

REPORT NUMBER: SideNCAPPole-MGA-21-041

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

**TOYOTA MOTOR CORPORATION
2021 Toyota Prius Hybrid LE 5-Door Hatchback
NHTSA No.: O20215112**

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



Test Date: April 30, 2021

Final Report Date: August 11, 2021

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
Room W43-410
Washington, DC 20590**

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Prepared by: 
Ben Fischer, Program Manager

Approved by: 
Robert Schnorenberg, Project Engineer

Approval Date: August 11, 2021

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

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7. Author(s) Ben Fischer, Program Manager		8. Performing Organization Report No. SideNCAPPole-MGA-21-041																											
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		14. Sponsoring Agency Code NRM-100																											
15. Supplementary Notes																													
16. Abstract A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2021 Toyota Prius Hybrid LE 5-Door Hatchback 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 April 30, 2021. The impact velocity was 32.31 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.5°C. The test vehicle post-test maximum crush was 297 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 (HIC₃₆)</td> <td></td> <td style="text-align: center;">1000</td> <td style="text-align: center;">267</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;">39</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;">3475</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;">17</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45*</td> <td style="text-align: center;">23</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD (SID-IIs)		Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	267	Resultant Lower Spine Acceleration	g	82	39	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3475	Maximum Thoracic Rib Deflection	mm	38*	17	Maximum Abdomen Rib Deflection	mm	45*	23
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*Proposed IARV																													
The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door(s) did not open during the side impact event.																													
17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																											
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat, Seat Belt, Steering Wheel Adjustment and Fuel System Data	8
3	Dummy Longitudinal Clearance Dimensions	11
4	Dummy Lateral Clearance Dimensions	12
5	Camera and Instrumentation Data	13
6	Test Vehicle Accelerometer Locations	14
7	Rigid Pole Load Cell Data	15
8	Post-Test Observations	16
9	Test Vehicle Profile Measurements	18
10	Test Vehicle Exterior Crush Measurements	19
11	FMVSS No. 301 Static Rollover Results	23
12	Dummy/Vehicle Temperature and Humidity Stabilization Data	24
305-1	General Test and Vehicle Parameter Data for Indicant FMVSS No. 305 Testing	25
305-2	Pre-Impact Data for Indicant FMVSS No. 305 Testing	26
305-3	Pre-Impact Electrical Isolation Measurements and Calculations for Indicant FMVSS No. 305 Testing	27
305-4	Post-Impact Data for Indicant FMVSS No. 305 Testing	29
305-5	Static Rollover Test Data for Indicant FMVSS No. 305 Testing	32
<u>Appendix</u>		
A	Photographs	A
B	Vehicle and Dummy Response Data Plots	B
C	Dummy Configuration and Performance Verification Data	C
D	Test Equipment and Instrumentation Calibration Data	D
E	Seating Procedure Worksheets and Plots	E

SECTION 1 PURPOSE AND SUMMARY OF TEST

PURPOSE

This side pole impact test is part of the MY 2021 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00353. The purpose of this test is to generate comparative side impact performance in a 2021 Toyota Prius Hybrid LE 5-Door Hatchback. 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 2021 Toyota Prius Hybrid LE 5-Door Hatchback. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.31 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on April 30, 2021. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in this report.

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

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

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

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

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

Measurement Description	Units	Driver ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	267
Resultant Lower Spine Acceleration	g	82	39
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3475
Maximum Thoracic Rib Deflection	mm	38*	17
Maximum Abdomen Rib Deflection	mm	45*	23

*Proposed IARV

Supplemental restraint information is given below:

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

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

GENERAL COMMENTS

Left Lower A-Post Y recorded questionable data.

Left B-Post @ Sill Y recorded no valid data after 54 ms.

Floorpan @ Rear Axle Y recorded low-level cyclical noise throughout the event.

Load Cell Pole #8 Fy recorded no valid data.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

**DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20215112	Traction Control System (TCS)	Yes
Model Year	2021	Auto-Leveling System	No
Make	Toyota	Automatic Door Locks (ADL)	Yes
Model	Prius Hybrid LE	Power Window Auto-Reverse	Yes
Body Style	5-Door Hatchback	Other Optional Feature	No
VIN	JTDKAMFU3M3130866	Driver Front Airbag	Yes
Body Color	Supersonic Red	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	272 km / 169 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	1.8 L	Driver Torso Airbag	No
Type/No. Cylinders	Inline 4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	CVT	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	FWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	Yes
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Safety Restraint	N/A

Does owner's manual provide instruction to turn off automatic door locks?	No
---	----

DATA FROM CERTIFICATION LABEL

Manufactured By	TOYOTA MOTOR CORPORATION	GVWR (kg)	1789
Date of Manufacture	08/20	GAWR Front (kg)	1021
Vehicle Type	Passenger Car	GAWR Rear (kg)	975

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				375	(A)
DSC x 68.04 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				27	(A-B)

* Rated Cargo and Luggage Weight (RCLW) reduced by 8 kg to account for Load Carrying Capacity Reduction Label.

VEHICLE SEAT TYPE

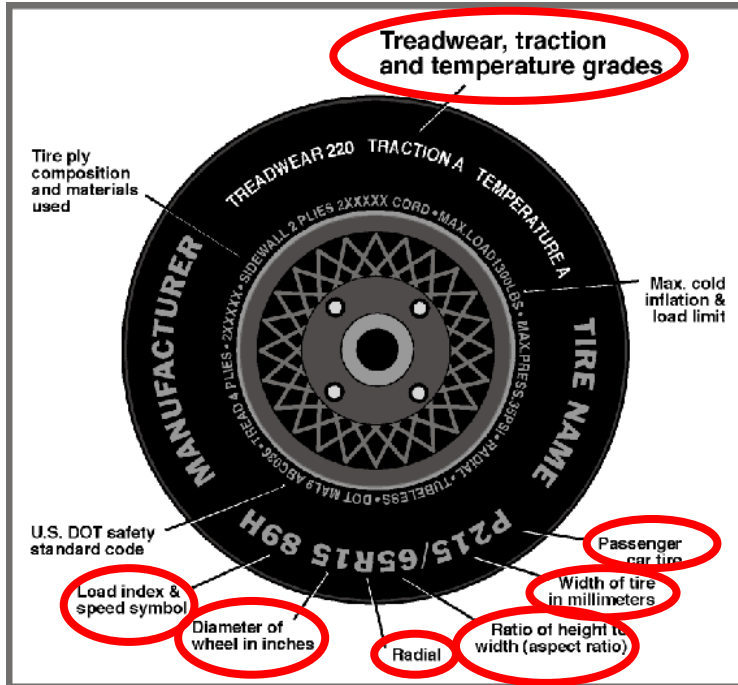
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	X					X	
Rear or Second Row				X	X		
Third Row Seat							

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	250	240
Recommended Tire Size	195/65R15	195/65R15
Tire Size on Vehicle	195/65R15	195/65R15
Tire Manufacturer	Dunlop	Dunlop
Tire Model	Enasave 01 A/S	Enasave 01 A/S
Treadwear	340	340
Traction	A	A
Temperature Grade	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	91S	91S
Tire Material	Rubber	Rubber
DOT Safety Code Left	1EU9N 2DMR 2920	1EU9N 2DMR 2920
DOT Safety Code Right	1EU9N 2DMR 2920	1EU9N 2DMR 2920

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	265	265	260	265
Tire Placard	kPa	250	250	240	240
Owner's Manual	kPa	250	250	240	240
As Tested	kPa	250	250	240	240

TEST AXLE VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	440.0	276.5		466.5	298.5		458.0	310.0	
Right	kg	401.0	282.0		411.0	294.5		404.5	306.0	
Ratio	%	60.1%	39.9%		59.7%	40.3%		58.3%	41.7%	
Totals	kg	841.0	558.5	1399.5	877.5	593.0	1470.5	862.5	616.0	1478.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1399.5	(A)
Actual Weight of 1 P572 ATD (SID-IIs) Used	kg	52	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	27	(C)
Calculated Test Vehicle Target Weight (TVTWT)	kg	1478.5	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement
Driver Door Sill Angle (front-to-back)*	deg	0.0	0.2	0.3	Yes
Front Pass. Door Sill Angle (front-to-back)*	deg	0.2	0.3	0.3	Yes
Front Bumper Angle (left-to-right)**	deg	-0.1	-0.2	-0.3	Yes
Rear Bumper Angle (left-to-right)**	deg	-0.2	-0.2	-0.2	Yes
Vehicle CG (Aft of Front Axle)	mm	1076	1087	1123	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	18	31	30	

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

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTWT

Component Description	Units	Weight
Weight of Ballast Added	kg	
Components Removed: Rear bumper, rear fascia	kg	13

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: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
Test Date: 4/30/2021

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm Target	873
Aft 25 mm Target	870

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

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	18.6	13.7	16.2
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As-Tested SCRL Angle (Mid) (°)	As-Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rear-Most	Mid	Forward-Most
Driver Seat	16.2	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

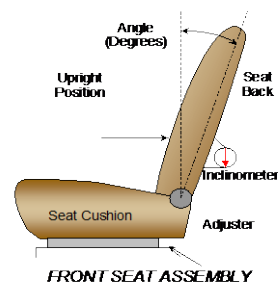
NHTSA No.: O20215112
 Test Date: 4/30/2021

SEAT FORE/AFT POSITIONS

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

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents (1 st as 1)	Degrees	Detent (1 st as 0)
Driver Seat	58.1	33	-5.1	1
Front Passenger Seat	68.2	33	-5.0	1
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

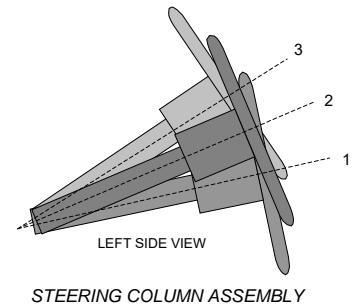
Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
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 Test Date: 4/30/2021

STEERING COLUMN ADJUSTMENT

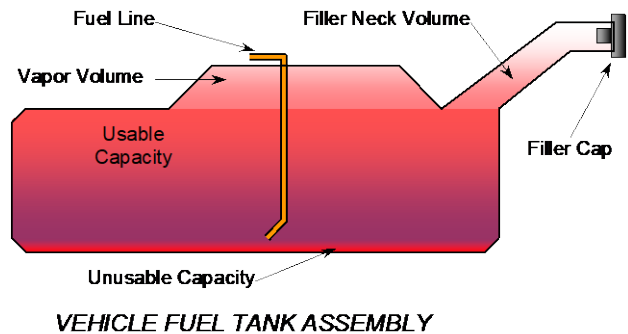
Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	70.6	
Geometric Center, Position 2	68.6	
Uppermost, Position 3	66.6	
Telescoping Steering Wheel Travel		38
Test Position	68.6	19



FUEL PUMP

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



FUEL TANK CAPACITY DATA

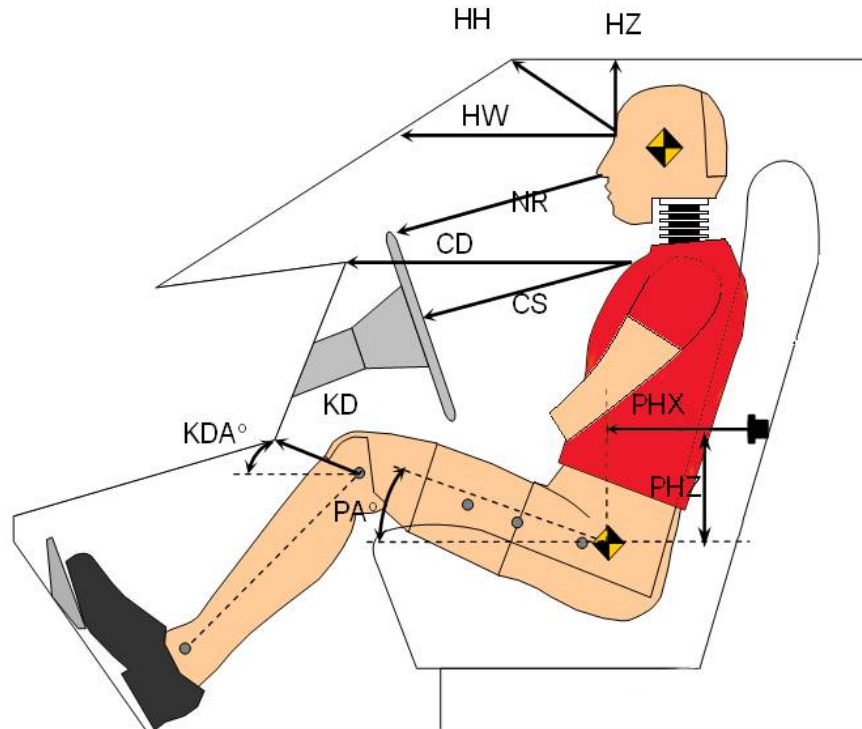
	Liters
Usable Capacity of Standard Tank (see S1 – Vehicle Setup Information)	43.0
Usable Capacity of Optional Tank (see S1 – Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	43.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	40.0
Actual Amount of Solvent Used	40.0
1/3 of Usable Capacity	14.3

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

**DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021



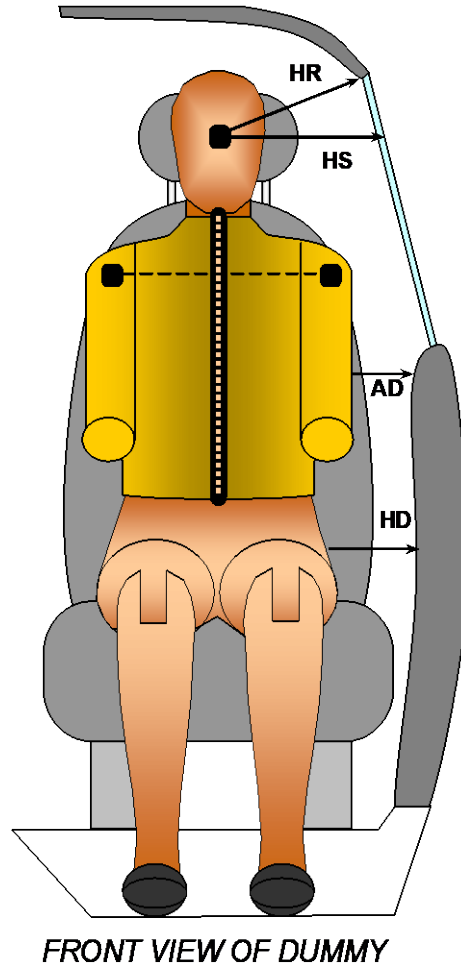
LEFT SIDE VIEW

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	320	
HW	Head to Windshield	687	
HZ	Head to Roof Liner	225	
NR	Nose to Rim/Seat Back	203	
CD	Chest to Dashboard/Seat Back	656	
CS	Chest to Steering Wheel	148	
KDL / KDAL	Left Knee to Dash/Seat Back	133	32.2
KDR / KDAL	Right Knee to Dash/Seat Back	132	33.1
PAX	Pelvic Tilt Angle X		21.5
PAY	Pelvic Tilt Angle Y		-1.3
PHX	Hip Point to Striker (X-Axis)	345	
PHZ	Hip Point to Striker (Z-Axis)	212	

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

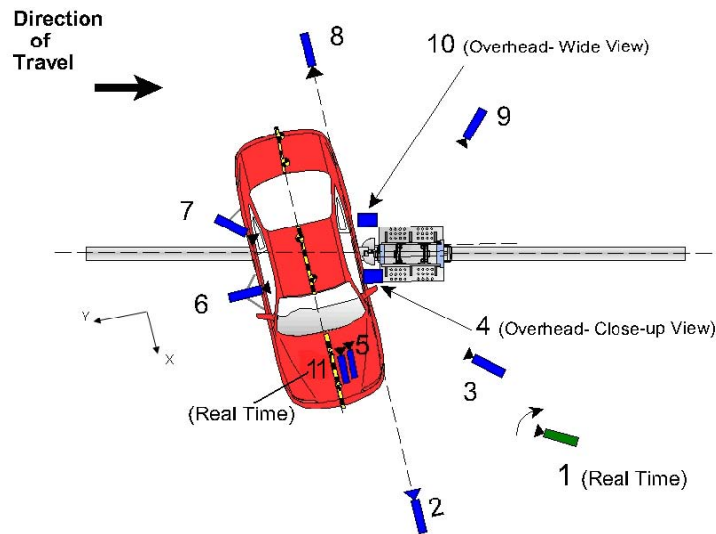


Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	265
HS	Head to Side Window	382
AD	Arm to Door	184
HD	Hip Point to Door	165

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021



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	6400	-140	-1695	25	1000
3	Impact Side 45° Forward	4205	-1500	-1820	20	1000
4	Overhead Closeup	0	0	-6670	70	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8.5	1000
7	Onboard – Driver Rear				8.5	1000
8	Rear Ground Level	-6845	-210	-1735	25	1000
9	Impact Side 45° Rearward	-2590	-3700	-1880	20	1000
10	Overhead Wide View	-100	800	-6650	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

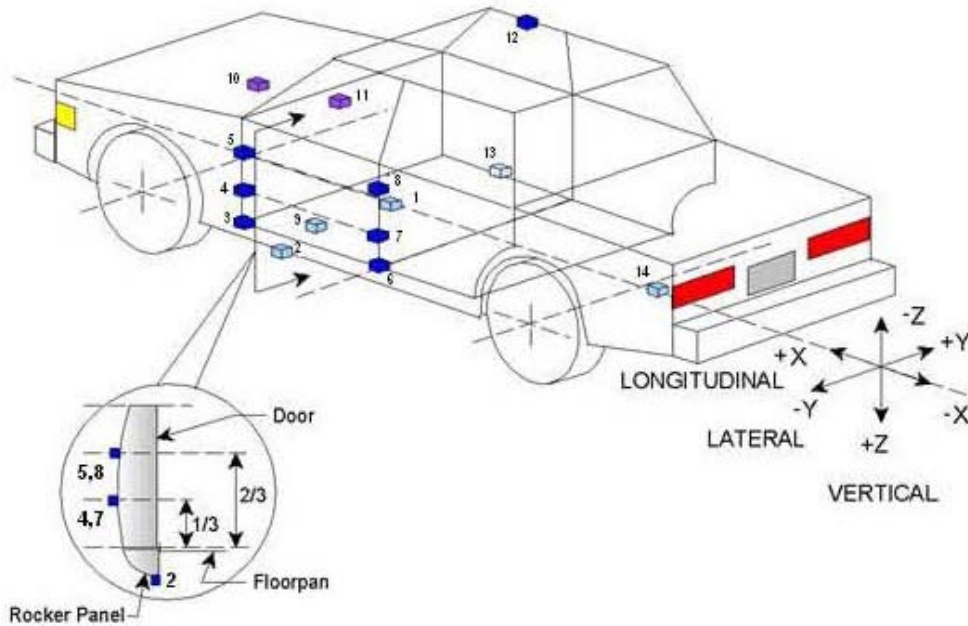
INSTRUMENTATION

	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: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
Test Date: 4/30/2021



TEST VEHICLE ACCELEROMETER LOCATIONS

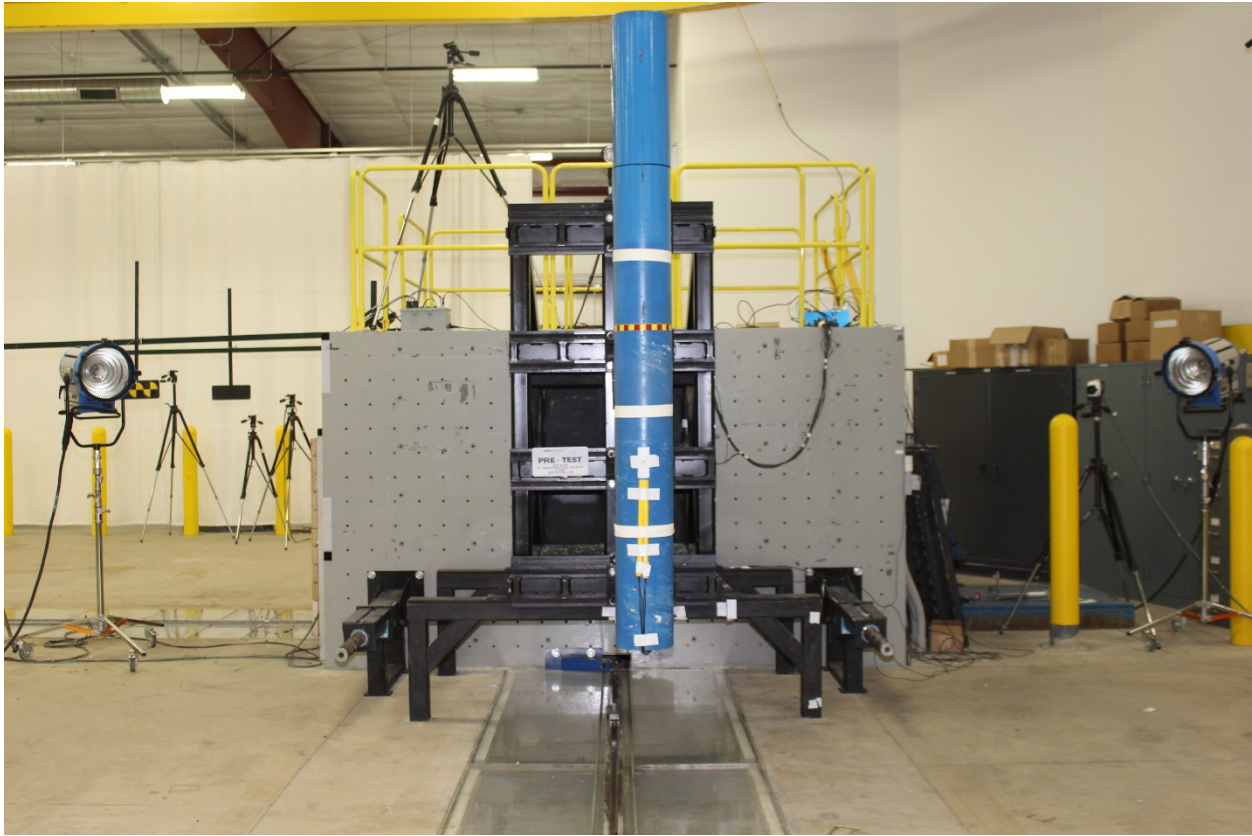
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2341	167	-220
2	Left Floor Sill	2750	-771	-183
3	A Pillar Sill	2994	-771	-180
4	A Pillar Low	3001	-812	-546
5	A Pillar Mid	3009	-808	-794
6	B Pillar Sill	1924	-770	-190
7	B Pillar Low	1923	-685	-511
8	B Pillar Mid	1882	-693	-763
9	Driver Seat Track	2122	-389	-240
10	Engine Top	3731	-20	-796
11	Firewall	3561	0	-829
12	Right Roof	2021	500	-1449
13	Right Floor Sill	2750	771	-195
14	Rear Floorpan	851	0	-520

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: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
Test Date: 4/30/2021



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: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

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
Back of Head	Headrest
Left Shoulder	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	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)					

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

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	Yes	Yes
Side Airbag (Other)				
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other:	No		No	

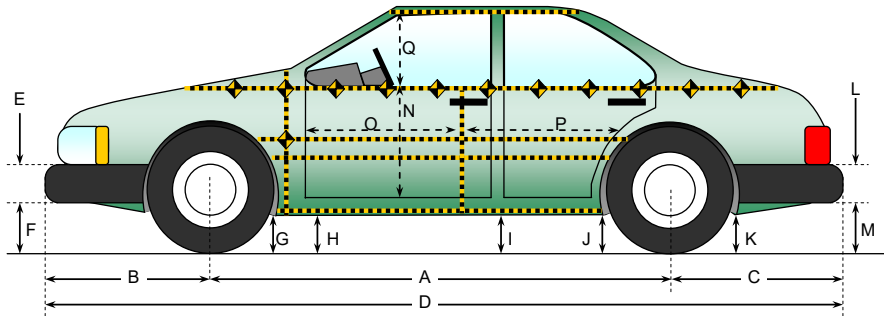
SPEED, ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1085
Actual Impact Point (Aft of Front Axle)	mm		1090
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	-5
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	75.0
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.31
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.37

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
Test Date: 4/30/2021



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

LEFT SIDE VIEW

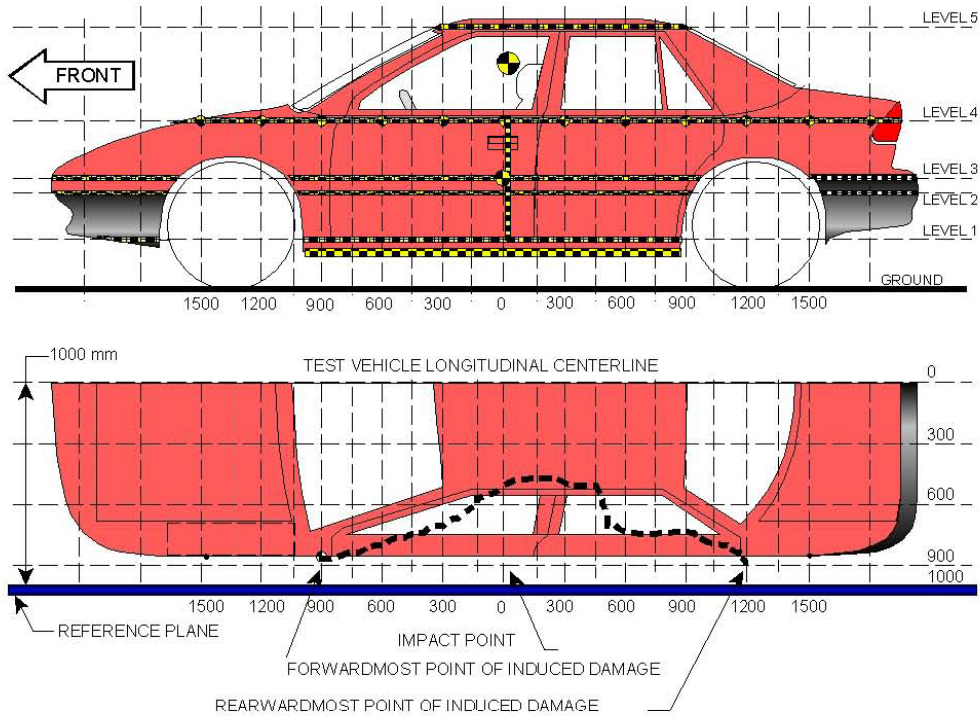
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2696	2640	56
B	Front Axle to FSOV	949	994	-45
C	Rear Axle to RSOV	842	825	17
D	Total Vehicle Length at Centerline	4487	4459	28
E	Front Bumper Thickness	118	118	0
F	Front Bumper Bottom to Ground	184	210	-26
G	Sill Height at Front Wheel Well	158	157	1
H	Sill Height at Front Door Leading Edge	156	166	-10
I	Sill Height at B-Pillar	169	180	-11
J1	Sill Height at Rear Wheel Well	176	190	-14
J2	Pinch Weld Height at Rear Wheel Well	174	187	-13
K	Sill Height Aft of Rear Wheel Well	240	248	-8
L	Rear Bumper Thickness	N/A	N/A	N/A
M	Rear Bumper Bottom to Ground	432	424	8
N	Sill Height to Bottom of Front Window Sill	703	706	-3
O	Front Door Leading Edge to Impact CL	628	535	93
P	Rear Door Trailing Edge to Impact CL	1274	1220	54
Q	Front Window Opening	470	432	38
R	Right Side Length	3794	3802	-8
S	Left Side Length	3794	3714	80
T	Vehicle Width at B-Pillars	1778	1752	26
U	Front Wheel Track Width	1534		
V	Rear Wheel Track Width	1534		

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021



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	273	262	0
2	Occupant H-Point	524	294	0
3	Mid Door	582	297	0
4	Window Sill	847	287	0
5	Window Top	1400	84	0

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

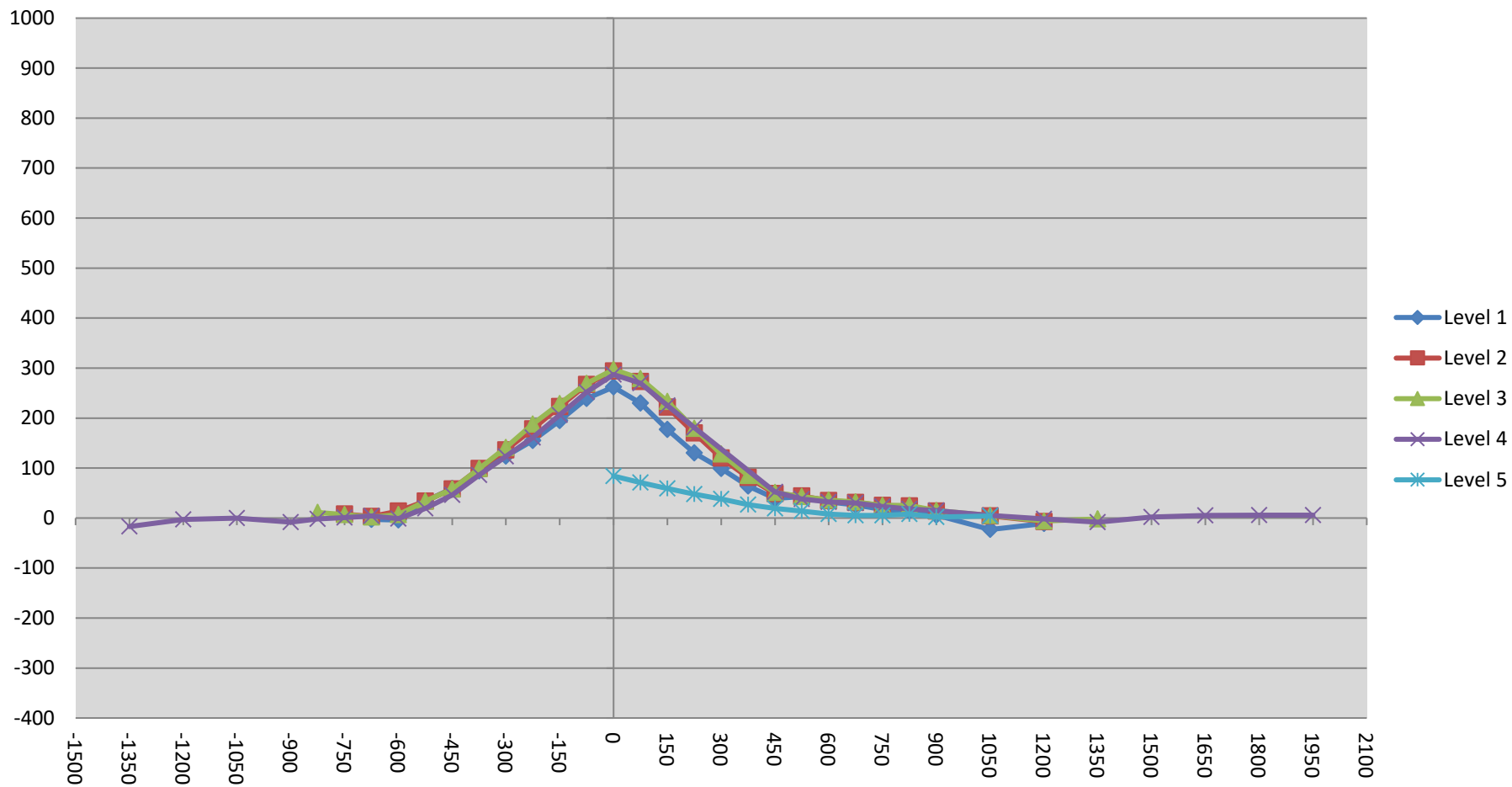
Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2700															
-2550															
-2400															
-2250															
-2100															
-1950															
-1800															
-1650															
-1500															
-1350				365					348					-17	
-1200				333					330					-3	
-1050				307					307					0	
-900				286					278					-8	
-825			221	279				232	277				11	-2	
-750		221	221	276			229	228	277			8	7	1	
-675	243	222	222	276		240	225	224	280		-3	3	2	4	
-600	245	224	223	273		241	238	230	272		-4	14	7	-1	
-525	246	225	224	269		280	259	258	288		34	34	34	19	
-450	249	226	224	265		308	284	282	311		59	58	58	46	
-375	250	226	224	261		344	325	323	347		94	99	99	86	
-300	252	227	224	257		376	363	365	380		124	136	141	123	
-225	253	227	225	255		408	405	413	416		155	178	188	161	
-150	253	227	225	252		448	450	454	458		195	223	229	206	
-75	255	228	226	250		494	495	495	502		239	267	269	252	
0	255	229	226	246	521	517	523	523	533	605	262	294	297	287	84
75	256	230	226	244	507	486	503	505	514	578	230	273	279	270	71
150	256	230	227	243	501	433	452	460	468	560	177	222	233	225	59
225	256	231	227	243	500	386	401	406	424	548	130	170	179	181	48
300	256	232	228		499	355	352	356		537	99	120	128		38
375	256	232	228		499	320	313	313		526	64	81	85		27
450	255	234	229	238	500	294	283	280	290	519	39	49	51	52	19
525	254	235	231	238	500	297	279	274	276	514	43	44	43	38	14
600	249	237	232	237	501	281	272	268	269	509	32	35	36	32	8
675	241	237	233	237	507	267	268	265	267	512	26	31	32	30	5
750	240	238	234	237	513	257	263	259	260	518	17	25	25	23	5
825	240	238	234	237	525	254	262	259	255	533	14	24	25	18	8
900	239	237	234	237	540	245	251	249	252	542	6	14	15	15	2
1050	234	231	230	241	580	211	235	235	246	584	-23	4	5	5	4
1200	233	223	224	241		222	216	218	239		-11	-7	-6	-2	
1350			225	244				223	236				-2	-8	
1500				250					252					2	
1650				257					262					5	
1800				267					273					6	
1950				282					288					6	
2100															
2250															
2400															
2550															
2700															

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

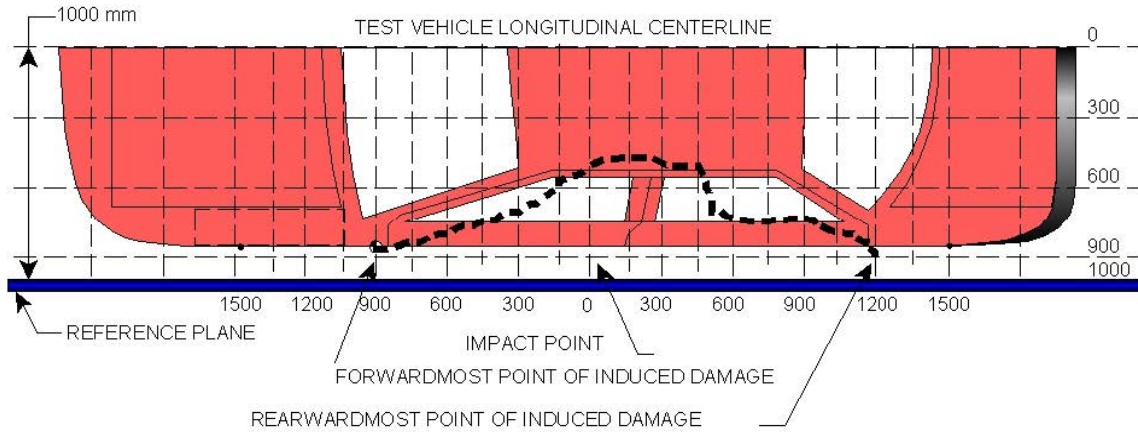
NHTSA No.: O20215112
 Test Date: 4/30/2021



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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	450	3	229	279	50
2	234	3	227	301	74
3	-18	3	226	520	294
4	-198	3	225	428	203
5	-414	3	224	303	79
6	-630	3	223	219	-4

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test

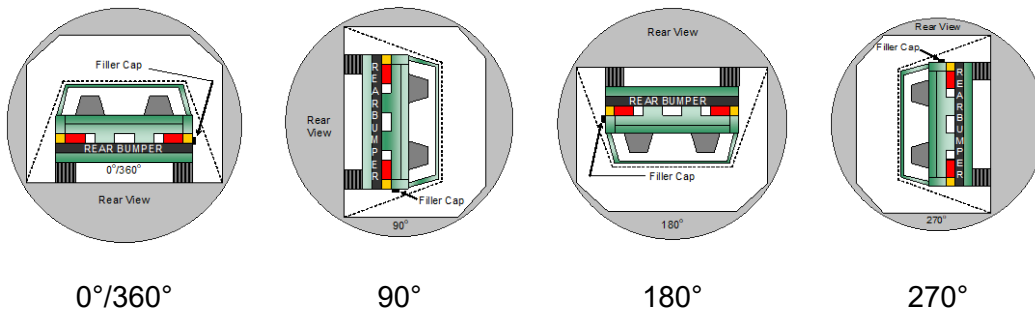
NHTSA No.: O20215112
Test Date: 4/30/2021

Test Time: 11:59 am

Temperature: 21.5°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°	111	300	411
90° to 180°	110	300	410
180° to 270°	107	300	407
270° to 360°	111	300	411

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	

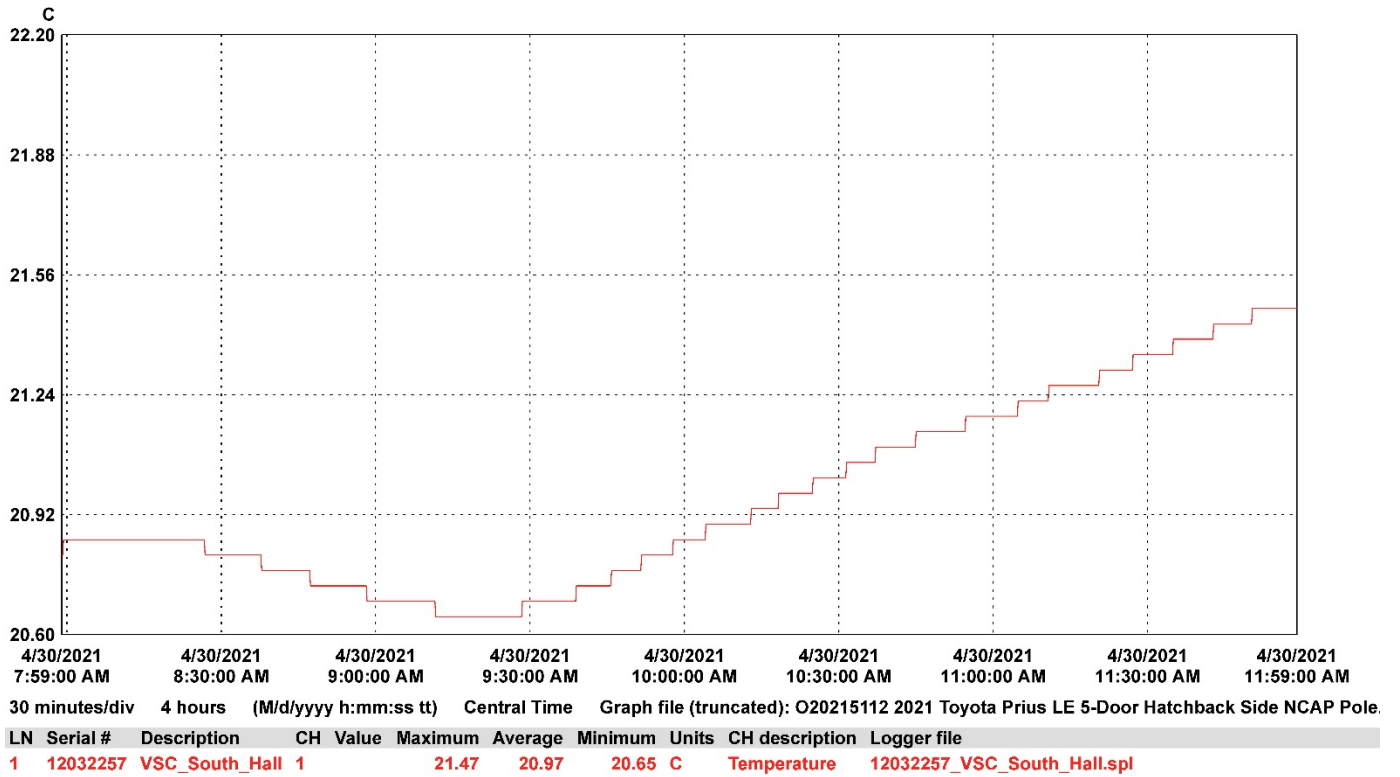
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021



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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
Test Date: 4/30/2021

ELECTRIC VEHICLE PROPULSION SYSTEM

	Units	Observations and Conclusions
Type of Electric Vehicle		Gas-Electric Hybrid
Propulsion Battery Type		Li-ion
Nominal Voltage	V	207.2
Physical Location of Automatic Propulsion Battery Disconnect		Physically contained within the hybrid battery system
Auxiliary Battery Type		Lead-acid Battery

PROPULSION BATTERY SYSTEM DATA

	Units	Observations and Conclusions
Electrolyte Fluid Type		Flammable Liquid Electrolyte
Electrolyte Fluid Specific Gravity	g/L	1.3
Electrolyte Fluid Kinematic Viscosity	cSt	4.0
Electrolyte Fluid Color		Clear
Propulsion Battery Coolant Type, Color, Specific Gravity (if applicable)		Air-Cooled
Location of Battery Modules		X Inside Passenger Compartment
		Outside Passenger Compartment
		The high-voltage battery is located below the 2 nd row seat cushion.

PROPULSION BATTERY STATE OF CHARGE

<i>For all battery types:</i>	
Voltage range corresponding to useable energy of the battery:	
Minimum State of Charge	
Maximum State of Charge	
95% of Maximum State of Charge	
Test Voltage - No less than 95% of maximum State of Charge	
<i>For batteries that are rechargeable ONLY by an energy source on the vehicle:</i>	
Voltage range corresponding to useable energy of the battery:	
Minimum State of Charge	N/A
Maximum State of Charge	N/A
Test Voltage – Maximum practicable State of Charge within Normal Operating Range	200.6 V

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

VEHICLE CHASSIS GROUND POINT(S) LOCATION(S)

Details of Vehicle Chassis Ground Point(s) & Location(s)	Vehicle body shell at cargo area floor
--	--

PROPULSION BATTERY SYSTEM

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

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
Test Date: 4/30/2021

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		51490264
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		3/3/2021

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	200.6
----	---	-------

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

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

V1	V	97.8
V2	V	98.4

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	110,000
V1' Pre-Impact	V	21.3
V2' Pre-Impact	V	18.3

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

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	792,565
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$		
Ri2 Pre-Impact	Ω	960,015
Ri = The lesser of Ri1 and Ri2		
Ri Pre-Impact	Ω	792,565
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$		
Ri / Vb Pre-Impact	Ω	3,951

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: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		51490264
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		3/3/2021

ELECTRICAL ISOLATION MEASUREMENTS

Vb Post-Impact	V	0.3
----------------	---	-----

V1 Post-Impact	V	2.6	Impact Time	1	Minutes	18	Seconds
V2 Post-Impact	V	2.4		1	Minutes	23	Seconds
V1' Post-Impact	V	0.2		1	Minutes	40	Seconds
V2' Post-Impact	V	0.1		1	Minutes	30	Seconds

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

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	2,538,462	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	5,270,833	Impact Time	1	Minutes	30	Seconds
Ri = The lesser of Ri1 and Ri2							
Ri Post-Impact	Ω	2,538,462	Impact Time	1	Minutes	40	Seconds
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$							
Ri / Vb Post-Impact	Ω	8,461,538	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: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

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

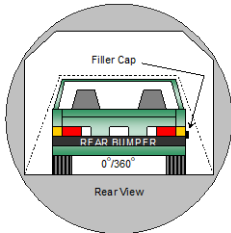
	Yes (Fail)	No
Is the Propulsion Battery Electrolyte Spillage visible in the passenger compartment?		X

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

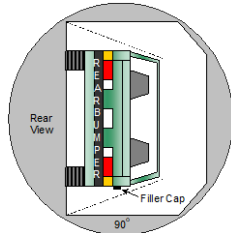
Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

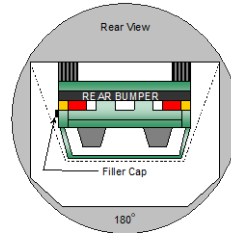
PROPULSION BATTERY SYSTEM COMPONENTS



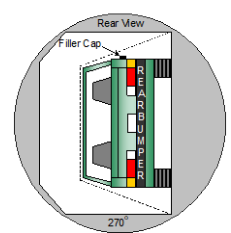
0°/360°



90°



180°



270°

PROPULSION BATTERY ELECTROLYTE COLLECTION TIME PERIOD

Test Phase	Rotation Time (spec. 1-3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
	1	min	51	sec	5	min	6	min	51	sec	7	min
0° - 90°	1	min	51	sec	5	min	6	min	51	sec	7	min
90° - 180°	1	min	50	sec	5	min	6	min	50	sec	7	min
180° - 270°	1	min	47	sec	5	min	6	min	47	sec	7	min
270° - 360°	1	min	51	sec	5	min	6	min	51	sec	7	min

TEST VEHICLE PROPULSION BATTERY ELECTROLYTE SPILLAGE

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

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

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

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

VOLTMETER INFORMATION

	Units	Observations and Conclusions
Make		Fluke
Model		177
Serial Number		51490264
Internal Impedance Value	MΩ	> 10 MΩ < 100 pF
Resolution	V	0.001
Last Calibration Date		3/3/2021

ELECTRICAL ISOLATION MEASUREMENTS

Vb Post-Impact	V	0.2
----------------	---	-----

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	0.2	V	0°		min		sec
	0.1		90°	2		29	
	0.1		180°	2		45	
	0.1		270°	2		35	
	0.2		360°	2		48	
V2	0.0	V	0°		min		sec
	0.0		90°	2		26	
	0.0		180°	2		42	
	0.1		270°	2		32	
	0.0		360°	2		51	
V1'	0.0	V	0°		min		sec
	0.0		90°	2		34	
	0.0		180°	2		50	
	0.0		270°	2		39	
	0.0		360°	2		2	
V2'	0.0	V	0°		min		sec
	0.0		90°	2		39	
	0.0		180°	2		56	
	0.0		270°	2		45	
	0.0		360°	2		56	

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

Test Vehicle: 2021 Toyota Prius Hybrid LE 5-Door Hatchback
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20215112
 Test Date: 4/30/2021

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		34
	Zero Volts		180°	2		50
	Zero Volts		270°	2		39
	Zero Volts		360°	2		2
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$						
Ri2	Zero Volts	Ω	0°		min	
	Zero Volts		90°	2		39
	Zero Volts		180°	2		56
	Zero Volts		270°	2		45
	Zero Volts		360°	2		56
$R_i = \text{The lesser of } R_{i1} \text{ and } R_{i2}$						
Ri	Zero Volts	Ω	0°		min	
	Zero Volts		90°	2		39
	Zero Volts		180°	2		56
	Zero Volts		270°	2		45
	Zero Volts		360°	2		56
$R_i / V_b = \text{Electrical Isolation Value} / \text{Nominal Battery Voltage}$						
Ri / Vb	Zero Volts	Ω/V	0°		min	
	Zero Volts		90°	2		39
	Zero Volts		180°	2		56
	Zero Volts		270°	2		45
	Zero Volts		360°	2		56

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**

TABLE OF PHOTOGRAPHS

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

		<u>Page No.</u>
Photo No. 029	Pre-Test Overhead View of Dummy Thighs on Seat Pan	A-15
Photo No. 030	Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket	A-15
Photo No. 031	Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level	A-16
Photo No. 032	Pre-Test Placement of Dummy's Feet	A-16
Photo No. 033	Pre-Test View of Belt Anchorage for Dummy	A-17
Photo No. 034	Pre-Test Left Side View of Steering Wheel	A-17
Photo No. 035	Pre-Test View of Disengaged Parking Brake	A-18
Photo No. 036	Pre-Test View of Parking Brake	A-18
Photo No. 037	Pre-Test Close-Up Left Side View of Driver Seat Track	A-19
Photo No. 038	Pre-Test Close-Up Left Side View of Driver Seat Back	A-19
Photo No. 039	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-20
Photo No. 040	Pre-Test Dummy and Door Clearance View	A-20
Photo No. 041	Post-Test Dummy and Door Clearance View	A-21
Photo No. 042	Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment	A-21
Photo No. 043	Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment	A-22
Photo No. 044	Pre-Test Inner Door Panel View	A-22
Photo No. 045	Post-Test Inner Door Panel View Showing Dummy Contact Location	A-23
Photo No. 046	Post-Test Dummy Close-Up Head Contact with Vehicle Interior View	A-23
Photo No. 047	Post-Test Dummy Close-Up Head Contact with Side Air Bag View	A-24
Photo No. 048	Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View	A-24
Photo No. 049	Post-Test Dummy Close-Up Torso Contact with Side Air Bag View	A-25
Photo No. 050	Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-25
Photo No. 051	Post-Test Dummy Close-Up Pelvis Contact with Side Air Bag View	A-26
Photo No. 052	Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View	A-26
Photo No. 053	Post-Test Right Side View of Dummy and Rear Seat of Occupant Compartment	A-27
Photo No. 054	Post-Test Inner Rear Passenger Torso Air Bag Deployment View	A-27
Photo No. 055	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-28

