

TEST DATE: 10/14/2022
TEST #: D222448



CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 306

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

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

ATD Serial No: 306

Test ID: D222581

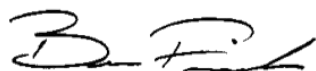
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Peak Resultant Acceleration	G's	115 to 137	131	Pass
Peak Longitudinal Acceleration	G's	+/- 15	5.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	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



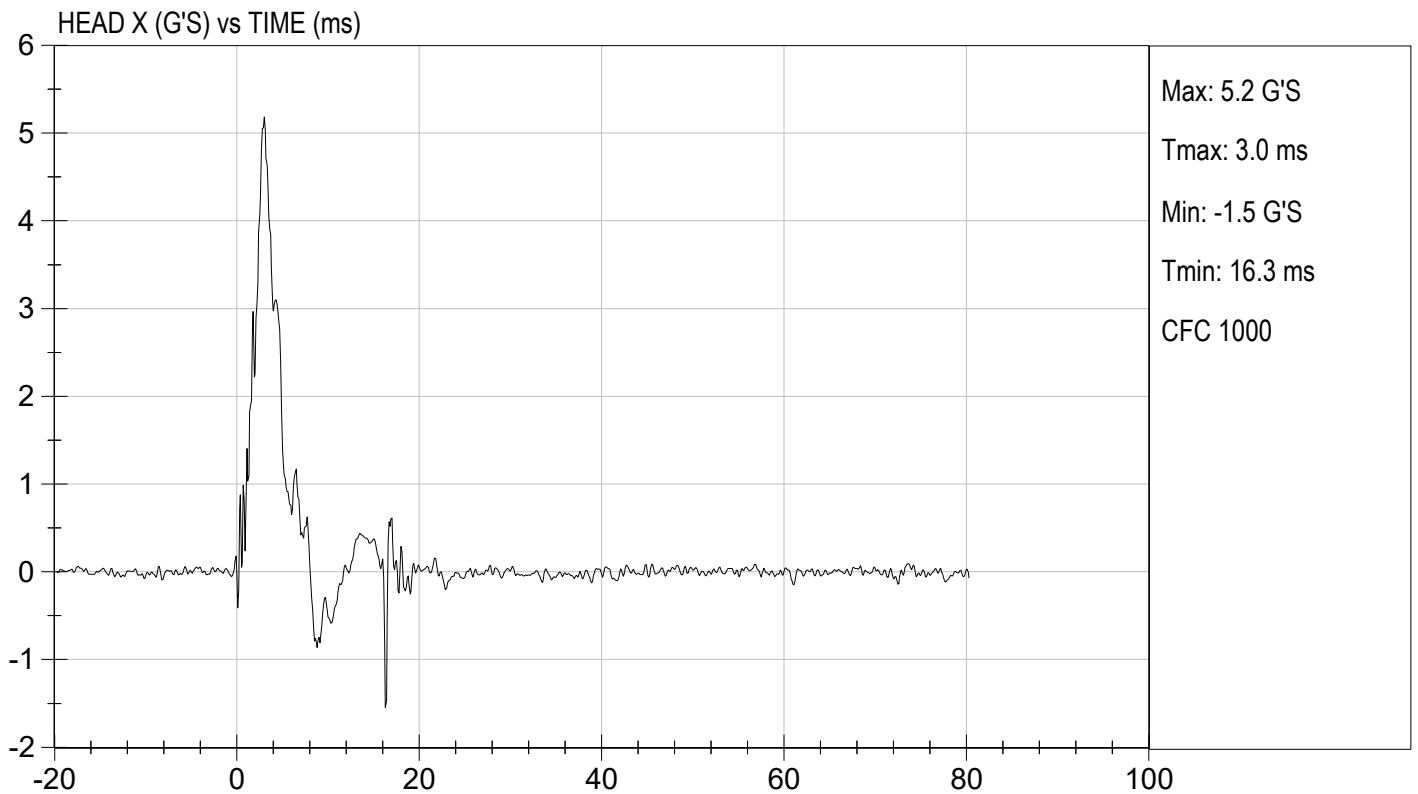
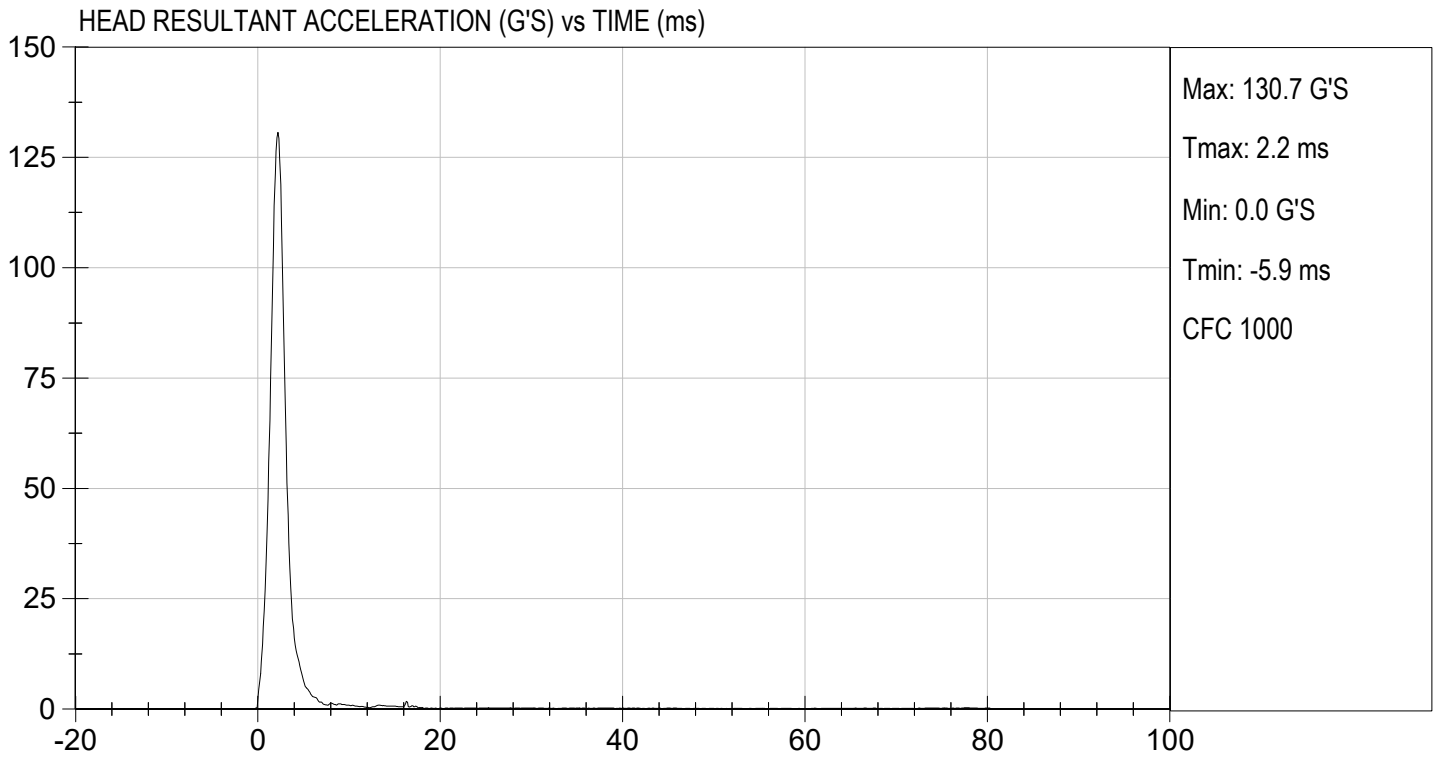
Laboratory Technician

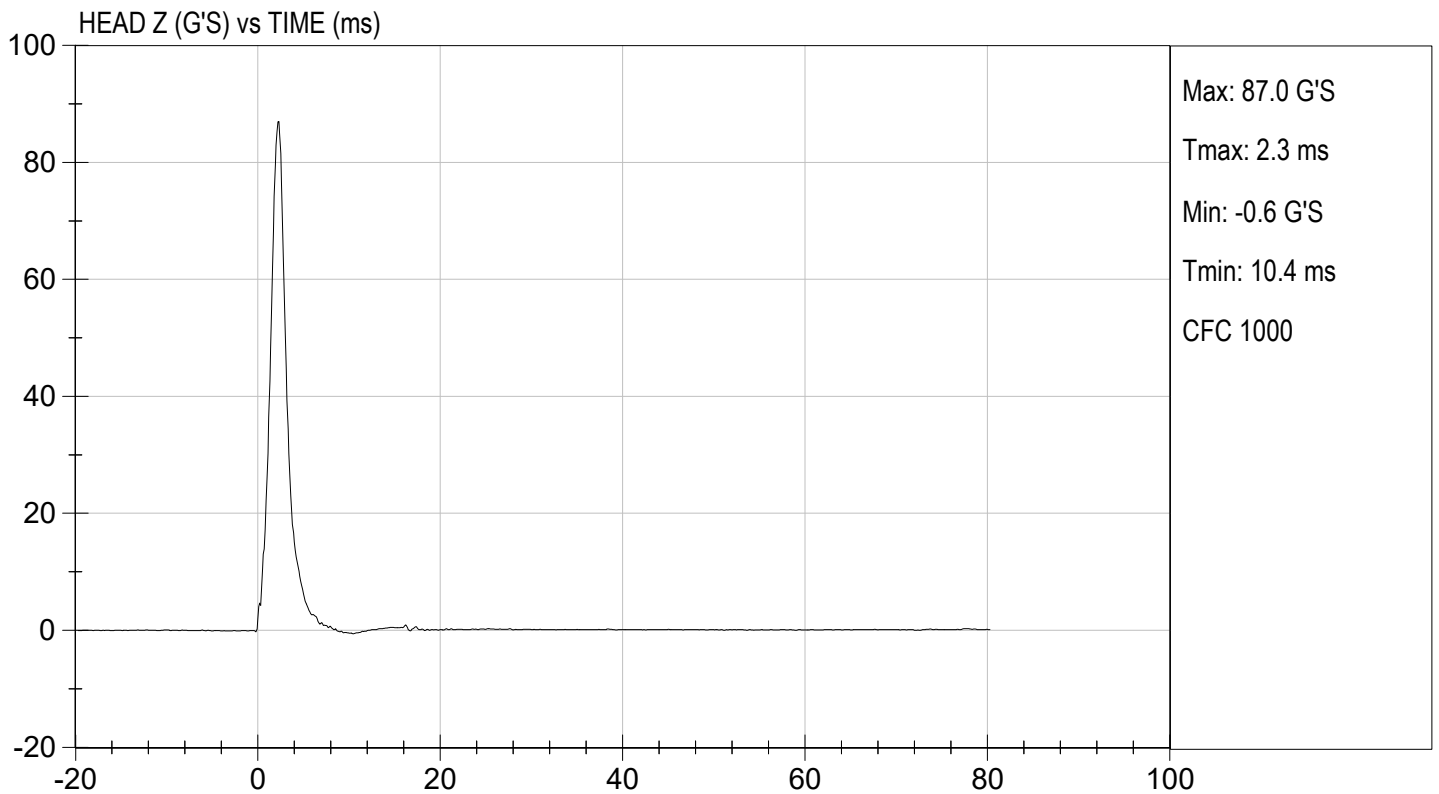
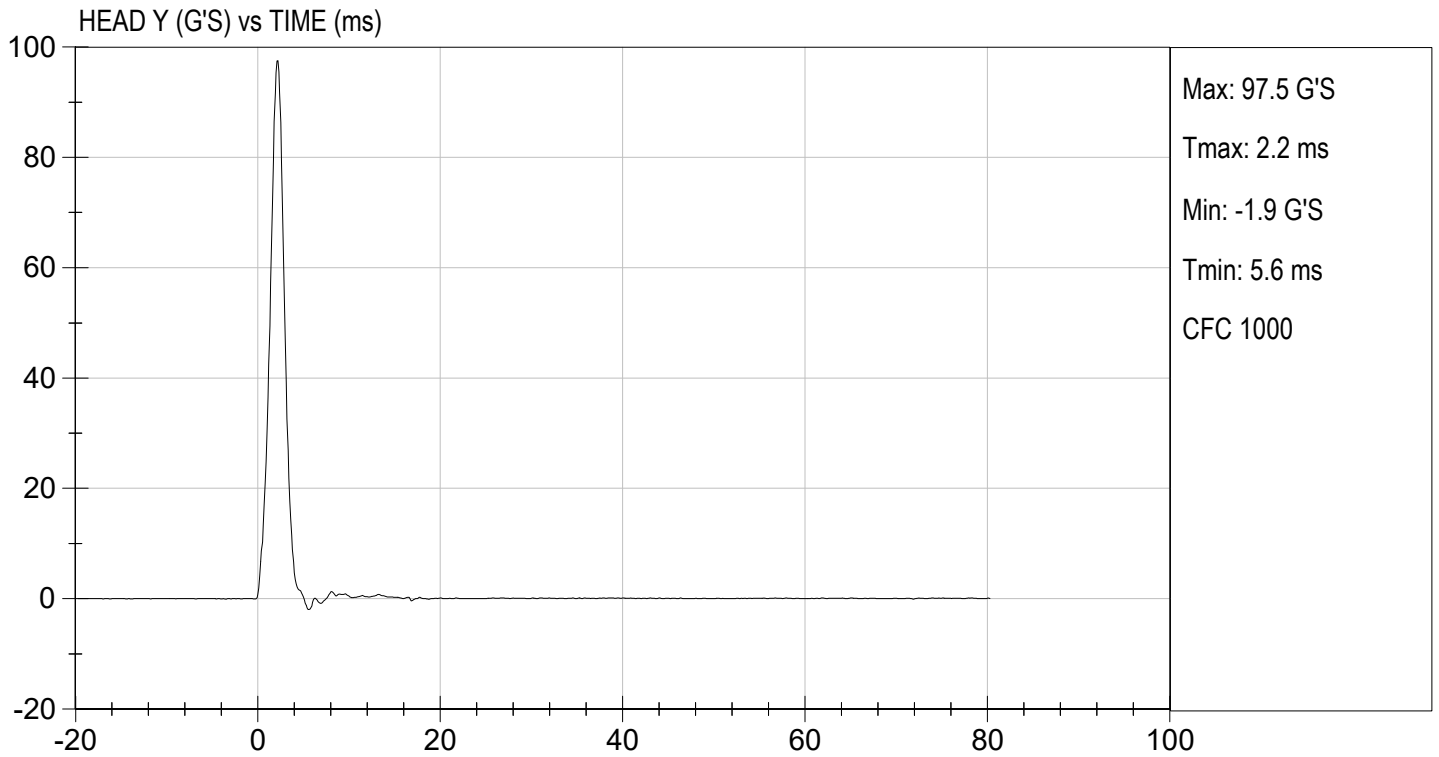
11/07/2022

