REPORT NUMBER: SideNCAPPole-MGA-20-026

NEW CAR ASSESSMENT PROGRAM (NCAP)
Side Impact Pole Test

FCA US LLC
2020 Dodge Challenger SXT 2-Door Coupe
NHTSA No.: M20200304

MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105

Test Date: July 13, 2020

Final Report Date: October 20, 2020

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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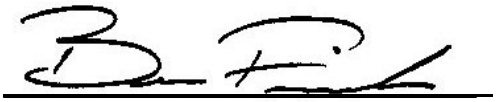
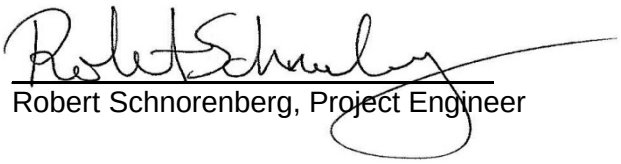
Prepared by: 
Ben Fischer, Project Engineer

Approved by: 
Robert Schnorenberg, Project Engineer

Approval Date: October 20, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SideNCAPPole-MGA-20-026		

4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304	**5. Report Date** October 20, 2020 **6. Performing Organization Code** MGA
7. Author(s) Ben Fischer, Project Engineer	**8. Performing Organization Report No.** SideNCAPPole-MGA-20-026
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105	**10. Work Unit No.** **11. Contract or Grant No.** DTNH22-14-D-00353
12. Sponsoring Agency Name and Address United States Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NRM-100 1200 New Jersey Ave, SE, Room W43-410 Washington, DC 20590	**13. Type of Report and Period Covered:** Final Test Report July 13, 2020 to October 20, 2020 **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 2020 Dodge Challenger SXT 2-Door Coupe 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 July 13, 2020.

The impact velocity was 32.22 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 22.0°C. The test vehicle post-test maximum crush was 398 mm at level 3. The test vehicle's performance was as follows:

Measurement Description	Units	Driver ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	176
Resultant Lower Spine Acceleration	g	82	36
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2515
Maximum Thoracic Rib Deflection	mm	38*	22
Maximum Abdomen Rib Deflection	mm	45*	20

*Proposed IARV

The door 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	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590

19. Security Classification of Report	20. Security Classification of Page	21. No. of Pages	22. Price
Unclassified	Unclassified	139	

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SECTION 1
PURPOSE AND SUMMARY OF TEST

PURPOSE

This side pole impact test is part of the MY 2020 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 2020 Dodge Challenger SXT 2-Door Coupe. 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 2020 Dodge Challenger SXT 2-Door Coupe. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.22 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on July 13, 2020. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

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

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

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

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

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

Measurement Description	Units	Driver ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC36)		1000	176
Resultant Lower Spine Acceleration	g	82	36
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2515
Maximum Thoracic Rib Deflection	mm	38*	22
Maximum Abdomen Rib Deflection	mm	45*	20

*Proposed IARV

Supplemental restraint information is given below:

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

Driver Seat Track Y recorded questionable data.
Right Roof Y recorded questionable data between 40-50 ms.
Load Cell Pole #8 Fy recorded no valid data.

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20200304	Traction Control System (TCS)	Yes
Model Year	2020	Auto-Leveling System	No
Make	Dodge	Automatic Door Locks (ADL)	Yes
Model	Challenger SXT	Power Window Auto-Reverse	Yes
Body Style	2-Door Coupe	Other Optional Feature	No
VIN	2C3CDZAG4LH135102	Driver Front Airbag	Yes
Body Color	IndiGo Blue	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	26 km / 16 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.6 L	Driver Torso Airbag	No
Type/No. Cylinders	V6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Longitudinal	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	8	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	RWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	Yes (Driver Seat Track)	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	FCA US LLC
Date of Manufacture	02/20
Vehicle Type	Passenger Car

GVWR (kg)	2246
GAWR Front (kg)	1275
GAWR Rear (kg)	1275

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				392	(A)
DSC x 68.04 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				52	(A-B)

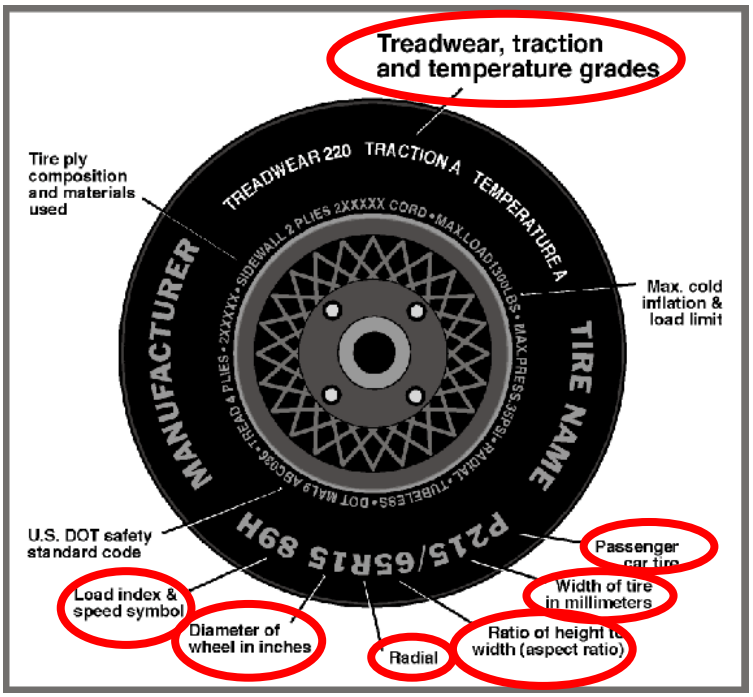
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable 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: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	235/55R18	235/55R18
Tire Size on Vehicle	235/55R18	235/55R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy MXM4	Primacy MXM4
Treadwear	500	500
Traction	AA	AA
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 1 Polyamide, 2 Steel	2 Polyester, 1 Polyamide, 2 Steel
Load Index/Speed Symbol	100 V	100 V
Tire Material	Rubber	Rubber
DOT Safety Code Left	B93J OJ4X 4719	B93J OJ4X 4719
DOT Safety Code Right	B93J OJ4X 4719	B93J OJ4X 4619

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

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	285	270	275	285
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

TEST AXLE VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	461.0	407.5		477.0	451.0		482.0	451.0	
Right	kg	457.0	415.0		457.0	452.5		461.0	450.5	
Ratio	%	52.7%	47.3%		50.8%	49.2%		51.1%	48.9%	
Totals	kg	918.0	822.5	1740.5	934.0	903.5	1837.5	943.0	901.5	1844.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1740.5	(A)
Actual Weight of 1 P572 ATD (SID-IIs) Used	kg	52	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	52	(C)
Calculated Test Vehicle Target Weight (TVTW)	kg	1844.5	(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	-0.7	-0.6	-0.6	Yes
Front Pass. Door Sill Angle (front-to-back)*	deg	-0.6	-0.6	-0.4	Yes
Front Bumper Angle (left-to-right)**	deg	0.0	0.0	0.0	Yes
Rear Bumper Angle (left-to-right)**	deg	-0.3	-0.3	-0.2	Yes
Vehicle CG (Aft of Front Axle)	mm	1397	1453	1445	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	-2	8	9	

* 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 TVTW

Component Description	Units	Weight
Weight of Ballast Added	kg	6
Components Removed: none	kg	

Test height adjustable suspension setting, if applicable:	Not Applicable

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

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm Target	945
Aft 25 mm Target	940

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

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	19.1	12.8	16.0
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	16.0	28	Max	56	56	56
			Mid	28	28	28
			Min	0	0	0
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

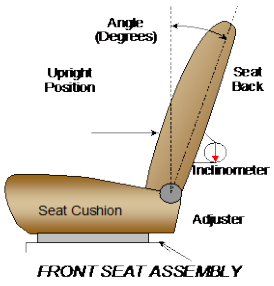
Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1st as 1)	mm	Detent (1st as 0)
Driver Seat	256		0	
Front Passenger Seat	220	23	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 (1st as 1)	Degrees	Detent (1st as 0)
Driver Seat	45.8	25	3.6	2
Front Passenger Seat	46.0	25	2.8	2
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	Fixed		Fixed	

All seat back angles measured on outboard headrest post.

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	Fixed	

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

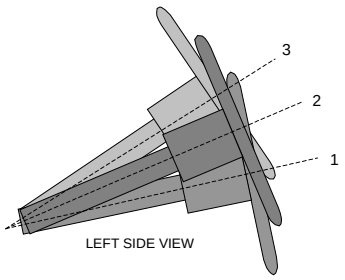
DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

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.

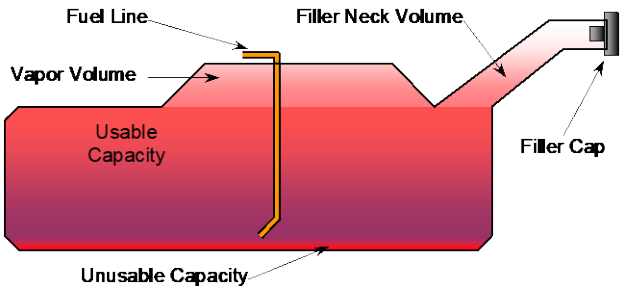
	Wheel Angle (°)	Fore/Aft Position (mm)
Lowermost, Position 1	69.3	
Geometric Center, Position 2	67.1	
Uppermost, Position 3	64.8	
Telescoping Steering Wheel Travel		57
Test Position	67.1	29



STEERING COLUMN ASSEMBLY

FUEL PUMP

The vehicle is equipped with an electronic fuel pump. The fuel pumps starts pumping fuel when the ignition is in the 'RUN' position. The filler neck is located on the driver's side



VEHICLE FUEL TANK ASSEMBLY

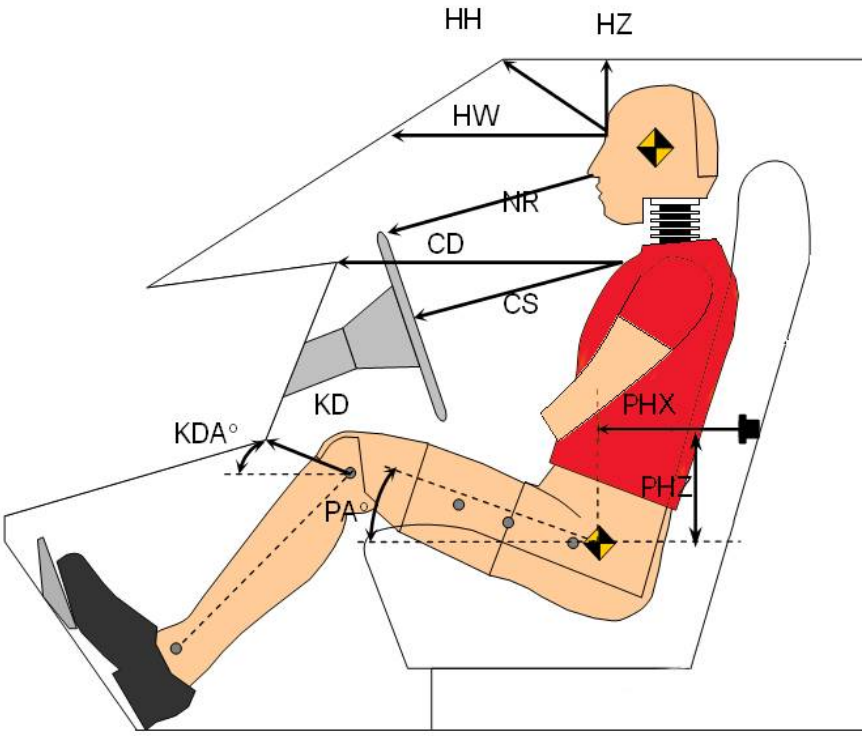
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of Standard Tank (see S1 – Vehicle Setup Information)	70.0
Usable Capacity of Optional Tank (see S1 – Vehicle Setup Information)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	70.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	65.1
Actual Amount of Solvent Used	65.1
1/3 of Usable Capacity	23.3

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe
Test Program: NCAP Side Pole Impact Test
NHTSA No.: M20200304
Test Date: 7/13/2020

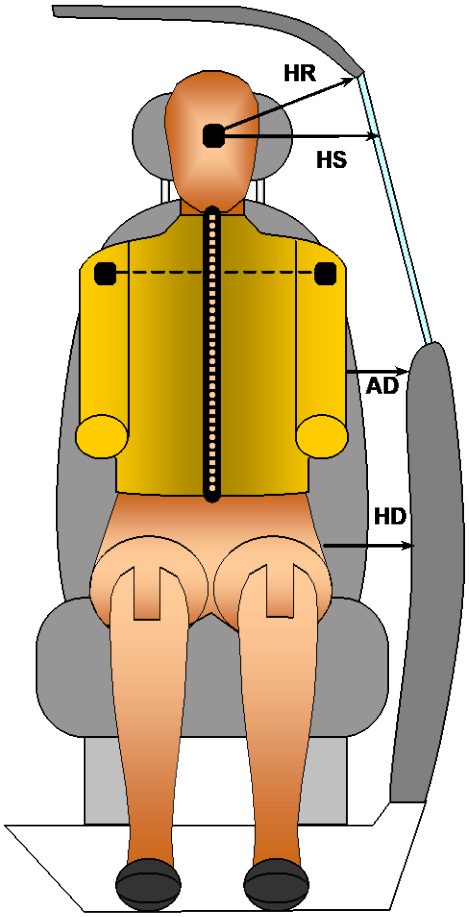


LEFT SIDE VIEW

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	316	
HW	Head to Windshield	630	
HZ	Head to Roof Liner	202	
NR	Nose to Rim/Seat Back	198	
CD	Chest to Dashboard/Seat Back	402	
CS	Chest to Steering Wheel	147	
KDL / KDAL	Left Knee to Dash/Seat Back	140	43.5
KDR / KDAL	Right Knee to Dash/Seat Back	131	44.0
PAX	Pelvic Tilt Angle X		18.7
PAY	Pelvic Tilt Angle Y		0.7
PHX	Hip Point to Striker (X-Axis)	600	
PHZ	Hip Point to Striker (Z-Axis)	127	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe
Test Program: NCAP Side Pole Impact Test
NHTSA No.: M20200304
Test Date: 7/13/2020

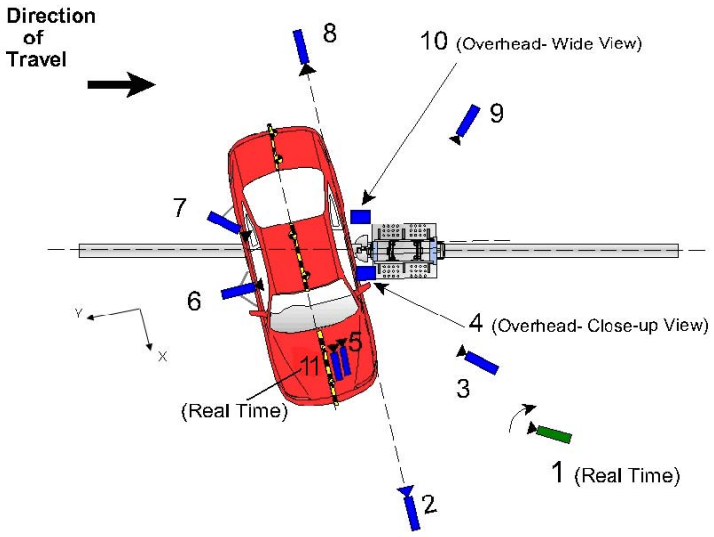


FRONT VIEW OF DUMMY

Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	263
HS	Head to Side Window	389
AD	Arm to Door	197
HD	Hip Point to Door	166

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020



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	6640	80	-1740	24	1000
3	Impact Side 45° Forward	-4200	-2180	-1690	12	1000
4	Overhead Closeup	0	0	-6700	85	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	-6830	300	-1730	24	1000
9	Impact Side 45° Rearward	-2500	-3400	-1700	12	1000
10	Overhead Wide View	150	880	-6540	12	1000
11	Real-Time Dummy Front View					30

*All measurements accurate to ±6 mm
Note: Vehicle was positioned at a 75° angle to the rigid pole.

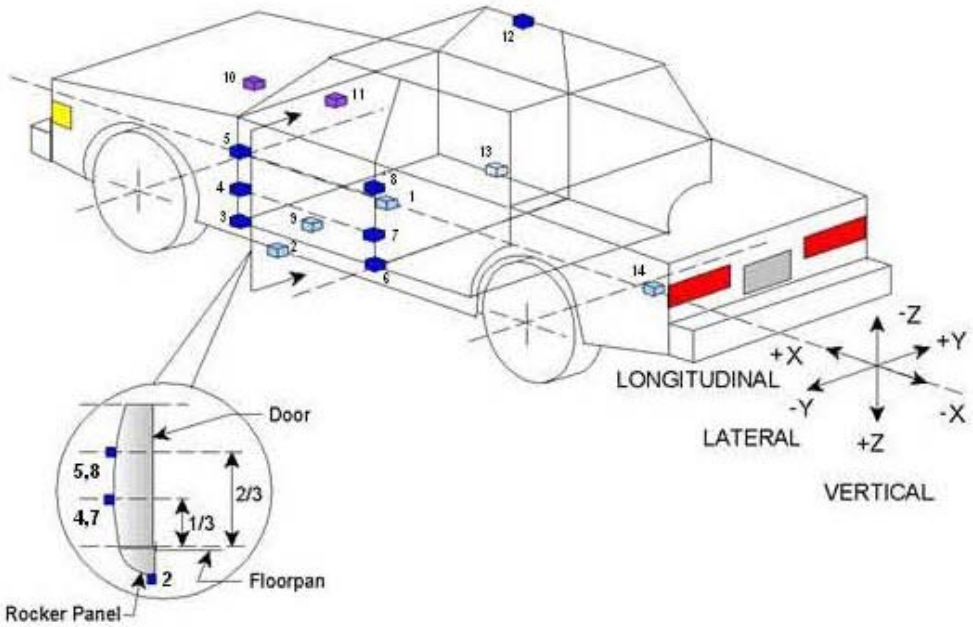
Explain why camera(s) did not operate as intended: None

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020



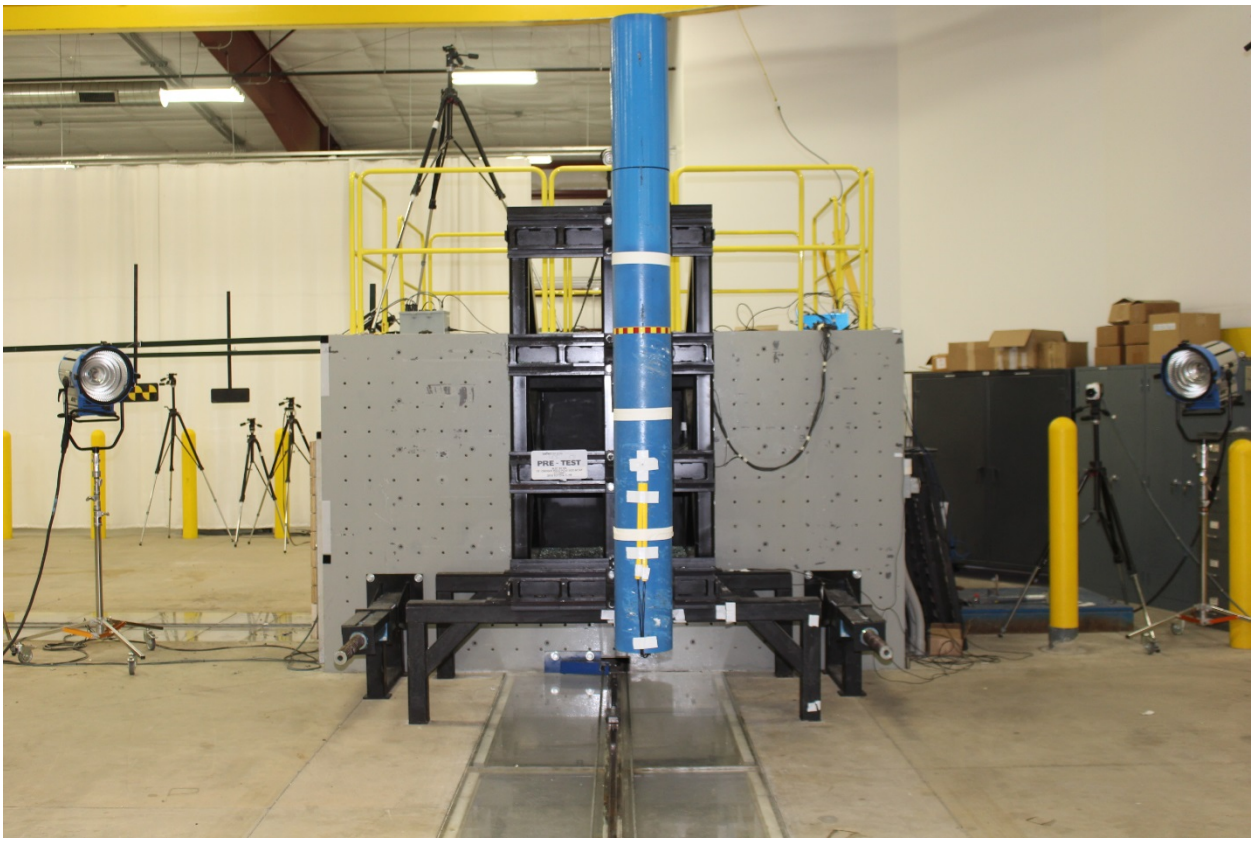
TEST VEHICLE ACCELEROMETER LOCATIONS

No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2588	152	-190
2	Left Floor Sill	2994	-767	-180
3	A Pillar Sill	3300	-767	-180
4	A Pillar Low	3261	-804	-564
5	A Pillar Mid	3249	-813	-792
6	B Pillar Sill	1993	-767	-184
7	B Pillar Low	2036	-773	-570
8	B Pillar Mid	1971	-773	-811
9	Driver Seat Track	2331	-354	-254
10	Engine Top	4099	74	-841
11	Firewall	3844	0	-945
12	Right Roof	2189	526	-1430
13	Right Floor Sill	2994	767	-178
14	Rear Floorpan	1125	22	-528

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: 2020 Dodge Challenger SXT 2-Door Coupe
Test Program: NCAP Side Pole Impact Test
NHTSA No.: M20200304
Test Date: 7/13/2020



254 mm Diameter Rigid Pole

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch
	Front	Rear	Front	Rear	
Remained Closed and Operational	No		Yes		
Total Separation from Vehicle at Hinges or Latches	No		No		
Latch or Hinge Systems Pulled Out of Their Anchorages	No		No		
Disengaged from Latched Position	No		No		
Latch Separated from Striker	No		No		
Jammed Shut	Yes		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: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

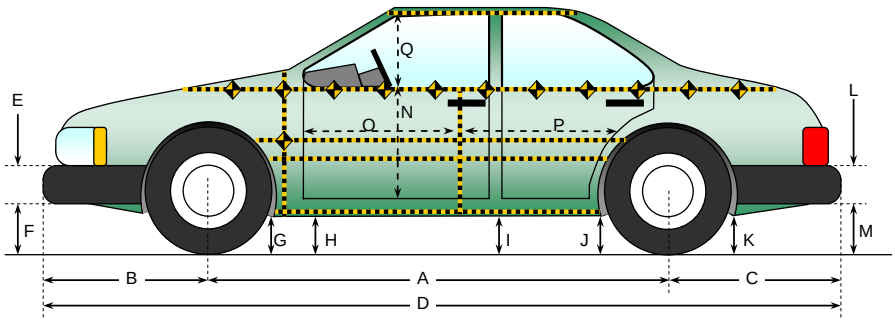
Restraint Type	Struck Side Driver		Struck Side Left Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No			
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	
Side Airbag (Other)				
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		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		1348
Actual Impact Point (Aft of Front Axle)	mm		1348
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	0
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	74.6
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.22
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.21

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe
Test Program: NCAP Side Pole Impact Test
NHTSA No.: M20200304
Test Date: 7/13/2020



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

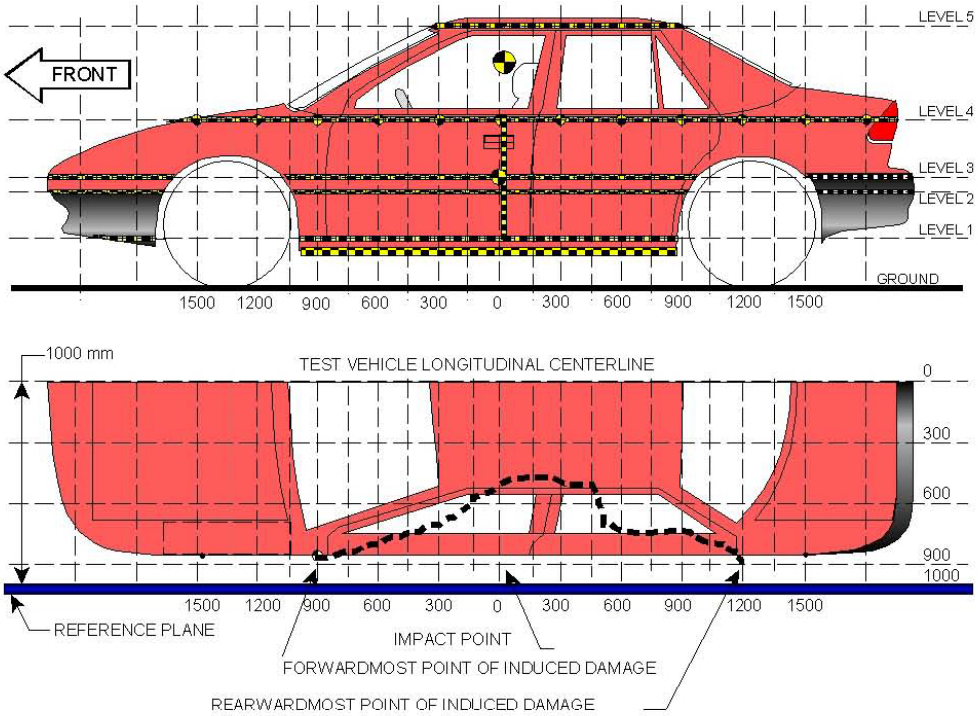
LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2956	2833	123
B	Front Axle to FSOV	952	1024	-72
C	Rear Axle to RSOV	1129	1106	23
D	Total Vehicle Length at Centerline	5037	4963	74
E	Front Bumper Thickness	104	104	0
F	Front Bumper Bottom to Ground	202	215	-13
G	Sill Height at Front Wheel Well	168	143	25
H	Sill Height at Front Door Leading Edge	168	147	21
I	Sill Height at B-Pillar	173	190	-17
J1	Sill Height at Rear Wheel Well	177	200	-23
J2	Pinch Weld Height at Rear Wheel Well	175	195	-20
K	Sill Height Aft of Rear Wheel Well	208	213	-5
L	Rear Bumper Thickness	106	106	0
M	Rear Bumper Bottom to Ground	263	251	12
N	Sill Height to Bottom of Front Window Sill	769	761	8
O	Front Door Leading Edge to Impact CL	757	641	116
P	Rear Door Trailing Edge to Impact CL	637	479	158
Q	Front Window Opening	376	335	41
R	Right Side Length	4482	4500	-18
S	Left Side Length	4482	4320	162
T	Vehicle Width at B-Pillars	1917	1908	9
U	Front Wheel Track Width	1616		
V	Rear Wheel Track Width	1632		

DATA SHEET NO. 10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020



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 MEAUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	294	319	-150
2	Occupant H-Point	546	385	-75
3	Mid Door	645	398	-75
4	Window Sill	972	326	0
5	Window Top	1360	173	-150

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

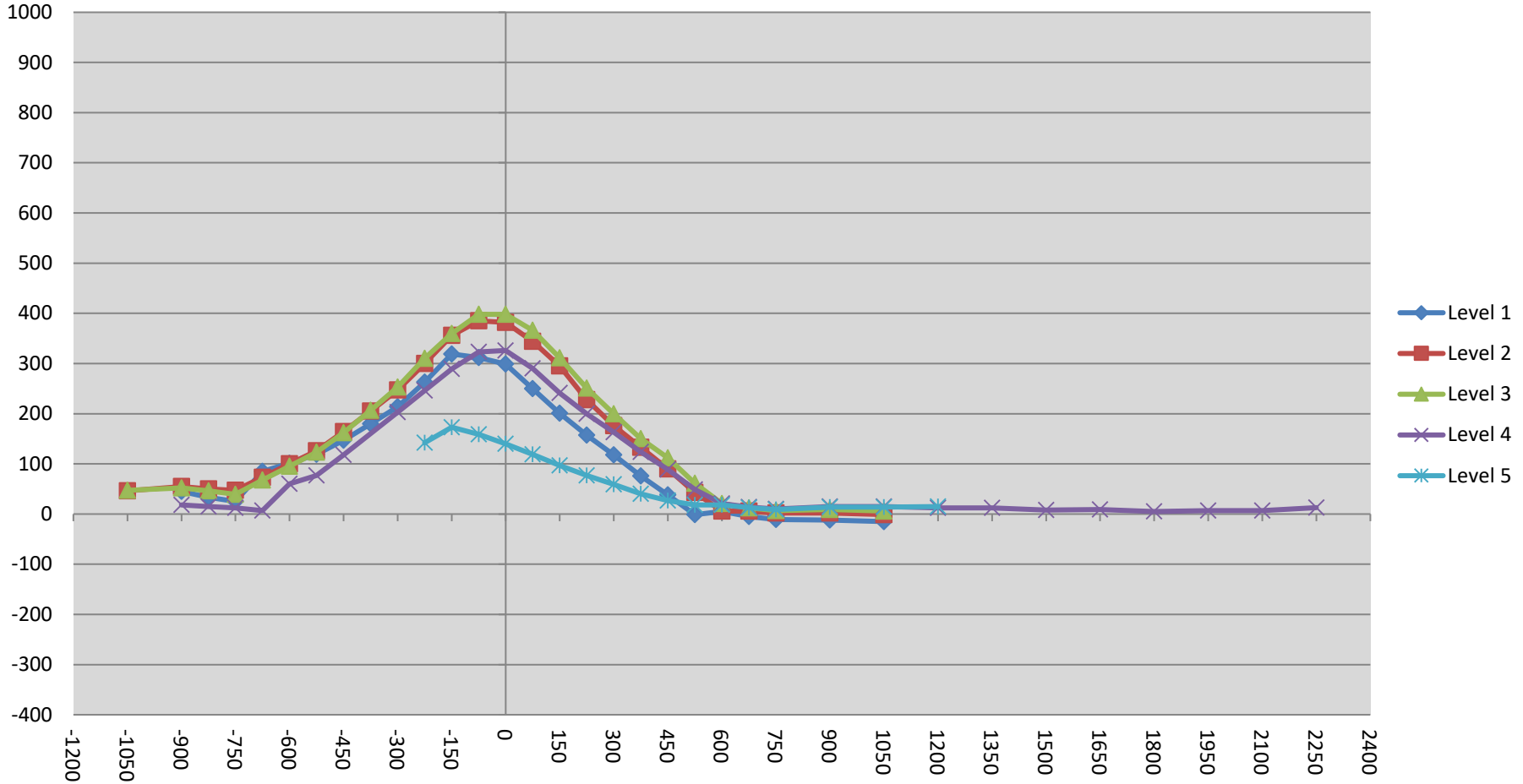
Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020

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															
-1200															
-1050		159	150				205	197				46	47		
-900	215	159	149	282		260	214	201	300		45	55	52	18	
-825	214	159	148	262		247	209	194	277		33	50	46	15	
-750	213	159	148	249		238	206	187	261		25	47	39	12	
-675	214	158	147	243		299	231	215	250		85	73	68	7	
-600	213	157	146	241		314	257	241	301		101	100	95	60	
-525	213	156	145	239		332	282	268	316		119	126	123	77	
-450	213	155	144	239		360	319	306	357		147	164	162	118	
-375	214	155	144			394	360	351			180	205	207		
-300	214	154	143	232		428	401	396	435		214	247	253	203	
-225	214	153	142	228	466	477	453	452	474	608	263	300	310	246	142
-150	213	153	142	225	433	532	509	502	514	606	319	356	360	289	173
-75	213	153	142	224	429	525	538	540	547	588	312	385	398	323	159
0	213	153	142	224	427	512	535	540	550	567	299	382	398	326	140
75	215	153	142	224	425	465	497	508	514	544	250	344	366	290	119
150	215	154	143	224	425	416	449	454	465	522	201	295	311	241	97
225	217	155	143	224	424	374	383	394	424	501	157	228	251	200	77
300	218	156	144	224	425	336	332	344	387	484	118	176	200	163	59
375	219	156	145	223	426	295	289	295	347	466	76	133	150	124	40
450	220	157	146	222	426	258	247	258	311	453	38	90	112	89	27
525	220	159	147	224	427	219	202	208	273	445	-1	43	61	49	18
600	221	159	148	224	427	226	165	169	245	445	5	6	21	21	18
675	222	160	149	218	428	217	166	161	232	441	-5	6	12	14	13
750	224	161	150	209	430	213	163	157	219	439	-11	2	7	10	9
825															
900	228	164	152	189	440	216	166	161	204	454	-12	2	9	15	14
1050	231	167	155	177	468	216	166	161	192	482	-15	-1	6	15	14
1200				174	518				186	533				12	15
1350				175					187					12	
1500				181					189					8	
1650				187					196					9	
1800				197					202					5	
1950				210					217					7	
2100				228					235					7	
2250				249					262					13	
2400															
2550															
2700															

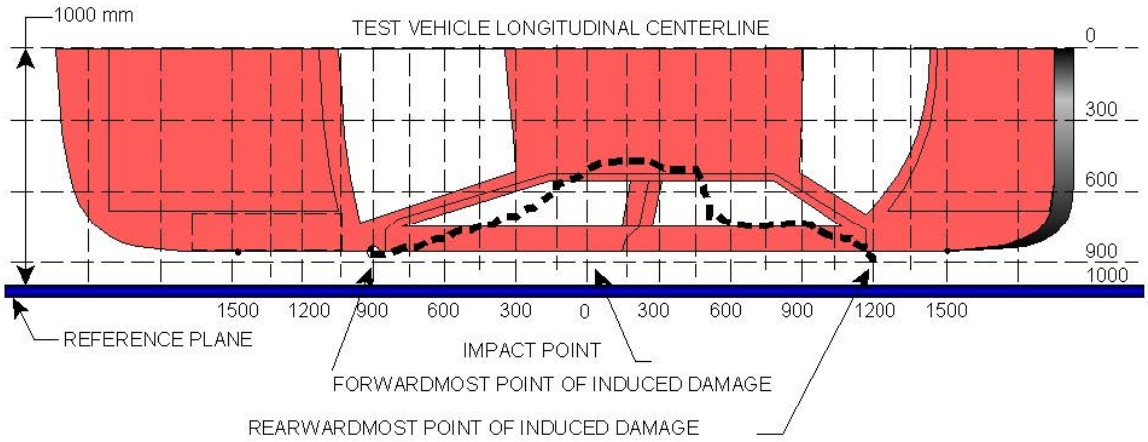
DATA SHEET NO. 10 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe
Test Program: NCAP Side Pole Impact Test
NHTSA No.: M20200304
Test Date: 7/13/2020



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

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	675	3	147	149	2
2	388	3	145	290	145
3	101	3	142	496	354
4	-186	3	142	482	340
5	-473	3	144	294	150
6	-760	3	148	183	35

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

Test Vehicle: 2020 Dodge Challenger SXT 2-Door Coupe
Test Program: NCAP Side Pole Impact Test
NHTSA No.: M20200304
Test Date: 7/13/2020

Test Time: 11:21 am
Temperature: 22.0°C

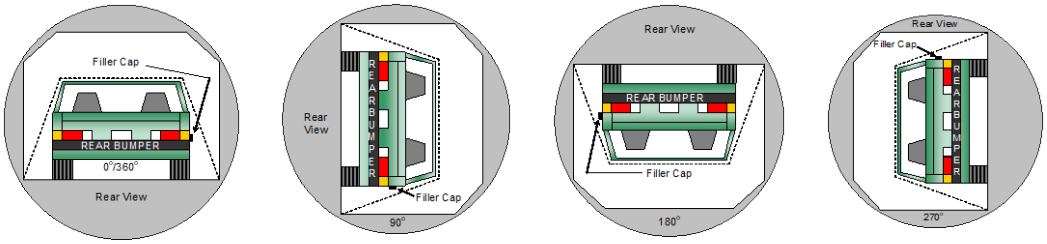
A. From impact until vehicle motion ceases: (Maximum Allowable = 1 ounce) 0.0 oz.

B. For the 5 minute period after motion ceases: (Maximum Allowable = 5 ounces) 0.0 oz.

C. For the following 25 minutes: (Maximum Allowable = 1 ounce / minute) None

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



0°/360° 90° 180° 270°

ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	113	300	413
90° to 180°	111	300	411
180° to 270°	107	300	407
270° to 360°	111	300	411

FMVSS 301 ROLLOVER SPILLAGE TABLE (UNITS IN OUNCES)

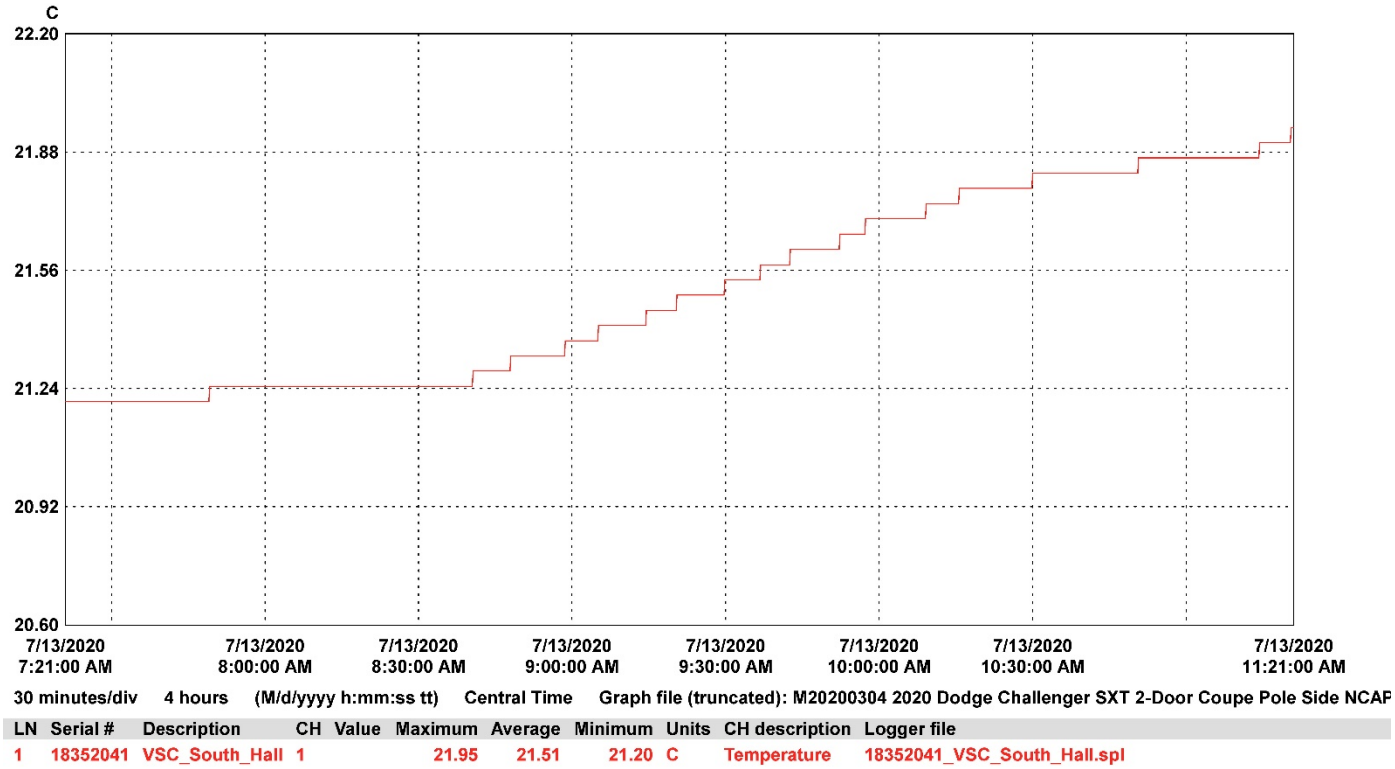
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0.0	0.0	0.0	
90° to 180°	0.0	0.0	0.0	
180° to 270°	0.0	0.0	0.0	
270° to 360°	0.0	0.0	0.0	

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: 2020 Dodge Challenger SXT 2-Door Coupe NHTSA No.: M20200304
Test Program: NCAP Side Pole Impact Test Test Date: 7/13/2020



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	18352041	VSC_South_Hall	1		21.95	21.51	21.20	C	Temperature	18352041_VSC_South_Hall.spl