		<u>Page No.</u>
Photo No. 056	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-28
Photo No. 057	Close-Up View of Vehicle's Certification Label	A-29
Photo No. 058	Close-Up View of Vehicle's Tire Information Placard or Label	A-29
Photo No. 058a	Close-Up View of Vehicle Load Carrying Capacity Reduction Label	A-30
Photo No. 059	Pre-Test Pole Barrier Front View	A-30
Photo No. 060	Post-Test Pole Barrier Front View	A-31
Photo No. 061	Pre-Test Pole Barrier Side View	A-31
Photo No. 062	Post-Test Pole Barrier Side View	A-32
Photo No. 063	Pre-Test Ballast View	A-32
Photo No. 064	Post-Test Primary and Redundant Speed Trap Read-Out	A-33
Photo No. 065	FMVSS No. 301 Static Rollover 0 Degrees	A-33
Photo No. 066	FMVSS No. 301 Static Rollover 90 Degrees	A-34
Photo No. 067	FMVSS No. 301 Static Rollover 180 Degrees	A-34
Photo No. 068	FMVSS No. 301 Static Rollover 270 Degrees	A-35
Photo No. 069	FMVSS No. 301 Static Rollover 360 Degrees	A-35
Photo No. 070	Impact Event	A-36
Photo No. 071	Monroney Label	A-36
Photo No. 072	Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-37
Photo No. 073	Post-Test View of Shattered Vehicle Inner Door Panel	A-37
Photo No. 305-01	Auxiliary Power Module Warning Label	A-38
Photo No. 305-02	Power Inverter Warning Label	A-38
Photo No. 305-03	First Responder Warning Label	A-39
Photo No. 305-04	First Responder Warning Location	A-39
Photo No. 305-05	Other Vehicle Label(s) Related to Electrical Propulsion System	A-40
Photo No. 305-06	Manual High Voltage Service Disconnect in Place	A-40
Photo No. 305-07	Manual High Voltage Service Disconnect Removed	A-41
Photo No. 305-08	Manual High Voltage Service Disconnect Removed	A-41
Photo No. 305-09	Pre-Impact View of Propulsion Battery	A-42
Photo No. 305-10	Post-Impact Front View of Propulsion Battery	A-42

	<u>Page No.</u>	
Photo No. 305-11	Post-Impact Rear View of Propulsion Battery	A-43
Photo No. 305-12	Pre-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules	A-43
Photo No. 305-13	Post-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules	A-44
Photo No. 305-14	Pre-Impact View of Propulsion Battery Module(s)	A-44
Photo No. 305-15	Post-Impact View of Propulsion Battery Module(s)	A-45
Photo No. 305-16	Pre-Impact View of Electric Propulsion Drive	A-45
Photo No. 305-17	Post-Impact View of Electric Propulsion Drive	A-46
Photo No. 305-18	Pre-Impact View of High Voltage Interconnect(s)	A-46
Photo No. 305-19	Pre-Impact View Propulsion Battery Venting System(s)	A-47
Photo No. 305-20	Pre-Impact View of Other Visible Electric Propulsion Components	A-47
Photo No. 305-21	Pre-Impact View of Ground Lead Attached	A-48
Photo No. 305-22	Pre-Impact View of High Voltage Leads Attached	A-48
Photo No. 305-23	Pre-Impact Close-Up View of High Voltage Leads Attached	A-49
Photo No. 305-24	Pre-Impact View of Installed Test Interface Port	A-49
Photo No. 305-25	Post-Impact View of Installed Test Interface Port	A-50
Photo No. 305-26	Pre-Impact View of Other Test Devices	A-50
Photo No. 305-27	Post-Impact View of Other Test Devices	A-51
Photo No. 305-28	FMVSS No. 305 Static Rollover at 90 Degrees	A-51
Photo No. 305-29	FMVSS No. 305 Static Rollover at 180 Degrees	A-52
Photo No. 305-30	FMVSS No. 305 Static Rollover at 270 Degrees	A-52
Photo No. 305-31	FMVSS No. 305 Static Rollover at 360 Degrees	A-53
Photo No. 305-32	Pre-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery	A-53
Photo No. 305-33	Post-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery	A-54
Photo No. 305-34	Post-Impact Propulsion Battery System Mounting and/or Intrusion Failure(s)	A-54
Photo No. 305-35	Post-Impact View of Battery Component Intrusion	A-55
Photo No. 305-36	Post-Impact View of Battery Module Movement or Retention Loss	A-55
Photo No. 305-37	Post-Impact View of Propulsion Battery Electrolyte Spillage Location	A-56
Photo No. 305-38	Post-Test View of Propulsion Battery Electrolyte Spillage Location	A-56



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

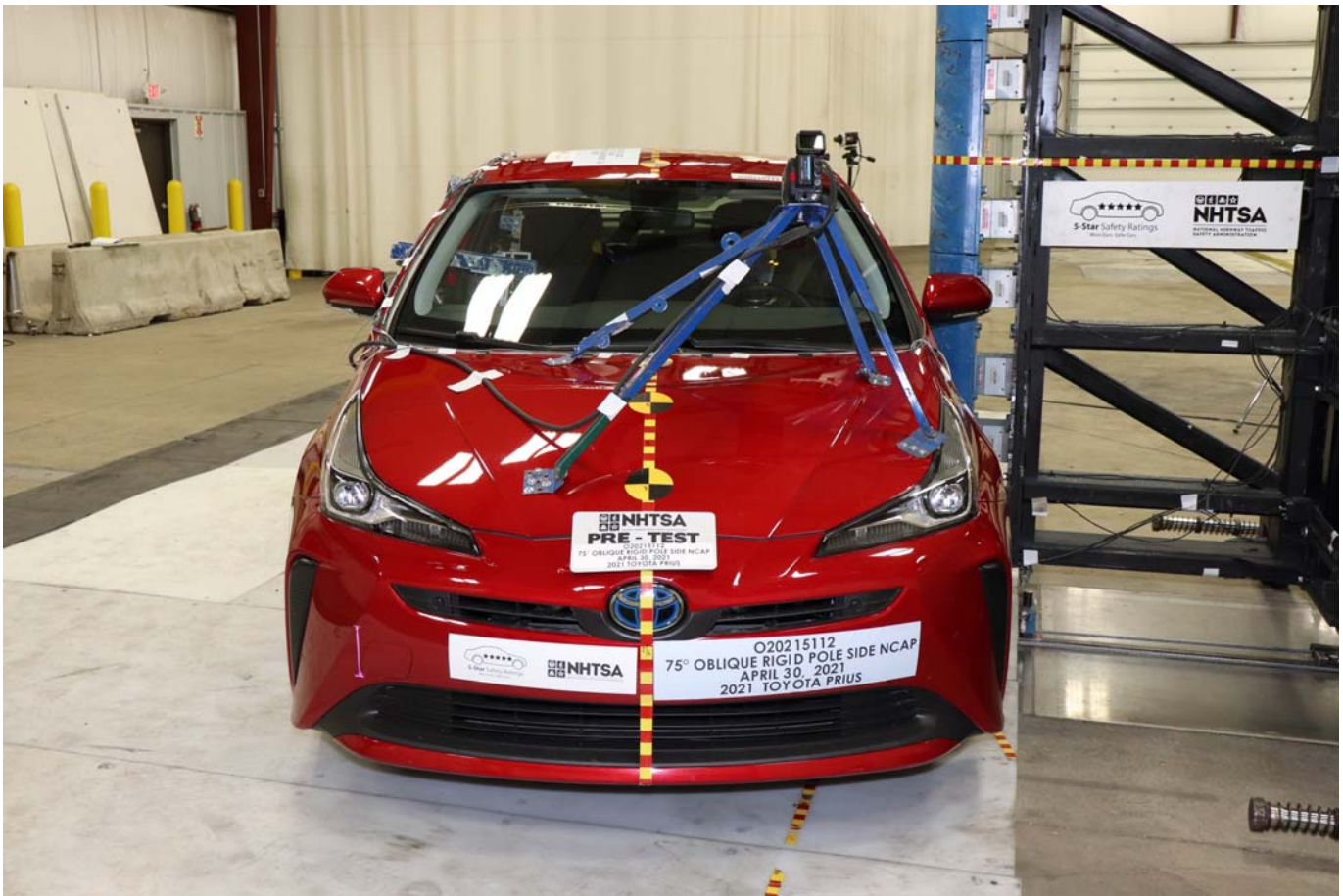


Photo No. 003 - Pre-Test Frontal View of Test Vehicle

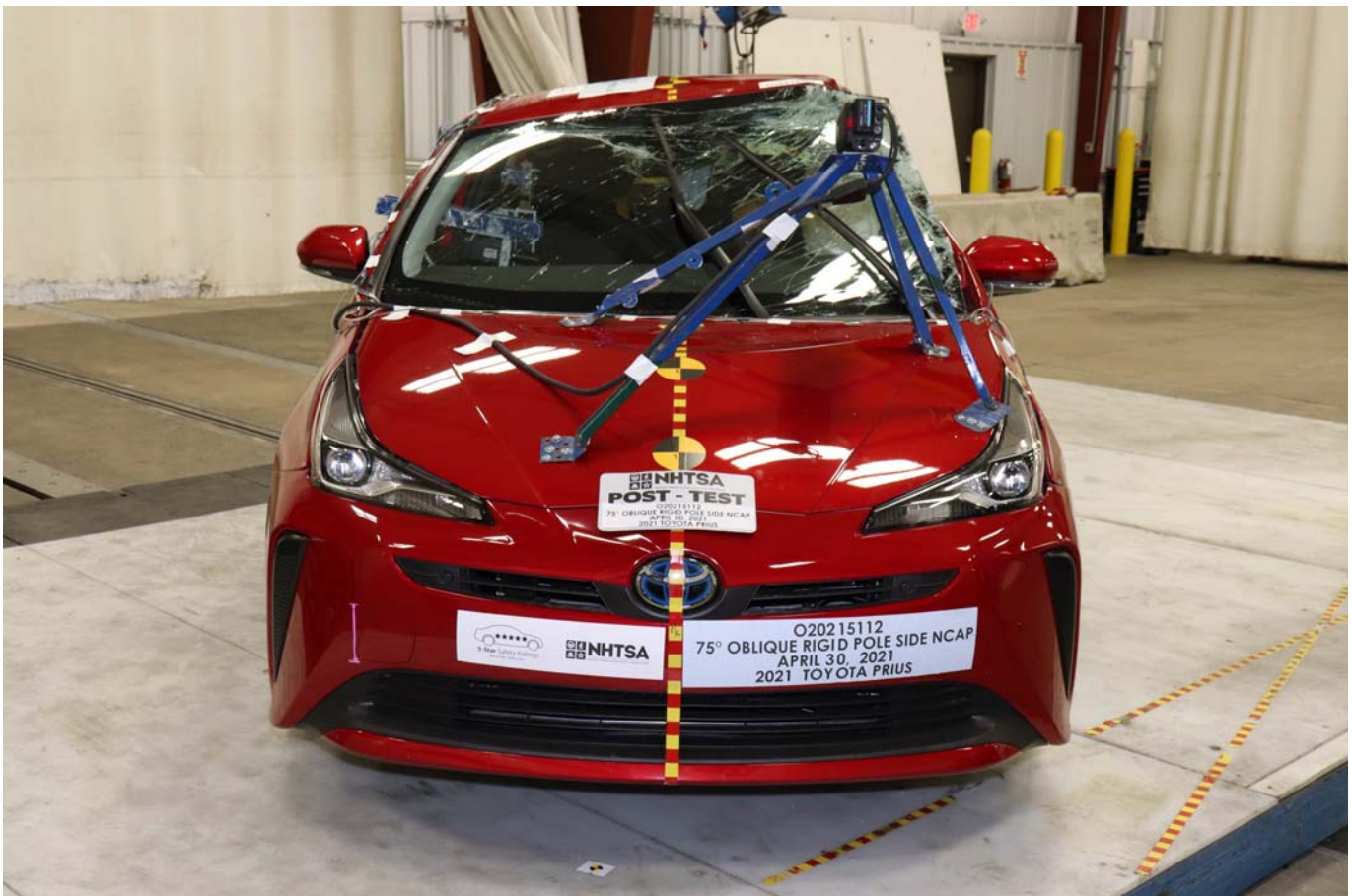


Photo No. 004 - Post-Test Frontal View of Test Vehicle



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

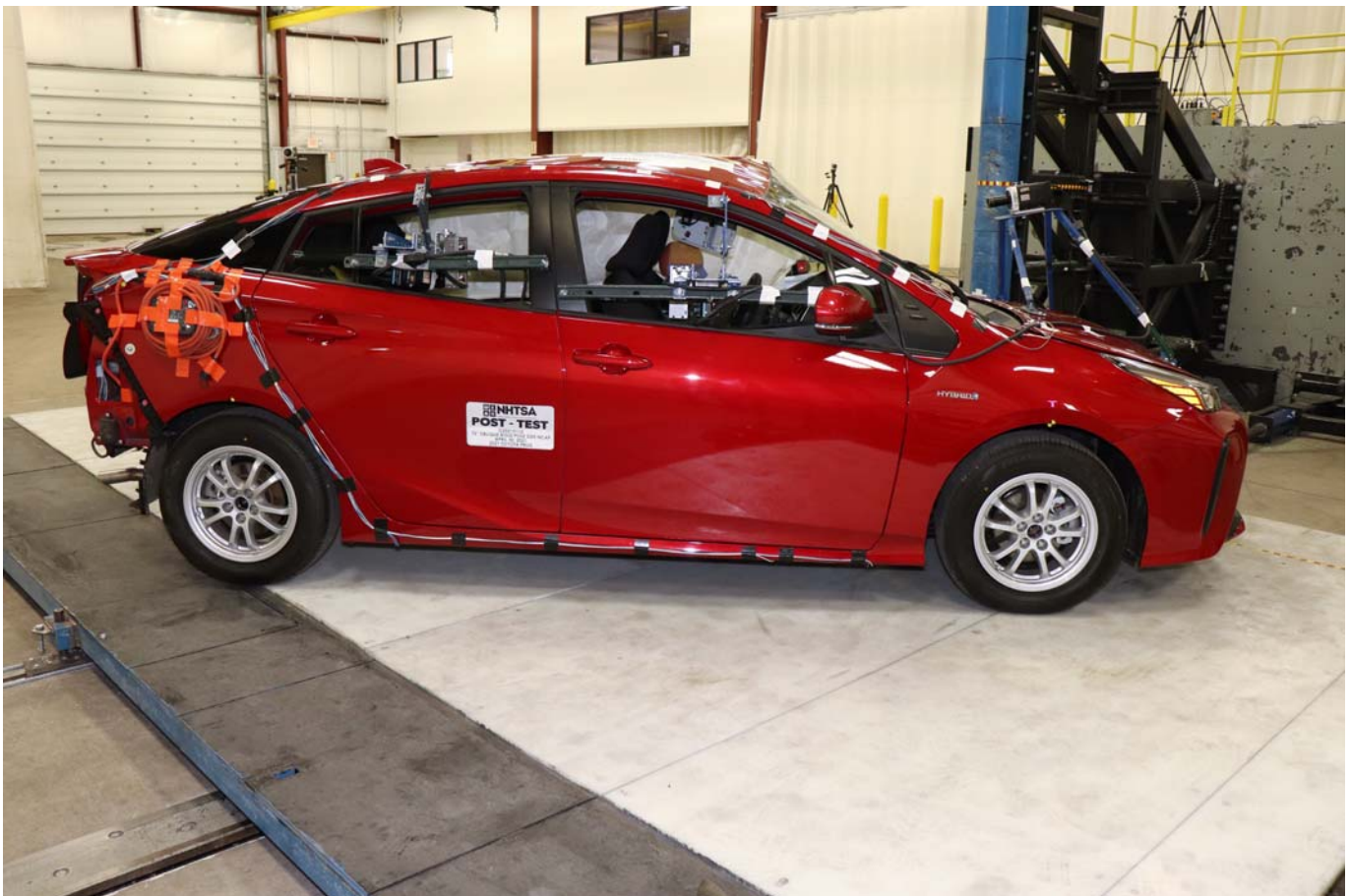


Photo No. 014 - Post-Test Right Side View of Test Vehicle



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

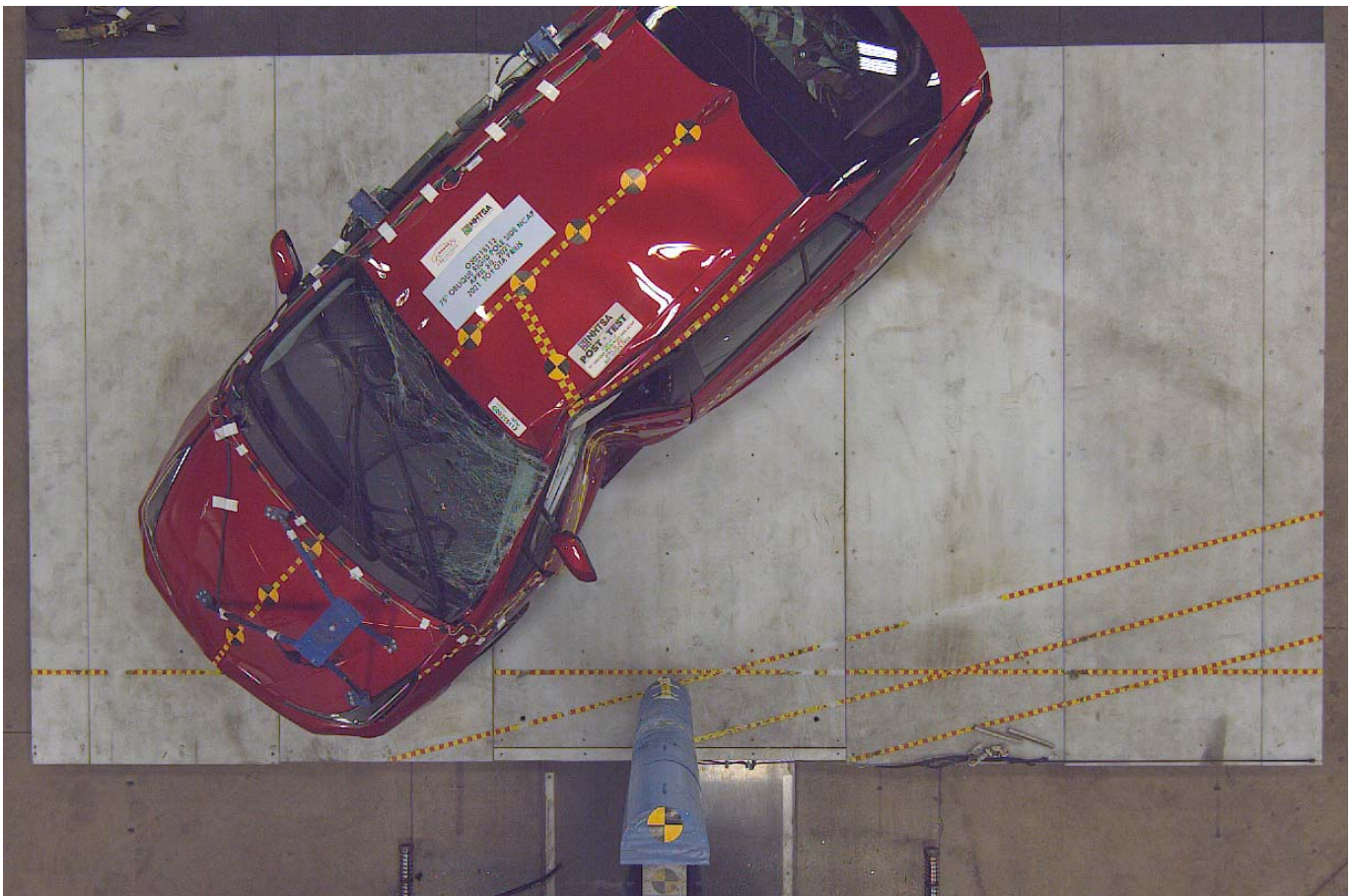


Photo No. 016 - Post-Test Overhead View of Test Area

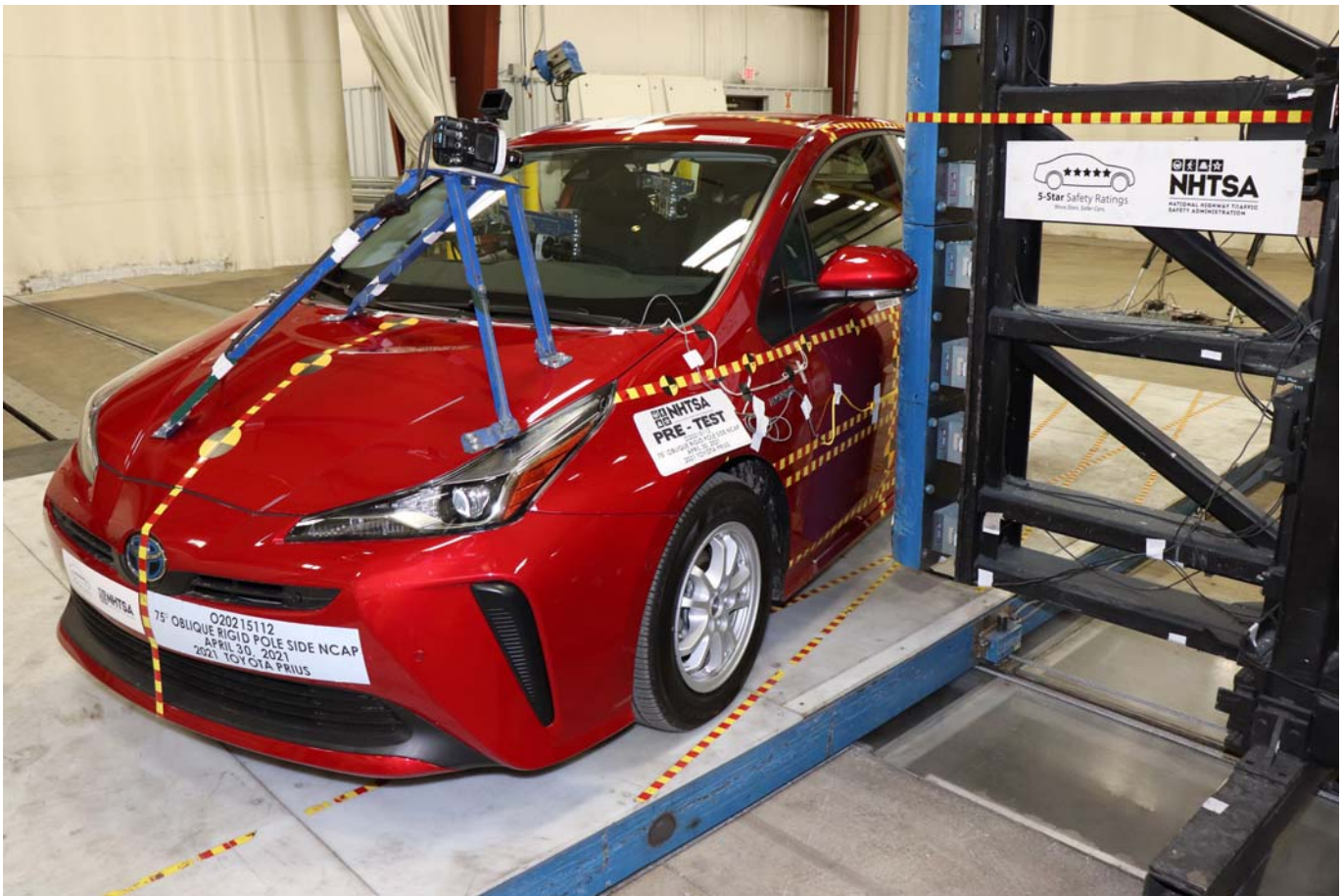


Photo No. 017 - Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



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

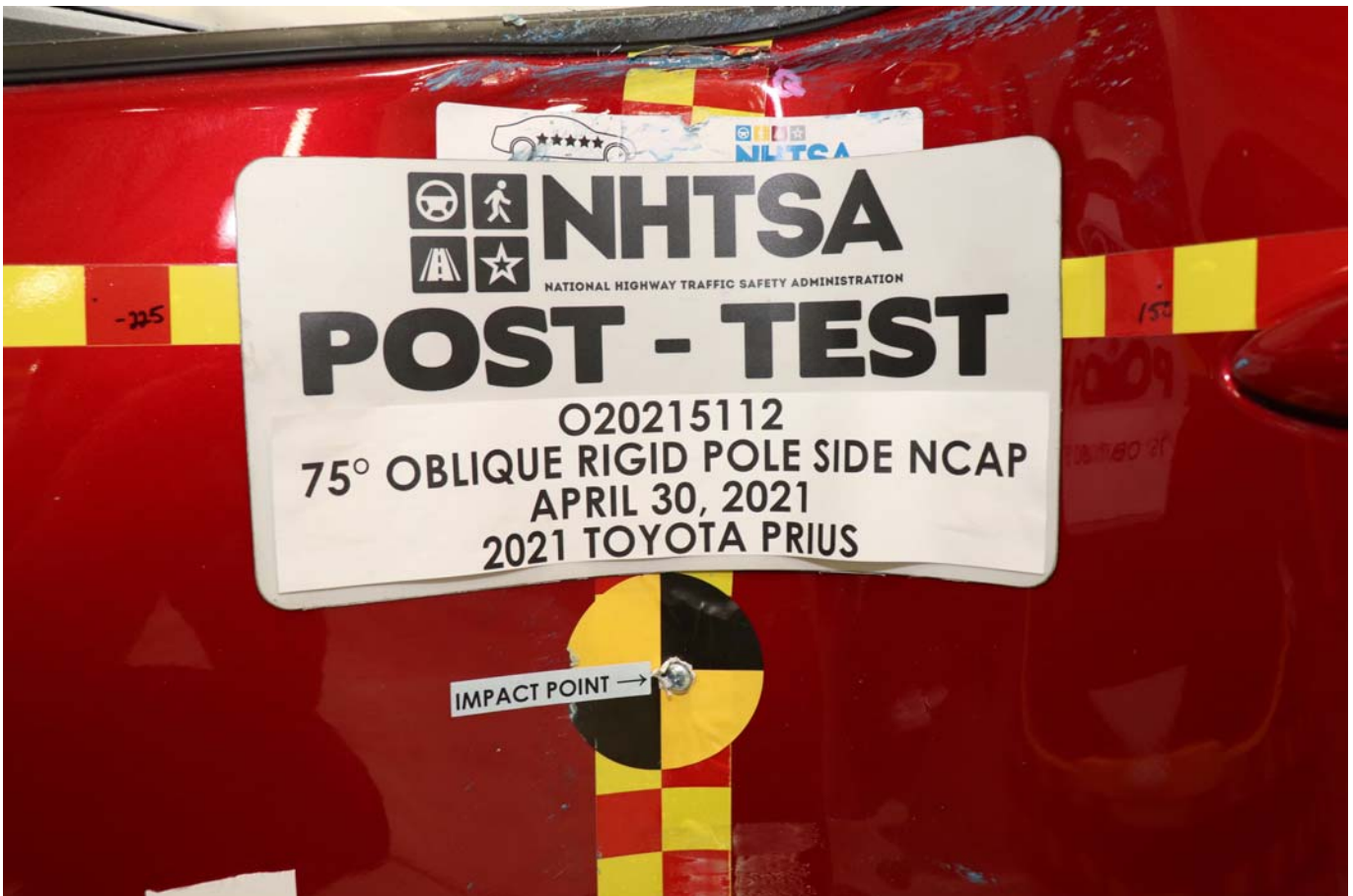


Photo No. 020 - Post-Test Close-Up View of Impact Point Target Showing Impact Location



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

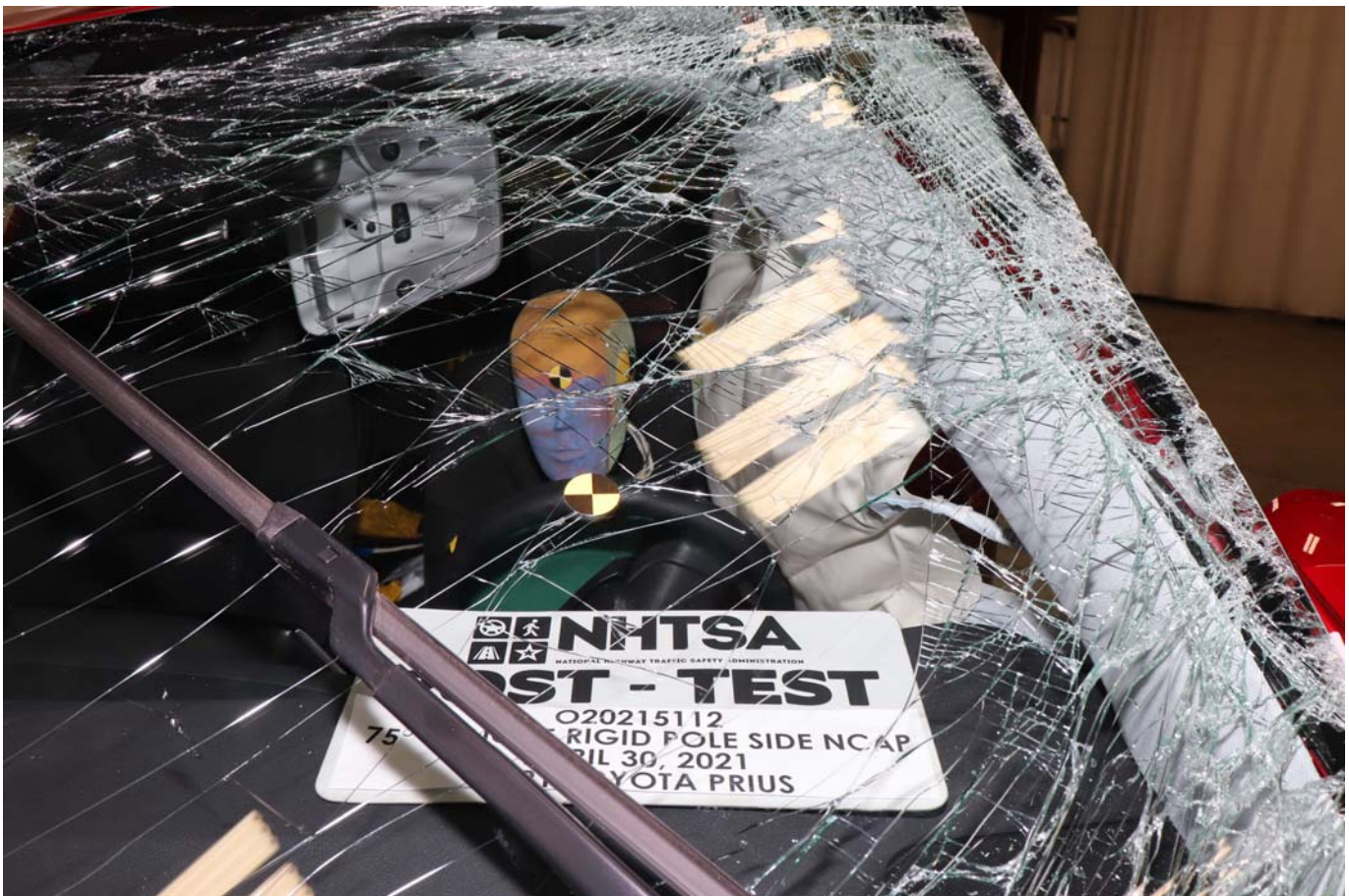


Photo No. 022 - Post-Test Front Close-Up View of Dummy



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 Neck Showing Position of Adjustable Neck Bracket



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



Photo No. 032 - Pre-Test Placement of Dummy 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

PHOTOGRAPH NOT APPLICABLE

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



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 Certification Label

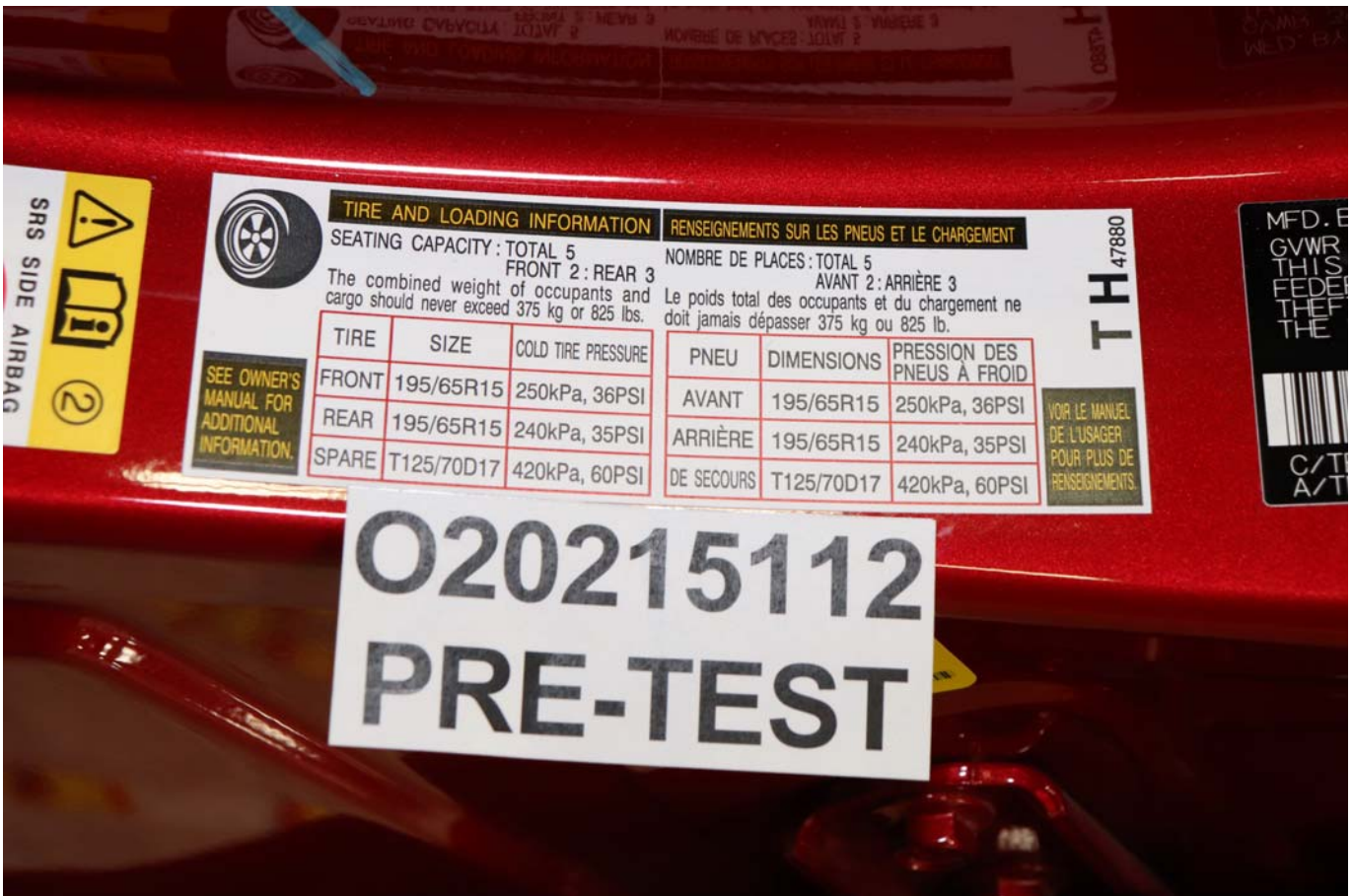


Photo No. 058 - Close-Up View of Vehicle Tire Information Placard or Label



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



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



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



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



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

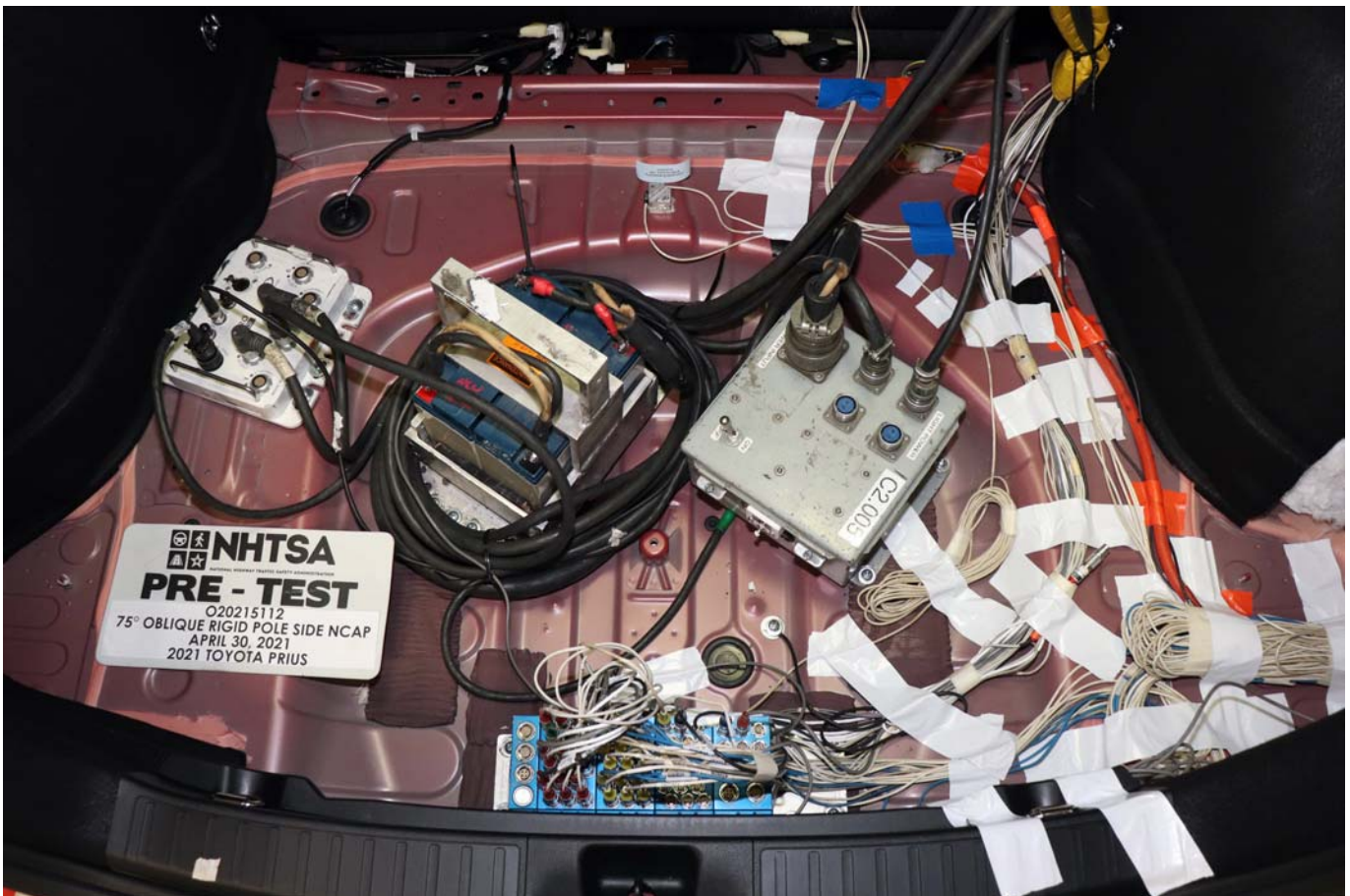


Photo No. 063 - Pre-Test Ballast View



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



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



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



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



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



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



Photo No. 070 - Impact Event

TOYOTA
Let's Go Places

DESC: **PRIUS** LE HYBRID
VIN: **JTDKAMFU3M3130866**
YR/MDL: 2021/1223A
CLR: SUPERSONIC RED/FD20 (03U5/20)
FINAL ASSEMBLY POINT: TOYOTA, AICHI, JAPAN

STANDARD EQUIPMENT

MECHANICAL & PERFORMANCE

- Hybrid Synergy Drive System, AT-PZEV
- 1.8L DOHC 16V VVT-i 4-Cylinder Engine
- EV/ECON/POWER Modes

SAFETY & CONVENIENCE

- 10 Airbags; Star Safety System
- Toyota Safety Sense 2.0: Pre-Collision Sys w/Pedestrian Detection, Dynamic Radar Cruise Control, Lane Departure Alert w/Steering Assist, Automatic High Beams, Road Sign Assist
- BlindSpot Monitor w/Rear Cross Traffic Alert
- Intelligent Clearance Sonar w/Intelligent Park Assist
- Smart Key System w/ Push Button Start
- Safety Connect w/ 1-Year Trial

EXTERIOR

- Bi-LED Headlights w/Auto-Off, LED DRLs
- Heated Power Outside Mirrors

INTERIOR

- Audio - 7-in Touchscreen, 6 Speakers, HandsFree Bluetooth Phone/Music, USB Media Port, 2 USB Charge-Ports, SiriusXM w/3-Month All Access Trial
- Android Auto & Apple CarPlay Compatible
- Fabric-Trimmed Seats
- 60/40 Split Folding Rear Seat
- 12V Outlet
- Temporary Spare Tire

Full Tank of Gas

MANUFACTURER'S SUGGESTED RETAIL PRICE \$25,735.00

OPTIONAL EQUIPMENT	PRICE
FE 50 State Emissions	425.00
PC Special Color	259.00
2T All Weather Floor Liners/Cargo Liner	79.00
3Y Rear Bumper Protector	

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	Driver Passenger	Not Rated
----------------------	------------------	------------------

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat Rear seat	Not Rated
-------------------	----------------------	------------------

Based on the risk of injury in a side impact.

Rollover ★★★★★
Based on the risk of rollover in a single-vehicle crash.

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

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy
52 MPG combined city/hwy
54 city
50 highway
1.9 gallons per 100 miles

You save \$3,500 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel COST \$800

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

Smog Rating (tailpipe only) 7 (Best)

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 \$7,900 to fuel over 5 years. Good estimates are based on 15,000 miles per year at 52.70 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel-economy.gov
Calculate personalized estimates and compare vehicles

DELIVERY PROCESSING AND HANDLING FEE 995.00

TOTAL \$27,493.00

The New Vehicle Limited Warranty provides 3-year/36,000 mile basic coverage, 5-year/60,000 mile powertrain coverage, 8-year/unlimited mile corrosion perforation coverage, 3-year/100,000 mile coverage for specific hybrid components and 10-year/100,000 mile coverage for the hybrid battery. Some components may have longer coverage under California emissions warranty (applicable in CA, CT, DC, HI, MD, MA, MI, NY, OR, PA, RI, VT, WA, District of Columbia). See Warranty and Maintenance Guide for details. An extended service contract may be available for the vehicle. Ask dealer for details. Manufacturer's suggested retail includes manufacturer's recommended pre-delivery service. Gasoline, license and title fees, applicable federal, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price. ToyotaCare, which covers normal factory scheduled maintenance for five years or 50,000 miles, whichever occurs first, is included as part of the sale price of the vehicle by qualifying buyers. See participating dealer for eligibility and coverage details.