Test Date



Approved By





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

ATD Serial No: 296

Test I.D.: D222582

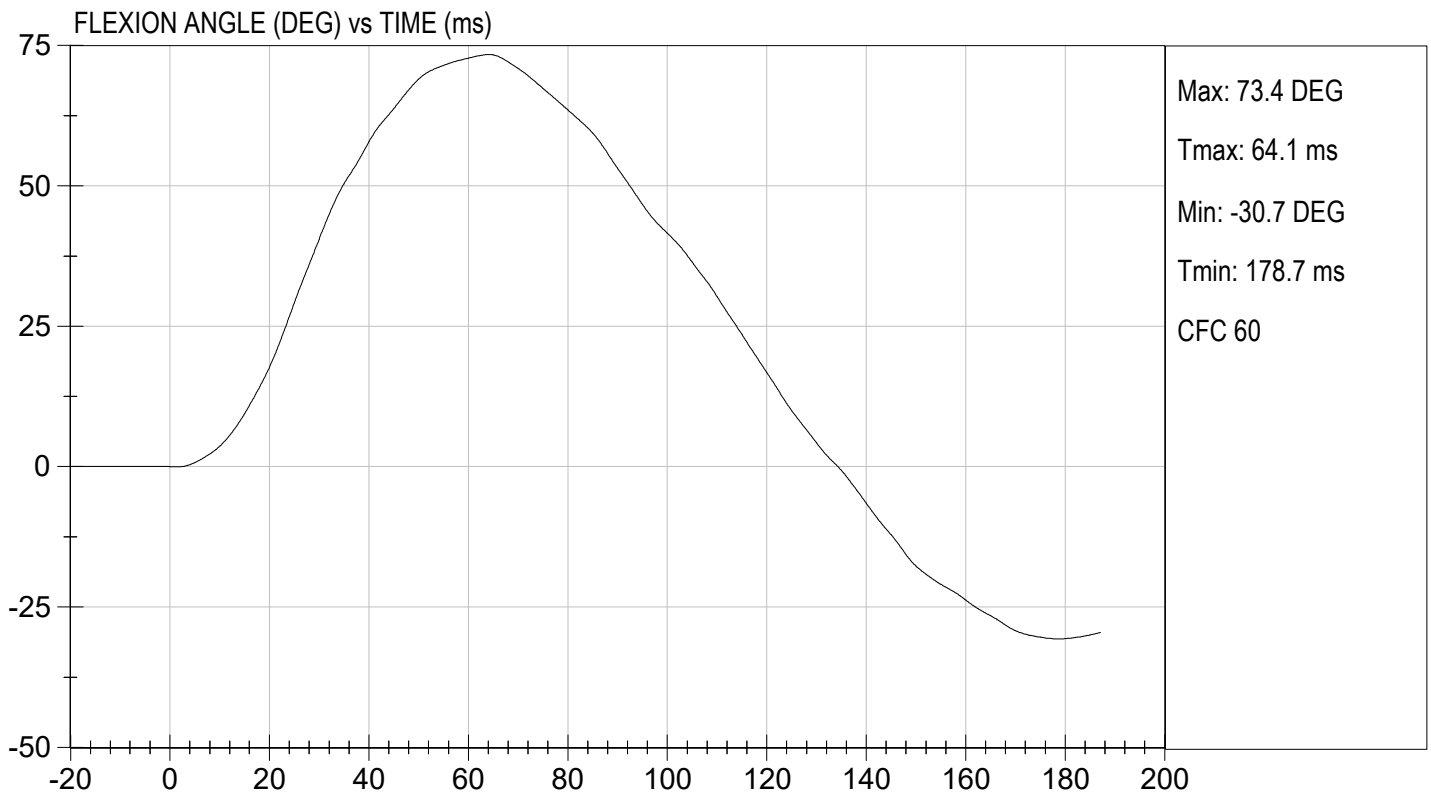
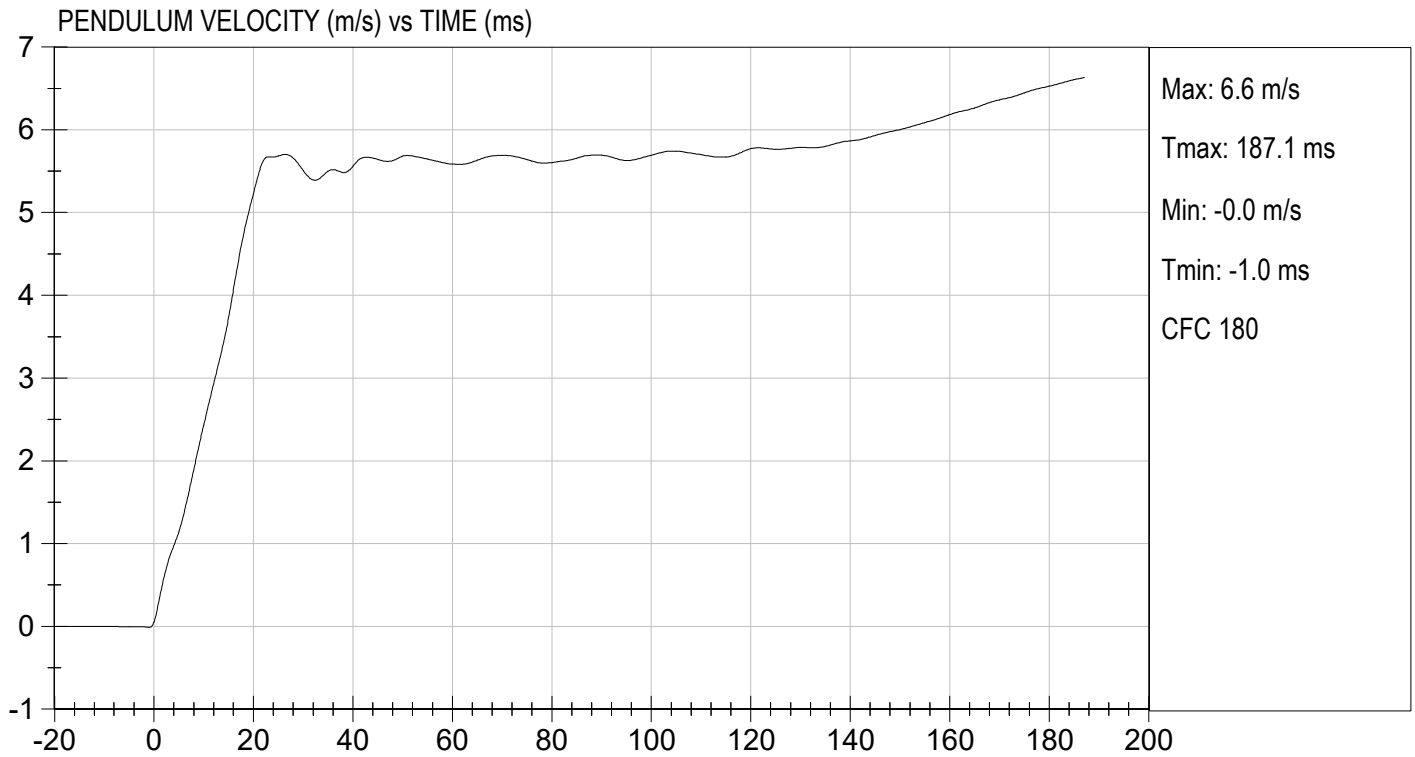
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	22.0	Pass	
Humidity	%	10 to 70	48	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.52	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.43	Pass
	15 ms	m/s	3.30 to 4.10	3.73	Pass
	20 ms	m/s	4.40 to 5.40	5.23	Pass
	25 ms	m/s	5.40 to 6.10	5.68	Pass
	25-100 ms	m/s	5.50 to 6.20	5.70	Pass
Maximum D-Plane Rotation	deg	71 to 81	73	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	64	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-38	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	119	Pass	
Overall Test Results				Pass	


 Laboratory Technician

11/04/2022

Test Date

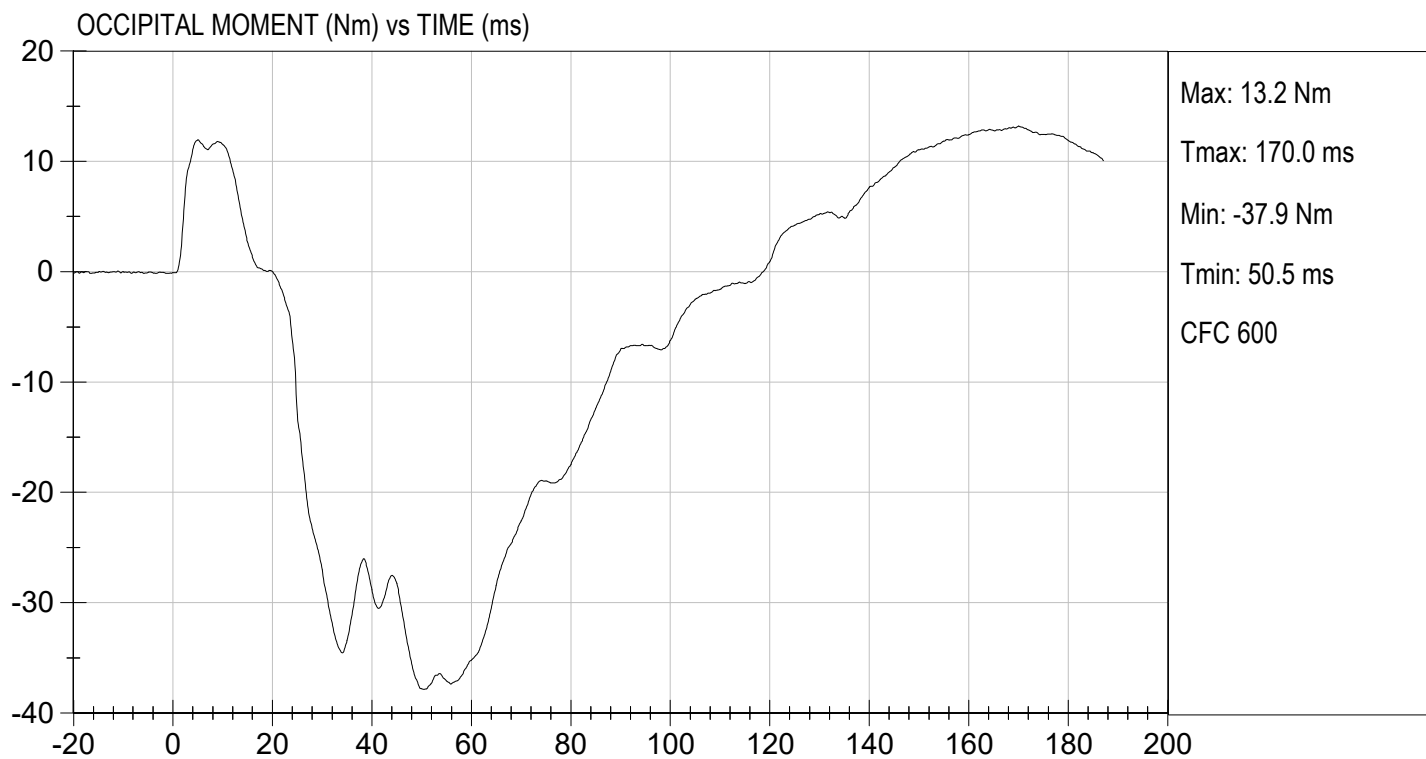

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TEST DESC: NECK BENDING
VELOCITY: 18.12 ft/s, 5.52 m/s

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



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

ATD Serial No: 306

Test ID: D222583

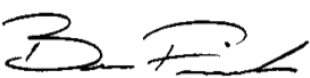
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass



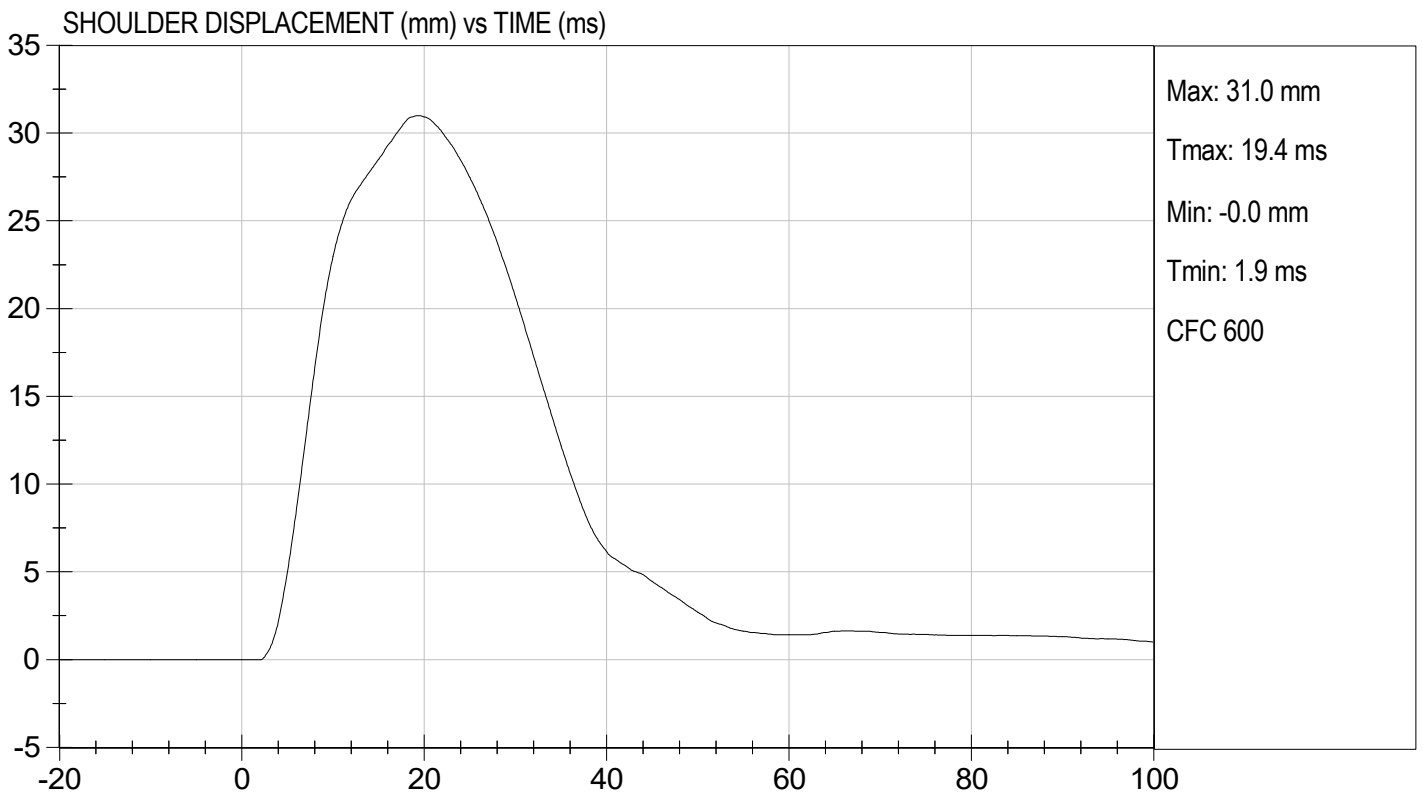
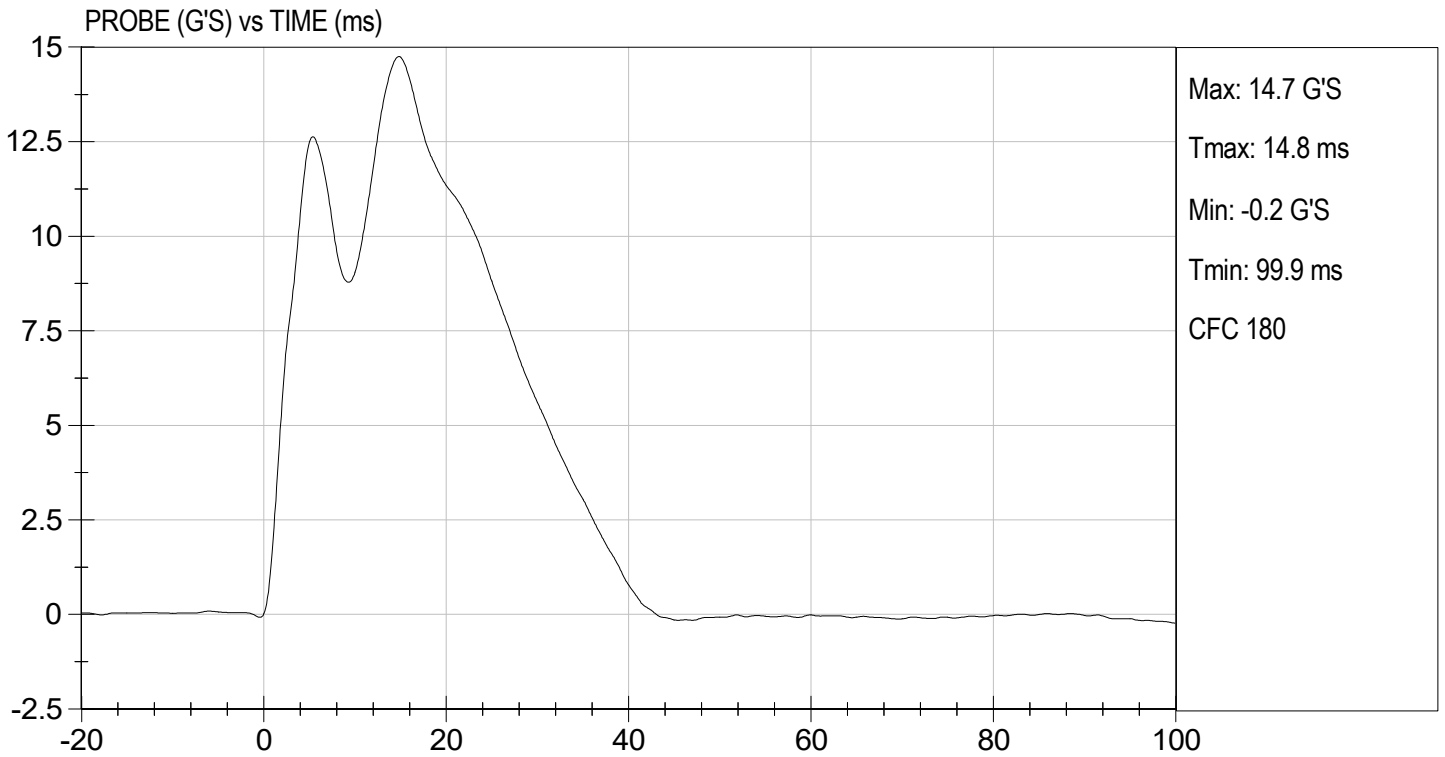
Laboratory Technician