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

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

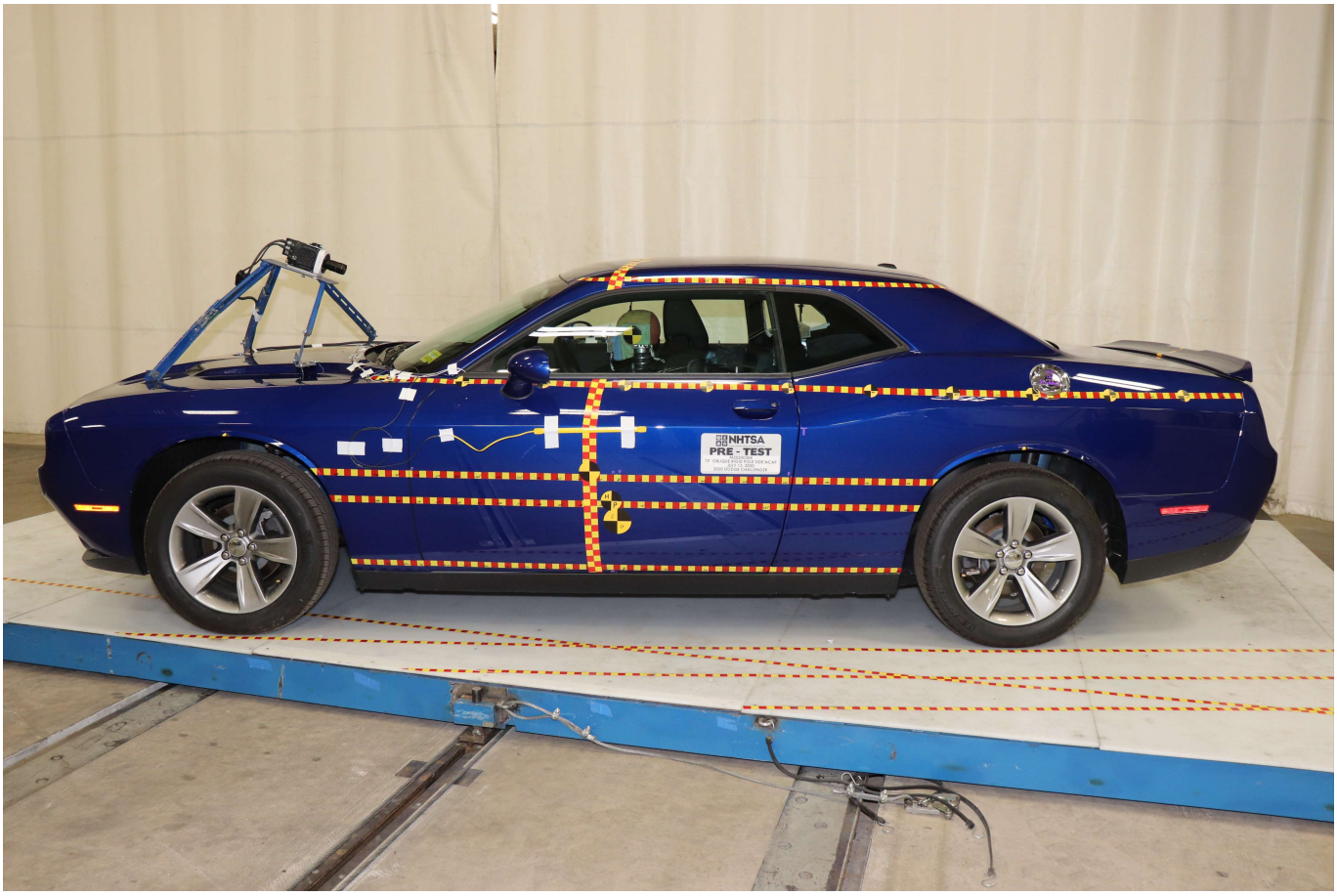


Photo No. 007 - Pre-Test Left Side View of Test Vehicle

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

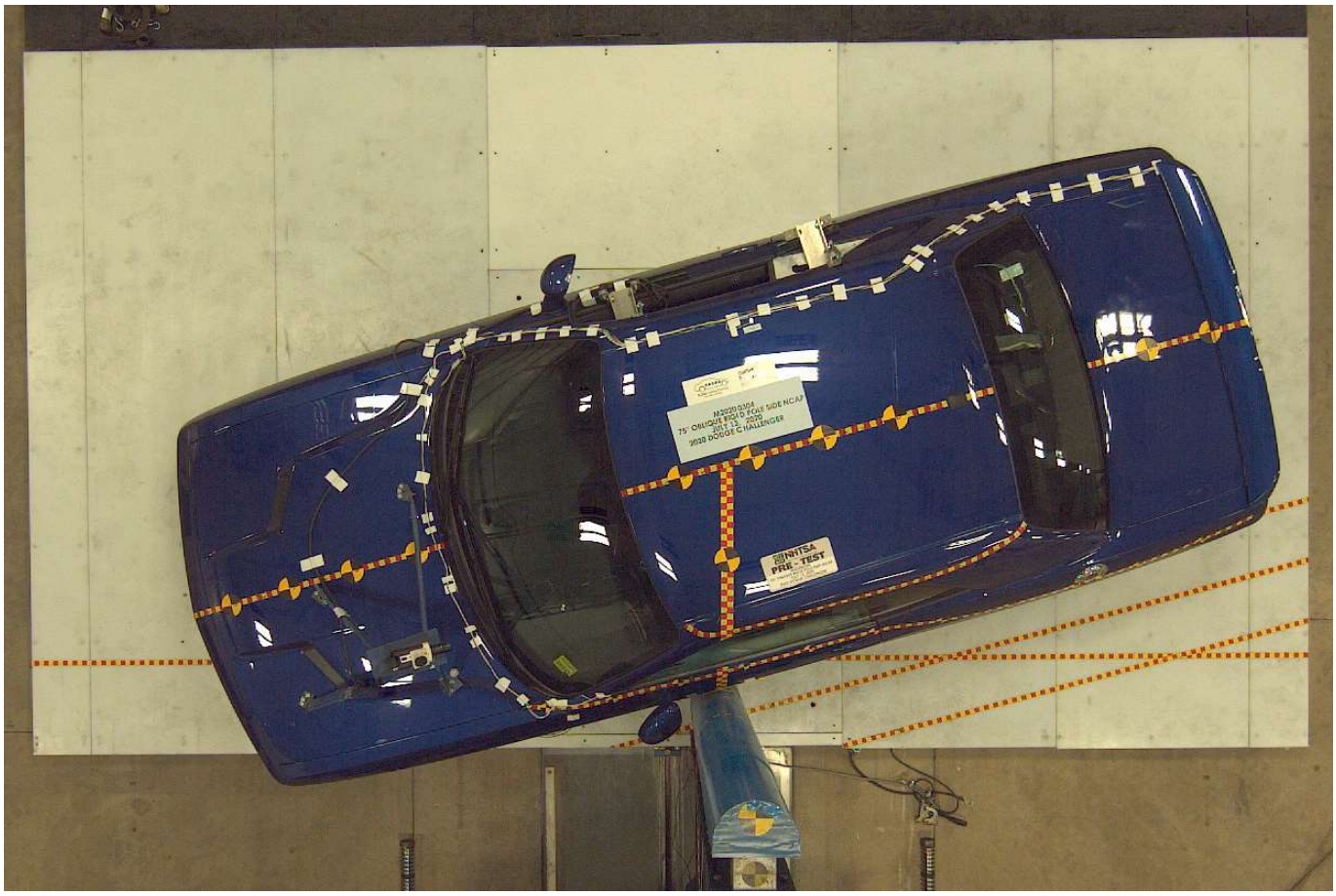


Photo No. 015 - Pre-Test Overhead View of Test Area

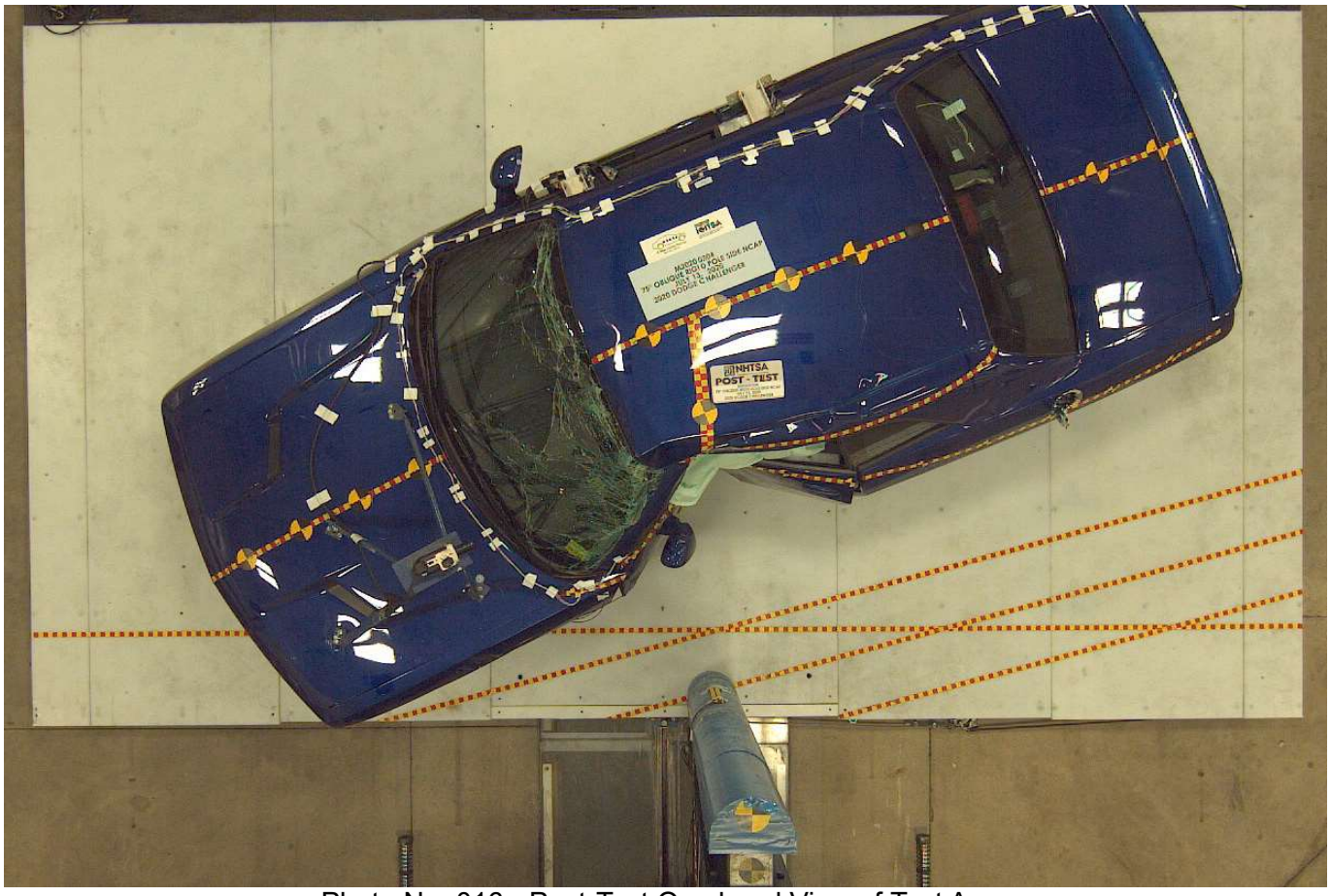


Photo No. 016 - Post-Test Overhead View of Test Area

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

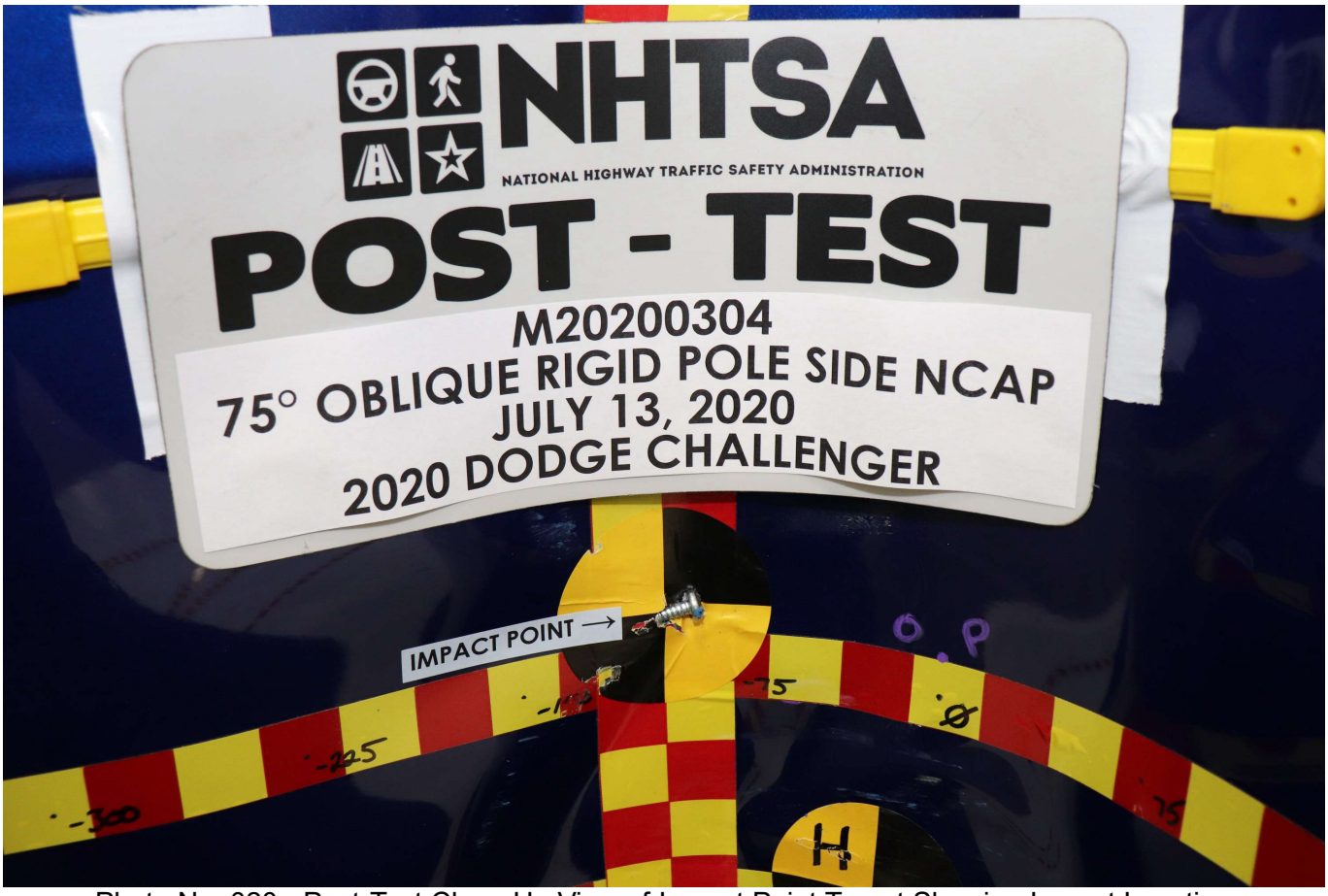


Photo No. 020 - Post-Test Close-Up View of Impact Point Target Showing Impact Location

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

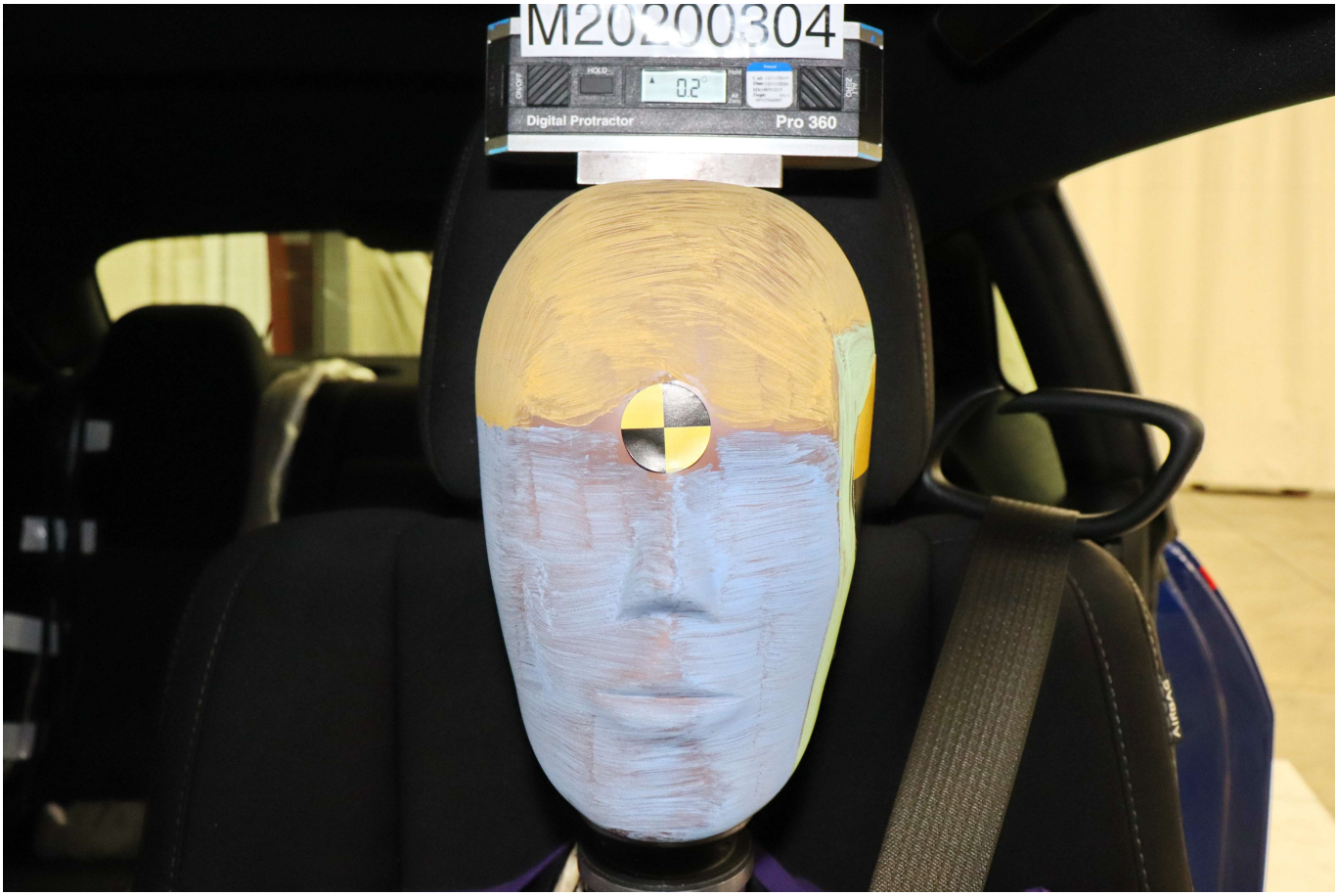


Photo No. 027 - Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint

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

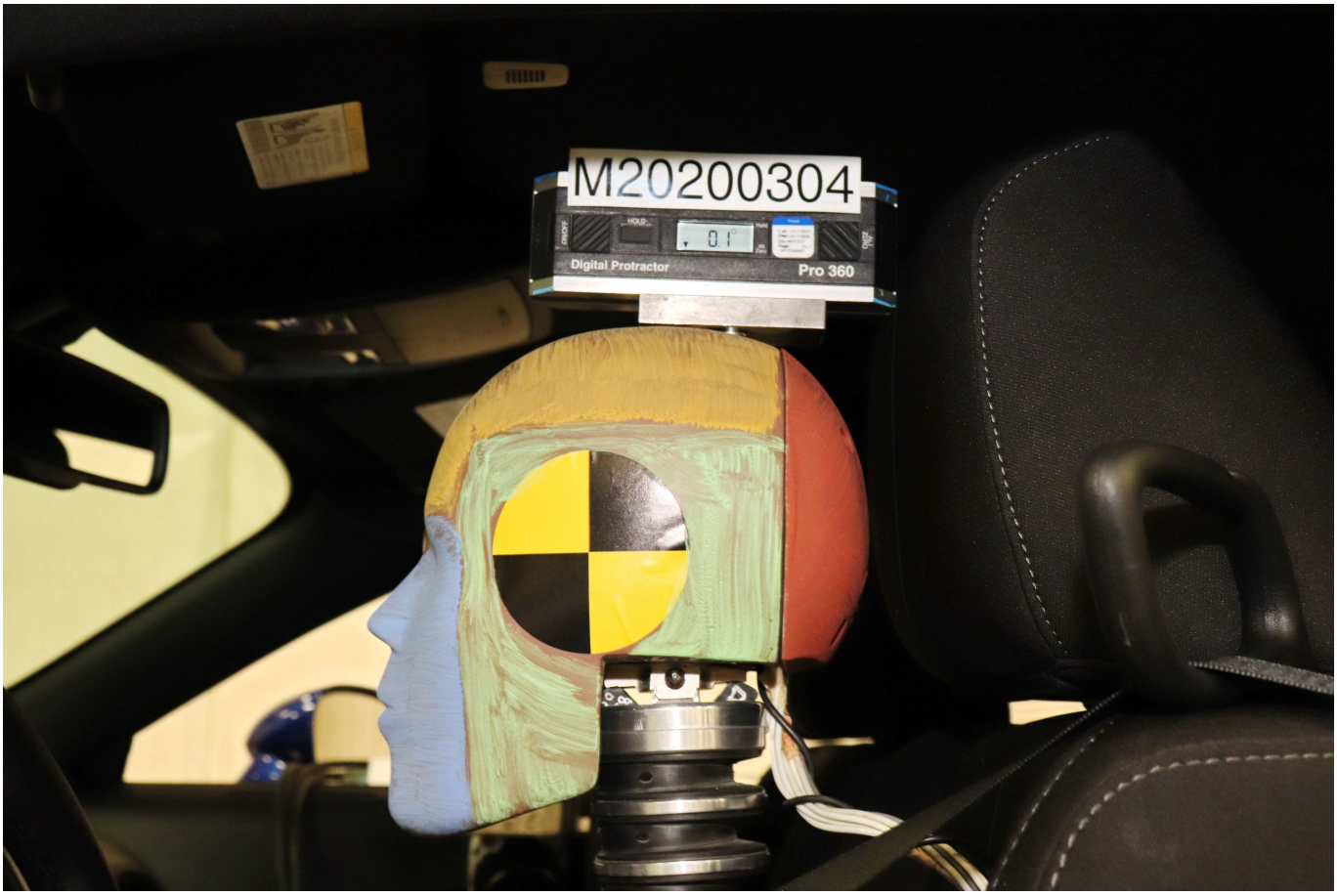


Photo No. 031 - Pre-Test Left Side View of Dummy Head Showing Dummy Head is Level

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

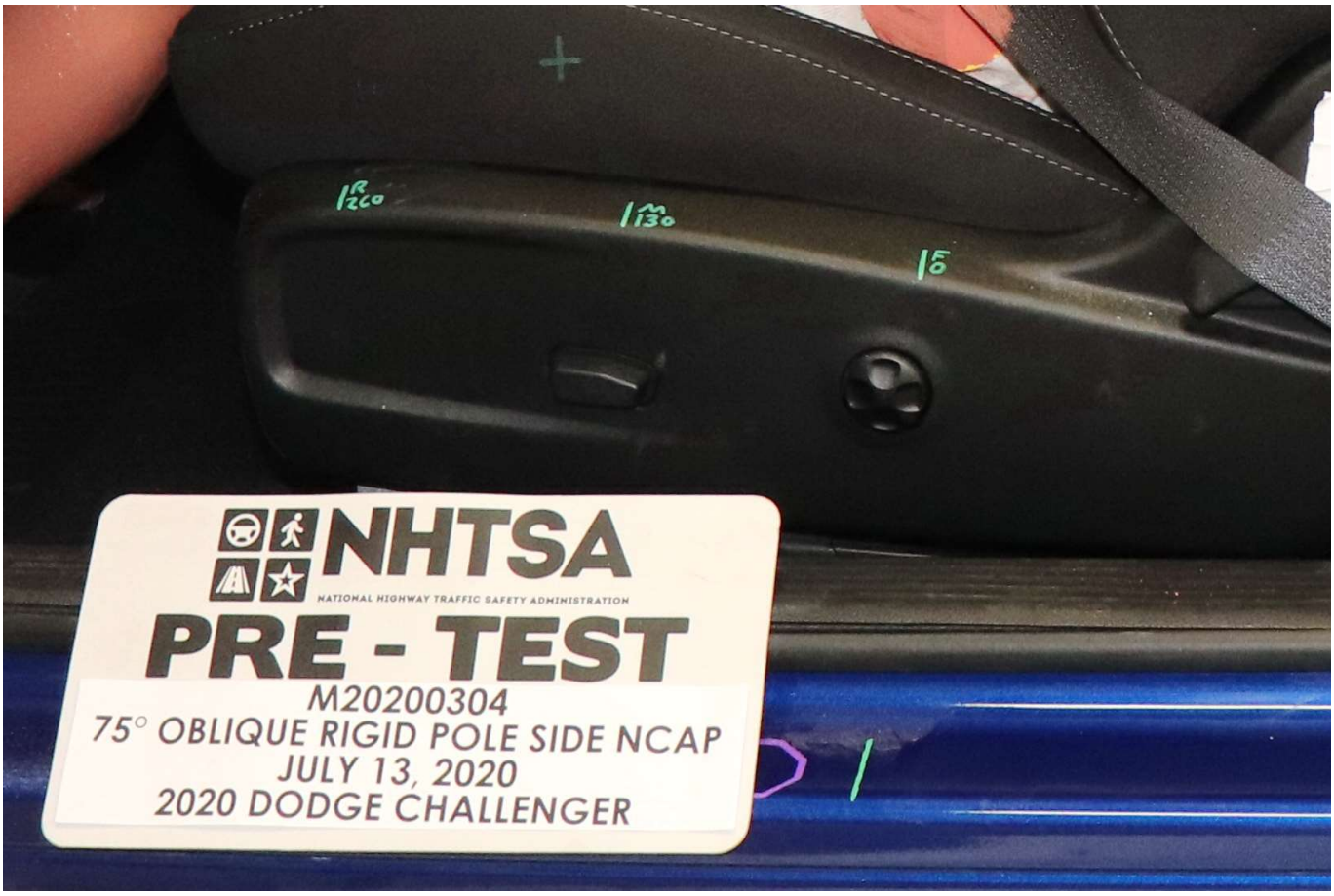


Photo No. 037 - Pre-Test Close-Up Left Side View of Driver Seat Track

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

PHOTOGRAPH NOT APPLICABLE

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

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

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

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

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

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

PHOTOGRAPH NOT APPLICABLE

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

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

PHOTOGRAPH NOT APPLICABLE

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

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

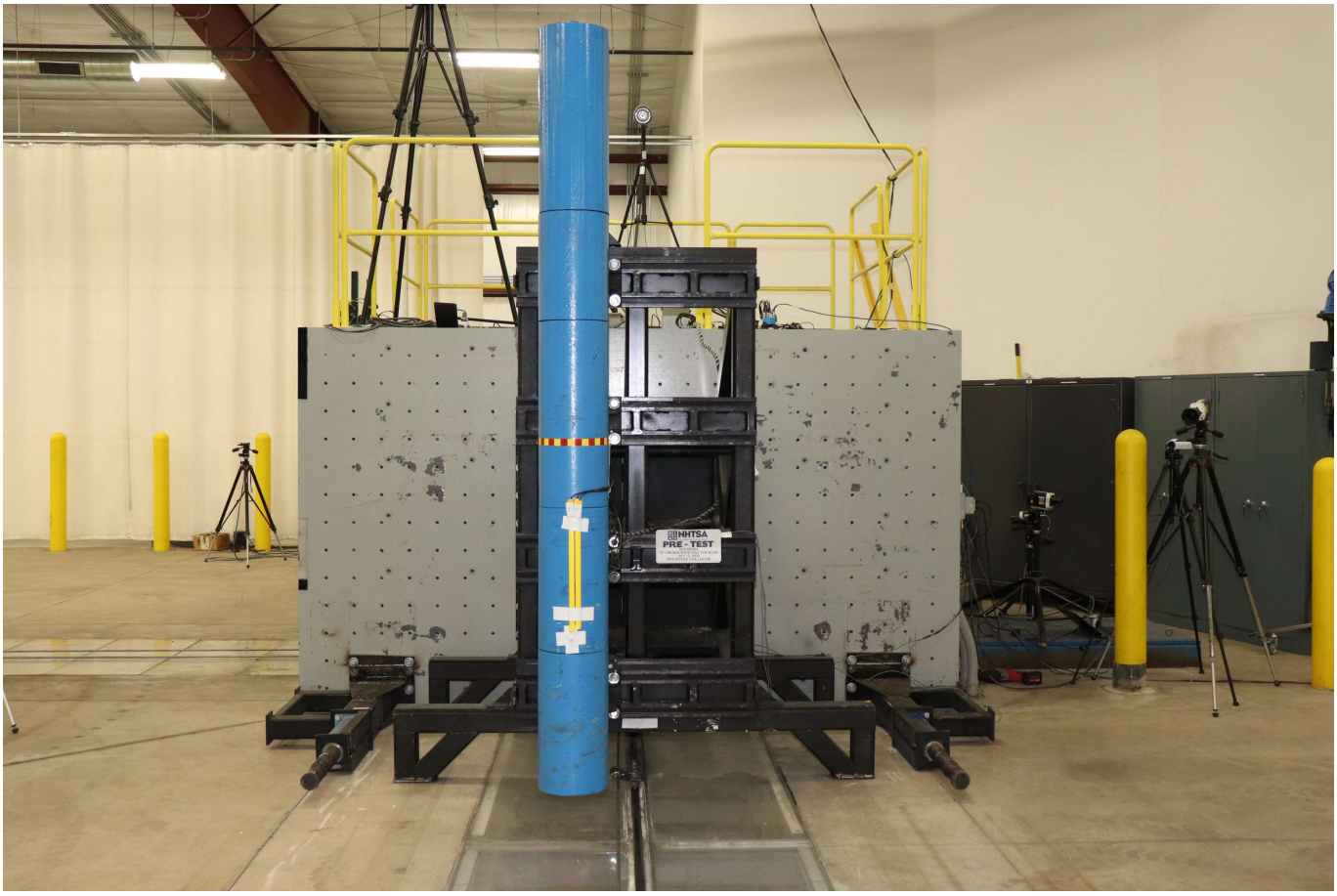


Photo No. 059 - Pre-Test Pole Barrier Front View

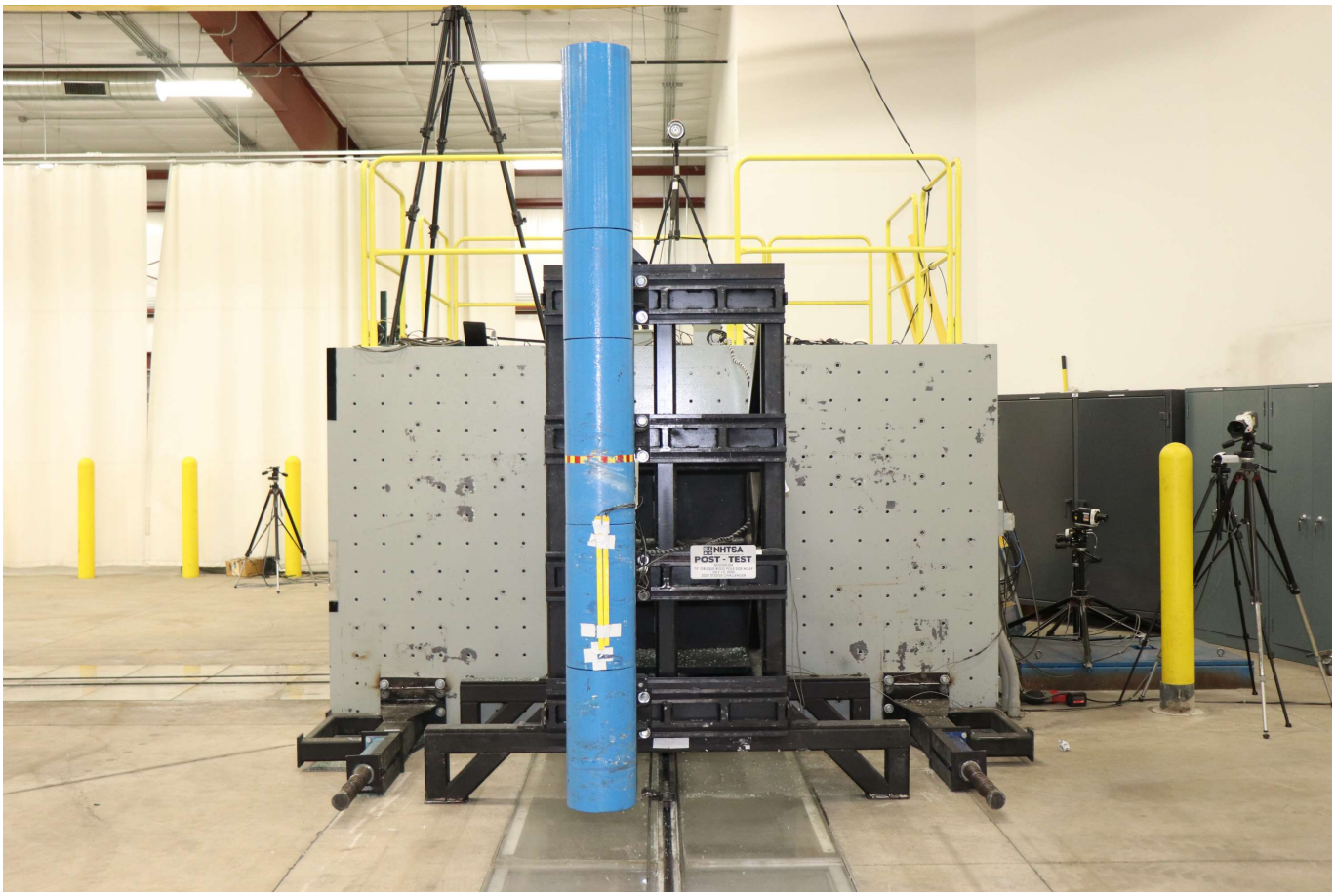


Photo No. 060 - Post-Test Pole Barrier Front View

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

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

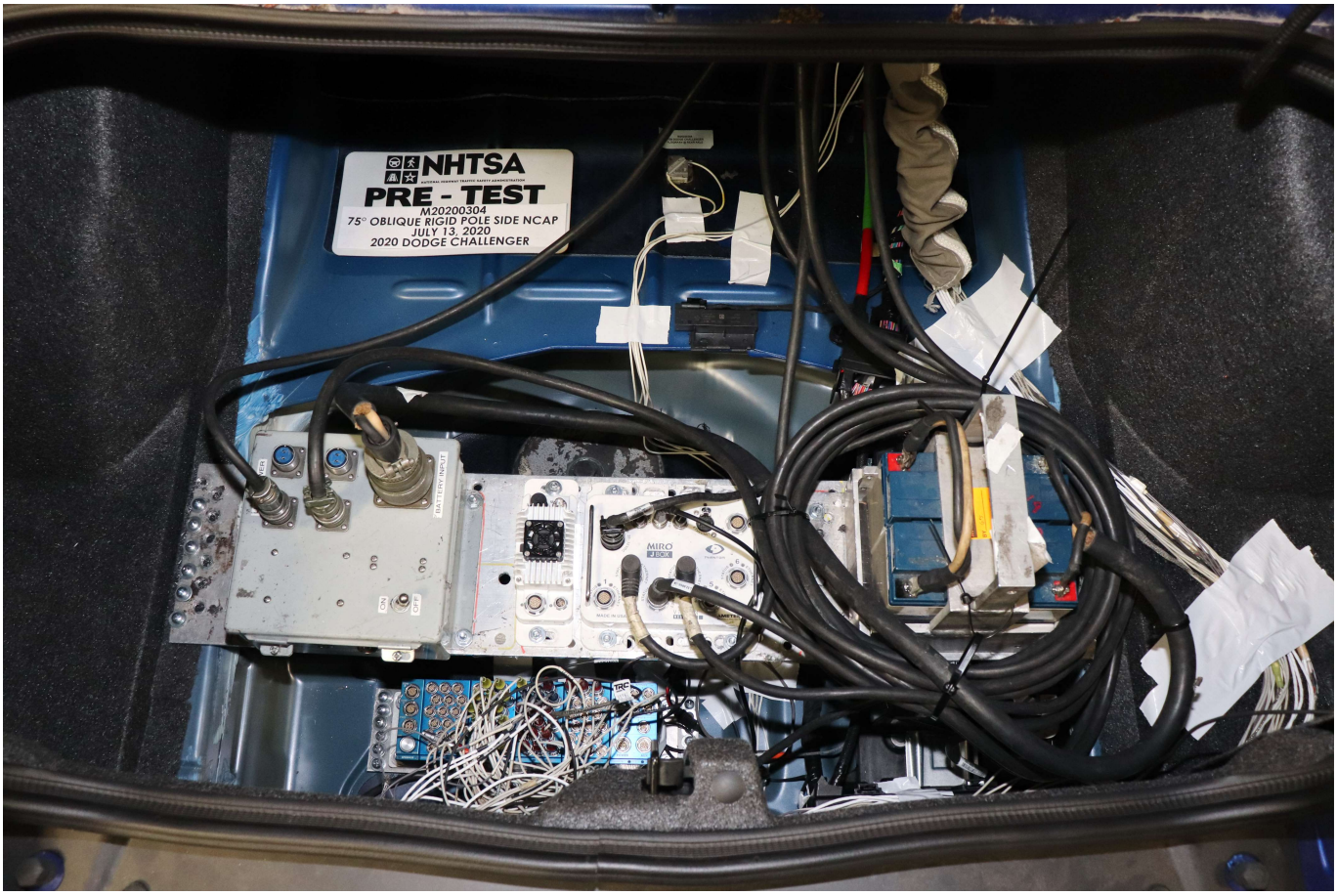


Photo No. 063 - Pre-Test Ballast View

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

2020 DODGE

CHALLENGER SXT

For more information visit: www.dodge.com
or call 1-800-4ADODGE

FCA US LLC

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $27,995

DODGE CHALLENGER SXT
Exterior Color: IndiGo Blue Exterior Paint
Interior Color: Black Interior Color
Interior: Houndstooth Cloth Sport Seat
Engine: 3.6-Liter V6 24-Valve VVT Engine
Transmission: TorqueFlite® 8-Speed Automatic Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Airbags
Supplemental Front Seat-Mounted Side Airbags
Supplemental Side-Curtain Front and Rear Airbags
ParkView® Rear Back-Up Camera
Active Head Restraints
Electronic Stability Control
All Speed Traction Control
Electric Power Steering
Electronic Roll Mitigation
Hill Start Assist
Tire Pressure Monitoring Display
Keyless Entry
Push-Button Start
Sentry Key® Theft Deterrent System
ABS Sport Brakes
Sport Suspension
Sport Mode
Child Seat Upper Tether Anchorages
Tire Inflator Kit (No Compact Spare)
18.5-Gallon Fuel Tank

INTERIOR FEATURES
Uconnect® 4 with 7-Inch Display
Apple CarPlay®
Google Android Auto™
Integrated Voice Command with Bluetooth®
Media Hub (2 USB, Aux)
6-Speakers
Leather Steering Wheel
Steering Wheel Mounted Audio Controls
Leather-Wrapped Shift Knob
Auto-Dimming Rear View Mirror
Manual Tilt / Telescope Steering Column
Dual-Zone Automatic Temperature Control
Outside Temperature Display
6-Way Power Driver Seat
4-Way Power Driver Lumbar Adjust
60 / 40 Split Rear Folding Seat
12-Volt Center Console Power Outlet
Illuminated Cup Holders

EXTERIOR FEATURES
18-Inch Satin Carbon Aluminum Wheels
235/55R18 All-Season Performance Tires
Body-Color Rear Spoiler
Daytime Running Lamps
Automatic Projector Headlamps
Bright Fuel-Filler Door
Satin Chrome Grille
Dual Bright Exhaust Tips
Power Mirrors with Manual Fold-Away

OPTIONAL EQUIPMENT (May Replace Standard Equipment)
Customer Preferred Package 2EA

DESTINATION CHARGE $1,495

TOTAL PRICE: * $29,490

WARRANTY COVERAGE
5-year or 60,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5YEAR/60,000MILE POWERTRAIN WARRANTY

Assembly Point/Port of Entry: BRAMPTON, ONTARIO, CANADA
VIN: 2C3-CDZAG4LH-135102 L4-VON: 5470 0208

SHIPTO: 66404 20
LEE DODGE CHRYSLER JEEP
200 MAIN STREET
WESTBROOK ME 04092-4733

SOLDTO: 32 66404
LEE DODGE CHRYSLER JEEP
200 MAIN STREET
WESTBROOK ME 04092-4733

THIS LABEL IS ADDED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.
* STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA DOT Fuel Economy and Environment

Gasoline Vehicle

Fuel Economy
23 MPG combined city/hwy — 19 city — 30 highway
4.3 gallons per 100 miles

These estimates reflect new EPA methods beginning with 2017 models.
Midsize cars range from 14 to 141 MPGe.
The best vehicle rates 136 MPGe.

You spend **$1,250** more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $1,750

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 5 (1–10, Best)
Smog Rating (tailpipe only): 3 (1–10, Best)

This vehicle emits 389 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and cost $7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.70 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code™

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 ★★★★★
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 Not Rated / 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

The safety ratings above are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ.
Bumper Performance
This vehicle is equipped with bumper systems that can withstand a frontal barrier impact speed of 2.5 miles per hour and a rear barrier impact speed of 2.5 miles per hour with no more damage than allowed by the Federal bumper standard. The Federal bumper standard allows damage to the bumpers and attaching hardware and specifies barrier tests to be conducted at 2.5 miles per hour.

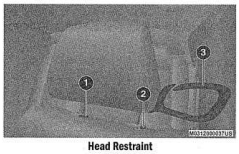
PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 60%
MAJOR SOURCES OF FOREIGN PARTS CONTENT:
MEXICO: 27%
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
BRAMPTON, ONTARIO, CANADA
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: GERMANY

MOPAR. VEHICLE PROTECTION
A PRODUCT OF FCA US LLC
Ask for Mopar Vehicle Protection for your vehicle. We Built It. We Back It.

Photo No. 071 - Monroney Label

The RHR will automatically return to their normal position following a rear impact. If the RHR do not return to their normal position, see an authorized dealer immediately.



Head Restraint
1 — Release Button
2 — Adjustment Button
3 — Seat Belt Loop

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, push the adjustment button located at the base of the head restraint and push downward on the head restraint.

To remove the head restraint, remove the seat belt from the seat belt loop. Raise the head restraint as far as it can go. Then, push the adjustment button and the release button at the base of each post while pulling the head restraint up. To reinstall the head restraint, put the head restraint posts into the holes while pushing the adjustment button and release button. Then, adjust it to the appropriate height.

NOTE:
It may be necessary to recline the front seat before removing the head restraint to provide enough clearance from the roof.

WARNING!
- A loose head restraint thrown forward in a collision or hard stop could cause serious injury or death to occupants of the vehicle. Always securely stow removed head restraints in a location outside the occupant compartment.
- ALL the head restraints MUST be reinstalled in the vehicle to properly protect the occupants. Follow the re-installation instructions above prior to operating the vehicle or occupying a seat.

(Continued)

WARNING! *(Continued)*
- Do not place items over the top of the Reactive Head Restraint, such as coats, seat covers or portable DVD players. These items may interfere with the operation of the Reactive Head Restraint in the event of a collision and could result in serious injury or death.

Rear Head Restraints

The rear outboard head restraints are non-adjustable and are designed to reduce the risk of injury by restricting head movement in the event of a rear impact.

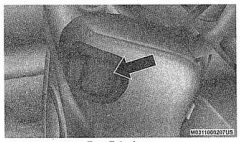
Vehicles Without Passenger Seating Installed

All passenger occupants within the vehicle must be in a seat equipped with a Seat Belt System and Head Restraint for the safety of the passenger. If the passenger and/or rear seats have been removed, do not ride in those areas.

This vehicle has been designed to maximize total performance. In doing so, the deletion of passenger seats and/or rear seat may affect the NVH (Noise, Vibration, and Harshness) characteristics. As a result, the interior will be louder overall.

Passenger Seat Easy Entry

On the passenger seat, pull forward on the lever located on the side of the seatback in order to dump the seatback and slide the seat forward. You can also temporarily remove the seat belt from the guide loop on the seat and allow the seat belt to retract out of the way. This allows for easier access to the rear seat. To return the seat to a normal seating position, first return the seatback to its original recline location and then slide the entire seat back to the pre-set lock position.



Easy Entry Lever

NOTE:
- The front passenger seat needs to slide back to a pre-set position for the fore-aft adjuster to be properly locked. For example, if the front passenger has the seat adjusted full rear and exits the vehicle to let a rear passenger enter using the easy entry handle, the fore-aft adjuster needs to slide back about 2/3 of the way rearward to hit the lock position. If the adjuster is not returned to this pre-set position, the seat will appear to be loose.
- Also, if the front passenger uses the easy entry handle and then lifts up the recliner handle without moving the seat back to its original pre-set position, the recliner will not lock until it is moved to the full recline position.

HEAD RESTRAINTS

Head restraints are designed to reduce the risk of injury by restricting head movement in the event of a rear impact. Head restraints should be adjusted so that the top of the head restraint is located above the top of your ear.

WARNING!
- All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a crash.
- Head restraints should never be adjusted while the vehicle is in motion. Driving a vehicle with the head restraints improperly adjusted or removed could cause serious injury or death in the event of a collision.

NOTE:
Do not reverse the head restraints (making the rear of the head restraint face forward) in an attempt to gain additional clearance to the back of your head.

Reactive Head Restraints — Front Seats

The front driver and passenger seats are equipped with Reactive Head Restraints (RHR). In the event of a rear impact, the RHR will automatically extend forward minimizing the gap between the back of the occupants head and the RHR.

