

REPORT NUMBER: SINCAP-MGA-2015-037

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

**MITSUBISHI MOTORS (THAILAND) CO., LTD.
2015 Mitsubishi Mirage DE 5-Dr Hatchback
NHTSA No.: M20155602**

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



Test Date: December 2, 2014

Final Report Date: January 16, 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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Approved by: 
Ben Fischer, Project Engineer

Approval Date: January 16, 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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15. Supplementary Notes																																																							
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the 2015 Mitsubishi Mirage DE 5-Dr Hatchback in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side Laboratory Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on December 2, 2014. The impact velocity of the Moving Deformable Barrier (MDB) was 61.7 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 20.7° C. The target vehicle post-test maximum crush was 250 mm at level 2. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="4">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>168</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>25</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>1123</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>2309</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="4">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>275</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>79</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>4267</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>35</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>26</td> </tr> </tbody> </table>				Driver ATD (ES-2re)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	168	Maximum Thorax Rib Deflection	mm	44	25	Total Abdominal Force	N	2500	1123	Pubic Symphysis Force	N	6000	2309	Passenger ATD (SID-IIs)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	275	Resultant Lower Spine Acceleration	Gs	82	79	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4267	Maximum Thoracic Rib Deflection	mm	38*	35	Maximum Abdomen Rib Deflection	mm	45*	26
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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 Mitsubishi Mirage DE 5-Dr Hatchback. 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 Mitsubishi Mirage DE 5-Dr Hatchback was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.7 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 December 2, 2014. 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	168
Maximum Thorax Rib Deflection	mm	44	25
Total Abdominal Force	N	2500	1123
Pubic Symphysis Force	N	6000	2309

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	275
Resultant Lower Spine Acceleration	Gs	82	79
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4267
Maximum Thoracic Rib Deflection	mm	38*	35
Maximum Abdomen Rib Deflection	mm	45*	26

*Proposed IARV

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

GENERAL COMMENTS

Left Lower B-Post Y has no valid data after 7 ms.
Left Mid B-Post Y has no valid data after 20 ms.
Driver Seat Track Y has no valid data after 26 ms.
Left Rear Seat Y has questionable data from 4-14 ms.

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 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20155602	Traction Control System (TCS)	Yes
Model Year	2015	Auto-Leveling System	No
Make	Mitsubishi	Automatic Door Locks (ADL)	No
Model	Mirage	Power Window Auto-Reverse	Yes
Body Style	5-Dr Hatchback	Other Optional Feature	N/A
VIN	ML32A3HJ7FH002314	Driver Front Airbag	Yes
Body Color	Infrared	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	117 / 73	Driver Head/Torso Airbag	No
Engine Displacement (L)	1.2	Driver Torso Airbag	No
Type/No. Cylinders	3	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Manual	Driver Knee Airbag	Yes
Transmission Speeds	5	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Restraint Feature	N/A

Does owner's manual provide instruction to turn off automatic door locks?	N/A
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DATA FROM CERTIFICATION LABEL

Manufactured By	Mitsubishi Motors (Thailand) Co., Ltd.	GVWR (kg)	2910
Date of Manufacture	MAY 2014	GAWR Front (kg)	1609
Vehicle Type	Passenger Car	GAWR Rear (kg)	1477

VEHICLE SEATING AND WEIGHT CAPACITY DATA

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

VEHICLE SEAT TYPE

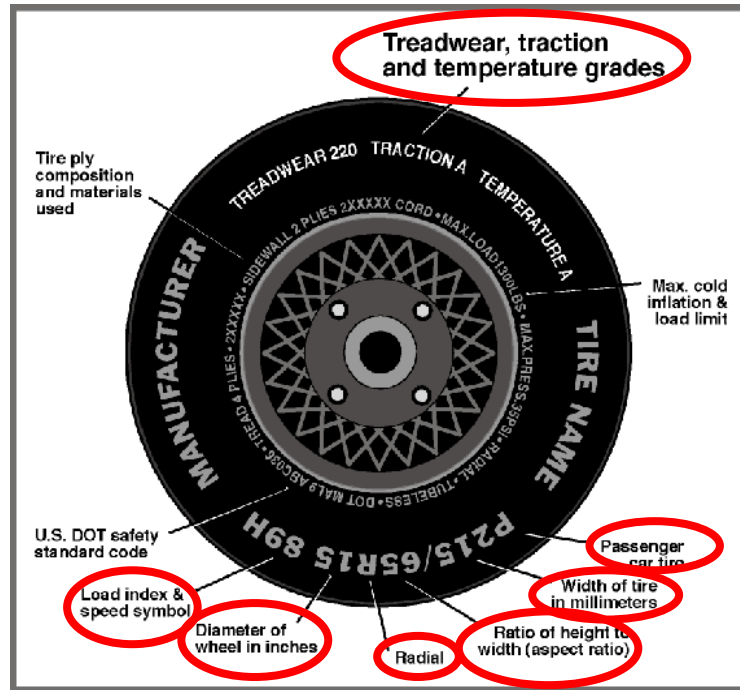
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X					w/lever	
Rear or Second Row		X			X		
Third Row Seat							

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	165/65R14	165/65R14
Tire Size on Vehicle	165/65R14	165/65R14
Tire Manufacturer	Dunlop	Dunlop
Tire Model	Enasave 01 A/S	Enasave 01 A/S
Treadwear	340	340
Traction	A	A
Temperature Grade	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	79S	79S
Tire Material	Rubber	Rubber
DOT Safety Code Left	R8CX 2MMR 4813	R8CX 2MMR 4813
DOT Safety Code Right	R8CX 2MMR 4813	R8CX 2MMR 4813

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	231	234	231	234
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

MDB TIRE SPECIFICATIONS

	Requirement	Units	LF	RF	LR	RR
Tire Size	P205/75R15	N/A	P205/75R15	P205/75R15	P205/75R15	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	271.5	190.5		310.0	255.5		307.0	268.0	
Right	kg	274.5	175.5		291.5	212.0		285.0	215.5	
Ratio	%	59.9	40.1		56.3	43.7		55.0	45.0	
Totals	kg	546.0	366.0	912.0	601.5	467.5	1069.0	592.0	483.5	1075.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	912.0	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	35	(C)
Calculated Test Vehicle Target Weight (TVTW)	kg	1076.3	(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	607	609	Yes
Right Front	mm	630	622	Yes
Right Rear	mm	592	597	Yes
Left Rear	mm	573	583	Yes
Vehicle CG (Aft of Front Axle)	mm	1101	1071	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	49	41	

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

Test height adjustable suspension setting, if applicable:

Not Applicable

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

Test Vehicle:	<u>2015 Mitsubishi Mirage DE 5-Dr Hatchback</u>	NHTSA No.	<u>M20155602</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>12/2/2014</u>

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Weight of Ballast, if any	0.0
Left taillight, front bumper cover, rear bumper cover.	8.6

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear- most	Mid- 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			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

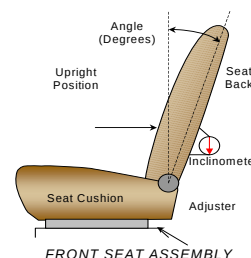
NHTSA No. M20155602
 Test Date: 12/2/2014

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	230	24 (1 st as 1)	120	12 th (1 st as 0)
Front Passenger Seat	230	24 (1 st as 1)	120	12 th (1 st as 0)
Front Center Seat				
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	63.4	34 (1 st as 1)	0.1	4 th (1 st as 0)
Front Passenger Seat	59.6	33 (1 st as 1)	-0.6	4 th (1 st as 0)
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

Seat back angles measured on headrest post.

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014

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)	0 th (uppermost as 0)
Rear Seat	Fixed	Not Applicable

HEAD RESTRAINT ADJUSTMENT

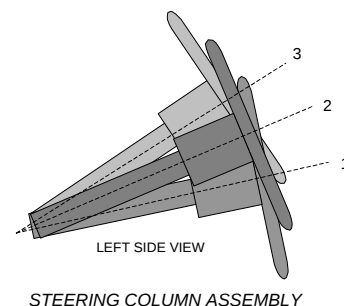
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	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.

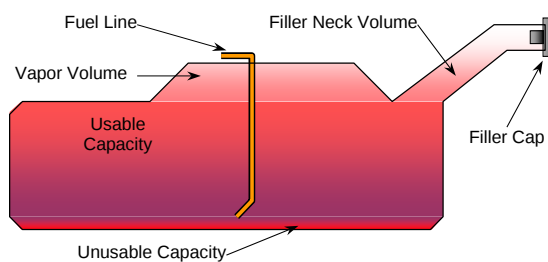
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	67.6	
Geometric Center, Position 2	65.9	
Uppermost, Position 3	64.2	
Telescoping Steering Wheel Travel		
Test Position	65.9	



FUEL PUMP

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

The vehicle is equipped with an electric fuel pump. The electric fuel pump operates when the engine is running. The fuel pipe is on the left side.



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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
Test Date: 12/2/2014

FUEL TANK CAPACITY DATA

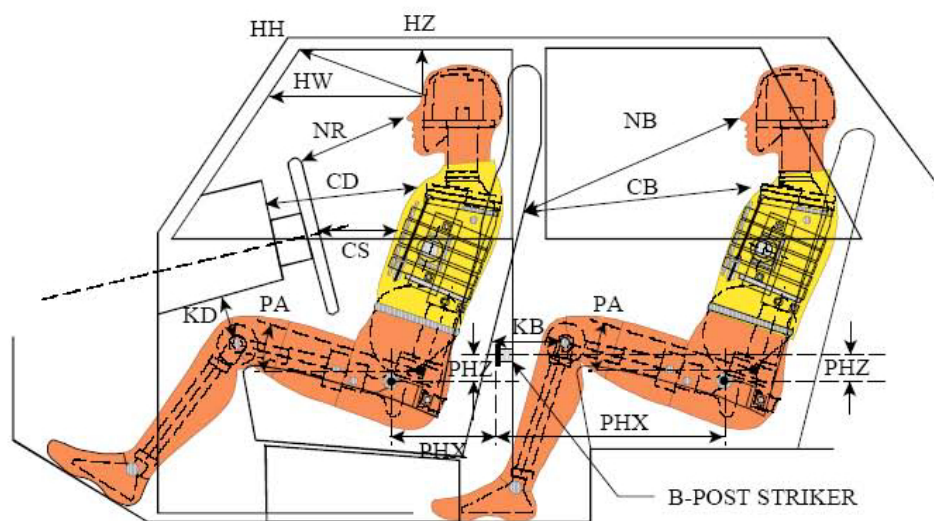
	Liters
Usable Capacity of "Standard" Tank (see Form No. 1)	34.8
Usable Capacity of "Optional" Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	35.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	32.4
Actual Amount of Solvent Used	32.4
1/3 of Usable Capacity	11.6

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 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
Test Date: 12/2/2014



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

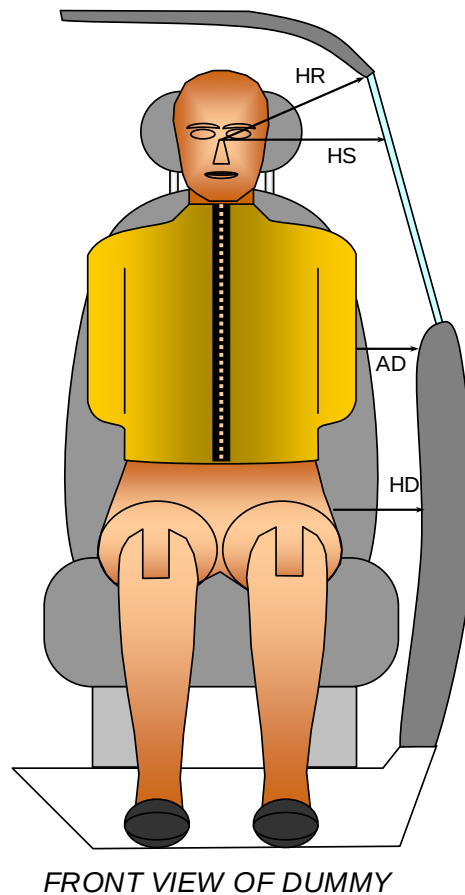
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	343	14.1		
HW		Head to Windshield	549			
HZ	HZ	Head to Roof Liner	153		251	
NR	NB	Nose to Rim/Seat Back	413	16.8	536	14.9
CD	CB	Chest to Dashboard/Seat Back	539	1.9	553	11.1
CS		Chest to Steering Wheel	341	13.2		
KDL	KBL	Left Knee to Dash/Seat Back	154	16.9	263	15.2
KDR	KBR	Right Knee to Dash/Seat Back	172	24.4	265	16.3
PAX	PAX	Pelvic Tilt Angle X		17.1		21.9
	PAY	Pelvic Tilt Angle Y		-1.0		-1.1
PHX	PHX	Hip Point to Striker (X-Axis)	199		198	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	144		203	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014



FRONT VIEW OF DUMMY

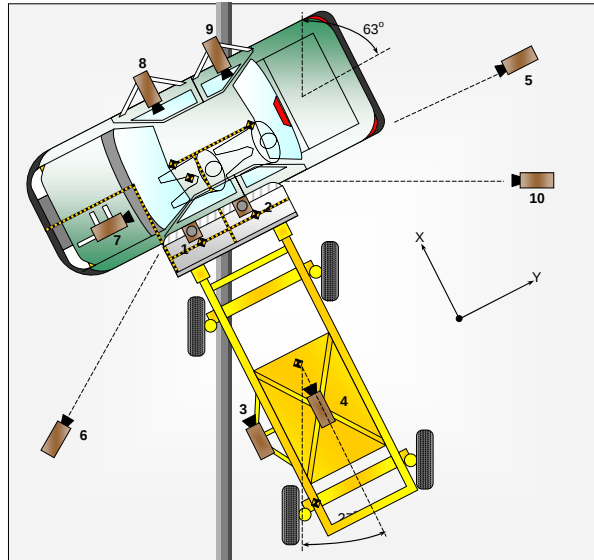
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	197	206
HS	Head to Side Window	mm	328	333
AD	Arm to Door	mm	89	144
HD	Hip Point to Door	mm	124	162

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
Test Date: 12/2/2014



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	-170	200	-5050	14	1000
2	Overhead Close-Up	110	80	-5050	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	90	4840	-1120	24	1000
6	Left Front	4130	-4230	-1160	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

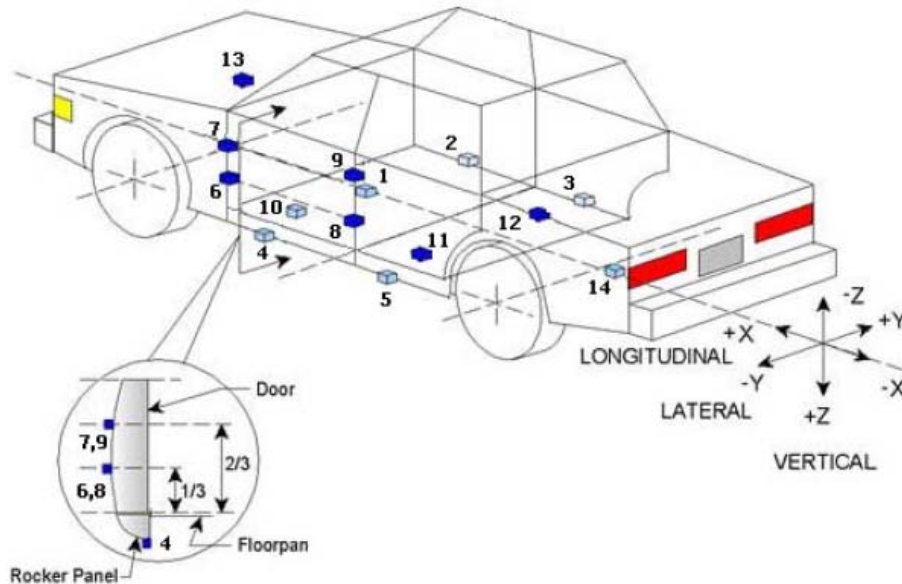
INSTRUMENTATION

	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 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
Test Date: 12/2/2014



TEST VEHICLE ACCELEROMETER LOCATIONS

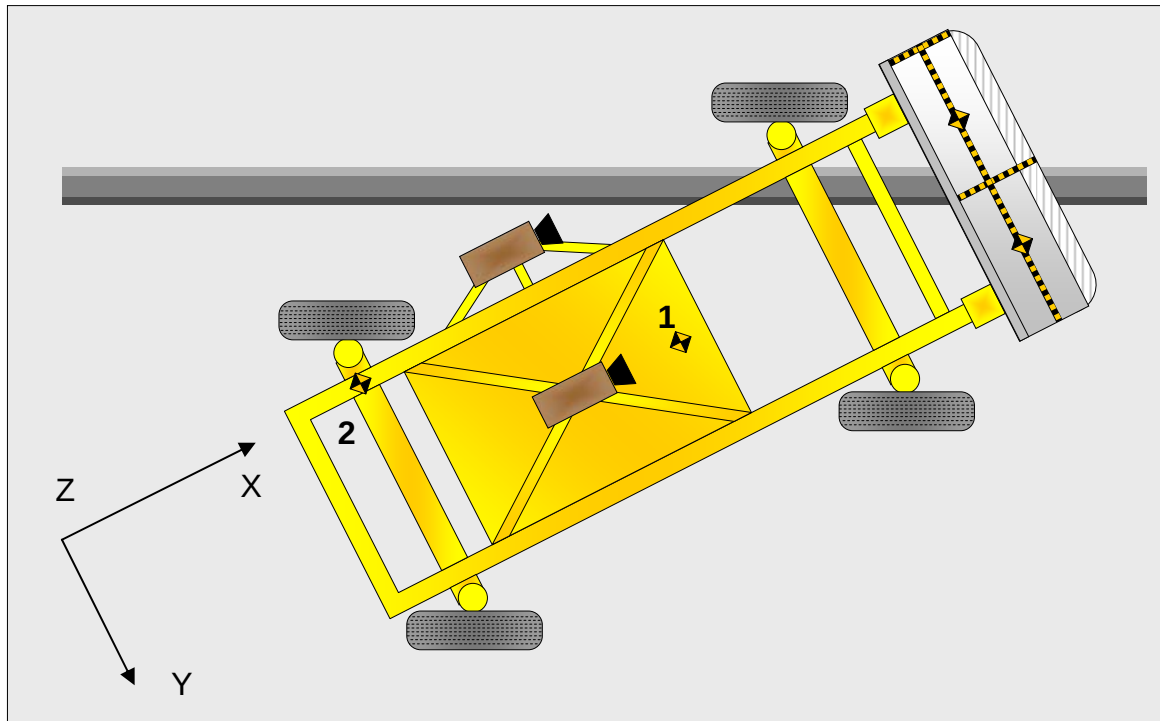
Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2060	135	-229
2	Right Sill at Front Seat	1788	670	-202
3	Right Sill at Rear Seat	898	665	-205
4	Left Sill at Front Door	2076	-665	-196
5	Left Sill at Rear Door	1121	-665	-204
6	Left Lower A-Post	2523	-754	-521
7	Left Middle A-Post	2545	-732	-858
8	Left Lower B-Post	1607	-658	-558
9	Left Middle B-Post	1544	-656	-789
10	Front Seat Track	1637	-310	-262
11	Rear Seat Structure	1246	-325	-290
12	Rt. Rear Occ. Compartment	1340	339	-263
13	Engine Block	3078	170	-785
14	Rear Above Axle	701	0	-488

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 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014



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 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
Test Date: 12/2/2014

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	Headliner	Curtain Airbag, Headliner
Left Side of Head	Curtain Airbag, Headliner	Curtain Airbag, Headliner
Back of Head	Curtain Airbag, Headliner, Headrest	Seatback
Left Shoulder	None	Curtain Airbag, Door Panel
Upper Torso	Side Airbag	None
Lower Torso	Side Airbag, Seatback	Door Panel
Left Hip	Side Airbag	Door Panel, Seatpan
Left Knee	Door Panel	Door Panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	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 and Left Rear Windows Broken
Other Notable Effects	None

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
Test Date: 12/2/2014

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2450
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		285
Actual Impact Point (Aft of Front Axle)	mm		283
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	+2
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	+6

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
Test Date: 12/2/2014

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	61.7
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.9
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.9
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27.0

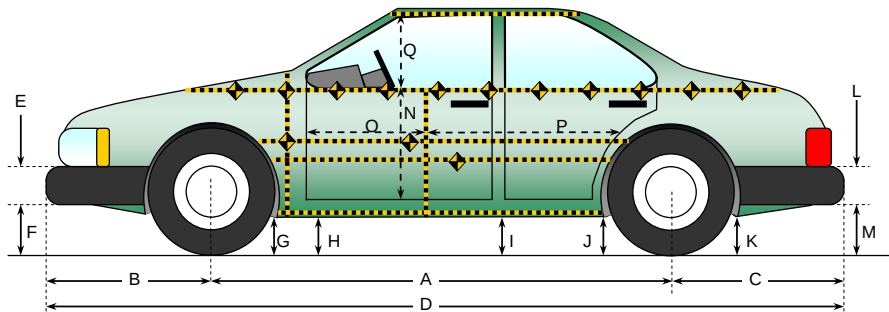
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	94
B	Top of Bumper	533	800	Left	55
C	Mid-Level	686	800	Left	78
D	Top of Stack	813	800	Left	127

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014



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

LEFT SIDE VIEW

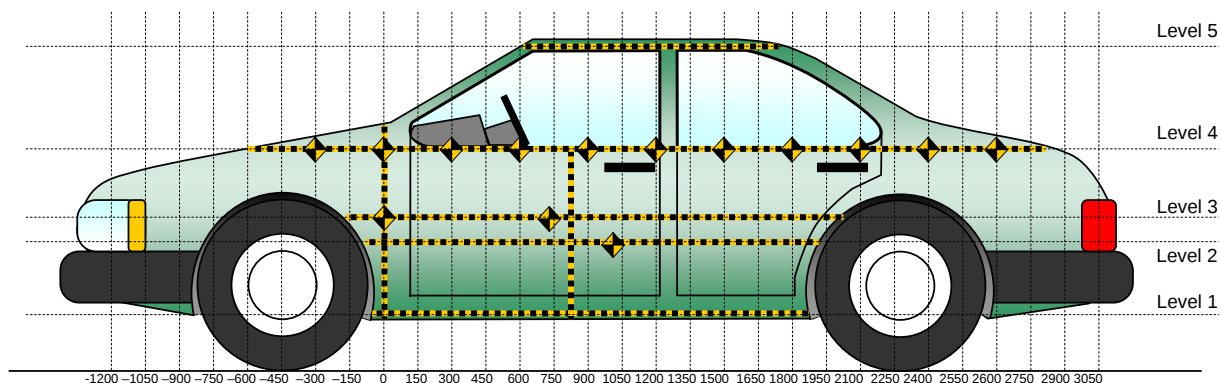
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2450	2455	-5
B	Front Axle to FSOV	711	709	2
C	Rear Axle to RSOV	547	547	0
D	Total Length at Centerline	3708	3711	-3
E	Front Bumper Thickness	100	100	0
F	Front Bumper Bottom to Ground	233	240	-7
G	Sill Height at Front Wheel Well	173	207	-34
H	Sill Height at Front Door Leading Edge	174	208	-34
I	Sill Height at B Pillar	169	225	-56
J1	Sill Height at Rear Wheel Well	166	223	-57
J2	Pinch Weld Height at Rear Wheel Well	168	230	-62
K	Sill Height Aft of Rear Wheel Well	533	548	-15
L	Rear Bumper Thickness	80	80	0
M	Rear Bumper Bottom to Ground	286	290	-4
N	Sill Height to Window Bottom Sill	710	544	166
O	Front Door Leading Edge to Impact CL	741	703	38
P	Rear Door Trailing Edge to Impact CL	1109	972	137
Q	Front Window Opening	410	410	0
R	Right Side Length	2946	2946	0
S	Left Side Length	2946	2894	52
T	Vehicle Width at B Post	1646	1446	200

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014



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	245	97	1350
2	Occupant Hip Point	577	250	900
3	Mid Door	600	242	900
4	Window Sill	887	202	750
5	Window Top	1375	28	1800

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 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014

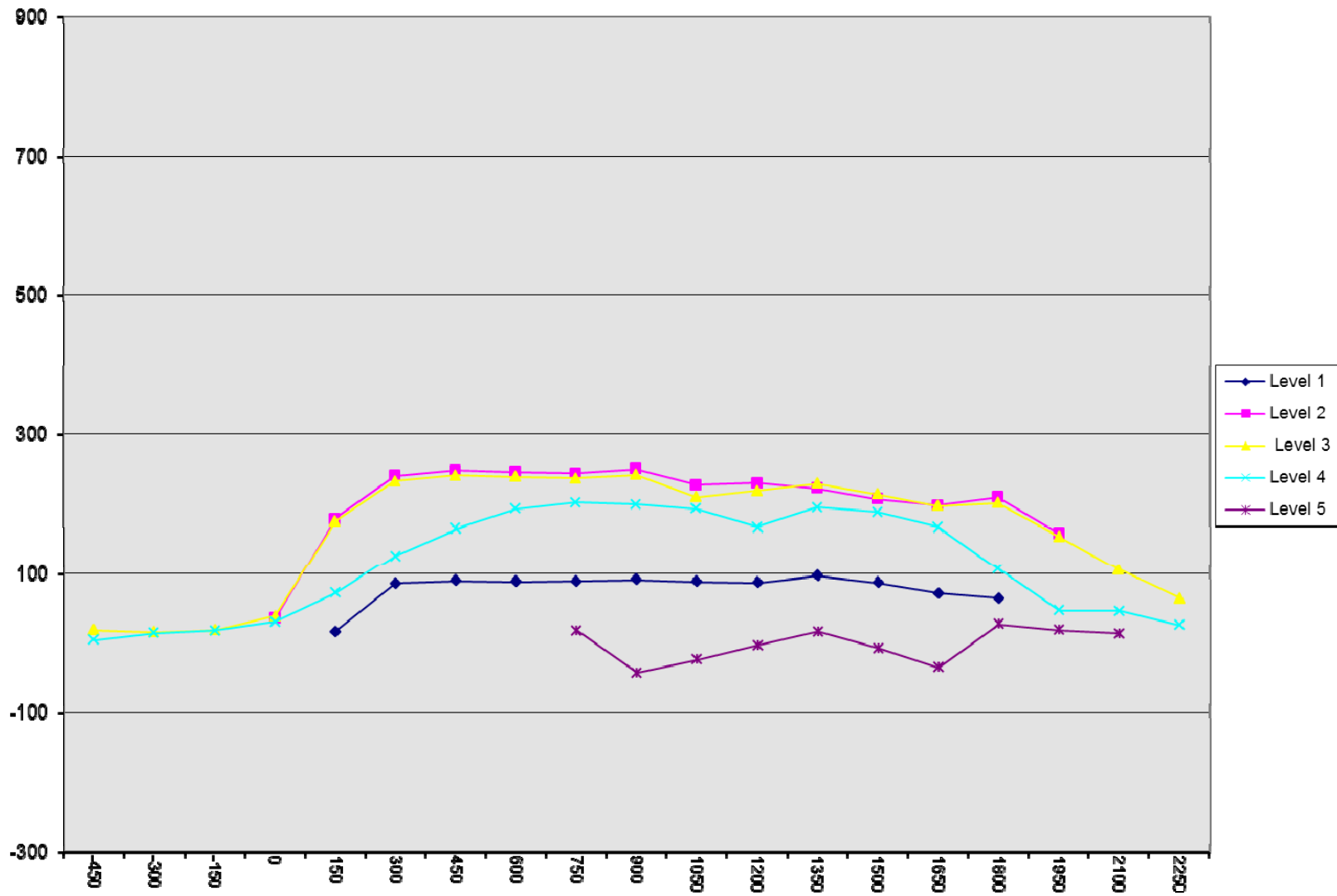
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-450			275	377				295	383				20	6	
-300			270	350				287	366				17	16	
-150			268	339				288	358				20	19	
0		273	275	332			310	315	364			37	40	32	
150	314	284	284	327		332	462	459	400		18	178	175	73	
300	316	282	281	321		402	522	514	448		86	240	233	127	
450	317	280	279	315		407	528	520	480		90	248	241	165	
600	318	279	278	309		406	525	517	502		88	246	239	193	
750	318	277	276	301	490	407	521	513	503	508	89	244	237	202	19
900	319	277	276	297	489	410	527	518	496	448	91	250	242	199	-41
1050	322	278	276	295	493	410	505	486	488	471	88	227	210	193	-22
1200	324	280	278	293	497	411	510	497	460	495	87	230	219	167	-2
1350	326	284	281	293	503	423	511	510	488	521	97	222	229	195	18
1500	330	288	286	298	511	417	495	500	486	505	87	207	214	188	-6
1650	333	292	290	305	522	405	490	487	472	489	72	198	197	167	-33
1800	335	287	289	313	533	400	497	490	420	561	65	210	201	107	28
1950		281	280	320	549		439	434	368	569		158	154	48	20
2100			284	327	567			390	374	582			106	47	15
2250			289	336				354	363				65	27	

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 Mitsubishi Mirage DE 5-Dr Hatchback
Test Program: NCAP Side MDB Impact Test

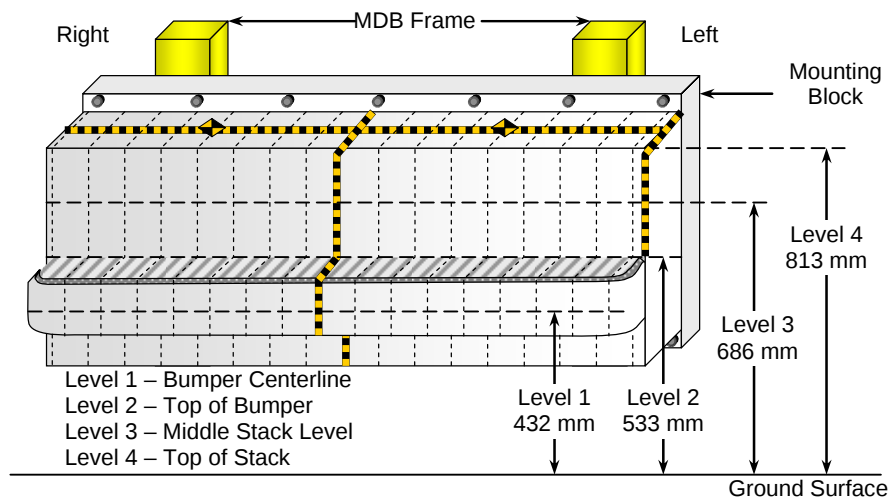
NHTSA No. M20155602
Test Date: 12/2/2014



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014



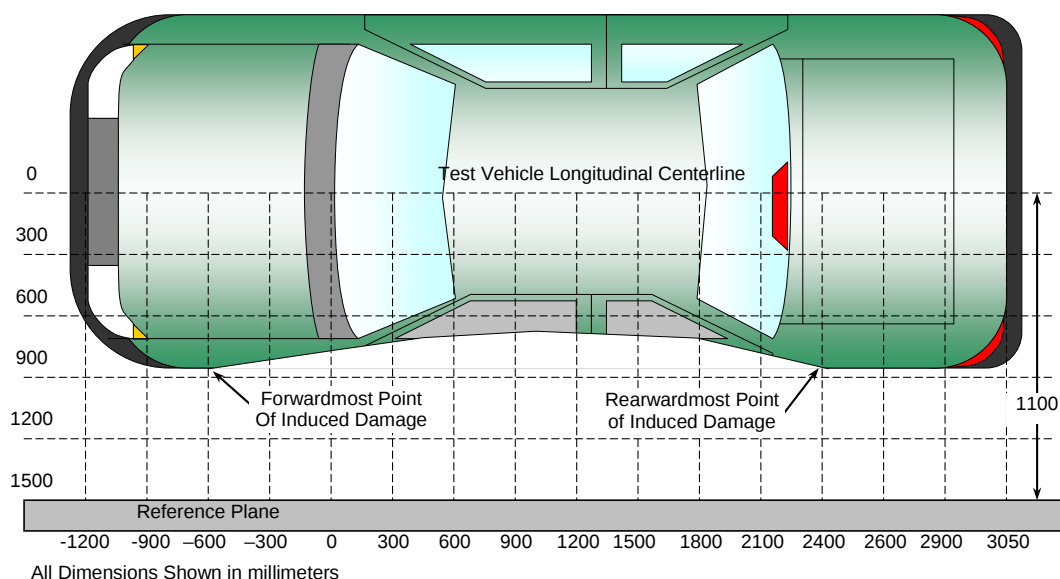
DEFORMABLE BARRIER STATIC CRUSH

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	-3	-6	-10	-8	2	25	60	30	15	8	7	9	12	22	44	74	127
3	-8	-12	-9	-5	0	3	23	32	12	4	4	6	8	10	13	23	78
2	32	32	33	33	32	30	28	28	25	31	39	42	42	43	46	51	55
1	60	68	67	67	70	73	75	73	71	69	69	69	70	72	76	90	94

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014



TOP VIEW

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2100	3	284	390	106
2	1680	3	290	487	197
3	1260	3	279	501	222
4	840	3	276	522	246
5	420	3	280	522	242
6	0	3	275	315	40

MDB DAMAGE PROFILE DISTANCES

DPD	Distance from Center of MDB	Level	Post-Test (mm)
1	800 mm right of center	1	60
2	480 mm right of center	1	67
3	160 mm right of center	1	74
4	160 mm left of center	1	69
5	480 mm left of center	1	72
6	800 mm left of center	1	94

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

Test Vehicle: 2015 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

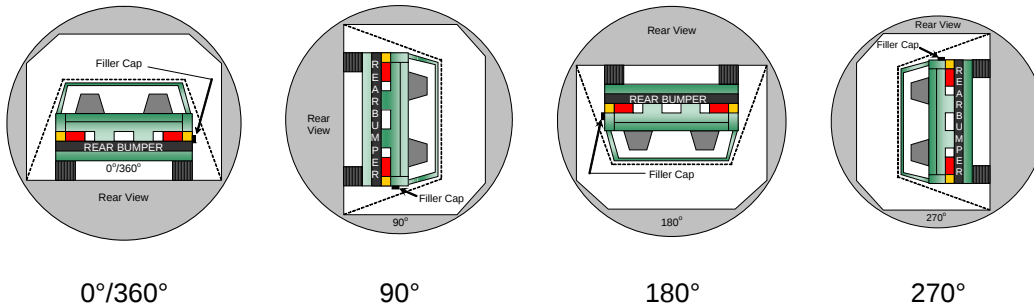
NHTSA No. M20155602
 Test Date: 12/2/2014

Test Time: 1:52 pm

Temperature: 20.7° 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°	111	300	411
90° to 180°	112	300	412
180° to 270°	106	300	406
270° to 360°	112	300	412

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

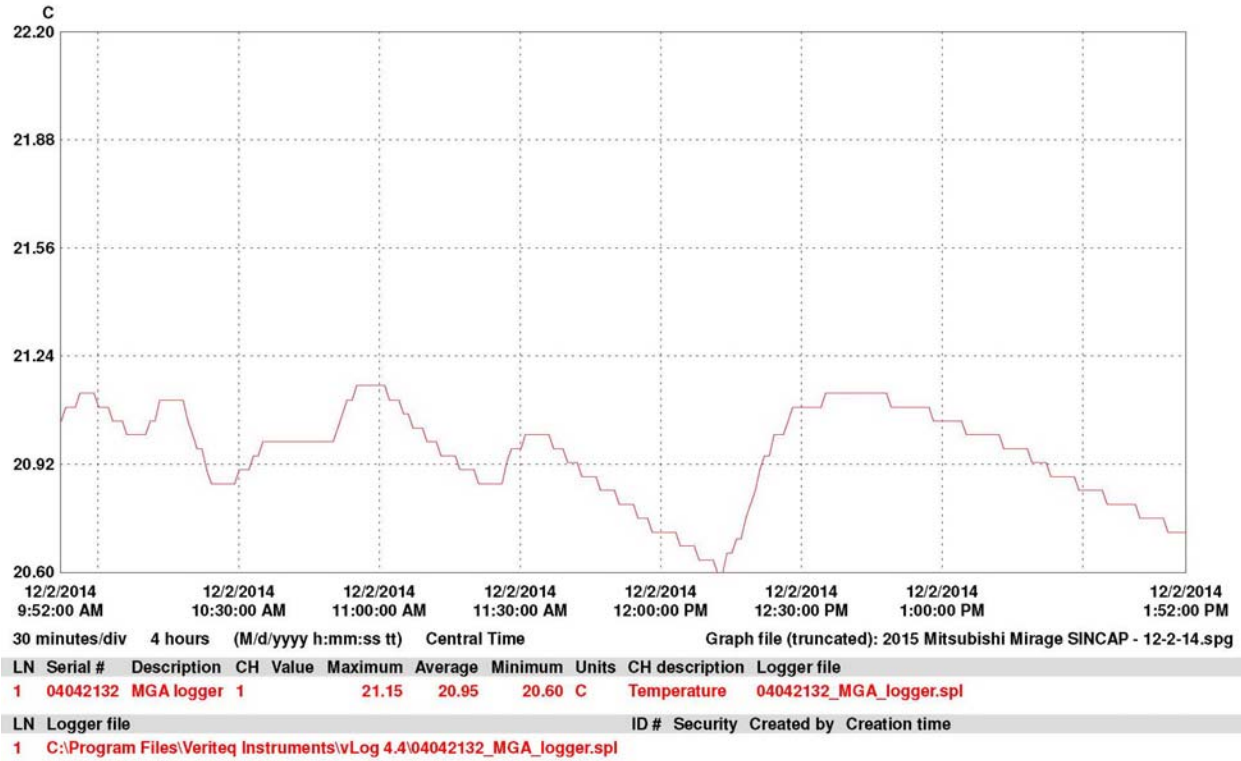
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Mitsubishi Mirage DE 5-Dr Hatchback
 Test Program: NCAP Side MDB Impact Test

NHTSA No. M20155602
 Test Date: 12/2/2014



**APPENDIX A
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As Delivered Right Front Three-Quarter View of Test Vehicle



As Delivered Left Rear Three-Quarter View of Test Vehicle



Pre-Test Frontal View of Test Vehicle



Post-Test Frontal View of Test Vehicle



Pre-Test Left Front Three-Quarter View of Test Vehicle



Post-Test Left Front Three-Quarter View of Test Vehicle



Pre-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Pre-Test Left Three-Quarter Rear View of Test Vehicle



Post-Test Left Three-Quarter Rear View of Test Vehicle



Pre-Test Rear View of Test Vehicle



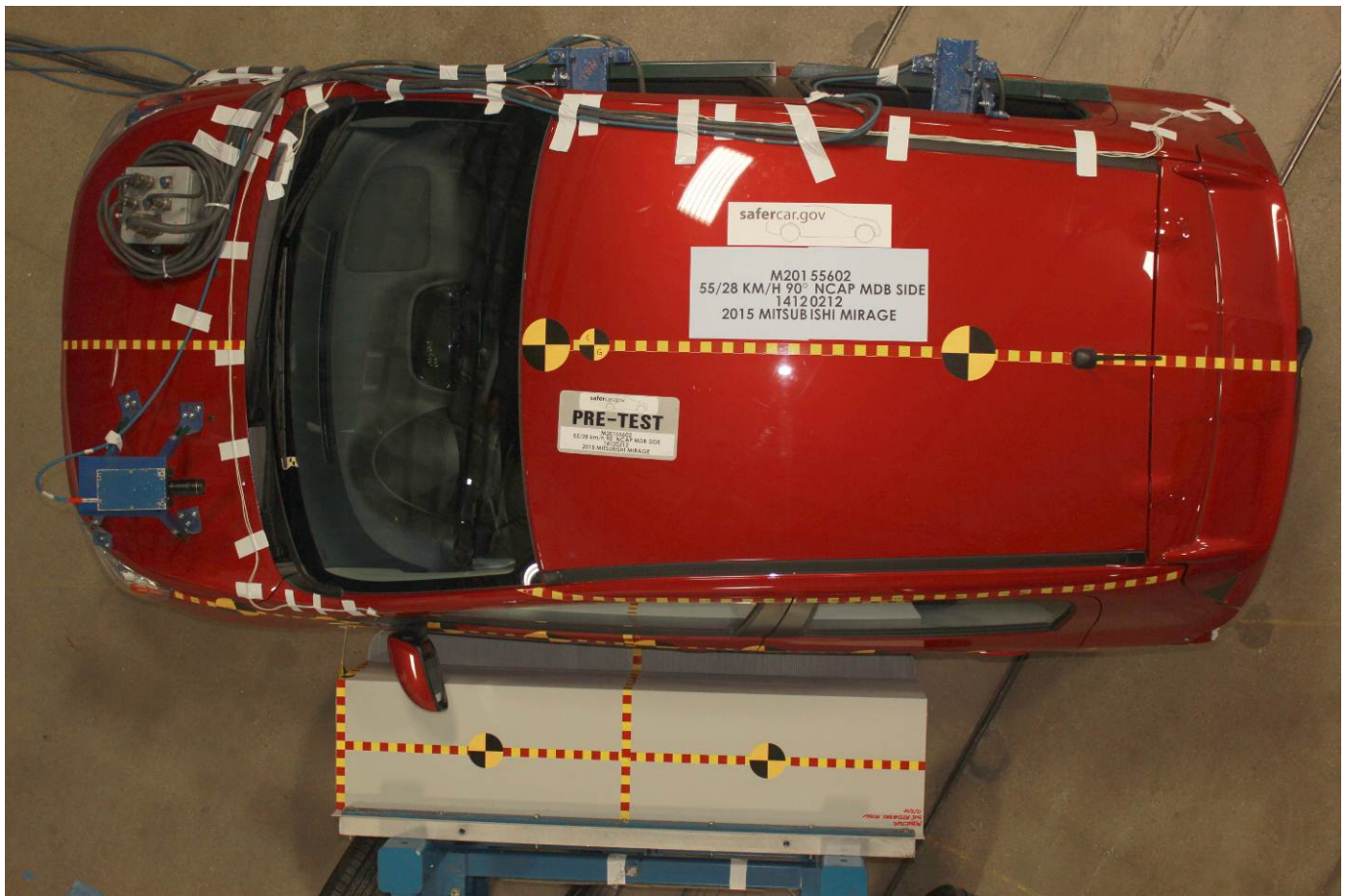
Post-Test Rear View of Test Vehicle



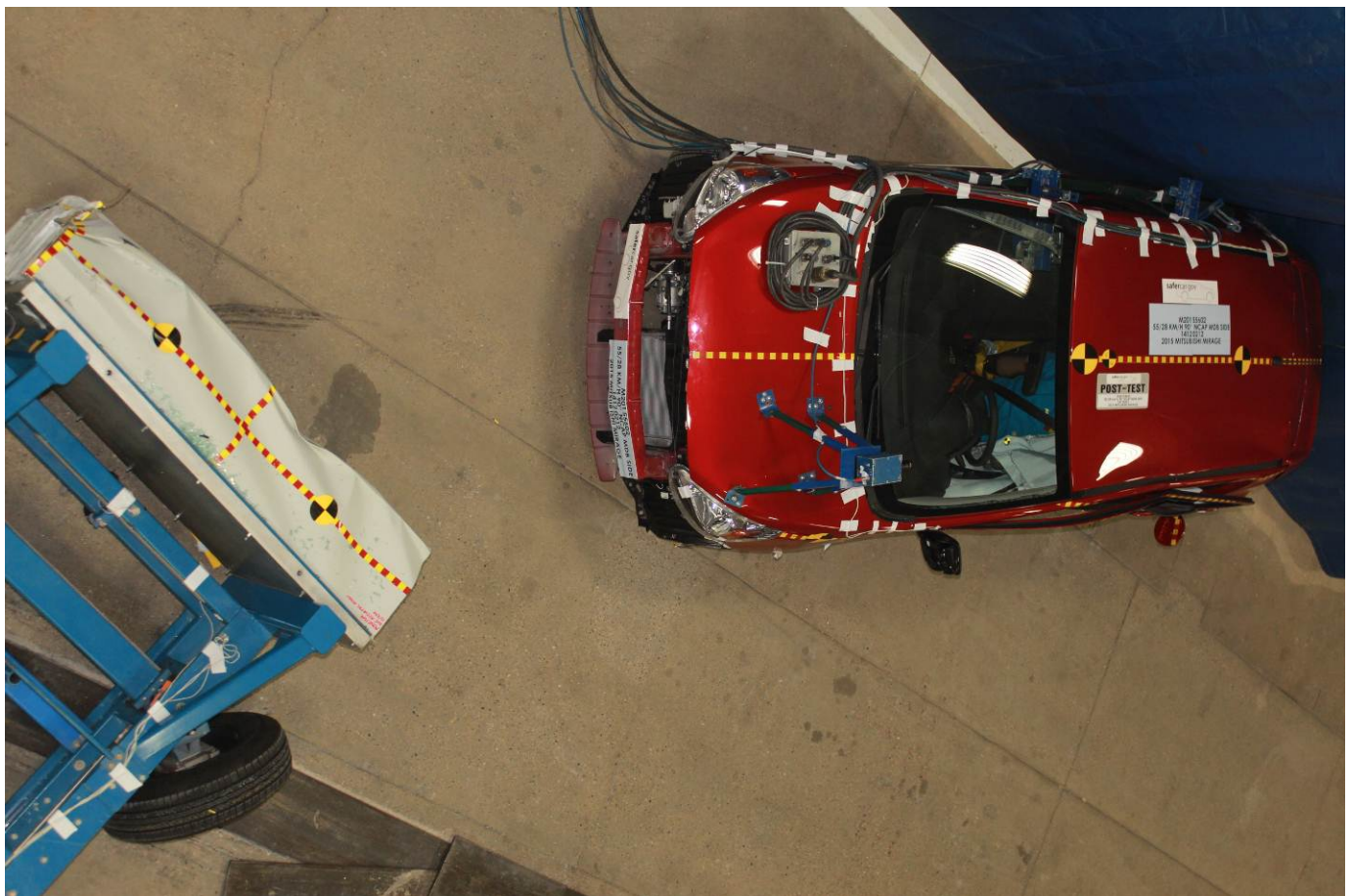
Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of Test Area



Post-Test Overhead View of Test Area



Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle



Pre-Test Close-Up View of Impact Point Target



Post-Test Close-Up View of Impact Point Target



Pre-Test Left Front Door Latch Close-Up



Post-Test Left Front Door Latch Close-Up



Pre-Test Left Rear Door Latch Close-Up



Post-Test Left Rear Door Latch Close-Up



Pre-Test Front Close-Up View of Driver Dummy



Post-Test Front Close-Up View of Driver Dummy



Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking



Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



Post-Test Left Side View of Driver Dummy Shoulder and Door Top View



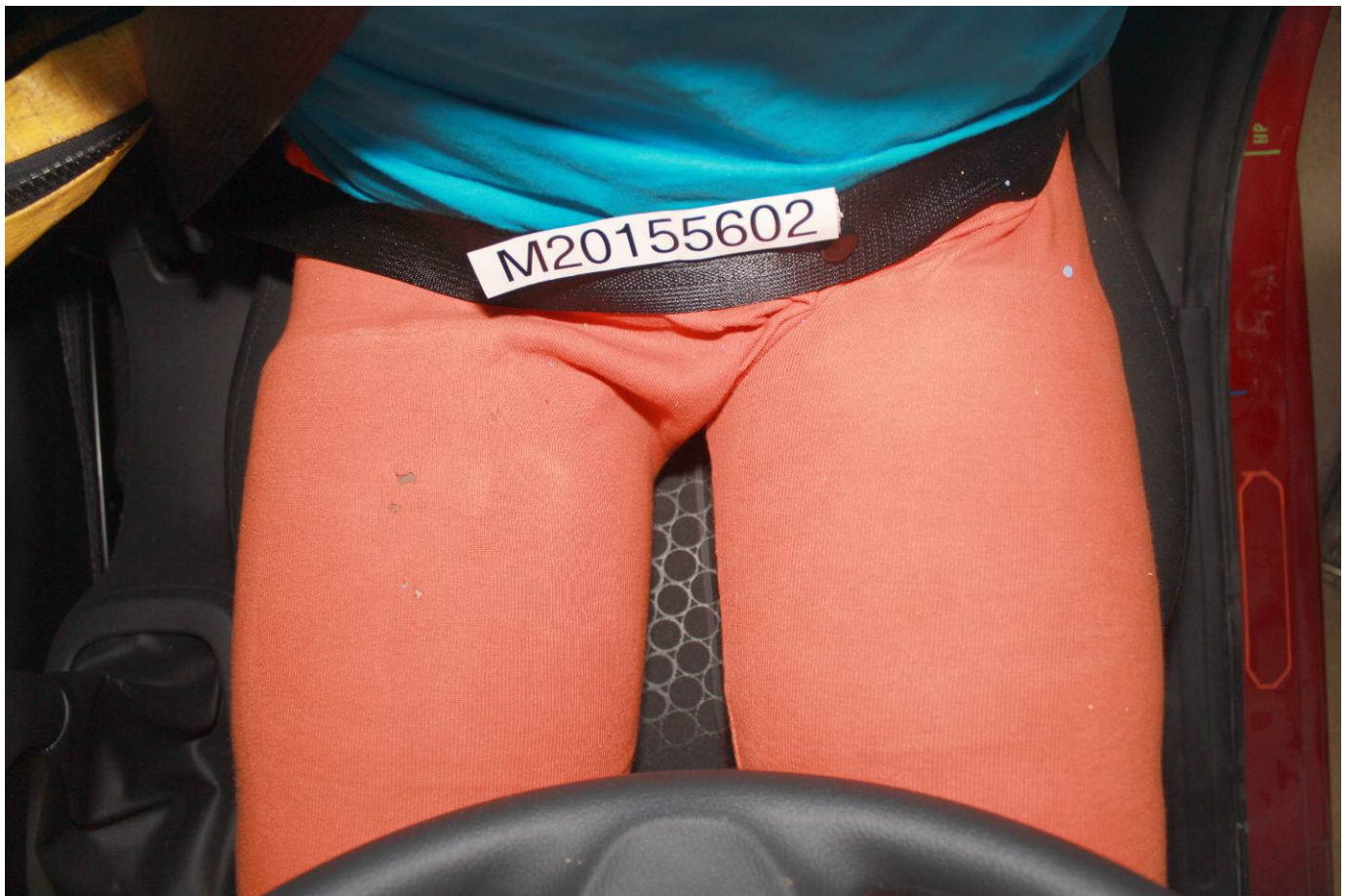
Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