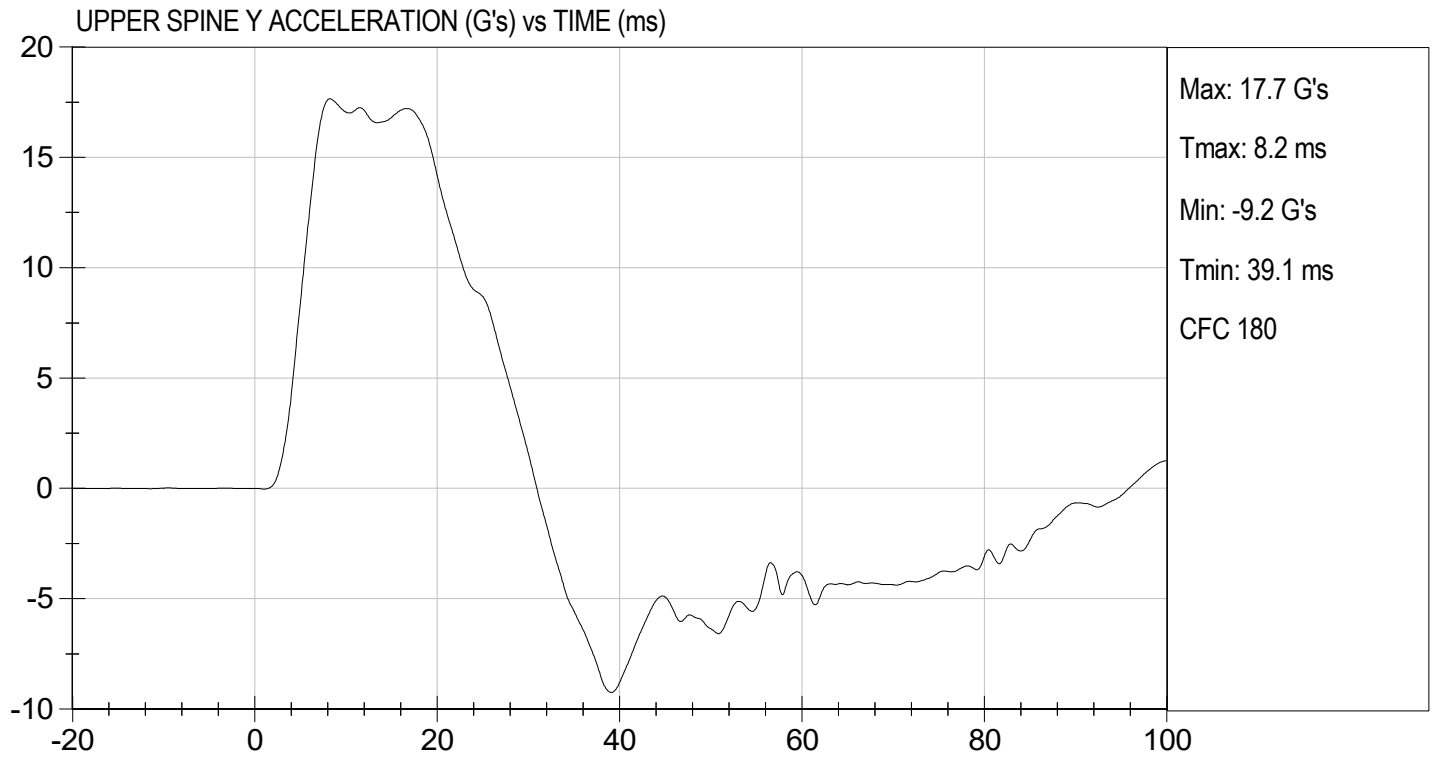
11/03/2022

Test Date



Approved By





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

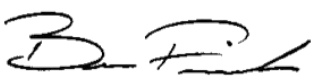
ATD Serial No: 306

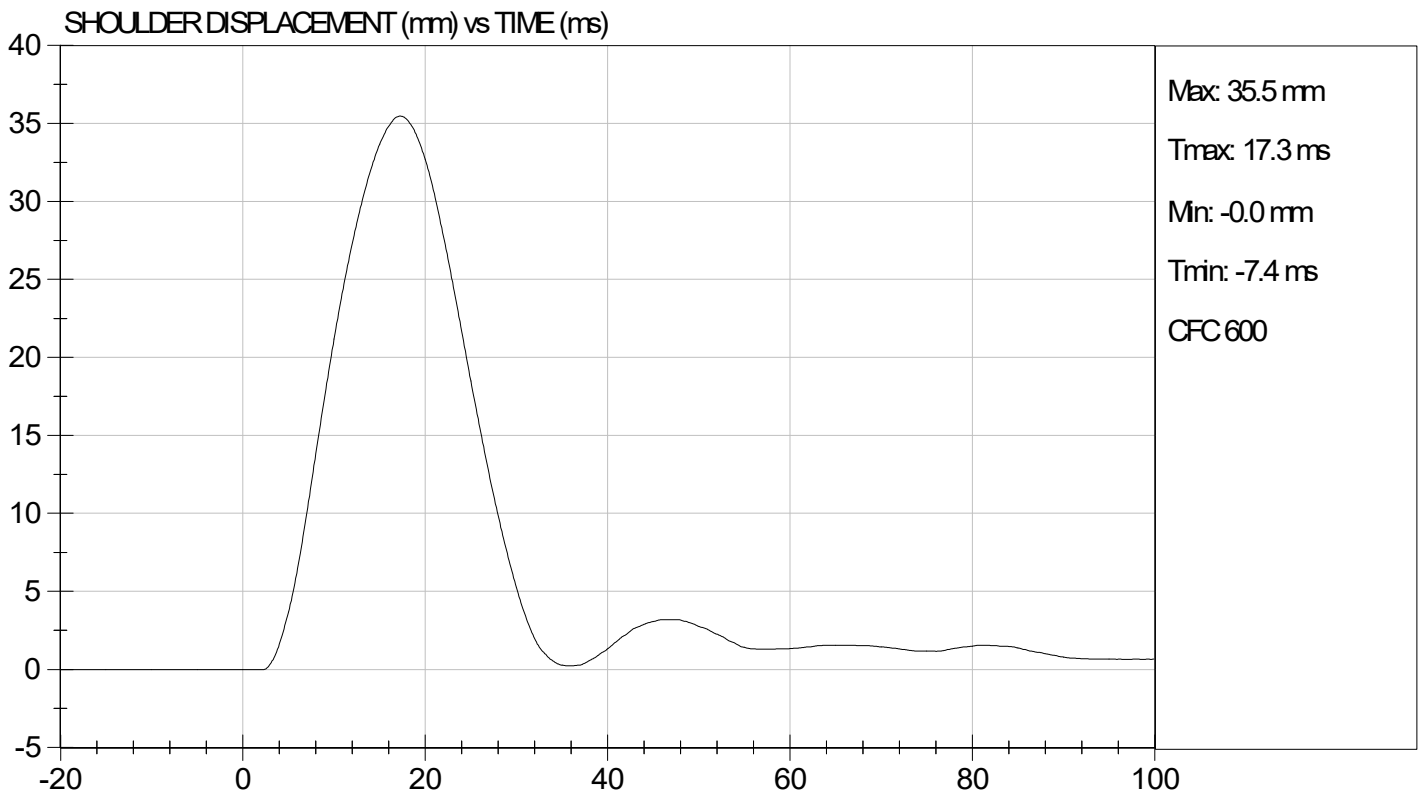
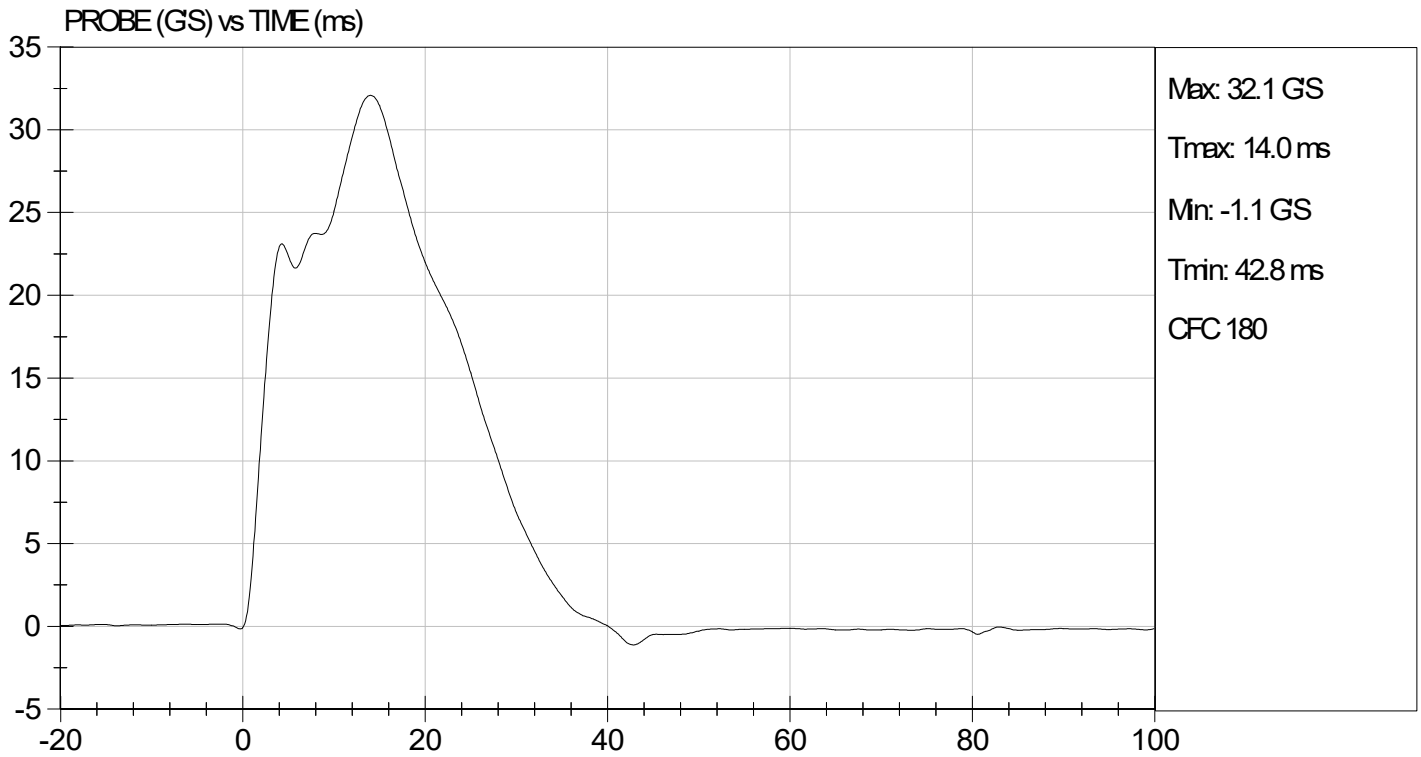
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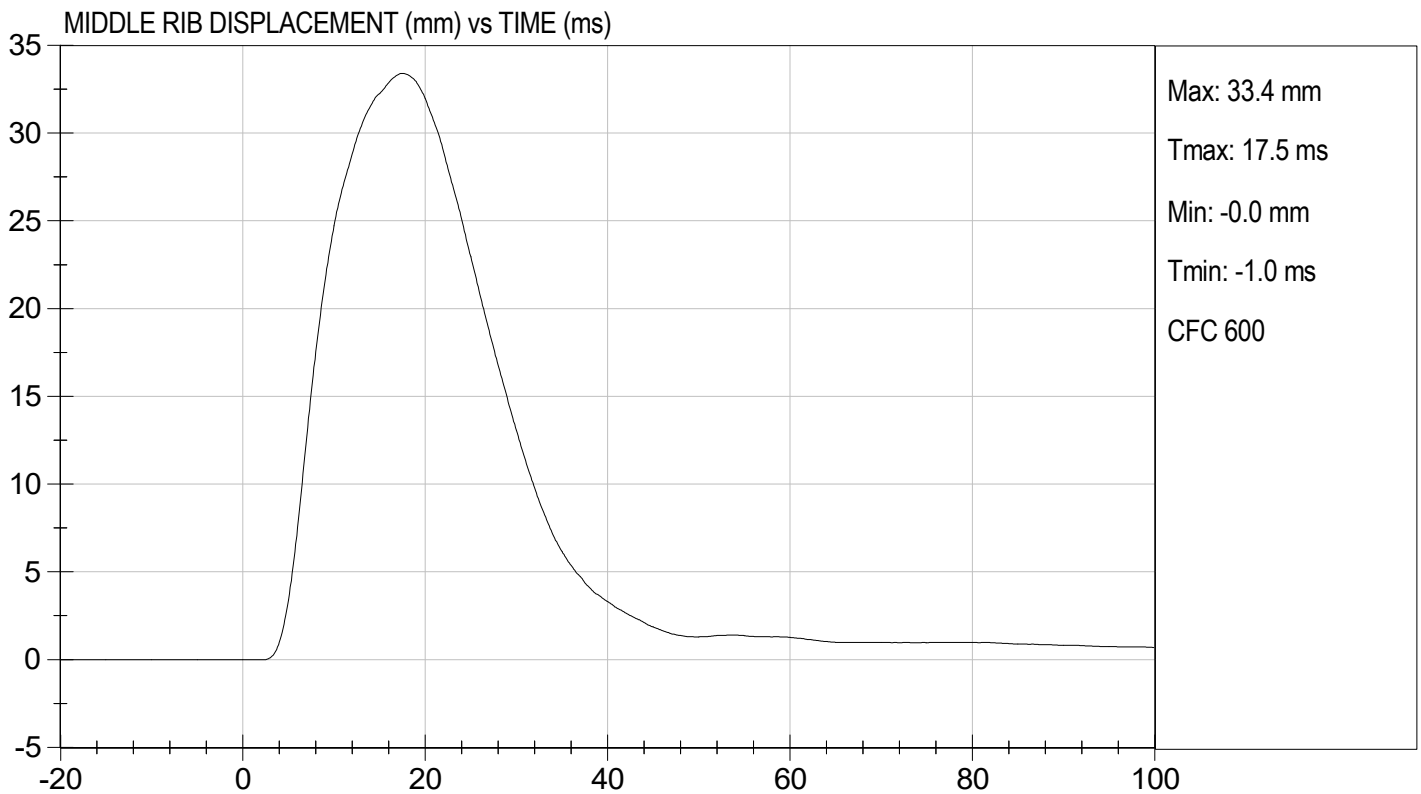
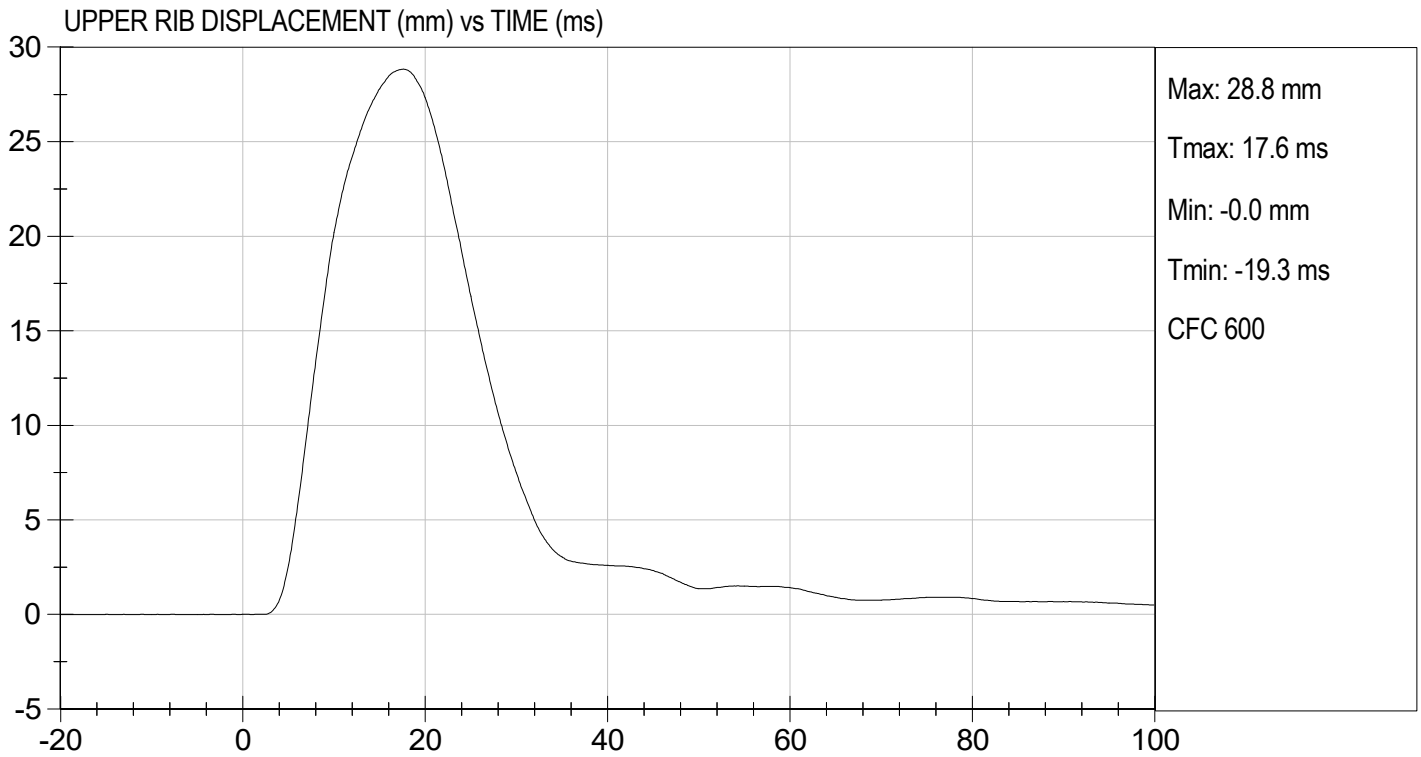
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle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