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

APPENDIX B
DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

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

Additional Driver Dummy Instrumentation Data

Driver Head CG Redundant Acceleration (X) vs. Time

Driver Head CG Redundant Acceleration (Y) vs. Time

Driver Head CG Redundant Acceleration (Z) vs. Time

Driver Head Angular Velocity X (Deg/Sec) vs. Time

Driver Head Angular Velocity Y (Deg/Sec) vs. Time

Driver Head Angular Velocity Z (Deg/Sec) vs. Time

Driver Upper Thorax Rib Deflection (Y)

Driver Middle Thorax Rib Deflection (Y)

Driver Lower Thorax Rib Deflection (Y)

Driver Upper Abdomen Rib Deflection (Y)

Driver Lower Abdomen Rib Deflection (Y)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)

Vehicle Center of Gravity Acceleration (Y)

Vehicle Center of Gravity Acceleration (Z)

Left Floor Sill Acceleration (Y)

Left A-Pillar Sill Acceleration (Y)

Left Lower A-Pillar Acceleration (Y)

Left Mid A-Pillar Acceleration (Y)

Left B-Pillar Sill Acceleration (Y)

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

Load Cell Pole Barrier #4 Force (Y)

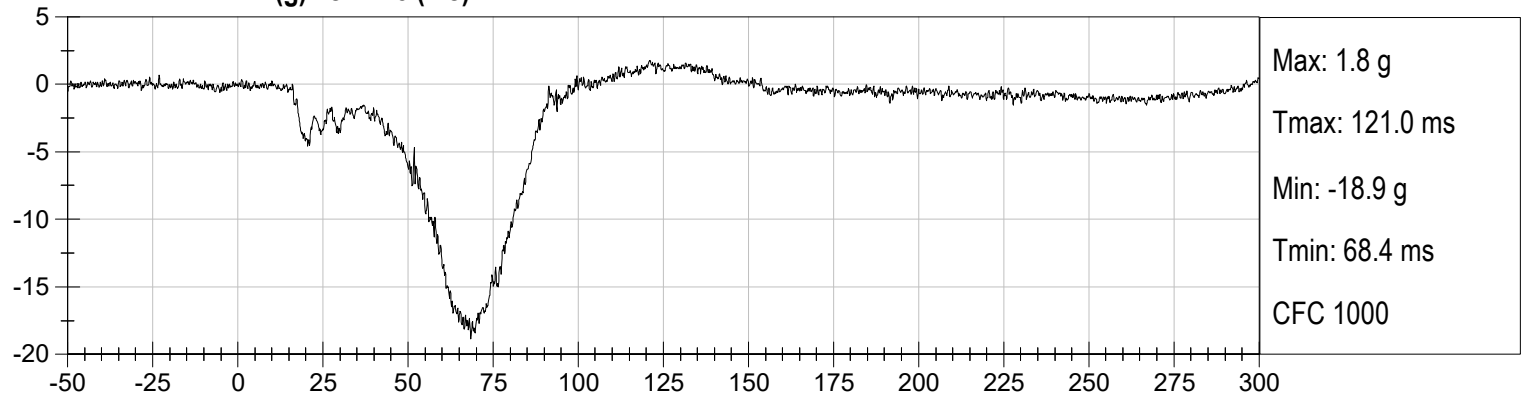
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

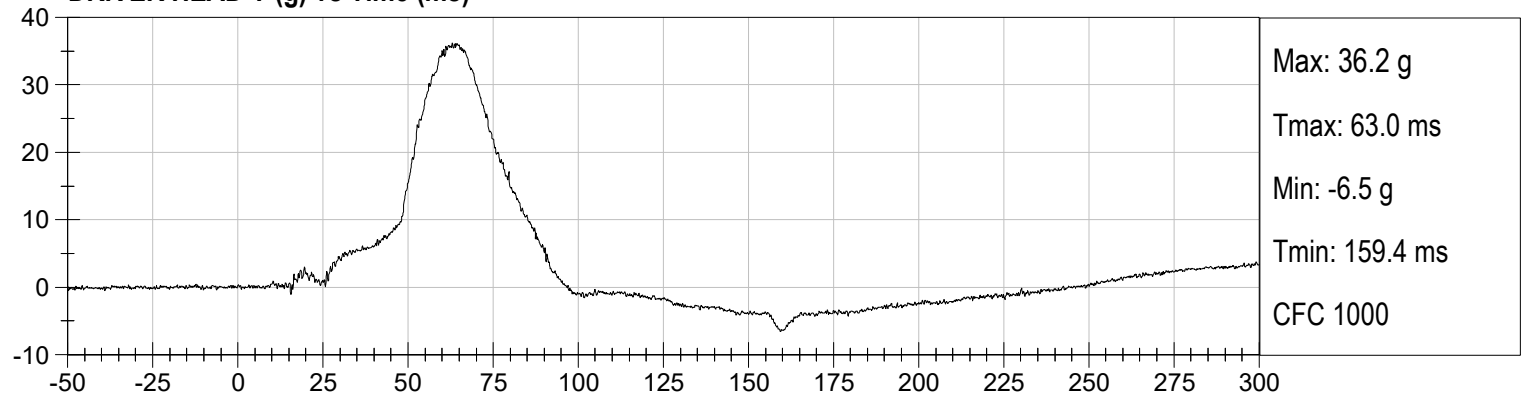
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

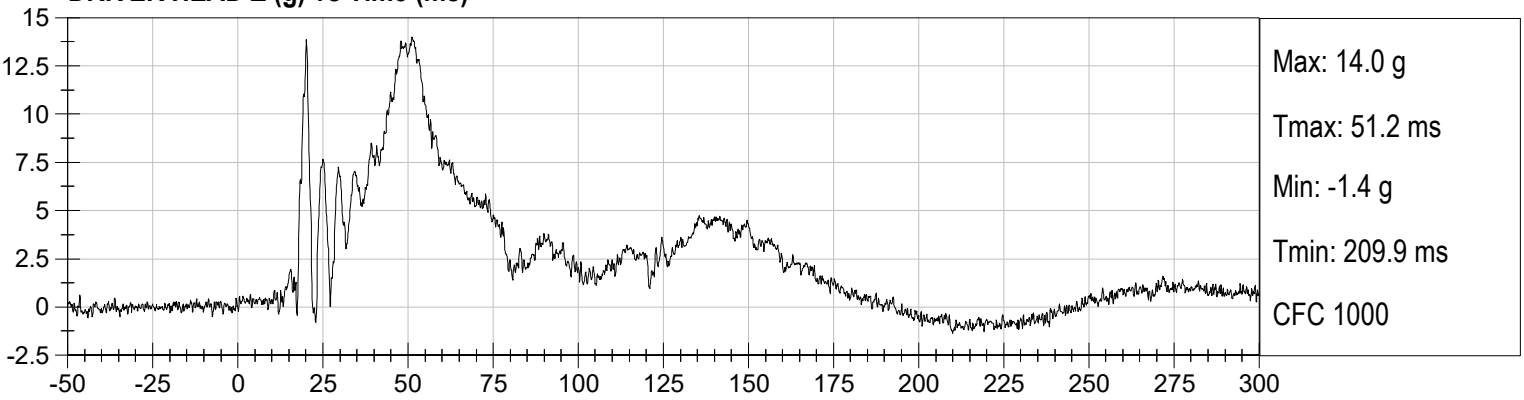
DRIVER HEAD X (g) vs Time (ms)



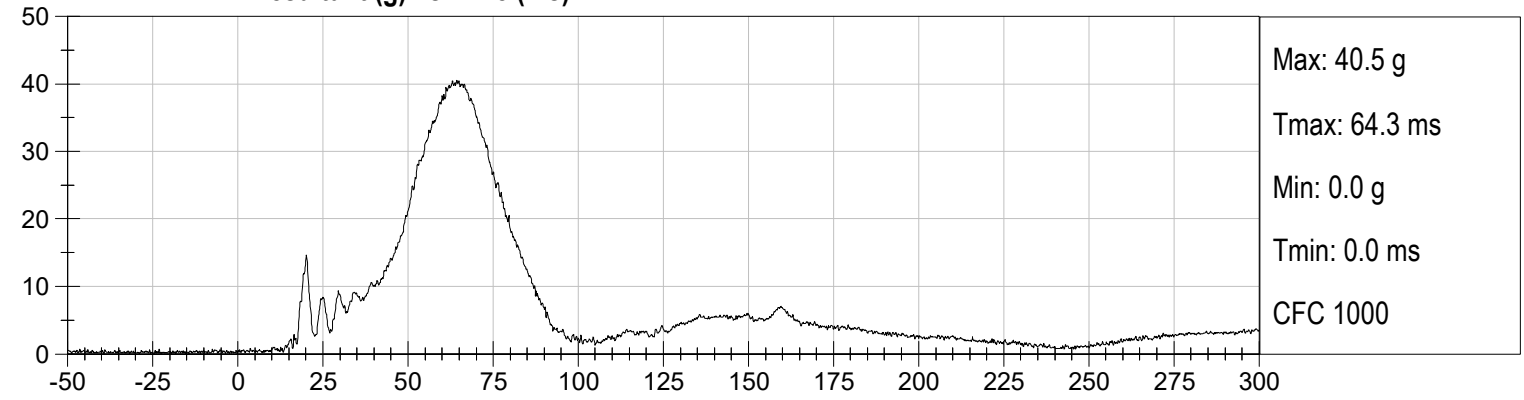
DRIVER HEAD Y (g) vs Time (ms)



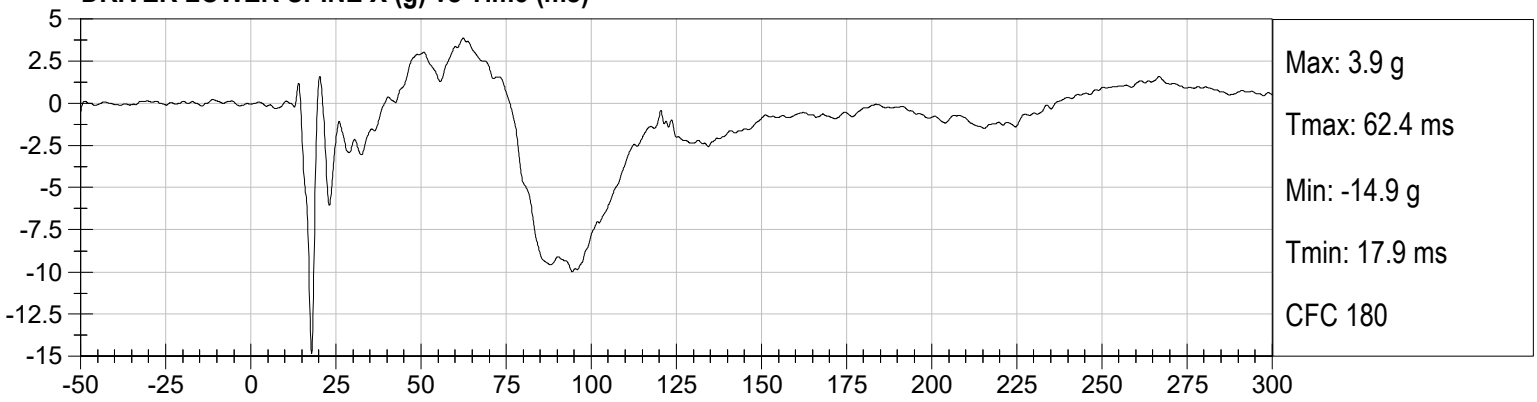
DRIVER HEAD Z (g) vs Time (ms)



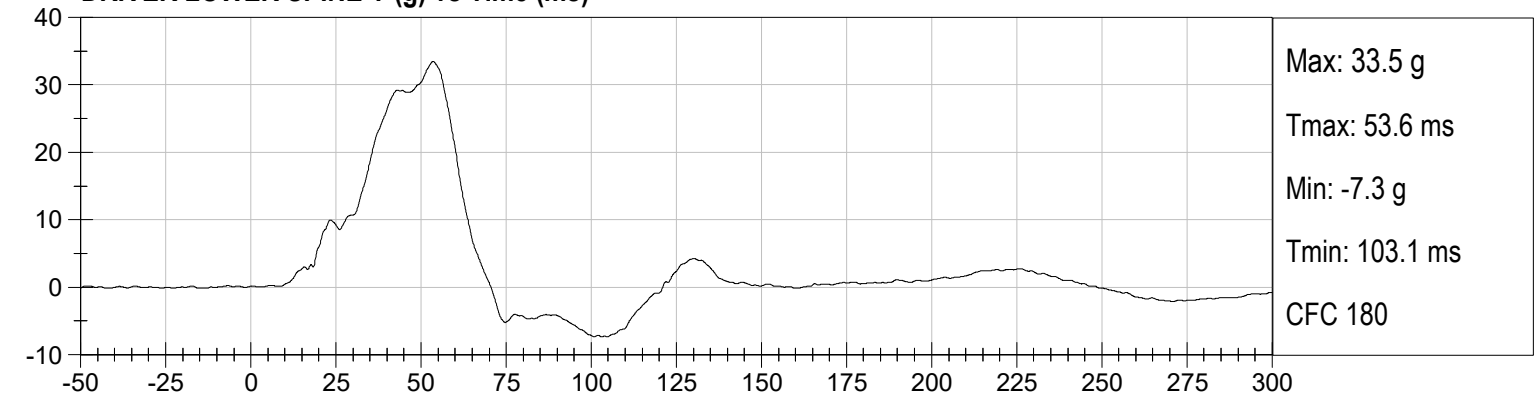
DRIVER HEAD Resultant (g) vs Time (ms)



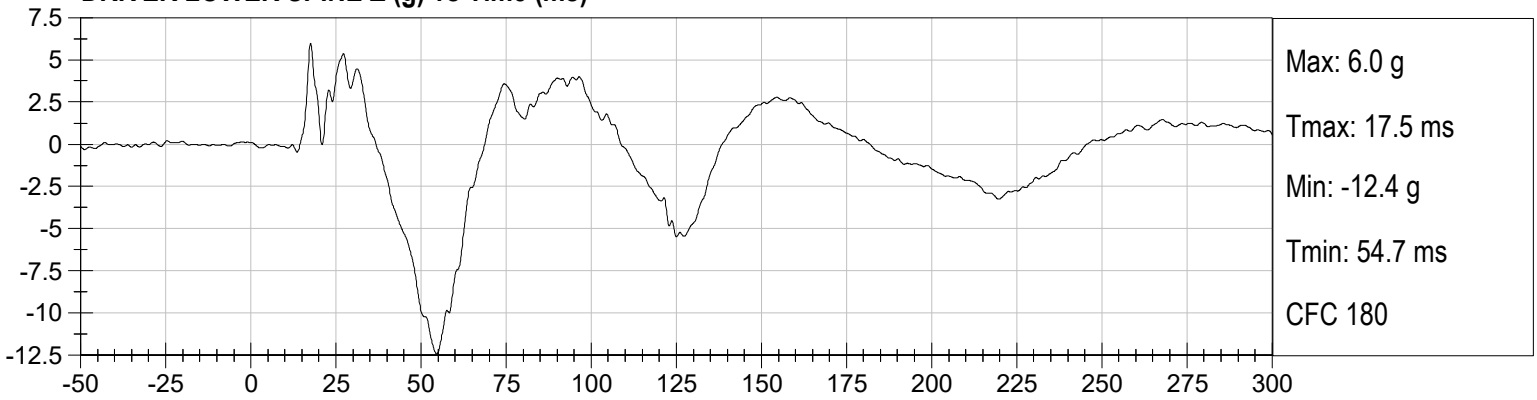
DRIVER LOWER SPINE X (g) vs Time (ms)



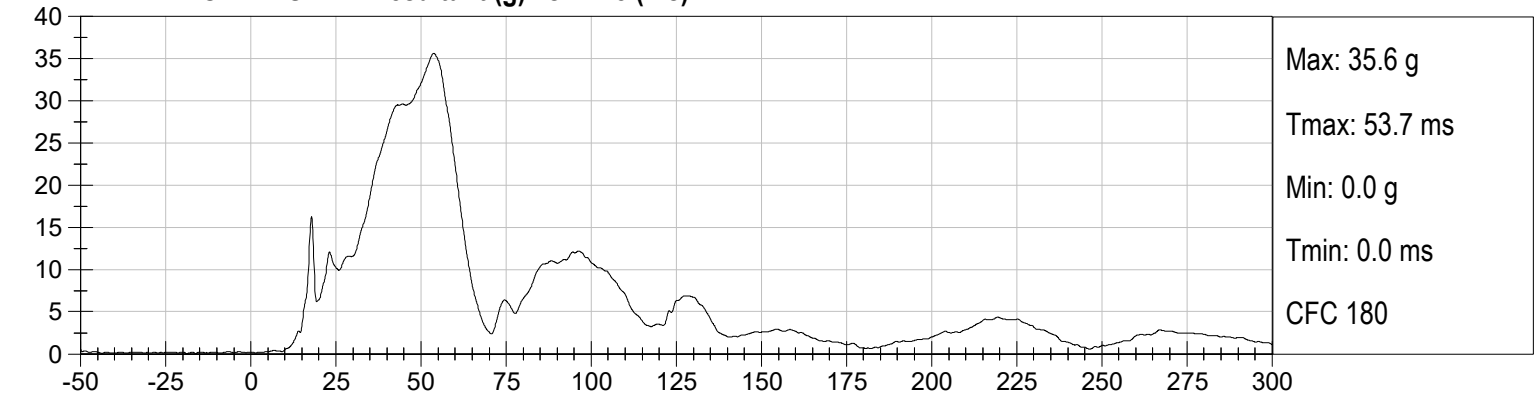
DRIVER LOWER SPINE Y (g) vs Time (ms)



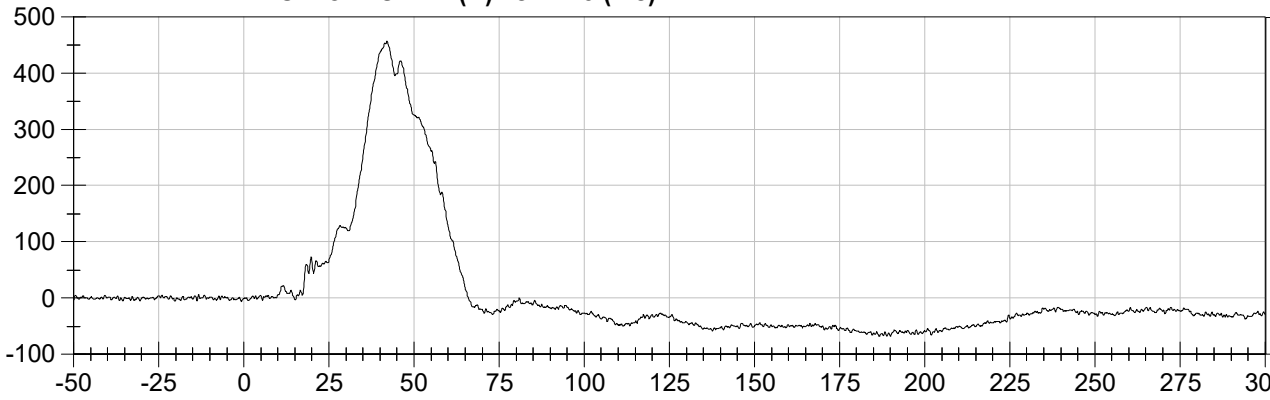
DRIVER LOWER SPINE Z (g) vs Time (ms)



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

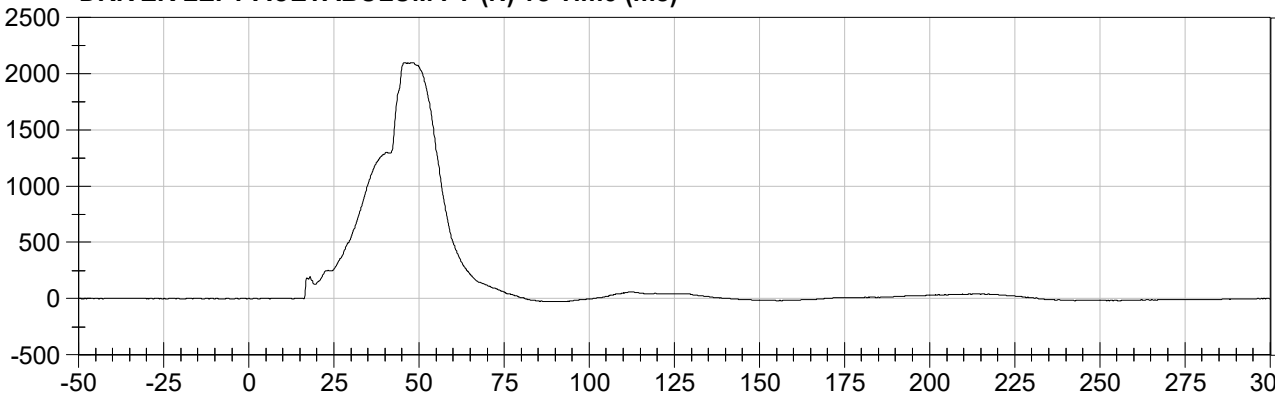


DRIVER LEFT ILIUM CREST FY (N) vs Time (ms)



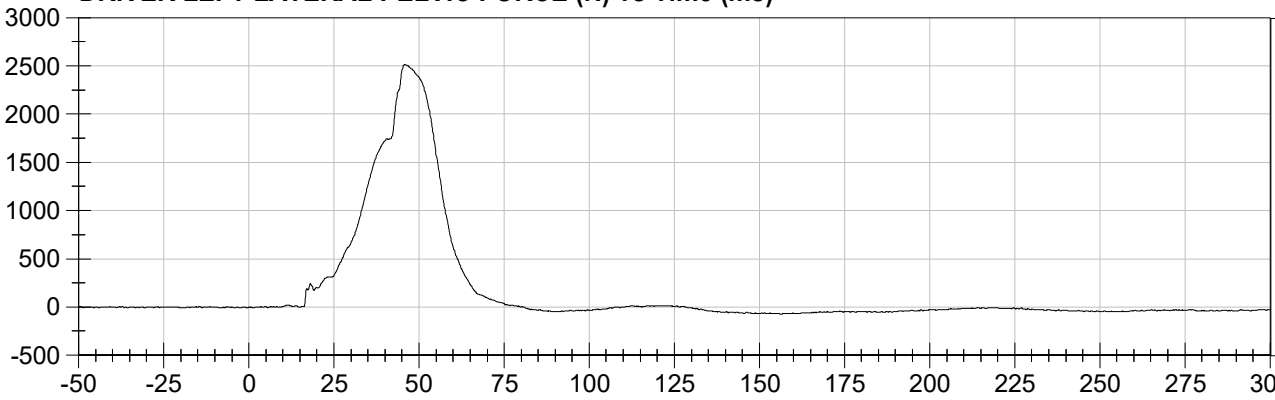
Max: 456.4 N
Tmax: 42.0 ms
Min: -68.1 N
Tmin: 186.7 ms
CFC 600

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



Max: 2095.9 N
Tmax: 45.6 ms
Min: -29.4 N
Tmin: 89.1 ms
CFC 600

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



Max: 2514.8 N
Tmax: 45.8 ms
Min: -72.4 N
Tmin: 156.5 ms
CFC 600

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 306

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

MGA RESEARCH CORPORATION

HEAD DROP TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D201611

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	115 to 137	129	Pass
Peak Longitudinal Acceleration	G's	+/- 15	7.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
		Overall Test Results		Pass

Gerald Guerrero
Laboratory Technician

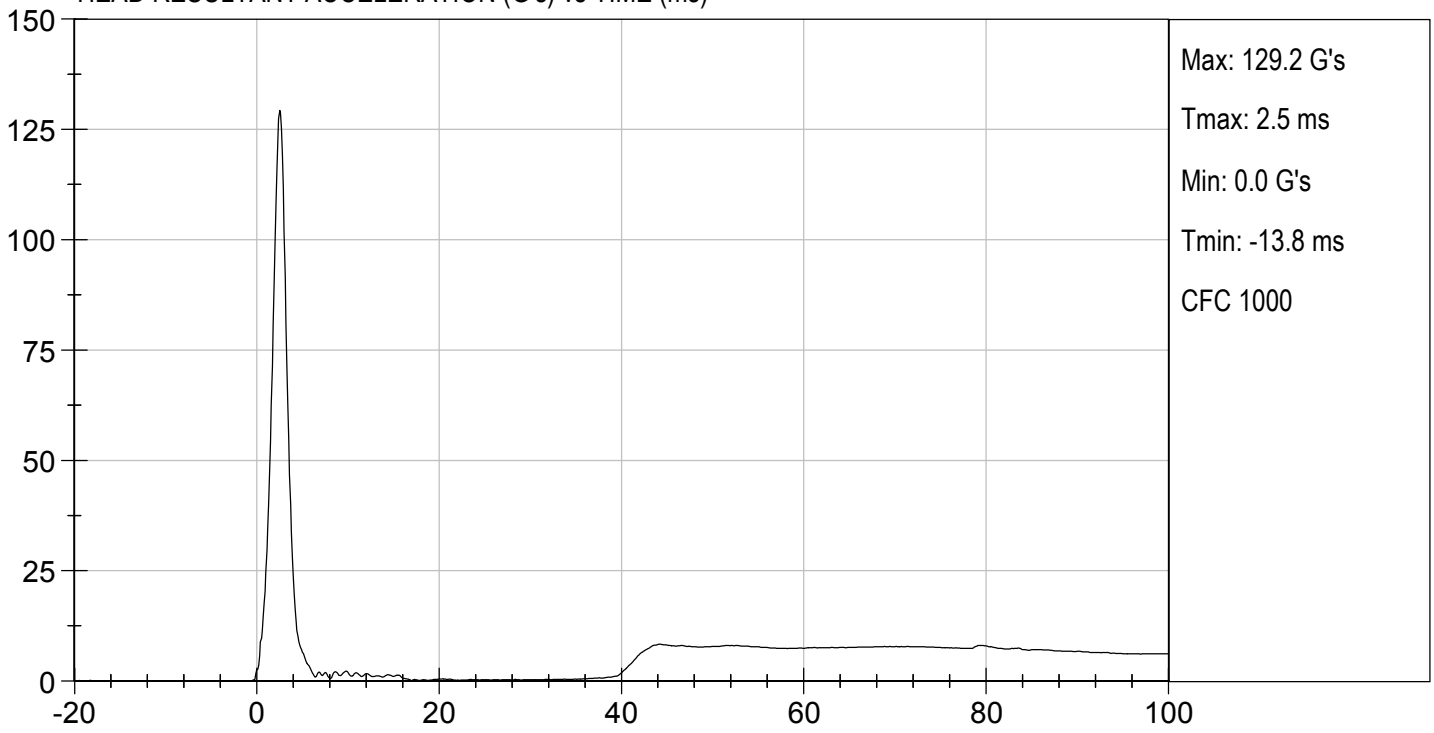
06/24/2020
Test Date

Approved By

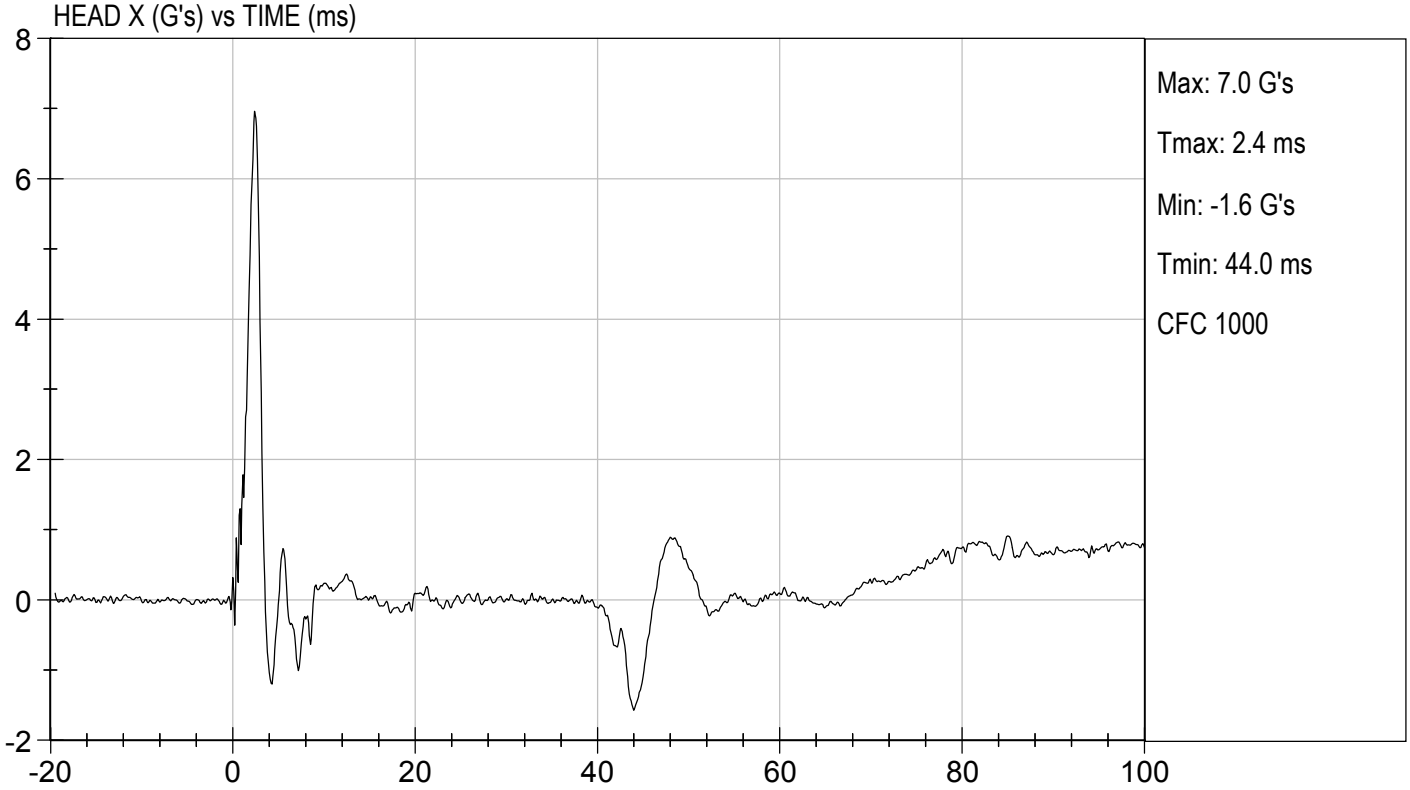
TEST DESC: HEAD DROP

TEST DATE: 06/24/2020
TEST #: D201611

HEAD RESULTANT ACCELERATION (G's) vs TIME (ms)



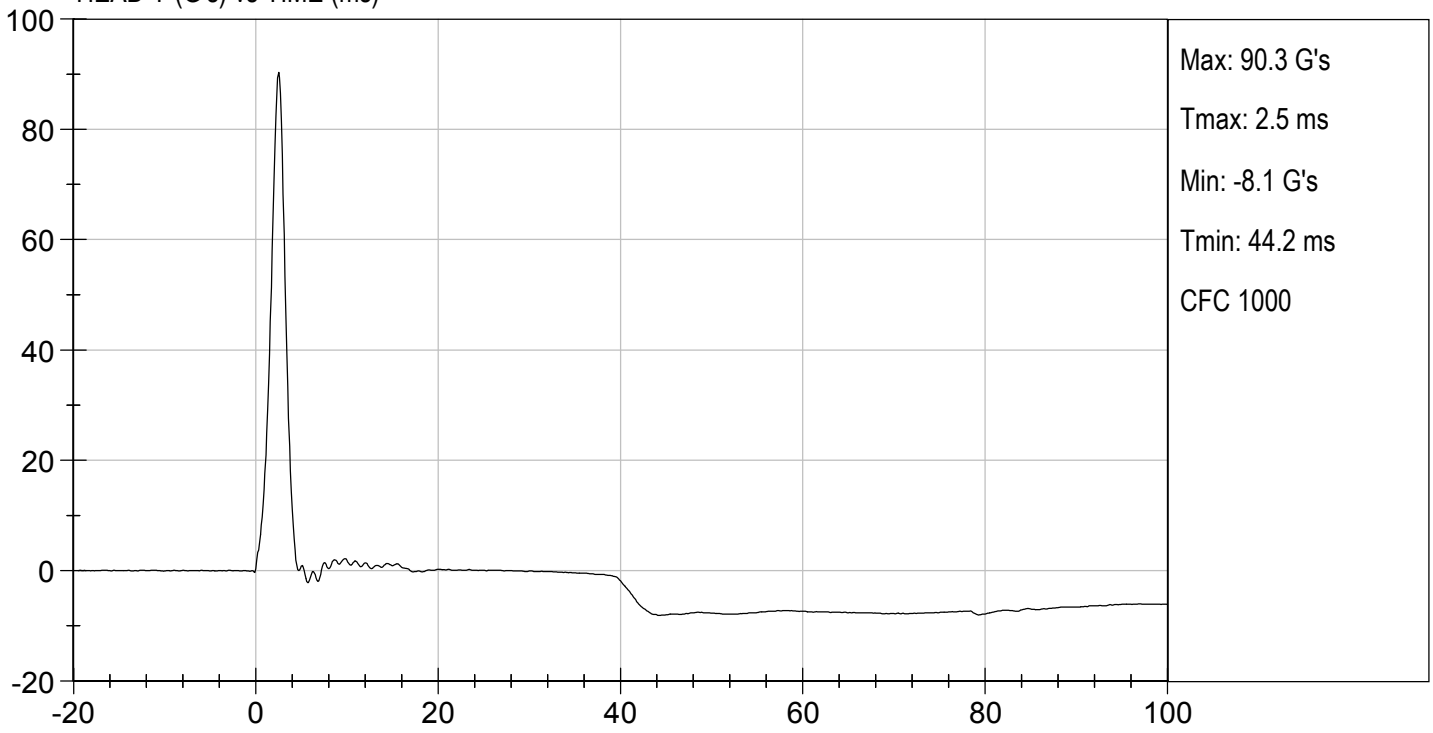
HEAD X (G's) vs TIME (ms)



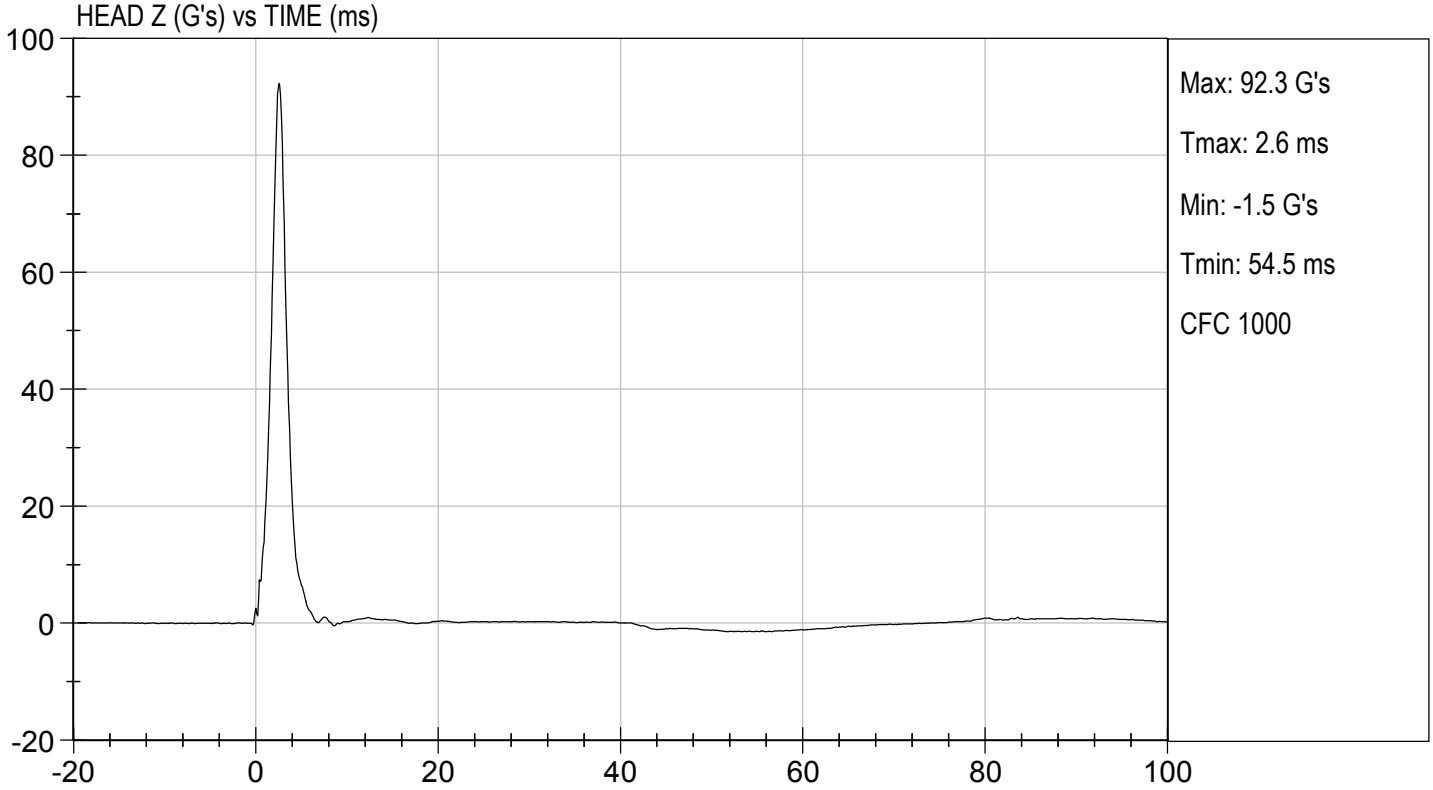
TEST DESC: HEAD DROP

TEST DATE: 06/24/2020
TEST #: D201611

HEAD Y (G's) vs TIME (ms)



HEAD Z (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

LATERAL NECK PENDULUM TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201612

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	22.2	Pass
Humidity		%	10 to 70	38	Pass
Impact Velocity		m/s	5.51 to 5.63	5.63	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.55	Pass
	15 ms	m/s	3.30 to 4.10	3.73	Pass
	20 ms	m/s	4.40 to 5.40	5.15	Pass
	25 ms	m/s	5.40 to 6.10	5.60	Pass
	25-100 ms	m/s	5.50 to 6.20	5.61	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	67	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-39	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	117	Pass
			Overall Test Results		Pass

Gerald Guerrero
Laboratory Technician

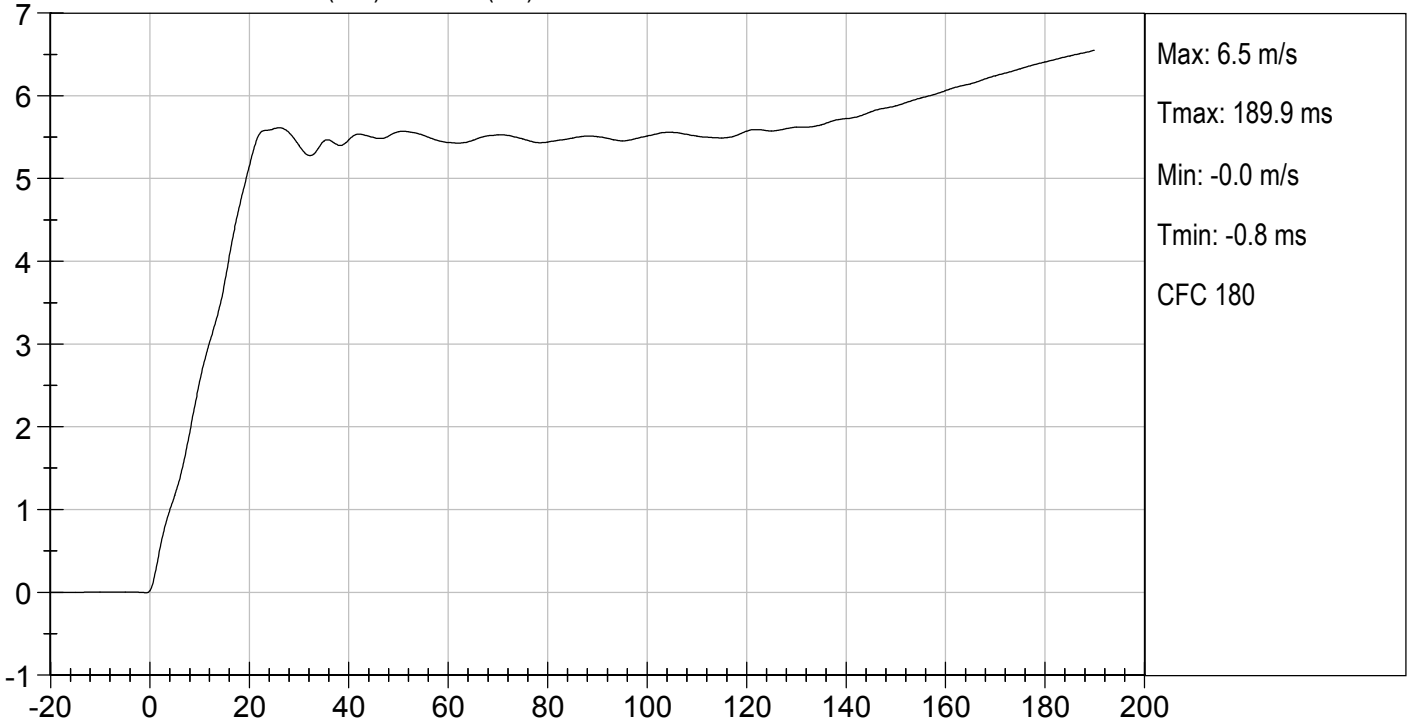
06/25/2020
Test Date

Approved By

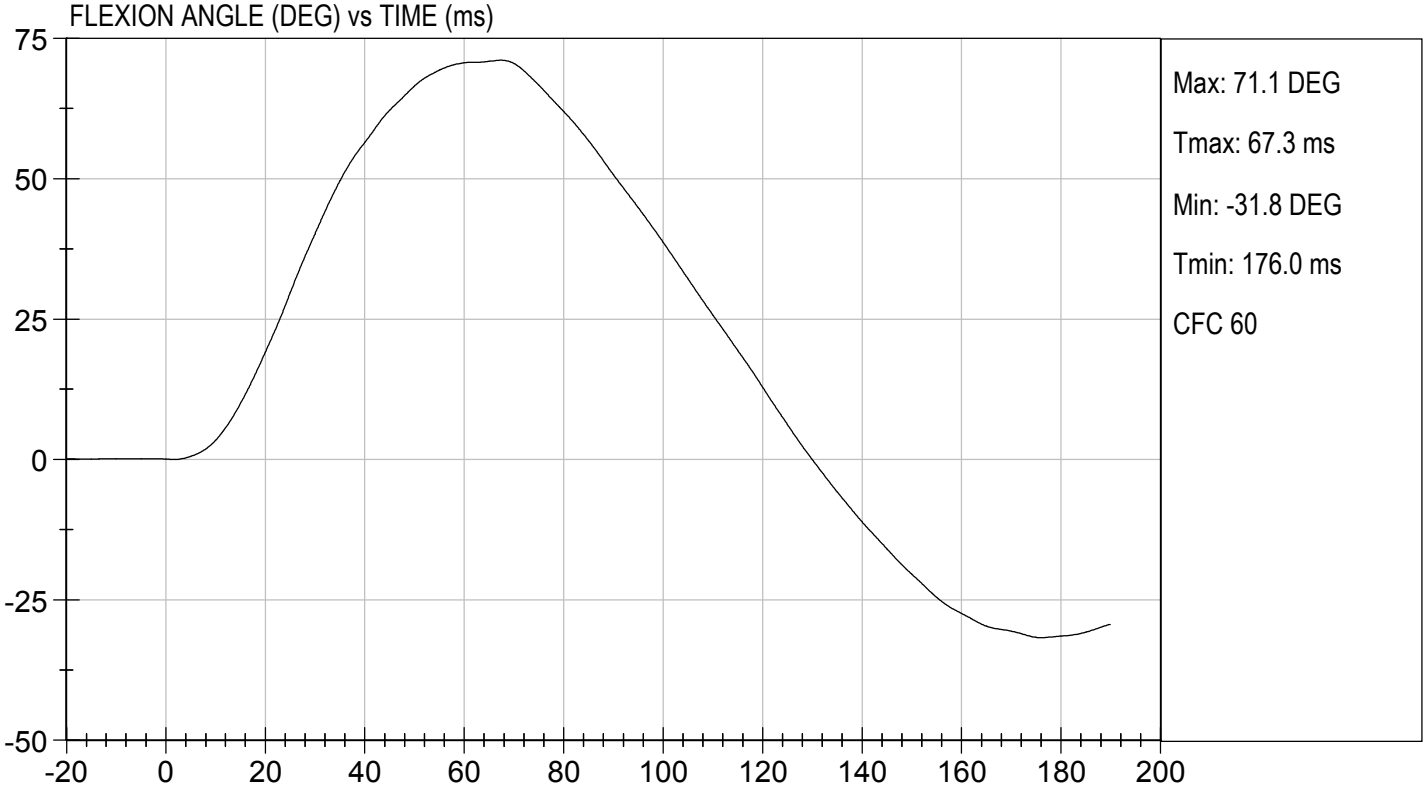
TEST DESC: NECK BENDING
VELOCITY: 18.48 ft/s, 5.63 m/s

