

**REPORT NUMBER: SideNCAPPole-MGA-22-030**

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

**FORD MOTOR CO.  
2022 Ford F-150 SuperCrew HEV  
NHTSA No.: M20220217**

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



**Test Date: August 24, 2022**

**Final Report Date: September 13, 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 13, 2023

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

## TECHNICAL REPORT DOCUMENTATION PAGE

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<b>9. Performing Organization Name and Address</b> MGA Research Corporation 5000 Warren Road Burlington, WI 53105		<b>8. Performing Organization Report No.</b> SideNCAPPole-MGA-22-030																											
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		<b>14. Sponsoring Agency Code</b> NRM-100																											
<b>16. Abstract</b> A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2022 Ford F-150 SuperCrew HEV 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 24, 2022.  The impact velocity was 32.27 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.6°C. The test vehicle post-test maximum crush was 343 mm at level 3. The test vehicle's performance was as follows:																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 55%;">Measurement Description</th> <th rowspan="2" style="width: 10%;">Units</th> <th colspan="2" style="width: 35%;">Driver ATD (SID-IIs)</th> </tr> <tr> <th style="width: 15%;">Threshold</th> <th style="width: 20%;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td></td> <td style="text-align: center;">1000</td> <td style="text-align: center;">226</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;">53</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;">2566</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;">19</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;">16</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD (SID-IIs)		Threshold	Result	Head Injury Criteria (HIC <sub>36</sub> )		1000	226	Resultant Lower Spine Acceleration	g	82	53	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2566	Maximum Thoracic Rib Deflection	mm	38*	19	Maximum Abdomen Rib Deflection	mm	45*	16
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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.																													
<b>17. Key Words</b> New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		<b>18. Distribution Statement</b> Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																											
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## SECTION 1 PURPOSE AND SUMMARY OF TEST

### PURPOSE

This 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 Ford F-150 SuperCrew HEV. 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 Ford F-150 SuperCrew HEV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.27 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on August 24, 2022. 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 <sub>36</sub> )		1000	226
Resultant Lower Spine Acceleration	g	82	53
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2566
Maximum Thoracic Rib Deflection	mm	38*	19
Maximum Abdomen Rib Deflection	mm	45*	16

\*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	No
Seat Belt Load Limiter	Yes		Yes	
Other:	No		No	

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

#### GENERAL COMMENTS

Load Cell Pole #8 Fy recorded no valid data.  
Optional running boards removed prior to testing.

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 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	M20220217	Traction Control System (TCS)	Yes
Model Year	2022	Auto-Leveling System	No
Make	Ford	Automatic Door Locks (ADL)	Yes
Model	F-150 SuperCrew HEV	Power Window Auto-Reverse	Yes
Body Style	4-Door Pickup Truck	Other Optional Feature	No
VIN	1FTFW1CD5NFA03140	Driver Front Airbag	Yes
Body Color	Rapid Red Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	114 km / 71 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.5 L	Driver Torso Airbag	No
Type/No. Cylinders	V6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Longitudinal	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	10	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	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	No	Rear Pass. Pelvis Airbag	No
Running Boards	Yes	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	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?	No
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**DATA FROM CERTIFICATION LABEL**

Manufactured By	FORD MOTOR CO.	GVWR (kg)	3334
Date of Manufacture	05/22	GAWR Front (kg)	1633
Vehicle Type	Truck	GAWR Rear (kg)	1882

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				836	(A)
DSC x 68.04 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: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**VEHICLE TIRE INFORMATION**



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	250	250
Recommended Tire Size	265/60R18	265/60R18
Tire Size on Vehicle	265/60R18	265/60R18
Tire Manufacturer	Hankook	Hankook
Tire Model	Dynapro HT	Dynapro HT
Treadwear	600	600
Traction	B	B
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 2 Nylon	2 Steel, 2 Polyester, 2 Nylon
Load Index/Speed Symbol	110T	110T
Tire Material	Rubber	Rubber
DOT Safety Code Left	IT7FA HUH0 2921	IT7FA HUH0 5121
DOT Safety Code Right	IT7FA HUH0 5121	IT7FA HUH0 5121

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**TEST PRESSURES**

	Units	LF	RF	LR	RR
As Delivered	kPa	255	250	250	250
Tire Placard	kPa	250	250	250	250
Owner's Manual	kPa	250	250	250	250
As Tested	kPa	250	250	250	250

**TEST AXLE VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	671.5	552.5		683.5	643.5		683.0	651.0	
Right	kg	699.5	524.5		691.5	611.5		685.5	616.5	
Ratio	%	56.0%	44.0%		52.3%	47.7%		51.9%	48.1%	
Totals	kg	1371.0	1077.0	2448.0	1375.0	1255.0	2630.0	1368.5	1267.5	2636.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2448.0	(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	2636.0	(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	-1.4	-0.6	-0.4	Yes
Front Pass. Door Sill Angle (front-to-back)*	deg	-1.2	-0.8	-0.7	Yes
Front Bumper Angle (left-to-right)**	deg	0.3	0.2	0.2	Yes
Rear Bumper Angle (left-to-right)**	deg	0.0	-0.2	-0.2	Yes
Vehicle CG (Aft of Front Axle)	mm	1771	1921	1936	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	0	8	10	

\* 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	77
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 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022

**TEST SURFACE MARKINGS**

	Distance from 75° Impact Location Line (mm)
Fore 25 mm Target	995
Aft 25 mm Target	988

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**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	17.1	6.7	11.9
Front Passenger Seat	16.2	11.0	13.6
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	11.9	24	Max	48	48	48
			Mid	24	24	24
			Min	0	0	0
Front Passenger Seat	13.6	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 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

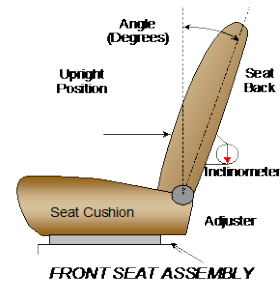
NHTSA No.: M20220217  
 Test Date: 8/24/2022

**SEAT FORE/AFT POSITIONS**

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1 <sup>st</sup> as 1)	mm	Detent (1 <sup>st</sup> as 0)
Driver Seat	256		0	
Front Passenger Seat	232		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 5<sup>th</sup> 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 <sup>st</sup> as 1)	Degrees	Detent (1 <sup>st</sup> as 0)
Driver Seat	71.2		-4.6	
Front Passenger Seat	71.4		-4.6	
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	4	0 (Lowest as 0) / Fixed Fore-Aft

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

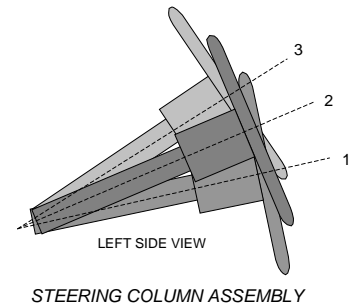
Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
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NHTSA No.: M20220217  
 Test Date: 8/24/2022

**STEERING COLUMN ADJUSTMENT**

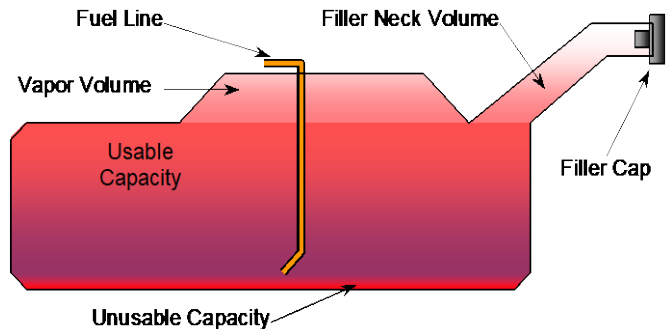
Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	70.3	
Geometric Center, Position 2	67.5	
Uppermost, Position 3	64.7	
Telescoping Steering Wheel Travel		62
Test Position	67.5	31



**FUEL PUMP**

The vehicle is equipped with an electronic fuel pump. The electric fuel pump operates for about 1 second to pressurize the fuel system following the actuation of the ignition. It also turns on with the power up of the PCM. If no attempt has been made to start the engine within 1 second following the ignition actuation, the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls, the fuel pump is deactivated. Additionally, the fuel pump is shut off by the restraint control module to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude. The filler neck is located on the driver's side.



**VEHICLE FUEL TANK ASSEMBLY**

**FUEL TANK CAPACITY DATA**

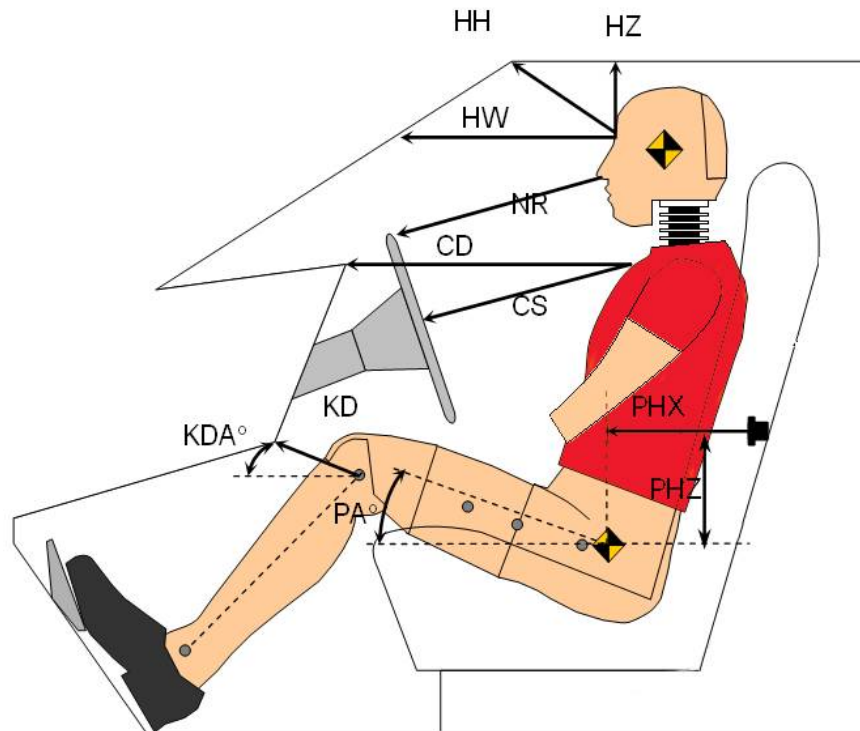
	Liters
Usable Capacity of Standard Tank (see S1 – Vehicle Setup Information)	123.4
Usable Capacity of Optional Tank (see S1 – Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	123.4
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	114.8
Actual Amount of Solvent Used	114.7
1/3 of Usable Capacity	41.1

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 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022



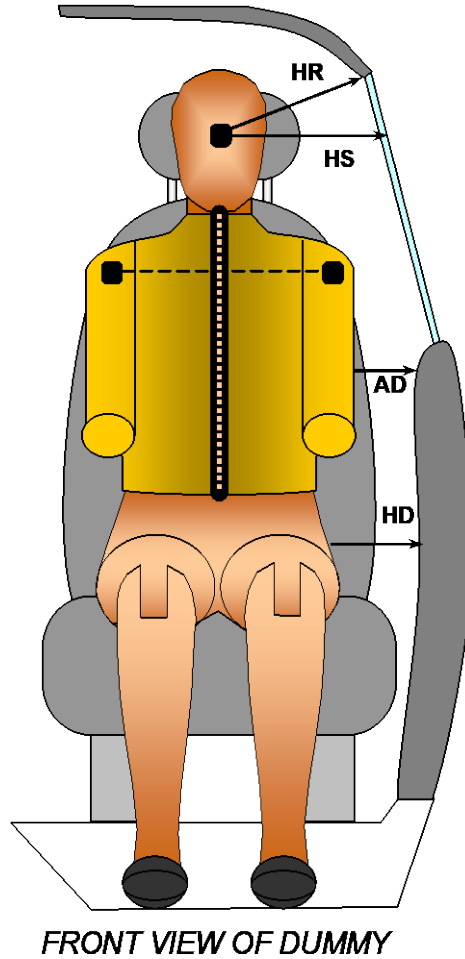
**LEFT SIDE VIEW**

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	355	
HW	Head to Windshield	659	
HZ	Head to Roof Liner	240	
NR	Nose to Rim/Seat Back	235	
CD	Chest to Dashboard/Seat Back	447	
CS	Chest to Steering Wheel	177	
KDL / KDAL	Left Knee to Dash/Seat Back	142	34.1
KDR / KDAL	Right Knee to Dash/Seat Back	135	35.0
PAX	Pelvic Tilt Angle X		21.9
PAY	Pelvic Tilt Angle Y		-0.1
PHX	Hip Point to Striker (X-Axis)	454	
PHZ	Hip Point to Striker (Z-Axis)	53	

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

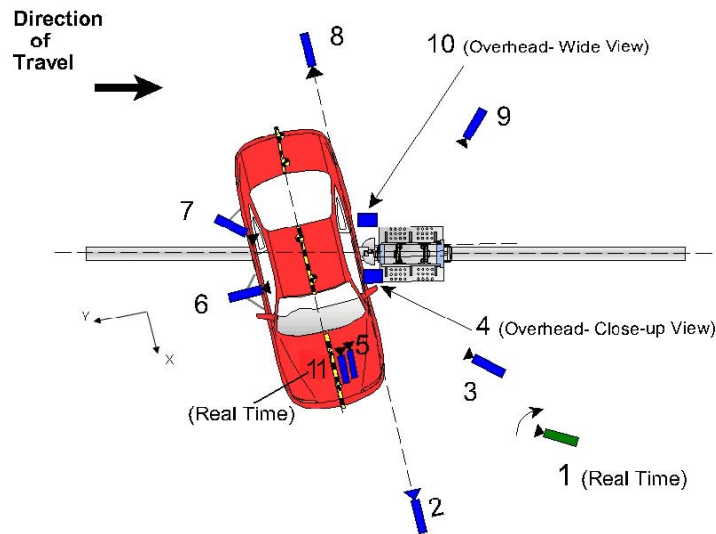


Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	264
HS	Head to Side Window	375
AD	Arm to Door	186
HD	Hip Point to Door	170

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022



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	6840	-4105	-1755	24	1000
3	Impact Side 45° Forward	4155	-1985	-1790	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	-7790	-40	-1800	24	1000
9	Impact Side 45° Rearward	-4480	-4340	-1820	12	1000
10	Overhead Wide View	300	920	-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

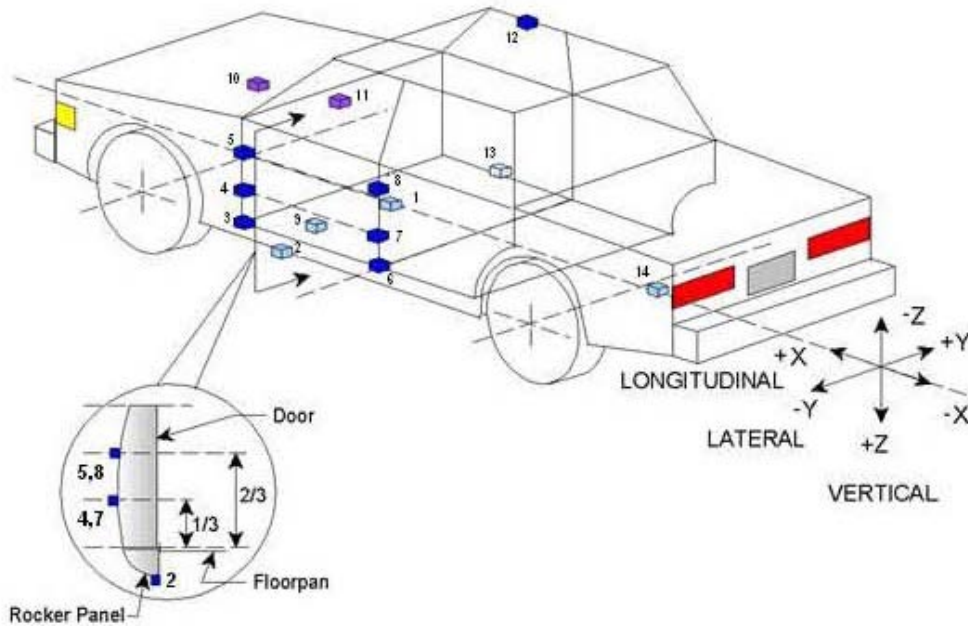
**INSTRUMENTATION**

	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 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022



**TEST VEHICLE ACCELEROMETER LOCATIONS**

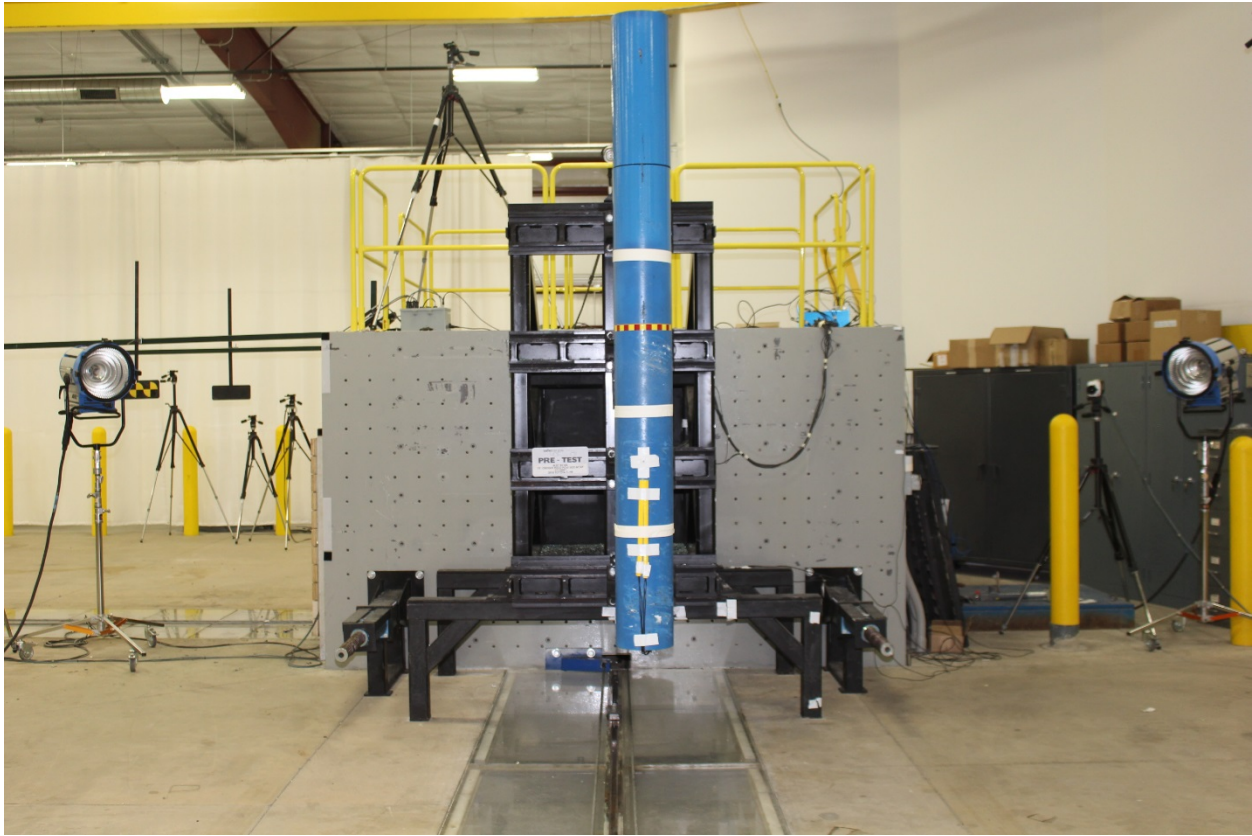
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3009	85	-532
2	Left Floor Sill	4241	-802	-356
3	A Pillar Sill	4338	-802	-356
4	A Pillar Low	4249	-889	-708
5	A Pillar Mid	4249	-889	-1004
6	B Pillar Sill	3081	-802	-380
7	B Pillar Low	2961	-795	-762
8	B Pillar Mid	2961	-795	-1002
9	Driver Seat Track	3262	-468	-613
10	Engine Top	4841	-65	-1044
11	Firewall	4750	0	-1216
12	Right Roof	3053	612	-1858
13	Right Floor Sill	4241	802	-350
14	Rear Floorpan	1258	-65	-771

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 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022



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: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**TEST DUMMY INFORMATION AND CONTACT POINTS**

Description	Driver Dummy (SID-IIs)
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag, Headrest
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	Door Panel

**POST-TEST DOOR PERFORMANCE**

Description	Struck Side		Non-Struck Side		Rear Hatch
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	
Disengaged from Latched Position	No	No	No	No	
Latch Separated from Striker	No	No	No	No	
Jammed Shut	Yes	Yes	No	No	
If Door Opened at Striker, Record Width of Opening at Striker (mm)					

**POST-TEST SEAT PERFORMANCE**

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

**POST-TEST STRUCTURAL OBSERVATIONS**

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	Cracked
Side Window Damage	LF window cracked
Other Notable Effects	Some windshield separation at A-pillar

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022

**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	No
Seat Belt Load Limiter	Yes		Yes	
Other:	No		No	

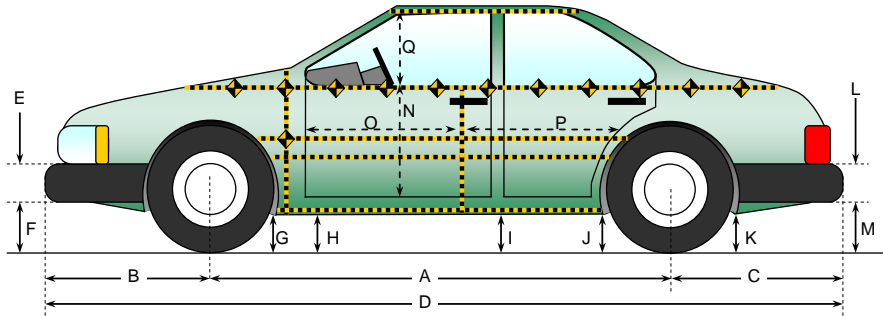
**SPEED, ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA**

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1254
Actual Impact Point (Aft of Front Axle)	mm		1262
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	-8
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	74.9
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.27
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.20

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022



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

**LEFT SIDE VIEW**

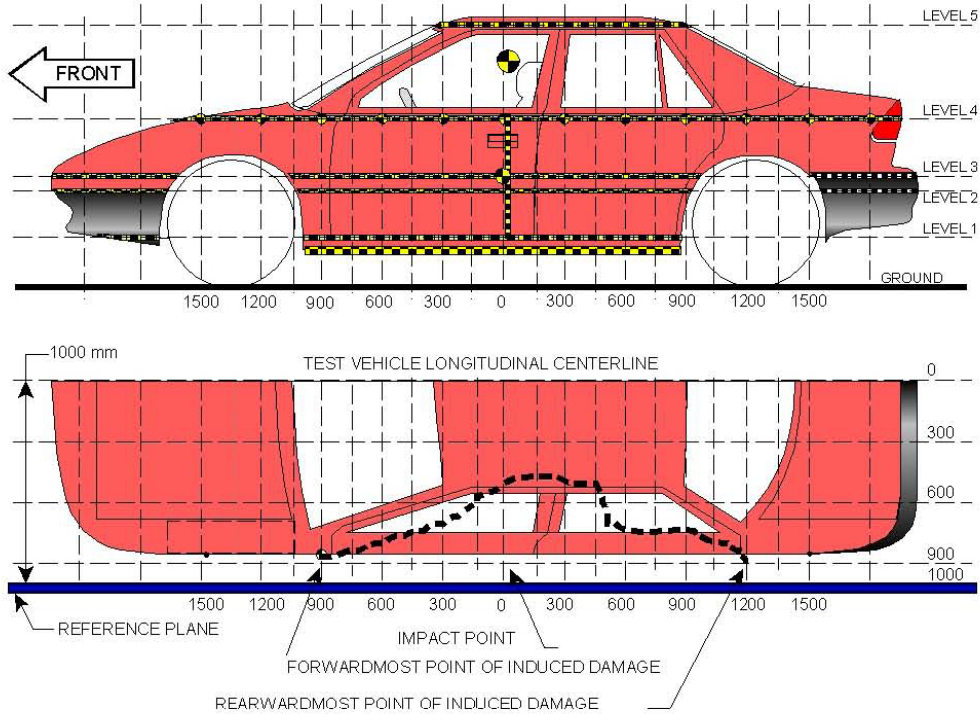
**VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION**

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	4026	3662	-364
B	Front Axle to FSOV	640	941	301
C	Rear Axle to RSOV	1232	1270	38
D	Total Vehicle Length at Centerline	5898	5873	-25
E	Front Bumper Thickness	155	155	0
F	Front Bumper Bottom to Ground	293	284	-9
G	Sill Height at Front Wheel Well	321	290	-31
H	Sill Height at Front Door Leading Edge	339	324	-15
I	Sill Height at B-Pillar	363	336	-27
J1	Sill Height at Rear Wheel Well	379	413	34
J2	Pinch Weld Height at Rear Wheel Well	373	398	25
K	Sill Height Aft of Rear Wheel Well	406	459	53
L	Rear Bumper Thickness	187	187	0
M	Rear Bumper Bottom to Ground	364	369	5
N	Sill Height to Bottom of Front Window Sill	822	824	2
O	Front Door Leading Edge to Impact CL	703	806	103
P	Rear Door Trailing Edge to Impact CL	1526	1476	-50
Q	Front Window Opening	558	572	14
R	Right Side Length	4948	4993	45
S	Left Side Length	4948	4820	-128
T	Vehicle Width at B-Pillars	2034	1995	-39
U	Front Wheel Track Width	1724		
V	Rear Wheel Track Width	1736		

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022



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	427	323	-75
2	Mid Door	779	338	0
3	Occupant H-Point	892	343	0
4	Window Sill	1136	335	0
5	Window Top	1745	102	0

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

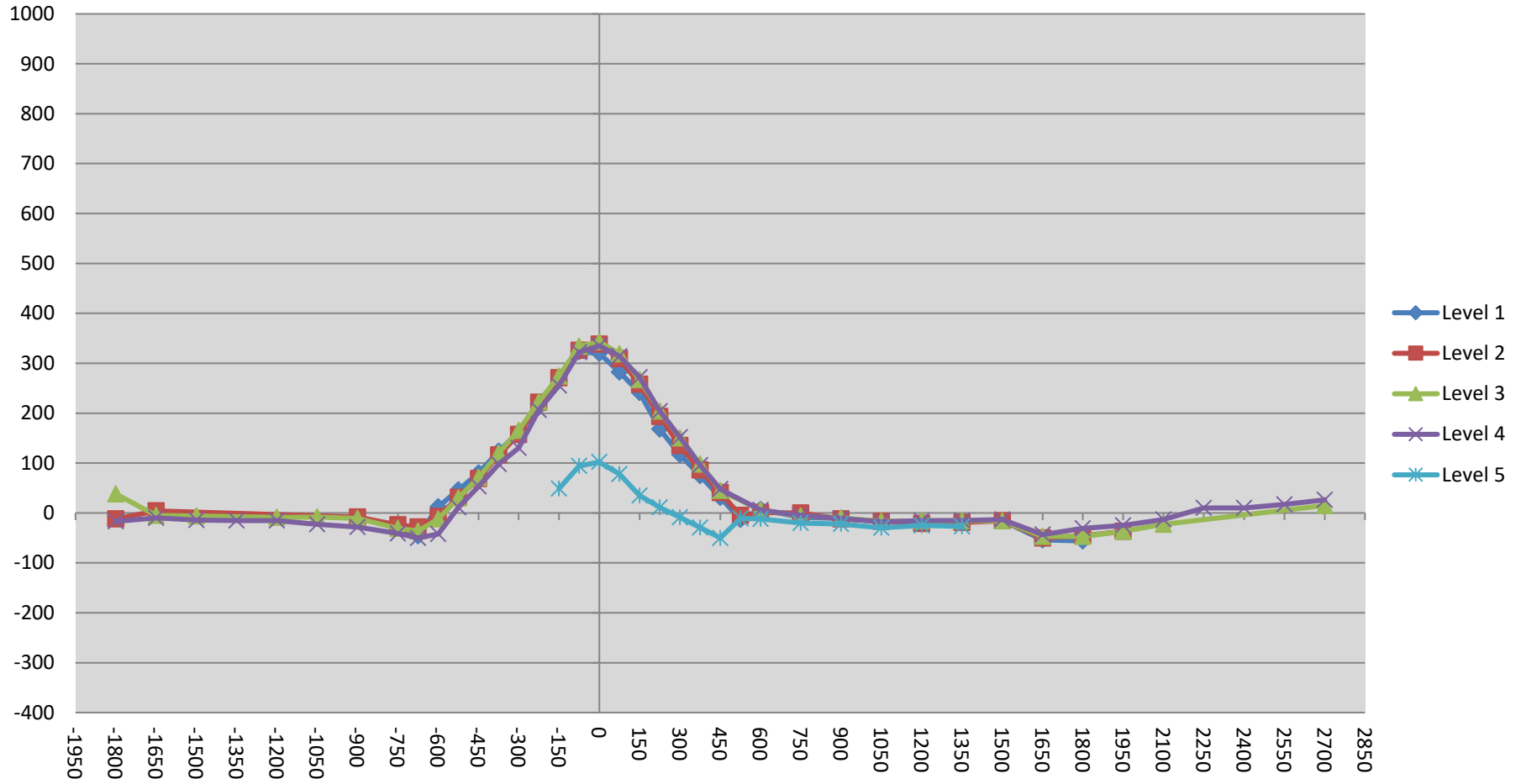
Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

	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		140	166	218			128	204	201			-12	38	-17	
-1650		110	119	195			114	114	185			4	-5	-10	
-1500			102	178				96	164				-6	-14	
-1350				162					147						-15
-1200			90	148				81	133				-9	-15	
-1050			86	140				78	117				-8	-23	
-900		87	90	134			79	79	106			-8	-11	-28	
-825															
-750	110	98	104	127		80	74	73	86		-30	-24	-31	-41	
-675	119	100	101	121		73	72	65	71		-46	-28	-36	-50	
-600	117	101	100	126		129	94	88	84		12	-7	-12	-42	
-525	118	102	100	122		164	133	130	133		46	31	30	11	
-450	117	103	99	120		197	172	170	173		80	69	71	53	
-375	115	102	99	119		239	218	219	217		124	116	120	98	
-300	115	101	97	117		277	258	262	247		162	157	165	130	
-225	114	100	95	115		326	322	318	321		212	222	223	206	
-150	113	100	95	113	380	378	371	369	368	429	265	271	274	255	49
-75	111	99	95	100	375	434	425	429	422	469	323	326	334	322	94
0	111	98	94	104	372	431	436	437	439	474	320	338	343	335	102
75	110	98	92	103	368	392	407	411	417	446	282	309	319	314	78
150	110	97	92	100	368	351	355	359	372	403	241	258	267	272	35
225	110	97	92	100	370	278	290	296	304	381	168	193	204	204	11
300	112	96	90	99	370	229	231	240	251	361	117	135	150	152	-9
375	111	96	90	98	366	186	182	188	194	337	75	86	98	96	-29
450	110	95	88	96	365	141	136	133	144	315	31	41	45	48	-50
525	111	95			364	98	90			353	-13	-5			-11
600	110	94	88	96	363	117	95	94	102	351	7	1	6	6	-12
675															
750	110	95	88	95	360	101	95	82	90	340	-9	0	-6	-5	-20
825															
900	110	95	88	95	356	99	83	78	84	334	-11	-12	-10	-11	-22
1050	112	95	89	95	358	95	78	72	77	328	-17	-17	-17	-18	-30
1200	112	97	89	94	356	95	76	73	79	331	-17	-21	-16	-15	-25
1350	115	97	90	95	357	98	78	74	80	330	-17	-19	-16	-15	-27
1500	115	97	91	96		100	81	75	83		-15	-16	-16	-13	
1650	120	108	102	109		66	58	55	66		-54	-50	-47	-43	
1800	121	99	103	111		65	53	56	80		-56	-46	-47	-31	
1950		90	95	112			53	58	87			-37	-37	-25	
2100			90	114				67	101				-23	-13	
2250				112					122					10	
2400				112					122					10	
2550				120					137					17	
2700			98	128				113	154				15	26	

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

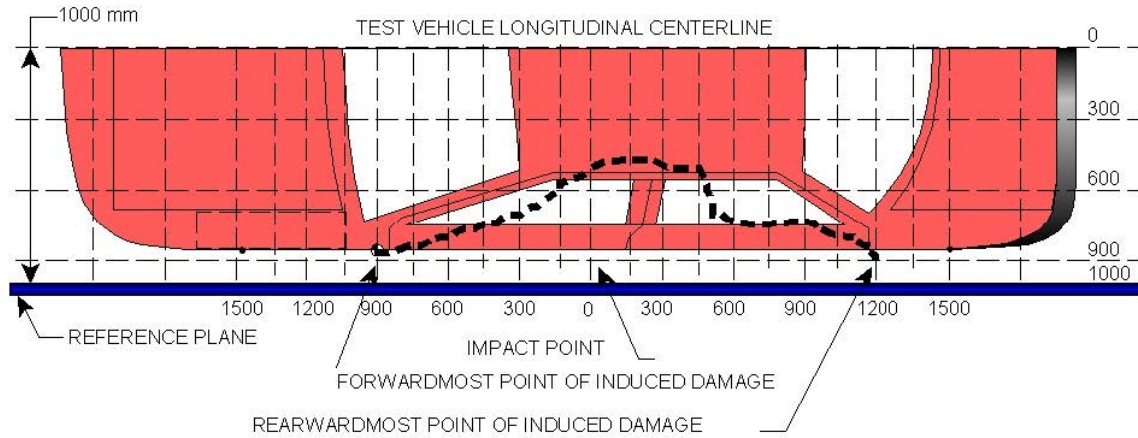
NHTSA No.: M20220217  
Test Date: 8/24/2022



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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022



**VEHICLE DAMAGE PROFILE DISTANCES**

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	500	3	88	94	6
2	260	3	91	260	169
3	20	3	93	435	342
4	-220	3	95	335	240
5	-460	3	99	152	53
6	-700	3	102	63	-39

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

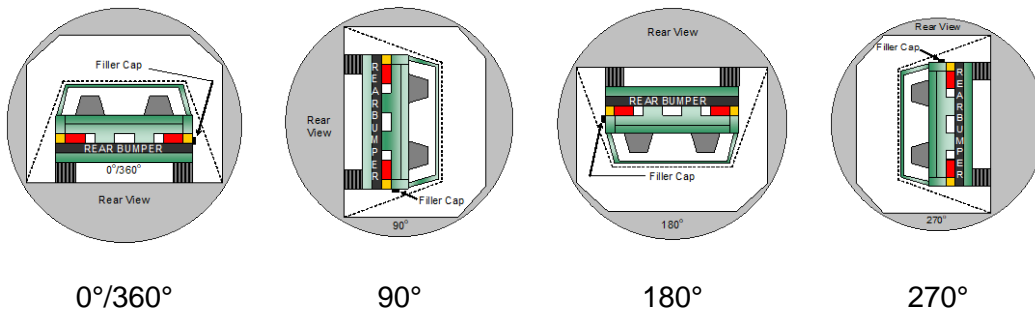
NHTSA No.: M20220217  
Test Date: 8/24/2022

Test Time: 11:48 am

Temperature: 21.6°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°	0	0	0
90° to 180°	0	0	0
180° to 270°	0	0	0
270° to 360°	0	0	0

**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	

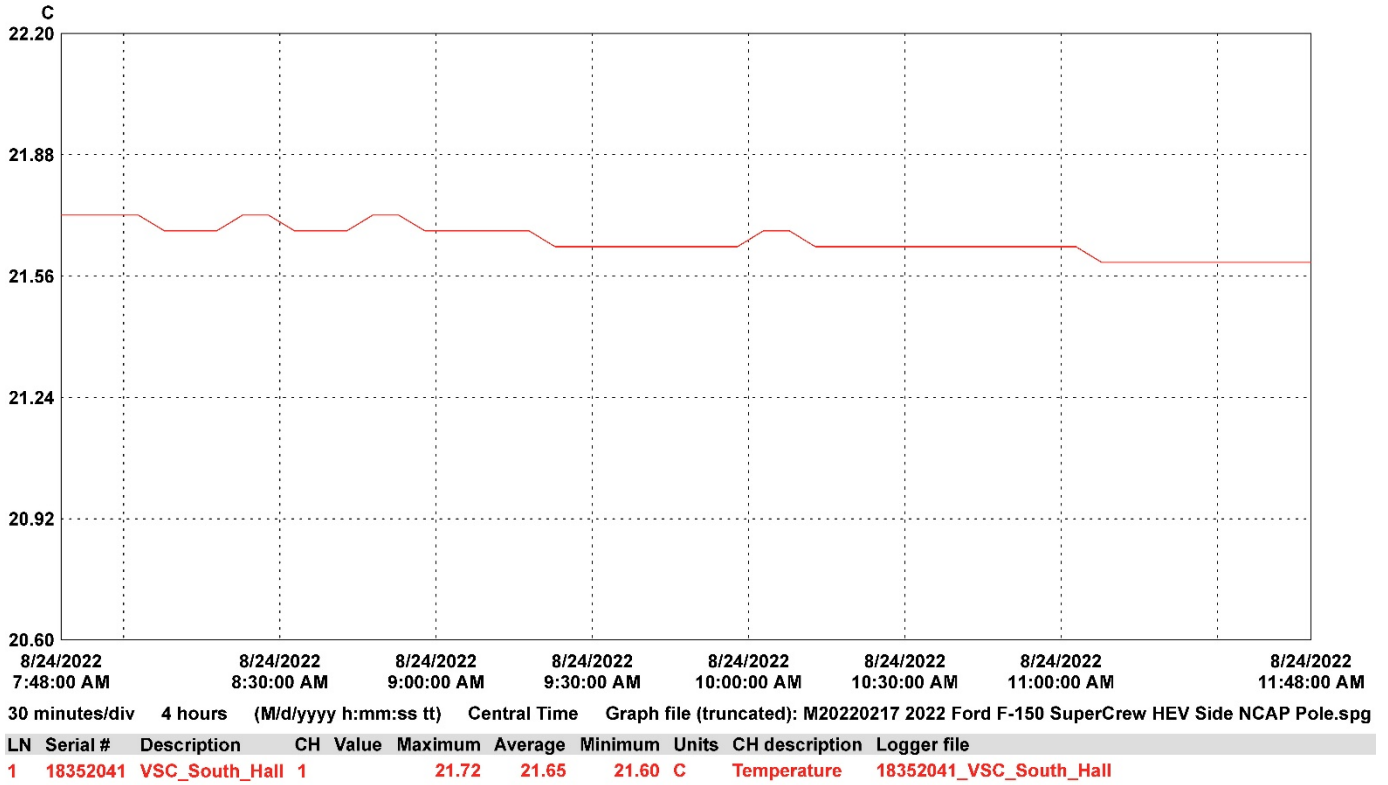
**ROLLOVER SOLVENT SPILLAGE LOCATION TABLE**

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 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022



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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022

**ELECTRIC VEHICLE PROPULSION SYSTEM**

	Units	Observations and Conclusions
Type of Electric Vehicle		Gasoline-Electric Hybrid
Propulsion Battery Type		Lithium-Ion
Nominal Voltage	V	300 V
Physical Location of Automatic Propulsion Battery Disconnect		Inside Battery Container
Auxiliary Battery Type		12 V Lead-Acid Under Hood and Under LR Pass. Seat

**PROPULSION BATTERY SYSTEM DATA**

	Units	Observations and Conclusions
Electrolyte Fluid Type		Organic Solution
Electrolyte Fluid Specific Gravity	g/L	1.25
Electrolyte Fluid Kinematic Viscosity	cSt	3.4
Electrolyte Fluid Color		Colorless
Propulsion Battery Coolant Type, Color, Specific Gravity (if applicable)		Air-Cooled
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 <b>useable energy</b> of the battery:	
Minimum State of Charge	
Maximum State of Charge	
95% of Maximum State of Charge	
Test Voltage - No less than 95% of maximum State of Charge	
<i>For batteries that are rechargeable ONLY by an energy source on the vehicle:</i>	
Voltage range corresponding to <b>useable energy</b> of the battery:	
Minimum State of Charge	260 V
Maximum State of Charge	314 V
Test Voltage – Maximum practicable State of Charge within Normal Operating Range	281.2 V

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**VEHICLE CHASSIS GROUND POINT(S) LOCATION(S)**

Details of Vehicle Chassis Ground Point(s) & Location(s)	Vehicle frame
---	---------------

**PROPULSION BATTERY SYSTEM**

Details of Electric Energy Storage/Conversion System Test Points	Connected at + and – terminal ends of propulsion system
Additional Comments	Vehicle fuel tank, exhaust, and HV battery were removed during vehicle preparations to connect HV monitoring leads.

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**VOLTMETER INFORMATION**

	Units	Observations and Conclusions
Make		Fluke
Model		189
Serial Number		93240010
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		5/23/2022

**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	281.2
----	---	-------

**ELECTRIC ISOLATION MEASUREMENTS**  
**PROPULSION BATTERY TO VEHICLE CHASSIS**

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

V1	V	169.0
V2	V	172.2

**PROPULSION BATTERY TO VEHICLE CHASSIS ACROSS RESISTOR**

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

$R_o$	Ω	226,000
-------	---	---------

V1' Pre-Impact	V	14.0
V2' Pre-Impact	V	12.2

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**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	5,051,664
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$		
Ri2 Pre-Impact	Ω	5,872,790
Ri = The lesser of Ri1 and Ri2		
Ri Pre-Impact	Ω	5,051,664
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$		
Ri / Vb Pre-Impact	Ω	17,965

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: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022

**VOLTMETER INFORMATION**

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		57580164
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		6/21/2022

**ELECTRICAL ISOLATION MEASUREMENTS**

Vb Post-Impact	V	12.4
----------------	---	------

V1 Post-Impact	V	7.5	Impact Time	1	Minutes	25	Seconds
V2 Post-Impact	V	3.8		1	Minutes	30	Seconds
V1' Post-Impact	V	0.5		1	Minutes	40	Seconds
V2' Post-Impact	V	0.2		1	Minutes	34	Seconds

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**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	4,767,093	Impact Time	1	Minutes	40	Seconds
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$							
Ri2 Post-Impact	Ω	12,096,947	Impact Time	1	Minutes	34	Seconds
Ri = The lesser of Ri1 and Ri2							
Ri Post-Impact	Ω	4,767,093	Impact Time	1	Minutes	40	Seconds
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$							
Ri / Vb Post-Impact	Ω	384,443	Impact Time	1	Minutes	40	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: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**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

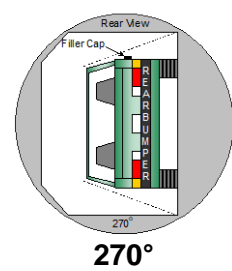
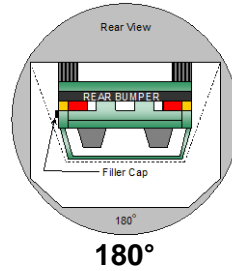
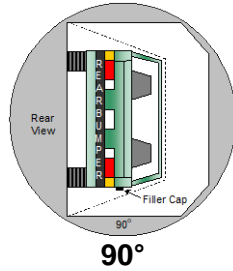
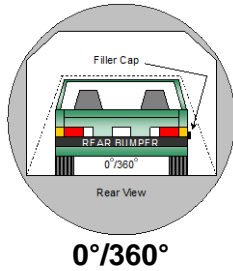
	Yes (Fail)	No
Is the Propulsion Battery Electrolyte Spillage visible in the passenger compartment?		X

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
Test Date: 8/24/2022

**PROPULSION BATTERY SYSTEM COMPONENTS**



**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	35	sec	5	min	6	min	35	sec	7	min
0° - 90°	1	min	35	sec	5	min	6	min	35	sec	7	min
90° - 180°	1	min	31	sec	5	min	6	min	31	sec	7	min
180° - 270°	1	min	20	sec	5	min	6	min	20	sec	7	min
270° - 360°	1	min	28	sec	5	min	6	min	28	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: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**VOLTMETER INFORMATION**

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		57580164
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		6/21/2022

**ELECTRICAL ISOLATION MEASUREMENTS**

Vb Post-Impact	V	12.4
----------------	---	------

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	0.0	V	0°				
	0.0		90°	2	min	25	sec
	0.0		180°	2		46	
	0.0		270°	2		17	
	0.0		360°	2		22	
V2	0.0	V	0°				
	0.0		90°	2	min	28	sec
	0.0		180°	2		50	
	0.0		270°	2		21	
	0.0		360°	2		26	
V1'	0.0	V	0°				
	0.0		90°	2	min	37	sec
	0.0		180°	3		0	
	0.0		270°	2		30	
	0.0		360°	2		34	
V2'	0.0	V	0°				
	0.0		90°	2	min	32	sec
	0.0		180°	2		54	
	0.0		270°	2		25	
	0.0		360°	2		30	

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

Test Vehicle: 2022 Ford F-150 SuperCrew HEV  
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20220217  
 Test Date: 8/24/2022

**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	Zero Volts	Ω	0°		min	
	Zero Volts		90°	2		37
	Zero Volts		180°	2		0
	Zero Volts		270°	2		30
	Zero Volts		360°	2		34
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$						
Ri2	Zero Volts	Ω	0°		min	
	Zero Volts		90°	2		32
	Zero Volts		180°	2		54
	Zero Volts		270°	2		25
	Zero Volts		360°	2		30
$R_i = \text{The lesser of } R_{i1} \text{ and } R_{i2}$						
Ri	Zero Volts	Ω	0°		min	
	Zero Volts		90°	2		37
	Zero Volts		180°	2		0
	Zero Volts		270°	2		30
	Zero Volts		360°	2		34
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$						
Ri / Vb	Zero Volts	Ω/V	0°		min	
	Zero Volts		90°	2		37
	Zero Volts		180°	2		0
	Zero Volts		270°	2		30
	Zero Volts		360°	2		34