Delivered by Truck to: 48065
TOYOTA OF BROOKFIELD
2065 WEST CAPITOL DR
BROOKFIELD WI 53005

Photo No. 071 - Monroney Label

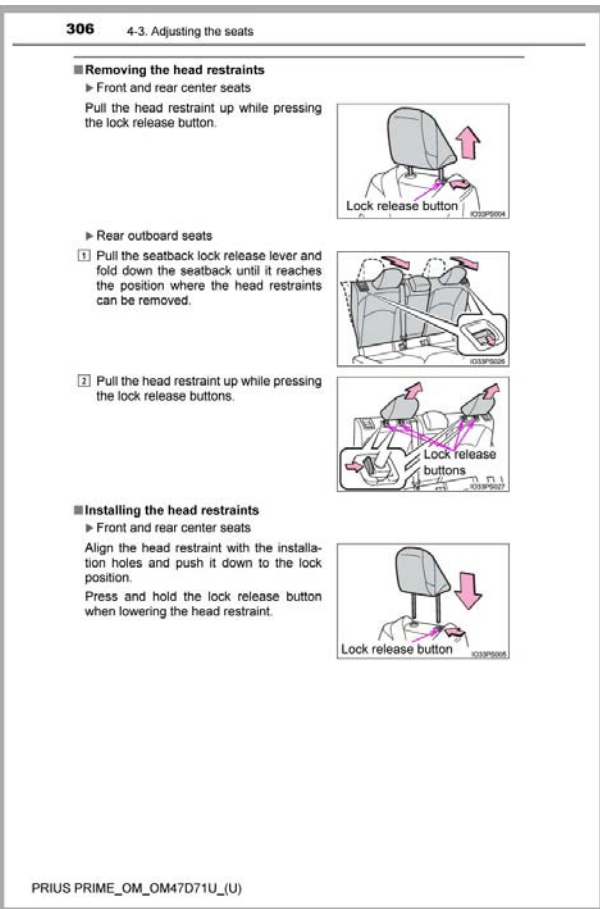
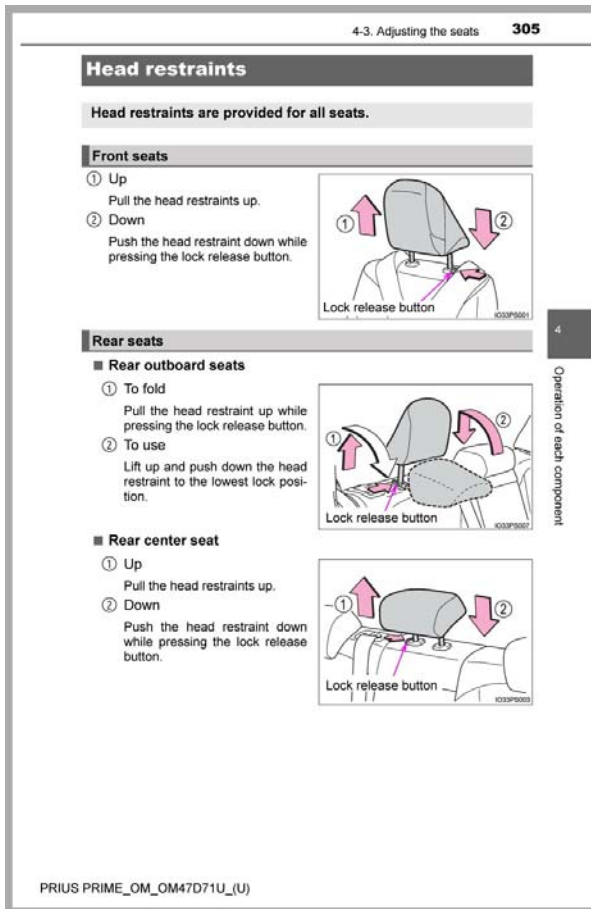


Photo No. 072 - Head Restraint Use and Adjustment Information from Vehicle Owners Manual

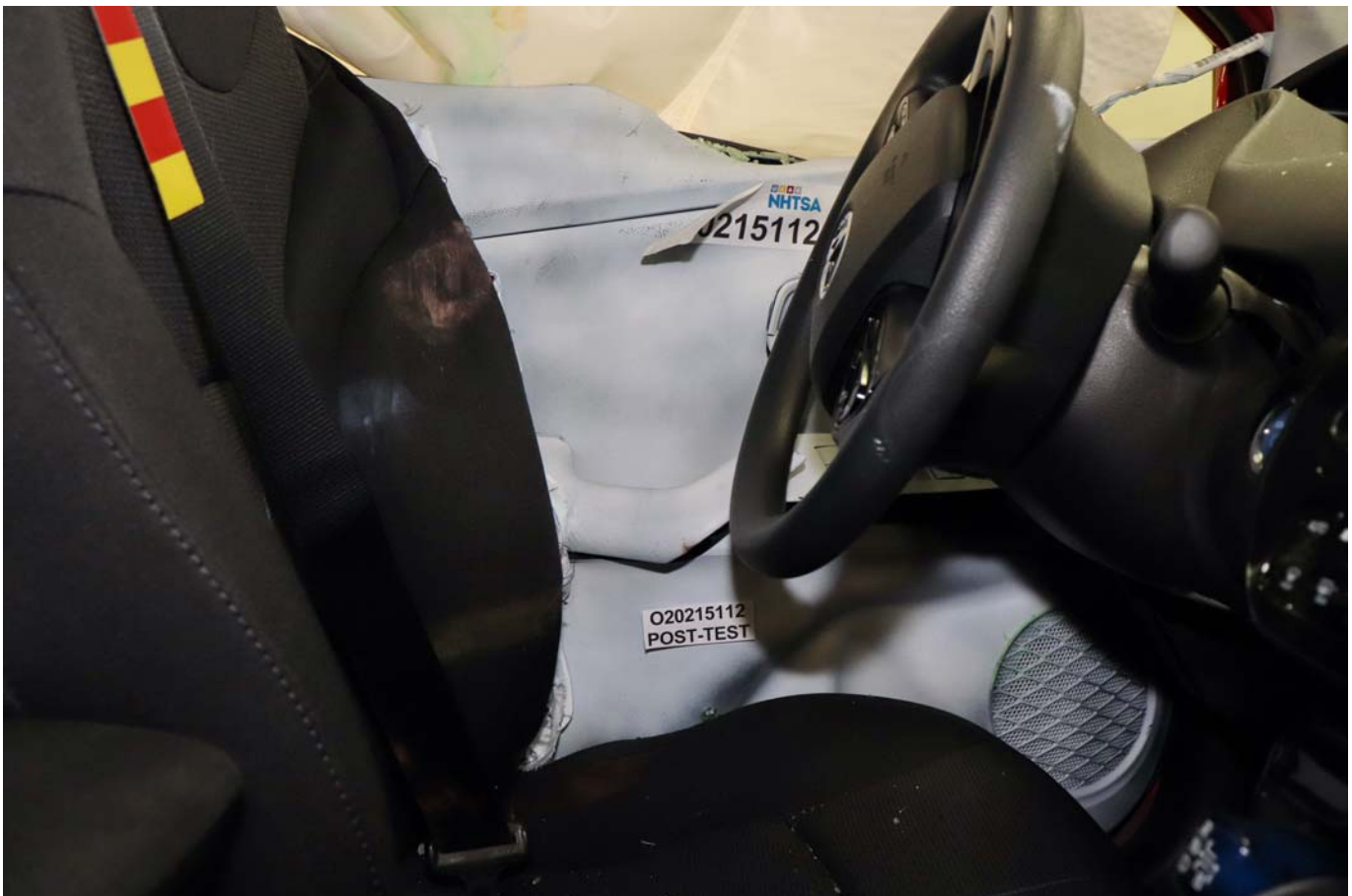


Photo No. 073 - Post-Test View of Shattered Vehicle Inner Door Panel

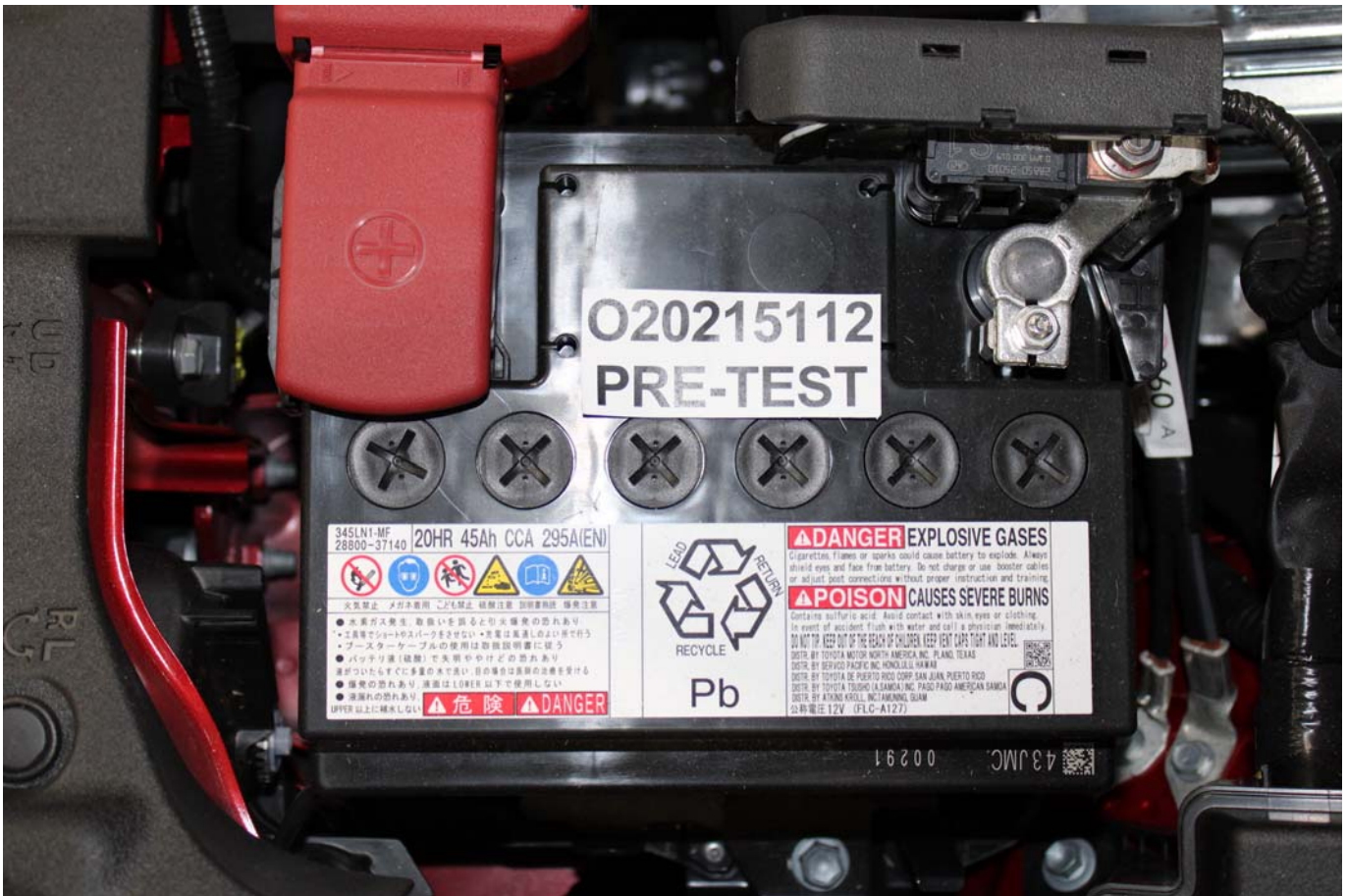


Photo No. 305-01 - Auxiliary Power Module Warning Label



Photo No. 305-02 - Power Inverter Warning Label



Photo No. 305-03 - First Responder Warning Label



Photo No. 305-04 - First Responder Warning Location



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



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



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



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

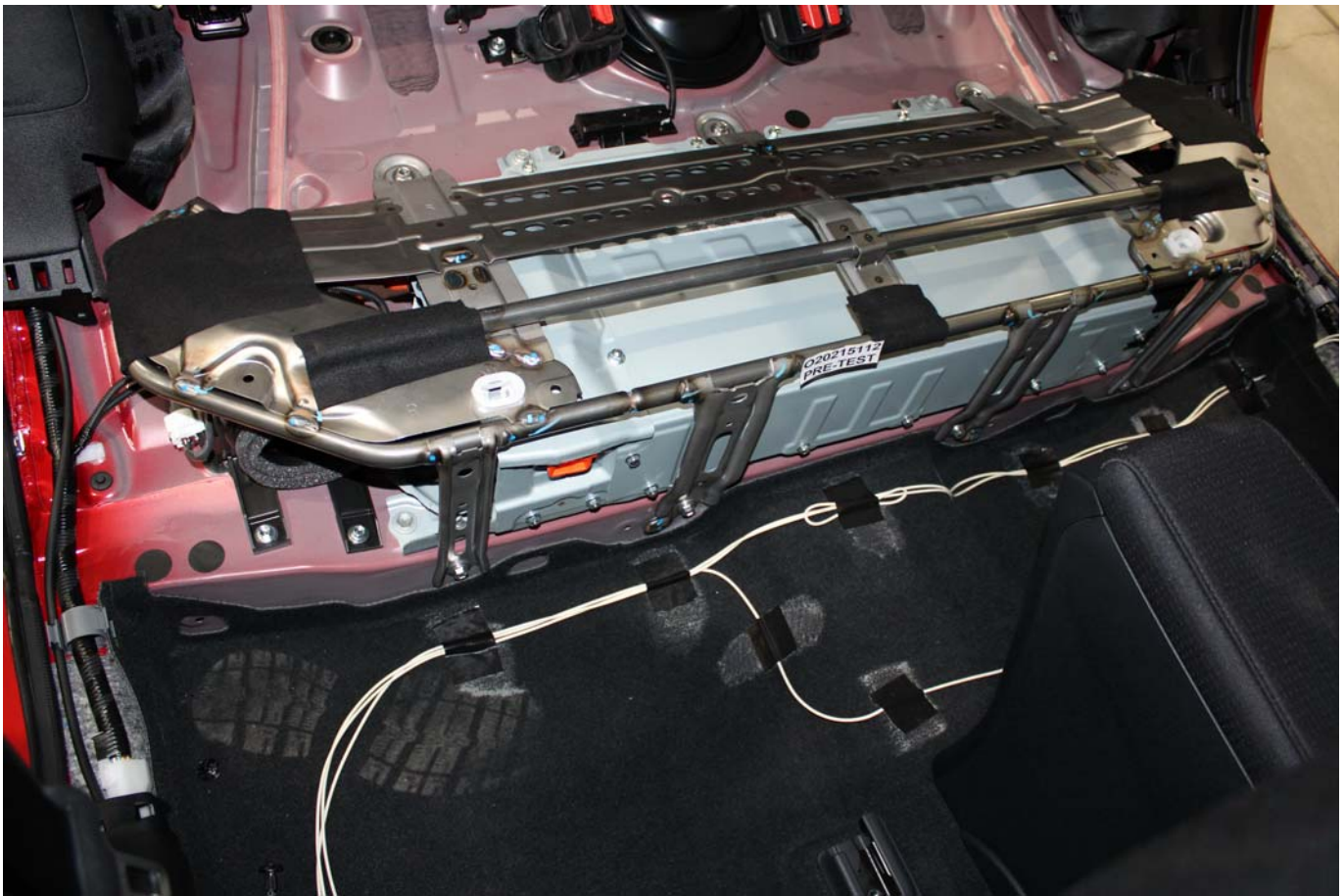


Photo No. 305-09 - Pre-Impact View of Propulsion Battery



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



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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

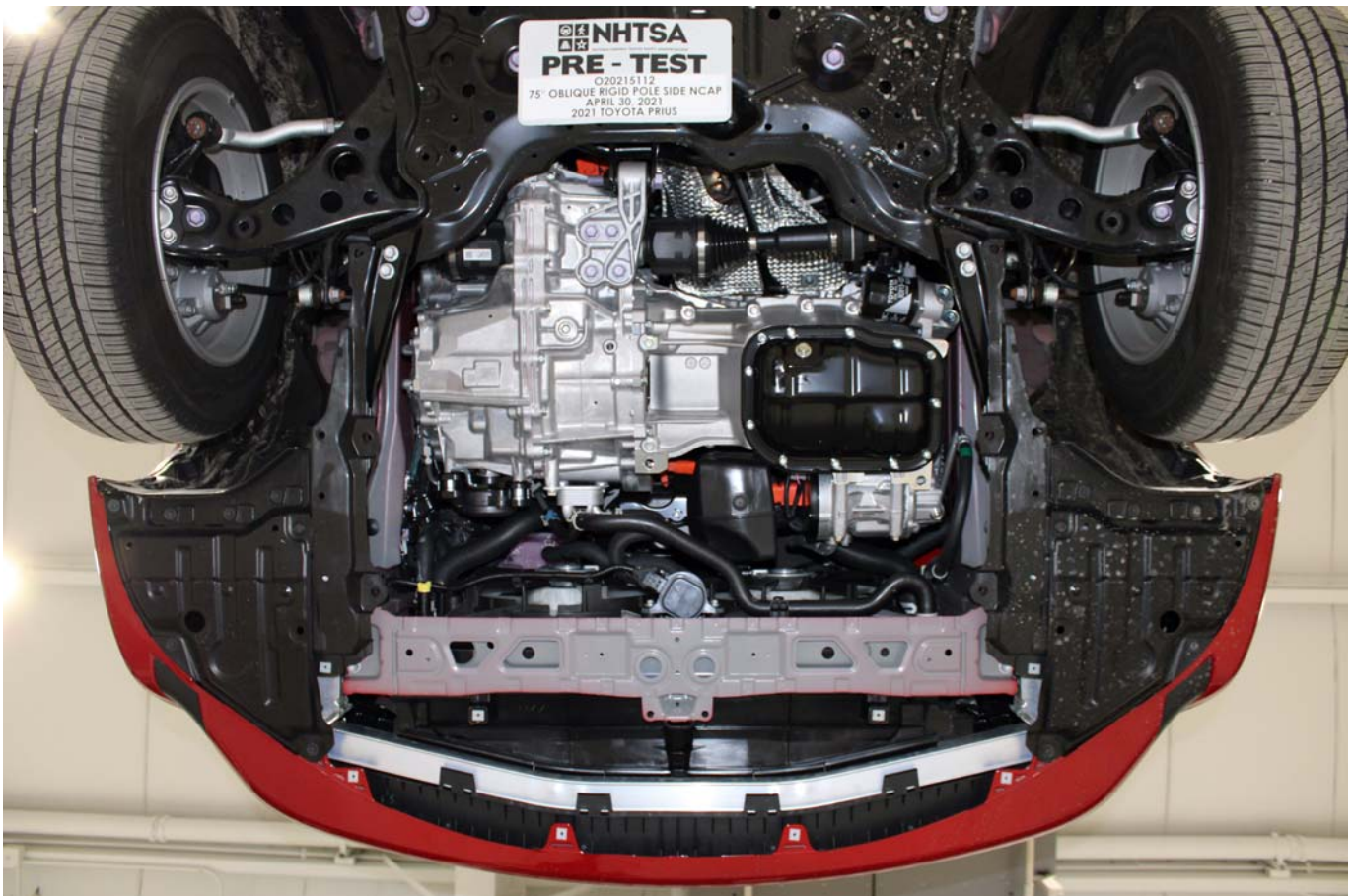


Photo No. 305-16 - Pre-Impact View of Electric Propulsion Drive

PHOTOGRAPH NOT AVAILABLE

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

PHOTOGRAPH NOT APPLICABLE

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



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



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

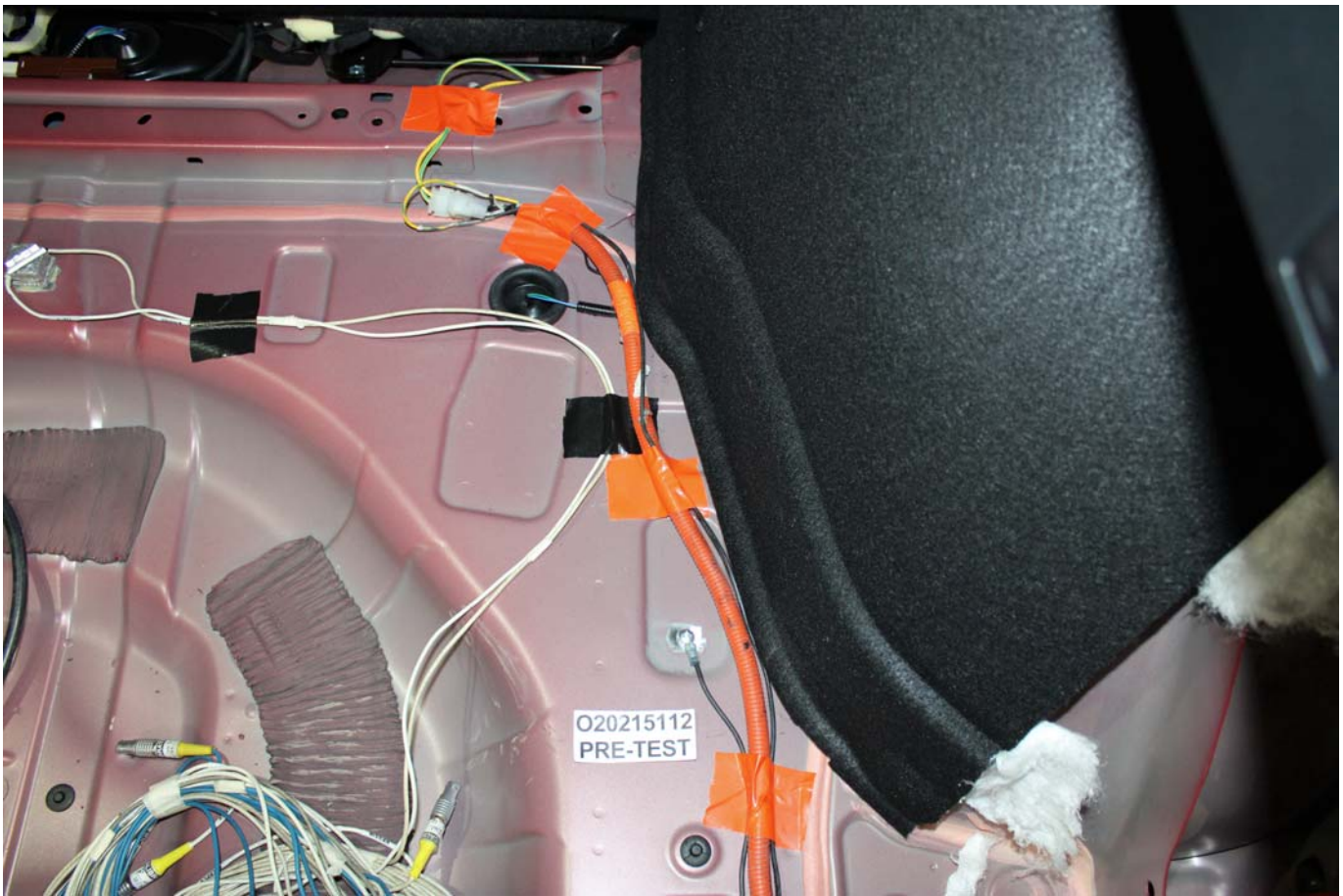


Photo No. 305-21 - Pre-Impact View of Ground Lead Attached

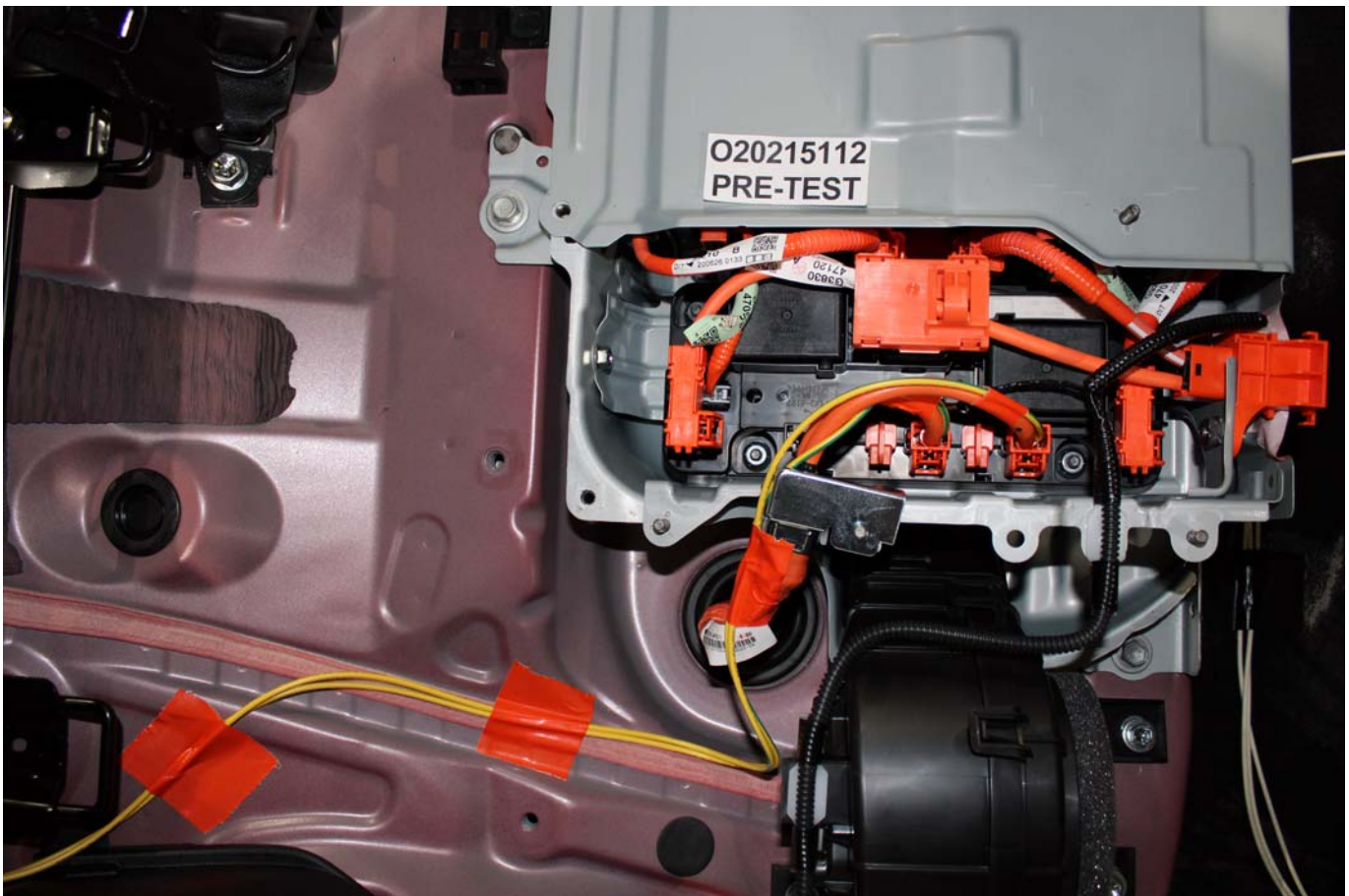


Photo No. 305-22 - Pre-Impact View of High Voltage Leads Attached

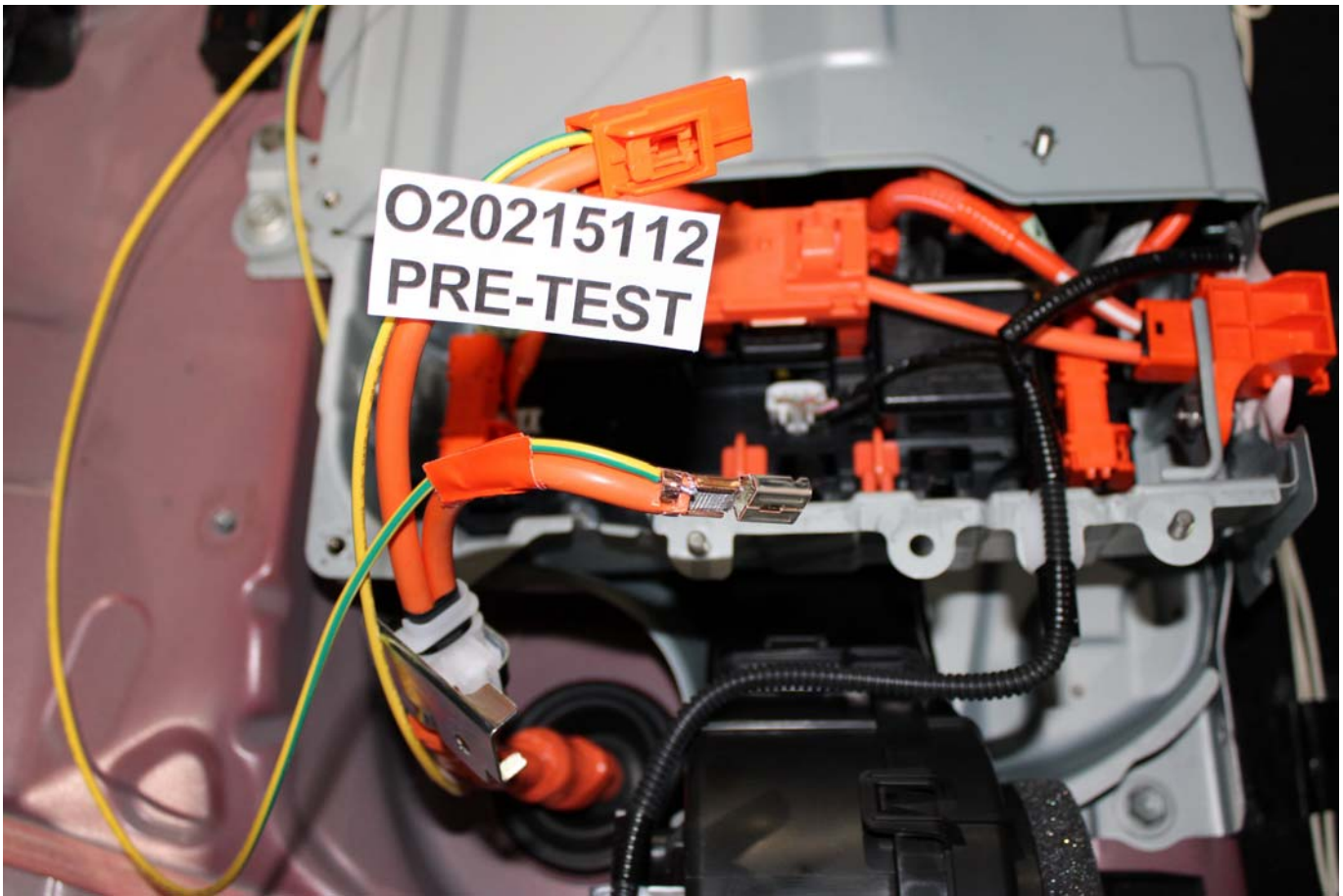


Photo No. 305-23 - Pre-Impact Close-Up View of High Voltage Leads Attached



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



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

PHOTOGRAPH NOT AVAILABLE

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

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)

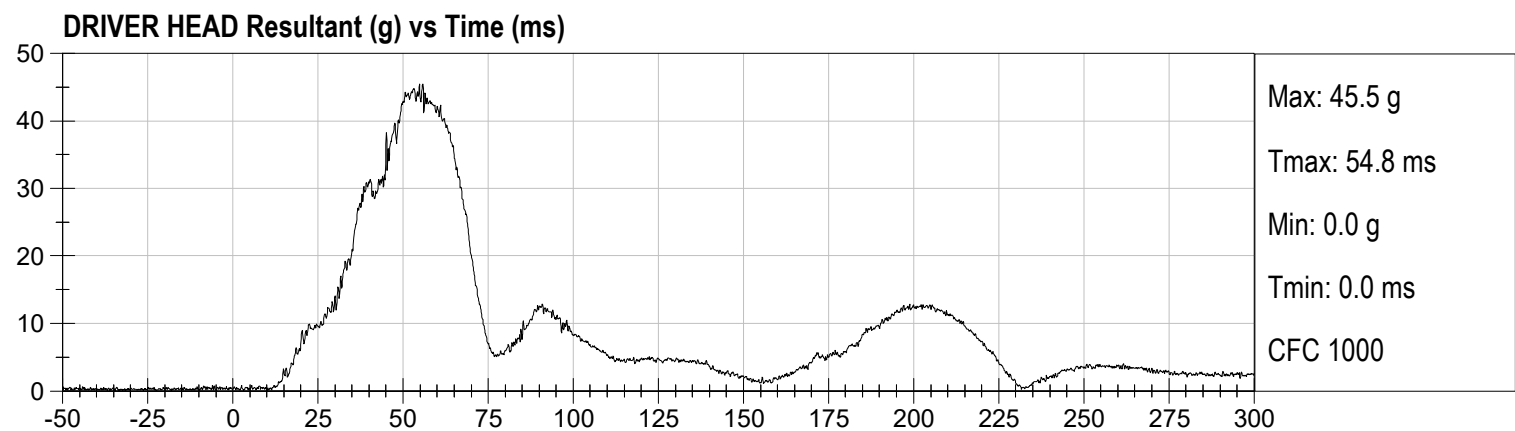
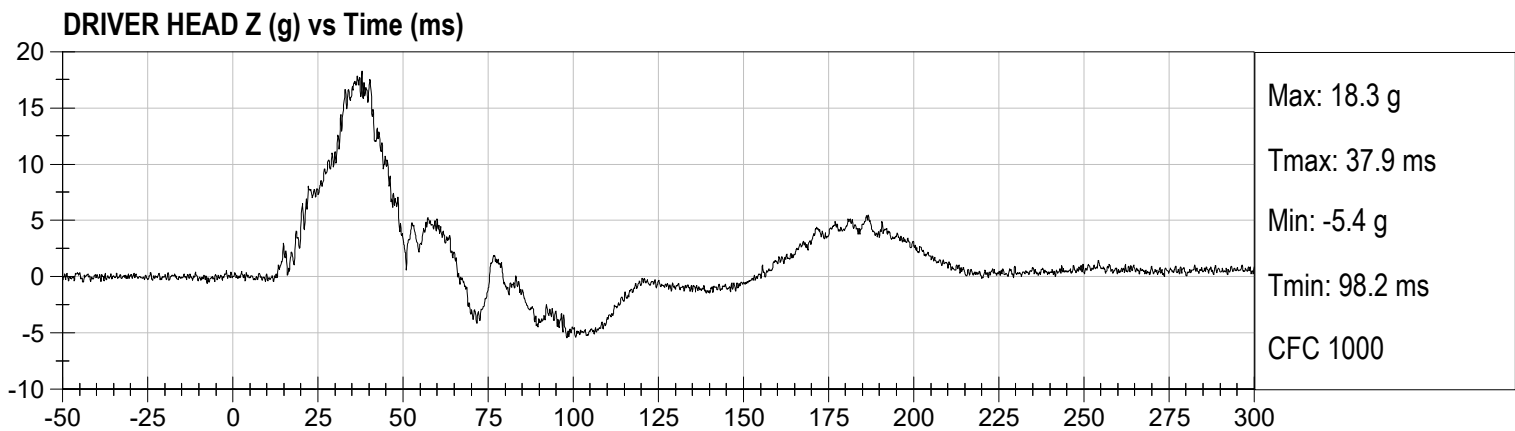
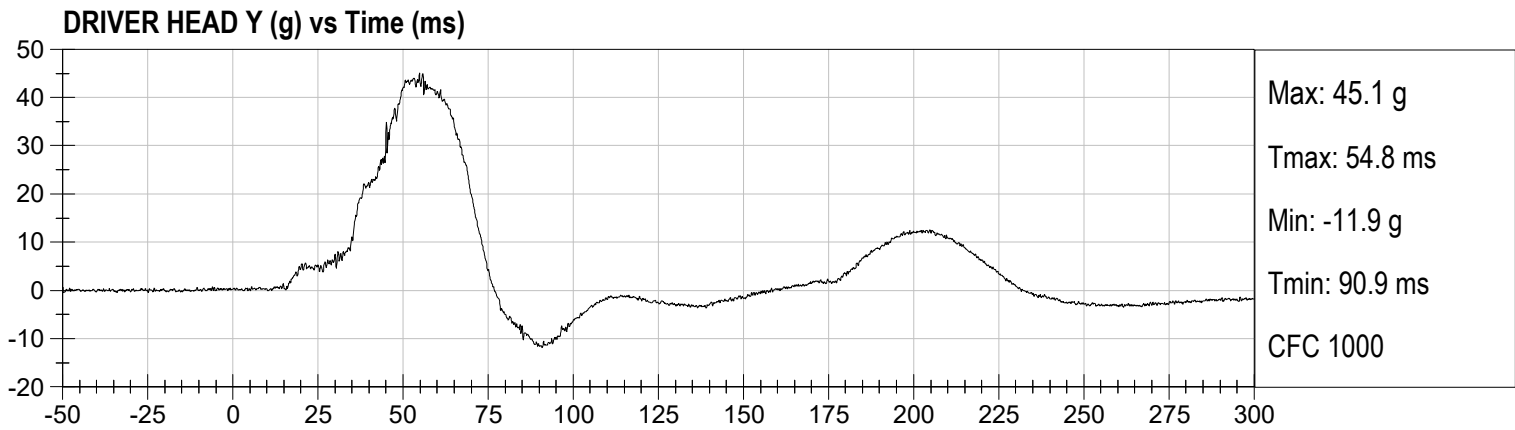
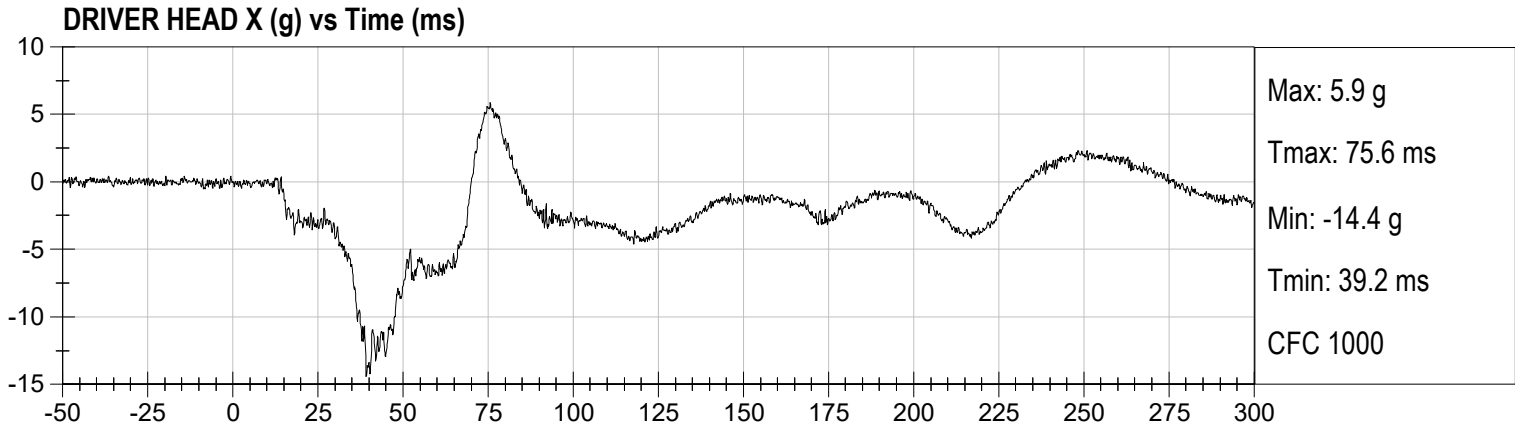
Load Cell Pole Barrier #4 Force (Y)

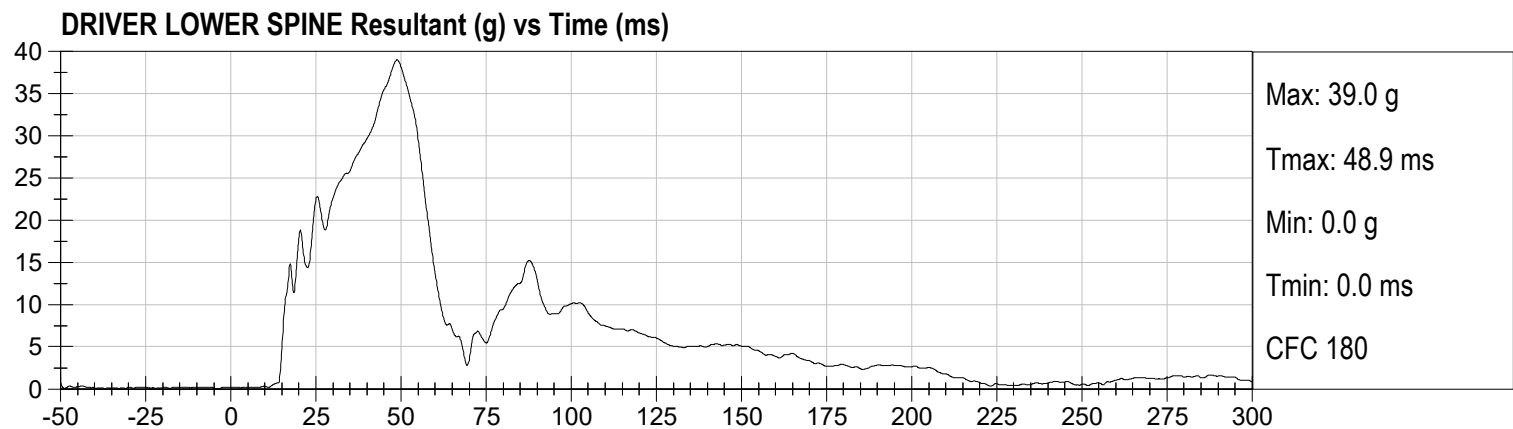
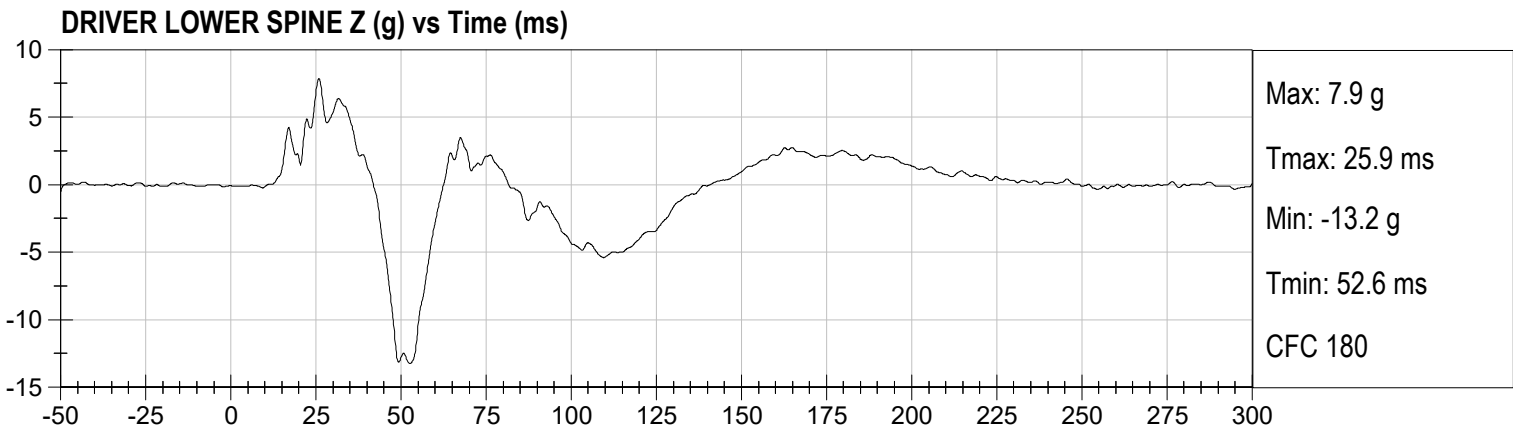
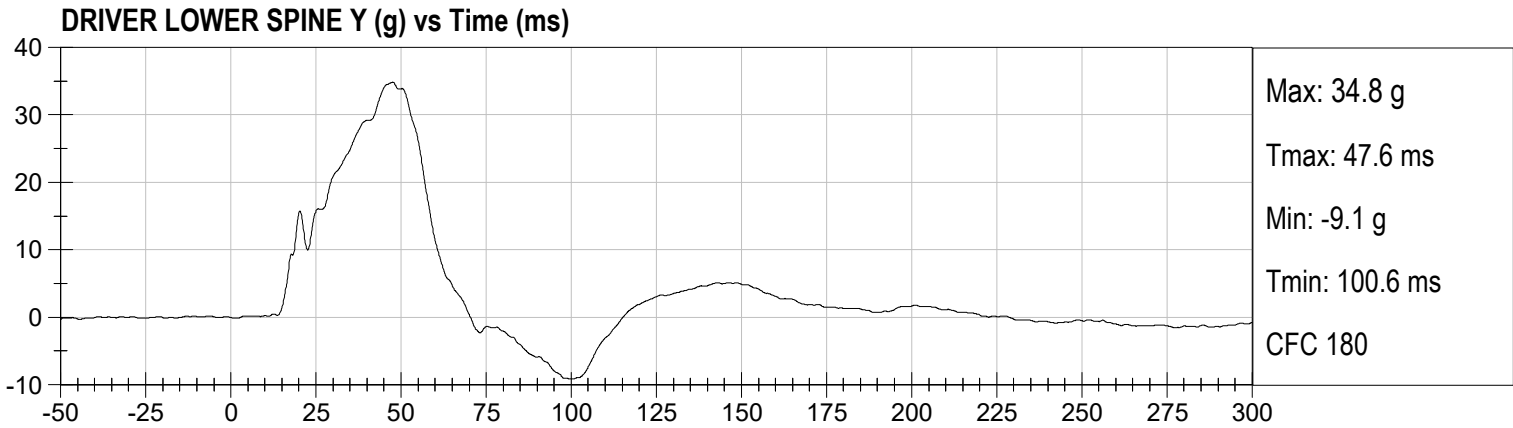
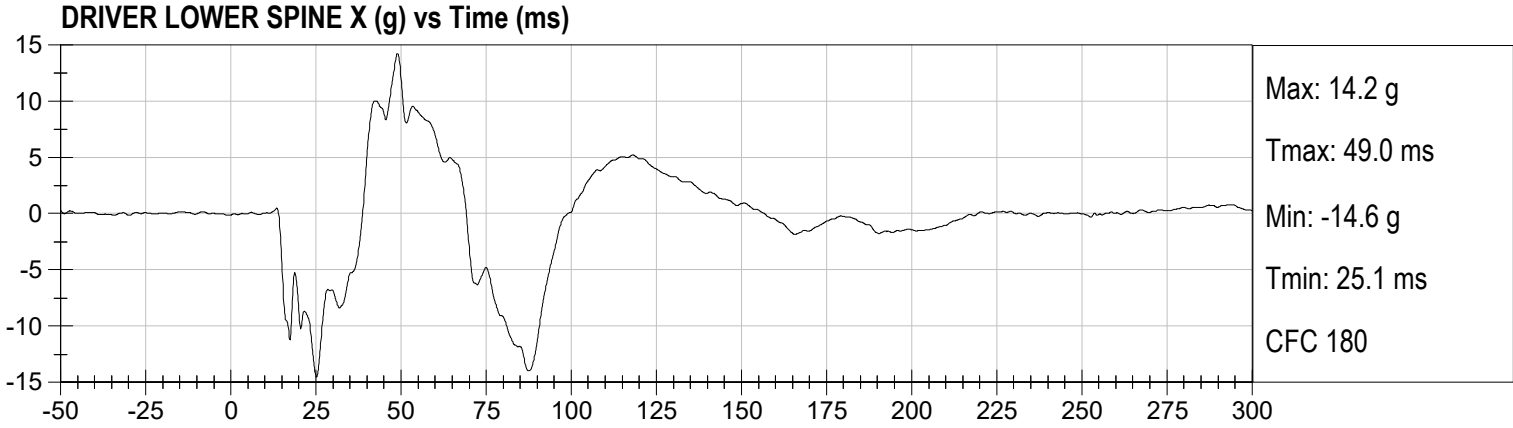
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

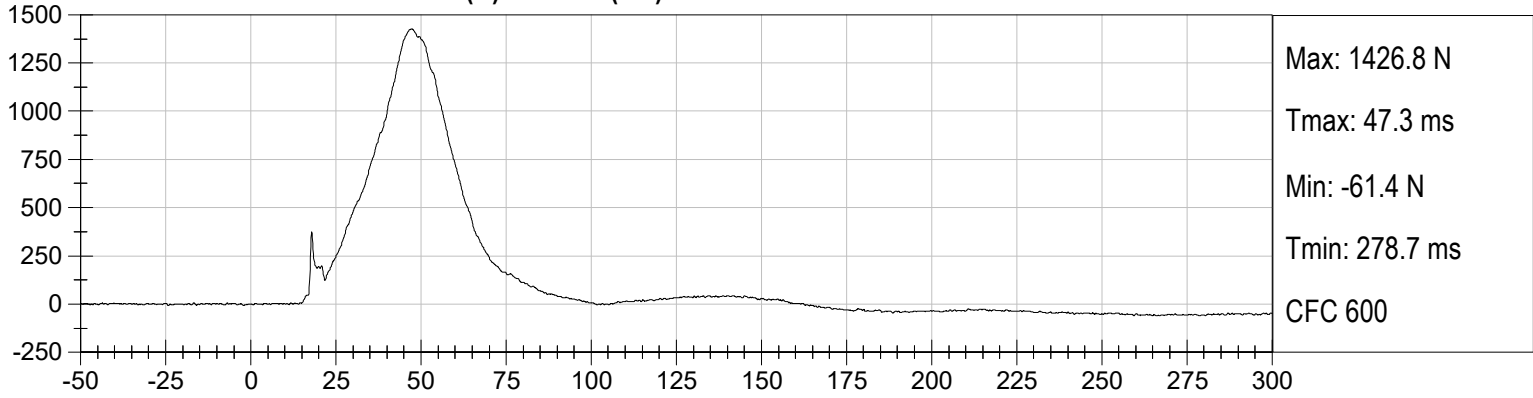
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

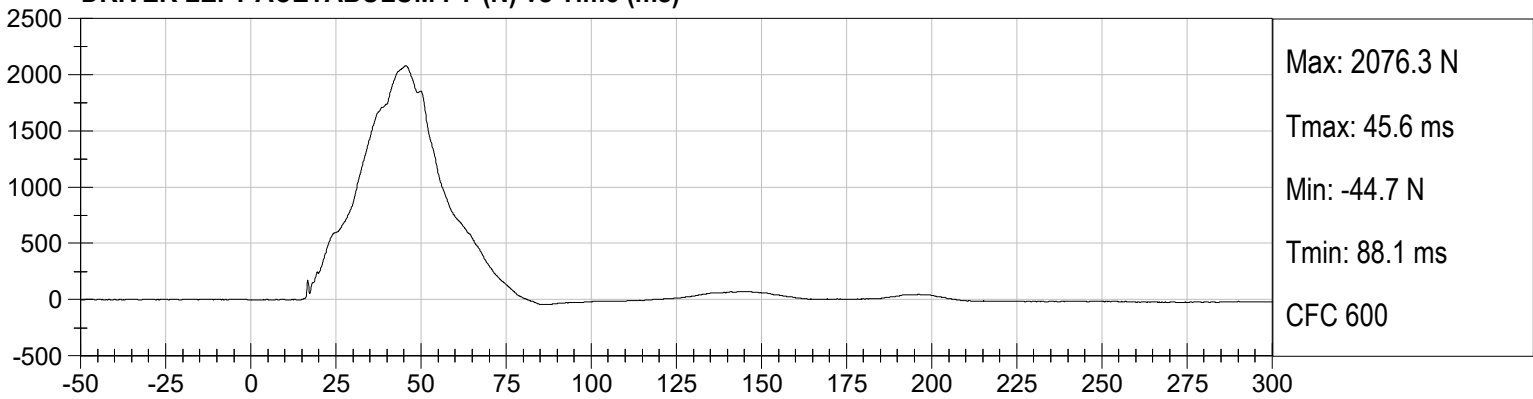




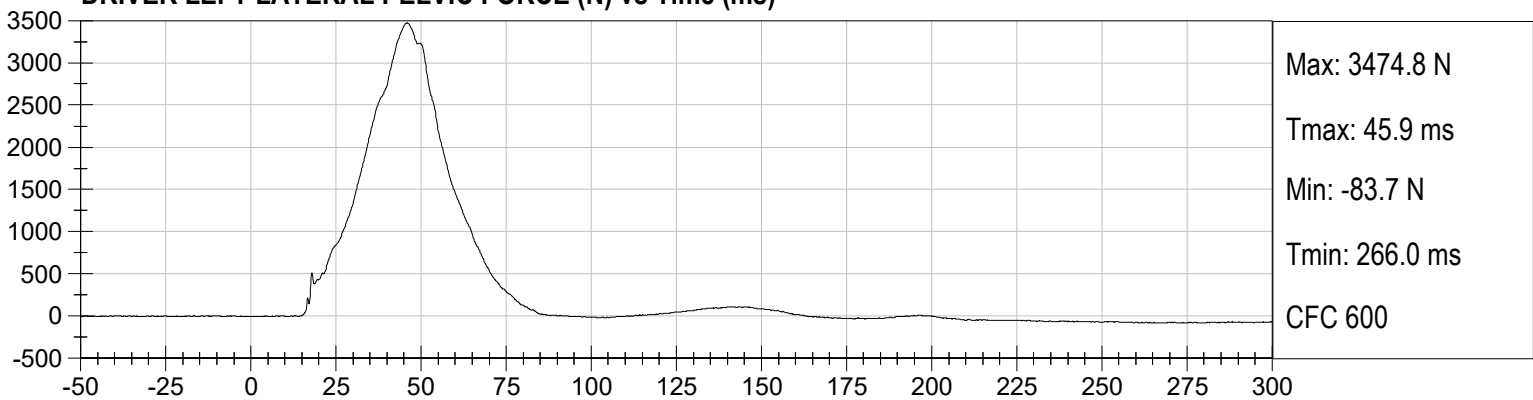
DRIVER LEFT ILIUM CREST FY (N) vs Time (ms)



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 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 296


No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	784	Pass
B	Shoulder Pivot Height	437 - 453	442	Pass
C	H-point Height	79 - 89	83	Pass
D	H-point from Seatback	141 - 151	145	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	121	Pass
G	Head Breadth	140 - 148	142	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	180	Pass
J	Head Circumference	541 - 551	548	Pass
K	Buttock to Knee Length	514 - 540	535	Pass
L	Popliteal Height	343 - 369	358	Pass
M	Knee Pivot to Floor Height	392 - 409	404	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	206	Pass
P	Foot Length	216 - 232	219	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	316	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	481	Pass
V	Shoulder Width	341 - 357	346	Pass
W	Foot Width	78 - 94	85	Pass
Y	Chest Circumference w/ jacket	851 - 881	870	Pass
Z	Waist Circumference	761 - 791	772	Pass