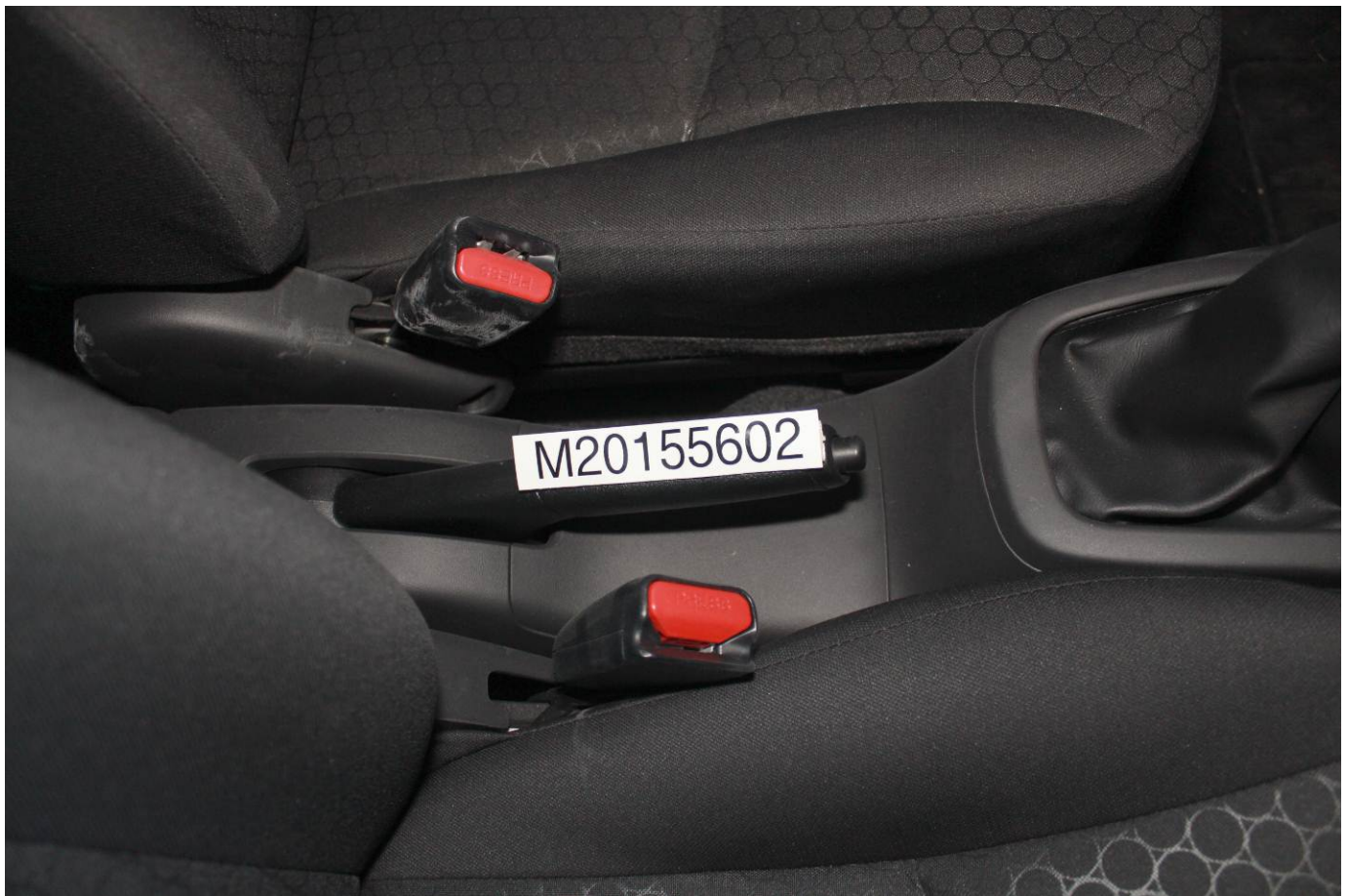
Pre-Test Placement of Driver Dummy's Feet



Pre-Test View of Belt Anchorage for Driver Dummy



Pre-Test Left Side View of Steering Wheel



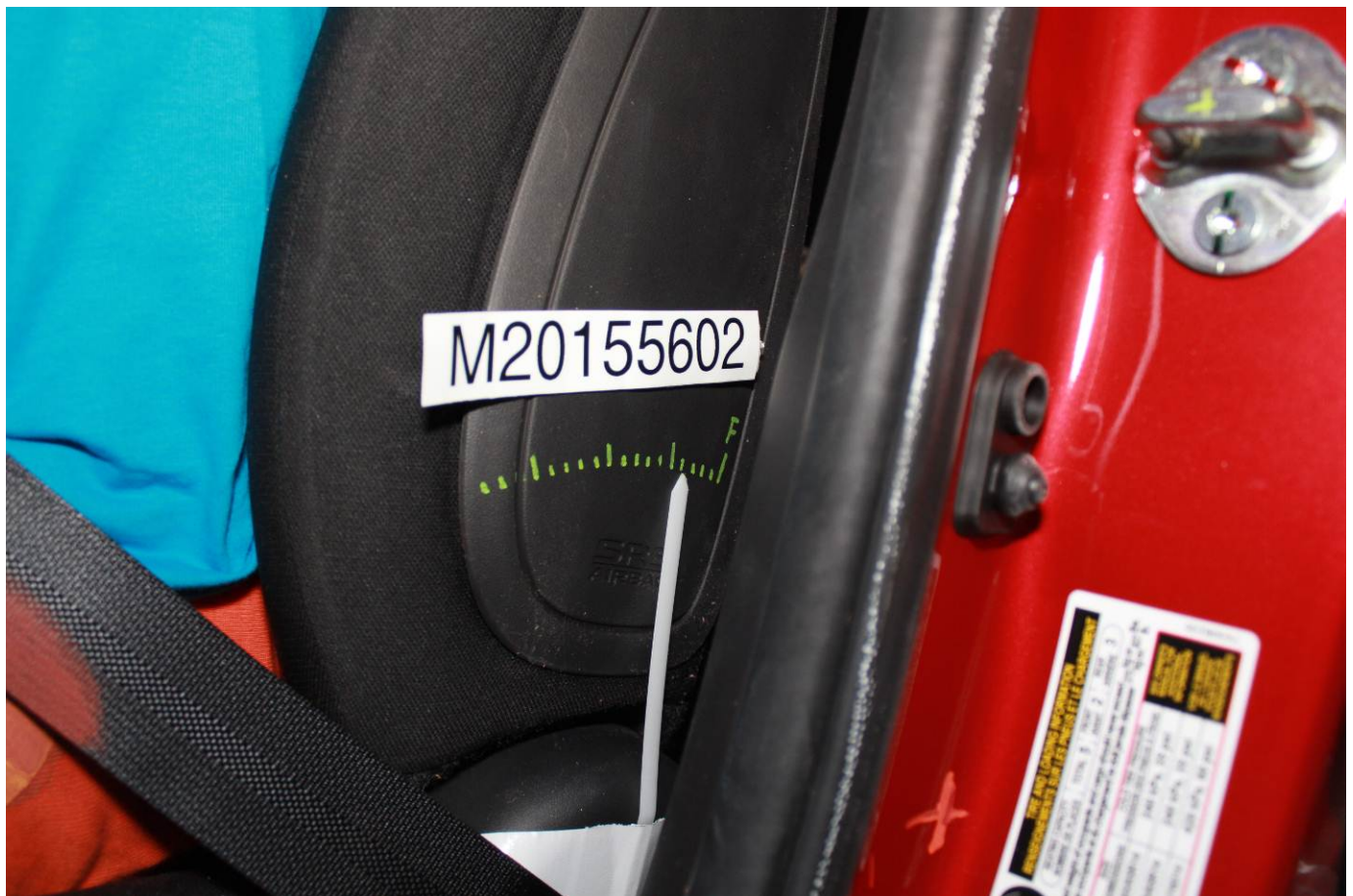
Pre-Test View of Disengaged Parking Brake



Pre-Test View of Parking Brake



Pre-Test Close-Up Left Side View of Driver Seat Track



Pre-Test Close-Up Left Side View of Driver Seat Back



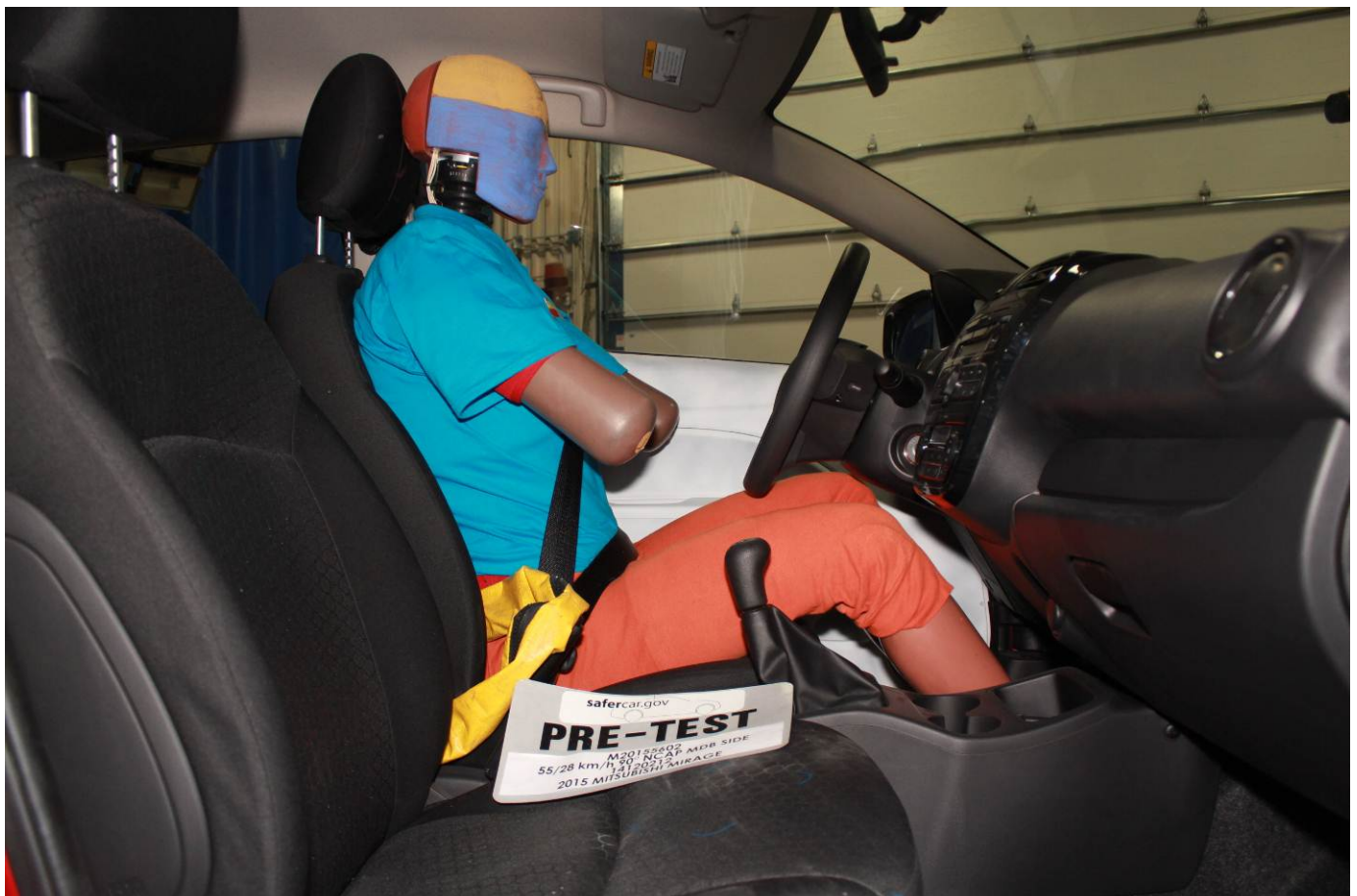
Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Pre-Test Driver Dummy and Door Clearance View



Post-Test Driver Dummy and Door Clearance View



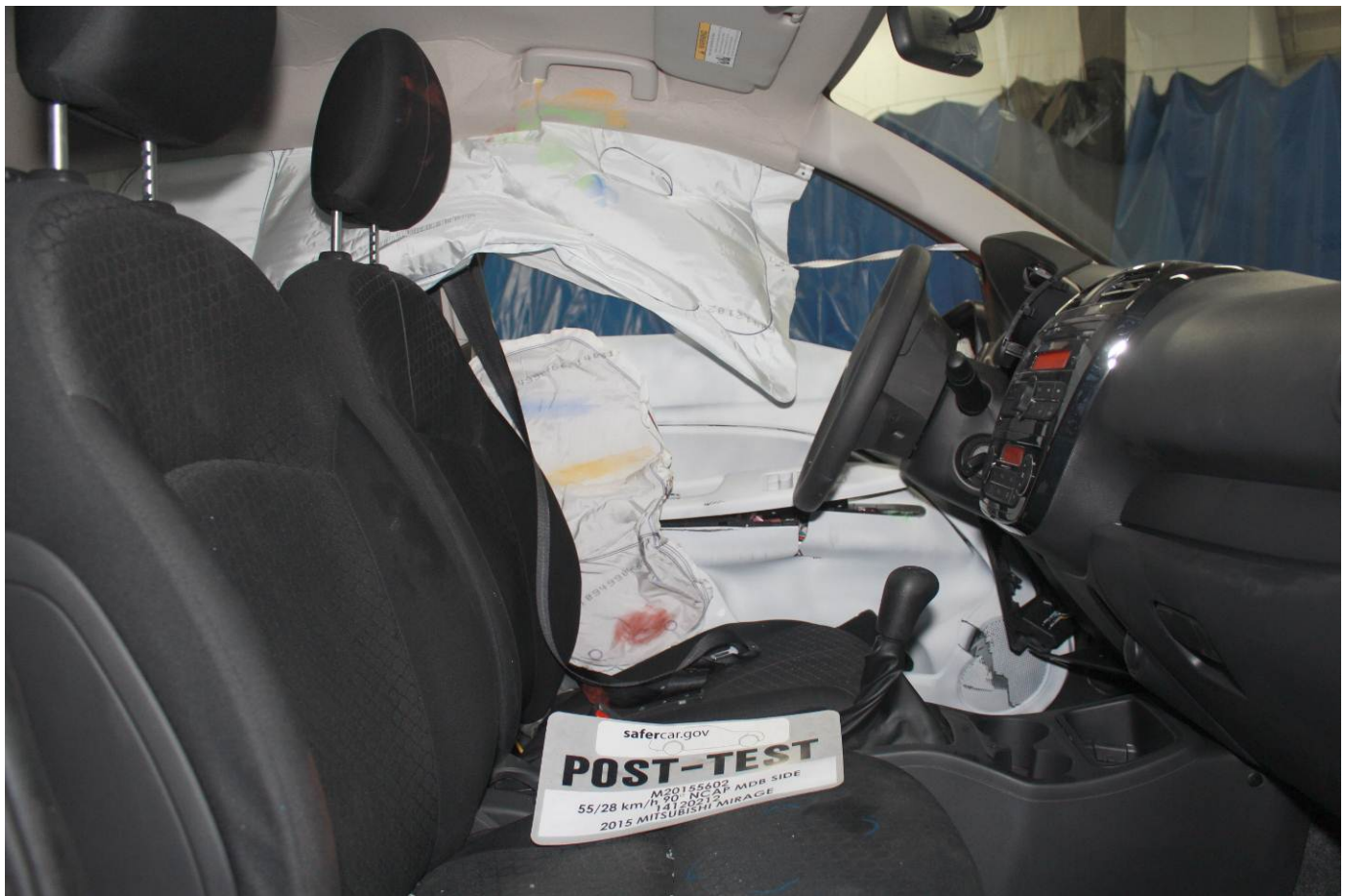
Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Pre-Test Driver Inner Door Panel View



Post-Test Driver Inner Door Panel View



Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View



Post-Test Driver Dummy Close-up Head Contact with Side Airbag View



Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View



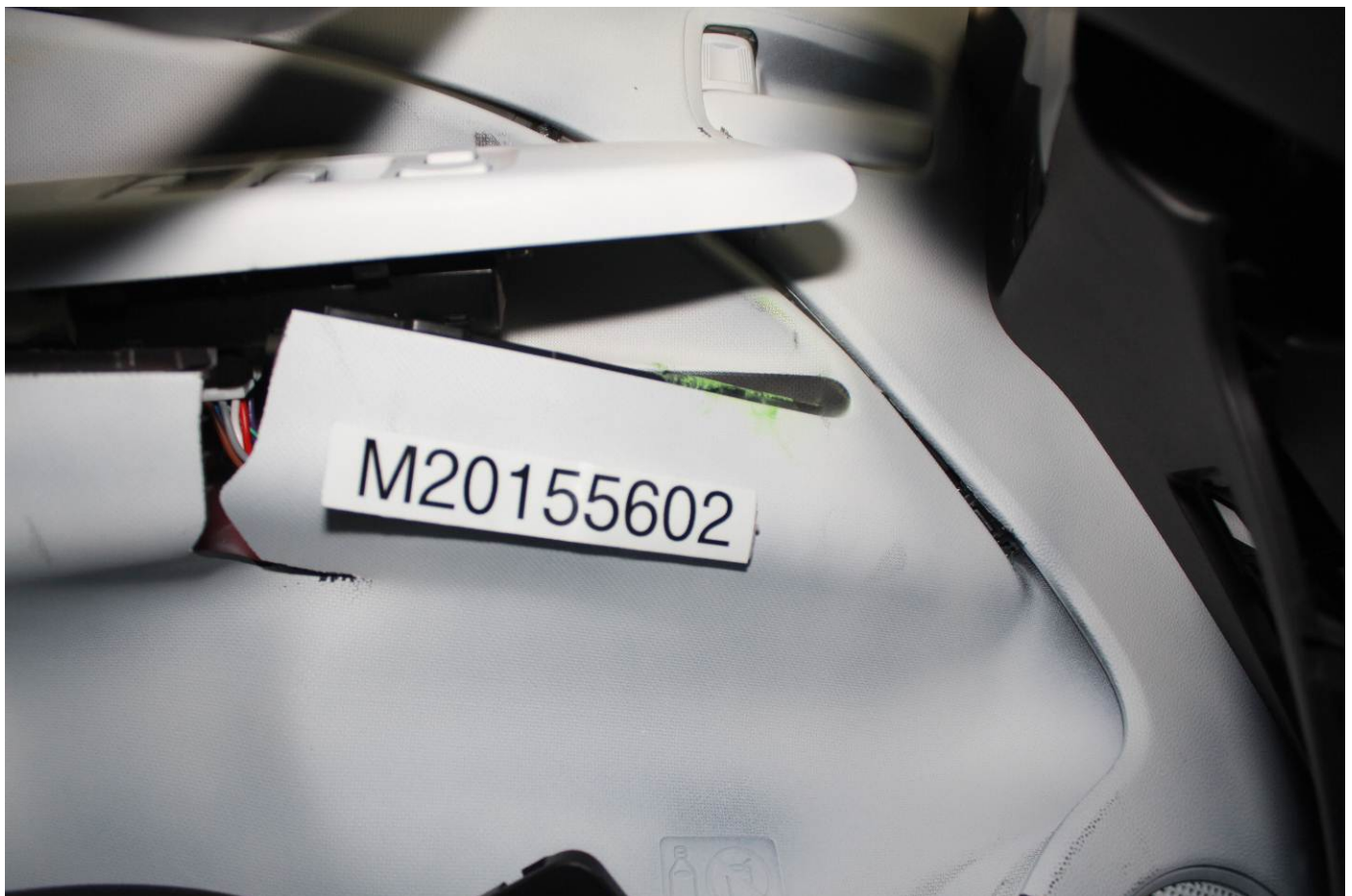
Post-Test Driver Dummy Close-up Torso Contact with Side Airbag View

PHOTOGRAPH NOT APPLICABLE

Post-Test Driver Dummy Close-up Pelvis Contact with Vehicle Interior View



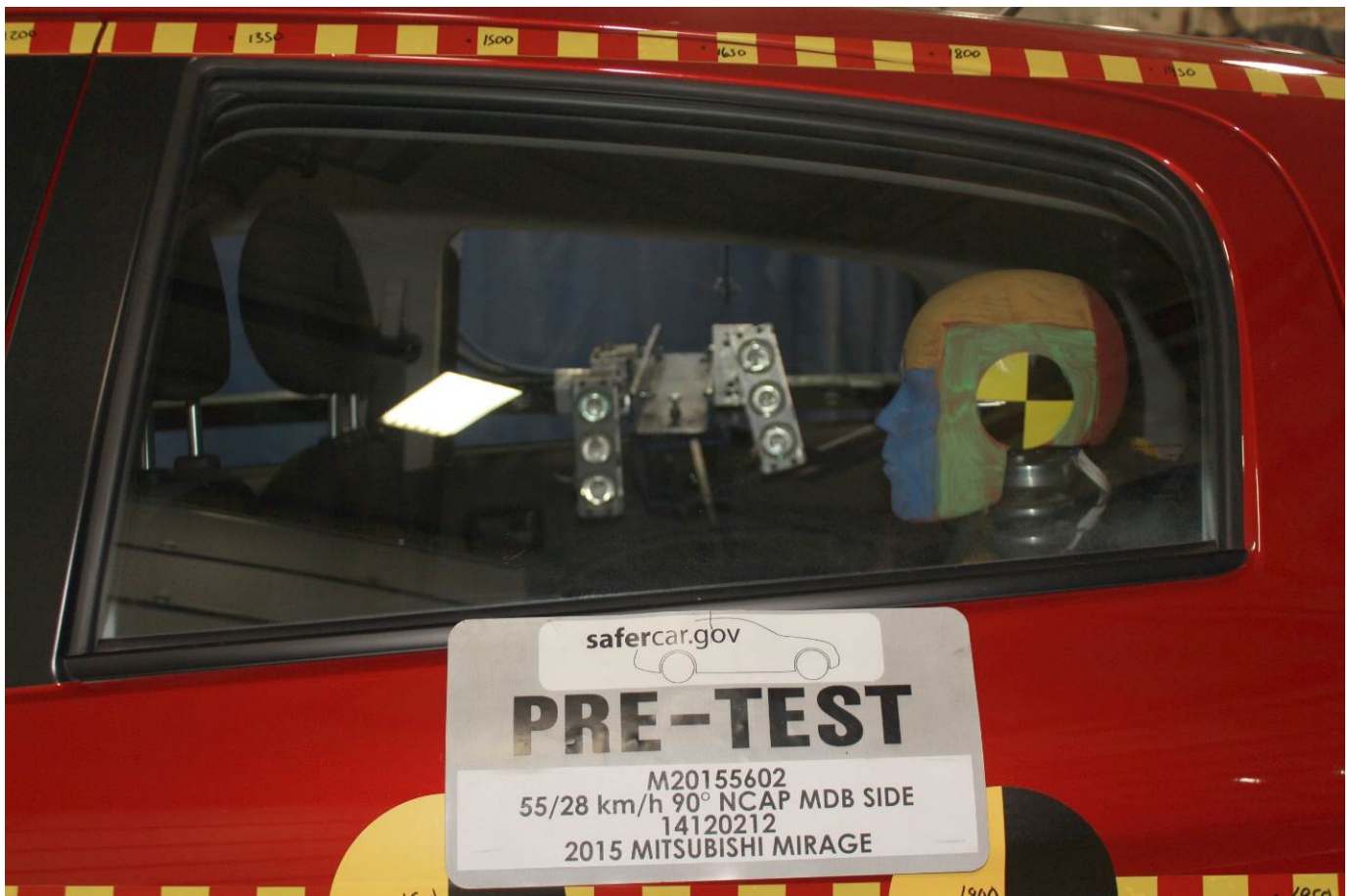
Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View



Post-Test Driver Dummy Close-up Knee Contact View



Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking



Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



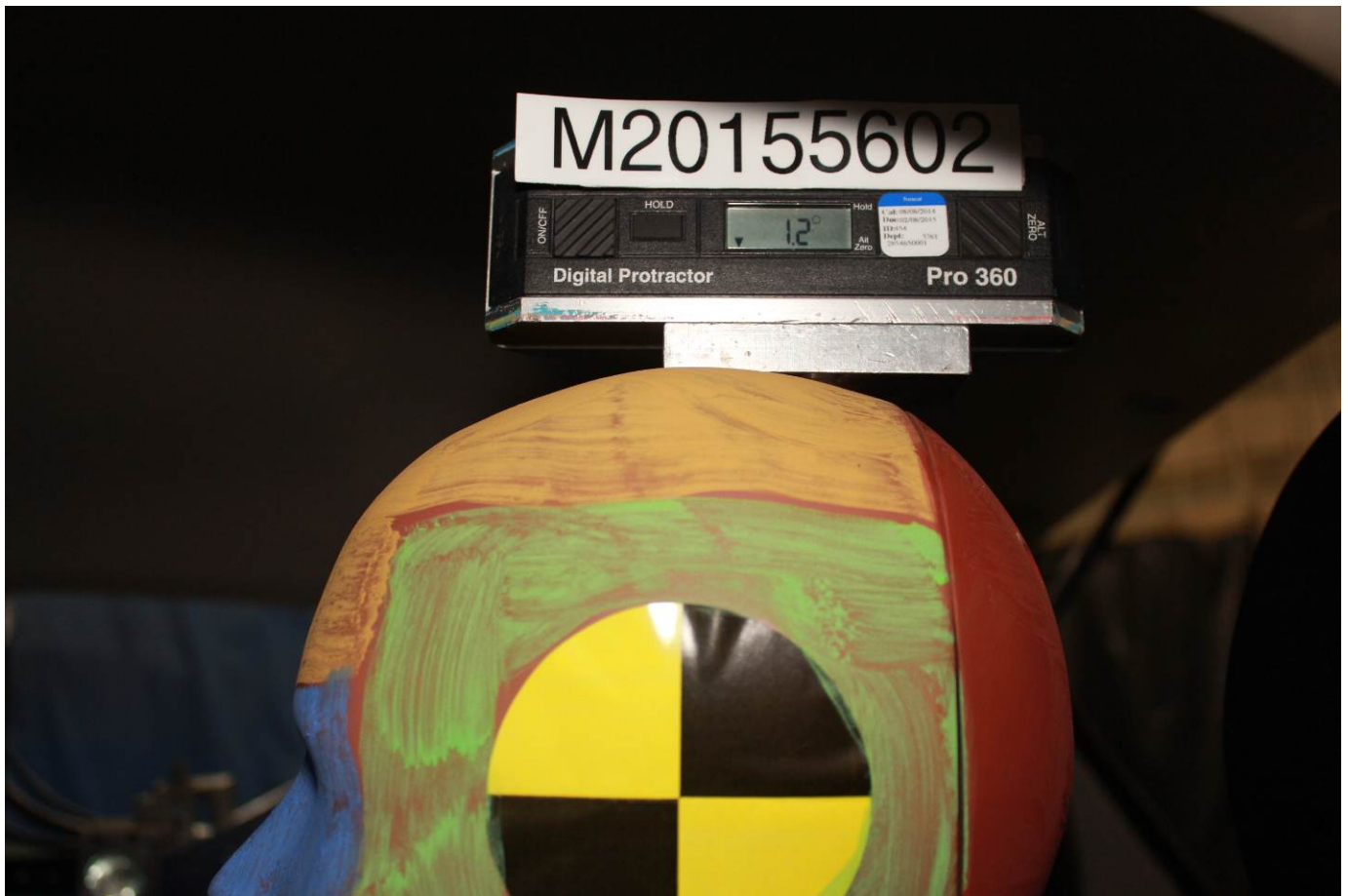
Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



Pre-Test Placement of Rear Passenger Dummy's Feet



Pre-Test View of Belt Anchorage for Rear Passenger Dummy



Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



Pre-Test Close-Up Left Side View of Rear Passenger Seat Back



Pre-Test Close-up View of Rear Passenger Seat Back or Head Restraint



Pre-Test Rear Passenger Dummy and Door Clearance View



Post-Test Rear Passenger Dummy and Door Clearance View



Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Pre-Test Rear Passenger Inner Door Panel View



Post-Test Rear Passenger Inner Door Panel View



Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View



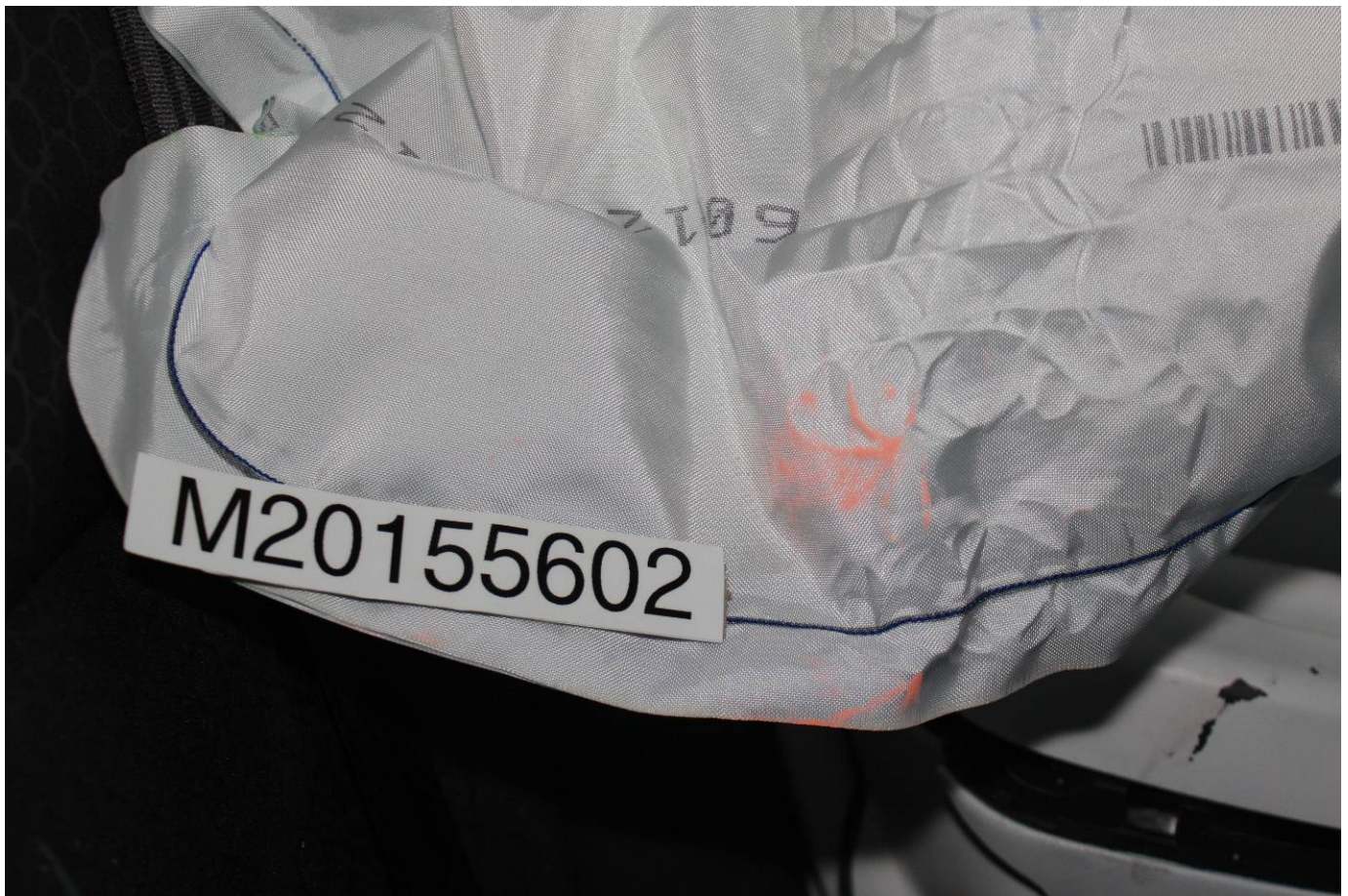
Post-Test Rear Passenger Dummy Close-up Head Contact with Side Airbag View



Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View



Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View



Post-Test Rear Passenger Dummy Close-up Torso Contact with Side Airbag View



Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Vehicle Interior View

PHOTOGRAPH NOT APPLICABLE

Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Side Airbag View



Post-Test Rear Passenger Dummy Close-up Knee Contact View



Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Pre-Test Front View of MDB Impactor Face



Post-Test Front View of MDB Impactor Face



Pre-Test Top View of MDB Impactor Face



Post-Test Top View of MDB Impactor Face



Pre-Test Left Side View of MDB Impactor Face



Post-Test Left Side View of MDB Impactor Face



Pre-Test Right Side View of MDB Impactor Face



Post-Test Right Side View of MDB Impactor Face



Close-Up View of Vehicle's Certification Label



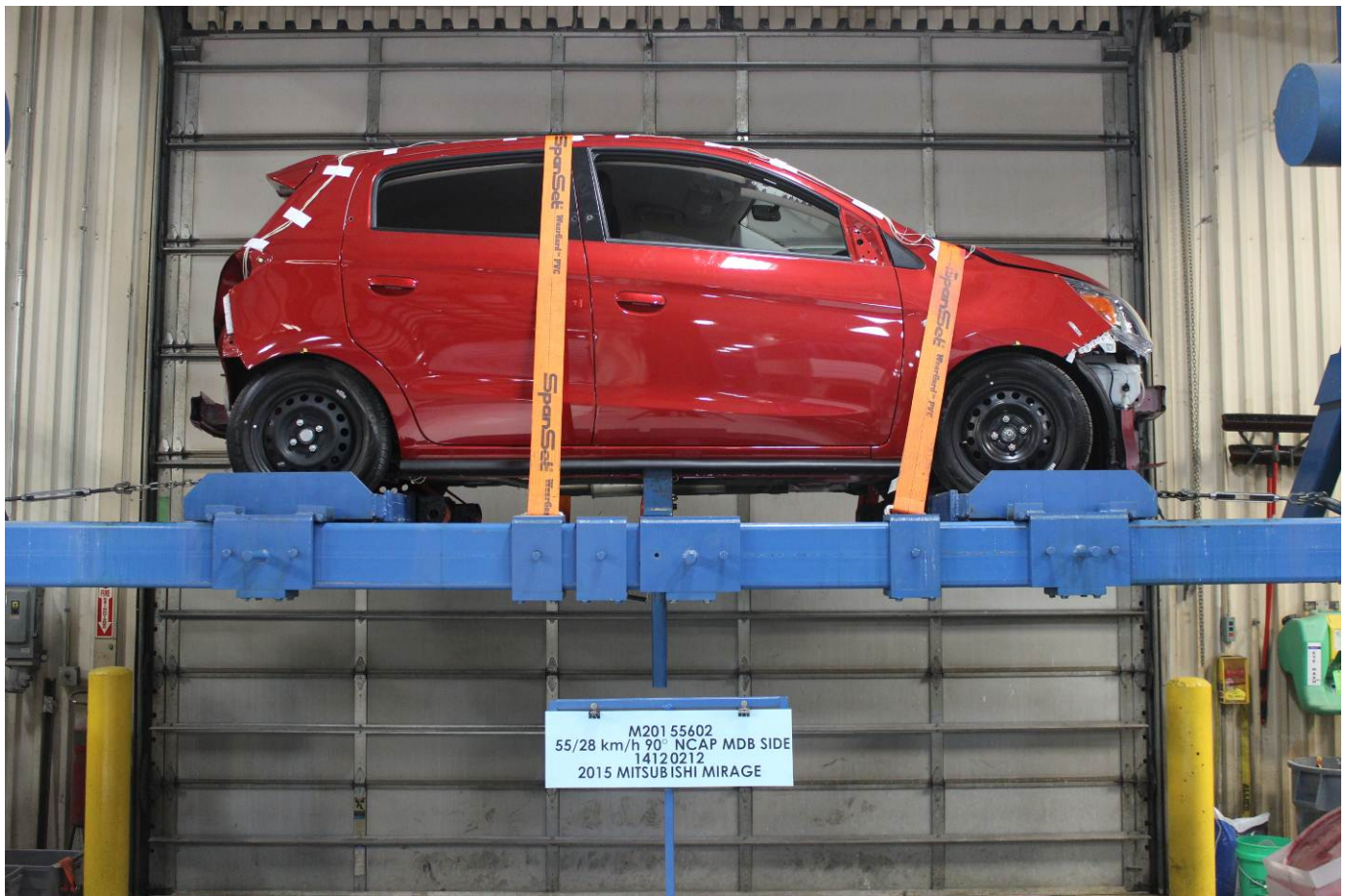
Close-Up View of Vehicle's Tire Information Placard or Label

PHOTOGRAPH NOT APPLICABLE

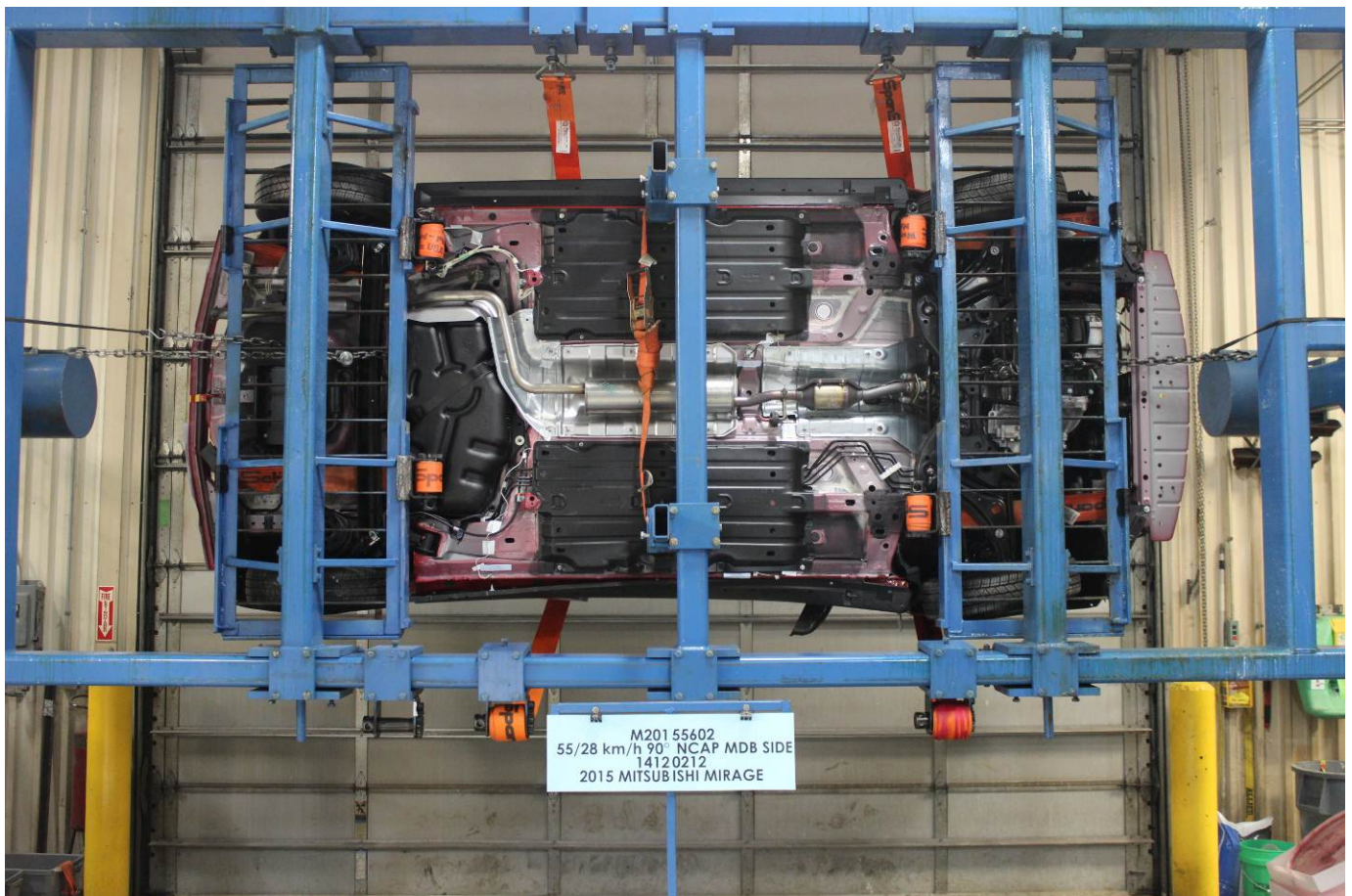
Pre-Test Ballast View



Post-Test Primary and Redundant Speed Trap Read-Out



FMVSS No. 301 Static Rollover 0 Degrees



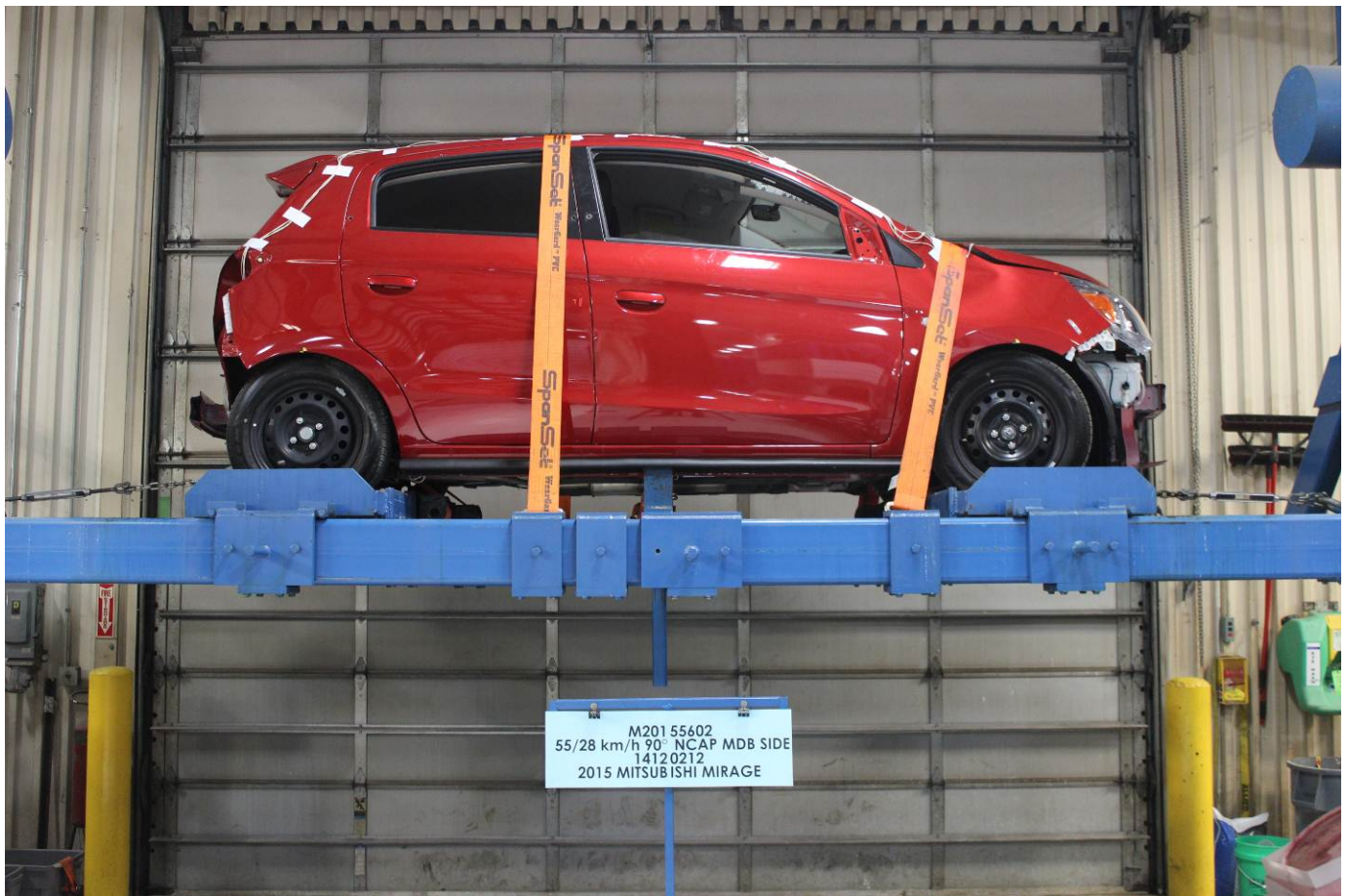
FMVSS No. 301 Static Rollover 90 Degrees



FMVSS No. 301 Static Rollover 180 Degrees



FMVSS No. 301 Static Rollover 270 Degrees



FMVSS No. 301 Static Rollover 360 Degrees



Impact Event



2015 MIRAGE DE 5-DOOR HATCHBACK INFRARED / BLACK

1.2L DOHC 3CYL MIVEC
5-SPEED U/D MANUAL TRANSMISSION
50-STATE EMISSIONS STANDARD

Mechanical Features

- Electric Power Steering Assist
- Front MacPherson strut suspension with stabilizer bar
- Rear torsion beam suspension
- Front Wheel Drive (FWD)

Exterior Features

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

Interior Features

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

Convenience Features

- 140 watt AM/FM/CD/MP3 audio system with 4 speakers
- USB port
- Keyless entry with panic alarm feature
- Trunk
- Trunk outlet (x1)
- Trunk console with cup holders (x3)
- Trunk assist grips (x2)
- Security
- Key System (ABS) with Electronic
- Nabstun (EBD) and brake assist
- Control (ASC)
- Monitoring System (TPMS)

Safety & Security (cont'd)

- Side curtain airbags
- Driver's side knee airbag
- Advanced dual-stage front airbags
- Three-point seatbelts and head restraints for all seating positions
- Height adjustable front shoulder belts with pretensioner
- LATCH child-restraint system
- Child safety rear door locks
- Anti-theft engine immobilizer
- RISE body construction

Optional Equipment
FULL TANK OF GAS

INCLUDED

MSRP*: \$12,995.00
Total Optional Equipment: \$0.00
Subtotal: \$12,995.00
Destination/Handling: \$810.00
Total MSRP*: \$13,805.00

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Fuel Economy
37 MPG
combined city/highway
2.7 gallons per 100 miles

Compact Cars range from 14 to 105 MPG.
The best vehicle rates 119 MPG.

34 city
42 highway

You save
\$4,000
in fuel costs
over 5 years
compared to the
average new vehicle.

Annual fuel cost
\$1,400

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

Smog Rating (tailpipe only)

1 9 10 10
Best Best

This vehicle emits 238 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fuelconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs \$11,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. 4MPG is miles per gasoline gallon improvement. Vehicle emissions are a significant source of climate change and smog.

fuelconomy.gov

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100,000-mile
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5"/60,000^{mi} 5"/UNLIMITED^{mi}
NEW VEHICLE LIMITED ROADSIDE ASSISTANCE

*See participating Retailer for Limited Warranty and Excludes Accessories terms and conditions.

GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash, or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA).
www.safercar.gov or 1-888-327-4236

Parts Content Information

For vehicles in this country:
U.S./Canadian Major Sources of Parts Content:
Parts Content: Foreign Parts Content:
0% THAILAND 90%

For this vehicle:
Final Assembly Point: CHONBURI, THAILAND
Country of Origin: THAILAND
Engine: THAILAND
Transmission: THAILAND

Note: Parts content does not include final assembly, distribution, or other non-parts costs.

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MITSUBISHI
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MILWAUKEE, WI 53221

Sold To: (Same unless indicated)

Method of Transport: RAIL
Plant/Port of Entry: TACOMA, WA

VIN: ML32A3HJ7FH002314
Route Code: RJO

Gasoline, license and title fees, applicable federal, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price. This label has been applied to this vehicle pursuant to federal law and cannot be moved or altered prior to delivery to the ultimate purchaser.

Monroney Label

Head restraints

WARNING

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

CAUTION

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

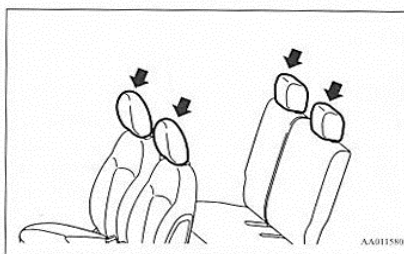
Head restraints

N00404300584

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

The head restraints are equipped in the illustrated position.

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



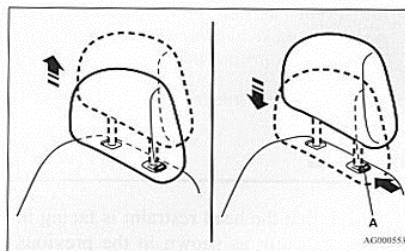
WARNING

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

Adjustment of the head restraint height

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

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



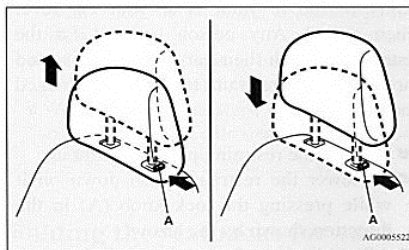
Seat and restraint systems 4-7

Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

To remove

Press the lock knob (A) in the direction shown by the arrows. Then pull the head restraint up and out of the seatback.

4



WARNING

- To help minimize the risk of neck injury in the event of an accident, the head restraints must be properly installed and positioned to proper height before vehicle operation.

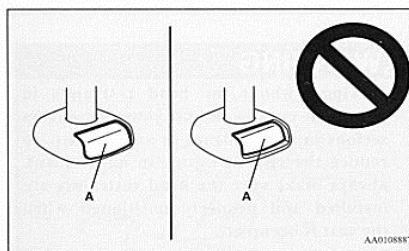
To install

First check that the head restraint is facing in the right direction as shown in the previous illustration, and then insert it into the seatback. Push the head restraint down while

pressing the lock knob (A) until the restraint locks into place.

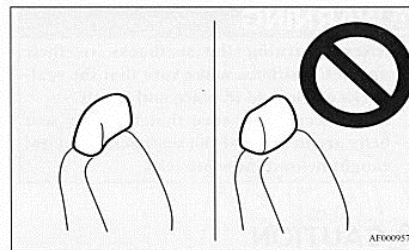
CAUTION

- Check that the lock knob (A) is extended out as shown in the illustration. Then pull the head restraint up to make sure that it is locked in place and will not come out of the seatback.



CAUTION

- The shape and size of the head restraint differs according to the seat. Always use the correct head restraint provided for the seat and do not install the head restraint in the wrong direction.



Seat belts

N00406001481

Seat belts are installed in your vehicle to help reduce the risk of injury to the driver and passenger in the event of an accident. Always use the provided seat belts.

Carefully review the following information for proper seat belt usage.

WARNING

- To help reduce the risk of injury or death in an accident, seat belts and child restraint systems must always be used. Refer to "Child restraint systems" on page 4-14 for additional information.
- Never use one seat belt for more than one person.
- Never carry more people in your vehicle than there are seat belts.
- Always adjust the seat belt for a snug fit.