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

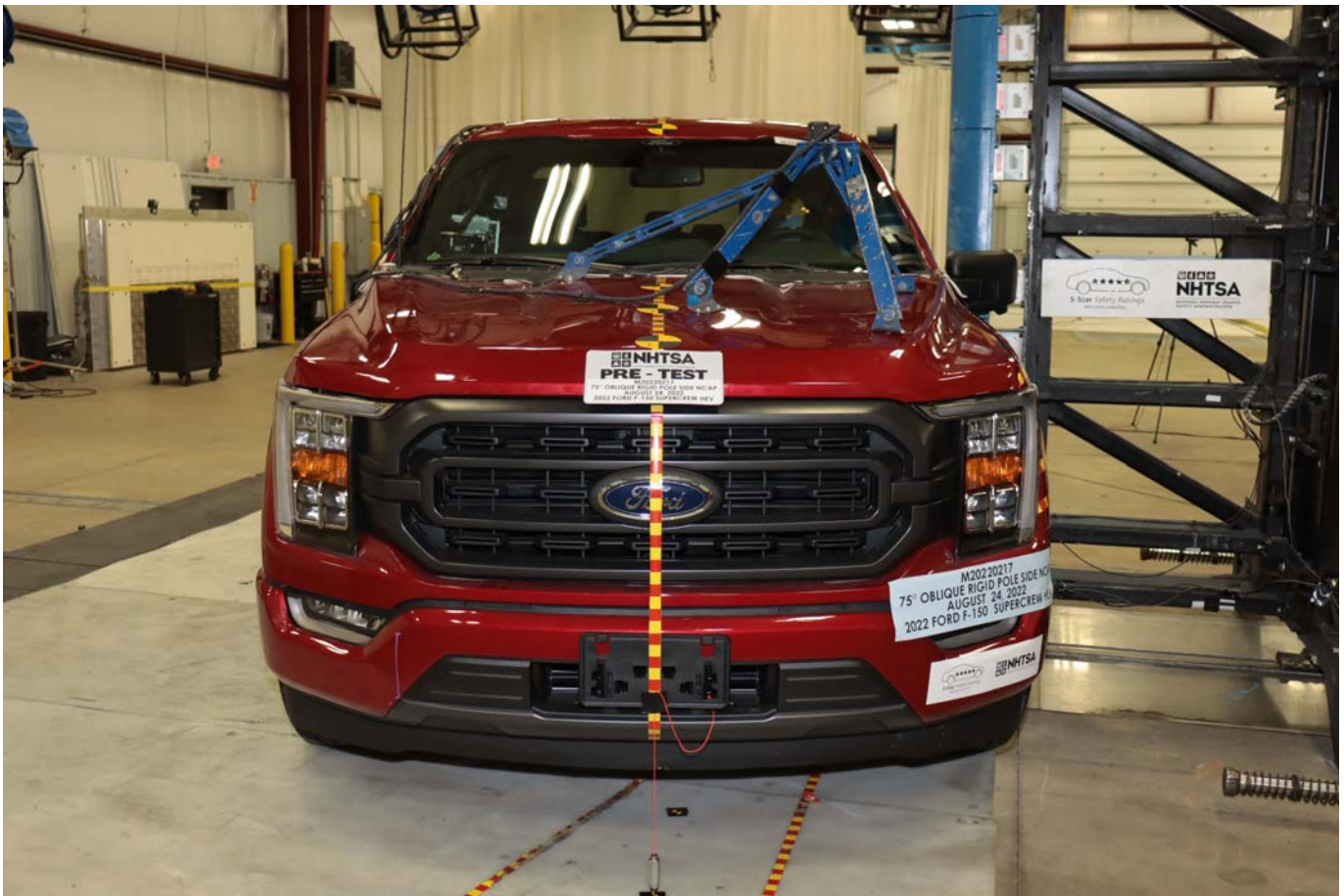


Photo No. 003 - Pre-Test Frontal View of Test Vehicle



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

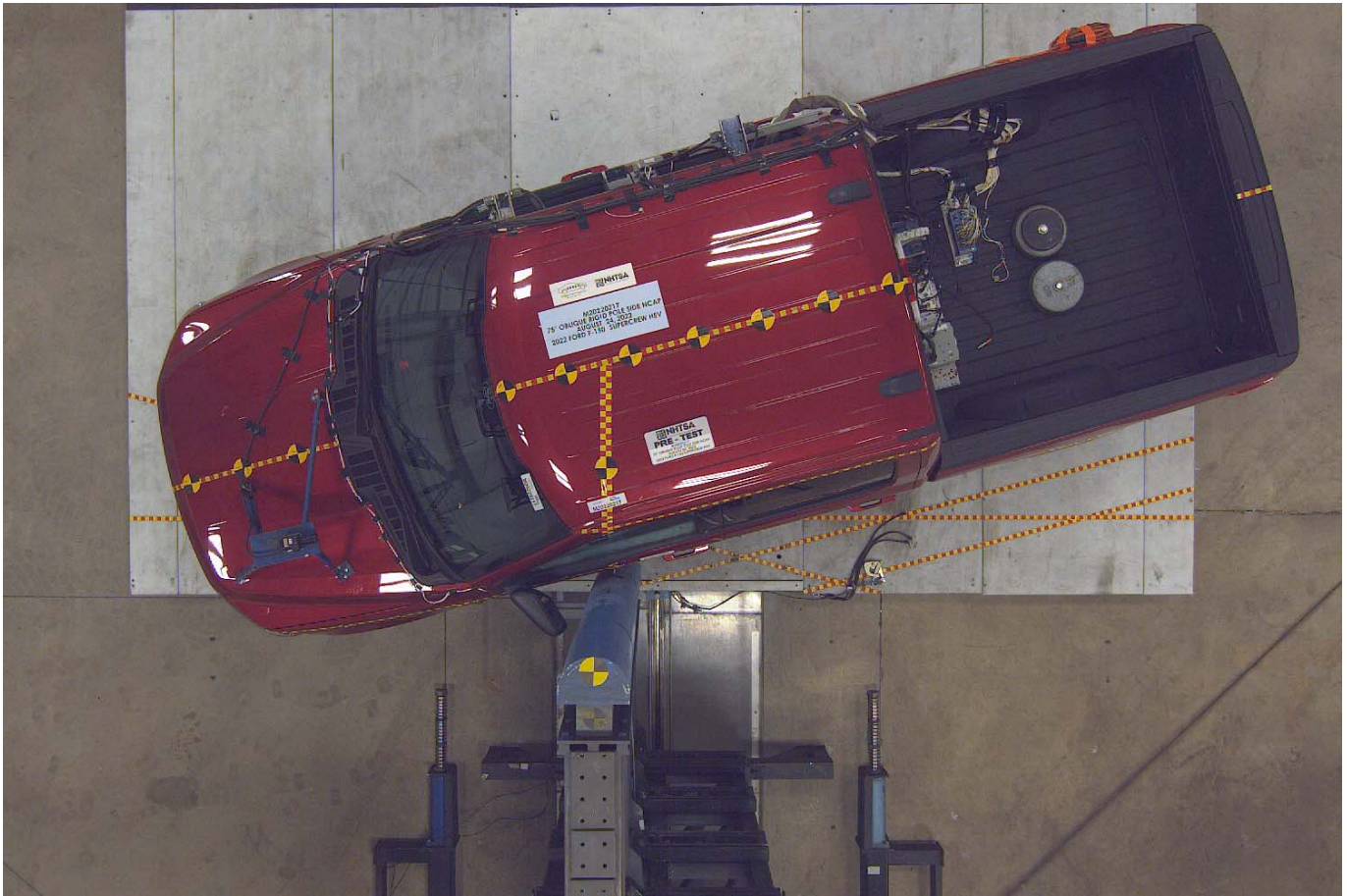


Photo No. 015 - Pre-Test Overhead View of Test Area

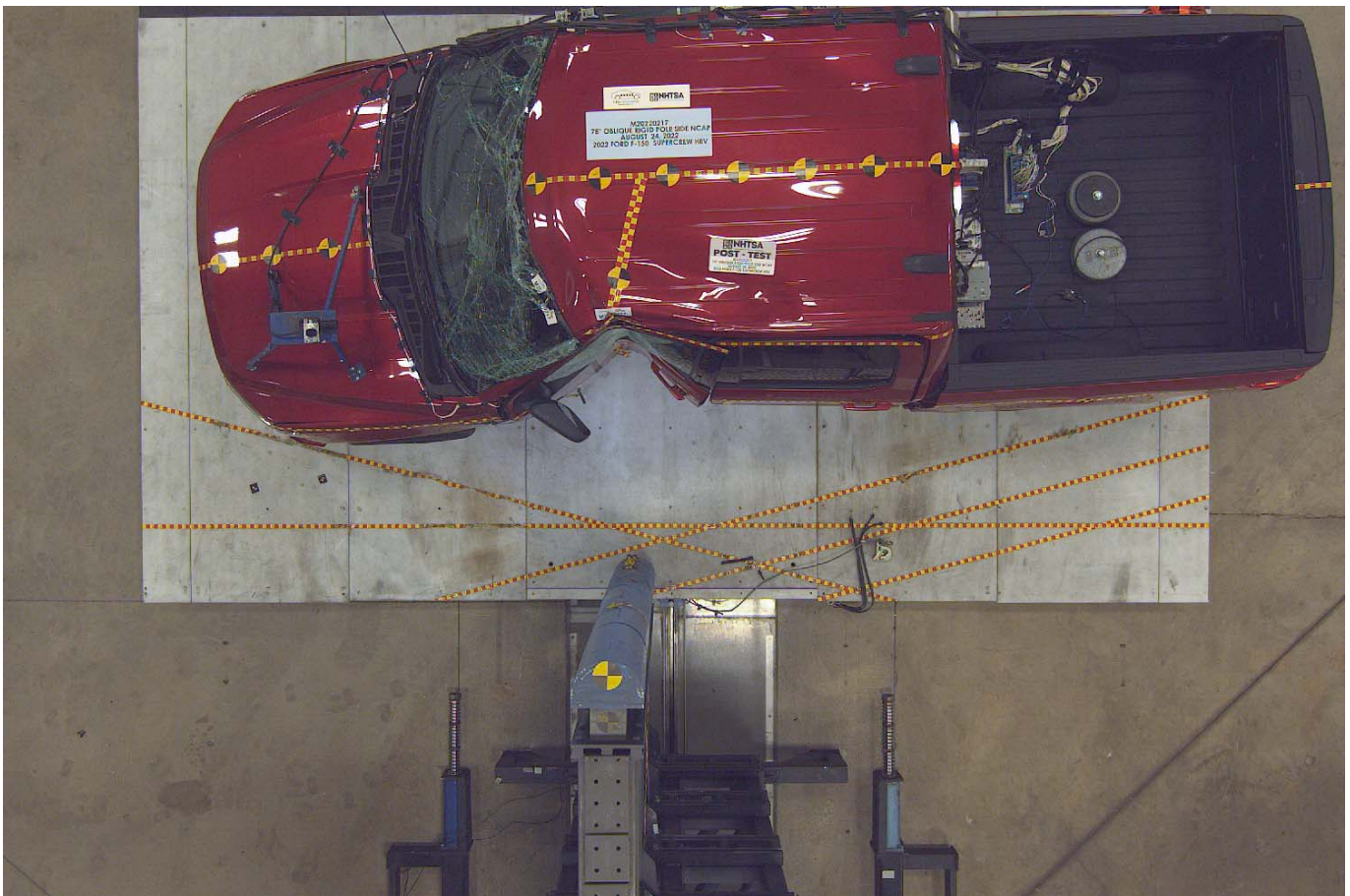


Photo No. 016 - Post-Test Overhead View of Test Area



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



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

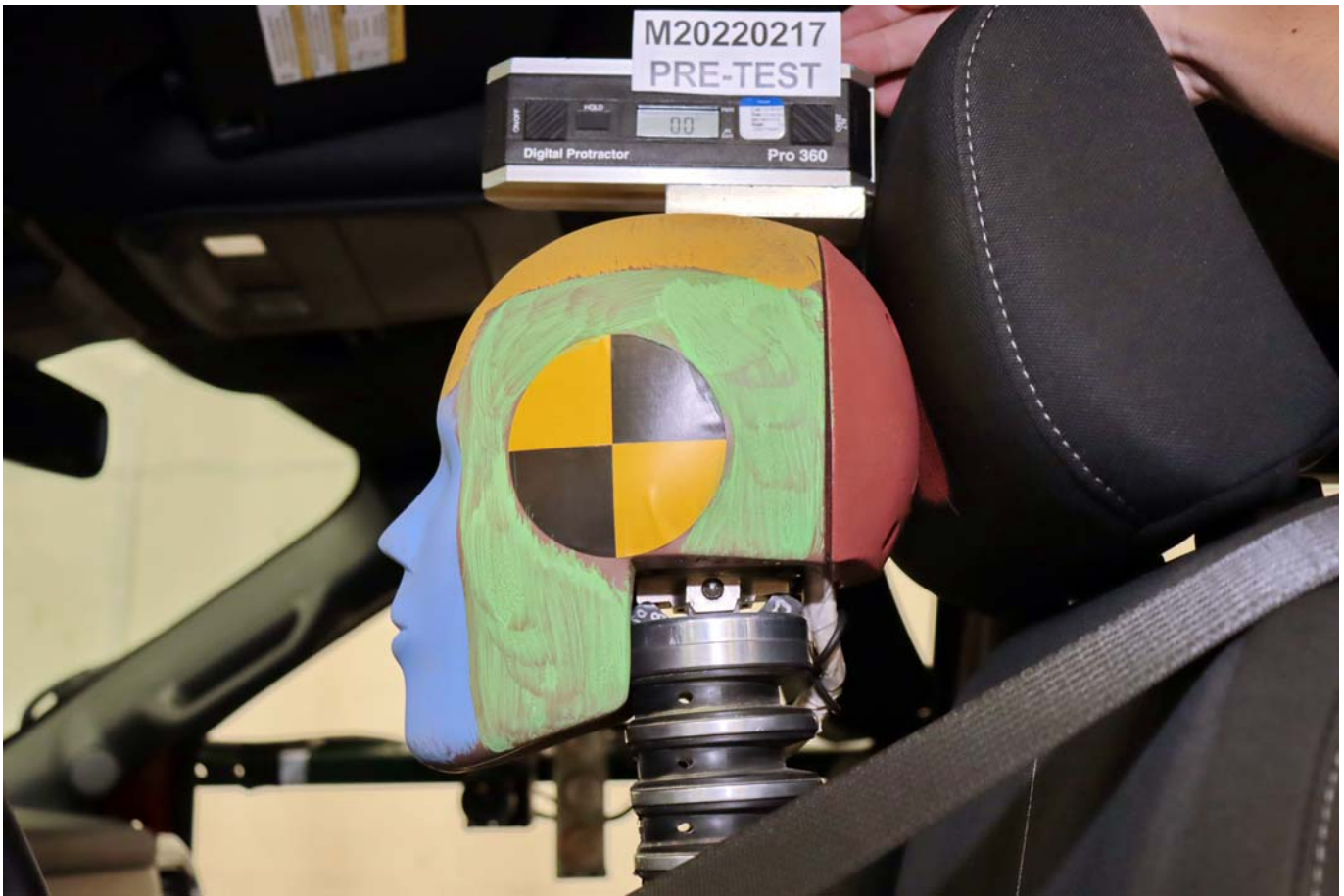


Photo No. 031 - Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level

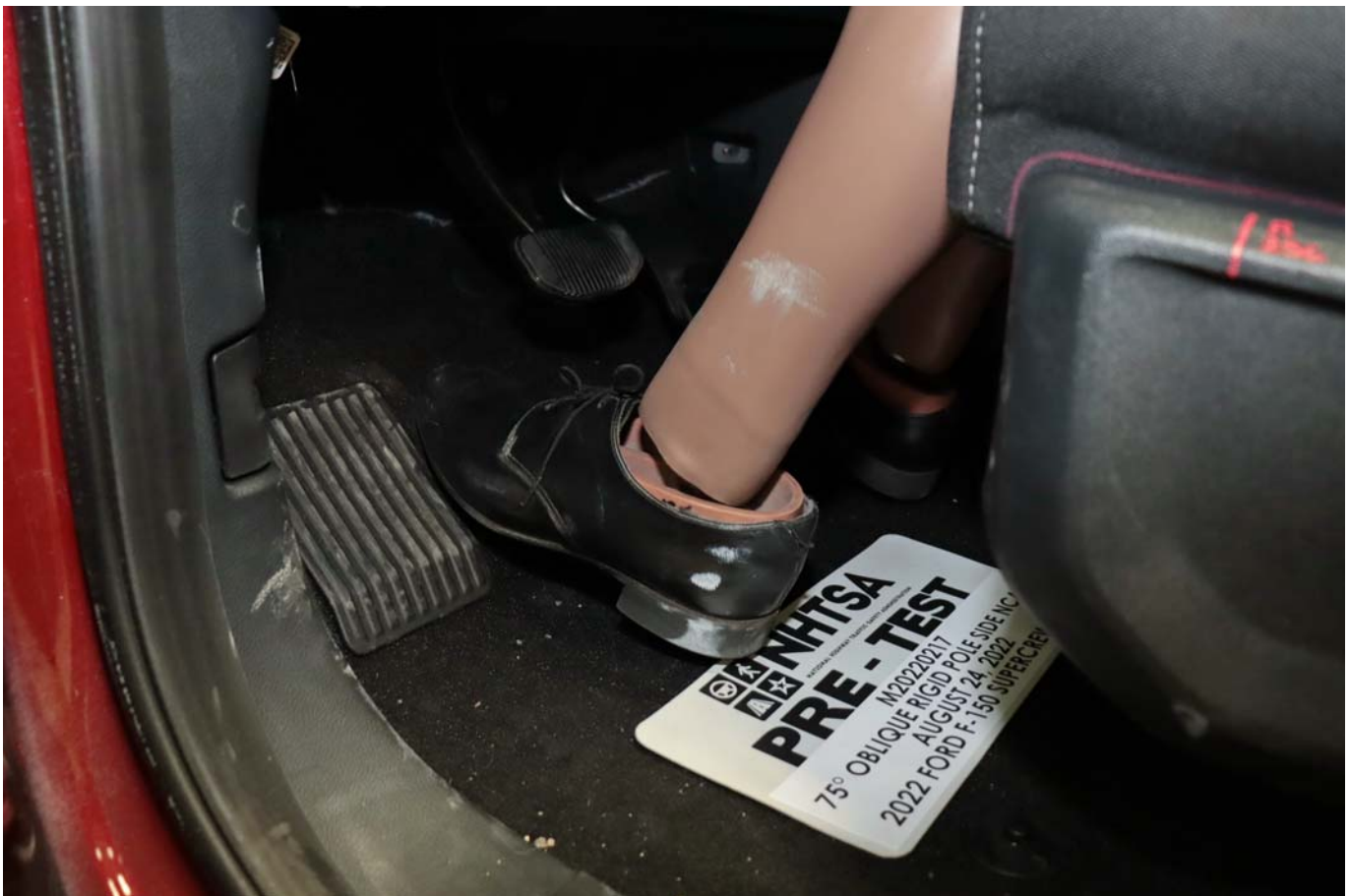


Photo No. 032 - Pre-Test Placement of Dummy's Feet



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

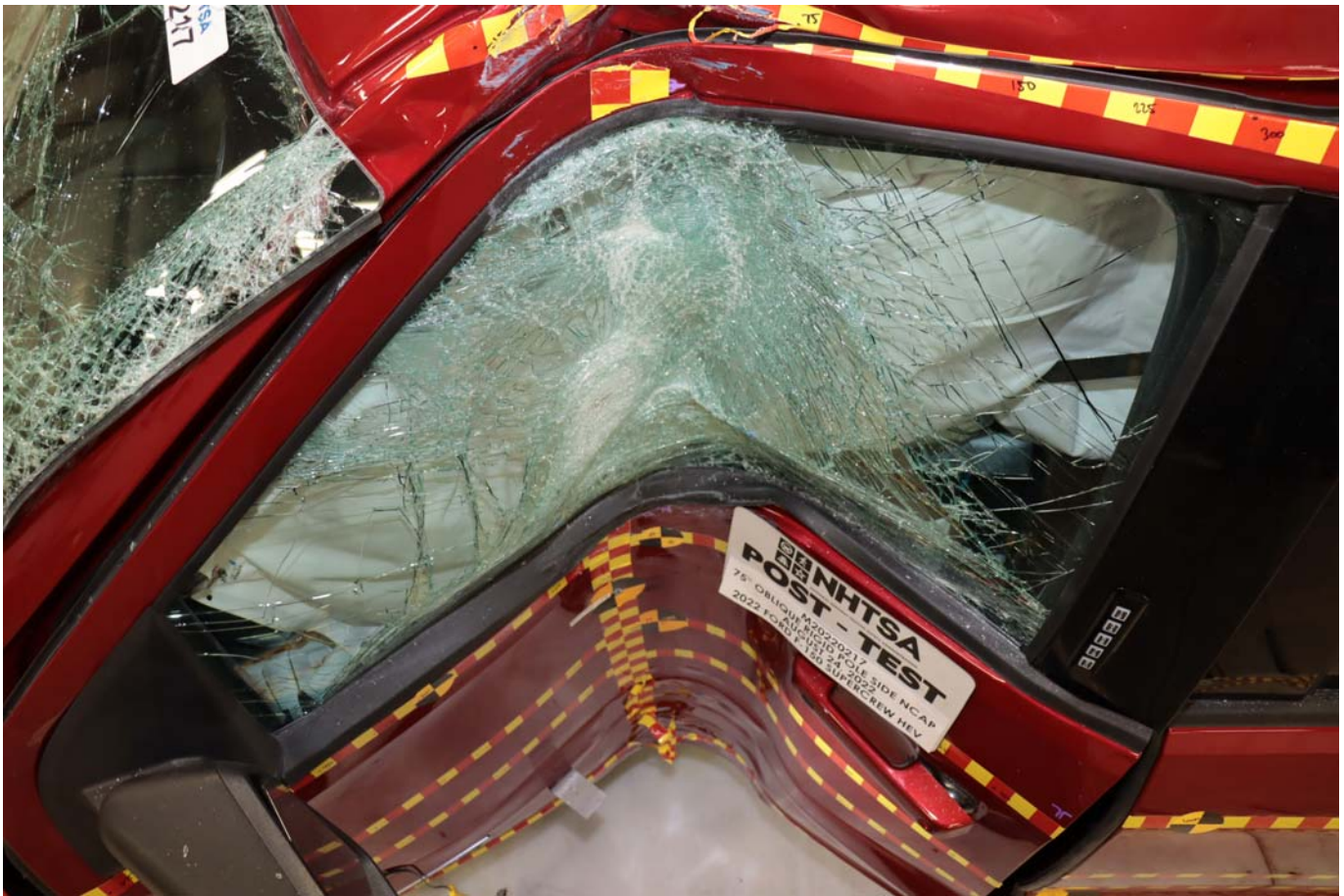


Photo No. 041 - Post-Test Dummy and Door Clearance View



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

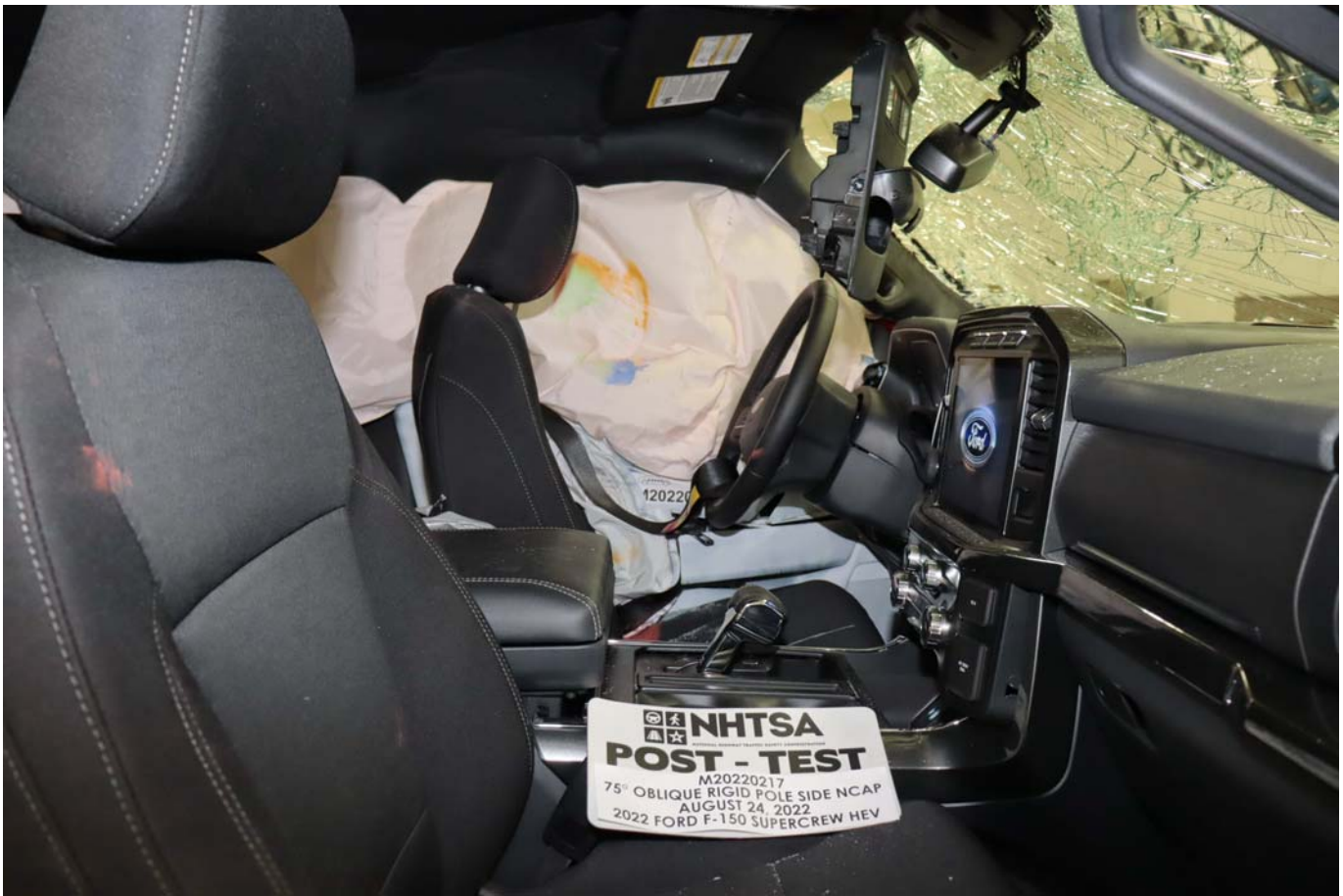


Photo No. 045 - Post-Test Inner Door Panel View Showing Dummy Contact Location



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



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



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. 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

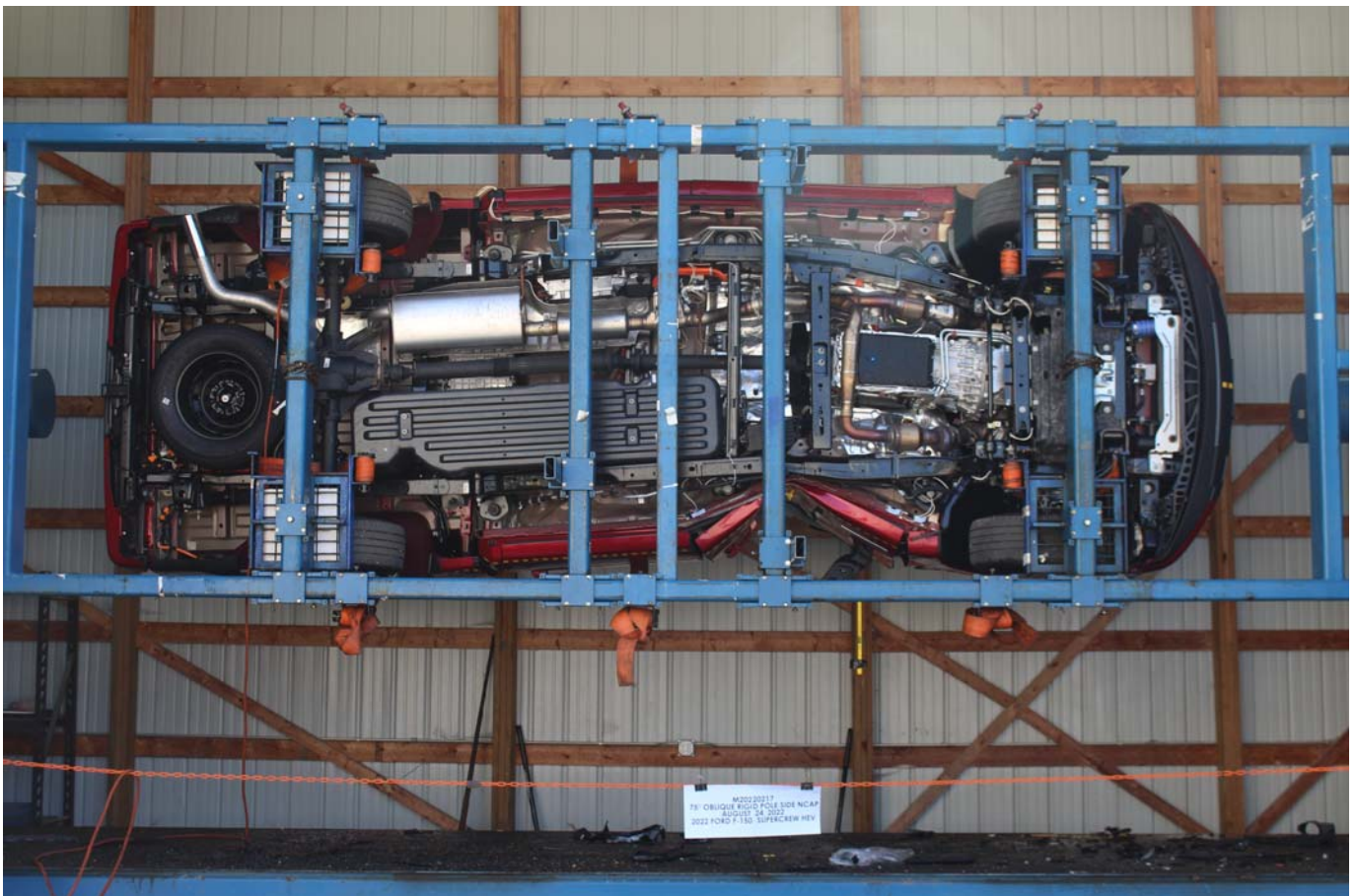


Photo No. 066 - FMVSS Photo No. 301 Static Rollover 90 Degrees



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

**Ford** **Go Further** ford.com

**VEHICLE DESCRIPTION**  
**F-150**  
 2022 F-150 4X2 SUPERCREW  
 145" WHEELBASE  
 3.5L POWERBOOST FULL HYBRID  
 HYBRID ELEC 10-SPD AUTO TRA

**EXTERIOR**  
 RAPID RED MET TINTED CC  
 INTERIOR  
 BLACK SPORT 40/CONSOLE/40

**VF A03140**

**STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE**

EXTERIOR	INTERIOR	FUNCTIONAL	SAFETY/SECURITY
<ul style="list-style-type: none"> <li>DAYTIME RUNNING LAMPS</li> <li>EASY FUEL CAPLESS FILLER</li> <li>FOG LAMPS</li> <li>FULLY BOXED STEEL FRAME</li> <li>HEADLAMPS - AUTO HIGH BEAM</li> <li>HEADLAMPS - AUTOLAMP (ON/OFF)</li> <li>MANUAL FOLD POWER MIRRORS</li> <li>PICKUP BOX TIE DOWN HOOKS</li> <li>POWER TAILGATE LOCK</li> <li>TRAILER PRIVACY GLASS</li> <li>TRAILER SWAY CONTROL</li> </ul>	<ul style="list-style-type: none"> <li>TROUGH UP/DOWN DRYPASS WIN</li> <li>60/40 FOLD-UP REAR BENCH SEAT</li> <li>DOOR LOCKS - POWER</li> <li>DUAL VISOR VANITY MIRRORS</li> <li>ILLUMINATED ENTRY</li> <li>MESSAGE CTR: OUTSIDE TEMP, COMPASS, TRIP COMPUTER</li> <li>POWERPOINTS - 12V</li> <li>TILT/TELESCOPE STR COLUMN</li> </ul>	<ul style="list-style-type: none"> <li>AUTO HOLD</li> <li>BUS W/CROSS-TRAFFIC ALERT</li> <li>DYNAMIC HITCH ASSIST</li> <li>FORDPASS CONNECT™ 4G</li> <li>HOTSPOT TELEMATICS MODEM</li> <li>GAS-CHARGED SHOCKS</li> <li>LANE-KEEPING SYSTEM</li> <li>MYKEY®</li> <li>POST-COLLISION BRAKING</li> <li>PRE-COLLISION ASSIST W/ABE</li> <li>REVERSE BRAKE ASSIST</li> <li>REVERSE SENSING AND REAR VIEW CAMERA</li> <li>SELECTSHIFT®</li> </ul>	<ul style="list-style-type: none"> <li>ADVANCETRAC™ WITH RSC®</li> <li>AIRBAGS - FRONT SEAT MOUNTED SIDE IMPACT</li> <li>AIRBAGS - SAFETY CANOPY®</li> <li>CTR HIGH MOUNT STOP LAMP</li> <li>PERIMETER ALARM</li> <li>SOS POST-CRASH ALERT SYS™</li> <li>TIRE PRESSURE MONIT SYS</li> </ul>

**INCLUDED ON THIS VEHICLE**

EQUIPMENT GROUP 302A	(MSRP)	(MSRP)	PRICE INFORMATION	(MSRP)
<ul style="list-style-type: none"> <li>XLT SERIES</li> <li>ELECTRONIC AUTO TEMP CONTROL</li> <li>SIRIUS XM W/ 360L</li> <li>SYNC 4 W/ENHANCED VOICE RECOG</li> <li>LED SIDE-MIRROR SPOTLIGHTS</li> <li>REMOTE START SYSTEM</li> </ul>	5,965.00	<ul style="list-style-type: none"> <li>XLT SPORT APPEARANCE PACKAGE</li> <li>.16" 8-SPOKE GLOSS BLACK WHEEL</li> <li>BEDLINER-TOUGHBED SPRAYINACY</li> </ul>	BASE PRICE \$43,730.00 TOTAL OPTIONS/OTHER 16,550.00	60,280.00
<ul style="list-style-type: none"> <li>2022 MODEL YEAR</li> <li>RAPID RED MET TINTED CC</li> <li>3.5L POWERBOOST FULL HYBRID</li> <li>HYBRID ELEC 10-SPD AUTO TRANS</li> <li>.265/60R18 BSW ALL-SEASON</li> <li>3.55 ELECTRONIC LOCK RR AXLE</li> <li>7350# GVWR PACKAGE</li> <li>FRONT LICENSE PLATE BRACKET</li> <li>50 STATE EMISSIONS</li> <li>LINER-TRAY STYLE-NO CARPET MAT</li> <li>INTERIOR WORK SURFACE</li> <li>CNGTD BLT-IN NAV (3-YR INC)</li> <li>AUTO START-STOP REMOVAL</li> <li>TRAILER TOW PACKAGE</li> <li>INTEGRATED TRAILER BRAKE CONT</li> <li>MIRROR MAN FOLD W/POWER GLASS</li> <li>B50 SOUND SYSTEM, 8 SPKR</li> <li>BED UTILITY PACKAGE</li> <li>.BOXLINK</li> <li>TAILGATE STEP</li> <li>LED BOX LIGHTING</li> <li>360-DEGREE CAMERA PACKAGE</li> </ul>	495.00 4,495.00 NO CHARGE NO CHARGE NO CHARGE NO CHARGE 160.00 195.00 795.00 NO CHARGE 1,325.00 NO CHARGE 610.00 695.00 NO CHARGE 765.00	TOTAL VEHICLE & OPTIONS/OTHER DESTINATION & DELIVERY 66,280.00 TOTAL BEFORE DISCOUNTS 62,075.00 XLT HIGH CHRM OR SPRT - 2,000.00 TOTAL SAVINGS - 2,000.00	TOTAL MSRP \$60,075.00	

**SOLD TO**  
 Ravenel Ford, Inc.  
 P.O. BOX 217  
 Ravenel SC 29470

**RAMP ONE** 21V 327  
**CA4F**

**FINAL ASSEMBLY PLANT** DEARBORN

**METHOD OF TRANSF.** CONVVOY

**ITEM #** 21-Z502 O/T 2

**FORD CREDIT**

**Whether you decide to lease or finance your vehicle, you'll find the choices that are right for you. See your dealer for details or visit [www.ford.com/finance](http://www.ford.com/finance).**

**NE031 N RB 2X 245 001172 05 03 22**

**EPA DOT Fuel Economy and Environment** Gasoline Vehicle

**Fuel Economy**  
**25** MPG combined city/hwy  
 25 city  
 25 highway  
 4.0 gallons per 100 miles

Standard Pickup Trucks range from 12 to 70 MPG. The best vehicle rates 142 MPGe.

**You spend \$500 more in fuel costs over 5 years compared to the average new vehicle.**

**Annual fuel cost \$1,400**

**Fuel Economy & Greenhouse Gas Rating** (tailpipe only) **5** Best

**Smog Rating** (tailpipe only) **6** Best

This vehicle emits 353 grams CO<sub>2</sub> per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at [fuelconomy.gov](http://fuelconomy.gov).

**Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$6,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.35 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.**

**GOVERNMENT 5-STAR SAFETY RATINGS**

**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  
 Not Rated

**Side Crash Not Rated**  
 Front seat Not Rated  
 Rear seat Not Rated

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

**1FTFW1CDSNF03140**

**WARNING:** Operating, servicing and maintaining a passenger vehicle, pickup truck, van, or off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to [www.P65Warnings.ca.gov/passenger-vehicle](http://www.P65Warnings.ca.gov/passenger-vehicle).

**SCAN OR TEXT: 1FMFA03140 TO 48009**  
 Help & Data rates may apply. Text HELP for help.

Photo No. 071 - Monroney Label

**Front Seats**

**POWER SEATS (IF EQUIPPED)**

**HEADRESTRAINT COMPONENTS**

The head restraints consist of:

- A An energy absorbing head restraint.
- B Two steel stems.
- C Guide sleeve adjust and release button.
- D Guide sleeve unlock and remove button (if equipped).

**ADJUSTING THE HEAD RESTRAINT**

**WARNING:** Fully adjust the head restraint before you sit in or operate your vehicle. This will help minimize the risk of neck injury in the event of a crash. Do not adjust the head restraint when your vehicle is moving.

**WARNING:** The head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied. Failure to adjust the head restraint properly could reduce its effectiveness during certain impacts.

**WARNING:** Adjust the head restraints for all passengers before you drive your vehicle. This will help minimize the risk of neck injury in the event of a crash. Do not adjust the head restraints when your vehicle is moving.

To raise the head restraint, pull the head restraint up.

To lower the head restraint:

- Press and hold the adjust and release button.
- Push the head restraint down.

To tilt the head restraint:

- Adjust the seat backrest to an upright driving or riding position.
- Pivot the head restraint forward toward your head to the preferred position.

After the head restraint reaches the forward-most tilt position, pivot it forward again to release it to the rearward, untilted position.

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2022 F-150 (F150) Canada/United States of America, en/USA, Edition date: 2021/05, First Printing

**Front Seats**

**ADJUSTING THE SEAT CUSHION (If Equipped)**

- Press and hold the control until the seat stops moving.
- Press and hold the control again until the seat stops.
- Continue holding the control for a few seconds. The new position is learned.

**REMOVING THE HEAD RESTRAINT**

- Pull up the head restraint until it reaches its highest position.
- Press and hold the adjust and release button and the unlock and remove button.
- Pull up the head restraint.

**INSTALLING THE HEAD RESTRAINT**

Align the steel stems into the guide sleeves and push the head restraint down until it locks.

**MOVING THE SEAT BACKWARD AND FORWARD**

**ADJUSTING THE SEAT BACKREST**

**WARNING:** Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

If the seat stops prior to reaching the end of the travel position, or an obstruction occurs, a new stopping position is learned. To reset the stopping position:

- Remove any obstruction.

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2022 F-150 (F150) Canada/United States of America, en/USA, Edition date: 2021/05, First Printing

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

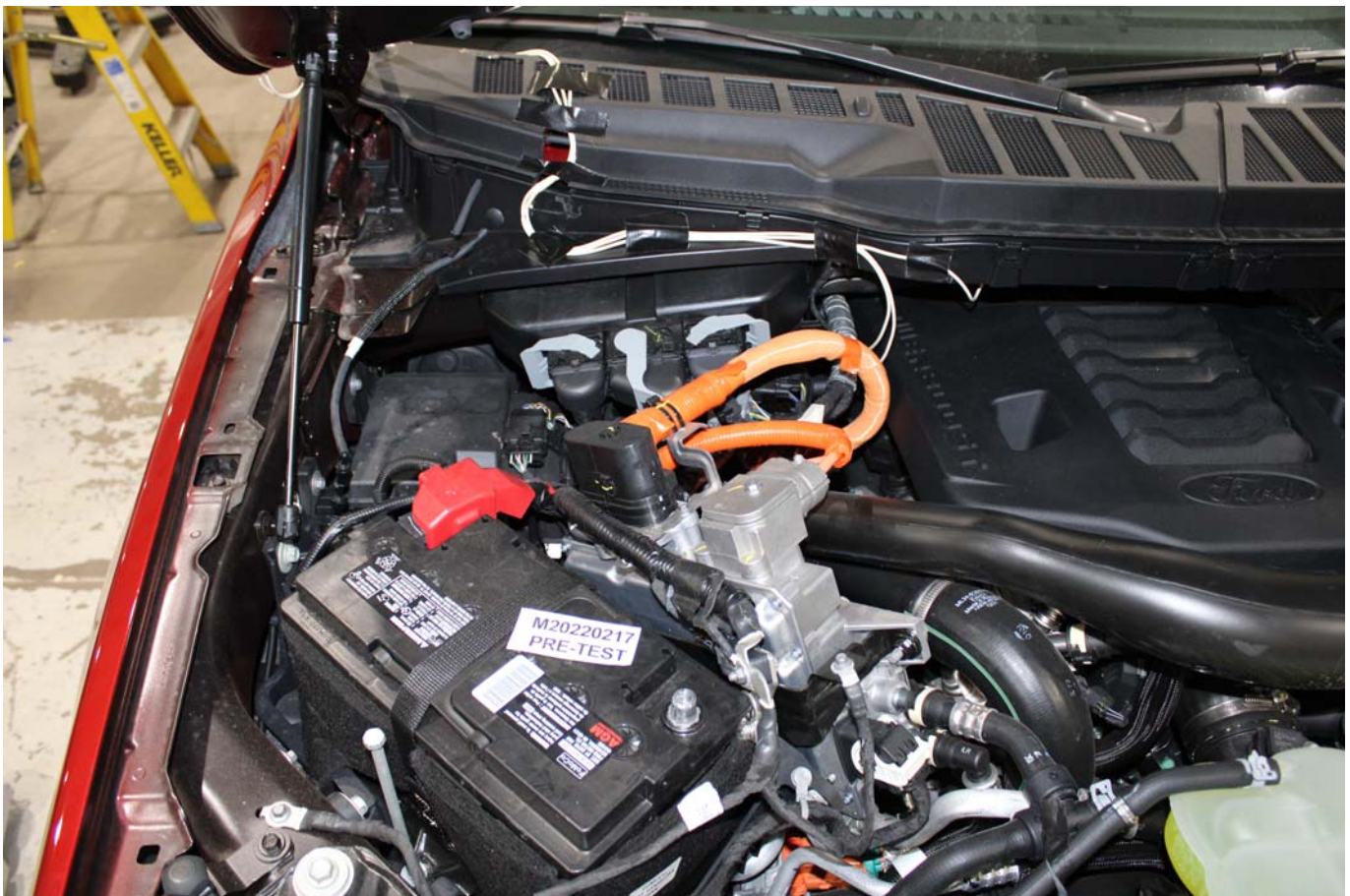


Photo No. 305-01 - Auxiliary Power Module Warning Label



Photo No. 305-02 - Power Inverter Warning Label

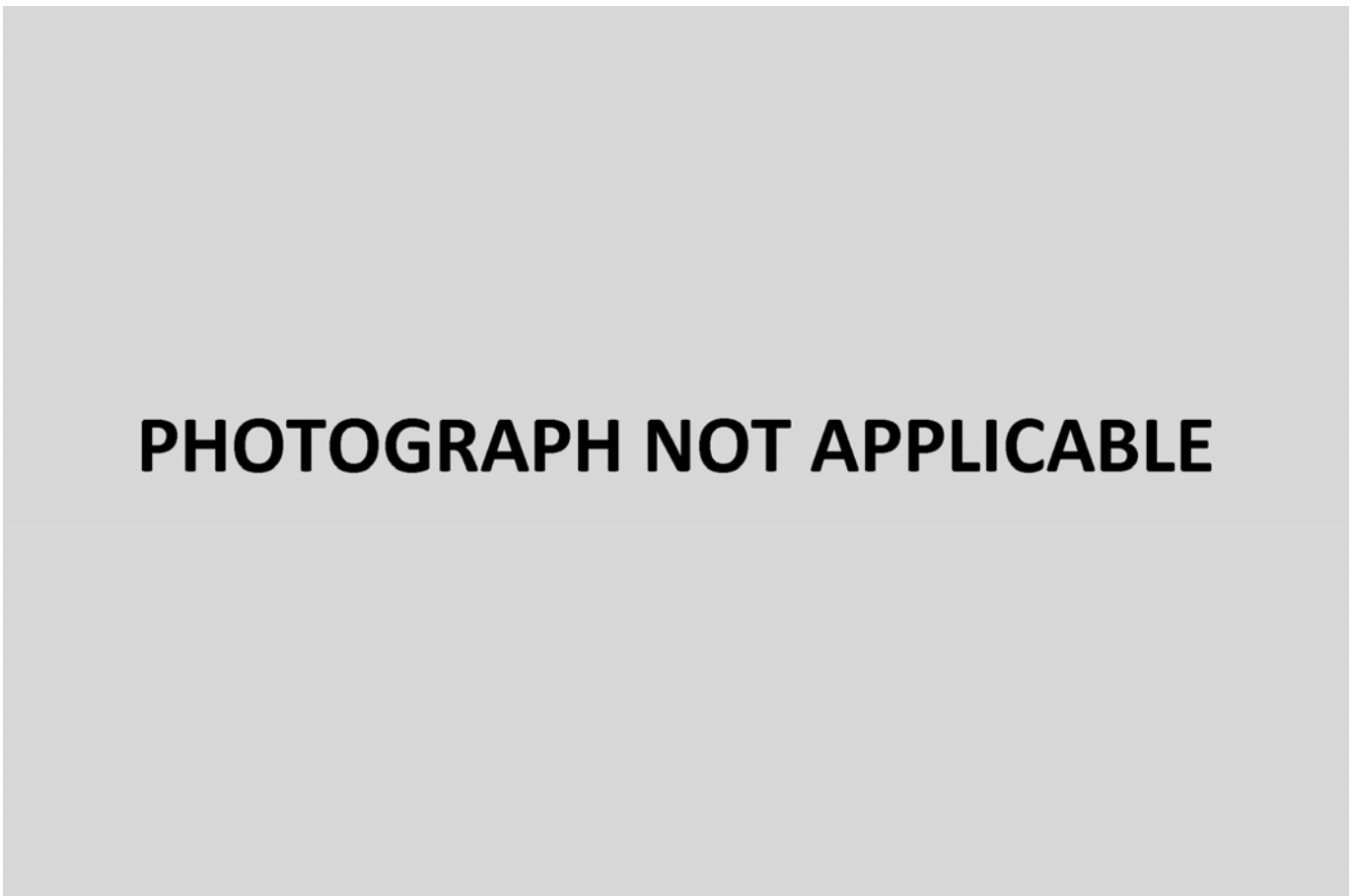


Photo No. 305-03 - First Responder Warning Label

# PHOTOGRAPH NOT APPLICABLE

Photo No. 305-04 - First Responder Warning Location



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



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

**PHOTOGRAPH NOT APPLICABLE**

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



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



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

**PHOTOGRAPH NOT APPLICABLE**

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

**PHOTOGRAPH NOT APPLICABLE**

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



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

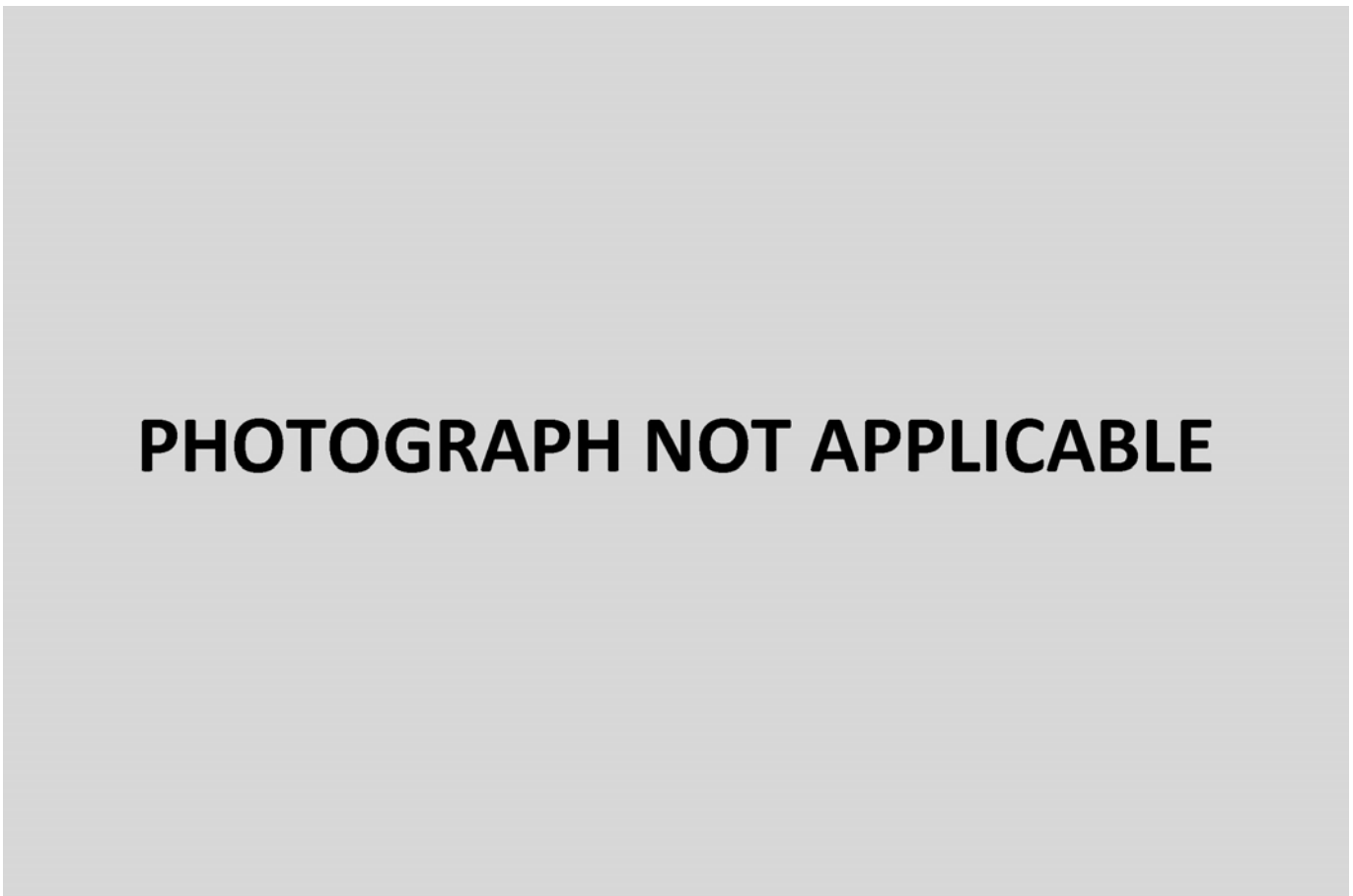


Photo No. 305-13 - Post-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules

