

REPORT NUMBER: SINCAP-MGA-2017-008

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

**MITSUBISHI MOTORS (THAILAND) CO., LTD.
2017 Mitsubishi Mirage ES 5-Door Hatchback
NHTSA No.: O20175601**

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



Test Date: August 24, 2016

Final Report Date: October 5, 2016

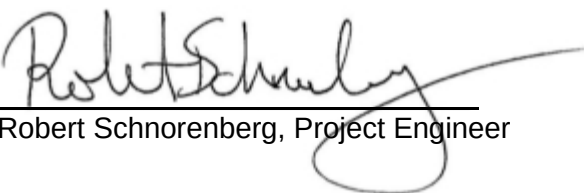
FINAL REPORT

**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**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: 
Ben Fischer, Project Engineer

Approved by: 
Robert Schnorenberg, Project Engineer

Approval Date: October 5, 2016

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

1. <i>Report No.</i> SINCAP-MGA-2017-008	2. <i>Government Accession No.</i>	3. <i>Recipient's Catalog No.</i>																																																									
4. <i>Title and Subtitle</i> Final Report of New Car Assessment Program Side Impact MDB Testing of 2017 Mitsubishi Mirage ES 5-Dr. Hatchback, NHTSA No.: O20175601		5. <i>Report Date</i> October 5, 2016																																																									
		6. <i>Performing Organization Code</i> MGA																																																									
7. <i>Author(s)</i> Ben Fischer, Project Engineer		8. <i>Performing Organization Report No.</i> SINCAP-MGA-2017-008																																																									
9. <i>Performing Organization Name and Address</i> MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. <i>Work Unit No.</i>																																																									
		11. <i>Contract or Grant No.</i> DTNH22-14-D-00353																																																									
12. <i>Sponsoring Agency Name and Address</i> 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. <i>Type of Report and Period Covered:</i> Final Test Report August 24, 2016 to October 5, 2016																																																									
		14. <i>Sponsoring Agency Code</i> NRM-110																																																									
15. <i>Supplementary Notes</i>																																																											
16. <i>Abstract</i> A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the 2017 Mitsubishi Mirage ES 5-Dr. Hatchback 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 August 24, 2016. The impact velocity of the Moving Deformable Barrier (MDB) was 61.57 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.4°C. The target vehicle post-test maximum crush was 240 mm at level 2. The test vehicle's performance was as follows:																																																											
<table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th colspan="4" style="text-align: center;">Driver ATD (ES-2re)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">147</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">44</td> <td style="text-align: center;">27</td> </tr> <tr> <td>Total Abdominal Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">2500</td> <td style="text-align: center;">786</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">6000</td> <td style="text-align: center;">2947</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">Gs</td> <td style="text-align: center;">82*</td> <td style="text-align: center;">40</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th colspan="4" style="text-align: center;">Passenger ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">628</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">Gs</td> <td style="text-align: center;">82</td> <td style="text-align: center;">74</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">3180</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38*</td> <td style="text-align: center;">40</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45*</td> <td style="text-align: center;">31</td> </tr> </tbody> </table>				Driver ATD (ES-2re)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	147	Maximum Thorax Rib Deflection	mm	44	27	Total Abdominal Force	N	2500	786	Pubic Symphysis Force	N	6000	2947	Resultant Lower Spine Acceleration	Gs	82*	40	Passenger ATD (SID-IIs)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	628	Resultant Lower Spine Acceleration	Gs	82	74	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3180	Maximum Thoracic Rib Deflection	mm	38*	40	Maximum Abdomen Rib Deflection	mm	45*	31
Driver ATD (ES-2re)																																																											
Measurement Description	Units	Threshold	Result																																																								
Head Injury Criteria (HIC ₃₆)	N/A	1000	147																																																								
Maximum Thorax Rib Deflection	mm	44	27																																																								
Total Abdominal Force	N	2500	786																																																								
Pubic Symphysis Force	N	6000	2947																																																								
Resultant Lower Spine Acceleration	Gs	82*	40																																																								
Passenger ATD (SID-IIs)																																																											
Measurement Description	Units	Threshold	Result																																																								
Head Injury Criteria (HIC ₃₆)	N/A	1000	628																																																								
Resultant Lower Spine Acceleration	Gs	82	74																																																								
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3180																																																								
Maximum Thoracic Rib Deflection	mm	38*	40																																																								
Maximum Abdomen Rib Deflection	mm	45*	31																																																								
*Proposed IARV																																																											
The door on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door did not open during the side impact event.																																																											
17. <i>Key Words</i> New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. <i>Distribution Statement</i> 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																																																									
19. <i>Security Classification of Report</i> Unclassified	20. <i>Security Classification of Page</i> Unclassified	21. <i>No. of Pages</i> 223	22. <i>Price</i>																																																								

TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Test Purpose and Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information / Data Sheets	4
 <u>Data Sheet No.</u>		 <u>Page No.</u>
1	General Test and Vehicle Parameter Data	5
2	Seat, Seat Belt, Steering Wheel Adjustment and Fuel System Data	9
3	Dummy Longitudinal Clearance Dimensions	13
4	Dummy Lateral Clearance Dimensions	14
5	Camera and Instrumentation Data	15
6	Test Vehicle Accelerometer Locations	16
7	MDB Accelerometer Locations	17
8	Post-Test Observations	18
9	MDB Summary of Results	20
10	Test Vehicle Profile Measurements	21
11	Test Vehicle Exterior Crush Measurements	22
12	MDB Exterior Static Crush Measurements	25
13	Vehicle and MDB Damage Profile Distances	26
14	FMVSS No. 301 Static Rollover Results	27
15	Dummy/Vehicle Temperature Stabilization Data	28
 <u>Appendix</u>		
A	Photographs	A
B	Dummy Response Data	B
C	Dummy Calibration and Performance Verification Data	C
D	Test Equipment and Instrumentation Calibration Data	D

SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2017 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 2017 Mitsubishi Mirage ES 5-Dr. Hatchback. 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 2017 Mitsubishi Mirage ES 5-Dr. Hatchback 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 61.57 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 August 24, 2016. 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

	Driver ATD (ES-2re)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	147
Maximum Thorax Rib Deflection	mm	44	27
Total Abdominal Force	N	2500	786
Pubic Symphysis Force	N	6000	2947
Resultant Lower Spine Acceleration	Gs	82*	40

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	628
Resultant Lower Spine Acceleration	Gs	82	74
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3180
Maximum Thoracic Rib Deflection	mm	38*	40
Maximum Abdomen Rib Deflection	mm	45*	31

*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	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other:	No		No	

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

GENERAL COMMENTS

Left Lower A-Post Y has no valid data after 6ms.
Left Mid A-Post Y has no valid data after 7ms.
Left Lower B-Post Y has no valid data after 6ms.
Left Mid B-Post Y has no valid data after 6ms.

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: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20175601	Traction Control System (TCS)	Yes
Model Year	2017	Auto-Leveling System	No
Make	Mitsubishi	Automatic Door Locks (ADL)	No
Model	Mirage ES	Power Window Auto-Reverse	Yes
Body Style	5-Door Hatchback	Other Optional Feature	N/A
VIN	ML32A3HJ4HH003813	Driver Front Airbag	Yes
Body Color	Sapphire Blue	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	74km / 46mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	1.2L	Driver Torso Airbag	No
Type/No. Cylinders	3	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Manual	Driver Knee Airbag	Yes
Transmission Speeds	5	Rear Pass. Curtain Airbag	Yes
Overdrive	No	Rear Pass. Head/Torso Airbag	No
Final Drive	FWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	No	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?	N/A
---	-----

DATA FROM CERTIFICATION LABEL

Manufactured By	MITSUBISHI MOTORS (THAILAND) CO., LTD.	GVWR (kg)	1320
Date of Manufacture	02/16	GAWR Front (kg)	730
Vehicle Type	Passenger Car	GAWR Rear (kg)	670

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				375	(A)
DSC x 68.04 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				35	(A-B)

VEHICLE SEAT TYPE

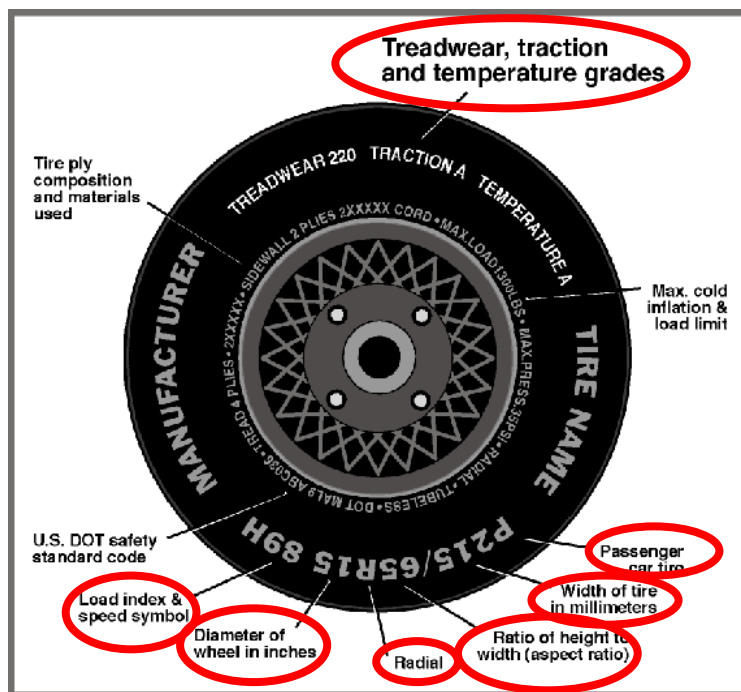
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X					w/ Lever	
Rear or Second Row Seat		X			X		
Third Row Seat							

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	165/65R14	165/65R14
Tire Size on Vehicle	165/65R14	165/65R14
Tire Manufacturer	Dunlop	Dunlop
Tire Model	Enasave	Enasave
Treadwear	340	340
Traction	A	A
Temperature Grade	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	79S	79S
Tire Material	Rubber	Rubber
DOT Safety Code Left	R8CX 2MMR 0416	R8CX 2MMR 0416
DOT Safety Code Right	R8CX 2MMR 0416	R8CX 2MMR 0416

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. 020175601
 Test Date: 8/24/2016

TEST PRESSURES

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

MDB TIRE SPECIFICATIONS

Requirement	Units	LF	RF	LR	RR
Tire Size	P205/75R15	N/A	P205/75R15	P205/75R15	P205/75R15
Tire	200 ± 21	kPa	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	276.0	191.0		312.5	258.5		310.5	268.0	
Right	kg	273.5	182.0		280.0	230.0		284.5	223.5	
Ratio	%	59.6%	40.4%		54.8%	45.2%		54.8%	45.2%	
Totals	kg	549.5	373.0	922.5	592.5	488.5	1081.0	595.0	491.5	1086.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	922.5	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	35	(C)
Calculated Test Vehicle Target Weight (TWTW)	kg	1086.5	(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	608	605	Yes
Right Front	mm	633	625	Yes
Right Rear	mm	600	600	Yes
Left Rear	mm	572	581	Yes
Vehicle CG (Aft of Front Axle)	mm	1108	1107	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	46	9	

*** 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
---	----------------

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Weight of Ballast, if any	
Front bumper fascia, rear bumper fascia, left rear tailight	9

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016

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	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

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

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

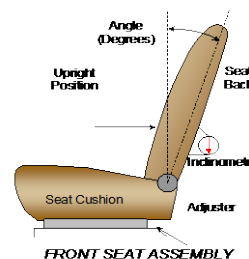
NHTSA No. O20175601
 Test Date: 8/24/2016

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	230	24	120	12
Front Passenger Seat	230	24	120	12
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	Fixed		Fixed	

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned 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	66.2	34	1.1	4
Front Passenger Seat	59.2	28	-1.2	4
Front Center Seat				
Struck Side Rear Seat	Fixed		17.8	
Non-Struck Side Rear Seat	Fixed		17.8	
Rear Center Seat	Fixed		17.8	

Driver seat back angle measured on headrest post
 Left rear passenger seat back angle measured on headrest post.

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016

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

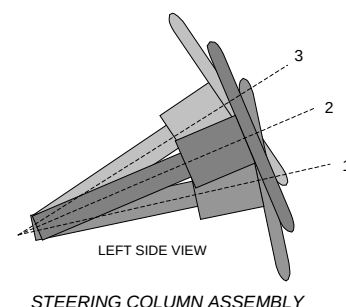
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

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

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.

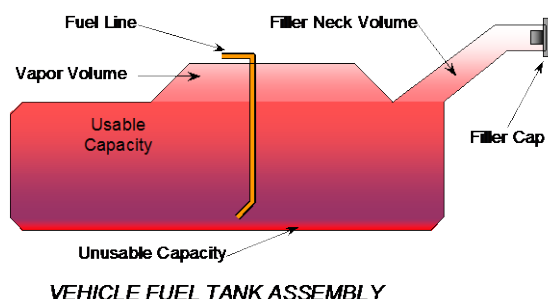
	Wheel Angle (deg)	Fore/Aft Position (mm)
Lowermost, Position 1	67.3	
Geometric Center, Position 2	65.7	
Uppermost, Position 3	64.0	
Telescoping Steering Wheel Travel		
Test Position	65.7	



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 electric fuel pump.
The electric fuel pump operates when the engine is running.
The fuel pipe is on the left side.



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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of Standard Tank (see Form No. 1)	34.8
Usable Capacity of Optional Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	34.8
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	32.4
Actual Amount of Solvent Used	32.9
1/3 of Usable Capacity	11.6

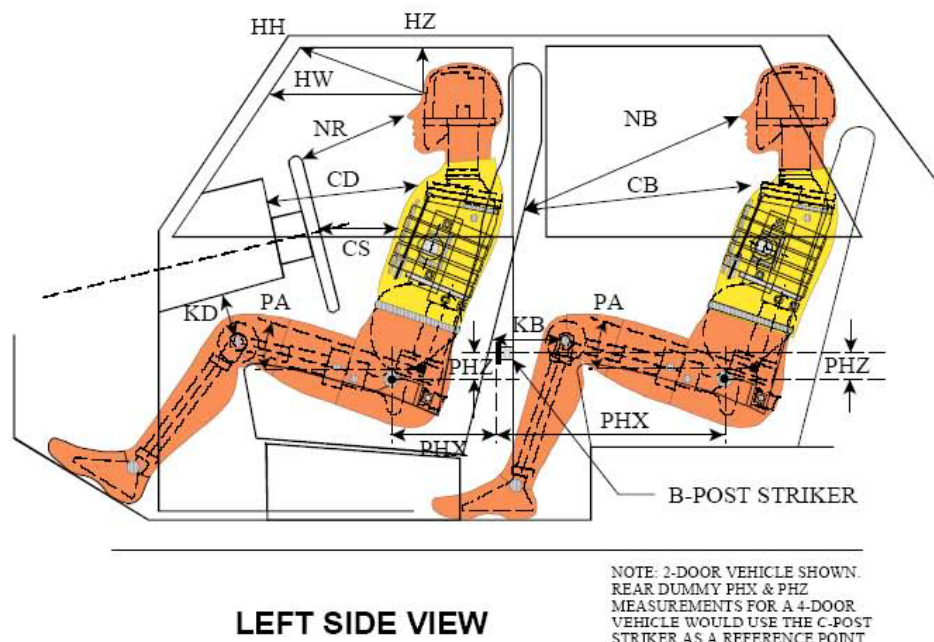
Is the actual amount of solvent used in the test equal to 93% + 1%
of the Usable Capacity stated in Form No. 1?

NO

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016



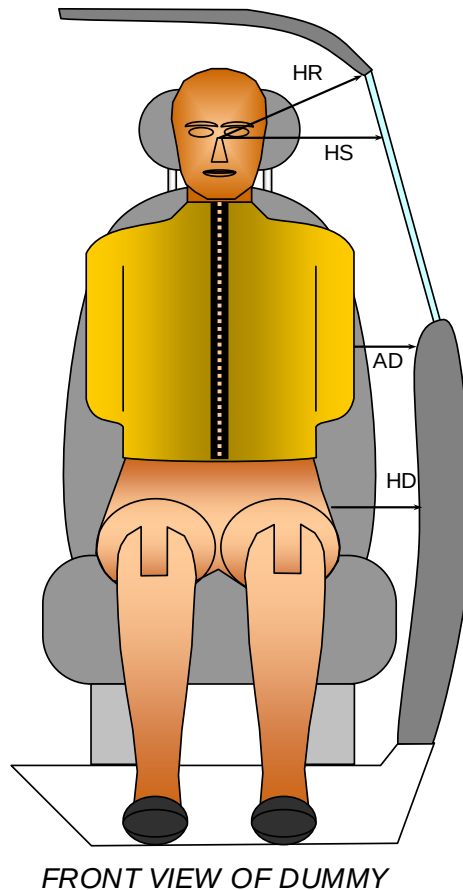
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	355	13.2		
HW		Head to Windshield	558	0		
HZ	HZ	Head to Roof Liner	151	90	245	90
NR	NB	Nose to Rim/Seat Back	419	14.1	531	12.9
CD	CB	Chest to Dashboard/Seat Back	569	5.2	537	10.1
CS		Chest to Steering Wheel	365	9.0		
KDL	KBL	Left Knee to Dash/Seat Back	157	30.4	262	11.6
KDR	KBR	Right Knee to Dash/Seat Back	176	19.3	263	12.1
PAX	PAX	Pelvic Tilt Angle X		17.4		21.7
PAY	PAY	Pelvic Tilt Angle Y		0.0		-1.0
PHX	PHX	Hip Point to Striker (X-Axis)	197		204	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	147		207	

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016



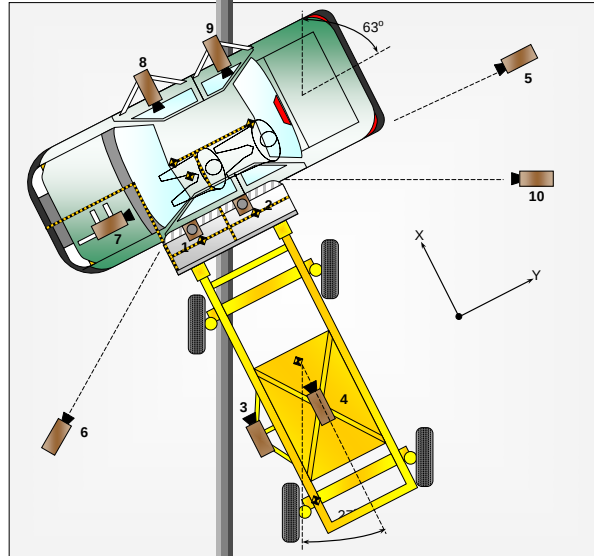
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	203	211
HS	Head to Side Window	mm	314	336
AD	Arm to Door	mm	92	121
HD	Hip Point to Door	mm	116	149

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	120	-60	-4430	14	1000
2	Overhead Close-Up	20	0	-4330	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	-40	5560	-1090	24	1000
6	Left Front	-1830	-5450	-1130	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

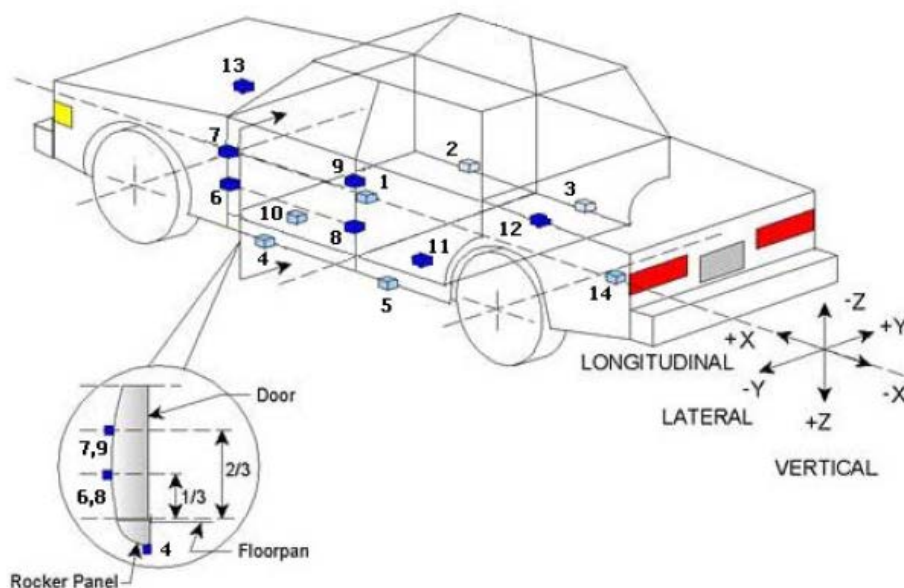
INSTRUMENTATION

	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: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016



TEST VEHICLE ACCELEROMETER LOCATIONS

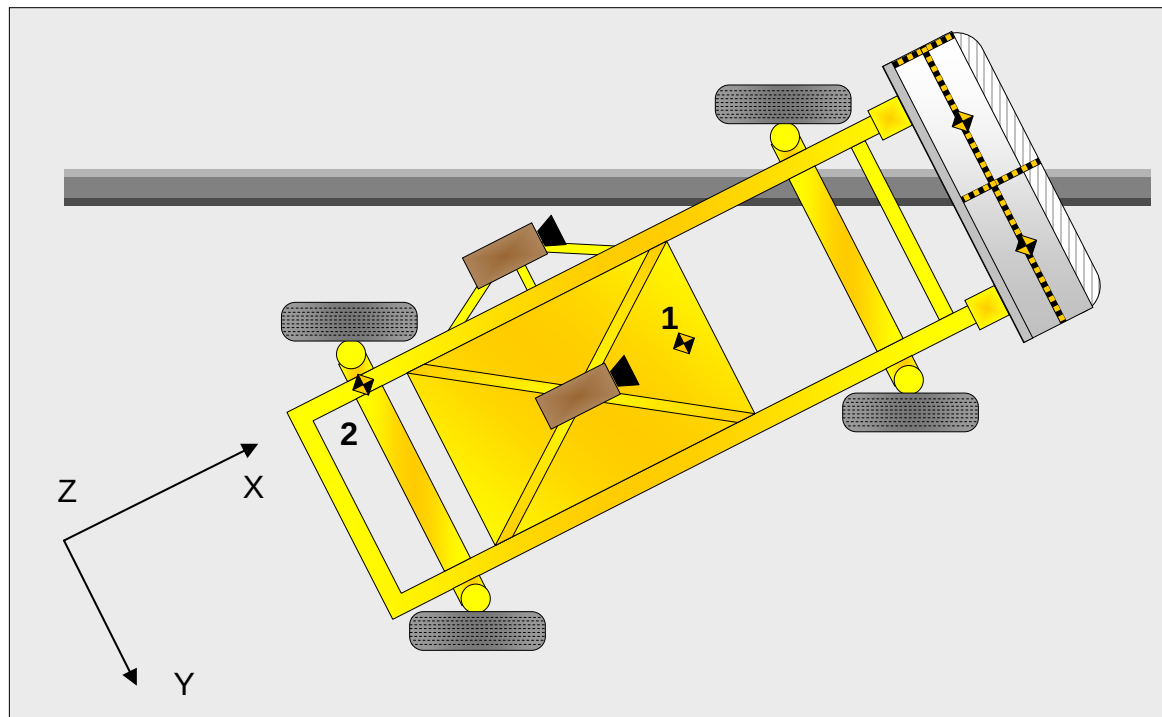
Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1996	128	-227
2	Right Sill at Front Seat	1779	666	-207
3	Right Sill at Rear Seat	863	666	-216
4	Left Sill at Front Door	1881	-666	-212
5	Left Sill at Rear Door	1263	-666	-209
6	Left Lower A-Post	2470	-737	-520
7	Left Middle A-Post	2479	-730	-756
8	Left Lower B-Post	1406	-646	-573
9	Left Middle B-Post	1381	-650	-783
10	Front Seat Track	1575	-333	-241
11	Rear Seat Structure	1167	-357	-278
12	Rt. Rear Occ. Compartment	1196	353	-211
13	Engine Block	3041	295	-786
14	Rear Above Axle	595	0	-480

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: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016



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: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. 020175601
Test Date: 8/24/2016

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	CAB	CAB, Center Seat Back
Top of Head	CAB, Headliner	Headliner, Center Seat Back
Left Side of Head	CAB, Headliner	CAB, Headliner
Back of Head	CAB, Headliner, Headrest	CAB, Headliner, Center Seat Back
Left Shoulder	None	Door Panel
Upper Torso	SAB	C-Pillar Trim
Lower Torso	SAB	C-Pillar Trim
Left Hip	SAB	C-Pillar Trim
Left Knee	Door Panel	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	LF Window Broken
Other Notable Effects	None

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2450
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		305
Actual Impact Point (Aft of Front Axle)	mm		300
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	5
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	-2

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
Test Date: 8/24/2016

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1250
Overall Length Including Honeycomb Face	4119
Wheelbase of Framework Carriage	2588
CG Location aft of Front Axle	1138

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	406.0	283.3	
Right	kg	357.9	316.4	
Ratio	%	56.0	44.0	
Totals	kg	763.9	599.7	1363.5

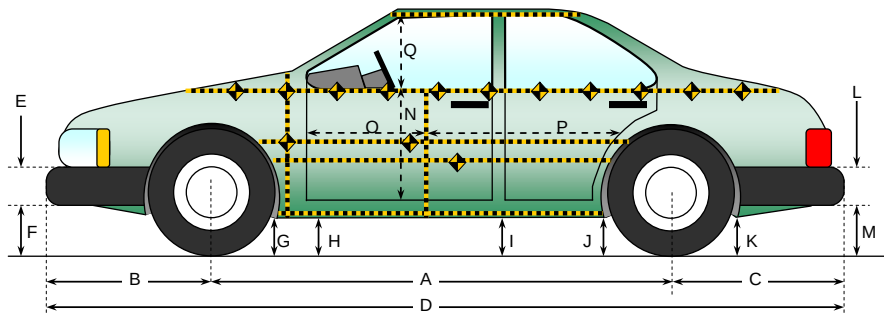
SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.57
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.72
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.2
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27.3

DATA SHEET NO. 10 **TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016



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

LEFT SIDE VIEW

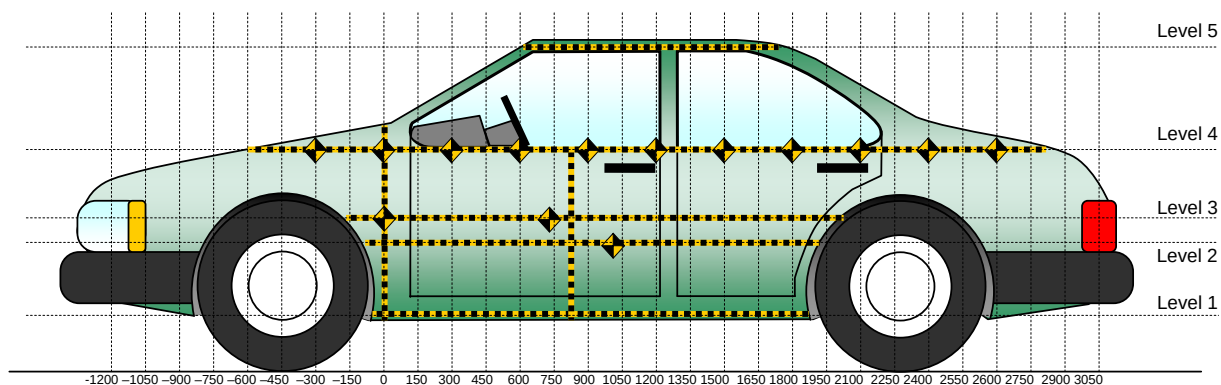
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2450	2454	-4
B	Front Axle to FSOV	683	714	-31
C	Rear Axle to RSOV	551	550	1
D	Total Length at Centerline	3684	3718	-34
E	Front Bumper Thickness	114	114	0
F	Front Bumper Bottom to Ground	213	227	-14
G	Sill Height at Front Wheel Well	160	200	-40
H	Sill Height at Front Door Leading Edge	172	206	-34
I	Sill Height at B Pillar	167	209	-42
J1	Sill Height at Rear Wheel Well	163	200	-37
J2	Pinch Weld Height at Rear Wheel Well	174	210	-36
K	Sill Height Aft of Rear Wheel Well	528	545	-17
L	Rear Bumper Thickness	140	140	0
M	Rear Bumper Bottom to Ground	243	251	-8
N	Sill Height to Window Bottom Sill	715	558	157
O	Front Door Leading Edge to Impact CL	831	799	32
P	Rear Door Trailing Edge to Impact CL	1061	1019	42
Q	Front Window Opening	450	477	-27
R	Right Side Length	3114	3121	-7
S	Left Side Length	3114	3061	53
T	Vehicle Width at B Post	1648	1475	173

DATA SHEET NO. 11 **TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016



All Measurements Shown in mm

LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEAUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	235	101	1350
2	Occupant H-Point	548	240	450
3	Mid Door	619	237	300
4	Window Sill	879	196	900
5	Window Top	1405	33	1200

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: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016

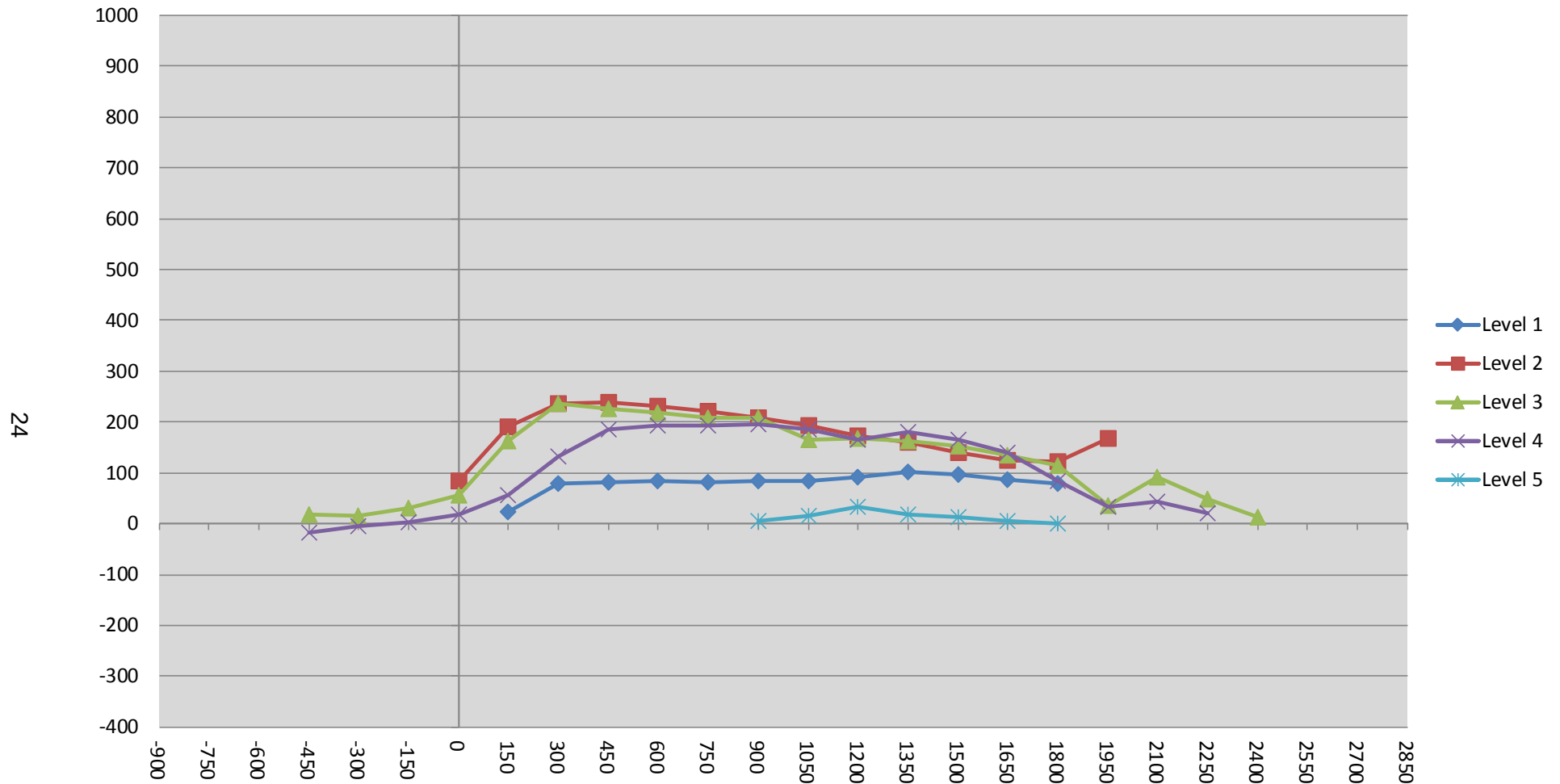
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2100															
-1950															
-1800															
-1650															
-1500															
-1350															
-1200															
-1050															
-900															
-750															
-600															
-450			275	387				294	370				19	-17	
-300			268	351				283	345				15	-6	
-150			266	335				296	338				30	3	
0		269	274	329			352	331	346			83	57	17	
150	315	281	284	326		339	471	446	383		24	190	162	57	
300	317	280	280	320		397	517	517	452		80	237	237	132	
450	317	278	277	313		399	518	504	498		82	240	227	185	
600	318	276	275	308		401	508	494	501		83	232	219	193	
750	319	276	274	301		401	496	483	495		82	220	209	194	
900	321	276	273	296	510	405	485	481	492	516	84	209	208	196	6
1050	322	278	274	293	511	407	472	440	479	527	85	194	166	186	16
1200	323	280	275	293	513	414	453	442	459	546	91	173	167	166	33
1350	325	283	278	294	525	426	443	441	475	544	101	160	163	181	19
1500	327	286	282	298	537	423	427	434	464	551	96	141	152	166	14
1650	329	289	287	305	557	415	413	422	445	562	86	124	135	140	5
1800	329	286	289	313	590	408	408	403	398	591	79	122	114	85	1
1950		279	282	321			446	318	353			167	36	32	
2100			280	329				372	372				92	43	
2250			286	340				335	361				49	21	
2400			303					317					14		
2550															
2700															
2850															
3000															
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: 2017 Mitsubishi Mirage ES 5-Door Hatchback
Test Program: NCAP Side MDB Impact Test

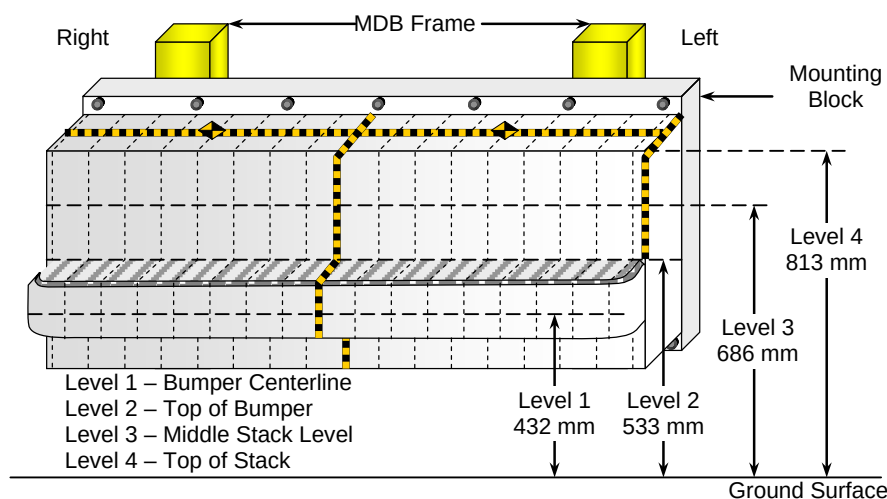
NHTSA No. O20175601
Test Date: 8/24/2016



DATA SHEET NO. 12 **MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016



FRONT VIEW

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	107
B	Top of Bumper	533	800	Left	69
C	Mid-Level	686	800	Left	88
D	Top of Stack	813	800	Left	137

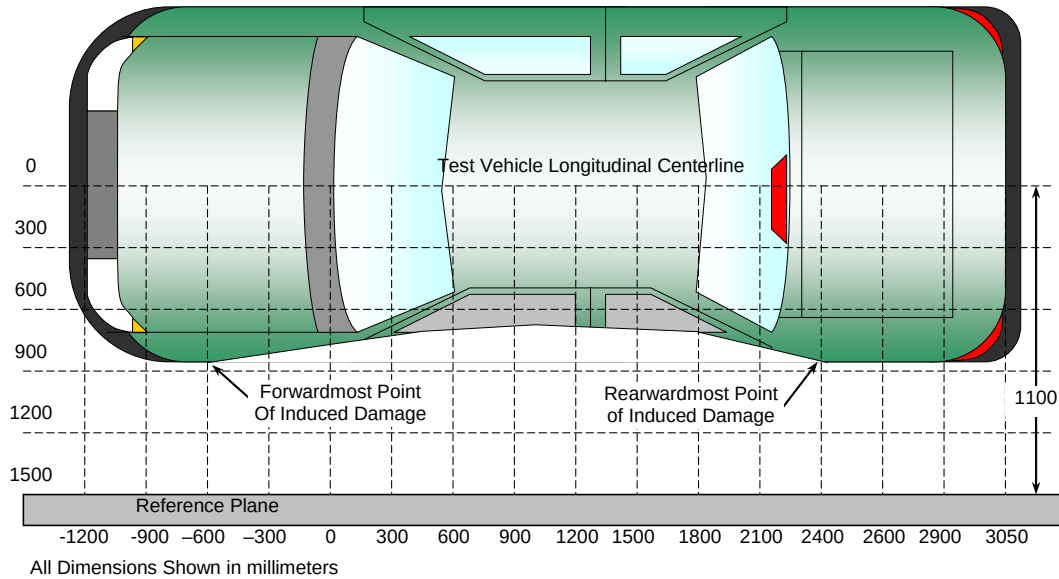
DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C _L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
4	19	8	3	4	10	33	57	29	21	8	10	11	14	20	44	80	137
3	9	-3	3	5	20	14	32	33	15	6	8	10	11	14	20	29	88
2	45	44	44	45	47	47	47	45	43	40	40	40	42	44	47	61	69
1	84	77	75	75	76	82	83	79	73	68	69	67	67	70	78	100	107

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016



TOP VIEW

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Max. Static Crush (mm)
1	2320	3	322	288	34
2	1181	3	406	275	131
3	1302	3	441	277	164
4	793	3	487	274	213
5	284	3	515	280	235
6	-225	3	289	267	22

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	560	476	84
2	480 mm right of center	1	544	465	79
3	160 mm right of center	1	541	461	79
4	160 mm left of center	1	524	461	62
5	480 mm left of center	1	545	465	80
6	800 mm left of center	1	583	476	107

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

Test Vehicle: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

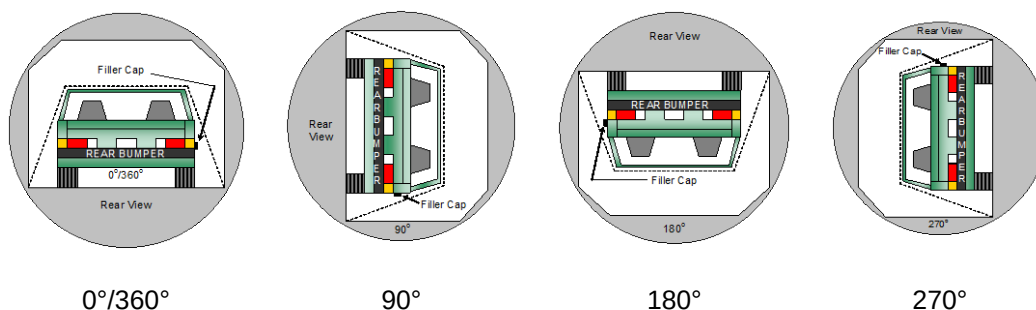
NHTSA No. O20175601
 Test Date: 8/24/2016

Test Time: 10:16 am

Temperature: 21.4 °C

- A. From impact until vehicle motion ceases: 0.0 oz.
 (Maximum Allowable = 1 ounce)
- 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°	115	300	415
90° to 180°	111	300	411
180° to 270°	108	300	408
270° to 360°	110	300	410

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	

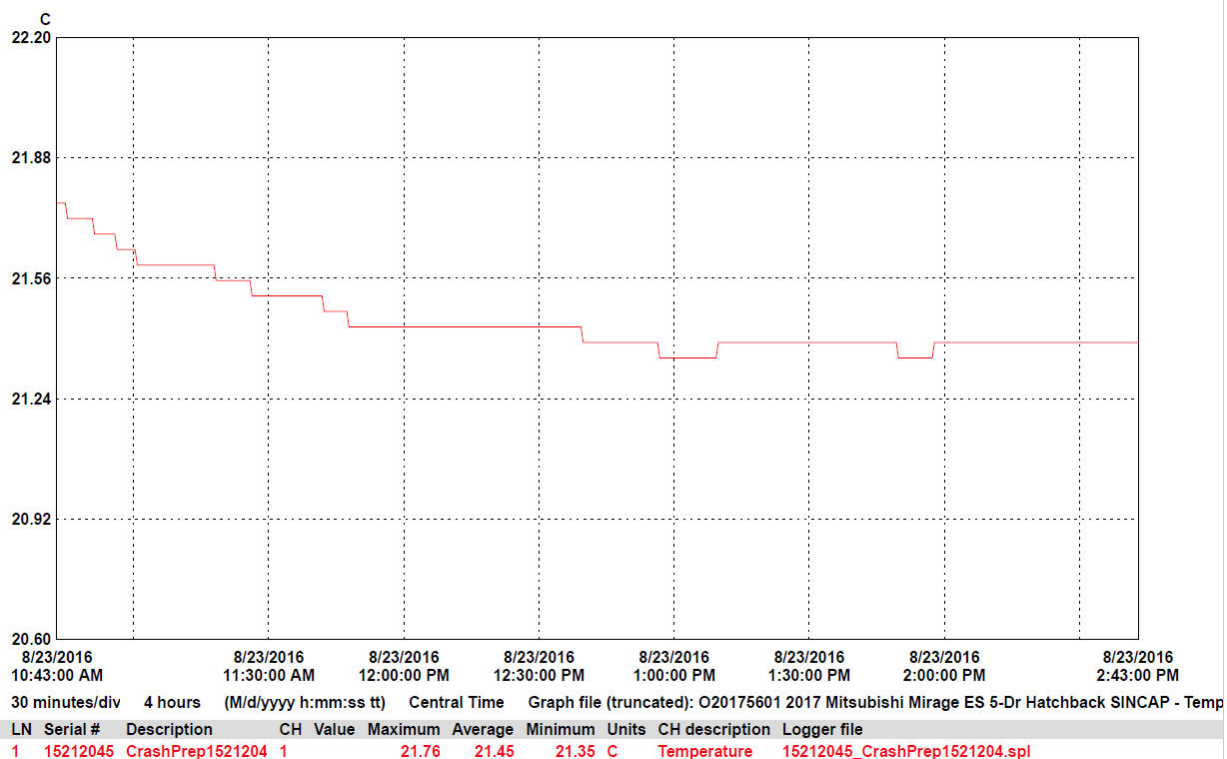
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2017 Mitsubishi Mirage ES 5-Door Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. O20175601
 Test Date: 8/24/2016



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

		<u>Page No.</u>
Photo No. 001	As Delivered Right Front Three-Quarter View of Test Vehicle	A-1
Photo No. 002	As Delivered Left Rear Three-Quarter View of Test Vehicle	A-1
Photo No. 003	Pre-Test Frontal View of Test Vehicle	A-2
Photo No. 004	Post-Test Frontal View of Test Vehicle	A-2
Photo No. 005	Pre-Test Left Front Three-Quarter View of Test Vehicle	A-3
Photo No. 006	Post-Test Left Front Three-Quarter View of Test Vehicle	A-3
Photo No. 007	Pre-Test Left Side View of Test Vehicle	A-4
Photo No. 008	Post-Test Left Side View of Test Vehicle	A-4
Photo No. 009	Pre-Test Left Three-Quarter Rear View of Test Vehicle	A-5
Photo No. 010	Post-Test Left Three-Quarter Rear View of Test Vehicle	A-5
Photo No. 011	Pre-Test Rear View of Test Vehicle	A-6
Photo No. 012	Post-Test Rear View of Test Vehicle	A-6
Photo No. 013	Pre-Test Right Side View of Test Vehicle	A-7
Photo No. 014	Post-Test Right Side View of Test Vehicle	A-7
Photo No. 015	Pre-Test Overhead View of Test Area	A-8
Photo No. 016	Post-Test Overhead View of Test Area	A-8
Photo No. 017	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	A-9
Photo No. 018	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	A-9
Photo No. 019	Pre-Test Close-Up View of Impact Point Target	A-10
Photo No. 020	Post-Test Close-Up View of Impact Point Target	A-10
Photo No. 021	Pre-Test Left Front Door Latch Close-Up	A-11
Photo No. 022	Post-Test Left Front Door Latch Close-Up	A-11

		<u>Page No.</u>
Photo No. 023	Pre-Test Left Rear Door Latch Close-Up	A-12
Photo No. 024	Post-Test Left Rear Door Latch Close-Up	A-12
Photo No. 025	Pre-Test Front Close-Up View of Driver Dummy	A-13
Photo No. 026	Post-Test Front Close-Up View of Driver Dummy	A-13
Photo No. 027	Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking	A-14
Photo No. 028	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-14
Photo No. 029	Post-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-15
Photo No. 030	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	A-15
Photo No. 031	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-16
Photo No. 032	Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning	A-16
Photo No. 033	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-17
Photo No. 034	Pre-Test Placement of Driver Dummy's Feet	A-17
Photo No. 035	Pre-Test View of Belt Anchorage for Driver Dummy	A-18
Photo No. 036	Pre-Test Left Side View of Steering Wheel	A-18
Photo No. 037	Pre-Test View of Disengaged Parking Brake	A-19
Photo No. 038	Pre-Test View of Parking Brake	A-19
Photo No. 039	Pre-Test Close-Up Left Side View of Driver Seat Track	A-20
Photo No. 040	Pre-Test Close-Up Left Side View of Driver Seat Back	A-20
Photo No. 041	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-21
Photo No. 042	Pre-Test Driver Dummy and Door Clearance View	A-21
Photo No. 043	Post-Test Driver Dummy and Door Clearance View	A-22
Photo No. 044	Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-22

		<u>Page No.</u>
Photo No. 045	Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-23
Photo No. 046	Pre-Test Driver Inner Door Panel View	A-23
Photo No. 047	Post-Test Driver Inner Door Panel View	A-24
Photo No. 048	Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View	A-24
Photo No. 049	Post-Test Driver Dummy Close-up Head Contact with Side Airbag View	A-25
Photo No. 050	Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View	A-25
Photo No. 051	Post-Test Driver Dummy Close-up Torso Contact with Side Airbag View	A-26
Photo No. 052	Post-Test Driver Dummy Close-up Pelvis Contact with Vehicle Interior View	A-26
Photo No. 053	Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View	A-27
Photo No. 054	Post-Test Driver Dummy Close-up Knee Contact View	A-27
Photo No. 055	Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking	A-28
Photo No. 056	Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-28
Photo No. 057	Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-29
Photo No. 058	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-29
Photo No. 059	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-30
Photo No. 060	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-30
Photo No. 061	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-31
Photo No. 062	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-31
Photo No. 063	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-32
Photo No. 064	Pre-Test Placement of Rear Passenger Dummy's Feet	A-32
Photo No. 065	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-33
Photo No. 066	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-33

		<u>Page No.</u>
Photo No. 067	Pre-Test Close-Up Left Side View of Rear Passenger Seat Back	A-34
Photo No. 068	Pre-Test Close-up View of Rear Passenger Seat Back or Head Restraint	A-34
Photo No. 069	Pre-Test Rear Passenger Dummy and Door Clearance View	A-35
Photo No. 070	Post-Test Rear Passenger Dummy and Door Clearance View	A-35
Photo No. 071	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-36
Photo No. 072	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-36
Photo No. 073	Pre-Test Rear Passenger Inner Door Panel View	A-37
Photo No. 074	Post-Test Rear Passenger Inner Door Panel View	A-37
Photo No. 075	Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View	A-38
Photo No. 076	Post-Test Rear Passenger Dummy Close-up Head Contact with Side Airbag View	A-38
Photo No. 077	Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View	A-39
Photo No. 078	Post-Test Rear Passenger Dummy Close-up Torso Contact with Side Airbag View	A-39
Photo No. 079	Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Vehicle Interior View	A-40
Photo No. 080	Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Side Airbag View	A-40
Photo No. 081	Post-Test Rear Passenger Dummy Close-up Knee Contact View	A-41
Photo No. 082	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-41
Photo No. 083	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-42
Photo No. 084	Pre-Test Front View of MDB Impactor Face	A-42
Photo No. 085	Post-Test Front View of MDB Impactor Face	A-43
Photo No. 086	Pre-Test Top View of MDB Impactor Face	A-43
Photo No. 087	Post-Test Top View of MDB Impactor Face	A-44
Photo No. 088	Pre-Test Left Side View of MDB Impactor Face	A-44

		<u>Page No.</u>
Photo No. 089	Post-Test Left Side View of MDB Impactor Face	A-45
Photo No. 090	Pre-Test Right Side View of MDB Impactor Face	A-45
Photo No. 091	Post-Test Right Side View of MDB Impactor Face	A-46
Photo No. 092	Close-Up View of Vehicle's Certification Label	A-46
Photo No. 093	Close-Up View of Vehicle's Tire Information Placard or Label	A-47
Photo No. 094	Pre-Test Ballast View	A-47
Photo No. 095	Post-Test Primary and Redundant Speed Trap Read-Out	A-48
Photo No. 096	FMVSS No. 301 Static Rollover 0 Degrees	A-48
Photo No. 097	FMVSS No. 301 Static Rollover 90 Degrees	A-49
Photo No. 098	FMVSS No. 301 Static Rollover 180 Degrees	A-49
Photo No. 099	FMVSS No. 301 Static Rollover 270 Degrees	A-50
Photo No. 100	FMVSS No. 301 Static Rollover 360 Degrees	A-50
Photo No. 101	Impact Event	A-51
Photo No. 102	Monroney Label	A-51
Photo No. 103	Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52



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

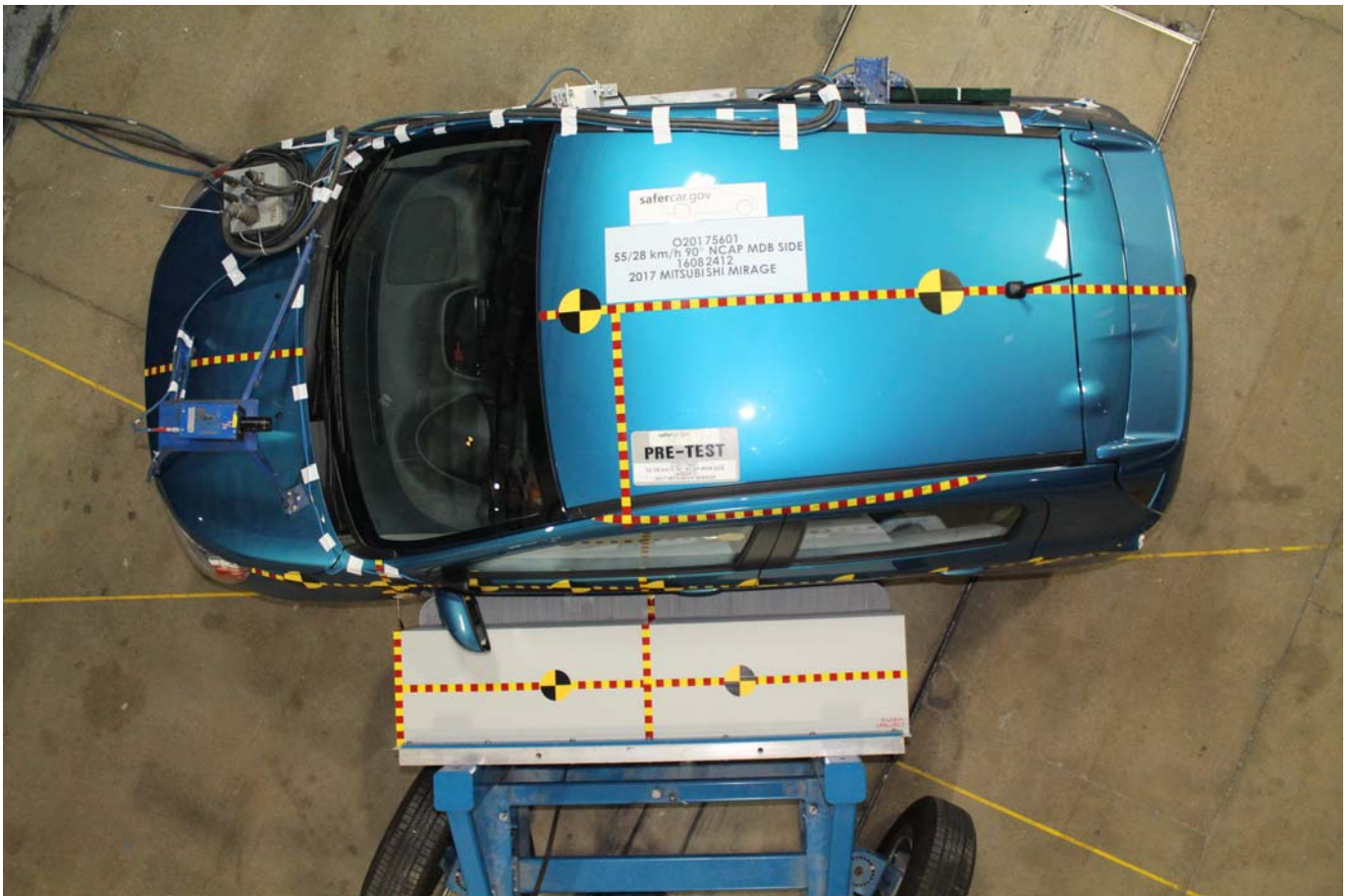


Photo No. 015 - Pre-Test Overhead View of Test Area



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

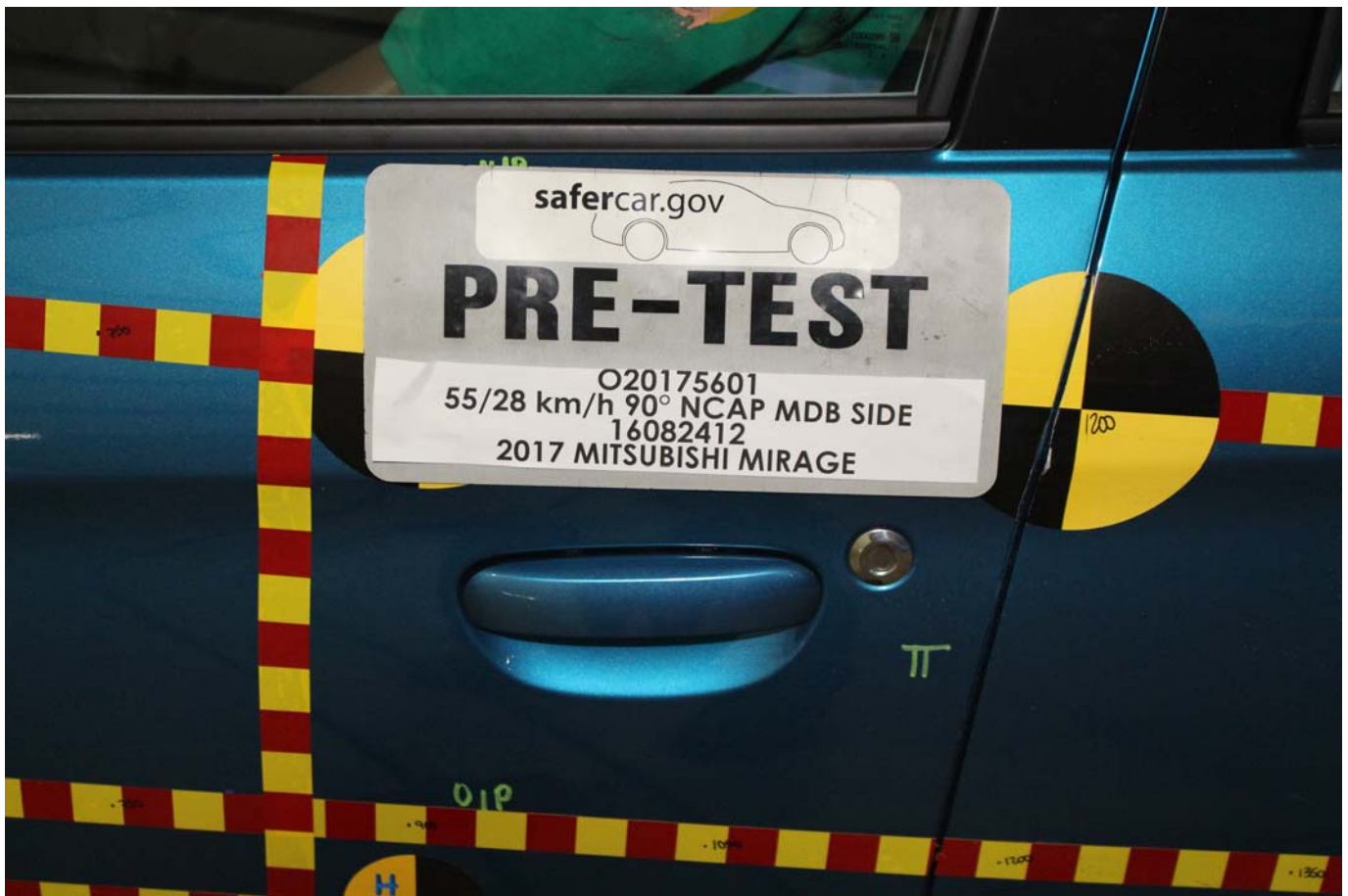


Photo No. 021 - Pre-Test Left Front Door Latch Close-Up



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



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

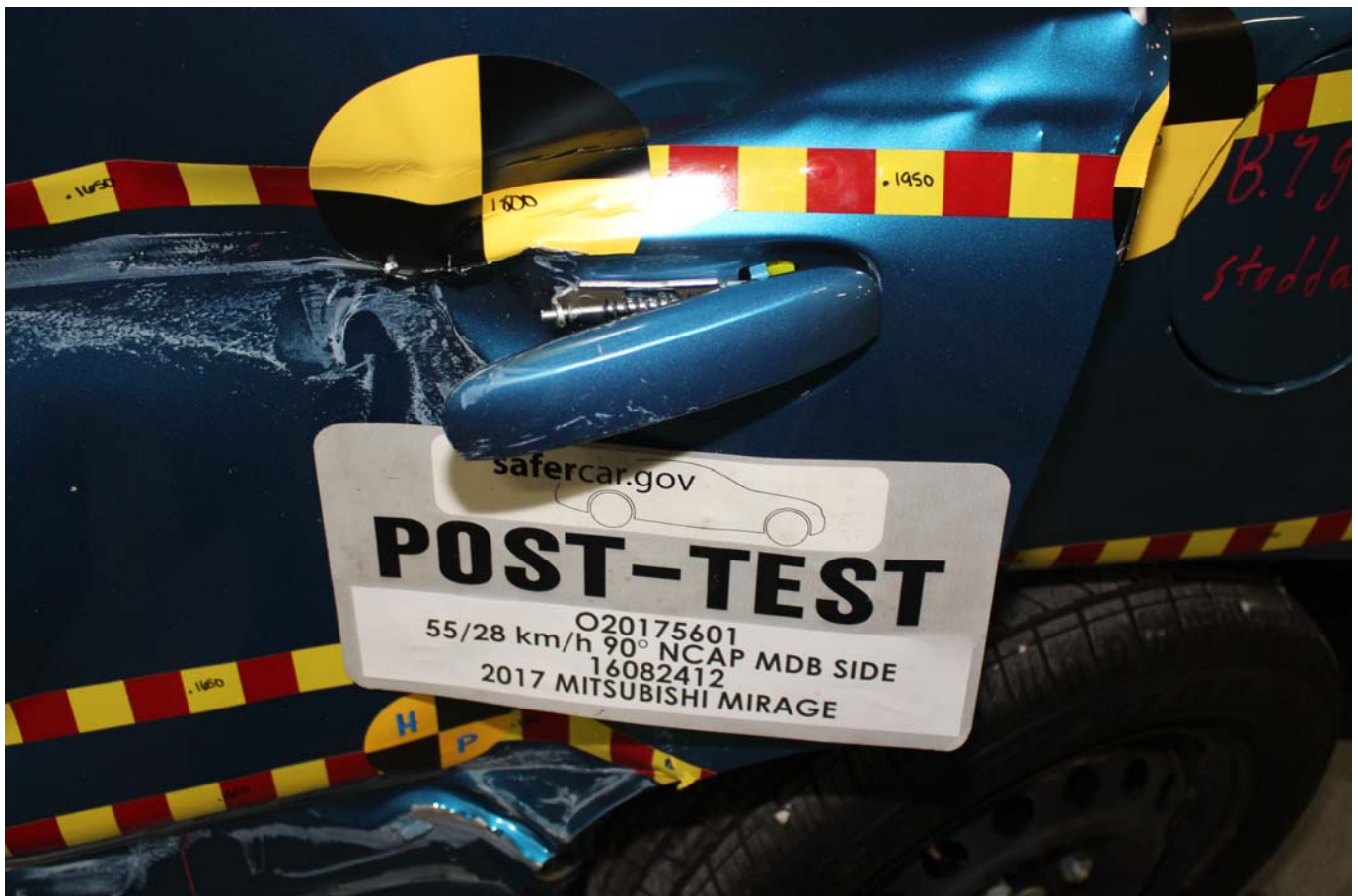


Photo No. 024 - Post-Test Left Rear Door Latch Close-Up



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



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's 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

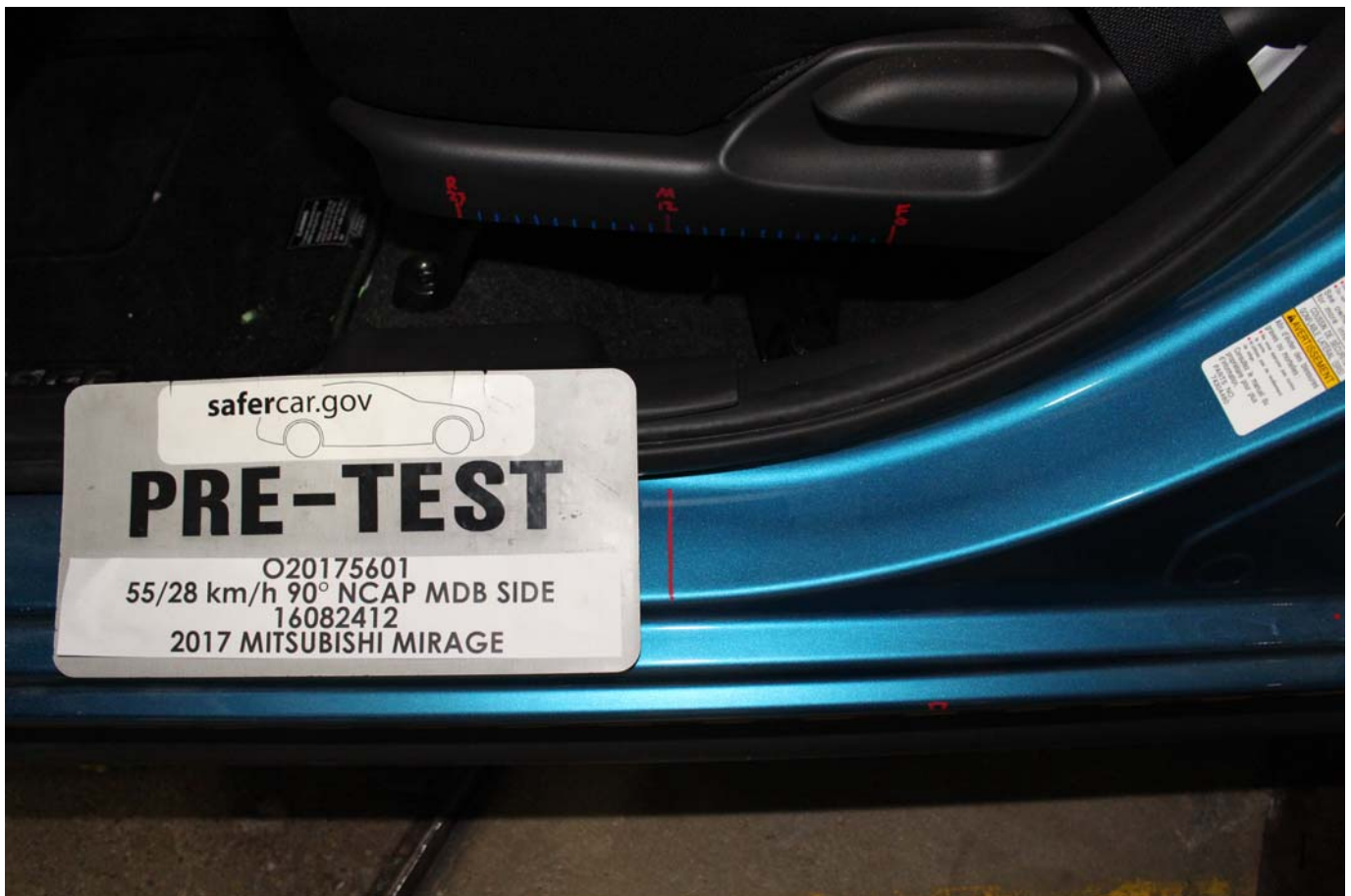


Photo No. 039 - Pre-Test Close-Up Left Side View of Driver Seat Track



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

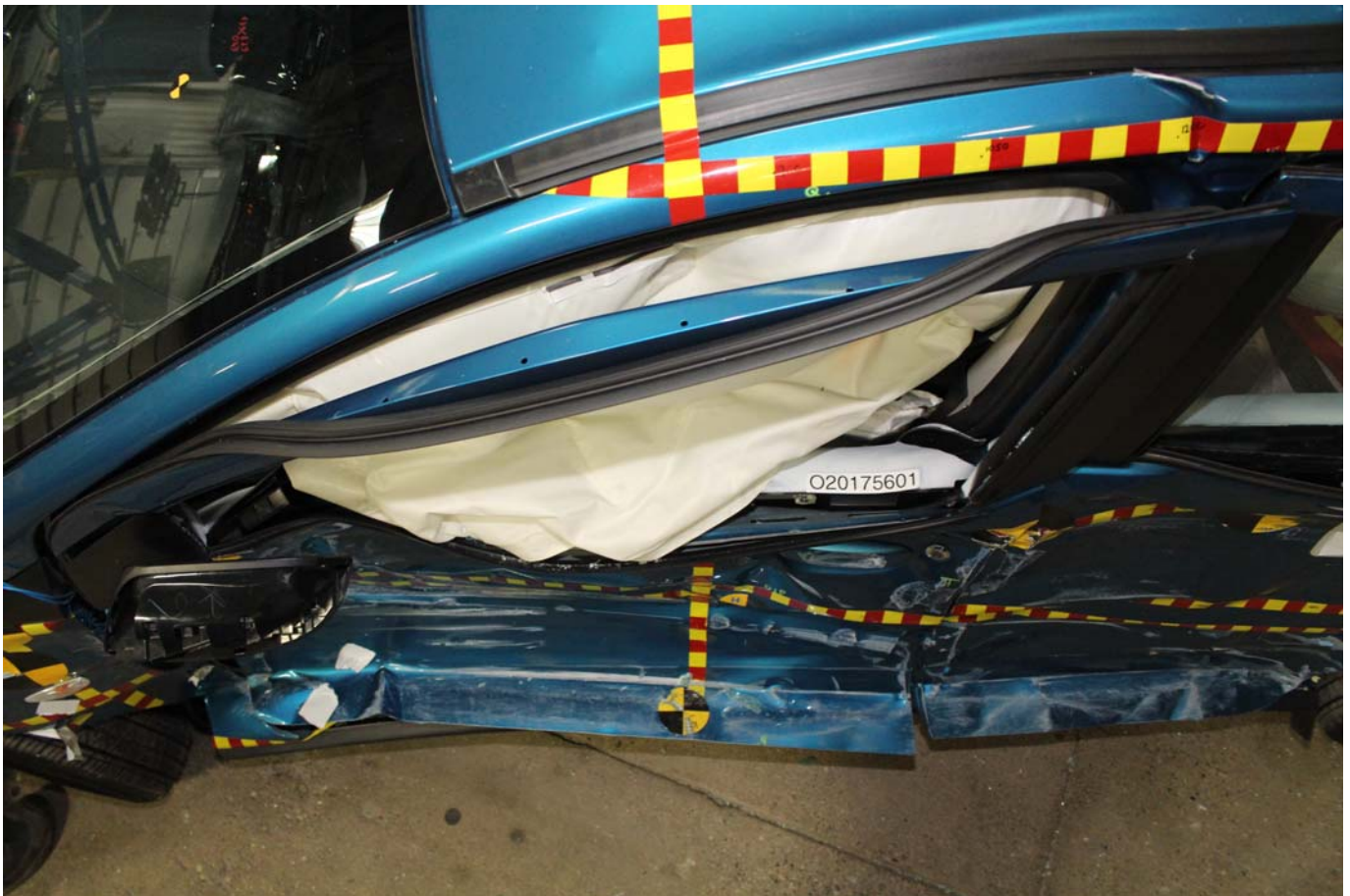


Photo No. 043 - Post-Test Driver Dummy and Door Clearance View



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

PHOTOGRAPH NOT APPLICABLE

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



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

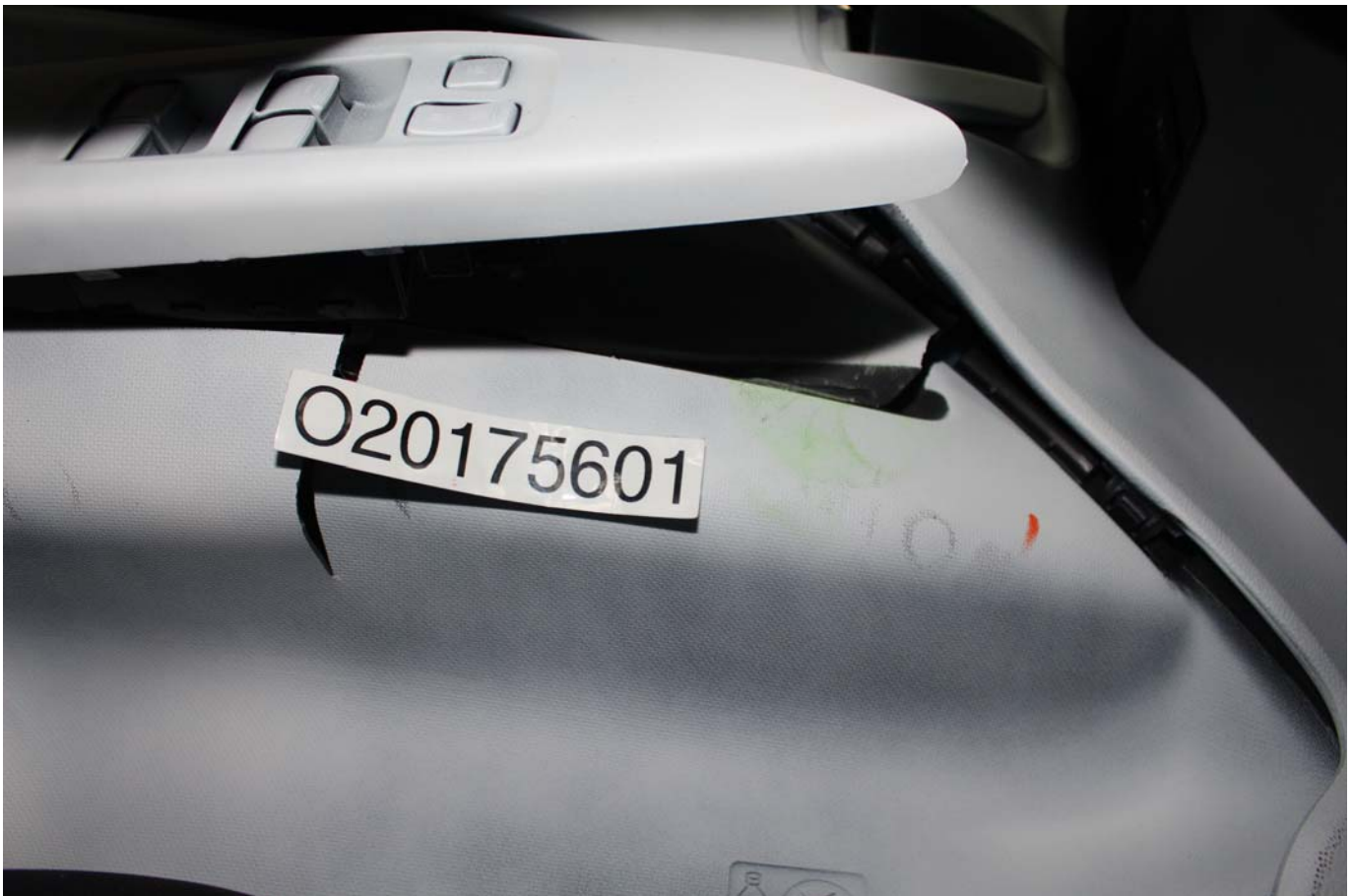


Photo No. 054 - Post-Test Driver Dummy Close-up Knee Contact View



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



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's Neck Showing Position of Adjustable Neck



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



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

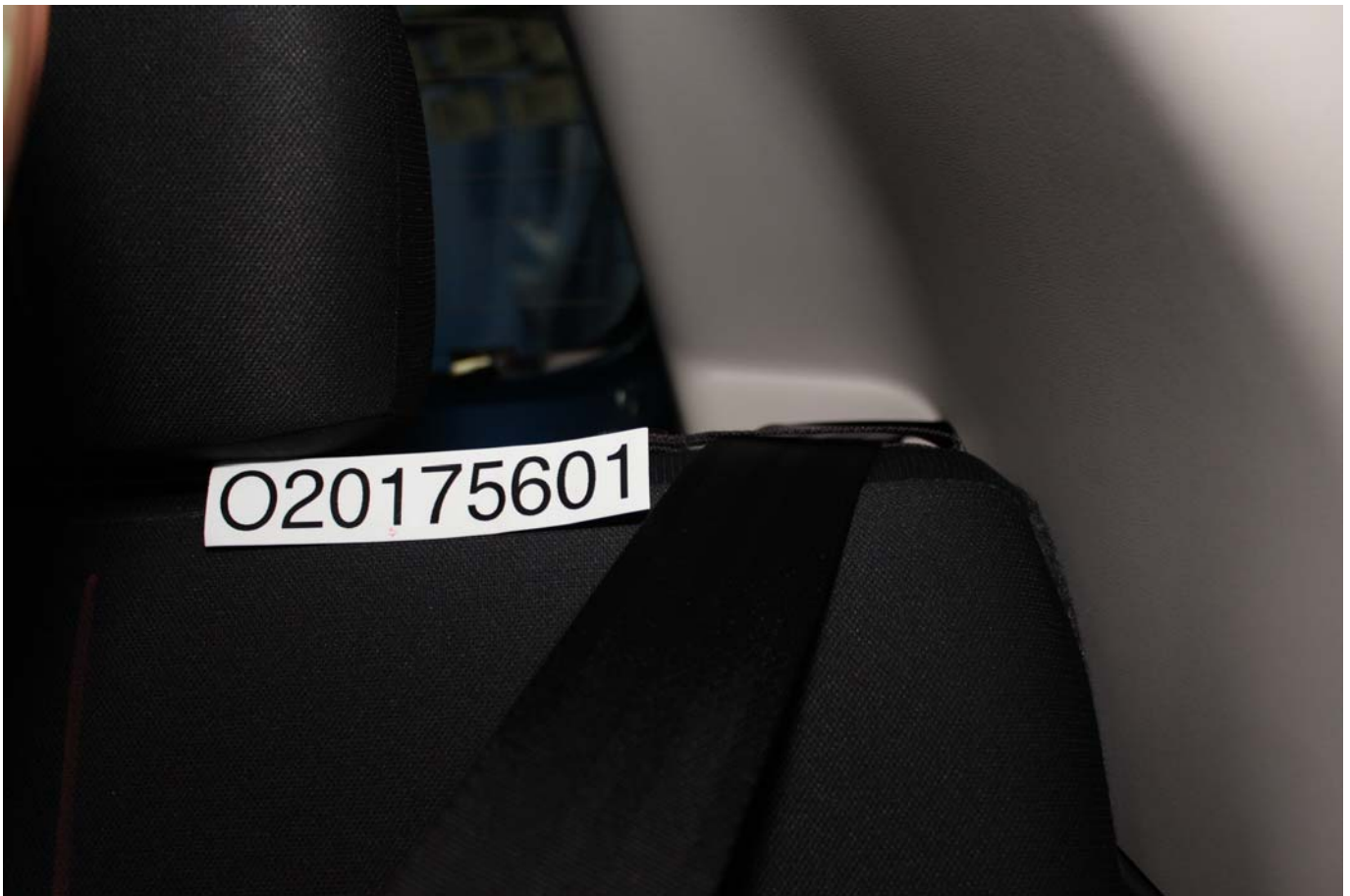


Photo No. 065 - Pre-Test View of Belt Anchorage for Rear Passenger Dummy

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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



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



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

PHOTOGRAPH NOT APPLICABLE

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

PHOTOGRAPH NOT APPLICABLE

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

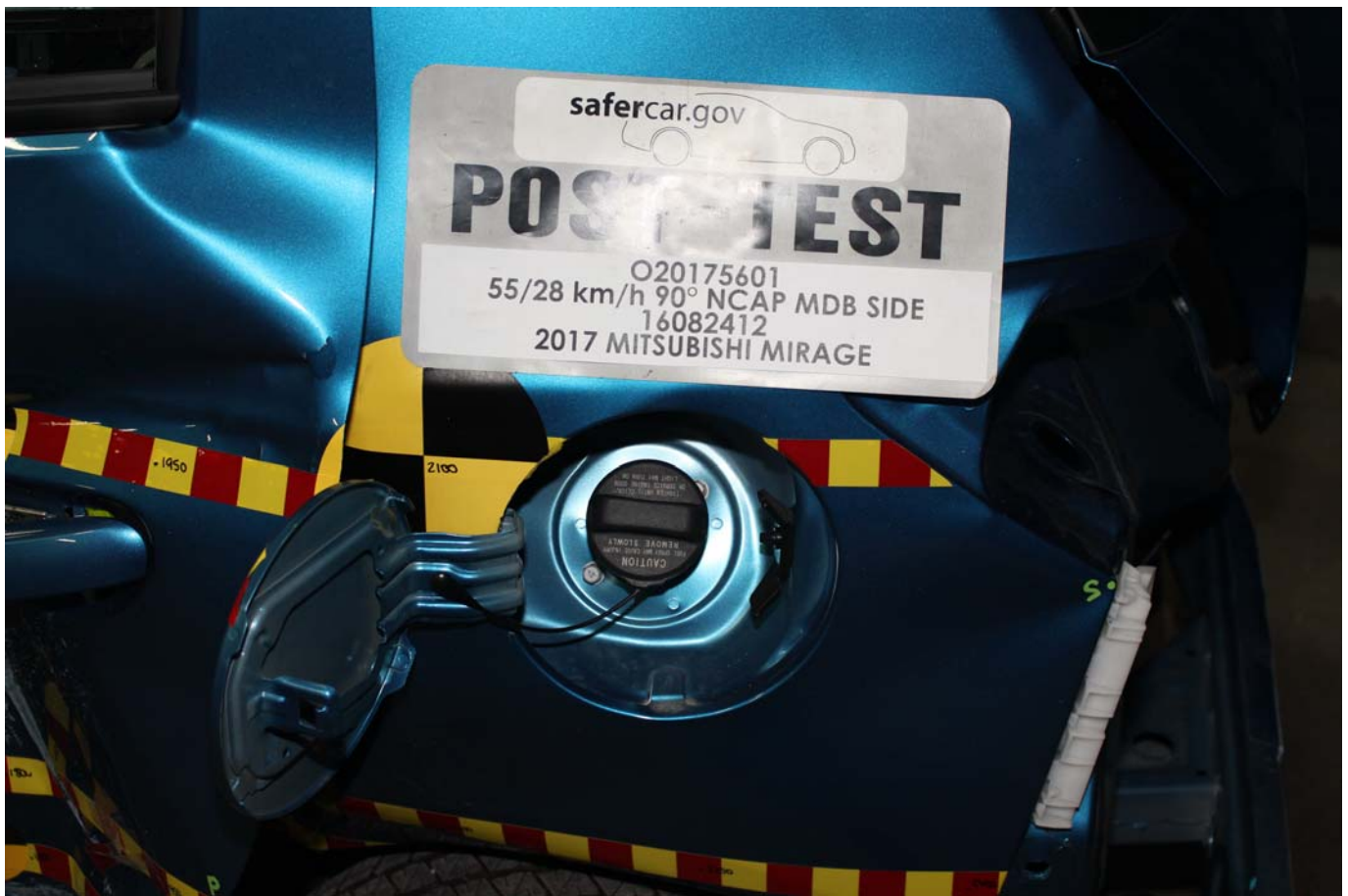


Photo No. 083 - Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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's Certification Label



