

REPORT NUMBER: SINCAP-MGA-2015-059

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

**FORD MOTOR CO.
2015 Ford F-150 SuperCab XL Truck
NHTSA No.: M20150215**

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



Test Date: February 25, 2015

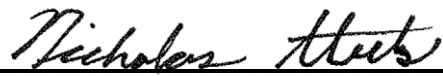
Final Report Date: April 24, 2015

FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE
Room W43-410
Washington, DC 20590**

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Approval Date: April 24, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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7. Author(s) Ben Fischer, Project Engineer		8. Performing Organization Report No. SINCAP-MGA-2015-059																																																																		
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15. Supplementary Notes																																																																				
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the 2015 Ford F-150 SuperCab XL Truck 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 February 25, 2015. The impact velocity of the Moving Deformable Barrier (MDB) was 62.2 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.2° C. The target vehicle post-test maximum crush was 284 at level 1. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2"></th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th colspan="2">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td colspan="2">22</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td colspan="2">21</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td colspan="2">380</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td colspan="2">772</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2"></th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th colspan="2">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td colspan="2">53</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td colspan="2">24</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td colspan="2">1358</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td colspan="2">6</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td colspan="2">6</td> </tr> </tbody> </table>						Driver ATD (ES-2re)			Measurement Description	Units	Threshold	Result		Head Injury Criteria (HIC ₃₆)	N/A	1000	22		Maximum Thorax Rib Deflection	mm	44	21		Total Abdominal Force	N	2500	380		Pubic Symphysis Force	N	6000	772				Passenger ATD (SID-IIs)			Measurement Description	Units	Threshold	Result		Head Injury Criteria (HIC ₃₆)	N/A	1000	53		Resultant Lower Spine Acceleration	Gs	82	24		Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1358		Maximum Thoracic Rib Deflection	mm	38*	6		Maximum Abdomen Rib Deflection	mm	45*	6	
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The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.																																																																				
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																																																																		
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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2015 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00124. The purpose of this test is to generate comparative side impact performance in a 2015 Ford F-150 SuperCab XL Truck. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated September 2013.

SECTION 2 SUMMARY OF TEST RESULTS

A 2015 Ford F-150 SuperCab XL Truck 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 62.2 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 February 25, 2015. 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 September 2013. 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
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	22
Maximum Thorax Rib Deflection	mm	44	21
Total Abdominal Force	N	2500	380
Pubic Symphysis Force	N	6000	772

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	53
Resultant Lower Spine Acceleration	Gs	82	24
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1358
Maximum Thoracic Rib Deflection	mm	38*	6
Maximum Abdomen Rib Deflection	mm	45*	6

*Proposed IARV

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

GENERAL COMMENTS

Left Rear Sill Y has no valid data after 3 ms.
Driver Seat Track Y has no valid data after 9 ms.
Left Front Sill Y has questionable data after 20 ms.
Left Lower B-Post Y was not installed.
Left Mid B-Post Y was not installed.

Photo No. 015 on page A-8 has inaccurate information on the vehicle placard.

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: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20150215	Traction Control System (TCS)	Yes
Model Year	2015	Auto-Leveling System	No
Make	Ford	Automatic Door Locks (ADL)	Yes
Model	F-150 SuperCab XL	Power Window Auto-Reverse	Yes
Body Style	2 Door Pickup	Other Optional Feature	N/A
VIN	1FTEX1C87FFA09292	Driver Front Airbag	Yes
Body Color	Blue Jeans Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	27 / 17	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.5	Driver Torso Airbag	No
Type/No. Cylinders	6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Longitudinal	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Rear	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?	Yes
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DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.	GVWR (kg)	2767
Date of Manufacture	12/14	GAWR Front (kg)	1361
Vehicle Type	Truck	GAWR Rear (kg)	1497

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	3	3		6	(A)
Capacity Weight (VCW) (kg)				770	(B)
DSC x 68.04 kg				408	(A-B)
Rated Cargo and Luggage Weight (RCLW)				362	

VEHICLE SEAT TYPE

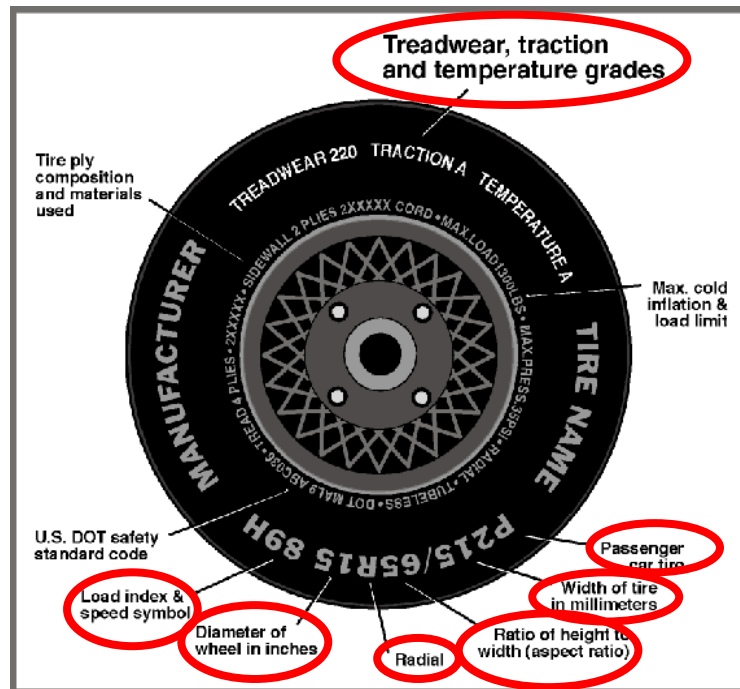
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X					X	
Rear or Second Row			X		X		
Third Row Seat							

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	260	260
Recommended Tire Size	245/70R17	245/70R17
Tire Size on Vehicle	245/70R17	245/70R17
Tire Manufacturer	Michelin	Michelin
Tire Model	LTX M/S	LTX M/S
Treadwear	720	720
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	110T	110T
Tire Material	Rubber	Rubber
DOT Safety Code Left	M3X6 OOAX 3914	M3X6 OOAX 3914
DOT Safety Code Right	M3X6 OOAX 2414	M3X6 OOAX 2414

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	290	290	283	276
Tire Placard	kPa	260	260	260	260
Owner's Manual	kPa				
As Tested	kPa	260	260	260	260

MDB TIRE SPECIFICATIONS

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	556.5	440.0		553.5	629.5		604.0	562.0	
Right	kg	584.5	407.0		564.0	499.5		574.5	512.0	
Ratio	%	57.4	42.6		49.7	50.2		52.3	47.7	
Totals	kg	1141.0	847.0	1988.0	1117.5	1129.0	2246.5	1178.5	1074.0	2252.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1988.0	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136	(C)
Calculated Test Vehicle Target Weight (TVTW)	kg	2253.0	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

	Units	Fully Loaded	As Tested	Meets Requirement***
Left Front	mm	920	922	Yes
Right Front	mm	923	915	Yes
Right Rear	mm	944	948	Yes
Left Rear	mm	940	939	Yes
Vehicle CG (Aft of Front Axle)	mm	1757	1851	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	30	46	

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

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
Test Date: 2/25/2015

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Weight of Ballast, if any	86.6
None	0.0

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015

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	Fixed	Fixed	Fixed
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- Fore/Aft	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	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
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: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

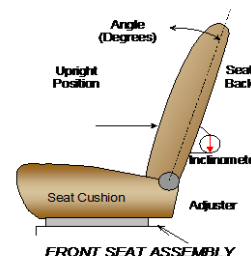
NHTSA No. M20150215
 Test Date: 2/25/2015

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	256	38 (1 st as 1)	130	19 (1 st as 0)
Front Passenger Seat	256	38 (1 st as 1)	130	19 (1 st as 0)
Front Center Seat	Fixed	Fixed	Fixed	Fixed
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	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 September 2013. 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	Degrees	Detent
Driver Seat w/Seated Dummy	50.7	28 (1 st as 1)	2.9	9 (1 st as 0)
Front Passenger Seat	50.6	28 (1 st as 1)	2.2	9 (1 st as 0)
Front Center Seat	Fixed	Fixed	Fixed	Fixed
Struck Side Rear Seat	Fixed	Fixed	4.5	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	4.5	Fixed
Rear Center Seat	Fixed	Fixed	4.5	Fixed

Seat back angles measured on outboard headrest post.

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015

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 detents (1 st as 1)	1 (Uppermost as 0)
Rear Seat	Fixed	Not Applicable

HEAD RESTRAINT ADJUSTMENT

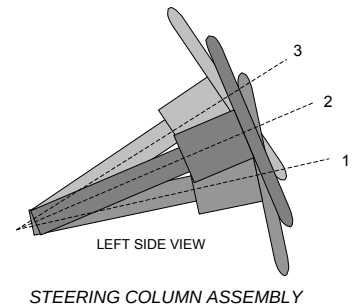
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	3	Highest
Rear Seat	Fixed	Not Applicable

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.

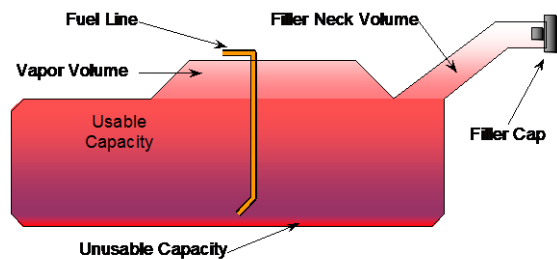
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	70.4	250
Geometric Center, Position 2	68.3	270
Uppermost, Position 3	66.2	290
Telescoping Steering Wheel Travel		40
Test Position	68.3	270



FUEL PUMP

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

The electric fuel pump operates for 3 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 3 seconds following ignition actuation the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls the fuel pump is deactivated. Also, the fuel pump is shut-off by the restraint control module to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



VEHICLE FUEL TANK ASSEMBLY

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
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FUEL TANK CAPACITY DATA

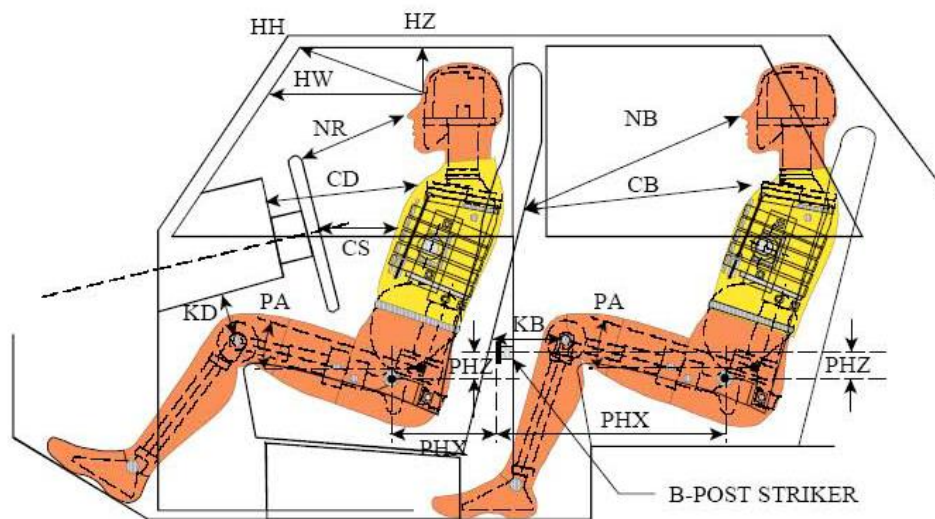
	Liters
Usable Capacity of "Standard" Tank (see Form No. 1)	90.8
Usable Capacity of "Optional" Tank (see Form No. 1)	136.3
Usable Capacity of Standard Tank as Specified in Owner's Manual	87.1
Usable Capacity of Optional Tank as Specified in Owner's Manual	136.2
93% of Usable Capacity	84.4
Actual Amount of Solvent Used	84.4
1/3 of Usable Capacity	30.3

Is the actual amount of solvent used in the test equal to 93% $\pm$ 1%
of the Usable Capacity stated in Form No. 1? **YES**

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
Test Date: 2/25/2015



LEFT SIDE VIEW

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

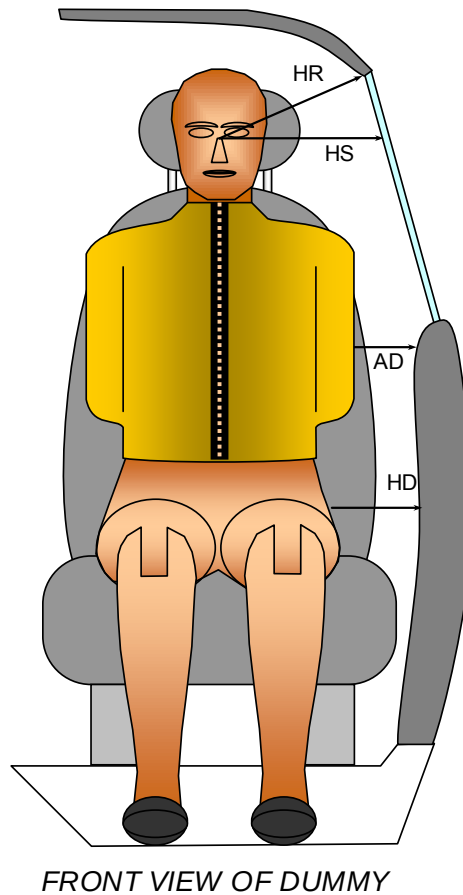
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	484	12.5		
HW		Head to Windshield	700			
HZ	HZ	Head to Roof Liner	192		325	
NR	NB	Nose to Rim/Seat Back	475	15.9	403	12.1
CD	CB	Chest to Dashboard/Seat Back	642	5.2	432	9.0
CS		Chest to Steering Wheel	405	12.1		
KDL	KBL	Left Knee to Dash/Seat Back	172	18.4	180	14.2
KDR	KBR	Right Knee to Dash/Seat Back	149	23.1	182	17.5
PAX	PAX	Pelvic Tilt Angle X		24.6		21.9
	PAY	Pelvic Tilt Angle Y		0.0		-0.1
PHX	PHX	Hip Point to Striker (X-Axis)	298		497	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	49		38	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015



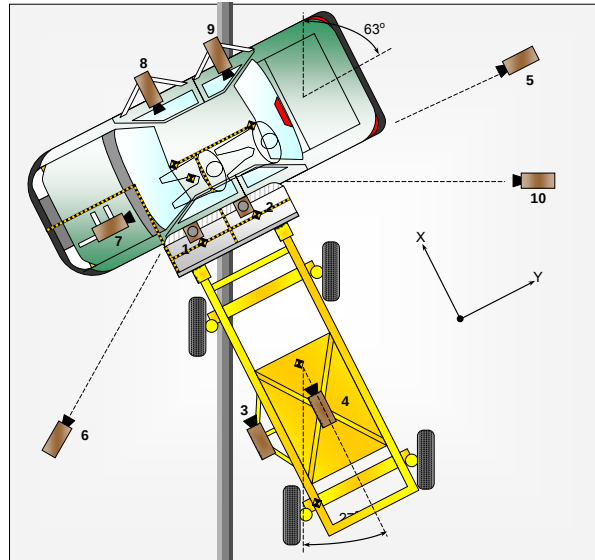
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	189	287
HS	Head to Side Window	mm	345	396
AD	Arm to Door	mm	125	177
HD	Hip Point to Door	mm	178	208

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
Test Date: 2/25/2015



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	100	800	-5040	14	1000
2	Overhead Close-Up	80	600	-5090	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	0	6000	-1260	24	1000
6	Left Front	-1220	-5500	-1270	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

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

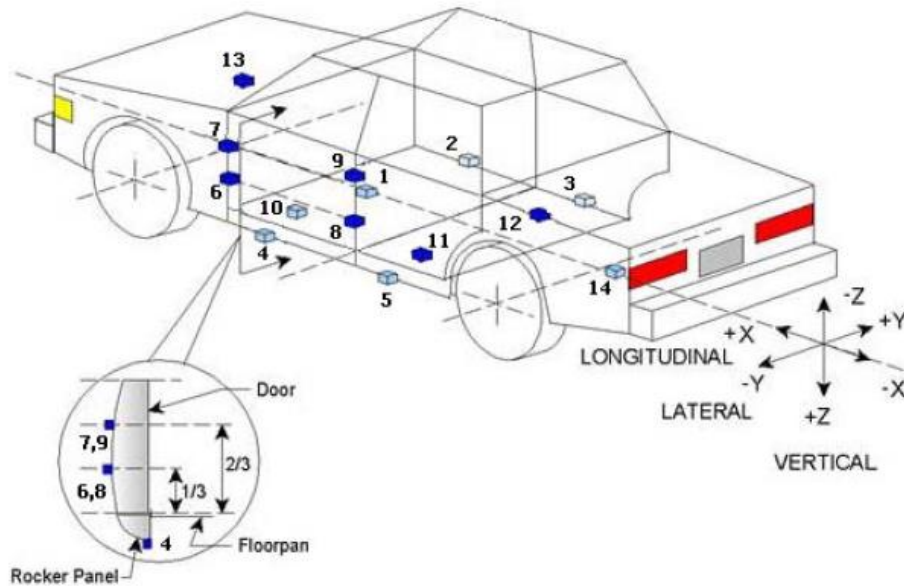
INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Passenger Dummy	16
Vehicle Structure	23
MDB Accelerometers	5
MDB Contacts	2
Total	62

DATA SHEET NO. 6 **TEST VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015



TEST VEHICLE ACCELEROMETER LOCATIONS

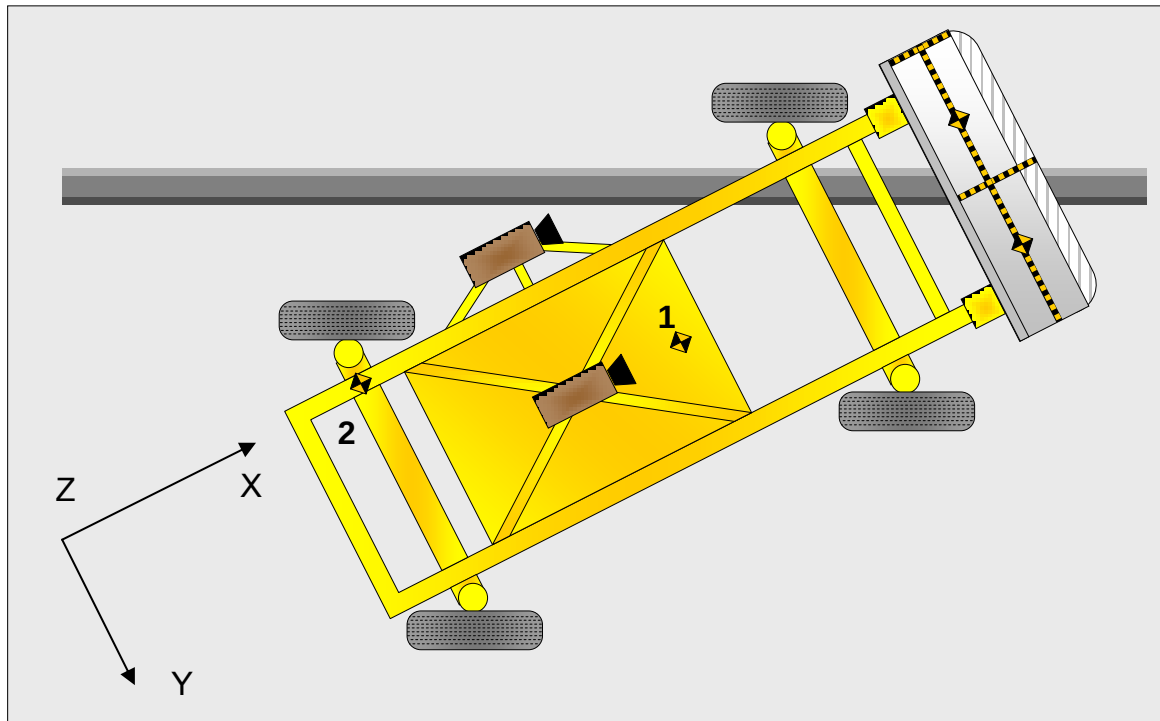
Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3285	-20	-560
2	Right Sill at Front Seat	3348	843	-378
3	Right Sill at Rear Seat	2560	845	-395
4	Left Sill at Front Door	3698	-843	-395
5	Left Sill at Rear Door	2730	-842	-400
6	Left Lower A-Post	4277	-898	-687
7	Left Middle A-Post	4272	-891	-1057
8	Left Lower B-Post	N/A	N/A	N/A
9	Left Middle B-Post	N/A	N/A	N/A
10	Front Seat Track	3395	-440	-605
11	Rear Seat Structure	2650	-420	-677
12	Rt. Rear Occ. Compartment	2950	470	-620
13	Engine Block	4863	110	-1149
14	Rear Above Axle	1284	0	-820

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: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Measurements (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: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
Test Date: 2/25/2015

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	Curtain Airbag
Top of Head	Curtain Airbag, Headliner	Curtain Airbag
Left Side of Head	Curtain Airbag, Headliner	Curtain Airbag
Back of Head	Headrest	C-Pillar
Left Shoulder	Curtain Airbag, Side Airbag	Curtain Airbag, Door Panel
Upper Torso	Seat Back, Side Airbag	None
Lower Torso	Seat Back, Side Airbag	Door Panel
Left Hip	Seat Pan, Side Airbag	Seat Pan, Door Panel
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	N/A
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)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Side Window Damage	Left Front Window Cracked
Other Notable Effects	Rear Window Broken

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
Test Date: 2/25/2015

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3684
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		520
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	-12
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	+1

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
Test Date: 2/25/2015

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1251
Overall Length Including Honeycomb Face	4115
Wheelbase of Framework Carriage	2595
CG Location aft of Front Axle	1134

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	390.0	300.1	
Right	kg	376.8	294.7	
Ratio	%	56.3	43.7	
Totals	kg	766.8	594.8	1361.6

SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.2
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.3
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.6
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.3
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27.1

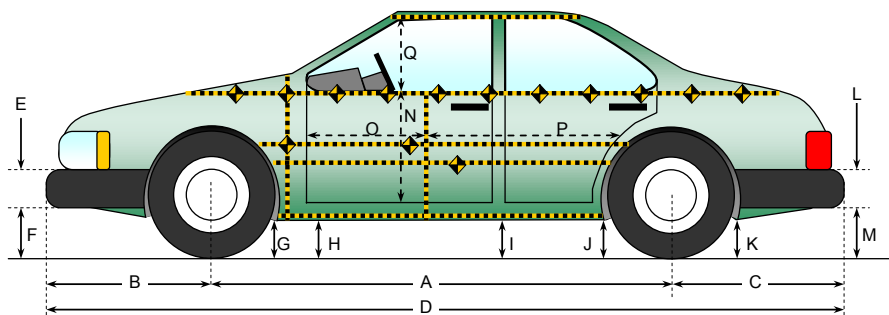
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	92
B	Top of Bumper	533	800	Right	156
C	Mid-Level	686	800	Right	157
D	Top of Stack	813	800	Right	197

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
Test Date: 2/25/2015



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

LEFT SIDE VIEW

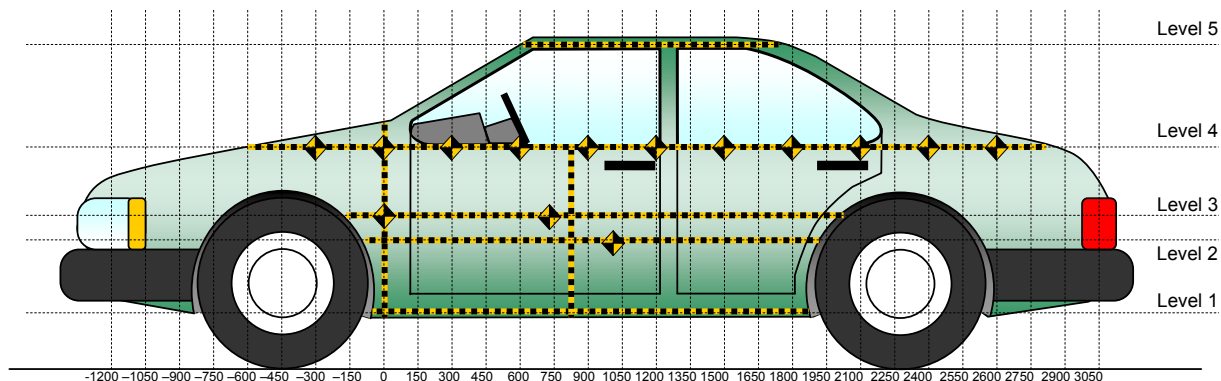
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3684	3672	12
B	Front Axle to FSOV	960	972	-12
C	Rear Axle to RSOV	1246	1250	-4
D	Total Length at Centerline	5890	5894	-4
E	Front Bumper Thickness	252	252	0
F	Front Bumper Bottom to Ground	418	418	0
G	Sill Height at Front Wheel Well	370	347	23
H	Sill Height at Front Door Leading Edge	374	345	29
I	Sill Height at B Pillar	376	371	5
J1	Sill Height at Rear Wheel Well	385	388	-3
J2	Pinch Weld Height at Rear Wheel Well	381	396	-15
K	Sill Height Aft of Rear Wheel Well	413	418	-5
L	Rear Bumper Thickness	205	205	0
M	Rear Bumper Bottom to Ground	415	418	-3
N	Sill Height to Window Bottom Sill	858	796	62
O	Front Door Leading Edge to Impact CL	724	708	16
P	Rear Door Trailing Edge to Impact CL	1190	1128	62
Q	Front Window Opening	540	546	-6
R	Right Side Length	4984	5026	-42
S	Left Side Length	4984	4944	40
T	Vehicle Width at B Post	2020	1941	79

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015



All Measurements Shown in mm

LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	494	284	1650
2	Mid Door	788	263	1350
3	Occupant Hip Point	917	226	1650
4	Window Sill	1160	151	1500
5	Window Top	1776	47	750

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: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015

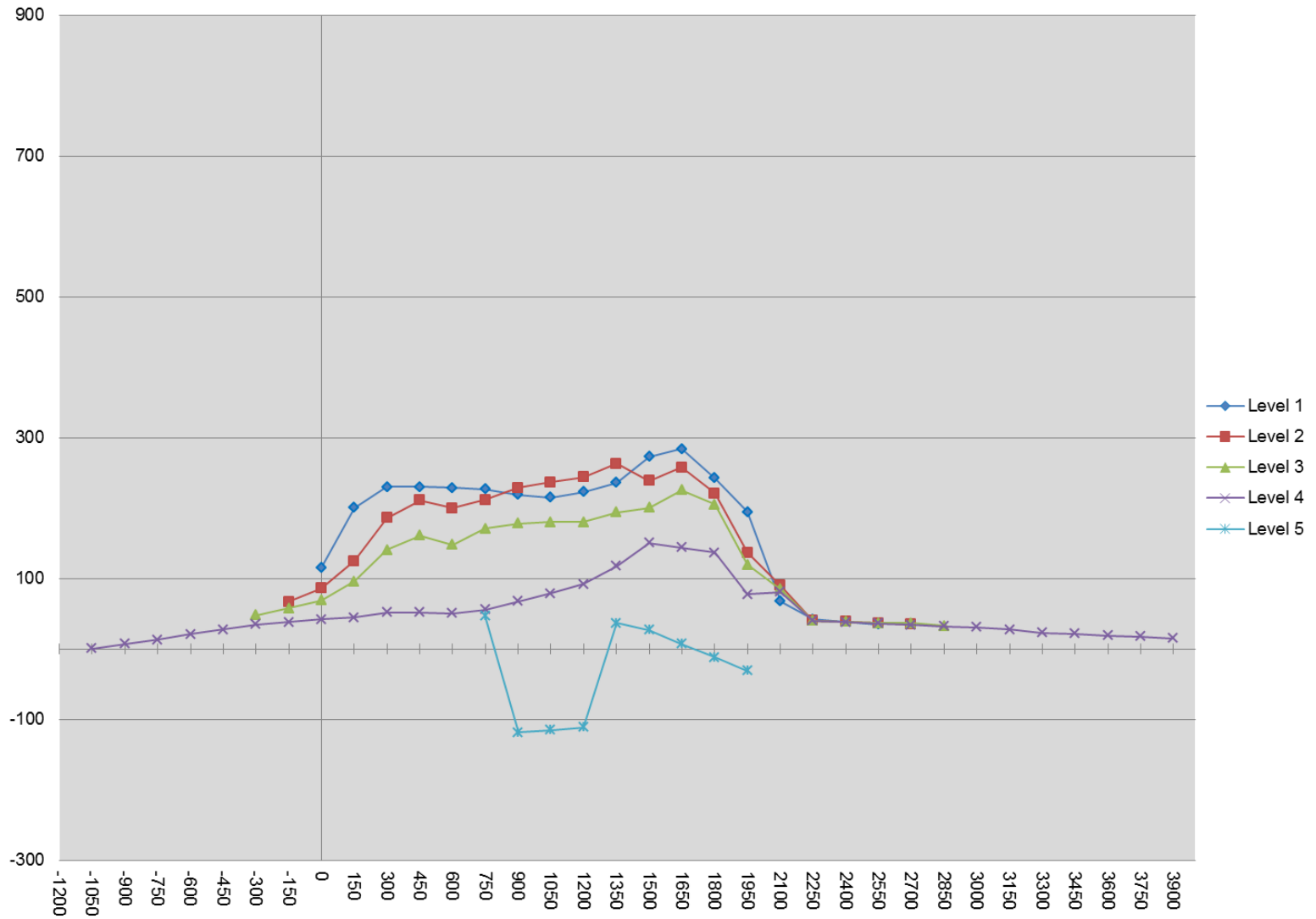
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1050				244					245					1	
-900				197					204					7	
-750				176					189					13	
-600				160					181					21	
-450				148					176					28	
-300			97	139				145	174				48	35	
-150		96	100	134			163	158	172			67	58	38	
0	111	101	104	129		226	187	173	171		115	86	69	42	
150	121	106	102	124		322	231	198	169		201	125	96	45	
300	120	104	100	122		350	290	241	174		230	186	141	52	
450	118	102	97	118		348	313	258	170		230	211	161	52	
600	116	99	95	113		345	299	243	164		229	200	148	51	
750	114	97	93	110	371	341	309	264	166	418	227	212	171	56	47
900	113	96	91	105	365	332	325	269	173	247	219	229	178	68	-118
1050	111	95	89	103	361	326	332	269	182	246	215	237	180	79	-115
1200	109	93	87	100	356	332	337	267	192	245	223	244	180	92	-111
1350	108	90	87	100	358	344	353	281	218	395	236	263	194	118	37
1500	107	91	88	99	357	380	330	289	250	384	273	239	201	151	27
1650	106	91	88	99	356	390	349	314	243	363	284	258	226	144	7
1800	106	91	88	100	354	349	312	293	237	342	243	221	205	137	-12
1950	106	92	89	100	354	301	229	209	178	323	195	137	120	78	-31
2100	111	104	100	111		179	194	185	192		68	90	85	81	
2250	117	104	100	112		159	144	140	152		42	40	40	40	
2400	119	104	100	112		158	143	139	150		39	39	39	38	
2550	117	104	102	114		152	141	139	150		35	37	37	36	
2700		90	103	116			125	140	150			35	37	34	
2850			86	118				119	150				33	32	
3000				119					150					31	
3150				122					150					28	
3300				126					149					23	
3450				130					152					22	
3600				136					155					19	
3750				141					159					18	
3900				148					163					15	

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: 2015 Ford F-150 SuperCab XL Truck
Test Program: NCAP Side MDB Impact Test

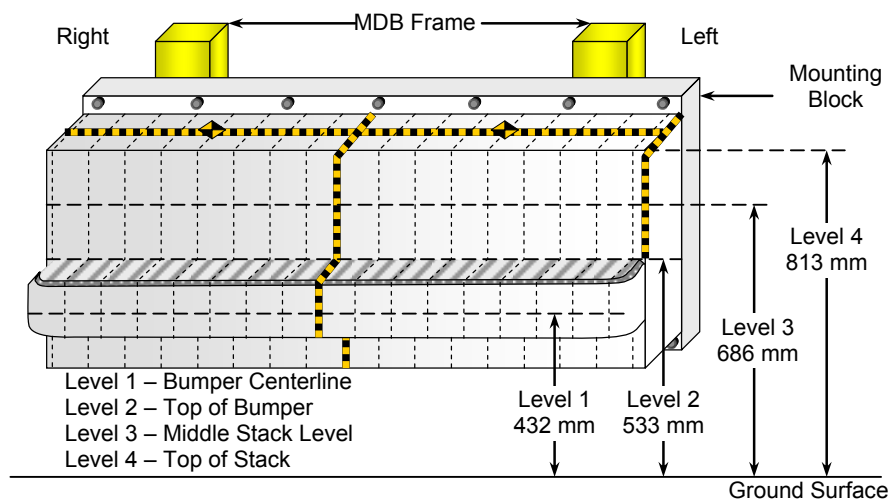
NHTSA No. M20150215
Test Date: 2/25/2015



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015



FRONT VIEW

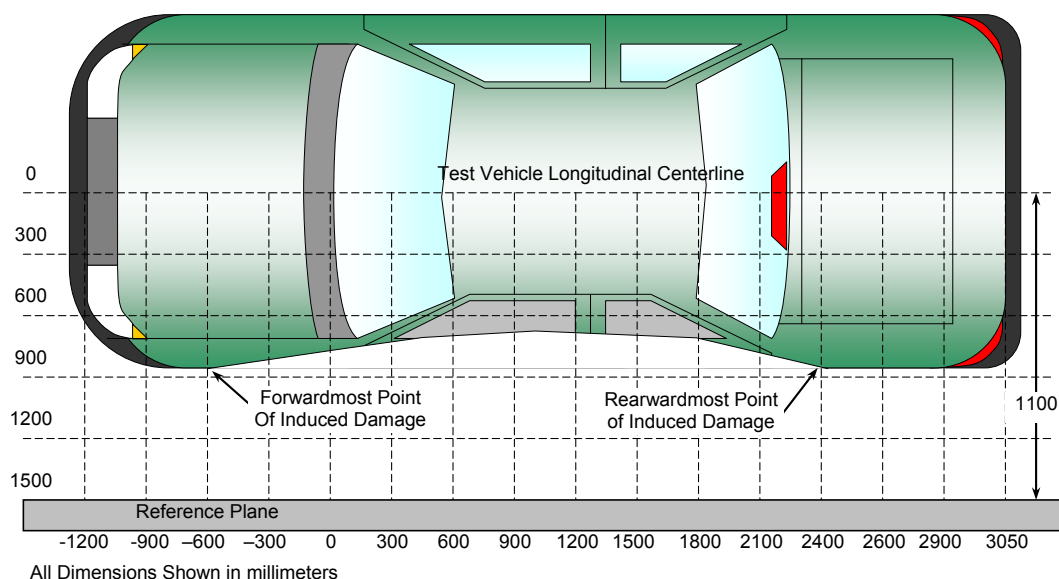
DEFORMABLE BARRIER STATIC CRUSH

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	197	154	125	96	88	107	101	108	99	85	66	61	61	59	72	80	119
3	157	129	106	89	92	105	100	102	103	81	63	44	35	35	38	44	89
2	156	115	91	71	97	79	84	79	75	72	64	69	72	70	76	81	84
1	92	73	61	60	60	63	62	65	64	62	64	61	59	61	66	76	76

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015



TOP VIEW

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2170	3	100	142	42
2	1756	3	88	305	217
3	1342	3	87	269	182
4	928	3	91	268	177
5	514	3	96	251	155
6	100	3	103	186	83

MDB DAMAGE PROFILE DISTANCES

DPD	Distance from Center of MDB	Level	Post-Test (mm)
1	800 mm right of center	1	92
2	480 mm right of center	1	60
3	160 mm right of center	1	63
4	160 mm left of center	1	63
5	480 mm left of center	1	60
6	800 mm left of center	1	76

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

Test Vehicle: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

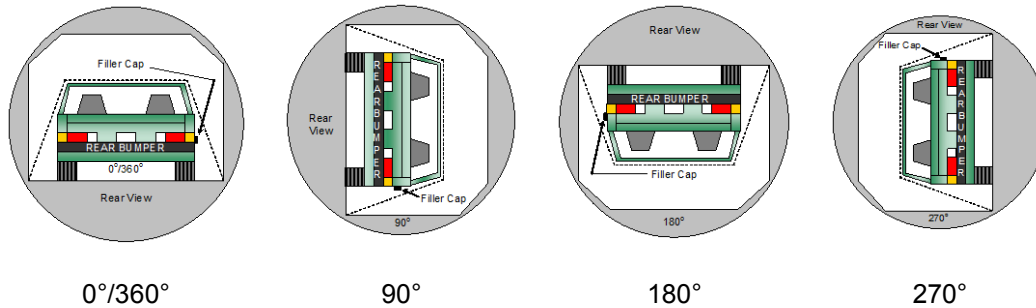
NHTSA No. M20150215
 Test Date: 2/25/2015

Test Time: 11:16 am

Temperature: 21.2° C

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum Allowable = 1 ounce)
 B. For the 5 minute period after motion ceases: None
 (Maximum allowable = 5 ounces)
 C. For the following 25 minutes: None
 (Maximum allowable = 1 oz./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°	144	300	444
90° to 180°	121	300	421
180° to 270°	128	300	428
270° to 360°	150	300	450

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

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

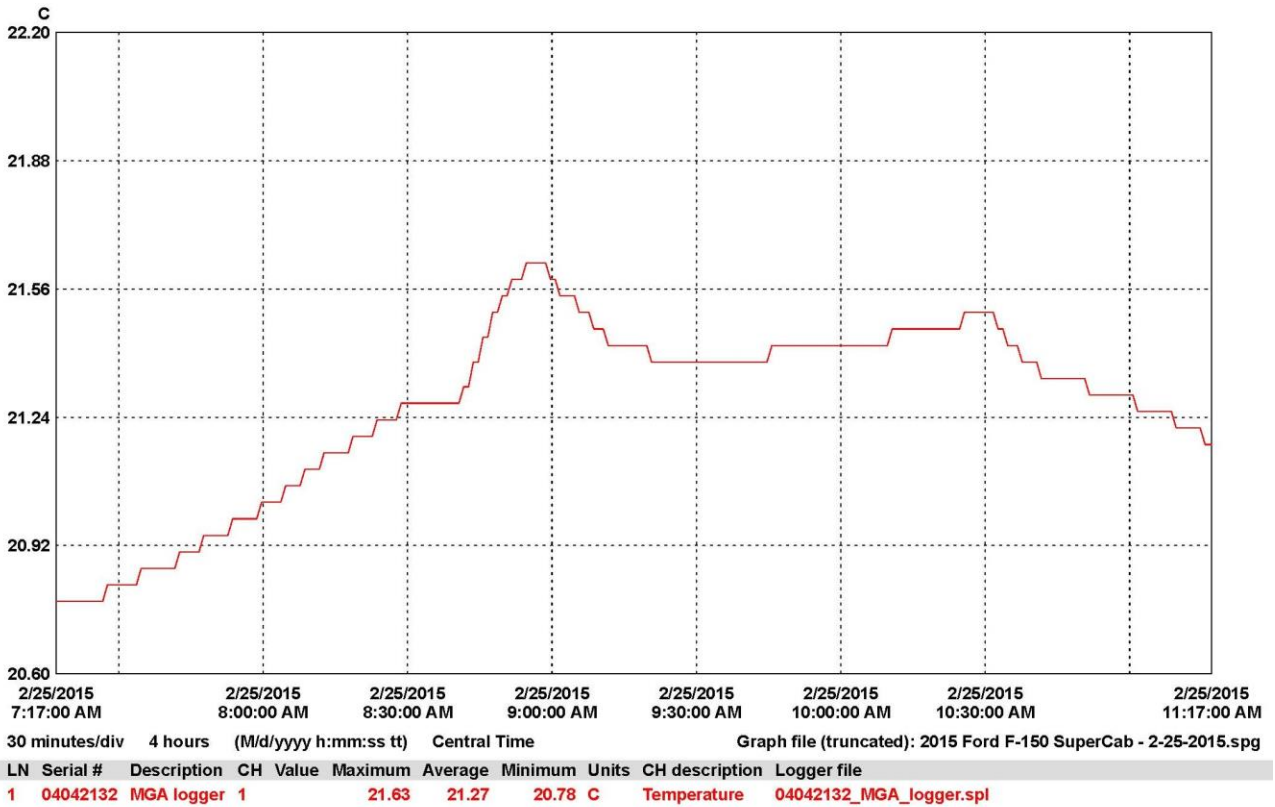
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2015 Ford F-150 SuperCab XL Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20150215
 Test Date: 2/25/2015



**APPENDIX A
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No. 002 As Delivered Left Rear Three-Quarter View of Test Vehicle



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No. 004 Post-Test Frontal View of Test Vehicle



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



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



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



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



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



No. 010 Post-Test Left Three-Quarter Rear View of Test Vehicle



No. 011 Pre-Test Rear View of Test Vehicle



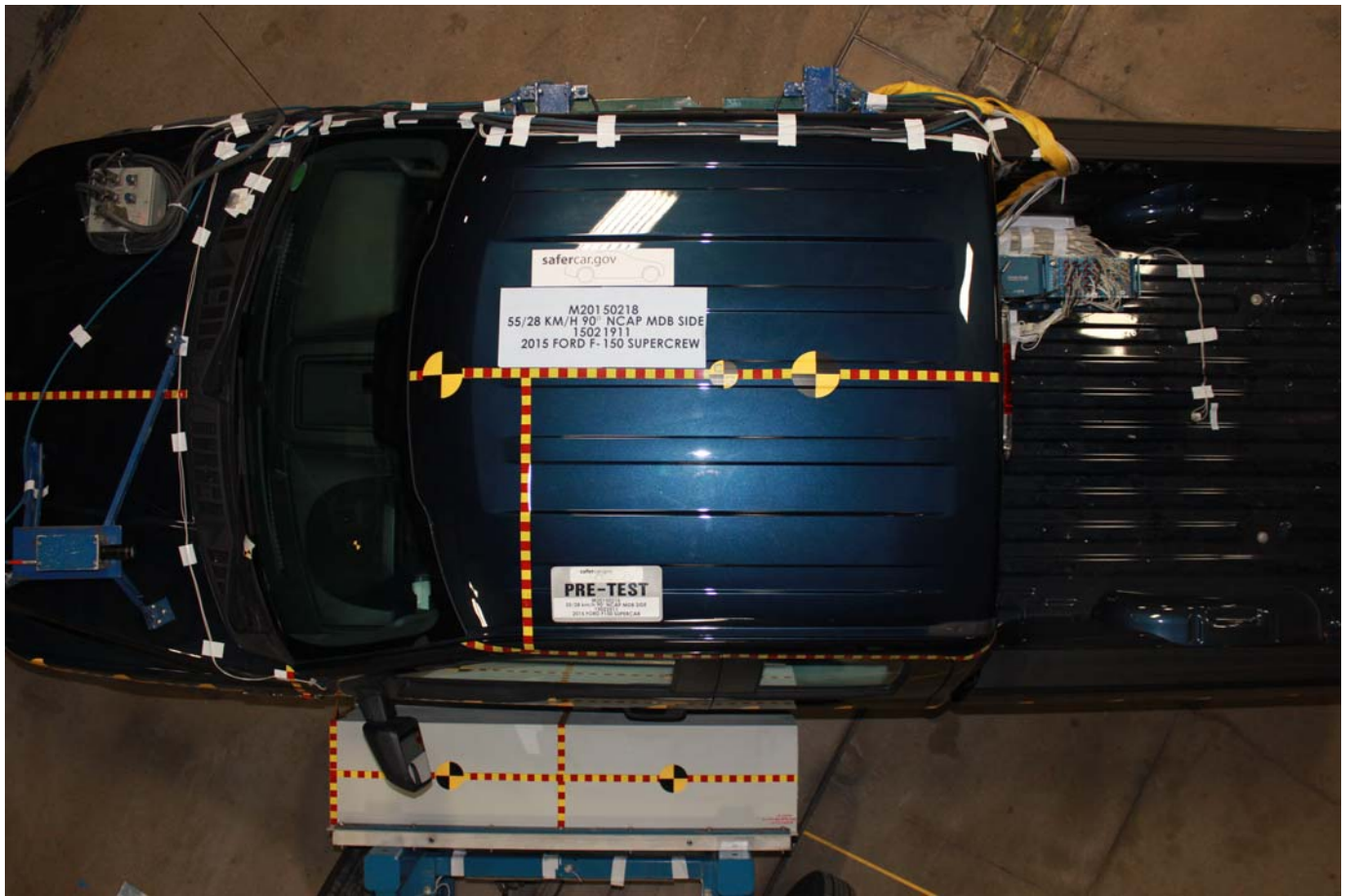
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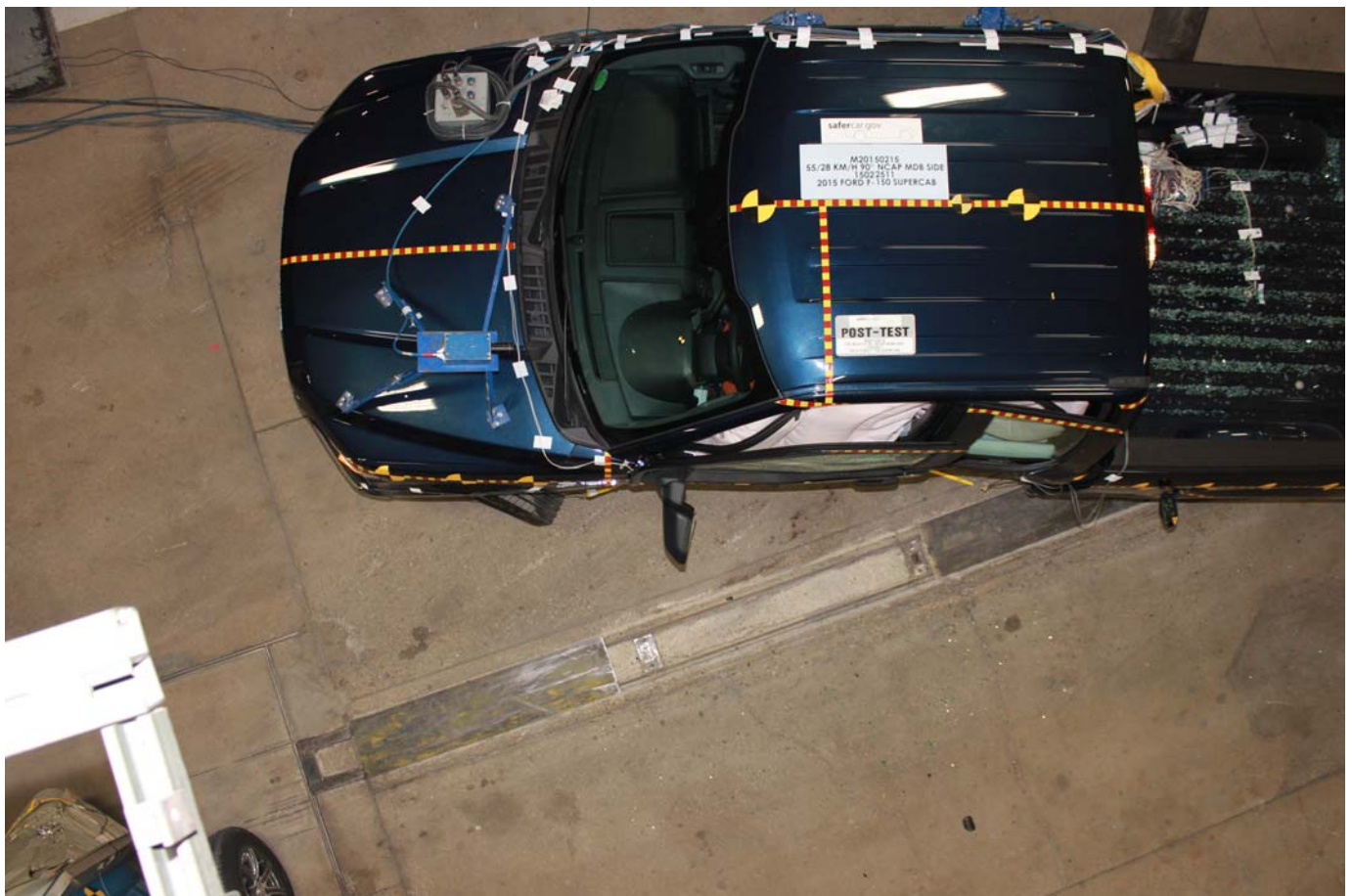
No. 013 Pre-Test Right Side View of Test Vehicle



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



No. 015 Pre-Test Overhead View of Test Area



No. 016 Post-Test Overhead View of Test Area



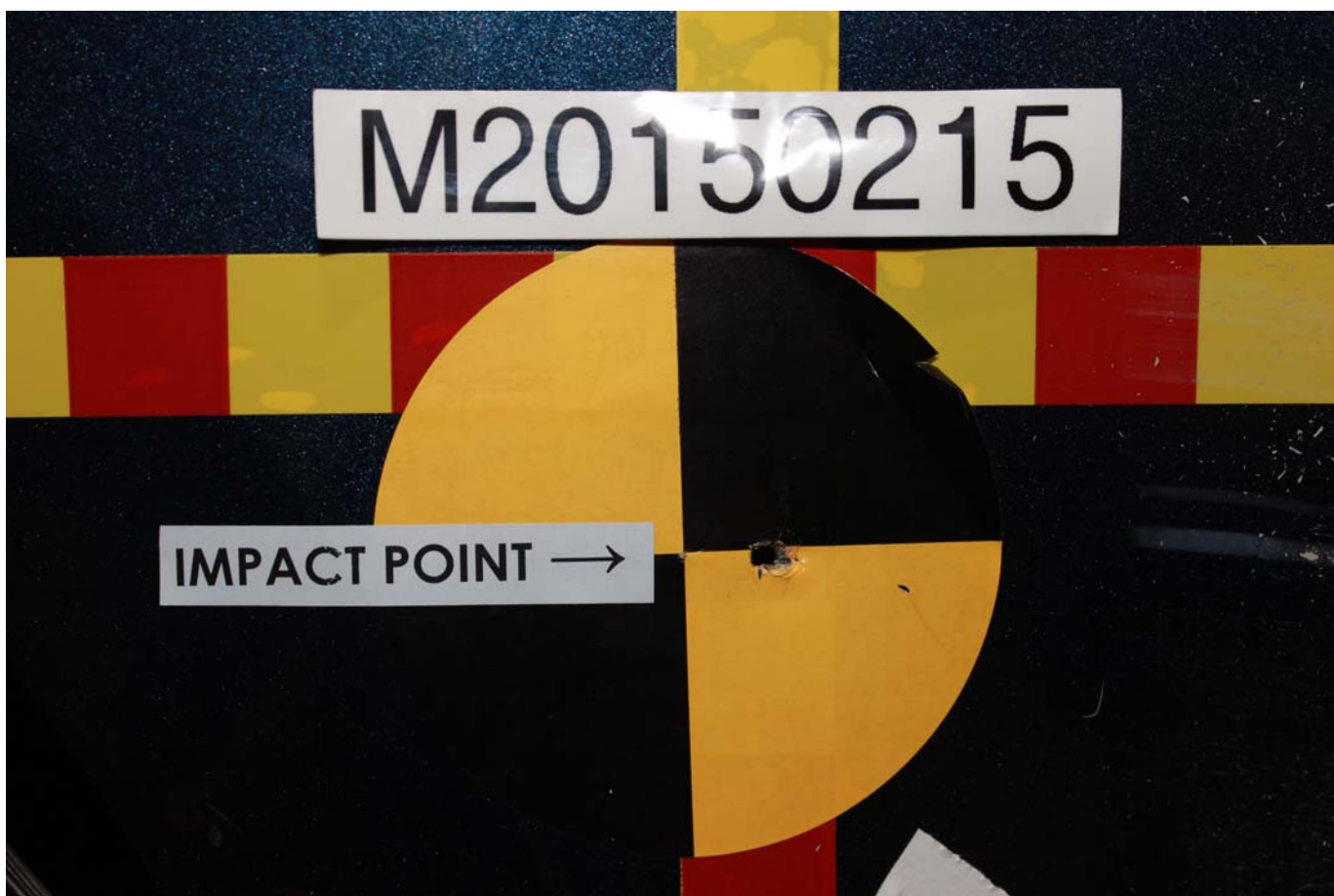
No. 017 Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



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



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

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

PHOTOGRAPH NOT APPLICABLE

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



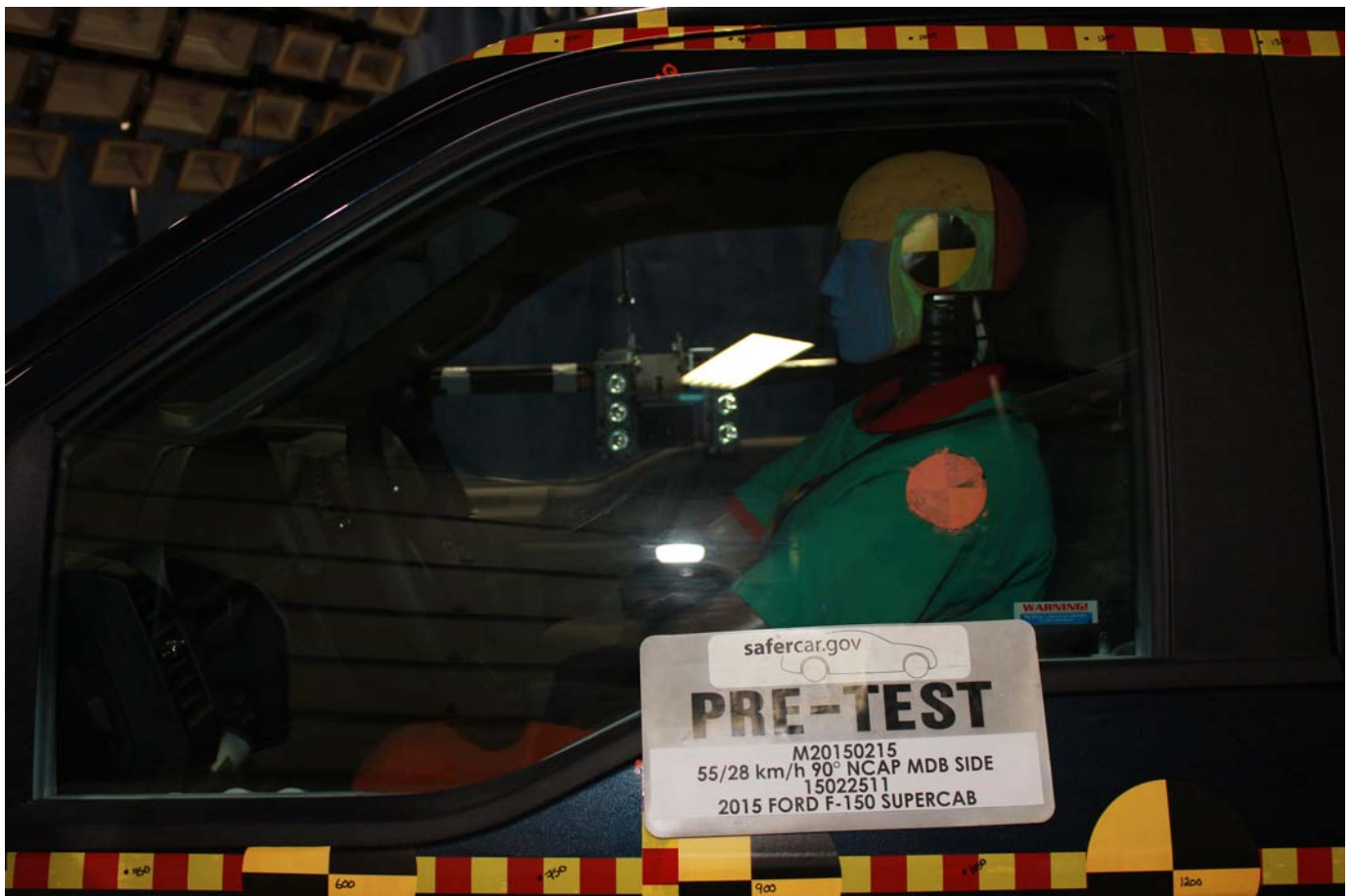
No. 025 Pre-Test Front Close-Up View of Driver Dummy



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



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



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



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



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



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



No. 034 Pre-Test Placement of Driver Dummy's Feet



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



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



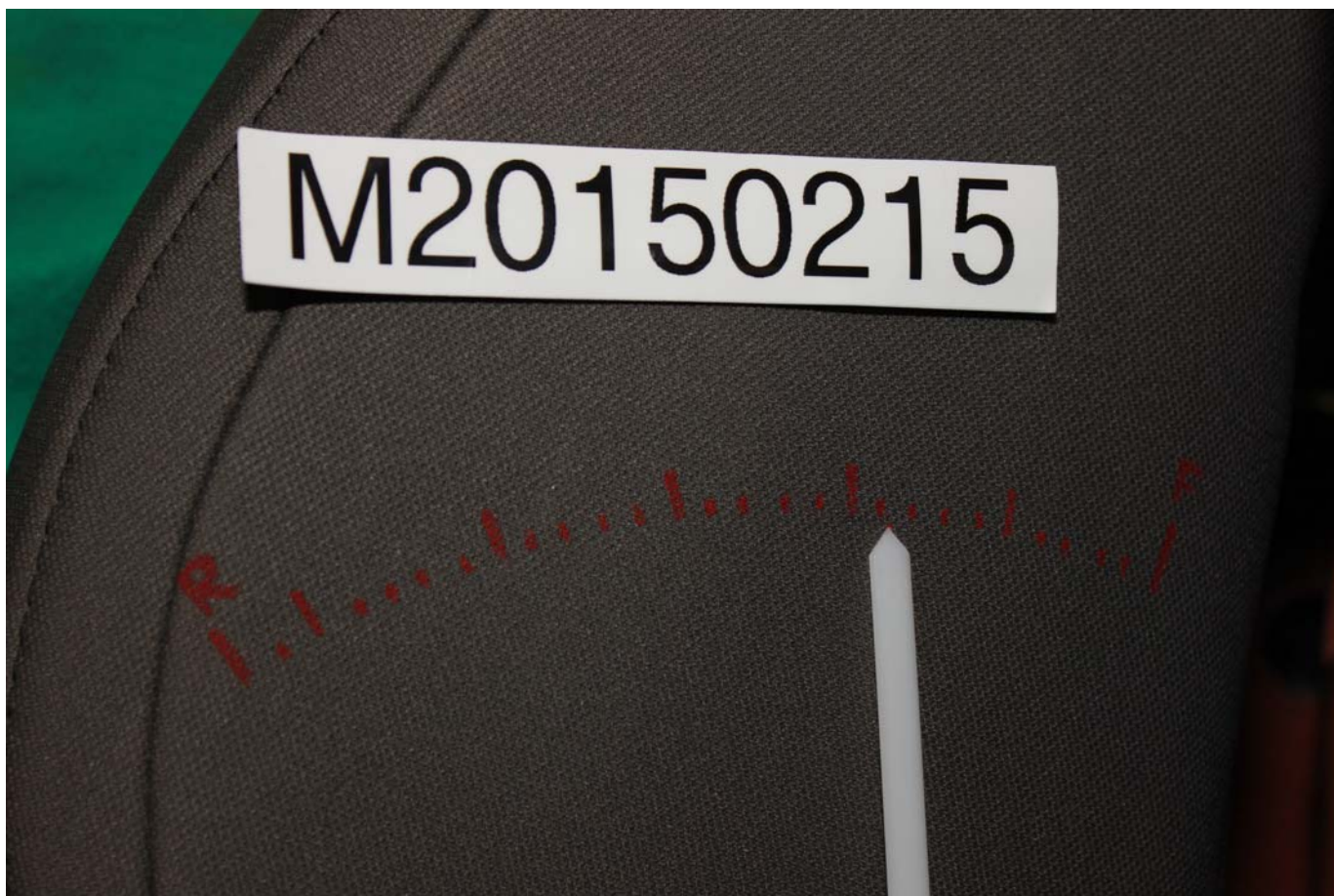
No. 037 Pre-Test View of Disengaged Parking Brake



No. 038 Pre-Test View of Parking Brake



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



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



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



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



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



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



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



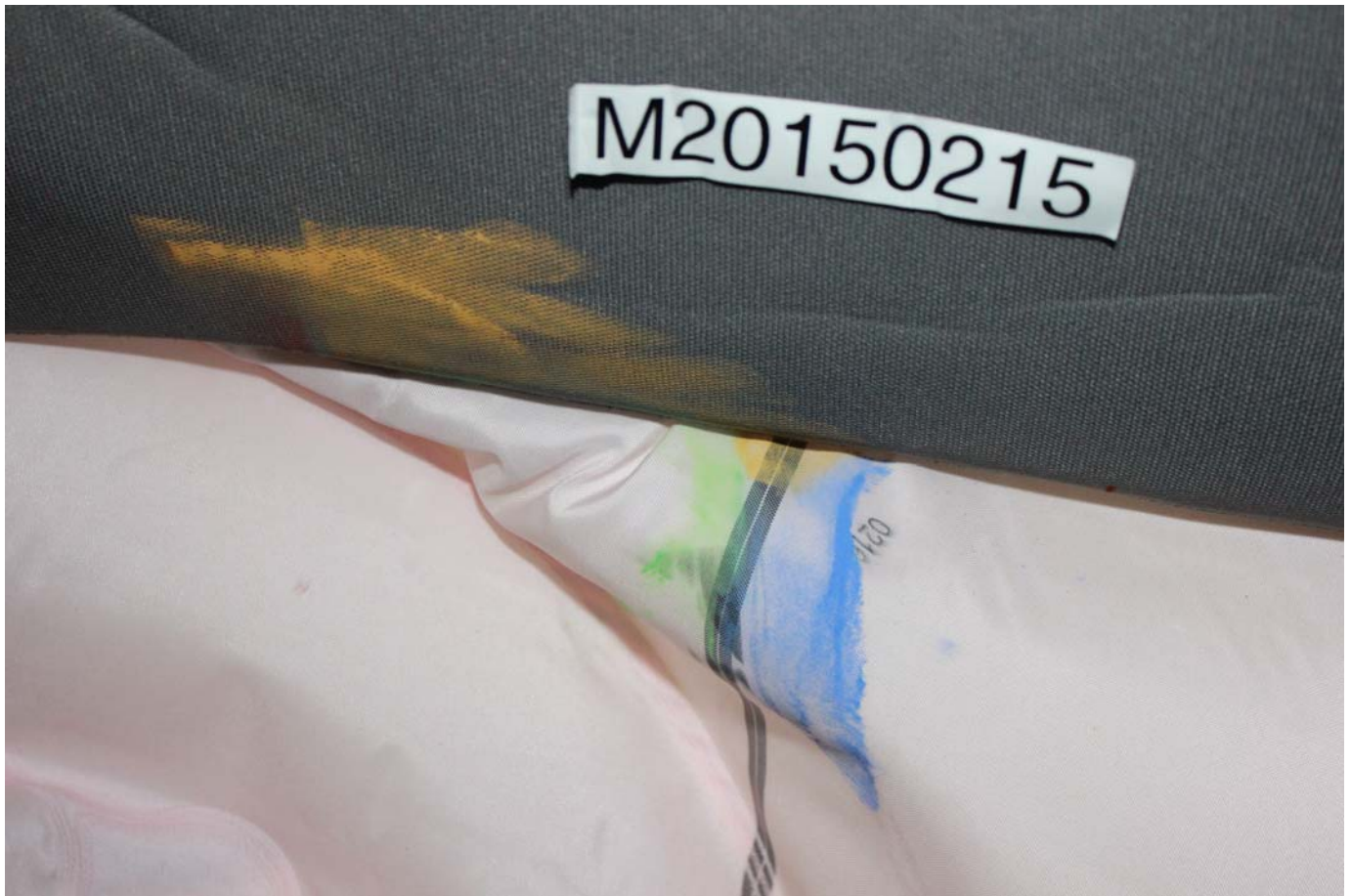
No. 046 Pre-Test Driver Inner Door Panel View



No. 047 Post-Test Driver Inner Door Panel View



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



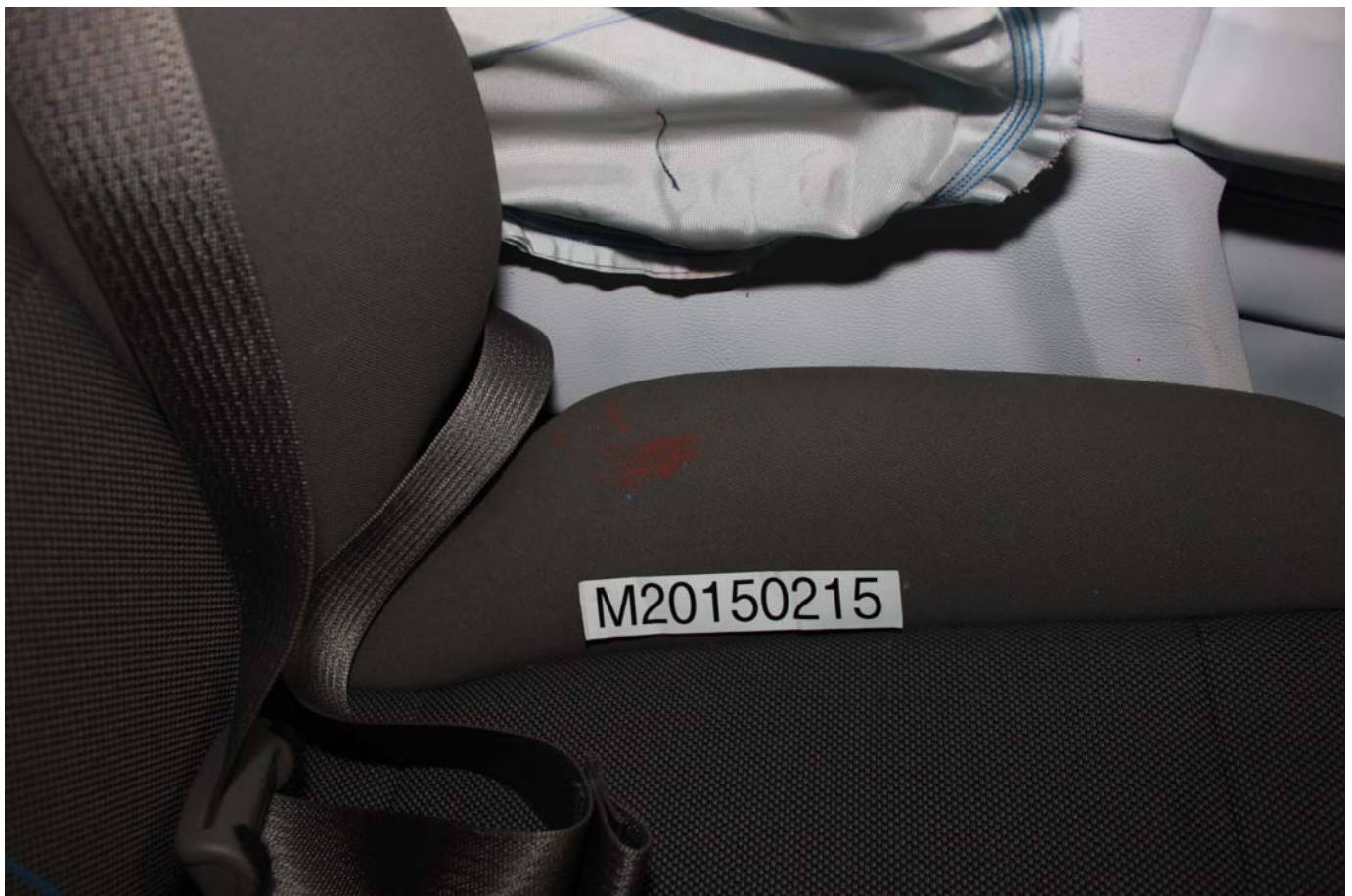
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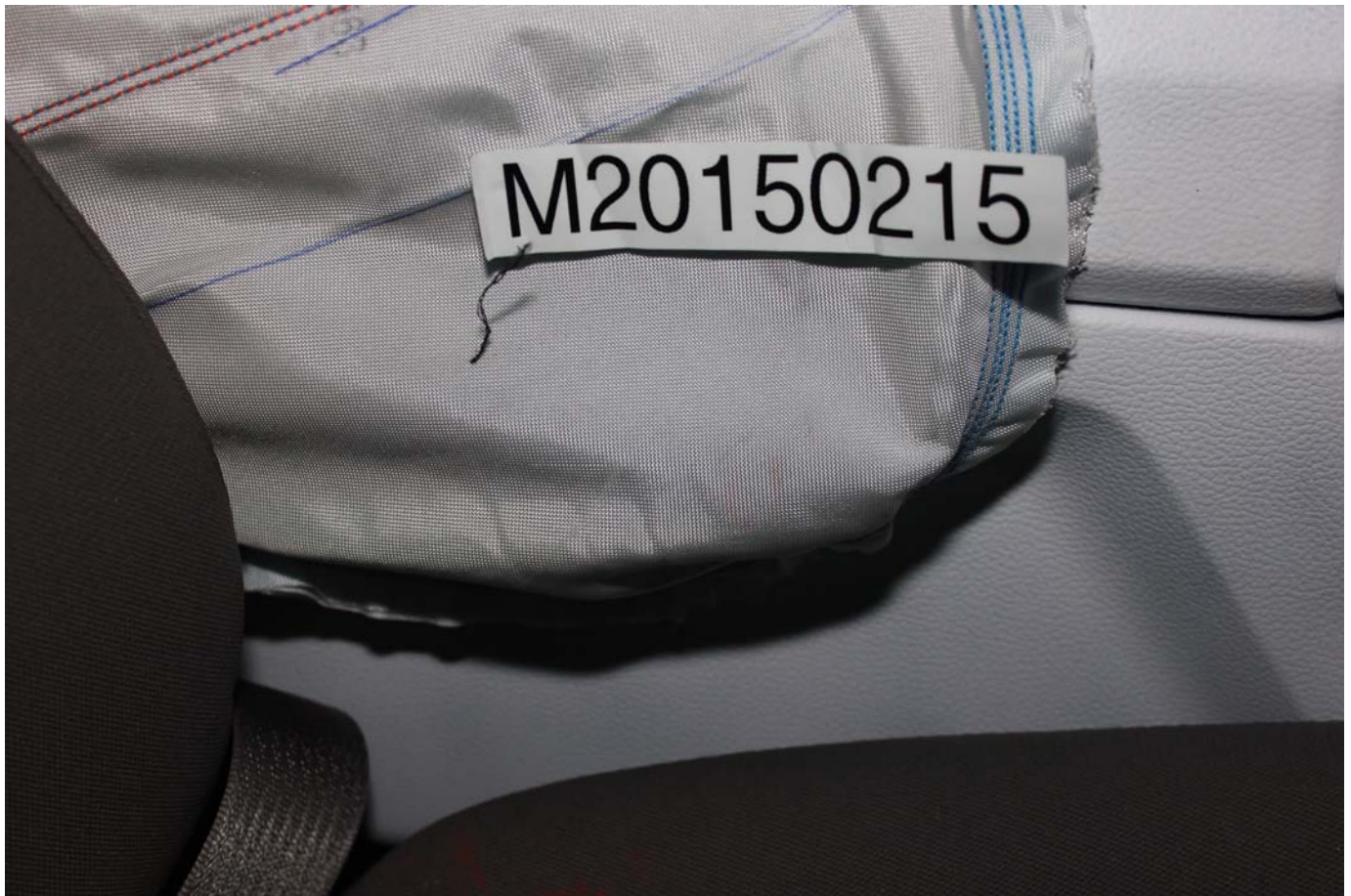
No. 050 Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



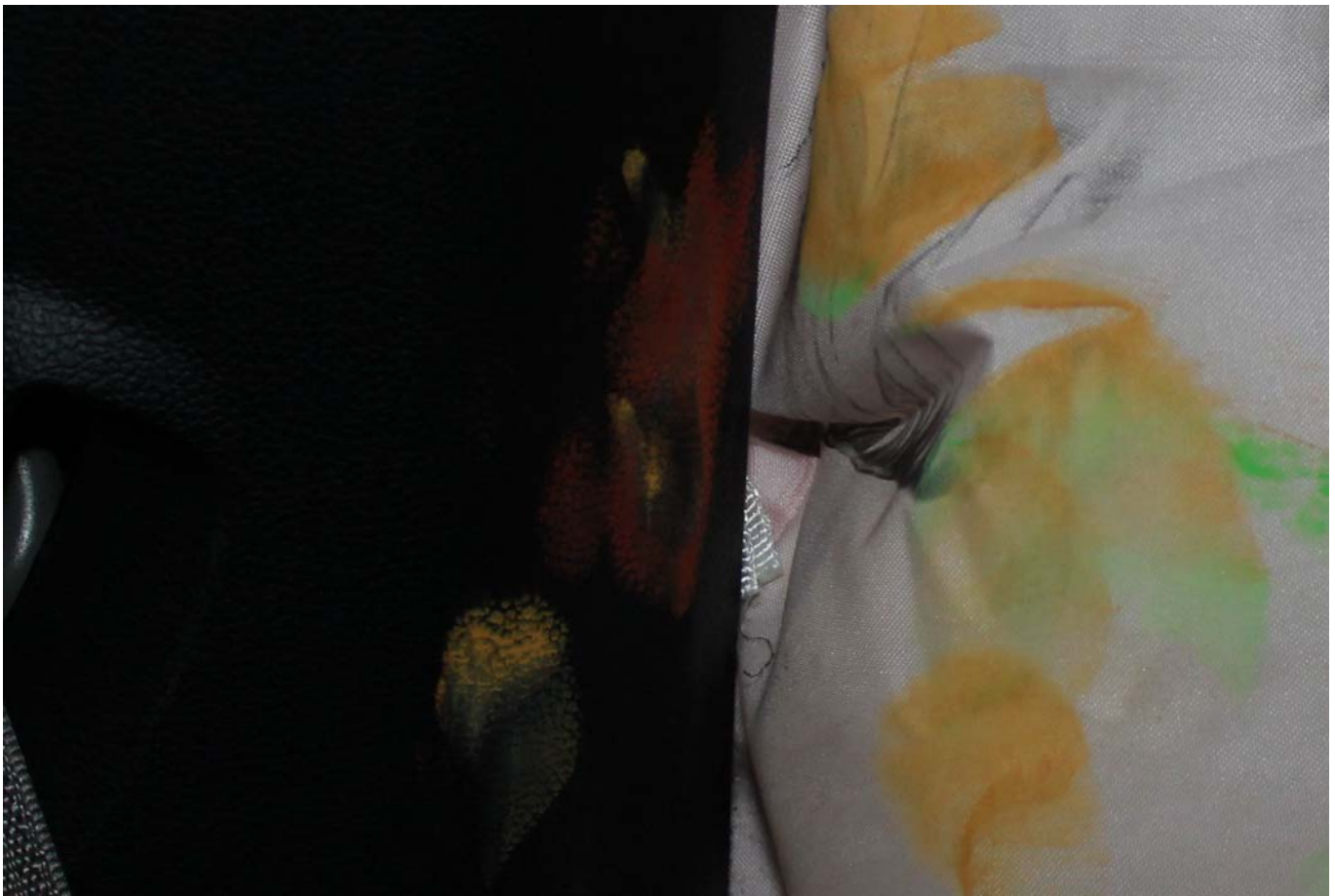
No. 072 Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