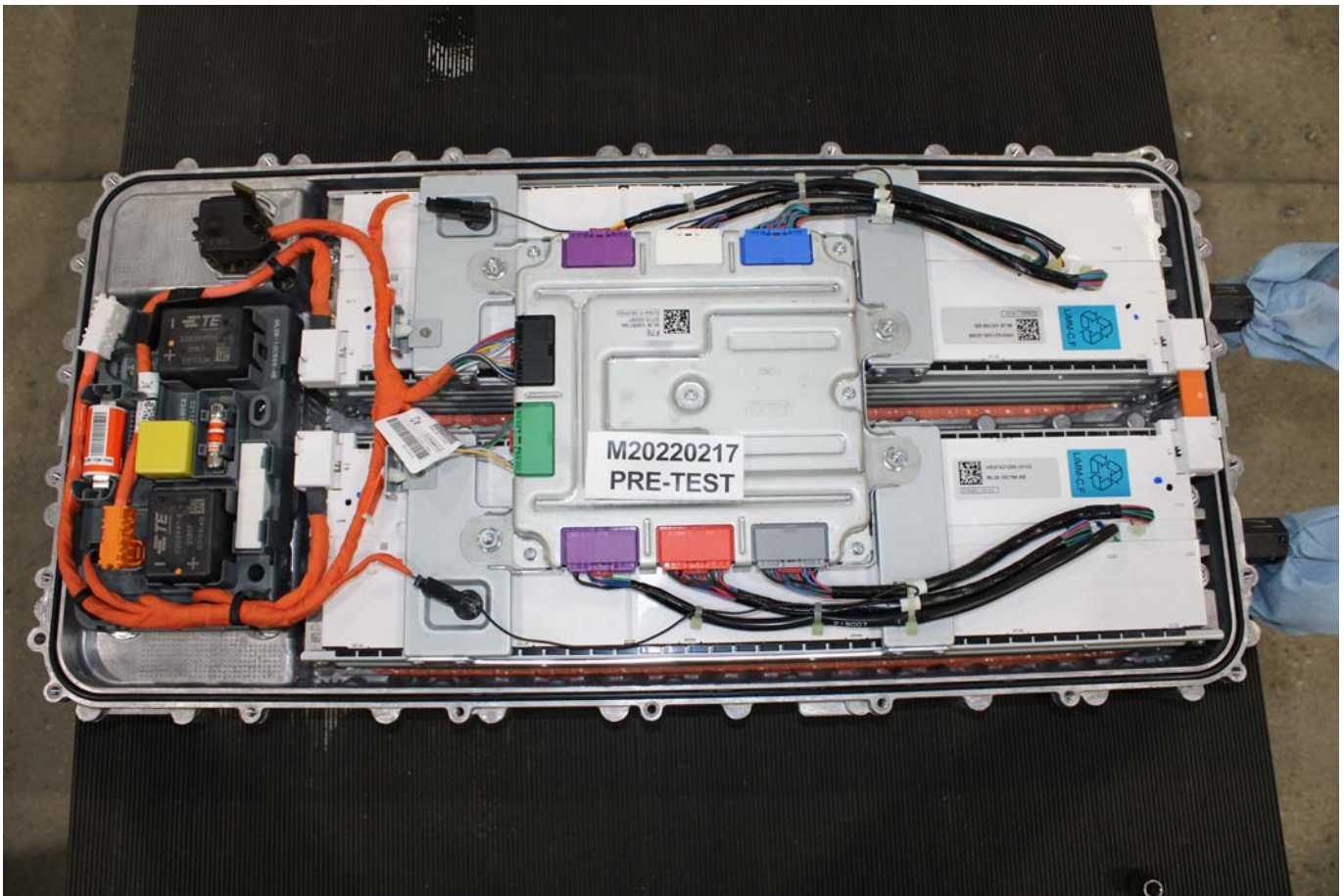


Photo No. 305-14 - Pre-Impact View of Propulsion Battery Module(s)

**PHOTOGRAPH NOT APPLICABLE**

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

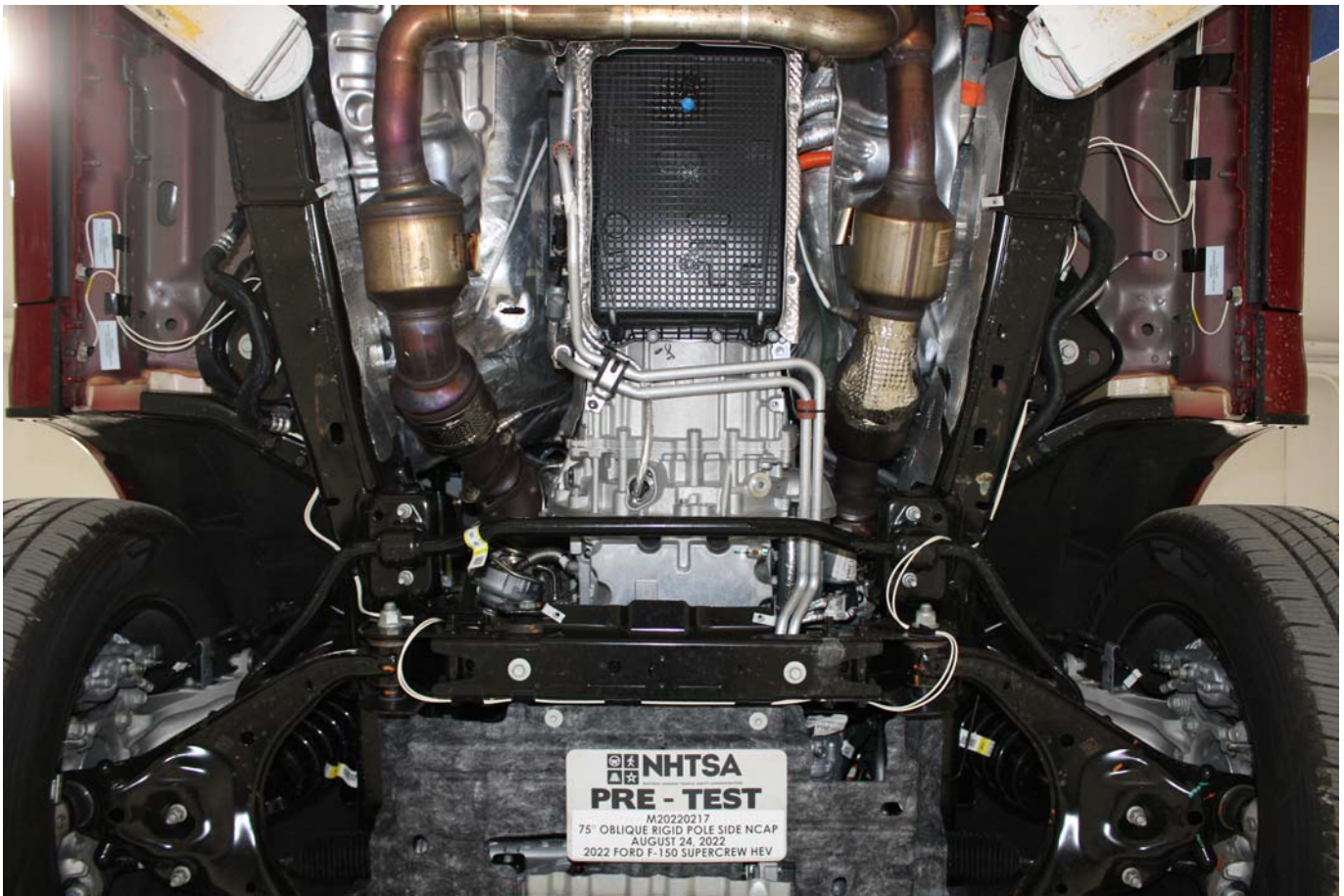


Photo No. 305-16 - Pre-Impact View of Electric Propulsion Drive

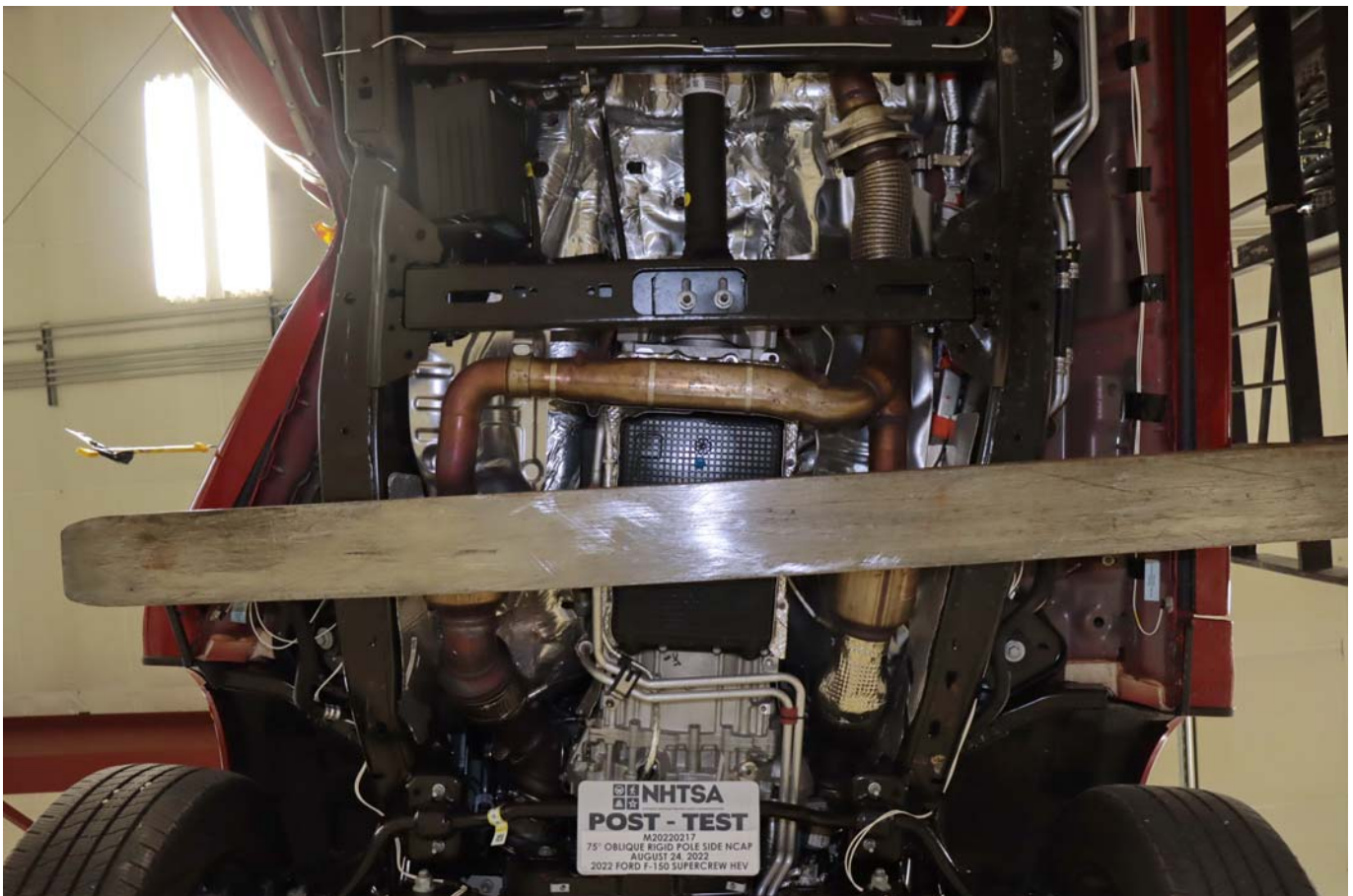


Photo No. 305-17 - Post-Impact View of Electric Propulsion Drive



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

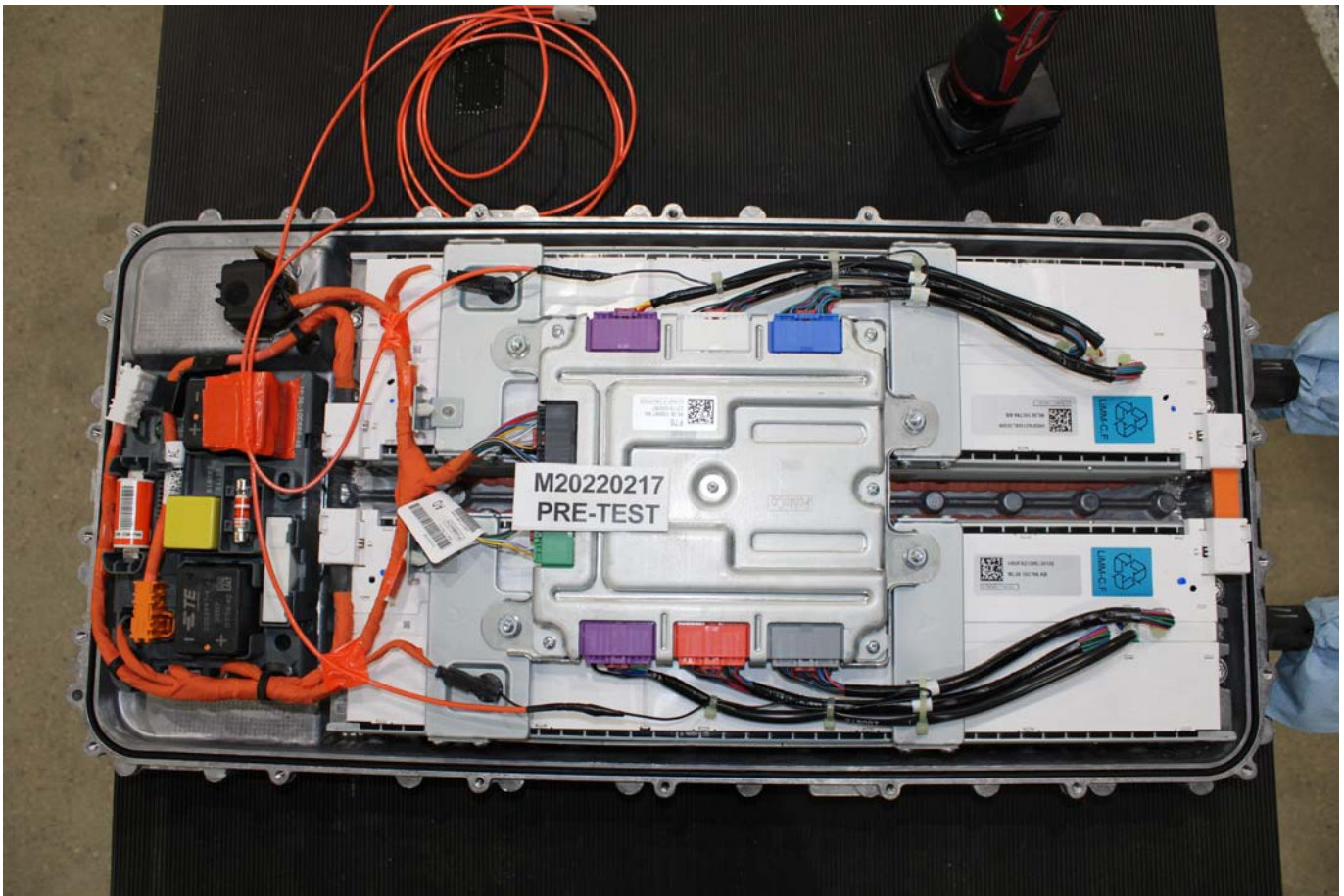


Photo No. 305-22 - Pre-Impact View of High Voltage Leads Attached

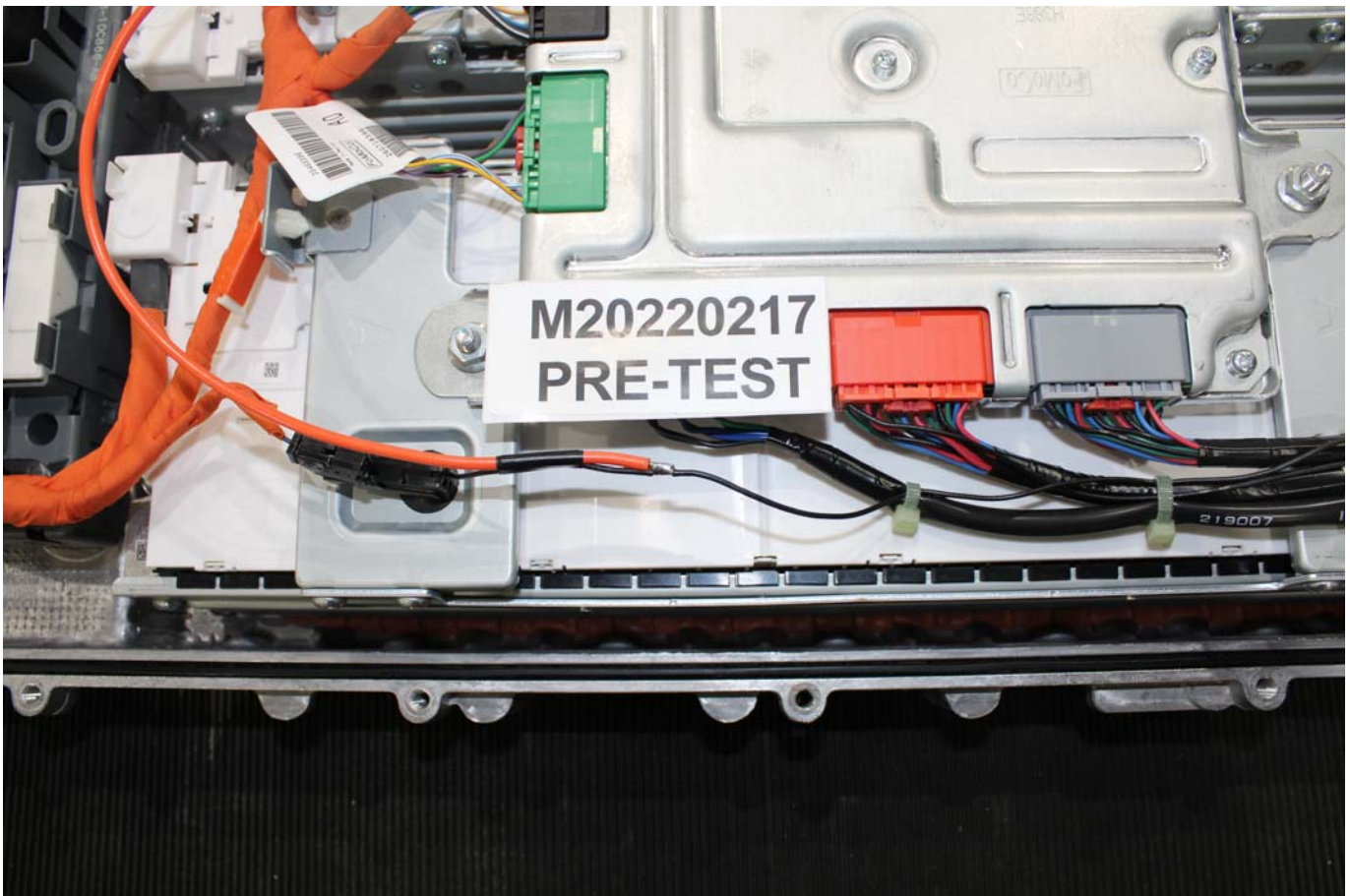


Photo No. 305-23 - Pre-Impact Close-Up View of High Voltage Leads Attached



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

**PHOTOGRAPH NOT AVAILABLE**

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



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



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



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



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

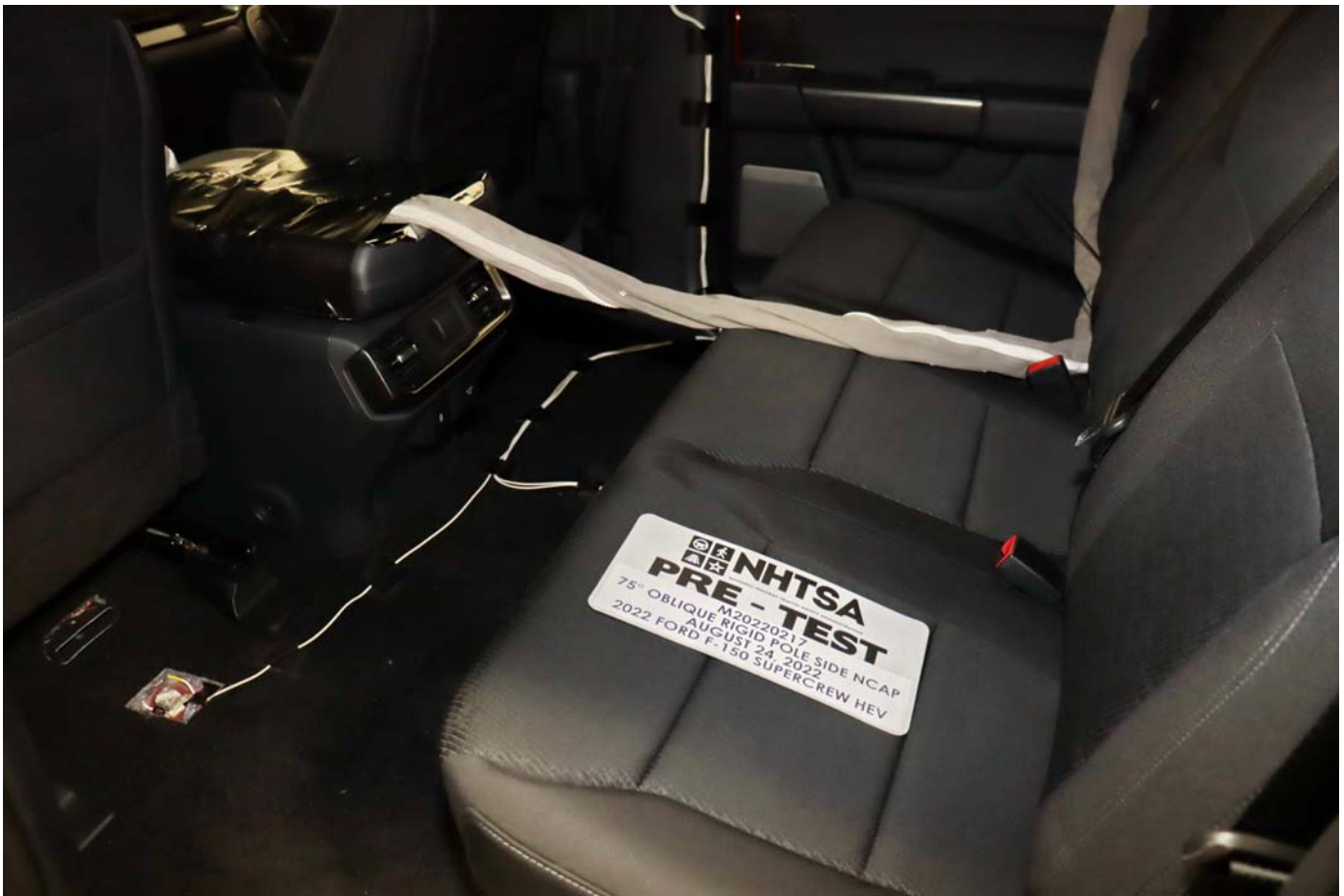


Photo No. 305-32 - Pre-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery



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

**PHOTOGRAPH NOT APPLICABLE**

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

**PHOTOGRAPH NOT APPLICABLE**

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

**PHOTOGRAPH NOT APPLICABLE**

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

**PHOTOGRAPH NOT APPLICABLE**

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

**PHOTOGRAPH NOT APPLICABLE**

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

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

**TABLE OF DATA PLOTS**  
**Driver Dummy Instrumentation Plots**

		<u>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](http://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)

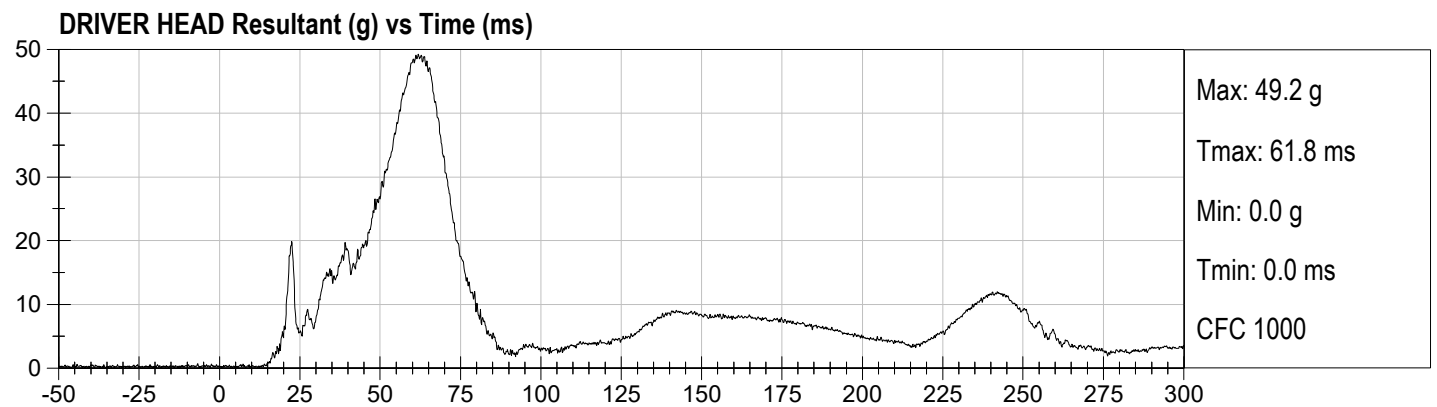
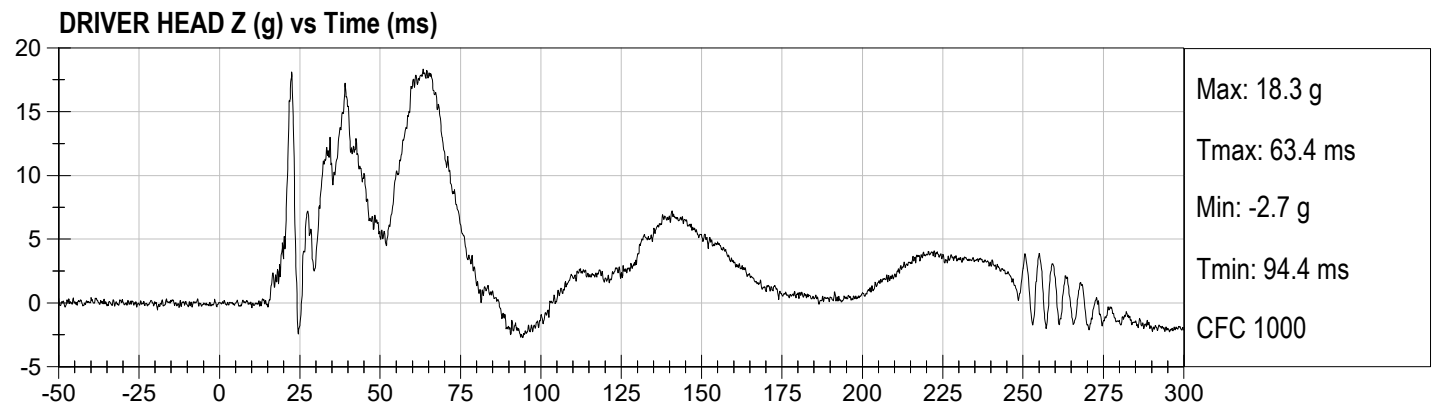
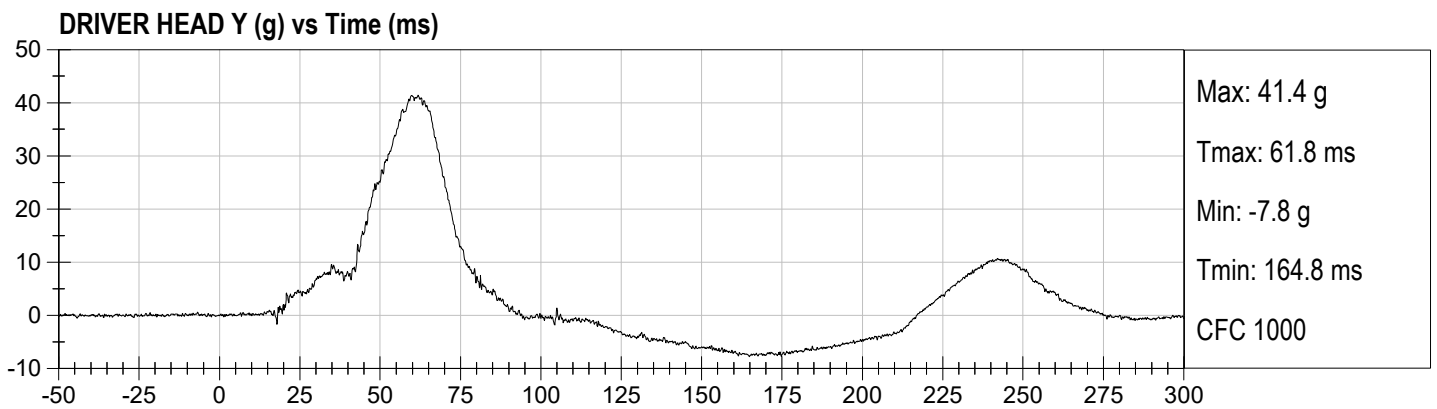
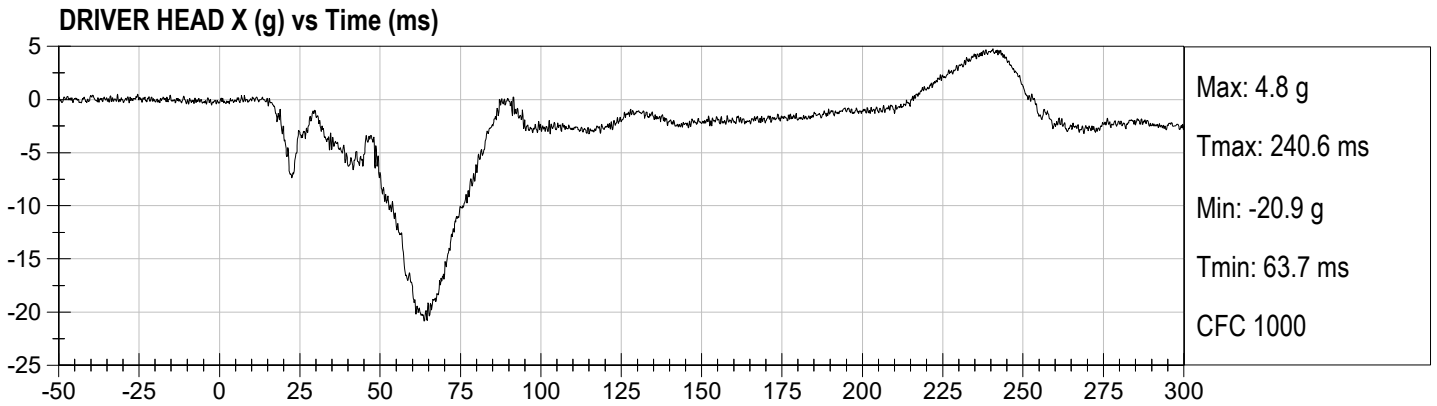
Load Cell Pole Barrier #4 Force (Y)

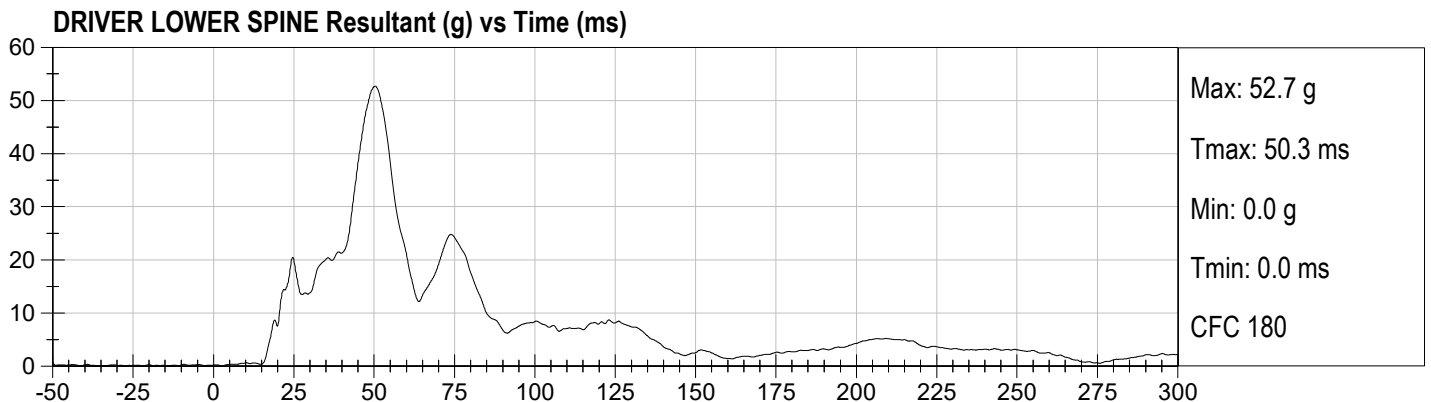
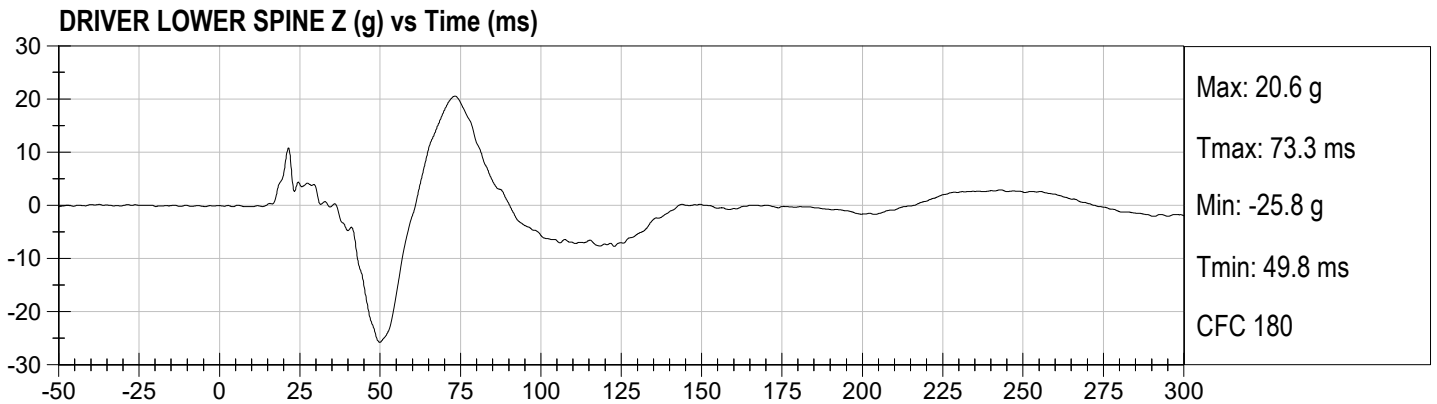
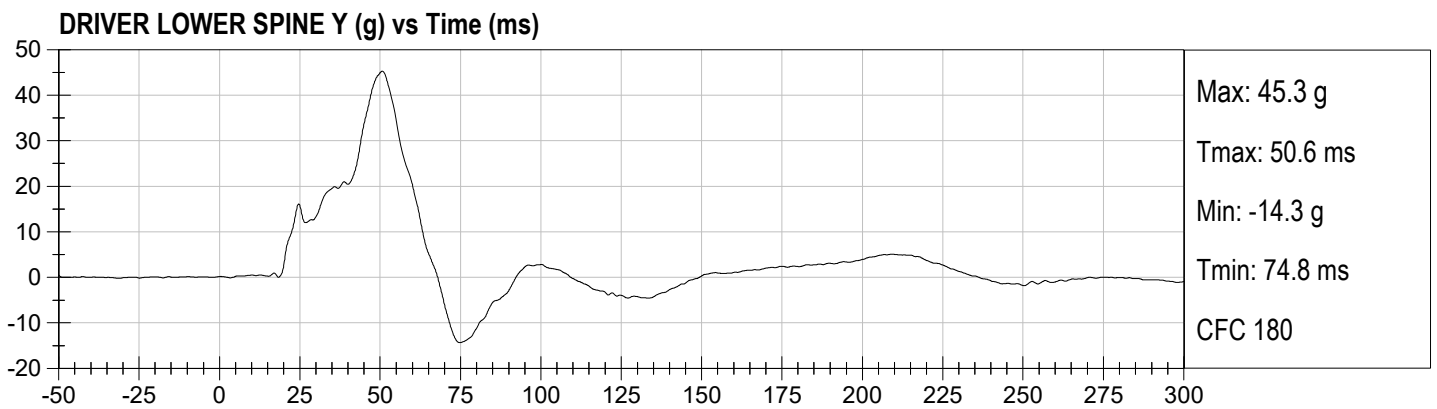
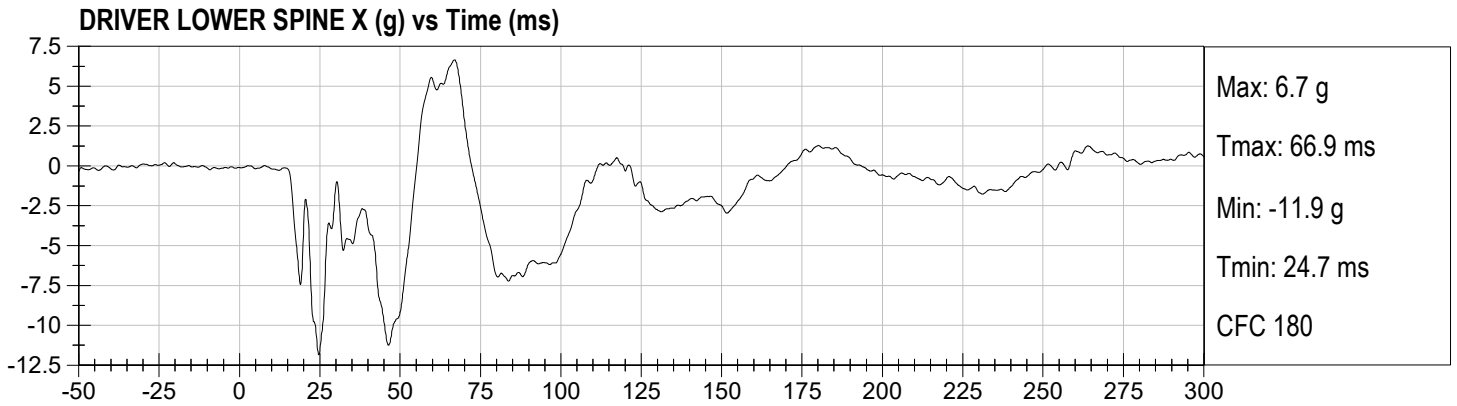
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

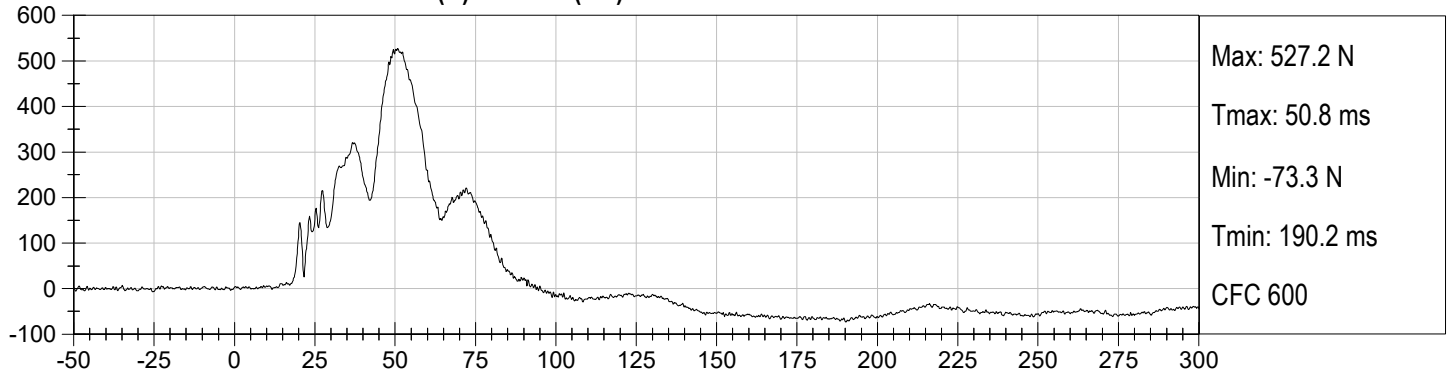
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

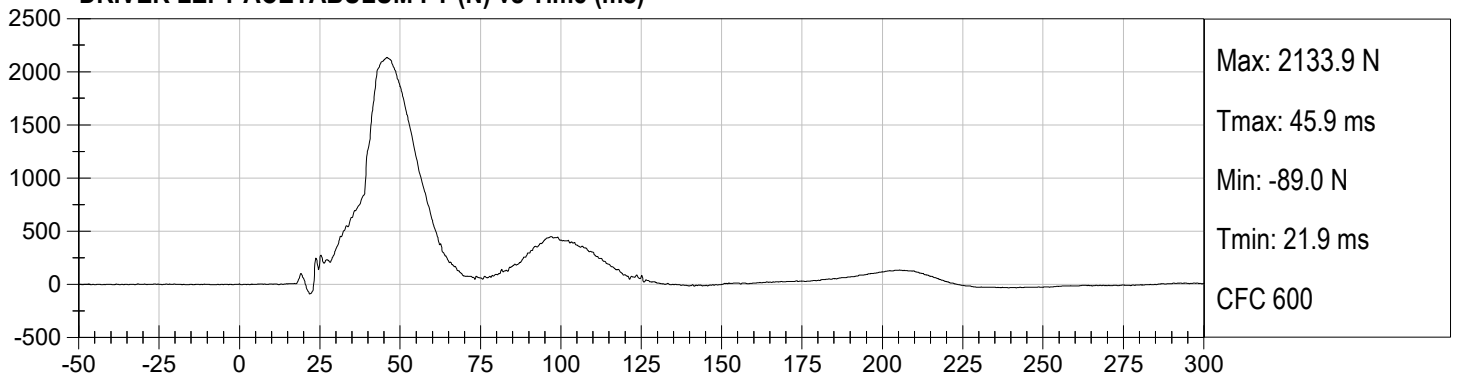




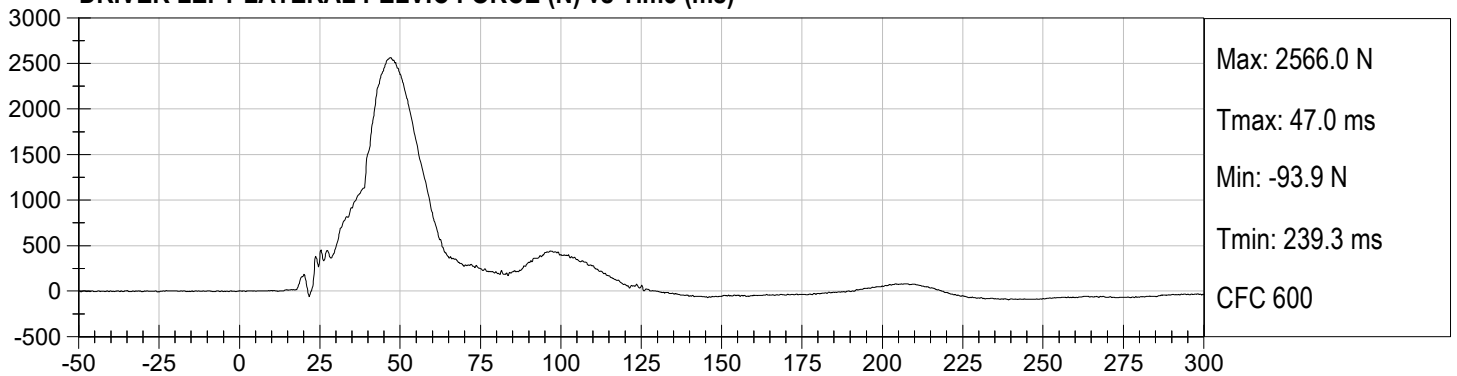
**DRIVER LEFT ILIUM CREST FY (N) vs Time (ms)**



**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 5<sup>TH</sup> PERCENTILE FEMALE - DRIVER ATD**

**SID-IIsD External Measurements**  
**SN: 306**

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

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

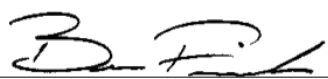
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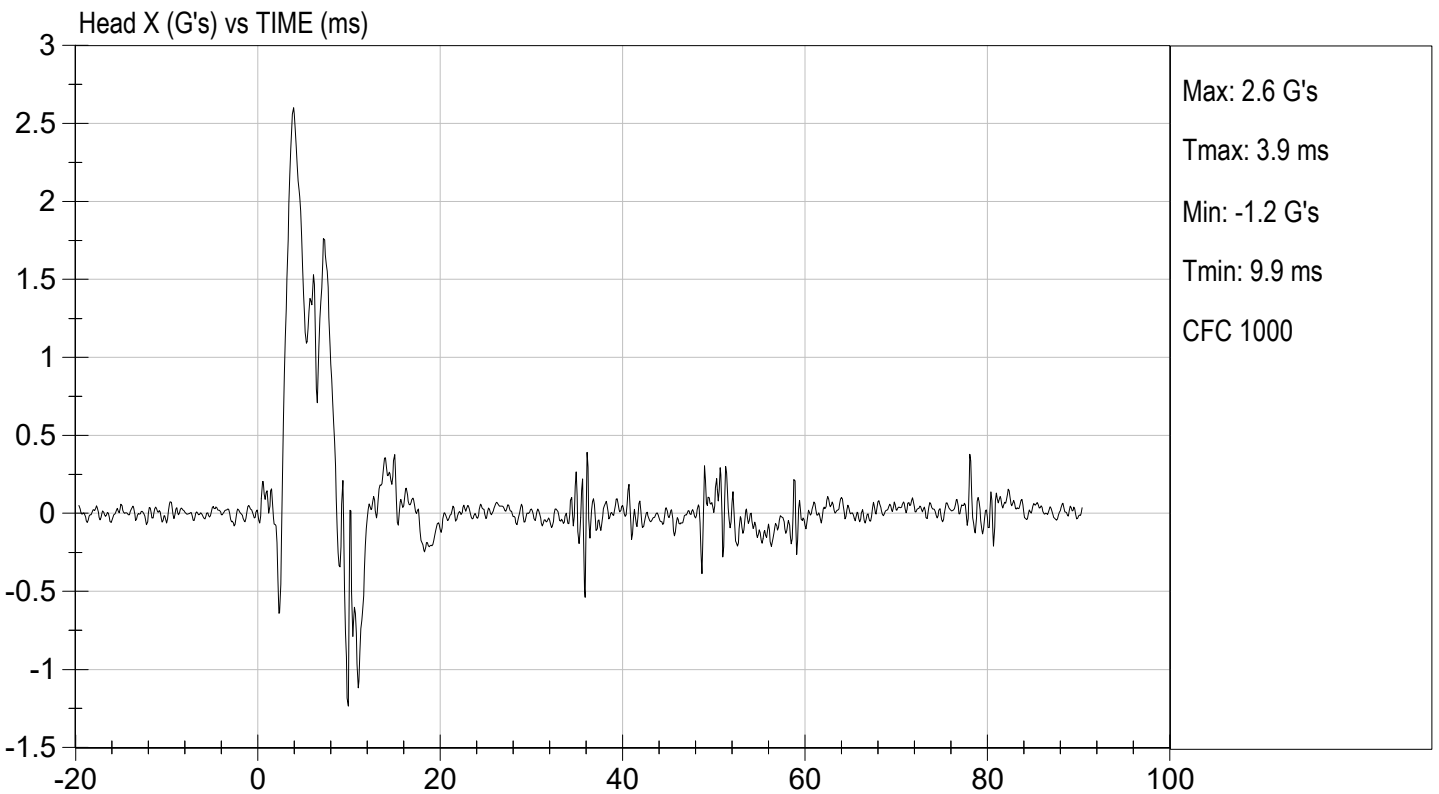
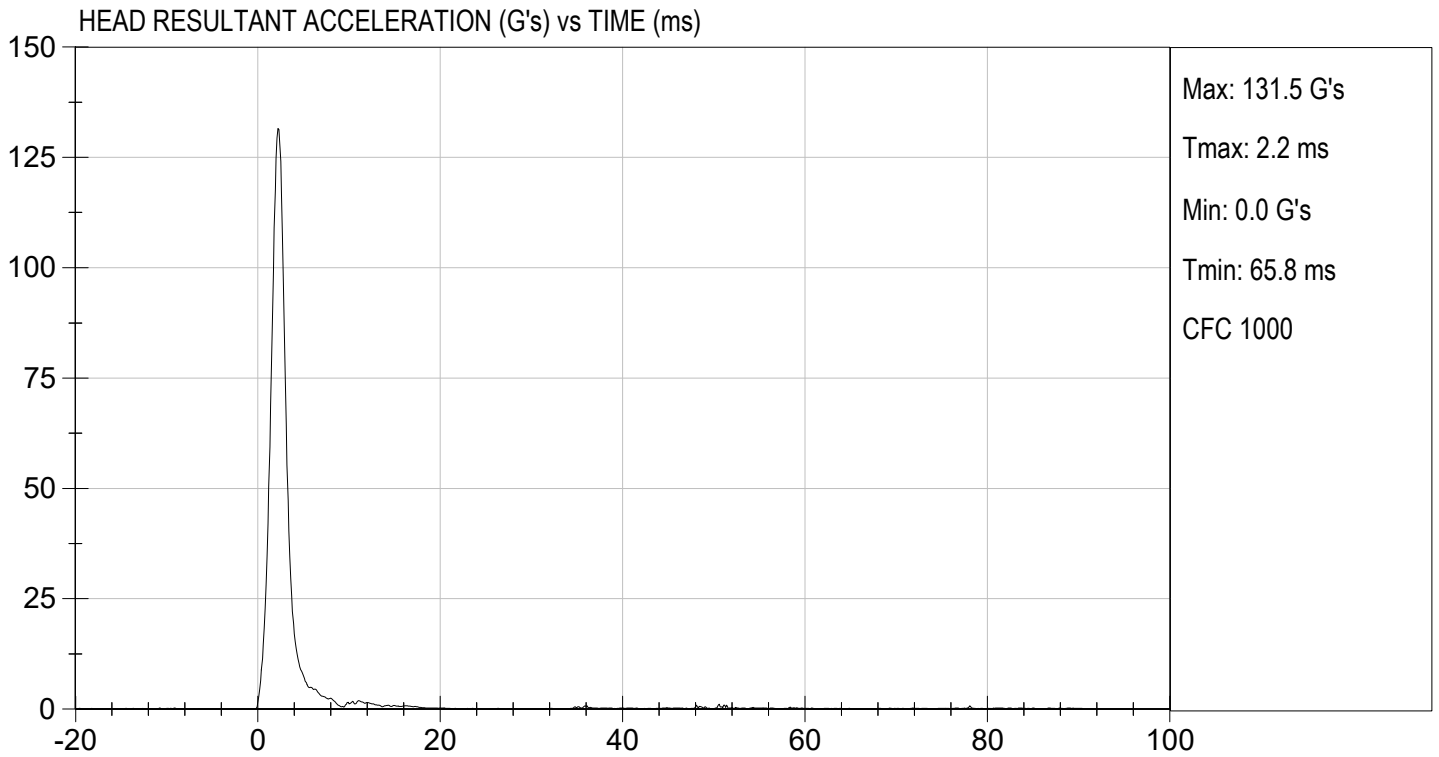
Test ID: D221661