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

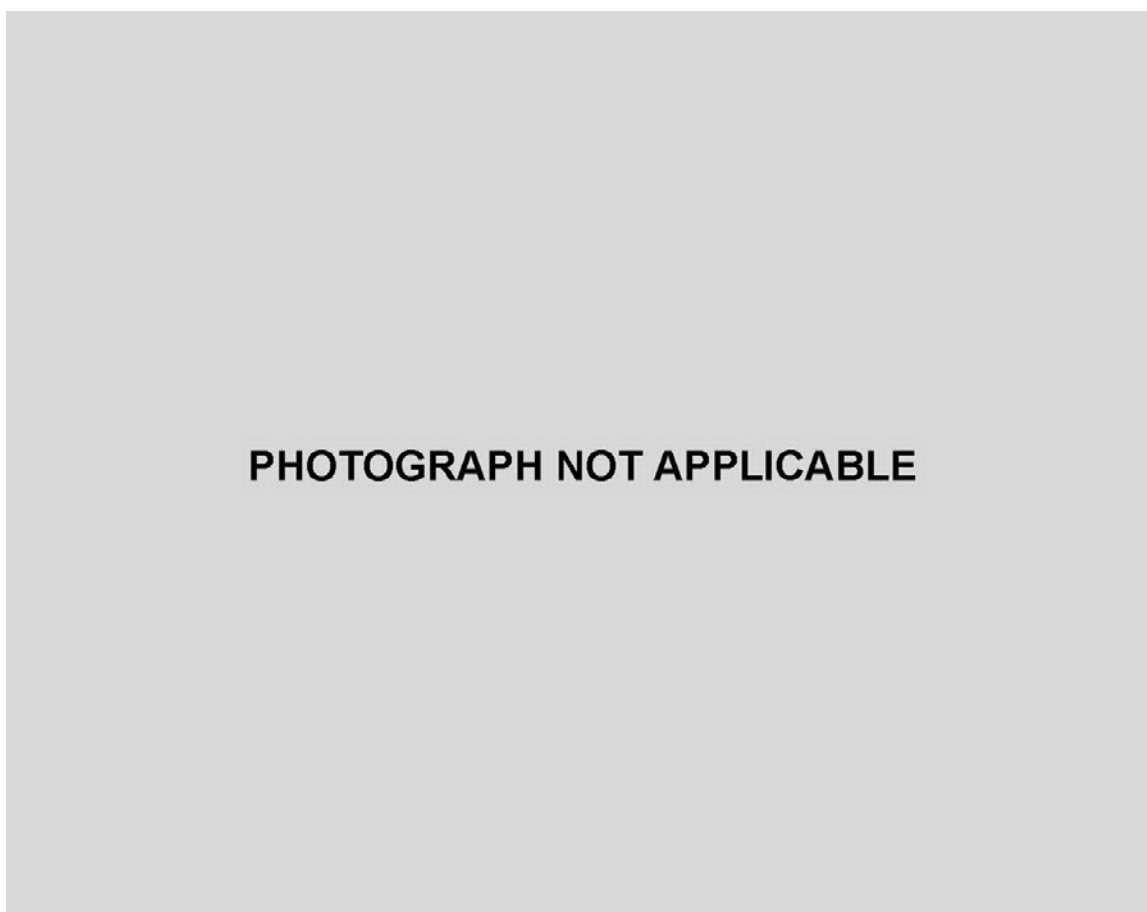


Photo No. 094 - Pre-Test Ballast View



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

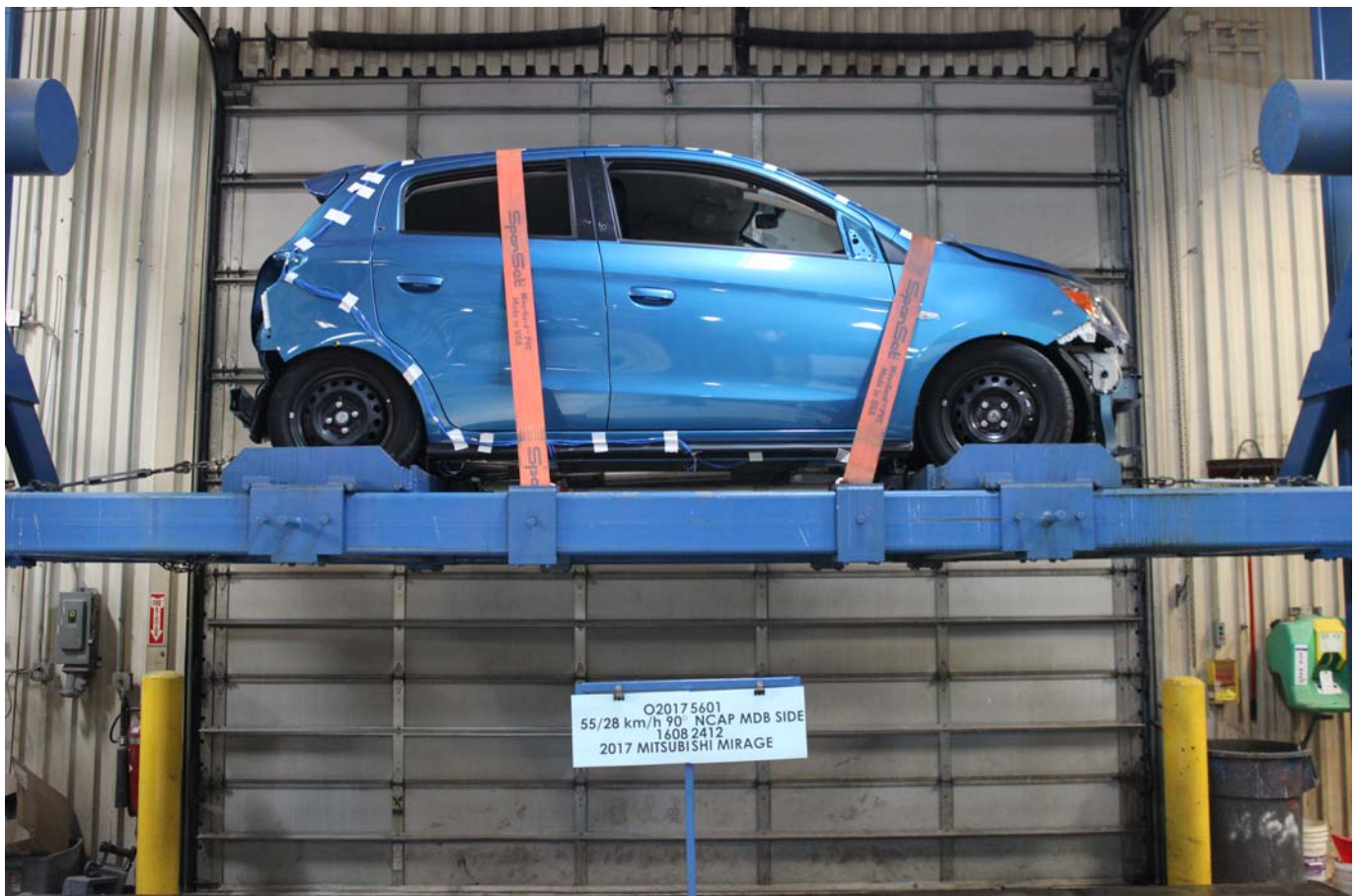


Photo No. 096 - FMVSS No. 301 Static Rollover 0 Degrees

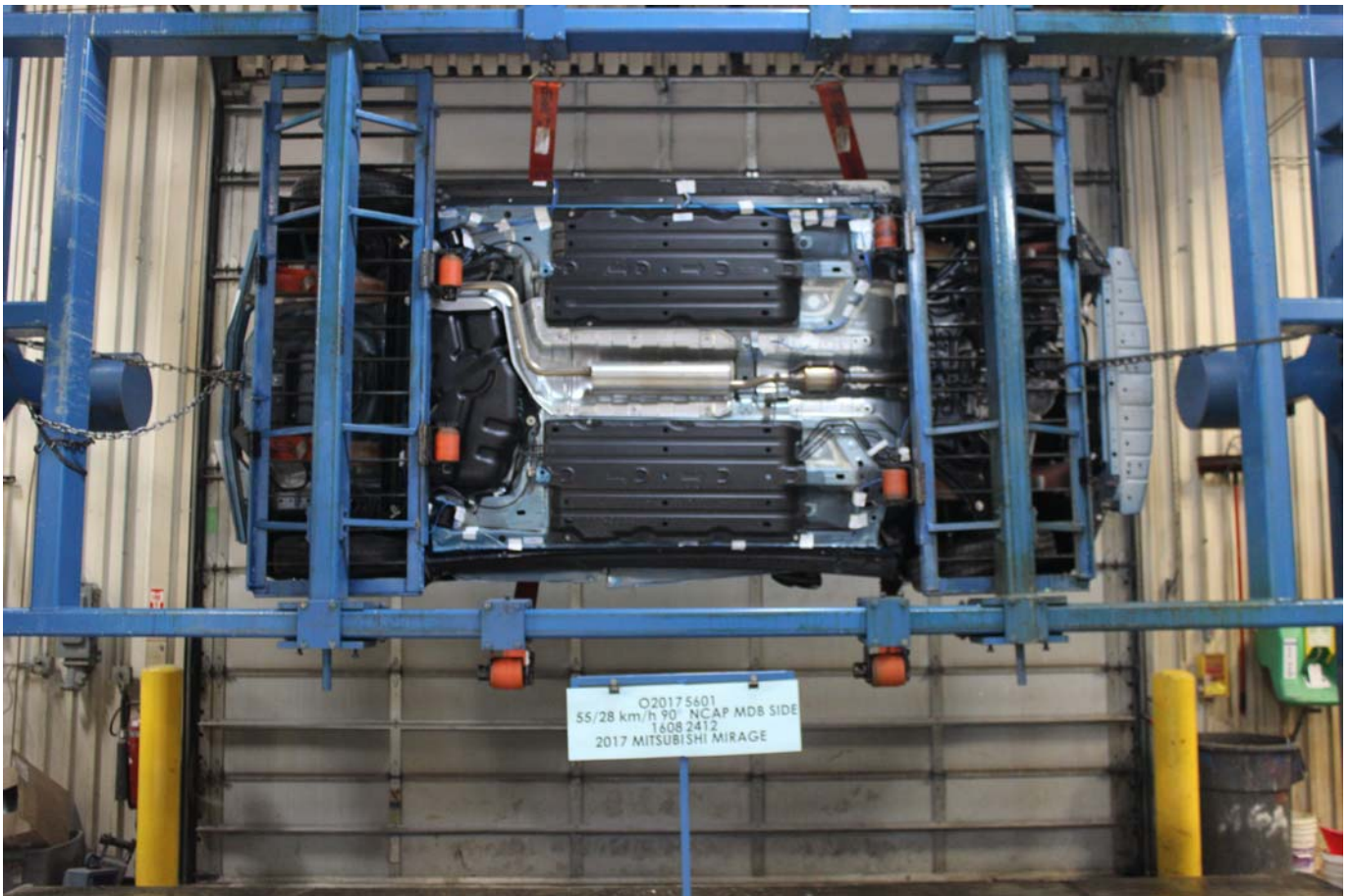


Photo No. 097 - FMVSS No. 301 Static Rollover 90 Degrees

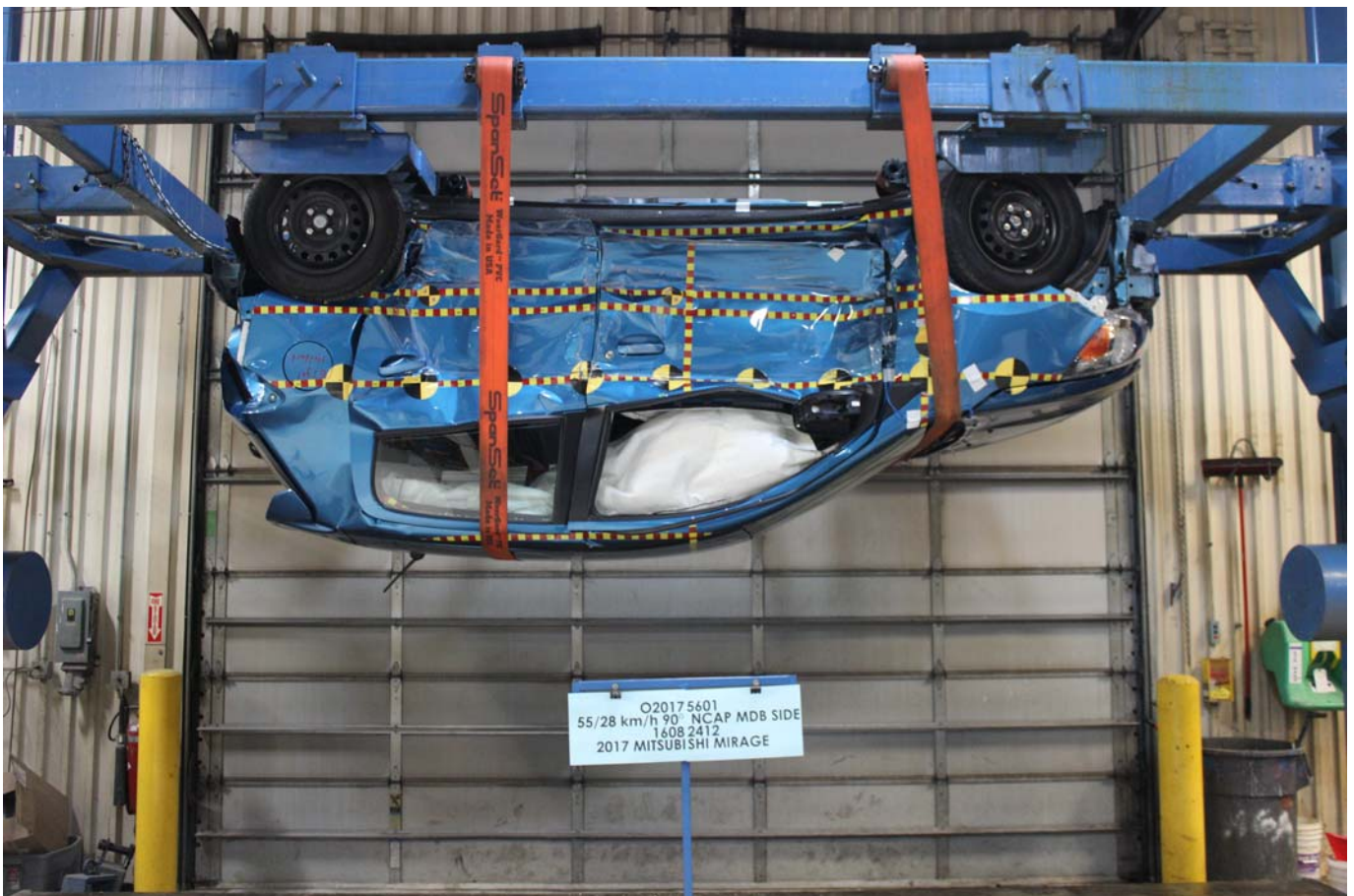


Photo No. 098 - FMVSS No. 301 Static Rollover 180 Degrees

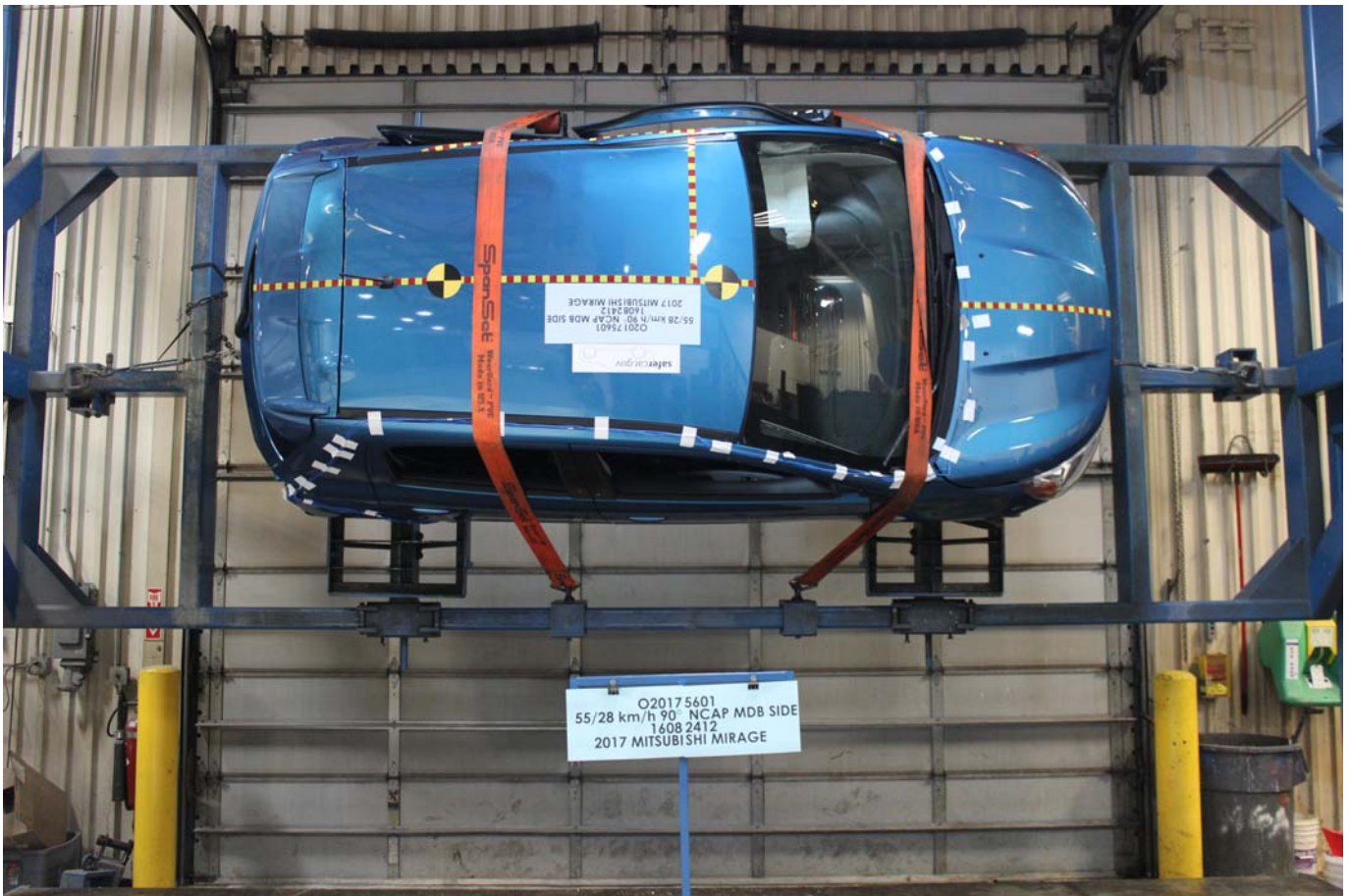


Photo No. 099 - FMVSS No. 301 Static Rollover 270 Degrees

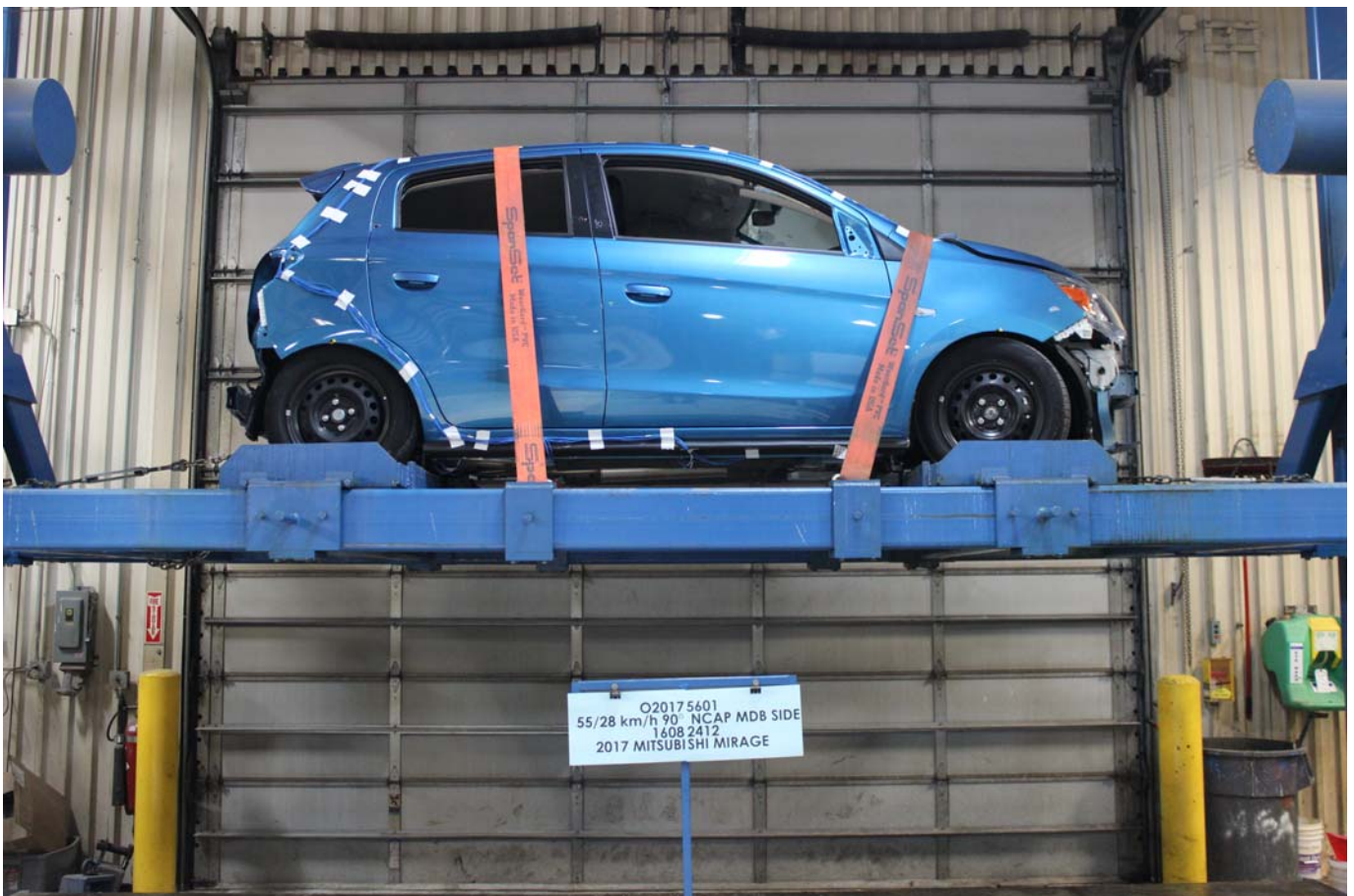


Photo No. 100 - FMVSS No. 301 Static Rollover 360 Degrees



Photo No. 101 - Impact Event



**2017 MIRAGE ES
5-DOOR HATCHBACK
SAPPHIRE BLUE / BLACK**

1.2L DOHC 301L MIVEC
5-SPEED Q/D MANUAL TRANSMISSION
50-STATE EMISSIONS STANDARD

Mechanical Features

- 1.2L MIVEC DOHC 12-valve 3-cylinder
- Electric Power Steering Assist
- Front MacPherson strut suspension with stabilizer bar
- Rear torsion beam suspension
- Front Wheel Drive (FWD)

Exterior Features

- Halogen headlights
- Rear combination LED tail lights
- High mount rear stop light
- Lower side air dam
- Rear spoiler
- Color-keyed front and rear bumpers
- Color-keyed folding side-view mirrors
- Color-keyed outer door handles
- Color-keyed tail gate handle
- Front windshield variable intermittent wipers and washers
- Rear intermittent wiper
- Power side-view mirrors
- Rear window defroster with timer
- 14-inch steel wheels with wheel covers
- Space saver temporary spare tire
- Short pole antenna

Interior Features

- Speedometer/tachometer gauge cluster
- ECO status indicator light
- Front room light
- Cargo light
- 4-way adjustable driver's seat
- Split folding rear seat
- Air conditioning
- Rear seat head restraints (x2)
- Micron air filtration
- Rear heater floor ducts
- Chrome accented HVAC panel
- Tilt steering wheel
- Gloss black center panel
- Driver and passenger sun visors with driver's side vanity mirror, lid and ticket holder
- Carpeted floor mats
- Fuel lid release lever
- Rear shelf

Convenience Features

- AM/FM/CD/MP3 audio system with 4 speakers and USB port
- Keyless entry with panic alarm feature
- Power windows
- Power door locks
- 12-volt accessory outlet (x1)
- Floor center console with cup holders (x3)
- Retractable assist grips (x2)

Safety & Security

- Hill Start Assist (HSA)
- Anti-lock Braking System (ABS) with Electronic Brakeforce Distribution (EBD) and brake assist

Safety & Security (cont'd)

- Active Stability Control (ASC)
- Tire Pressure Monitoring System (TPMS)
- Side curtain airbags
- Driver's side knee airbag
- Advanced dual-stage front airbags
- Three-point seatbelts for all seating positions
- Height-adjustable front shoulder belts with pretensioner
- LATCH child-restraint system
- Child safety rear door locks
- Anti-theft engine immobilizer
- RISE body construction

Optional Equipment

Full Tank of Gas

INCLUDED

Fuel Economy and Environment

Fuel Economy

36 MPG combined city/hwy

33 city 41 highway

2.8 gallons per 100 miles

You save \$2,000 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,000

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **8** (Best)

Smog Rating (tailpipe only) **7** (Best)

10-year 100,000-mile LIMITED POWERTRAIN WARRANTY

10^{new}/100,000^{mi} **7^{new}/100,000^{mi}** **5^{new}/60,000^{mi}** **5^{new}/UNLIMITED^{mi}**

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score **Not Rated**

Frontal Crash **Driver** **★★★★** **Passenger** **★★★★**

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

Rollover **★★★★**

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

10-year 100,000-mile LIMITED POWERTRAIN WARRANTY

10^{new}/100,000^{mi} **7^{new}/100,000^{mi}** **5^{new}/60,000^{mi}** **5^{new}/UNLIMITED^{mi}**

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score **Not Rated**

Frontal Crash **Driver** **★★★★** **Passenger** **★★★★**

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

Rollover **★★★★**

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

MSRP: \$12,995.00

Total Optional Equipment: \$0.00

Subtotal: \$12,995.00

Destination/Handling: \$835.00

Total MSRP: \$13,830.00

Visit us at www.mitsubishicars.com

Photo No. 102 - Monroney Label

WARNING

- After returning the seatbacks to their upright positions, make sure that the seatbacks are locked in place and firmly. Also check to be sure that the rear seat belts are in front of the seatbacks, and not caught behind the seatbacks.

CAUTION

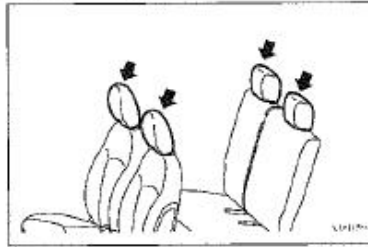
- Do not grab the seat belt guide to raise the seatback; doing so can cause damage of the seat belt guide and the seatback.

Head restraints

Padded head restraints for the seats can reduce the risk of a whiplash injury if your vehicle is hit from the rear.

The head restraints are equipped in the illustrated position.

To maximize the effectiveness of your head restraint, adjust the front seatback to the upright position, the rear seatback to the normal seating position, and the head restraint to the proper position. Sit back against the seatback with your head close to the head restraint.

**WARNING**

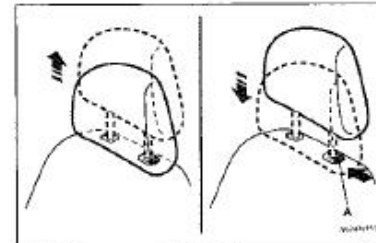
- Driving without the head restraints in place can cause you and your passengers serious injury or death in an accident. To reduce the risk of injury in an accident, always make sure the head restraints are installed and properly positioned when the seat is occupied.
- In order to minimize the risk of a neck injury due to a rear impact, the front seatback must be adjusted to the upright position, the rear seatback to the normal seating position, and the head restraint to the proper position before vehicle operation. The driver should never adjust the seat while the vehicle is in motion.
- Never place a cushion or similar device on the seatback. This can adversely affect head restraint performance by increasing the distance between your head and the restraint.

Adjustment of the head restraint height

To reduce the risk of injury in an accident, adjust the head restraint height so that the center of the restraint is at your ear level when seated. Any person too tall for the restraint to reach their ear level when seated should raise the restraint to the highest locked position.

4

- To raise the restraint, pull it straight up.
- To lower the restraint, push down on it while pressing the lock knob (A) in the direction shown by the arrow.
- After adjusting the height, push down on the restraint to make sure it is locked in position.



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
Figure No. 6.	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 7.	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 8.	Driver Thorax Rib Deflection Maximum vs. Time	B-2
Figure No. 9.	Driver Anterior Abdomen Force (Y) vs. Time	B-3
Figure No. 10.	Driver Middle Abdomen Force (Y) vs. Time	B-3
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
Figure No. 15.	Passenger Head Acceleration (Y) Primary vs. Time	B-5
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)

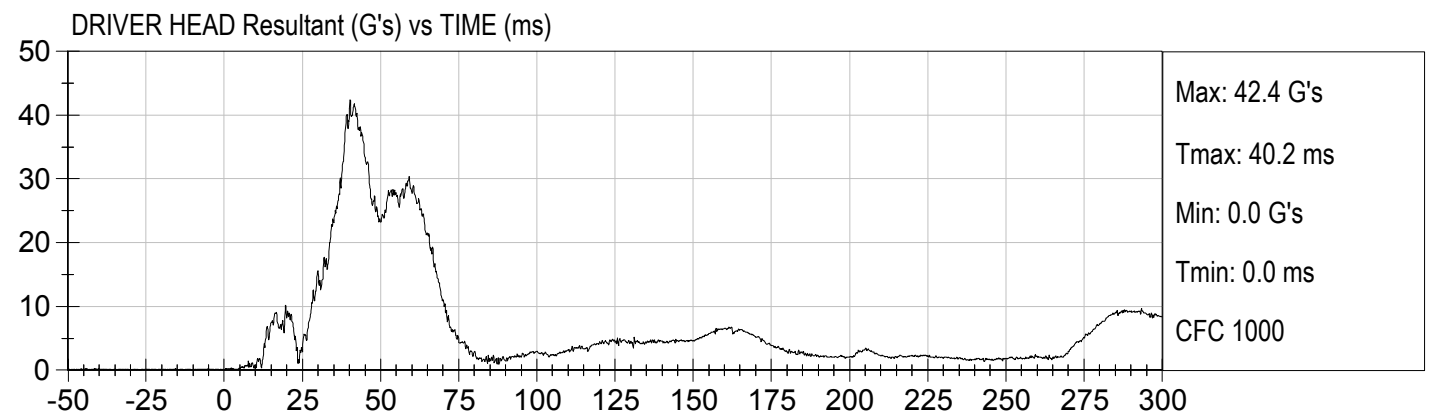
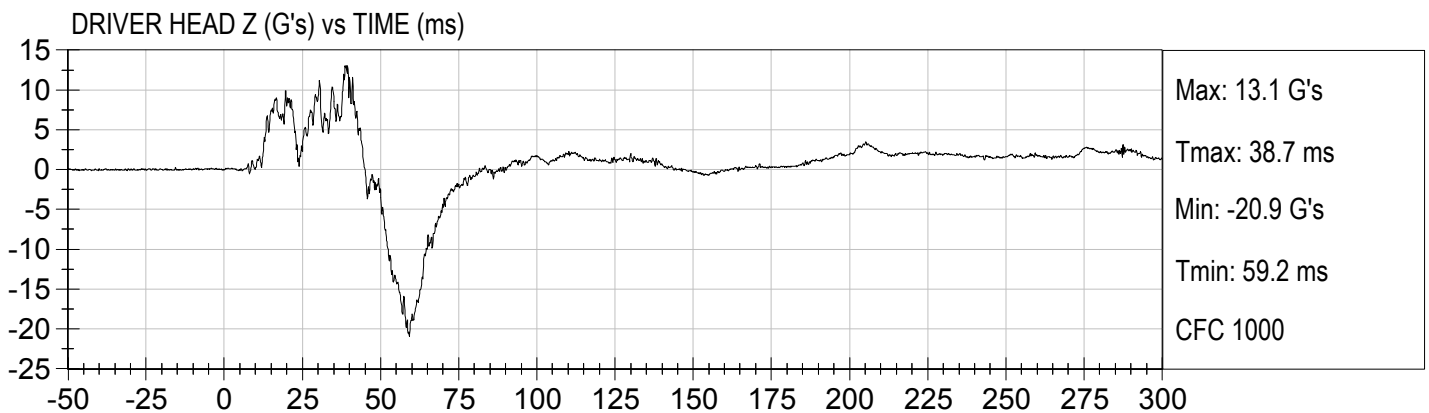
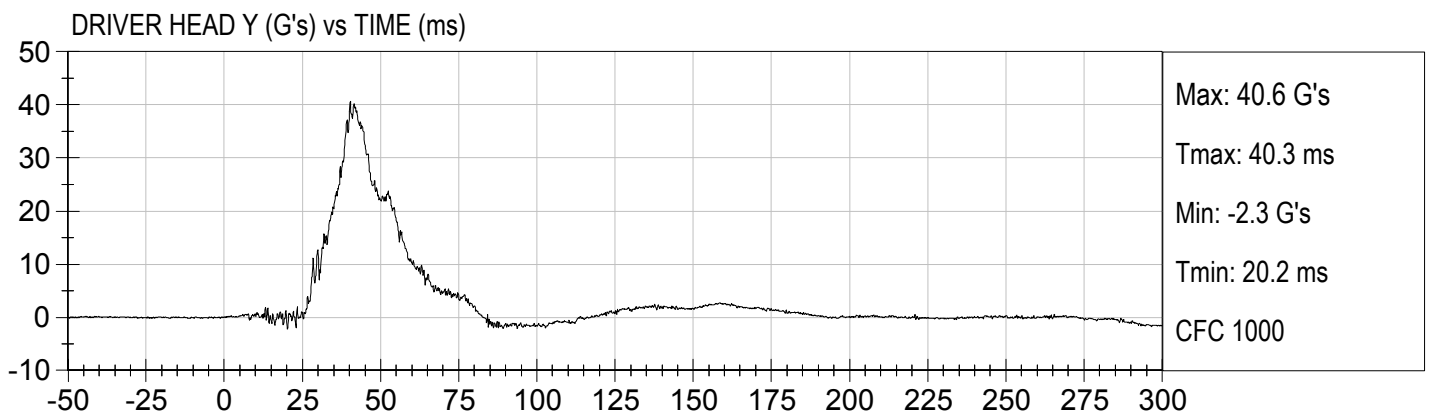
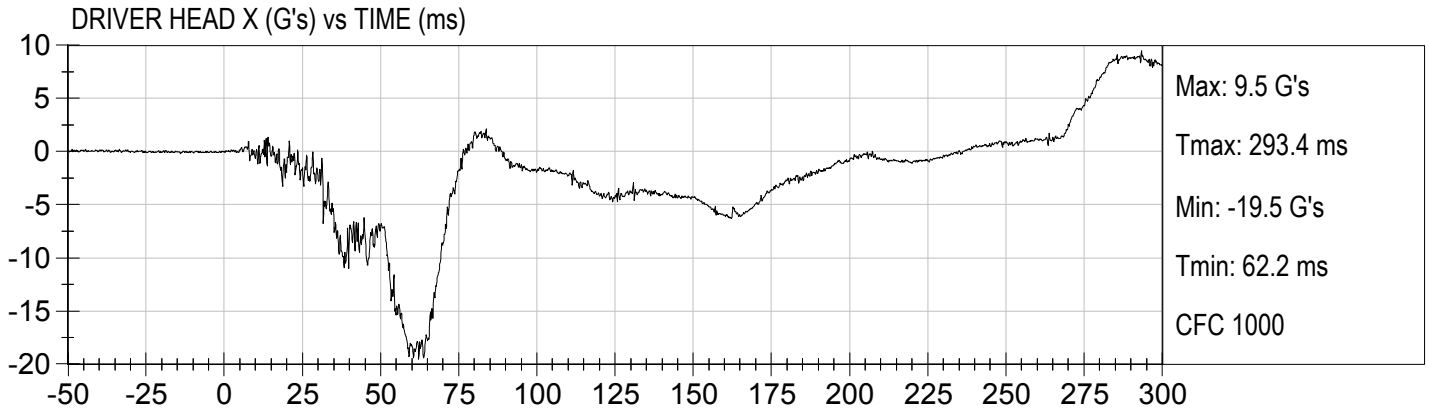
MDB Center of Gravity Acceleration (Z)

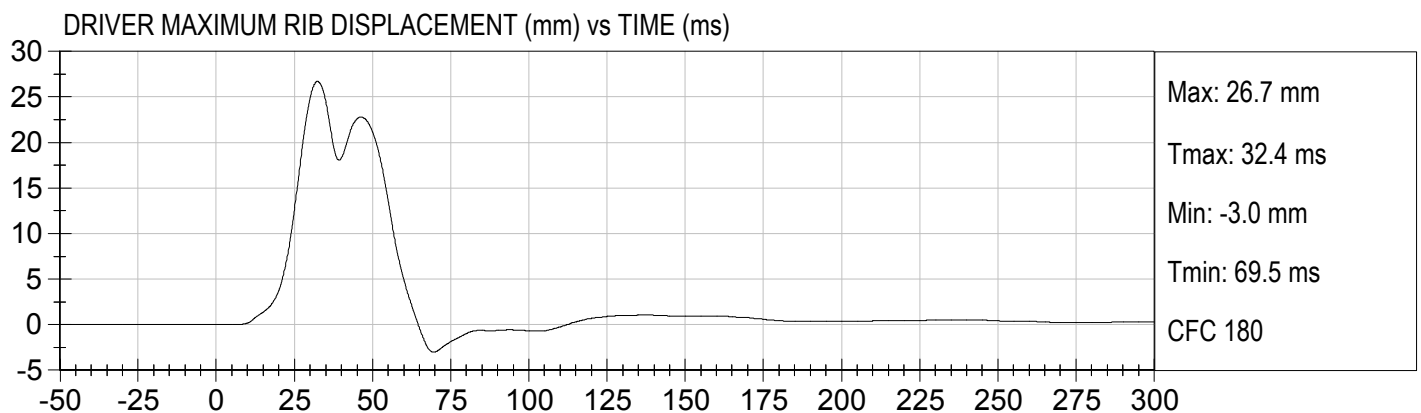
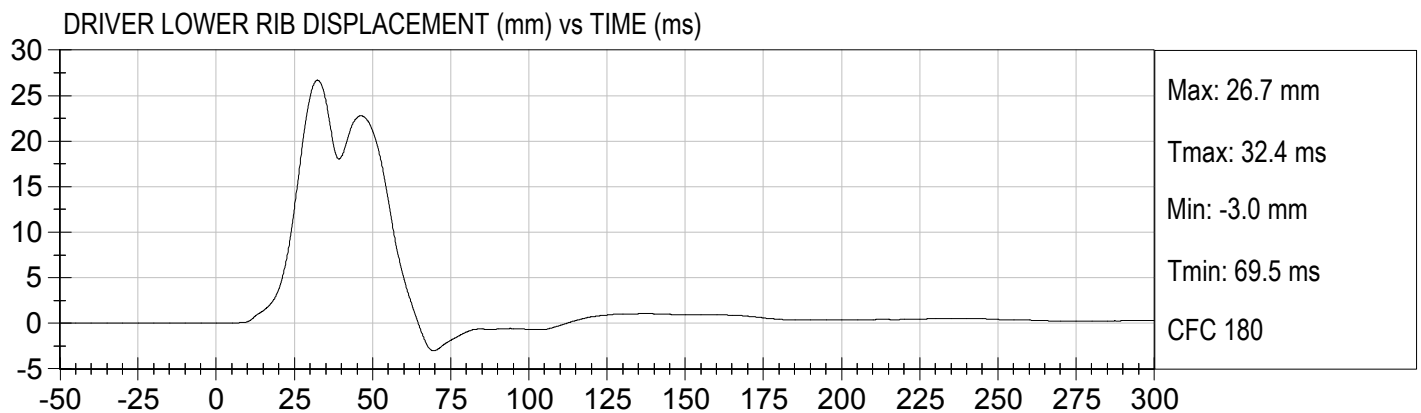
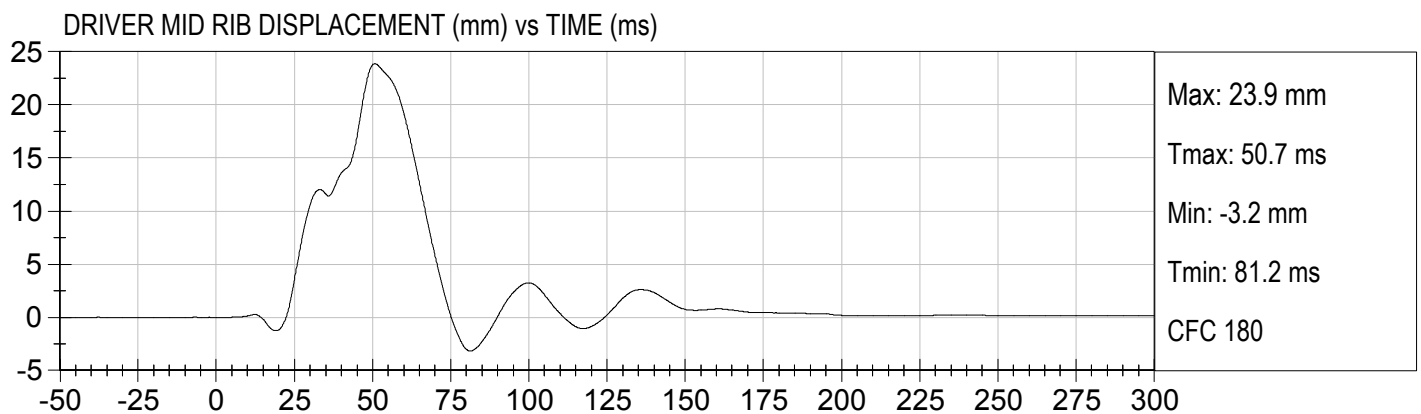
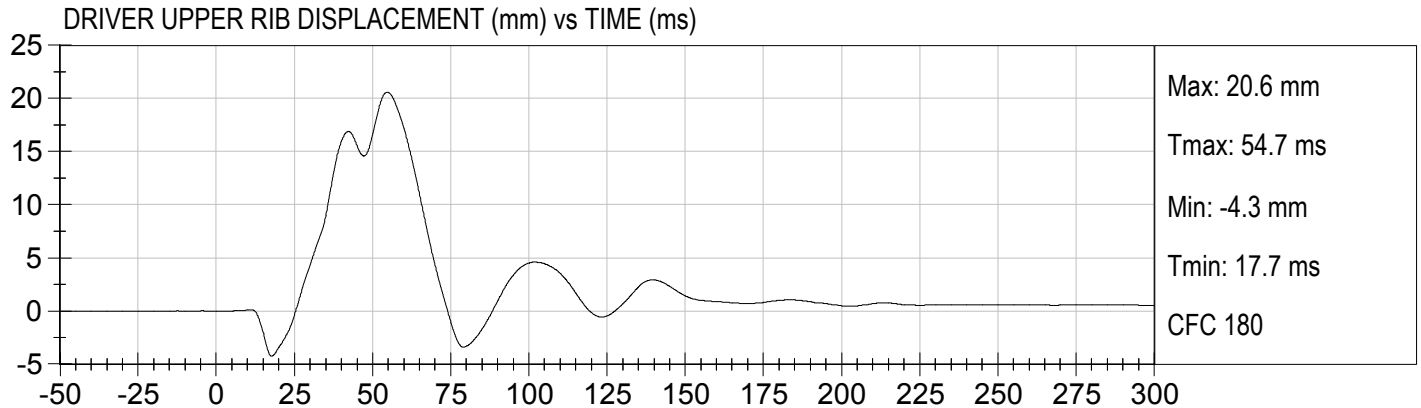
MDB Rear Acceleration (X)

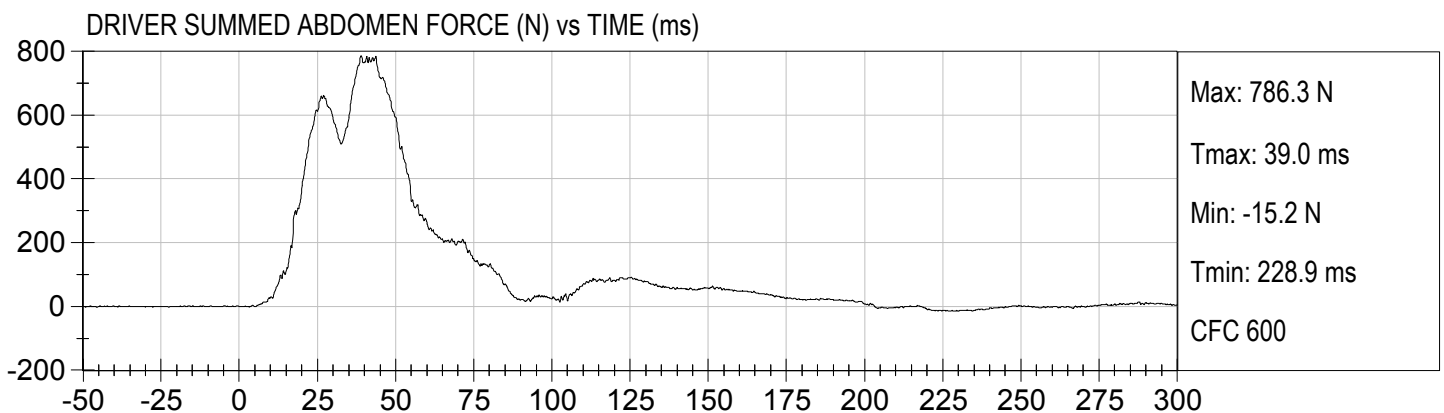
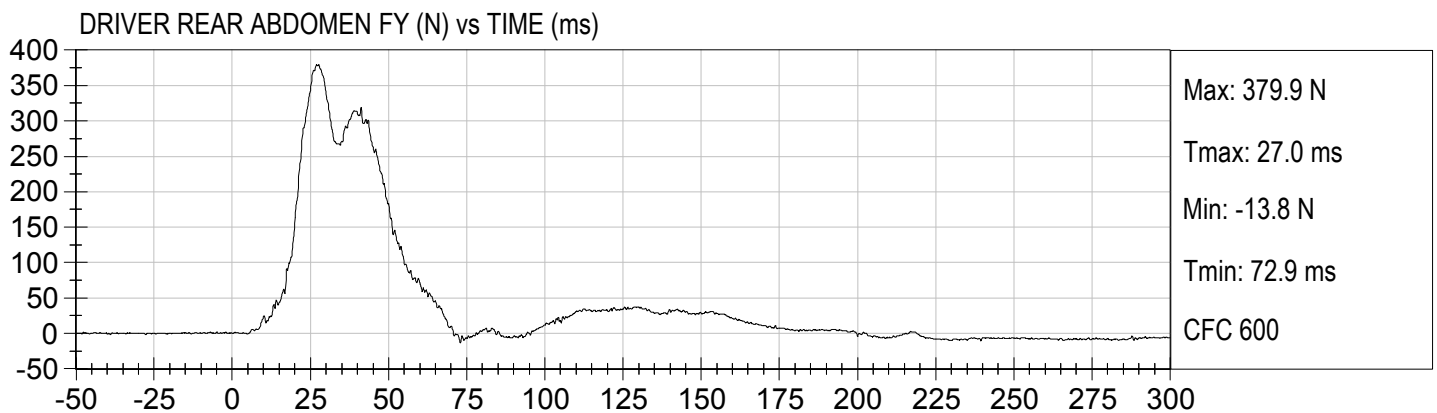
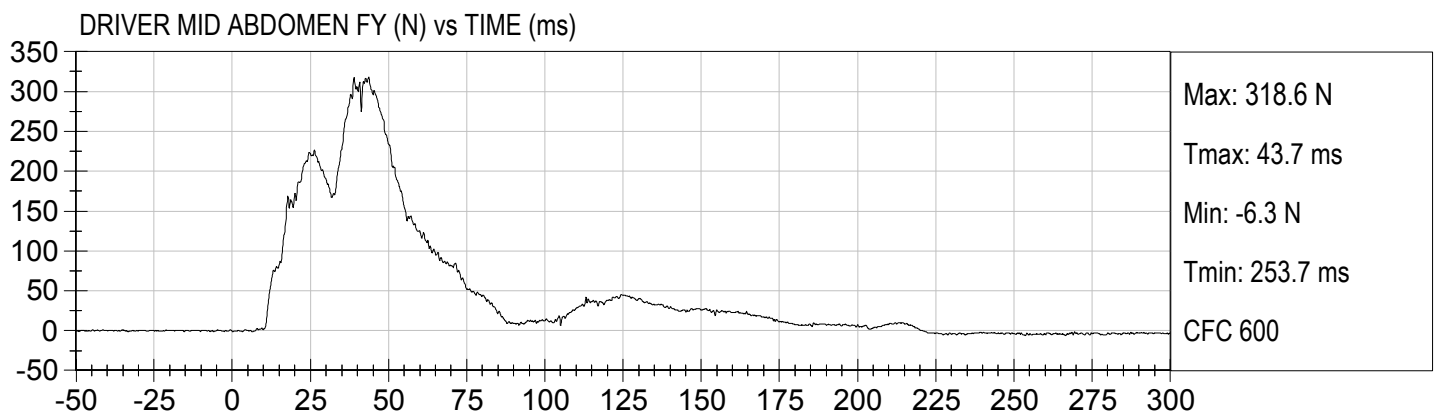
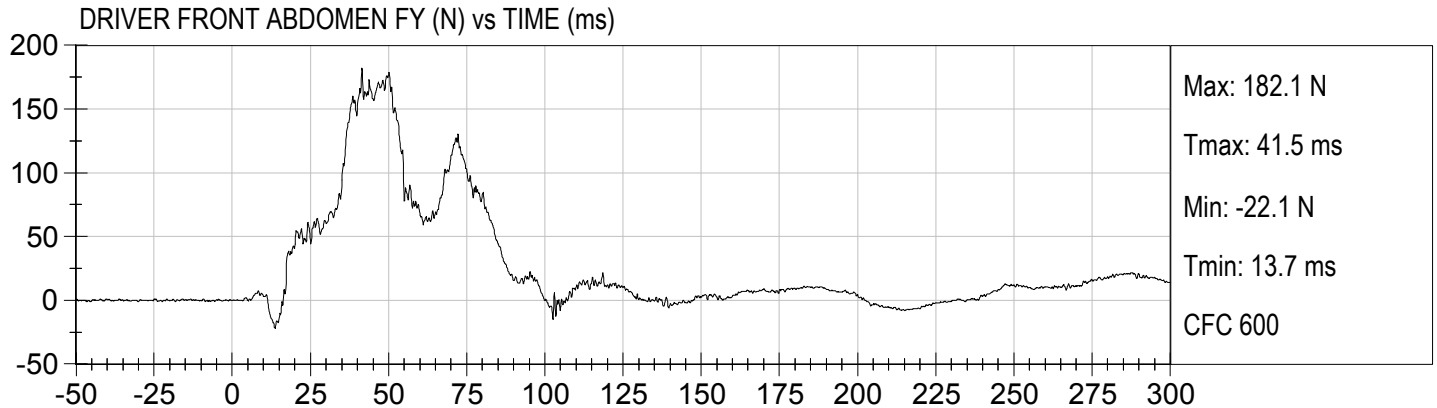
MDB Rear Acceleration (Y)

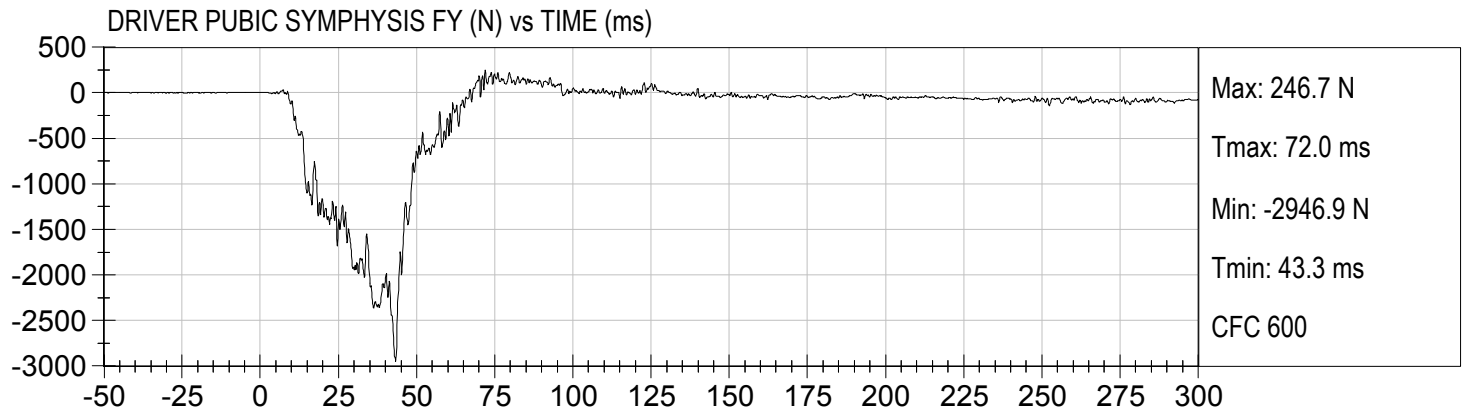
Left MDB Contact Switch

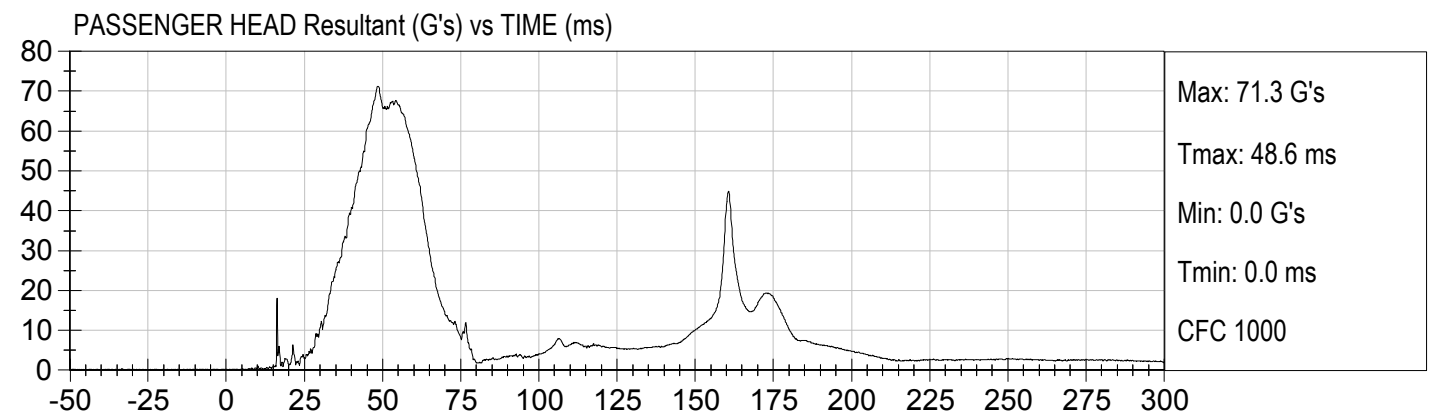
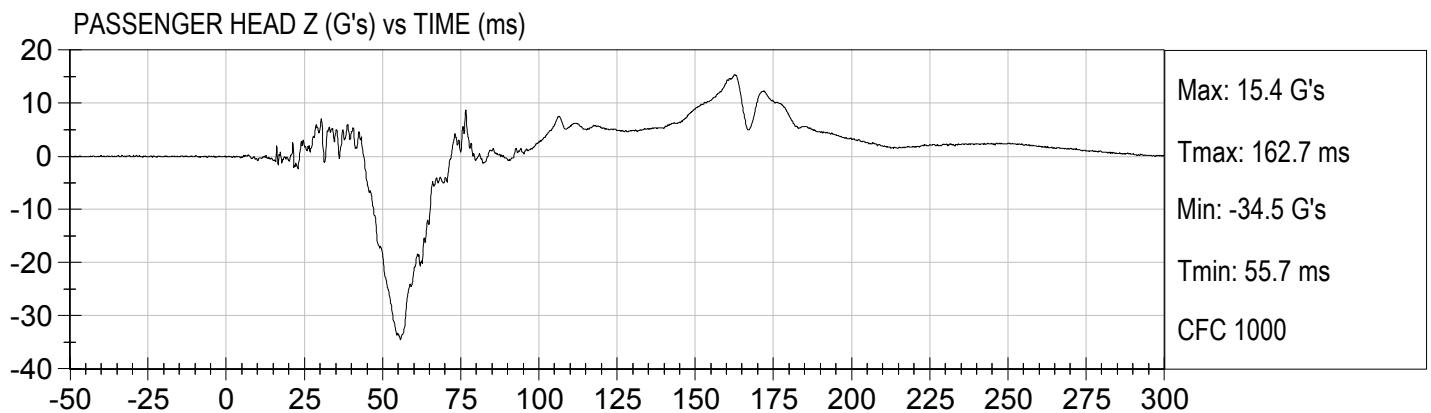
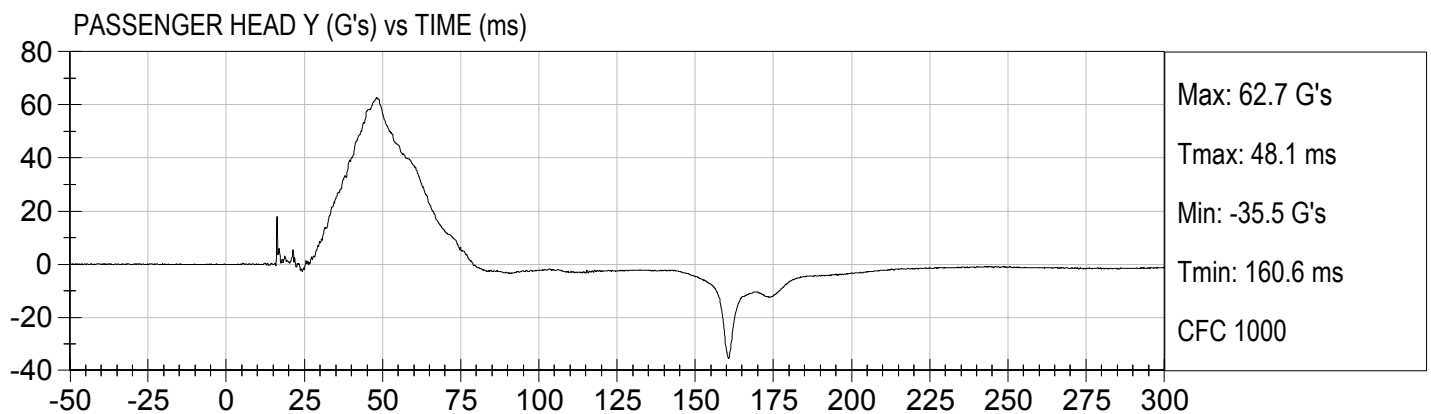
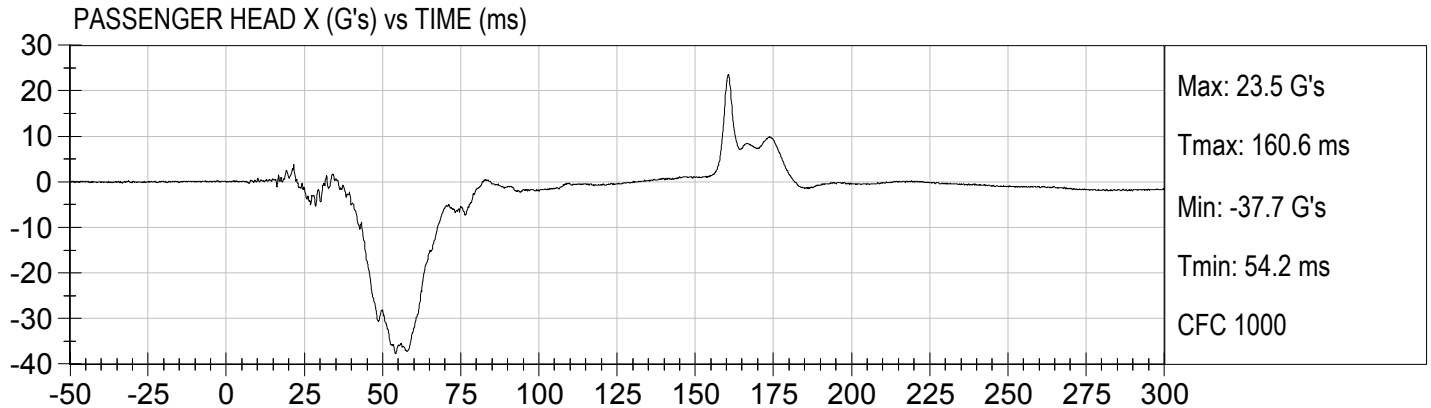
Right MDB Contact Switch

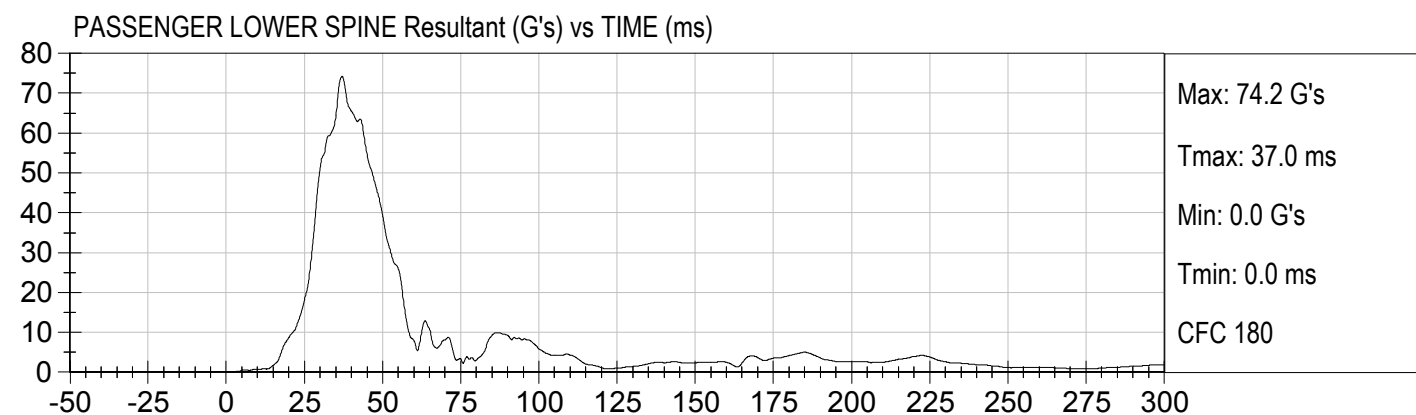
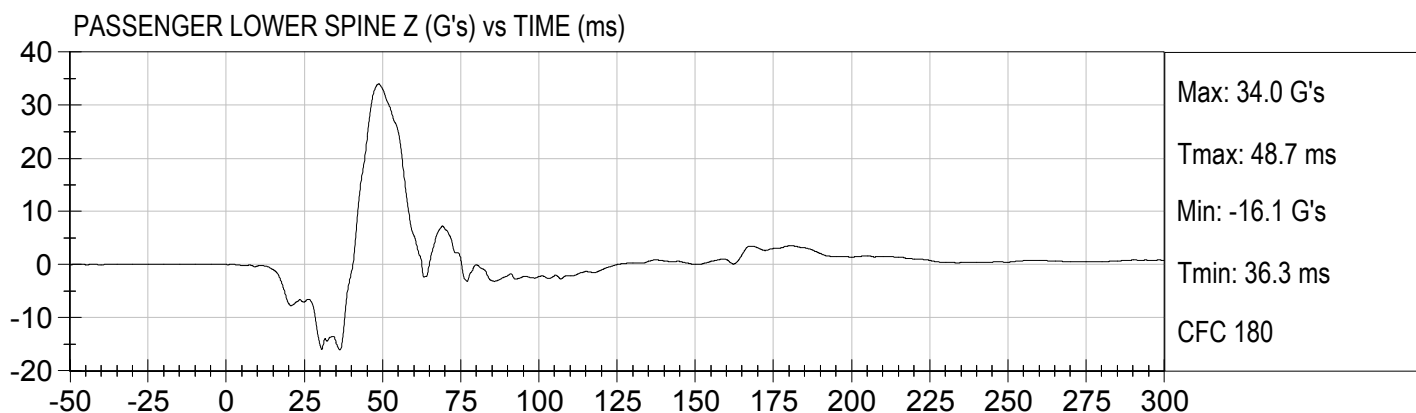
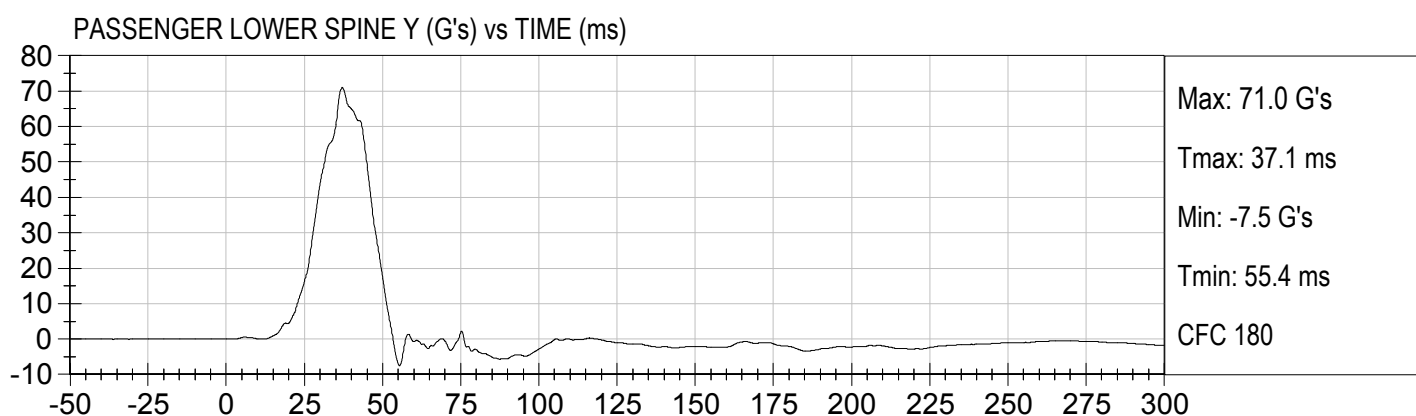
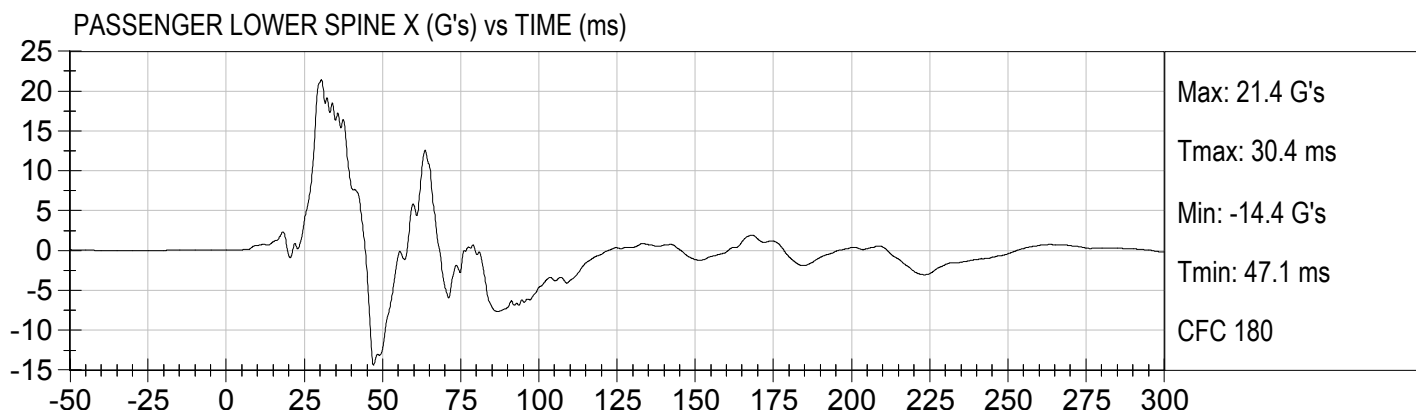


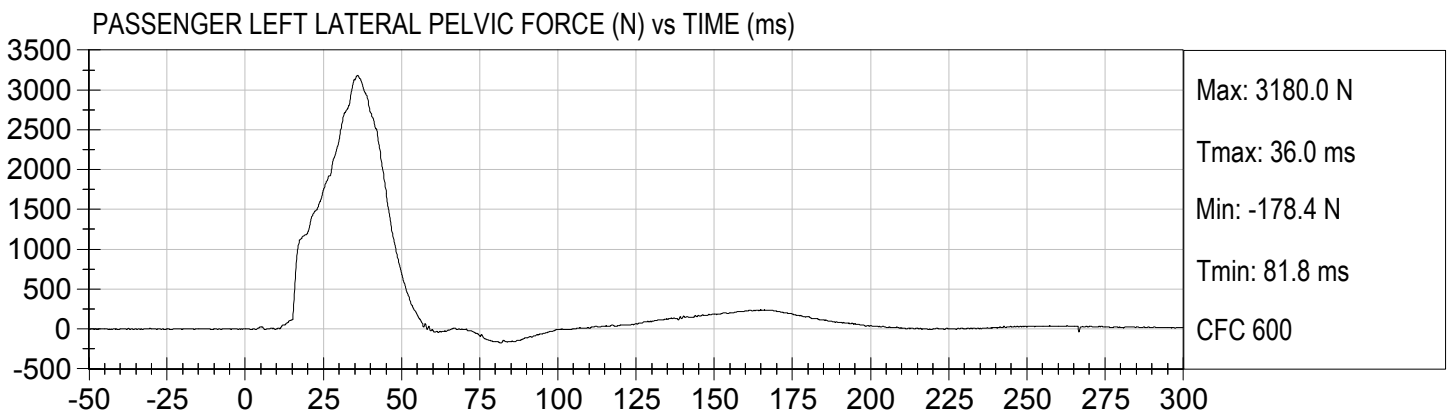
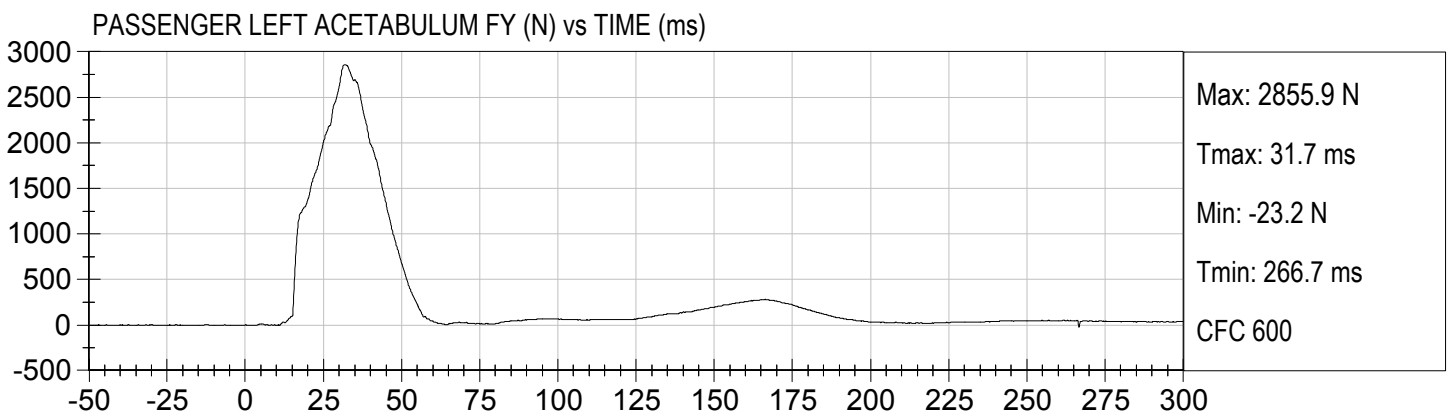
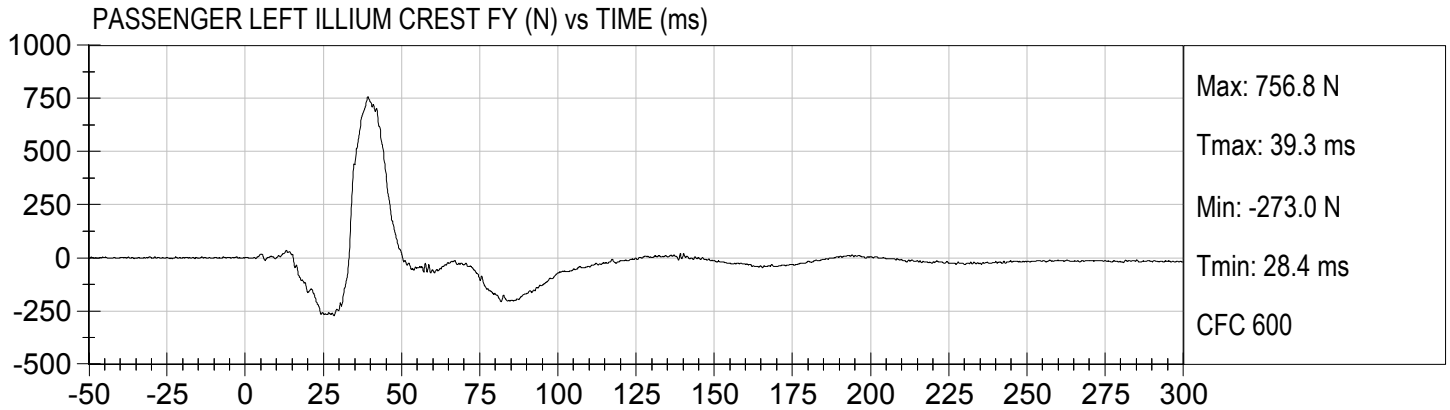












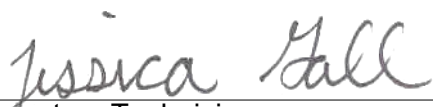
APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

ES-2re External Measurements
SN: 032

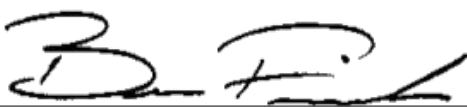
No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	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

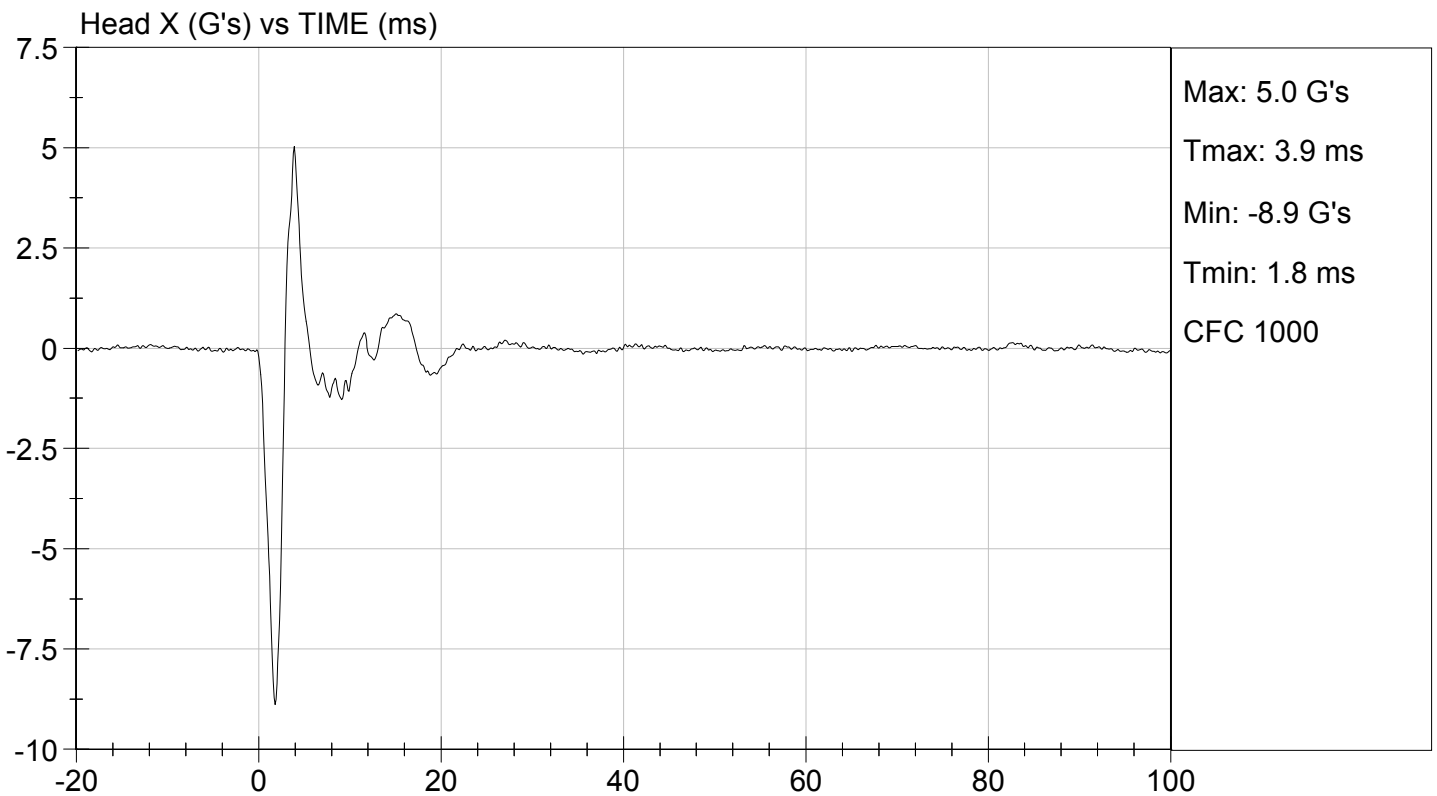
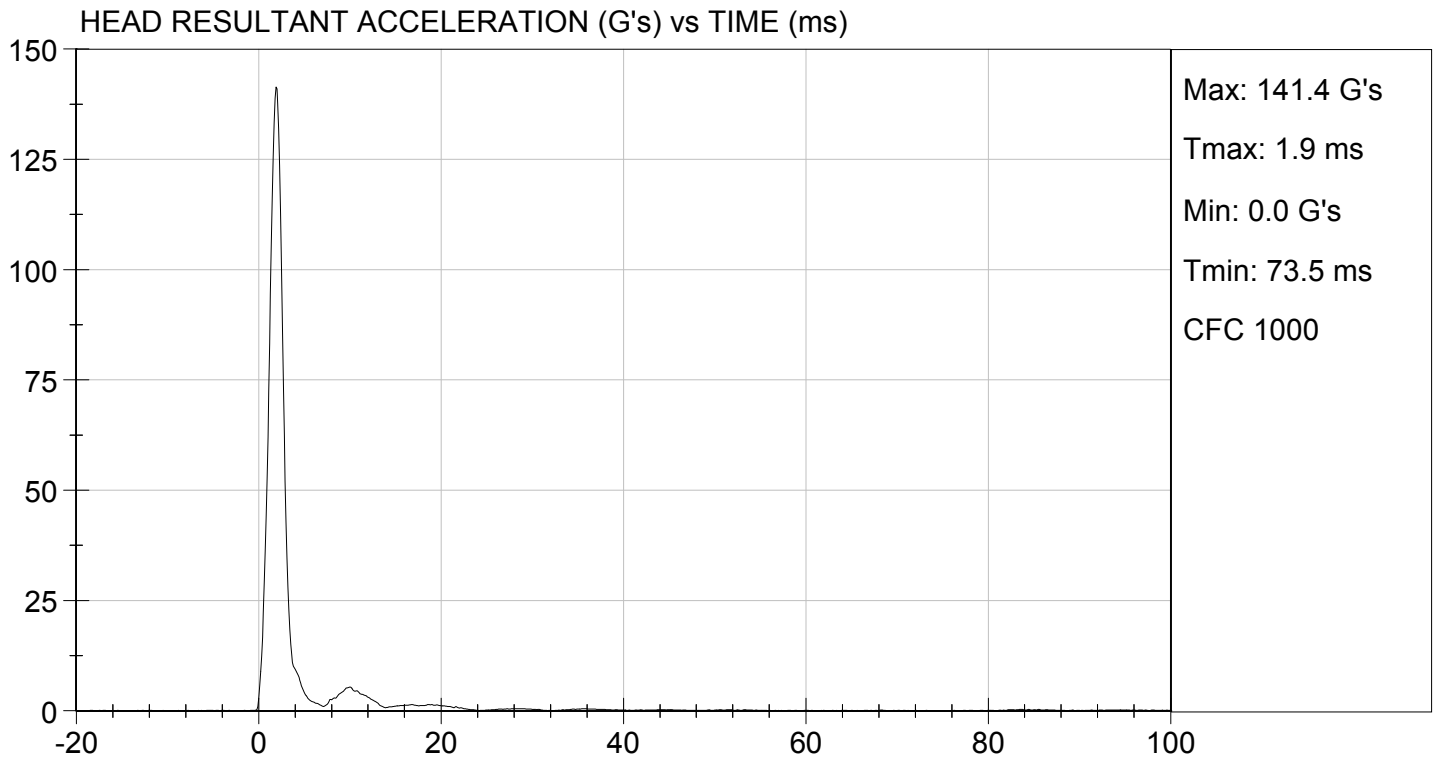
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY****ATD Serial No:** 031**Test ID:** D162571

