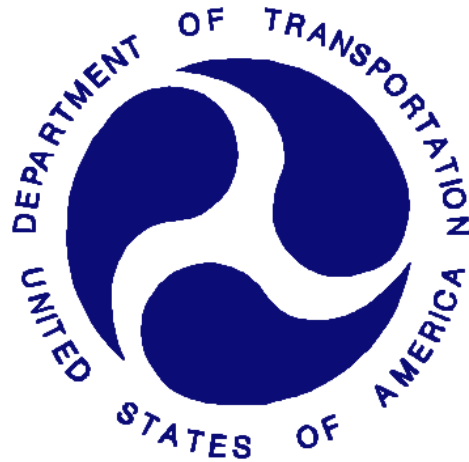


REPORT NUMBER: SINCAP-MGA-2018-015

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Moving Deformable Barrier Side Impact Test**

**AUDI AG
2018 Audi Q7 2.0T AWD 5-Door SUV
NHTSA No.: O20185811**

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



Test Date: November 3, 2017

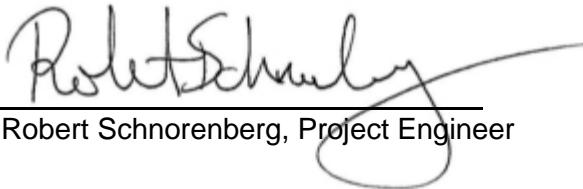
Final Report Date: December 11, 2017


FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NRM-110
1200 New Jersey Ave, SE
Room W43-410
Washington, DC 20590**

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Prepared by: 
Robert Schnorenberg, Project Engineer

Approved by: 
David Winkelbauer, Project Manager

Approval Date: December 11, 2017

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of 2018 Audi Q7 2.0T AWD 5-Door SUV, NHTSA No.: O20185811		5. Report Date December 11, 2017																													
		6. Performing Organization Code MGA																													
7. Author(s) Robert Schnorenberg, Project Engineer		8. Performing Organization Report No. SINCAP-MGA-2018-015																													
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																													
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12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590		13. Type of Report and Period Covered: Final Test Report November 3, 2017 to December 11, 2017																													
		14. Sponsoring Agency Code NRM-110																													
15. Supplementary Notes																															
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the 2018 Audi Q7 2.0T AWD 5-Door SUV in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side Laboratory Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on November 3, 2017. The impact velocity of the Moving Deformable Barrier (MDB) was 61.69 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.7°C. The target vehicle post-test maximum crush was 197 mm at level 3. The test vehicle's performance was as follows:																															
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The door on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door did not open during the side impact event.																															
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																													
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SECTION 1
TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2018 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 2018 Audi Q7 2.0T AWD 5-Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated October 2015.

SECTION 2 SUMMARY OF TEST RESULTS

A 2018 Audi Q7 2.0T AWD 5-Door SUV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.69 km/h. The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin on November 3, 2017. Pre-test and post-test photographs of the test vehicle, the MDB, and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS NCAP Side Laboratory Test Procedure dated October 2015. The side impact event was documented by eleven (11) cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and Redundant Head CG Triaxial Accelerometers
Chest Upper Rib, Middle Rib, and Lower Rib Y-Axis Displacement Potentiometers
Abdomen Forward, Middle, and Rear Y-Axis Load Cells
Lower Spine (T12) Triaxial Accelerometers
Pubic Symphysis Y-Axis Load Cell

PASSENGER ATD (SID-IIs)

Primary and Redundant Head CG Triaxial Accelerometers
Primary Head CG Angular Rate Sensors
Chest Upper Rib, Middle Rib, and Lower Rib Y-Axis Displacement Potentiometers
Abdomen Upper Rib and Lower Rib Y-Axis Displacement Potentiometers
Lower Spine (T12) Triaxial Accelerometers
Acetabulum and Iliac Wing Y-Axis Load Cells

Appendix B contains the 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.

Dummy Injury readings were recorded as follows:

DUMMY INJURY VALUES

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	81
Maximum Thorax Rib Deflection	mm	44	20
Total Abdominal Force	N	2500	504
Pubic Symphysis Force	N	6000	1110
Resultant Lower Spine Acceleration	Gs	82*	23

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	76
Resultant Lower Spine Acceleration	Gs	82	41
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3167
Maximum Thoracic Rib Deflection	mm	38*	10
Maximum Abdomen Rib Deflection	mm	45*	34

*Proposed IARV

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side 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	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		No	
Other:	No		No	

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

GENERAL COMMENTS

Left Front Sill Y recorded questionable data between 25 and 45ms.
Left Front A-Post Y recorded questionable data.
Left Lower B-Post Y was not installed.
Left Mid B-Post Y was not installed.

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

SECTION 3
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
Test Date: 11/3/2017

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20185811	Traction Control System (TCS)	Yes
Model Year	2018	Auto-Leveling System	No
Make	Audi	Automatic Door Locks (ADL)	Yes
Model	Q7 2.0T	Power Window Auto-Reverse	Yes
Body Style	5-Door SUV	Other Optional Feature	N/A
VIN	WA1AHAF72JD007222	Driver Front Airbag	Yes
Body Color	Graphite Gray Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	42km / 26mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.0L	Driver Torso Airbag	No
Type/No. Cylinders	4	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	AWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	Yes	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Restraint Feature	N/A

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

DATA FROM CERTIFICATION LABEL

Manufactured By	AUDI AG	GVWR (kg)	2920
Date of Manufacture	08/17	GAWR Front (kg)	1390
Vehicle Type	MPV	GAWR Rear (kg)	1710

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	2	7	
Capacity Weight (VCW) (kg)				600	(A)
DSC x 68.04 kg				476	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				124	(A-B)

VEHICLE SEAT TYPE

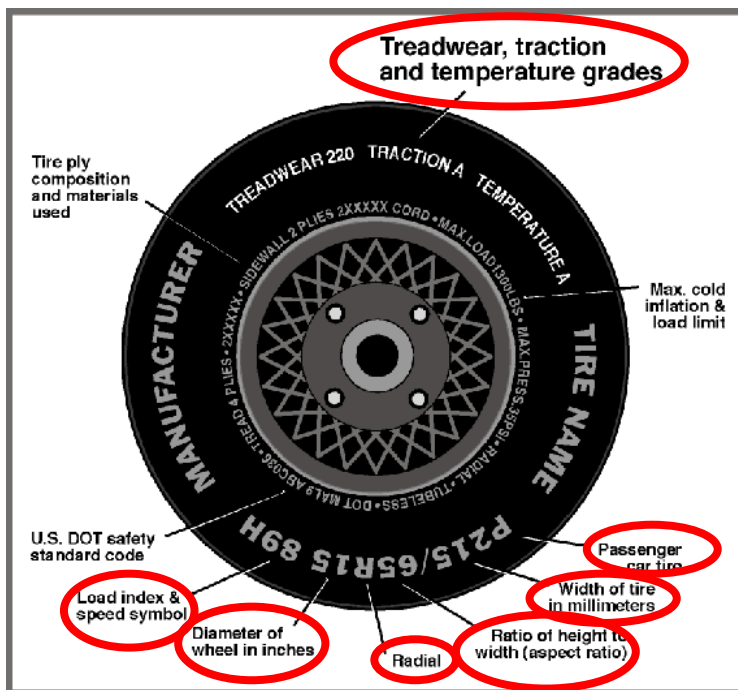
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X						X
Rear or Second Row Seat			X			w/ Lever	
Third Row Seat			X		X		

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
 Test Date: 11/3/2017

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	240
Recommended Tire Size	255/60R18	255/60R18
Tire Size on Vehicle	255/60R18	255/60R18
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle Sport	Eagle Sport
Treadwear	560	560
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	2 Steel, 2 Rayon, 1 Polyamide	2 Steel, 2 Rayon, 1 Polyamide
Load Index/Speed Symbol	108H	108H
Tire Material	Rubber	Rubber
DOT Safety Code Left	NEYP JJ1R 5016	NEYP JJ1R 5116
DOT Safety Code Right	NEYP JJ1R 5116	NEYP JJ1R 5116

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	230	230	250	255
Tire Placard	kPa	220	220	240	240
Owner's Manual	kPa	220	220	240	240
As Tested	kPa	220	220	240	240

MDB TIRE SPECIFICATIONS

Requirement		Units	LF	RF	LR	RR
Tire Size	P205/75R15	N/A	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire	200 ± 21	kPa	200	200	200	200

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	572.0	485.5		609.5	598.0		607.0	608.5	
Right	kg	577.5	498.5		573.5	598.5		576.5	594.0	
Ratio	%	53.9%	46.1%		49.7%	50.3%		49.6%	50.4%	
Totals	kg	1149.5	984.0	2133.5	1183.0	1196.5	2379.5	1183.5	1202.5	2386.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2133.5	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	124	(C)
Calculated Test Vehicle Target Weight (TVTW)	kg	2386.5	(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	Fully Loaded	As Tested	Meets Requirement***
Left Front	mm	822	822	Yes
Right Front	mm	823	816	Yes
Right Rear	mm	823	829	Yes
Left Rear	mm	818	820	Yes
Vehicle CG (Aft of Front Axle)	mm	1508	1504	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	16	-7	

*** The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well.

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
Test Date: 11/3/2017

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Weight of Ballast, if any	90
None	

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, 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	23.2	12.3	17.8
Front Passenger Seat	22.8	12.2	17.5
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	17.8	0	Max	72	72	72
			Mid	36	36	36
			Min	0	0	0
Front Passenger Seat	17.5	0	Max	70	70	70
			Mid	35	35	35
			Min	0	0	0
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

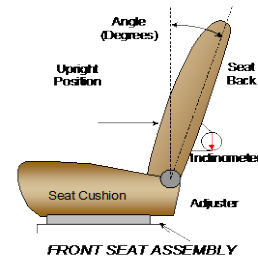
NHTSA No. Q20185811
 Test Date: 11/3/2017

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-Most Position	
	mm	Detents (1 st as 1)	mm	Detent (1 st as 0)
Driver Seat	250		125	
Front Passenger Seat	250		125	
Front Center Seat				
Struck Side Rear Seat	110	12	110	11
Non-Struck Side Rear Seat	110	12	110	11
Rear Center Seat	110	12	110	11

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The front passenger's seat back is positioned in a similar manner as the driver's seat back. The struck side rear seat back is adjusted following Appendix C, "Positioning Dummies in the Test Vehicle" in the NCAP Laboratory Test Procedure dated October 2015. The rear center and non-struck side rear outboard seat backs are positioned to match the struck side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents (1 st as 1)	Degrees	Detent (1 st as 0)
Driver Seat	69.5		19.6	
Front Passenger Seat	69.8		19.5	
Front Center Seat				
Struck Side Rear Seat	29.6	16	3.8	1
Non-Struck Side Rear Seat	30.0	16	3.8	1
Rear Center Seat	29.6	16	3.8	1

Driver and left rear passenger seat back angle measured with level on seatback.

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
 Test Date: 11/3/2017

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

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

HEAD RESTRAINT ADJUSTMENT

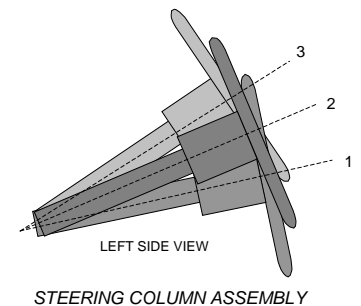
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	4 (Lowest as 0) / Foremost
Rear Seat	2	0 (Lowest as 0) / Fixed Fore-Aft

STEERING COLUMN ADJUSTMENT

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

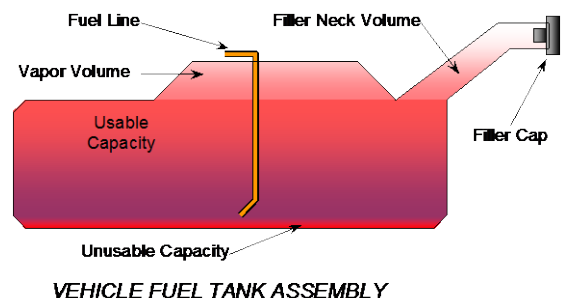
	Wheel Angle (deg)	Fore/Aft Position (mm)
Lowermost, Position 1	69.6	162
Geometric Center, Position 2	67.7	129
Uppermost, Position 3	65.7	95
Telescoping Steering Wheel Travel		67
Test Position	67.7	129



FUEL PUMP

Describe the fuel pump type, details about how it operates and the location of the fuel filler pipe.

The vehicle is equipped with an electronic fuel pump. The fuel pump runs for a short time after ignition is switched on. If the engine is started the pump works normally. The filler neck is located on the passenger's side.



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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
Test Date: 11/3/2017

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of Standard Tank (see Form No. 1)	84.8
Usable Capacity of Optional Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	84.8
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	78.9
Actual Amount of Solvent Used	78.7
1/3 of Usable Capacity	28.3

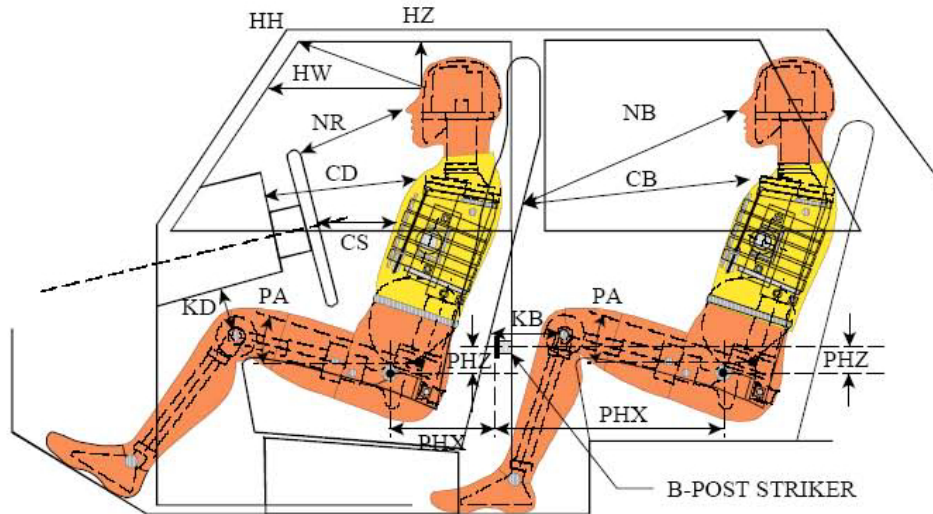
Is the actual amount of solvent used in the test equal to 93% + 1%
of the Usable Capacity stated in Form No. 1?

YES

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
 Test Date: 11/3/2017



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

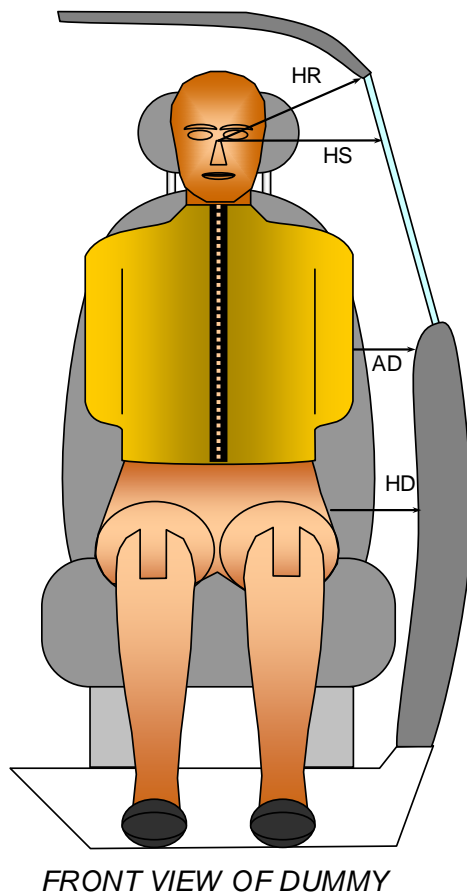
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	373	20.0		
HW		Head to Windshield	653	0		
HZ	HZ	Head to Roof Liner	184	90	310	90
NR	NB	Nose to Rim/Seat Back	418	11.1	488	10.8
CD	CB	Chest to Dashboard/Seat Back	561	9.5	503	8.7
CS		Chest to Steering Wheel	370	6.7		
KDL	KBL	Left Knee to Dash/Seat Back	222	26.4	308	17.0
KDR	KBR	Right Knee to Dash/Seat Back	197	30.5	307	17.0
PAX	PAX	Pelvic Tilt Angle X		17.2		21.2
PAY	PAY	Pelvic Tilt Angle Y		-0.7		-0.2
PHX	PHX	Hip Point to Striker (X-Axis)	149		292	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	154		200	

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017



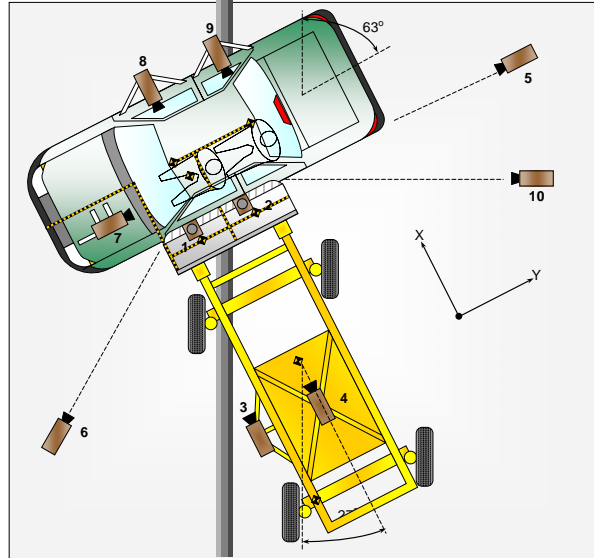
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	238	256
HS	Head to Side Window	mm	346	348
AD	Arm to Door	mm	126	138
HD	Hip Point to Door	mm	103	133

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	900	-980	-4995	14	1000
2	Overhead Close-Up	240	110	-4895	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	-90	6490	-1610	24	1000
6	Left Front	-4700	-1640	-1530	24	1000
7	Driver Front (OB)				16	1000
8	Driver Side (OB)				8	1000
9	Passenger Side (OB)				8	1000
10	Real Time Left Rear					30
11	Real Time Inrun					30

Reference: Impact Point projected to Ground; +X = To Front of MDB, +Y = To Right of MDB, +Z = Down
 * All measurements accurate to ± 6 mm

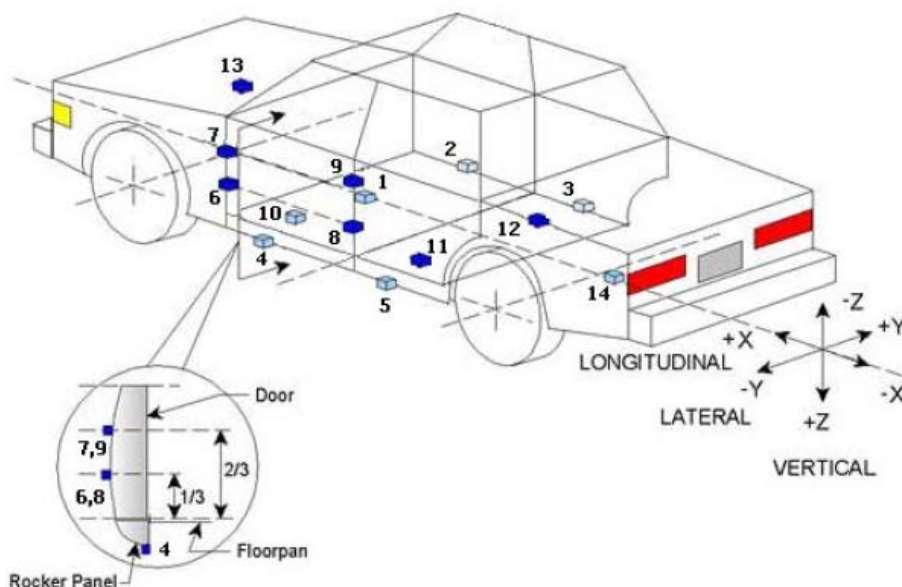
INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Passenger Dummy	19
Vehicle Structure	23
MDB Accelerometers	5
MDB Contacts	2
Total	65

DATA SHEET NO. 6 TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017



TEST VEHICLE ACCELEROMETER LOCATIONS

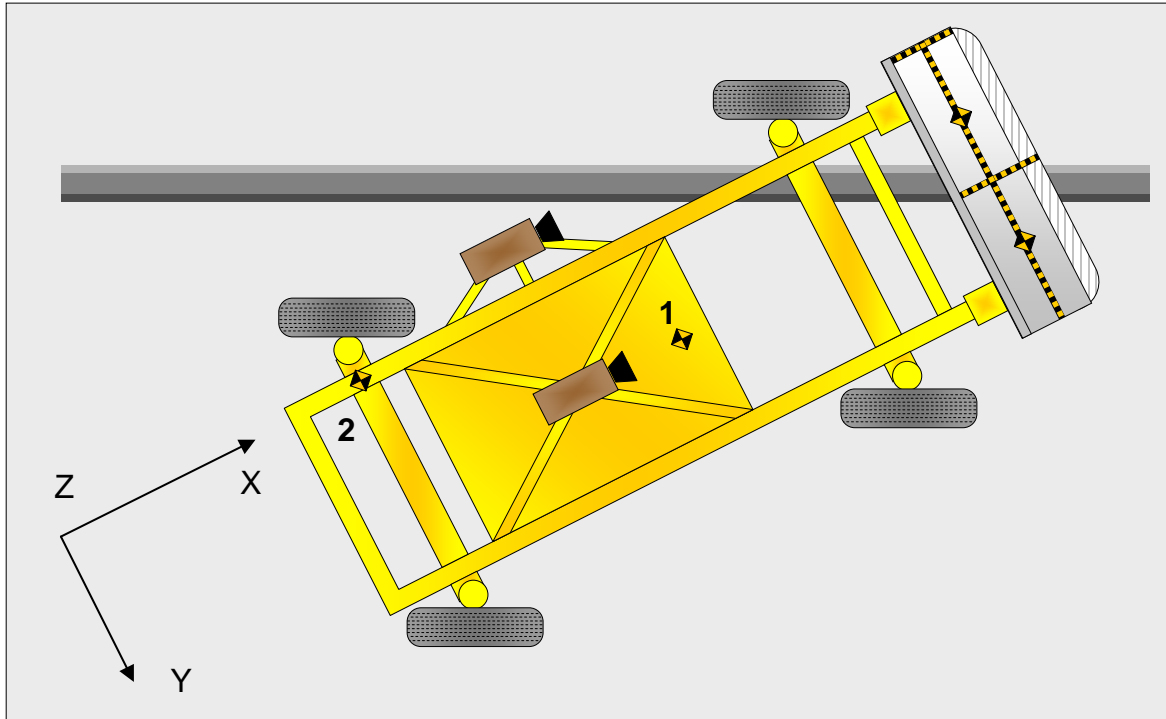
Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2437	307	-248
2	Right Sill at Front Seat	2944	801	-263
3	Right Sill at Rear Seat	1759	801	-258
4	Left Sill at Front Door	2934	-801	-266
5	Left Sill at Rear Door	1846	-801	-265
6	Left Lower A-Post	3422	-890	-689
7	Left Middle A-Post	3422	-880	-916
8	Left Lower B-Post			
9	Left Middle B-Post			
10	Front Seat Track	2551	-404	-430
11	Rear Seat Structure	2040	-409	-476
12	Rt. Rear Occ. Compartment	2130	430	-248
13	Engine Block	4298	10	-988
14	Rear Above Axle	1050	0	-523

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

**DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS**

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017



MDB ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-1105	0	-330
2	MDB Rear	-2580	-650	-625

Reference: X – MDB Face (+ forward)
 Y – MDB Centerline (+ to right)
 Z – Ground Plane (+ down)

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-lis)
Face	Curtain Airbag	None
Top of Head	Curtain Airbag	Curtain Airbag
Left Side of Head	Curtain Airbag	Curtain Airbag
Back of Head	Curtain Airbag, Headrest	Curtain Airbag, Headrest, Seat Back
Left Shoulder	None	Door Panel
Upper Torso	Side Torso/Pelvis Airbag	None
Lower Torso	Side Torso/Pelvis Airbag	Door Panel
Left Hip	Side Torso/Pelvis Airbag	Door Panel
Left Knee	None	Door Panel

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

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

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
 Test Date: 11/3/2017

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side 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	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		No	
Other:	No		No	

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2992
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		508
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	0
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	-4

**DATA SHEET NO. 9
MDB SUMMARY OF RESULTS**

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1250
Overall Length Including Honeycomb Face	4119
Wheelbase of Framework Carriage	2584
CG Location aft of Front Axle	1128

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	427.9	264.0	
Right	kg	340.6	331.2	
Ratio	%	56.4	43.6	
Totals	kg	768.5	595.2	1363.7

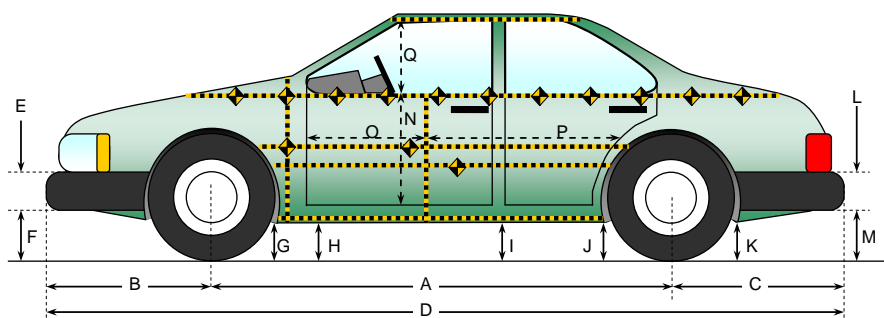
SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.69
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.83
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.3
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.9
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	26.8

DATA SHEET NO. 10 TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017



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

LEFT SIDE VIEW

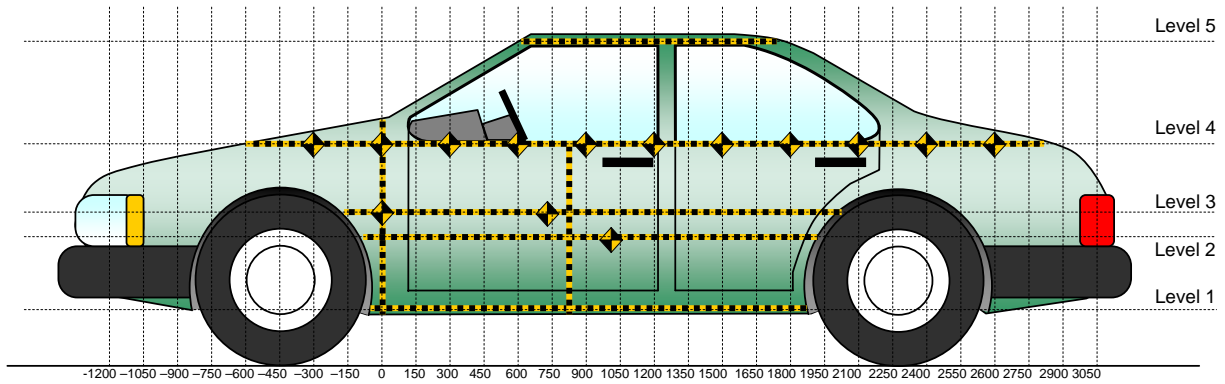
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2992	2994	-2
B	Front Axle to FSOV	981	979	2
C	Rear Axle to RSOV	1052	1071	-19
D	Total Length at Centerline	5025	5044	-19
E	Front Bumper Thickness	118	118	0
F	Front Bumper Bottom to Ground	282	295	-13
G	Sill Height at Front Wheel Well			
H	Sill Height at Front Door Leading Edge	240	239	1
I	Sill Height at B Pillar			
J1	Sill Height at Rear Wheel Well			
J2	Pinch Weld Height at Rear Wheel Well	224	227	-3
K	Sill Height Aft of Rear Wheel Well	267	276	-9
L	Rear Bumper Thickness	105	105	0
M	Rear Bumper Bottom to Ground	275	284	-9
N	Sill Height to Window Bottom Sill	973	868	105
O	Front Door Leading Edge to Impact CL	774	743	31
P	Rear Door Trailing Edge to Impact CL	1365	1303	62
Q	Front Window Opening	475	470	5
R	Right Side Length	4033	4034	-1
S	Left Side Length	4033	4030	3
T	Vehicle Width at B Post	1956	1848	108

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017



All Measurements Shown in mm

LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	510	136	300
2	Occupant H-Point	688	194	900
3	Mid Door	711	197	750
4	Window Sill	1132	38	1200
5	Window Top	1630	0	1950

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

DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. Q20185811
 Test Date: 11/3/2017

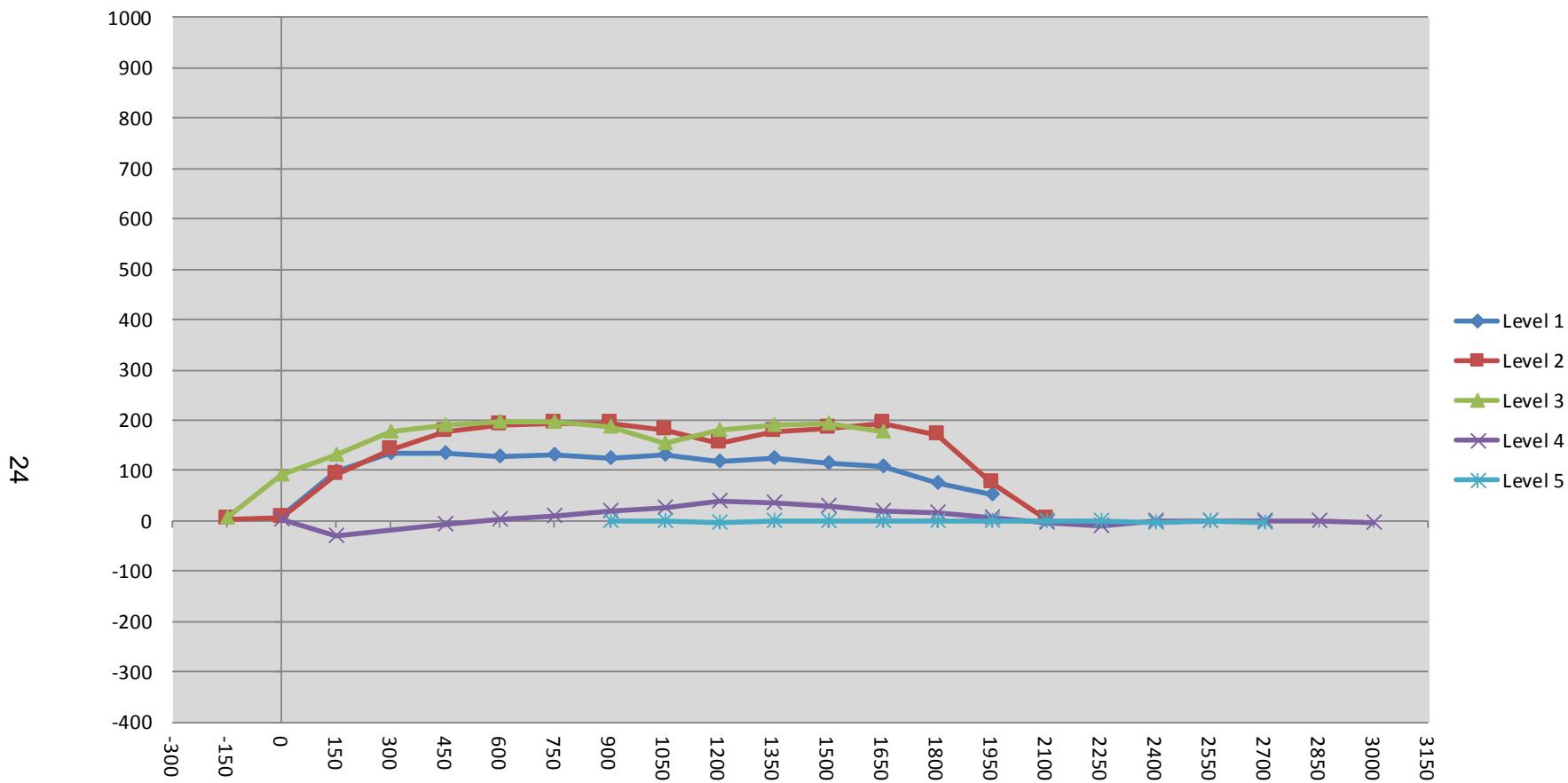
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900															
-750															
-600															
-450															
-300															
-150		127	126				130	130				3	4		
0	129	130	132	248		139	137	137	251		10	7	5	3	
150	141	134	133	236		238	227	225	205		97	93	92	-31	
300	145	133	133			281	275	263			136	142	130		
450	146	131	132	217		281	308	308	211		135	177	176	-6	
600	145	130	130	212		272	320	321	214		127	190	191	2	
750	144	130	129	207		275	323	326	216		131	193	197	9	
900	143	130	129	204	455	269	324	326	222	454	126	194	197	18	-1
1050	142	130	130	199	447	272	311	318	226	446	130	181	188	27	-1
1200	141	132	132	198	447	260	285	287	236	445	119	153	155	38	-2
1350	141	134	132	201	448	267	310	311	236	447	126	176	179	35	-1
1500	139	135	134	202	450	253	318	323	230	449	114	183	189	28	-1
1650	139	137	137	204	450	248	329	331	224	449	109	192	194	20	-1
1800	137	138	138	205	452	213	308	315	221	451	76	170	177	16	-1
1950	134	136	138	209	454	185	212	221	215	454	51	76	83	6	0
2100		125	124	212	458		129	133	210	457		4	9	-2	-1
2250				212	465				203	464				-9	-1
2400				214	473				214	471				0	-2
2550				215	484				215	483				0	-1
2700				220	500				220	496				0	-4
2850				227					226					-1	
3000				243					241					-2	
3150															
3300															
3450															
3600															
3750															
3900															

NOTE: 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.

DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

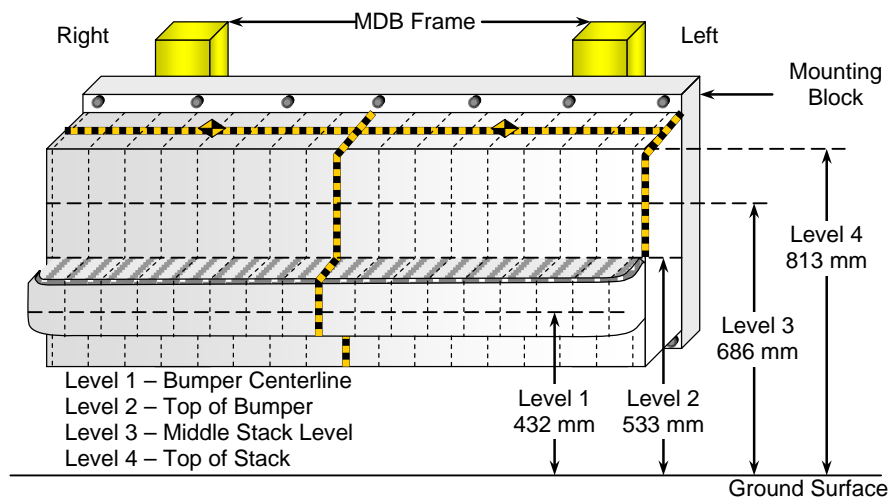
NHTSA No. O20185811
 Test Date: 11/3/2017



DATA SHEET NO. 12 MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
 Test Date: 11/3/2017



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	300	Right	261
B	Top of Bumper	533	800	Left	140
C	Mid-Level	686	800	Left	149
D	Top of Stack	813	800	Left	169

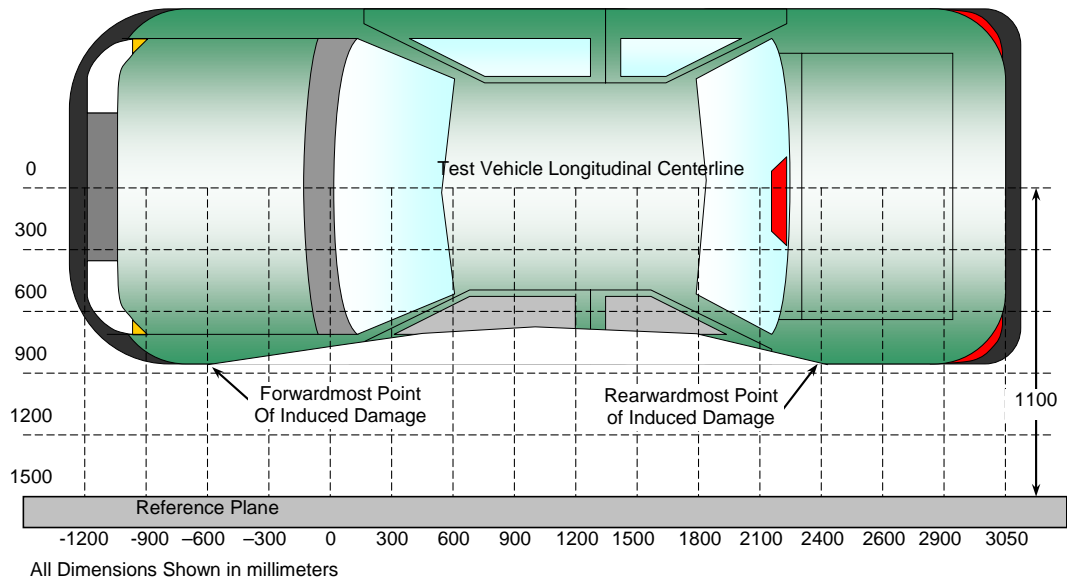
DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C _L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
4	87	68	71	73	70	83	95	95	82	68	81	85	93	103	118	135	169
3	86	68	65	66	70	77	96	83	49	45	45	47	52	62	85	121	149
2	126	119	122	125	127	120	116	119	124	126	127	131	135	139	138	135	140
1	233	237	242	245	249	261	245	245	250	243	242	242	240	241	242	245	249

**DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES**

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
Test Date: 11/3/2017



TOP VIEW

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Max. Static Crush (mm)
1	2192	3	91	134	-43
2	1767	3	322	138	184
3	1341	3	311	132	179
4	916	3	326	129	197
5	490	3	312	131	181
6	65	3	173	132	41

MDB DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Max. Static Crush (mm)
1	800 mm right of center	1	709	476	233
2	480 mm right of center	1	709	465	244
3	160 mm right of center	1	712	461	251
4	160 mm left of center	1	702	461	241
5	480 mm left of center	1	708	465	243
6	800 mm left of center	1	725	476	249

DATA SHEET NO. 14
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

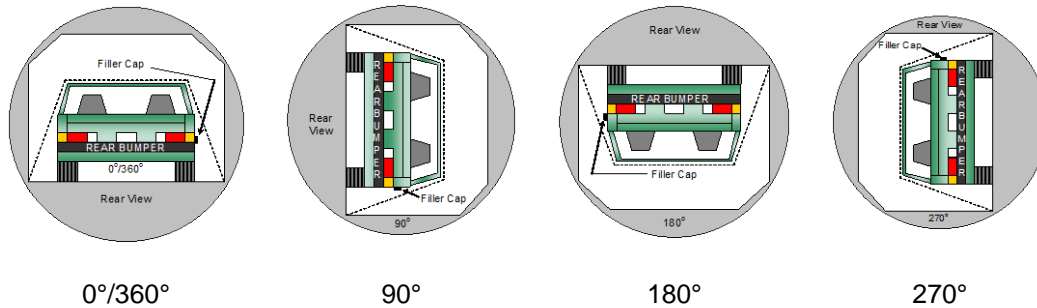
NHTSA No. O20185811
 Test Date: 11/3/2017

Test Time: 1:03 pm

Temperature: 21.7 °C

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

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	91	300	391
90° to 180°	93	300	393
180° to 270°	90	300	390
270° to 360°	87	300	387

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	

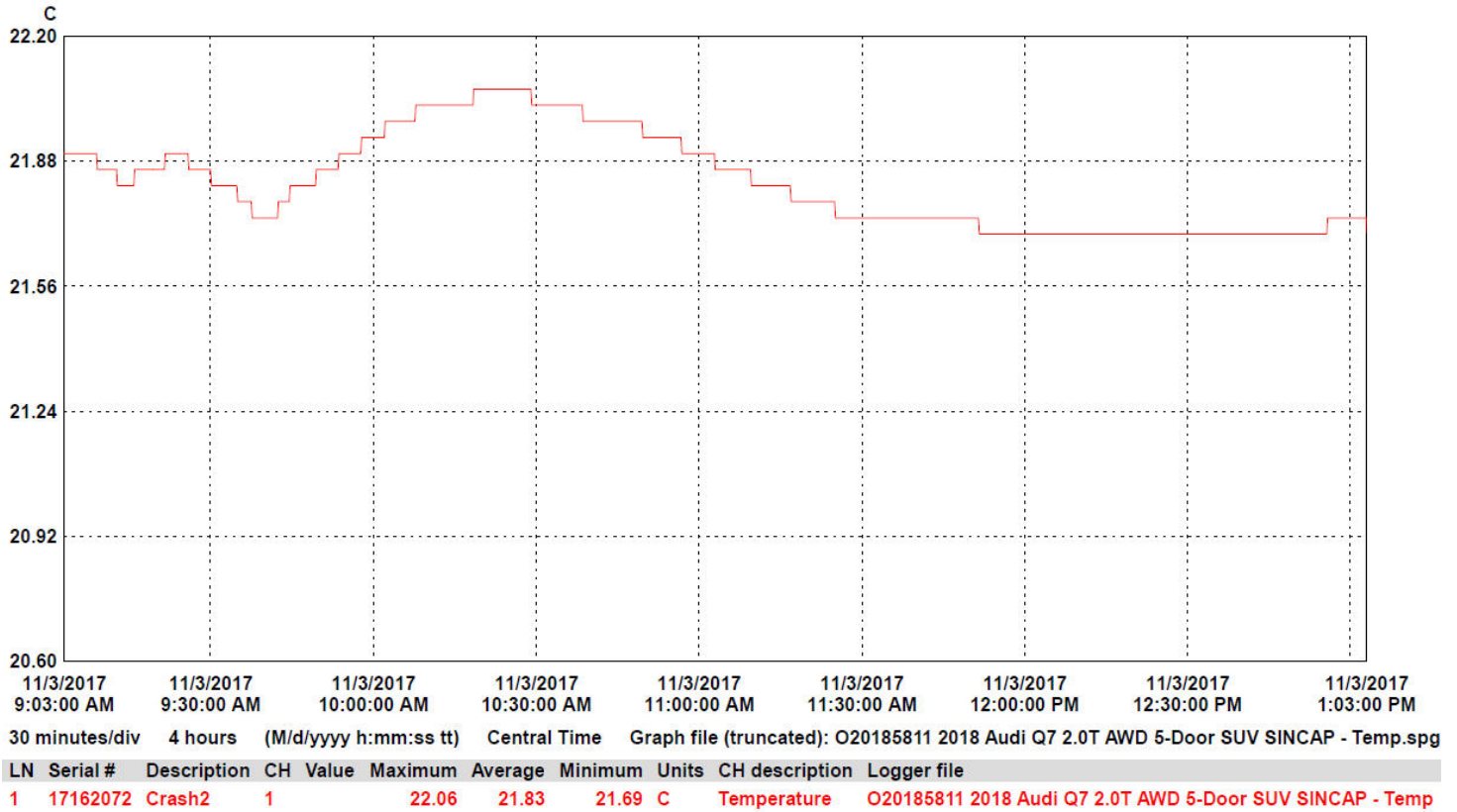
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

**DATA SHEET NO. 15
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA**

Test Vehicle: 2018 Audi Q7 2.0T AWD 5-Door SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20185811
 Test Date: 11/3/2017



**APPENDIX A
PHOTOGRAPHS**

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



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



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



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



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

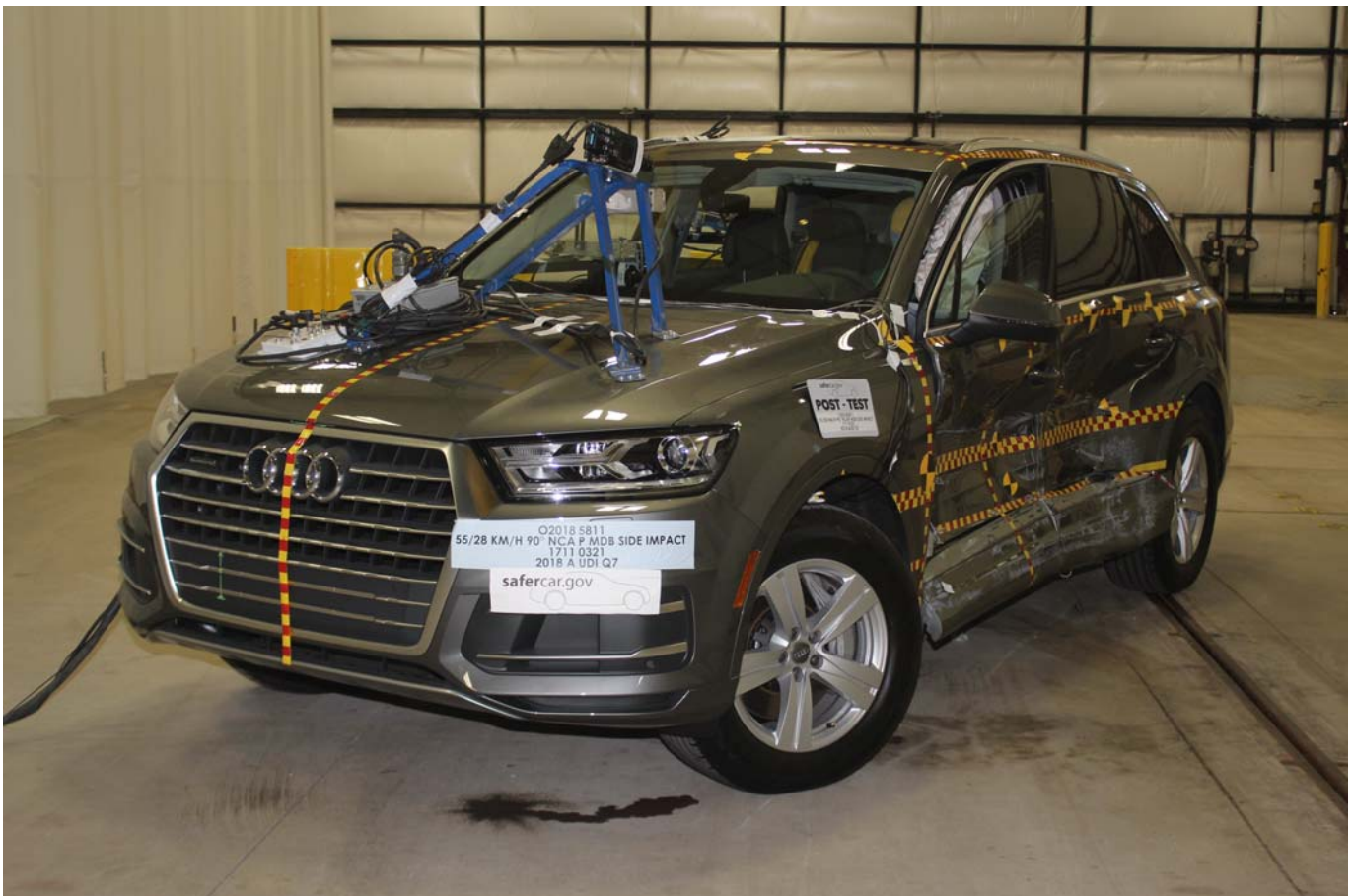


Photo No. 006 - Post-Test Left Front Three-Quarter View of Test Vehicle

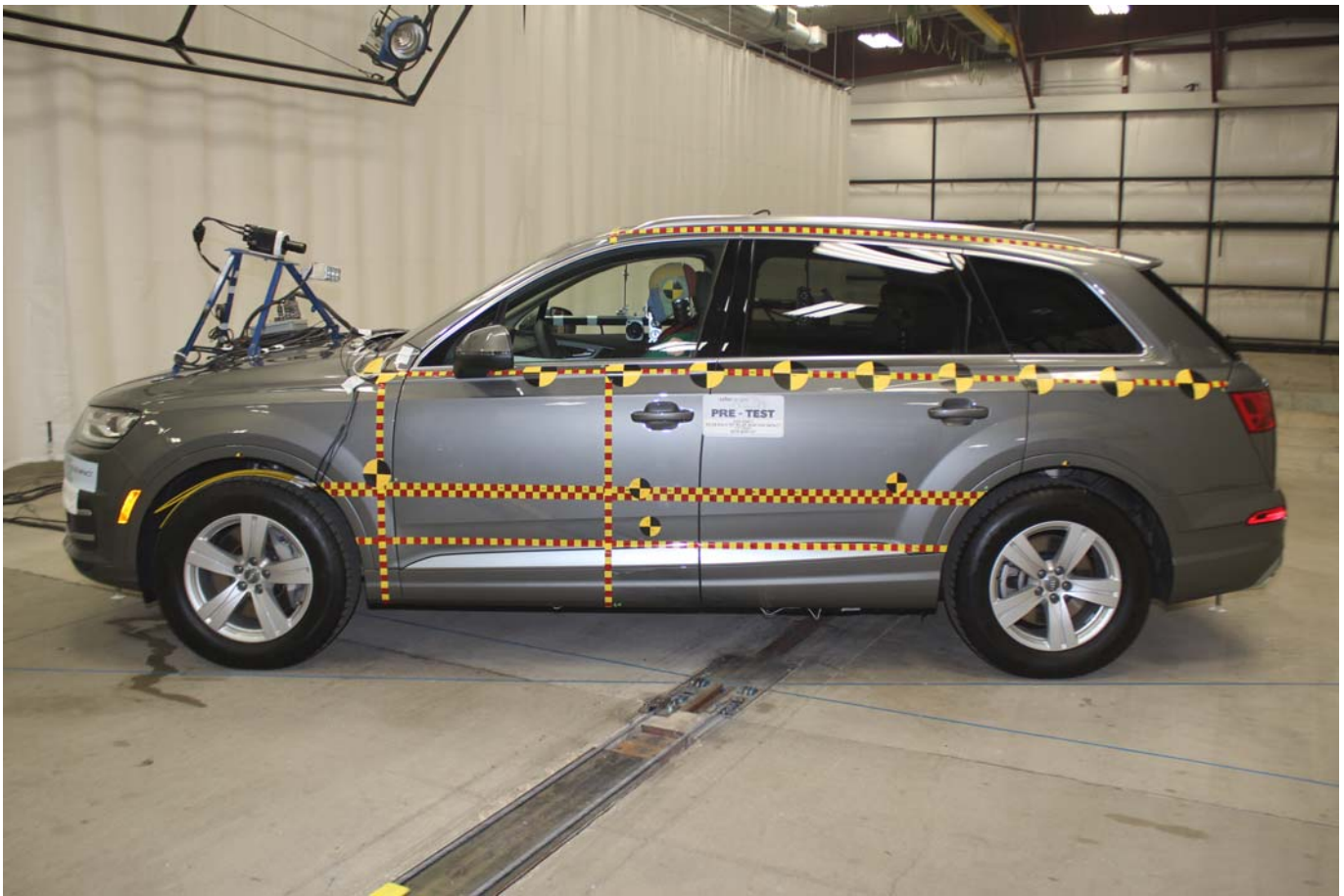


Photo No. 007 - Pre-Test Left Side View of Test Vehicle



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



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



Photo No. 010 - Post-Test Left Three-Quarter Rear 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

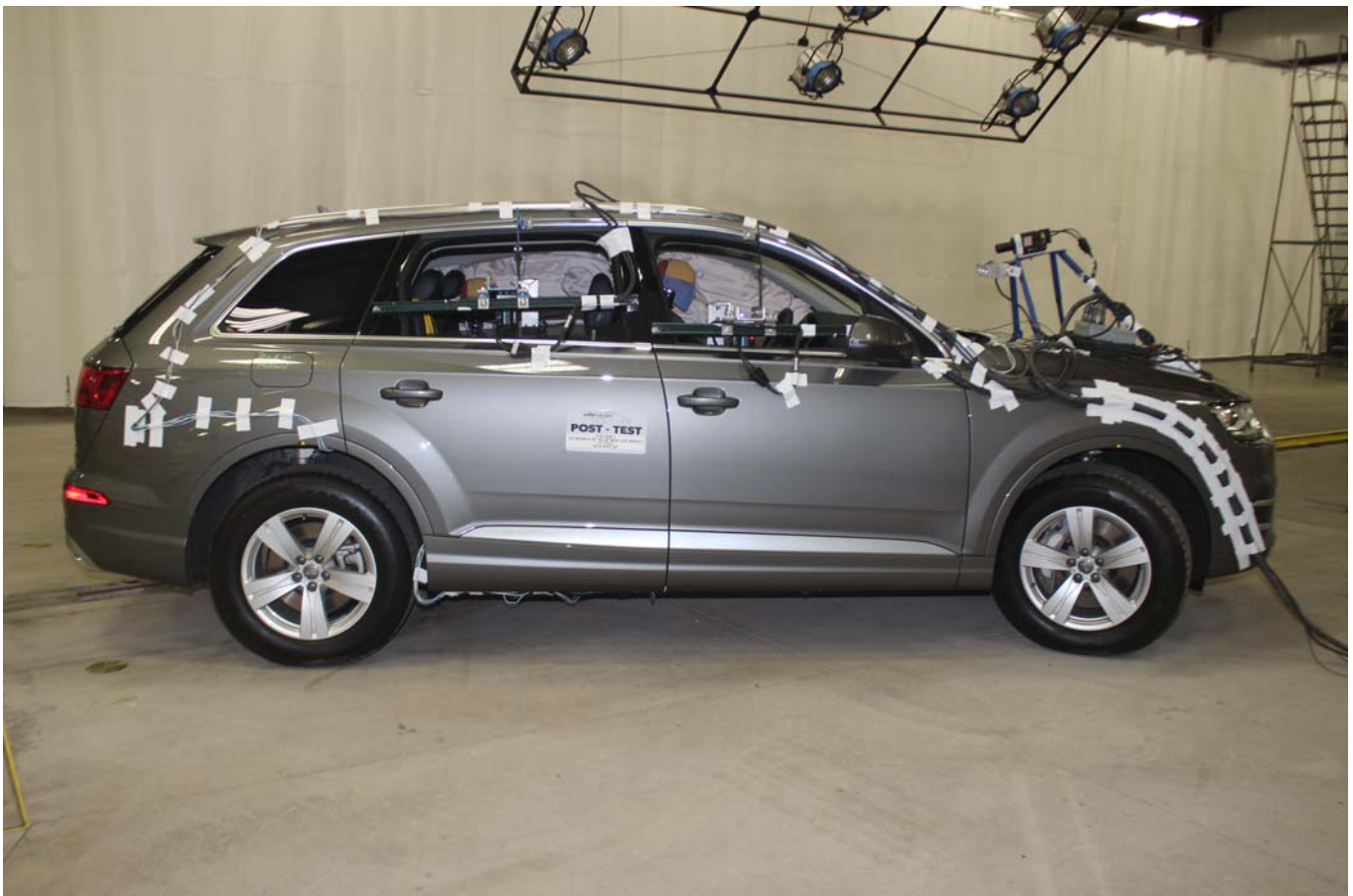


Photo No. 014 - Post-Test Right Side View of Test Vehicle

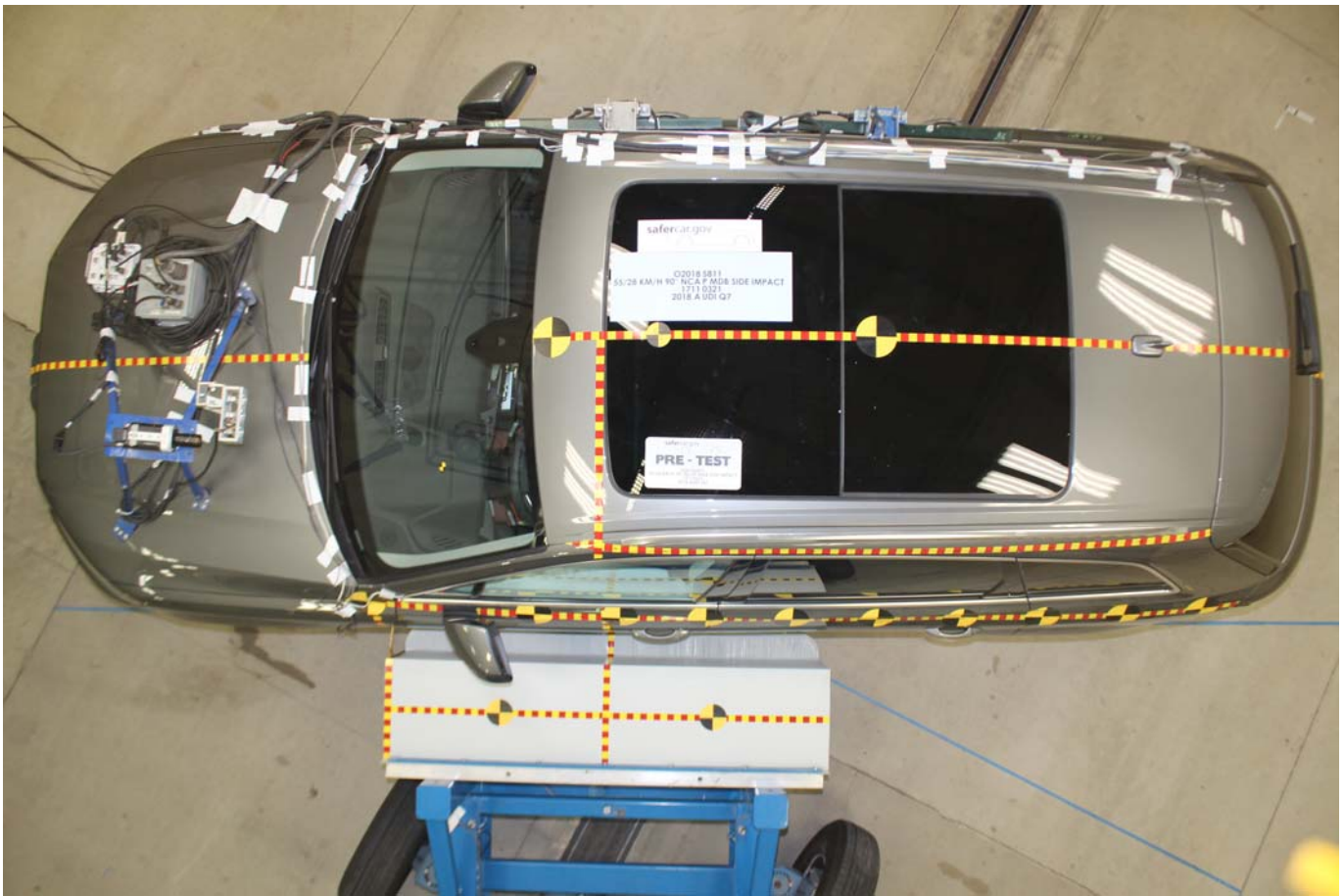


Photo No. 015 - Pre-Test Overhead View of Test Area



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



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



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



Photo No. 021 - Pre-Test Left Front Door Latch Close-Up



Photo No. 022 - Post-Test Left Front Door Latch Close-Up



Photo No. 023 - Pre-Test Left Rear Door Latch Close-Up



Photo No. 024 - Post-Test Left Rear Door Latch Close-Up



Photo No. 025 - Pre-Test Front Close-Up View of Driver Dummy



Photo No. 026 - Post-Test Front Close-Up View of Driver Dummy



Photo No. 027 - Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking



Photo No. 028 - Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



Photo No. 029 - Post-Test Left Side View of Driver Dummy Shoulder and Door Top View



Photo No. 030 - Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning

PHOTOGRAPH NOT AVAILABLE

Photo No. 031 - Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



Photo No. 032 - Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



Photo No. 033 - Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



Photo No. 034 - Pre-Test Placement of Driver Dummy Feet

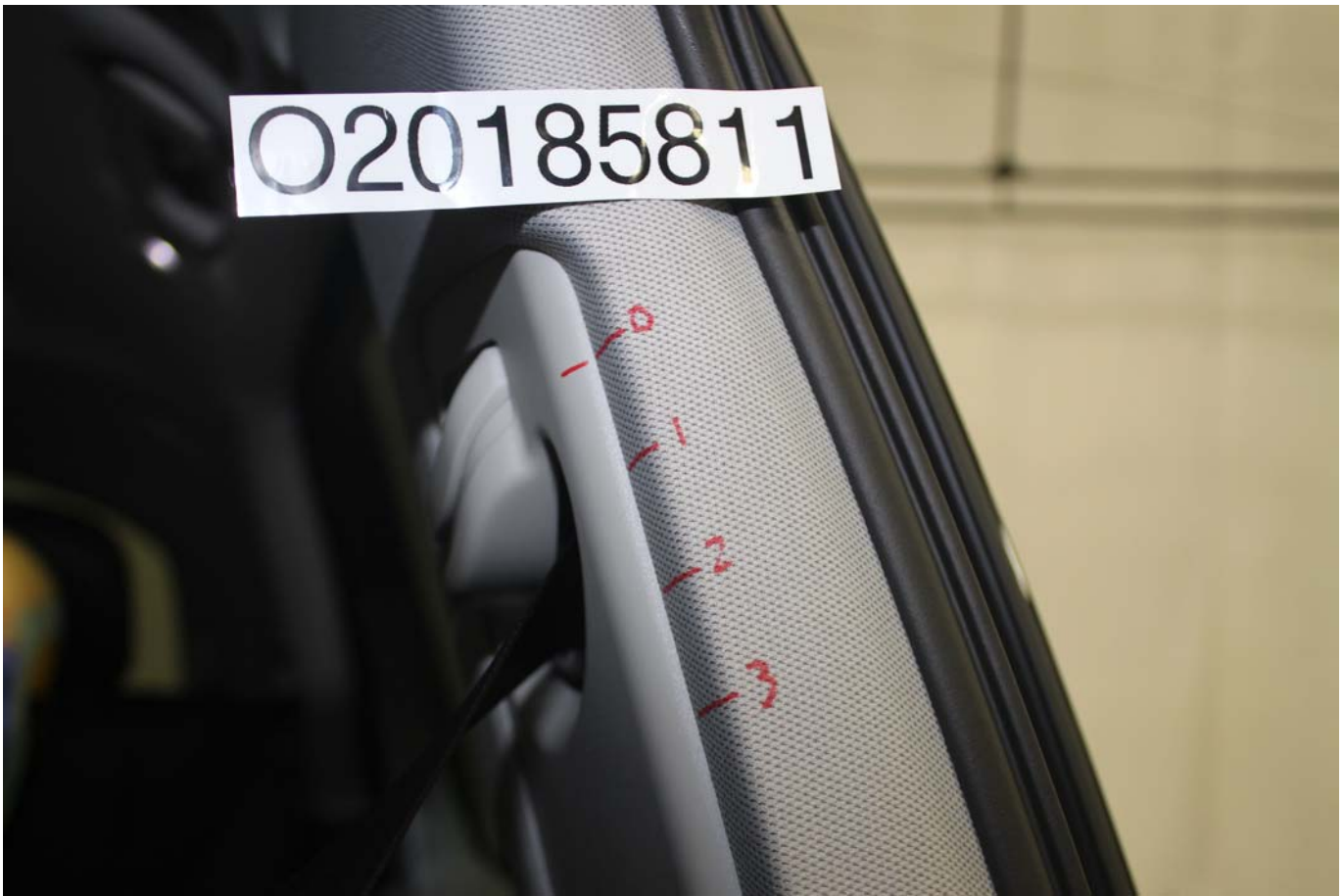


Photo No. 035 - Pre-Test View of Belt Anchorage for Driver Dummy



Photo No. 036 - Pre-Test Left Side View of Steering Wheel



Photo No. 037 - Pre-Test View of Disengaged Parking Brake



Photo No. 038 - Pre-Test View of Parking Brake



Photo No. 039 - Pre-Test Close-Up Left Side View of Driver Seat Track



Photo No. 040 - Pre-Test Close-Up Left Side View of Driver Seat Back

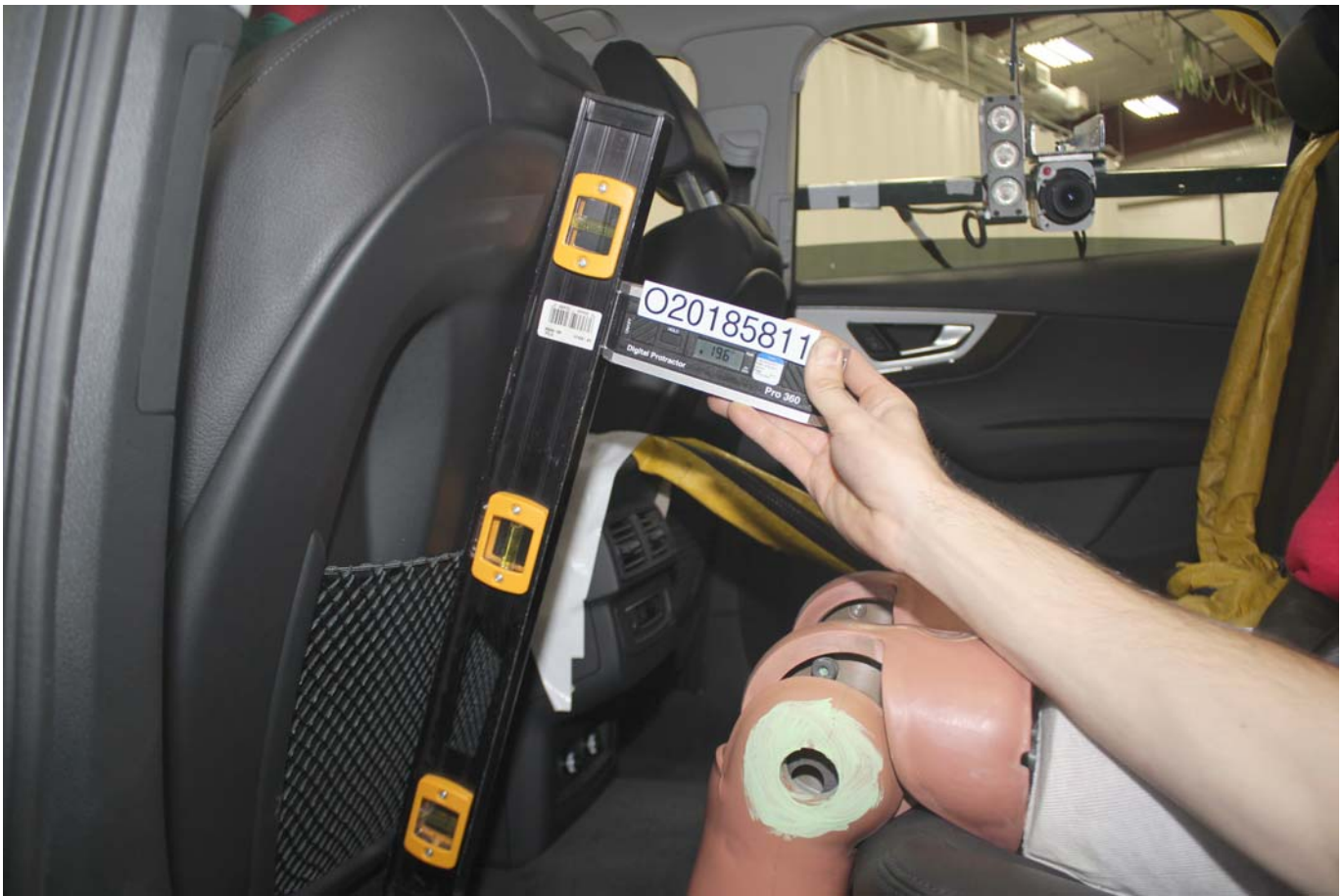


Photo No. 041 - Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Photo No. 042 - Pre-Test Driver Dummy and Door Clearance View



Photo No. 043 - Post-Test Driver Dummy and Door Clearance View



Photo No. 044 - Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Photo No. 045 - Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Photo No. 046 - Pre-Test Driver Inner Door Panel View



Photo No. 047 - Post-Test Driver Inner Door Panel View



Photo No. 048 - Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View



Photo No. 049 - Post-Test Driver Dummy Close-up Head Contact with Side Airbag View



Photo No. 050 - Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View



Photo No. 051 - Post-Test Driver Dummy Close-up Torso Contact with Side Airbag View



Photo No. 052 - Post-Test Driver Dummy Close-up Pelvis Contact with Vehicle Interior View

PHOTOGRAPH NOT AVAILABLE

Photo No. 053 - Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View

PHOTOGRAPH NOT APPLICABLE

Photo No. 054 - Post-Test Driver Dummy Close-up Knee Contact View



Photo No. 055 - Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking



Photo No. 056 - Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



Photo No. 057 - Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



Photo No. 058 - Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



Photo No. 059 - Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Photo No. 060 - Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



Photo No. 061 - Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



Photo No. 062 - Pre-Test View of Rear Passenger Dummy Neck Showing Position of Adjustable Neck Bracket



Photo No. 063 - Pre-Test View of Rear Passenger Dummy Head Showing Dummy Head is Level



Photo No. 064 - Pre-Test Placement of Rear Passenger Dummy Feet

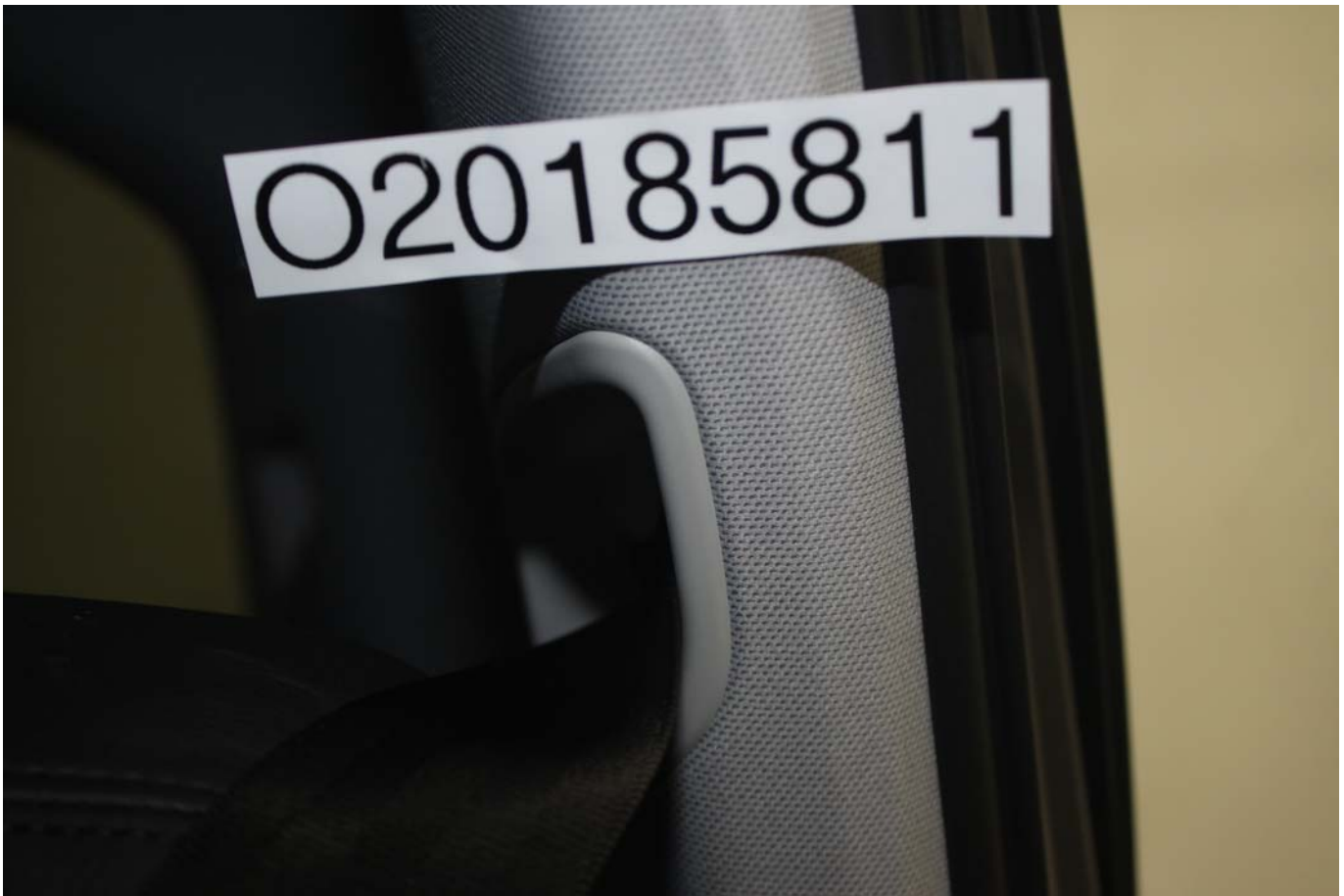


Photo No. 065 - Pre-Test View of Belt Anchorage for Rear Passenger Dummy



Photo No. 066 - Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



Photo No. 067 - Pre-Test Close-Up Left Side View of Rear Passenger Seat Back



Photo No. 068 - Pre-Test Close-up View of Rear Passenger Seat Back or Head Restraint



Photo No. 069 - Pre-Test Rear Passenger Dummy and Door Clearance View



Photo No. 070 - Post-Test Rear Passenger Dummy and Door Clearance View



Photo No. 071 - Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Photo No. 072 - Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Photo No. 073 - Pre-Test Rear Passenger Inner Door Panel View



Photo No. 074 - Post-Test Rear Passenger Inner Door Panel View

PHOTOGRAPH NOT AVAILABLE

Photo No. 075 - Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View

PHOTOGRAPH NOT AVAILABLE

Photo No. 076 - Post-Test Rear Passenger Dummy Close-up Head Contact with Side Airbag View



Photo No. 077 - Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View

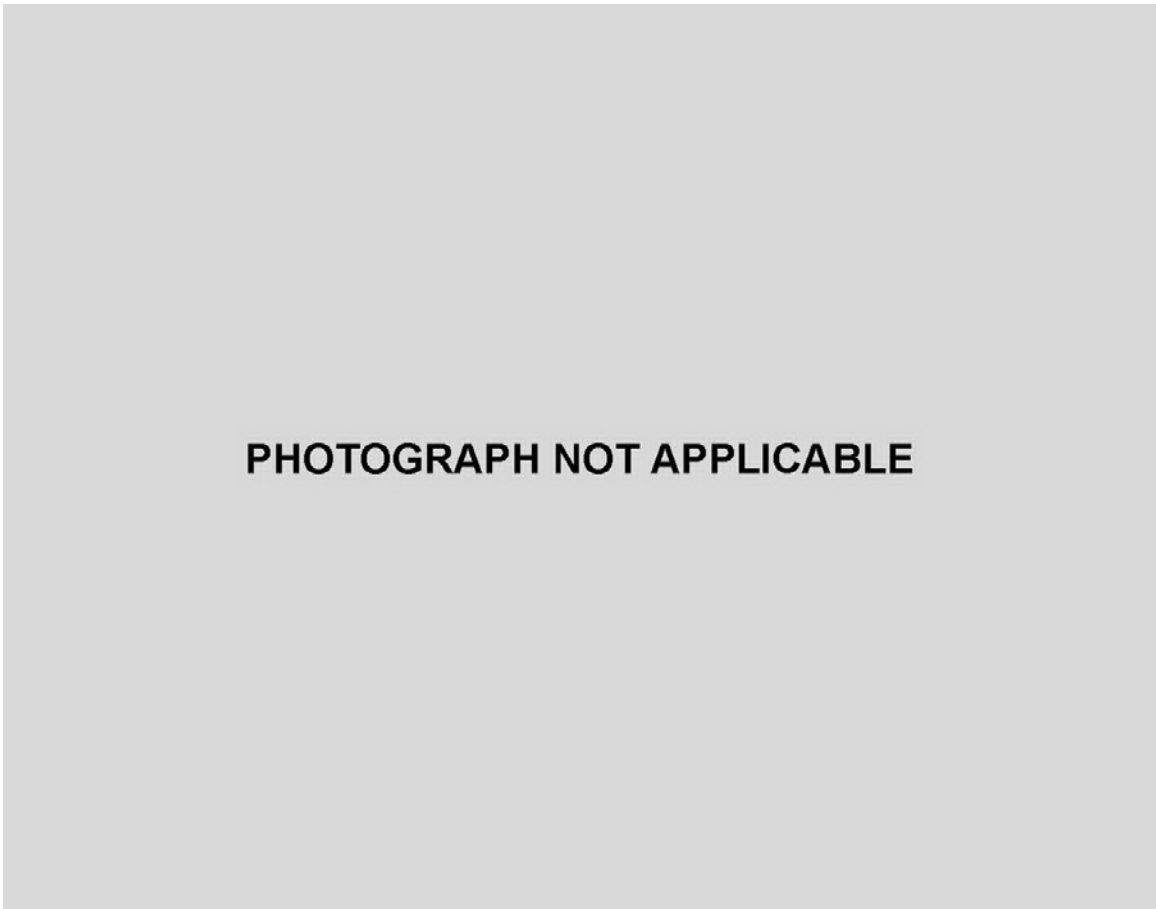


Photo No. 078 - Post-Test Rear Passenger Dummy Close-up Torso Contact with Side Airbag View



Photo No. 079 - Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Vehicle Interior View

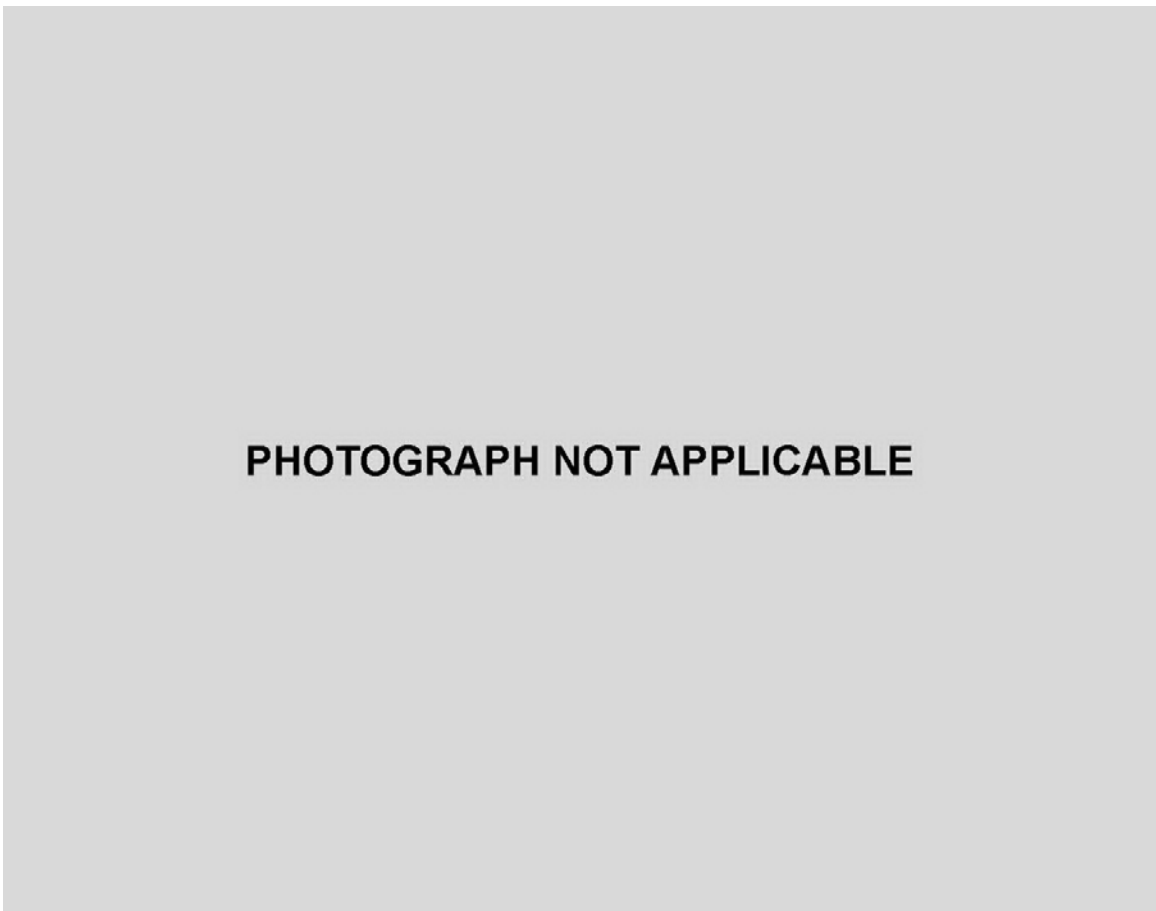


Photo No. 080 - Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Side Airbag View