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)

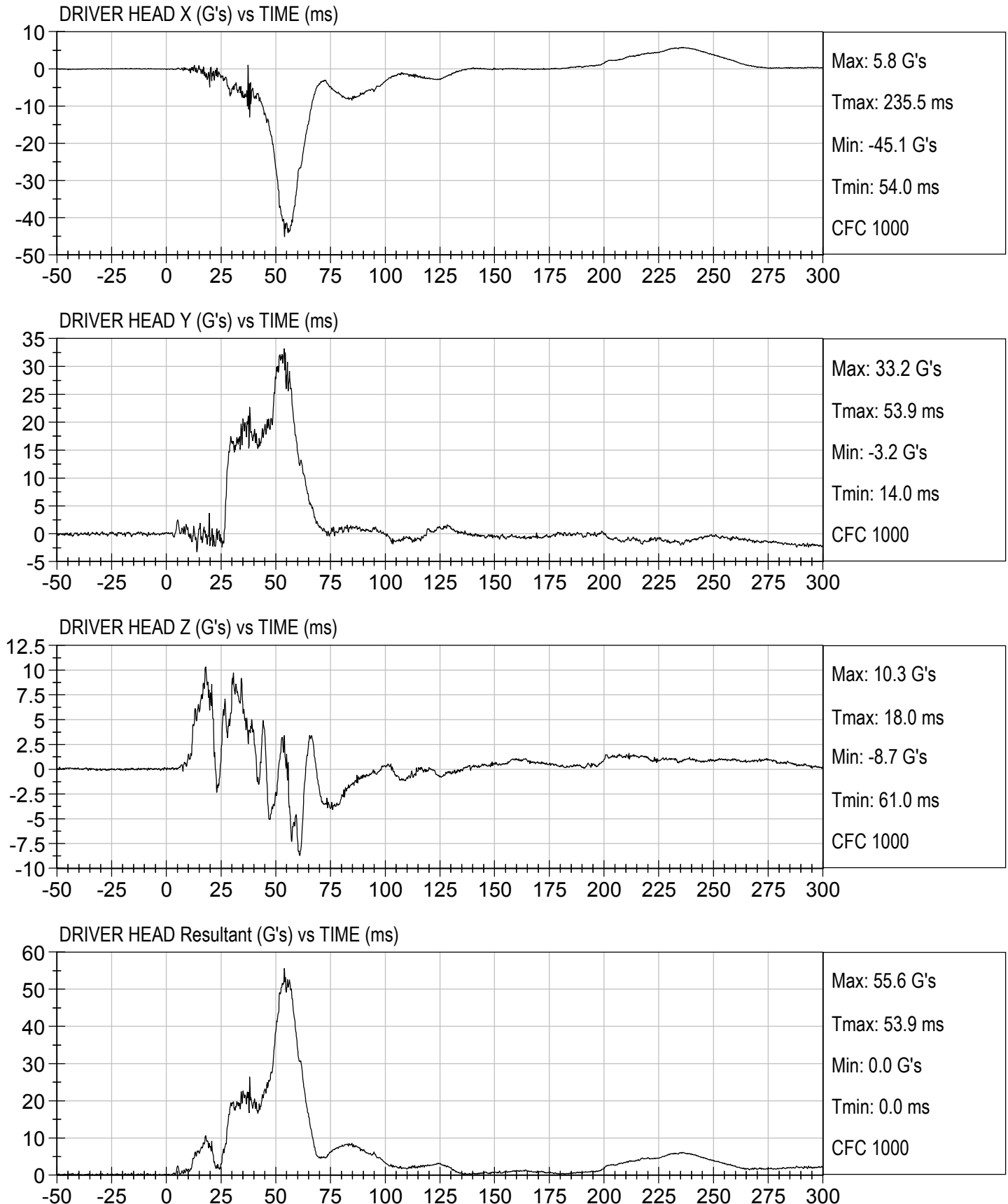
MDB Center of Gravity Acceleration (Z)

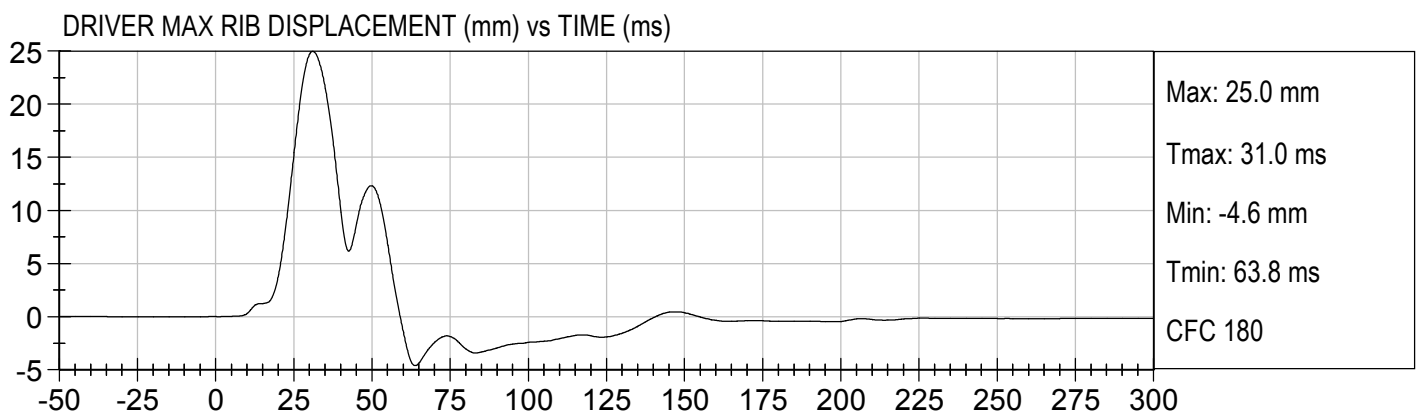
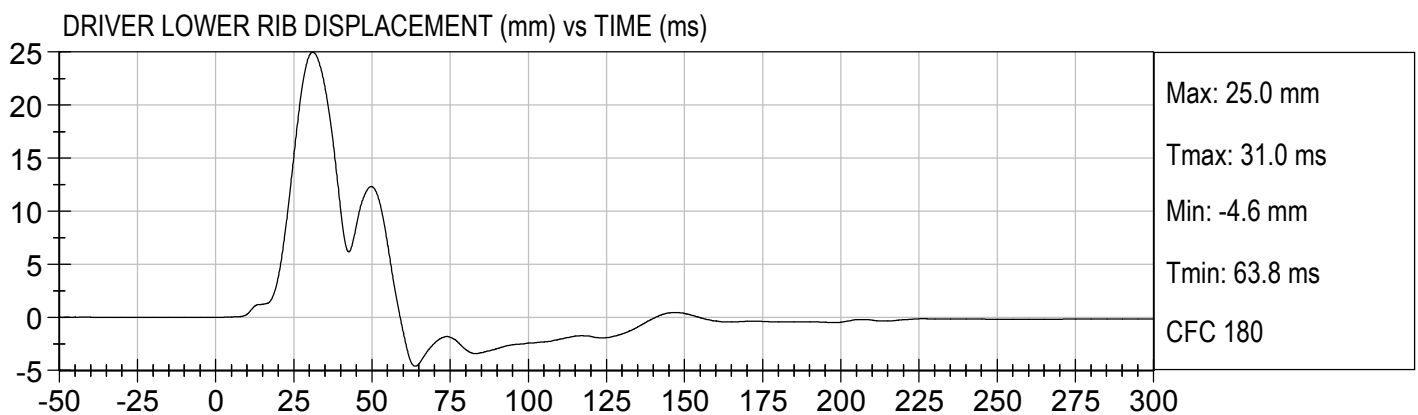
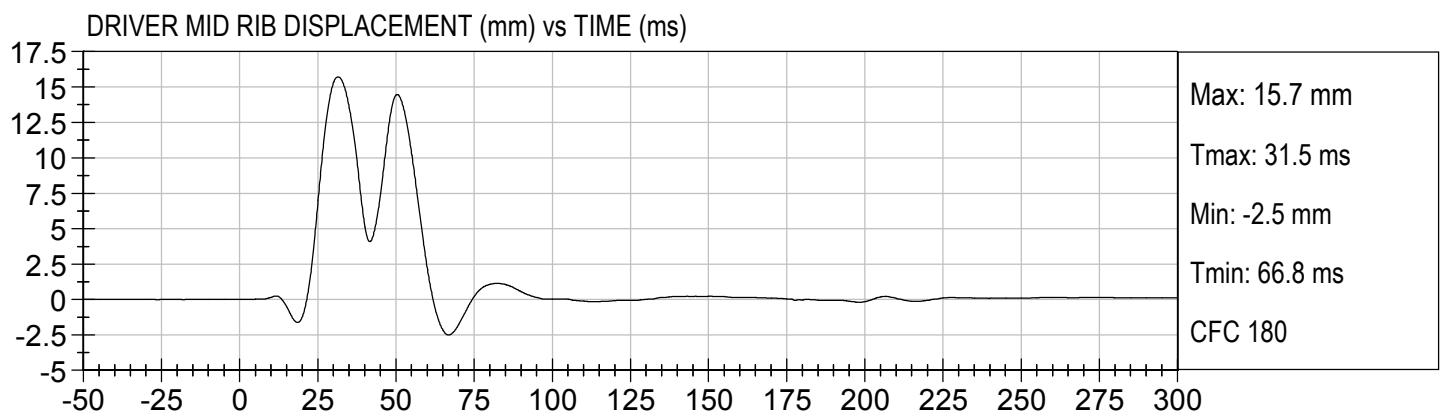
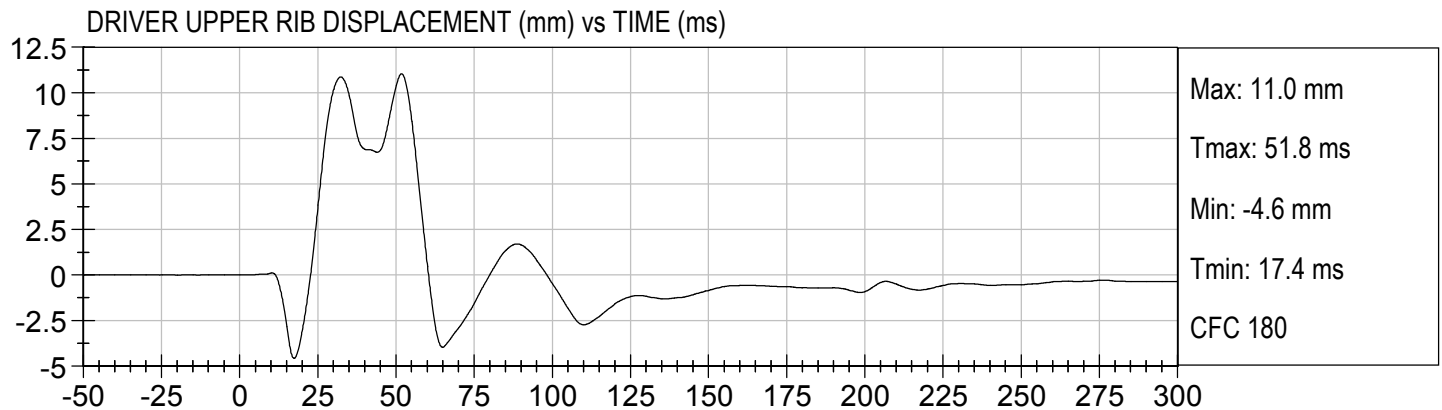
MDB Rear Acceleration (X)

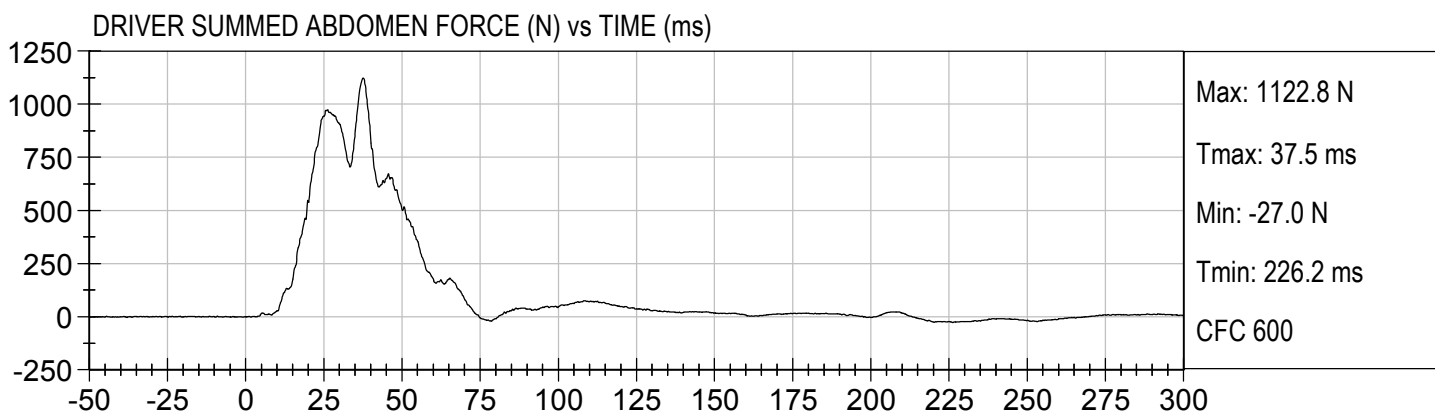
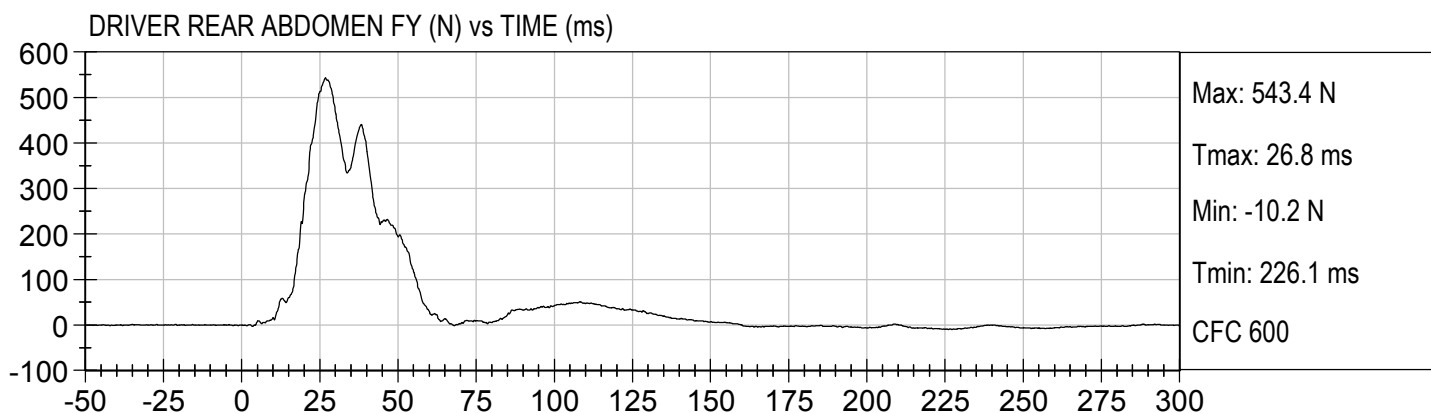
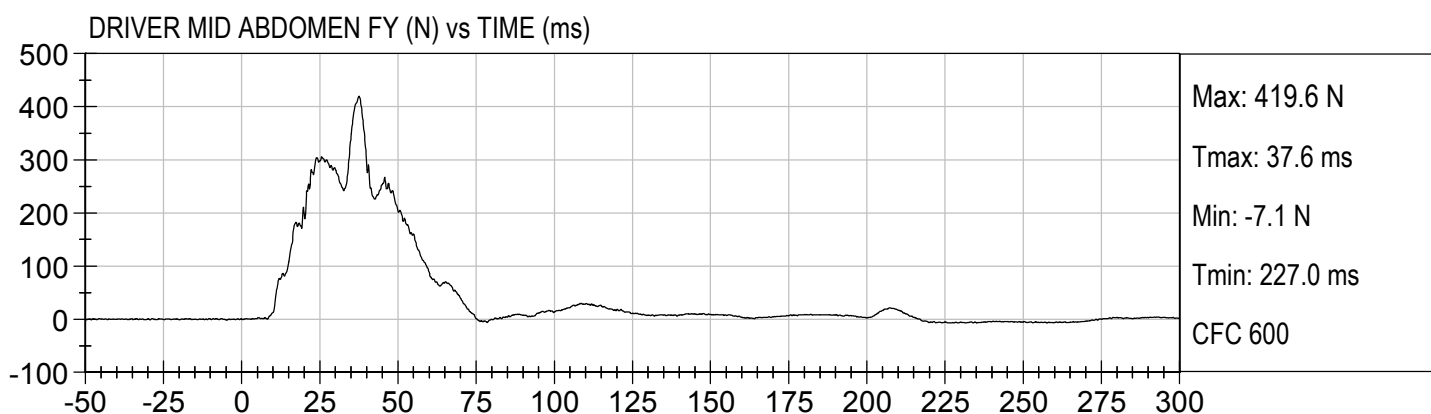
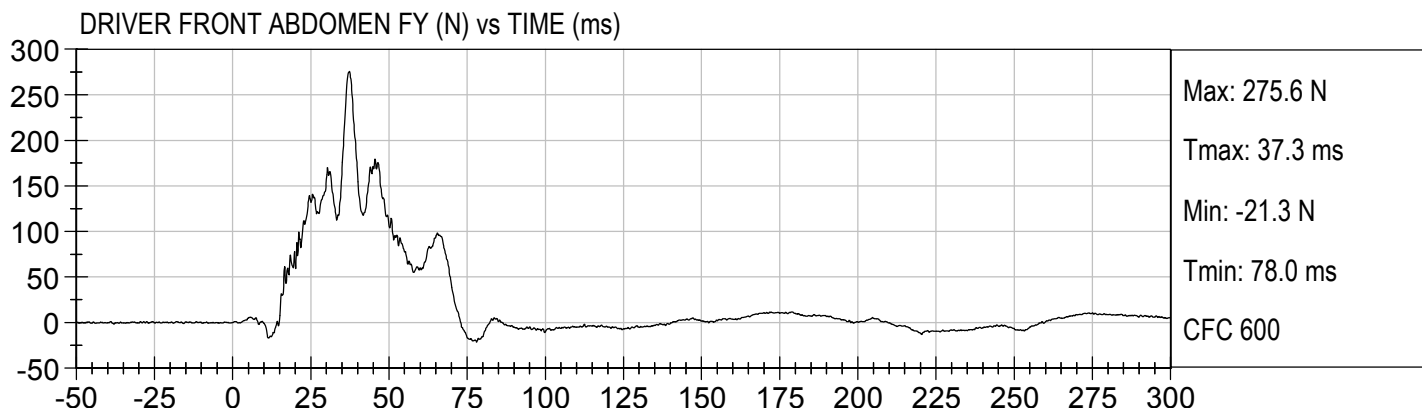
MDB Rear Acceleration (Y)

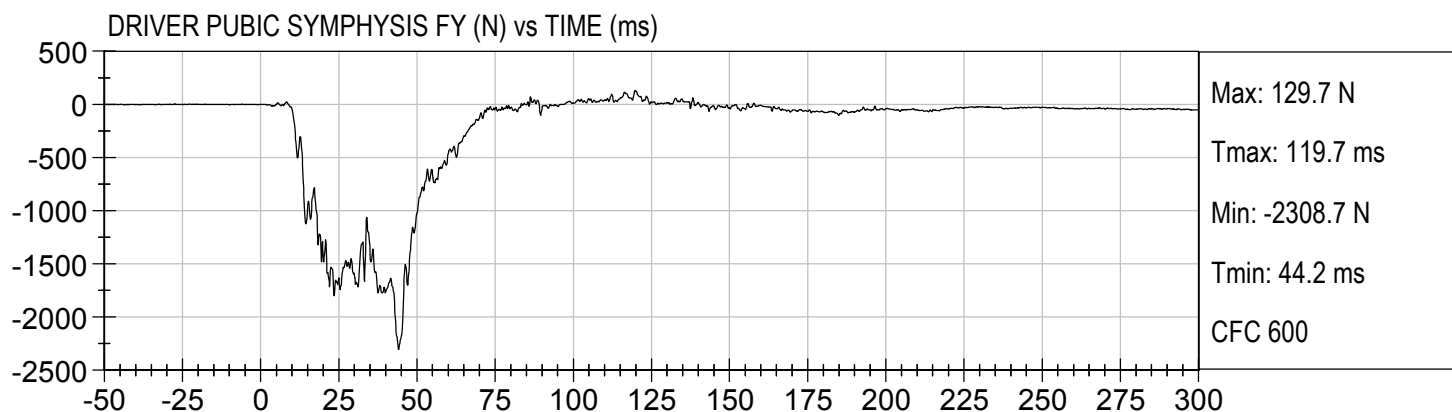
Left MDB Contact Switch

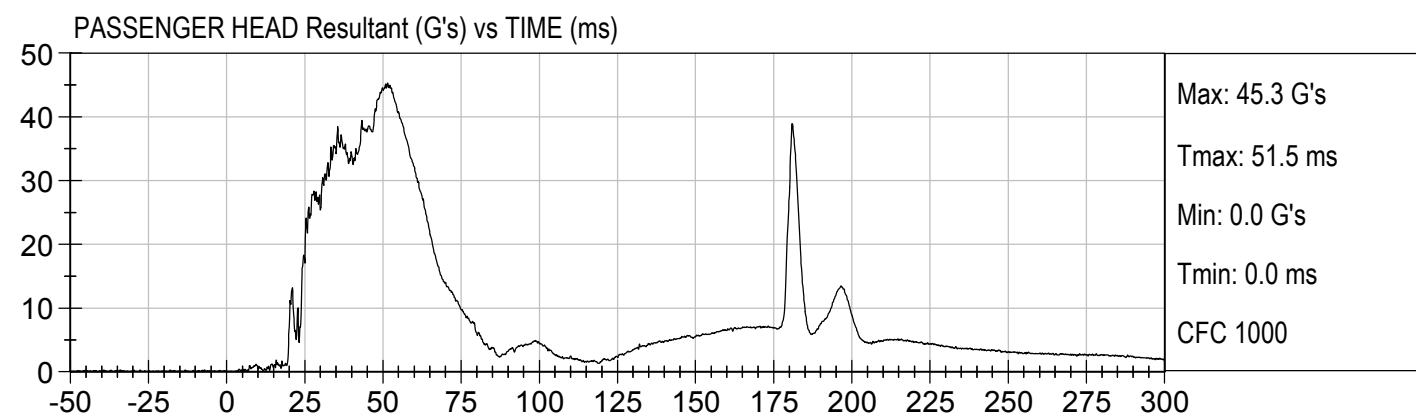
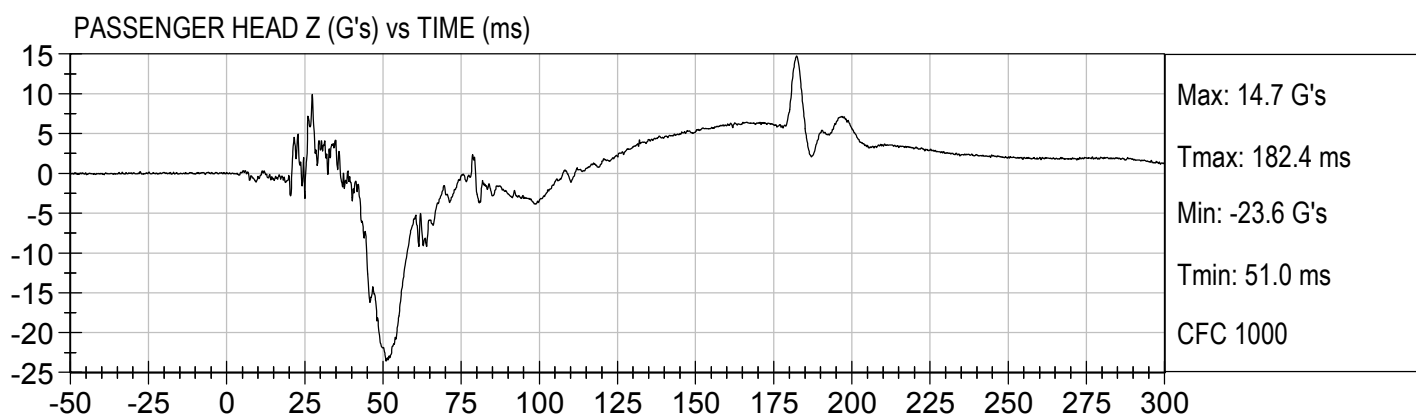
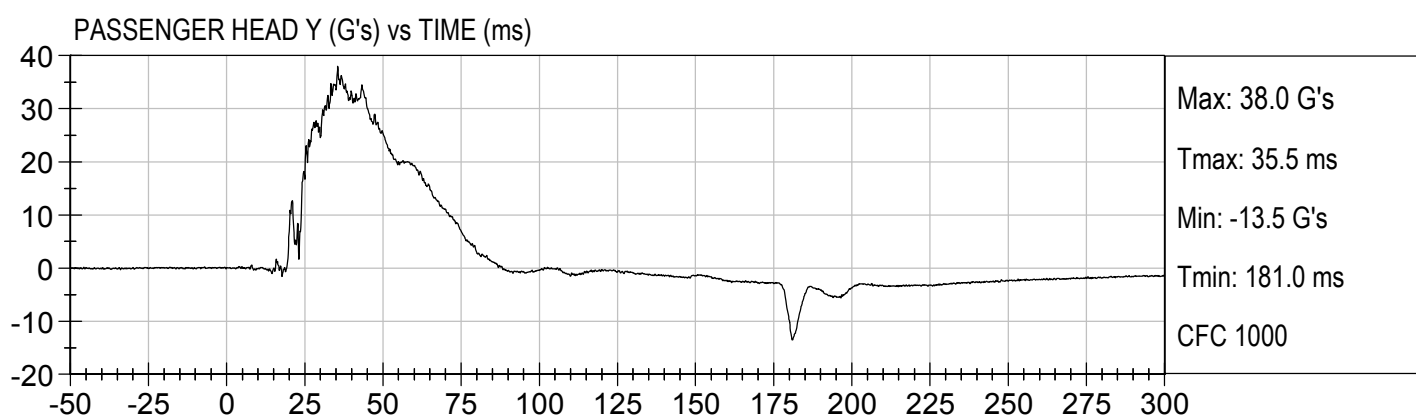
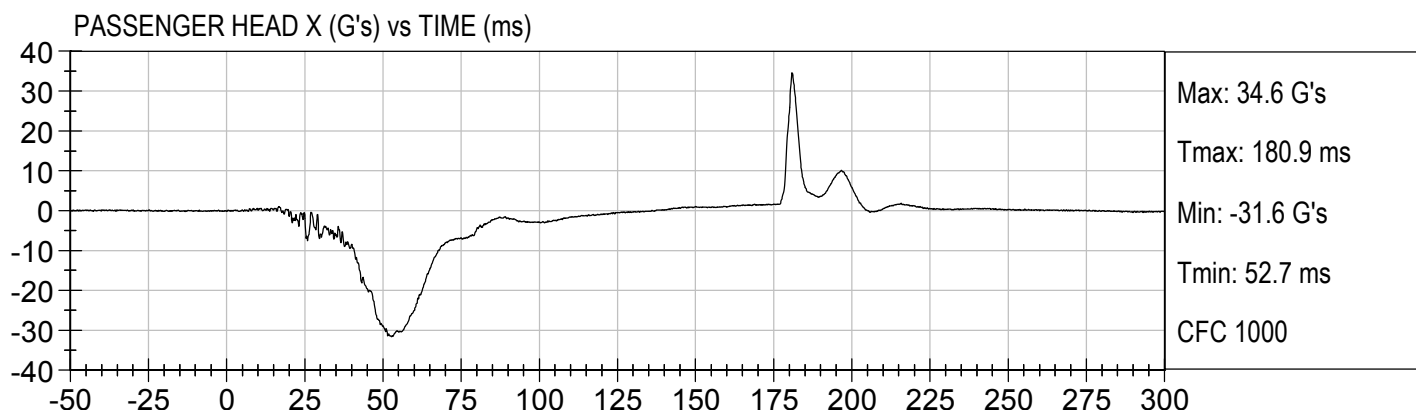
Right MDB Contact Switch

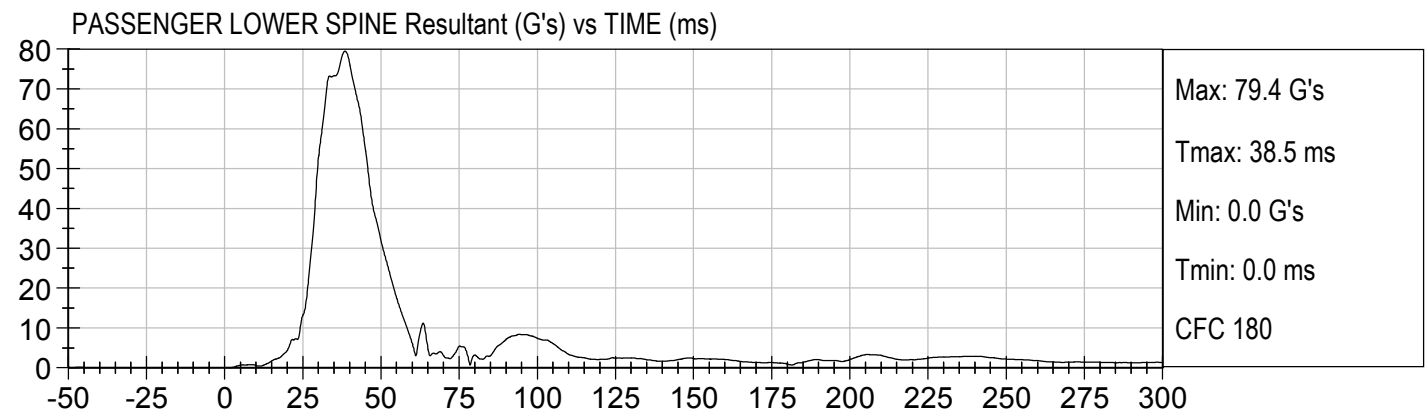
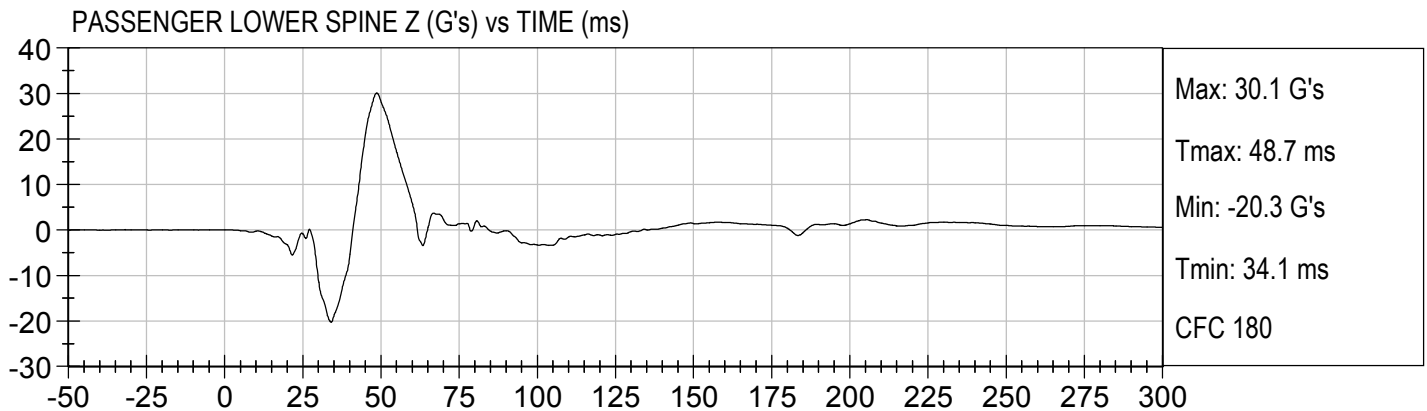
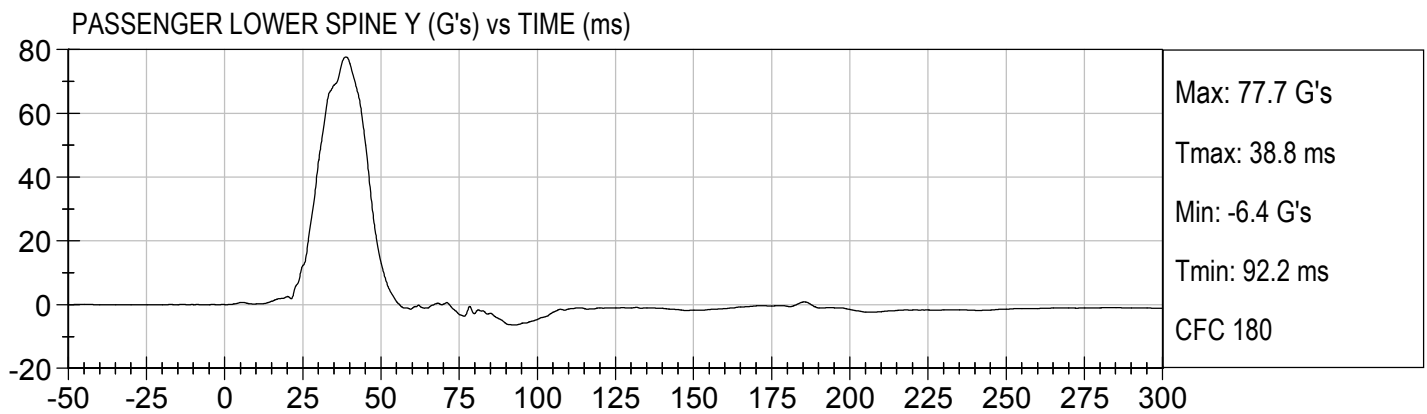
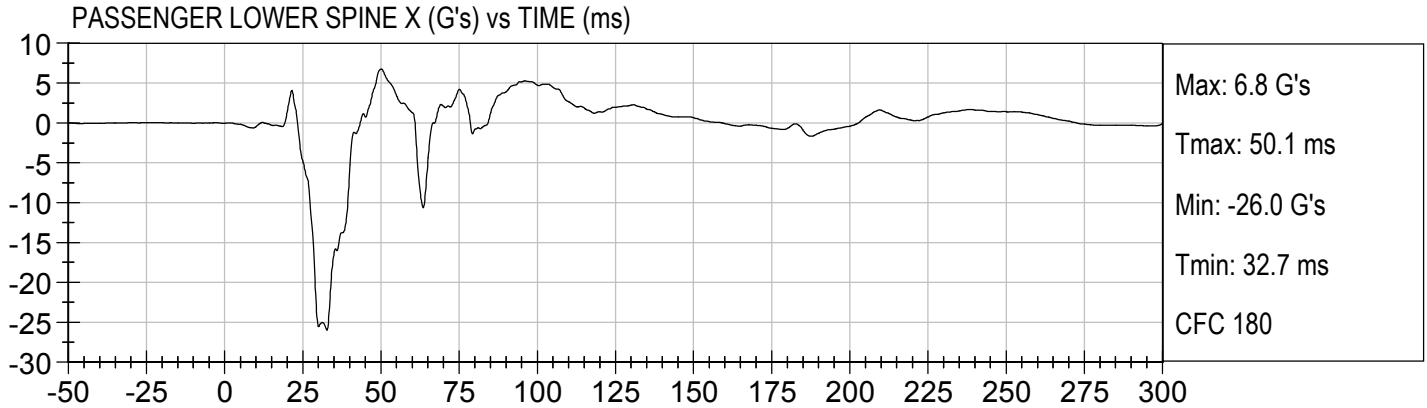


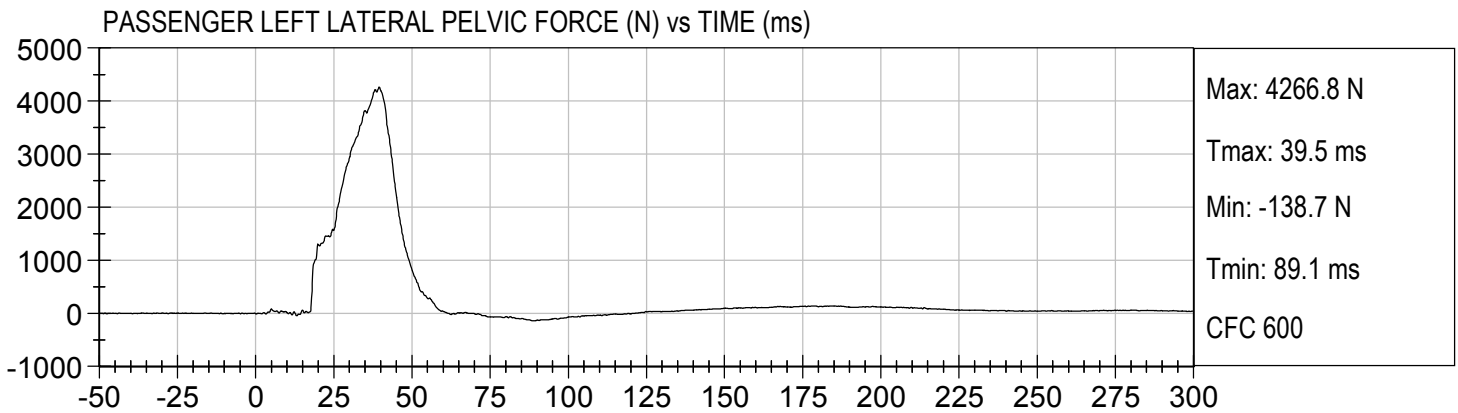
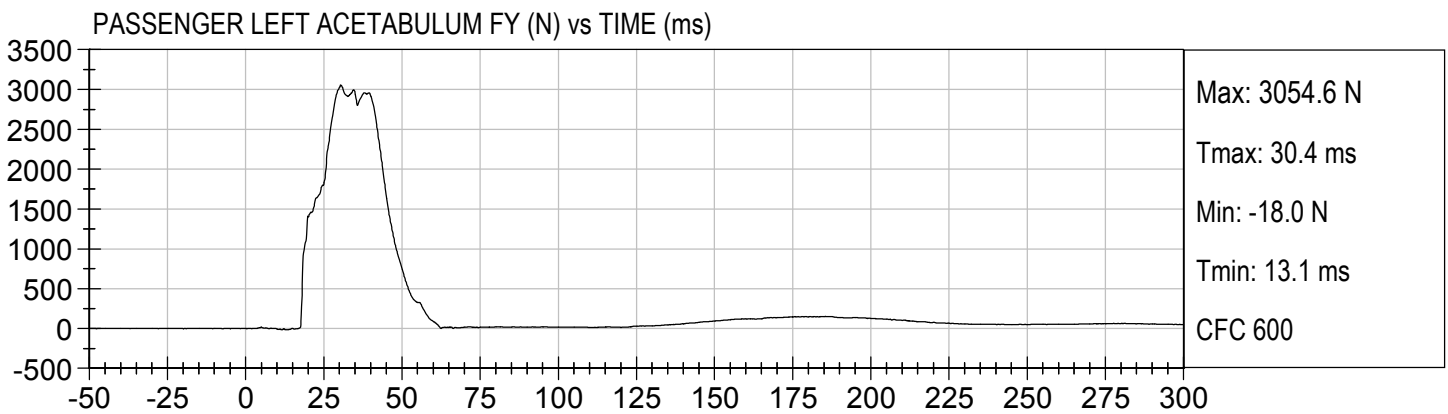
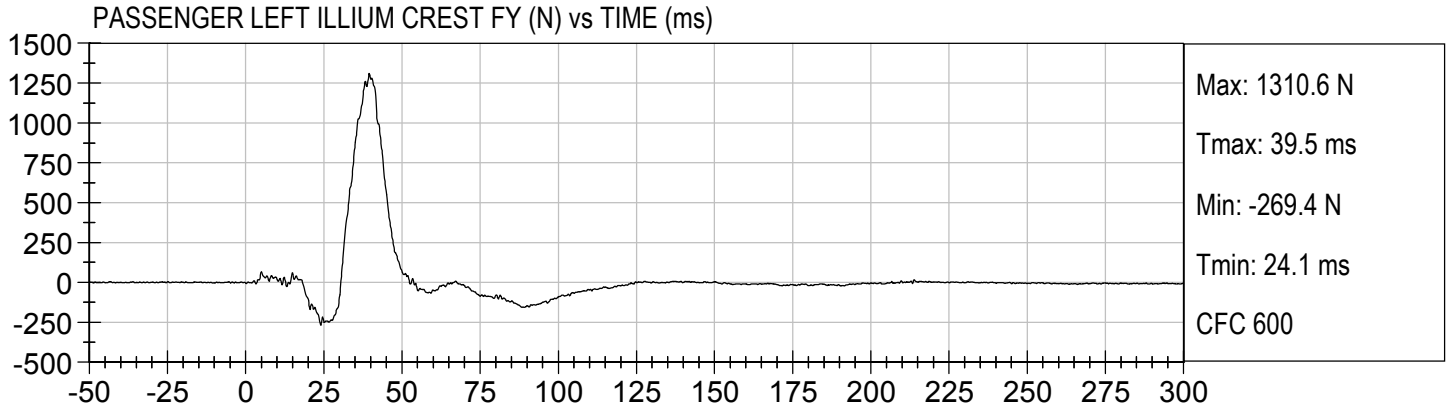












APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

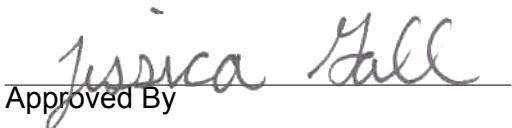
MGA RESEARCH CORPORATION**HEAD DROP TEST****ES-2re DUMMY**ATD Serial No: 032Test ID: D144111

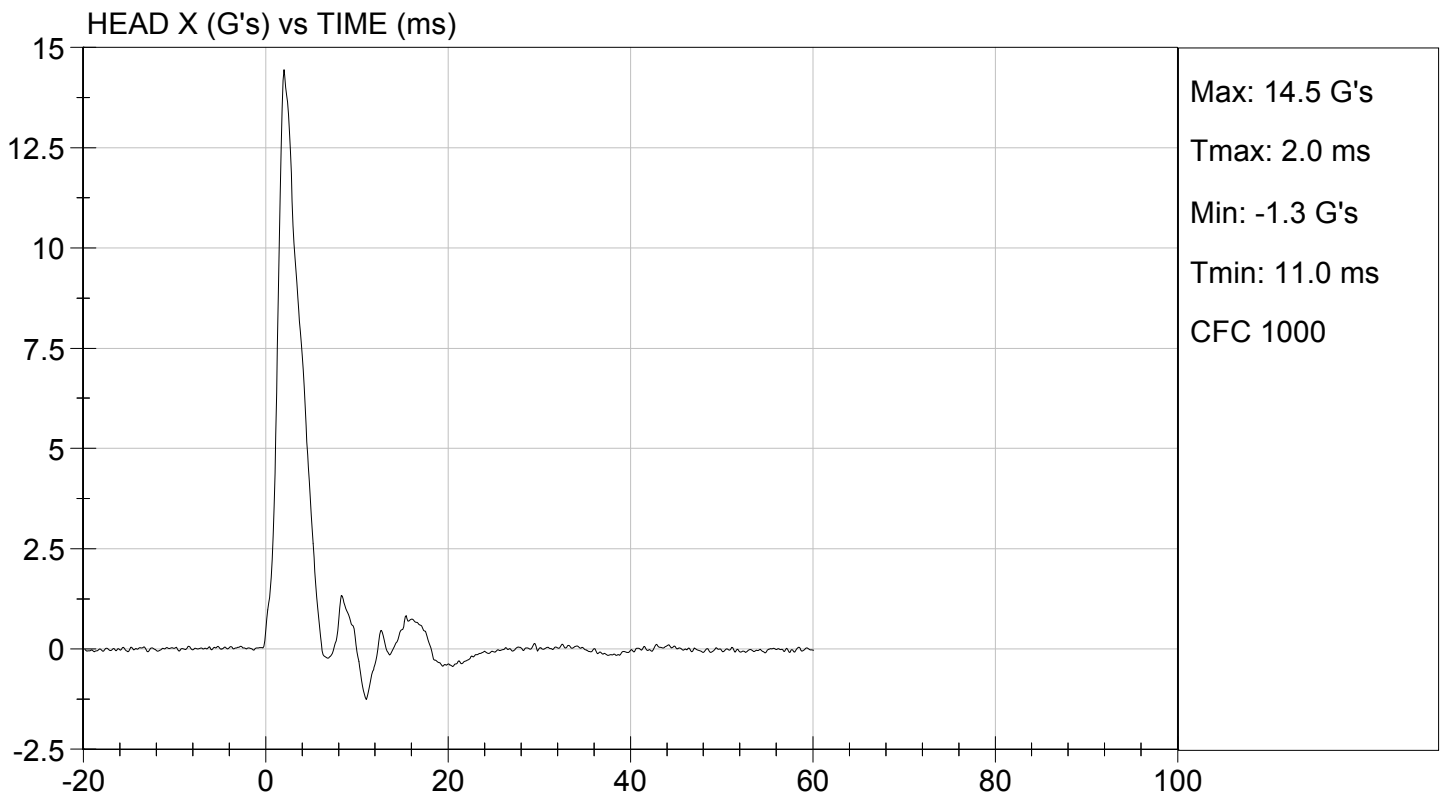
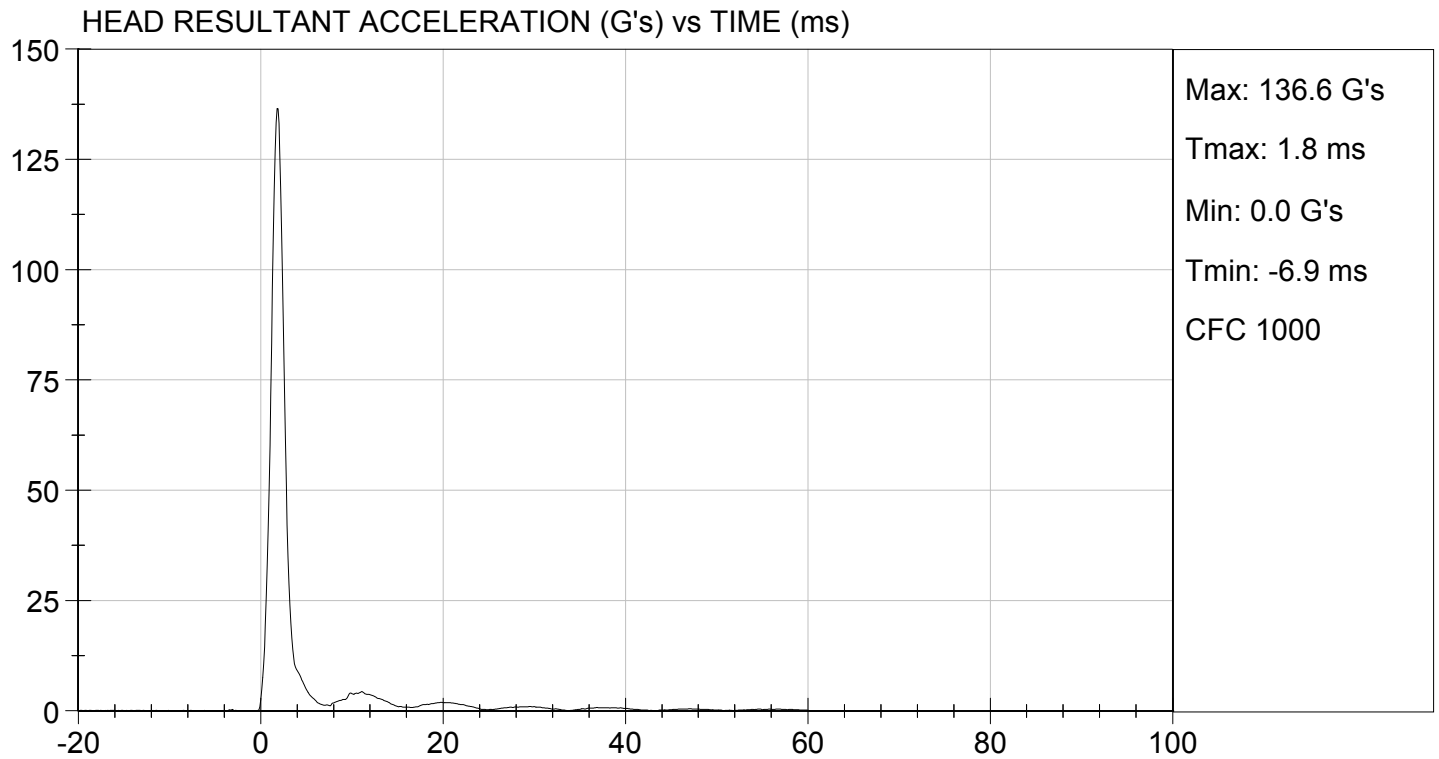
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	18	Pass
Peak Resultant Acceleration	G's	125 to 155	137	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	14.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