TEST DATE: 06/25/2020
TEST #: D201612

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

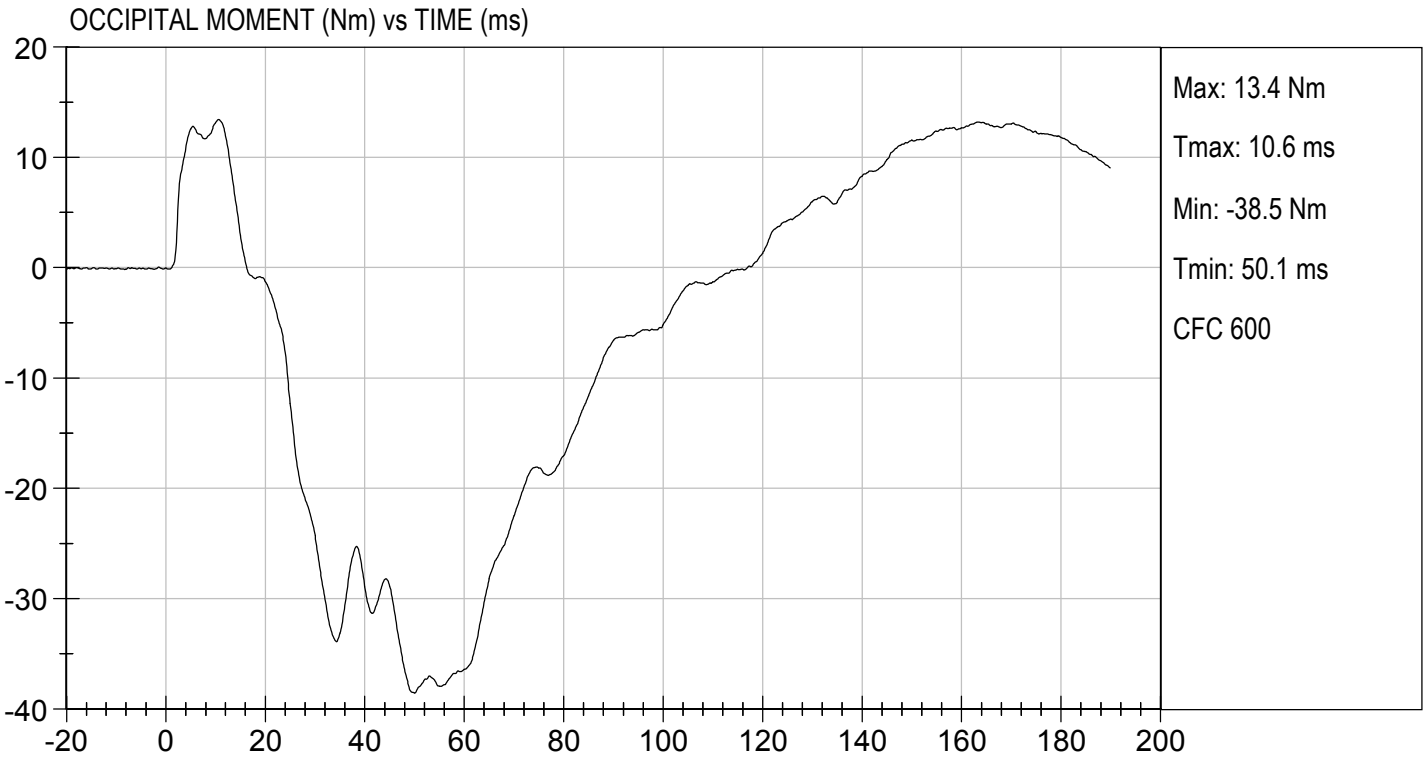


FLEXION ANGLE (DEG) vs TIME (ms)



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

TEST DATE: 06/25/2020
TEST #: D201612



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D201613

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	13 to 18	14	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
		Overall Test Results		Pass

Gerald Guerrero
Laboratory Technician

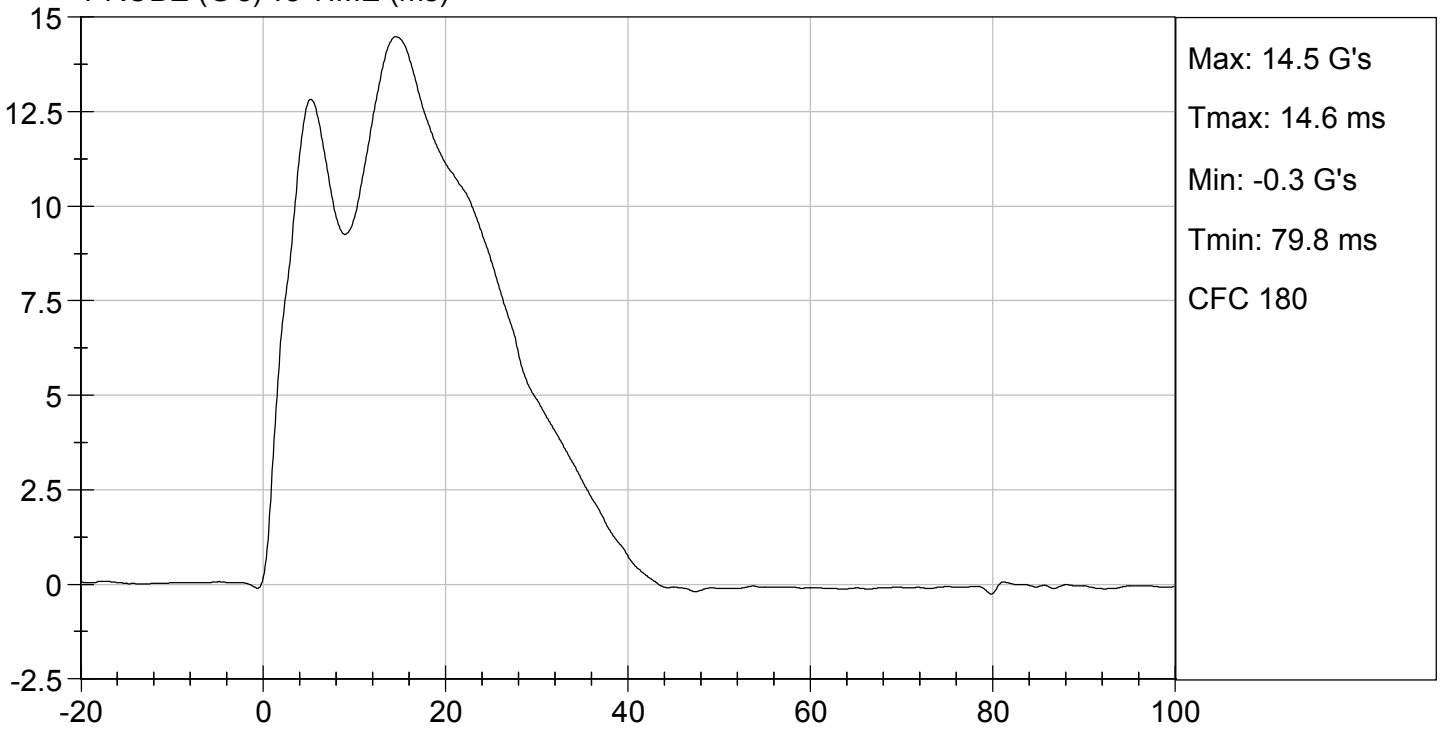
06/29/2020
Test Date

Approved By

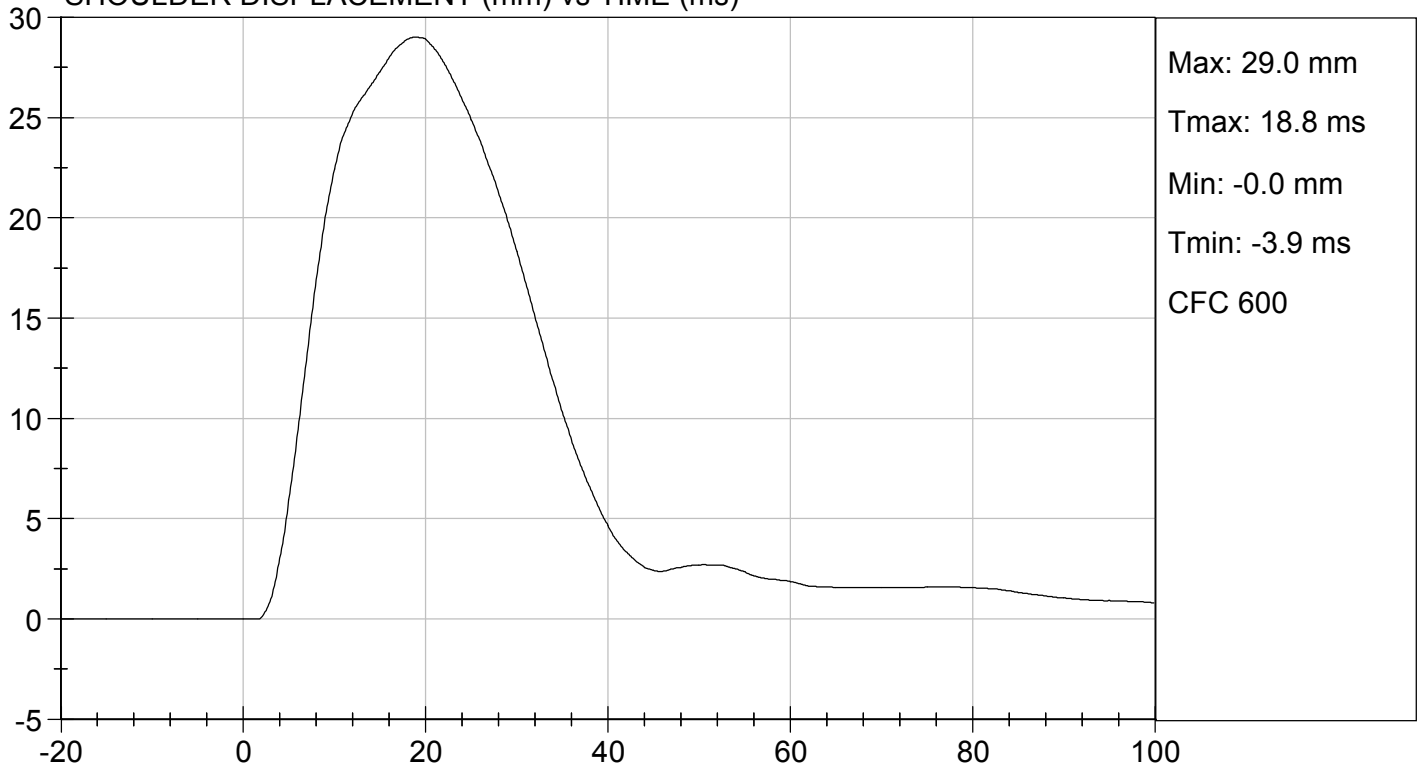
TEST DESC: SHOULDER IMPACT
VELOCITY: 14.00 ft/s, 4.27 m/s

TEST DATE: 06/29/2020
TEST #: D201613

PROBE (G's) vs TIME (ms)

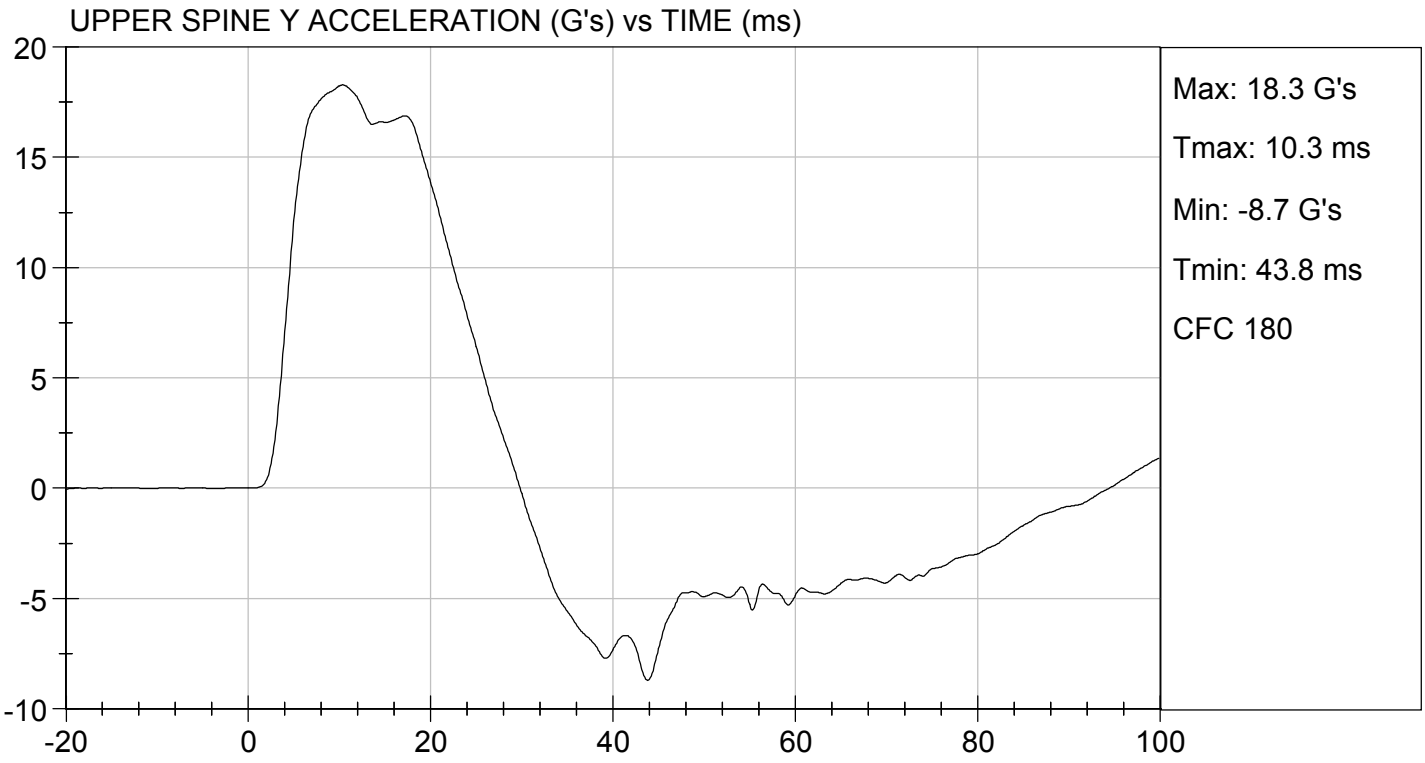


SHOULDER DISPLACEMENT (mm) vs TIME (ms)



TEST DESC: SHOULDER IMPACT
VELOCITY: 14.00 ft/s, 4.27 m/s

TEST DATE: 06/29/2020
TEST #: D201613



MGA RESEARCH CORPORATION

THORAX (WITH ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201614

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	44	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	39	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	30	Pass
		Overall Test Results		Pass

Laboratory Technician

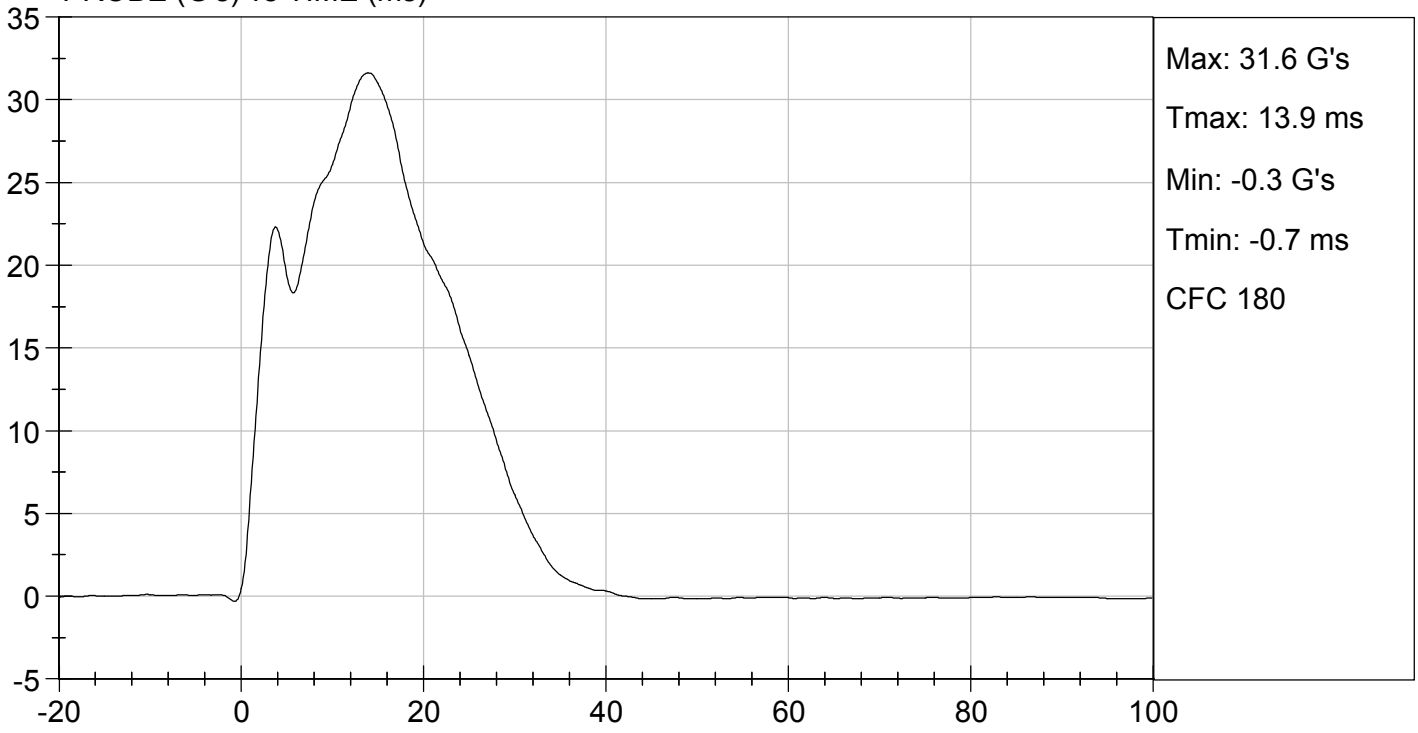
06/29/2020
Test Date

Approved By

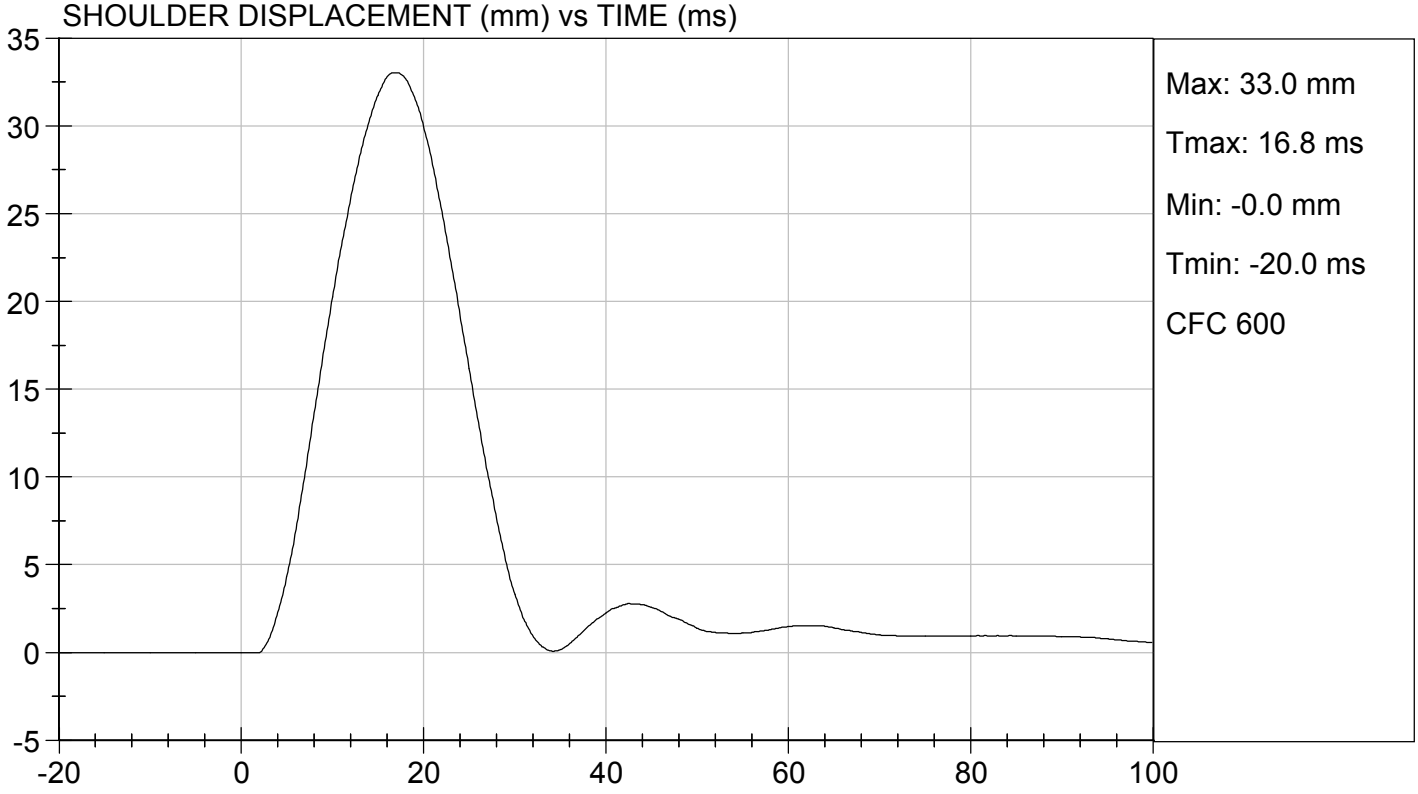
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 06/29/2020
TEST #: D201614

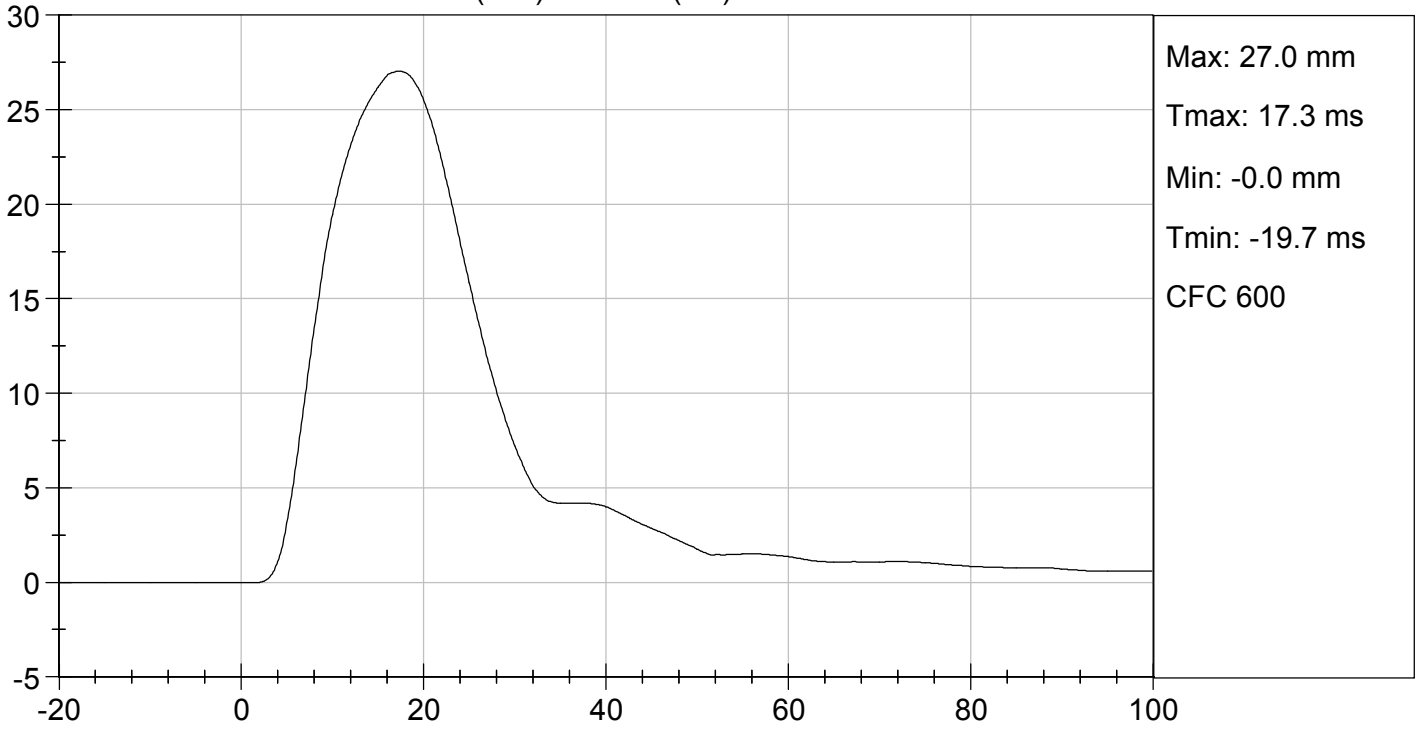
PROBE (G's) vs TIME (ms)



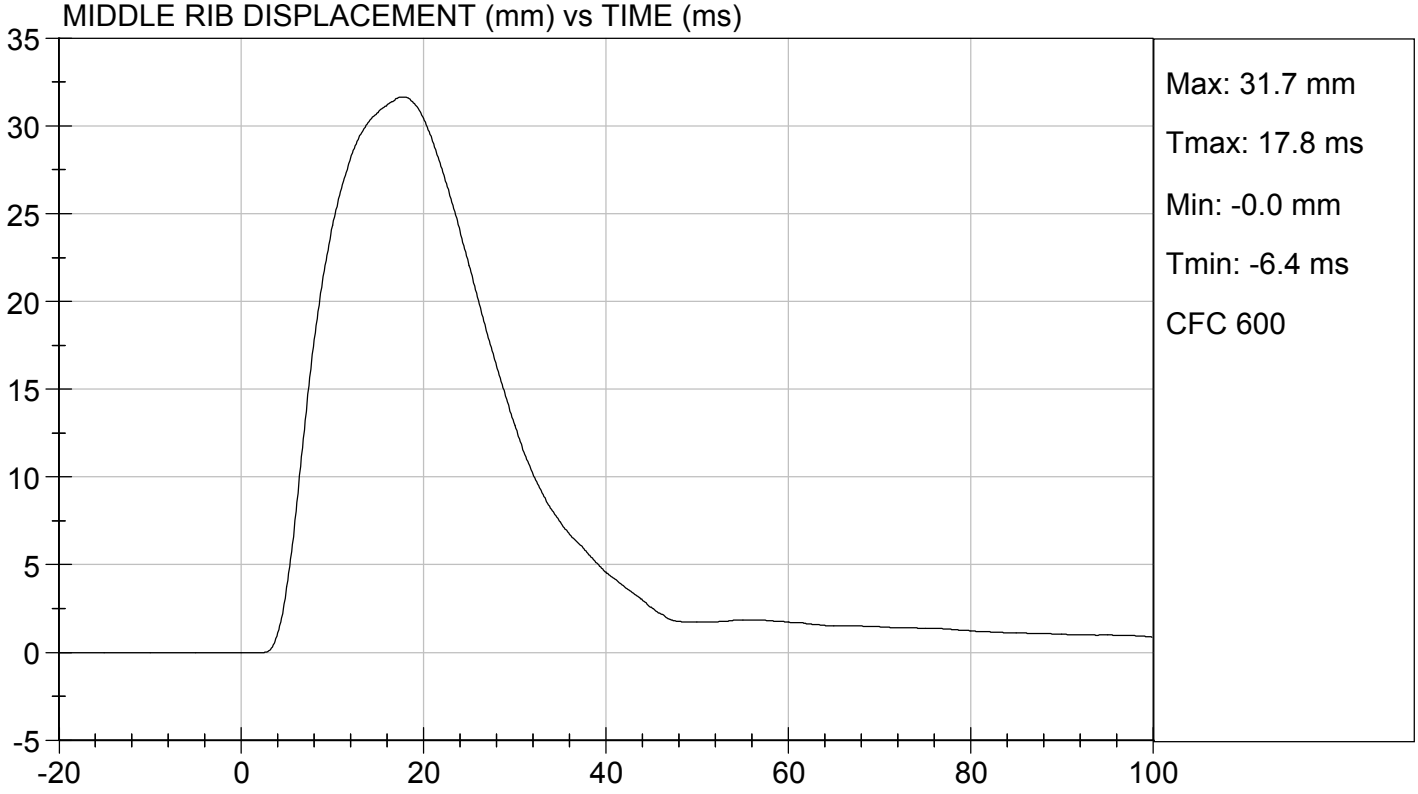
SHOULDER DISPLACEMENT (mm) vs TIME (ms)



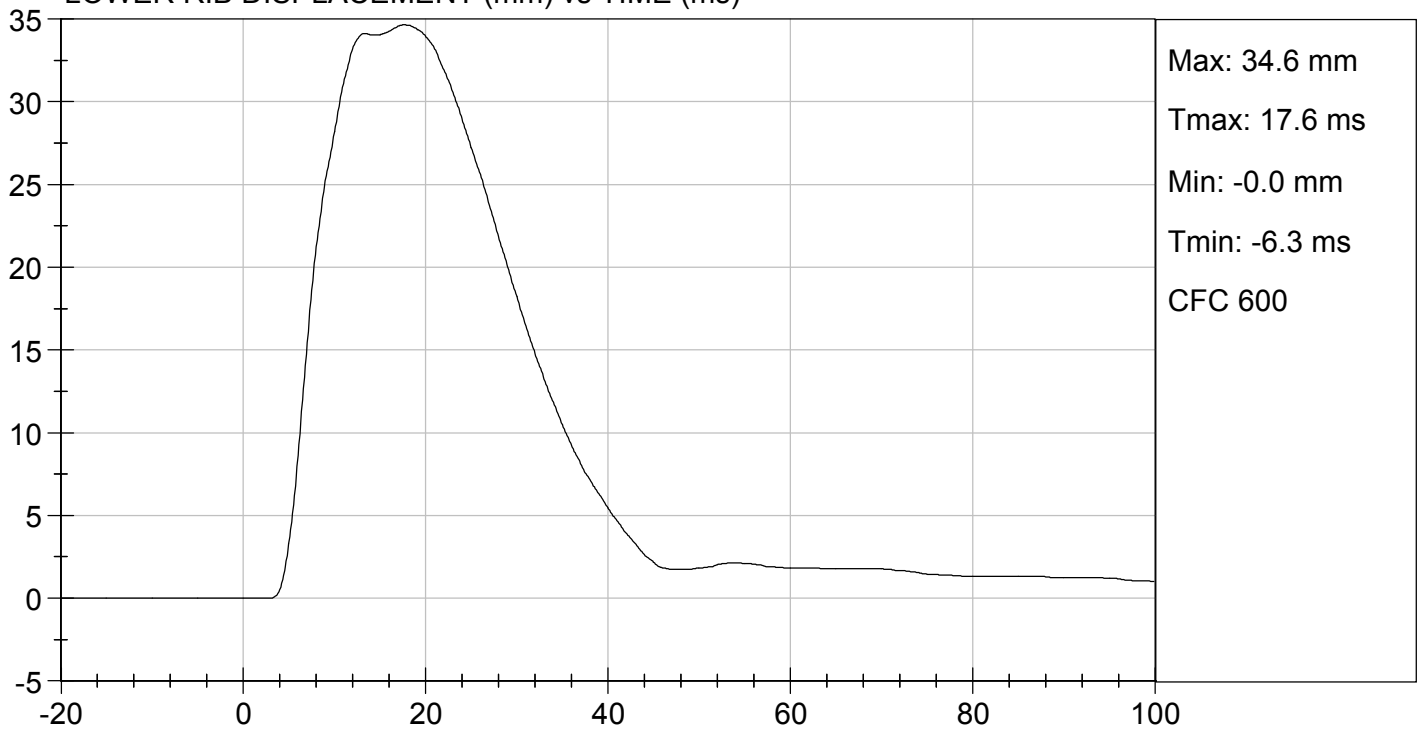
UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



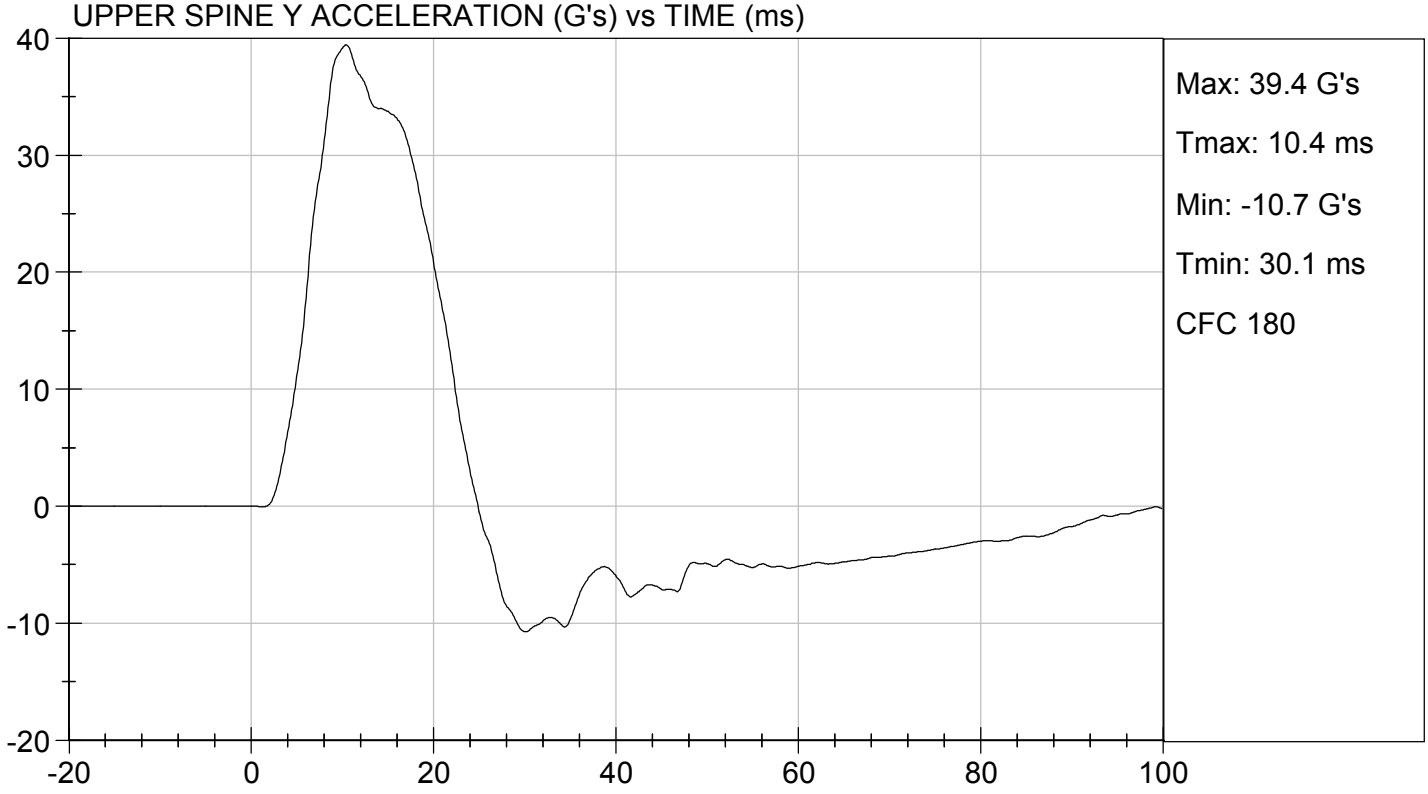
MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



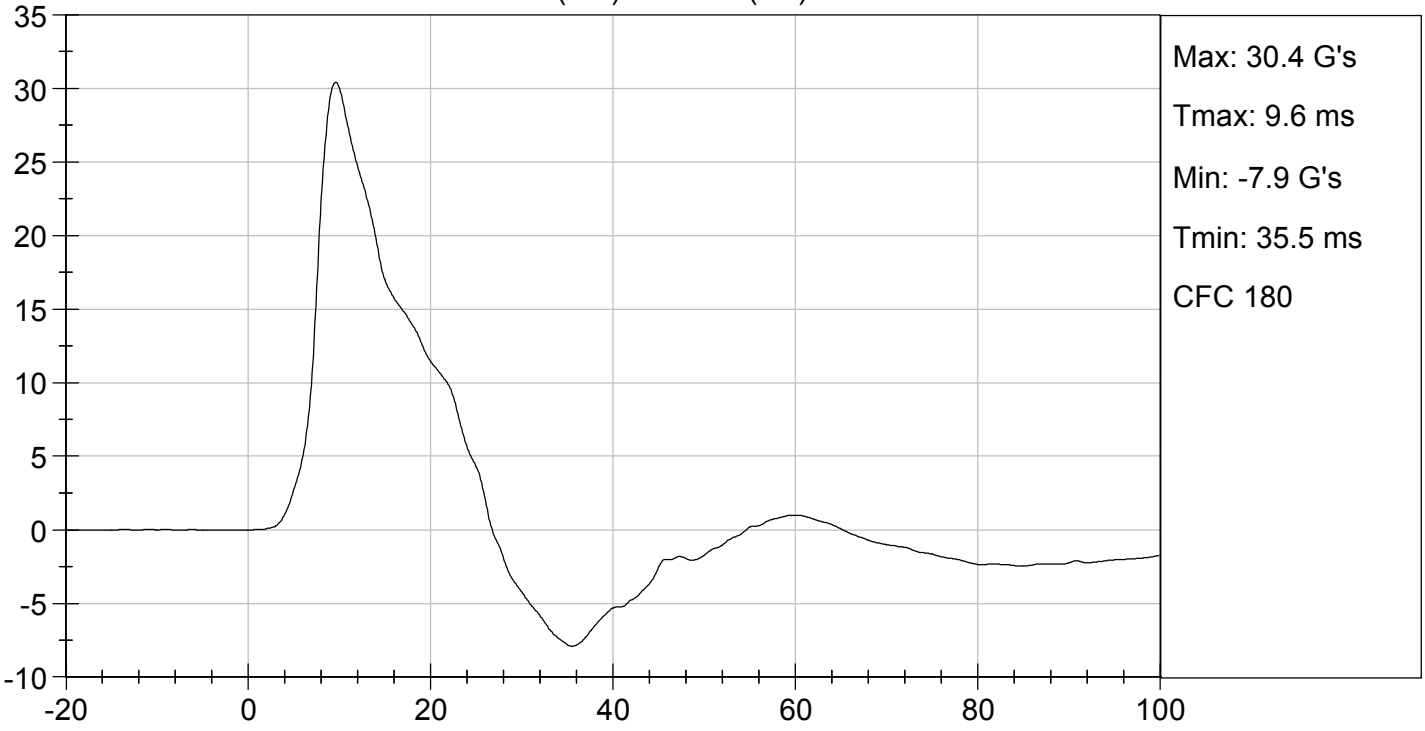
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



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

TEST DATE: 06/29/2020
TEST #: D201614

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



MGA RESEARCH CORPORATION

THORAX (WITHOUT ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201615

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	44	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	35	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
		Overall Test Results		Pass

Laboratory Technician

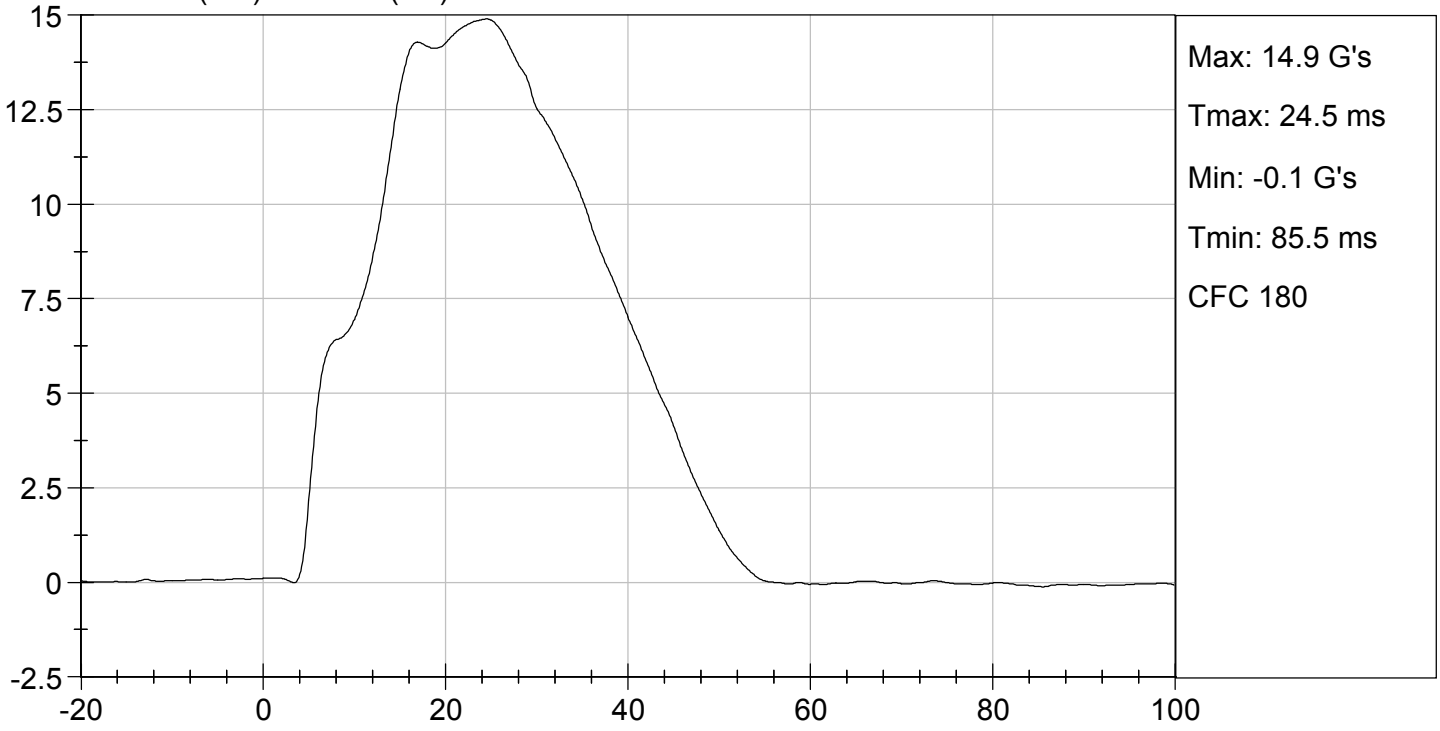
06/29/2020
Test Date

Approved By

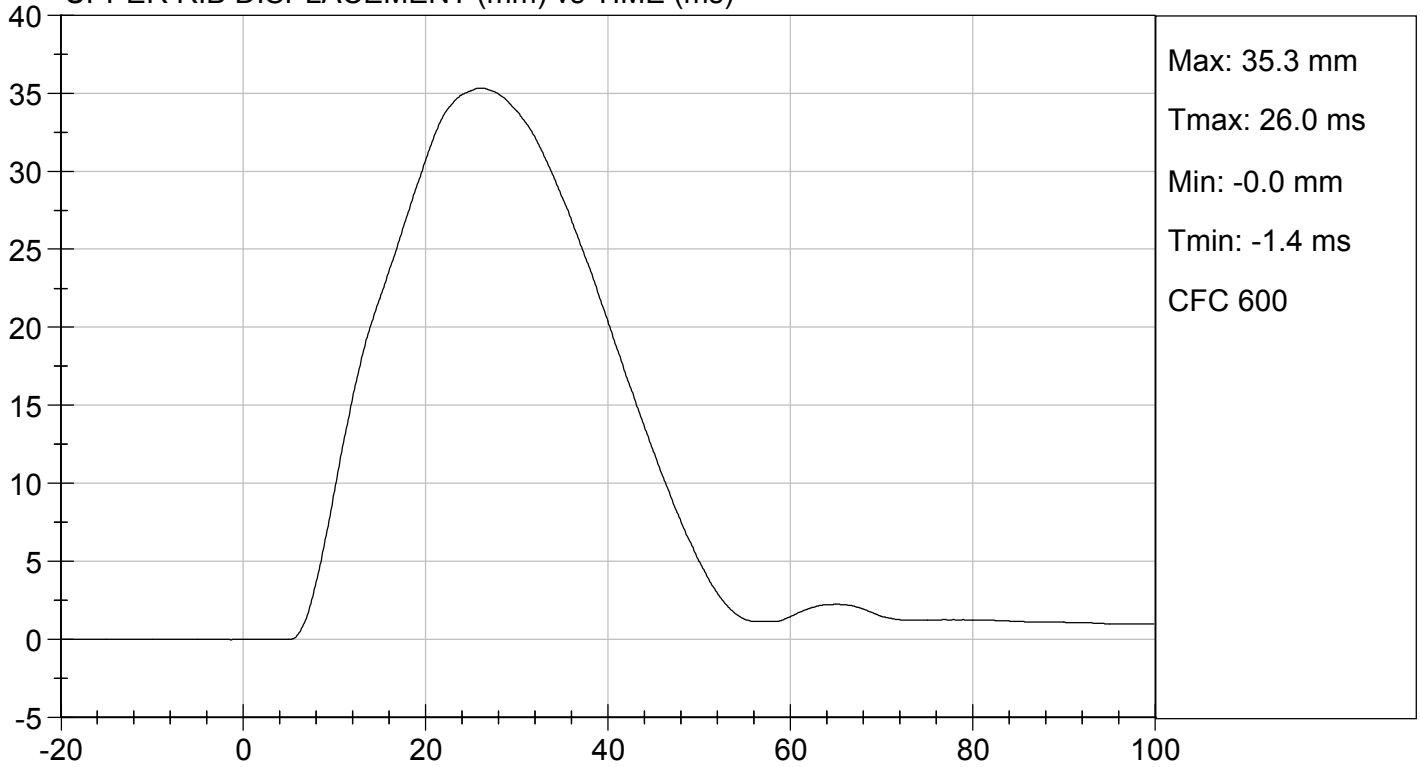
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 06/29/2020
TEST #: D201615