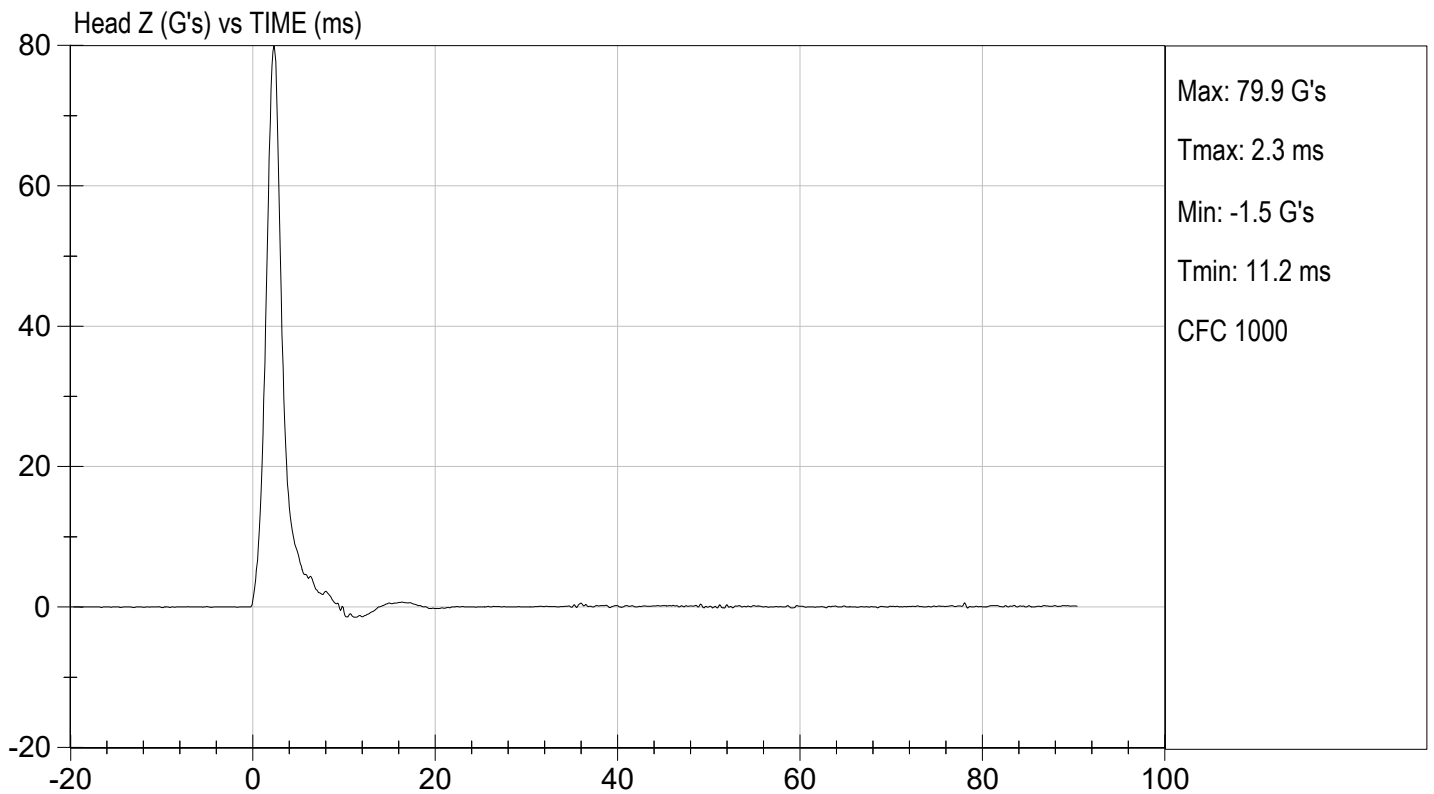
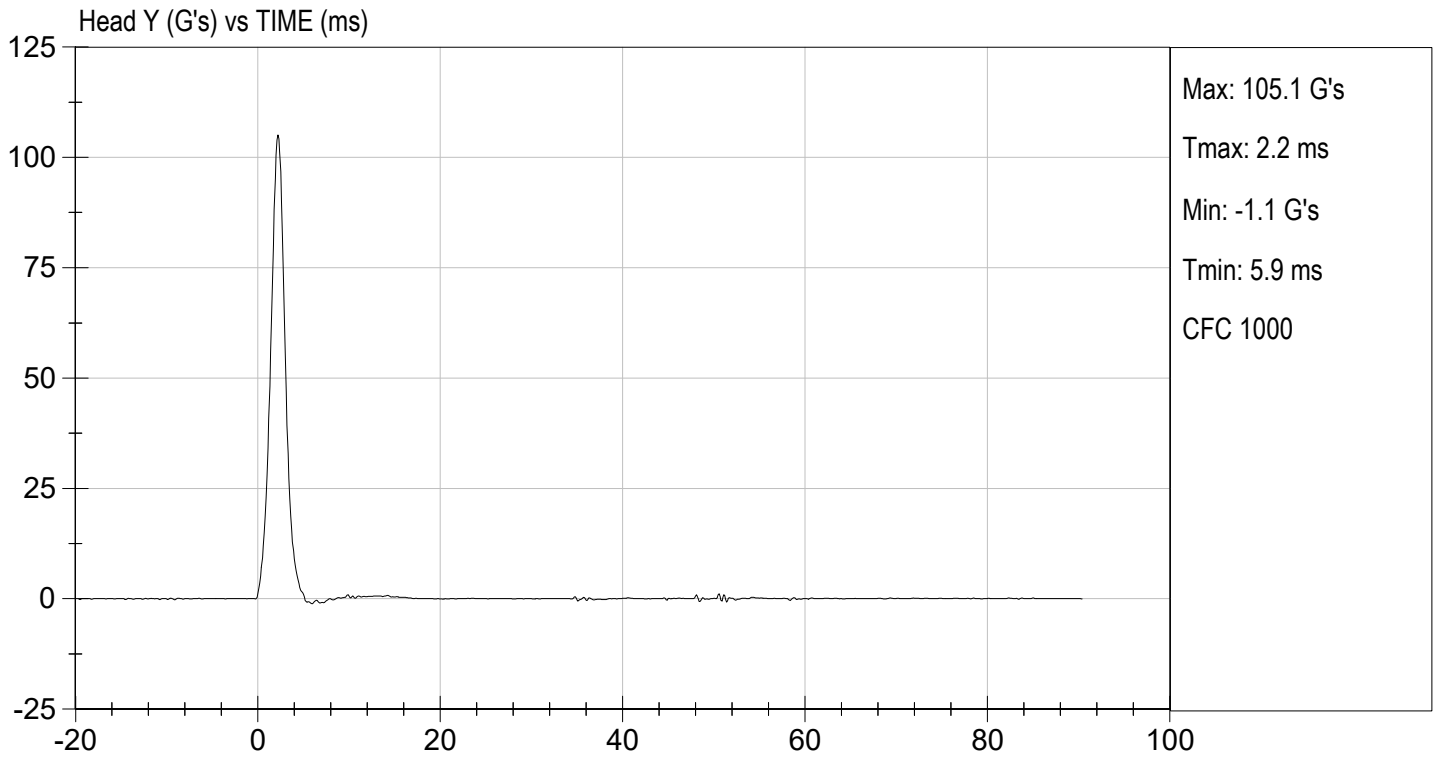
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Peak Resultant Acceleration	G's	115 to 137	132	Pass
Peak Longitudinal Acceleration	G's	+/- 15	2.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

07/18/2022  
 Test Date

  
 Approved By





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

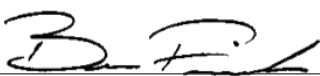
ATD Serial No: 306

Test I.D.: D221662

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	5.63	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.29	Pass
	15 ms	m/s	3.30 to 4.10	3.51	Pass
	20 ms	m/s	4.40 to 5.40	5.07	Pass
	25 ms	m/s	5.40 to 6.10	5.70	Pass
	25-100 ms	m/s	5.50 to 6.20	5.74	Pass
Maximum D-Plane Rotation	deg	71 to 81	74	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	60	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-39	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	110	Pass	
Overall Test Results				Pass	

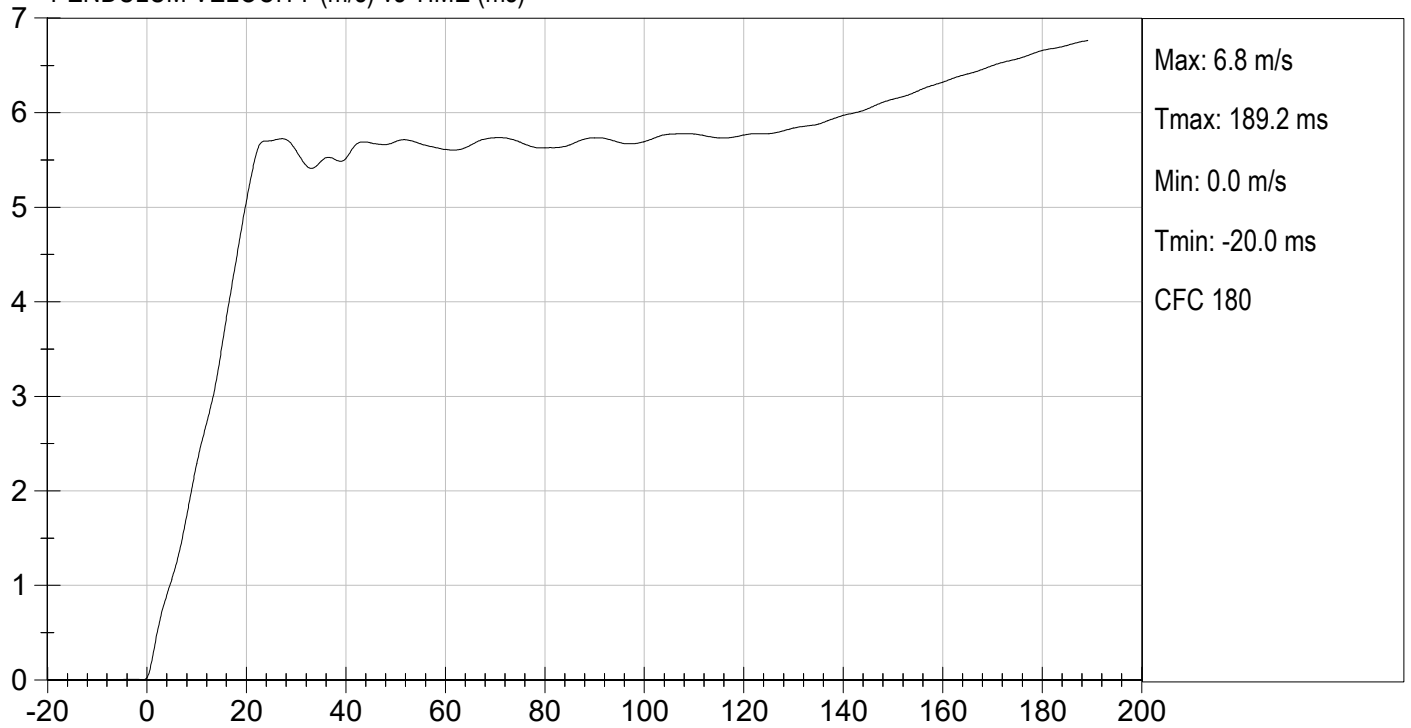
  
Laboratory Technician

07/18/2022  
Test Date

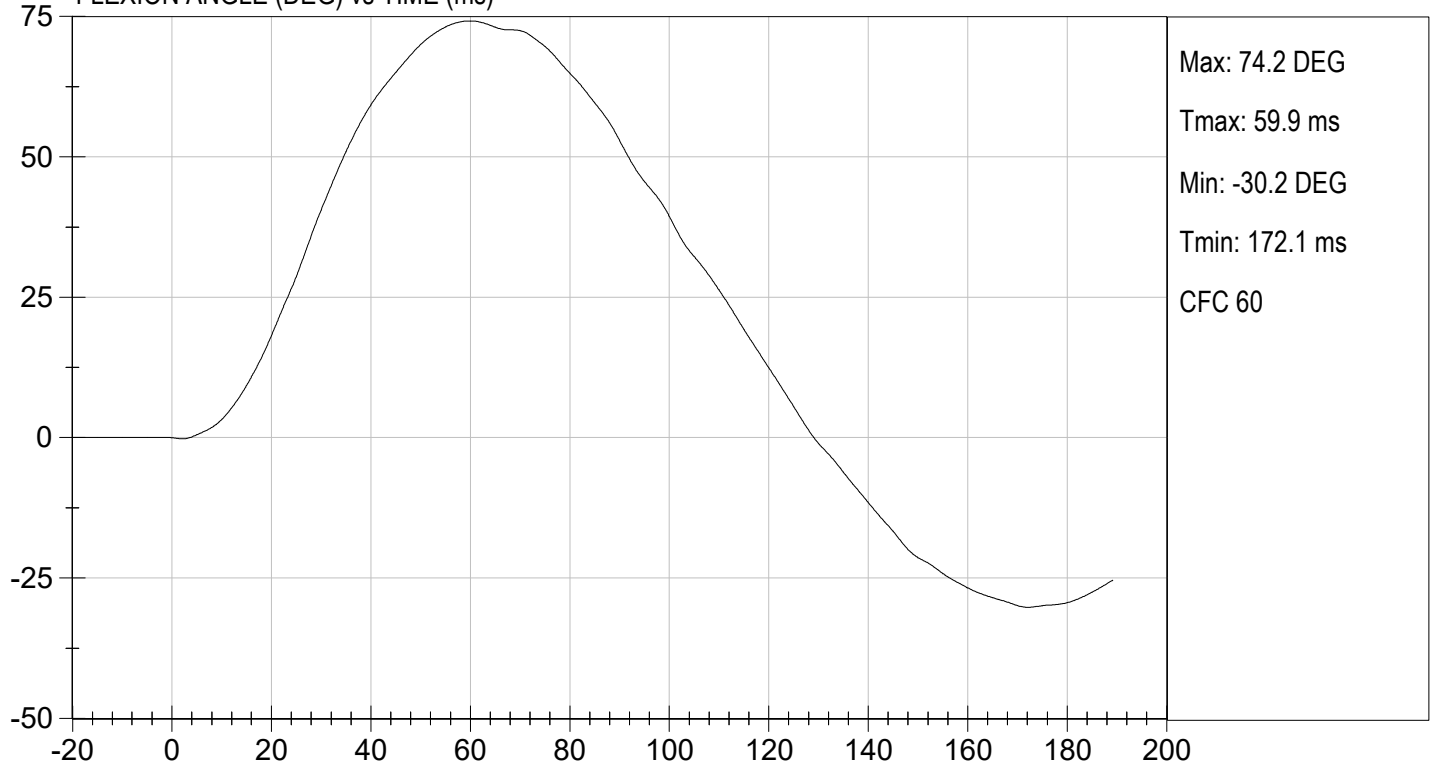
  
Approved By



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



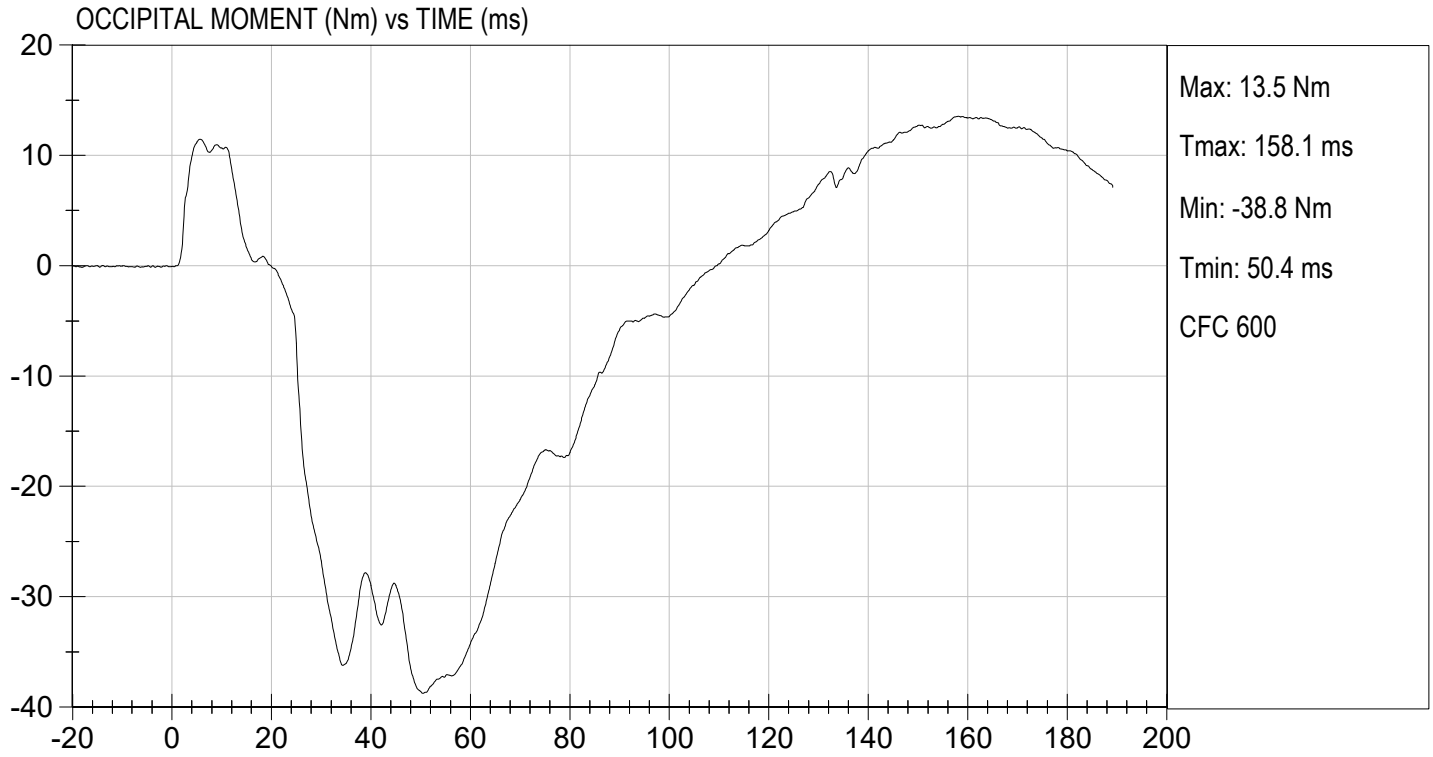
FLEXION ANGLE (DEG) vs TIME (ms)





TEST DESC: NECK BENDING  
VELOCITY: 18.48 ft/s, 5.63 m/s

TEST DATE: 07/18/2022  
TEST #: D221662



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

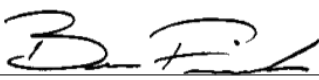
ATD Serial No: 306

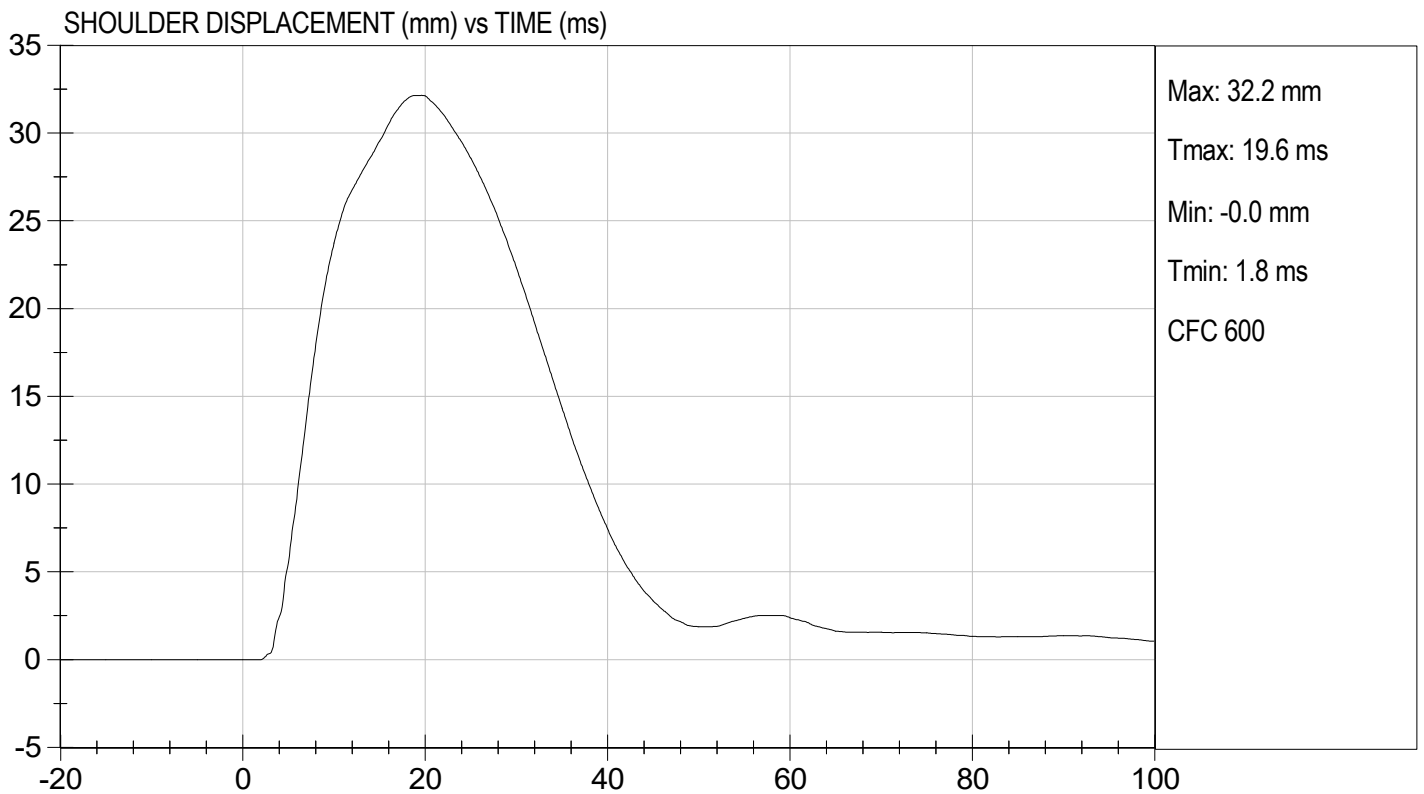
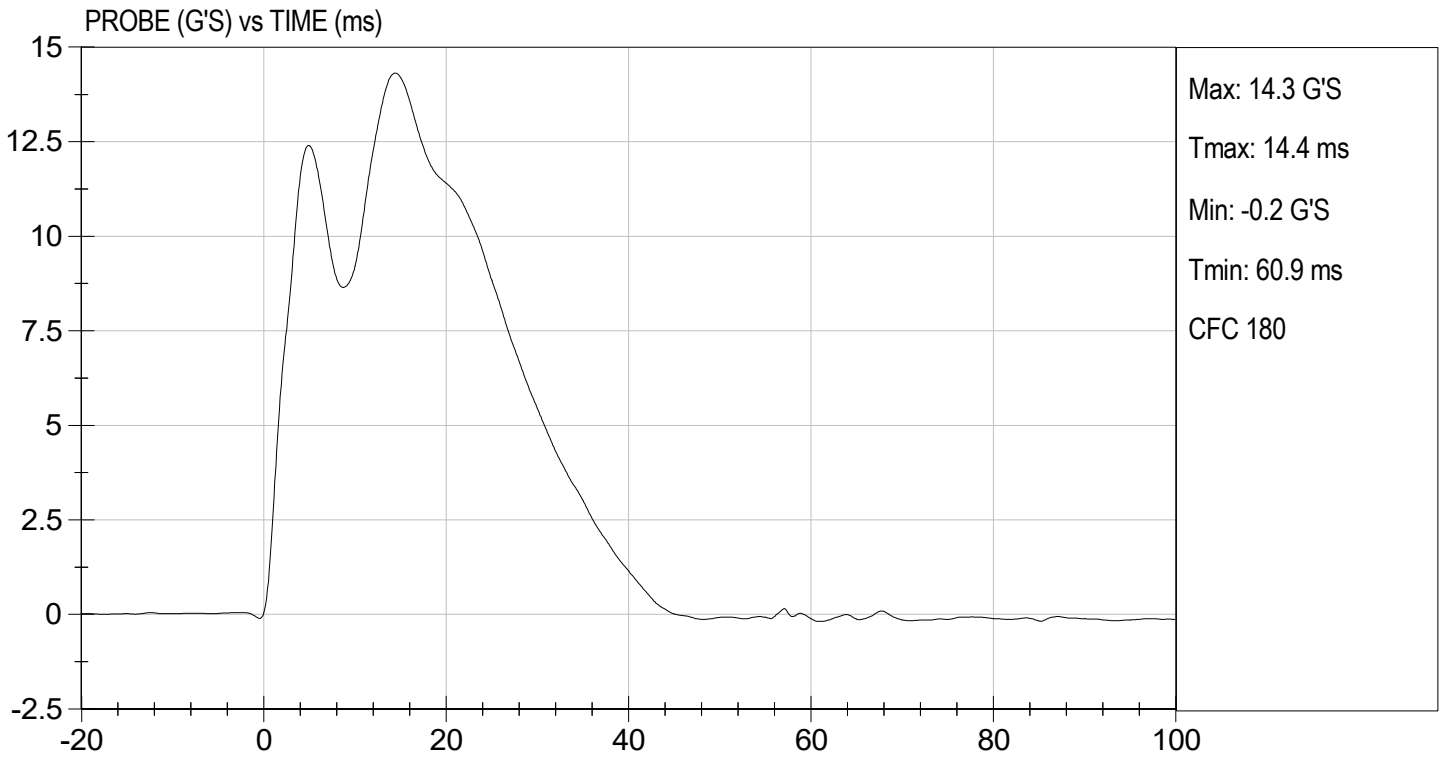
Test ID: D221663

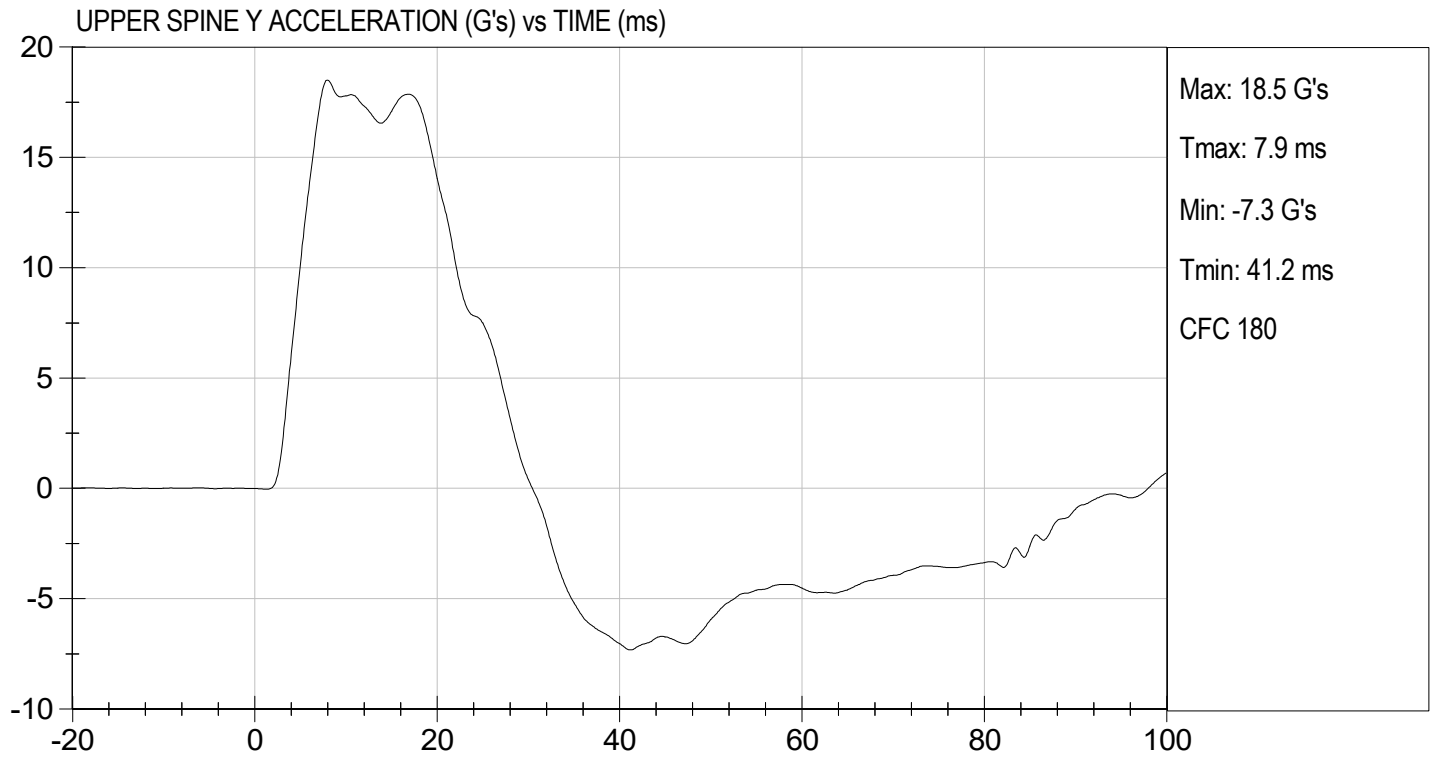
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	14	Pass
Shoulder Displacement	mm	28 to 37	32	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass

  
Laboratory Technician

07/15/2022  
Test Date

  
Approved By





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

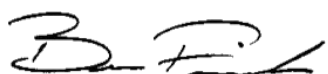
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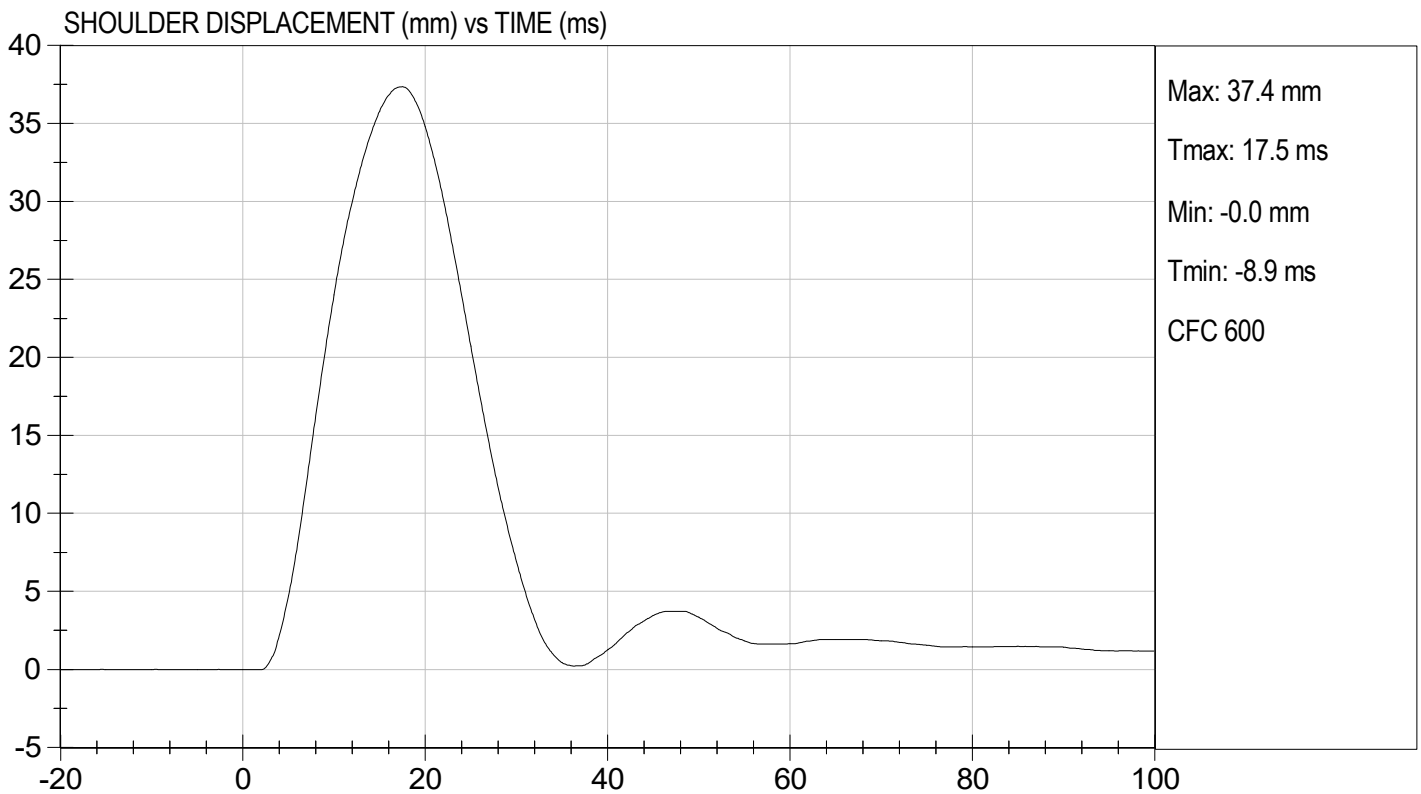
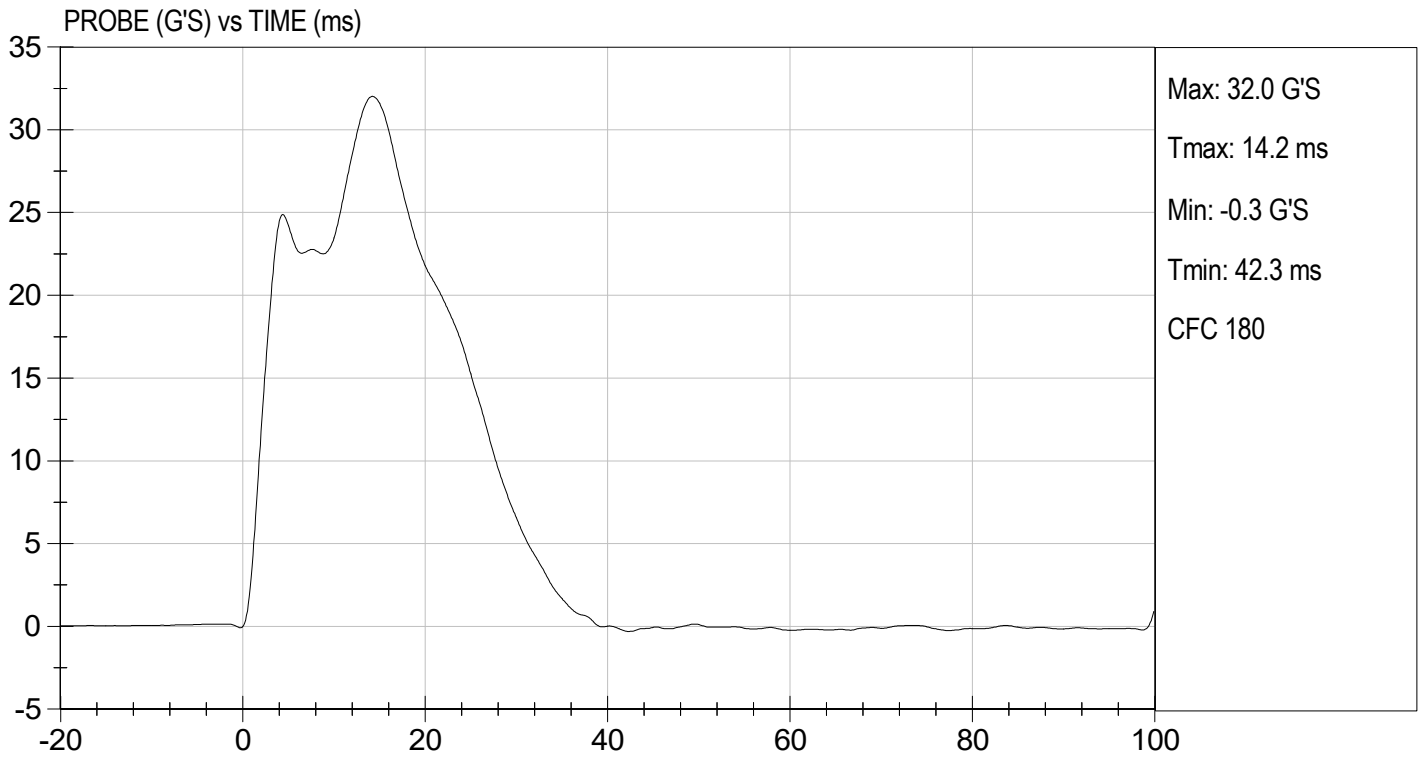
Test I.D: D221664

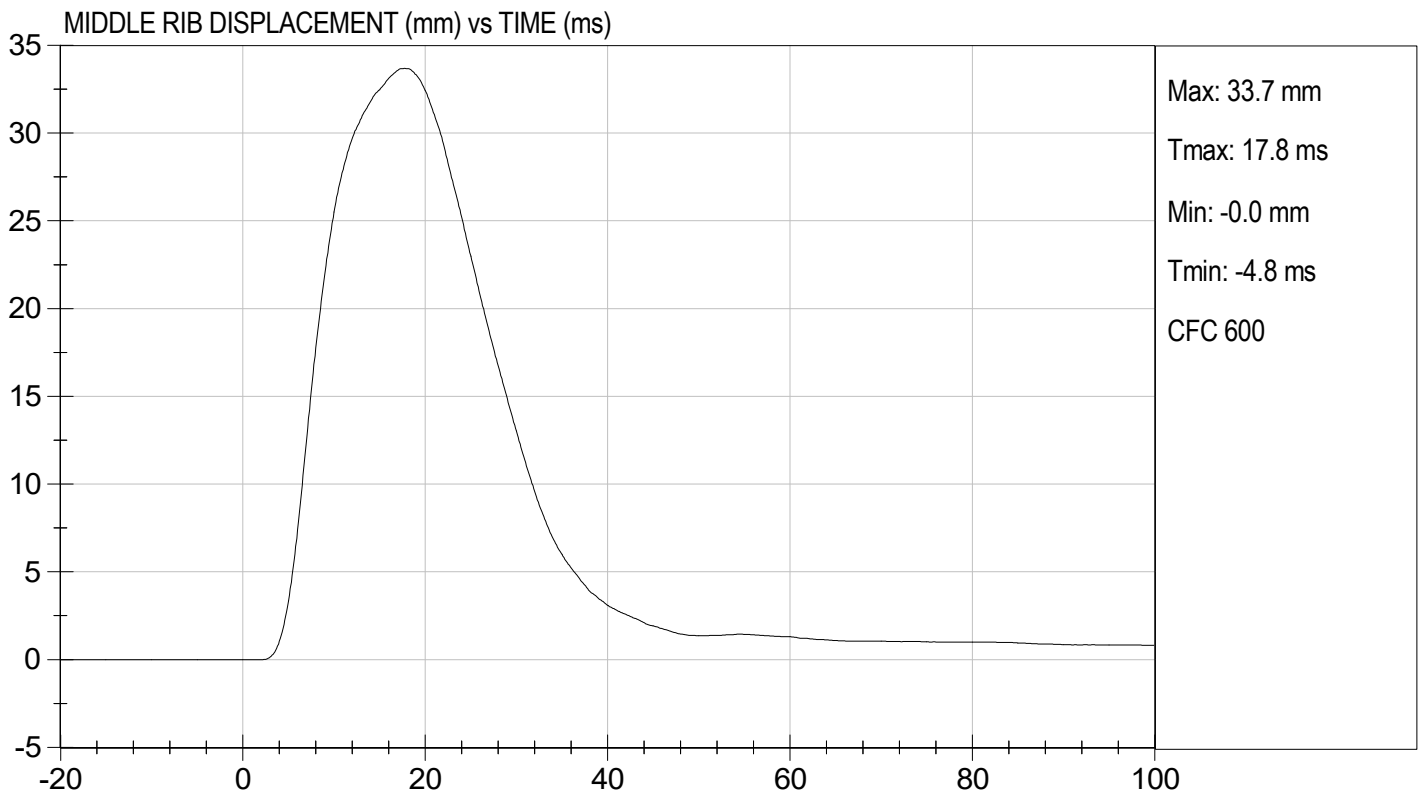
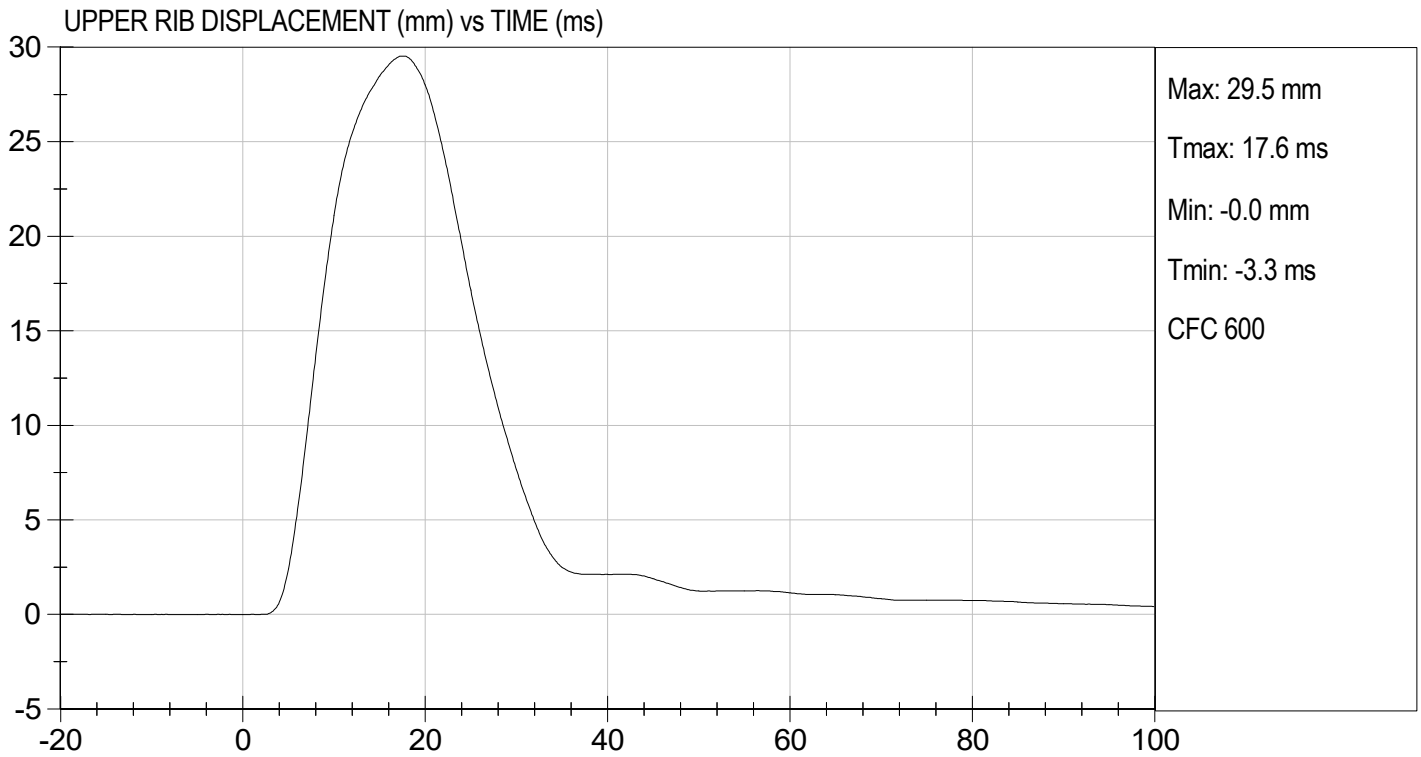
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	37	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle Rib Displacement	mm	30 to 36	34	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results				Pass