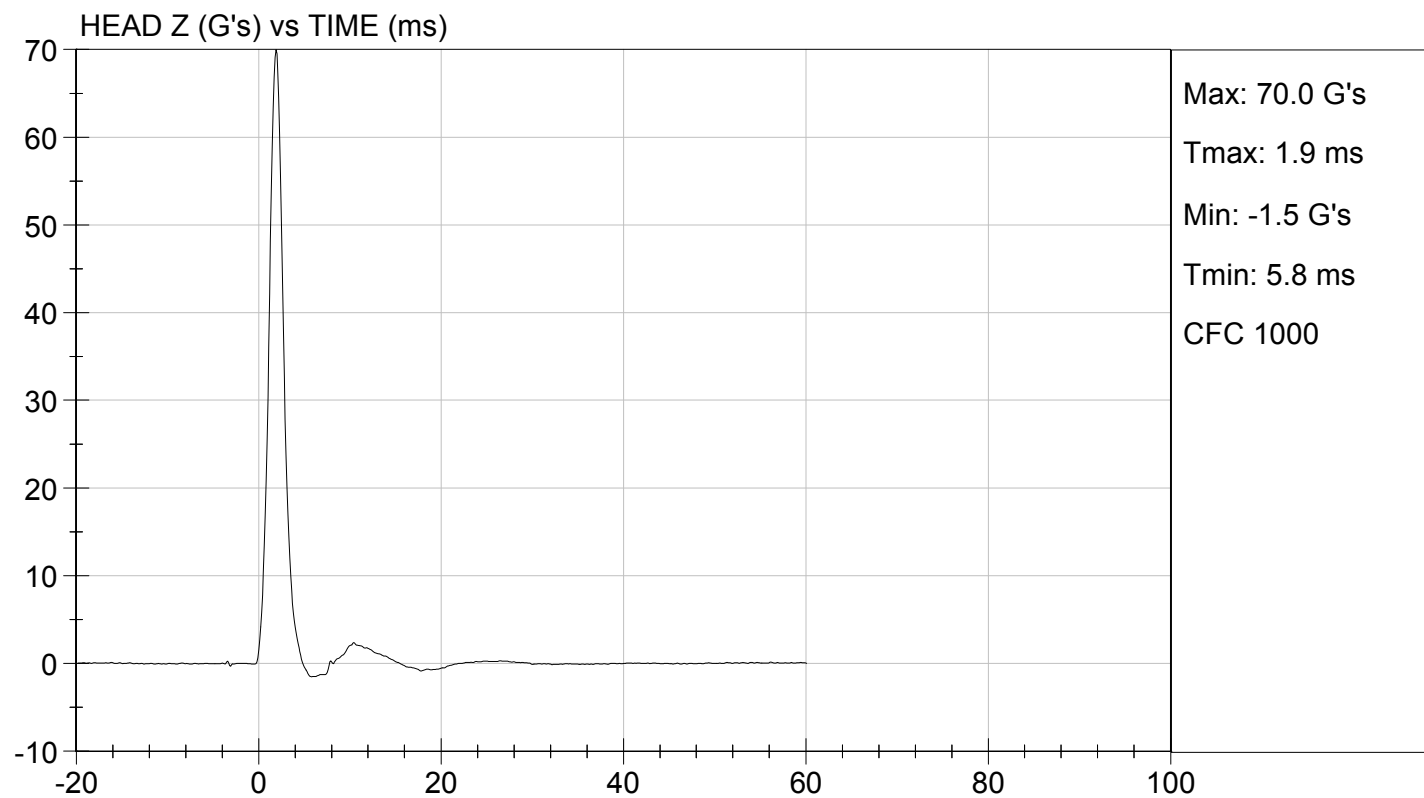
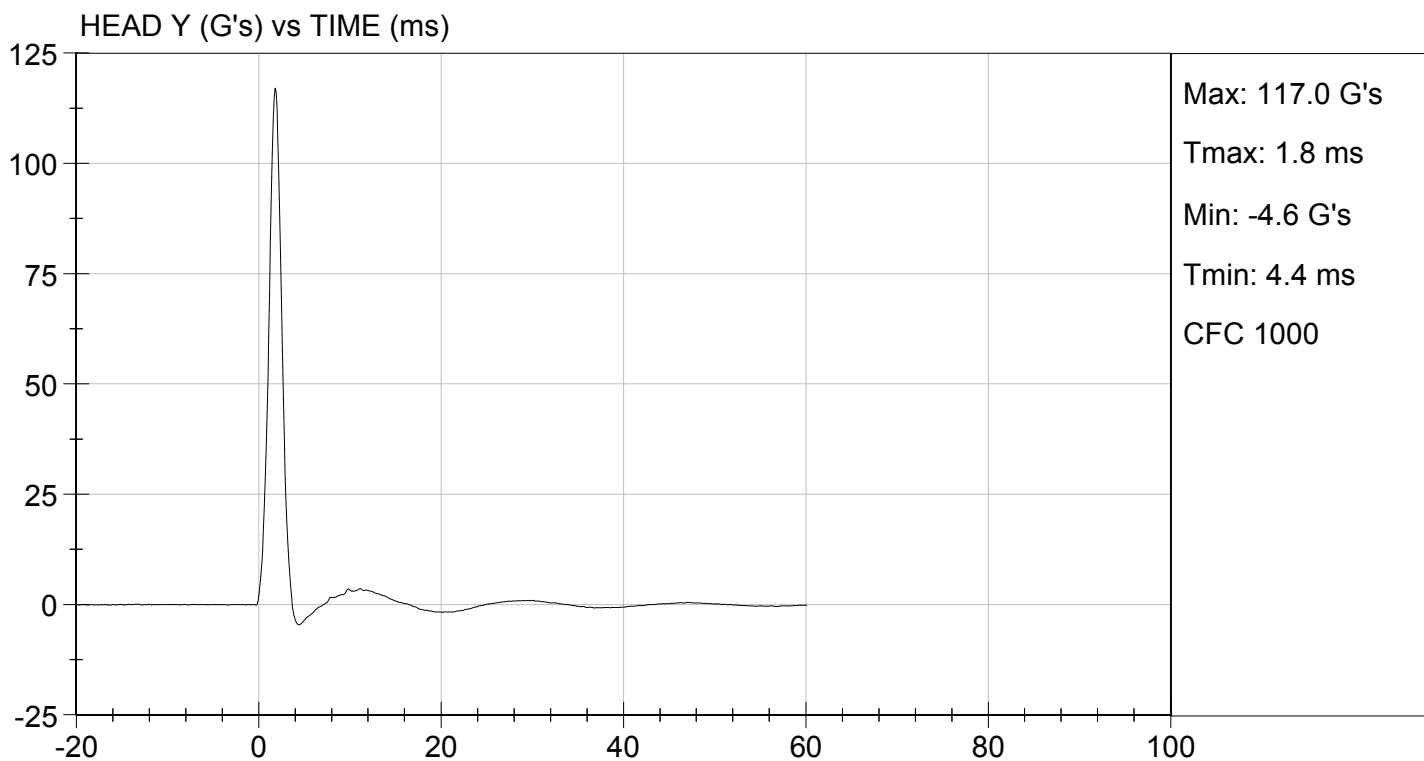

Laboratory Technician

11/19/2014

Test Date


Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144112

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	16	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.48	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.03	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.33	Pass
	17 ms	m/s	>= -3.70	-3.42	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	49.8	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	54.6	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	53.3	Pass
Overall Results					Pass

David Schoedel
 Laboratory Technician

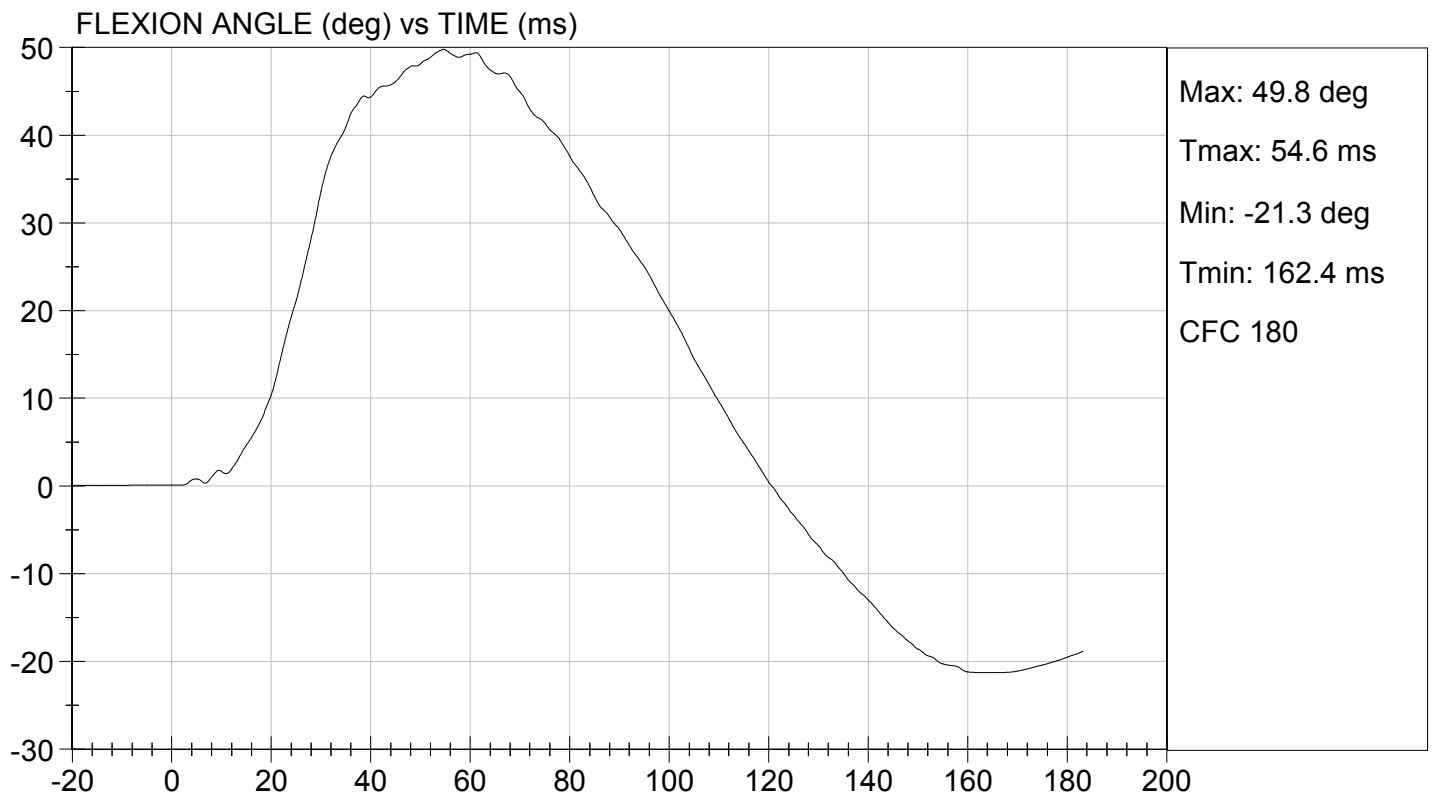
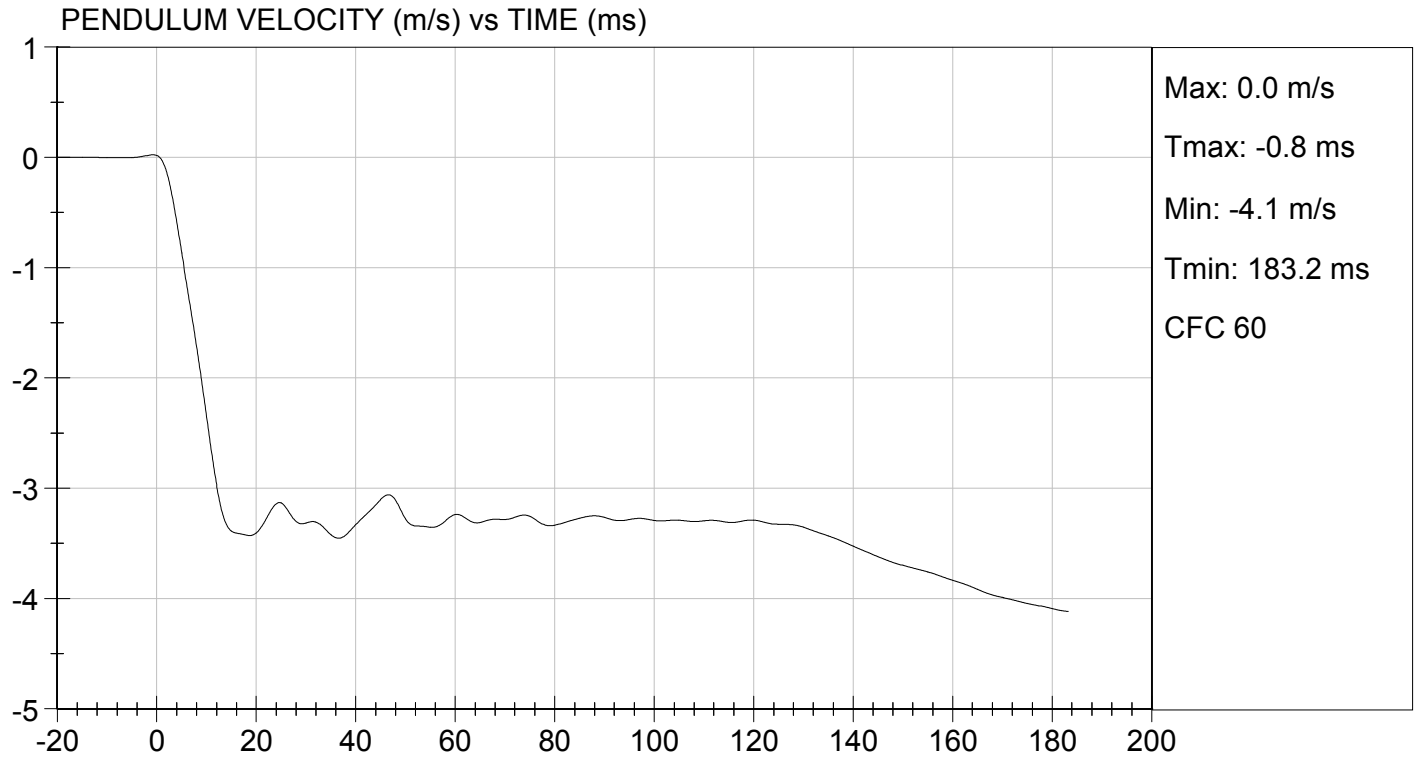
11/20/2014
 Test Date

Jessica Hall
 Approved By



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

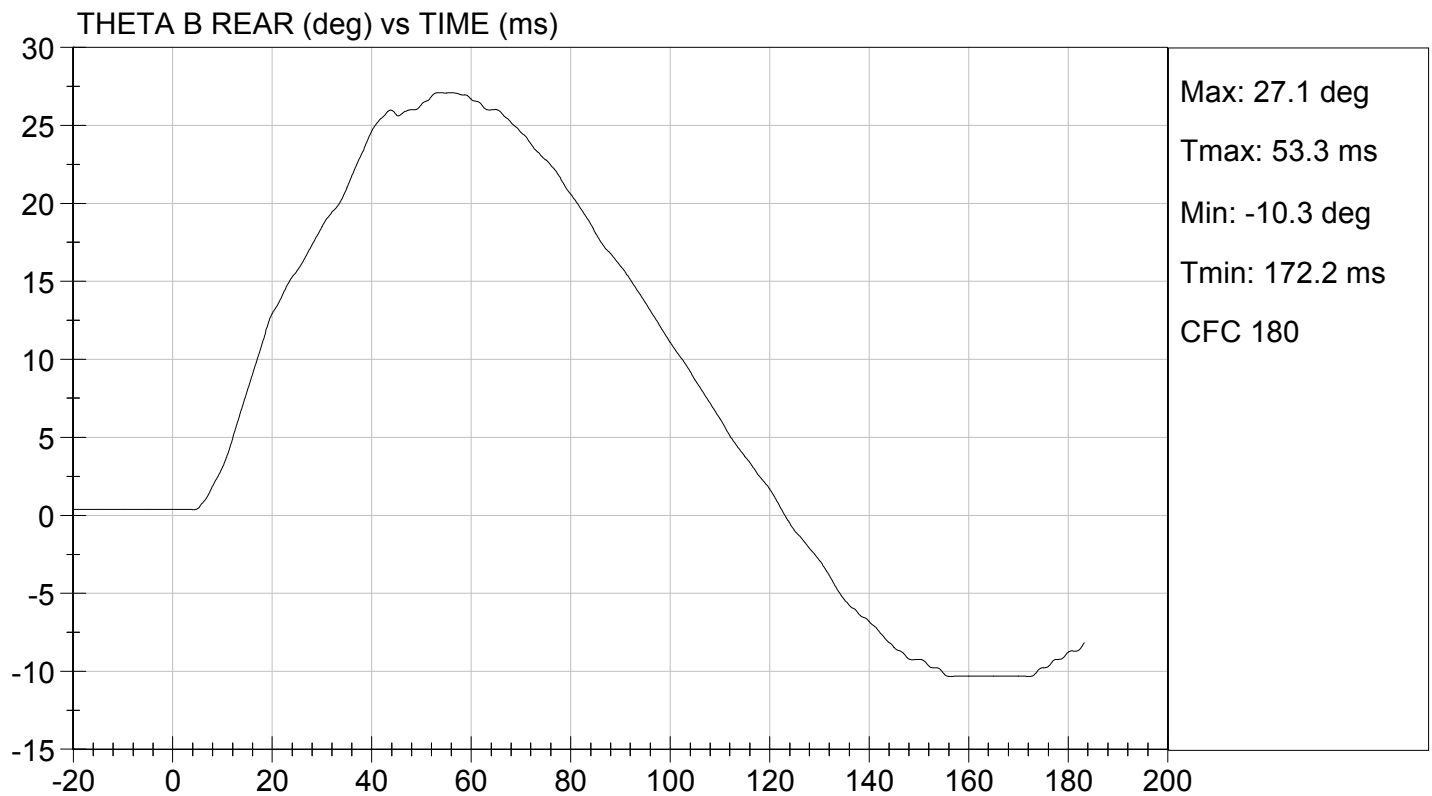
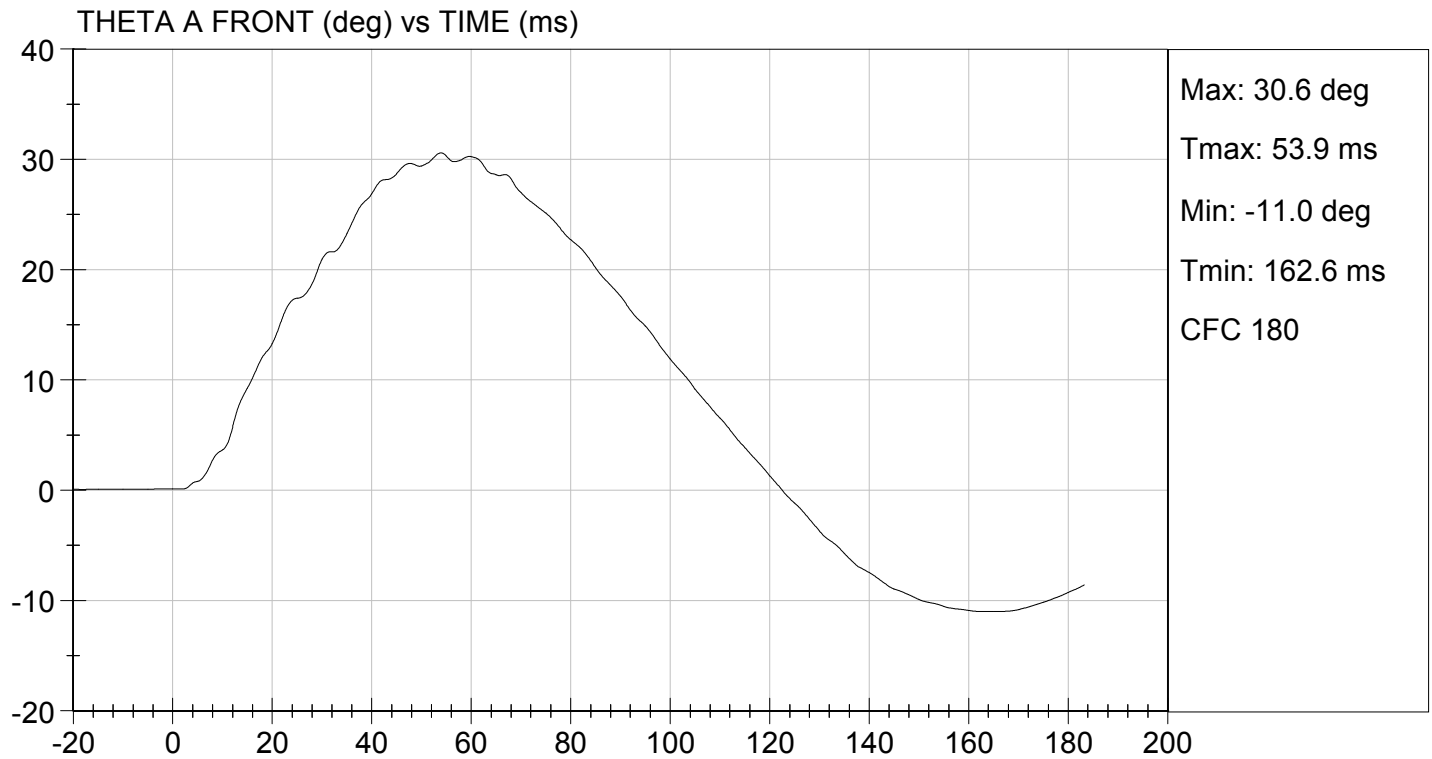
TEST DATE: 11/20/2014
TEST #: D144112





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

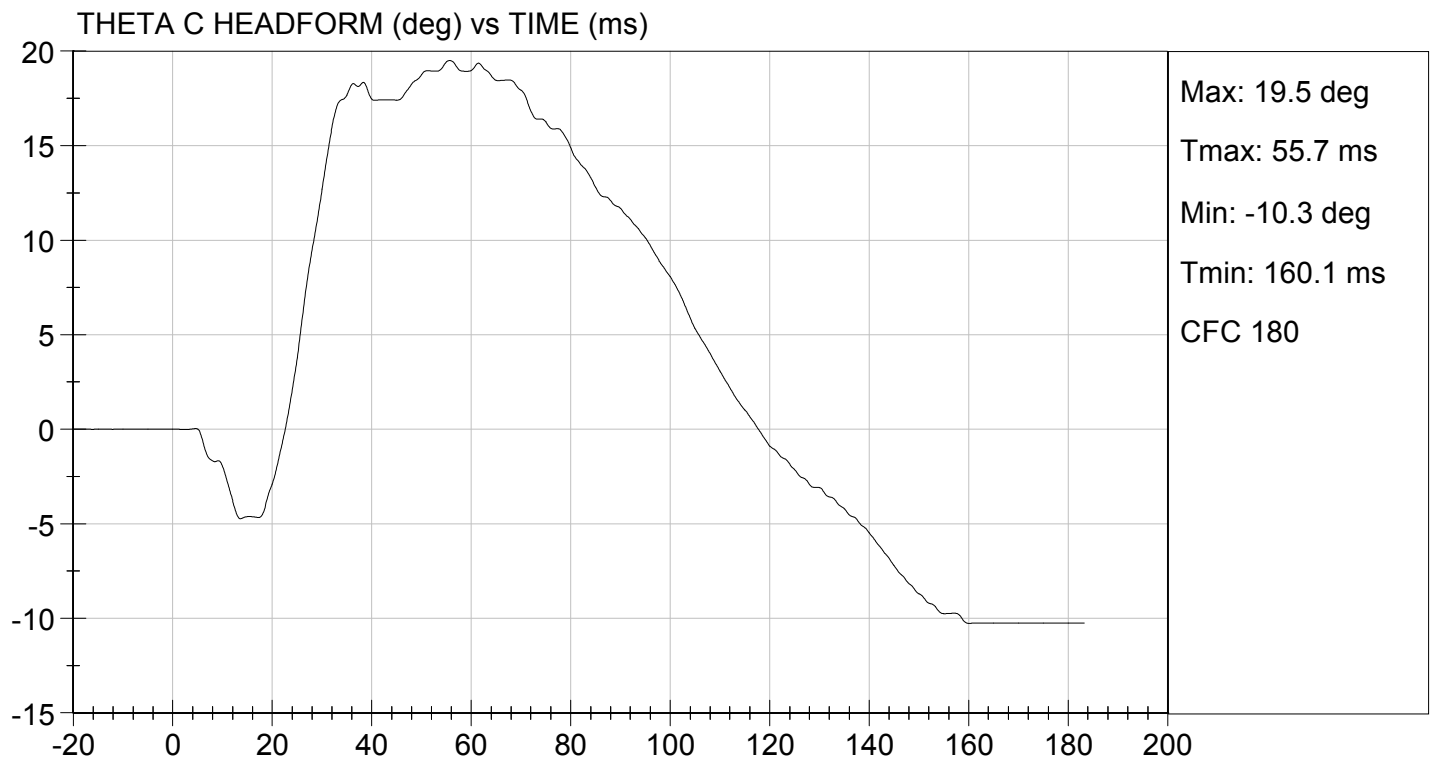
TEST DATE: 11/20/2014
TEST #: D144112





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

TEST DATE: 11/20/2014
TEST #: D144112



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144113

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.4	Pass
Overall Test Results				Pass


Laboratory Technician

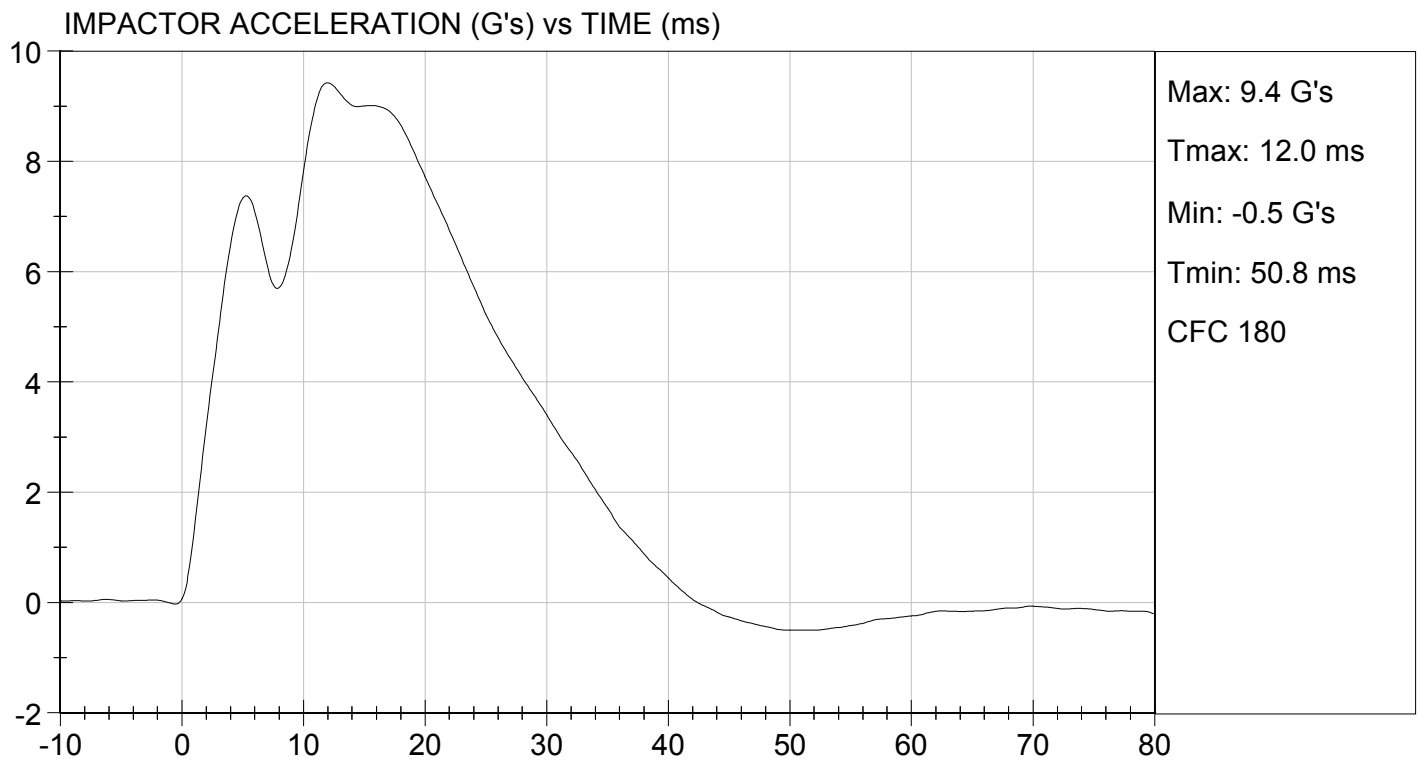
11/20/2014
Test Date


Approved By



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

TEST DATE: 11/20/2014
TEST #: D144113



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144114

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	17	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.7	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.5	Pass
Overall Test Results				Pass


Laboratory Technician

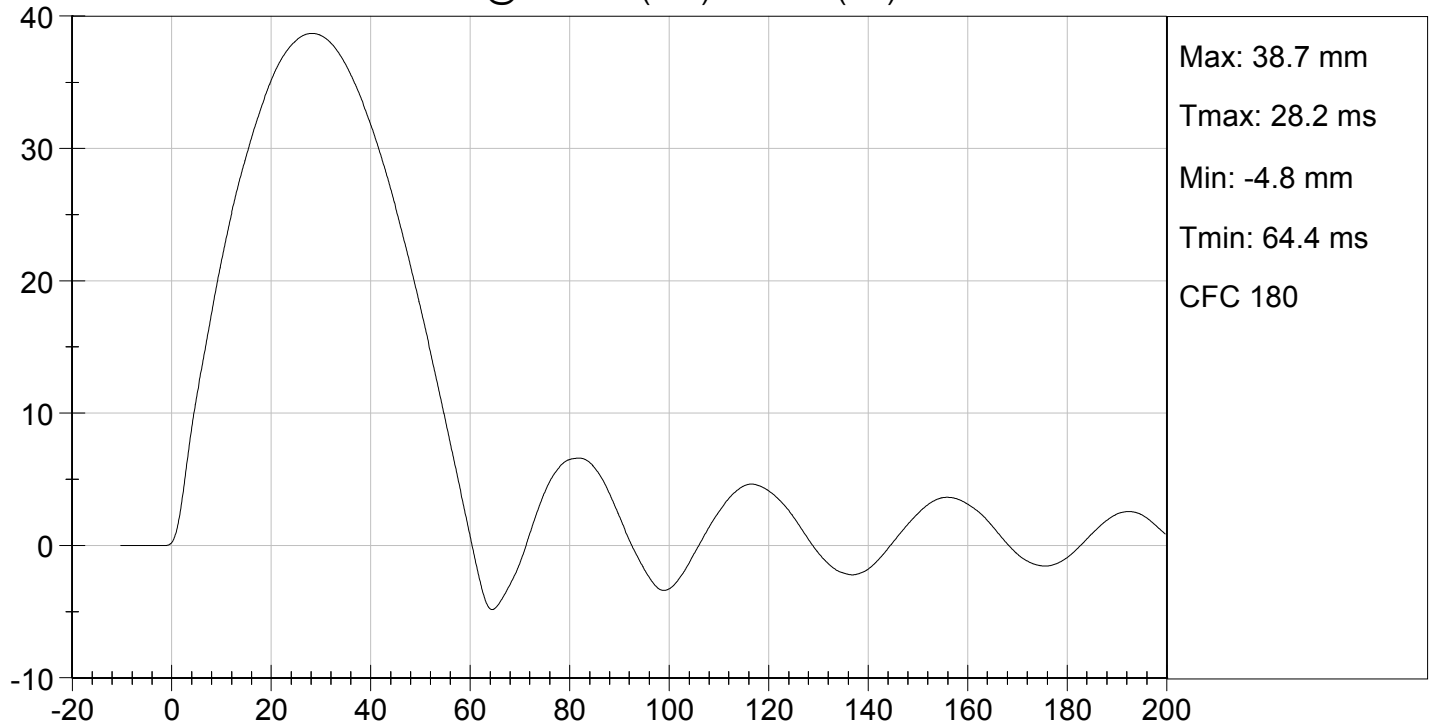
11/19/2014

Test Date

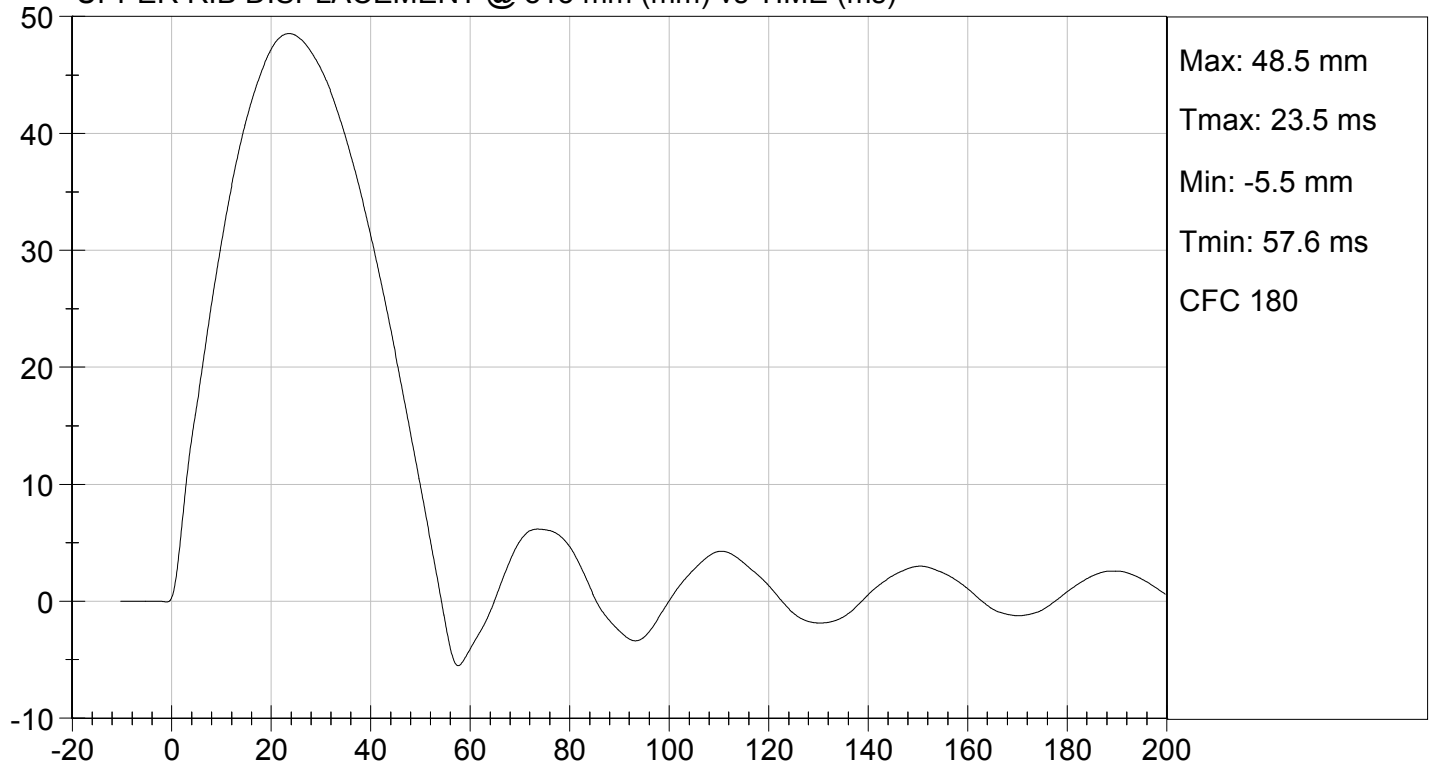

Approved By



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: D144115

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	17	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.5	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.6	Pass
Overall Test Results				Pass


Laboratory Technician

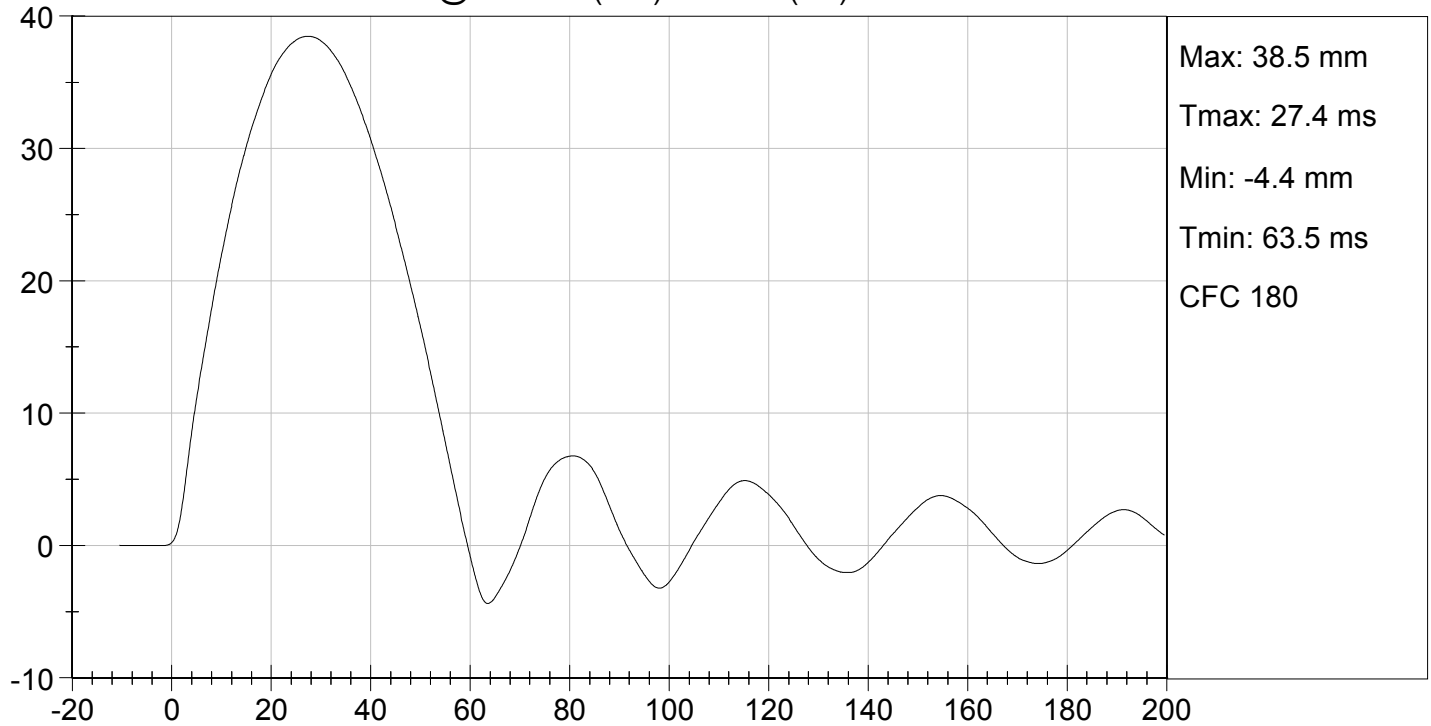
11/19/2014

Test Date

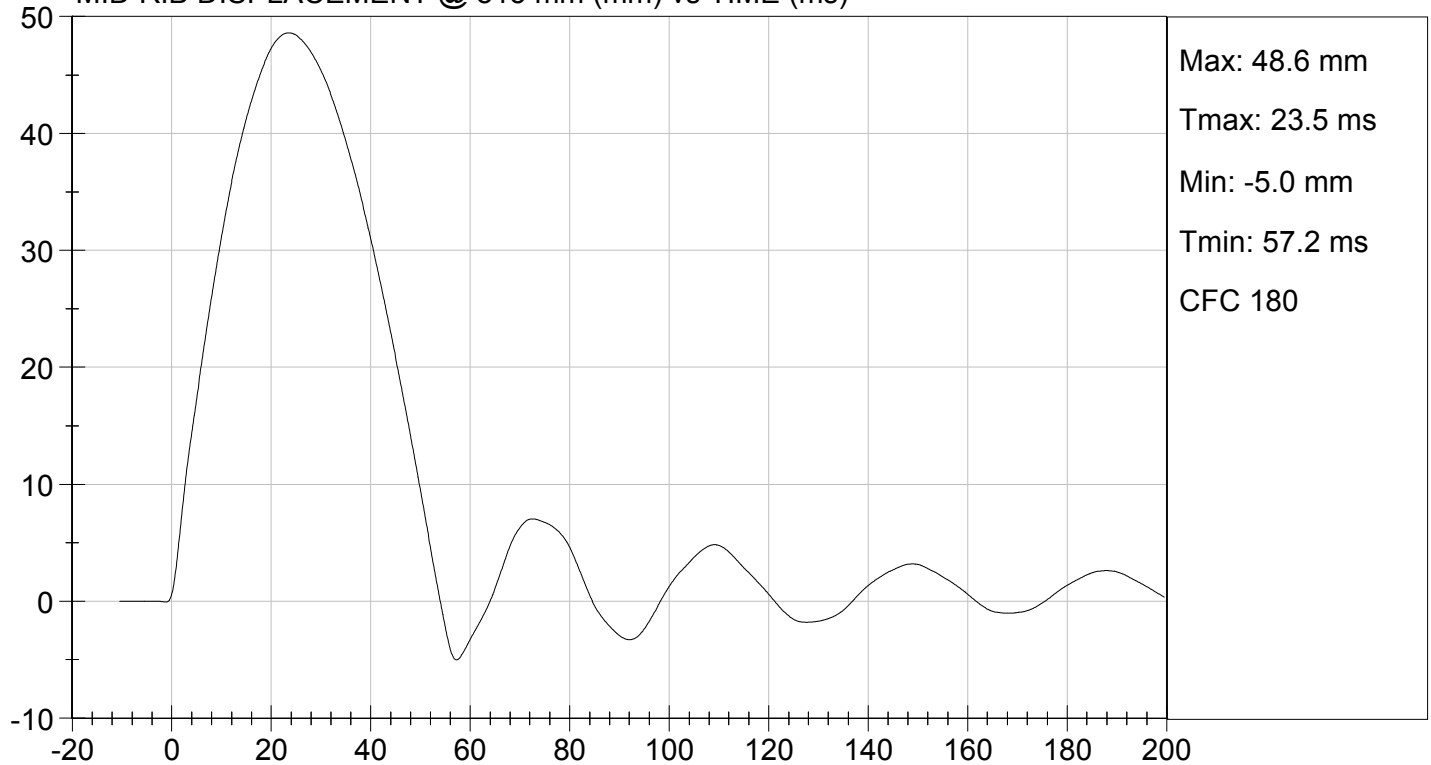

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MID RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



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



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

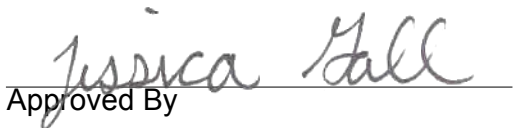
Test I.D: D144116

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	17	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.7	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.6	Pass
Overall Test Results				Pass


Laboratory Technician

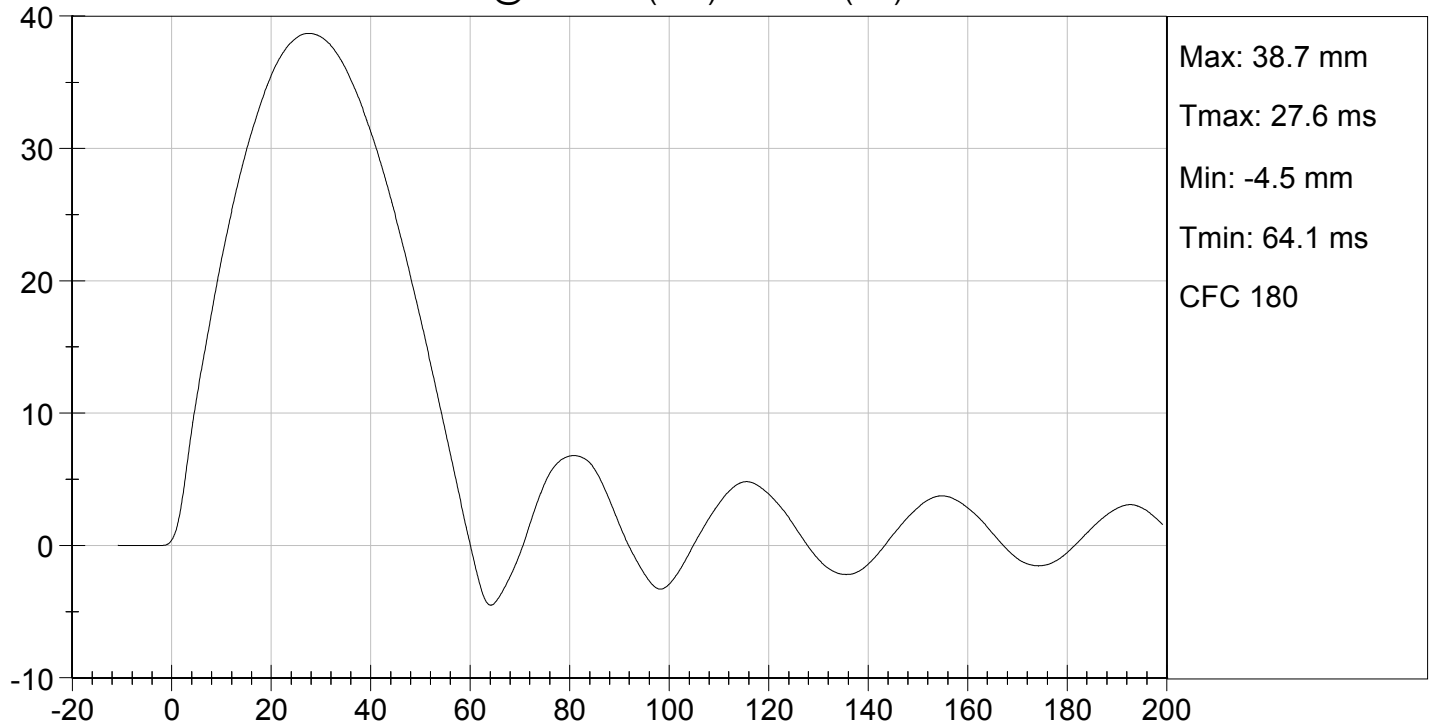
11/19/2014

Test Date

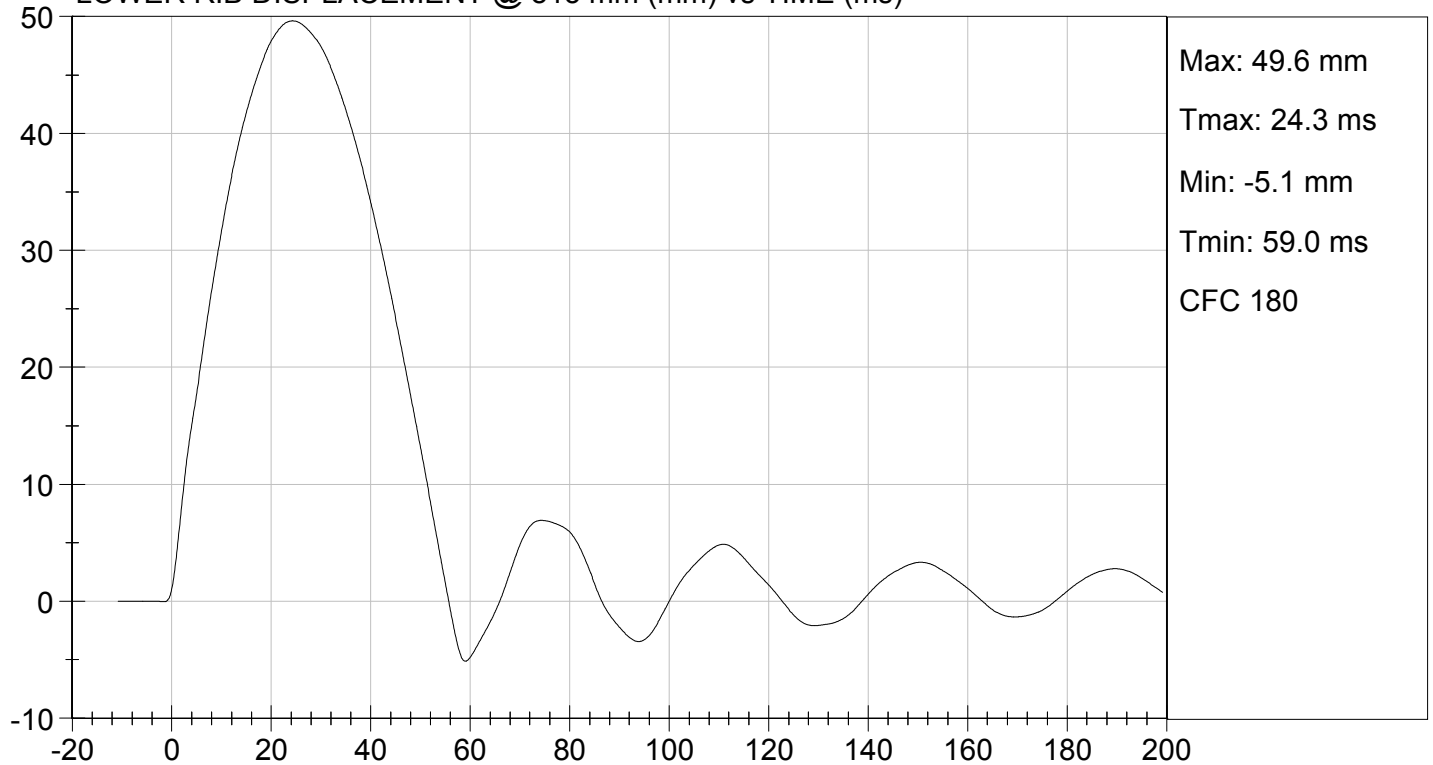

Approved By



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



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



MGA RESEARCH CORPORATION**THORAX IMPACT TEST****ES-2re DUMMY****ATD Serial No:** 032**Test I.D:** D144110

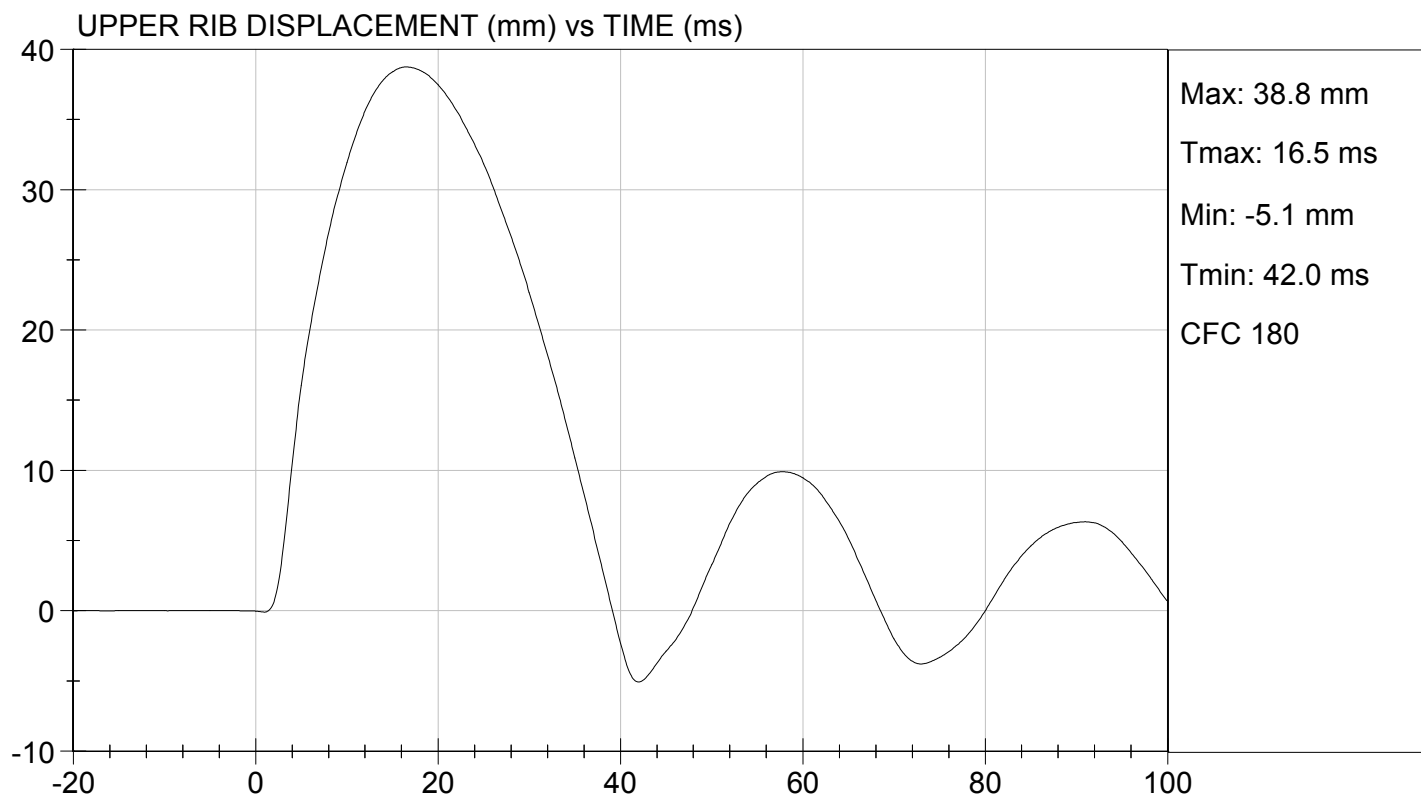
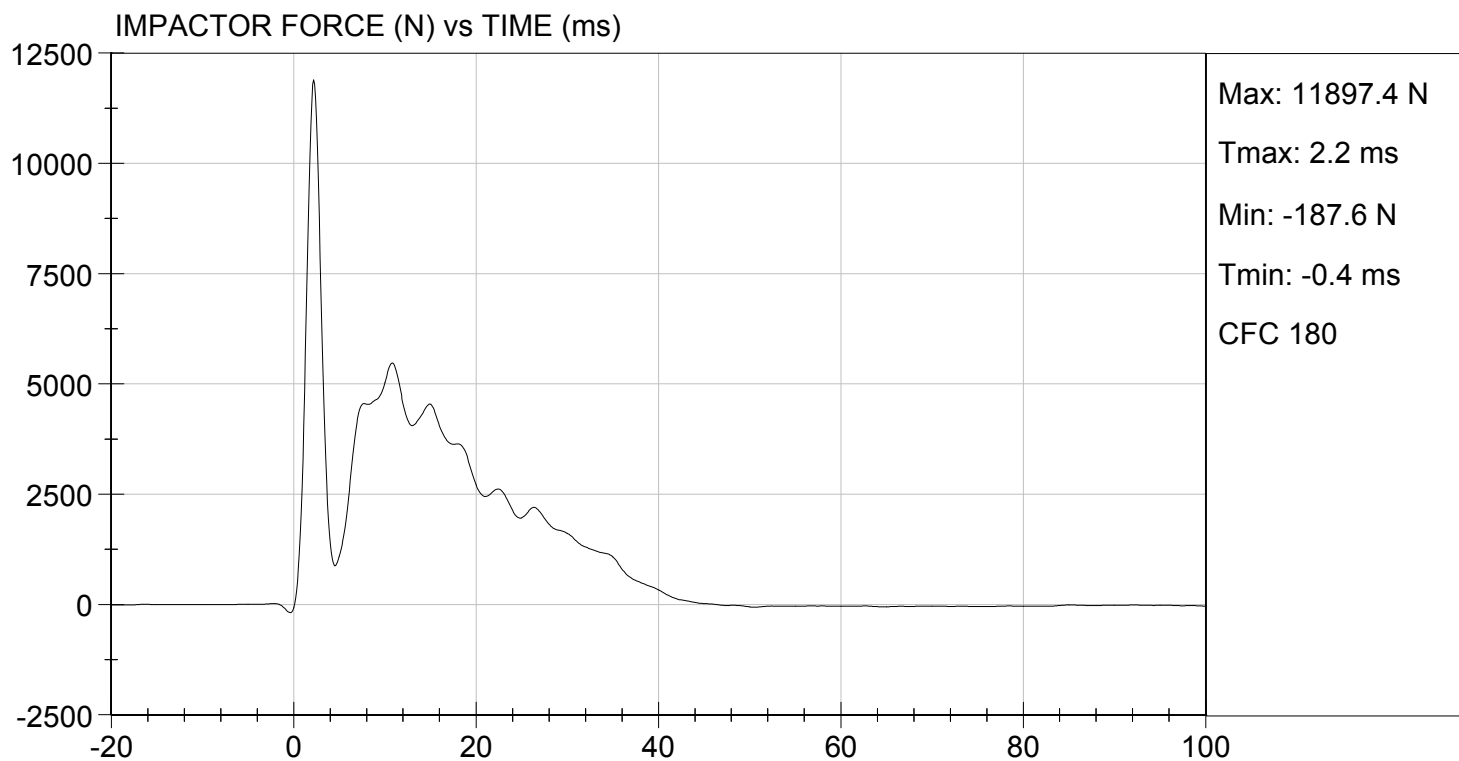
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	17	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5481	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.8	Pass
Middle Rib Displacement	mm	37.0 to 45.0	41.9	Pass
Lower Rib Displacement	mm	37.0 to 44.0	40.6	Pass
Overall Test Results				Pass