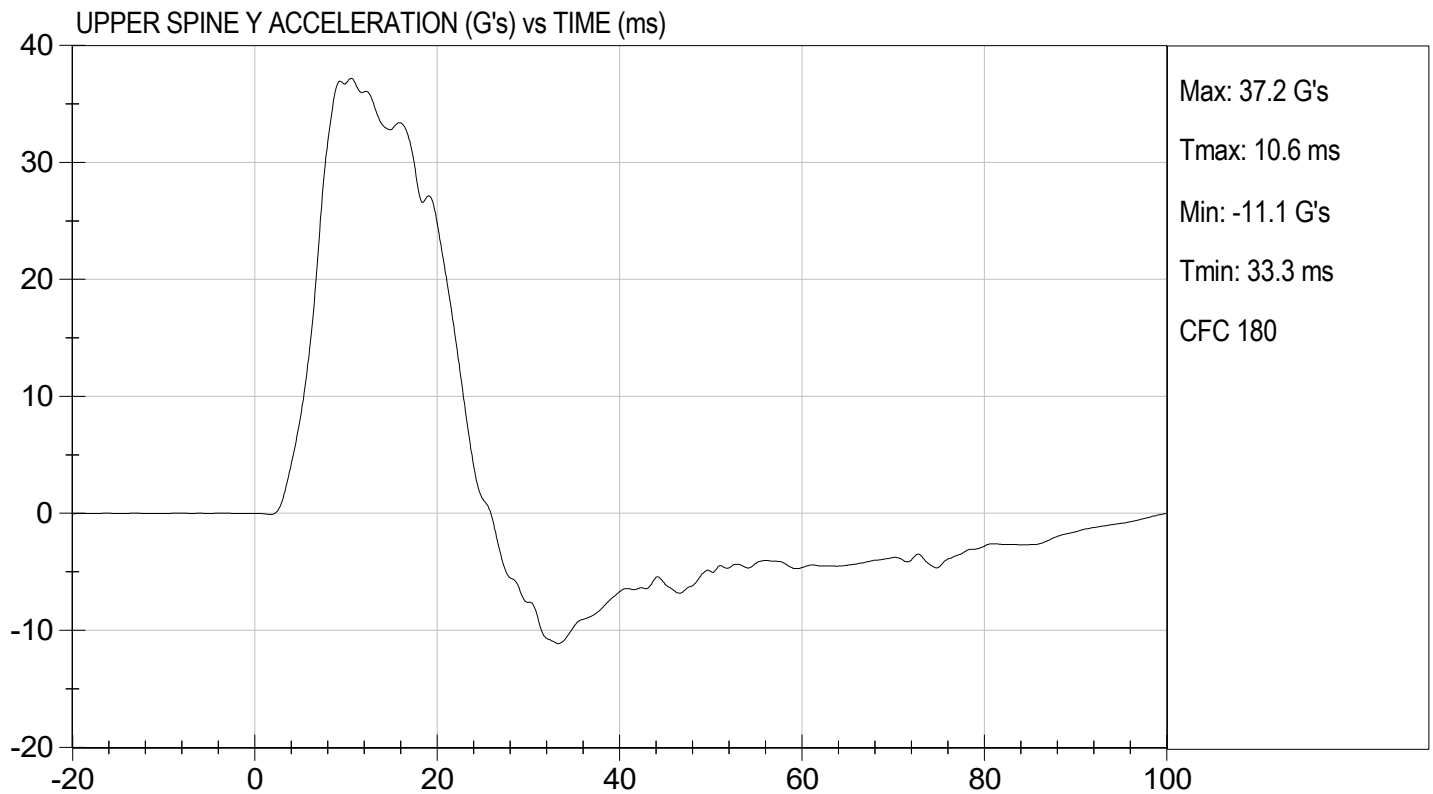
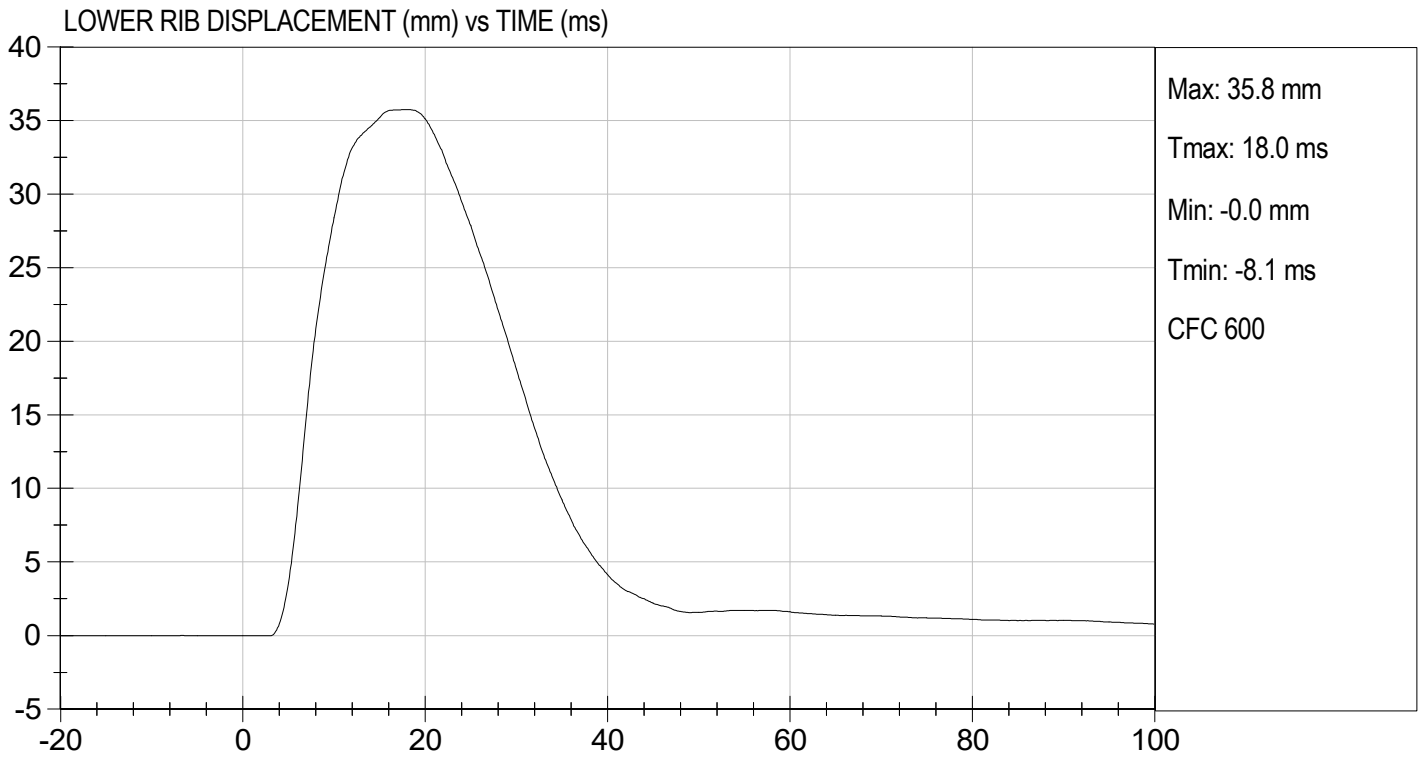