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



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



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



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



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



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

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



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



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



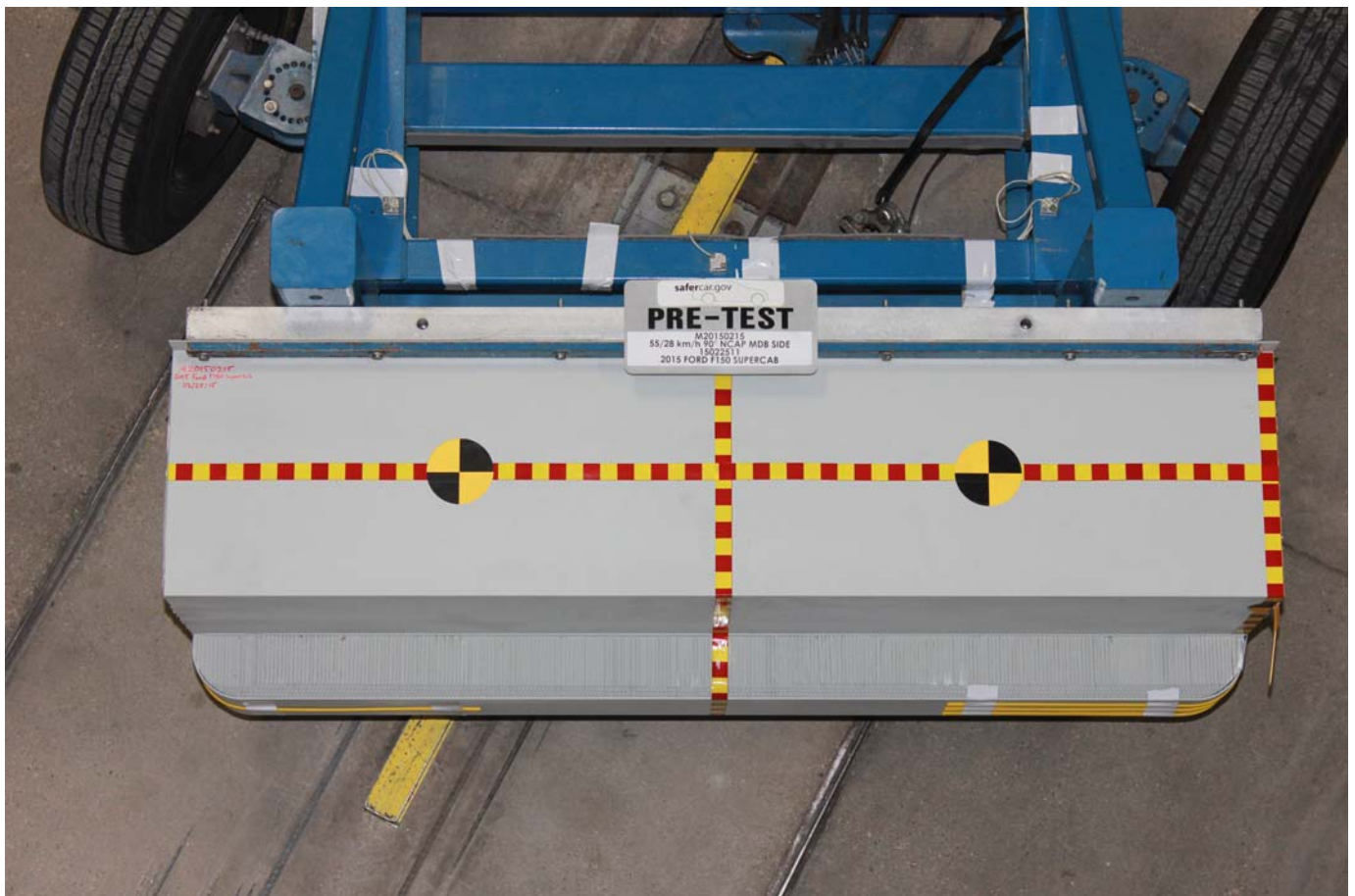
No. 083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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



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



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



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



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



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



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



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



No. 092 Close-Up View of Vehicle's Certification Label



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



No. 094 Pre-Test Ballast View



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



No. 096 FMVSS No. 301 Static Rollover 0 Degrees



No. 097 FMVSS No. 301 Static Rollover 90 Degrees



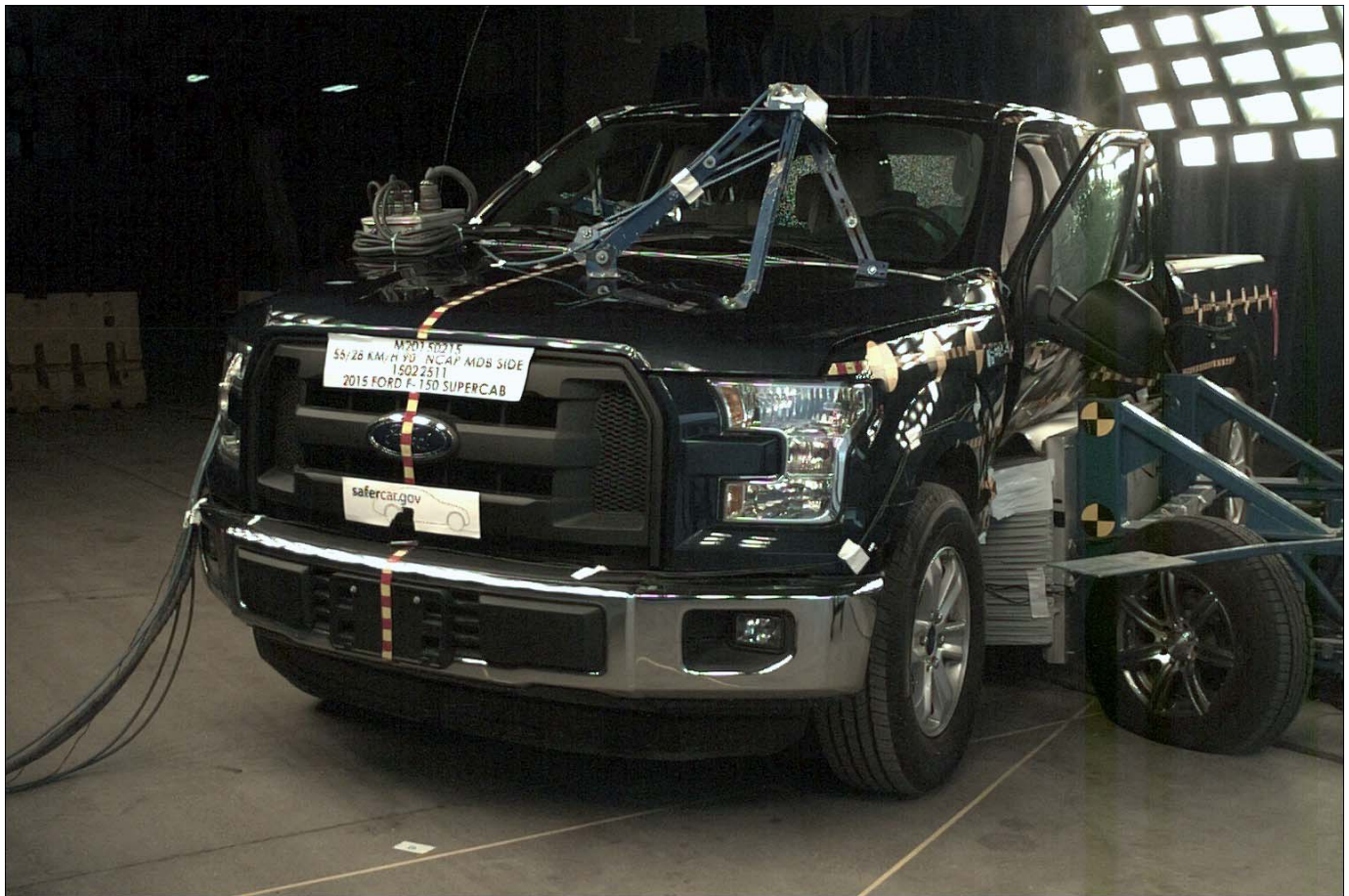
No. 098 FMVSS No. 301 Static Rollover 180 Degrees



No. 099 FMVSS No. 301 Static Rollover 270 Degrees



No. 100 FMVSS No. 301 Static Rollover 360 Degrees



No. 101 Impact Event

Ford Go Further ford.com		VEHICLE DESCRIPTION F-150 2015 F-150 4X2 SUPERCAB 145" WHEELBASE 3.5L V6 TIVCT FTV ENGINE ELEC 6-SPEED AUTO W/TOW MOD		FF A09292		EPA DOT Fuel Economy and Environment Flexible-Fuel Vehicle Gasoline-Ethanol (E85)	
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE EXTERIOR • DOOR HANDLES - BLACK • EASY FUEL CAPLESS FILLER • FULLY BOXED STEEL FRAME • HALOGEN HEADLAMPS • LOCKING REMOVABLE TAILGATE • PICKUP BOX TIE DOWN HOOKS • REAR SOLAR TINTED GLASS • SPARE TIRE & WHEEL LOCK INTERIOR • A/C W/MANUAL CLIMATE CONTROL, SINGLE ZONE • BLACK VINYL FLOOR COVERING • DAY/NIGHT REARVIEW MIRROR • TILT/TELESCOPE STR COLUMN FUNCTIONAL • 4-WHEEL DISC BRAKES W/ABS • 12V AUXILIARY POWER POINT • FADE-TO-OFF INTERIOR LIGHT • FAIL-SAFE COOLING SYSTEM • HILL START ASSIST • INTERMITTENT SPEED WIPERS • MANUAL FOLD MIRRORS • OUTBOARD MNTD REAR SHOCKS • PWR RACK AND PINION STEER • TRAILER SWAY CONTROL SAFETY/SECURITY • ADVANCETRAC WITH RSC • AIRBAGS - FRONT SEAT MOUNTED SIDE IMPACT • AIRBAGS - SAFETY CANOPY SIDE CURTAIN • CTR HIGH MOUNT STOP LAMP • SOS POST CRASH ALERT SYS • TIRE PRESSURE MONITOR SYS WARRANTY • 3YR/50,000 BUMPER TO BUMPER • 5YR/100,000 POWERTRAIN • 5YR/100,000 ROADSIDE ASSIST		INCLUDED ON THIS VEHICLE (MSRP) EQUIPMENT GROUP 101A 2,265.00 •XL SERIES •XO POWER EQUIPMENT GROUP •SYNC •CRUISE CONTROL •SOLARLINK OPTIONAL EQUIPMENT/OTHER 245/70R 17 BSW ALL-SEASON 3.56 RATIO REGULAR AXLE NO CHARGE 8100H GVWR PACKAGE NO CHARGE FRONT LICENSE PLATE BRACKET NO CHARGE CALIFORNIA EMISSIONS SYSTEM NO CHARGE 20 GALLON FUEL TANK XL CHROME APPEARANCE PACKAGE 775.00 FOG LAMPS 17" SILVER PAINTED ALUMINUM		PRICE INFORMATION (MSRP) BASE PRICE \$29,490.00 TOTAL OPTIONS/OTHER 3,030.00 TOTAL VEHICLE & OPTIONS/OTHER DESTINATION & DELIVERY 32,510.00 1,165.00 TOTAL BEFORE DISCOUNTS 33,765.00 XL MID DISCOUNT - 800.00 XL DSCT CHRSM OR SPORT - 250.00 TOTAL SAVINGS - 700.00		Fuel Economy 20 MPG 18 25 5.0 combined city/hwy city highway gallons per 100 miles Driving Range Gasoline 482 miles Ethanol (E85) 362 miles You spend \$2,000 more in fuel costs over 5 years compared to the average new vehicle. Annual fuel cost \$2,600 Fuel Economy & Greenhouse Gas Rating (tailpipe only) 5 This vehicle emits 436 grams CO ₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fueleconomy.gov. Smog Rating (tailpipe only) 6 This vehicle emits 436 grams CO ₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fueleconomy.gov. fueleconomy.gov Calculate personalized estimates and compare vehicles.	
GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score To Be Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight. Frontal Crash Driver Passenger To Be Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight. Side Crash Front seat Rear seat To Be Rated Based on the risk of injury in a side impact. Rollover To Be Rated Based on the risk of rollover in a single-vehicle crash. Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236		37 YEARS FORD F-SERIES AMERICA'S BEST-SELLING TRUCK Scan this code to experience this vehicle or test 1FFFA09292 to 48028 or Visit ford.com/windowsticker Standard messaging & data plan rates may apply.					
SOLD TO All Superior Ford, Inc. 3727 State Road Croyhoga Falls OH 44223 SHIP TO (if other than ROAD TO)		DEALER NO. 44C 200 RAMP ONE CV59 RAMP TWO FINAL ASSEMBLY PLANT DEARBORN ITEM P. 44-1775 O/T 2 METHOD OF TRANSFER CONVOY EM001 R RB X 625 002830 12 08 14		TOTAL MSRP \$32,955.00 This label is affixed pursuant to the Federal Automobile Information Disclosure Act, Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.			

No. 102 Monroney Label

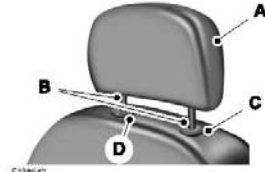
Seats

WARNINGS

 Install the head restraint properly to help minimize the risk of neck injury in the event of a crash.

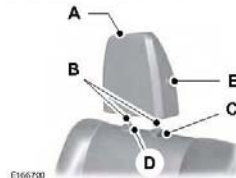
Note: Adjust the seatback to an upright driving position before adjusting the head restraint. Adjust the head restraint so that the top of it is level with the top of your head and as far forward as possible. Make sure that you remain comfortable. If you are extremely tall, adjust the head restraint to its highest position.

Front Seat Head Restraint



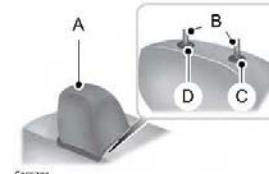
E106542

Rear Seat Outboard Head Restraints



E166700

Rear Seat Center Head Restraint



E166701

The head restraints consist of:

- A An energy absorbing head restraint.
- B Two steel stems.
- C Guide sleeve adjust and release button.
- D Guide sleeve unlock and remove button.
- E Fold button (rear seat outboard only).

Adjusting the Head Restraint

Raising the Head Restraint

Pull the head restraint up.

Lowering the Head Restraint

1. Press and hold button C.
2. Push the head restraint down.

Removing the Head Restraint

1. Pull up the head restraint until it reaches the highest adjustment position.
2. Press and hold buttons C and D.
3. Pull up the head restraint.

Note: For rear seat outboard seats, you can fold the head restraint forward for easier removal.

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No. 103 Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Seats

Installing the Head Restraint

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

Folding the Head Restraint

Note: The rear seat outboard head restraints may fold forward for improved visibility.

1. Press and hold button E.
2. Pull it back up to reset.

Front Seat Center Head Restraint

Your vehicle may be equipped with a front row center head restraint that you cannot adjust or remove.

Tilting Head Restraints (If Equipped)

The front head restraints tilt for extra comfort. To tilt the head restraint, do the following:



E144727

1. Adjust the seatback to an upright driving or riding position.
2. Pivot the head restraint forward toward your head to the desired position.

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

Note: Do not attempt to force the head restraint backward after it is tilted. Instead, continue tilting it forward until the head restraint releases to the upright position.

MANUAL SEATS

WARNING

 Do not adjust the driver's seat or seatback when your vehicle is moving.

Moving the Seat Backward and Forward



E175314

Recline Adjustment



E175315

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No. 104 Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

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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

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)

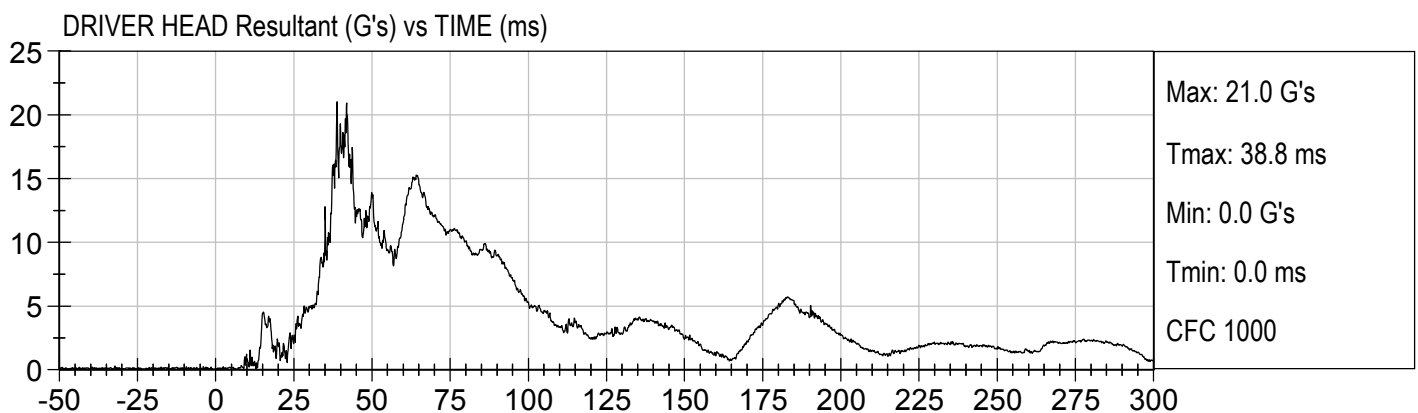
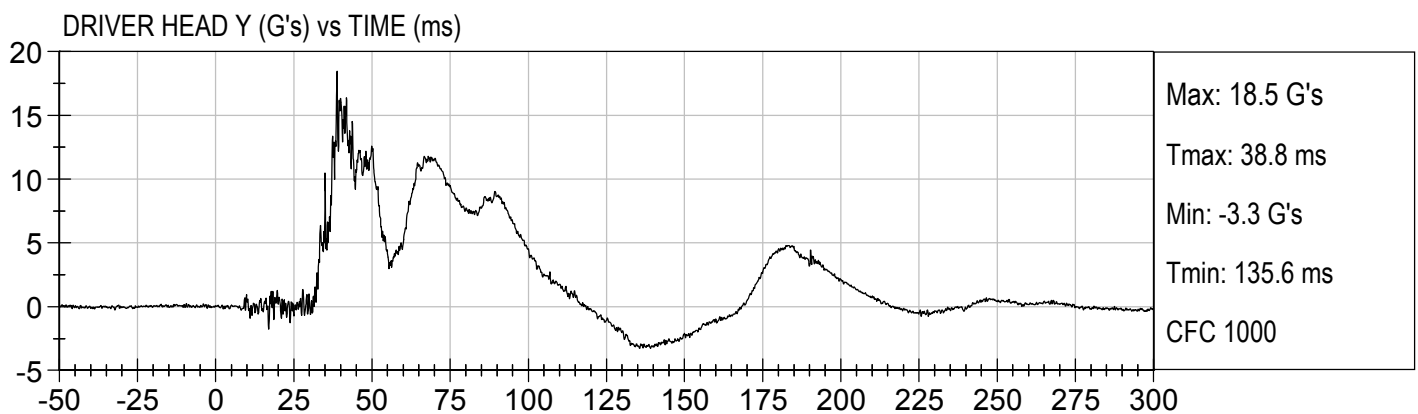
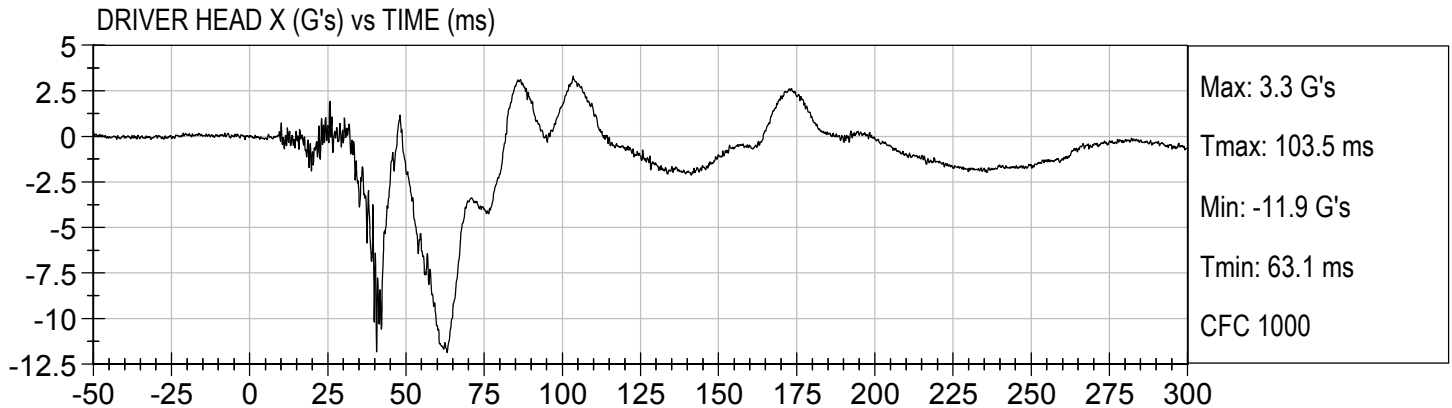
MDB Center of Gravity Acceleration (Z)

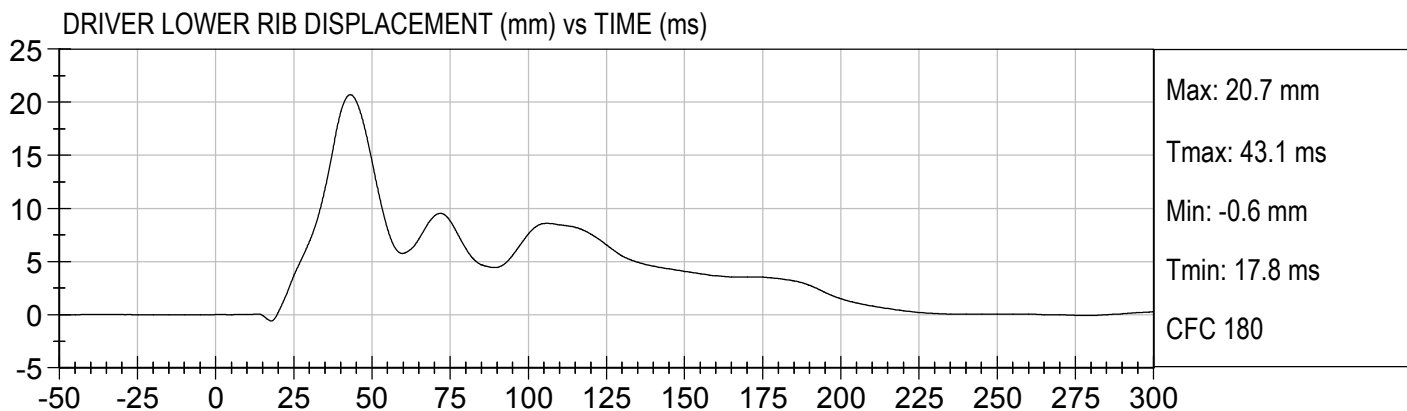
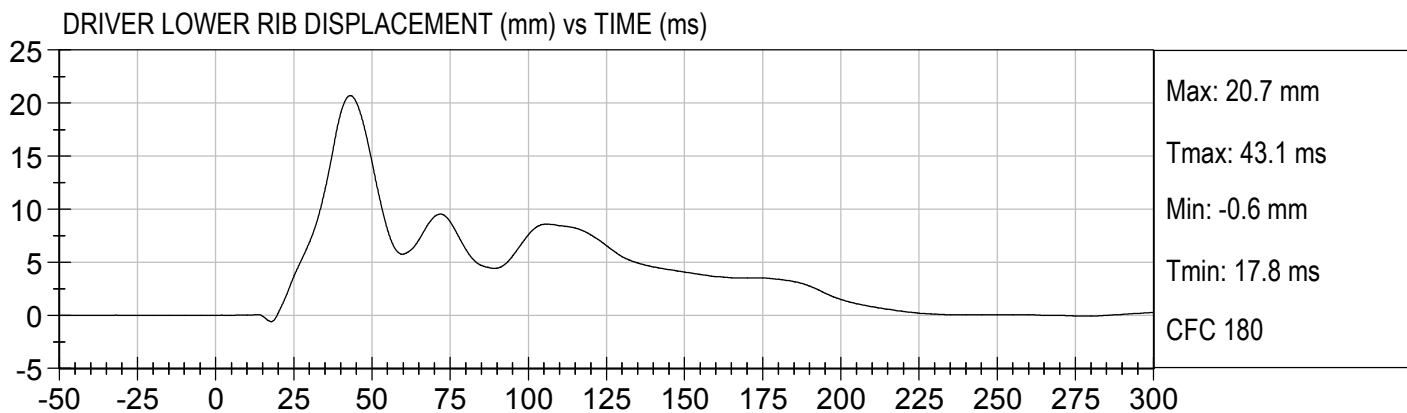
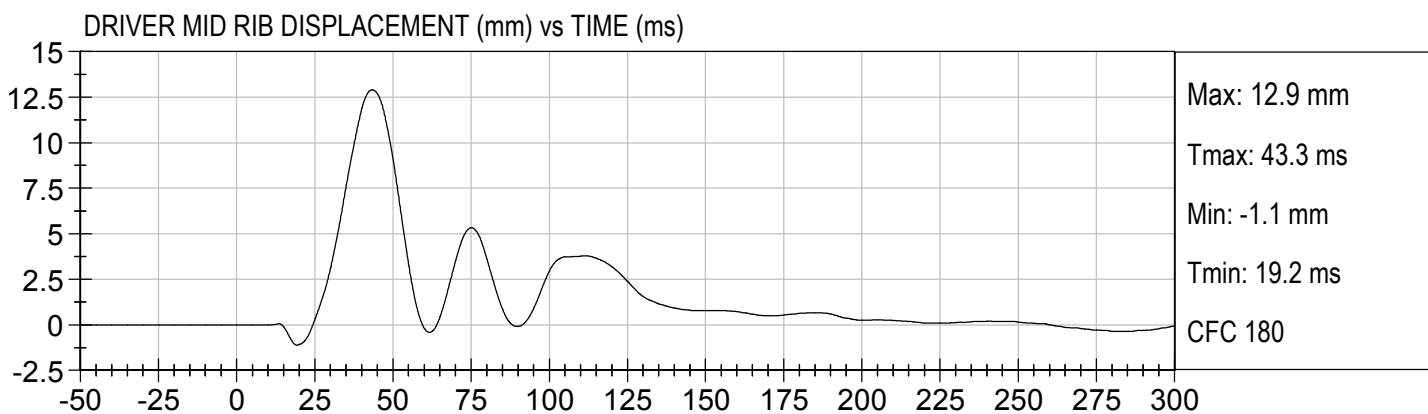
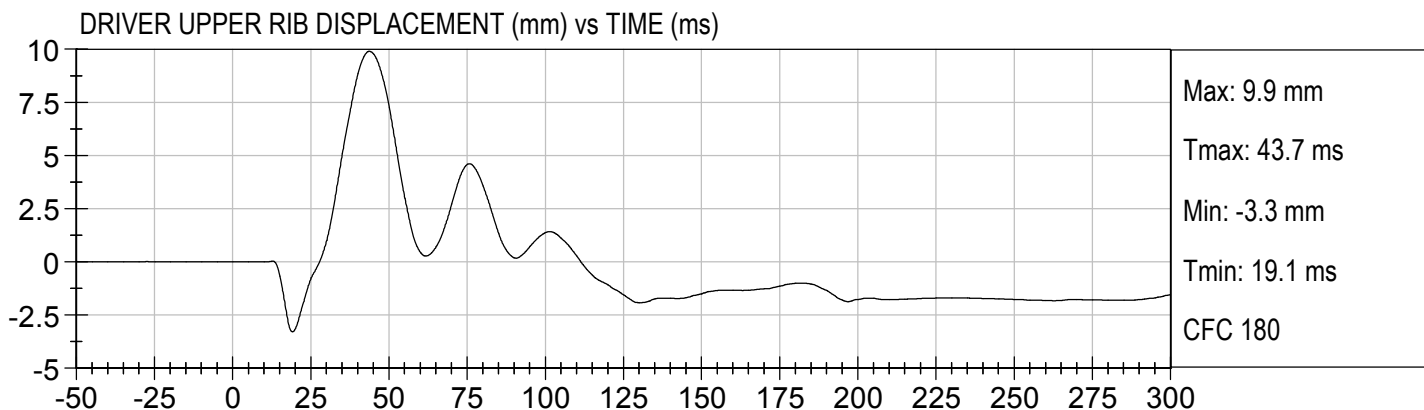
MDB Rear Acceleration (X)

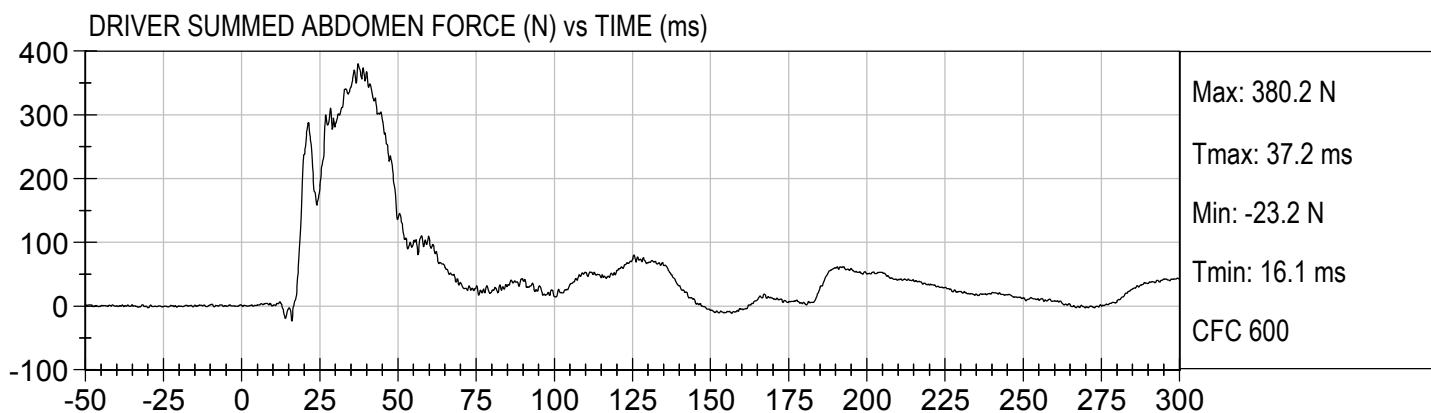
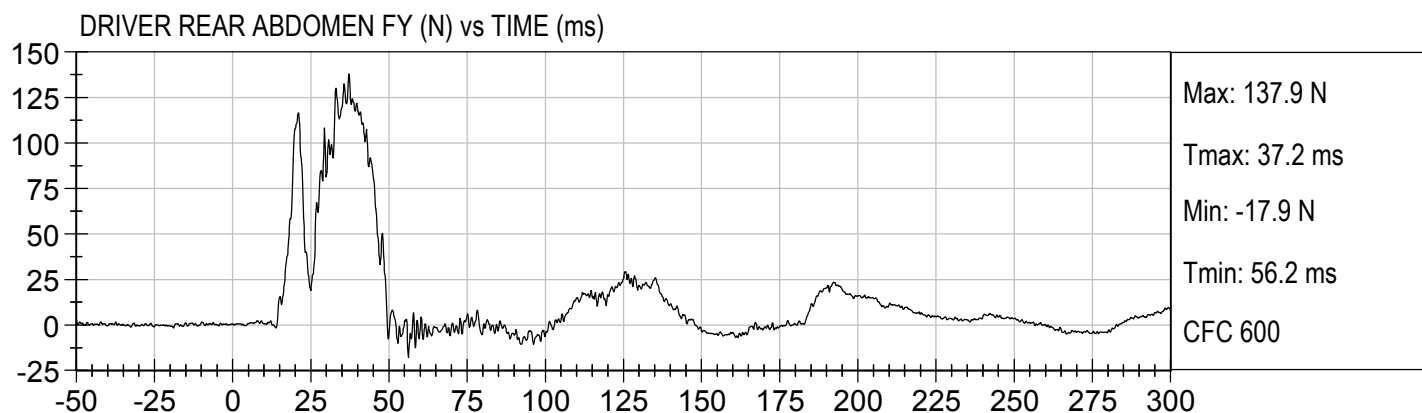
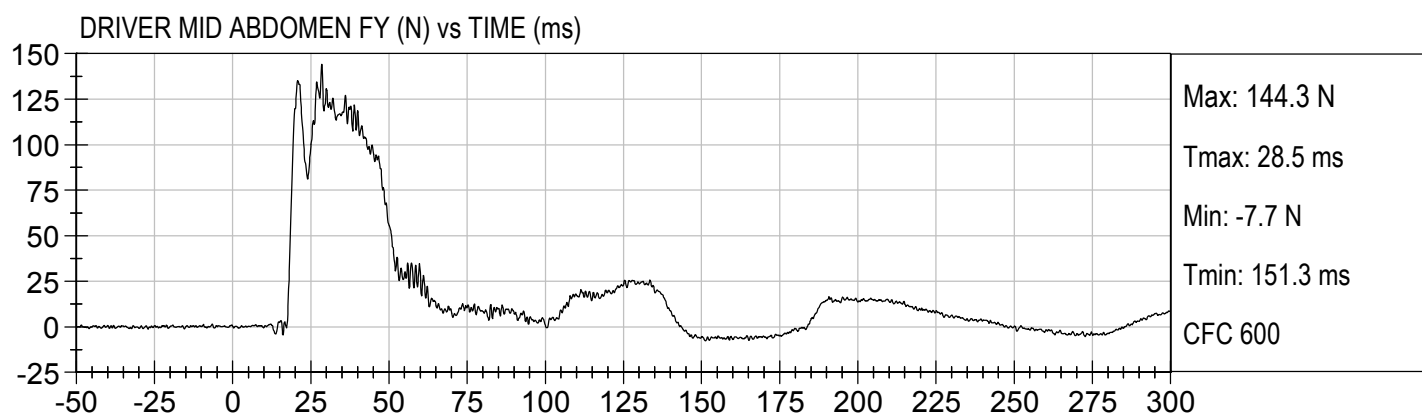
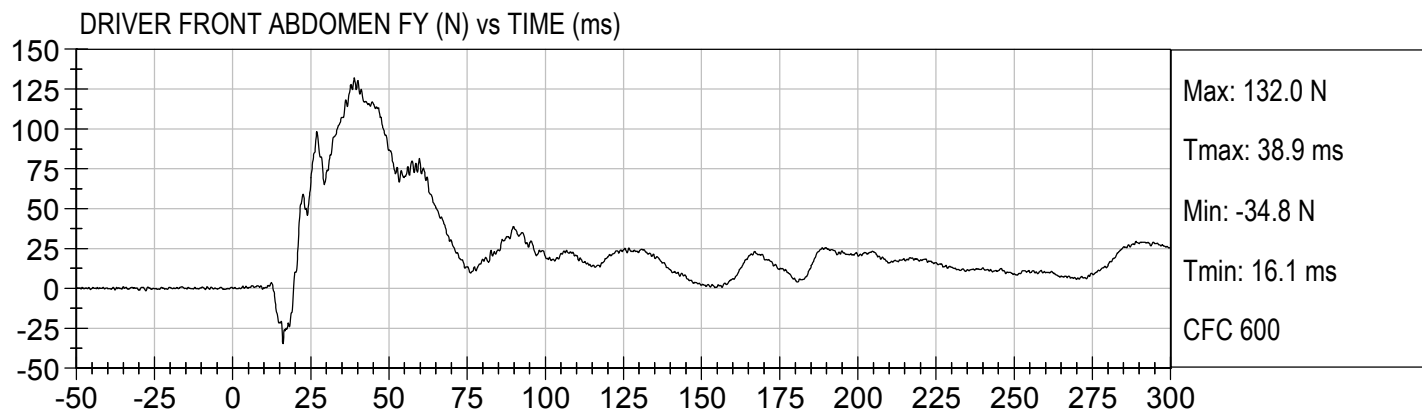
MDB Rear Acceleration (Y)

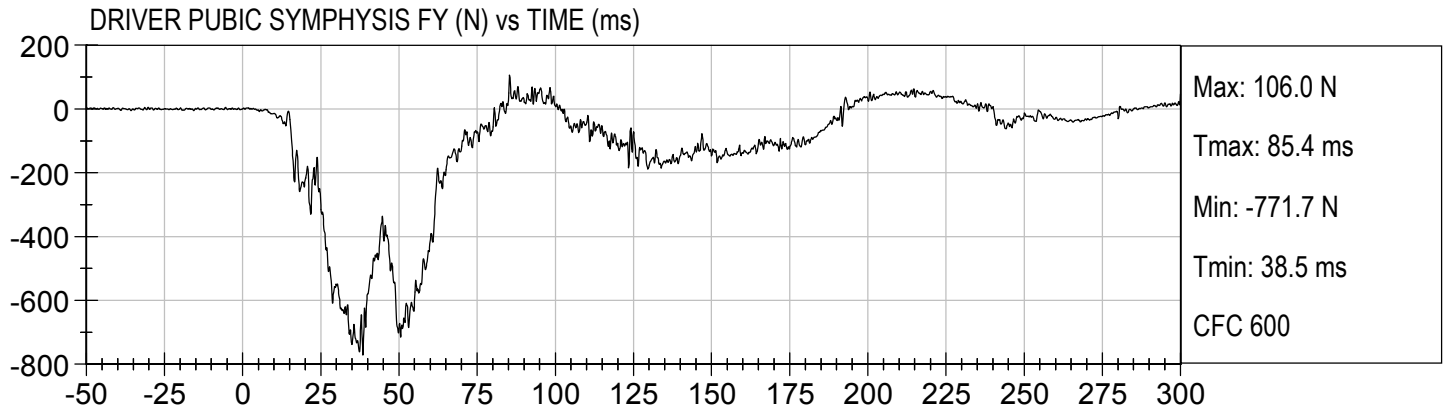
Left MDB Contact Switch

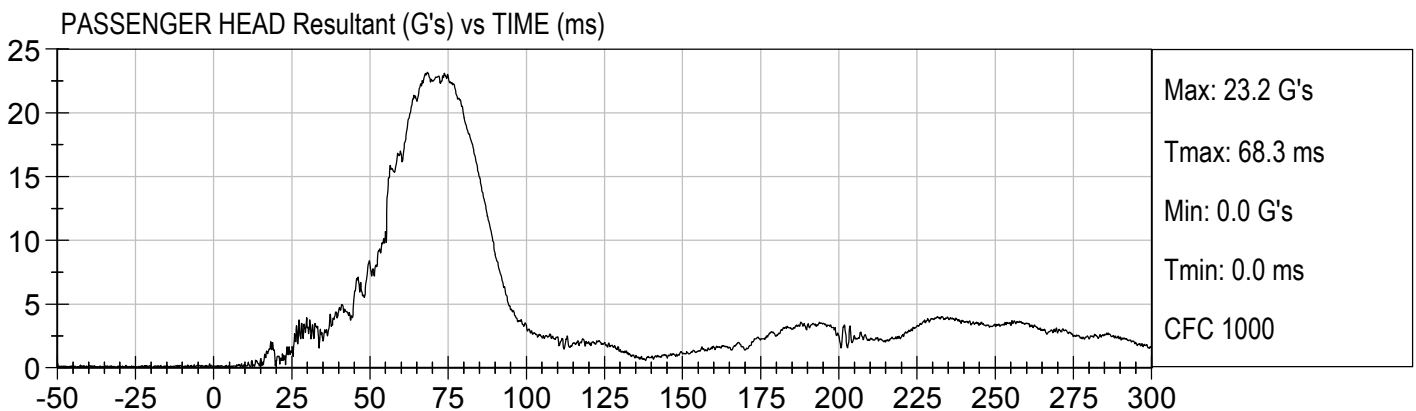
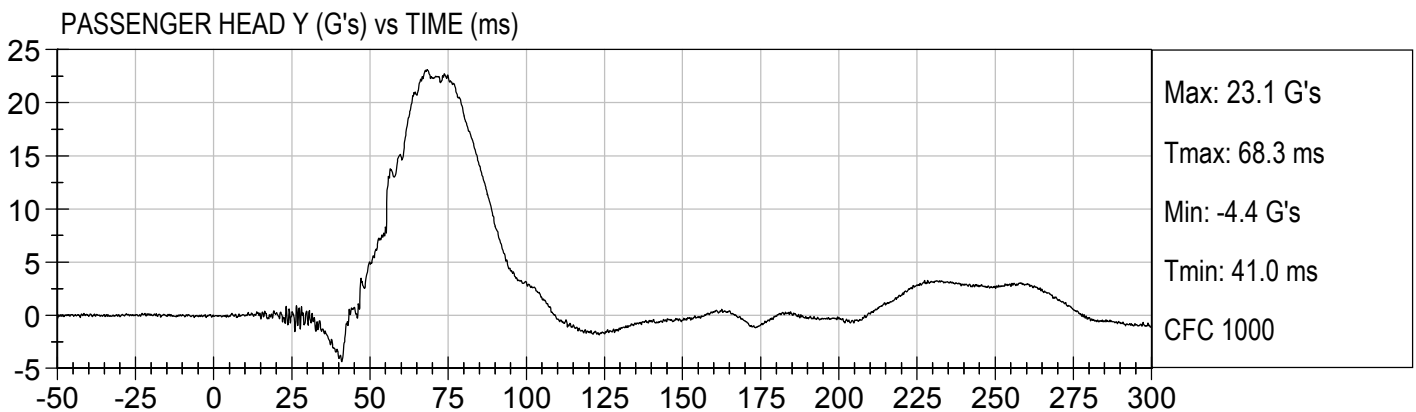
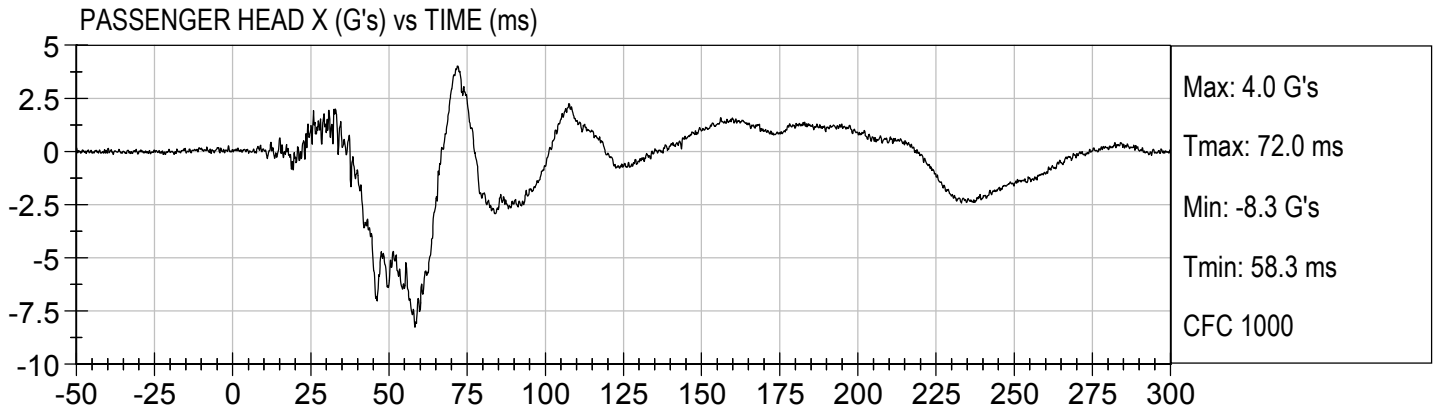
Right MDB Contact Switch

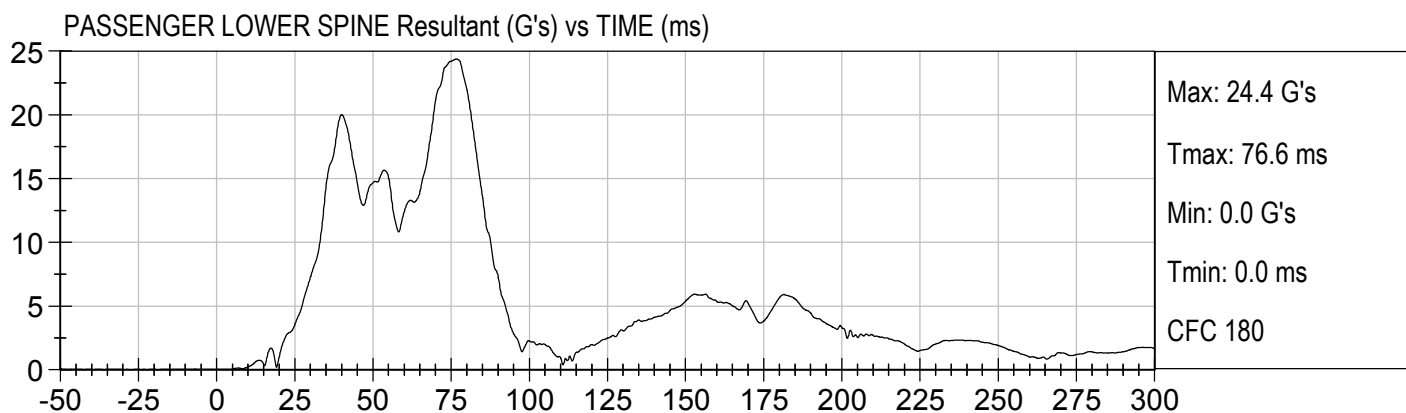
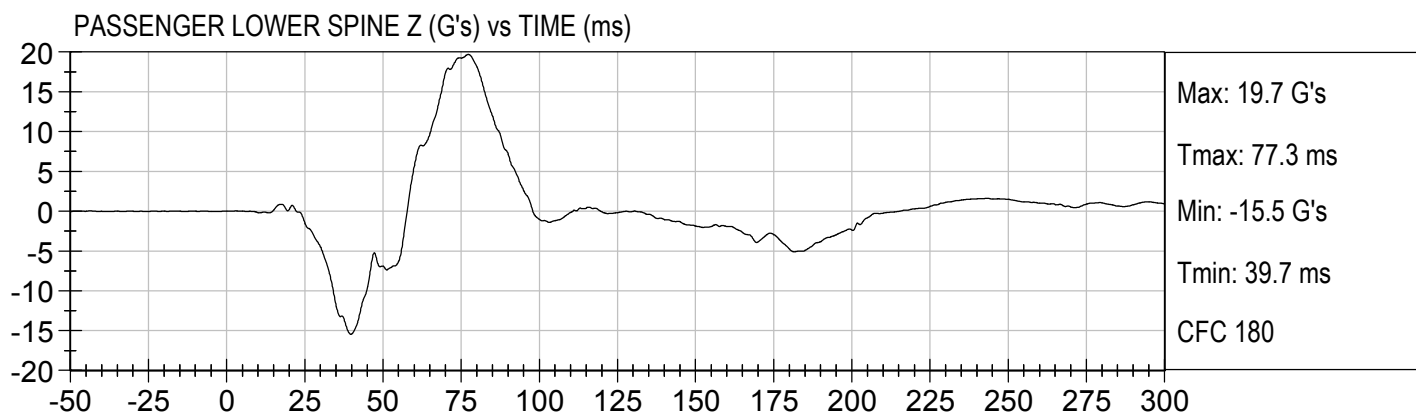
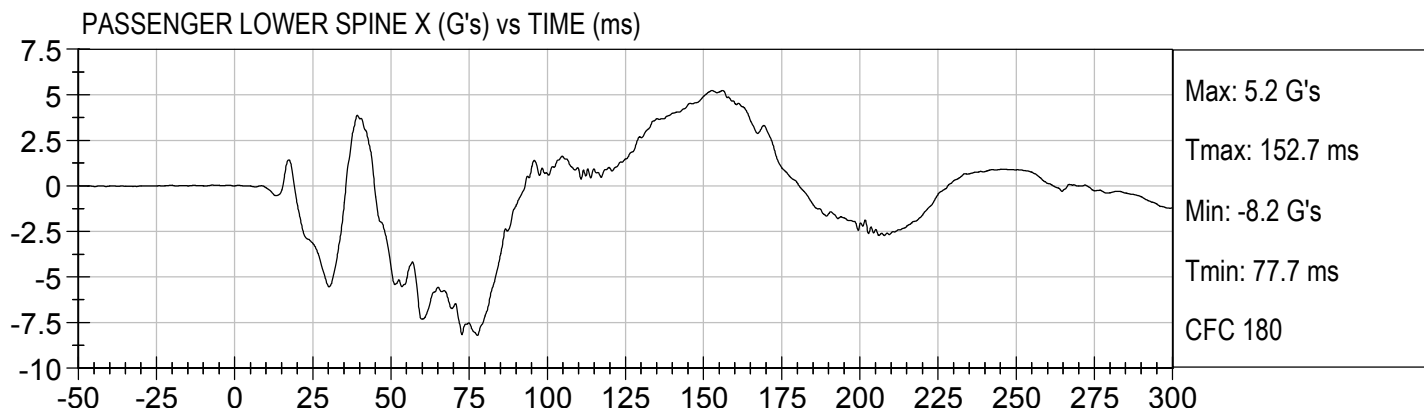


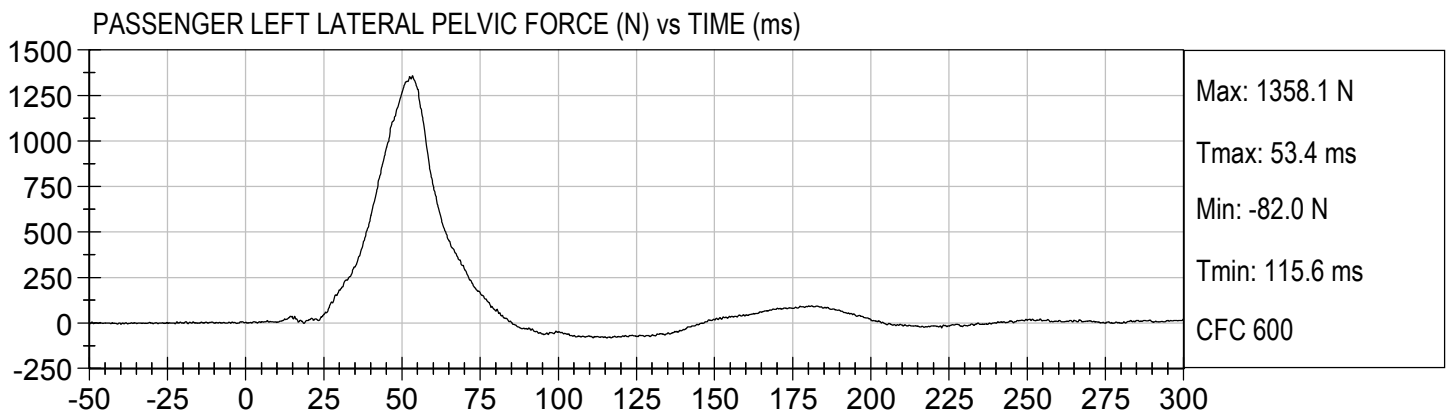
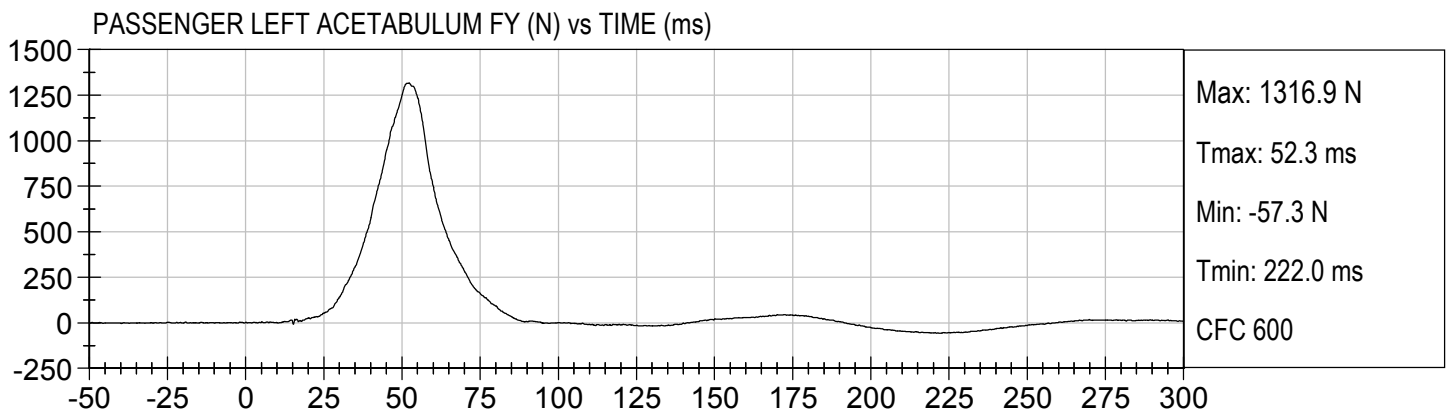
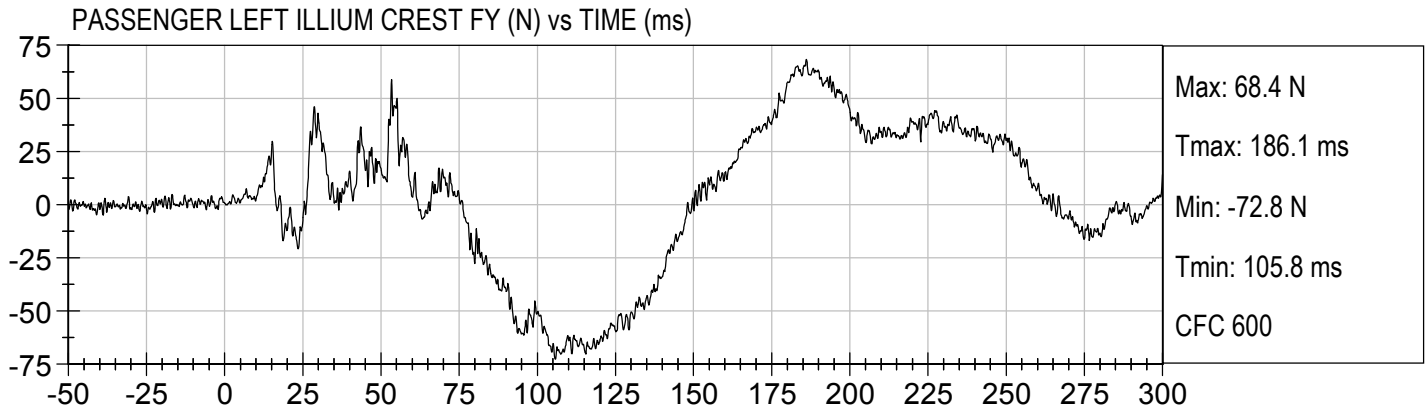












APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

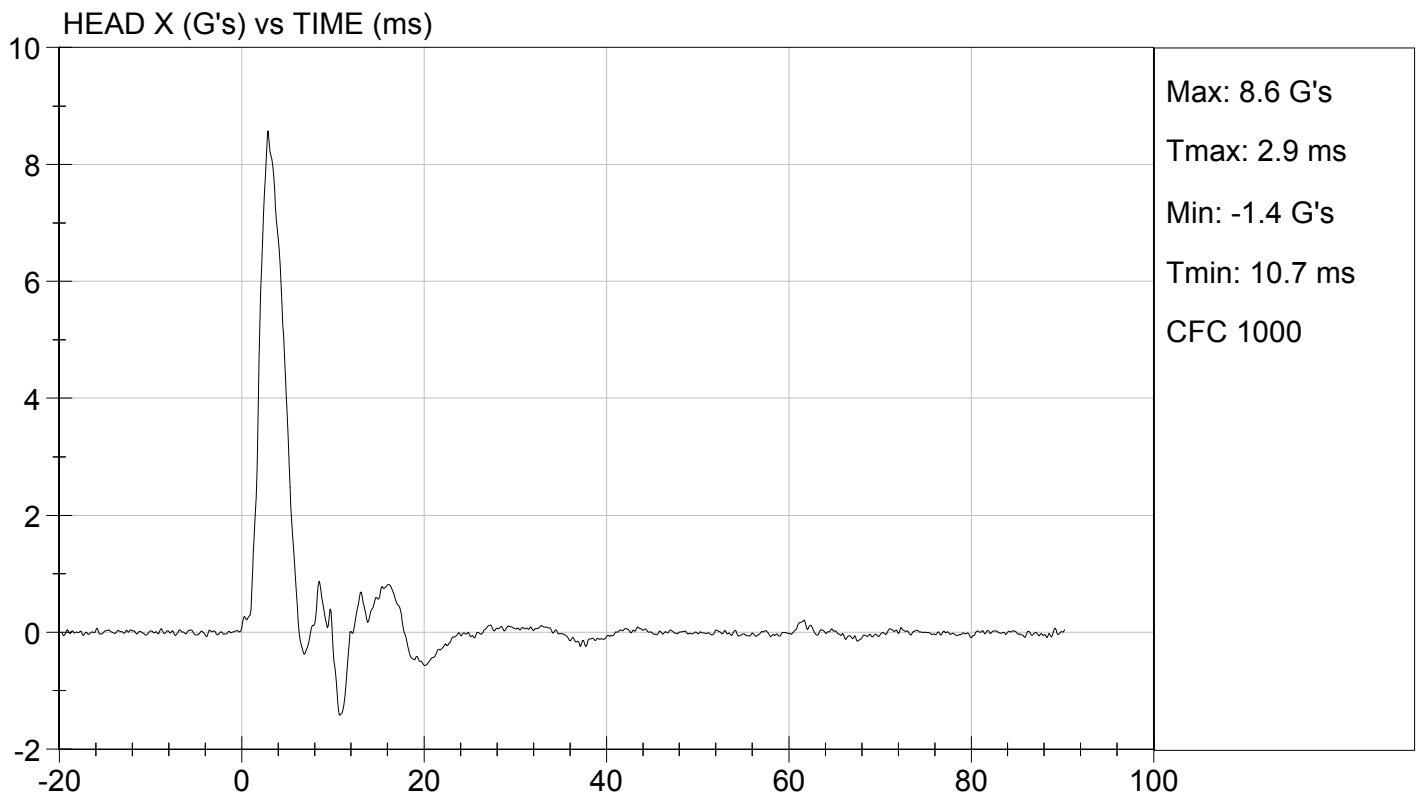
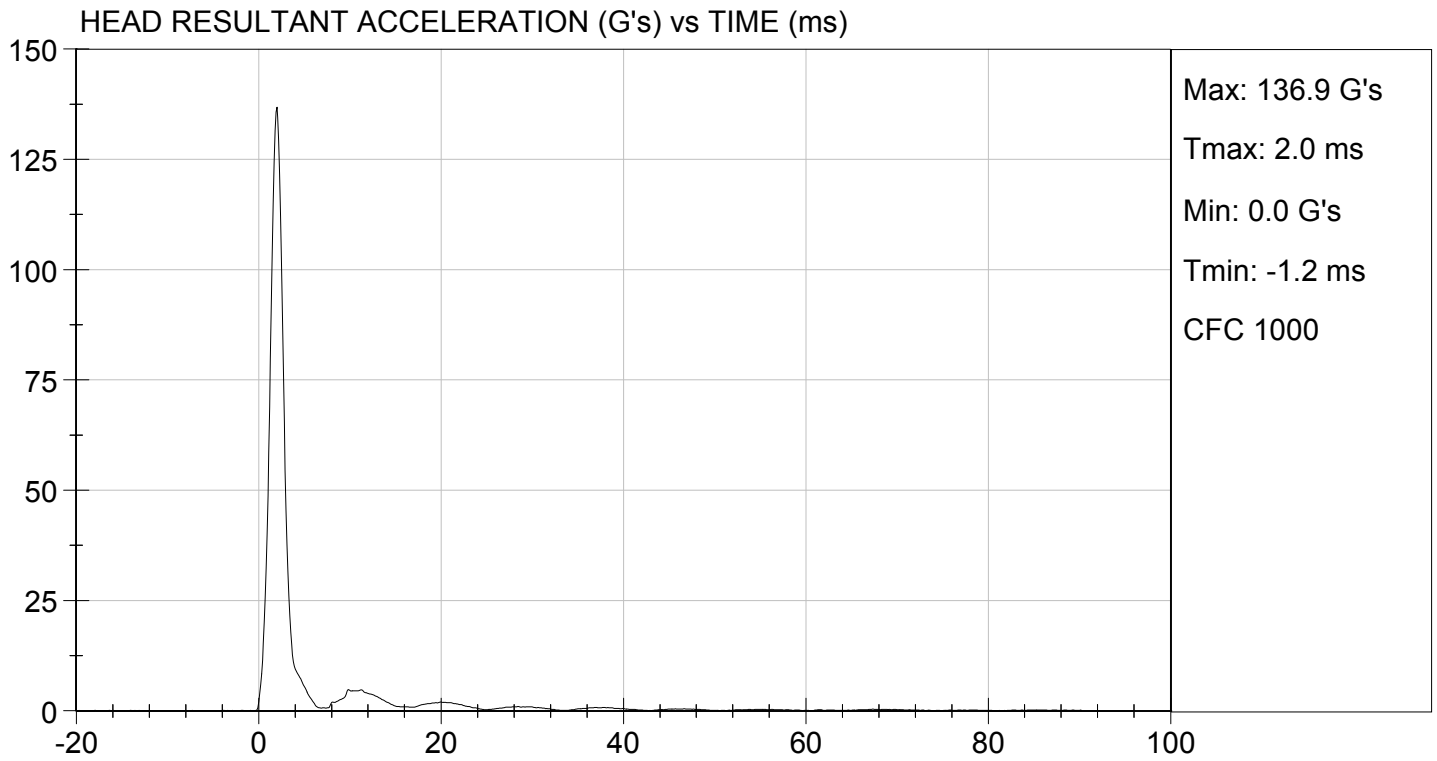
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY****ATD Serial No:** 032**Test ID:** D15461

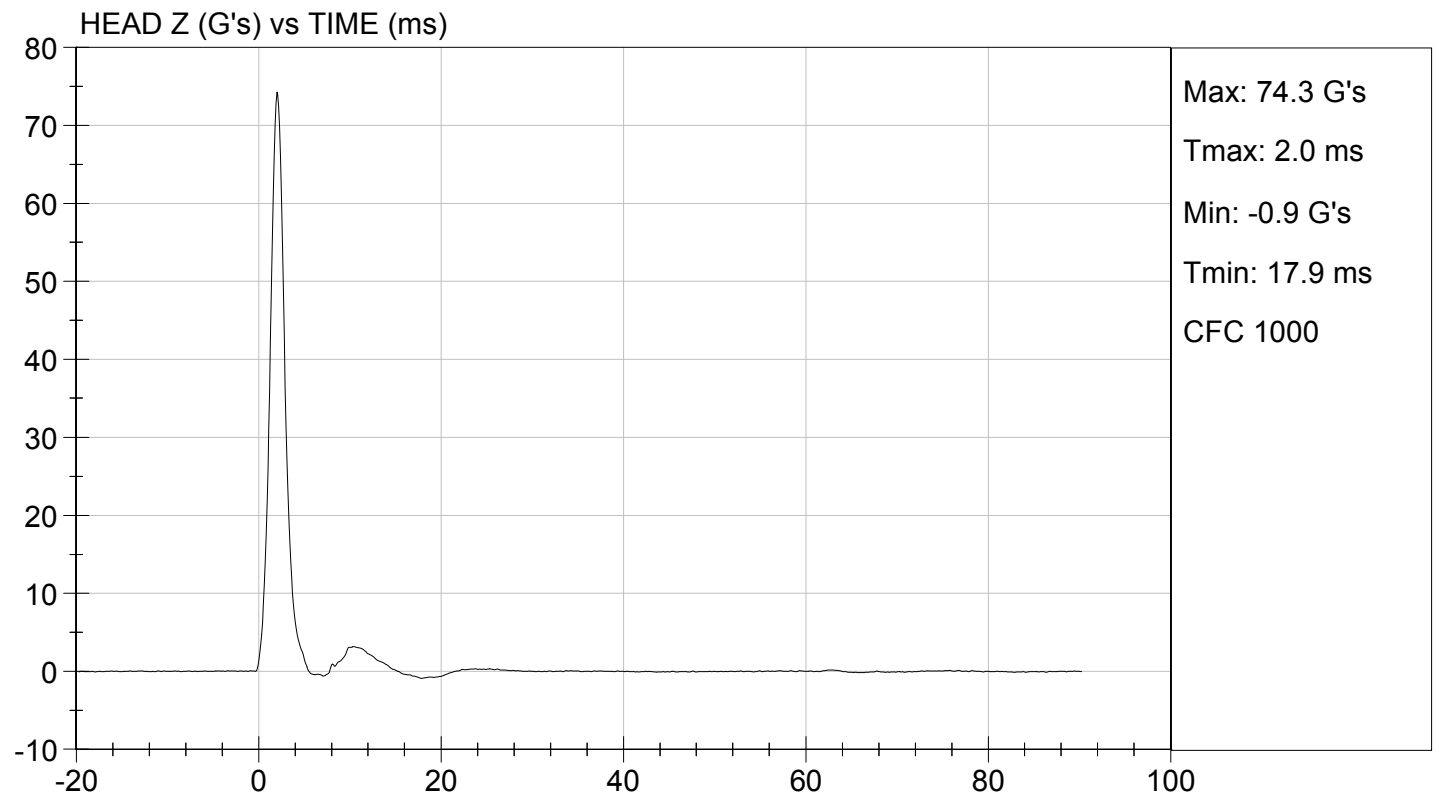
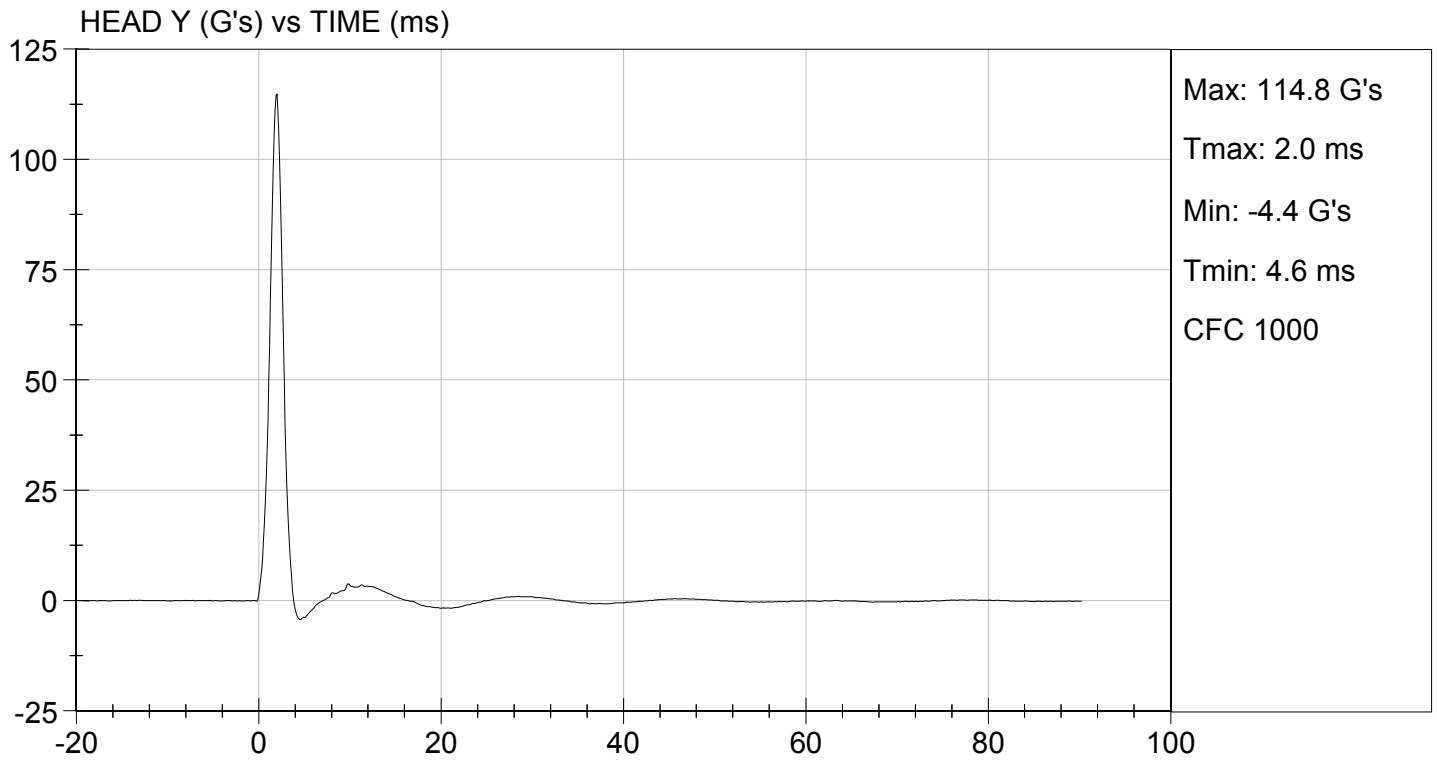
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Peak Resultant Acceleration	G's	125 to 155	137	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	8.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

02/17/2015
Test Date


Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

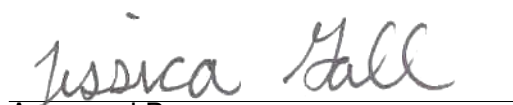
ATD Serial No: 032

Test I.D: D15462

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.48	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.04	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.23	Pass
	17 ms	m/s	>= -3.70	-3.52	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	50.7	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	59.9	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	60.9	Pass
Overall Results					Pass


Laboratory Technician

02/17/2015
Test Date

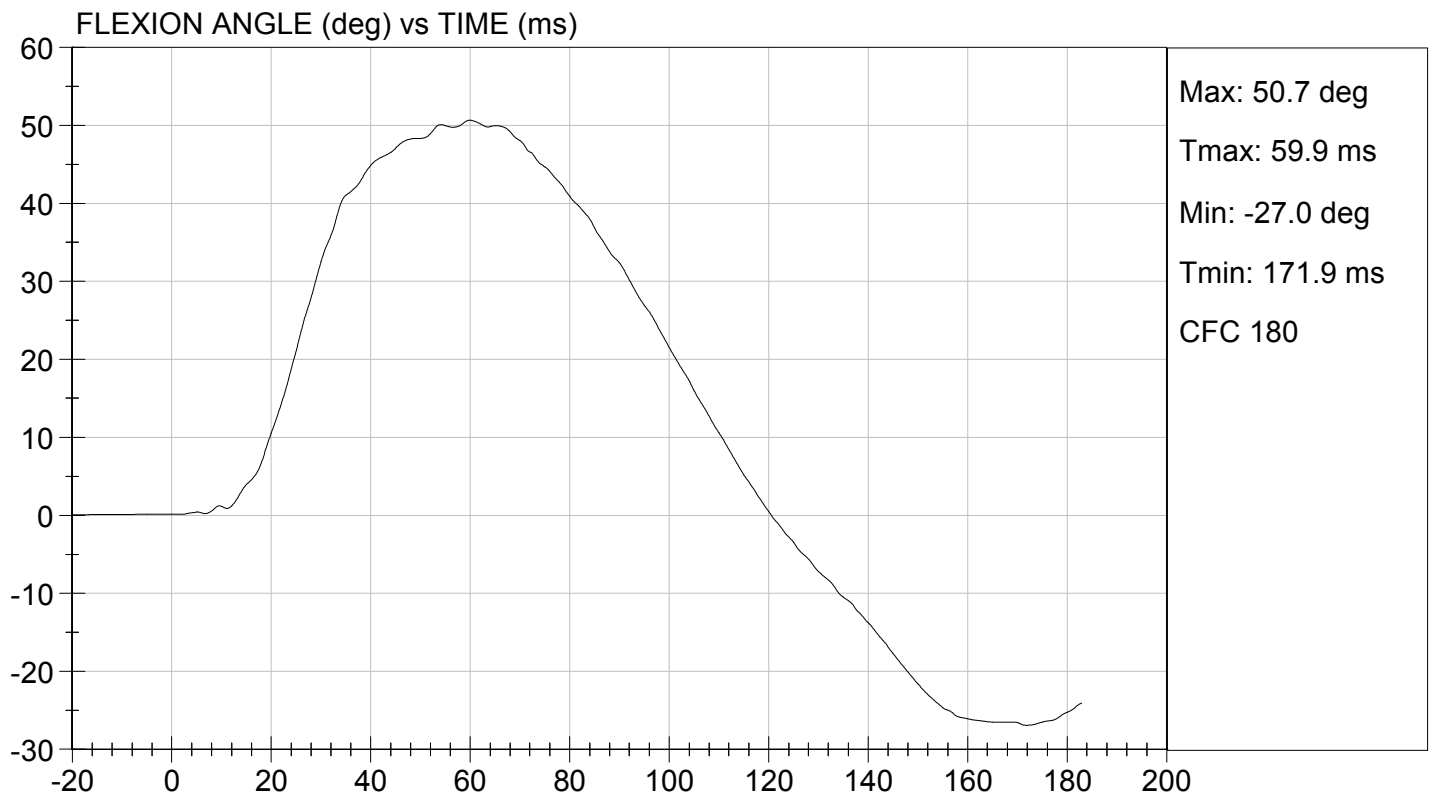
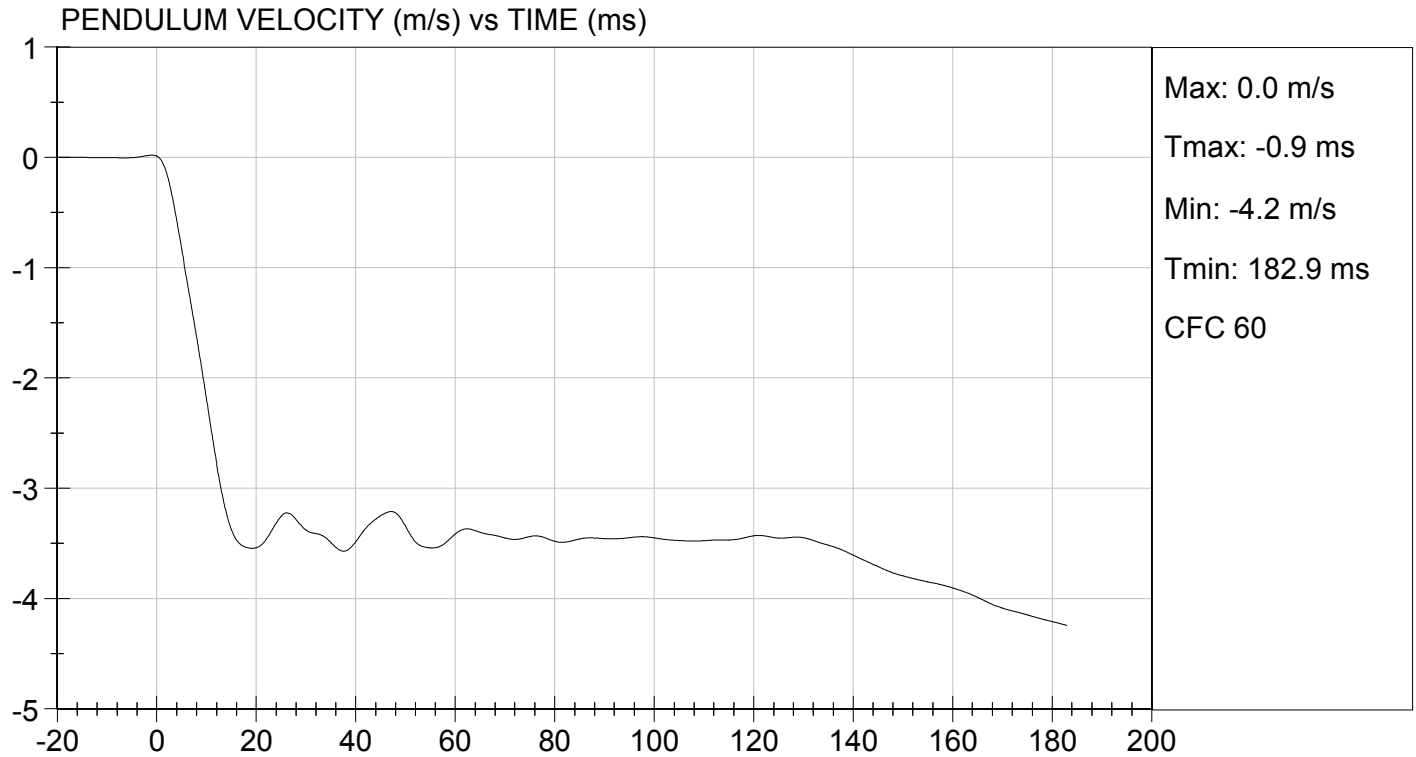