Laboratory Technician

11/20/2014

Test Date

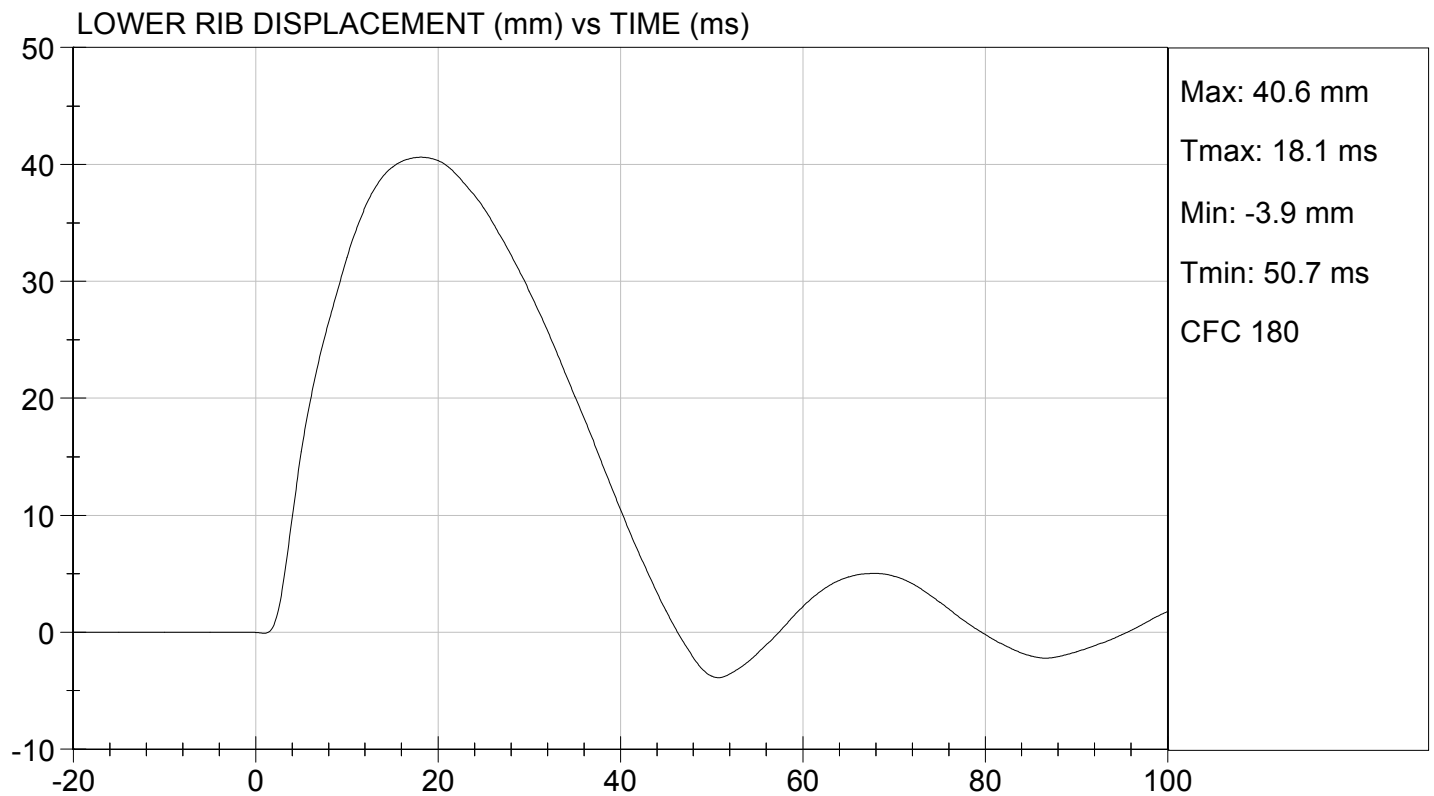
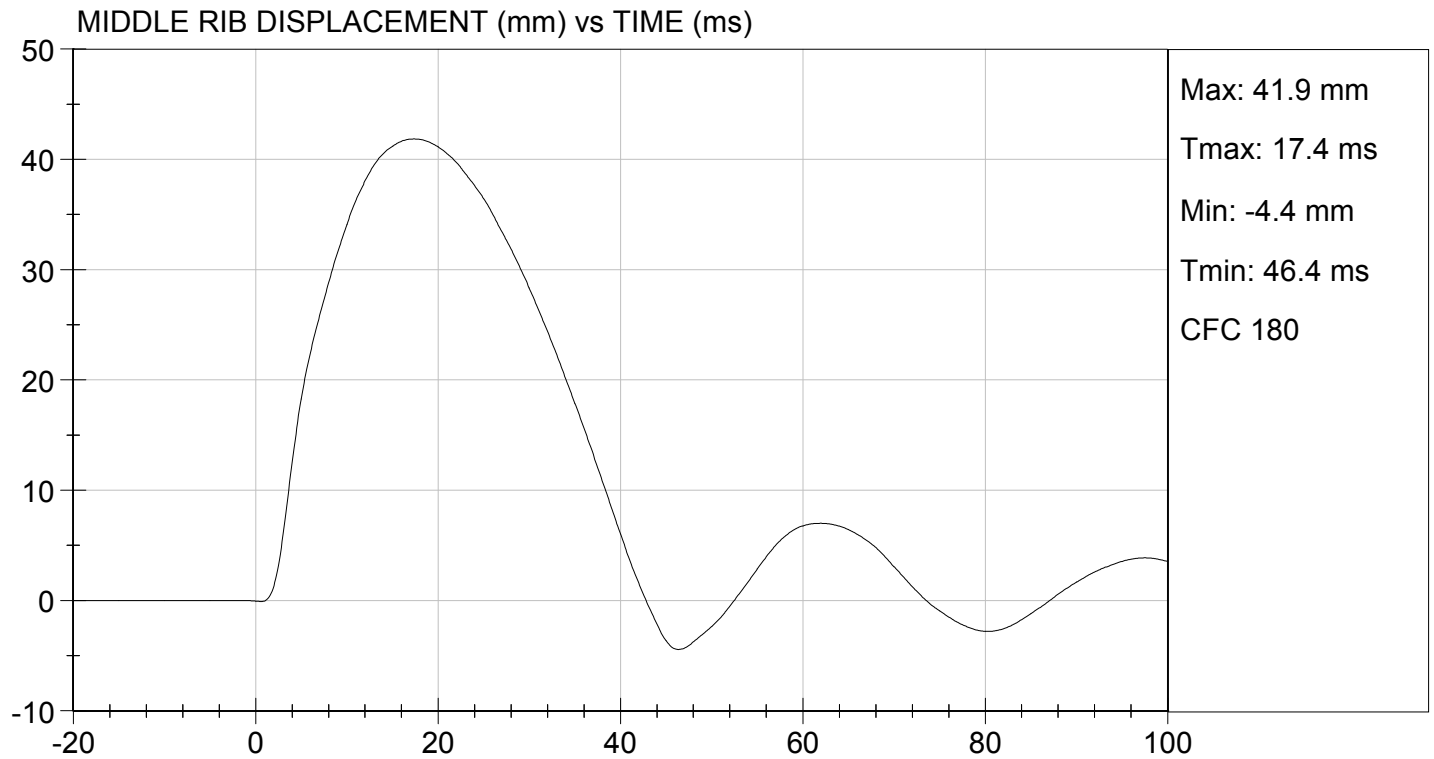

Approved By





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

TEST DATE: 11/20/2014
TEST #: D144110



MGA RESEARCH CORPORATION

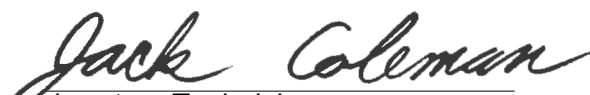
ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144117

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4654	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	10.6	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2372	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	10.5	Pass
Overall Test Results				Pass


Laboratory Technician

11/20/2014

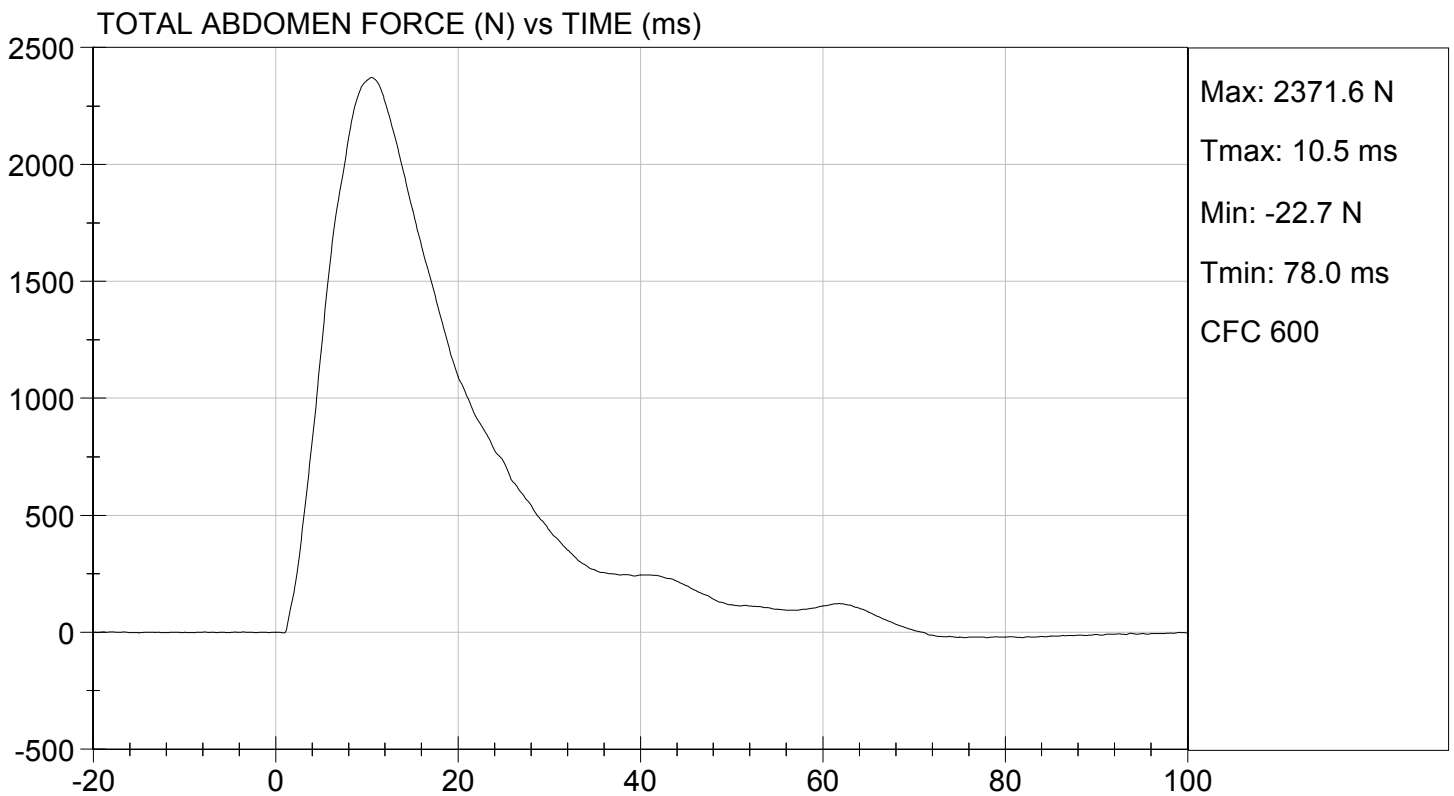
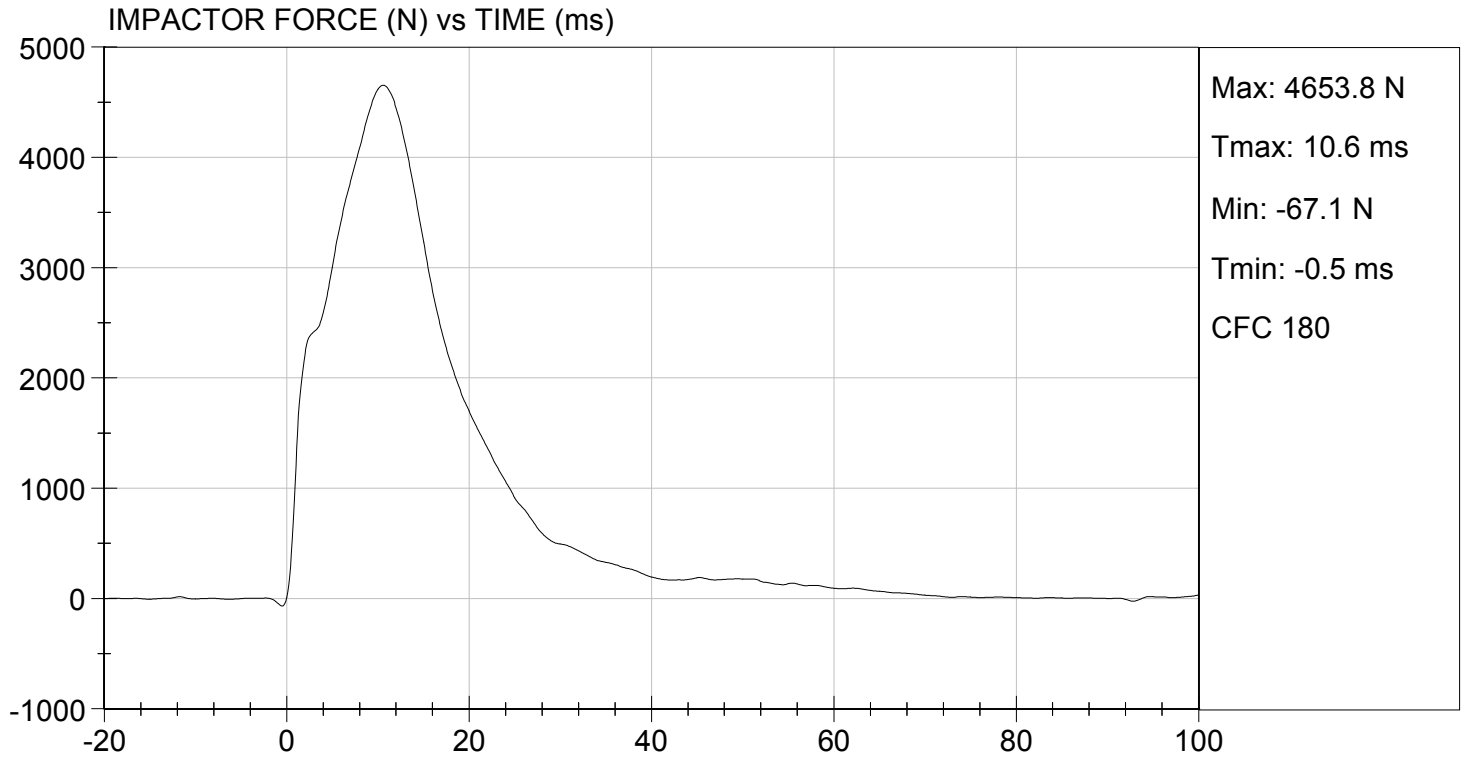
Test Date


Approved By



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

TEST DATE: 11/20/2014
TEST #: D144117

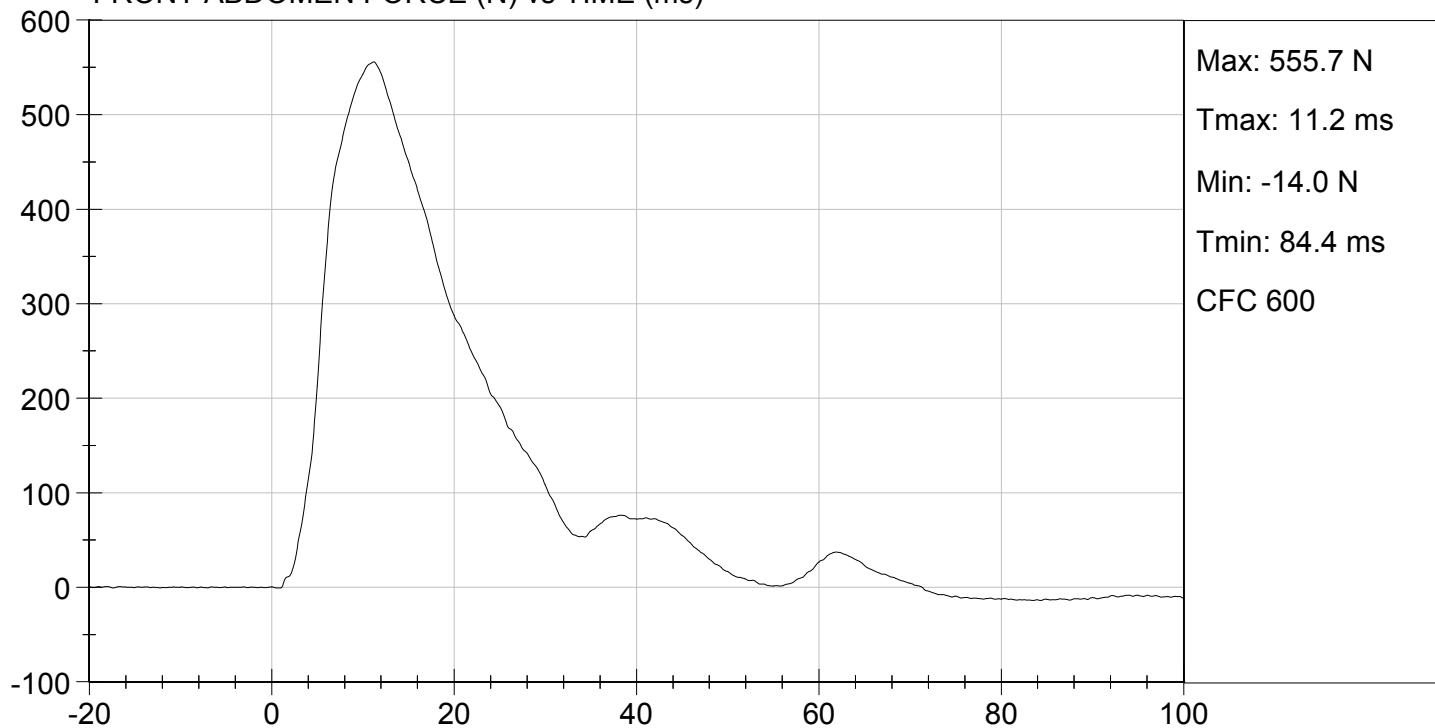




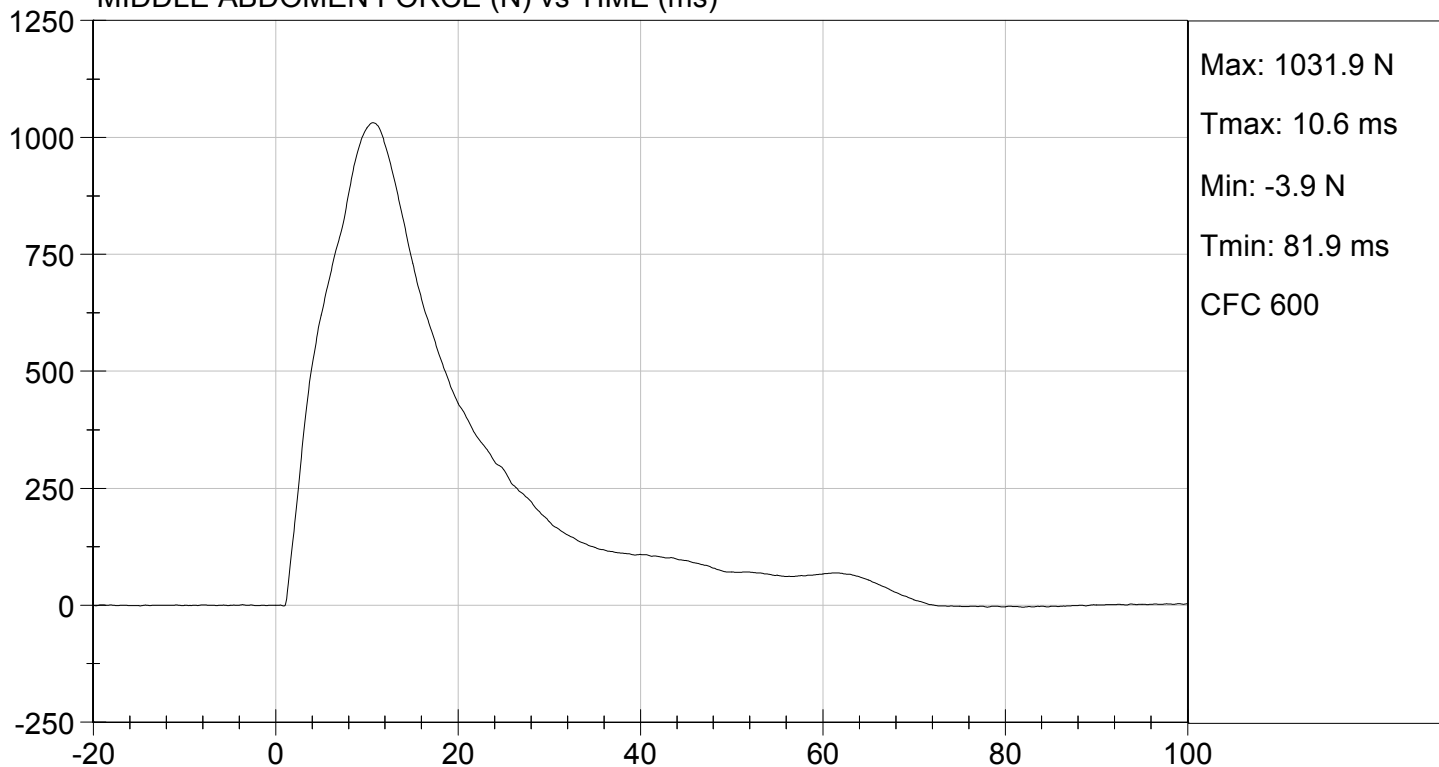
TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.33 ft/s, 4.06 m/s

TEST DATE: 11/20/2014
TEST #: D144117

FRONT ABDOMEN FORCE (N) vs TIME (ms)



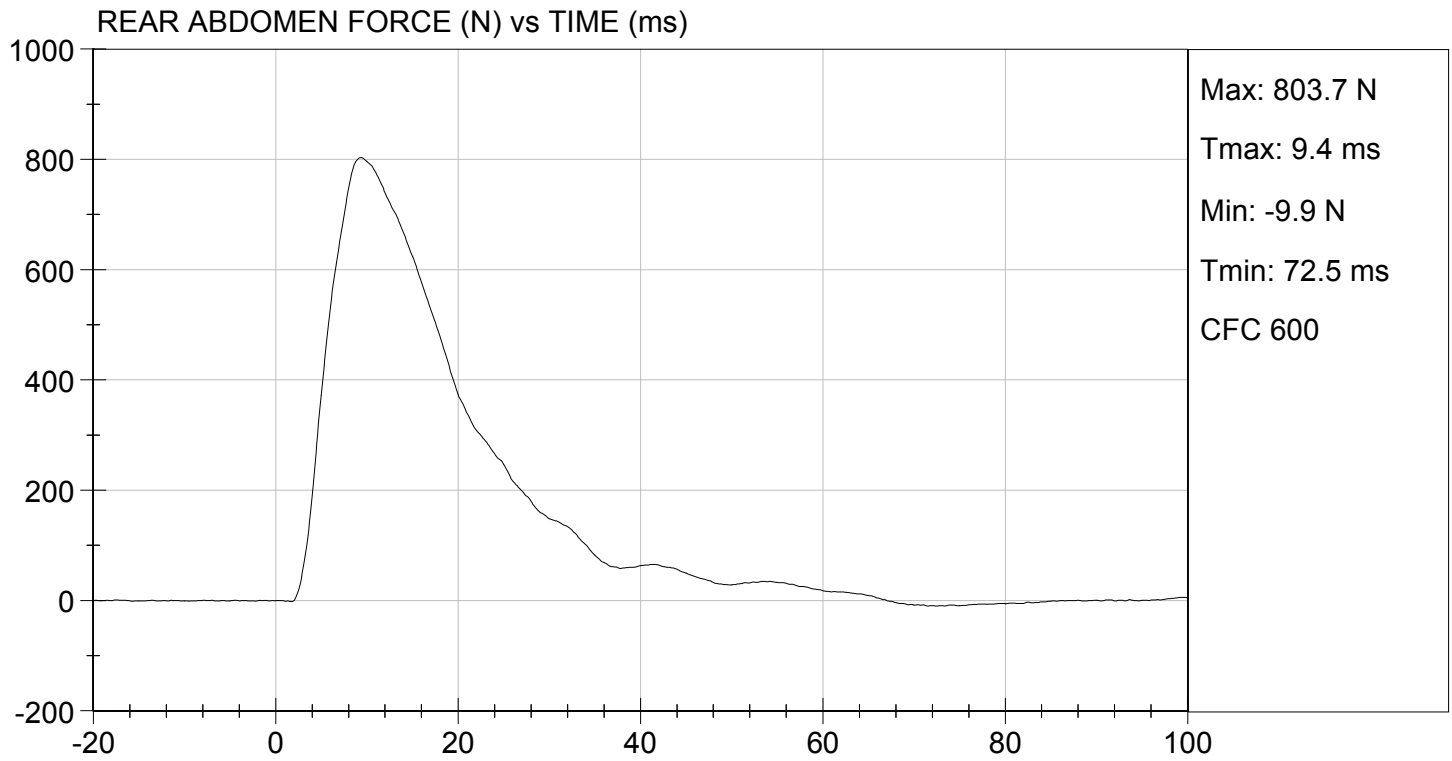
MIDDLE ABDOMEN FORCE (N) vs TIME (ms)





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

TEST DATE: 11/20/2014
TEST #: D144117



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144118

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	18	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.15	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	-0.417	Pass
	27 ms	m/s	-6.50 to -5.80	-5.95	Pass
	30 ms	m/s	>= -6.50	-6.49	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	45.3	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	46.2	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	45	Pass
Overall Results					Pass

David Schoedel
Laboratory Technician

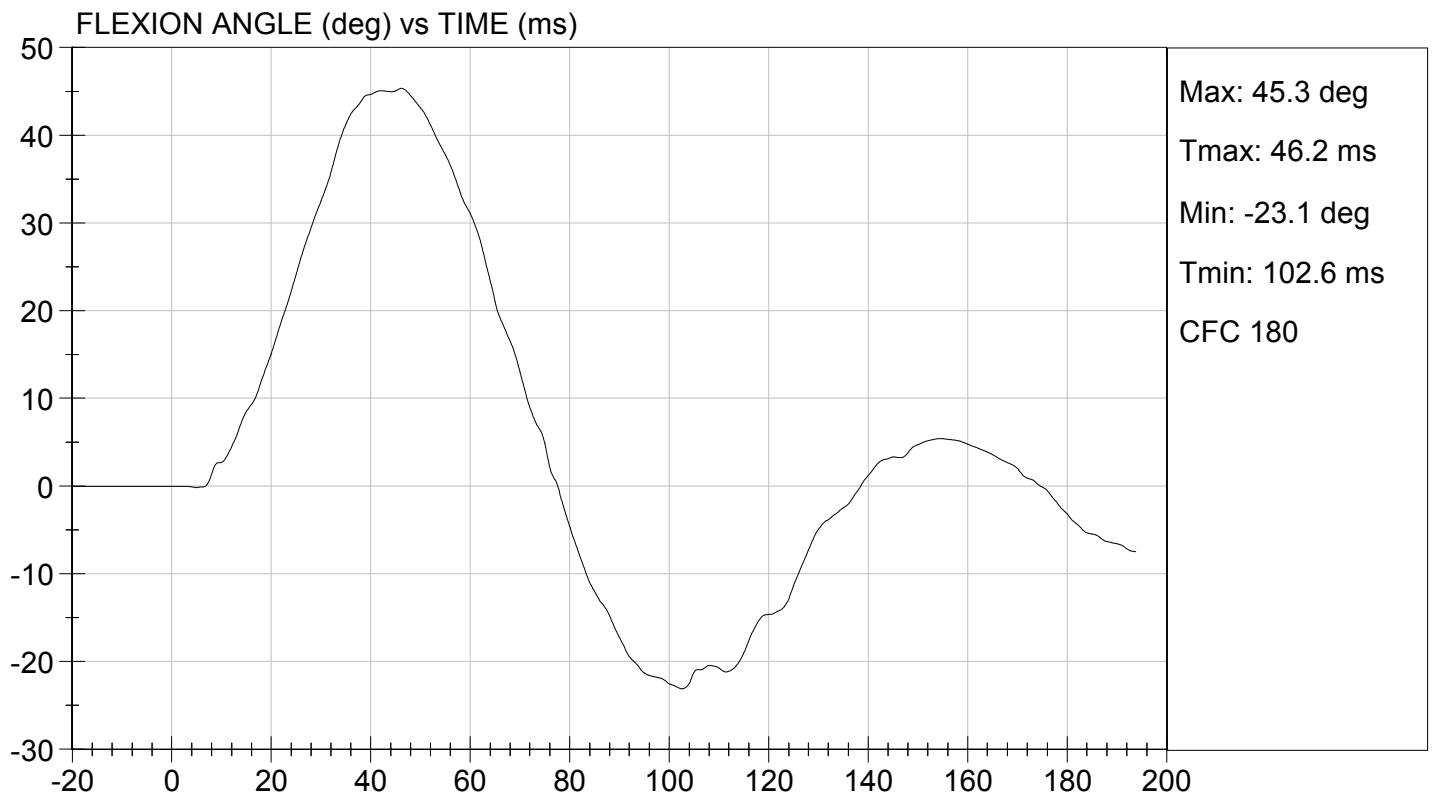
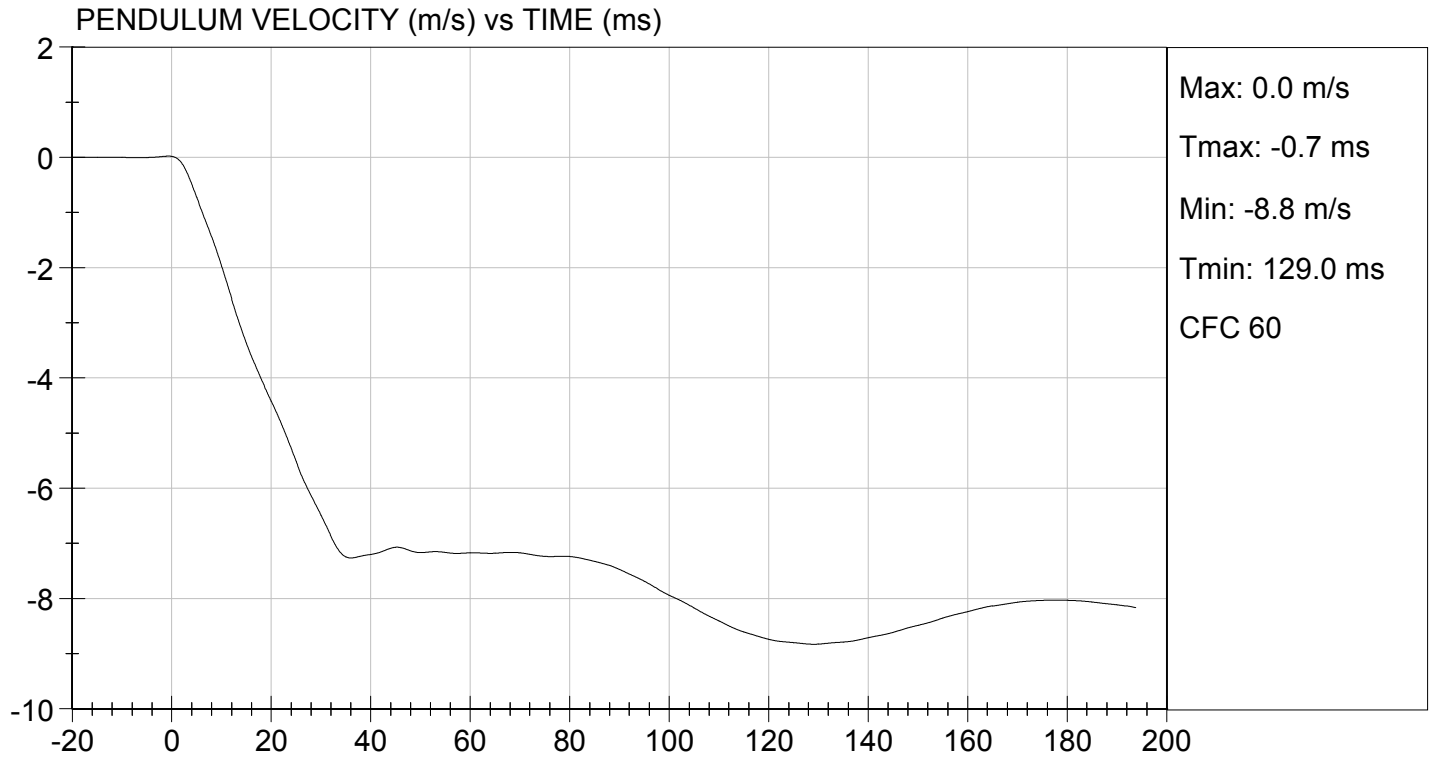
Jessica Hall
Approved By

11/19/2014
Test Date



TEST DESC: LUMBAR BENDING
VELOCITY: 20.18 ft/s, 6.15 m/s

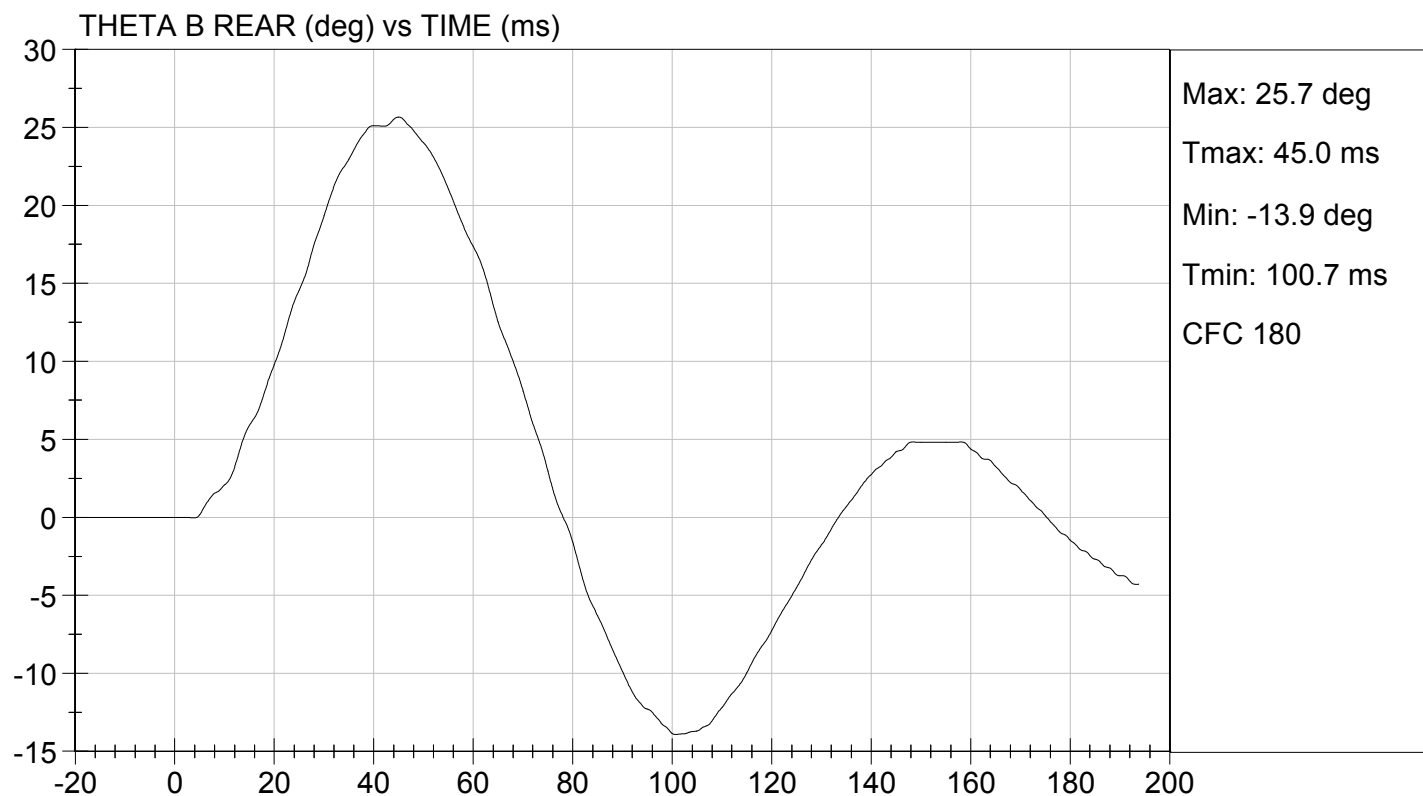
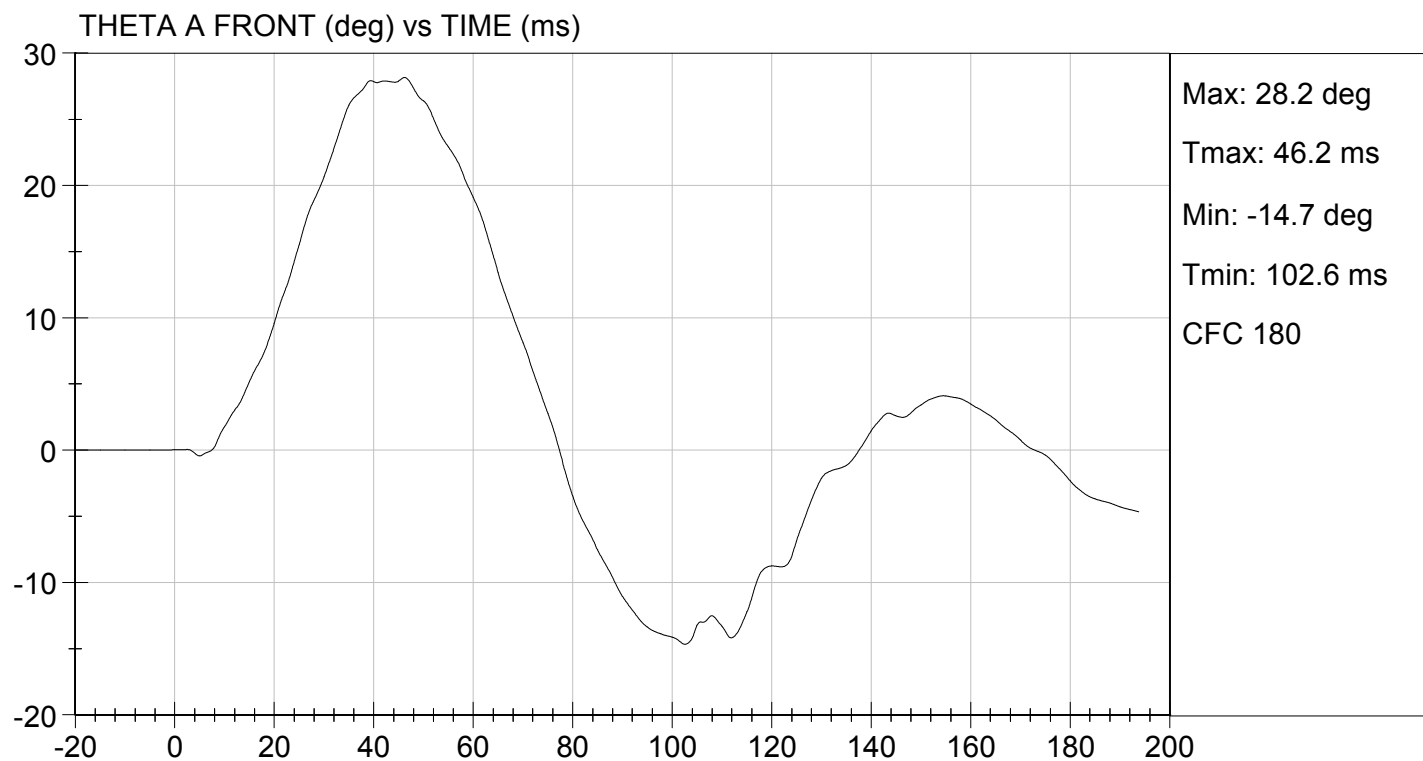
TEST DATE: 11/19/2014
TEST #: D144118





TEST DESC: LUMBAR BENDING
VELOCITY: 20.18 ft/s, 6.15 m/s

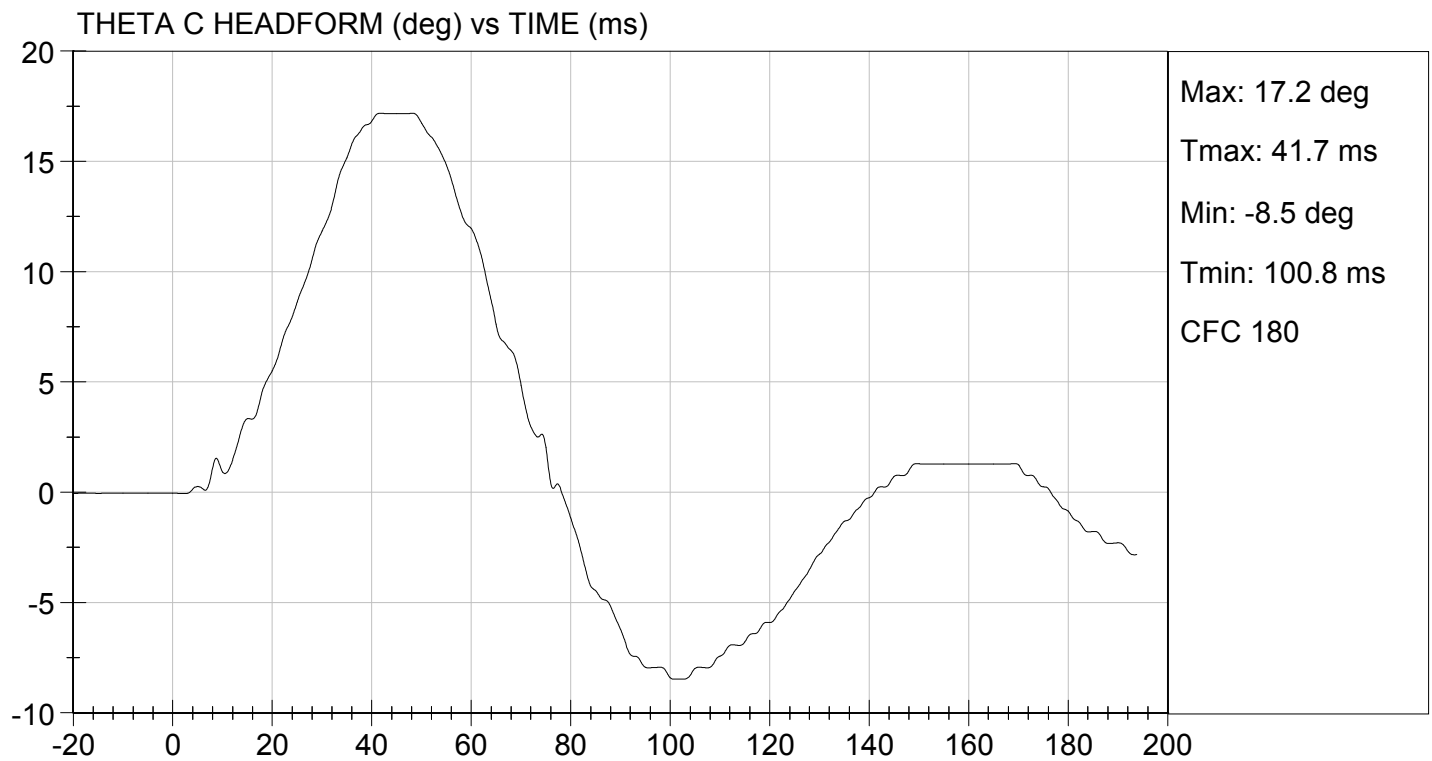
TEST DATE: 11/19/2014
TEST #: D144118





TEST DESC: LUMBAR BENDING
VELOCITY: 20.18 ft/s, 6.15 m/s

TEST DATE: 11/19/2014
TEST #: D144118



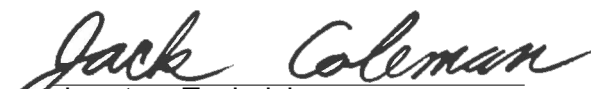
MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D144119

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Probe Speed	m/s	4.20 to 4.40	4.27	Pass
Maximum Impactor Force	N	4700 to 5400	4834	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.4	Pass
Maximum Pubic Force	N	1230 to 1590	1309	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	14.2	Pass
Overall Test Results				Pass