PROBE (G's) vs TIME (ms)



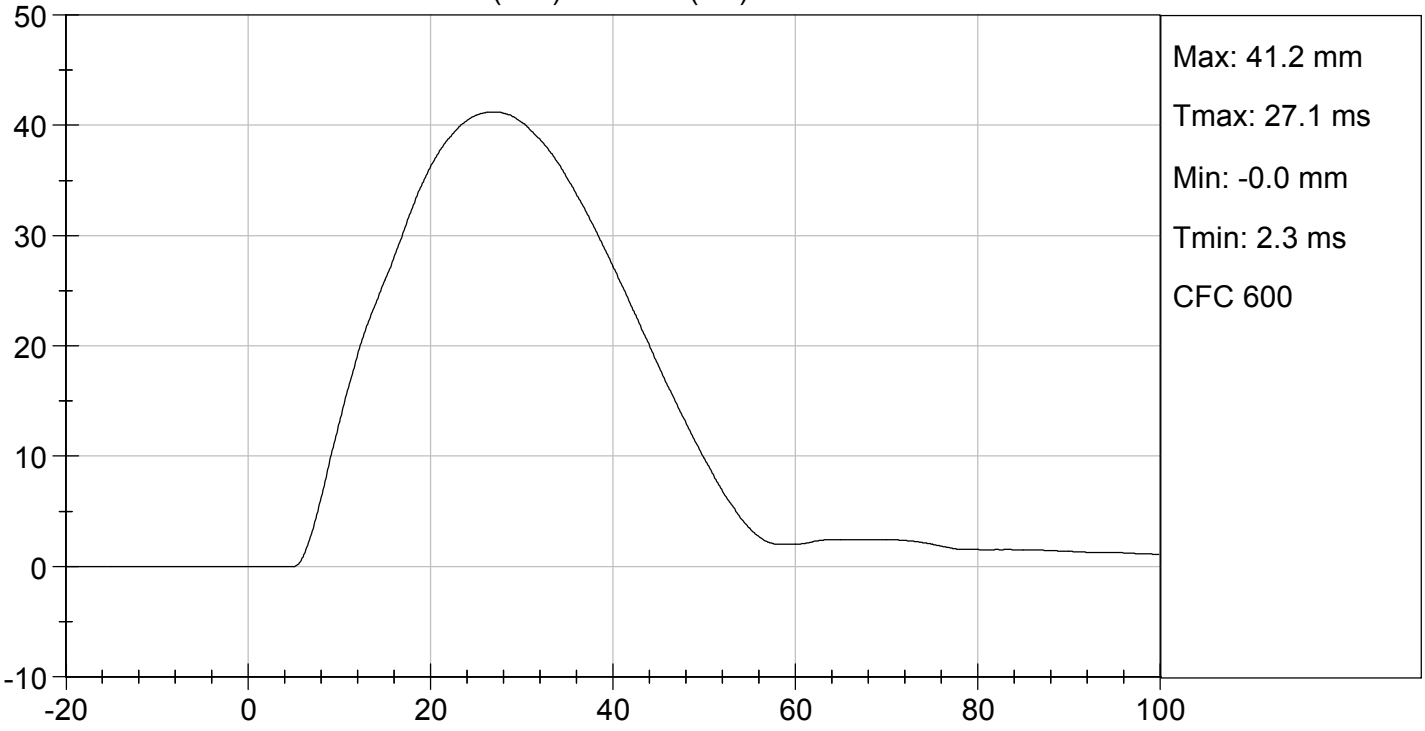
UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



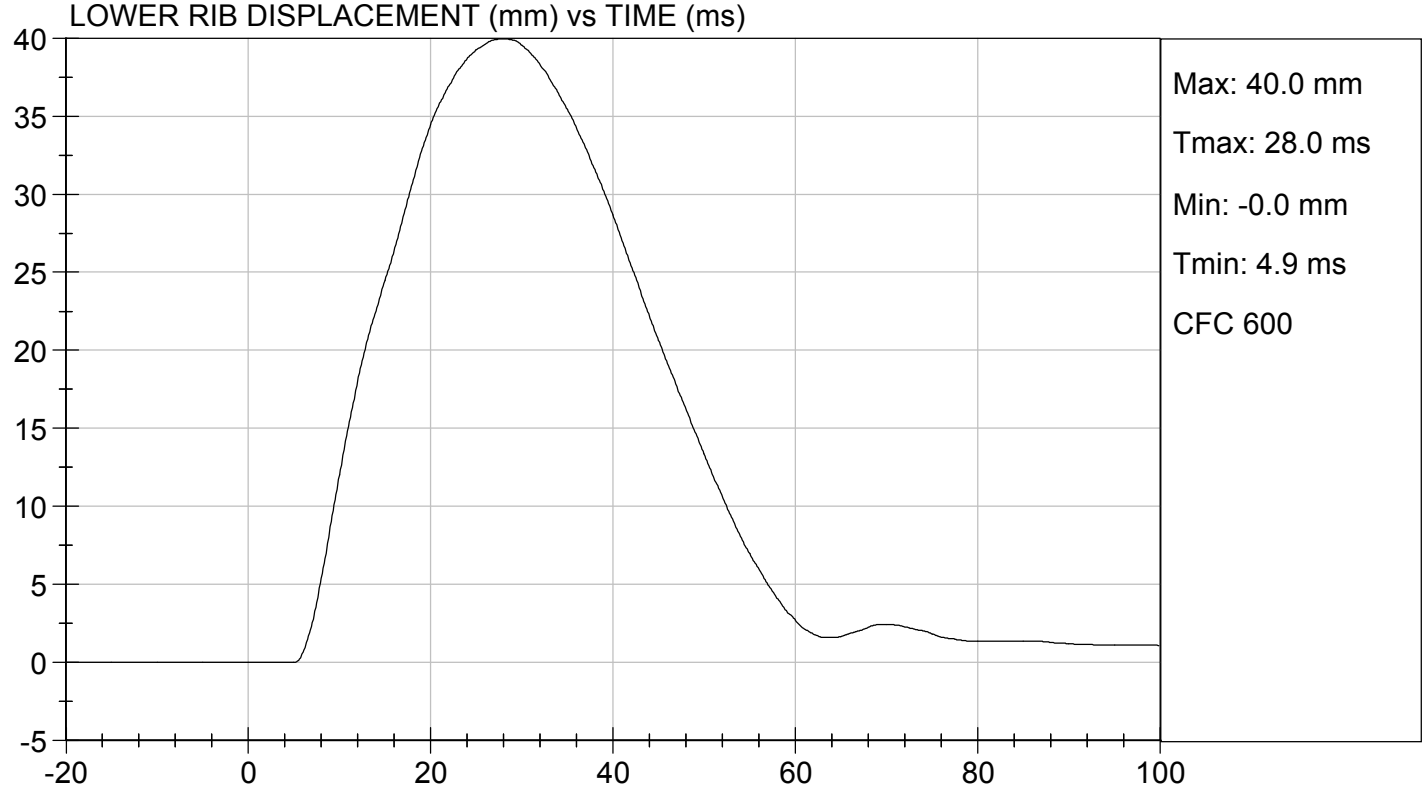
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 06/29/2020
TEST #: D201615

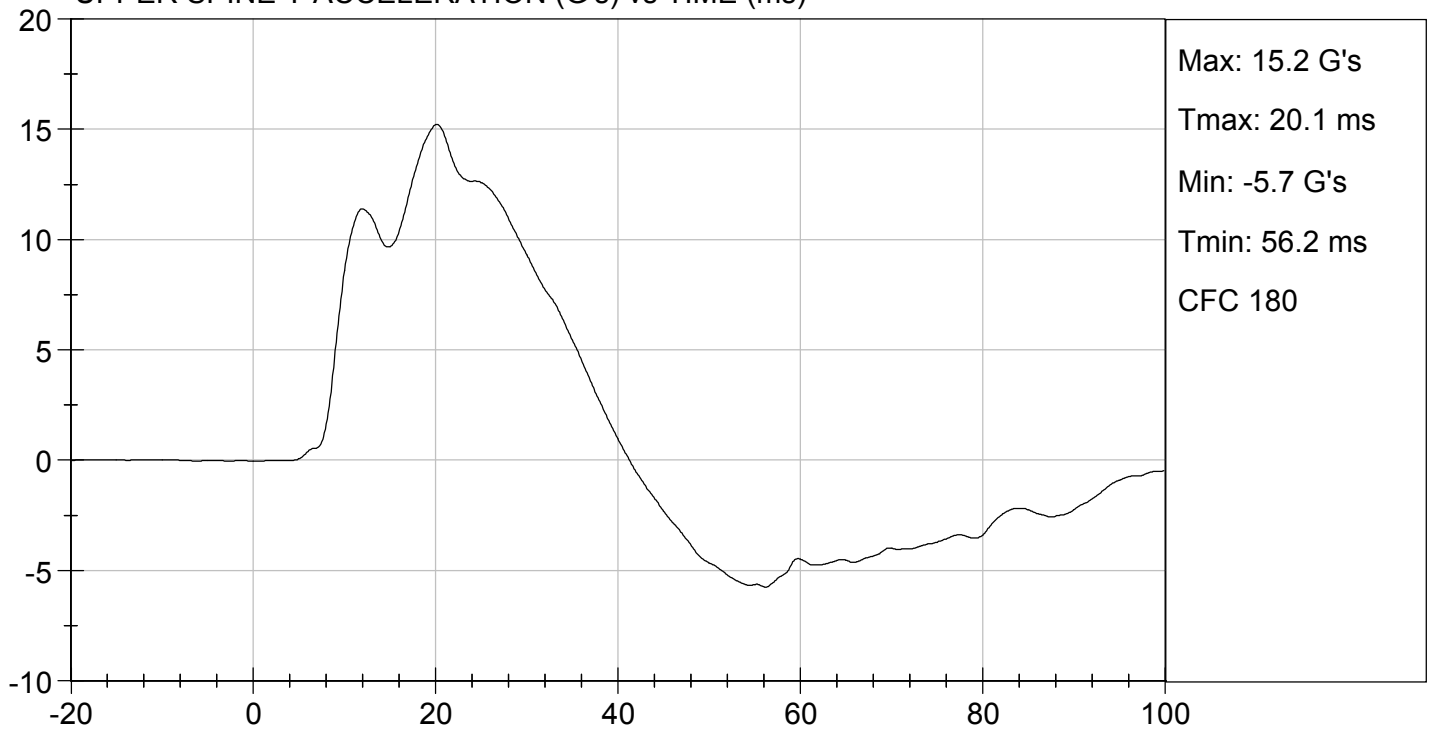
MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



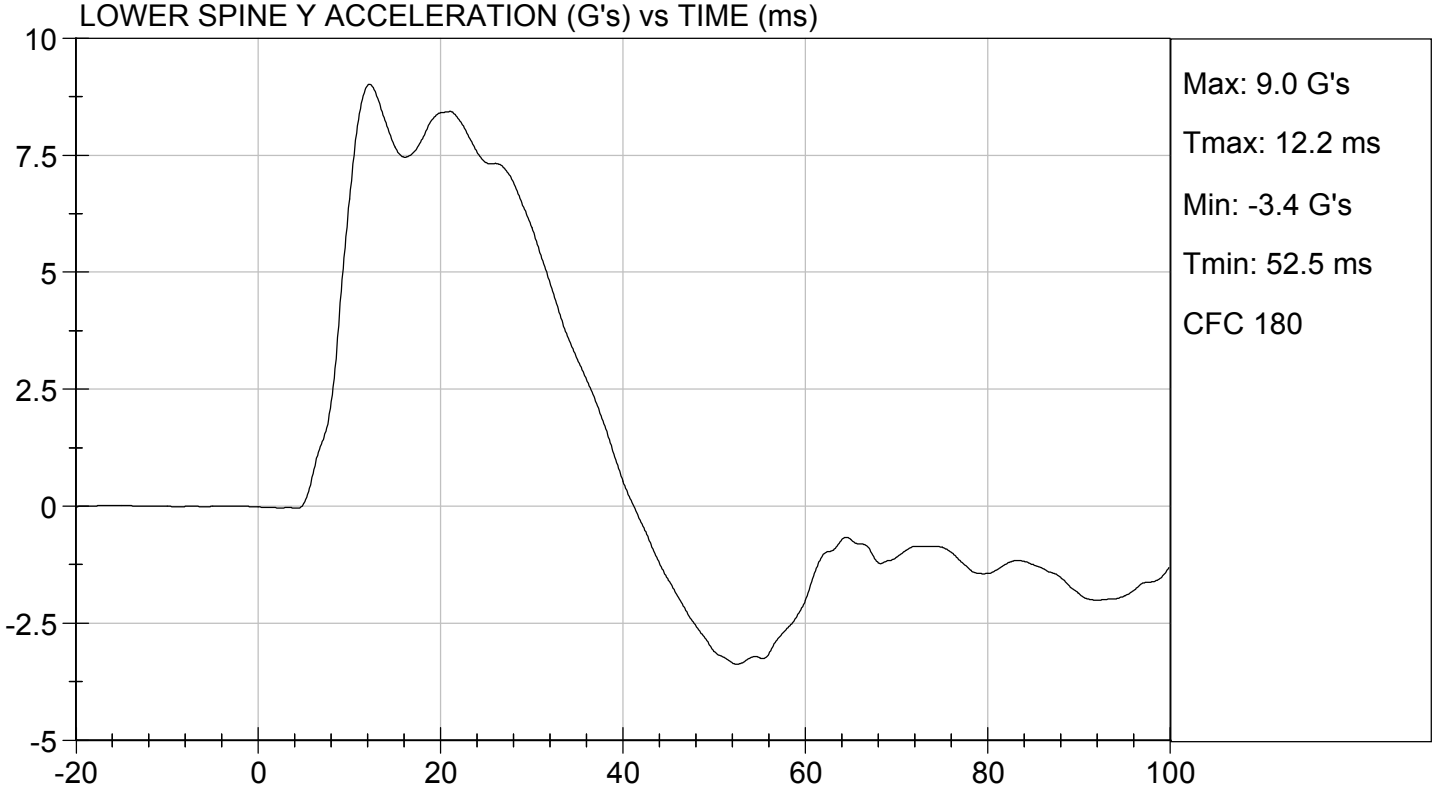
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



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



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



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201616

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	44	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	42	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
		Overall Test Results		Pass

Laboratory Technician

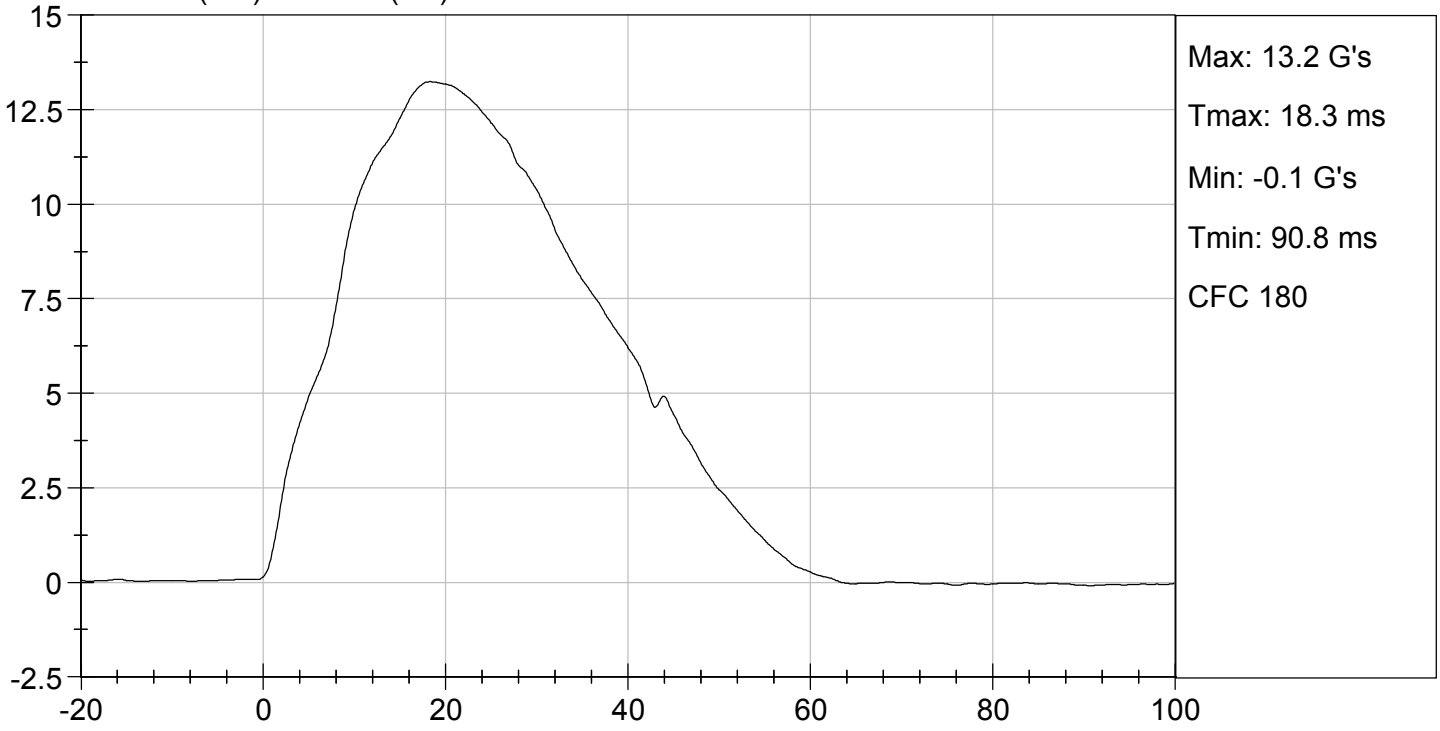
06/29/2020
Test Date

Approved By

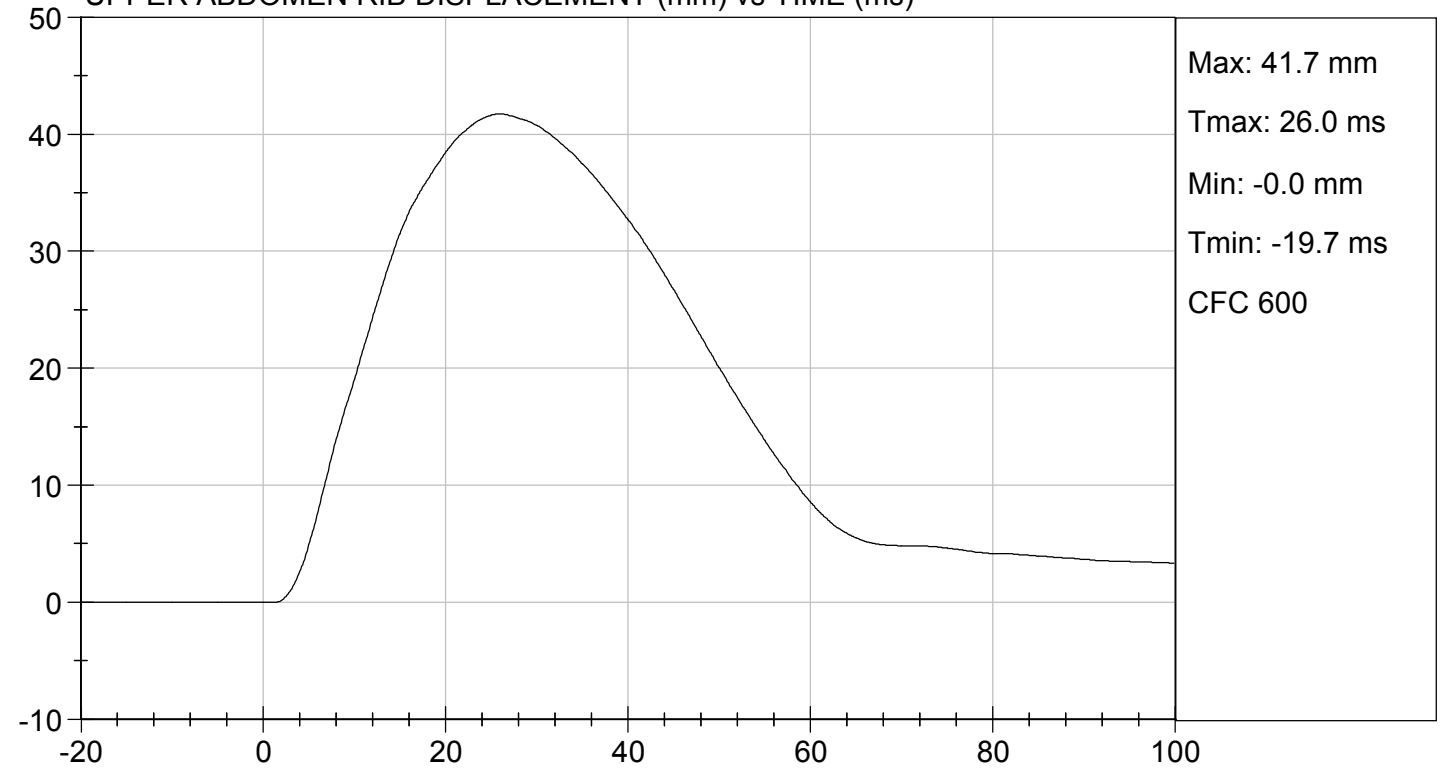
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 06/29/2020
TEST #: D201616

PROBE (G's) vs TIME (ms)



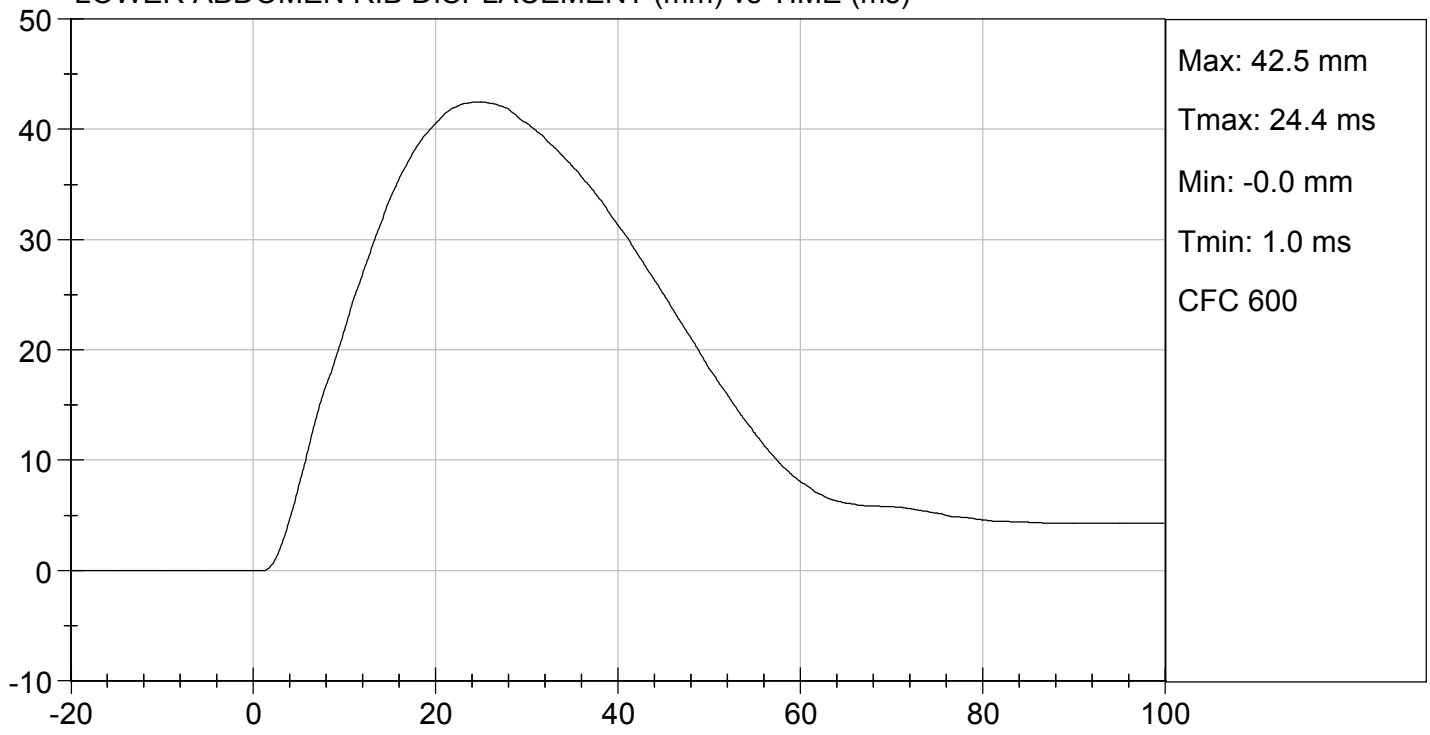
UPPER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



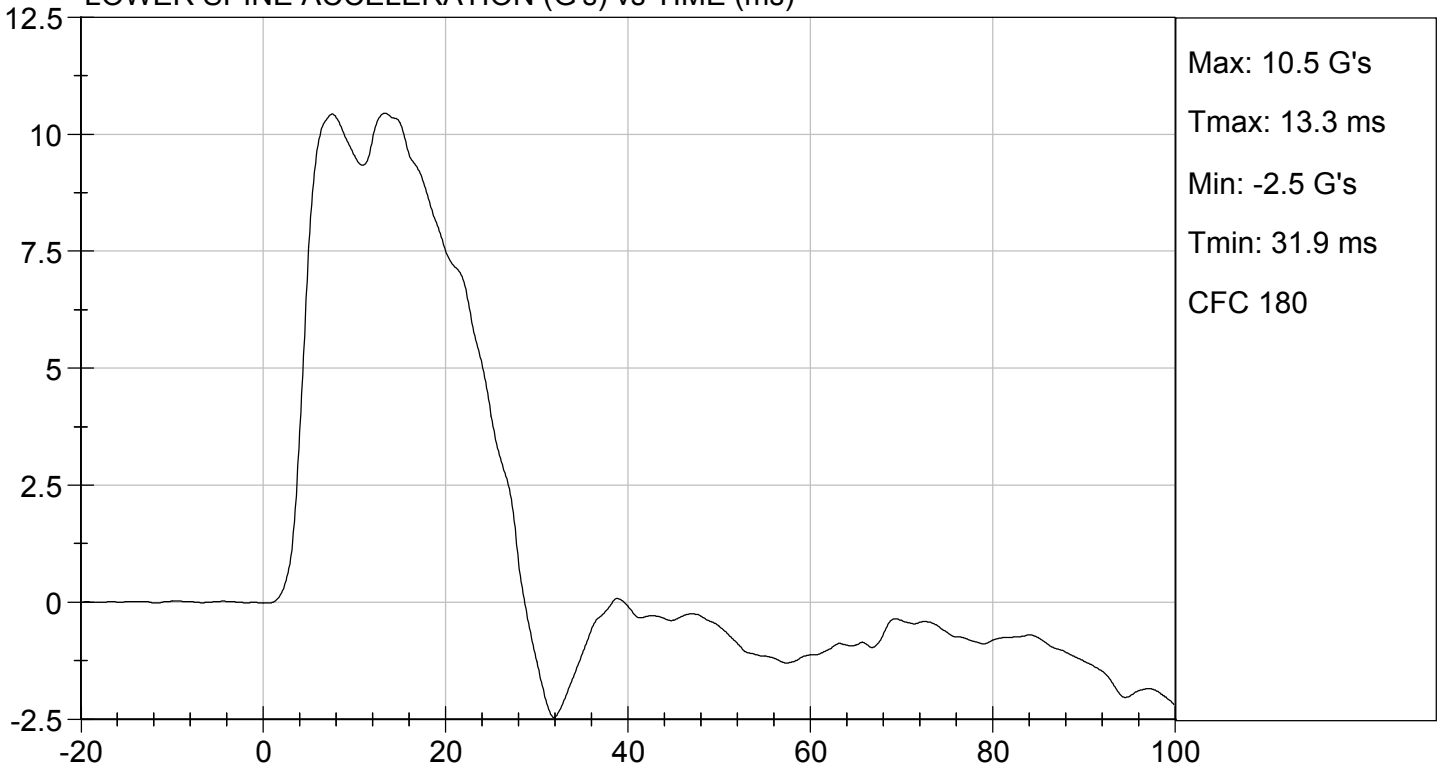
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 06/29/2020
TEST #: D201616

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201617

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22	Pass
Humidity	%	10 to 70	44	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	3,787	Pass
		Overall Test Results		Pass

Laboratory Technician

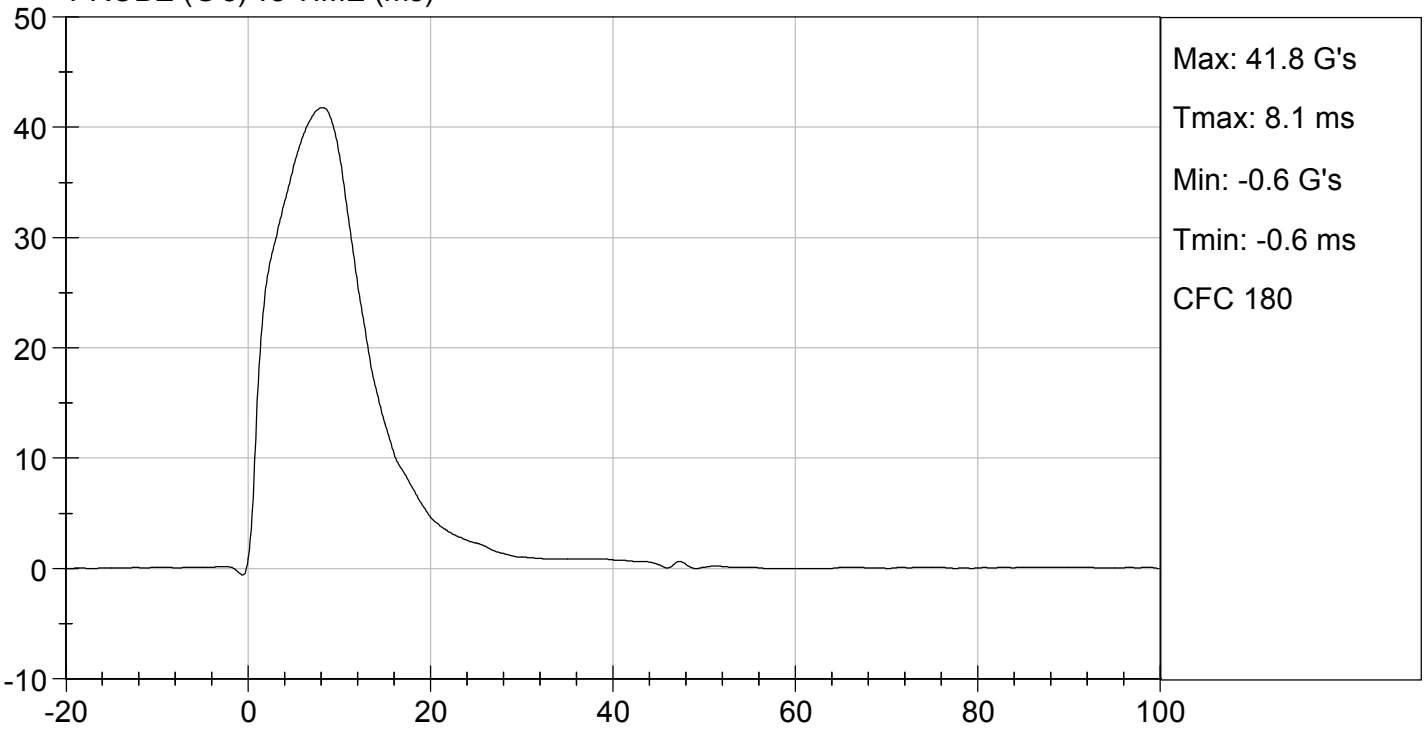
06/29/2020
Test Date

Approved By

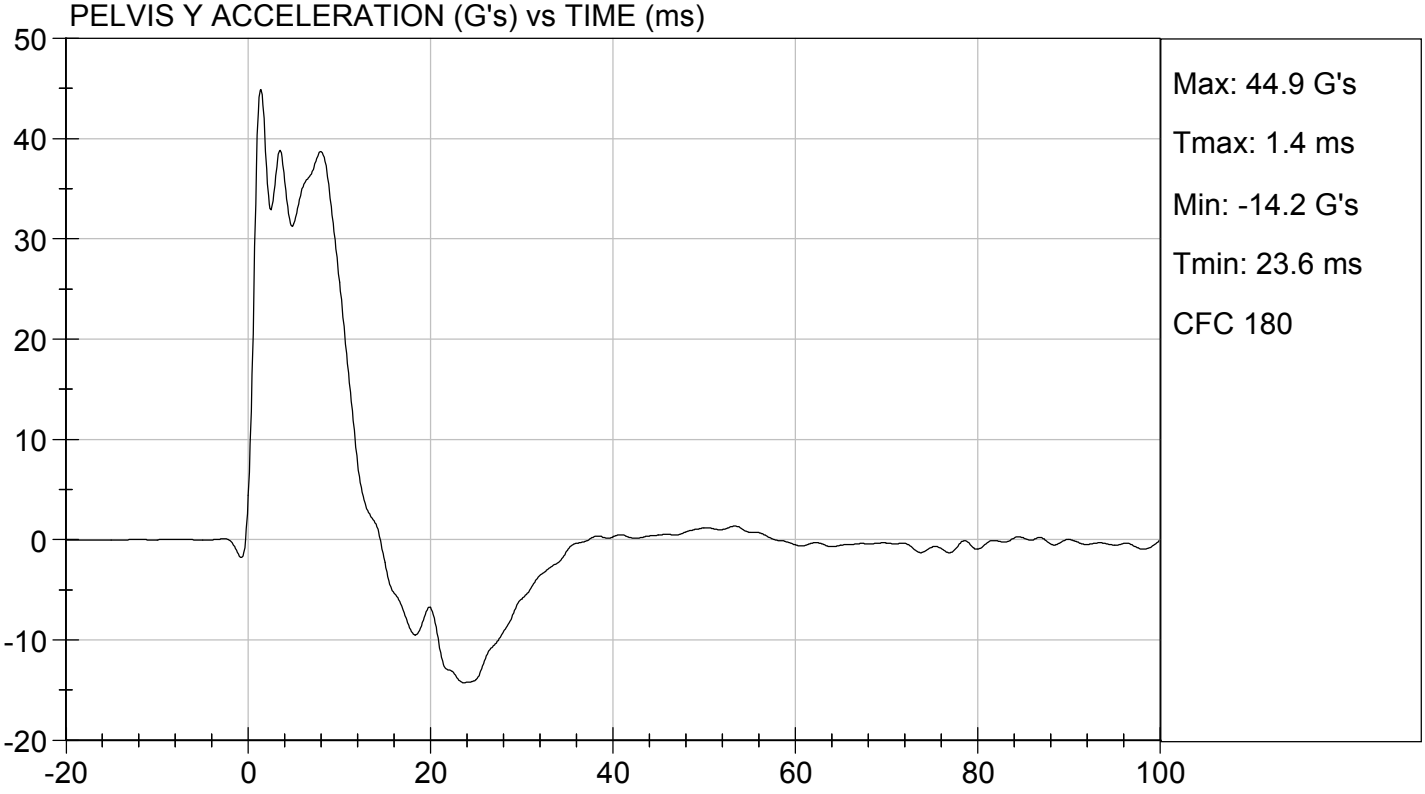
TEST DESC: PELVIS IMPACT
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 06/29/2020
TEST #: D201617

PROBE (G's) vs TIME (ms)

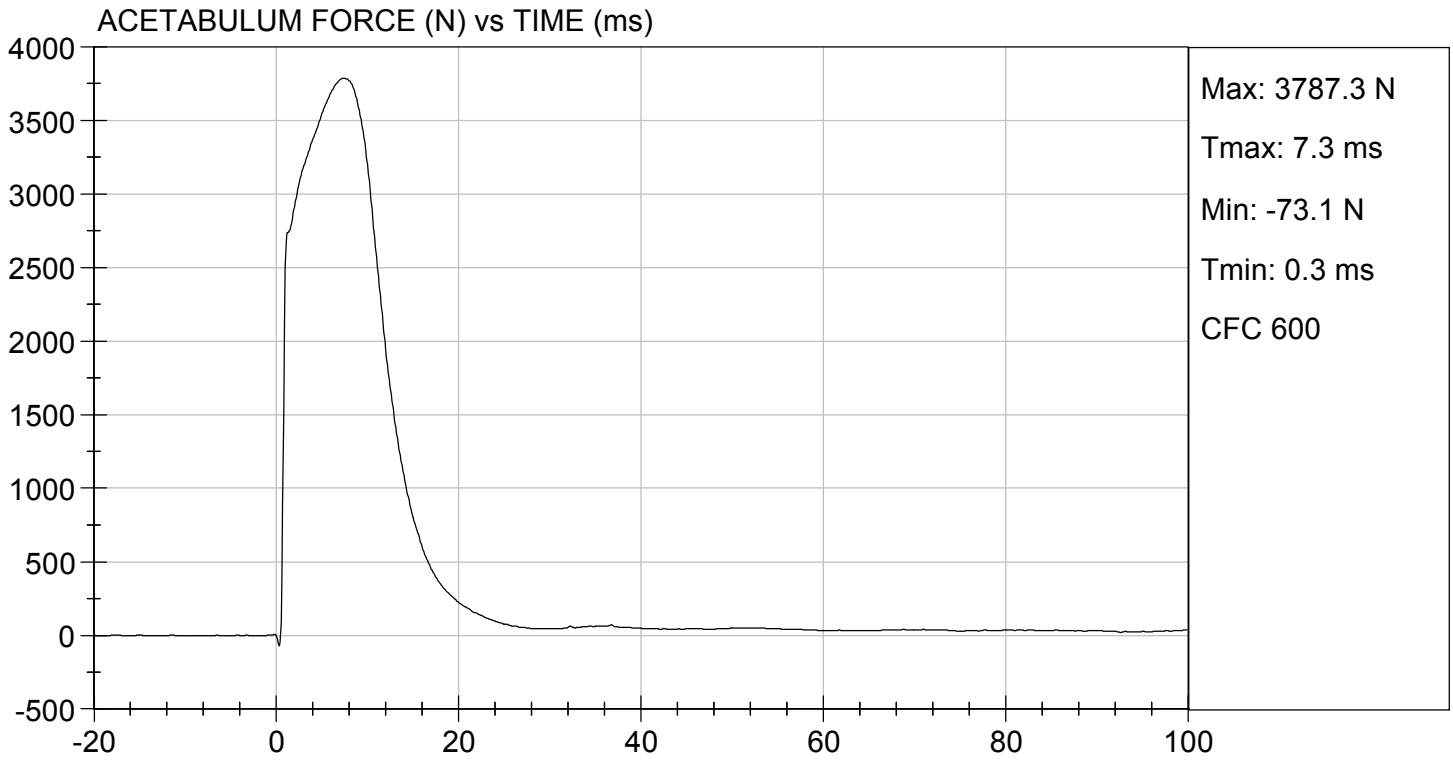


PELVIS Y ACCELERATION (G's) vs TIME (ms)



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

TEST DATE: 06/29/2020
TEST #: D201617



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201618

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	31	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,404	Pass
		Overall Test Results		Pass

Gerald Guerrero
Laboratory Technician

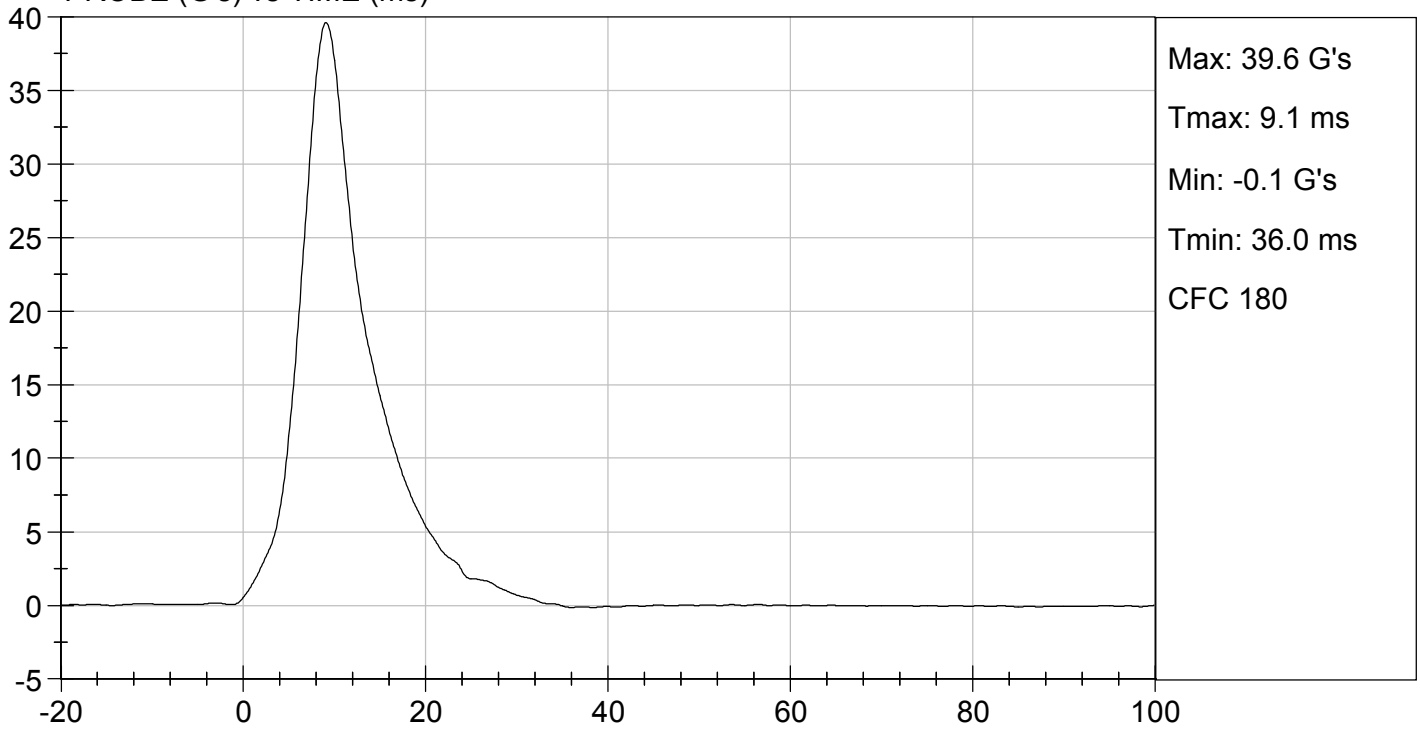
06/24/2020
Test Date

Approved By

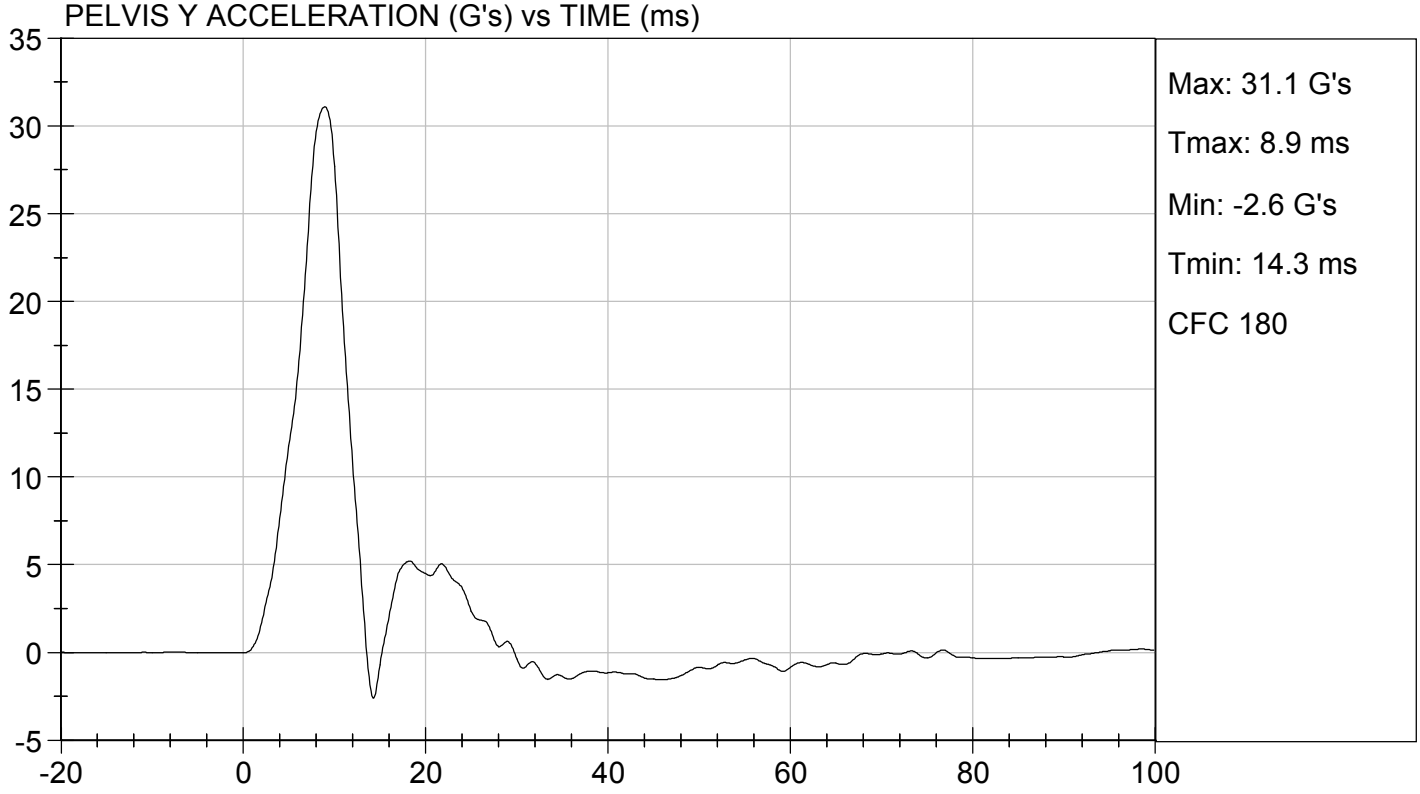
TEST DESC: ILLIAC
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 06/24/2020
TEST #: D201618