Approved By



TEST DESC: NECK BENDING
VELOCITY: 11.42 ft/s, 3.48 m/s

TEST DATE: 02/17/2015

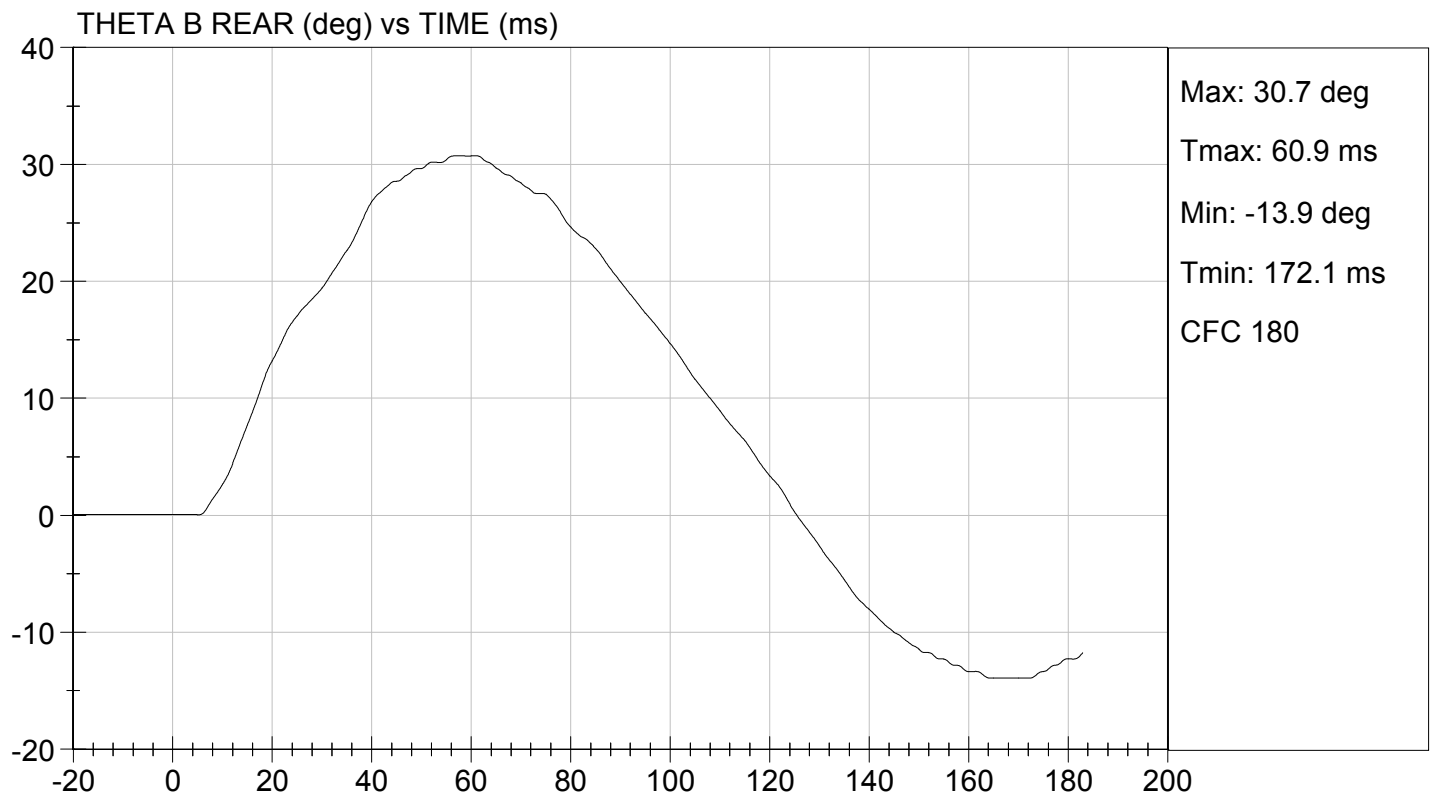
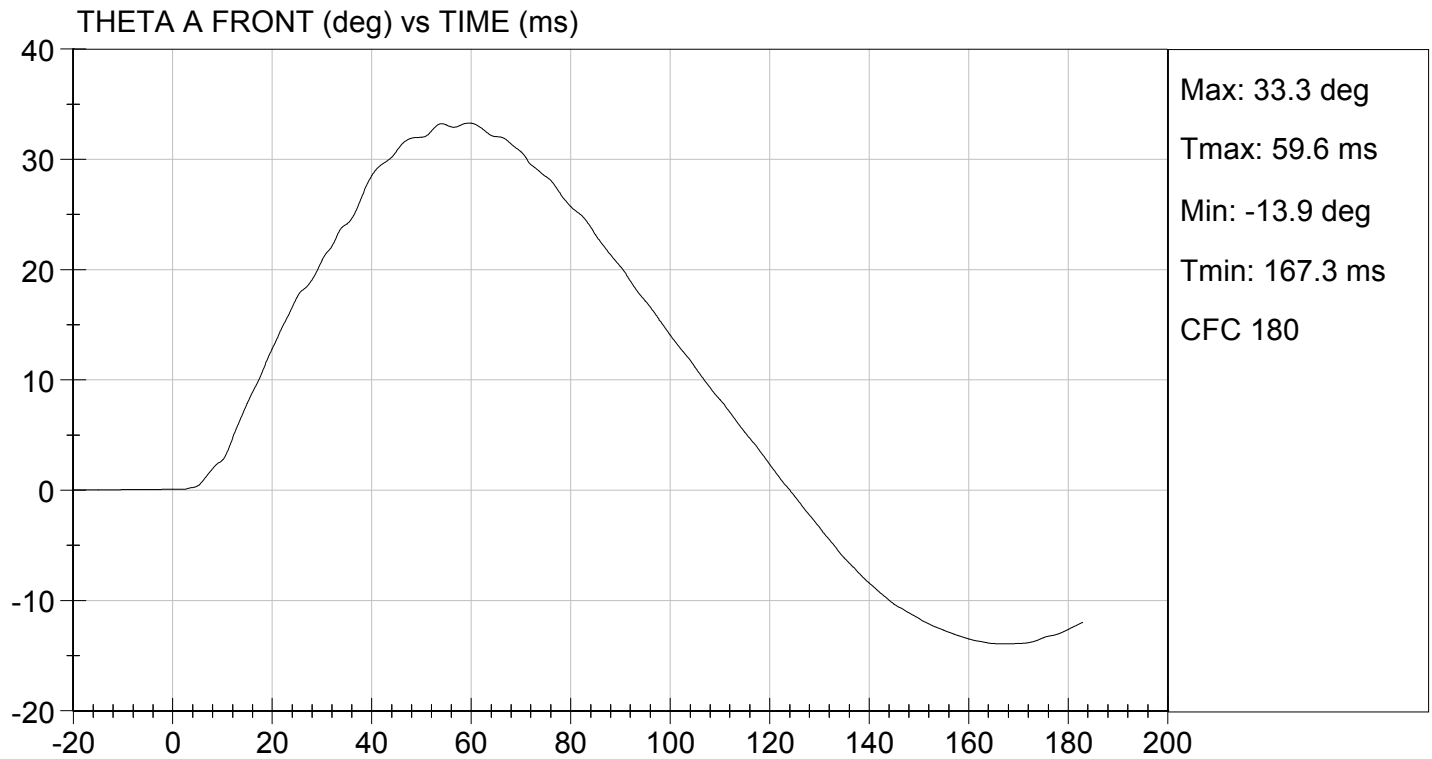
TEST #: D15462





TEST DESC: NECK BENDING
VELOCITY: 11.42 ft/s, 3.48 m/s

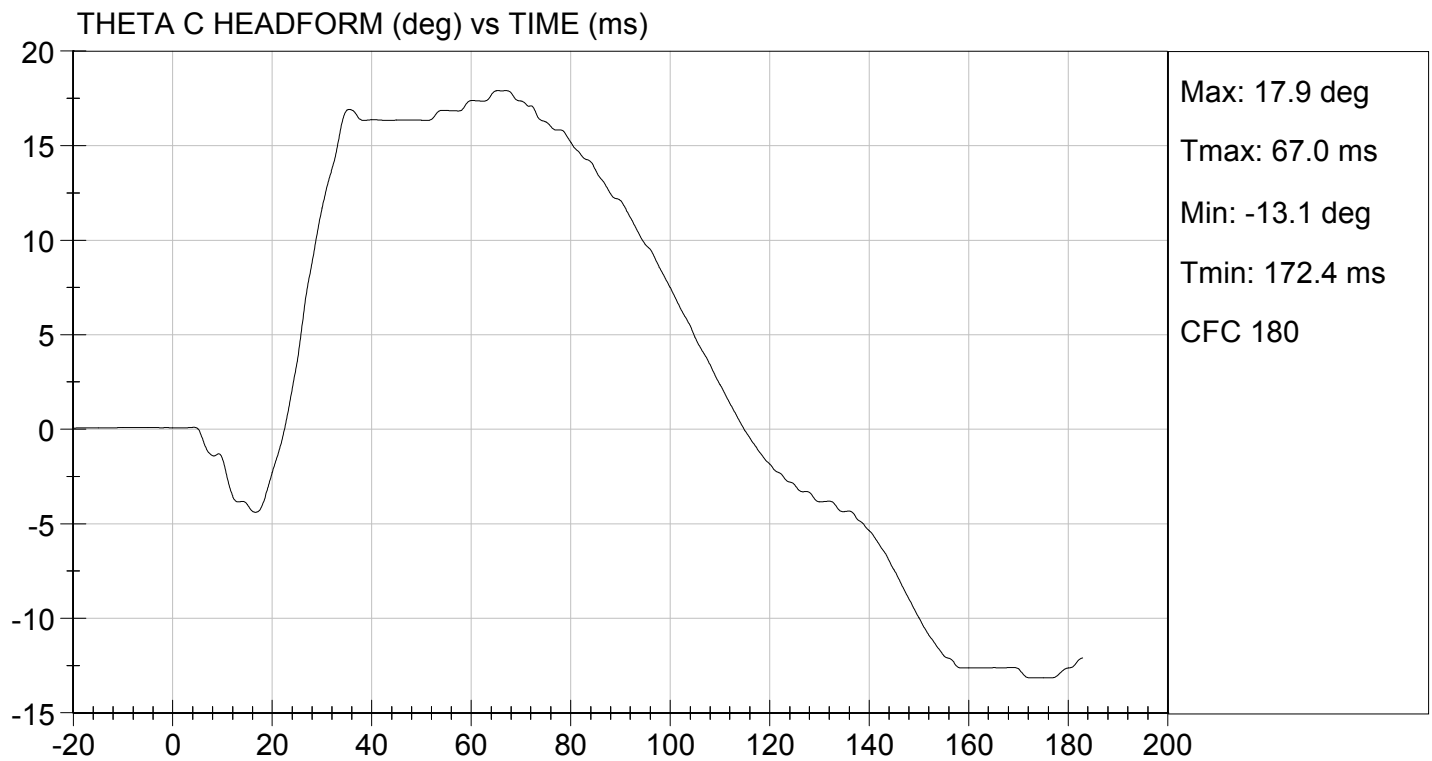
TEST DATE: 02/17/2015
TEST #: D15462





TEST DESC: NECK BENDING
VELOCITY: 11.42 ft/s, 3.48 m/s

TEST DATE: 02/17/2015
TEST #: D15462



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D15463

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	19	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	8.8	Pass
Overall Test Results				Pass

Jack Coleman
Laboratory Technician

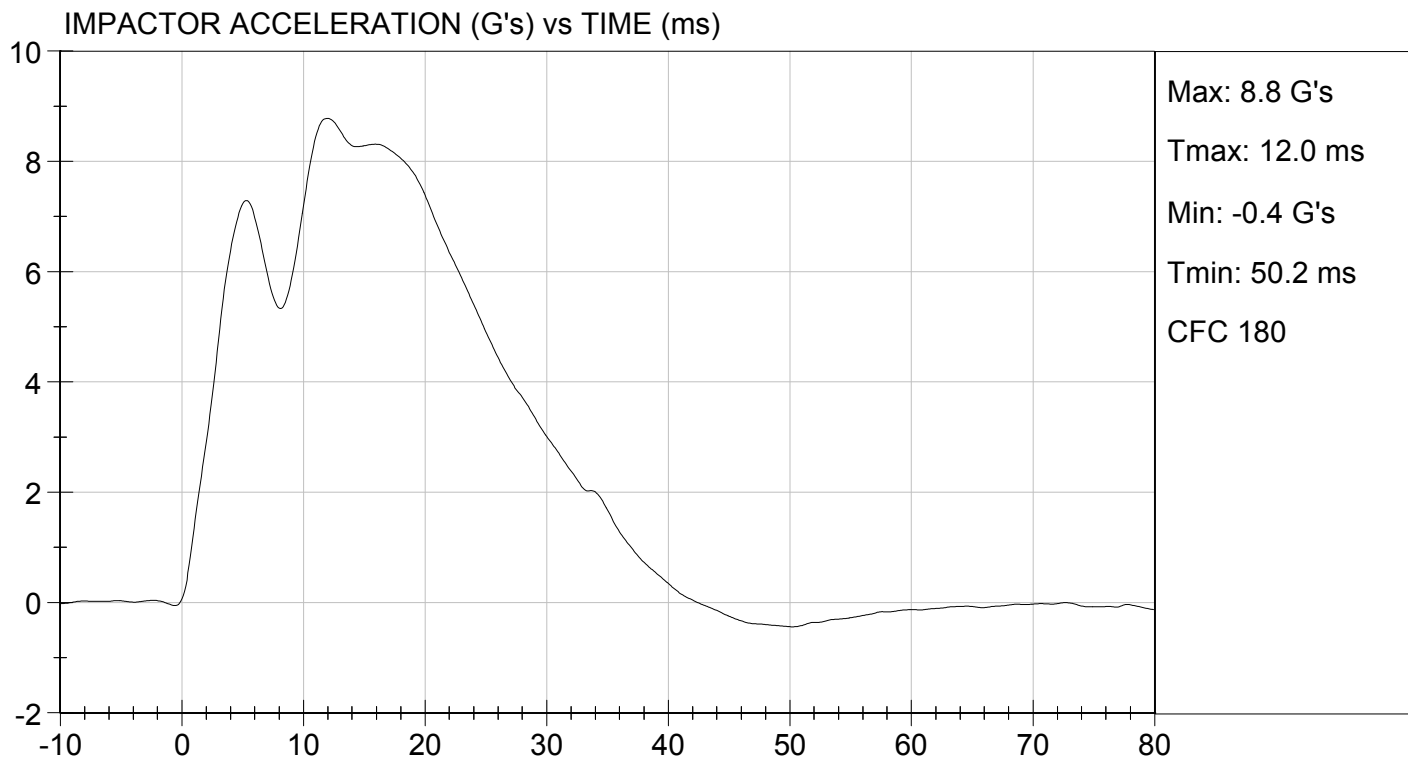
02/18/2015
Test Date

Jessica Hall
Approved By



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

TEST DATE: 02/18/2015
TEST #: D15463



MGA RESEARCH CORPORATION

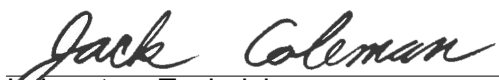
UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D15464

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.7	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.9	Pass
			Overall Test Results	Pass

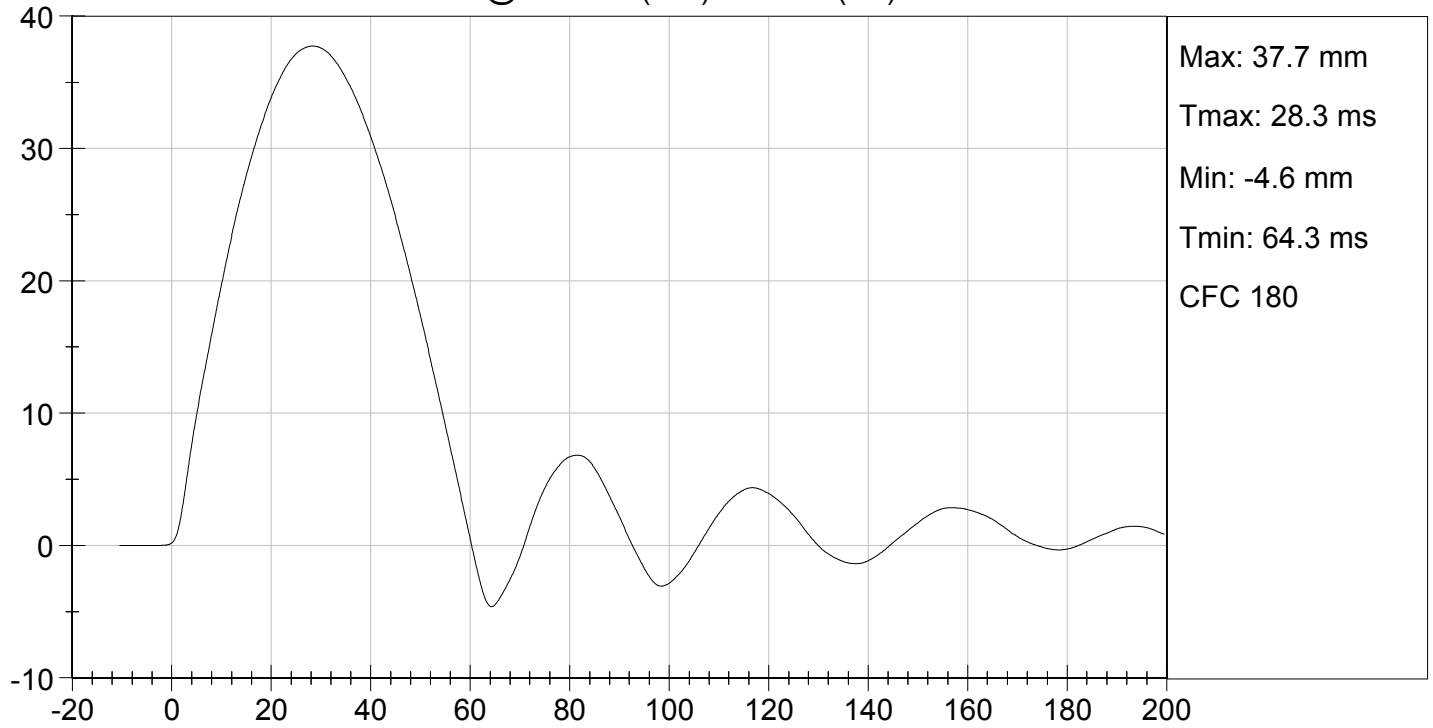

Laboratory Technician

02/17/2015
Test Date

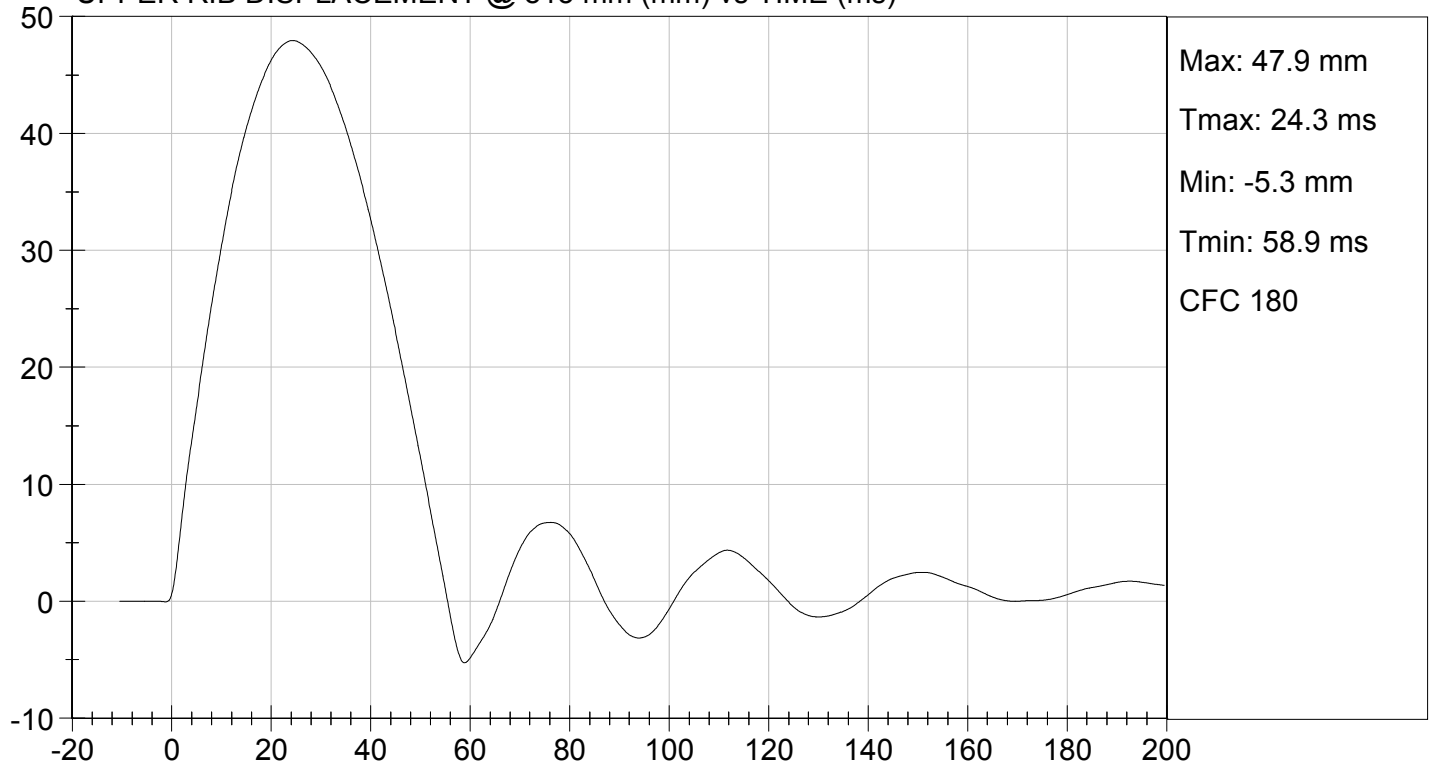

Approved By



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



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



MGA RESEARCH CORPORATION

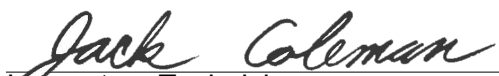
MID RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D15465

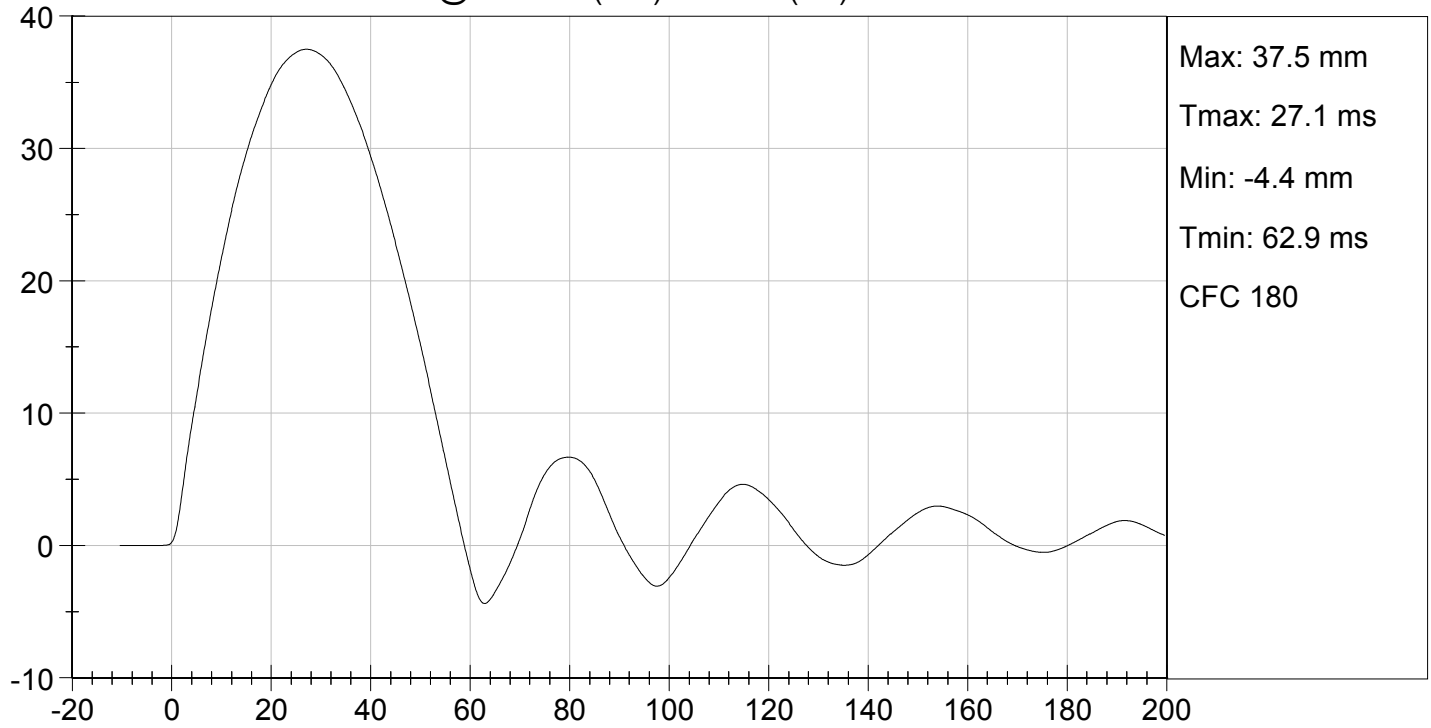
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.5	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.5	Pass
Overall Test Results				Pass


Laboratory Technician

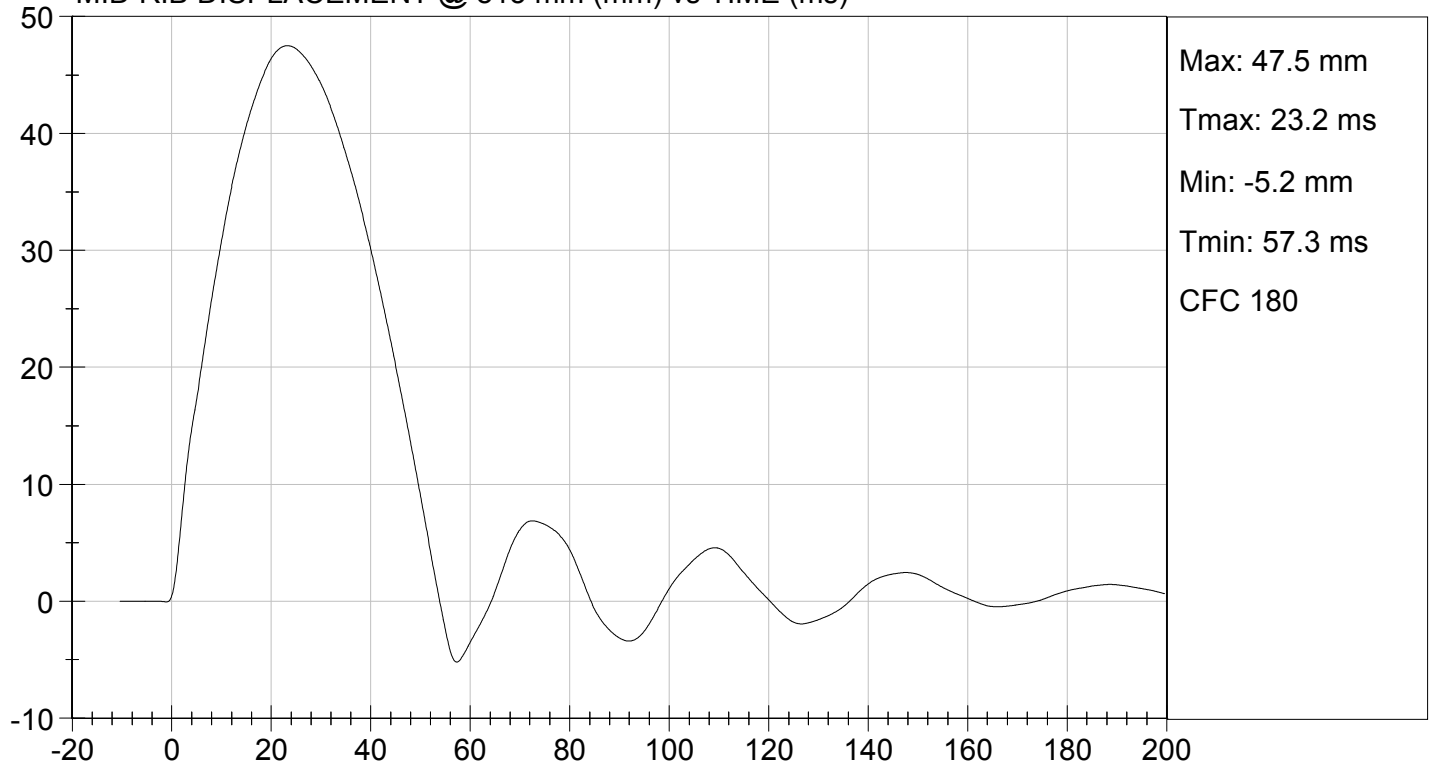
02/17/2015
Test Date


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: D15466

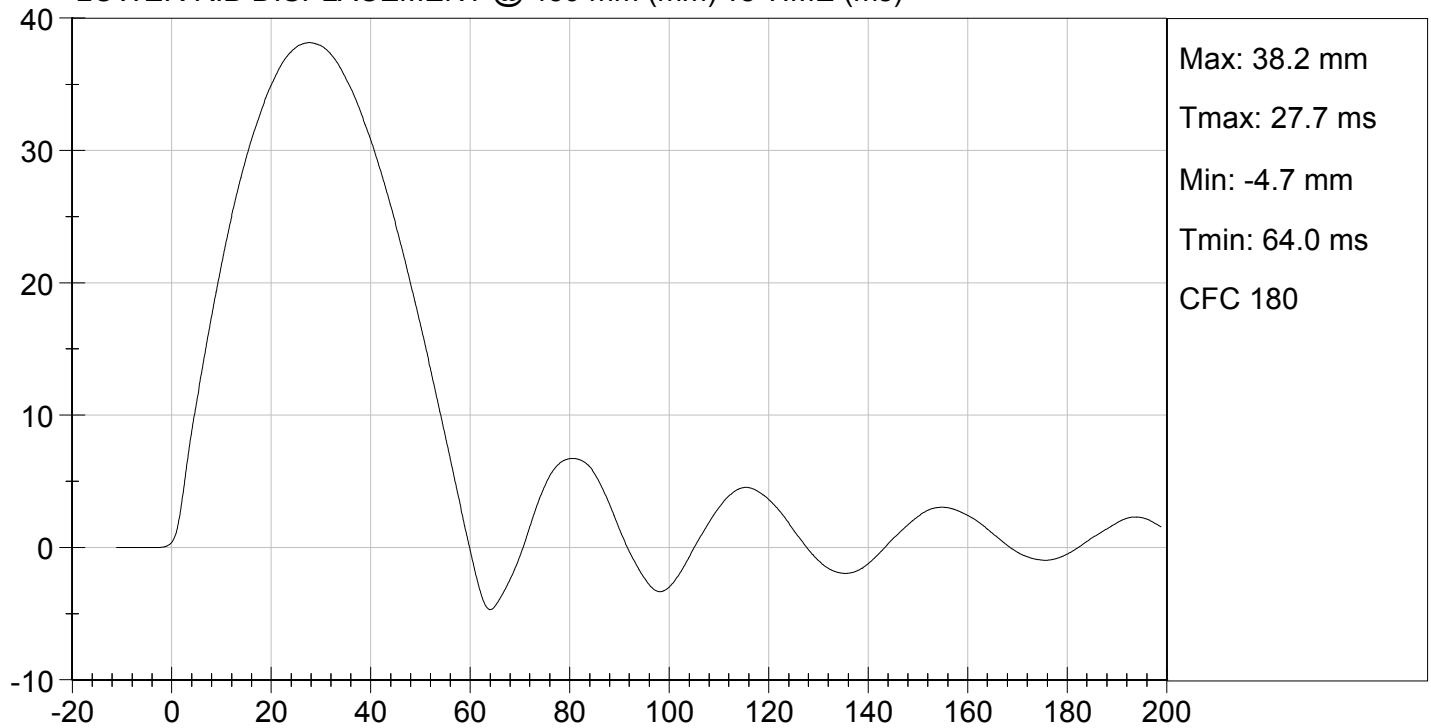
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.2	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.9	Pass
Overall Test Results				Pass

Jack Coleman
Laboratory Technician

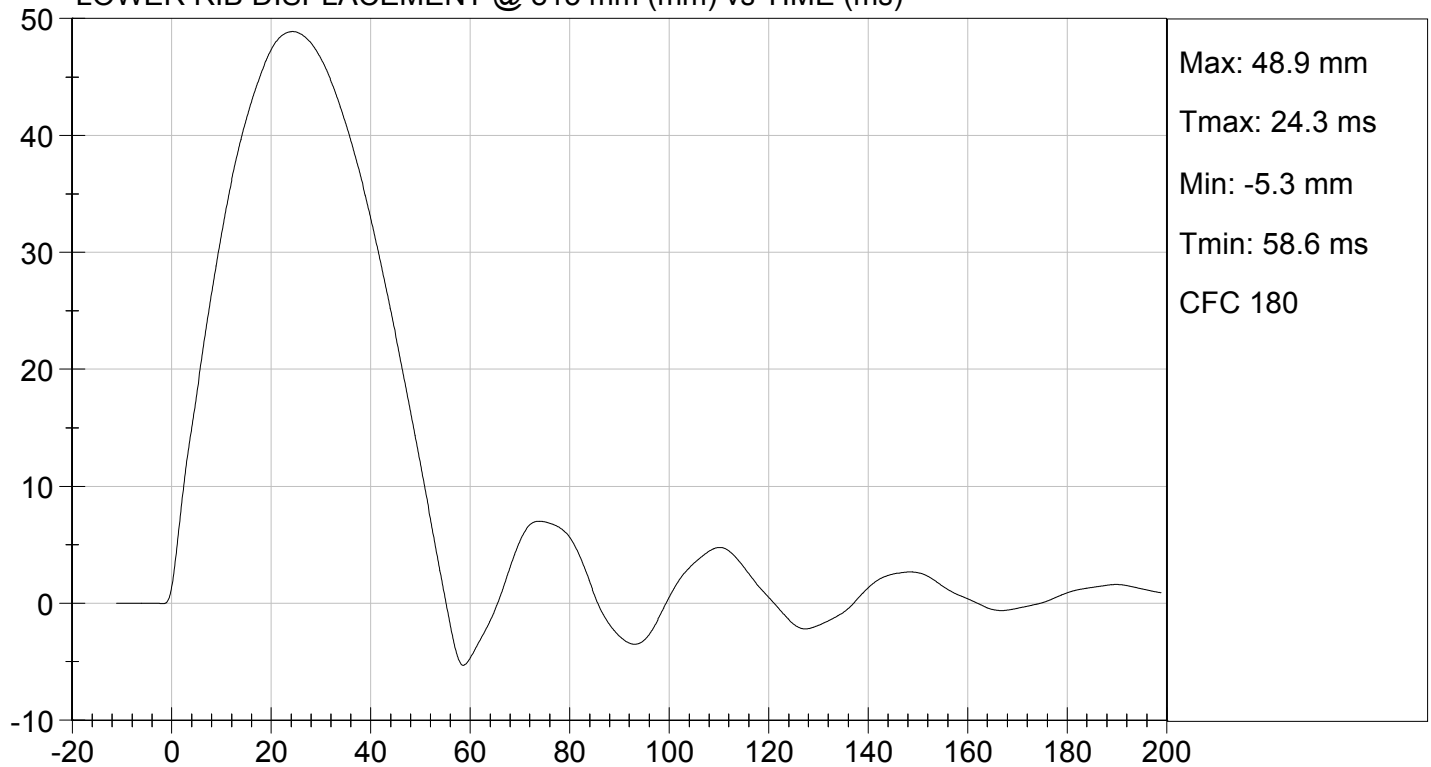
02/17/2015
Test Date

Jessica Hall
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: 032

Test I.D: D15460

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	19	Pass
Probe Speed	m/s	5.40 to 5.60	5.46	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5774	Pass
Upper Rib Displacement	mm	34.0 to 41.0	37.8	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.3	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.4	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

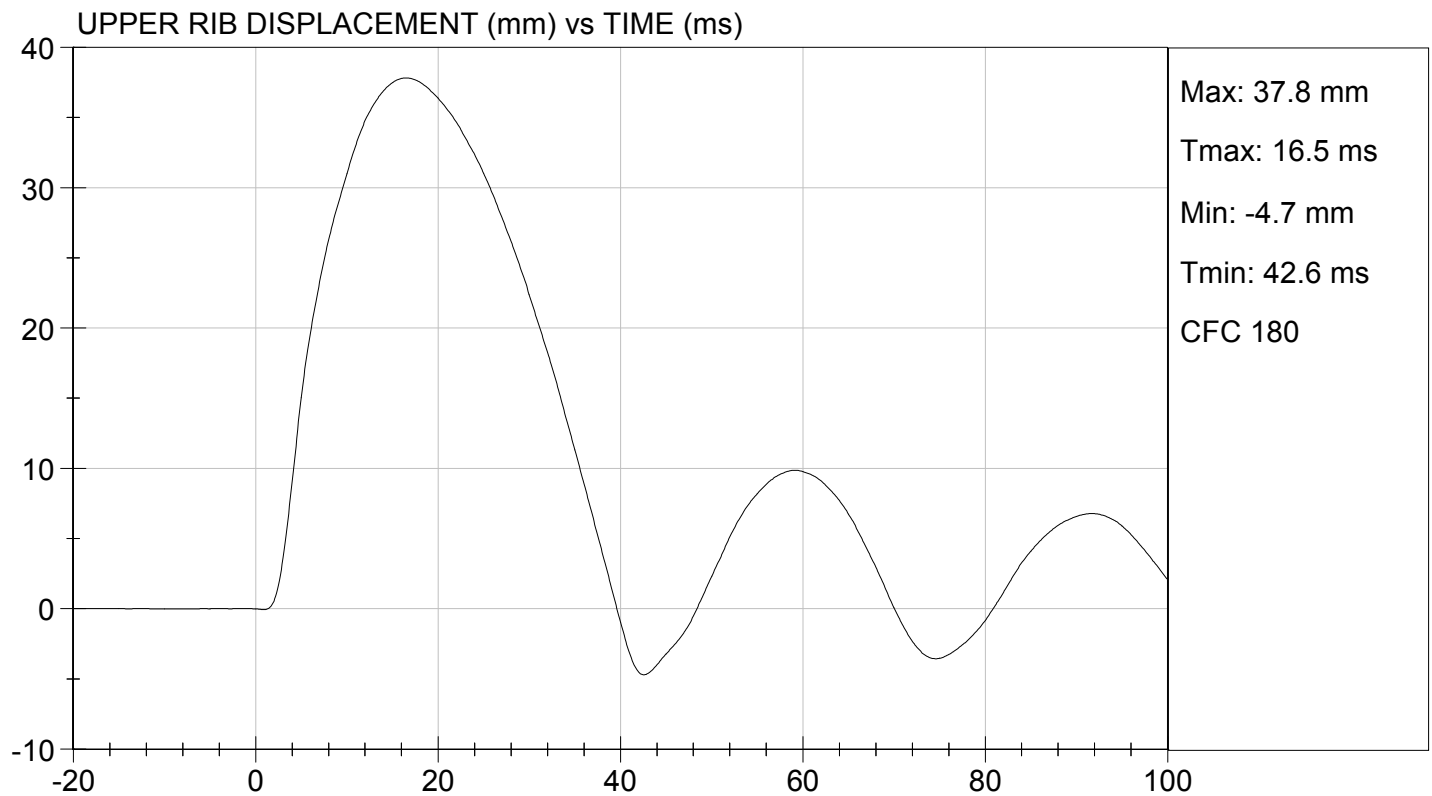
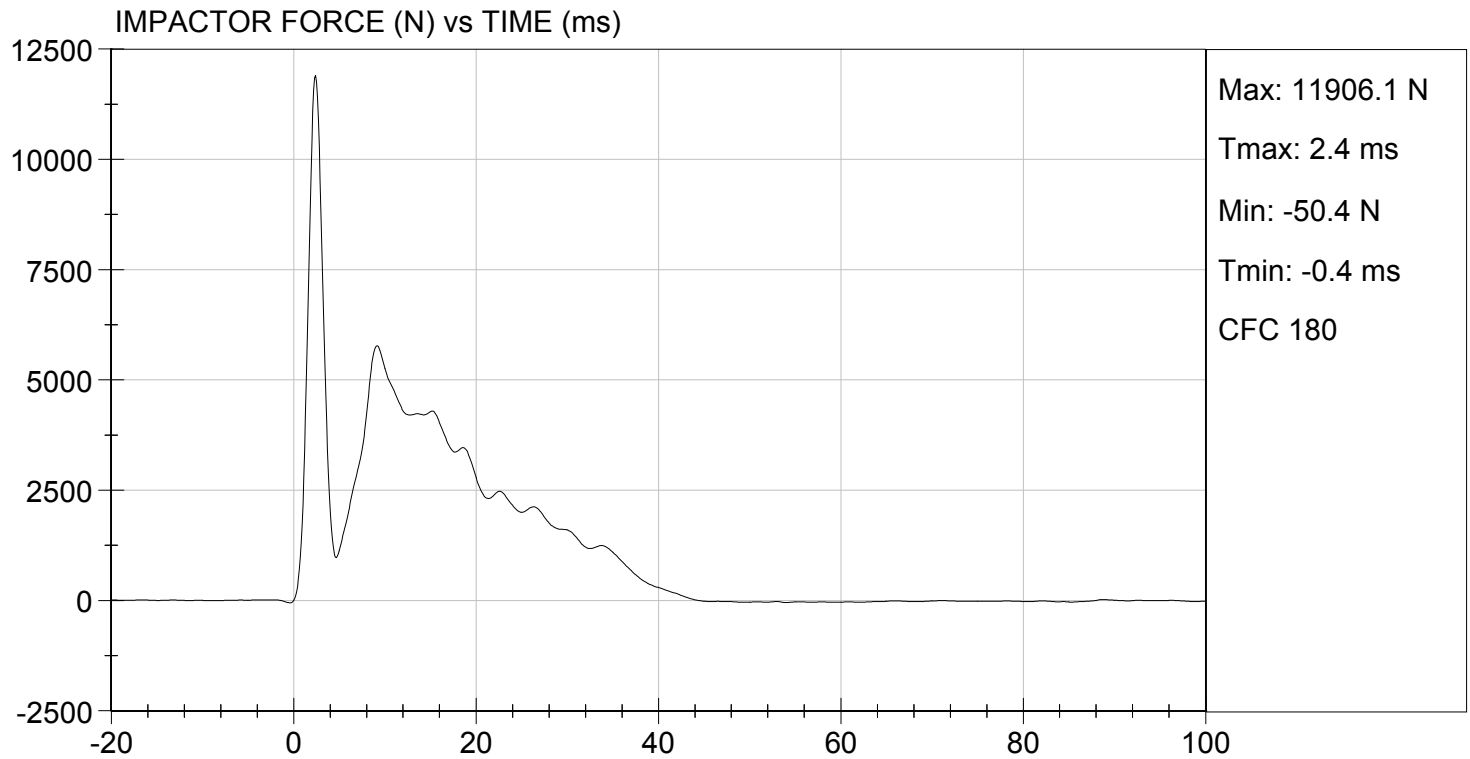
02/18/2015

Test Date



TEST DESC: THORAX IMPACT
VELOCITY: 17.92 ft/s, 5.46 m/s

TEST DATE: 02/18/2015
TEST #: D15460

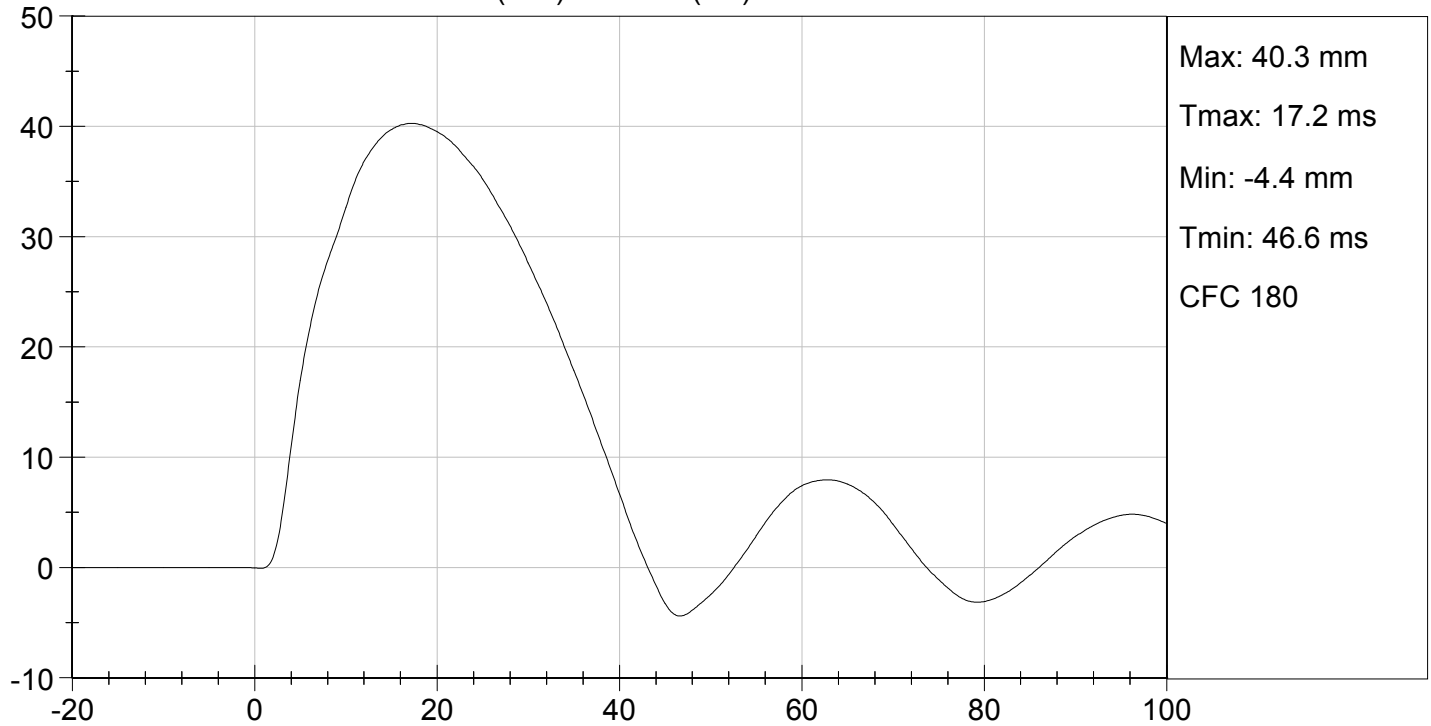




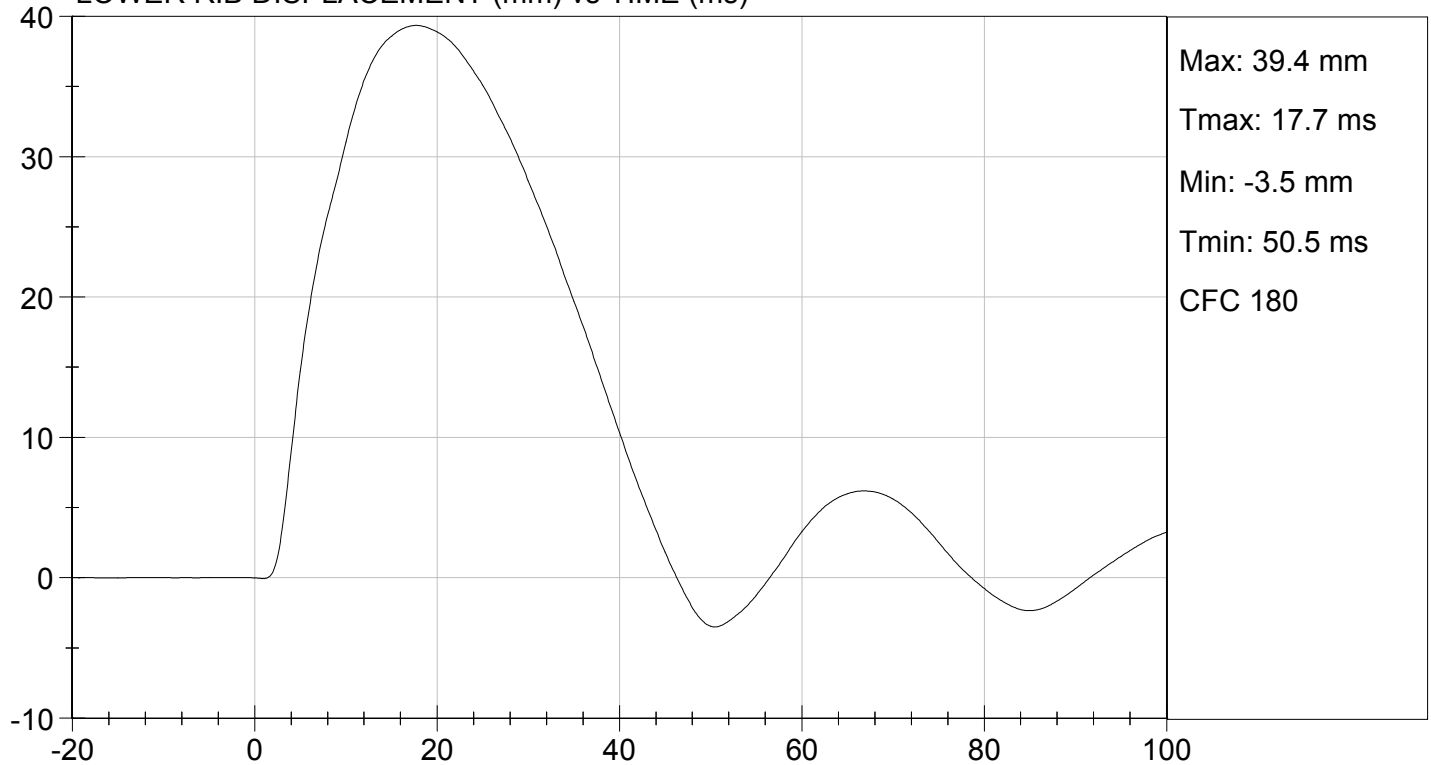
TEST DESC: THORAX IMPACT
VELOCITY: 17.92 ft/s, 5.46 m/s

TEST DATE: 02/18/2015
TEST #: D15460

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

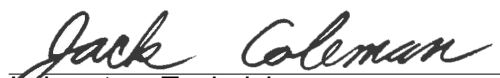
ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D15467

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	19	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4052	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.3	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2233	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	12.2	Pass
Overall Test Results				Pass


Laboratory Technician

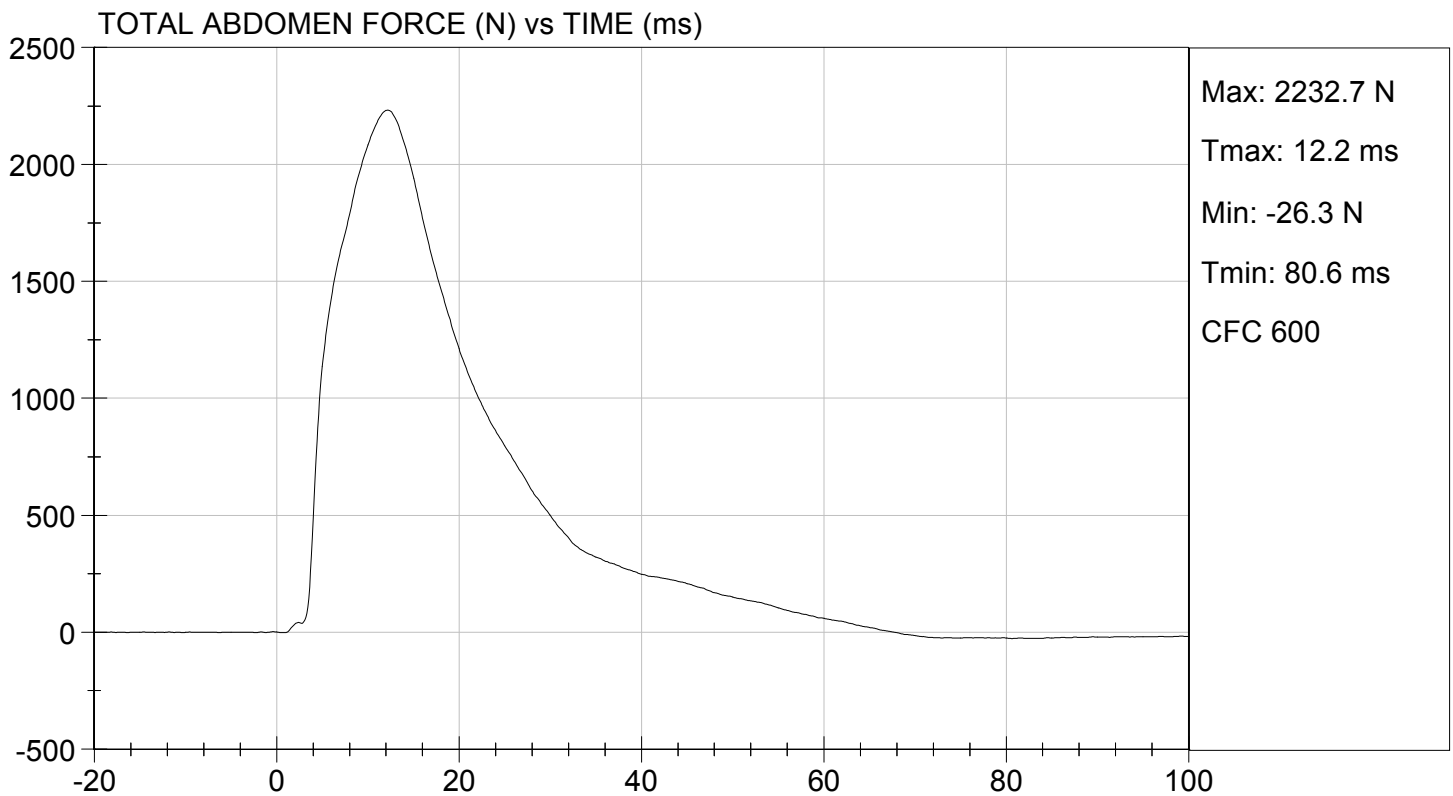
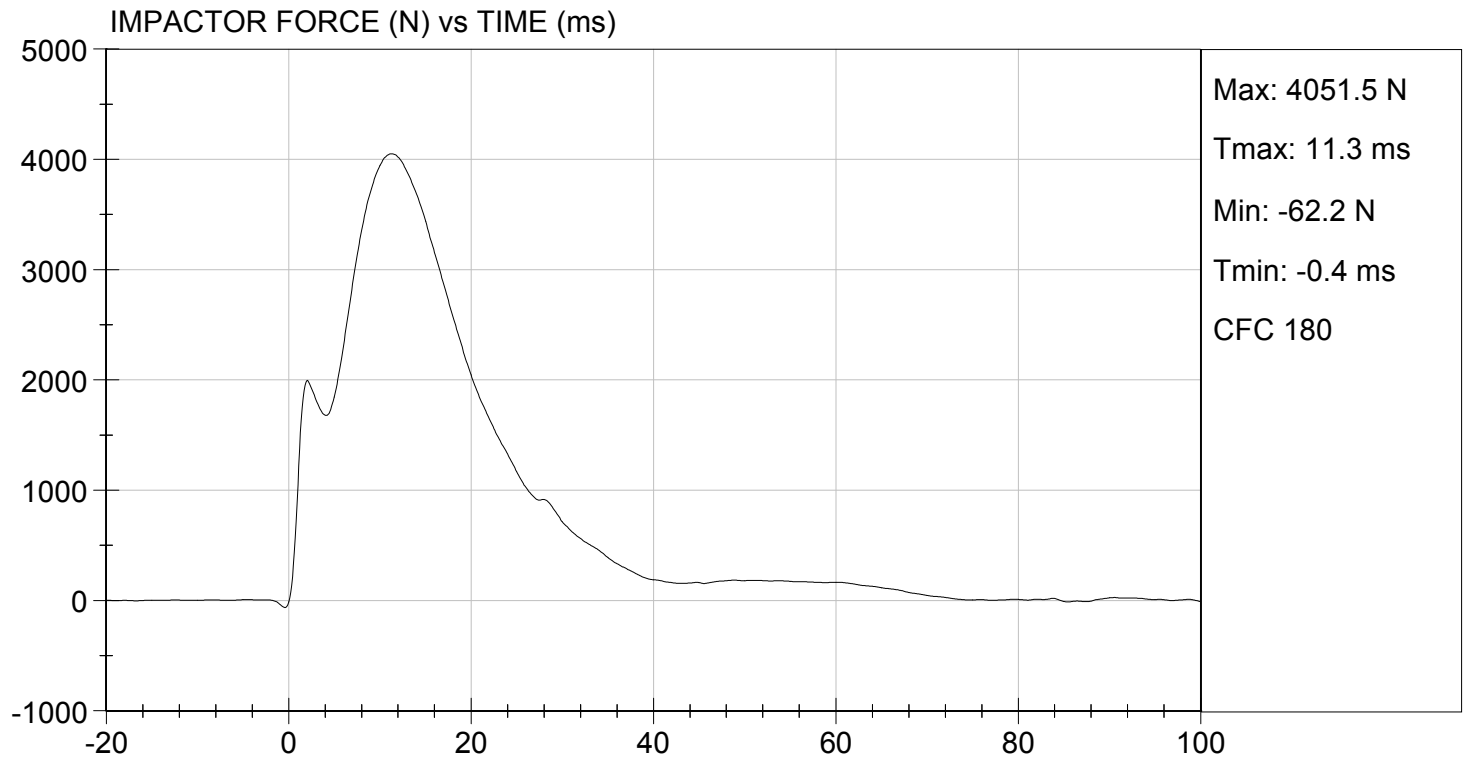
02/18/2015
Test Date


Approved By



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

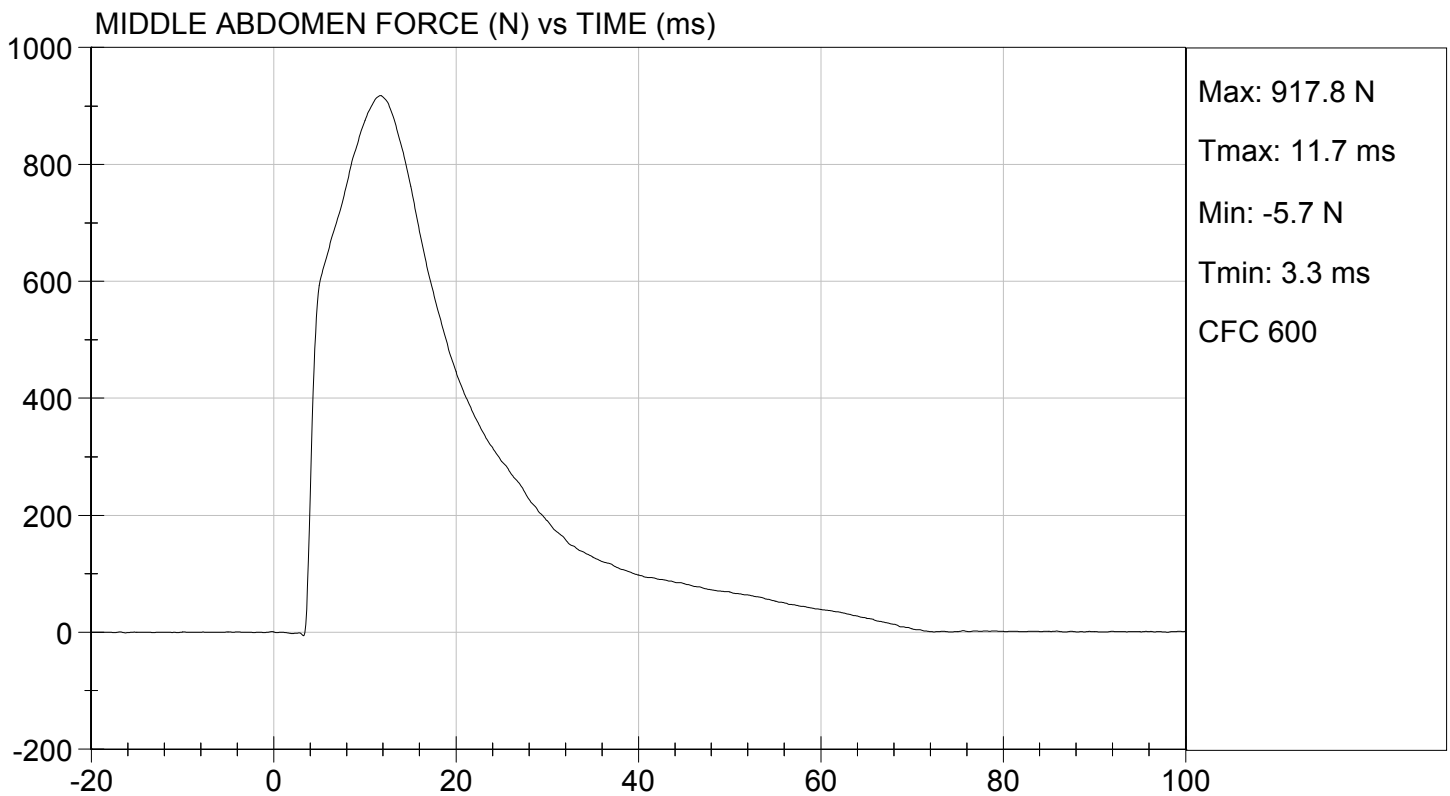
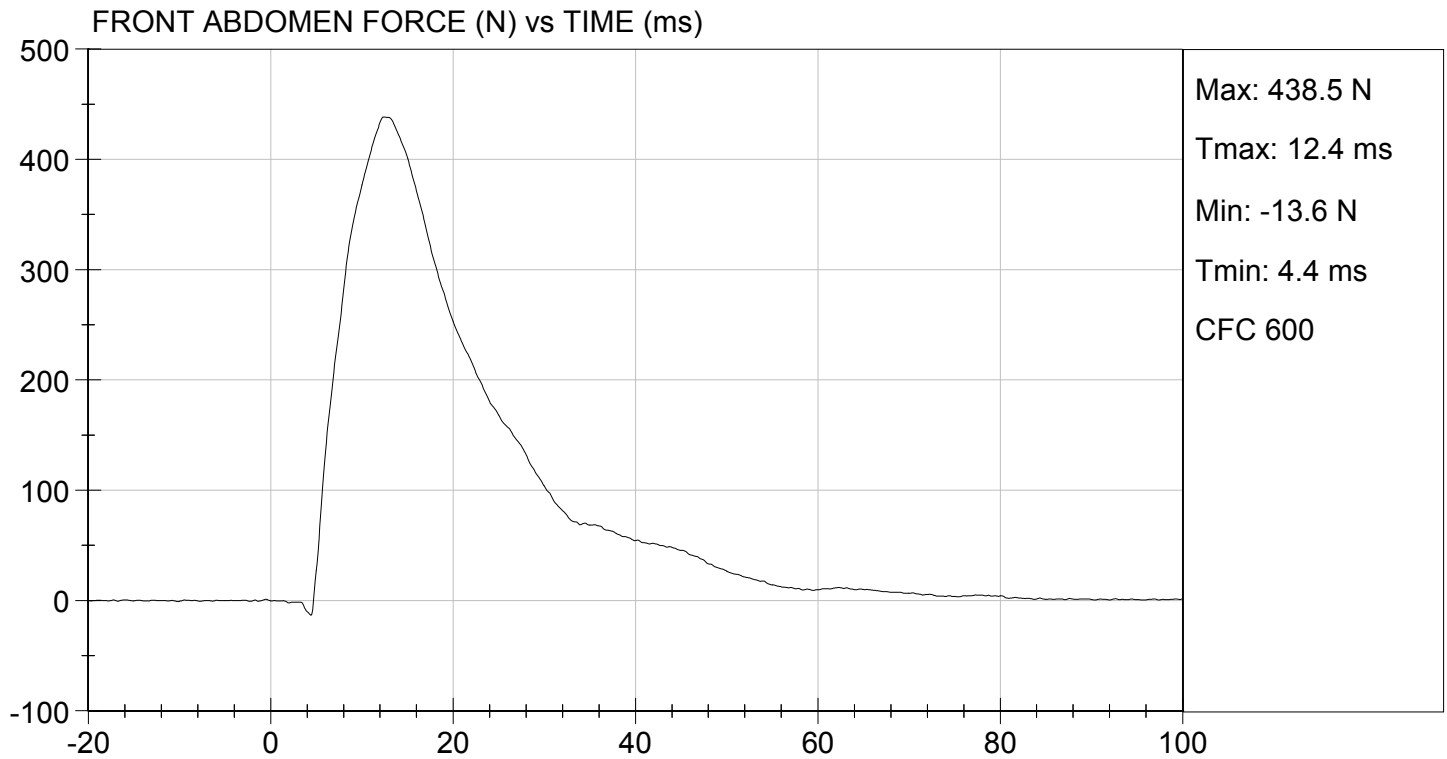
TEST DATE: 02/18/2015
TEST #: D15467





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

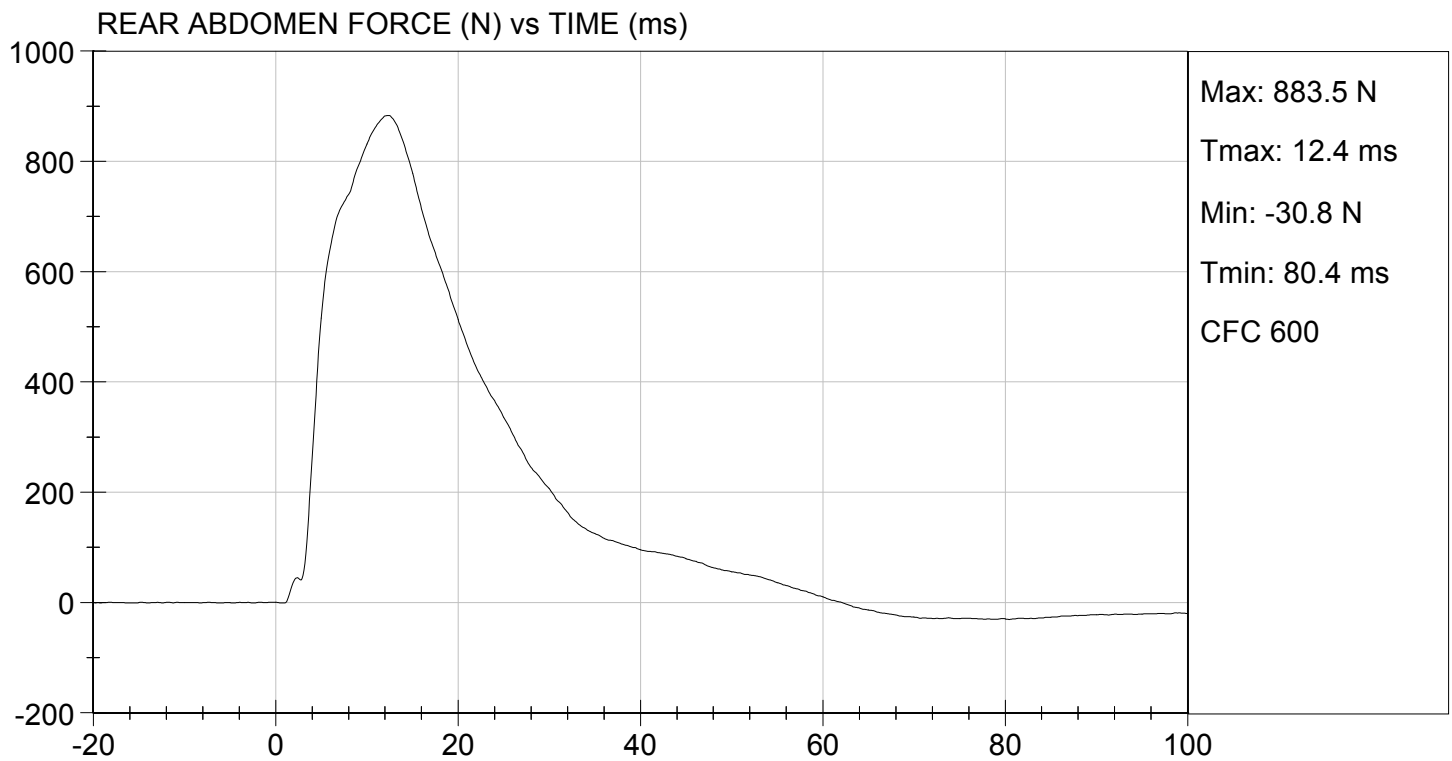
TEST DATE: 02/18/2015
TEST #: D15467





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

TEST DATE: 02/18/2015
TEST #: D15467



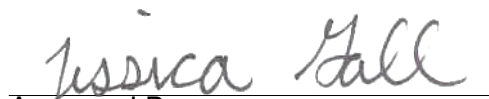
MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

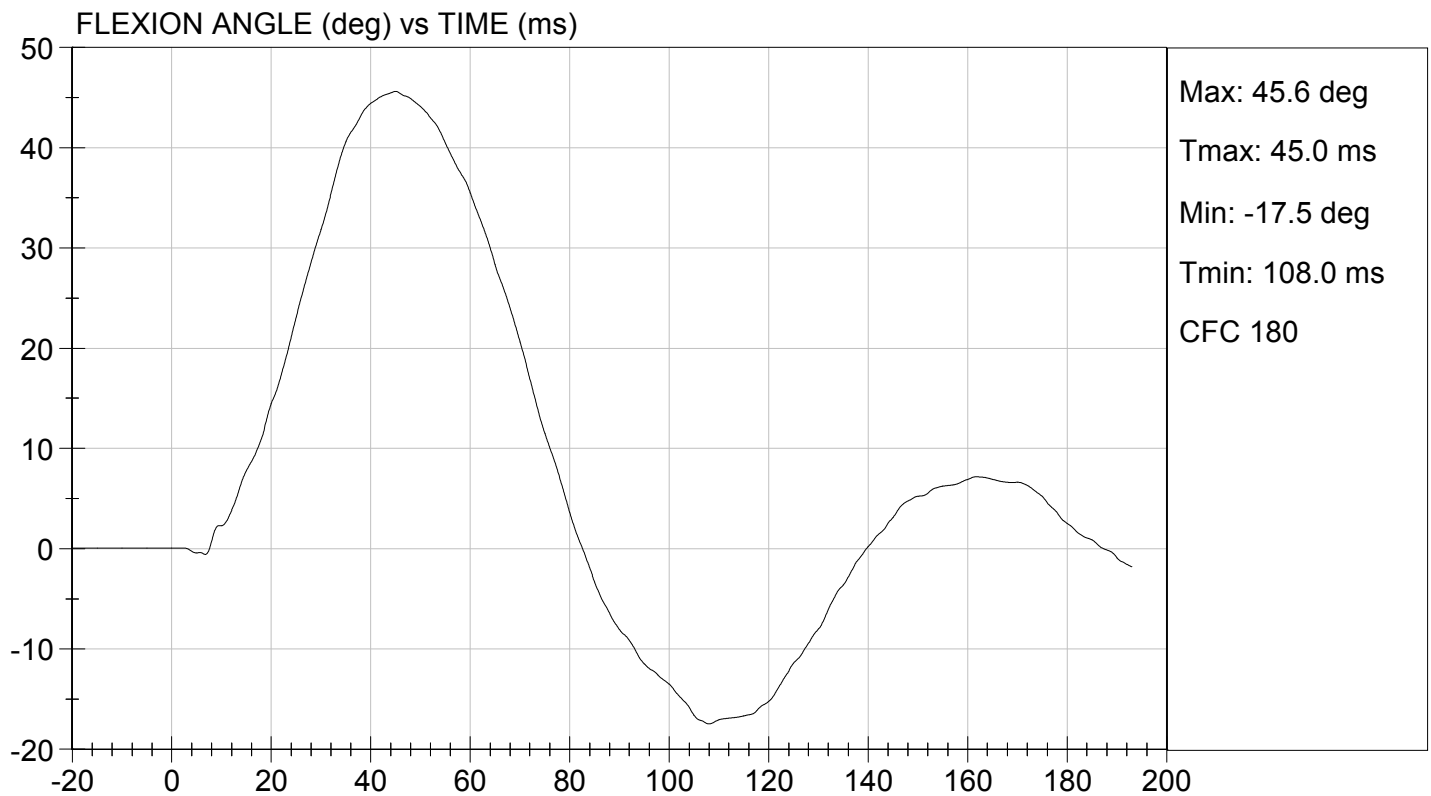
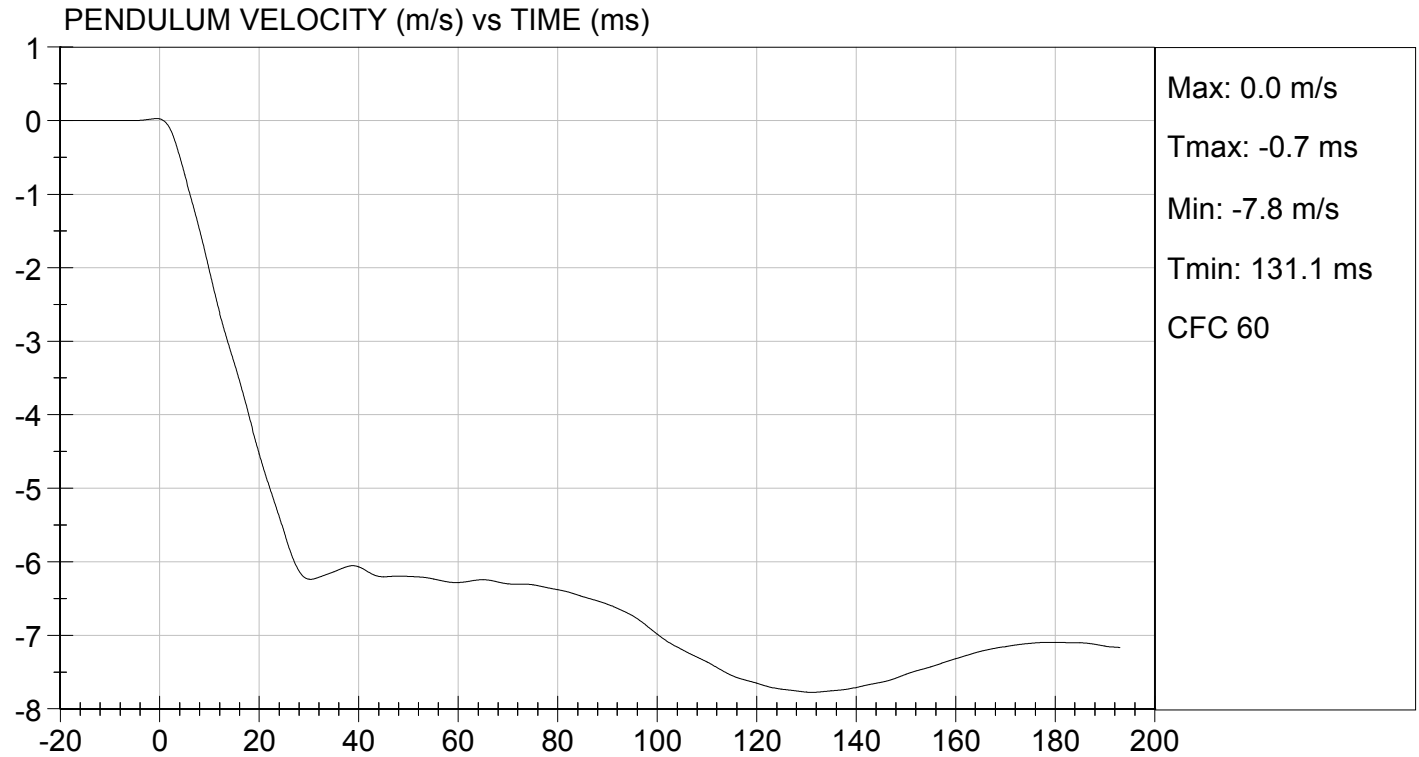
Test I.D: D15468

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.421	Pass
	27 ms	m/s	-6.50 to -5.80	-5.99	Pass
	30 ms	m/s	>= -6.50	-6.24	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	45.6	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	45.0	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	45	Pass
Overall Results					Pass