Laboratory Technician

11/20/2014

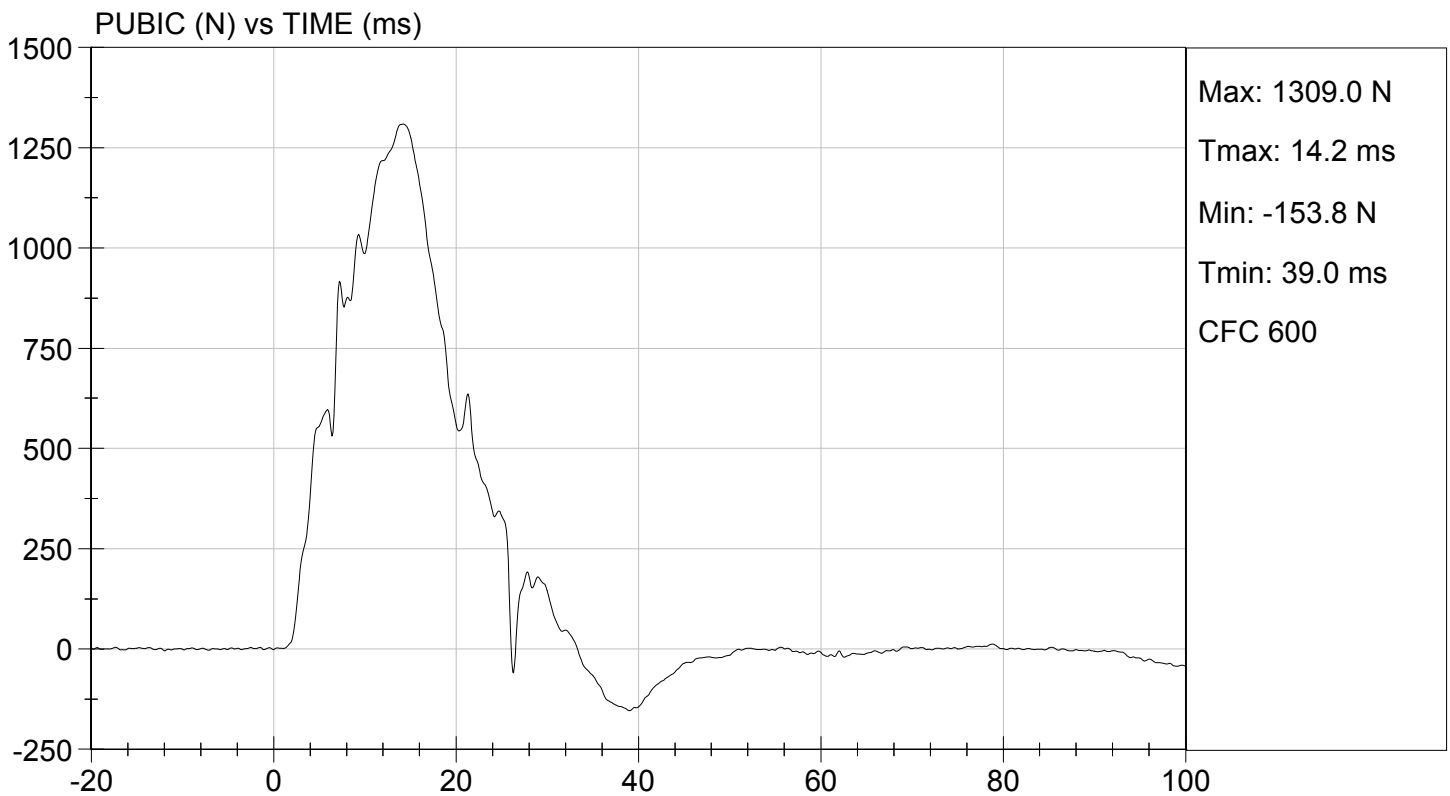
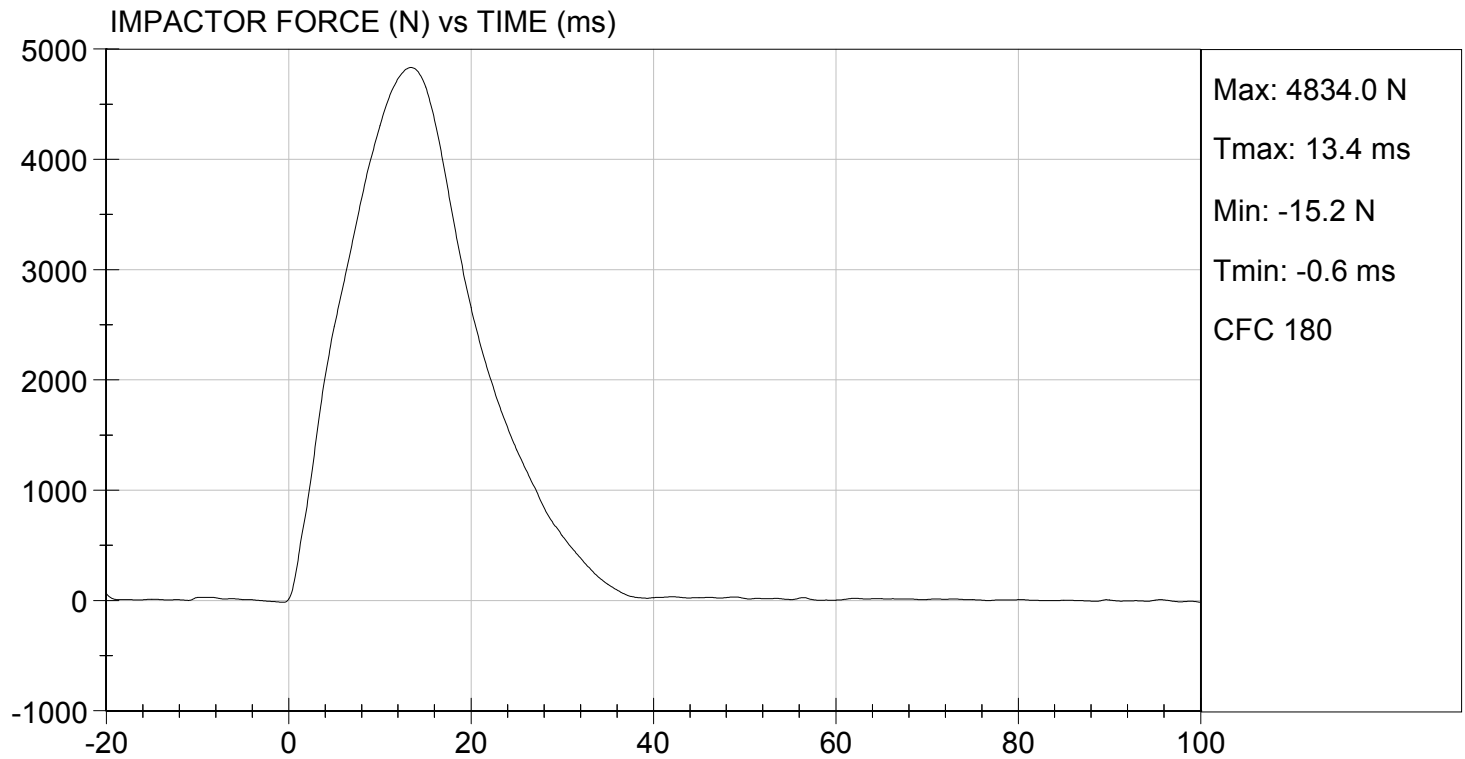
Test Date


Approved By



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

TEST DATE: 11/20/2014
TEST #: D144119



MGA RESEARCH CORPORATION
HEAD DROP TEST
ES-2re DUMMY

ATD Serial No: 032

Test ID: D144261

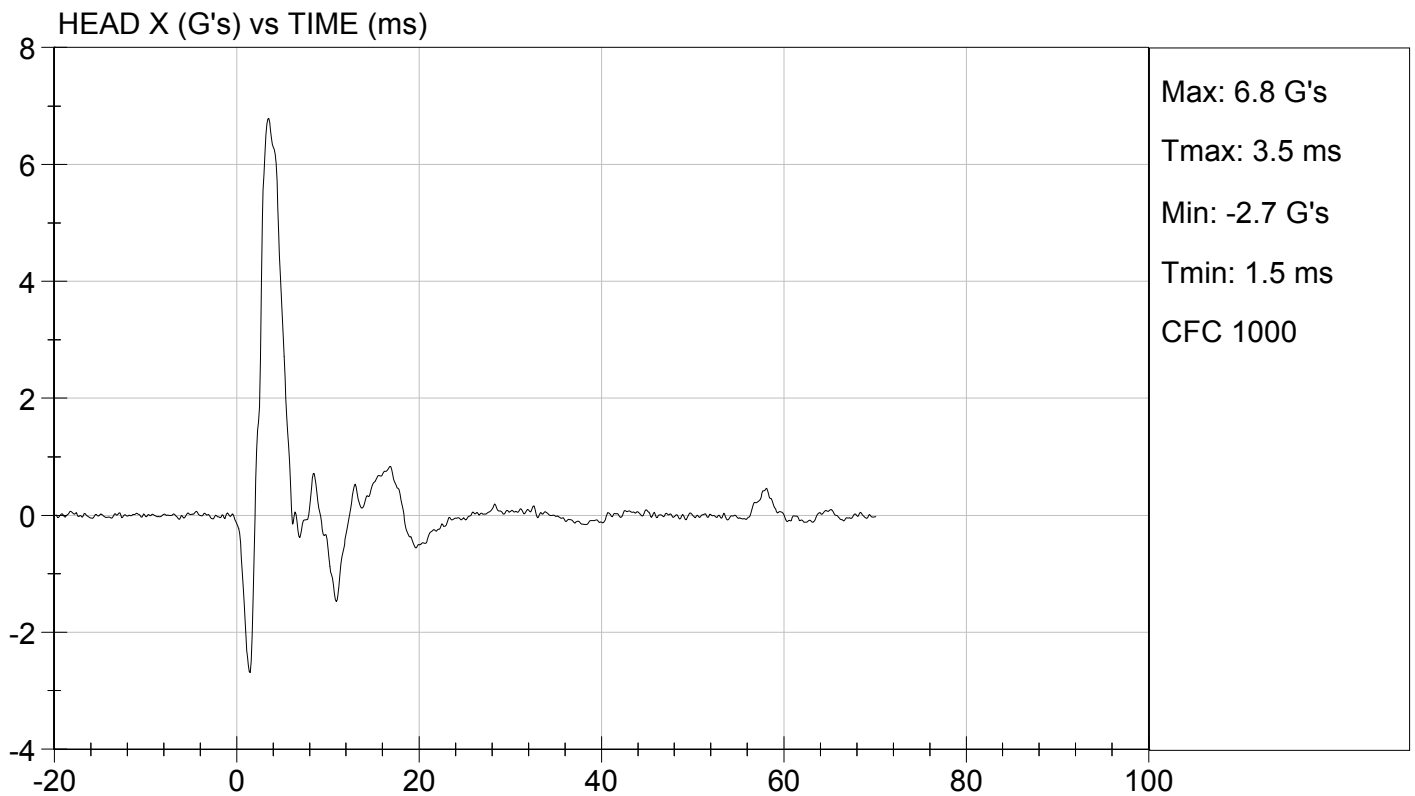
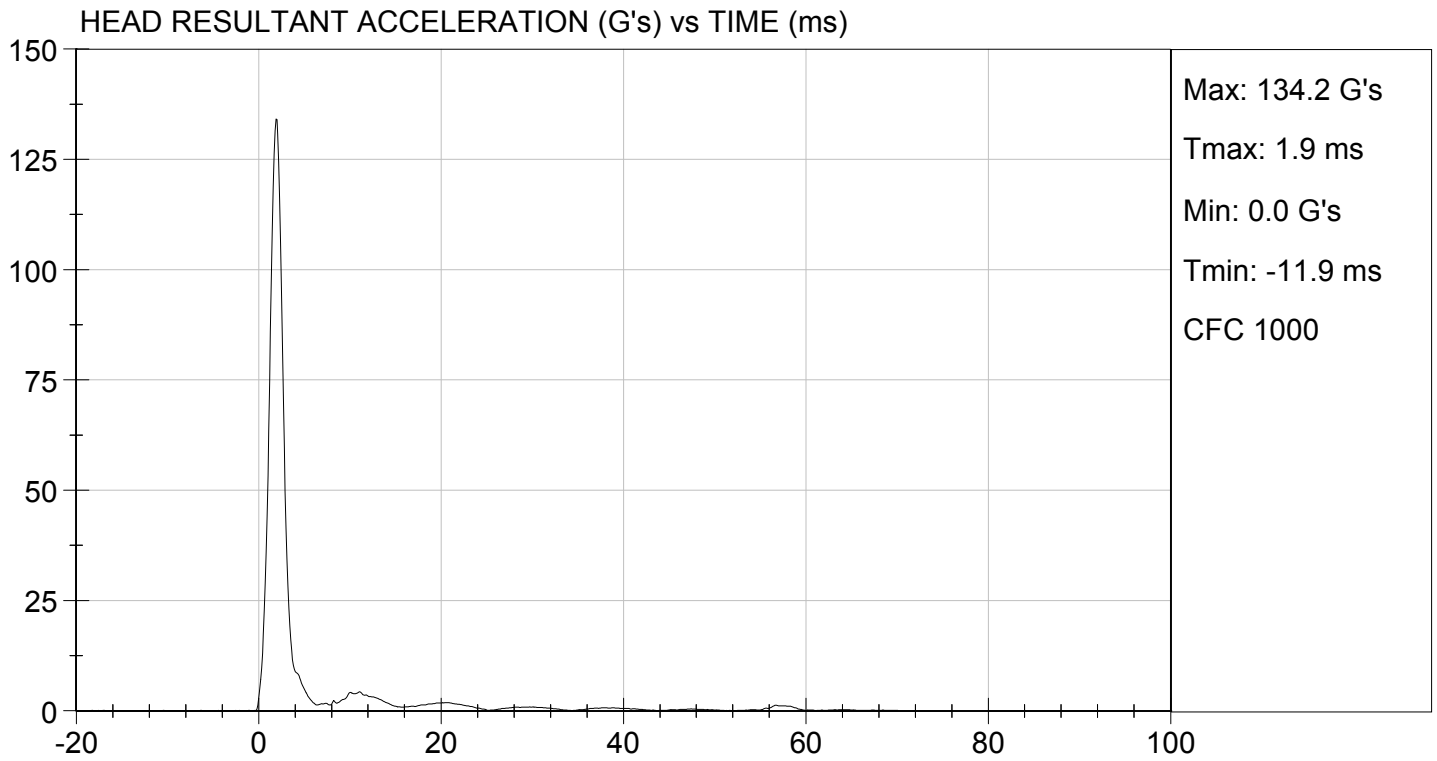
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	16	Pass
Peak Resultant Acceleration	G's	125 to 155	134	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	6.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

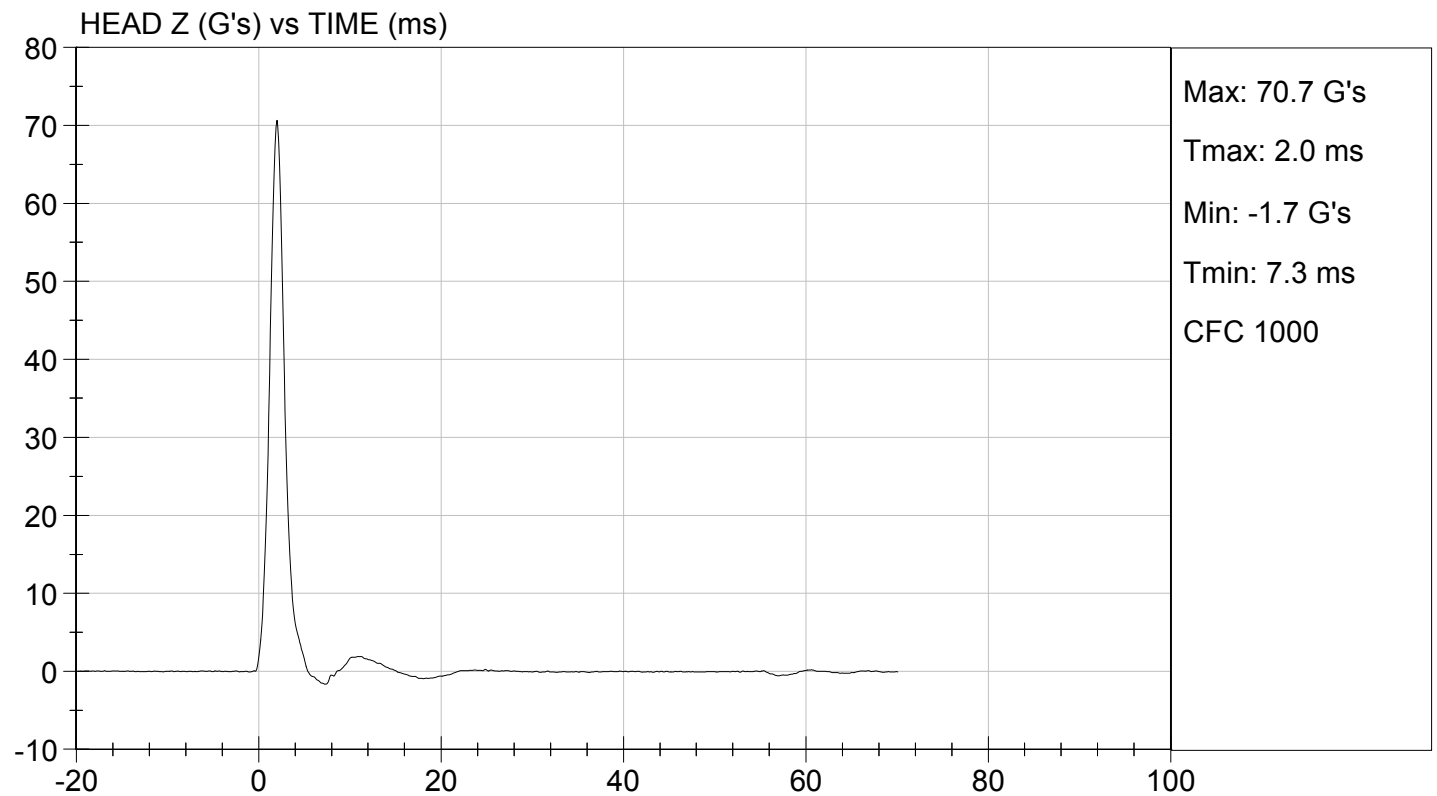
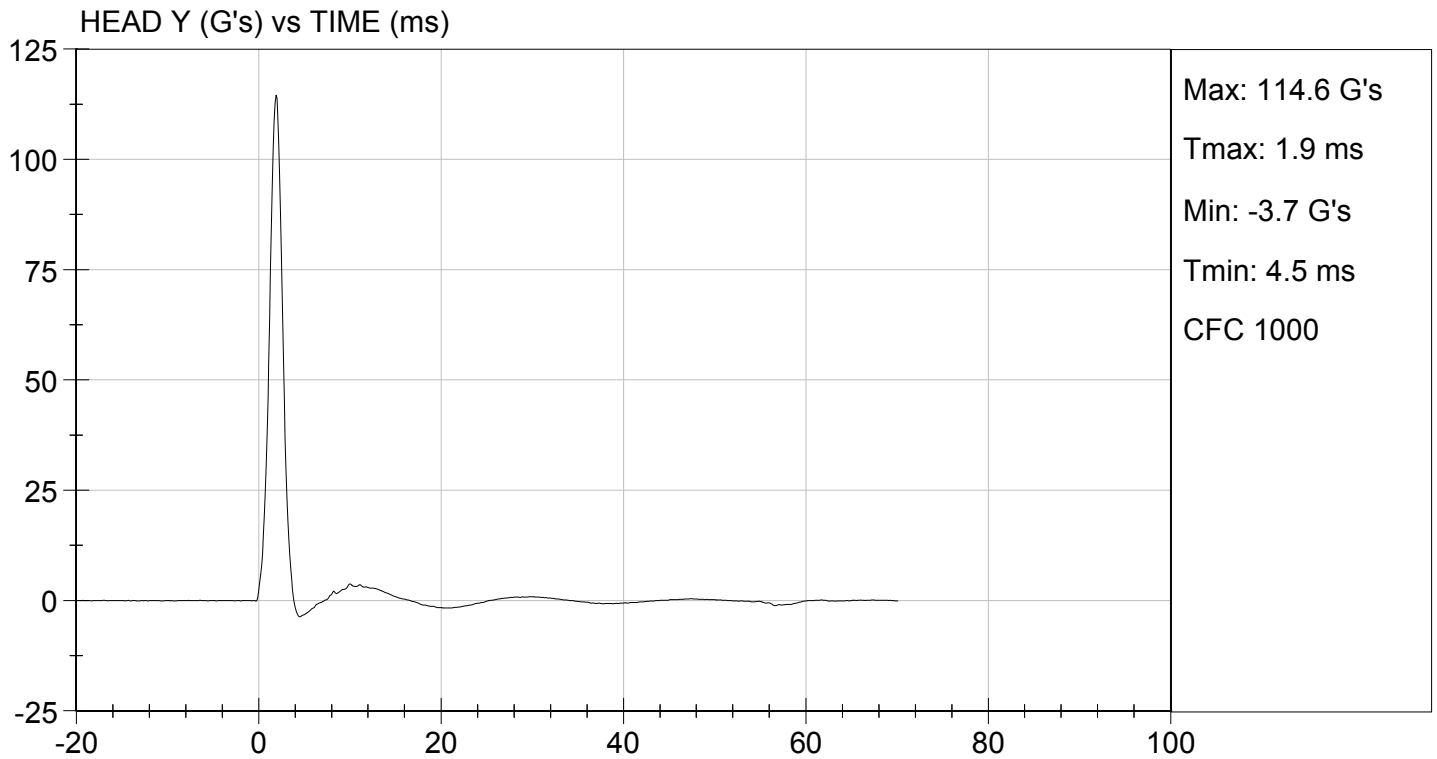

Laboratory Technician

12/03/2014

Test Date


Approved By





MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

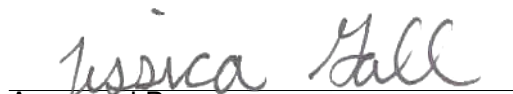
ATD Serial No: 032

Test I.D: D144262

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	20	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.39	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	-3.28	Pass
	17 ms	m/s	>= -3.70	-3.35	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	50.6	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	58.7	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	57.7	Pass
Overall Results					Pass


Laboratory Technician

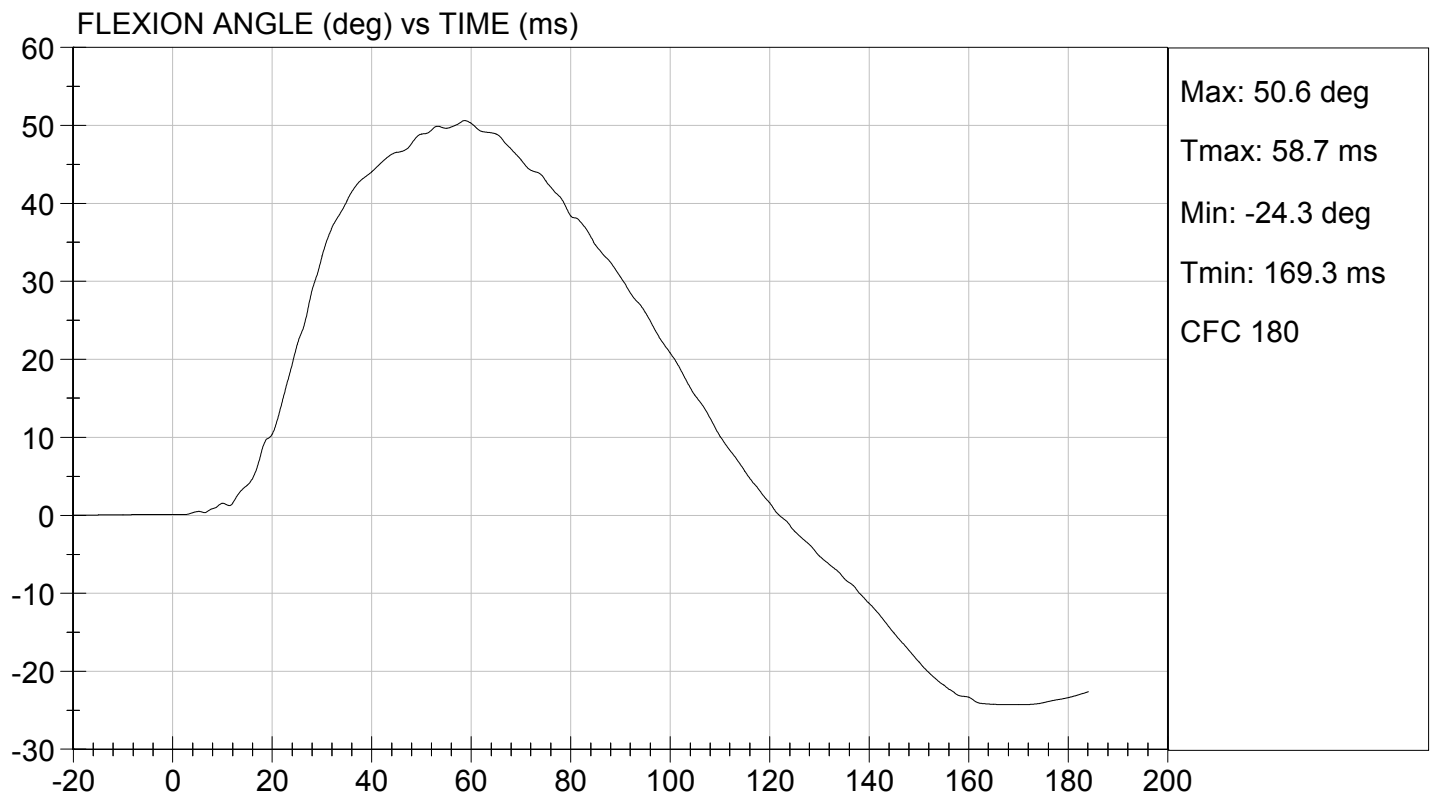
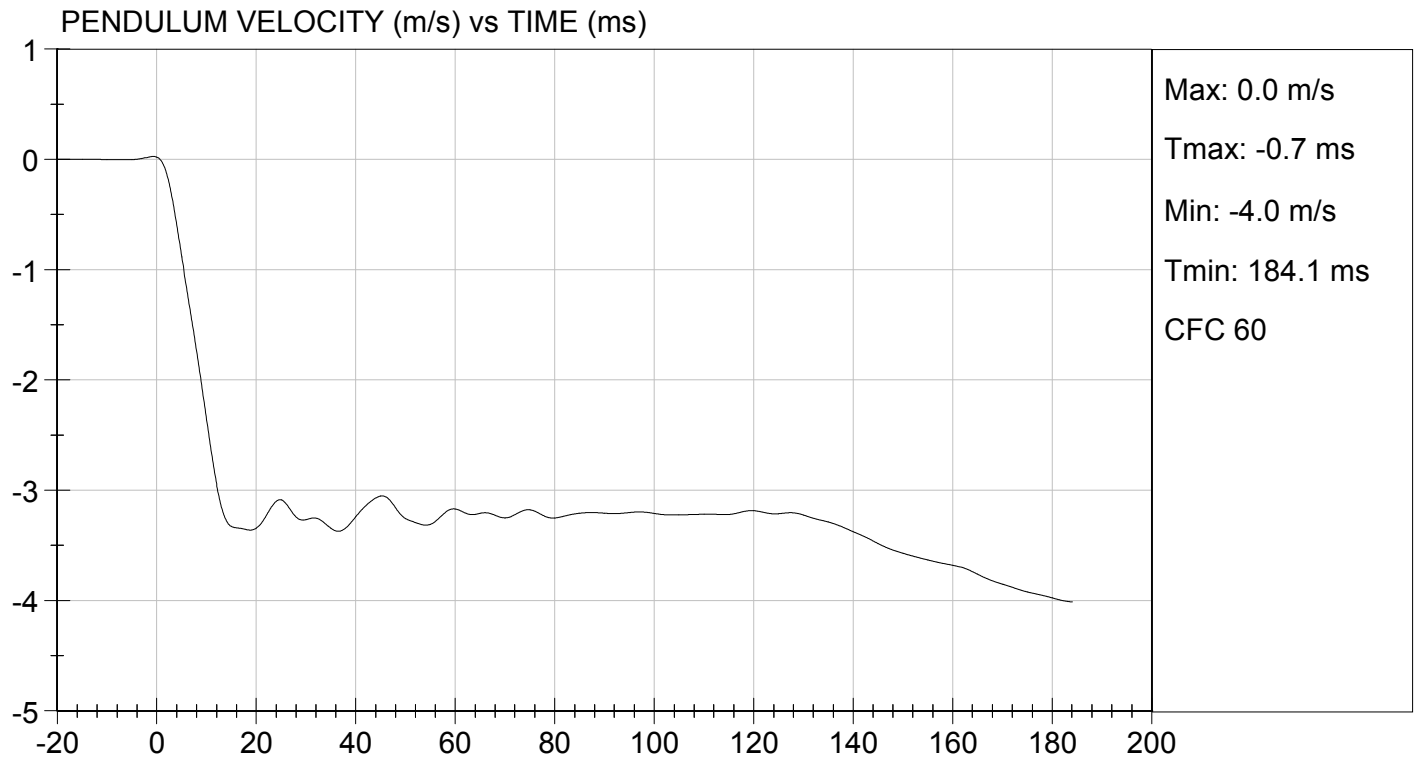
12/03/2014
Test Date


Approved By



TEST DESC: NECK BENDING
VELOCITY: 11.11 ft/s, 3.39 m/s

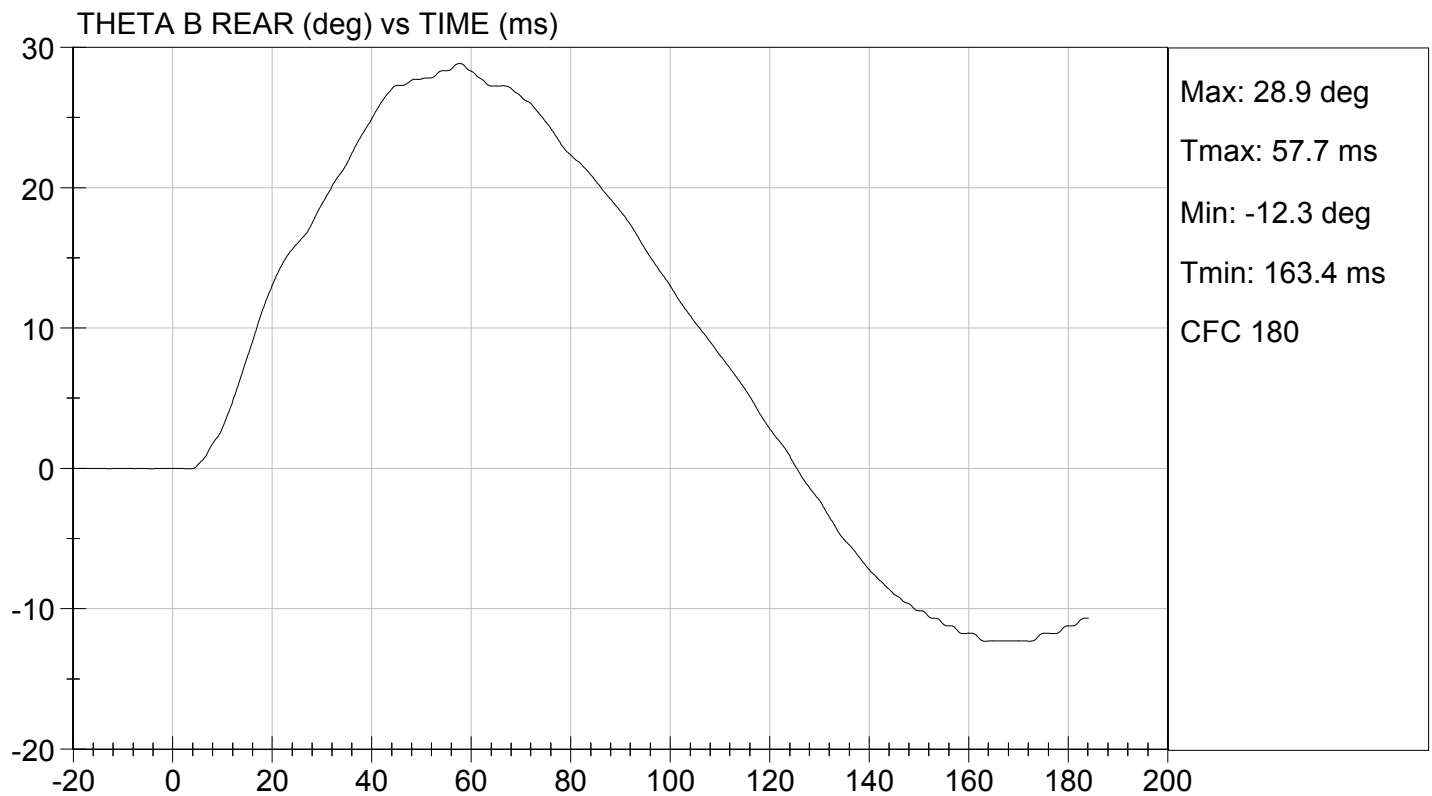
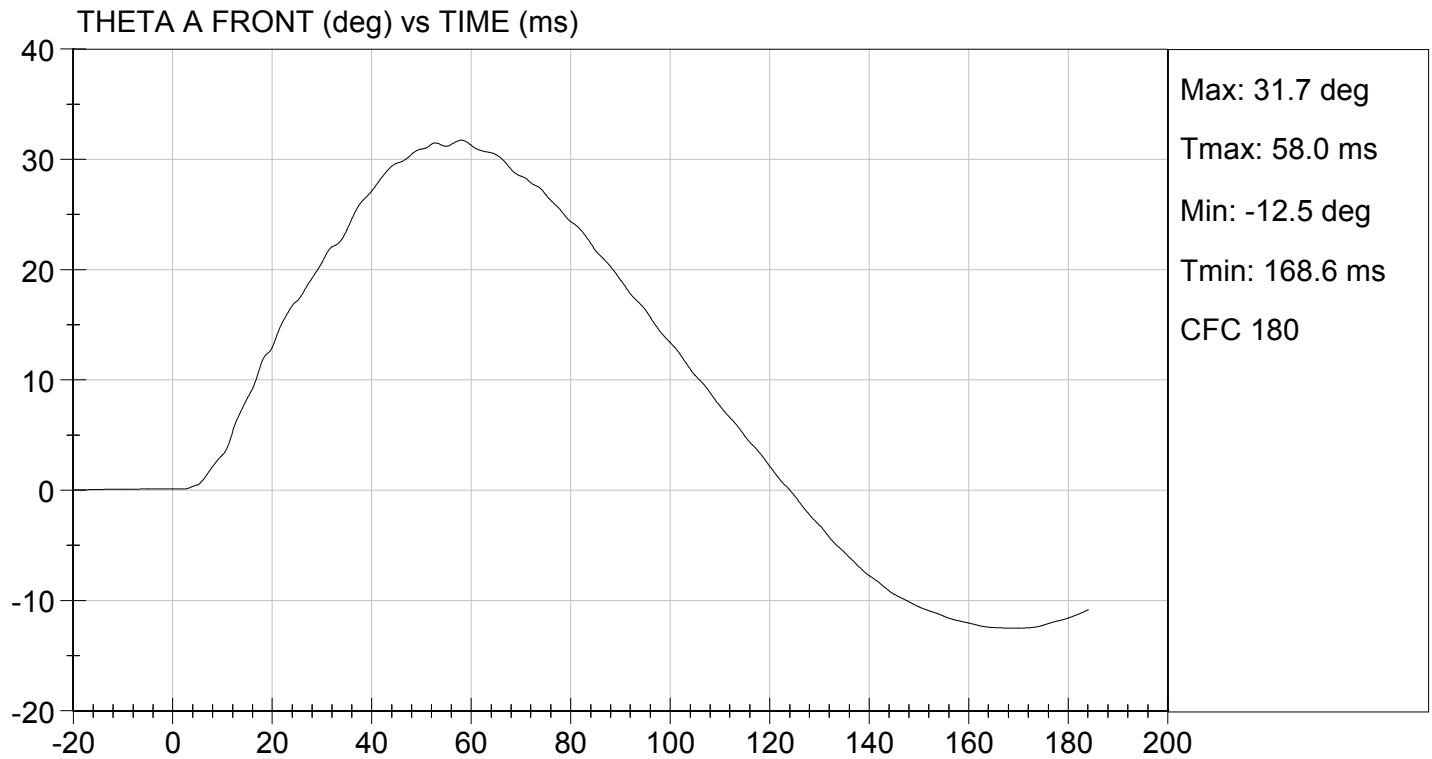
TEST DATE: 12/03/2014
TEST #: D144262





TEST DESC: NECK BENDING
VELOCITY: 11.11 ft/s, 3.39 m/s

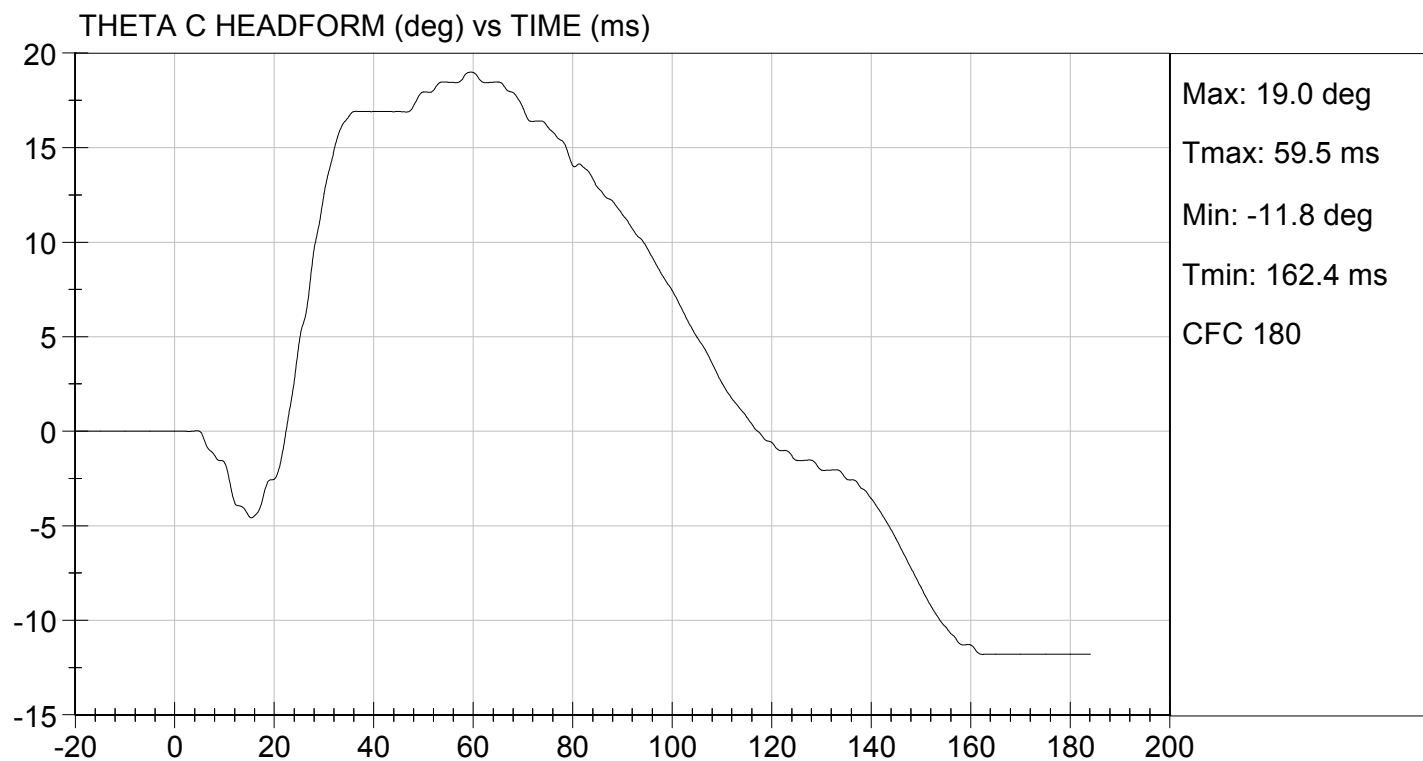
TEST DATE: 12/03/2014
TEST #: D144262





TEST DESC: NECK BENDING
VELOCITY: 11.11 ft/s, 3.39 m/s

TEST DATE: 12/03/2014
TEST #: D144262



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144263

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	18	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.23	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	8.4	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

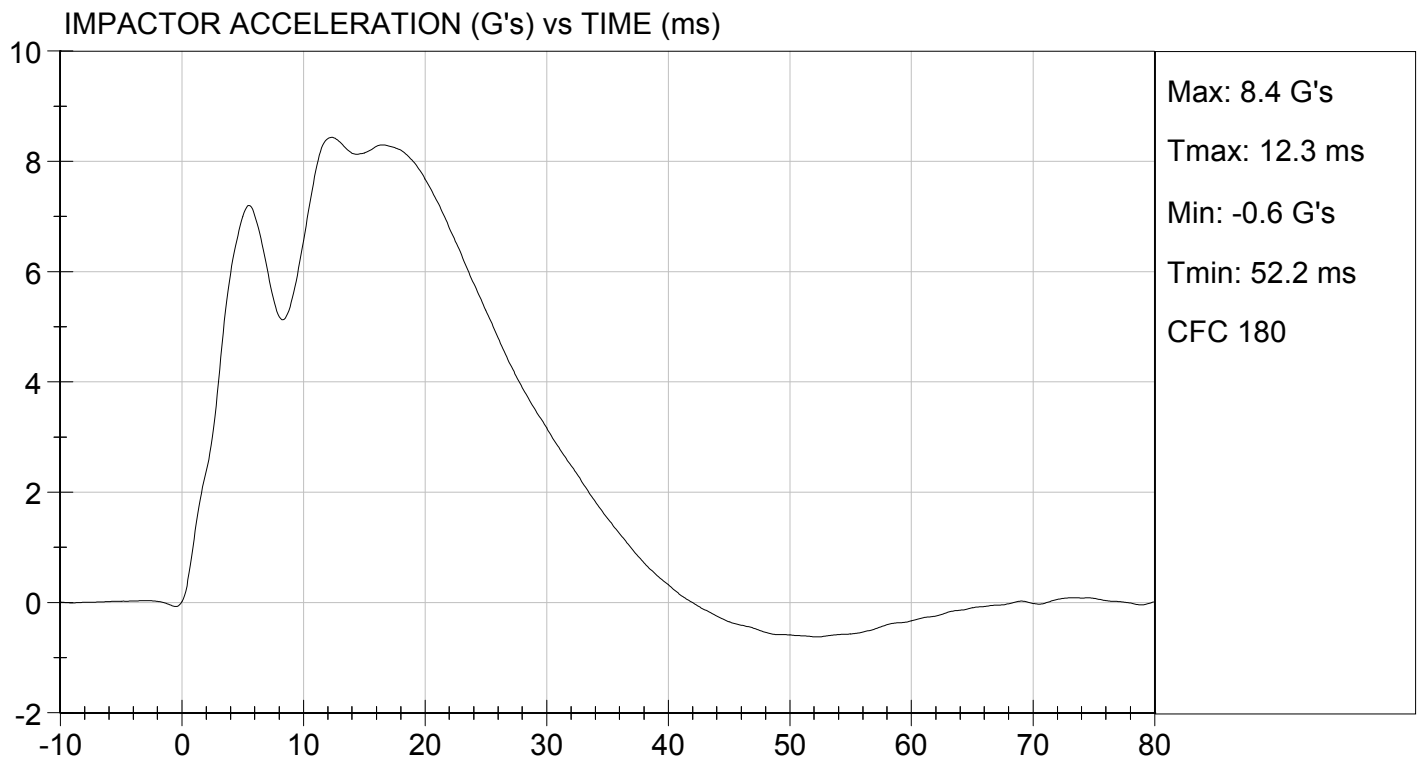
12/03/2014
Test Date

Jessica Hall
Approved By



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

TEST DATE: 12/03/2014
TEST #: D144263



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144264

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	19	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.0	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

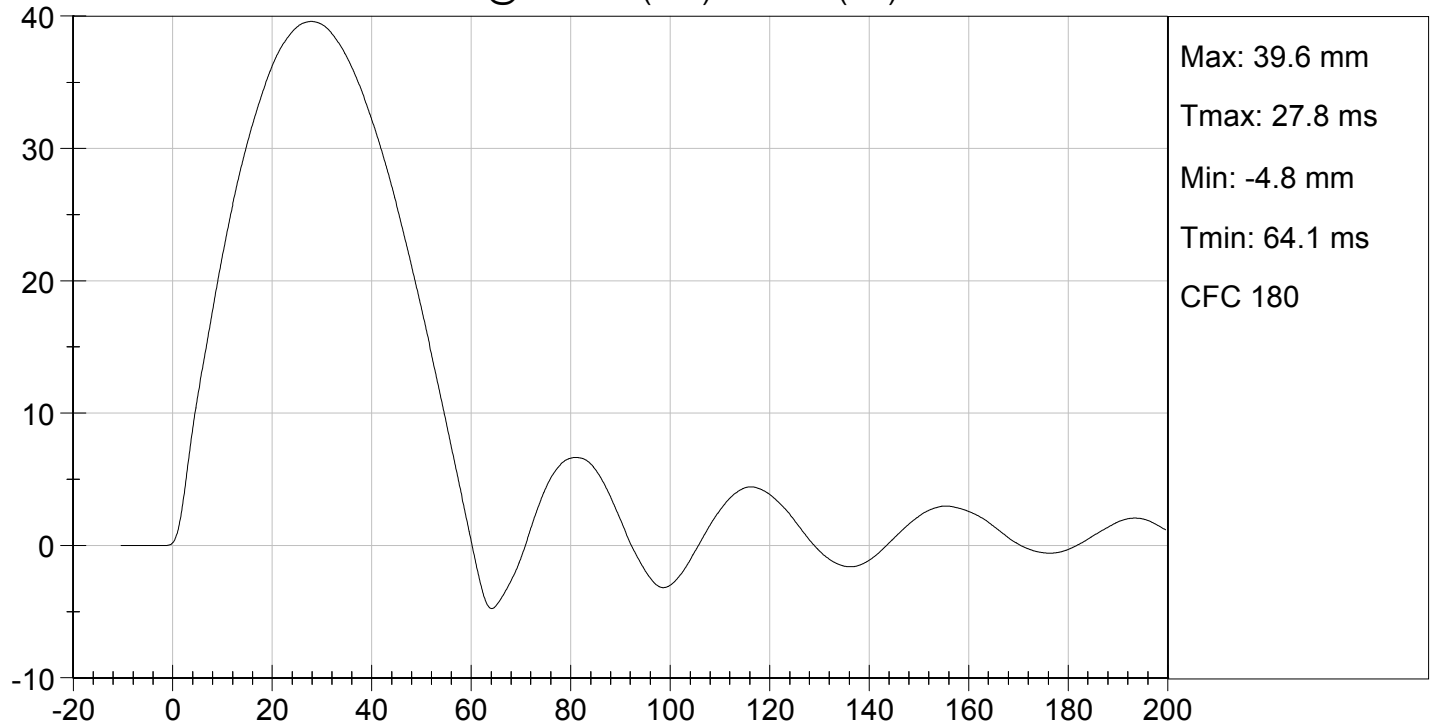
12/03/2014

Test Date

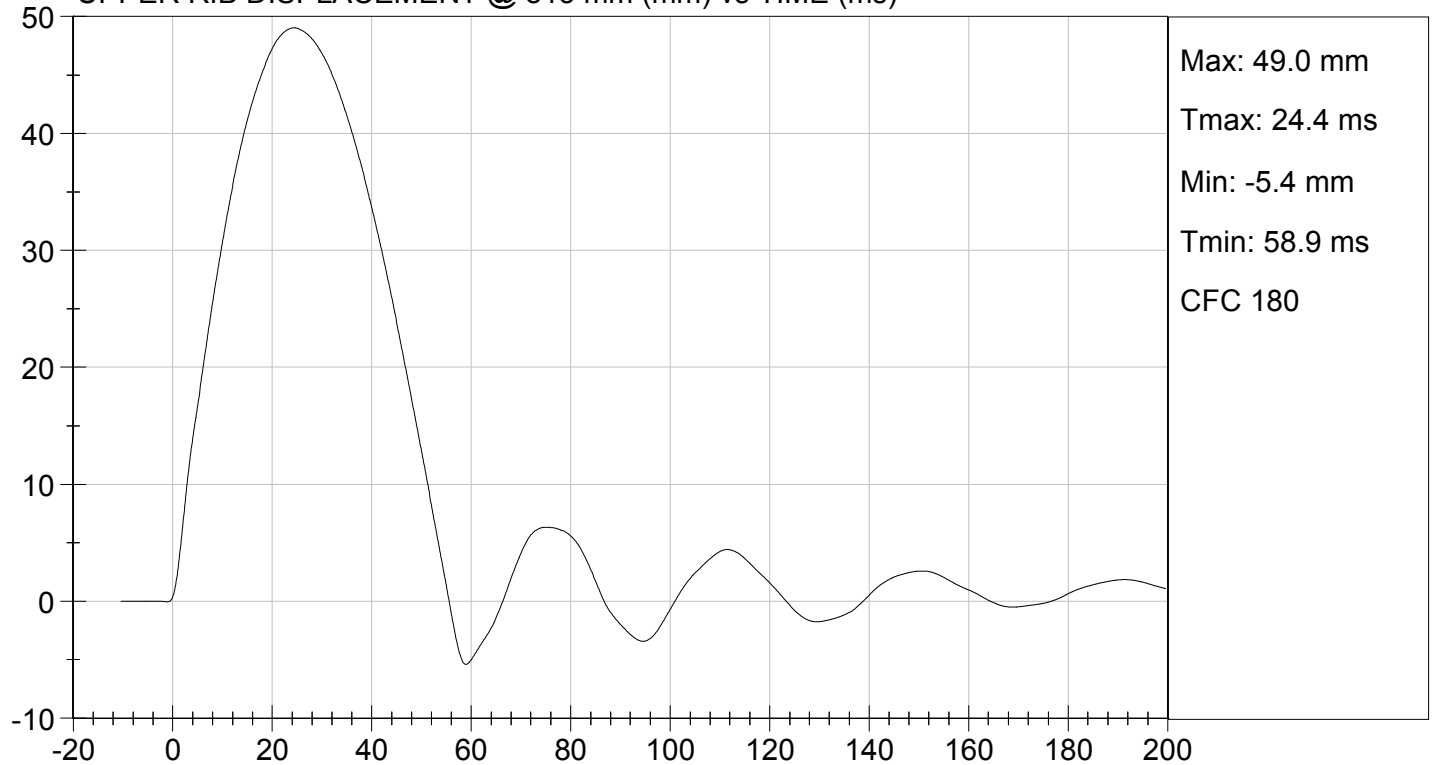
Jessica Hall
Approved By



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: D144265

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	19	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.8	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.6	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