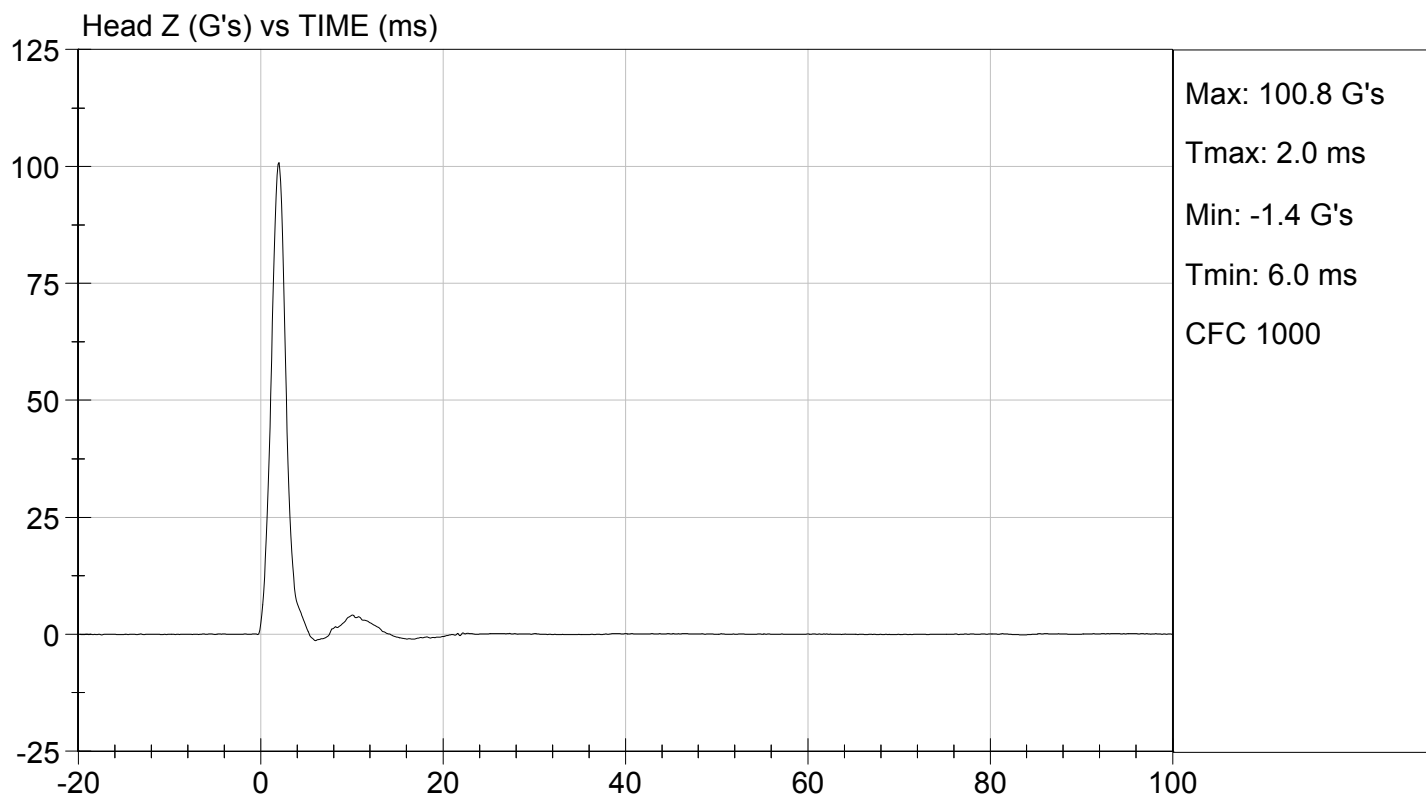
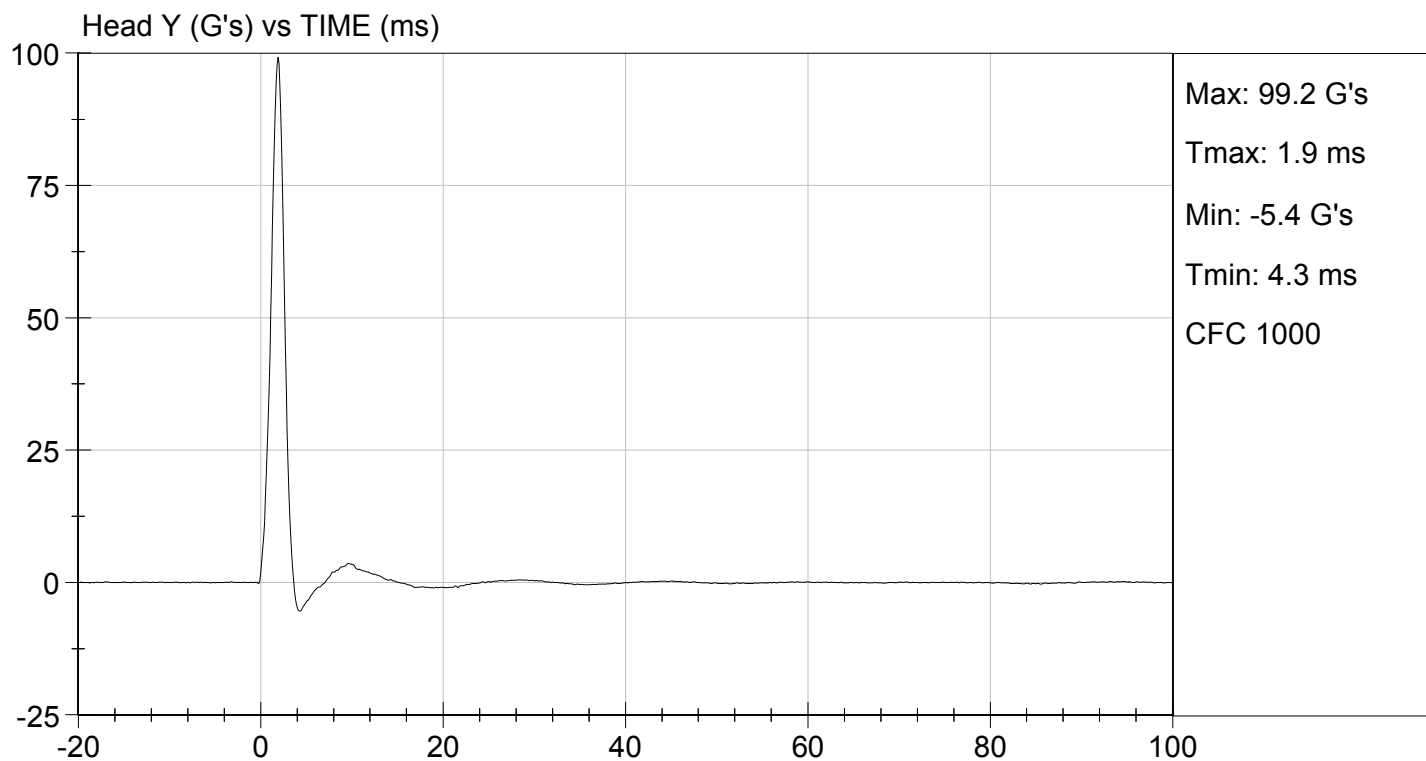
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Peak Resultant Acceleration	G's	125 to 155	141	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	-8.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

07/29/2016
Test Date


Approved By



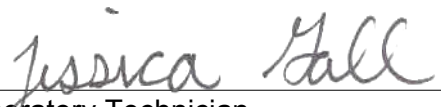


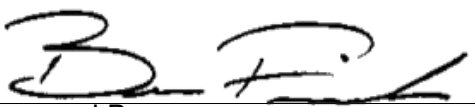
MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

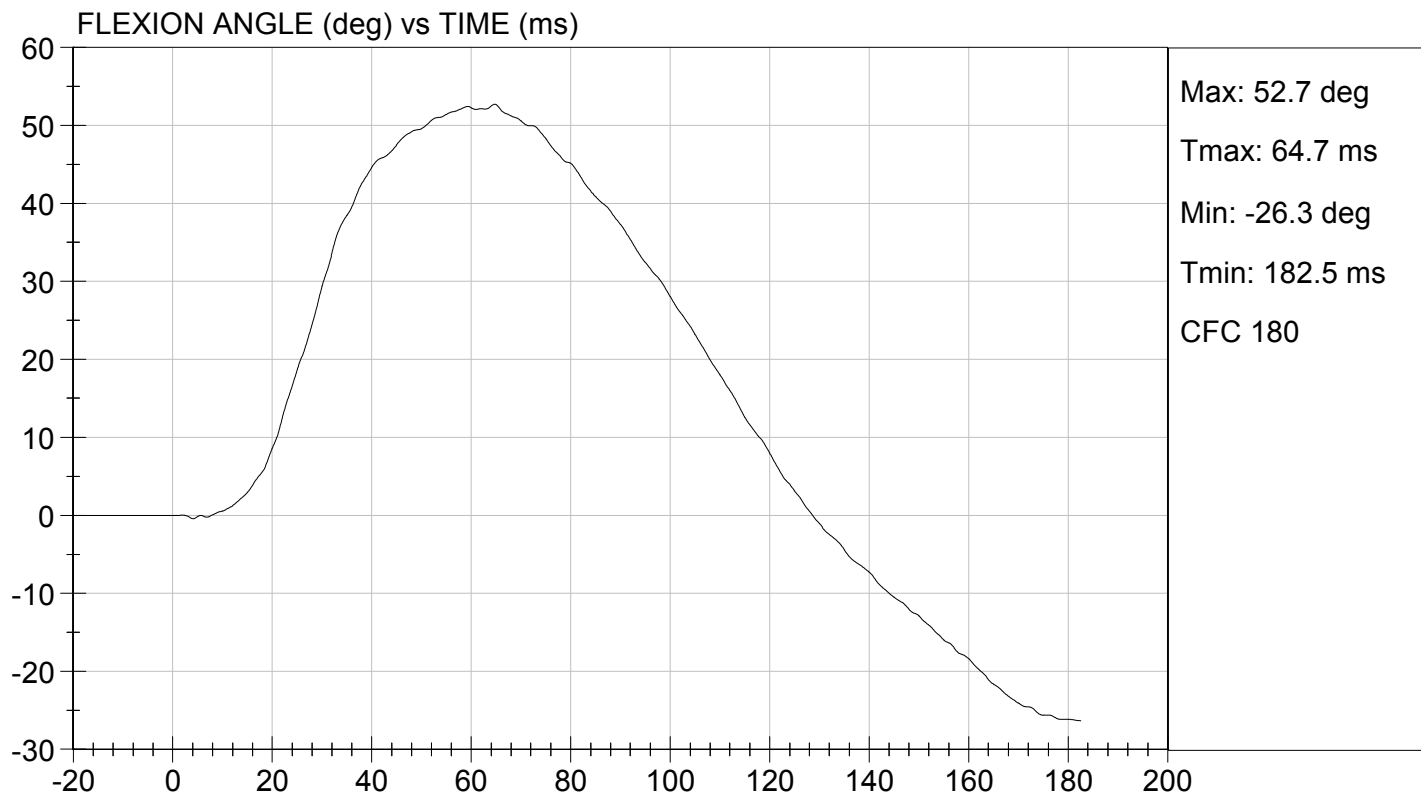
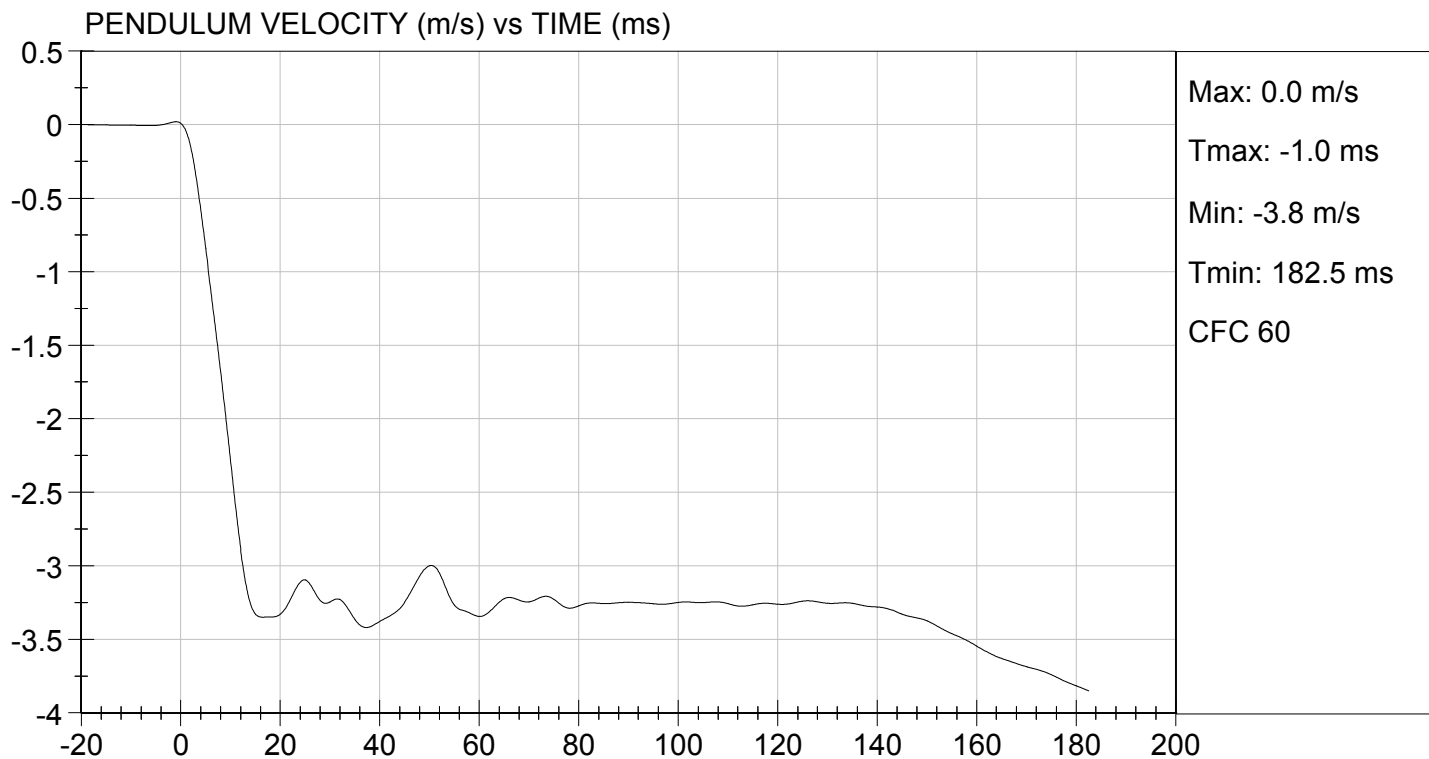
Test I.D: D162572

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	50	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.41	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.04	Pass
	3 ms	m/s	-0.25 to -0.375	-0.34	Pass
	14 ms	m/s	-3.20 to -3.70	-3.26	Pass
	17 ms	m/s	>= -3.70	-3.35	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.7	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	64.7	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	63.9	Pass
Overall Results					Pass


 Laboratory Technician


 Approved By

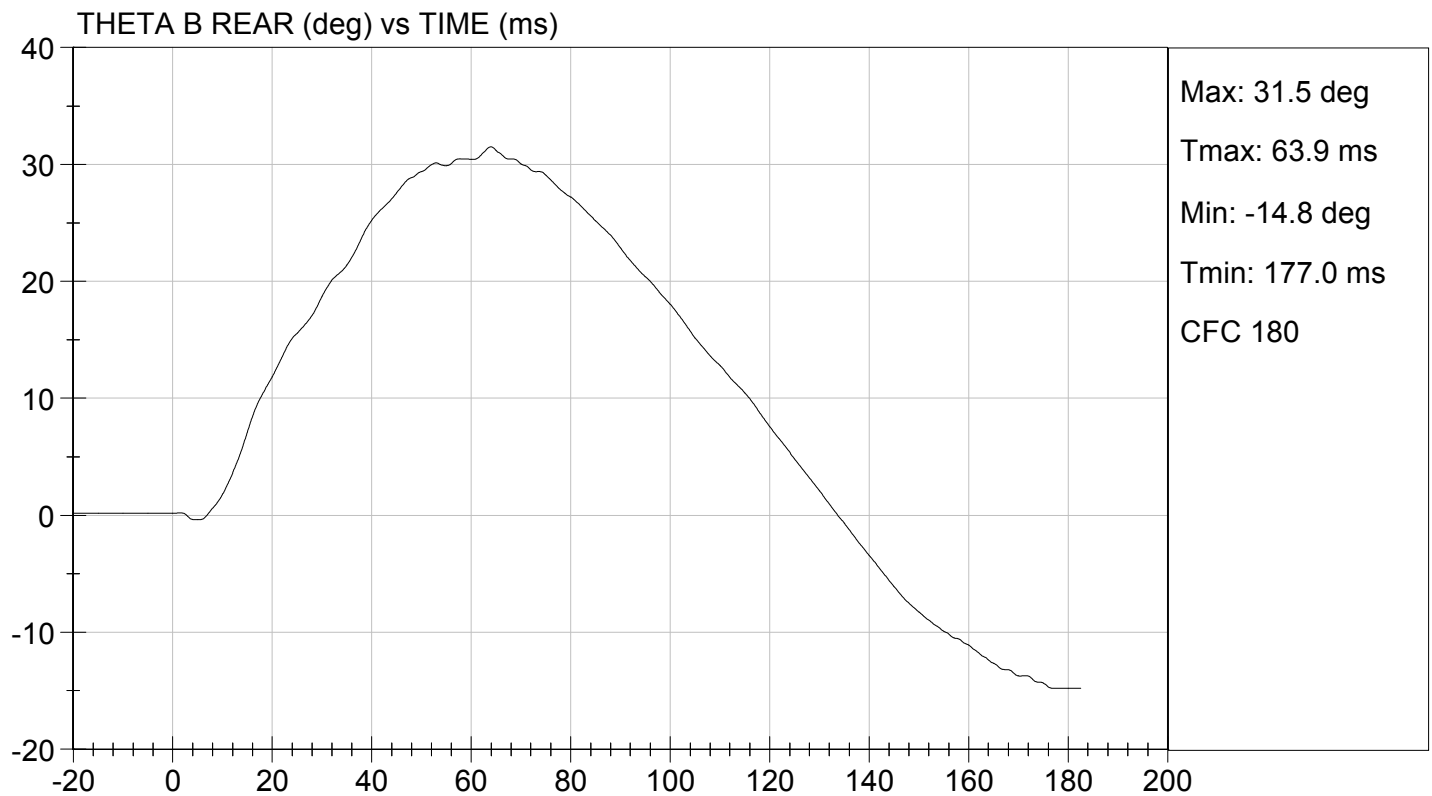
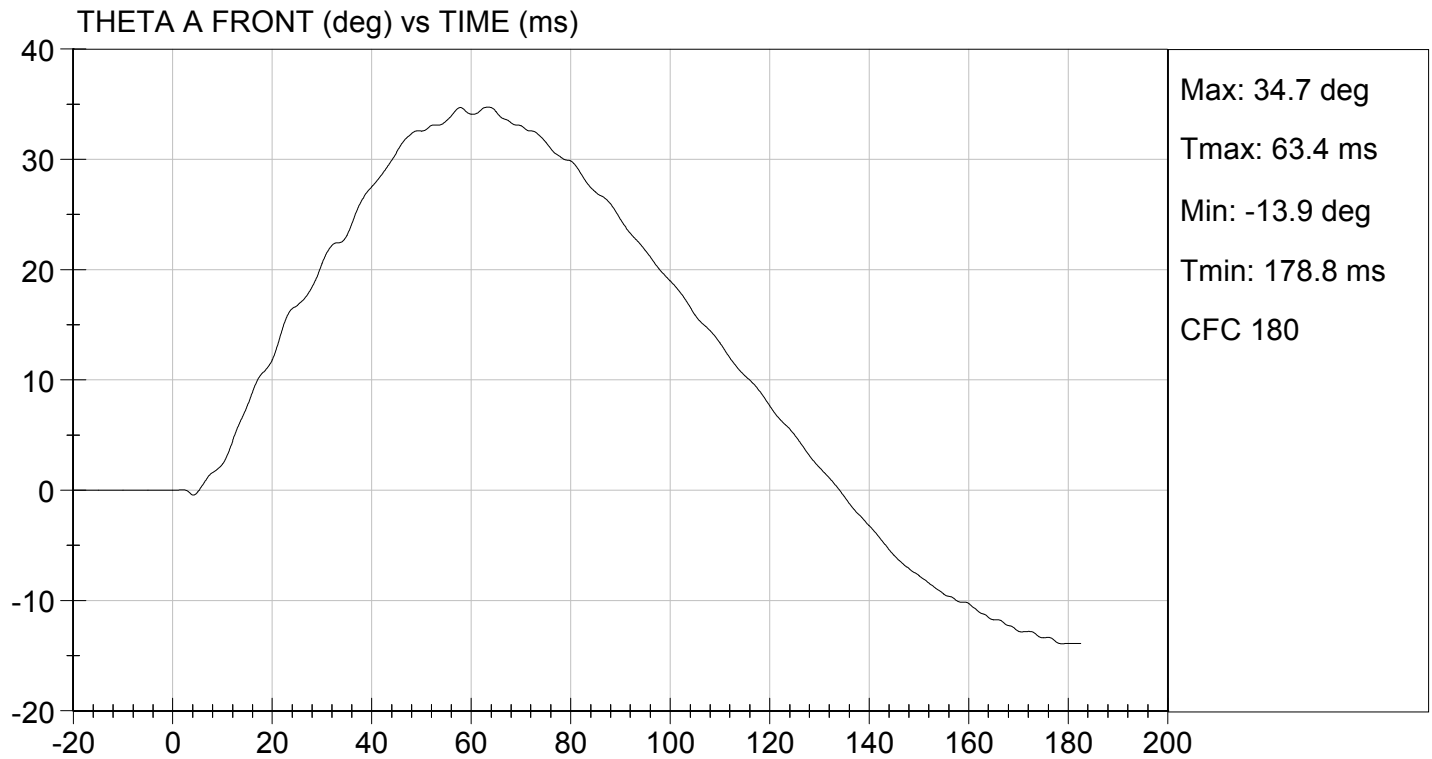
07/29/2016
 Test Date





TEST DESC: NECK BENDING
VELOCITY: 11.18 ft/s, 3.41 m/s

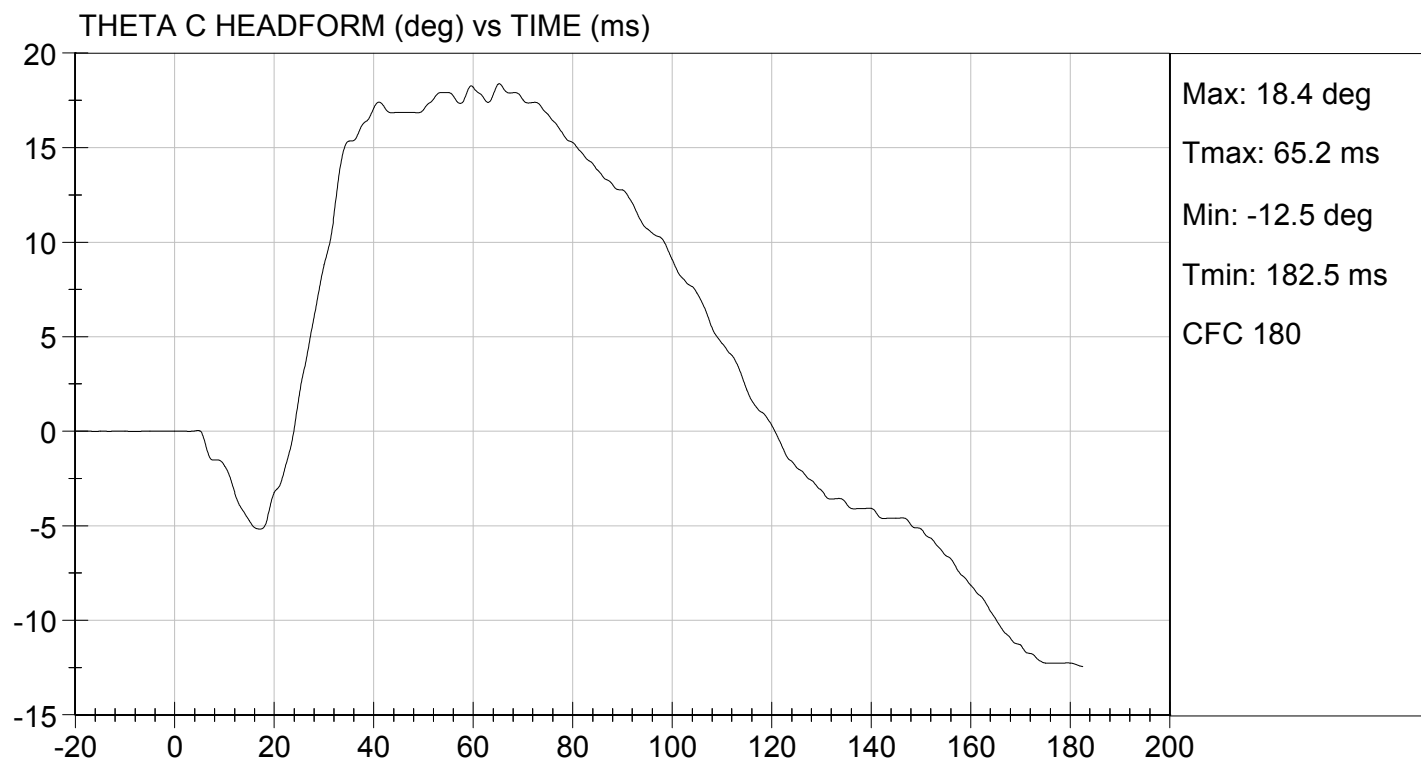
TEST DATE: 07/29/2016
TEST #: D162572





TEST DESC: NECK BENDING
VELOCITY: 11.18 ft/s, 3.41 m/s

TEST DATE: 07/29/2016
TEST #: D162572



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

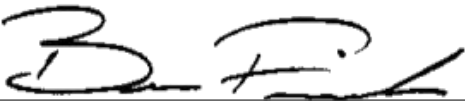
ATD Serial No: 032

Test I.D: D162573

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	51	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	8.4	Pass
Overall Test Results				Pass


Laboratory Technician

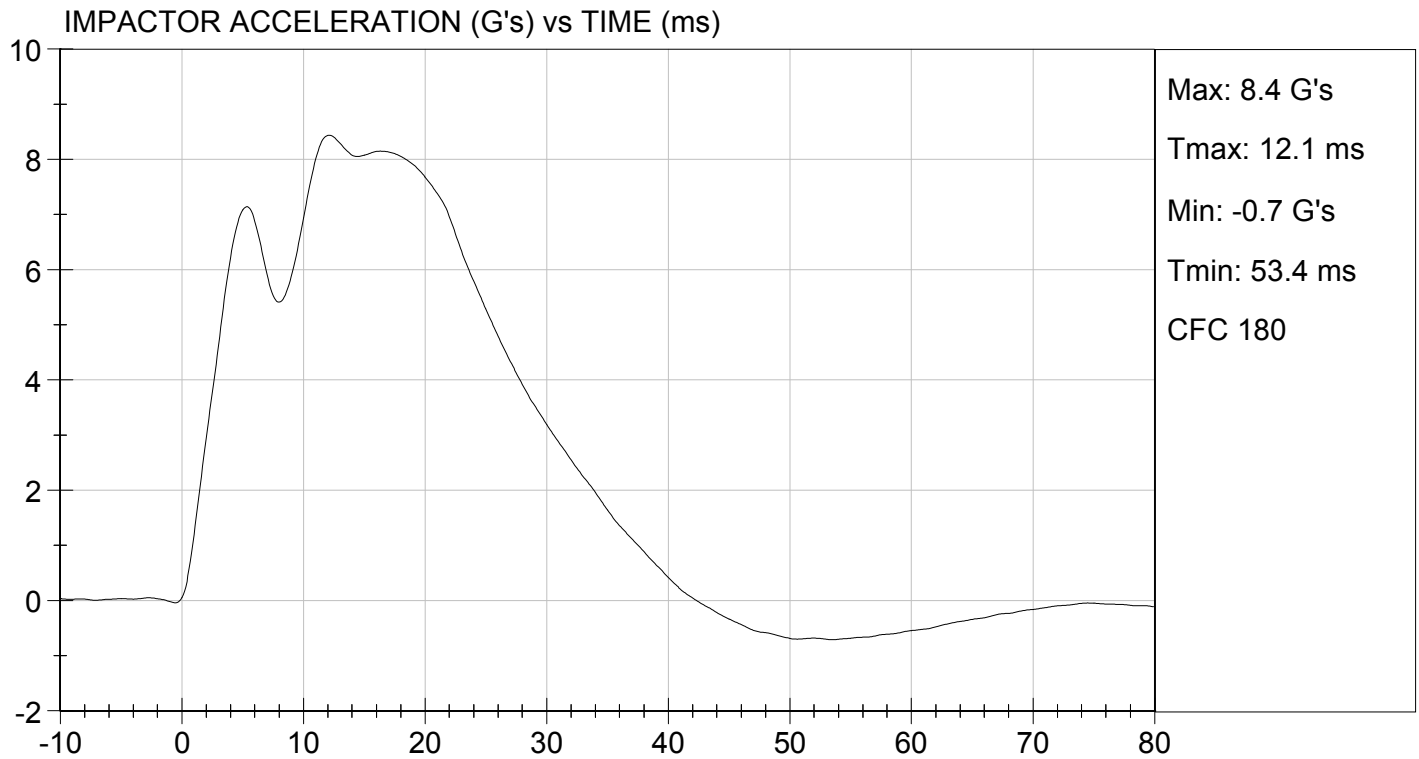
07/29/2016
Test Date


Approved By



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

TEST DATE: 07/29/2016
TEST #: D162573



MGA RESEARCH CORPORATION

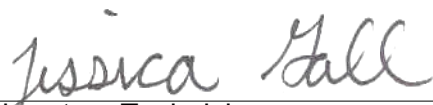
UPPER RIB TEST

ES-2re DUMMY

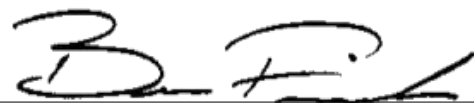
ATD Serial No: 032

Test I.D: D162574

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.2	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.1	Pass
Overall Test Results				Pass

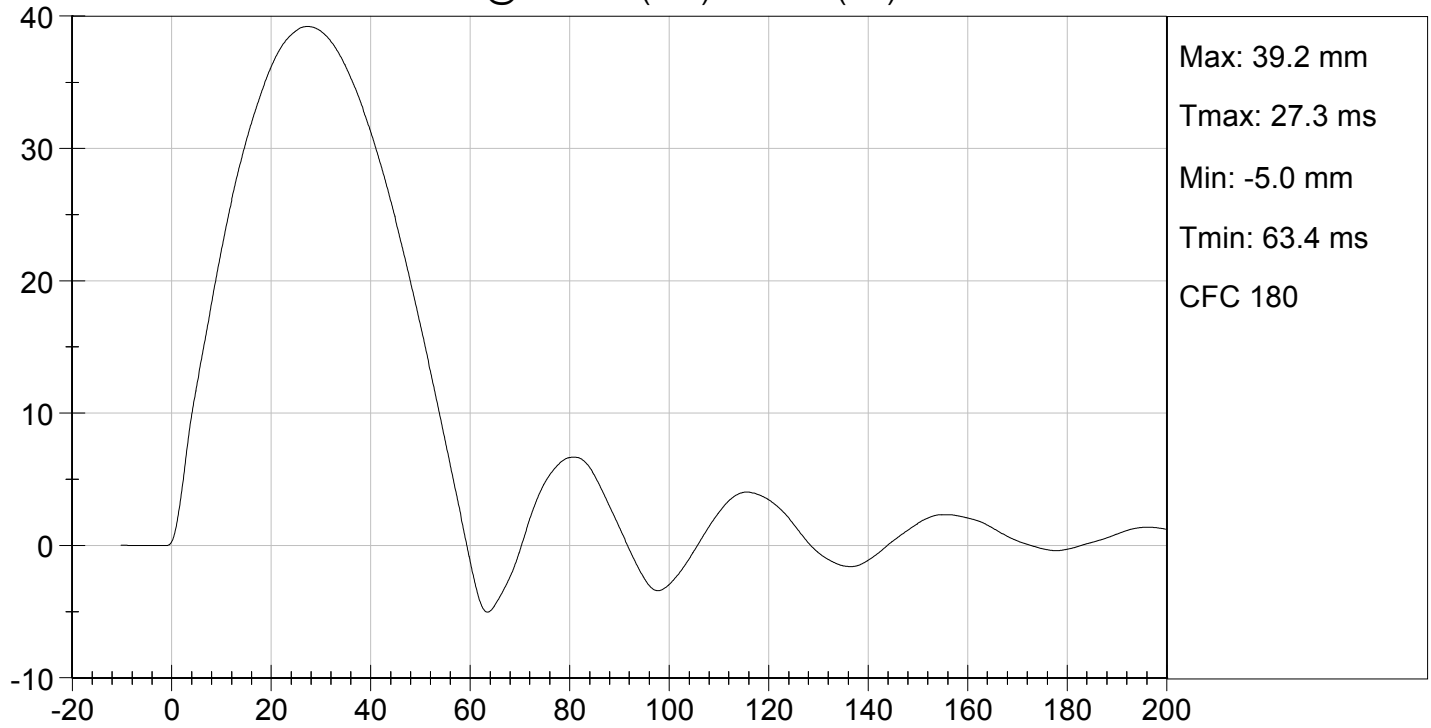

Laboratory Technician

07/29/2016
Test Date

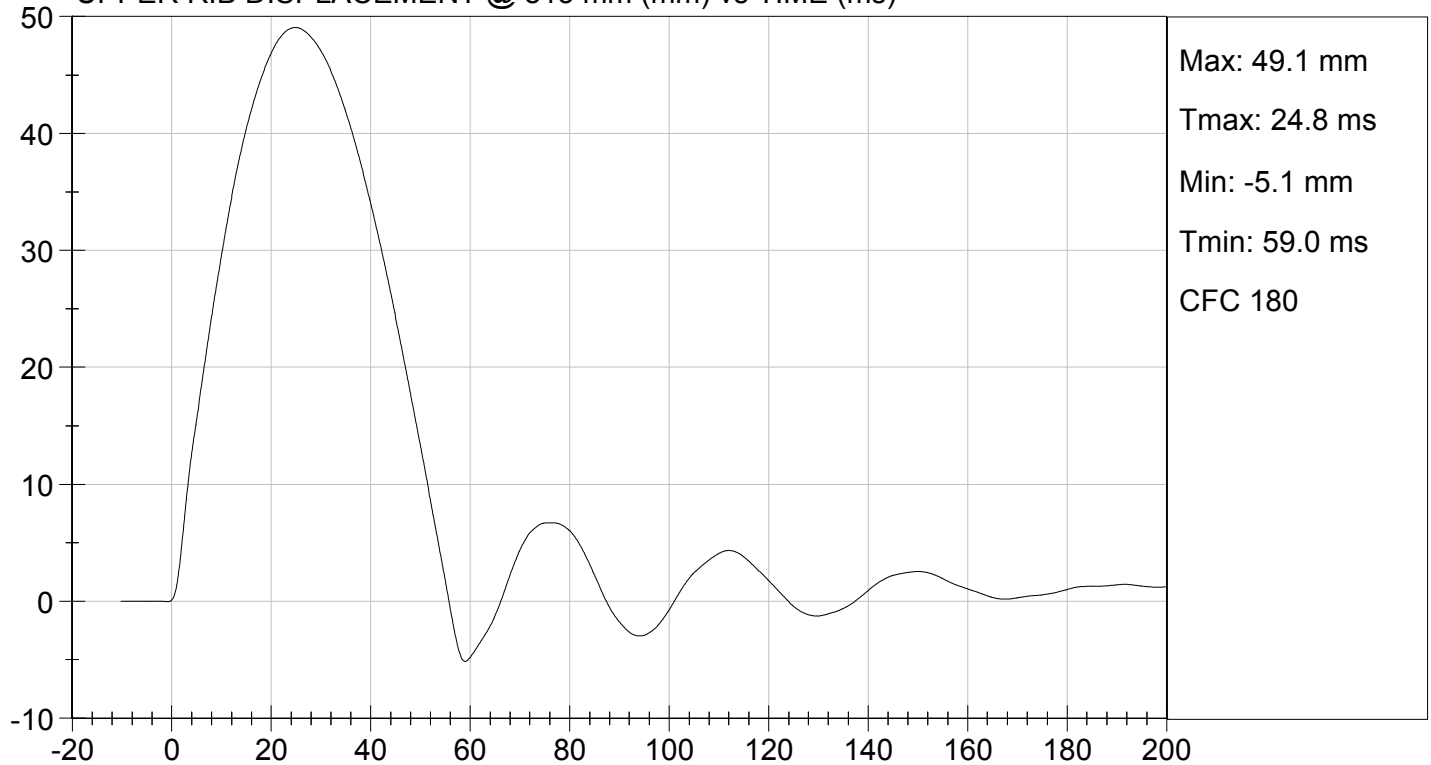

Approved By



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



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



MGA RESEARCH CORPORATION

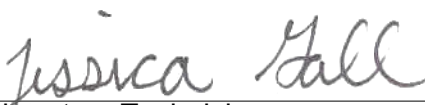
MID RIB TEST

ES-2re DUMMY

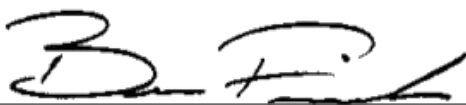
ATD Serial No: 032

Test I.D: D162575

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.1	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.6	Pass
Overall Test Results				Pass

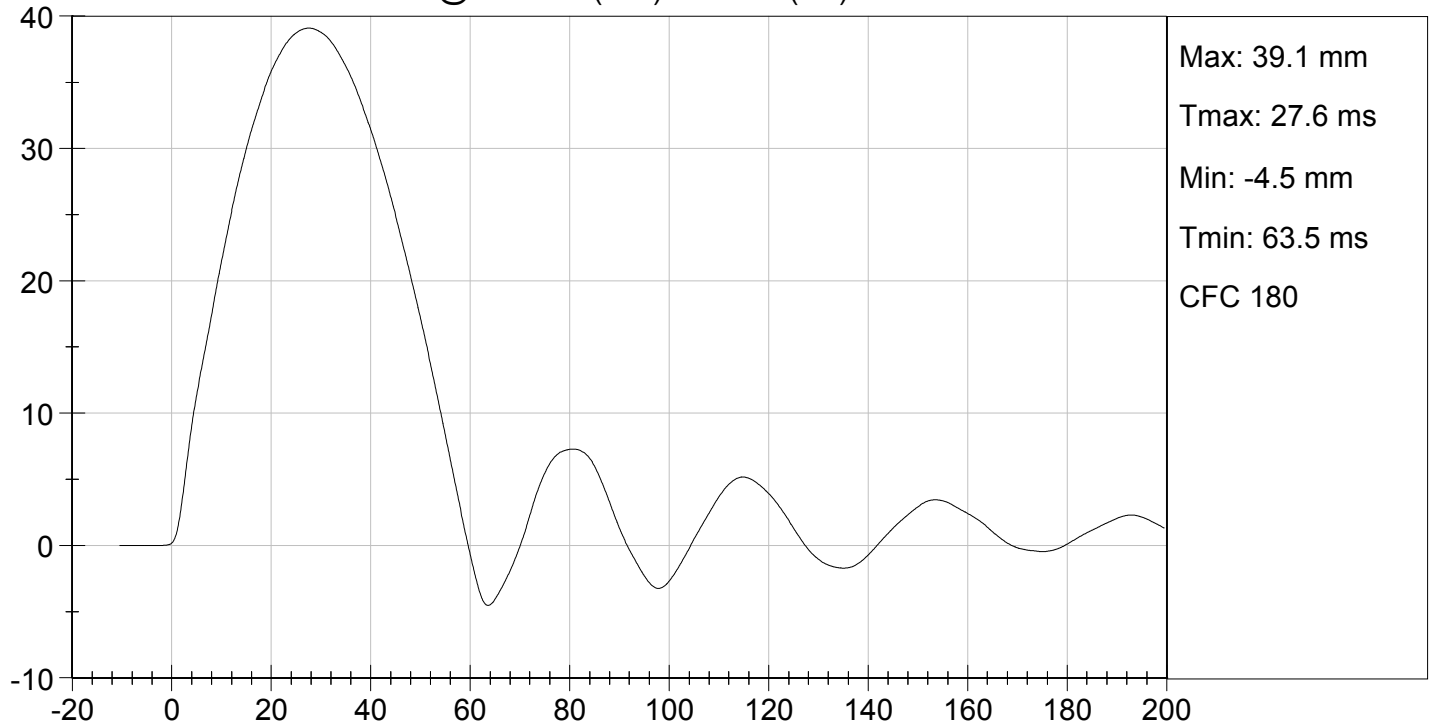

Laboratory Technician

07/29/2016
Test Date

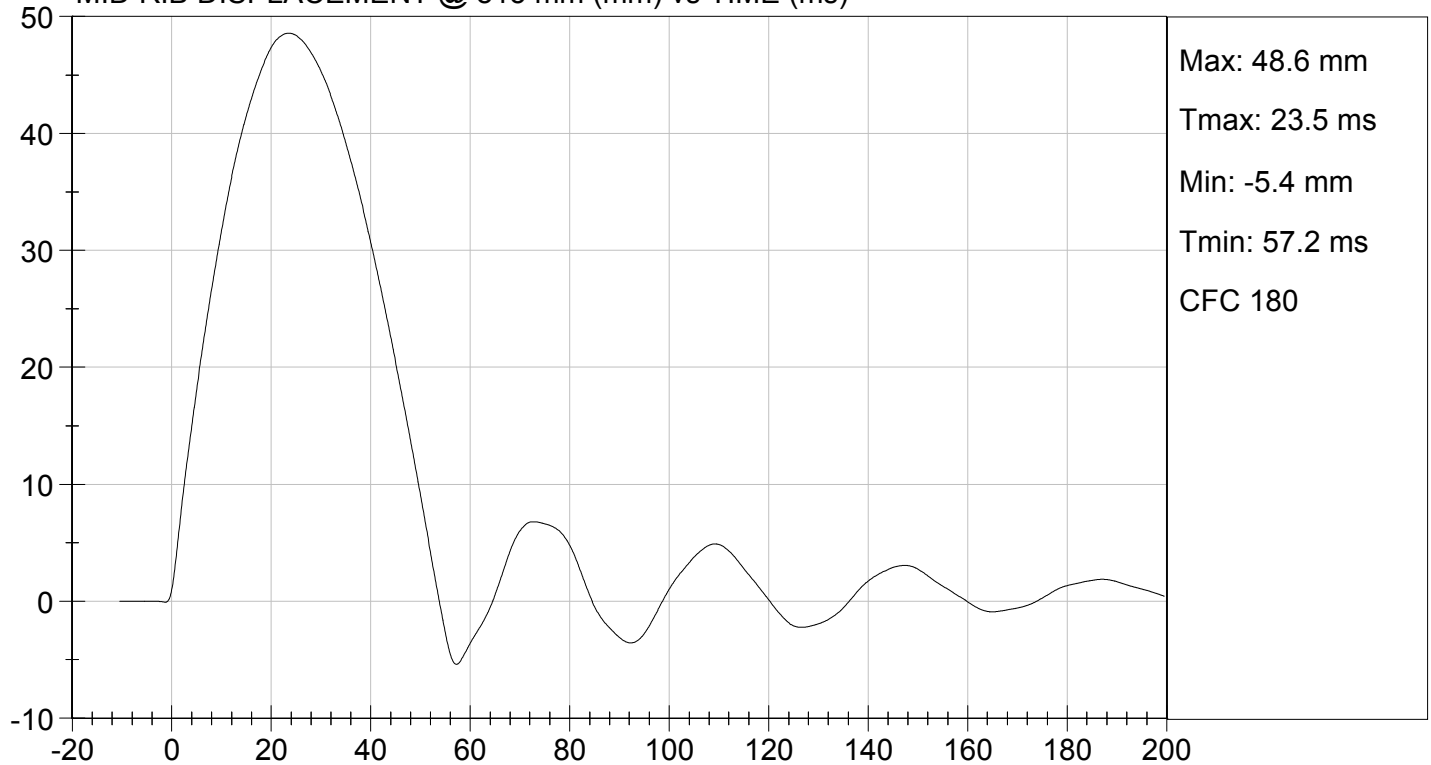

Approved By



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



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



MGA RESEARCH CORPORATION

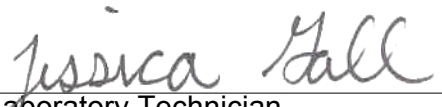
LOWER RIB TEST

ES-2re DUMMY

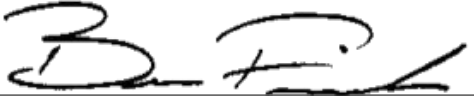
ATD Serial No: 032

Test I.D: D162576

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	50.2	Pass
Overall Test Results				Pass

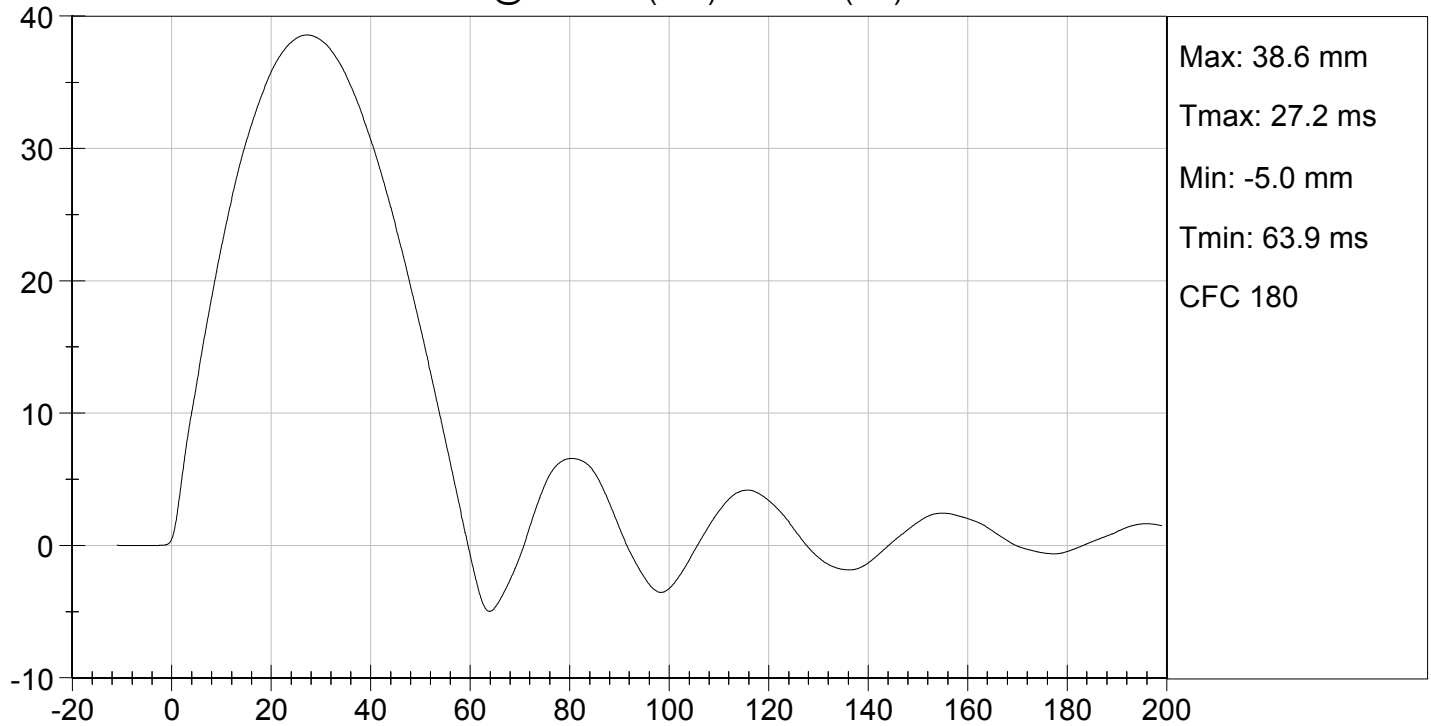

Laboratory Technician

07/29/2016
Test Date

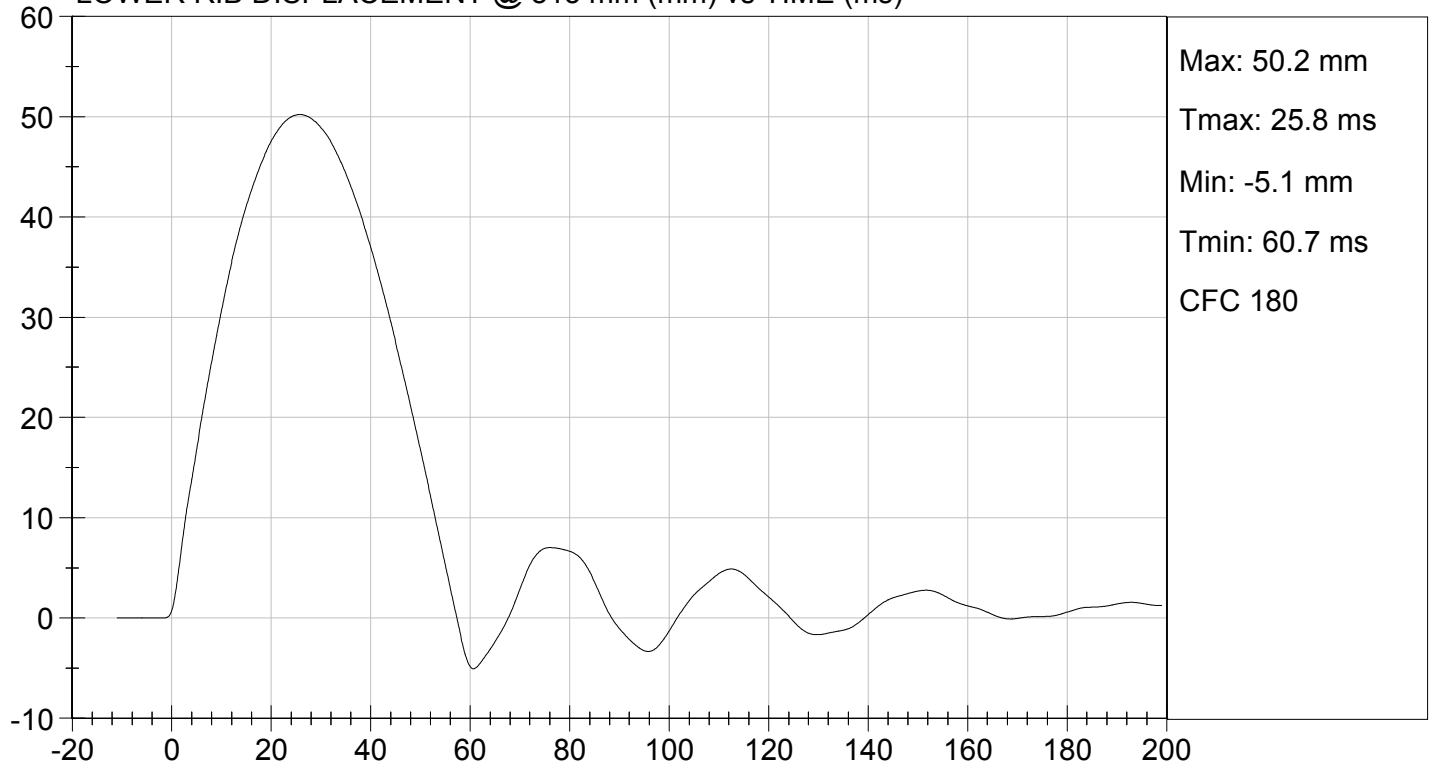

Approved By



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



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



MGA RESEARCH CORPORATION**THORAX IMPACT TEST****ES-2re DUMMY**ATD Serial No: 032Test I.D: D162570

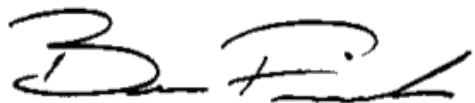
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	51	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5544	Pass
Upper Rib Displacement	mm	34.0 to 41.0	39.1	Pass
Middle Rib Displacement	mm	37.0 to 45.0	41.8	Pass
Lower Rib Displacement	mm	37.0 to 44.0	41.6	Pass
Overall Test Results				Pass



Laboratory Technician

07/29/2016

Test Date

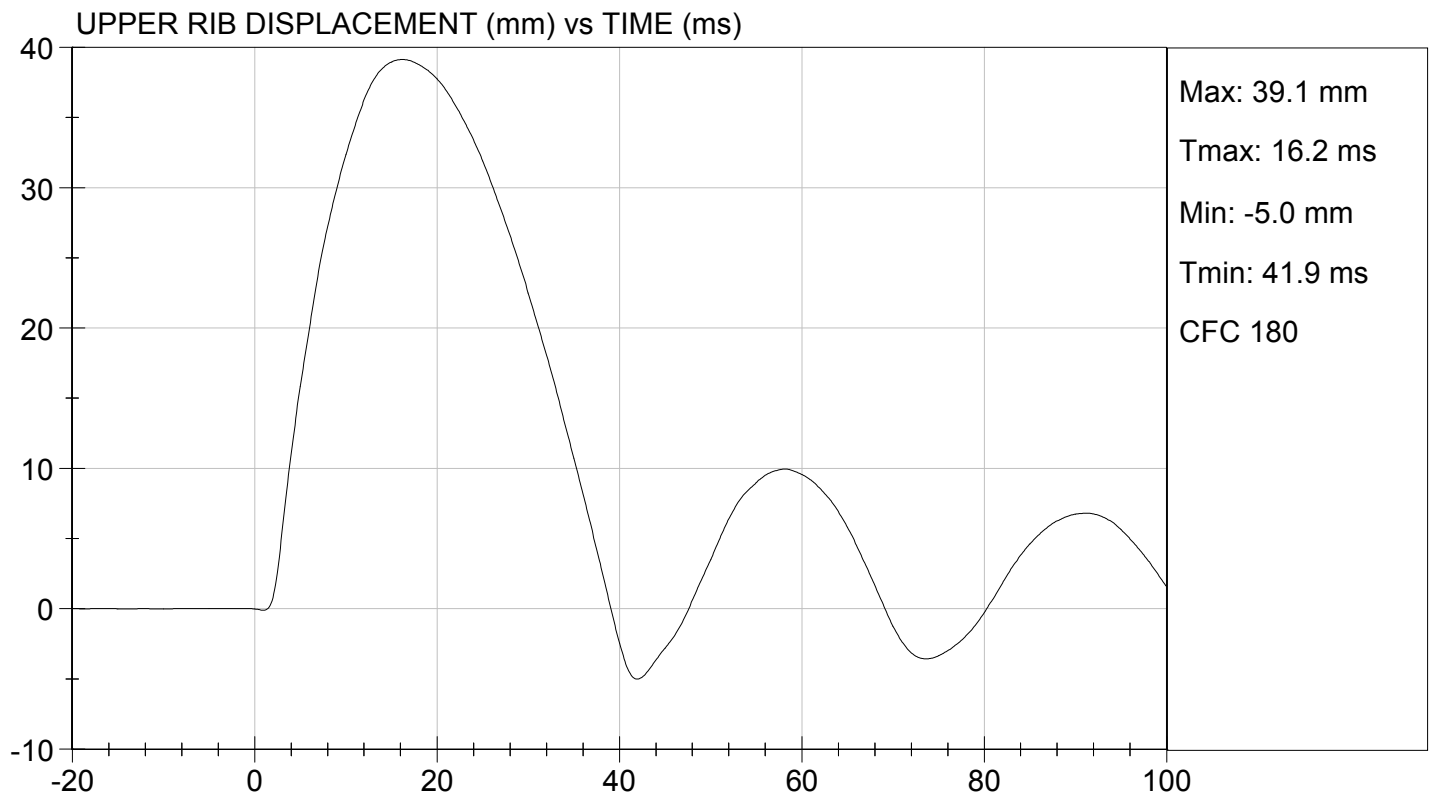
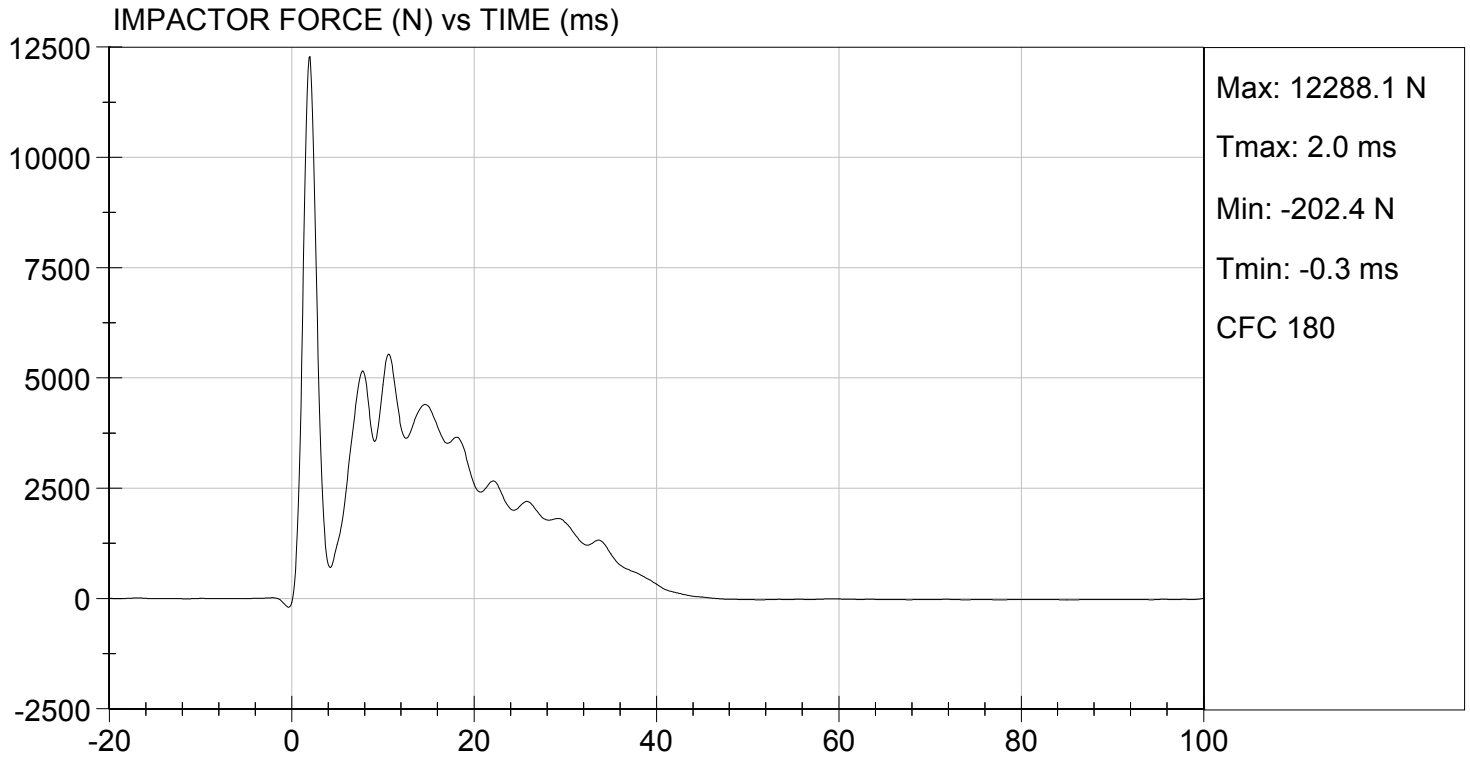


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 07/29/2016
TEST #: D162570

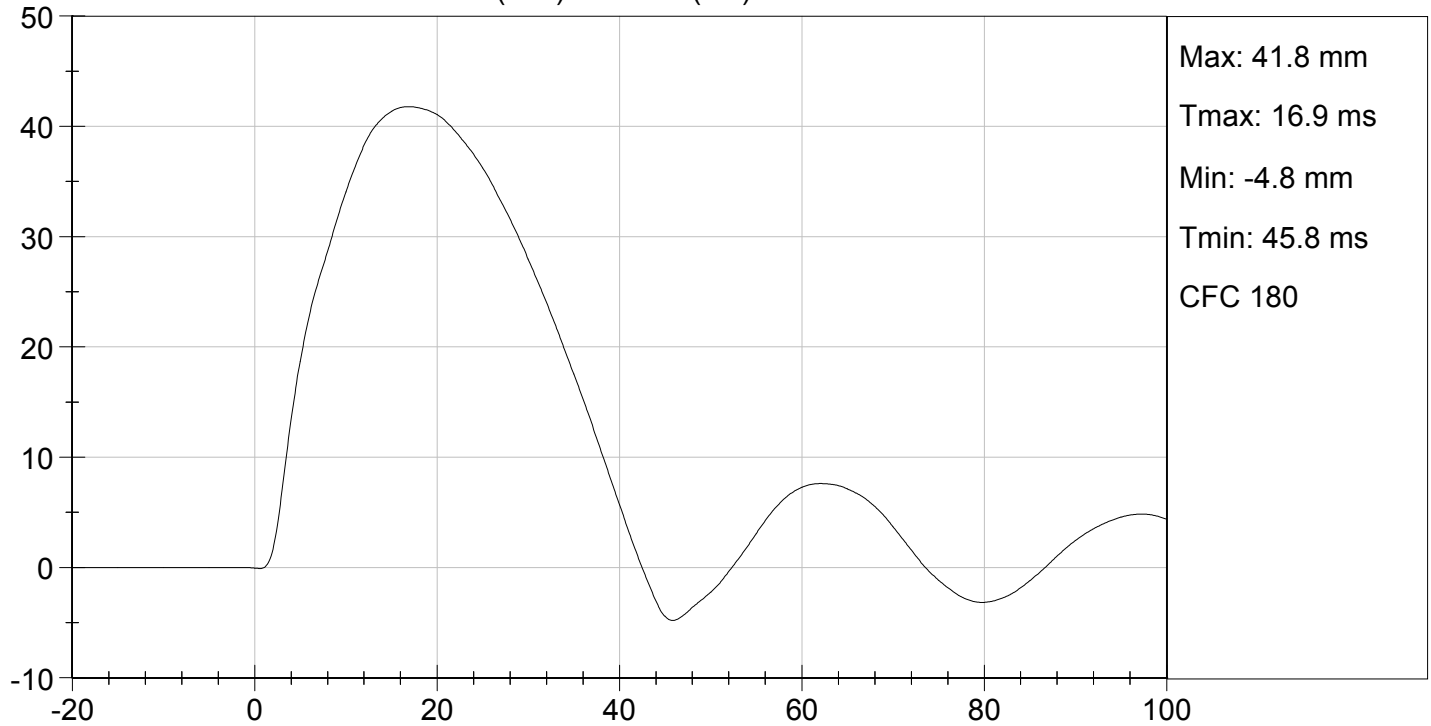




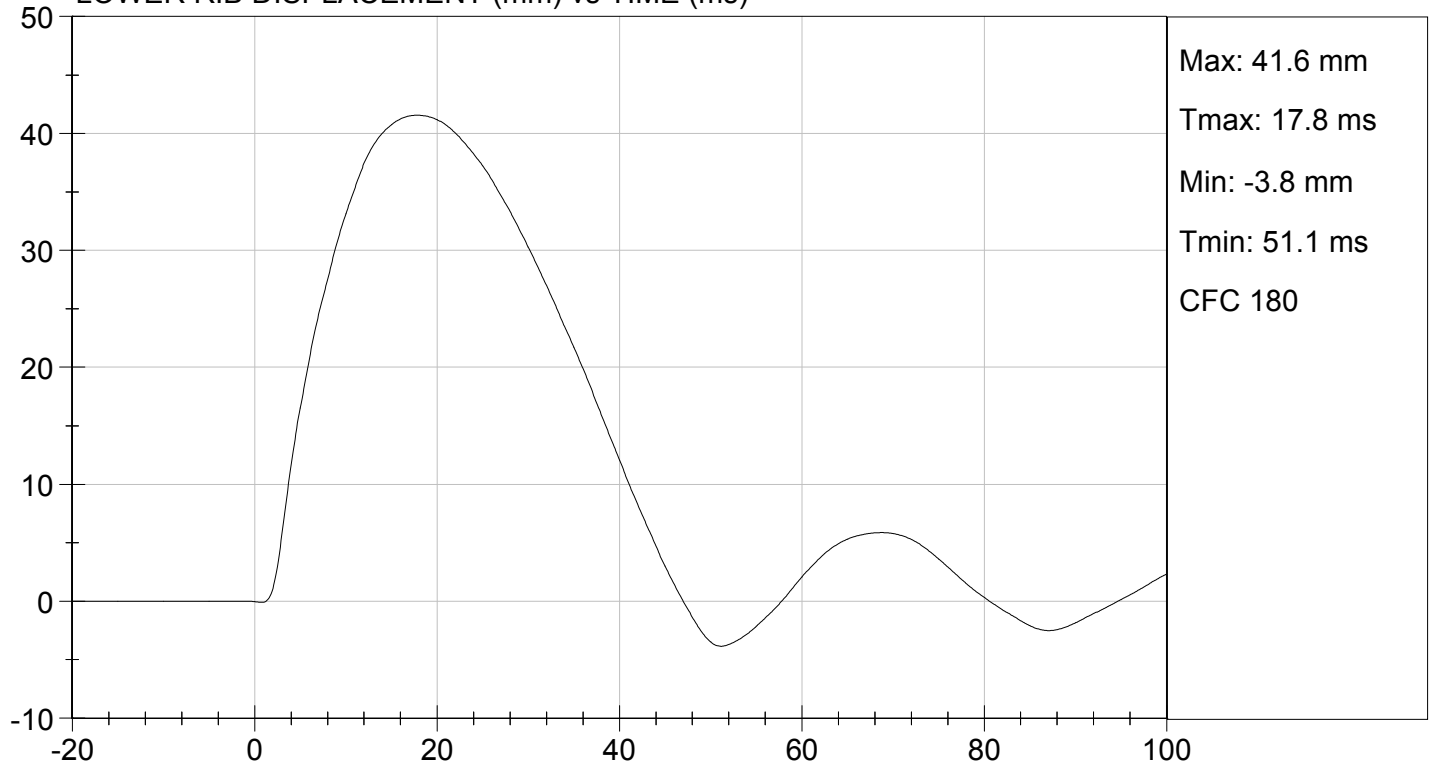
TEST DESC: THORAX IMPACT
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 07/29/2016
TEST #: D162570

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D162577

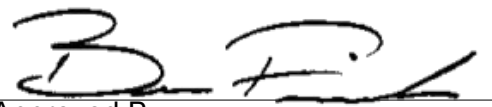
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4321	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.6	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2349	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	11.5	Pass
Overall Test Results				Pass



Laboratory Technician

07/29/2016

Test Date

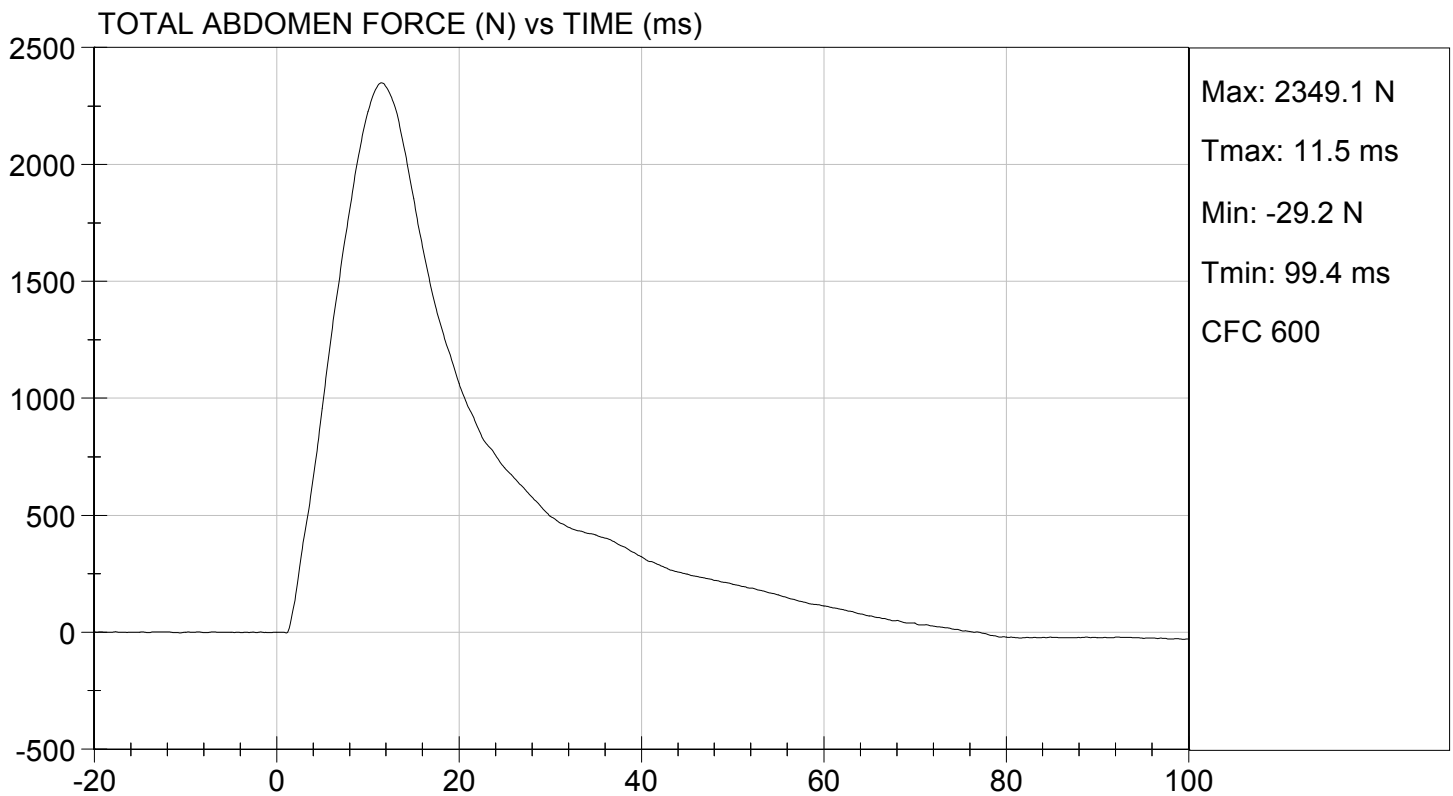
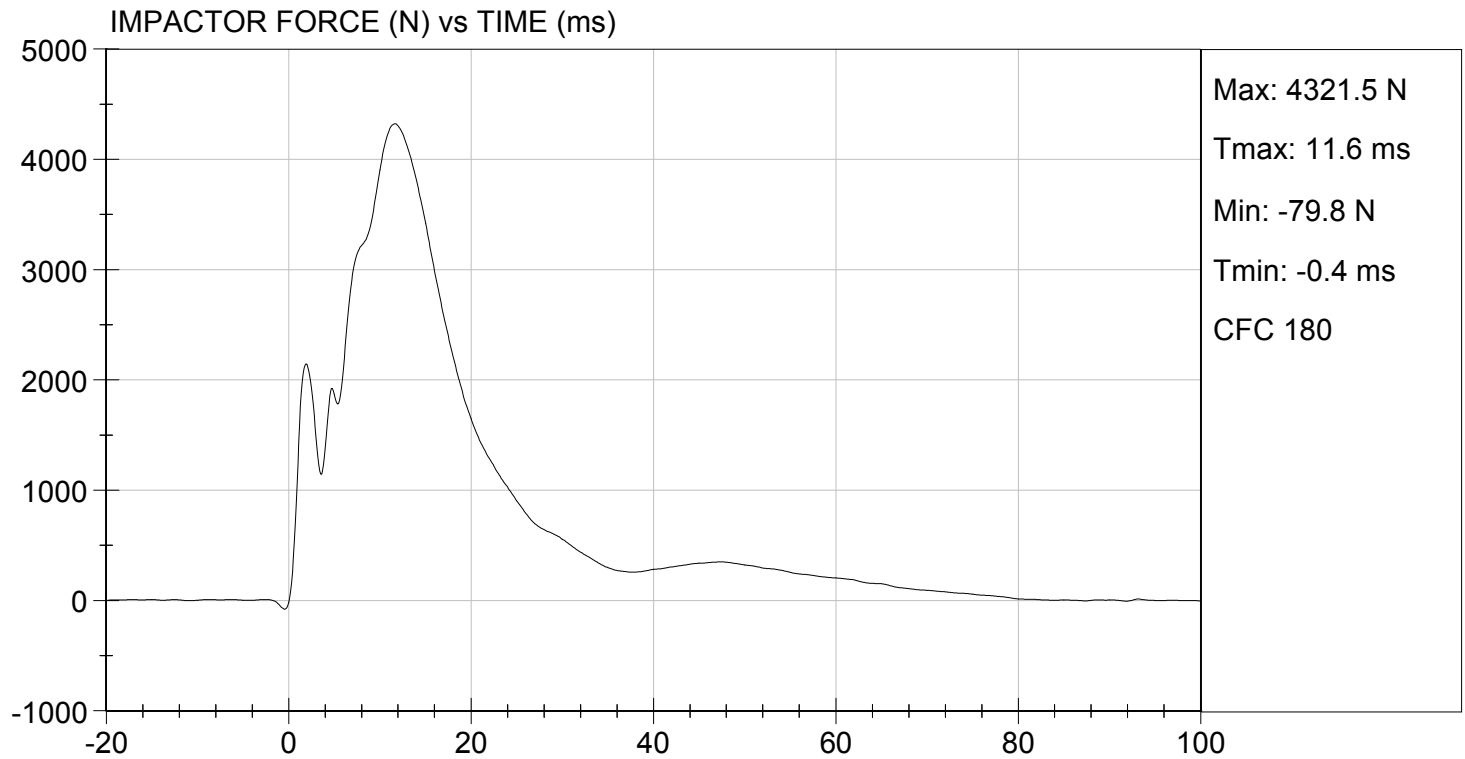


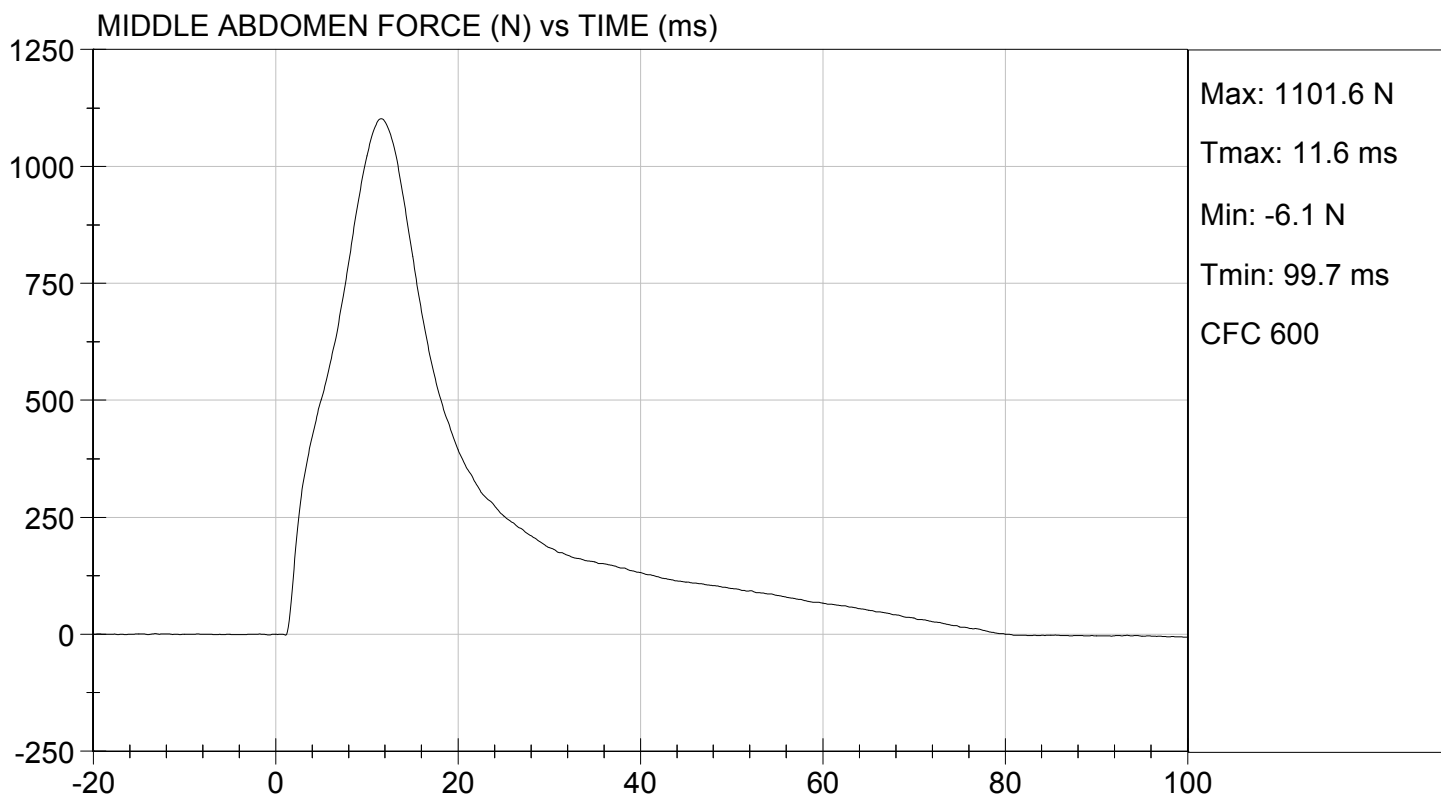
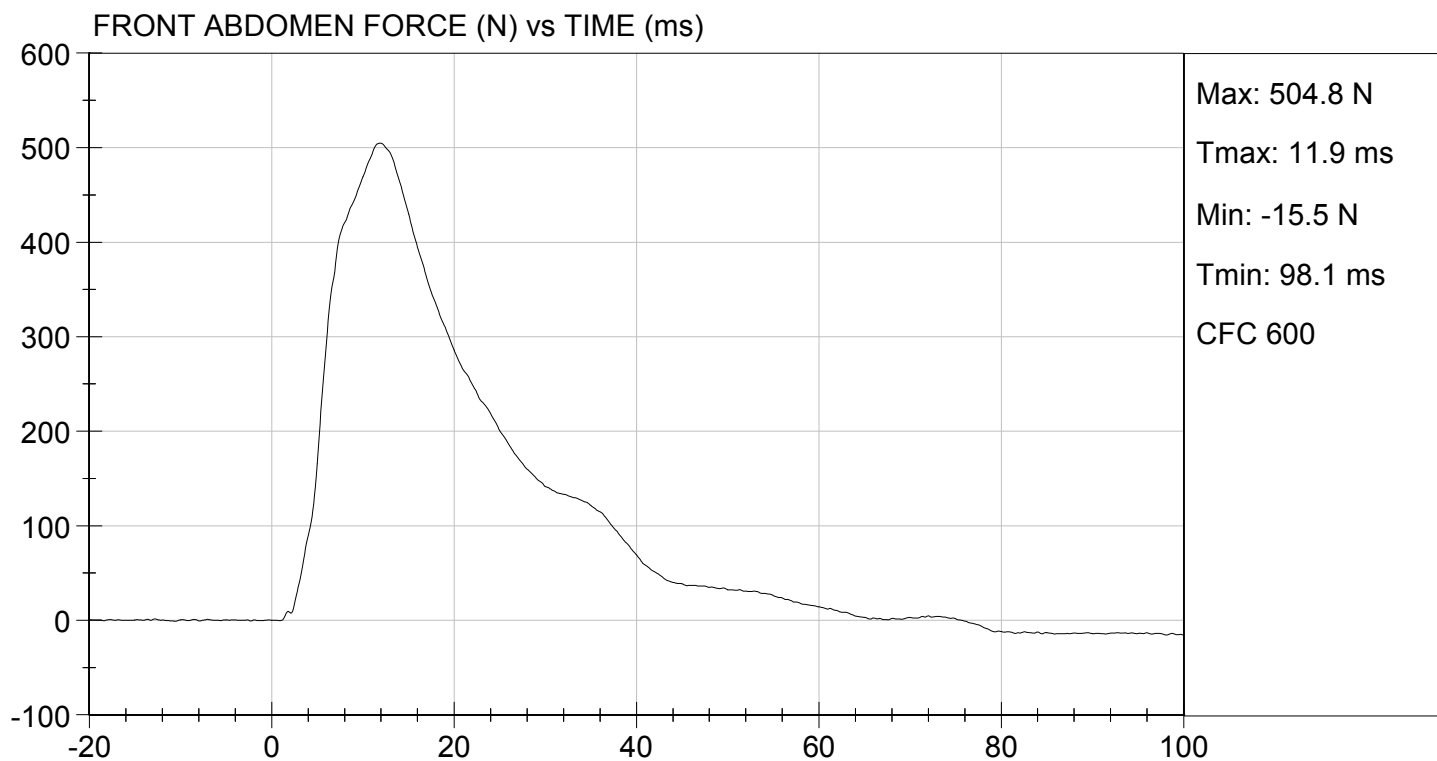
Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