Laboratory Technician


Approved By

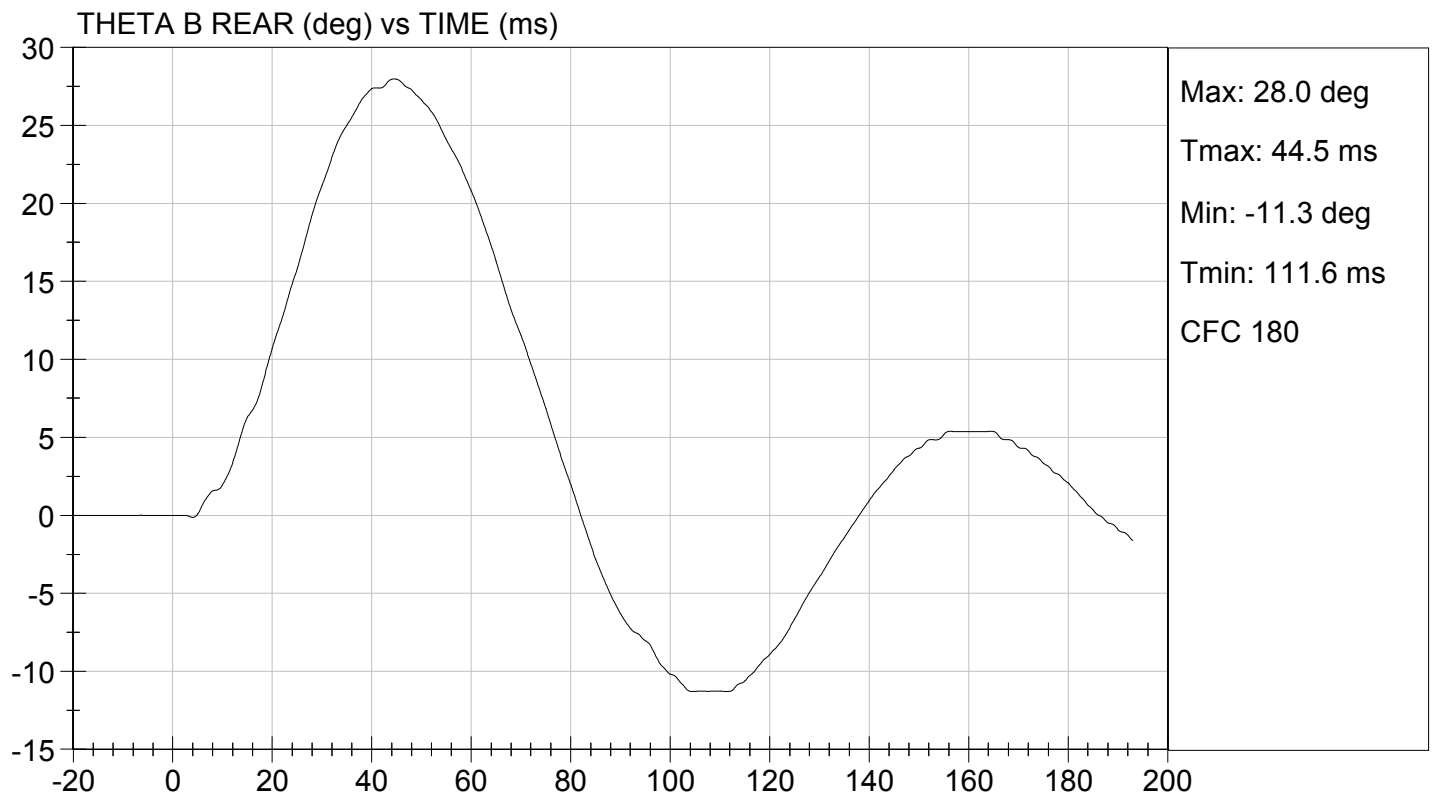
02/17/2015
Test Date





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

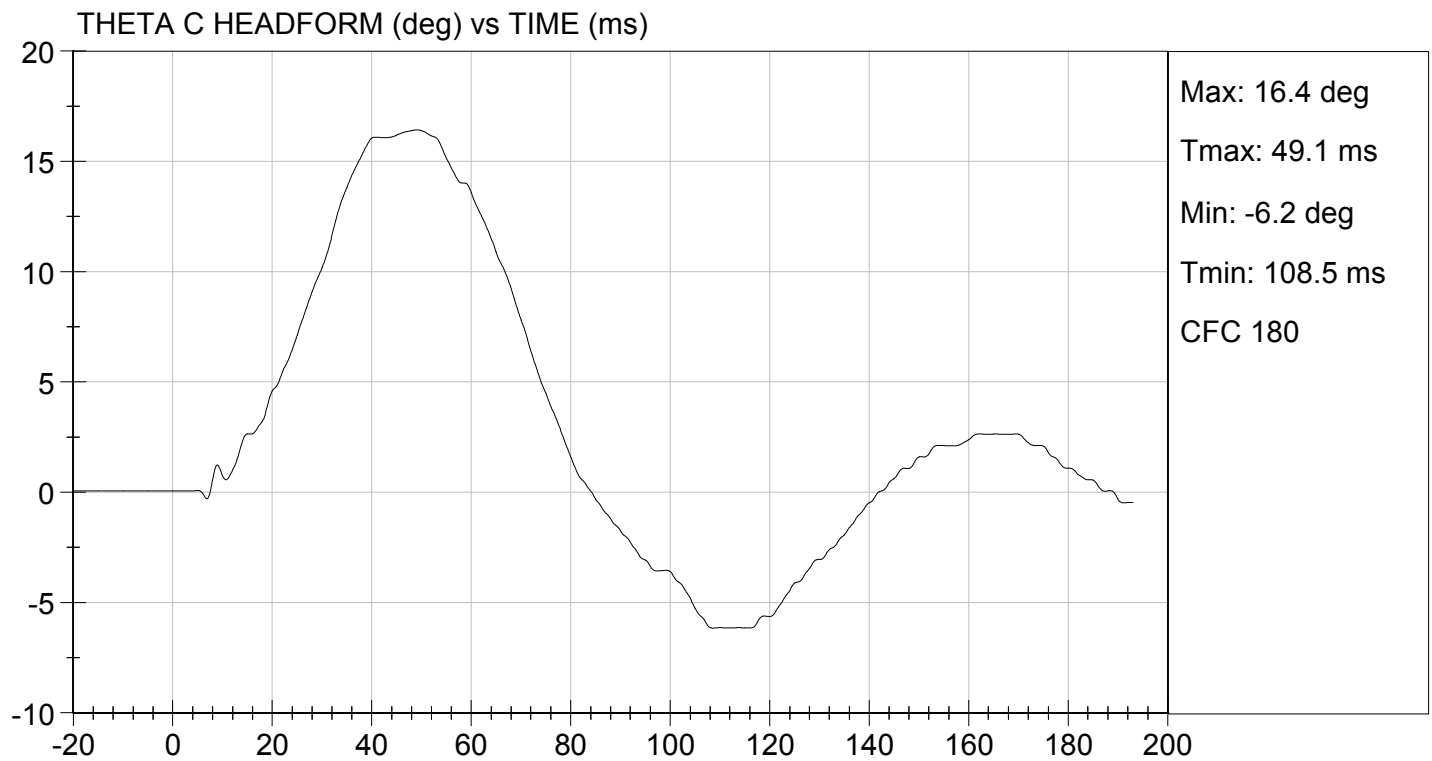
TEST DATE: 02/17/2015
TEST #: D15468





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

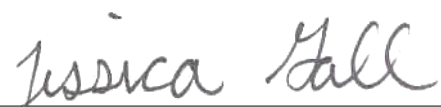
TEST DATE: 02/17/2015
TEST #: D15468



MGA RESEARCH CORPORATION**PELVIS TEST
ES-2re DUMMY****ATD Serial No:** 032**Test I.D:** D15469

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	19	Pass
Probe Speed	m/s	4.20 to 4.40	4.23	Pass
Maximum Impactor Force	N	4700 to 5400	4833	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.3	Pass
Maximum Pubic Force	N	1230 to 1590	1257	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	15.3	Pass
Overall Test Results				Pass


Laboratory Technician

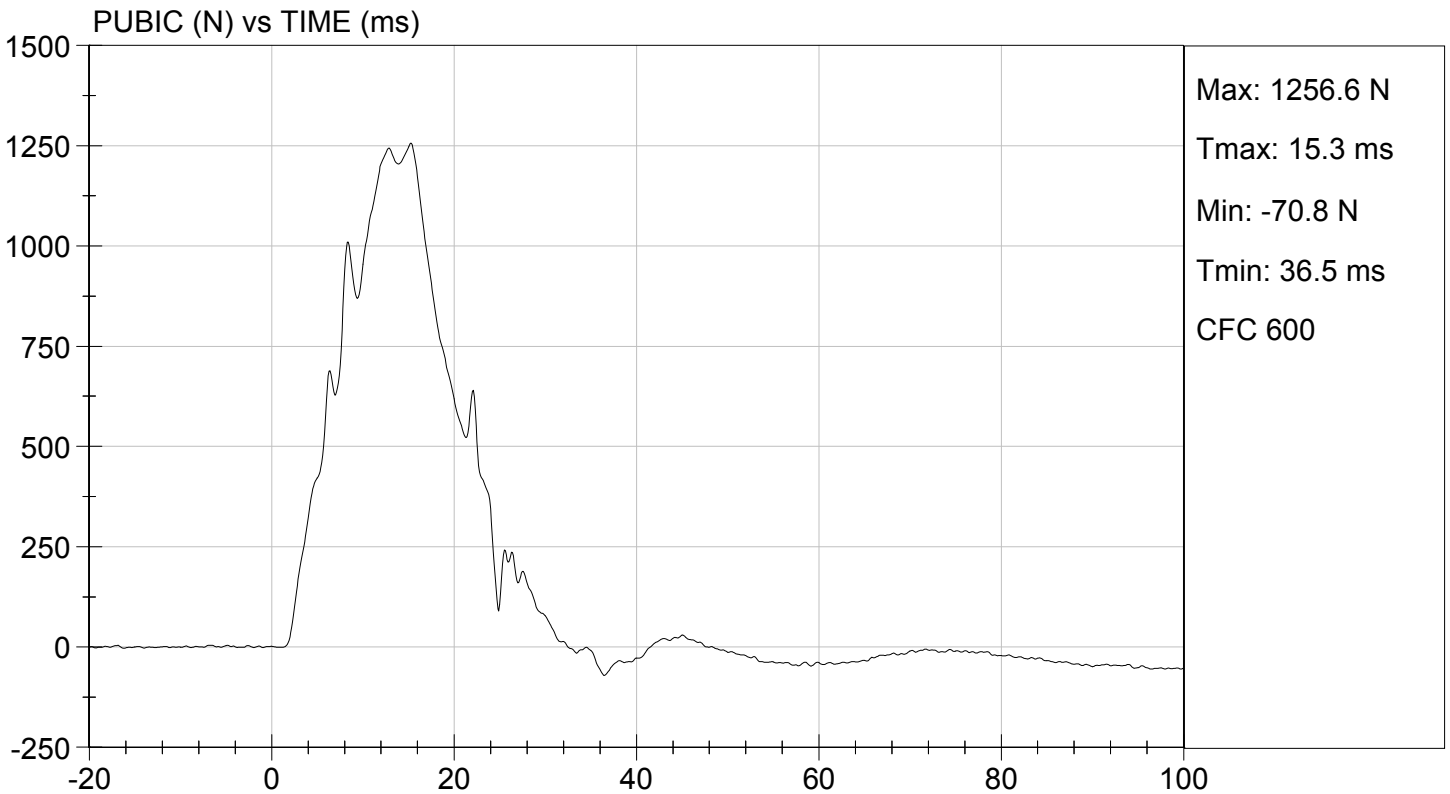
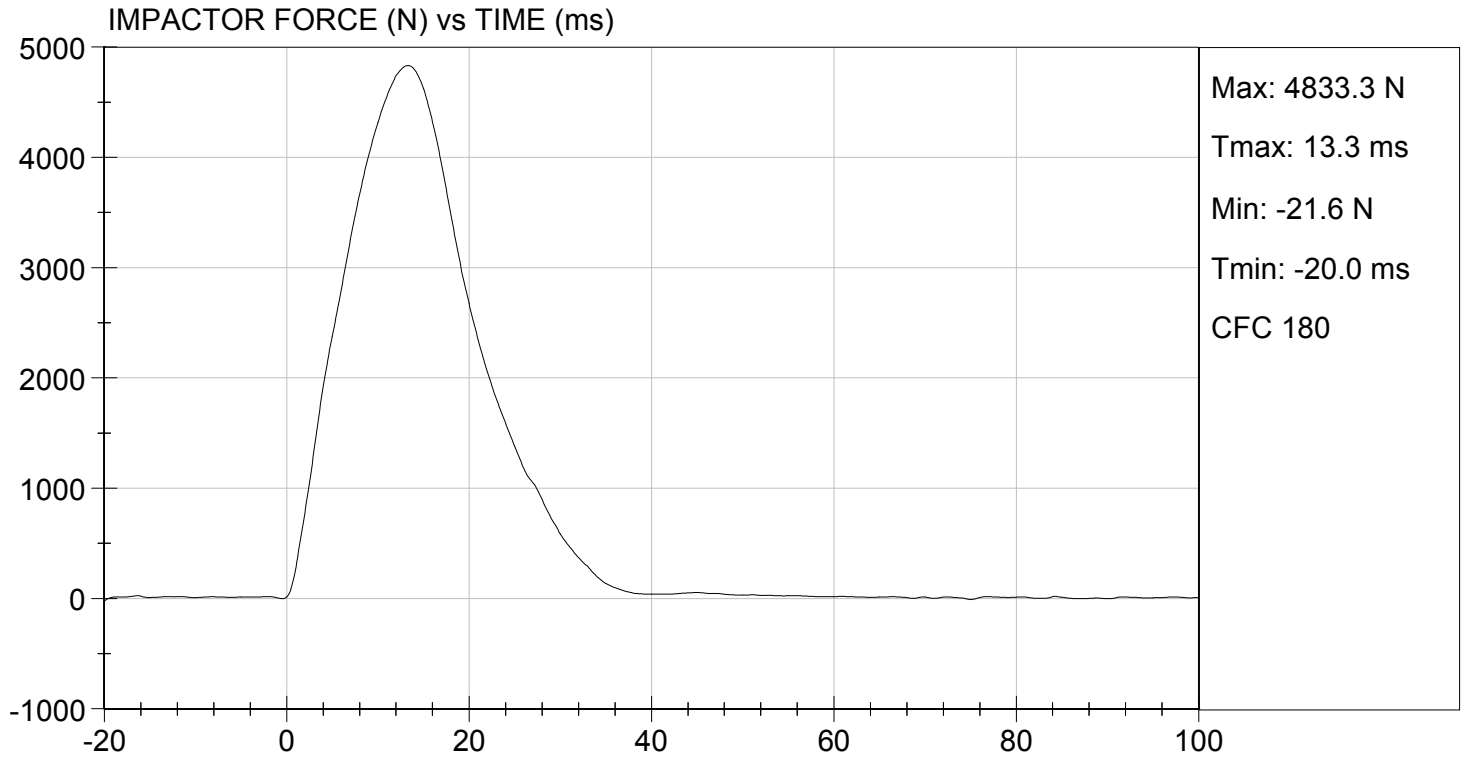

Approved By

02/18/2015
Test Date



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

TEST DATE: 02/18/2015
TEST #: D15469



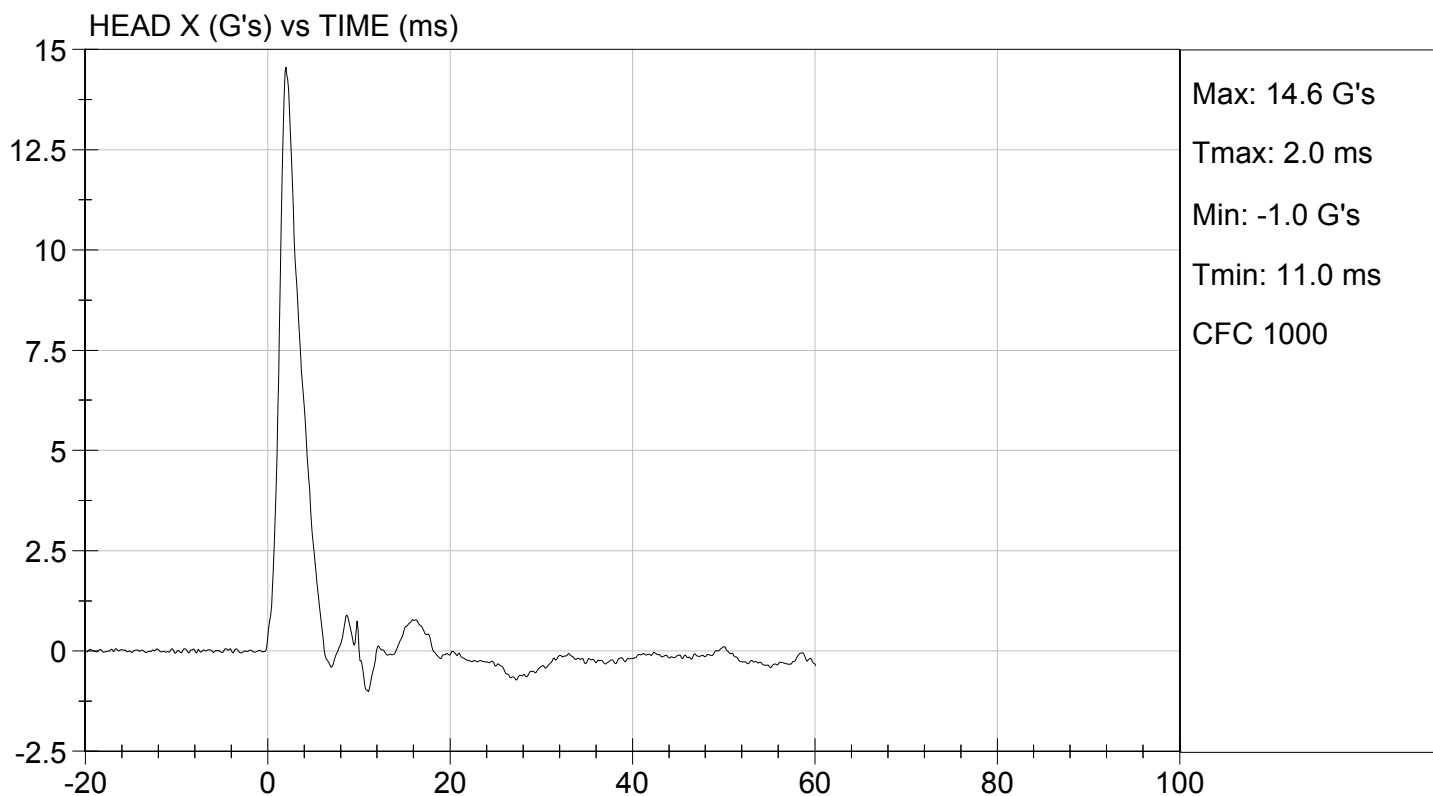
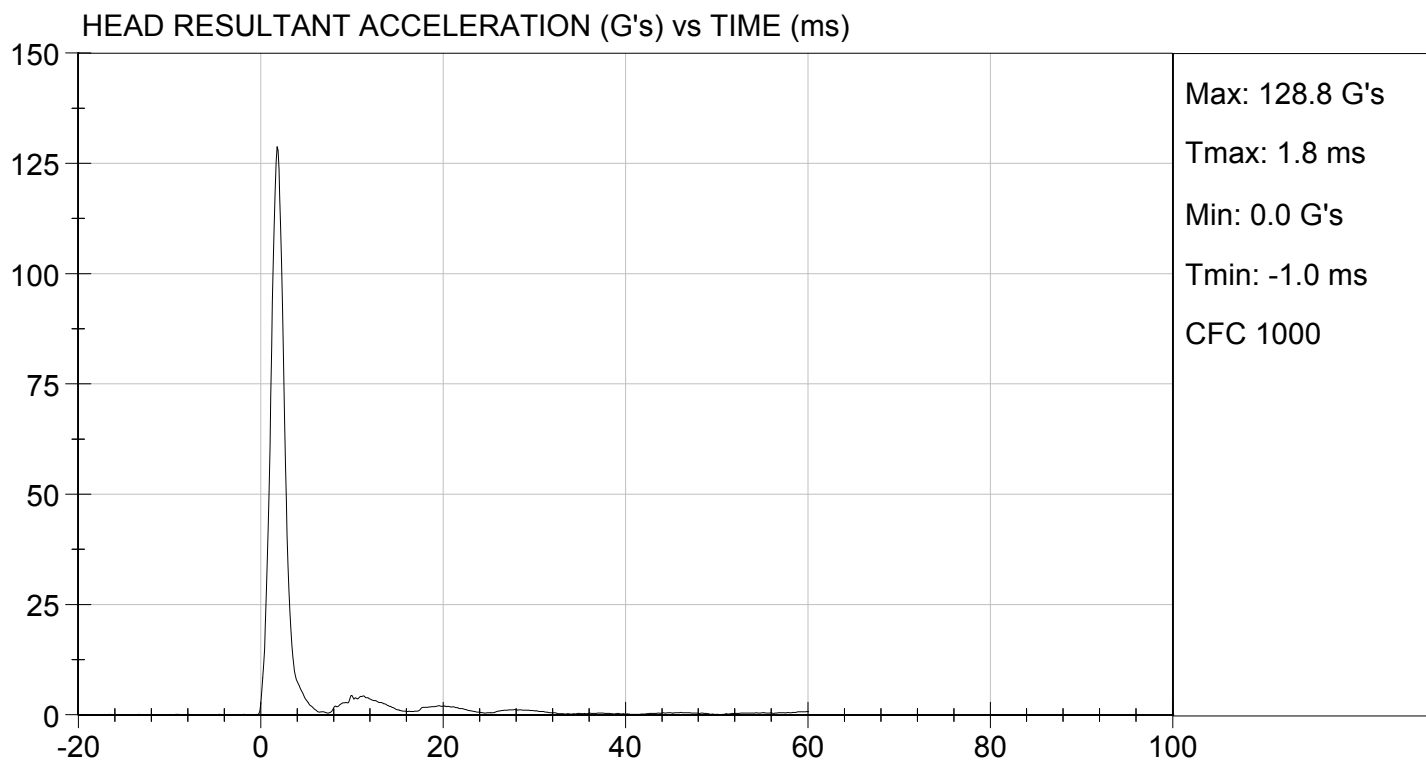
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY**ATD Serial No: 032Test ID: D15561

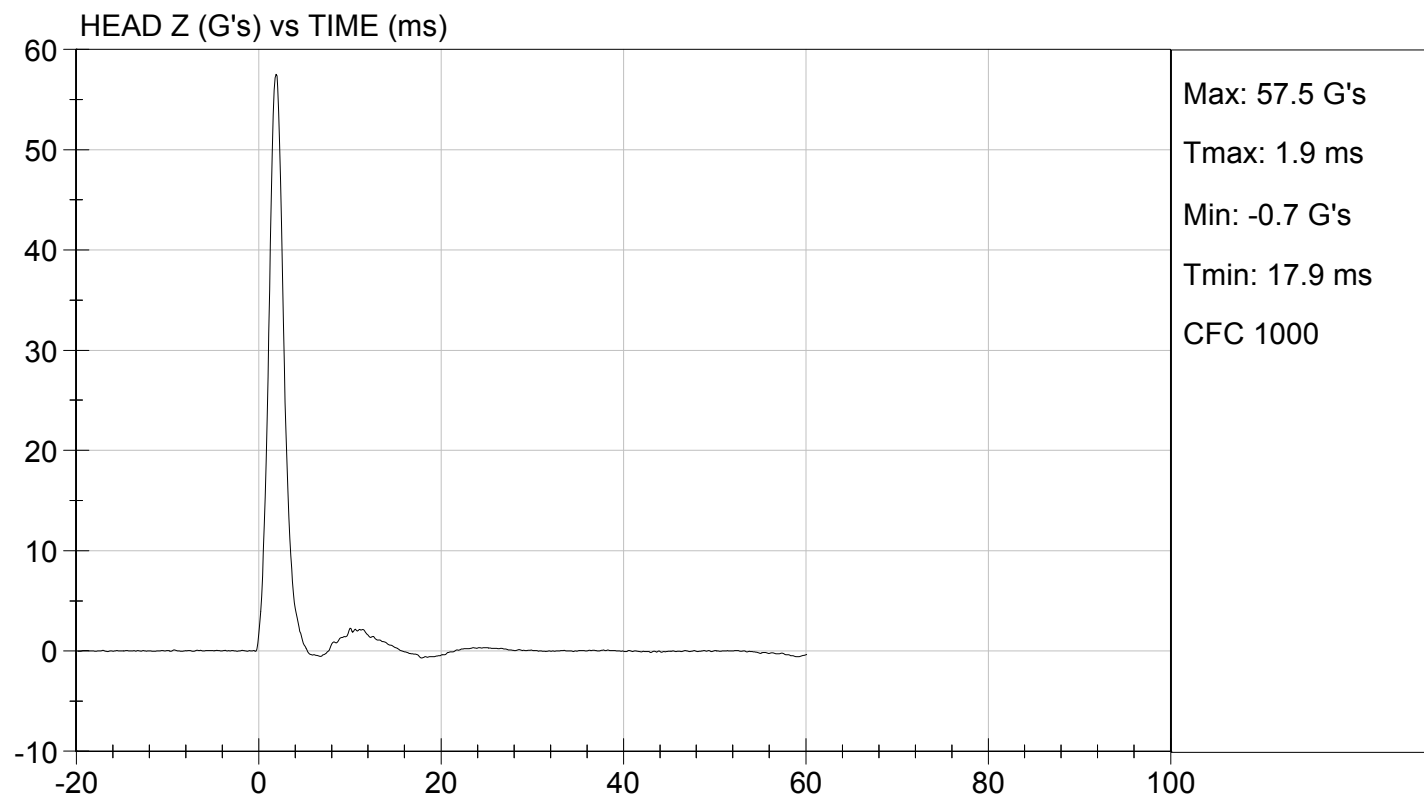
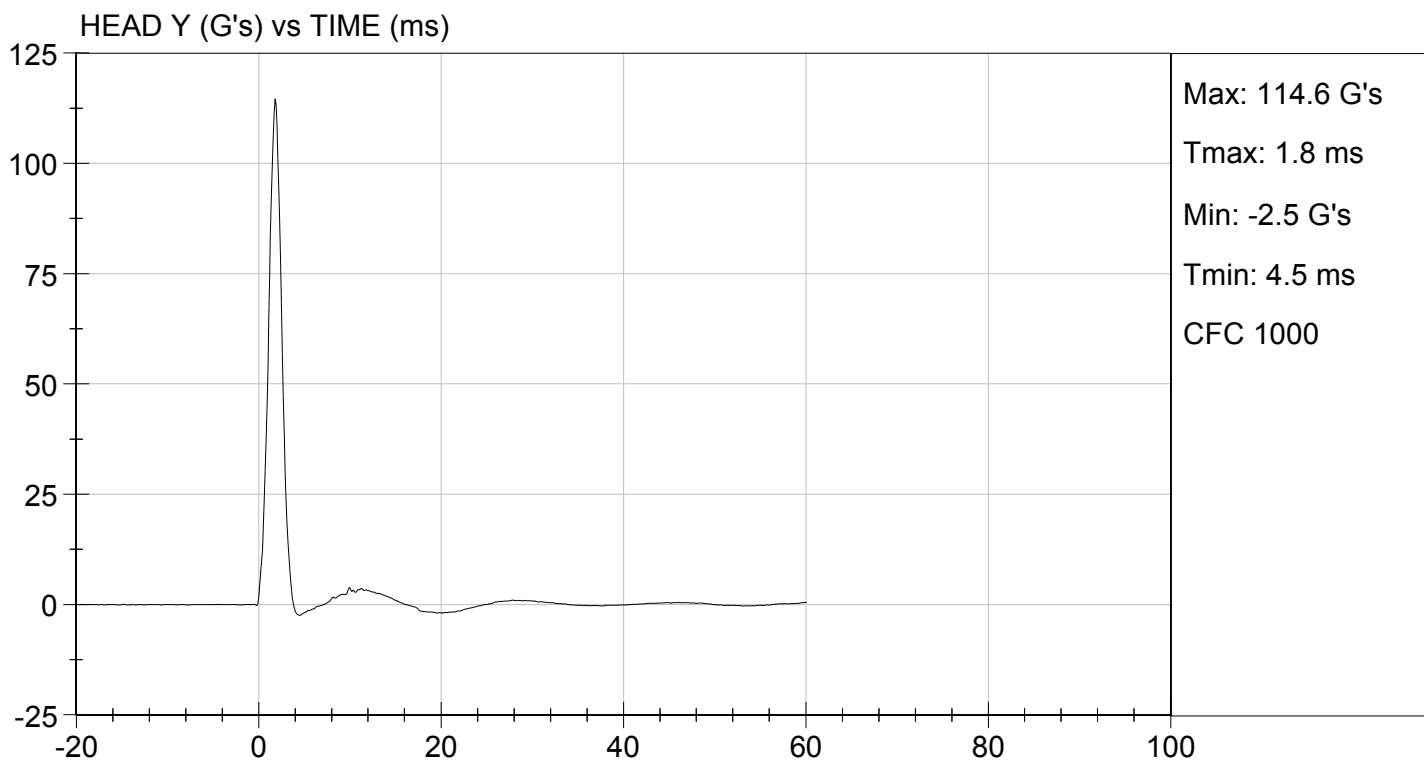
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	125 to 155	129	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	14.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

02/25/2015
Test Date

Jessica Hall
Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D15562

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	15	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.37	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.25	Pass
	17 ms	m/s	>= -3.70	-3.33	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	50.1	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	59.5	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	60.5	Pass
Overall Results					Pass

David Schoedel

Laboratory Technician

02/26/2015

Test Date

Jessica Hall

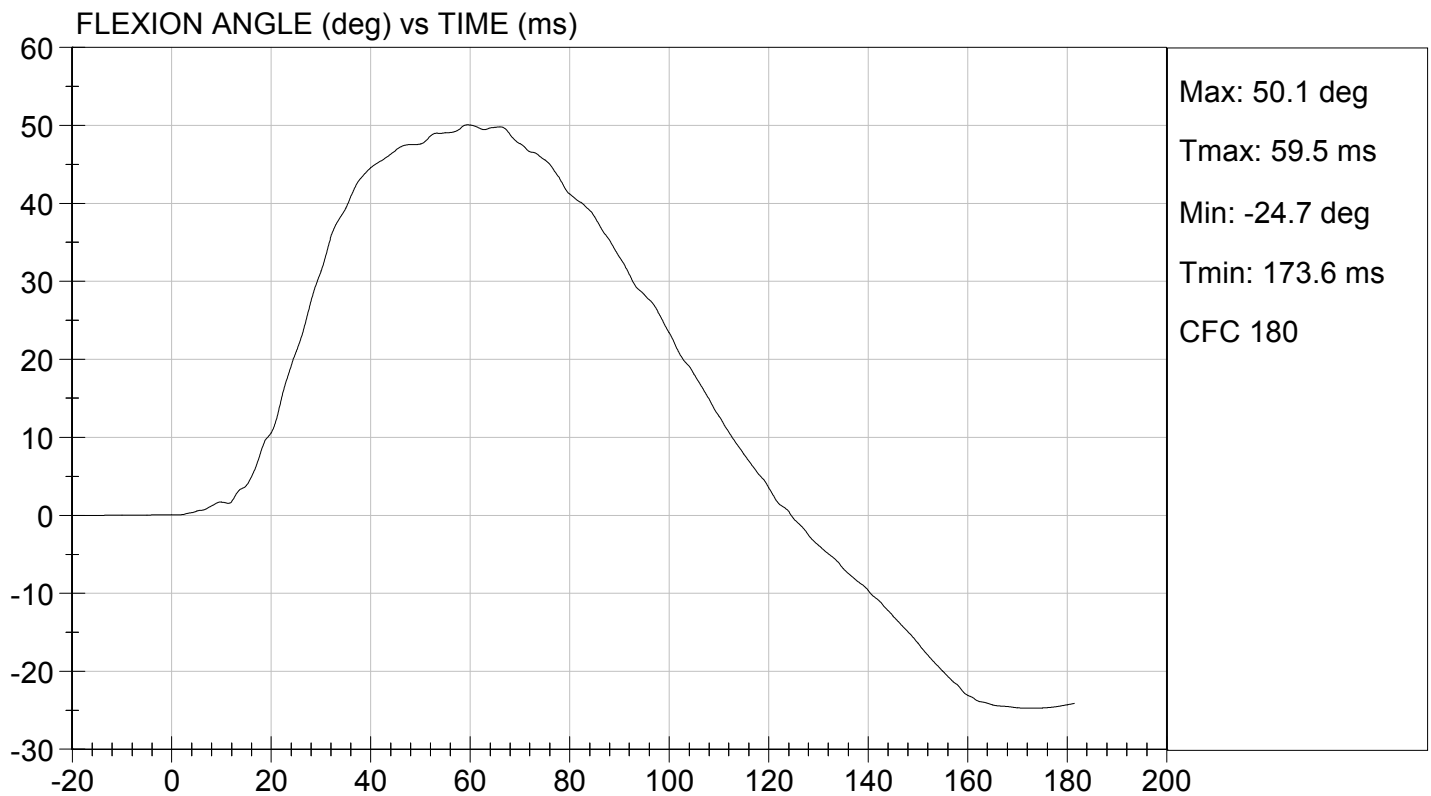
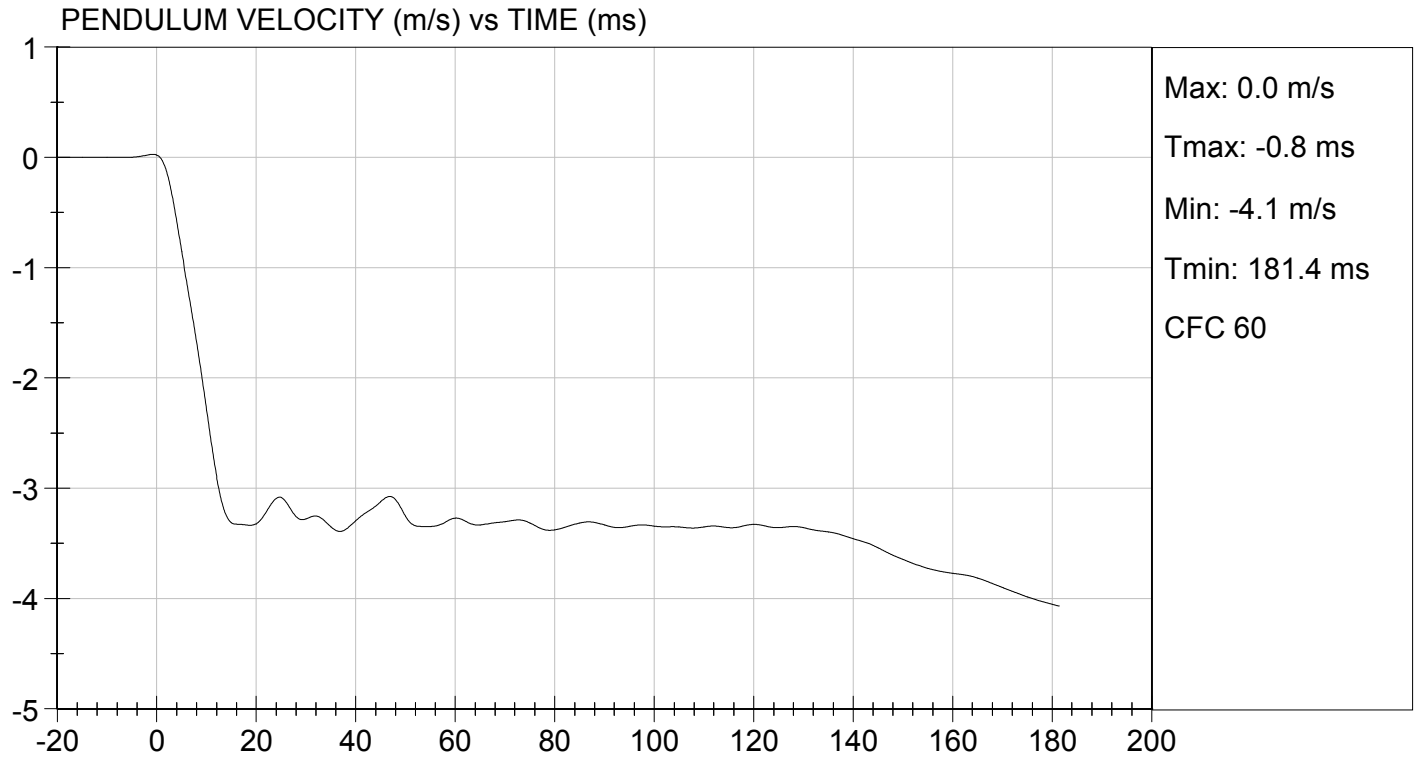
Approved By



TEST DESC: NECK BENDING
VELOCITY: 11.06 ft/s, 3.37 m/s

TEST DATE: 02/26/2015

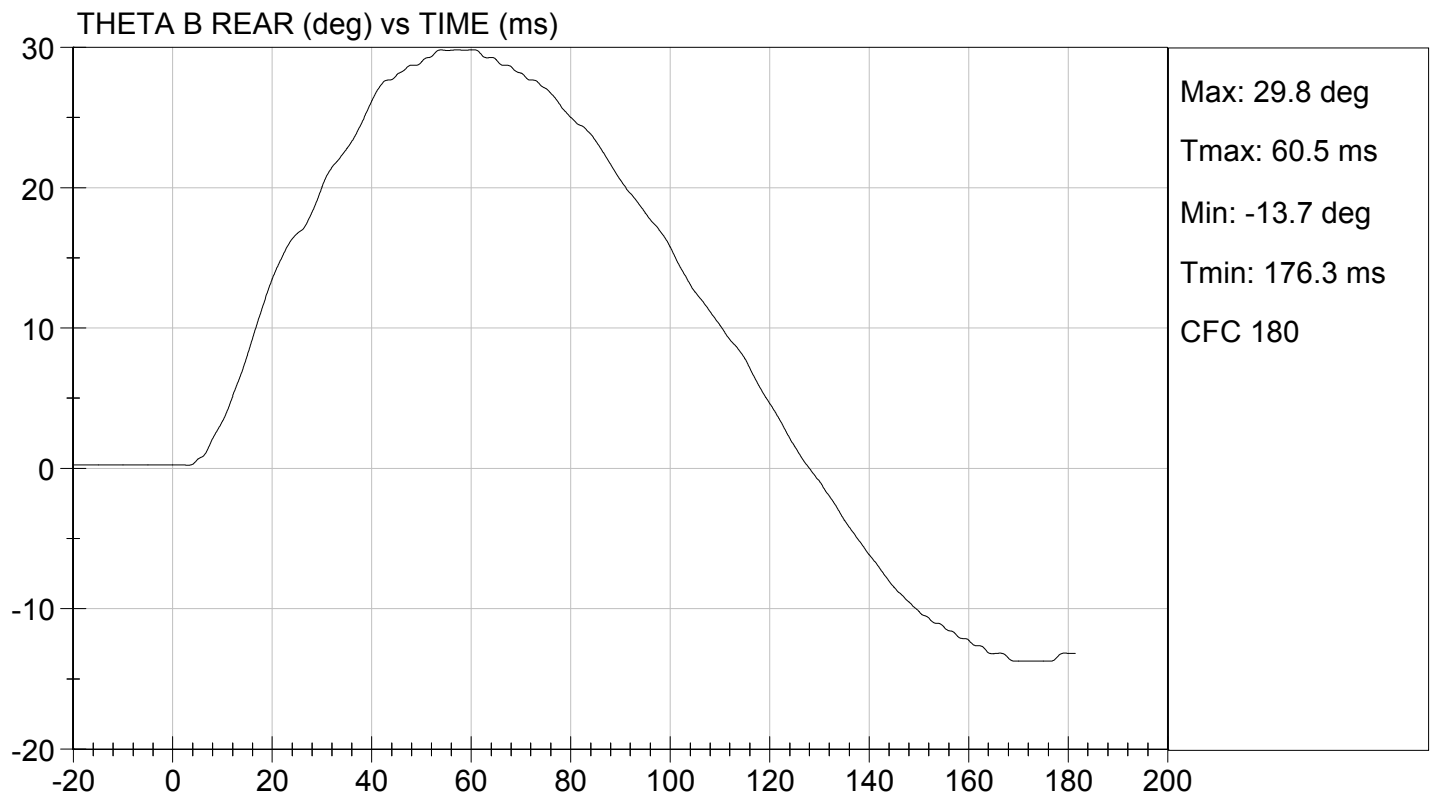
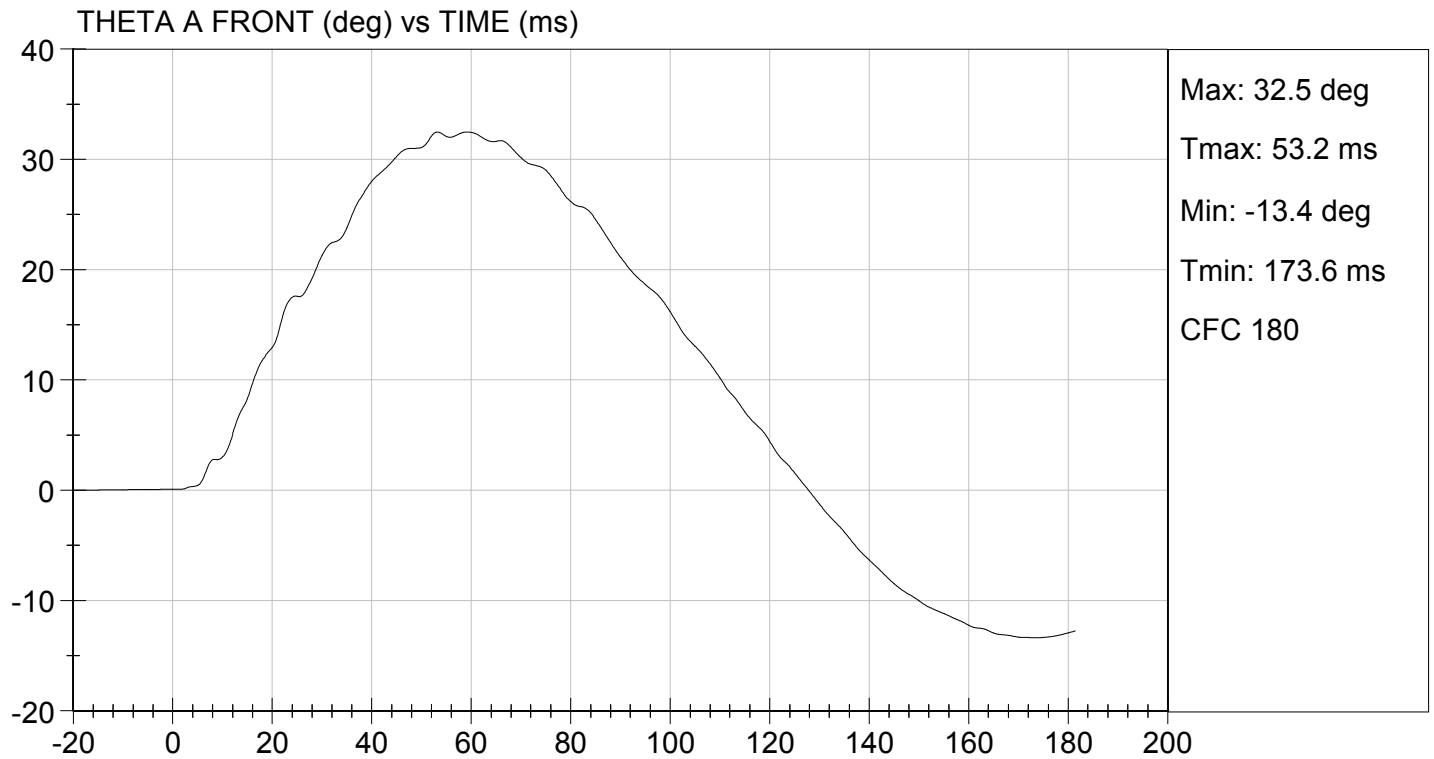
TEST #: D15562





TEST DESC: NECK BENDING
VELOCITY: 11.06 ft/s, 3.37 m/s

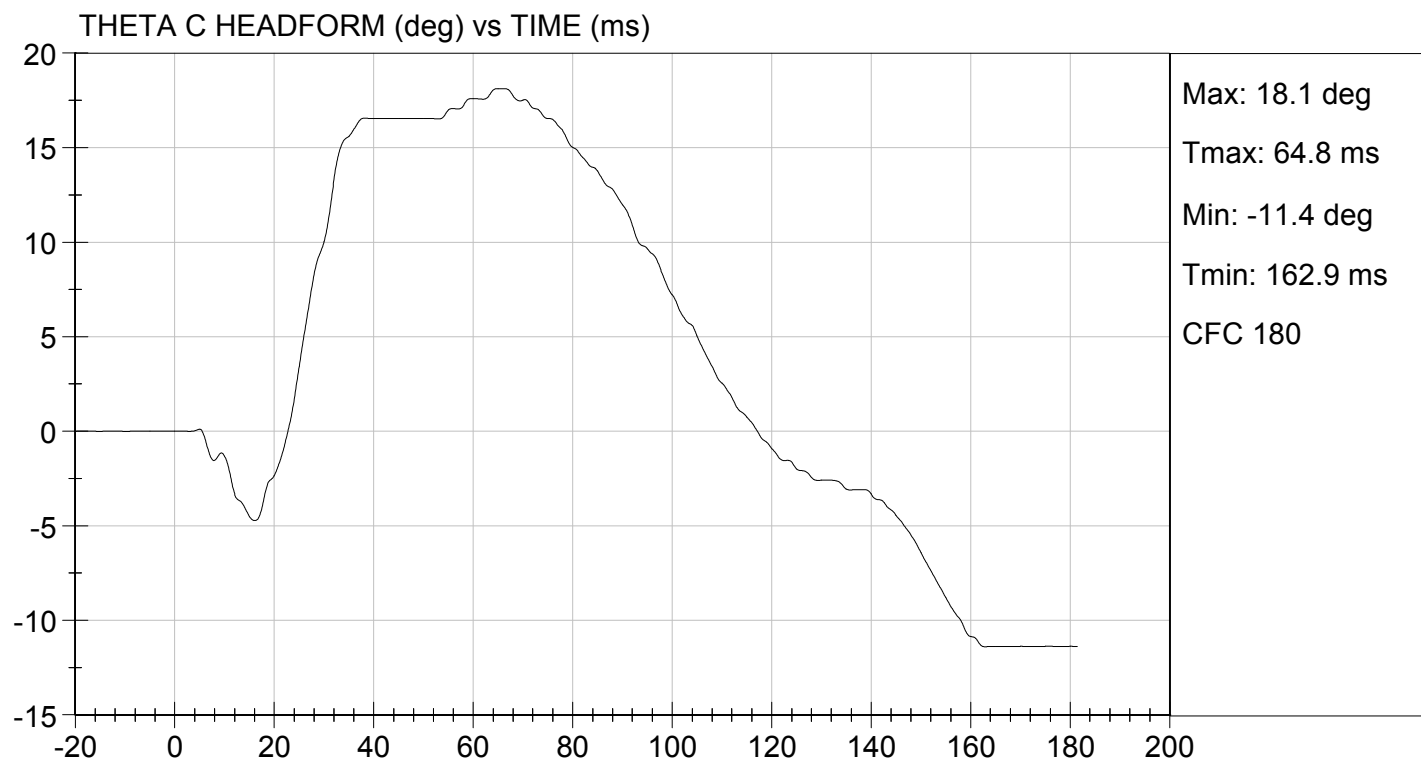
TEST DATE: 02/26/2015
TEST #: D15562





TEST DESC: NECK BENDING
VELOCITY: 11.06 ft/s, 3.37 m/s

TEST DATE: 02/26/2015
TEST #: D15562



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D15563

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.1	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

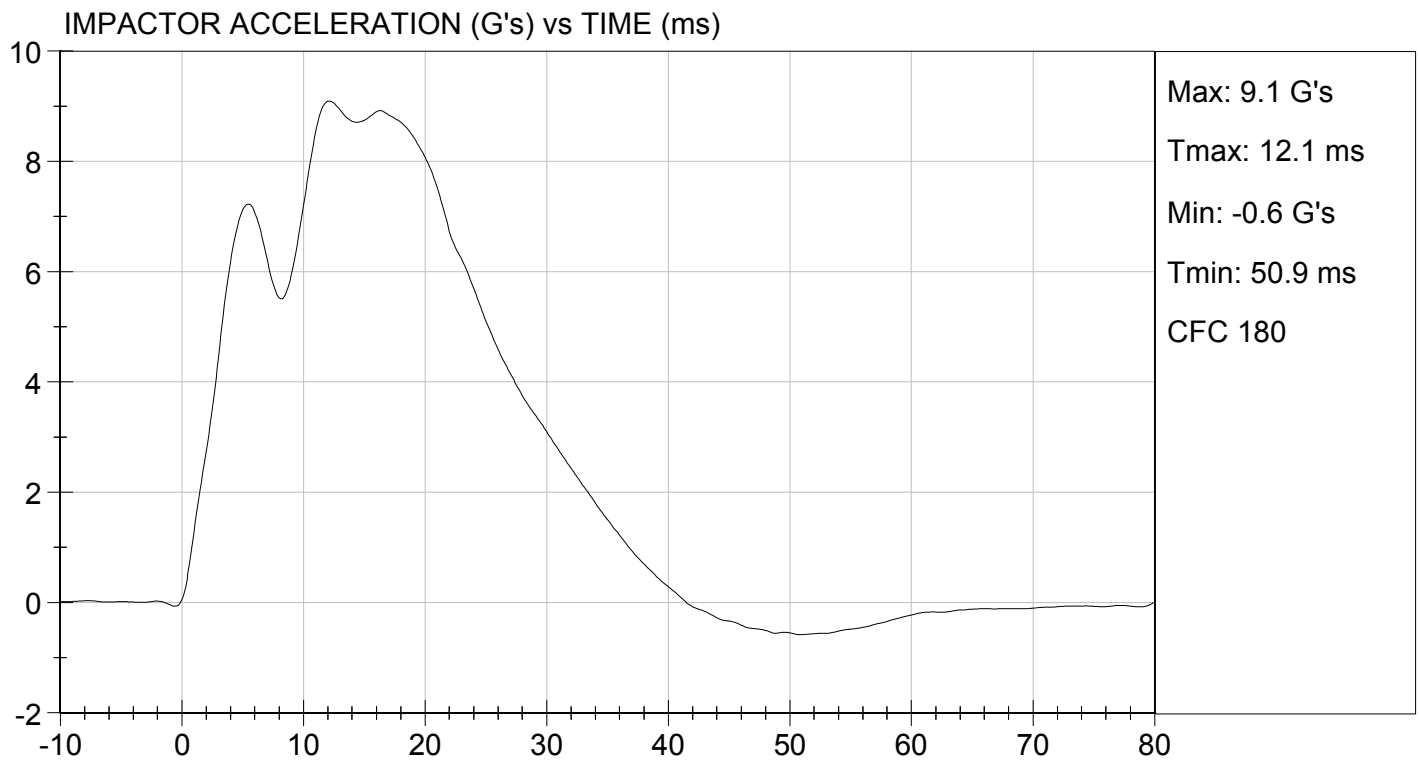
02/26/2015
Test Date

Jessica Hall
Approved By



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

TEST DATE: 02/26/2015
TEST #: D15563



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D15564

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	22	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.3	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.0	Pass
Overall Test Results				Pass

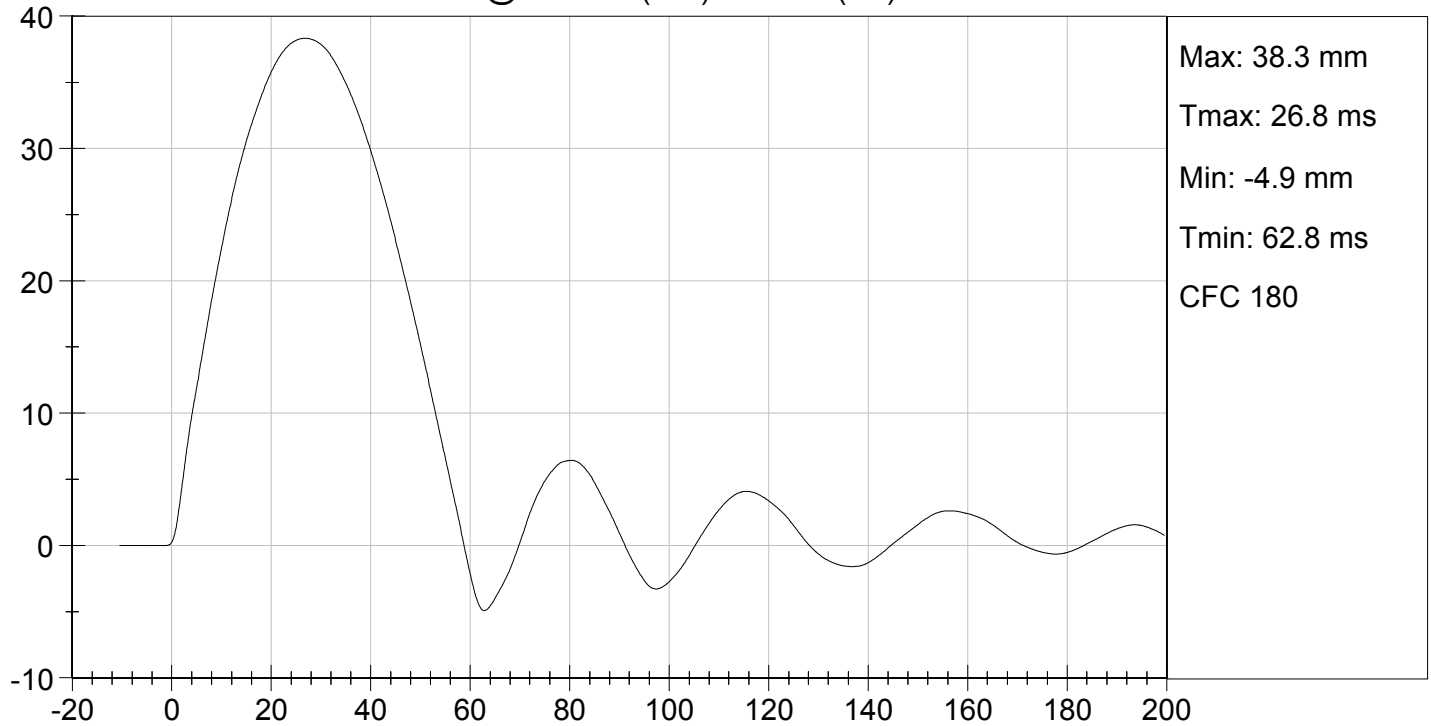
David Schoedel
Laboratory Technician

02/26/2015
Test Date

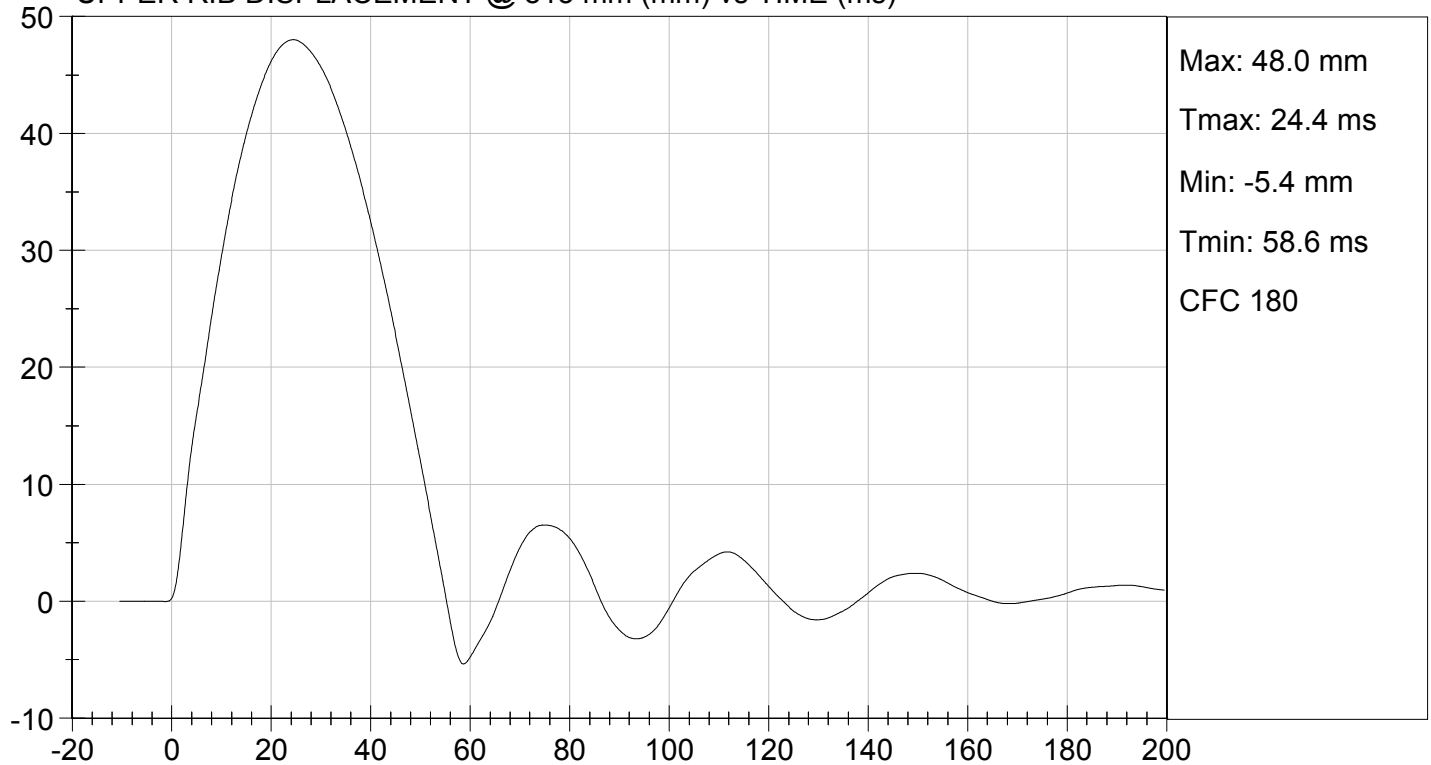
Jessica Hall
Approved By



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: D15565

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	22	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.3	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

02/26/2015

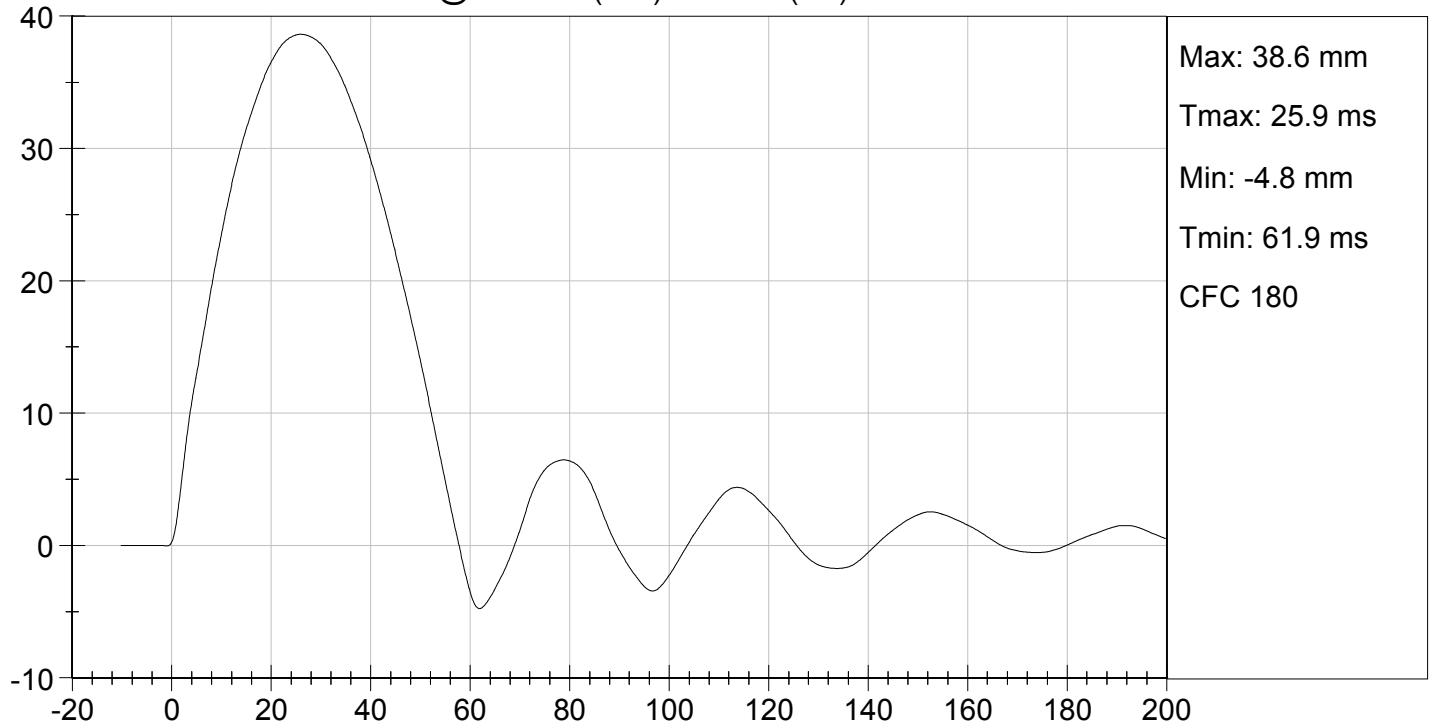
Test Date

Jessica Hall

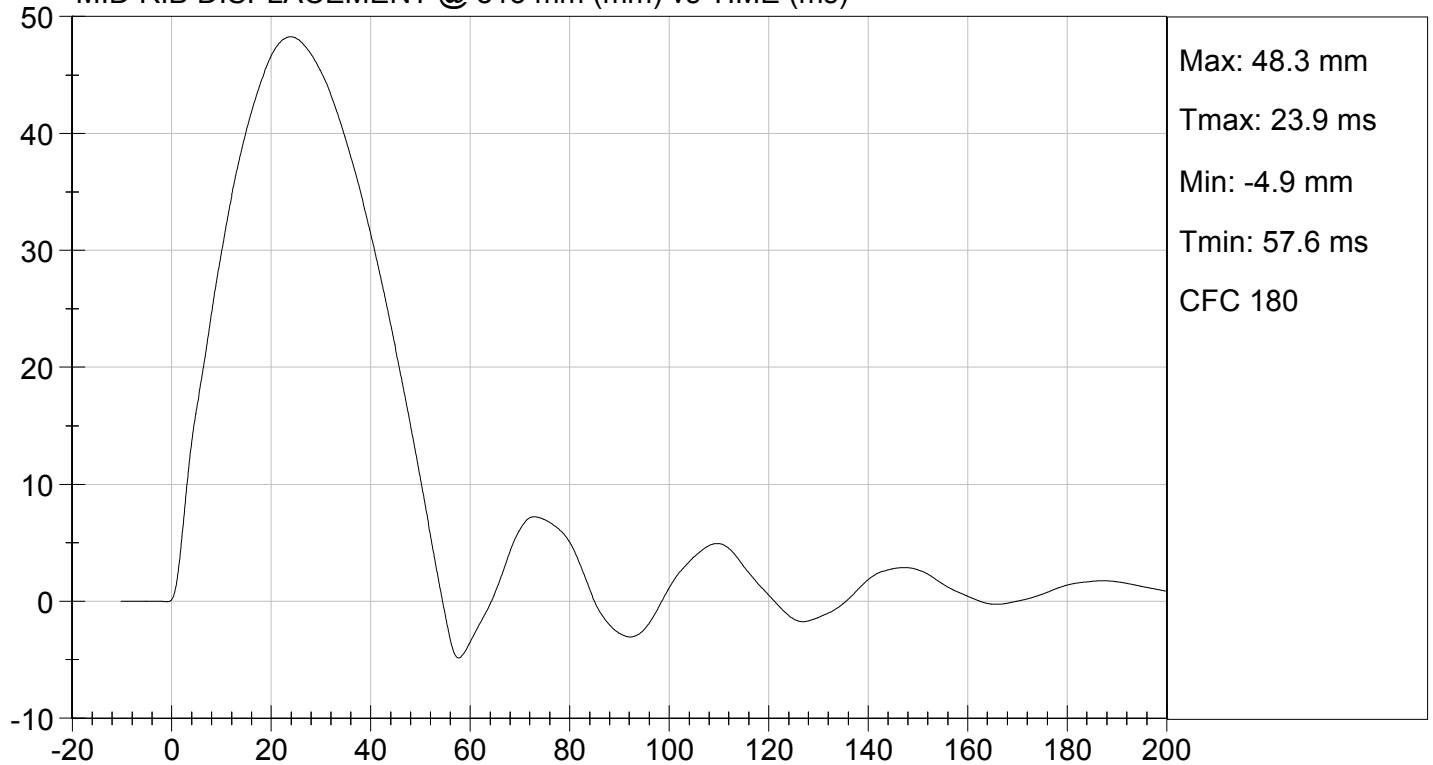
Approved By



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: D15566

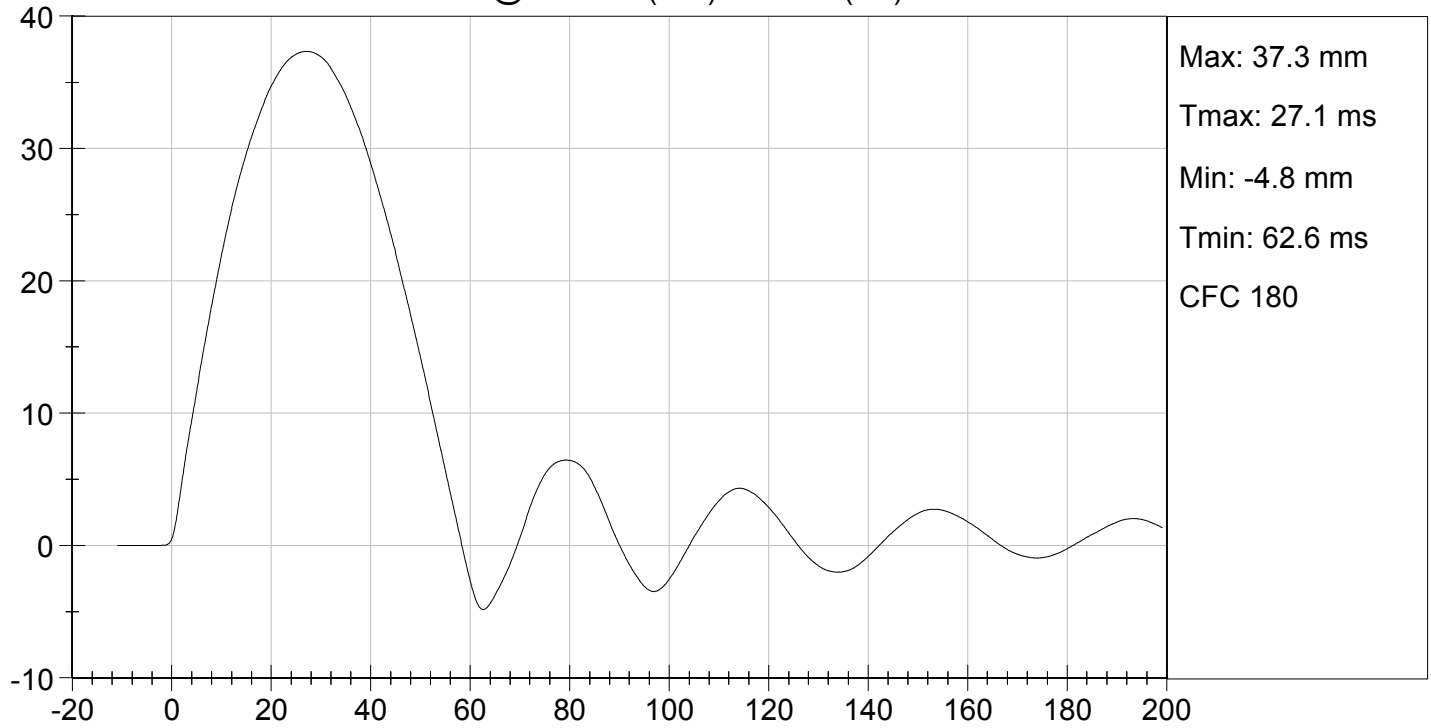
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.3	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.0	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

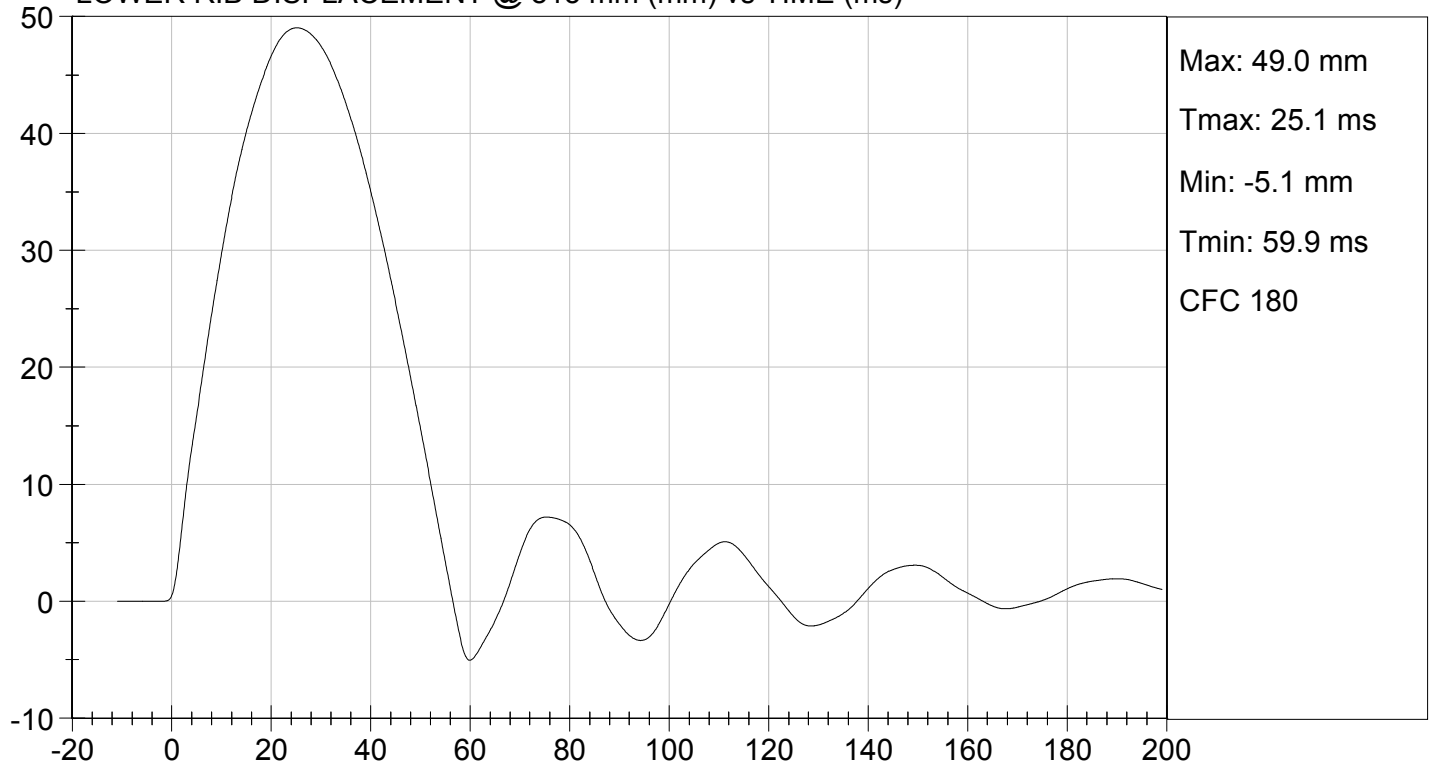
02/26/2015
Test Date

Jessica Hall
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: 032

Test I.D: D15560

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	24	Pass
Probe Speed	m/s	5.40 to 5.60	5.46	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5927	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.4	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.6	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.9	Pass
Overall Test Results				Pass