PROBE (G's) vs TIME (ms)

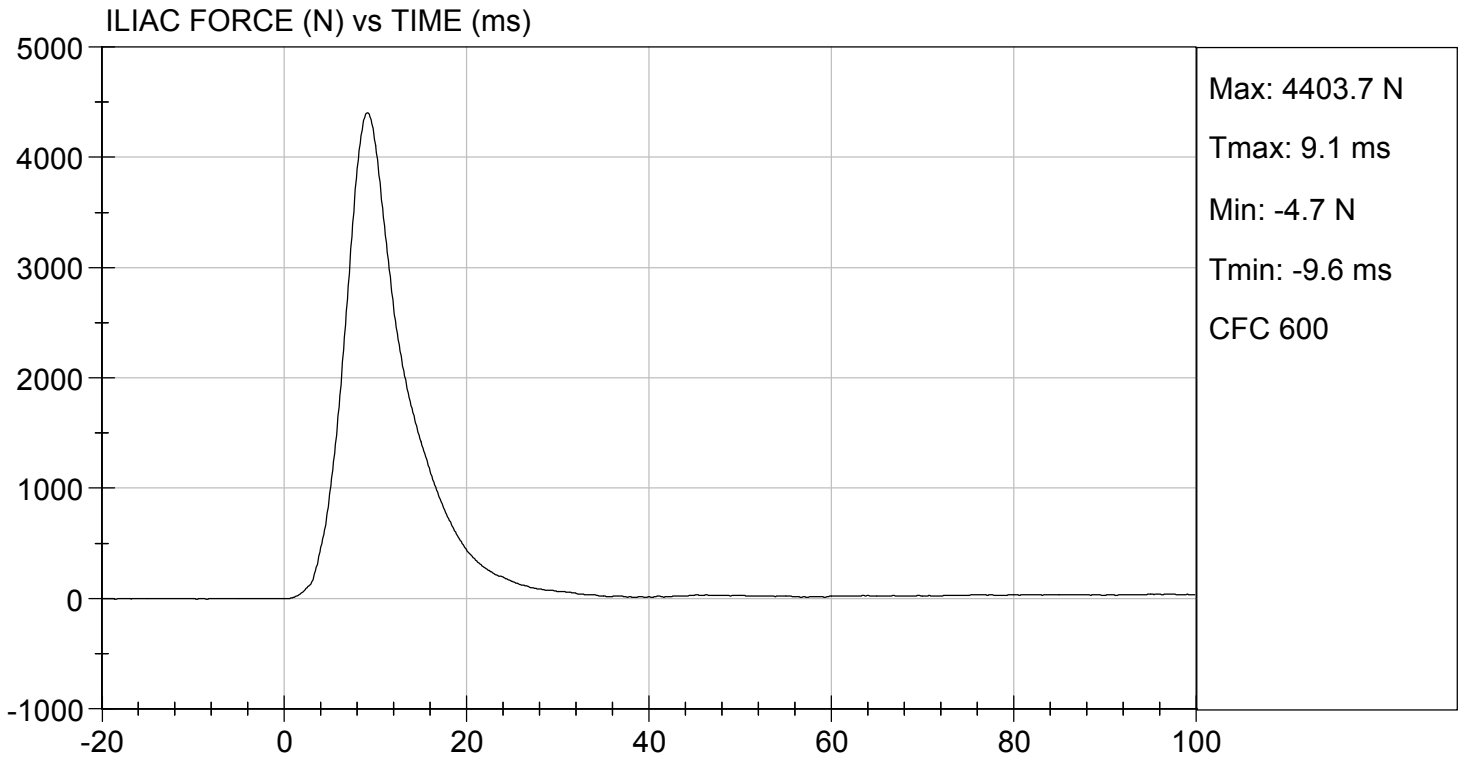


PELVIS Y ACCELERATION (G's) vs TIME (ms)



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

TEST DATE: 06/24/2020
TEST #: D201618



CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SID-IIsD External Measurements
SN: 306

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

MGA RESEARCH CORPORATION

HEAD DROP TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D201711

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Peak Resultant Acceleration	G's	115 to 137	130	Pass
Peak Longitudinal Acceleration	G's	+/- 15	3.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

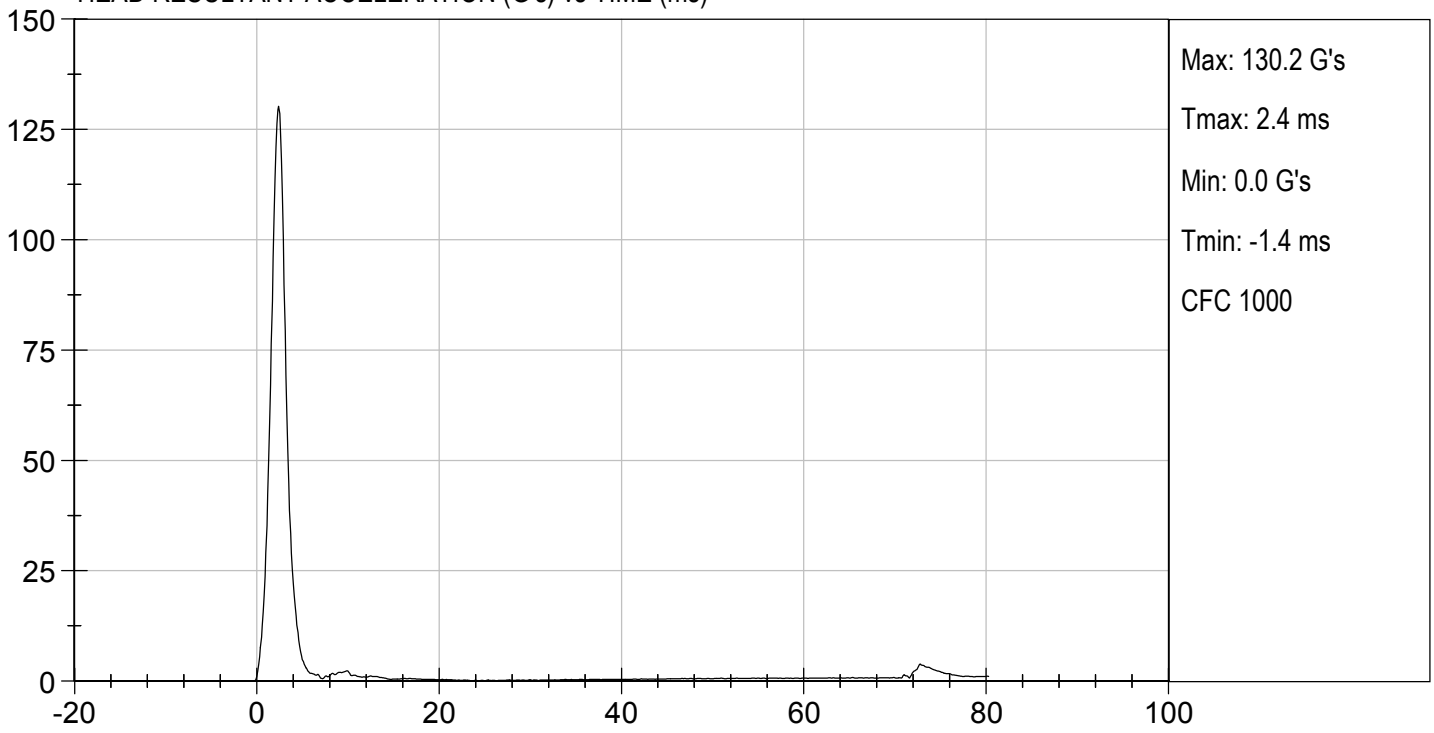
07/14/2020
Test Date

Approved By

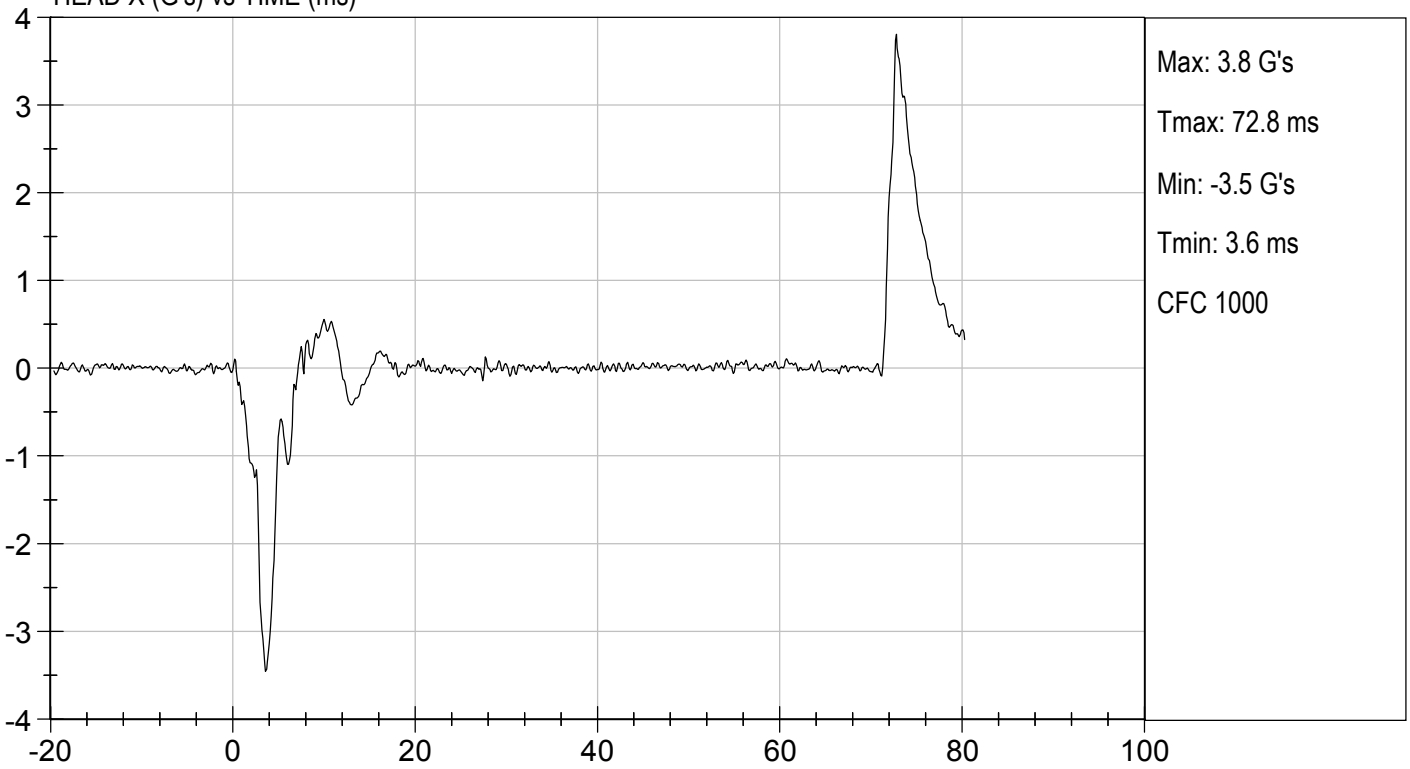
TEST DESC: HEAD DROP

TEST DATE: 07/14/2020
TEST #: D201711

HEAD RESULTANT ACCELERATION (G's) vs TIME (ms)

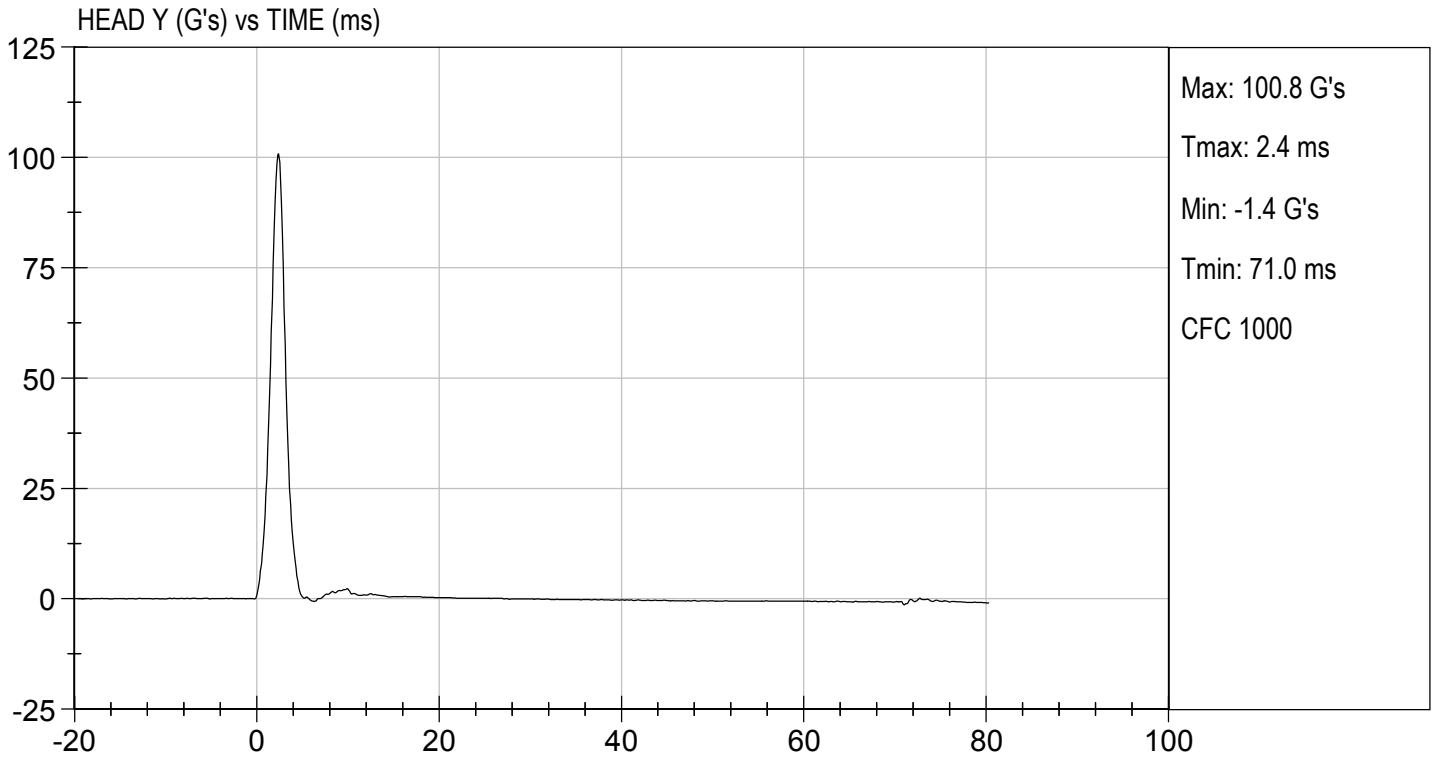


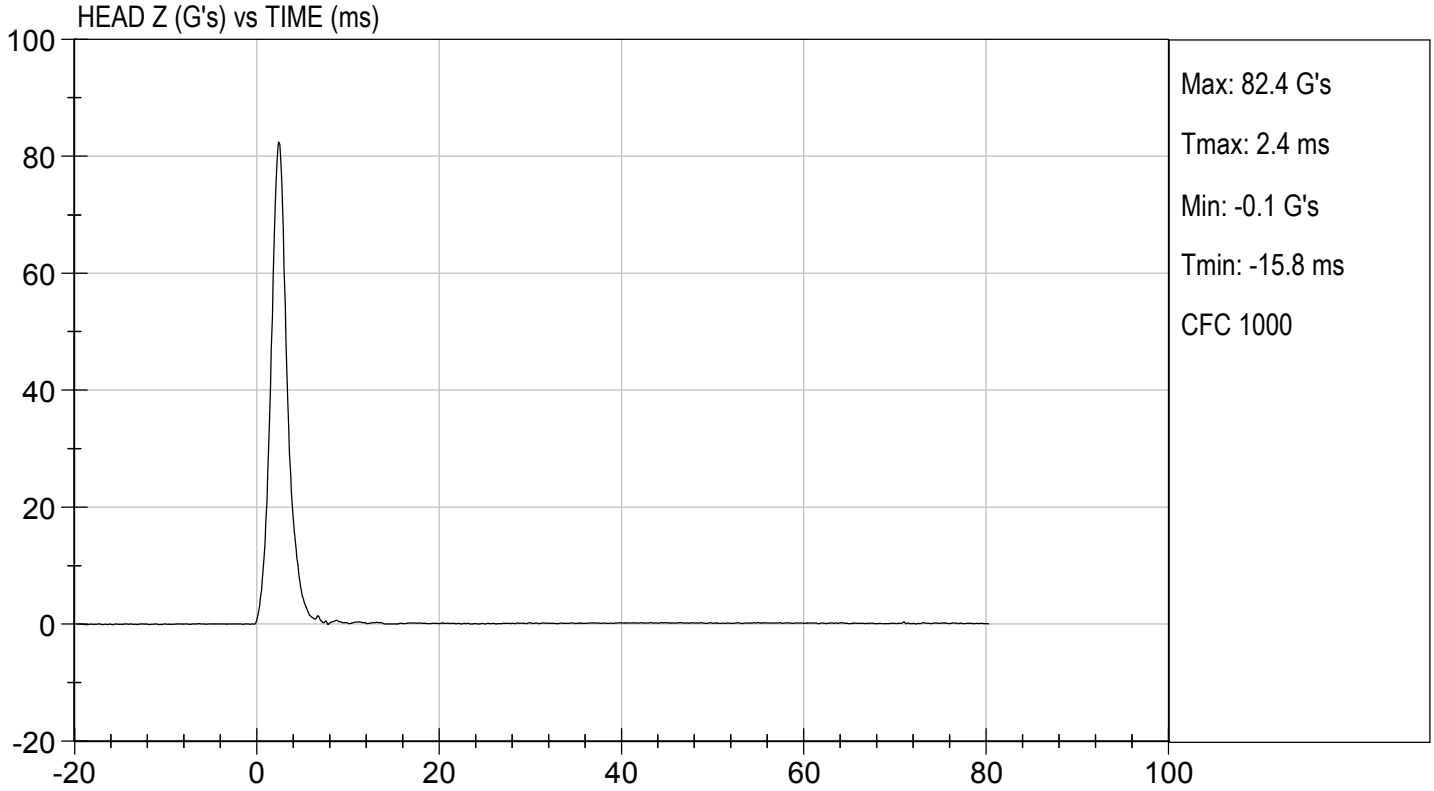
HEAD X (G's) vs TIME (ms)



TEST DESC: HEAD DROP

TEST DATE: 07/14/2020
TEST #: D201711





MGA RESEARCH CORPORATION

LATERAL NECK PENDULUM TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 075 **Test I.D:** D201712

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.1	Pass
Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.59	Pass
	15 ms	m/s	3.30 to 4.10	3.72	Pass
	20 ms	m/s	4.40 to 5.40	5.18	Pass
	25 ms	m/s	5.40 to 6.10	5.63	Pass
	25-100 ms	m/s	5.50 to 6.20	5.64	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	62	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-37	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	119	Pass
			Overall Test Results		Pass

Laboratory Technician

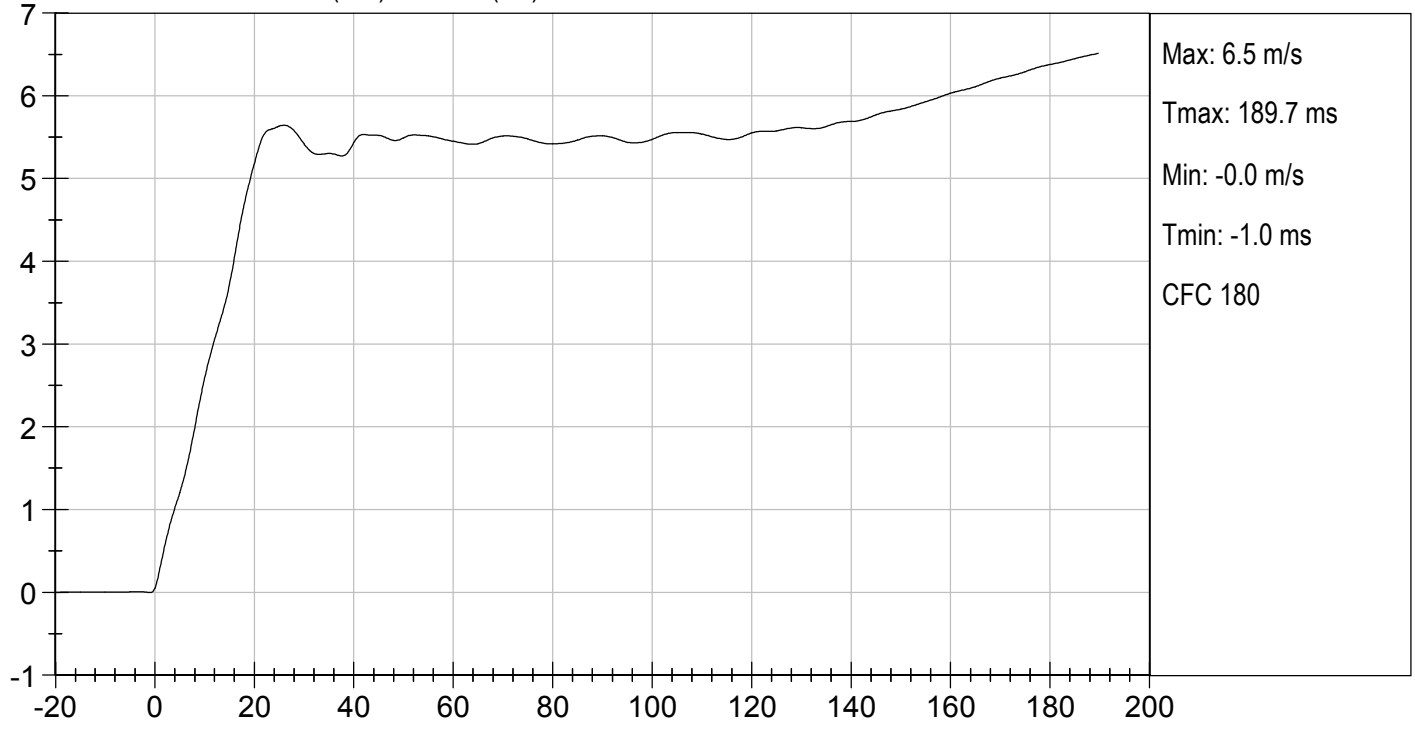
07/14/2020
Test Date

Approved By

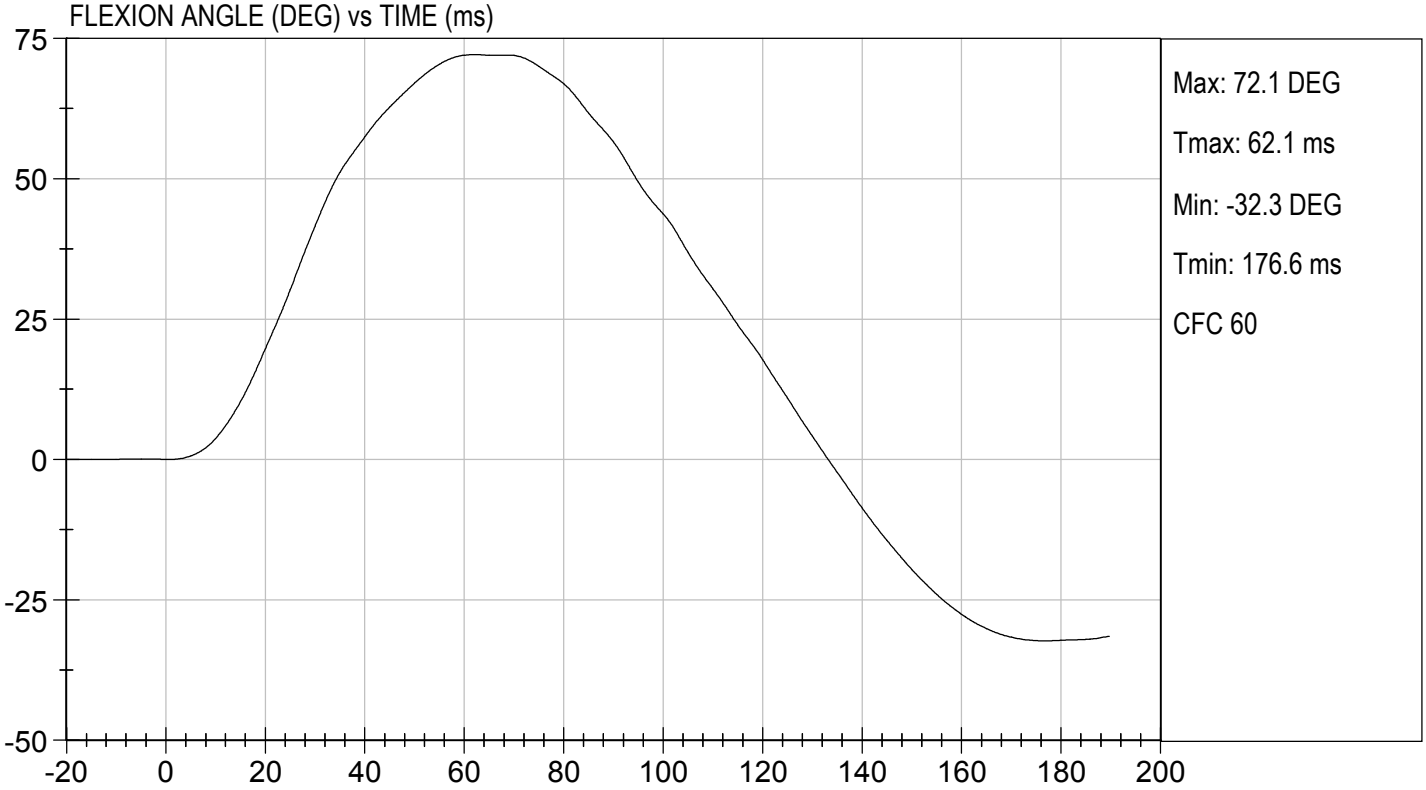
TEST DESC: NECK BENDING
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 07/14/2020
TEST #: D201712

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

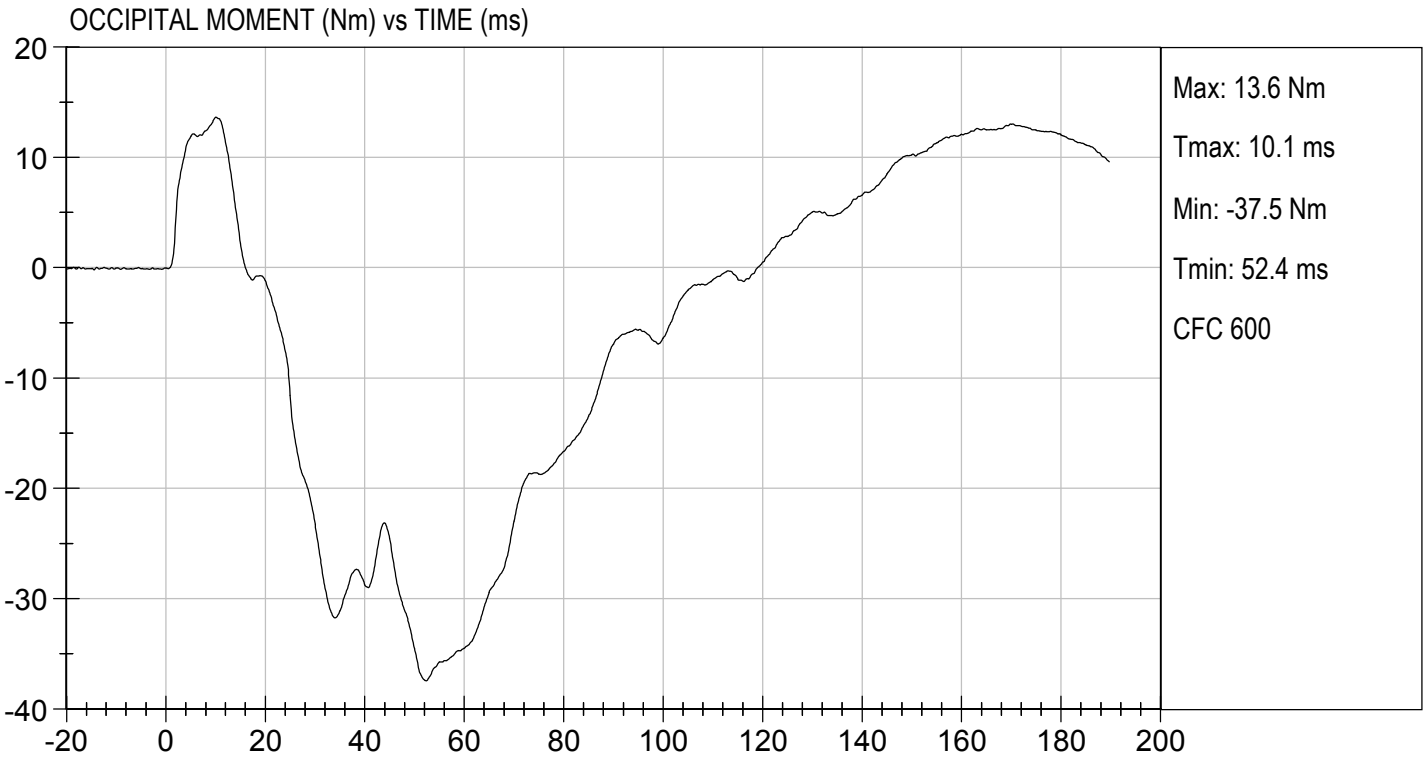


FLEXION ANGLE (DEG) vs TIME (ms)



TEST DESC: NECK BENDING
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 07/14/2020
TEST #: D201712



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D201713

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
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	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
		Overall Test Results		Pass

Laboratory Technician

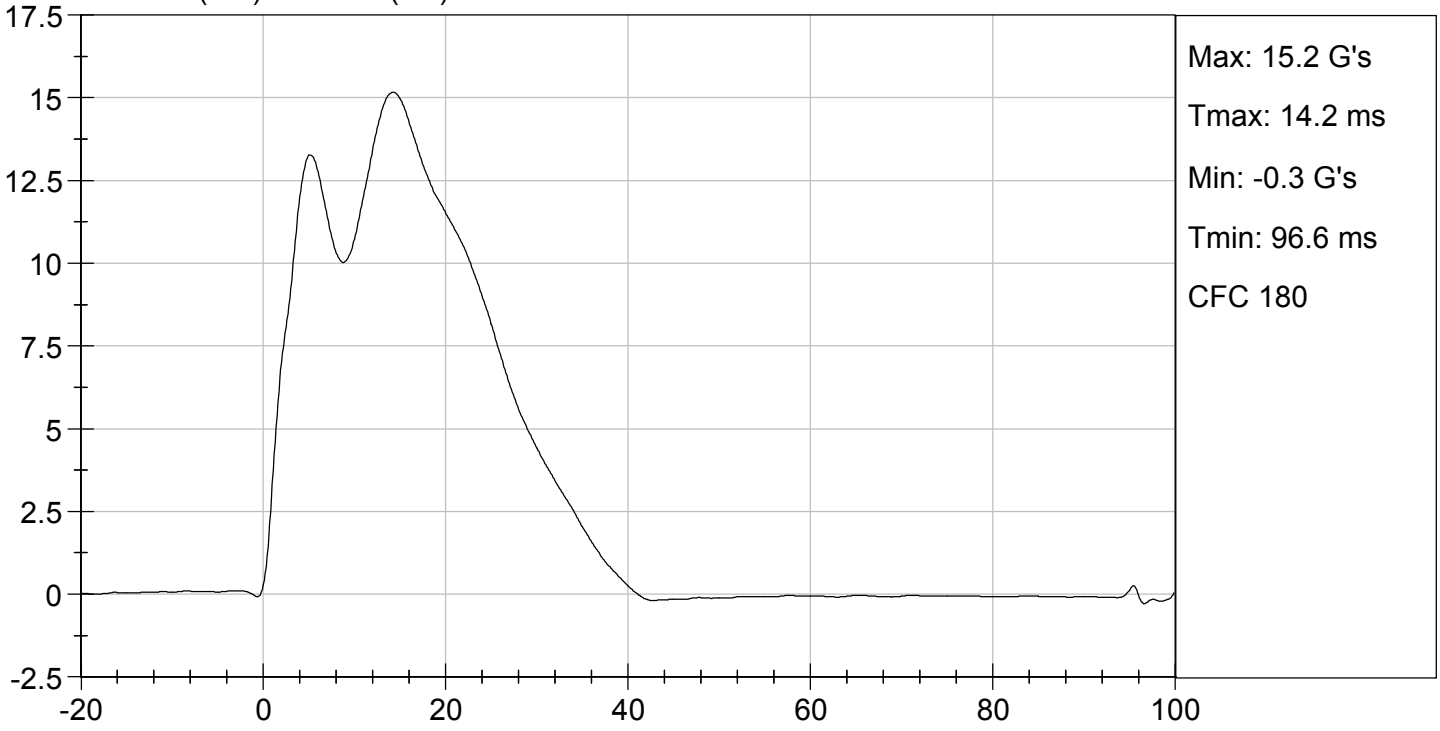
07/14/2020
Test Date

Approved By

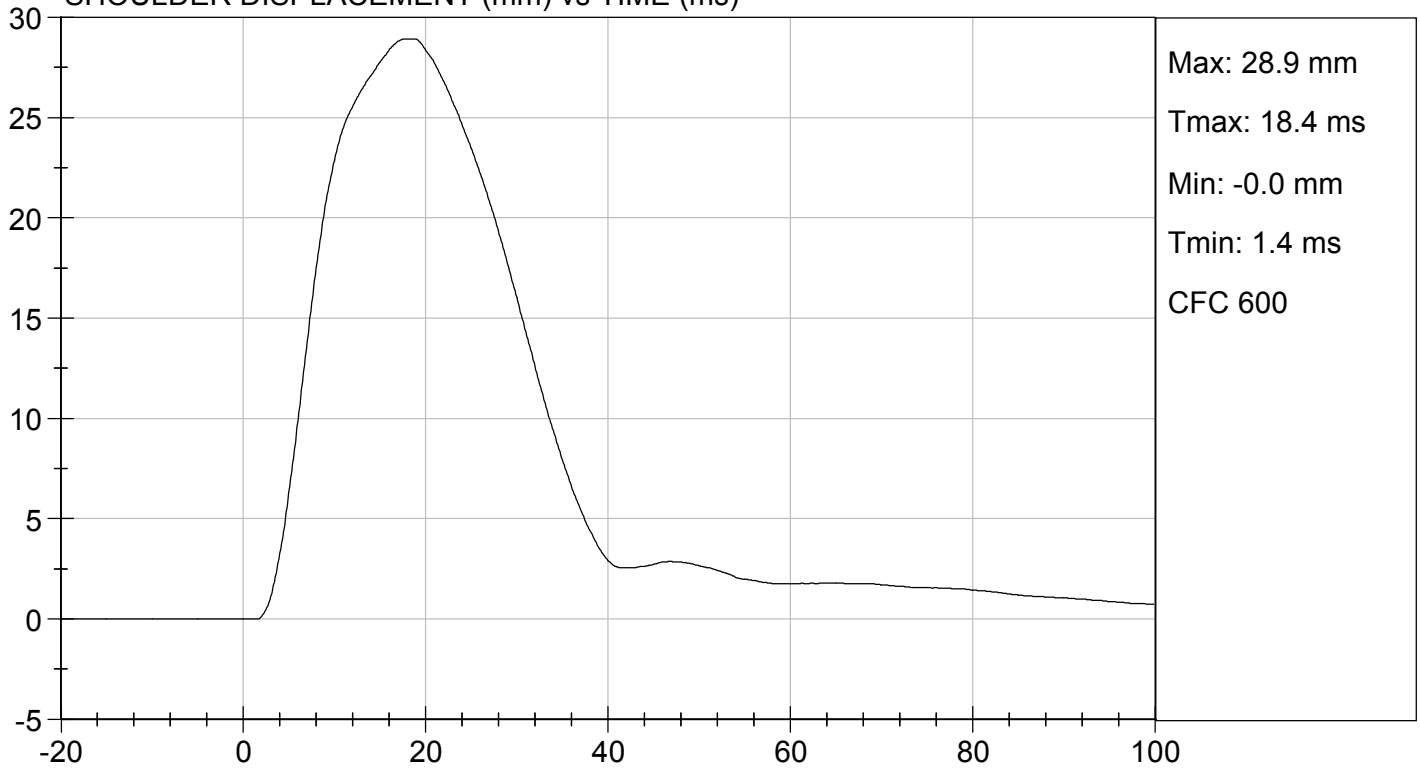
TEST DESC: SHOULDER IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 07/14/2020
TEST #: D201713

PROBE (G's) vs TIME (ms)

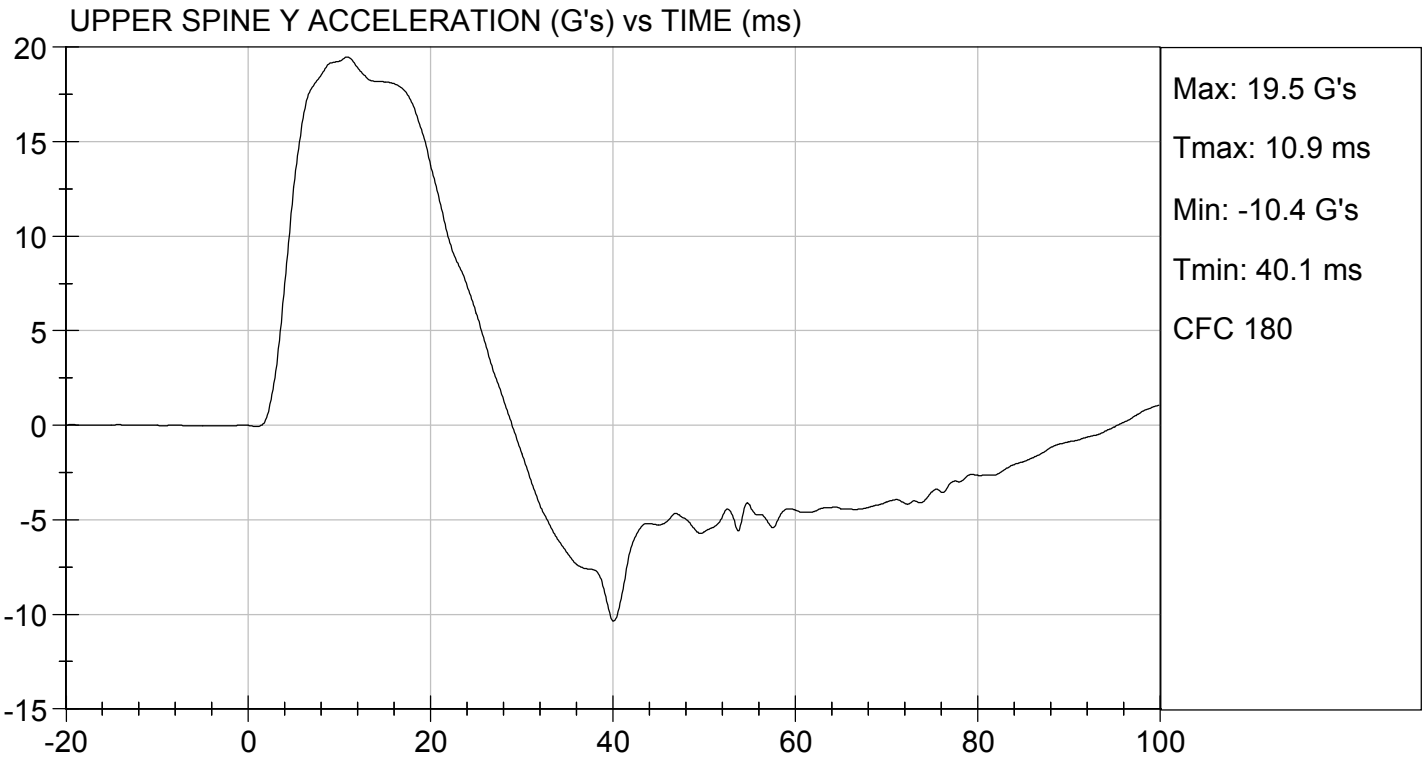


SHOULDER DISPLACEMENT (mm) vs TIME (ms)



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

TEST DATE: 07/14/2020
TEST #: D201713



MGA RESEARCH CORPORATION

THORAX (WITH ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201714

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
		Overall Test Results		Pass