TEST DATE: 07/29/2016
TEST #: D162577

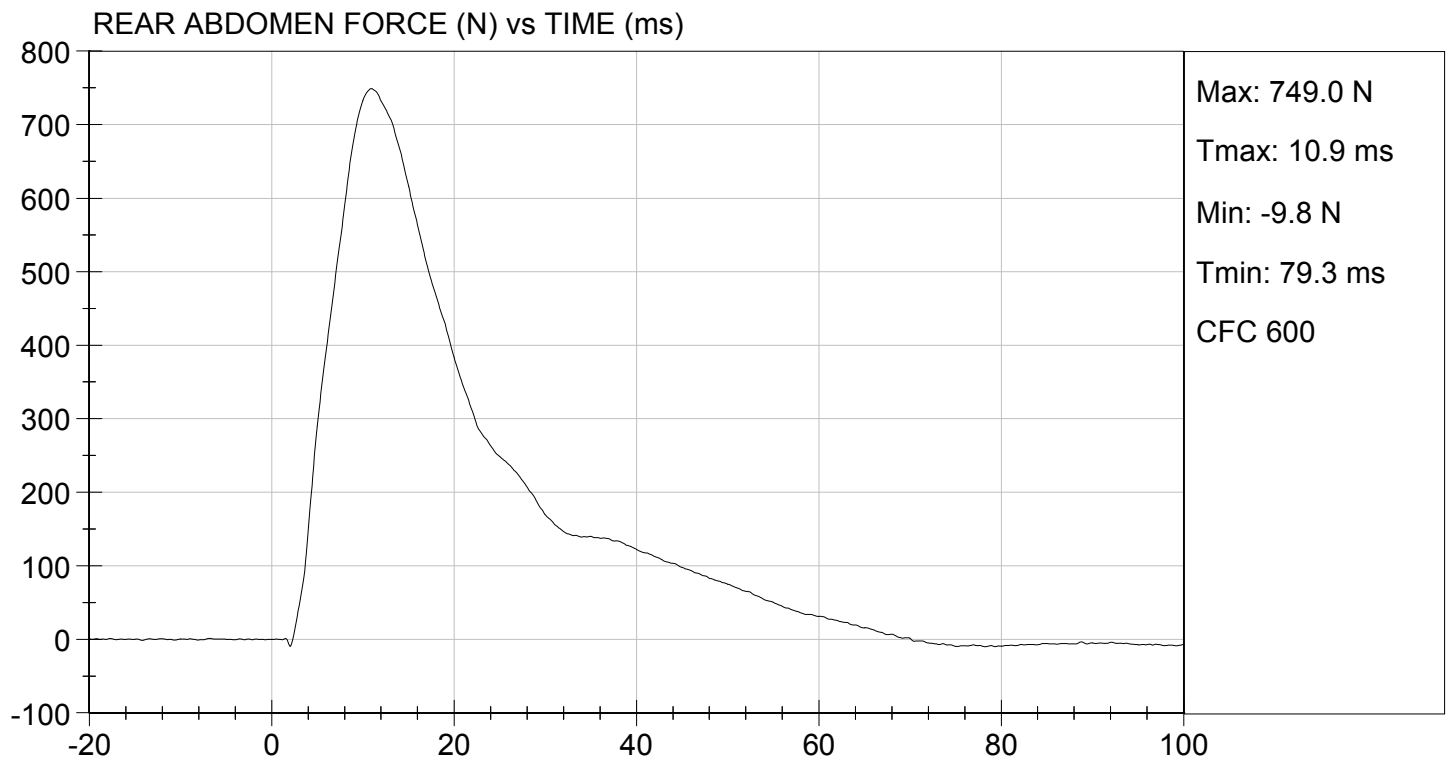






TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

TEST DATE: 07/29/2016
TEST #: D162577



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

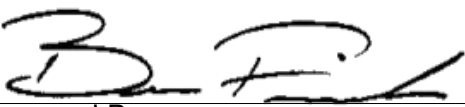
ATD Serial No: 032

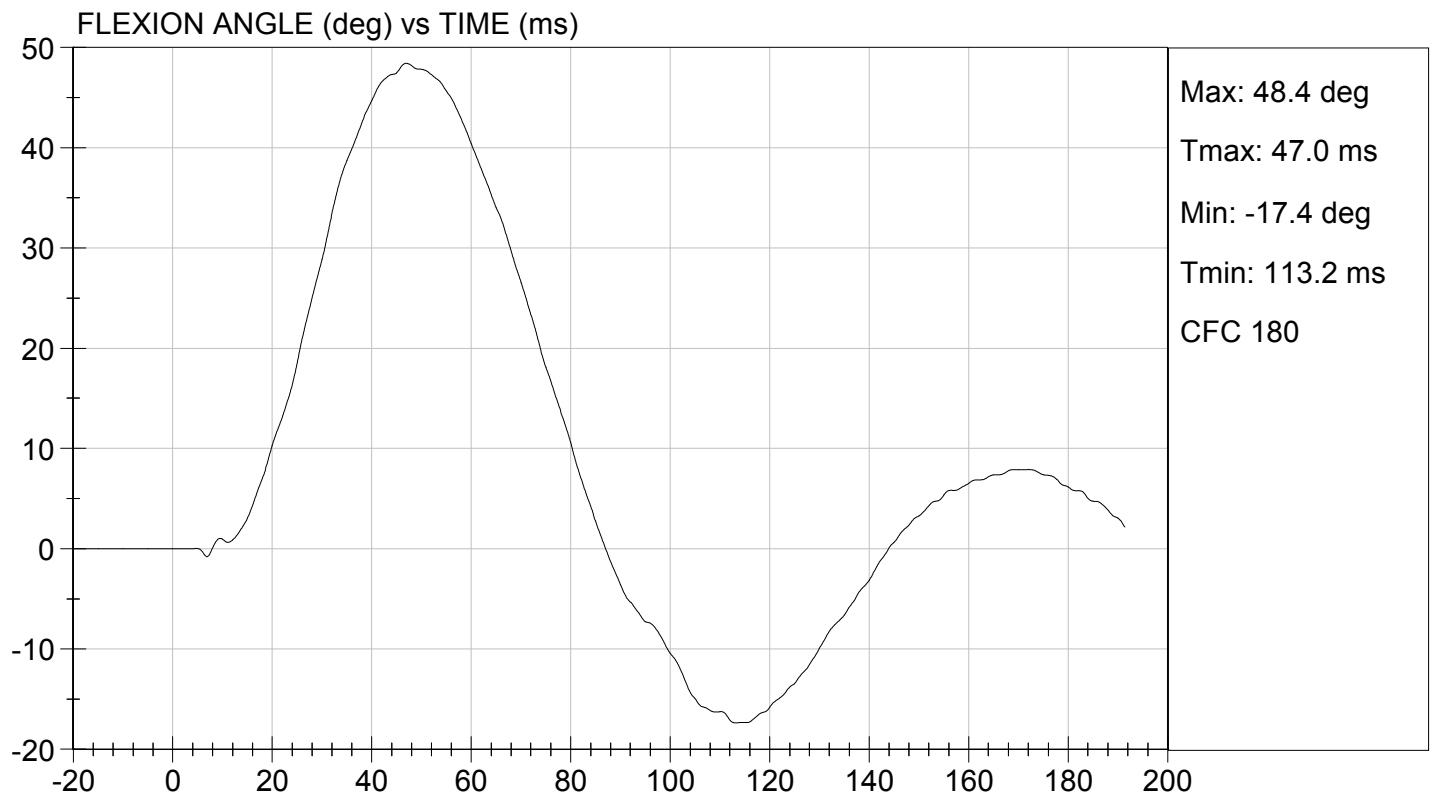
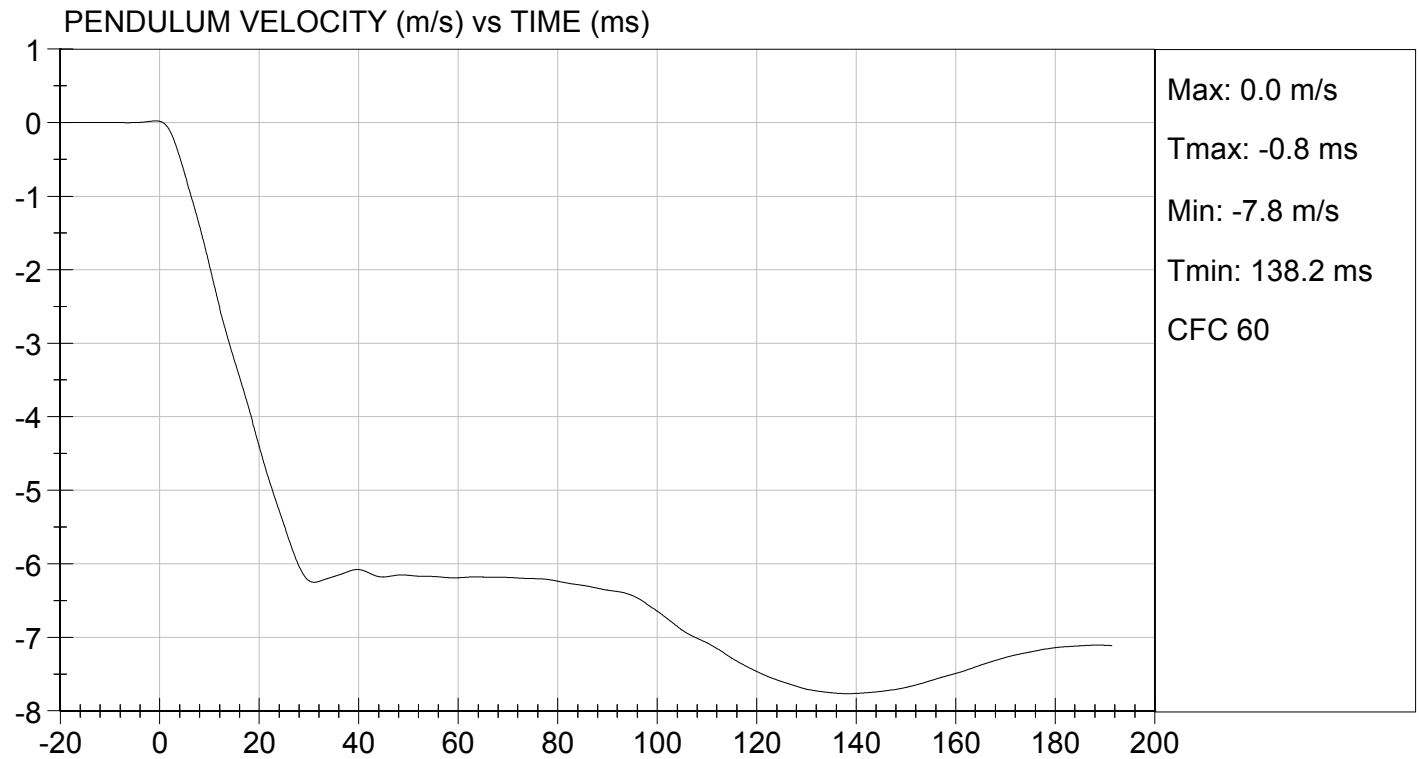
Test I.D: D162578

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	50	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	-0.407	Pass
	27 ms	m/s	-6.50 to -5.80	-5.86	Pass
	30 ms	m/s	>= -6.50	-6.23	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	48.4	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	47.0	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	46	Pass
Overall Results					Pass


 Laboratory Technician

07/29/2016
 Test Date

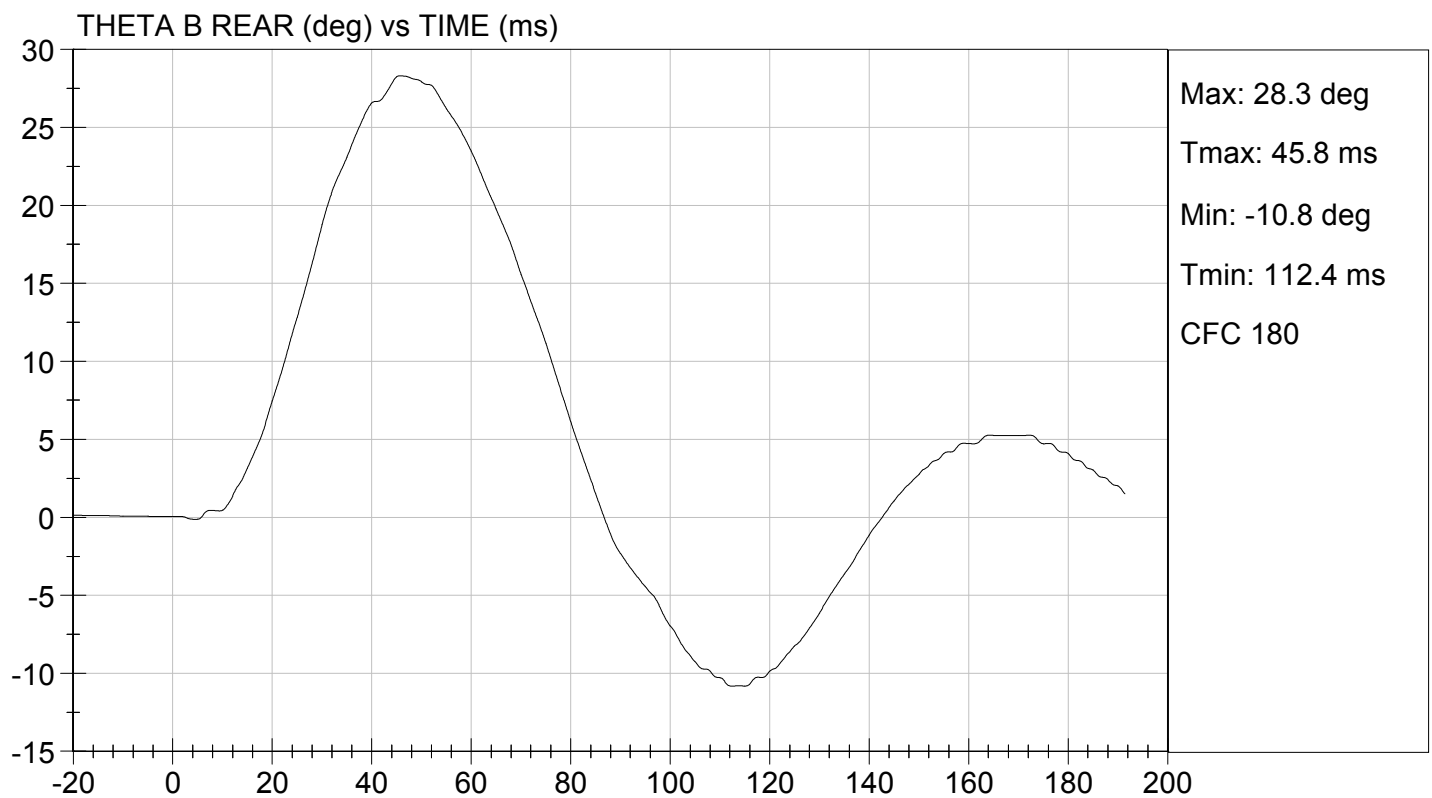
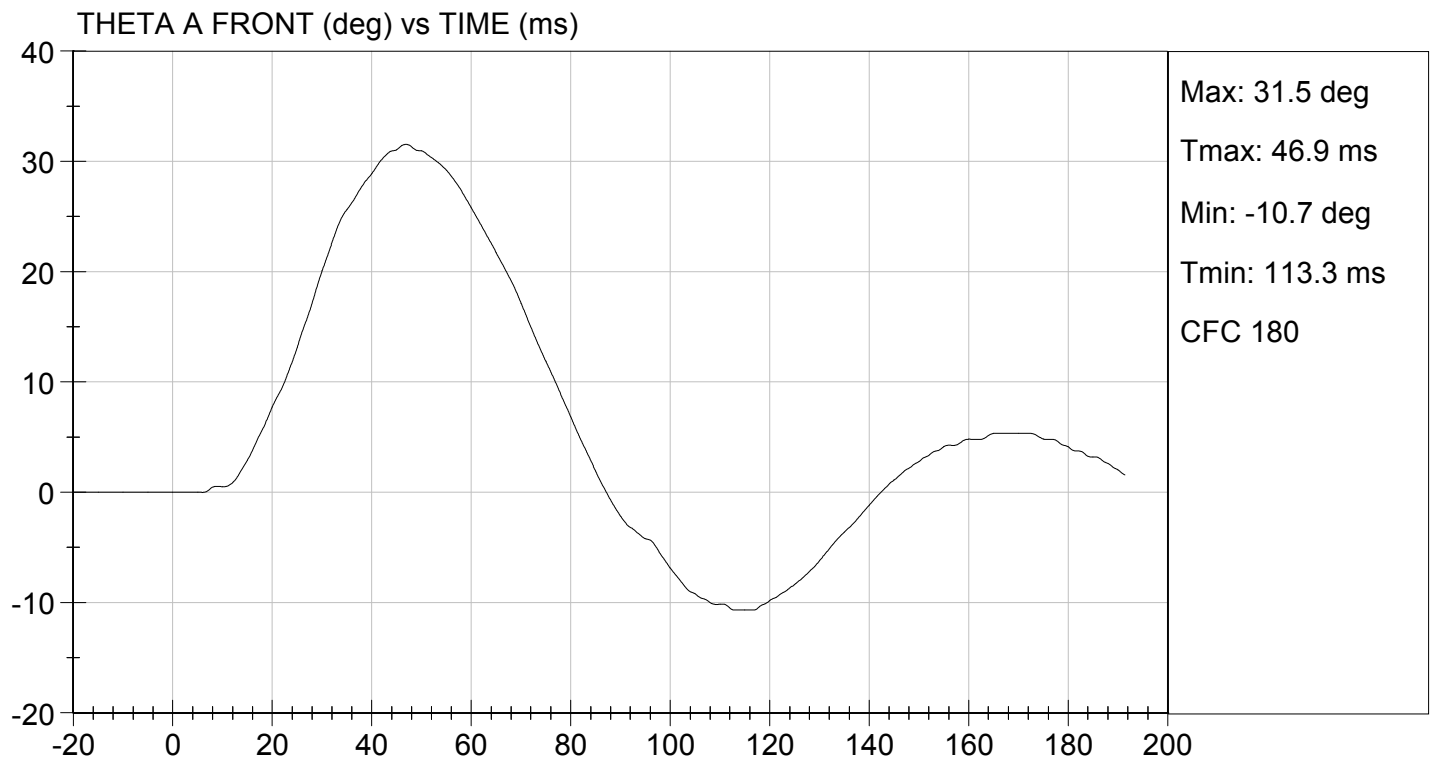

 Approved By





TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

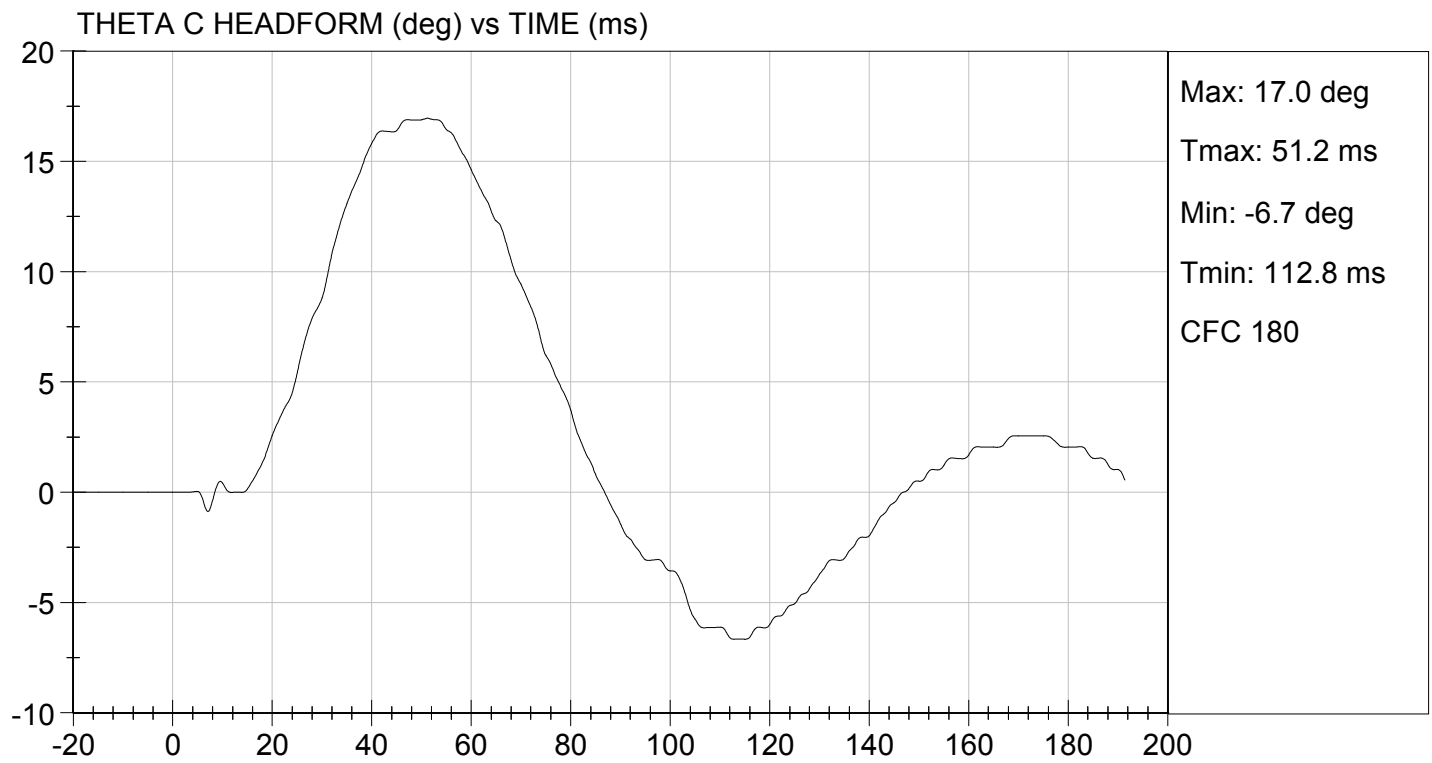
TEST DATE: 07/29/2016
TEST #: D162578





TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 07/29/2016
TEST #: D162578



MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

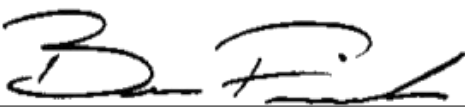
ATD Serial No: 032

Test I.D: D162579

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	51	Pass
Probe Speed	m/s	4.20 to 4.40	4.34	Pass
Maximum Impactor Force	N	4700 to 5400	4827	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.5	Pass
Maximum Pubic Force	N	1230 to 1590	1322	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	15.2	Pass
Overall Test Results				Pass


Laboratory Technician

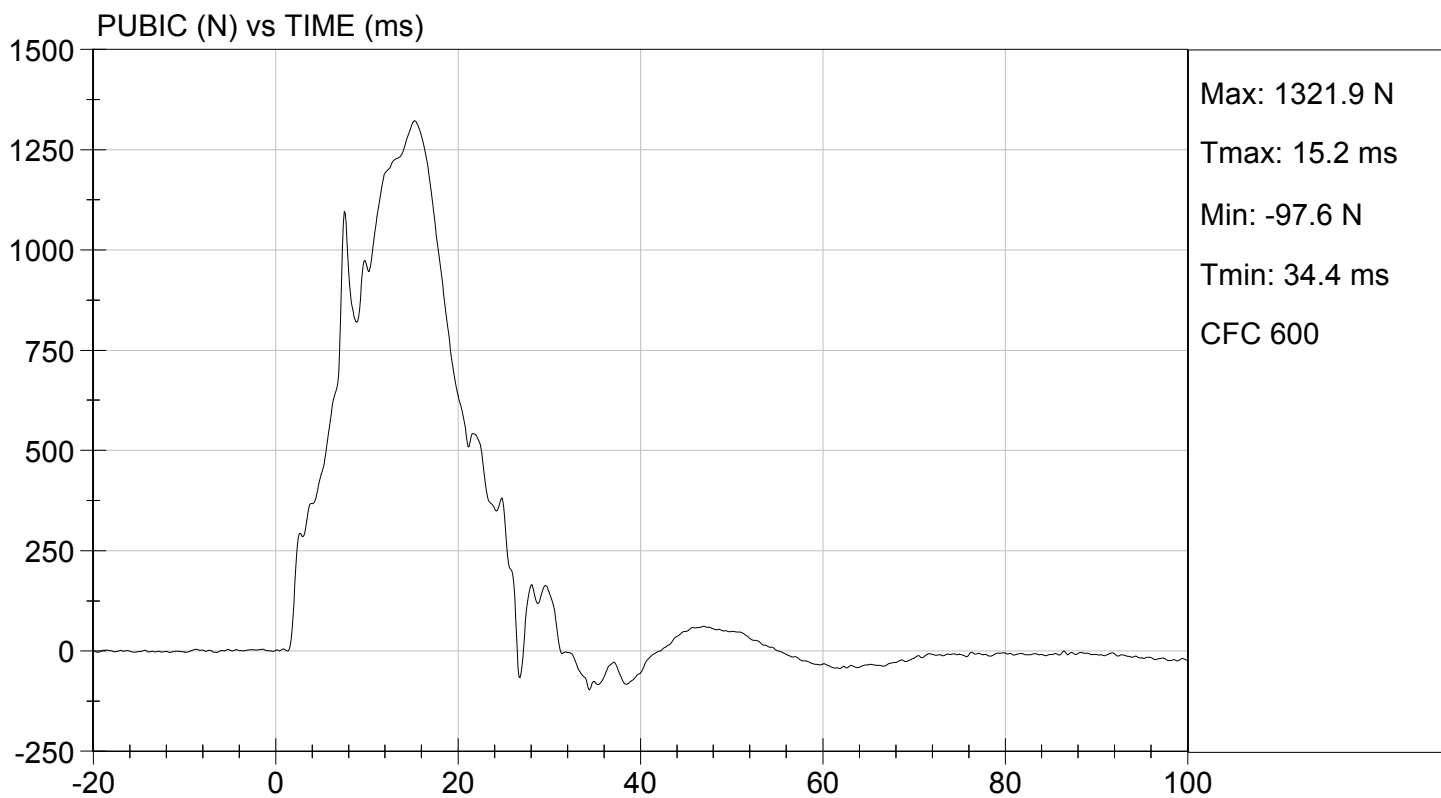
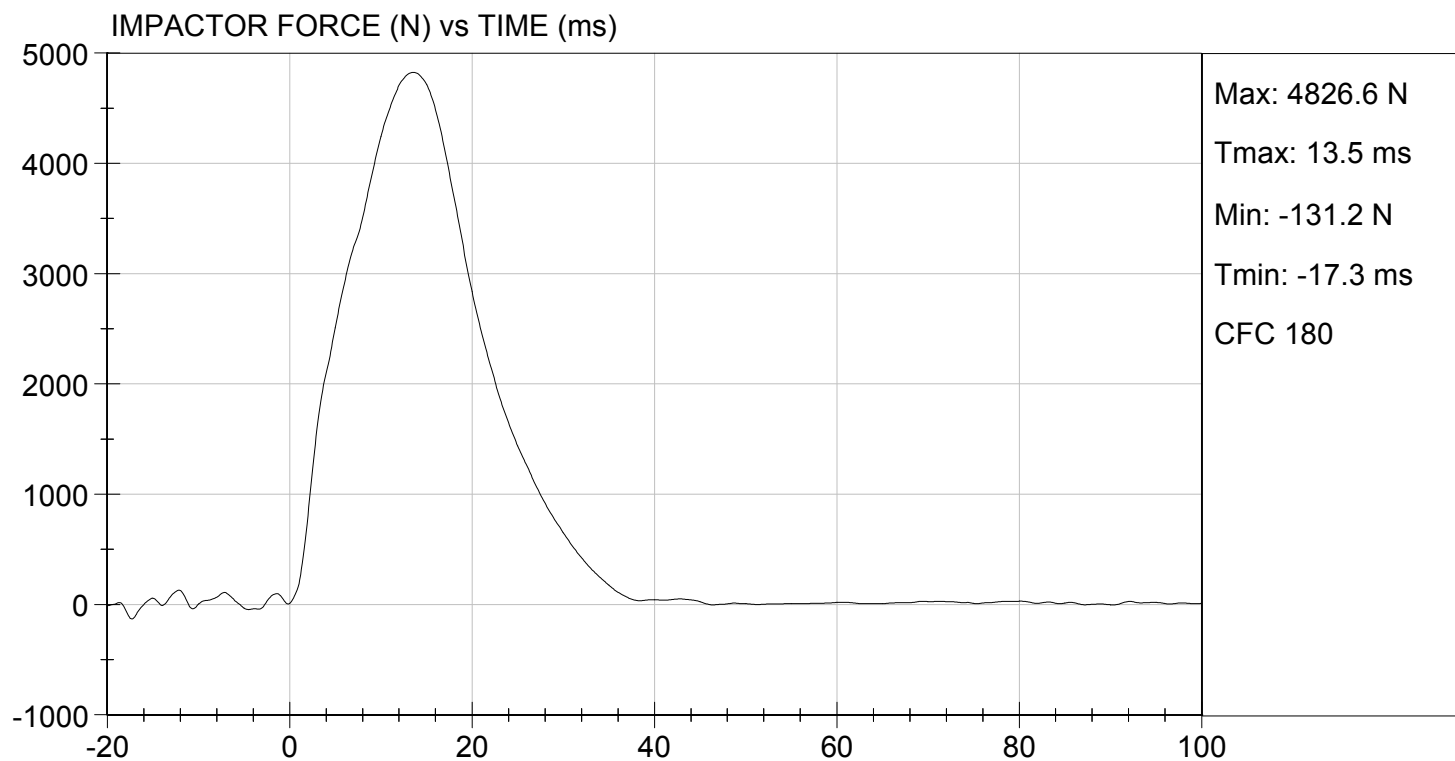
07/29/2016
Test Date


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 07/29/2016
TEST #: D162579

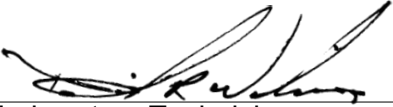
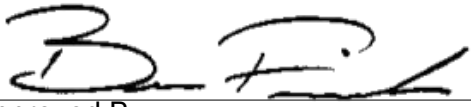


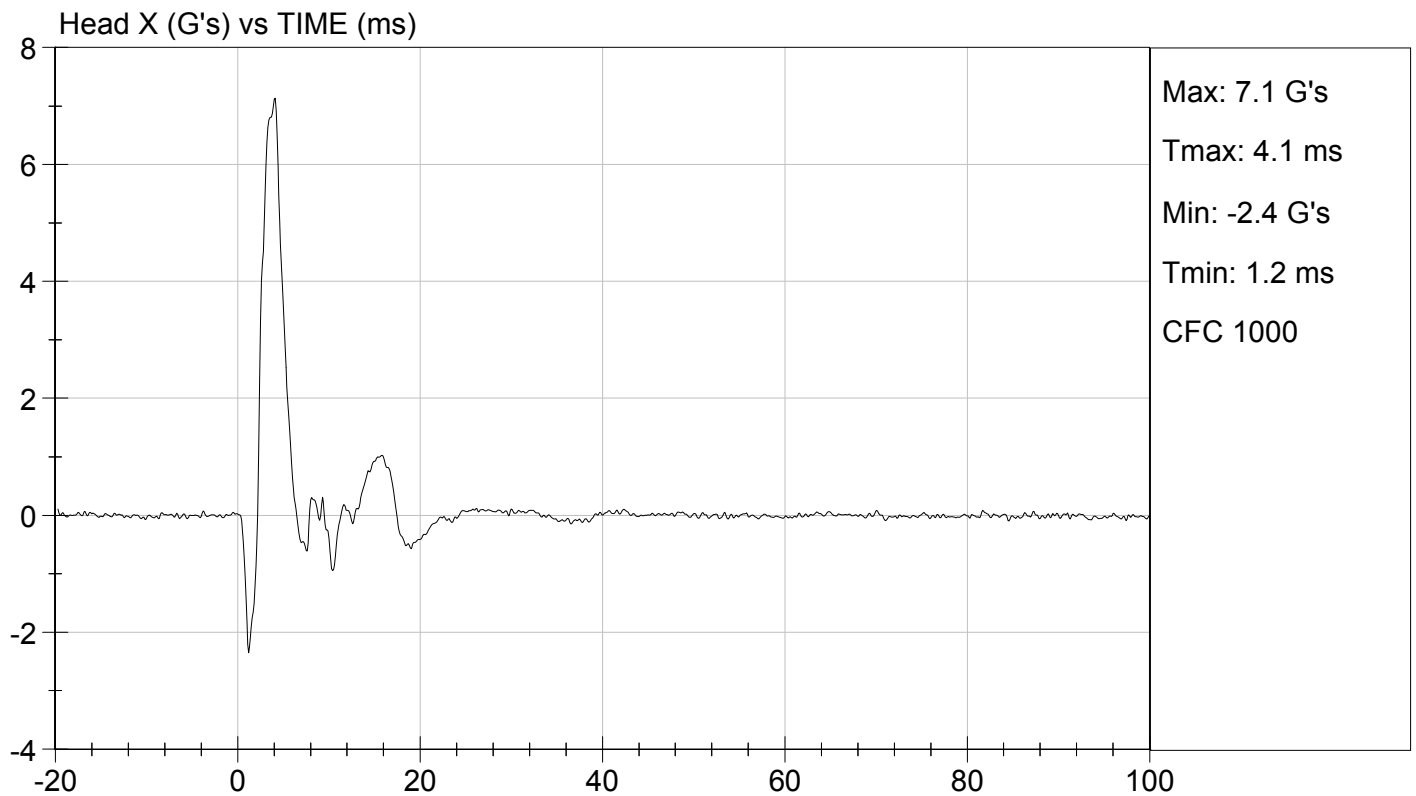
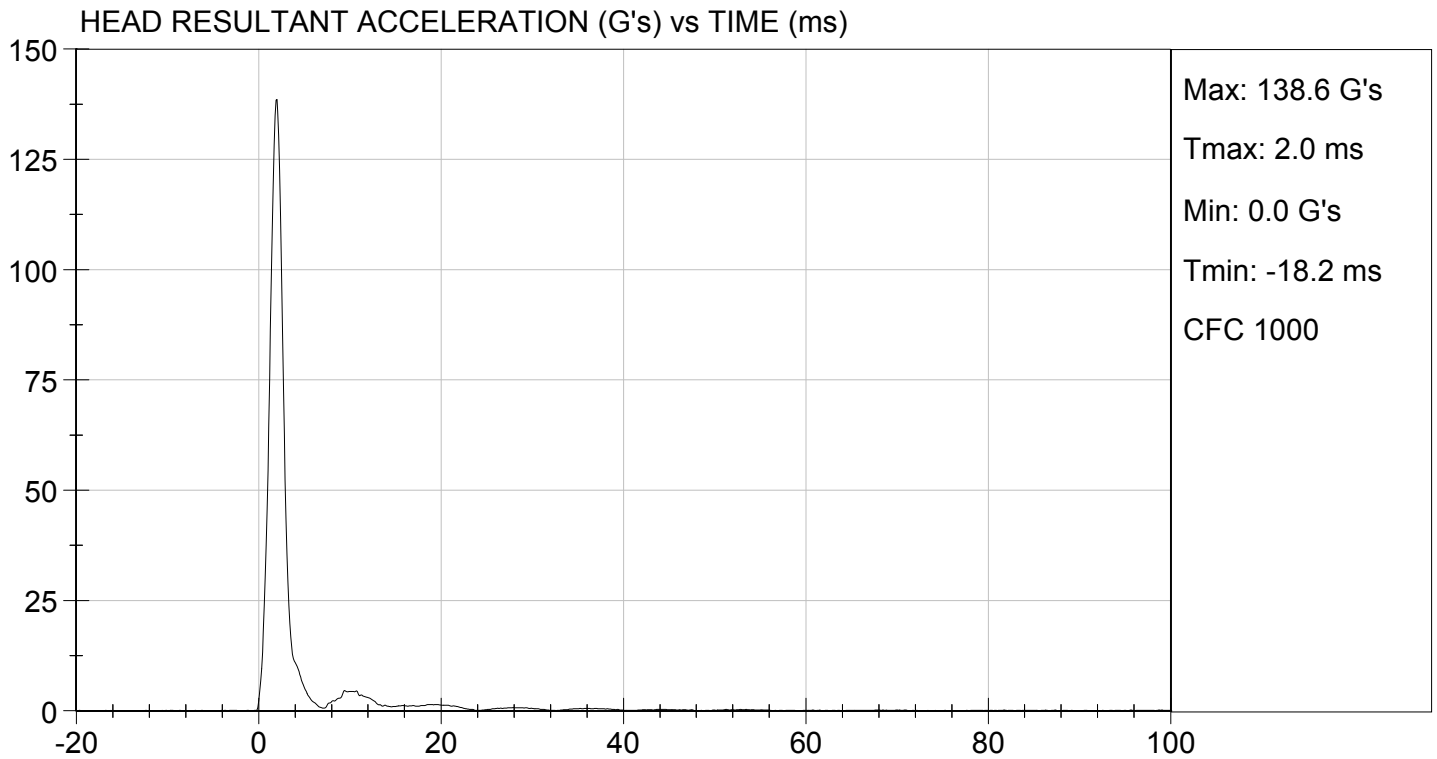
ES-2re External Measurements
SN: 032

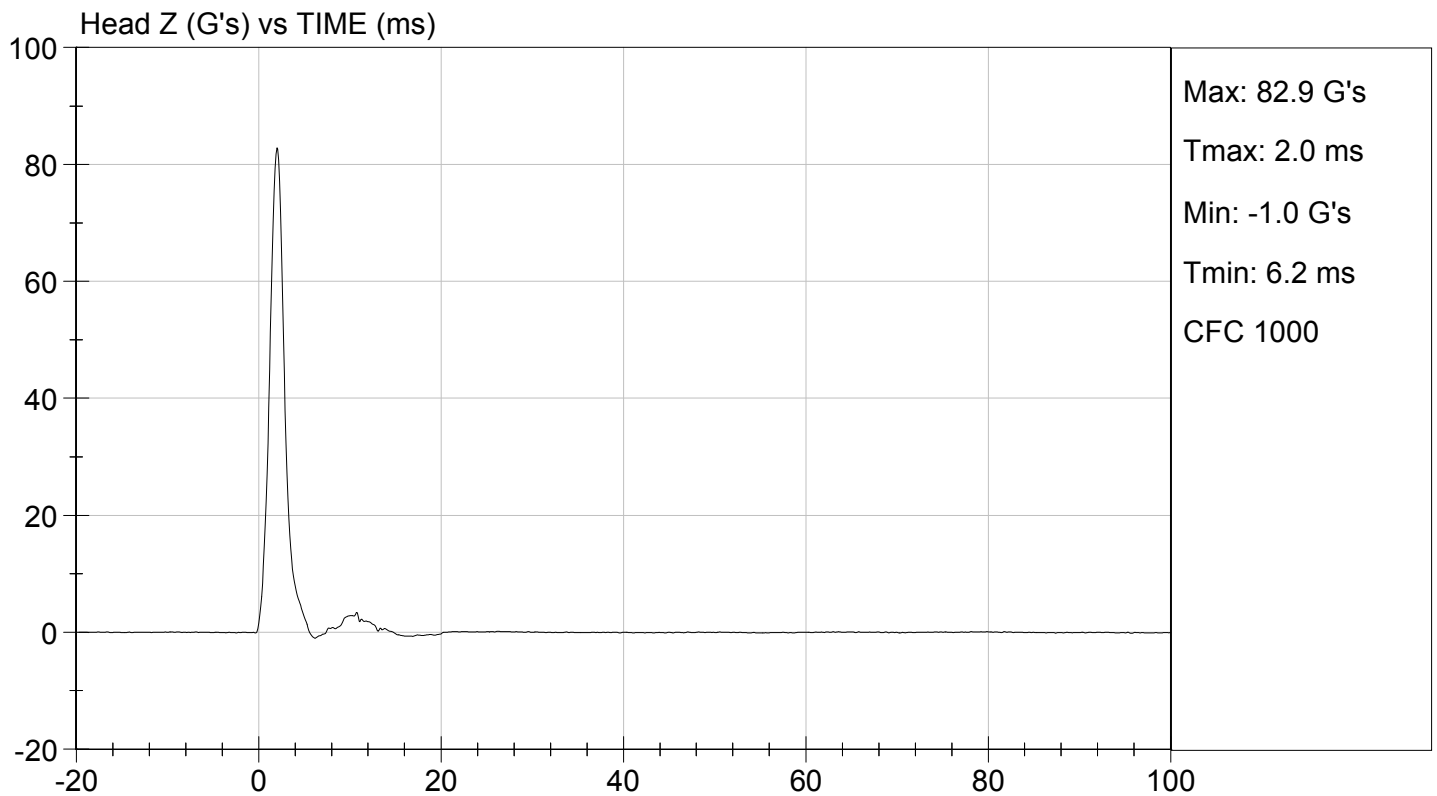
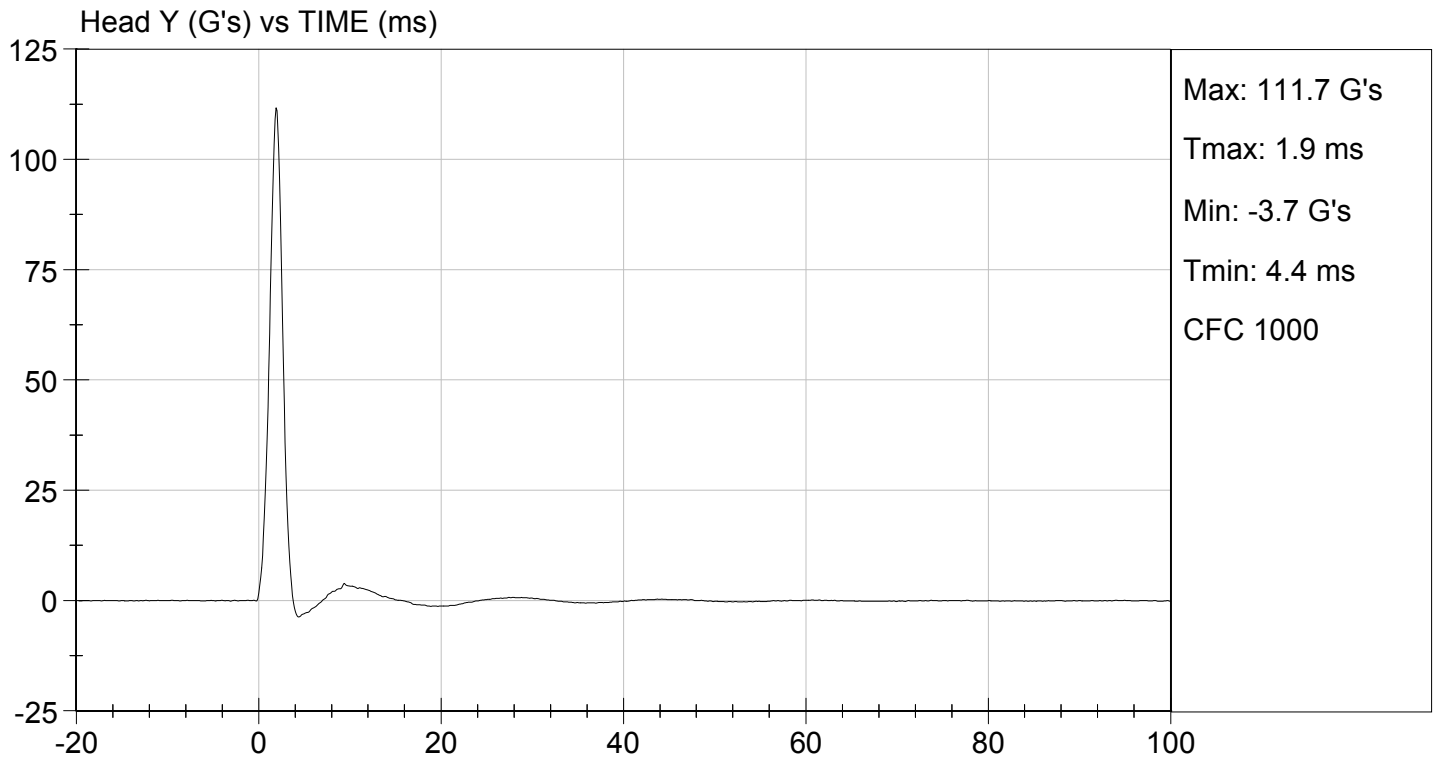
No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	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:** D162861

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	125 to 155	139	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	7.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician08/25/2016
Test Date
Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

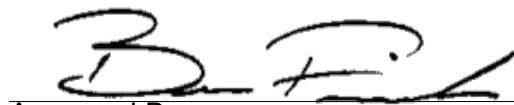
ATD Serial No: 032

Test I.D: D162862

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	46	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.43	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.03	Pass
	3 ms	m/s	-0.25 to -0.375	-0.34	Pass
	14 ms	m/s	-3.20 to -3.70	-3.27	Pass
	17 ms	m/s	>= -3.70	-3.37	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	50.0	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	63.8	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	63.7	Pass
Overall Results					Pass


 Laboratory Technician

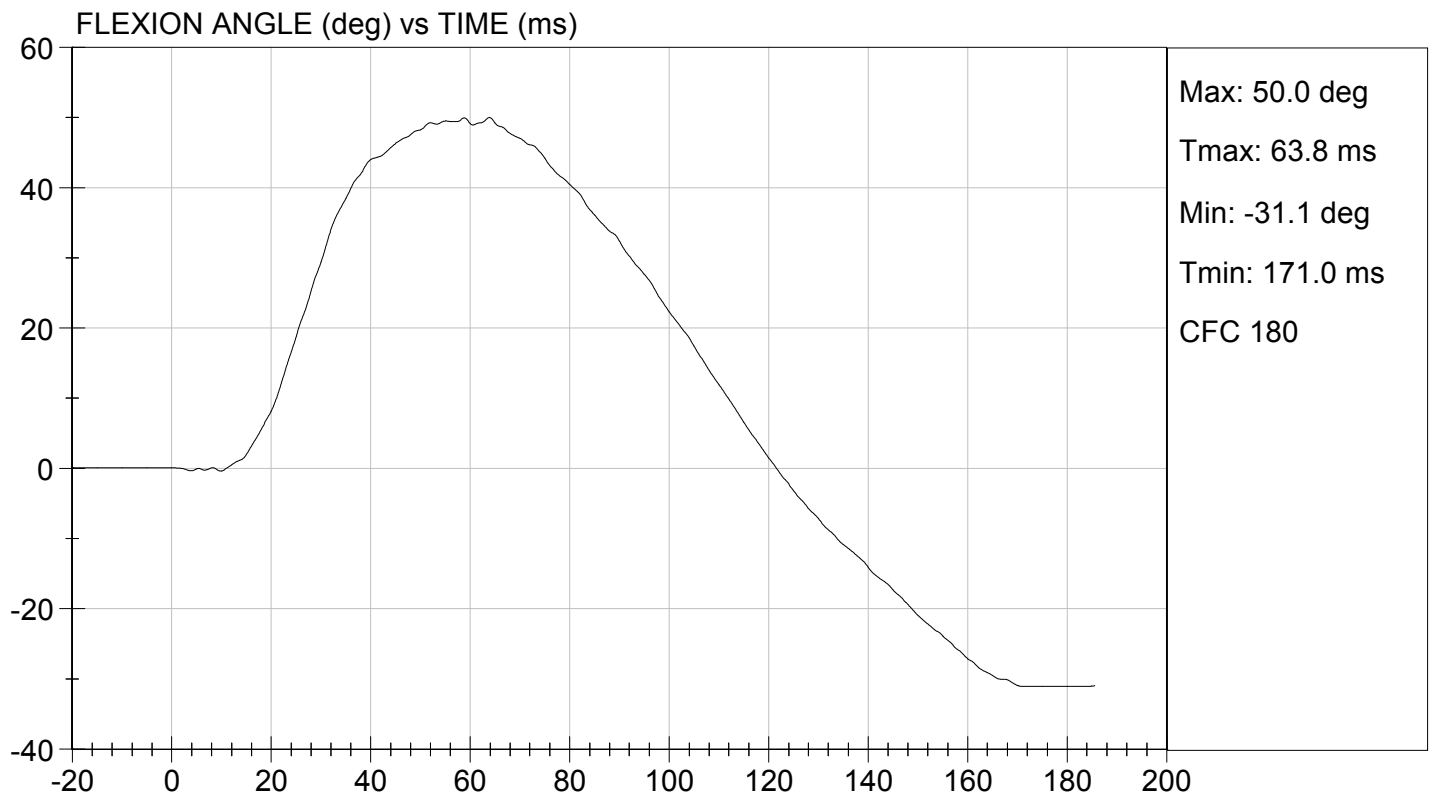
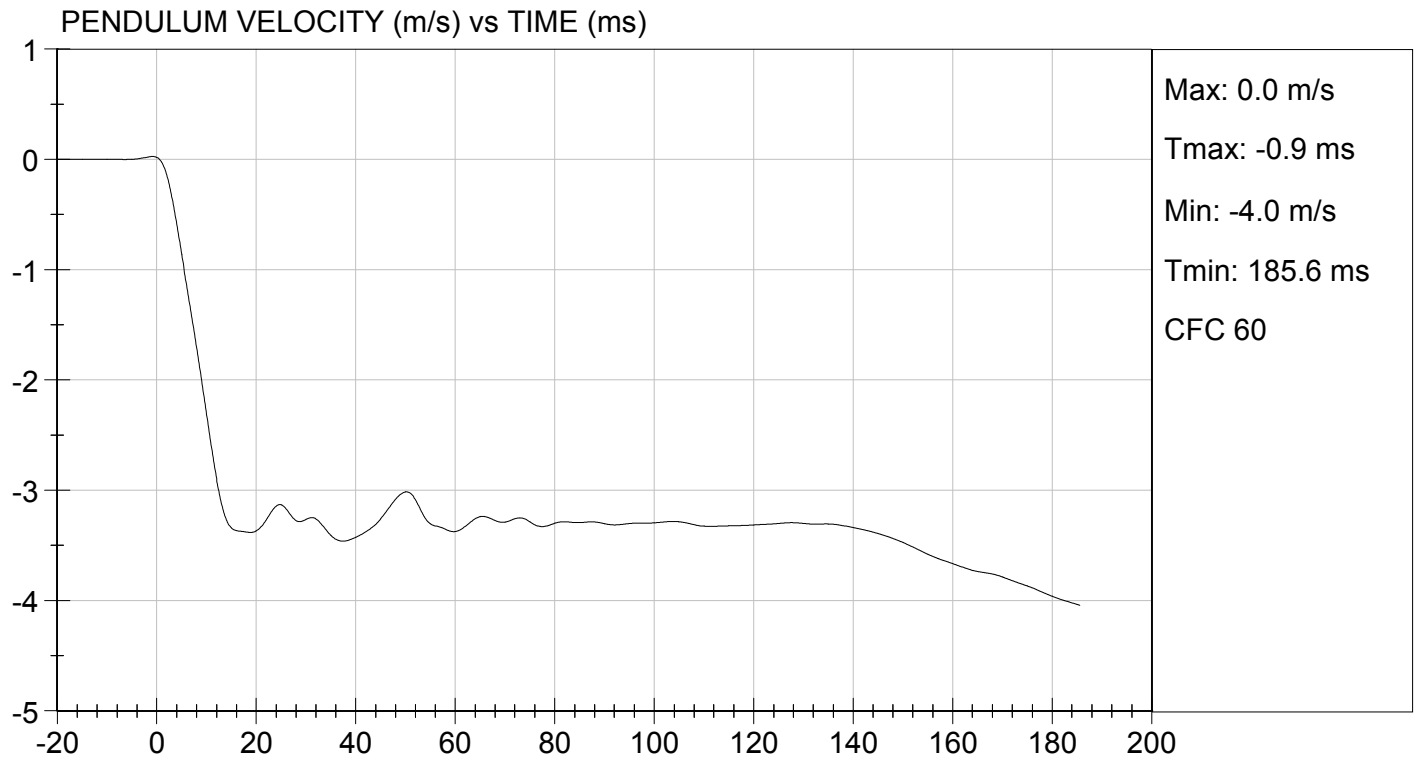
08/26/2016
 Test Date


 Approved By



TEST DESC: NECK BENDING
VELOCITY: 11.26 ft/s, 3.43 m/s

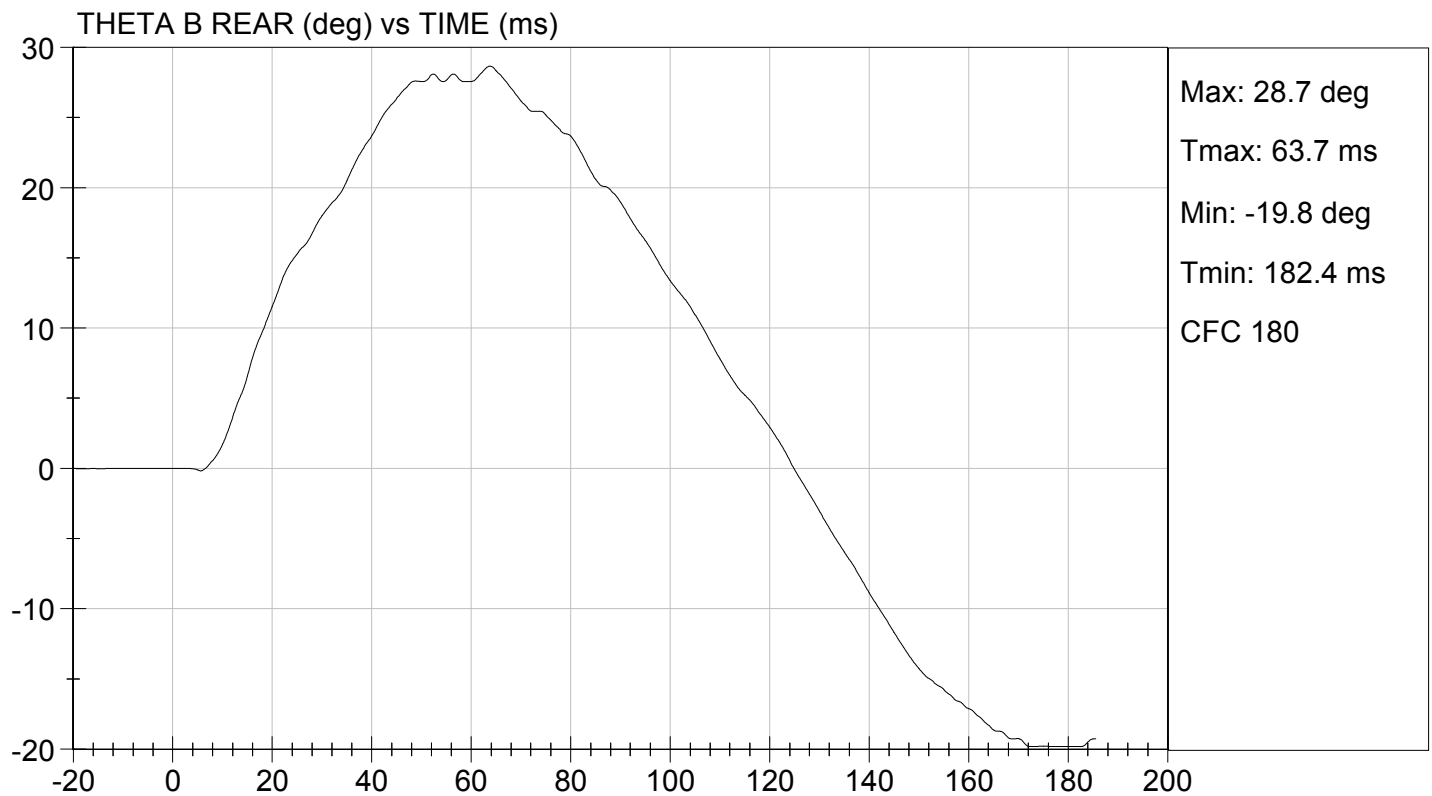
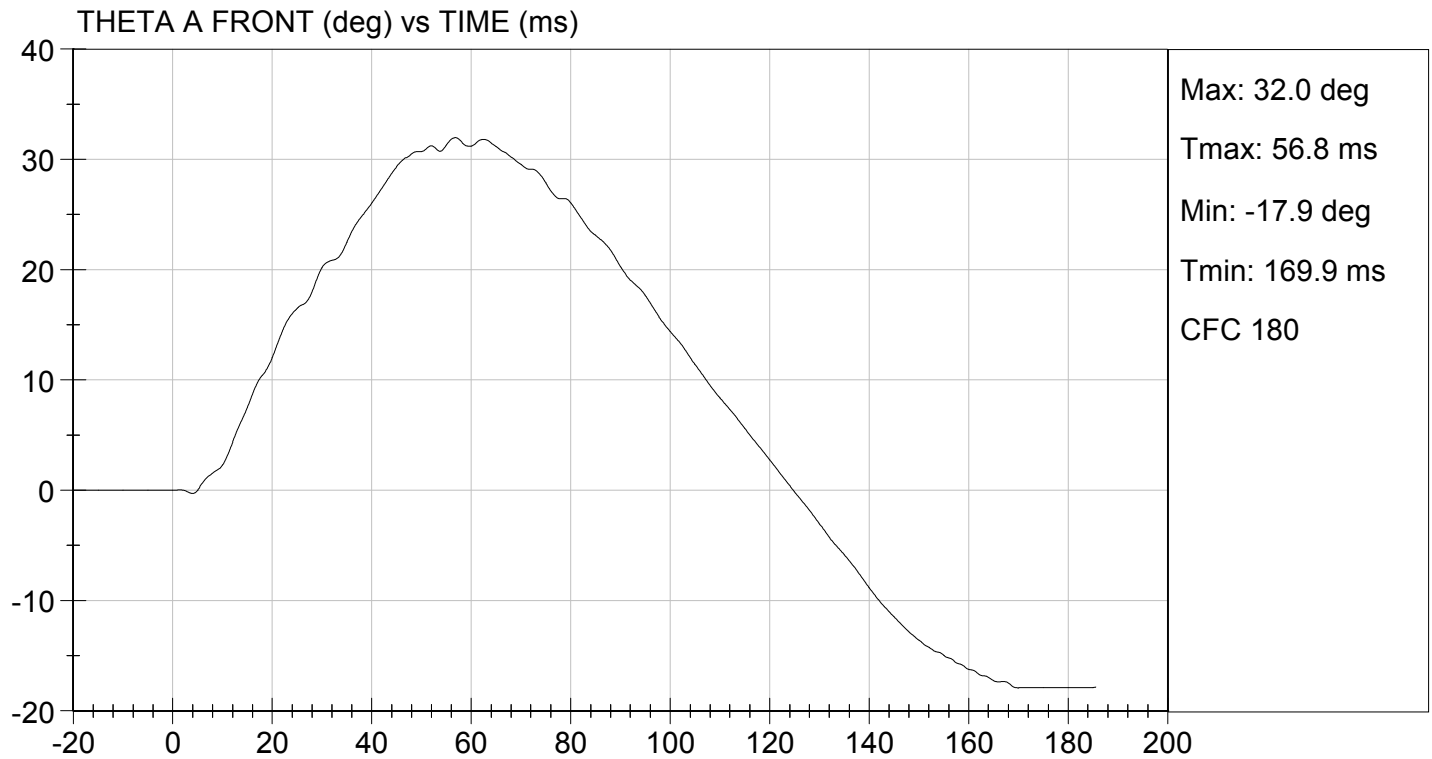
TEST DATE: 08/26/2016
TEST #: D162862





TEST DESC: NECK BENDING
VELOCITY: 11.26 ft/s, 3.43 m/s

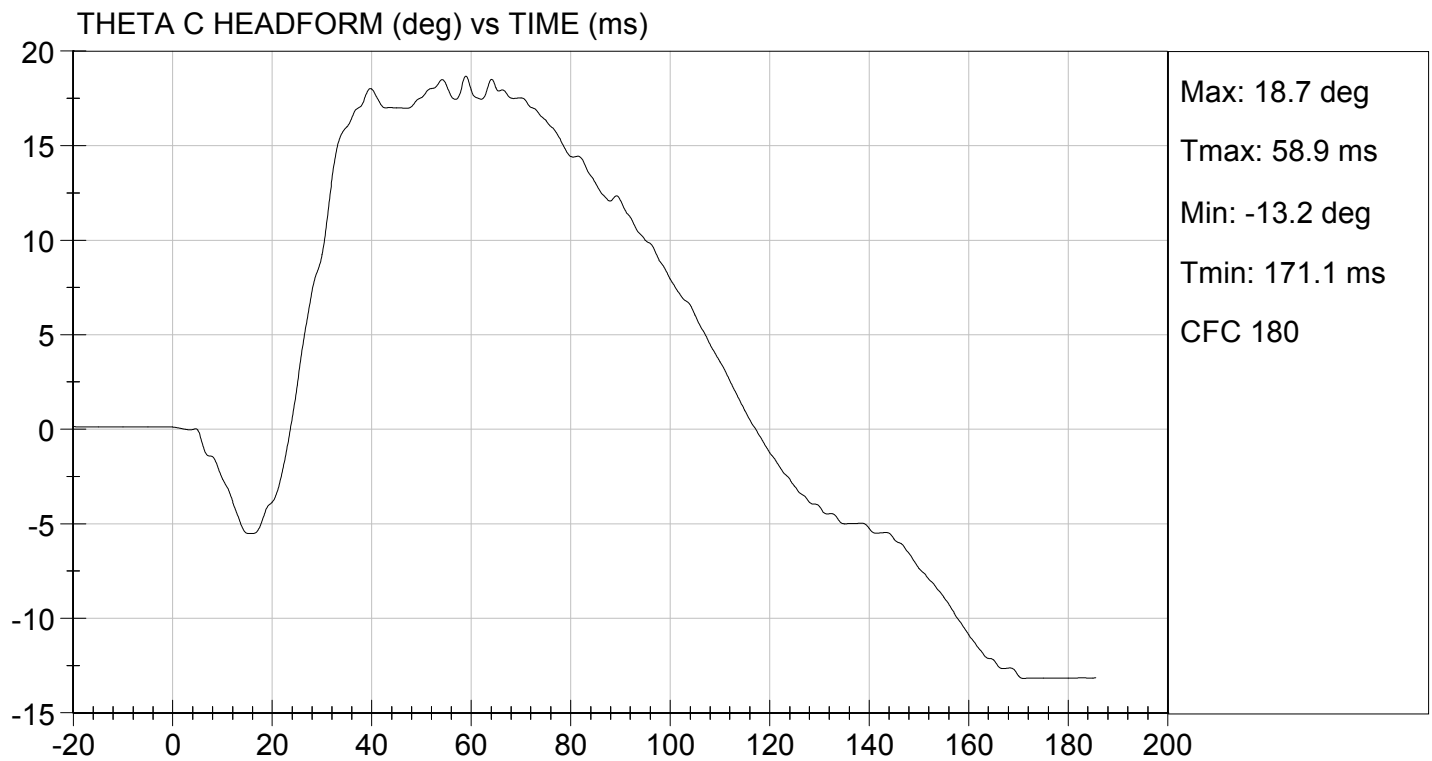
TEST DATE: 08/26/2016
TEST #: D162862





TEST DESC: NECK BENDING
VELOCITY: 11.26 ft/s, 3.43 m/s

TEST DATE: 08/26/2016
TEST #: D162862



MGA RESEARCH CORPORATION

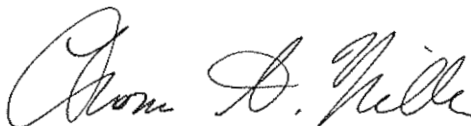
SHOULDER IMPACT TEST

ES-2re DUMMY

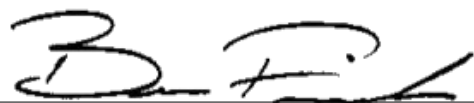
ATD Serial No: 032

Test I.D: D162863

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	8.3	Pass
Overall Test Results				Pass


Laboratory Technician

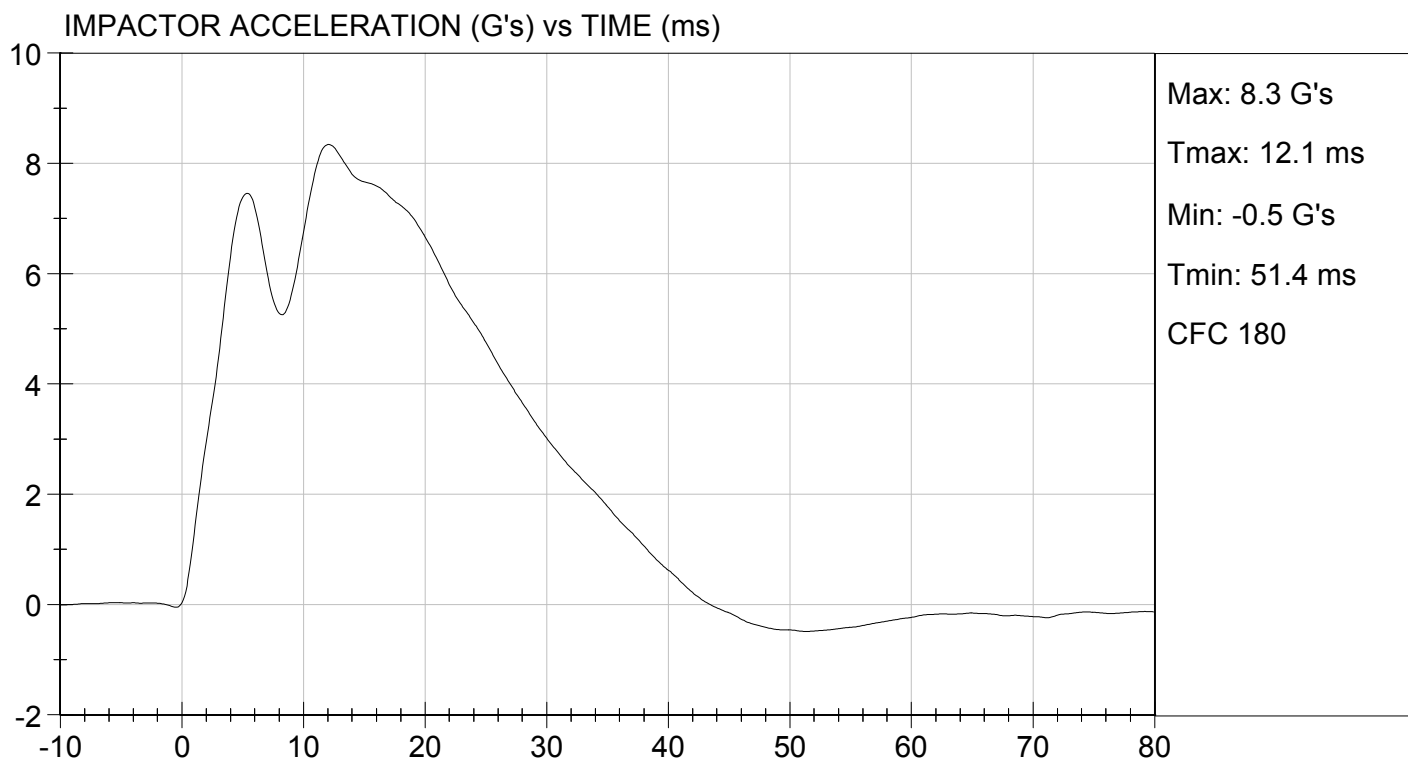
08/26/2016
Test Date


Approved By



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

TEST DATE: 08/26/2016
TEST #: D162863



MGA RESEARCH CORPORATION

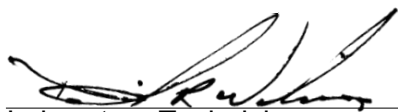
UPPER RIB TEST

ES-2re DUMMY

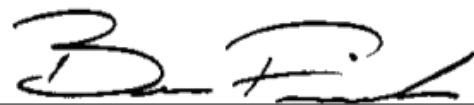
ATD Serial No: 032

Test I.D: D162864

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.9	Pass
			Overall Test Results	Pass

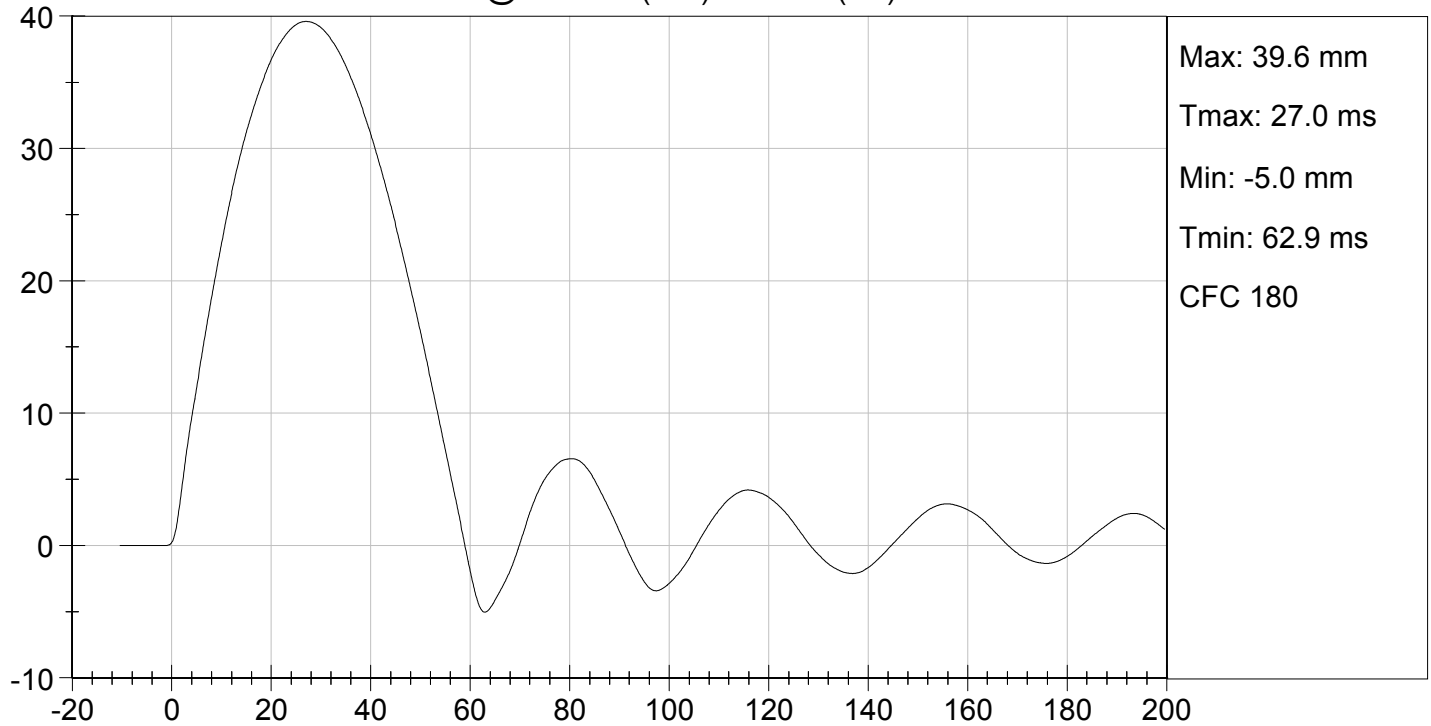

Laboratory Technician

08/25/2016
Test Date

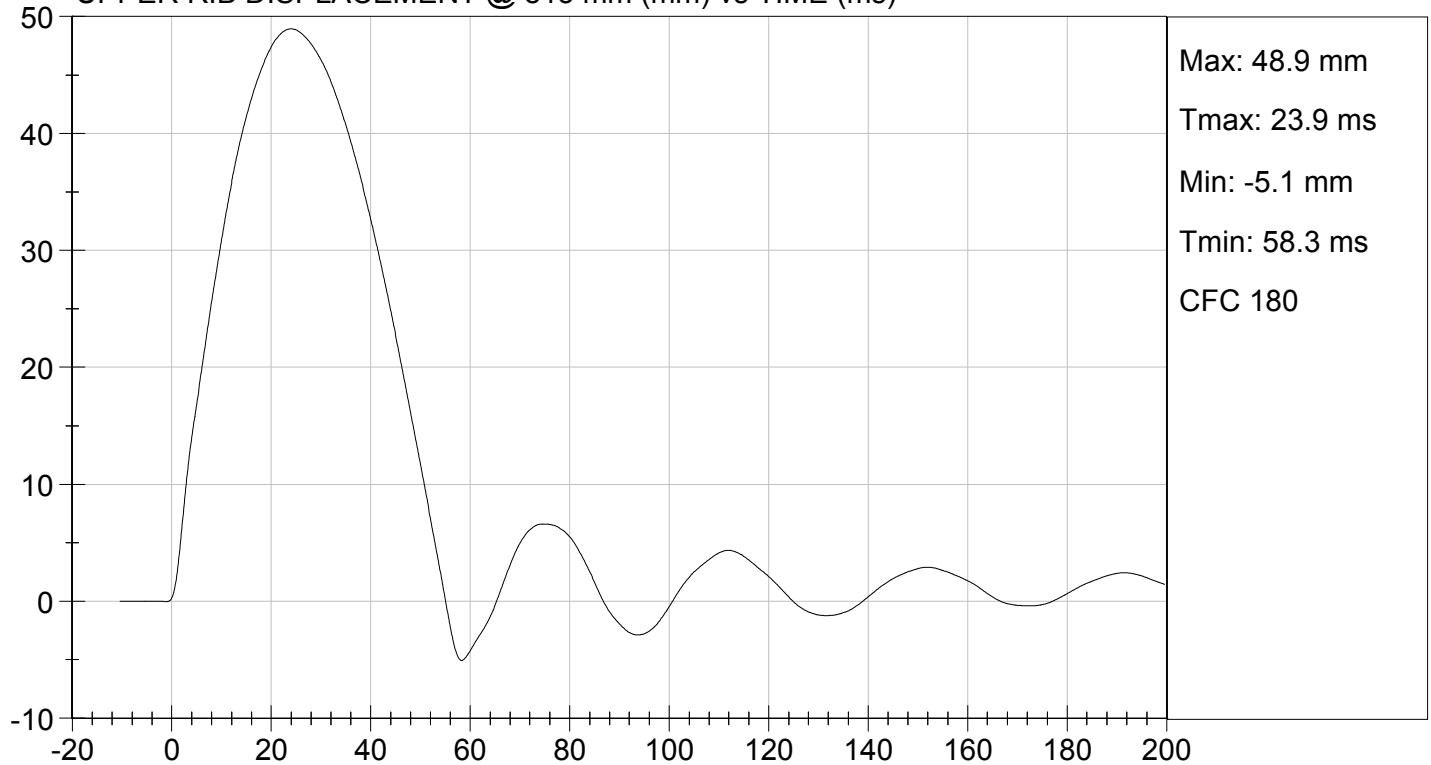

Approved By



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



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



MGA RESEARCH CORPORATION

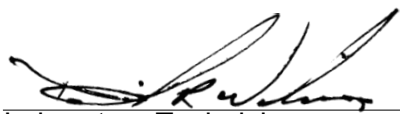
MID RIB TEST

ES-2re DUMMY

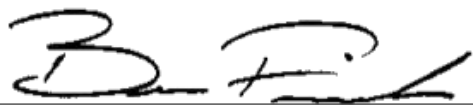
ATD Serial No: 032

Test I.D: D162865

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.4	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.6	Pass
Overall Test Results				Pass