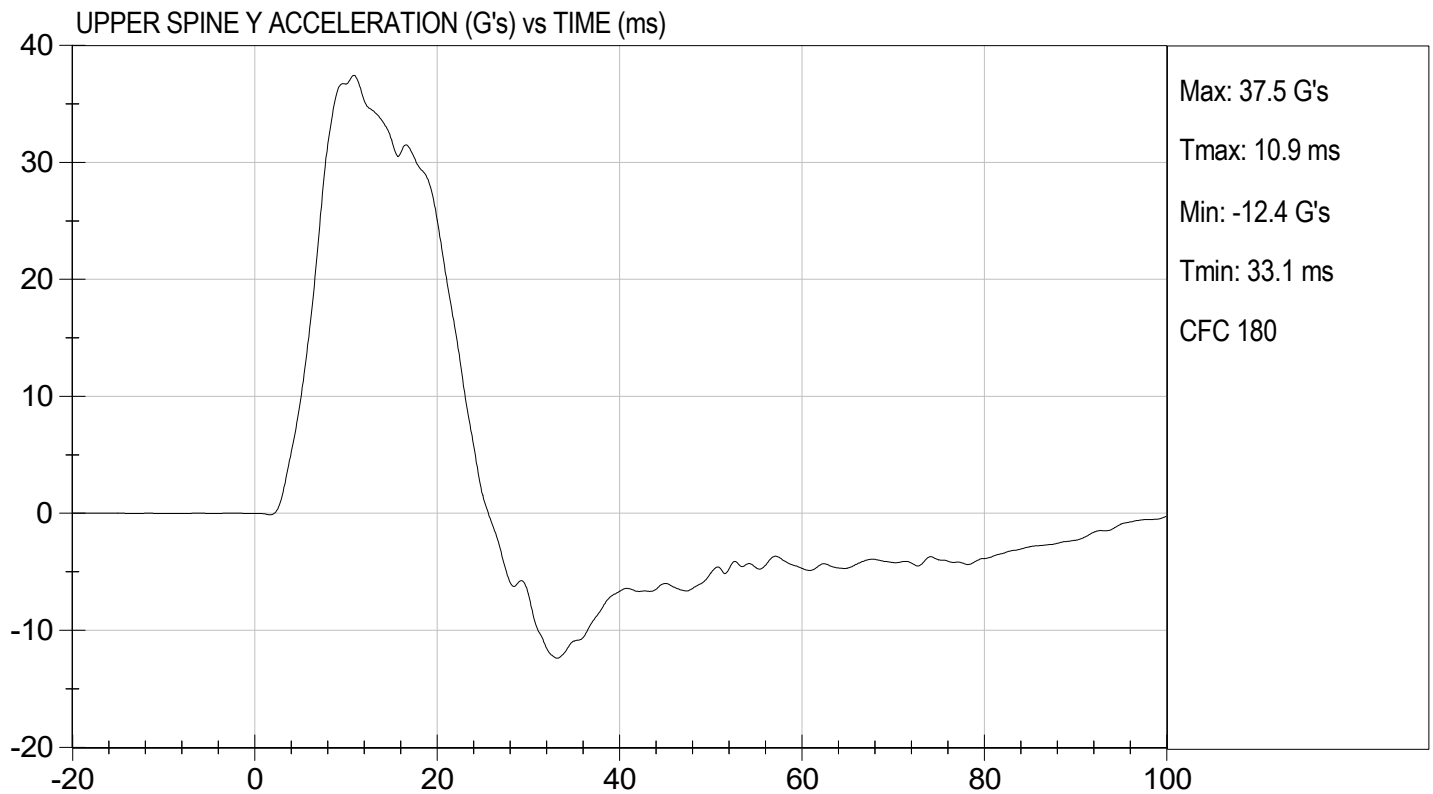
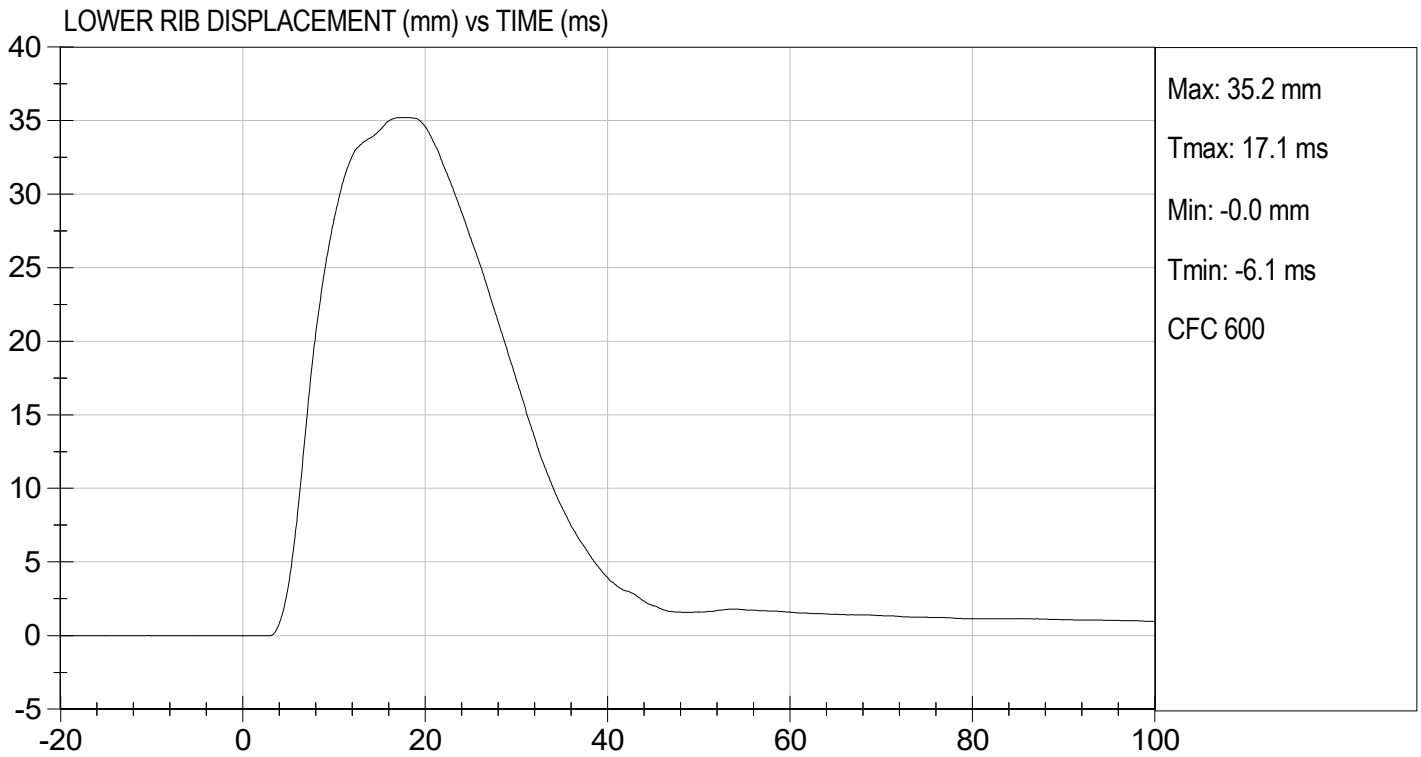
  
Laboratory Technician

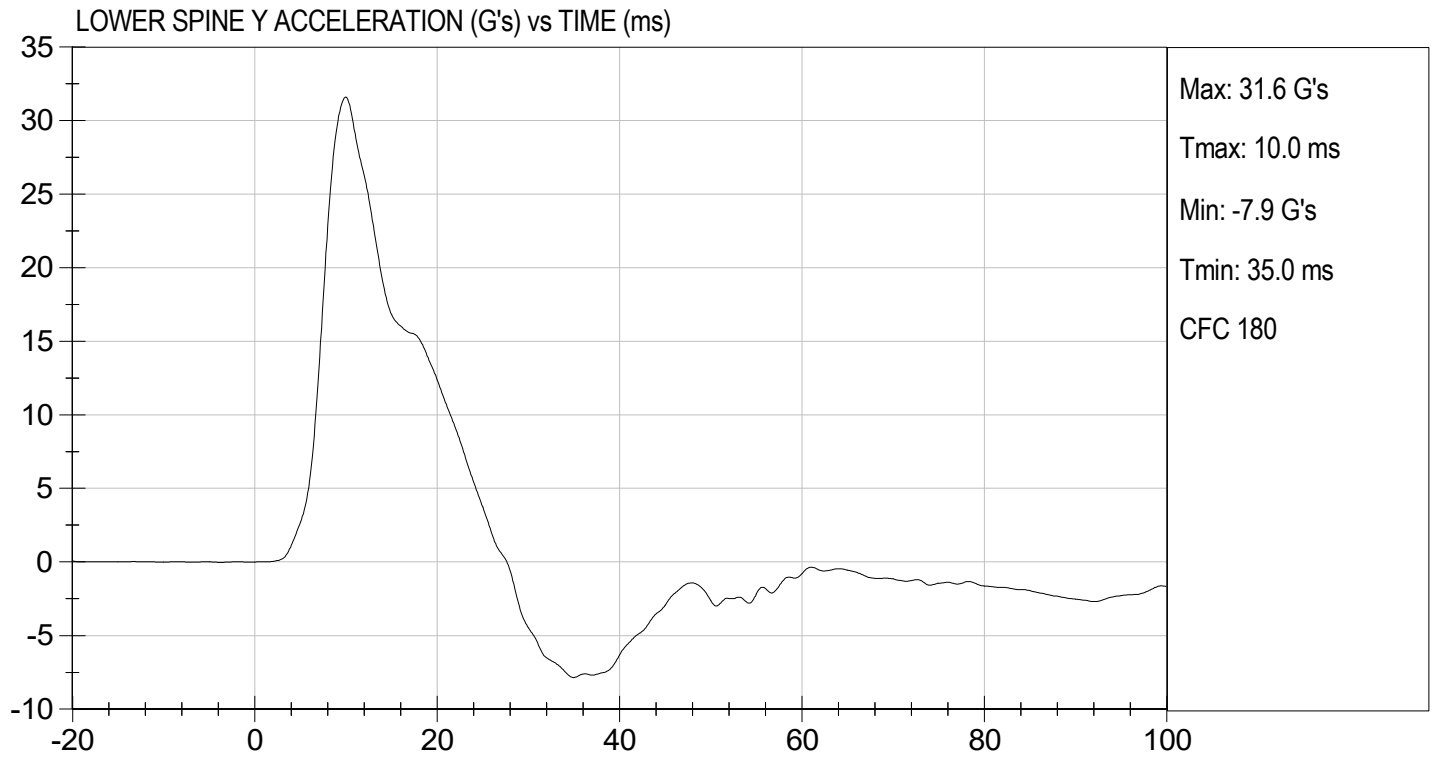
07/15/2022  
Test Date

  
Approved By









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

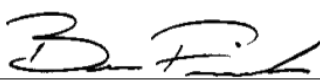
ATD Serial No: 306

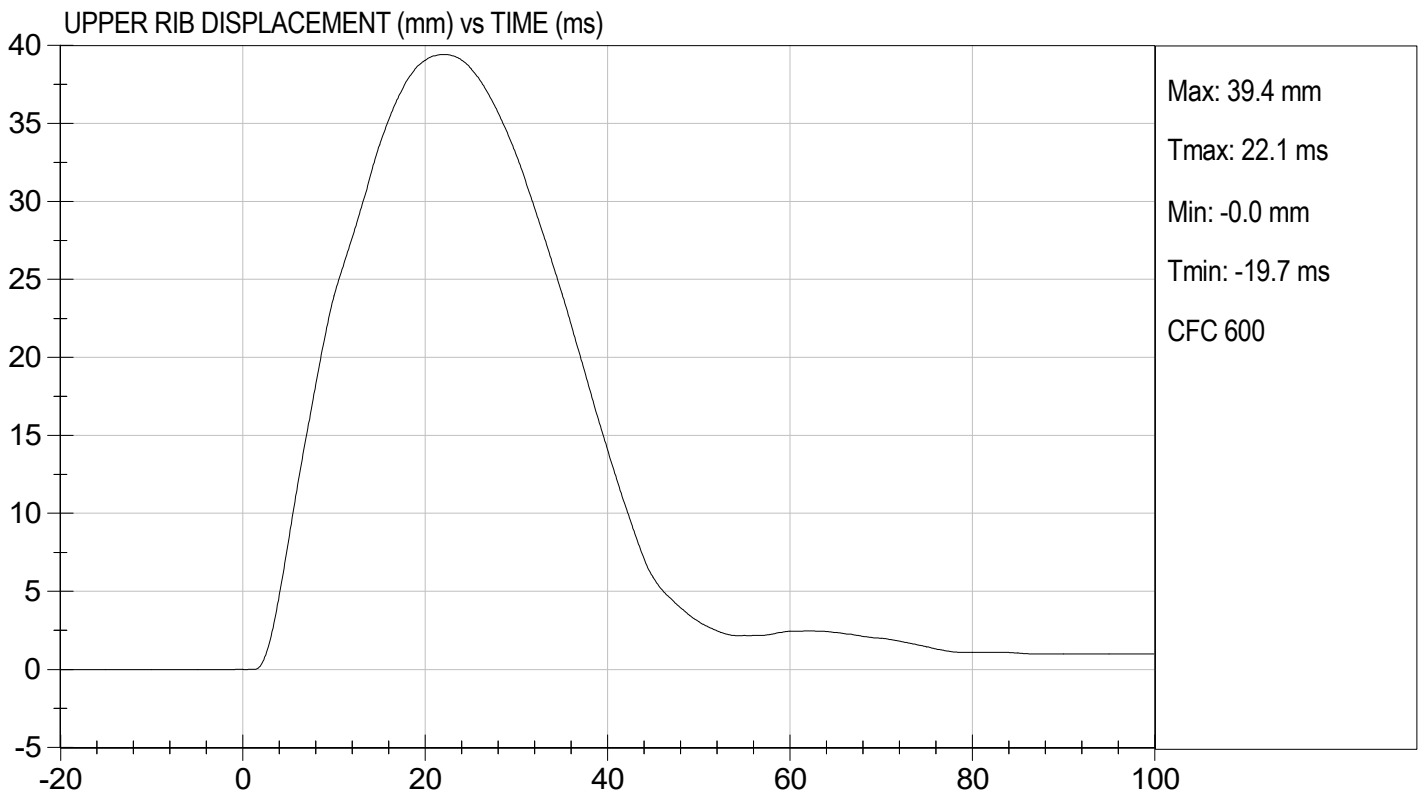
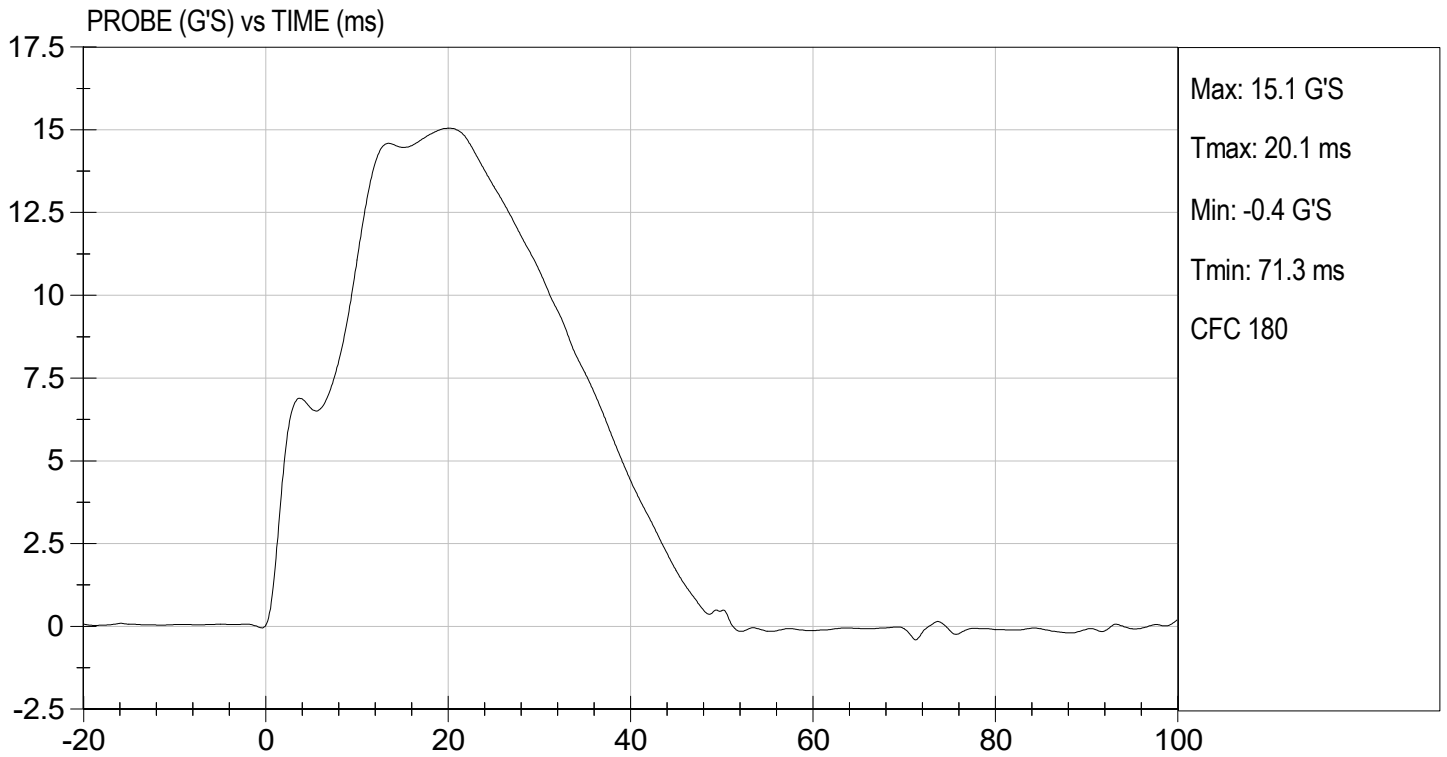
Test I.D: D221665

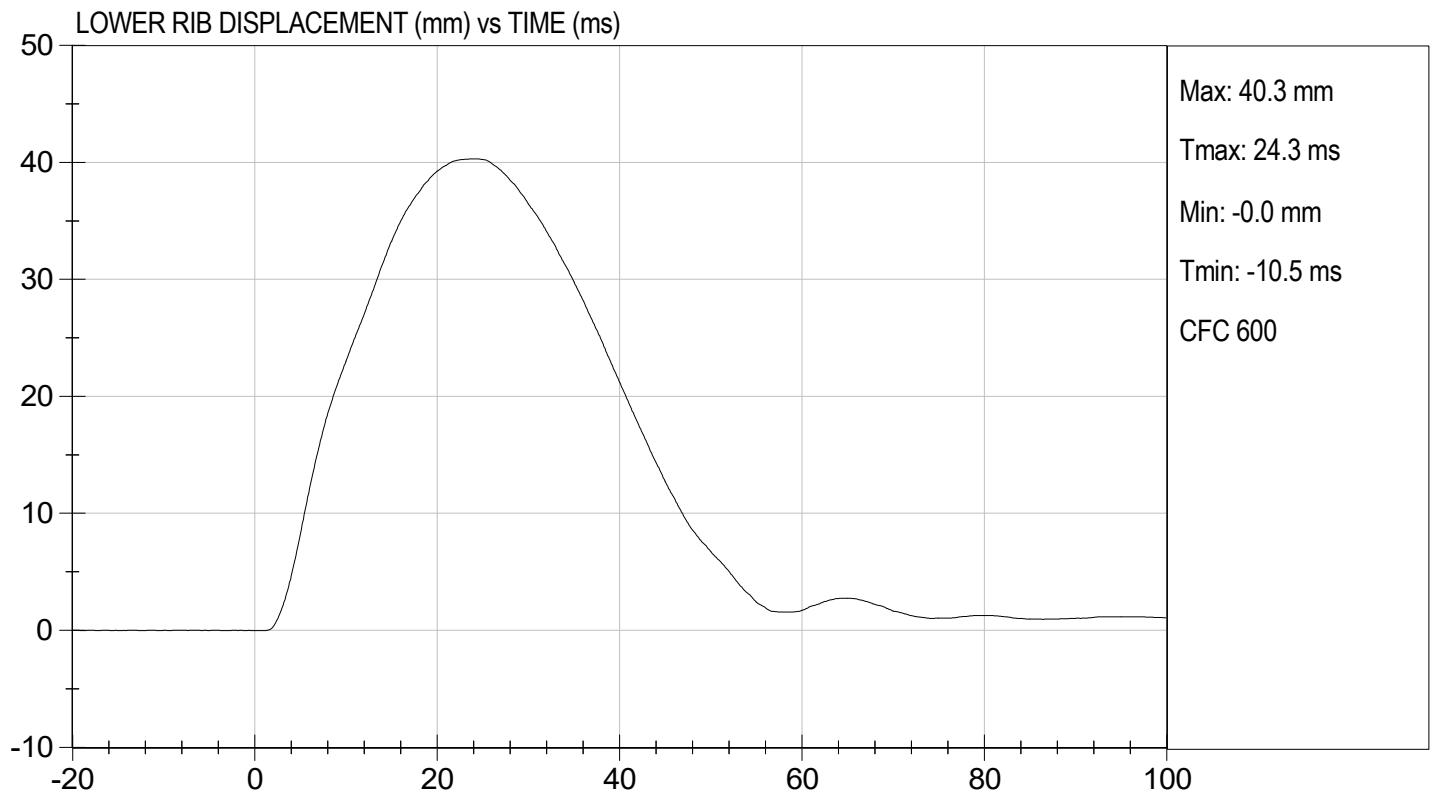
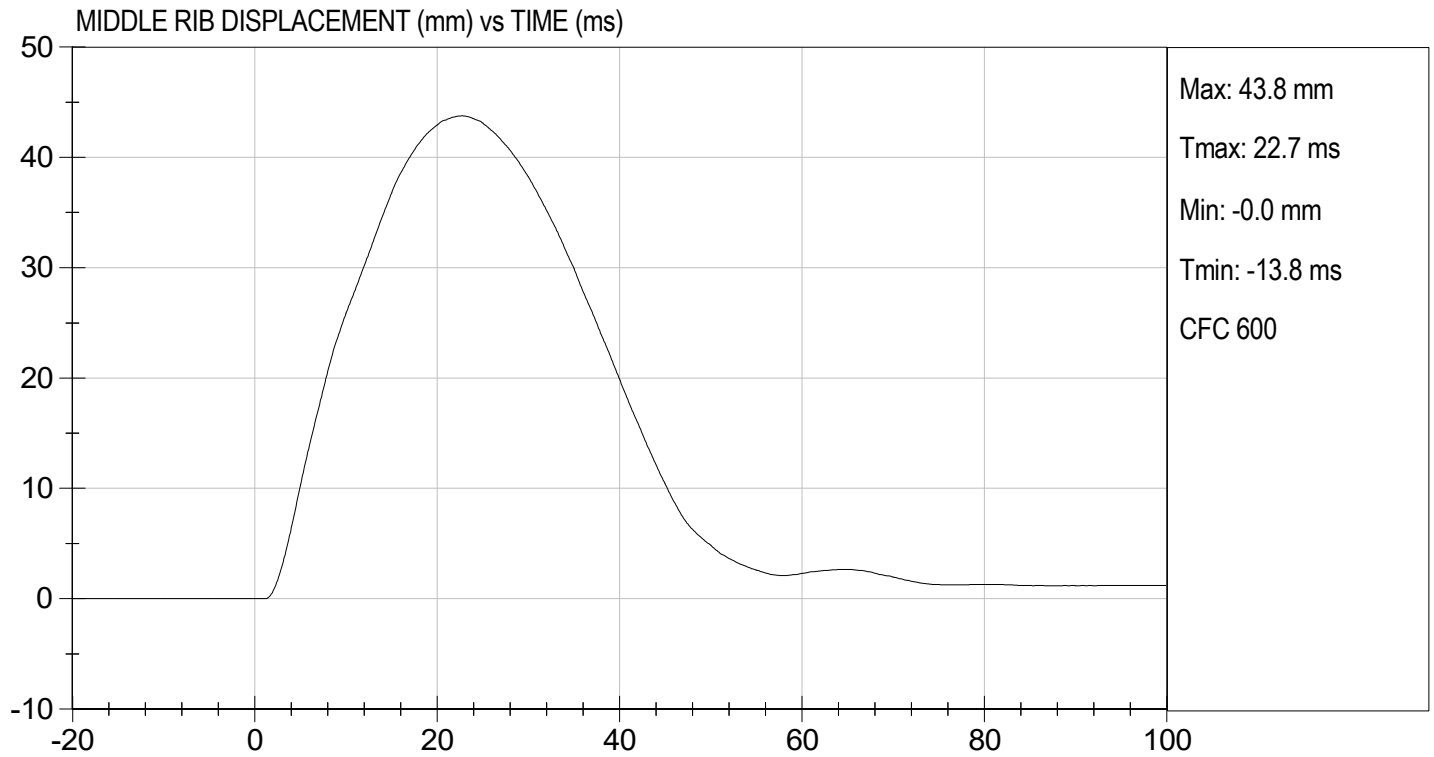
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	44	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass

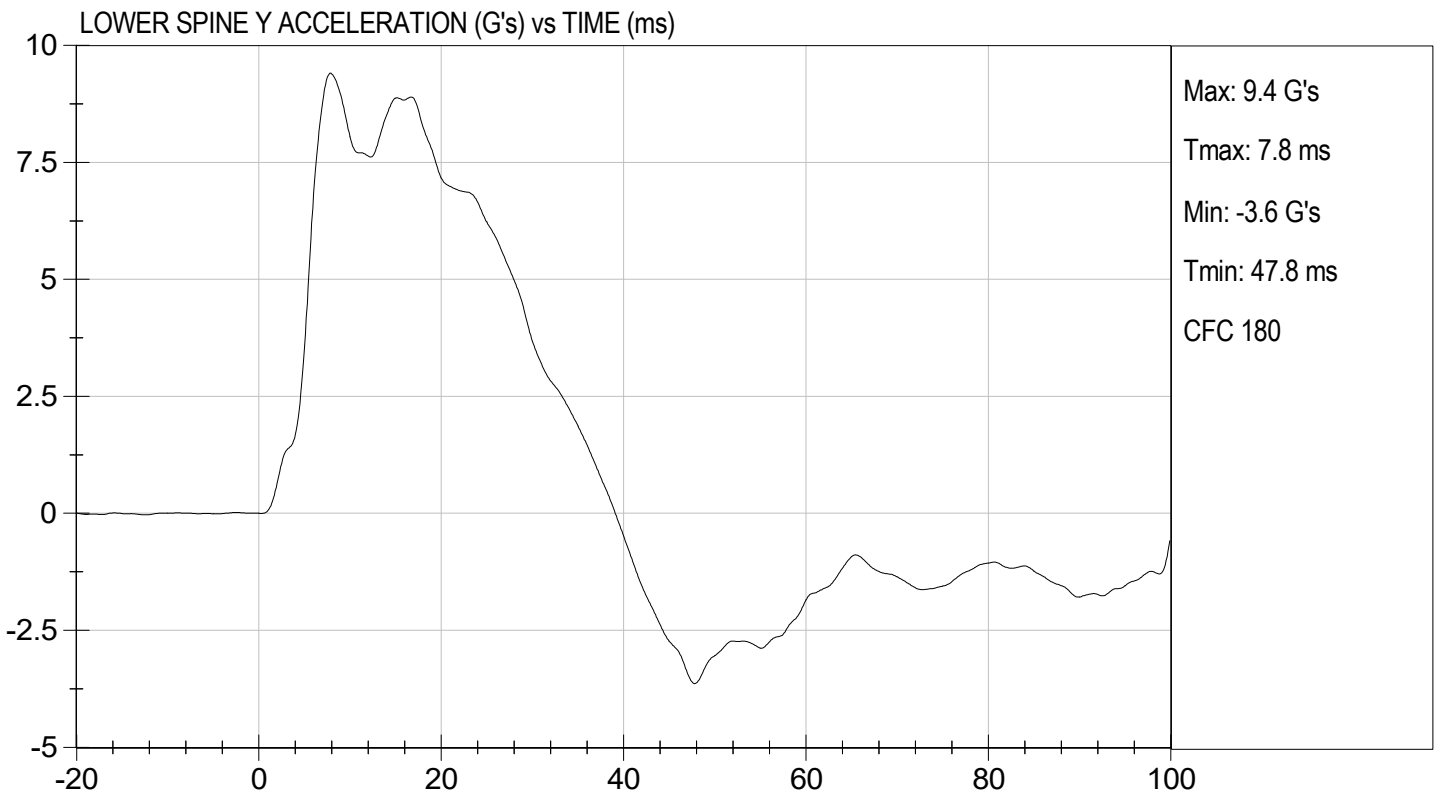
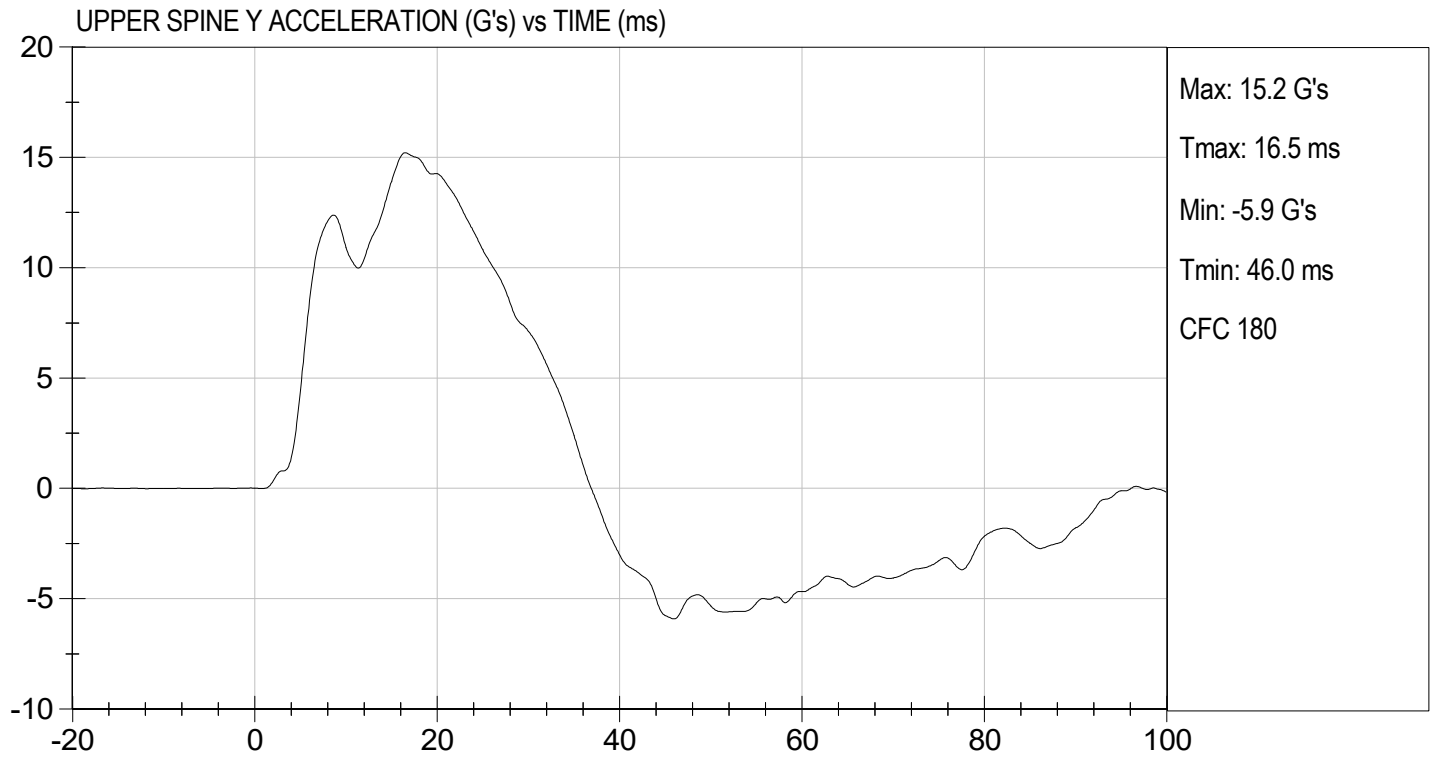
  
 Laboratory Technician

07/15/2022  
 Test Date

  
 Approved By







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

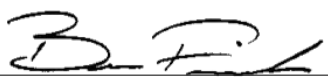
ATD Serial No: 306

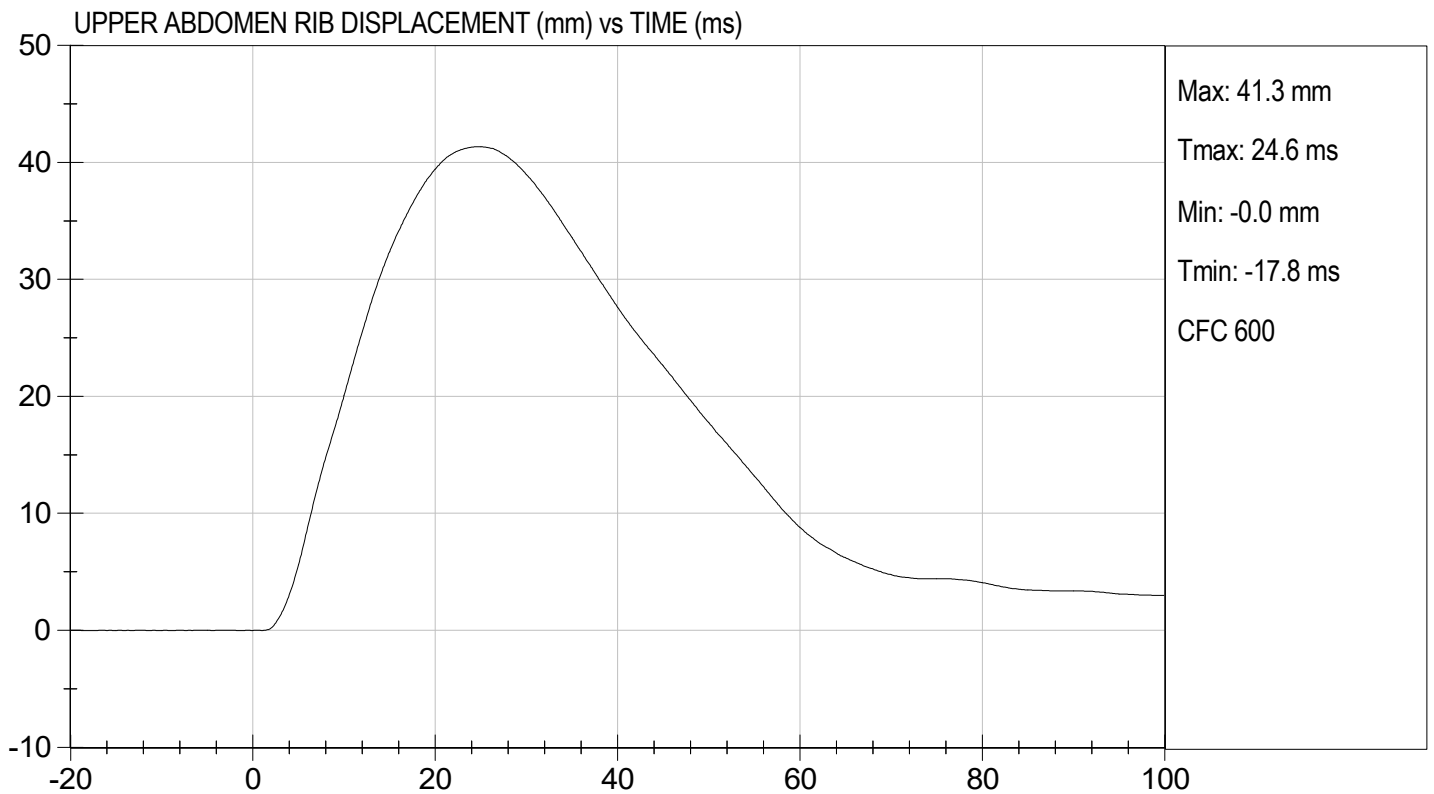
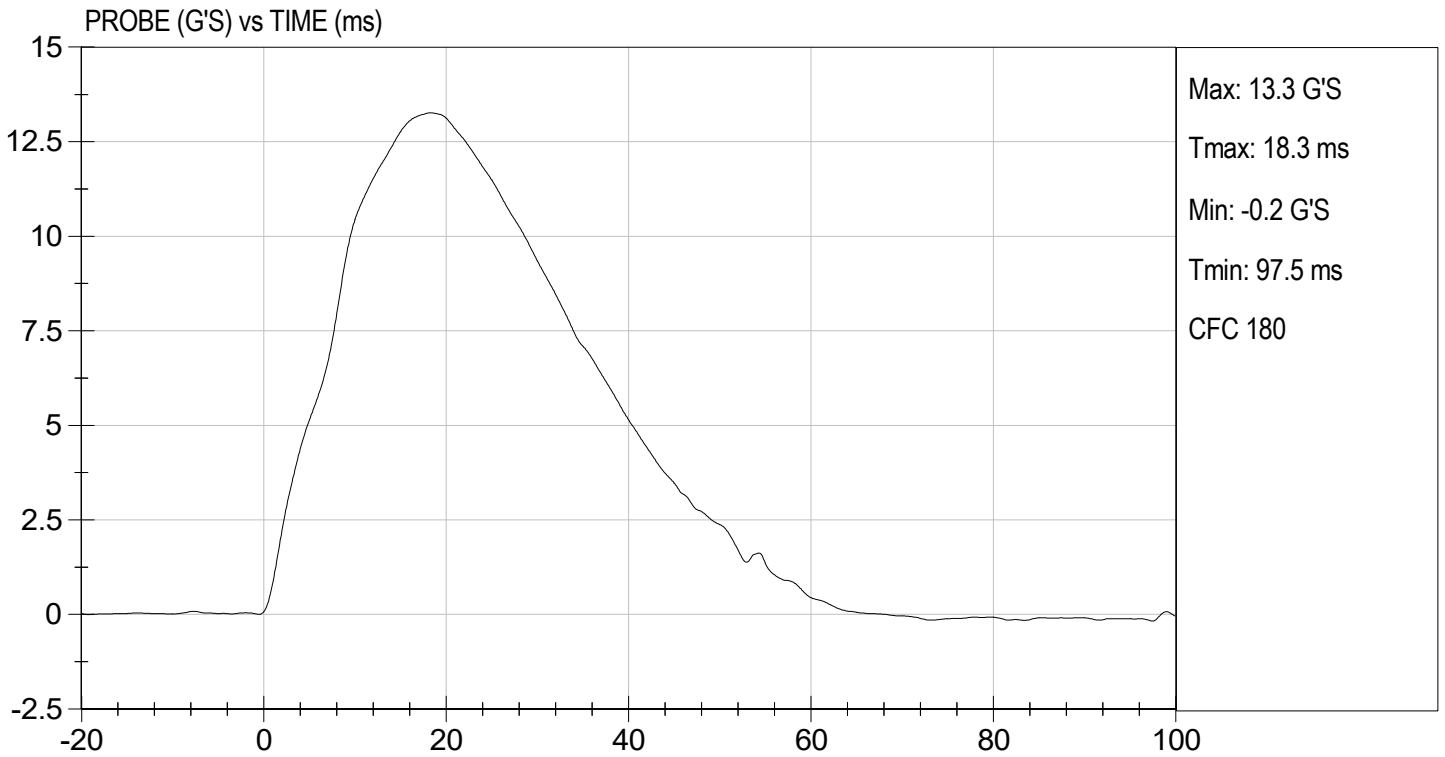
Test I.D: D221666

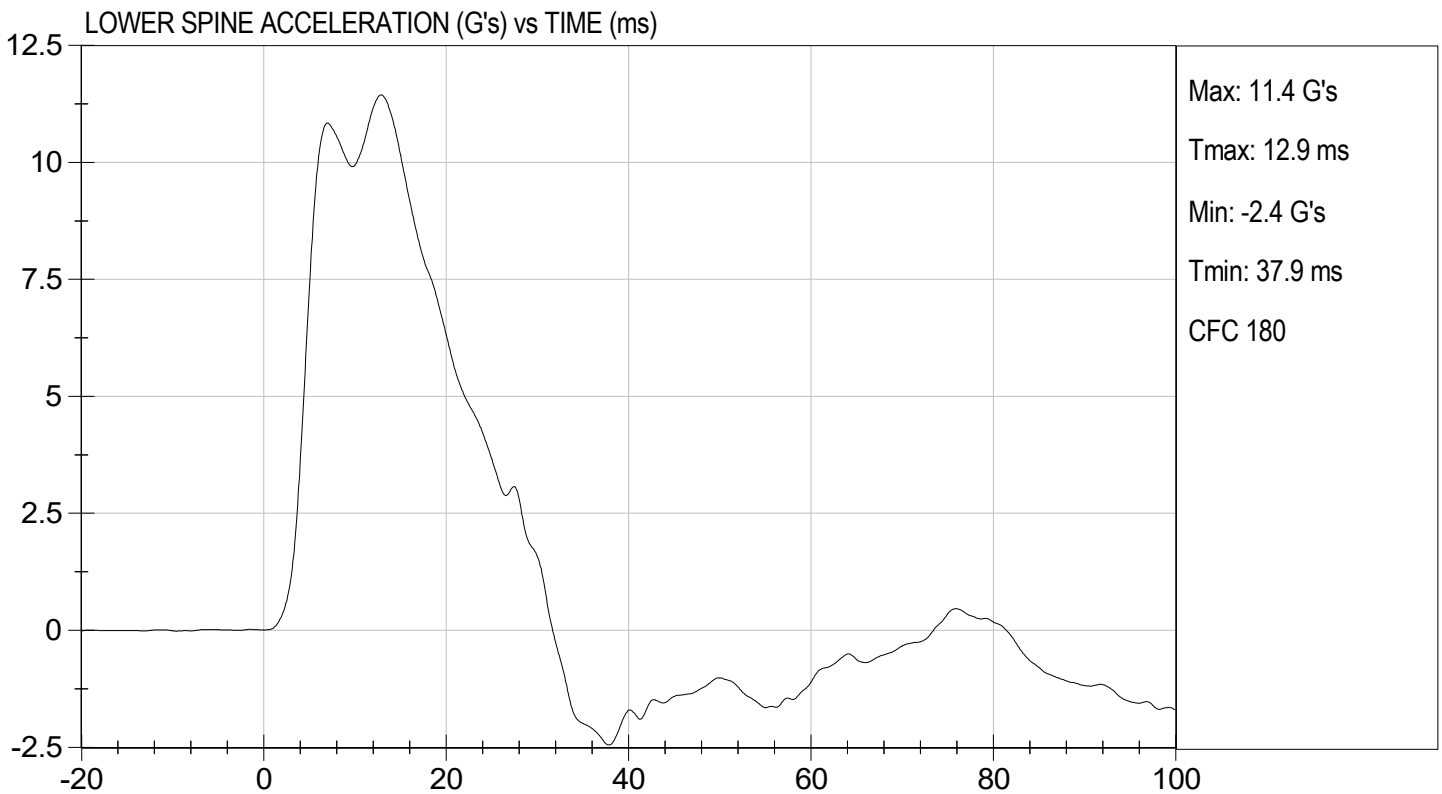
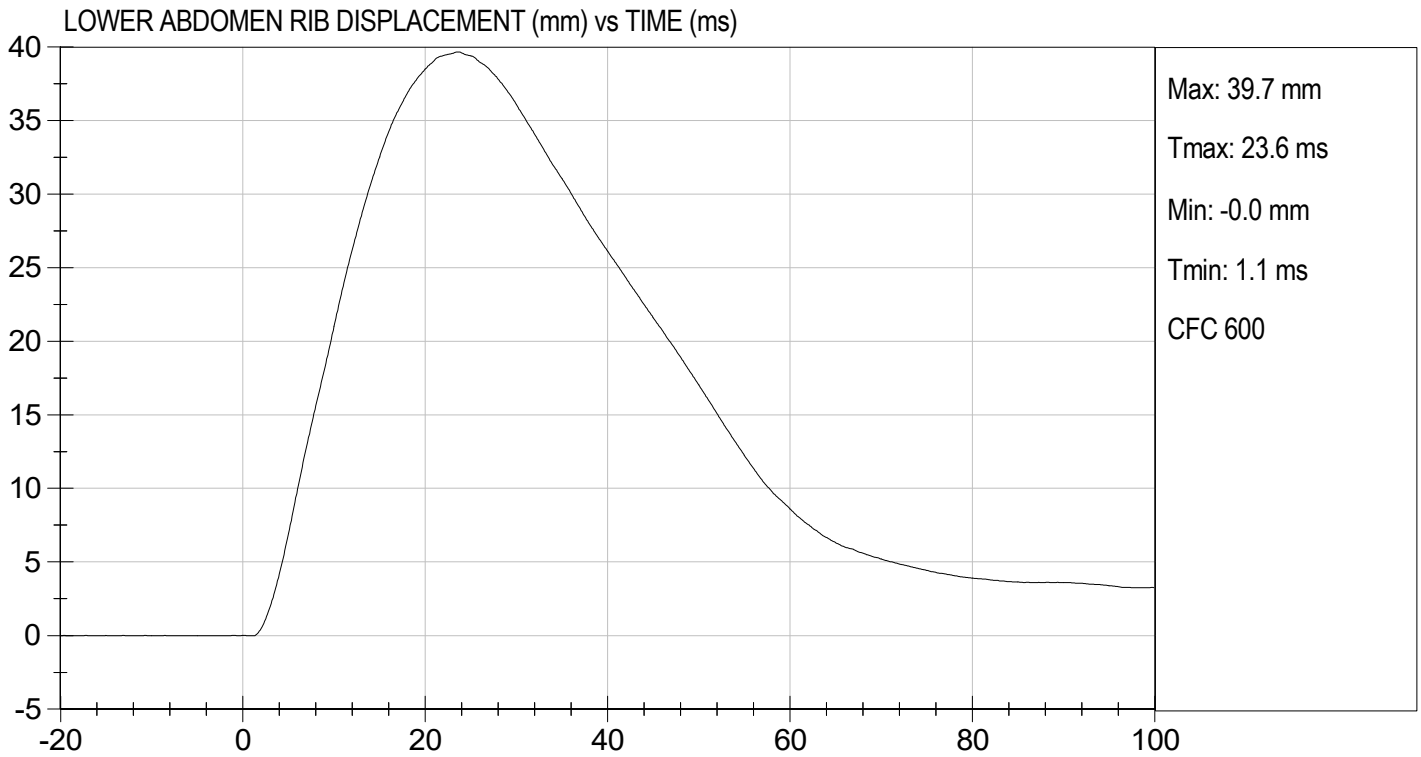
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	40	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