 Laboratory Technician

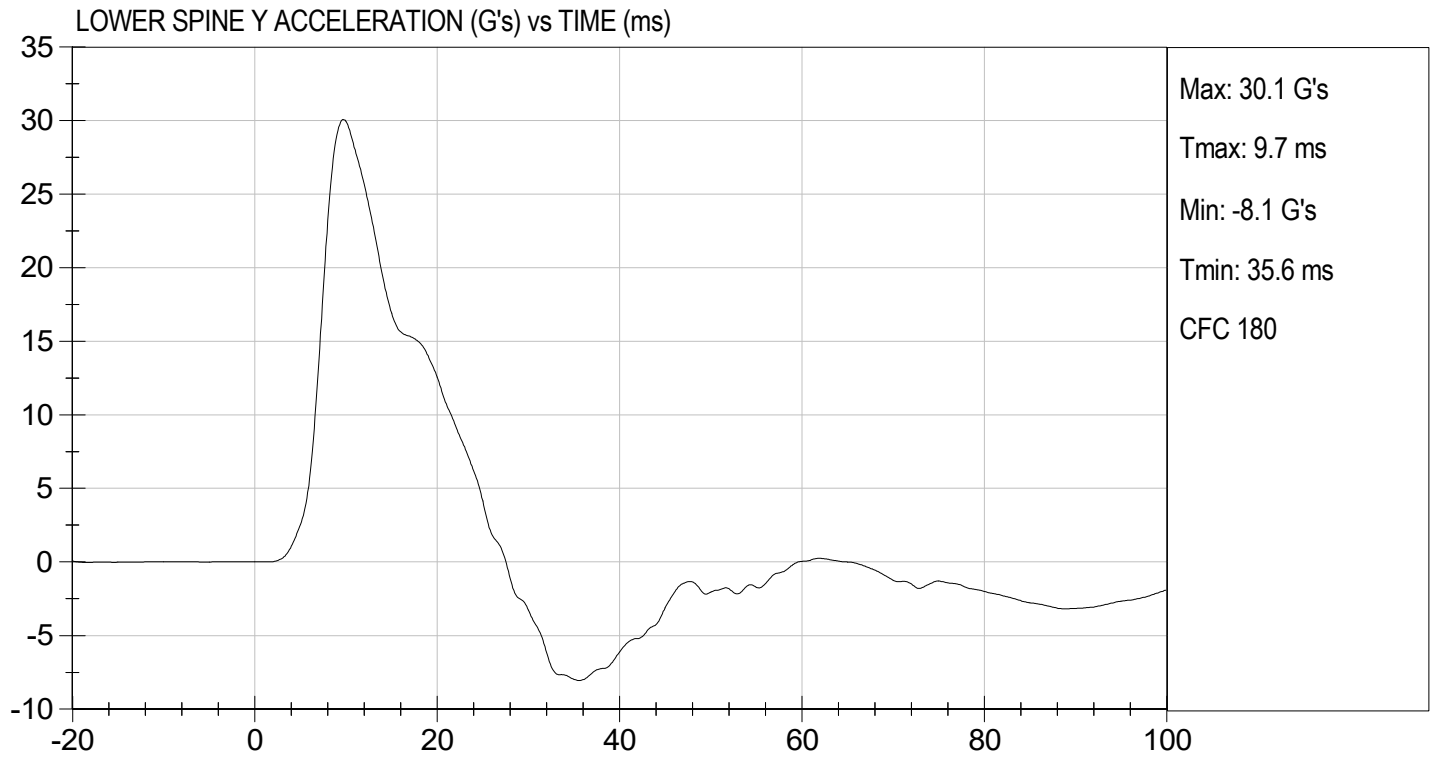
11/04/2022
 Test Date


 Approved By









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

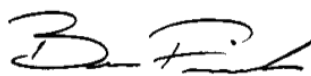
ATD Serial No: 306

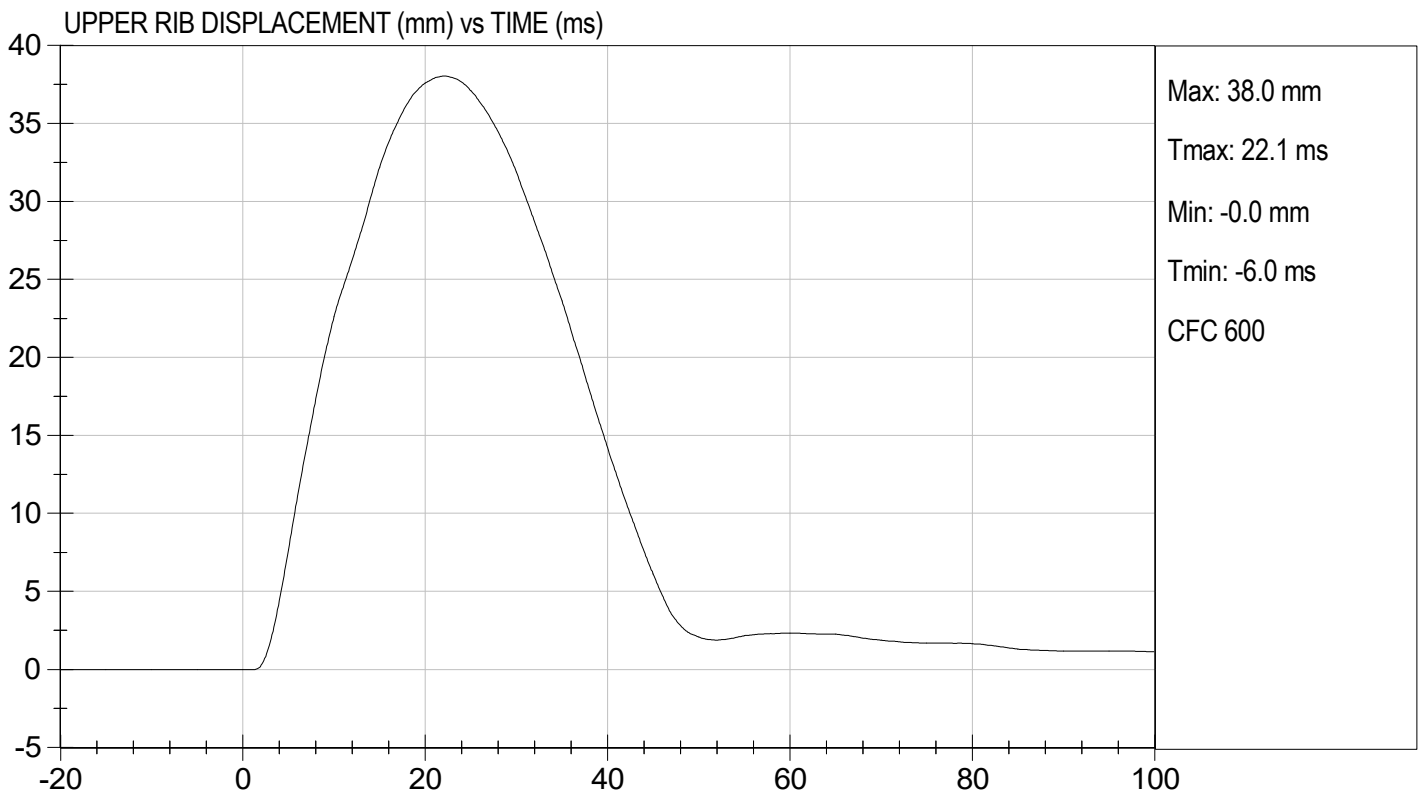
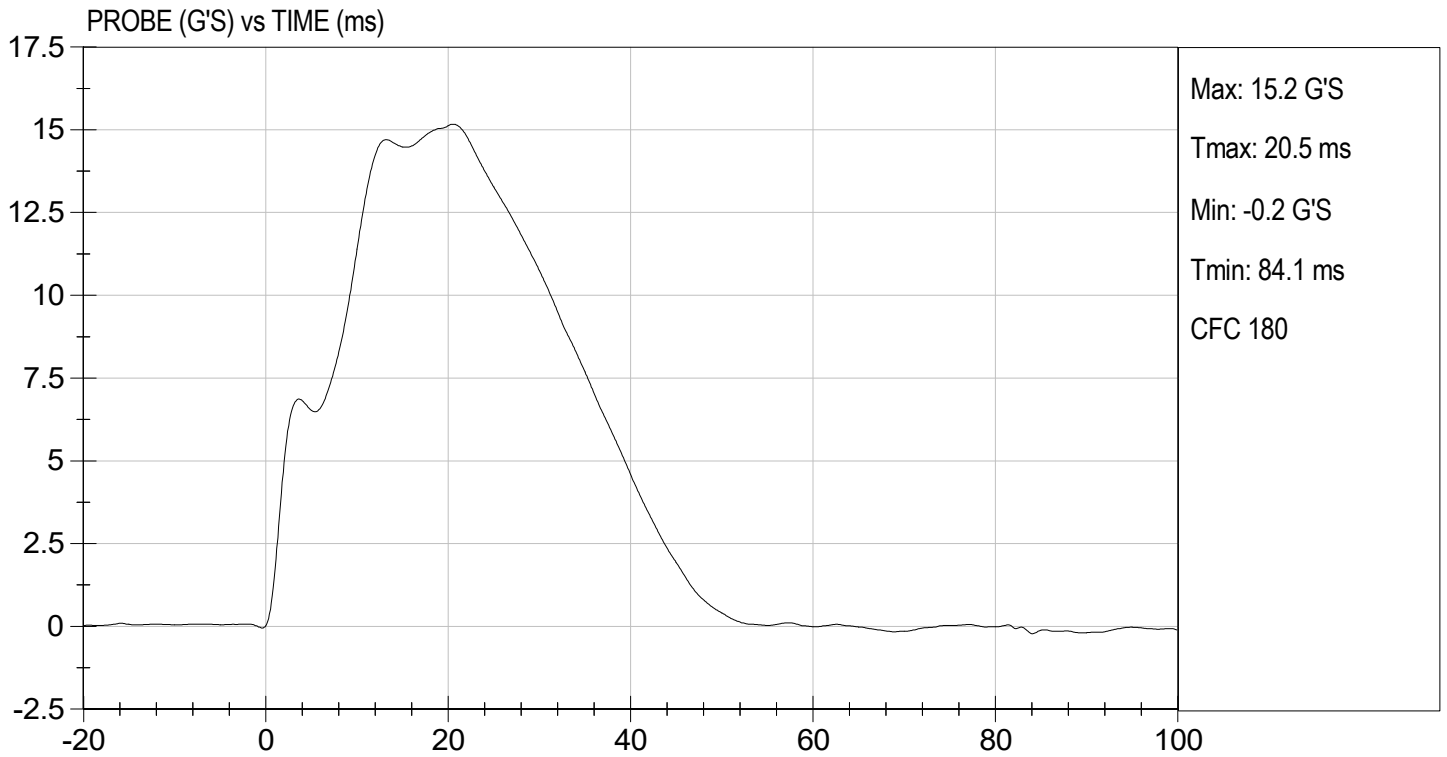
Test I.D: D222585

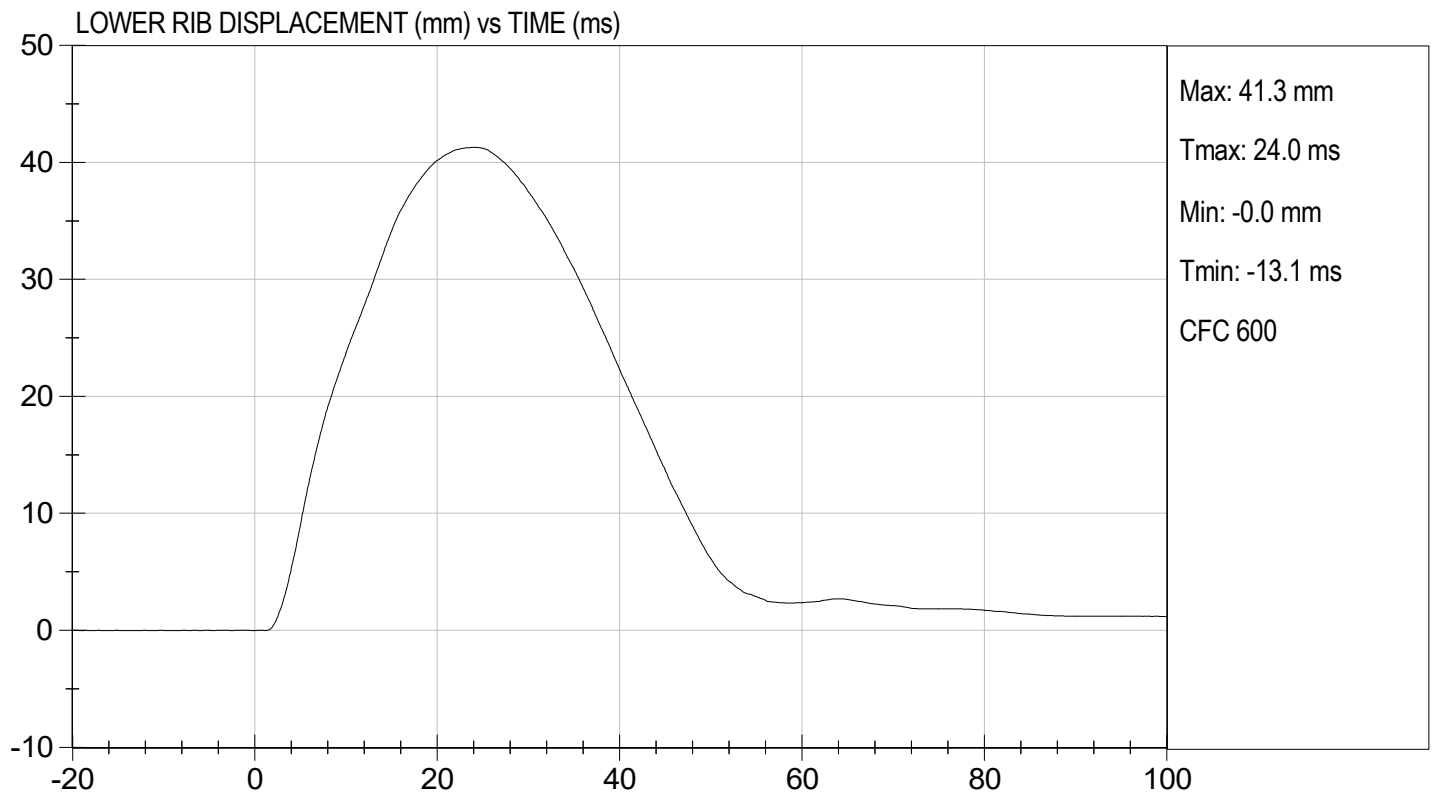
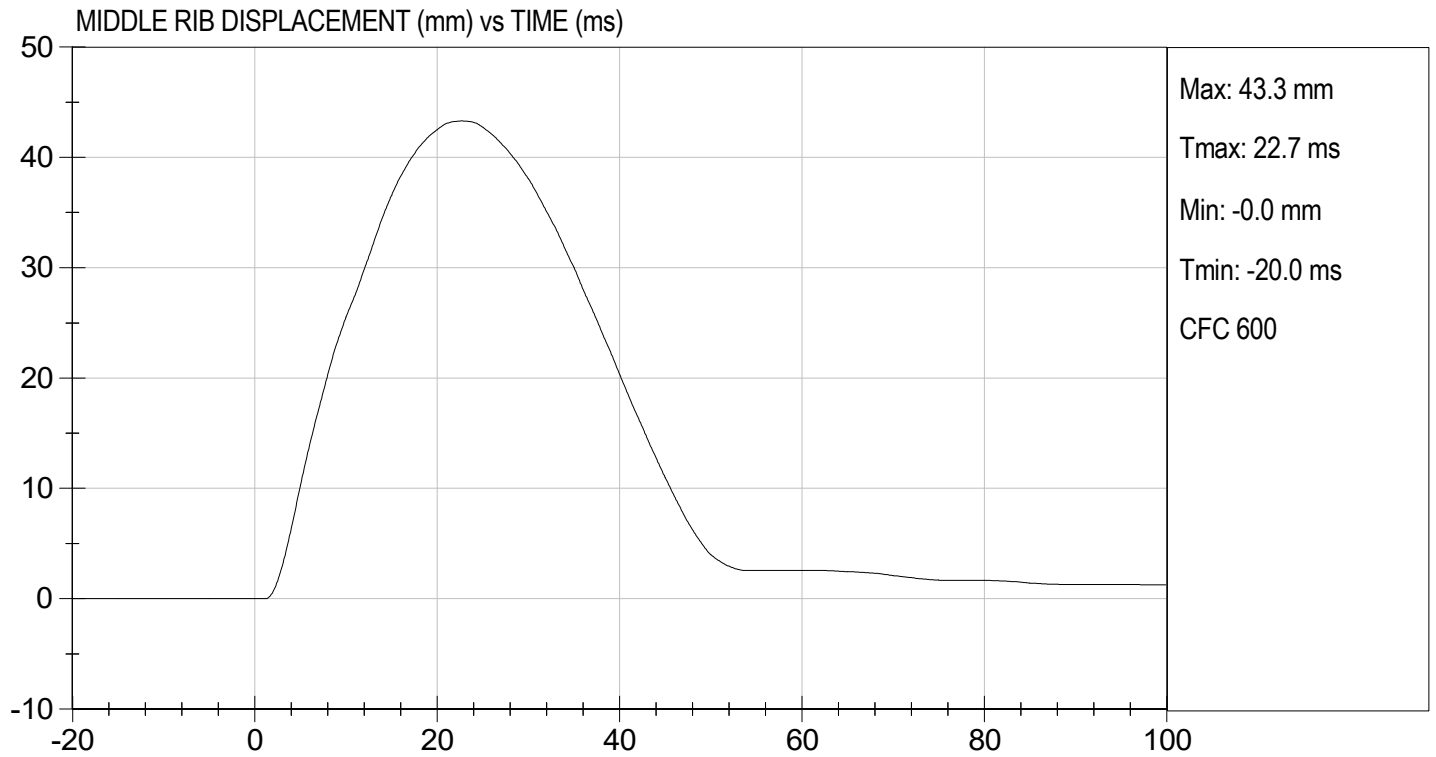
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	38	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	16	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass

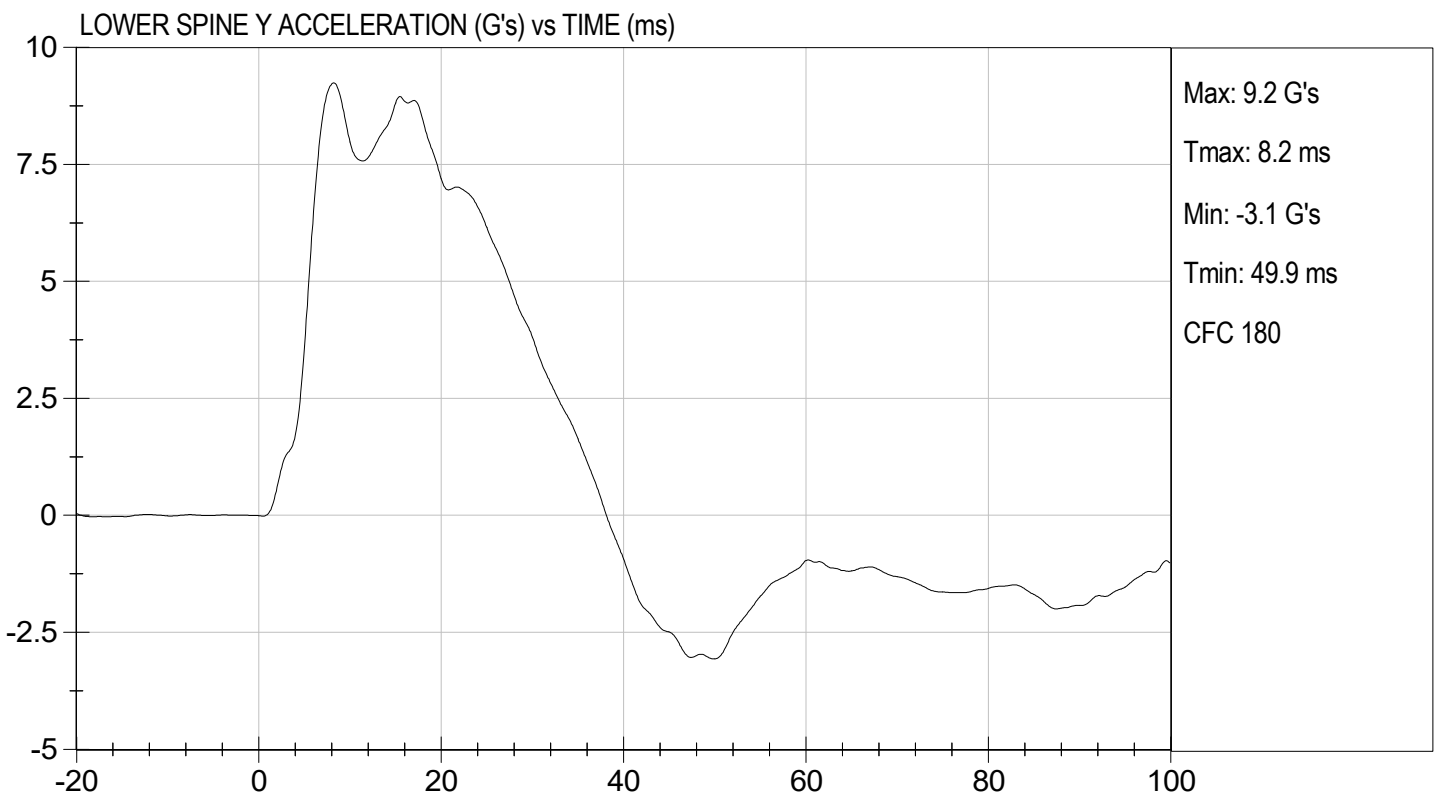

 Laboratory Technician

11/03/2022
 Test Date


 Approved By







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

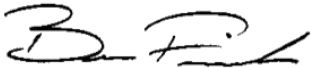
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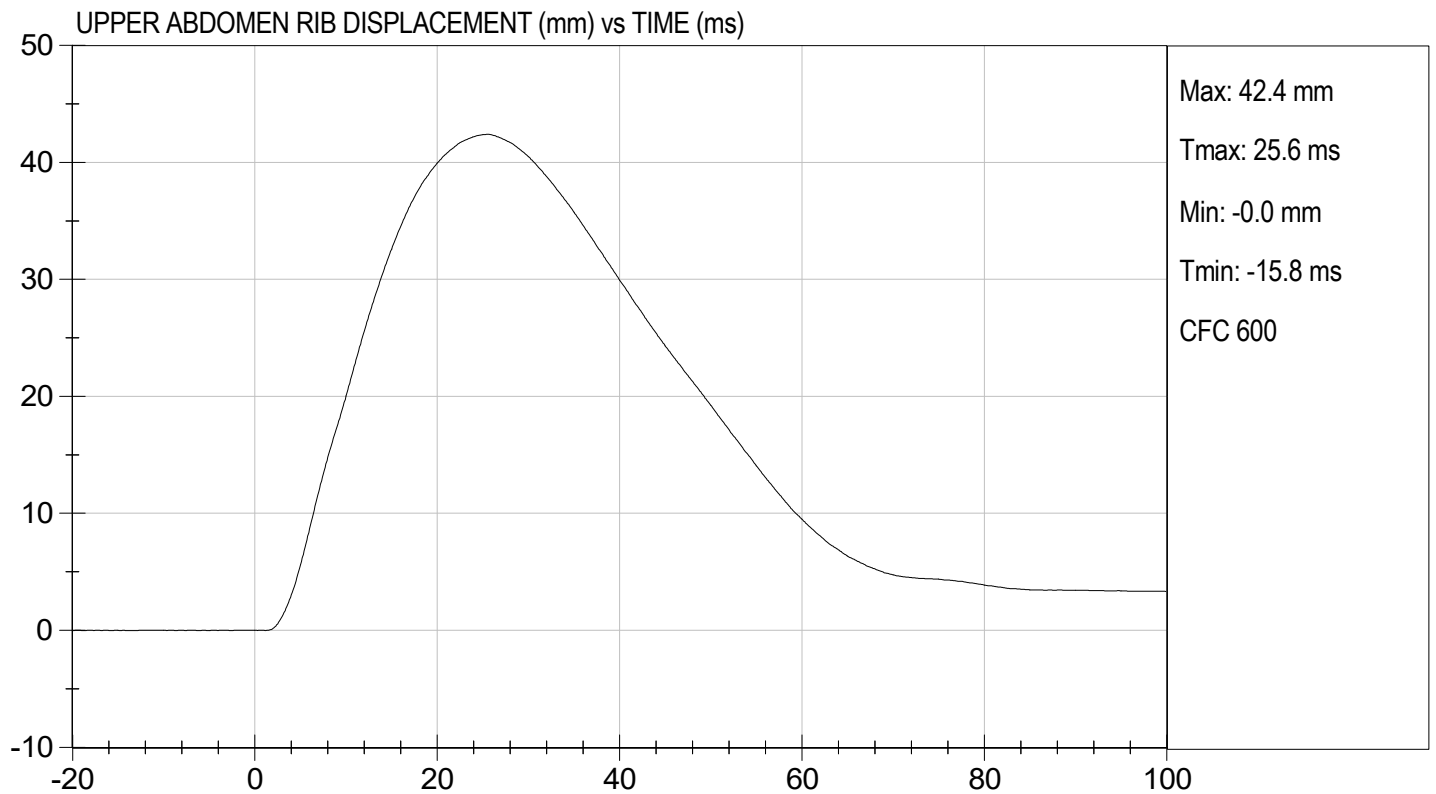
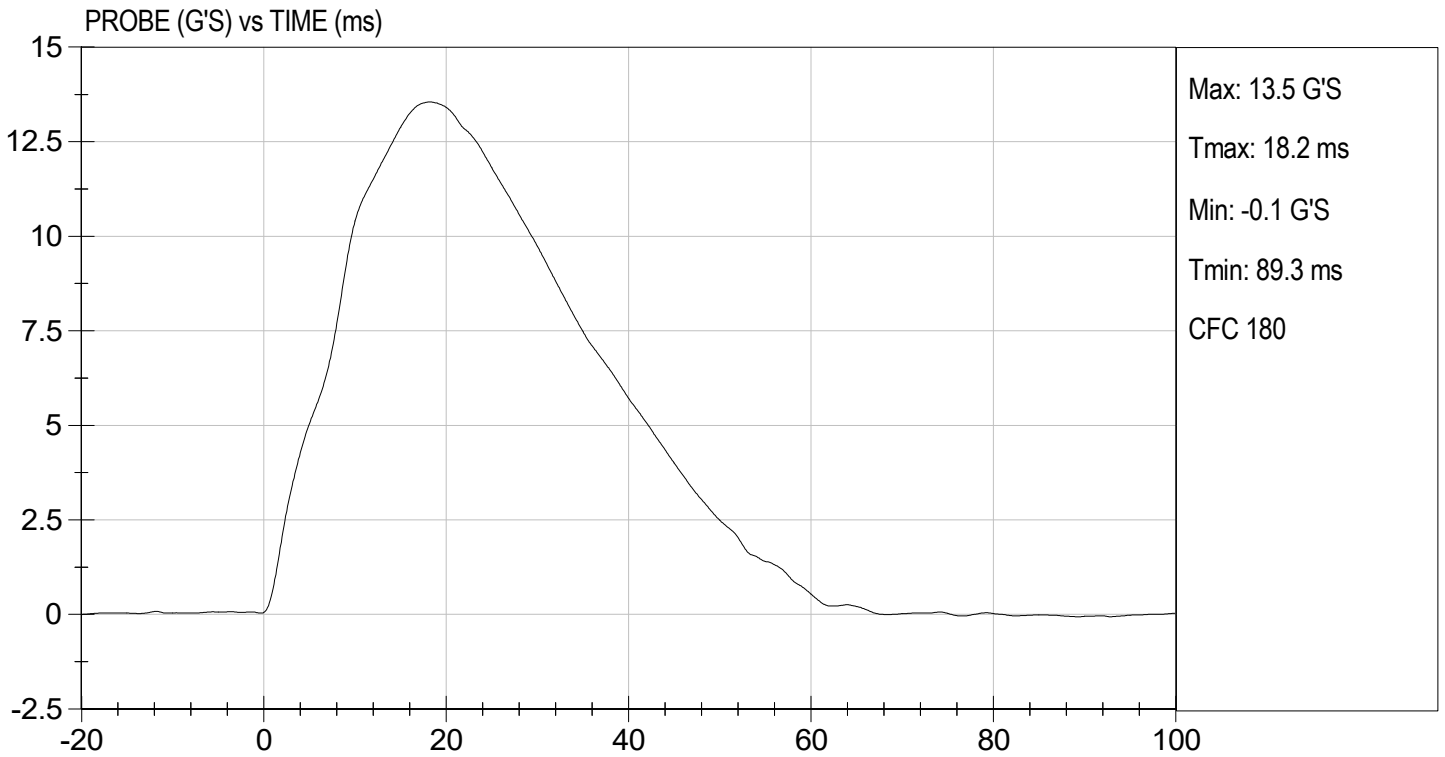
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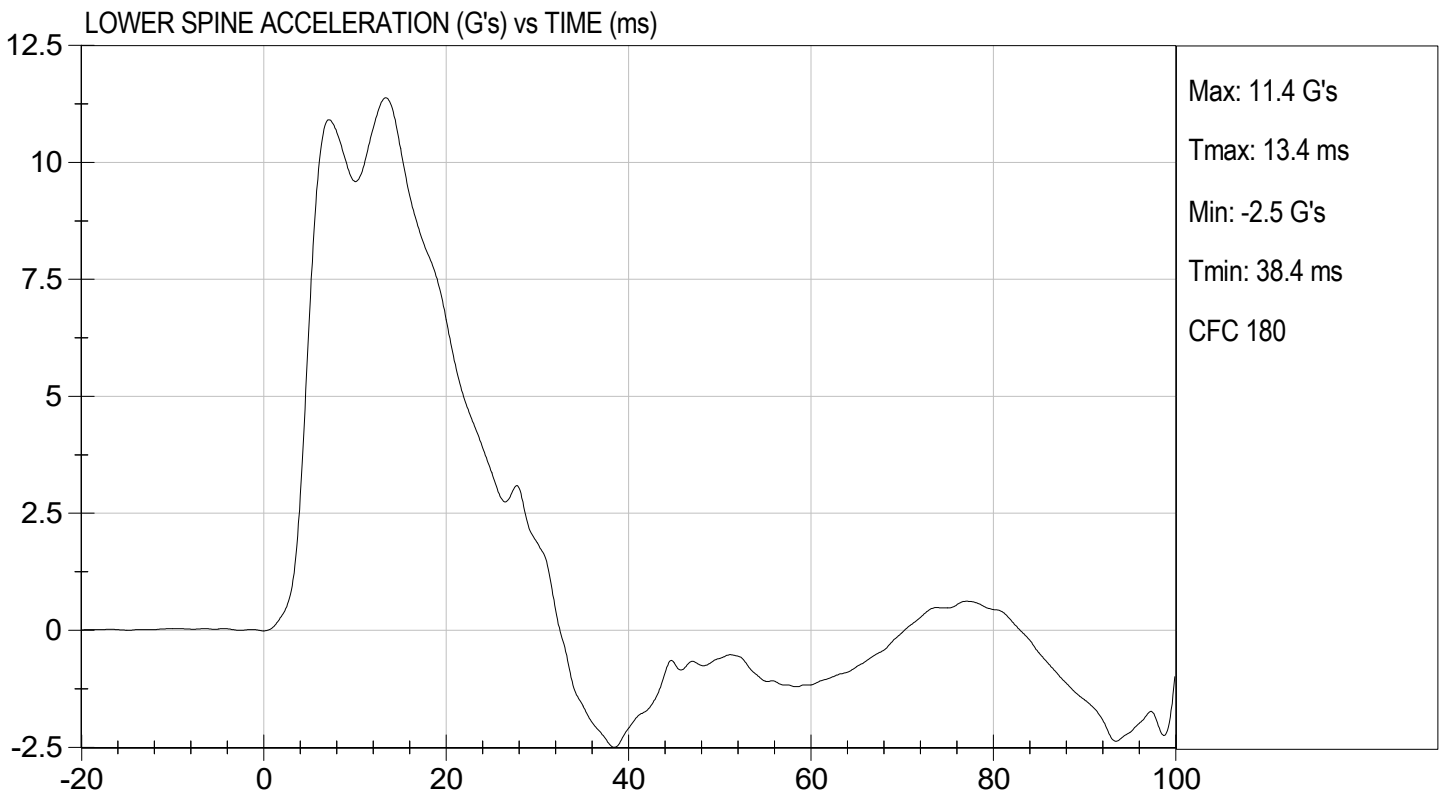
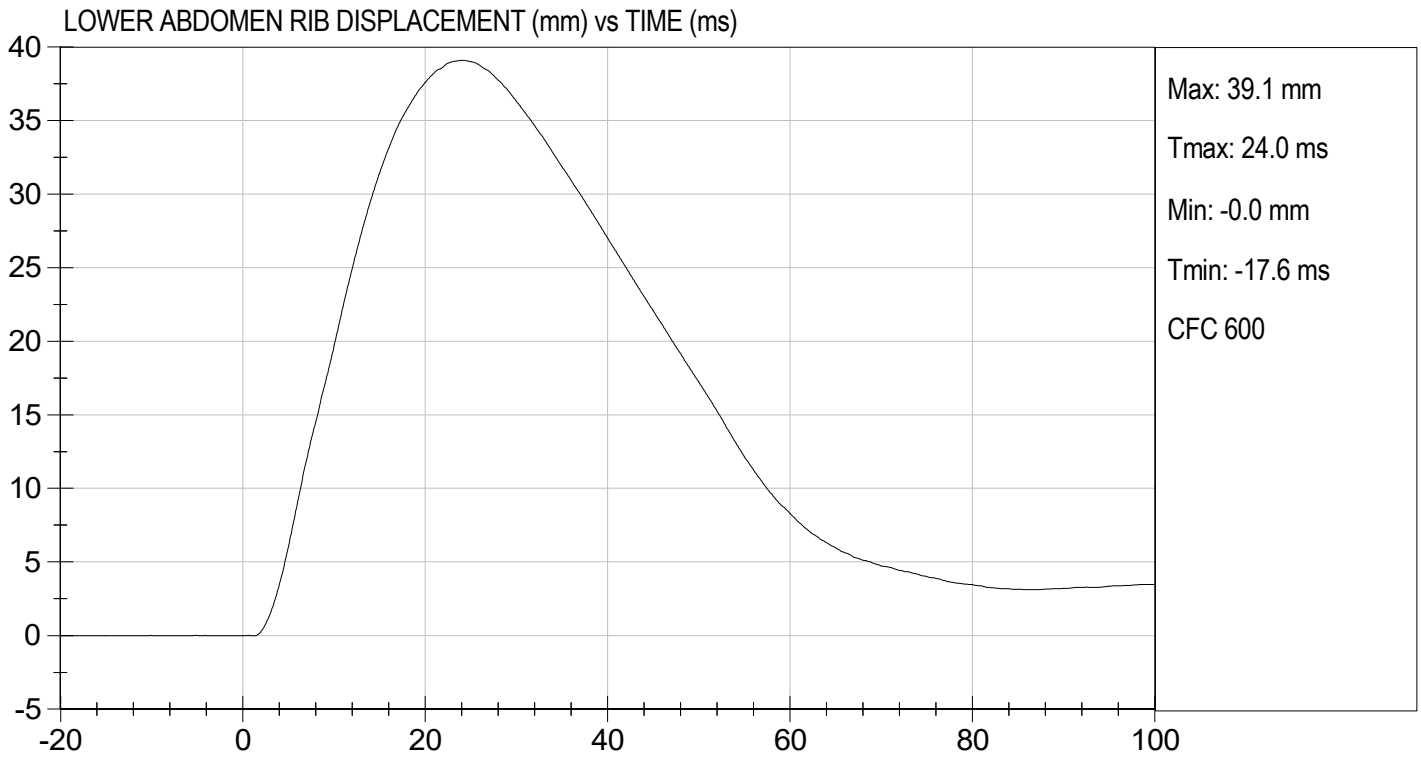
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33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