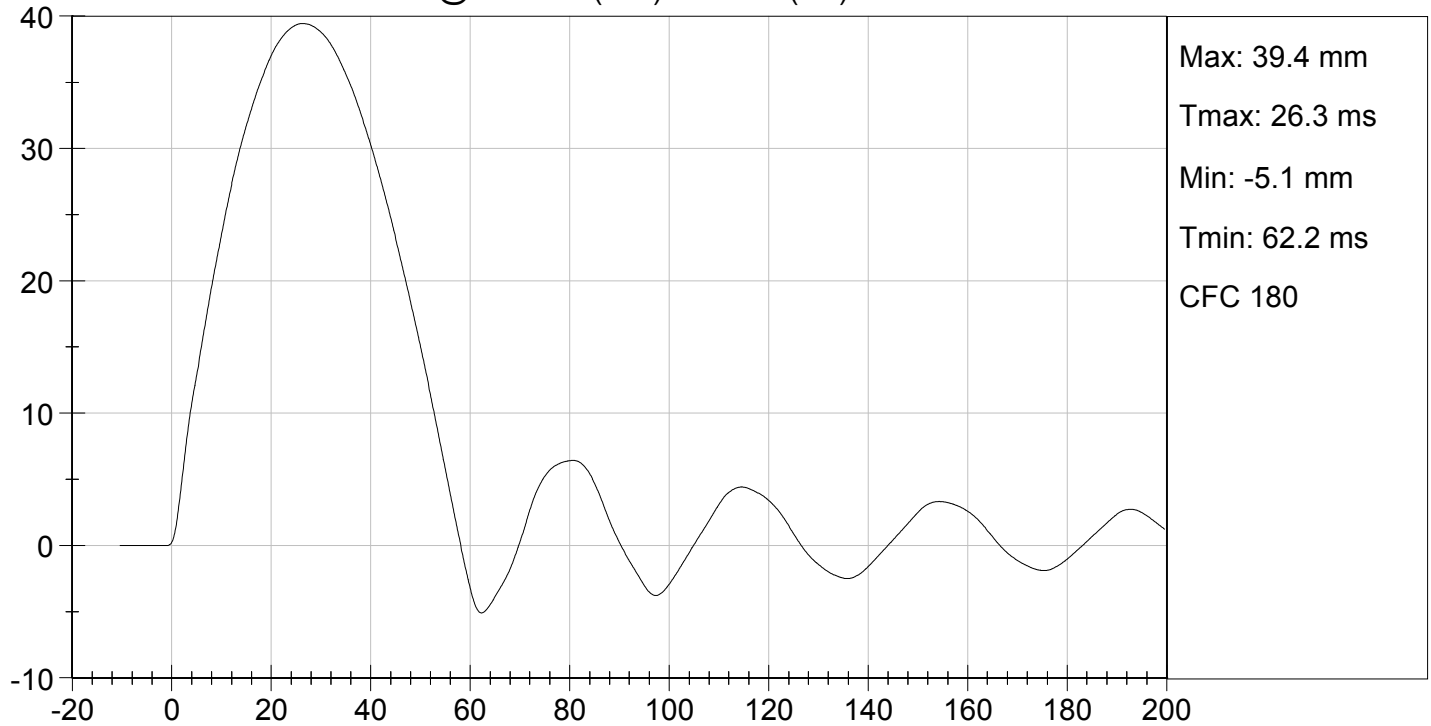

Laboratory Technician

08/25/2016
Test Date

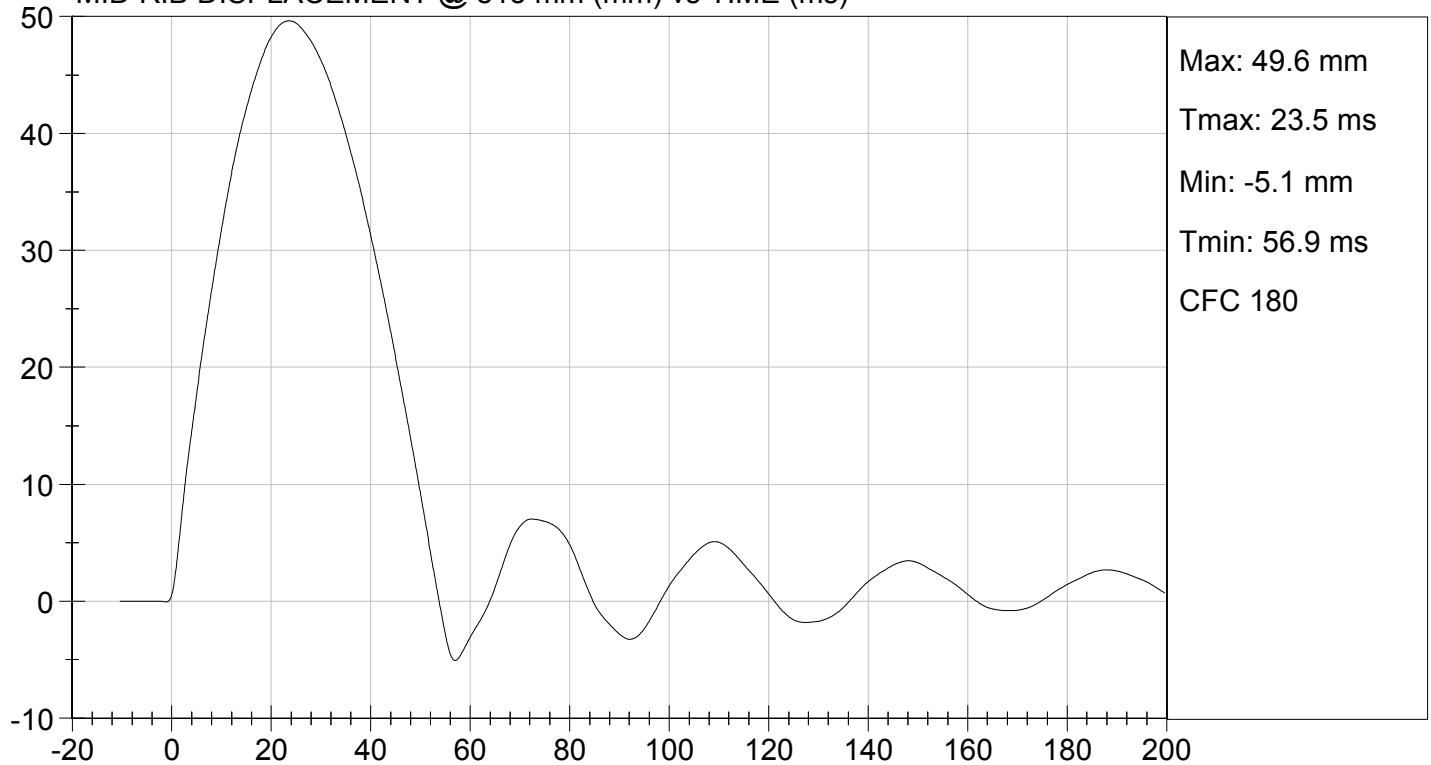

Approved By



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



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



MGA RESEARCH CORPORATION

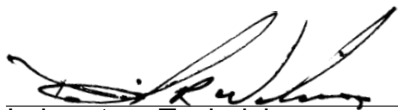
LOWER RIB TEST

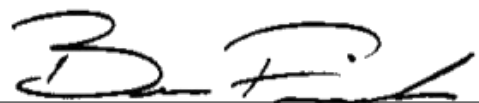
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D162866

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.8	Pass
Displacement at 815 mm	mm	46.0 to 51.0	50.0	Pass
Overall Test Results				Pass


Laboratory Technician

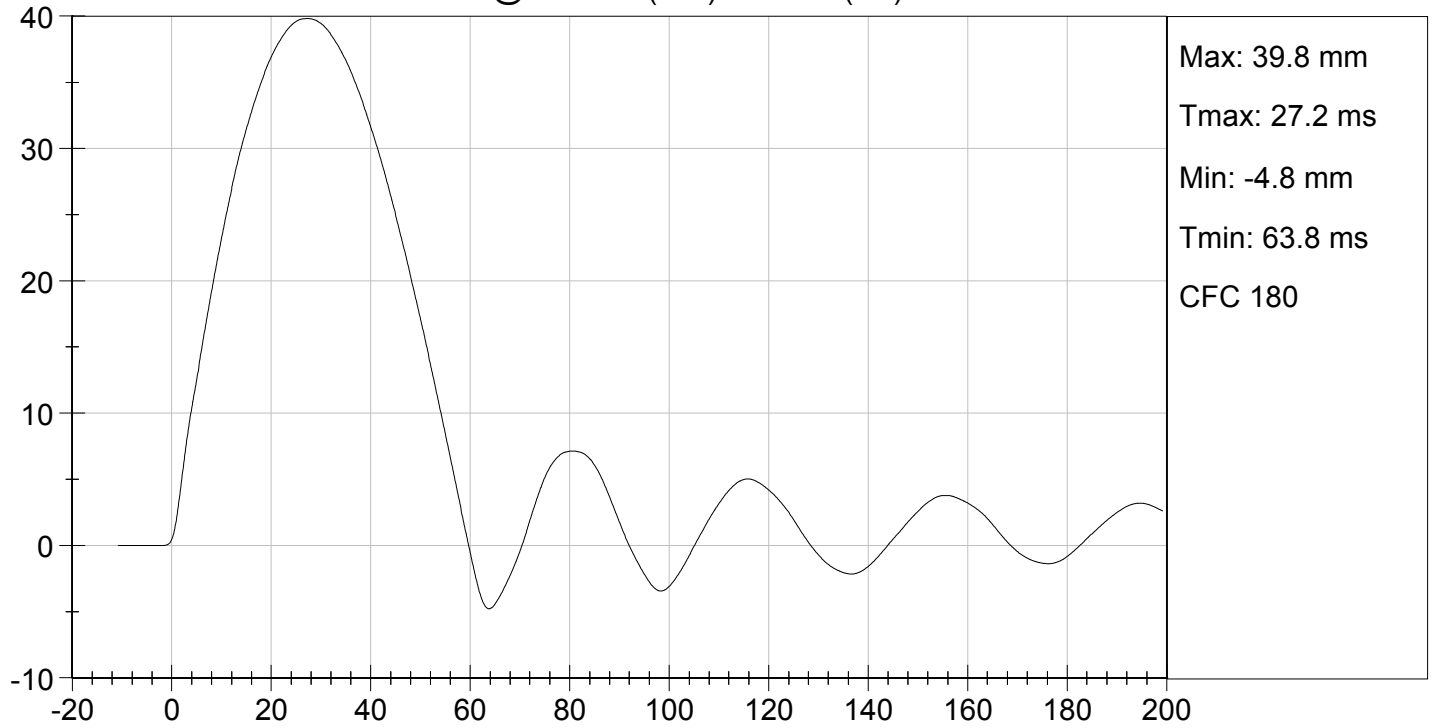

Approved By

08/25/2016

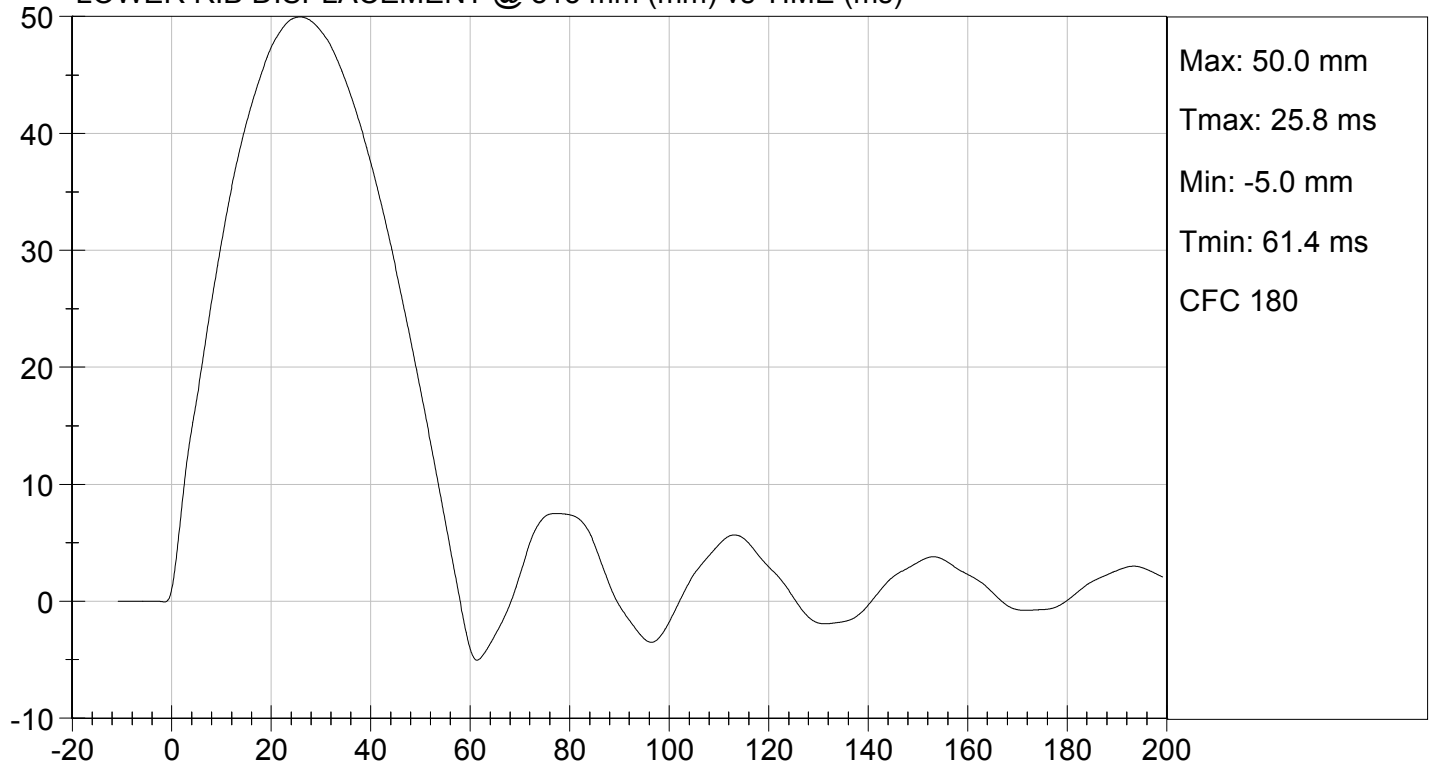
Test Date



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



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



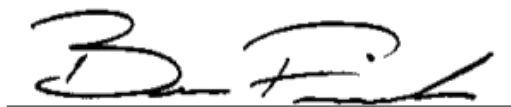
MGA RESEARCH CORPORATION**THORAX IMPACT TEST****ES-2re DUMMY****ATD Serial No:** 032**Test I.D:** D162860

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	6042	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.7	Pass
Middle Rib Displacement	mm	37.0 to 45.0	41.2	Pass
Lower Rib Displacement	mm	37.0 to 44.0	40.7	Pass
Overall Test Results				Pass


Laboratory Technician

08/26/2016

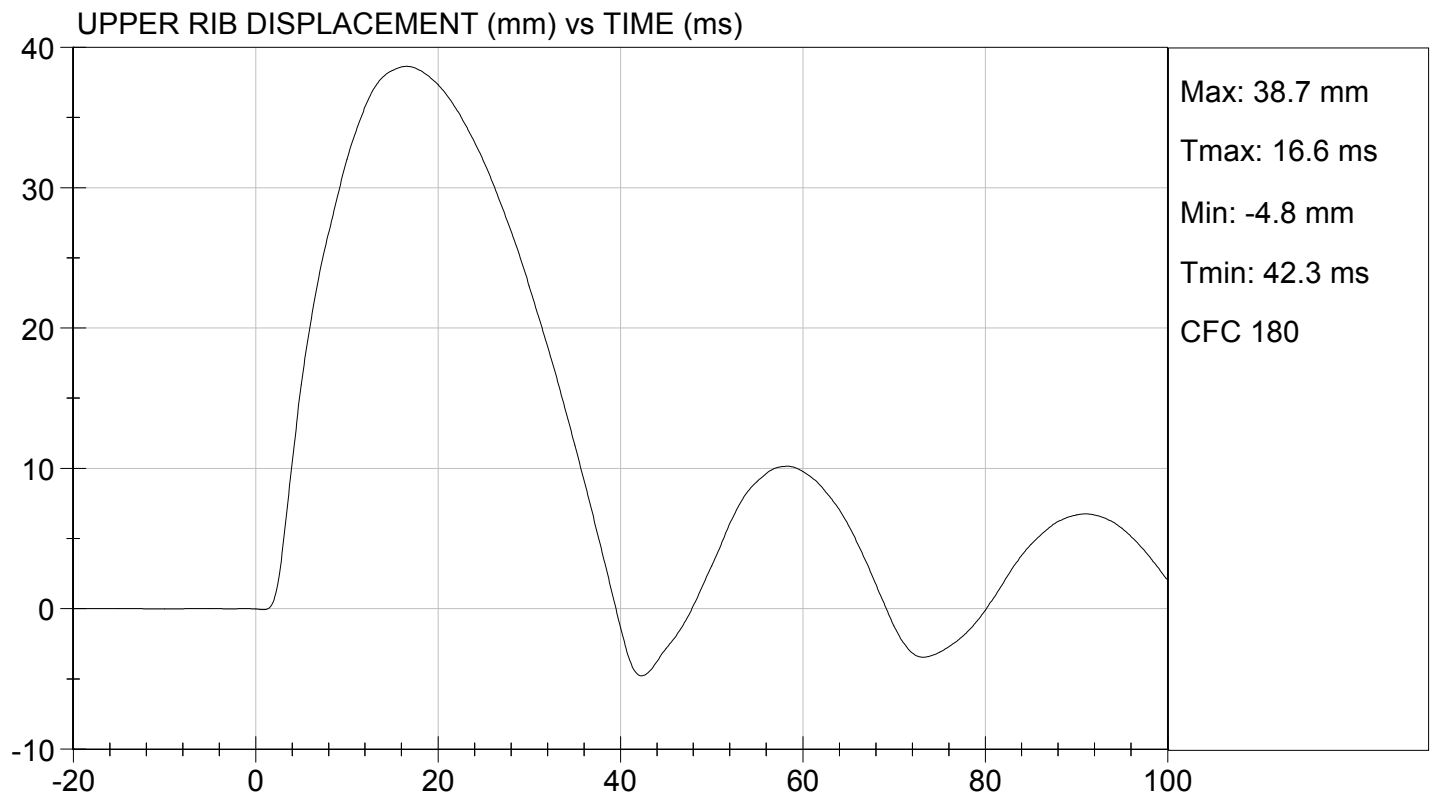
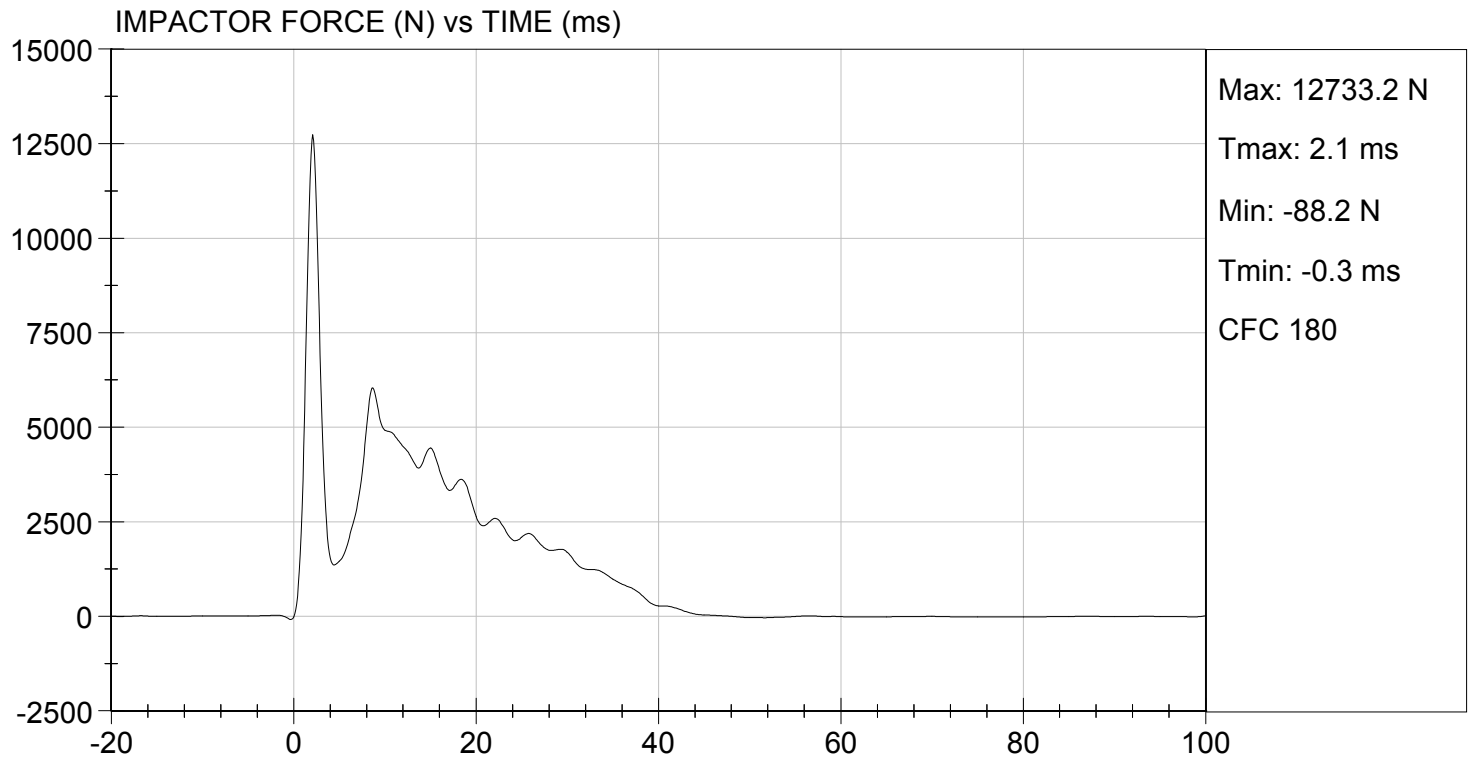
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 08/26/2016
TEST #: D162860

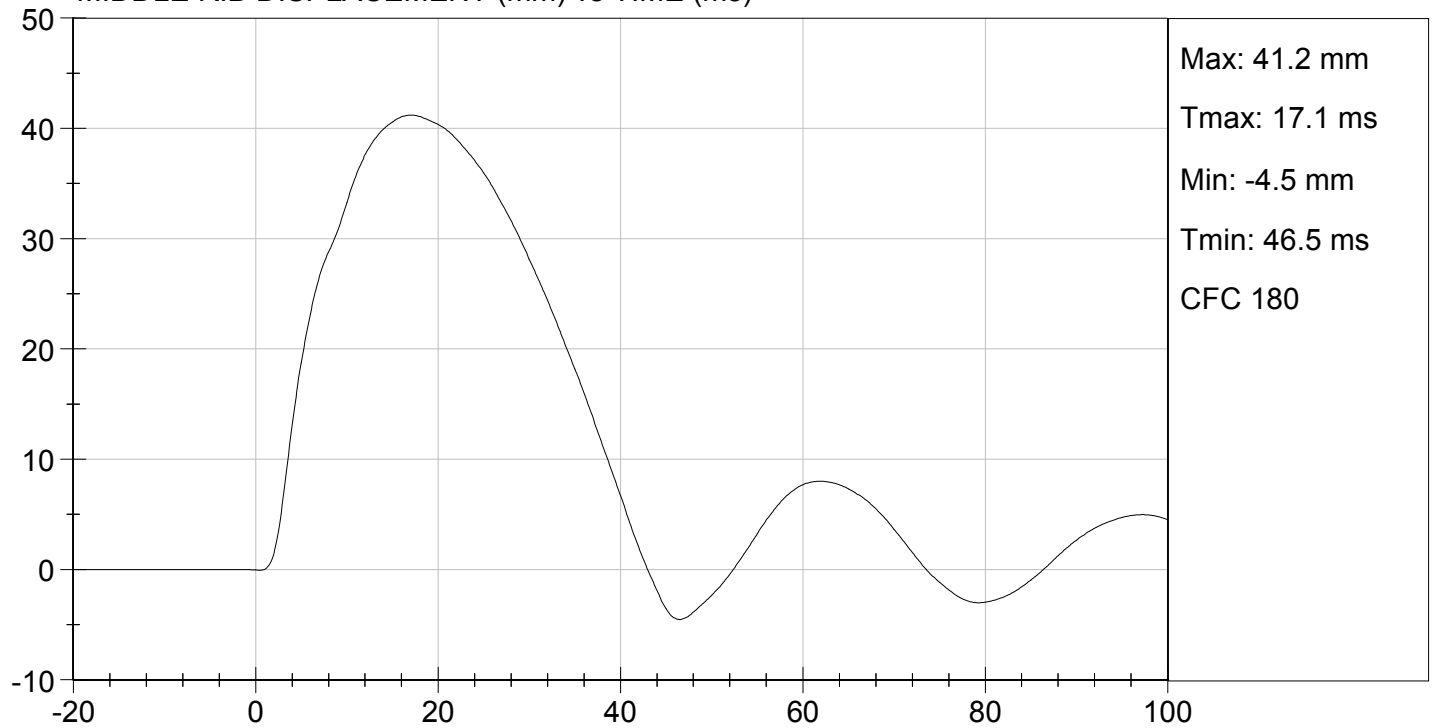




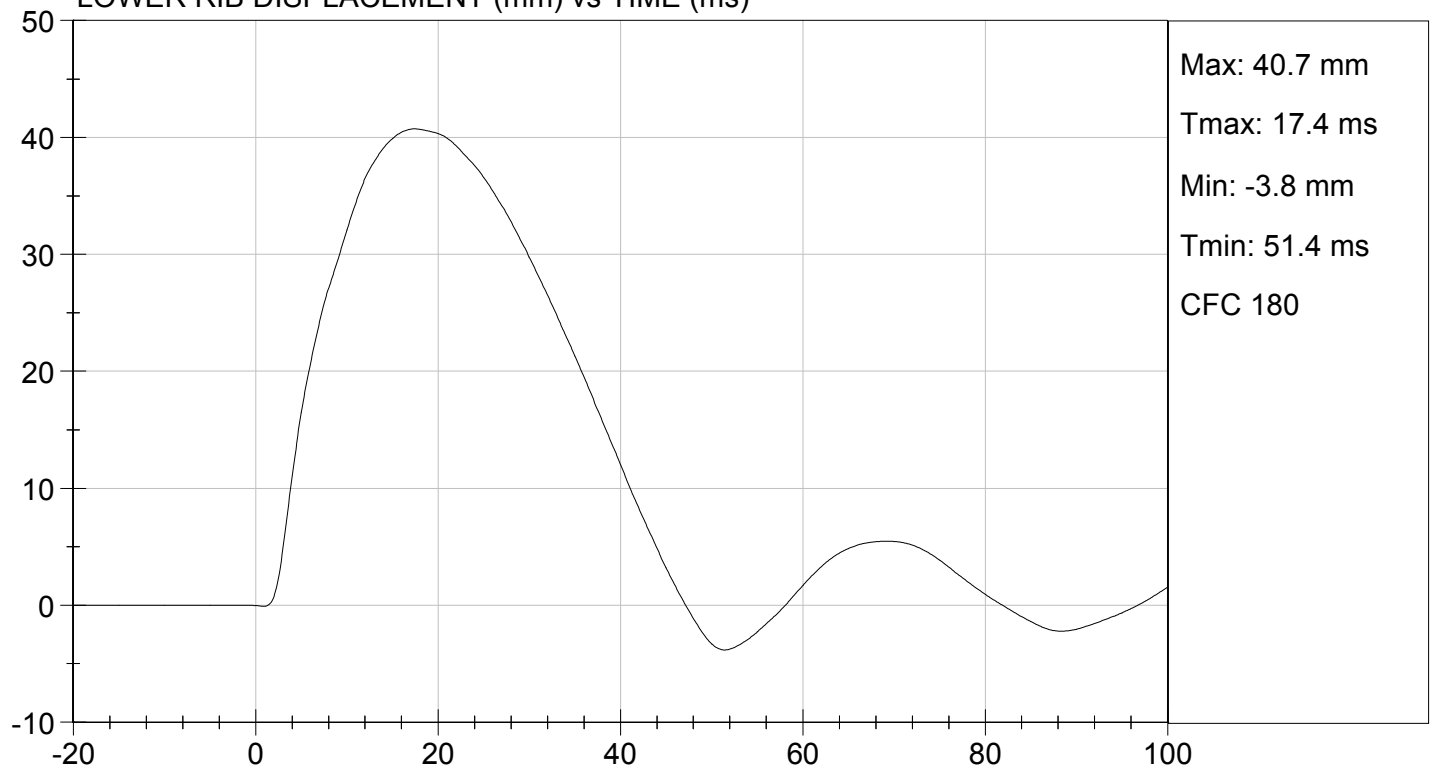
TEST DESC: THORAX IMPACT
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 08/26/2016
TEST #: D162860

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

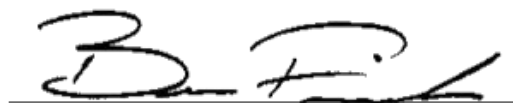
ATD Serial No: 032

Test I.D: D162867

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4426	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	12.1	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2325	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	12.1	Pass
Overall Test Results				Pass


Laboratory Technician

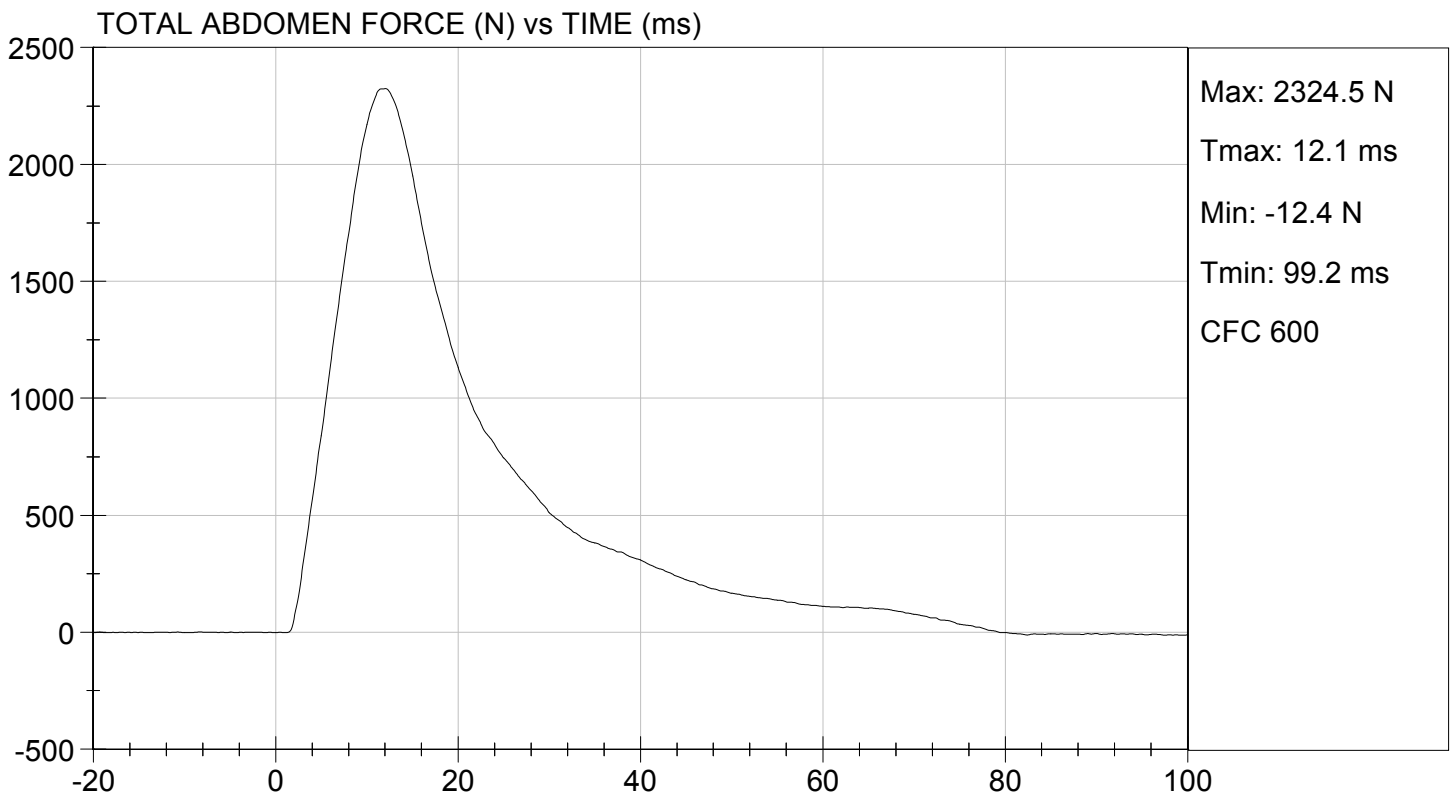
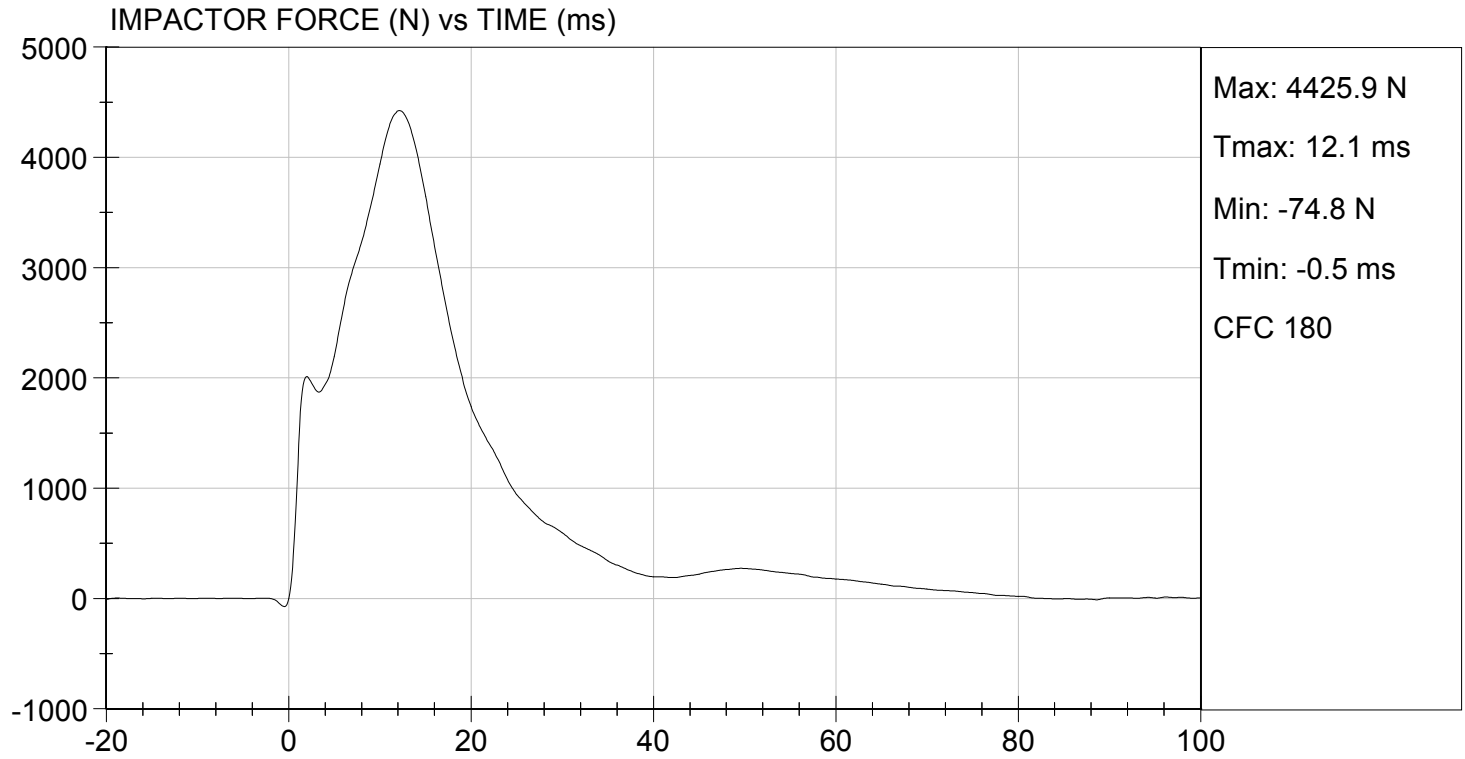
08/26/2016
Test Date

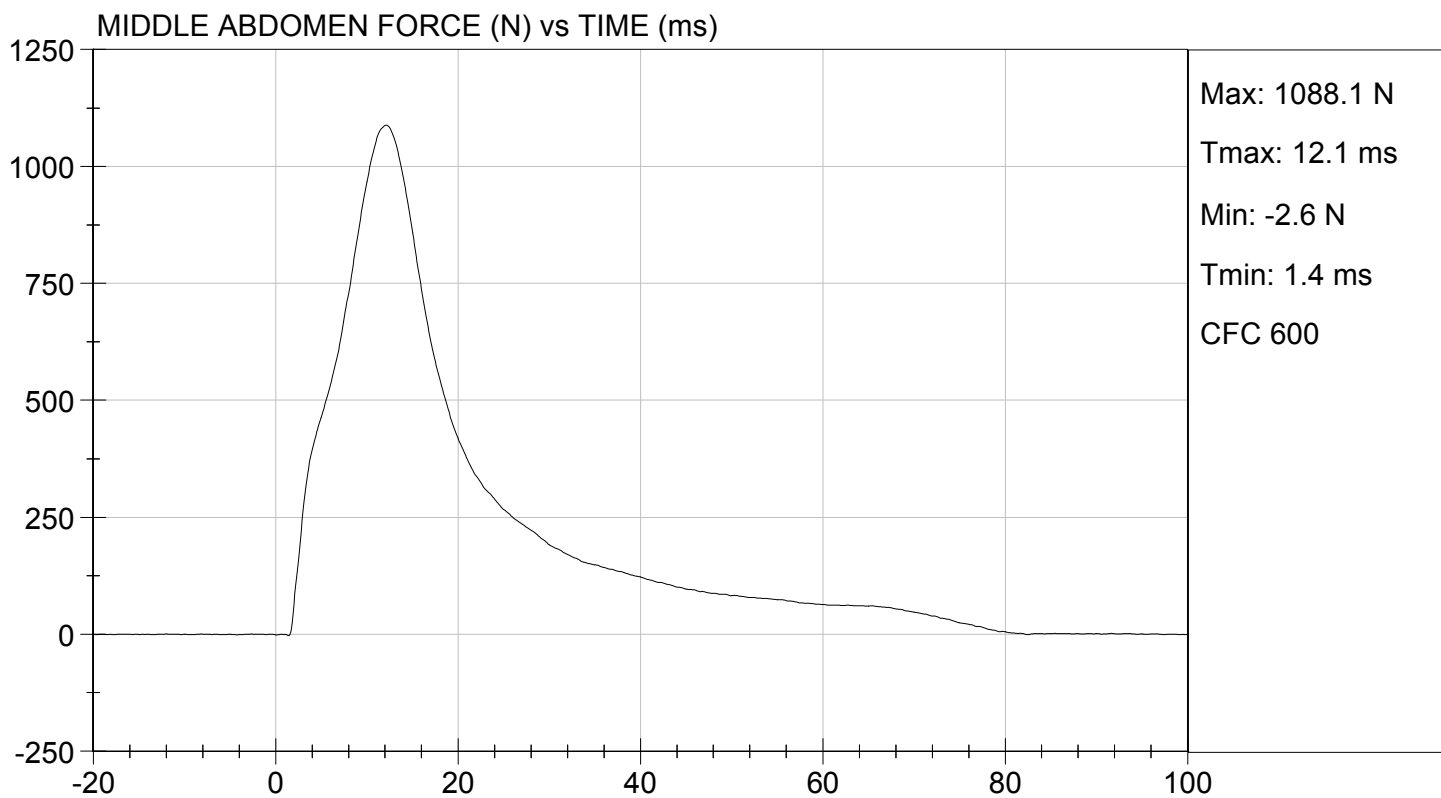
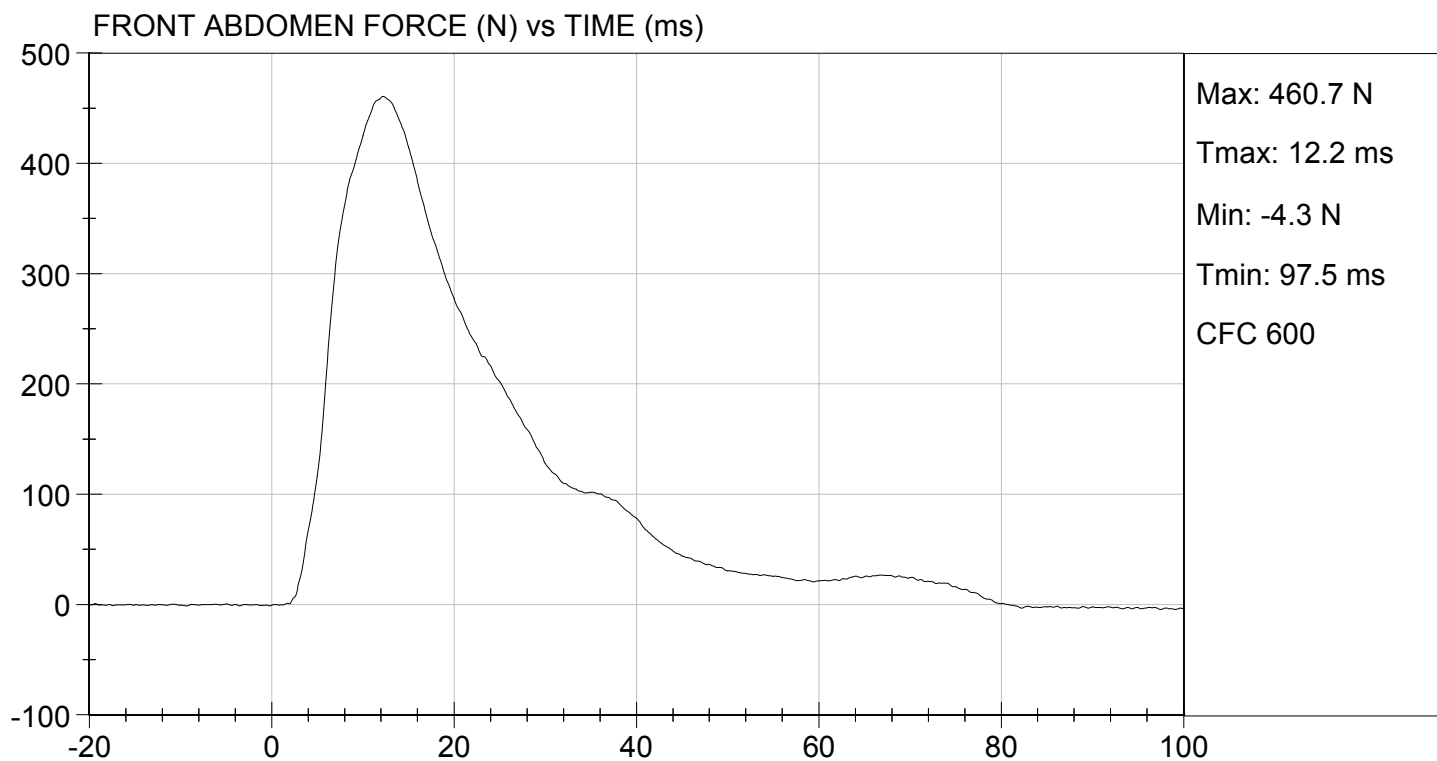

Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

TEST DATE: 08/26/2016
TEST #: D162867

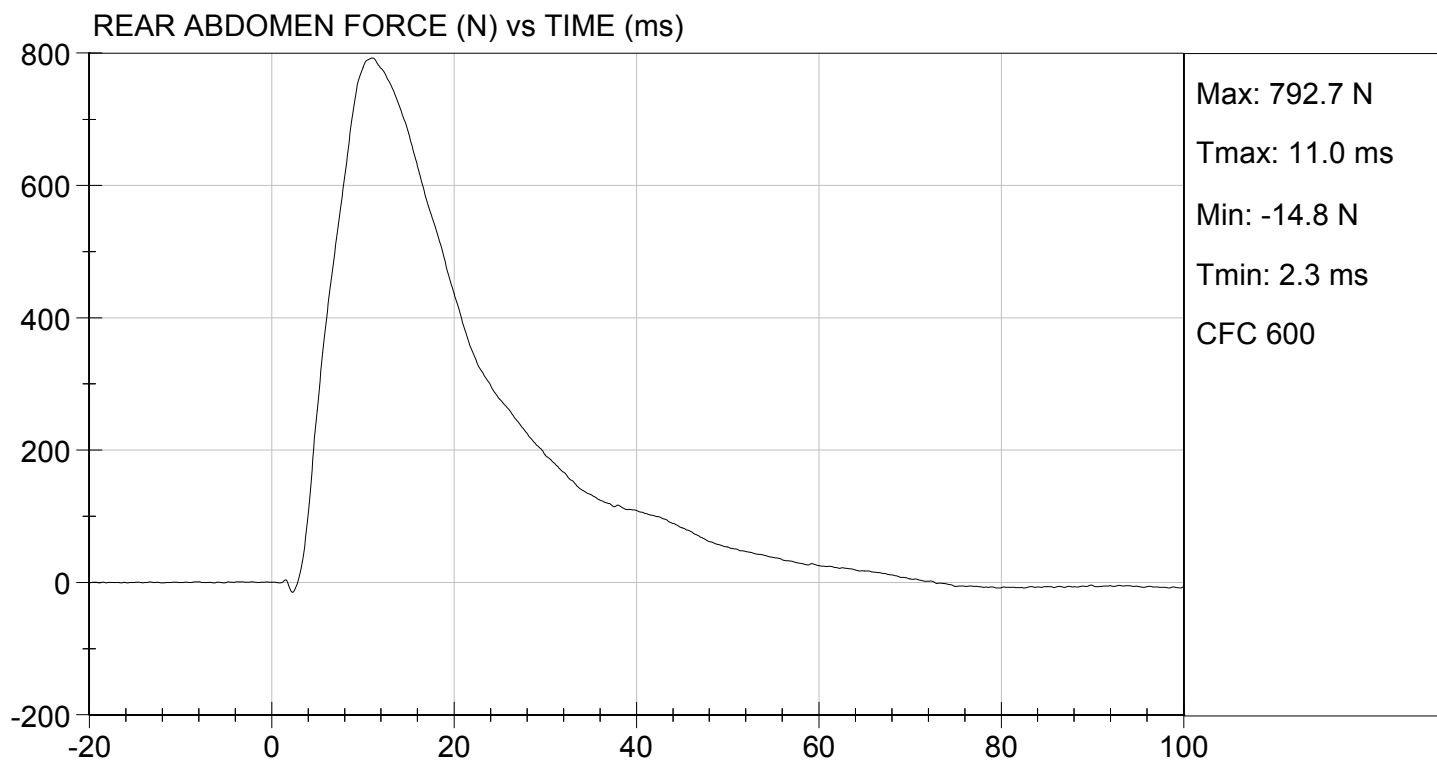






TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

TEST DATE: 08/26/2016
TEST #: D162867

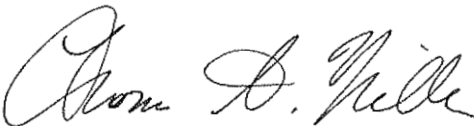


MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

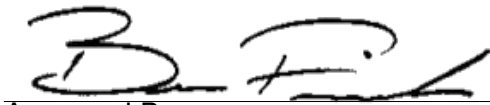
ATD Serial No: 032

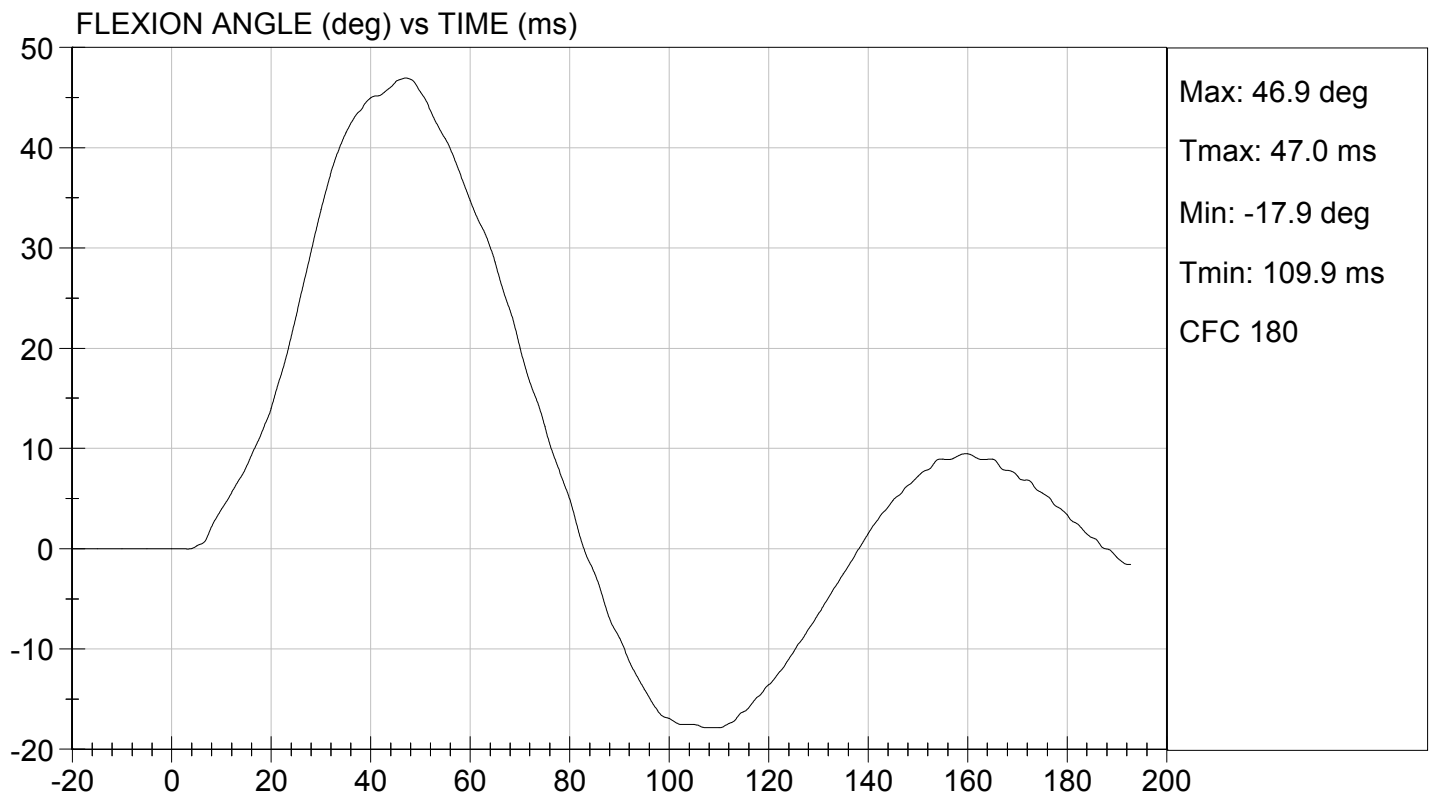
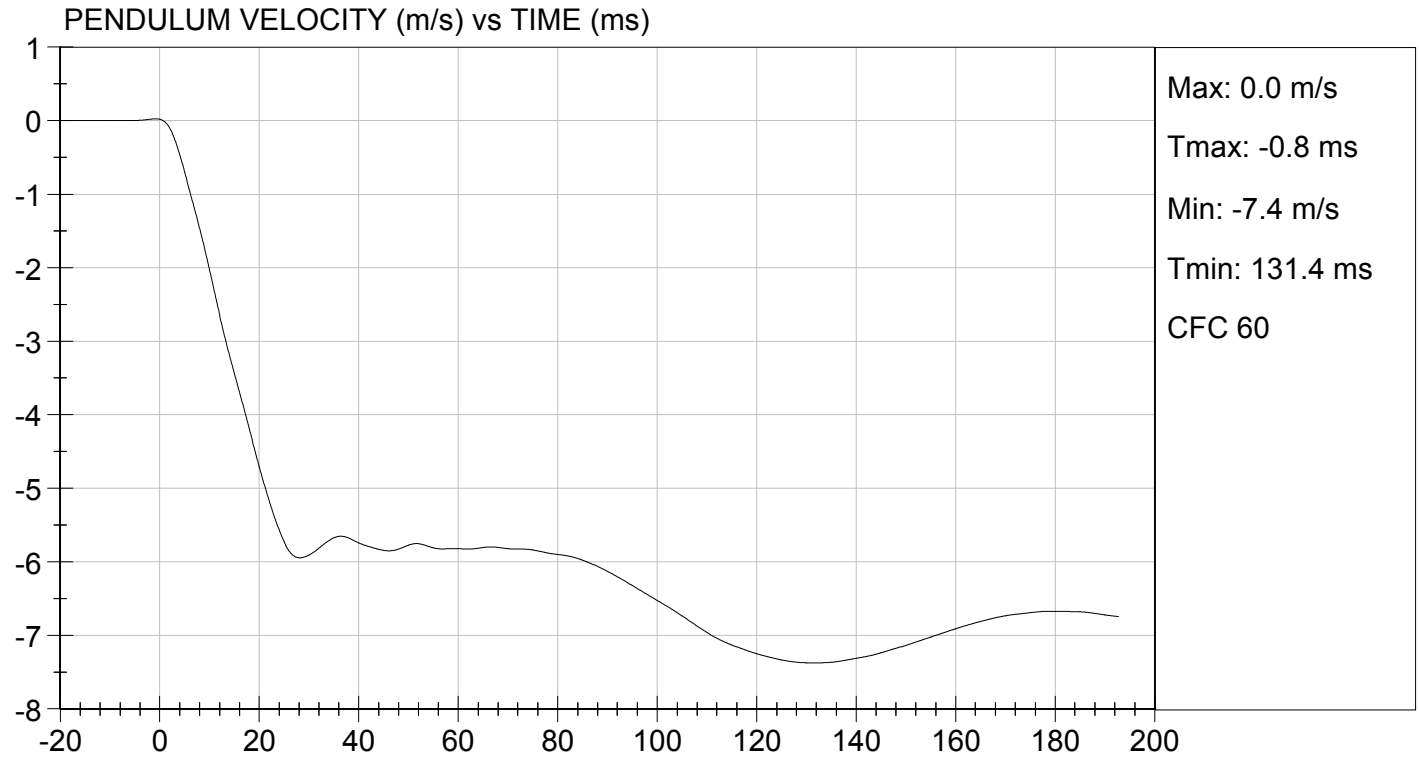
Test I.D: D162868

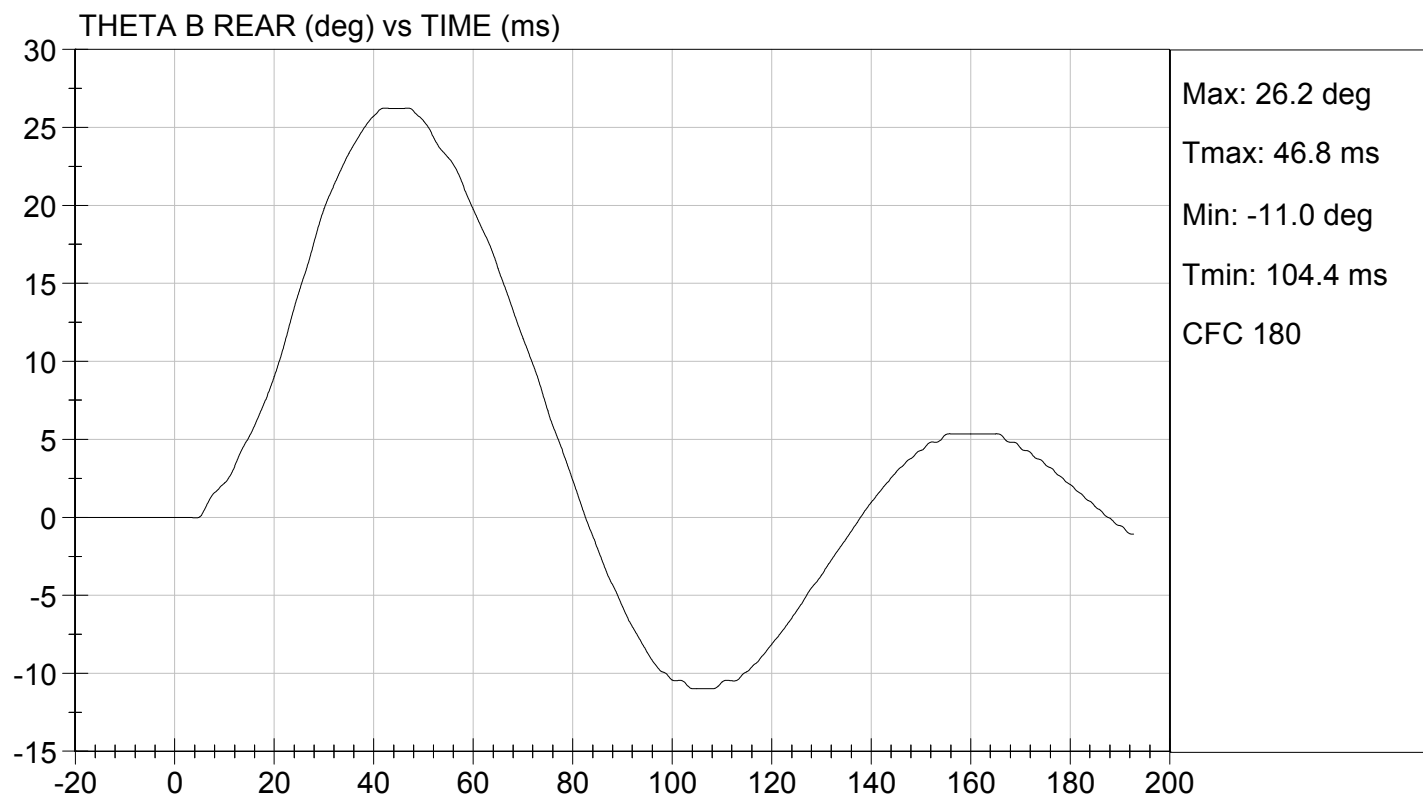
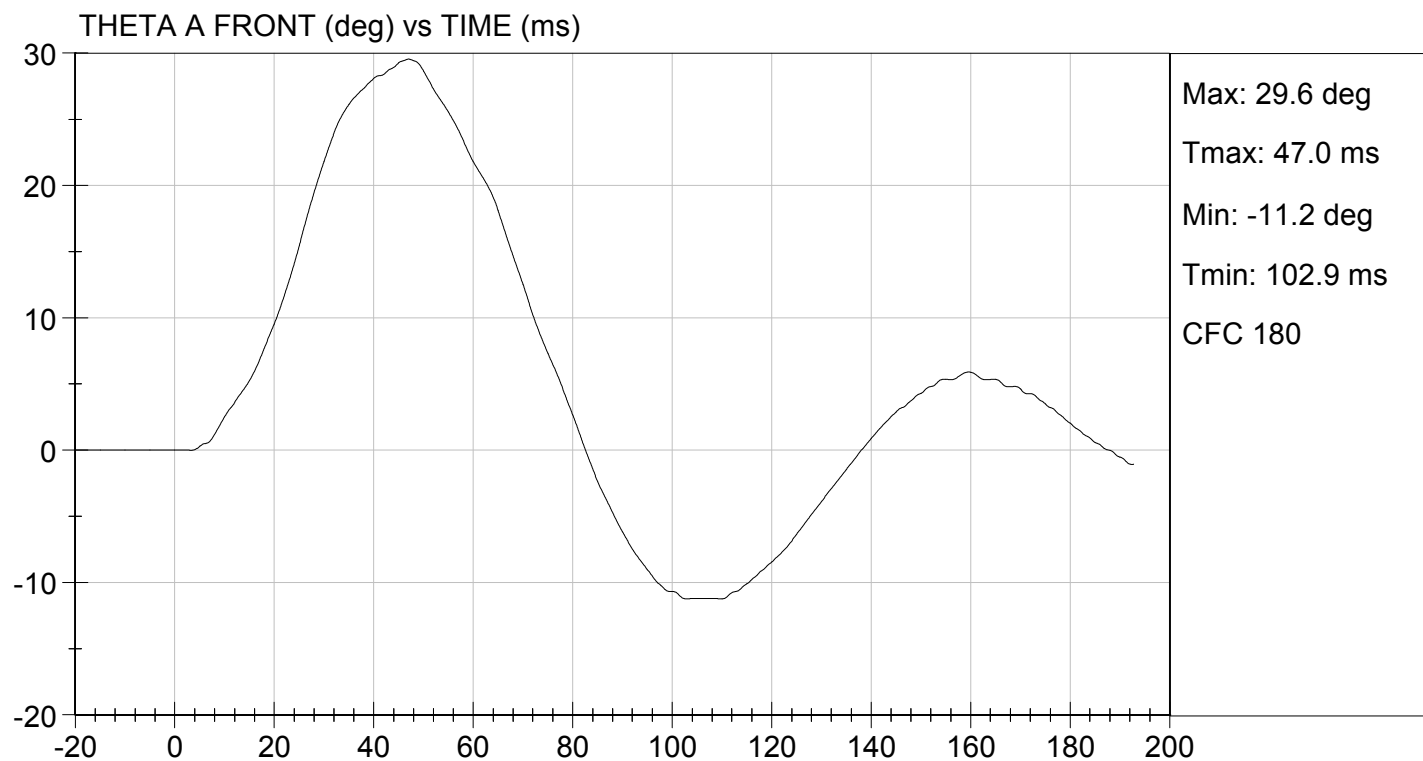
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	46	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.399	Pass
	27 ms	m/s	-6.50 to -5.80	-5.92	Pass
	30 ms	m/s	>= -6.50	-5.91	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	46.9	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	47.0	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	47	Pass
Overall Results					Pass


 Laboratory Technician

08/25/2016
 Test Date


 Approved By

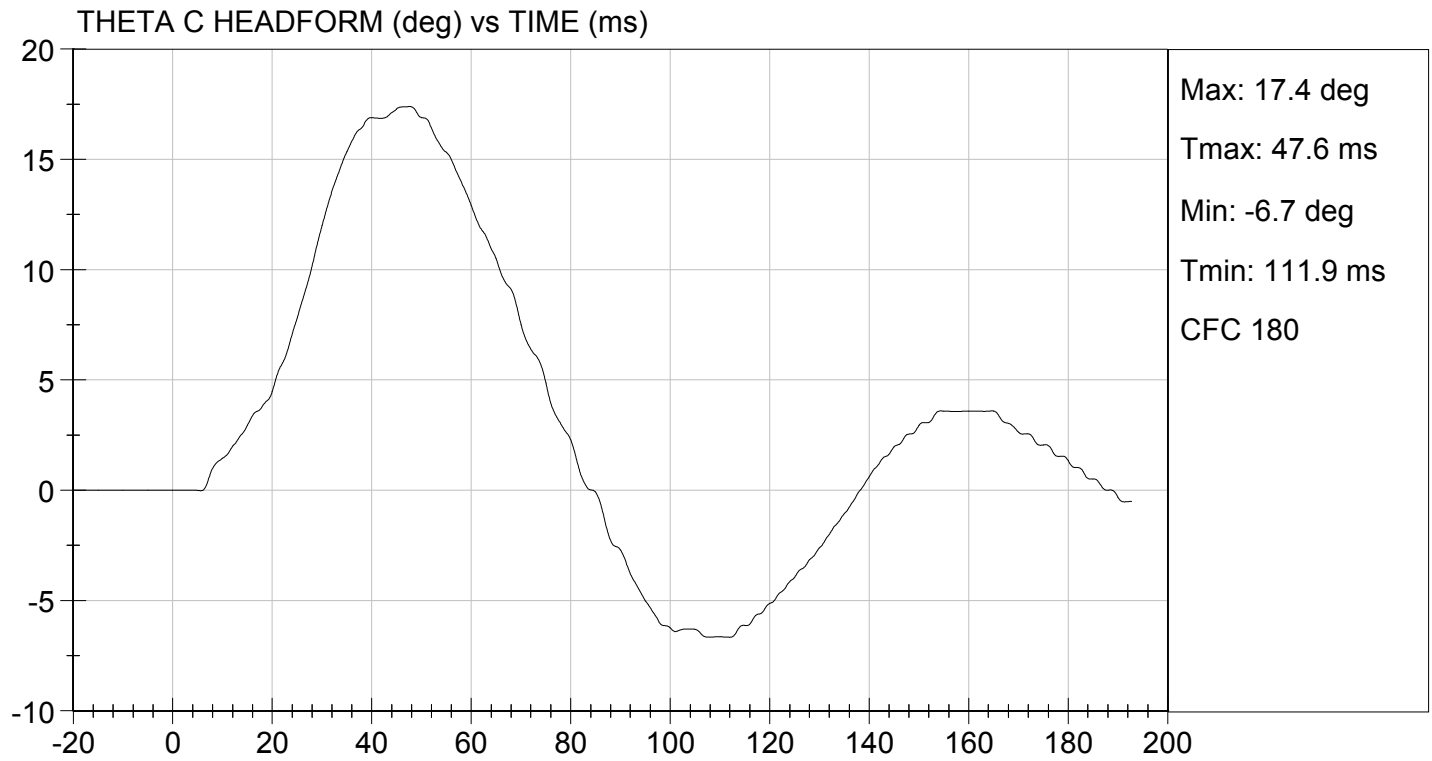






TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 08/25/2016
TEST #: D162868

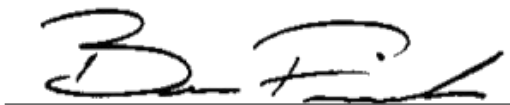


MGA RESEARCH CORPORATION**PELVIS TEST
ES-2re DUMMY****ATD Serial No:** 032**Test I.D:** D162869

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	N	4700 to 5400	4780	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.3	Pass
Maximum Pubic Force	N	1230 to 1590	1273	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	14.6	Pass
Overall Test Results				Pass


Laboratory Technician08/26/2016

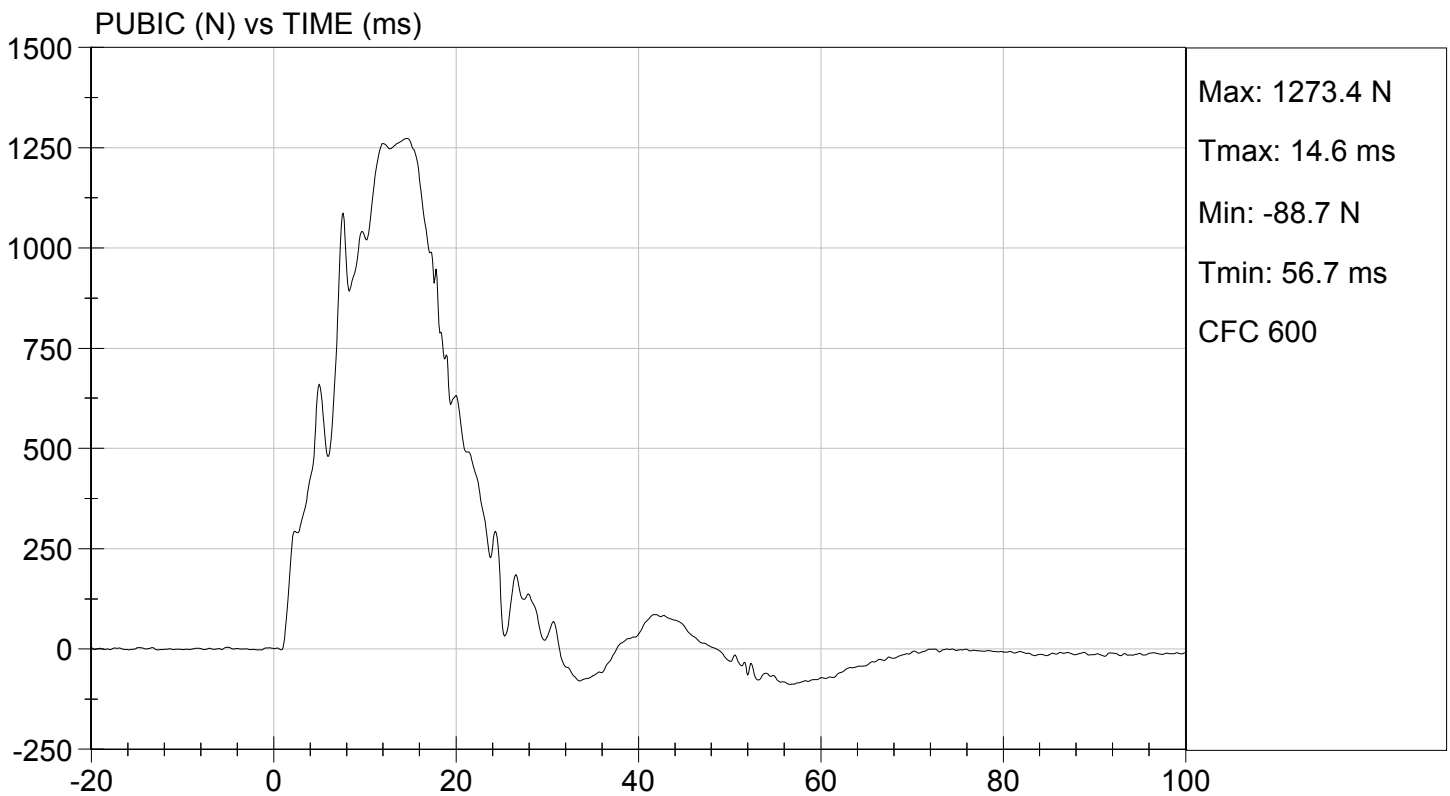
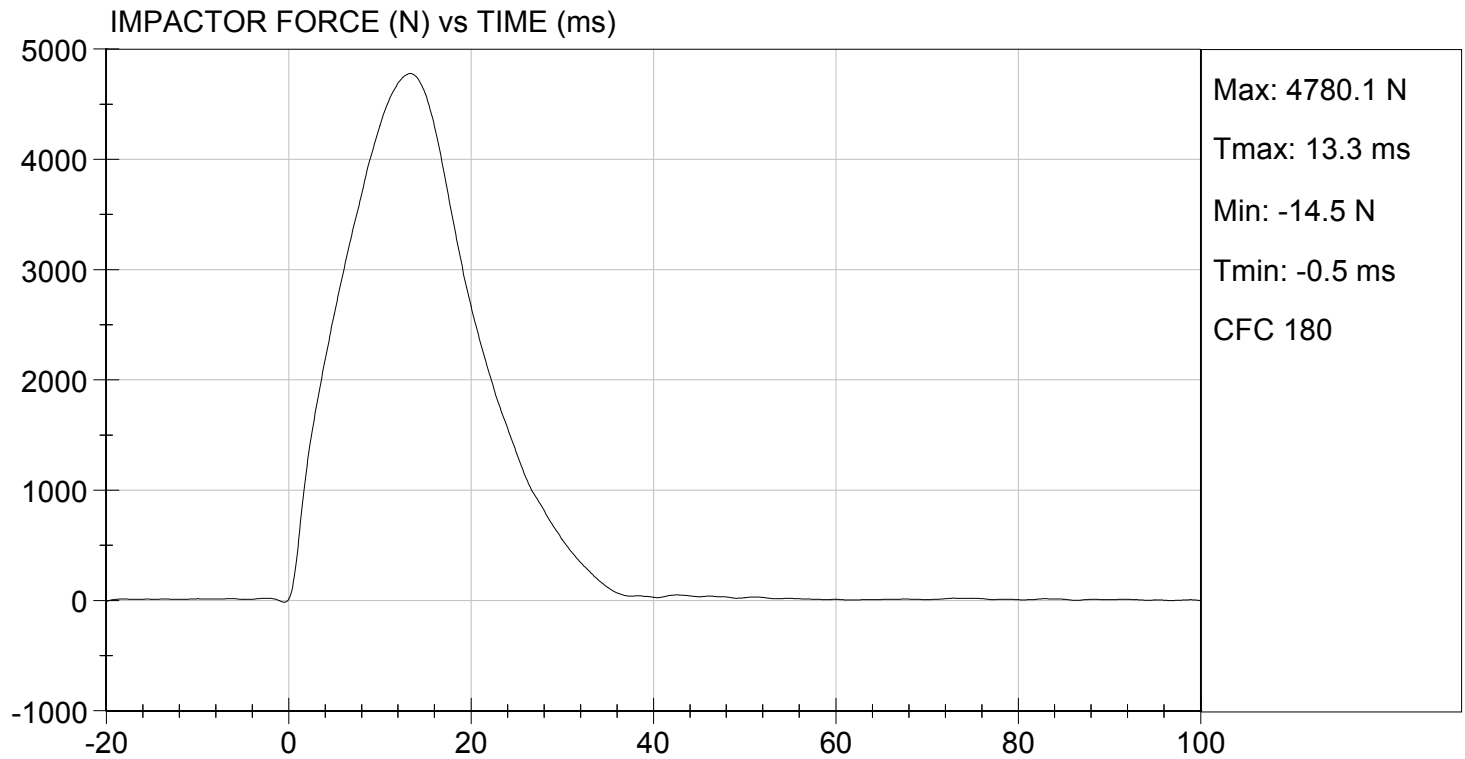
Test Date


Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 14.12 ft/s, 4.3 m/s

TEST DATE: 08/26/2016
TEST #: D162869



SID-IIsD External Measurements
SN: 306

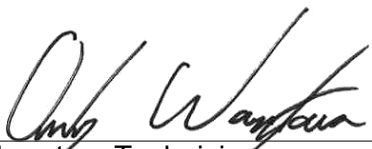
No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	785	Pass
B	Shoulder Pivot Height	437 - 453	449	Pass
C	H-point Height	79 - 89	86	Pass
D	H-point from Seatback	141 - 151	147	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	120	Pass
G	Head Breadth	140 - 148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

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

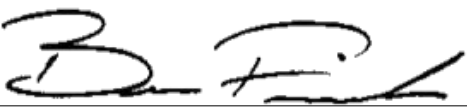
ATD Serial No: 306

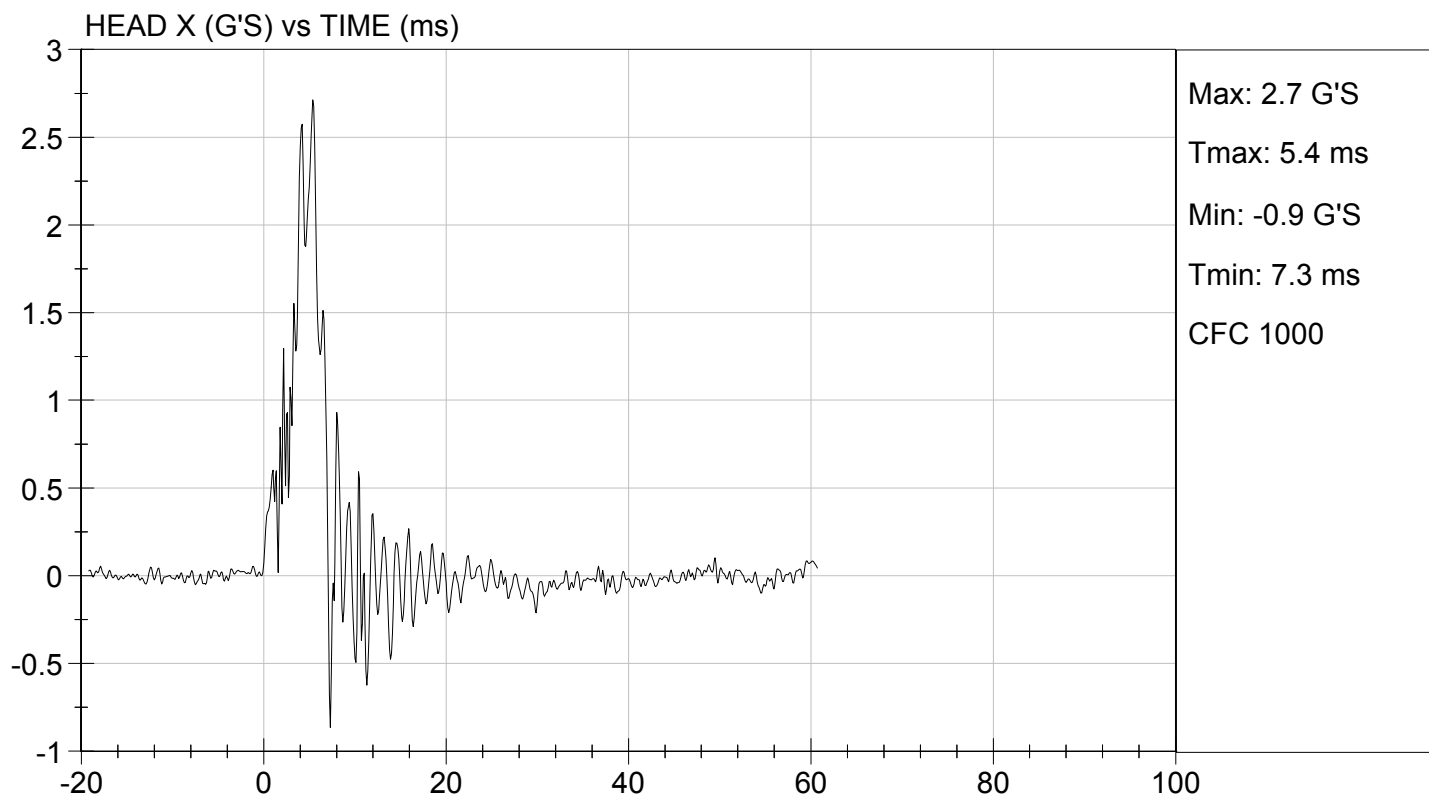
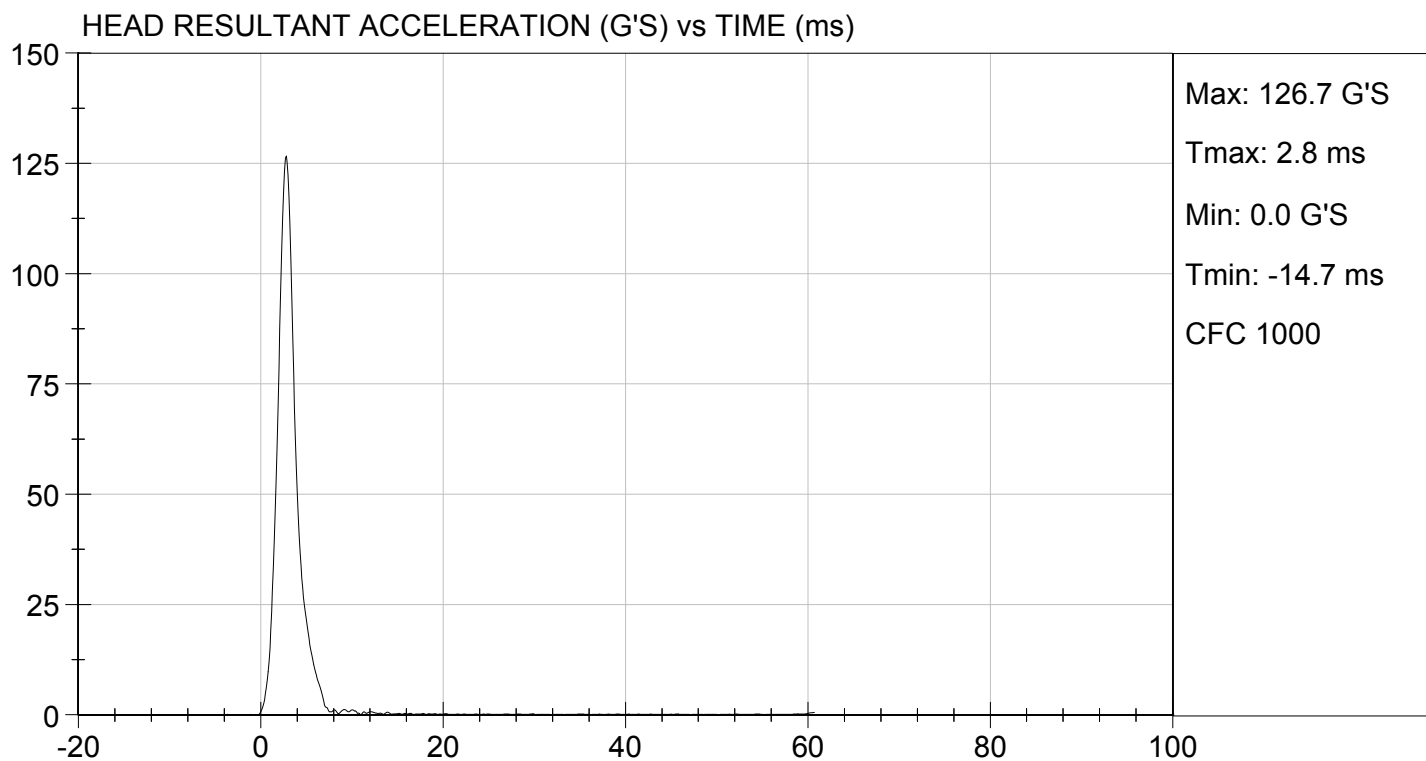
Test ID: D162561