  
 Laboratory Technician

07/15/2022  
 Test Date

  
 Approved By





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

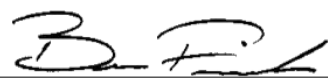
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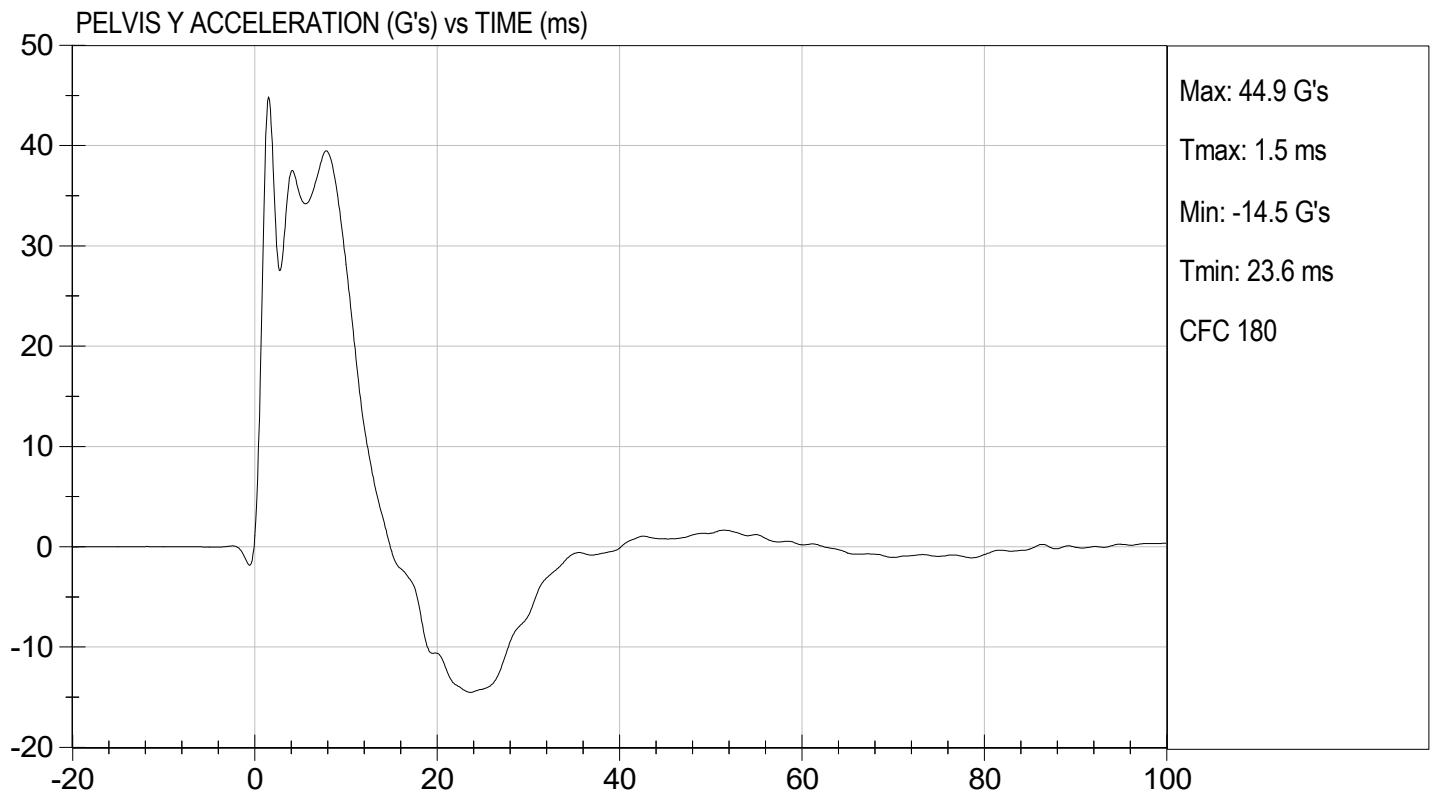
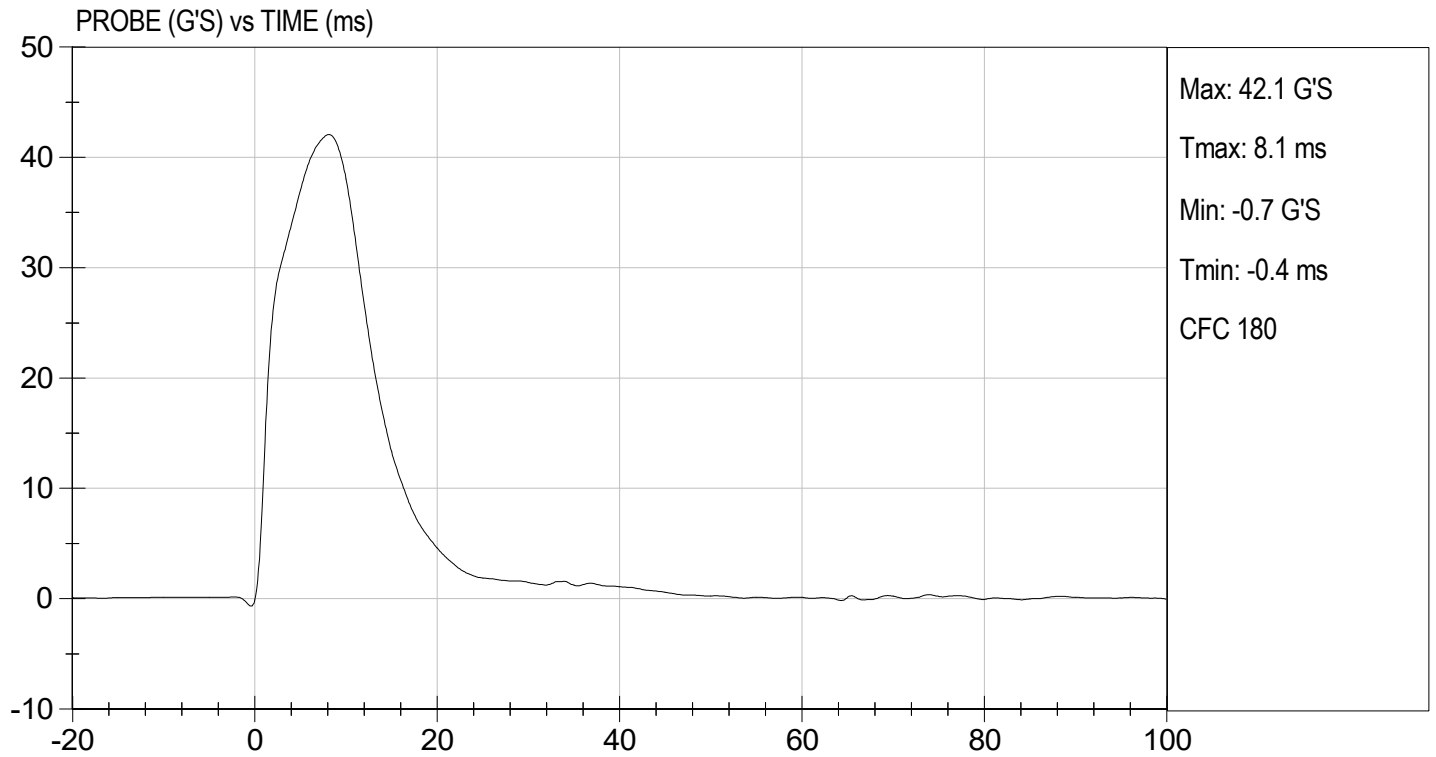
Test I.D: D221667

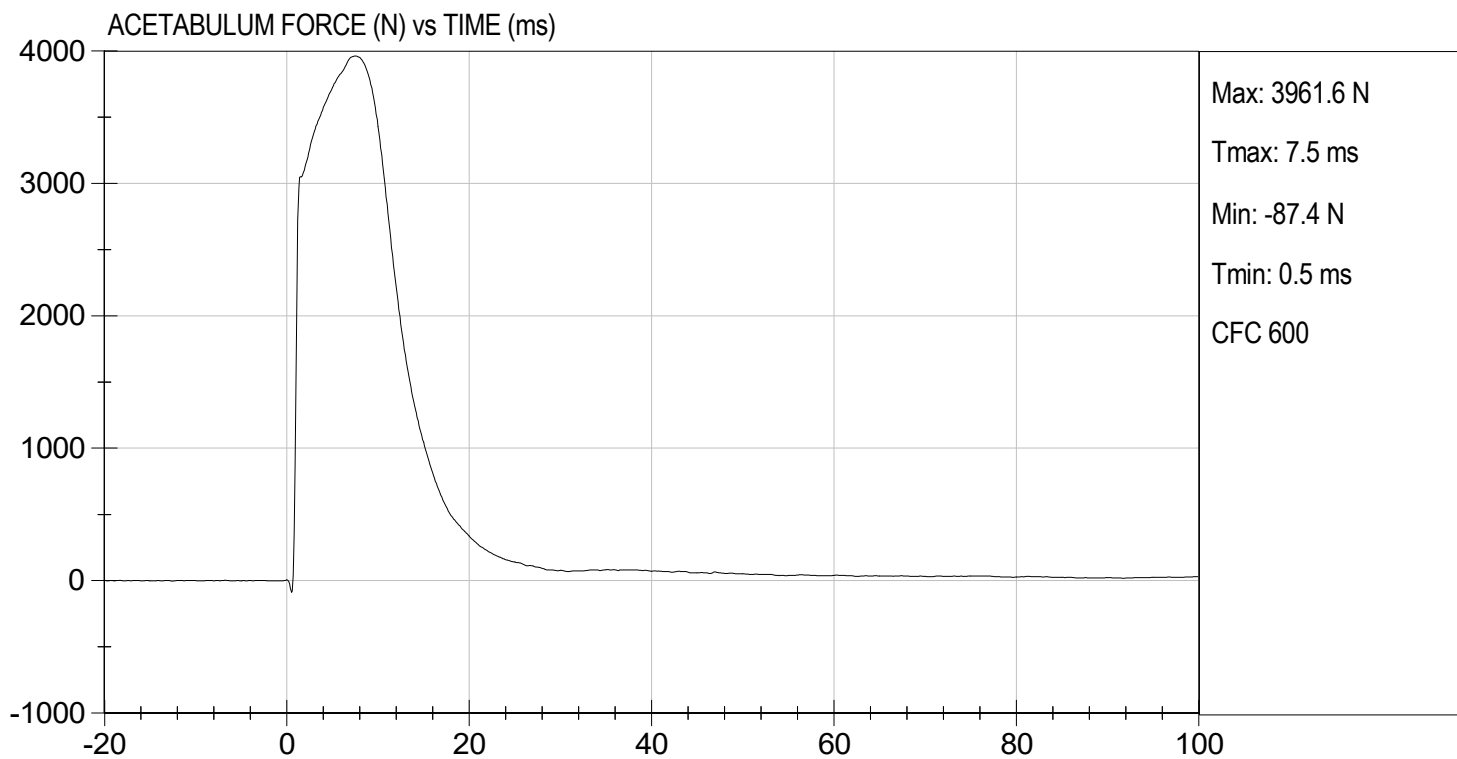
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3,962	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

07/15/2022  
 Test Date

  
 Approved By





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

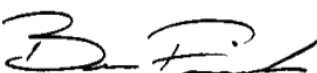
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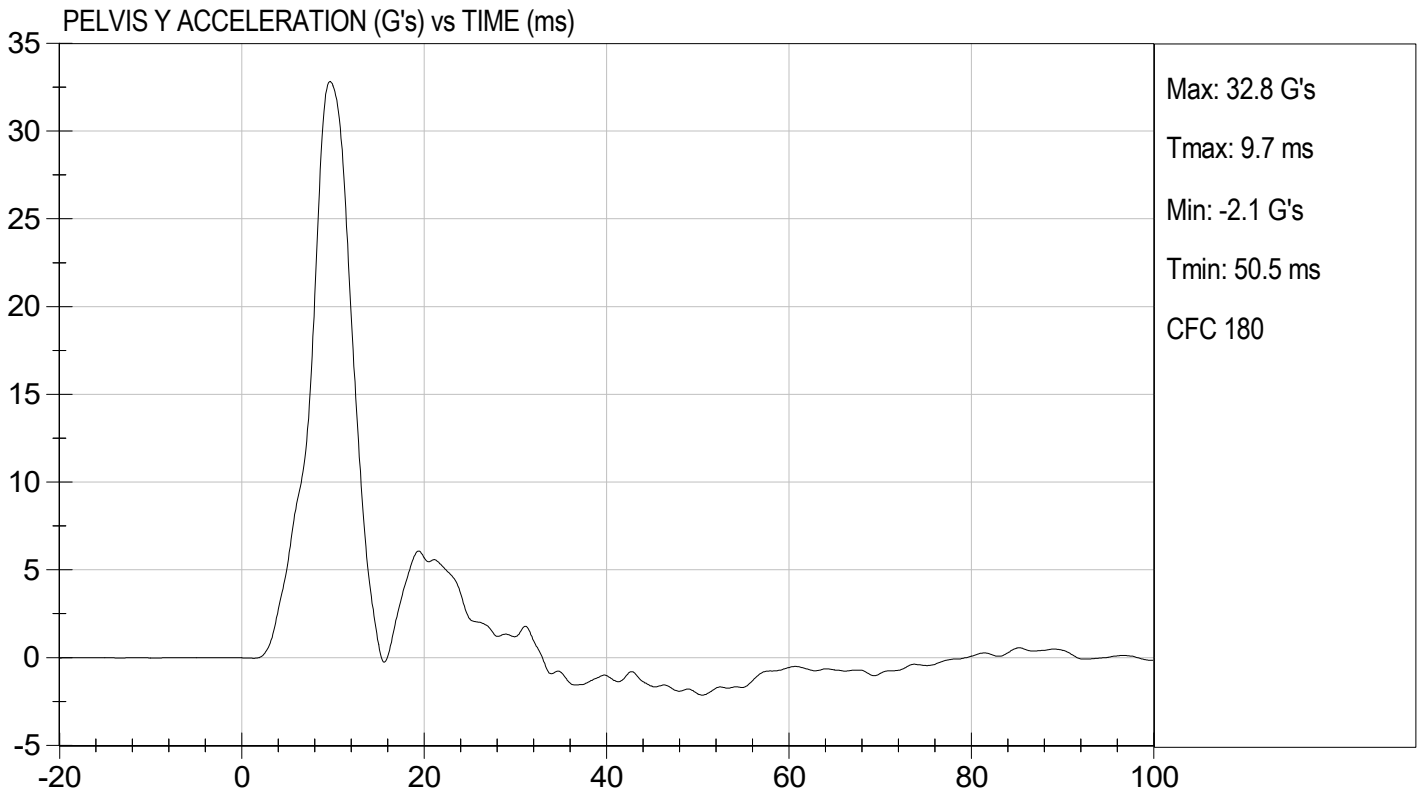
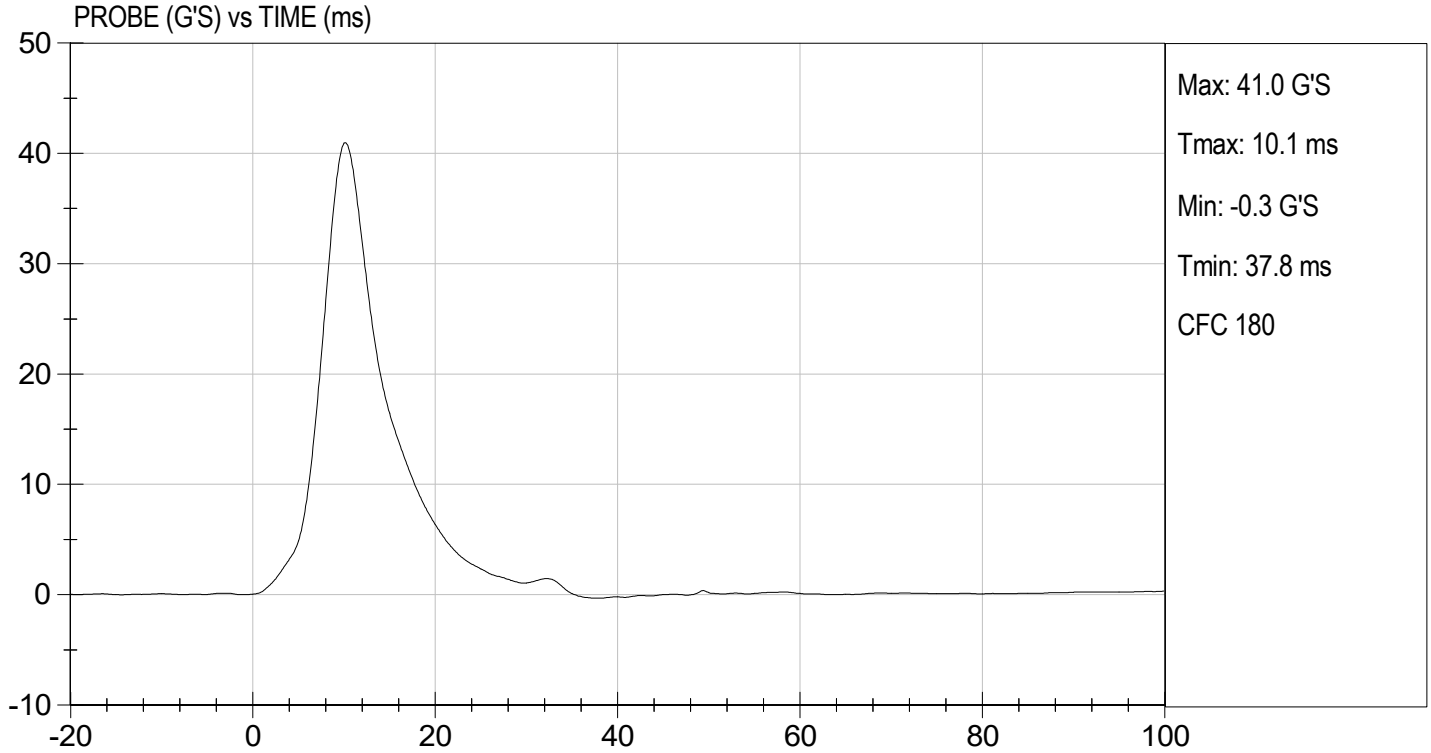
Test I.D: D221668

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	36 to 45	41	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,721	Pass
Overall Test Results				Pass

  
 Laboratory Technician

07/15/2022  
 Test Date

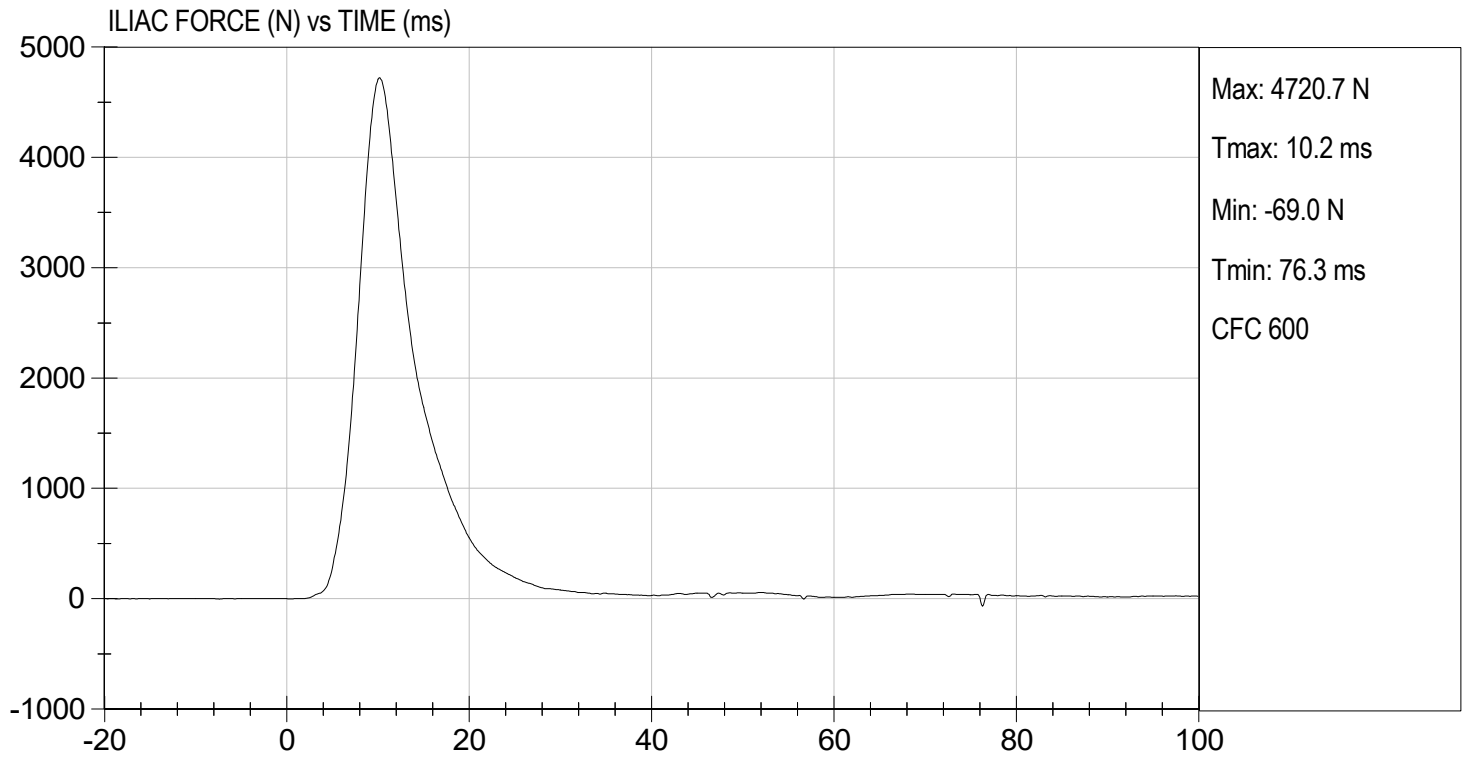
  
 Approved By





TEST DESC: ILLIAC  
VELOCITY: 14.00 ft/s, 4.27 m/s

TEST DATE: 07/15/2022  
TEST #: D221668



**CALIBRATION TEST RESULTS**

**POST-TEST**

**SID-IIS 5<sup>TH</sup> PERCENTILE FEMALE - DRIVER ATD**

**SID-IIsD External Measurements**  
**SN: 306**

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

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

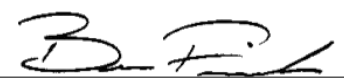
ATD Serial No: 306

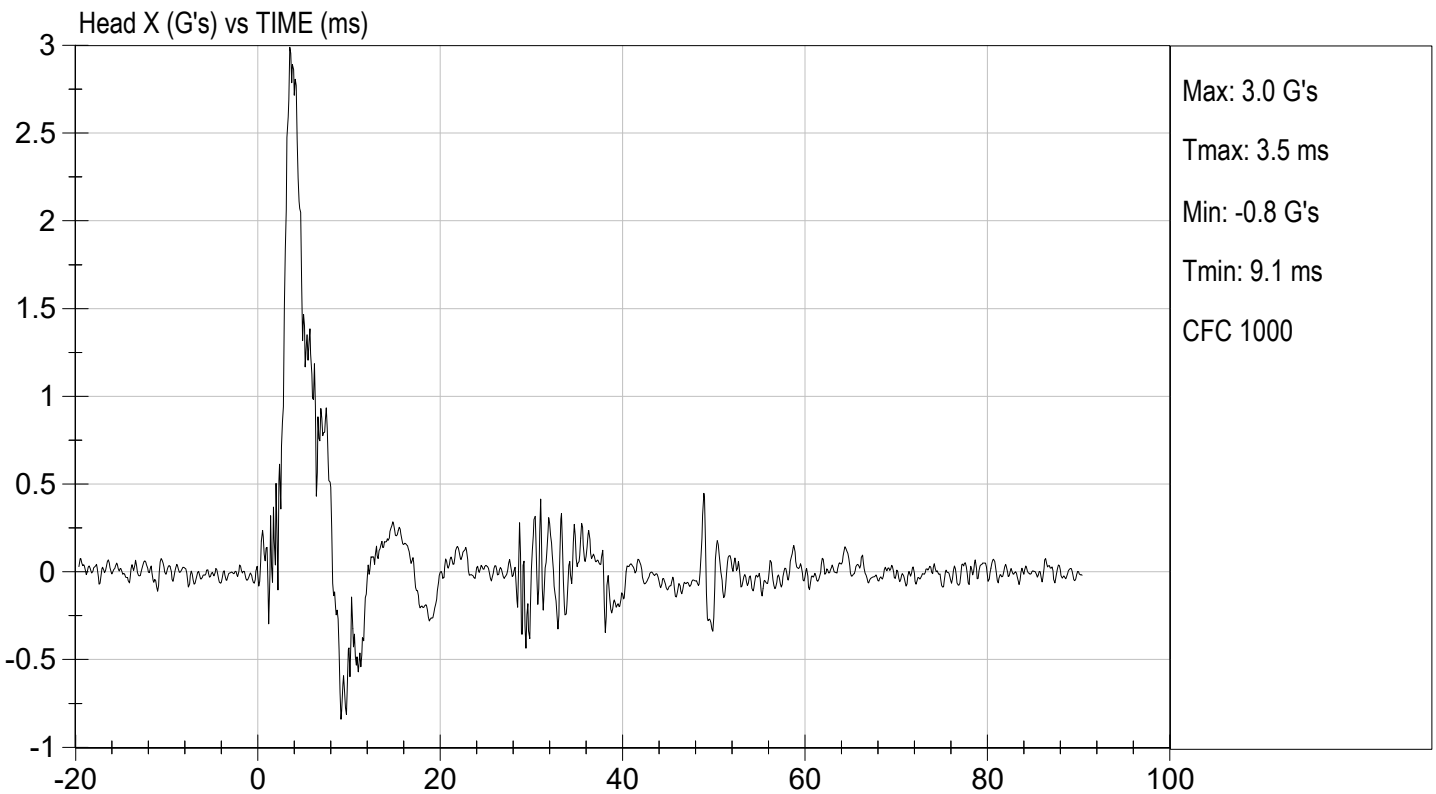
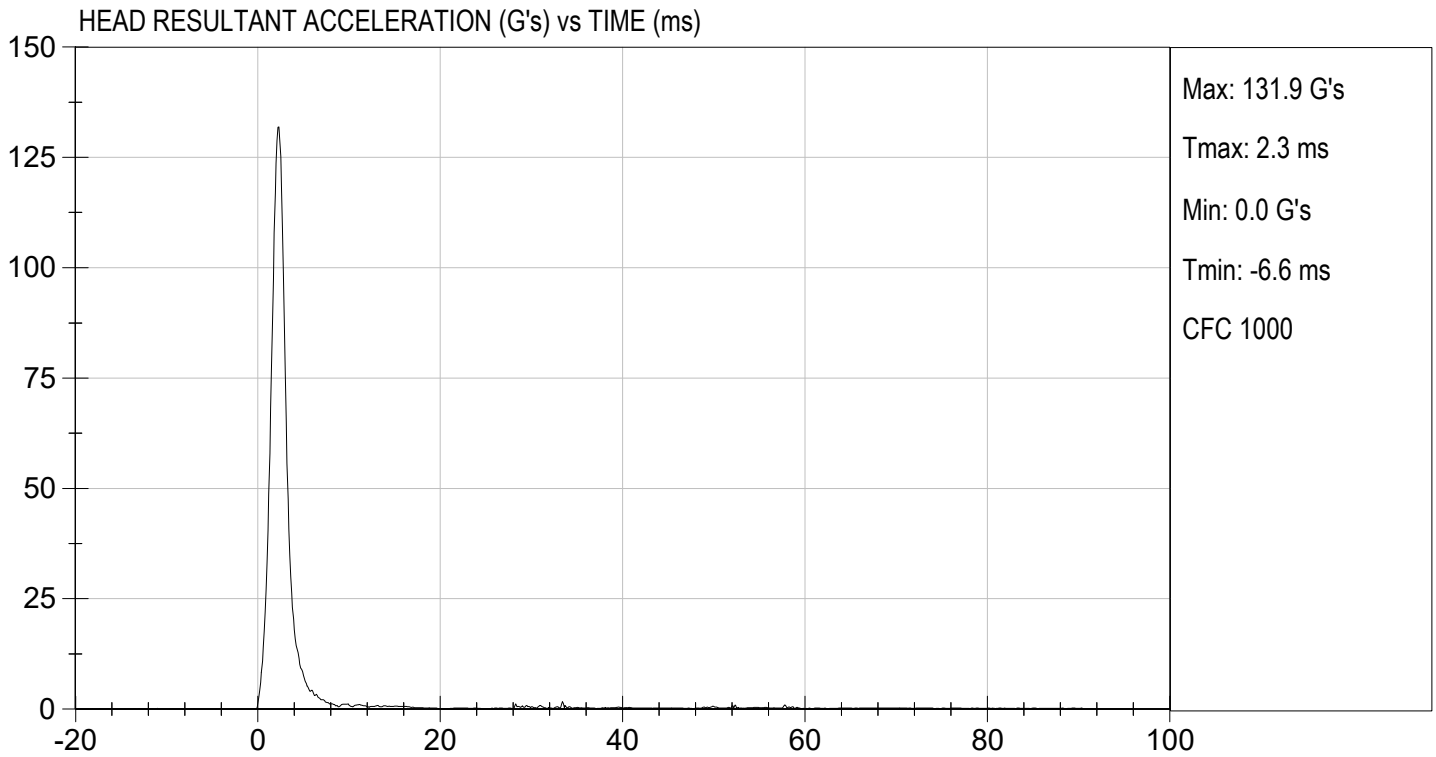
Test ID: D221921

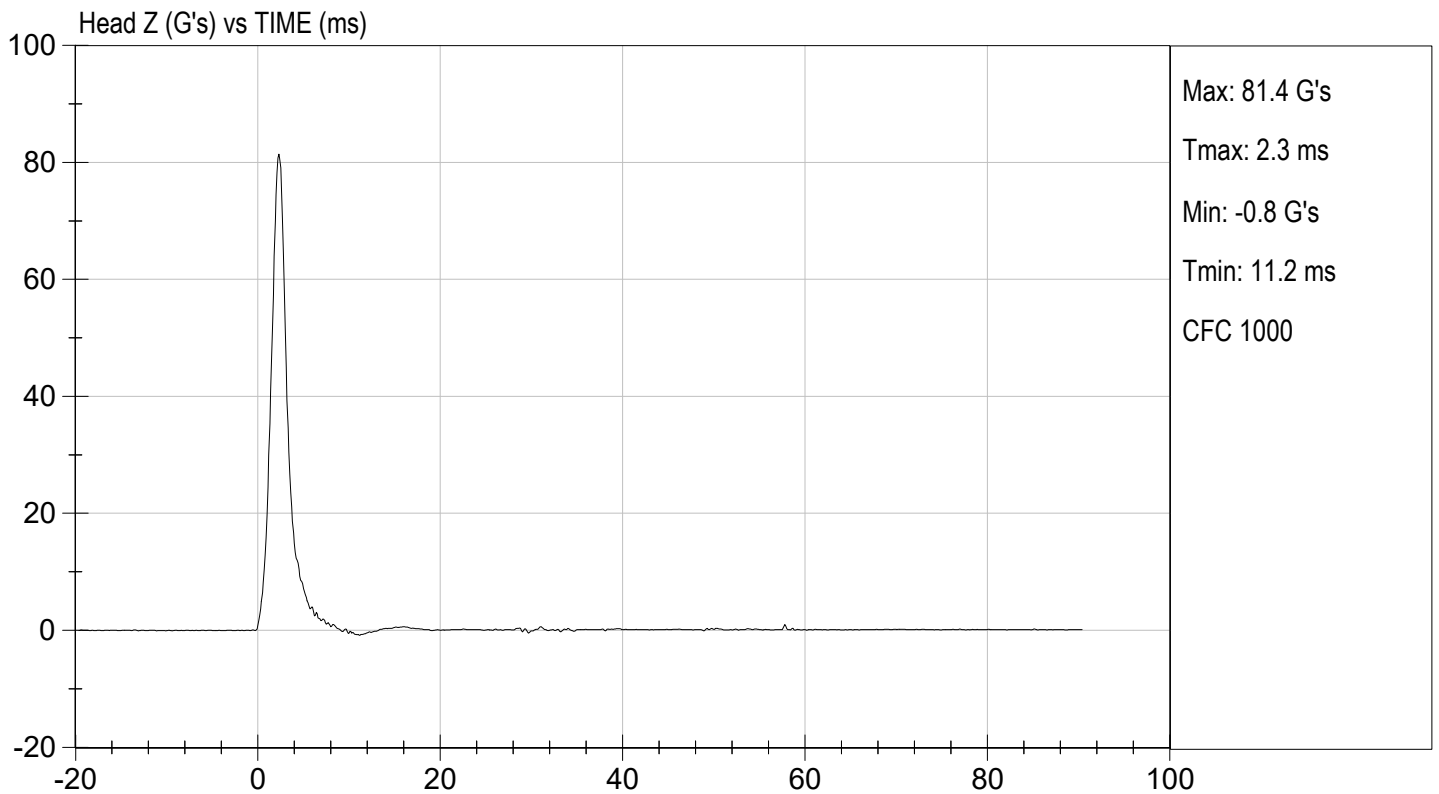
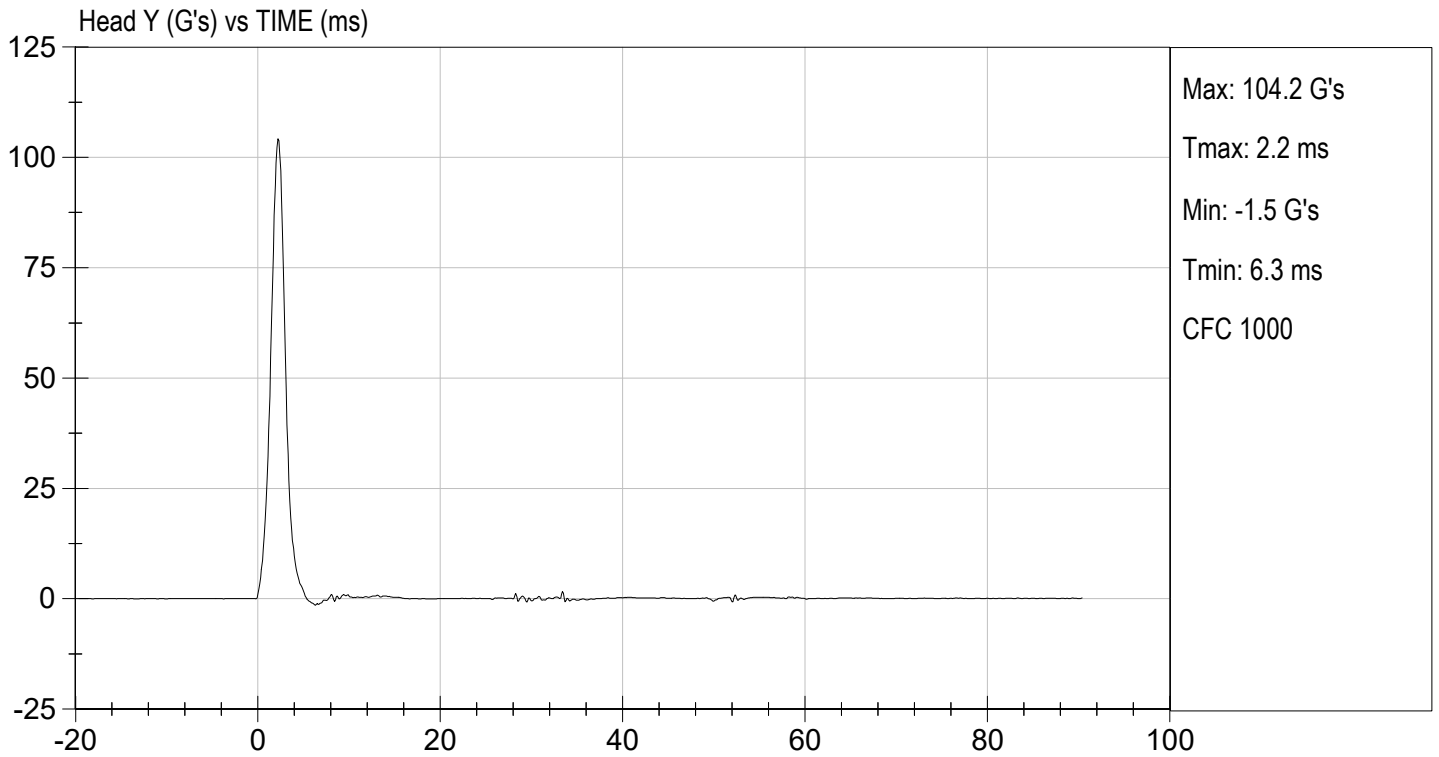
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Peak Resultant Acceleration	G's	115 to 137	132	Pass
Peak Longitudinal Acceleration	G's	+/- 15	3.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass

  
 Laboratory Technician

08/26/2022  
 Test Date

  
 Approved By





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

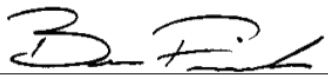
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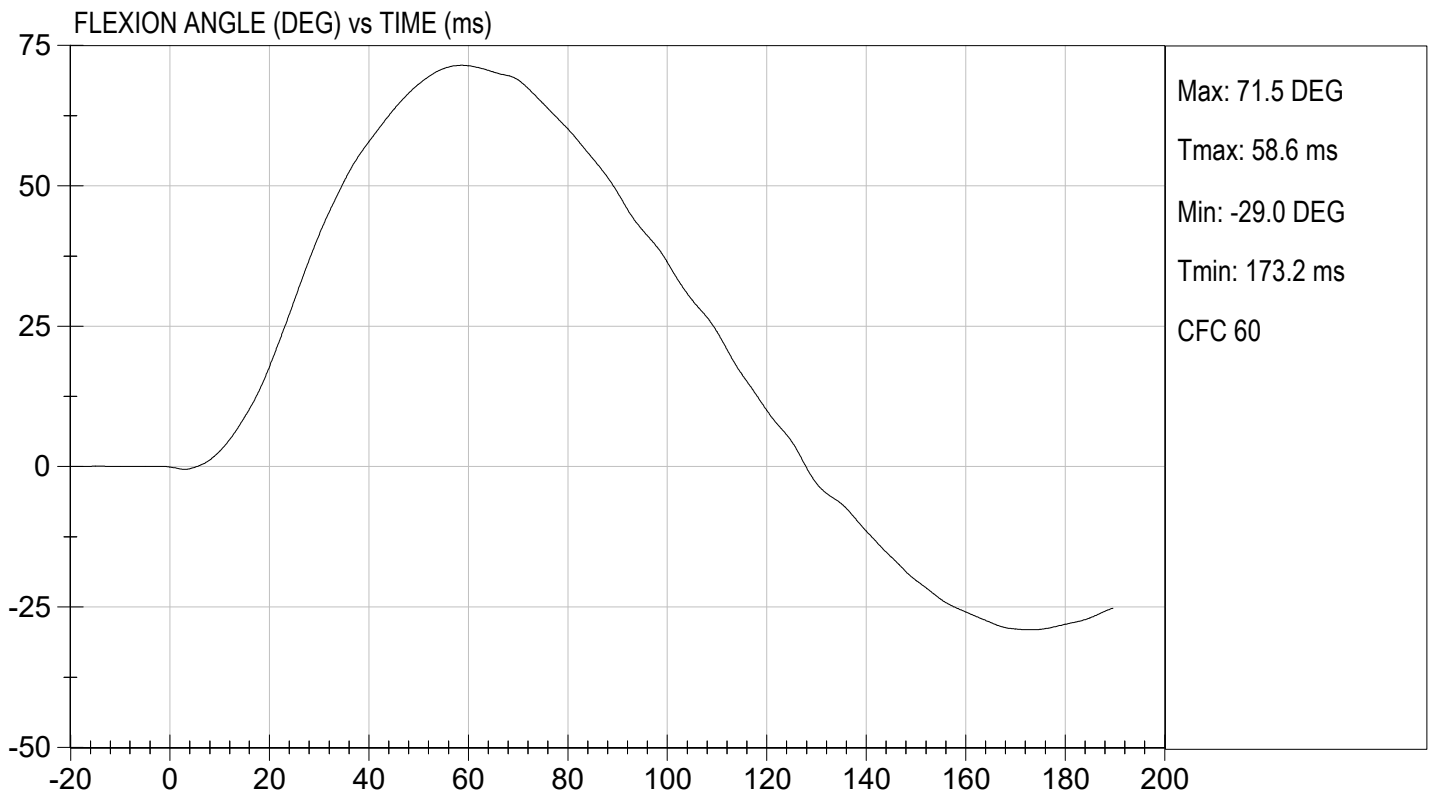
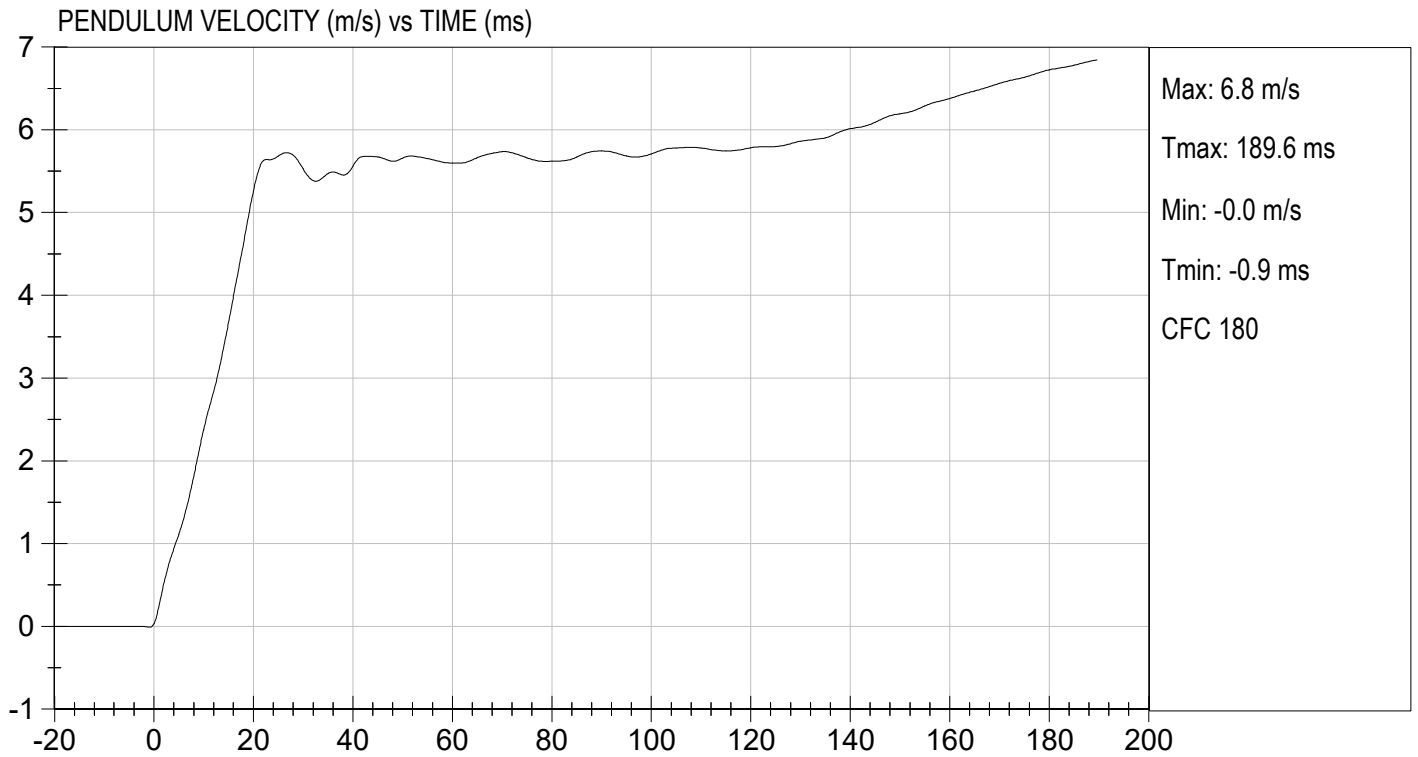
Test I.D.: D221922

Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.4	Pass	
Humidity	%	10 to 70	43	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.63	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.38	Pass
	15 ms	m/s	3.30 to 4.10	3.67	Pass
	20 ms	m/s	4.40 to 5.40	5.26	Pass
	25 ms	m/s	5.40 to 6.10	5.68	Pass
	25-100 ms	m/s	5.50 to 6.20	5.75	Pass
Maximum D-Plane Rotation	deg	71 to 81	71	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	59	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-41	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	109	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	

  
 Laboratory Technician

08/26/2022  
 Test Date

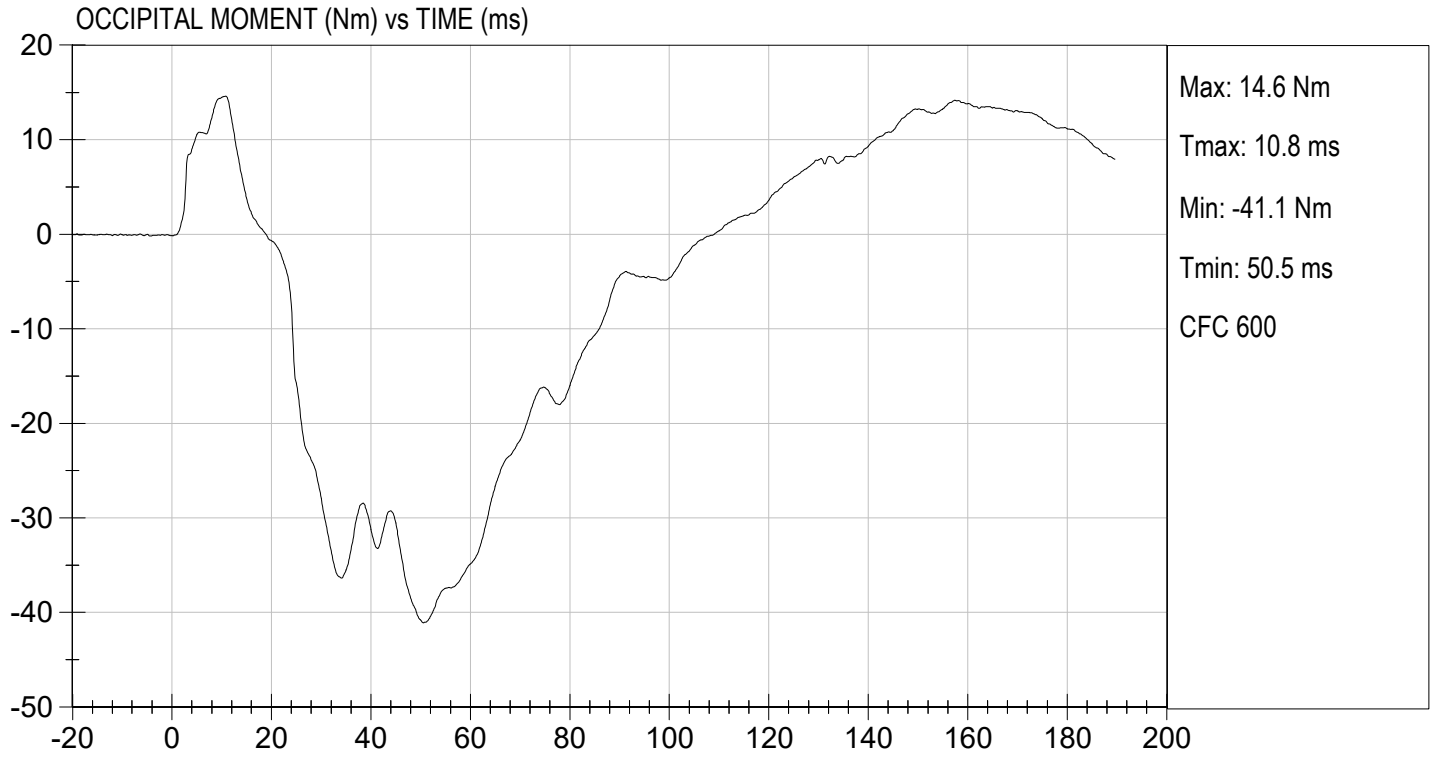
  
 Approved By





TEST DESC: NECK BENDING  
VELOCITY: 18.48 ft/s, 5.63 m/s

TEST DATE: 08/26/2022  
TEST #: D221922



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

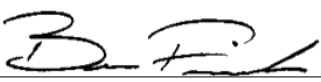
ATD Serial No: 306

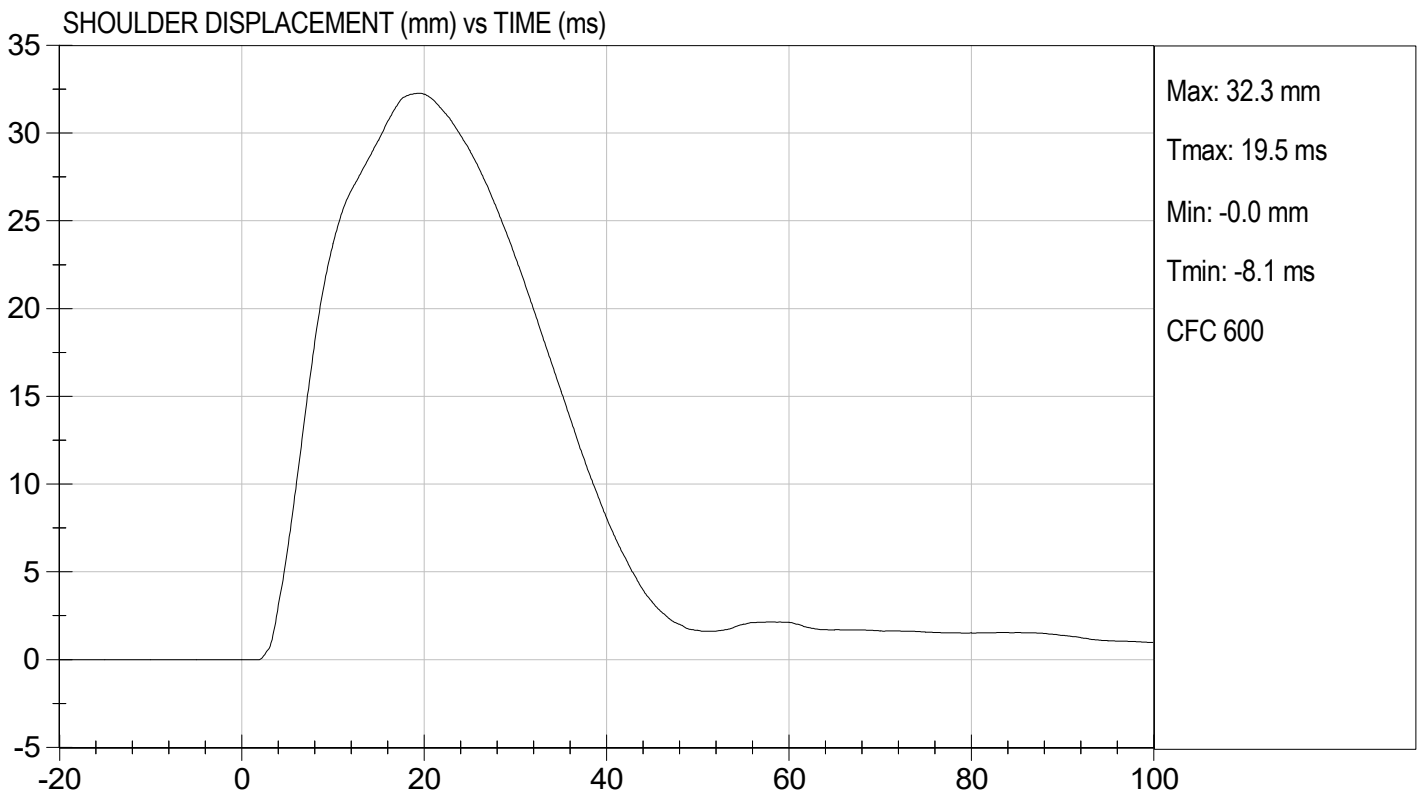
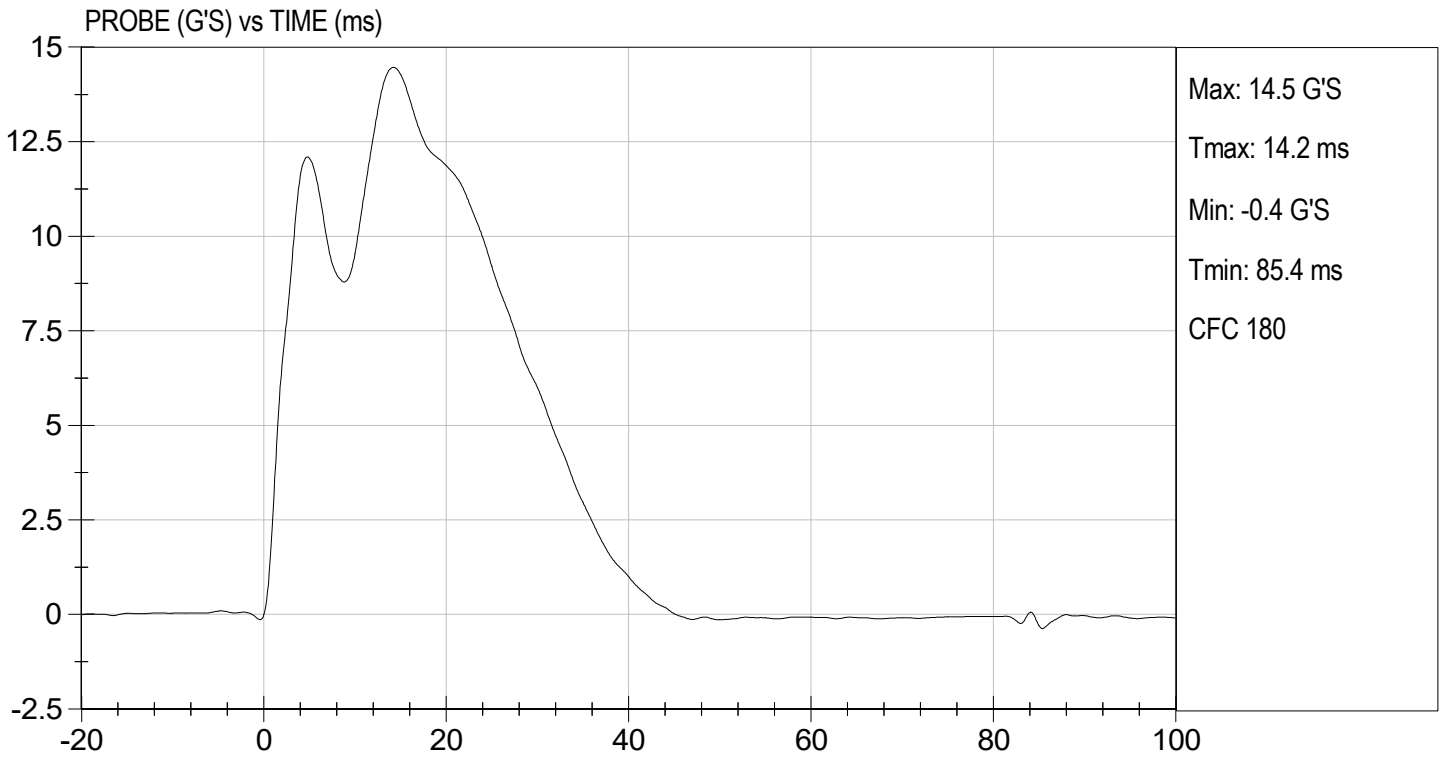
Test ID: D221923