Photo No. 081 - Post-Test Rear Passenger Dummy Close-up Knee Contact View



Photo No. 082 - Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

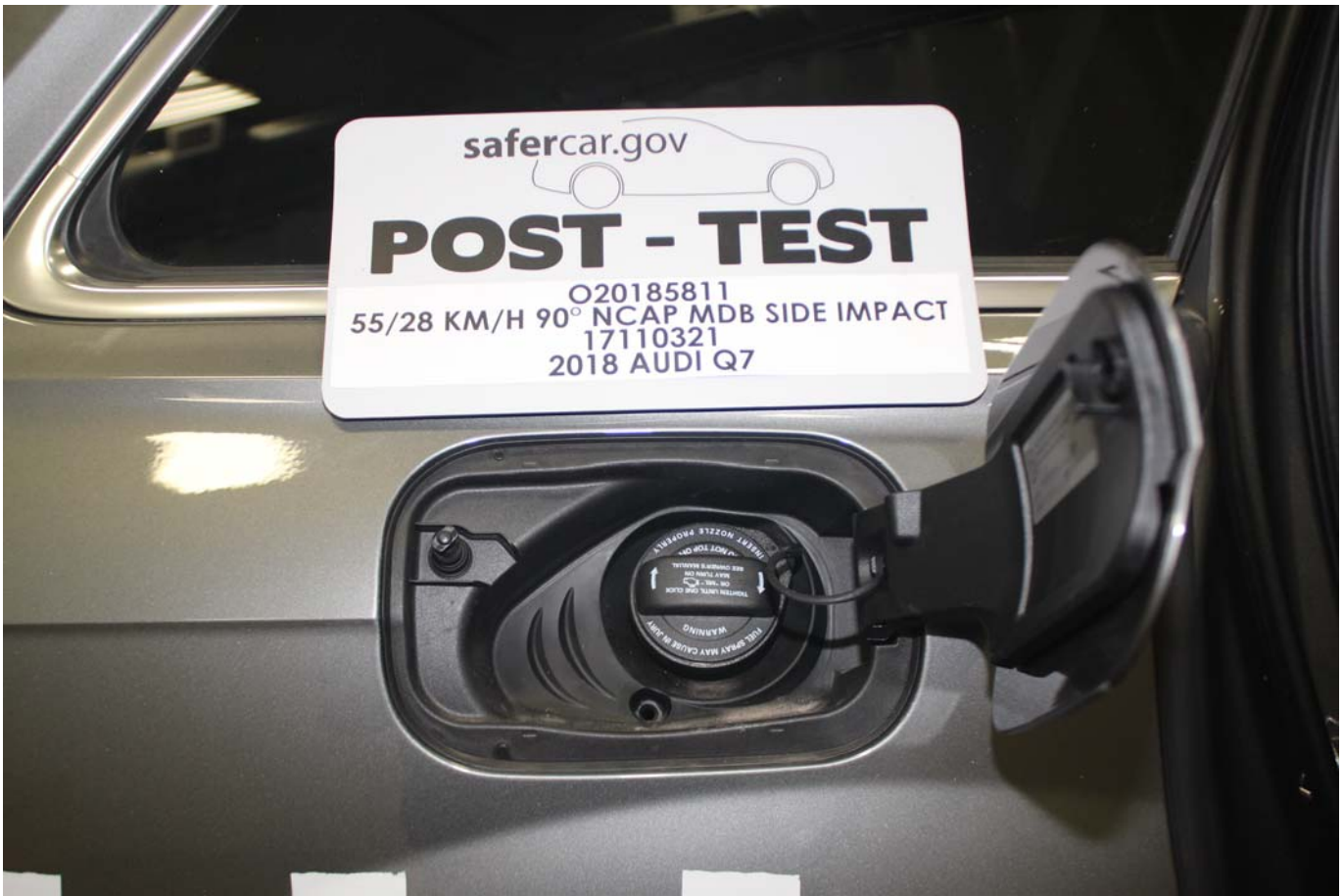


Photo No. 083 - Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Photo No. 084 - Pre-Test Front View of MDB Impactor Face



Photo No. 085 - Post-Test Front View of MDB Impactor Face



Photo No. 086 - Pre-Test Top View of MDB Impactor Face



Photo No. 087 - Post-Test Top View of MDB Impactor Face



Photo No. 088 - Pre-Test Left Side View of MDB Impactor Face



Photo No. 089 - Post-Test Left Side View of MDB Impactor Face



Photo No. 090 - Pre-Test Right Side View of MDB Impactor Face

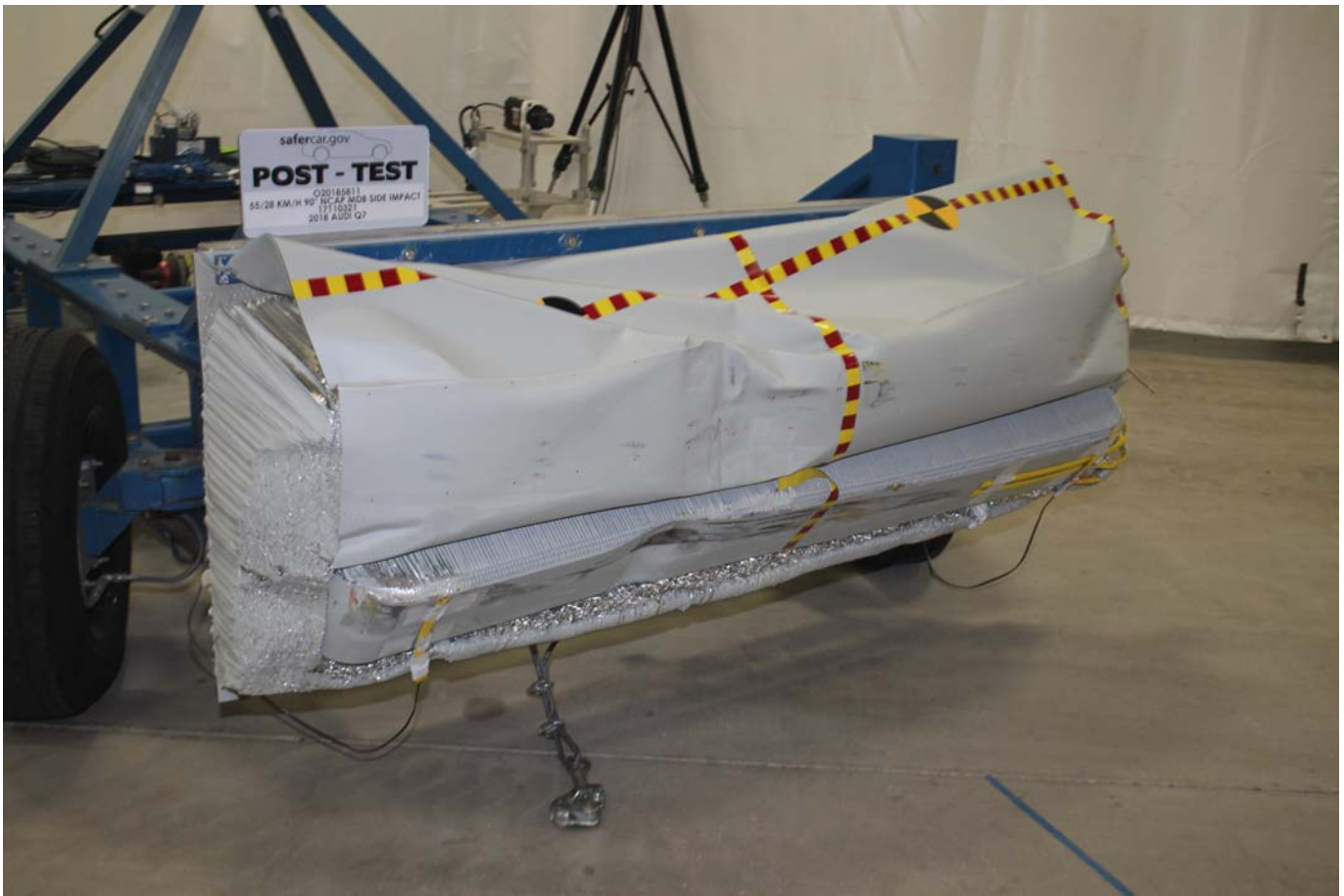


Photo No. 091 - Post-Test Right Side View of MDB Impactor Face

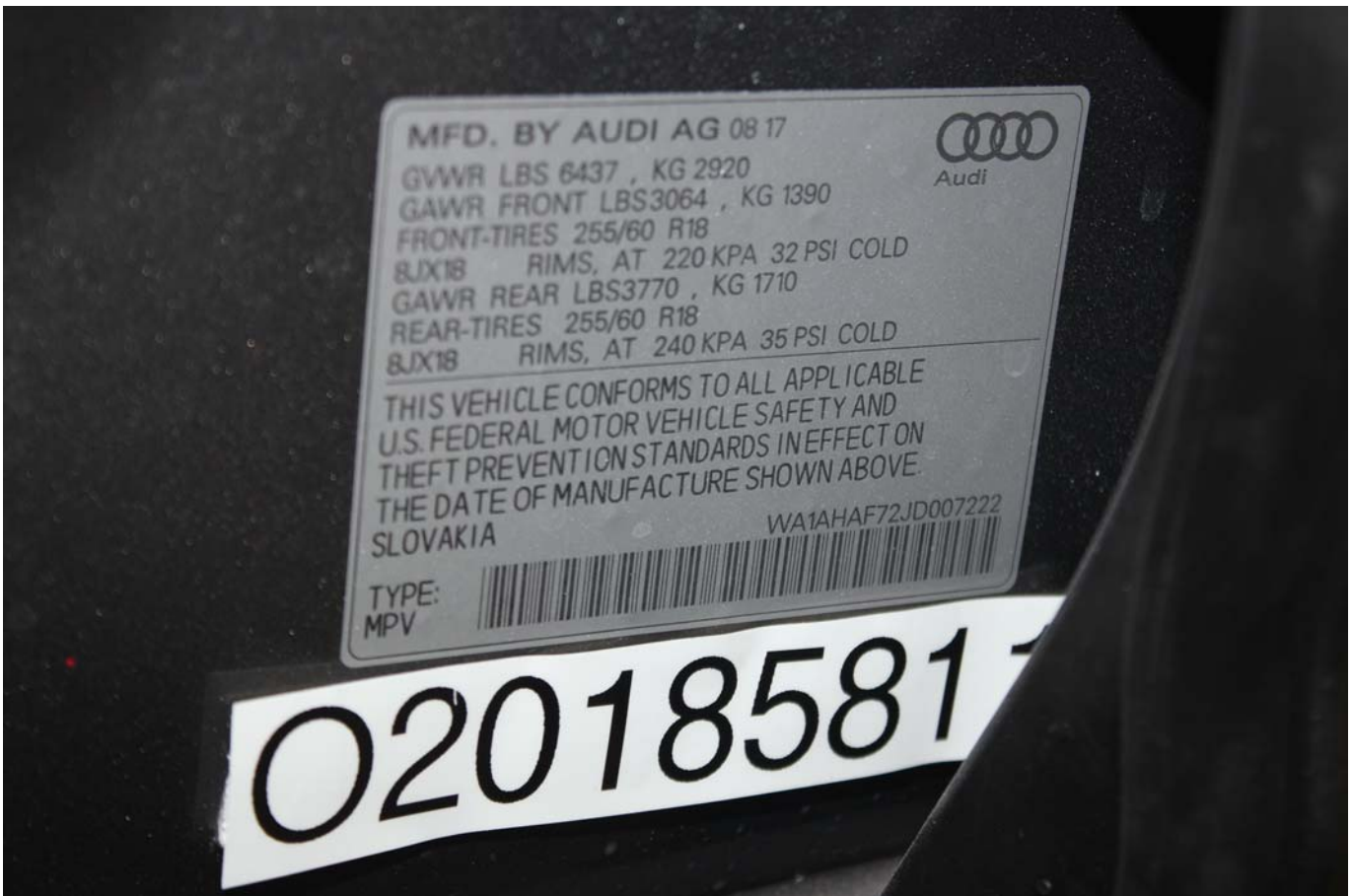


Photo No. 092 - Close-Up View of Vehicle Certification Label

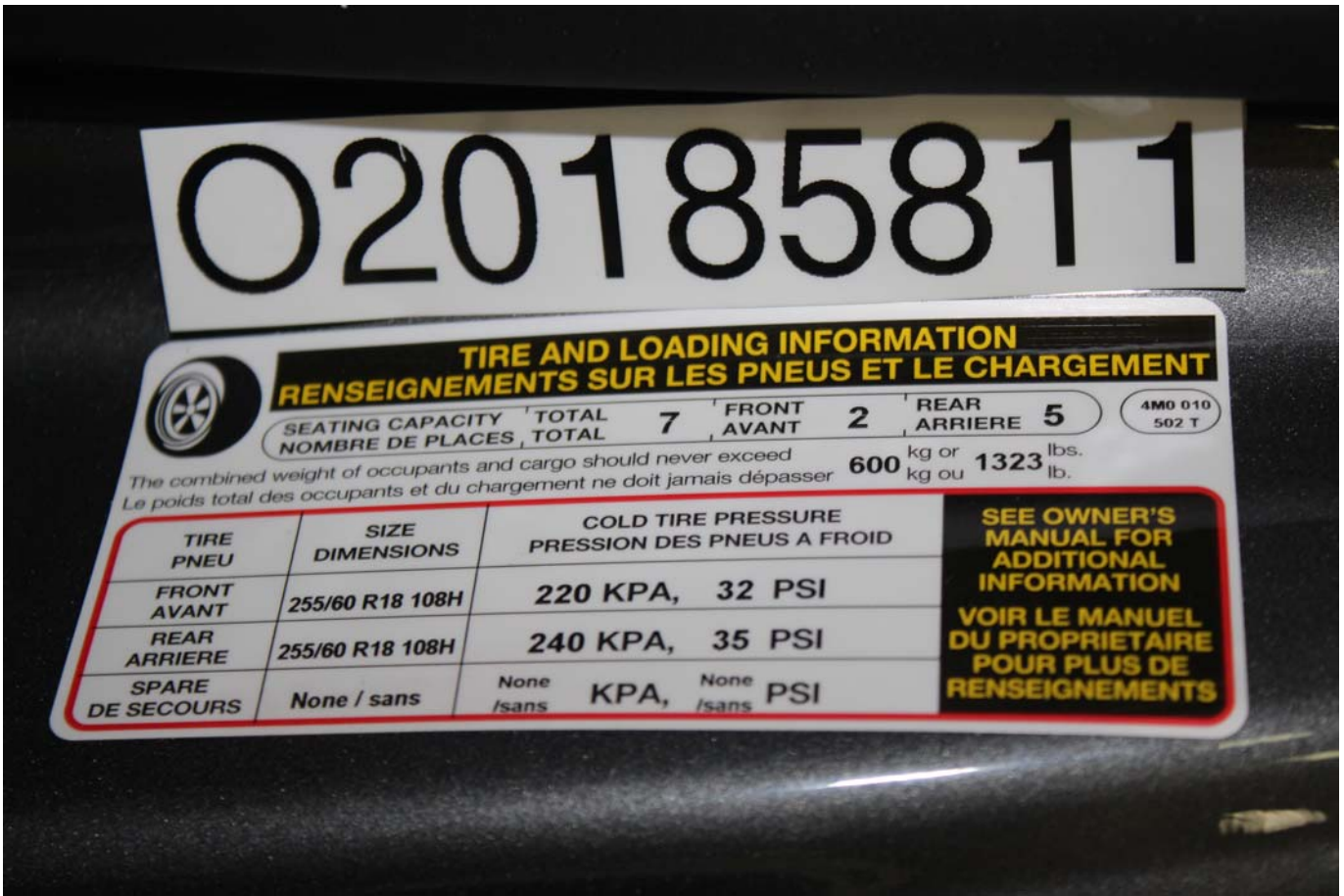


Photo No. 093 - Close-Up View of Vehicle Tire Information Placard or Label

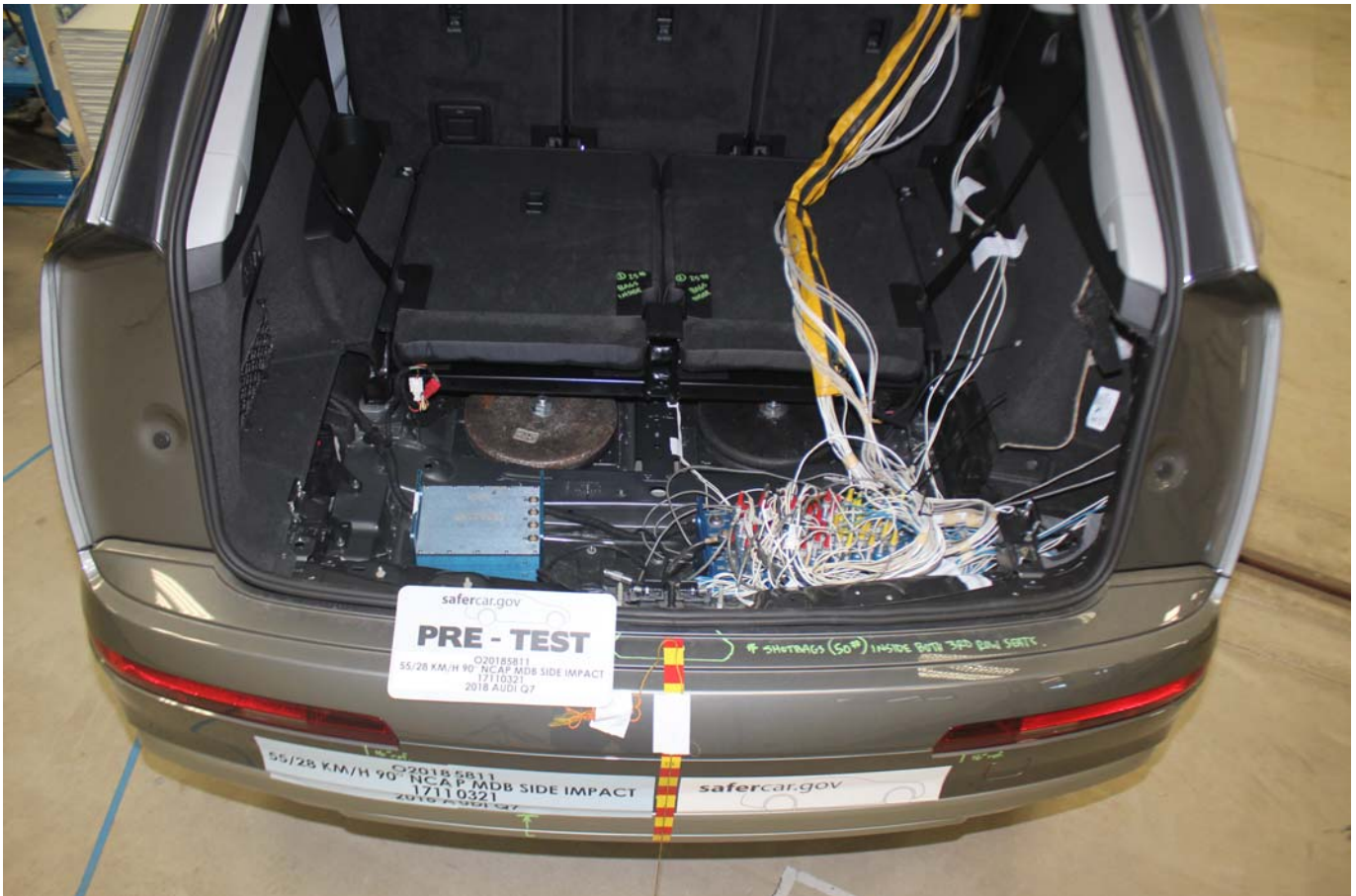


Photo No. 094 - Pre-Test Ballast View



Photo No. 095 - Post-Test Primary and Redundant Speed Trap Read-Out



Photo No. 096 - FMVSS Photo No. 301 Static Rollover 0 Degrees

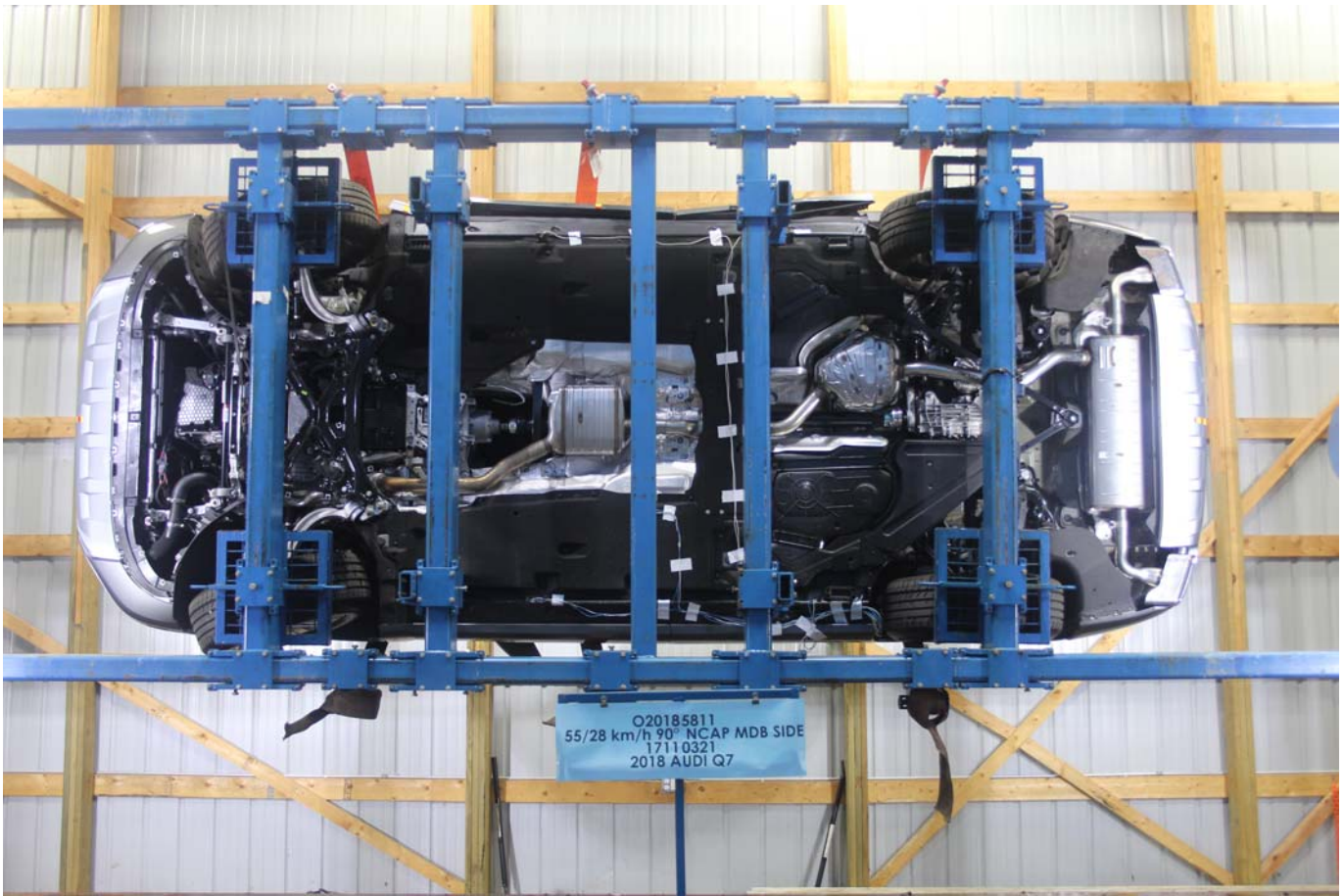


Photo No. 097 - FMVSS Photo No. 301 Static Rollover 90 Degrees



Photo No. 098 - FMVSS Photo No. 301 Static Rollover 180 Degrees

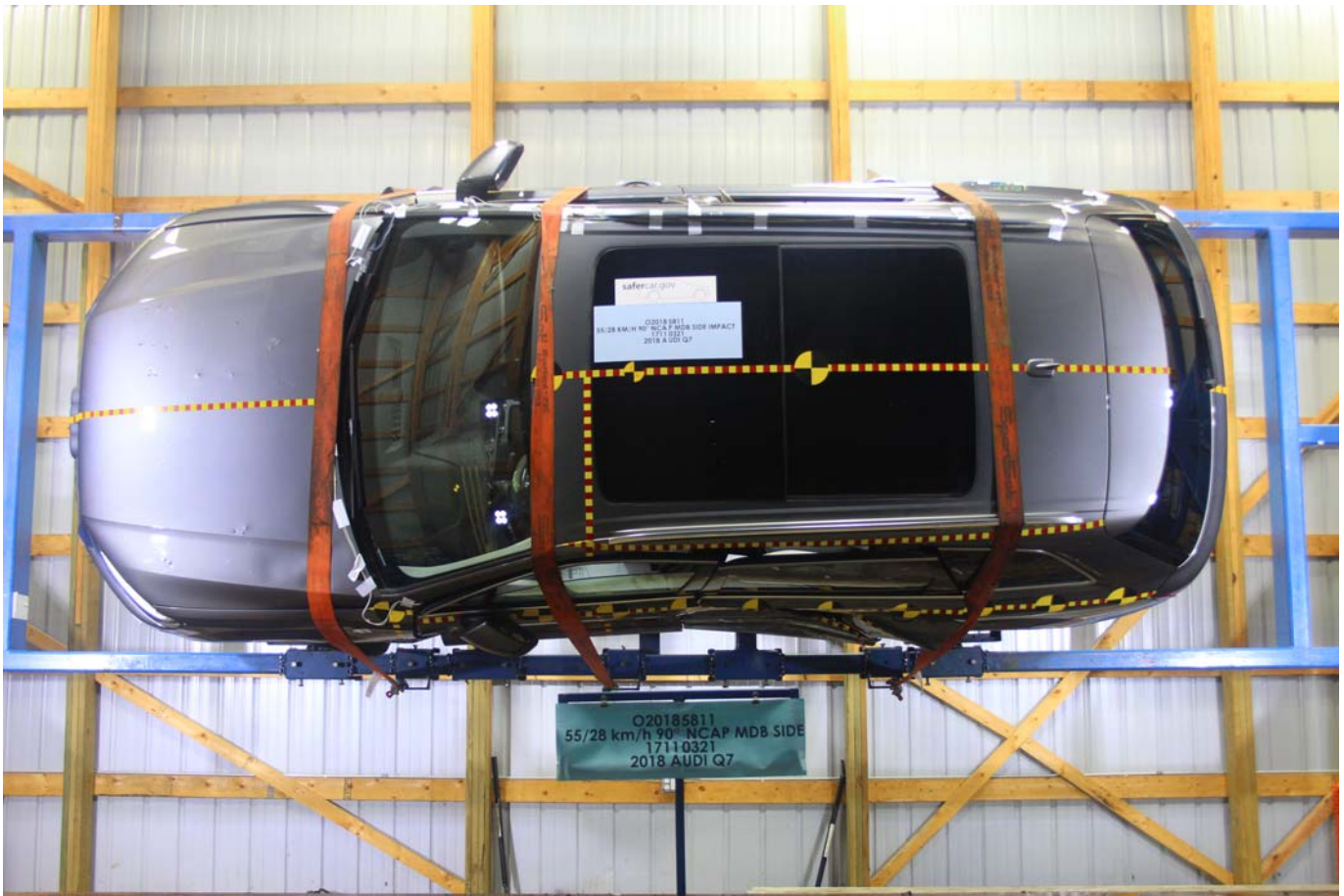


Photo No. 099 - FMVSS Photo No. 301 Static Rollover 270 Degrees



Photo No. 100 - FMVSS Photo No. 301 Static Rollover 360 Degrees



Photo No. 101 - Impact Event

LOC: PR * Dealer Stock Status: INVENTORY
Exterior: Graphite Gray Metallic

VIN: WA1AHAF72JD007222
Interior: Black Interior

MODEL: 4MB5H1-2018 Audi Q7 2.0T quattro Tiptronic
2017241-ORIGINAL

2018 Audi Q7 2.0T quattro Tiptronic

<p>STANDARD EQUIPMENT (unless replaced by options)</p> <p>TECHNICAL</p> <ul style="list-style-type: none"> 2.0L TFSI® 252hp / 273lb-ft 4 engine 6-speed Tiptronic® transmission quattro® all-wheel drive system 18" 5-arm-design wheels, 265/60 all-season tires Energy recuperation system w/ start-stop <p>COMFORT/TECHNOLOGY</p> <ul style="list-style-type: none"> Audi advanced key Auto dimming interior mirror with compass Garage door opener (HomeLink®) Heated, 8-way power front seats w/ driver memory and 4-way lumbar adjustment Heated exterior mirrors, power-folding with memory Inlays - Upper: Silver finish / Lower: Terra brown walnut Leather seating surfaces MMB® Radio with Audi sound system Panoramic sunroof (optional) with electric sunshade Power-folding 3rd row (includes LATCH for all 2nd & 3rd row seats) Power tailgate Preparation for mobile phone (Bluetooth®) Rain & light sensor ServiceXpress All Access service (w/ 3-month trial subscription) Three-zone automatic climate control Trailer hitch preparation (includes brake controller wiring) USB Audi music interface, AM/FM/SAT/HD radio Xenon plus headlights 3-spoke leather-wrapped multifunction steering wheel w/ shift paddles 7 passenger seating <p>SAFETY/CONVENIENCE</p> <ul style="list-style-type: none"> Advanced Airbag Protection System with 6 airbags Anti-lock Braking System (ABS) w/ Brake Assist Audi pre sense basic (preventative occupant protection) Audi pre sense city (low speed collision assist) Child safety locks in rear doors, power Electronic Stabilization Control (ESC) w/ Offroad mode Electronic vehicle immobilization w/ anti-theft alarm LED Daytime Running Lights (DRLs) LED taillights Lower Anchors and Tethers for Children (LATCH) Rearview camera Tire Pressure Monitoring System (TPMS) <p>WARRANTY/MAINTENANCE</p> <ul style="list-style-type: none"> 4 Year/50,000 mile (whichever occurs first) New Vehicle Limited Warranty* 12 Year Limited Warranty Against Corrosion Perforation 1 Year/10,000 mile (whichever occurs first) First Scheduled Maintenance Service FREE OF CHARGE 4 Years Roadside Assistance coverage provided by a third party supplier *Please refer to the 2018 Audi Warranty and Maintenance Booklet for complete coverage information. 	<p>MANUFACTURER'S SUGGESTED RETAIL PRICE</p> <p>2018 Audi Q7 2.0T quattro Tiptronic \$49,900.00</p> <p>PACKAGES / OPTIONS</p> <ul style="list-style-type: none"> Graphite Gray metallic \$575.00 Black interior Included Cold weather package \$650.00 Heated steering wheel and heated rear seats All-weather Black rubber floor mats w/ Q7 logo (set of 4) Silver finish / Gray Oak wood inlays Included Front filler panel Included <p>Destination Charge \$975.00</p> <p>Total Price: \$52,100.00</p> <p>Fuel, license, title fees, taxes and dealer-installed accessories are not included.</p>	<p>MODEL: 4MB5H1</p> <p>VIN: WA1AHAF72JD007222</p> <p>DEALER: 406A40 AUDI ALLENTOWN 4725 HAMILTON BLVD ALLENTOWN, PA 18103 COMM NUM: PE2479</p> <p>SHIP TO: 406A40 AUDI ALLENTOWN 4725 HAMILTON BLVD ALLENTOWN, PA 18103 COMM NUM: PE2479 Transportation Method: TRUCK</p>	<p>GOVERNMENT 5-STAR SAFETY RATINGS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Overall Vehicle Score</td> <td>Not Rated</td> </tr> <tr> <td colspan="3"><small>Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</small></td> </tr> <tr> <td>Frontal Crash</td> <td>Driver Passenger</td> <td>Not Rated</td> </tr> <tr> <td colspan="3"><small>Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.</small></td> </tr> <tr> <td>Side Crash</td> <td>Front Seat Rear Seat</td> <td>Not Rated</td> </tr> <tr> <td colspan="3"><small>Based on the risk of injury in a side impact.</small></td> </tr> <tr> <td colspan="2">Rollover</td> <td>Not Rated</td> </tr> <tr> <td colspan="3"><small>Based on the risk of rollover in a single-vehicle crash.</small></td> </tr> </table> <p>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</p>	Overall Vehicle Score		Not Rated	<small>Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</small>			Frontal Crash	Driver Passenger	Not Rated	<small>Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.</small>			Side Crash	Front Seat Rear Seat	Not Rated	<small>Based on the risk of injury in a side impact.</small>			Rollover		Not Rated	<small>Based on the risk of rollover in a single-vehicle crash.</small>		
Overall Vehicle Score		Not Rated																									
<small>Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</small>																											
Frontal Crash	Driver Passenger	Not Rated																									
<small>Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.</small>																											
Side Crash	Front Seat Rear Seat	Not Rated																									
<small>Based on the risk of injury in a side impact.</small>																											
Rollover		Not Rated																									
<small>Based on the risk of rollover in a single-vehicle crash.</small>																											

EPA DOT Fuel Economy and Environment Gasoline Vehicle

<p>Fuel Economy</p> <p>21 MPG</p> <p>combined city/hwy</p>	<p>Standard Sport Utility Vehicles range from 12 to 93 MPG. The best vehicle rates 136 MPG.</p>	<p>You spend \$3,250</p> <p>more in fuel costs over 5 years compared to the average new vehicle.</p>
<p>19 city</p> <p>25 highway</p> <p>4.8 gallons per 100 miles</p>		

Annual fuel cost \$2,000

Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only)

<p>1 4 10</p> <p>Best</p>	<p>1 3 10</p> <p>Best</p>
---------------------------	---------------------------

This vehicle emits 415 grams of CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fuelconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$6,750 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.80 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles.

PARTS CONTENT INFORMATION

<p>FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 1% MAJOR SOURCES OF FOREIGN PARTS CONTENT: GERMANY: 39% SLOVAKIA: 33%</p>	<p>FOR THIS VEHICLE: FINAL ASSEMBLY POINT: BRATISLAVA, SLOVAKIA COUNTRY OF ORIGIN: HUNGARY TRANSMISSION: GERMANY</p>
---	--

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION OR OTHER NON-PARTS COSTS.

Photo No. 102 - Monroney Label

A-51

Head restraints

Front head restraints

Applies to: vehicles with adjustable head restraints

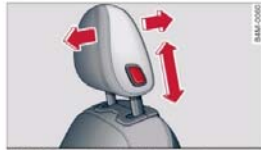


Fig. 59 Front seat: adjusting the head restraint

Adjust the head restraints so the upper edge is as even as possible with the top of your head. If that is not possible, try to adjust as close to this position as possible.

Adjusting the head restraints

- To move the head restraint upward/forward, hold it at the sides with both hands and slide it upward/forward until you feel it click into place.
- To move the head restraint downward/backward, press the side button and slide the head restraint downward/backward. Release the button and slide the head restraint farther until it locks into place.

WARNING

Always read and follow the applicable warnings ⇒ page 255, *Proper adjustment of head restraints*.

Rear head restraints

Applies to: vehicles with adjustable head restraints



Fig. 60 Second row seats: adjusting the head restraint



Fig. 61 Rear seat: removing the head restraint

If passengers will be sitting in the rear seats, move the head restraints in the second row all the way up or fold up the head restraints on the occupied third row seats ⇒ ⚠.

Moving the head restraints

- To move the head restraint upward, hold it at the sides with both hands and slide it upward until it clicks into place ⇒ fig. 60.
- To move the head restraint down, press the button -arrow- ⇒ fig. 60 and slide the head restraint downward.

Folding the head restraints for the third row seats* down and up

- Fold the head restraint down by pulling on the tab ⇒ page 57, fig. 57.
- Unfold the head restraint by tilting it upward until you feel it click into place.

Removing the head restraints

- Move the head restraint upward as far as it can go. ▶

- Press the release point ⇒ fig. 61 using the mechanical key ⇒ page 30, *Key set* and press the button -arrow- ⇒ fig. 60. Pull the head restraint out of the backrest at the same time ⇒ ⚠.

Installing the head restraints

- Slide the posts on the head restraint down into the guides until the posts click into place.
- Press the button -arrow- ⇒ fig. 60 and slide the head restraint all the way down. You should not be able to remove the head restraint from the backrest without pressing the button.

WARNING

- Always read and follow the applicable warnings ⇒ page 255, *Proper adjustment of head restraints*.
- Only remove the head restraints for the second row seats when it is necessary for installing a child safety seat ⇒ page 291, *Child safety*. Install the head restraint again immediately once the child safety seat is removed. Driving with the head restraints removed or not in the upright position increases the risk of serious injury.

Memory function

Description

Applies to: vehicles with memory function

Using the memory function, you can quickly and easily store a personal seat profile for the driver and recall the settings later. The memory function is controlled by the remote control key and the memory buttons in the driver's door.

The driver's seat profile is stored again and assigned to the remote control key each time the vehicle is locked. When you open the door, the seat profile is automatically recalled. If two people use the vehicle, it is recommended that each person always uses their "own" remote control key.

Two seat profiles can be stored each using the memory buttons. Once they are stored, these seat profiles can be selected at any time.

The following settings are stored:

	Remote control key	Memory button
	Driver	Driver
Seat	X	X
Steering wheel*	X	X
Both exterior mirrors*	X	X

Remote control key

Applies to: vehicles with memory function

The driver's seat profile can be assigned to the remote control key when the vehicle is locked.

- Select in the Infotainment system: **MENU** button > **Vehicle** > left control button > **Vehicle settings** > **Seats** > **Driver's seat** > **Store settings on remote control key**.

Tips

If you do not wish to have the seat profile for another driver assigned to the remote control key, switch the memory function off in the Infotainment system.

Memory buttons

Applies to: vehicles with memory function



Fig. 62 Driver's door: memory function buttons

Storing a seat profile

- Press the **SET** button. The LED in the button turns on.
- Press memory button **1** or **2**.

A signal tone will sound when it is successfully stored. ▶

APPENDIX B
DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

<u>No.</u>	<u>Description</u>	<u>Page No.</u>
Figure No. 1.	Driver Head Acceleration (X) Primary vs. Time	B-1
Figure No. 2.	Driver Head Acceleration (Y) Primary vs. Time	B-1
Figure No. 3.	Driver Head Acceleration (Z) Primary vs. Time	B-1
Figure No. 4.	Driver Head Resultant Acceleration Primary vs. Time	B-1
Figure No. 5.	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
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Figure No. 8.	Driver Thorax Rib Deflection Maximum vs. Time	B-2
Figure No. 9.	Driver Anterior Abdomen Force (Y) vs. Time	B-3
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Figure No. 11.	Driver Posterior Abdomen Force (Y) vs. Time	B-3
Figure No. 12.	Driver Total Abdominal Force (Y) vs. Time	B-3
Figure No. 13.	Driver Pubic Symphysis Force (Y) vs. Time	B-4
Figure No. 14.	Passenger Head Acceleration (X) Primary vs. Time	B-5
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Figure No. 16.	Passenger Head Acceleration (Z) Primary vs. Time	B-5
Figure No. 17.	Passenger Head Resultant Acceleration Primary vs. Time	B-5
Figure No. 18.	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
Figure No. 19.	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
Figure No. 20.	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
Figure No. 21.	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
Figure No. 22.	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
Figure No. 23.	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
Figure No. 24.	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

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.dot.gov

Additional Driver & Passenger Dummy Instrumentation Data

Passenger Head Angular Velocity (X)
Passenger Head Angular Velocity (Y)
Passenger Head Angular Velocity (Z)
Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Track Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

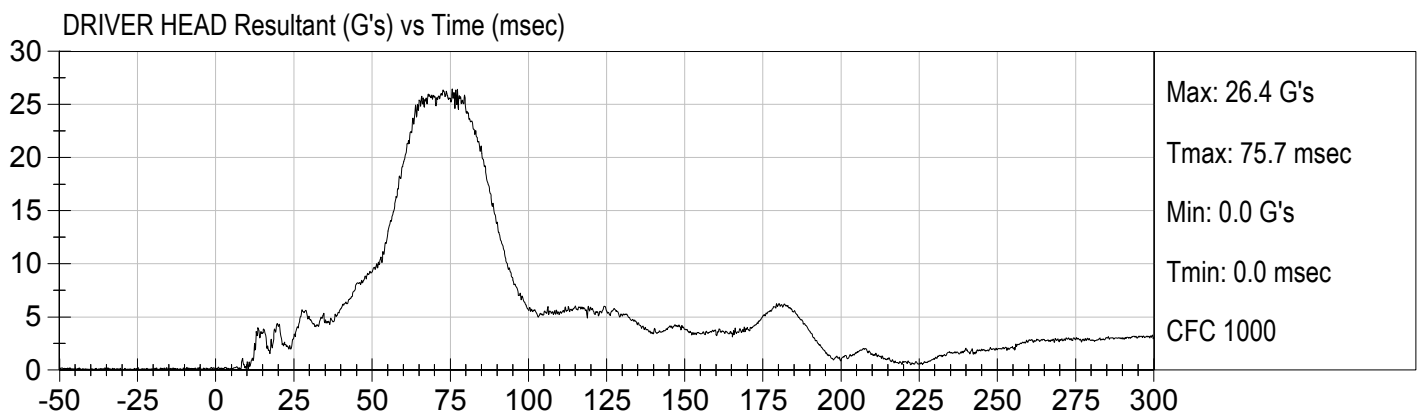
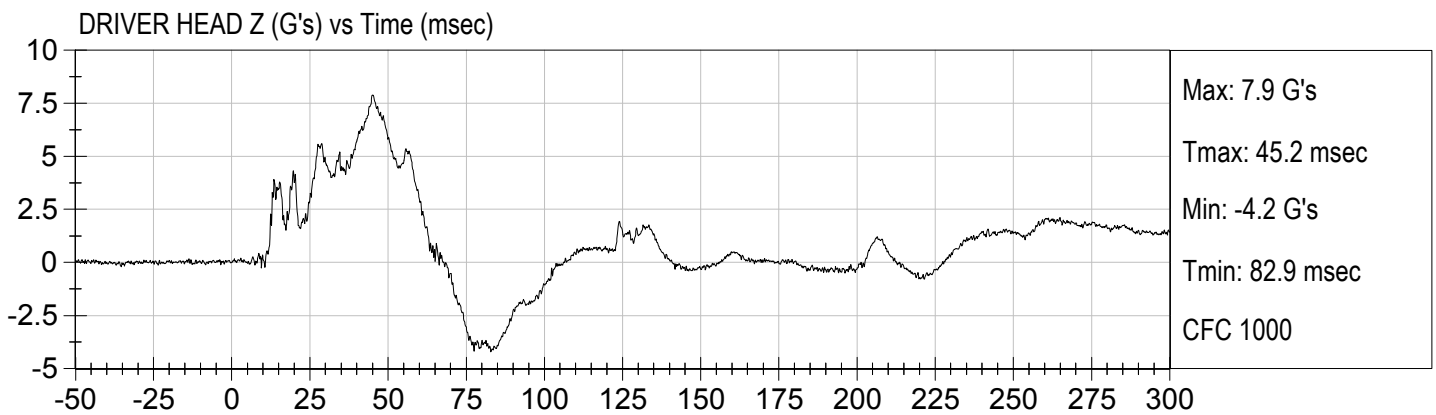
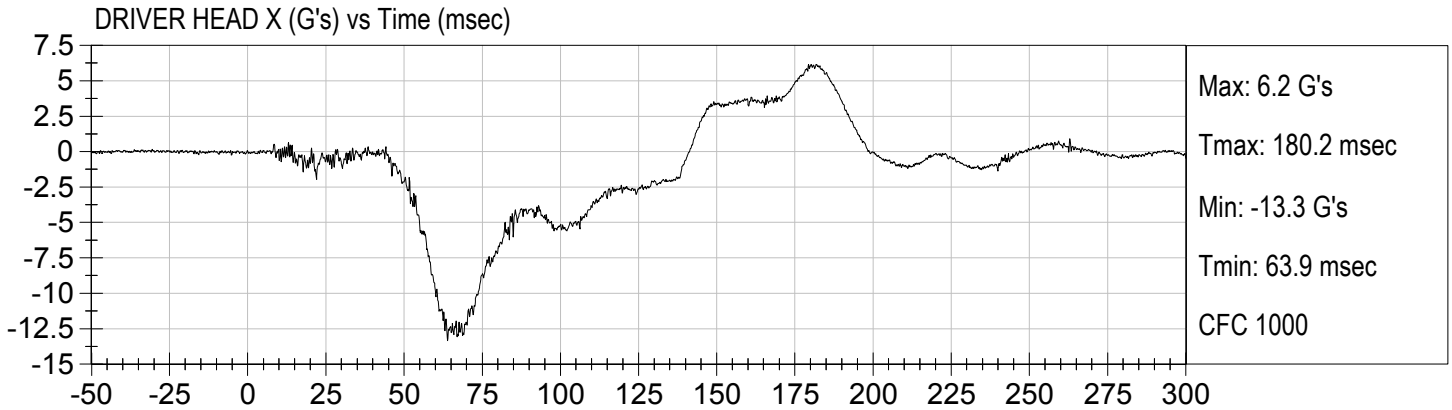
MDB Center of Gravity Acceleration (Z)

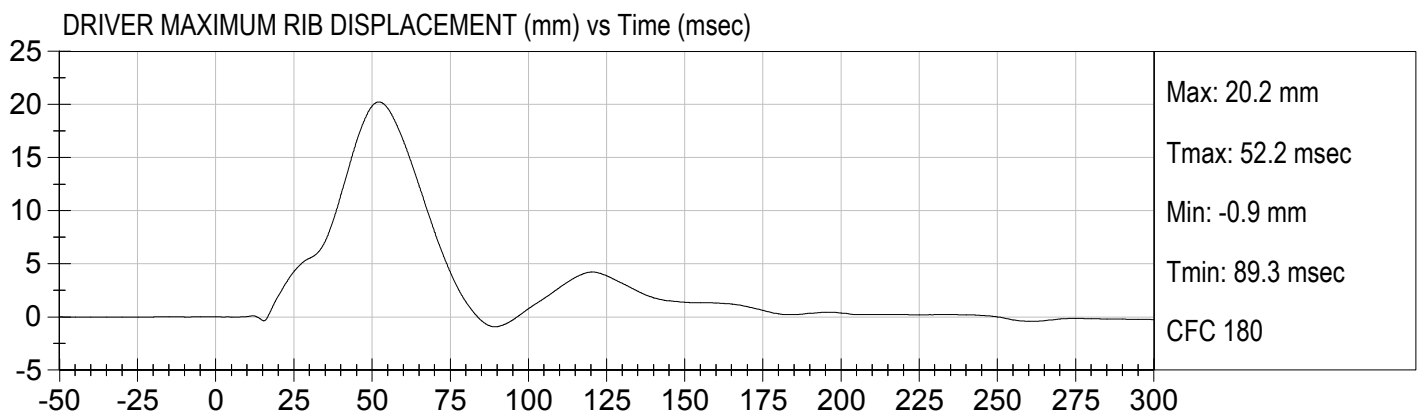
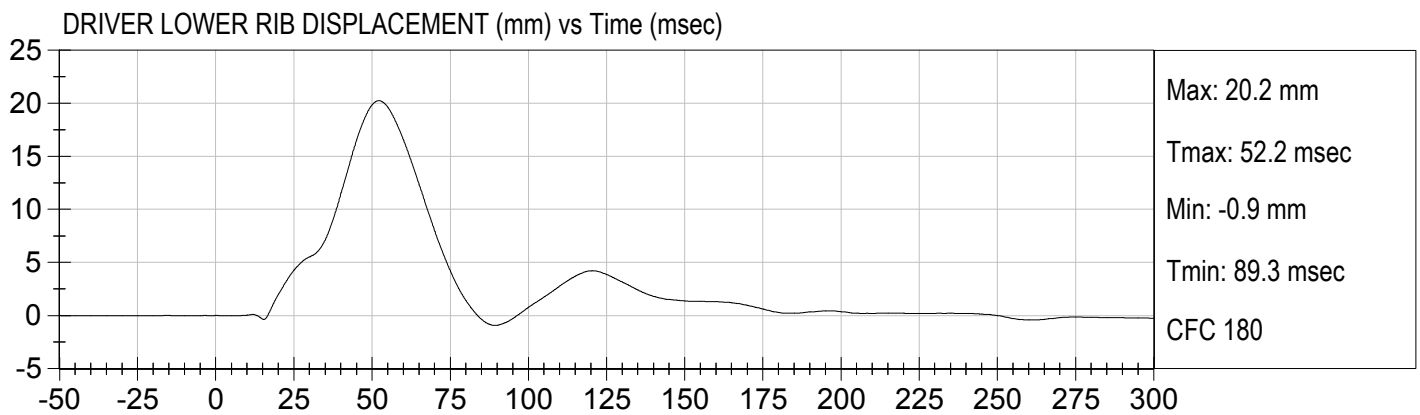
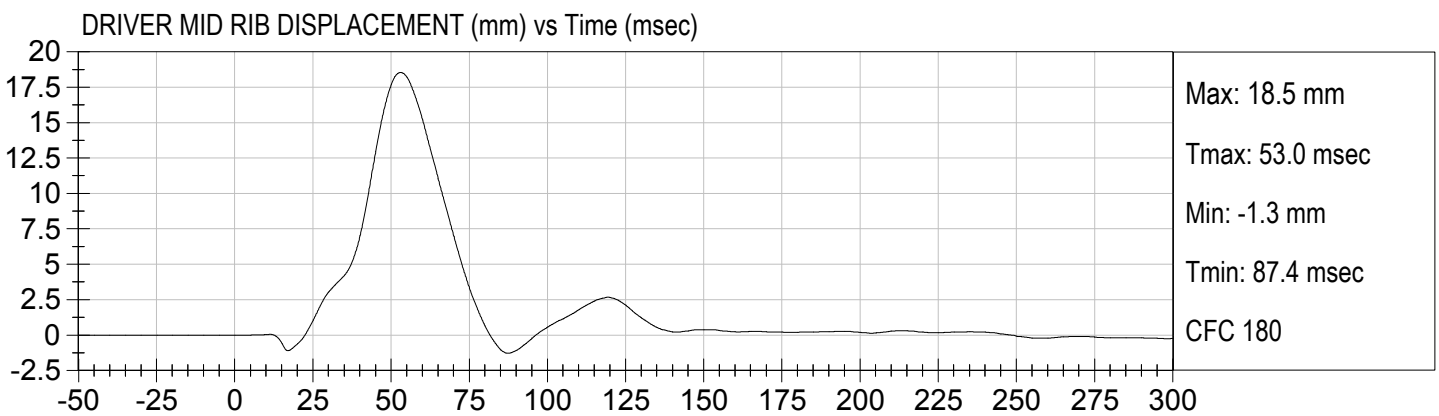
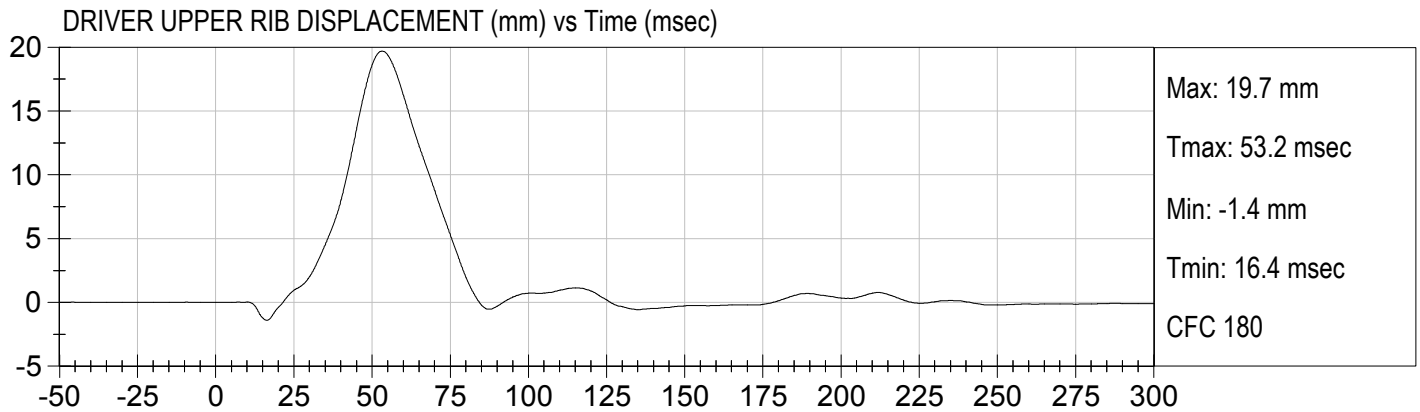
MDB Rear Acceleration (X)

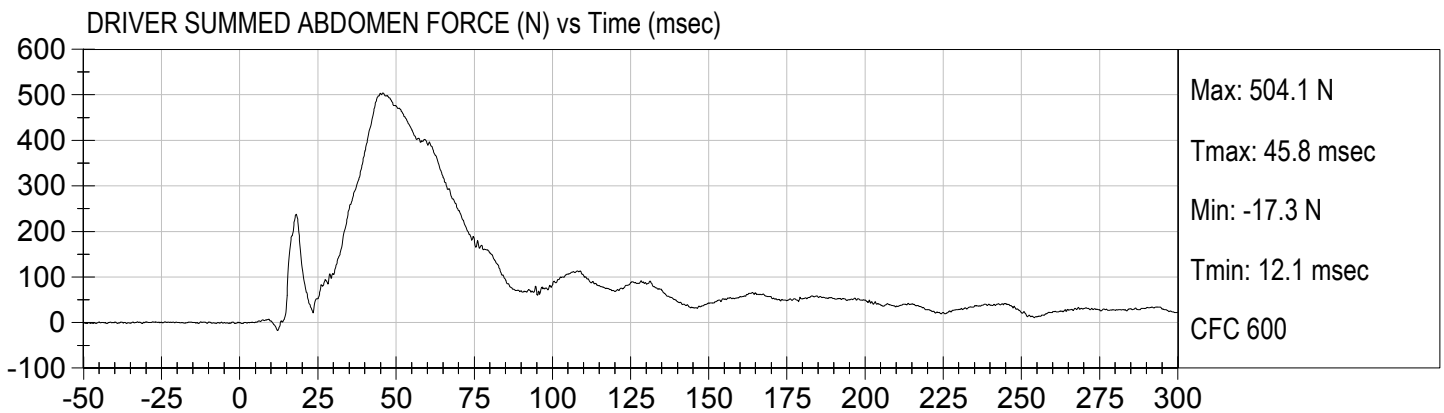
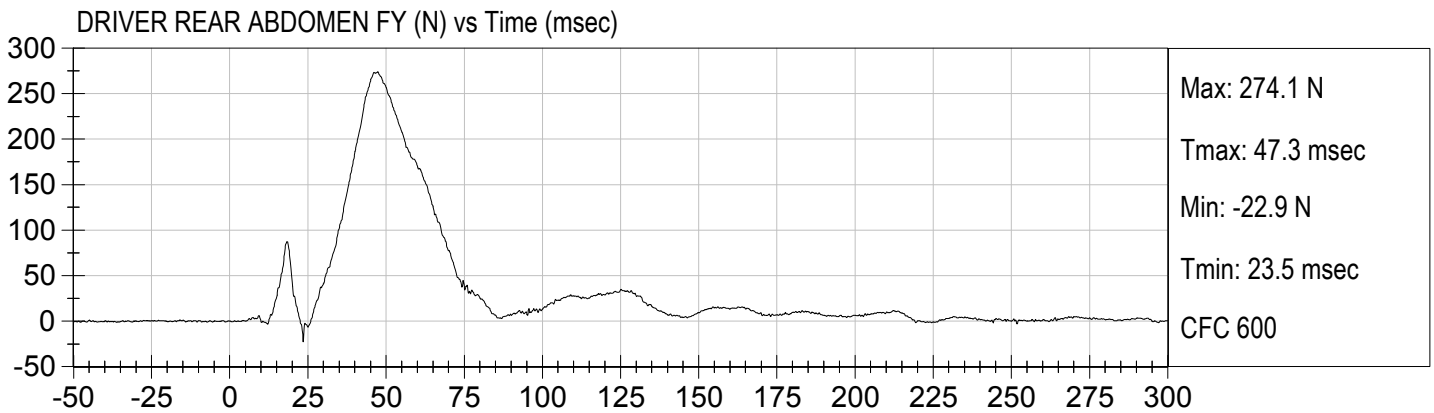
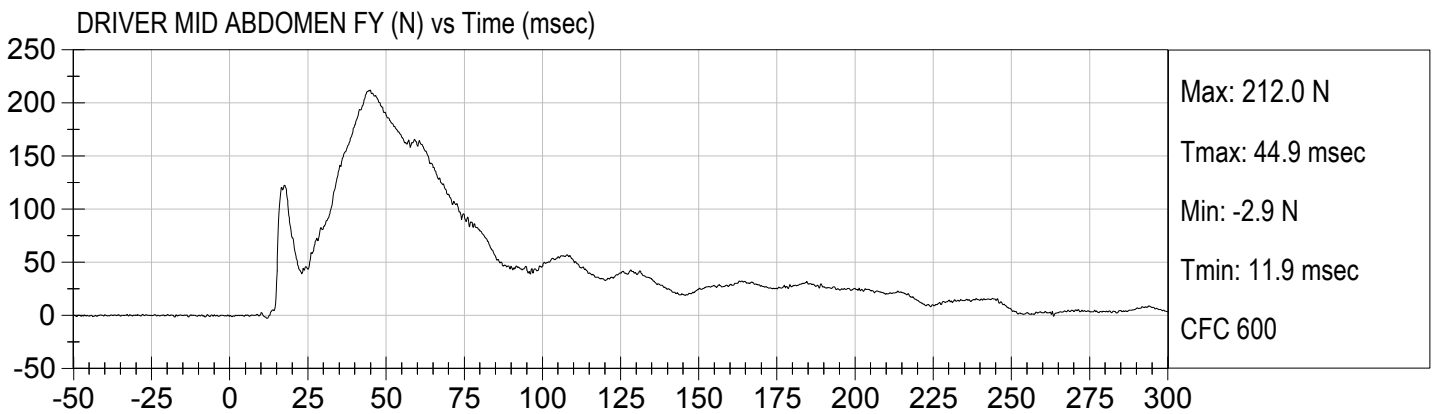
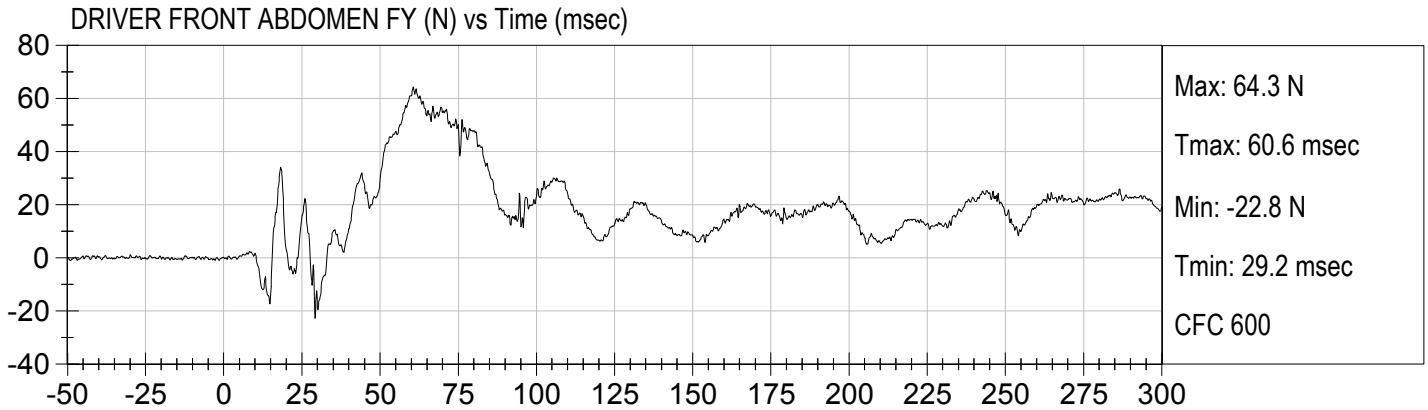
MDB Rear Acceleration (Y)

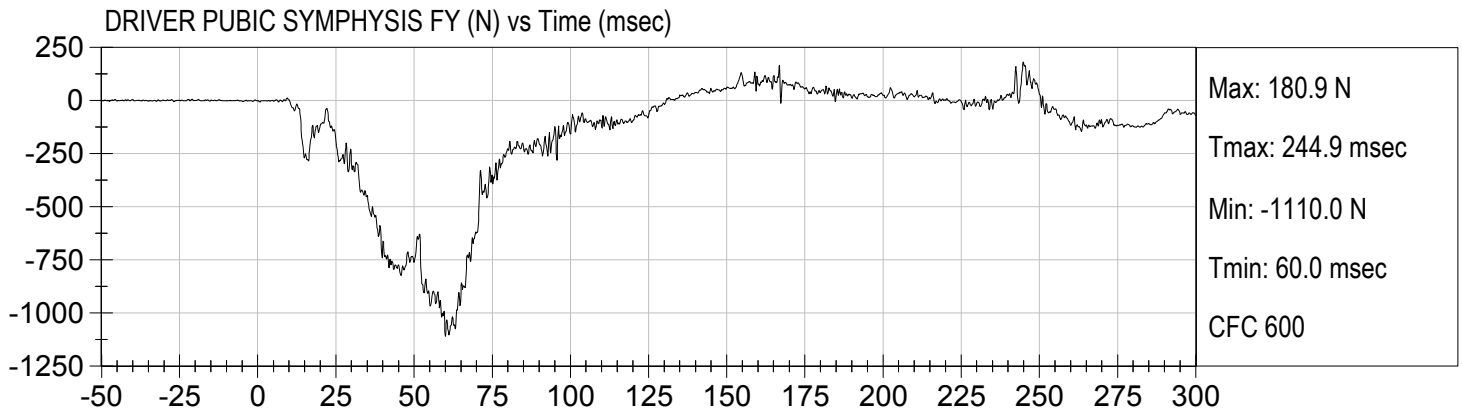
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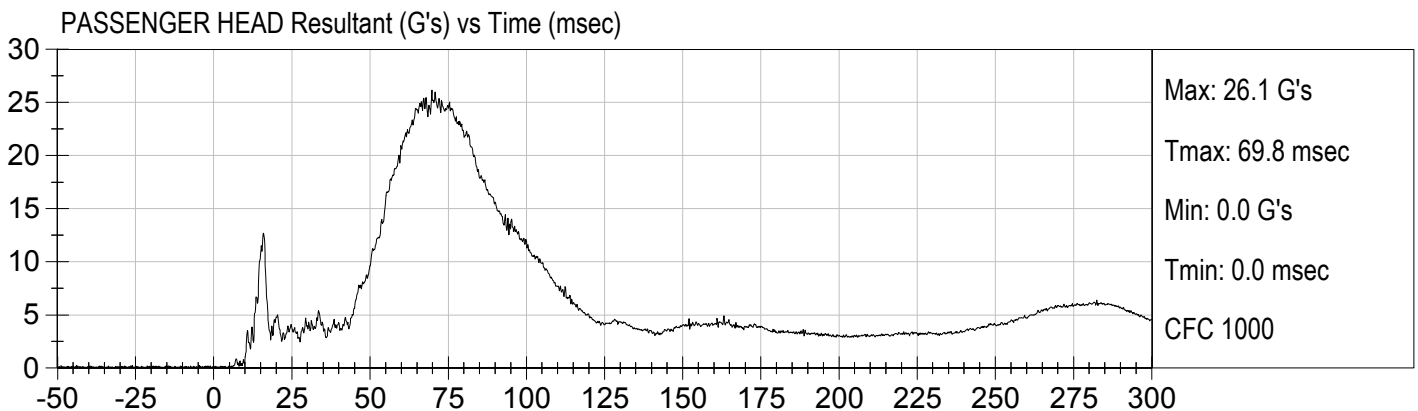
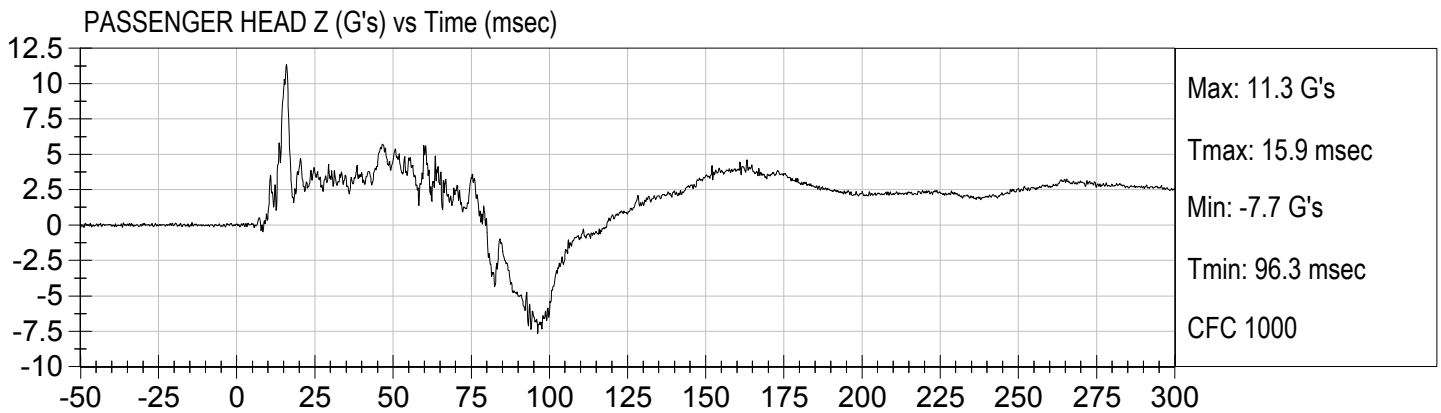
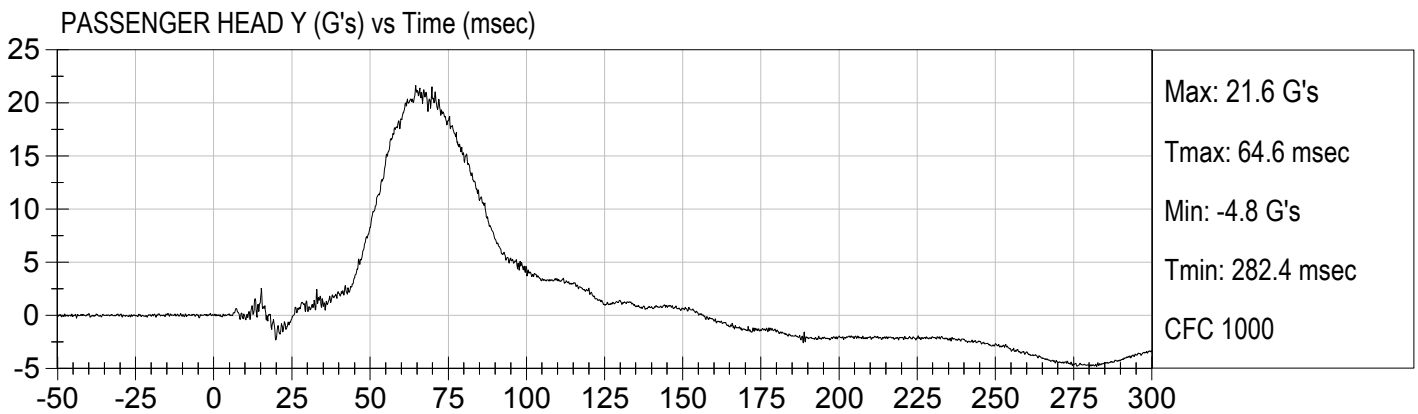
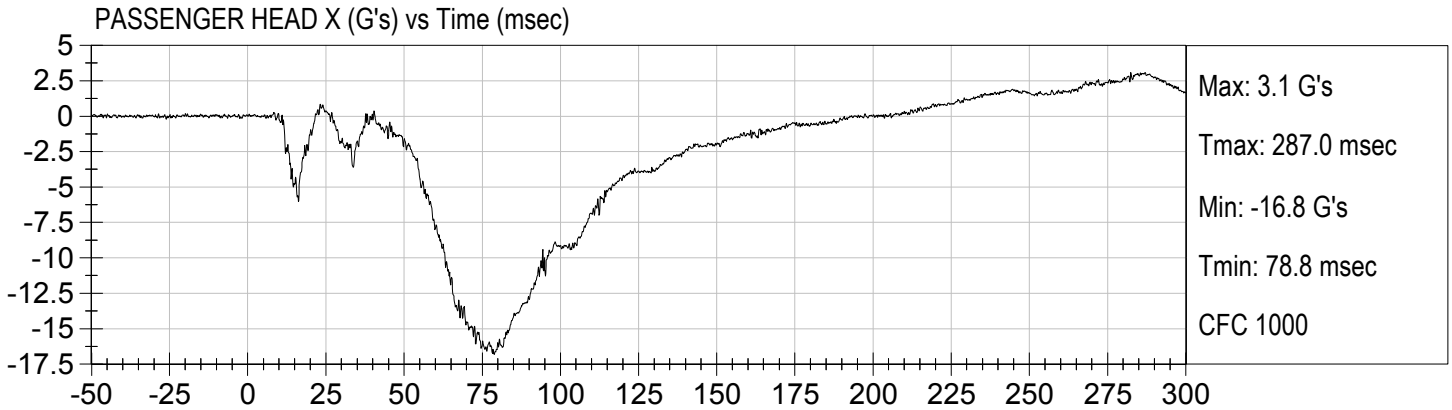
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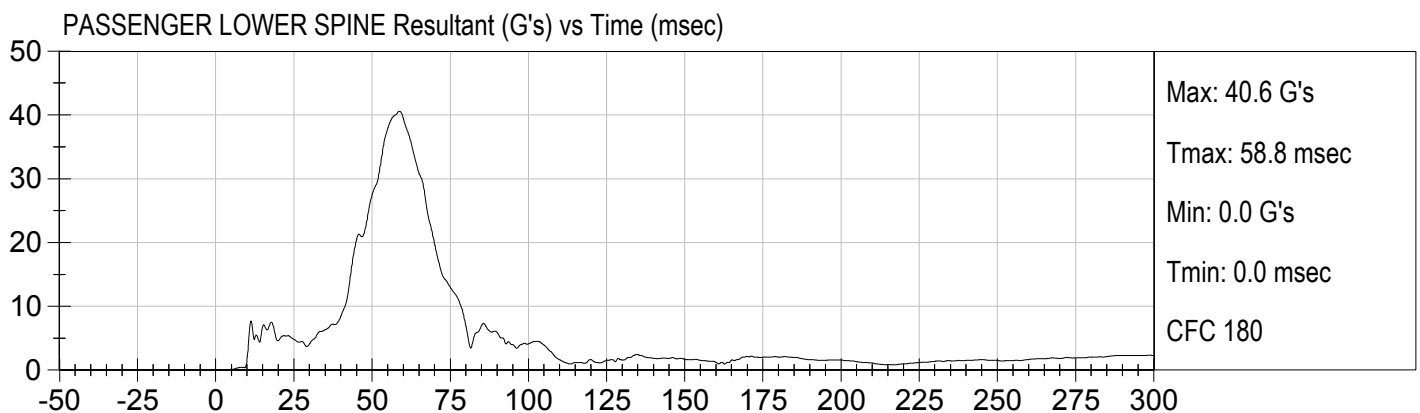
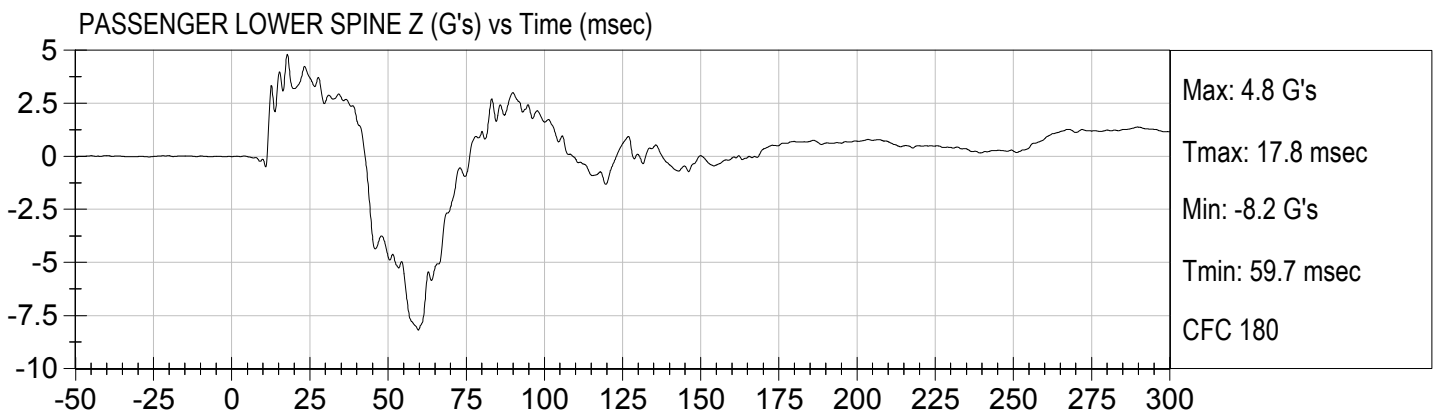
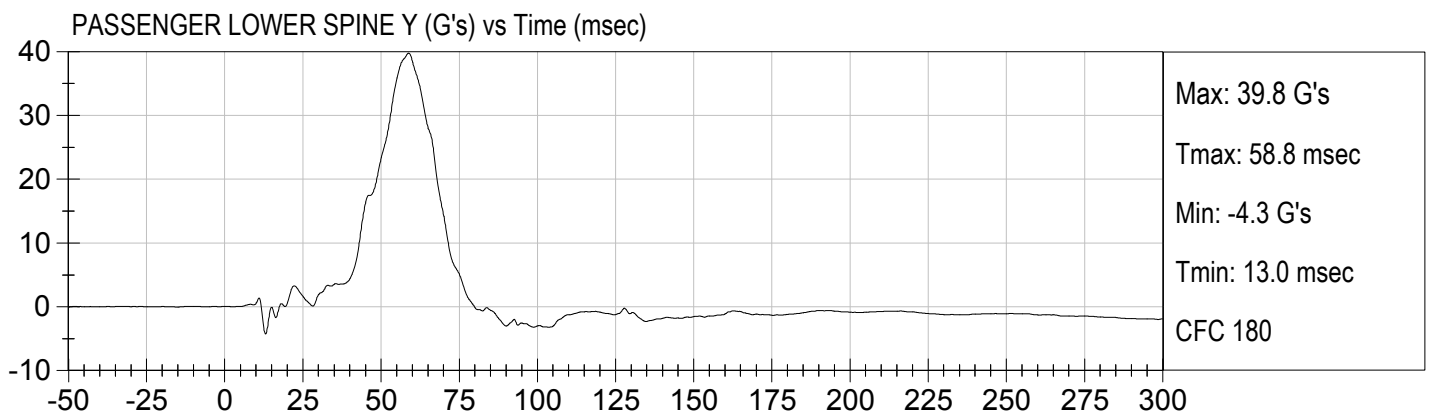
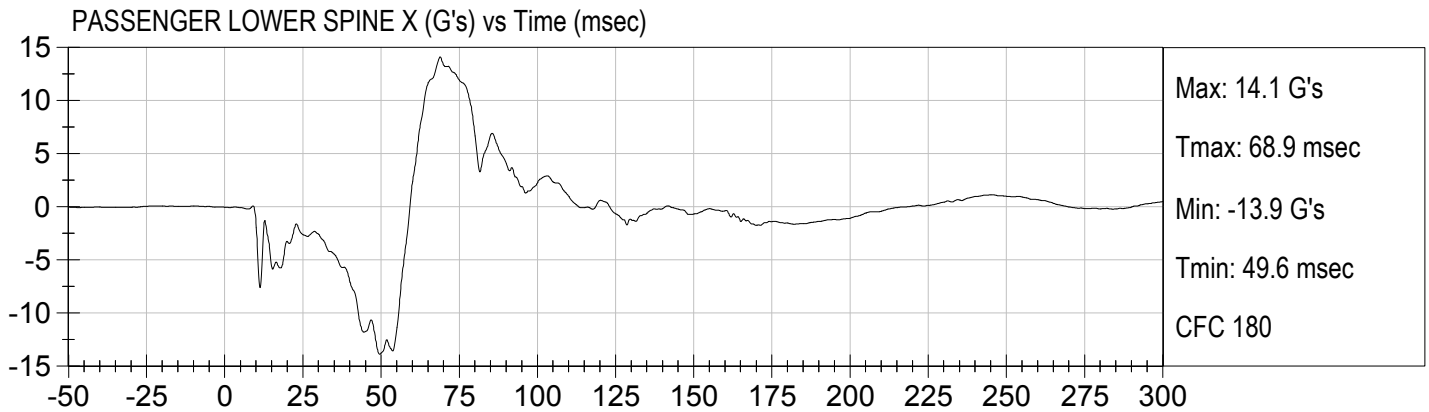


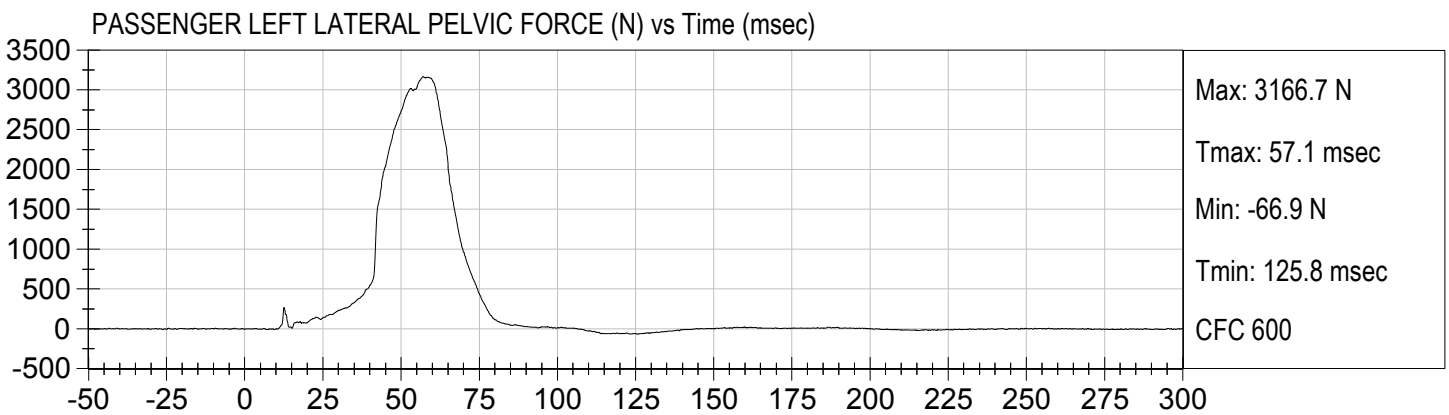
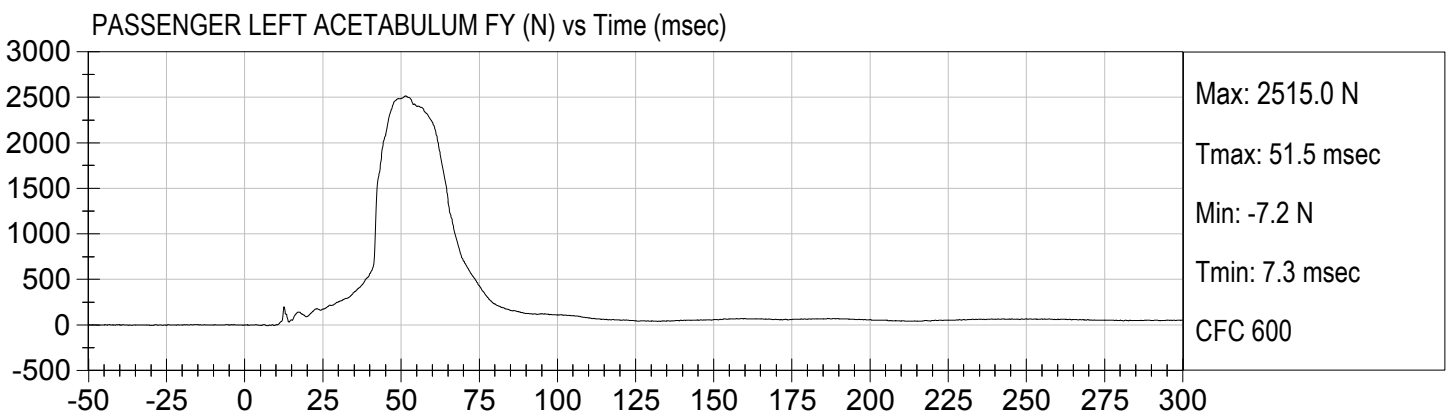
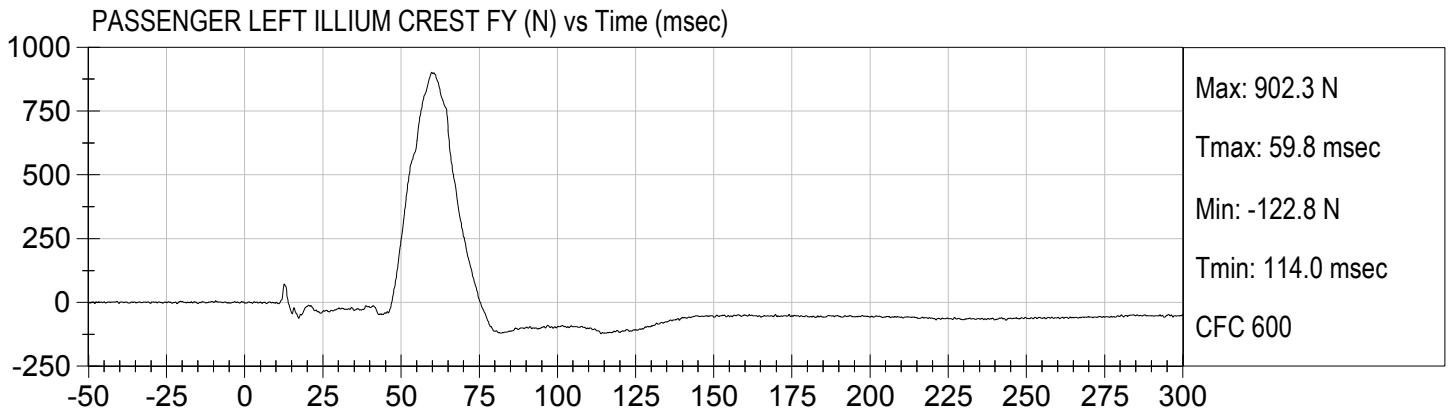












APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

ES-2re External Measurements
SN: 032

No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	Pass
7	Shoulder/Arm Width	461 - 479	464	Pass
8	Thorax Width	322 - 332	323	Pass
9	Abdomen Width	273 - 287	281	Pass
10	Pelvis Lap Width	359 - 373	370	Pass
11	Head Depth	196 - 206	203	Pass
12	Thorax Depth	262 - 272	264	Pass
13	Abdomen Depth	194 - 204	196	Pass
14	Pelvis Depth	235 - 245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150 - 160	151	Pass
16	Back of Buttocks to Front Knee	597 - 615	607	Pass

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HEAD DROP TEST
ES-2re DUMMY

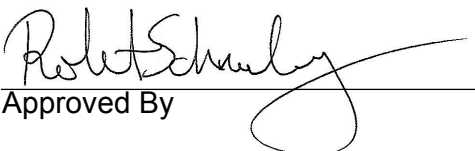
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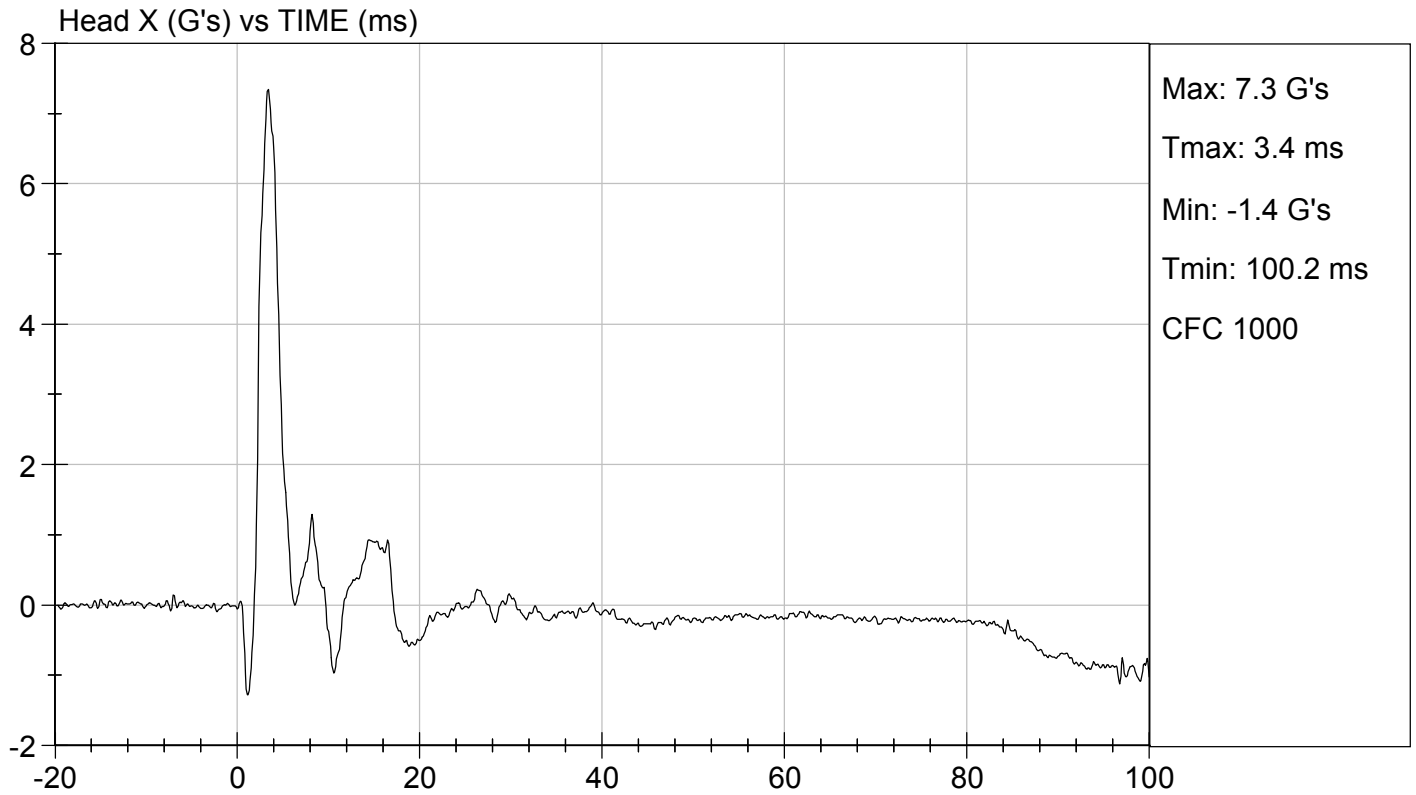
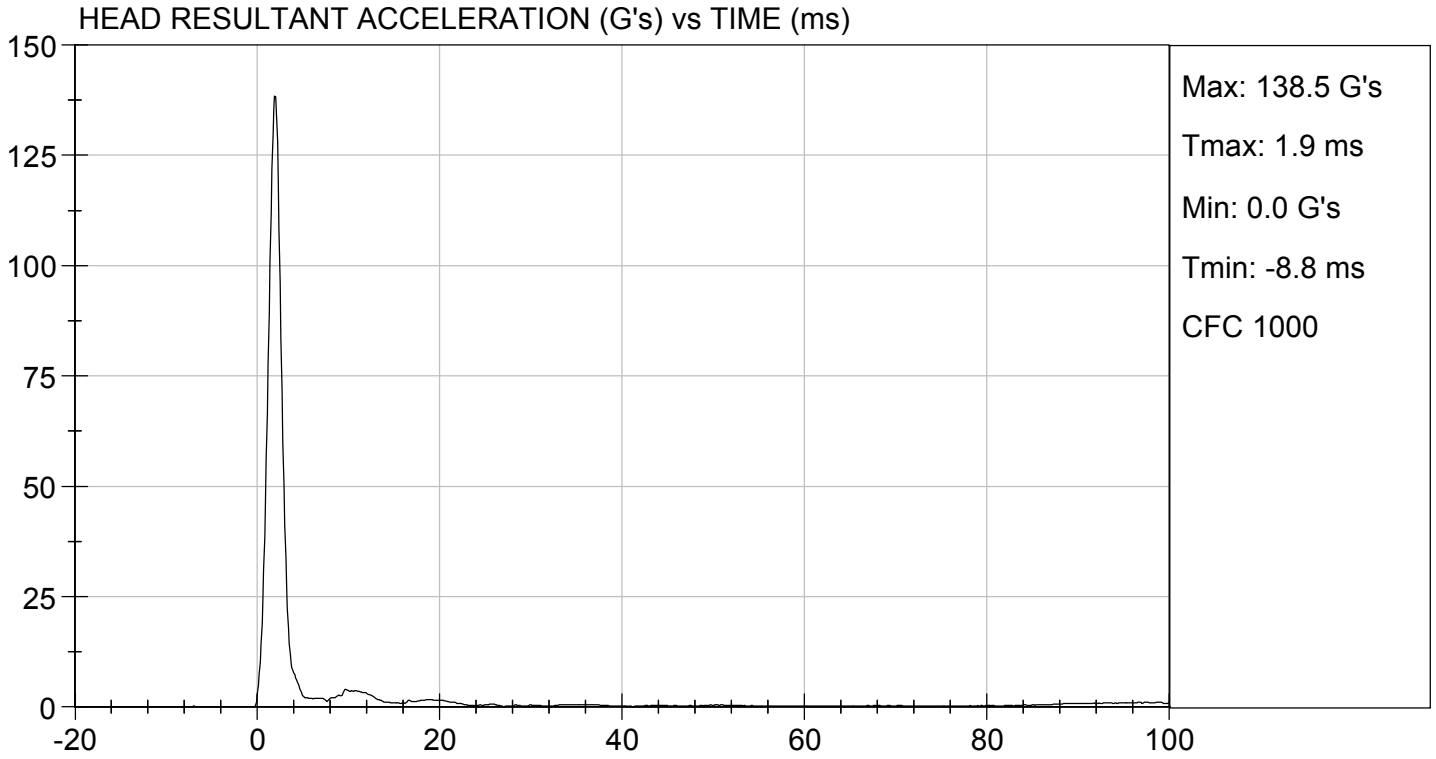
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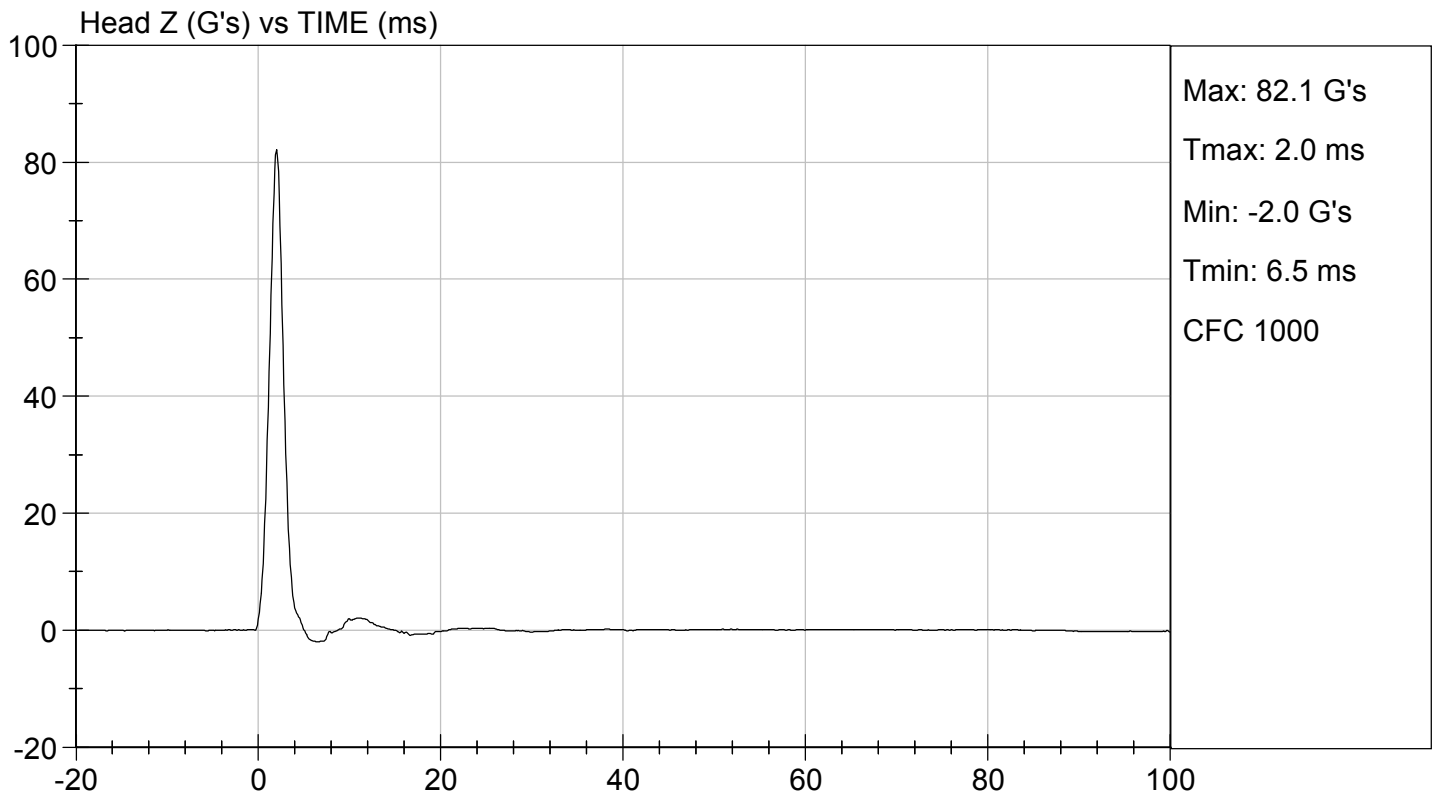
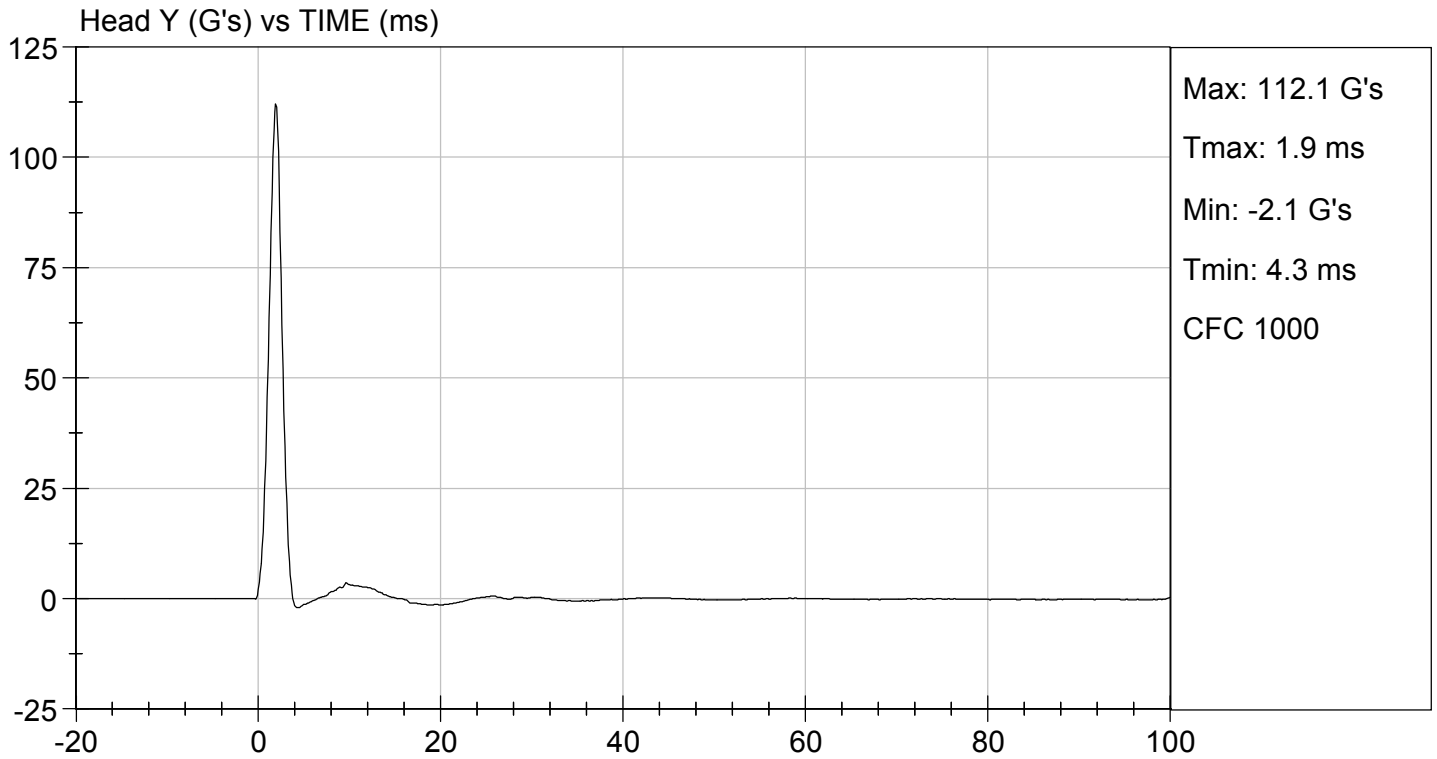
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	125 to 155	138	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	7.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

10/24/2017
 Test Date


 Approved By





**MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY**

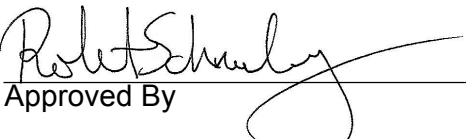
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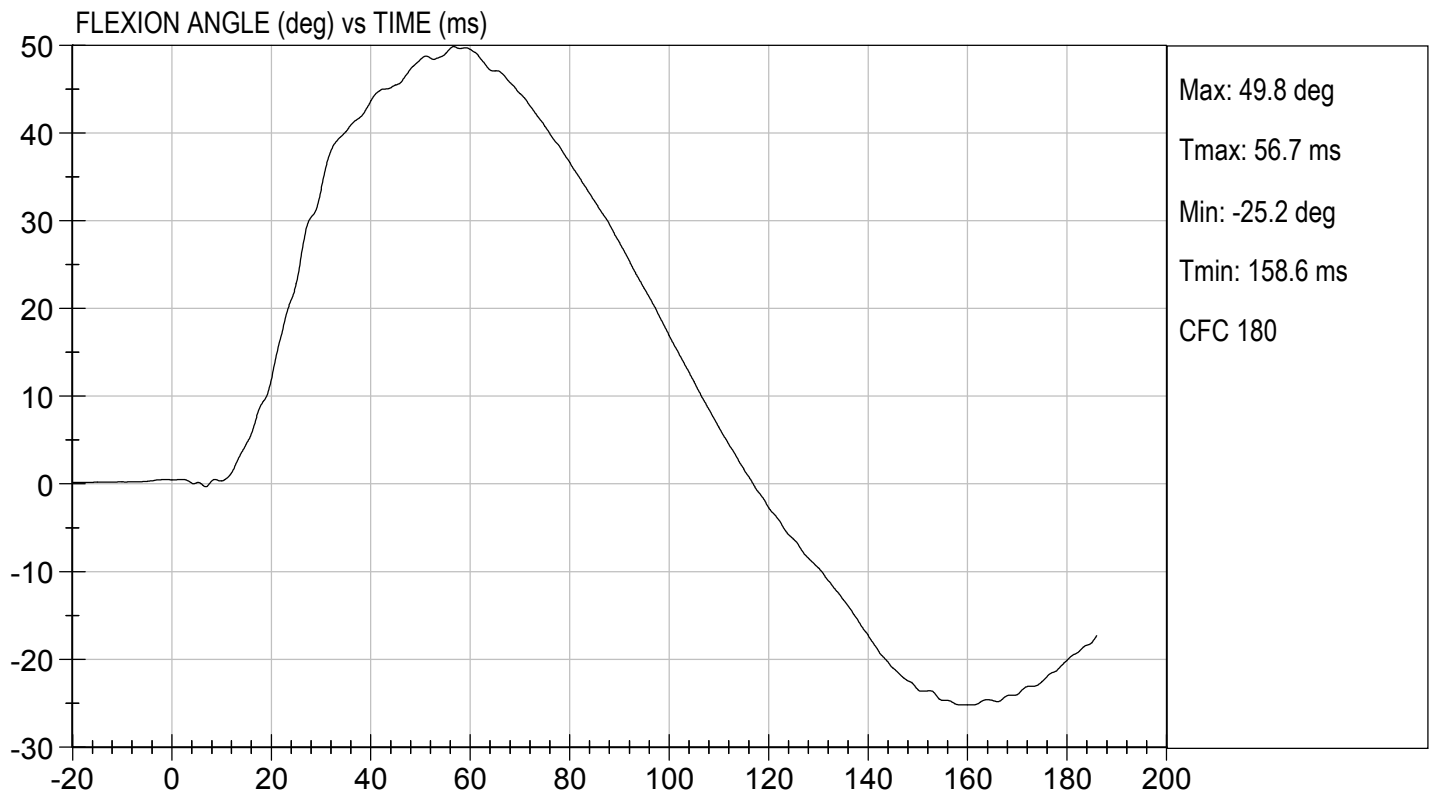
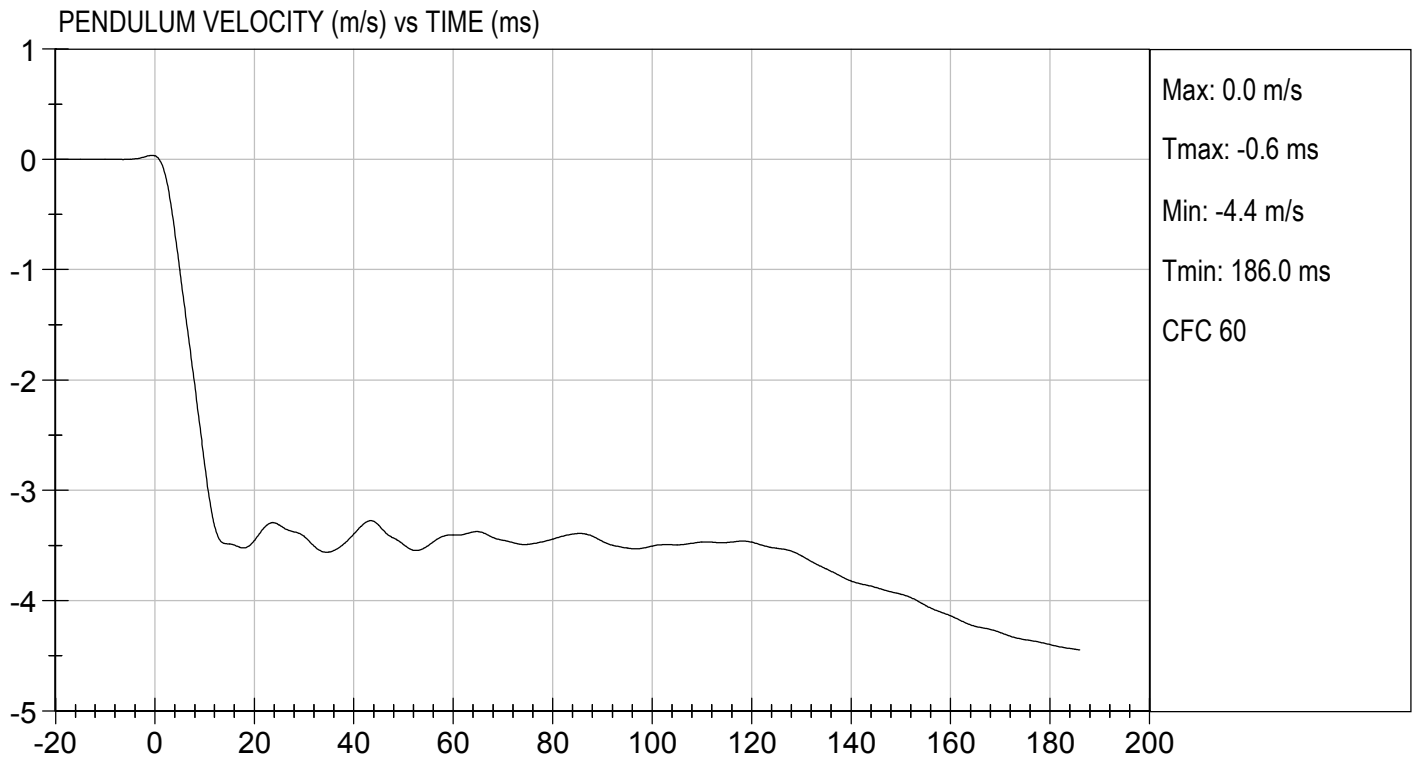
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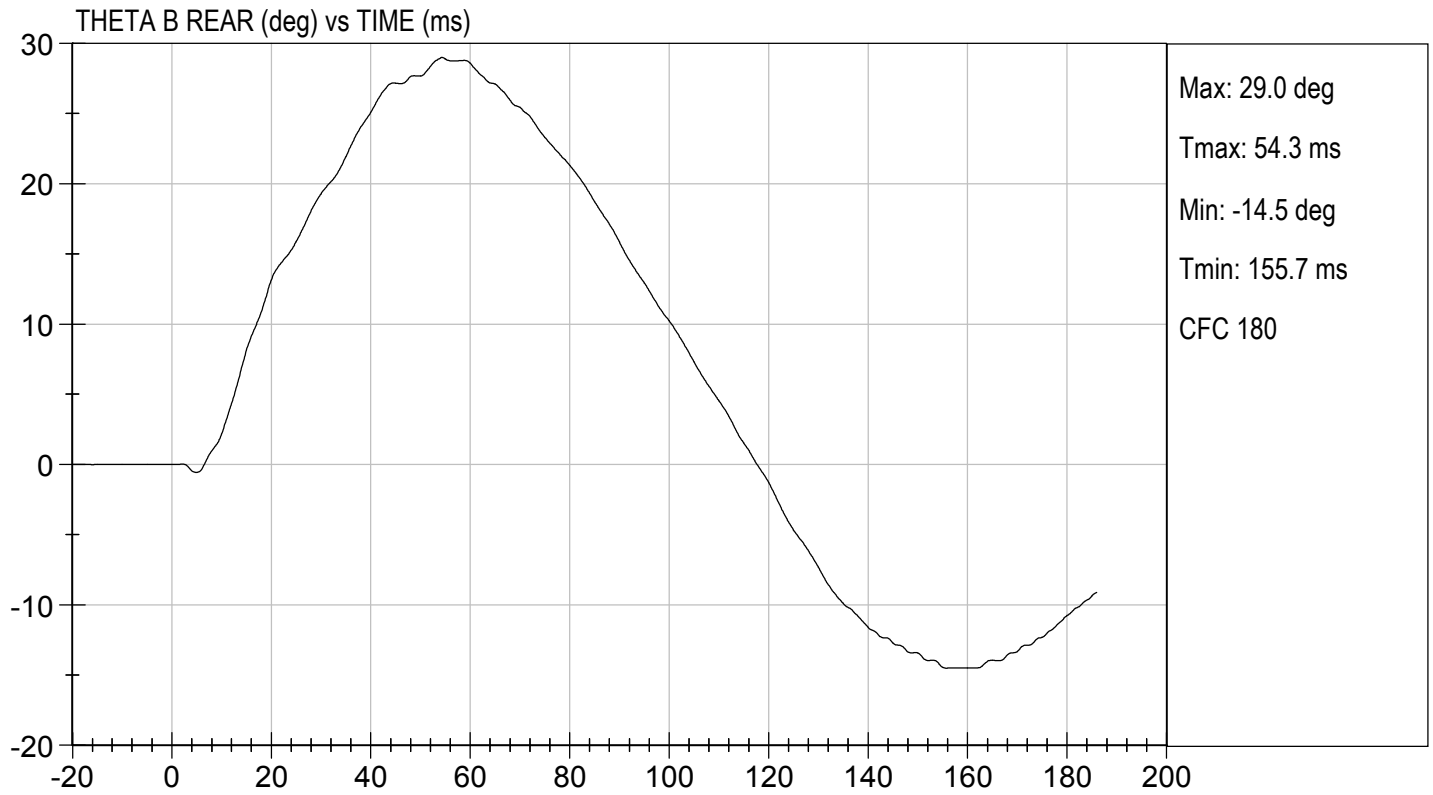
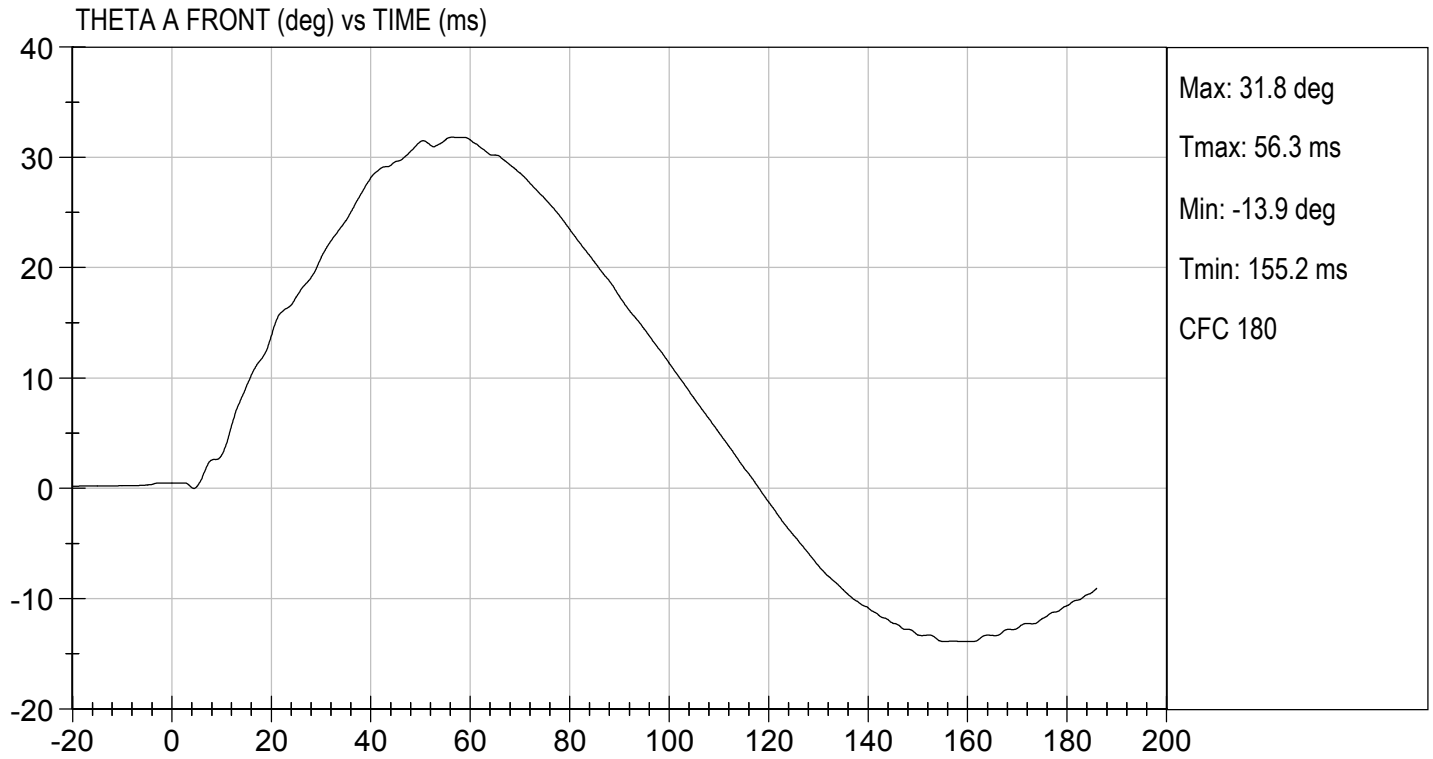
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass	
Laboratory Relative Humidity	%	10 to 70	42	Pass	
Pendulum Speed	m/s	3.30 to 3.50	3.48	Pass	
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3 ms	m/s	-0.25 to -0.375	-0.35	Pass
	14 ms	m/s	-3.20 to -3.70	-3.48	Pass
	17 ms	m/s	>= -3.70	-3.52	Pass
Maximum Flexion Angle	deg	49.0 to 59.0	49.8	Pass	
Time of Maximum Flexion Angle	ms	54.0 to 66.0	56.7	Pass	
Head Rotation Decay Time to 0 Degree	ms	53.0 to 88.0	54.3	Pass	
Overall Results				Pass	

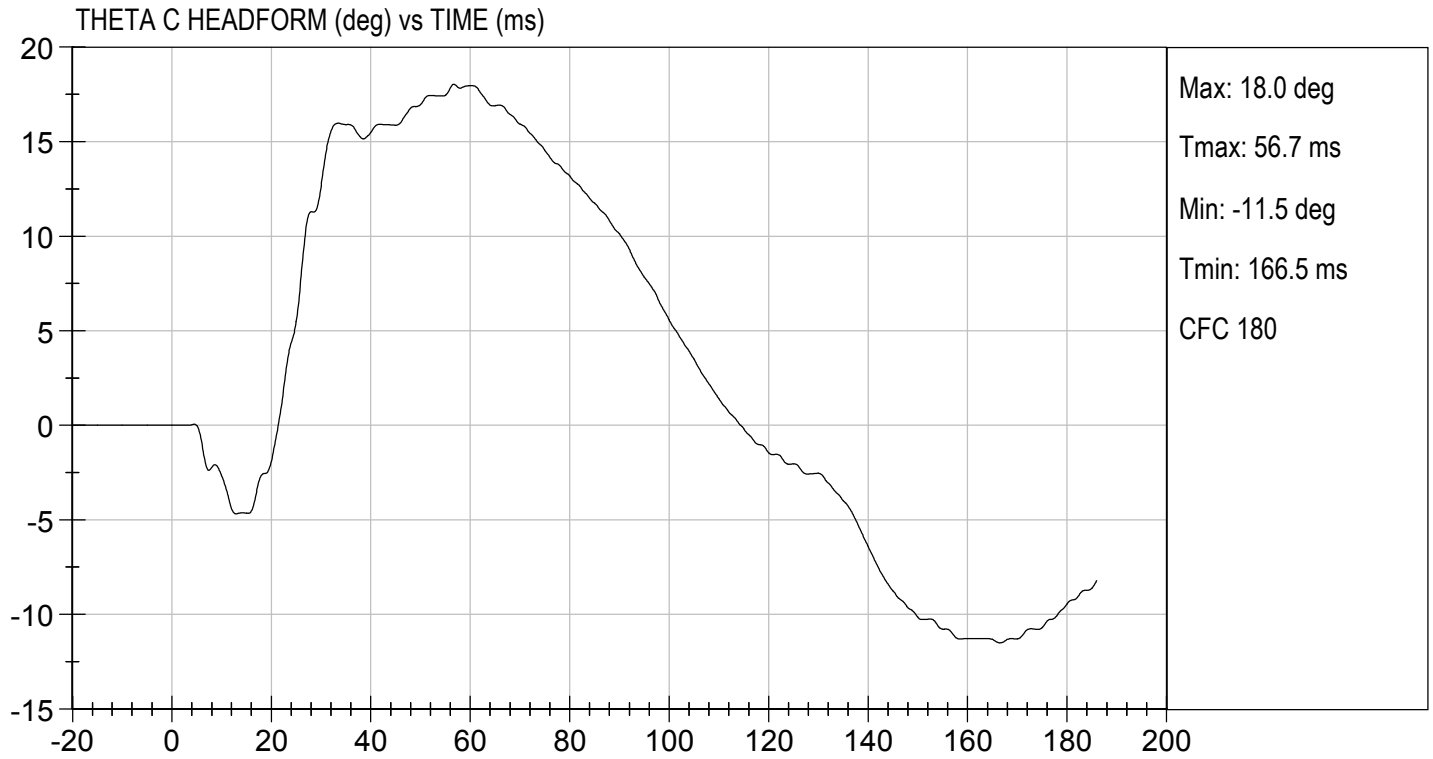

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10/23/2017
Test Date


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SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

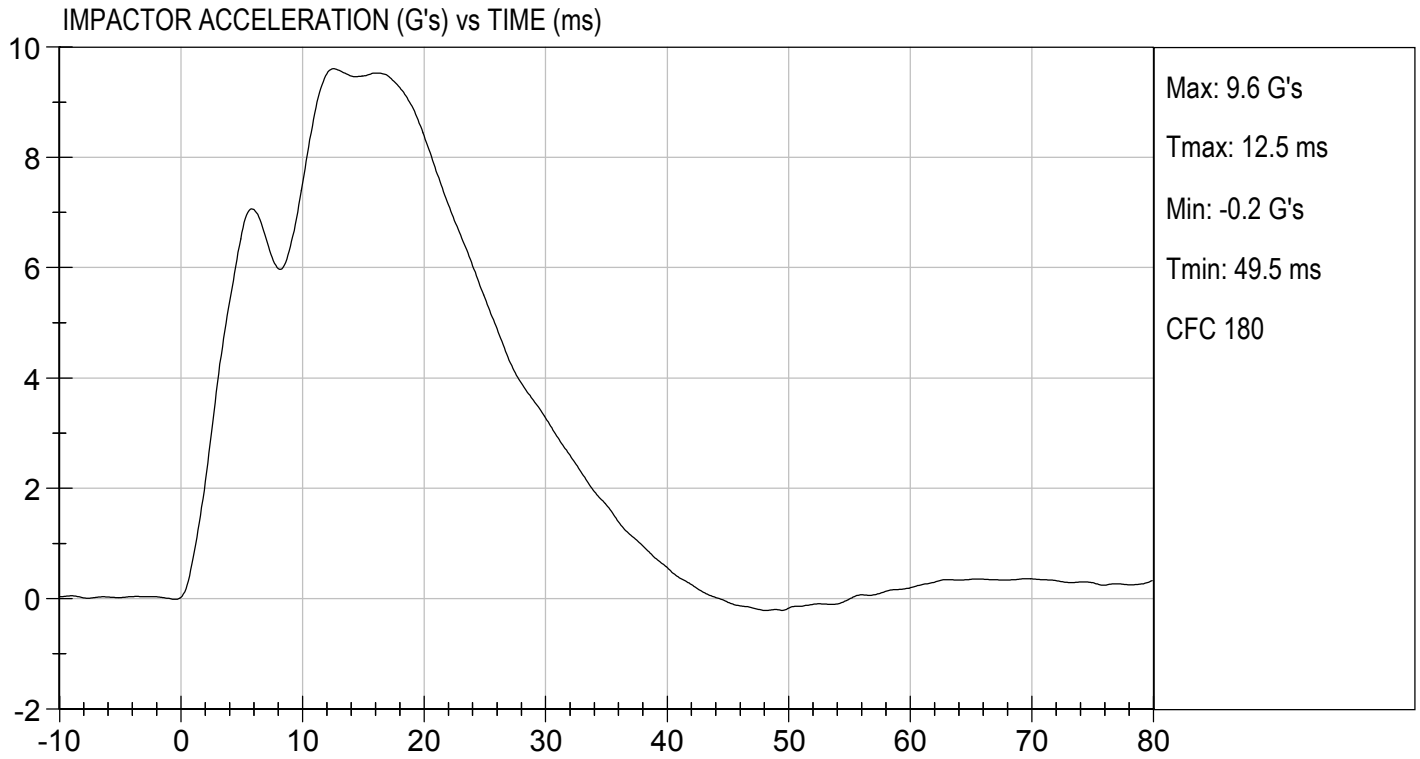
Test I.D: D173073

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.2	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.6	Pass
Overall Test Results				Pass


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10/24/2017
 Test Date


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UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D173074

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.0	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.0	Pass
Overall Test Results				Pass

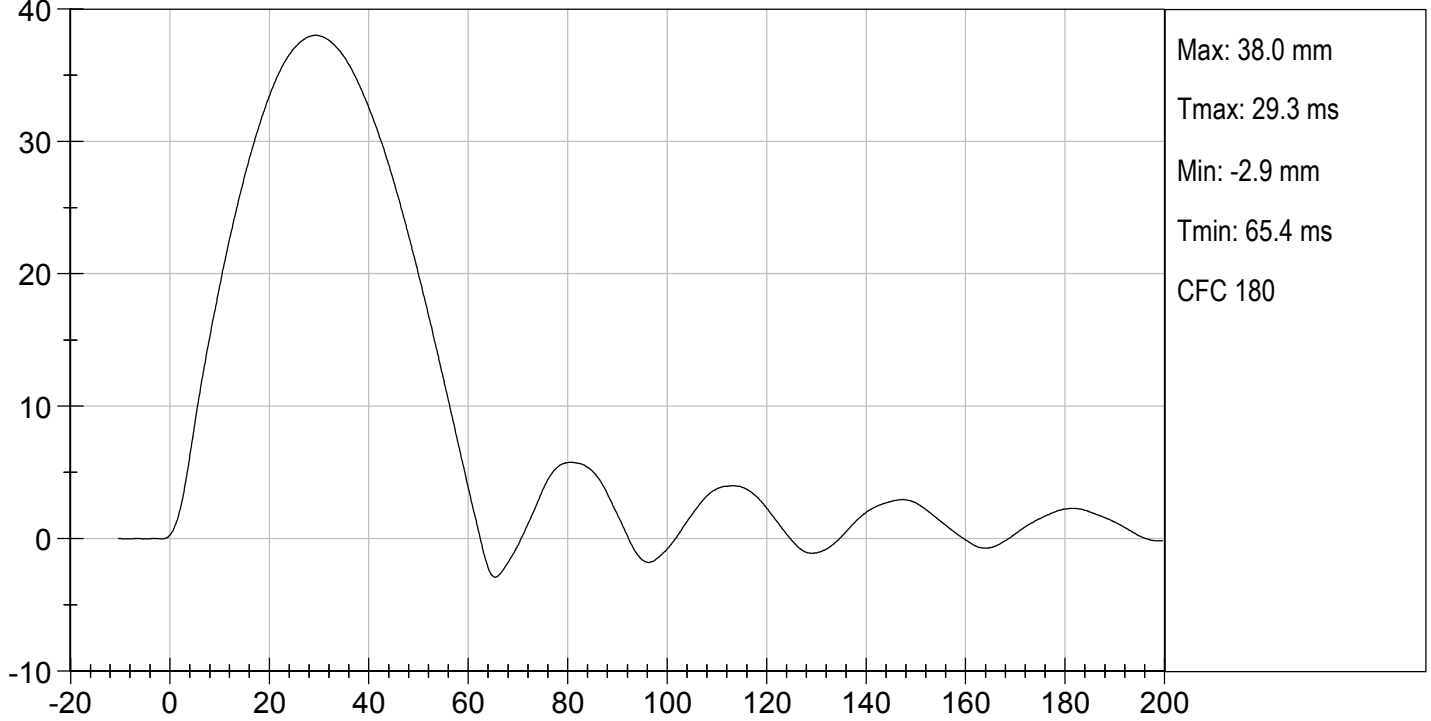

Laboratory Technician

10/23/2017
Test Date

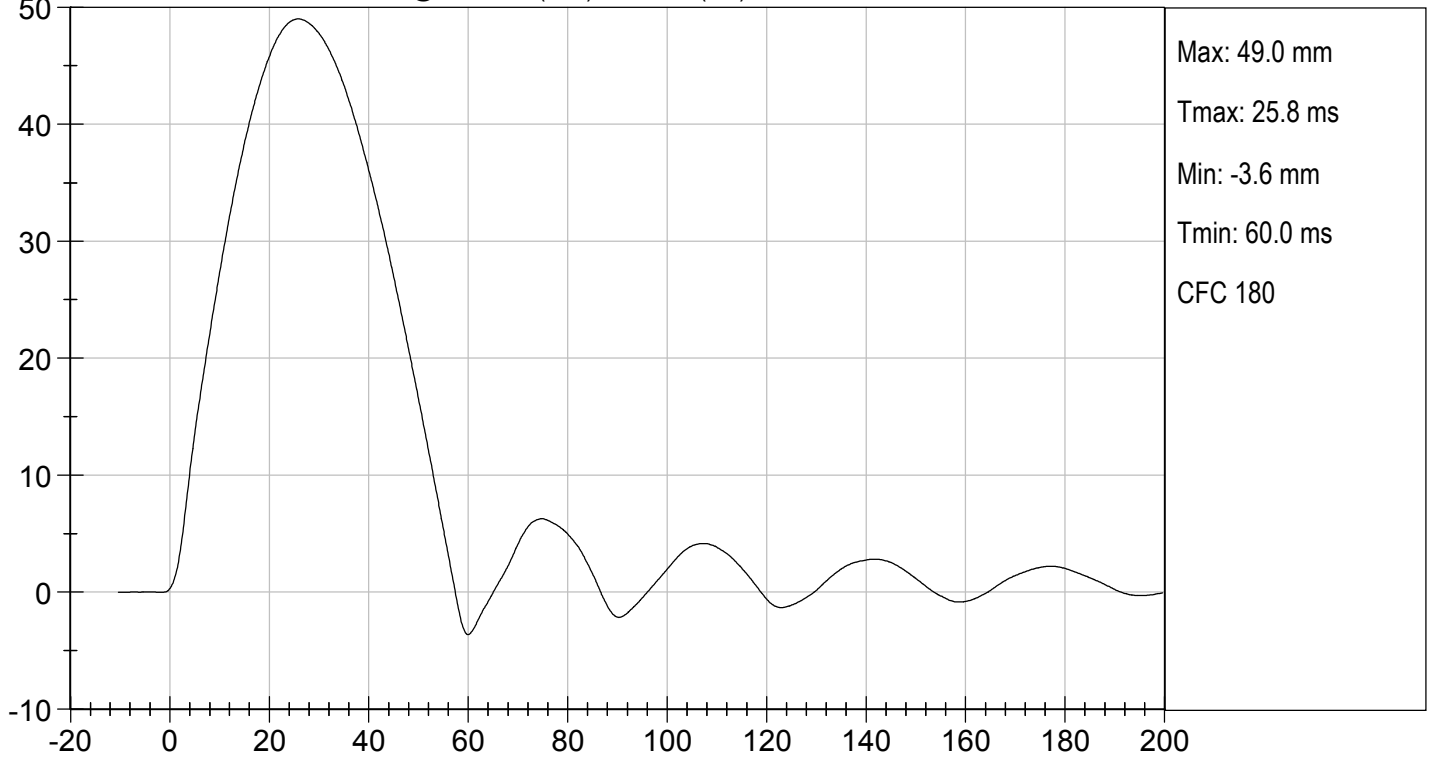

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UPPER RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



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MID RIB TEST

ES-2re DUMMY

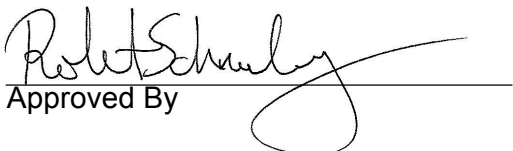
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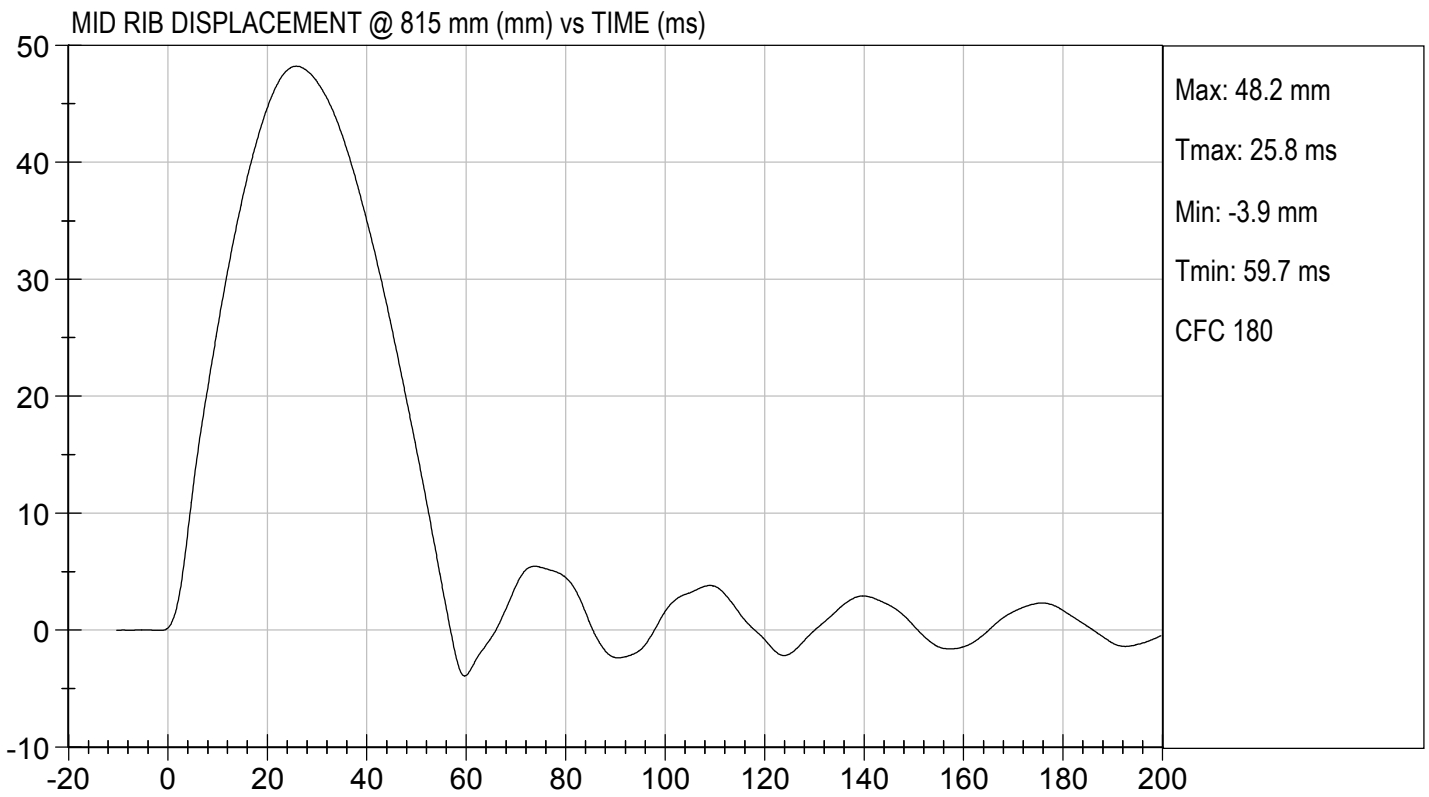
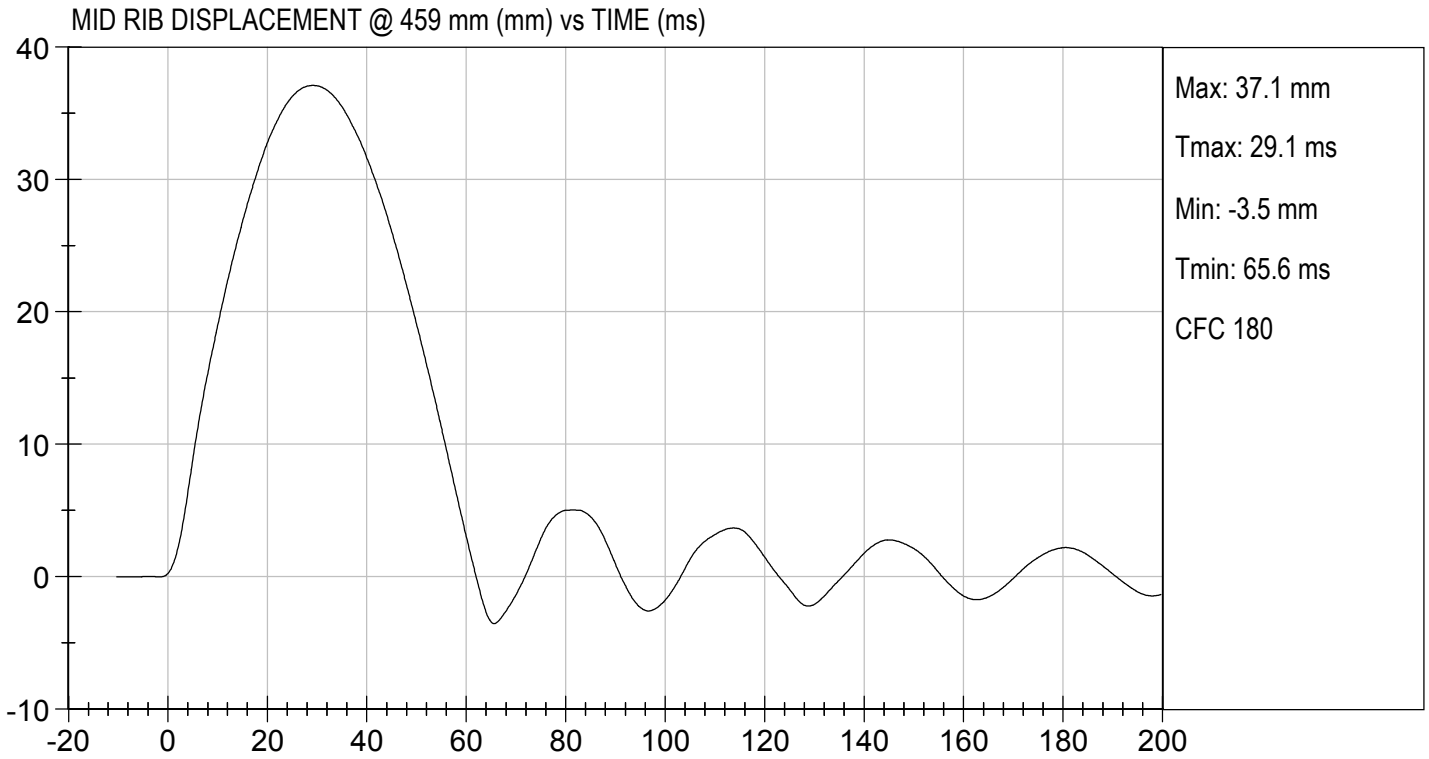
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Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.1	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.2	Pass
Overall Test Results				Pass


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10/23/2017
Test Date


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LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

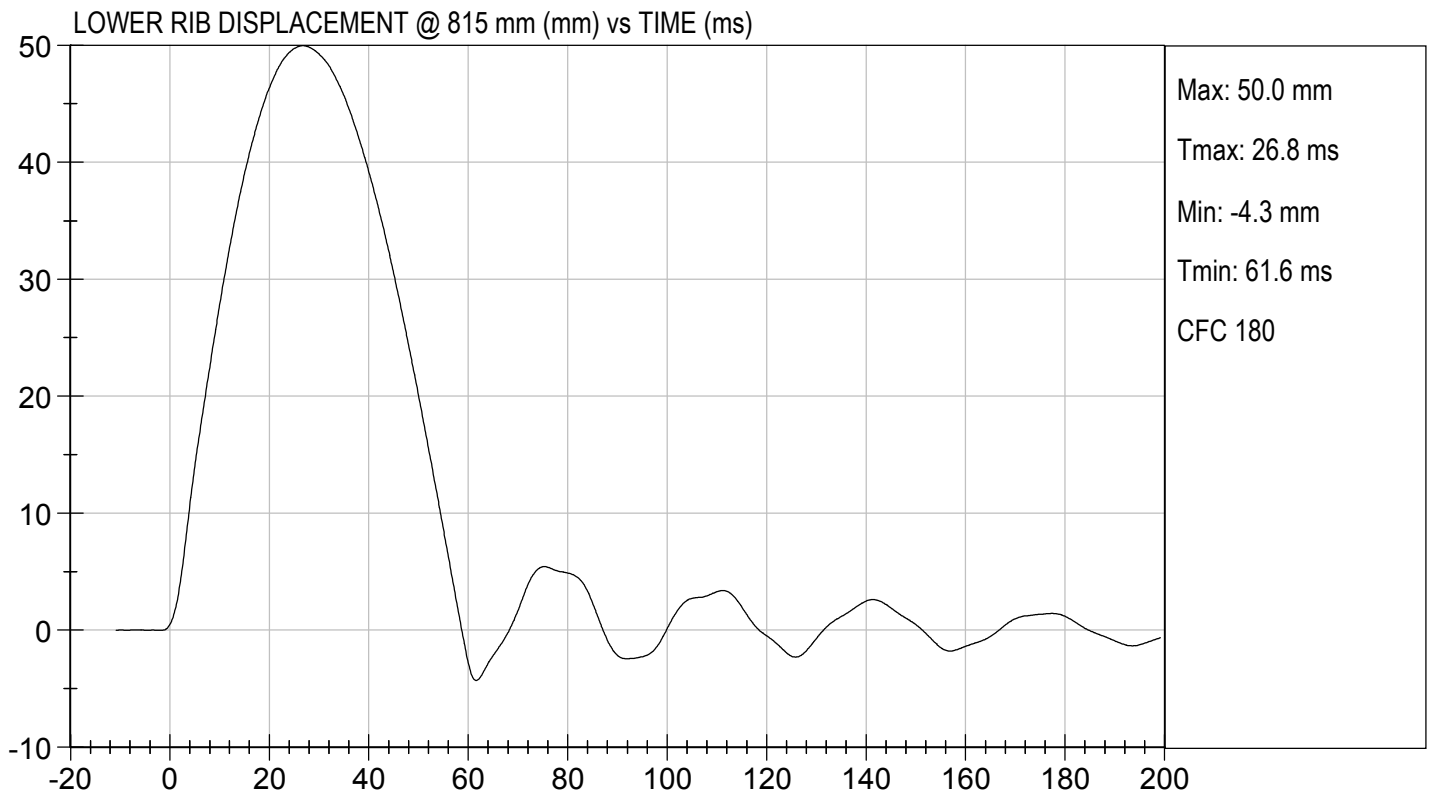
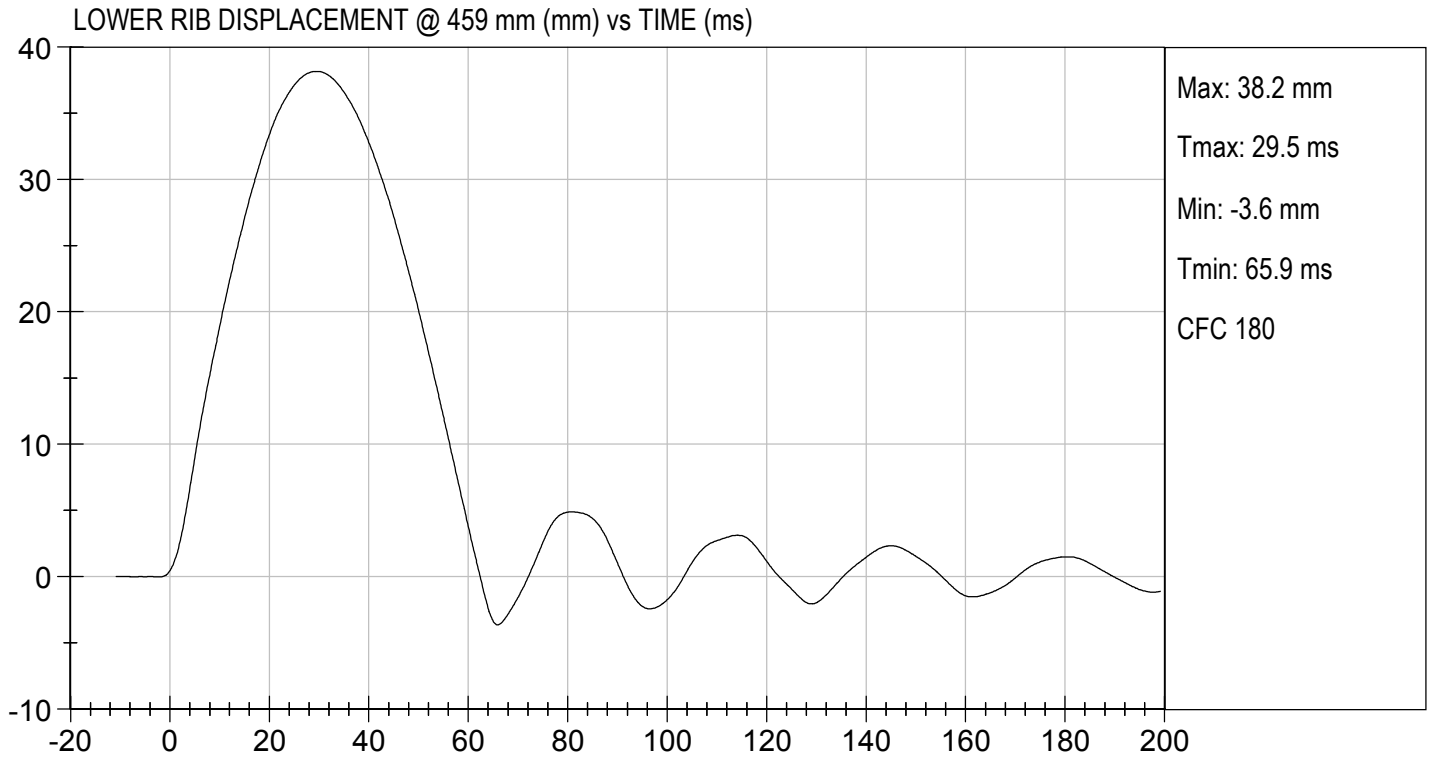
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Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.2	Pass
Displacement at 815 mm	mm	46.0 to 51.0	50.0	Pass
Overall Test Results				Pass


Laboratory Technician

10/23/2017
Test Date


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MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

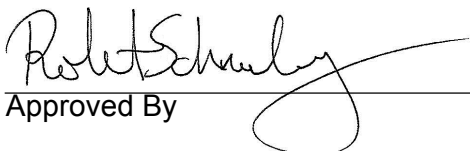
ATD Serial No: 032

Test I.D: D173077

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impactor Force	N	4000 to 4800	4582	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.8	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2418	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	11.6	Pass
Overall Test Results				Pass


Laboratory Technician

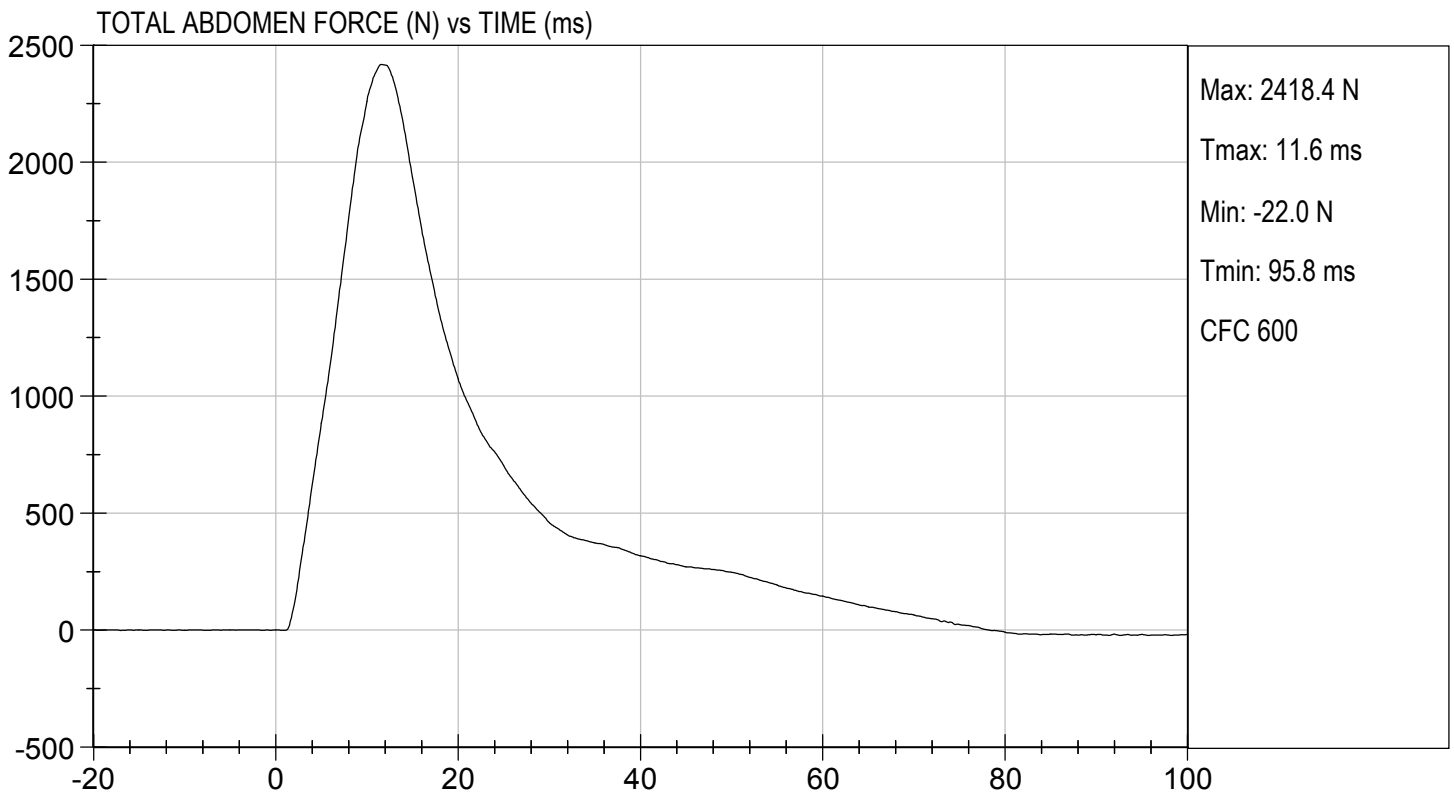
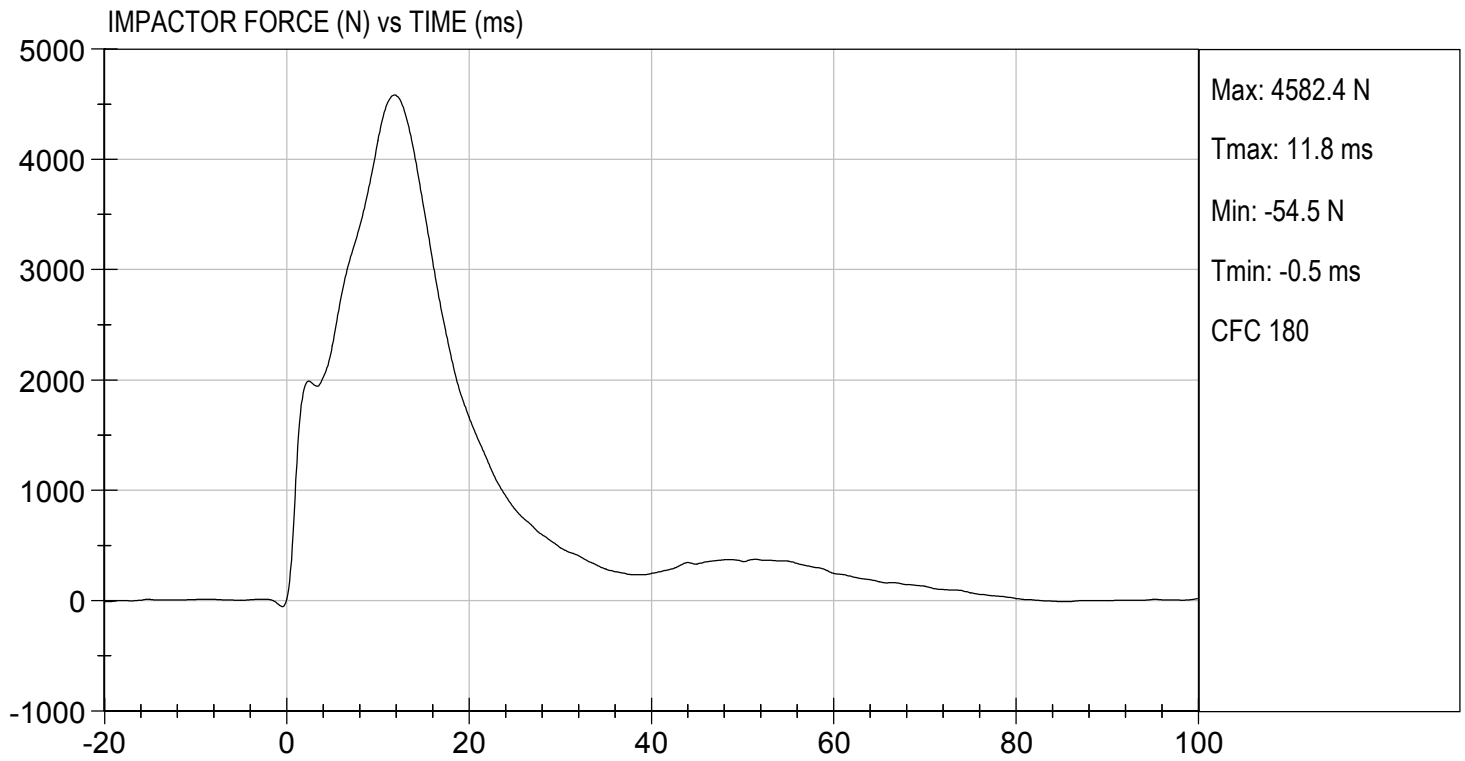
10/24/2017
Test Date

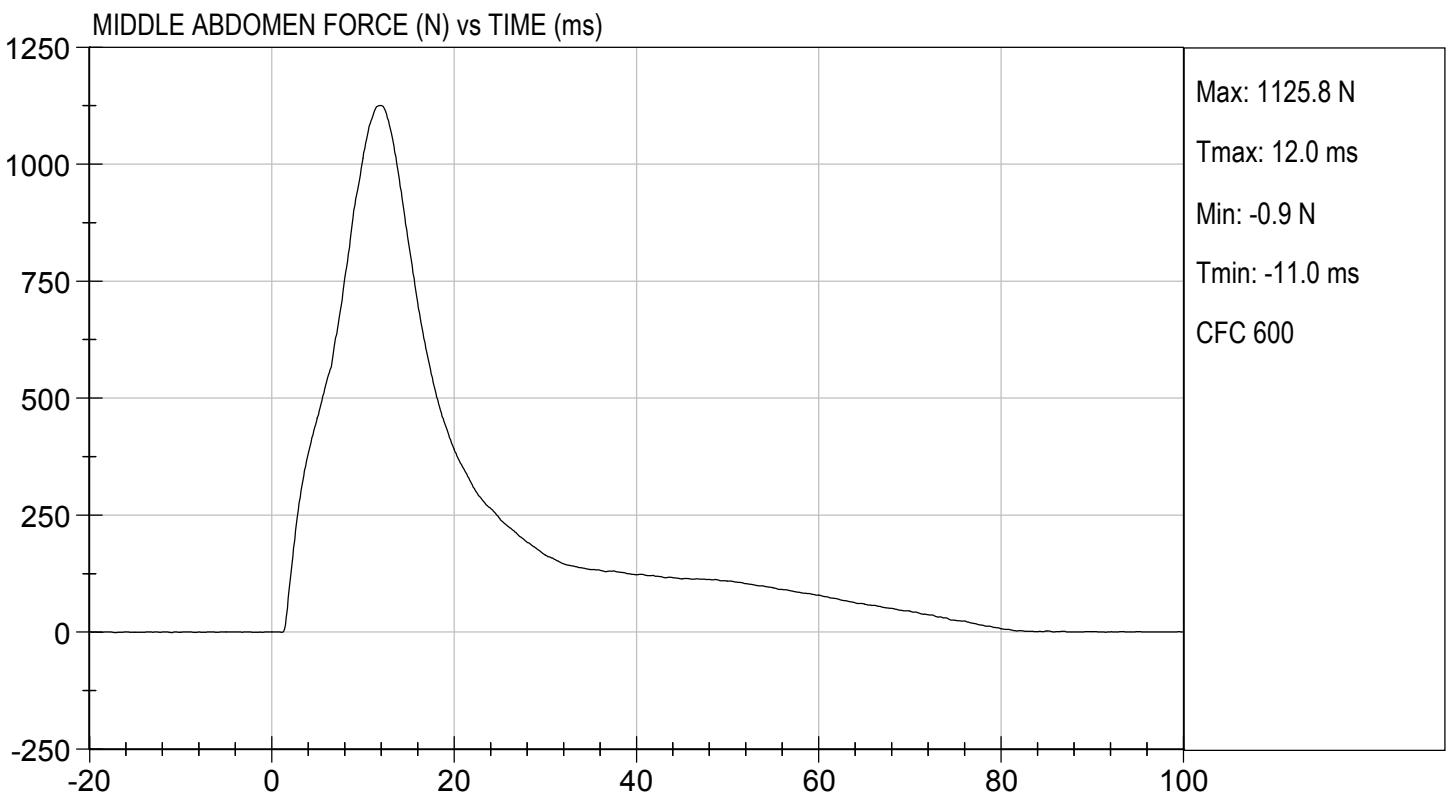
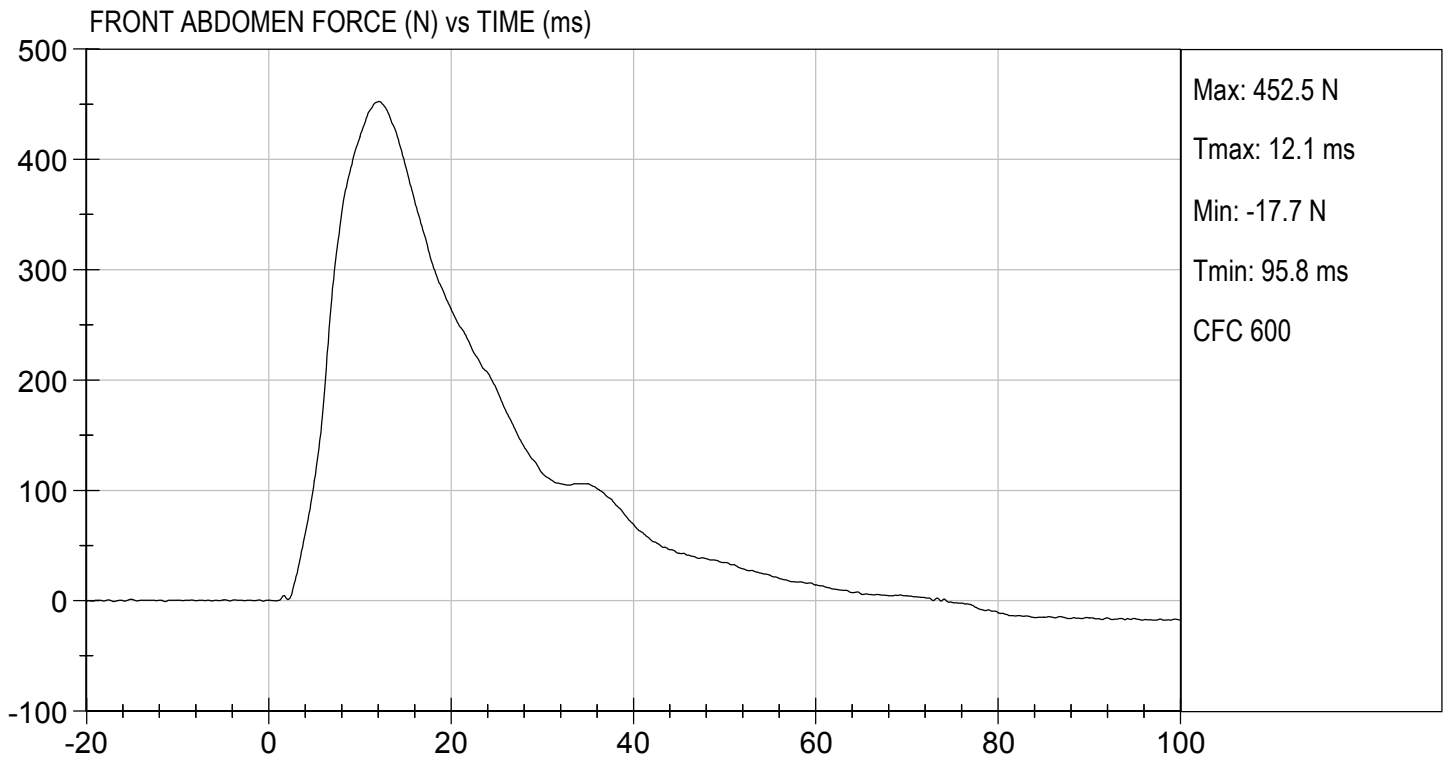

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TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.44 ft/s, 4.10 m/s

TEST DATE: 10/24/2017
TEST #: D173077

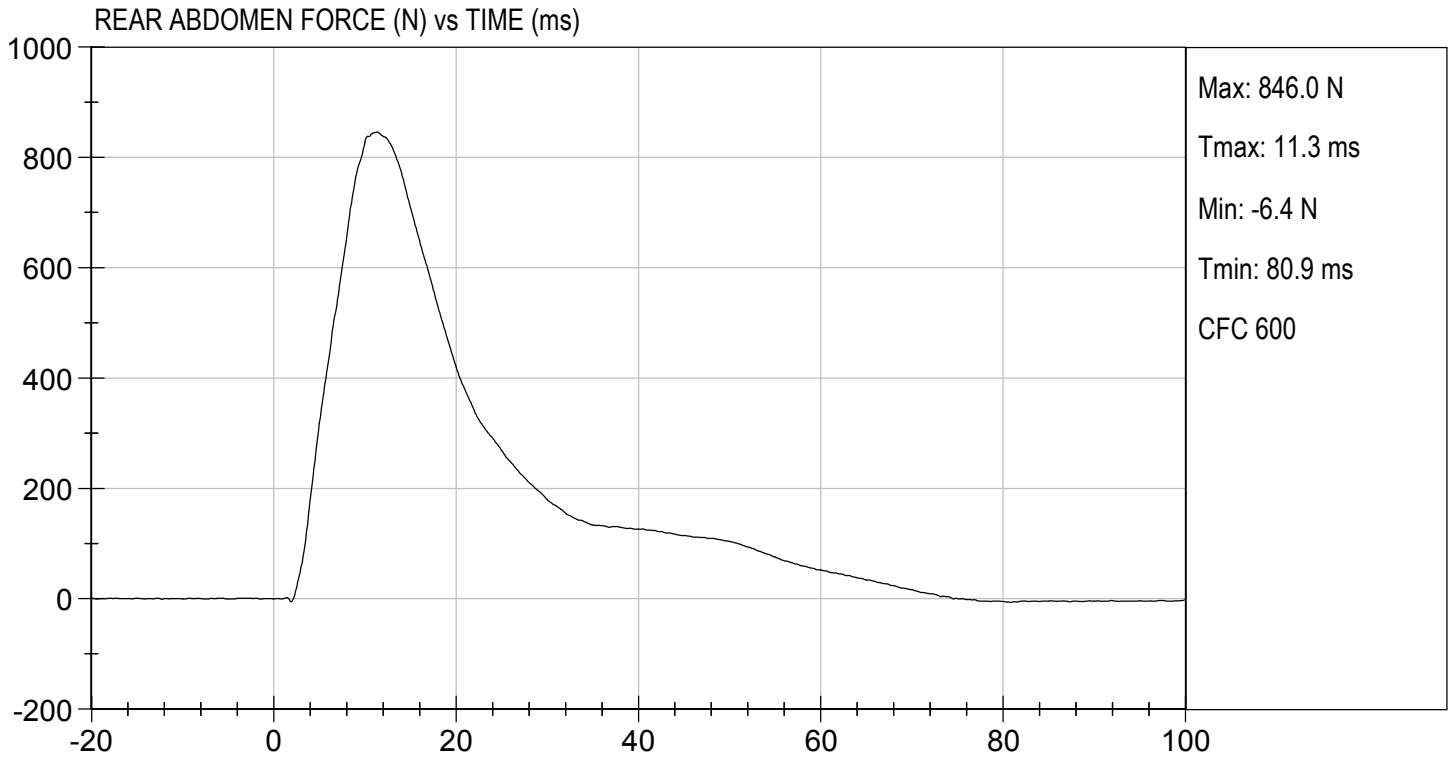






TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.44 ft/s, 4.10 m/s

TEST DATE: 10/24/2017
TEST #: D173077



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

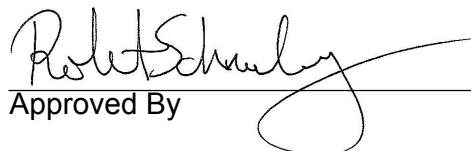
ATD Serial No: 032

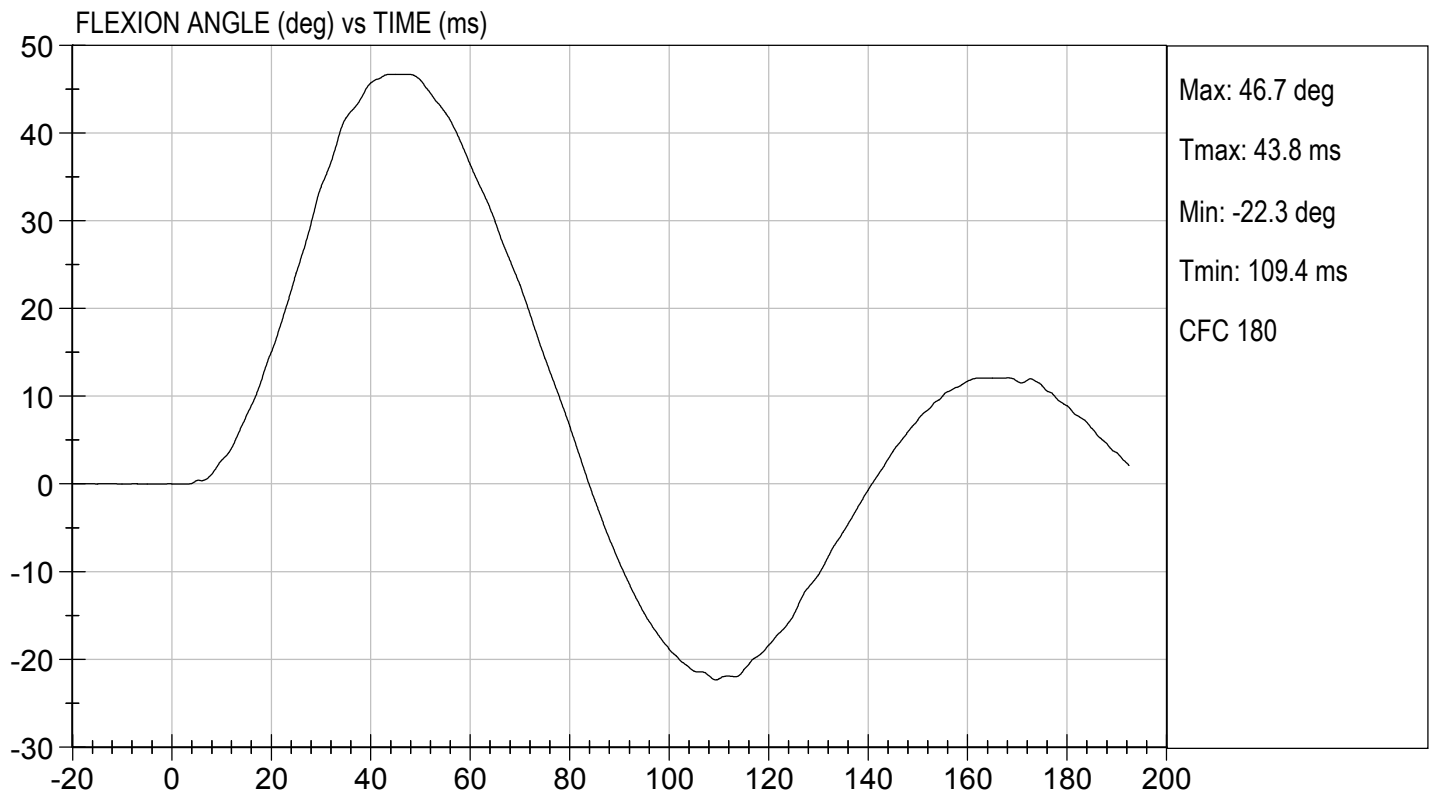
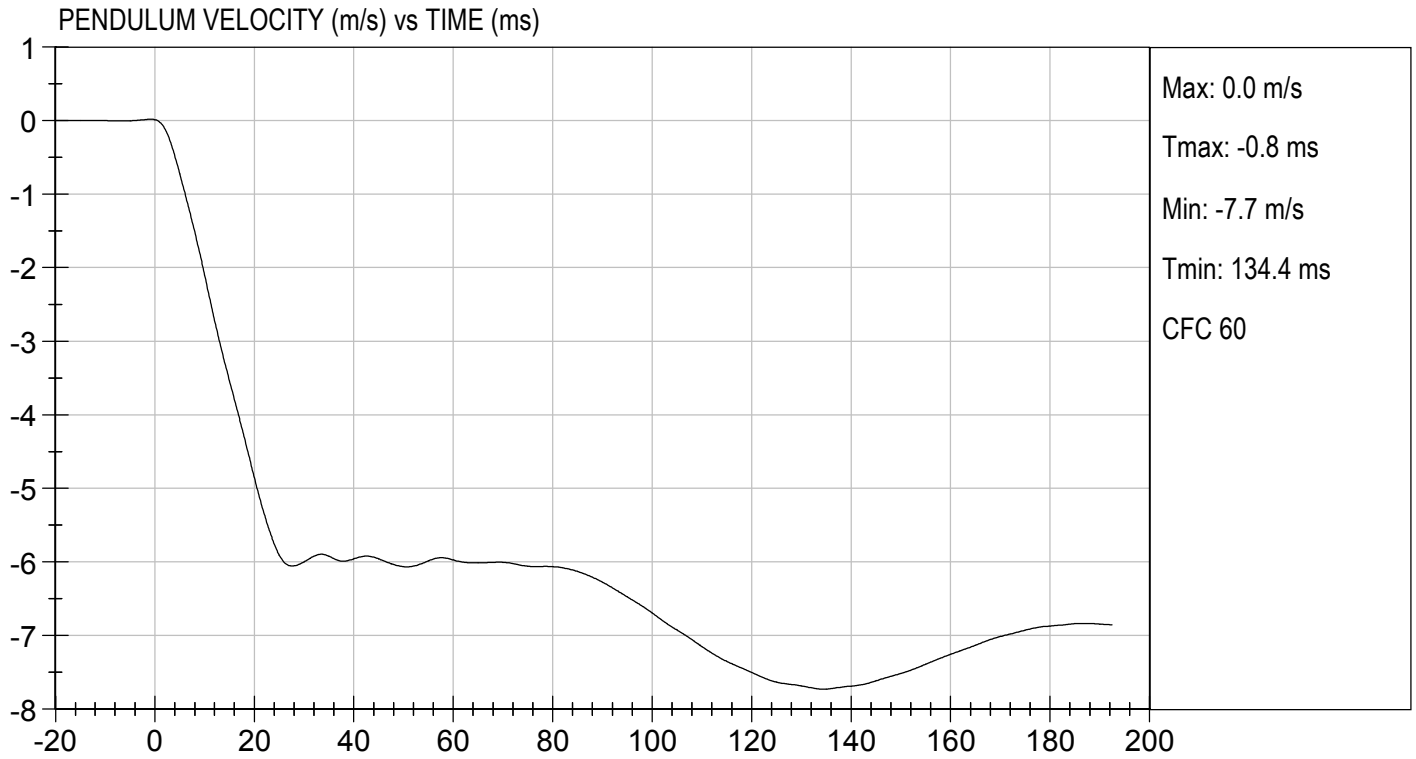
Test I.D.: D173078