Laboratory Technician

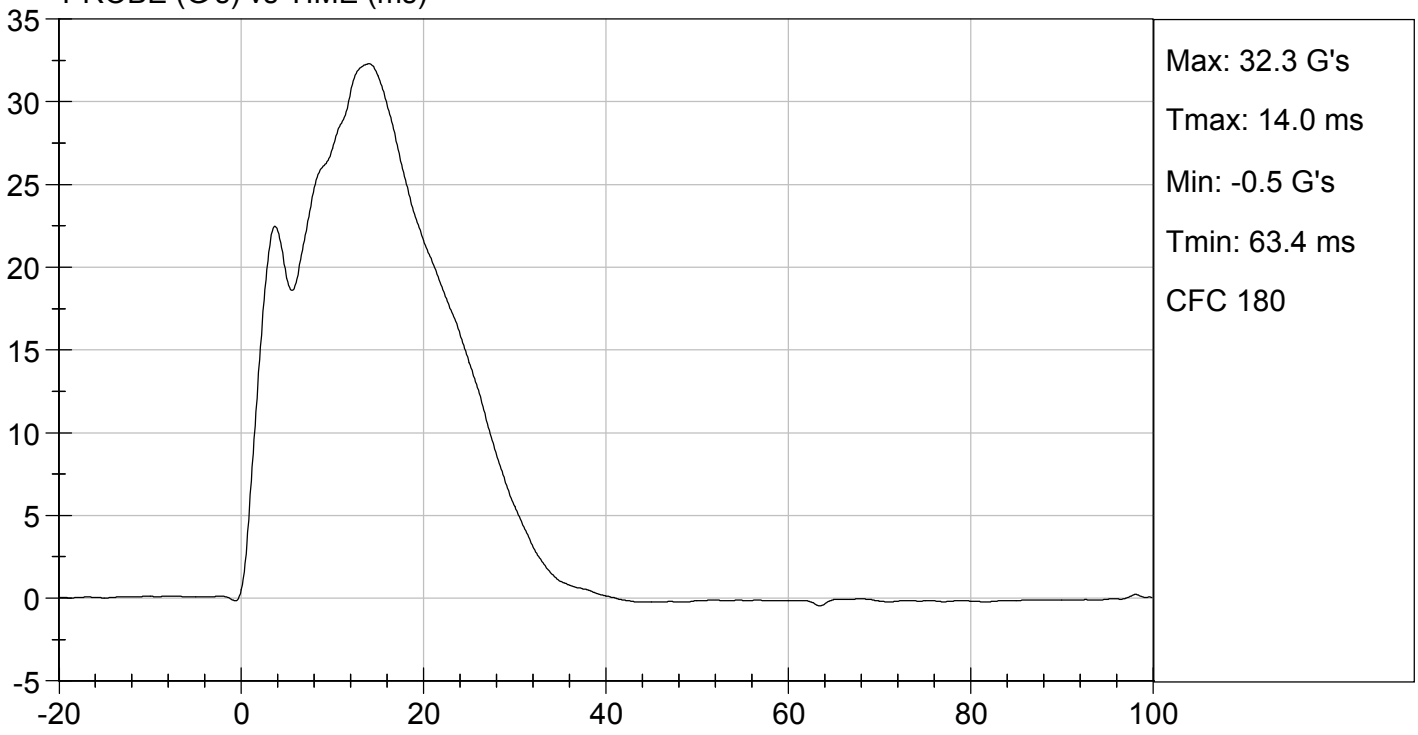
07/14/2020
Test Date

Approved By

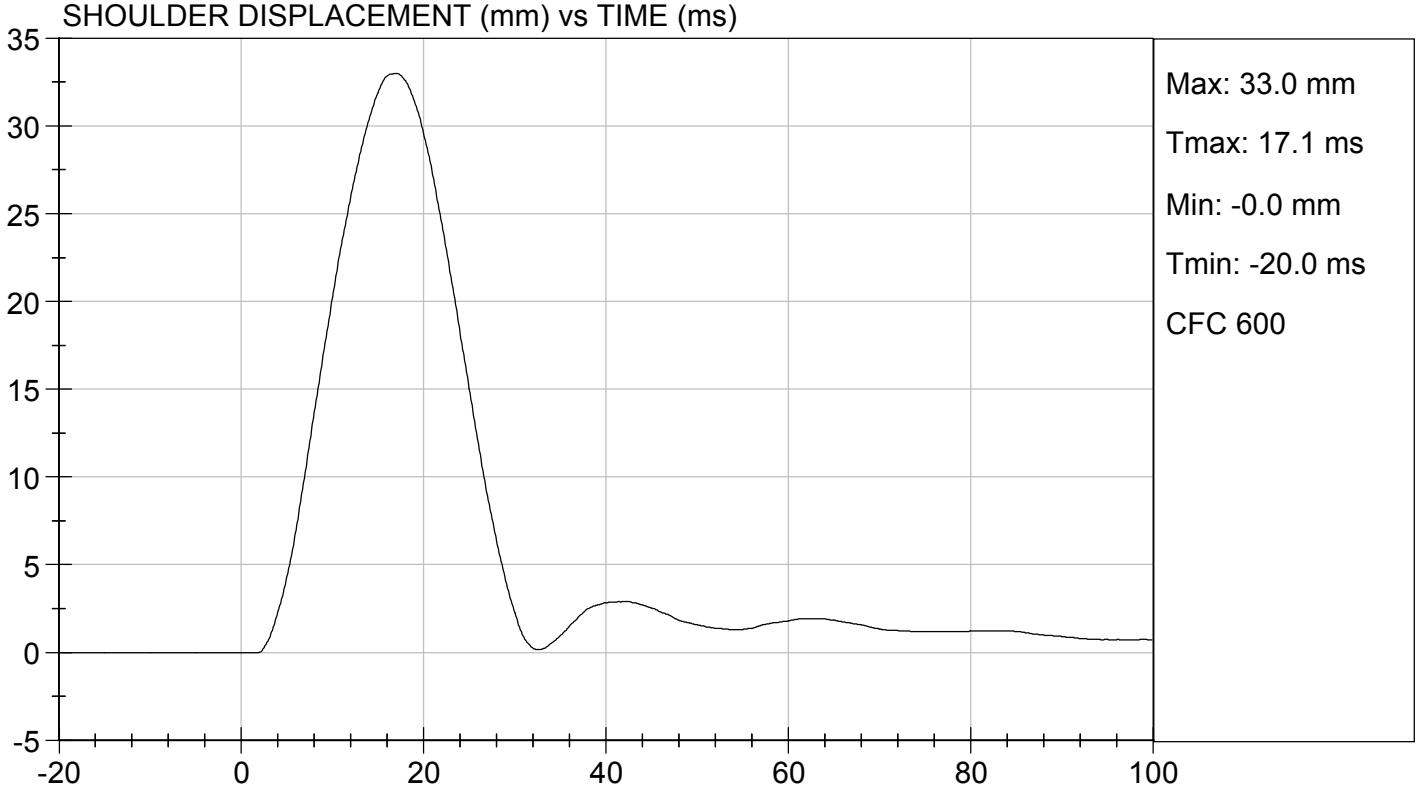
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 07/14/2020
TEST #: D201714

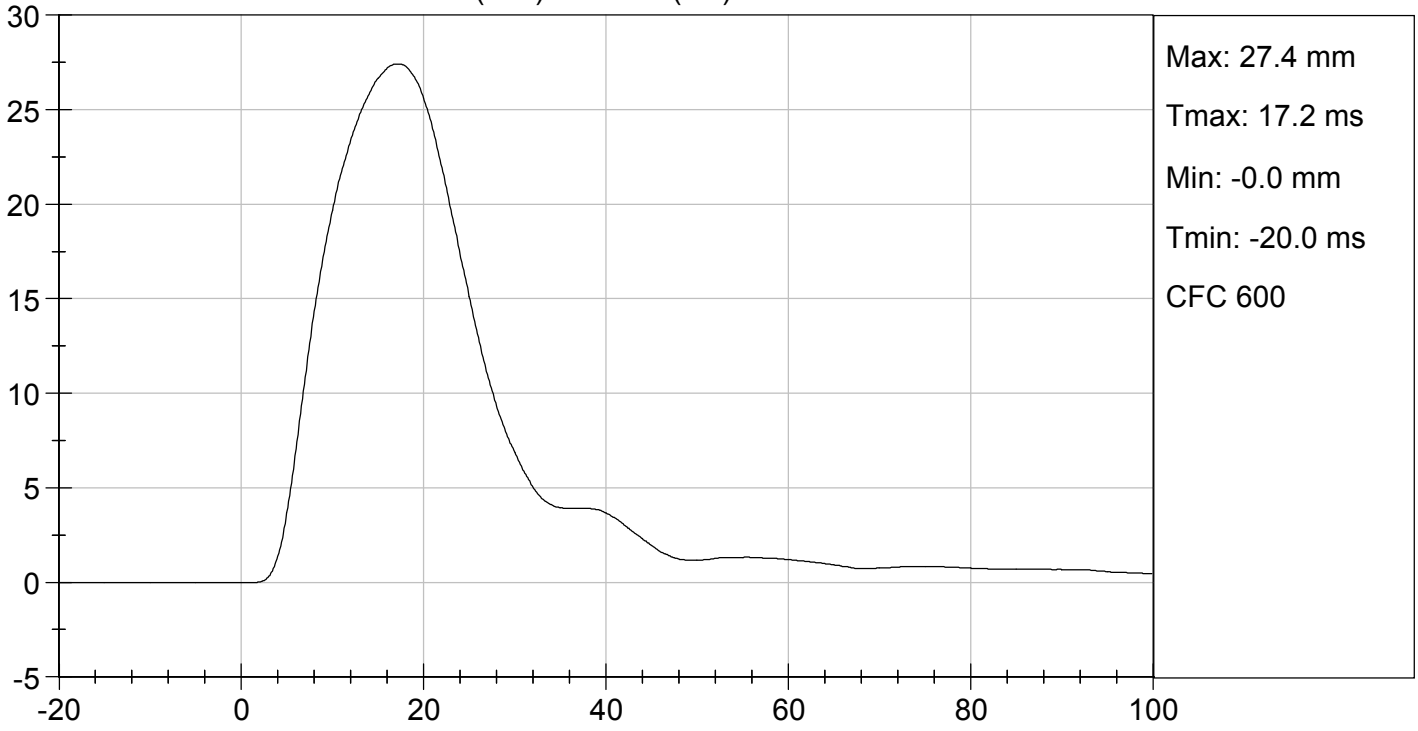
PROBE (G's) vs TIME (ms)



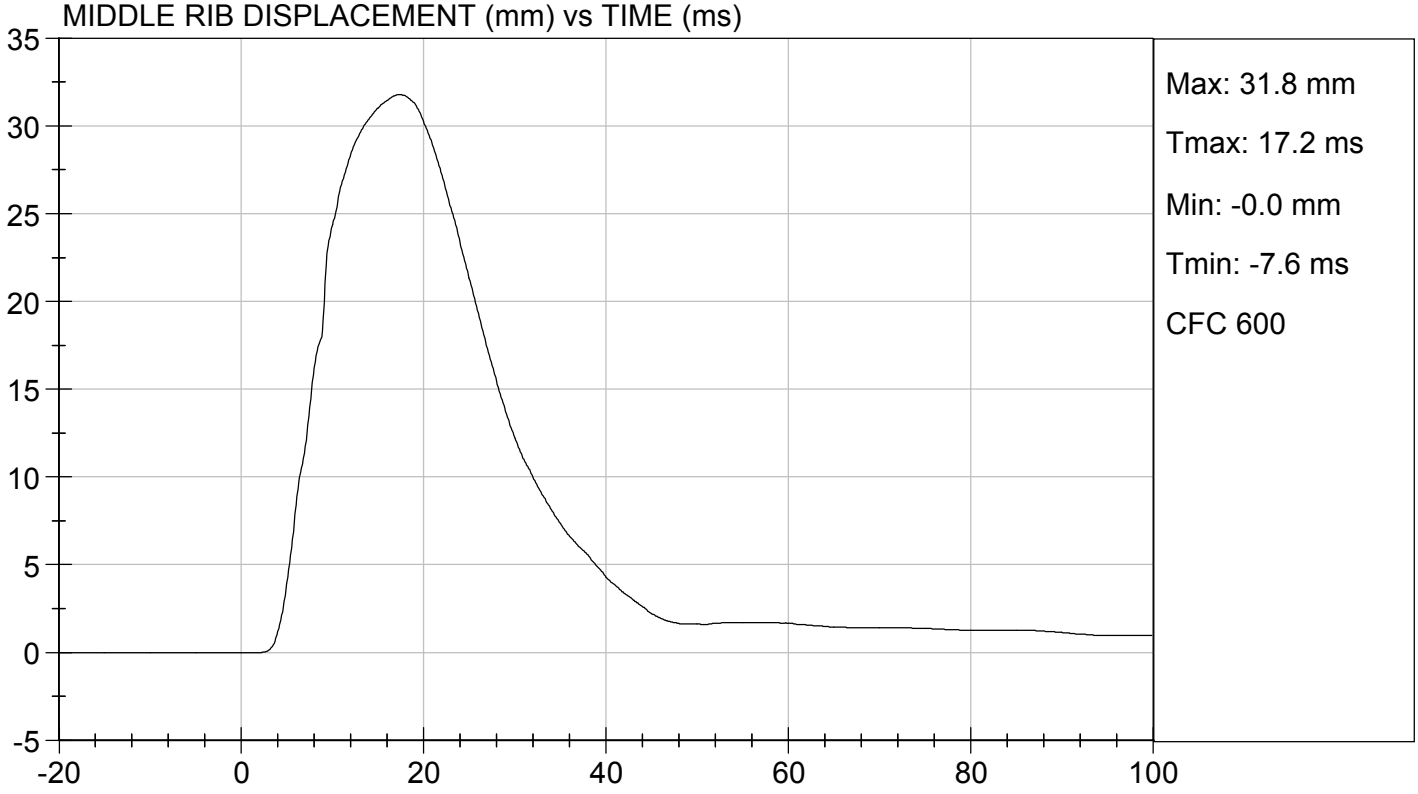
SHOULDER DISPLACEMENT (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



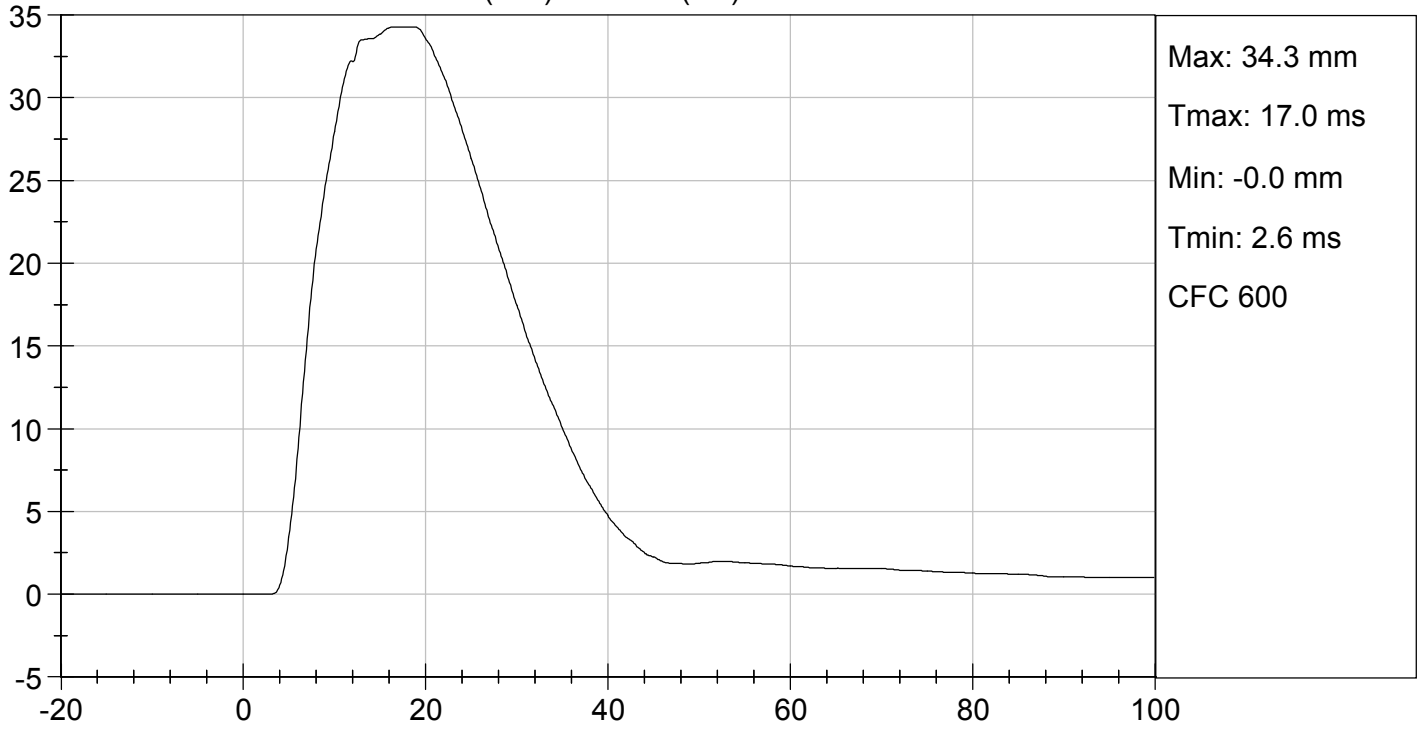
MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



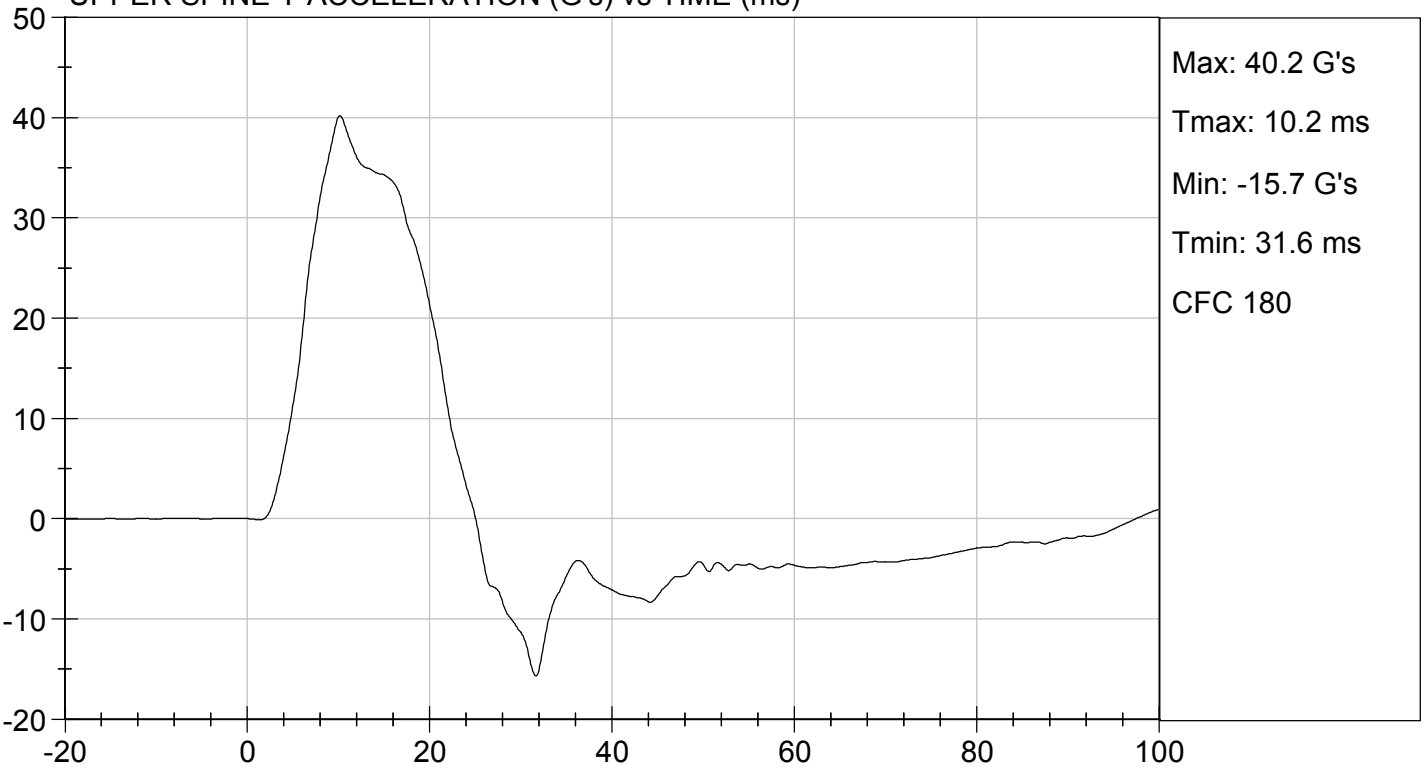
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 07/14/2020
TEST #: D201714

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



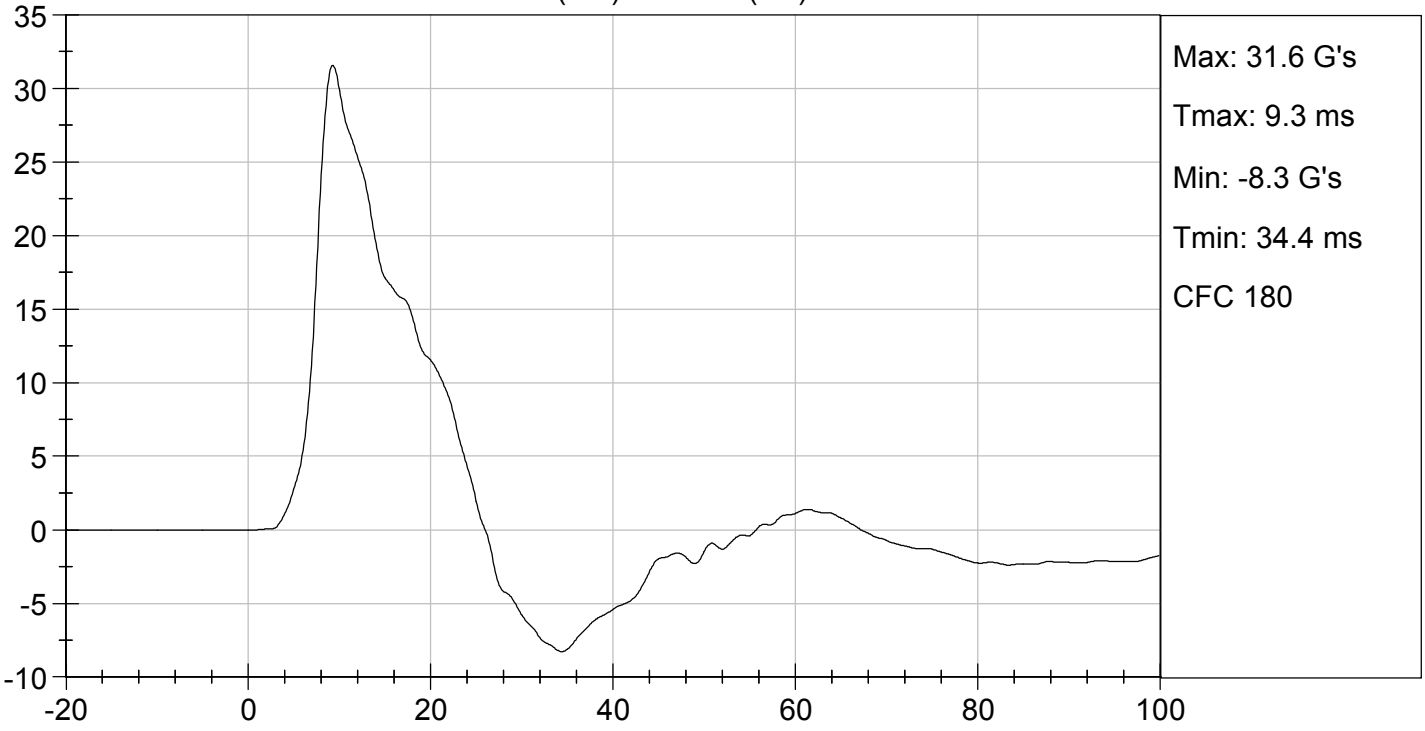
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



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

TEST DATE: 07/14/2020
TEST #: D201714

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



MGA RESEARCH CORPORATION

THORAX (WITHOUT ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201715

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	37	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	16	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
		Overall Test Results		Pass

Laboratory Technician

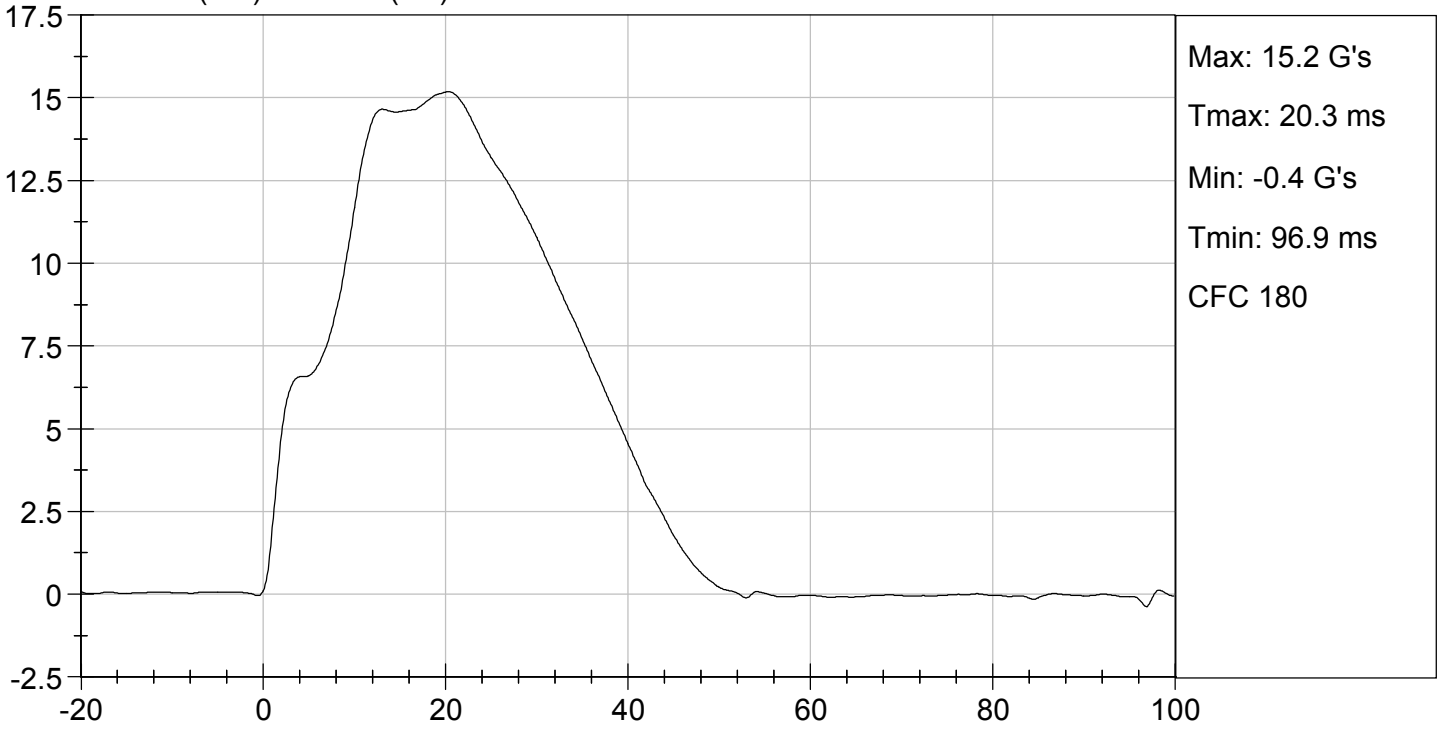
07/14/2020
Test Date

Approved By

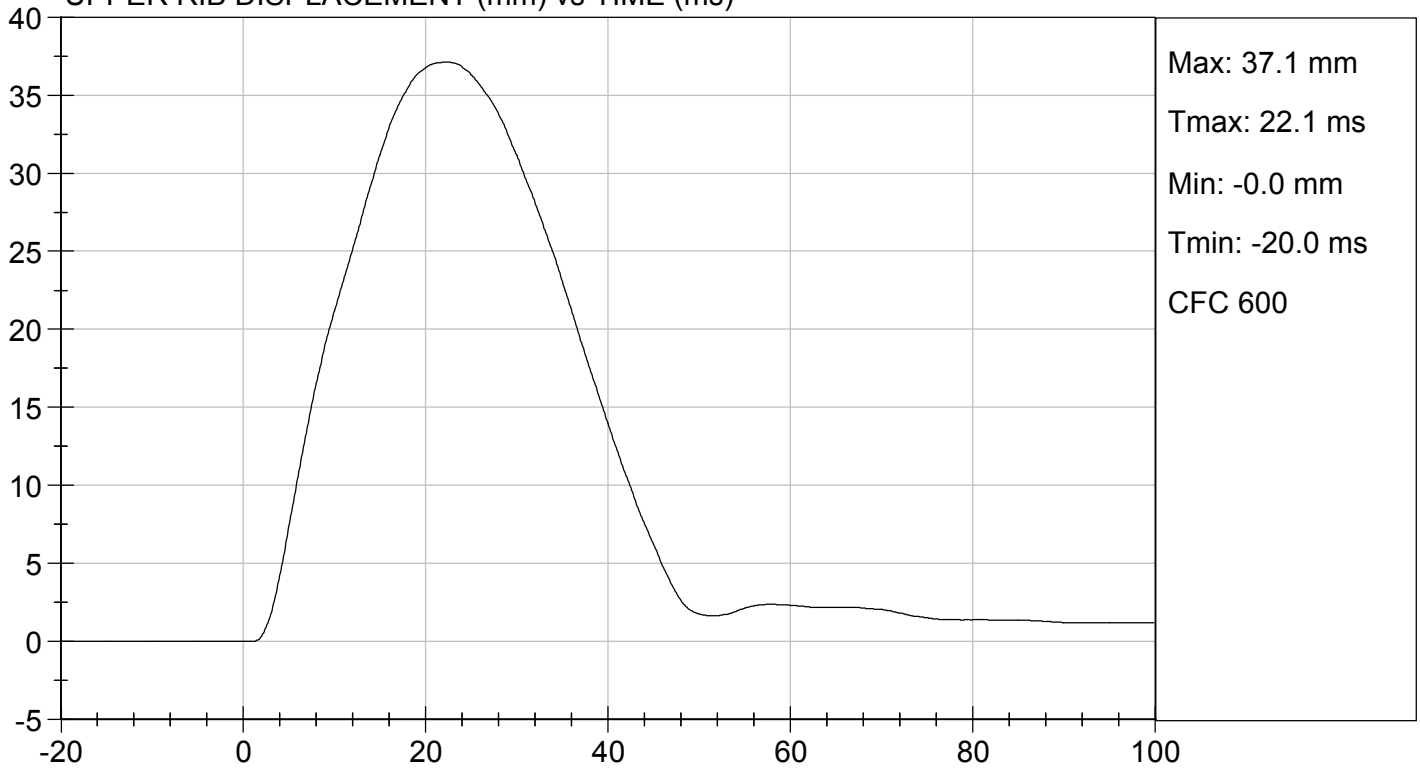
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 07/14/2020
TEST #: D201715

PROBE (G's) vs TIME (ms)



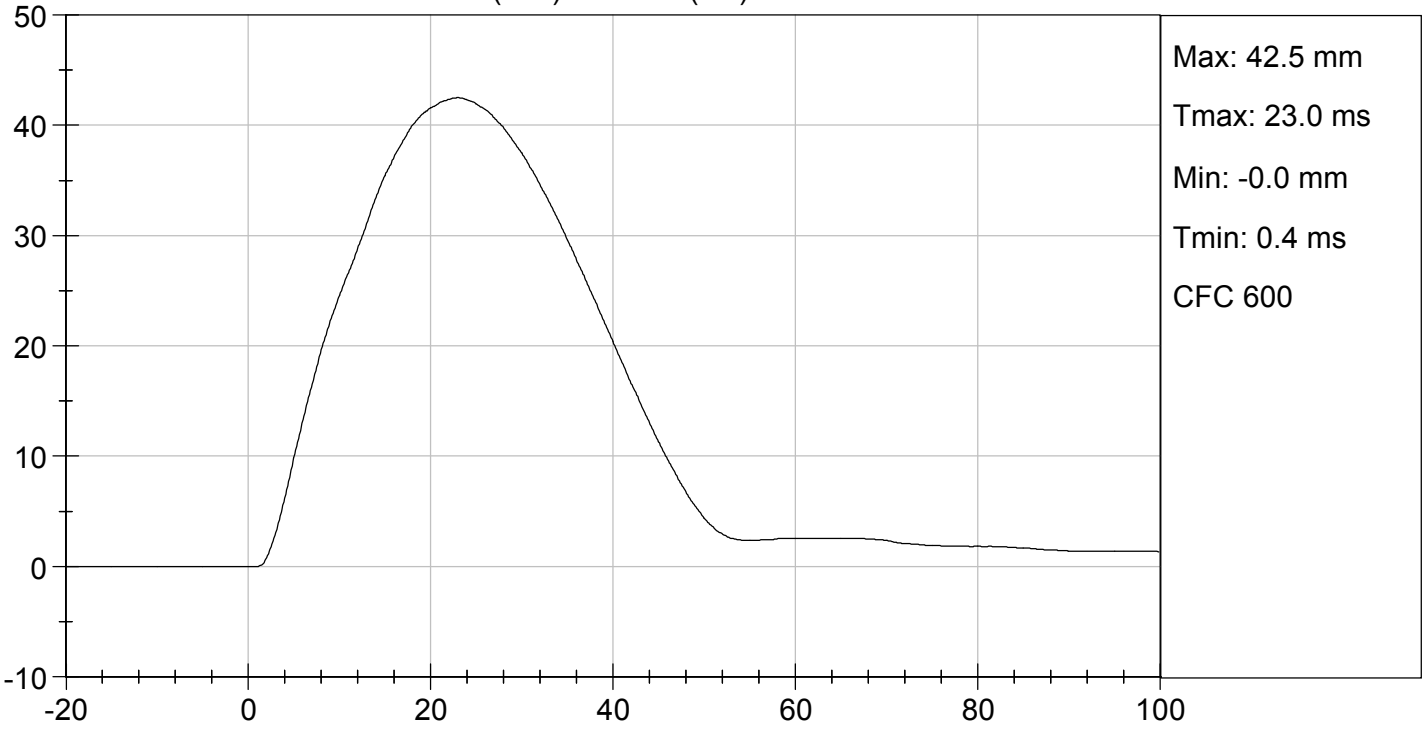
UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



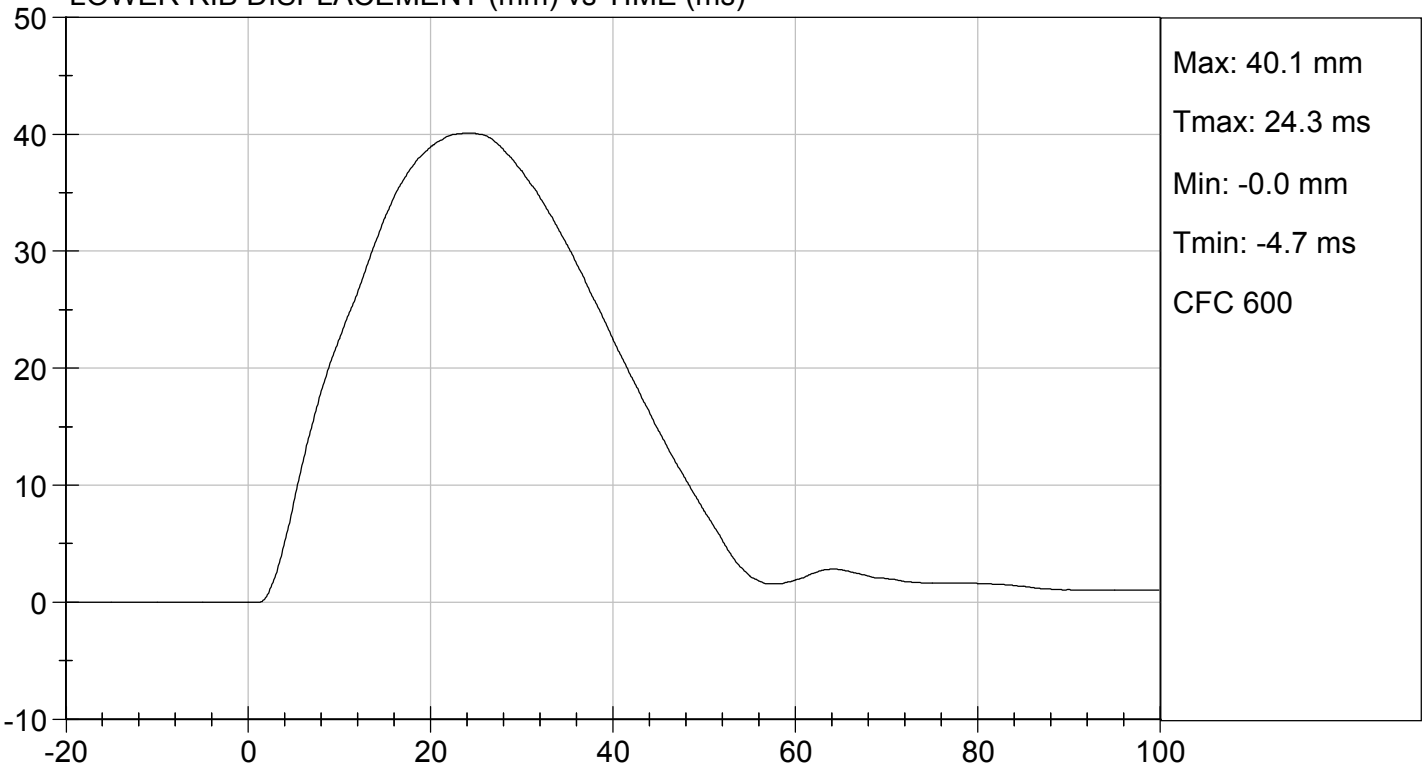
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 07/14/2020
TEST #: D201715

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



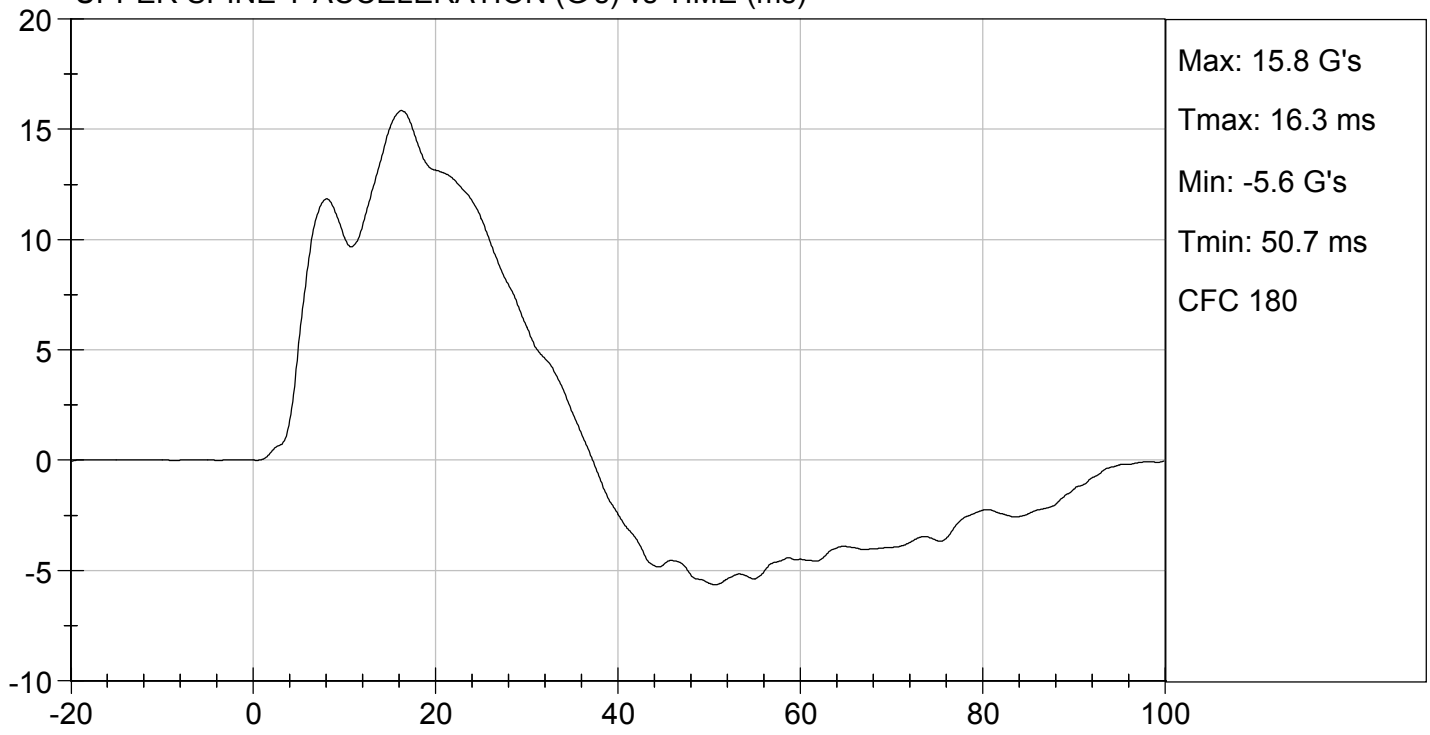
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



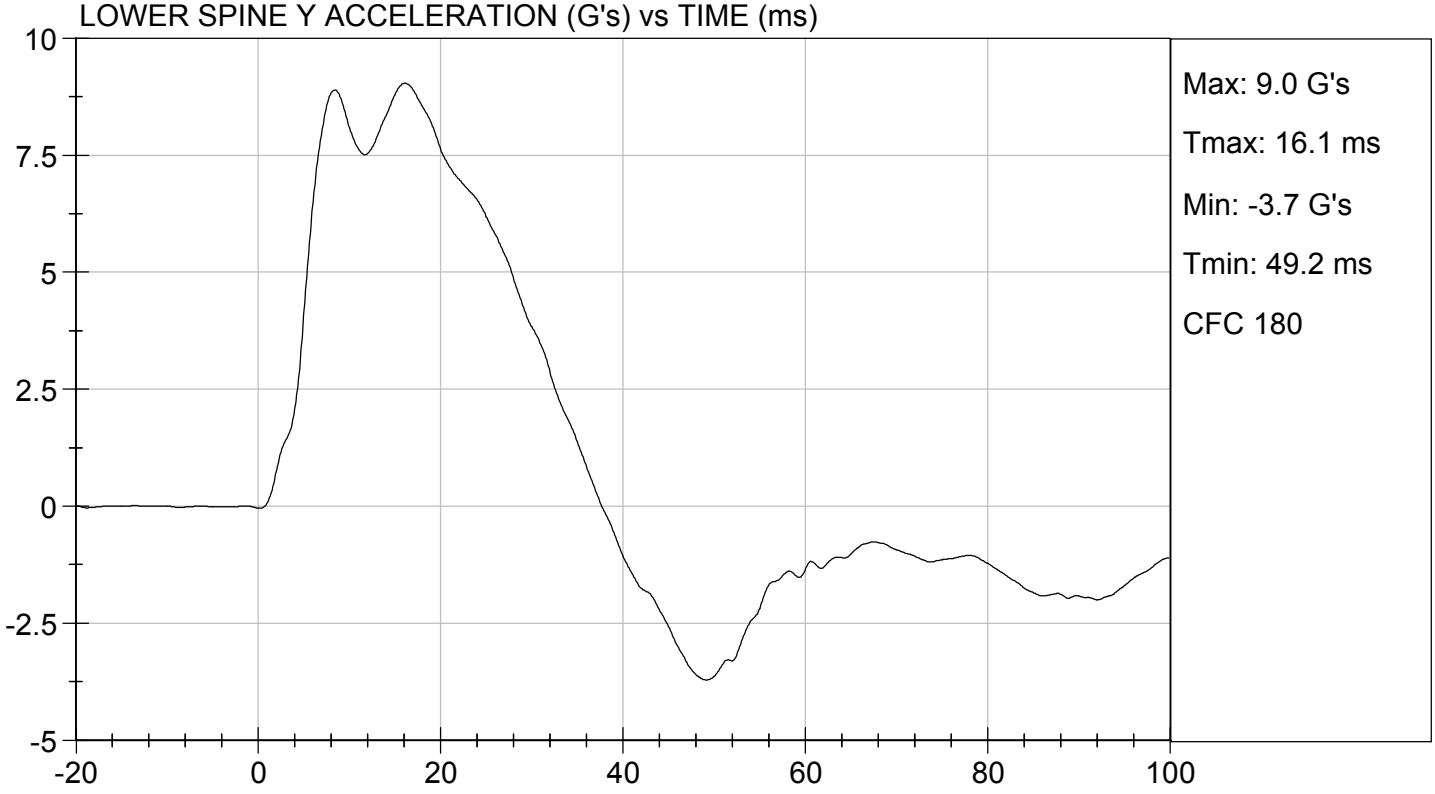
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 07/14/2020
TEST #: D201715