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

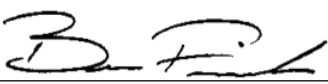
ATD Serial No: 296

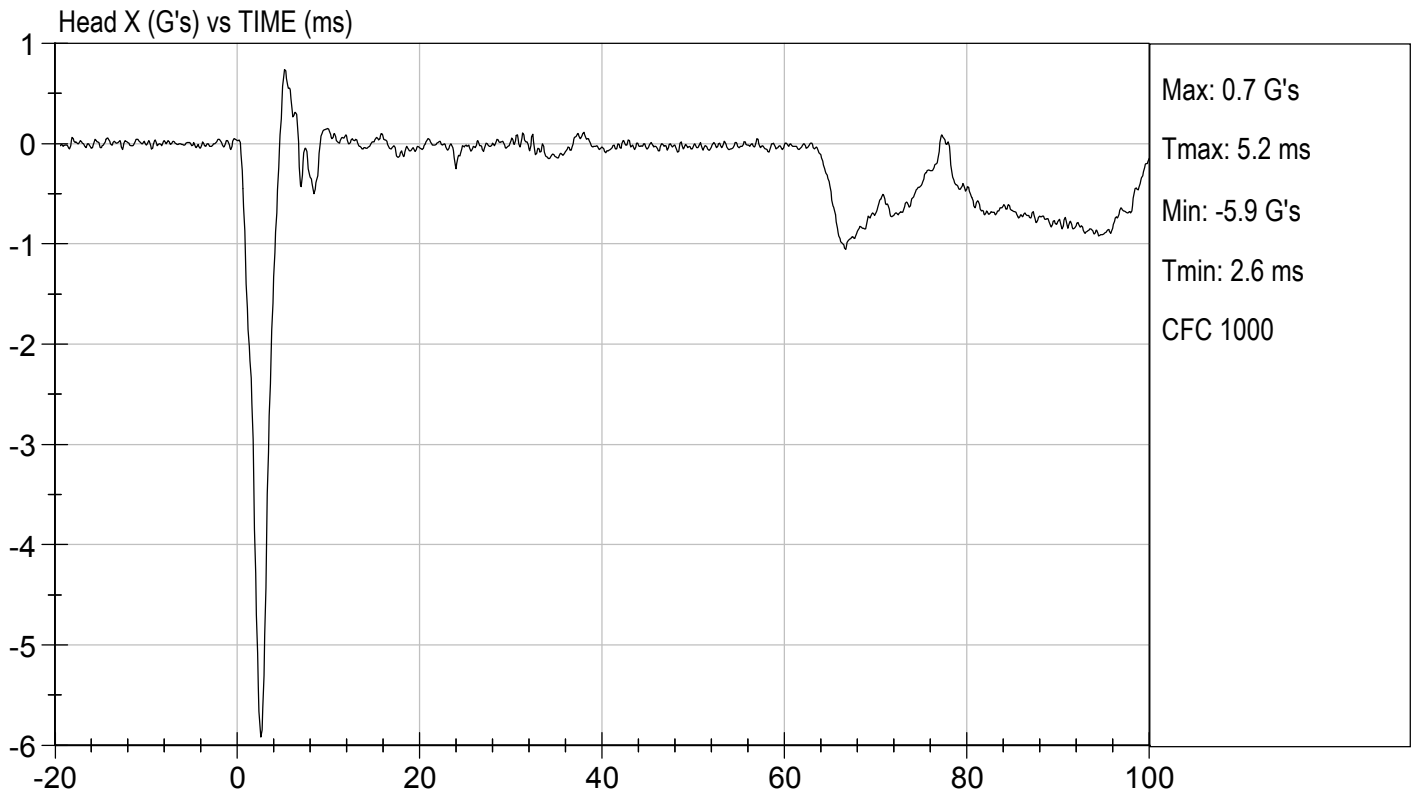
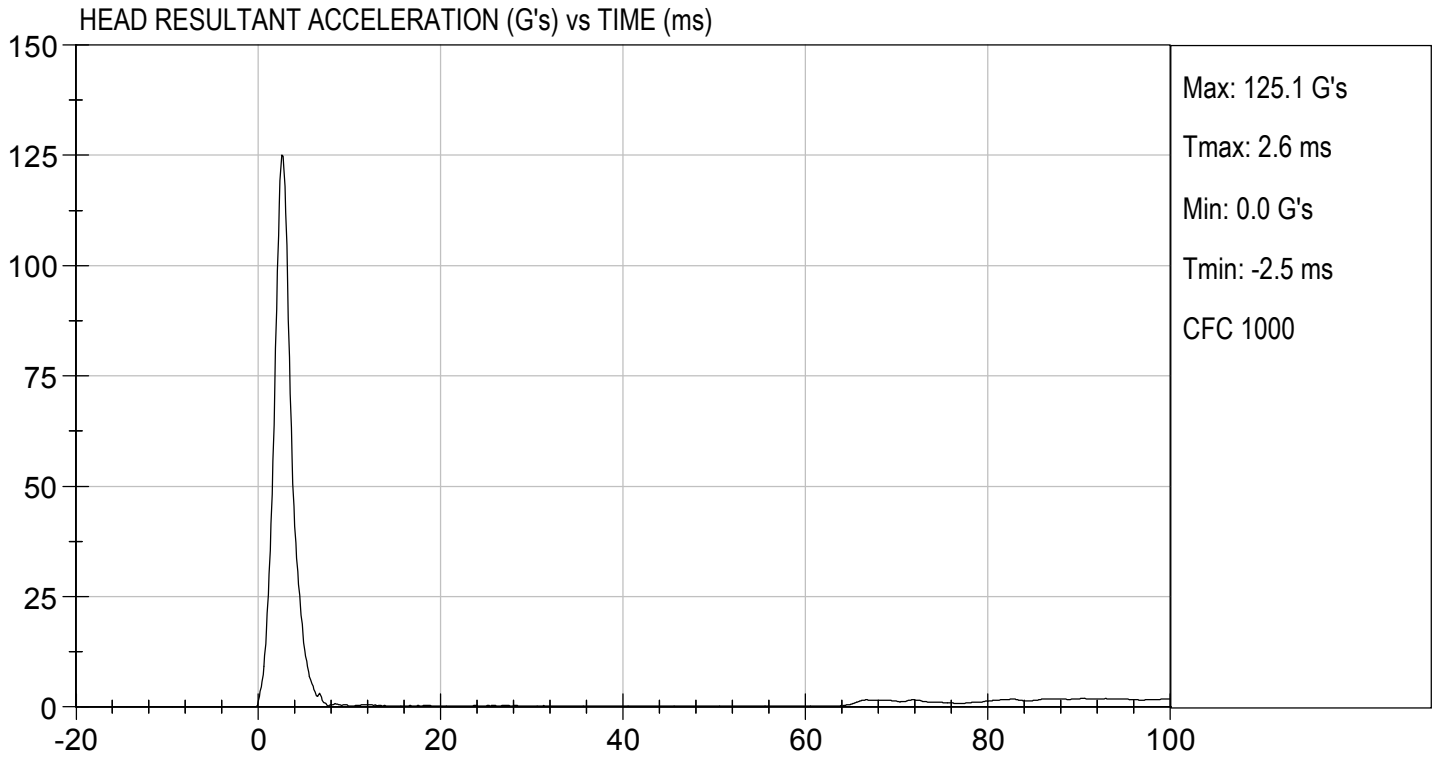
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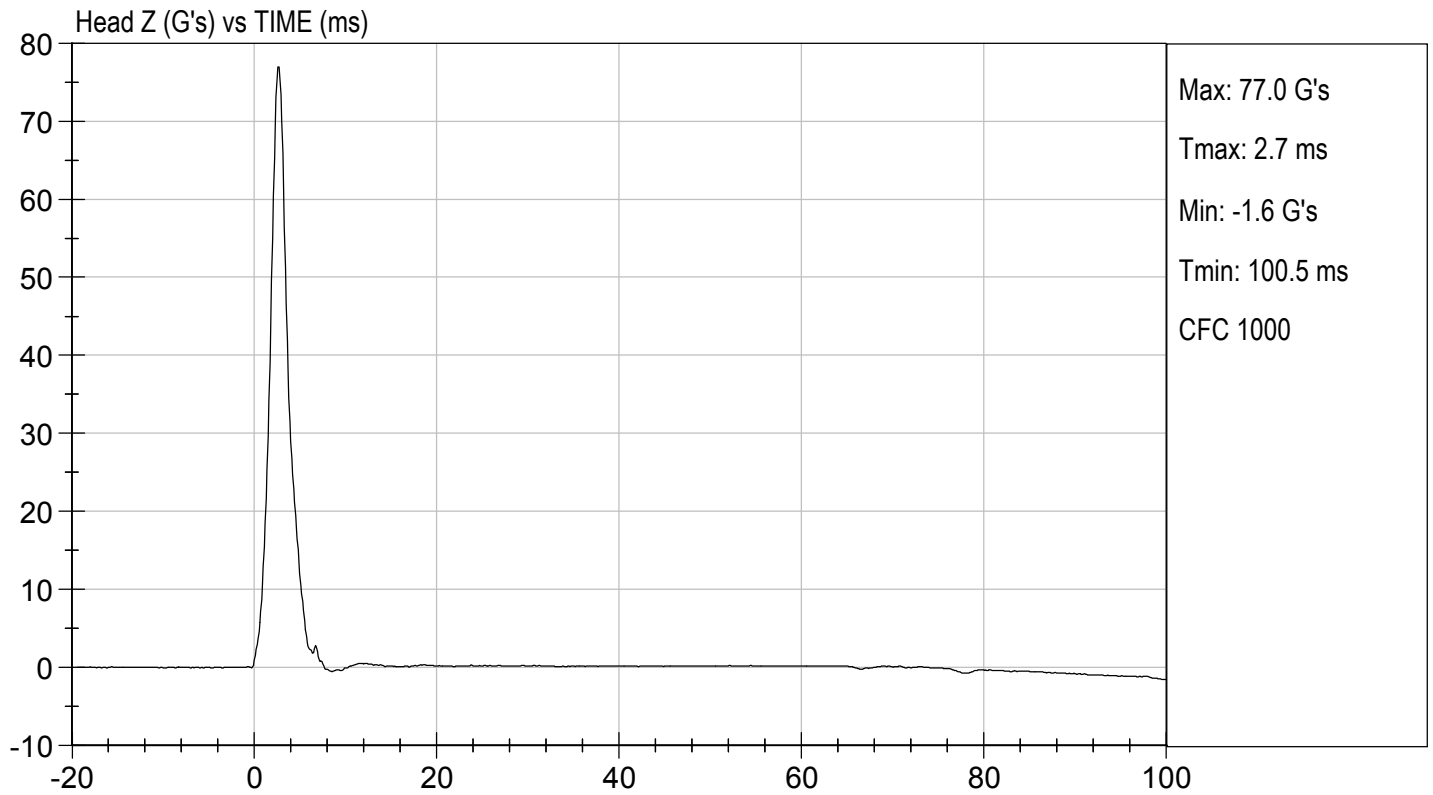
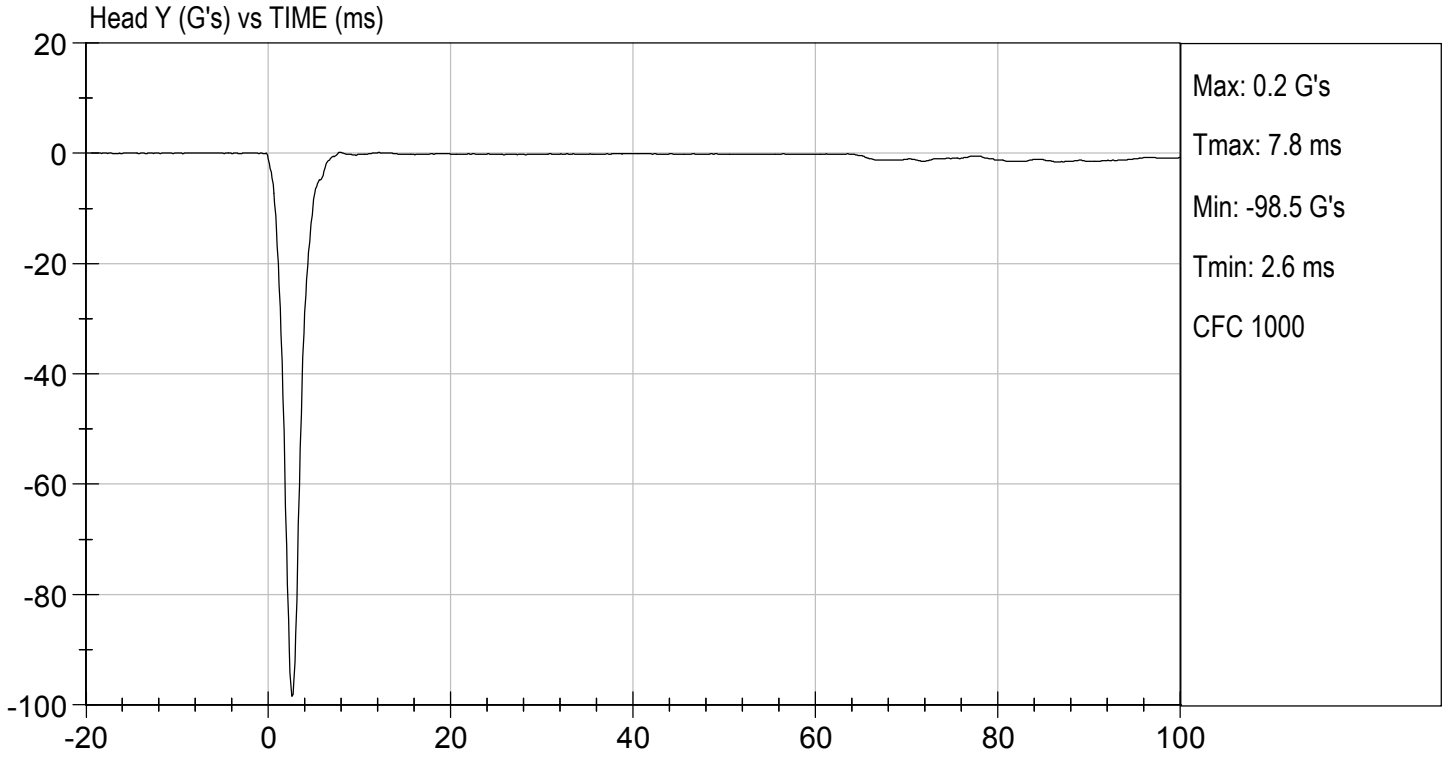
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Peak Resultant Acceleration	G's	115 to 137	125	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-5.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

04/21/2021
 Test Date


 Approved By





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

ATD Serial No: 296

Test I.D.: D211372

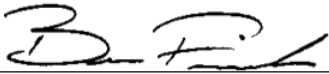
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21	Pass	
Humidity	%	10 to 70	21	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.52	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.72	Pass
	15 ms	m/s	3.30 to 4.10	3.92	Pass
	20 ms	m/s	4.40 to 5.40	5.29	Pass
	25 ms	m/s	5.40 to 6.10	5.68	Pass
	25-100 ms	m/s	5.50 to 6.20	5.71	Pass
Maximum D-Plane Rotation	deg	71 to 81	72	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	66	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-36	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	121	Pass	
Overall Test Results				Pass	



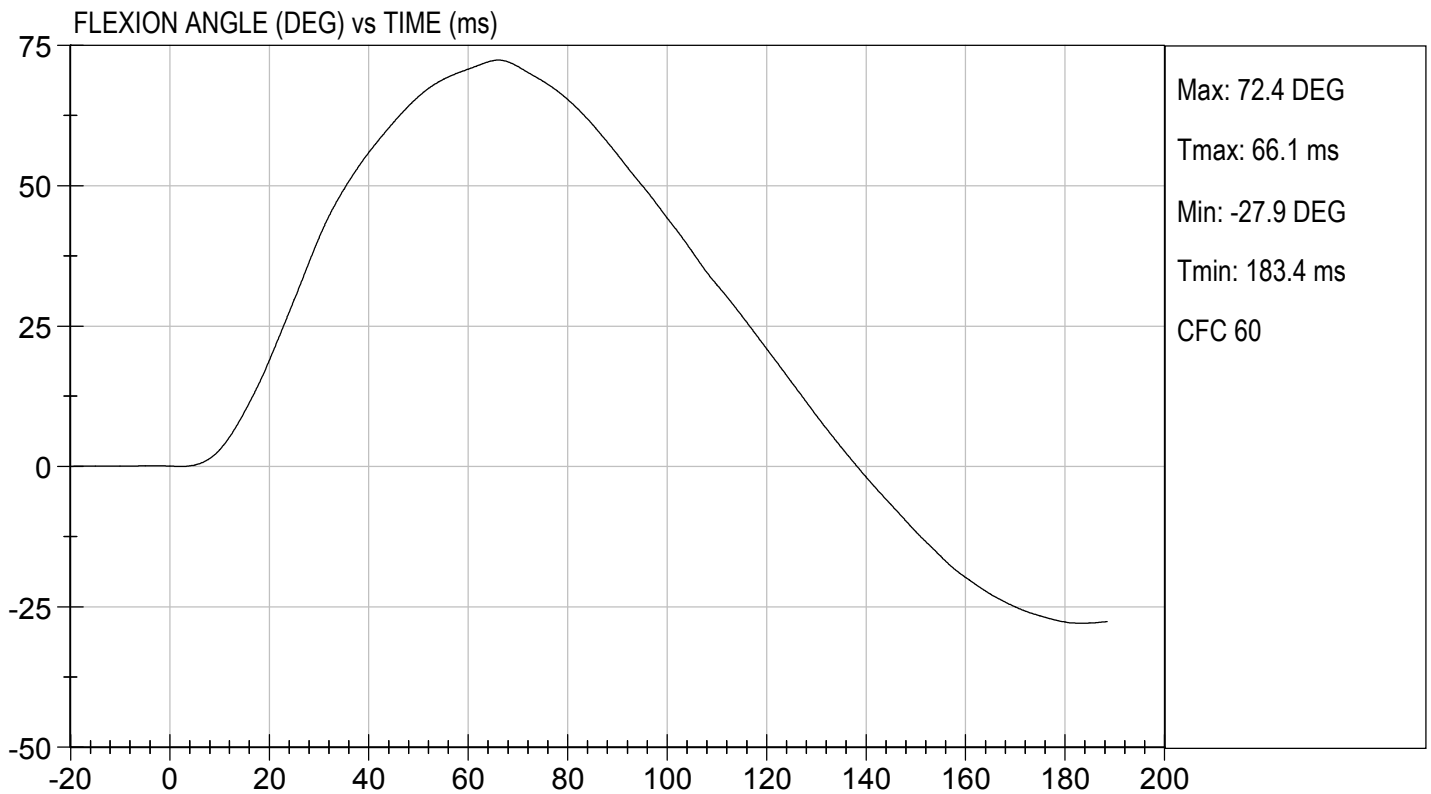
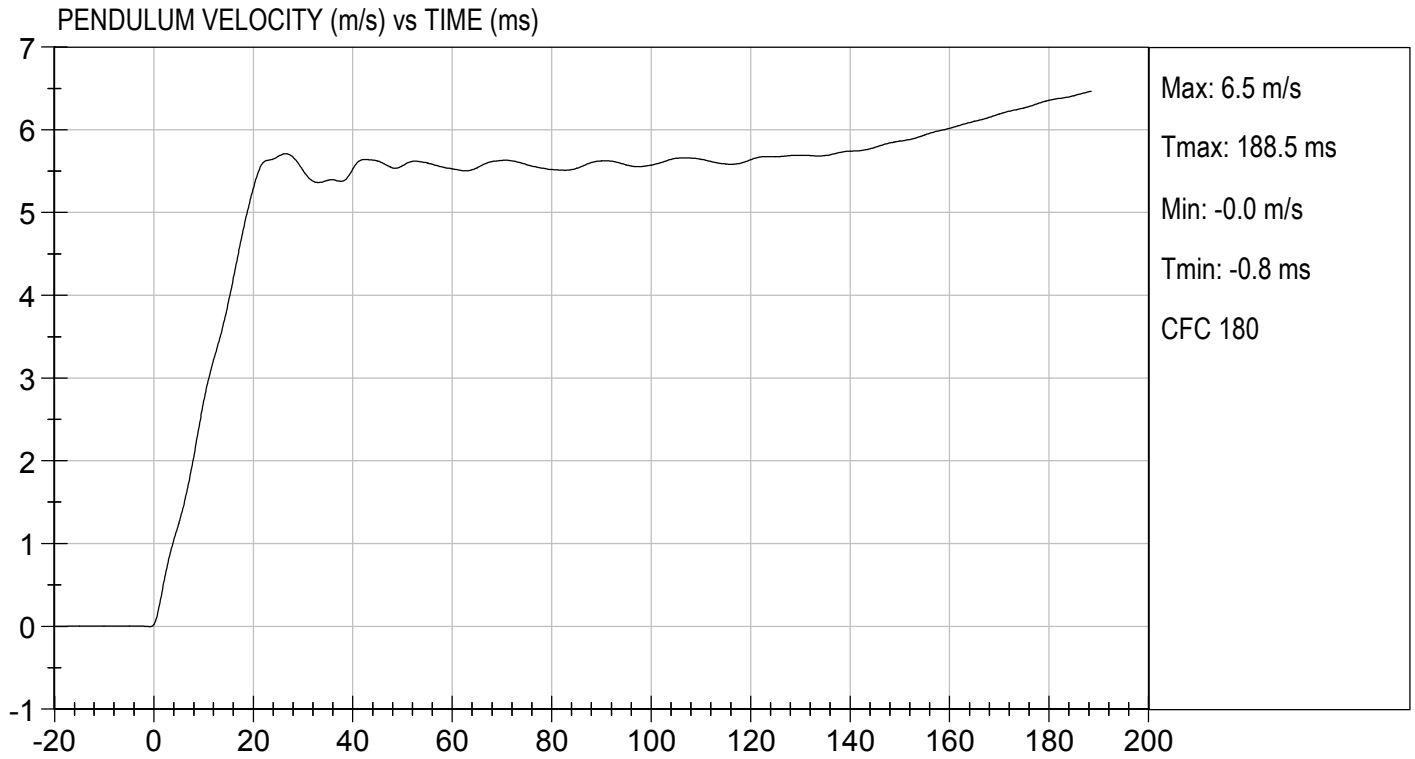
Laboratory Technician

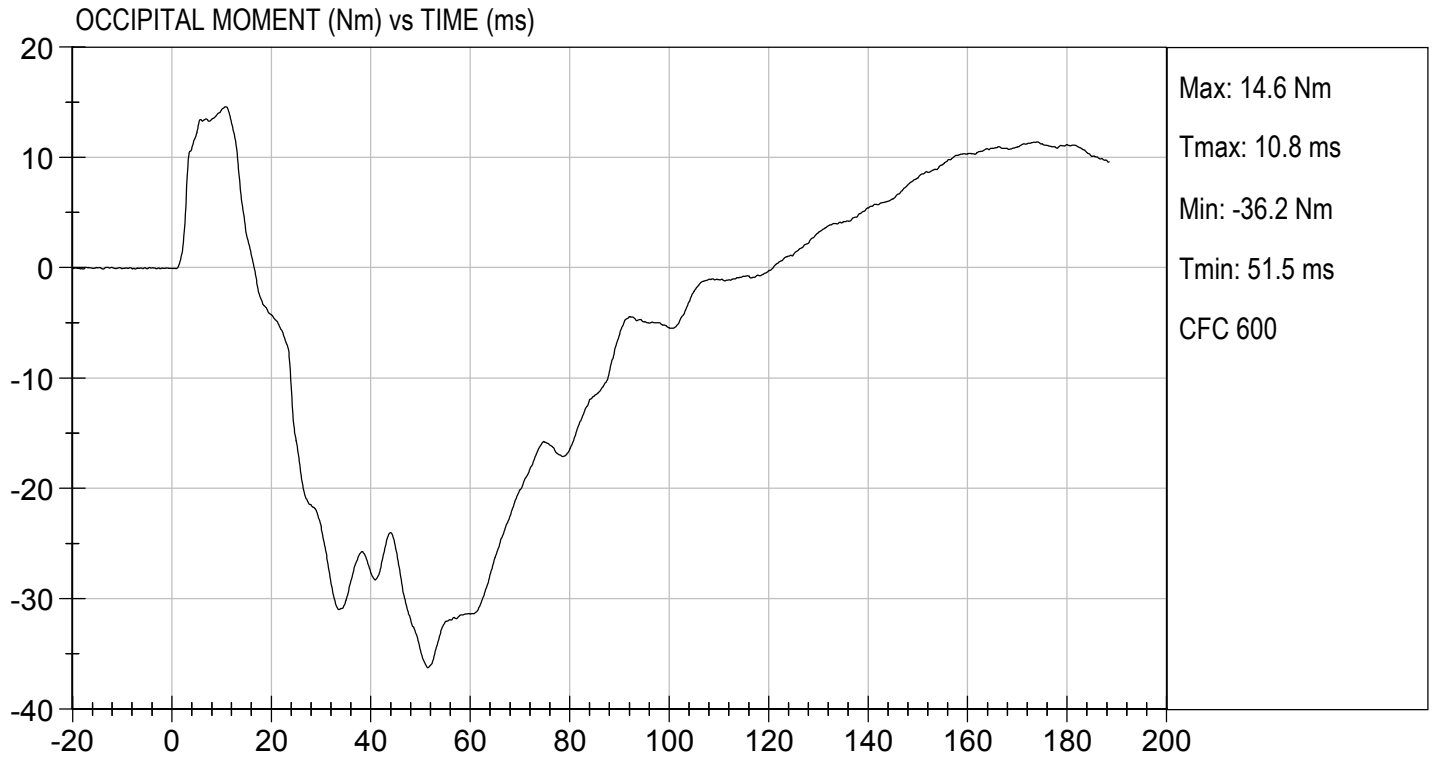
04/21/2021

Test Date



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

ATD Serial No: 296

Test ID: D211373


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22	Pass
Laboratory Relative Humidity	%	10 to 70	21.4	Pass
Impact Velocity	m/s	4.20 to 4.40	4.22	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	33	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass



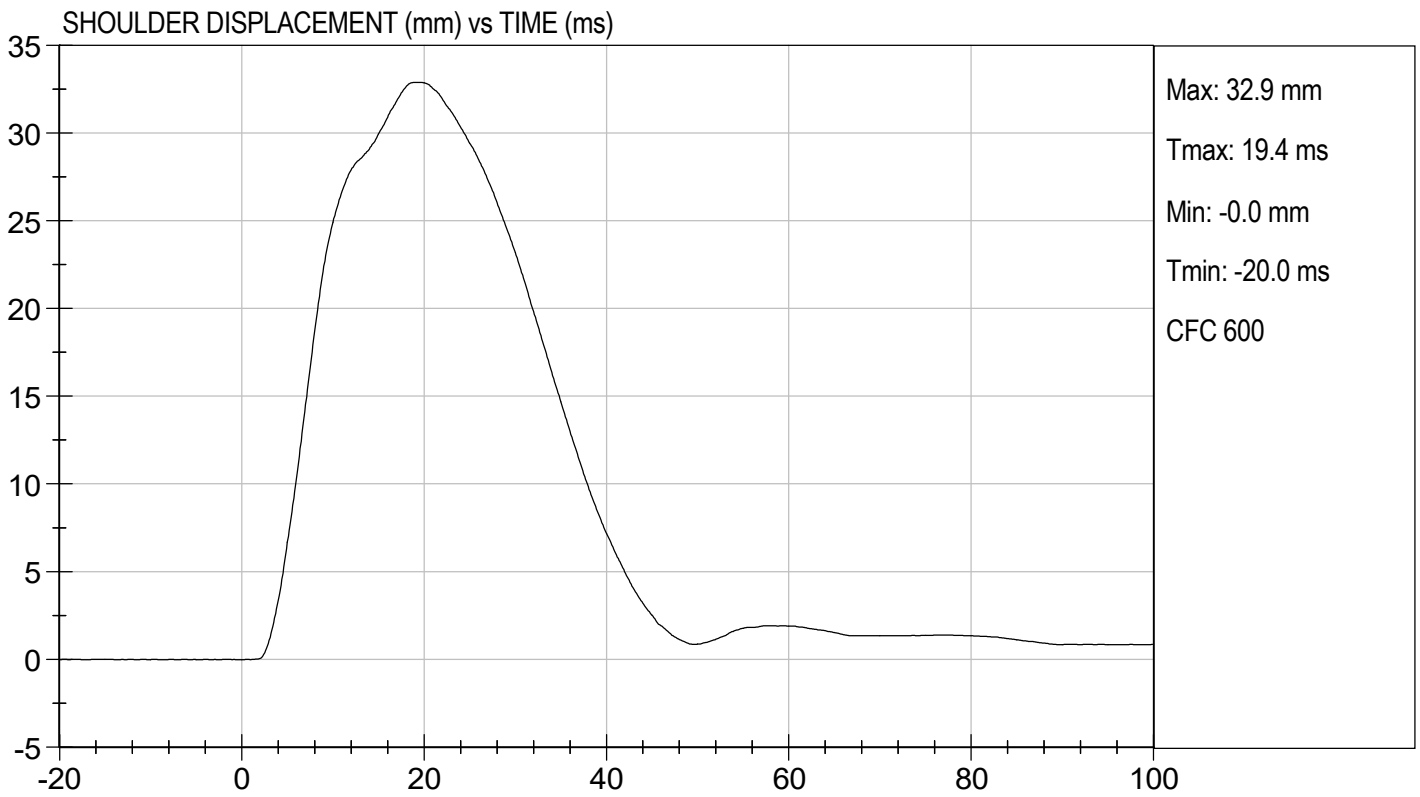
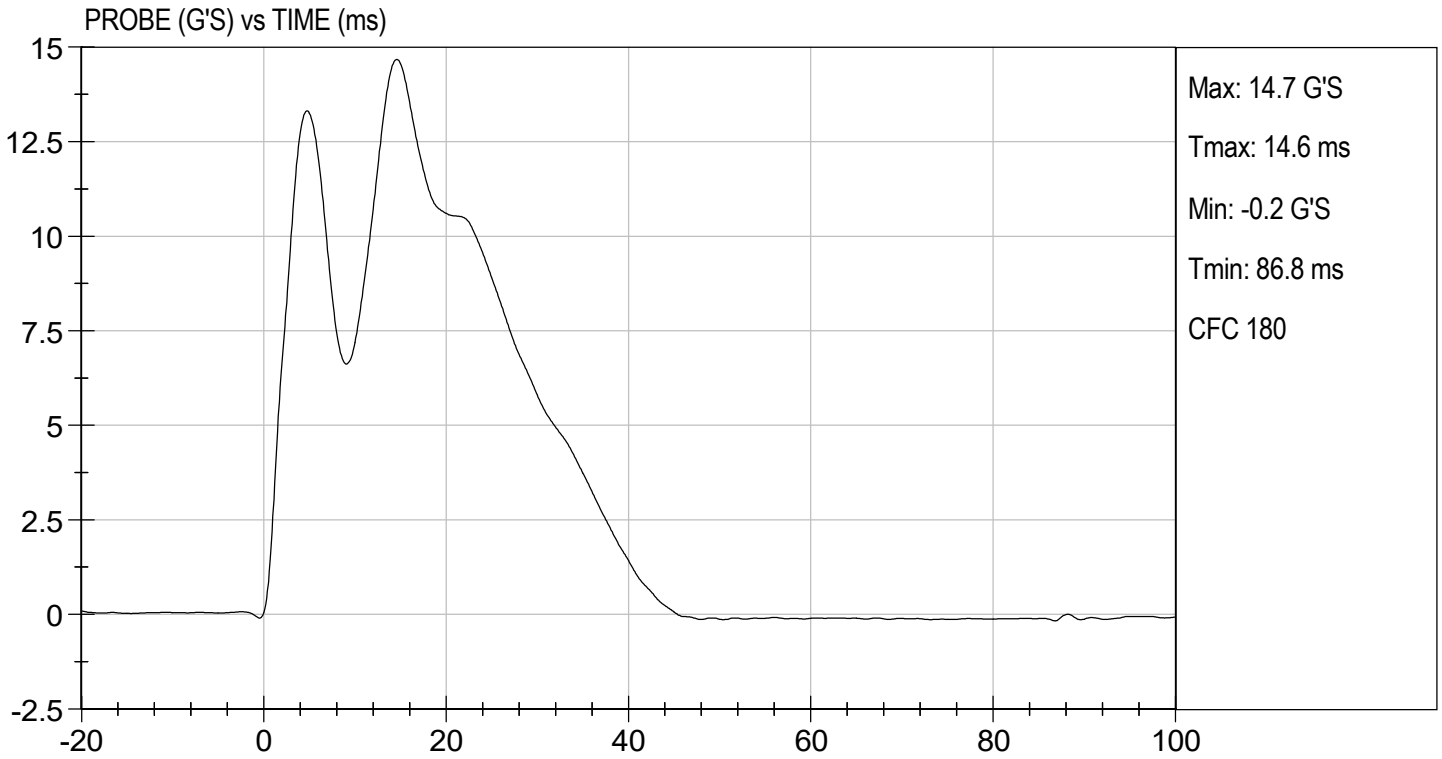
Laboratory Technician

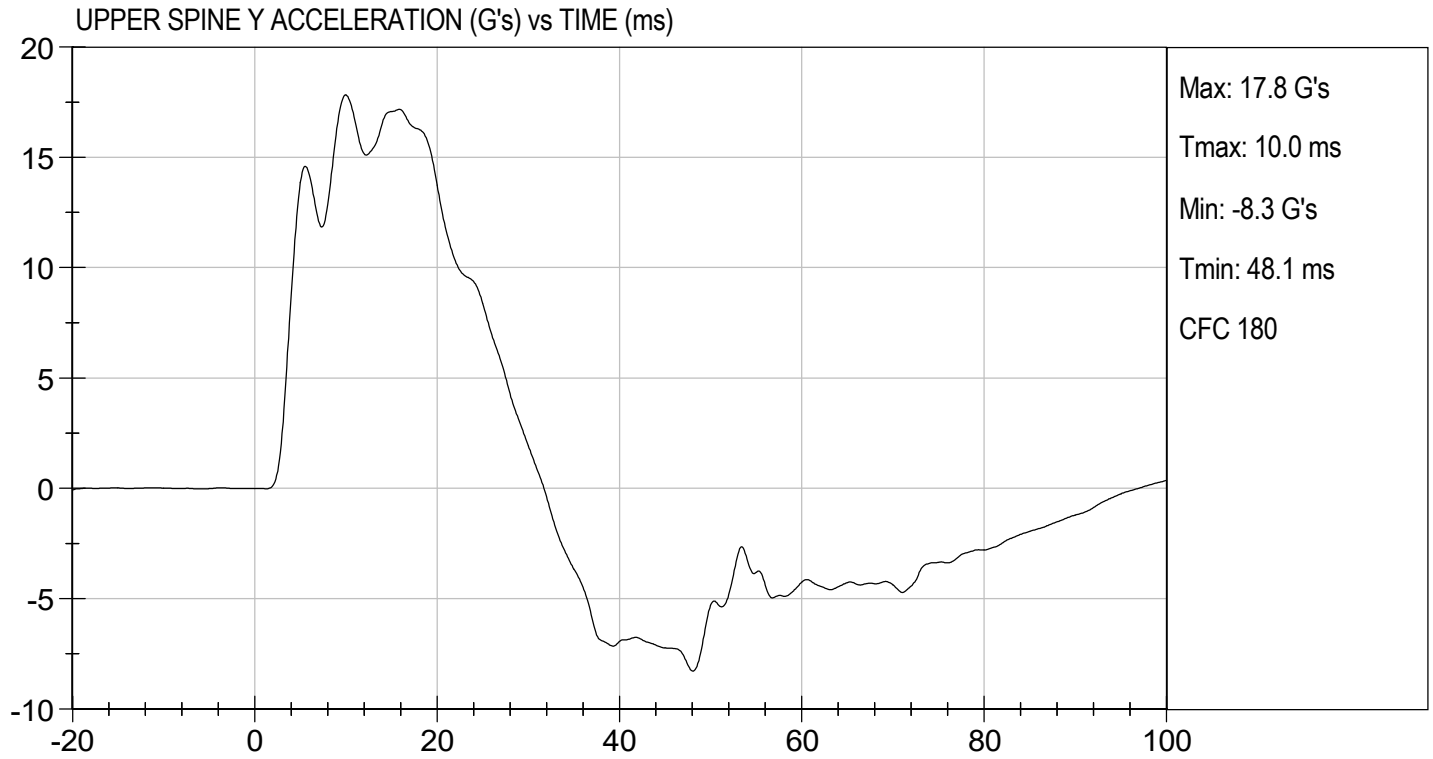
04/20/2021

Test Date



Approved By





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

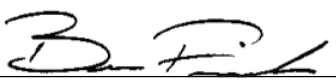
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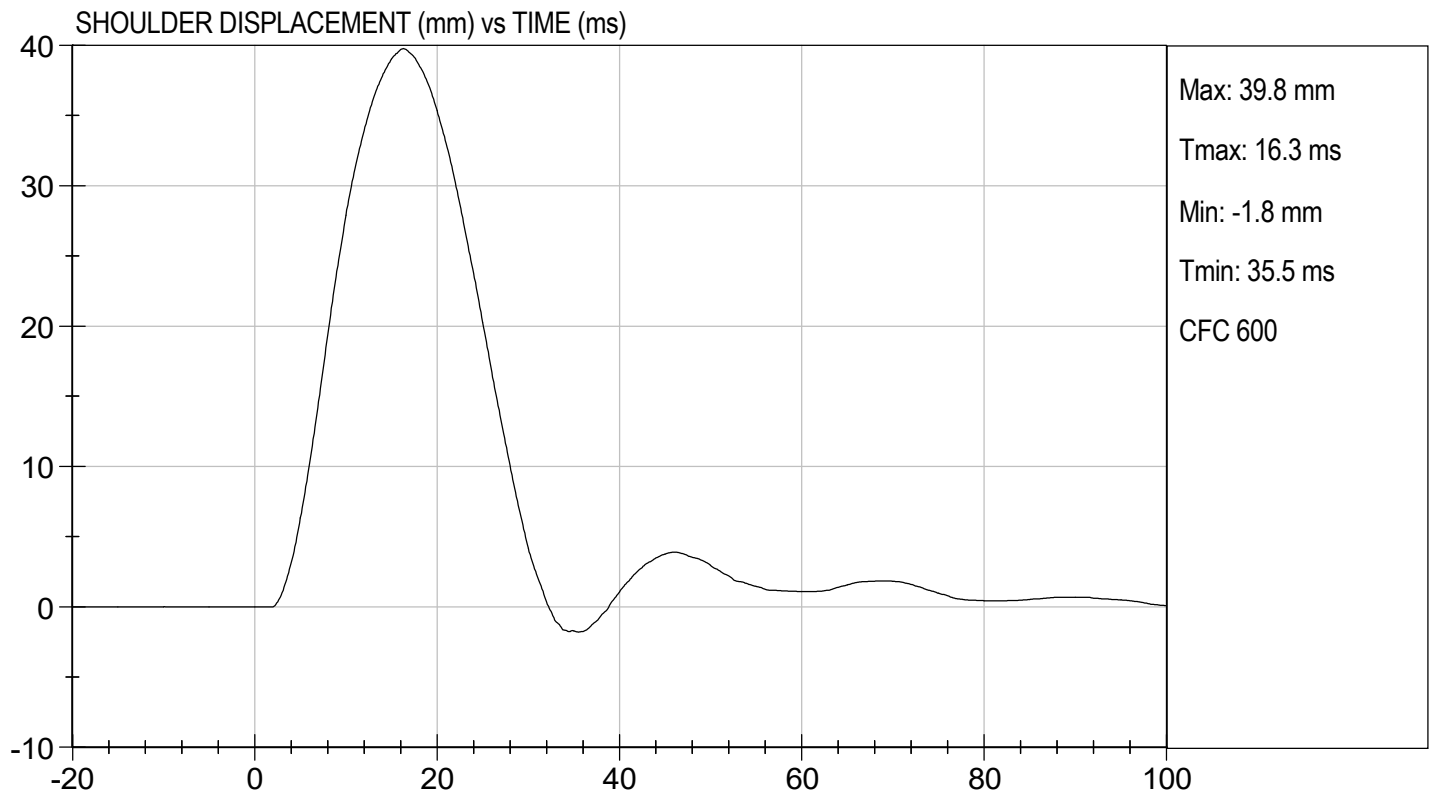
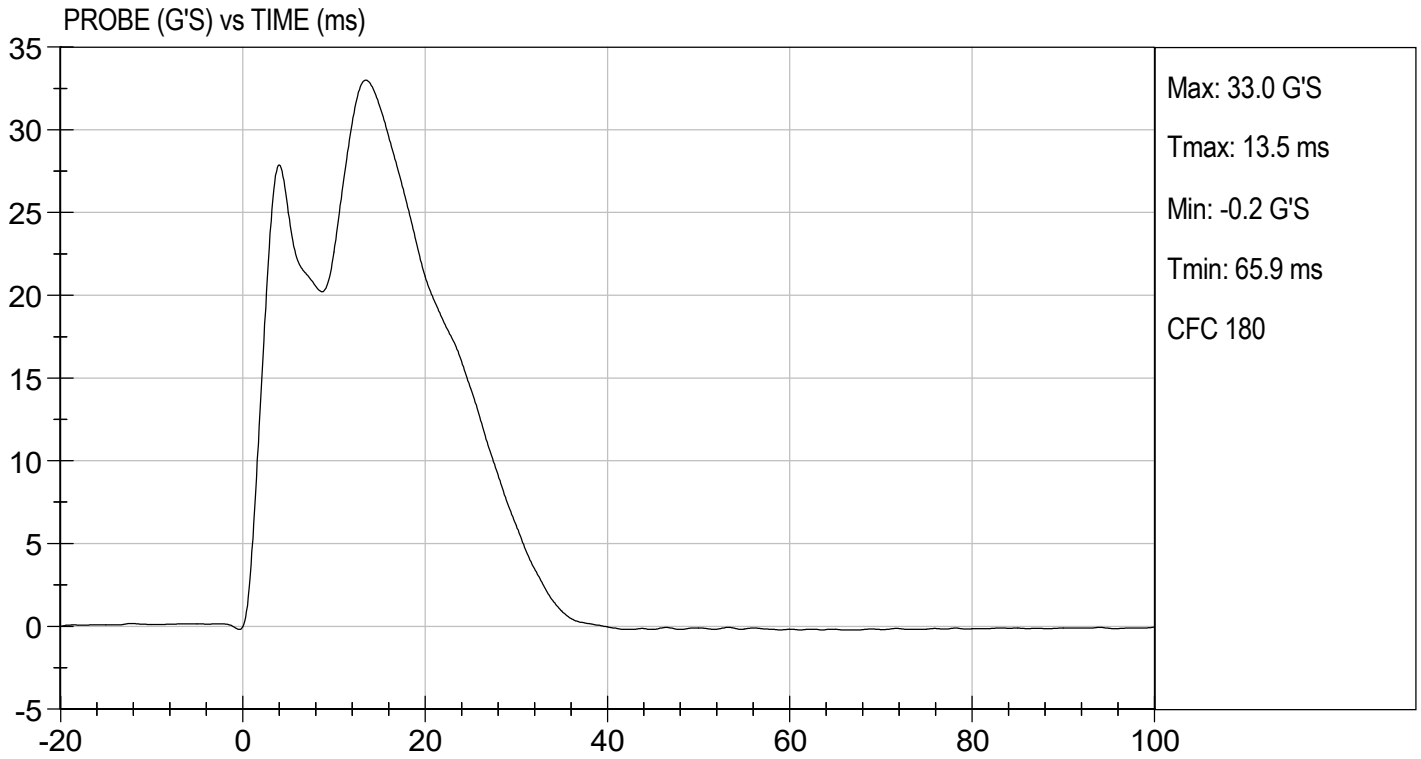
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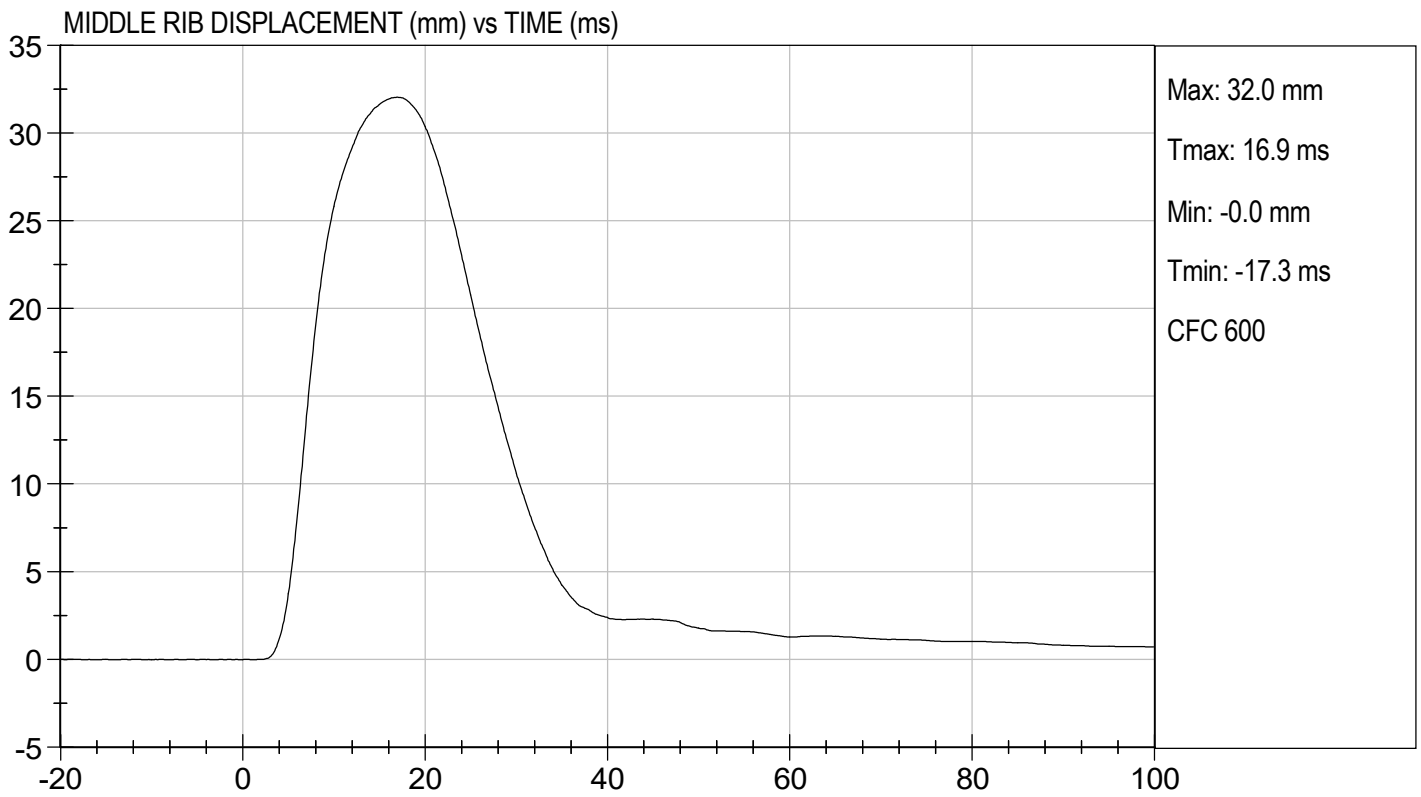
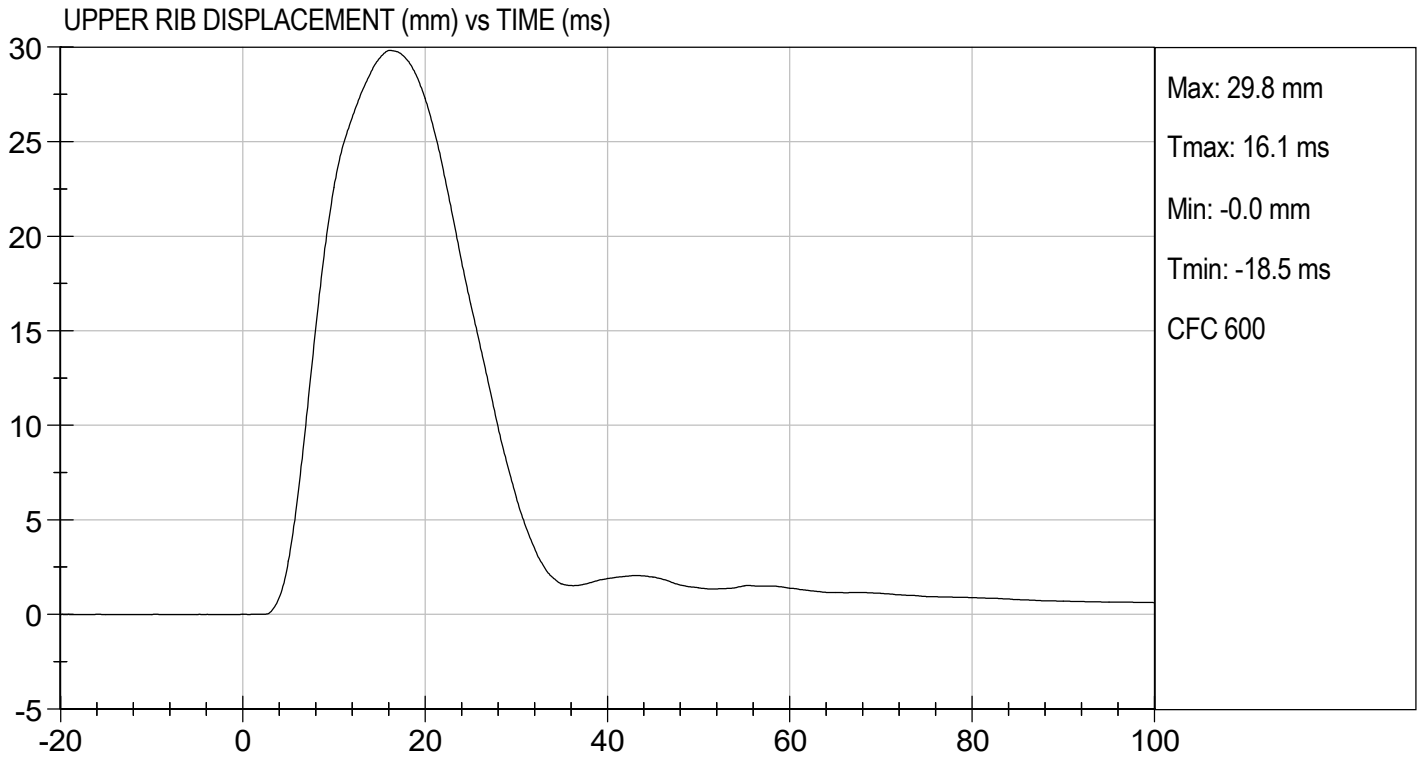
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	21.4	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	40	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	33	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