Laboratory Technician

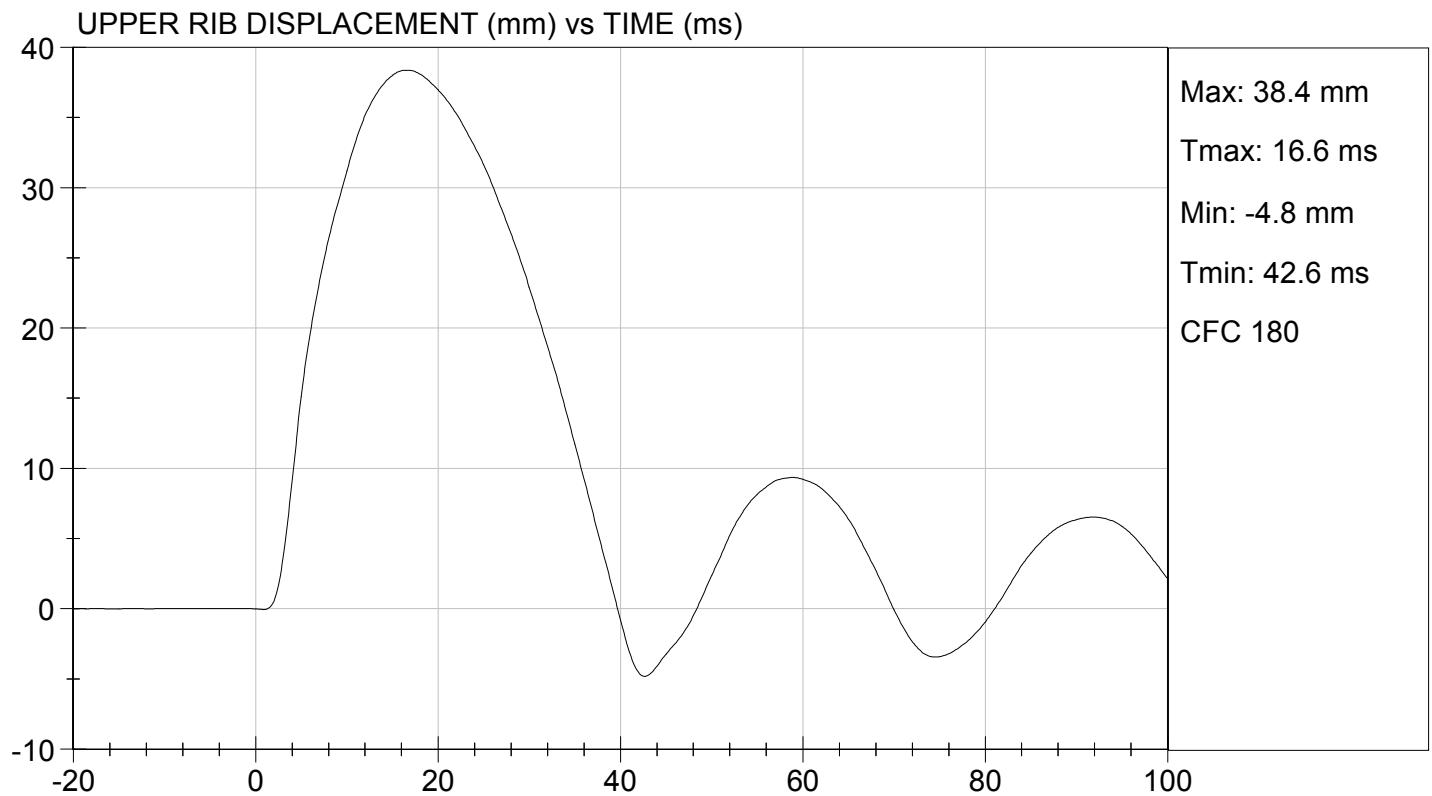
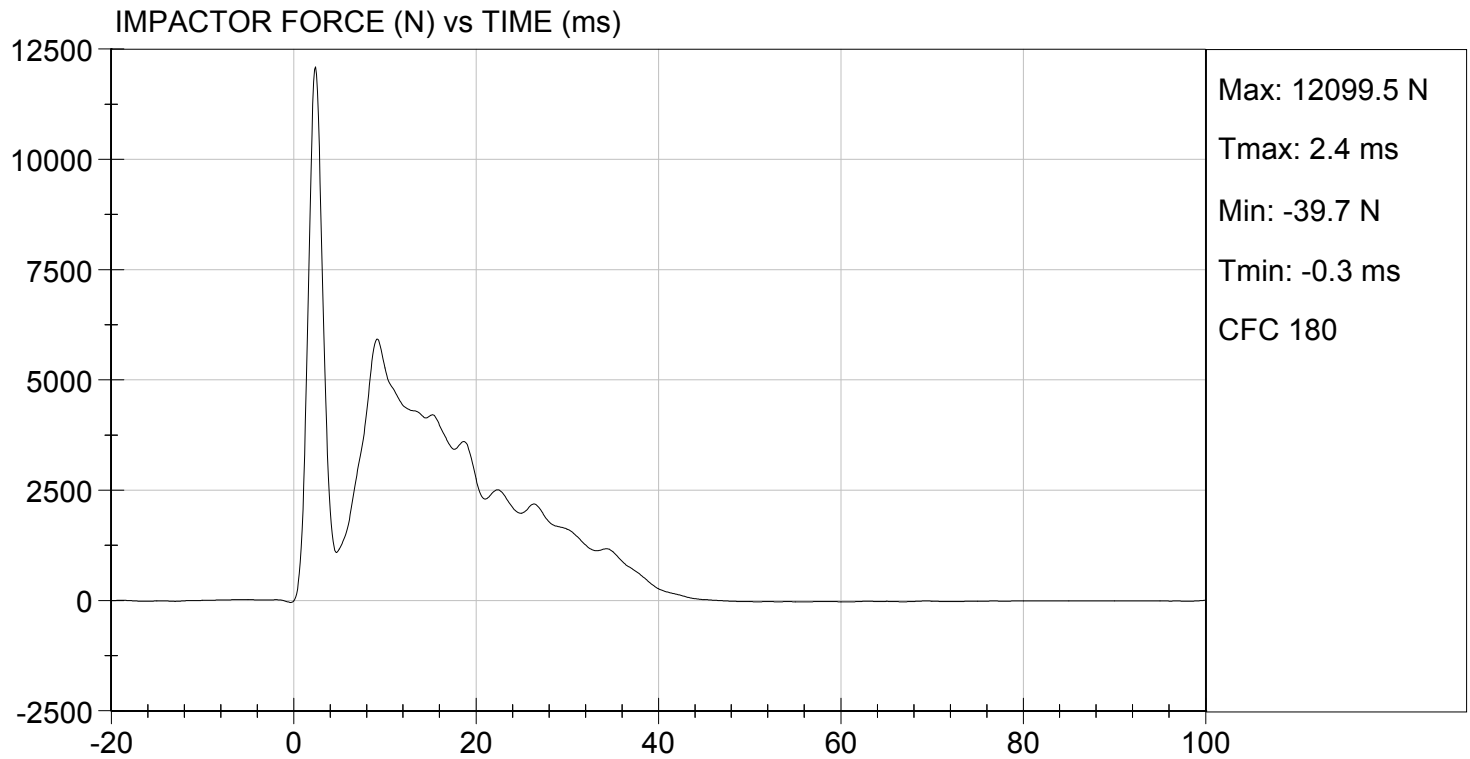
02/26/2015
Test Date


Approved By



TEST DESC: THORAX IMPACT
VELOCITY: 17.92 ft/s, 5.46 m/s

TEST DATE: 02/26/2015
TEST #: D15560

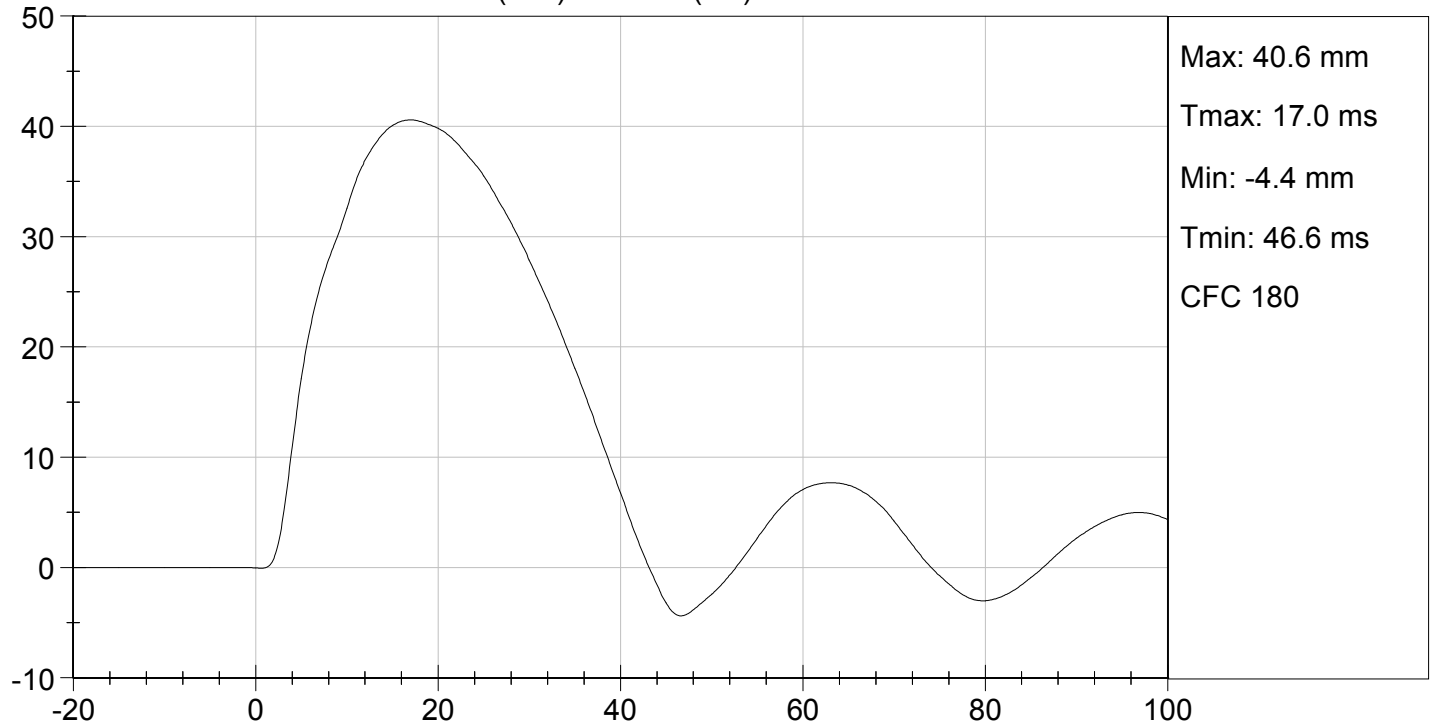




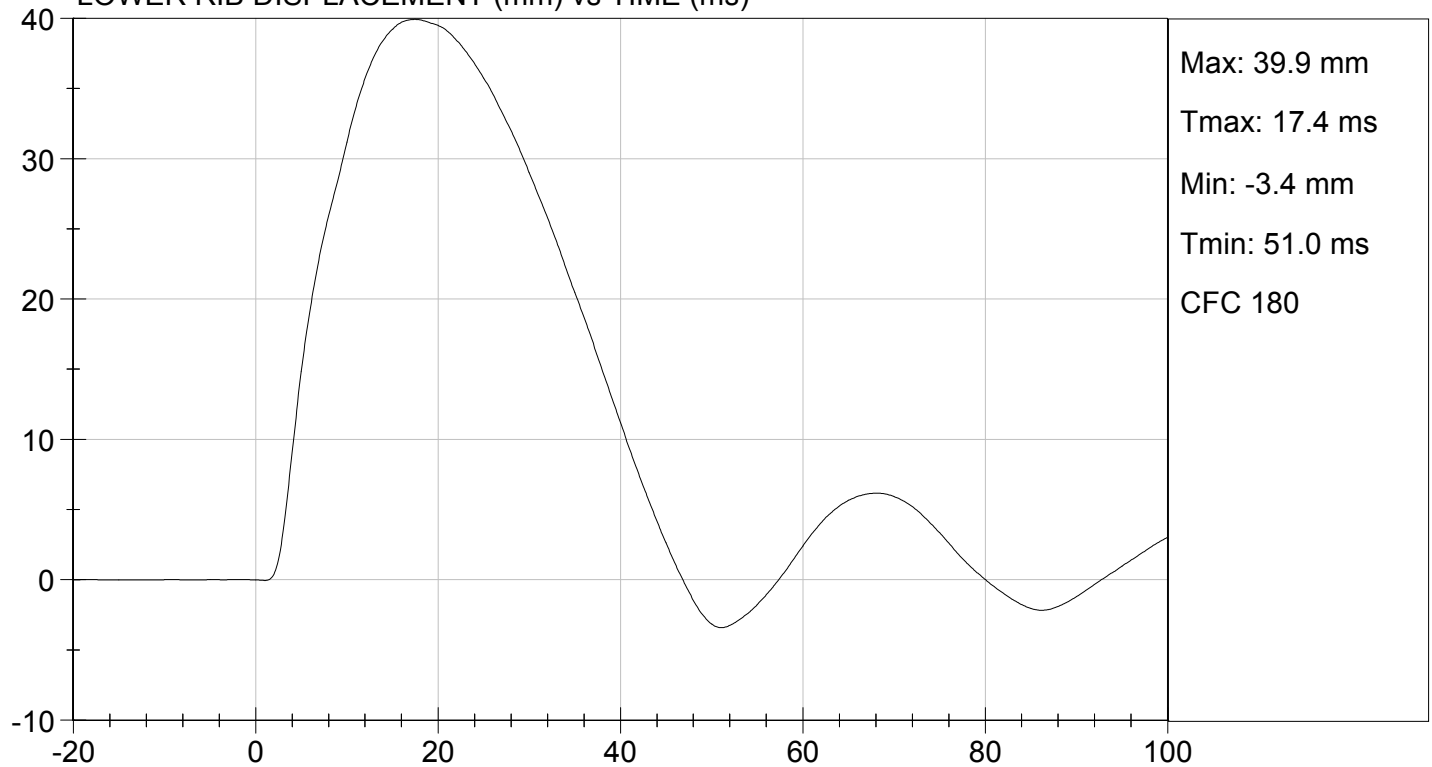
TEST DESC: THORAX IMPACT
VELOCITY: 17.92 ft/s, 5.46 m/s

TEST DATE: 02/26/2015
TEST #: D15560

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: D15567

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4101	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.2	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2272	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	11.5	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

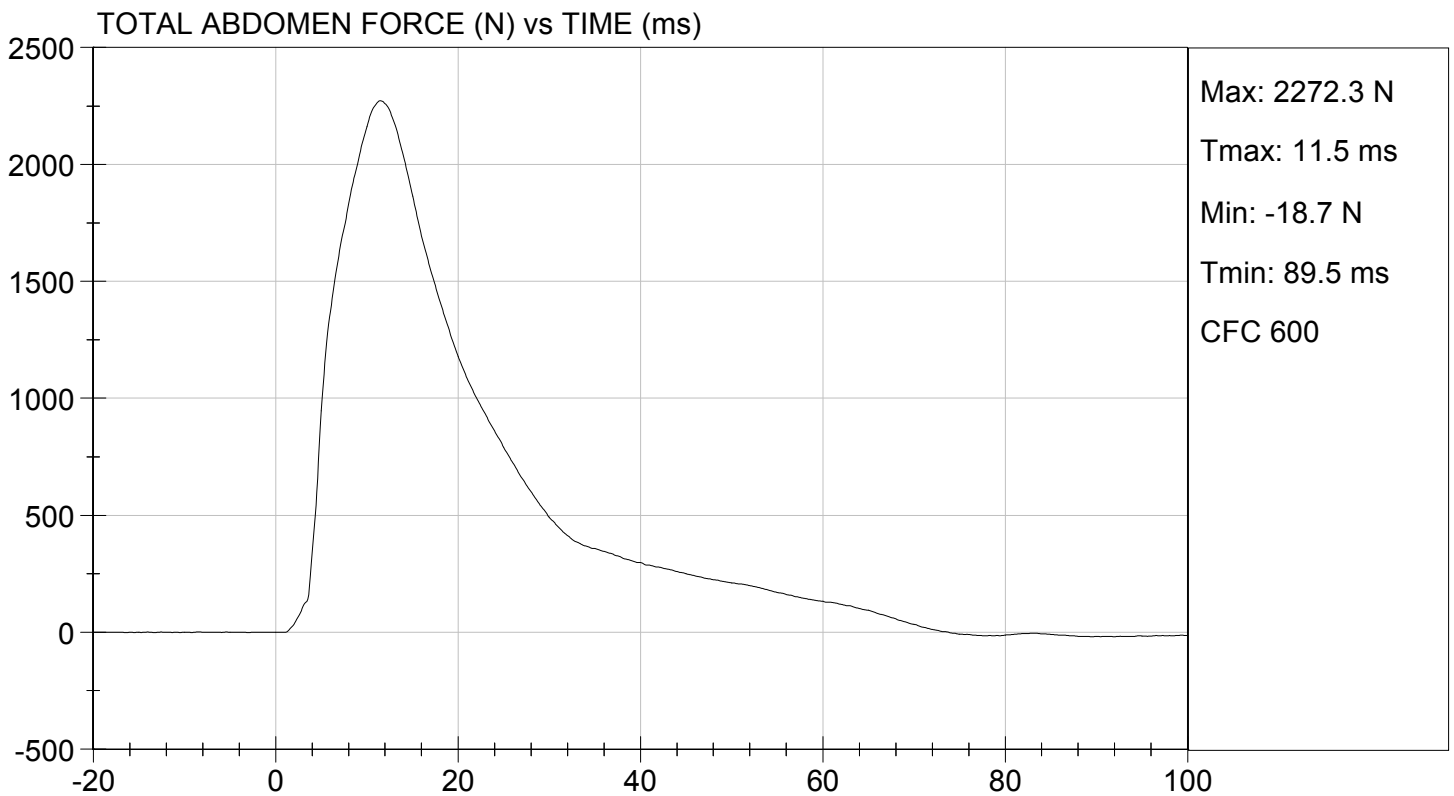
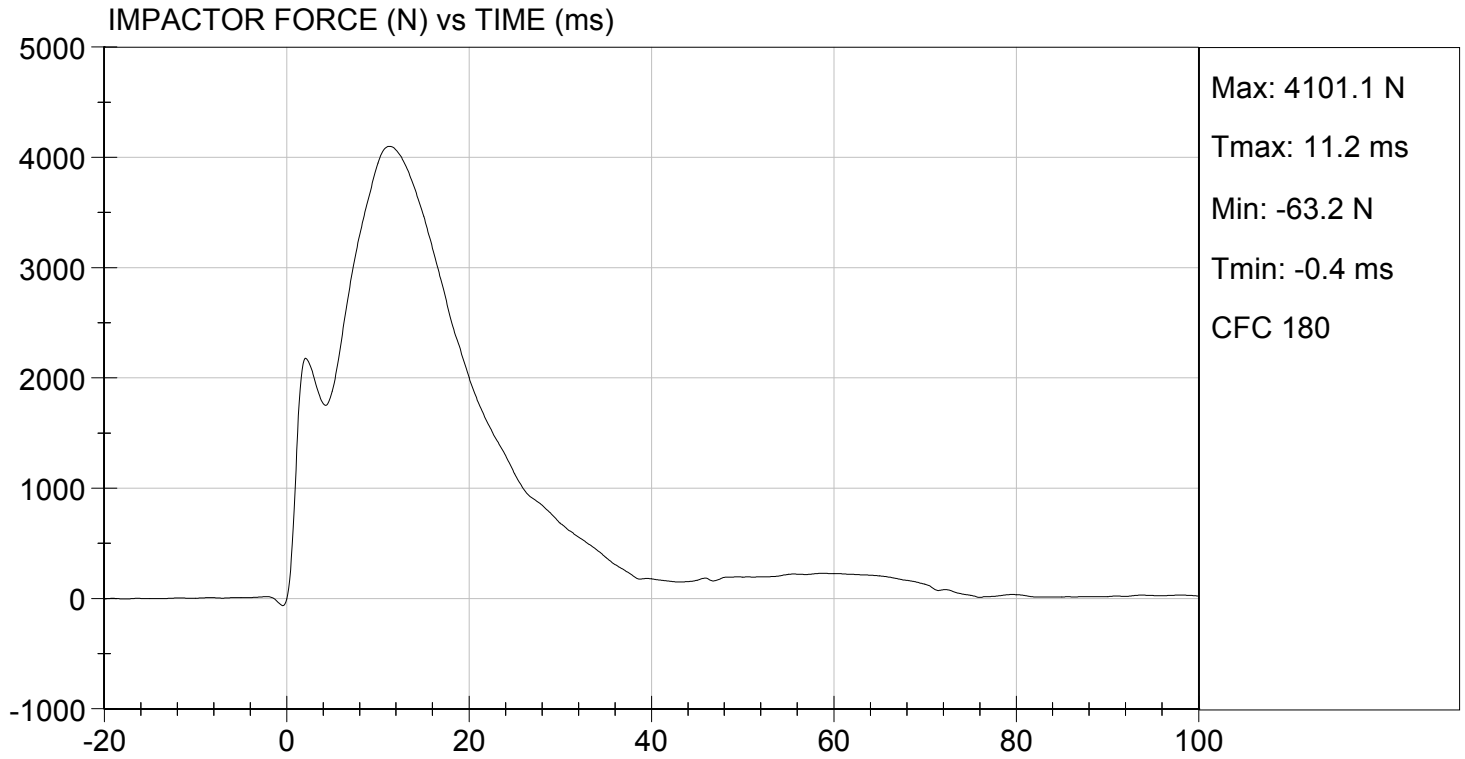
02/26/2015
Test Date

Jessica Hall
Approved By



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

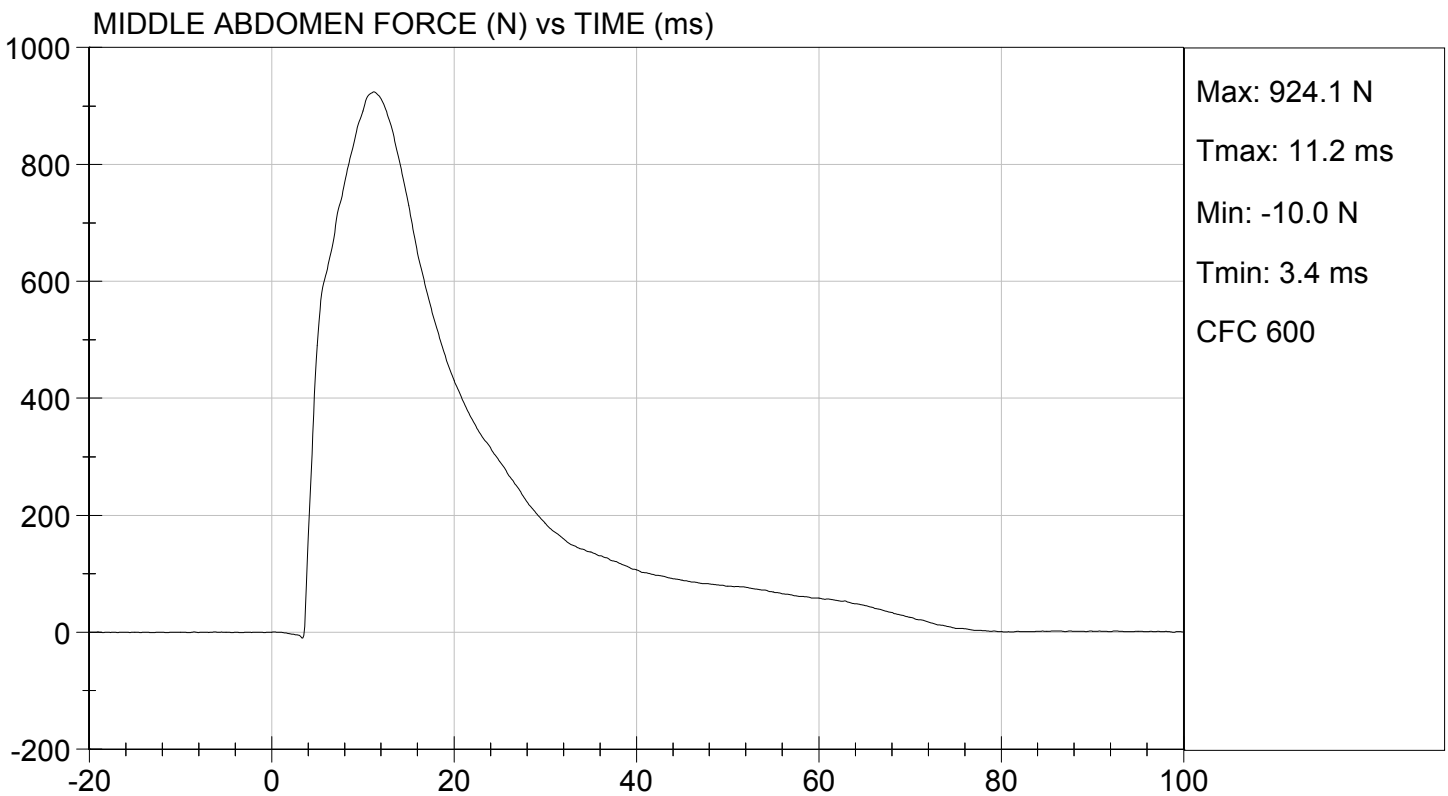
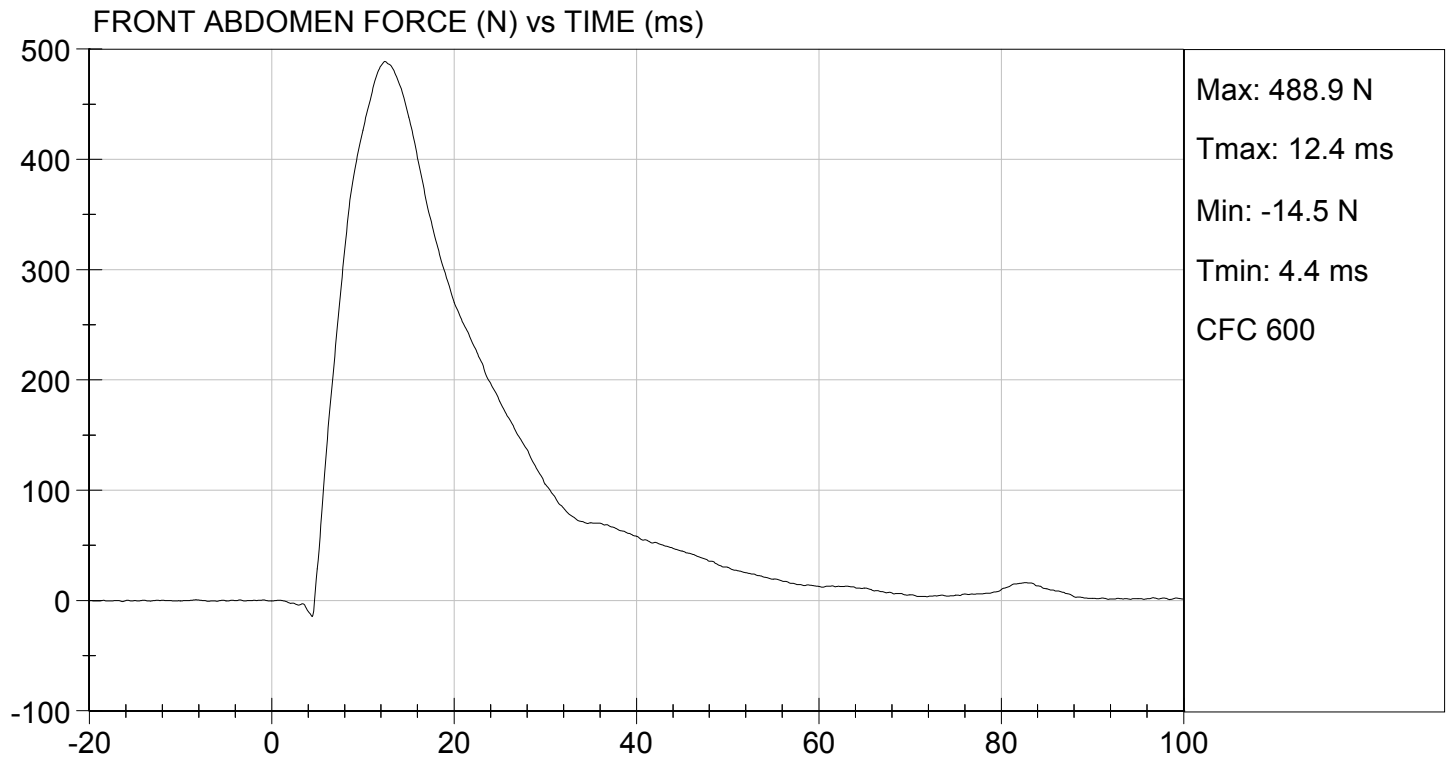
TEST DATE: 02/26/2015
TEST #: D15567





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

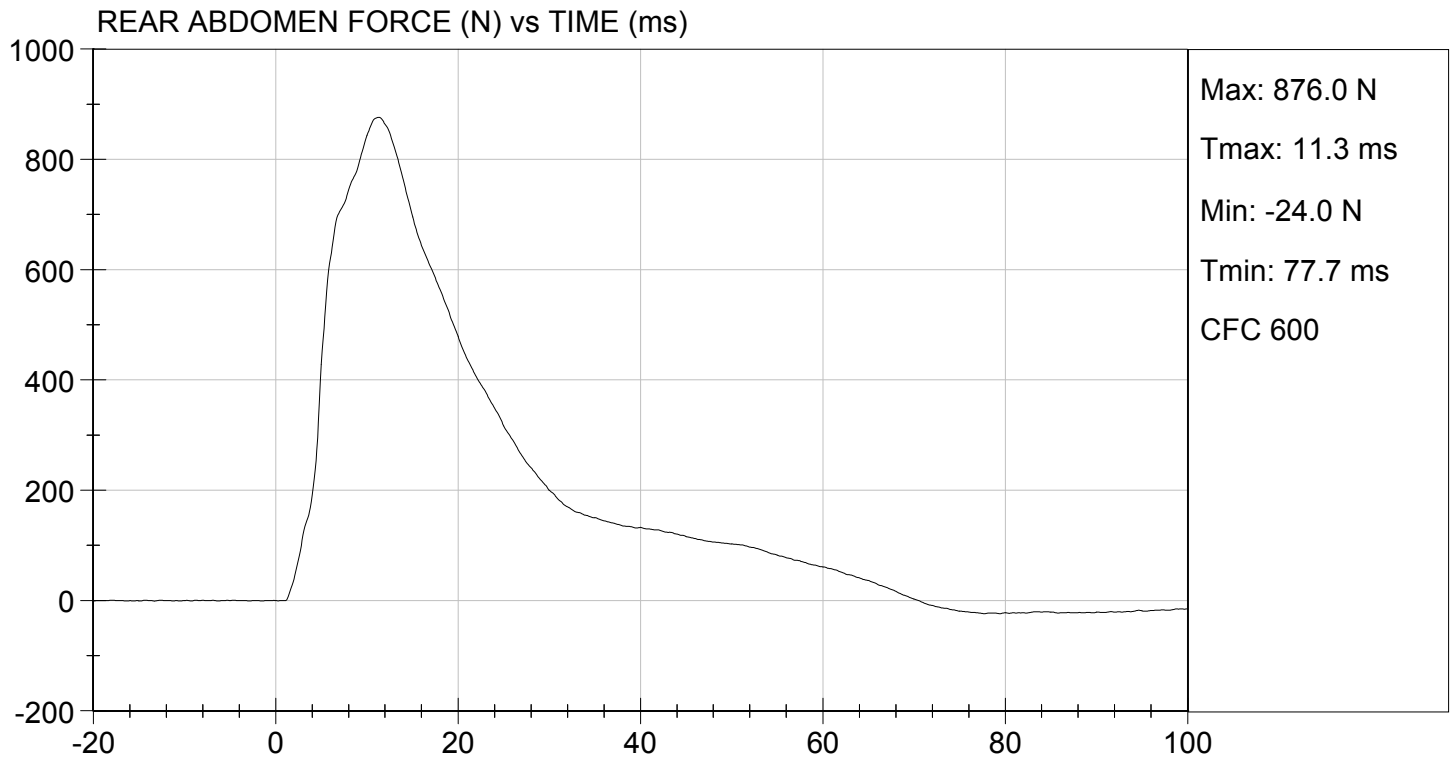
TEST DATE: 02/26/2015
TEST #: D15567





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

TEST DATE: 02/26/2015
TEST #: D15567



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

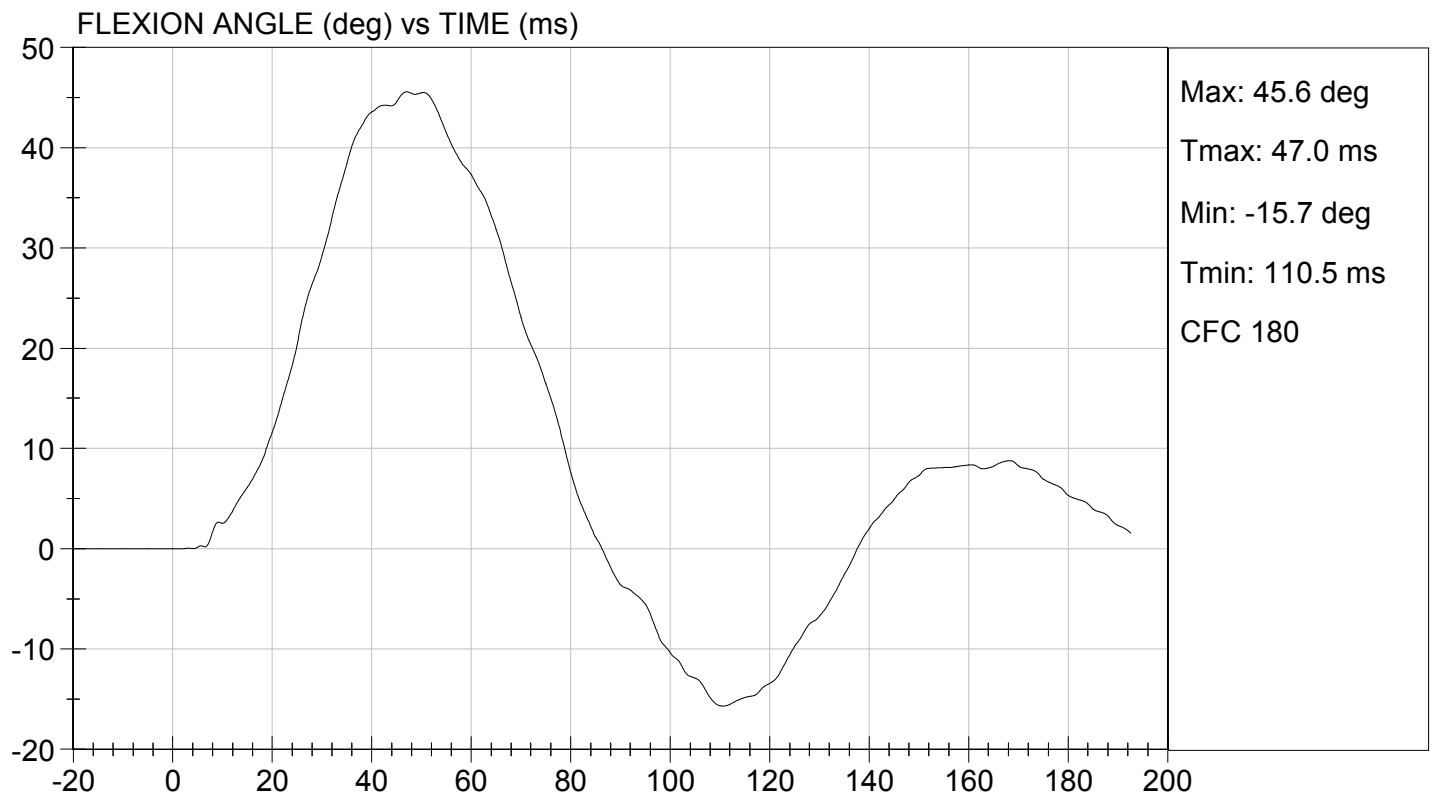
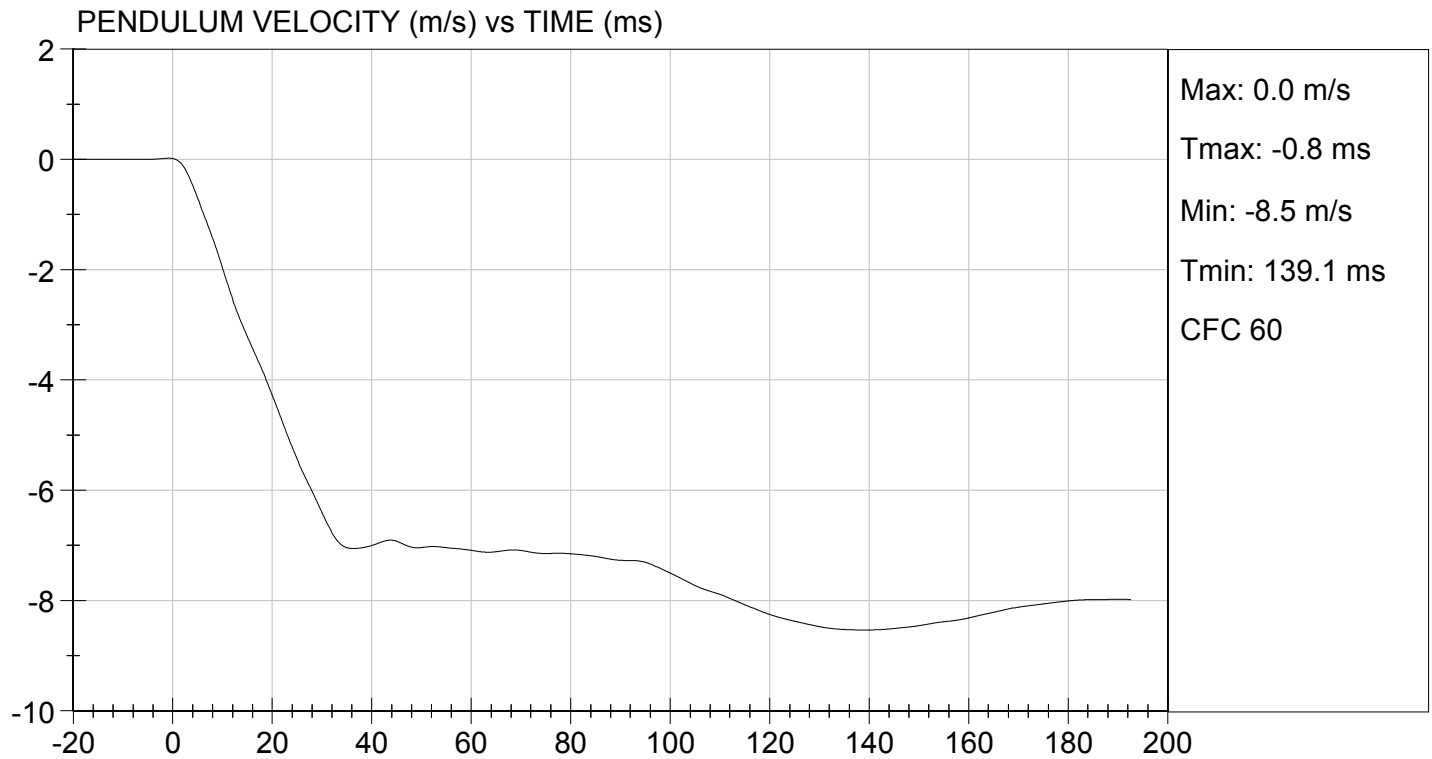
Test I.D: D15568

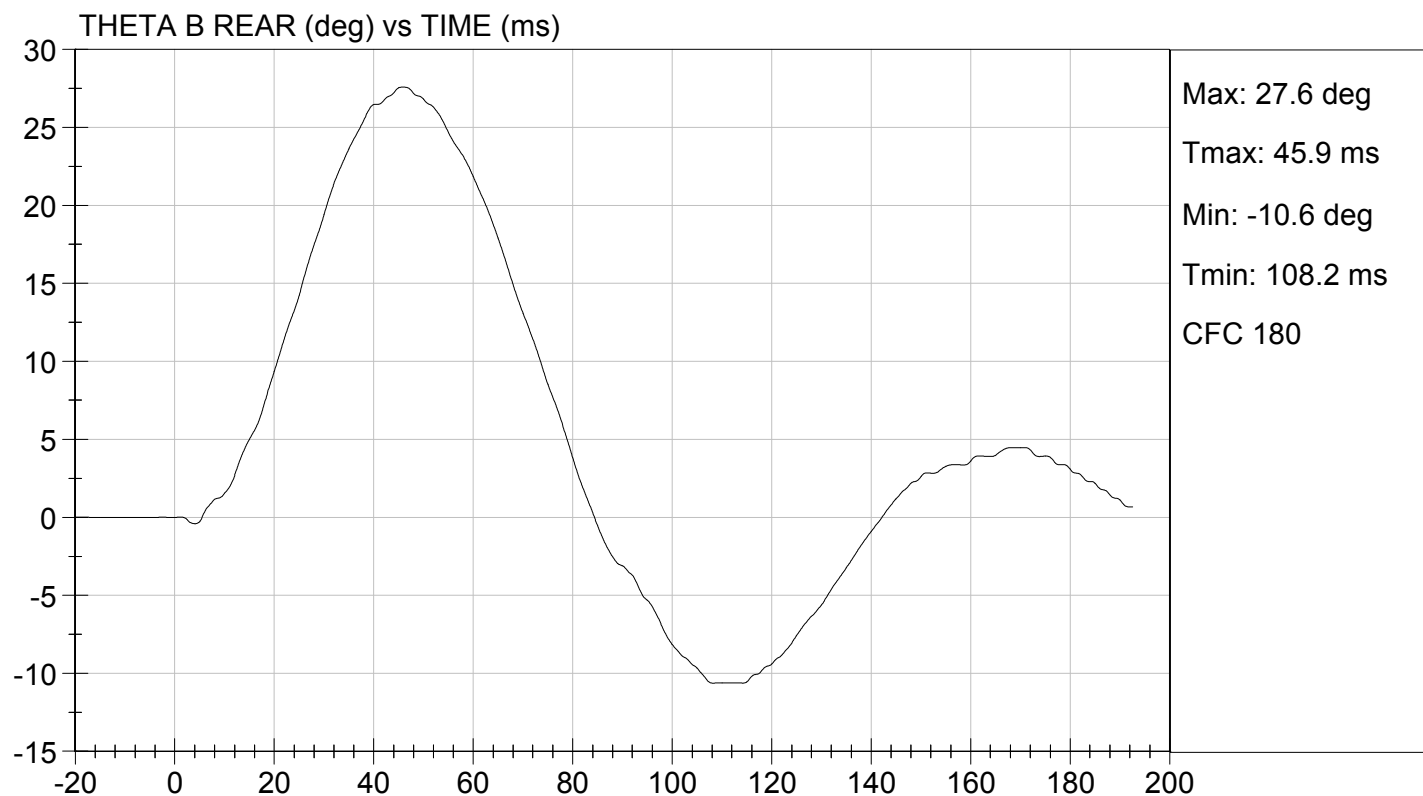
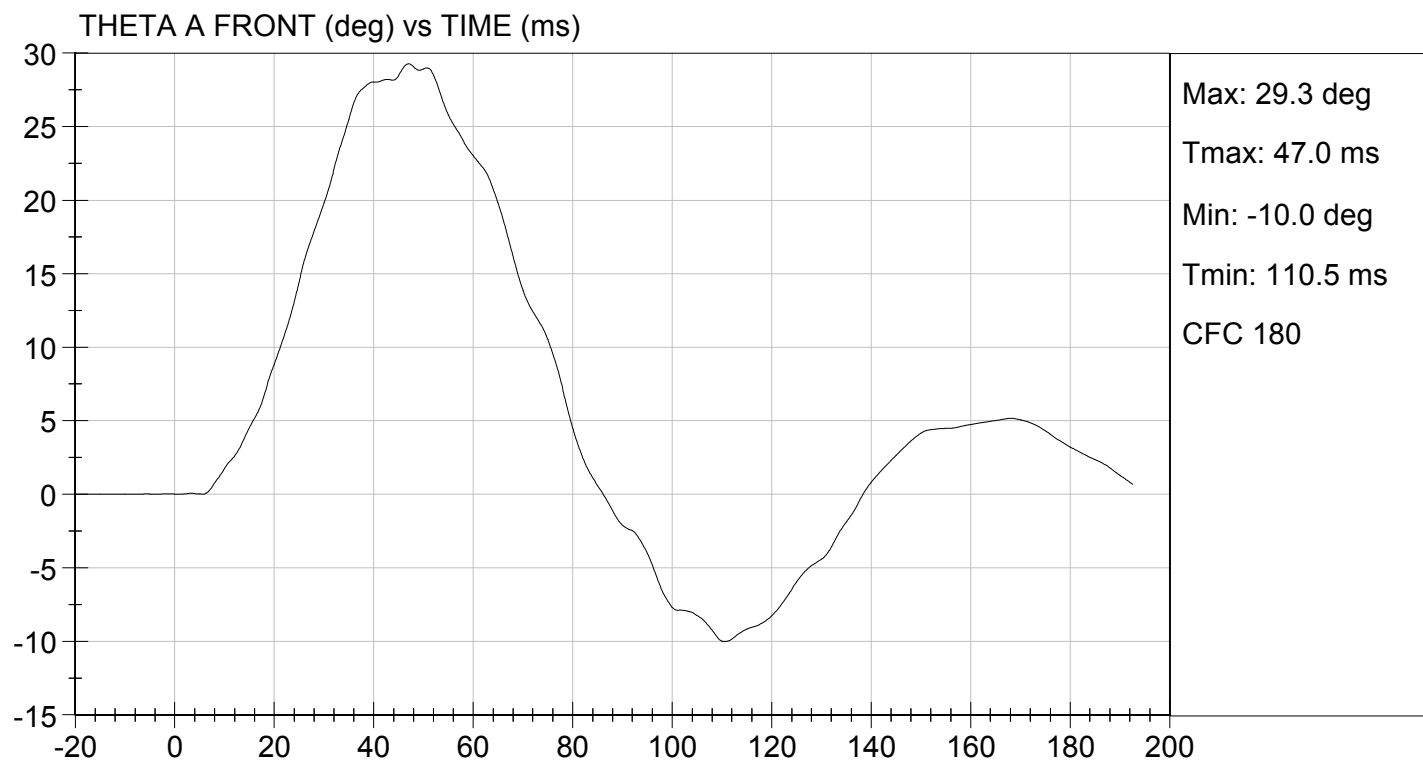
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	15	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.409	Pass
	27 ms	m/s	-6.50 to -5.80	-5.83	Pass
	30 ms	m/s	>= -6.50	-6.41	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	45.6	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

David Schoedel
 Laboratory Technician

02/26/2015
 Test Date

Jessica Hall
 Approved By

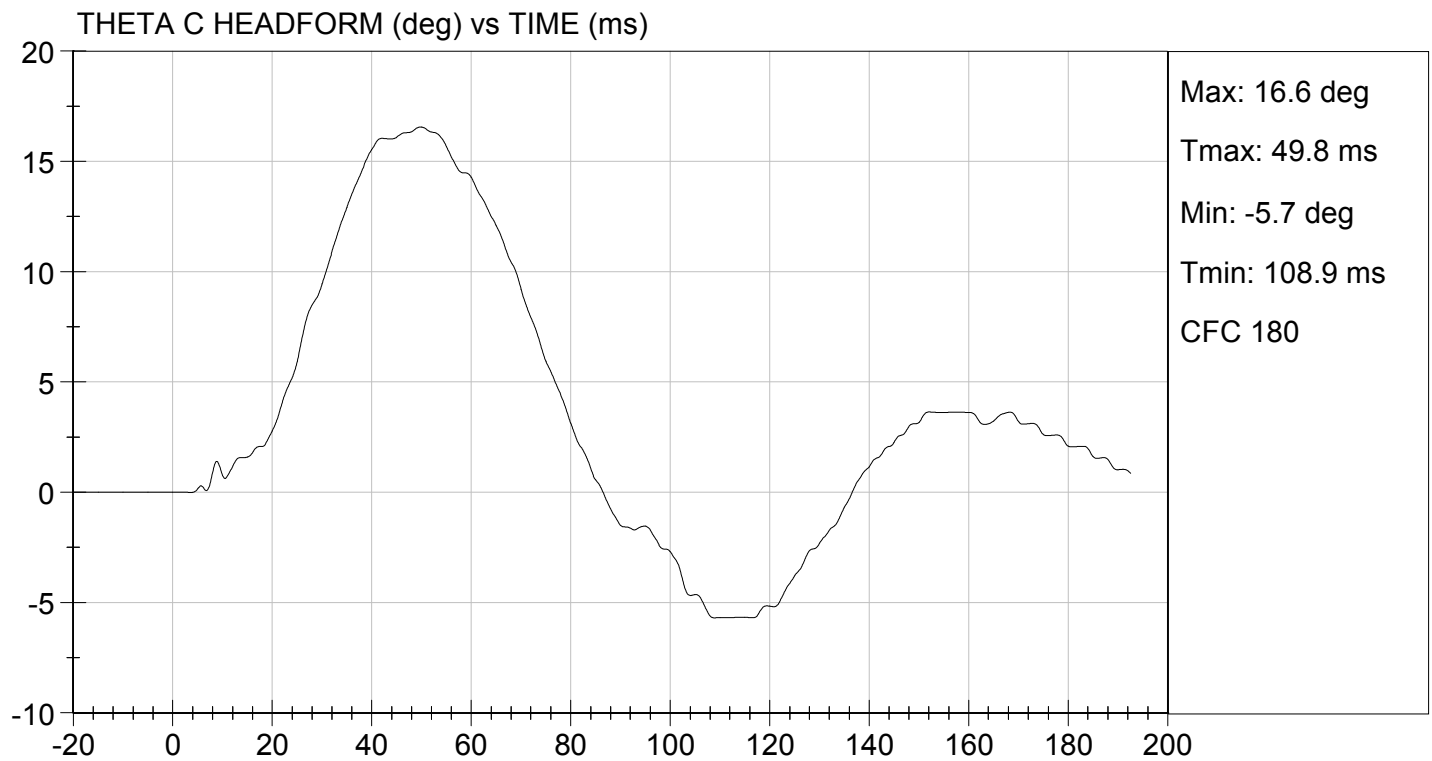






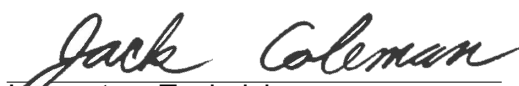
TEST DESC: LUMBAR BENDING
VELOCITY: 20.08 ft/s, 6.12 m/s

TEST DATE: 02/26/2015
TEST #: D15568



MGA RESEARCH CORPORATION**PELVIS TEST****ES-2re DUMMY****ATD Serial No:** 032**Test I.D:** D15569

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	N	4700 to 5400	5017	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.8	Pass
Maximum Pubic Force	N	1230 to 1590	1277	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	13.5	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

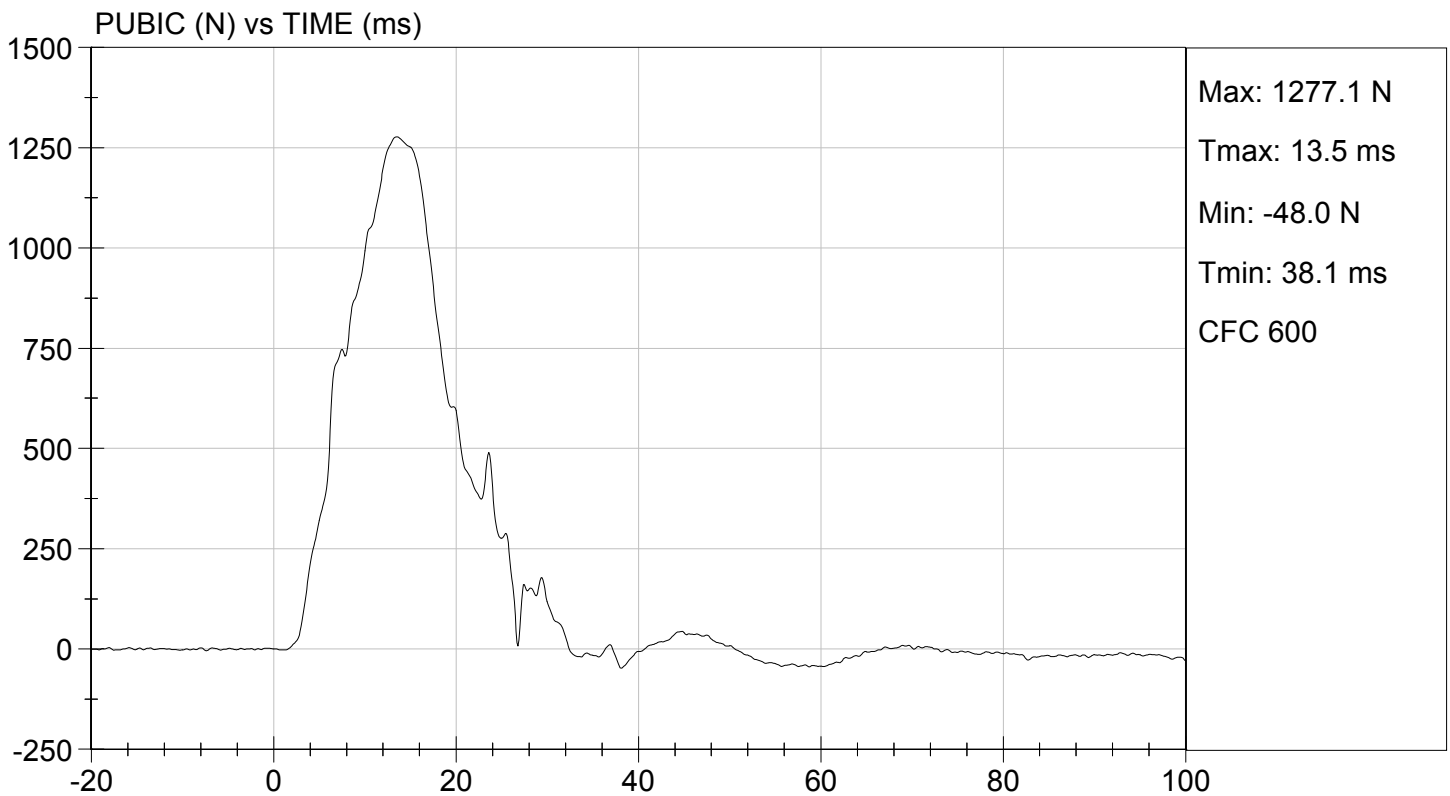
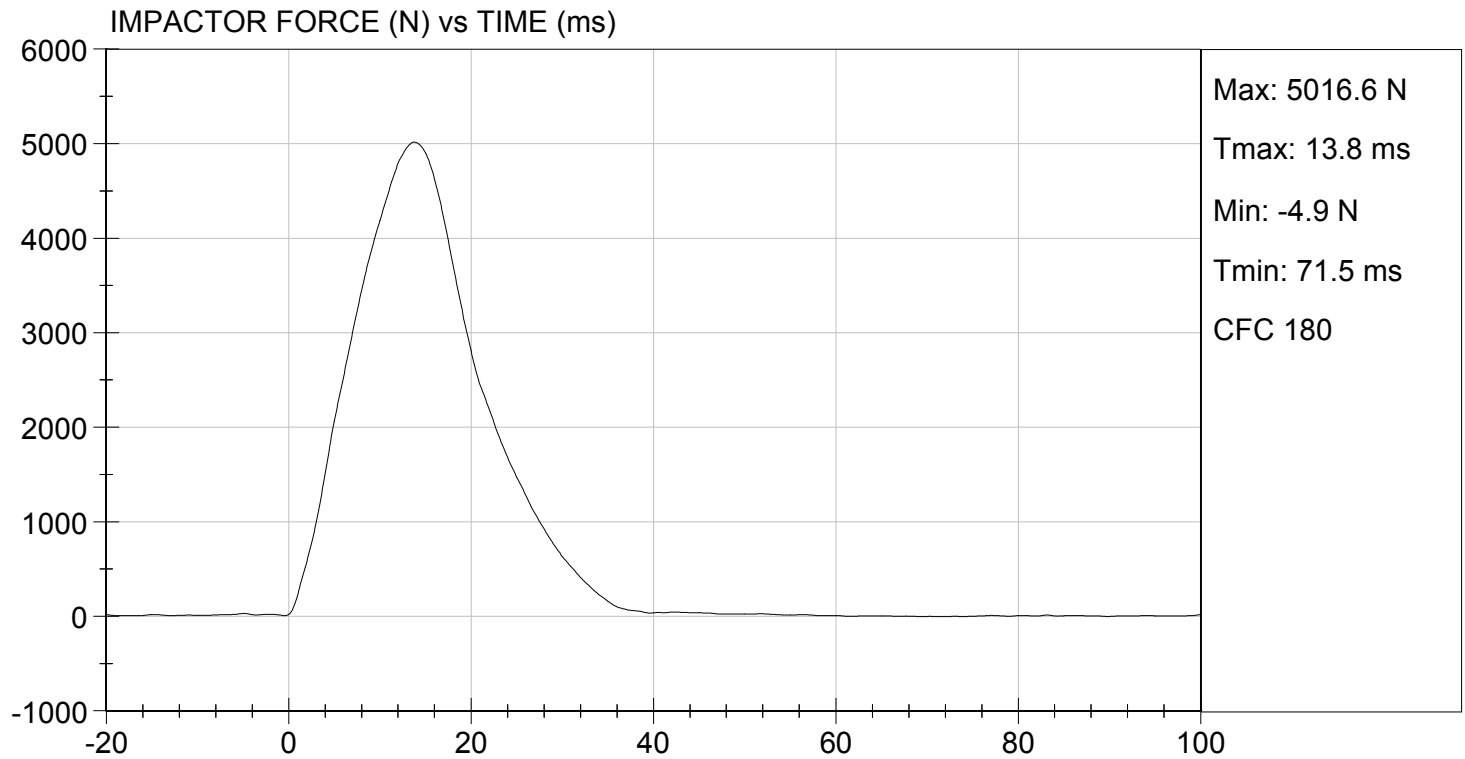
02/26/2015

Test Date



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

TEST DATE: 02/26/2015
TEST #: D15569



SID-IIsD External Measurements
SN: 296

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

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

ATD Serial No: 296

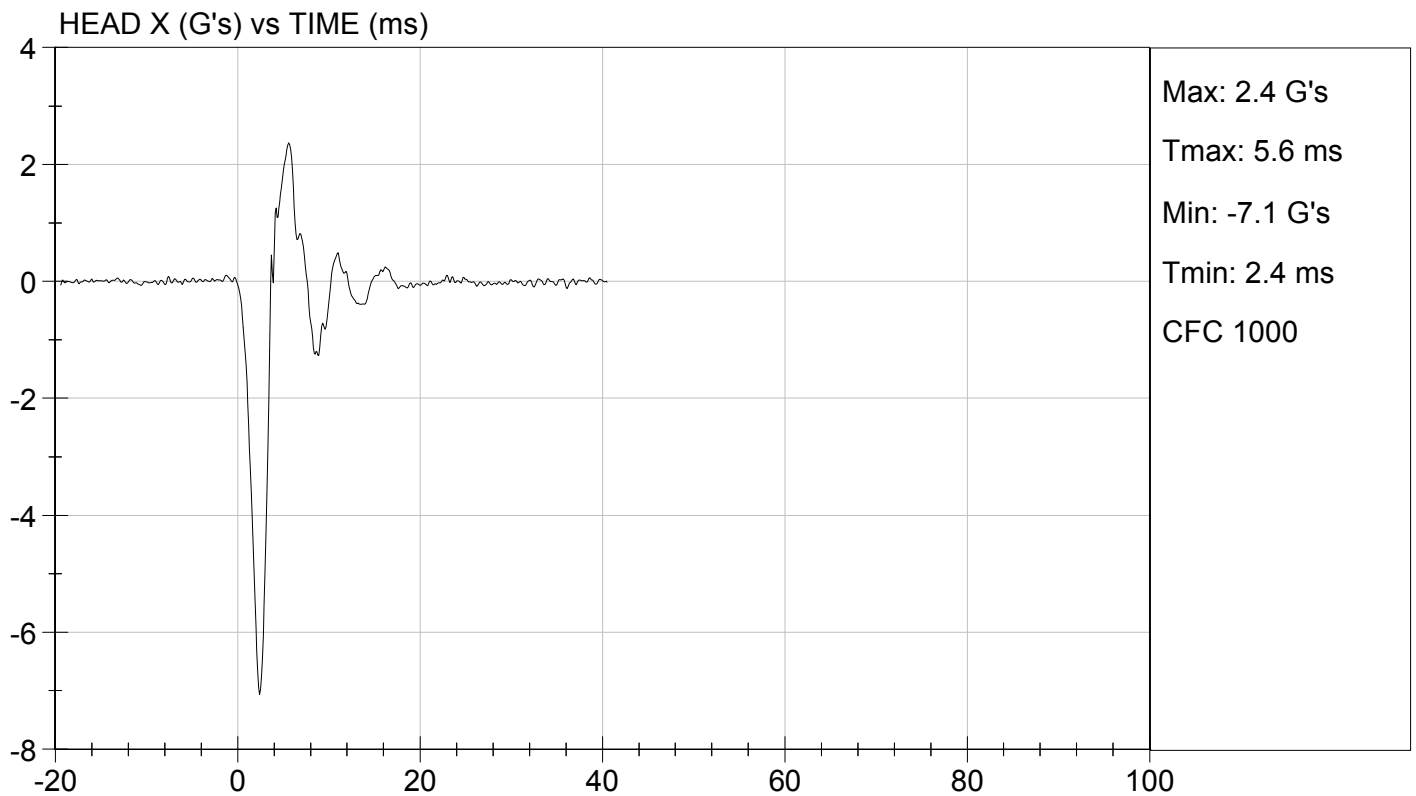
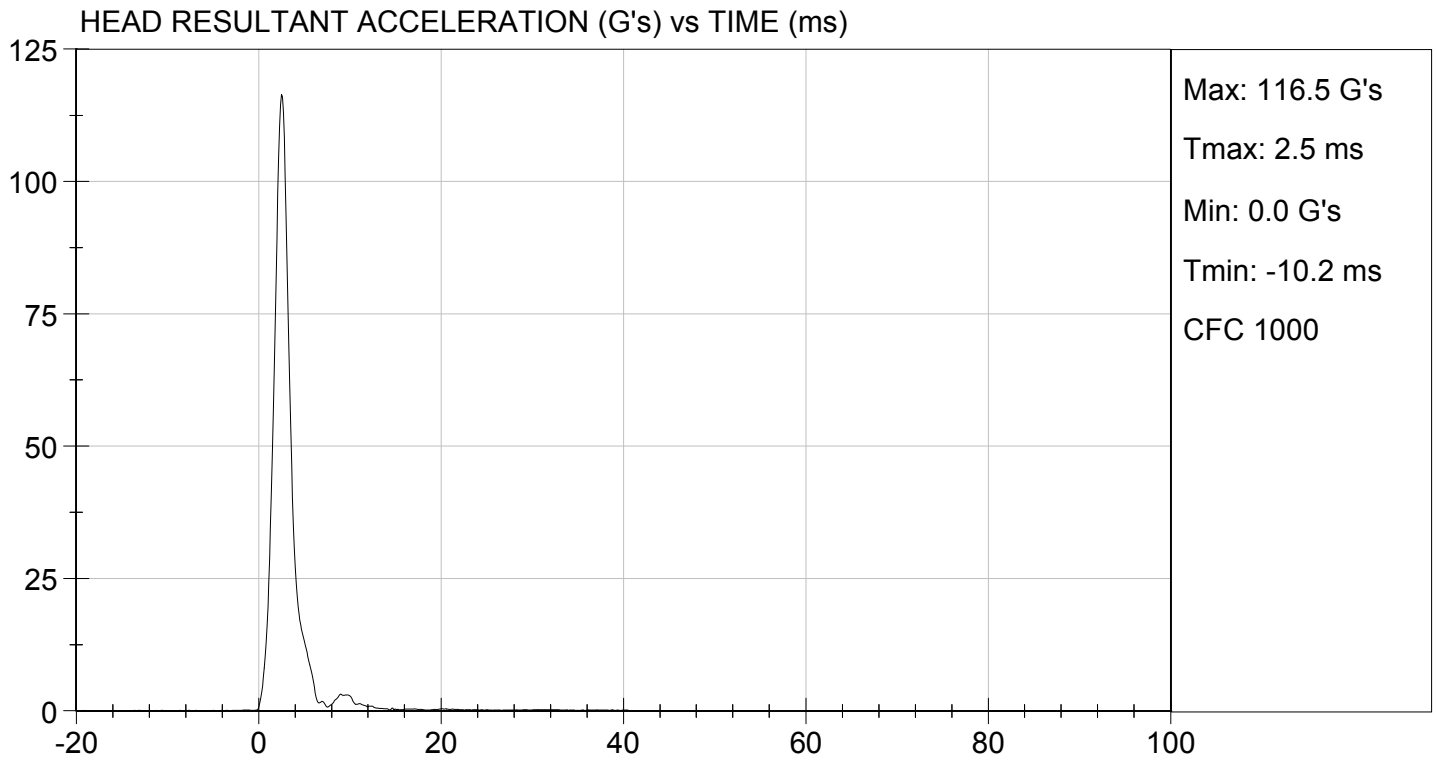
Test ID: D15471

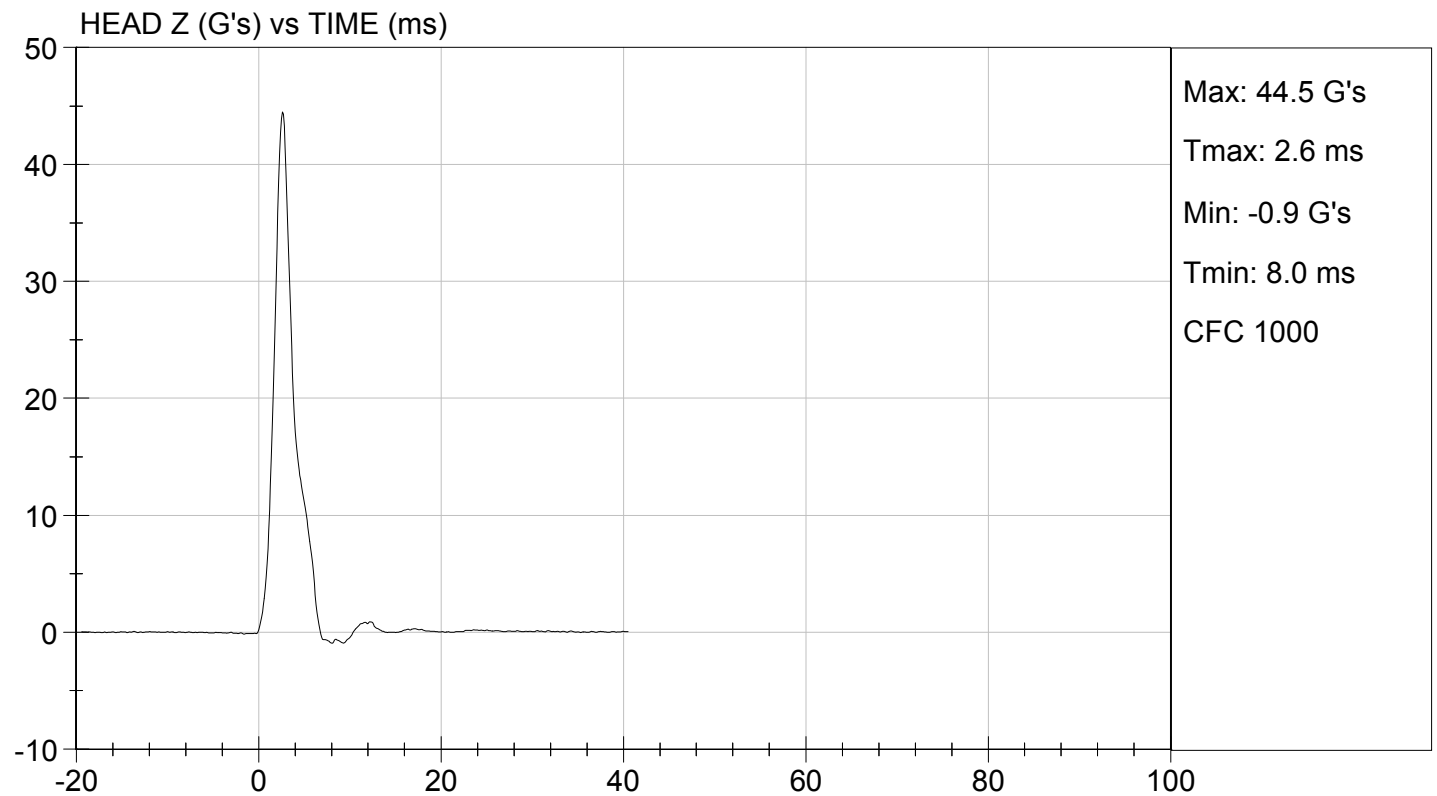
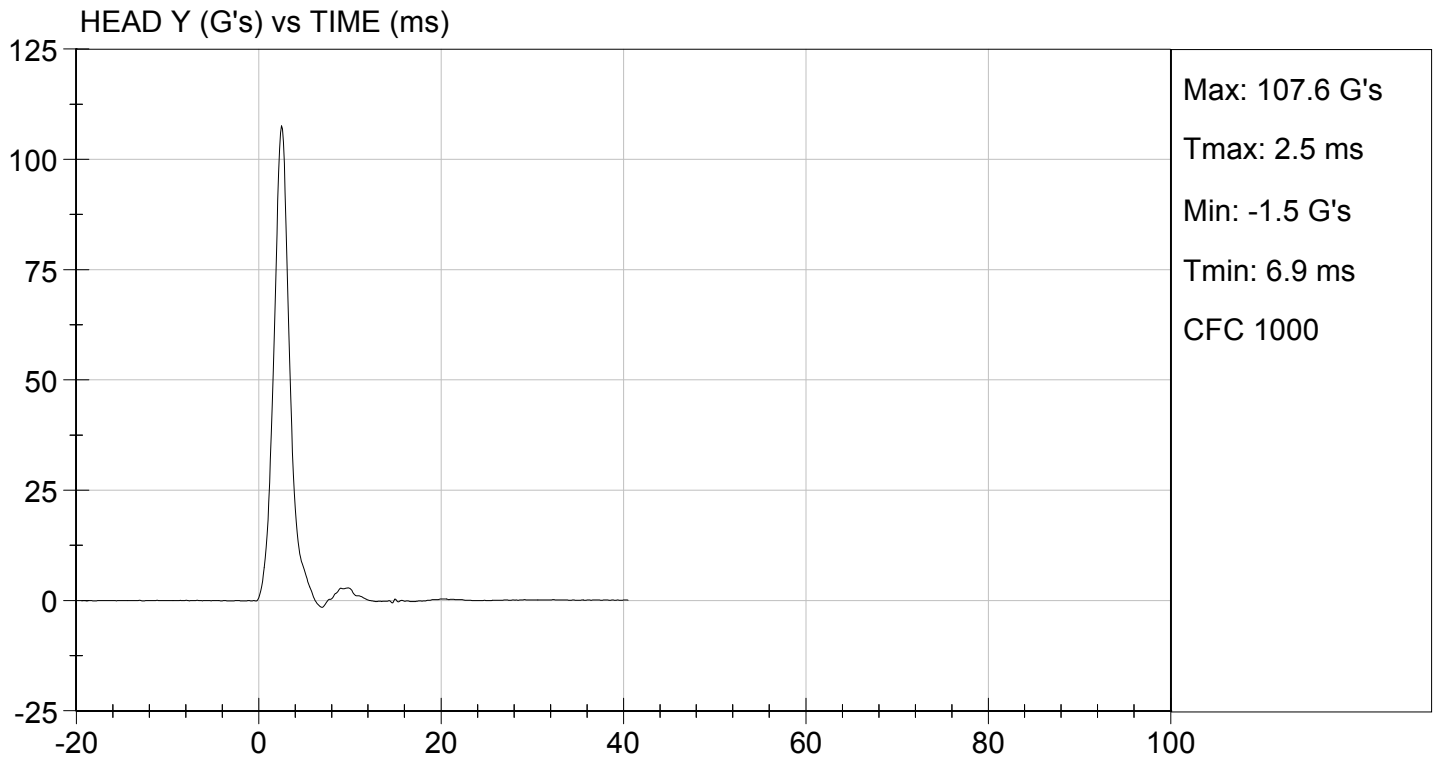
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Peak Resultant Acceleration	G's	115 to 137	117	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-7.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

02/17/2015
Test Date

Jessica Hall
Approved By





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

ATD Serial No: 296

Test I.D: D15472

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.8	Pass
Humidity		%	10 to 70	31	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.51	Pass
	15 ms	m/s	3.30 to 4.10	3.47	Pass
	20 ms	m/s	4.40 to 5.40	4.53	Pass
	25 ms	m/s	5.40 to 6.10	5.40	Pass
	25-100 ms	m/s	5.50 to 6.20	5.99	Pass
Maximum D-Plane Rotation		deg	71 to 81	75	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	62	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-39	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	117	Pass
Overall Test Results					Pass

David Schoedel
Laboratory Technician

02/17/2015

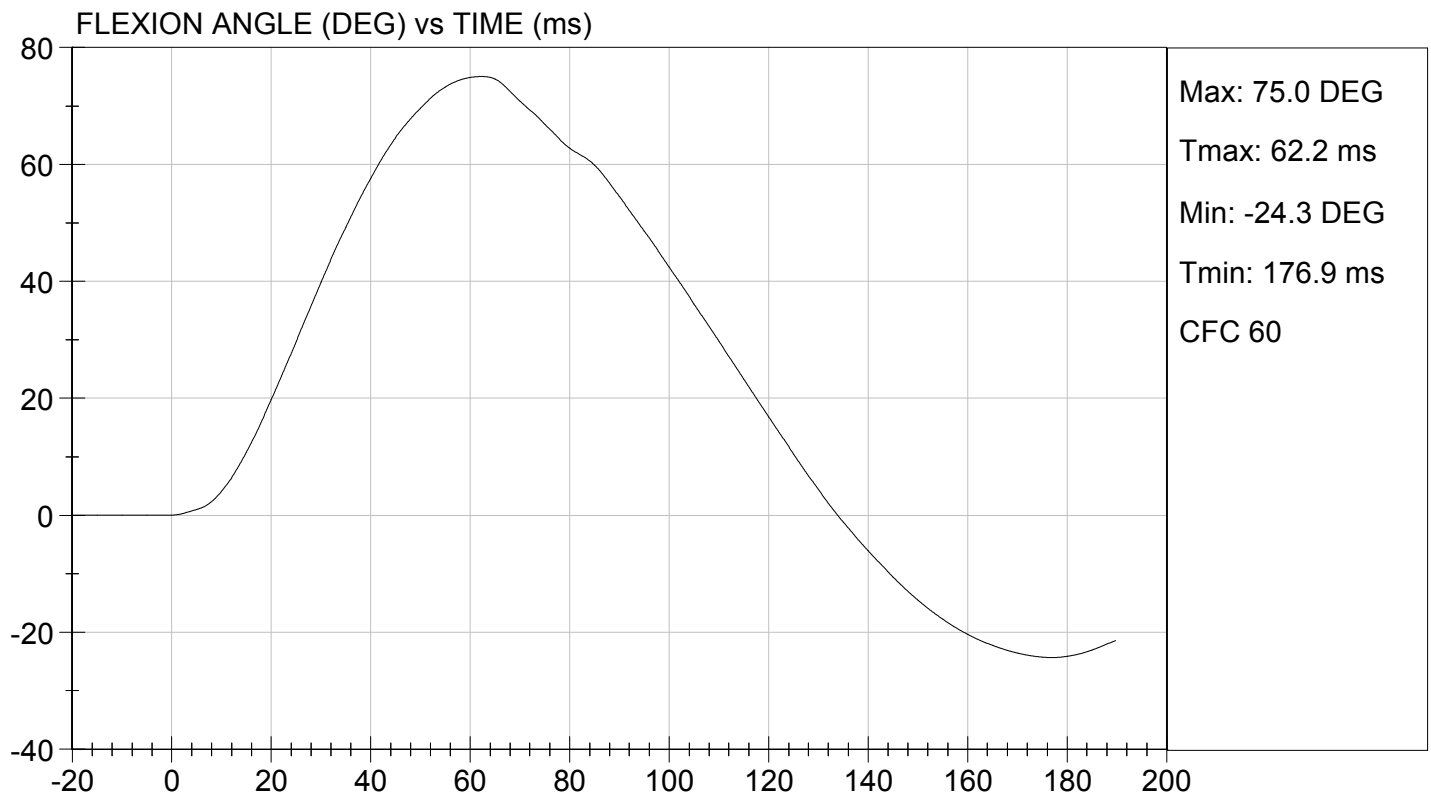
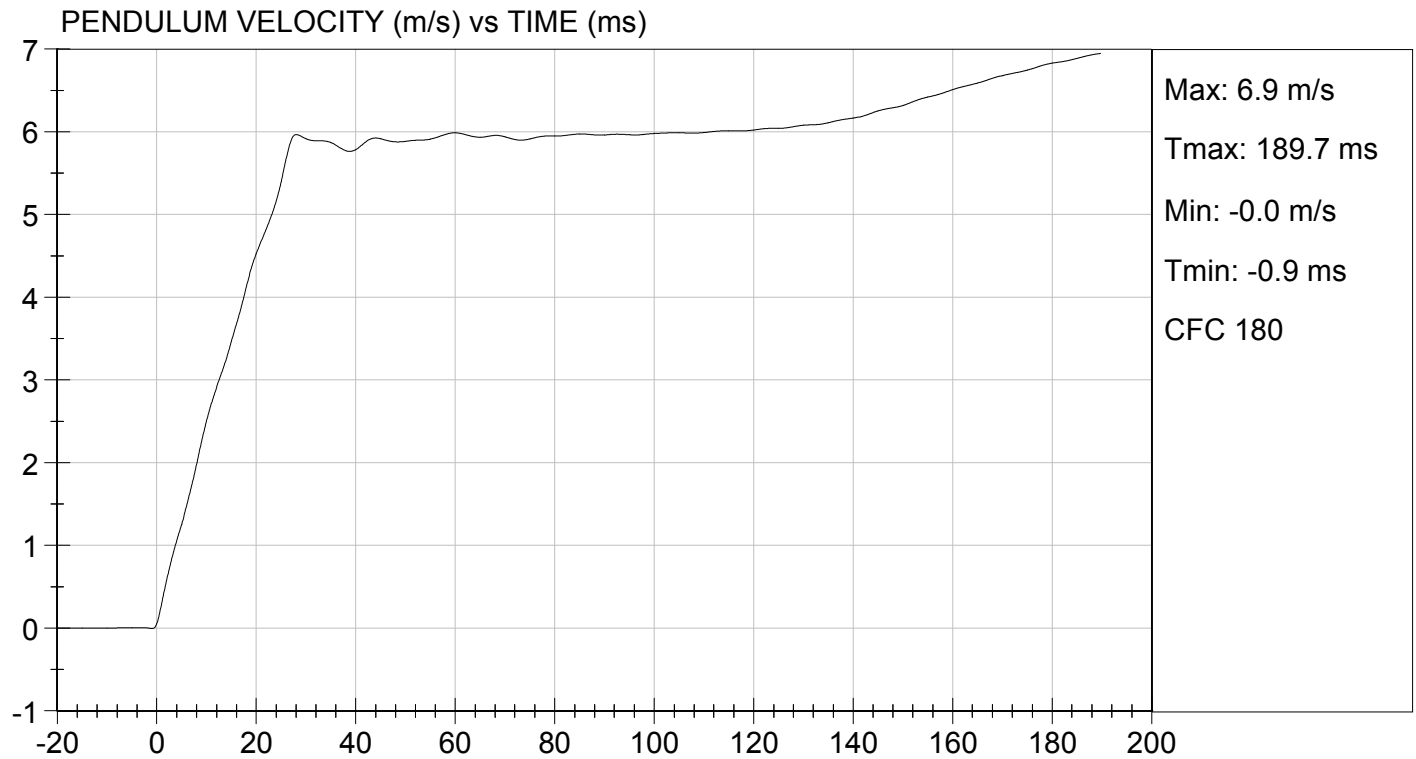
Test Date