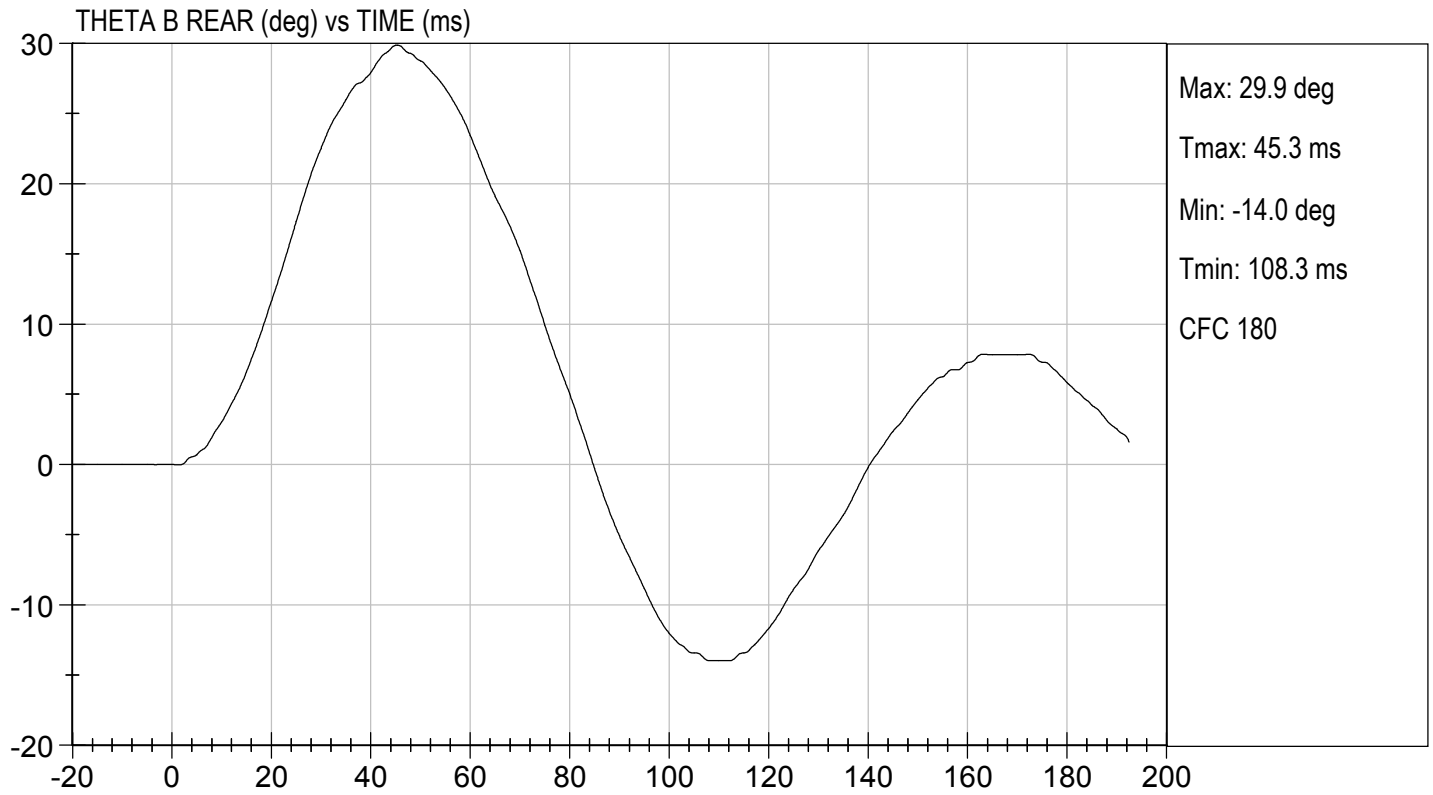
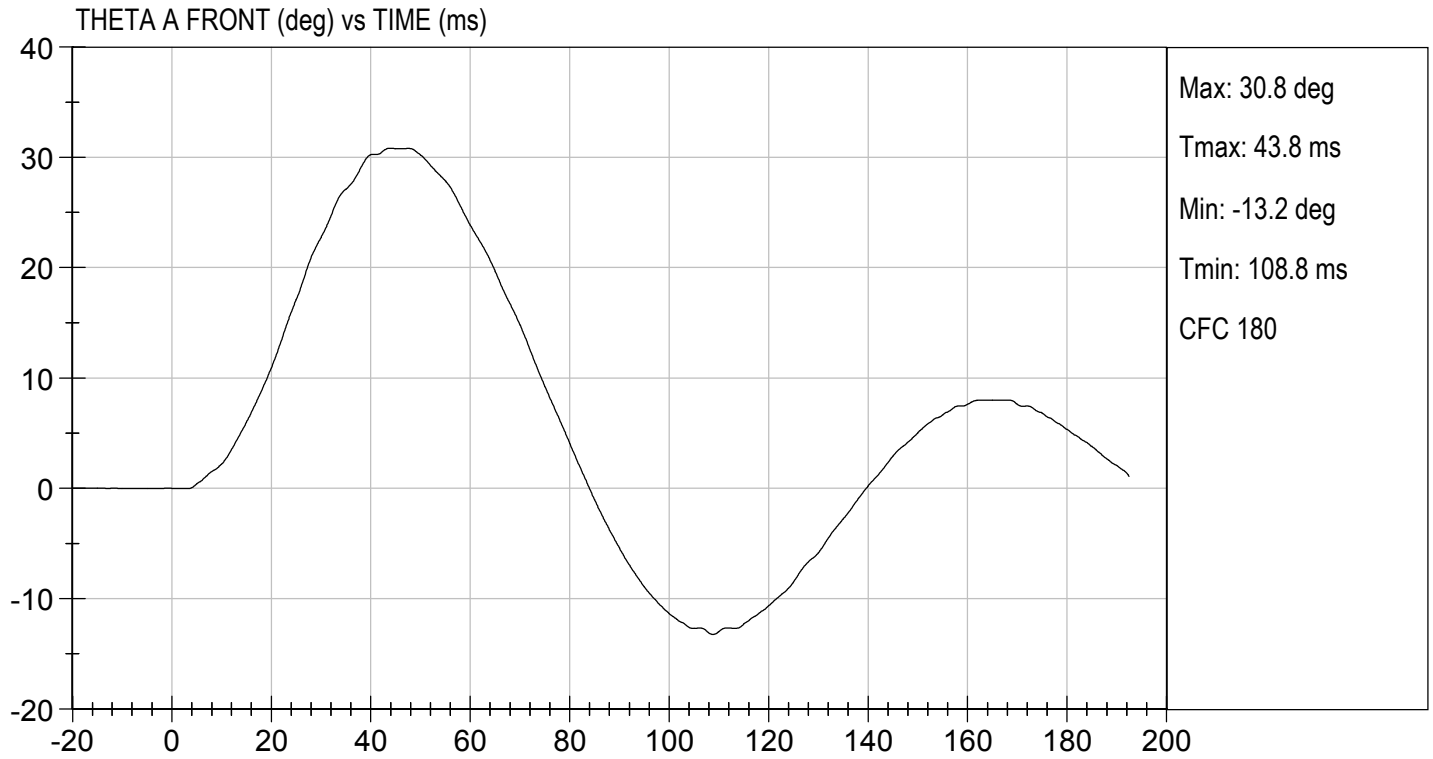
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass	
Laboratory Relative Humidity	%	10 to 70	42	Pass	
Pendulum Speed	m/s	5.95 to 6.15	6.12	Pass	
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.411	Pass
	27 ms	m/s	-6.50 to -5.80	-6.05	Pass
	30 ms	m/s	>= -6.50	-6.00	Pass
Maximum Flexion Angle	deg	45.0 to 55.0	46.7	Pass	
Time of Maximum Flexion Angle	ms	39.0 to 53.0	43.8	Pass	
Headform Rotation Decay to Initial Position	ms	37 to 57	45	Pass	
Overall Results				Pass	

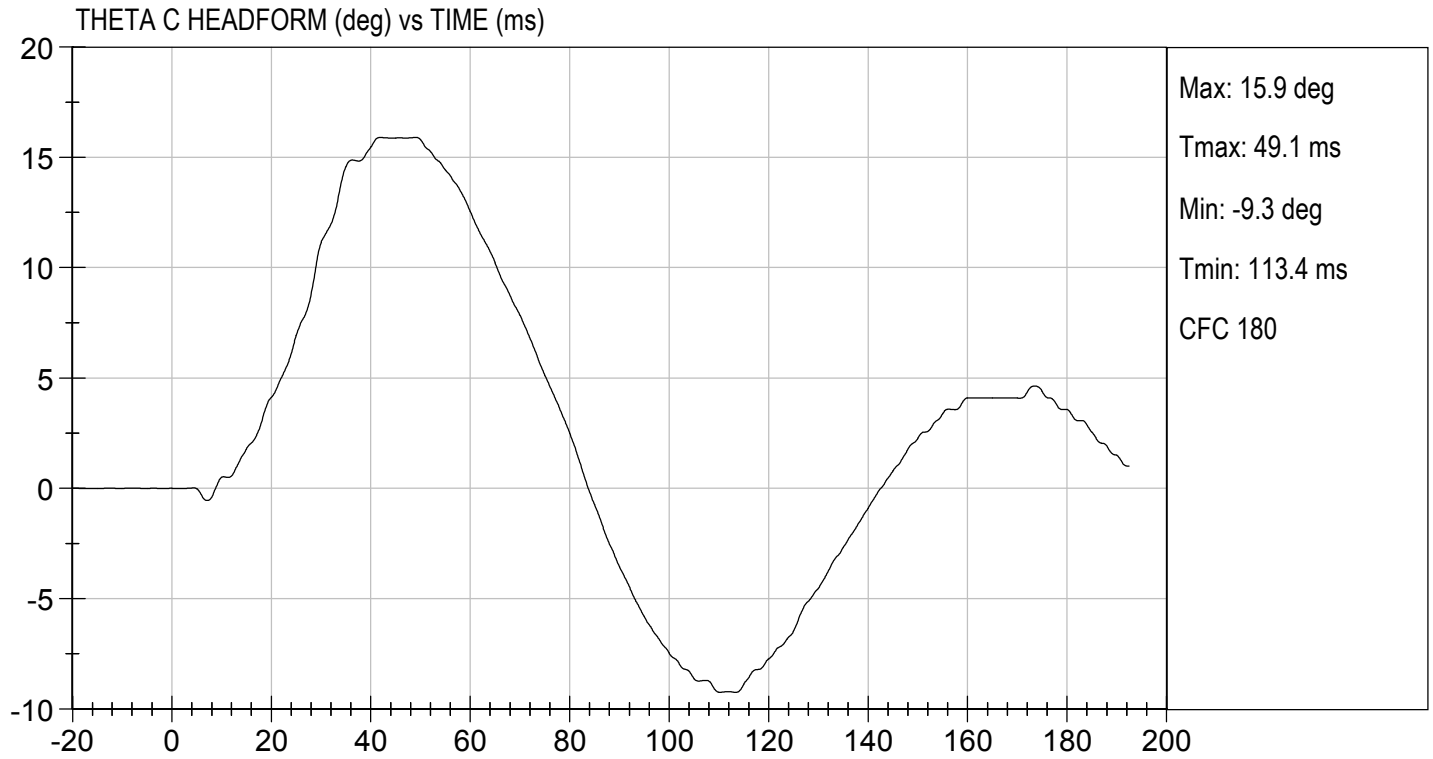

 Laboratory Technician

10/23/2017
 Test Date


 Approved By







MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D173079

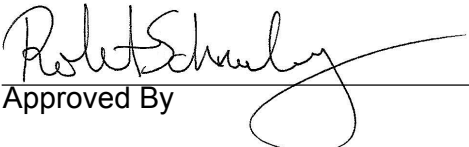
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Speed	m/s	4.20 to 4.40	4.27	Pass
Maximum Impactor Force	N	4700 to 5400	4851	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.2	Pass
Maximum Pubic Force	N	1230 to 1590	1261	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	13.8	Pass
Overall Test Results				Pass



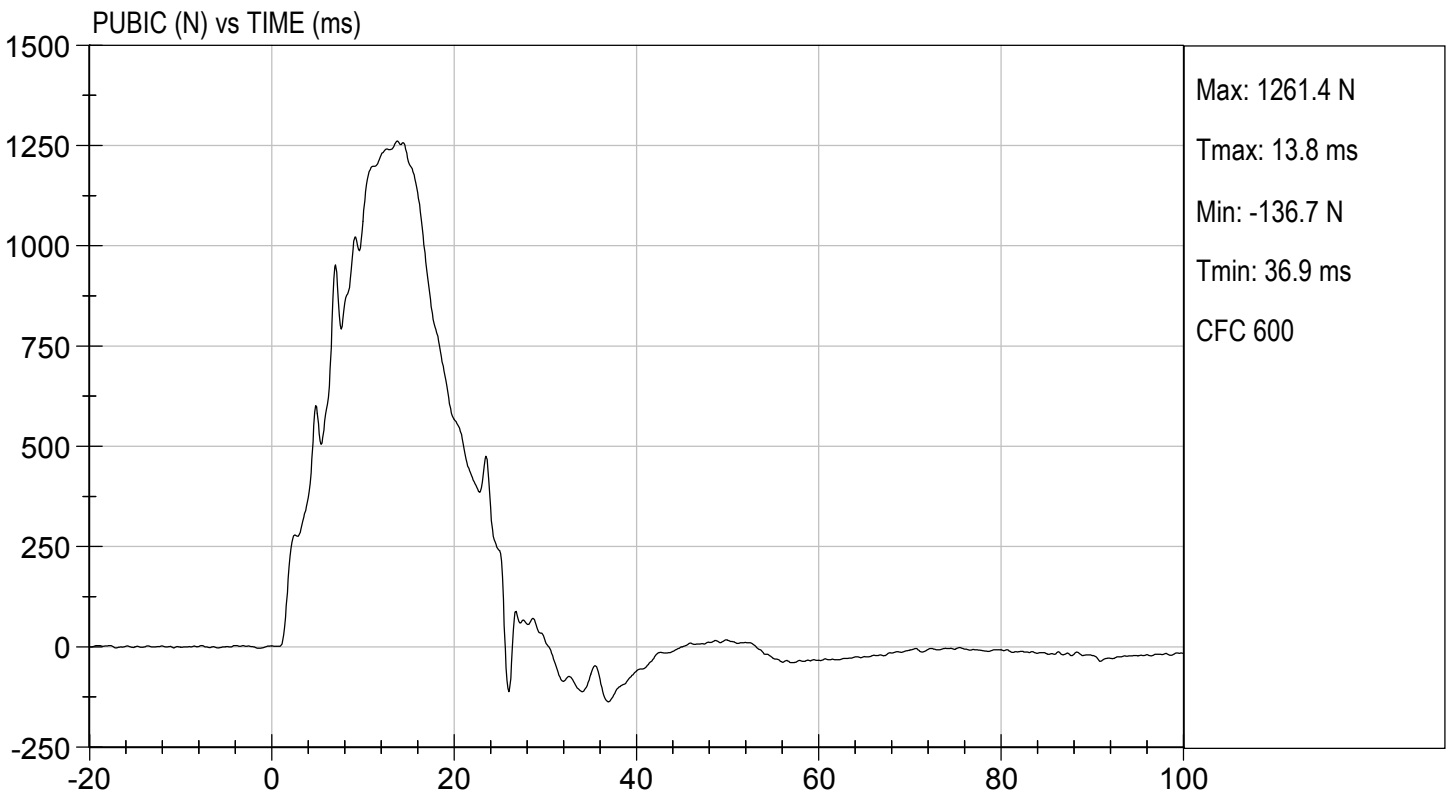
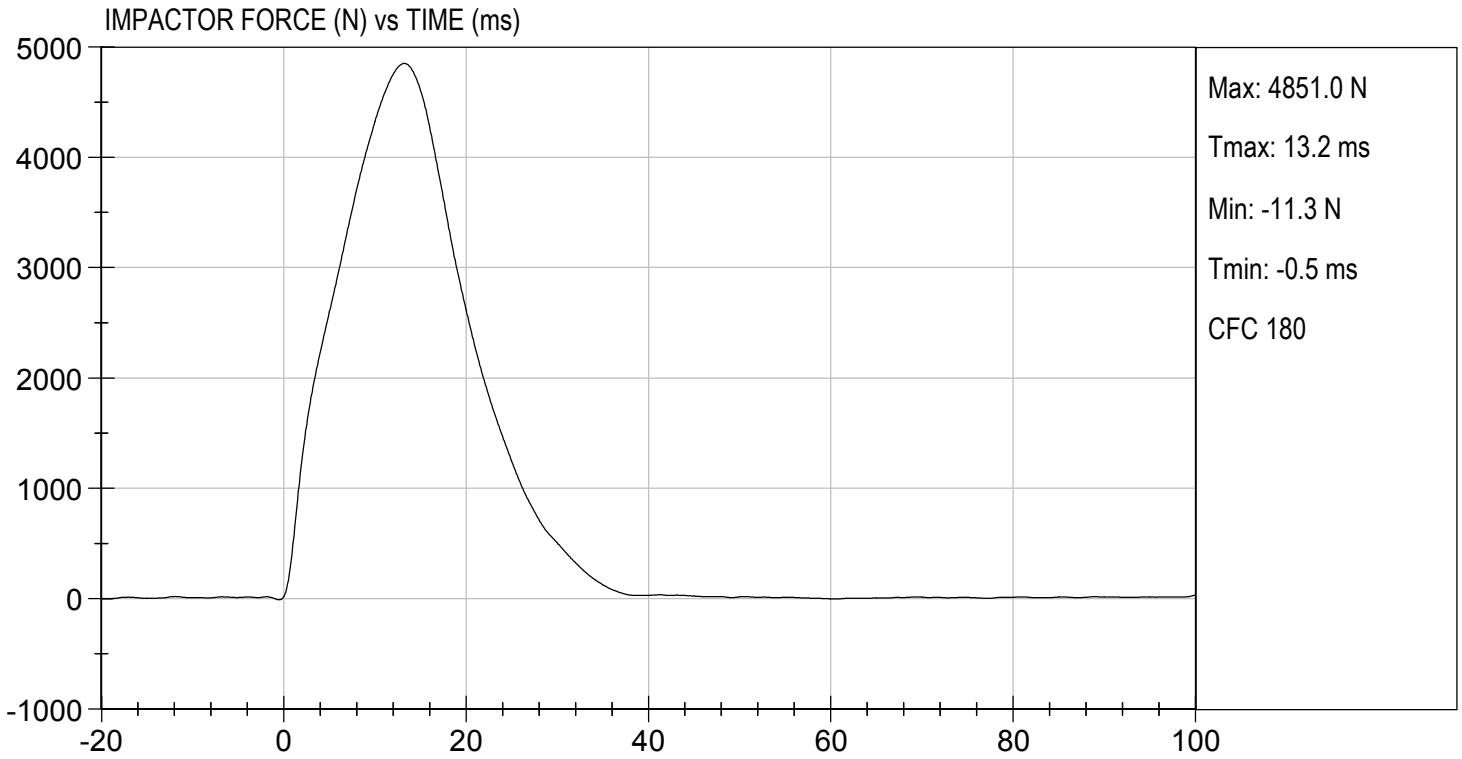
Laboratory Technician

10/24/2017

Test Date



Approved By



MGA RESEARCH CORPORATION
THORAX IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

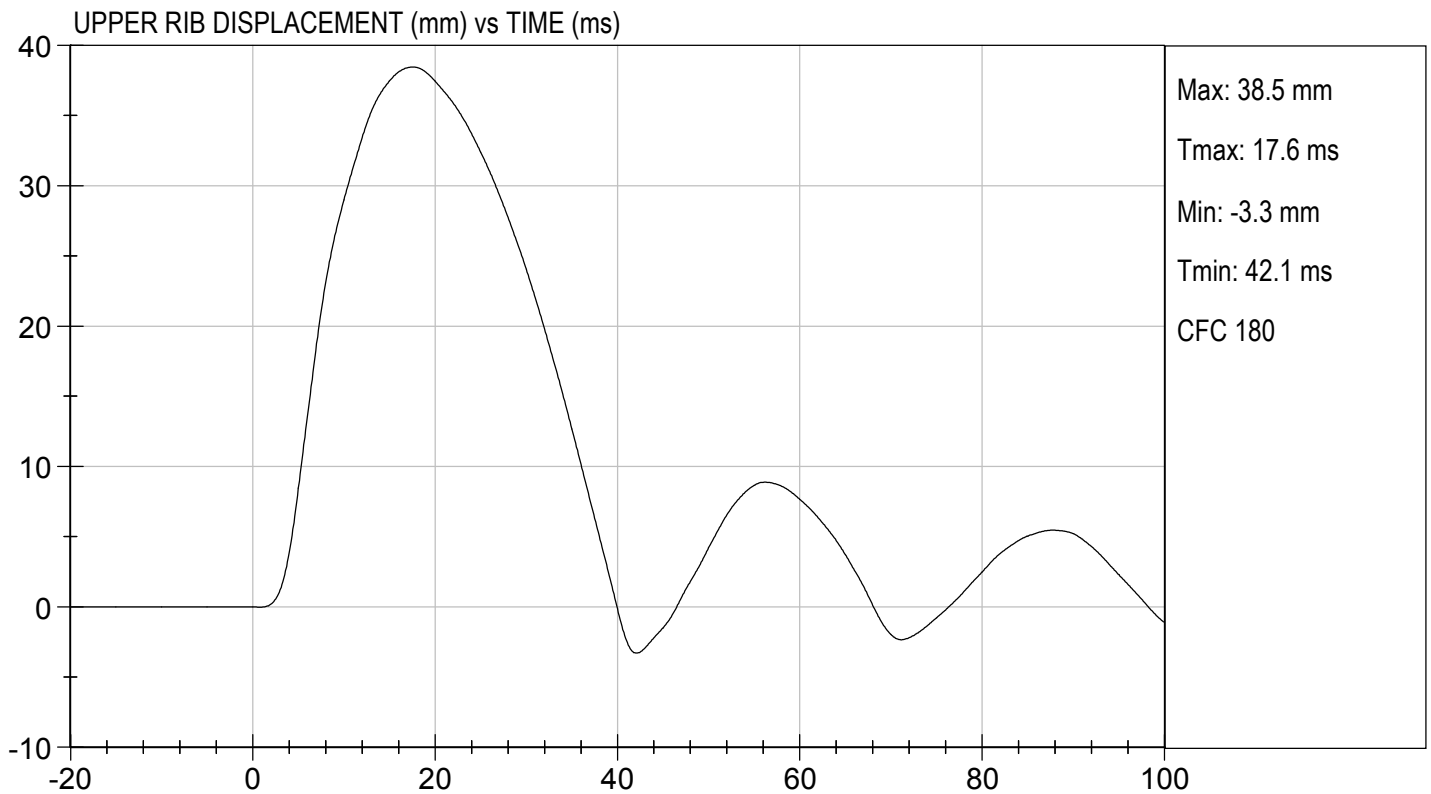
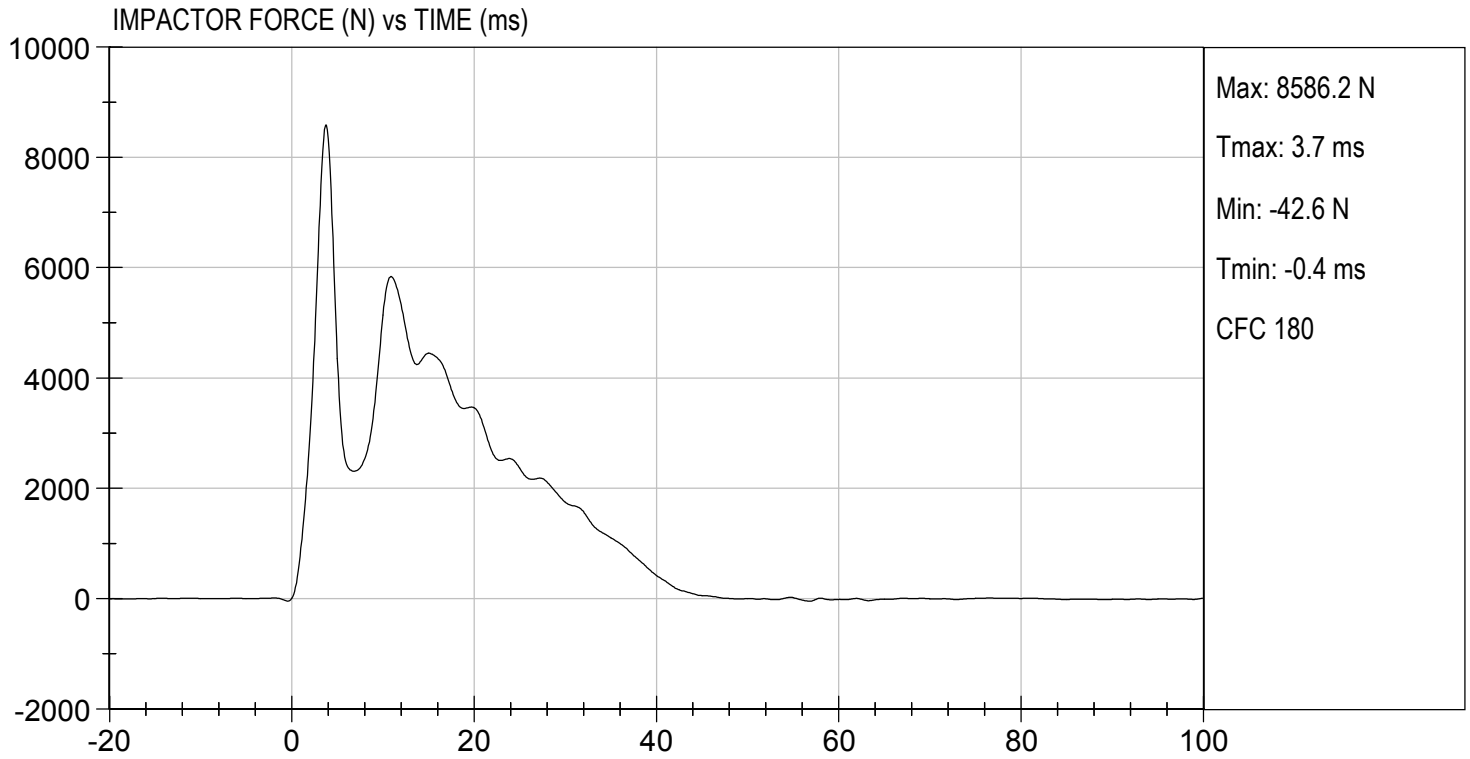
Test I.D: D173070

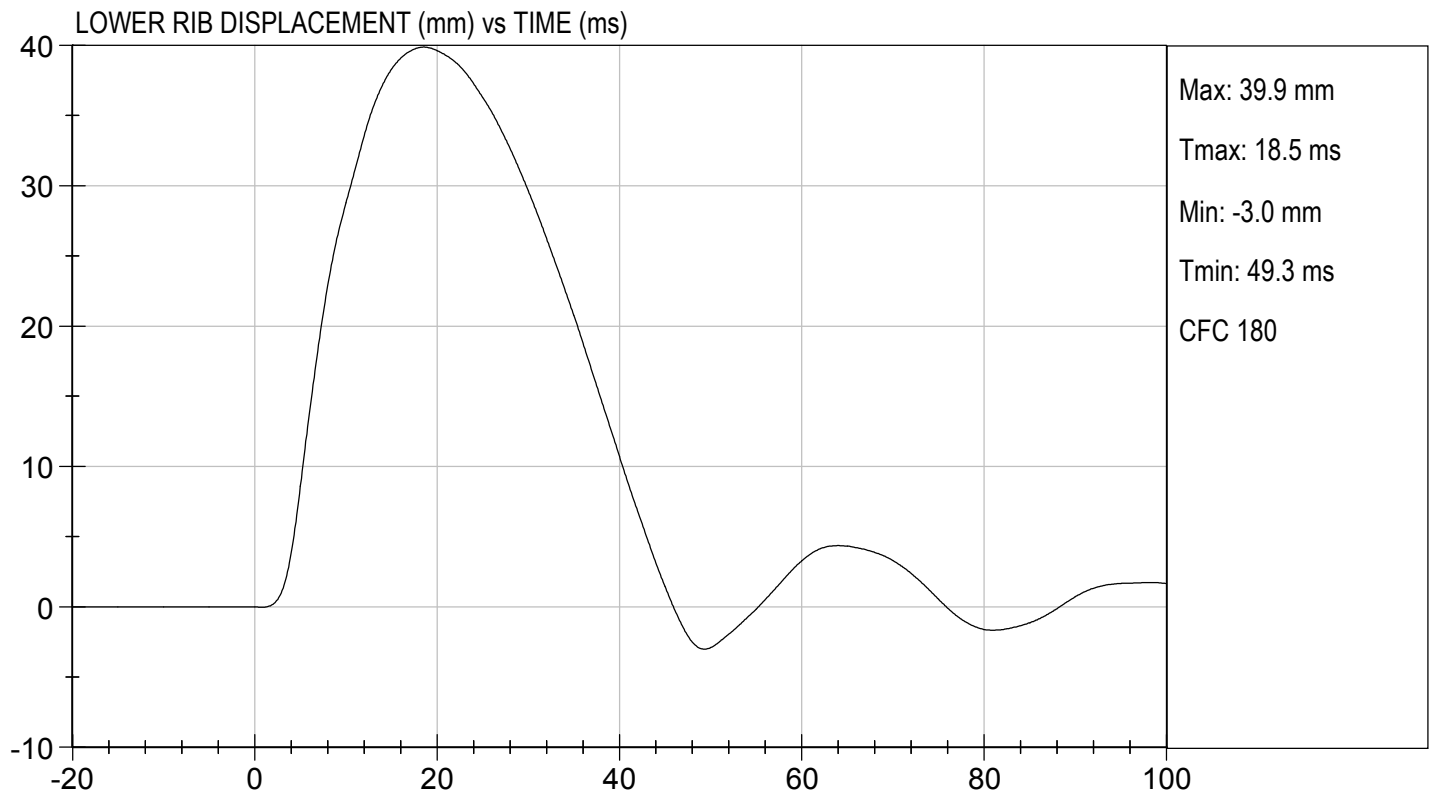
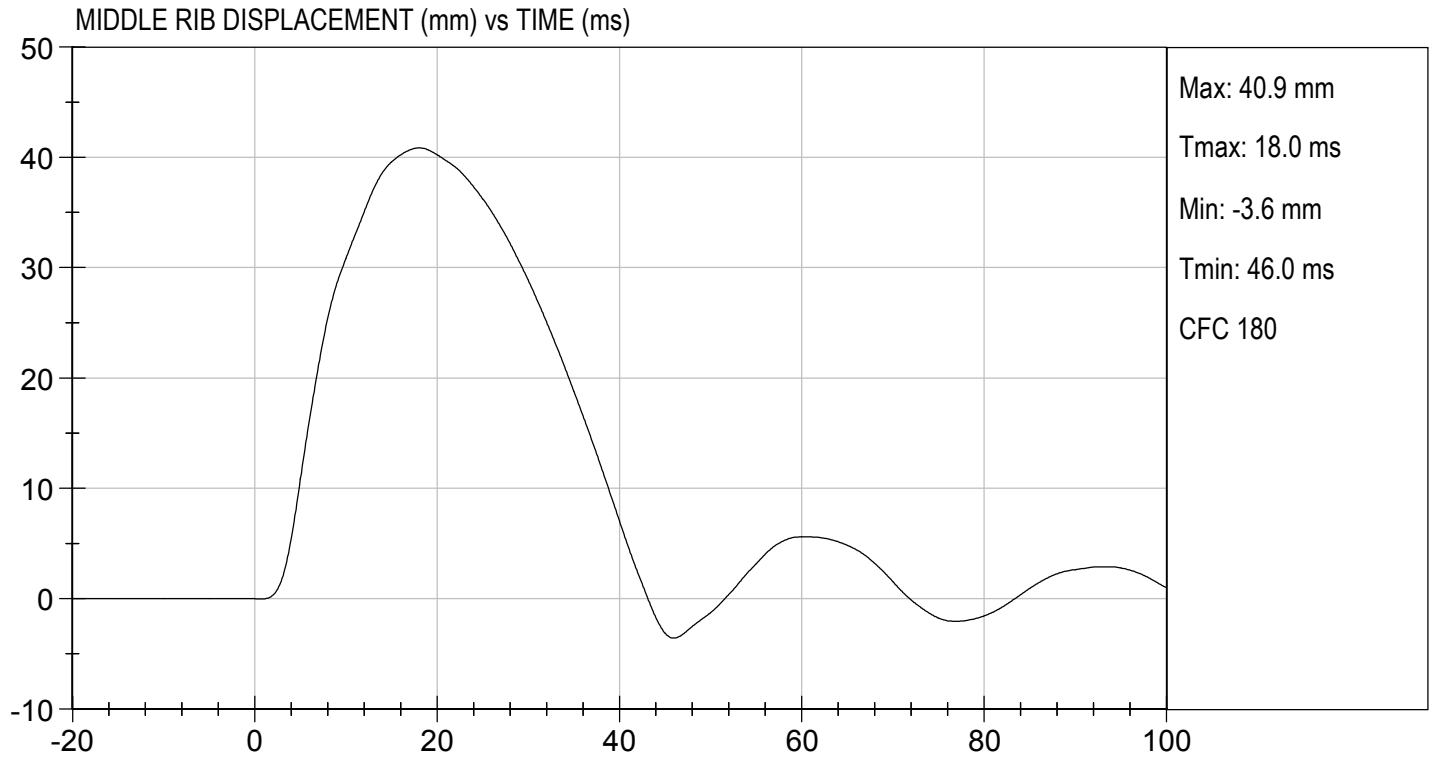
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	42	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5840	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.5	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.9	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.9	Pass
Overall Test Results				Pass


 Laboratory Technician

10/24/2017
 Test Date


 Approved By





ES-2re External Measurements
SN: 032

No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	Pass
7	Shoulder/Arm Width	461 - 479	464	Pass
8	Thorax Width	322 - 332	323	Pass
9	Abdomen Width	273 - 287	281	Pass
10	Pelvis Lap Width	359 - 373	370	Pass
11	Head Depth	196 - 206	203	Pass
12	Thorax Depth	262 - 272	264	Pass
13	Abdomen Depth	194 - 204	196	Pass
14	Pelvis Depth	235 - 245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150 - 160	151	Pass
16	Back of Buttocks to Front Knee	597 - 615	607	Pass

MGA RESEARCH CORPORATION
HEAD DROP TEST
ES-2re DUMMY

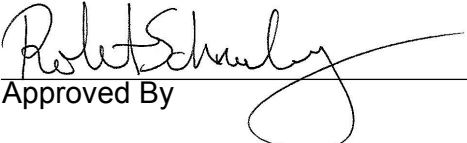
ATD Serial No: 032

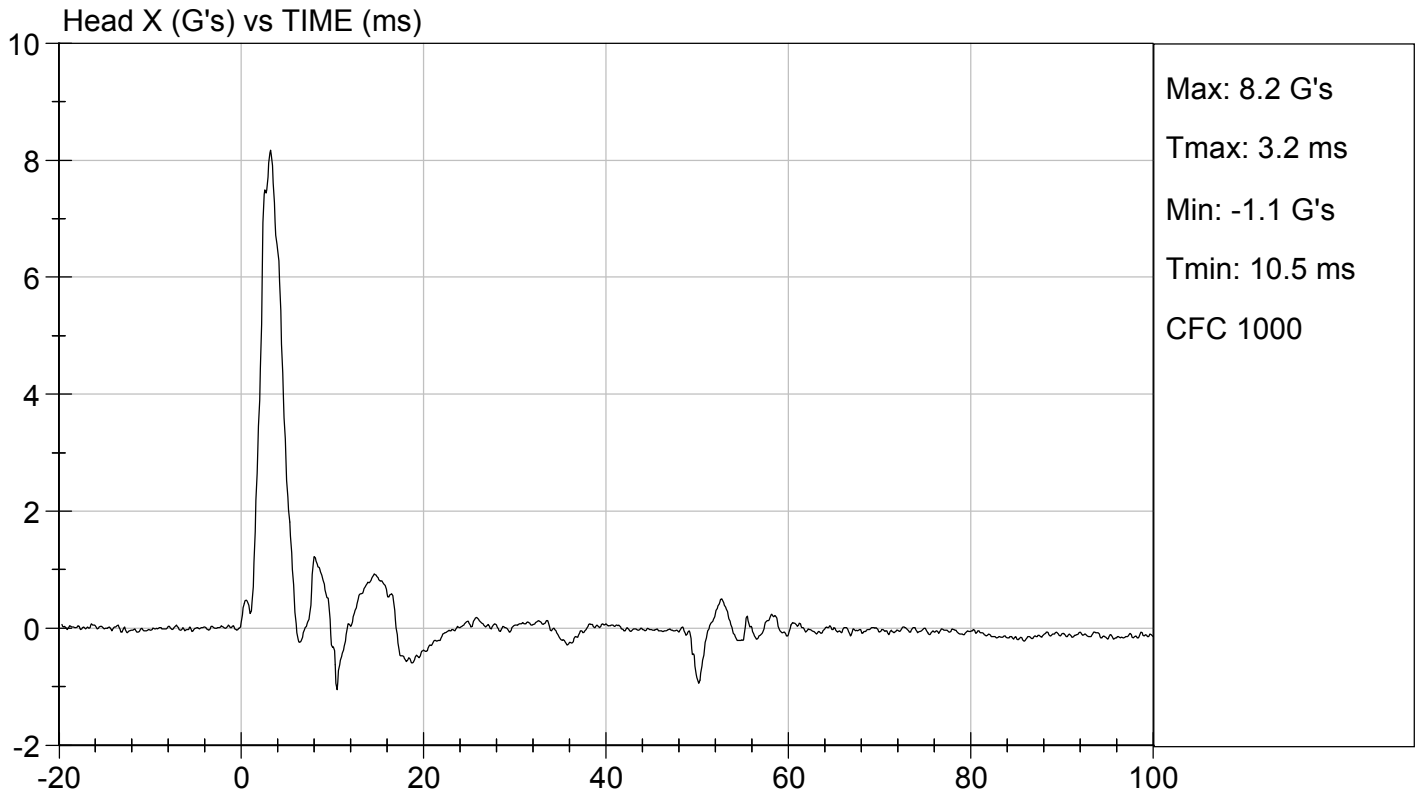
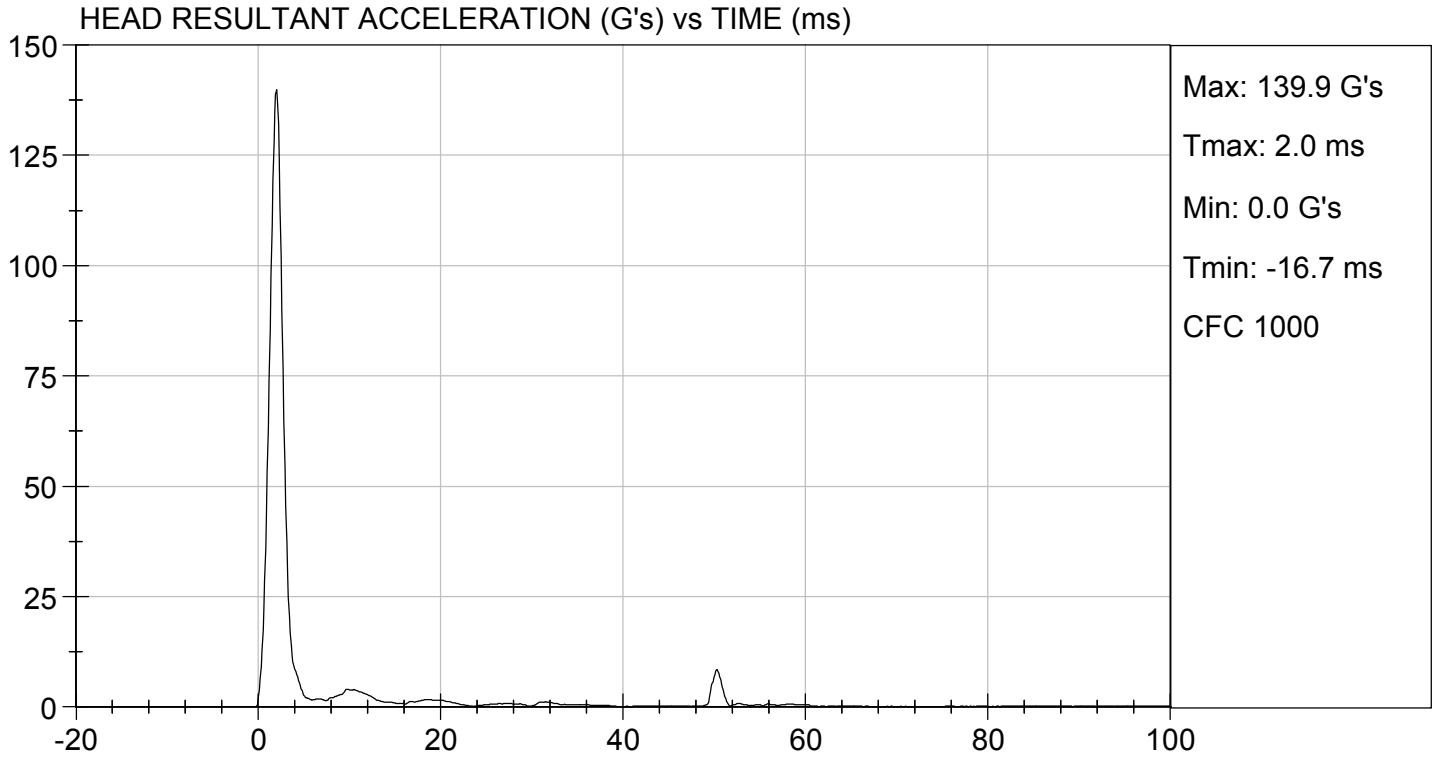
Test ID: D173231

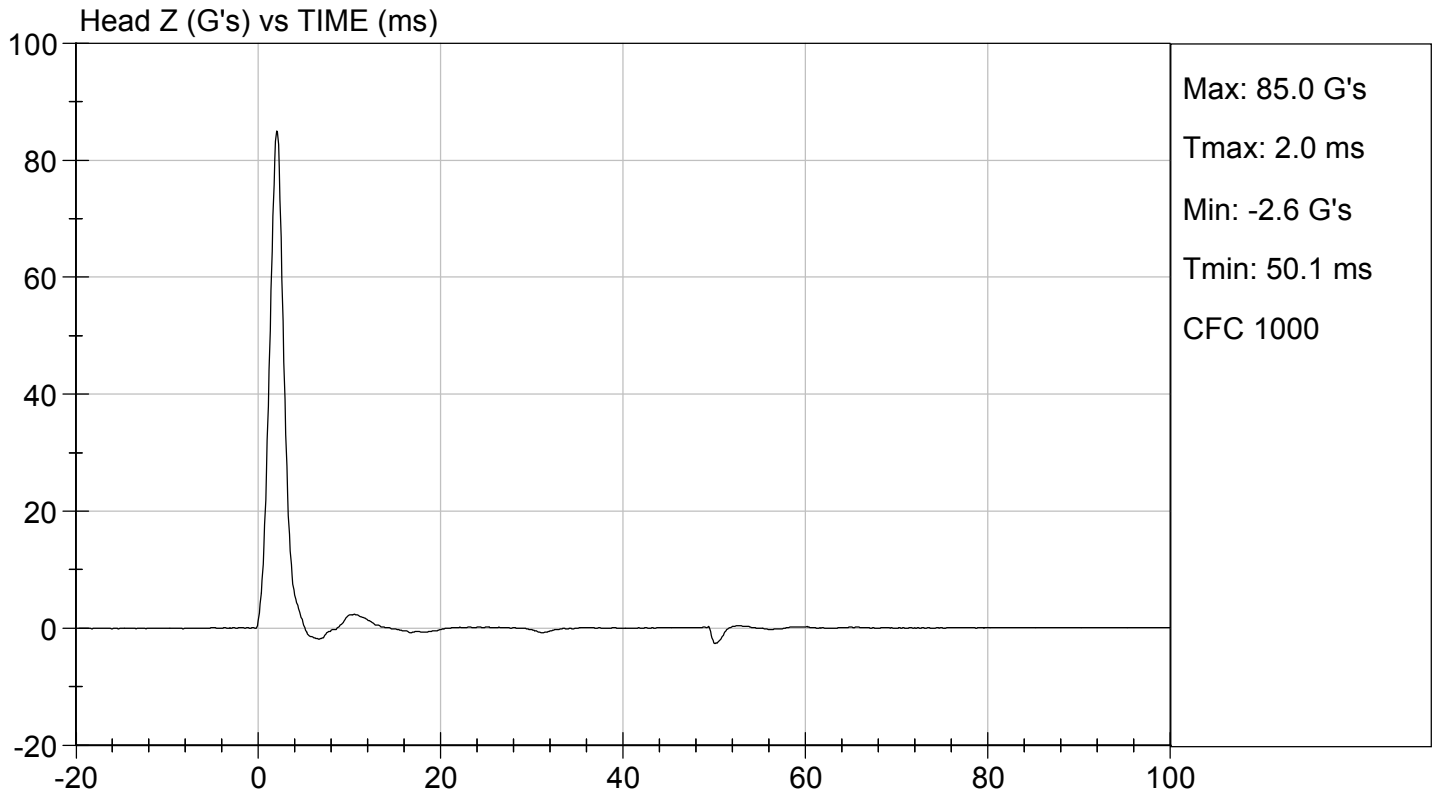
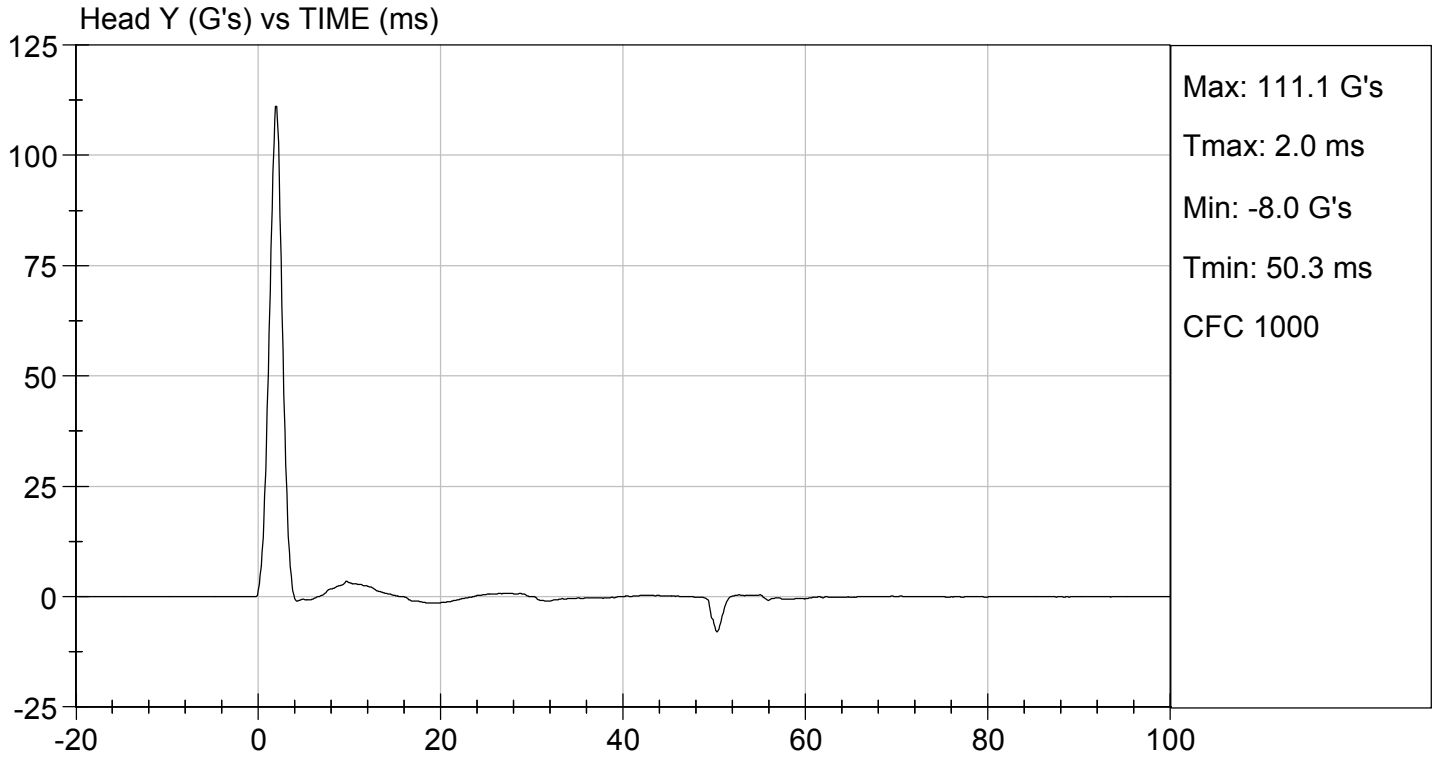
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	125 to 155	140	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	8.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

11/06/2017
 Test Date


 Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

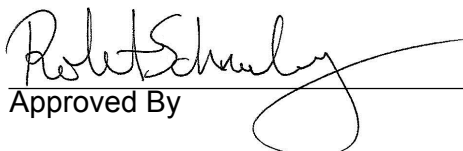
ATD Serial No: 032

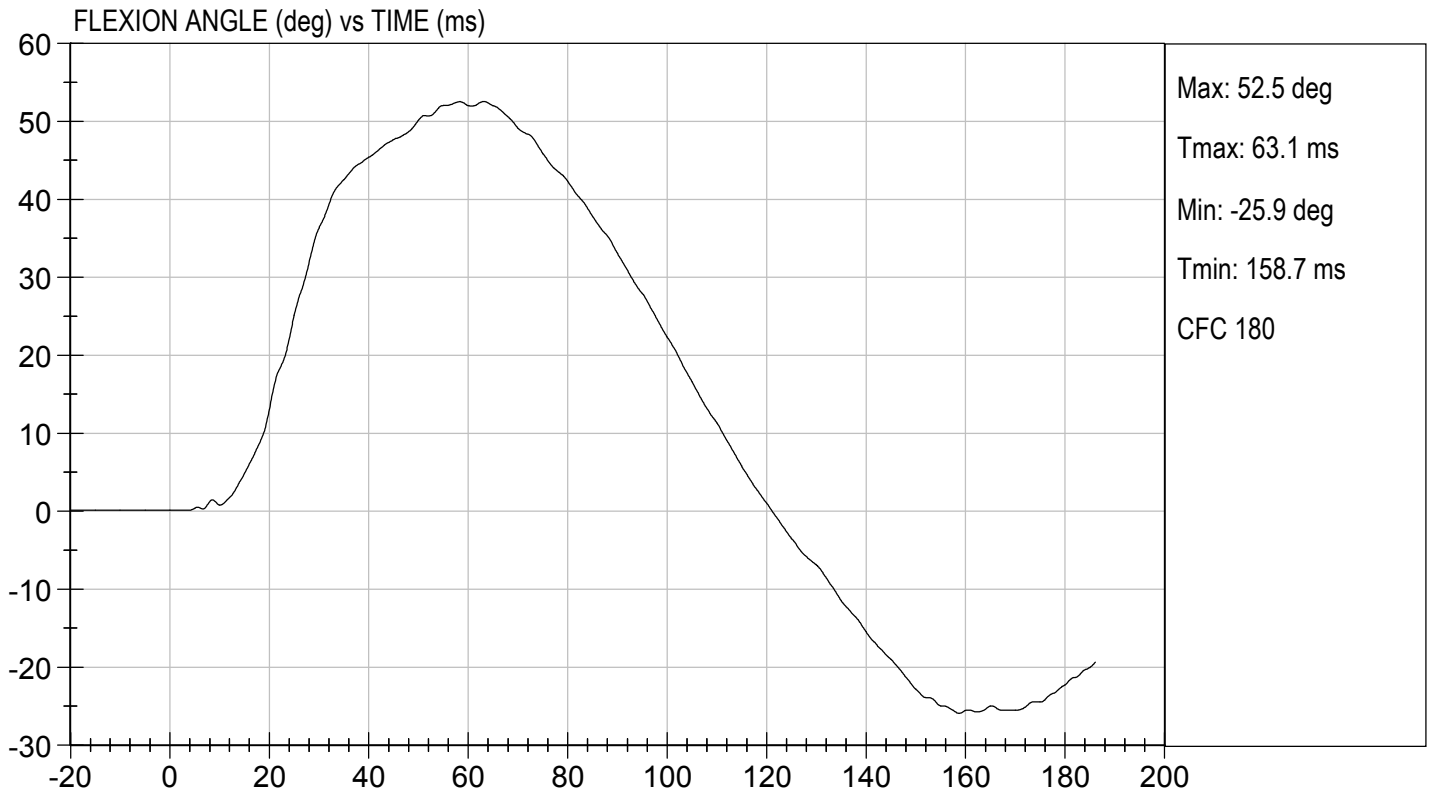
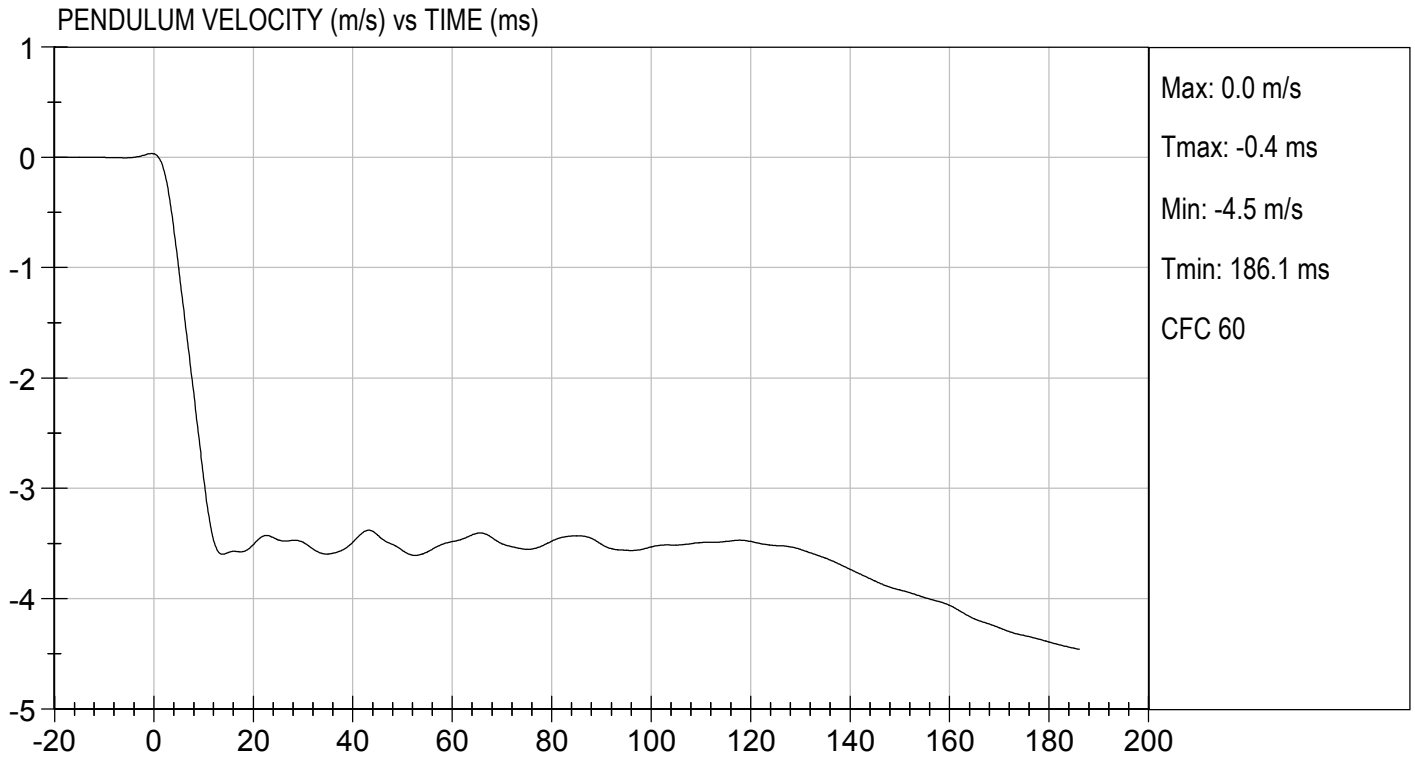
Test I.D.: D173232

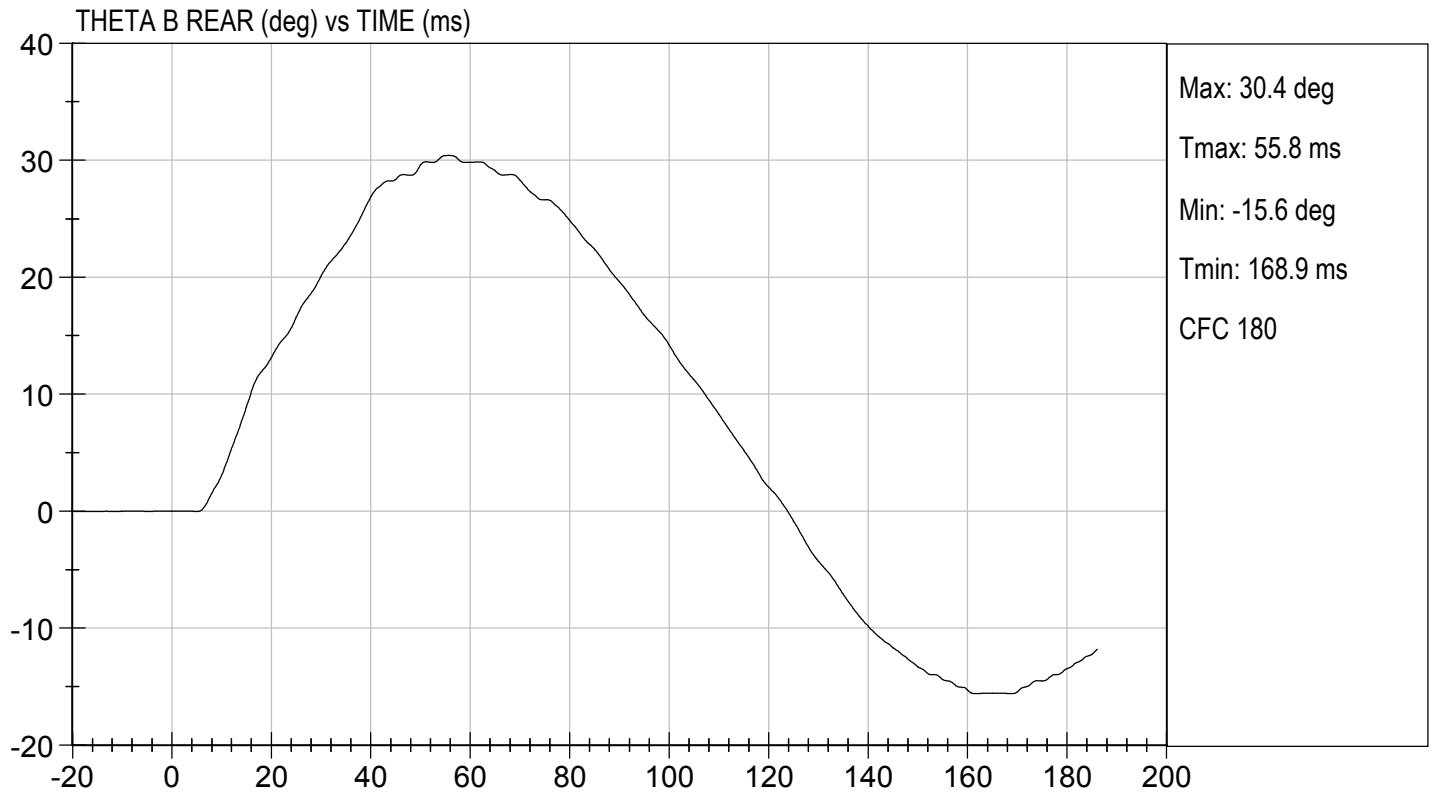
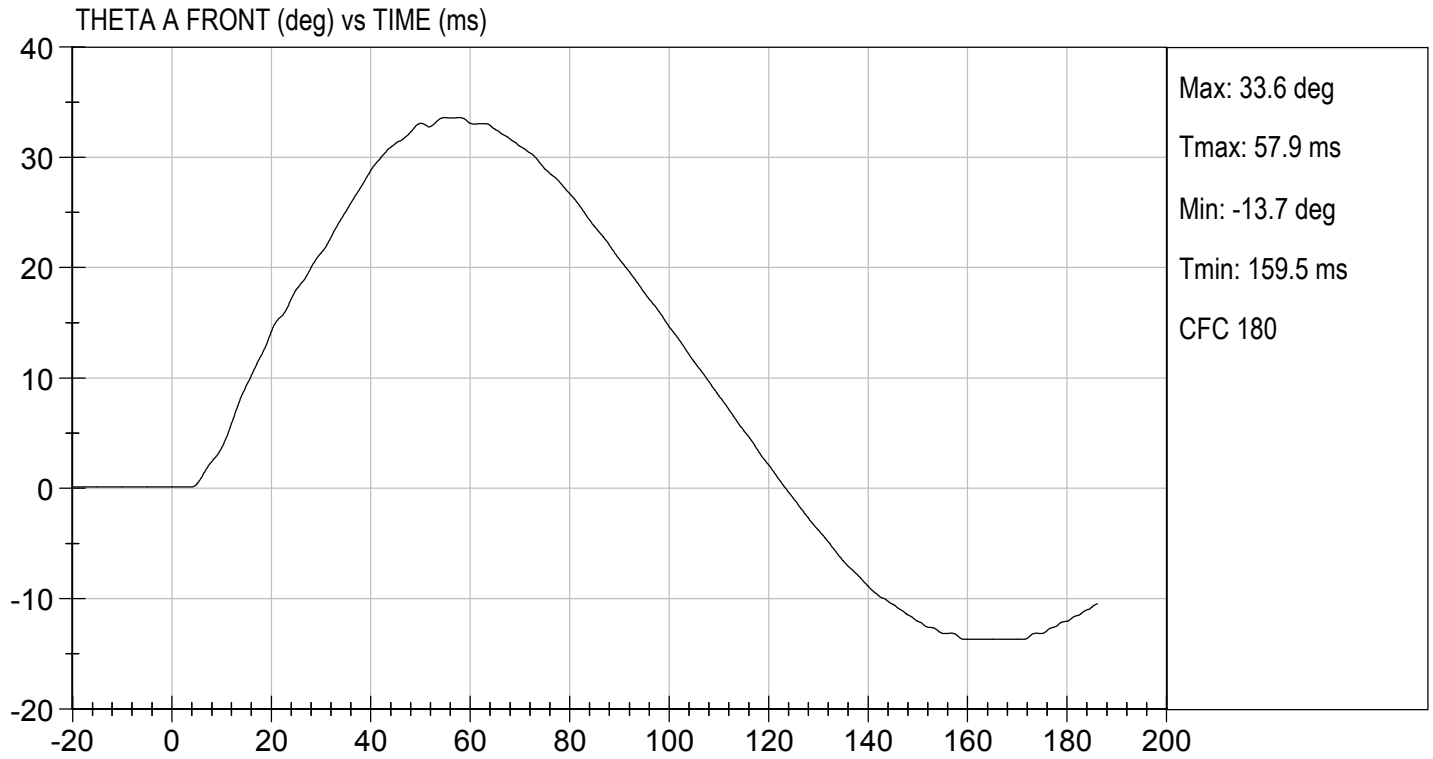
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.32	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.60	Pass
	17 ms	m/s	>= -3.70	-3.58	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.5	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	63.1	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	55.8	Pass
Overall Results					Pass


 Laboratory Technician

11/07/2017
 Test Date


 Approved By

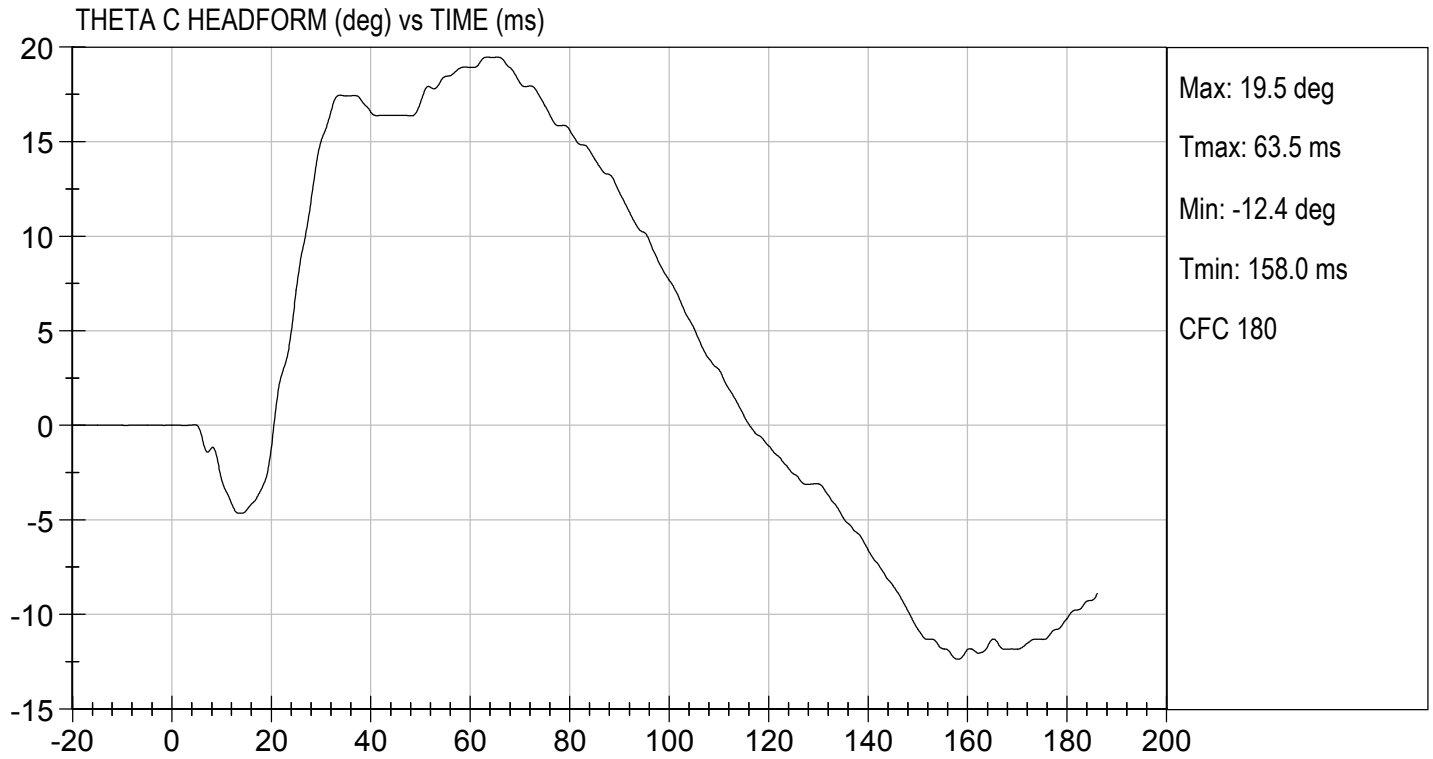






TEST DESC: NECK BENDING
VELOCITY: 10.89 ft/s, 3.32 m/s

TEST DATE: 11/07/2017
TEST #: D173232



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

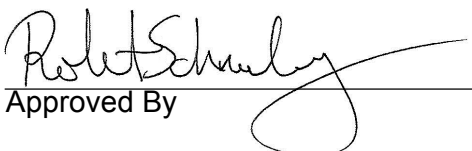
ATD Serial No: 032

Test I.D: D173233

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.2	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	10.4	Pass
Overall Test Results				Pass


 Laboratory Technician

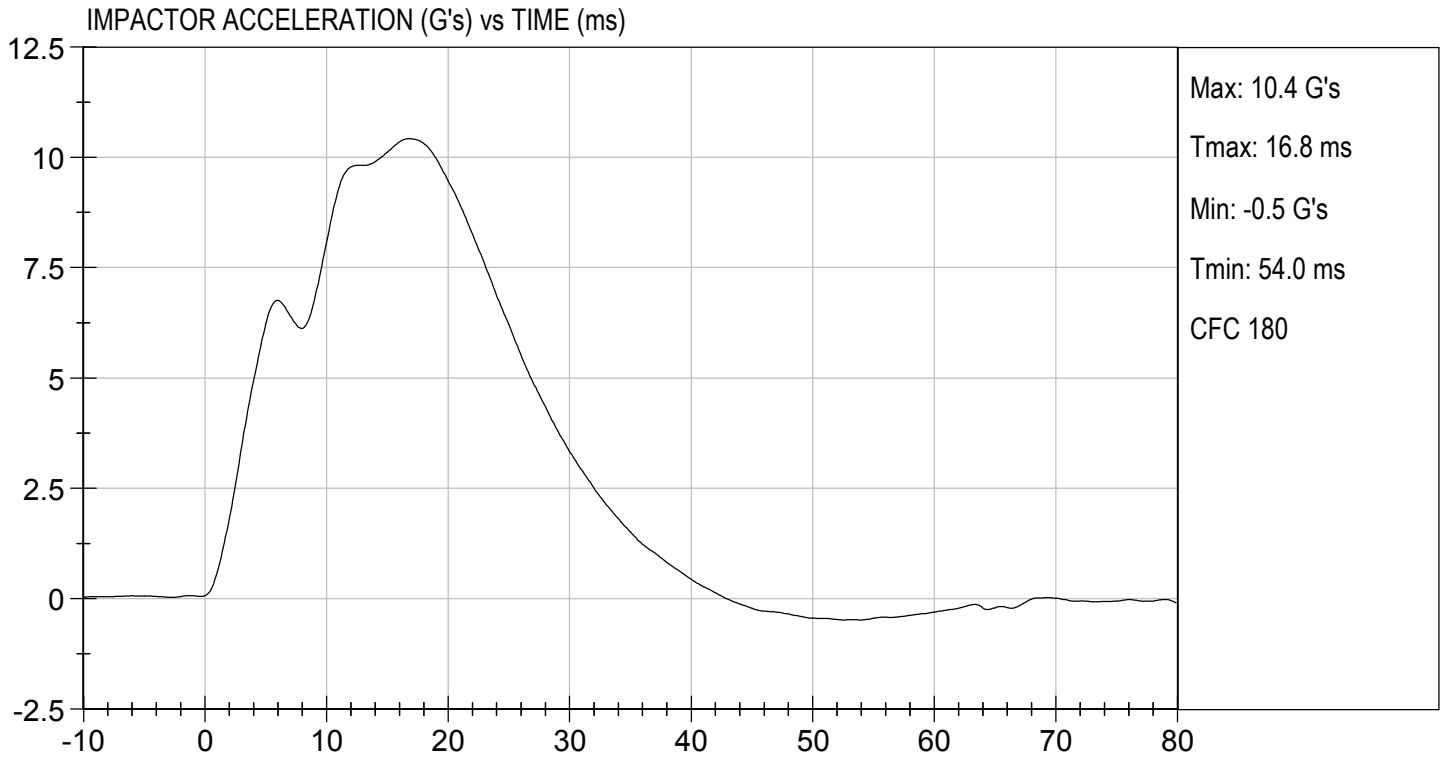
11/07/2017
 Test Date


 Approved By



TEST DESC: SHOULDER IMPACT
VELOCITY: 13.77 ft/s, 4.2 m/s

TEST DATE: 11/07/2017
TEST #: D173233



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D173234

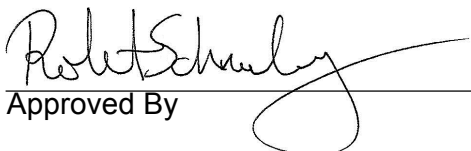
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.7	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.1	Pass
Overall Test Results				Pass