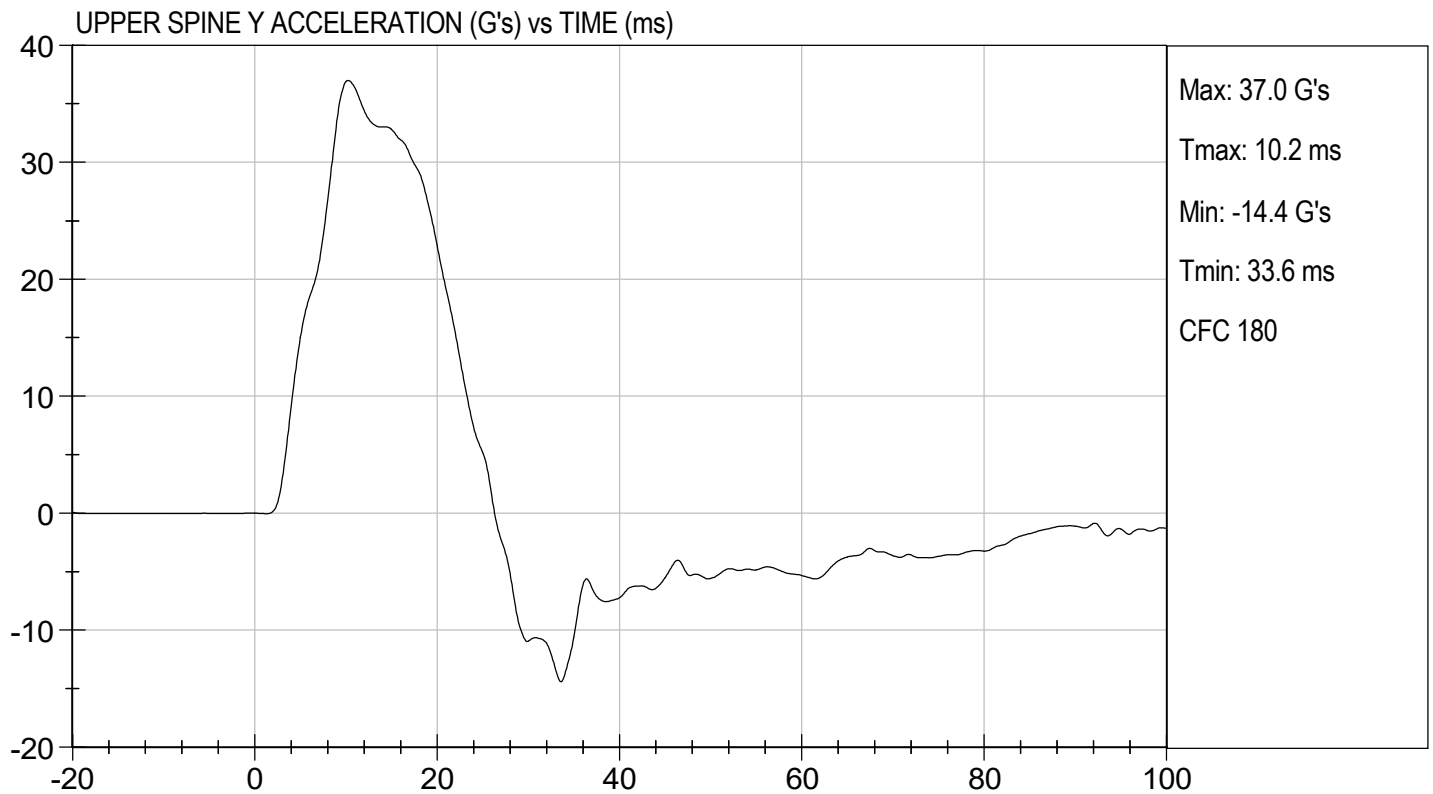
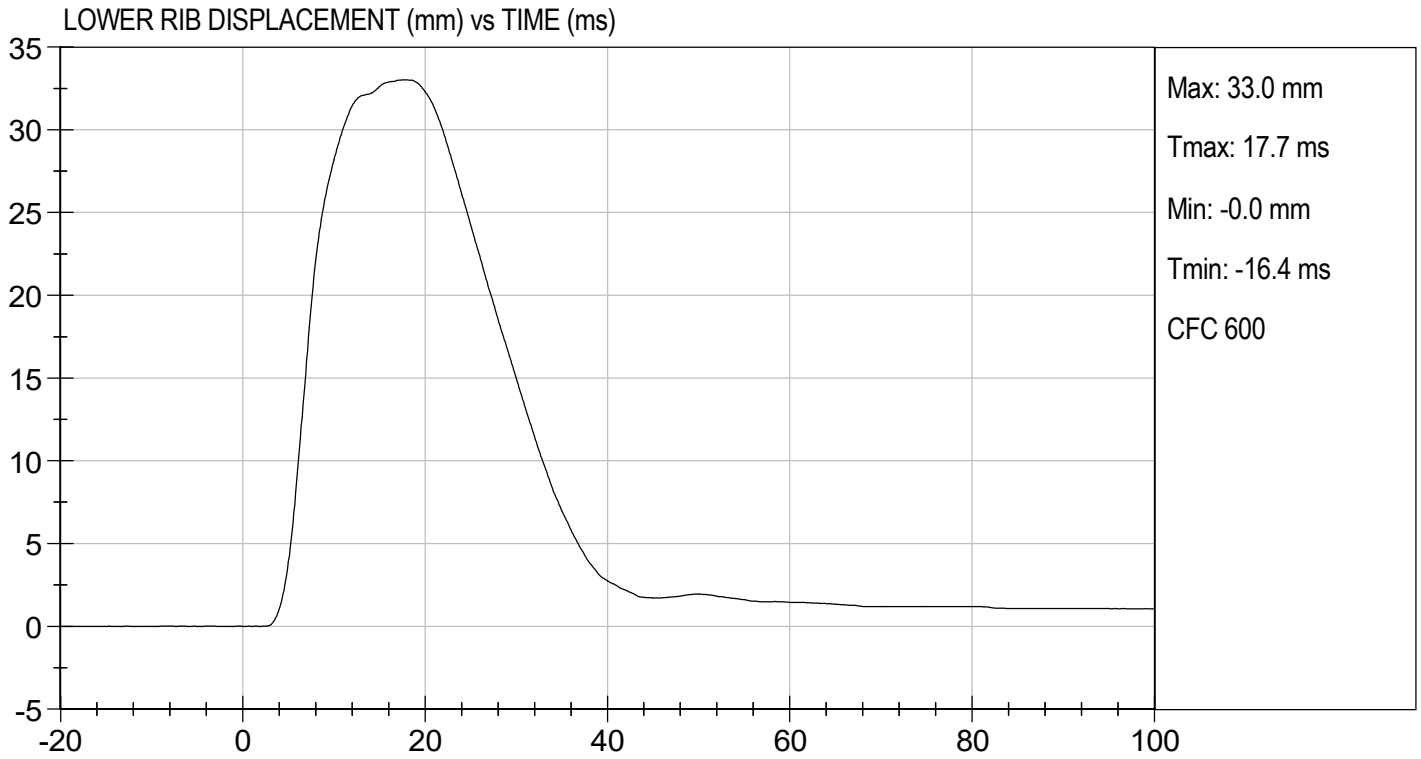

Laboratory Technician

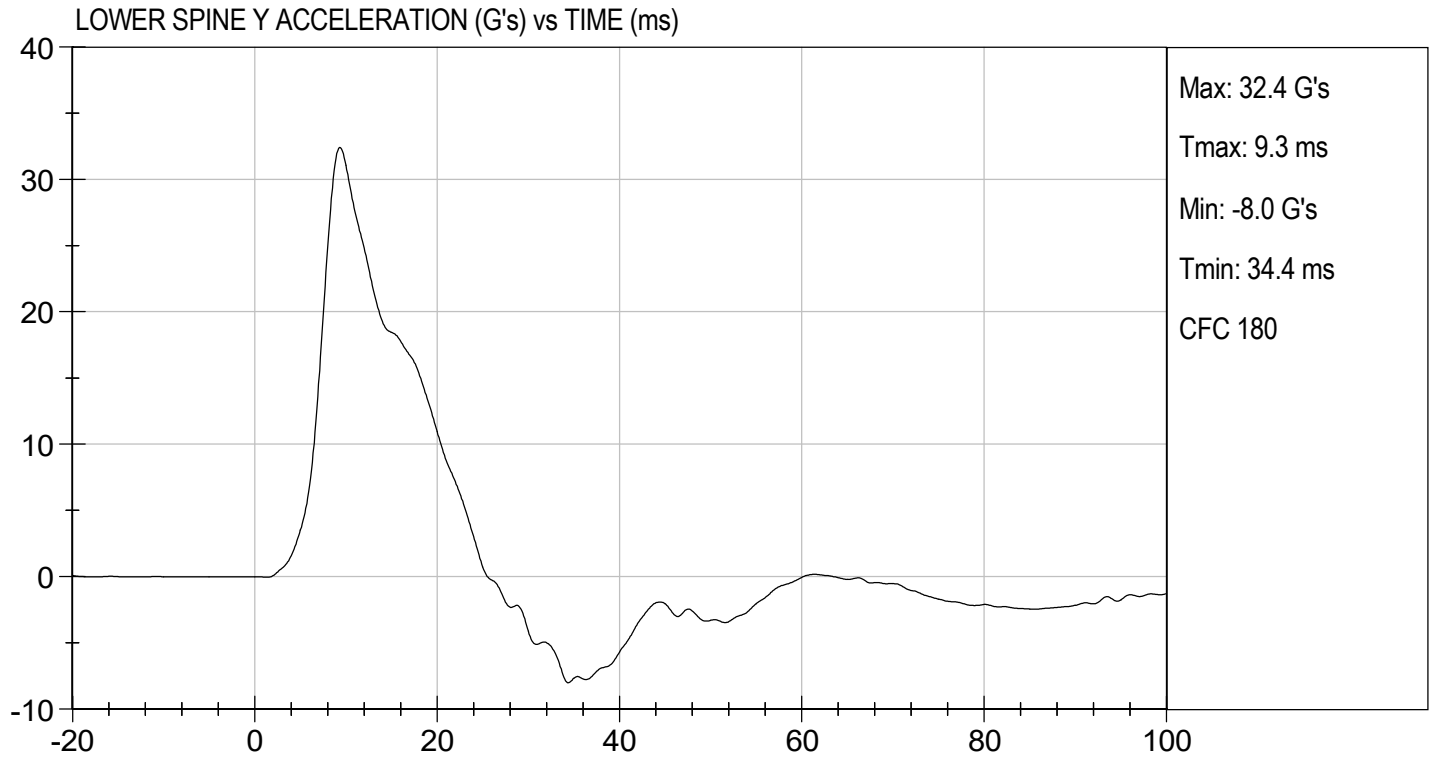
04/20/2021
Test Date


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

ATD Serial No: 296

Test I.D: D211375

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	21.4	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
			Overall Test Results	Pass

Tammie Lison

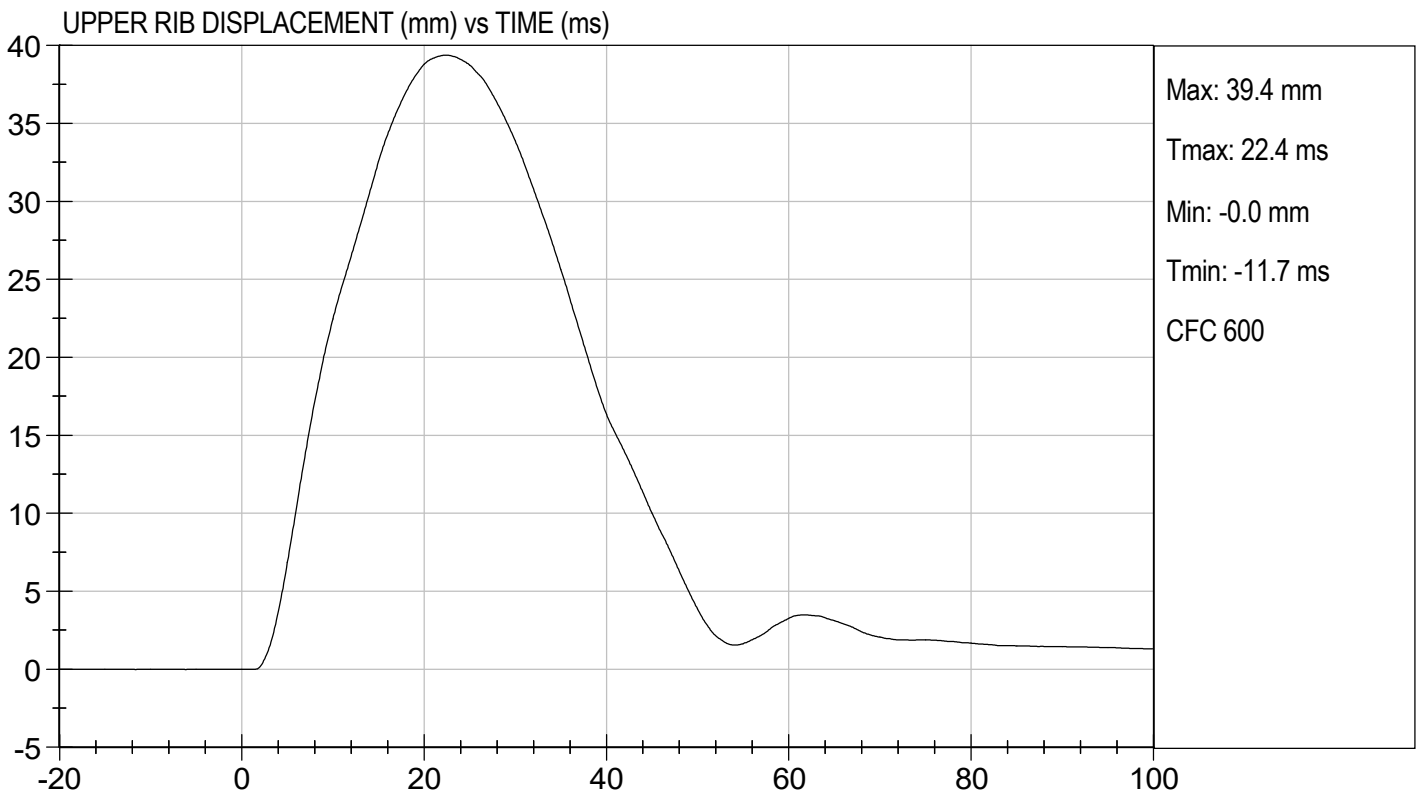
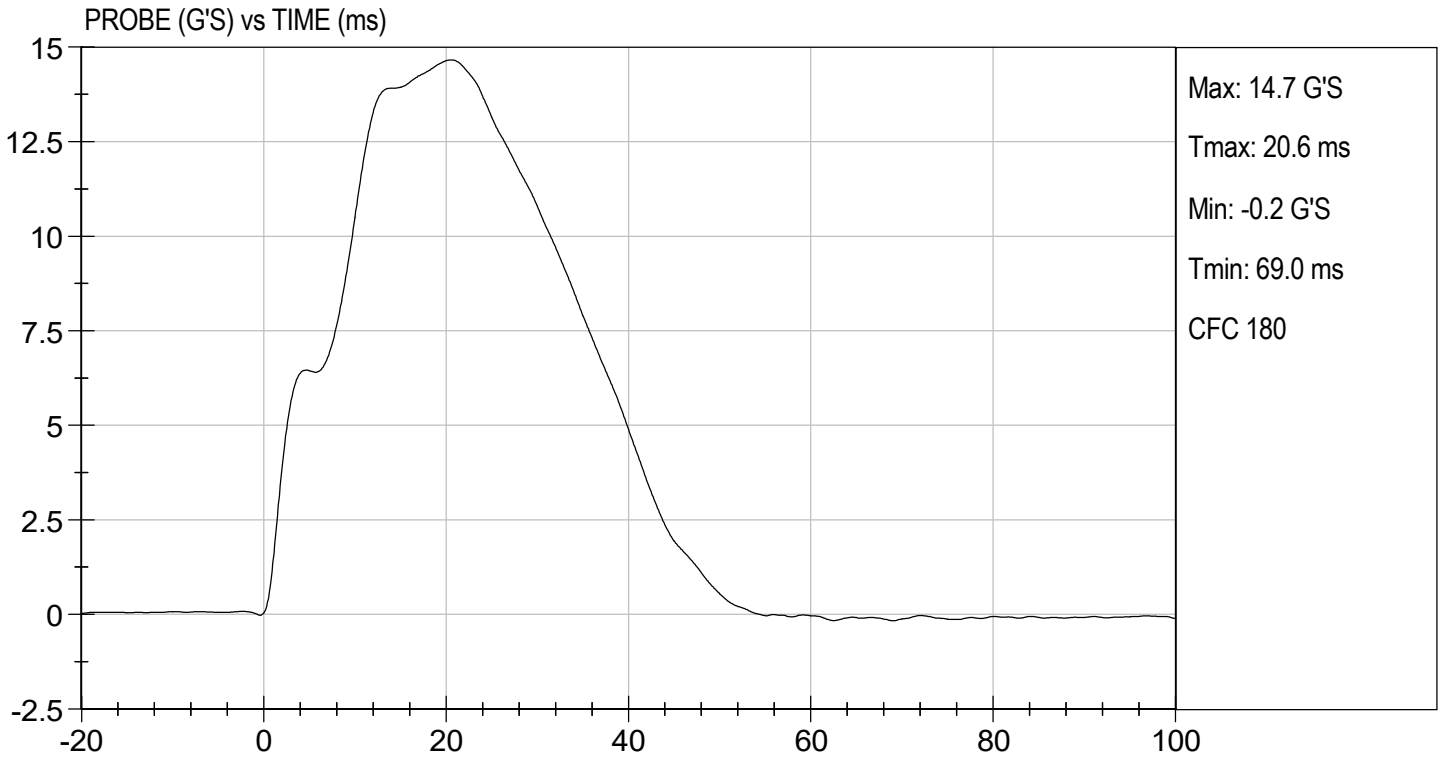
Laboratory Technician

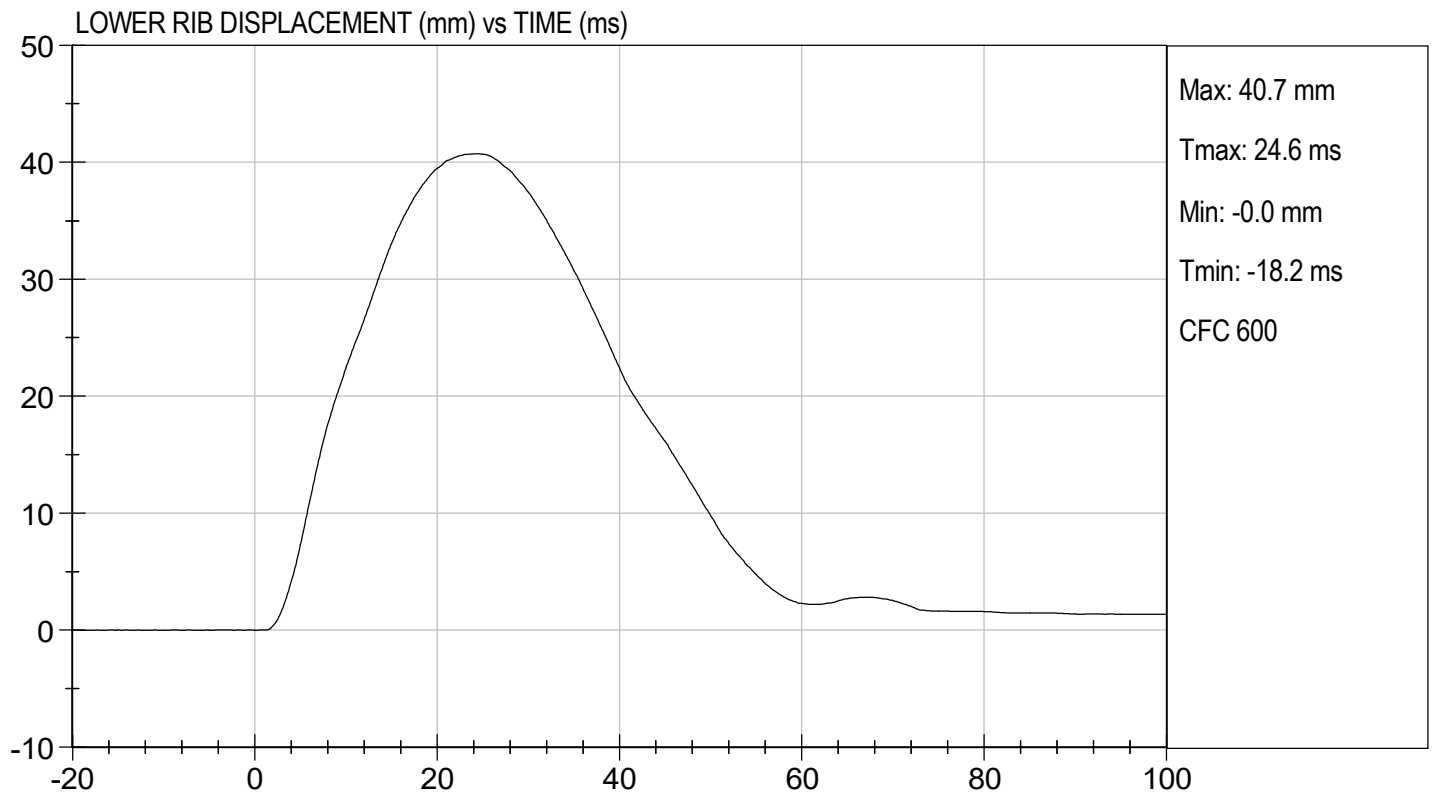
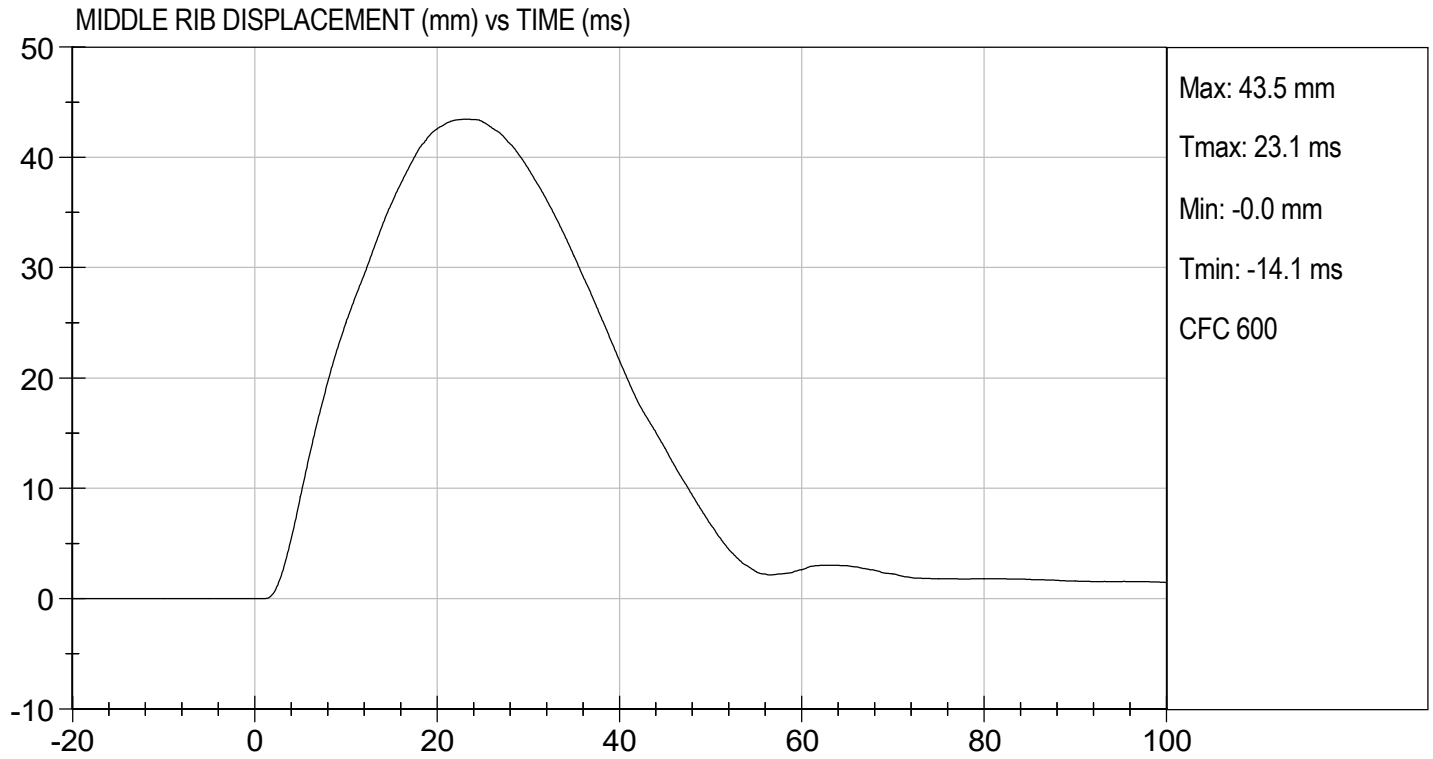
04/20/2021

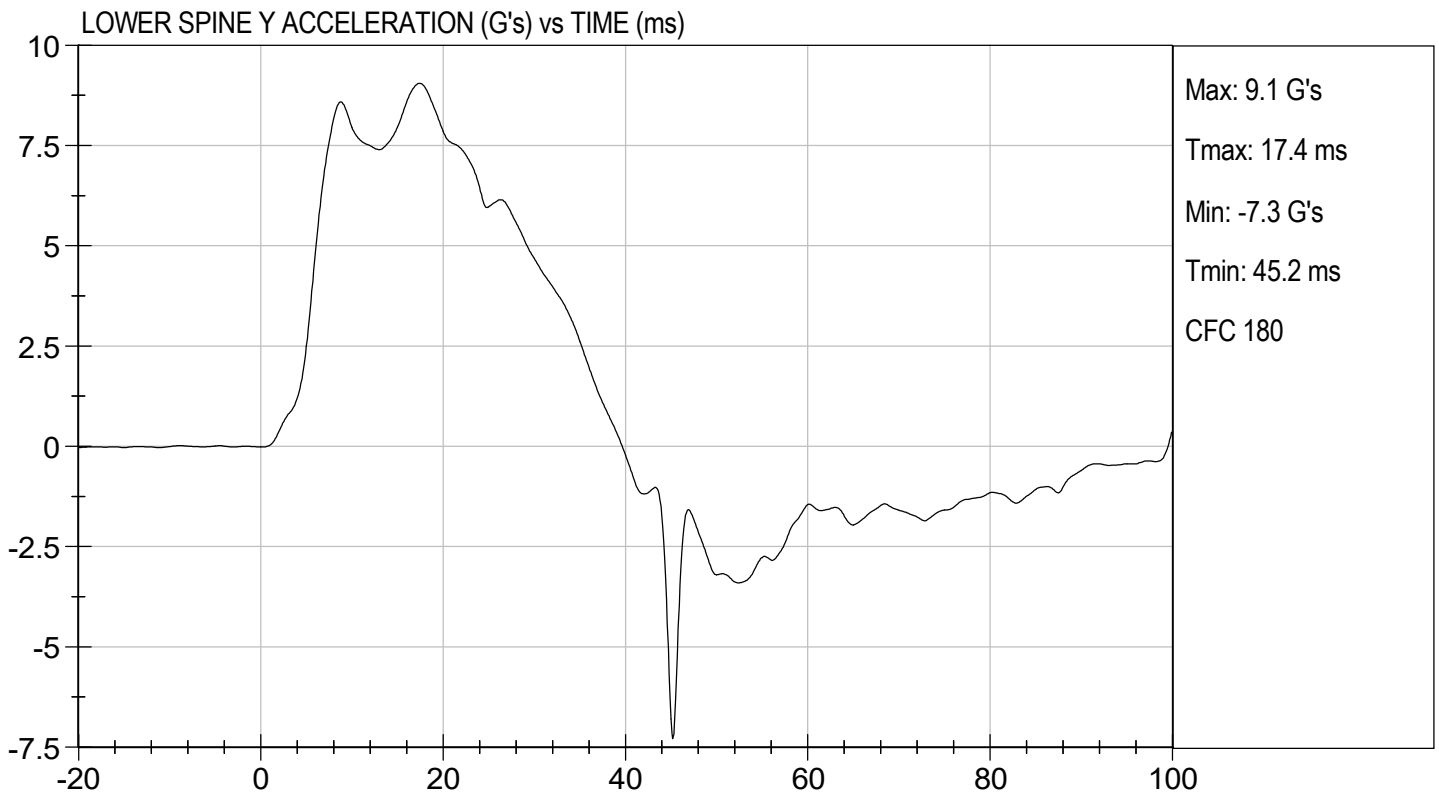
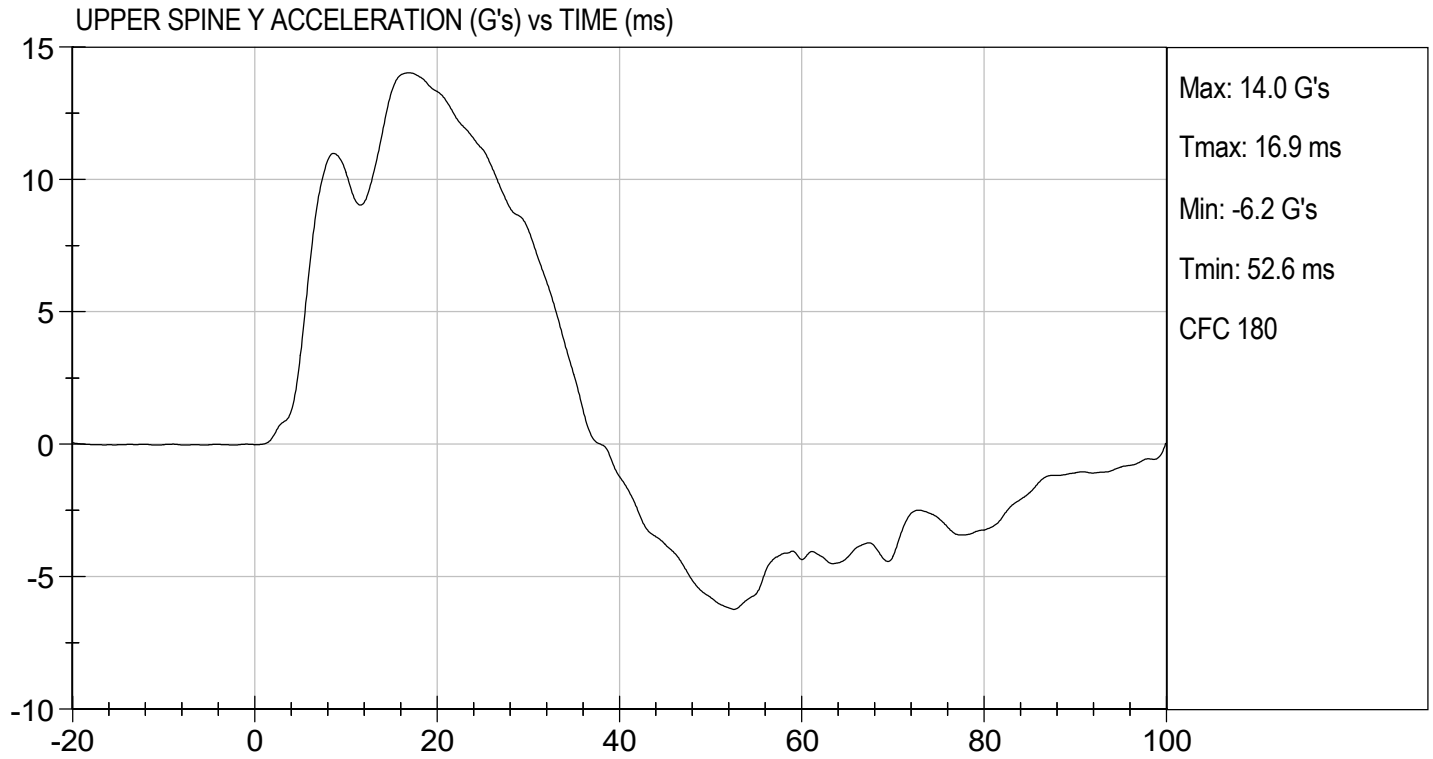
Test Date

B. F. L.

Approved By







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

ATD Serial No: 296

Test I.D: D211376

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	21.4	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

Tammie Liden

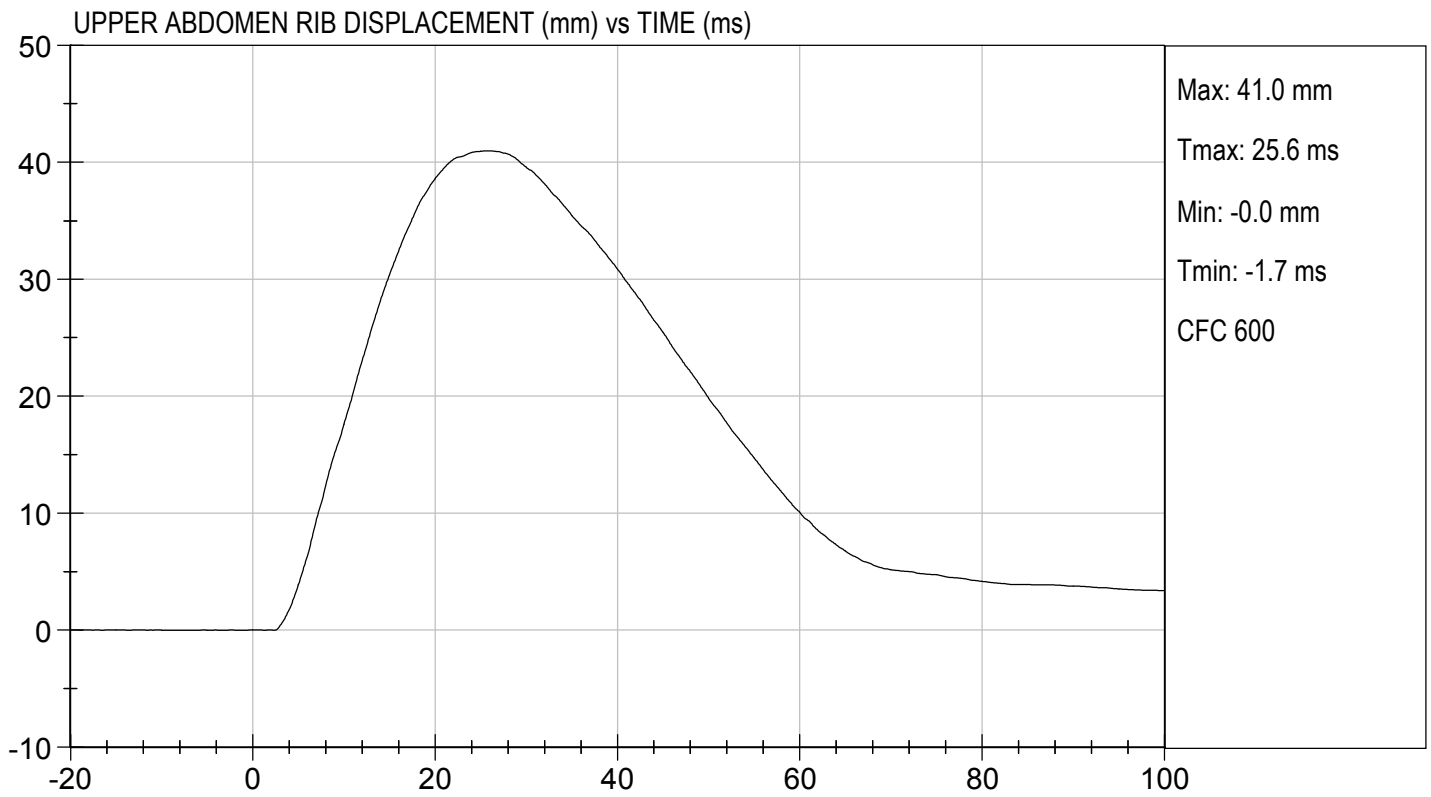
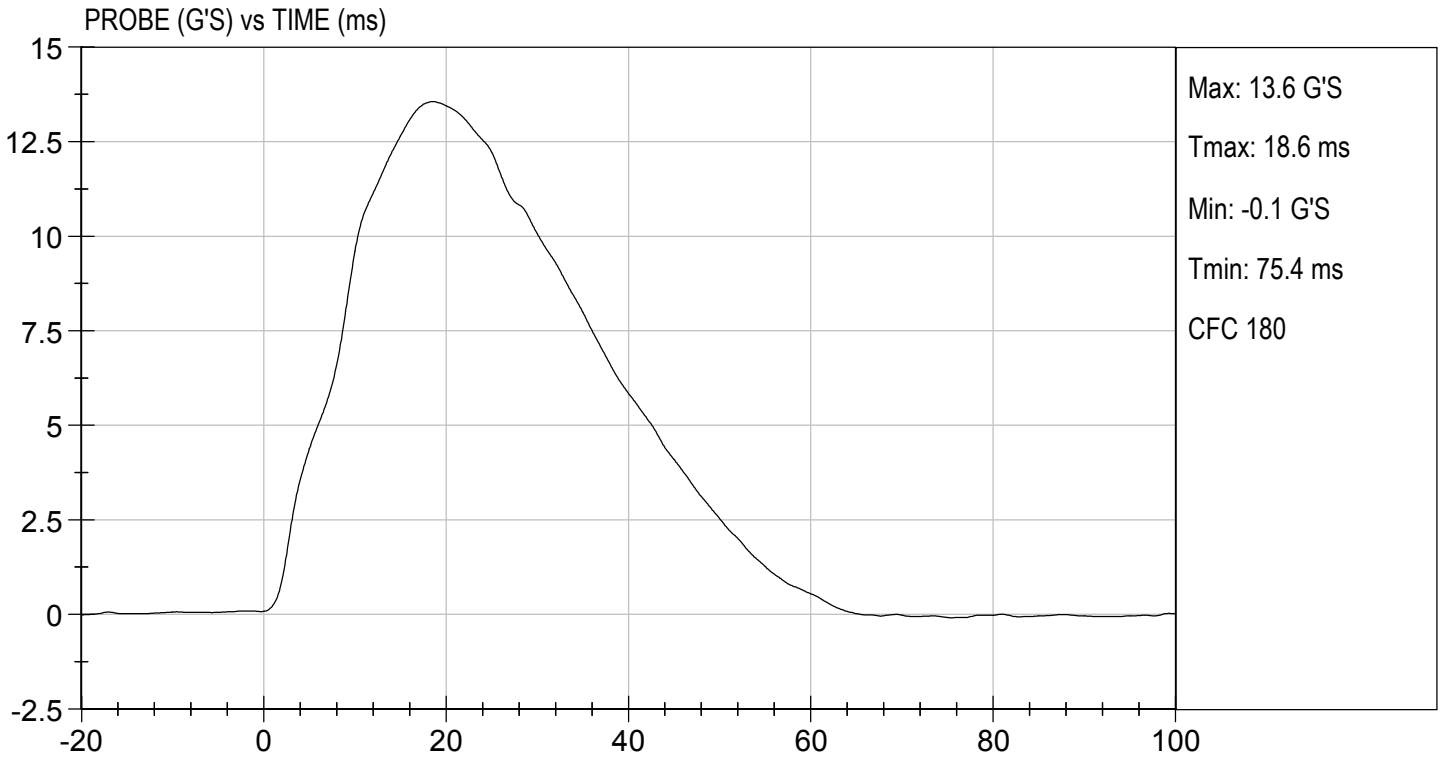
Laboratory Technician

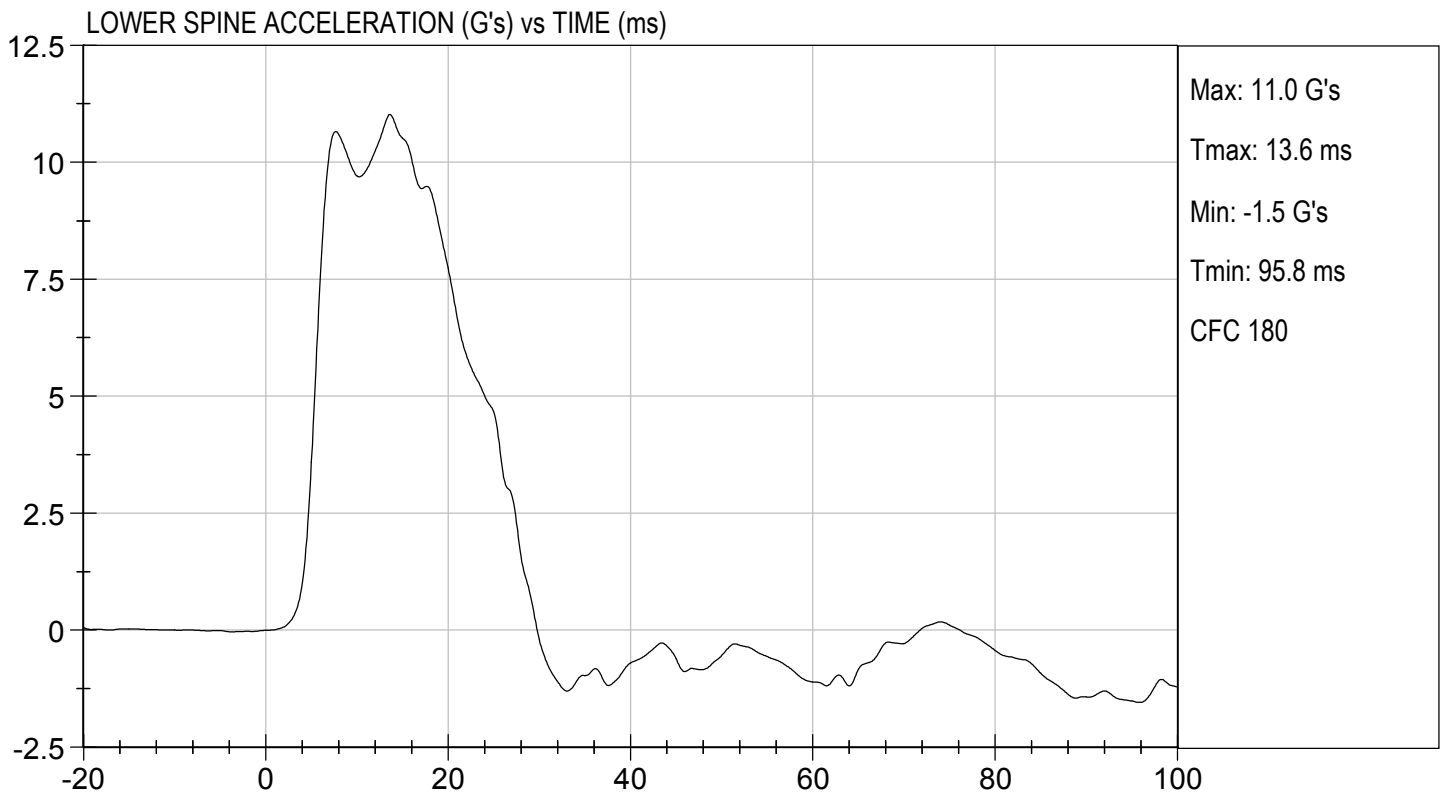
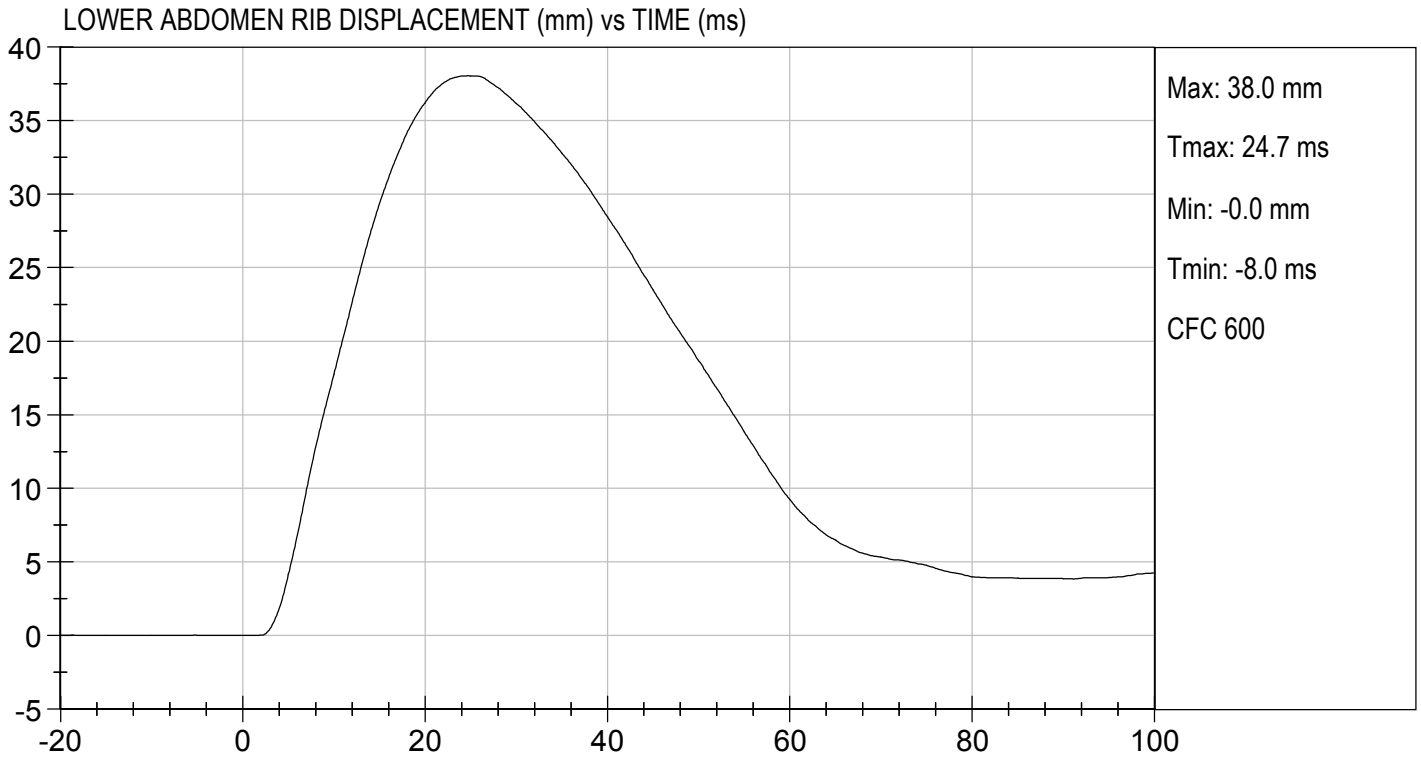
04/20/2021

Test Date

B. F. H.

Approved By





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

ATD Serial No: 296

Test I.D: D211377

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	21.4	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	40	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	37	Pass
Peak Acetabulum Force	N	3600 to 4300	3,960	Pass
Overall Test Results				Pass