Jessica Hall
Approved By



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

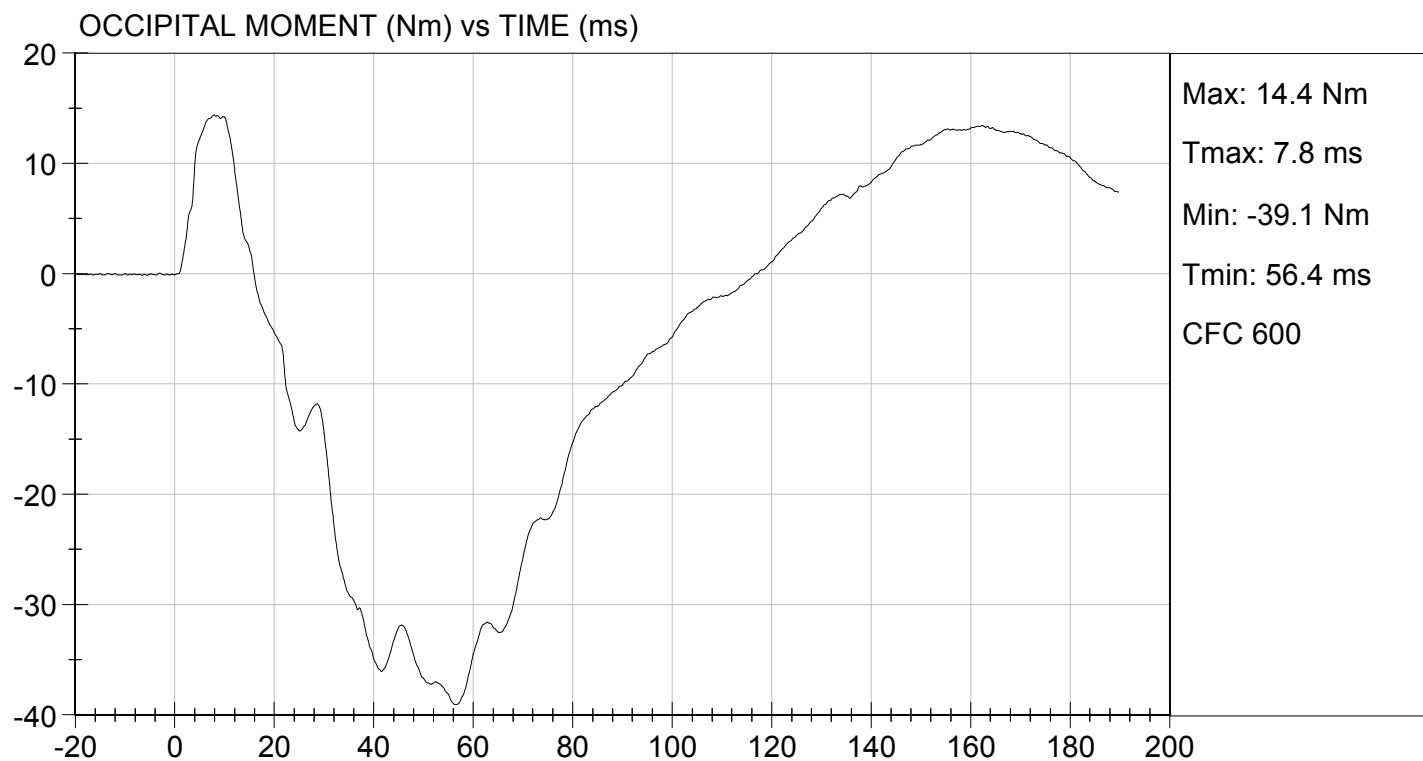
TEST DATE: 02/17/2015
TEST #: D15472





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

TEST DATE: 02/17/2015
TEST #: D15472



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

ATD Serial No: 296

Test ID: D15473

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

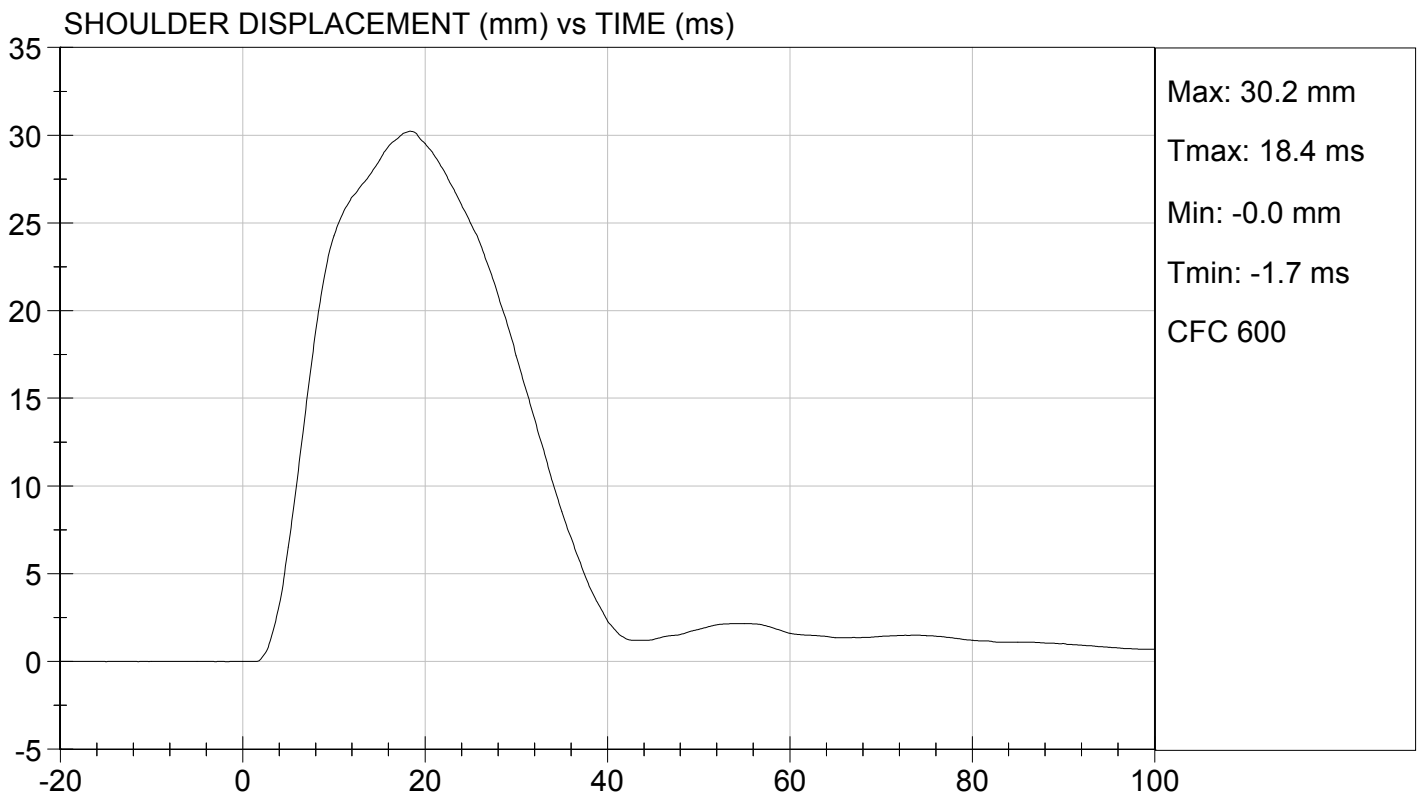
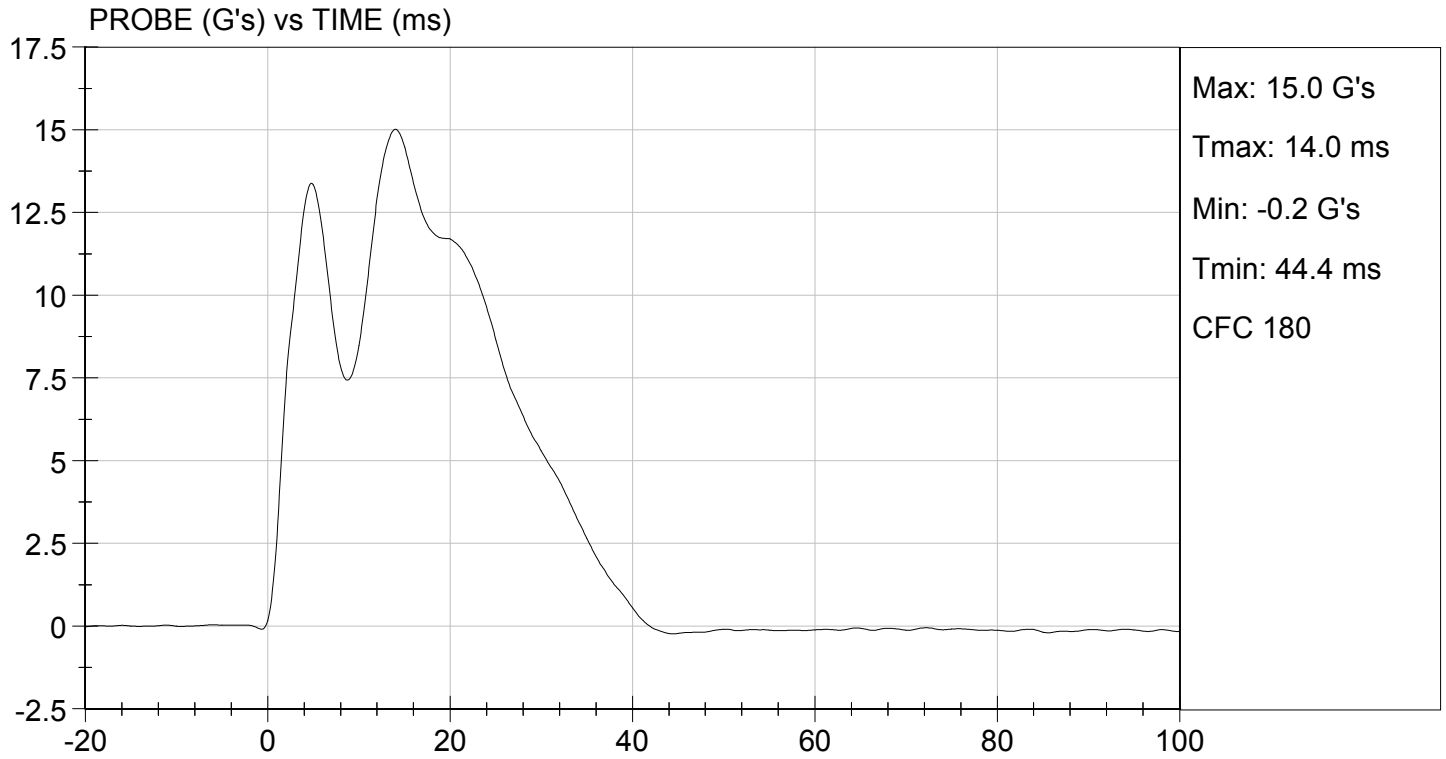
02/17/2015
Test Date

Jessica Hall
Approved By



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

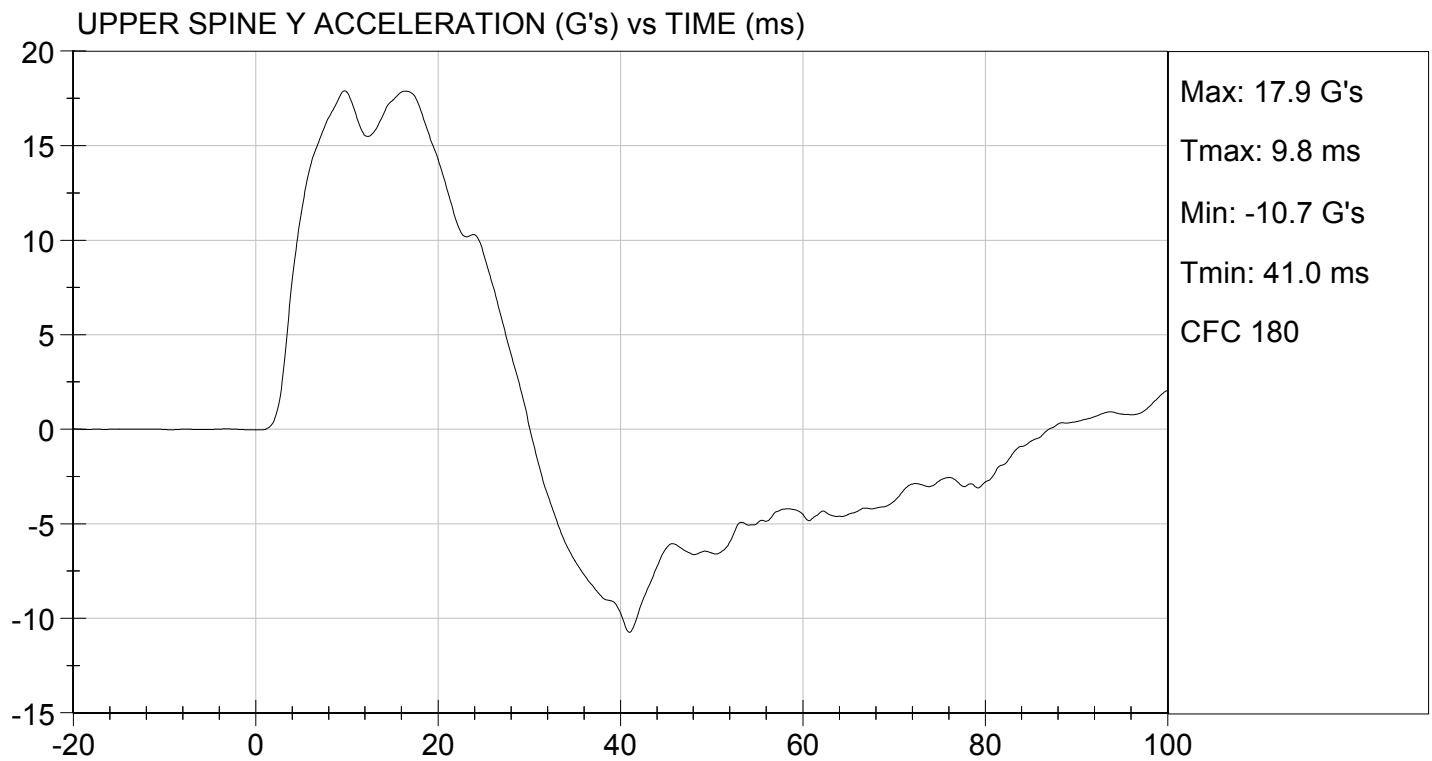
TEST DATE: 02/17/2015
TEST #: D15473





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

TEST DATE: 02/17/2015
TEST #: D15473



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

ATD Serial No: 296

Test I.D: D15474

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	30	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	33	Pass
Lower Rib Displacement	mm	32 to 38	36	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	34	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	29	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

02/17/2015

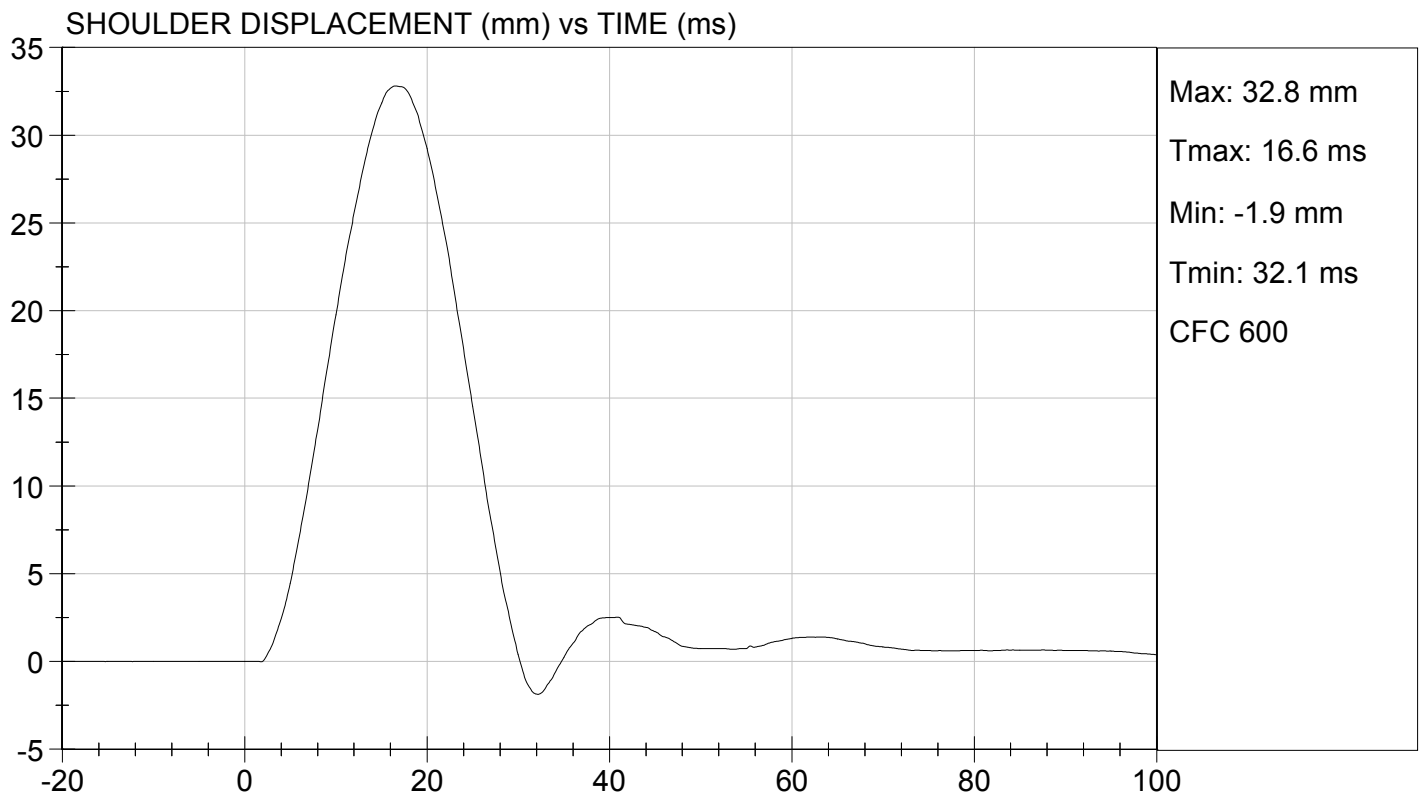
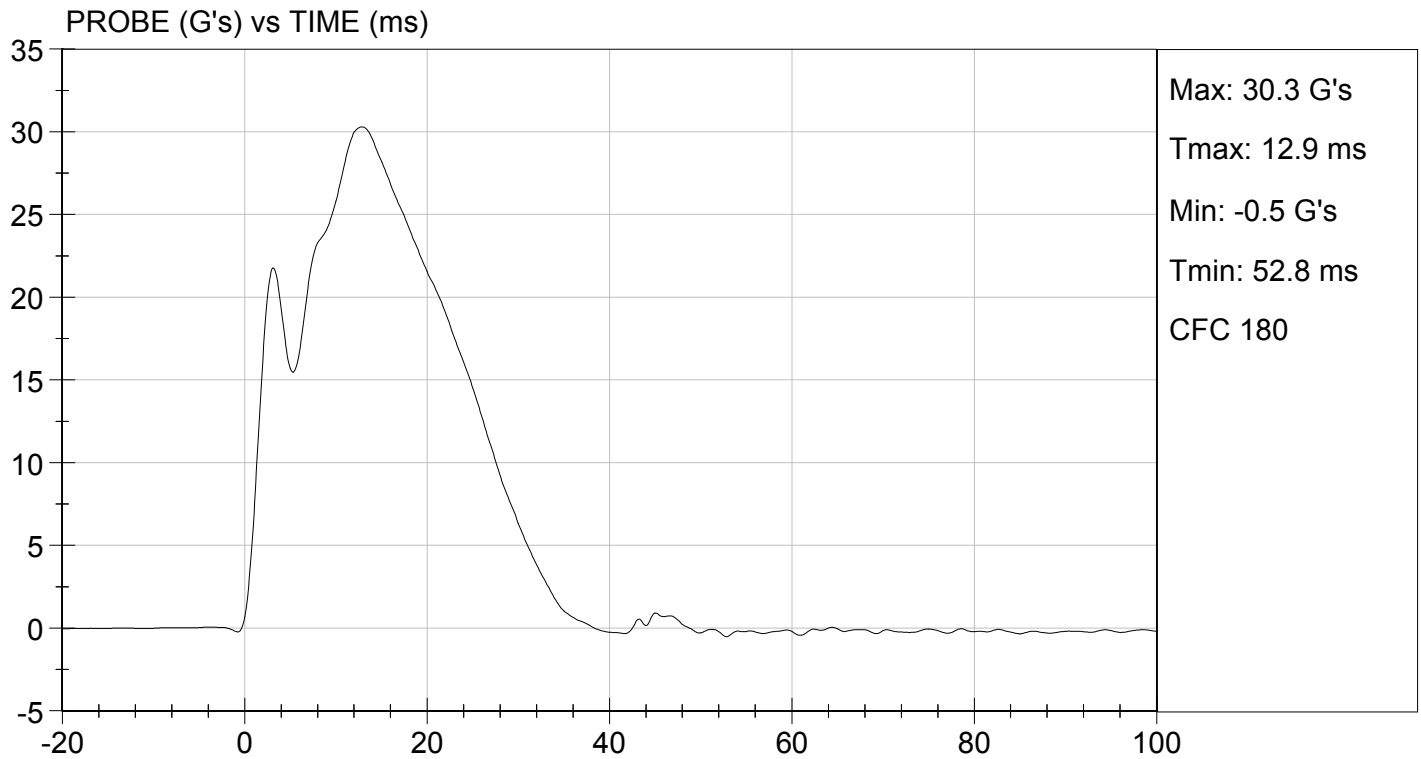
Test Date

Jessica Hall
Approved By



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

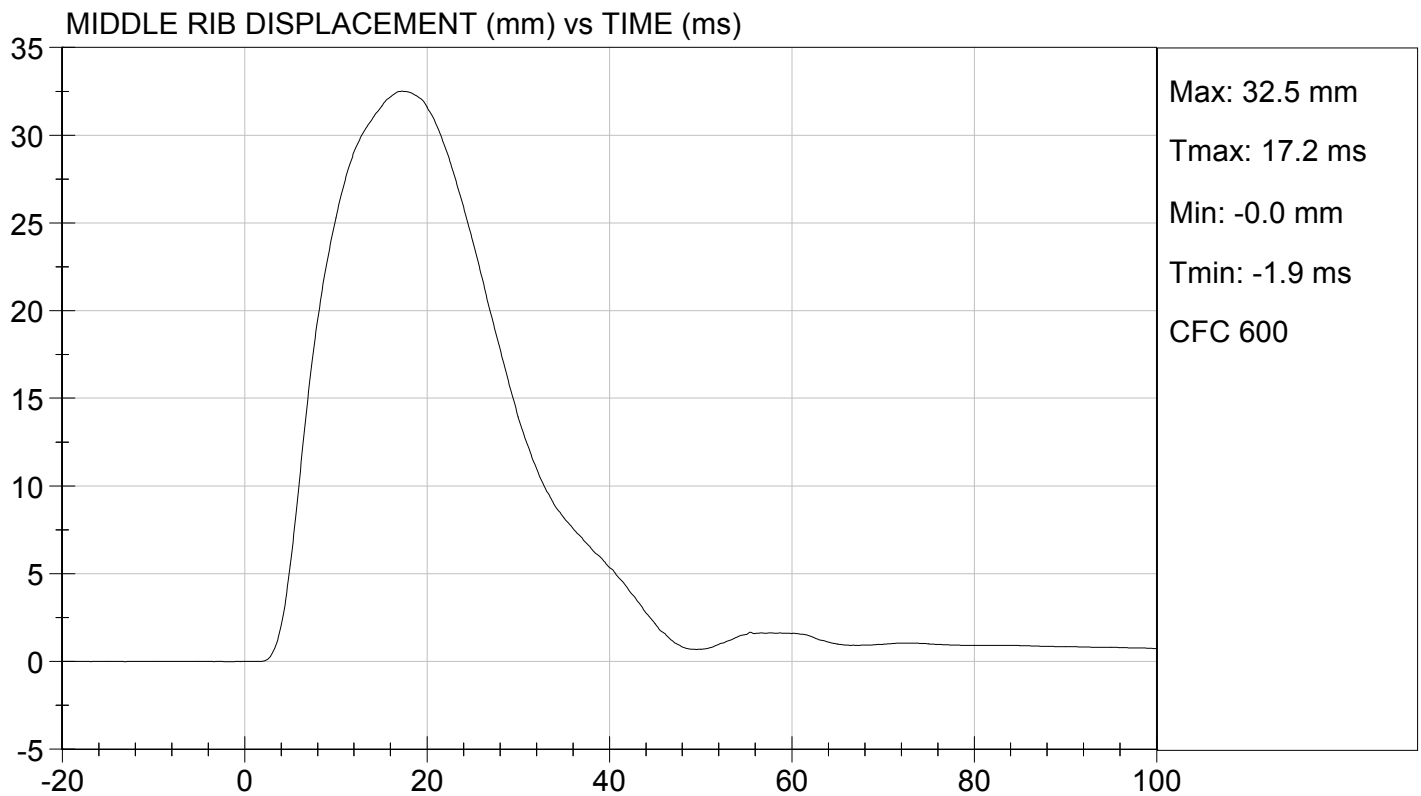
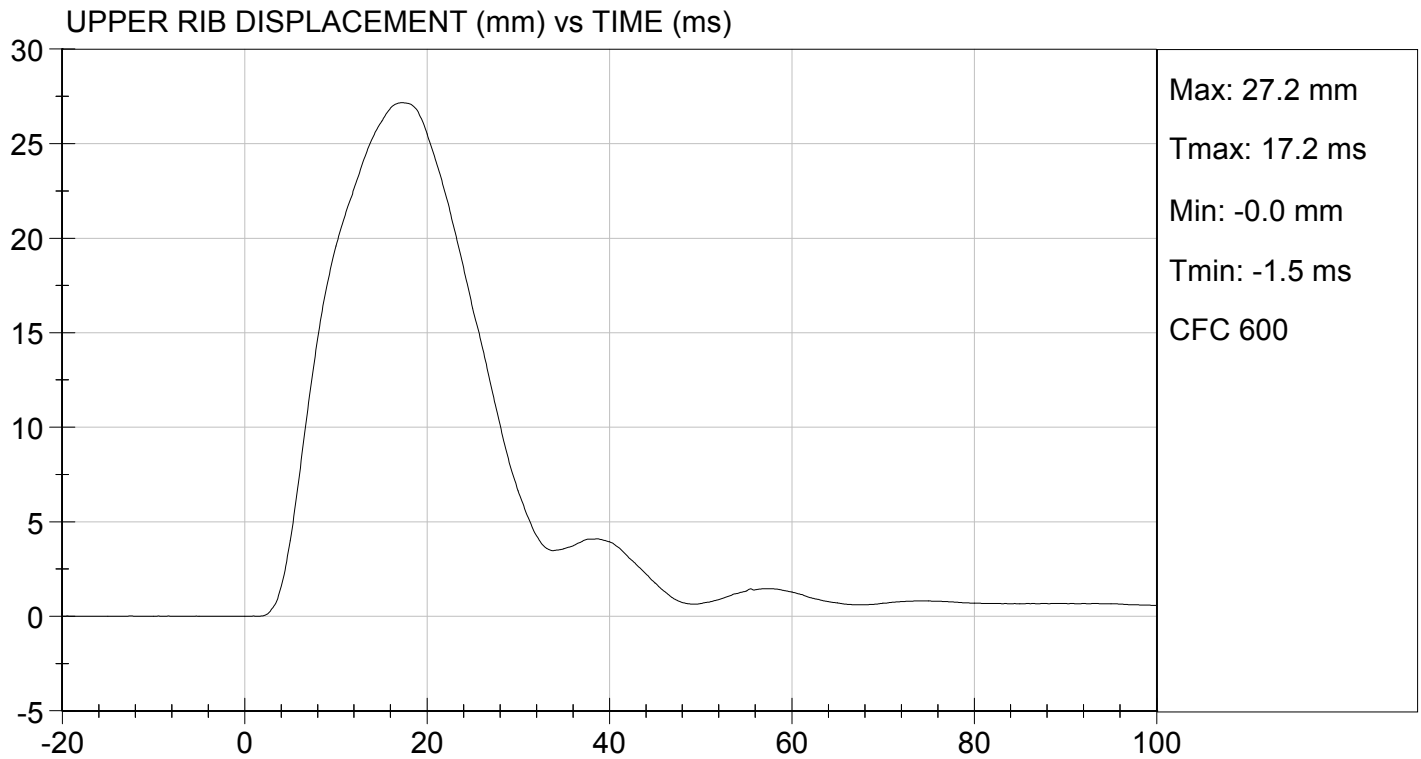
TEST DATE: 02/17/2015
TEST #: D15474





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

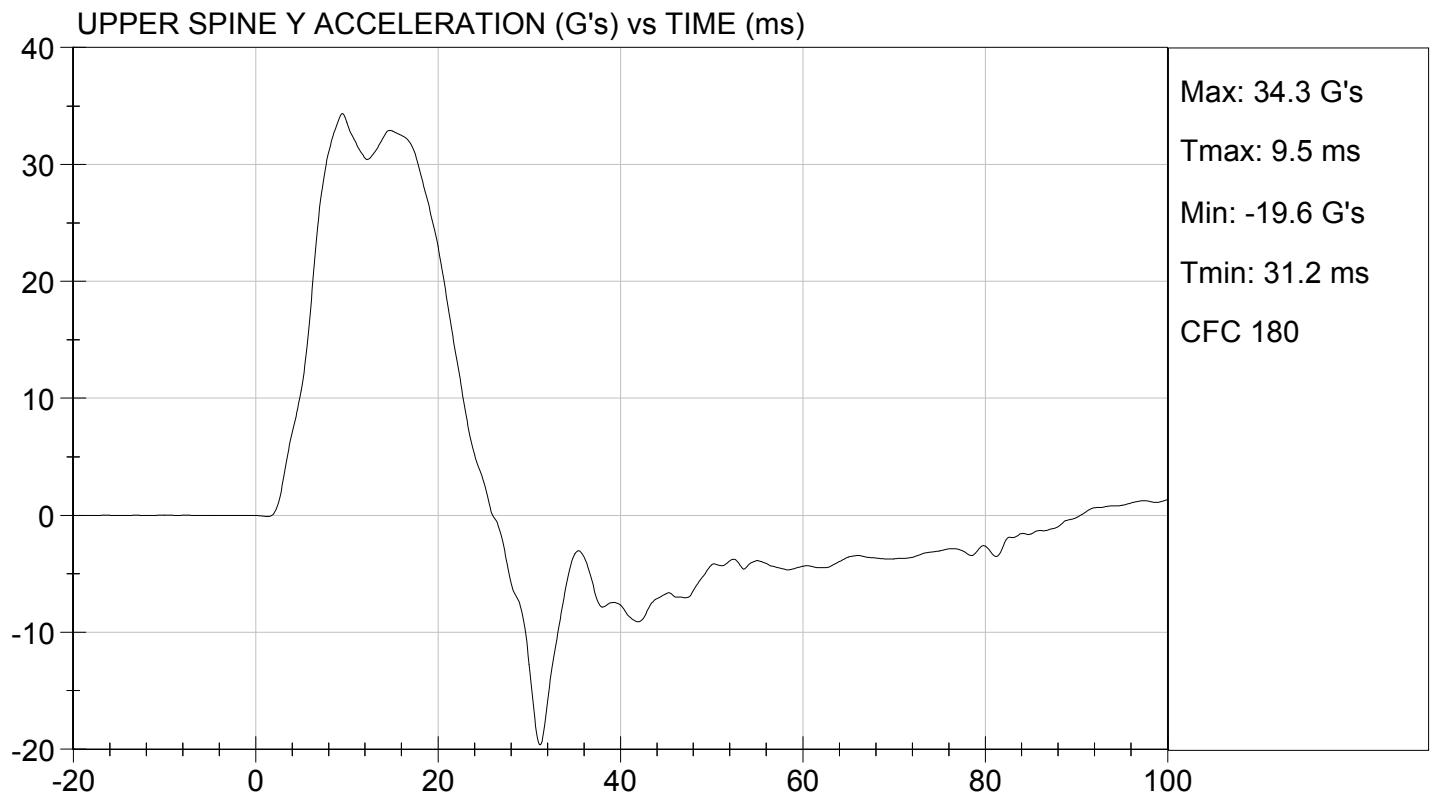
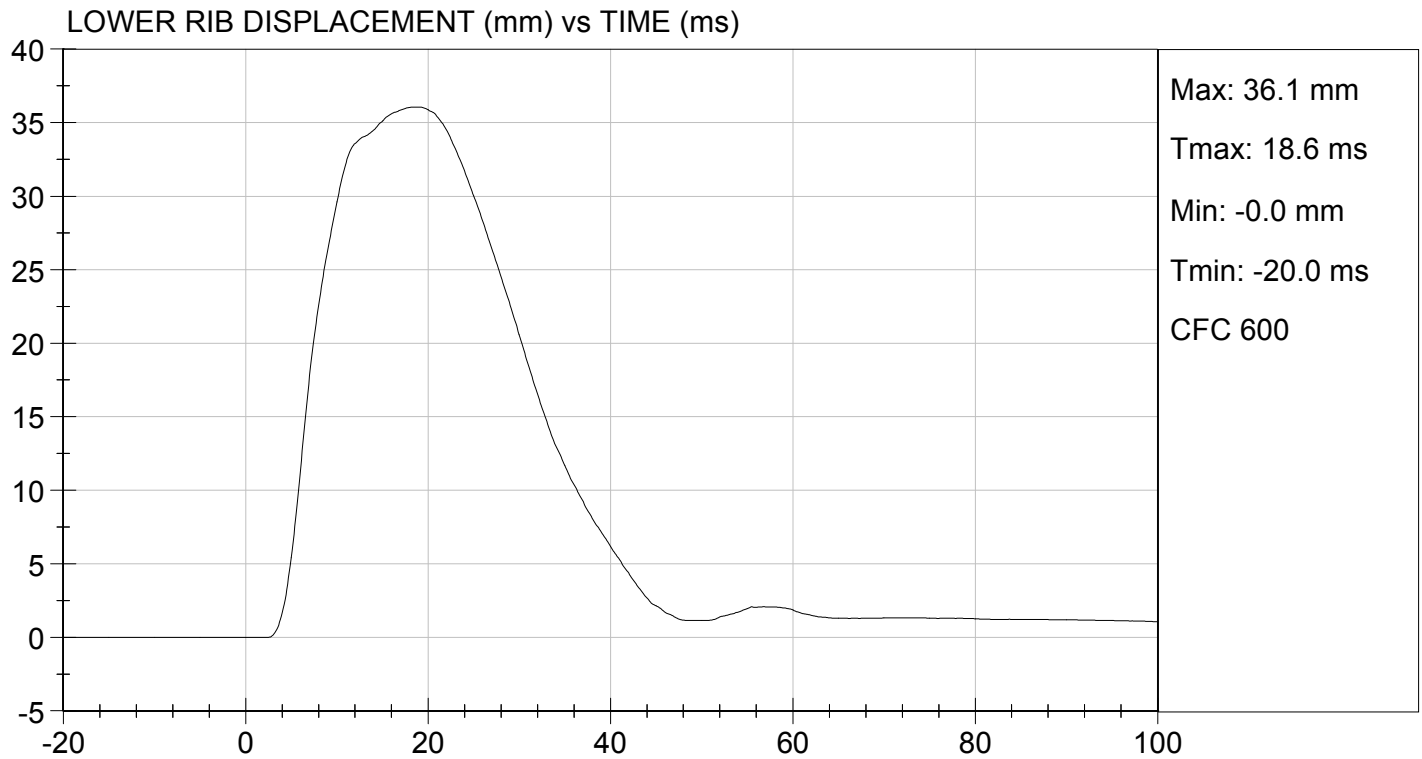
TEST DATE: 02/17/2015
TEST #: D15474





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

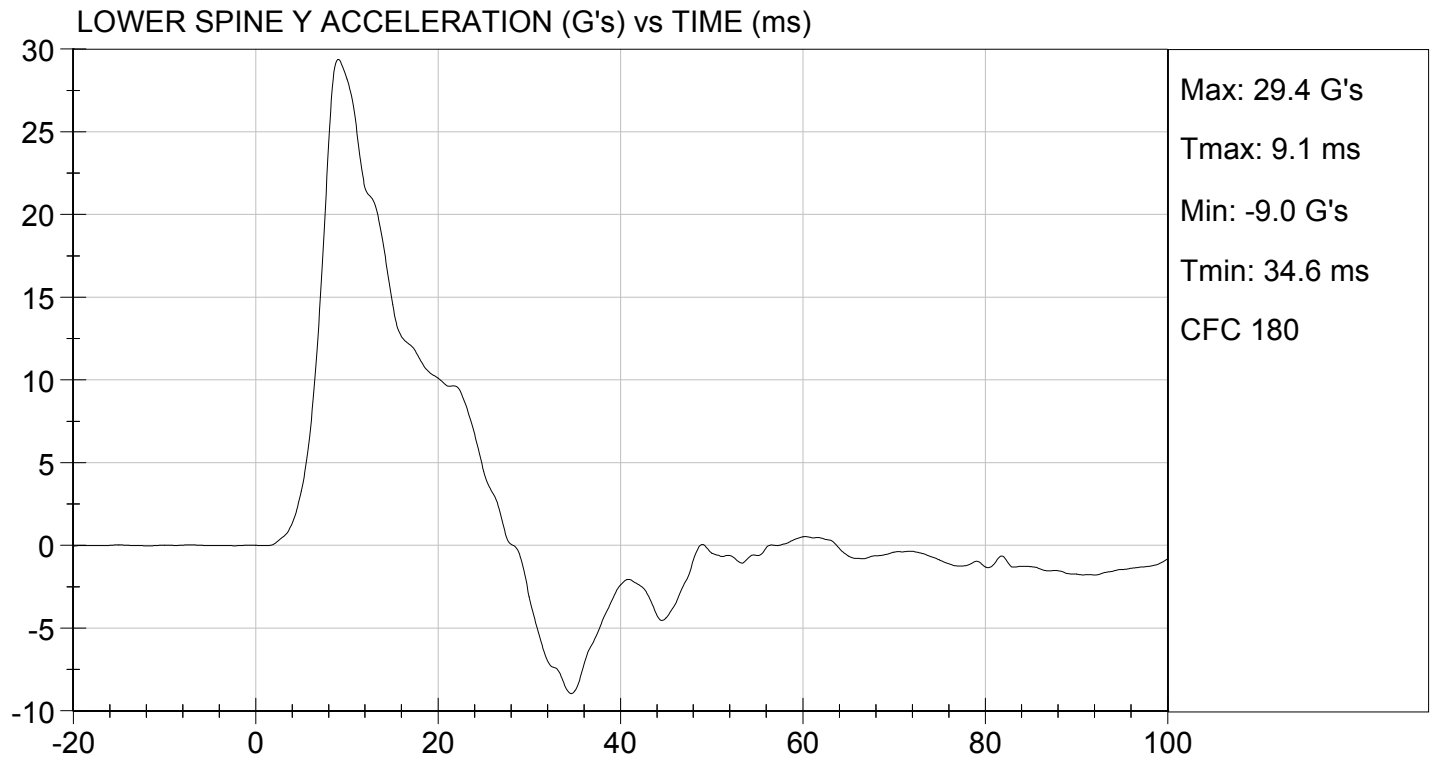
TEST DATE: 02/17/2015
TEST #: D15474





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

TEST DATE: 02/17/2015
TEST #: D15474



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

ATD Serial No: 296

Test I.D: D15475

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	44	Pass
Lower Rib Displacement	mm	35 to 43	42	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

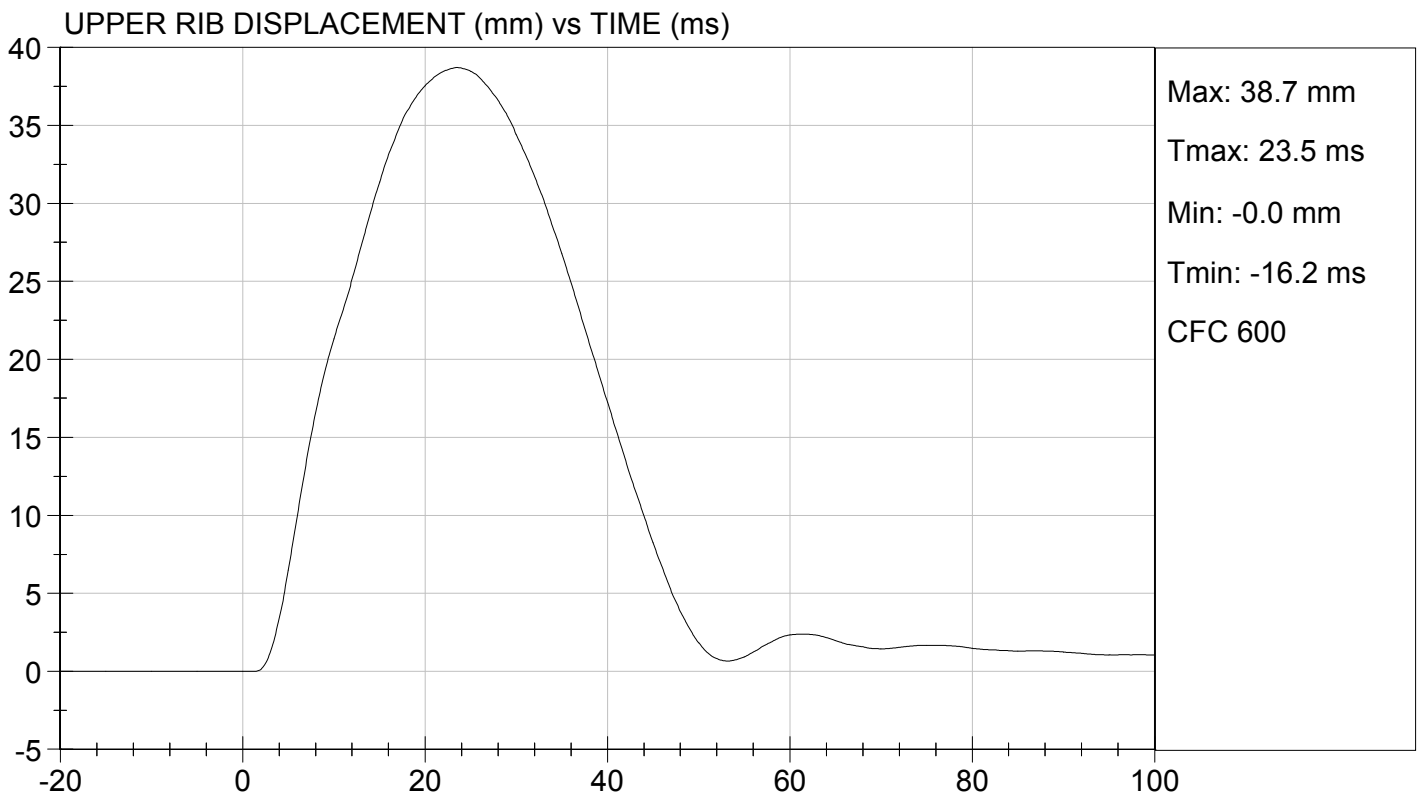
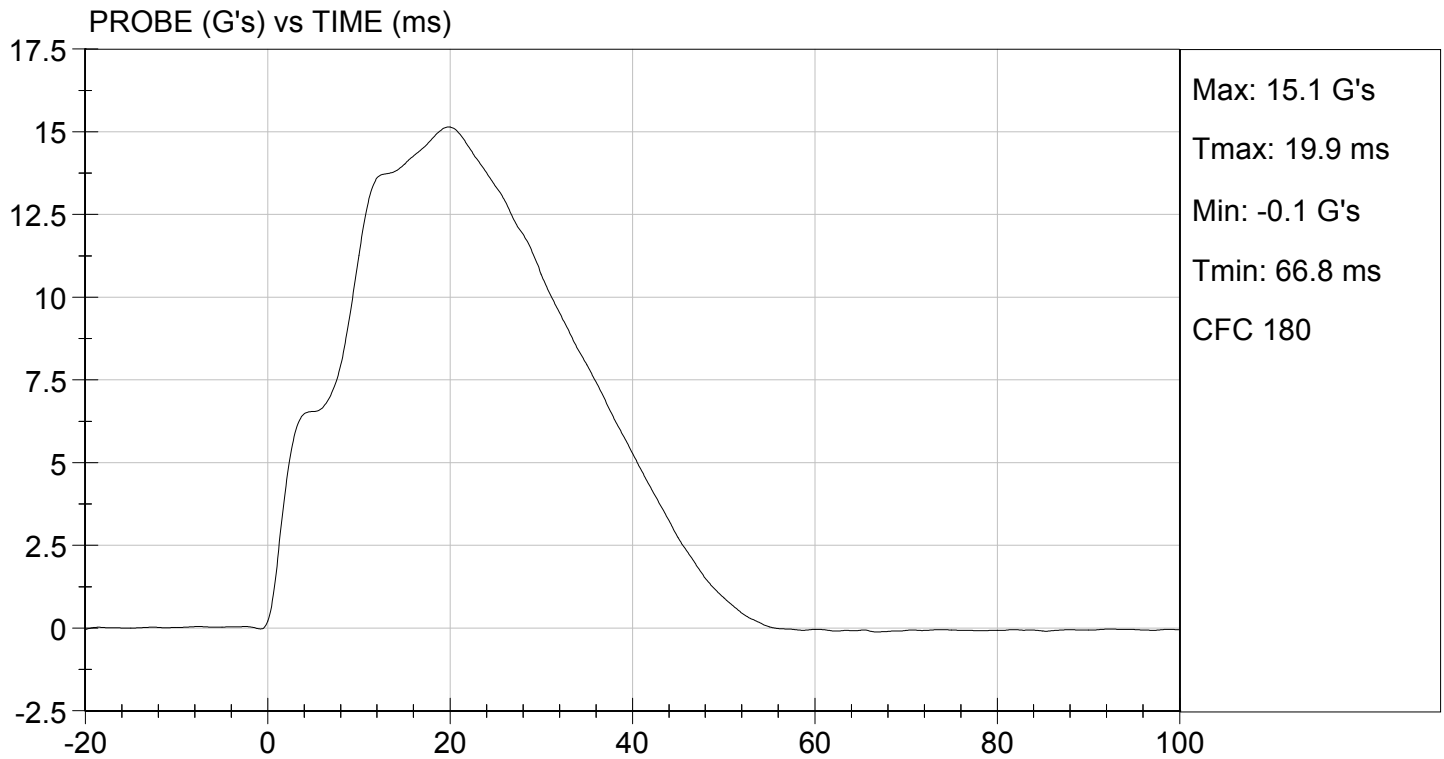
02/17/2015
Test Date

Jessica Hall
Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/17/2015
TEST #: D15475

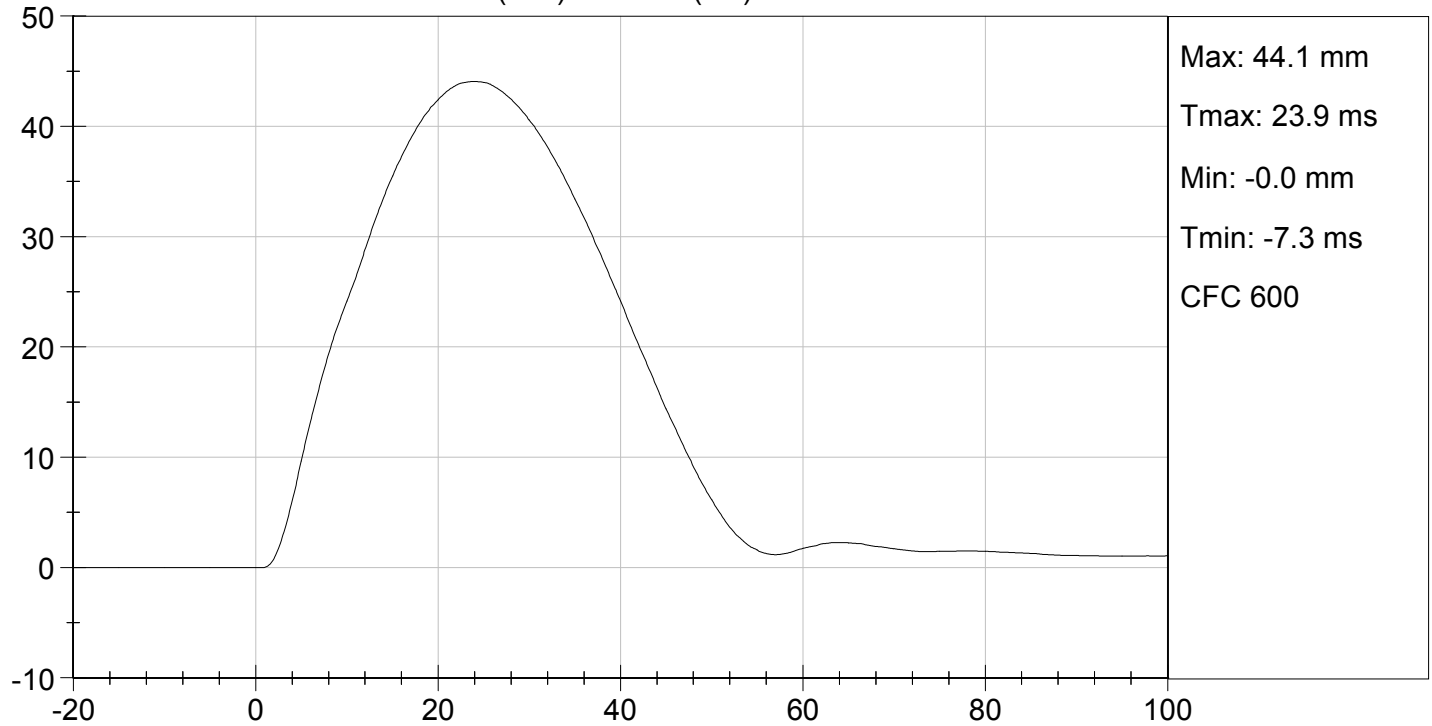




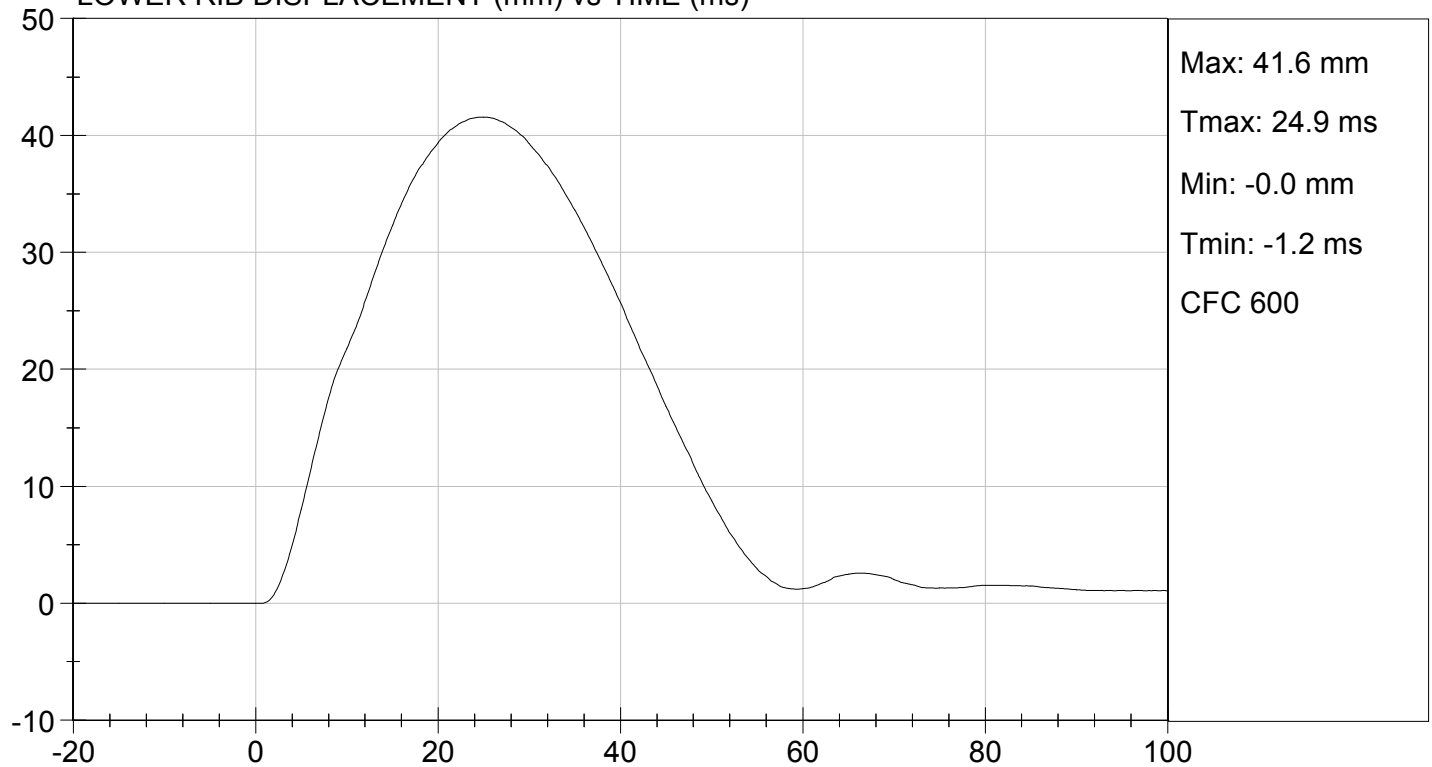
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/17/2015
TEST #: D15475

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)

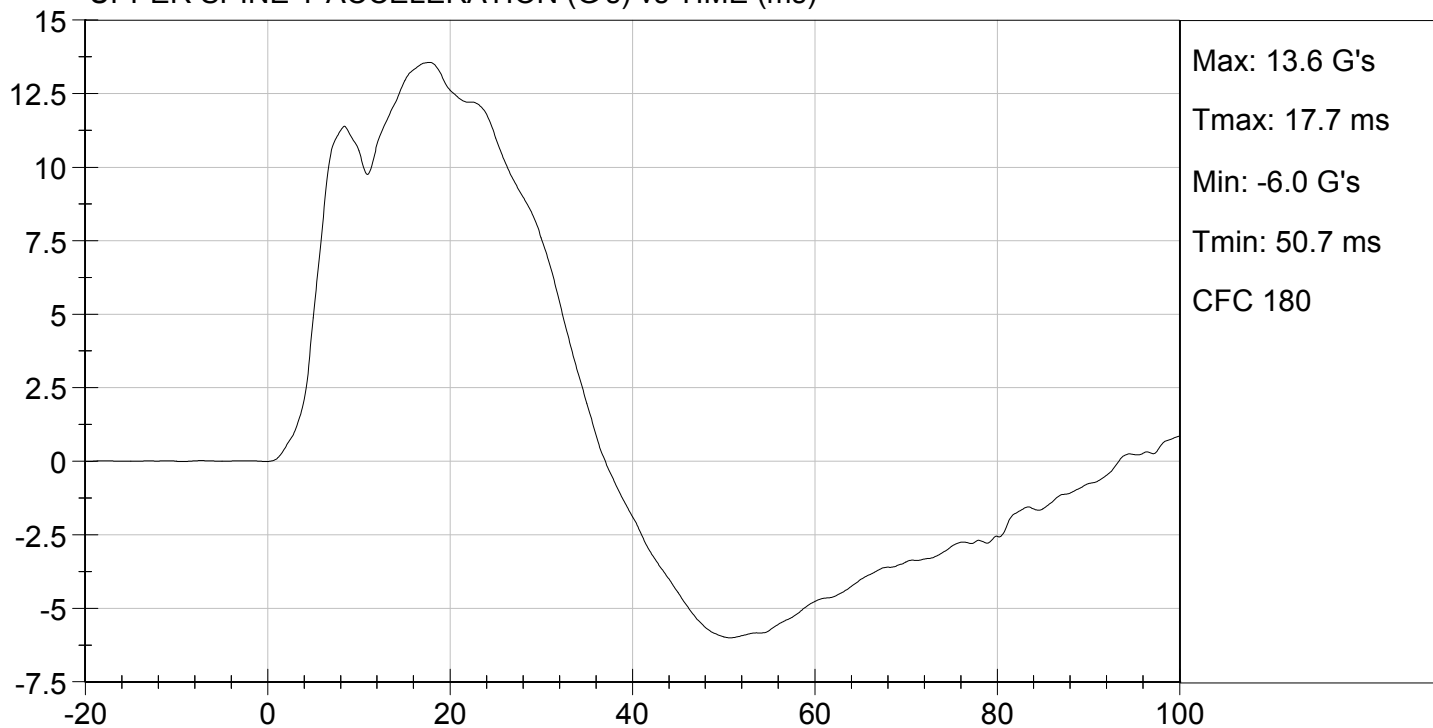


LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

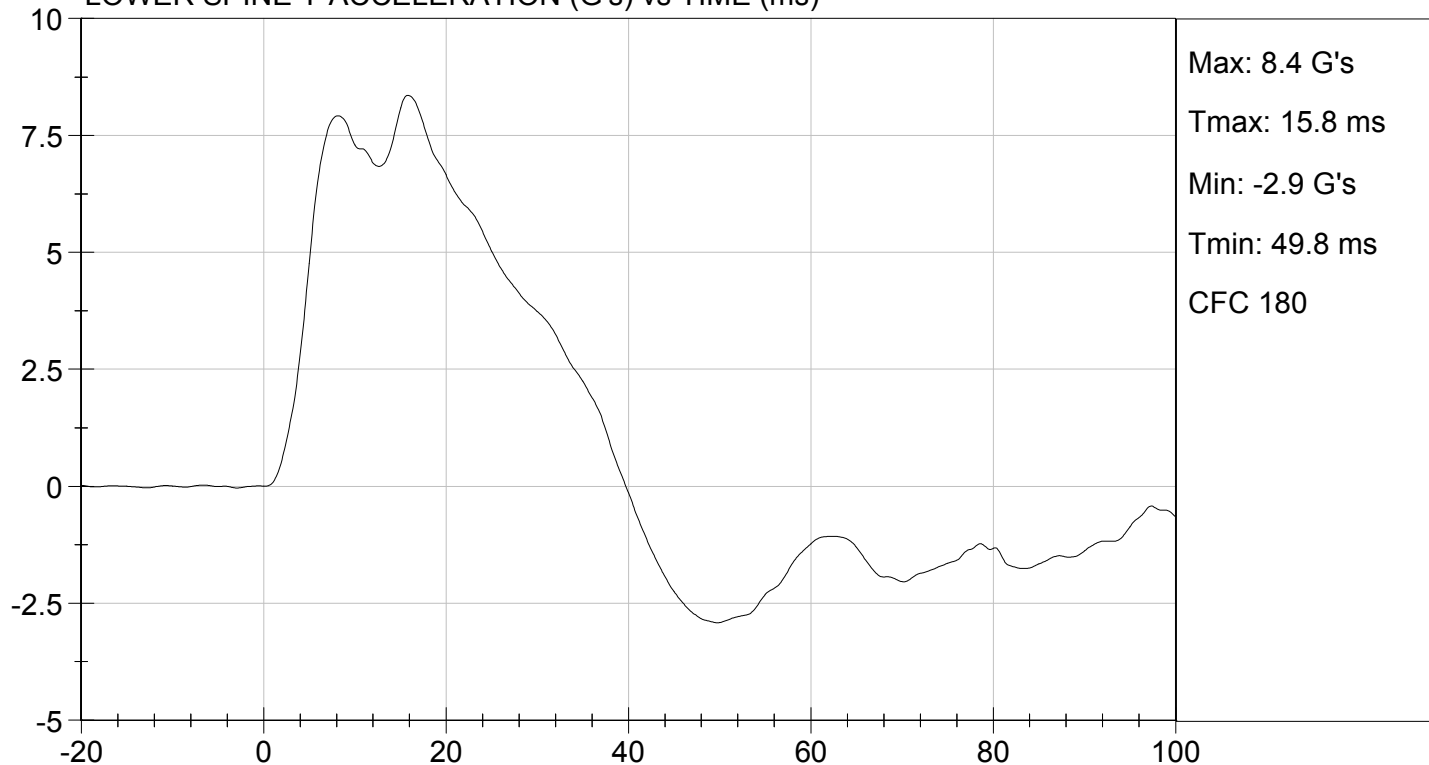




UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



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



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D15476

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	43	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	41	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

02/17/2015

Test Date

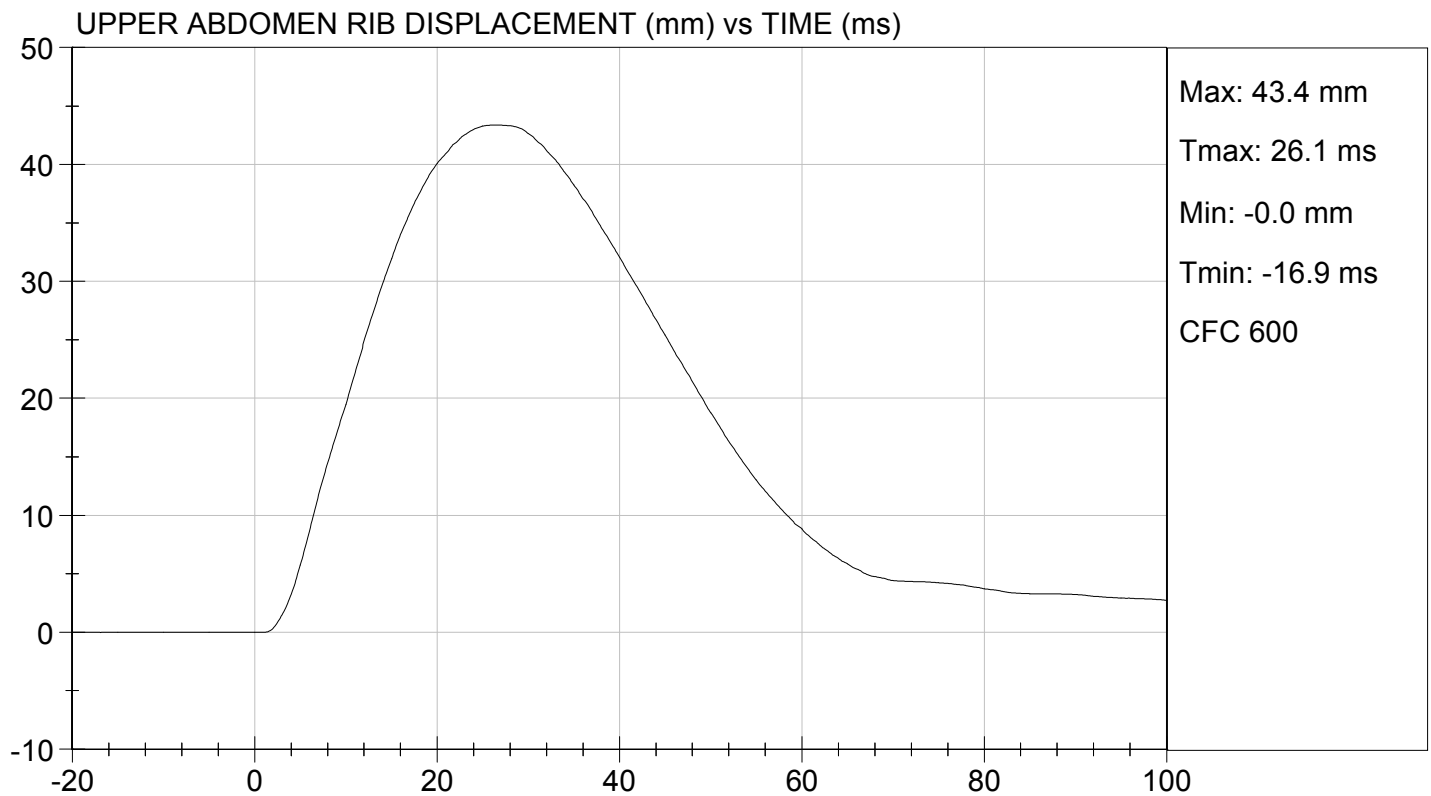
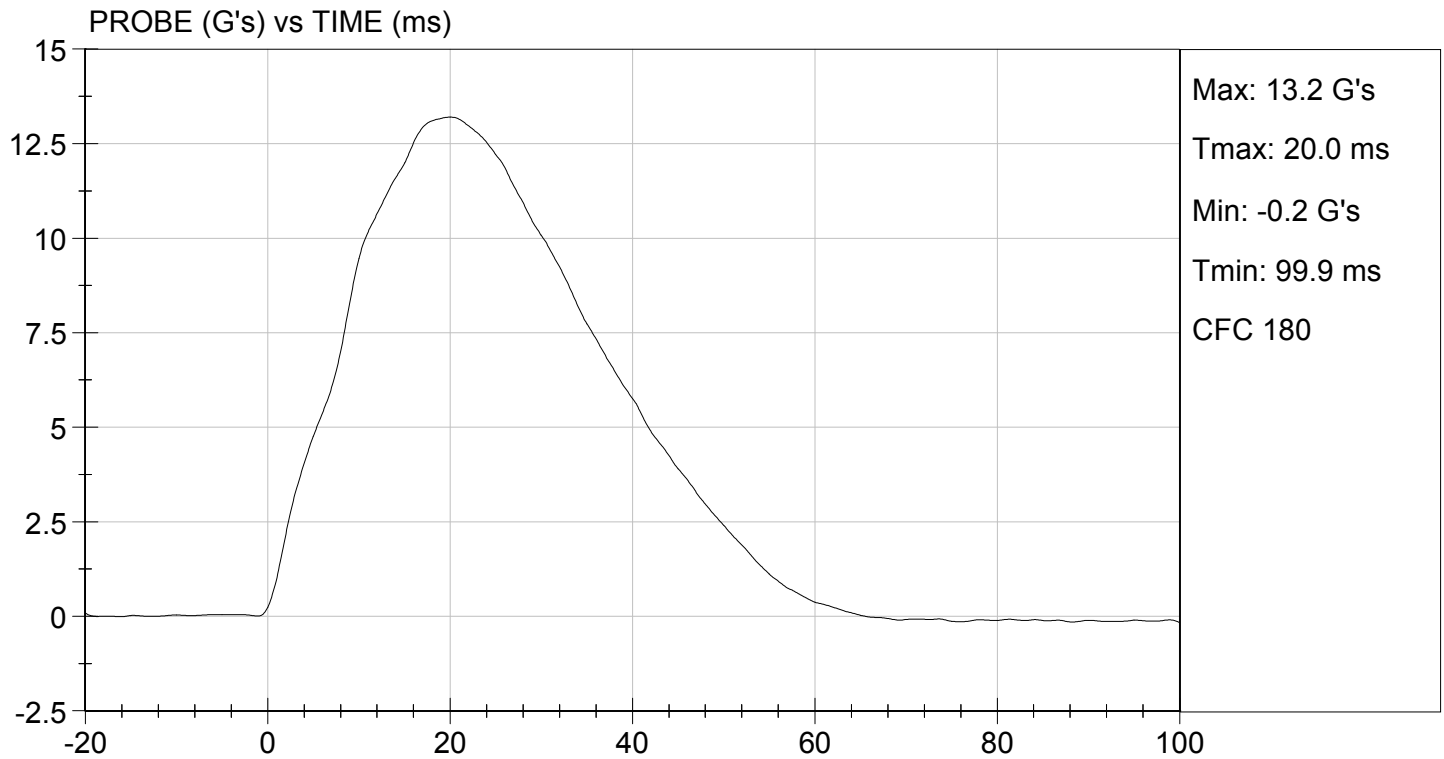
Jessica Hall

Approved By



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

TEST DATE: 02/17/2015
TEST #: D15476

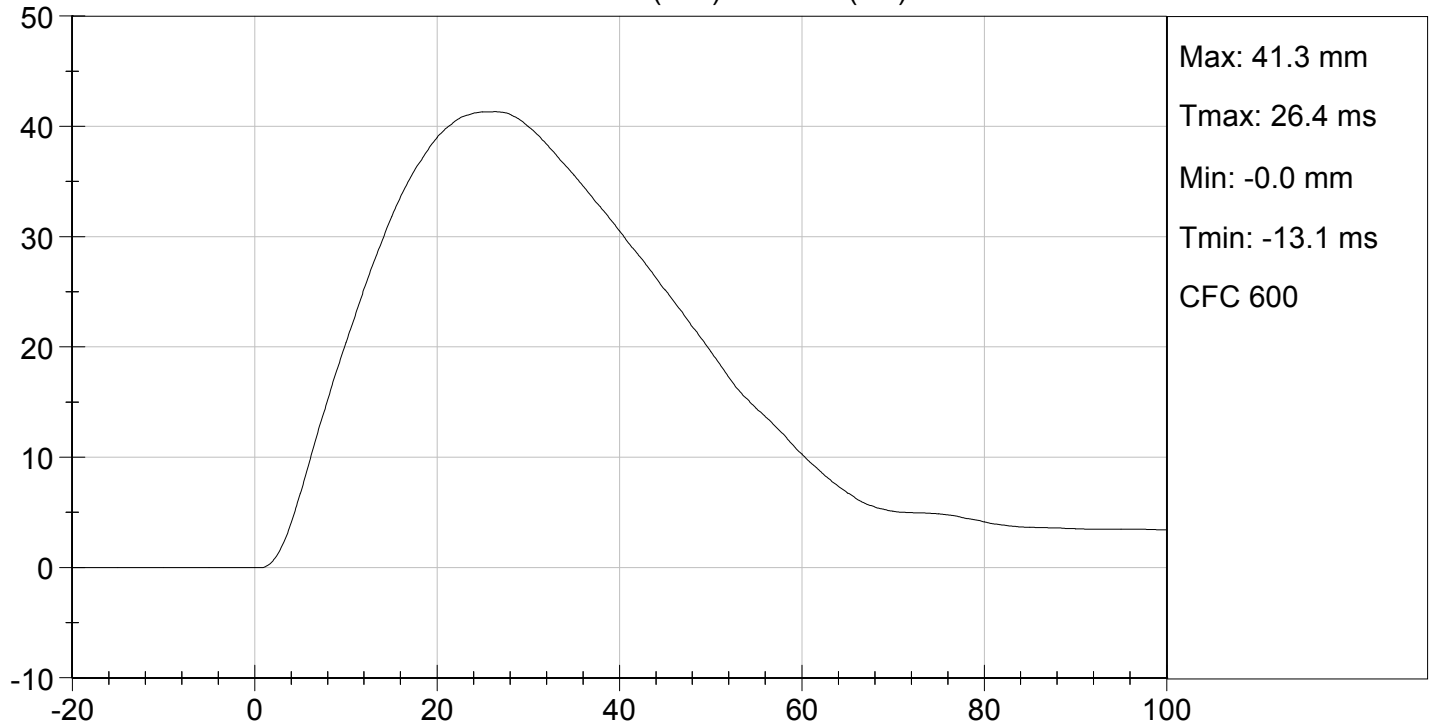




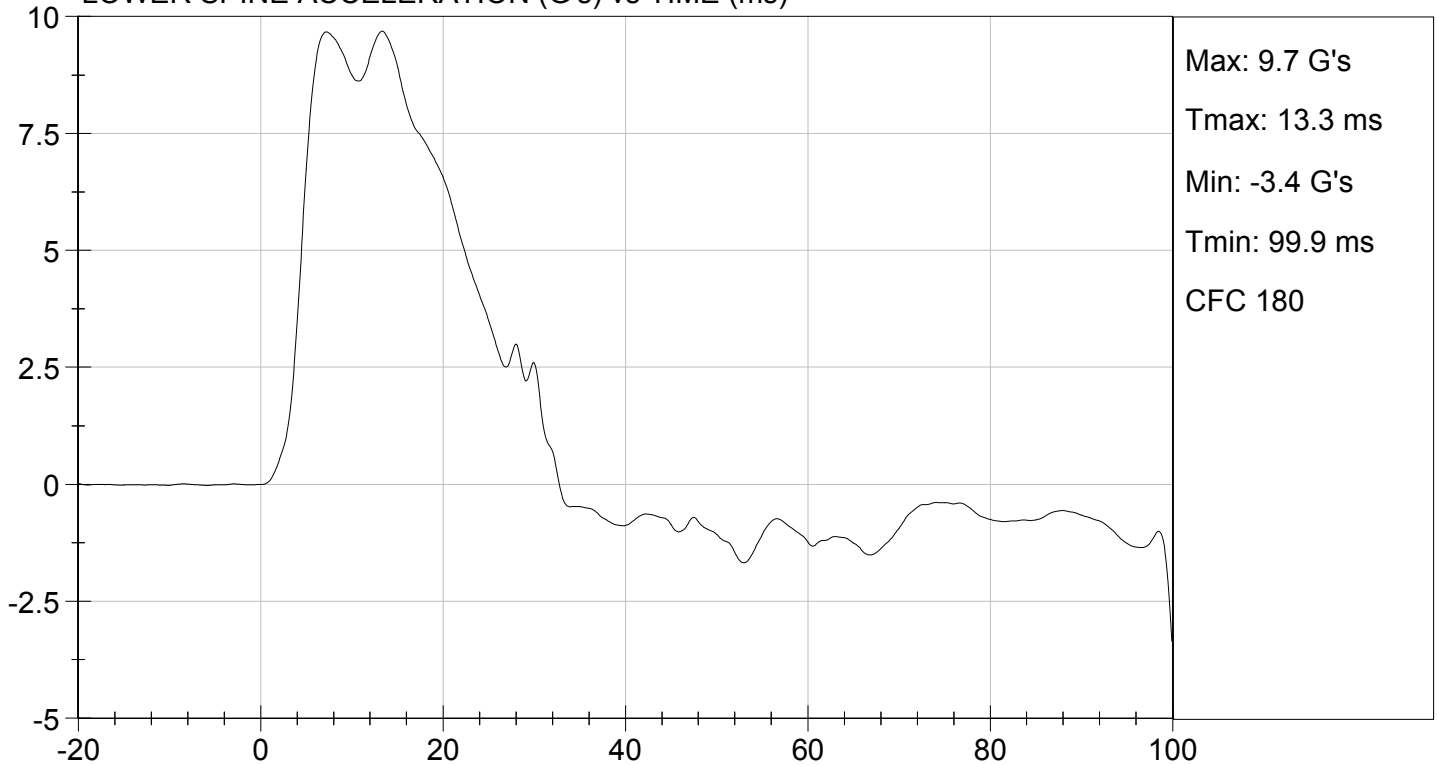
TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 02/17/2015
TEST #: D15476

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D15477

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	44	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	4,175	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