Laboratory Technician

11/06/2017

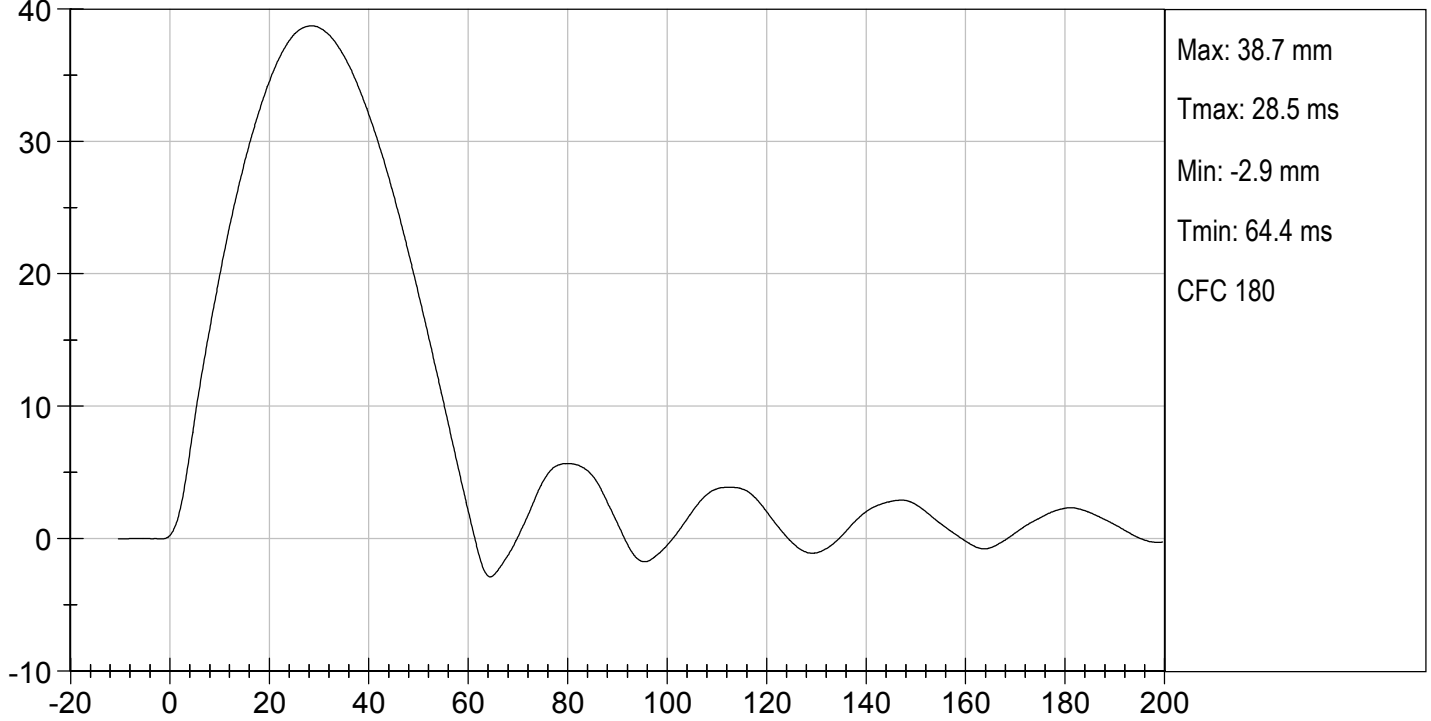
Test Date



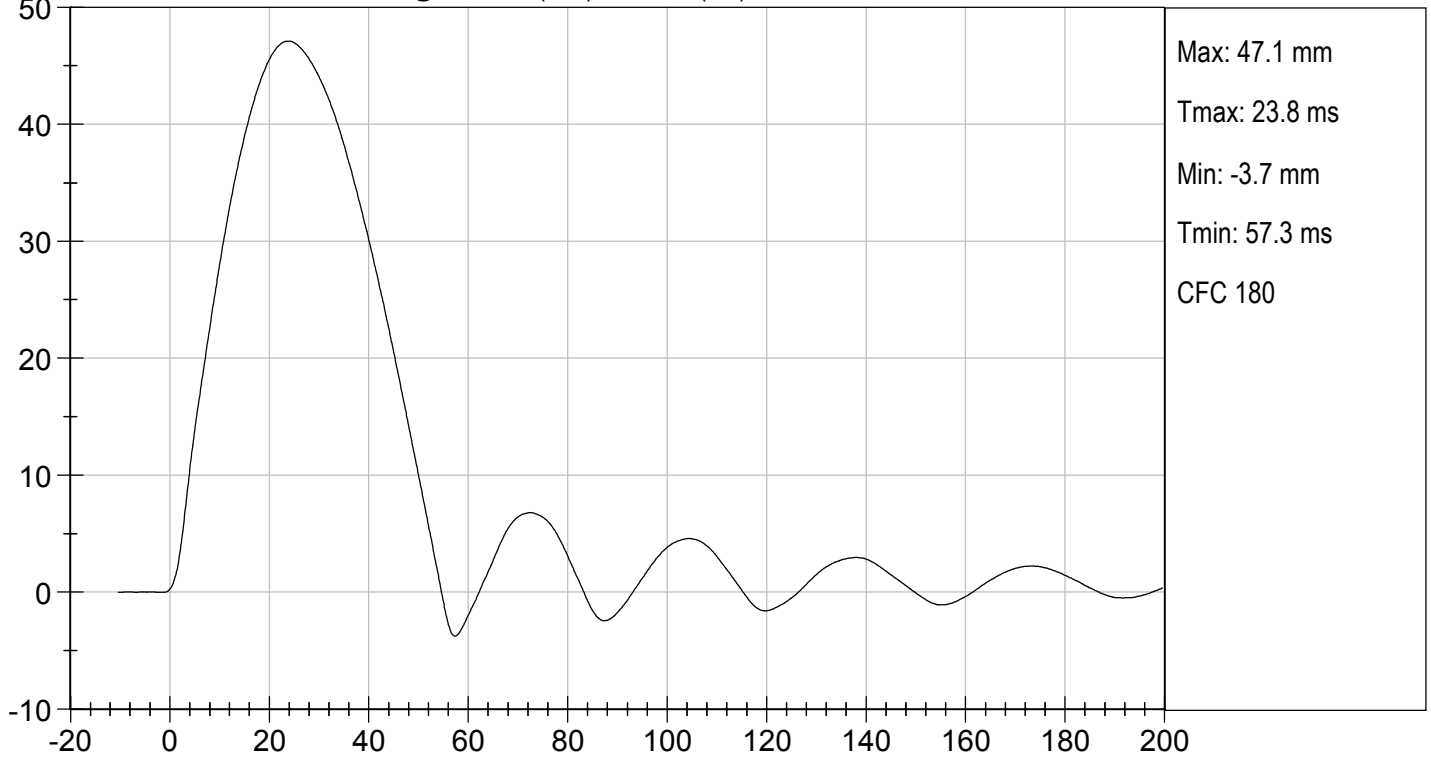
Approved By



UPPER RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

MID RIB TEST

ES-2re DUMMY

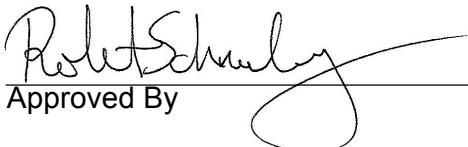
ATD Serial No: 032

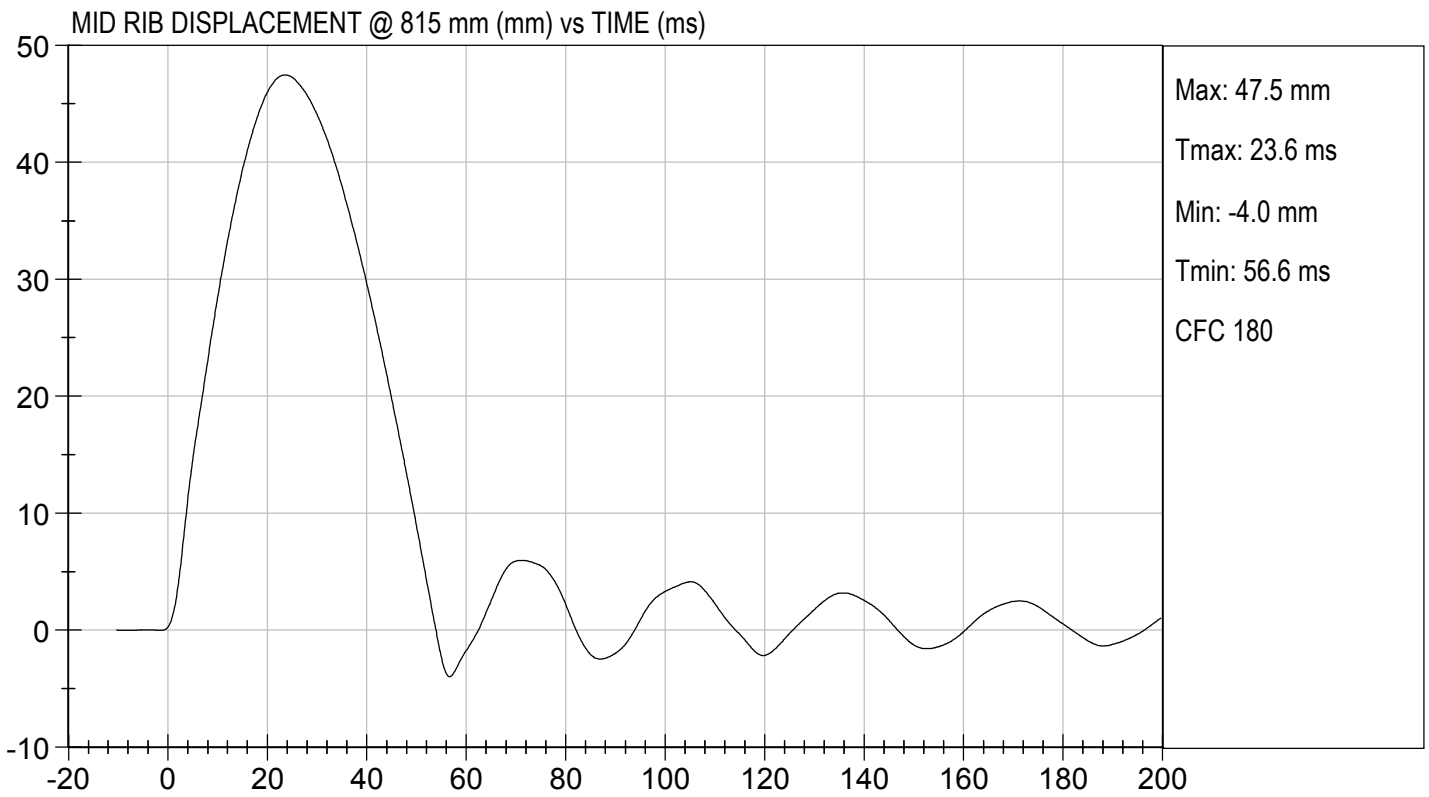
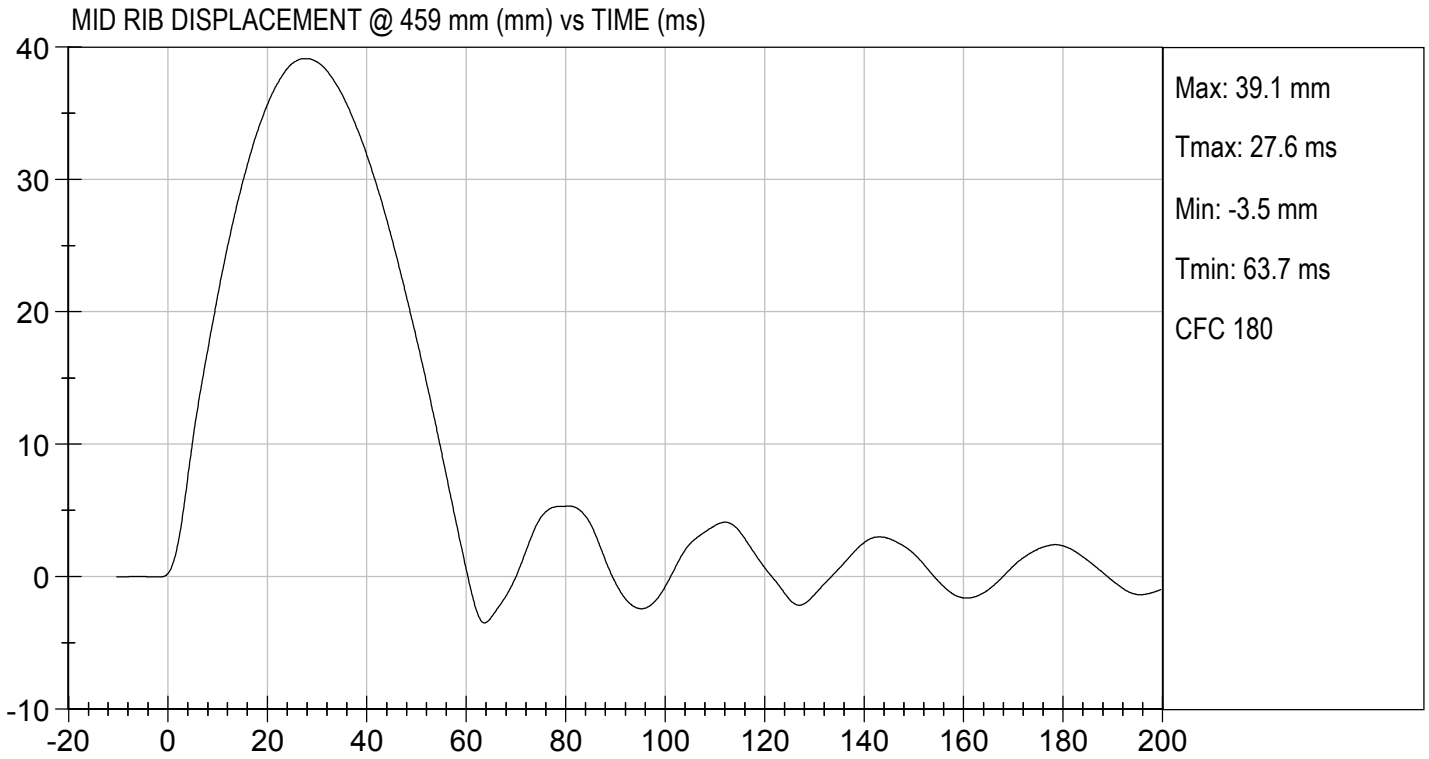
Test I.D: D173235

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	30	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.1	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.5	Pass
Overall Test Results				Pass


Laboratory Technician

11/07/2017
Test Date


Approved By



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

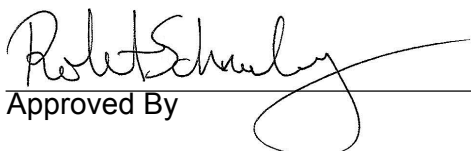
ATD Serial No: 032

Test I.D: D173236

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	30	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.1	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.6	Pass
Overall Test Results				Pass

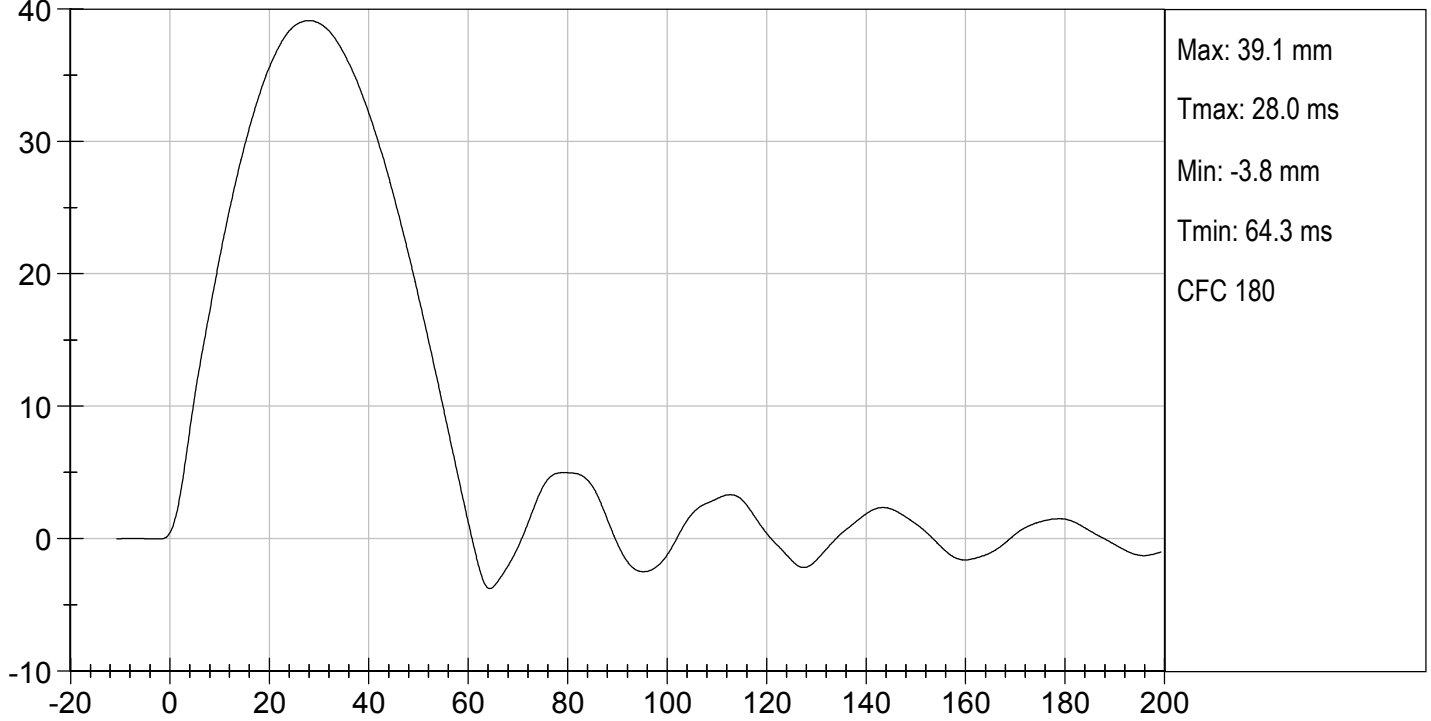

Laboratory Technician

11/07/2017
Test Date

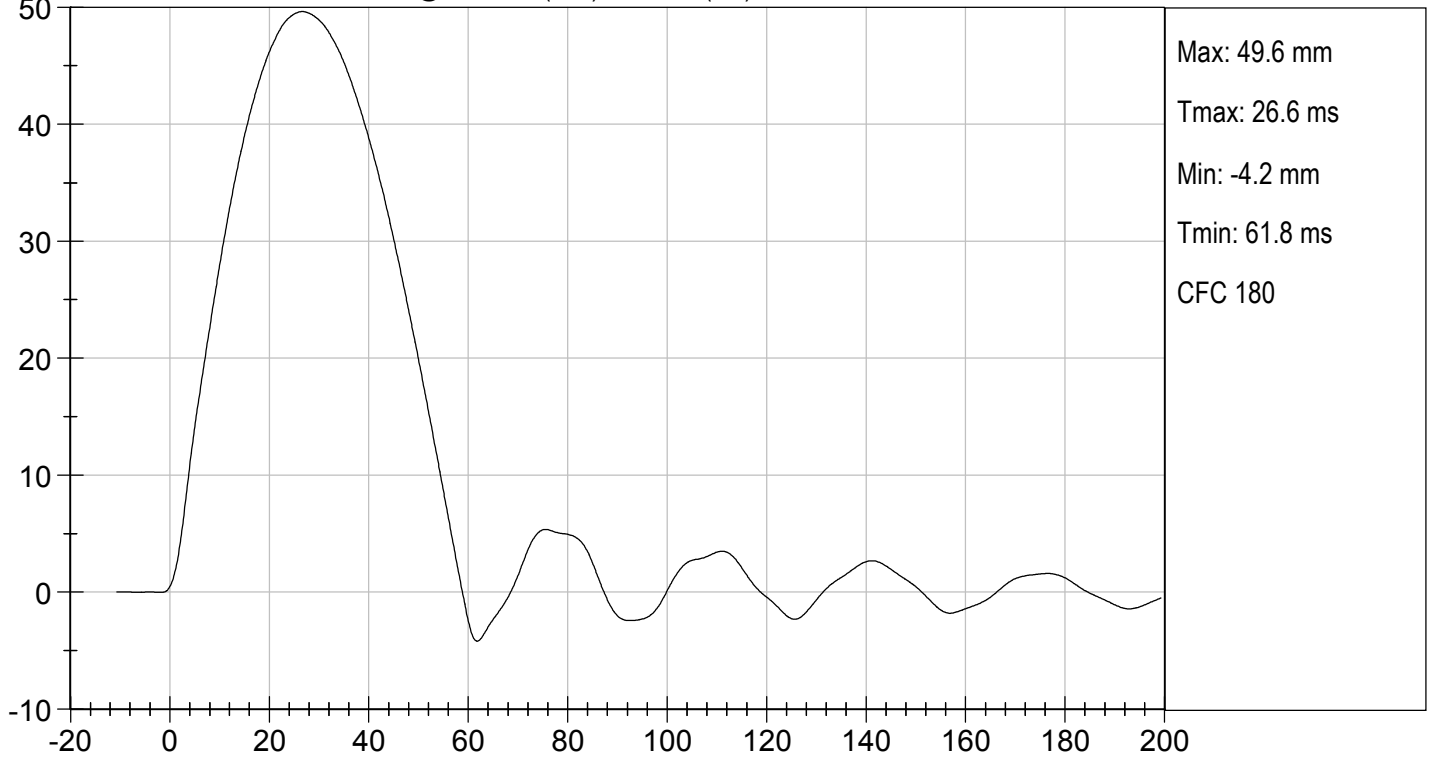

Approved By



LOWER RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

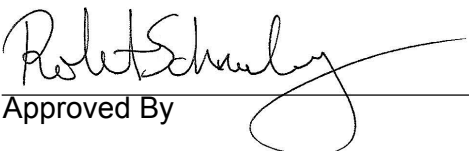
Test I.D: D173237

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	3.90 to 4.10	4.03	Pass
Maximum Impactor Force	N	4000 to 4800	4433	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.1	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2396	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	11.4	Pass
Overall Test Results				Pass



Laboratory Technician

11/08/2017
Test Date

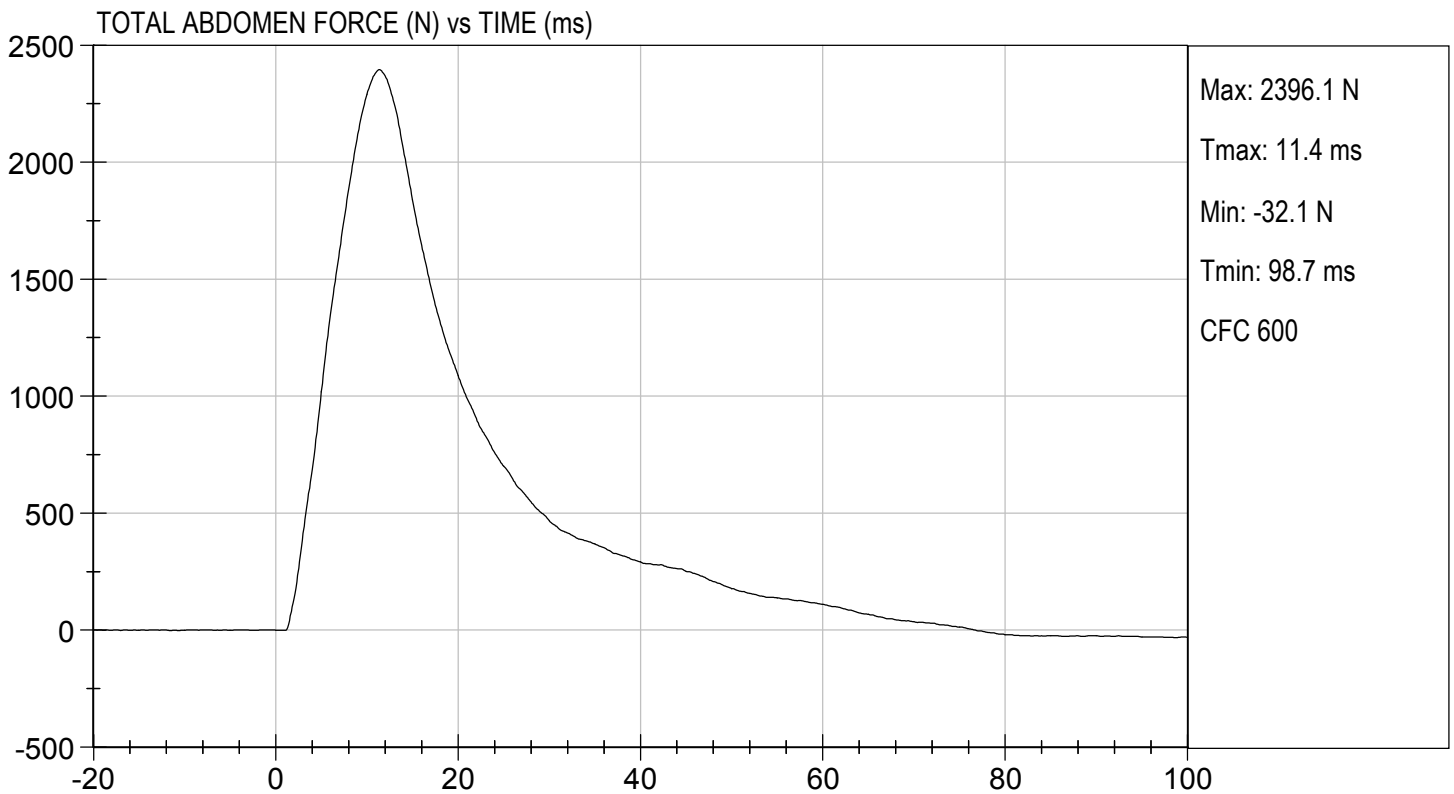
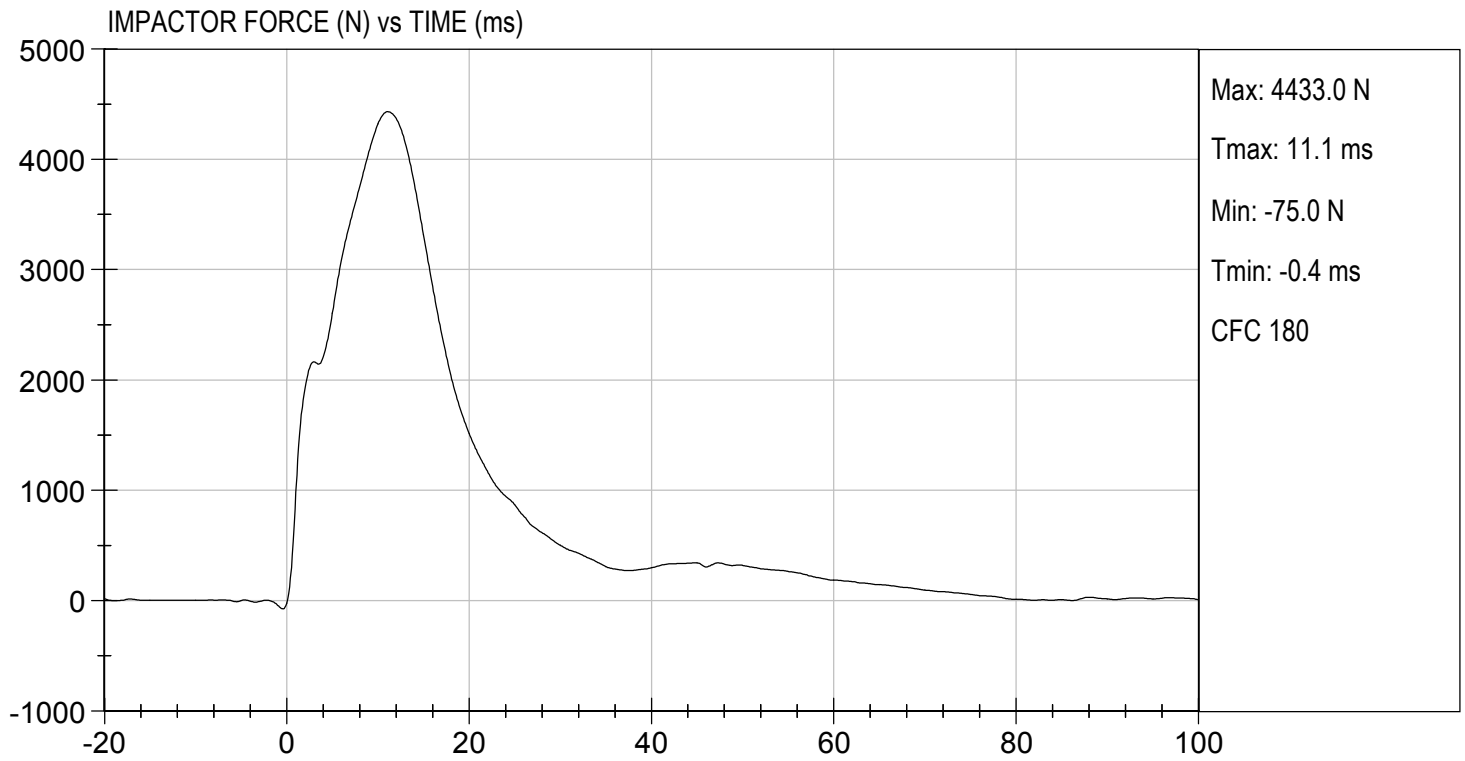


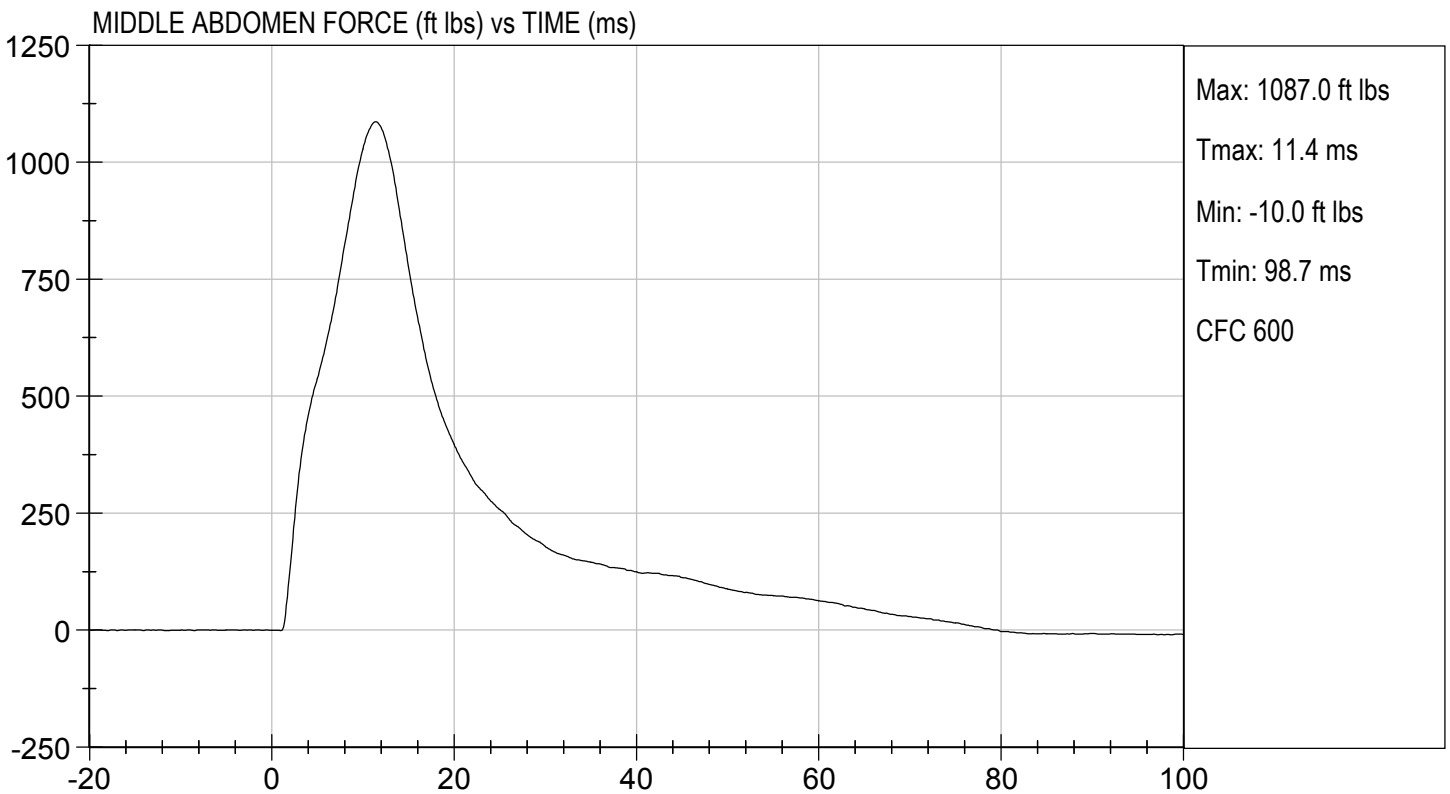
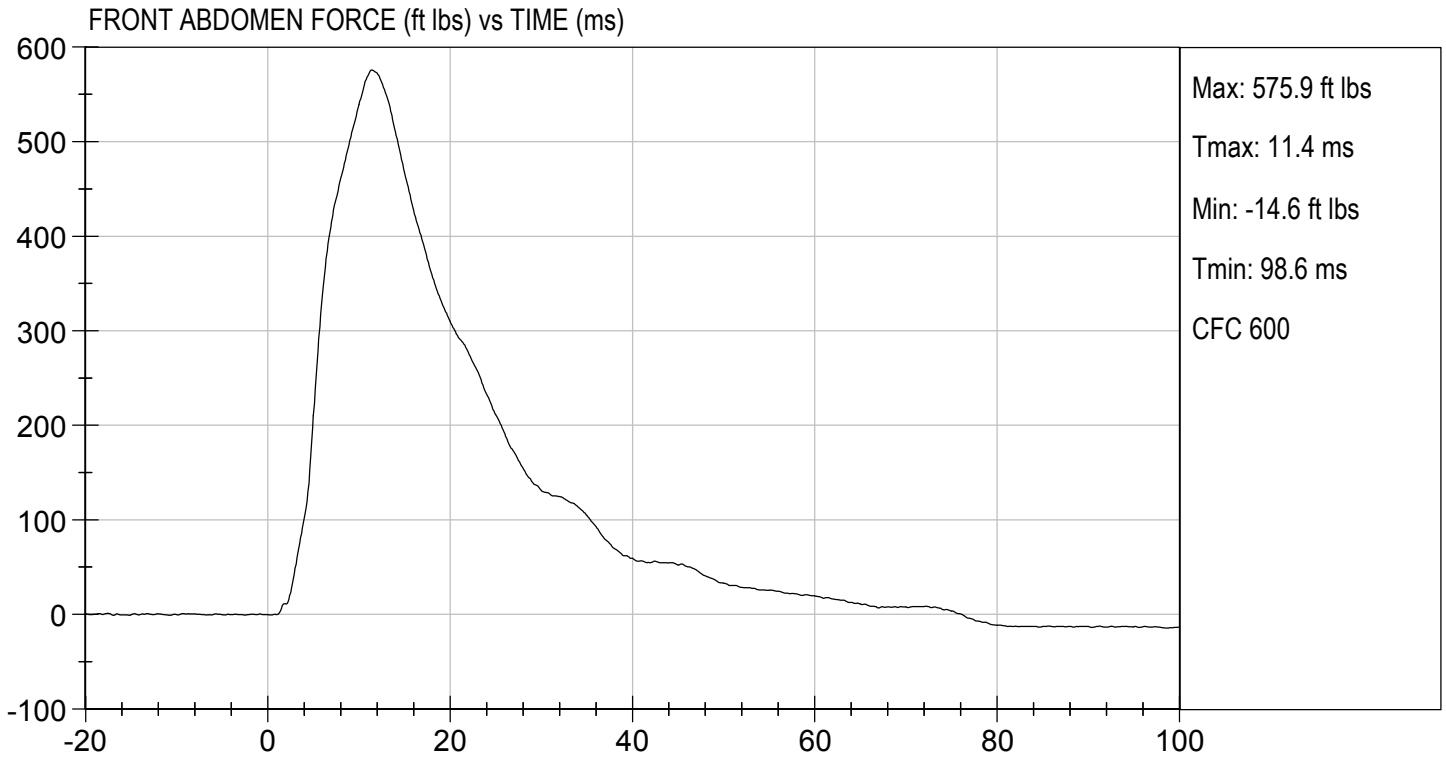
Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.23 ft/s, 4.03 m/s

TEST DATE: 11/08/2017
TEST #: D173237

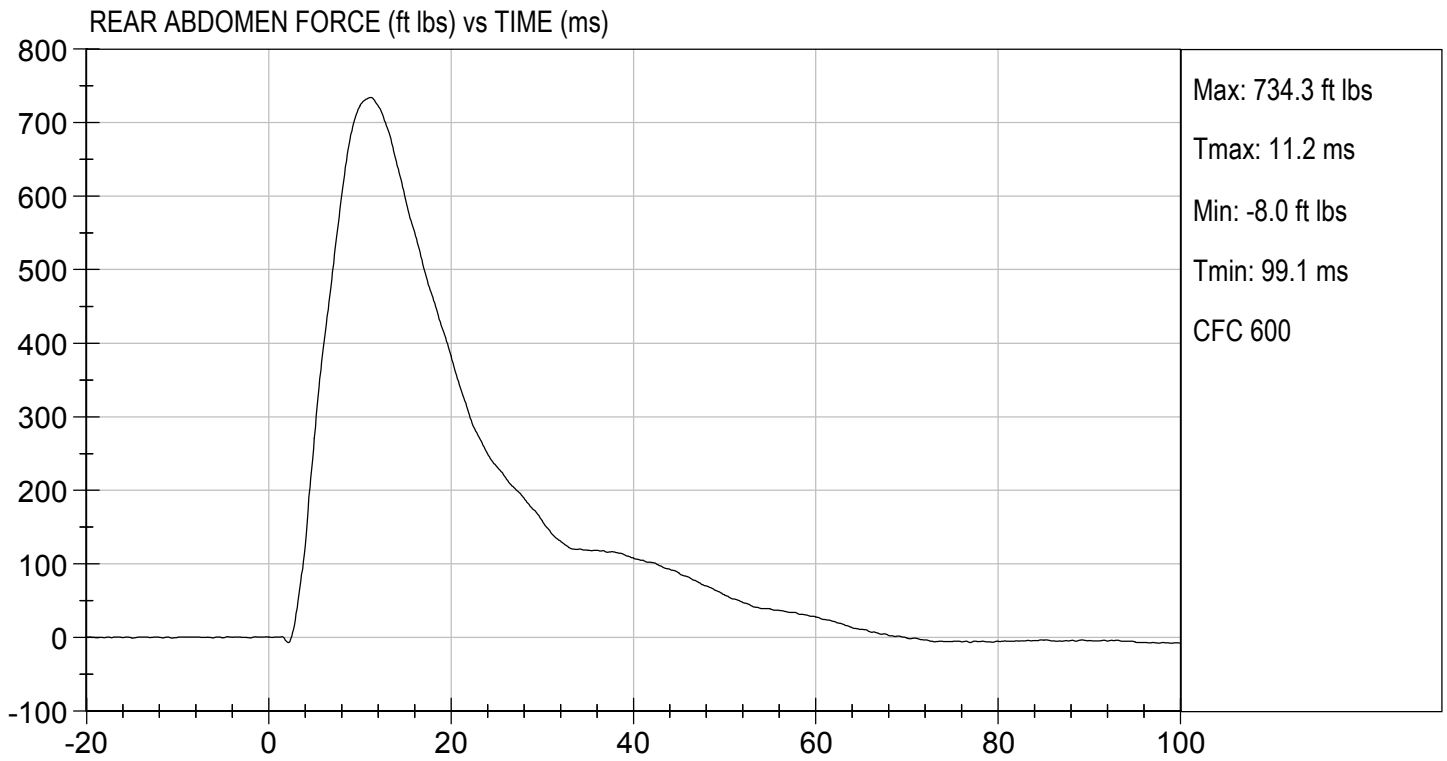






TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.23 ft/s, 4.03 m/s

TEST DATE: 11/08/2017
TEST #: D173237



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

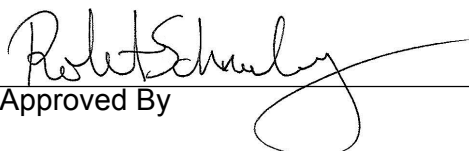
ATD Serial No: 032

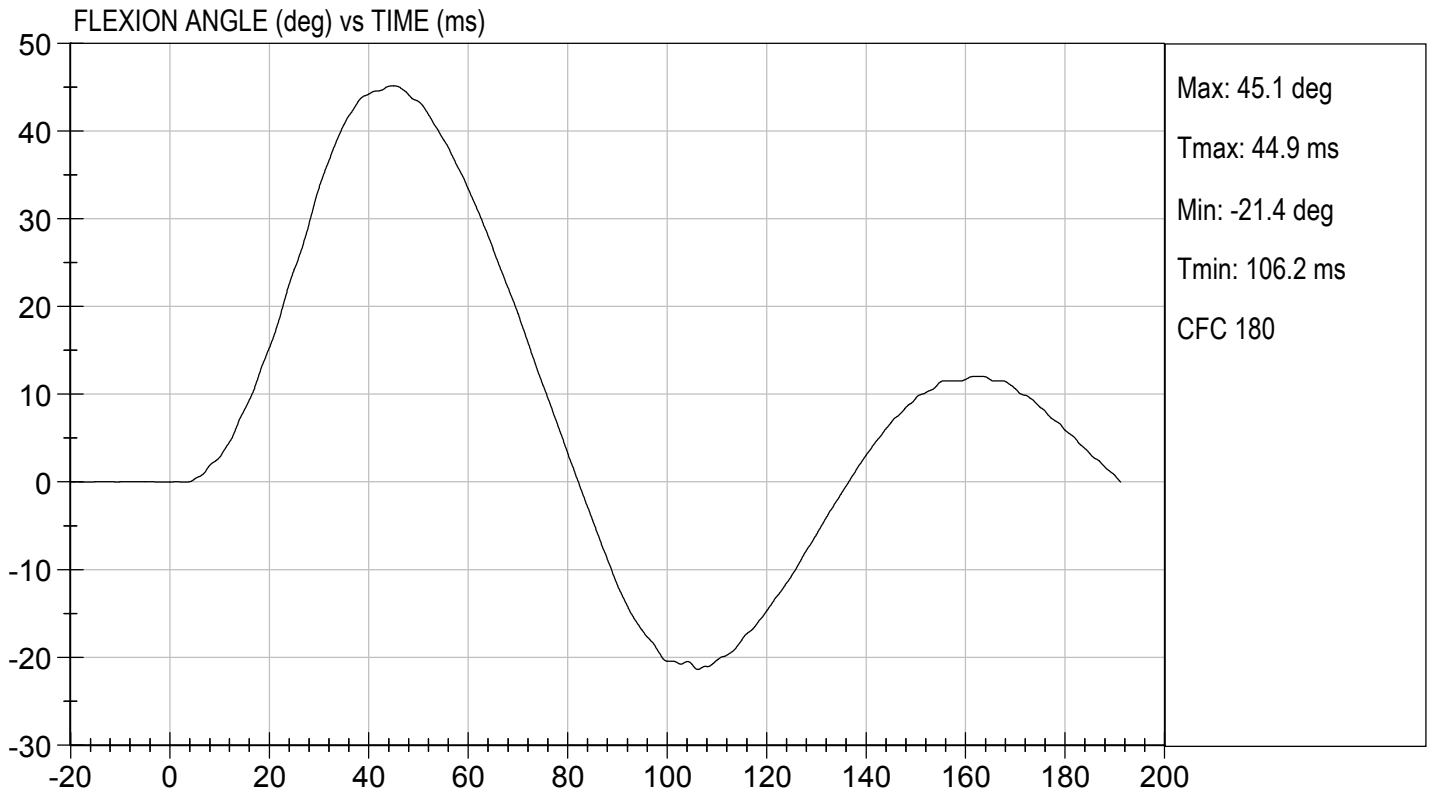
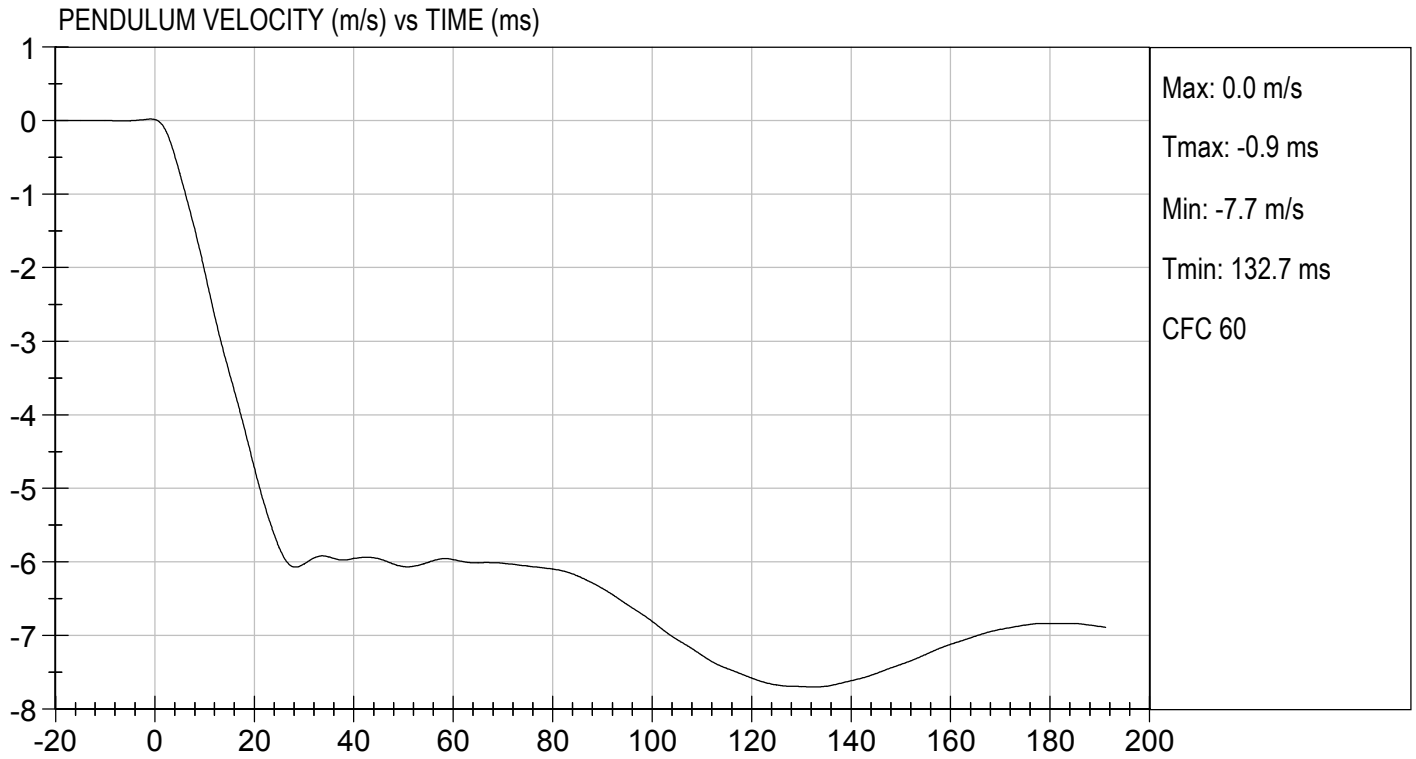
Test I.D.: D173238

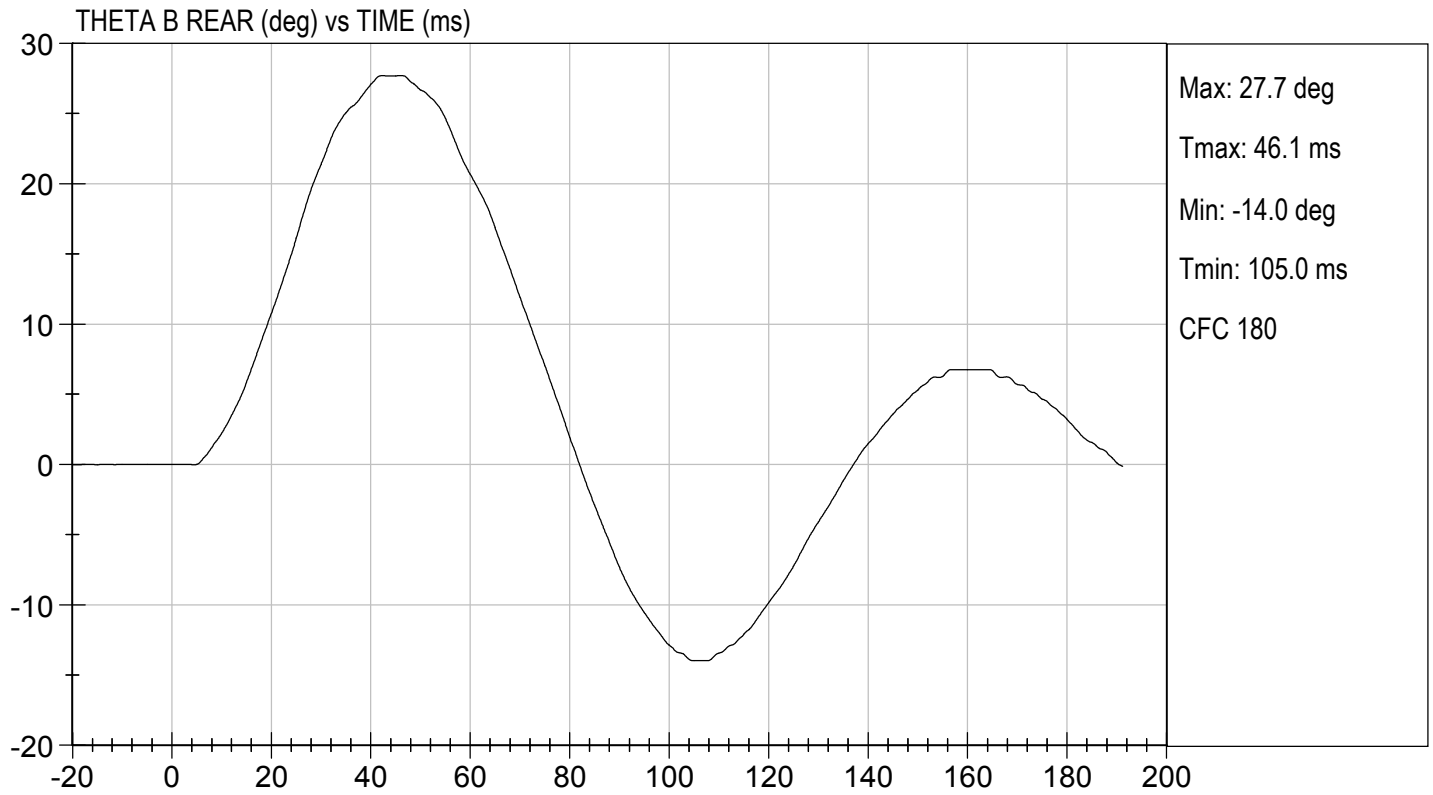
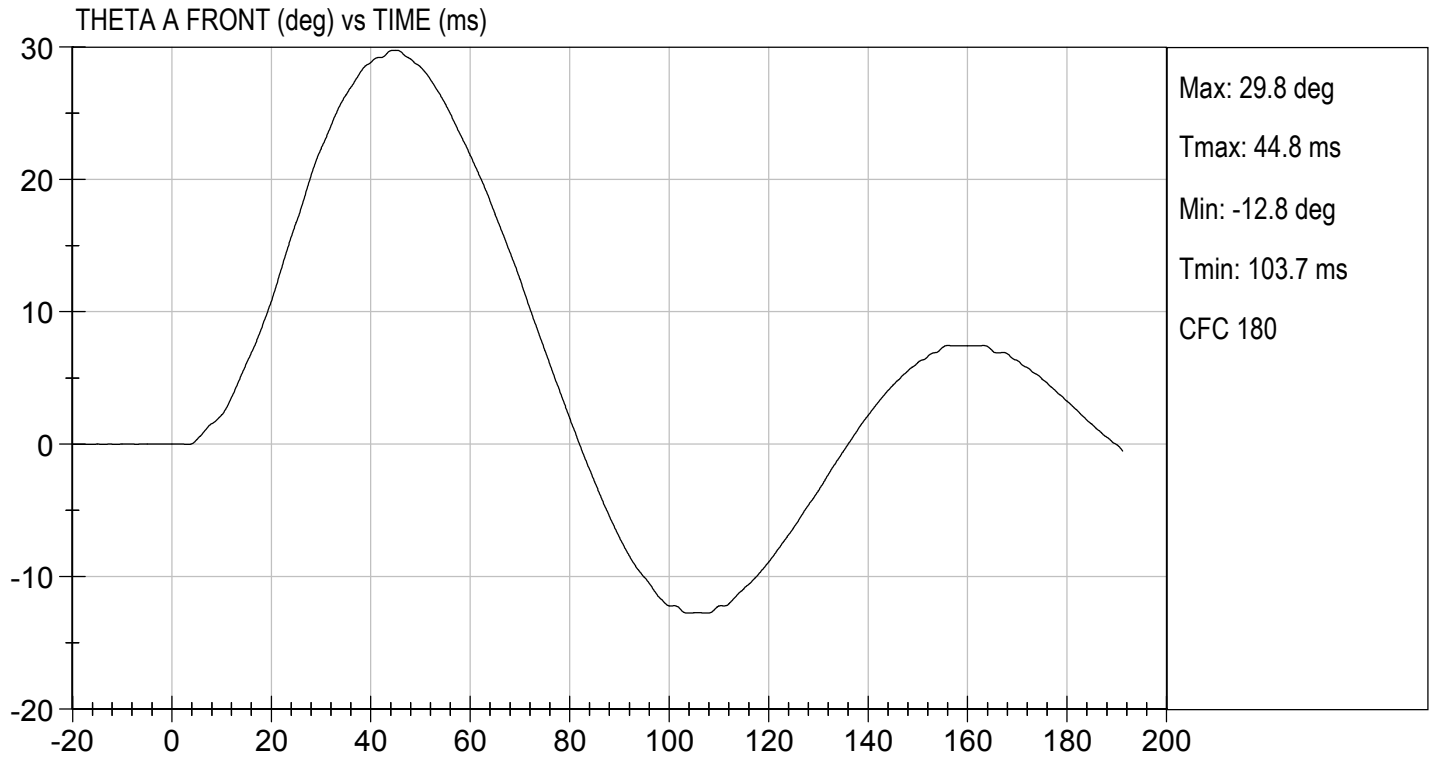
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass	
Laboratory Relative Humidity	%	10 to 70	30	Pass	
Pendulum Speed	m/s	5.95 to 6.15	6.05	Pass	
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.412	Pass
	27 ms	m/s	-6.50 to -5.80	-6.04	Pass
	30 ms	m/s	>= -6.50	-6.03	Pass
Maximum Flexion Angle	deg	45.0 to 55.0	45.1	Pass	
Time of Maximum Flexion Angle	ms	39.0 to 53.0	44.9	Pass	
Headform Rotation Decay to Initial Position	ms	37 to 57	46	Pass	
Overall Results				Pass	

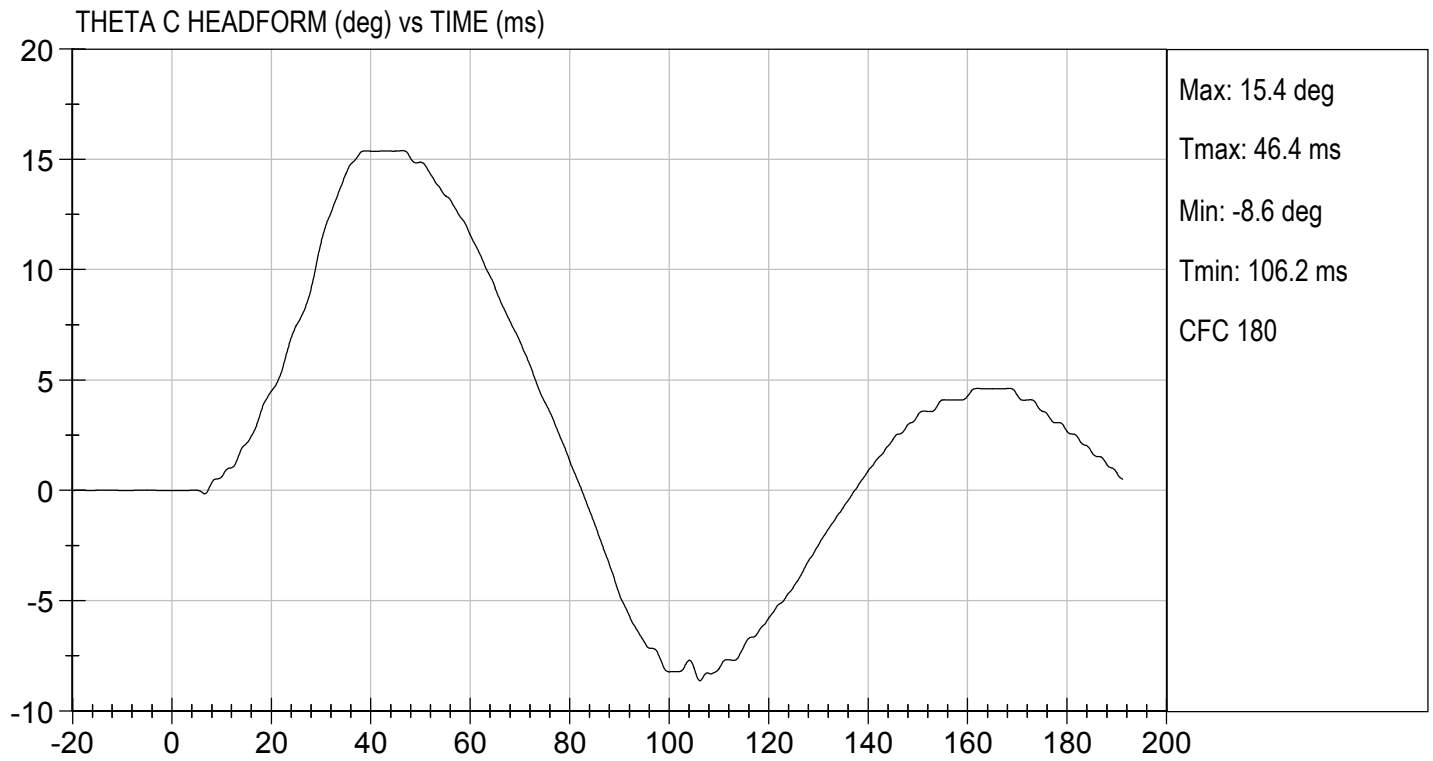

 Laboratory Technician

11/07/2017
 Test Date


 Approved By







MGA RESEARCH CORPORATION

PELVIS TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D173239

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	4.20 to 4.40	4.23	Pass
Maximum Impactor Force	N	4700 to 5400	4760	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.0	Pass
Maximum Pubic Force	N	1230 to 1590	1373	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	13.3	Pass
Overall Test Results				Pass


Laboratory Technician

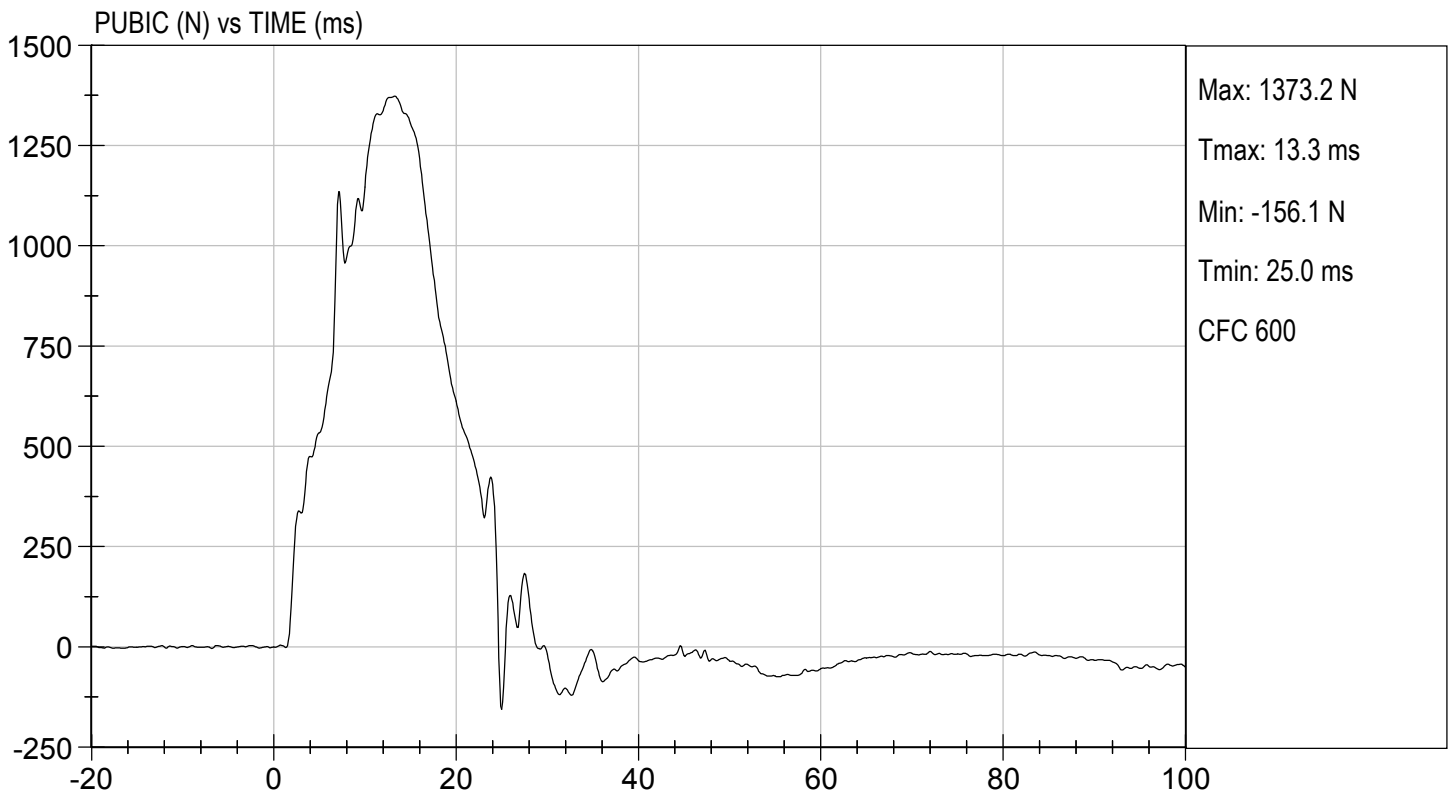
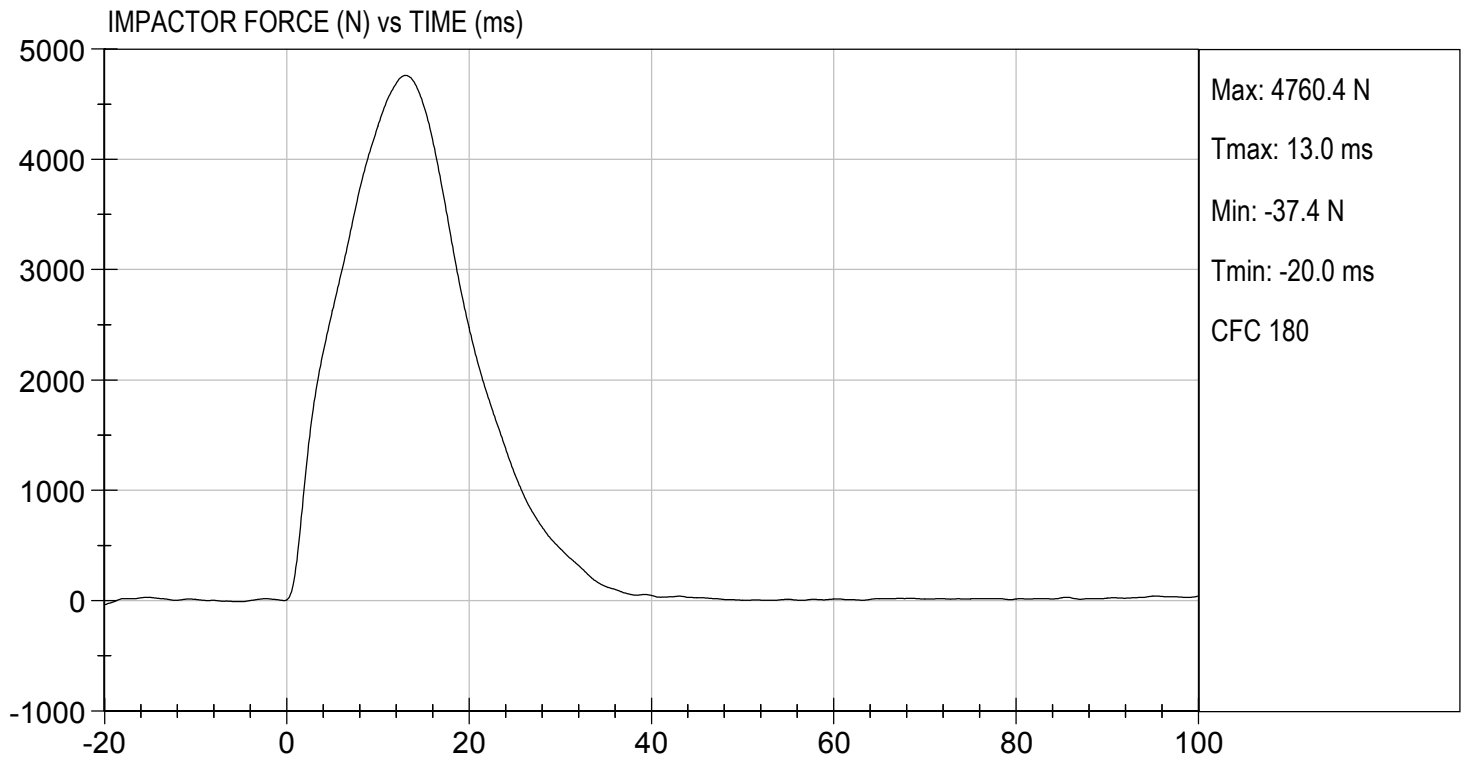
11/08/2017
Test Date


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 11/08/2017
TEST #: D173239



MGA RESEARCH CORPORATION
THORAX IMPACT TEST
ES-2re DUMMY

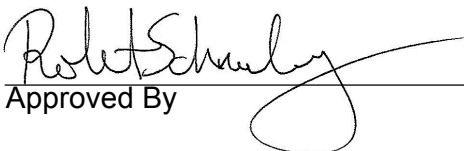
ATD Serial No: 032

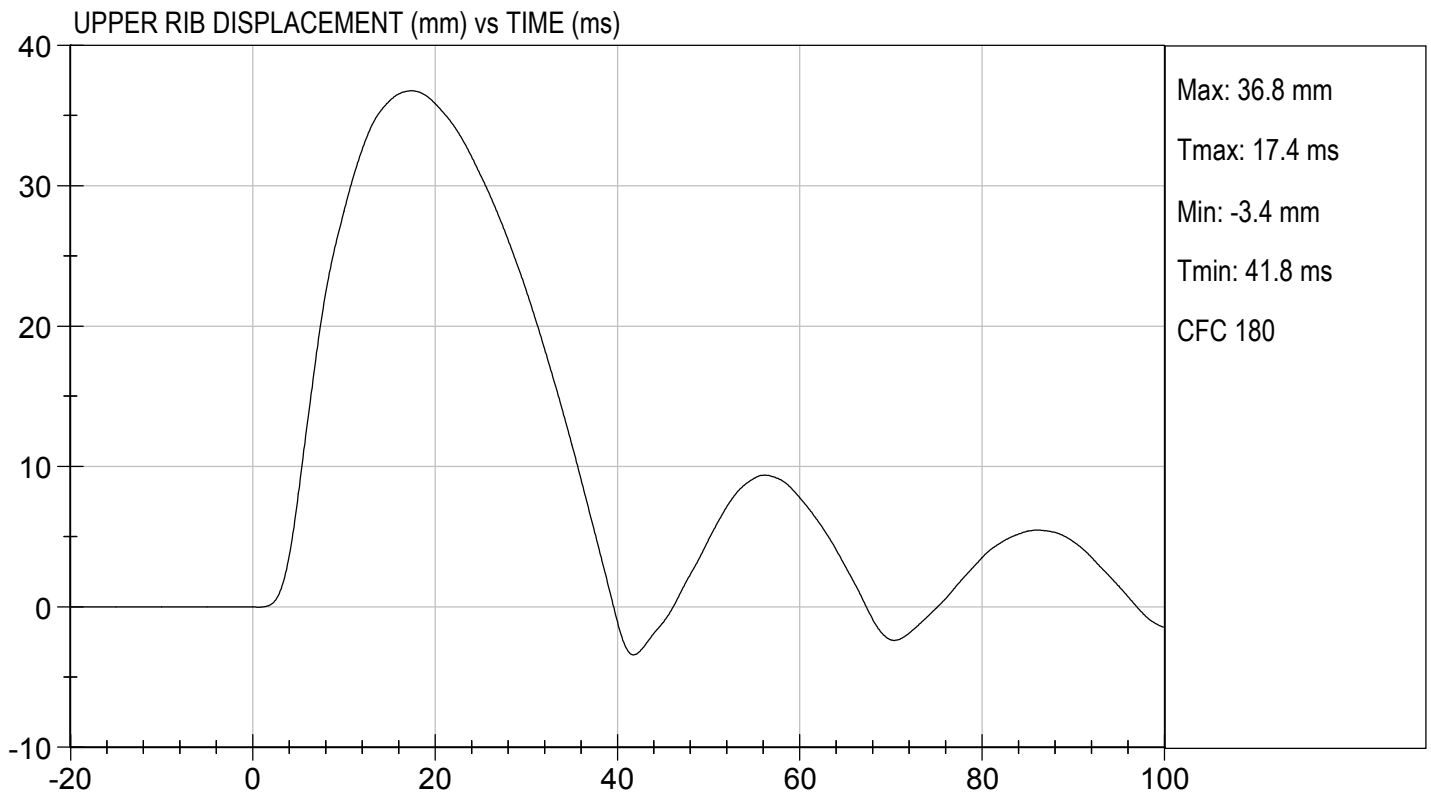
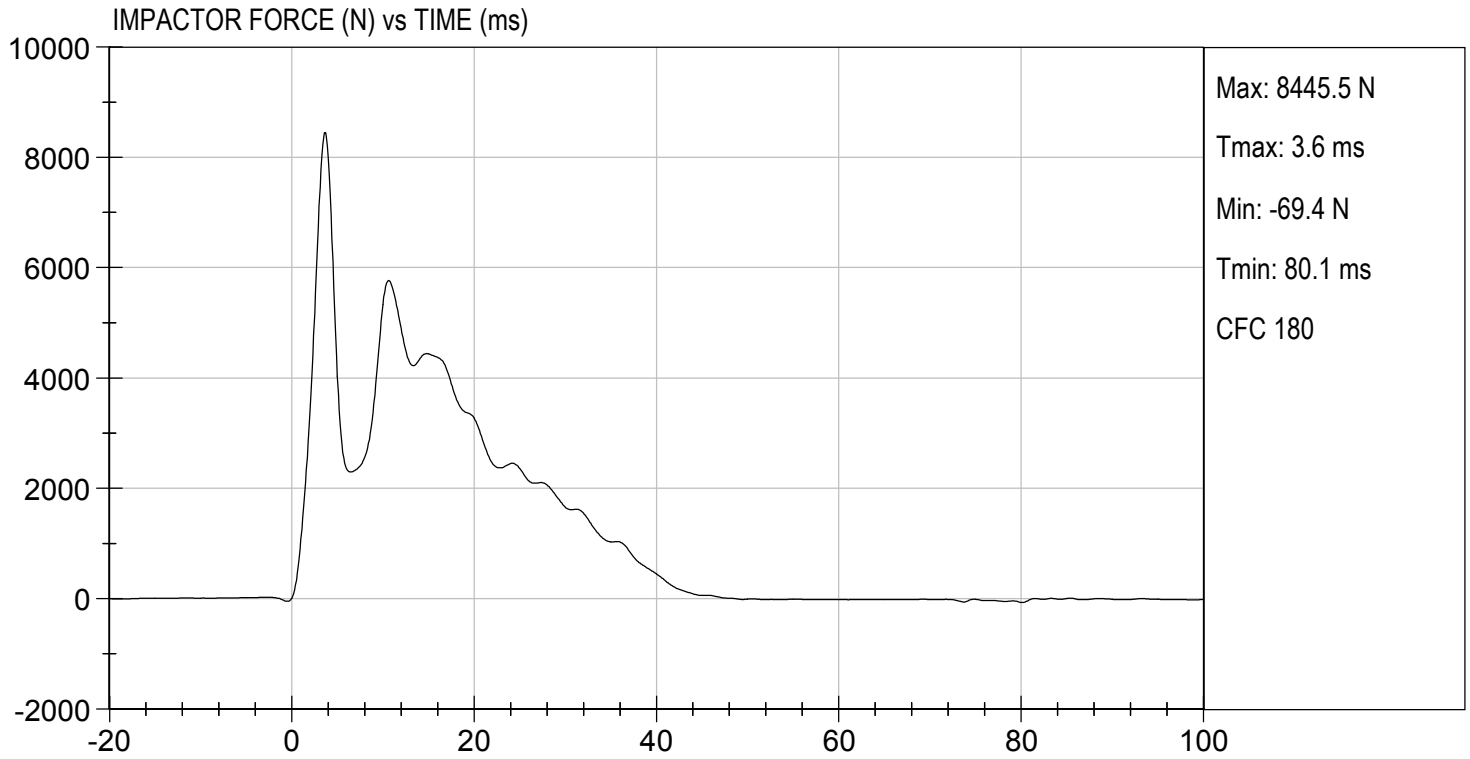
Test I.D: D173230

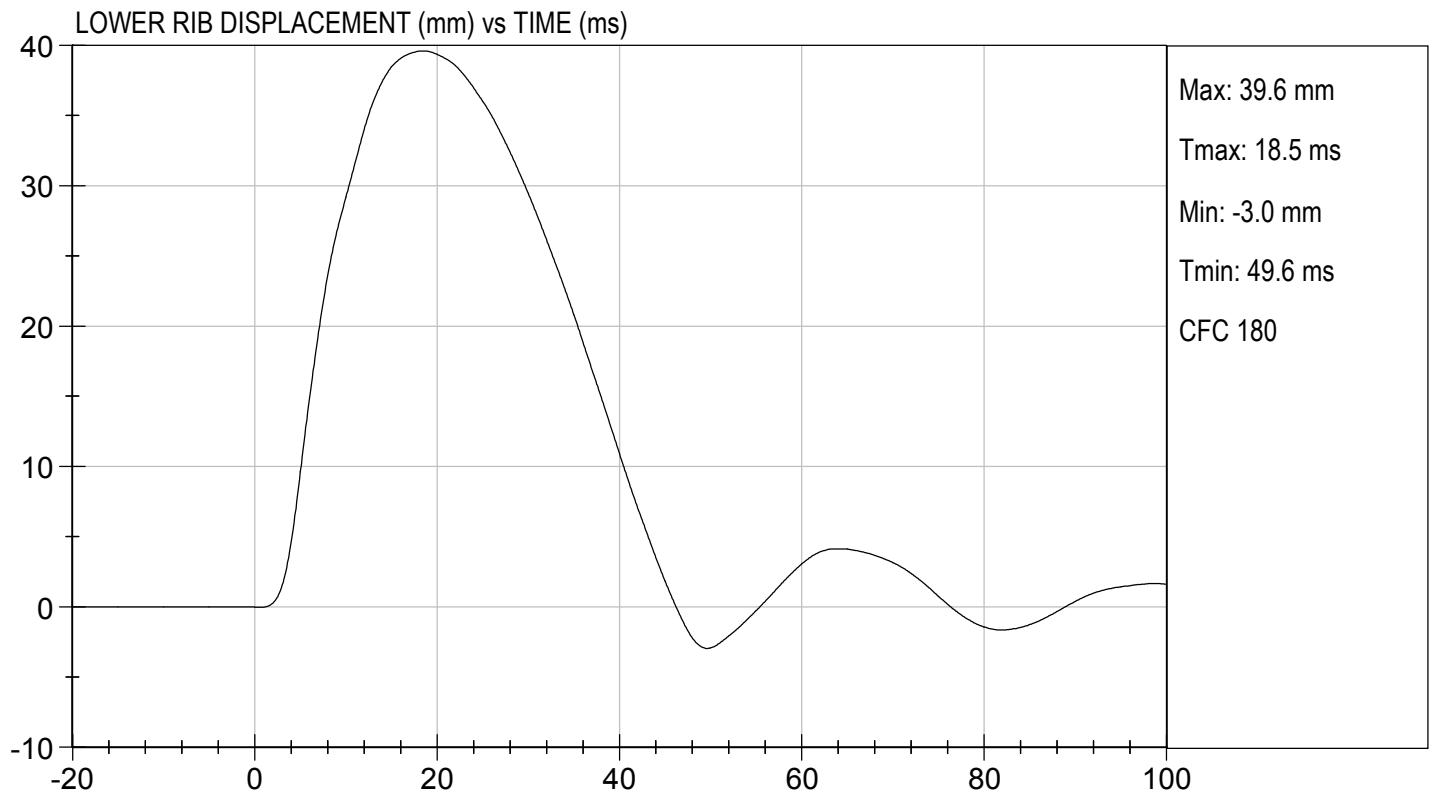
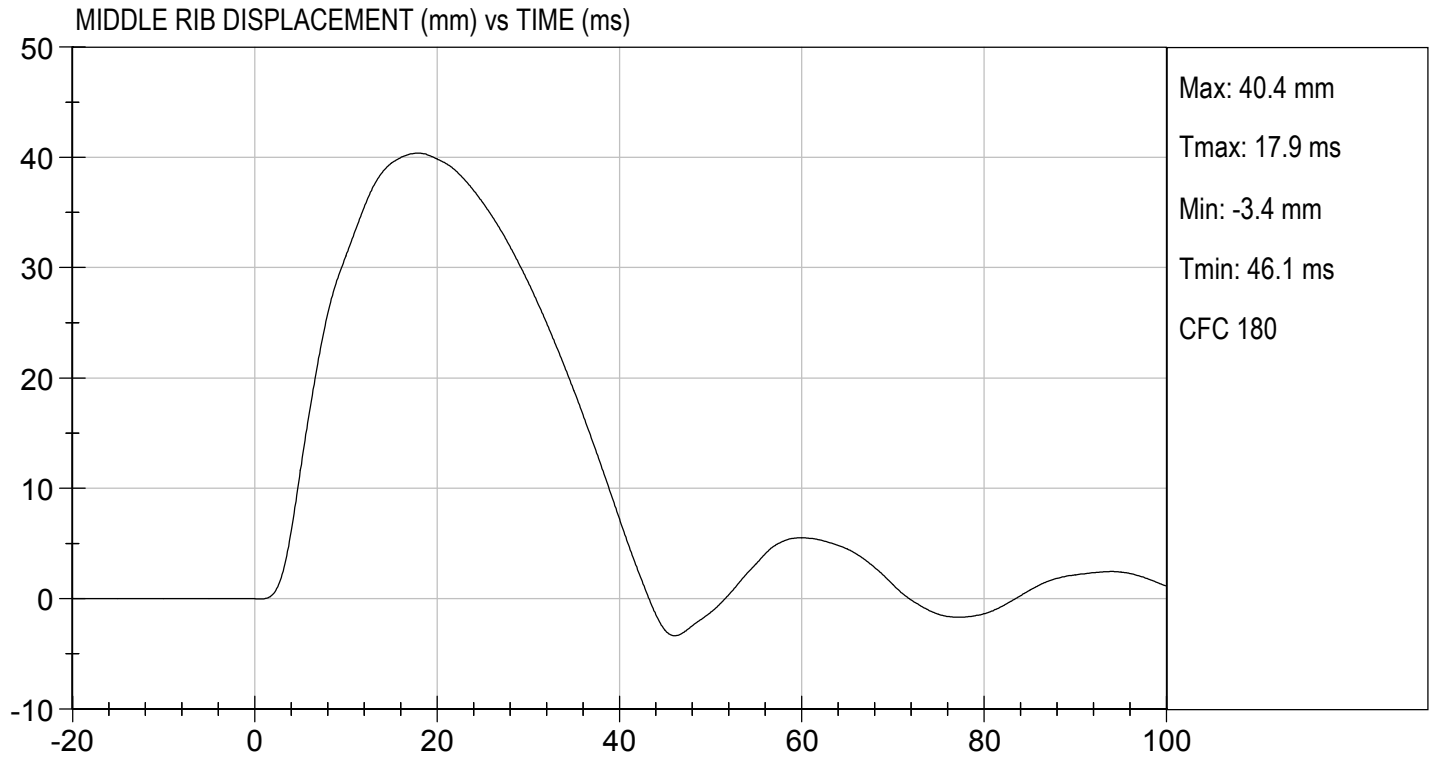
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5767	Pass
Upper Rib Displacement	mm	34.0 to 41.0	36.8	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.4	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.6	Pass
Overall Test Results				Pass


 Laboratory Technician

11/07/2017
 Test Date


 Approved By





SID-IIsD External Measurements
SN: 296


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

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


ATD Serial No: 296

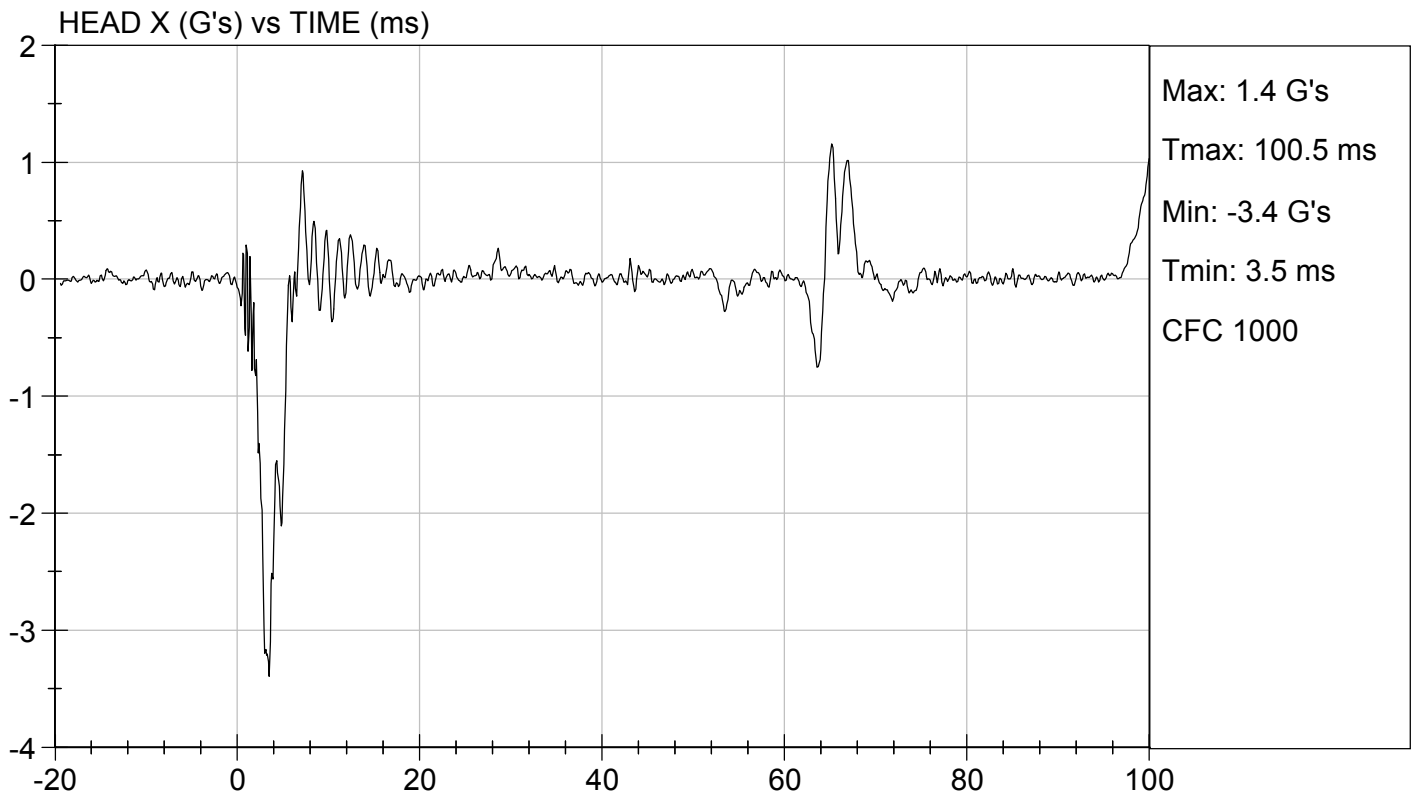
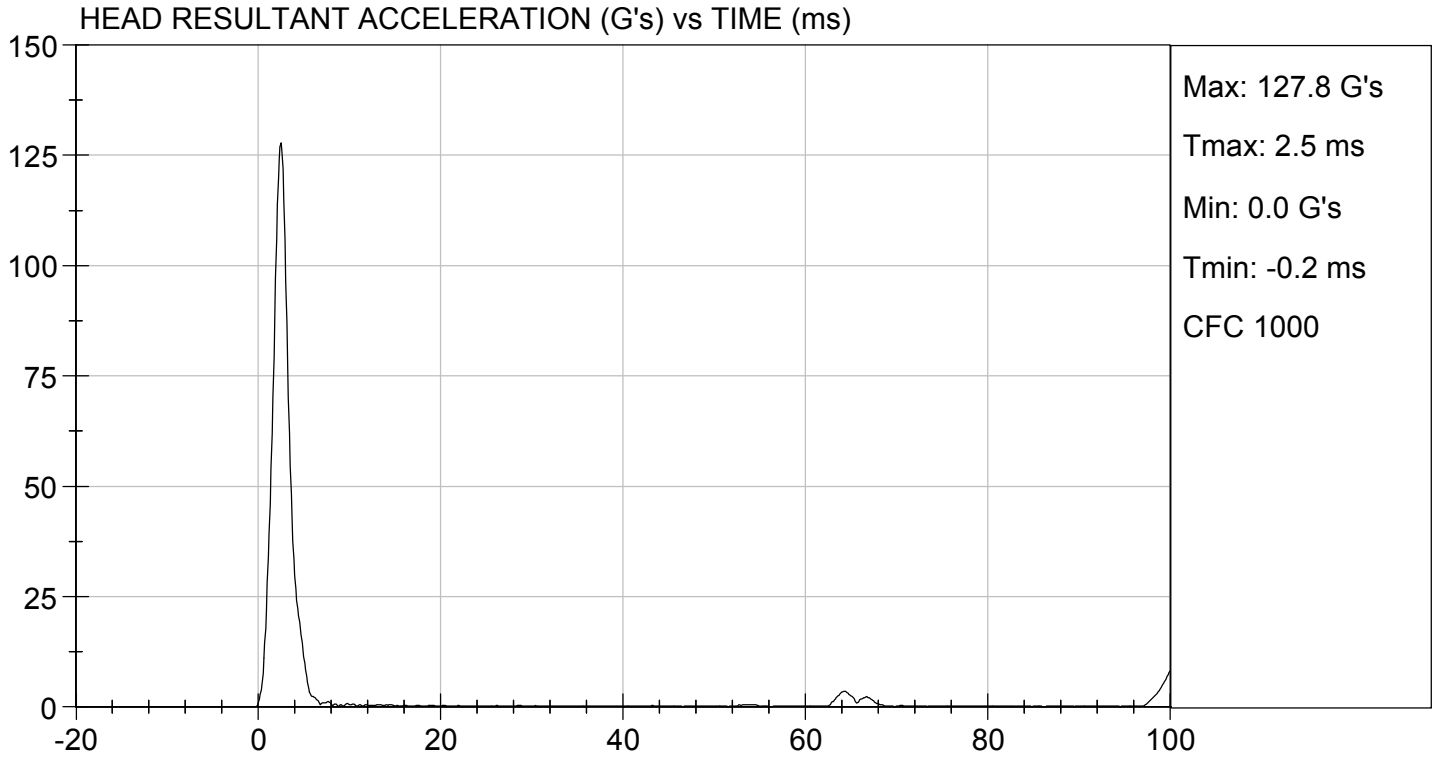
Test ID: D173061