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



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



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201716

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	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	42	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
		Overall Test Results		Pass

Laboratory Technician

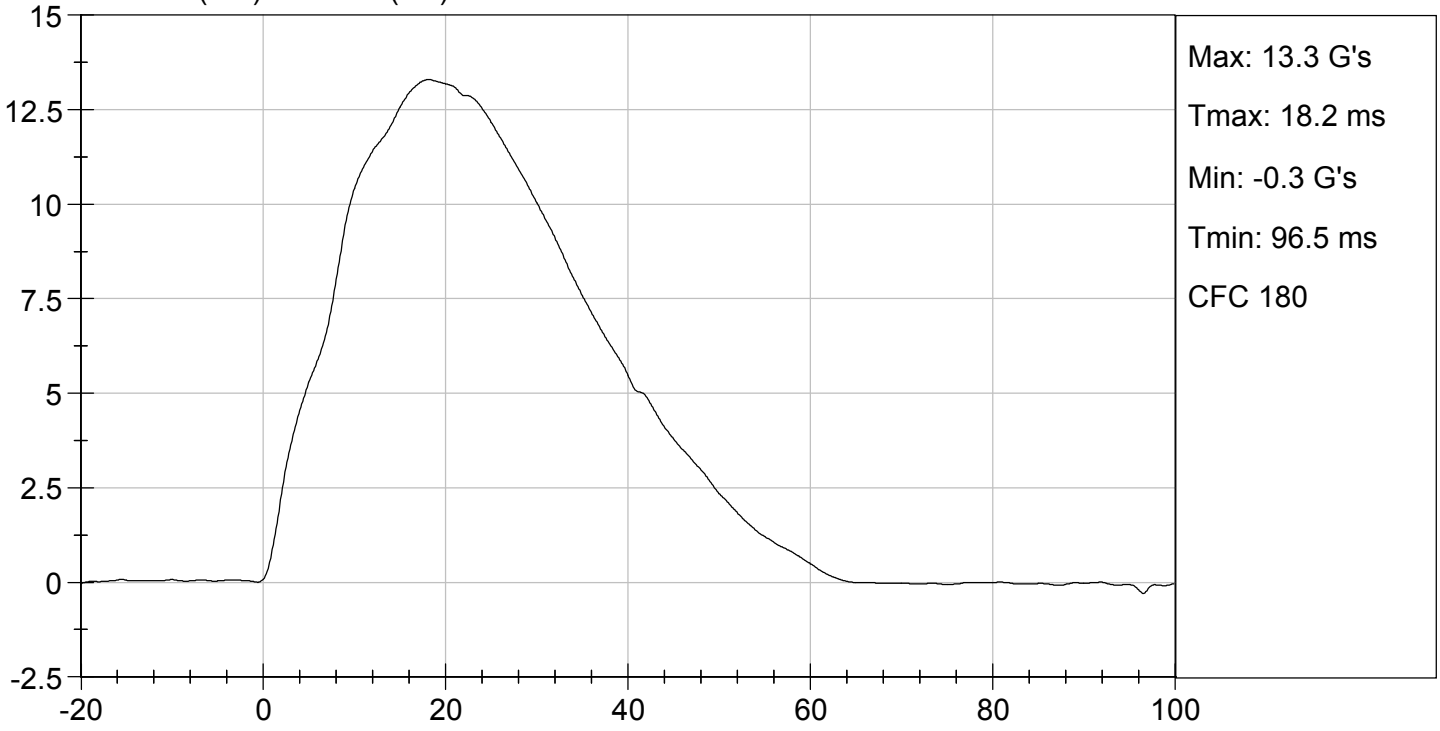
07/14/2020
Test Date

Approved By

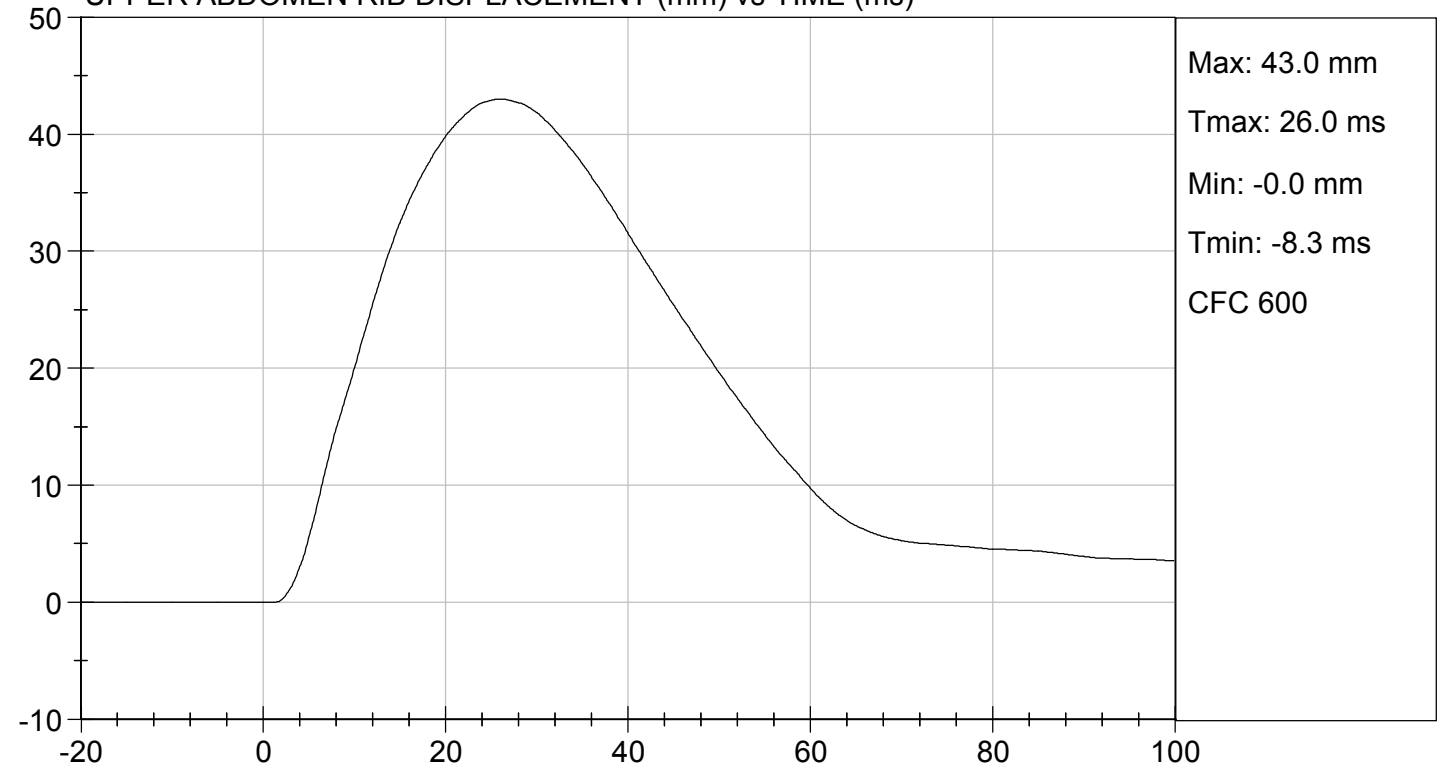
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 07/14/2020
TEST #: D201716

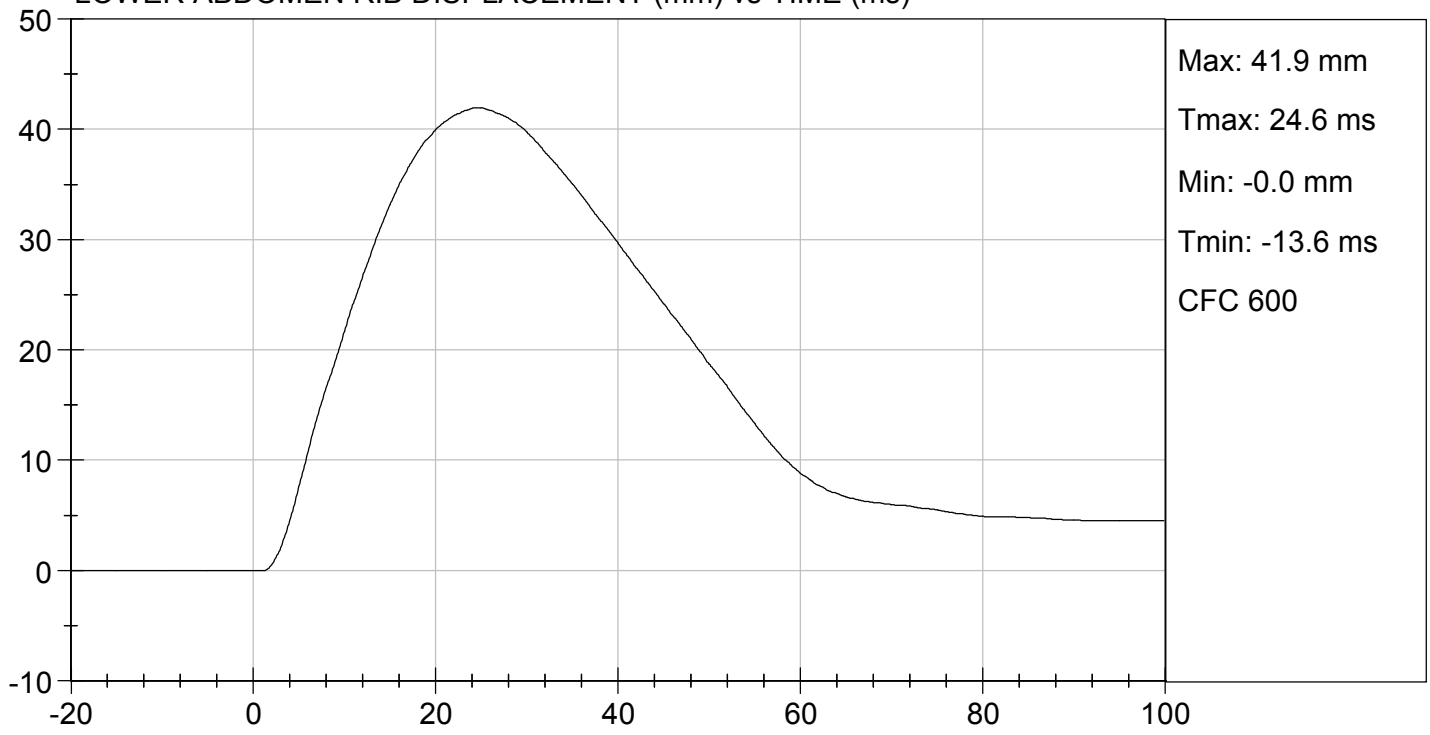
PROBE (G's) vs TIME (ms)



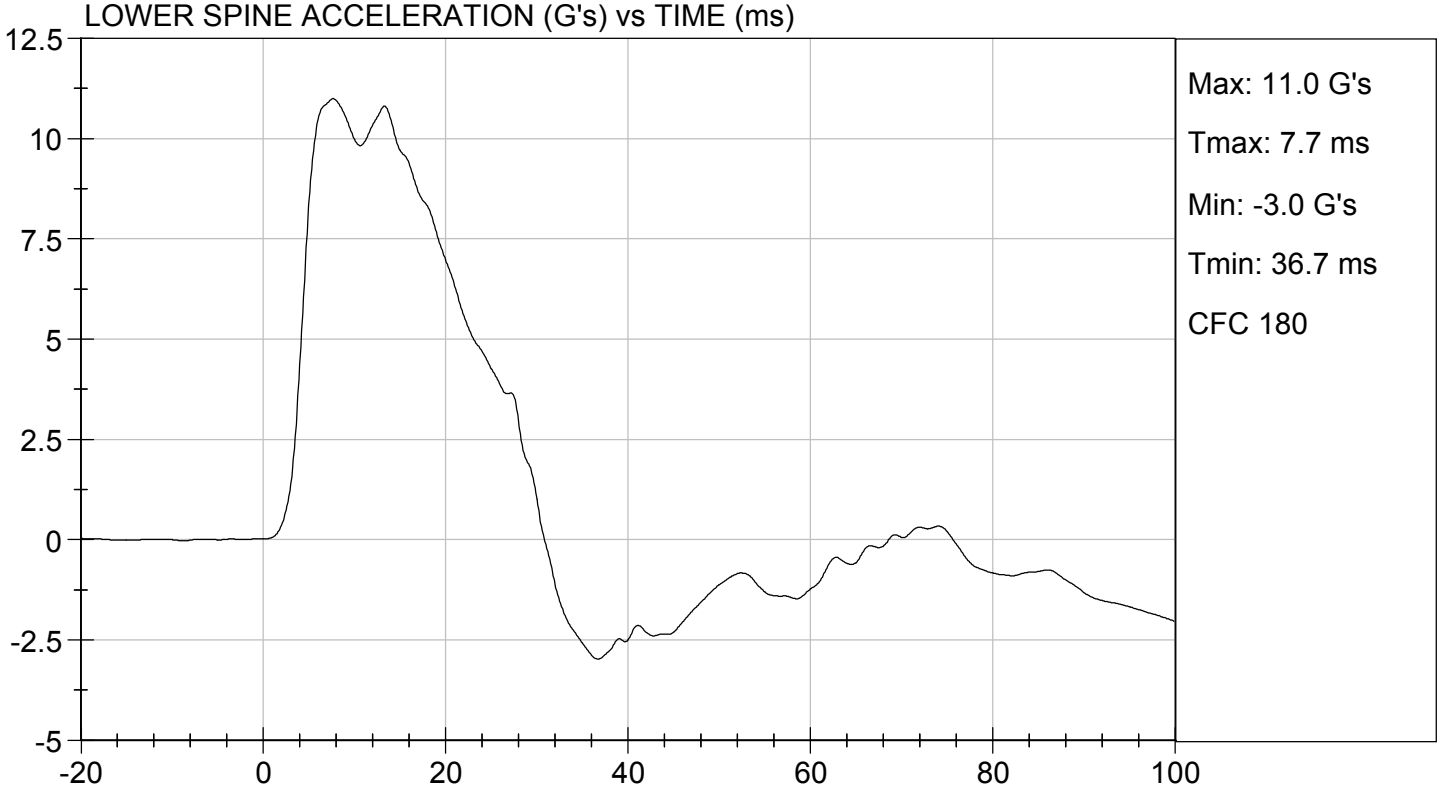
UPPER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201717

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3,747	Pass
		Overall Test Results		Pass

Laboratory Technician

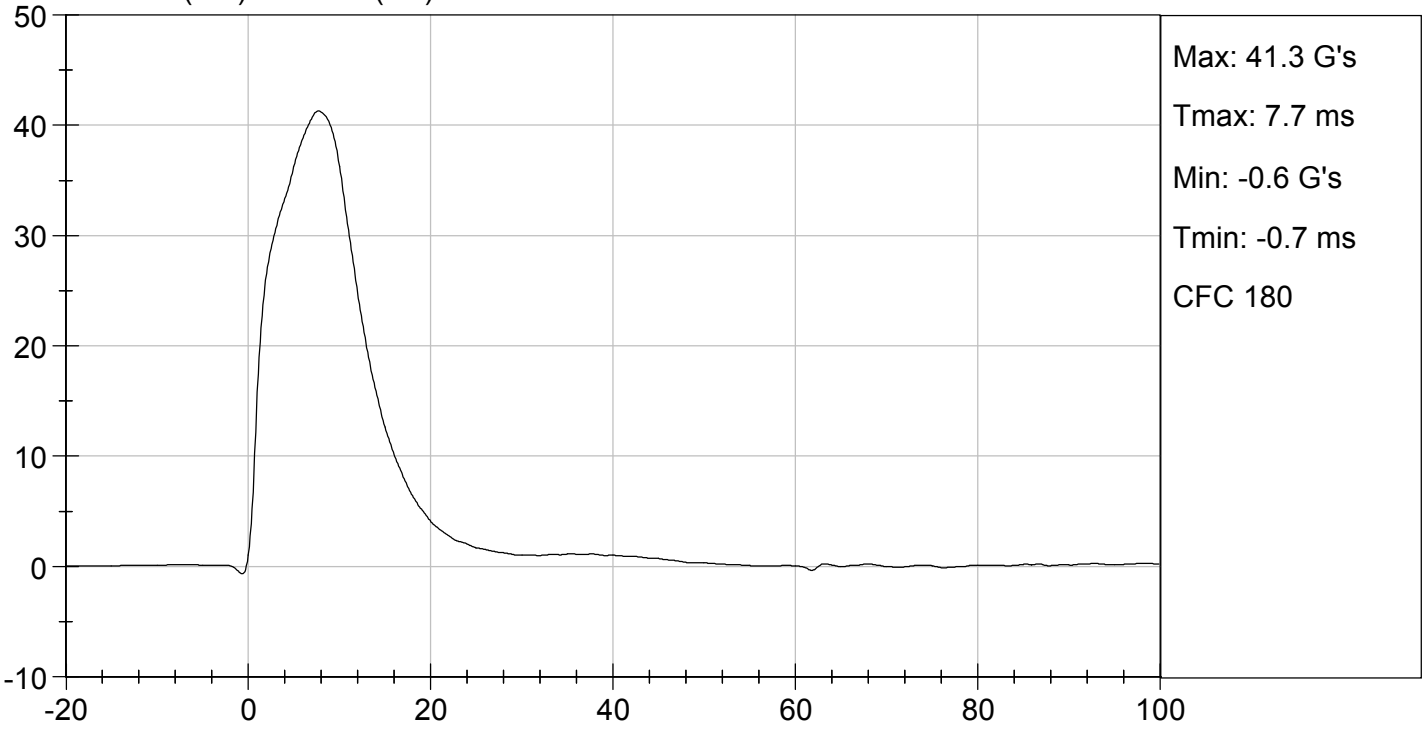
07/14/2020
Test Date

Approved By

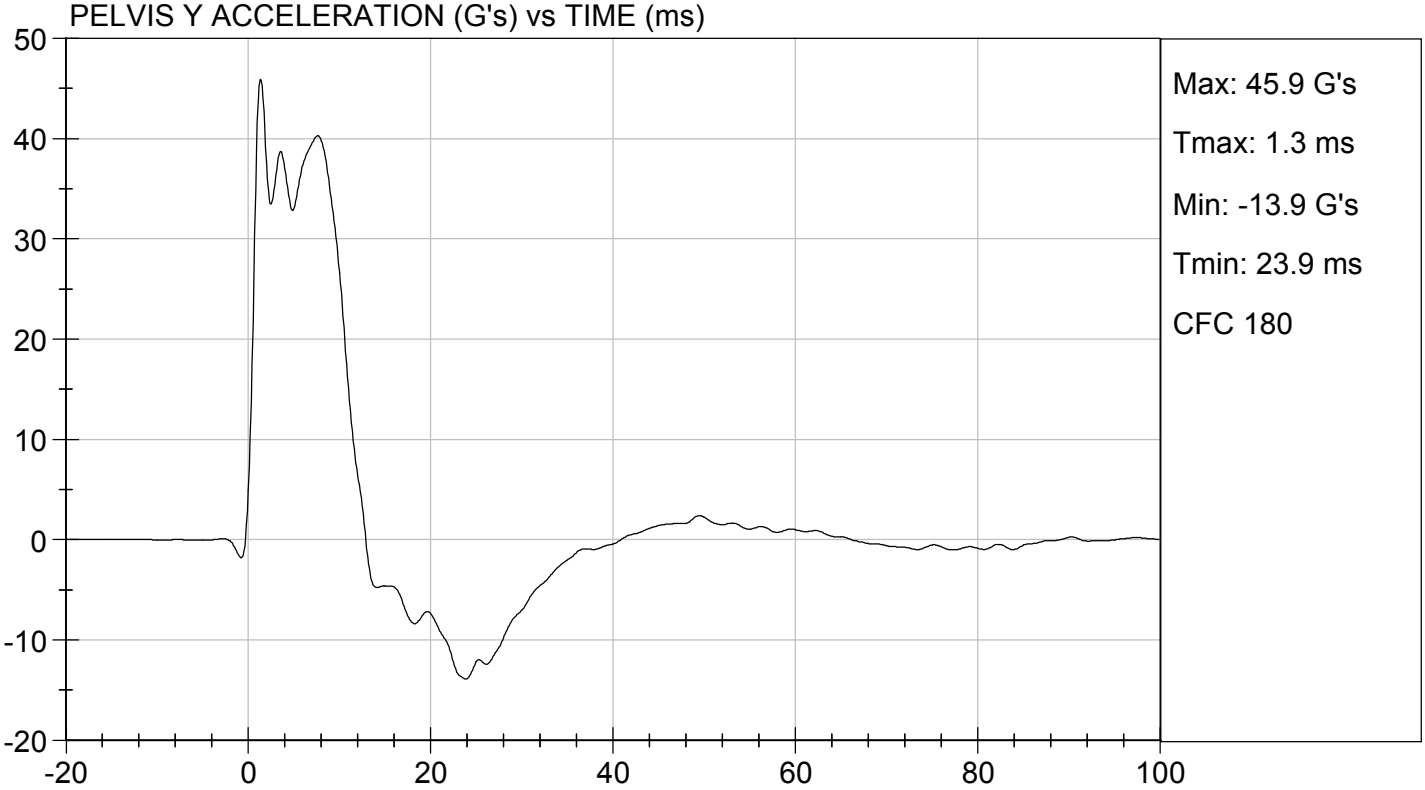
TEST DESC: PELVIS IMPACT
VELOCITY: 21.65 ft/s, 6.60 m/s

TEST DATE: 07/14/2020
TEST #: D201717

PROBE (G's) vs TIME (ms)

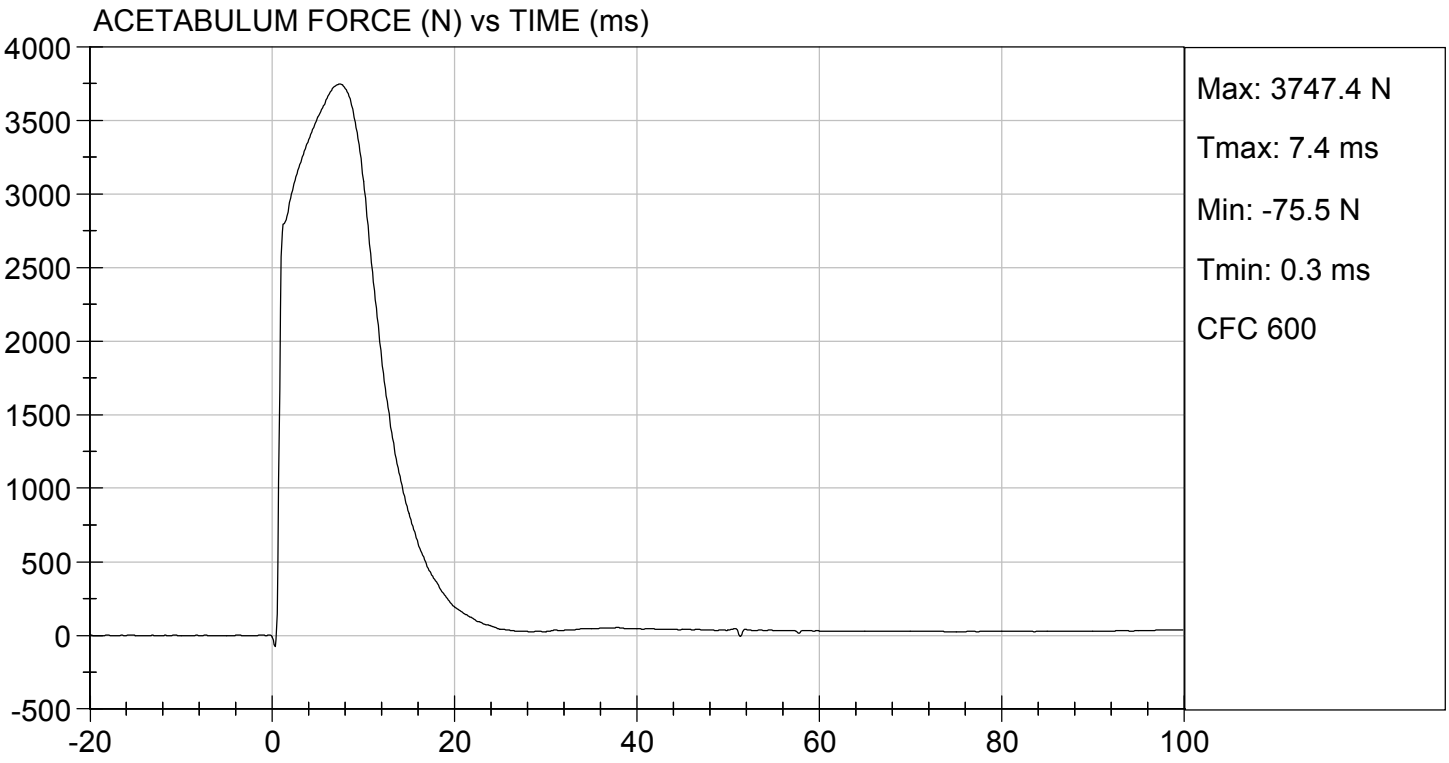


PELVIS Y ACCELERATION (G's) vs TIME (ms)



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

TEST DATE: 07/14/2020
TEST #: D201717



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D201718

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	43	Pass
Pelvis Y Acceleration	G's	28 to 39	37	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,957	Pass
		Overall Test Results		Pass

Laboratory Technician

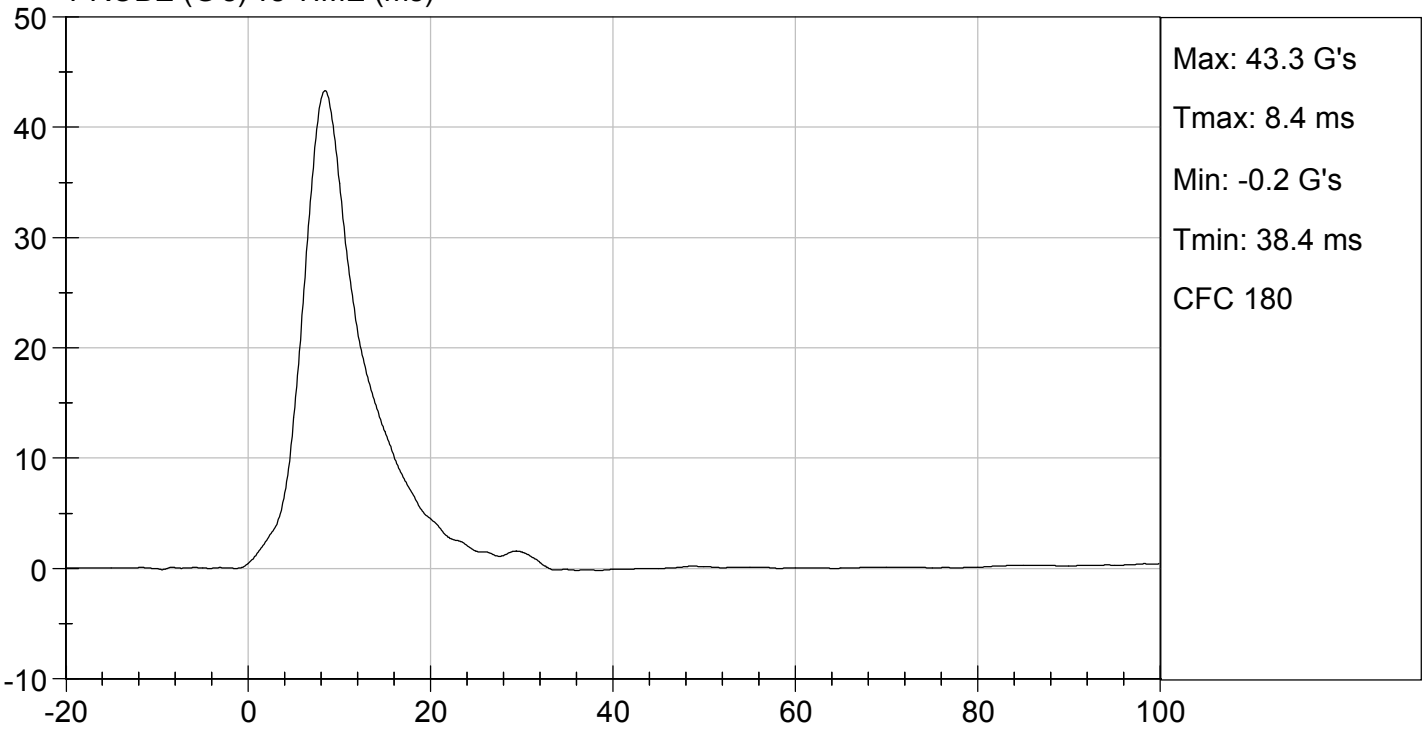
07/14/2020
Test Date

Approved By

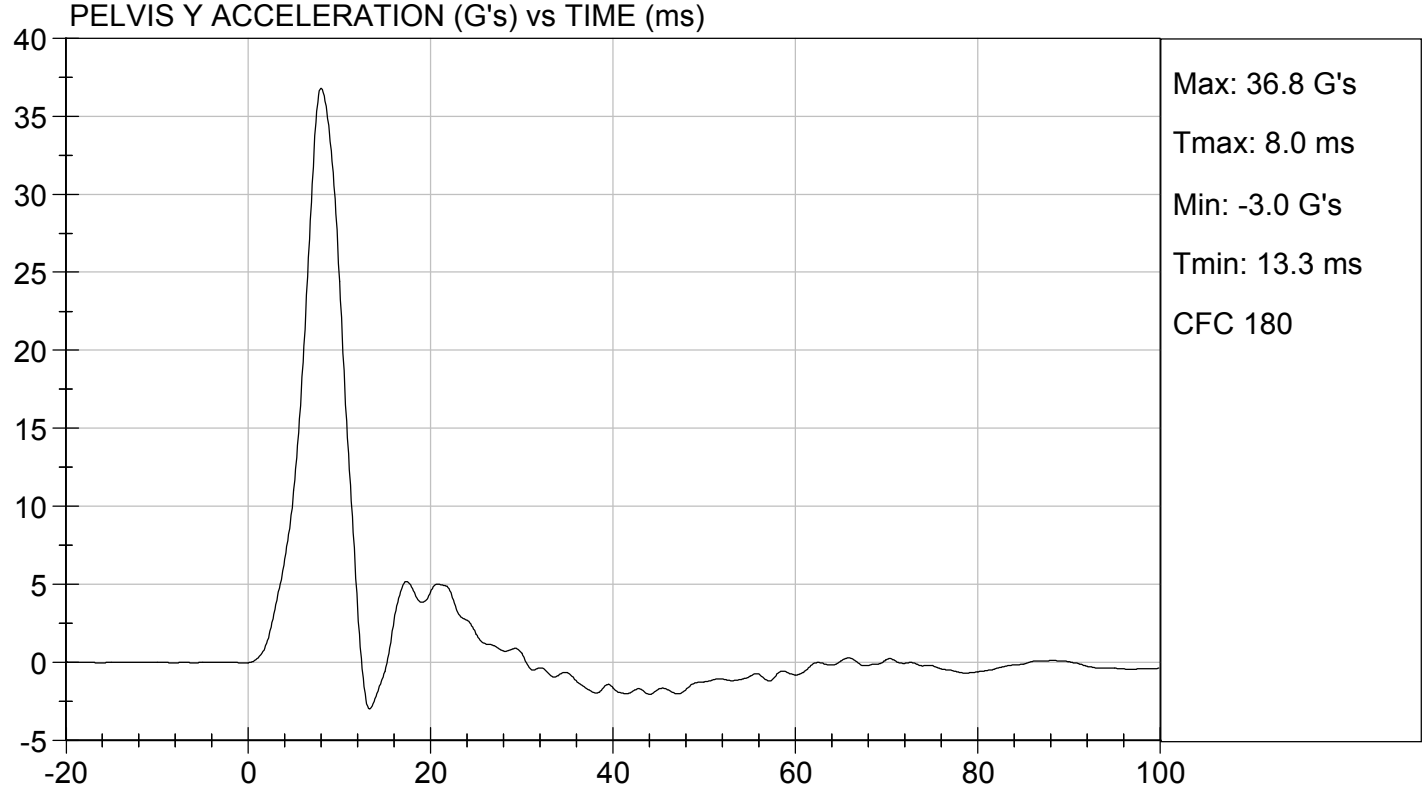
TEST DESC: ILLIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 07/14/2020
TEST #: D201718

PROBE (G's) vs TIME (ms)

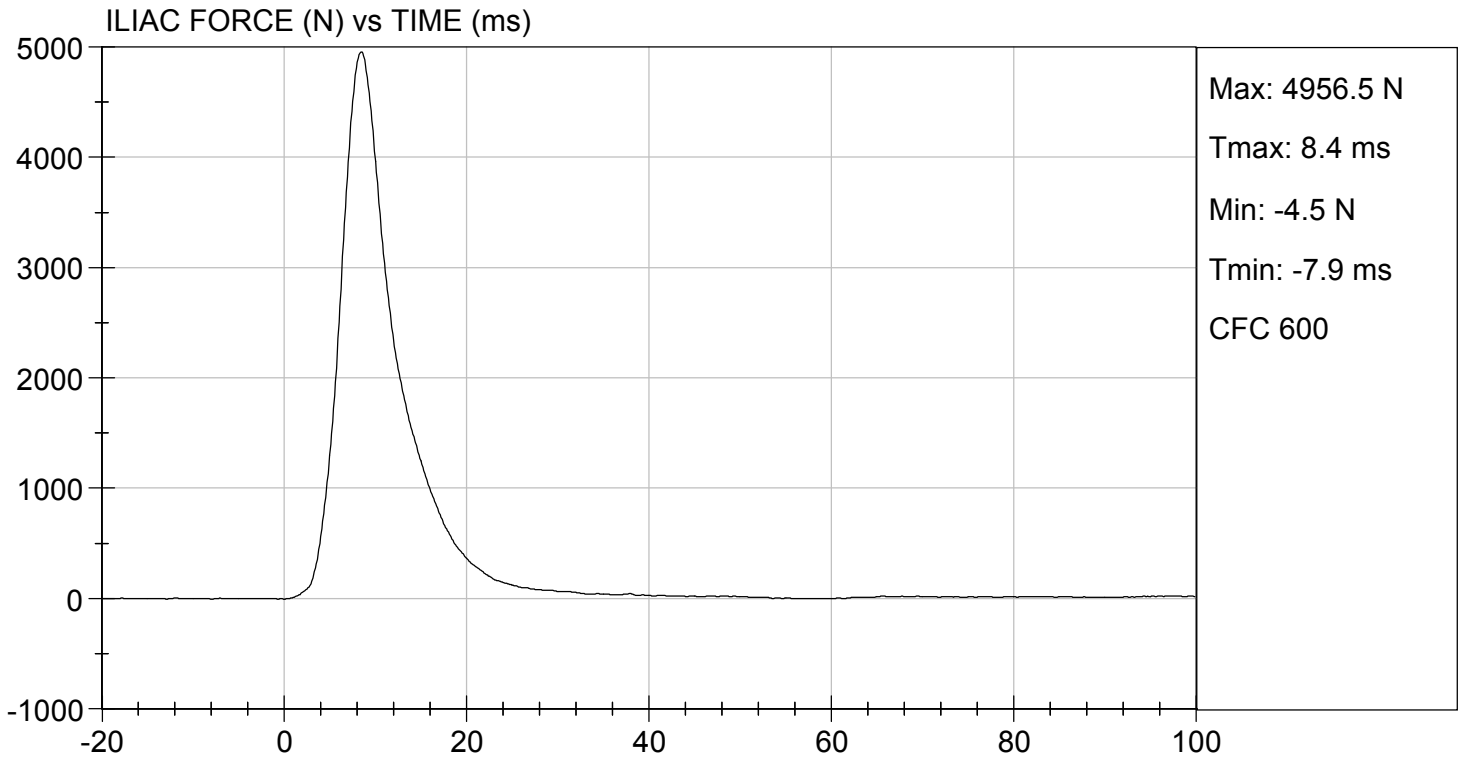


PELVIS Y ACCELERATION (G's) vs TIME (ms)



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

TEST DATE: 07/14/2020
TEST #: D201718



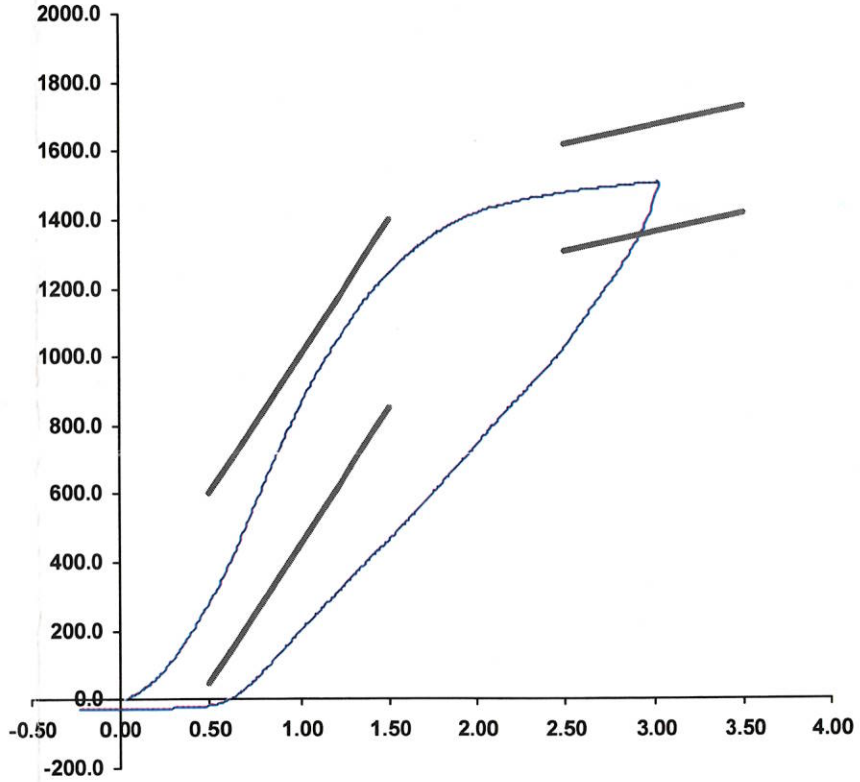
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13513
Test Number 11157
Report Number 11195
Test Date 9/23/2019 10:21:13 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	298.49	50.00	600.00
Force @ 1.5 mm (N)	1,246.23	850.00	1,400.00
Force @ 2.5 mm (N)	1,477.49	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,505.70	1,361.00	1,673.00

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS 1000

Crosshead Speed (mm / min) or Rat 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Operator

Part Number 180-4450

Template No 107 23-Sep-19
SACO Research

By : DC Date : 9/23/2019

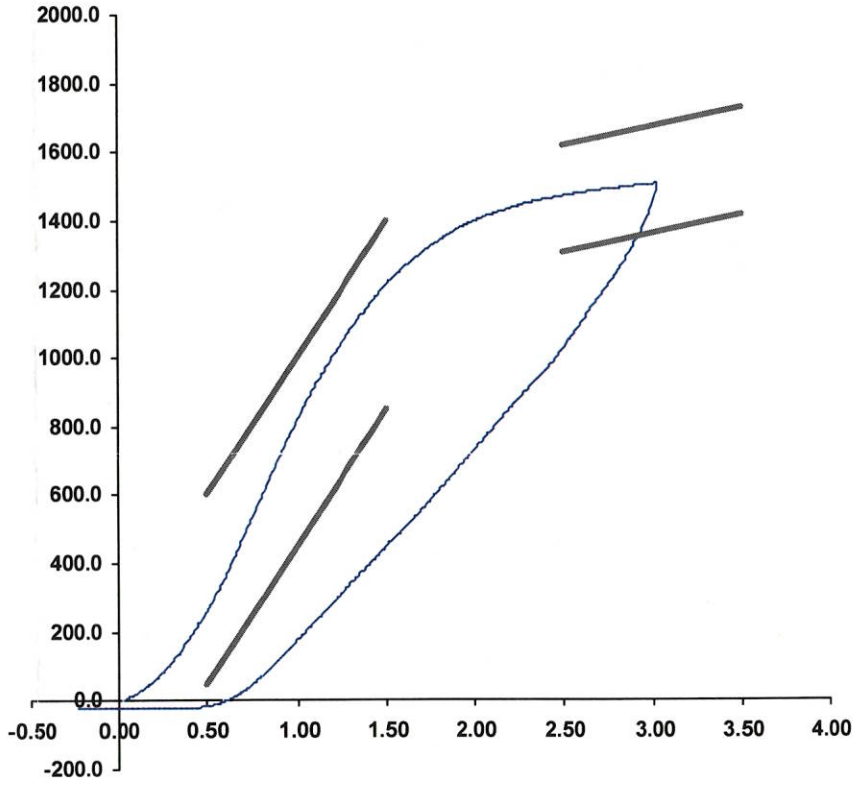
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13399
Test Number 11041
Report Number 11079
Test Date 9/19/2019 12:33:57 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	273.68	50.00	600.00
Force @ 1.5 mm (N)	1,215.80	850.00	1,400.00
Force @ 2.5 mm (N)	1,472.29	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,506.26	1,361.00	1,673.00

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS 1000

Crosshead Speed (mm / min) or Rat 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Operator

Part Number 180-4450

Template No 107 19-Sep-19
SACO Research

By : DC Date : 9/19/2019

SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation

				SID-IIs S/N 306		
				Serial Number	Manufacturer	Calibration Date
Head CG Accelerometers			X	P79721	Endevco	06/29/2020
			Y	P79724	Endevco	06/29/2020
			Z	P79445	Endevco	06/29/2020
			Xr	P84999	Endevco	06/29/2020
			Yr	P85000	Endevco	06/29/2020
			Zr	P85001	Endevco	06/29/2020
Head Angular Rate Sensors			X	ARS15231	DTS	11/08/2019
			Y	ARS15213	DTS	11/08/2019
			Z	ARS15229	DTS	11/08/2019
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	06/30/2019
		Middle	Y	G1261	FTSS	06/30/2019
		Lower	Y	G1270	FTSS	06/30/2019
	Abdominal Rib	Upper	Y	G032	FTSS	06/30/2019
		Lower	Y	G1304	FTSS	06/30/2019
Lower Spine Accelerometers (T12)			X	P96332	Endevco	06/29/2020
			Y	P96335	Endevco	06/29/2020
			Z	P96341	Endevco	06/29/2020
Acetabulum Load Cell			Y	ACG4285	FTSS	11/27/2019
Iliac Wing Load Cell			Y	IWG3023	FTSS	11/27/2019
Pelvis Plug (struck side)				13513	SACO	09/23/2019
Pelvis Plug (non-struck side)				13399	SACO	09/19/2019

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A305694	MSI	06/02/2020
Vehicle Center of Gravity	Y	A305725	MSI	06/02/2020
Vehicle Center of Gravity	Z	A305697	MSI	06/02/2020
Left Floor Sill	Y	T22879	Endevco	06/30/2020
A-Pillar Sill	Y	T20020	Endevco	06/29/2020
A-Pillar Low	Y	T21426	Endevco	02/27/2020
A-Pillar Mid	Y	T18996	Endevco	02/27/2020
B-Pillar Sill	Y	T20376	Endevco	06/30/2020
B-Pillar Low	Y	T22814	Endevco	06/18/2020
B-Pillar Mid	Y	T22751	Endevco	06/18/2020
Driver Seat	Y	T22632	Endevco	06/30/2020
Engine Top	X	T20393	Endevco	06/18/2020
Engine Top	Y	T21472	Endevco	06/18/2020
Firewall	Y	T22584	Endevco	02/20/2020
Right Roof	Y	T20733	Endevco	06/18/2020
Right Floor Sill	Y	T22633	Endevco	06/30/2020
Rear Floorpan	X	T22701	Endevco	06/18/2020
Rear Floorpan	Y	T22740	Endevco	06/18/2020

Table 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	DG6277	FTSS	07/30/18
Load Cell 2	DG6278	FTSS	07/30/18
Load Cell 3	DG6279	FTSS	07/30/18
Load Cell 4	DG6280	FTSS	07/30/18
Load Cell 5	DG6281	FTSS	07/30/18
Load Cell 6	DG6283	FTSS	07/30/18
Load Cell 7	DG6284	FTSS	07/30/18
Load Cell 8	DG6582	FTSS	07/30/18