02/17/2015

Test Date

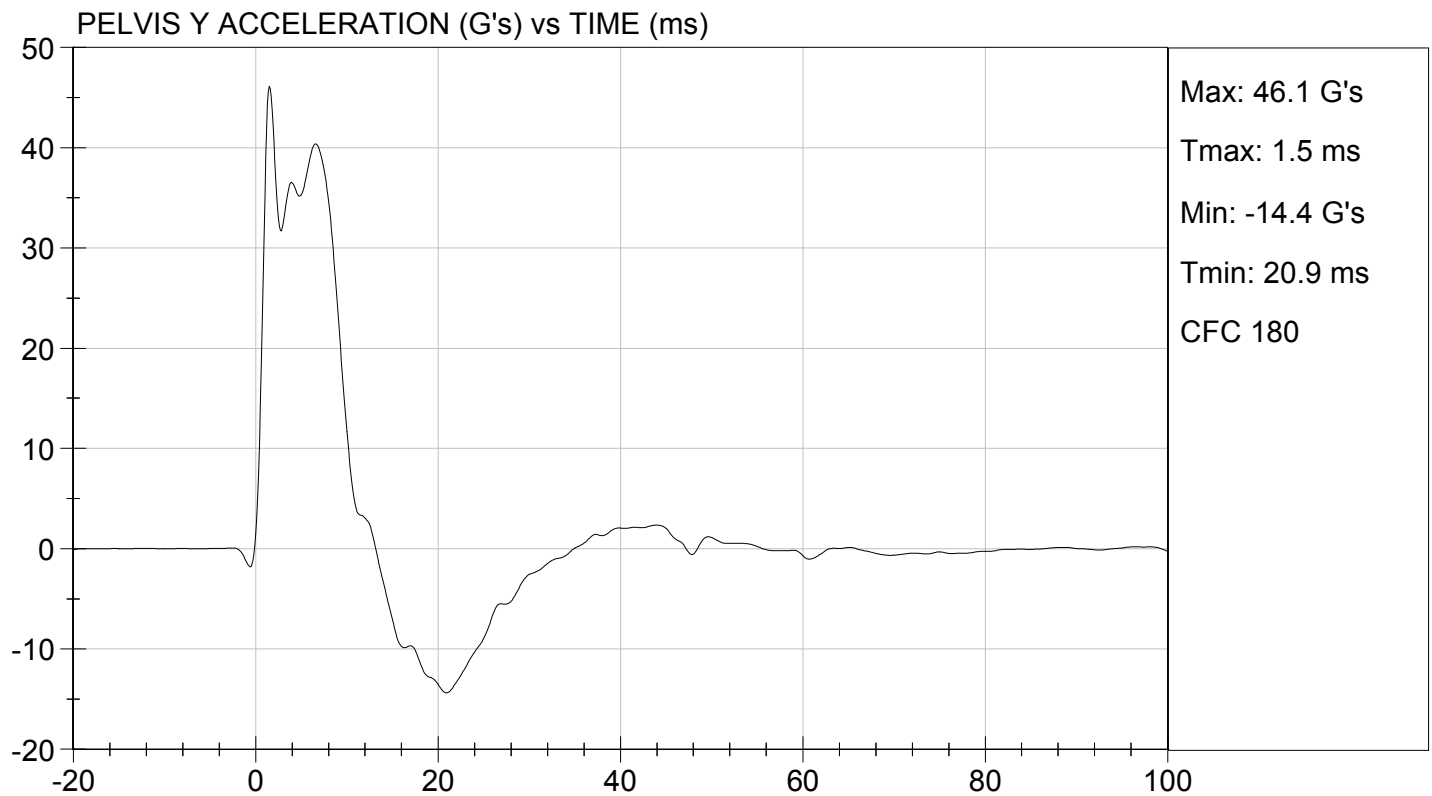
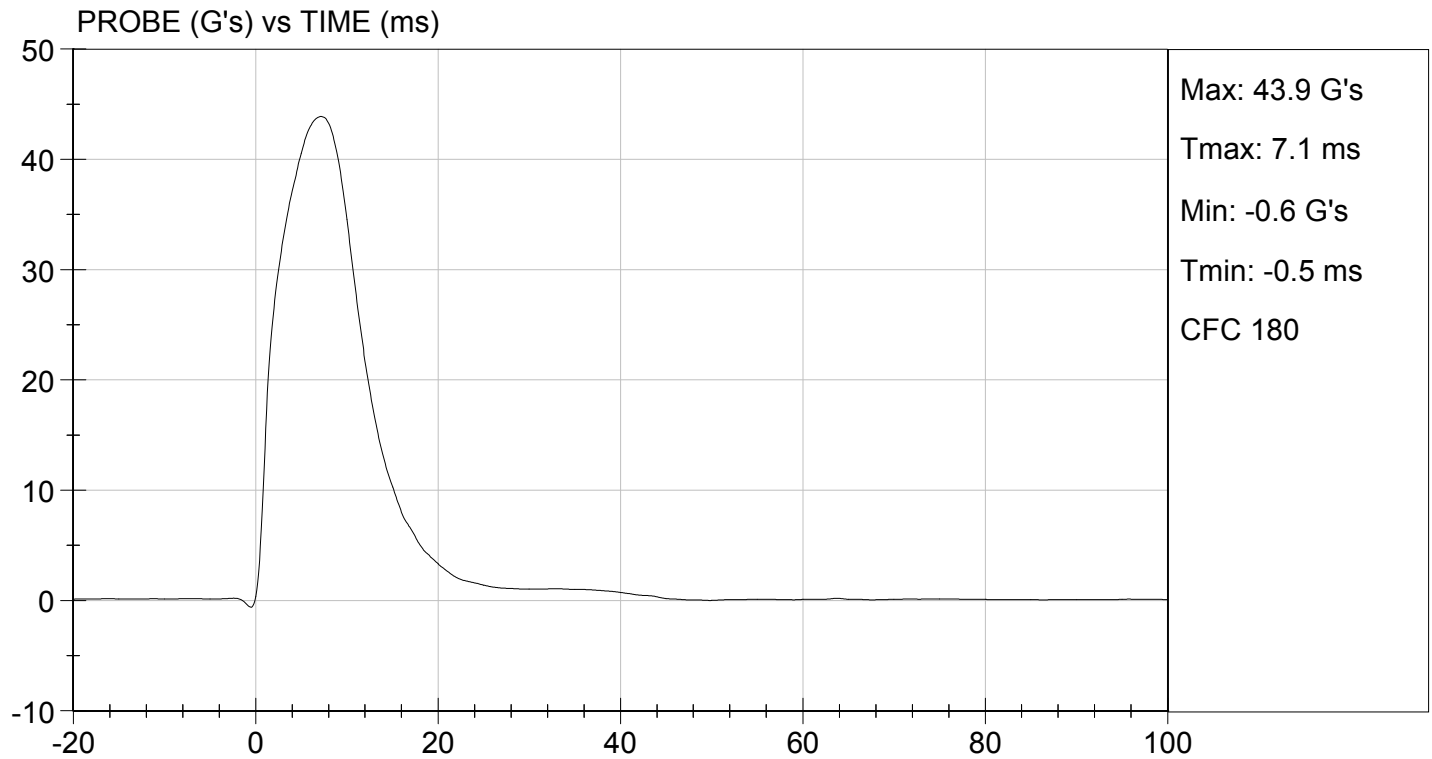
Jessica Hall

Approved By



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

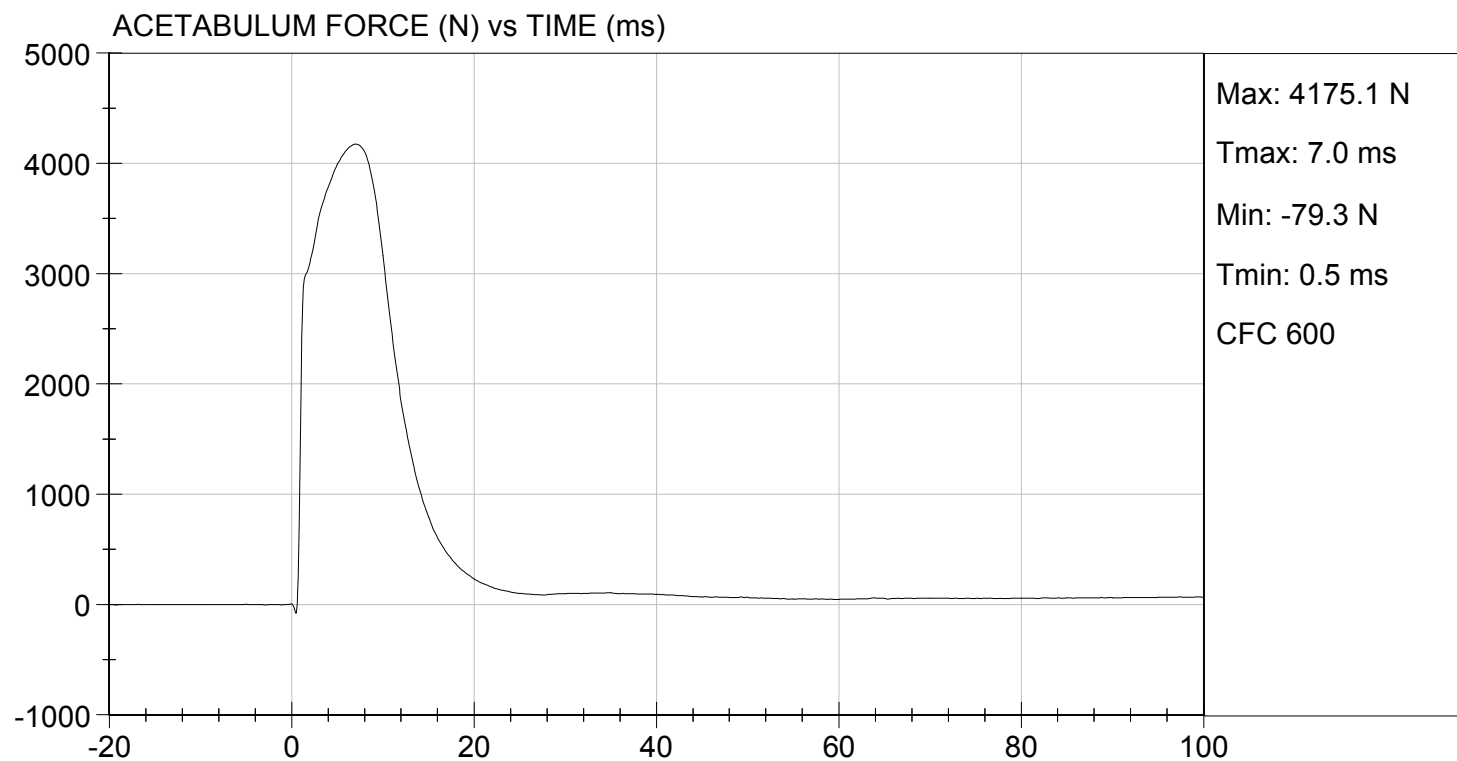
TEST DATE: 02/17/2015
TEST #: D15477





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

TEST DATE: 02/17/2015
TEST #: D15477



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D15478

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	36 to 45	41	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,831	Pass
			Overall Test Results	Pass

David Schoedel

Laboratory Technician

02/17/2015

Test Date

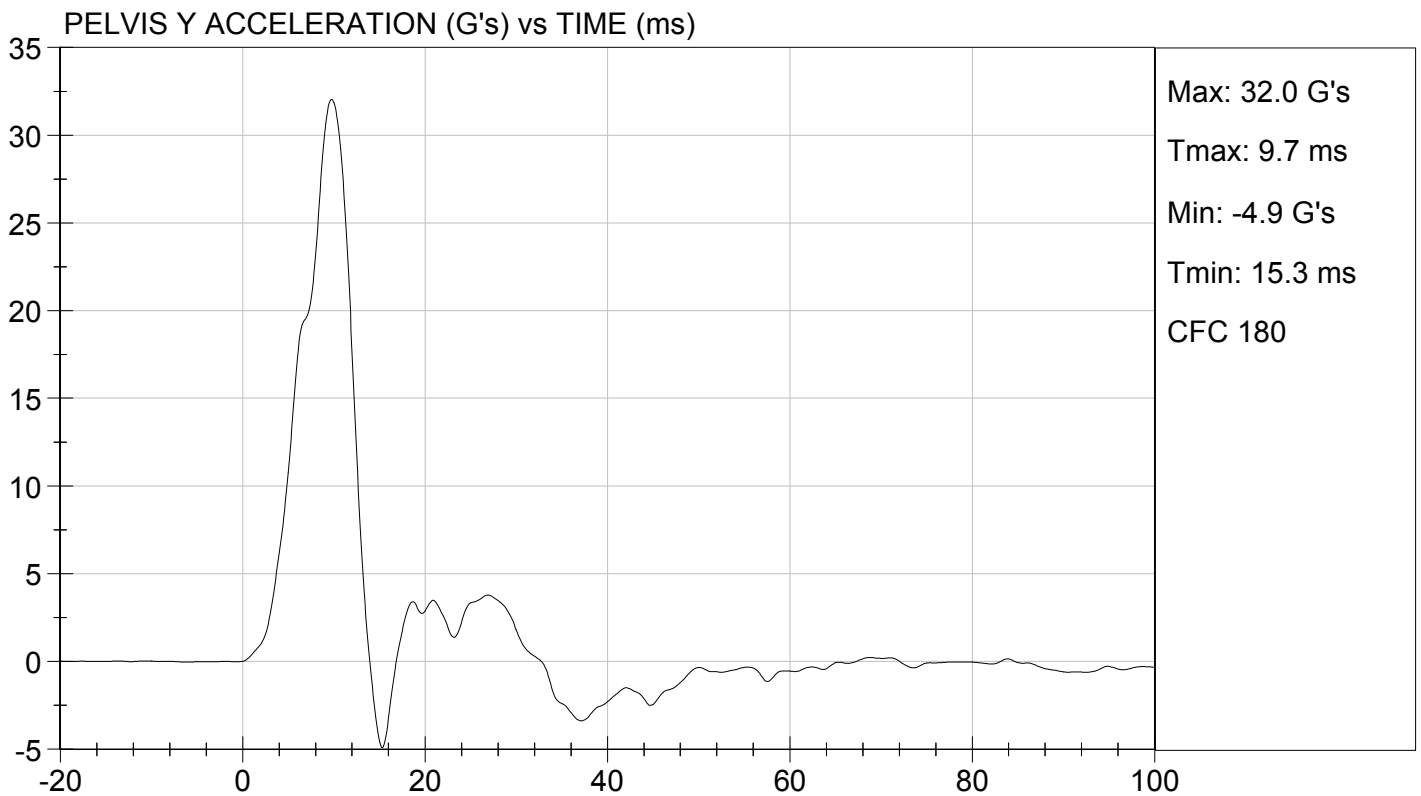
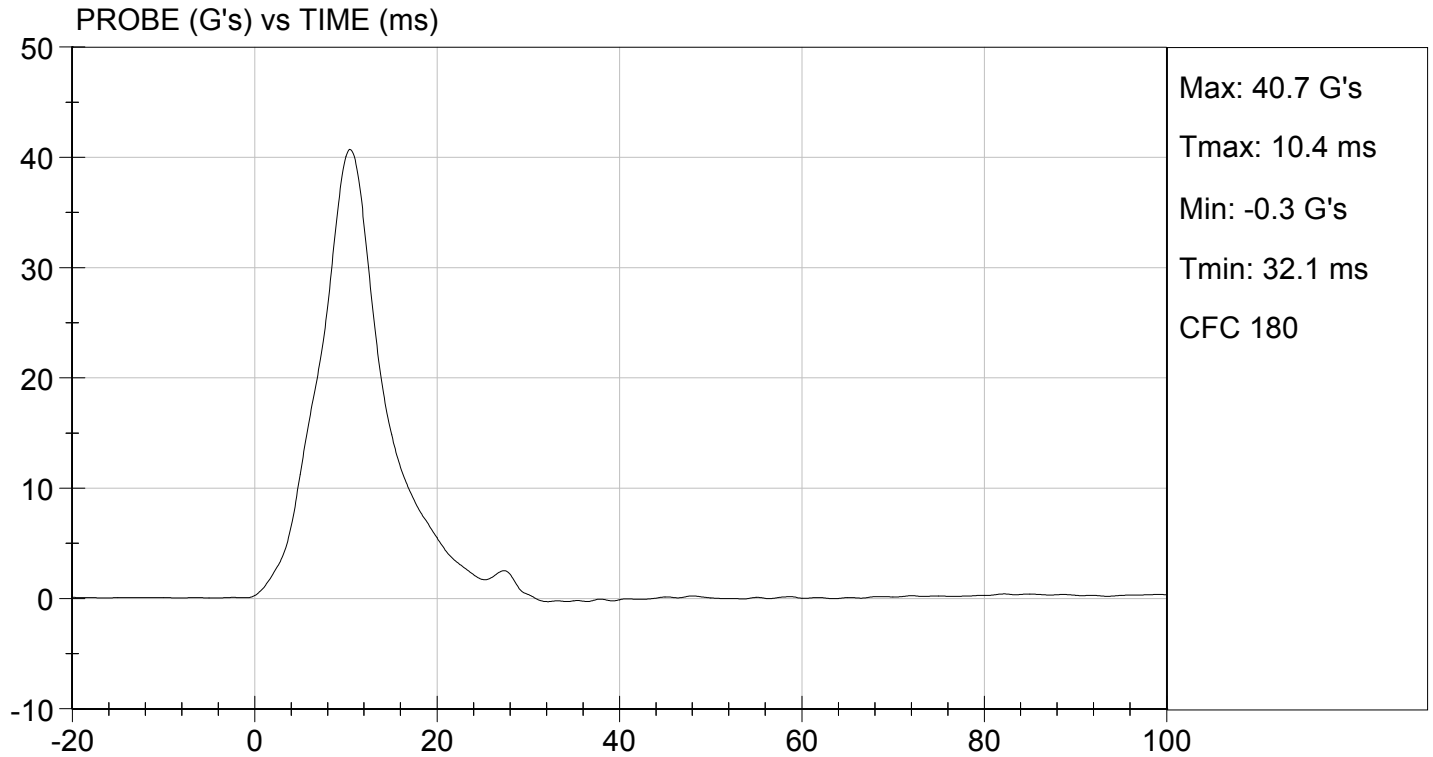
Jessica Hall

Approved By



TEST DESC: ILLIAC
VELOCITY: 14.01 ft/s, 4.27 m/s

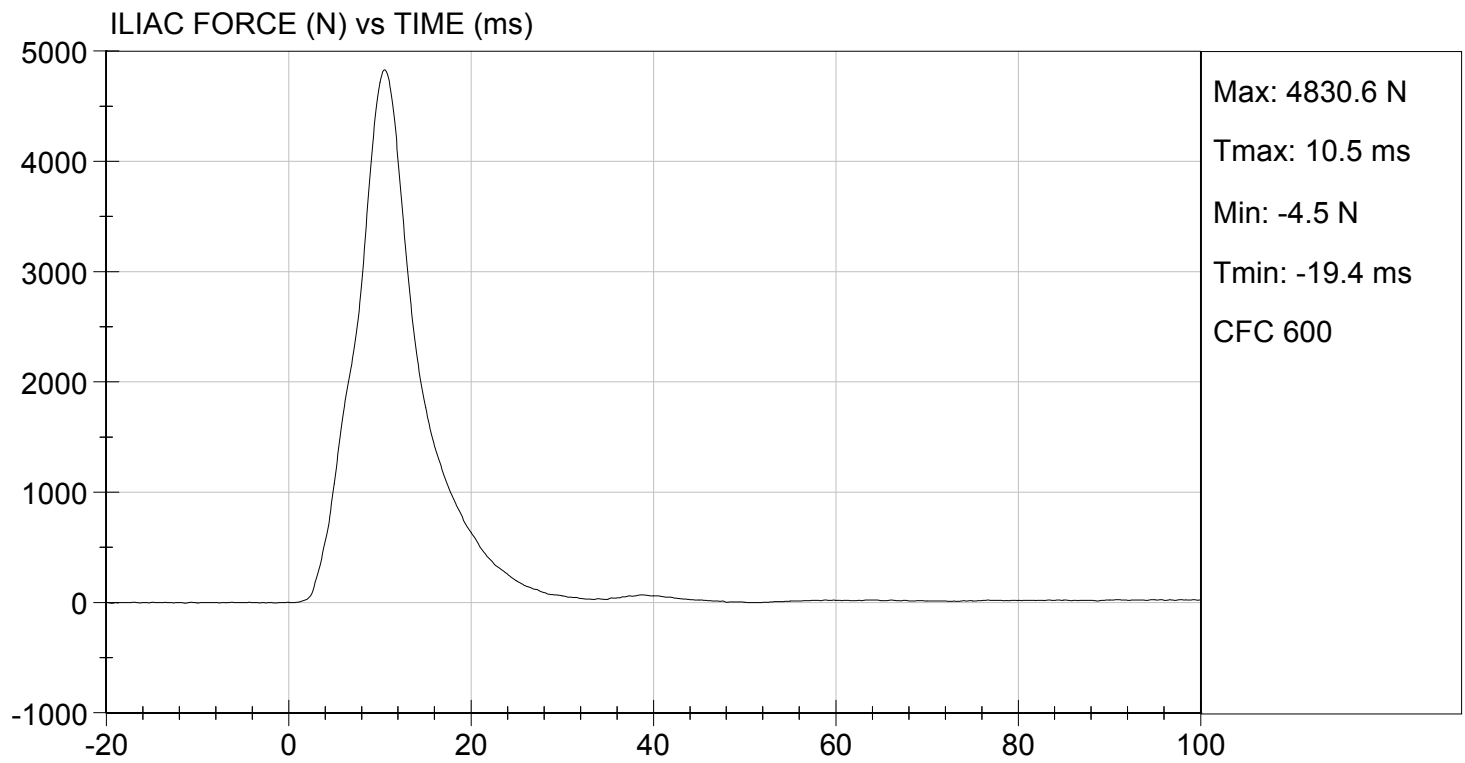
TEST DATE: 02/17/2015
TEST #: D15478





TEST DESC: ILLIAC
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 02/17/2015
TEST #: D15478



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

ATD Serial No: 296

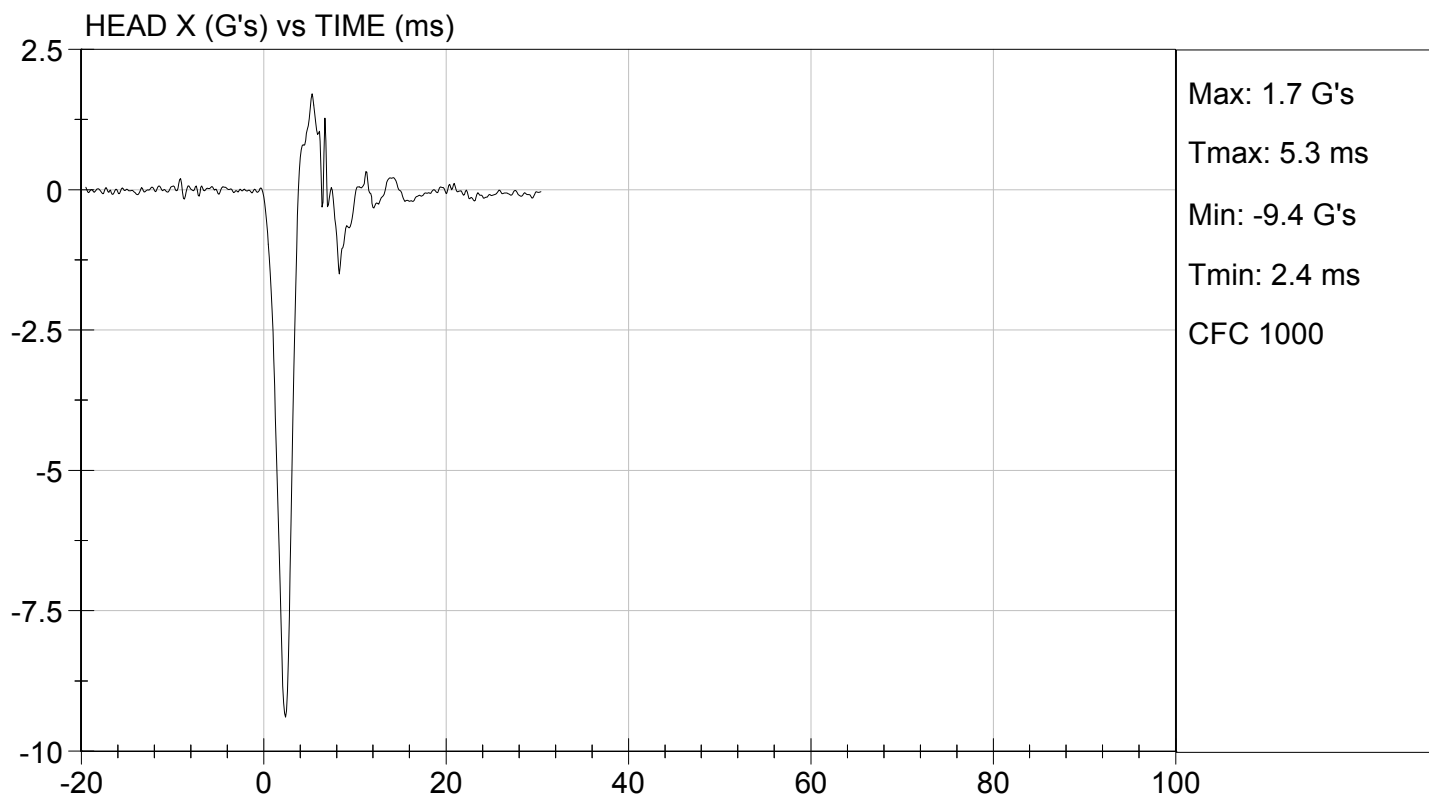
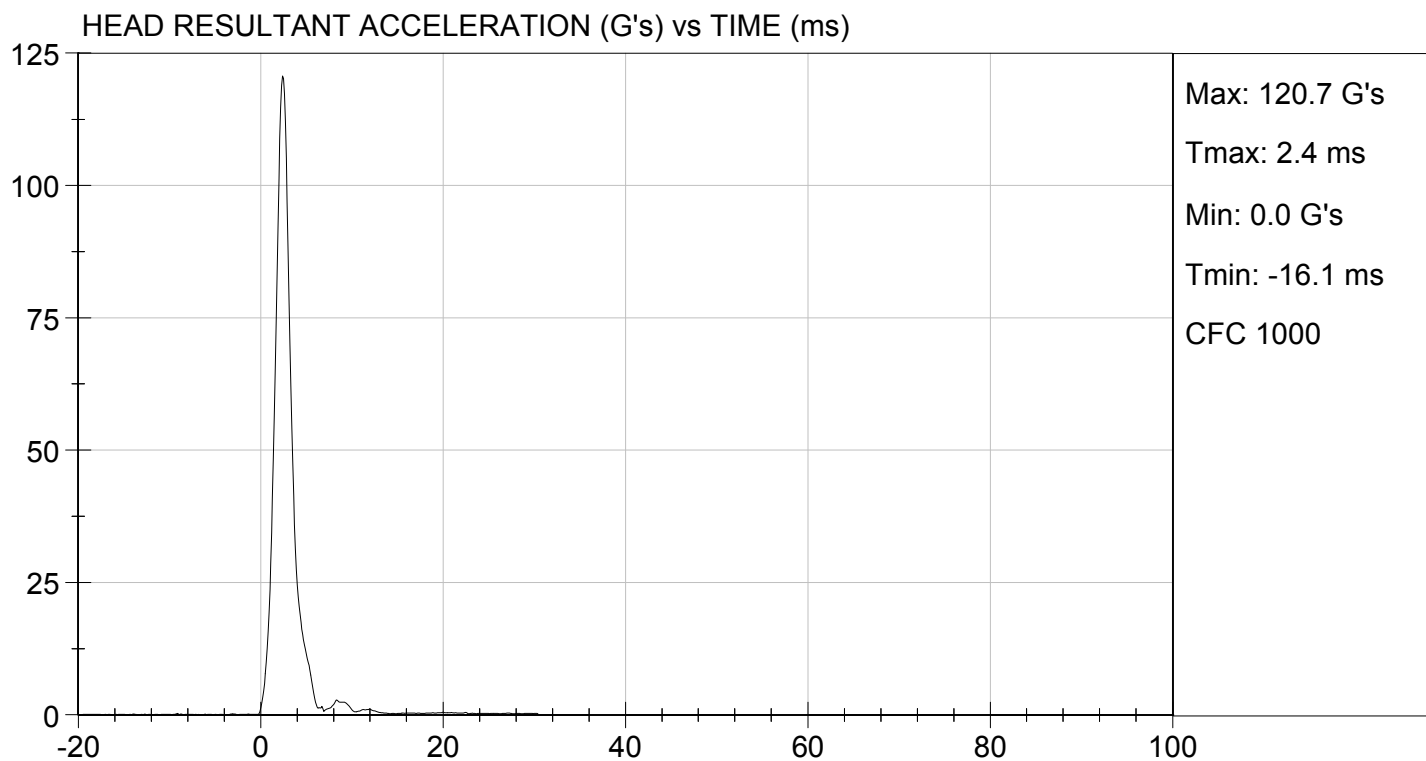
Test ID: D15571

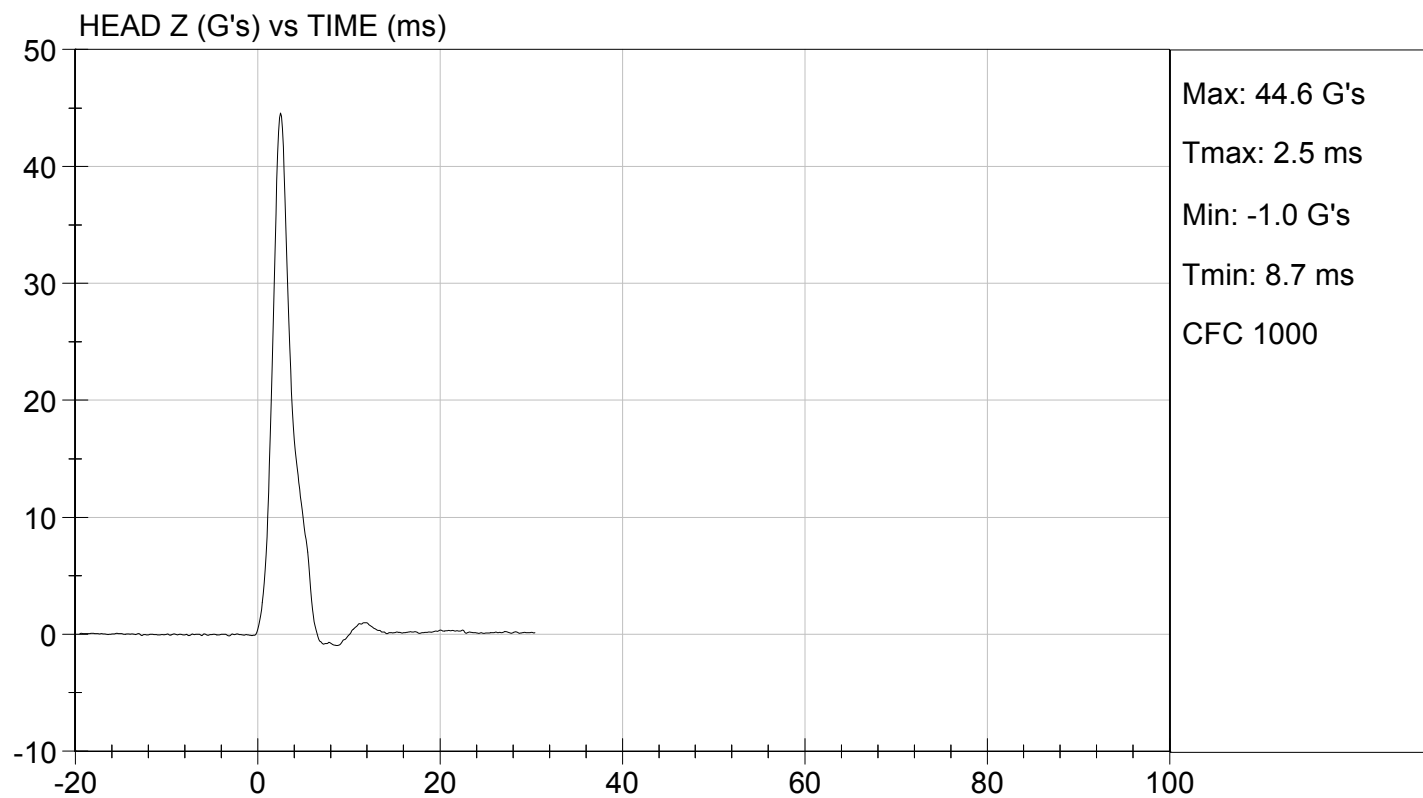
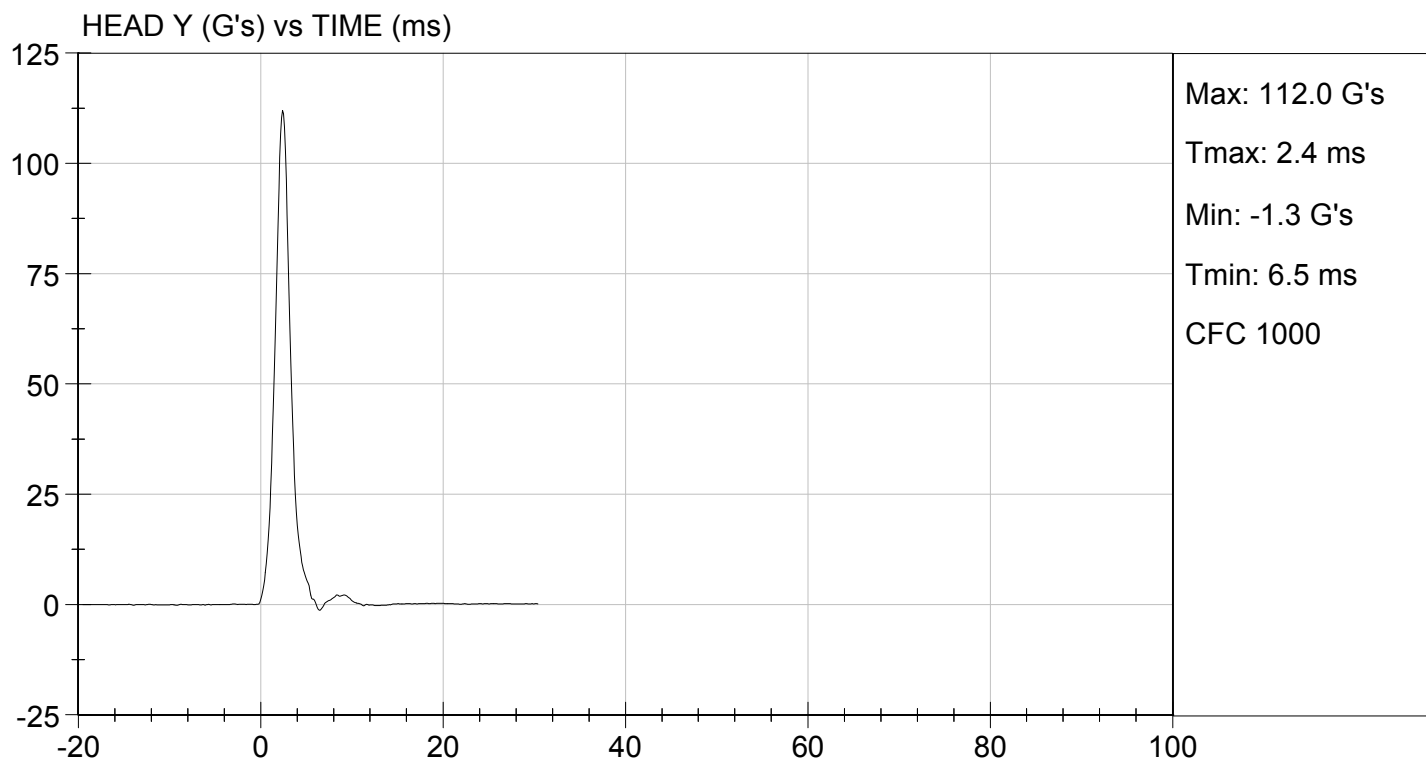
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	115 to 137	121	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-9.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

02/25/2015
Test Date

Jessica Hall
Approved By





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

ATD Serial No: 296

Test I.D: D15572

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.8	Pass
Humidity		%	10 to 70	28	Pass
Impact Velocity		m/s	5.51 to 5.63	5.63	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.39	Pass
	15 ms	m/s	3.30 to 4.10	3.43	Pass
	20 ms	m/s	4.40 to 5.40	4.54	Pass
	25 ms	m/s	5.40 to 6.10	5.51	Pass
	25-100 ms	m/s	5.50 to 6.20	5.67	Pass
Maximum D-Plane Rotation		deg	71 to 81	74	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	61	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-42	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	117	Pass
Overall Test Results					Pass

David Schoedel

Laboratory Technician

02/25/2015

Test Date

Jessica Hall

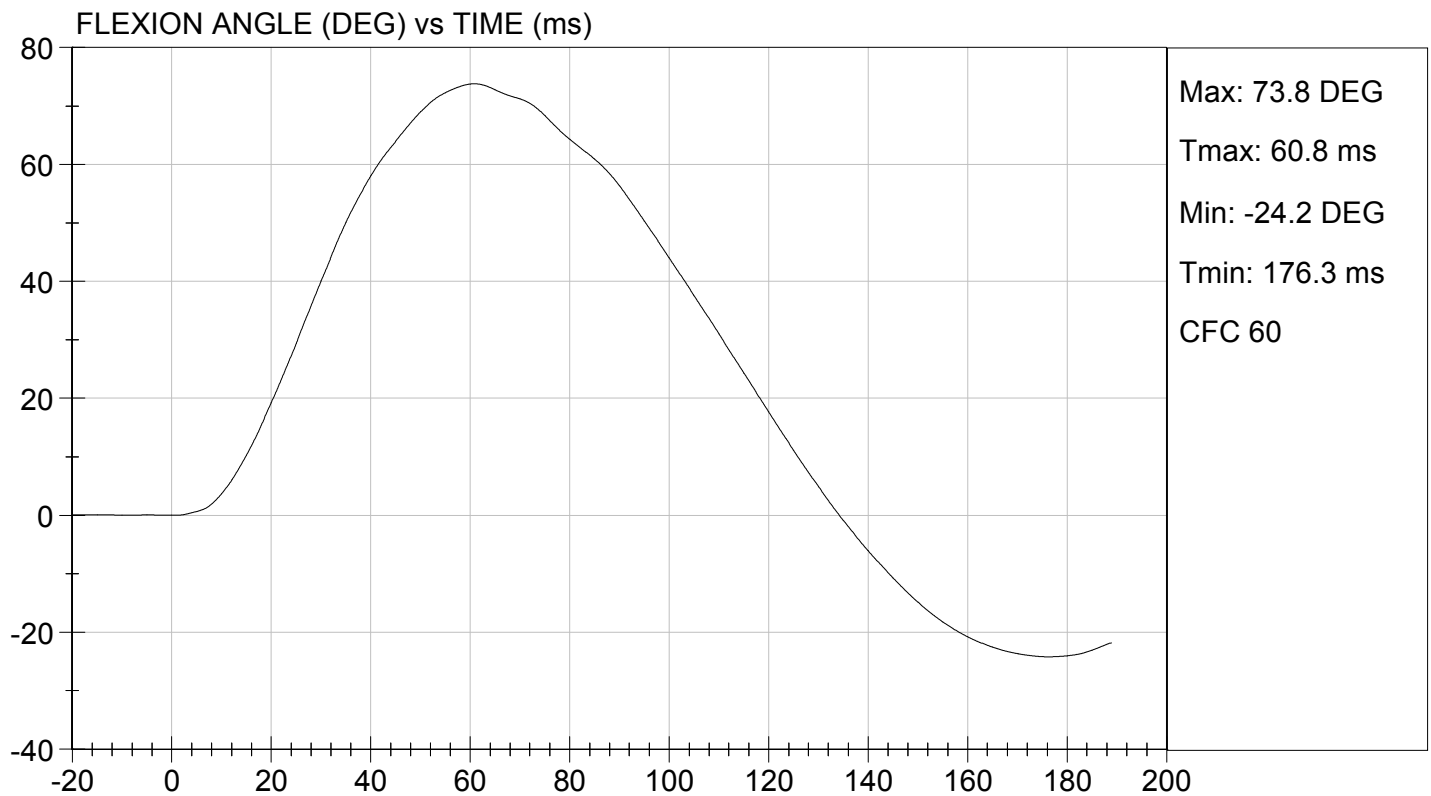
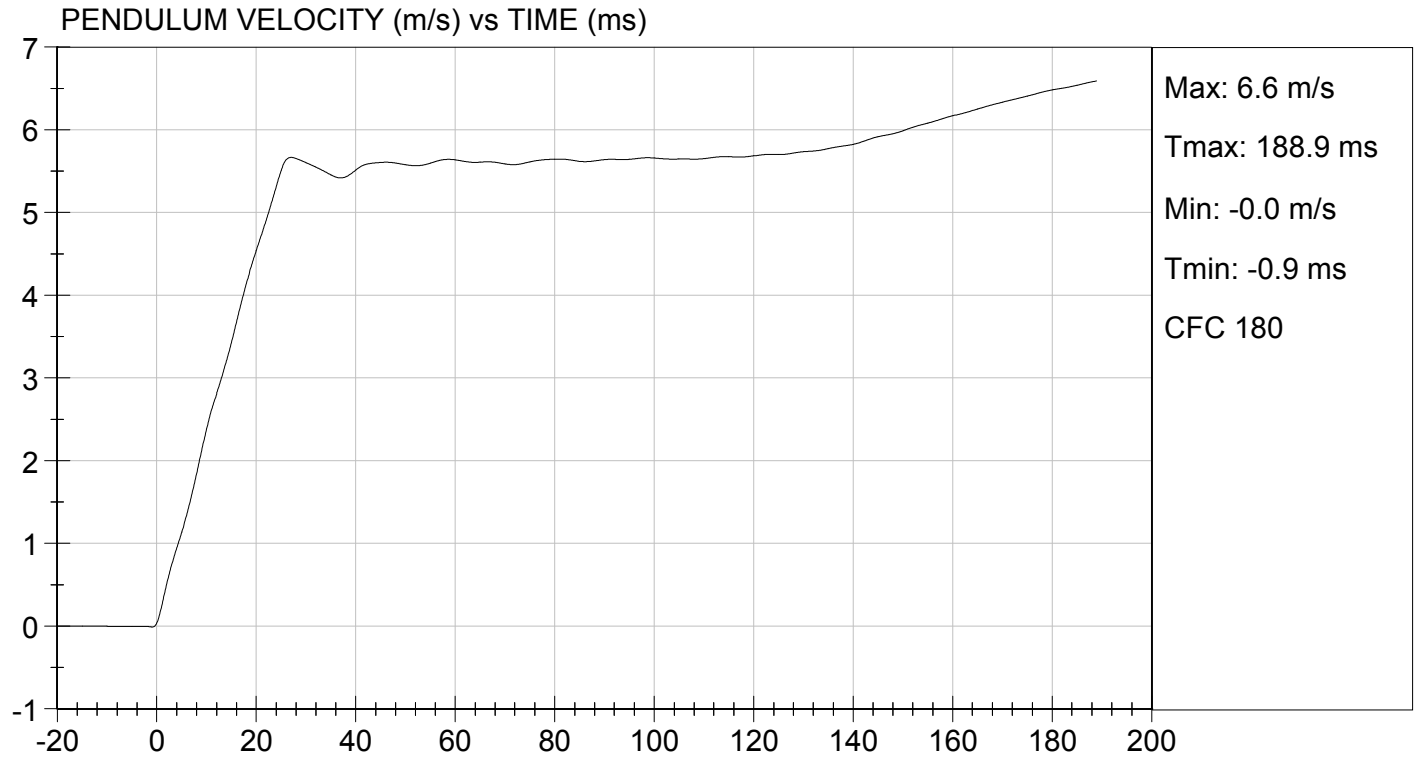
Approved By



TEST DESC: NECK BENDING
VELOCITY: 18.47 ft/s, 5.63 m/s

TEST DATE: 02/25/2015

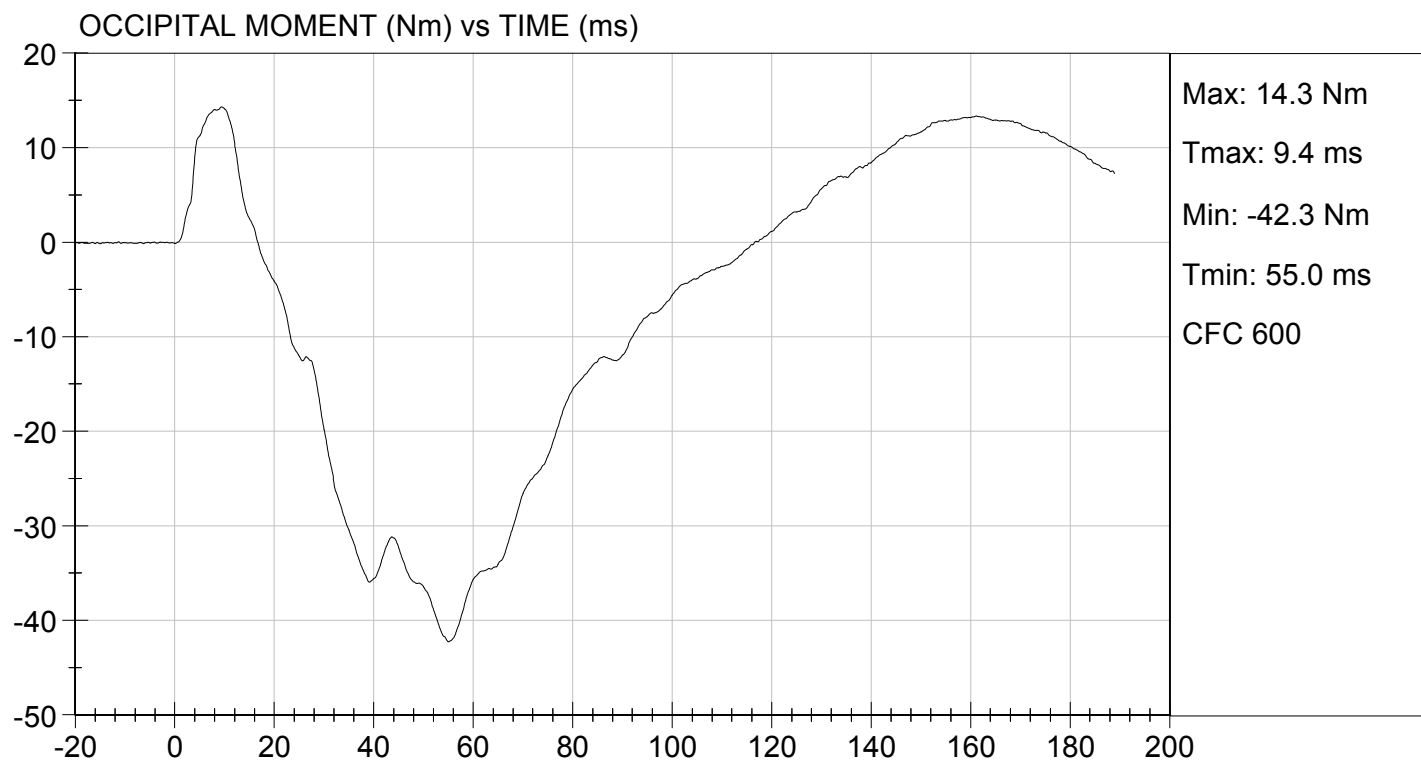
TEST #: D15572





TEST DESC: NECK BENDING
VELOCITY: 18.47 ft/s, 5.63 m/s

TEST DATE: 02/25/2015
TEST #: D15572



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

ATD Serial No: 296

Test ID: D15573

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

02/25/2015

Test Date

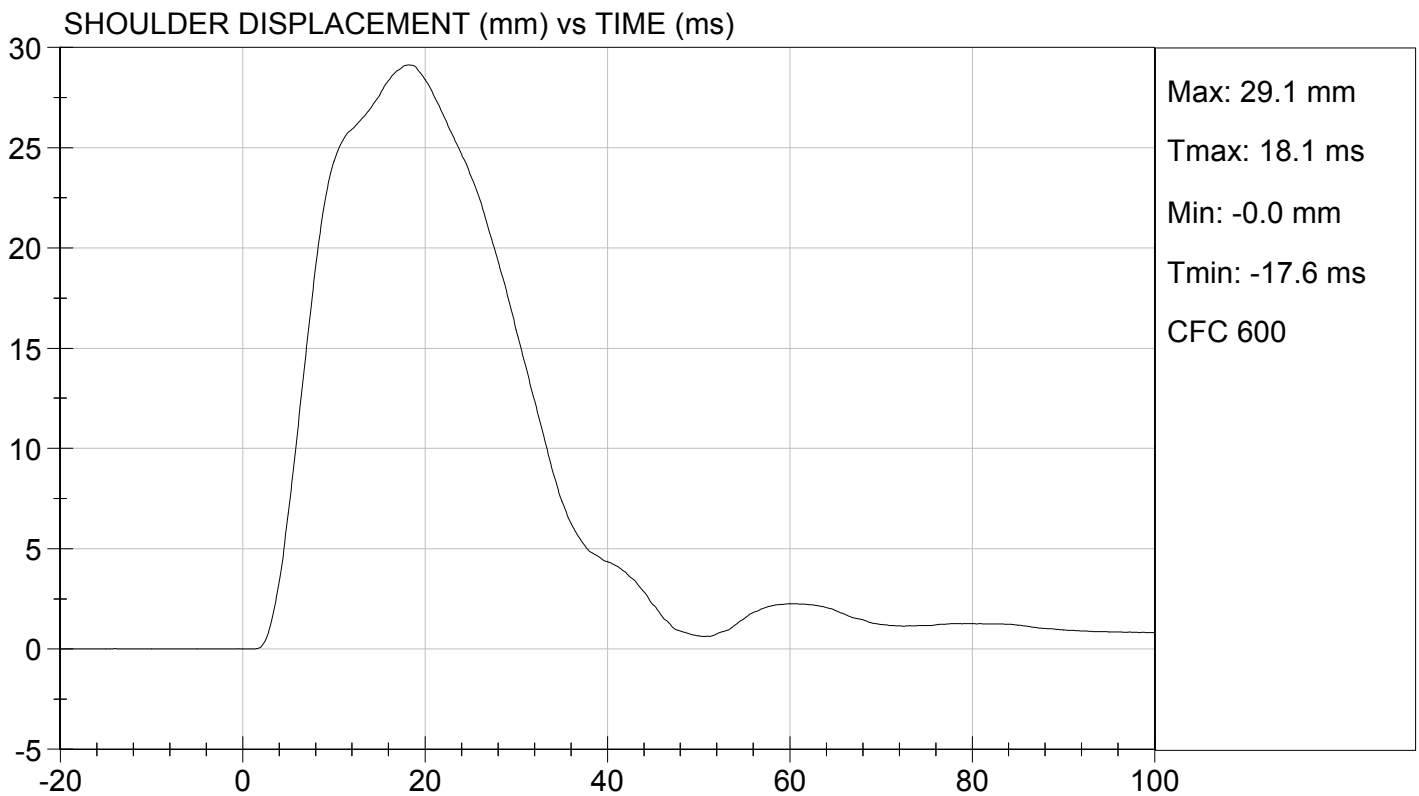
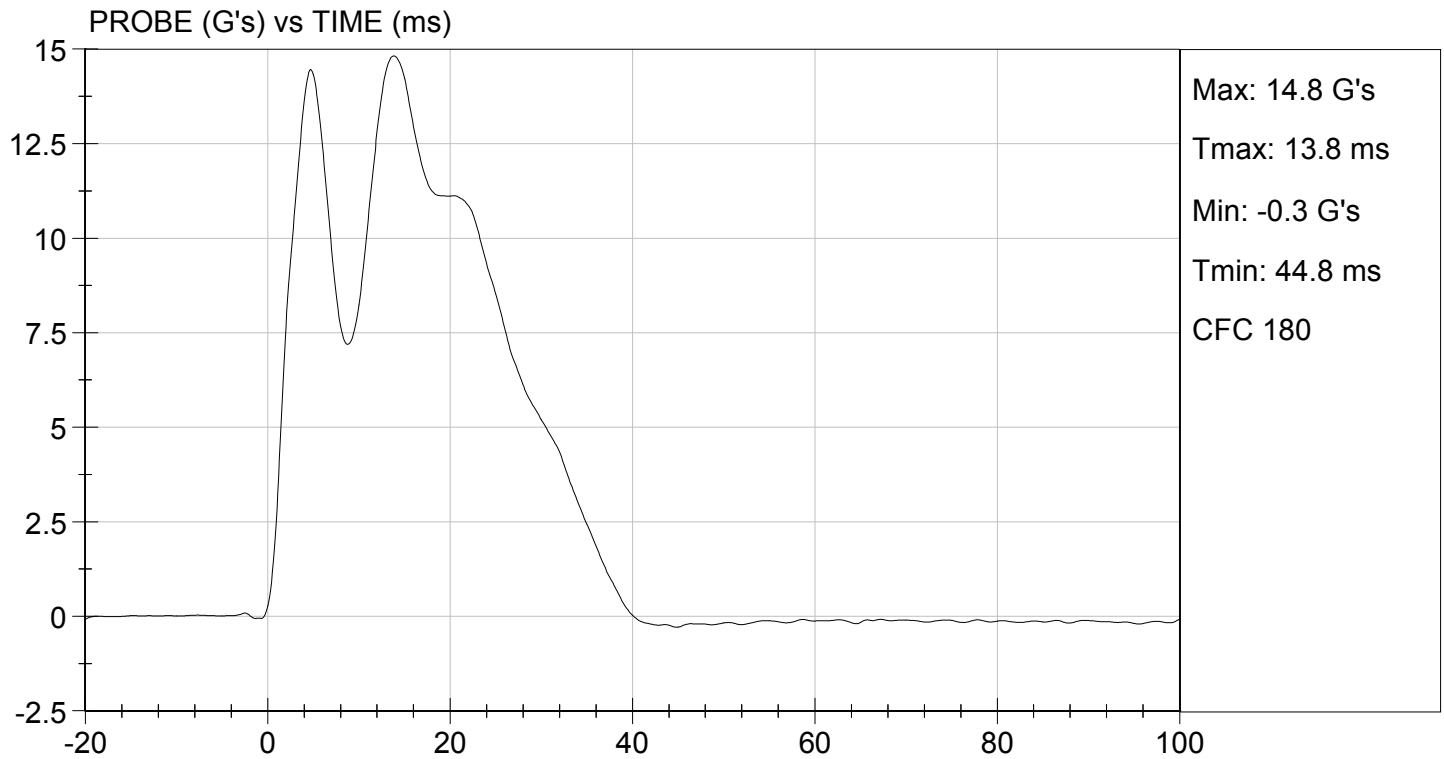
Jessica Hall

Approved By



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

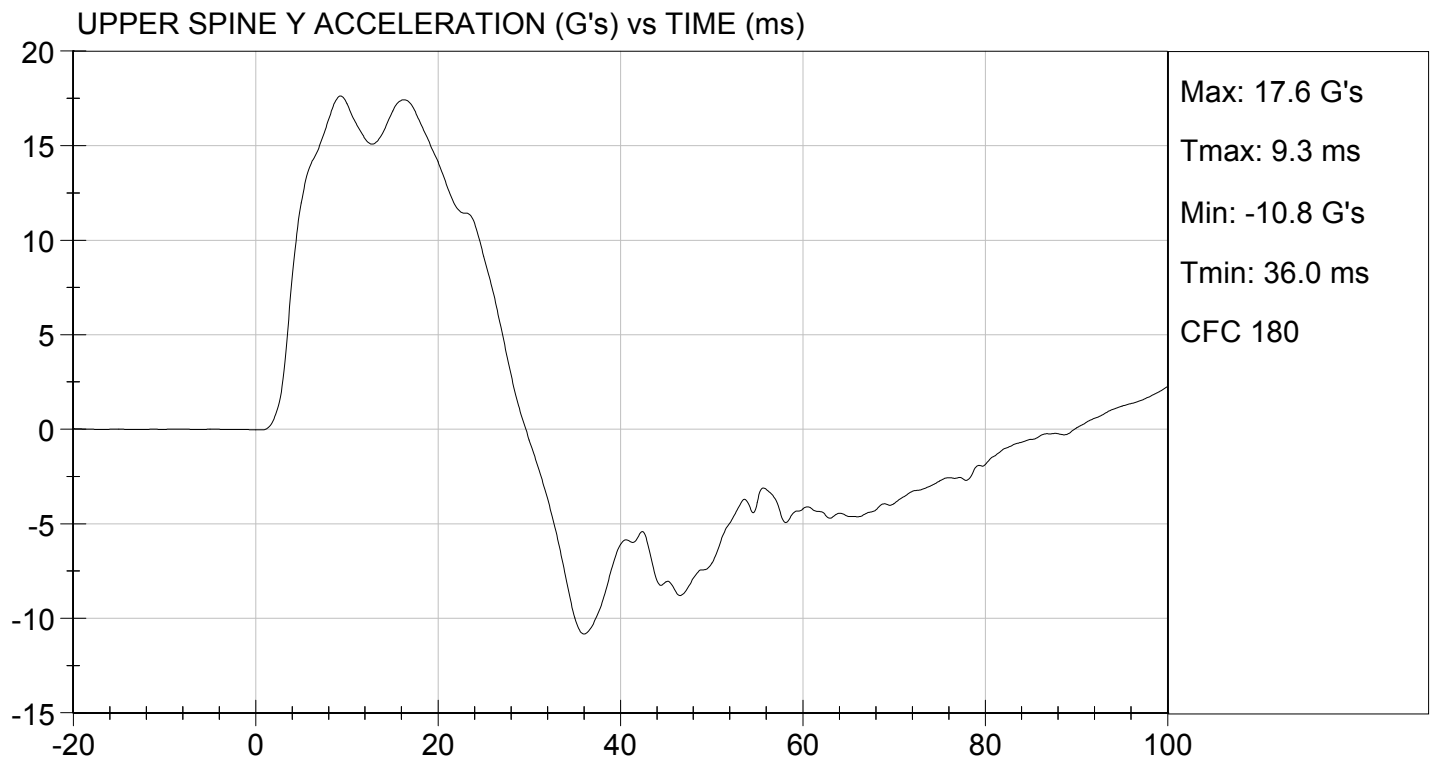
TEST DATE: 02/25/2015
TEST #: D15573





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

TEST DATE: 02/25/2015
TEST #: D15573



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

ATD Serial No: 296

Test I.D: D15574

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	31	Pass
Shoulder Displacement	mm	31 to 40	37	Pass
Upper Rib Displacement	mm	25 to 32	30	Pass
Middle Rib Displacement	mm	30 to 36	33	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	35	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	30	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

02/25/2015

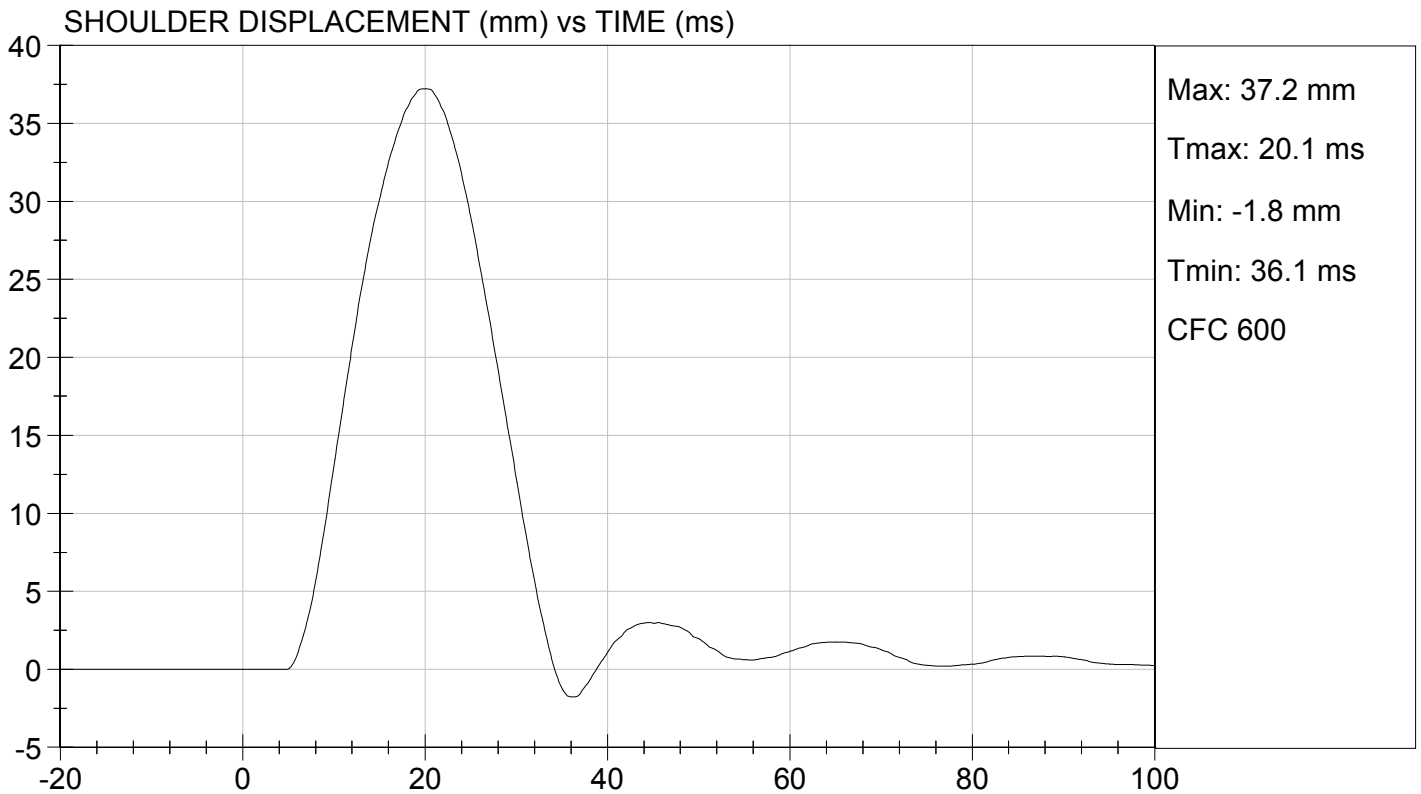
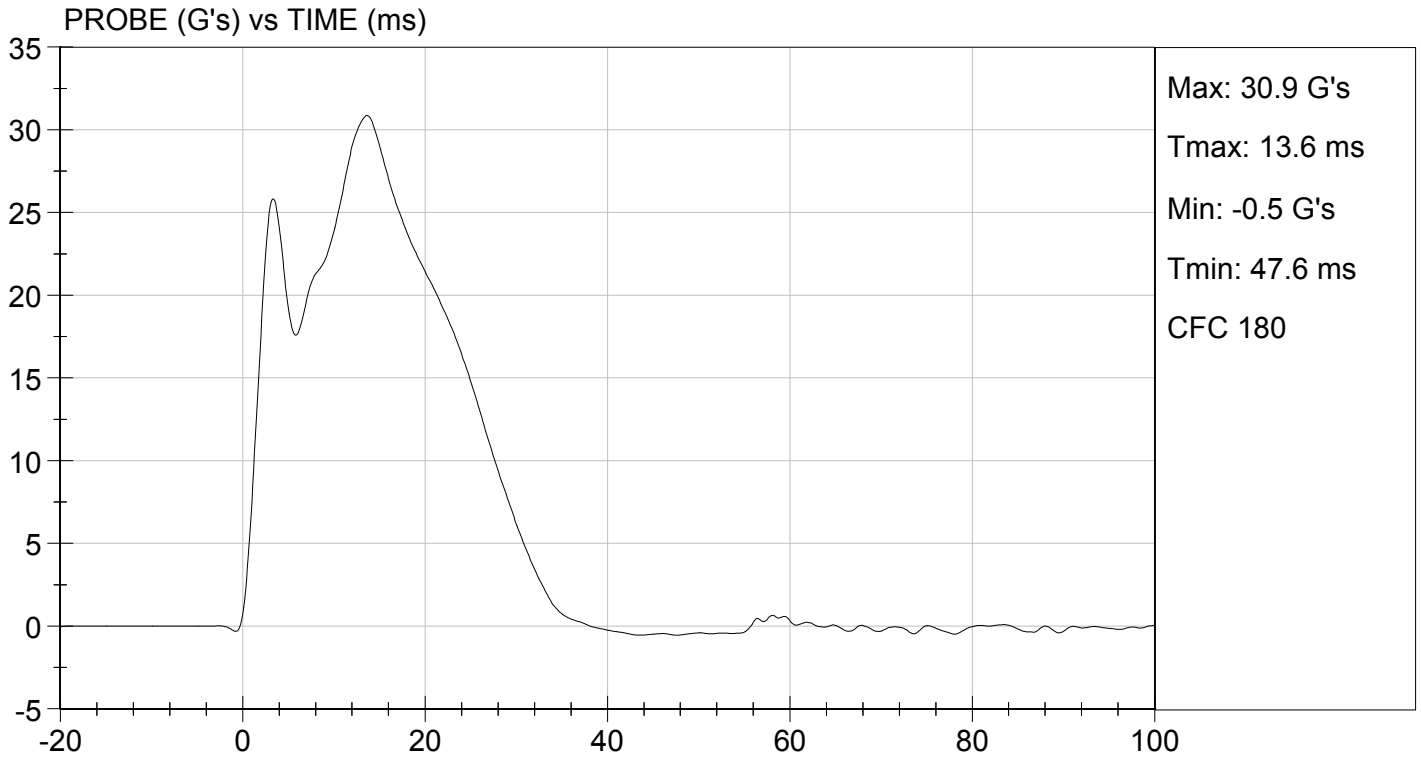
Test Date

Jessica Hall
Approved By



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

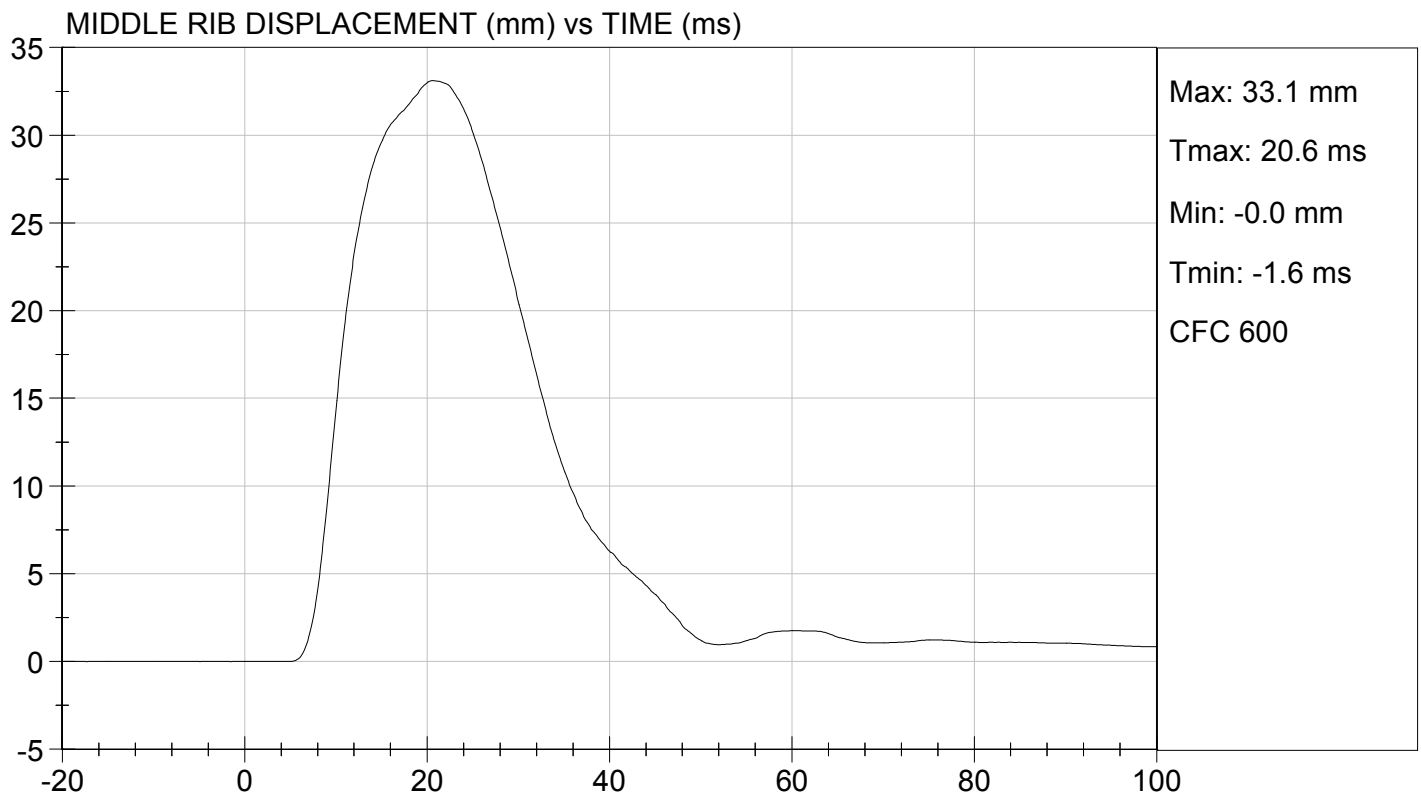
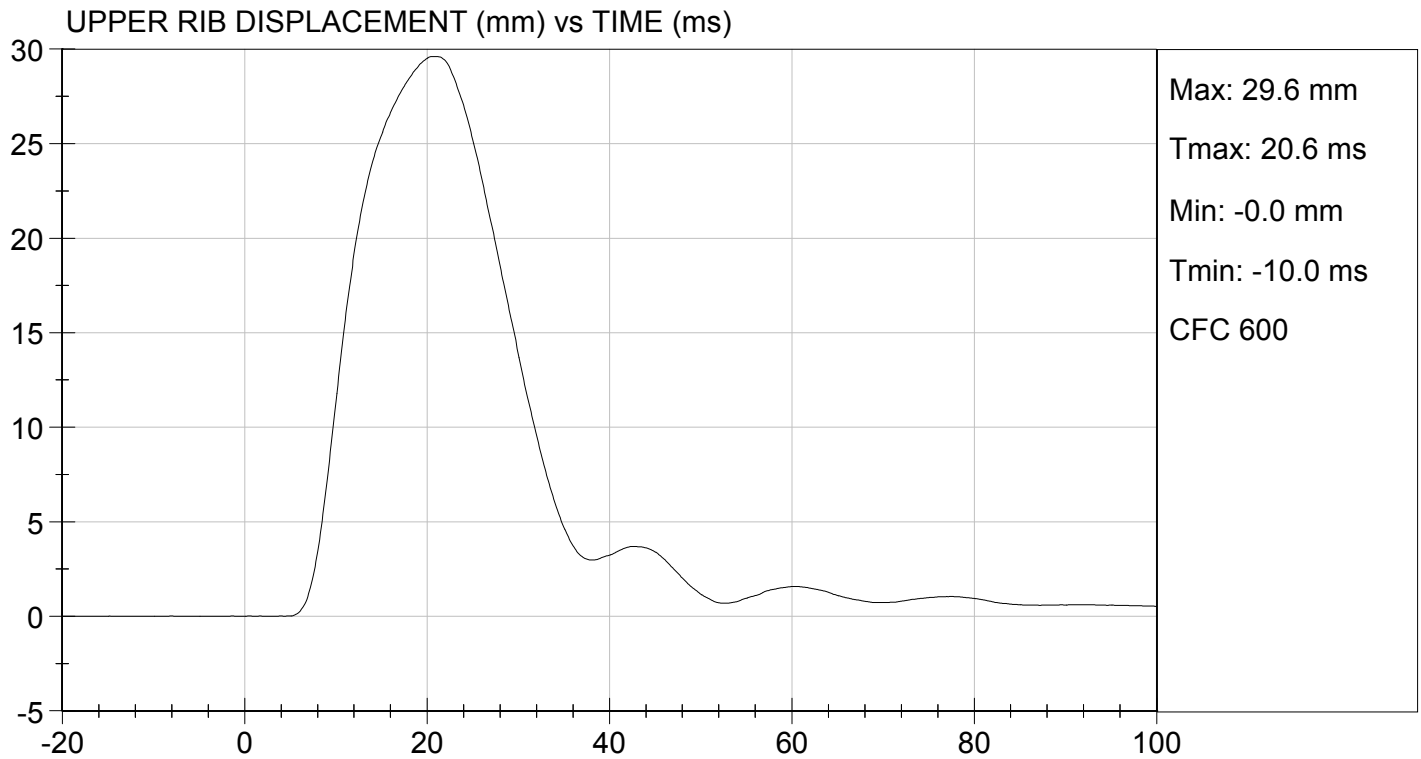
TEST DATE: 02/25/2015
TEST #: D15574