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	47	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	13 to 18	14	Pass
Shoulder Displacement	mm	28 to 37	32	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass

  
Laboratory Technician

08/25/2022  
Test Date

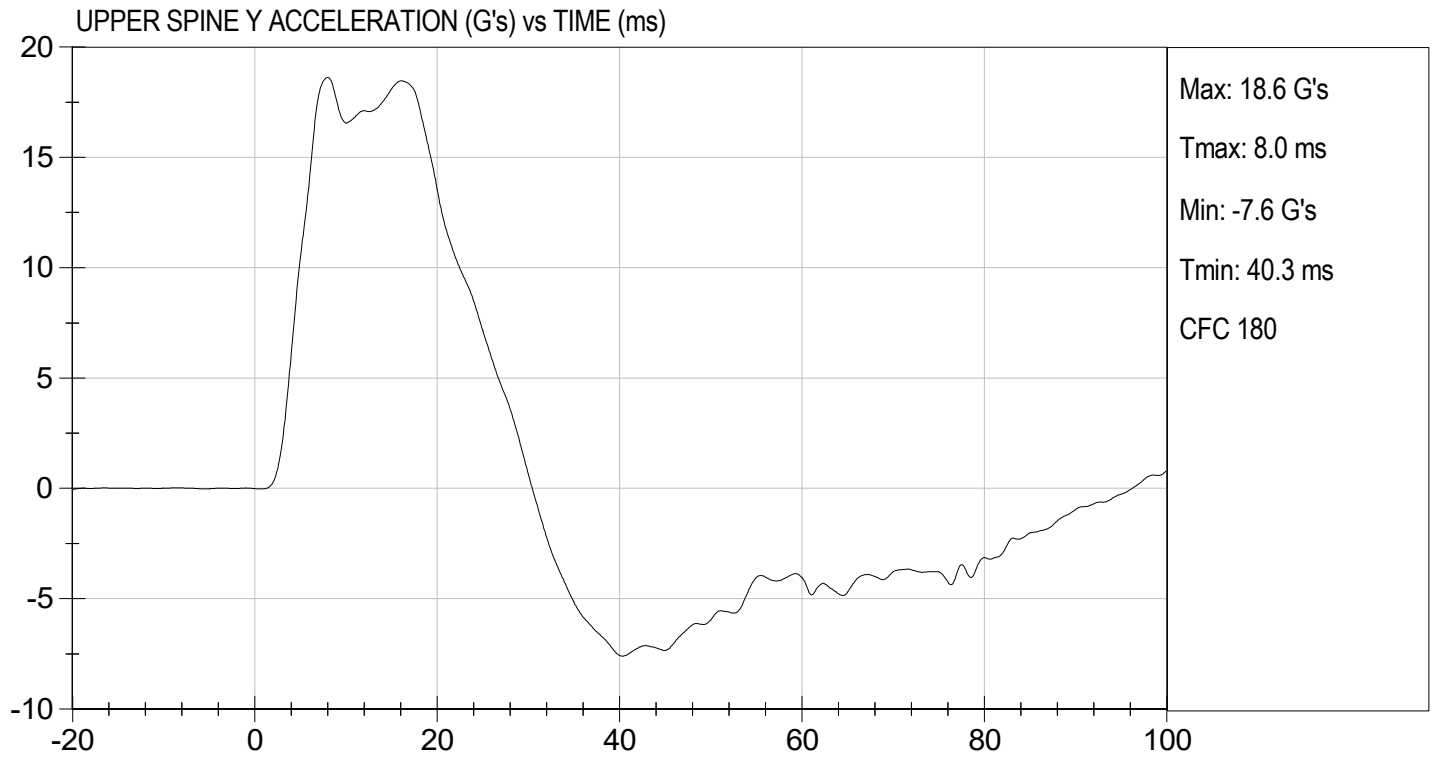
  
Approved By





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

TEST DATE: 08/25/2022  
TEST #: D221923



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

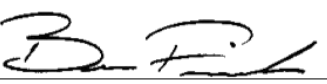
**ATD Serial No:** 306

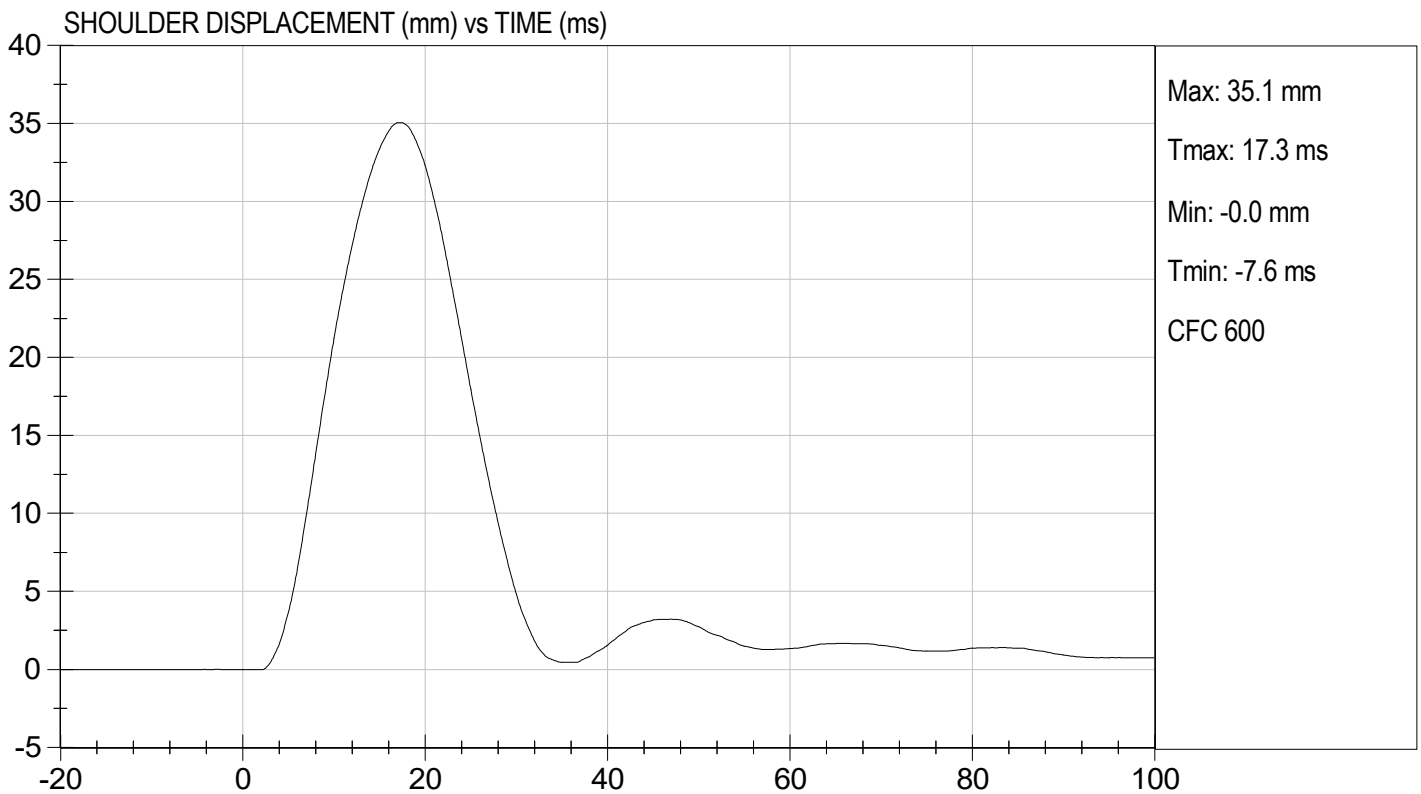
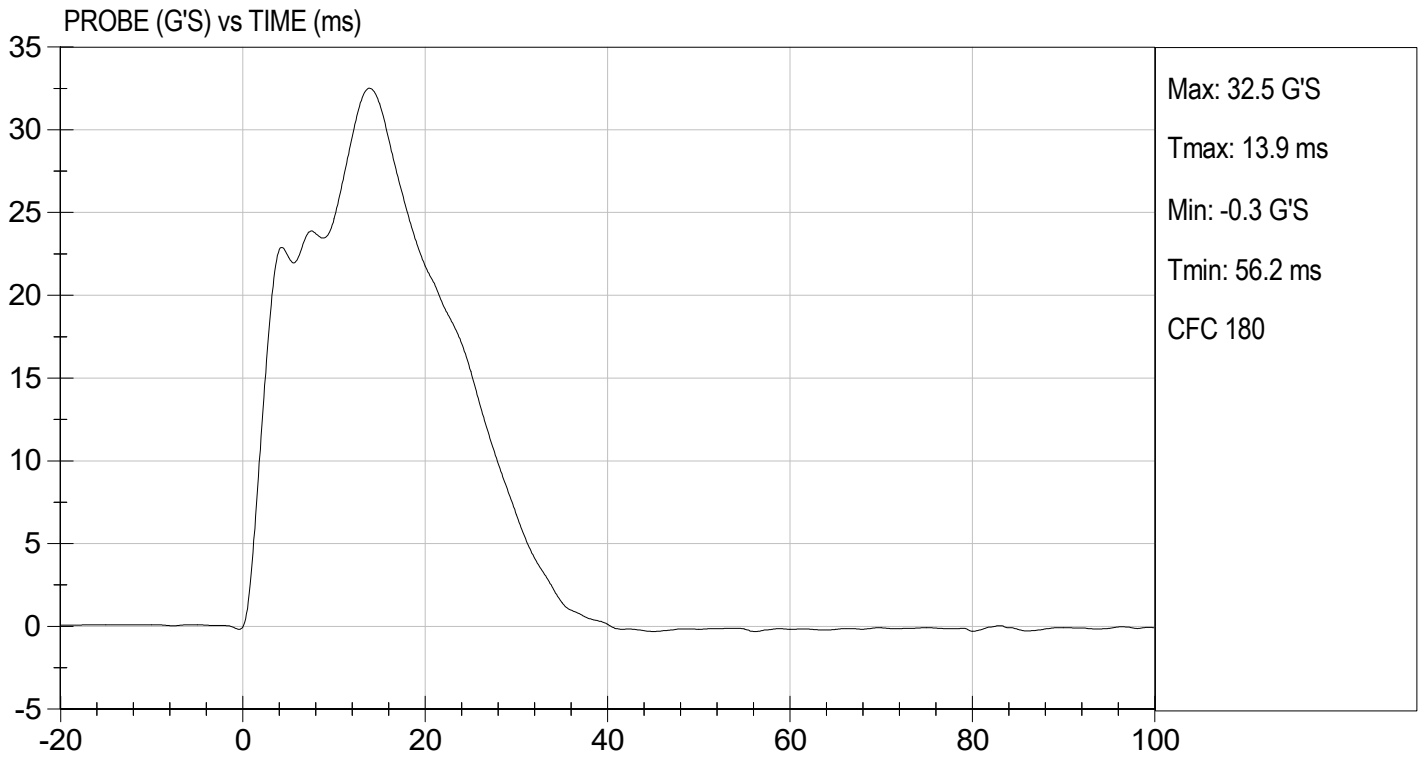
**Test I.D.:** D221924

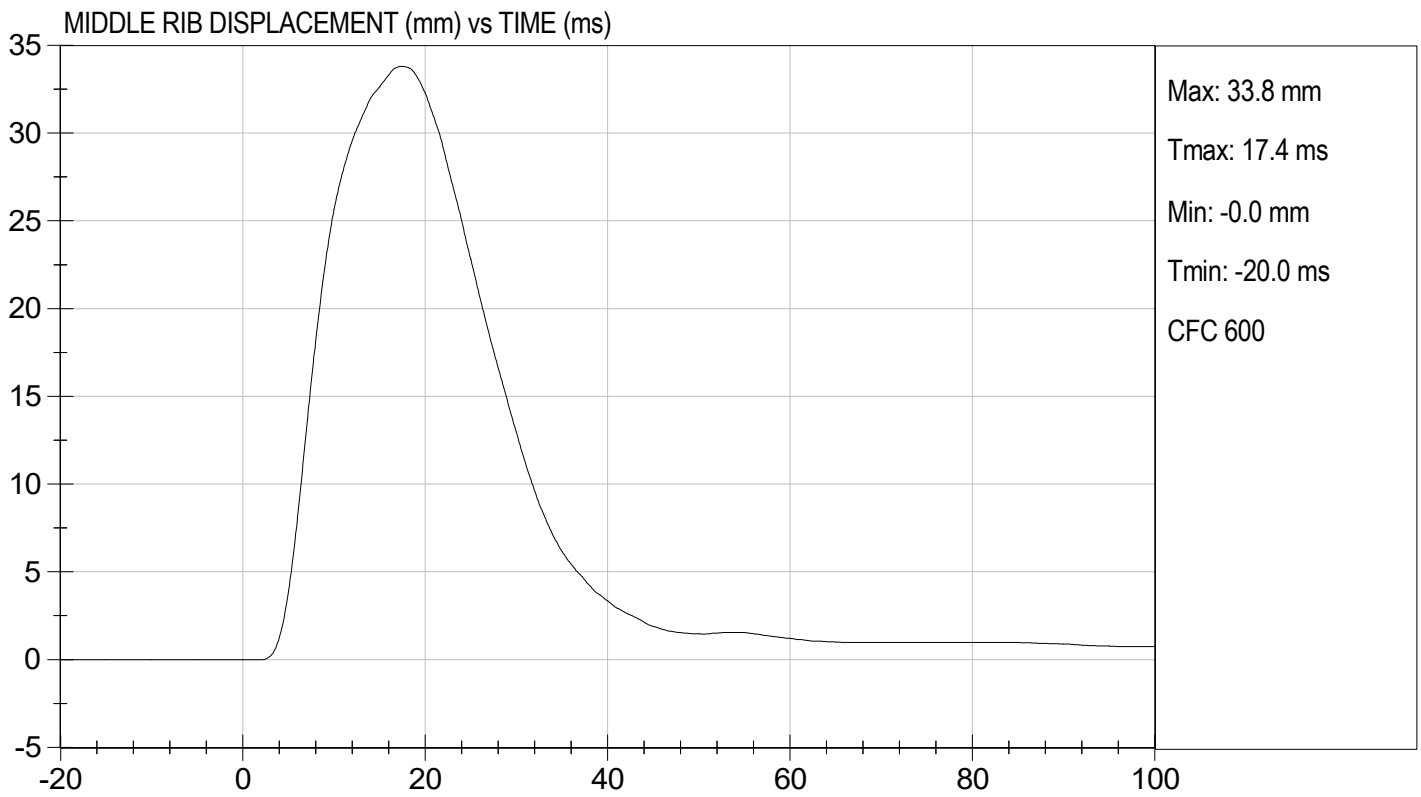
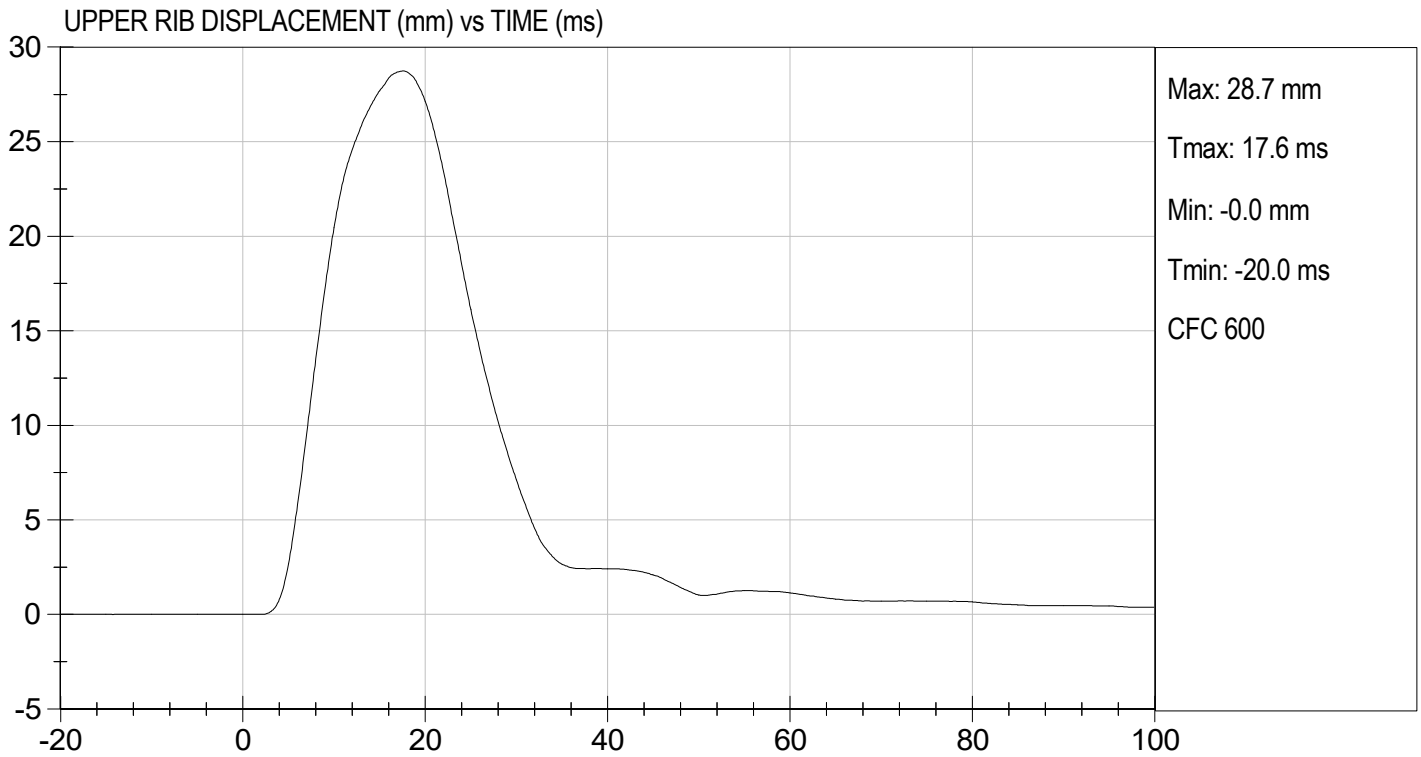
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	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

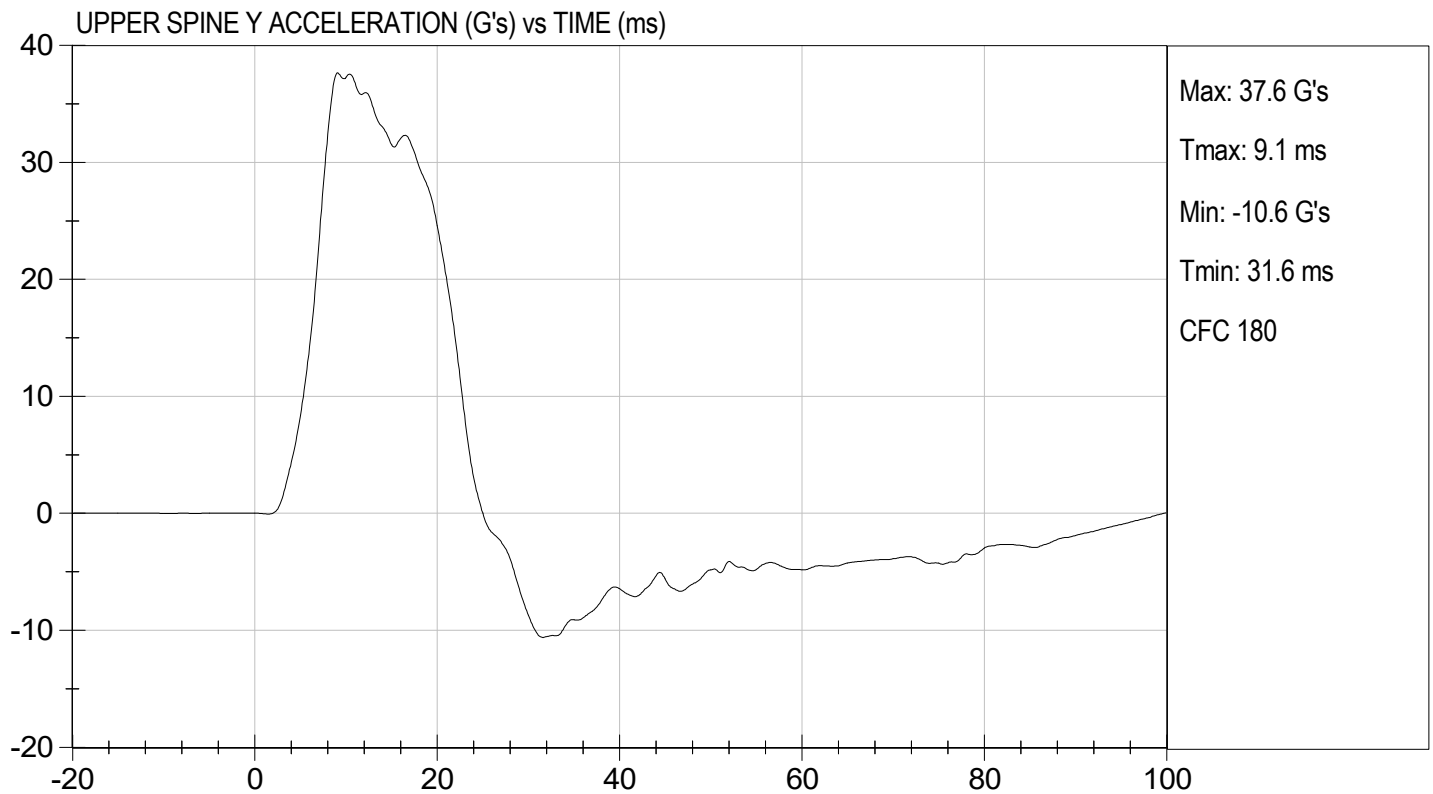
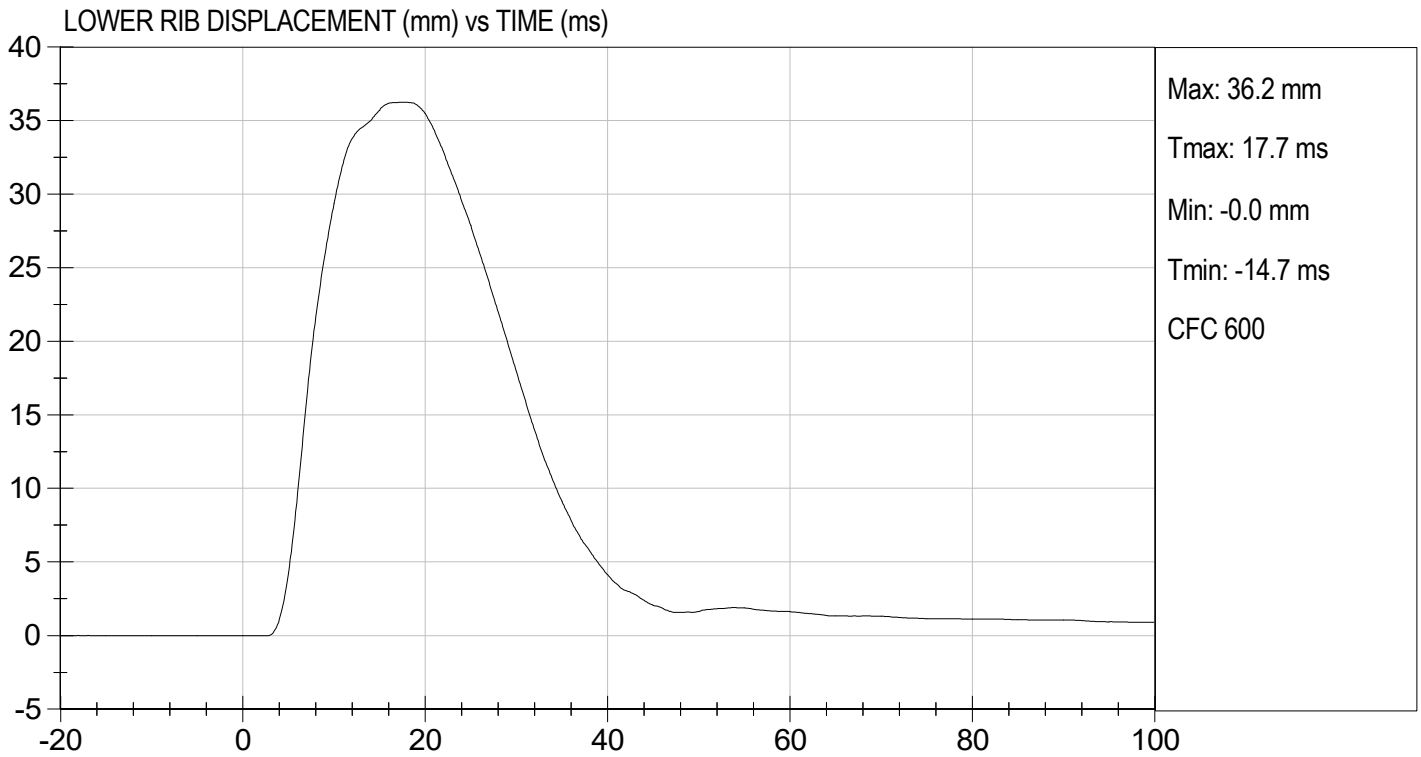
  
\_\_\_\_\_  
Laboratory Technician

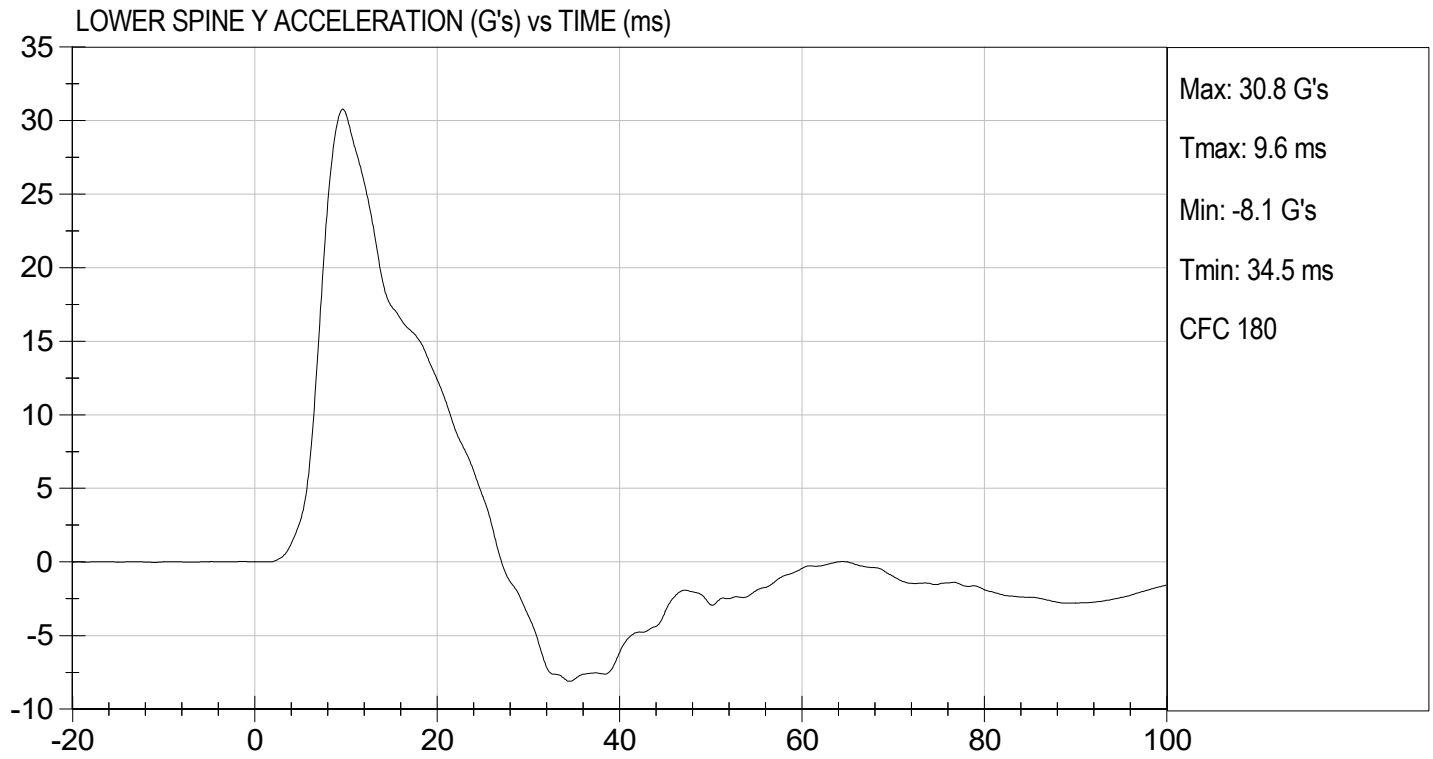
08/25/2022  
\_\_\_\_\_  
Test Date

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







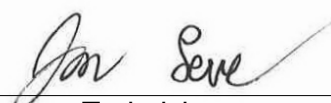


**MGA RESEARCH CORPORATION**  
**THORAX (WITHOUT ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

ATD Serial No: 306

Test I.D: D221925

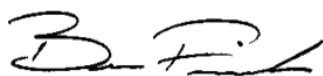
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	47	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass



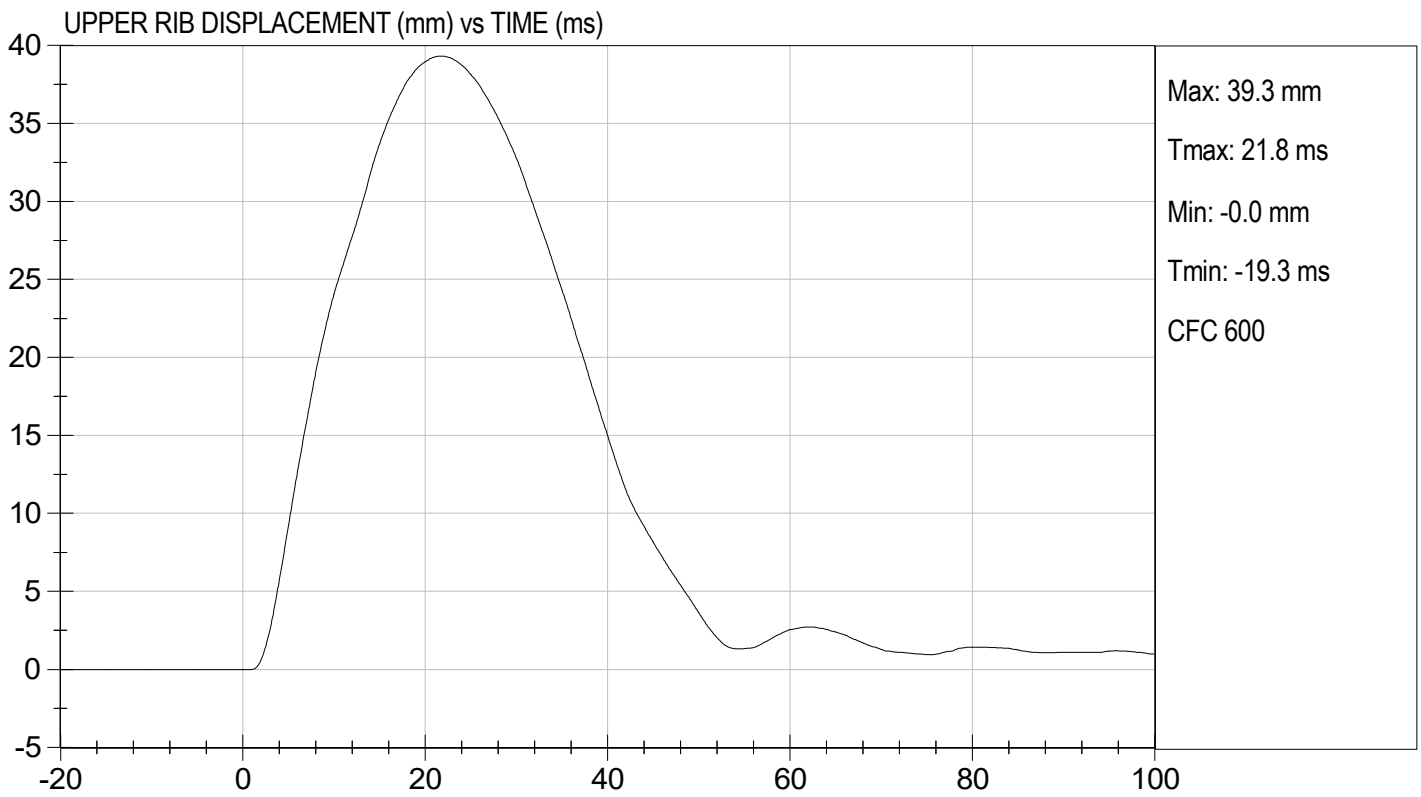
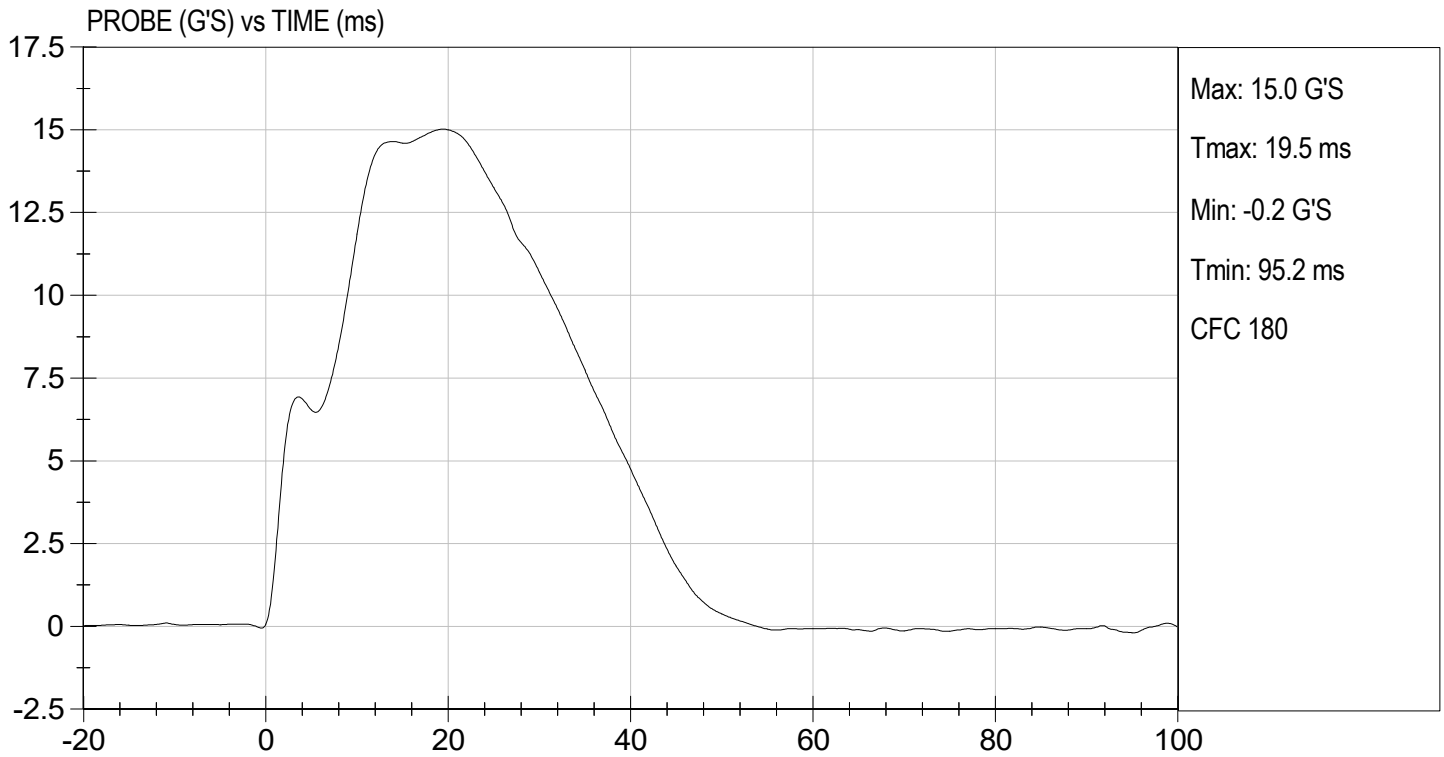
Laboratory Technician

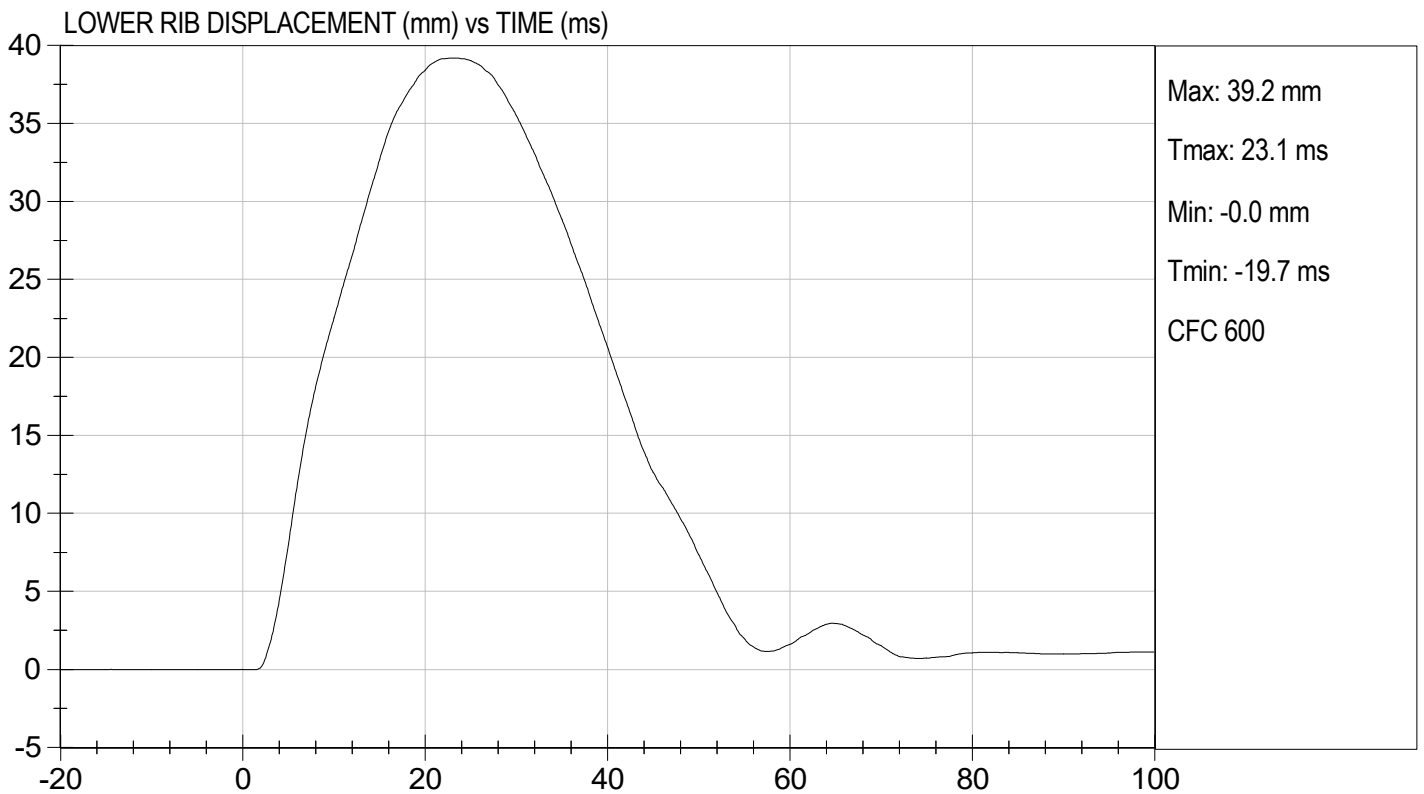
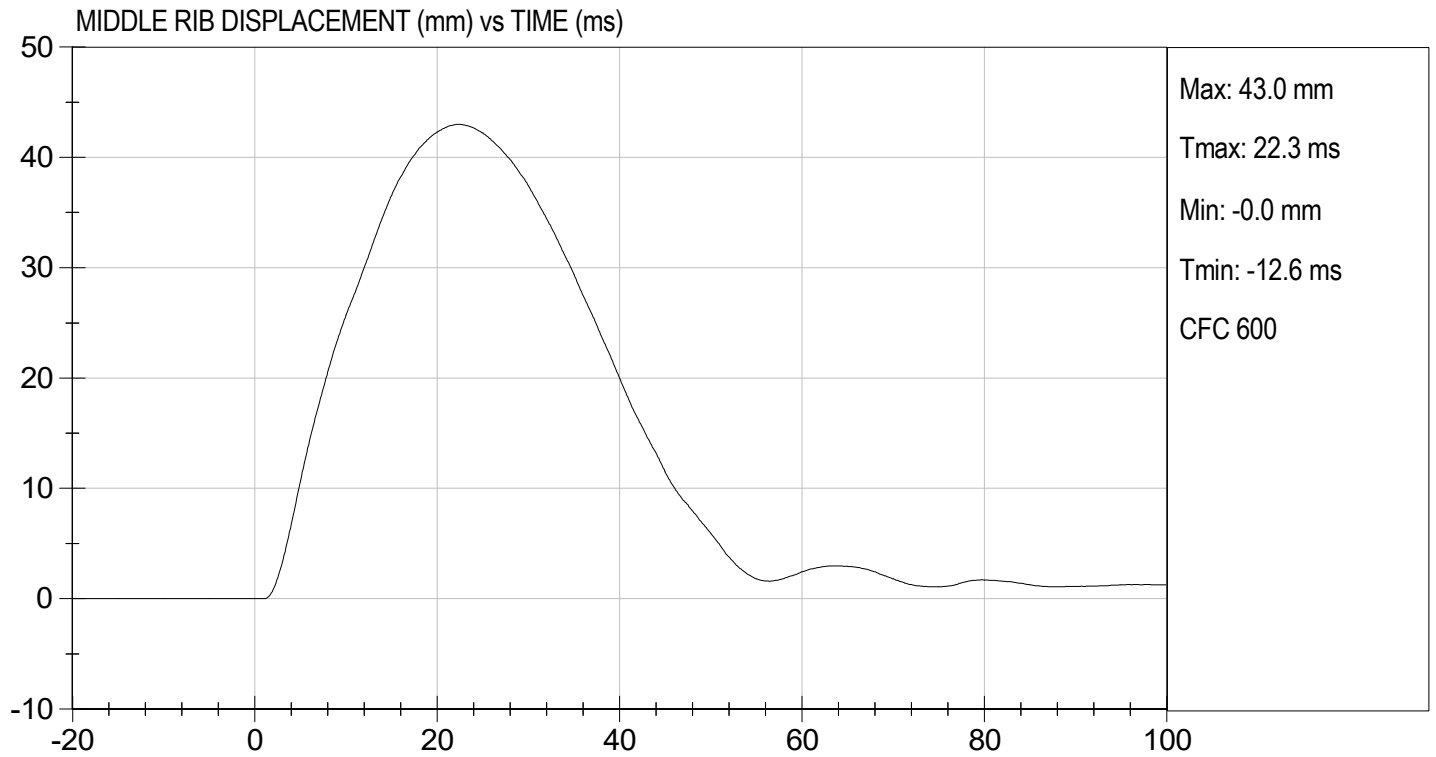
08/25/2022