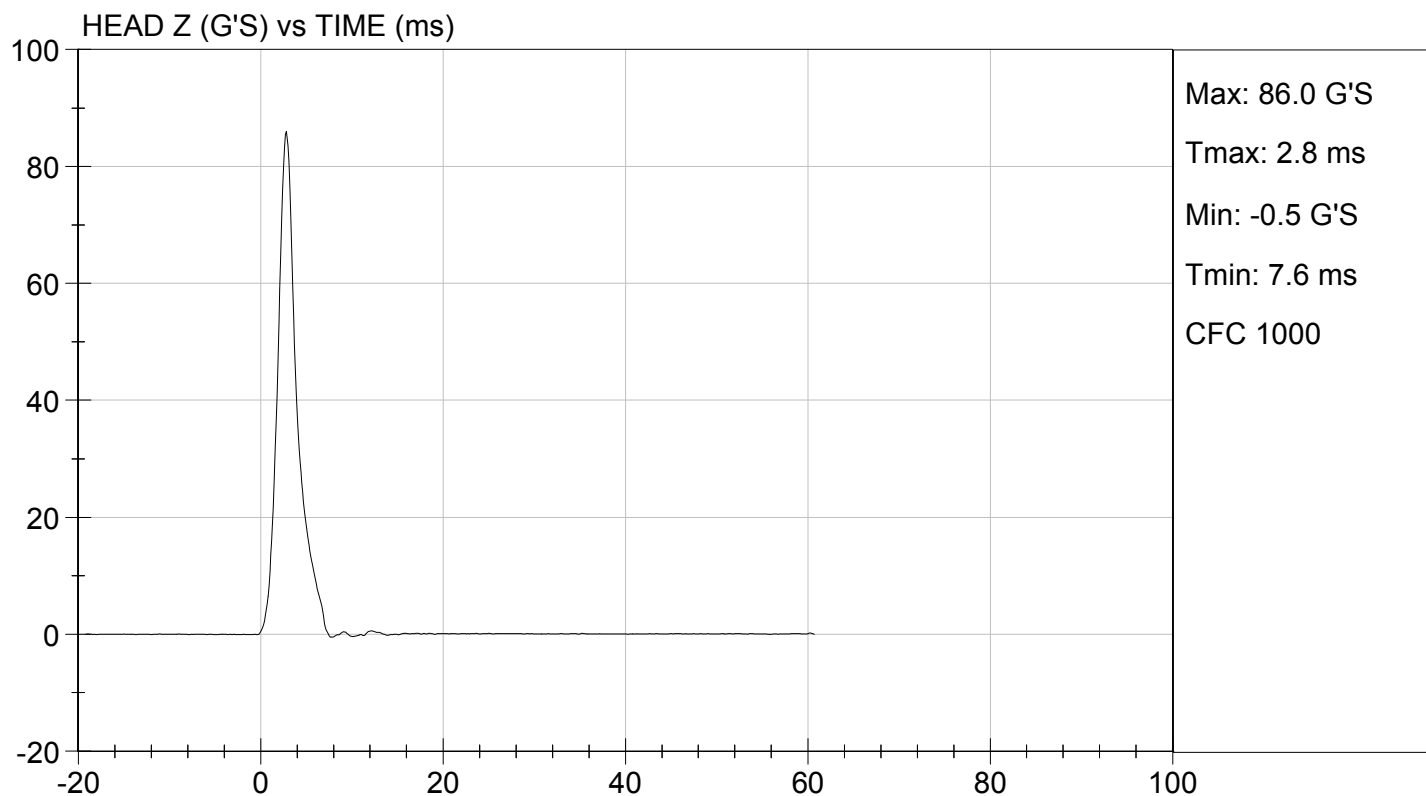
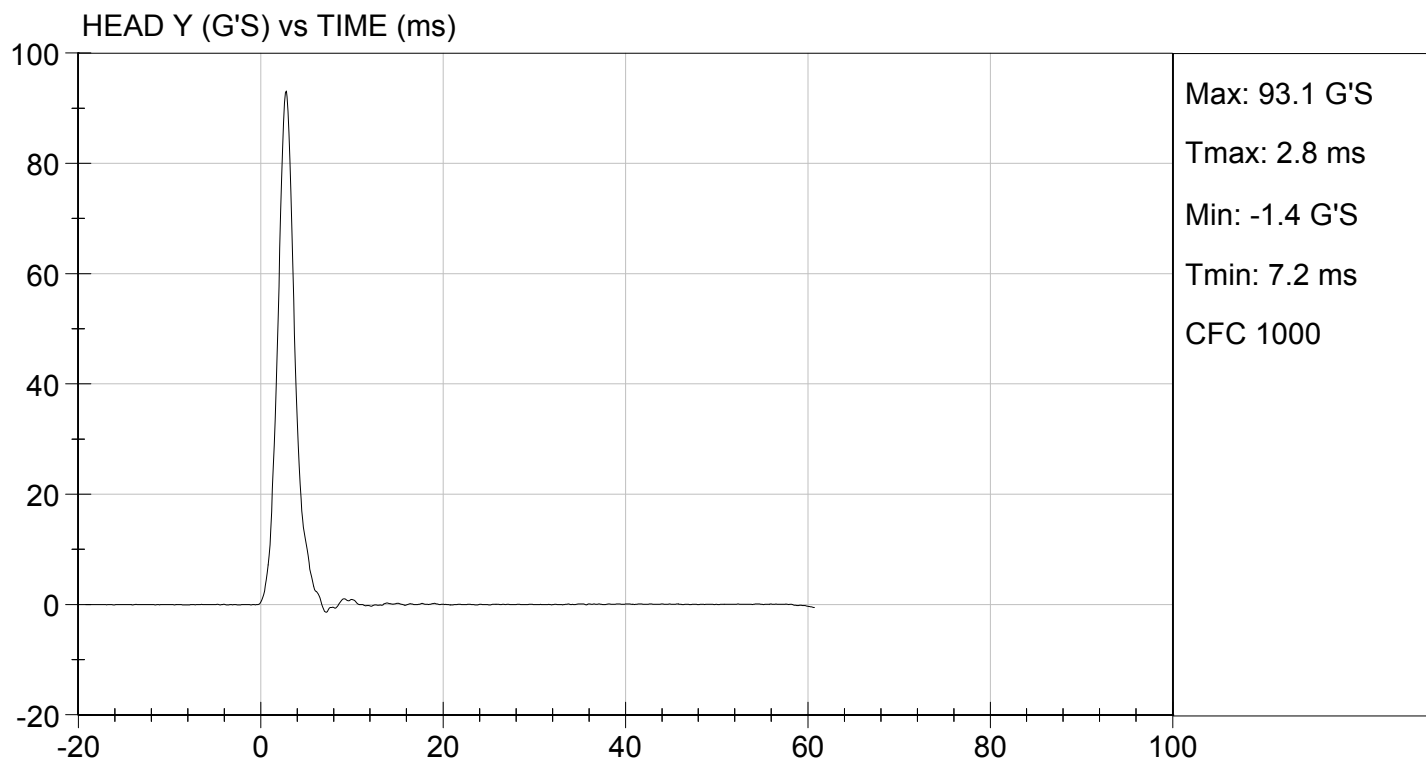
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Peak Resultant Acceleration	G's	115 to 137	127	Pass
Peak Longitudinal Acceleration	G's	+/- 15	2.7	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass


Laboratory Technician

07/28/2016
Test Date


Approved By





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

ATD Serial No: 306

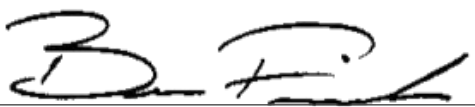
Test I.D: D162562

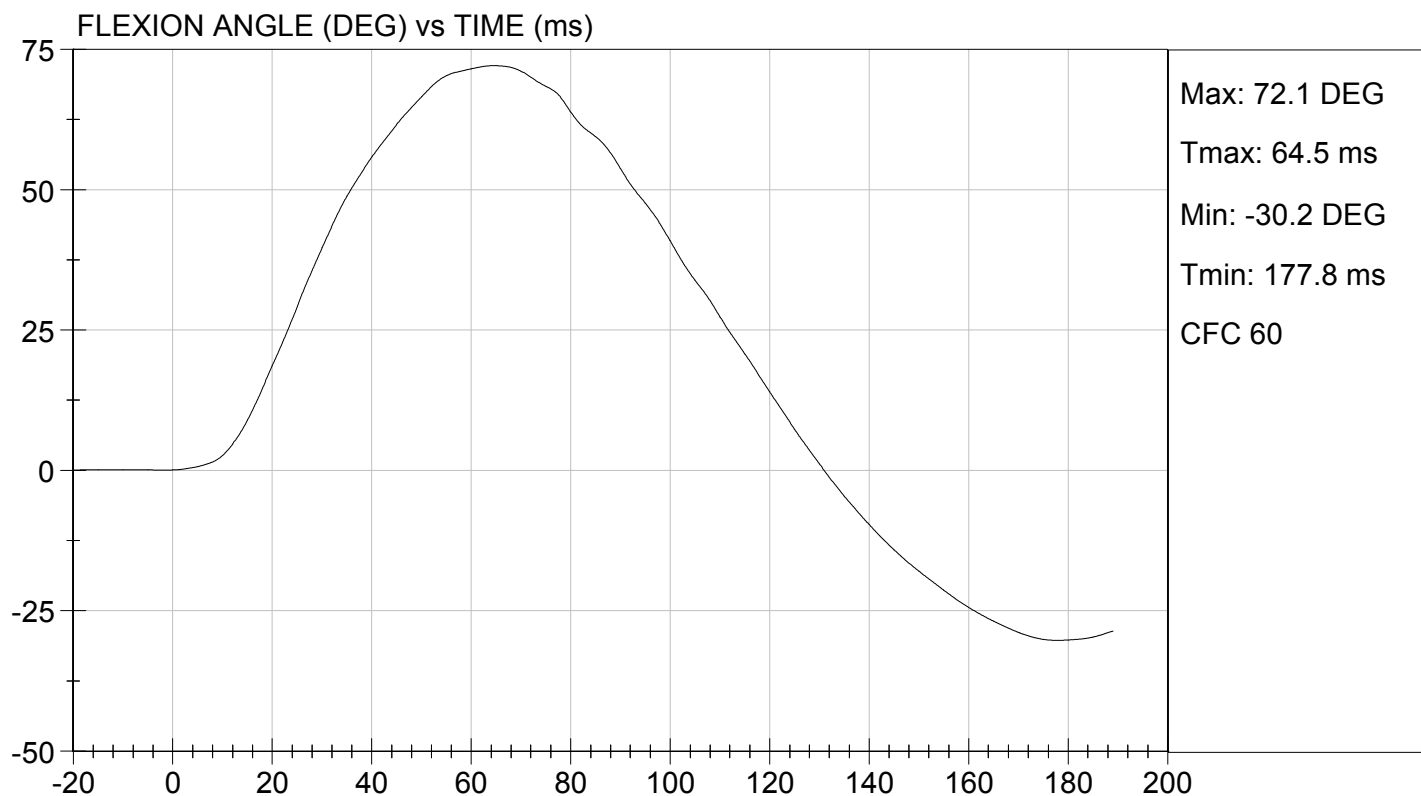
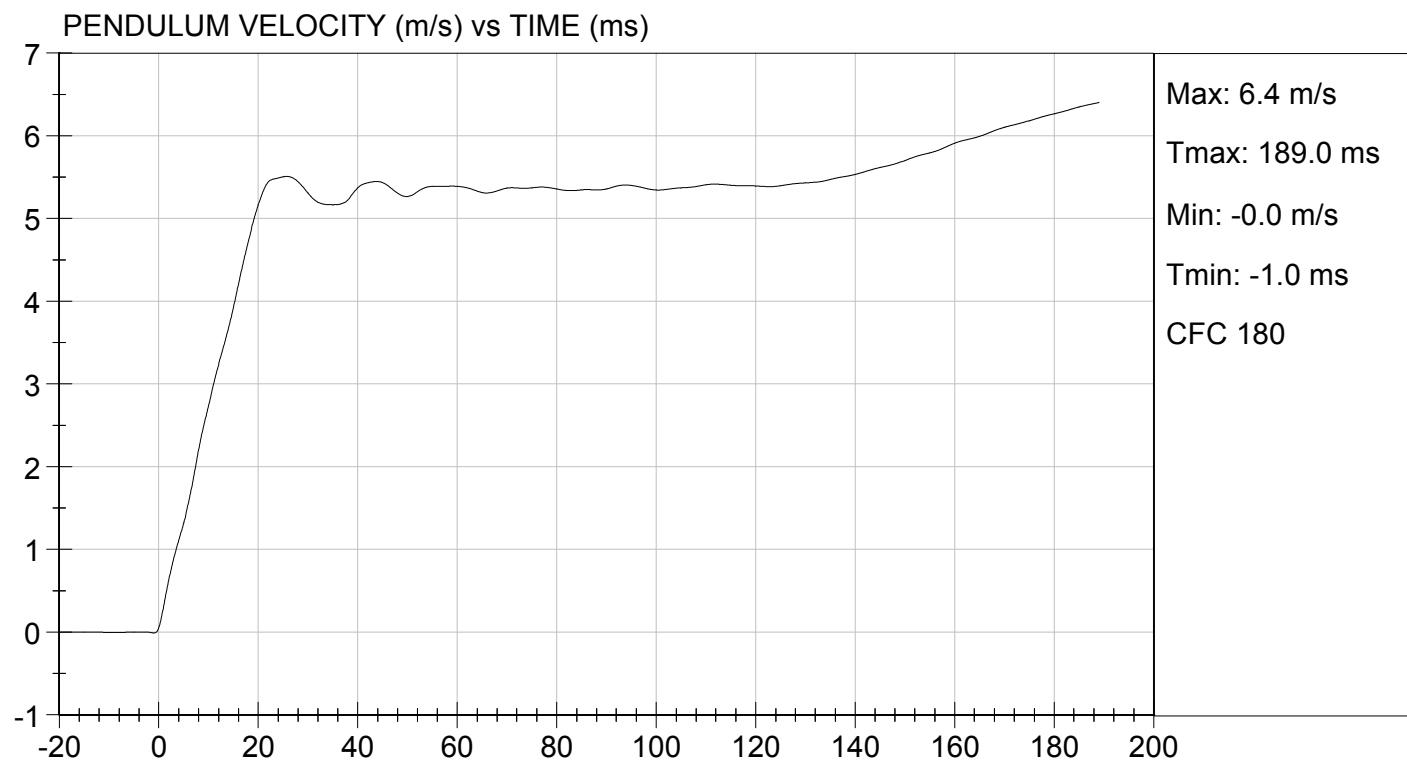
Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.7	Pass
Humidity		%	10 to 70	51	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.74	Pass
	15 ms	m/s	3.30 to 4.10	3.93	Pass
	20 ms	m/s	4.40 to 5.40	5.16	Pass
	25 ms	m/s	5.40 to 6.10	5.50	Pass
	25-100 ms	m/s	5.50 to 6.20	5.51	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	65	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-40	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	110	Pass
Overall Test Results					Pass


 Laboratory Technician

07/28/2016

Test Date

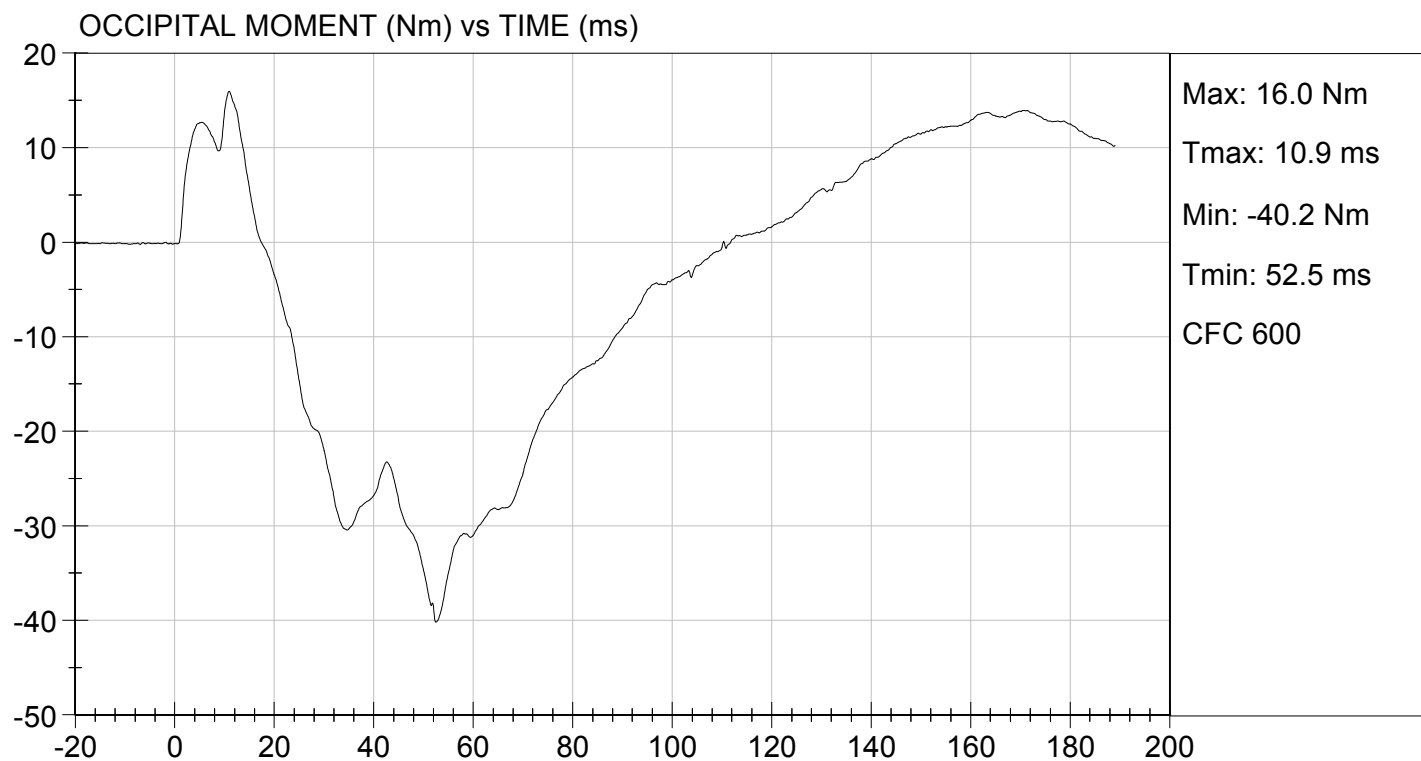

 Approved By





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

TEST DATE: 07/28/2016
TEST #: D162562

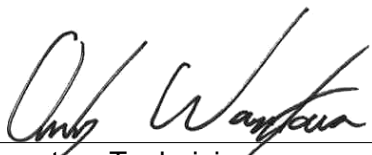


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

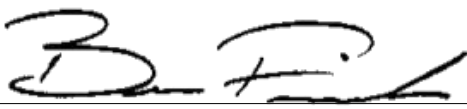
ATD Serial No: 306

Test ID: D162563

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	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.37	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results			Pass	


Laboratory Technician

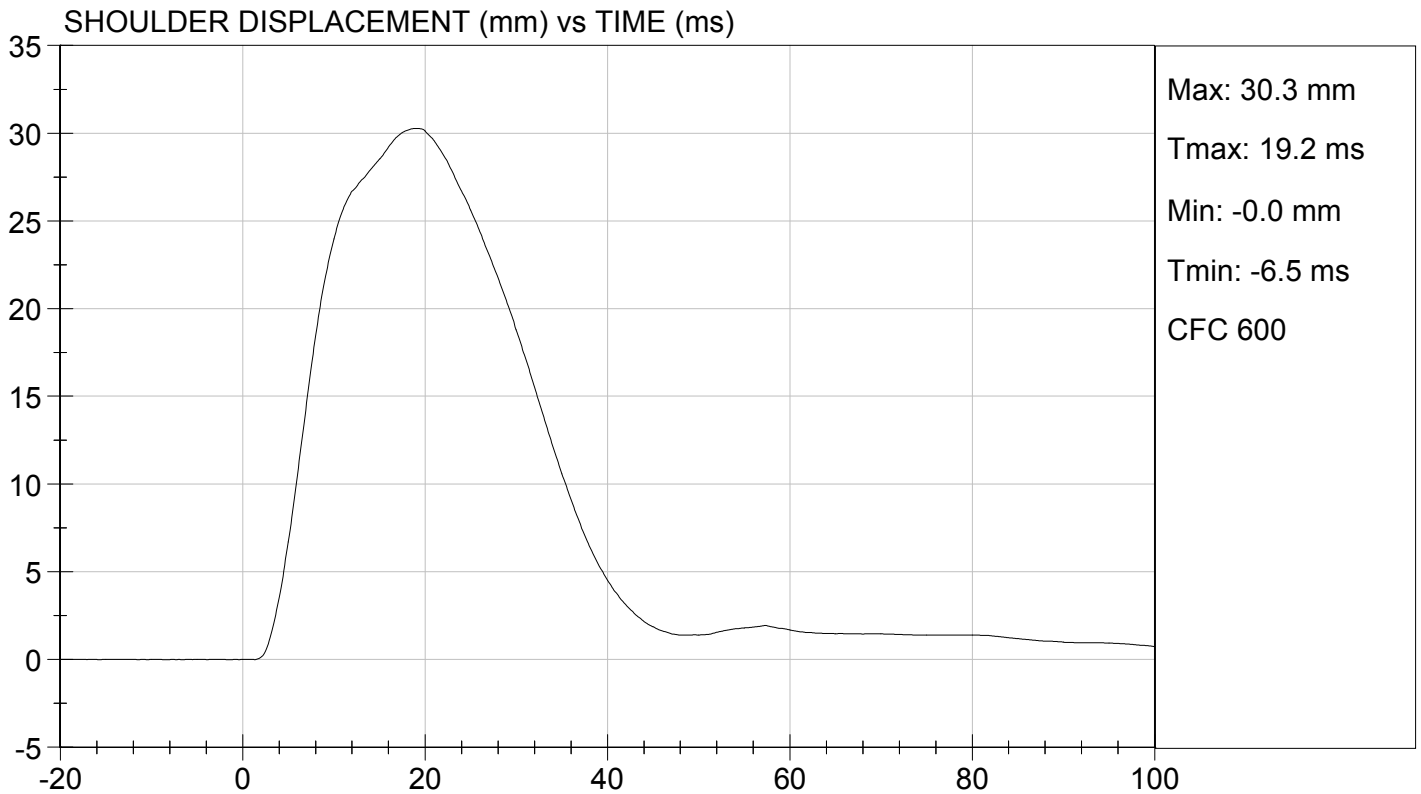
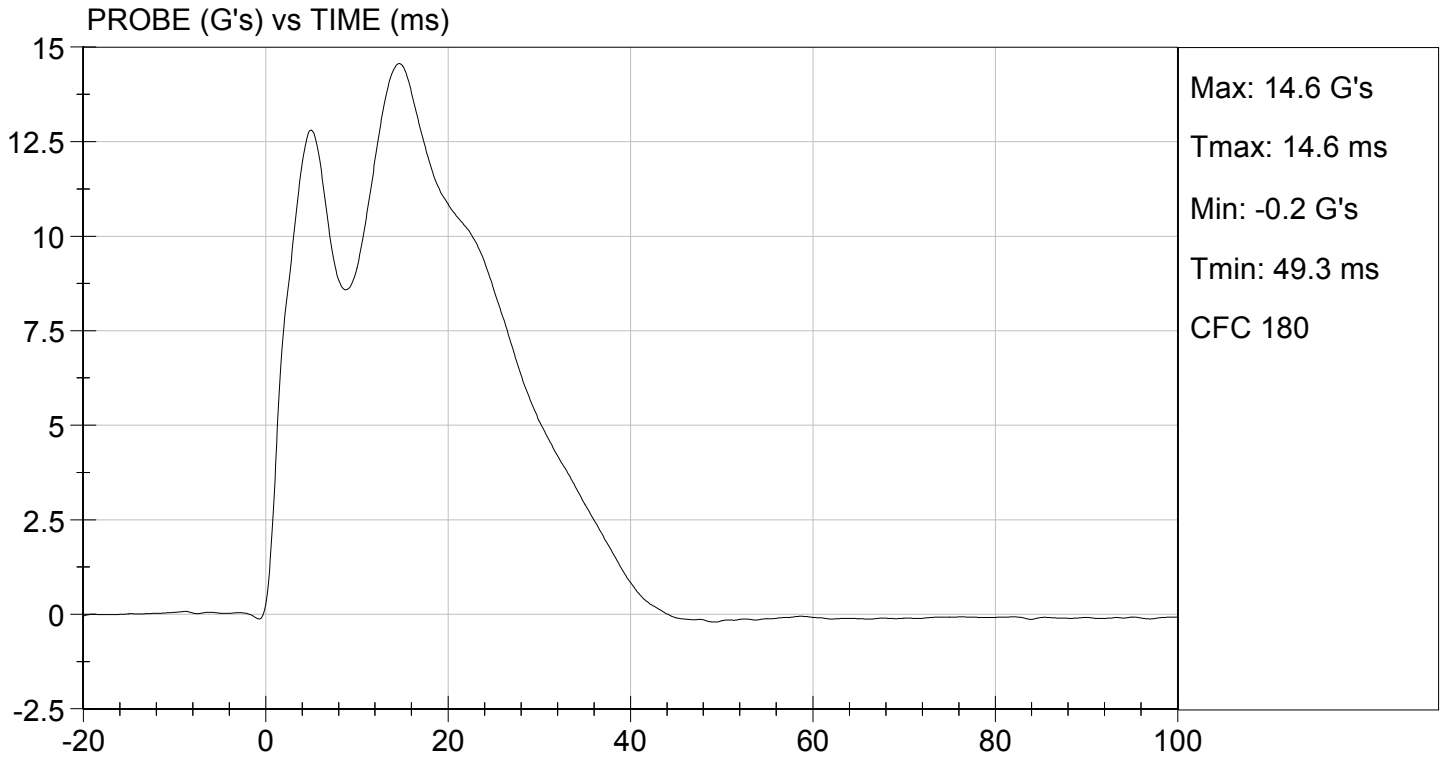
07/28/2016
Test Date


Approved By



TEST DESC: SHOULDER IMPACT
VELOCITY: 14.34 ft/s, 4.37 m/s

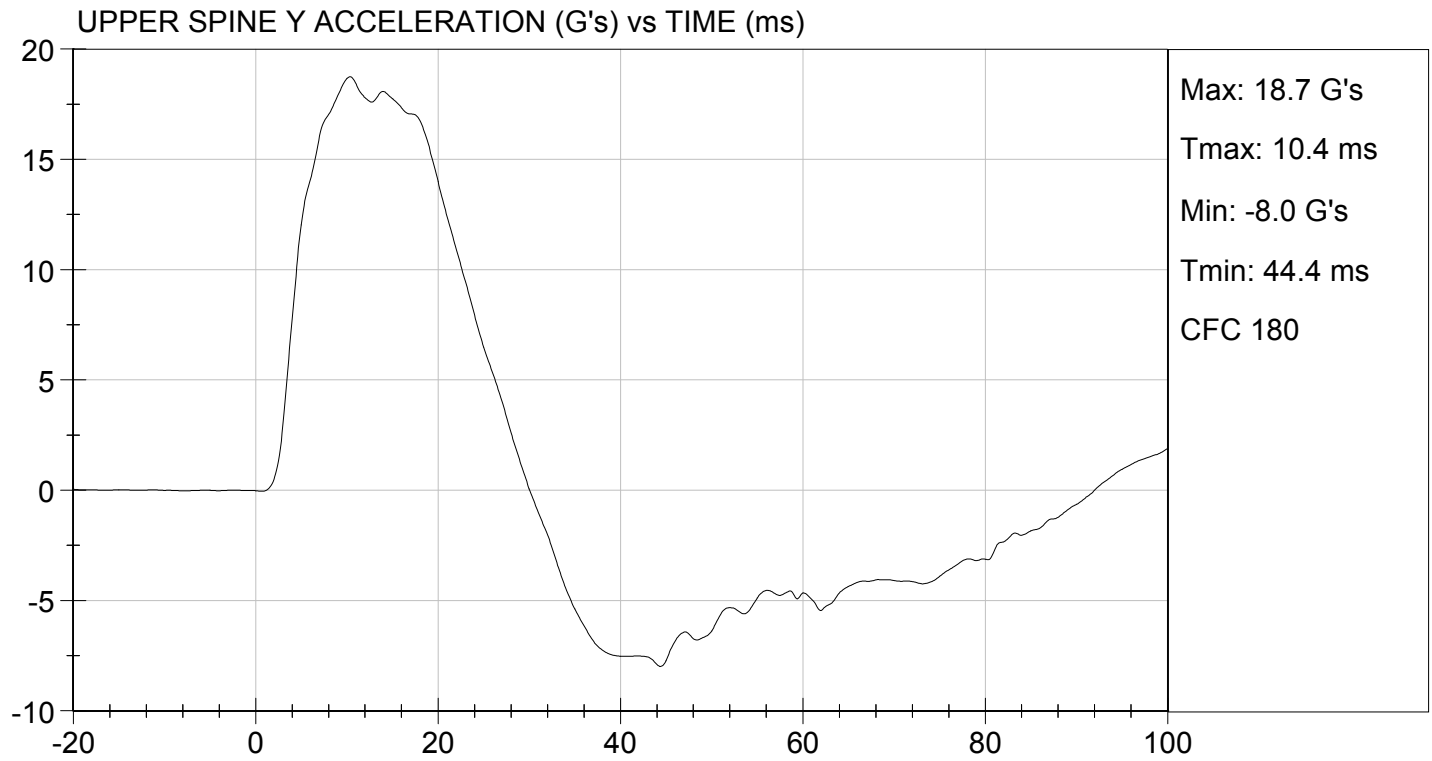
TEST DATE: 07/28/2016
TEST #: D162563





TEST DESC: SHOULDER IMPACT
VELOCITY: 14.34 ft/s, 4.37 m/s

TEST DATE: 07/28/2016
TEST #: D162563



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

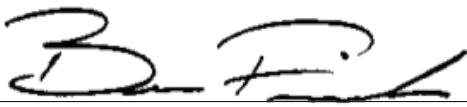
ATD Serial No: 306

Test I.D: D162564

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	36	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	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass


Laboratory Technician

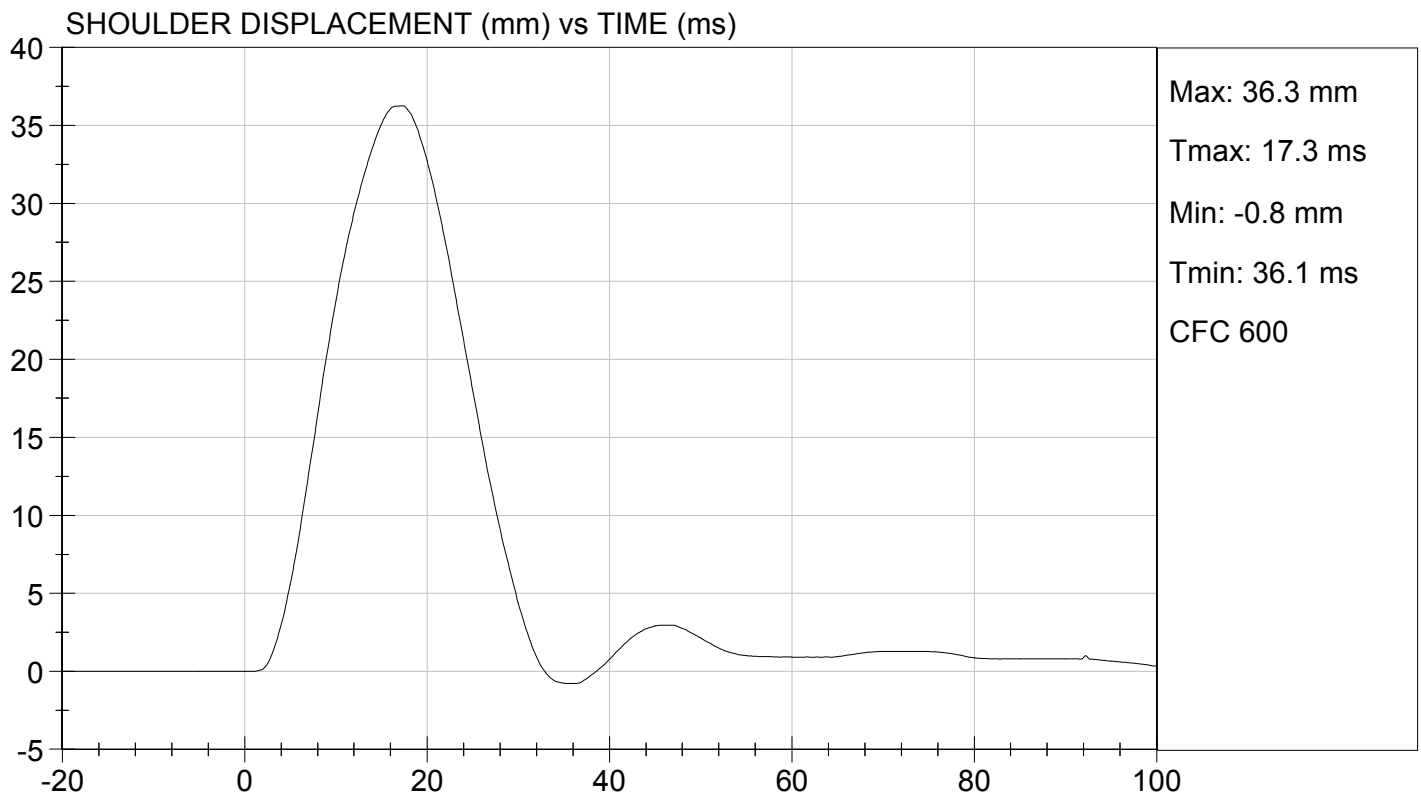
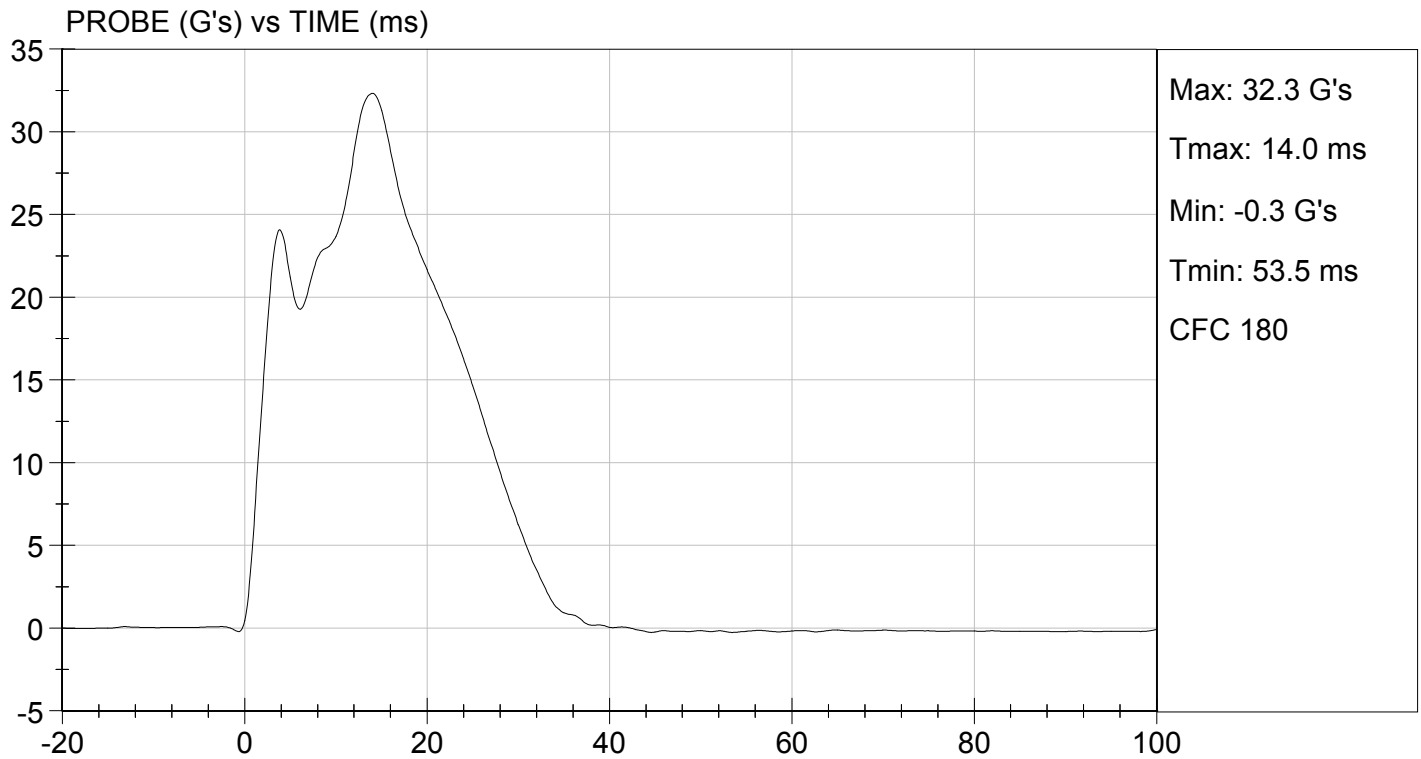
07/28/2016
Test Date


Approved By



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

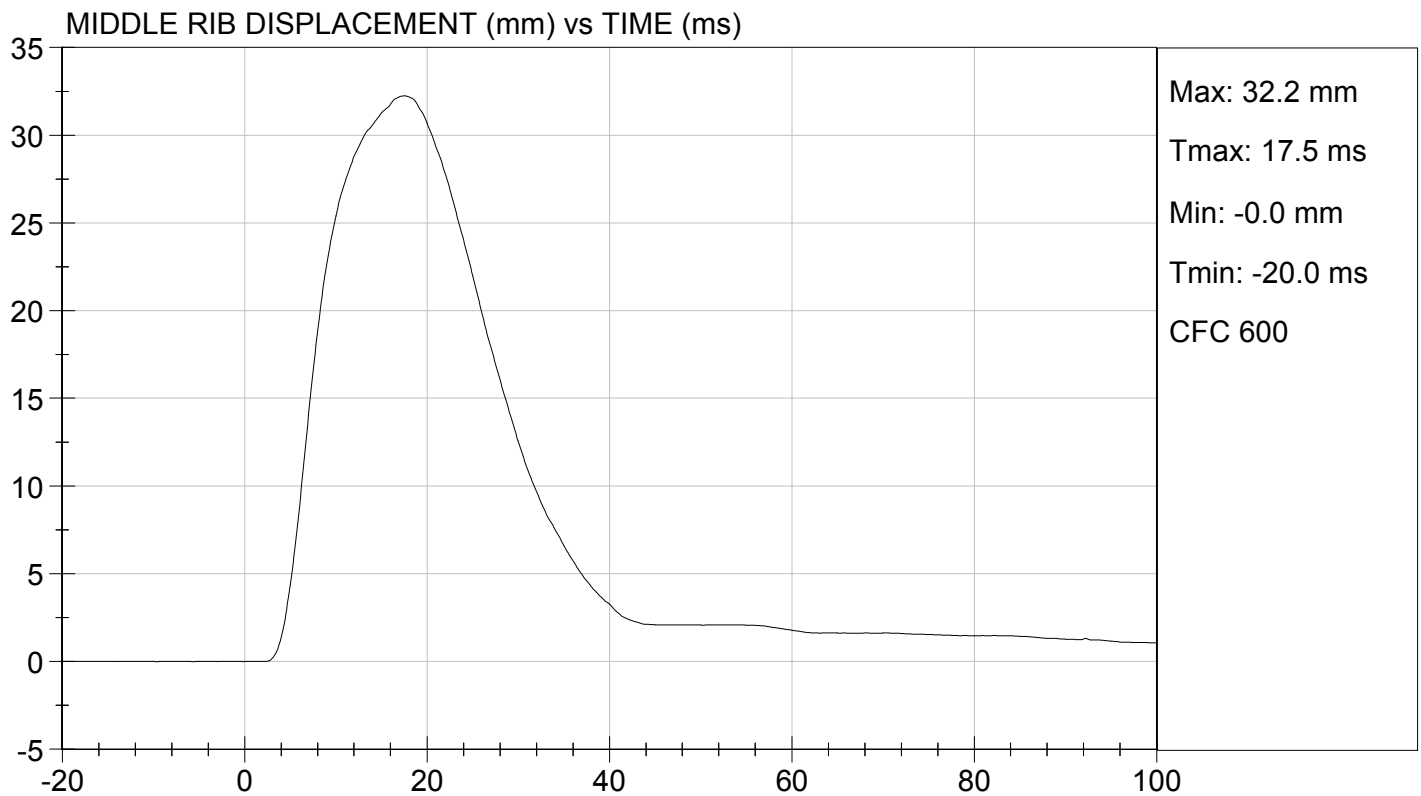
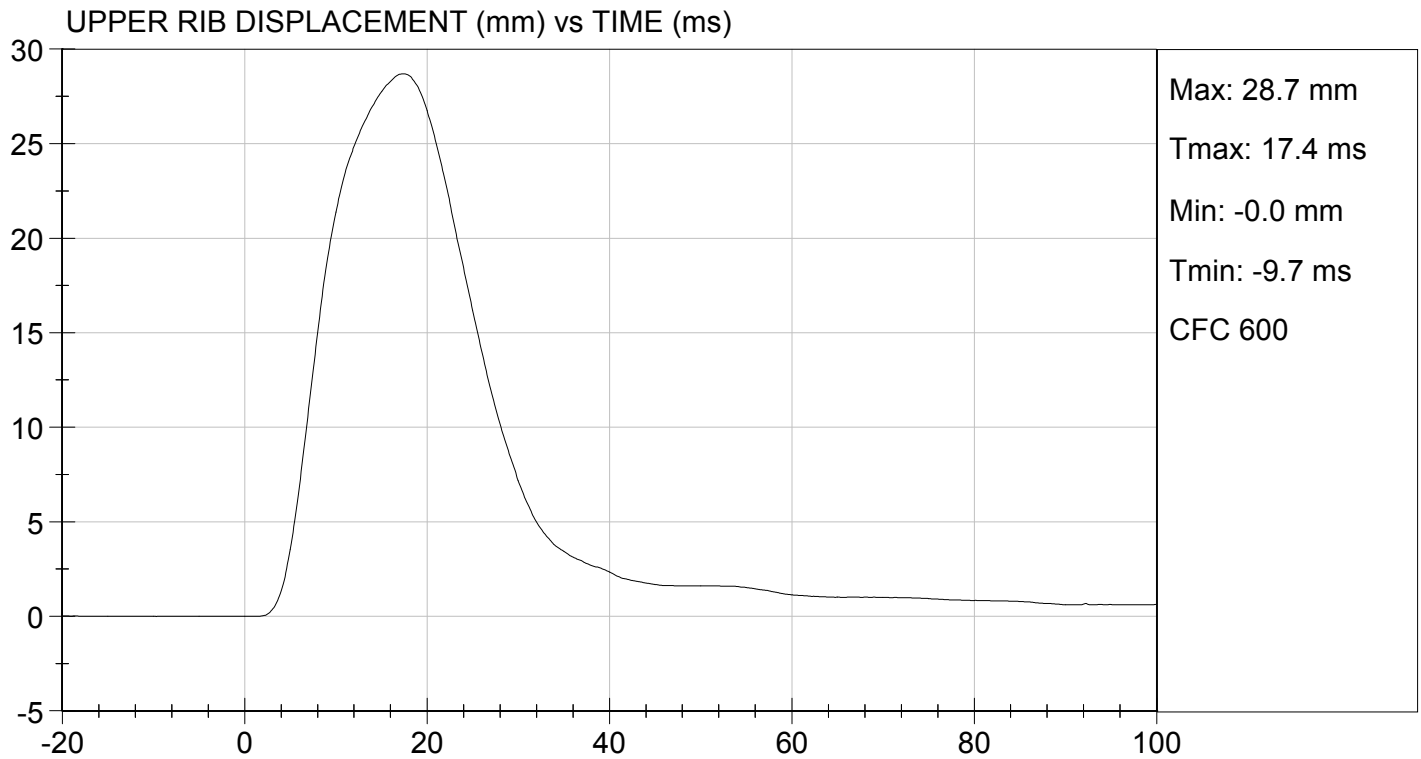
TEST DATE: 07/28/2016
TEST #: D162564





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 07/28/2016
TEST #: D162564

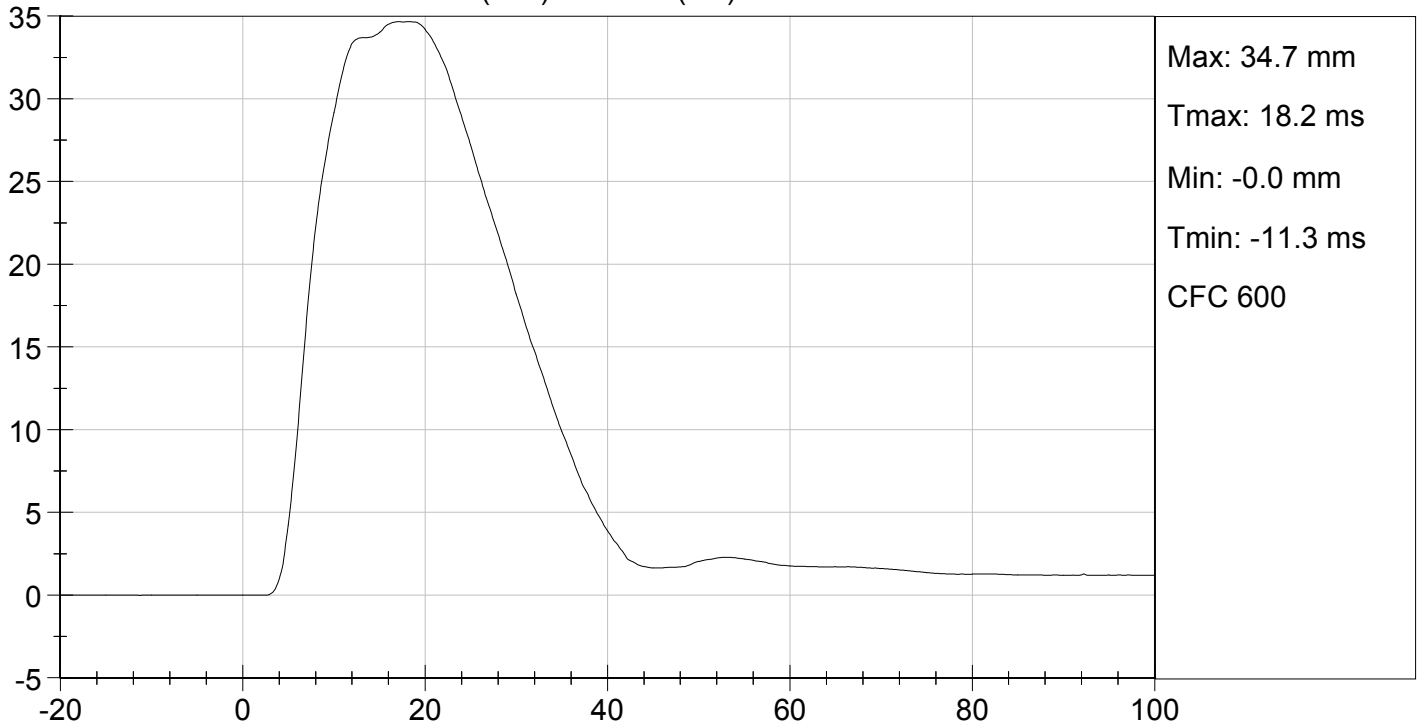




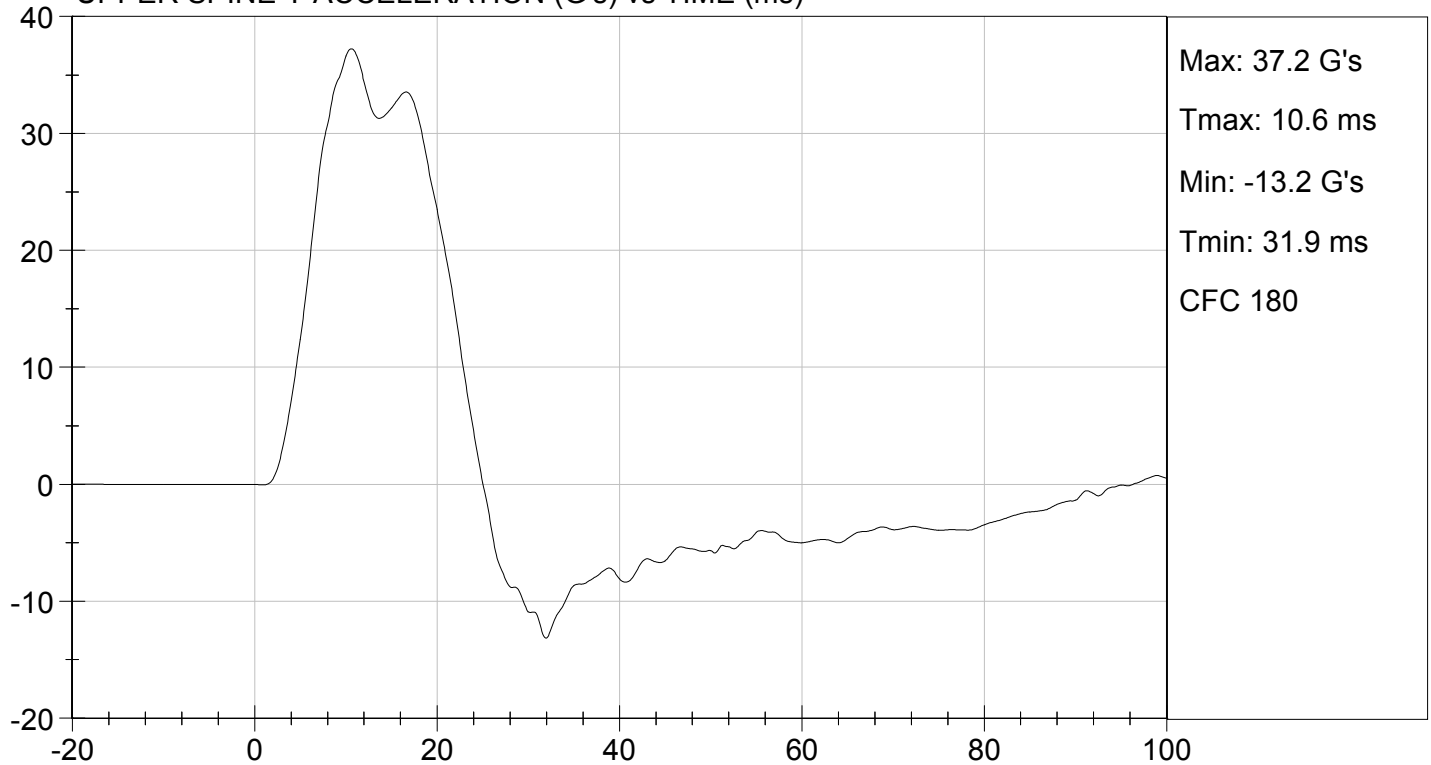
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 07/28/2016
TEST #: D162564

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



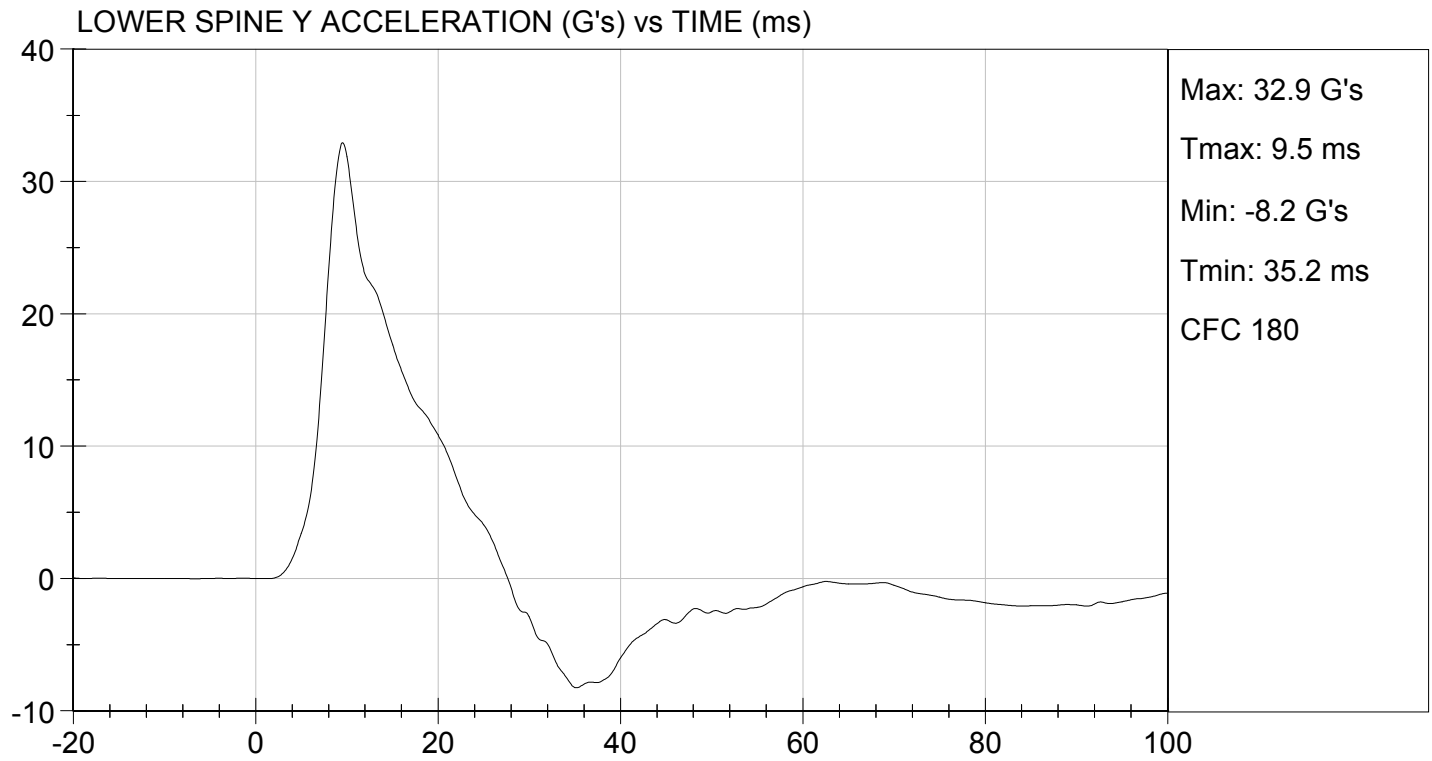
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 07/28/2016
TEST #: D162564



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

ATD Serial No: 306

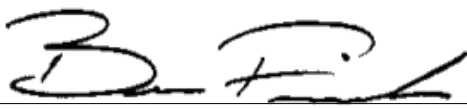
Test I.D: D162565

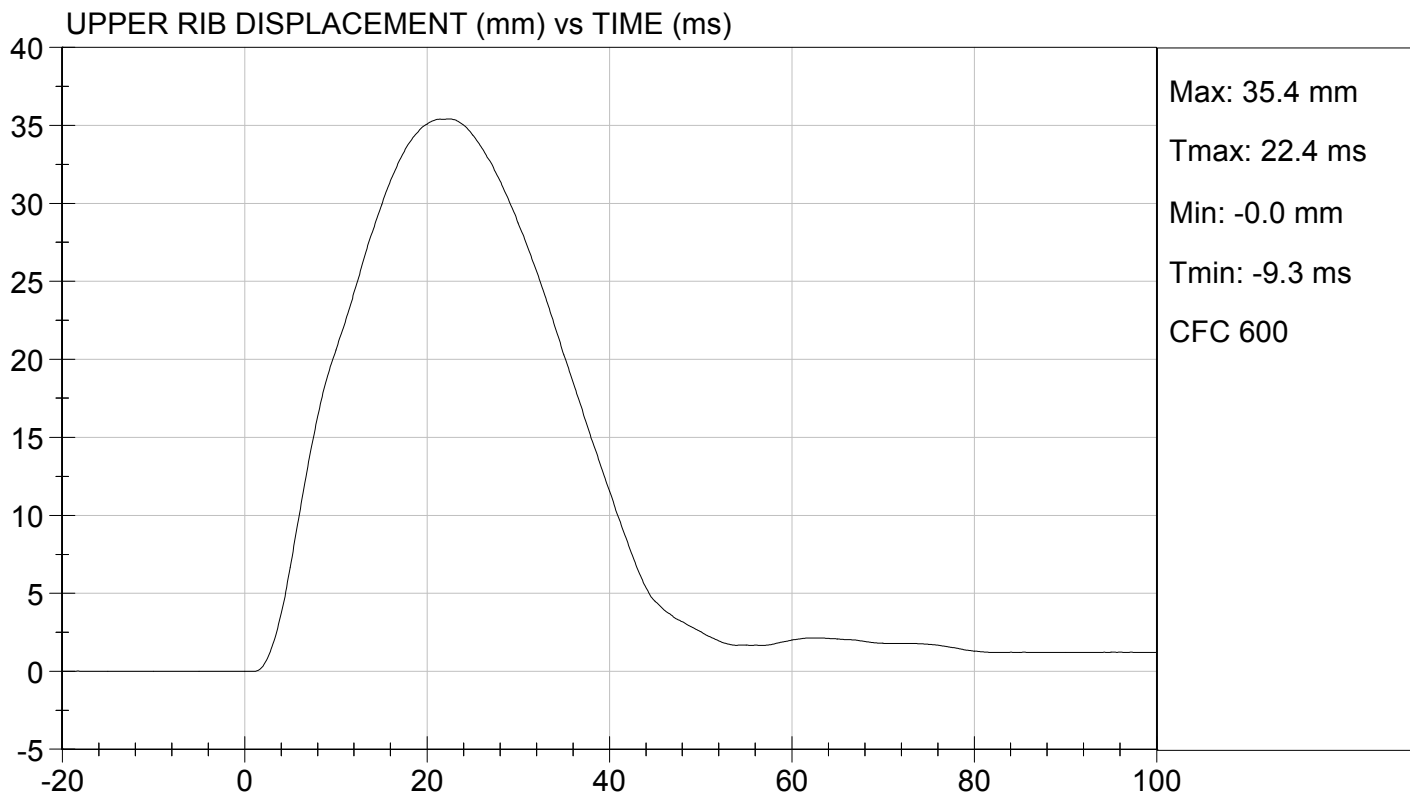
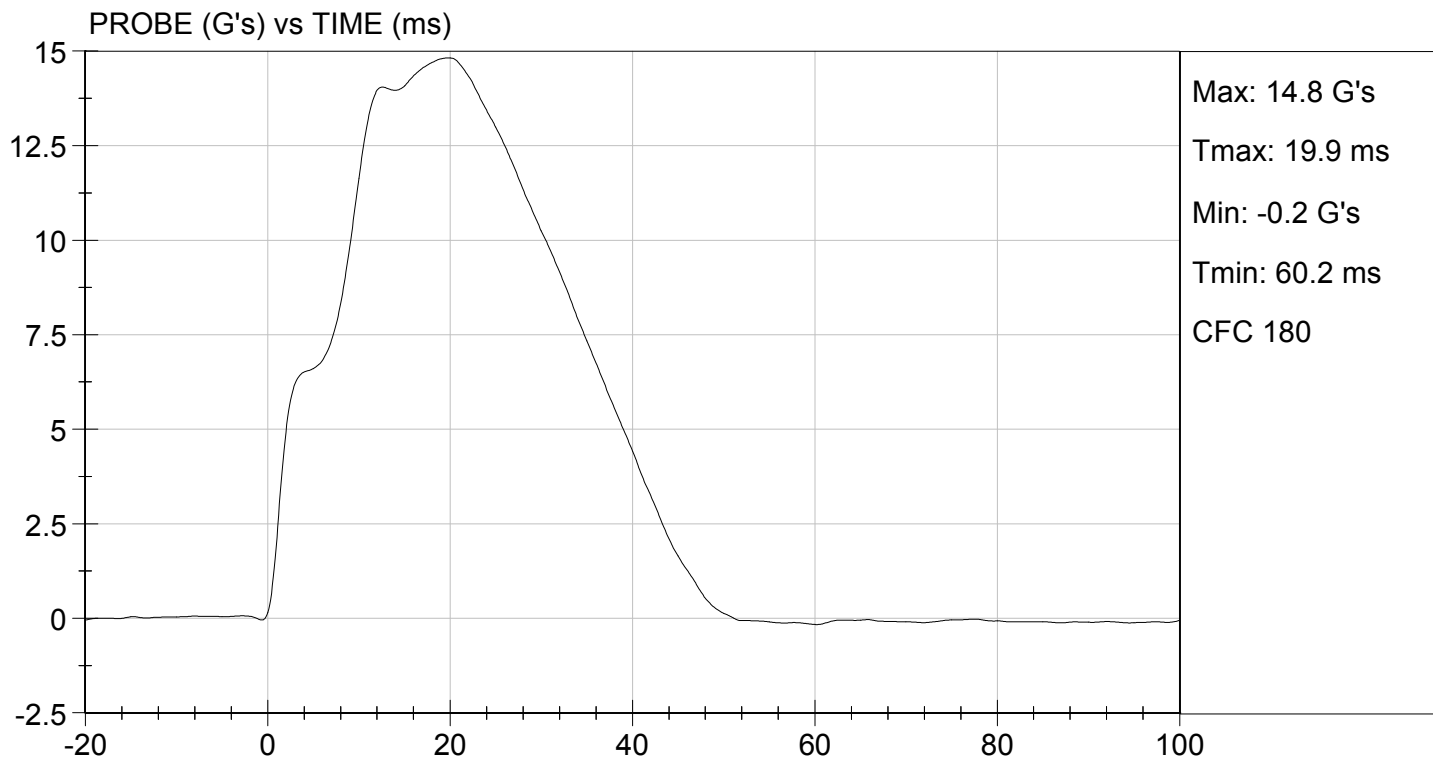
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
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

07/28/2016

Test Date


 Approved By

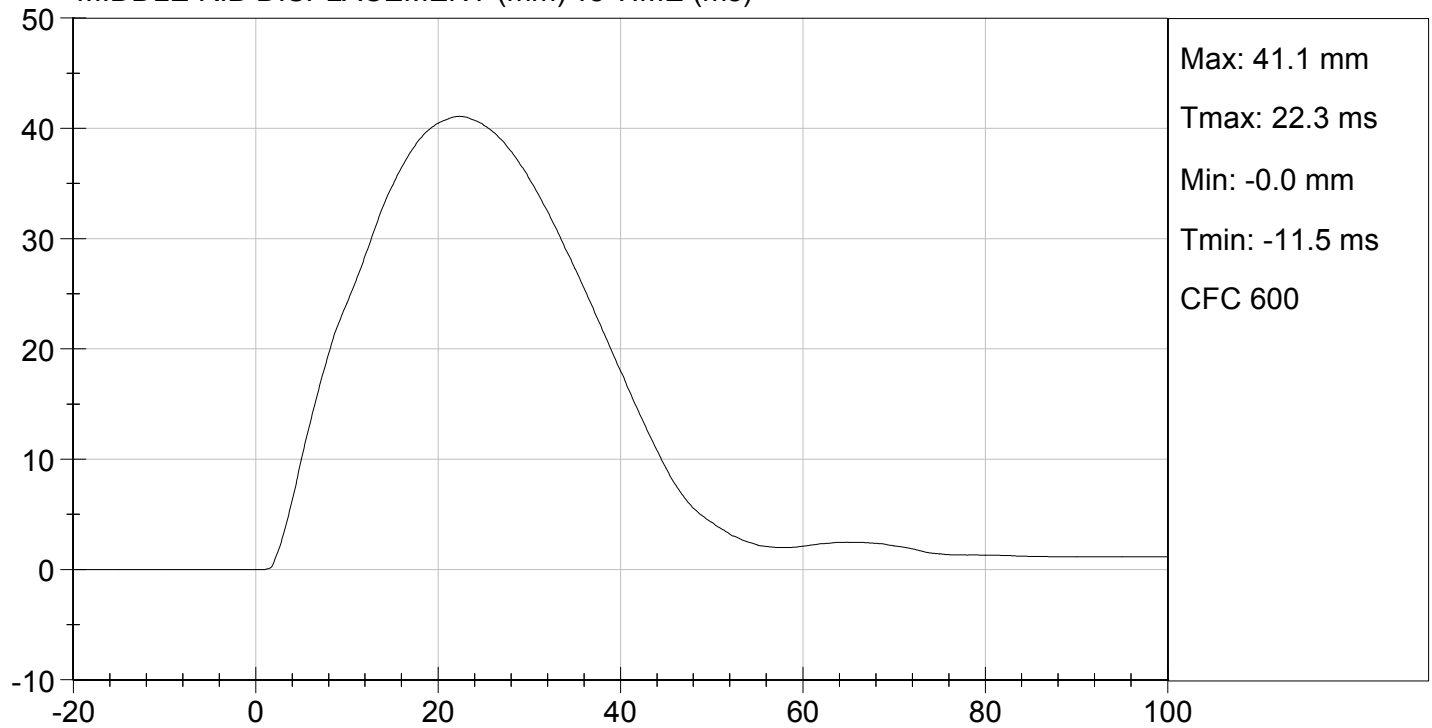




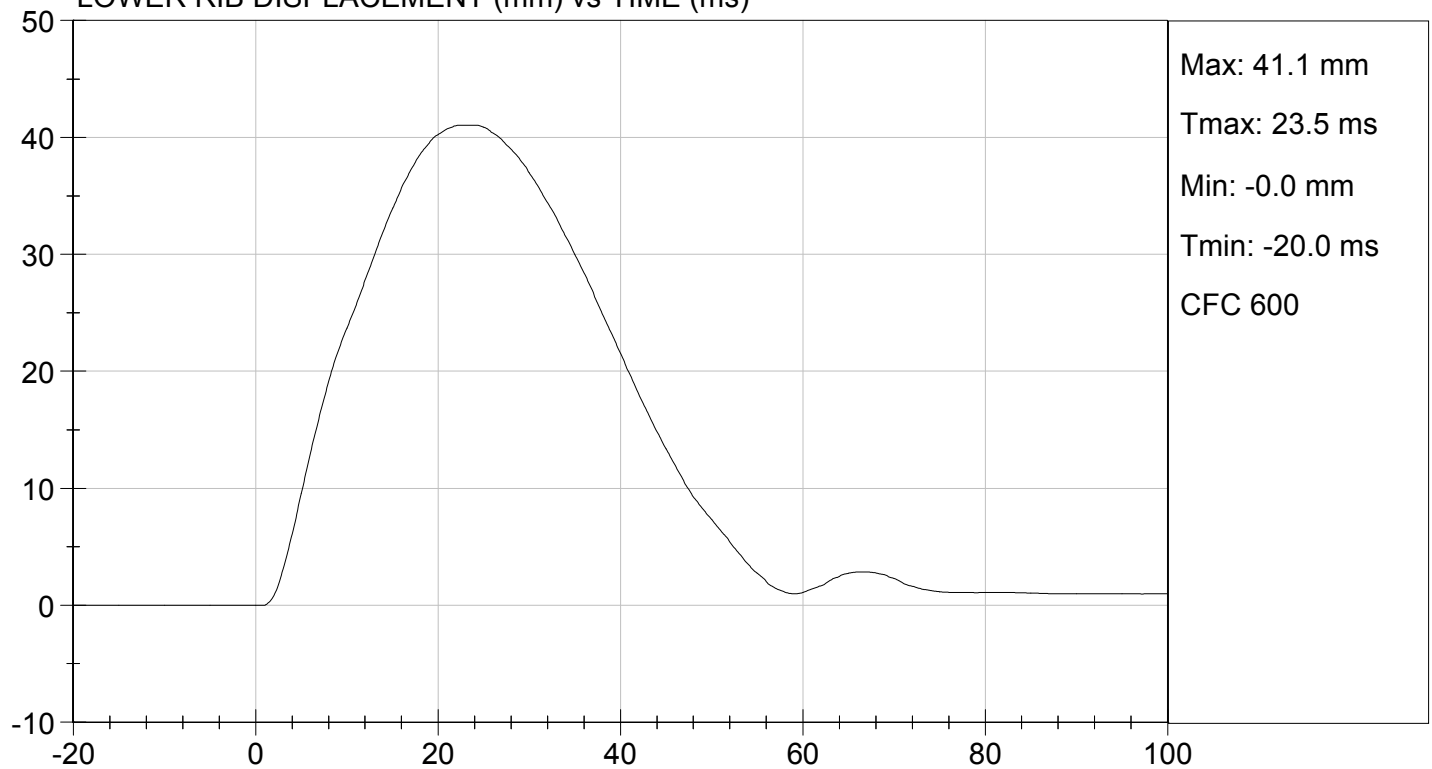
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 07/28/2016
TEST #: D162565

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

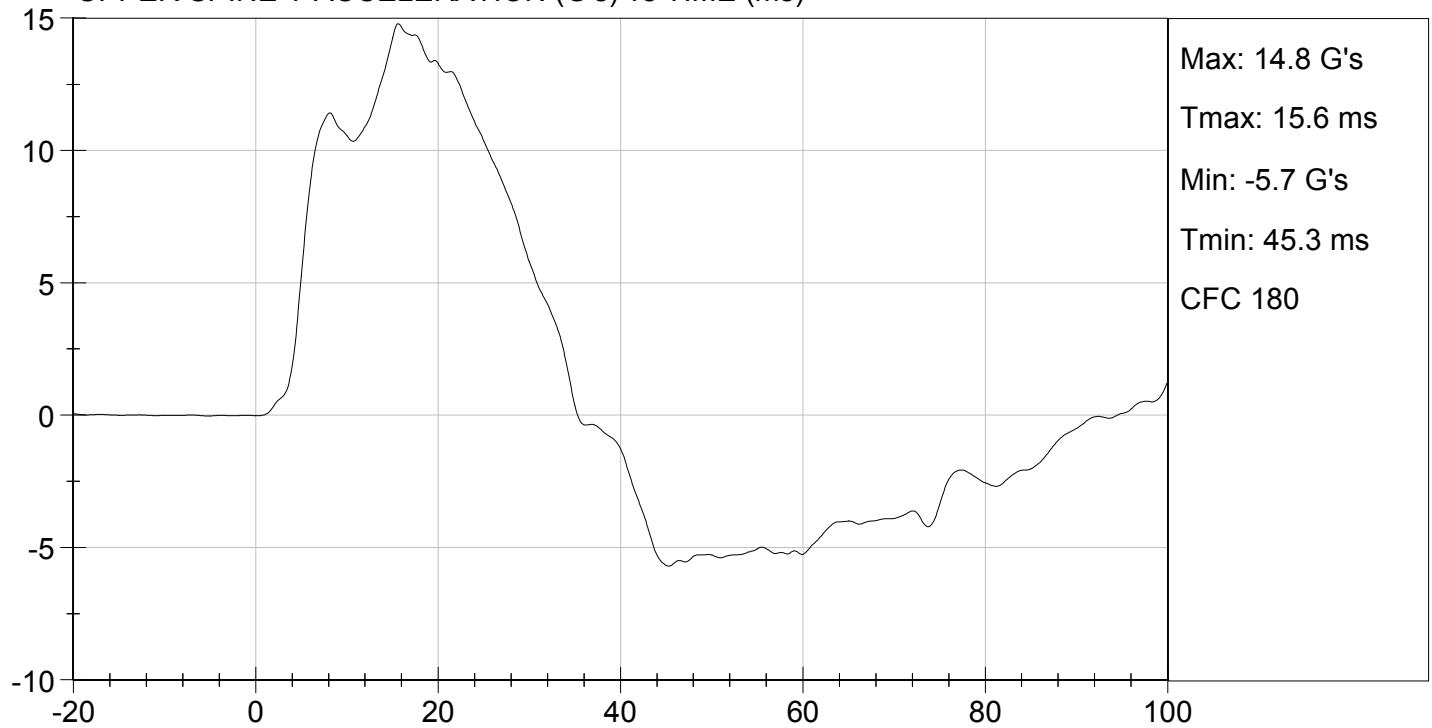




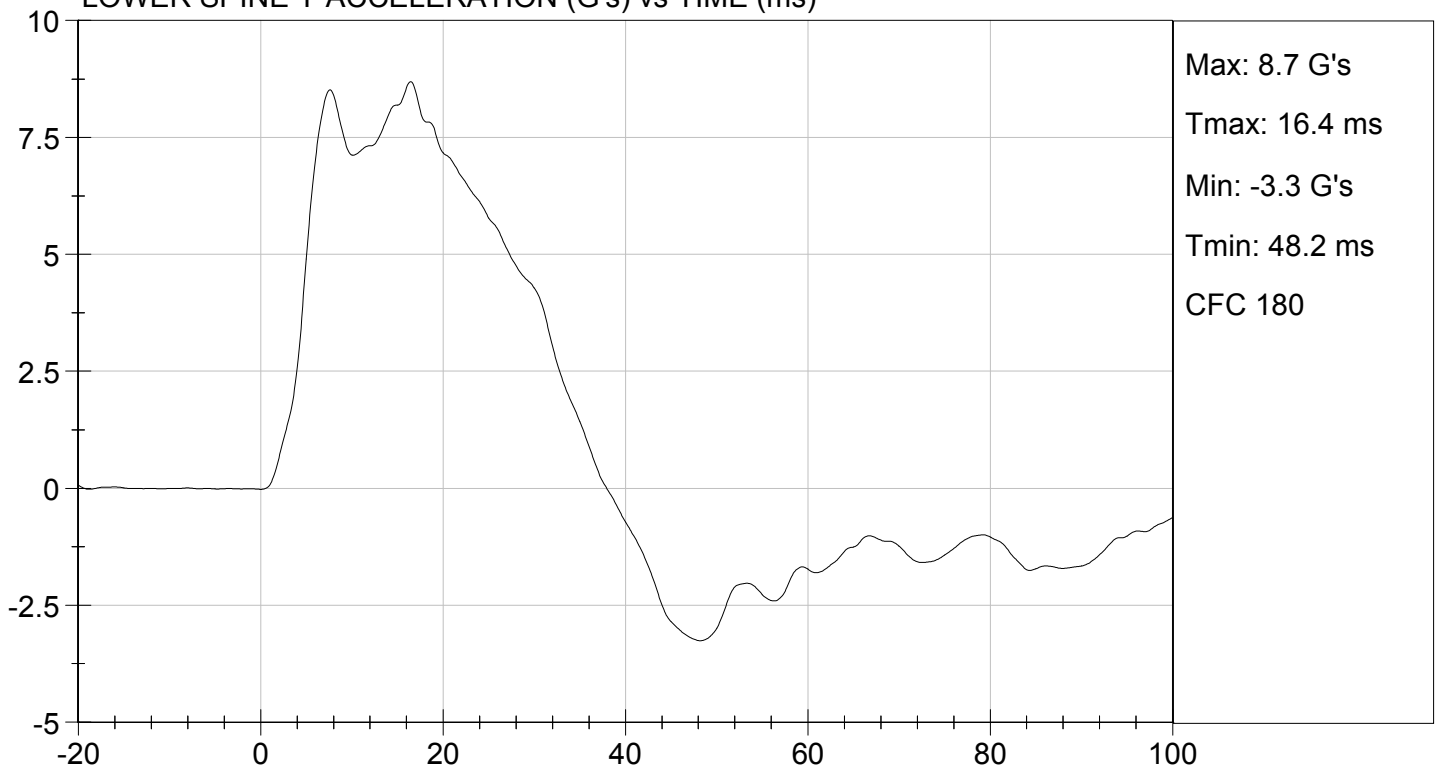
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 07/28/2016
TEST #: D162565

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



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



MGA RESEARCH CORPORATION

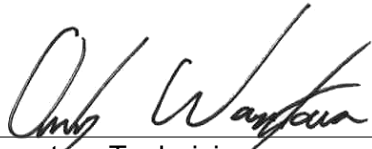
ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

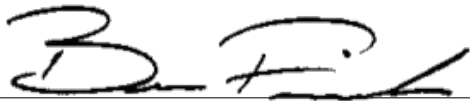
Test I.D: D162566

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	40	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

07/28/2016

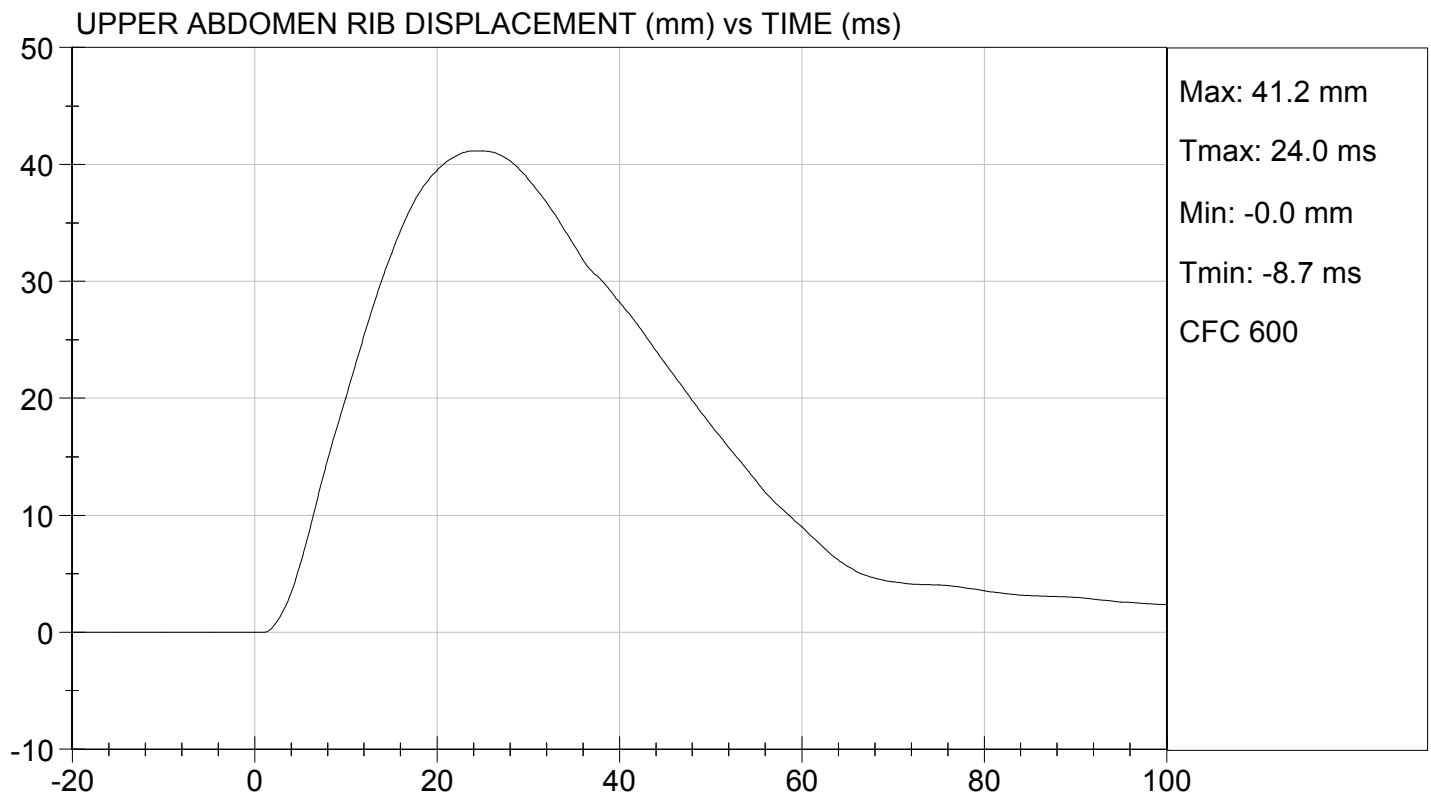
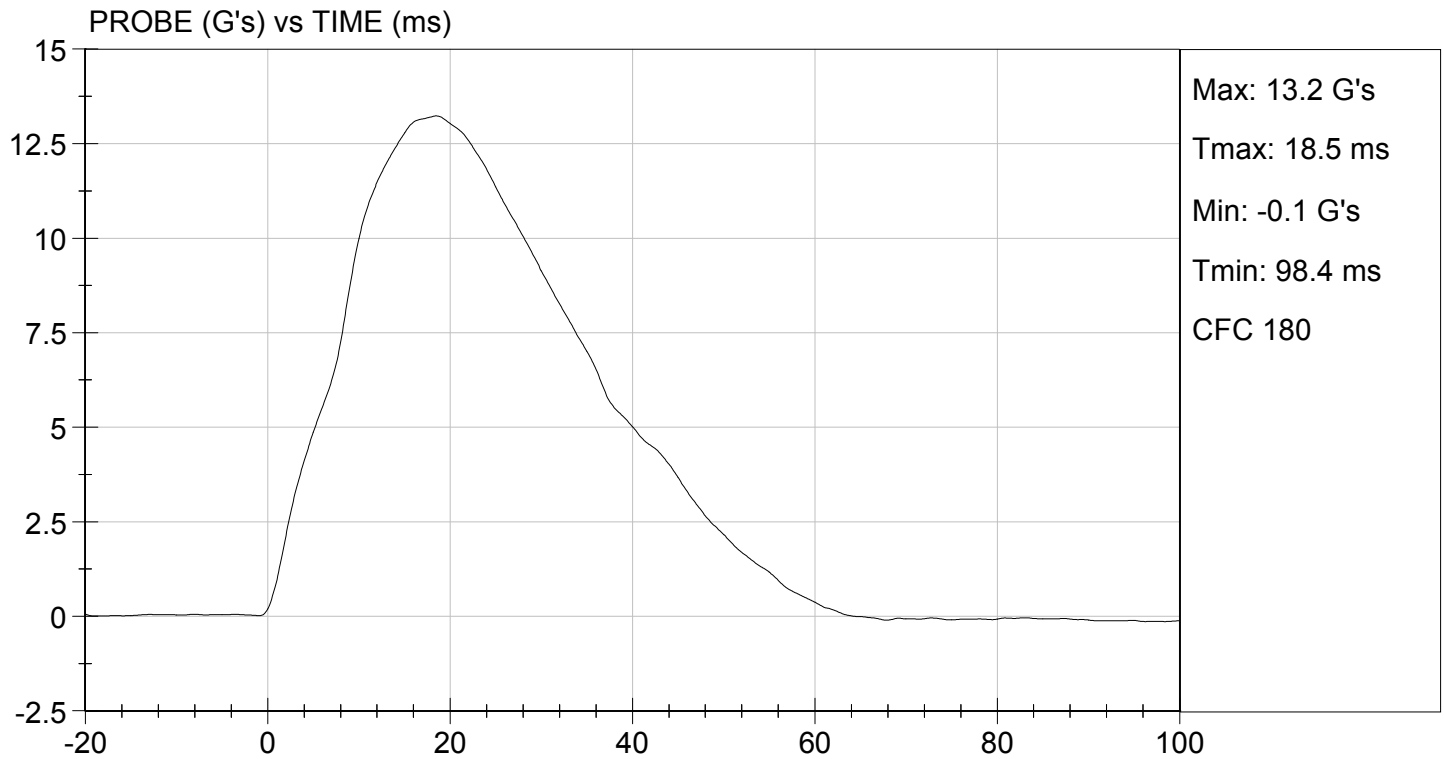
Test Date