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

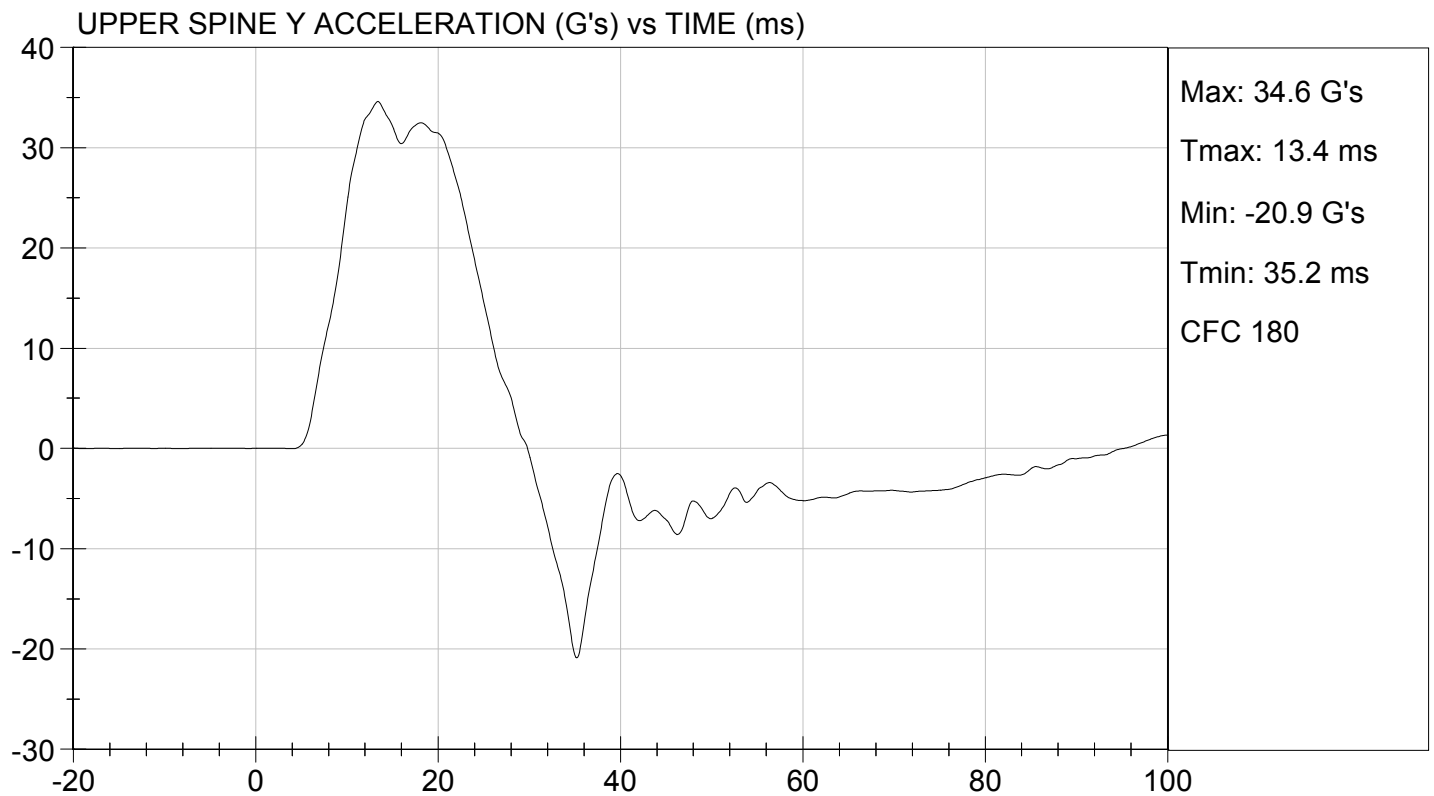
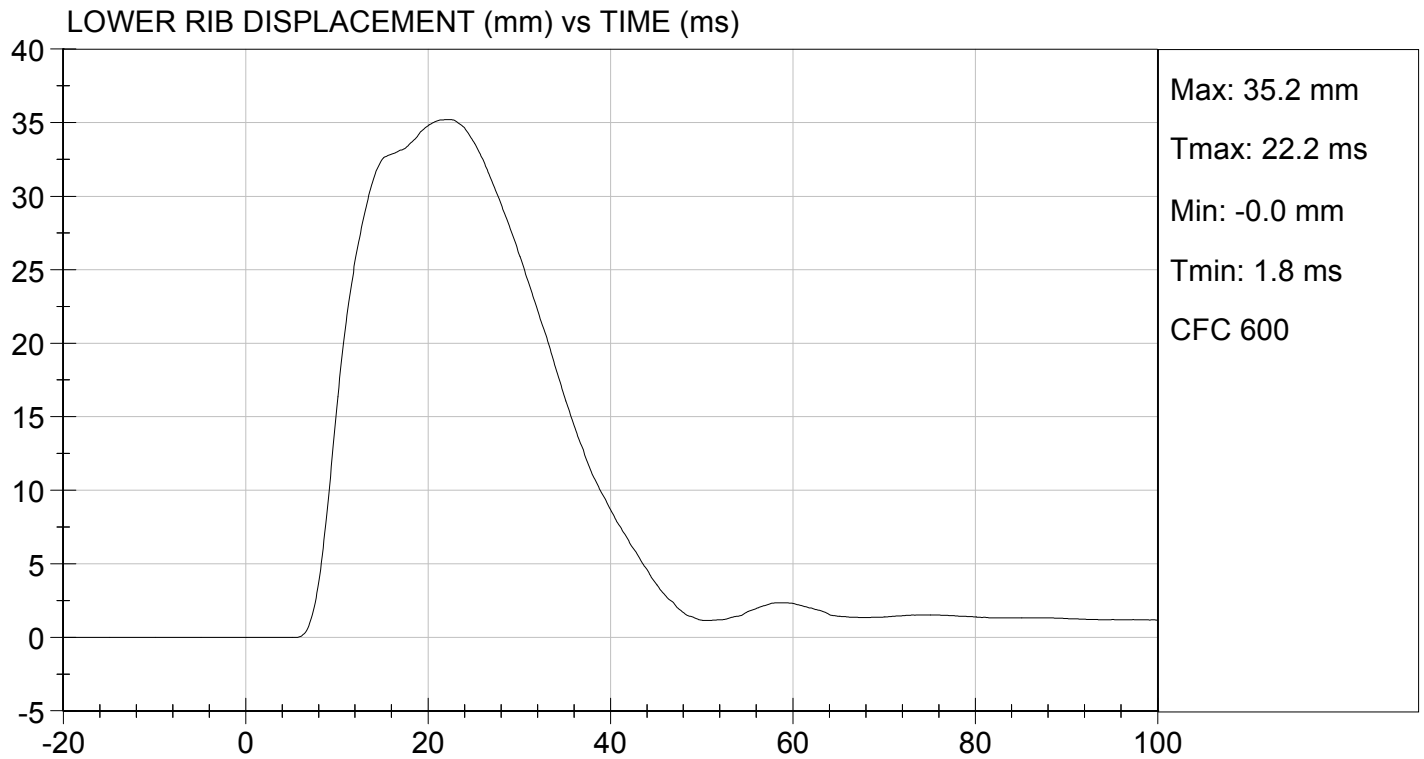
TEST DATE: 02/25/2015
TEST #: D15574





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

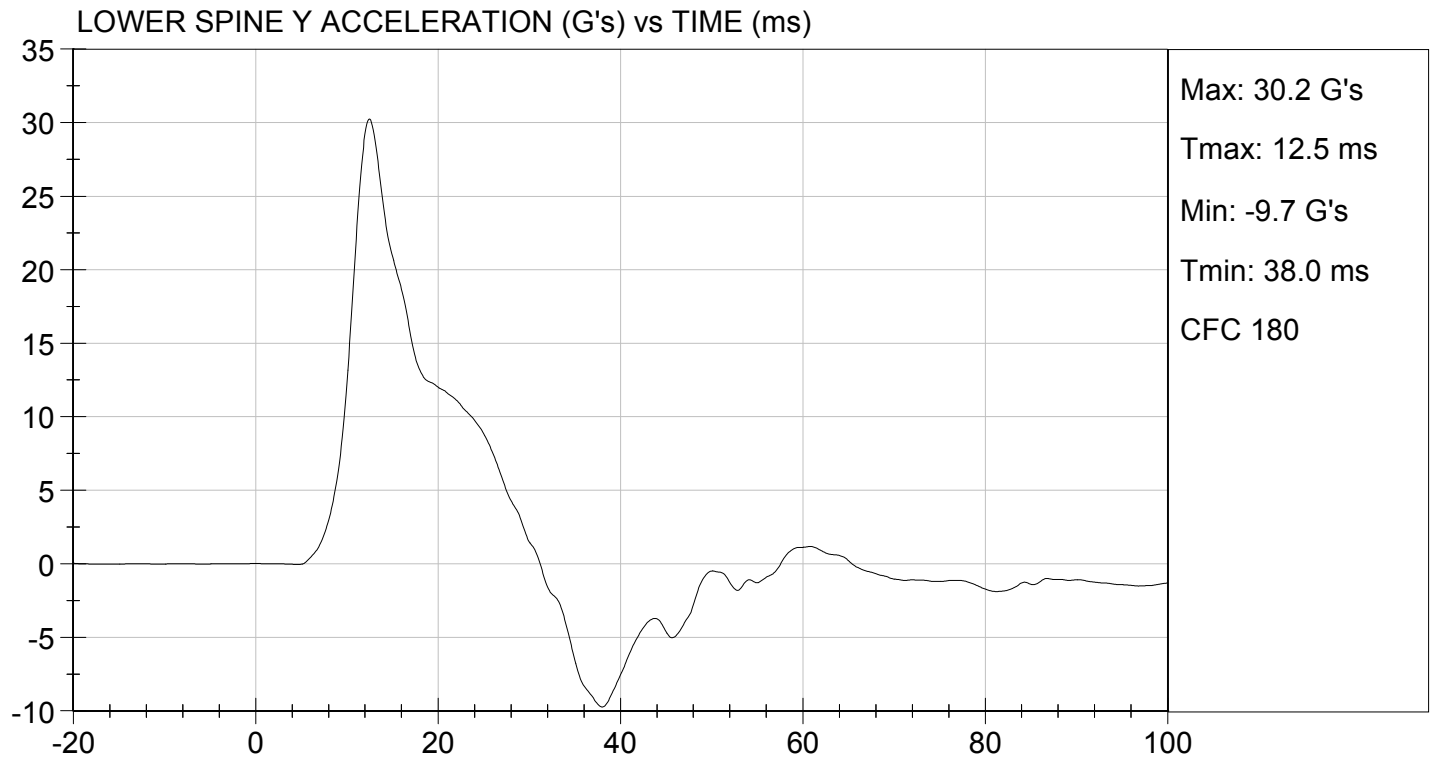
TEST DATE: 02/25/2015
TEST #: D15574





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

TEST DATE: 02/25/2015
TEST #: D15574



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

ATD Serial No: 296

Test I.D: D15575

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	13	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

02/25/2015

Test Date

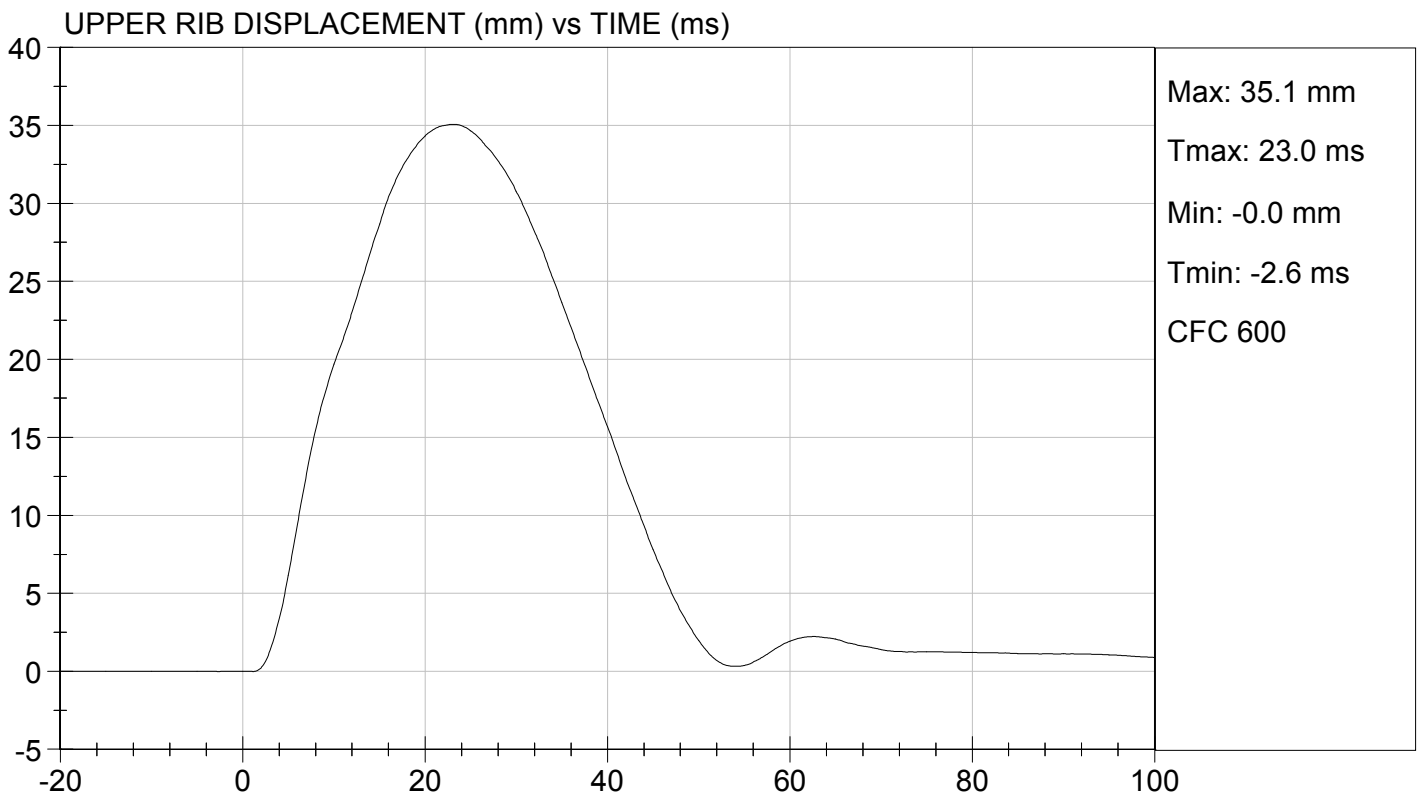
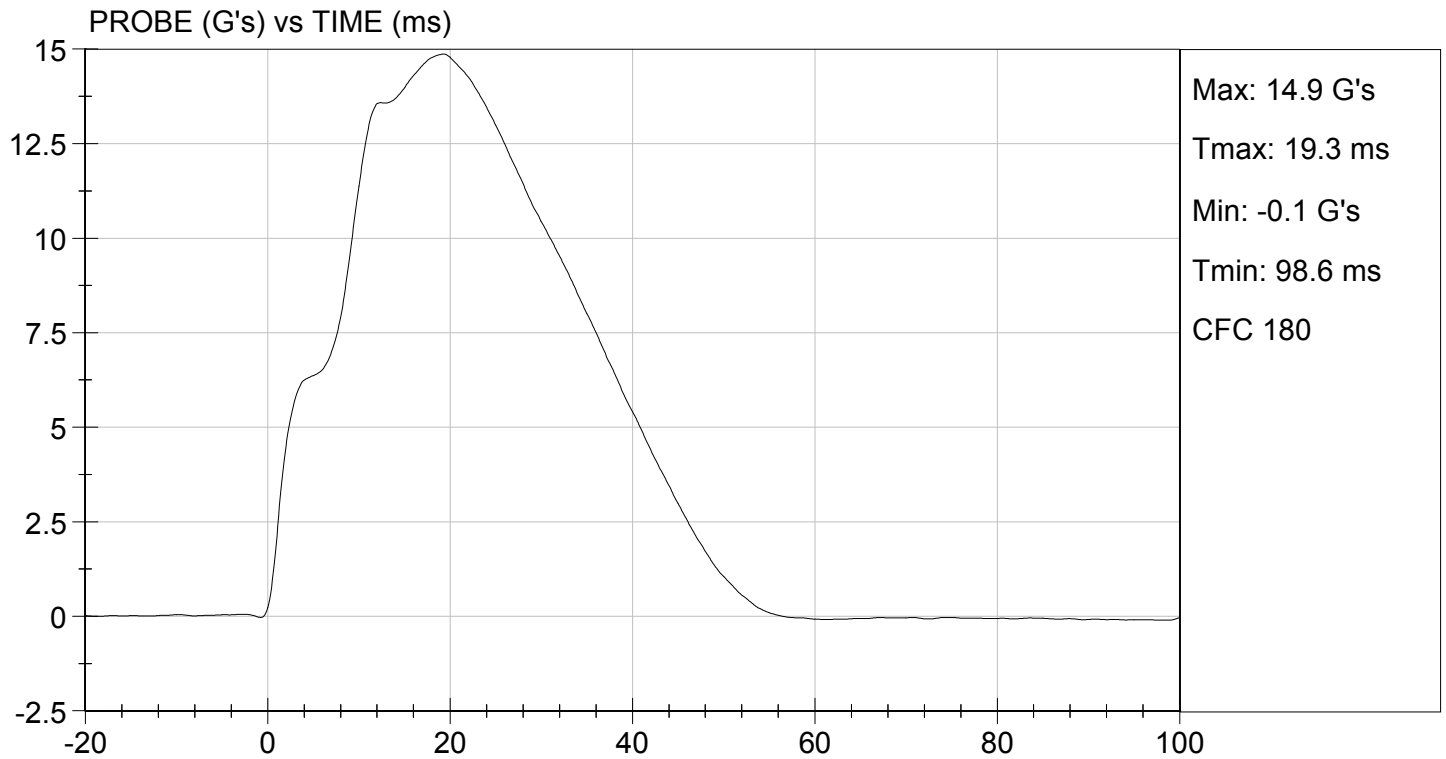
Jessica Hall

Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/25/2015
TEST #: D15575

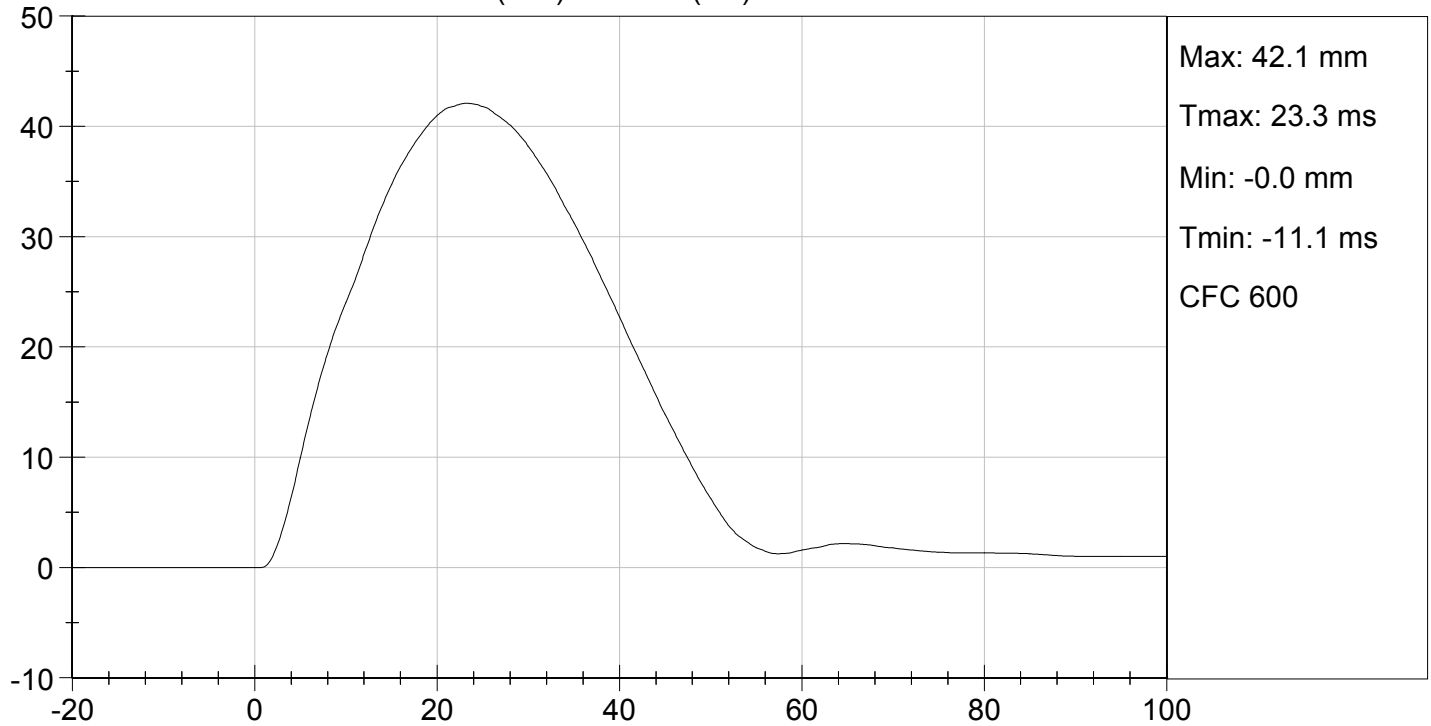




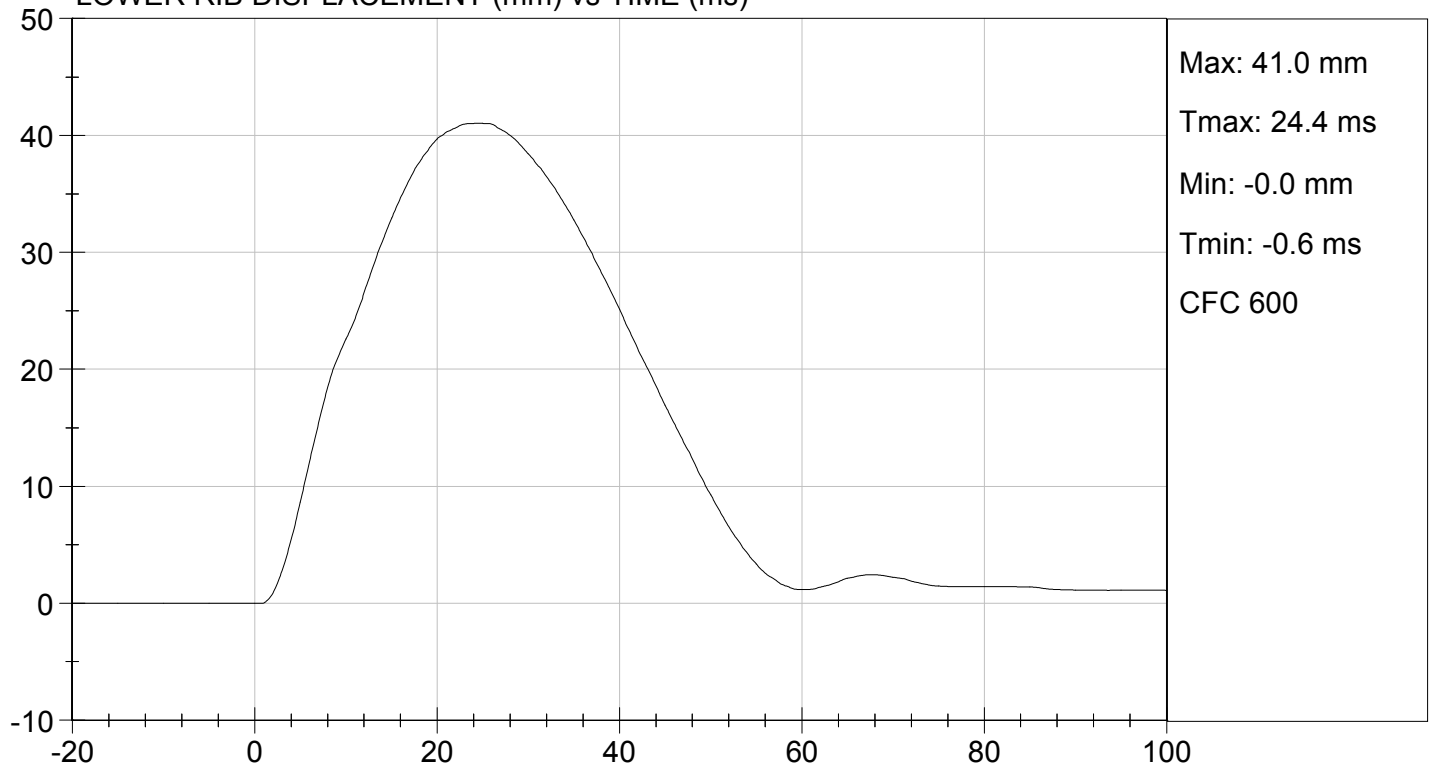
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/25/2015
TEST #: D15575

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

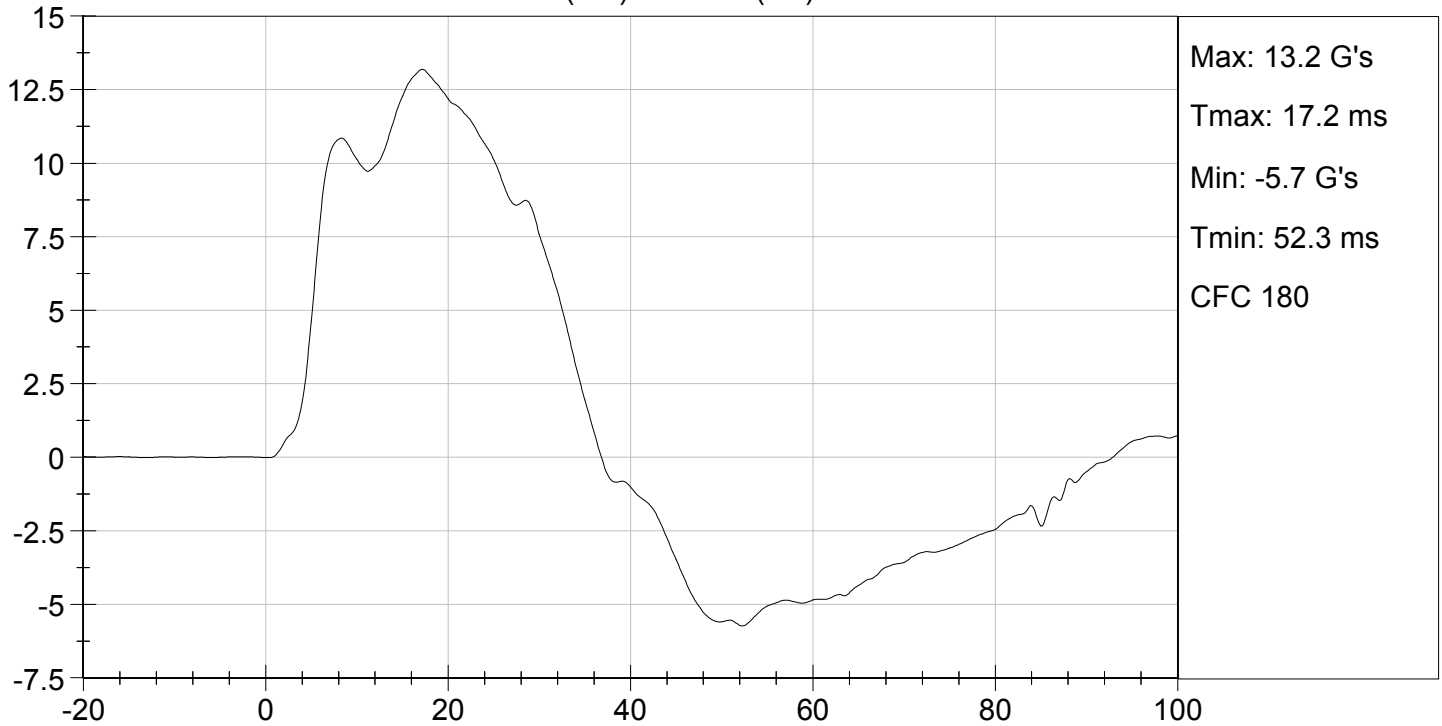




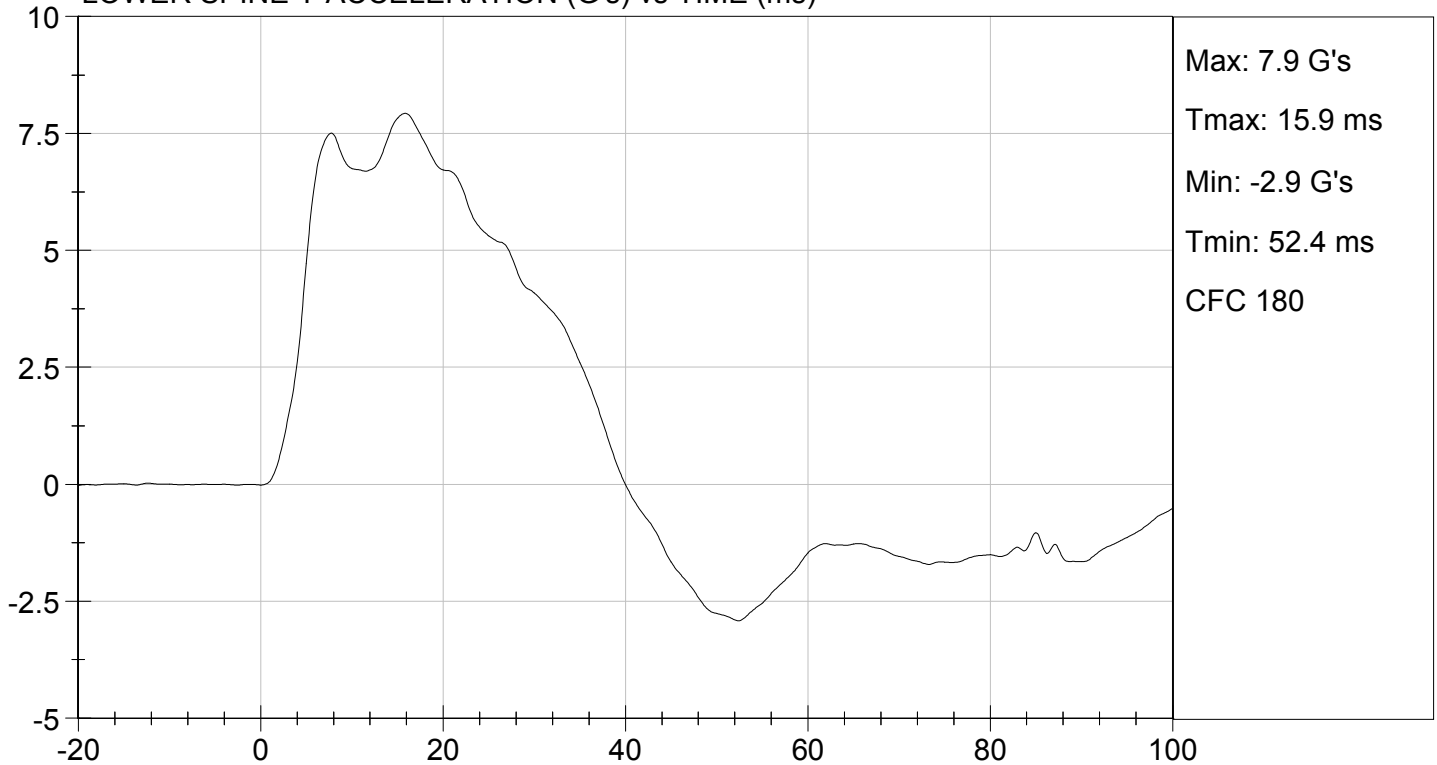
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/25/2015
TEST #: D15575

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: 296

Test I.D: D15576

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	43	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

02/25/2015

Test Date

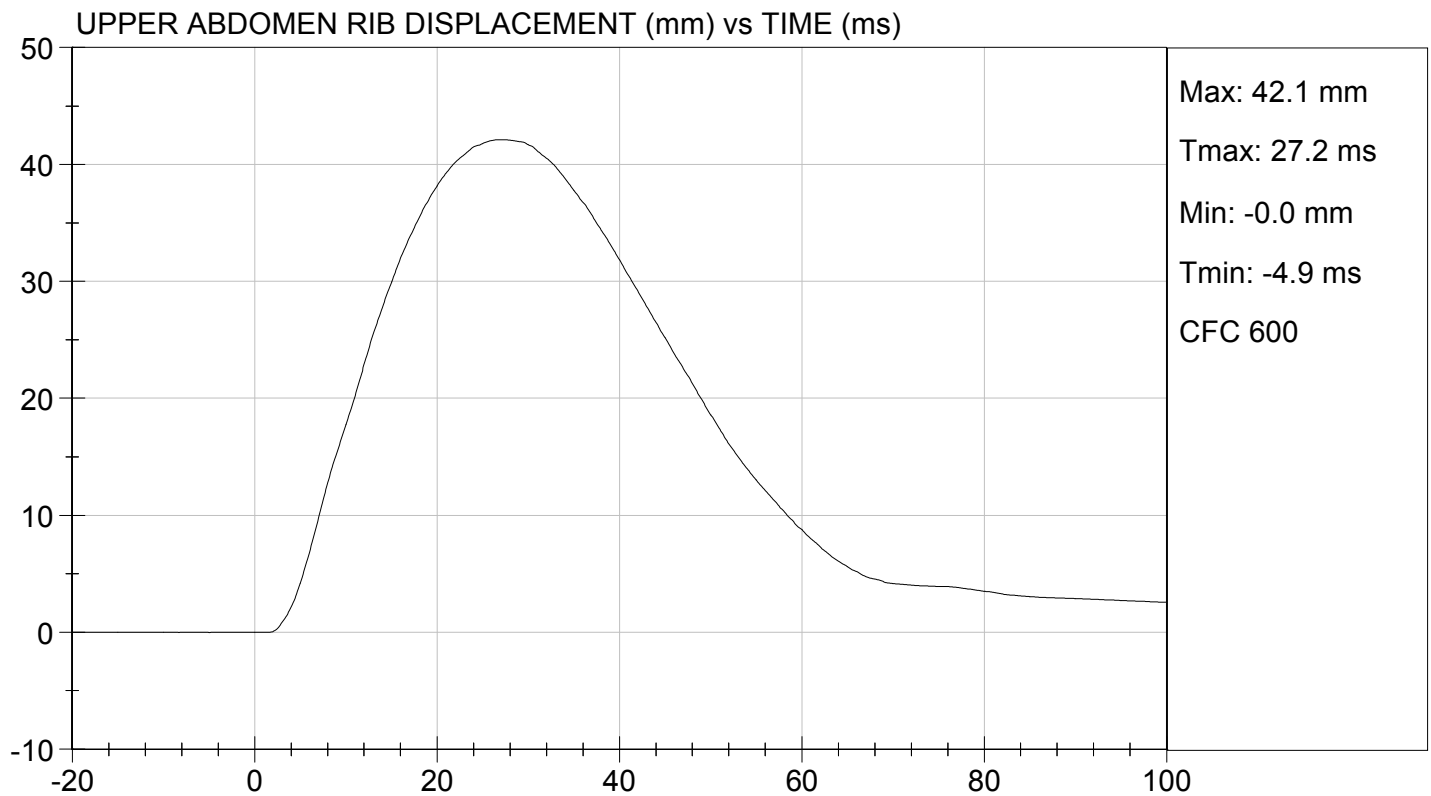
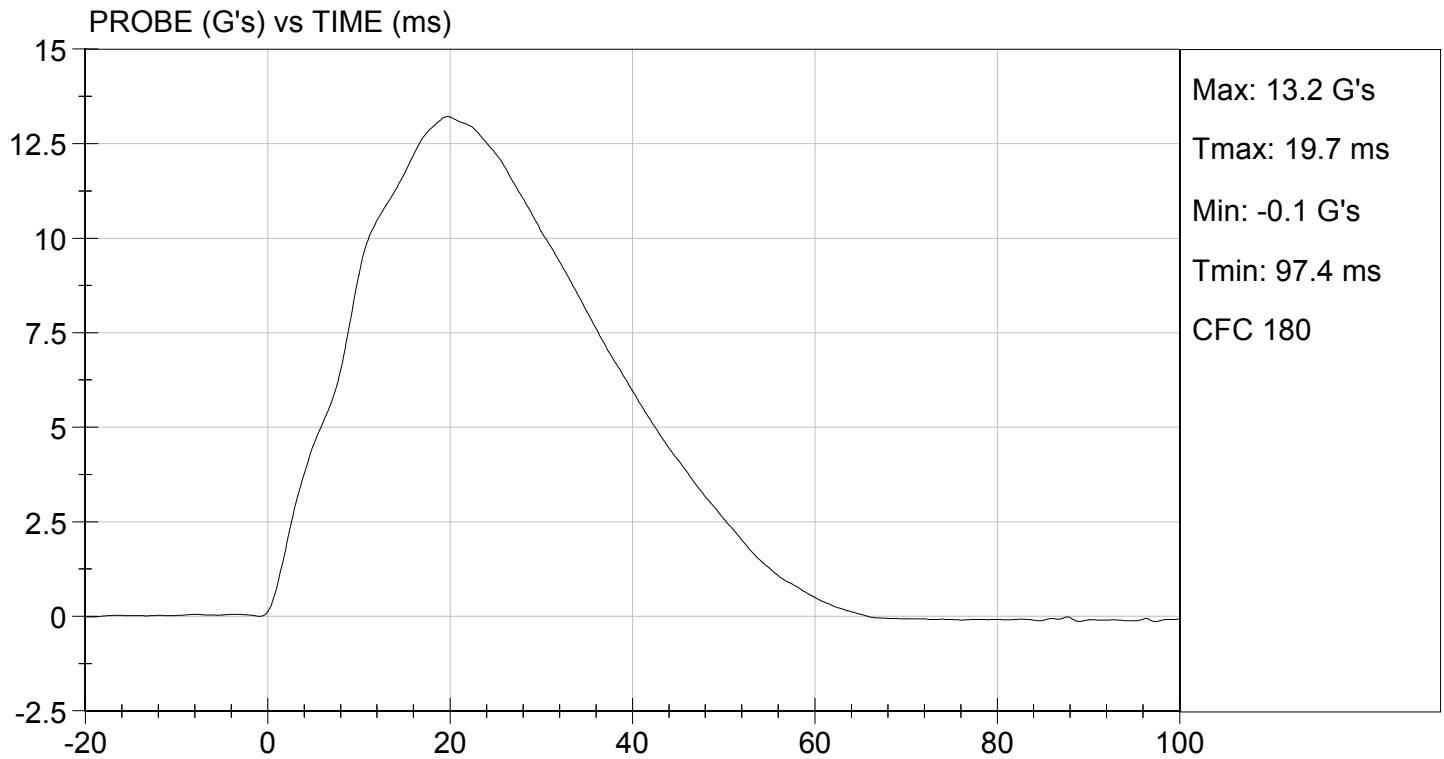
Jessica Hall

Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.77 ft/s, 4.20 m/s

TEST DATE: 02/25/2015
TEST #: D15576

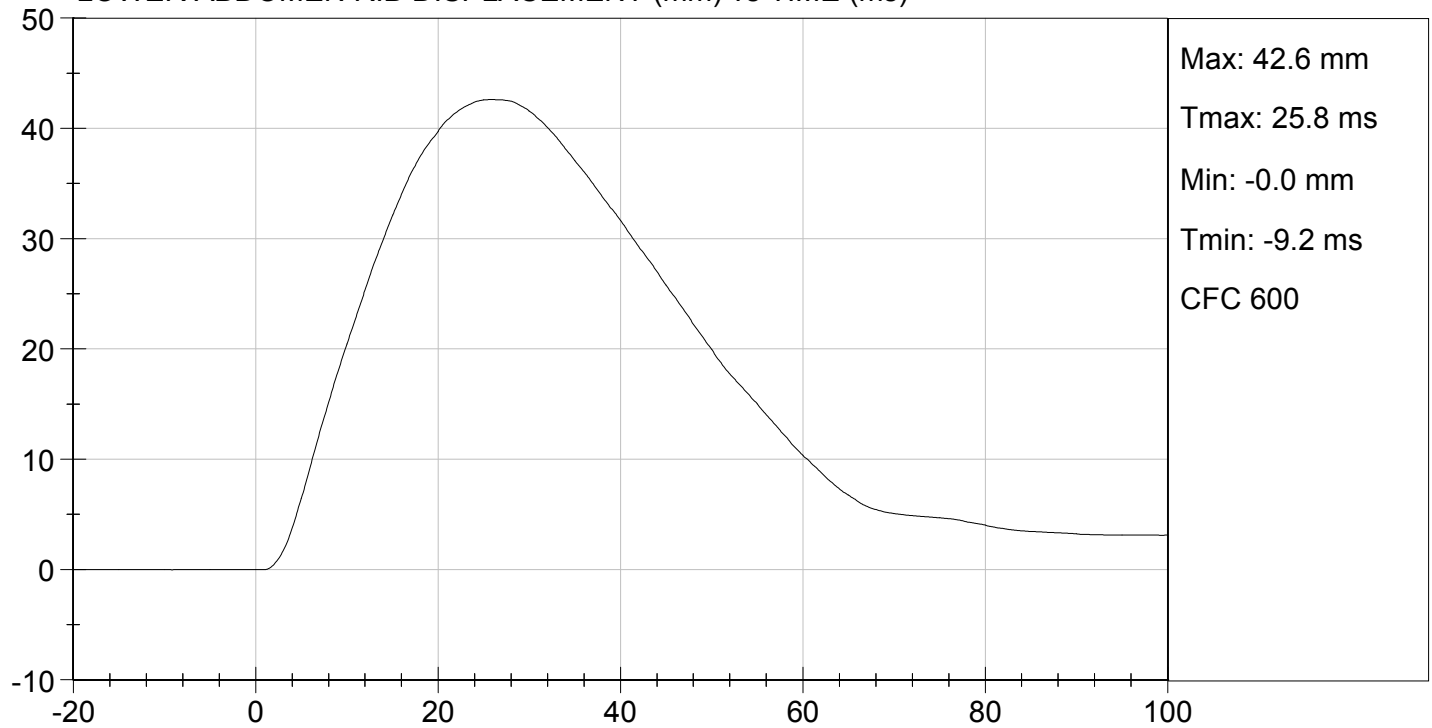




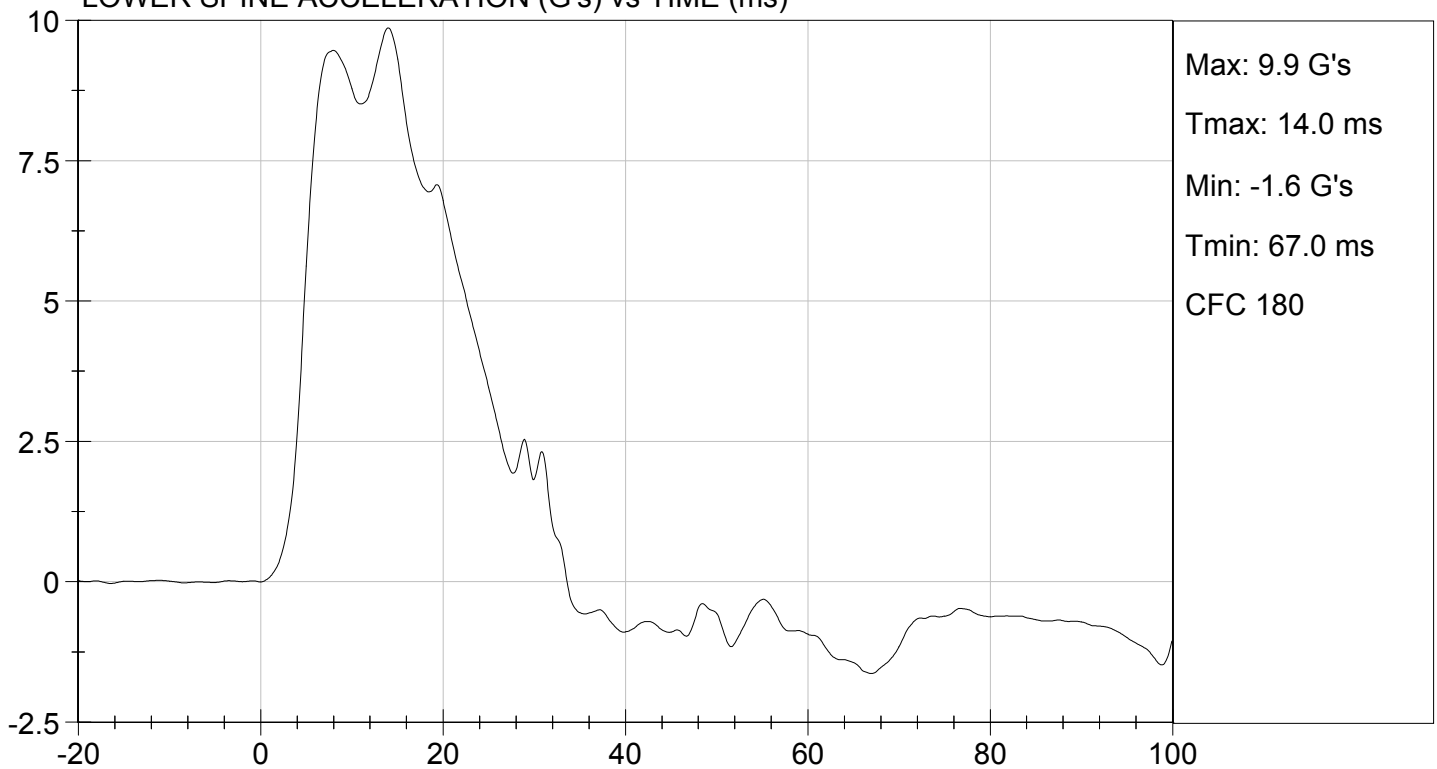
TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.77 ft/s, 4.20 m/s

TEST DATE: 02/25/2015
TEST #: D15576

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D15577

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	45	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	4,268	Pass
Overall Test Results				Pass

David Schoedel

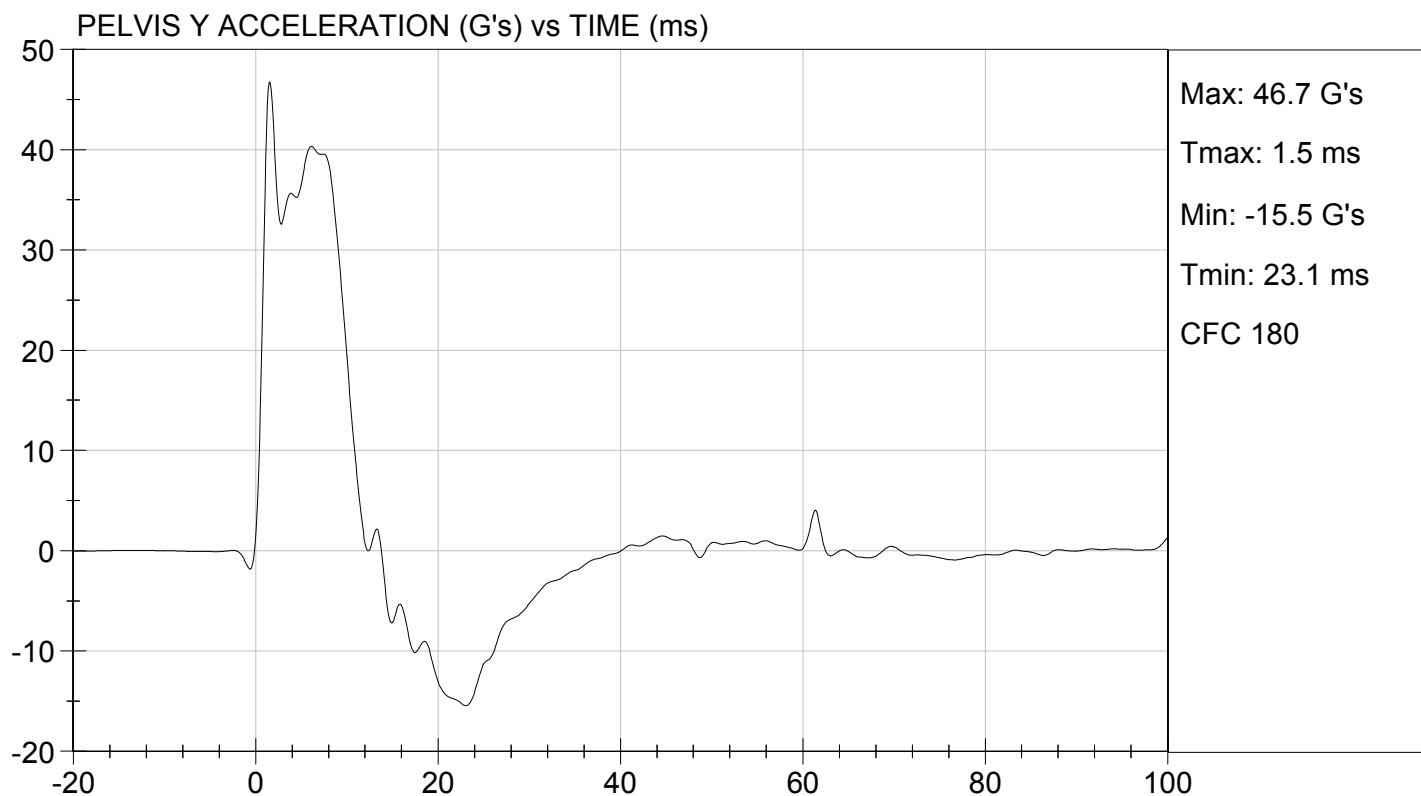
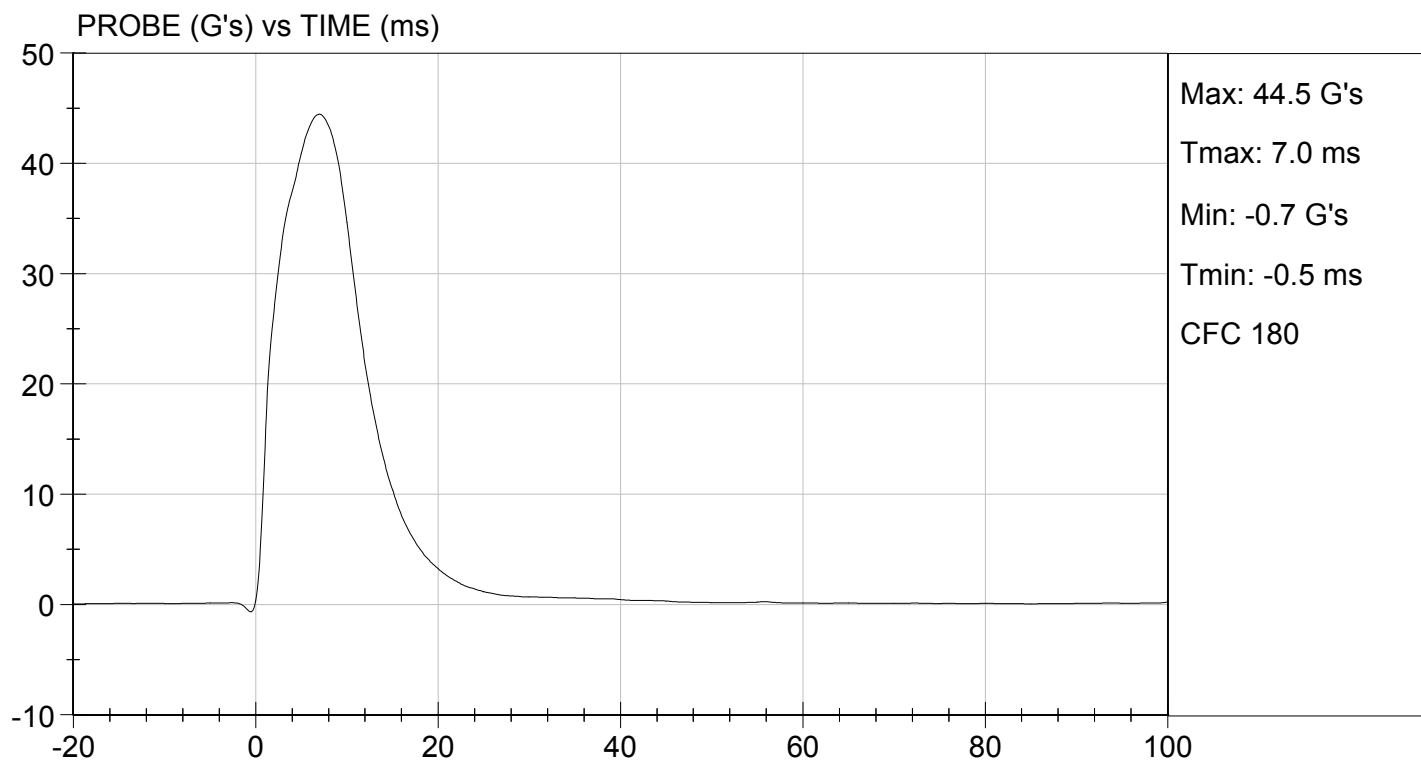
Laboratory Technician

02/25/2015

Test Date

Jessica Hall

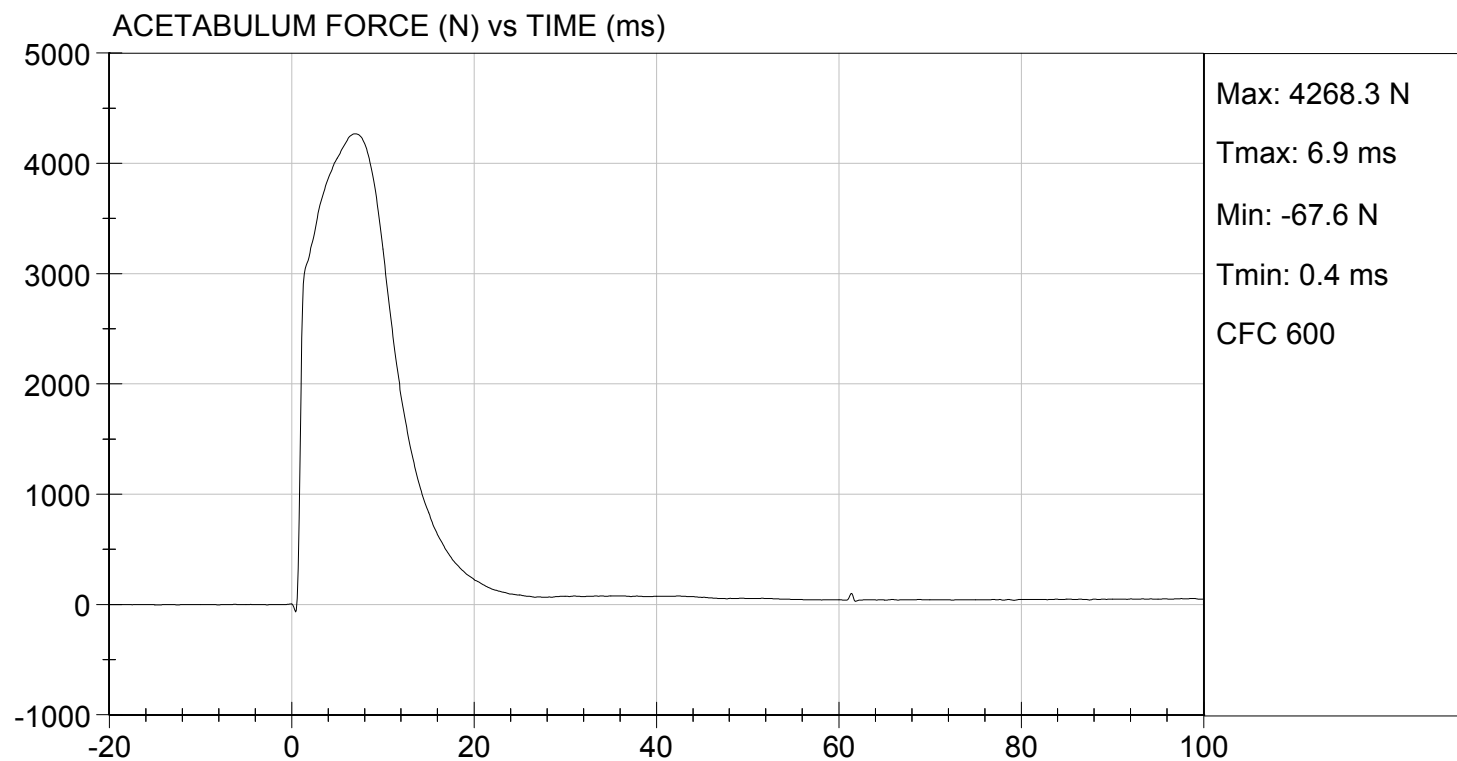
Approved By





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

TEST DATE: 02/25/2015
TEST #: D15577



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D15578

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	27	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	42	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,930	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

02/25/2015

Test Date

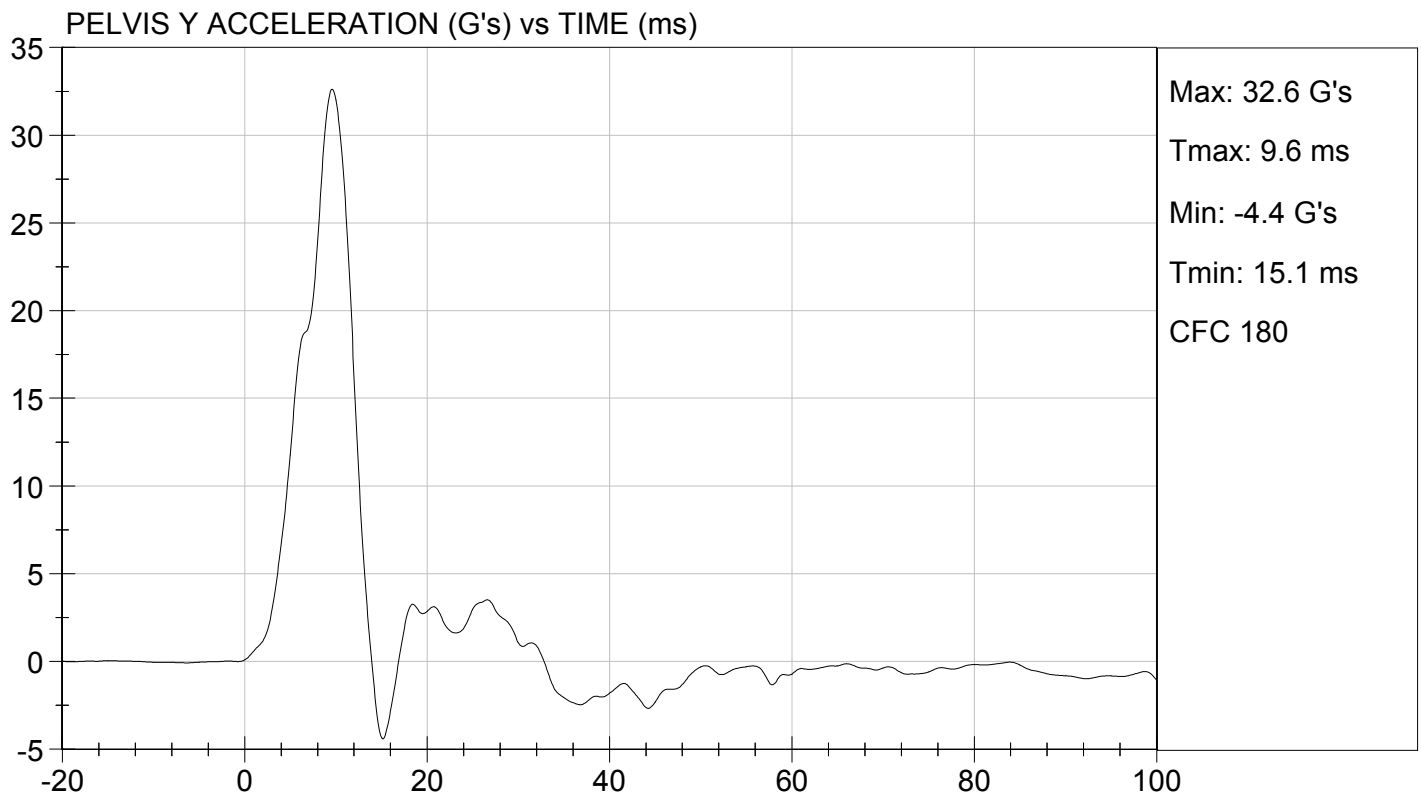
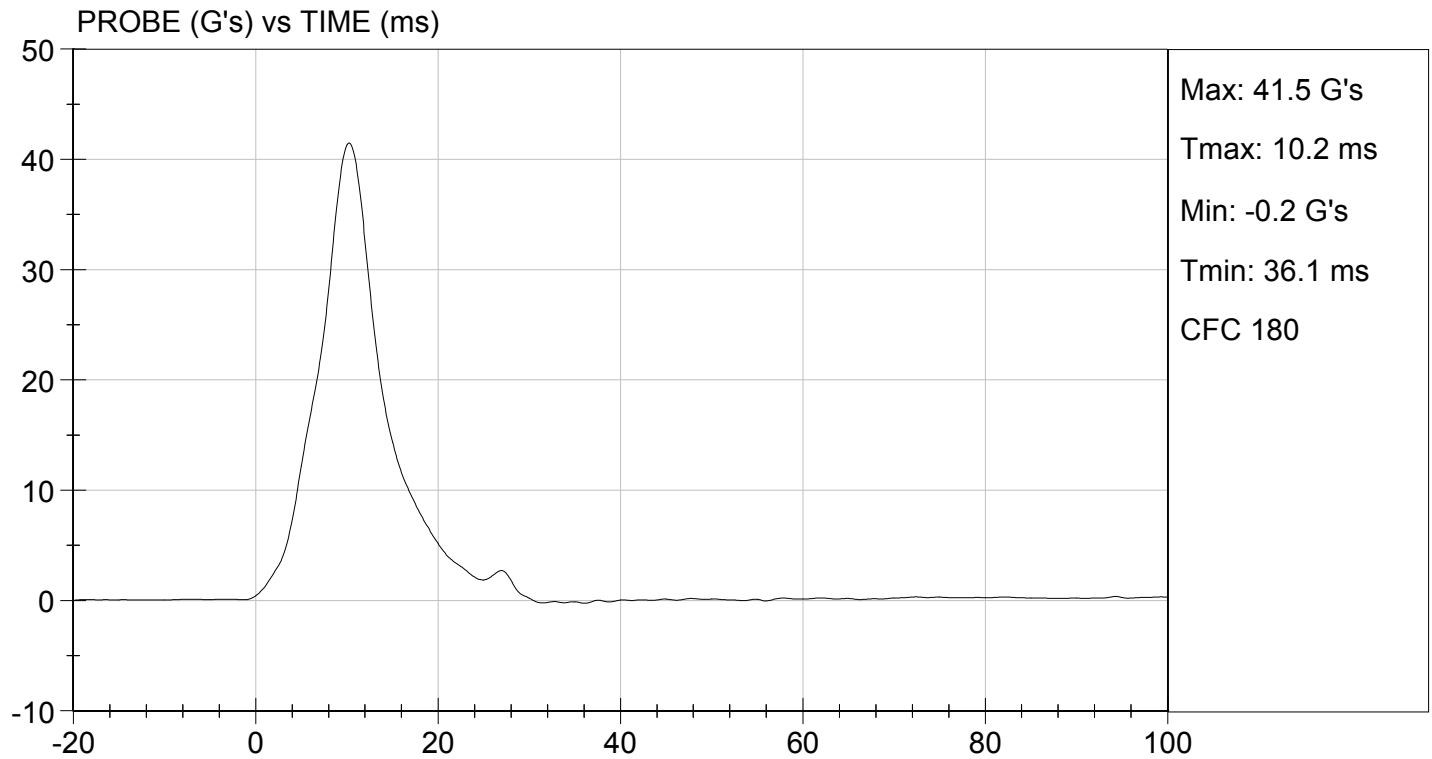
Jessica Hall

Approved By



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

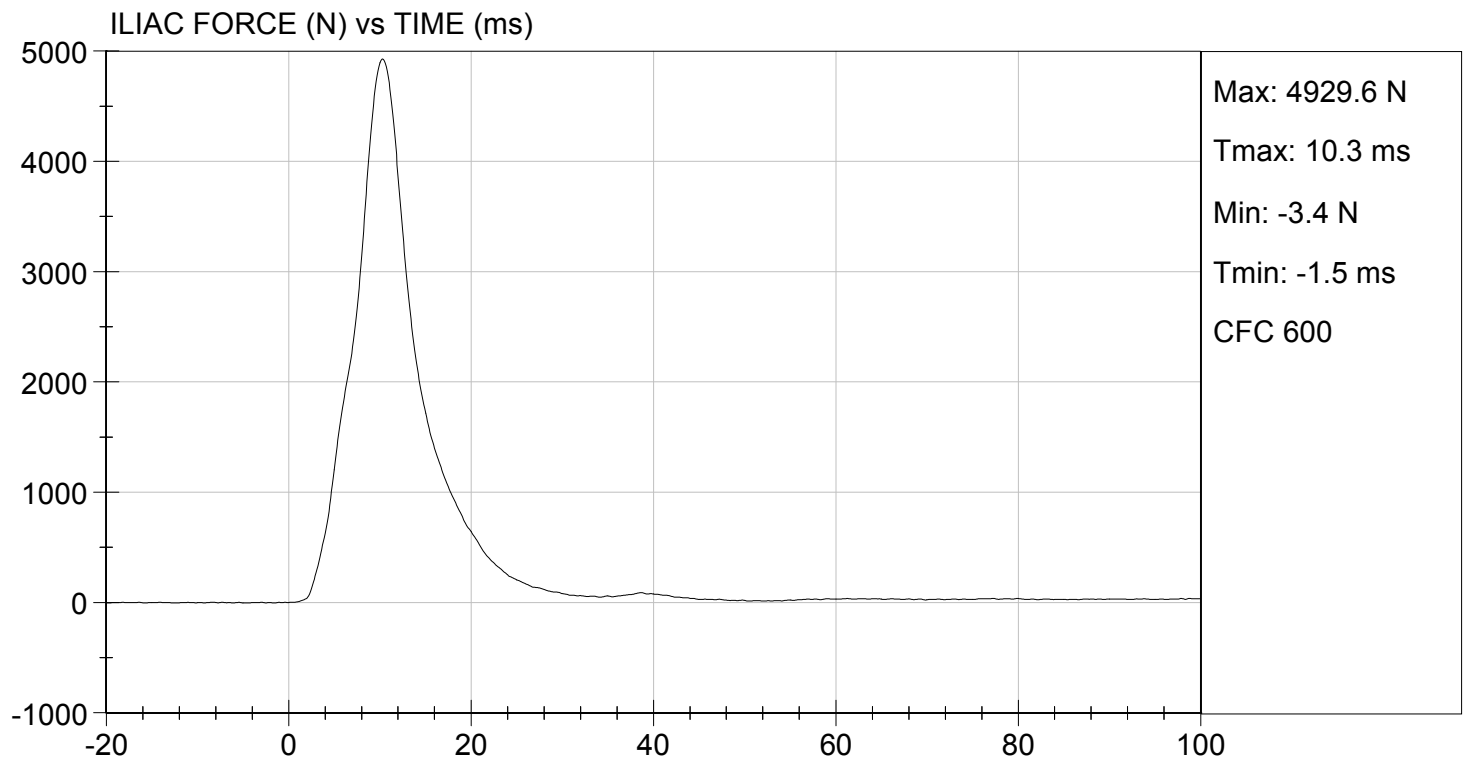
TEST DATE: 02/25/2015
TEST #: D15578



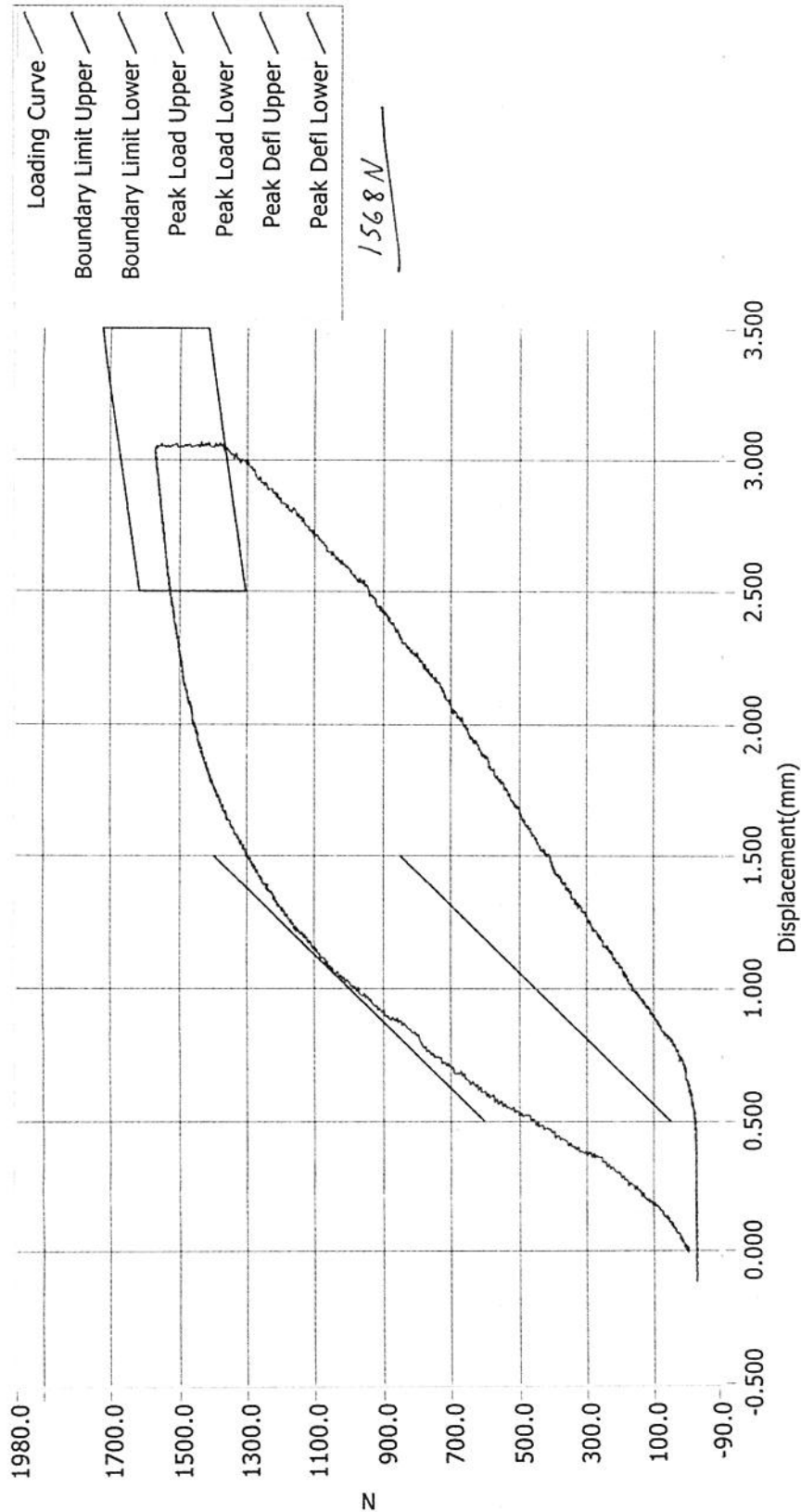


TEST DESC: ILLIAC
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 02/25/2015
TEST #: D15578



Resultant Data - SIDIIs Plug Compression



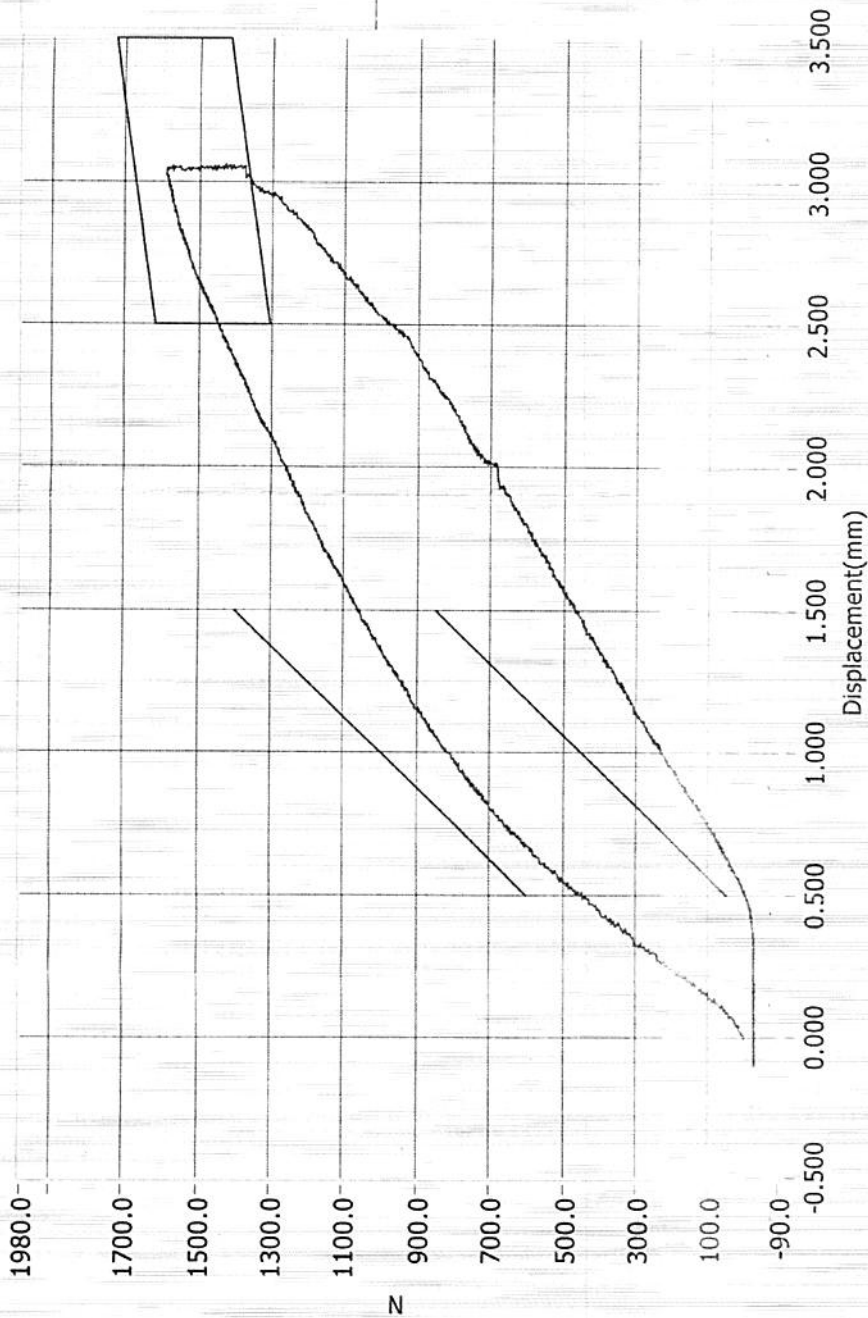
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	71264	12/19/2013	7:52 PM
Cert ID	ATD Serial Number	ATD Type	SIDIIs
	N/A		

Current Date : 12/19/2013

Current Time : 19:53:29

Resultant Data - SIDIIs Plug Compression



Loading Curve
 Boundary Limit Upper
 Boundary Limit Lower
 Peak Load Upper
 Peak Load Lower
 Peak Defl Upper
 Peak Defl Lower

ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	
	71377	12/19/2013	10:37 PM

Current Date : 12/19/2013 Current Time : 22:37:39

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	P84436	Endevco	01/28/15
		Y	P84439	Endevco	01/28/15
		Z	P84440	Endevco	01/28/15
		Xr	P84450	Endevco	01/28/15
		Yr	P84456	Endevco	01/28/15
		Zr	P84457	Endevco	01/28/15
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	01/30/15
	Middle	Y	G169	Honeywell	01/30/15
	Lower	Y	G164	Honeywell	01/30/15
Abdomen Load Cells	Forward	Y	ABG1513	Denton	12/15/14
	Middle	Y	ABG1531	Denton	12/15/14
	Rear	Y	ABG1536	Denton	12/15/14
Lower Spine Accelerometers (T12)		X	P79597	Endevco	01/07/15
		Y	P79598	Endevco	01/07/15
		Z	P79600	Endevco	01/07/15
Public Symphysis Load Cell		Y	PG462	Denton	12/15/14

Table 2 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N 296			
			Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers			X	P83220	Endevco	01/27/15
			Y	P83221	Endevco	01/27/15
			Z	P83222	Endevco	01/27/15
			Xr	P83223	Endevco	01/27/15
			Yr	P83224	Endevco	01/27/15
			Zr	P83225	Endevco	01/27/15
Displacement Potentiometers	Thoracic Rib	Upper	Y	G012	Servo	01/28/15
		Middle	Y	G1163	FTSS	01/28/15
		Lower	Y	G1158	FTSS	01/28/15
	Abdominal Rib	Upper	Y	G1146	FTSS	01/28/15
		Lower	Y	G1126	FTSS	01/28/15
Lower Spine Accelerometers (T12)			X	P86751	Endevco	01/22/15
			Y	P86752	Endevco	01/22/15
			Z	P86753	Endevco	01/22/15
Acetabulum Load Cell			Y	ACG268	Denton	01/06/15
Iliac Wing Load Cell			Y	IWG282	Denton	01/06/15
Pelvis Plug (struck side)				71264	FTSS	12/19/13
Pelvis Plug (non-struck side)				71377	FTSS	12/19/13

Table 3 – Vehicle Instrumentation

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P78751	Endevco	12/09/14
	Vehicle Center of Gravity	Y	P78753	Endevco	12/09/14
	Vehicle Center of Gravity	Z	P78752	Endevco	12/09/14
2	Right Sill at Front Seat	X	P85143	Endevco	09/18/14
	Right Sill at Front Seat	Y	P85145	Endevco	09/18/14
	Right Sill at Front Seat	Z	P85144	Endevco	09/18/14
3	Right Sill at Rear Seat	X	P77646	Endevco	01/23/15
	Right Sill at Rear Seat	Y	P77645	Endevco	01/23/15
	Right Sill at Rear Seat	Z	P77644	Endevco	01/23/15
4	Left Sill at Front Door	Y	P72794	Endevco	09/23/14
5	Left Sill at Rear Door	Y	P78945	Endevco	02/05/15
6	Left A-Post Lower	Y	P84448	Endevco	02/05/15
7	Left A-Post Middle	Y	P78817	Endevco	02/05/15
8	Left B-Post Lower	Y			
9	Left B-Post Middle	Y			
10	Front Seat Track	Y	P78863	Endevco	01/30/15
11	Rear Seat Track or Structure	Y	P59623	Endevco	02/05/15
12	Right Rear Occ. Compartment	Y	P66869	Endevco	10/31/14
13	Engine Block	X	P79863	Endevco	10/31/14
	Engine Block	Y	P79862	Endevco	10/31/14
14	Rear Floorpan Above Axle	X	P77640	Endevco	10/02/14
	Rear Floorpan Above Axle	Y	P77639	Endevco	10/02/14
	Rear Floorpan Above Axle	Z	P77641	Endevco	10/02/14

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P85036	Endevco	01/16/15
MDB Center of Gravity	Y	P85037	Endevco	01/16/15
MDB Center of Gravity	Z	P85038	Endevco	01/16/15
Left Frame at Rear Axle Centerline	X	P67517	Endevco	01/16/15
Left Frame at Rear Axle Centerline	Y	P67518	Endevco	01/16/15