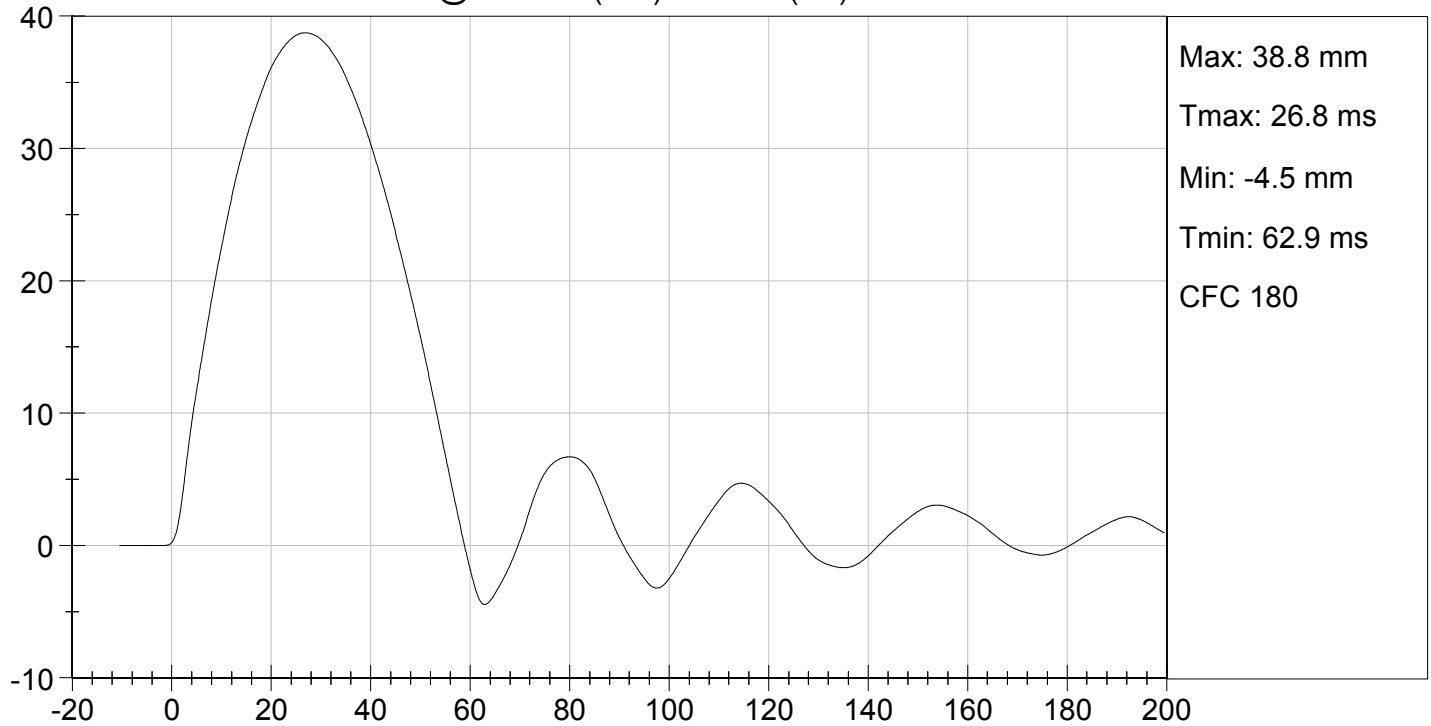
12/03/2014

Test Date

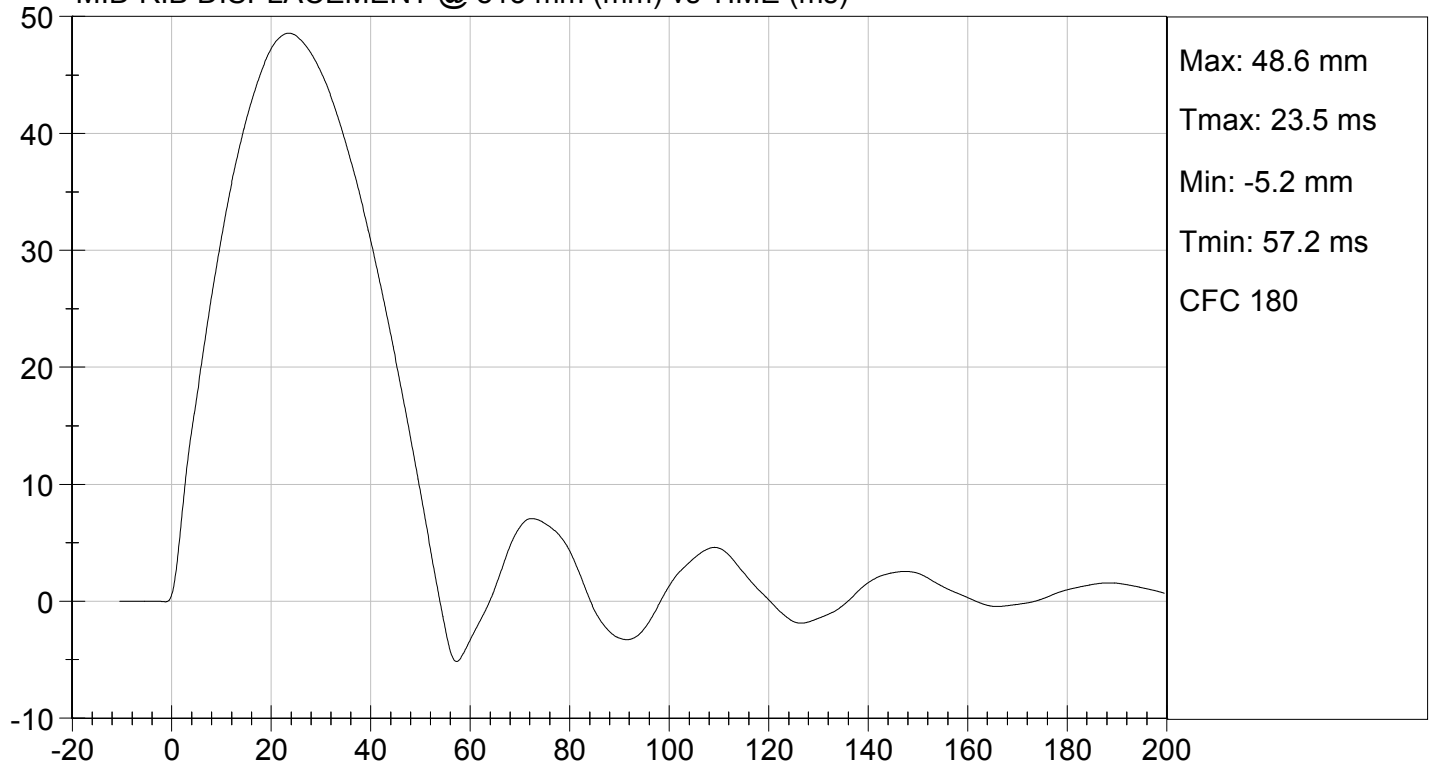
Jessica Hall
Approved By



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: D144266

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	19	Pass
Displacement at 459 mm	mm	36.0 to 40.0	39.0	Pass
Displacement at 815 mm	mm	46.0 to 51.0	49.4	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

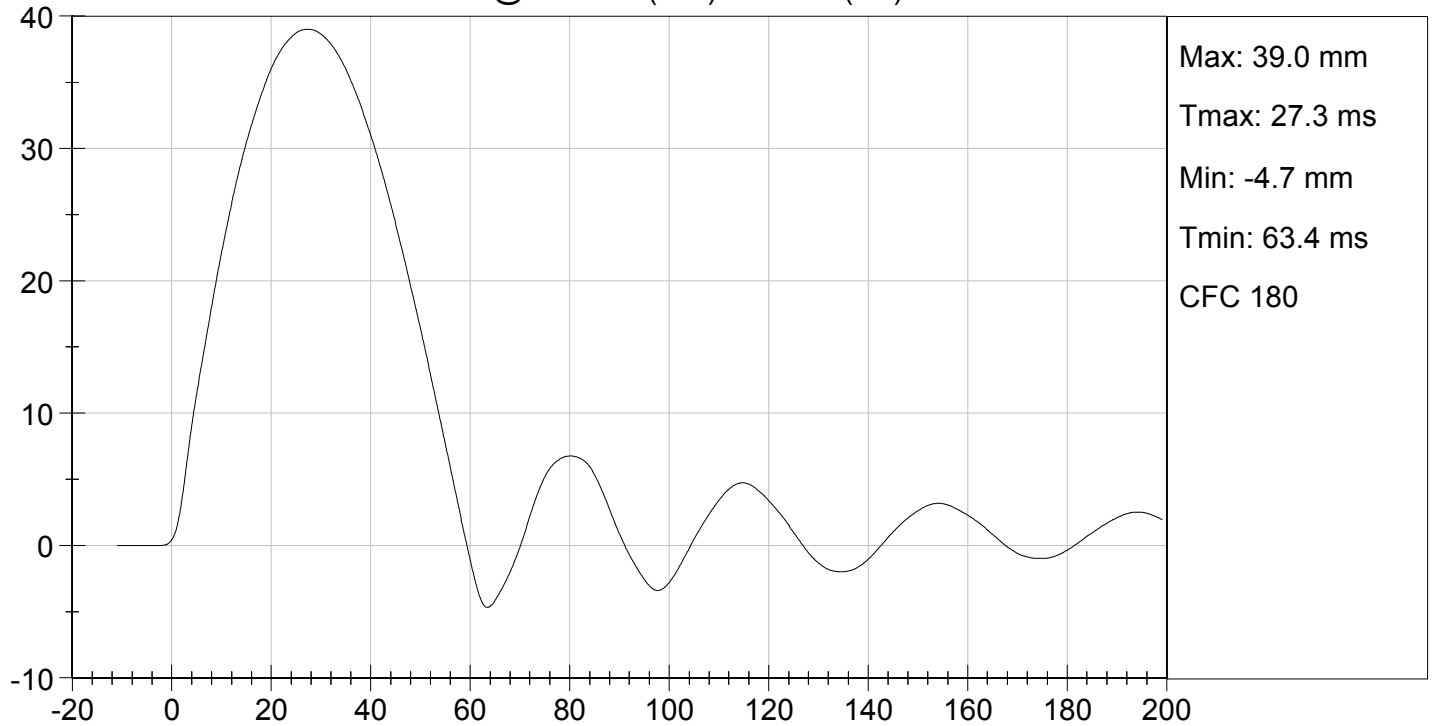
12/03/2014

Test Date

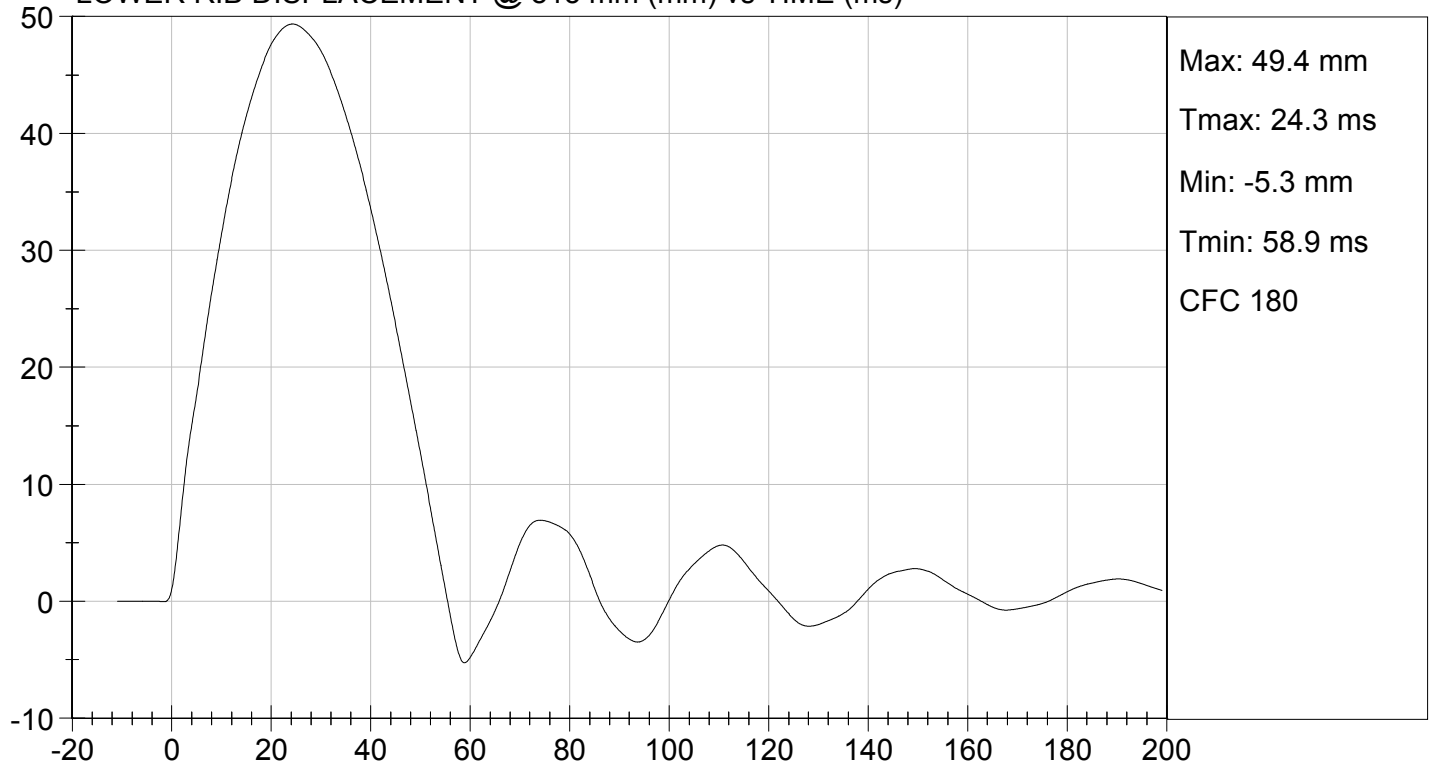
Jessica Hall
Approved By



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



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



MGA RESEARCH CORPORATION

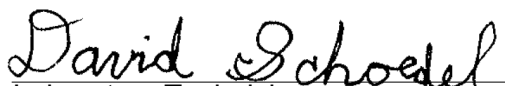
THORAX IMPACT TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D144260

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	18	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5820	Pass
Upper Rib Displacement	mm	34.0 to 41.0	39.5	Pass
Middle Rib Displacement	mm	37.0 to 45.0	42.3	Pass
Lower Rib Displacement	mm	37.0 to 44.0	40.6	Pass
Overall Test Results				Pass


Laboratory Technician

12/03/2014

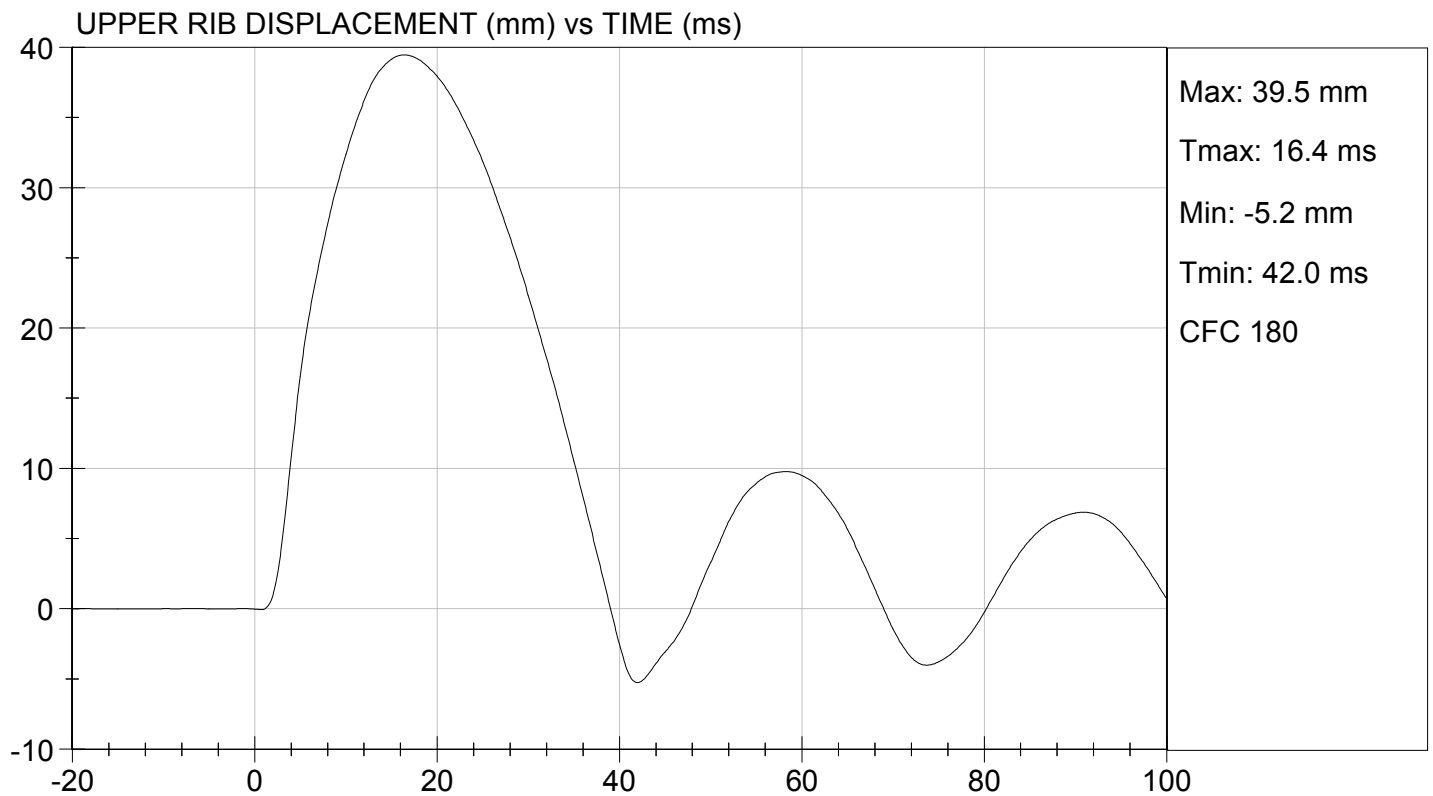
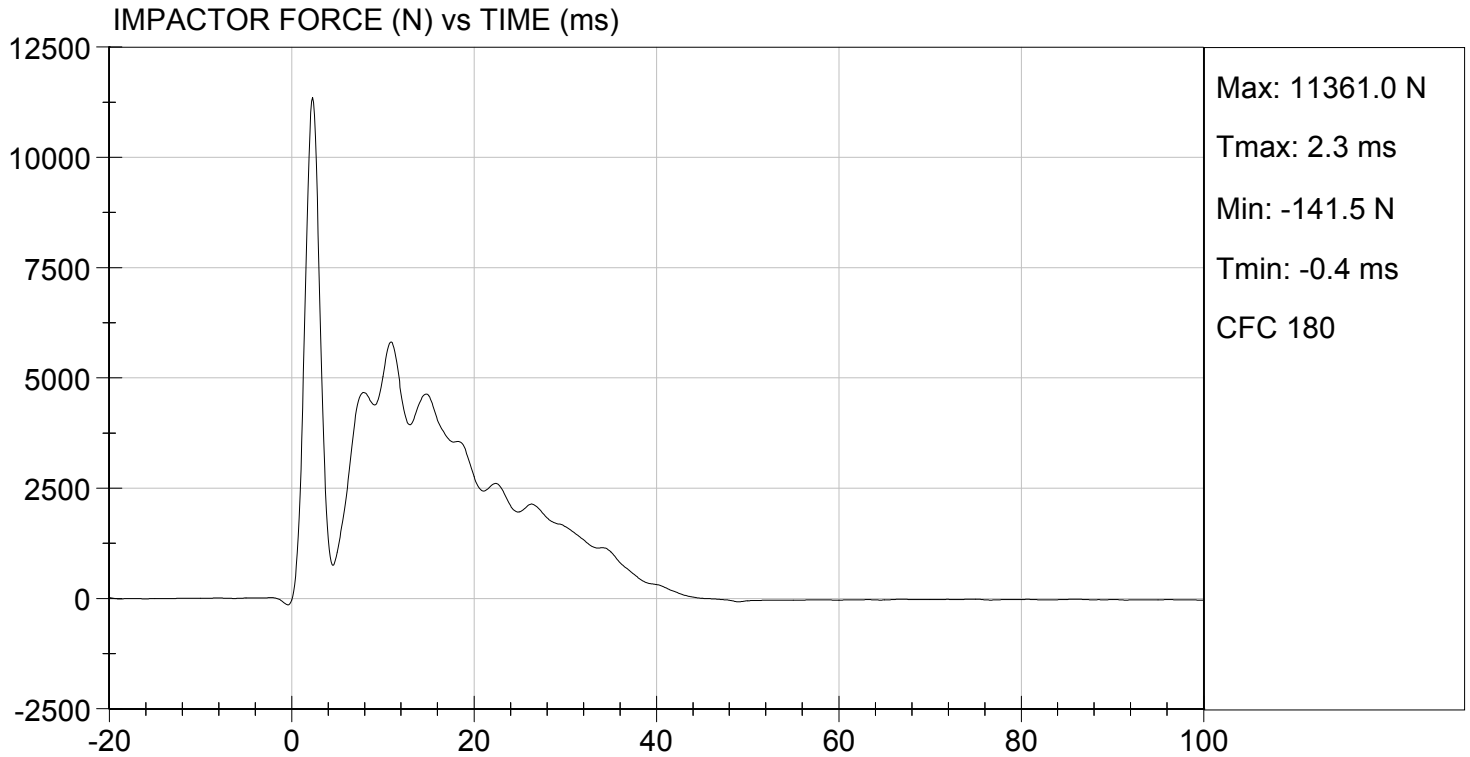
Test Date


Approved By



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

TEST DATE: 12/03/2014
TEST #: D144260

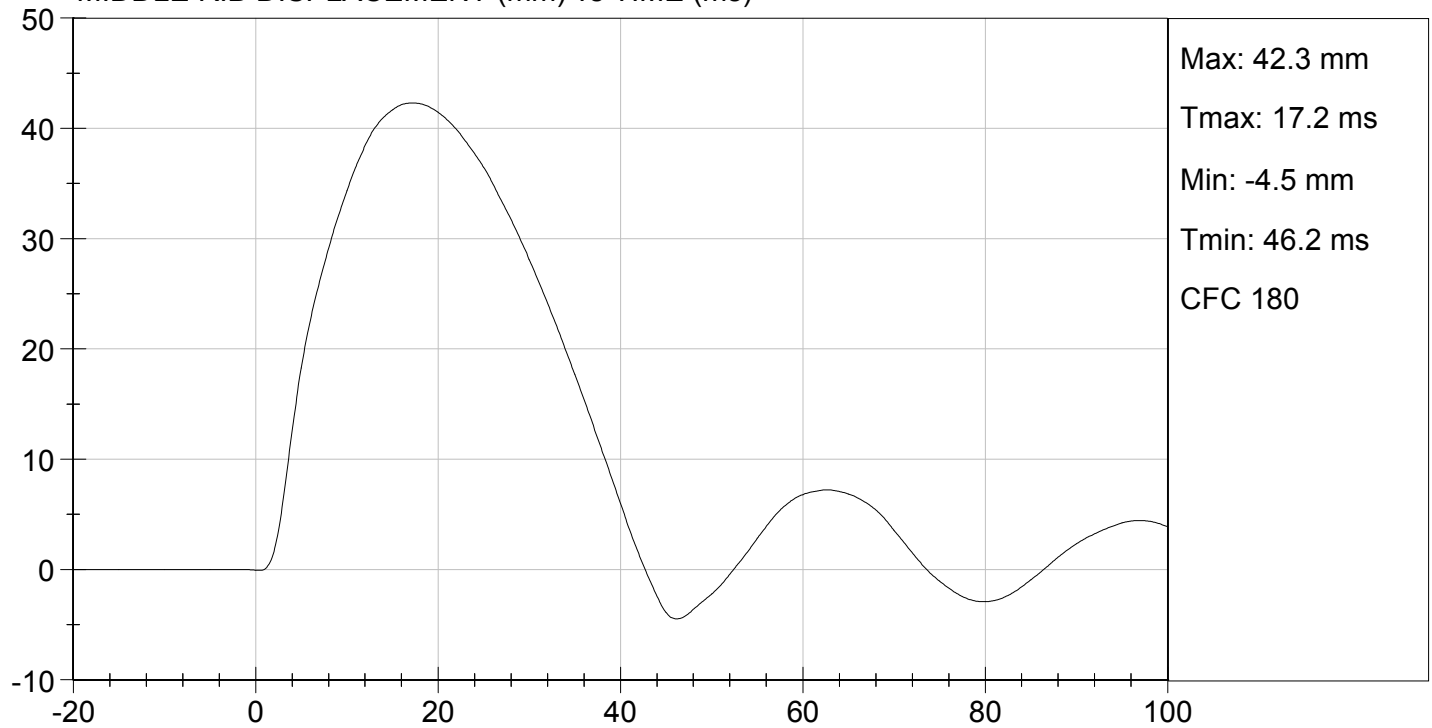




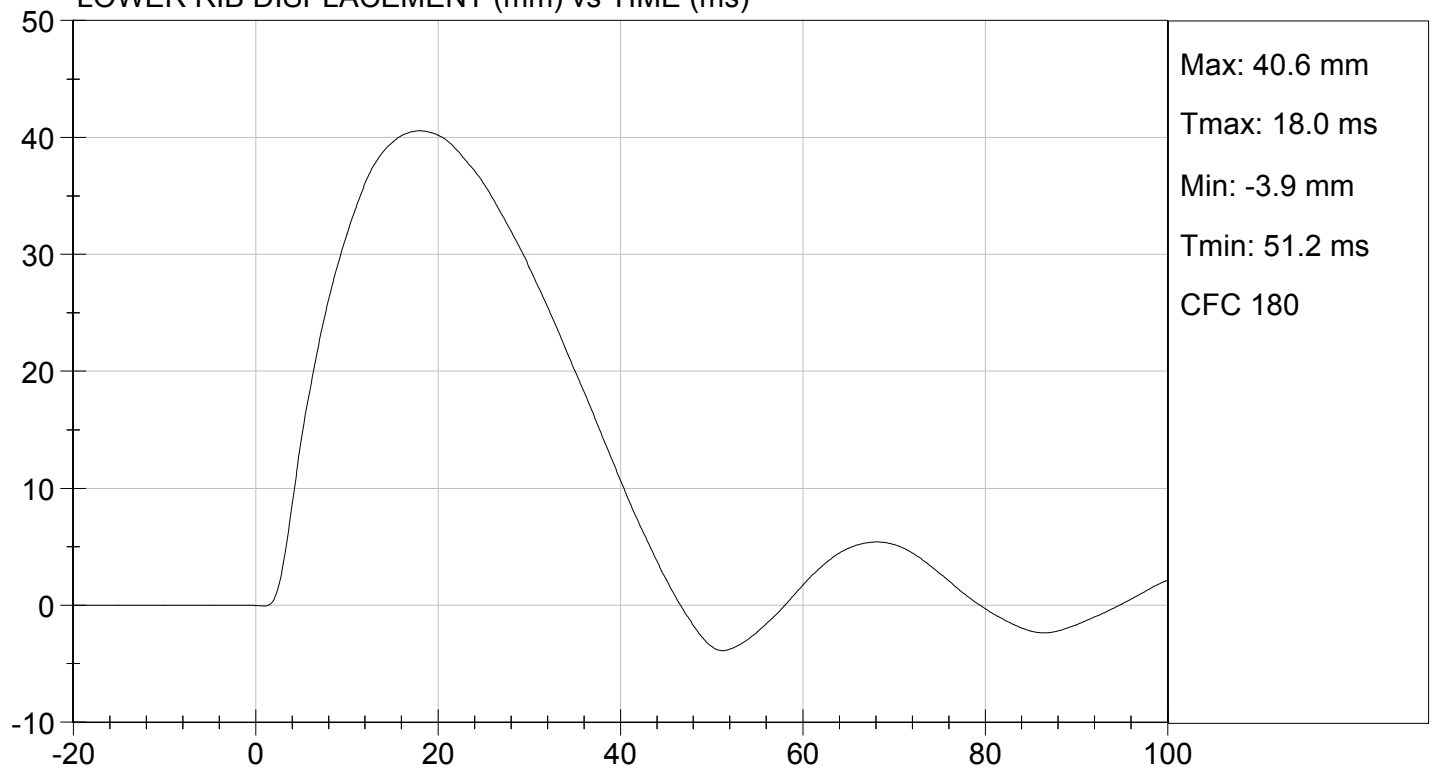
TEST DESC: THORAX IMPACT
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 12/03/2014
TEST #: D144260

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: D144267

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	28	Pass
Probe Speed	m/s	3.90 to 4.10	4.00	Pass
Maximum Impactor Force	N	4000 to 4800	4264	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.1	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2275	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	10.3	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

12/03/2014

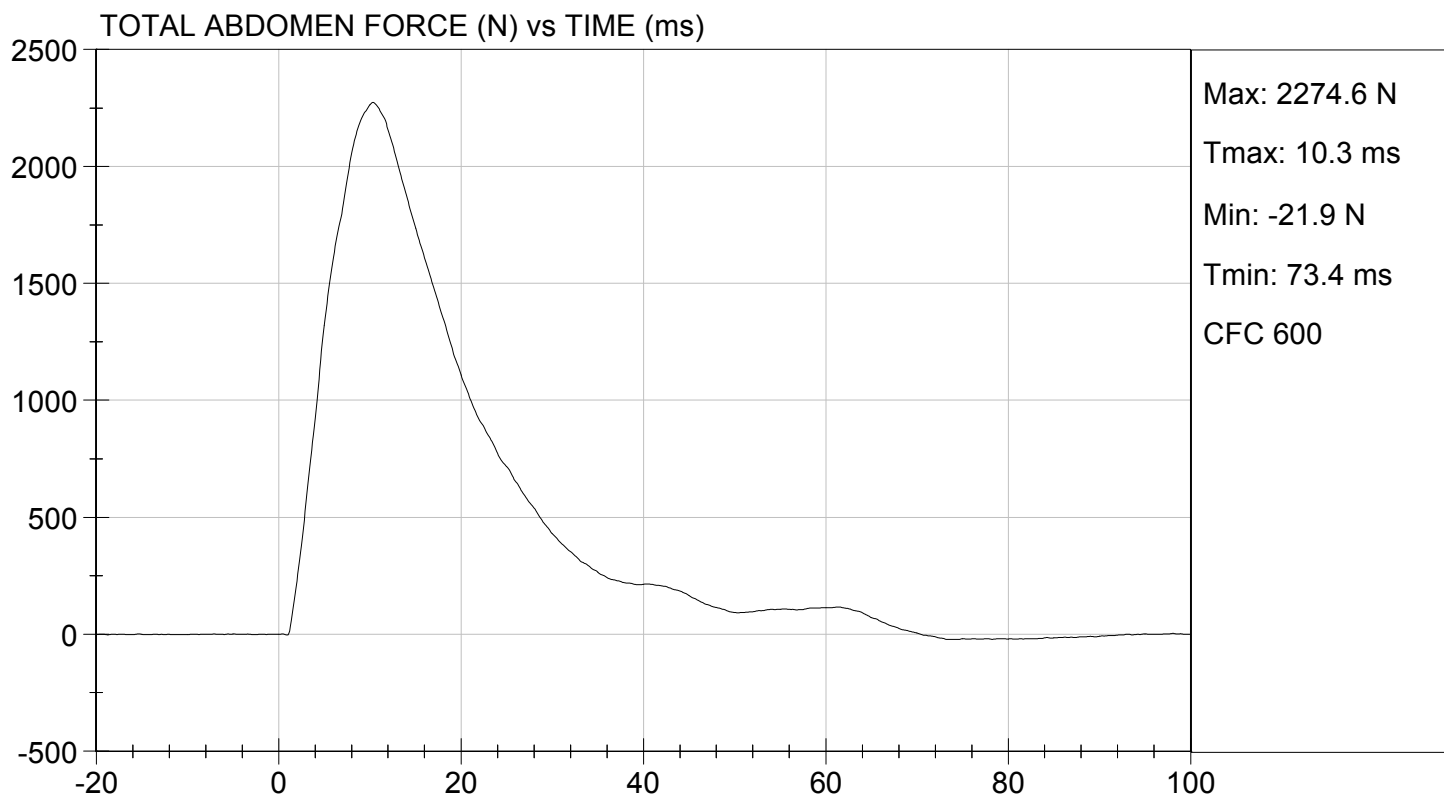
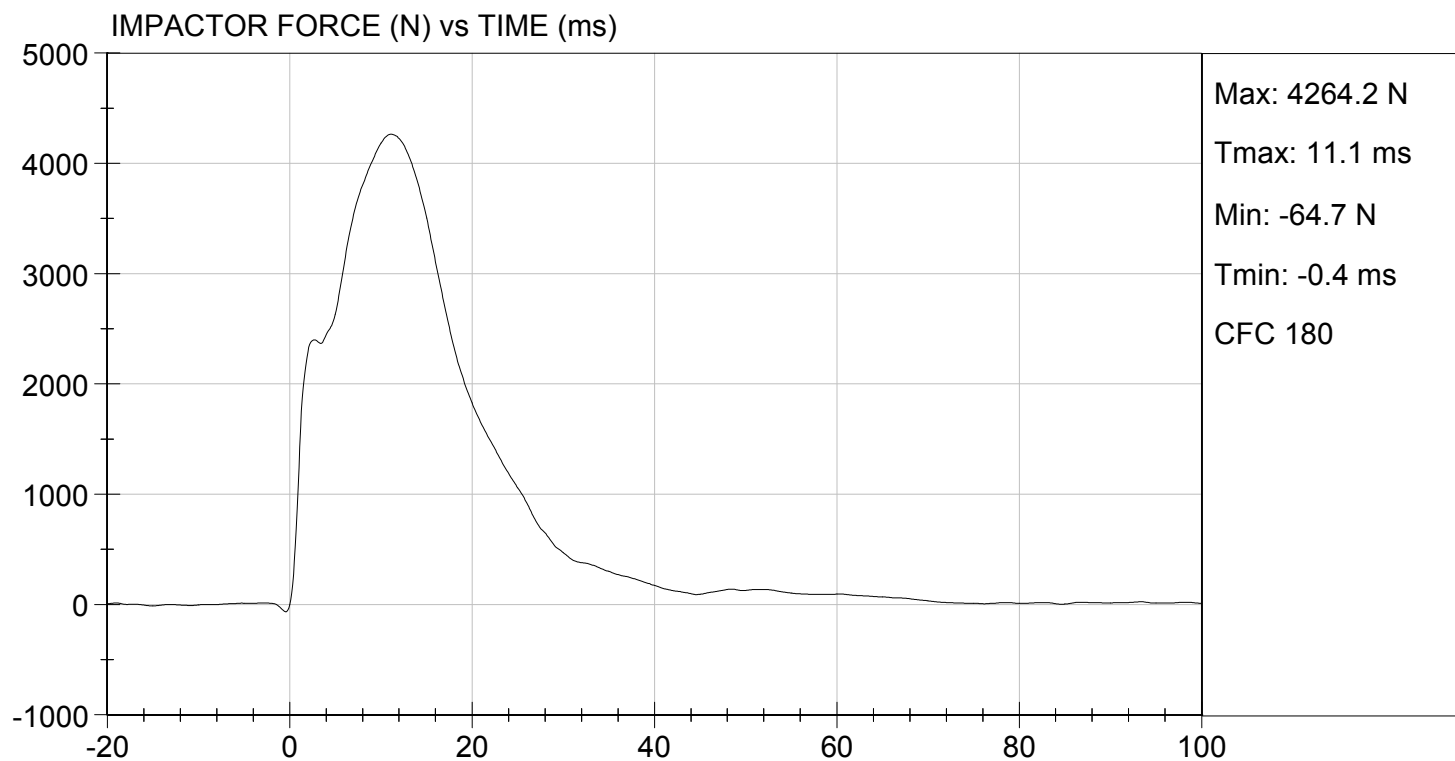
Test Date

Jessica Hall
Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.12 ft/s, 4.00 m/s

TEST DATE: 12/03/2014
TEST #: D144267

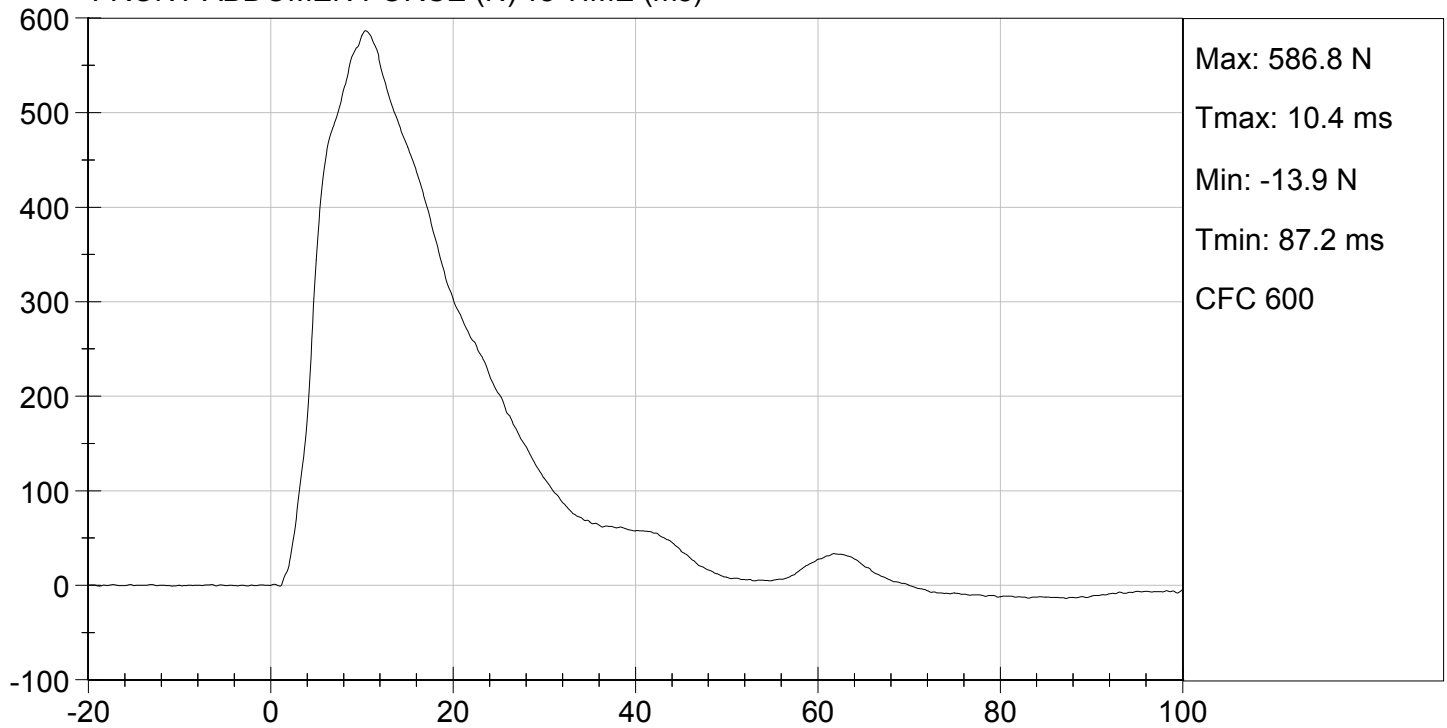




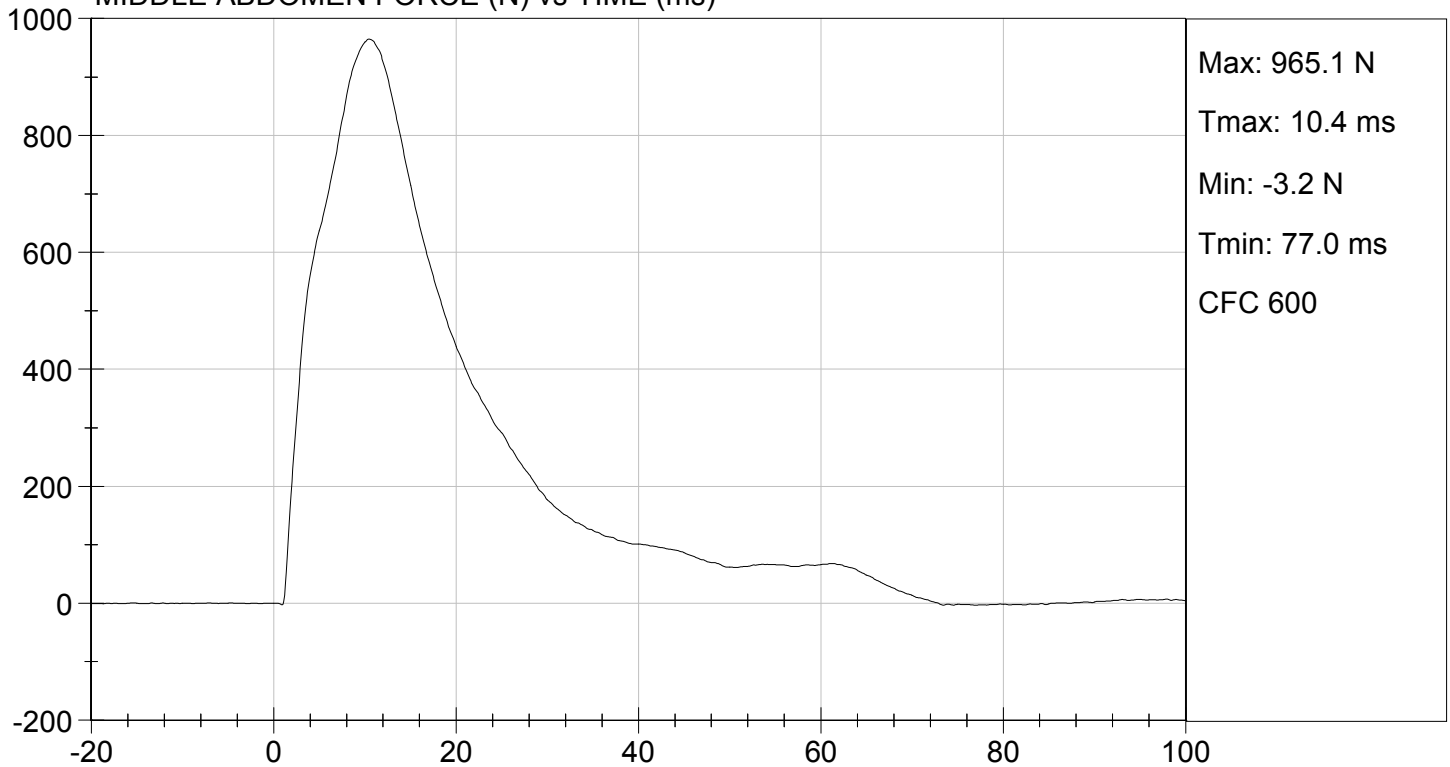
TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.12 ft/s, 4.00 m/s

TEST DATE: 12/03/2014
TEST #: D144267

FRONT ABDOMEN FORCE (N) vs TIME (ms)



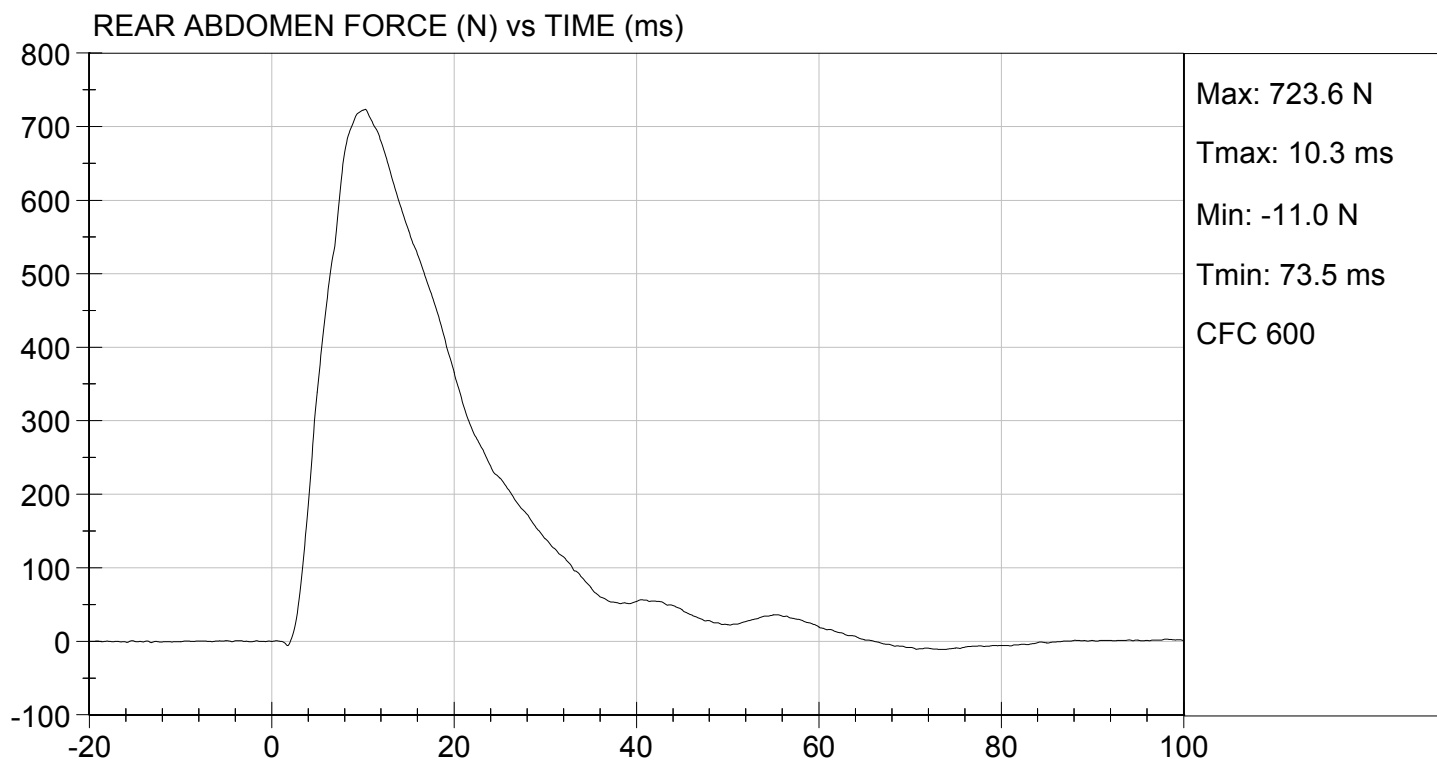
MIDDLE ABDOMEN FORCE (N) vs TIME (ms)





TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.12 ft/s, 4.00 m/s

TEST DATE: 12/03/2014
TEST #: D144267



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

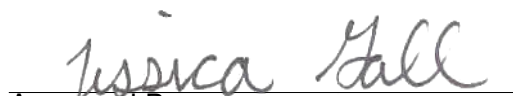
ATD Serial No: 032

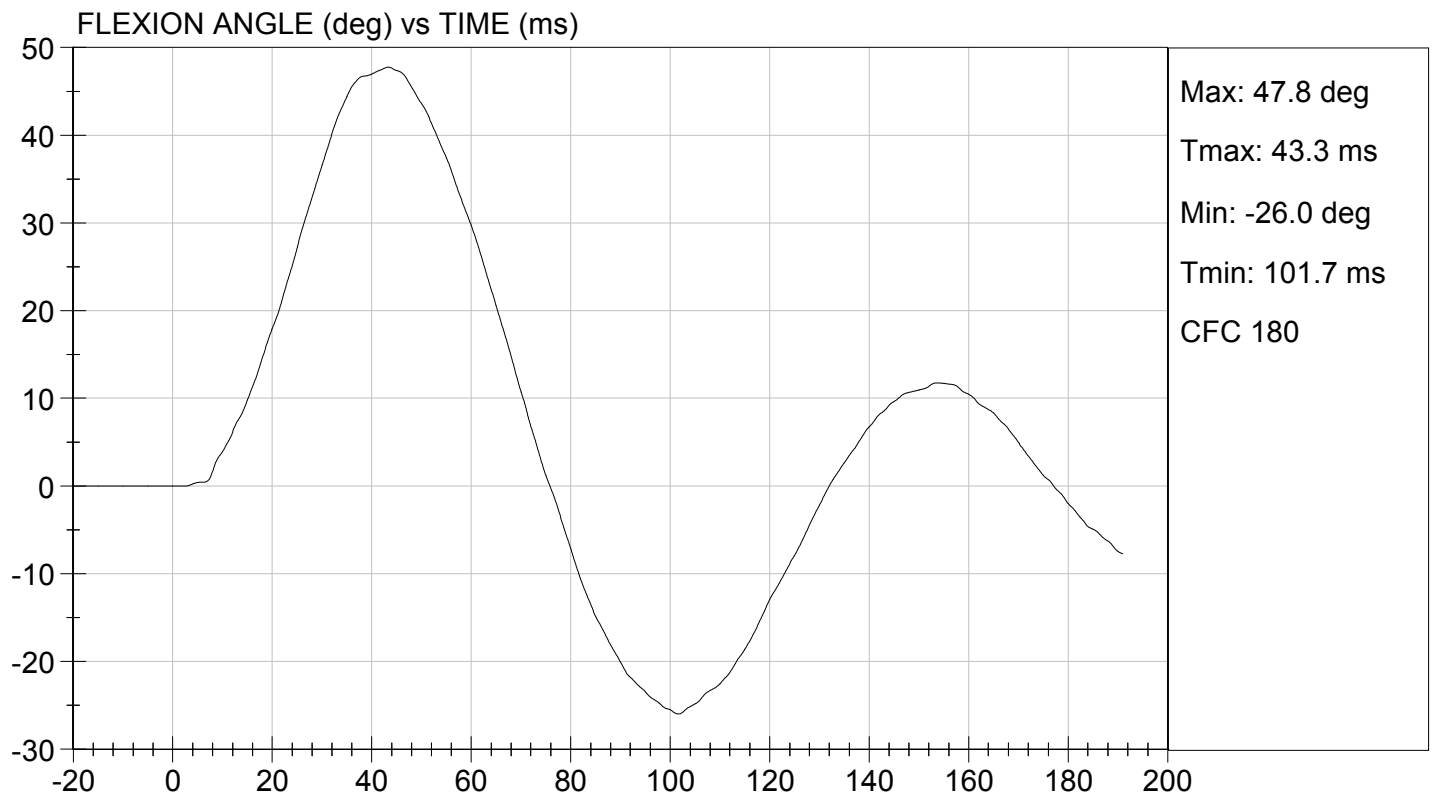
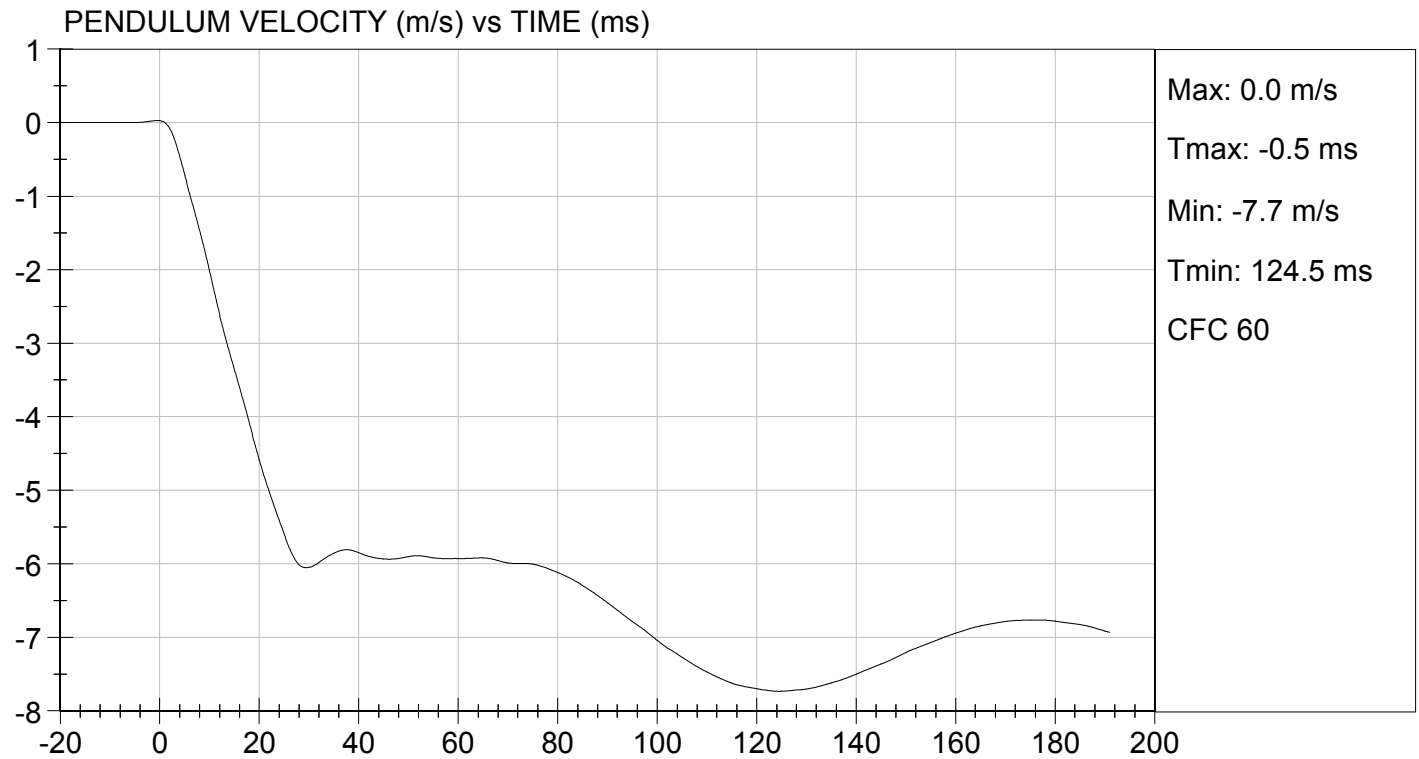
Test I.D: D144268