Approved By



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

TEST DATE: 07/28/2016
TEST #: D162566

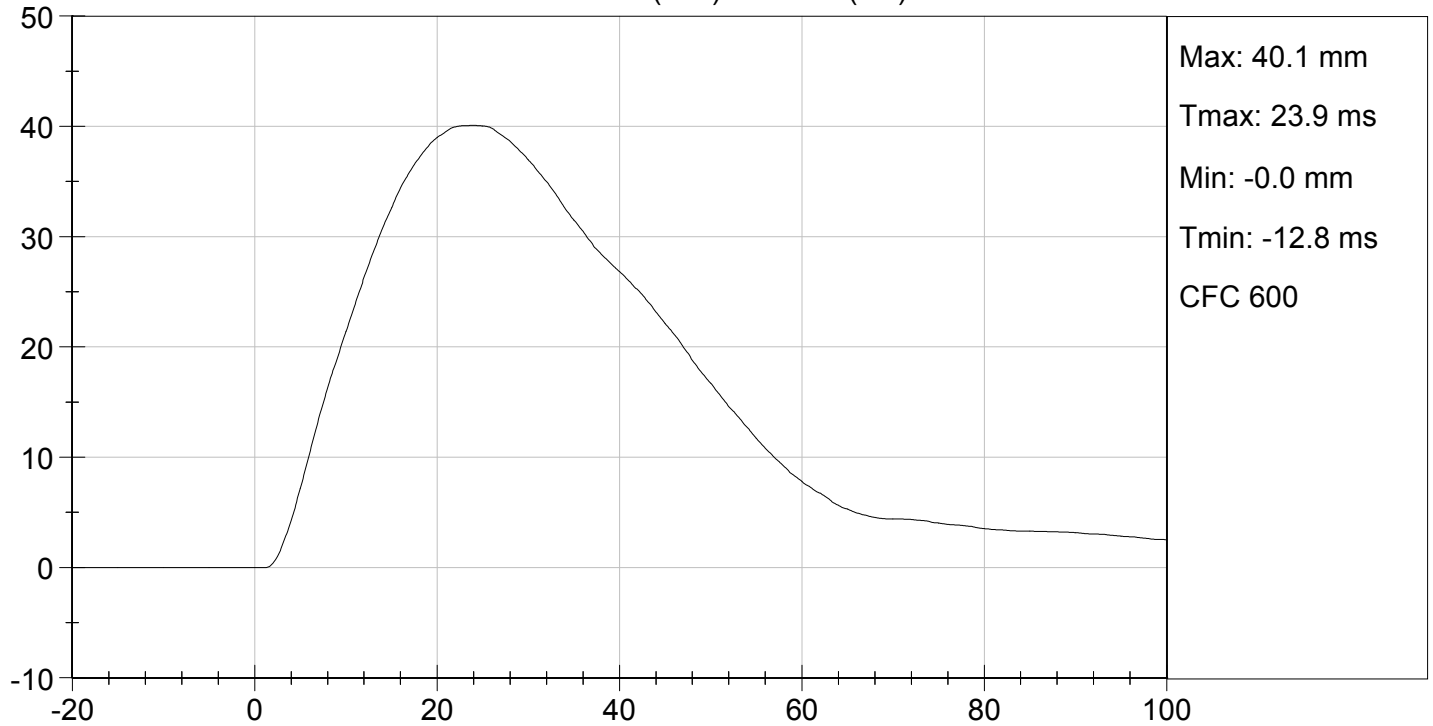




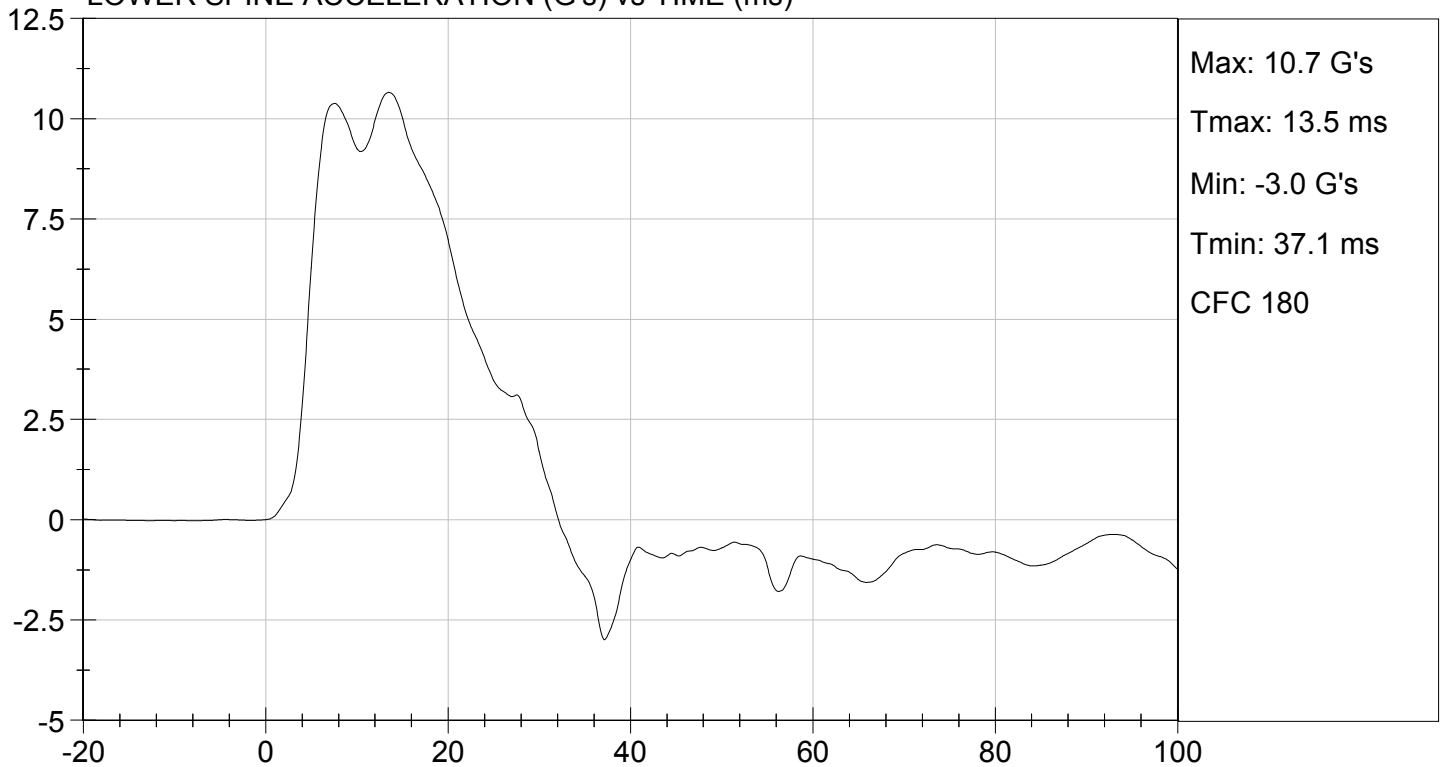
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 07/28/2016
TEST #: D162566

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

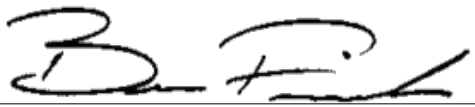
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D162567

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	4,011	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

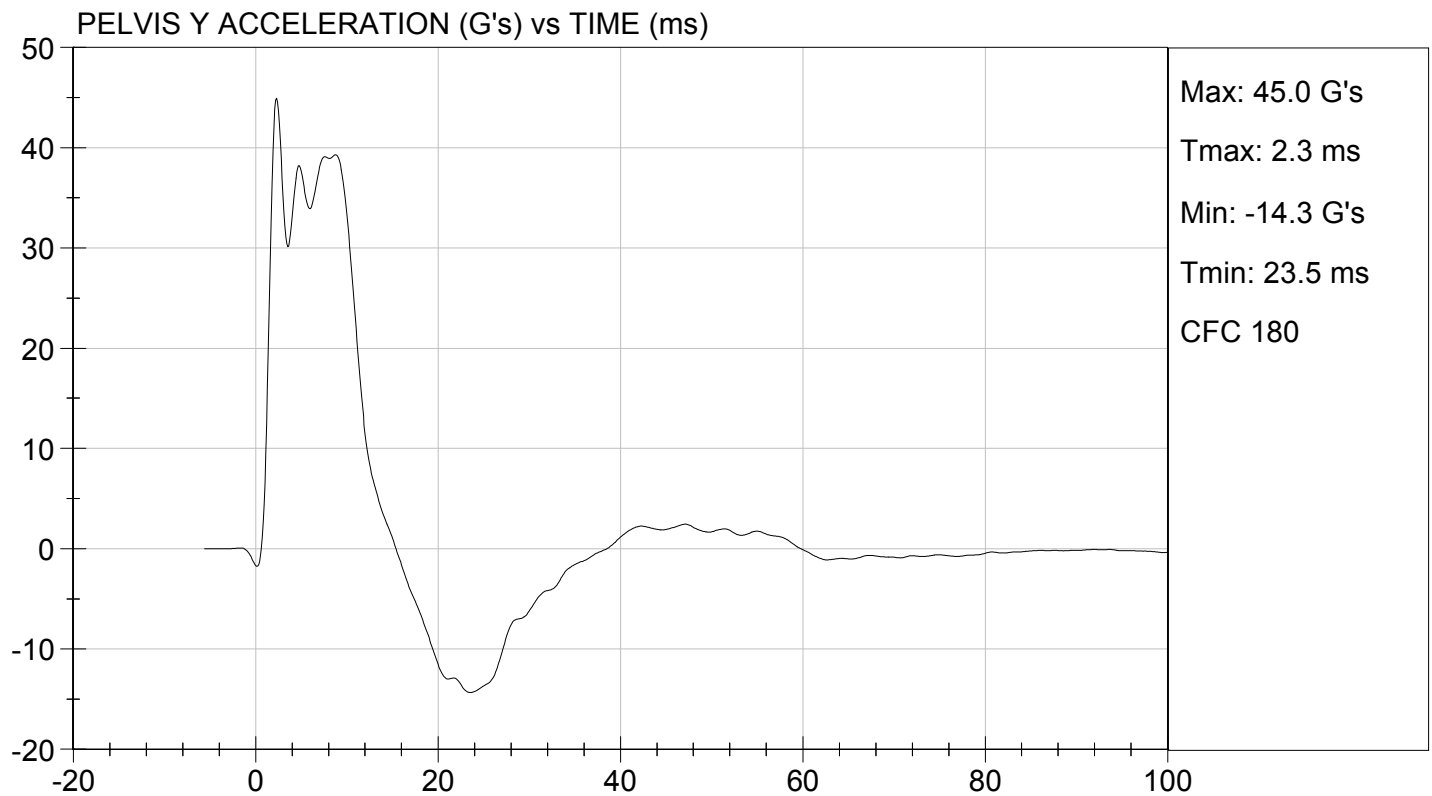
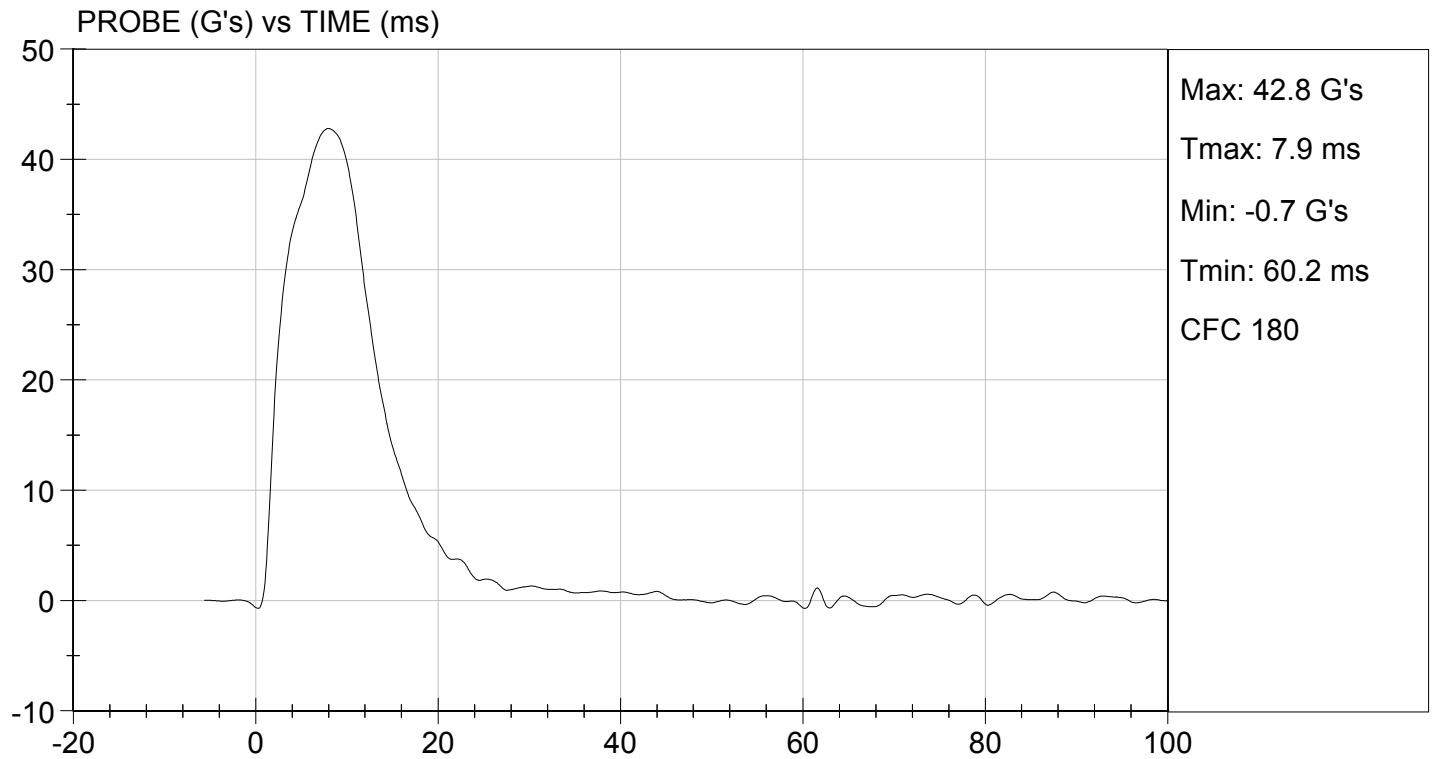
07/28/2016

Test Date



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

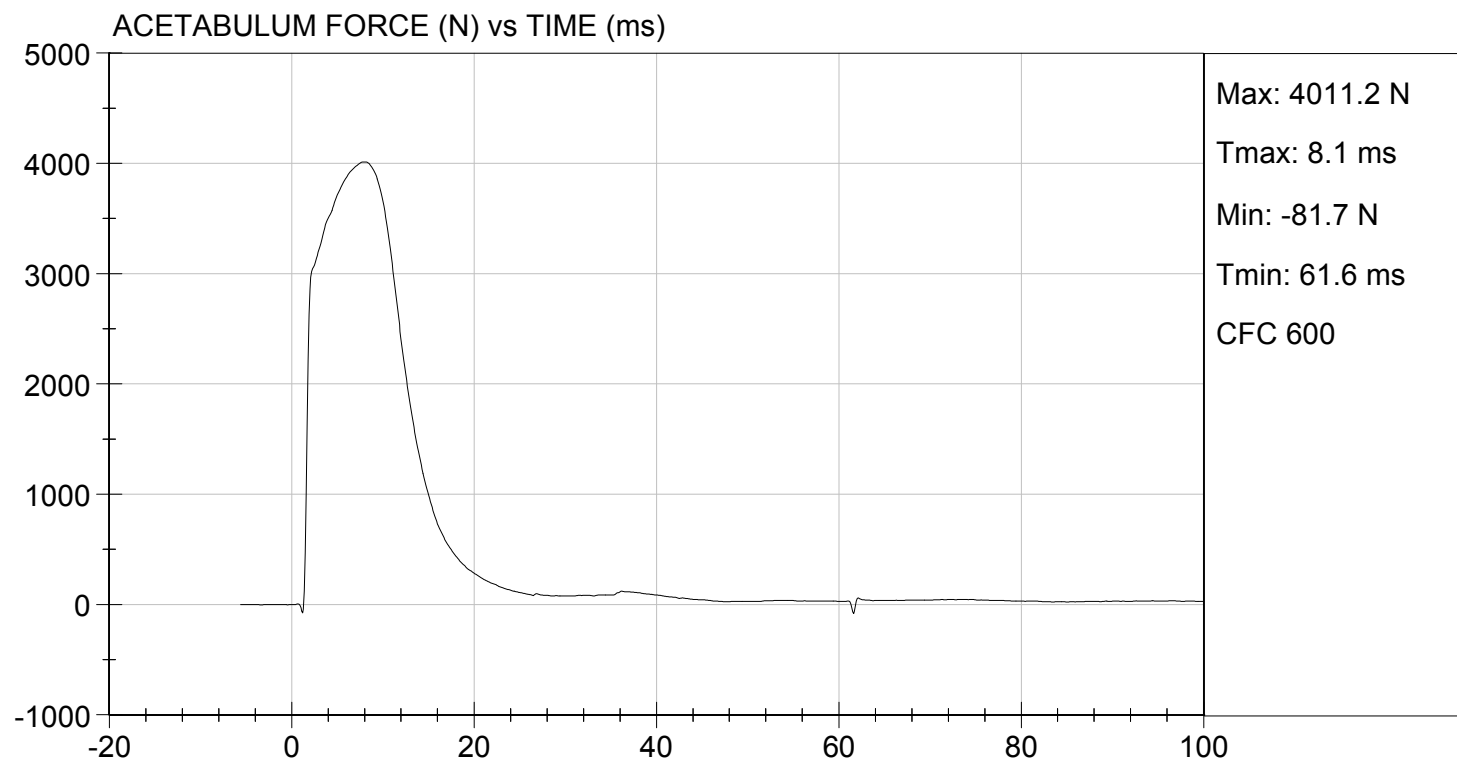
TEST DATE: 07/28/2016
TEST #: D162567





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

TEST DATE: 07/28/2016
TEST #: D162567



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

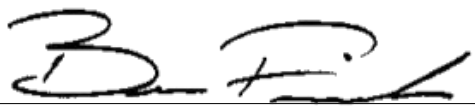
Test I.D: D162568

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	31	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,432	Pass
Overall Test Results				Pass


Laboratory Technician

07/28/2016

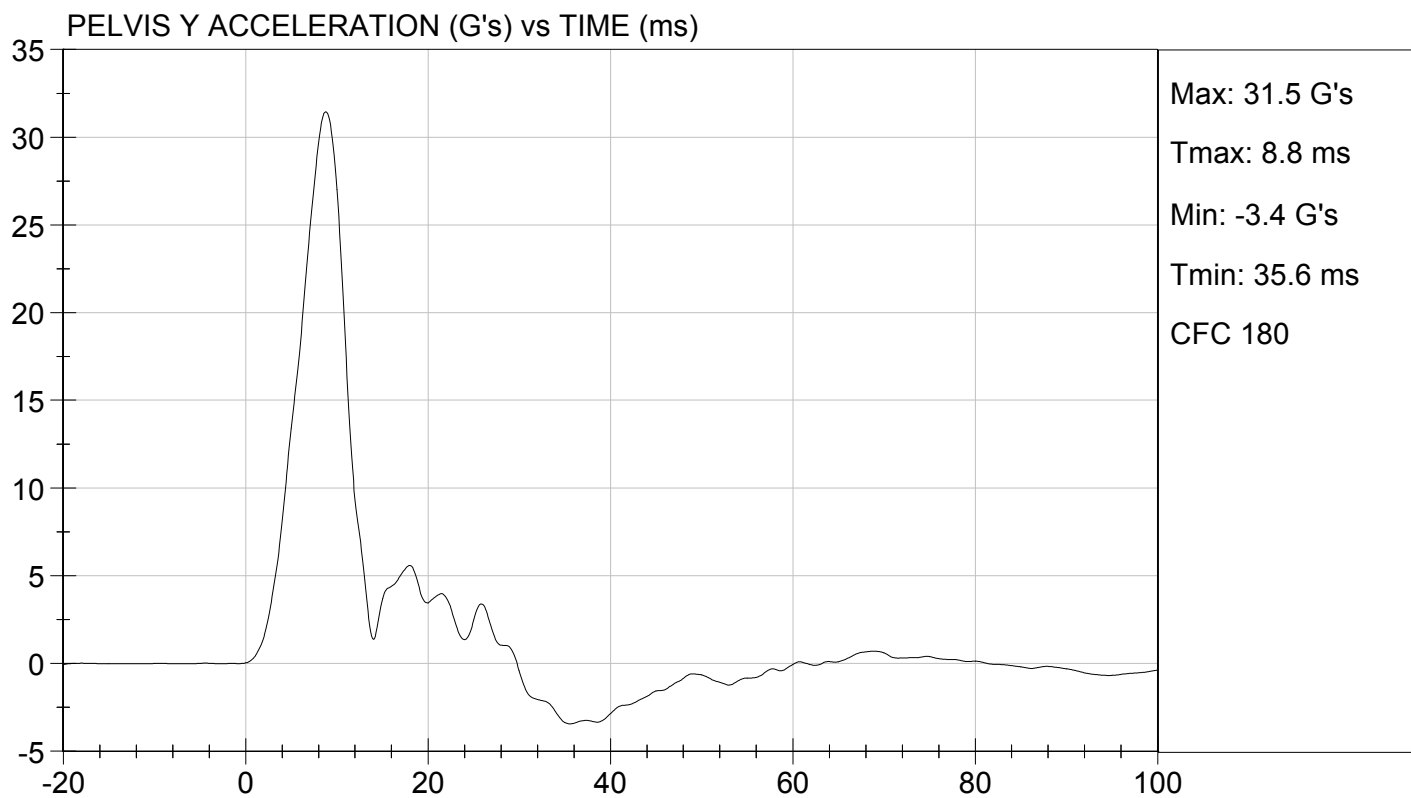
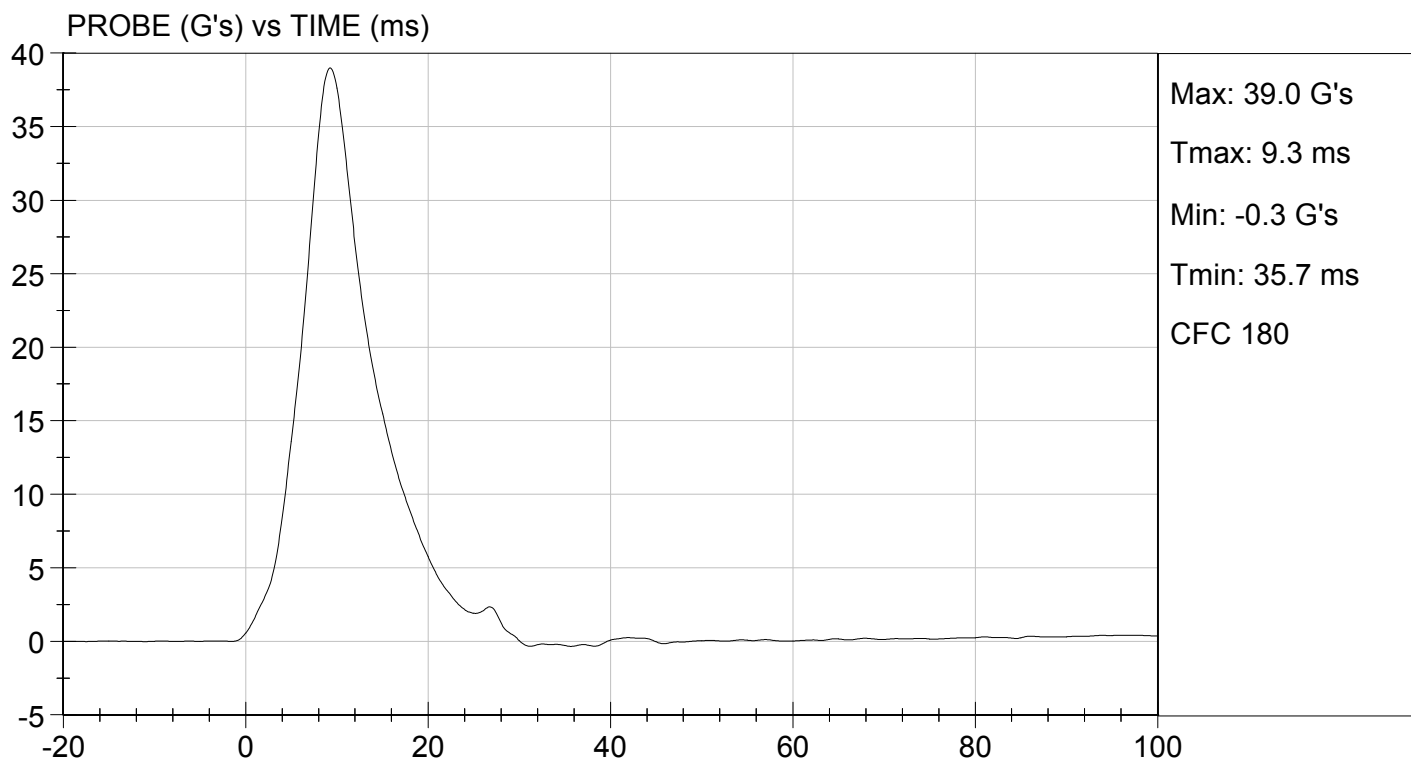
Test Date


Approved By



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

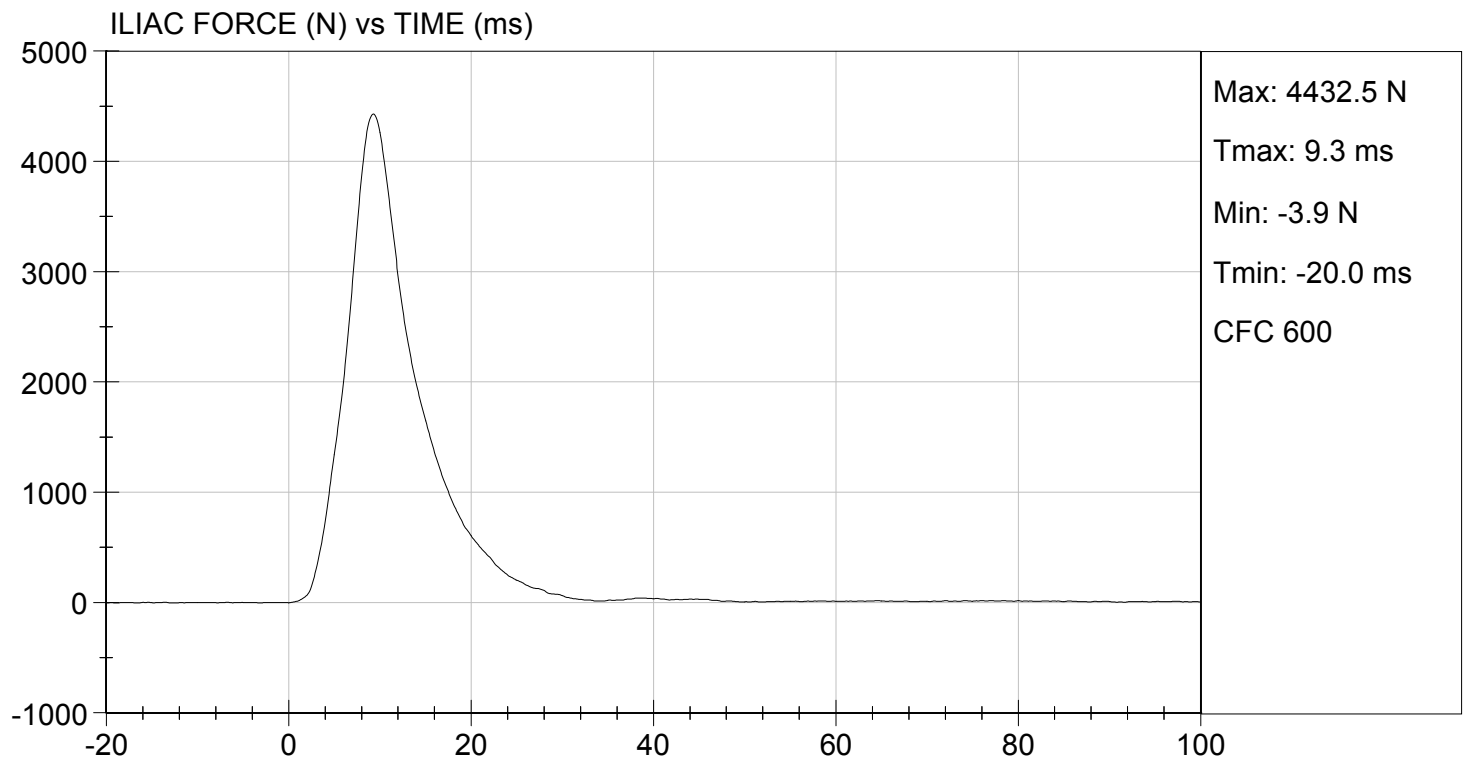
TEST DATE: 07/28/2016
TEST #: D162568





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

TEST DATE: 07/28/2016
TEST #: D162568



SID-IIsD External Measurements
SN: 306

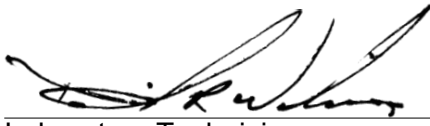
No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	785	Pass
B	Shoulder Pivot Height	437 - 453	449	Pass
C	H-point Height	79 - 89	86	Pass
D	H-point from Seatback	141 - 151	147	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	120	Pass
G	Head Breadth	140 - 148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

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

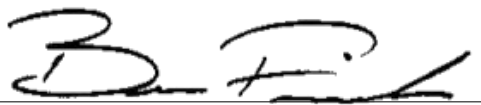
ATD Serial No: 306

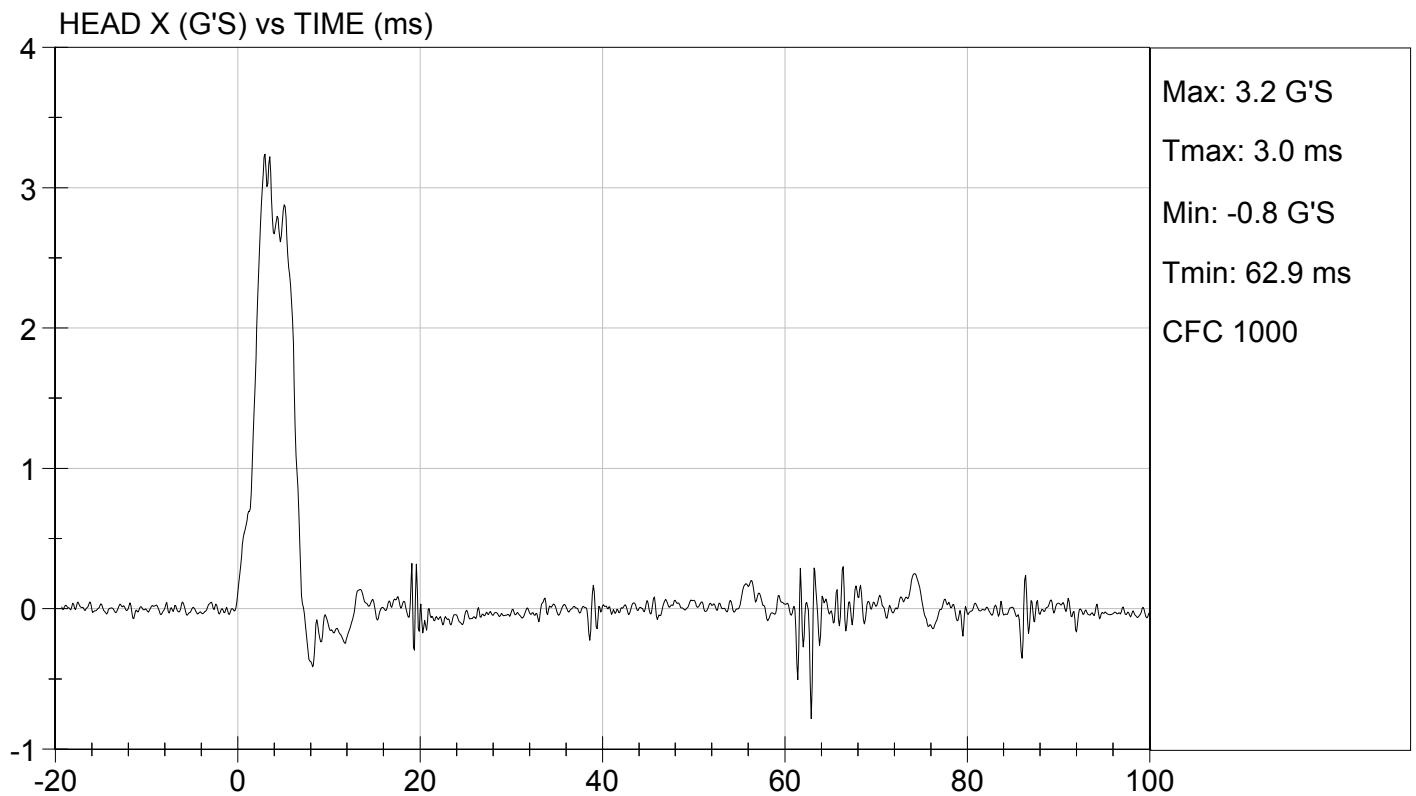
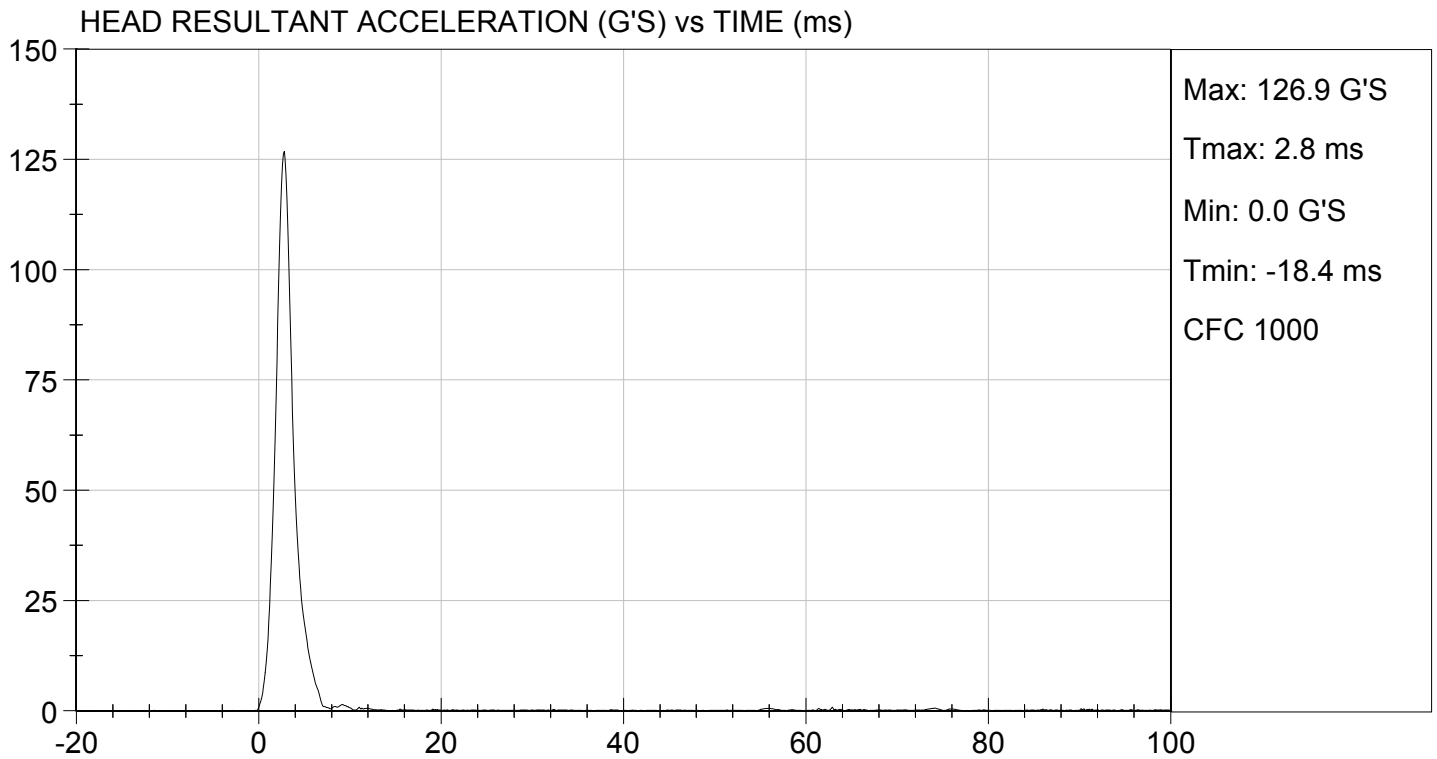
Test ID: D162851

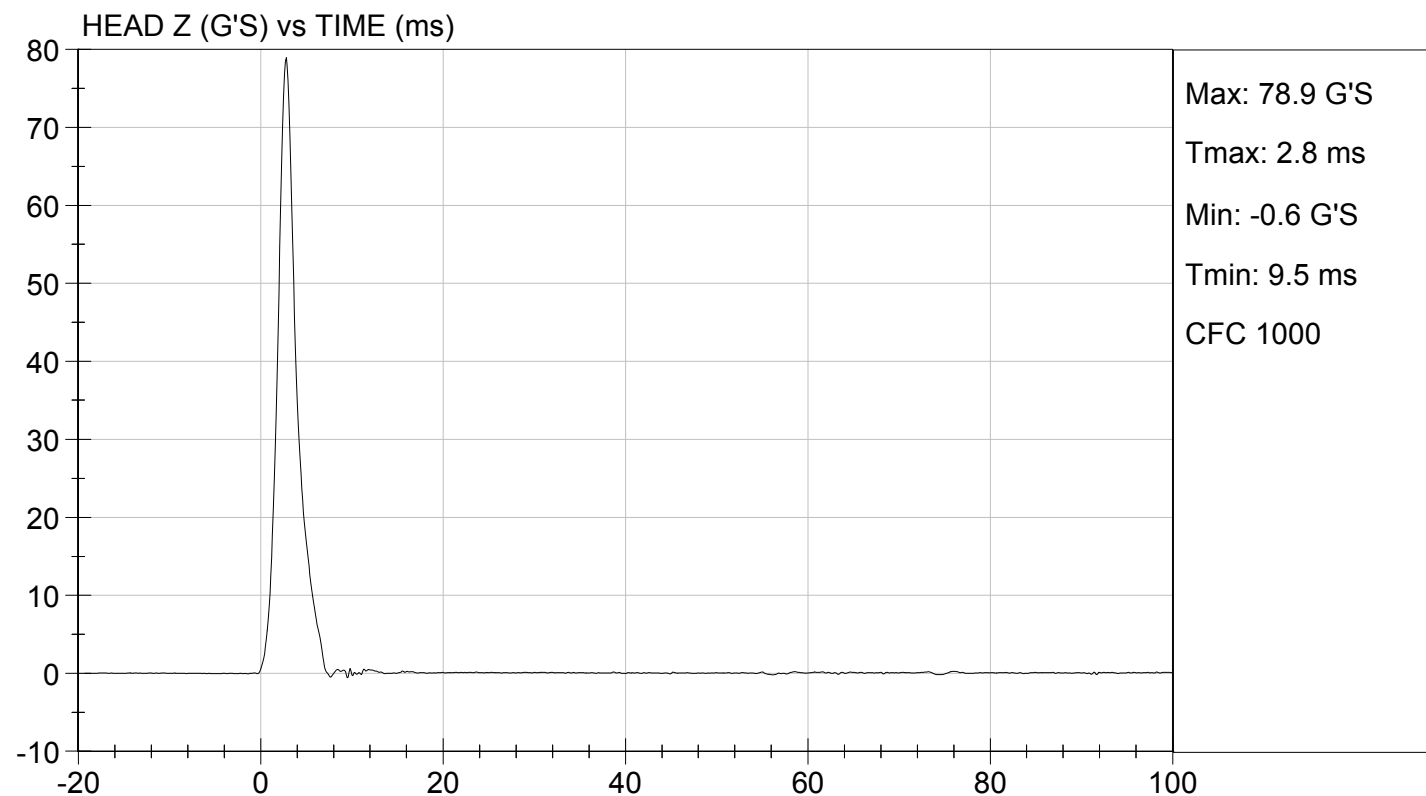
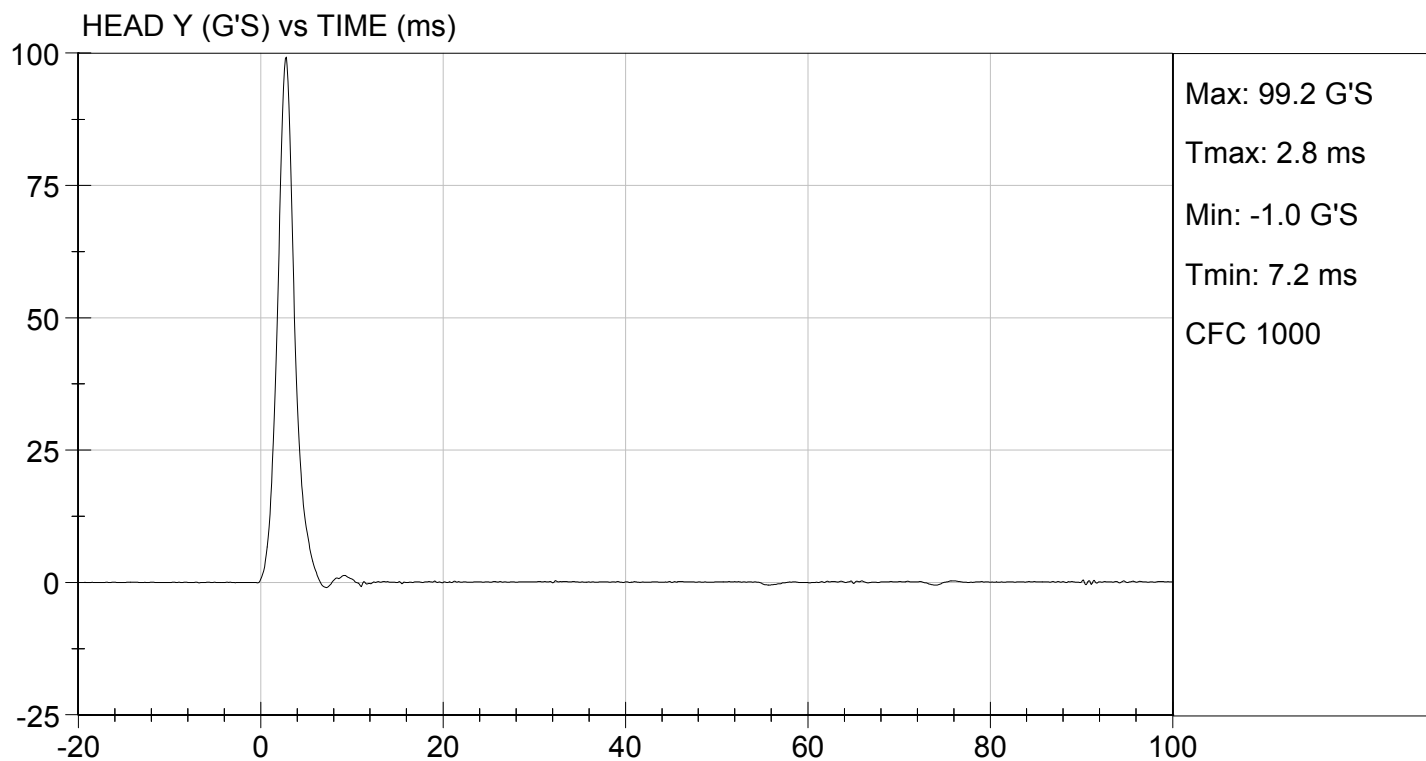
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	115 to 137	127	Pass
Peak Longitudinal Acceleration	G's	+/- 15	3.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results			Pass	


Laboratory Technician

08/25/2016
Test Date


Approved By





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

ATD Serial No: 306

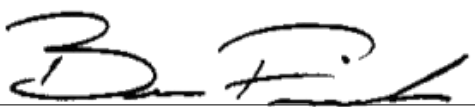
Test I.D: D162852

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.1	Pass
Humidity		%	10 to 70	46	Pass
Impact Velocity		m/s	5.51 to 5.63	5.52	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.59	Pass
	15 ms	m/s	3.30 to 4.10	3.73	Pass
	20 ms	m/s	4.40 to 5.40	5.07	Pass
	25 ms	m/s	5.40 to 6.10	5.50	Pass
	25-100 ms	m/s	5.50 to 6.20	5.53	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	61	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-40	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	112	Pass
Overall Test Results					Pass


 Laboratory Technician

08/25/2016

Test Date

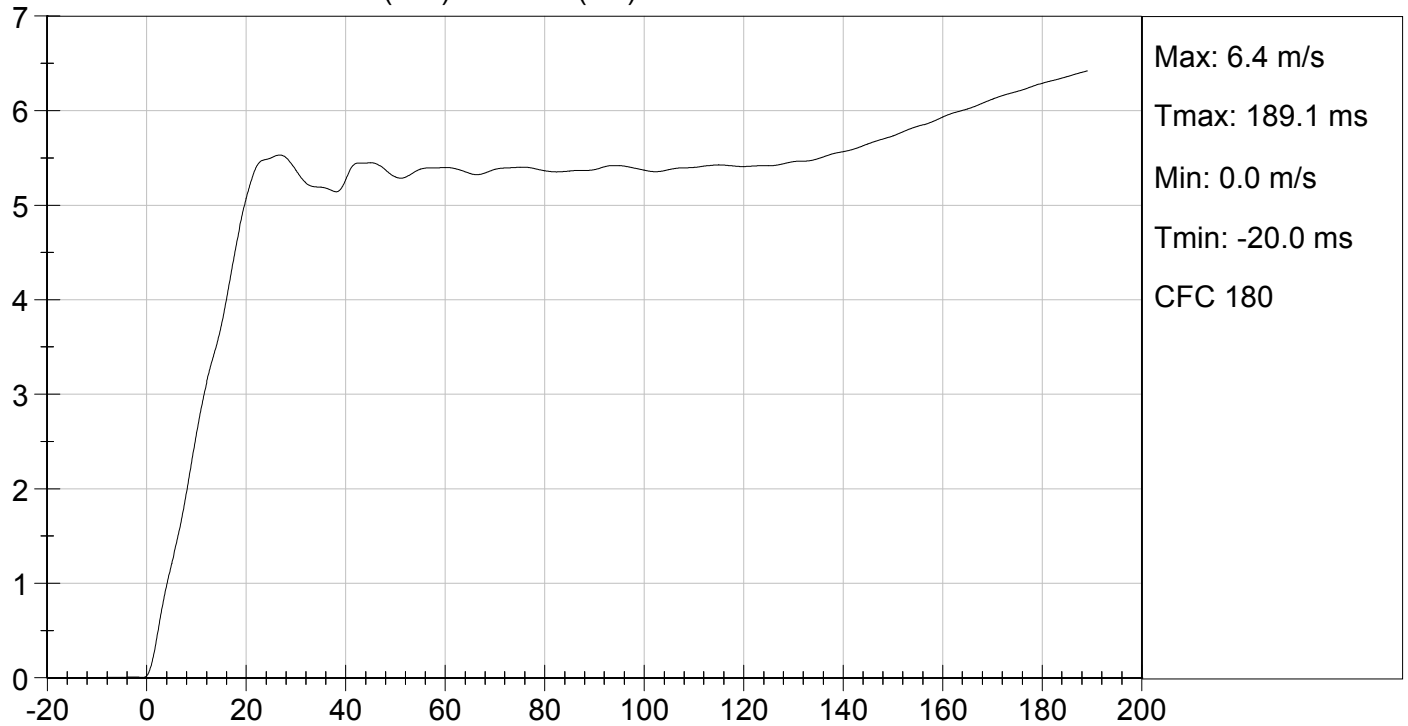

 Approved By



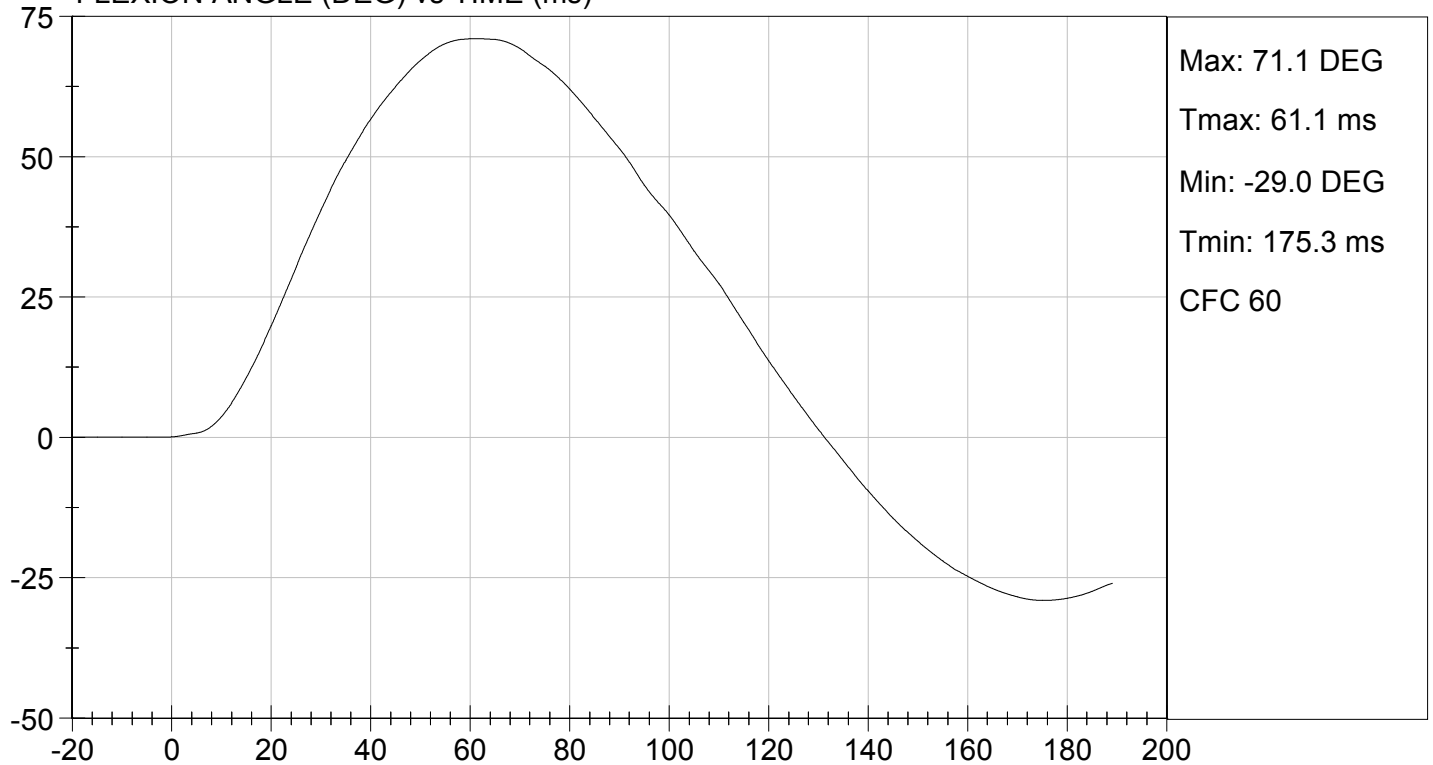
TEST DESC: NECK BENDING
VELOCITY: 18.12 ft/s, 5.52 m/s

TEST DATE: 08/25/2016
TEST #: D162852

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



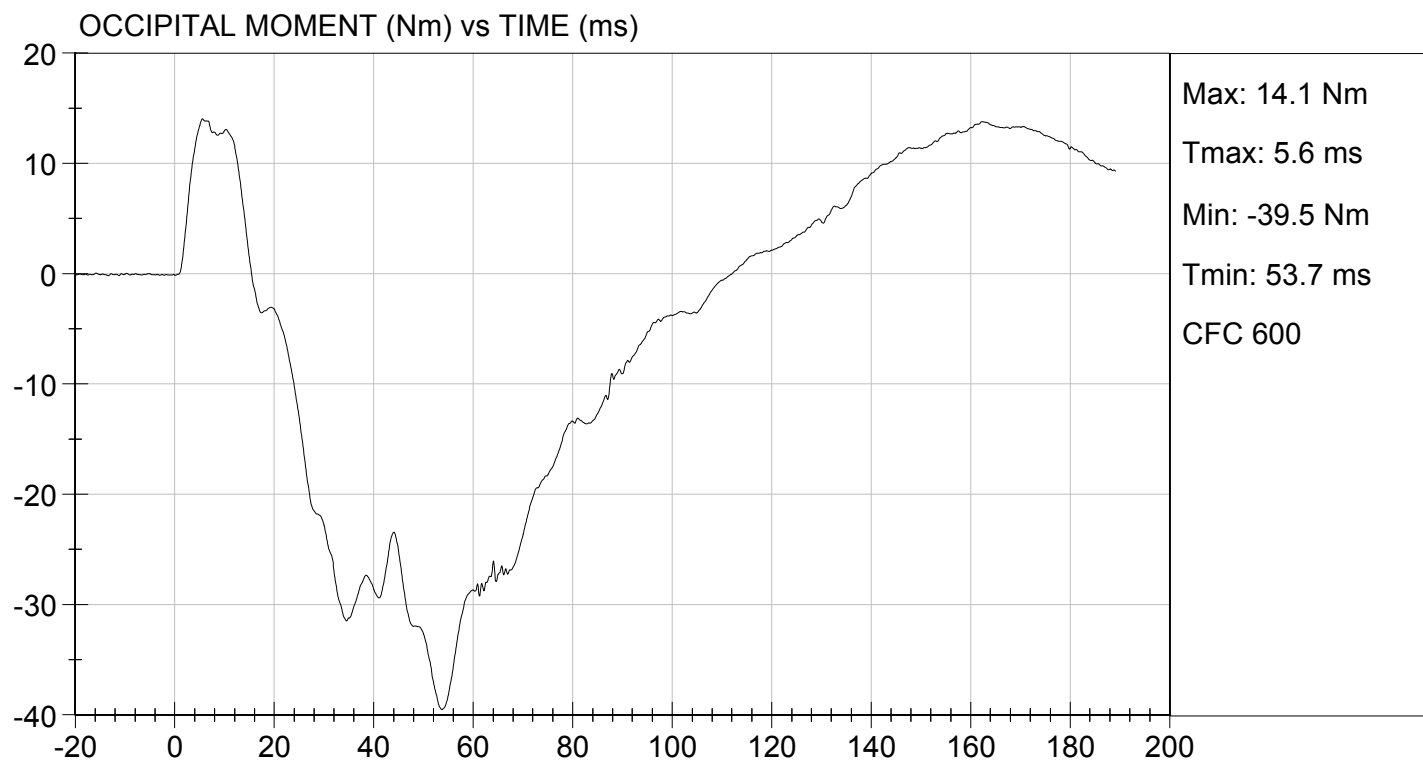
FLEXION ANGLE (DEG) vs TIME (ms)





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

TEST DATE: 08/25/2016
TEST #: D162852

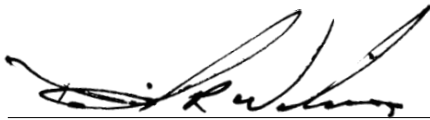


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

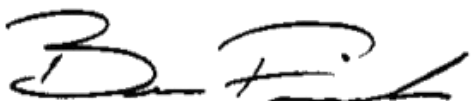
ATD Serial No: 306

Test ID: D162853

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	48	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	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass


Laboratory Technician

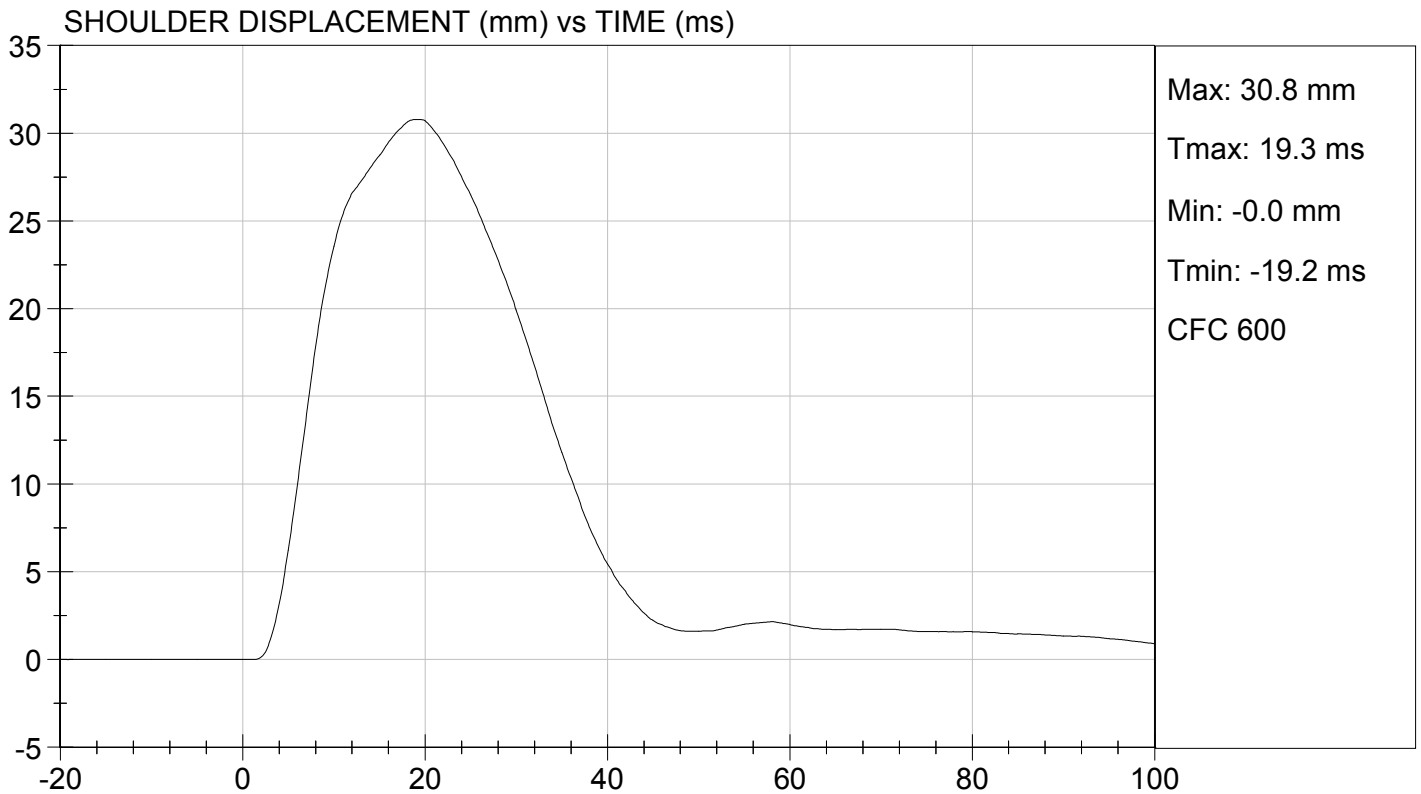
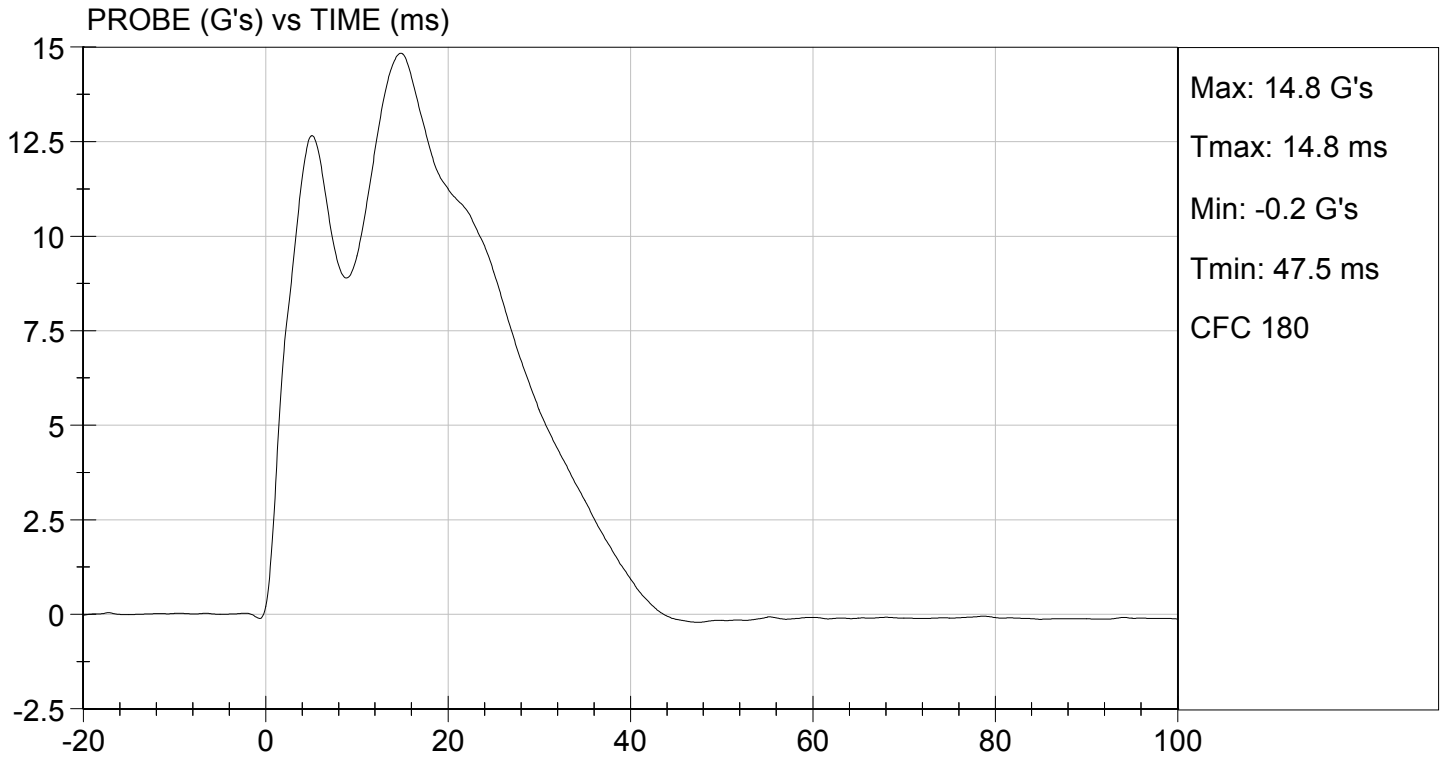
08/25/2016
Test Date


Approved By



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

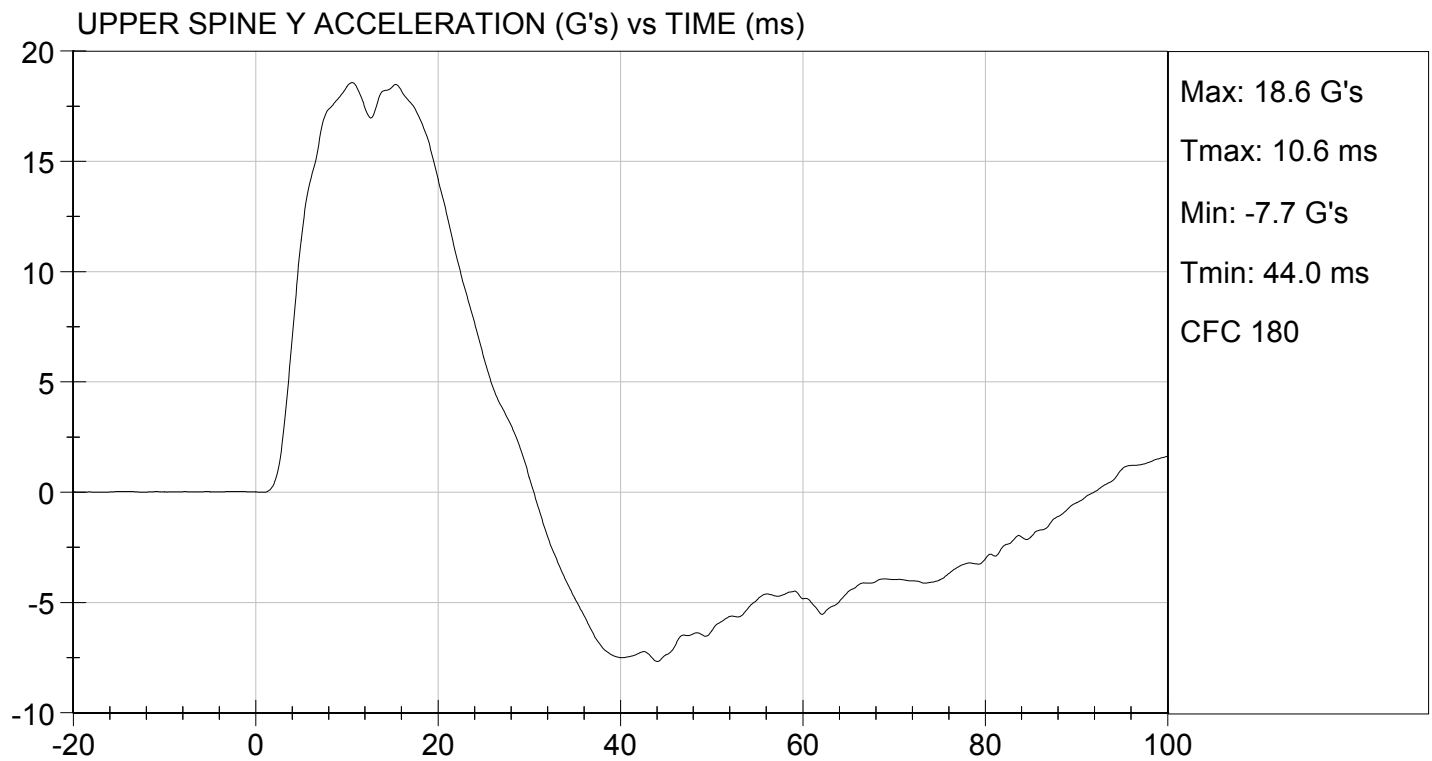
TEST DATE: 08/25/2016
TEST #: D162853





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

TEST DATE: 08/25/2016
TEST #: D162853

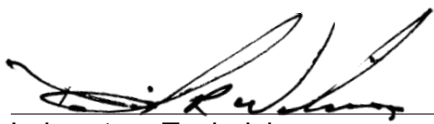


MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

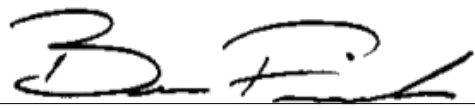
ATD Serial No: 306

Test I.D: D162854

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	36	Pass
Upper Rib Displacement	mm	25 to 32	28	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	33	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results				Pass


Laboratory Technician

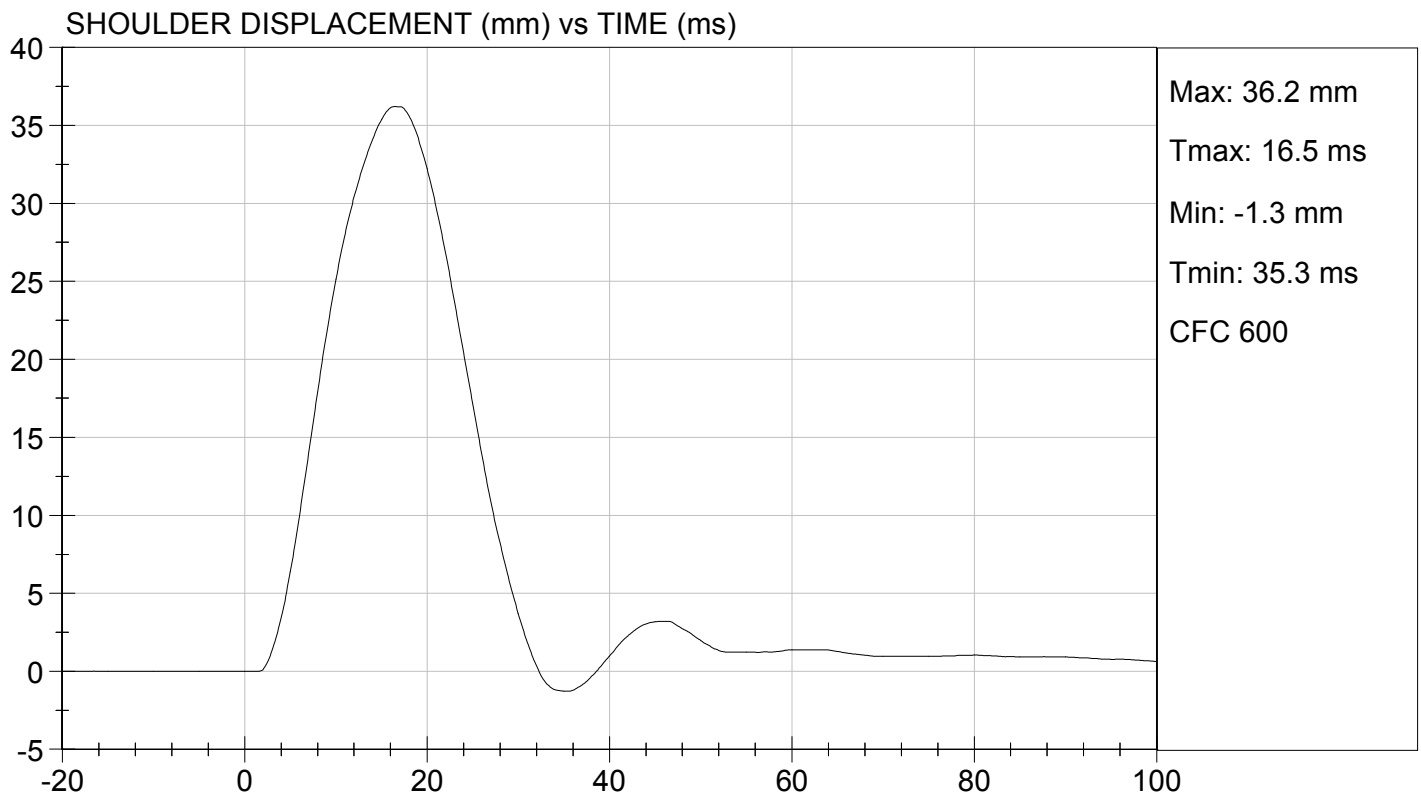
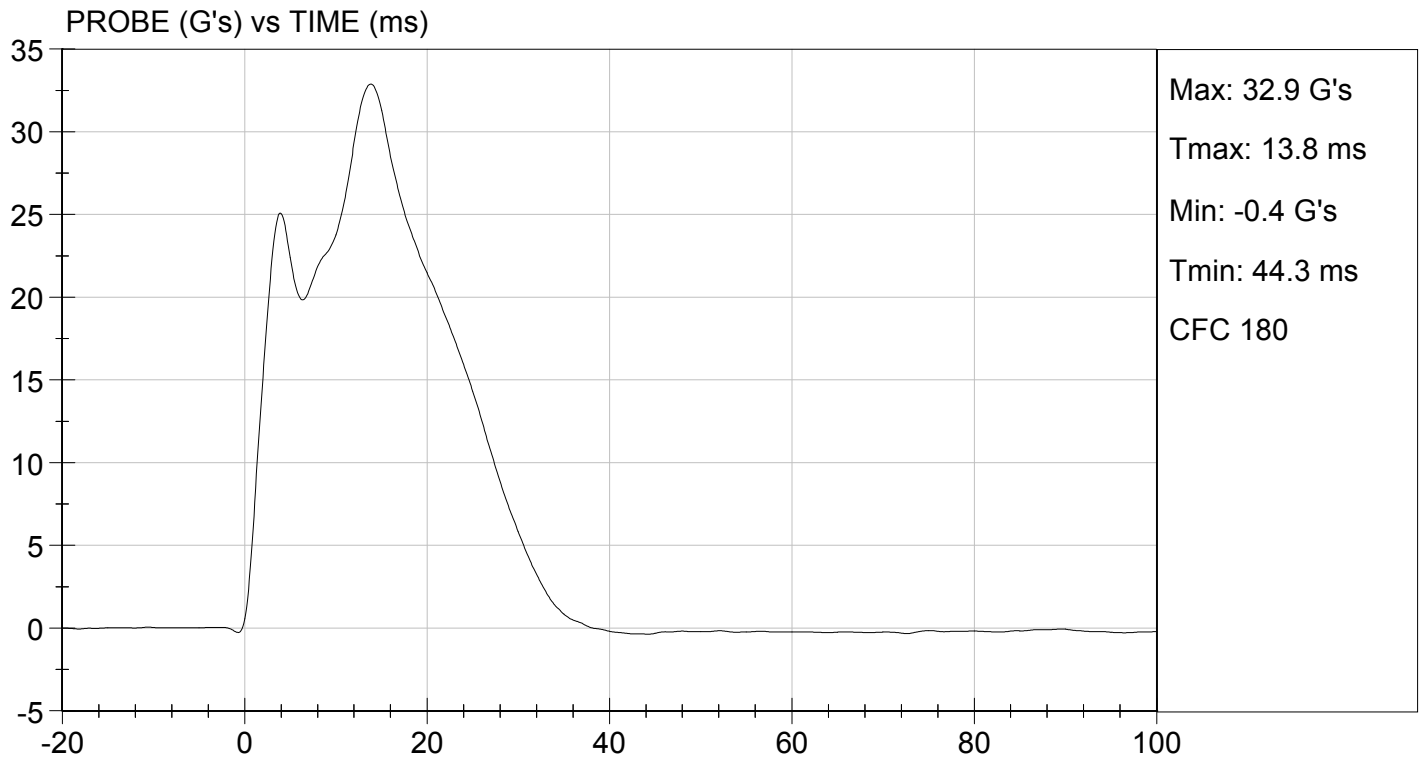
08/25/2016
Test Date

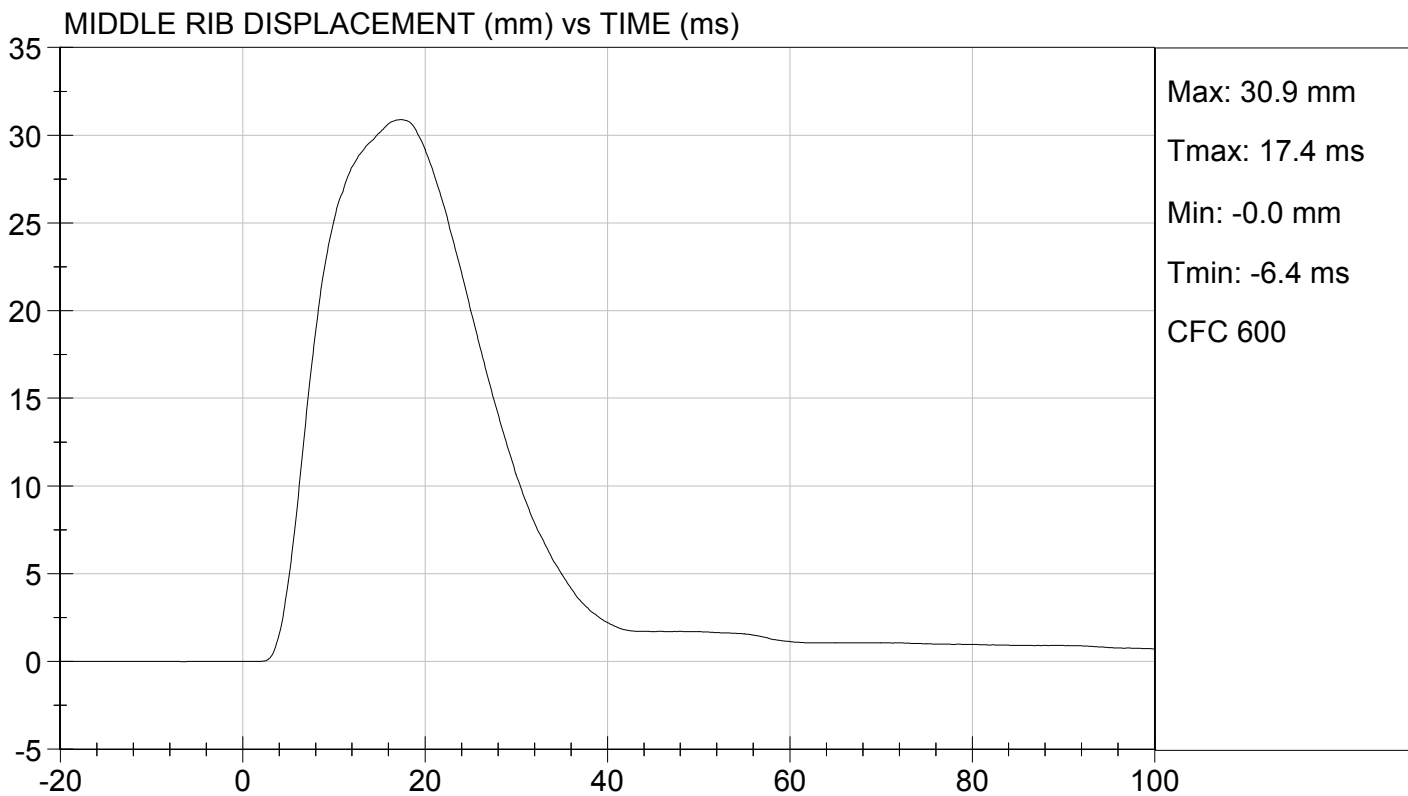
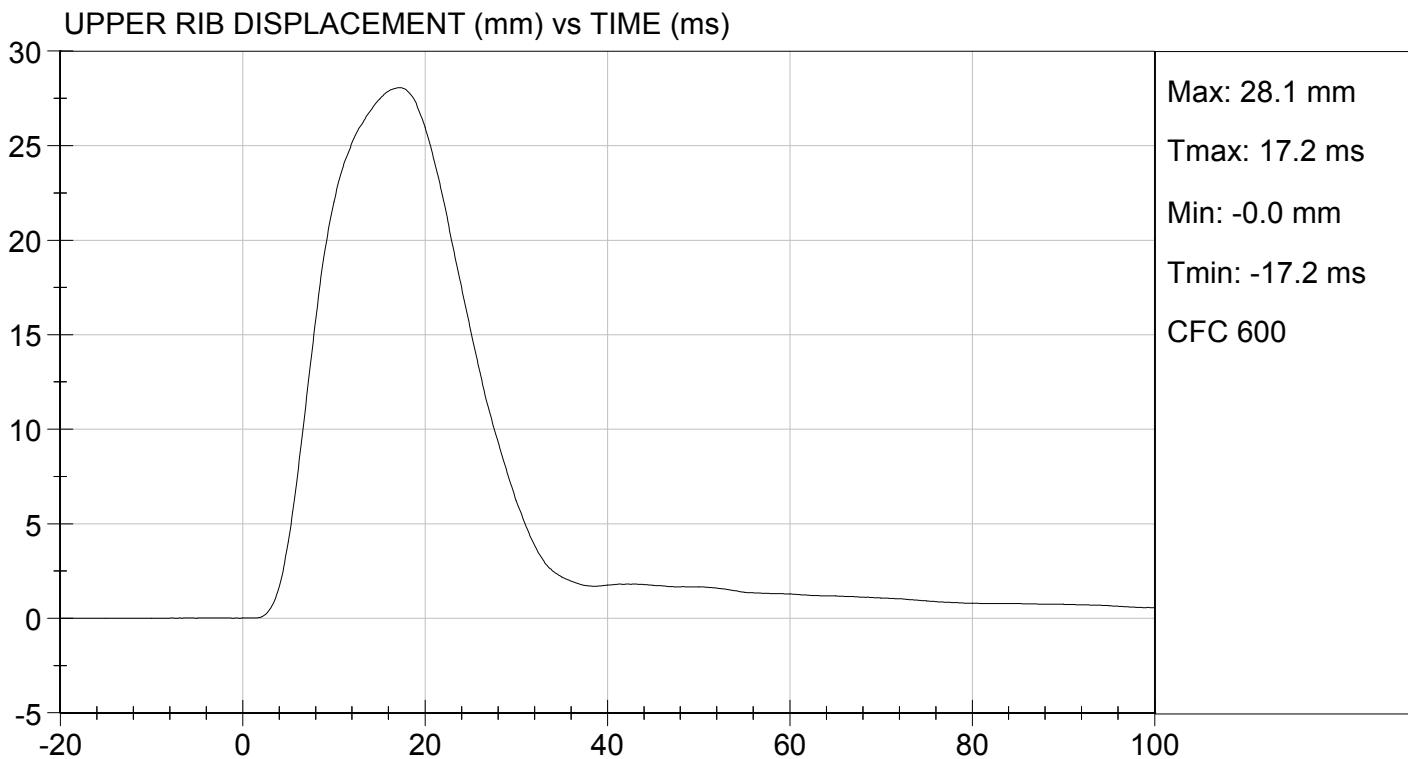