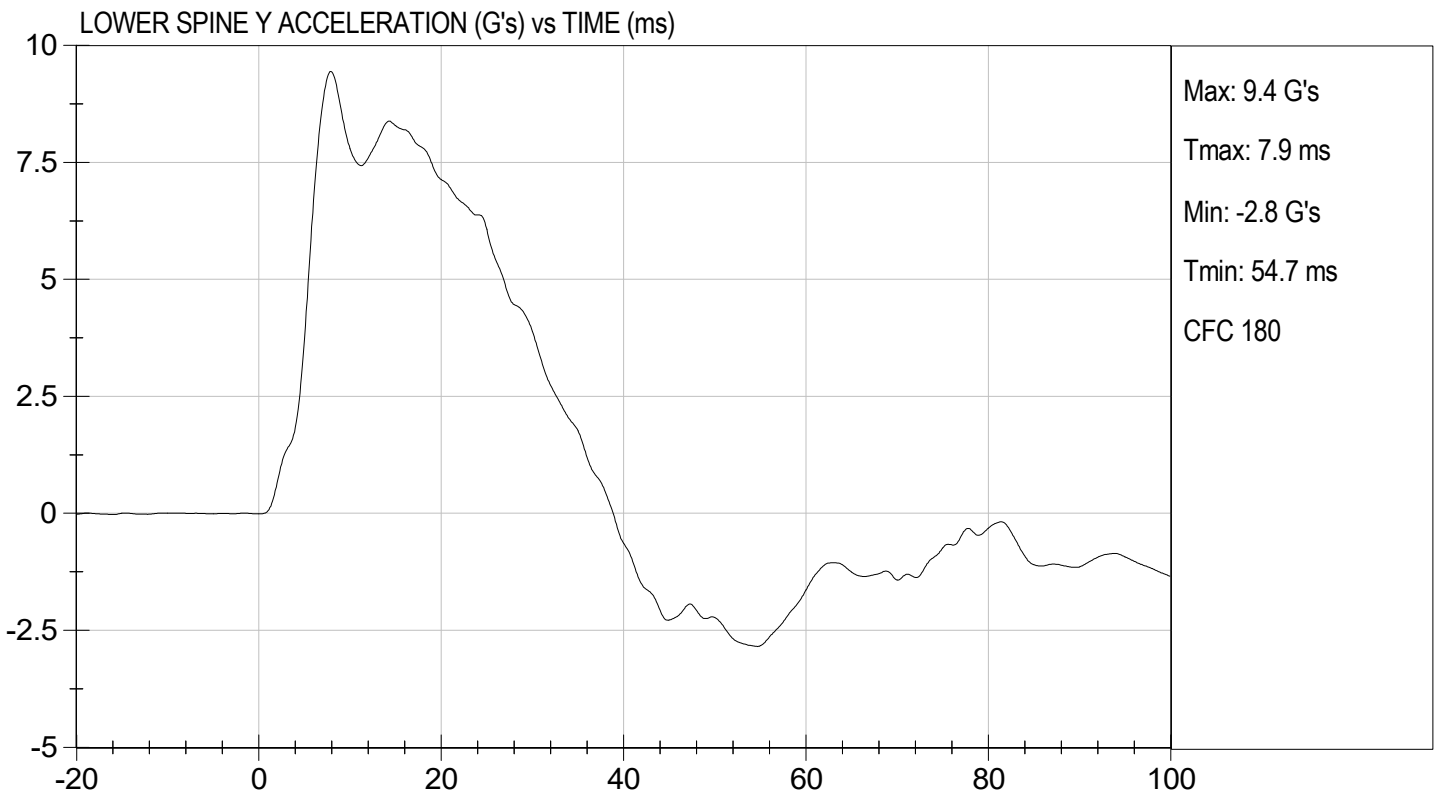
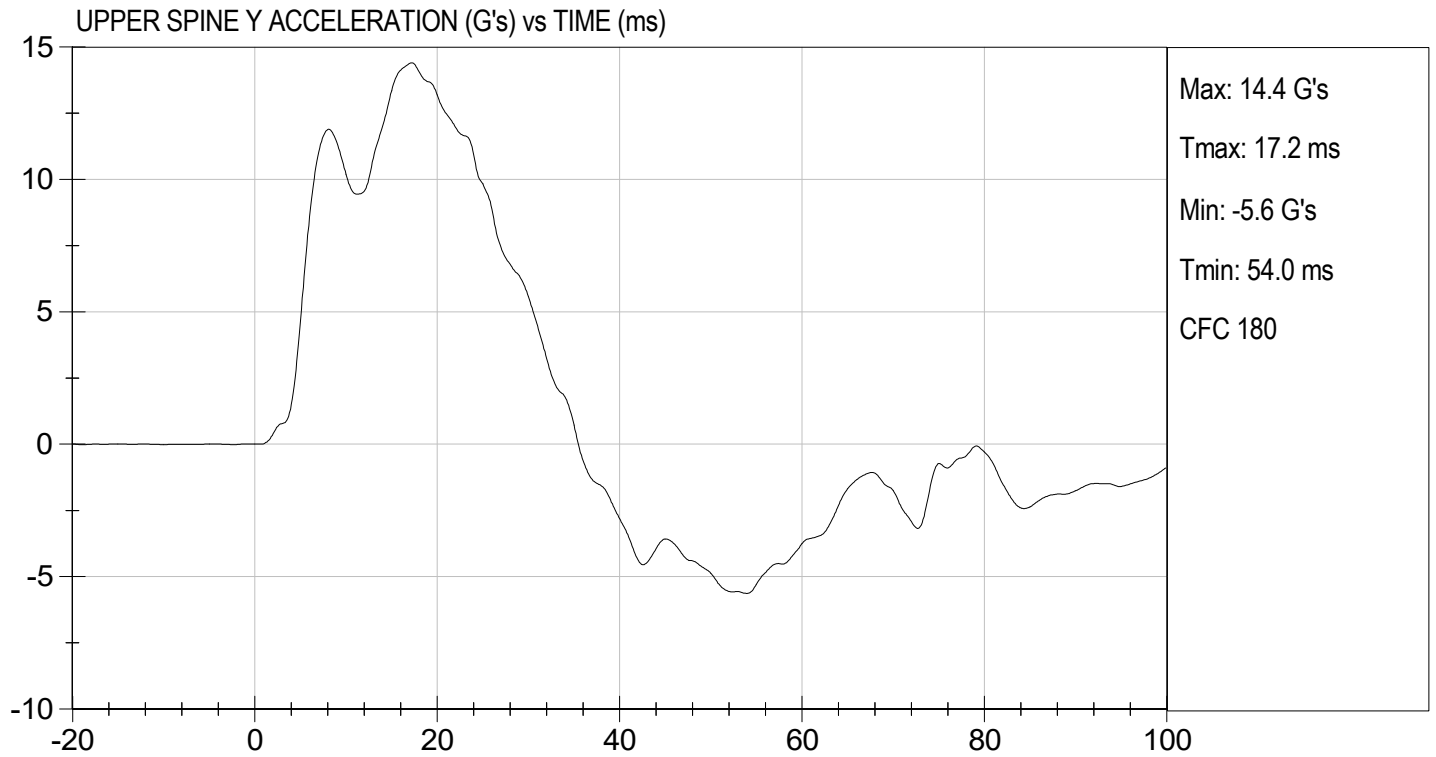
Test Date



Approved By







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

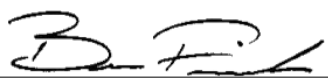
ATD Serial No: 306

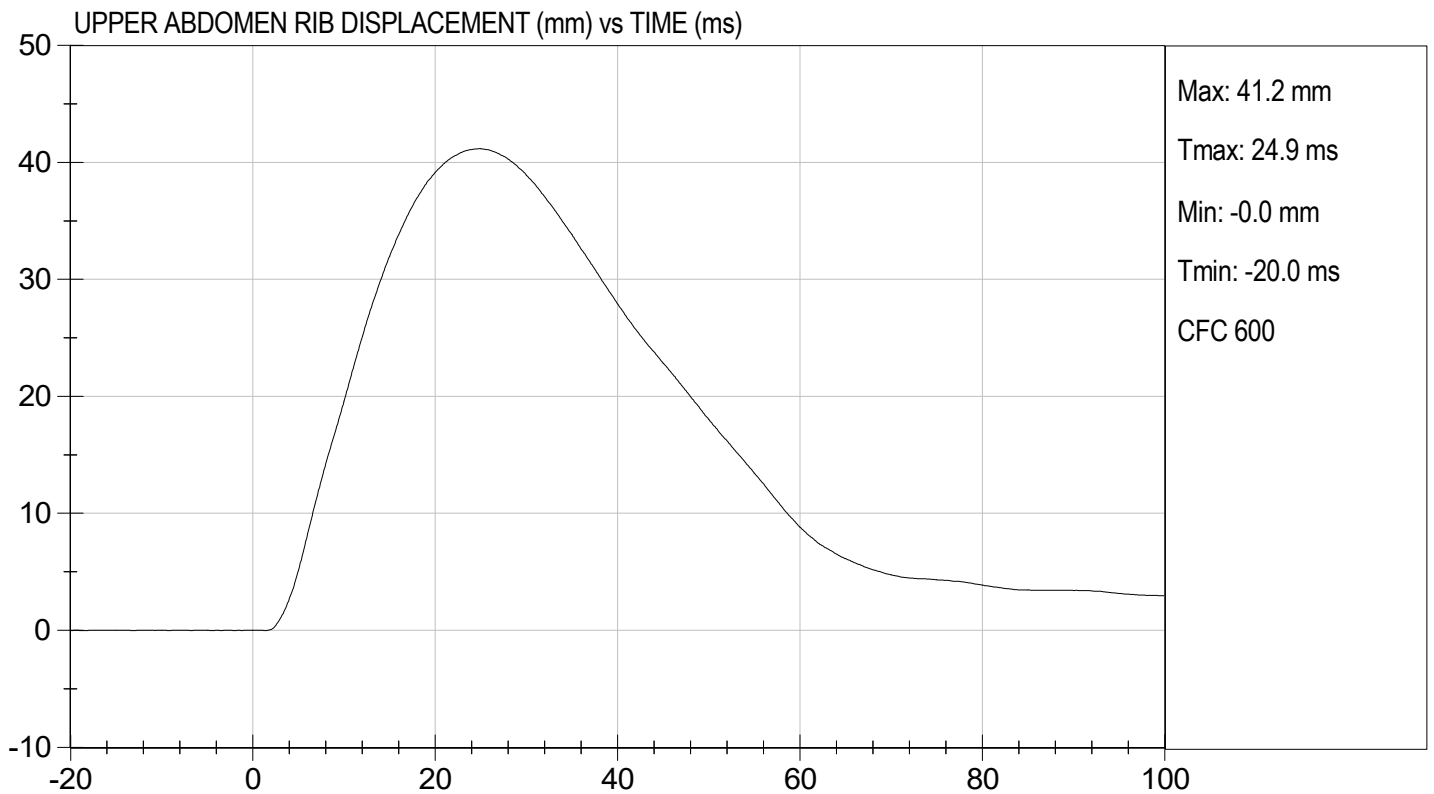
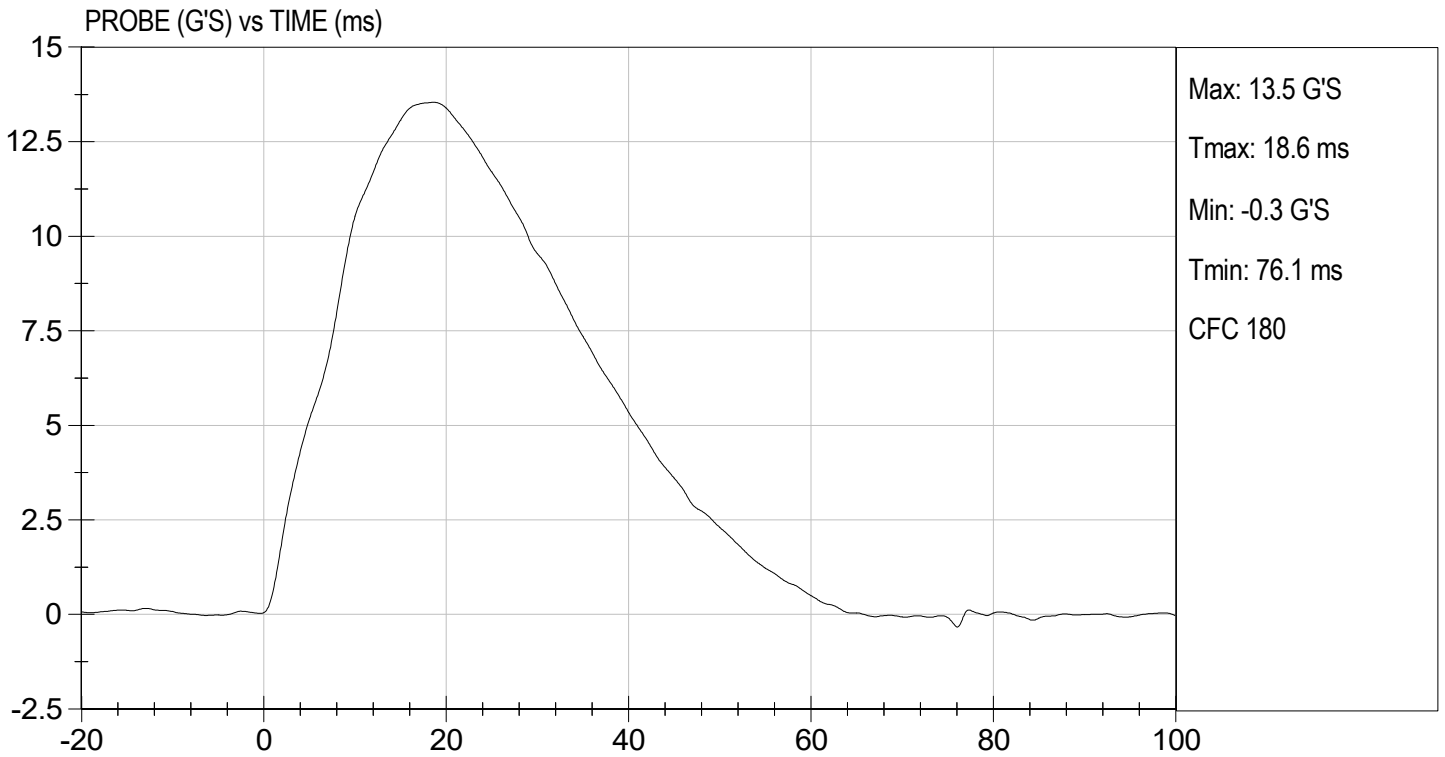
Test I.D: D221926

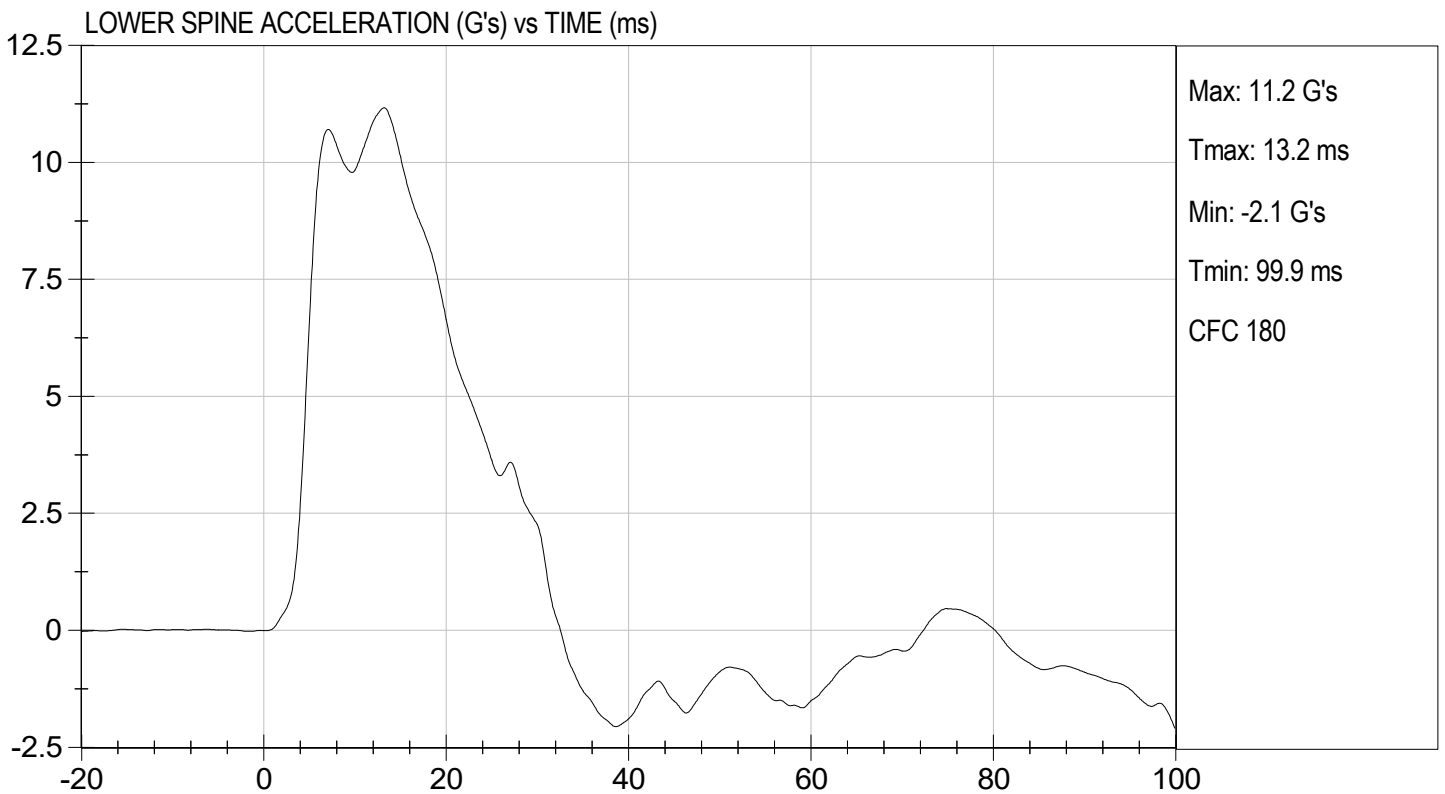
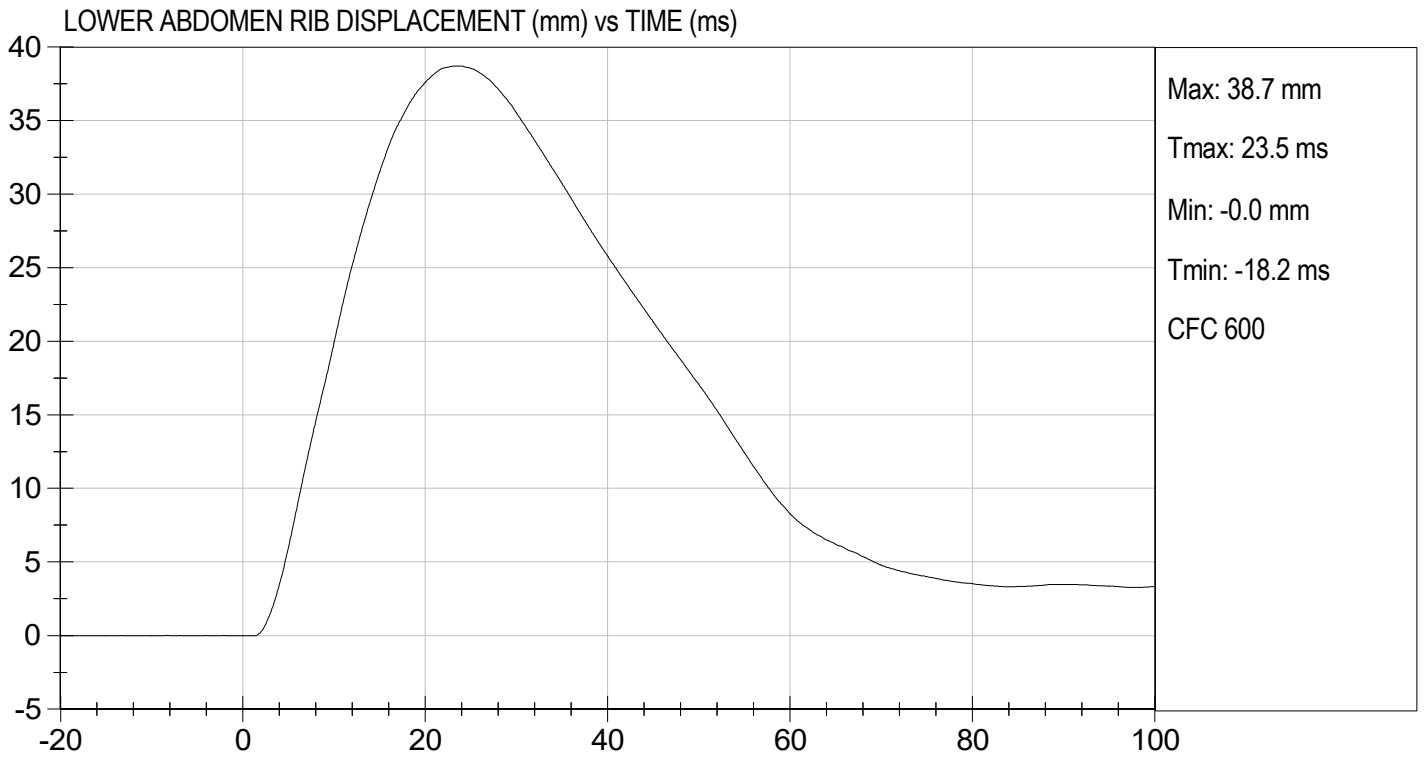
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	39	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

  
 Laboratory Technician

08/25/2022  
 Test Date

  
 Approved By



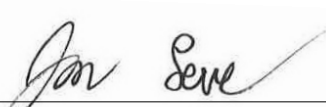


**MGA RESEARCH CORPORATION  
 PELVIS IMPACT TEST  
 SID-IIs BUILD LEVEL D DUMMY**

ATD Serial No: 306

Test I.D: D221927

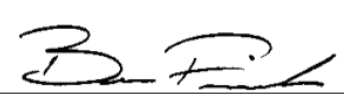
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	47	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	3,926	Pass
Overall Test Results				Pass



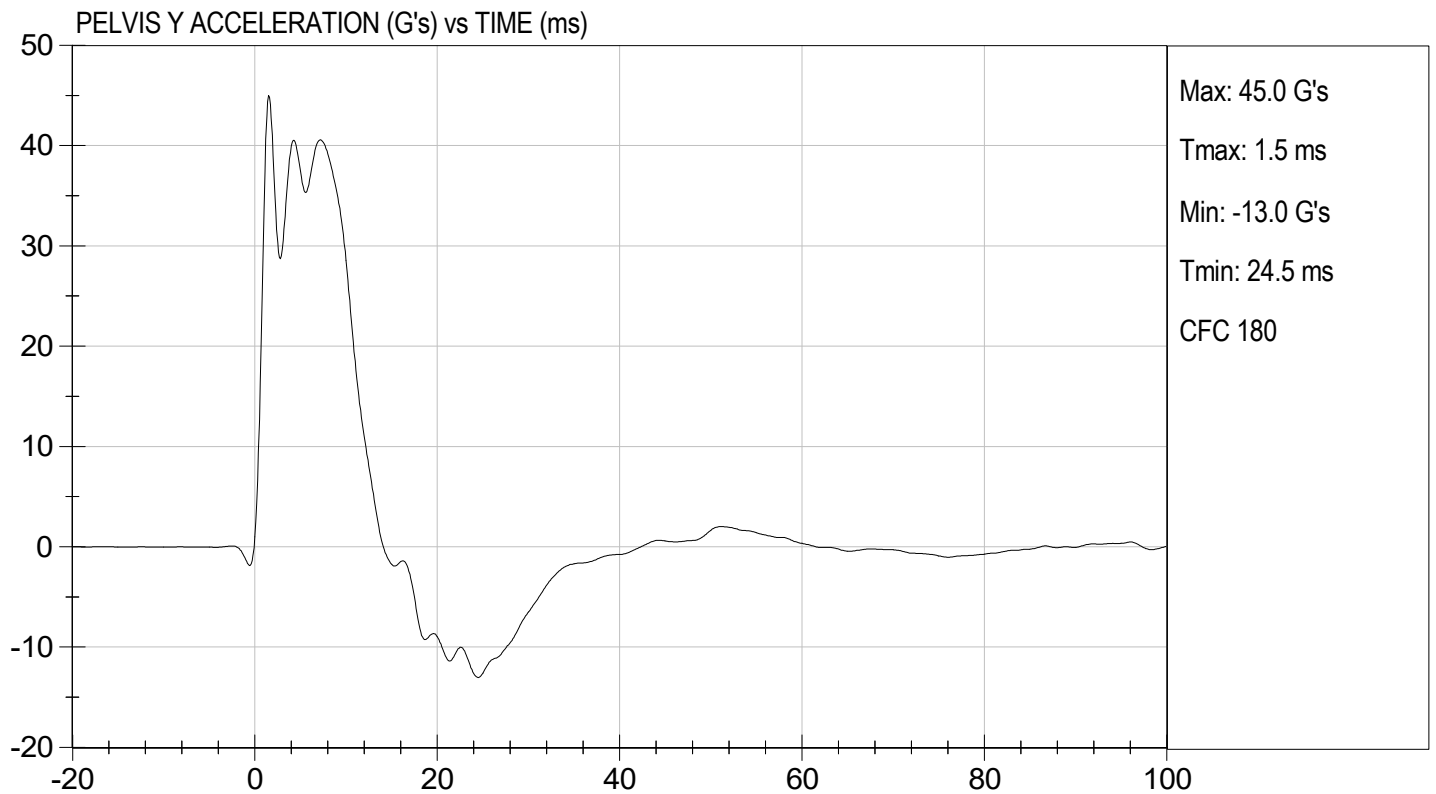
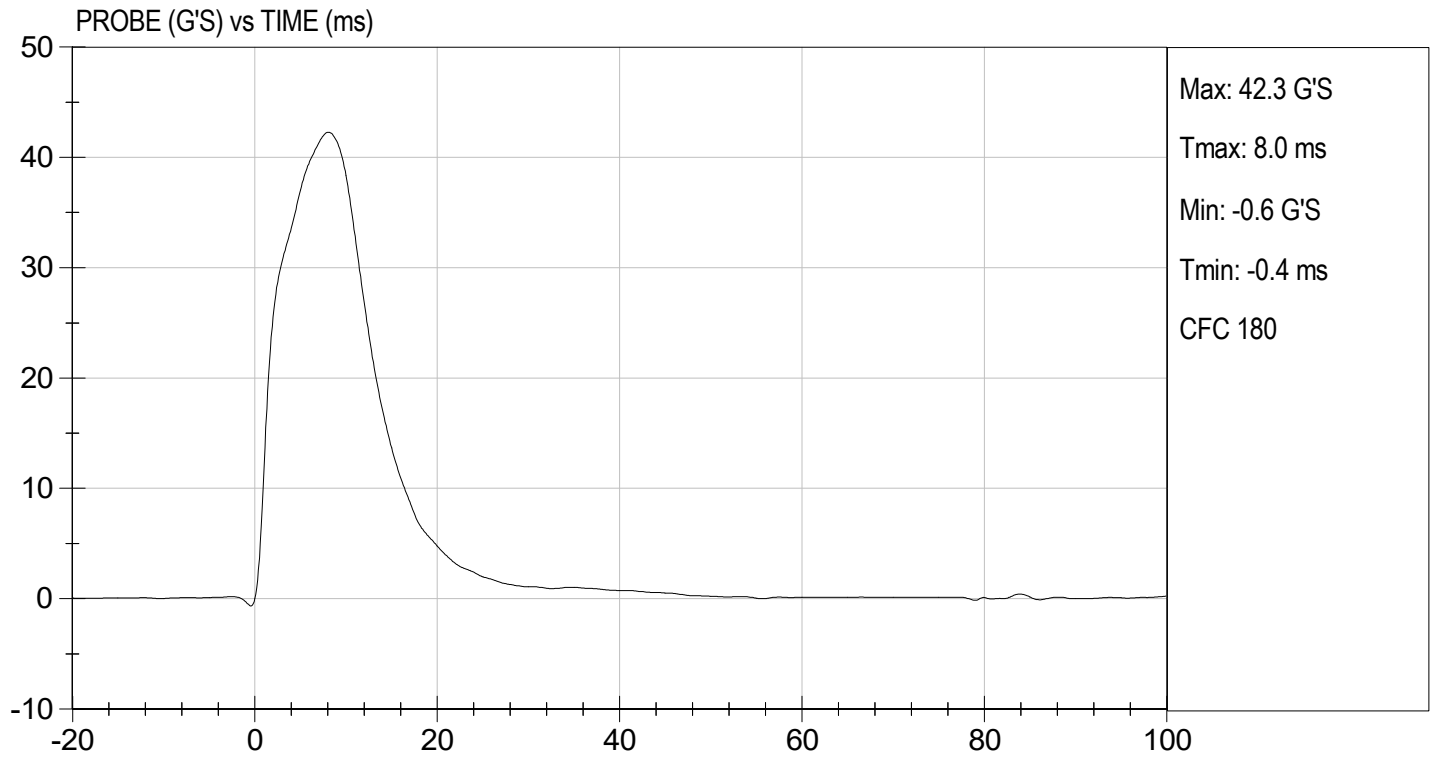
Laboratory Technician

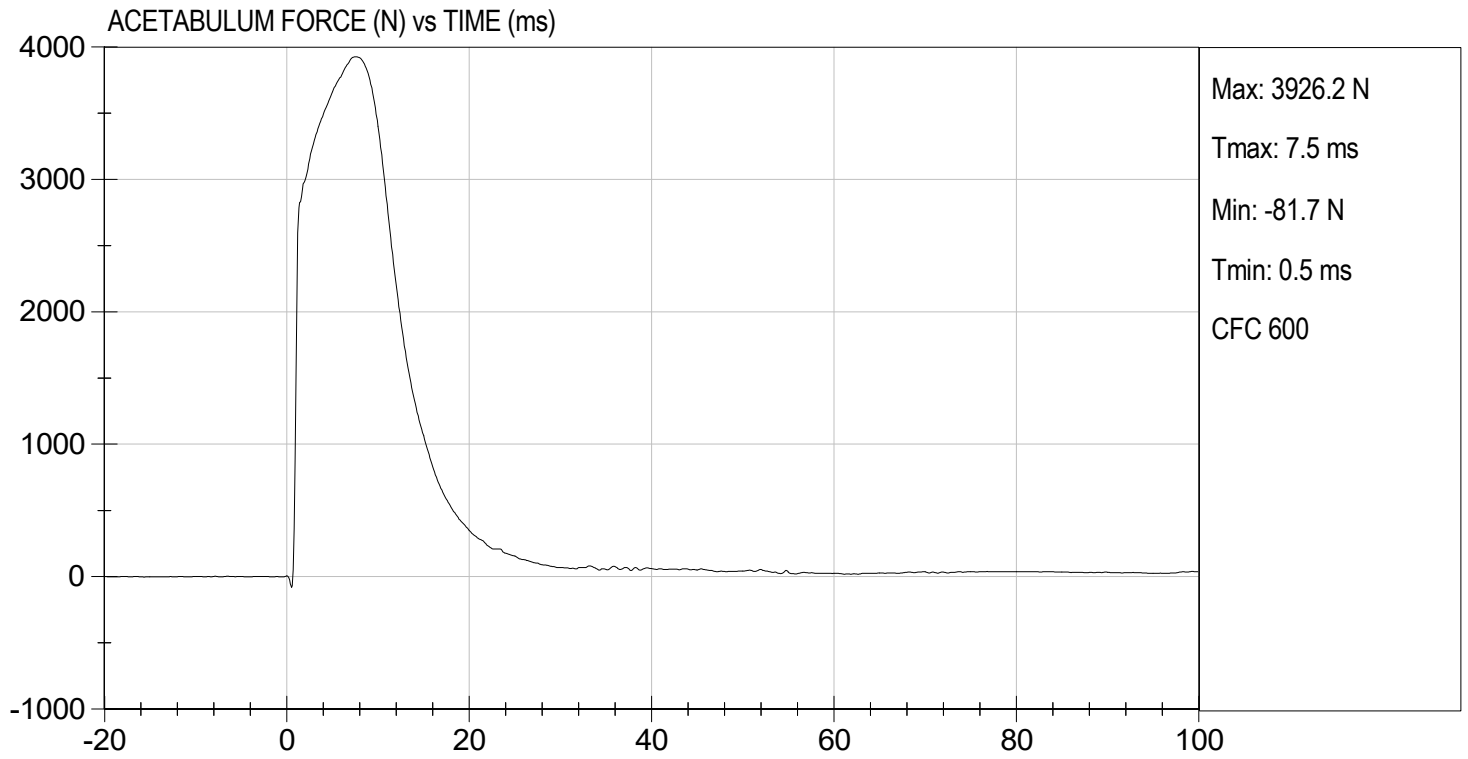
08/25/2022

Test Date



Approved By



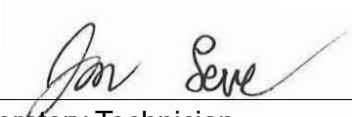


**MGA RESEARCH CORPORATION**  
**ILIAC IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

ATD Serial No: 306

Test I.D: D221928

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	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,538	Pass
Overall Test Results				Pass



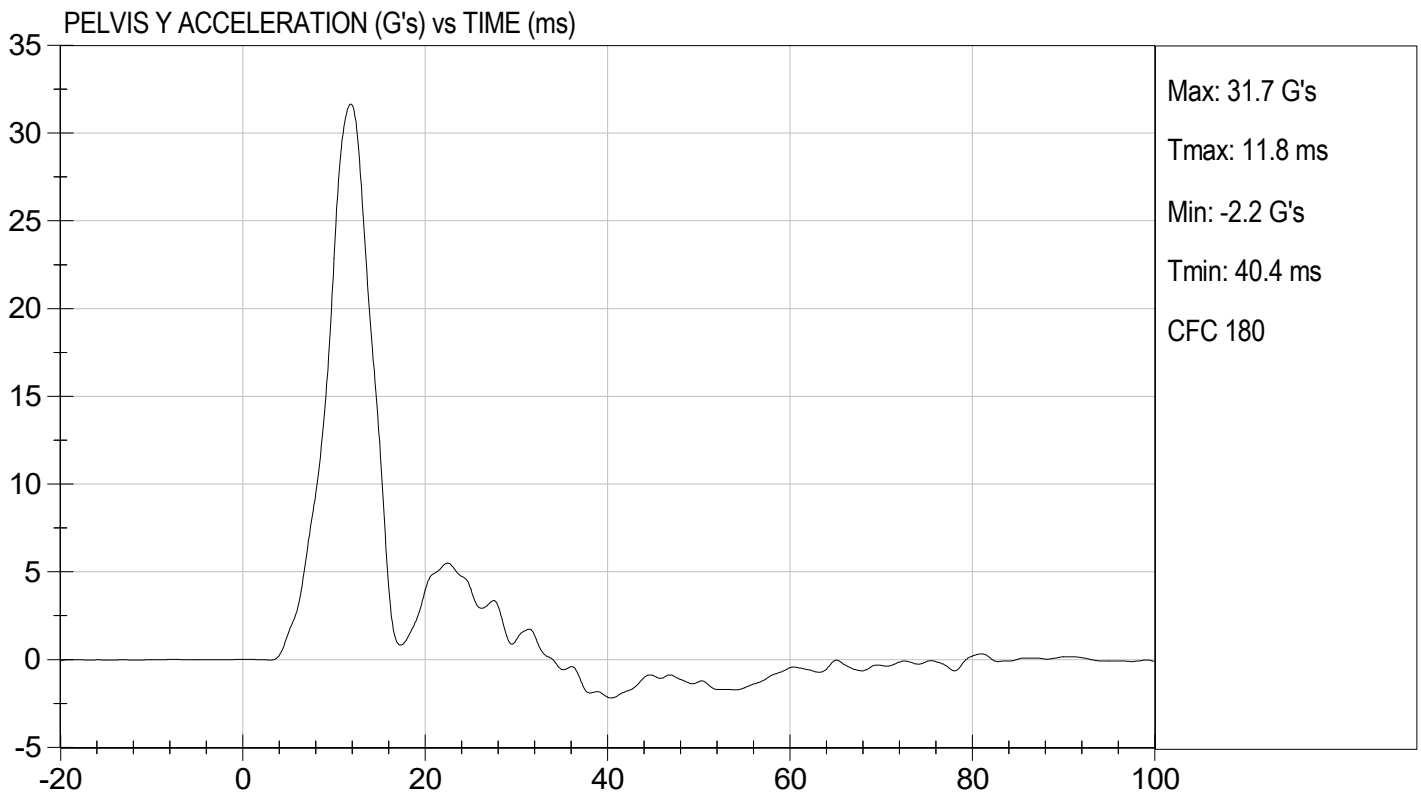
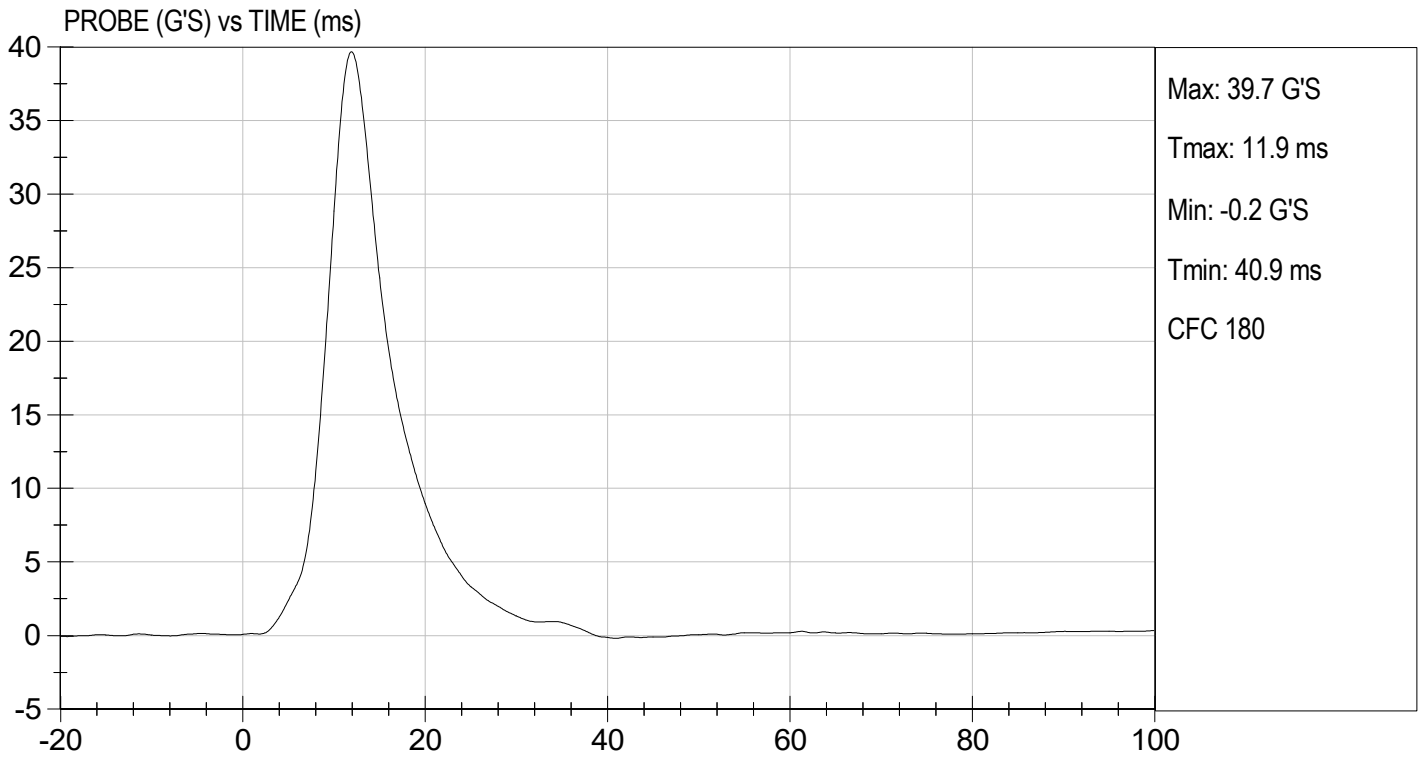
Laboratory Technician

08/26/2022

Test Date



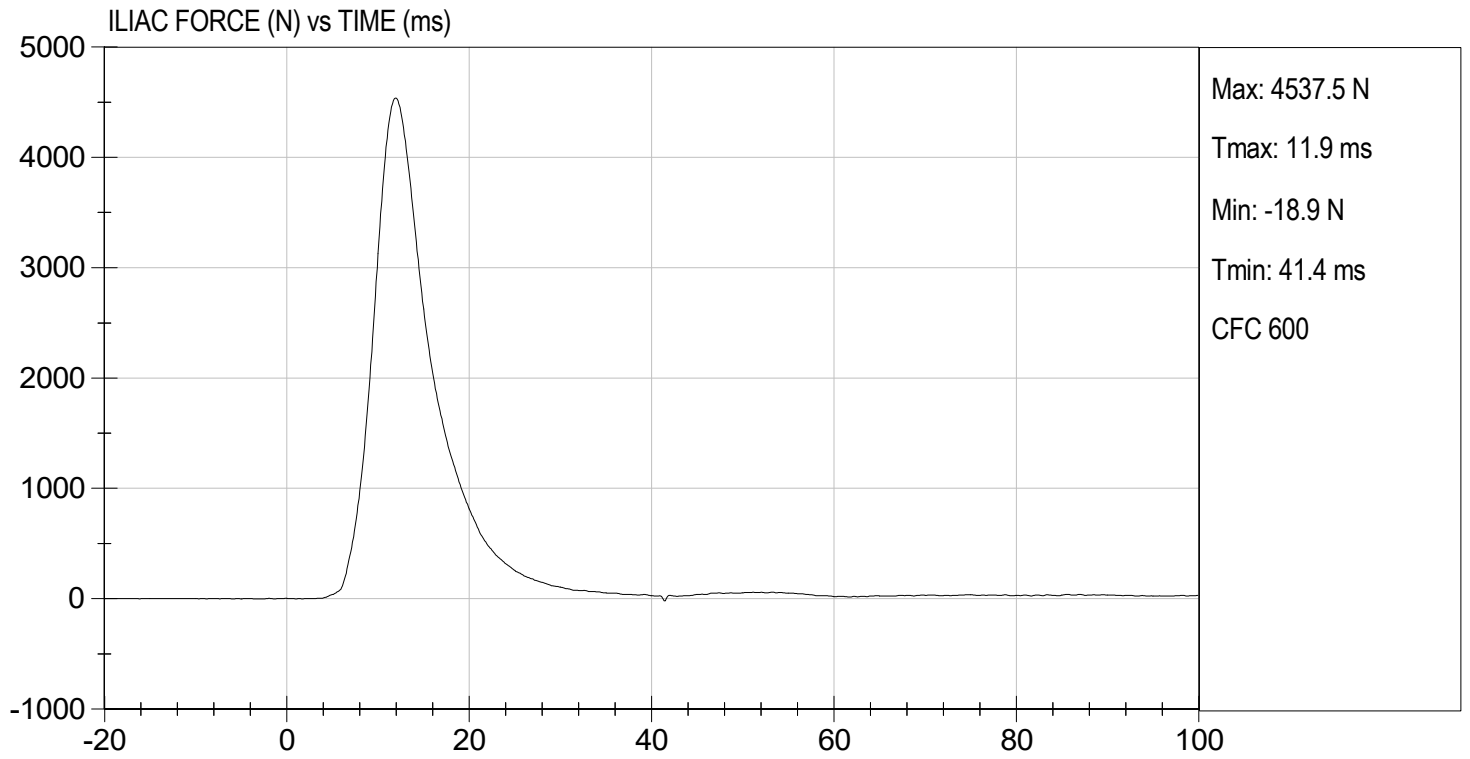
Approved By





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

TEST DATE: 08/26/2022  
TEST #: D221928





### SID-IIs Pelvis Plug Certification Test

Plug S/N 15381

Test Number 19797

Report Number 19849

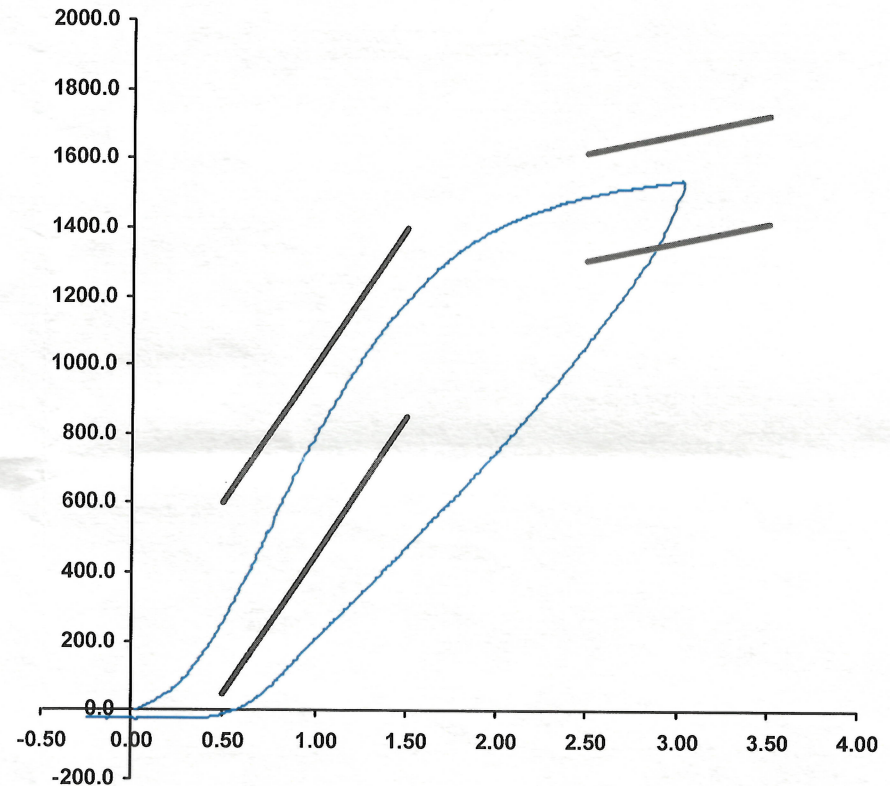
Test Date 7/26/2021 9:21:00 AM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	266	50	600
Force @ 1.5 mm (N)	1,190	850	1,400
Force @ 2.5 mm (N)	1,494	1,306	1,618
Force @ 3.0 mm (N)	1,540	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**

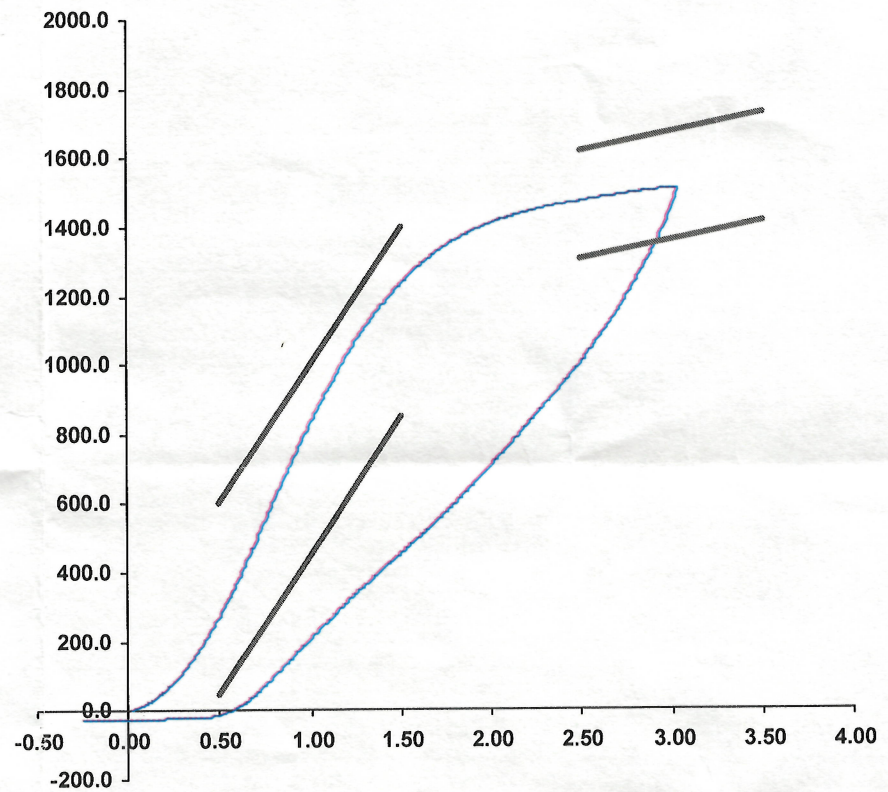
Plug S/N 14783  
 Test Number 16756  
 Report Number 16802  
 Test Date 12/29/2020 11:22:11 AM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	276.19	50.00	600.00
Force @ 1.5 mm (N)	1,237.45	850.00	1,400.00
Force @ 2.5 mm (N)	1,474.22	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,511.50	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	ACG259	Denton	11/11/2021
Iliac Wing Load Cell			Y	IWG286	Denton	10/21/2021
Pelvis Plug (struck side)				15381	SACO	07/26/2021
Pelvis Plug (non-struck side)				14783	SACO	12/29/2020

**Table 2 – Vehicle Instrumentation**

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A356243	MSI	04/21/2022
Vehicle Center of Gravity	Y	A337168	MSI	08/04/2022
Vehicle Center of Gravity	Z	P79422	Endevco	08/04/2022
Left Floor Sill	Y	A416940	MSI	08/16/2022
A-Pillar Sill	Y	A416945	MSI	08/16/2022
A-Pillar Low	Y	A416924	MSI	08/16/2022
A-Pillar Mid	Y	A416946	MSI	12/23/2021
B-Pillar Sill	Y	A414582	MSI	08/16/2022
B-Pillar Low	Y	T30606	Endevco	07/18/2022
B-Pillar Mid	Y	T30582	Endevco	07/19/2022
Driver Seat	Y	A416957	MSI	08/16/2022
Engine Top	X	A394374	MSI	07/13/2022
Engine Top	Y	A405523	MSI	07/13/2022
Firewall	Y	A416911	MSI	08/16/2022
Right Roof	Y	A416913	MSI	08/16/2022
Right Floor Sill	Y	A416919	MSI	08/16/2022
Rear Floorpan	X	A416932	MSI	08/16/2022
Rear Floorpan	Y	A416925	MSI	08/16/2022

**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