Jane Leach

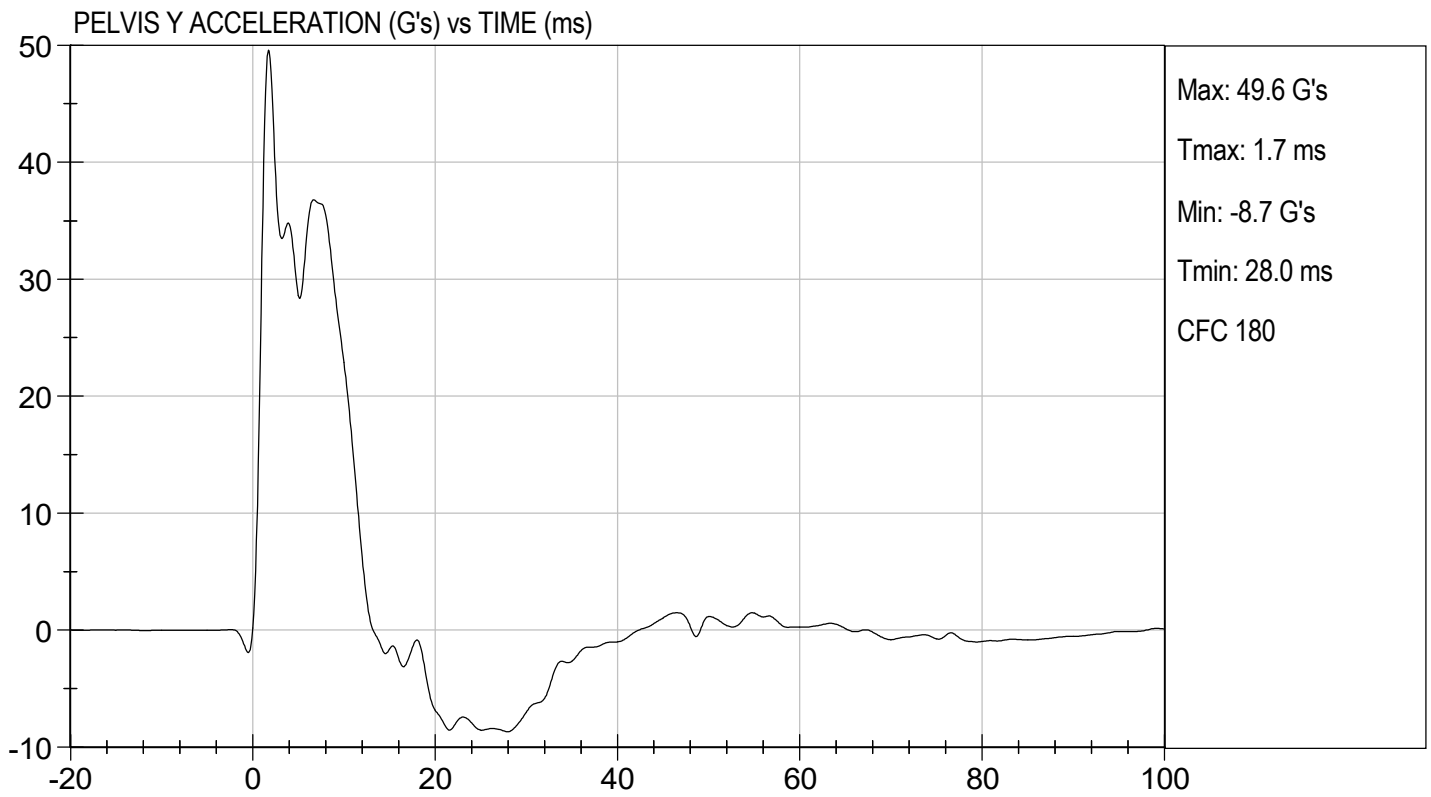
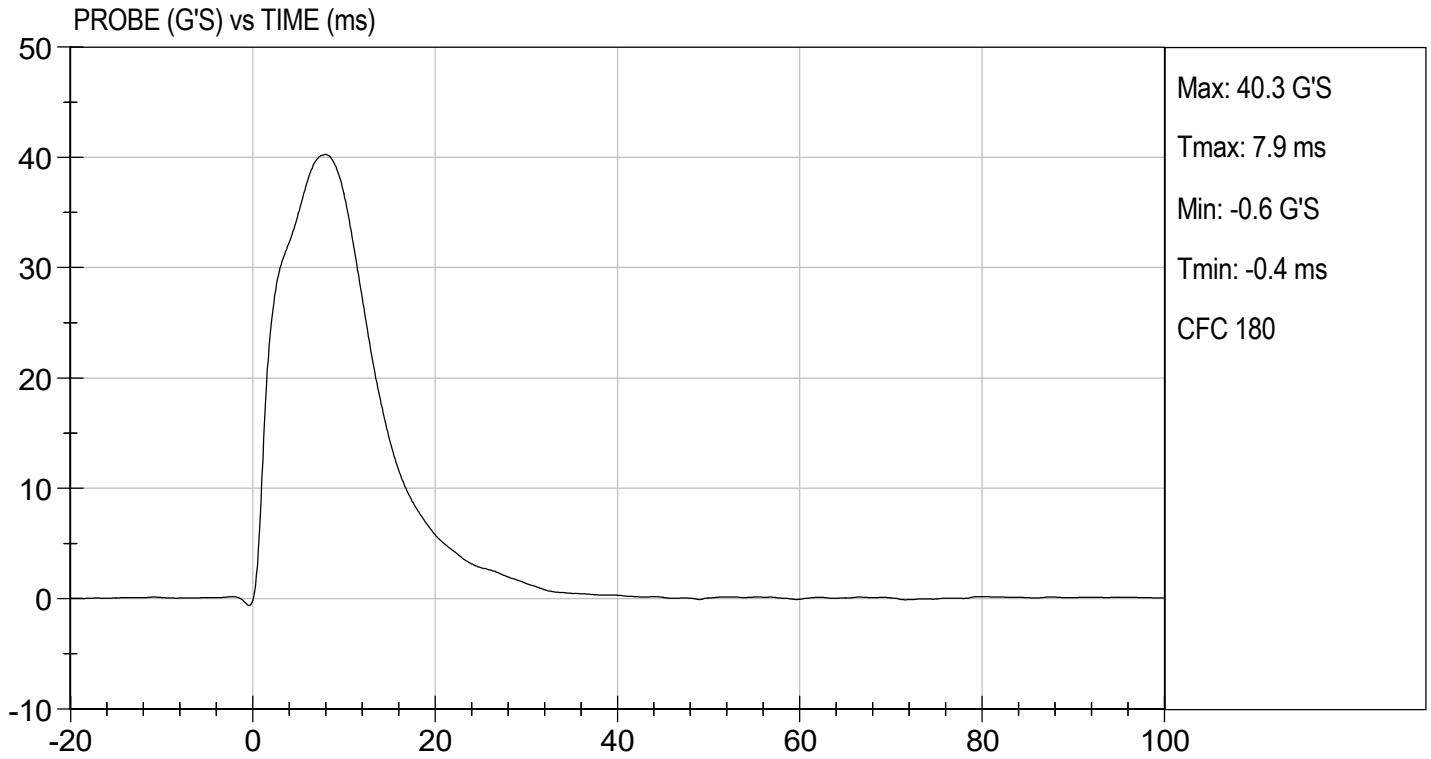
 Laboratory Technician

04/20/2021

 Test Date

B. F. H.

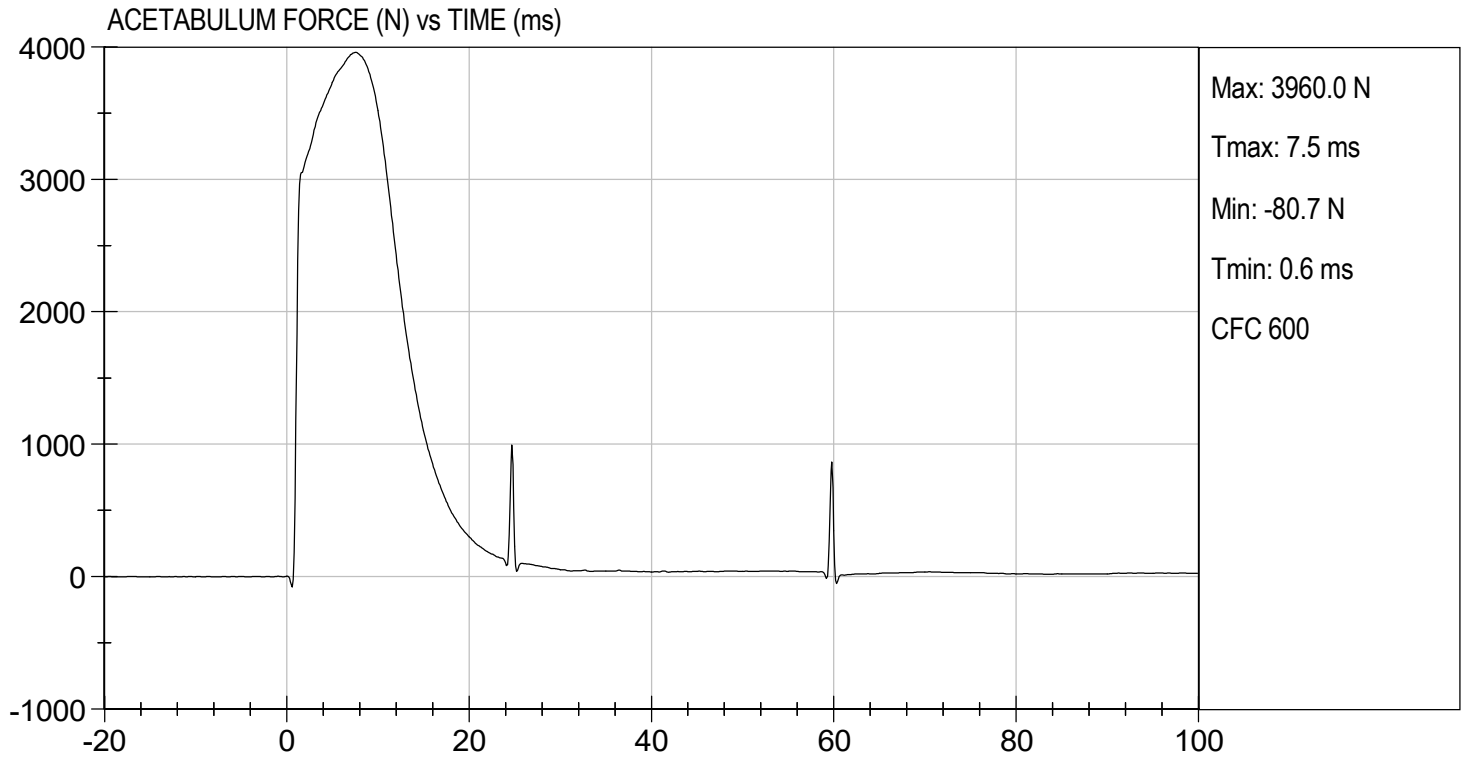
 Approved By





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

TEST DATE: 04/20/2021
TEST #: D211377



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

ATD Serial No: 296

Test I.D: D211378

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21	Pass
Humidity	%	10 to 70	26.8	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,637	Pass
Overall Test Results				Pass

Tammie Leich

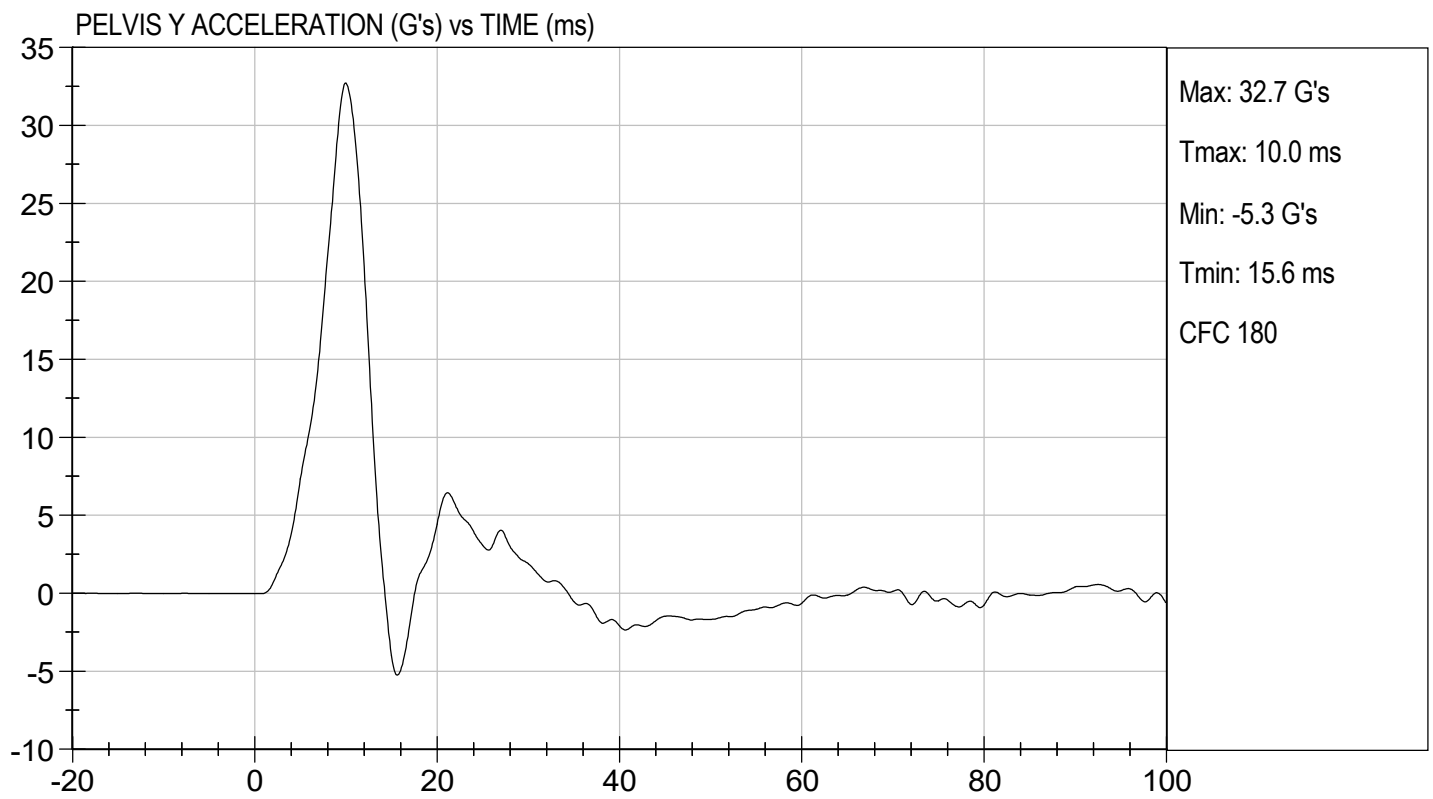
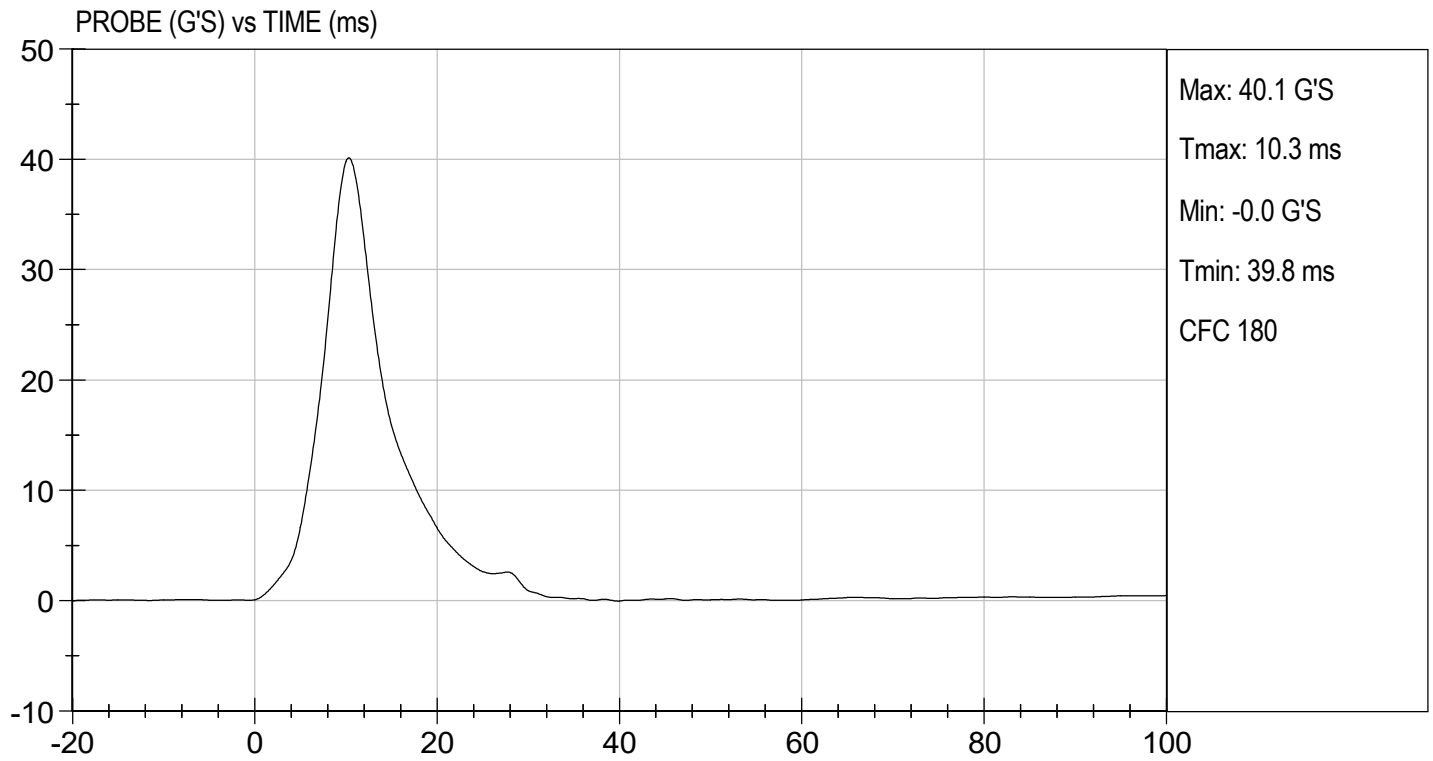
Laboratory Technician

04/20/2021

Test Date

B. F. K.

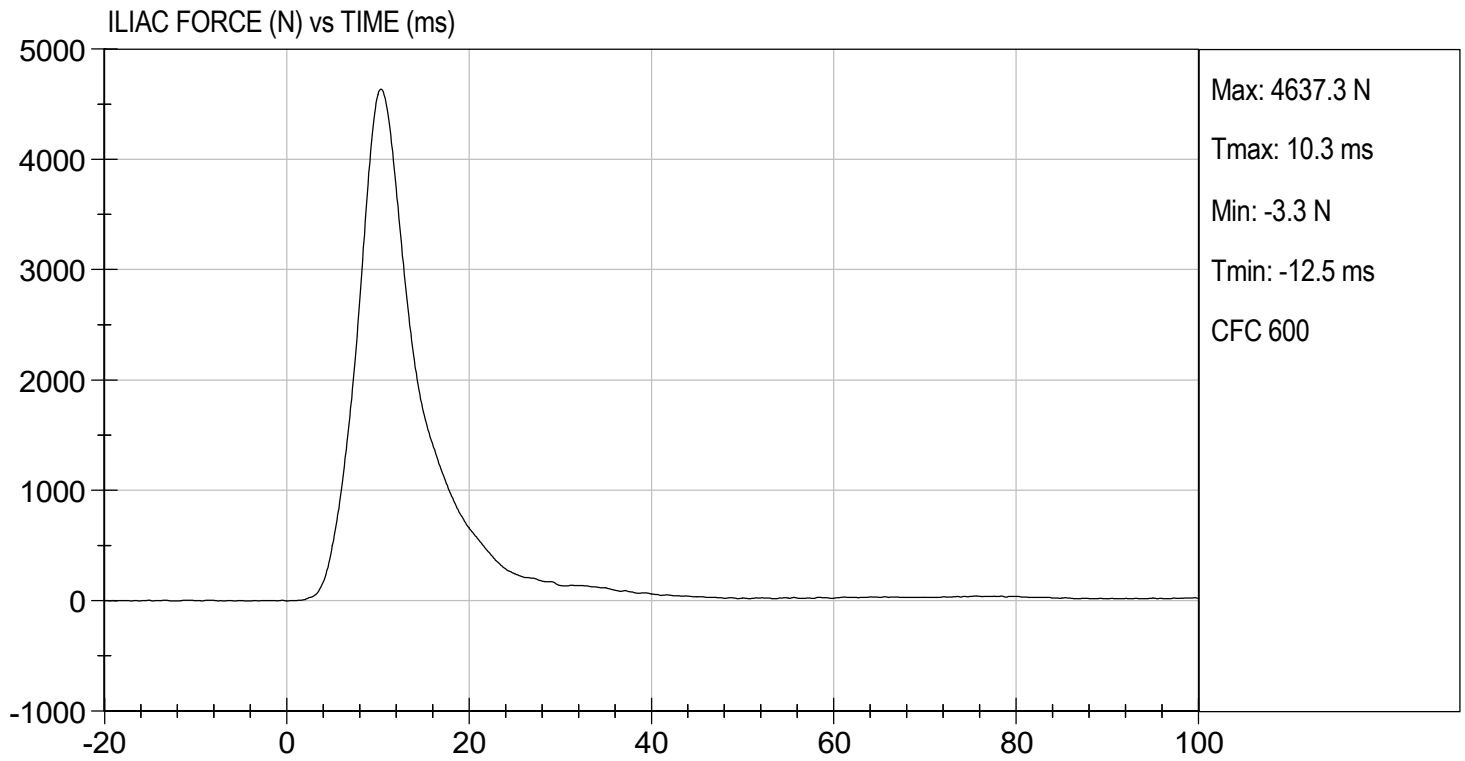
Approved By





TEST DESC: ILIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 04/20/2021
TEST #: D211378



CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 296

No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	784	Pass
B	Shoulder Pivot Height	437 - 453	442	Pass
C	H-point Height	79 - 89	83	Pass
D	H-point from Seatback	141 - 151	145	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	121	Pass
G	Head Breadth	140 - 148	142	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	180	Pass
J	Head Circumference	541 - 551	548	Pass
K	Buttock to Knee Length	514 - 540	535	Pass
L	Popliteal Height	343 - 369	358	Pass
M	Knee Pivot to Floor Height	392 - 409	404	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	206	Pass
P	Foot Length	216 - 232	219	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	316	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	481	Pass
V	Shoulder Width	341 - 357	346	Pass
W	Foot Width	78 - 94	85	Pass
Y	Chest Circumference w/ jacket	851 - 881	870	Pass
Z	Waist Circumference	761 - 791	772	Pass

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

ATD Serial No: 296

Test ID: D211581

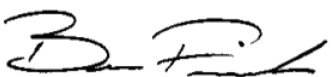
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Peak Resultant Acceleration	G's	115 to 137	129	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-5.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass



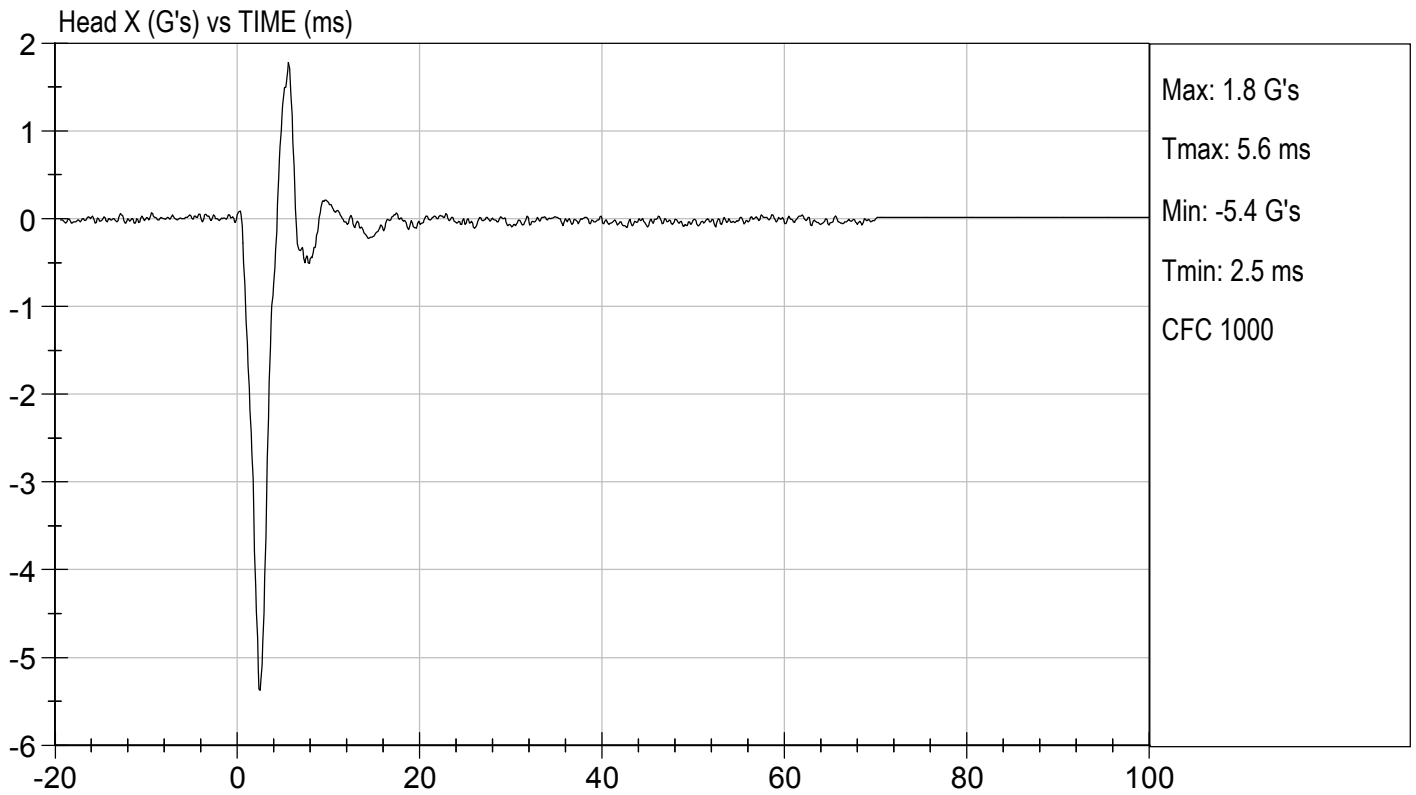
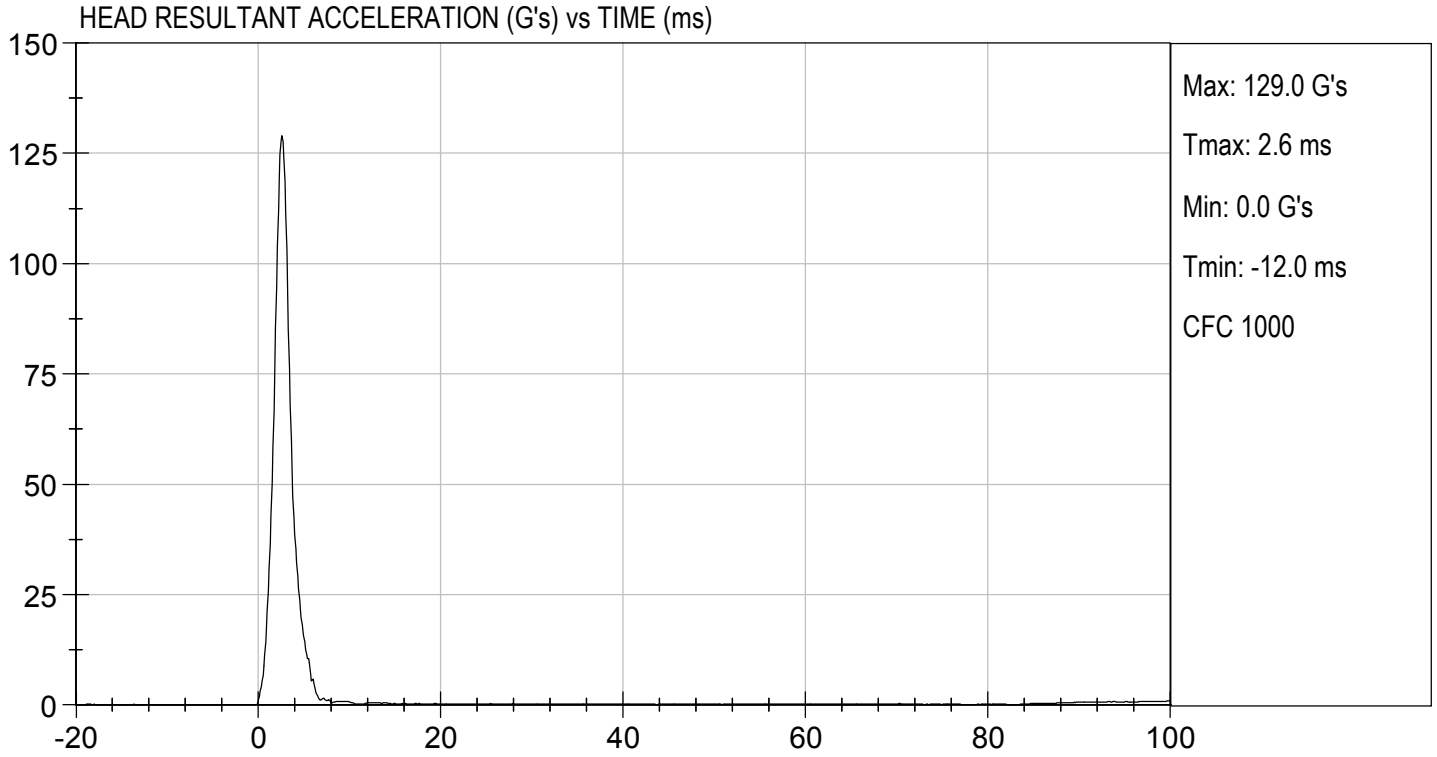
 Laboratory Technician

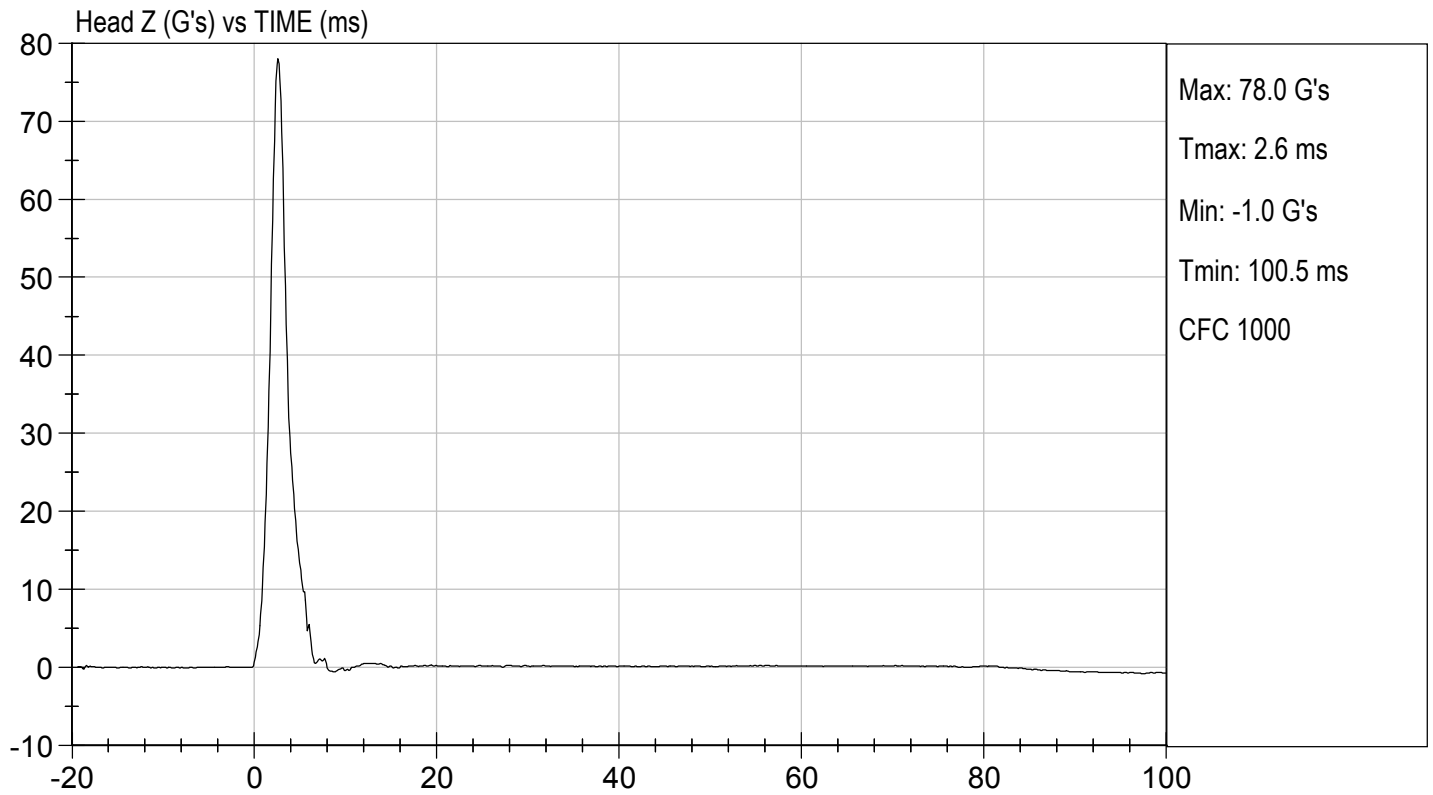
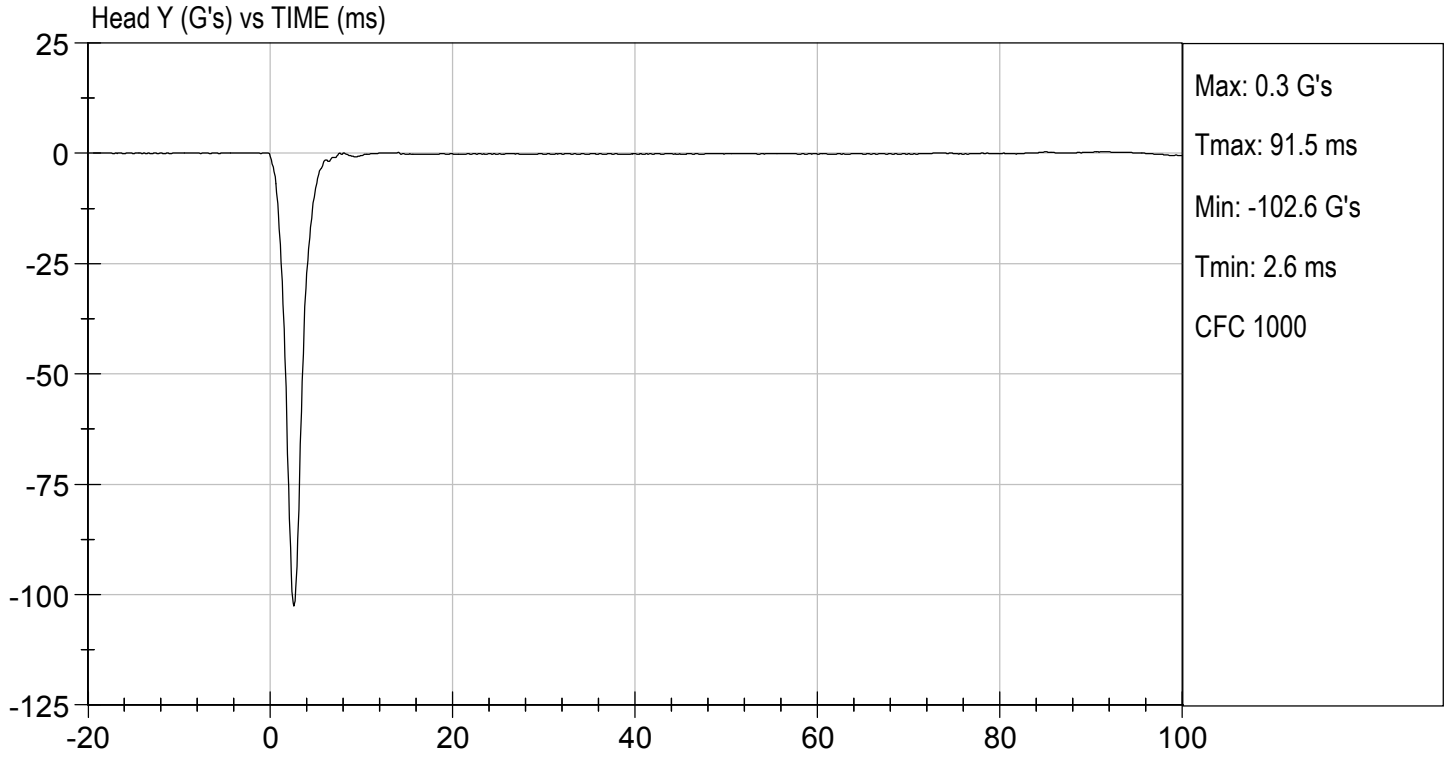
05/03/2021

 Test Date



 Approved By





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

ATD Serial No: 296

Test I.D.: D211582

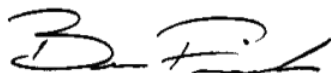
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.4	Pass	
Humidity	%	10 to 70	44	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.58	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.64	Pass
	15 ms	m/s	3.30 to 4.10	4.04	Pass
	20 ms	m/s	4.40 to 5.40	5.39	Pass
	25 ms	m/s	5.40 to 6.10	5.77	Pass
	25-100 ms	m/s	5.50 to 6.20	5.78	Pass
Maximum D-Plane Rotation	deg	71 to 81	72	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	65	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-40	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	113	Pass	
Overall Test Results				Pass	



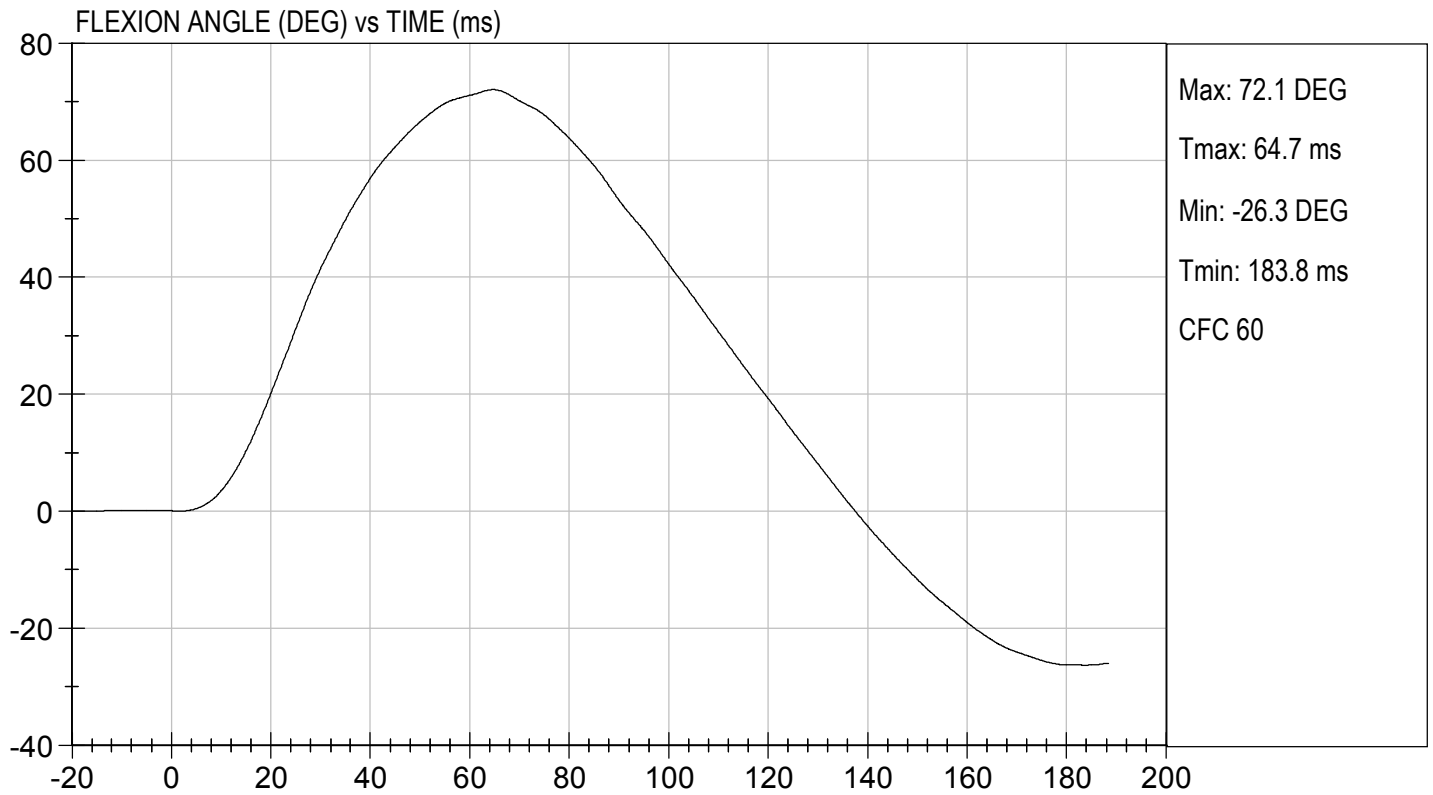
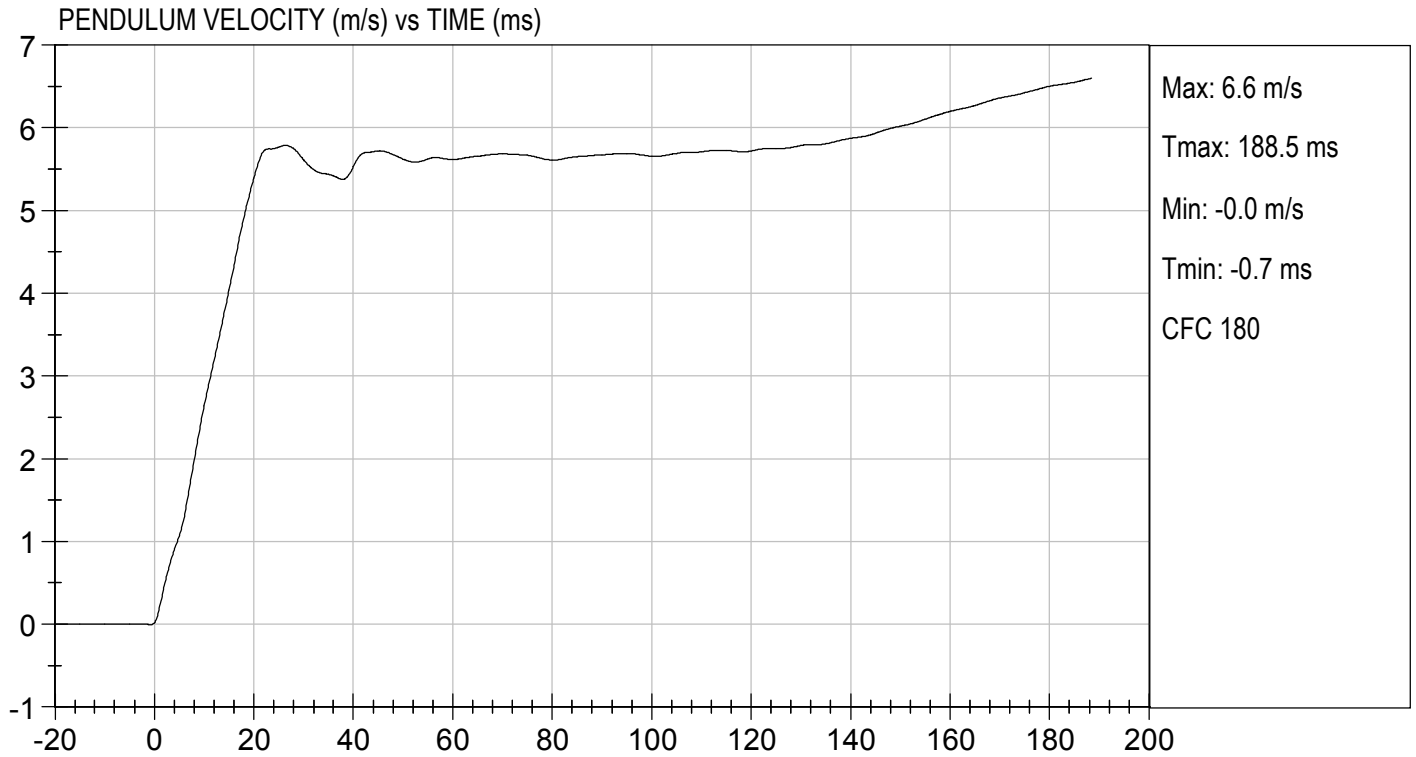
Laboratory Technician

05/03/2021

Test Date



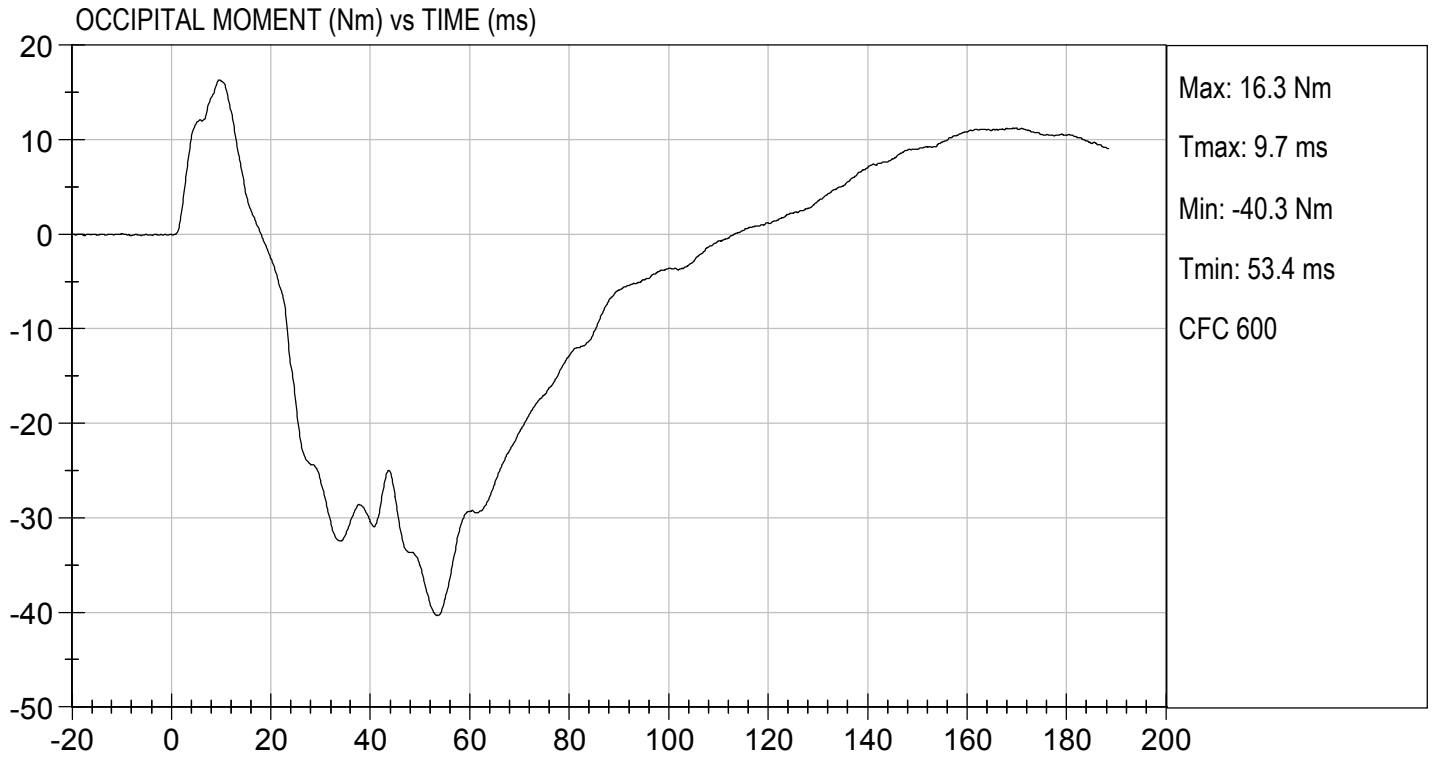
Approved By





TEST DESC: NECK BENDING
VELOCITY: 18.31 ft/s, 5.58 m/s

TEST DATE: 05/03/2021
TEST #: D211582



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

ATD Serial No: 296

Test ID: D211583

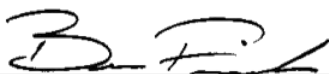
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	33	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass