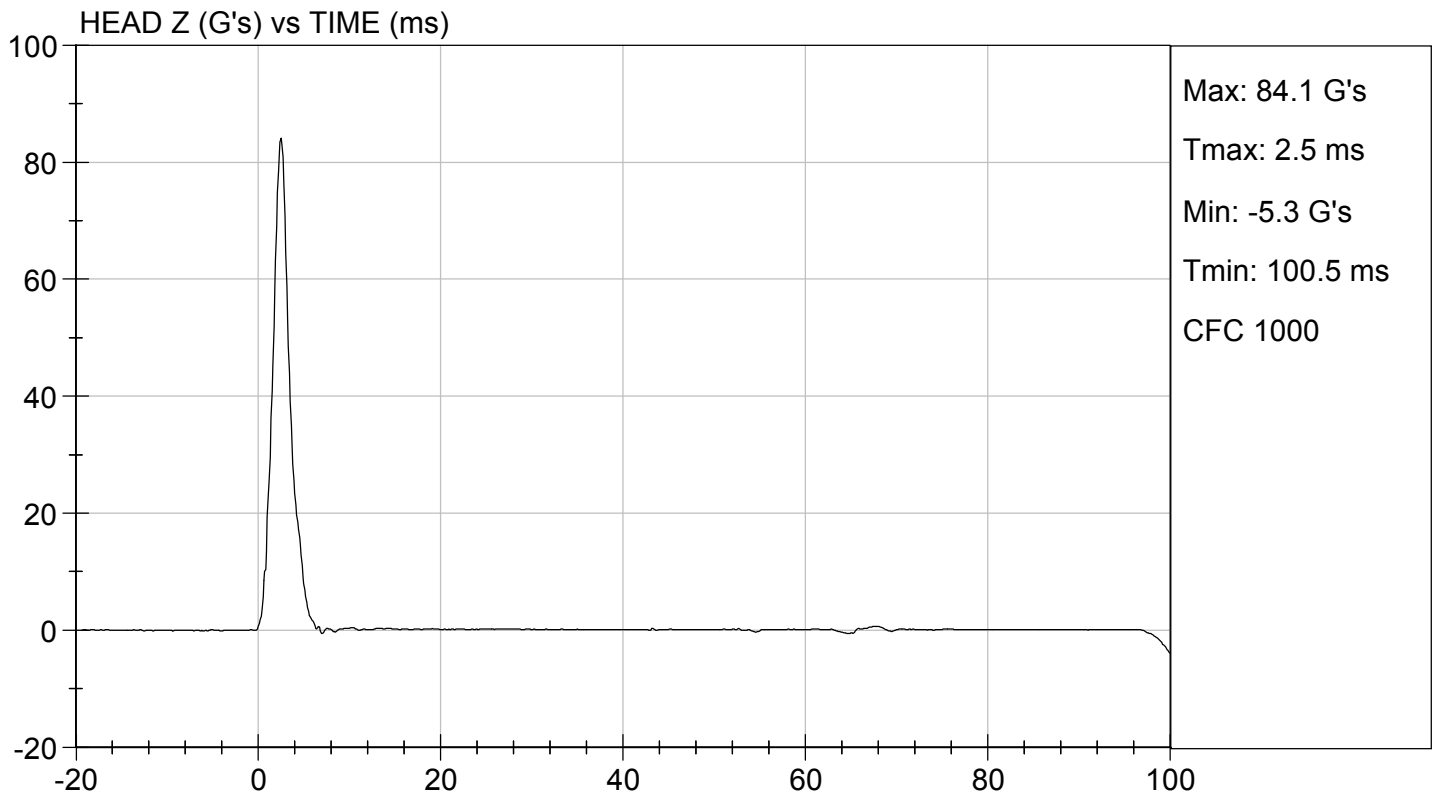
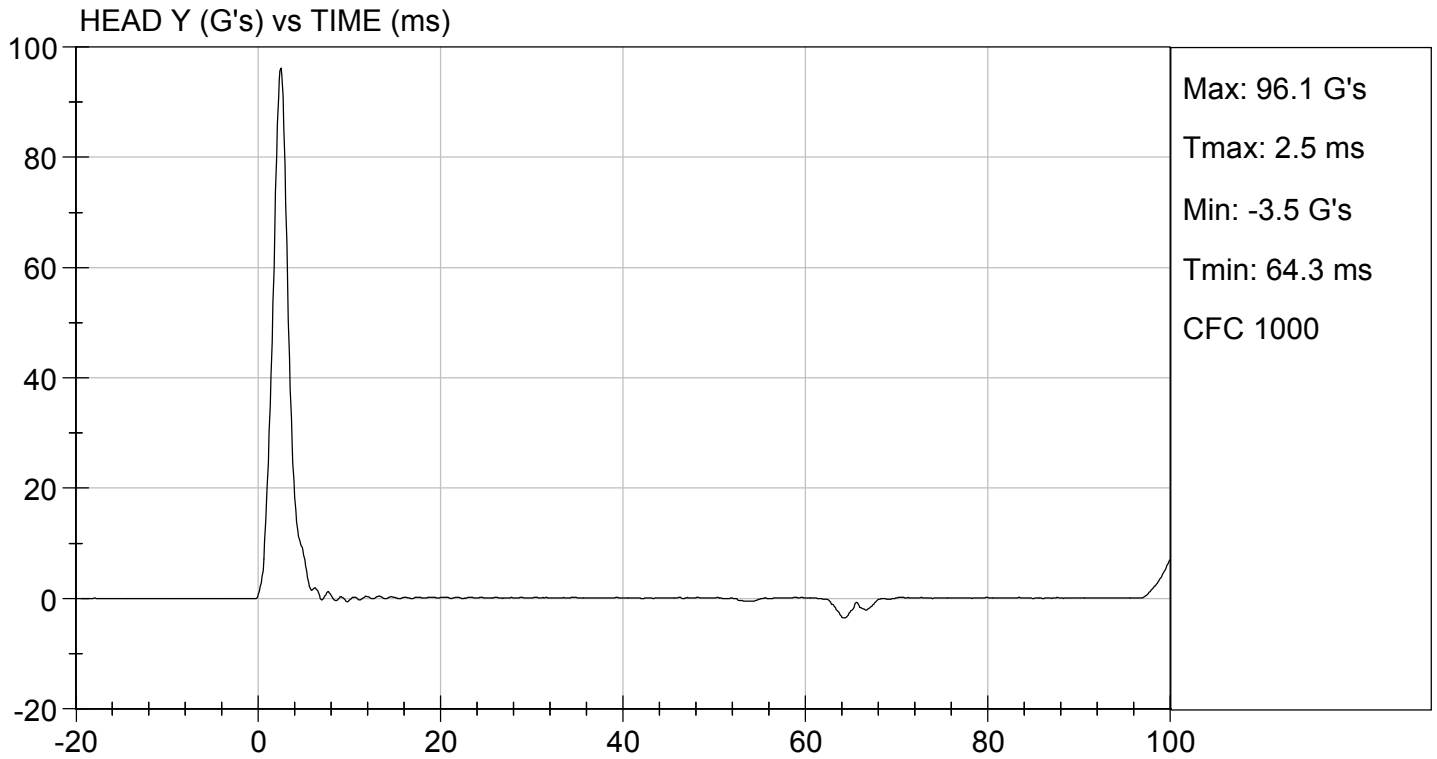
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	115 to 137	128	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-3.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

10/23/2017
Test Date


Approved By



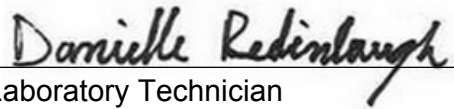


**MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY**

ATD Serial No: 296

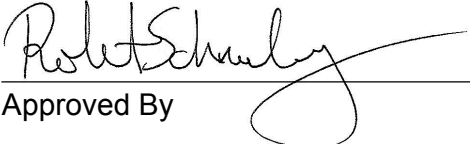
Test I.D.: D173062

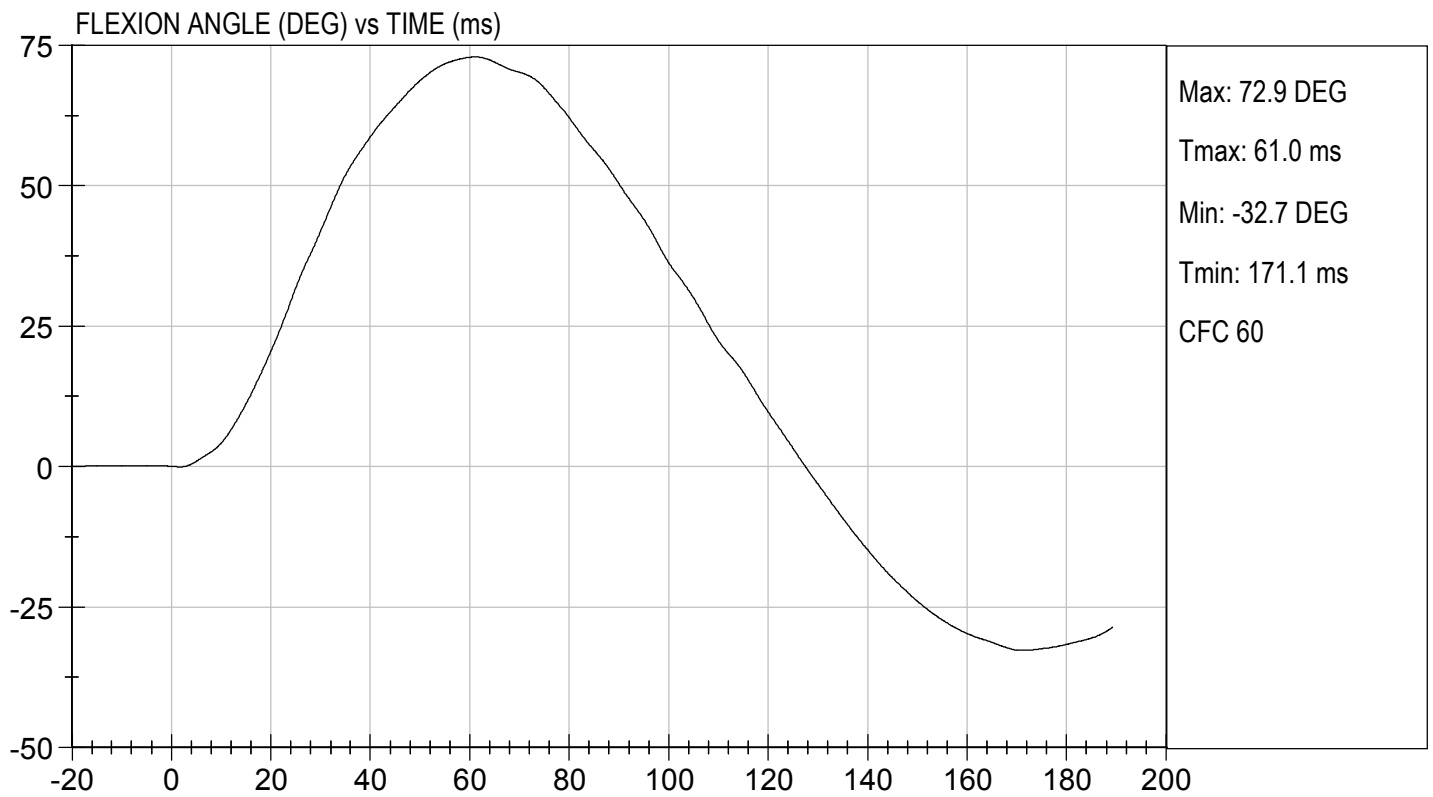
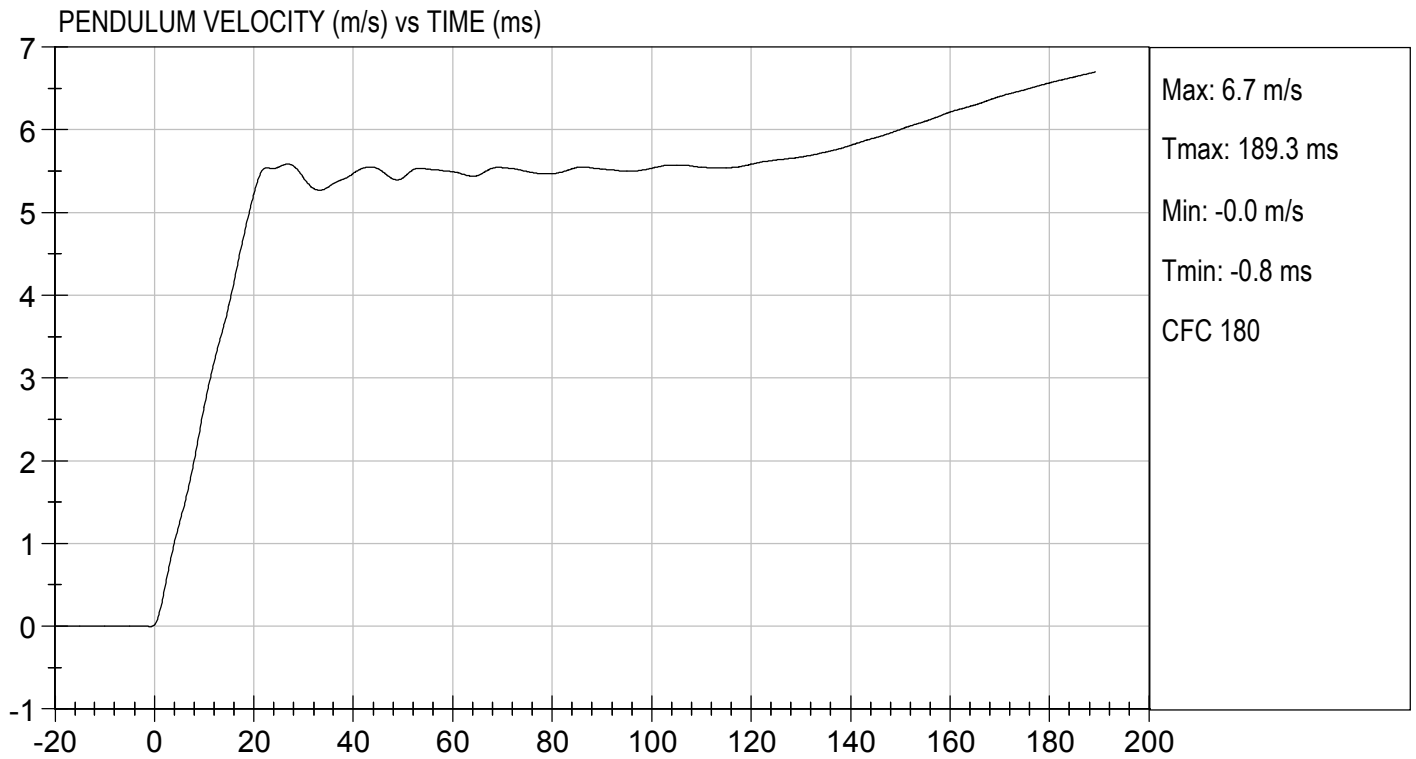
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.7	Pass	
Humidity	%	10 to 70	42	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.58	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.65	Pass
	15 ms	m/s	3.30 to 4.10	3.88	Pass
	20 ms	m/s	4.40 to 5.40	5.22	Pass
	25 ms	m/s	5.40 to 6.10	5.55	Pass
	25-100 ms	m/s	5.50 to 6.20	5.58	Pass
Maximum D-Plane Rotation	deg	71 to 81	73	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	61	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-43	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	113	Pass	
Overall Test Results				Pass	

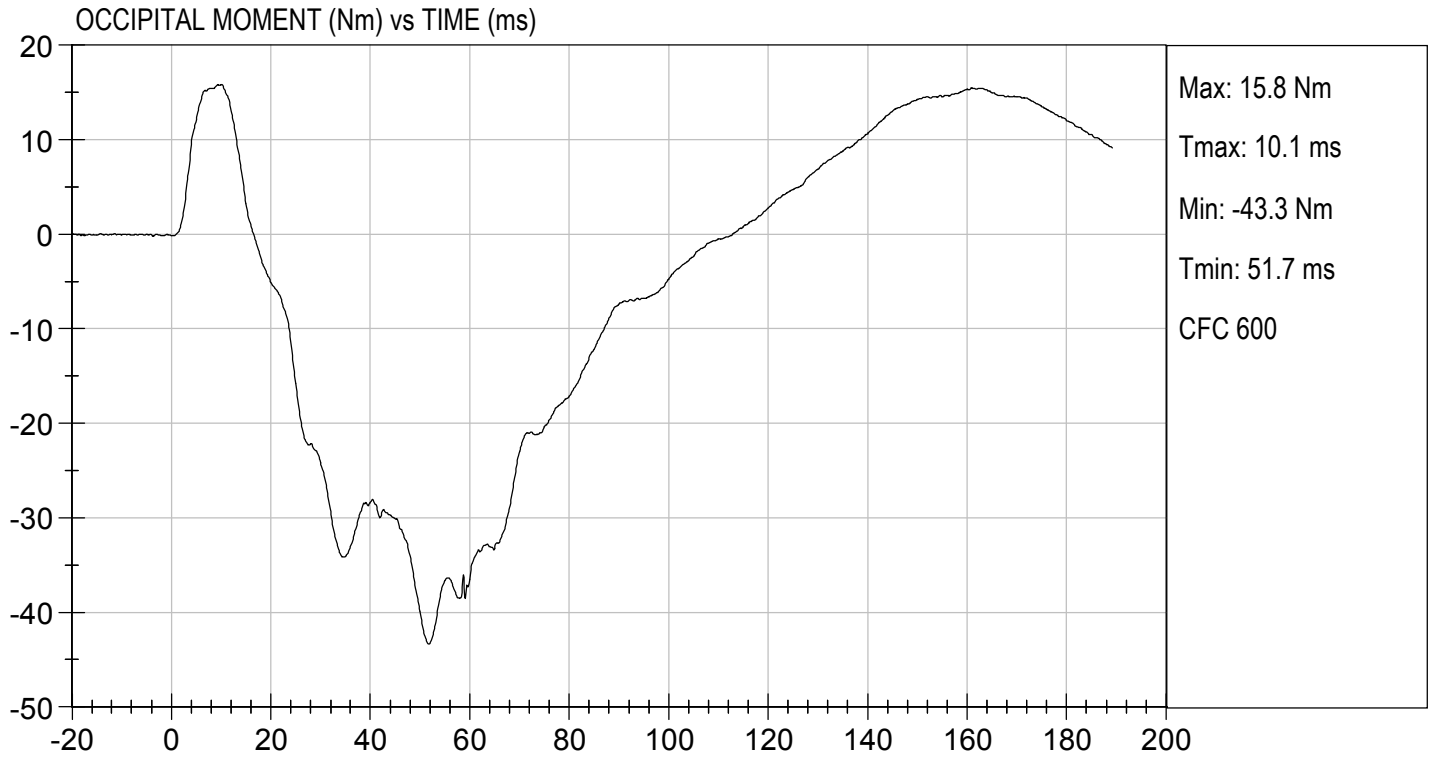

Laboratory Technician

10/23/2017

Test Date


Approved By






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

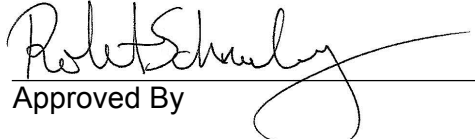
ATD Serial No: 296

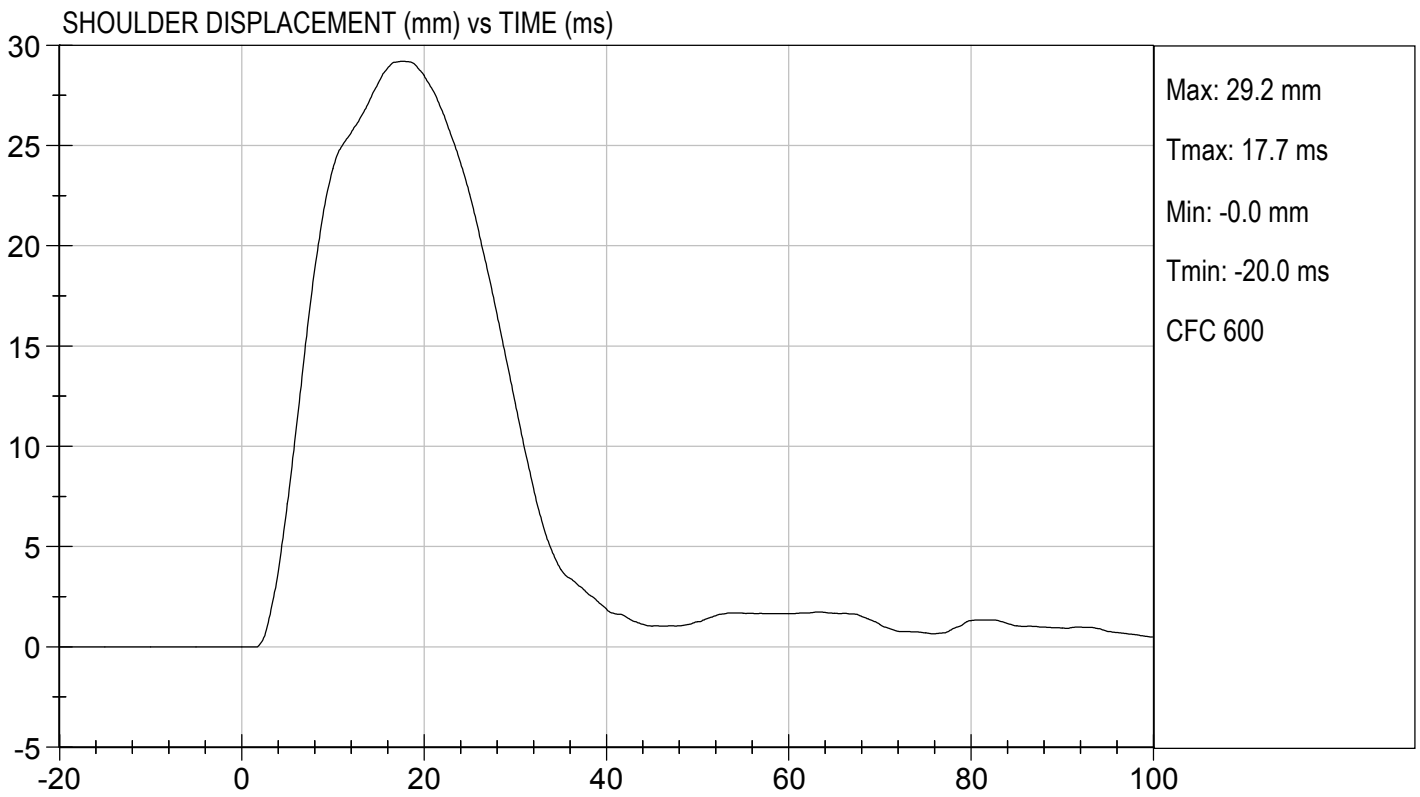
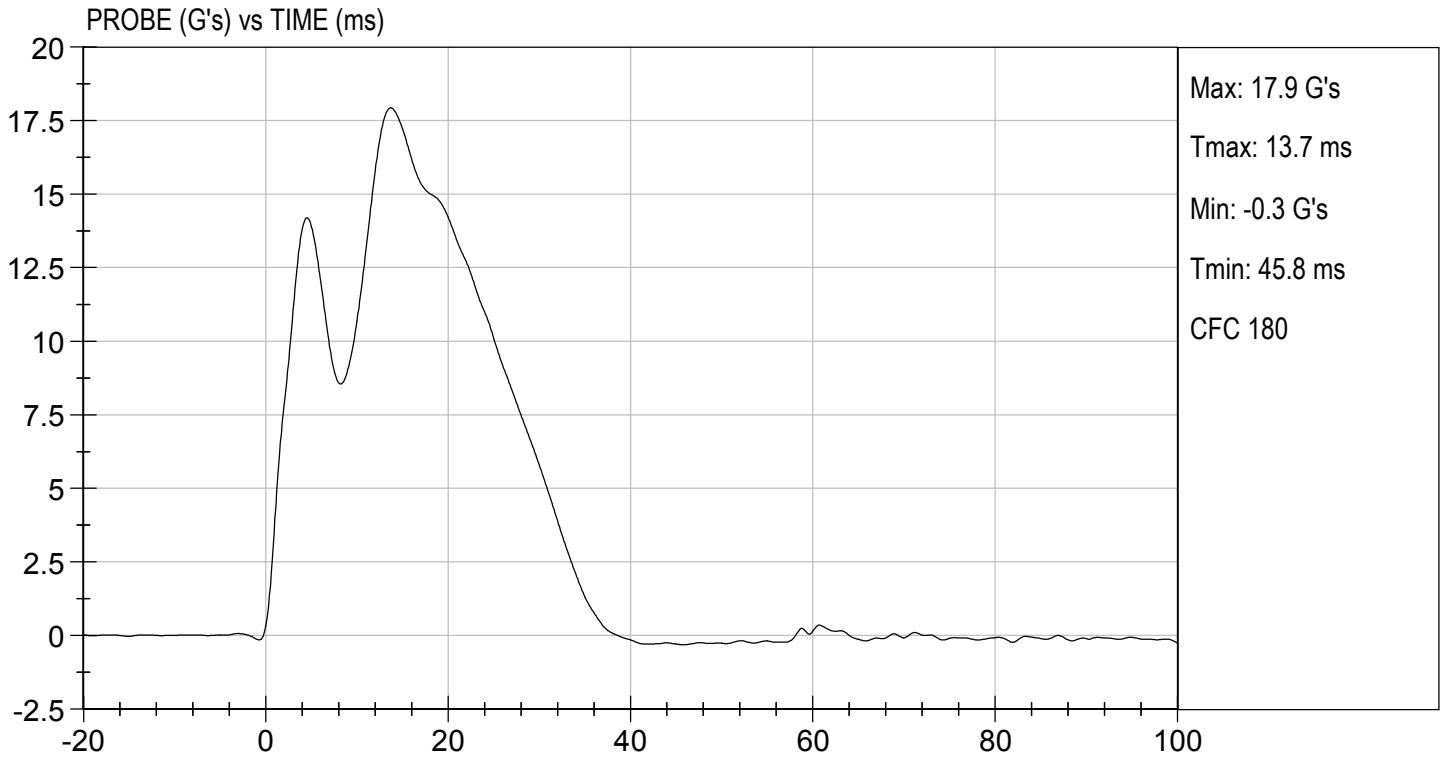
Test ID: D173063

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	4.27	Pass
Maximum Probe Acceleration	G's	13 to 18	18	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	20	Pass
Overall Test Results				Pass


Laboratory Technician

10/23/2017
Test Date

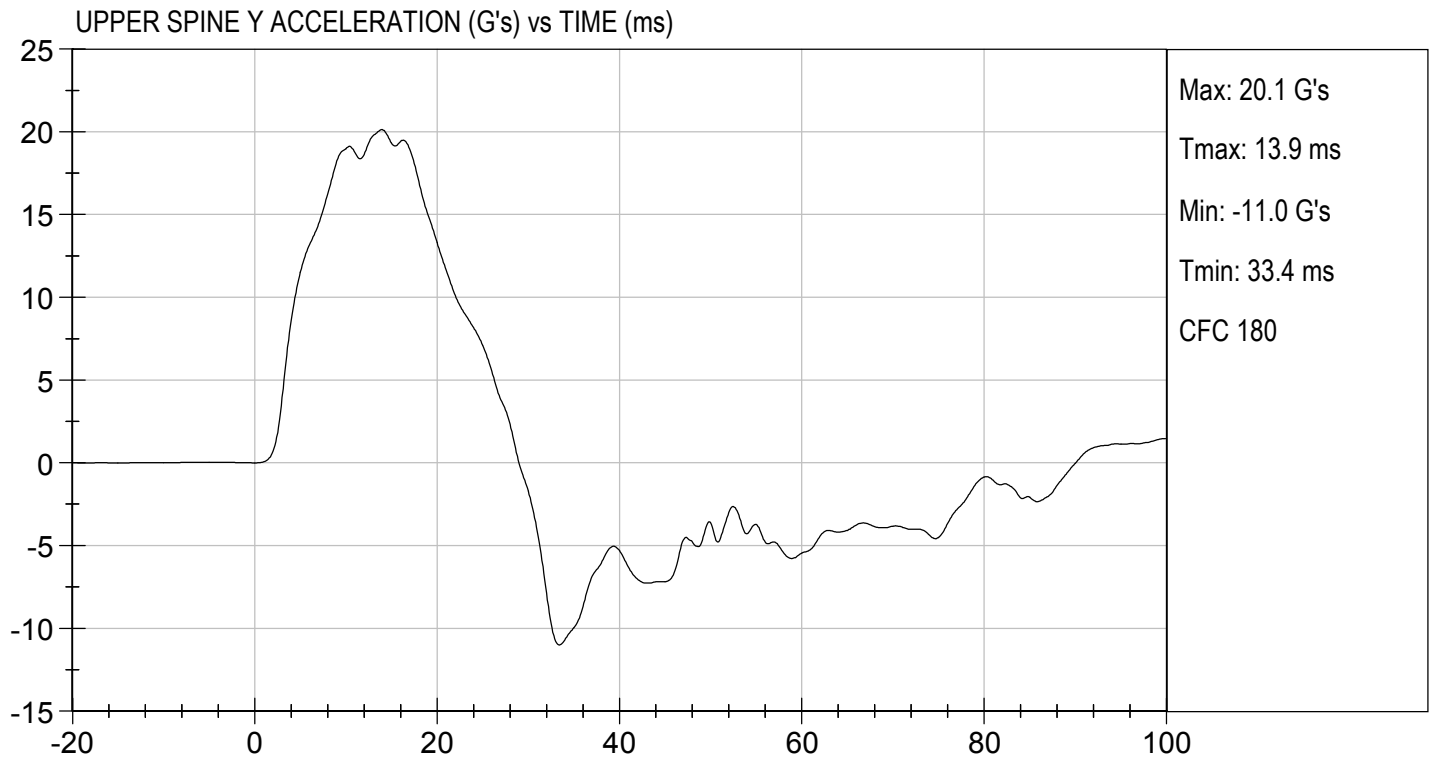

Approved By





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

TEST DATE: 10/23/2017
TEST #: D173063




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

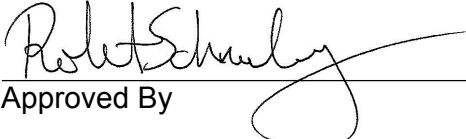
ATD Serial No: 296

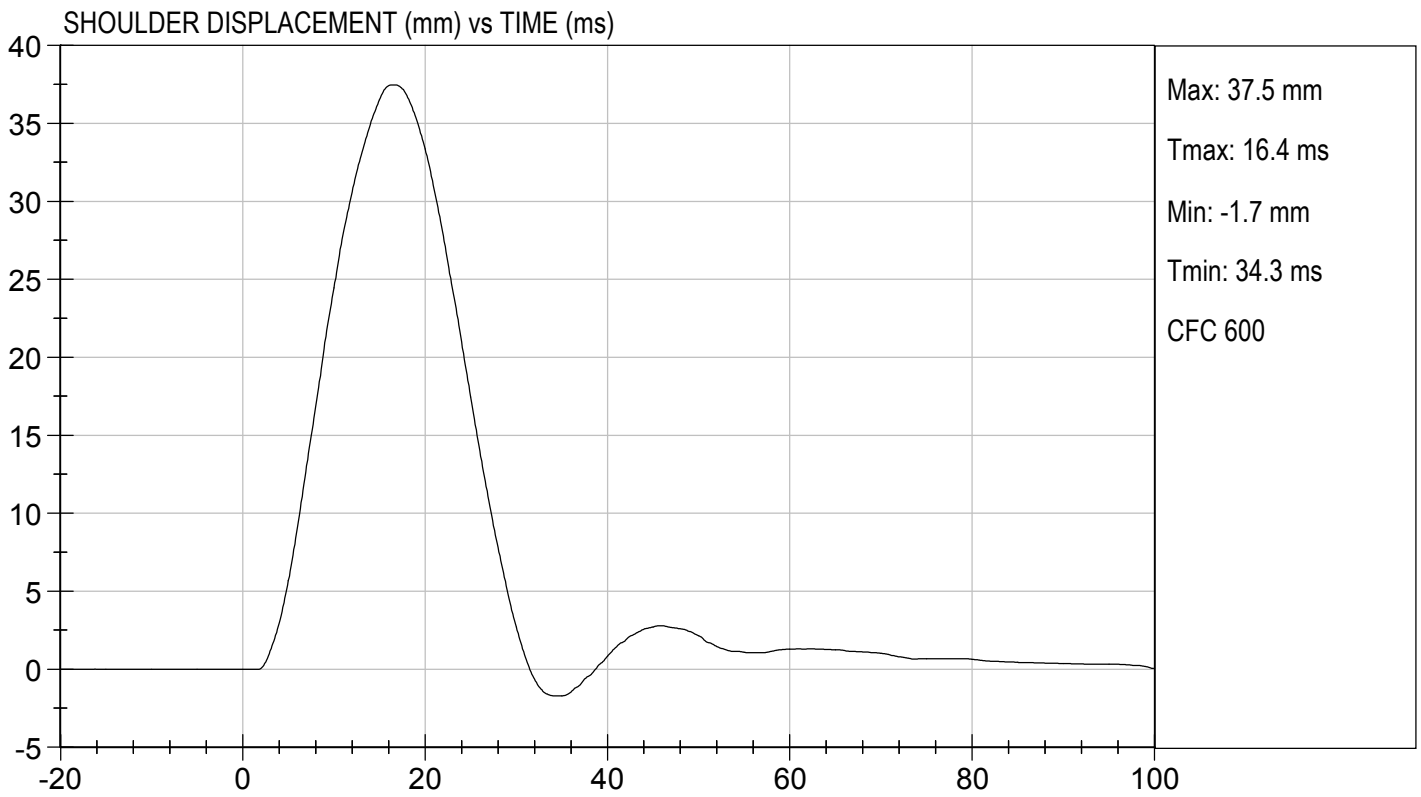
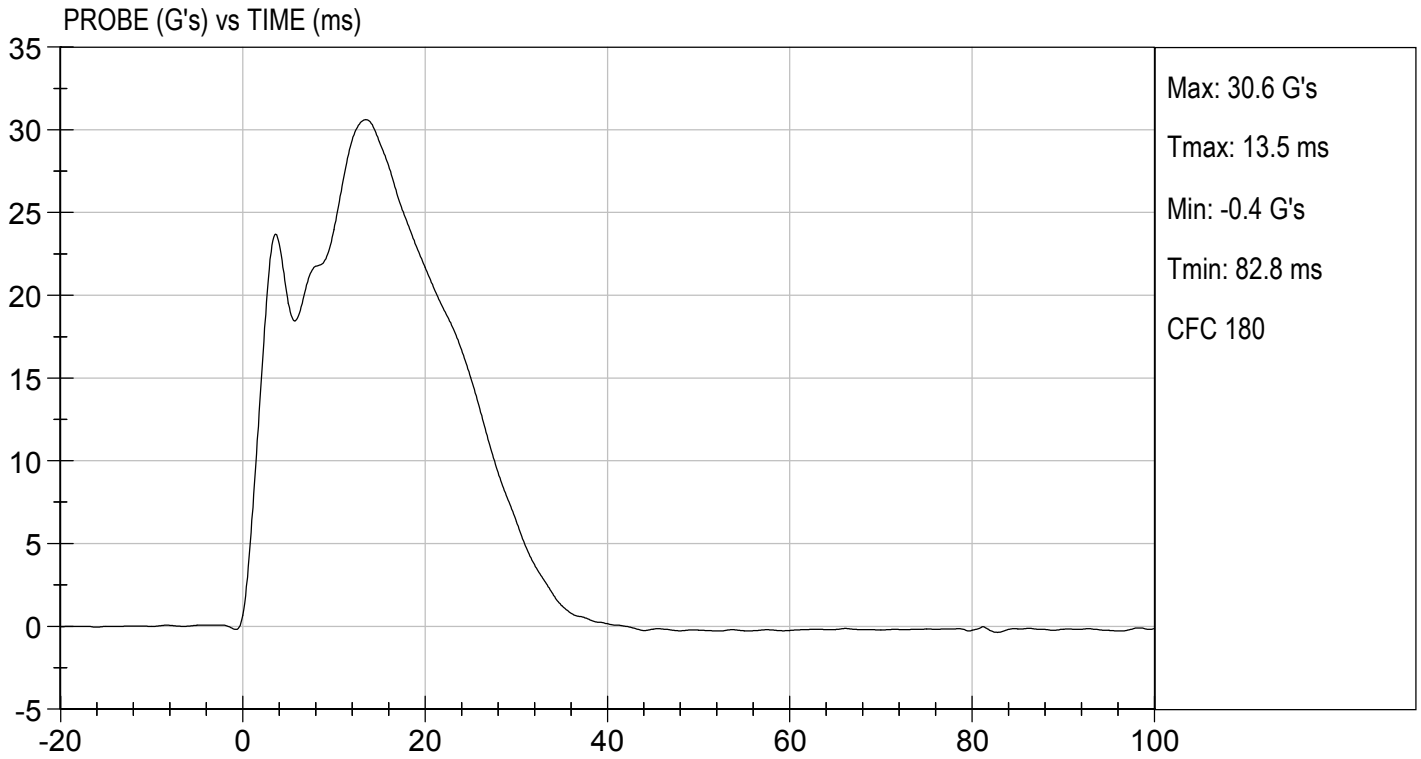
Test I.D: D173064

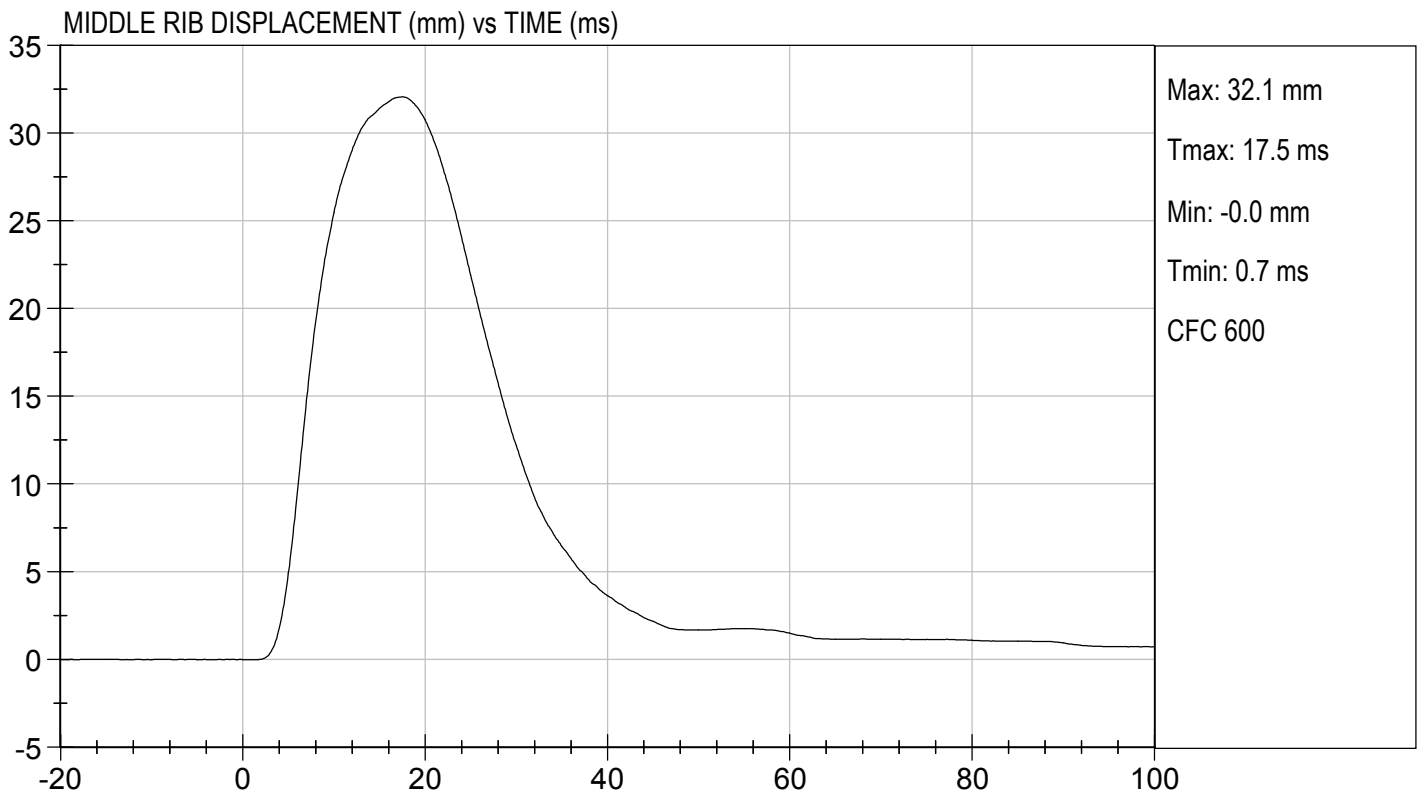
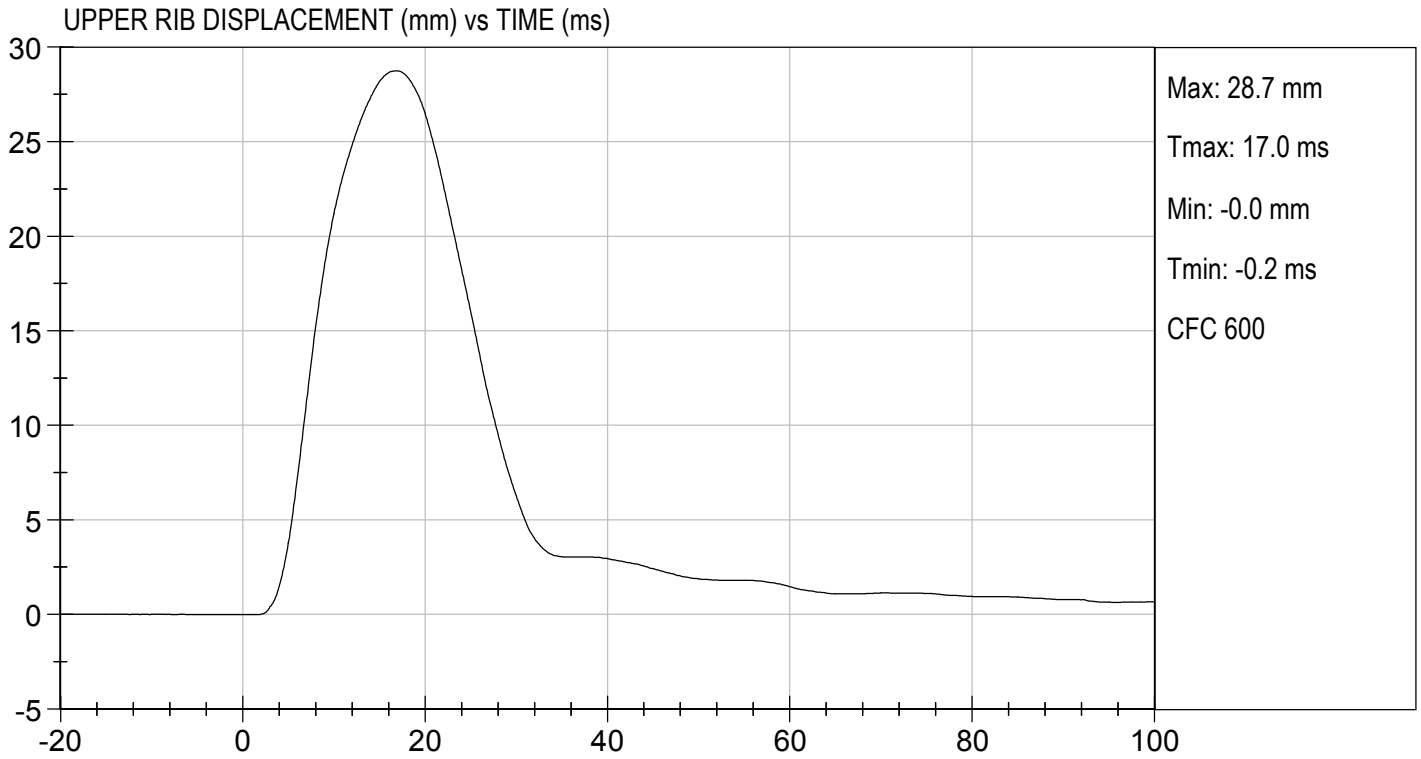
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	31	Pass
Shoulder Displacement	mm	31 to 40	37	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	35	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass

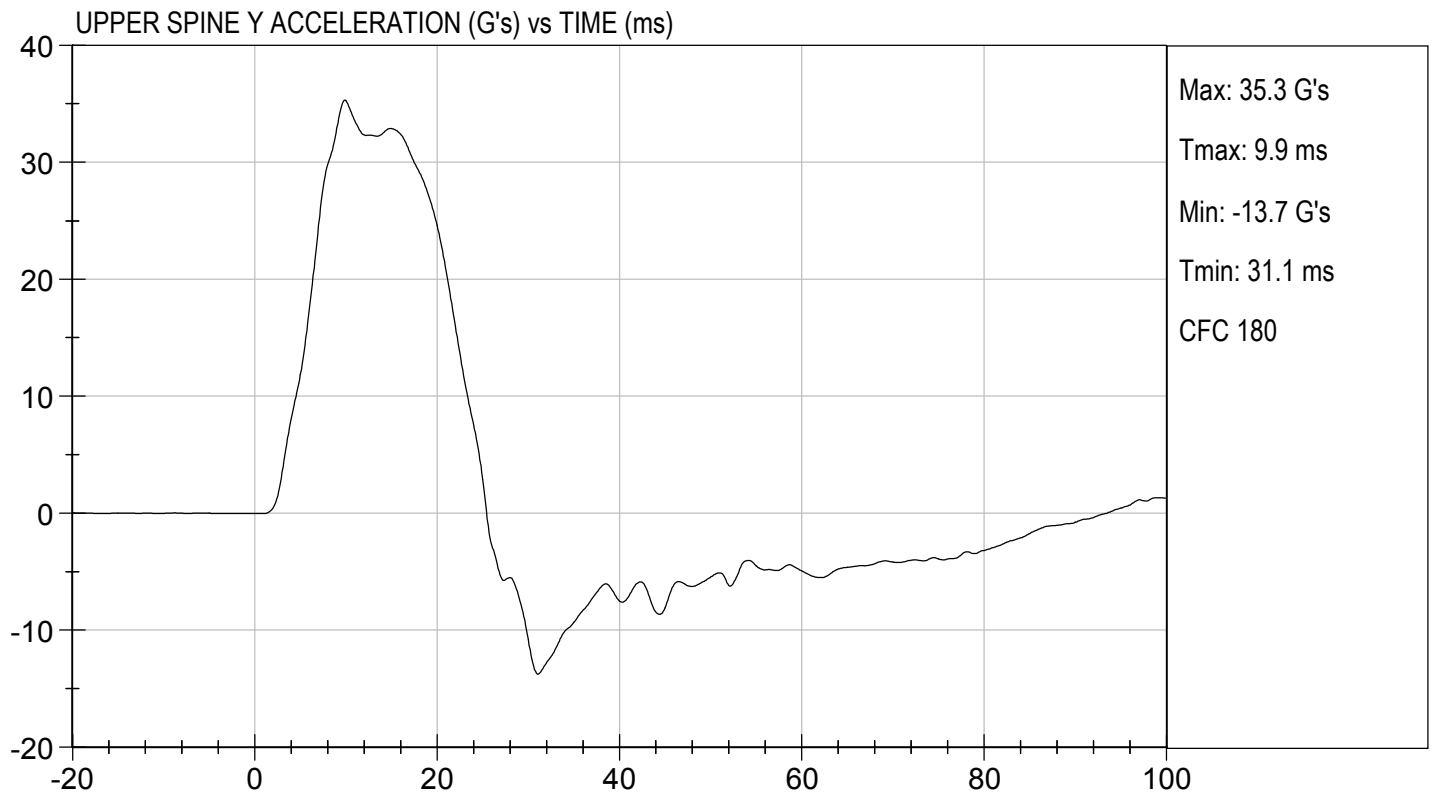
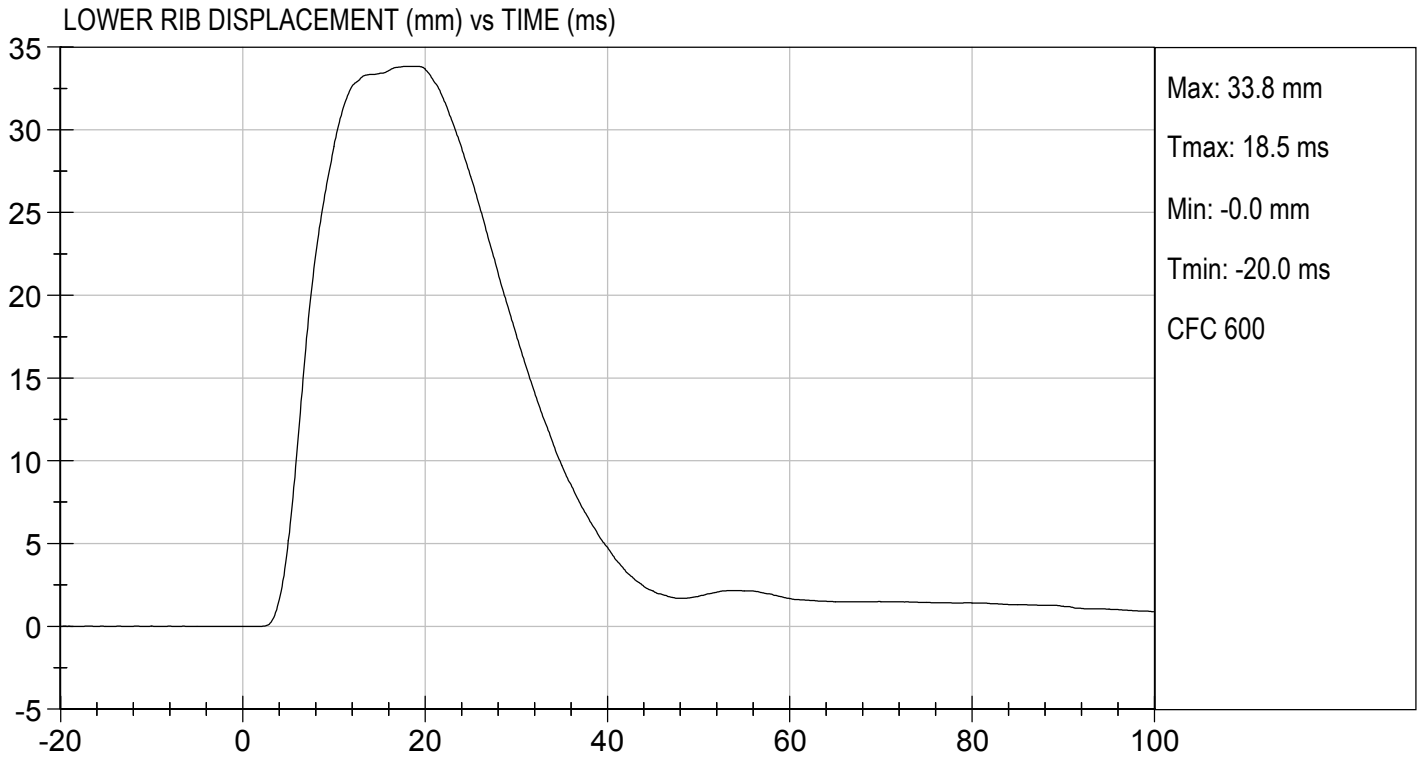

 Laboratory Technician

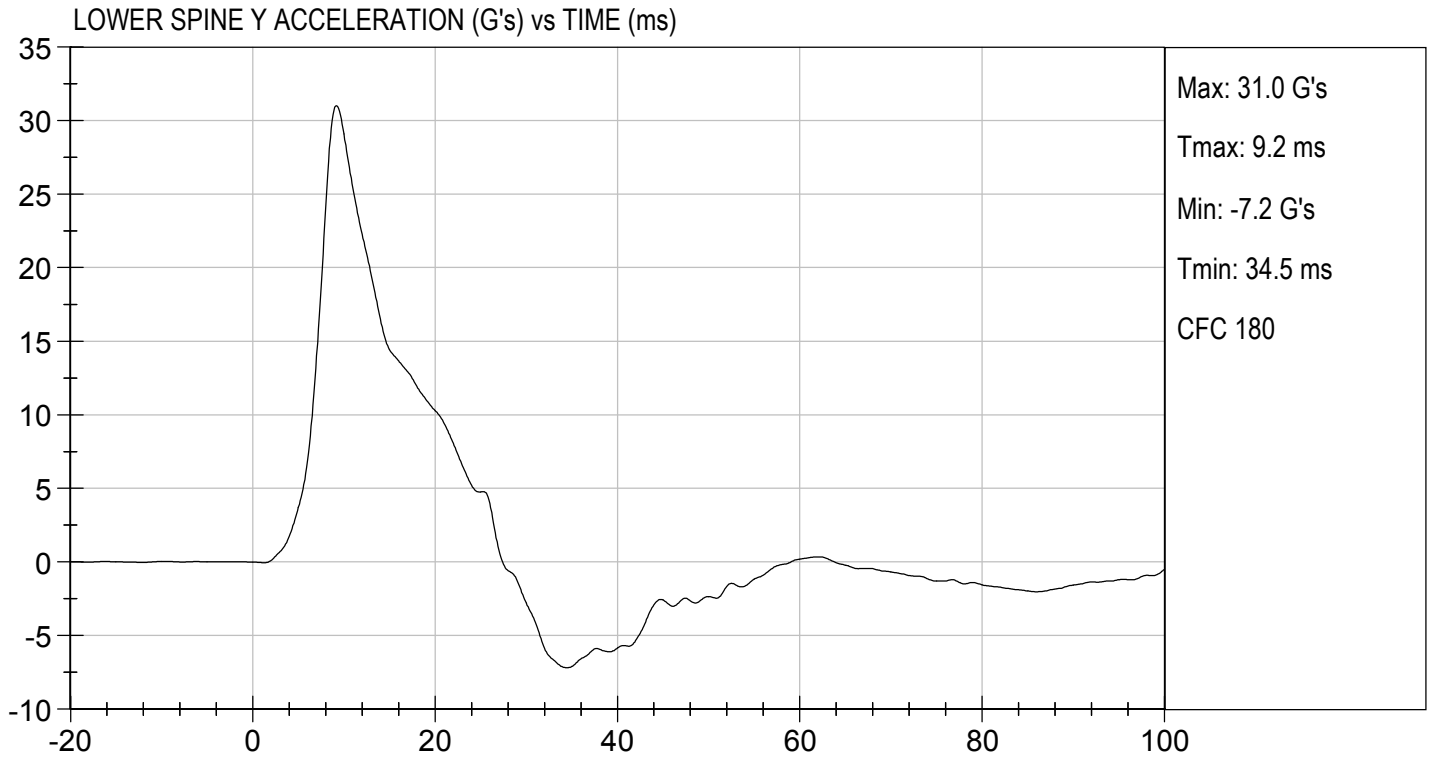
10/23/2017
 Test Date


 Approved By










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

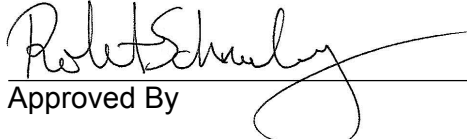
ATD Serial No: 296

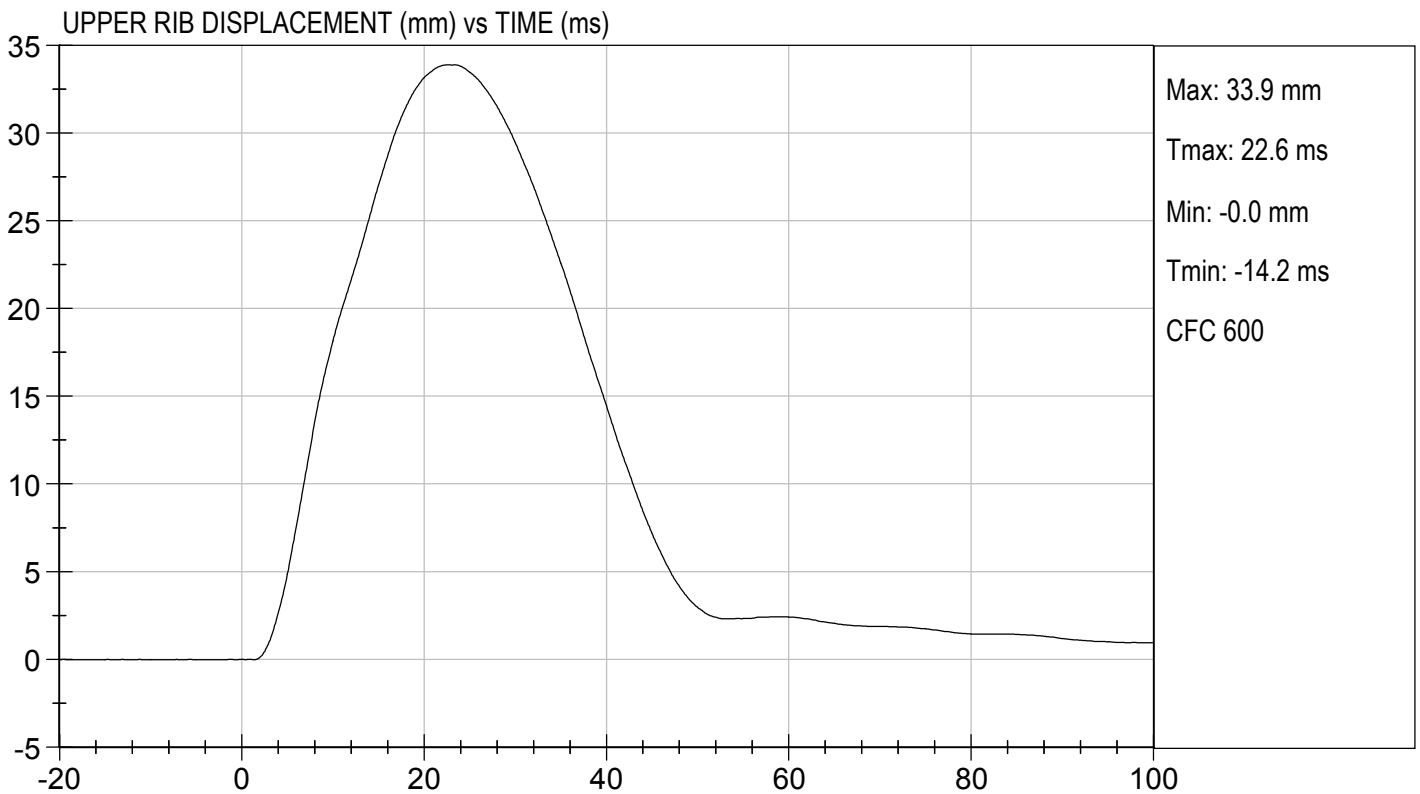
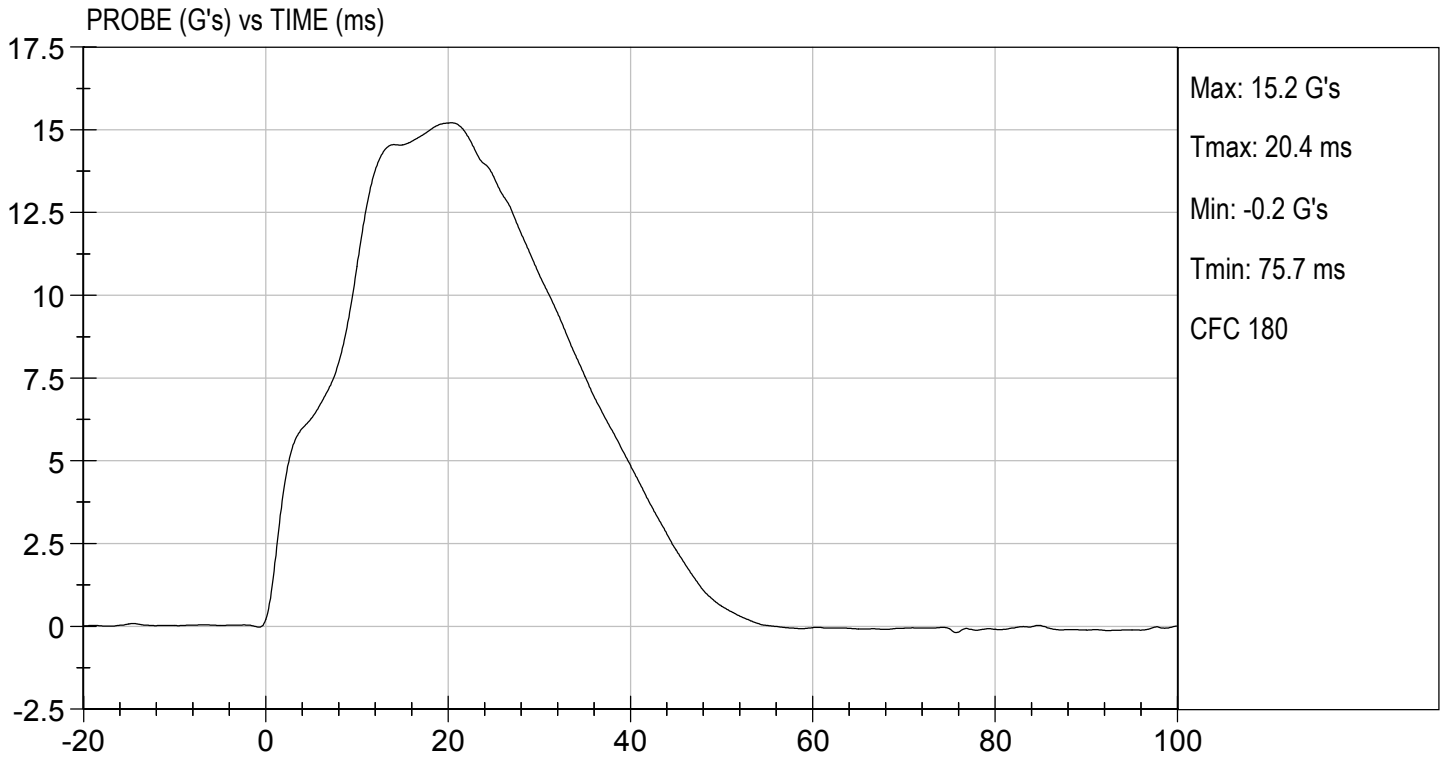
Test I.D: D173065

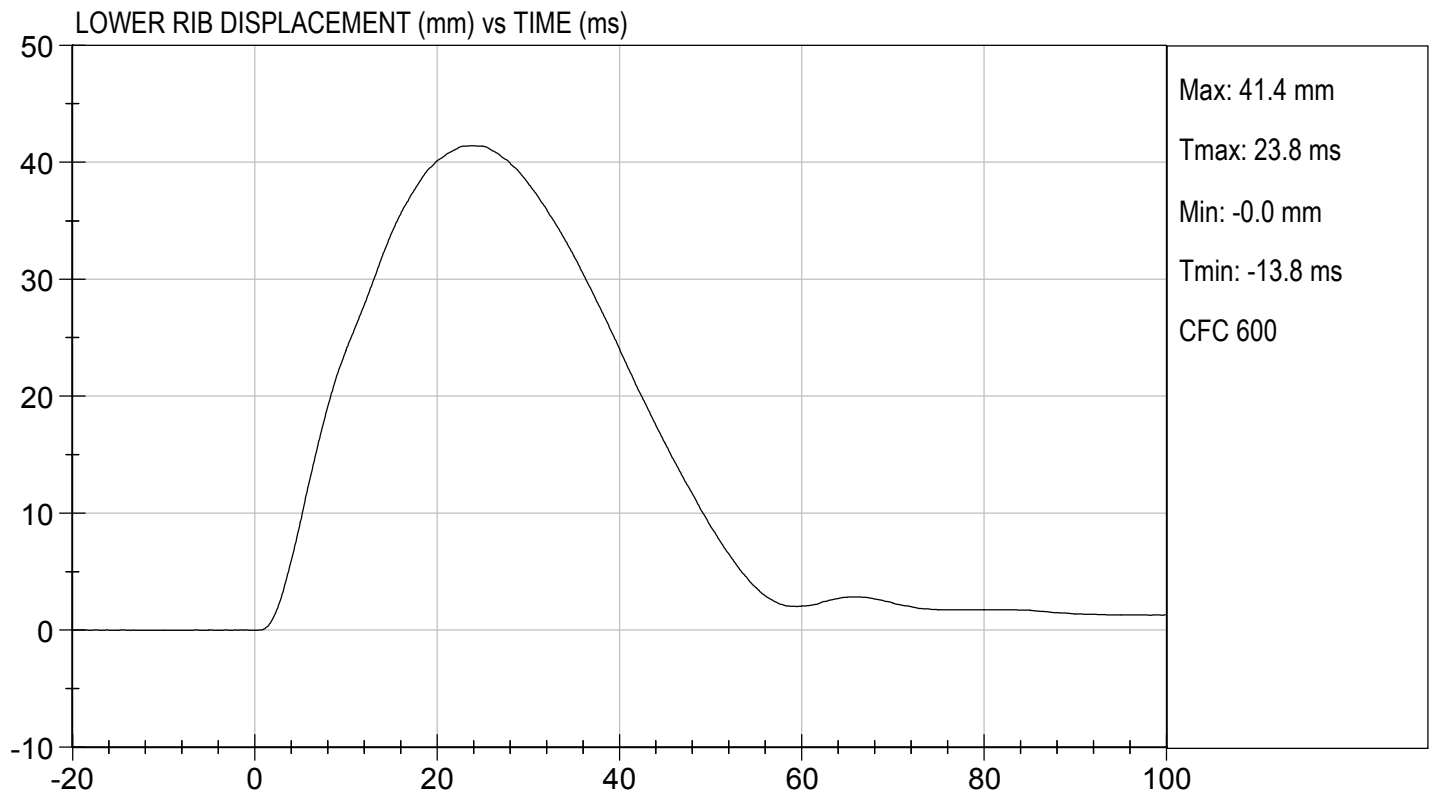
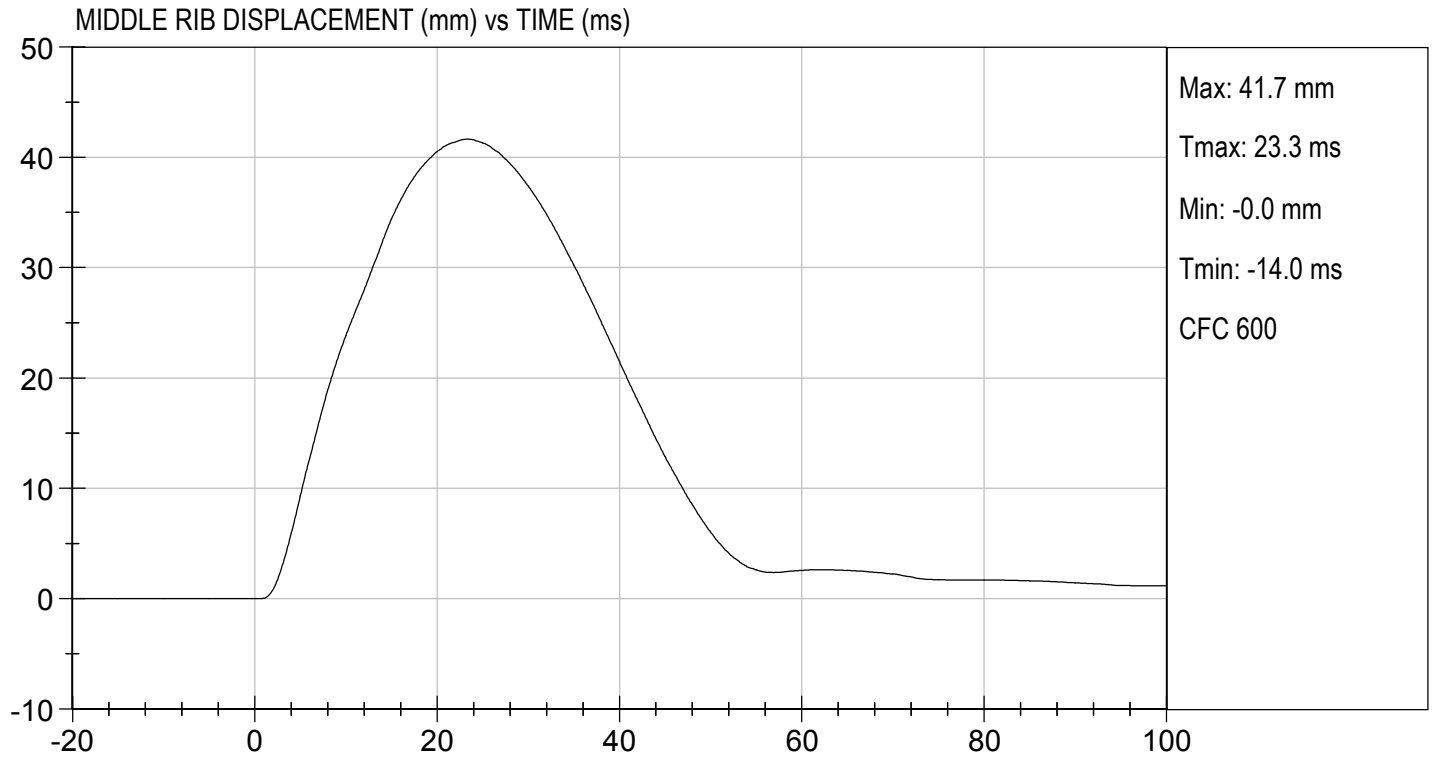
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	34	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	41	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

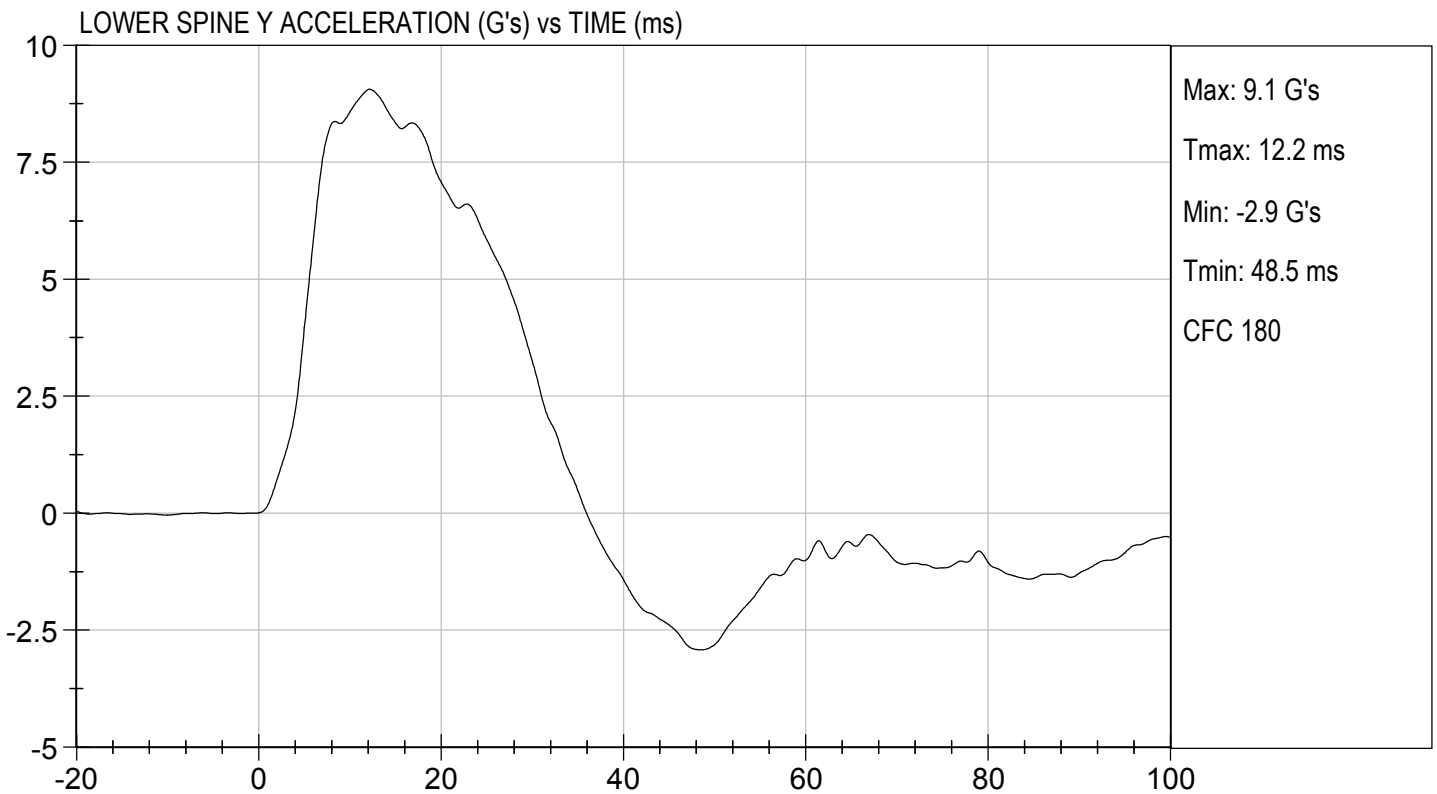
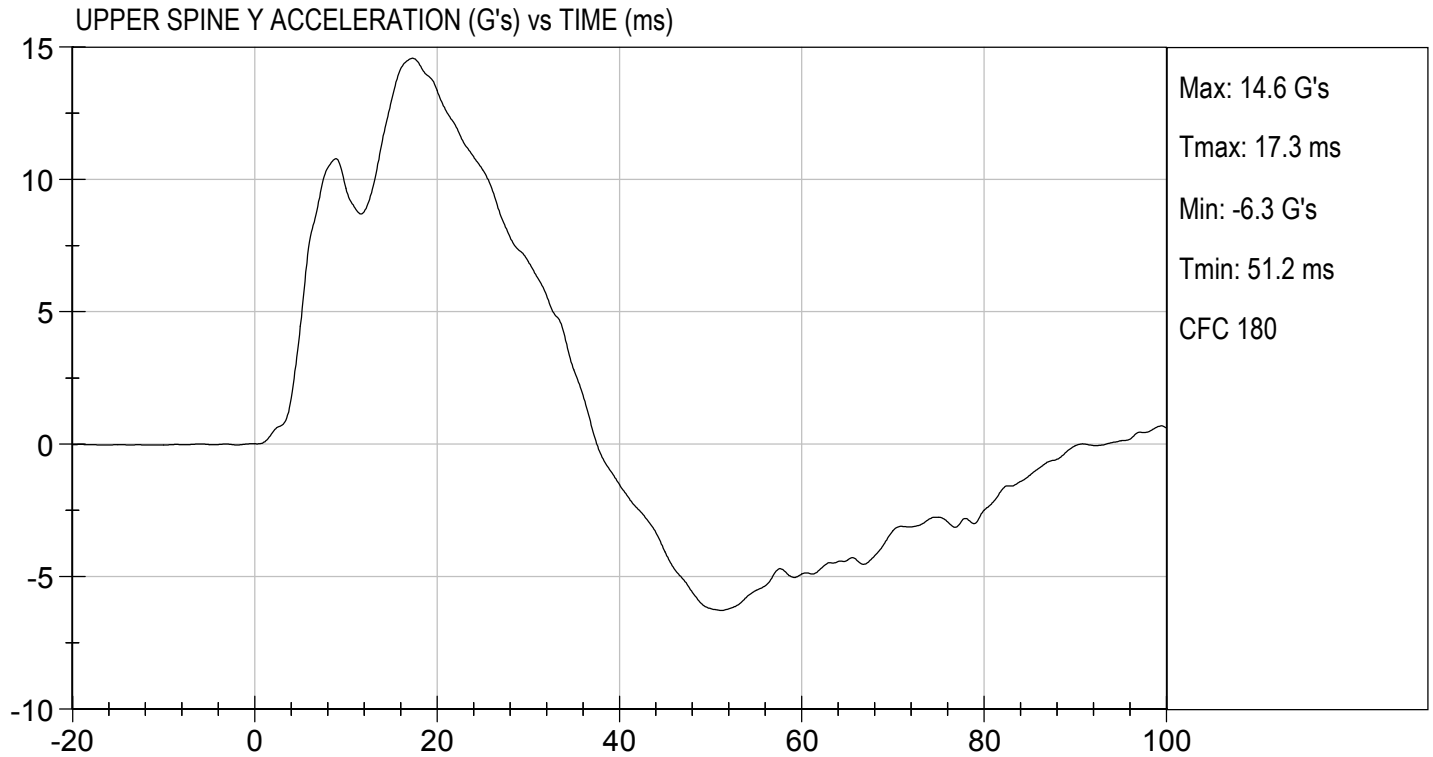