 Laboratory Technician

11/04/2022
 Test Date


 Approved By





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

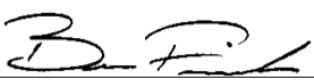
ATD Serial No: 306

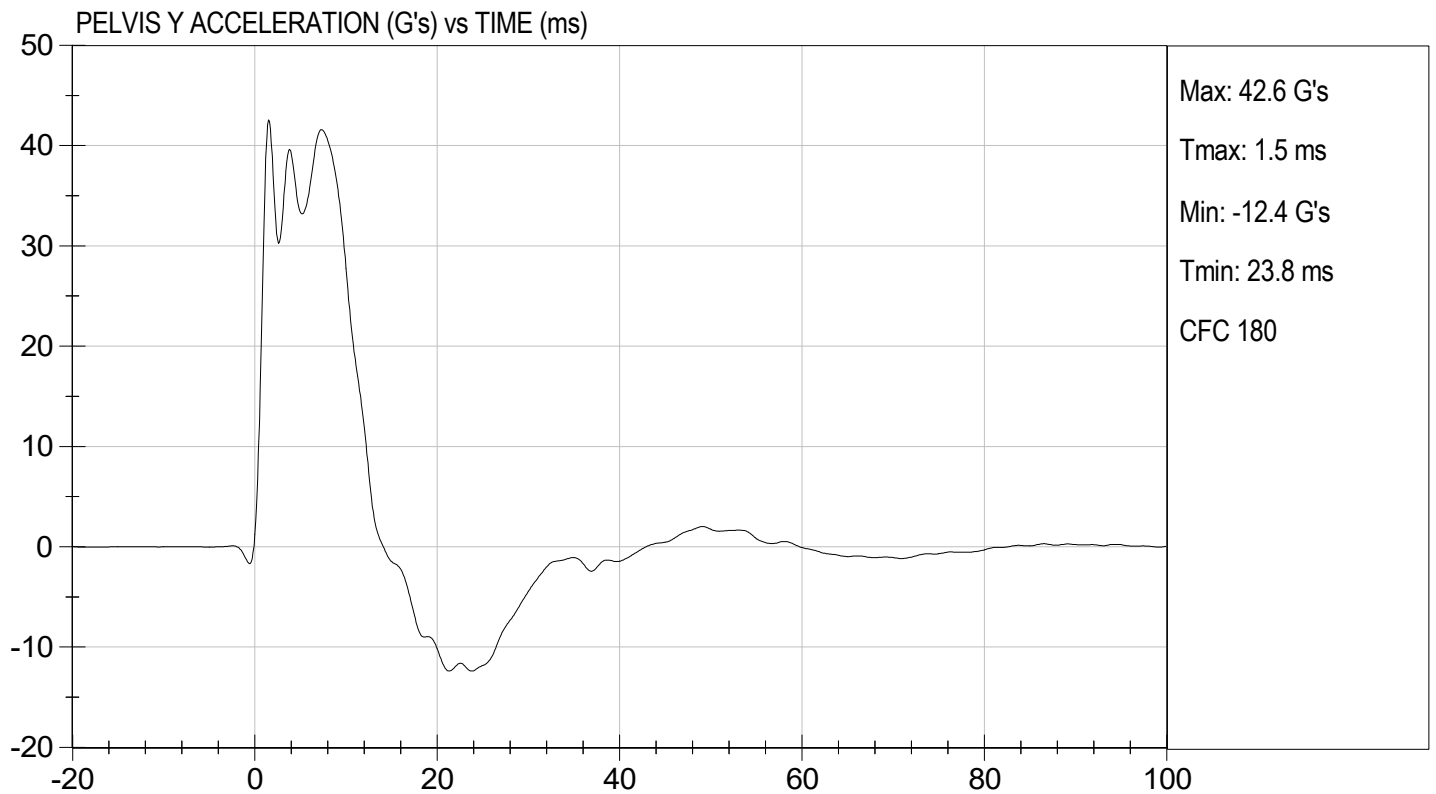
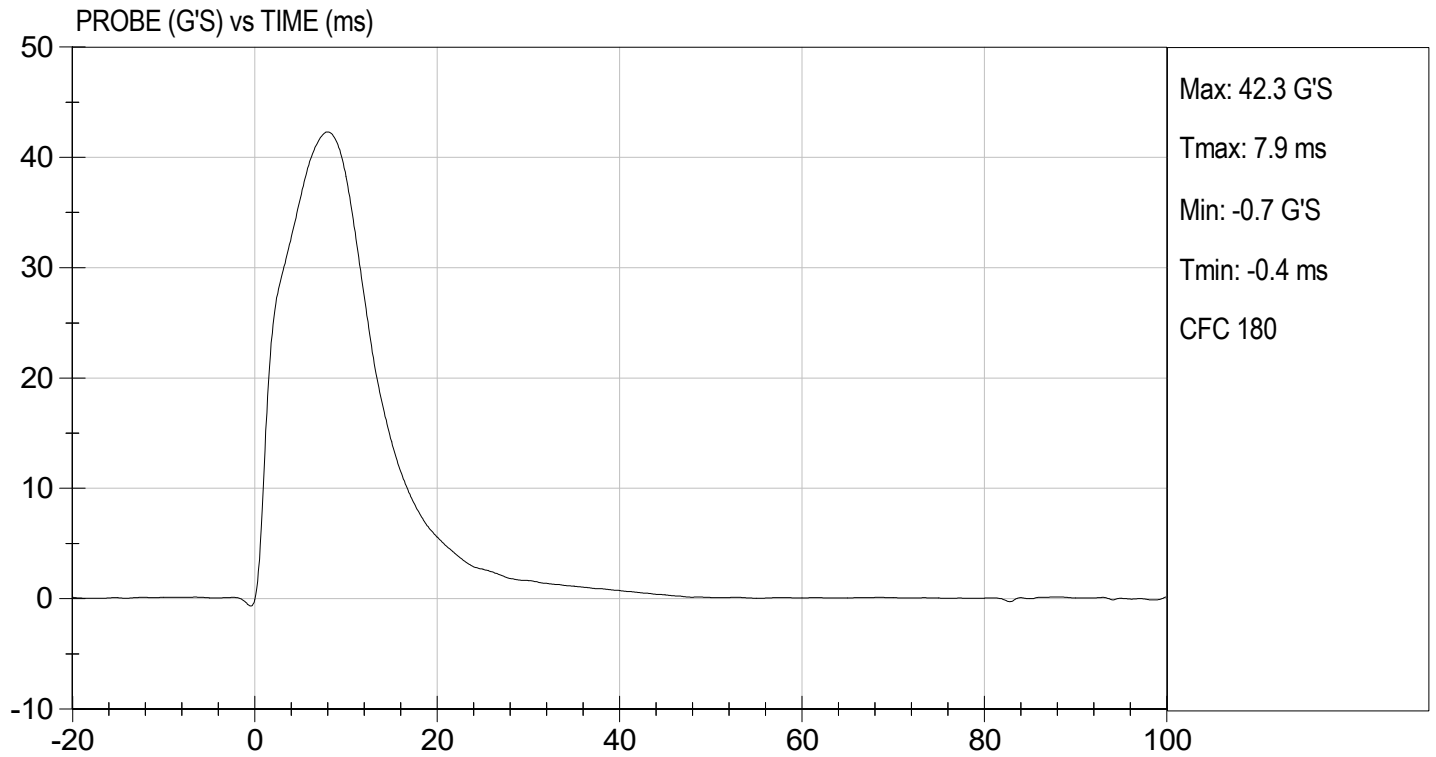
Test I.D: D222587

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	42	Pass
Peak Acetabulum Force	N	3600 to 4300	3,718	Pass
Overall Test Results				Pass


 Laboratory Technician

11/04/2022
 Test Date

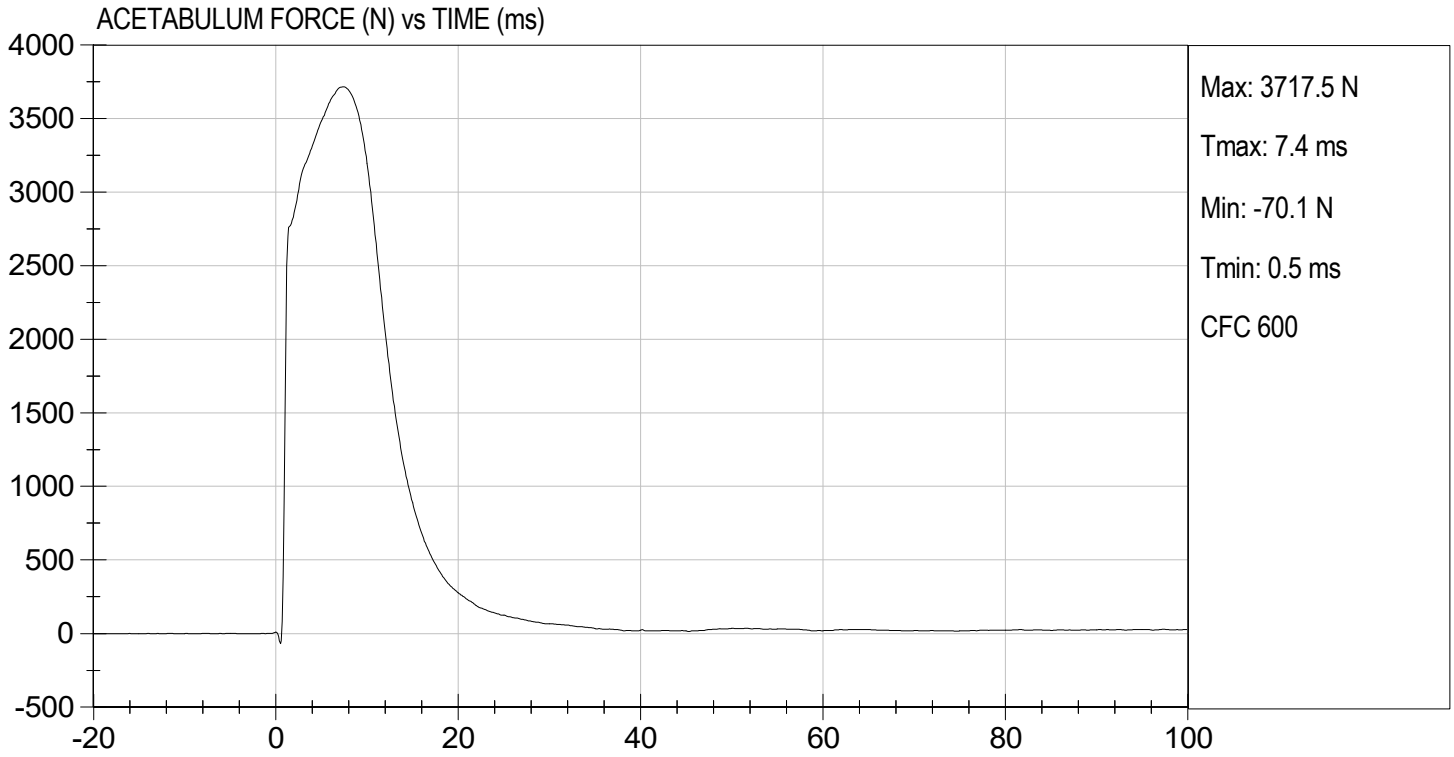

 Approved By





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

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



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

ATD Serial No: 306

Test I.D: D222588

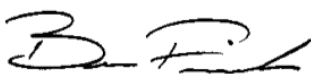
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	42	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,797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