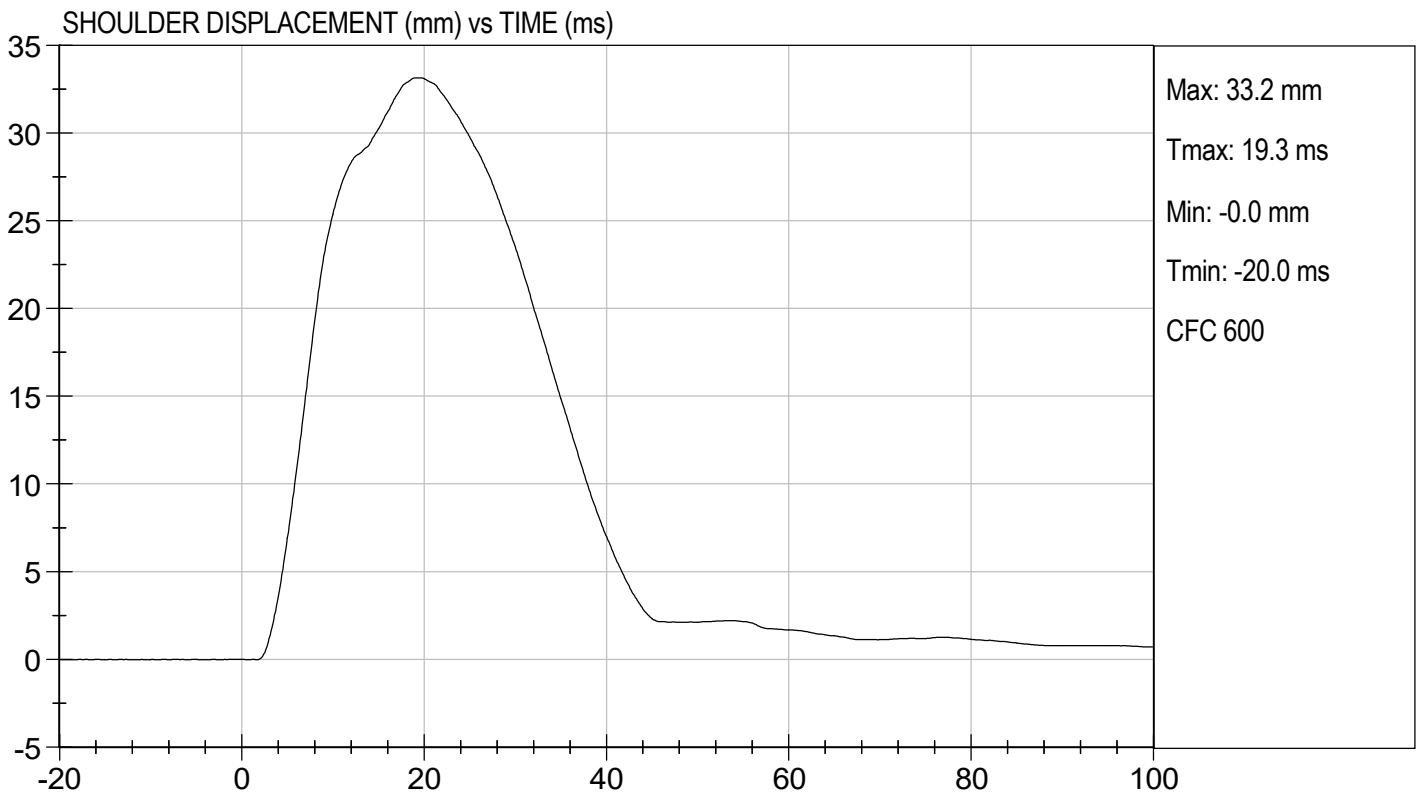
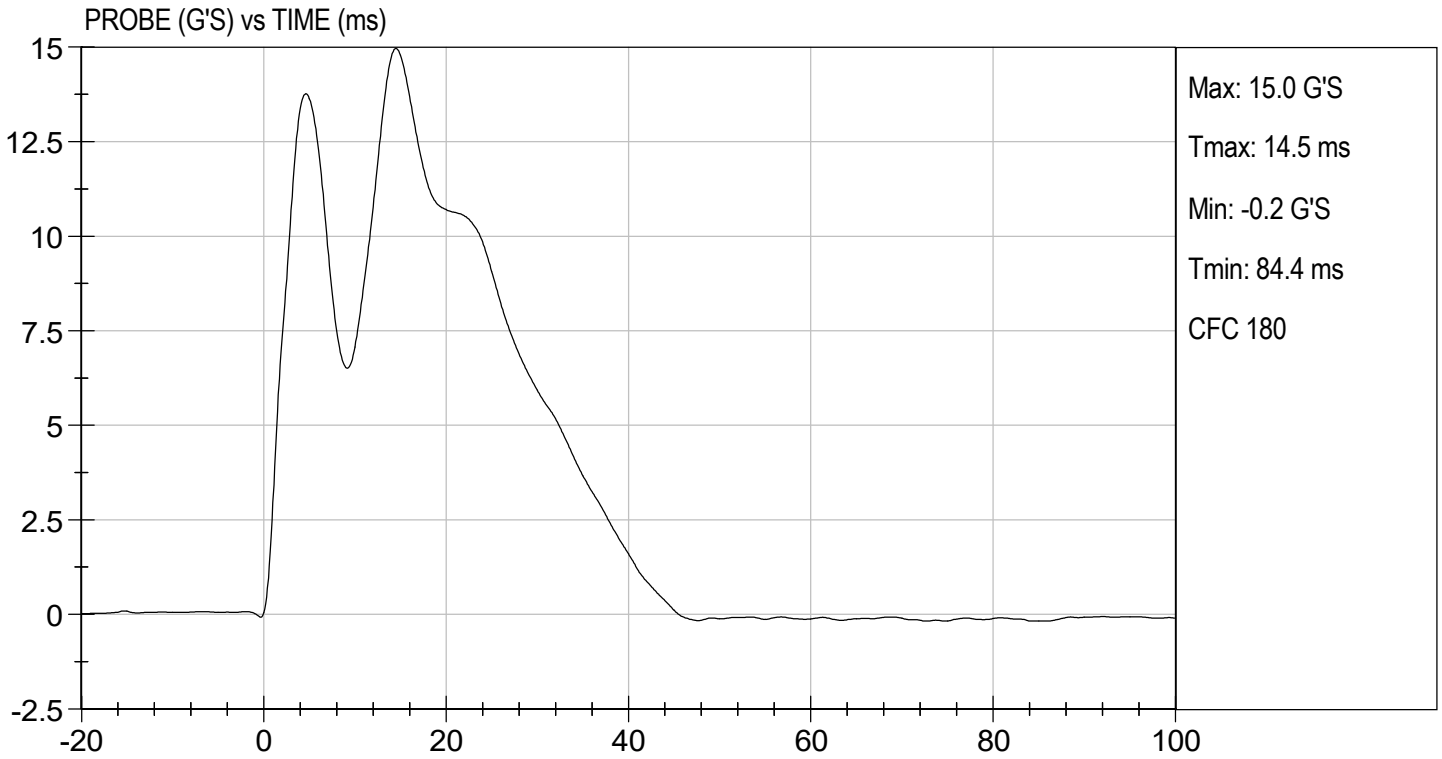
Laboratory Technician

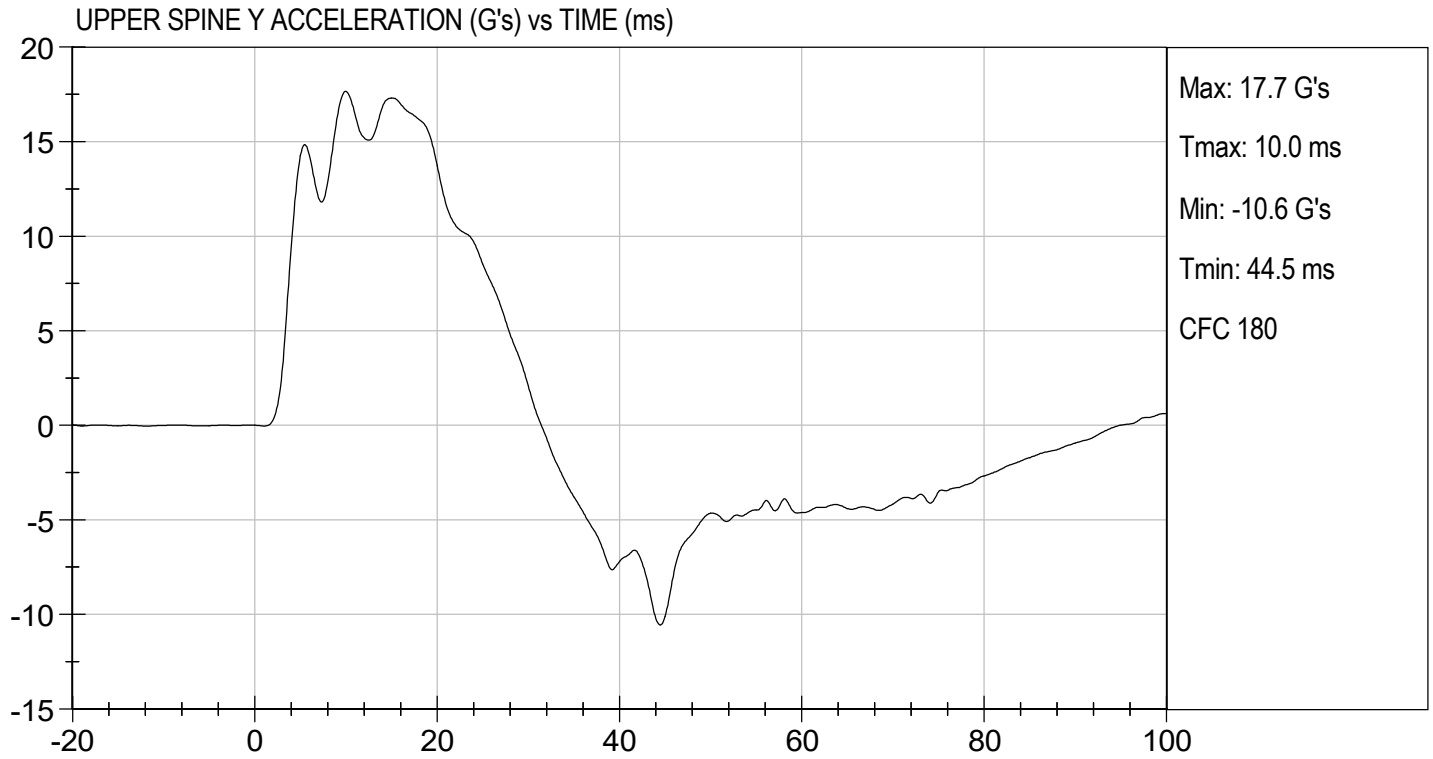
04/30/2021

Test Date



Approved By






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

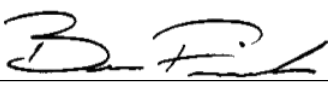
ATD Serial No: 296

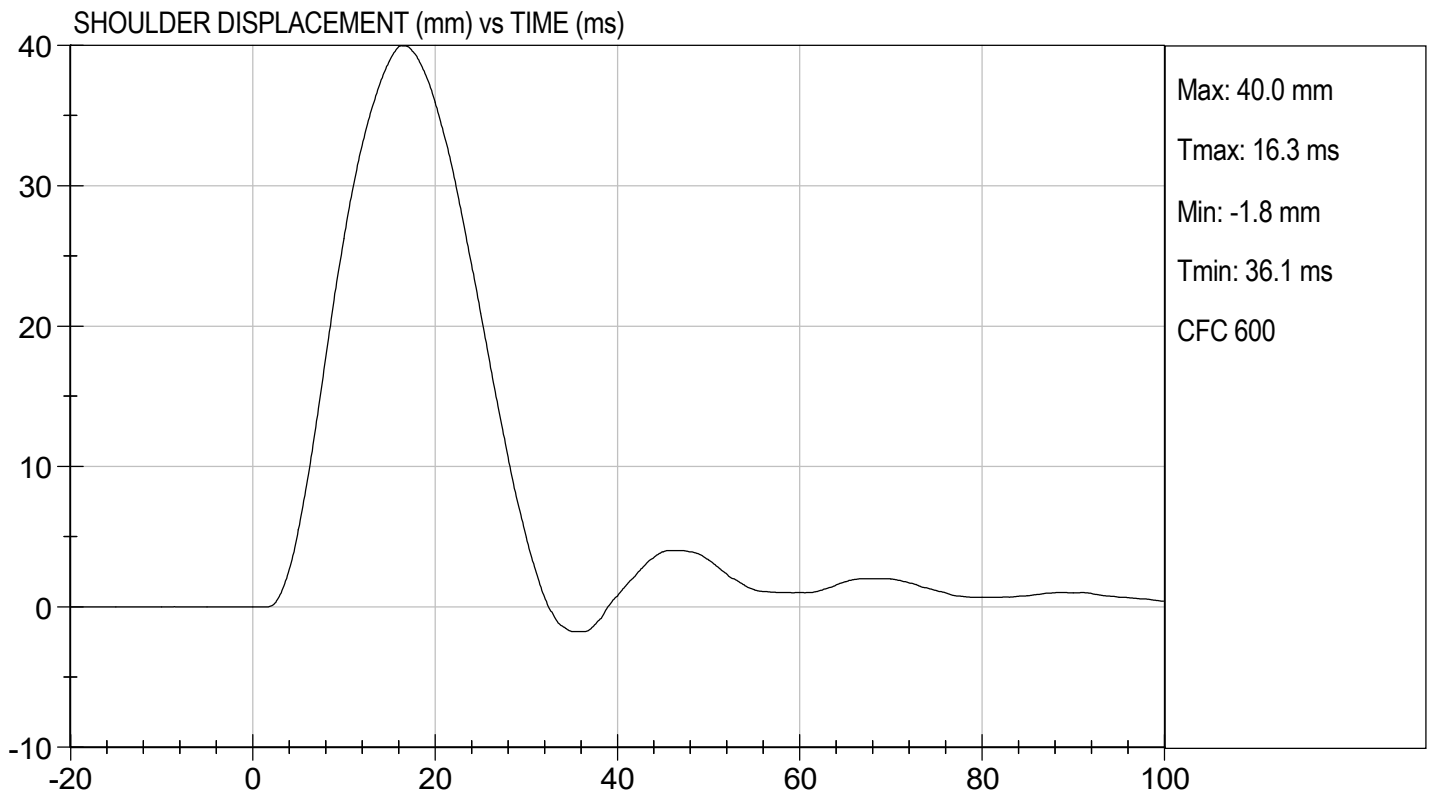
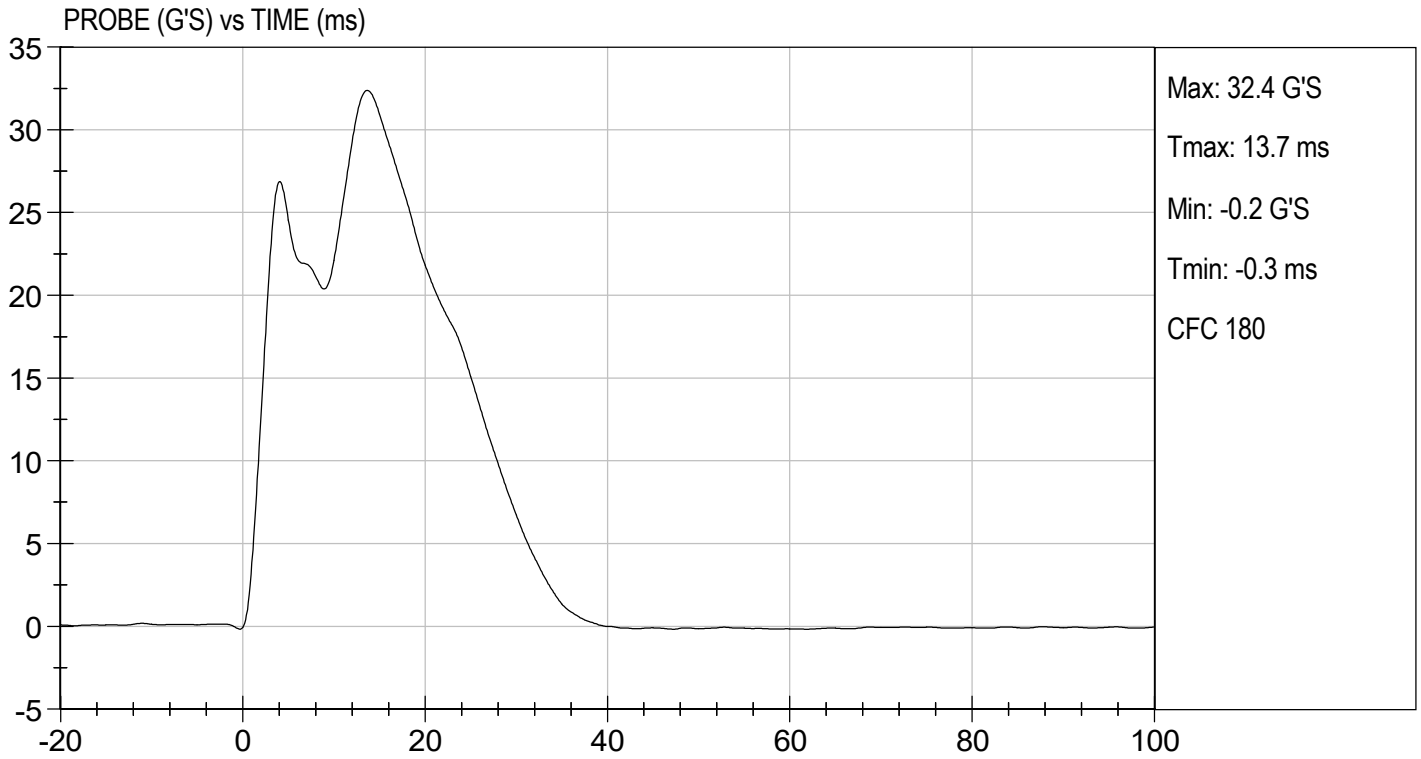
Test I.D: D211584

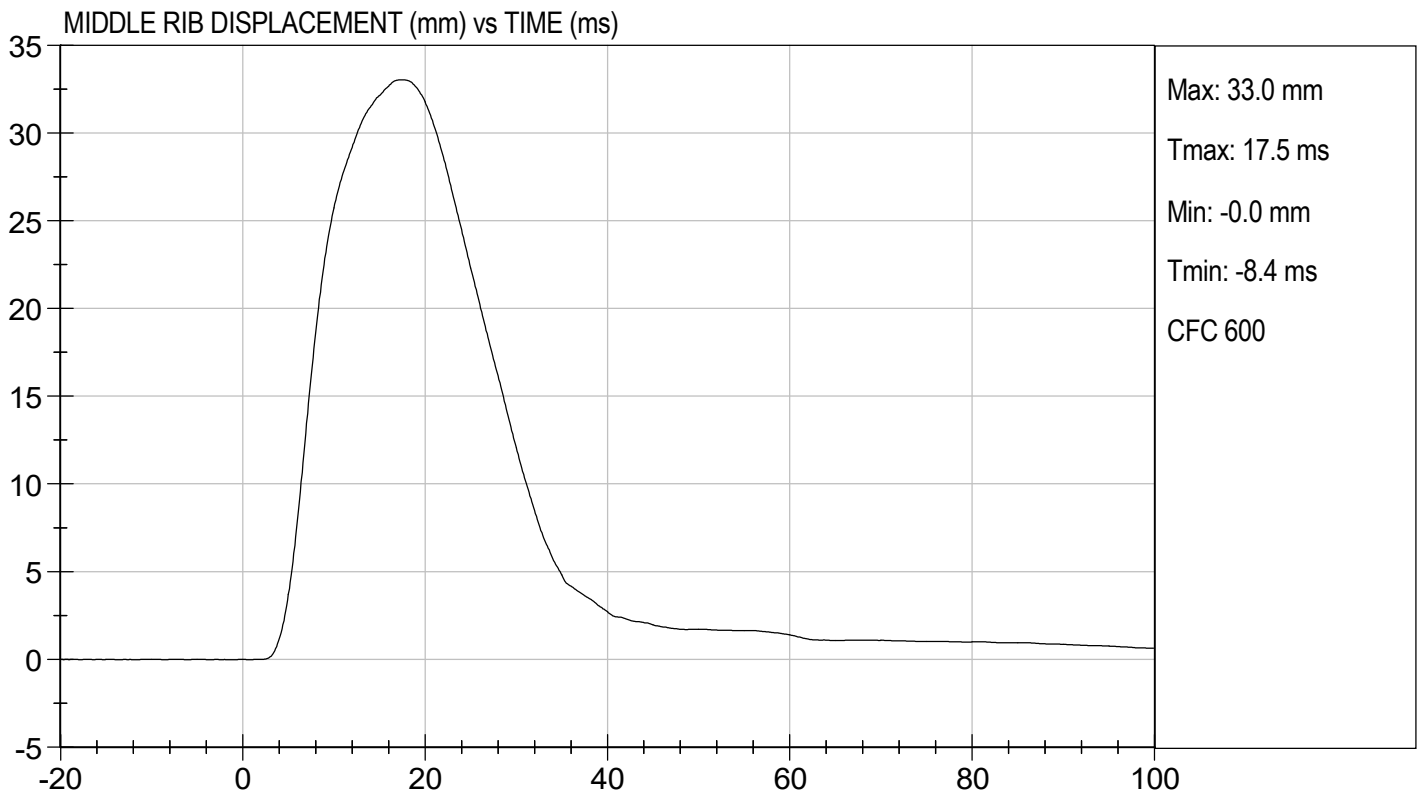
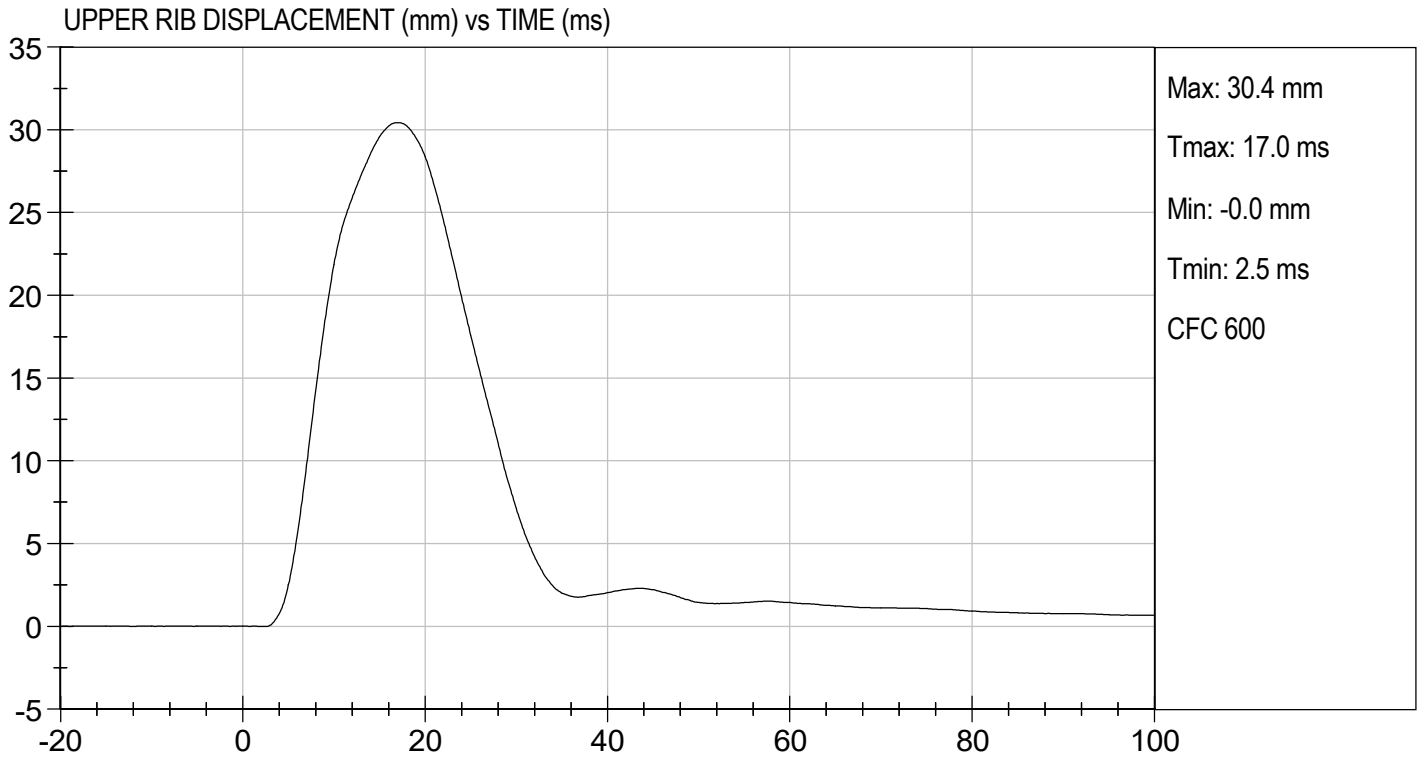
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	40	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle Rib Displacement	mm	30 to 36	33	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	36	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results				Pass

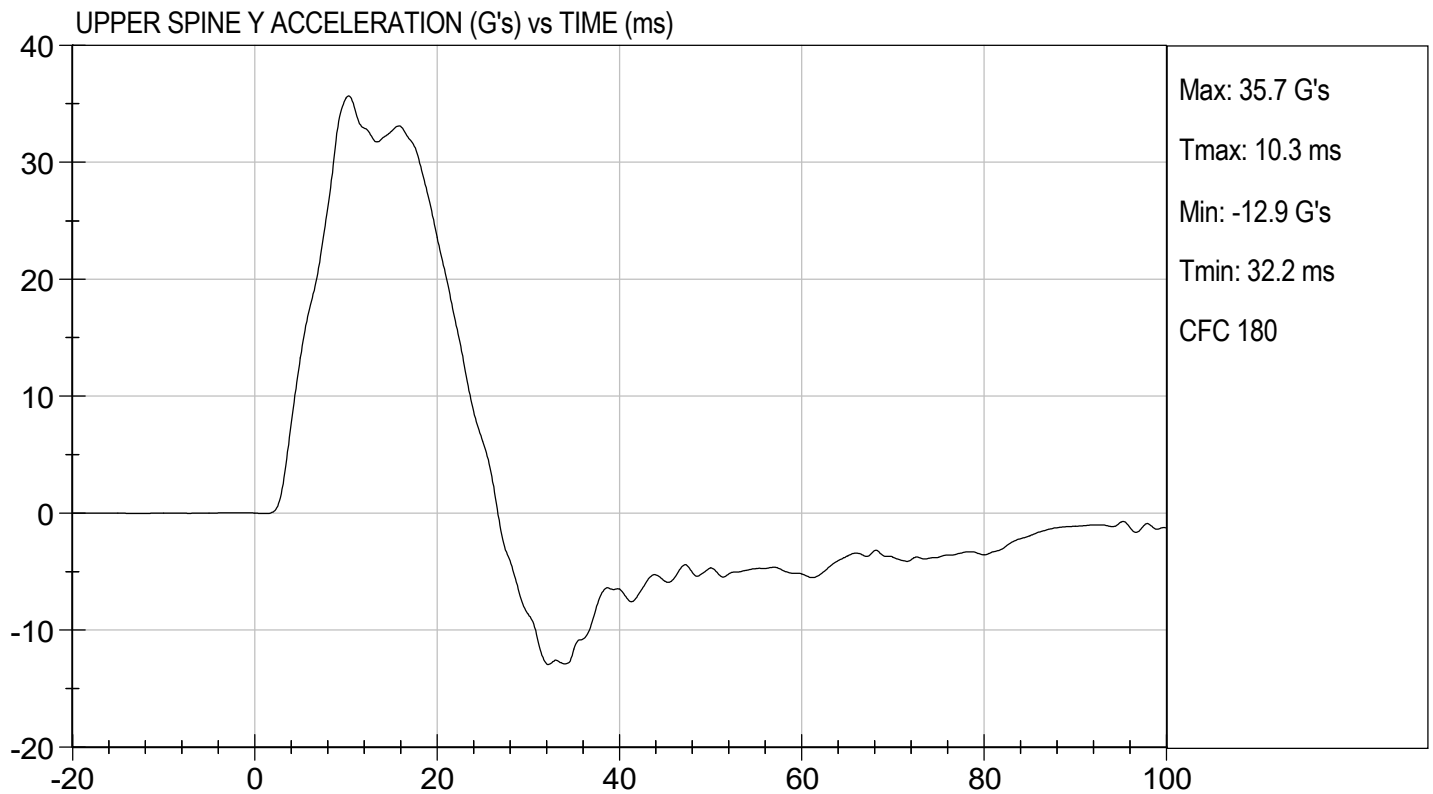
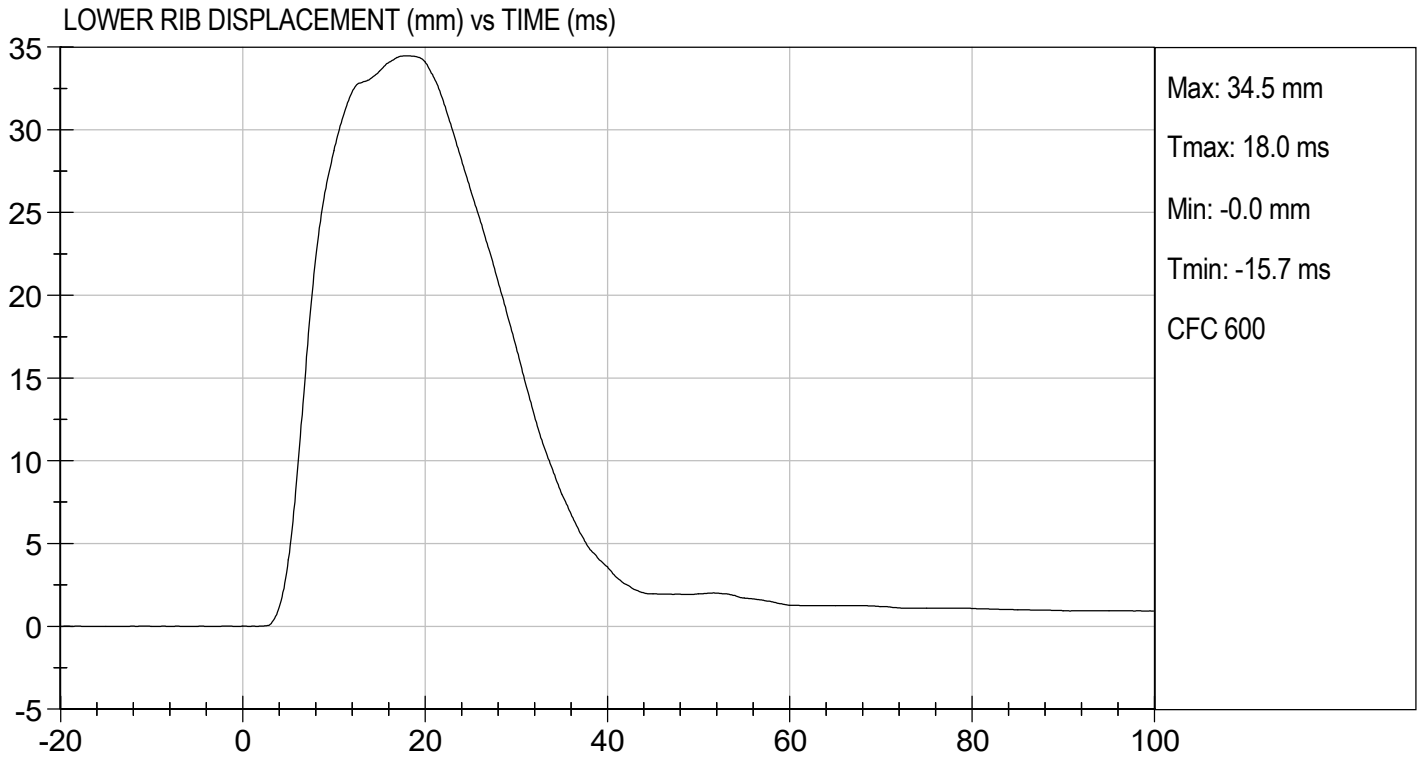

 Laboratory Technician

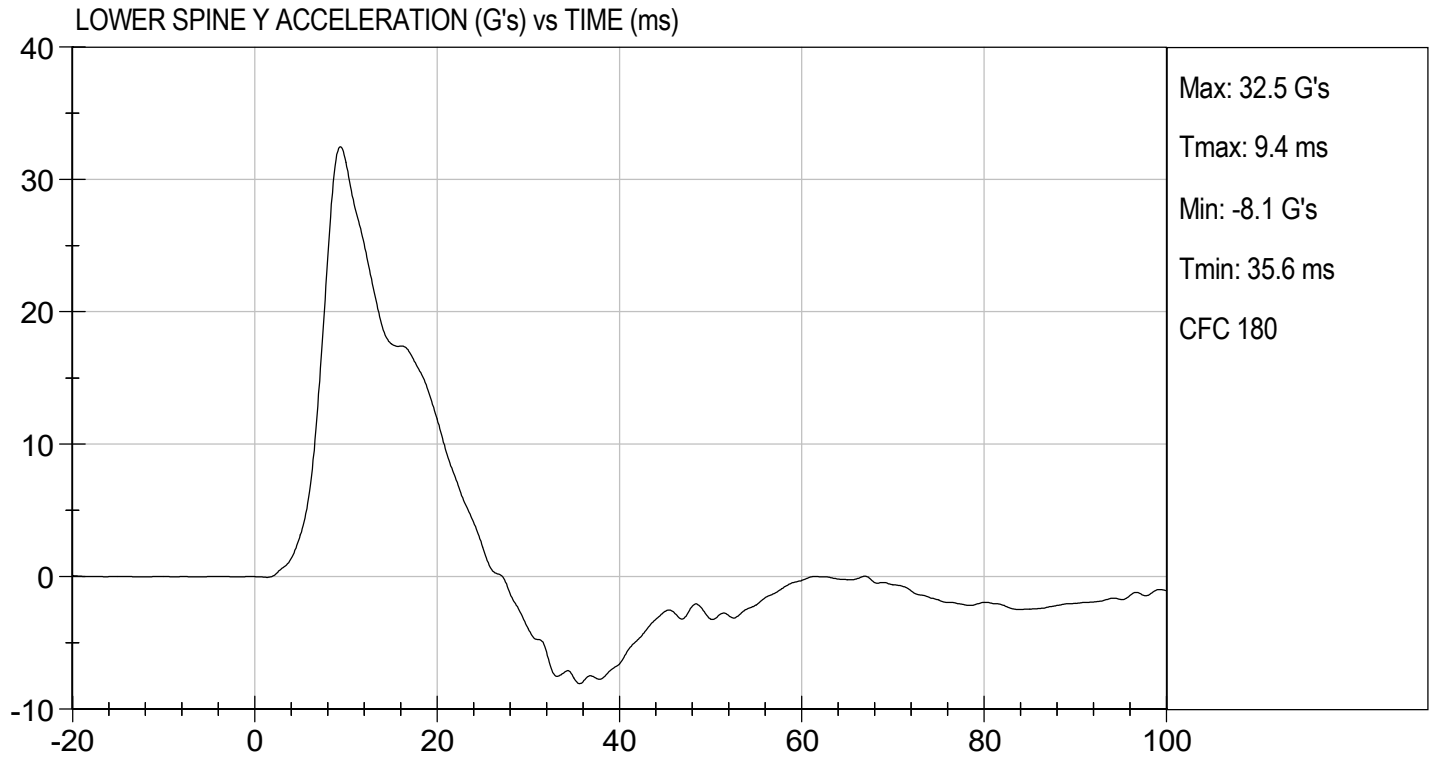
04/30/2021
 Test Date


 Approved By










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

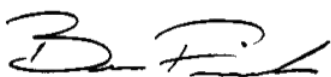
ATD Serial No: 296

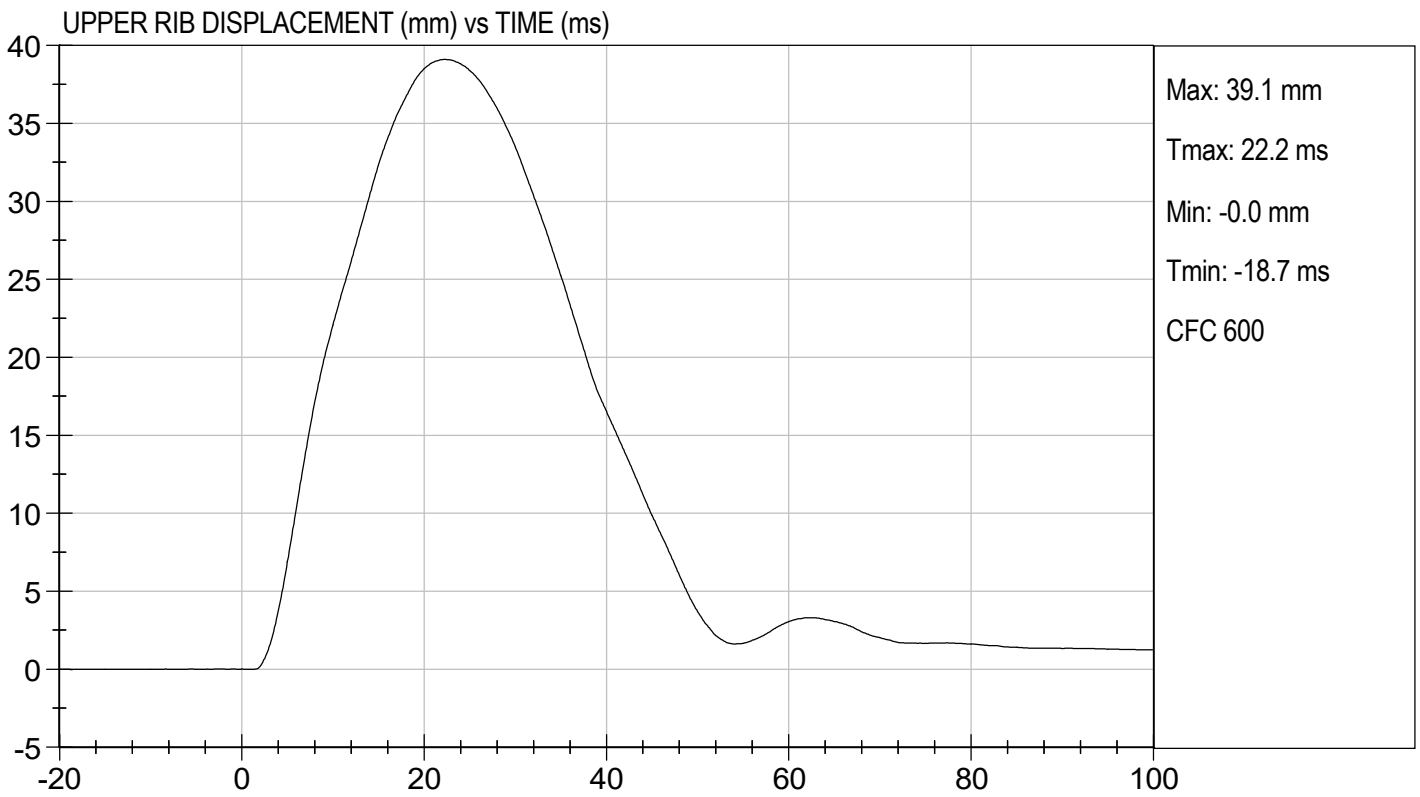
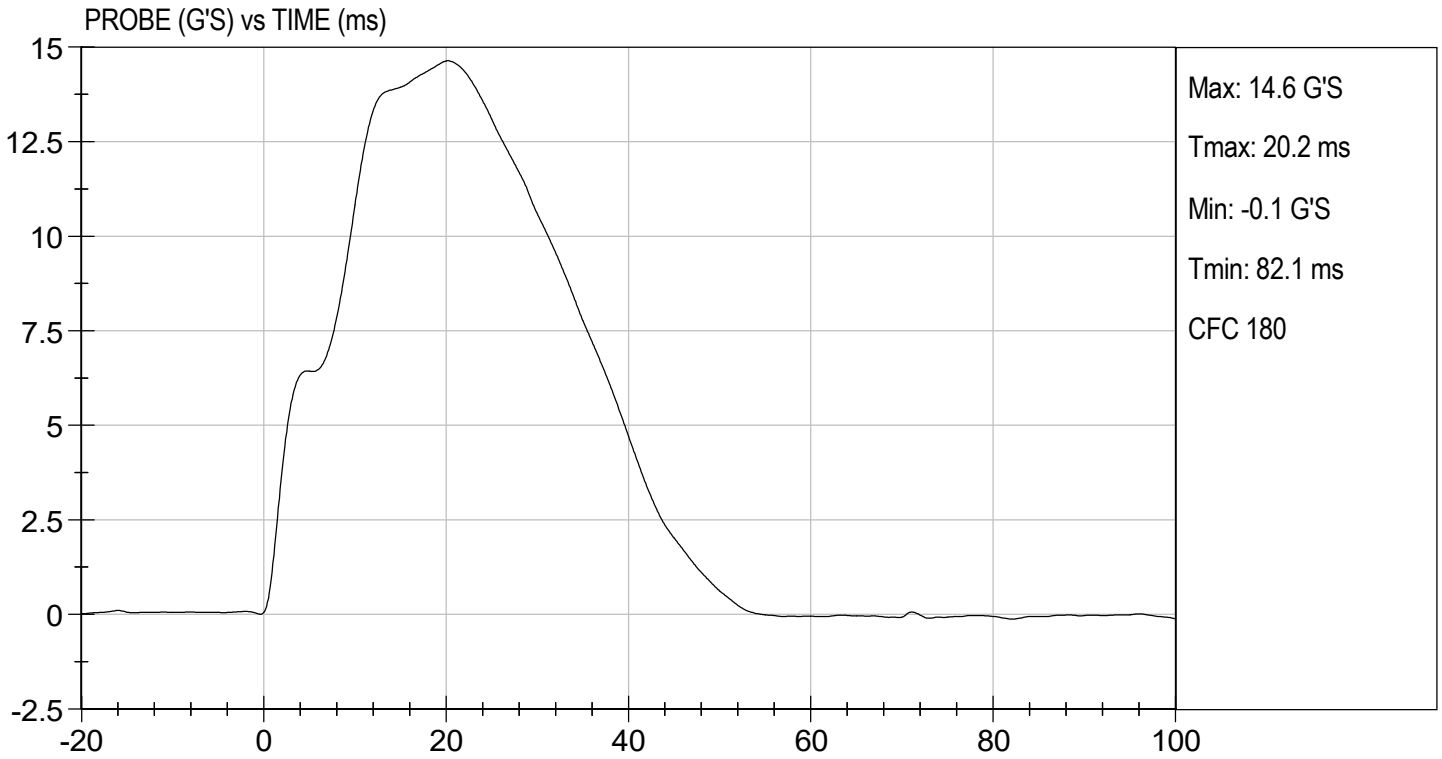
Test I.D: D211585

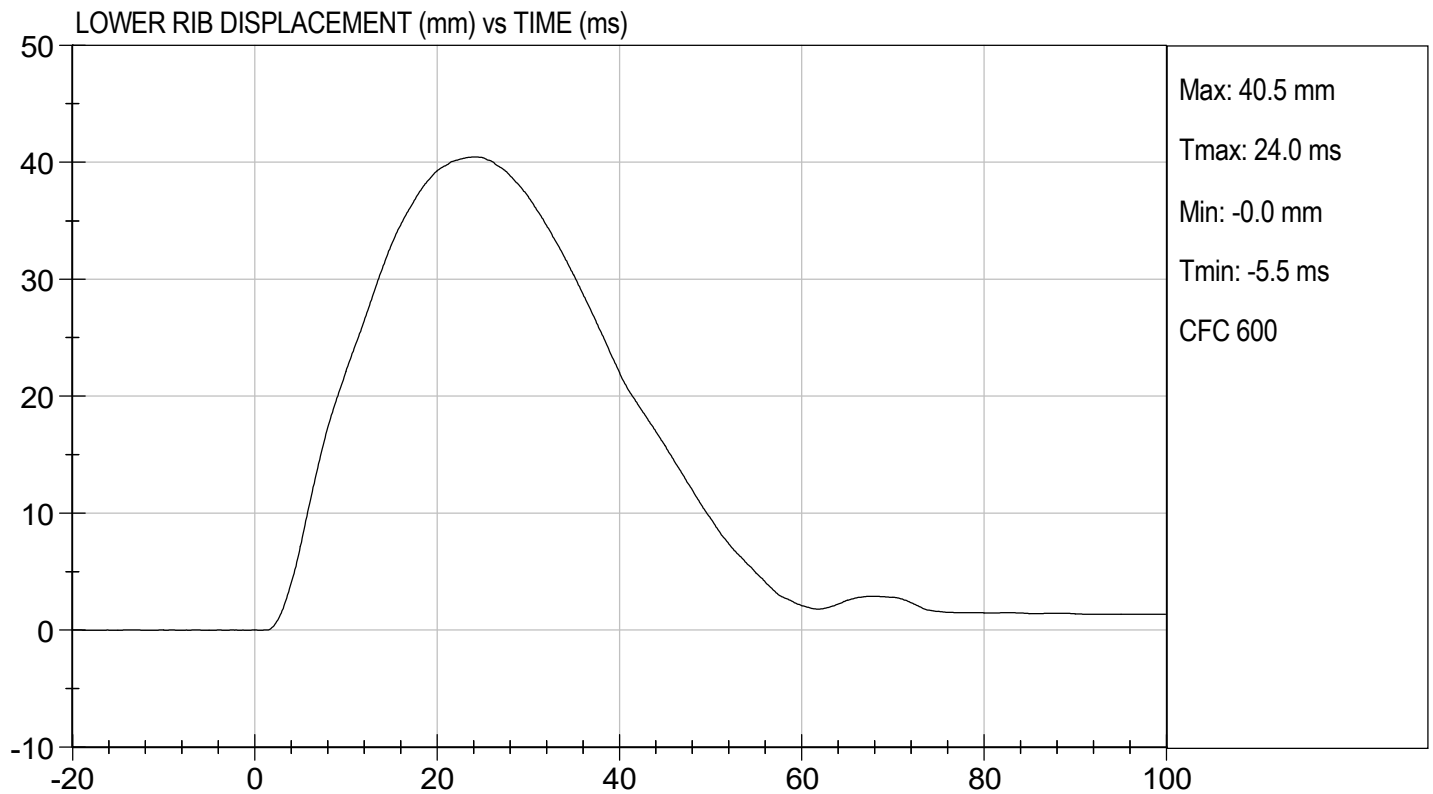
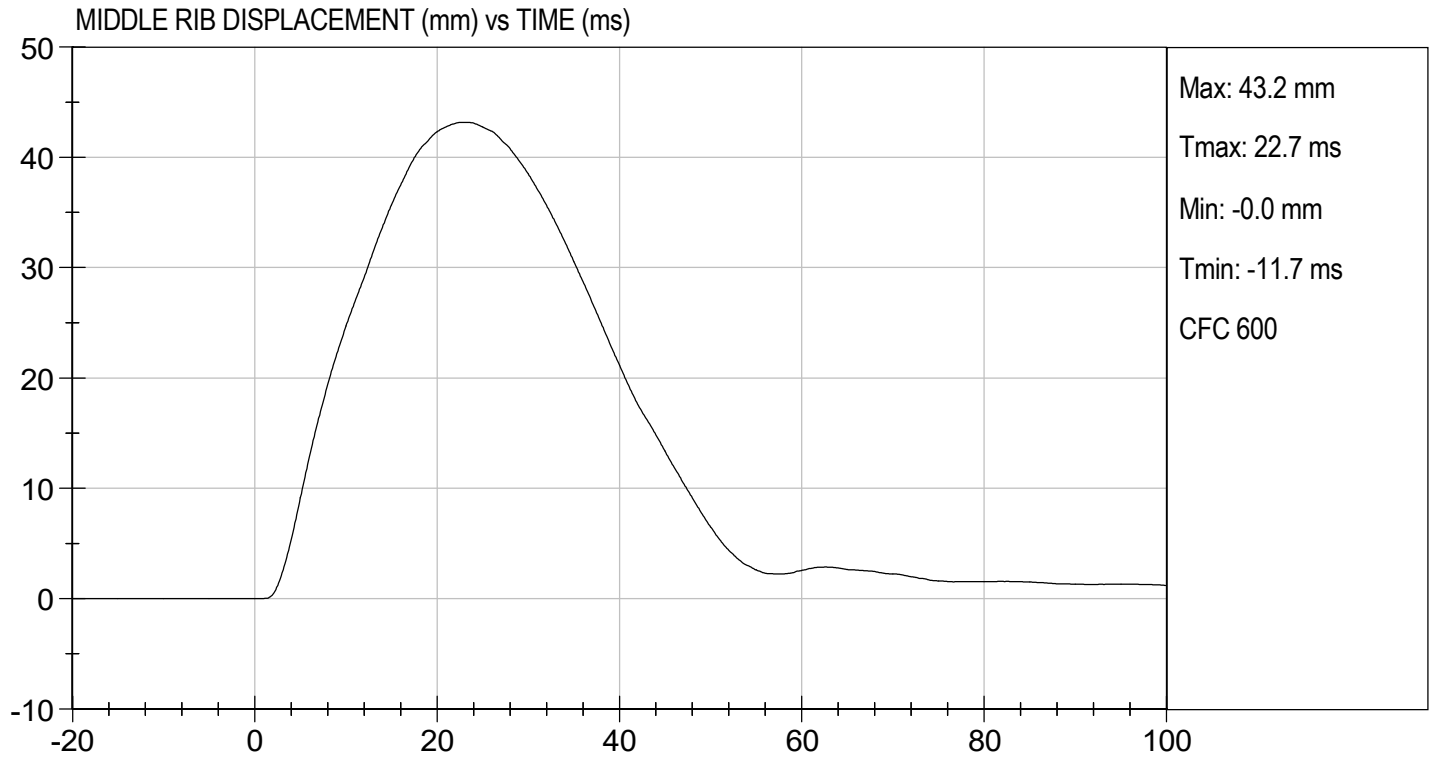
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	40	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