Approved By



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

TEST DATE: 08/25/2016
TEST #: D162854



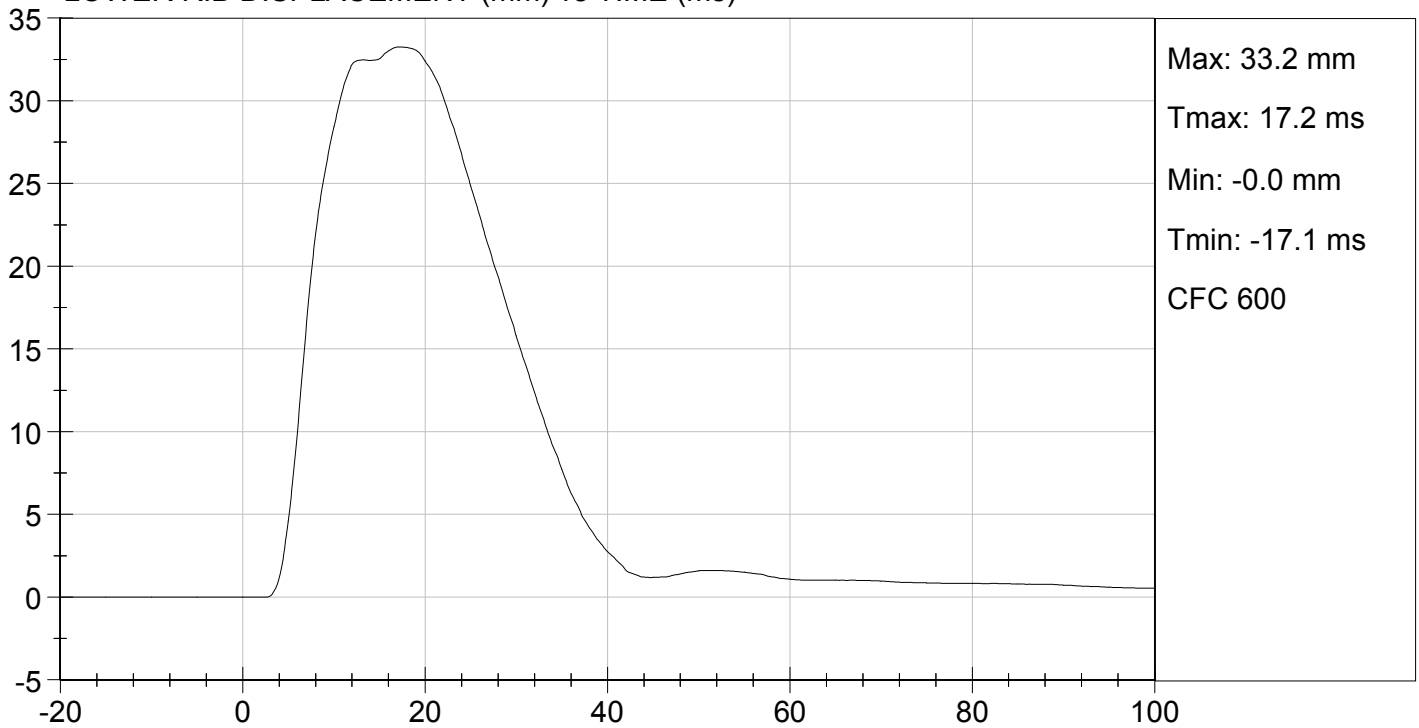




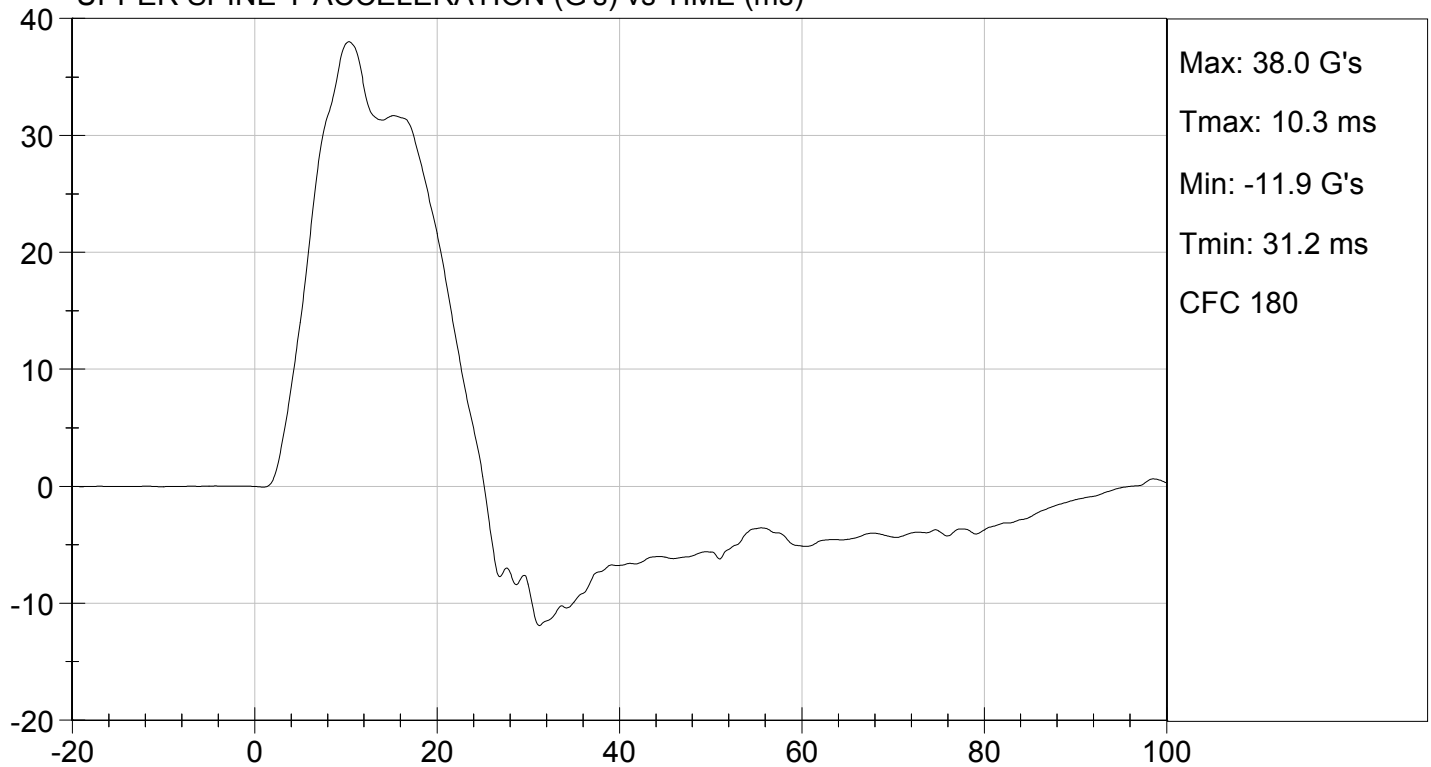
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 08/25/2016
TEST #: D162854

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



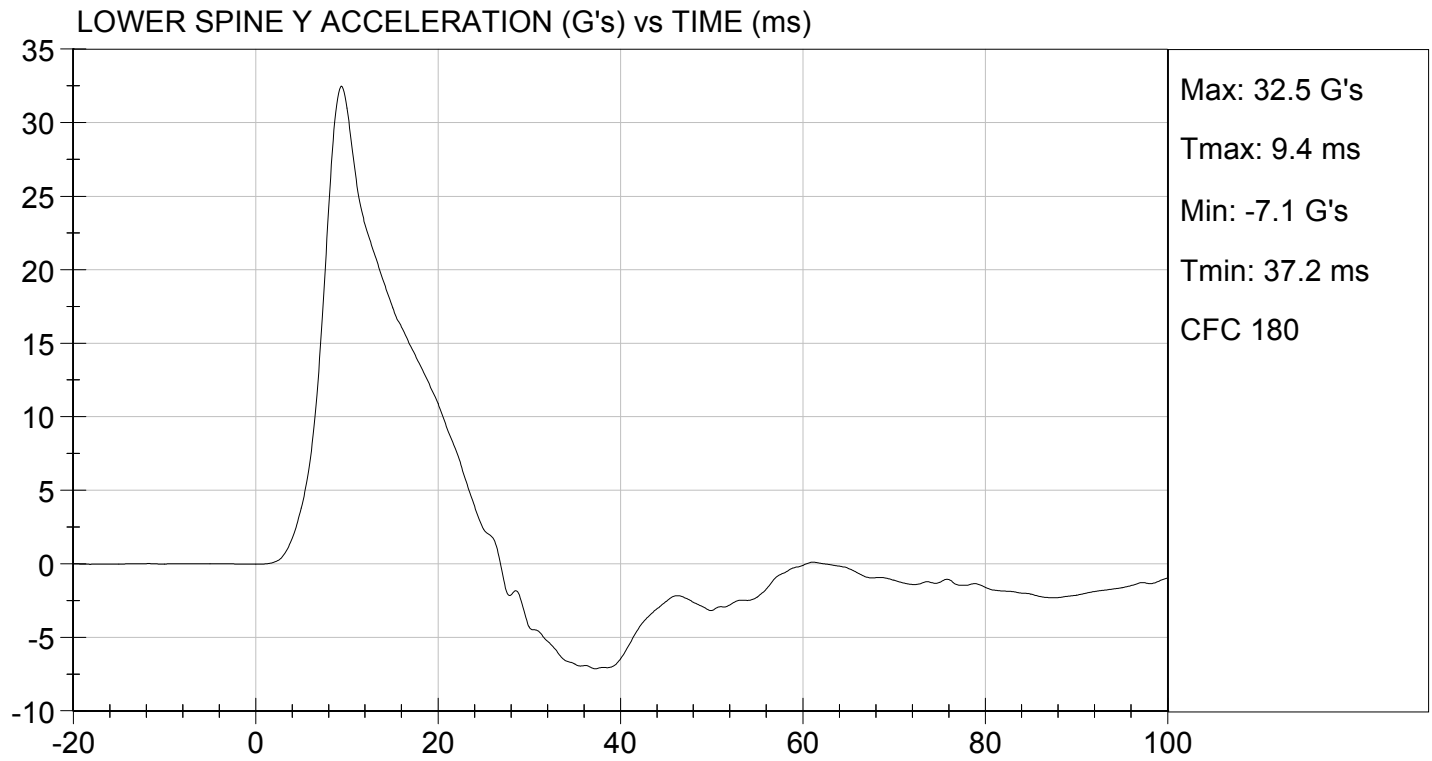
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





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

TEST DATE: 08/25/2016
TEST #: D162854



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

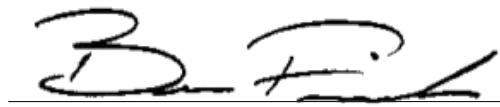
ATD Serial No: 306

Test I.D: D162855

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	38	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass


Laboratory Technician

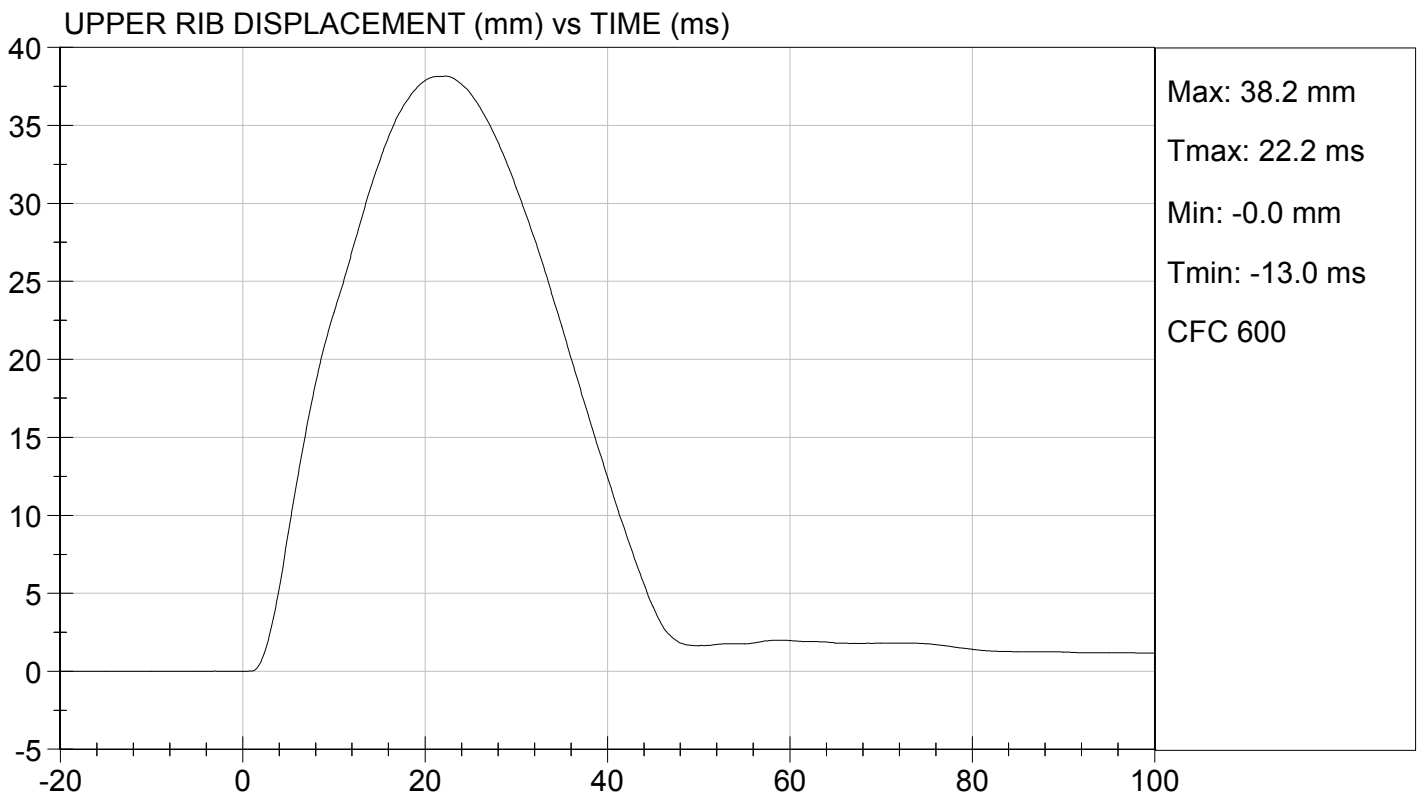
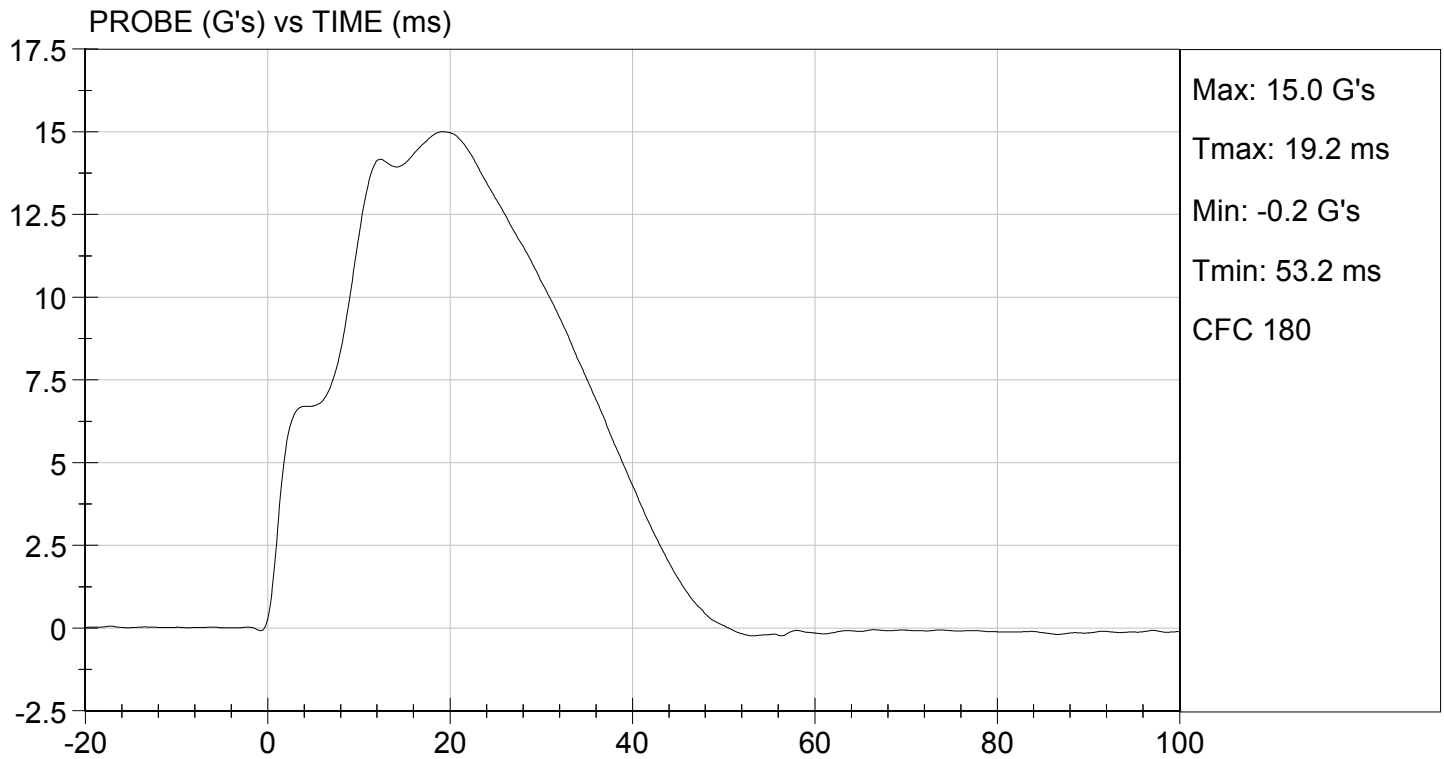
08/25/2016
Test Date


Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.37 ft/s, 4.38 m/s

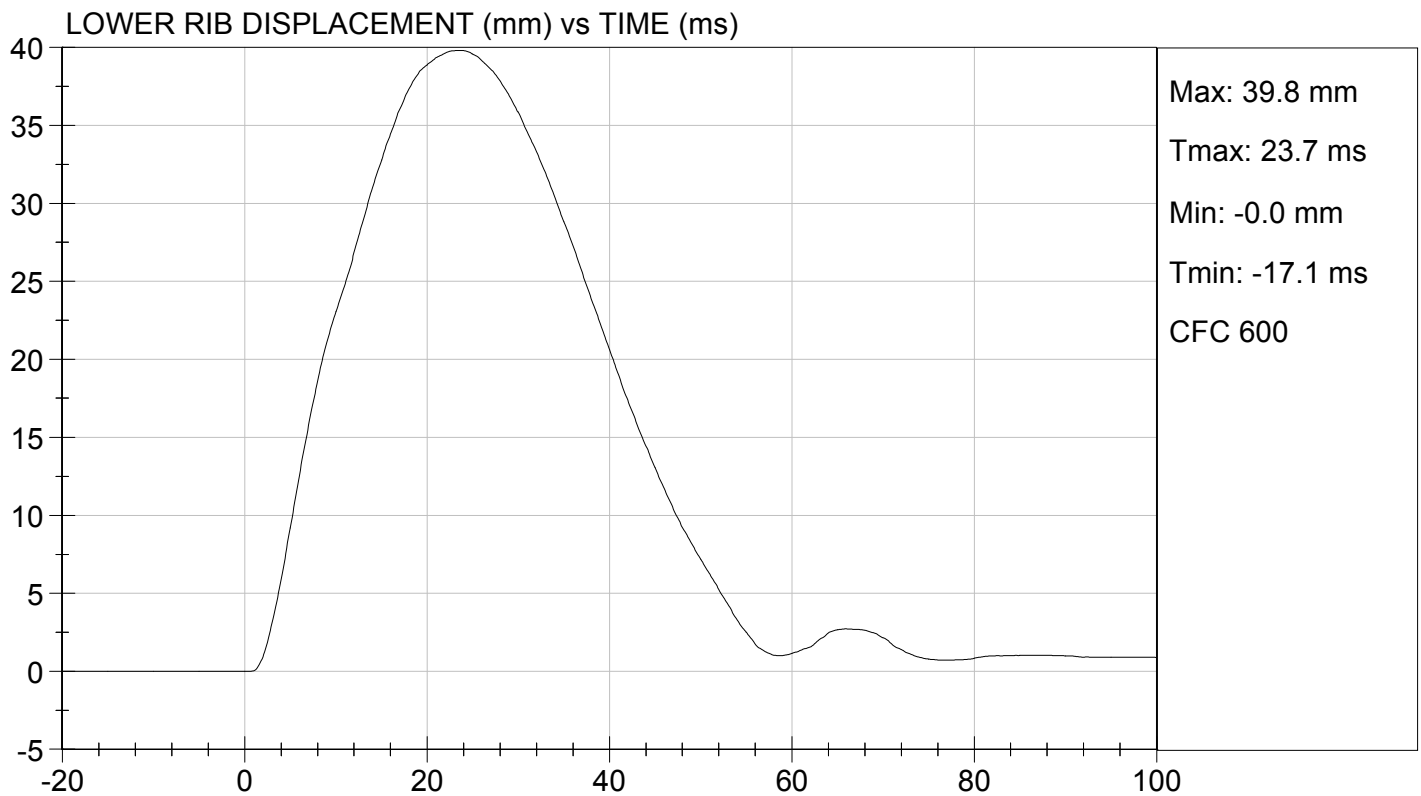
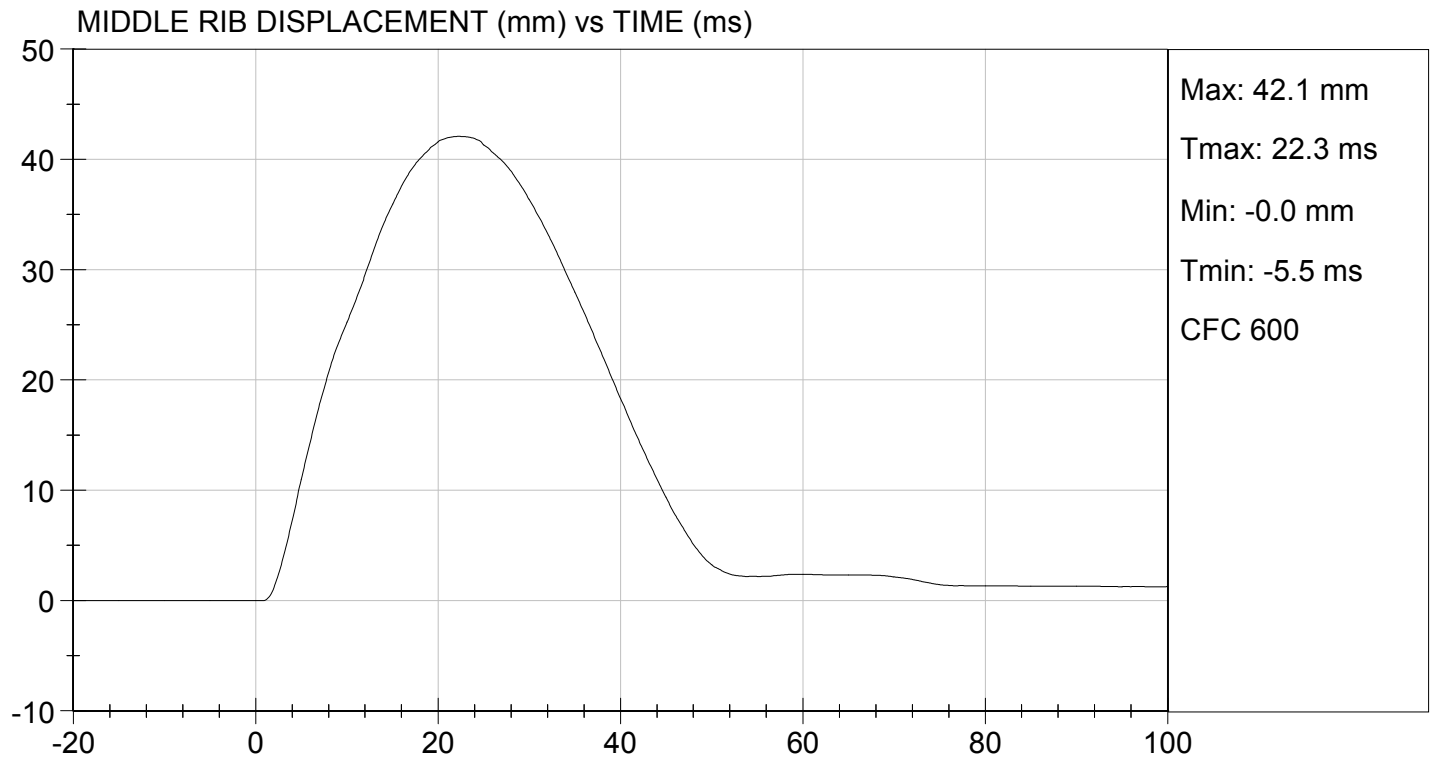
TEST DATE: 08/25/2016
TEST #: D162855





TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 08/25/2016
TEST #: D162855

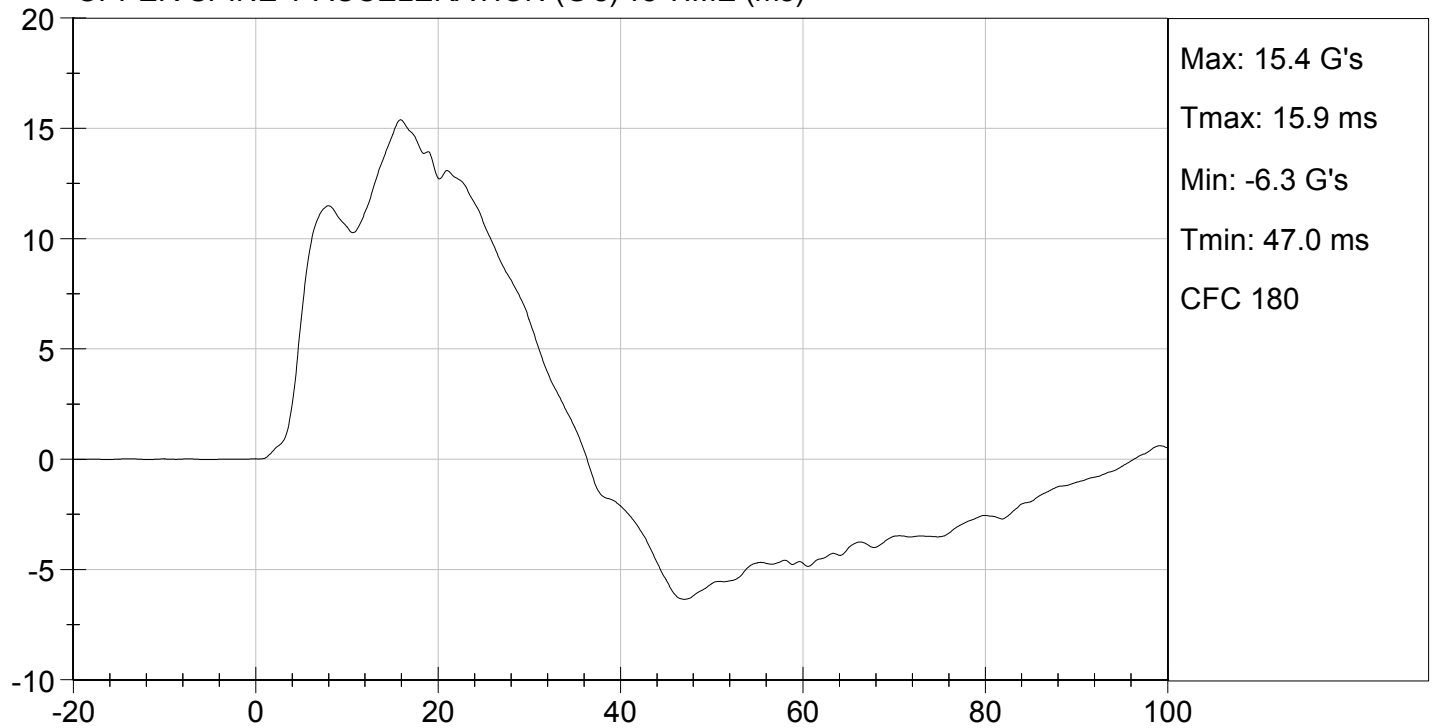




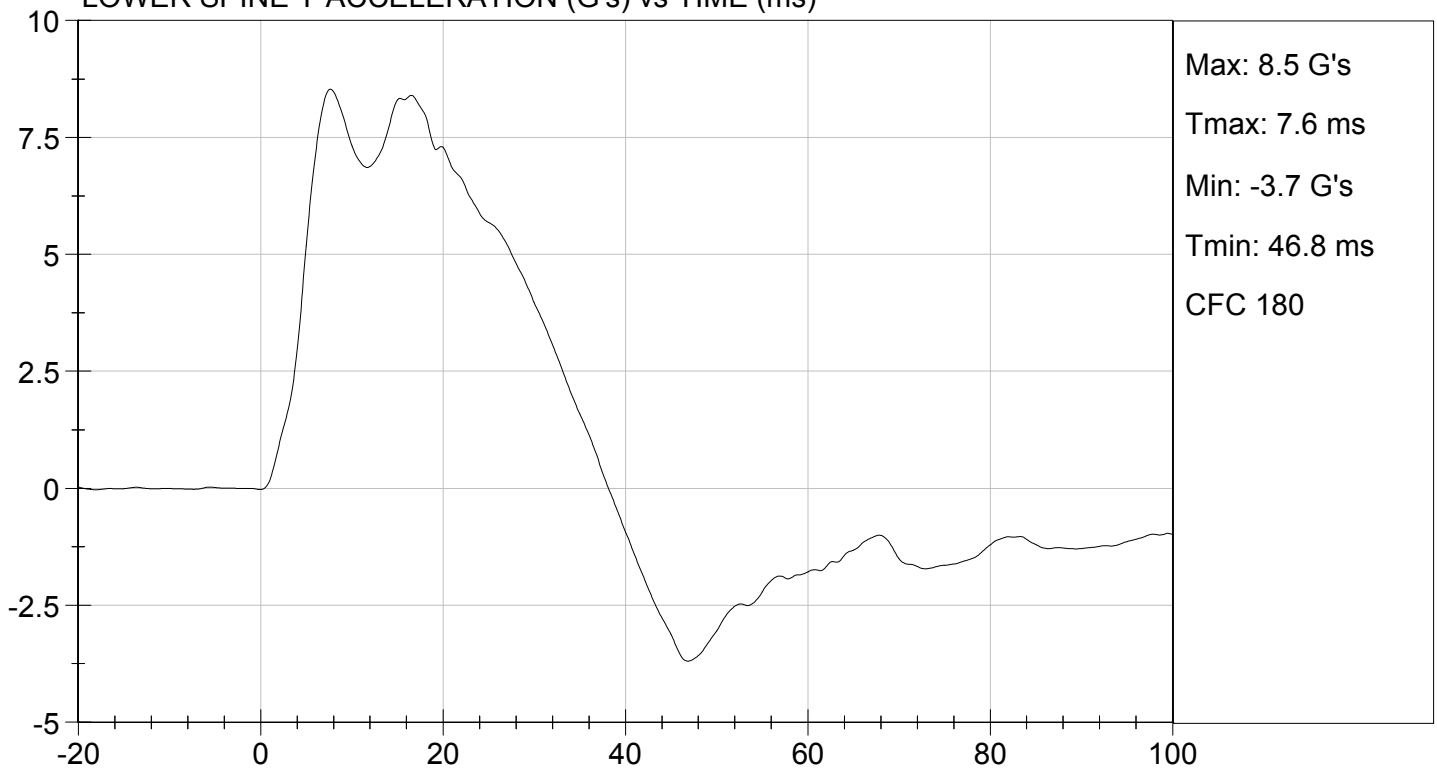
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 08/25/2016
TEST #: D162855

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



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



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

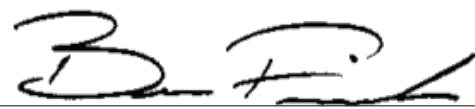
Test I.D: D162856

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	39	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

08/25/2016

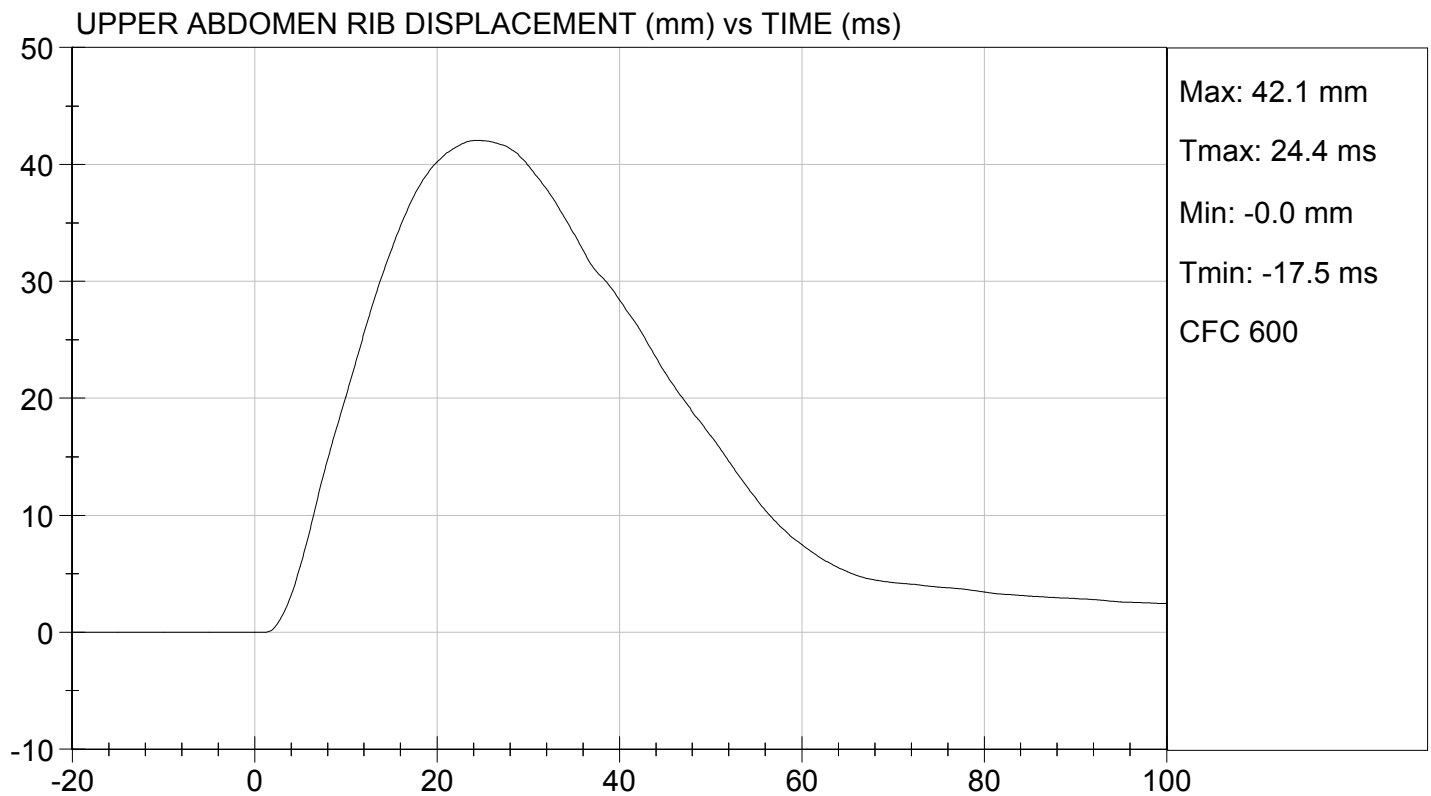
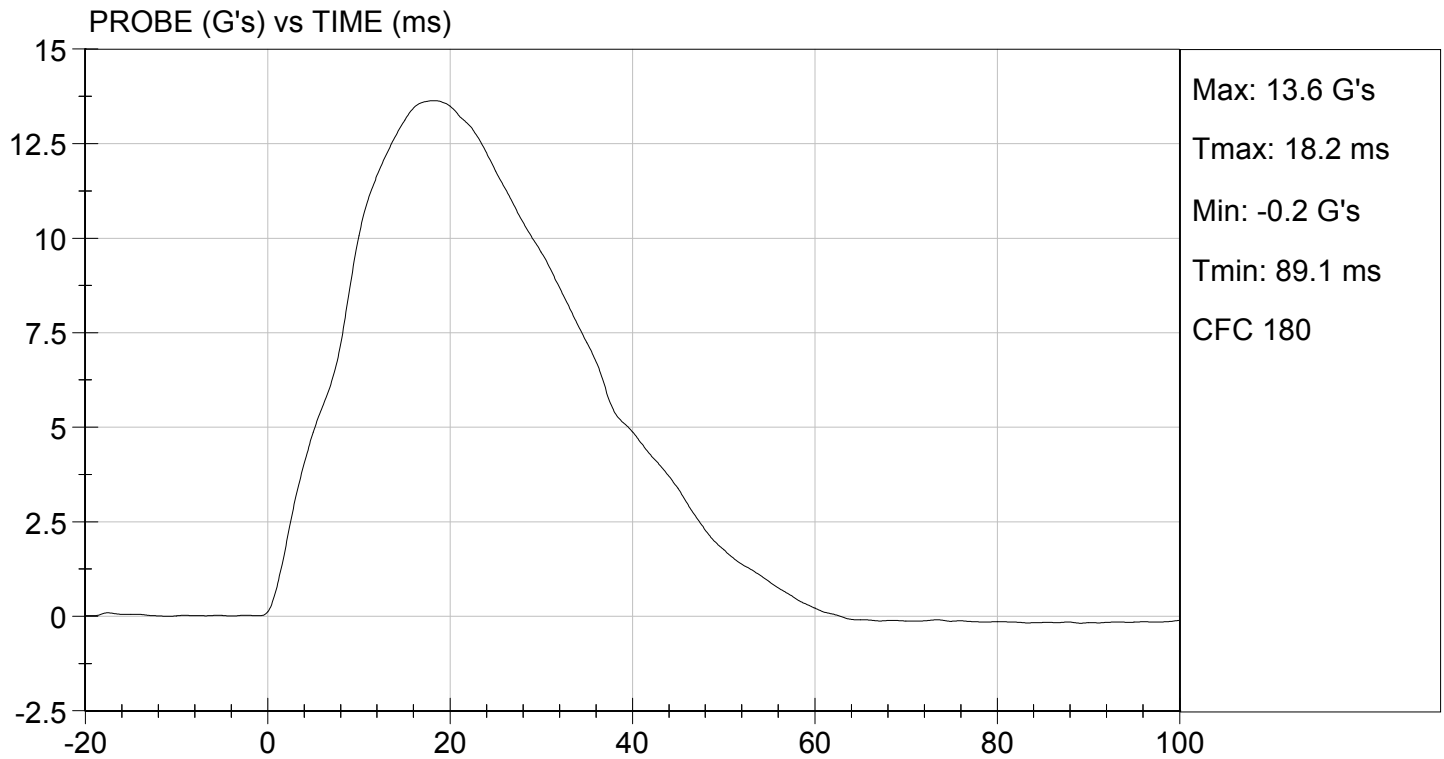
Test Date


Approved By



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

TEST DATE: 08/25/2016
TEST #: D162856

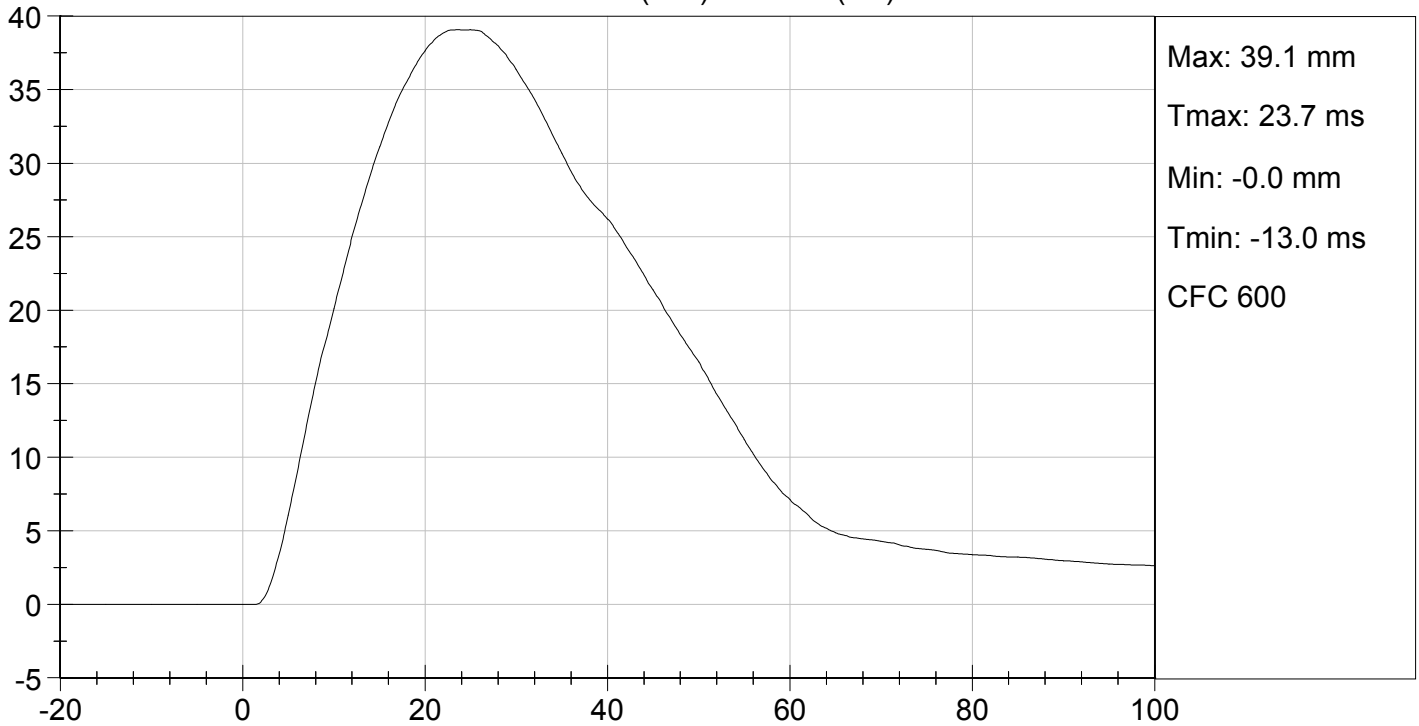




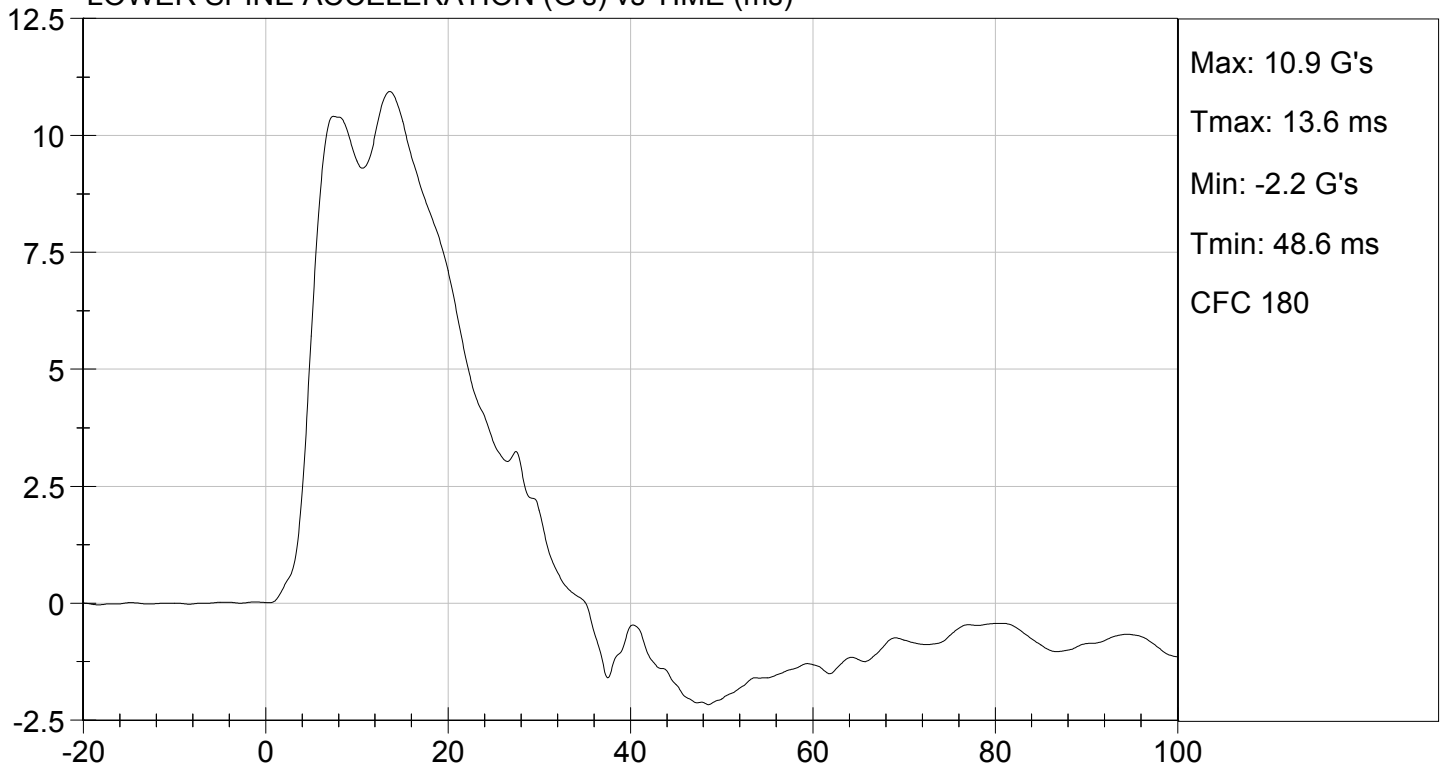
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 08/25/2016
TEST #: D162856

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

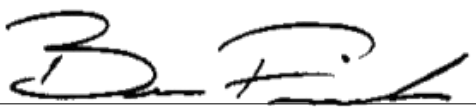
Test I.D: D162857

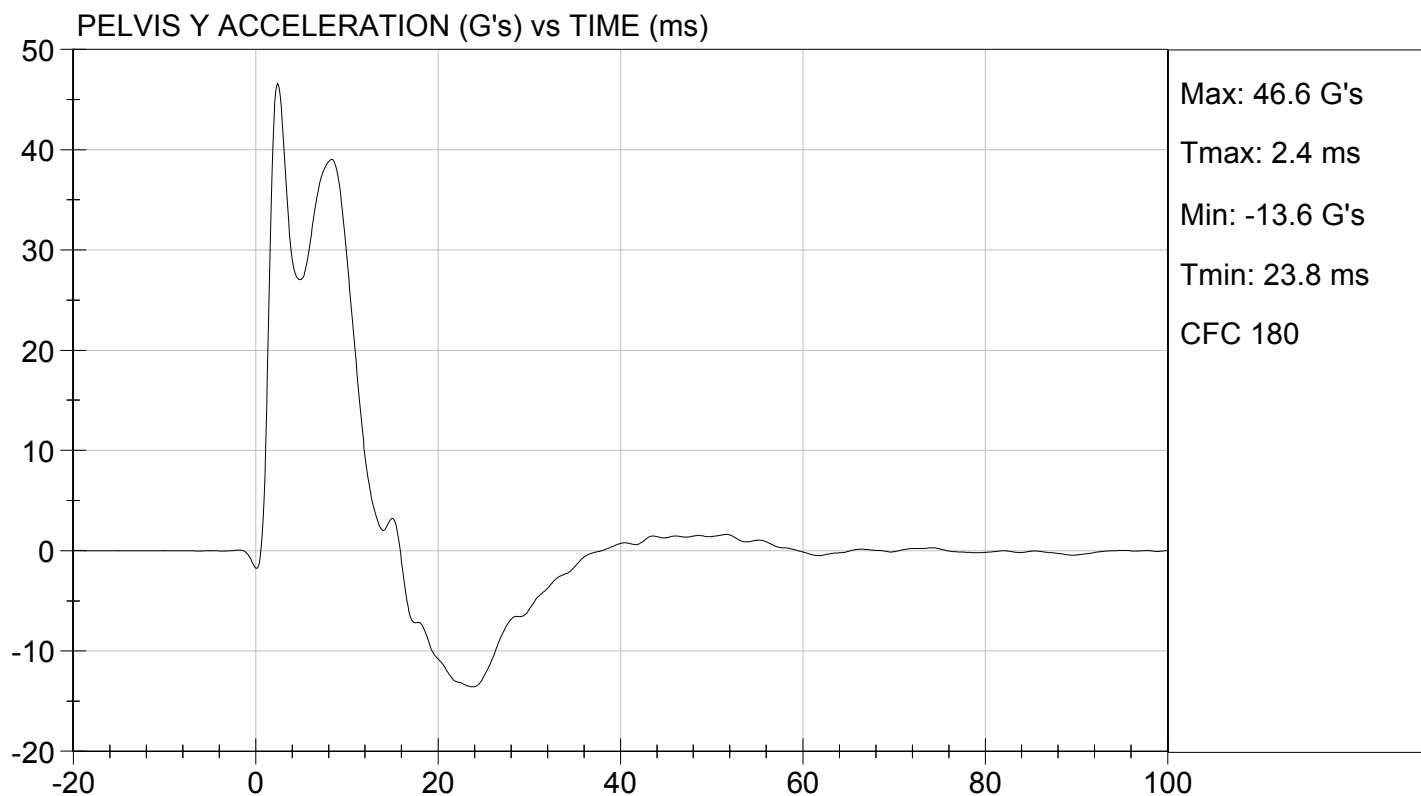
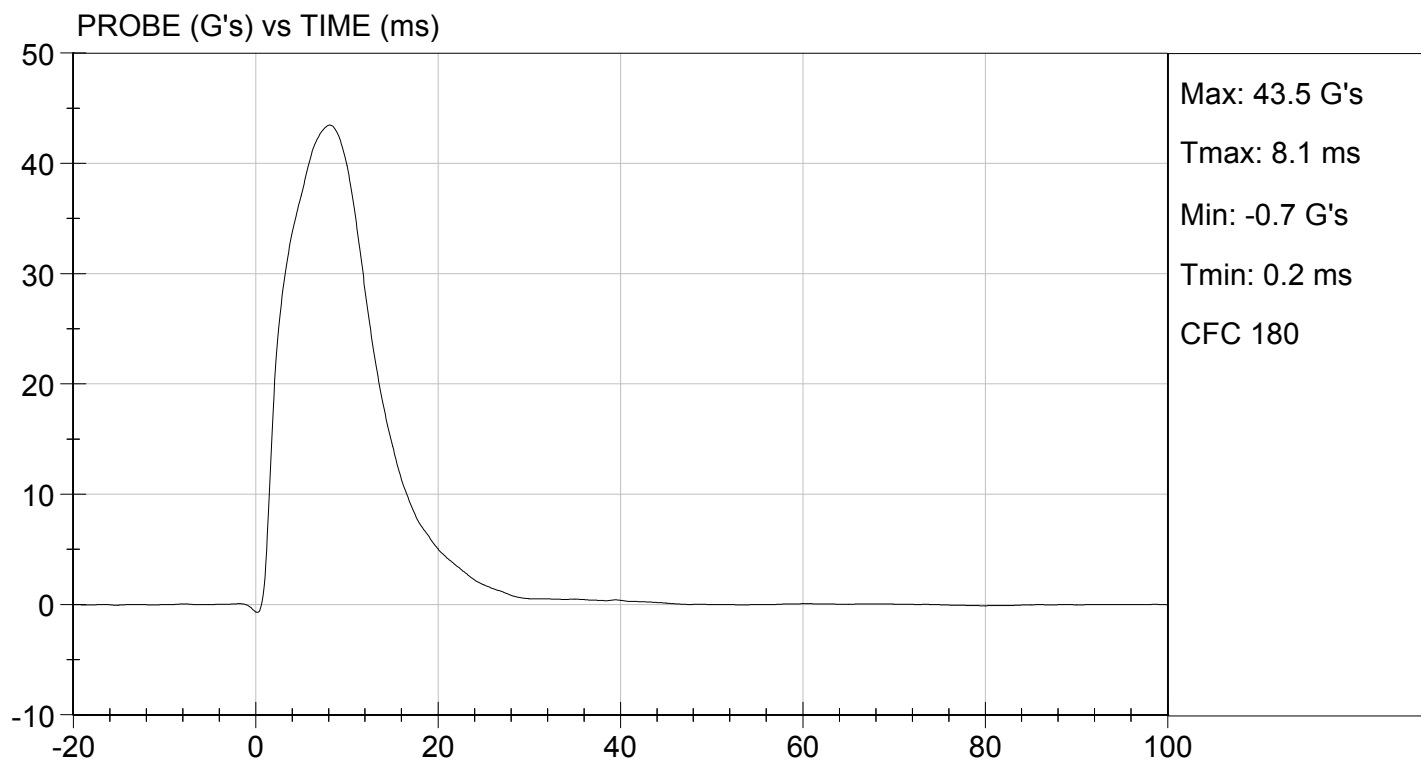
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	4,023	Pass
Overall Test Results				Pass


Laboratory Technician

08/25/2016

Test Date

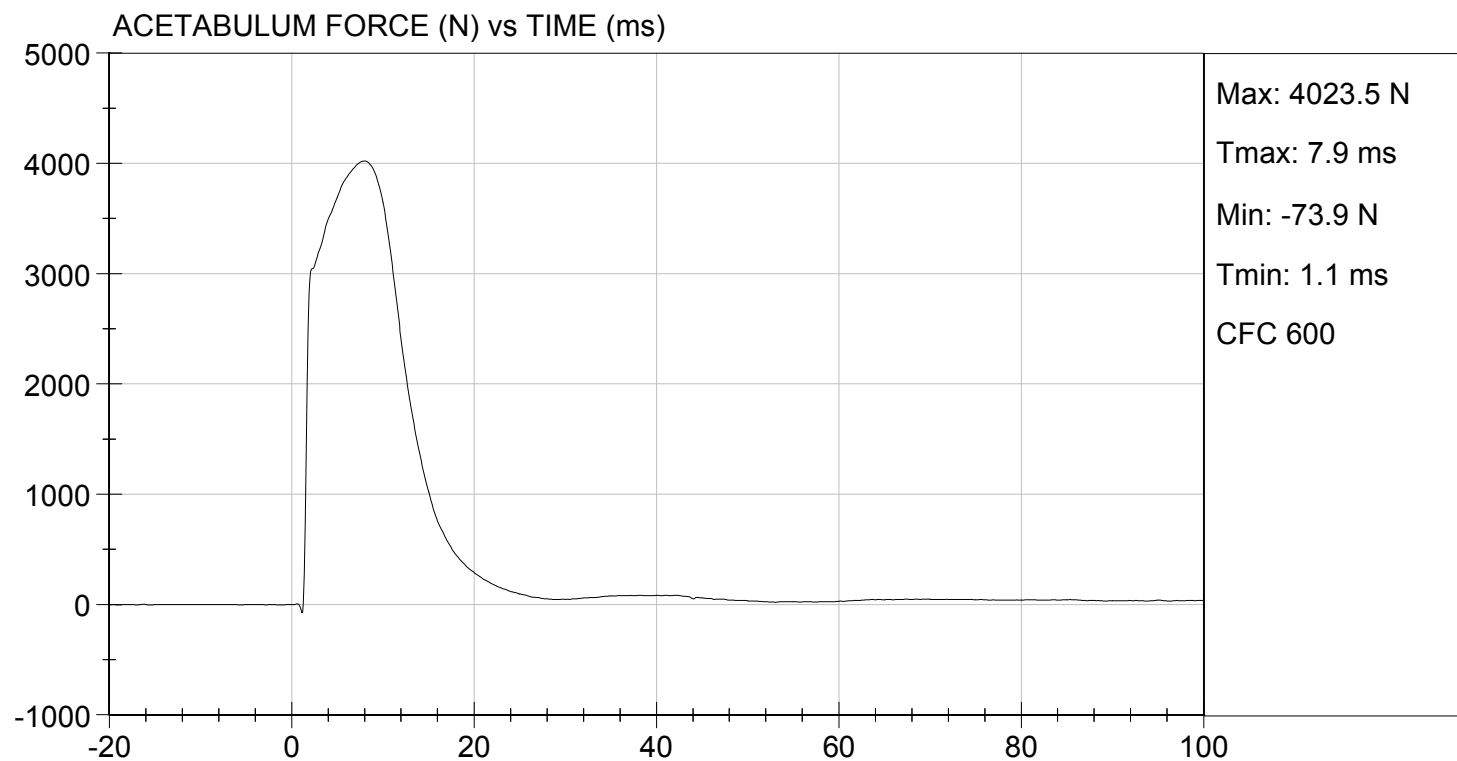

Approved By





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

TEST DATE: 08/25/2016
TEST #: D162857



MGA RESEARCH CORPORATION

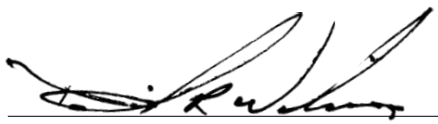
ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

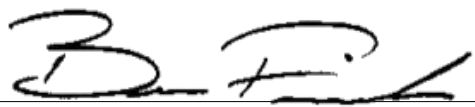
Test I.D: D162858

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	48	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	31	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,512	Pass
Overall Test Results				Pass


Laboratory Technician

08/25/2016

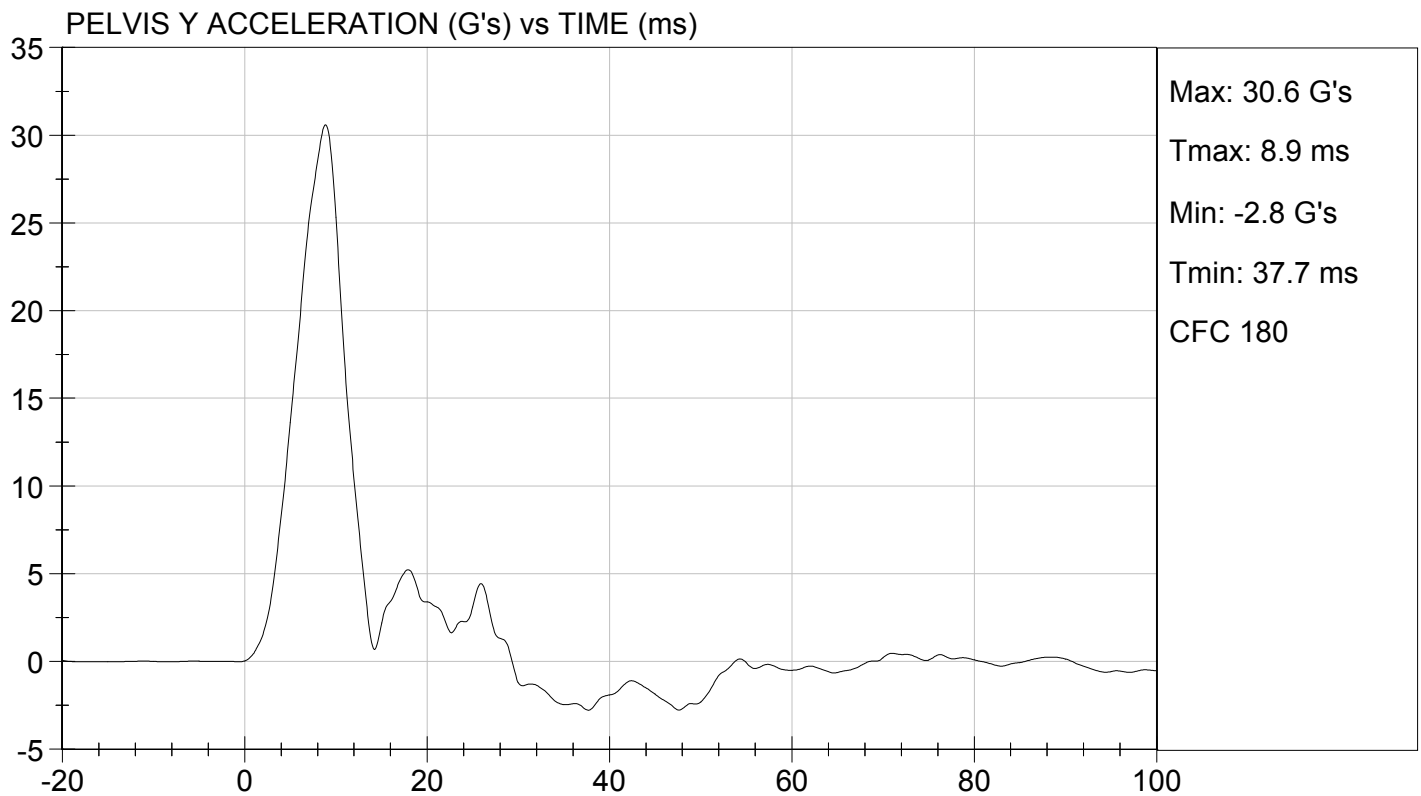
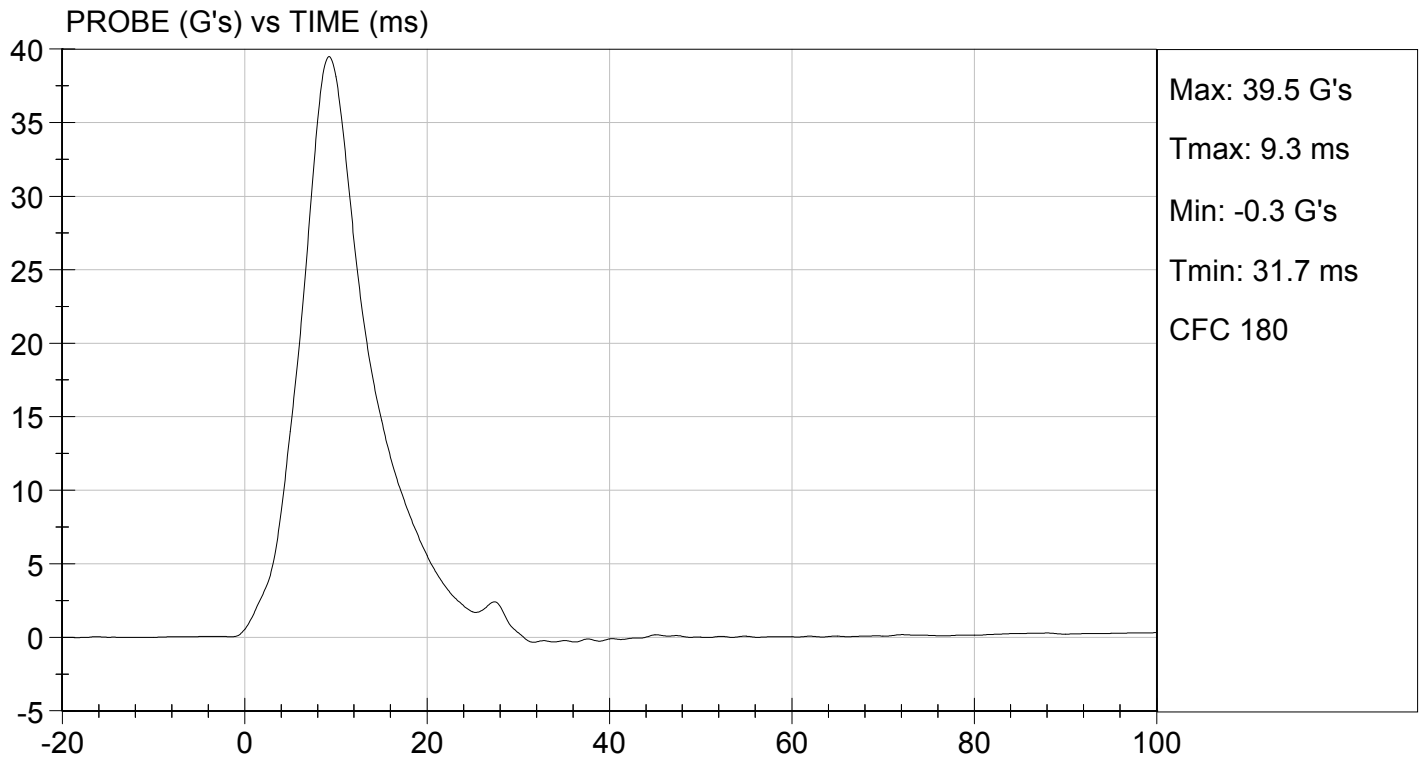
Test Date


Approved By



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

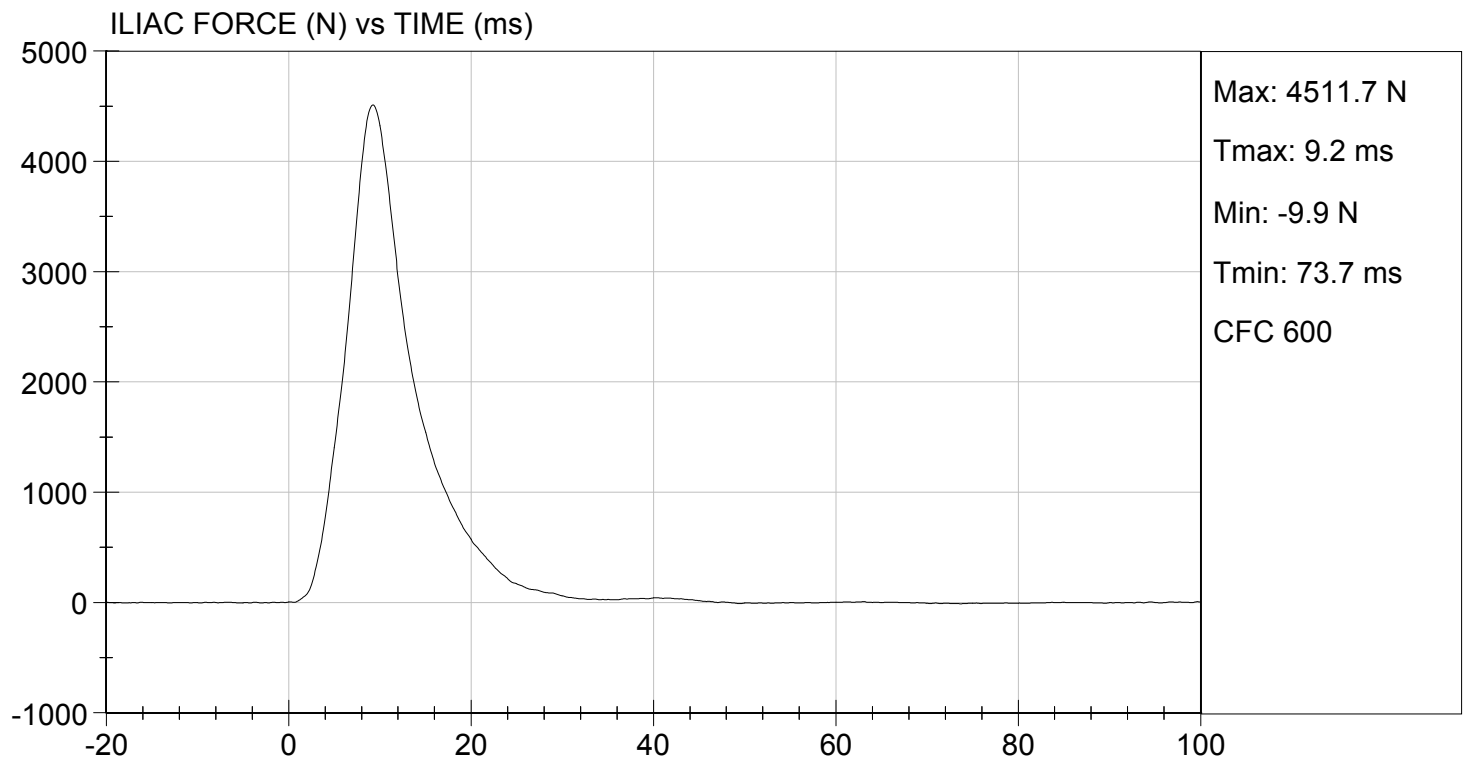
TEST DATE: 08/25/2016
TEST #: D162858



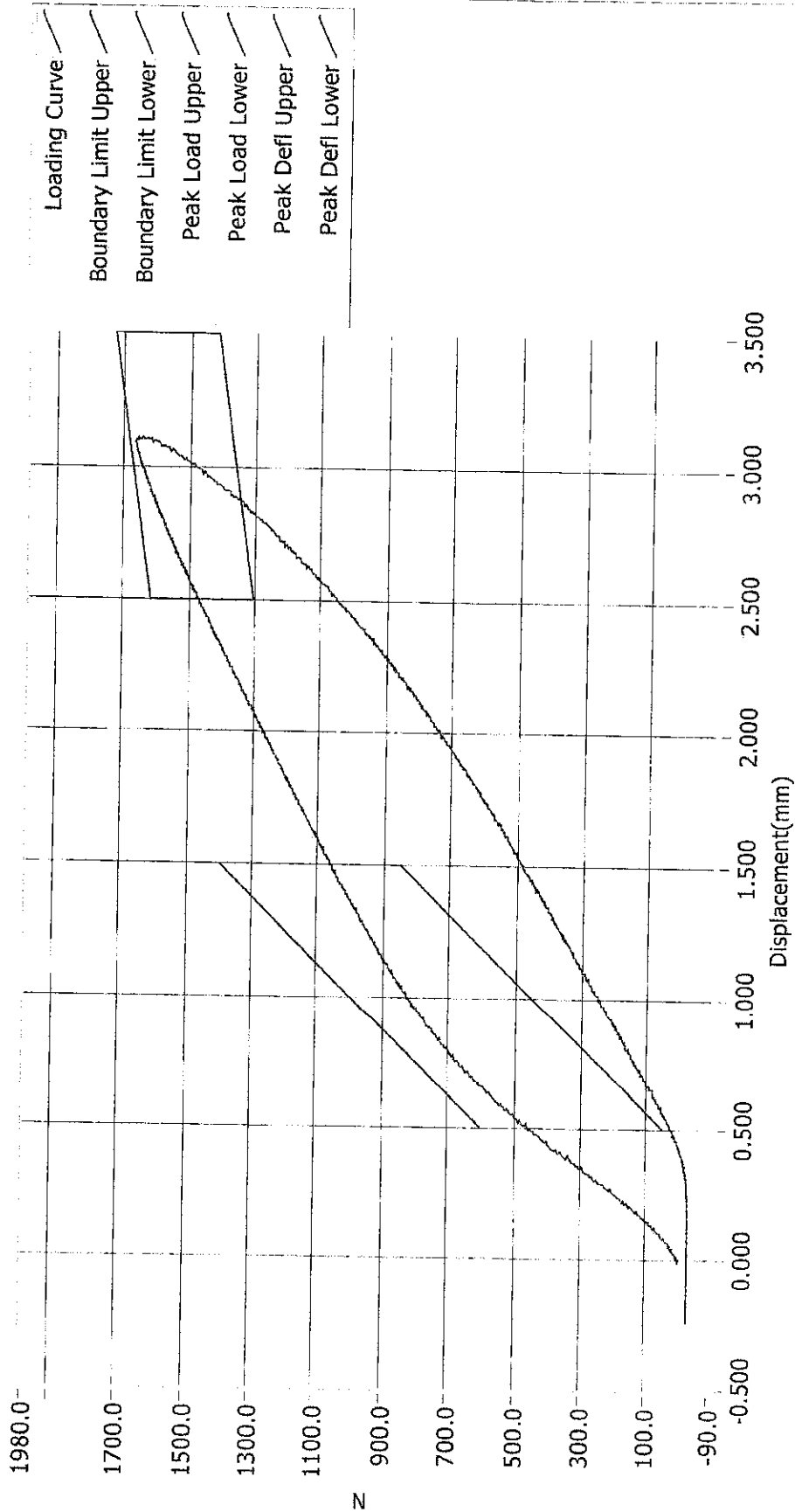


TEST DESC: ILLIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 08/25/2016
TEST #: D162858



Resultant Data - SIDIIs Plug Compression

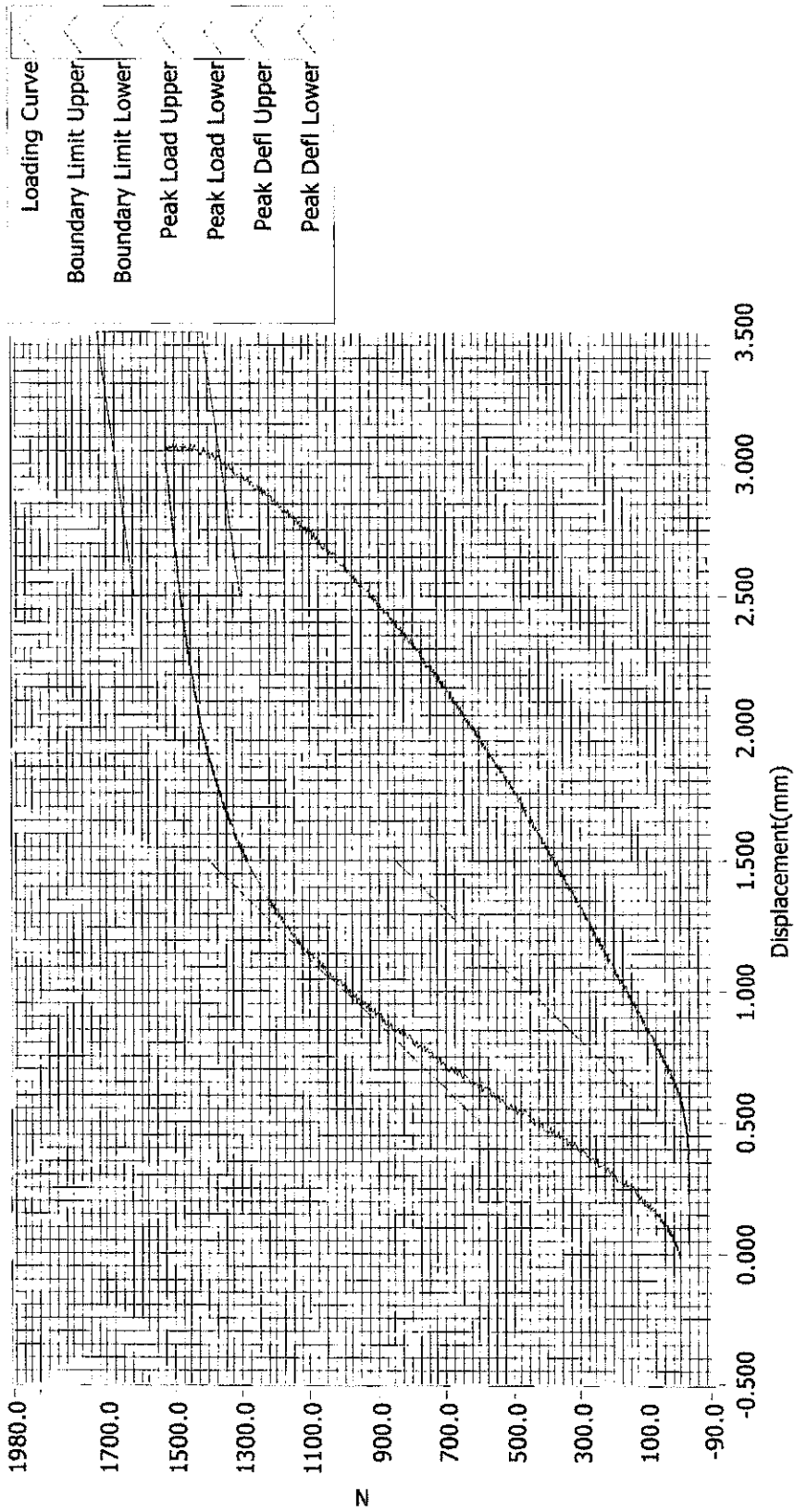


ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
	81026	12/3/2014	11:48 PM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

Current Date : 12/3/2014 Current Time : 23:49:34

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
Cert ID	ATD Serial Number	ATD Type	
	8140	SIDIIs	
		2/19/2007	5:36 AM

Current Date : 2/19/2007 Current Time : 05:37:21

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	P79741	Endevco	07/08/16
		Y	P79743	Endevco	07/08/16
		Z	P79744	Endevco	07/08/16
		Xr	P79586	Endevco	07/08/16
		Yr	P79590	Endevco	07/08/16
		Zr	P79592	Endevco	07/08/16
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	07/14/16
	Middle	Y	G169	Honeywell	07/14/16
	Lower	Y	G164	Honeywell	07/14/16
Abdomen Load Cells	Forward	Y	ABG1532	Denton	11/19/15
	Middle	Y	ABG1534	Denton	11/19/15
	Rear	Y	ABG1535	Denton	11/19/15
Lower Spine Accelerometers (T12)		X	P85161	Endevco	06/07/16
		Y	P85162	Endevco	06/07/16
		Z	P85163	Endevco	06/07/16
Public Symphysis Load Cell		Y	PG461	Denton	11/19/15

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 296			
				Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers				X	P88705	Endevco	03/28/16
				Y	P88706	Endevco	03/28/16
				Z	P88707	Endevco	03/28/16
				Xr	P88711	Endevco	03/28/16
				Yr	P88712	Endevco	03/28/16
				Zr	P88713	Endevco	03/28/16
Head Angular Rate Sensors				X	ARS7416	DTS	07/15/14
				Y	ARS7442	DTS	07/15/14
				Z	ARS7475	DTS	07/15/14
Displacement Potentiometers	Thoracic Rib	Upper	Y	G033	FTSS	03/29/16	
		Middle	Y	G1261	FTSS	03/29/16	
		Lower	Y	G1270	FTSS	03/29/16	
	Abdominal Rib	Upper	Y	G032	FTSS	03/29/16	
		Lower	Y	G1304	FTSS	03/29/16	
Lower Spine Accelerometers (T12)				X	P88348	Endevco	03/28/16
				Y	P88666	Endevco	03/28/16
				Z	P88667	Endevco	03/28/16
Acetabulum Load Cell				Y	ACG269	Denton	05/06/16
Iliac Wing Load Cell				Y	IWG282	Denton	01/08/16
Pelvis Plug (struck side)					81026	FTSS	12/03/14
Pelvis Plug (non-struck side)					8140	FTSS	02/19/07

Table 3 – Vehicle Instrumentation

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	PCB325	PCB	04/22/2016
	Vehicle Center of Gravity	Y	PCB324	PCB	04/22/2016
	Vehicle Center of Gravity	Z	PCB326	PCB	04/22/2016
2	Right Sill at Front Seat	X	PCB548	PCB	05/26/2016
	Right Sill at Front Seat	Y	PCB386	PCB	04/22/2016
	Right Sill at Front Seat	Z	PCB549	PCB	05/26/2016
3	Right Sill at Rear Seat	X	PCB591	PCB	06/13/2016
	Right Sill at Rear Seat	Y	PCB387	PCB	04/22/2016
	Right Sill at Rear Seat	Z	PCB486	PCB	06/13/2016
4	Left Sill at Front Door	Y	PCB161	PCB	04/12/2016
5	Left Sill at Rear Door	Y	PCB592	PCB	05/26/2016
6	Left A-Post Lower	Y	PCB555	PCB	06/13/2016
7	Left A-Post Middle	Y	PCB554	PCB	06/13/2016
8	Left B-Post Lower	Y	P95334	Endevco	07/28/2016
9	Left B-Post Middle	Y	P95336	Endevco	07/28/2016
10	Front Seat Track	Y	PCB177	PCB	06/06/2016
11	Rear Seat Track or Structure	Y	PCB351	PCB	04/22/2016
12	Right Rear Occ. Compartment	Y	P90596	Endevco	07/12/2016
13	Engine Block	X	PCB632	PCB	06/20/2016
	Engine Block	Y	PCB594	PCB	06/20/2016
14	Rear Floorpan Above Axle	X	P95049	Endevco	06/01/2016
	Rear Floorpan Above Axle	Y	P95067	Endevco	06/01/2016
	Rear Floorpan Above Axle	Z	P74568	Endevco	04/05/2016

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	PCB677D	PCB	08/05/2016
MDB Center of Gravity	Y	PCB676D	PCB	08/05/2016
MDB Center of Gravity	Z	PCB675D	PCB	08/05/2016
Left Frame at Rear Axle Centerline	X	PCB495D	PCB	08/05/2016
Left Frame at Rear Axle Centerline	Y	PCB494D	PCB	08/05/2016