 Laboratory Technician

10/23/2017
 Test Date


 Approved By







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

ATD Serial No: 296

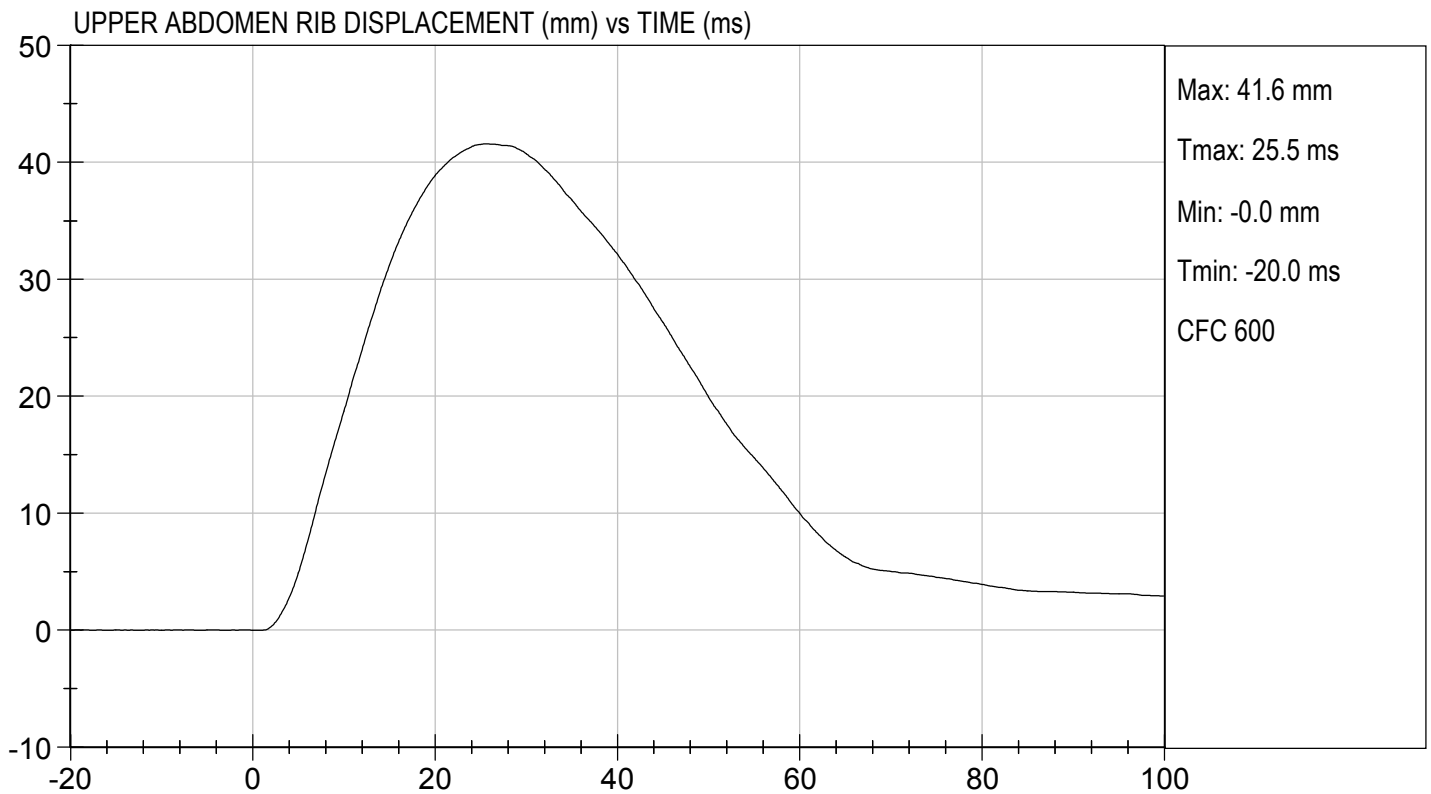
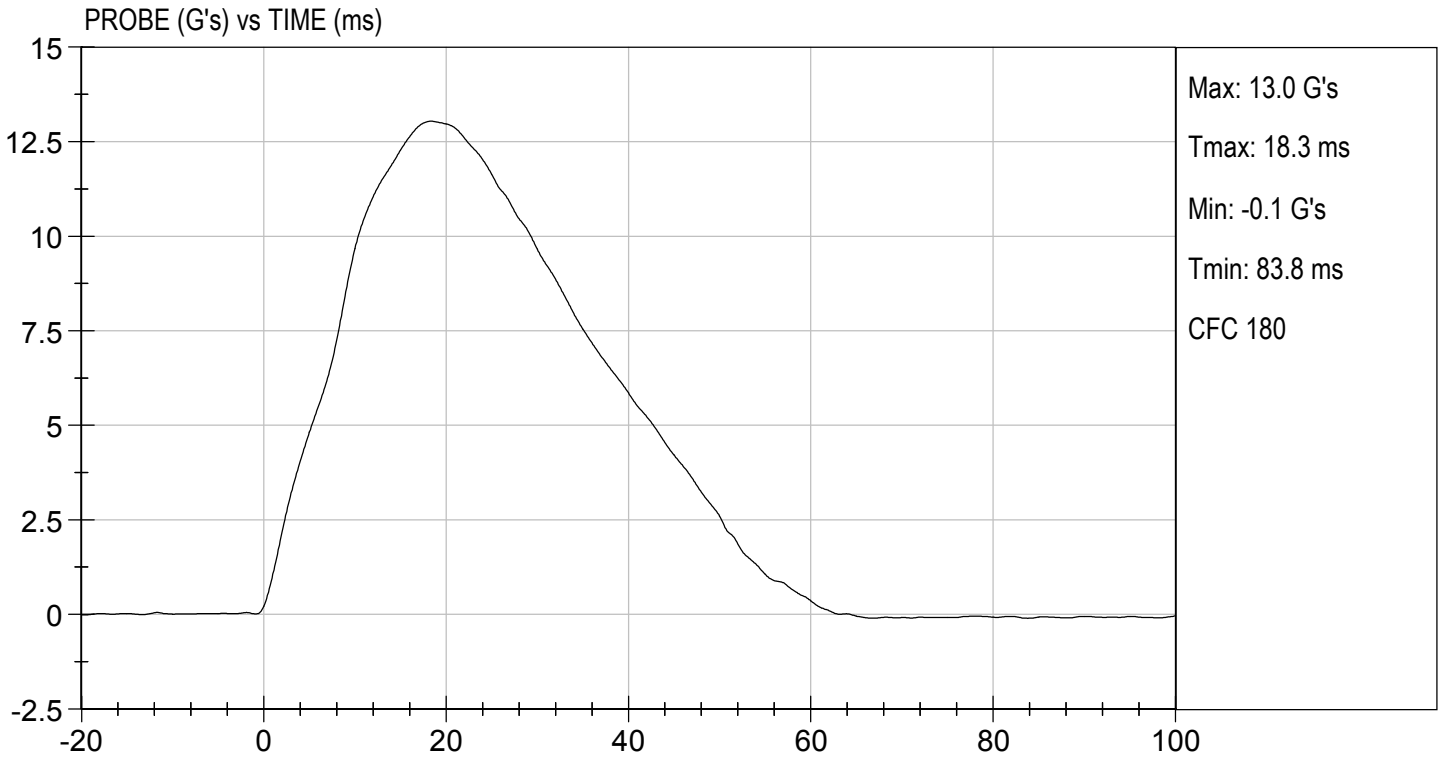
Test I.D: D173066

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	4.27	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	41	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

Danielle Redinlaugh
 Laboratory Technician

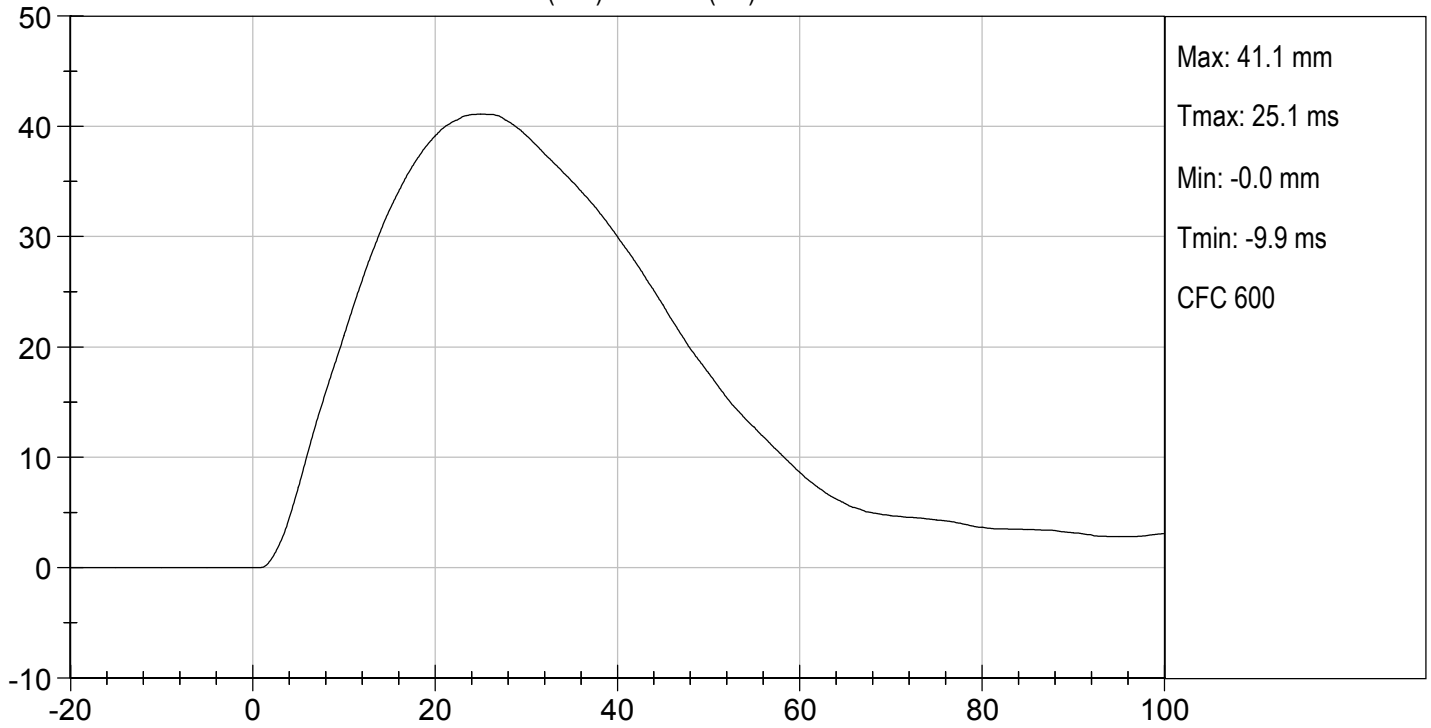
10/23/2017
 Test Date

Robert Schaub
 Approved By

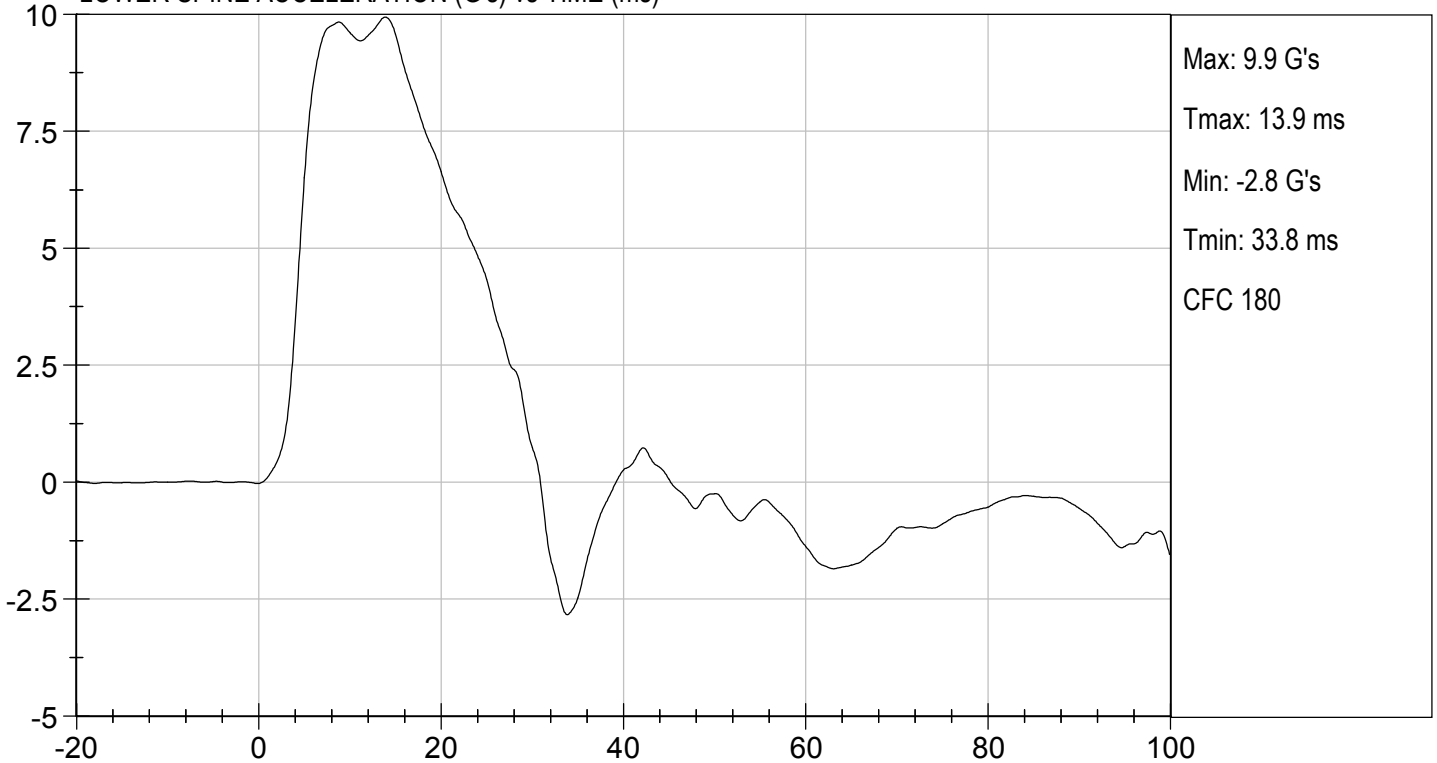




LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



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



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

ATD Serial No: 296

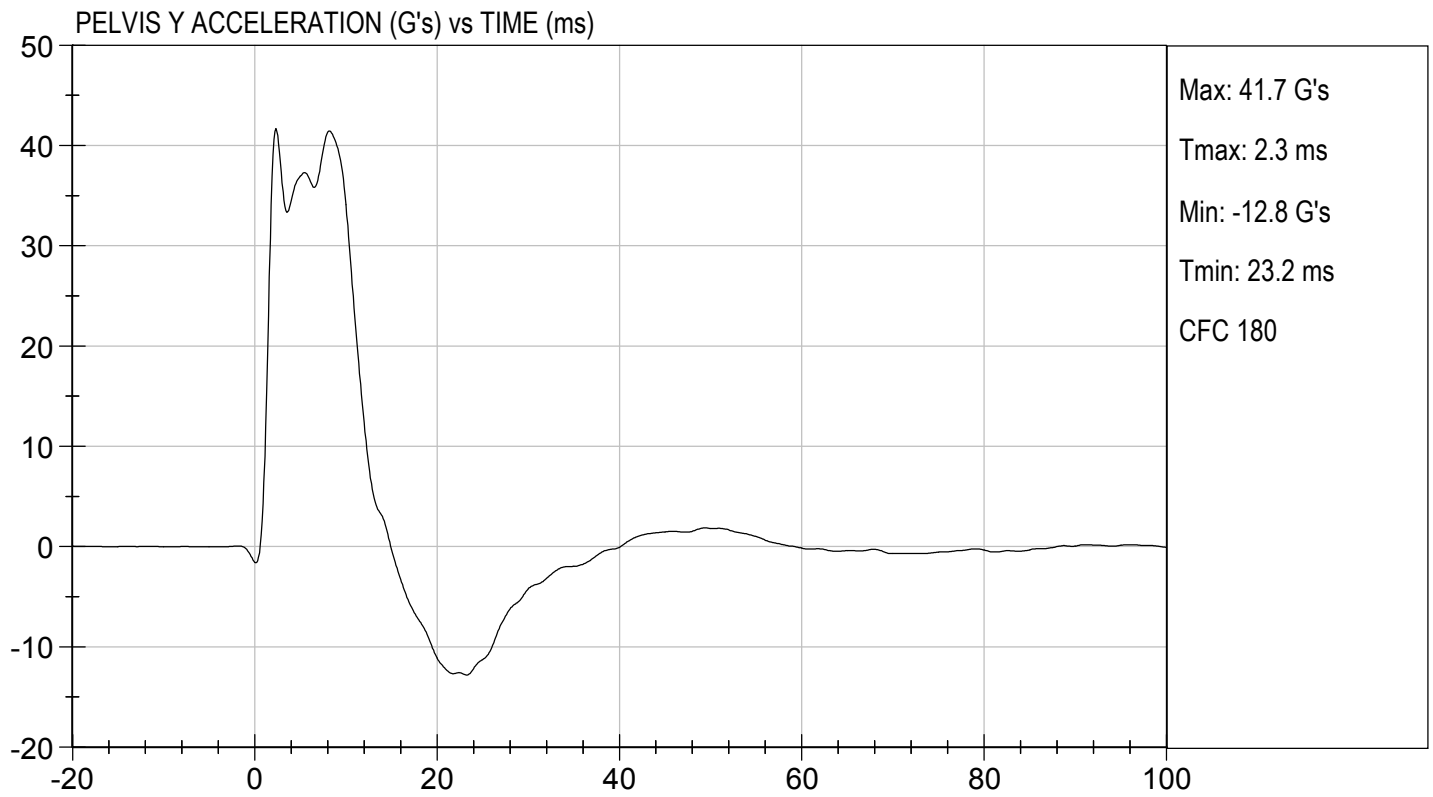
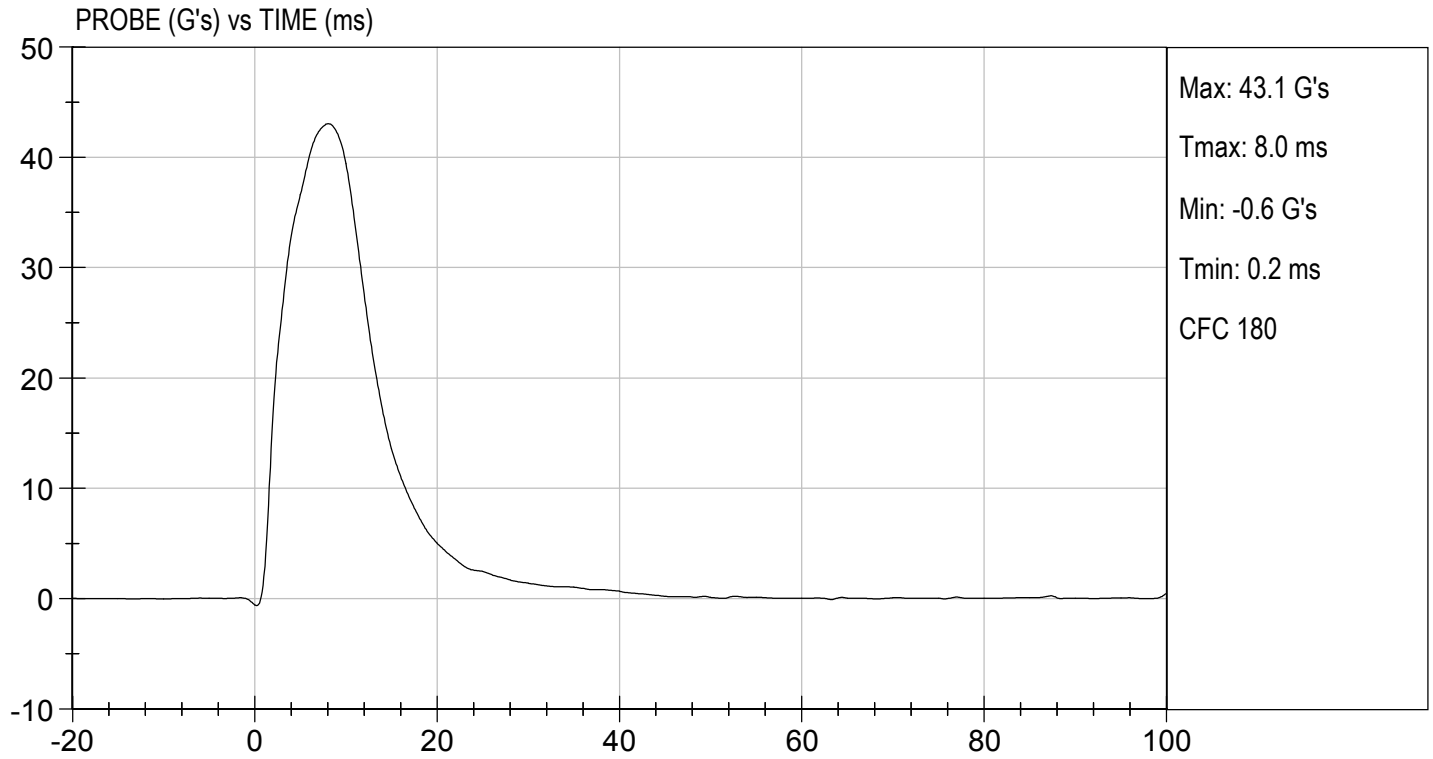
Test I.D: D173067

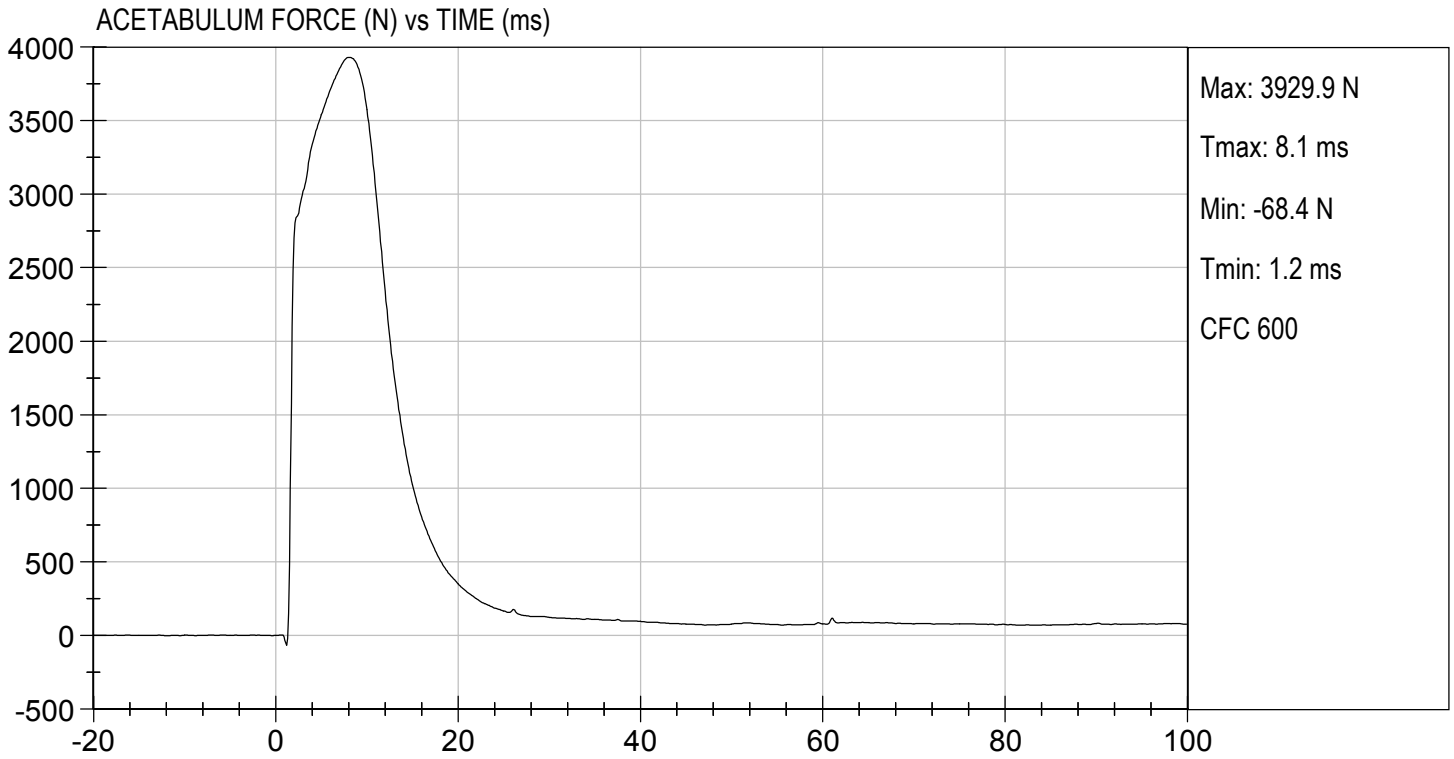
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	3,930	Pass
Overall Test Results				Pass

Danielle Redinlaugh
 Laboratory Technician

10/23/2017
 Test Date

Robert Schaub
 Approved By





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

ATD Serial No: 296

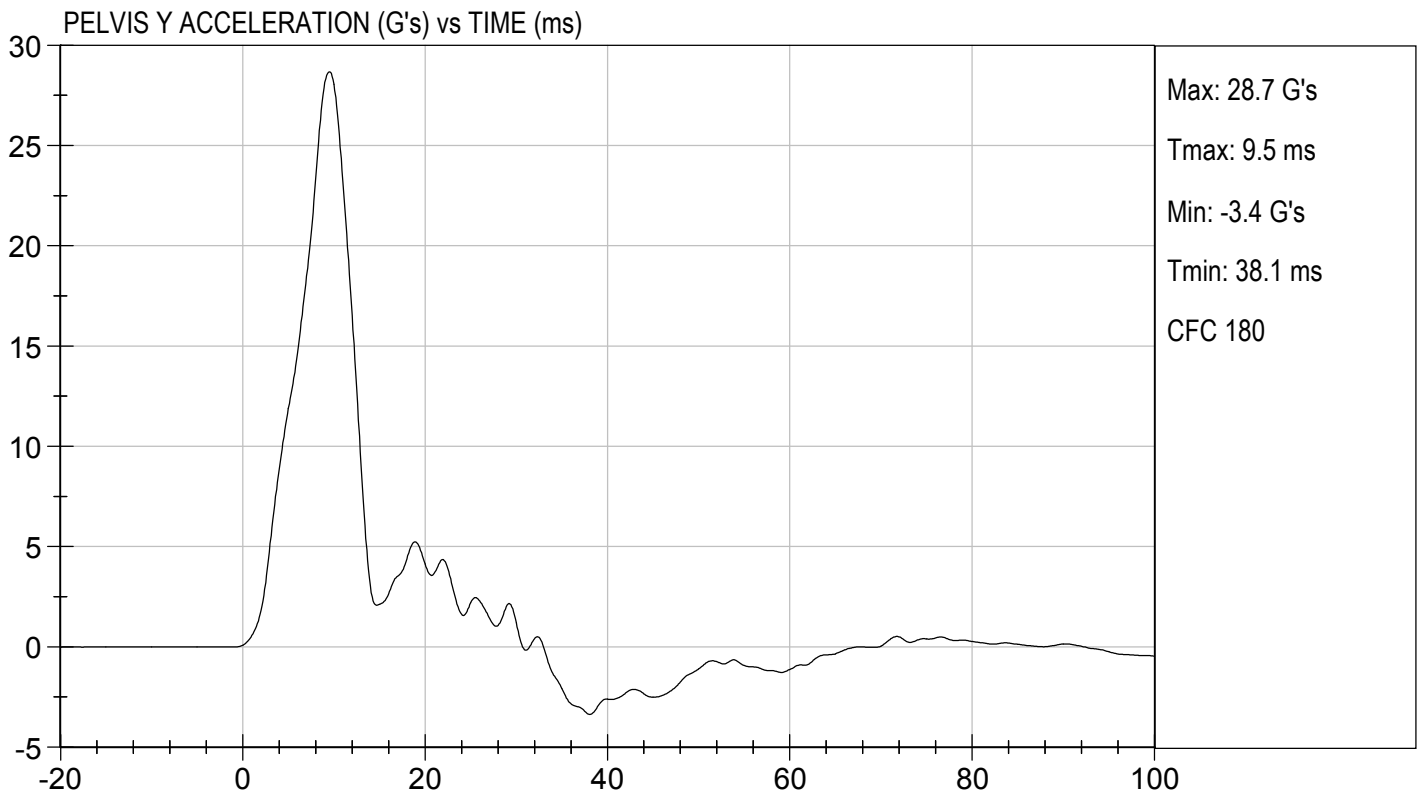
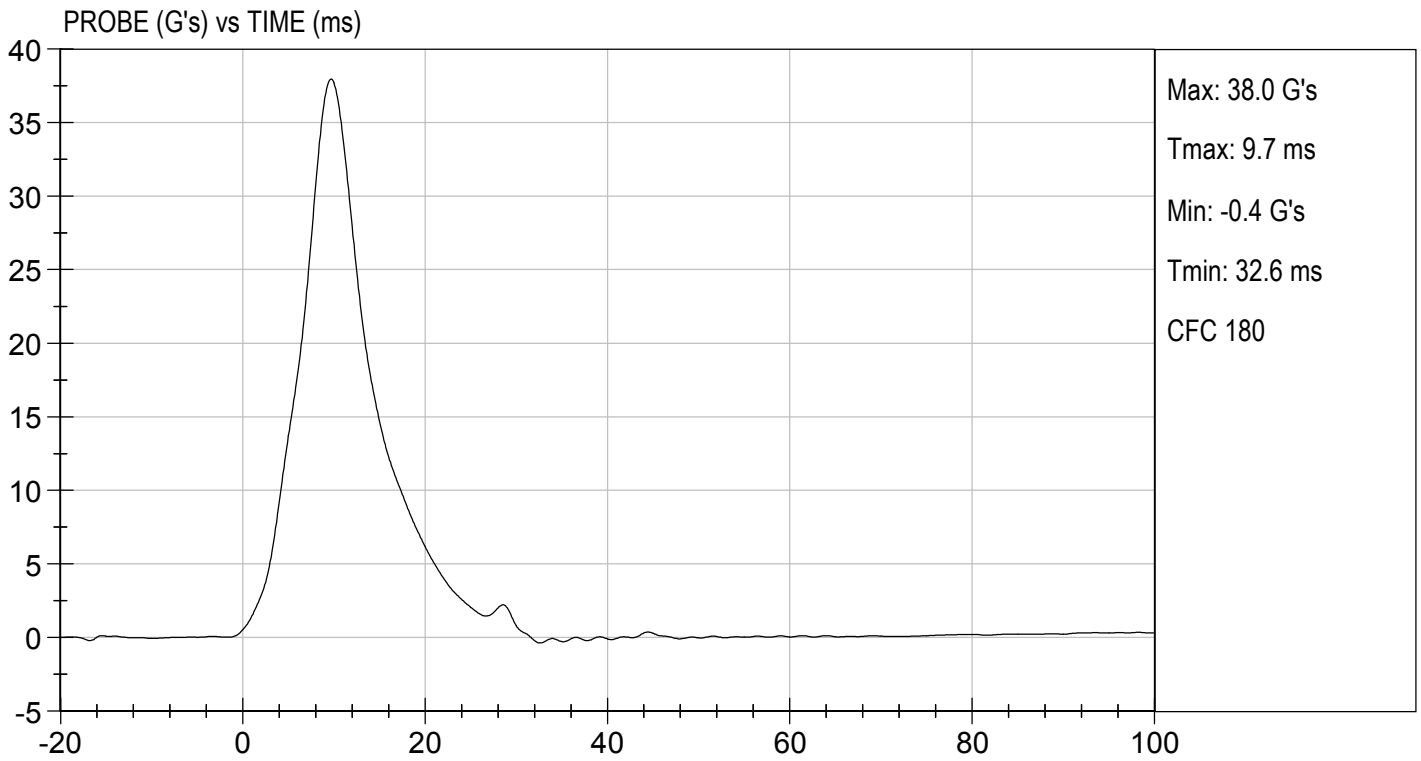
Test I.D: D173068

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	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	29	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,373	Pass
Overall Test Results				Pass

Danielle Redinlaugh
 Laboratory Technician

10/23/2017
 Test Date

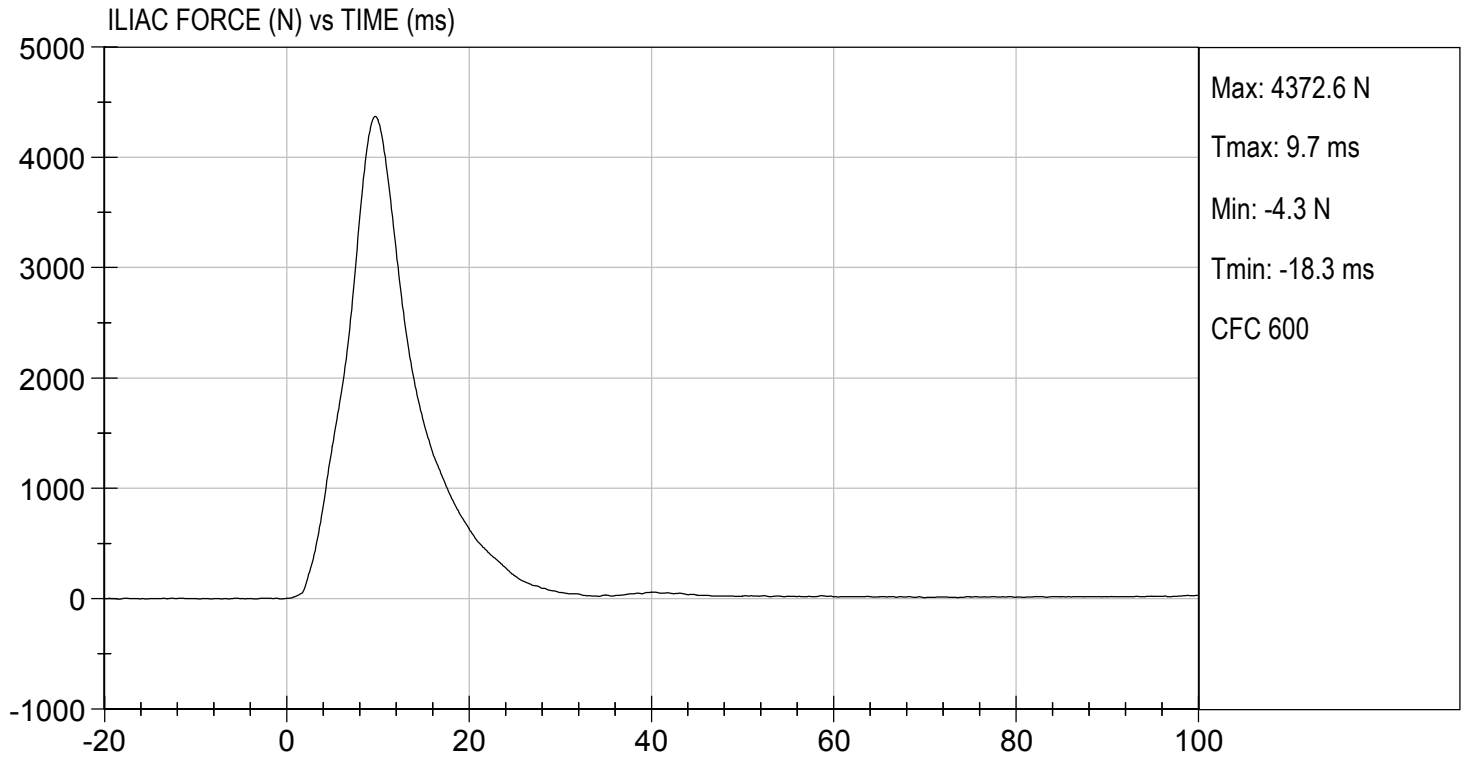
Robert Schaub
 Approved By





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

TEST DATE: 10/23/2017
TEST #: D173068



SID-IIsD External Measurements
SN: 296


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

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

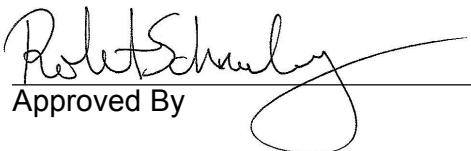
ATD Serial No: 296

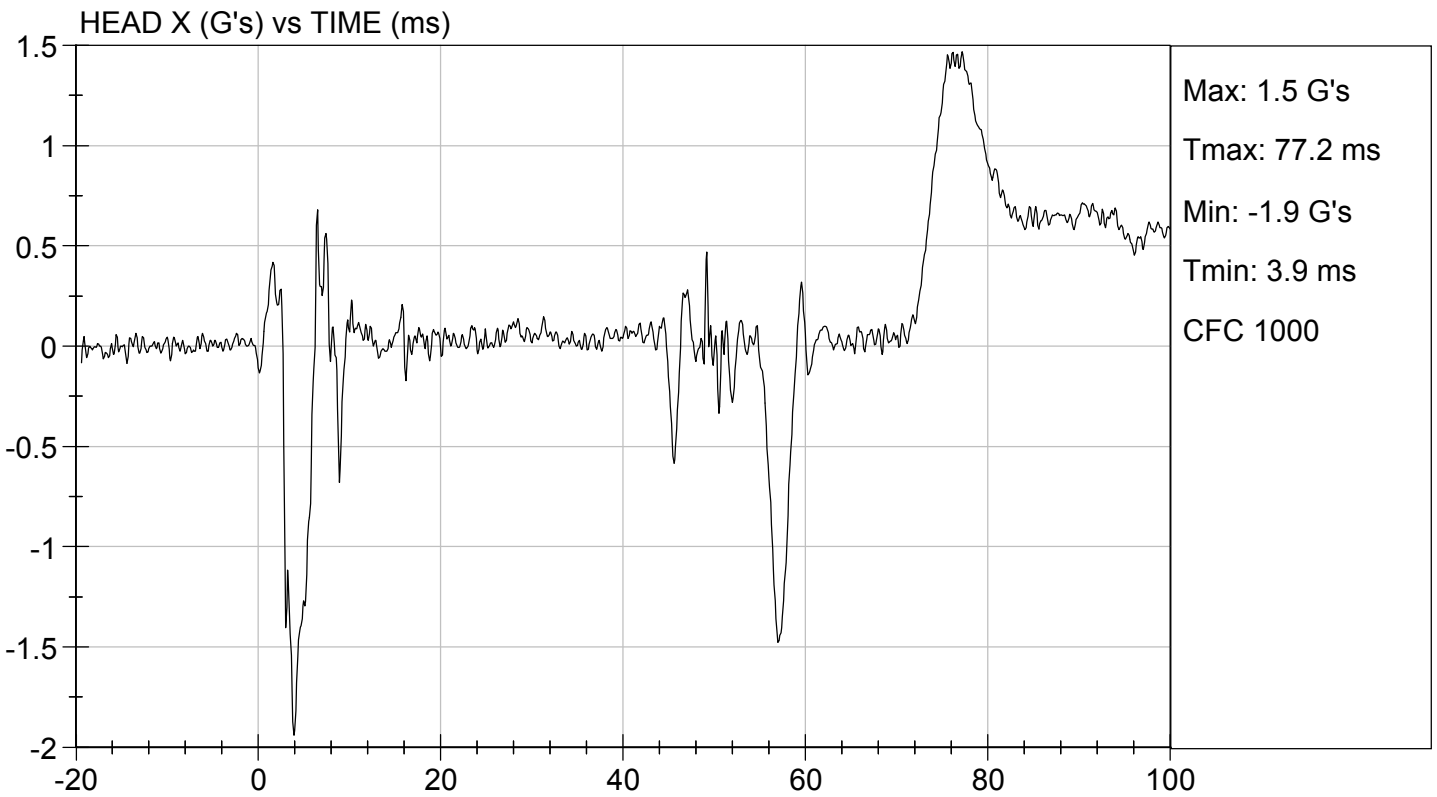
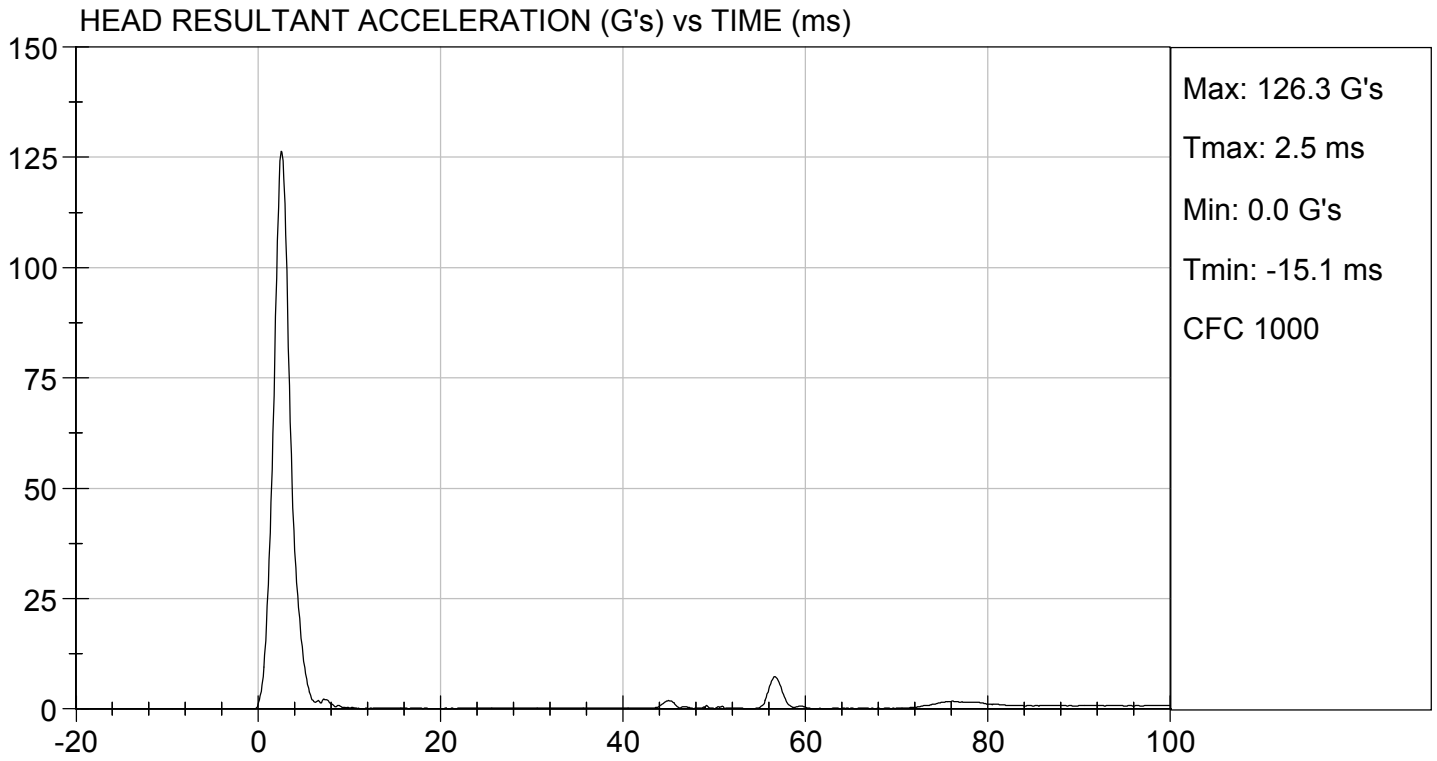
Test ID: D173221

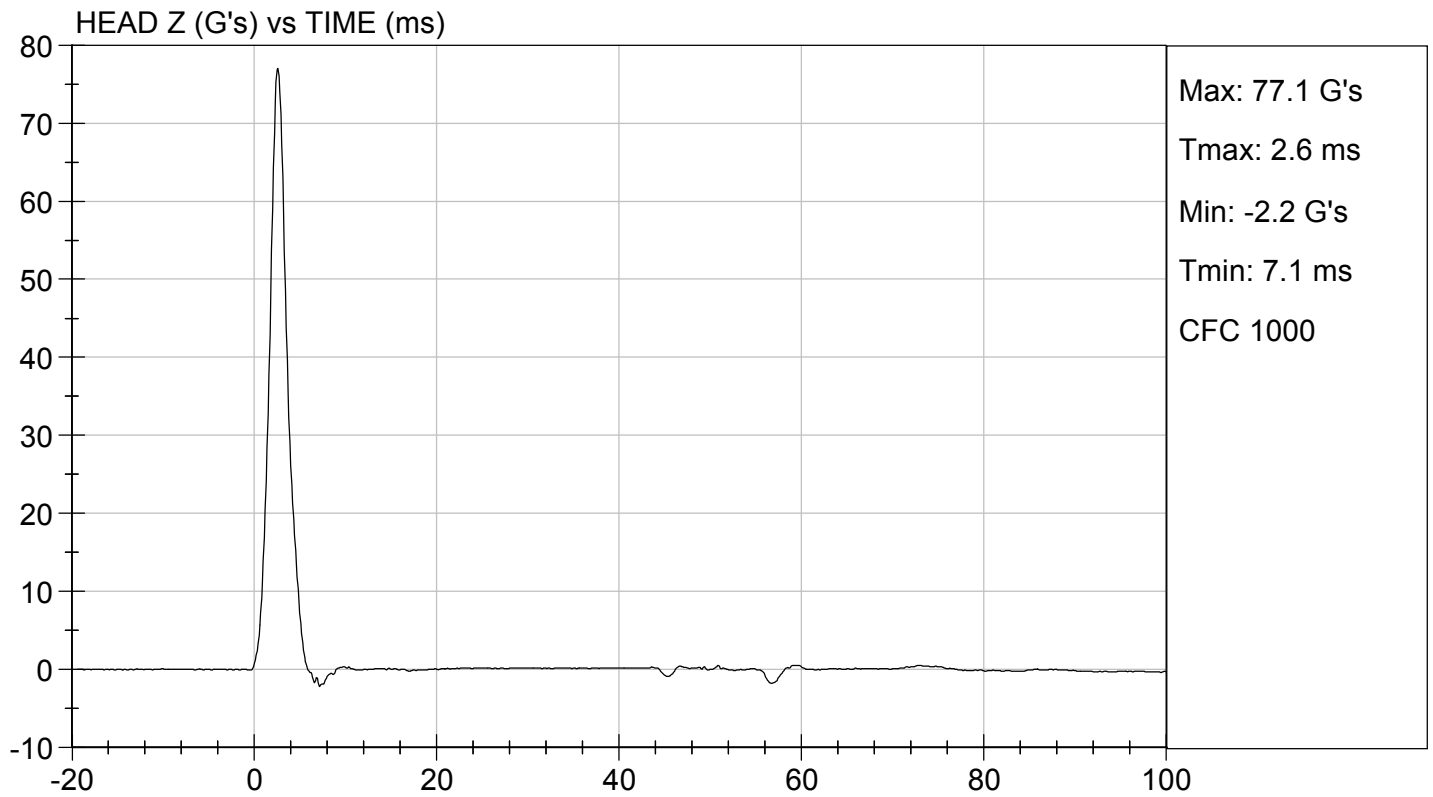
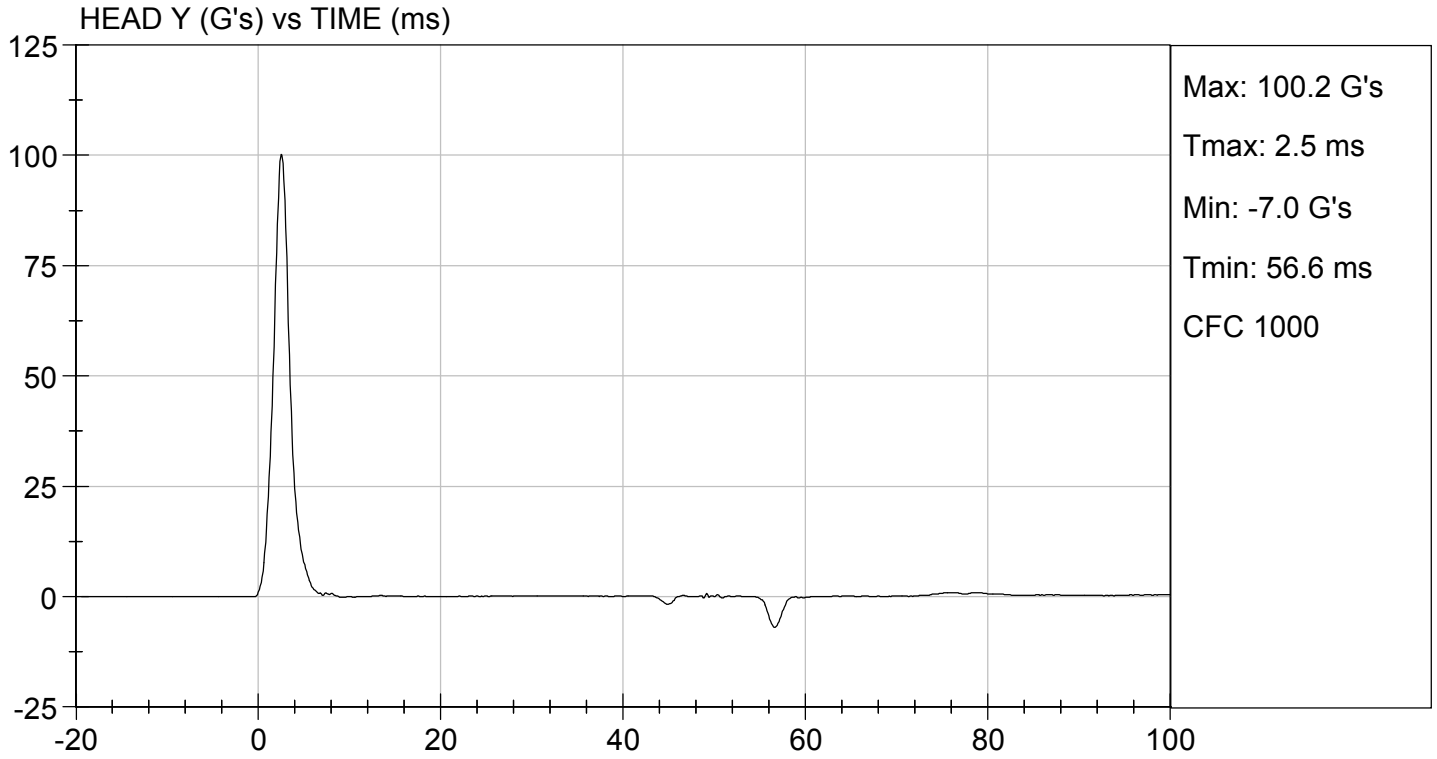
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	115 to 137	126	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-1.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass


 Laboratory Technician

11/06/2017
 Test Date


 Approved By



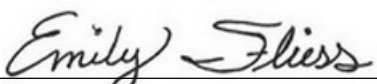


**MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY**

ATD Serial No: 306

Test I.D.: D173222

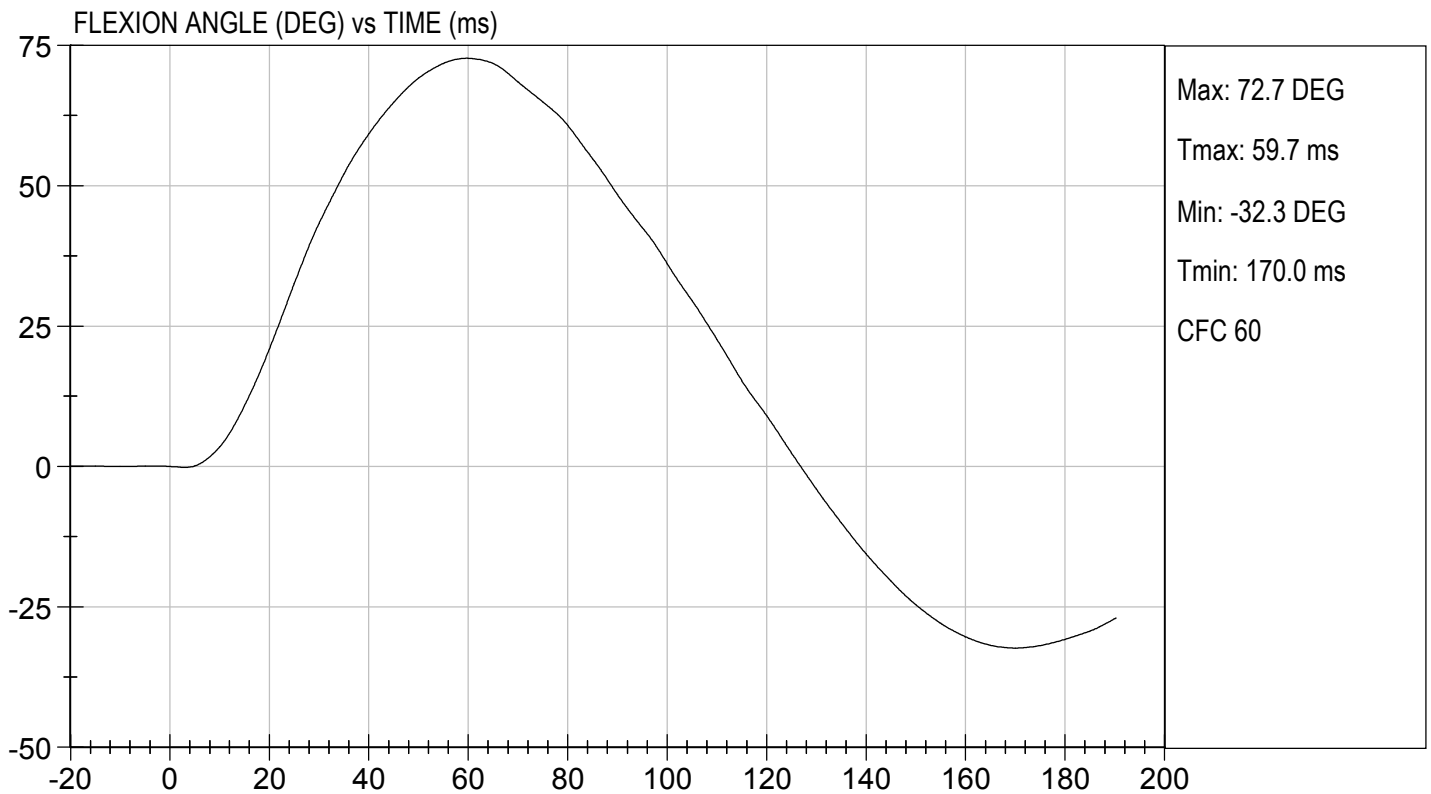
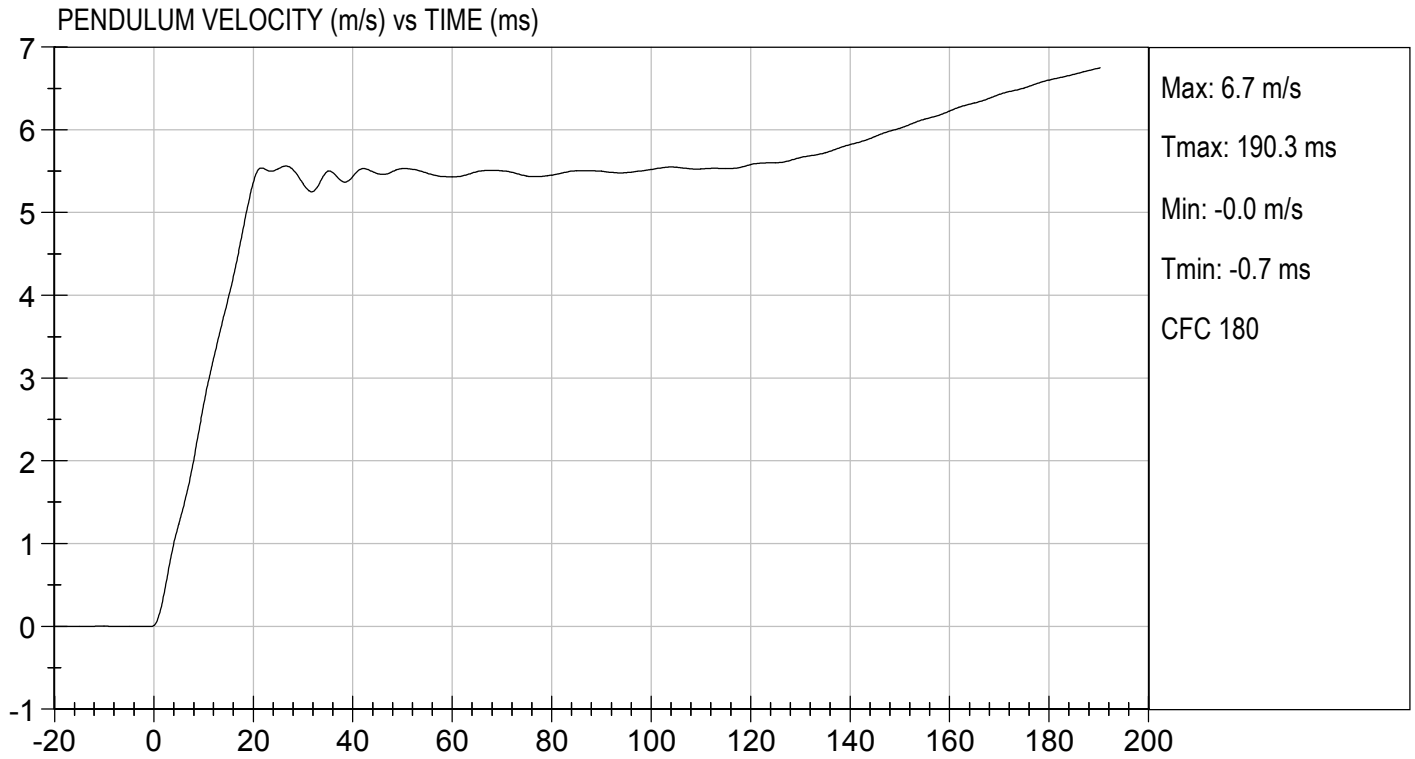
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	21.8	Pass	
Humidity	%	10 to 70	30	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.58	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.68	Pass
	15 ms	m/s	3.30 to 4.10	3.97	Pass
	20 ms	m/s	4.40 to 5.40	5.37	Pass
	25 ms	m/s	5.40 to 6.10	5.53	Pass
	25-100 ms	m/s	5.50 to 6.20	5.56	Pass
Maximum D-Plane Rotation	deg	71 to 81	73	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	60	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-42	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	111	Pass	
Overall Test Results				Pass	

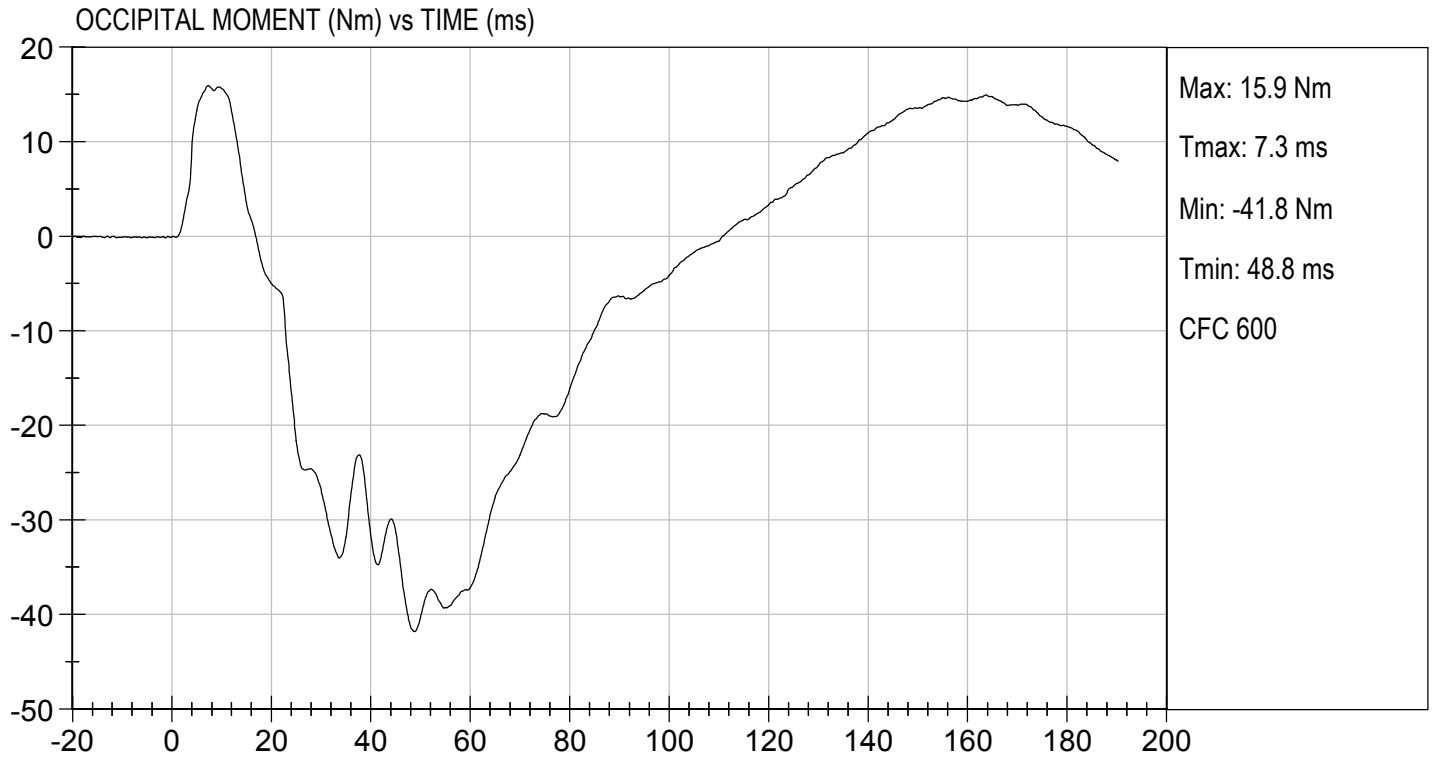

Laboratory Technician

11/06/2017

Test Date


Approved By





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

ATD Serial No: 296

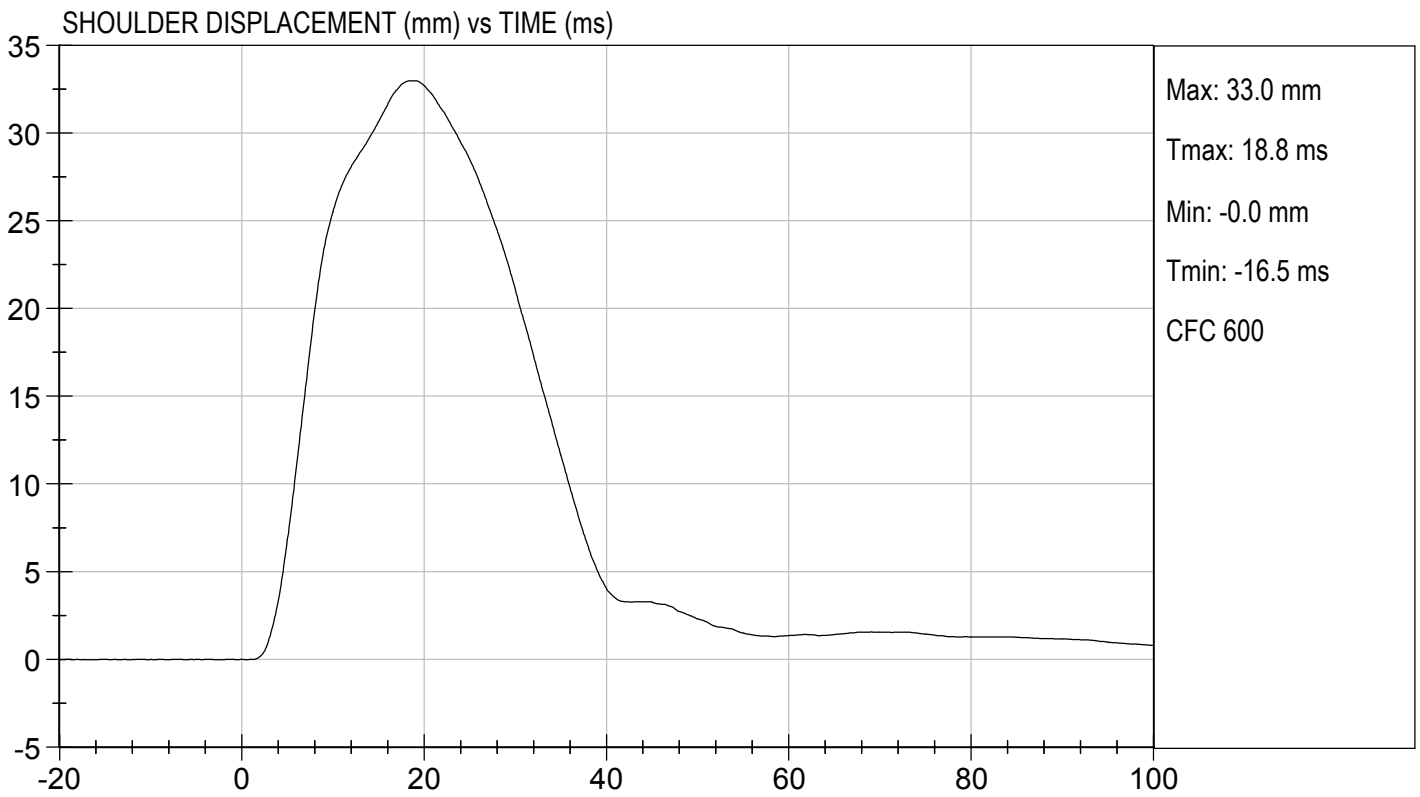
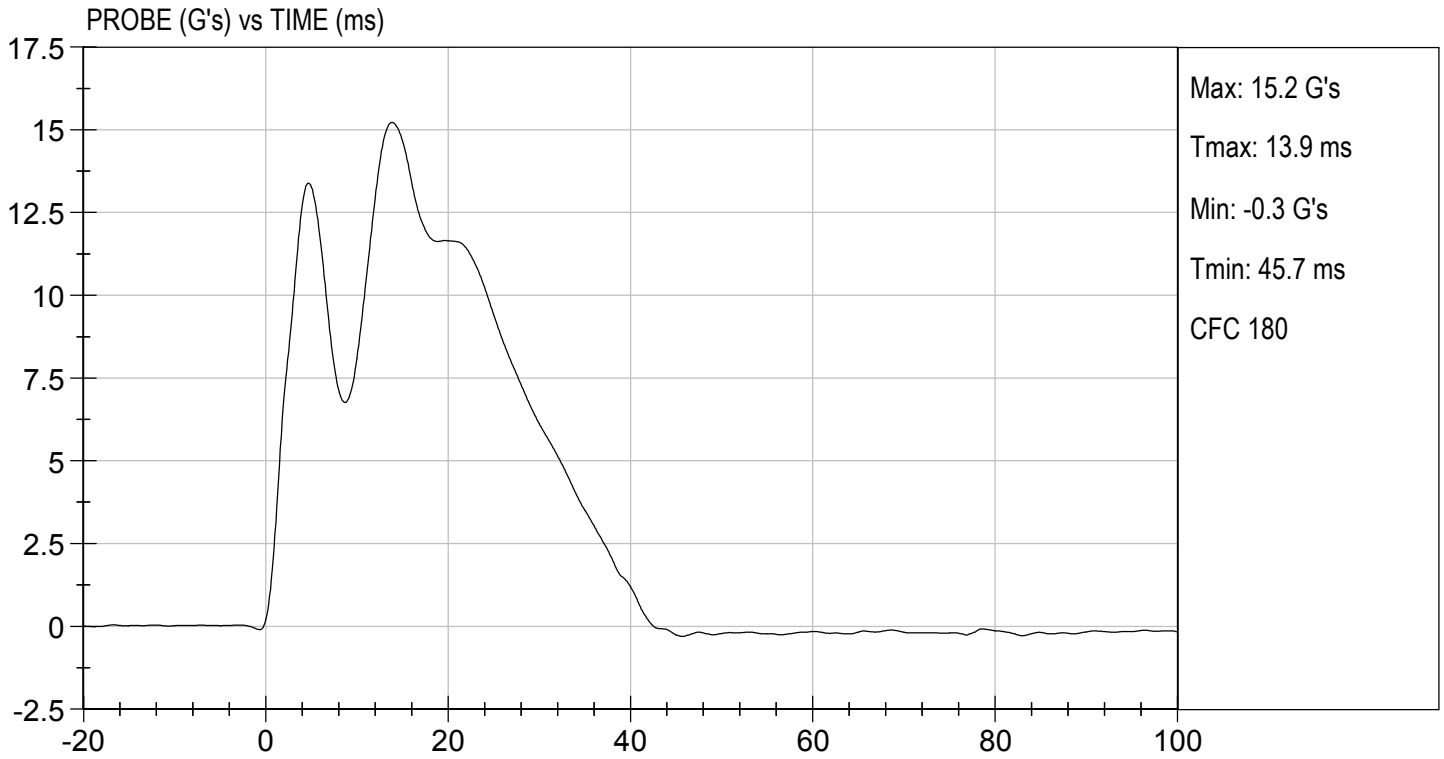
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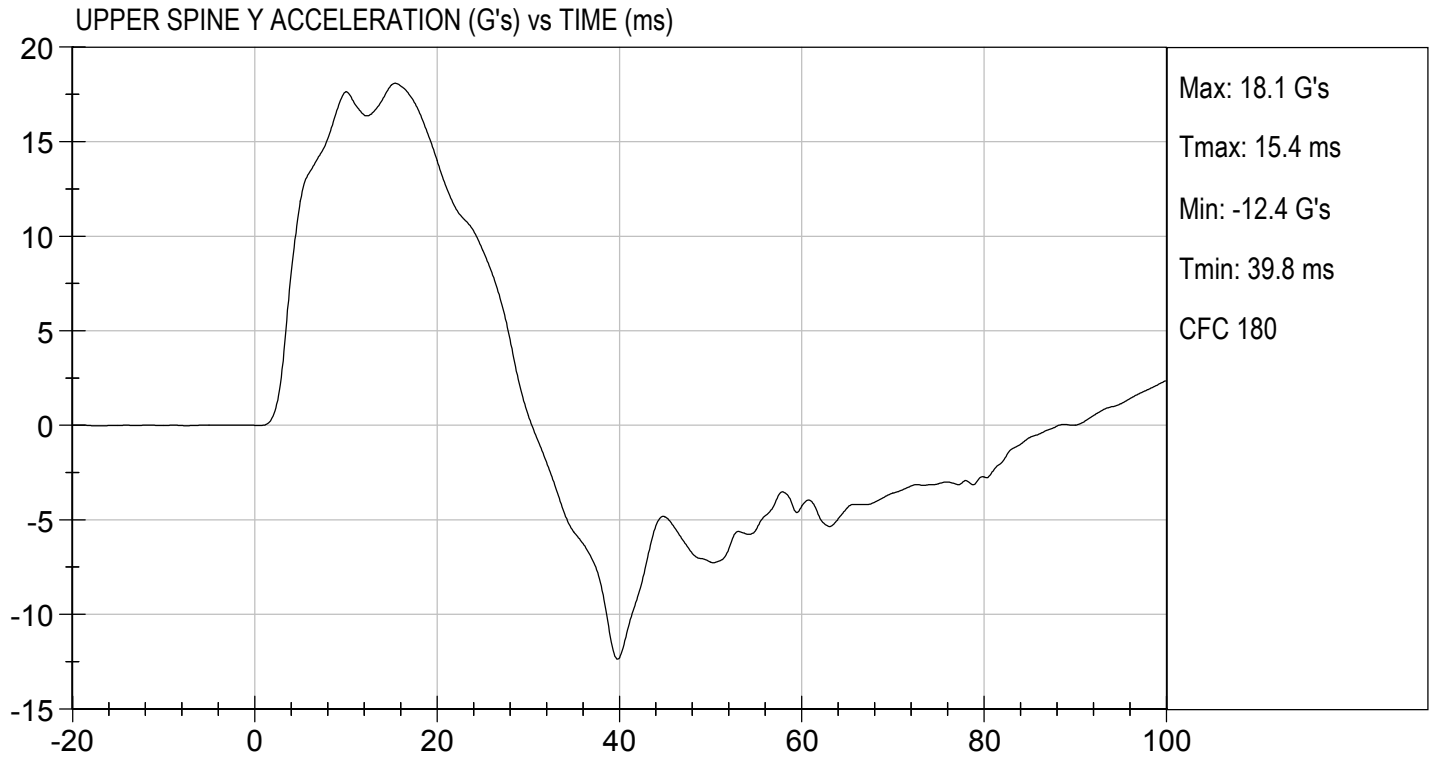
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	33	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass

Danielle Redinlaugh
Laboratory Technician

11/06/2017
Test Date

Robert Schaub
Approved By



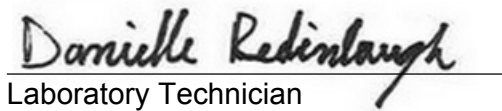


**MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY**


ATD Serial No: 296

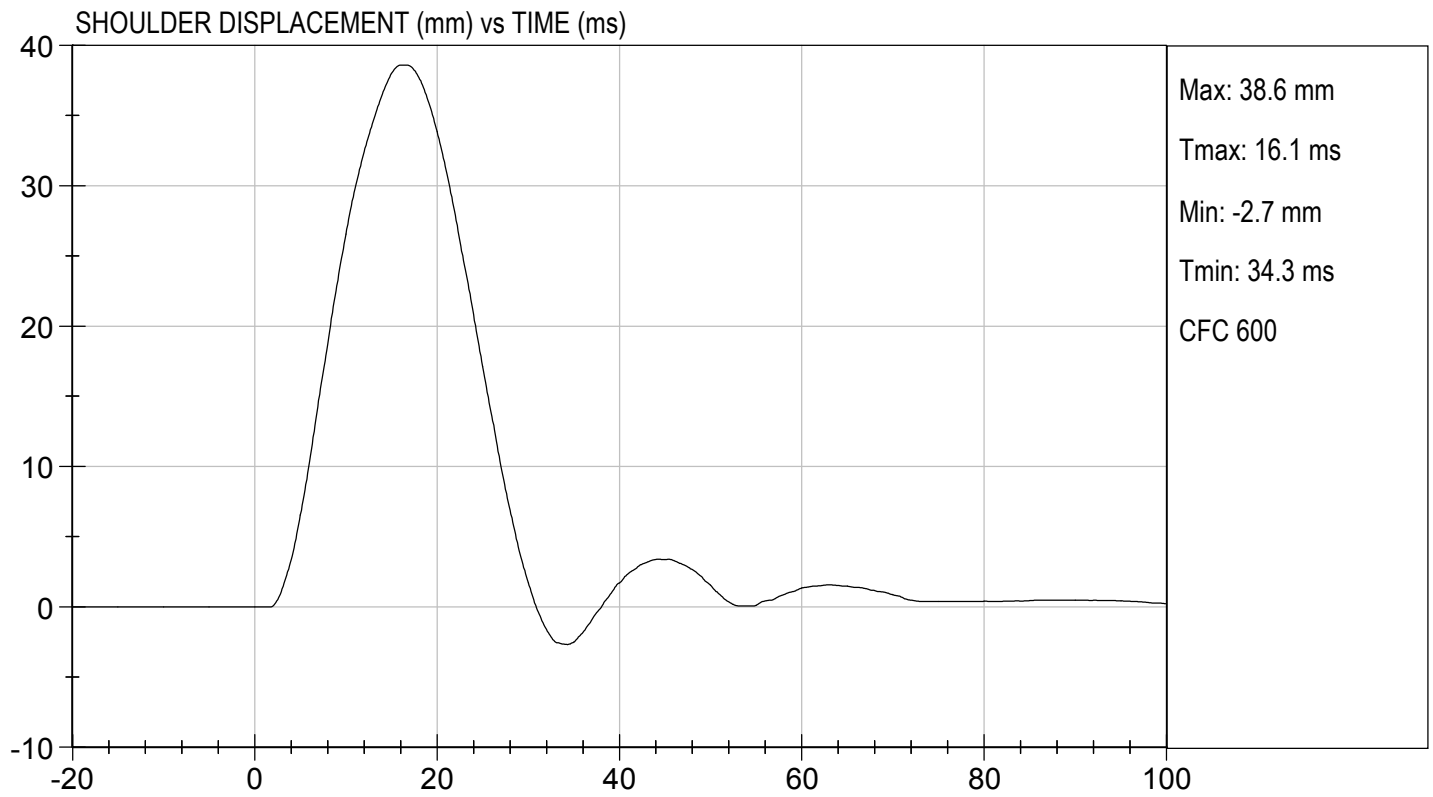
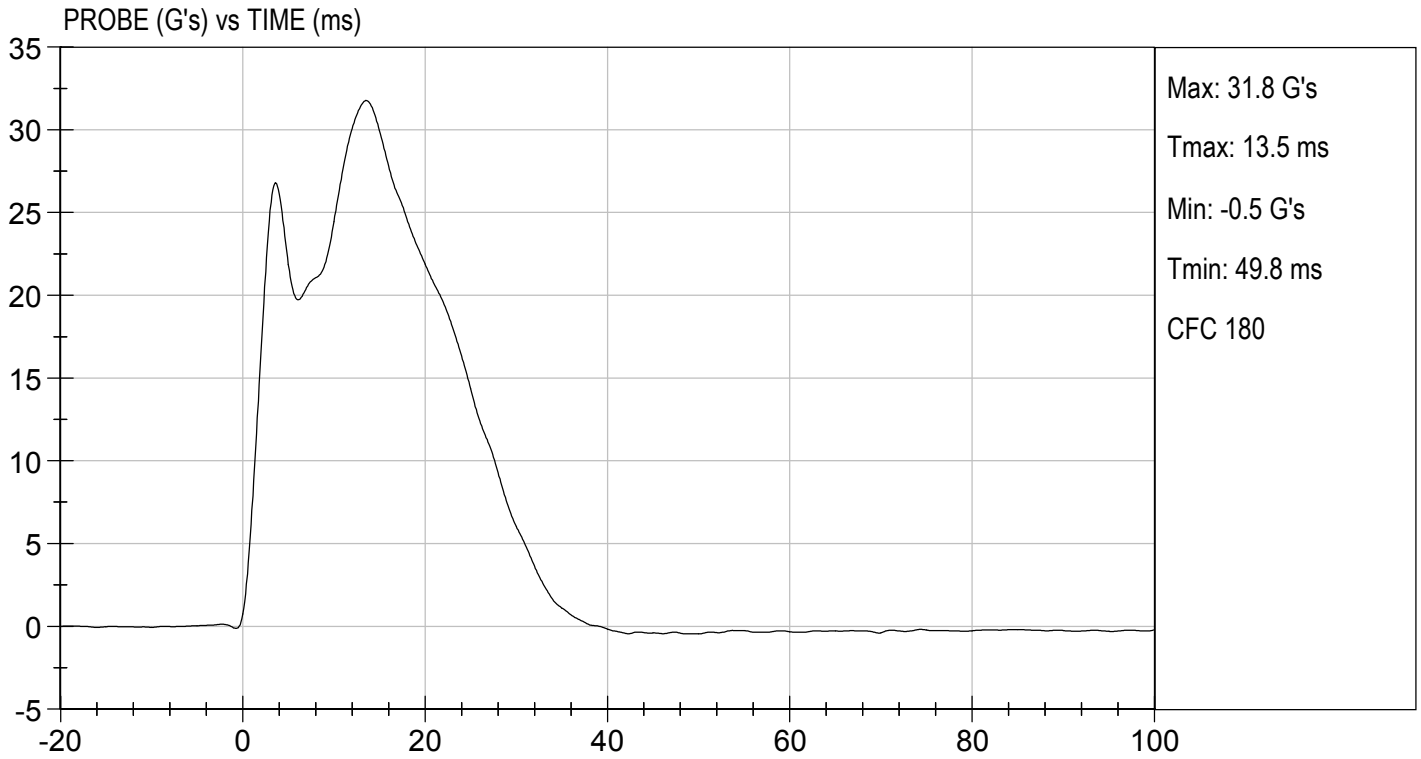
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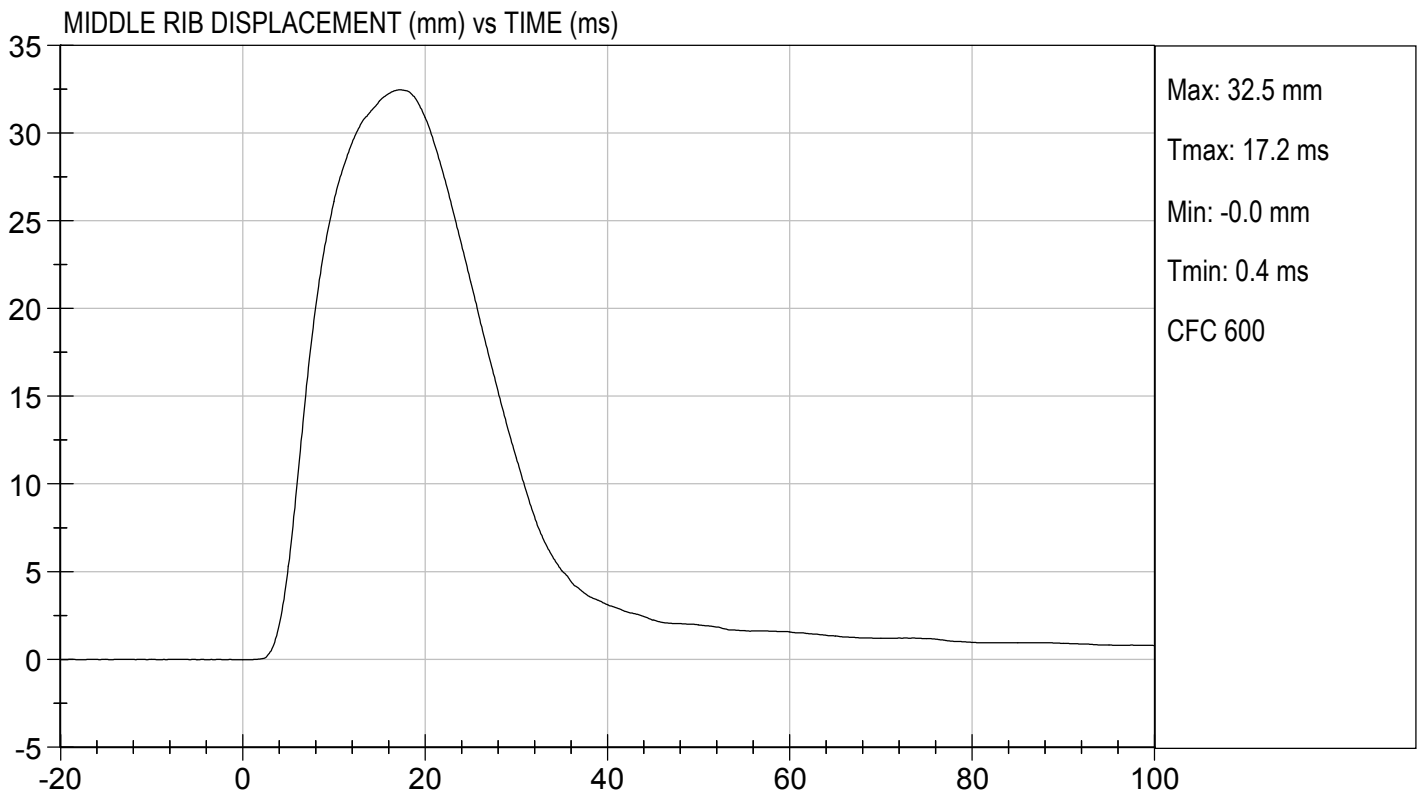
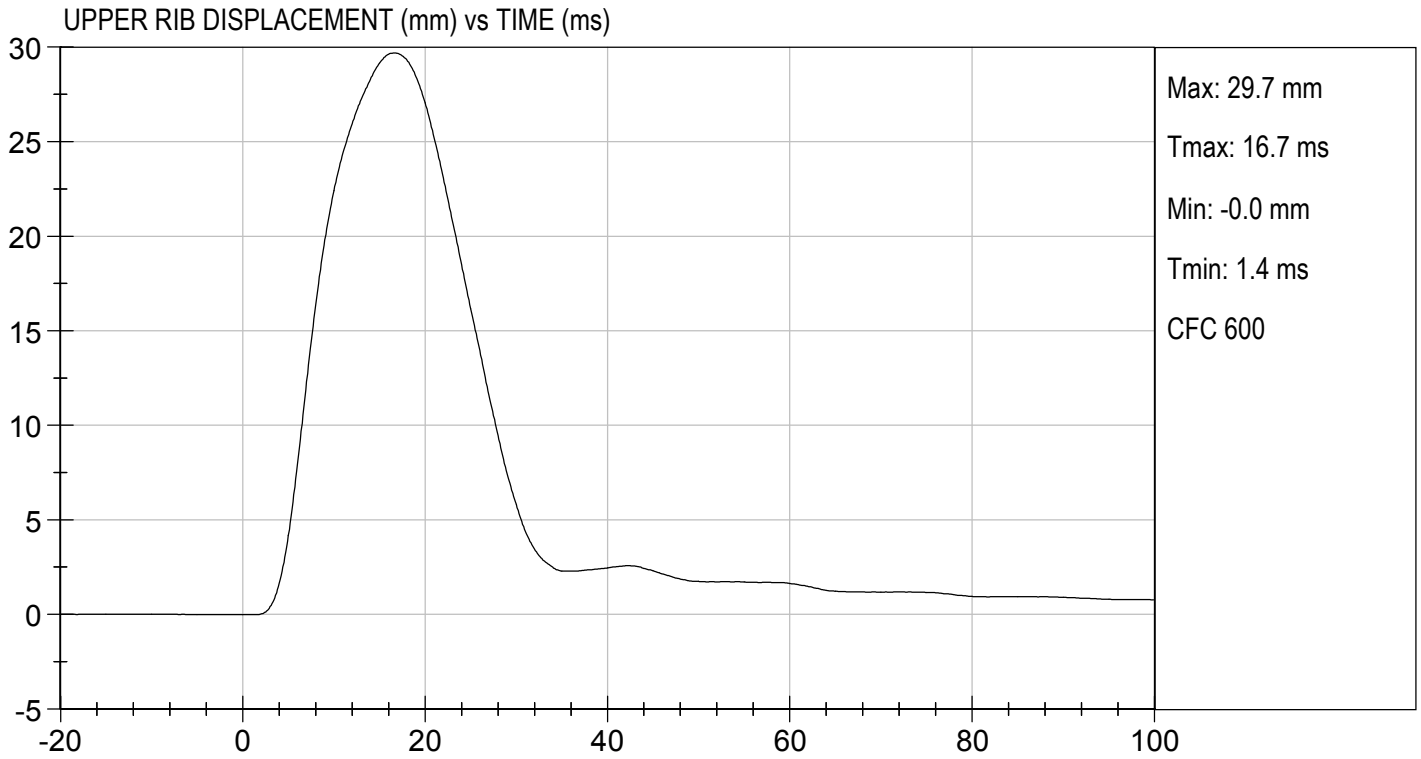
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	6.60 to 6.80	6.80	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	39	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results				Pass