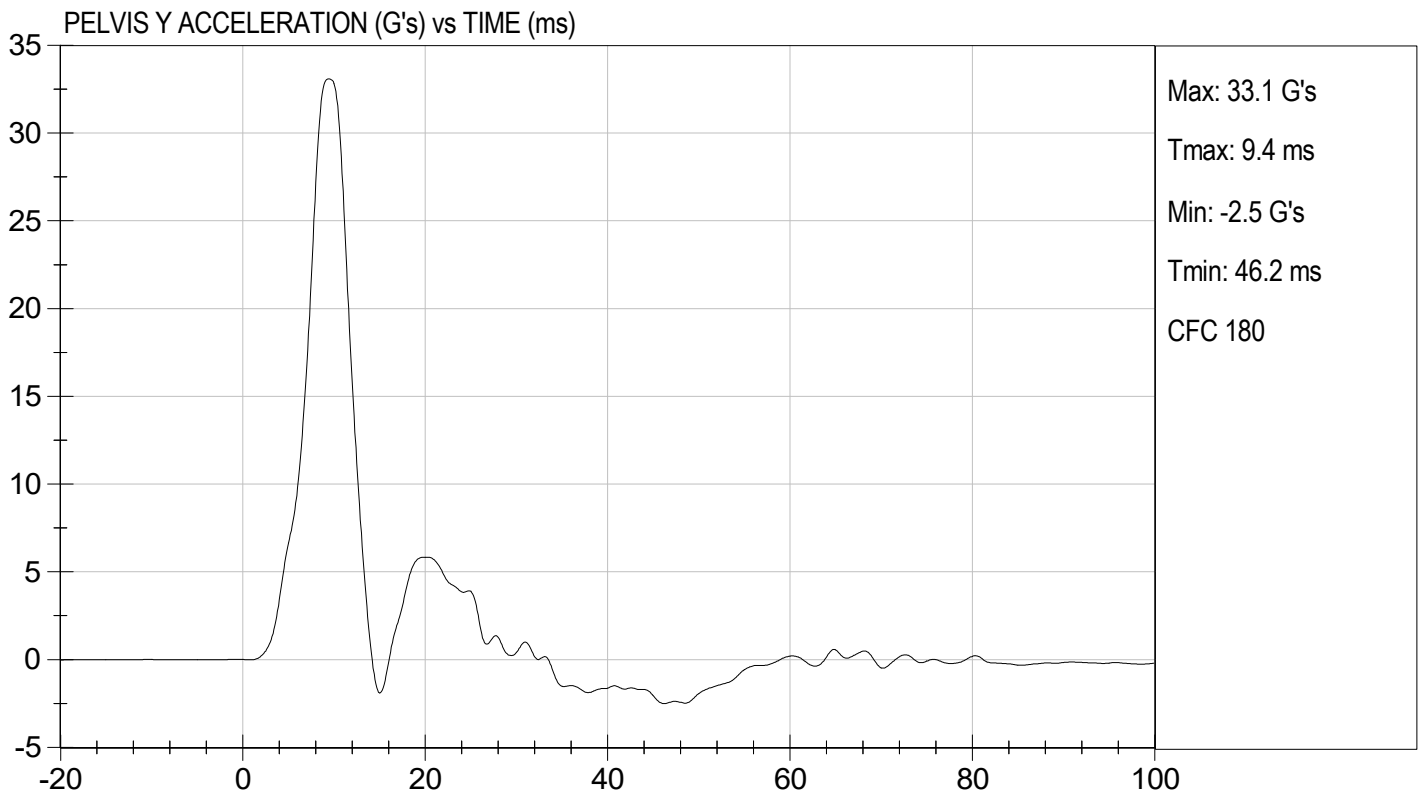
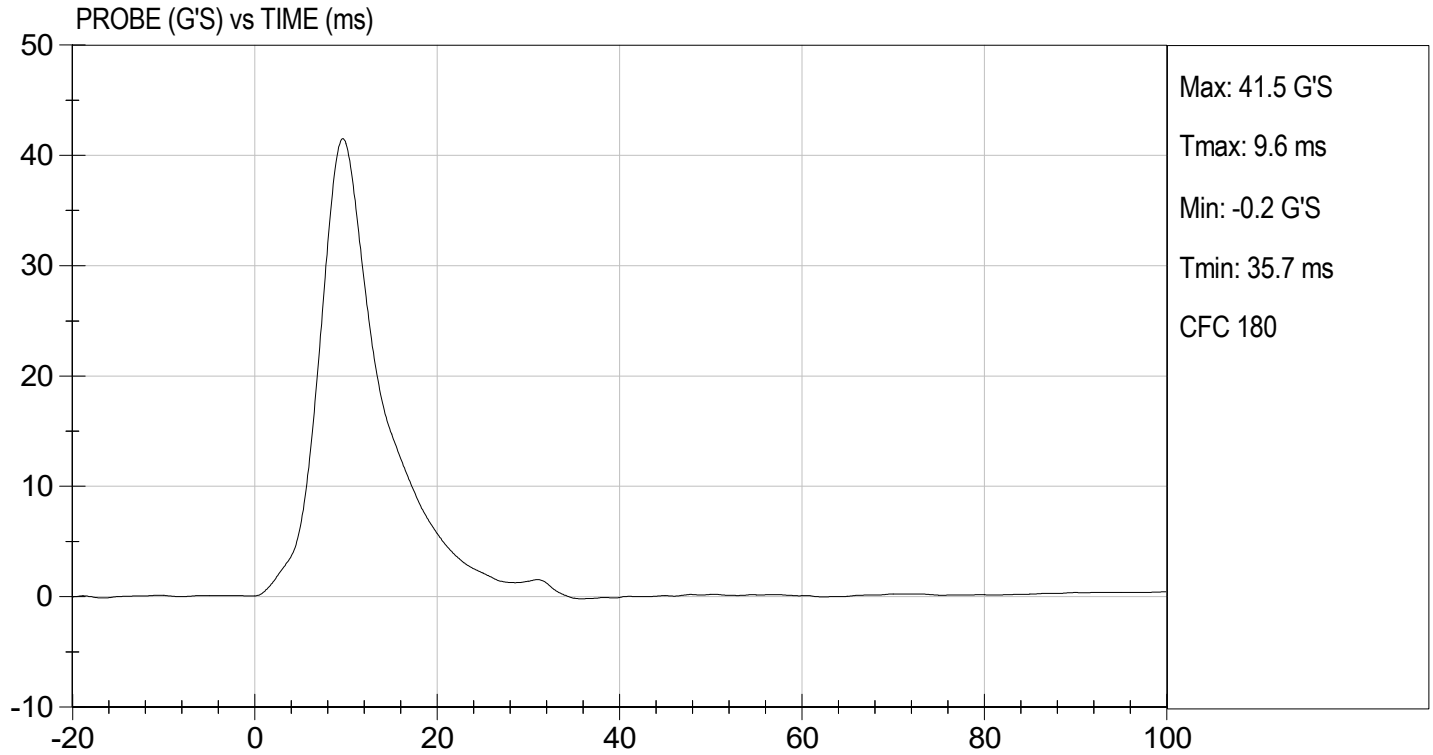
 Laboratory Technician

11/04/2022

 Test Date



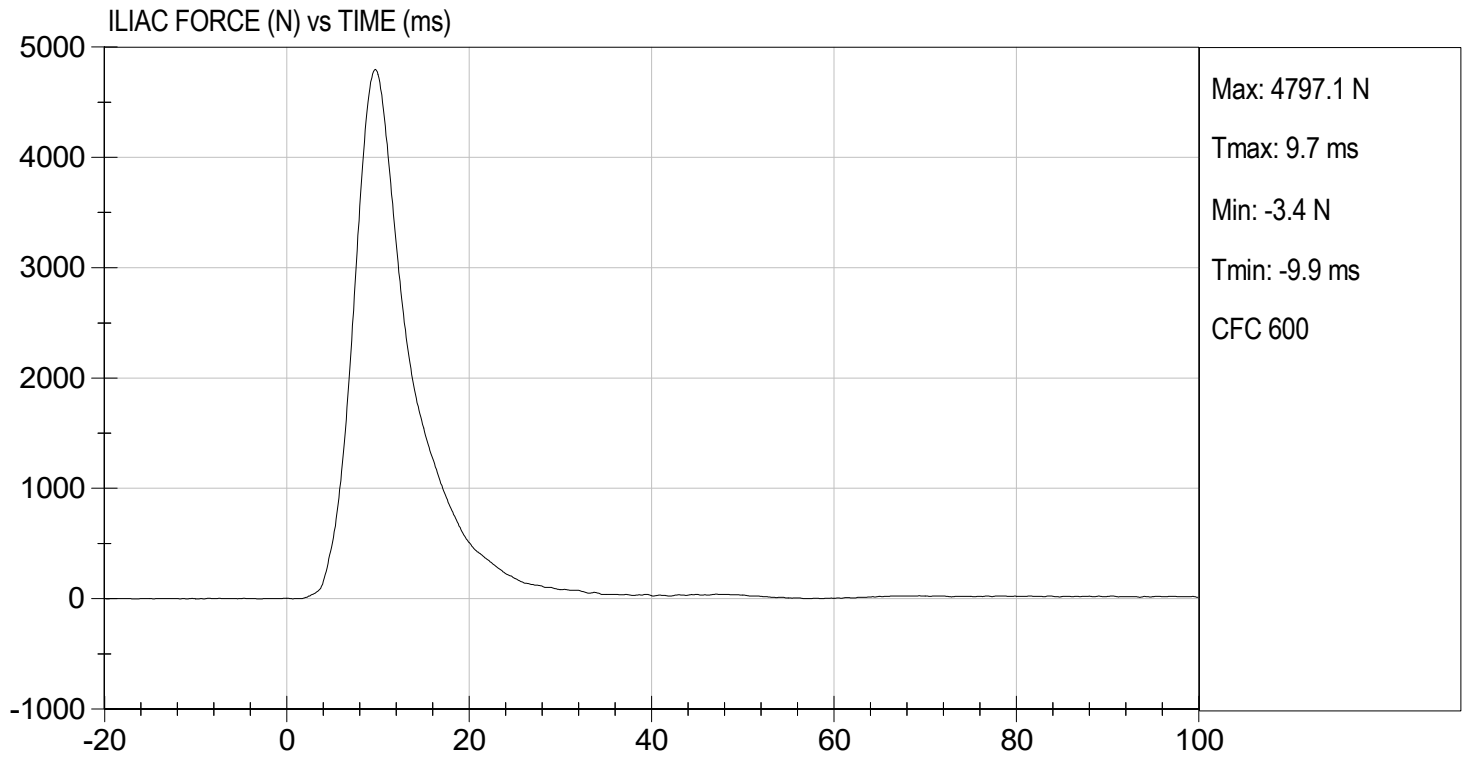
 Approved By





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

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





SID-IIs Pelvis Plug Certification Test

Plug S/N 15393

Test Number 19810

Report Number 19862

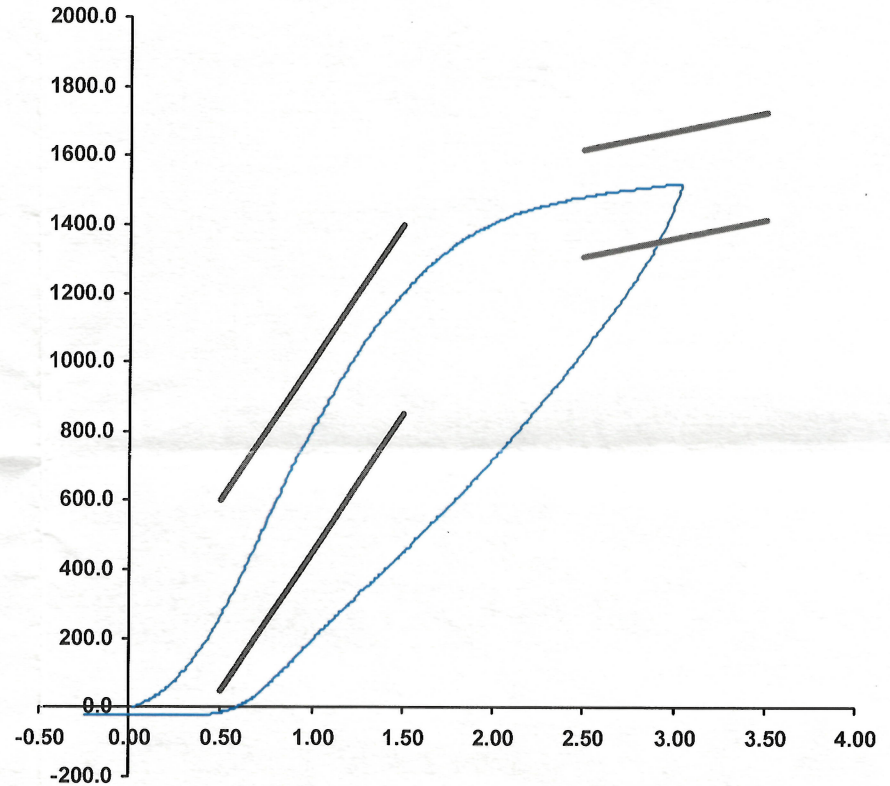
Test Date 7/26/2021 9:43:02 AM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	274	50	600
Force @ 1.5 mm (N)	1,206	850	1,400
Force @ 2.5 mm (N)	1,484	1,306	1,618
Force @ 3.0 mm (N)	1,521	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 26-Jul-21

SACO Research

By : DC Date : 7/26/2021



SID-IIs Pelvis Plug Certification Test

Plug S/N 14824

Test Number 16797

Report Number 16843

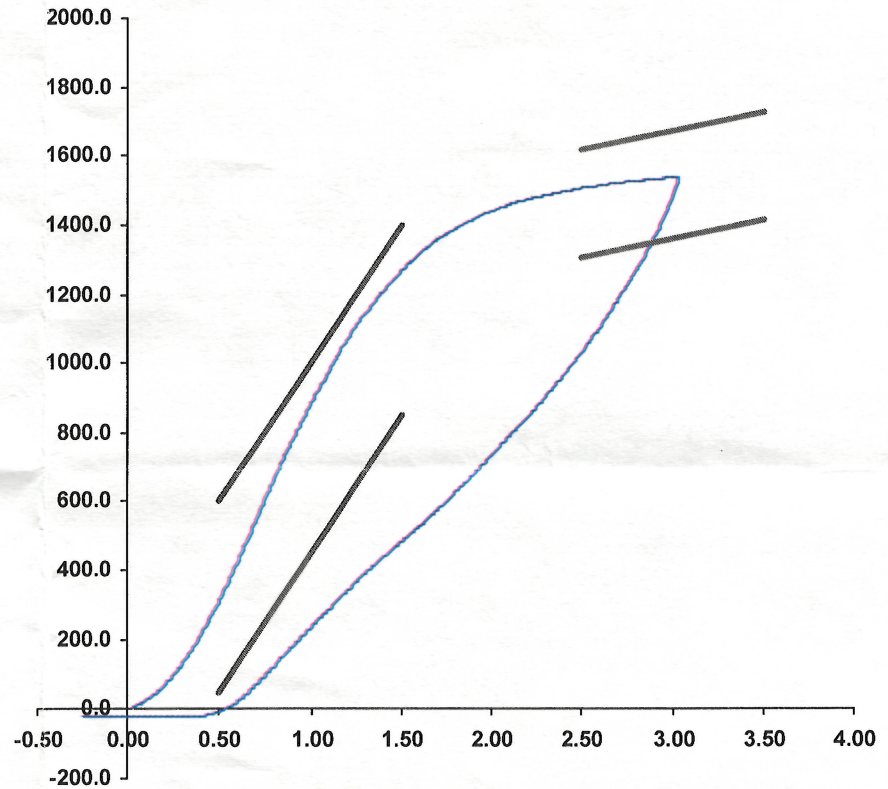
Test Date 12/29/2020 1:38:13 PM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	320.16	50.00	600.00
Force @ 1.5 mm (N)	1,270.09	850.00	1,400.00
Force @ 2.5 mm (N)	1,506.79	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,539.06	1,361.00	1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000
Preload Value (-N) 22.24
Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 29-Dec-20

SACO Research

By: DC Date: 12/29/20

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation

			SID-IIs S/N 306			
			Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers			X	P79445	Endevco	07/07/2022
			Y	P79721	Endevco	07/07/2022
			Z	P79724	Endevco	07/07/2022
			Xr	P84999	Endevco	07/07/2022
			Yr	P85000	Endevco	07/07/2022
			Zr	P85001	Endevco	07/07/2022
Head Angular Rate Sensors			X	ARS7423	DTS	03/15/2022
			Y	ARS7547	DTS	03/14/2022
			Z	ARS7586	DTS	03/14/2022
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	07/07/2022
		Middle	Y	G2403	FTSS	07/07/2022
		Lower	Y	G1270	FTSS	07/07/2022
	Abdominal Rib	Upper	Y	G032	FTSS	07/07/2022
		Lower	Y	MJ5171	Medius	07/07/2022
Lower Spine Accelerometers (T12)			X	P96332	Endevco	07/07/2022
			Y	P96335	Endevco	07/07/2022
			Z	P96341	Endevco	07/07/2022
Acetabulum Load Cell			Y	ACG4285	Denton	08/18/2022
Iliac Wing Load Cell			Y	IWG3023	Denton	08/18/2022
Pelvis Plug (struck side)				15393	SACO	07/26/2021
Pelvis Plug (non-struck side)				14824	SACO	12/29/2020

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	T32193	Endevco	08/29/2022
Vehicle Center of Gravity	Y	T25689	Endevco	08/31/2022
Vehicle Center of Gravity	Z	T24818	Endevco	07/14/2022
Left Floor Sill	Y	P68311	Endevco	09/08/2022
A-Pillar Sill	Y	T29904	Endevco	07/14/2022
A-Pillar Low	Y	A393844	MSI	08/04/2022
A-Pillar Mid	Y	A390874	MSI	08/04/2022
B-Pillar Sill	Y	A390882	MSI	08/04/2022
B-Pillar Low	Y	A416954	MSI	08/16/2022
B-Pillar Mid	Y	A416918	MSI	08/16/2022
Driver Seat	Y	A356243	MSI	10/26/2022
Engine Top	X	A416933	MSI	08/16/2022
Engine Top	Y	A416917	MSI	08/16/2022
Firewall	Y	A411493	MSI	07/13/2022
Right Roof	Y	T30583	Endevco	07/19/2022
Right Floor Sill	Y	A416953	MSI	08/18/2022
Rear Floorpan	X	T30608	Endevco	07/18/2022
Rear Floorpan	Y	P84458	Endevco	06/16/2022

Table 3 – Pole Instrumentation

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