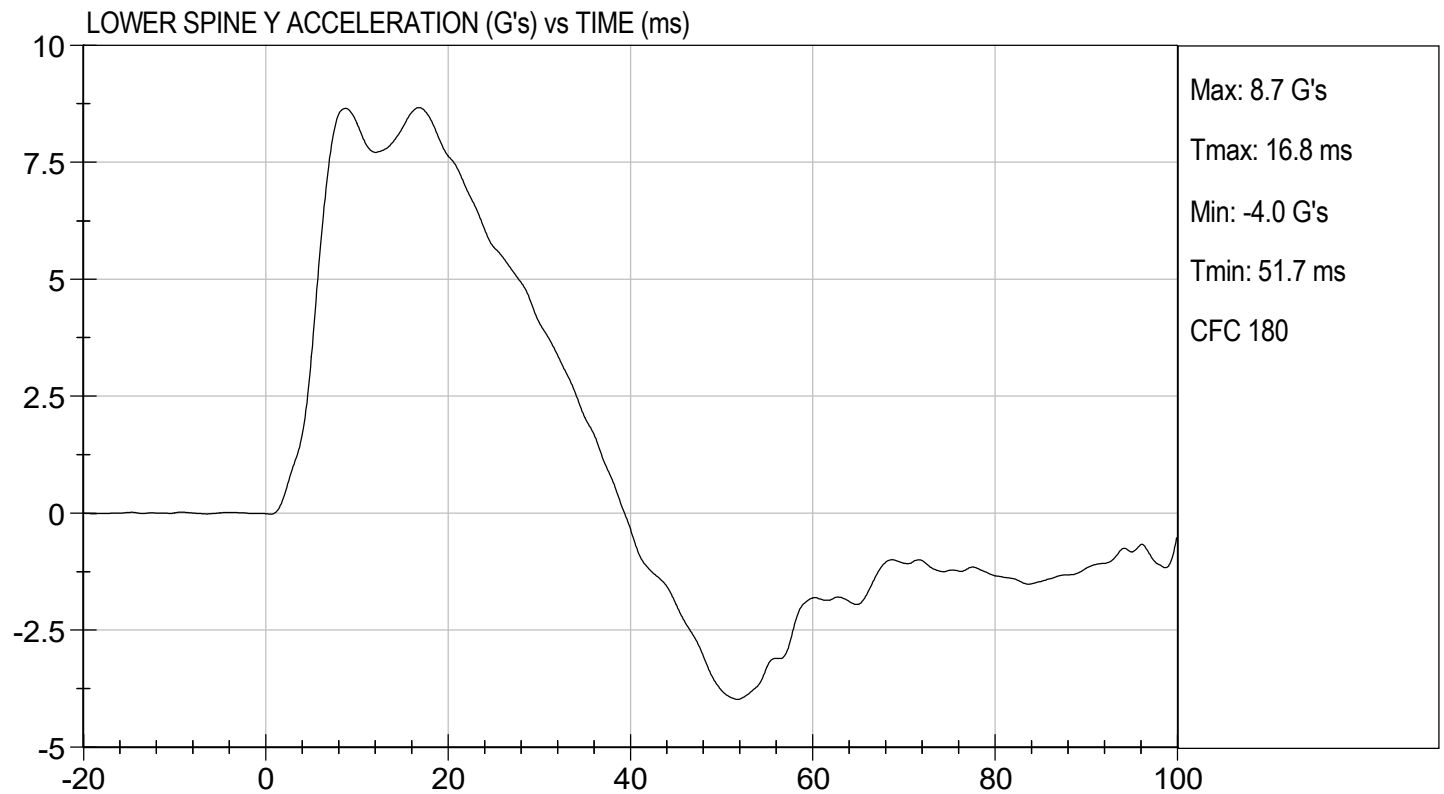
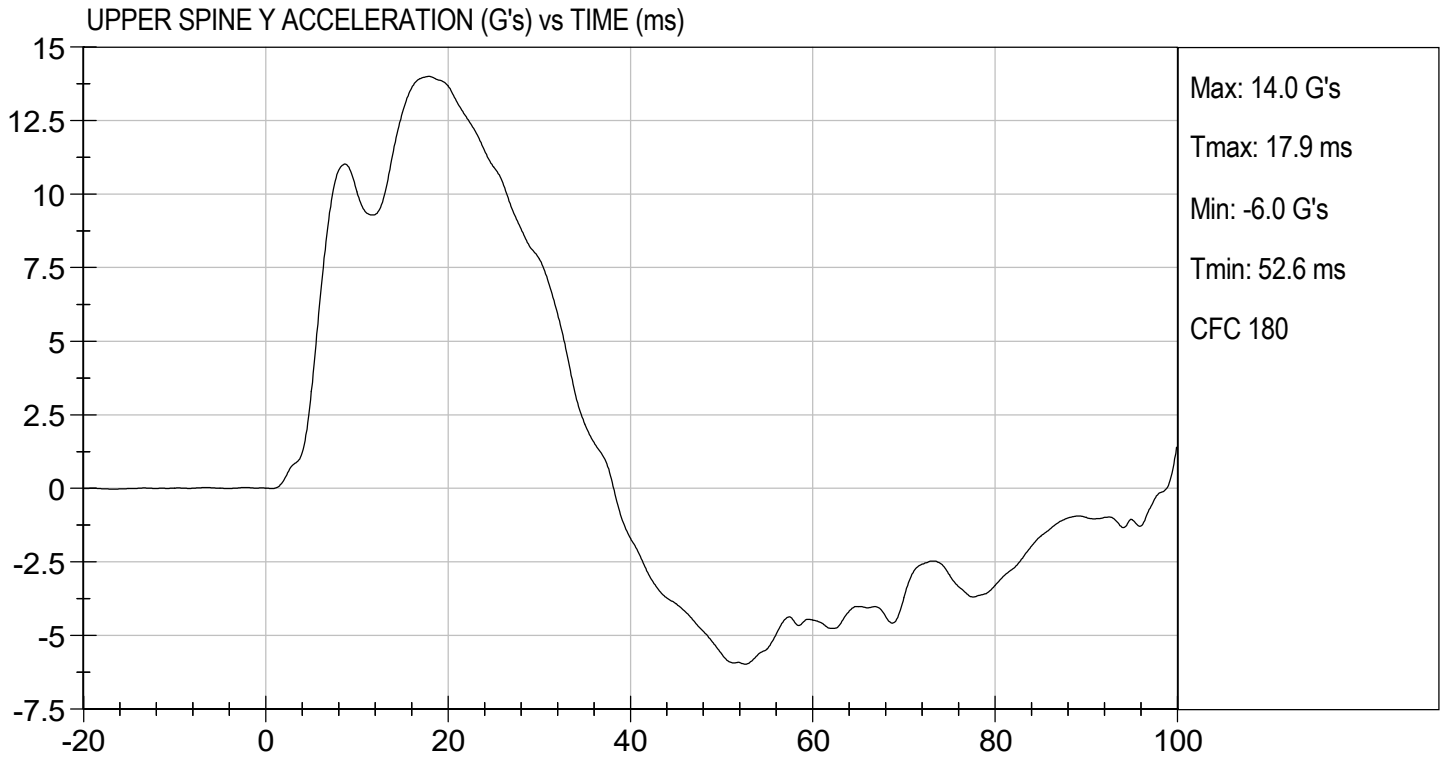

 Laboratory Technician

04/30/2021
 Test Date


 Approved By







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

ATD Serial No: 296

Test I.D: D211586

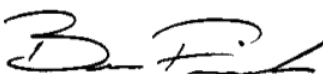
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	43	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	37	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass



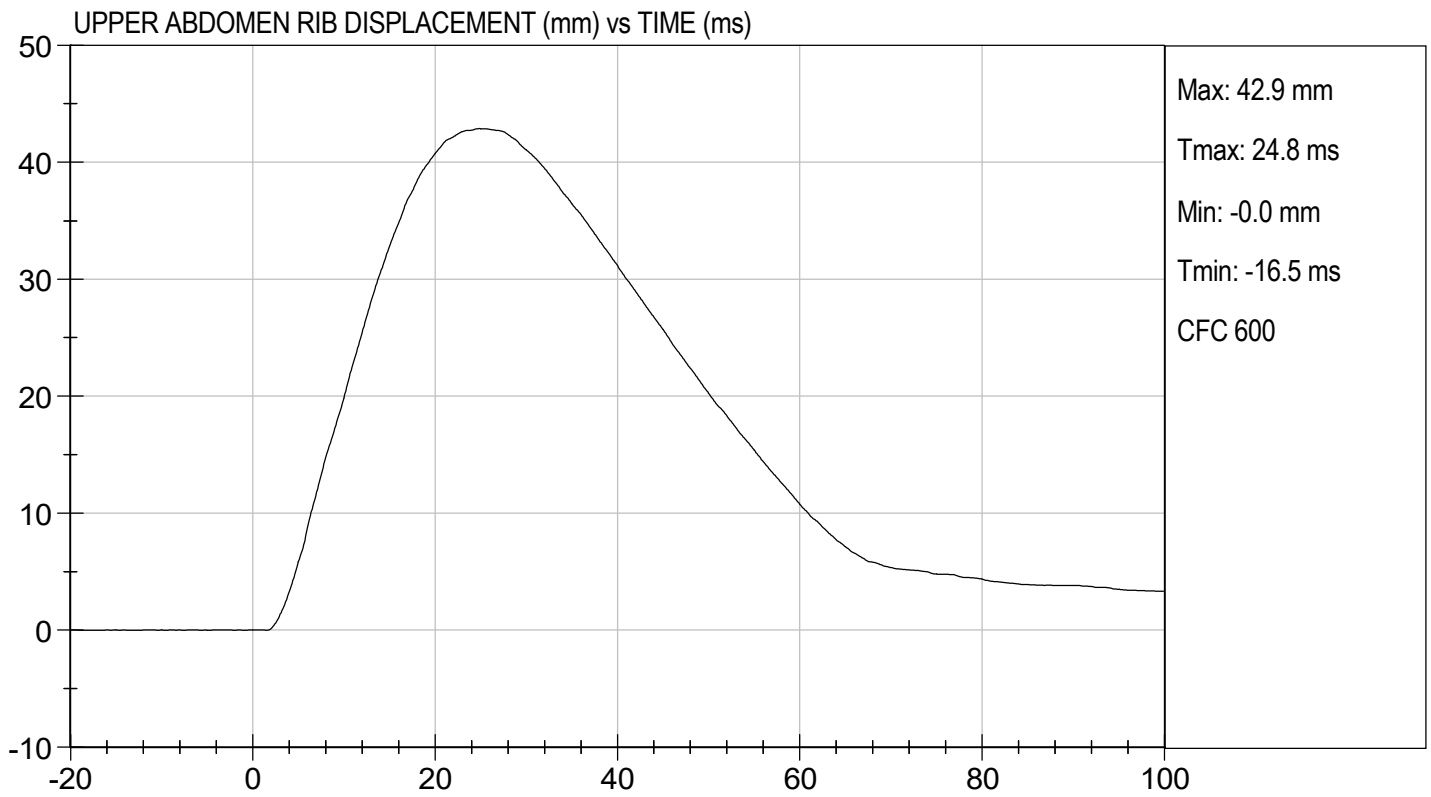
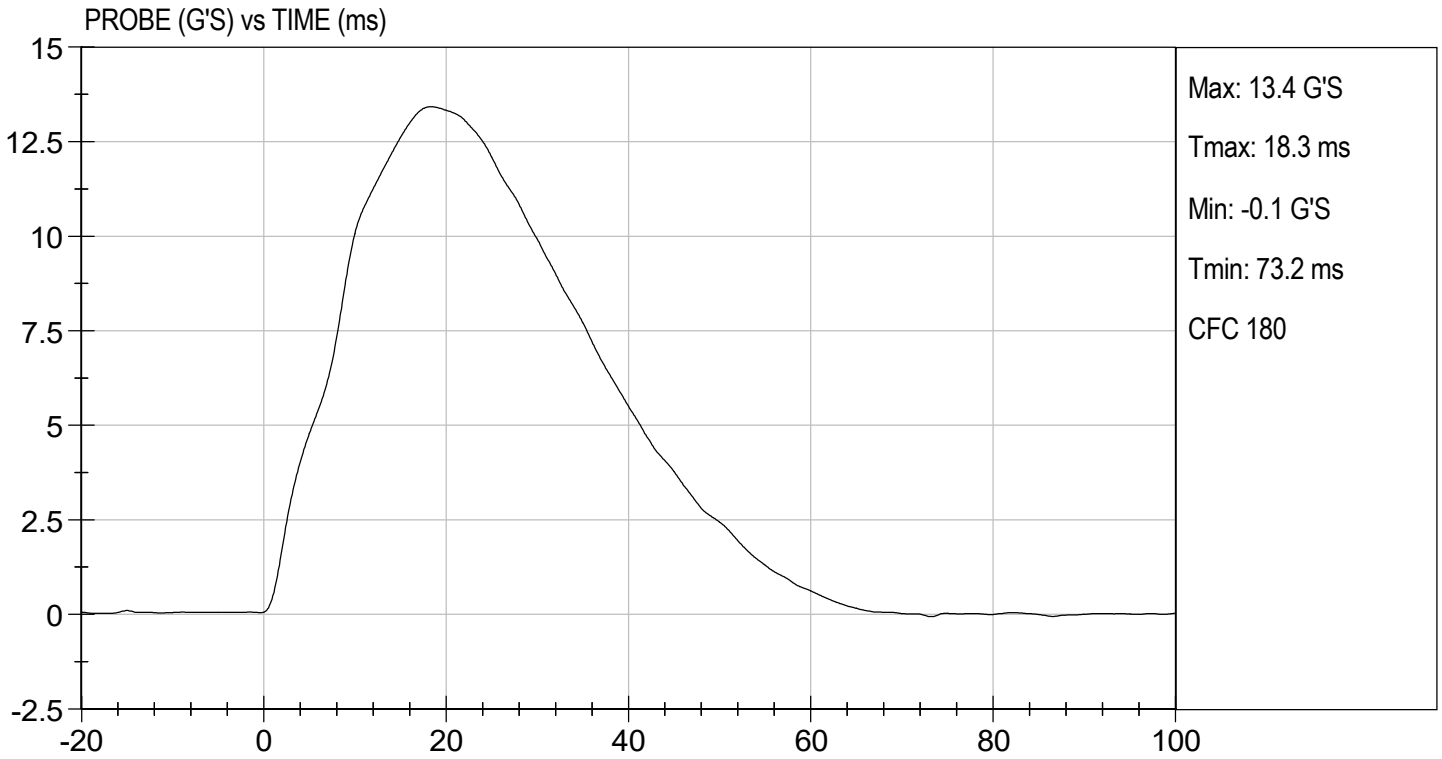
Laboratory Technician

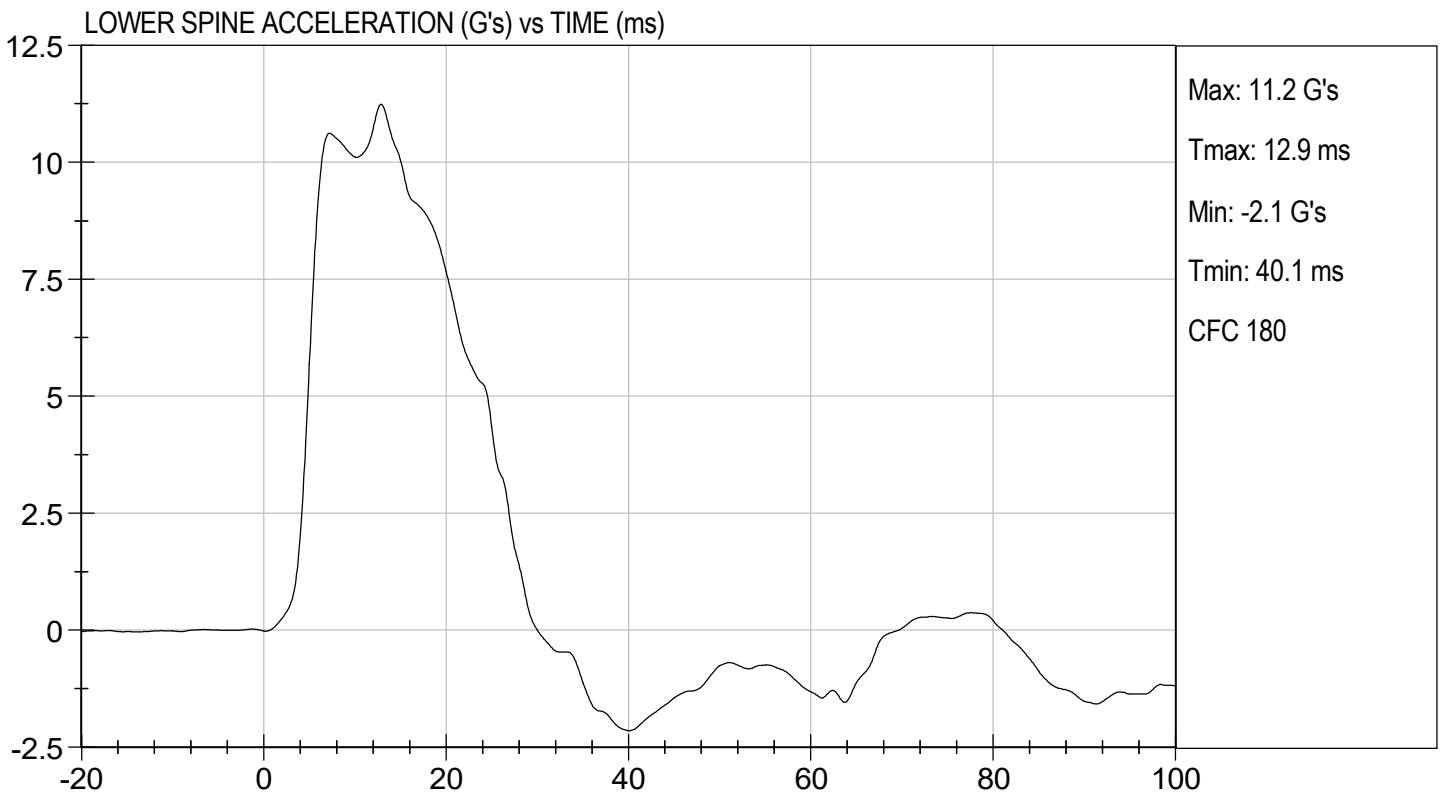
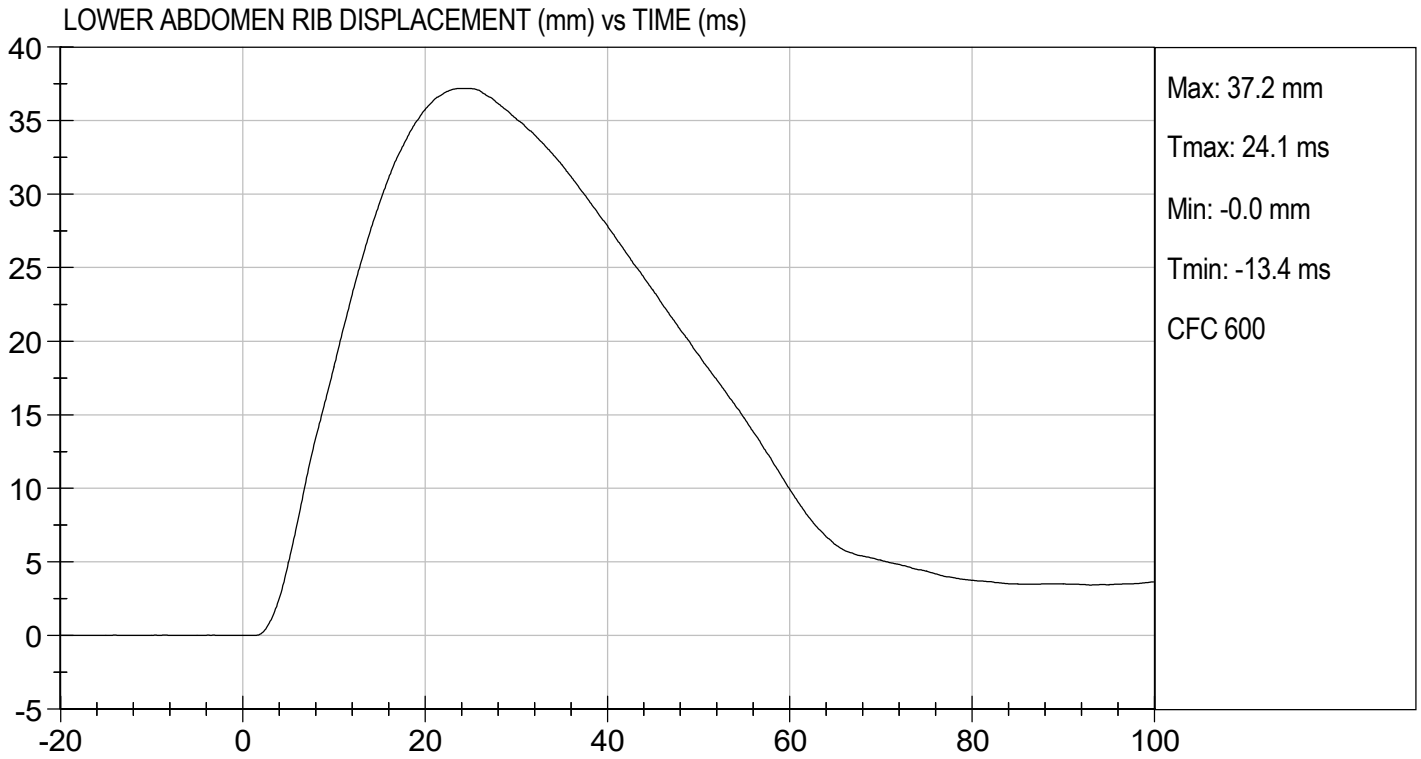
04/30/2021

Test Date



Approved By





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

ATD Serial No: 296

Test I.D: D211587

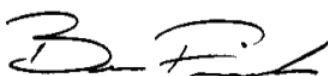
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	4,051	Pass
Overall Test Results				Pass



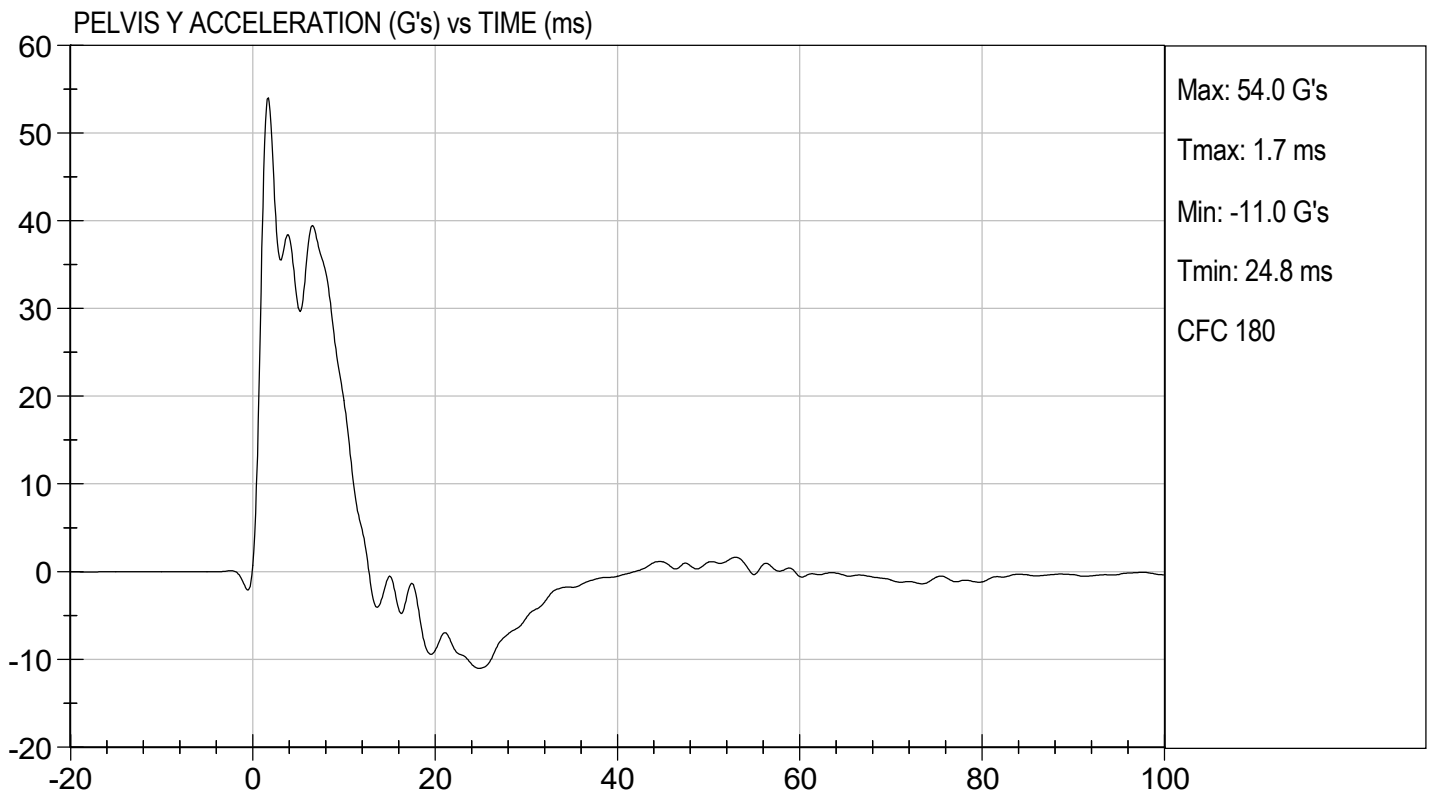
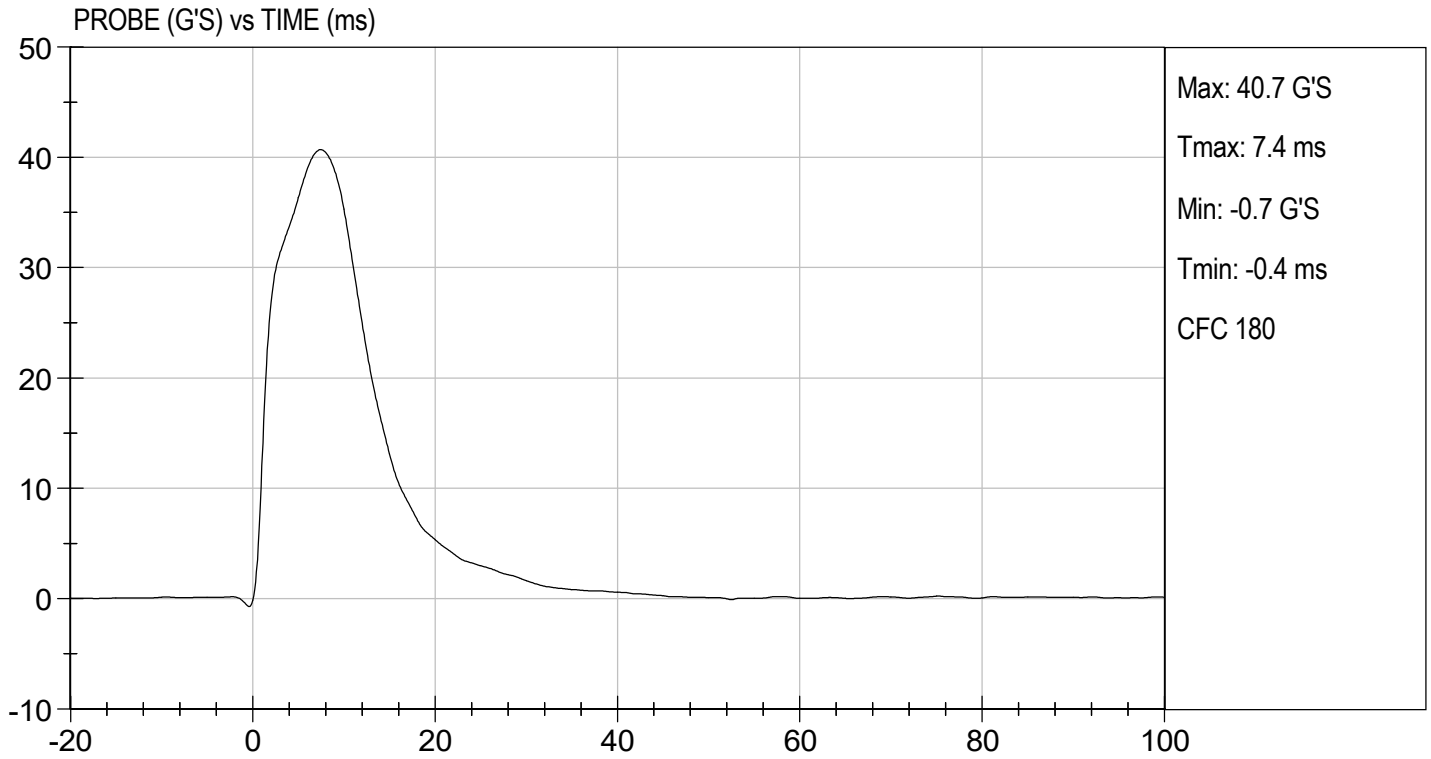
Laboratory Technician

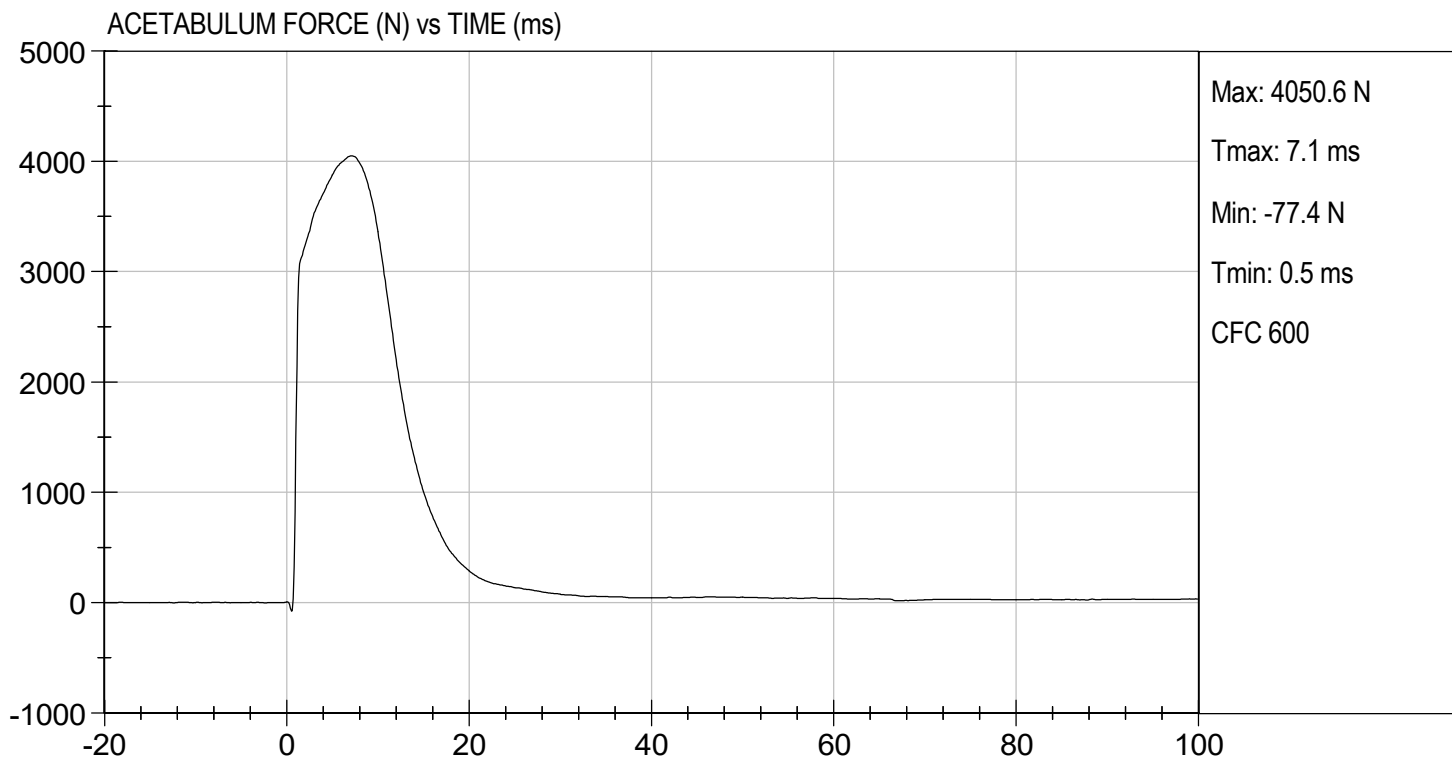
04/30/2021

Test Date



Approved By





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

ATD Serial No: 296

Test I.D: D211588

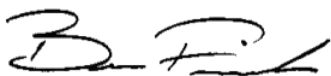
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	36 to 45	41	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,832	Pass
Overall Test Results				Pass



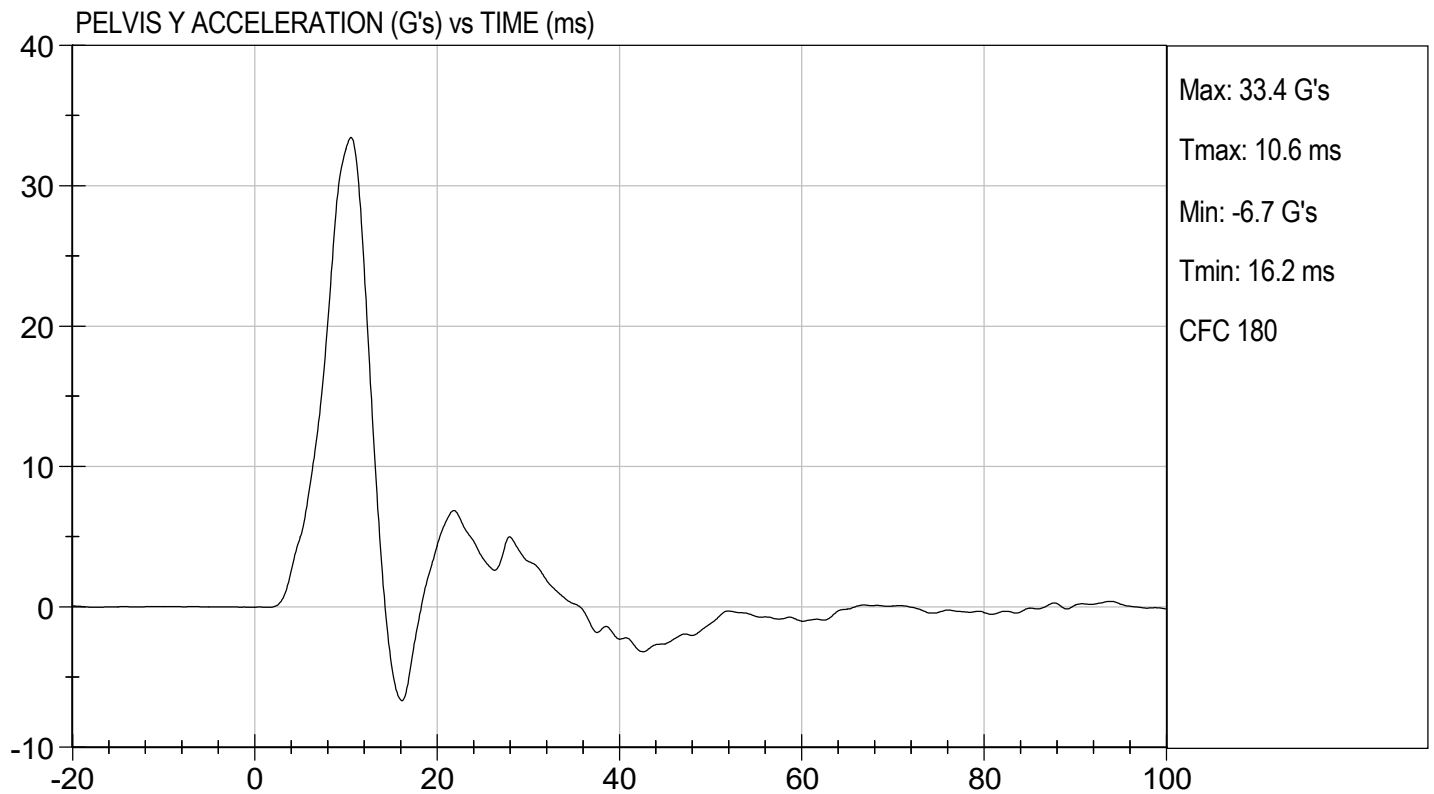
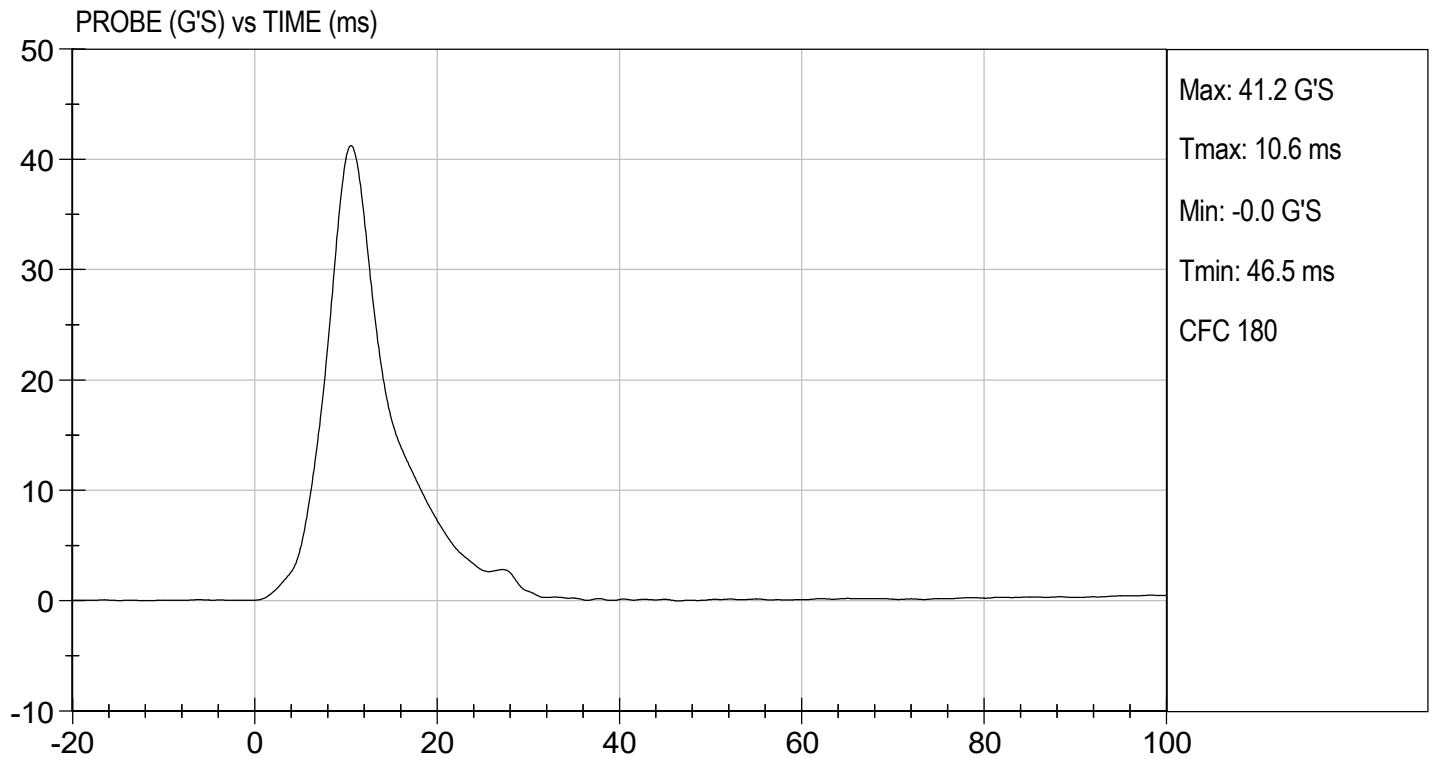
Laboratory Technician

04/30/2021

Test Date



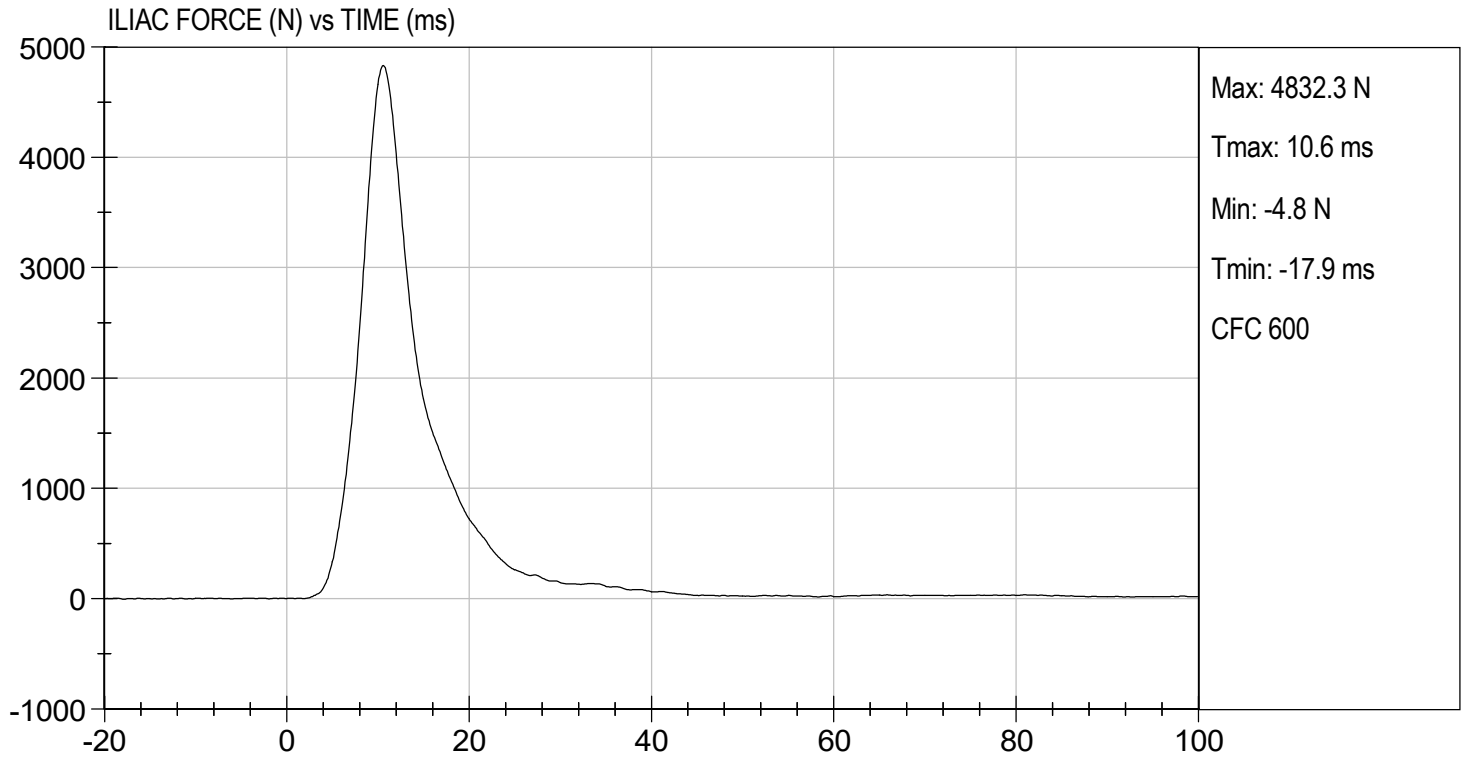
Approved By





TEST DESC: ILIAC
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 04/30/2021
TEST #: D211588





SID-IIs Pelvis Plug Certification Test

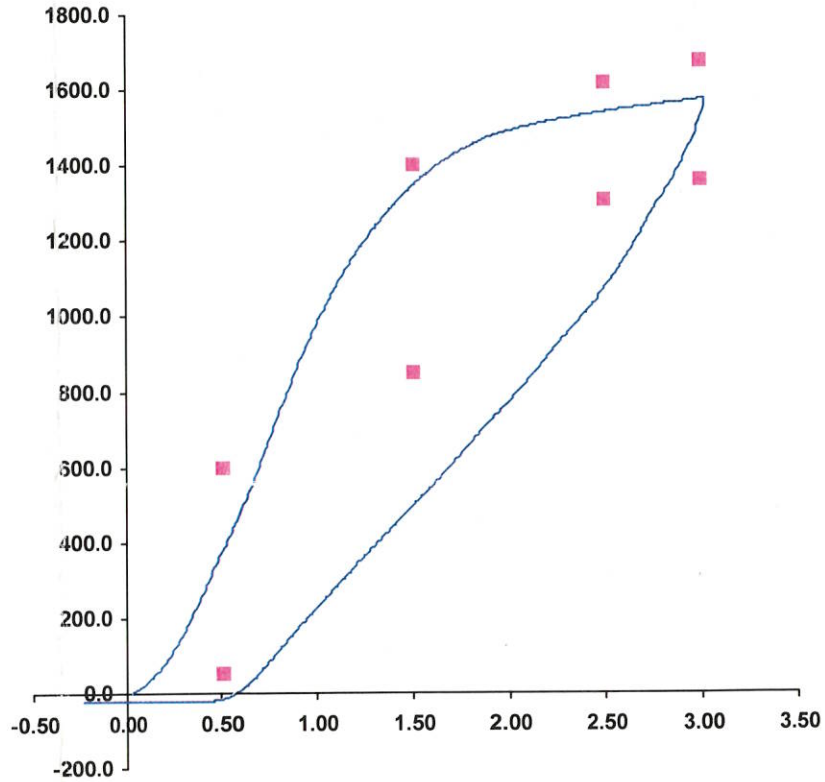
Plug S/N 13731
 Test Number 12359
 Report Number 12402
 Test Date 2/6/2020 1:22:43 PM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	377.18	50.00	600.00
Force @ 1.5 mm (N)	1,346.76	850.00	1,400.00
Force @ 2.5 mm (N)	1,540.13	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,572.64	1,361.00	1,673.00

Testing Machine STM-20 596542
 Load Cell S/N (TI240813), 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 06-Feb-20
 SACO Research

By: DC Date: 2/6/2020



SID-IIs Pelvis Plug Certification Test

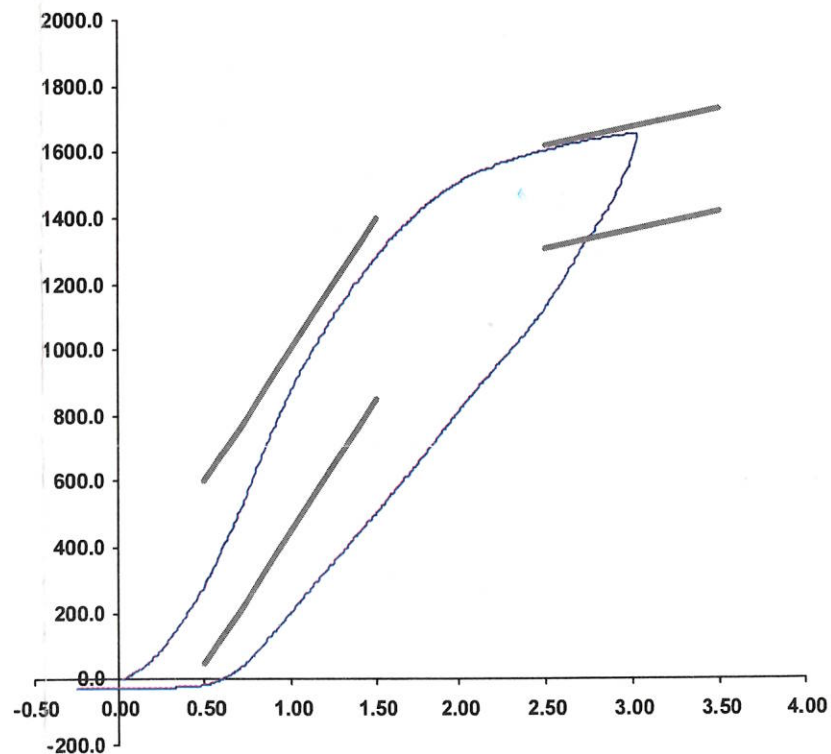
Plug S/N 13103
 Test Number 10423
 Report Number 10458
 Test Date 7/30/2019 4:57:31 PM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	294.01	50.00	600.00
Force @ 1.5 mm (N)	1,284.22	850.00	1,400.00
Force @ 2.5 mm (N)	1,604.54	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,654.29	1,361.00	1,673.00

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 30-Jul-19
 SACO Research

By : DC Date : 7/30/2019

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation

			SID-IIs S/N 296			
			Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers			X	P85003	Endevco	01/18/2021
			Y	P94783	Endevco	01/18/2021
			Z	P94786	Endevco	01/18/2021
			Xr	P94938	Endevco	01/18/2021
			Yr	P96854	Endevco	01/18/2021
			Zr	P97386	Endevco	01/18/2021
Head Angular Rate Sensors			X	ARS7325	DTS	09/14/2020
			Y	ARS7354	DTS	08/04/2020
			Z	ARS7371	DTS	09/14/2020
Displacement Potentiometers	Thoracic Rib	Upper	Y	G012	Servo	12/23/2020
		Middle	Y	G1163	FTSS	12/23/2020
		Lower	Y	G1158	FTSS	12/23/2020
	Abdominal Rib	Upper	Y	G1146	FTSS	12/23/2020
		Lower	Y	G1126	FTSS	12/23/2020
Lower Spine Accelerometers (T12)			X	P79418	Endevco	01/18/2021
			Y	P79439	Endevco	01/18/2021
			Z	P79614	Endevco	01/18/2021
Acetabulum Load Cell			Y	ACG4285	FTSS	02/10/2021
Iliac Wing Load Cell			Y	IWG3023	FTSS	02/10/2021
Pelvis Plug (struck side)				13731	SACO	02/06/2020
Pelvis Plug (non-struck side)				13103	SACO	07/30/2019

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	PCB1408	PCB	02/15/2021
Vehicle Center of Gravity	Y	PCB1461	PCB	03/08/2021
Vehicle Center of Gravity	Z	PCB1438	PCB	12/30/2020
Left Floor Sill	Y	PCB1148	PCB	02/17/2021
A-Pillar Sill	Y	A340696	MSI	04/19/2021
A-Pillar Low	Y	A355157	MSI	12/09/2020
A-Pillar Mid	Y	P80123	Endevco	10/30/2020
B-Pillar Sill	Y	A356243	MSI	12/05/2020
B-Pillar Low	Y	A382561	MSI	04/09/2021
B-Pillar Mid	Y	A382600	MSI	04/09/2021
Driver Seat	Y	A340253	MSI	04/19/2021
Engine Top	X	PCB1434	PCB	03/15/2021
Engine Top	Y	PCB1411	PCB	03/15/2021
Firewall	Y	A370345	MSI	03/09/2021
Right Roof	Y	A340219	MSI	04/20/2021
Right Floor Sill	Y	A340260	MSI	04/20/2021
Rear Floorpan	X	A360965	MSI	12/14/2020
Rear Floorpan	Y	A360960	MSI	12/05/2020

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