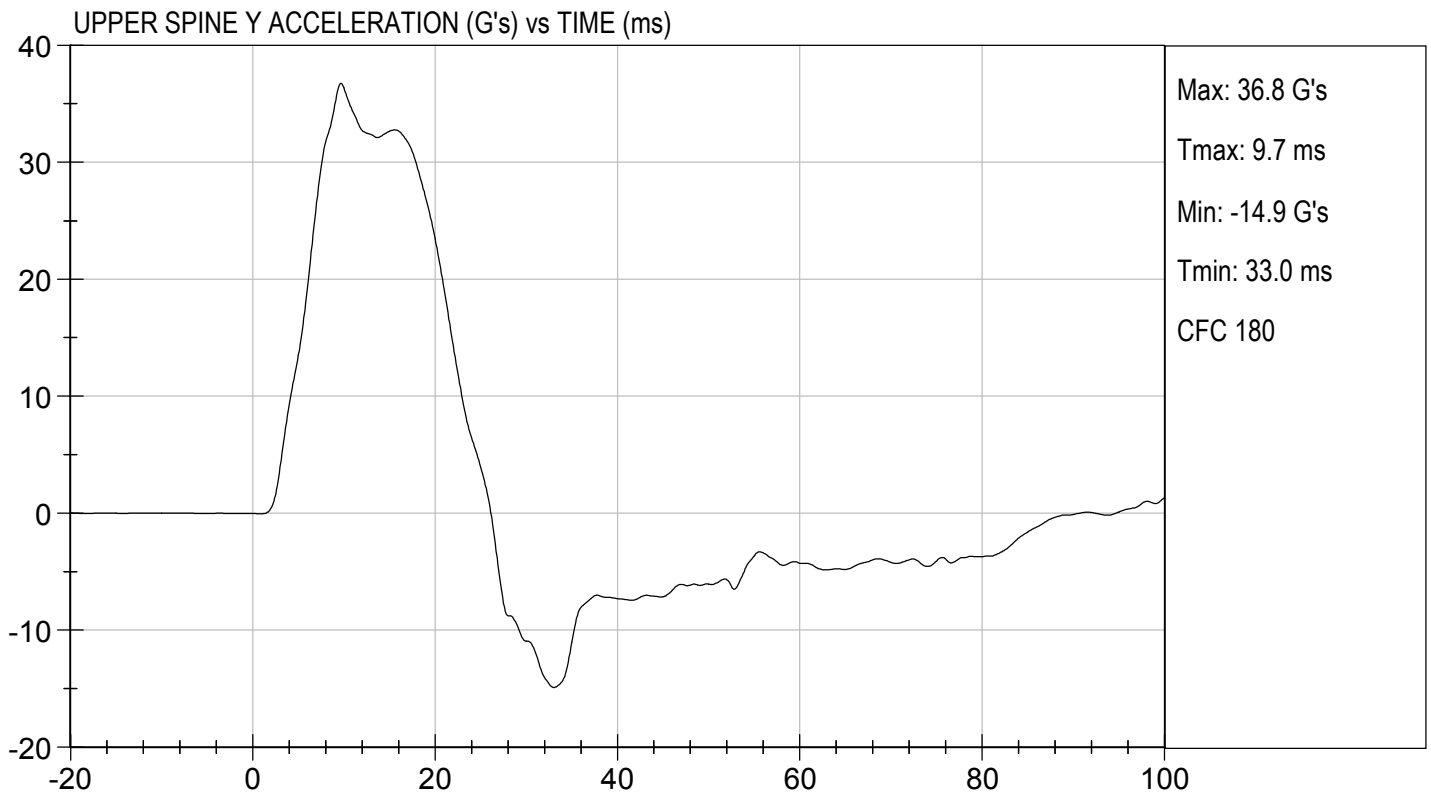
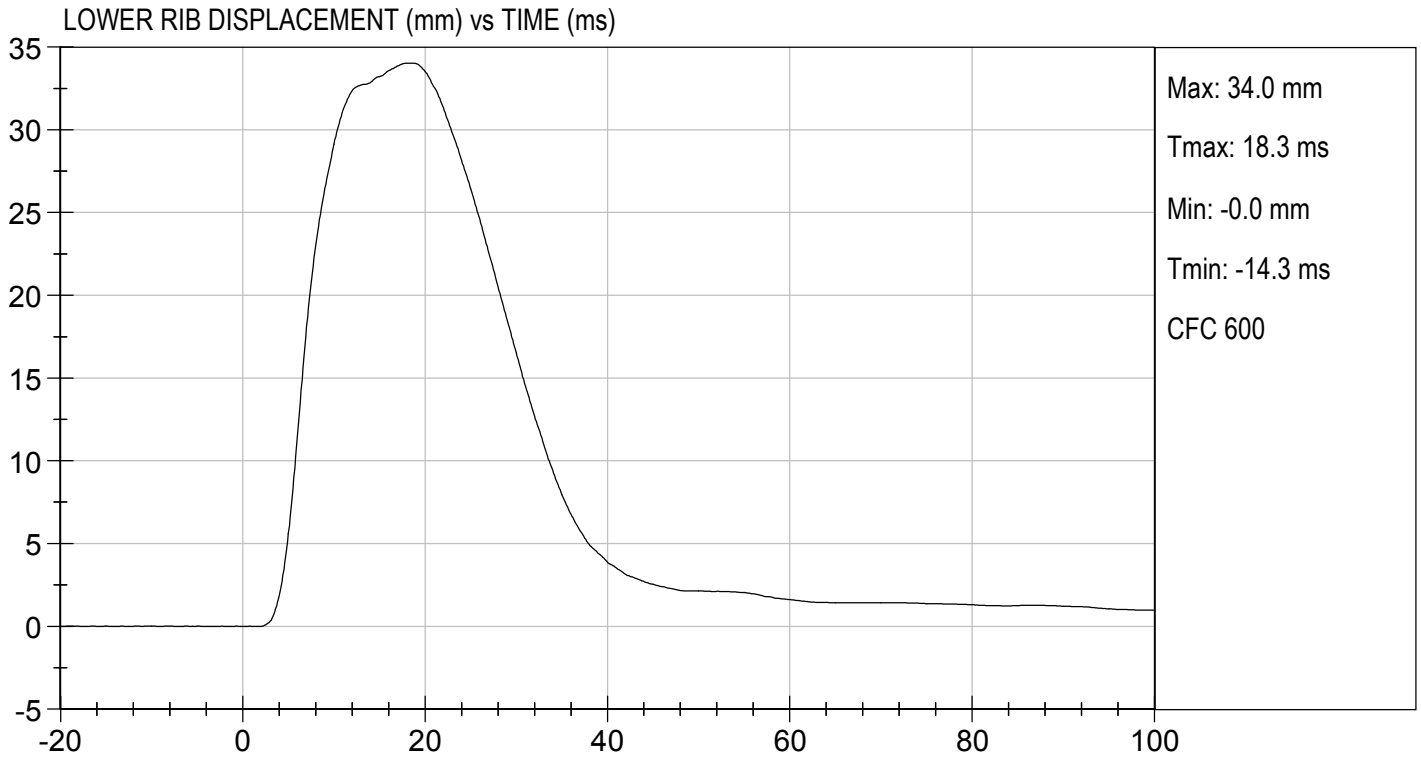

Laboratory Technician

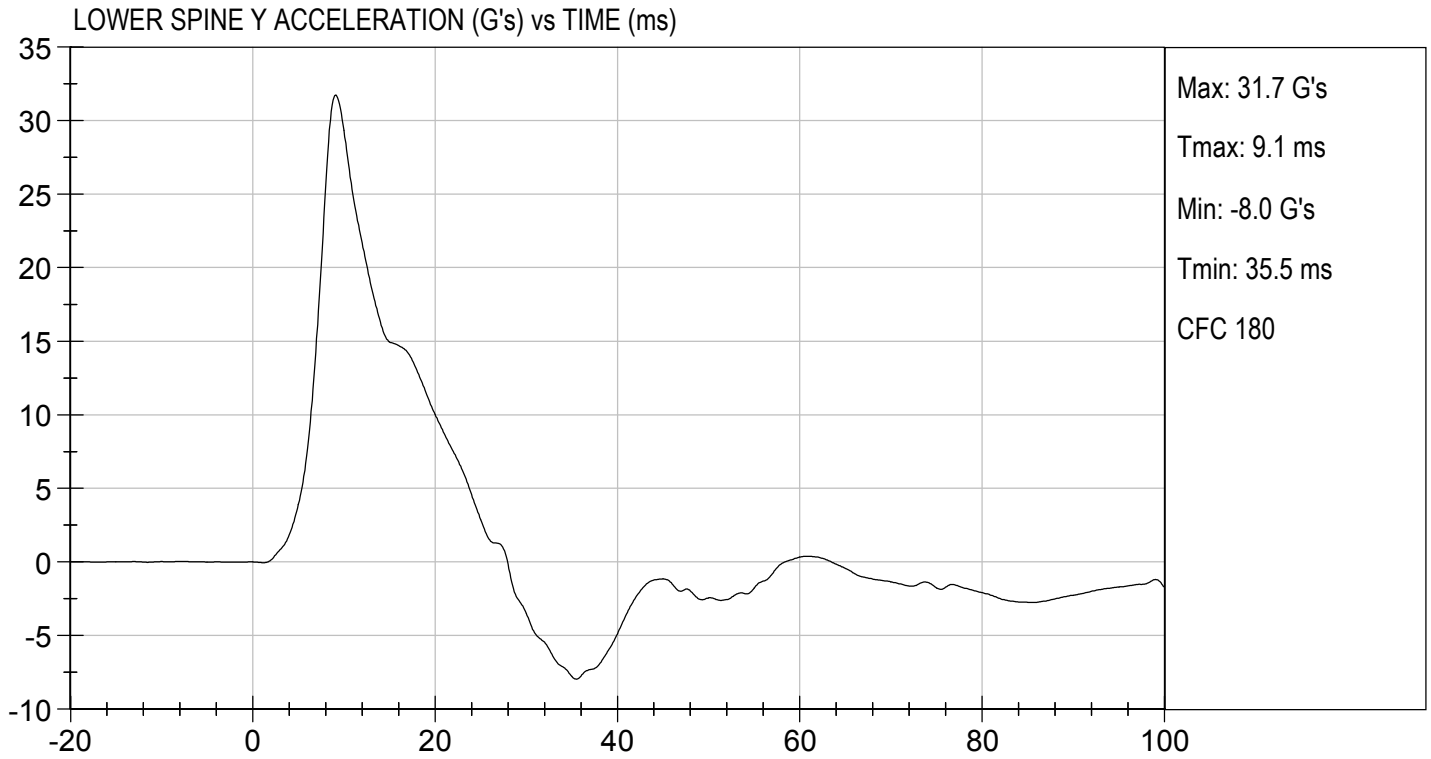
11/06/2017
Test Date


Approved By









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

ATD Serial No: 296

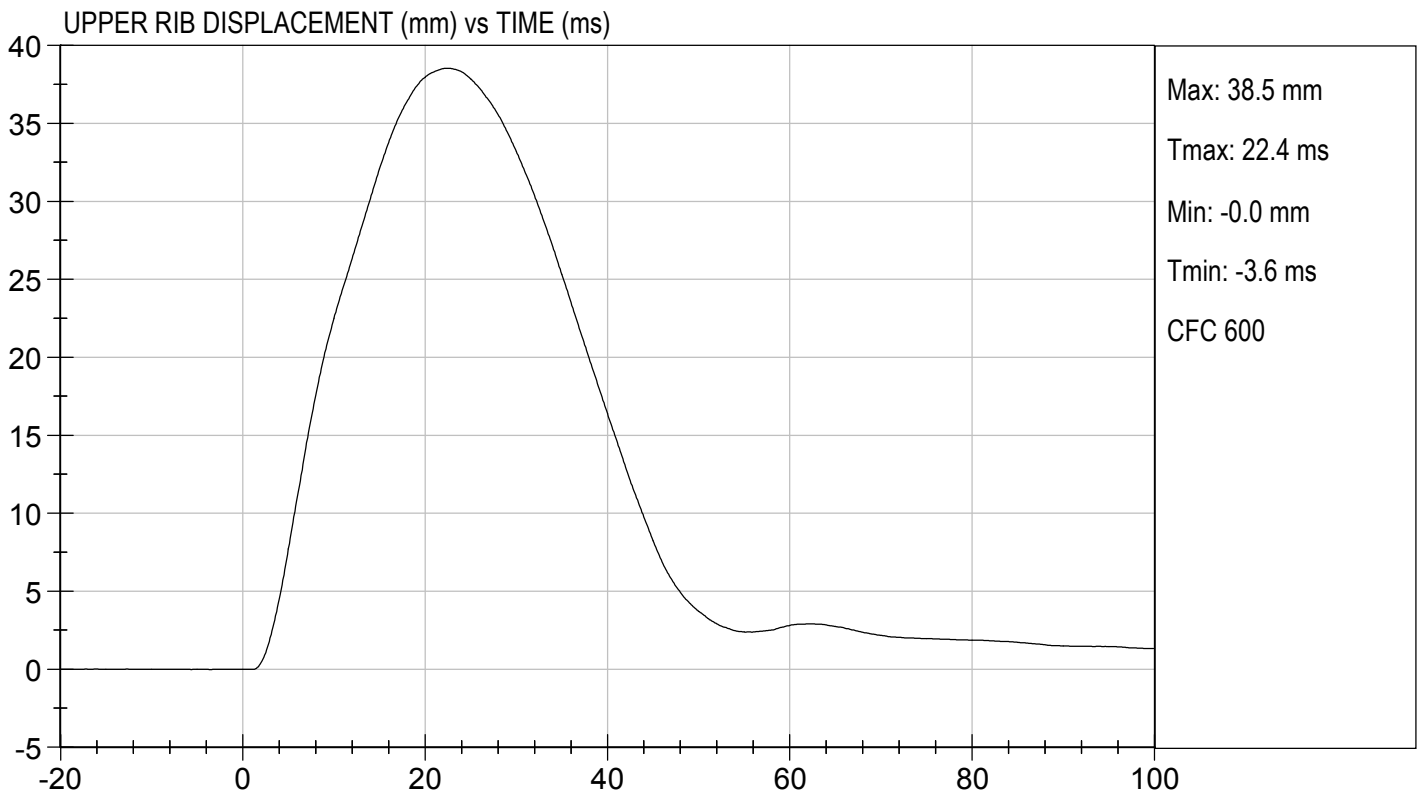
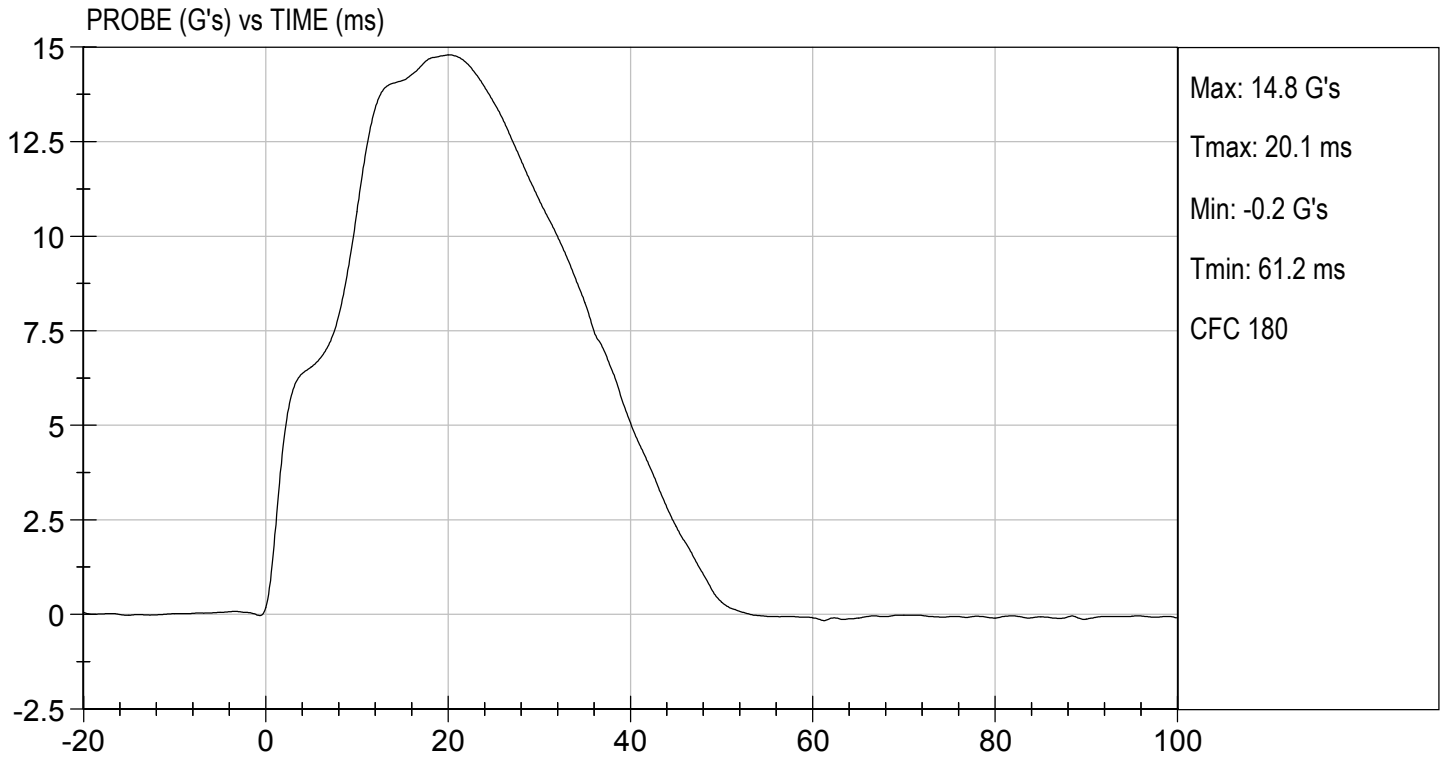
Test I.D: D173225

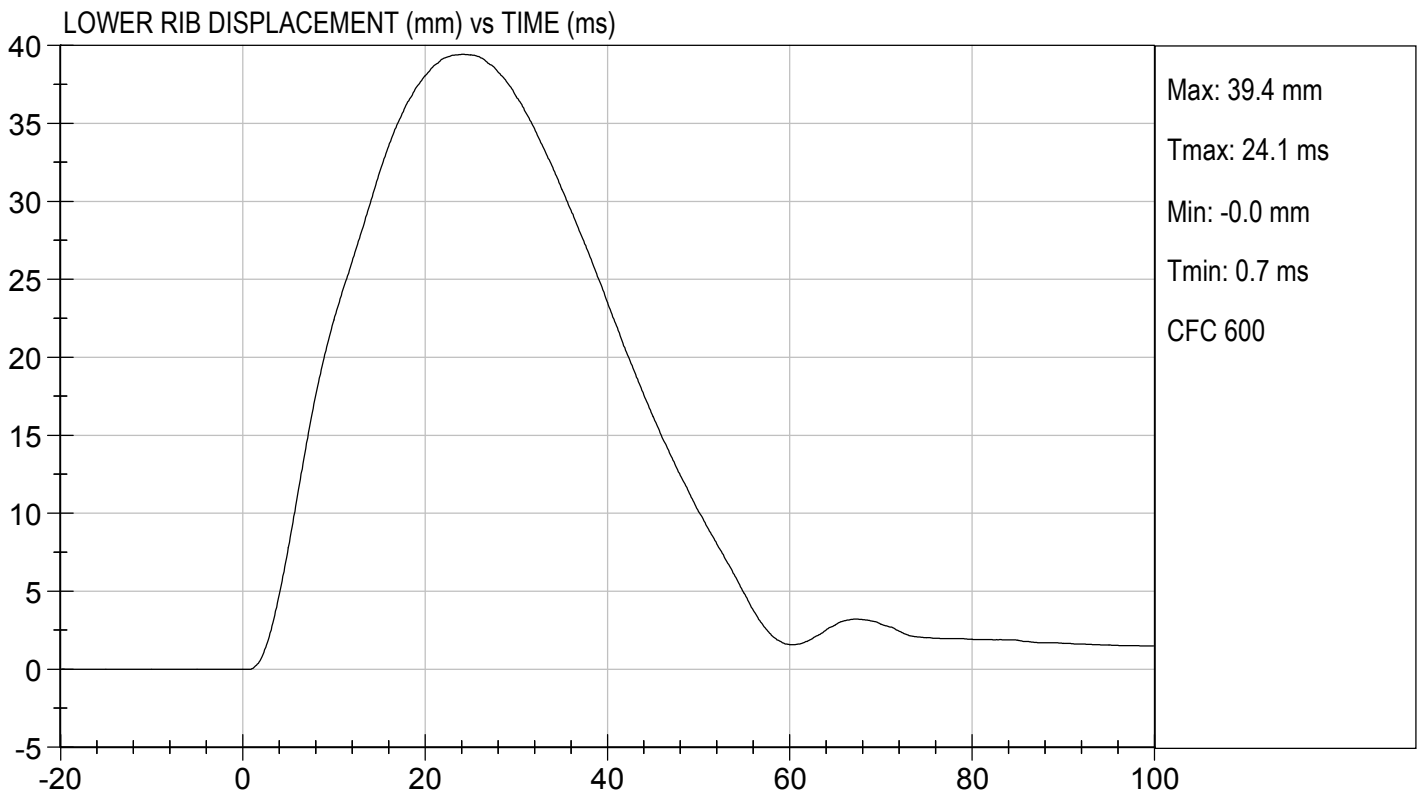
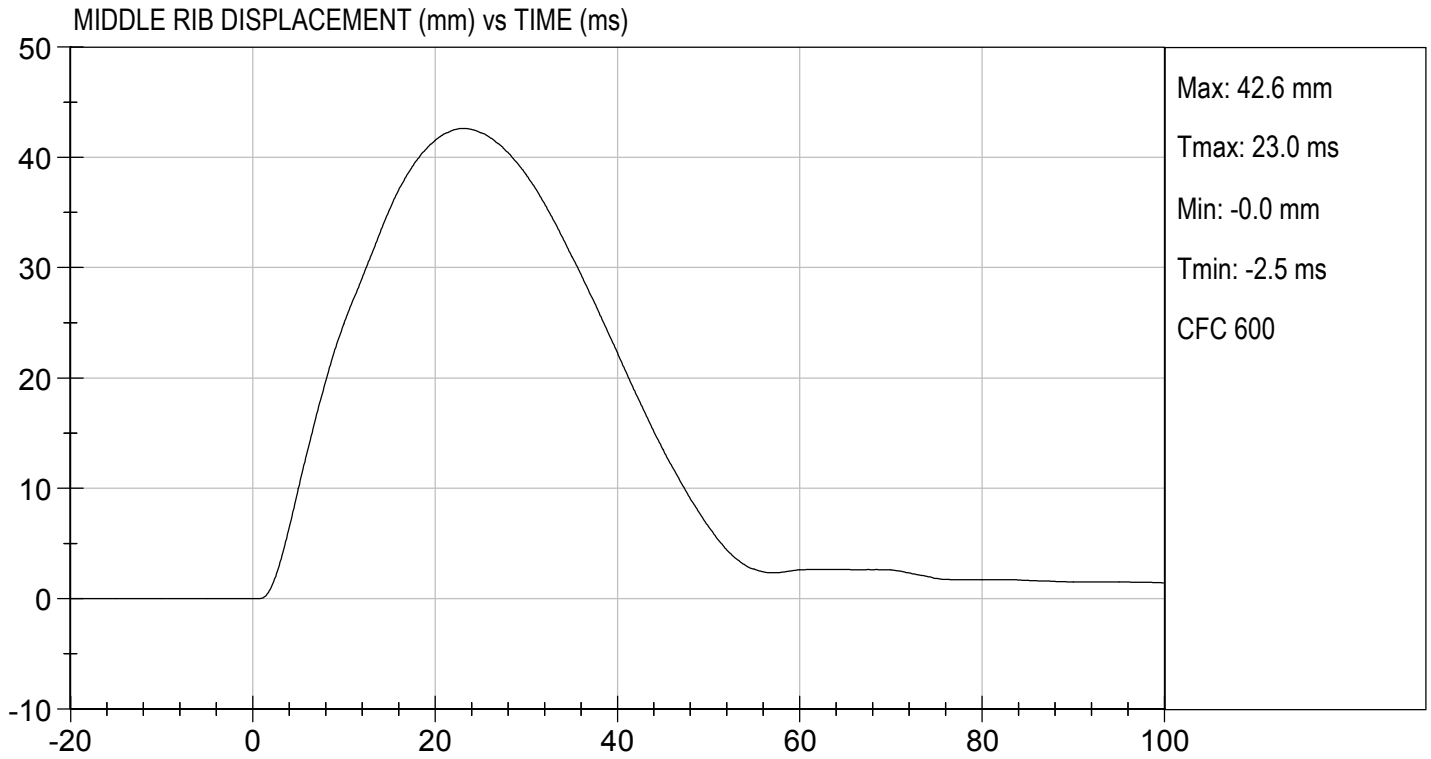
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass

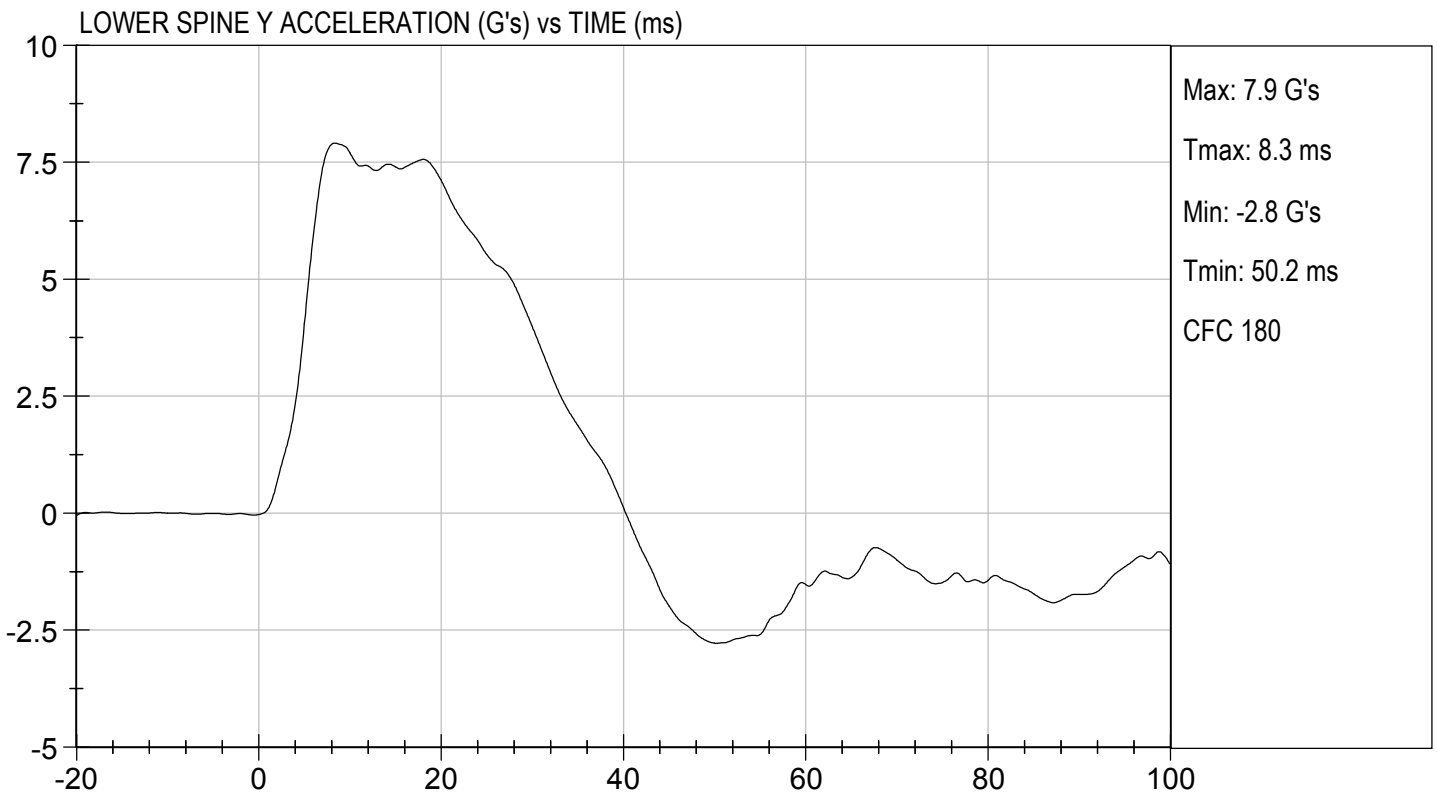
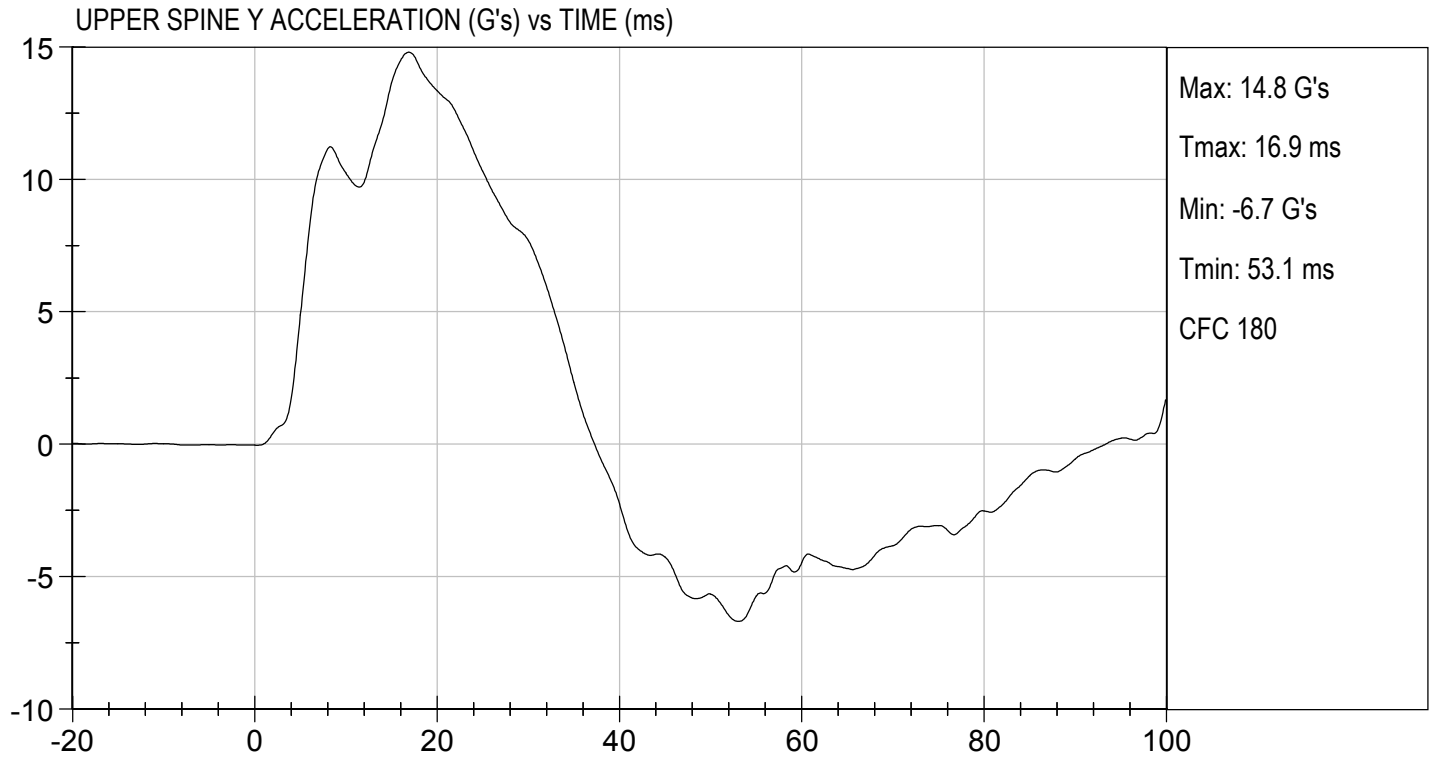
Danielle Redinlaugh
 Laboratory Technician

11/06/2017
 Test Date

Robert Schuler
 Approved By







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

ATD Serial No: 296

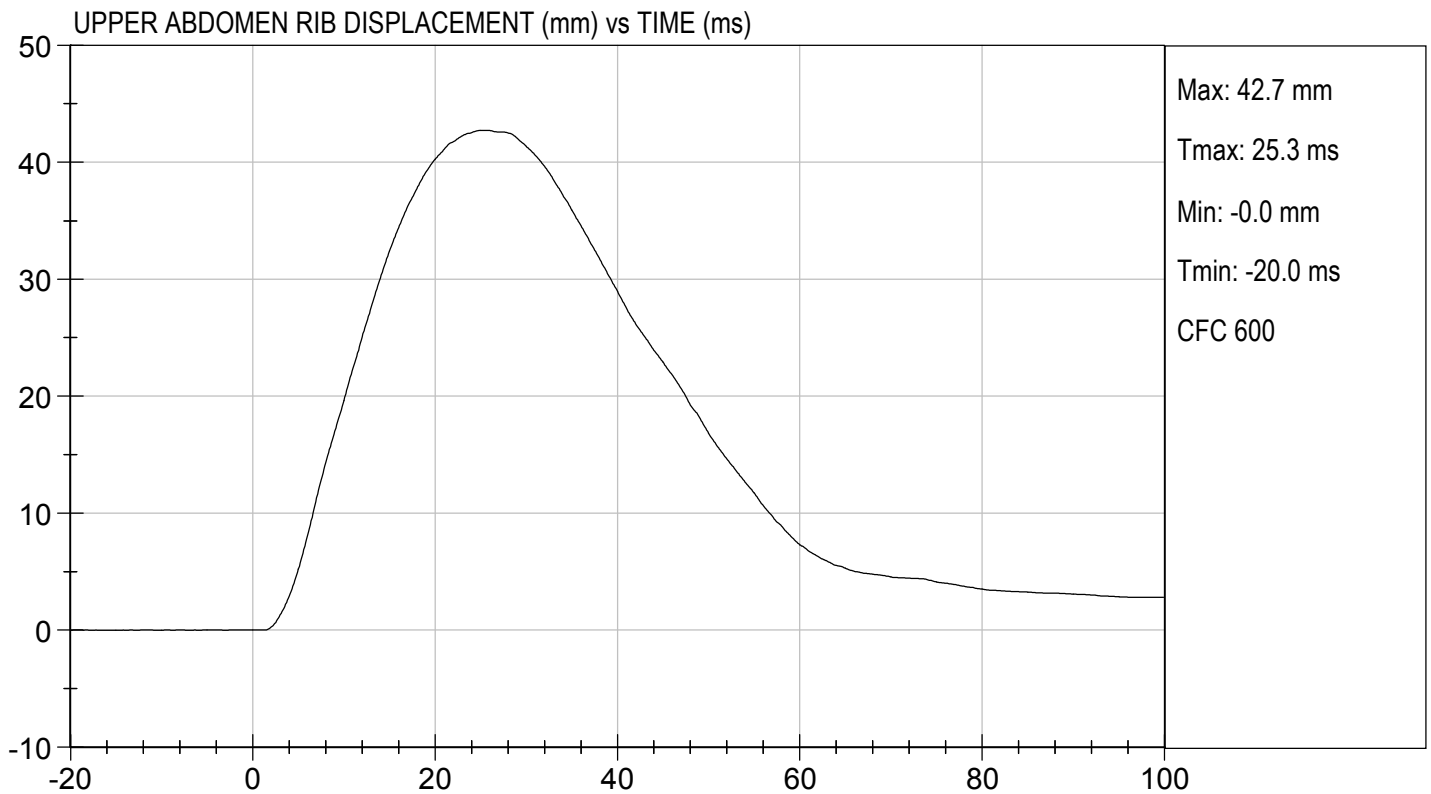
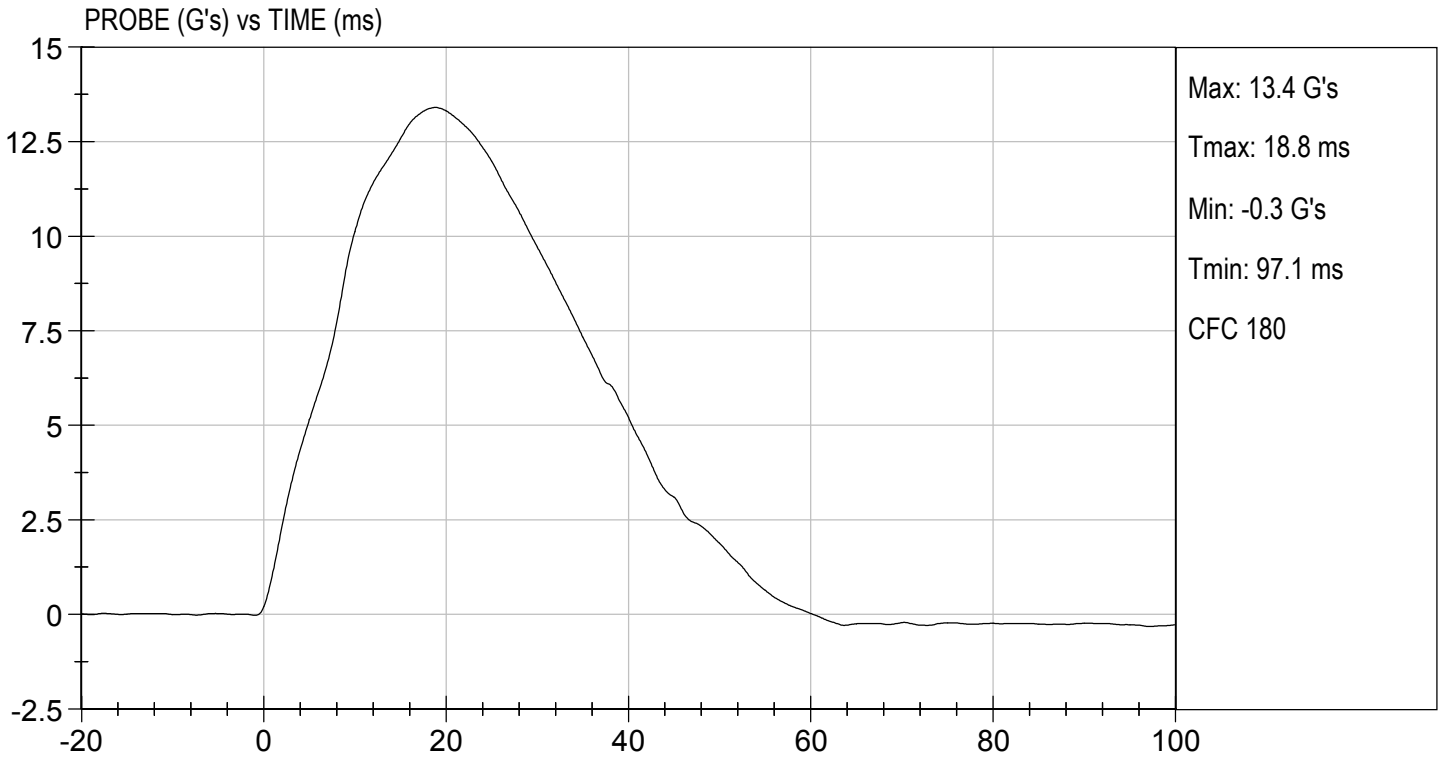
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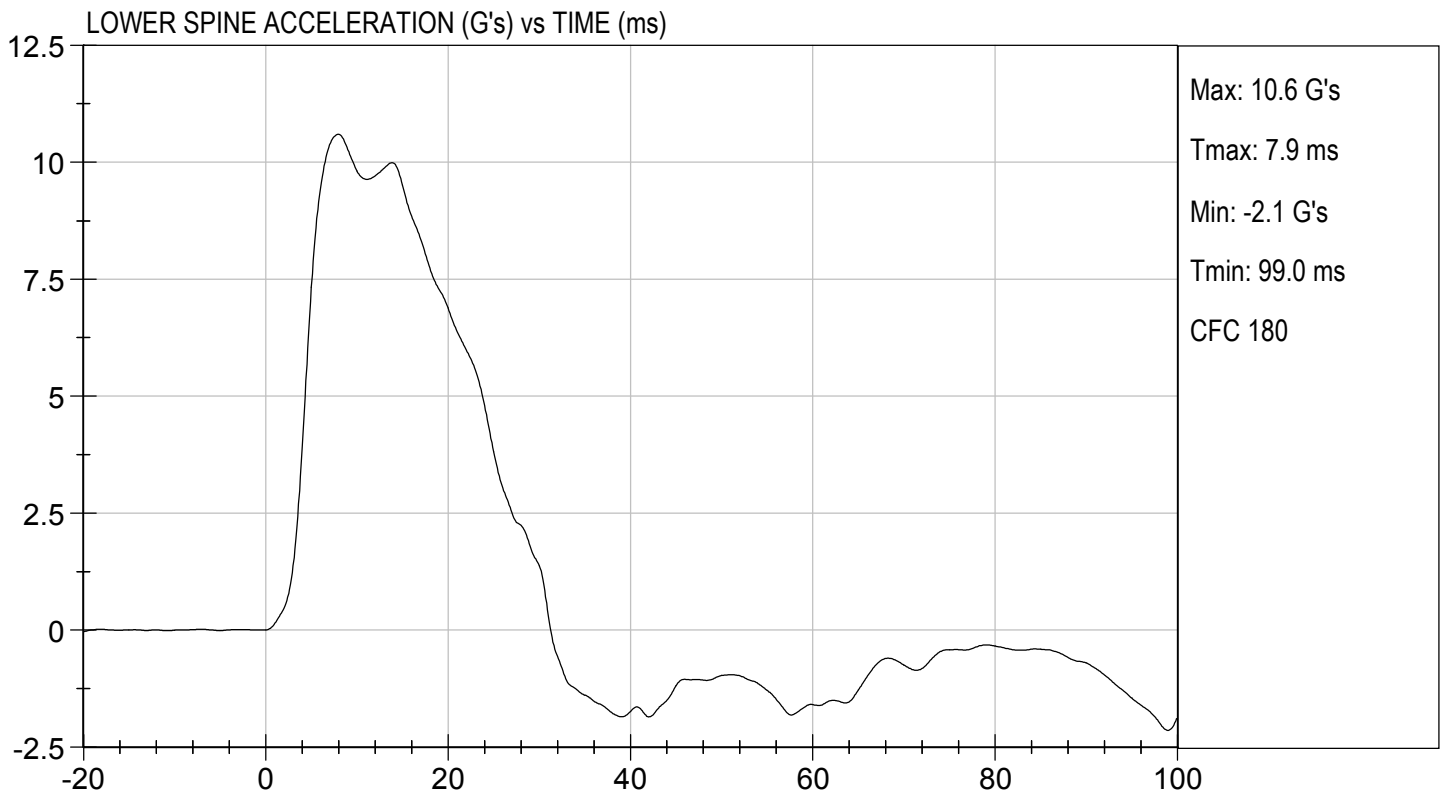
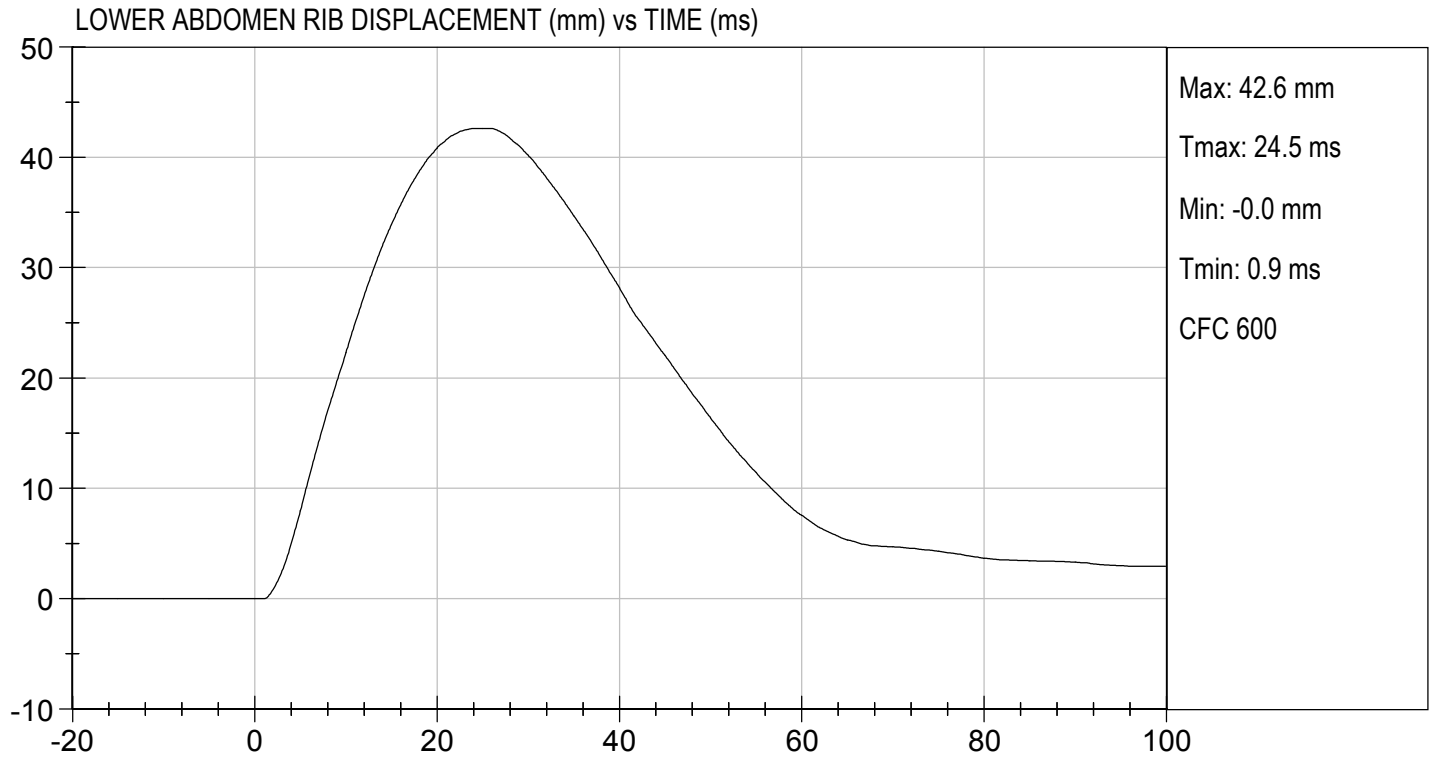
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.39	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	43	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	43	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

Danielle Redinlaugh
 Laboratory Technician

11/06/2017
 Test Date

Robert Schaub
 Approved By






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

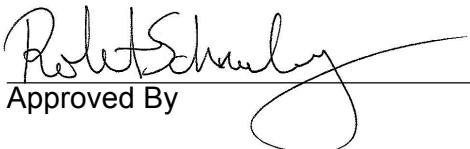
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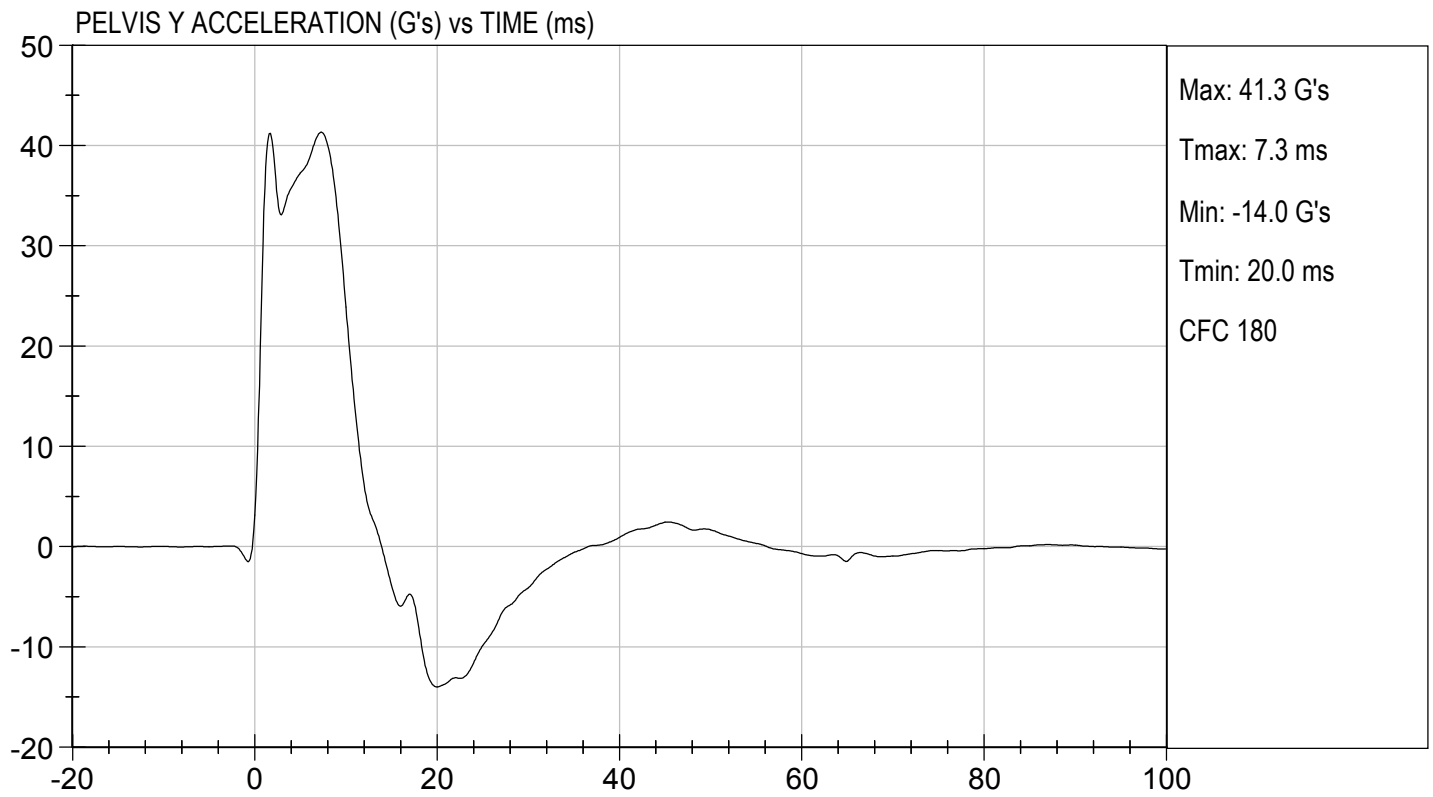
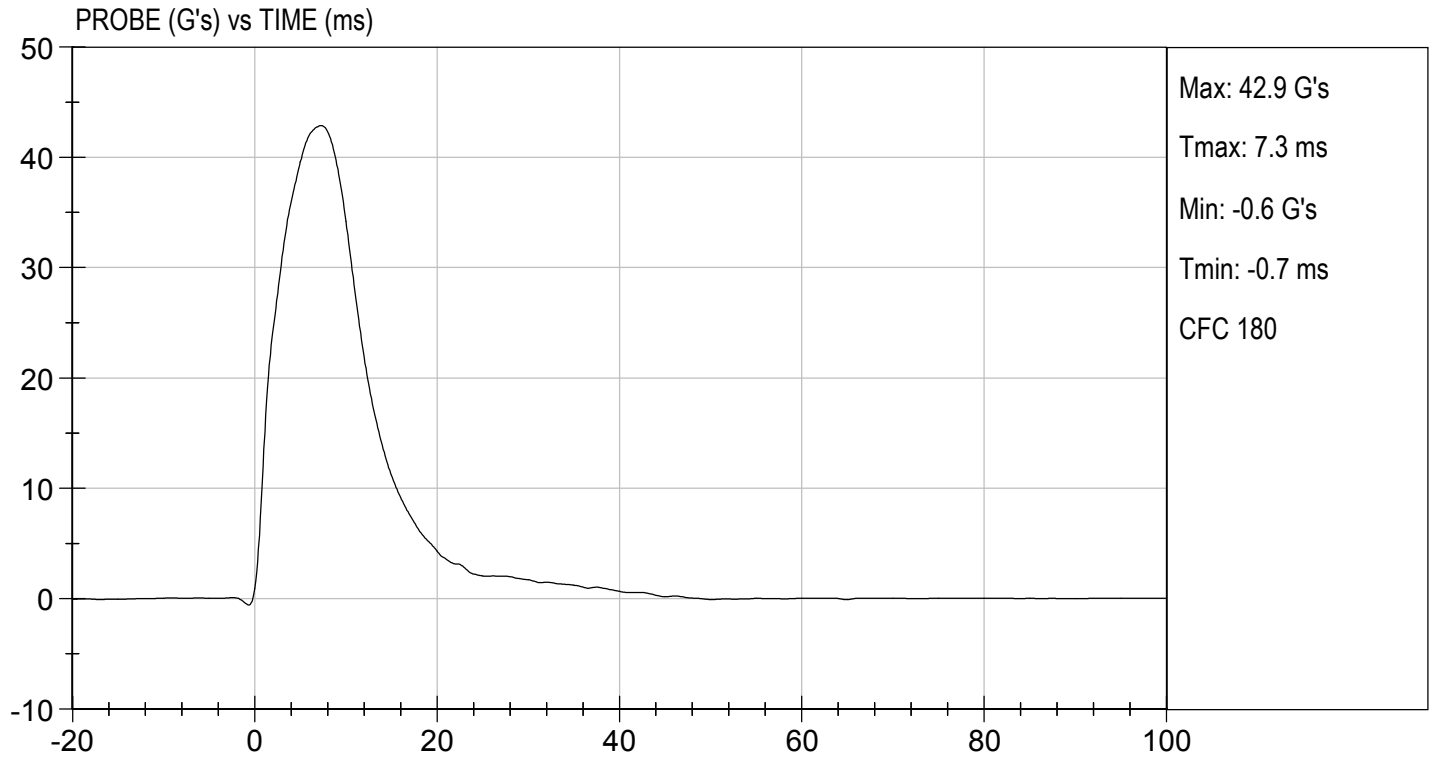
Test I.D: D173227

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	3,915	Pass
Overall Test Results				Pass


 Laboratory Technician

11/06/2017
 Test Date

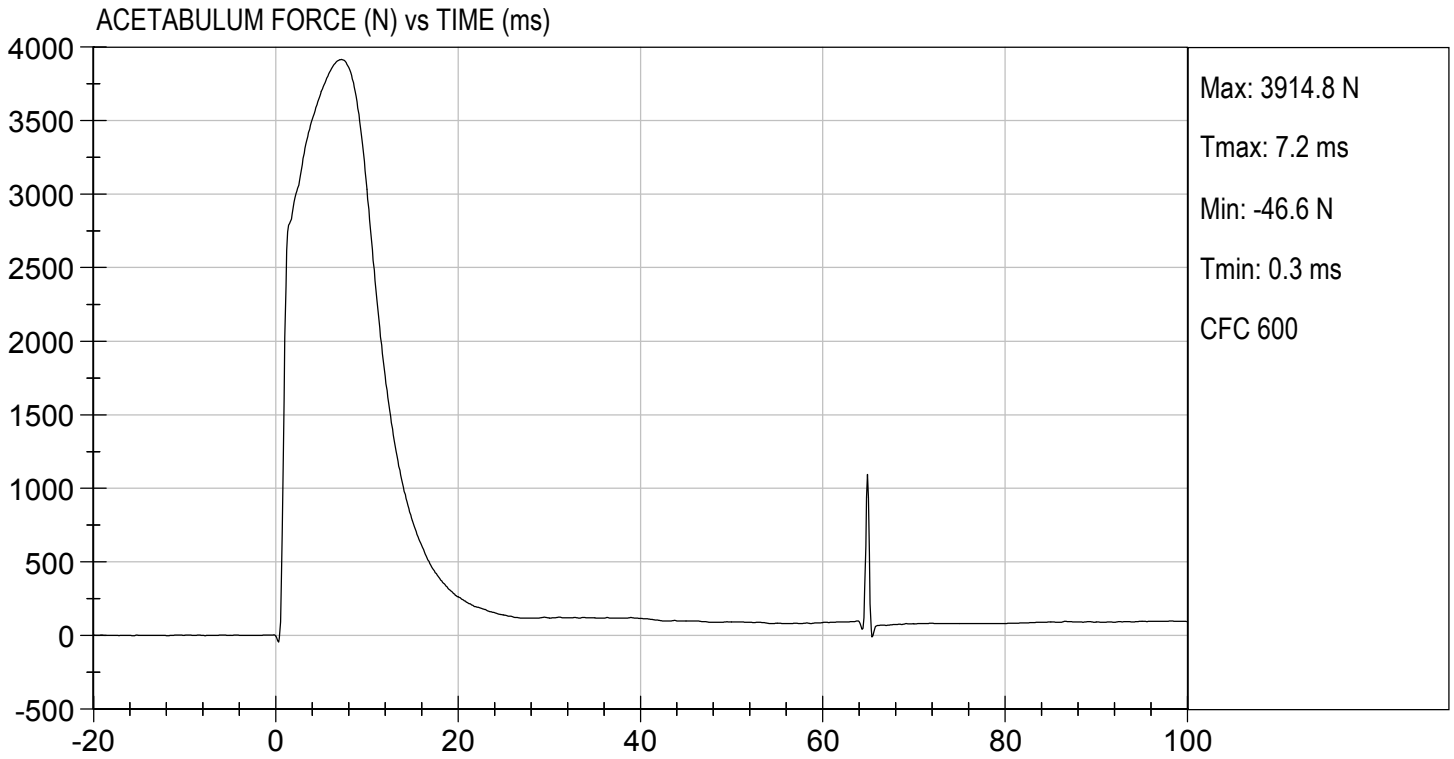

 Approved By





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

TEST DATE: 11/06/2017
TEST #: D173227



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

ATD Serial No: 296

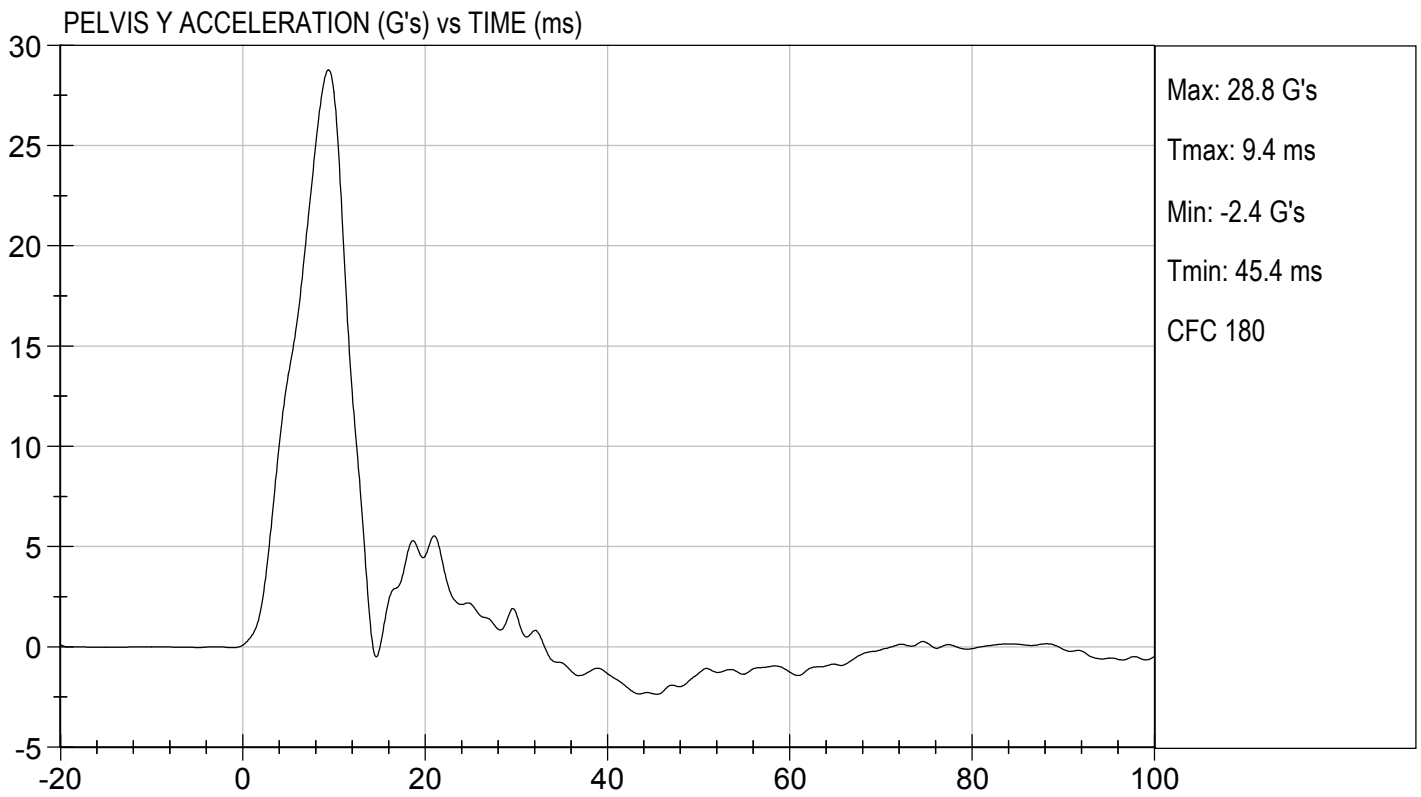
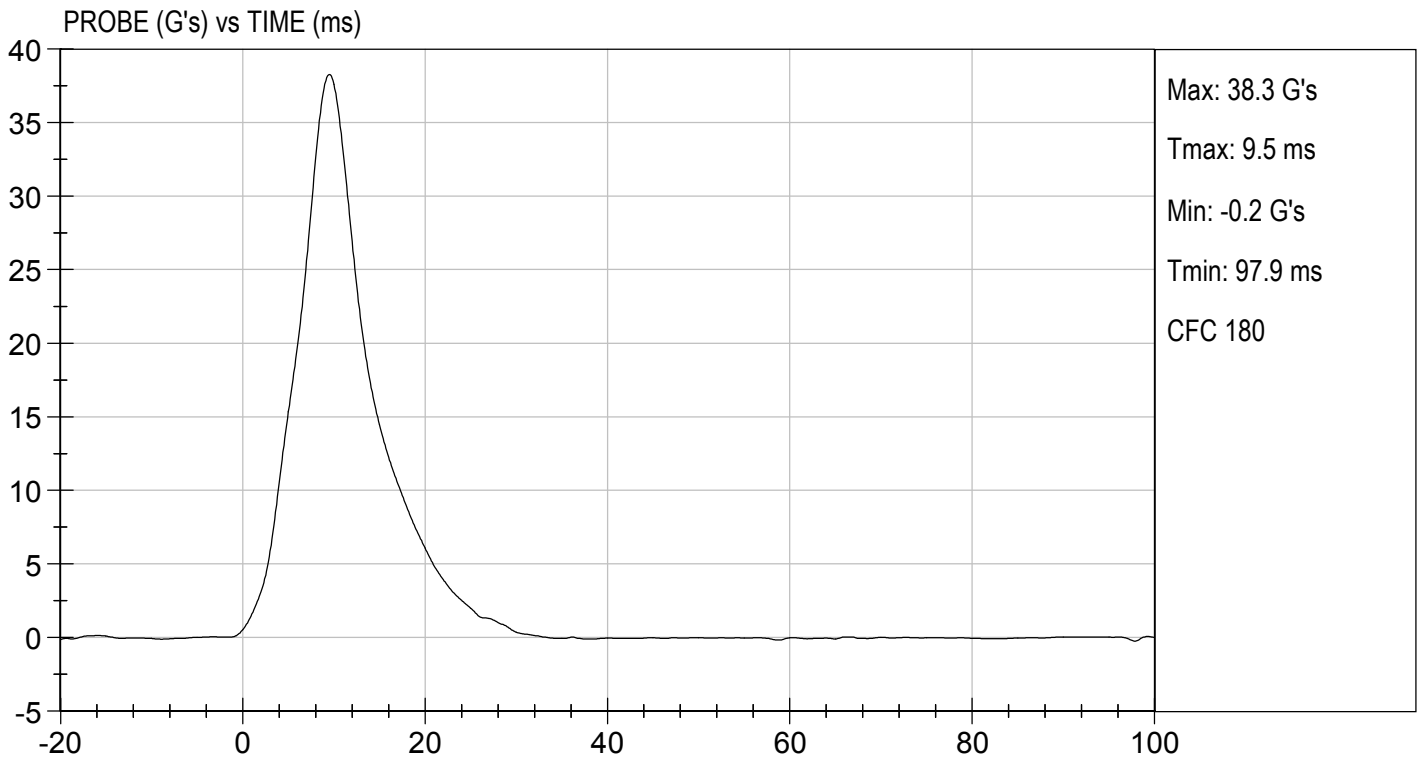
Test I.D: D173228

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.39	Pass
Maximum Probe Acceleration	G's	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	29	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,394	Pass
Overall Test Results				Pass

Danielle Redinlaugh
 Laboratory Technician

11/06/2017
 Test Date

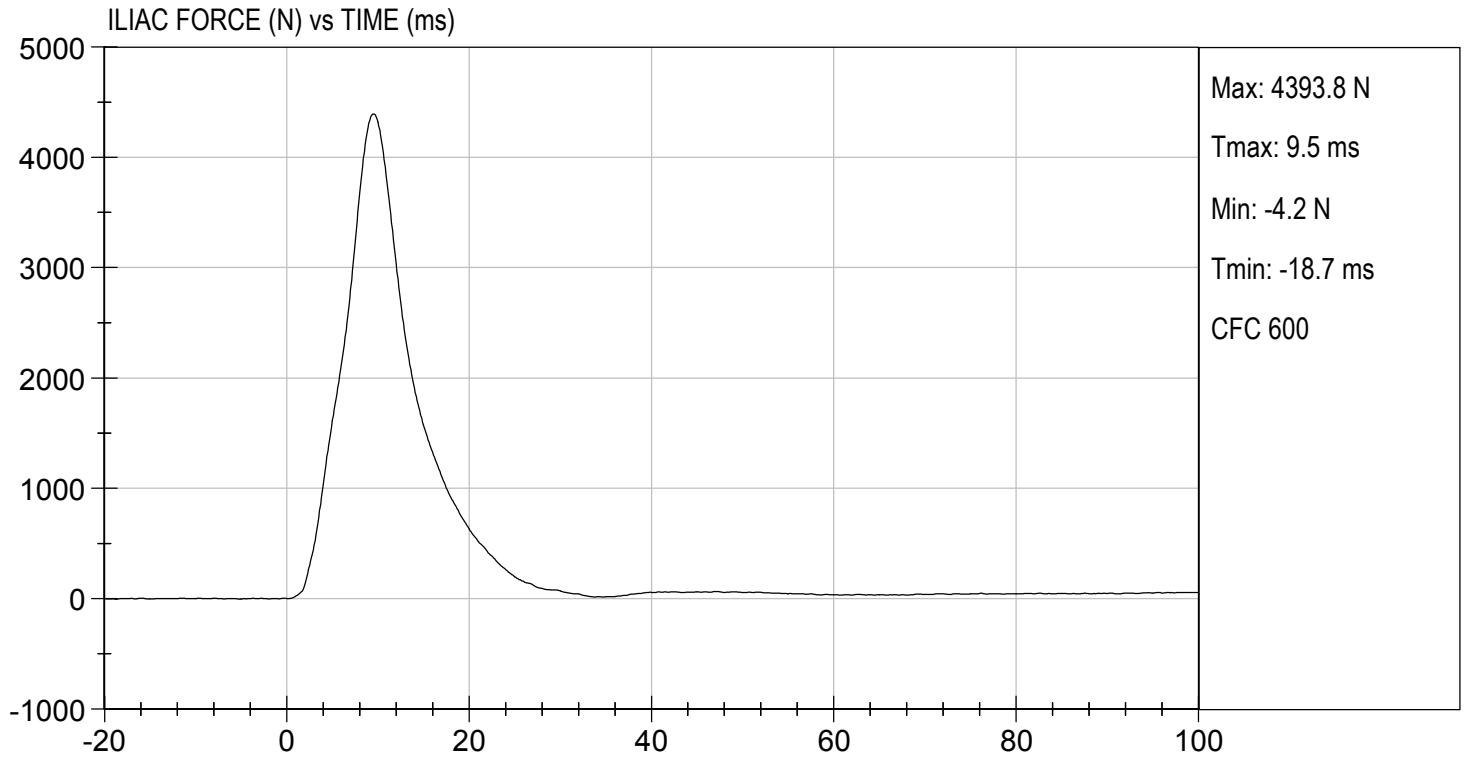
Robert Schaub
 Approved By





TEST DESC: ILLIAC
VELOCITY: 14.40 ft/s, 4.39 m/s

TEST DATE: 11/06/2017
TEST #: D173228





SID-IIs Pelvis Plug Certification Test

Plug S/N 11367

Test Number 2752

Report Number 2749

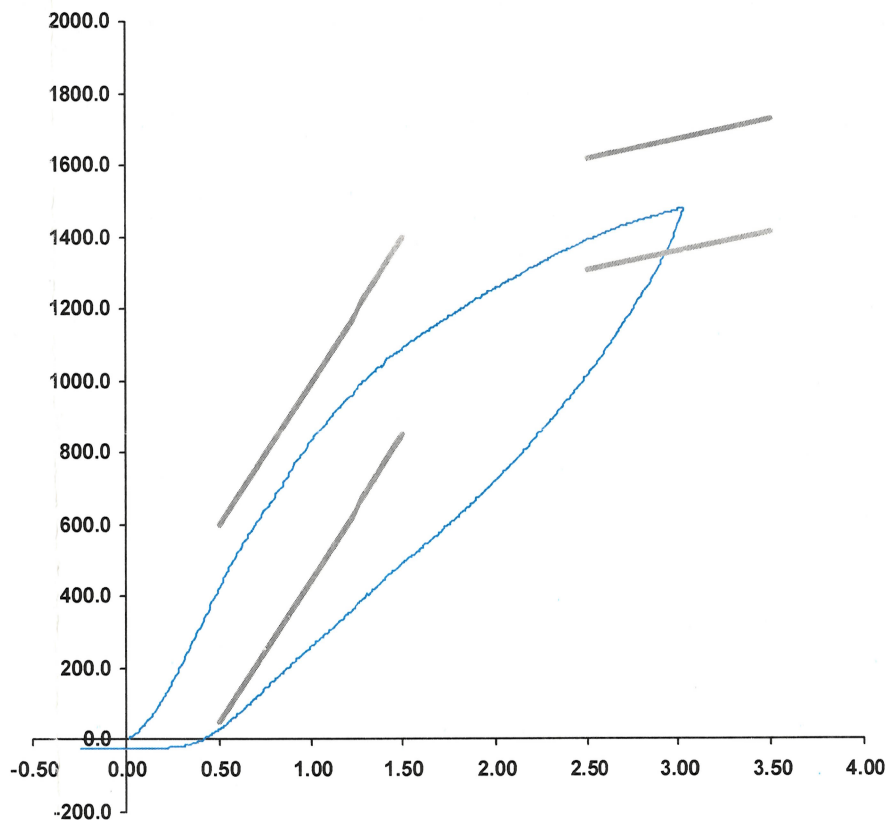
Test Date 5/3/2016 8:11:03 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	424.93	50.00	600.00
Force @ 1.5 mm (N)	1,089.17	850.00	1,400.00
Force @ 2.5 mm (N)	1,390.10	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,475.90	1,361.00	1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (TI240813), Units (LBS) 1000
Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator DC
Part Number 180-4450

Template No 107 03-May-16
SACO Research

By : DC Date : 5/3/16



SID-IIs Pelvis Plug Certification Test

Plug S/N 11338

Test Number 2697

Report Number 2693

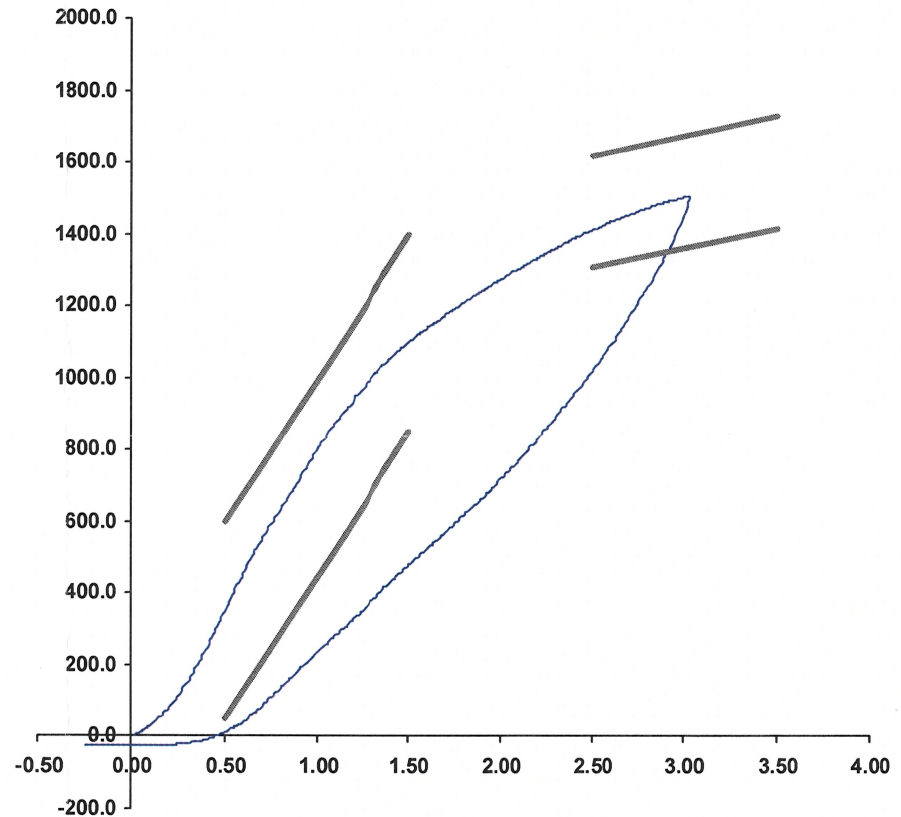
Test Date 5/2/2016 8:31:56 AM

	<u>Test Results</u>	<u>Spec Min</u>	<u>Spec Max</u>
Force @ 0.5 mm (N)	350.79	50.00	600.00
Force @ 1.5 mm (N)	1,099.34	850.00	1,400.00
Force @ 2.5 mm (N)	1,412.18	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,503.80	1,361.00	1,673.00

Testing Machine STM-20 5965542
 Load Cell S/N (TI240813), Units (LBS) 1000
 Crosshead Speed (mm / min) or Rate 12.7
 Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator DC
 Part Number 180-4450

Template No 107 02-May-16
 SACO Research

By : DC Date : 5/2/16

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (ES-2re)

		ES-2re S/N 032			
		Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers		X	P79711	Endevco	07/05/17
		Y	P79712	Endevco	07/05/17
		Z	P88170	Endevco	07/05/17
		Xr	P79750	Endevco	07/05/17
		Yr	P79751	Endevco	07/05/17
		Zr	P79753	Endevco	07/05/17
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	07/11/17
	Middle	Y	G169	Honeywell	07/11/17
	Lower	Y	G164	Honeywell	07/11/17
Abdomen Load Cells	Forward	Y	ABG1532	Denton	10/03/17
	Middle	Y	ABG1534	Denton	10/03/17
	Rear	Y	ABG1535	Denton	10/03/17
Lower Spine Accelerometers (T12)		X	P79574	Endevco	07/05/17
		Y	P82097	Endevco	07/05/17
		Z	P82603	Endevco	07/05/17
Public Symphysis Load Cell		Y	PG461	Denton	10/03/17

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 296			
				Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers				X	P94783	Endevco	06/27/17
				Y	P94784	Endevco	06/27/17
				Z	P94786	Endevco	06/27/17
				Xr	P94934	Endevco	06/27/17
				Yr	P94936	Endevco	06/27/17
				Zr	P94938	Endevco	06/27/17
Head Angular Rate Sensors				X	ARS7413	DTS	07/15/14
				Y	ARS7421	DTS	07/15/14
				Z	ARS7423	DTS	07/15/14
Displacement Potentiometers	Thoracic Rib	Upper	Y	G012	FTSS	06/28/17	
		Middle	Y	G1163	FTSS	06/28/17	
		Lower	Y	G1158	FTSS	06/28/17	
	Abdominal Rib	Upper	Y	G1146	FTSS	06/28/17	
		Lower	Y	G1126	FTSS	06/28/17	
Lower Spine Accelerometers (T12)				X	P79418	Endevco	06/27/17
				Y	P79439	Endevco	06/27/17
				Z	P79614	Endevco	06/27/17
Acetabulum Load Cell				Y	ACG4285	Denton	04/20/17
Iliac Wing Load Cell				Y	IWG3023	Denton	04/20/17
Pelvis Plug (struck side)					11367	SACO	05/03/16
Pelvis Plug (non-struck side)					11338	SACO	05/02/16

Table 3 – Vehicle Instrumentation

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	PCB511	PCB	05/10/17
	Vehicle Center of Gravity	Y	T10028	Endevco	09/29/17
	Vehicle Center of Gravity	Z	PCB730	PCB	09/07/17
2	Right Sill at Front Seat	X	PCB538	PCB	09/07/17
	Right Sill at Front Seat	Y	T11129	Endevco	10/27/17
	Right Sill at Front Seat	Z	PCB537	PCB	09/07/17
3	Right Sill at Rear Seat	X	T11731	Endevco	10/05/17
	Right Sill at Rear Seat	Y	PCB860	PCB	06/02/17
	Right Sill at Rear Seat	Z	PCB592	PCB	06/12/17
4	Left Sill at Front Door	Y	T11703	Endevco	10/27/17
5	Left Sill at Rear Door	Y	T11183	Endevco	10/27/17
6	Left A-Post Lower	Y	T10886	Endevco	09/26/17
7	Left A-Post Middle	Y	T11204	Endevco	09/29/17
8	Left B-Post Lower	Y			
9	Left B-Post Middle	Y			
10	Front Seat Track	Y	T11178	Endevco	10/27/17
11	Rear Seat Track or Structure	Y	T11512	Endevco	10/27/17
12	Right Rear Occ. Compartment	Y	T11190	Endevco	10/27/17
13	Engine Block	X	PCB657	PCB	09/14/17
	Engine Block	Y	P96706	Endevco	09/22/17
14	Rear Floorpan Above Axle	X	P97707	Endevco	09/27/17
	Rear Floorpan Above Axle	Y	T11220	Endevco	09/28/17
	Rear Floorpan Above Axle	Z	T11728	Endevco	09/21/17

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	PCB661D	PCB	08/21/17
MDB Center of Gravity	Y	PCB798D	PCB	08/21/17
MDB Center of Gravity	Z	PCB660D	PCB	08/21/17
Left Frame at Rear Axle Centerline	X	PCB495D	PCB	08/21/17
Left Frame at Rear Axle Centerline	Y	PCB494D	PCB	08/21/17