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	19	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.390	Pass
	27 ms	m/s	-6.50 to -5.80	-5.92	Pass
	30 ms	m/s	>= -6.50	-6.05	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	47.8	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	43.3	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	44	Pass
Overall Results					Pass


 Laboratory Technician

12/03/2014
 Test Date

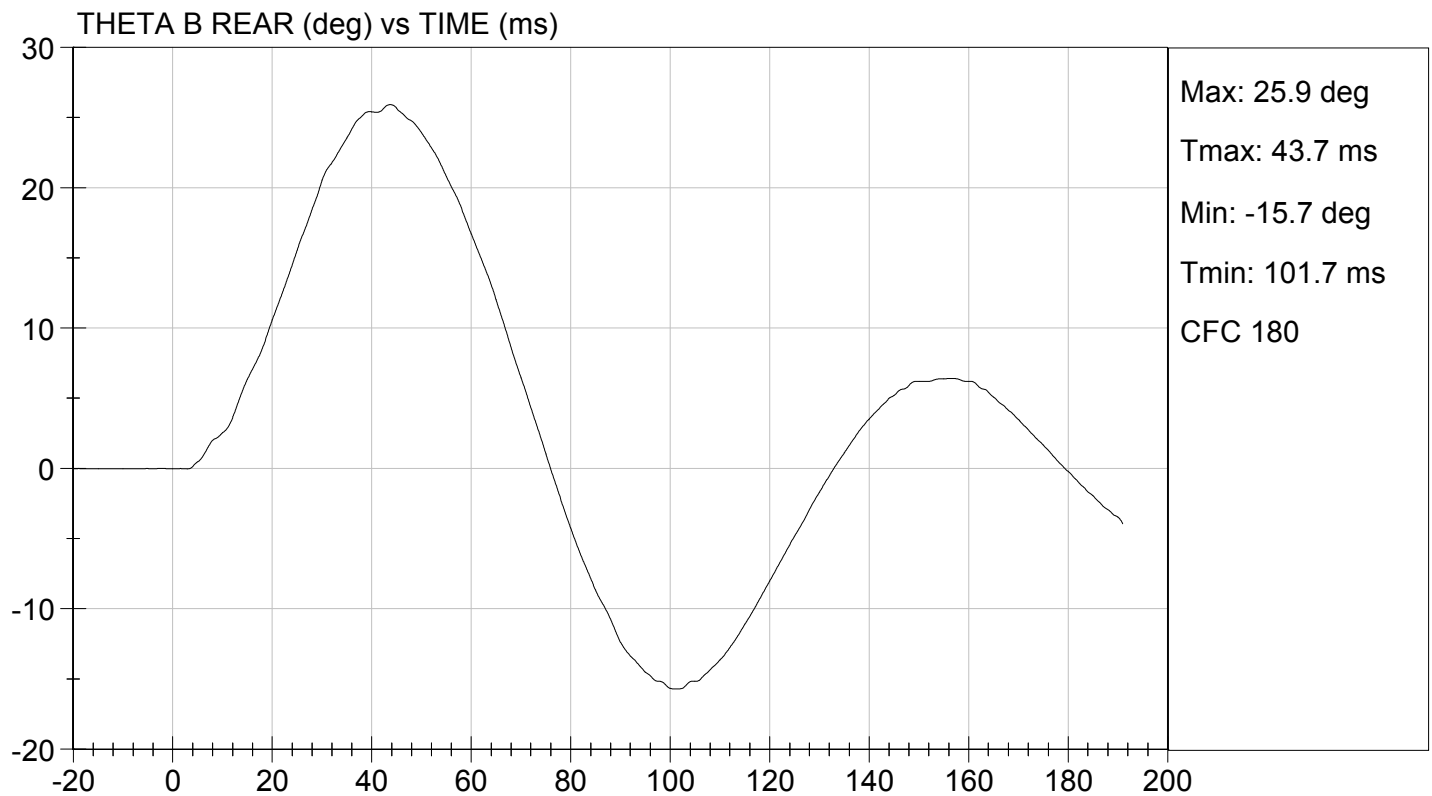
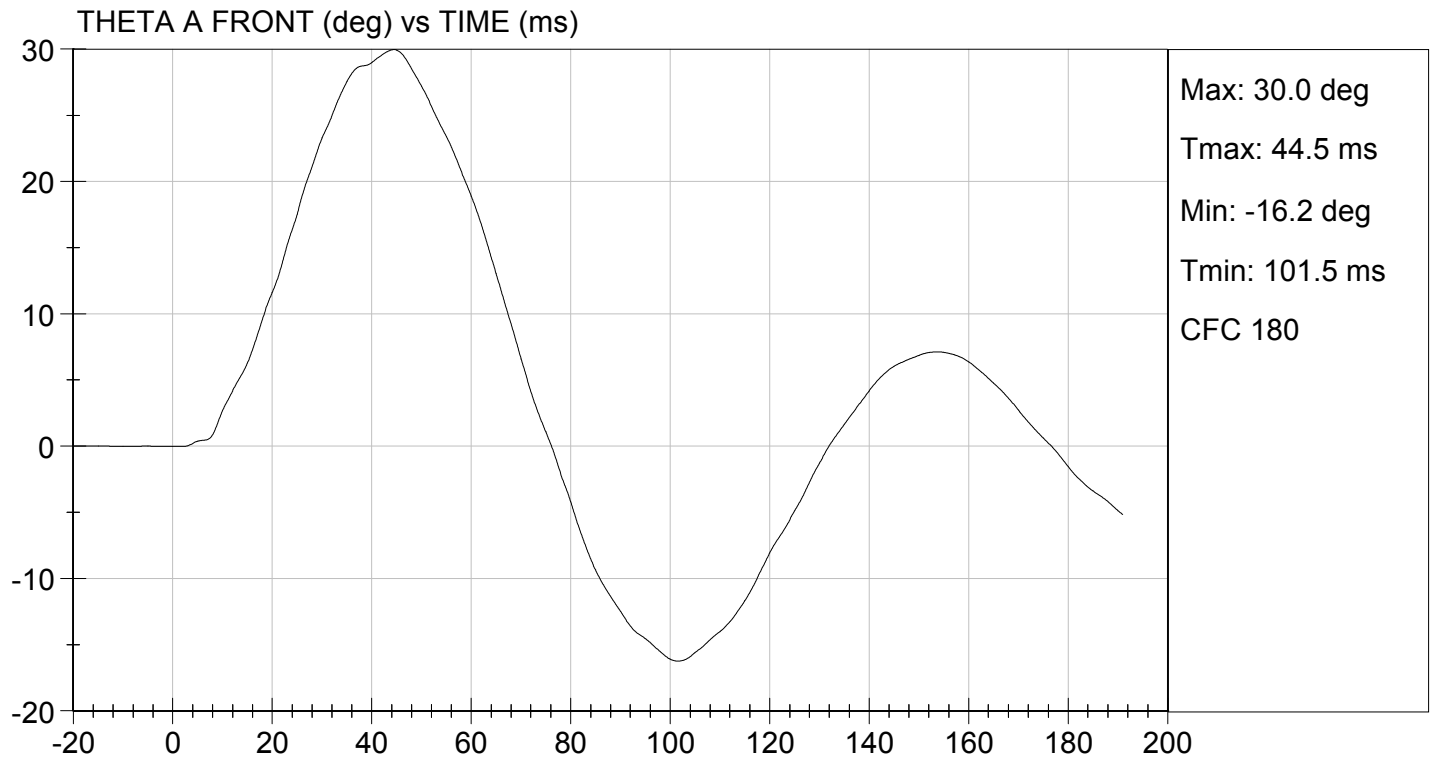

 Approved By





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

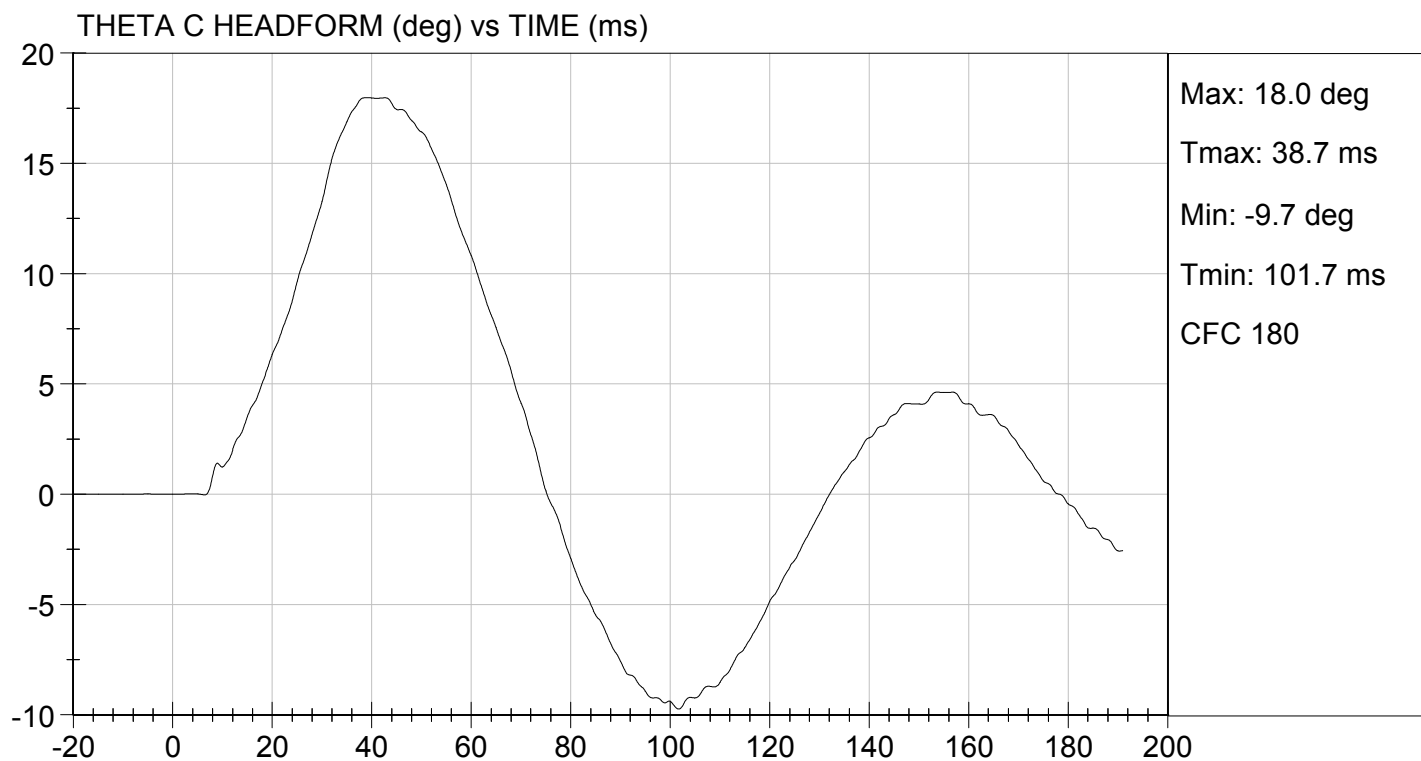
TEST DATE: 12/03/2014
TEST #: D144268





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

TEST DATE: 12/03/2014
TEST #: D144268



MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D144269

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	18	Pass
Probe Speed	m/s	4.20 to 4.40	4.23	Pass
Maximum Impactor Force	N	4700 to 5400	4853	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	12.7	Pass
Maximum Pubic Force	N	1230 to 1590	1313	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	13.6	Pass
Overall Test Results				Pass


Laboratory Technician

12/03/2014

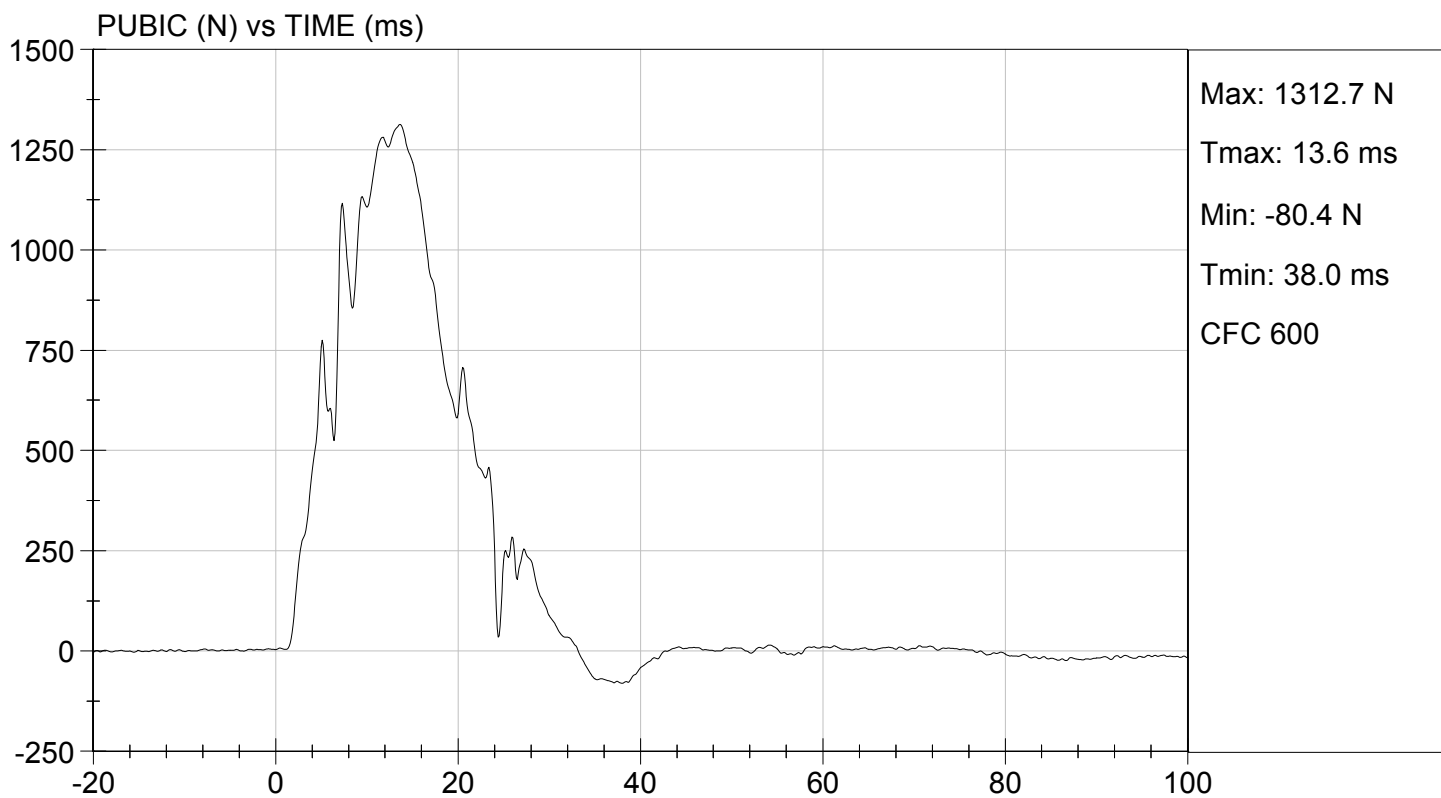
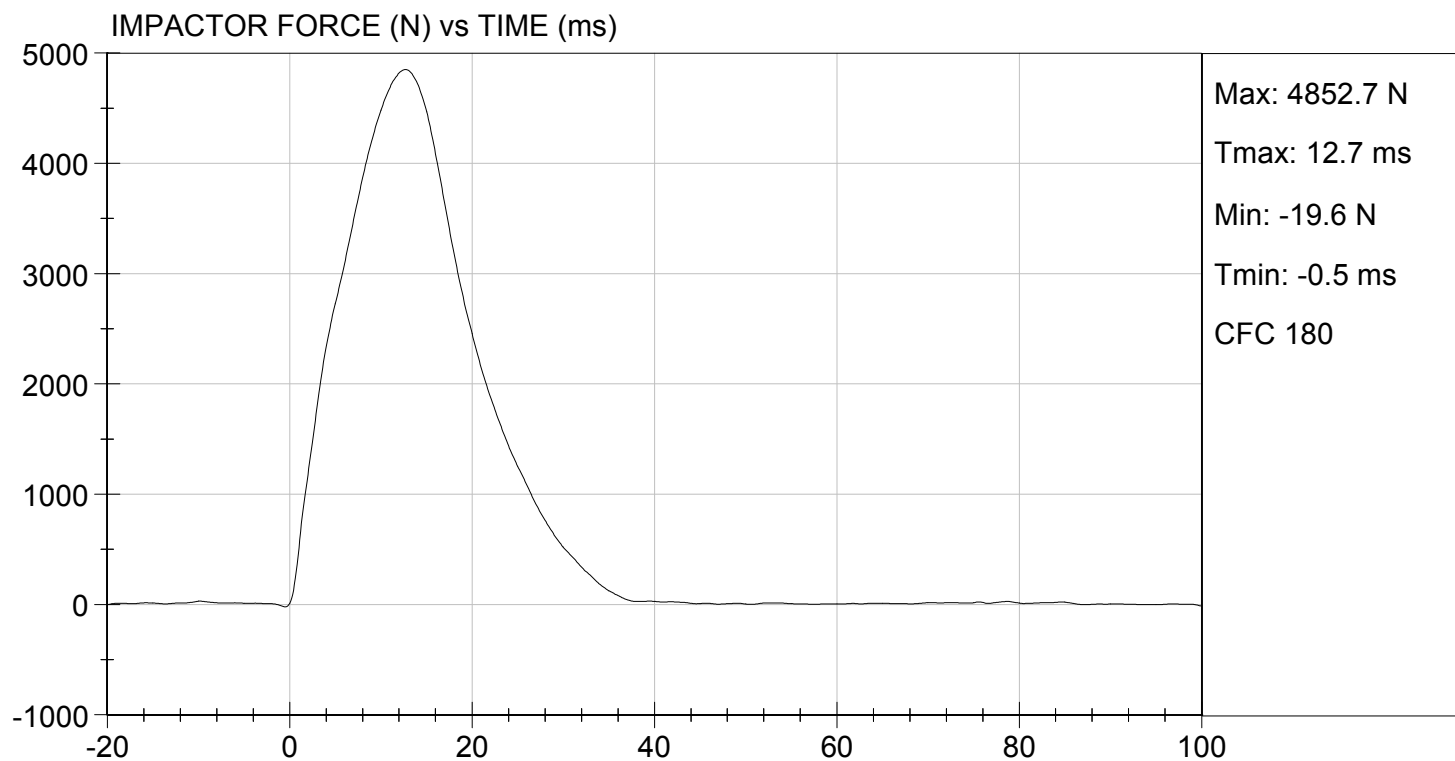
Test Date


Approved By



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

TEST DATE: 12/03/2014
TEST #: D144269



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: D144101

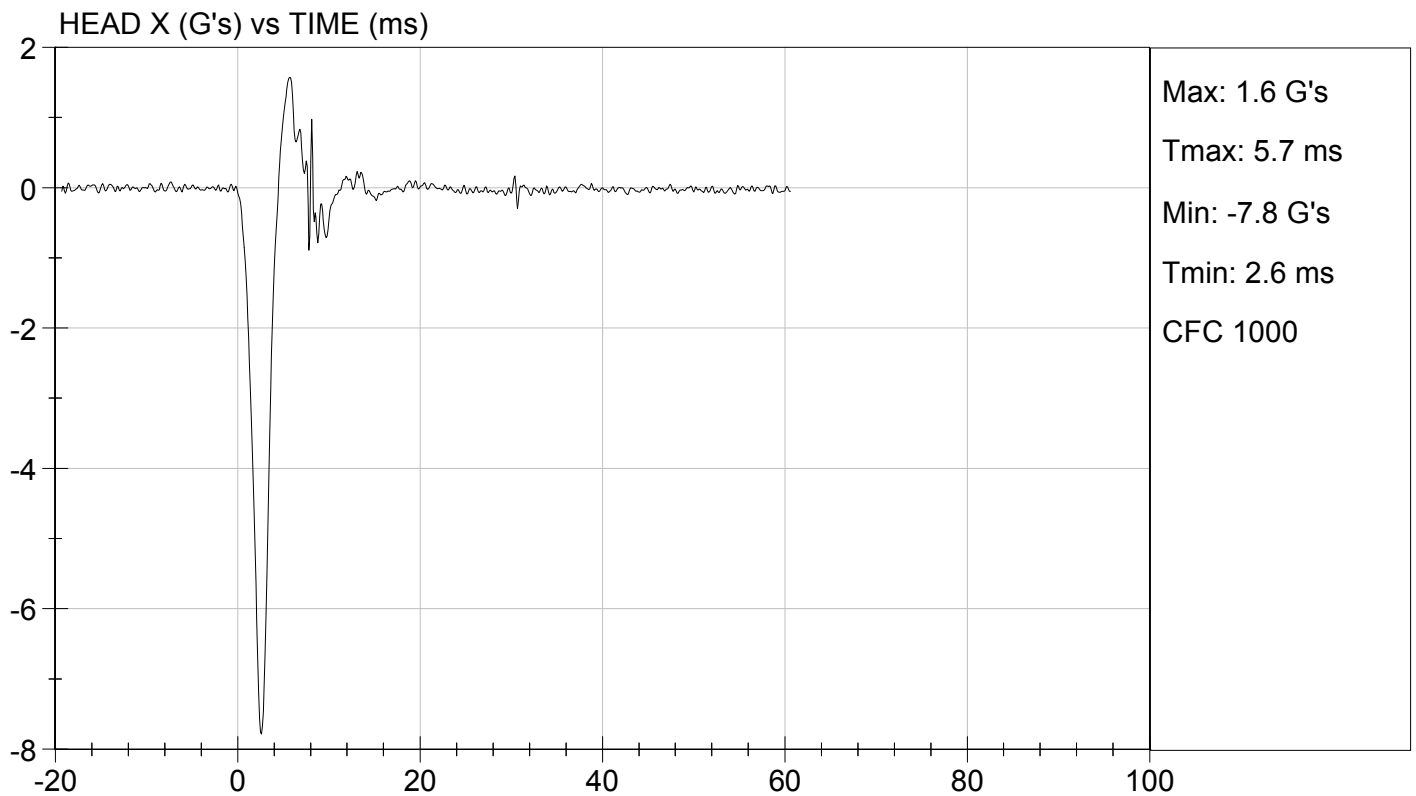
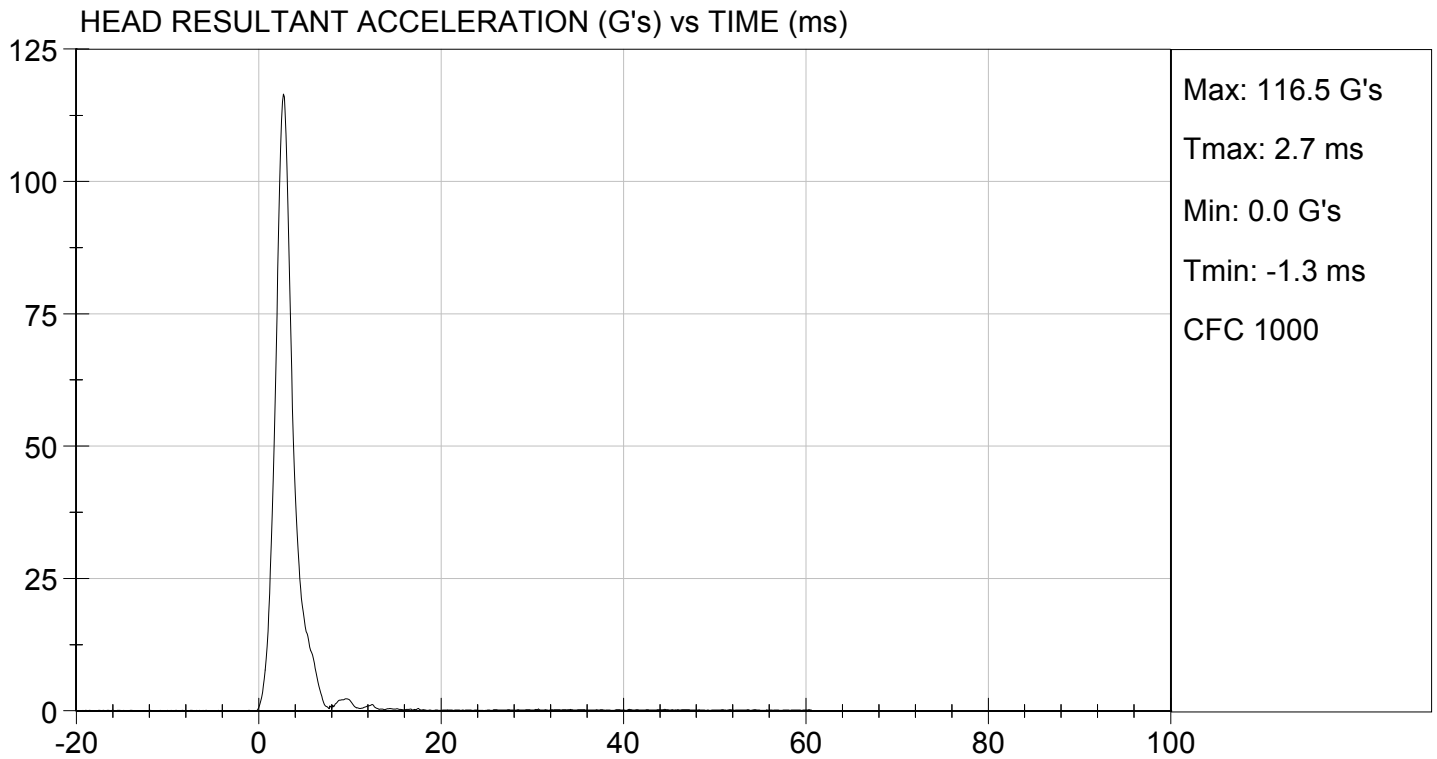
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	15	Pass
Peak Resultant Acceleration	G's	115 to 137	117	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-7.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass

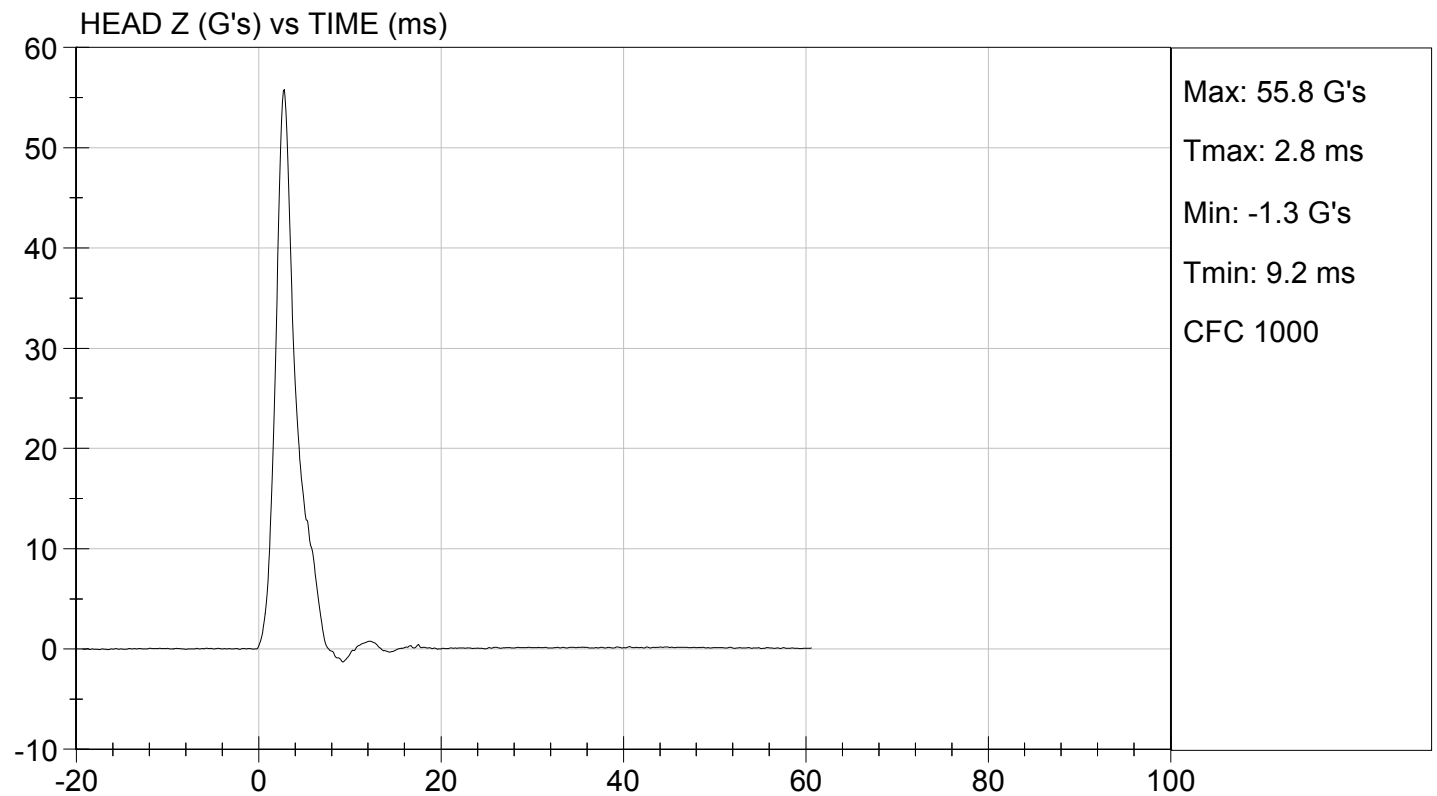
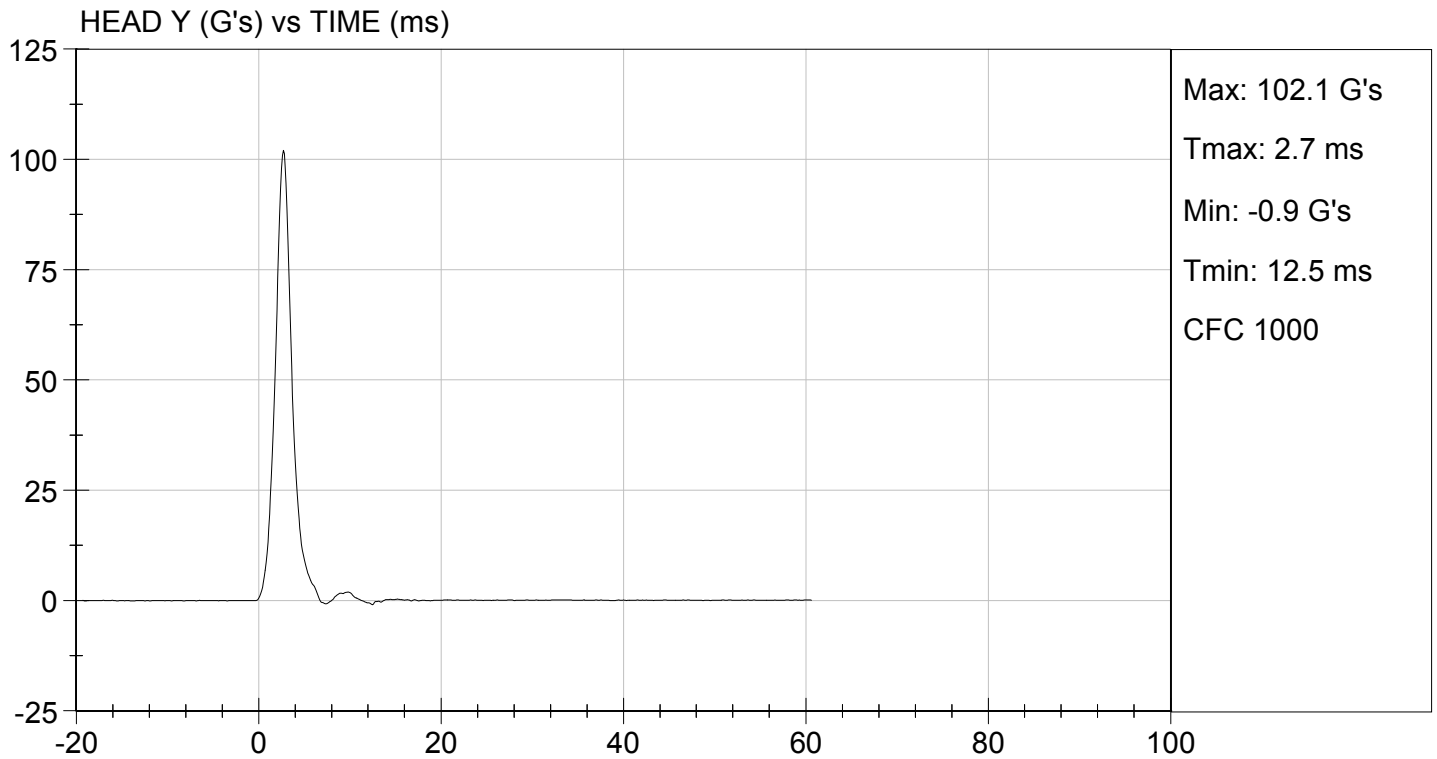

Laboratory Technician

11/19/2014

Test Date


Approved By





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

ATD Serial No: 296

Test I.D: D144102

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.8	Pass
Humidity		%	10 to 70	18	Pass
Impact Velocity		m/s	5.51 to 5.63	5.63	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.59	Pass
	15 ms	m/s	3.30 to 4.10	3.65	Pass
	20 ms	m/s	4.40 to 5.40	4.73	Pass
	25 ms	m/s	5.40 to 6.10	5.50	Pass
	25-100 ms	m/s	5.50 to 6.20	5.55	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	58	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-41	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	118	Pass
Overall Test Results				Pass	

David Schoedel
Laboratory Technician

11/19/2014

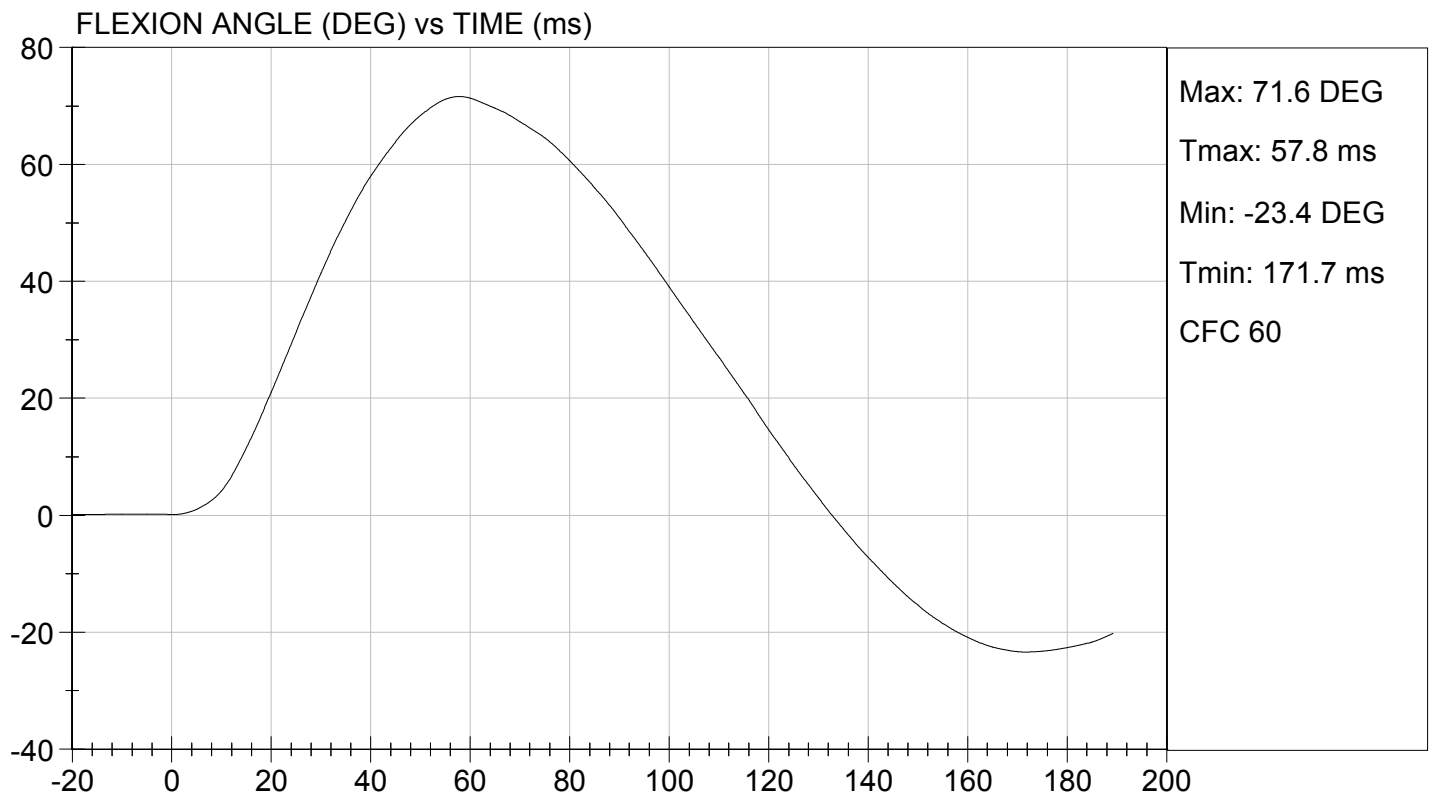
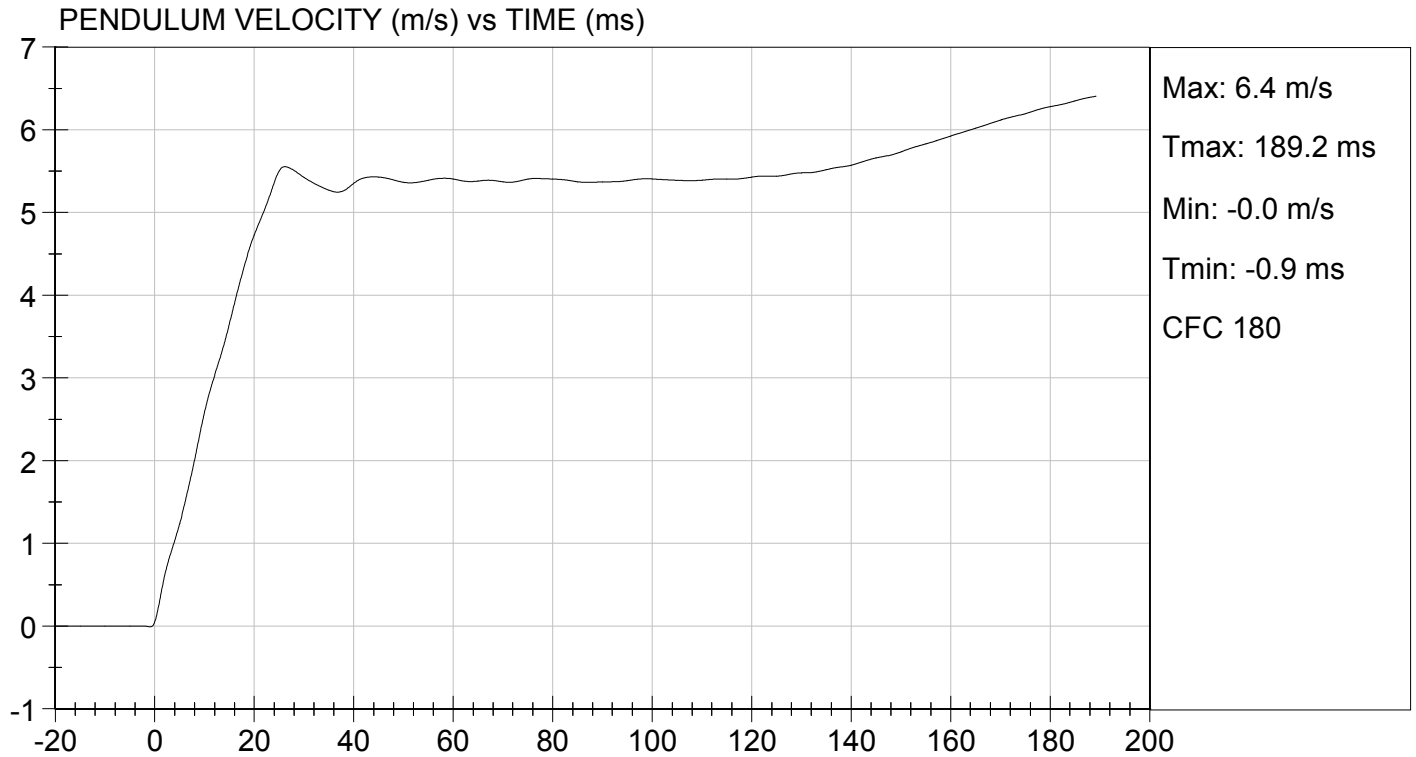
Test Date

Jessica Hall
Approved By



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

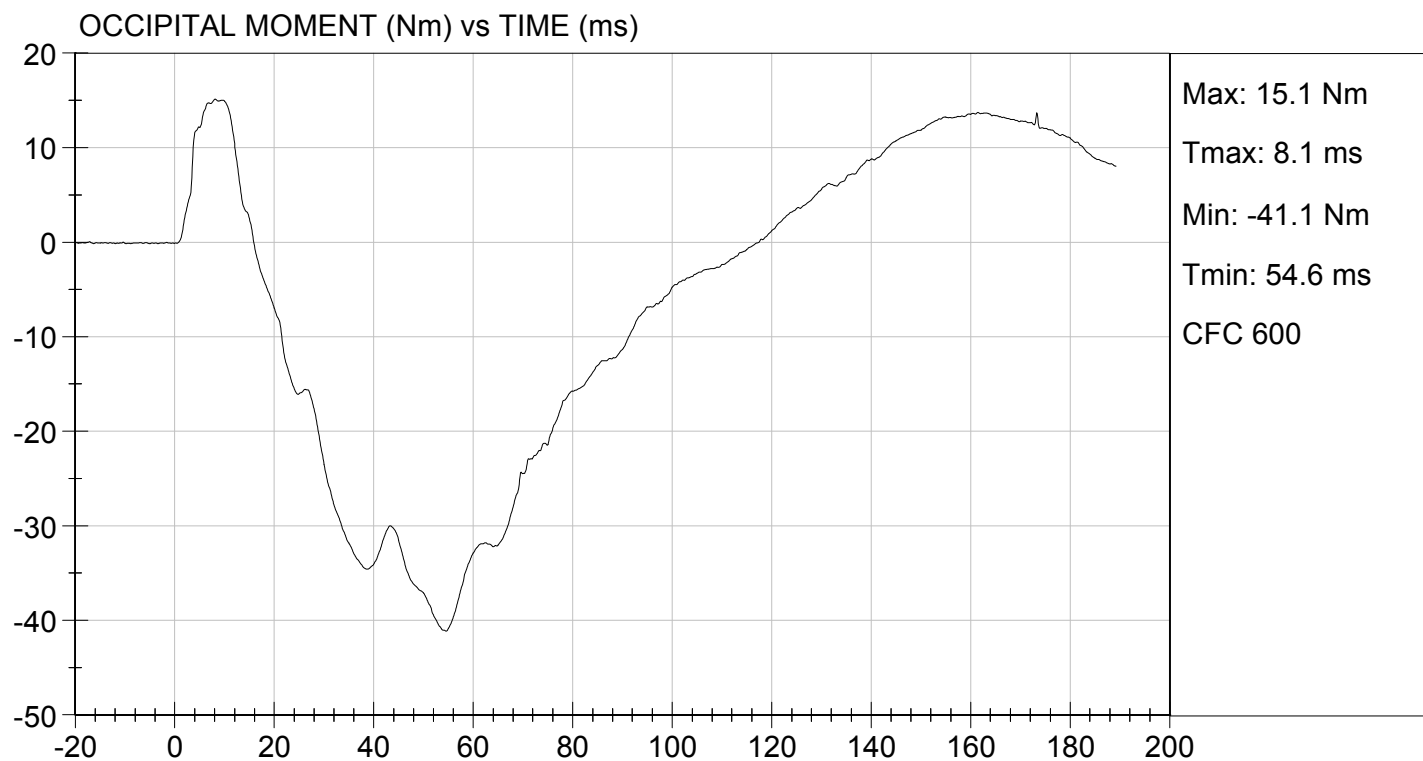
TEST DATE: 11/19/2014
TEST #: D144102





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

TEST DATE: 11/19/2014
TEST #: D144102



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

ATD Serial No: 296

Test ID: D144103

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	15	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	17	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

11/19/2014

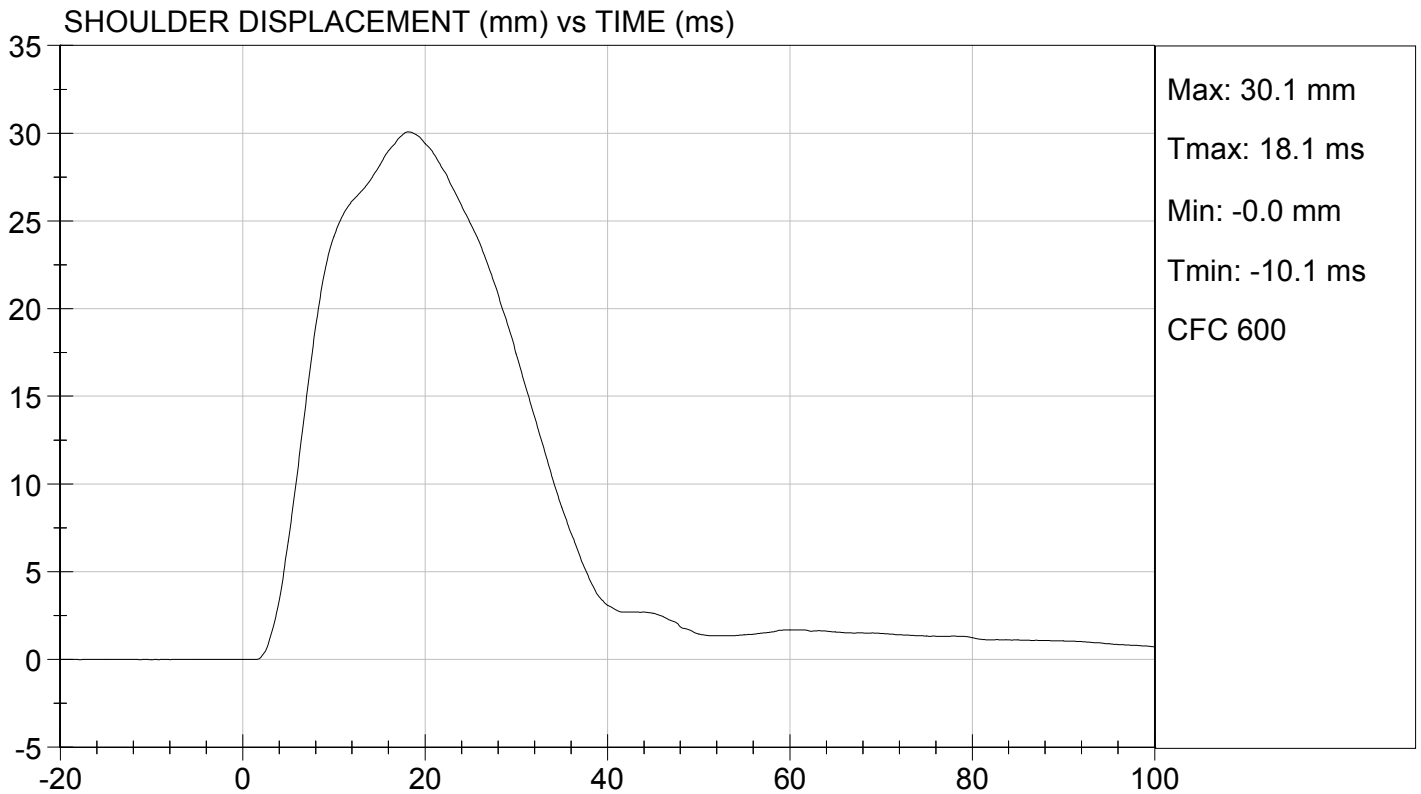
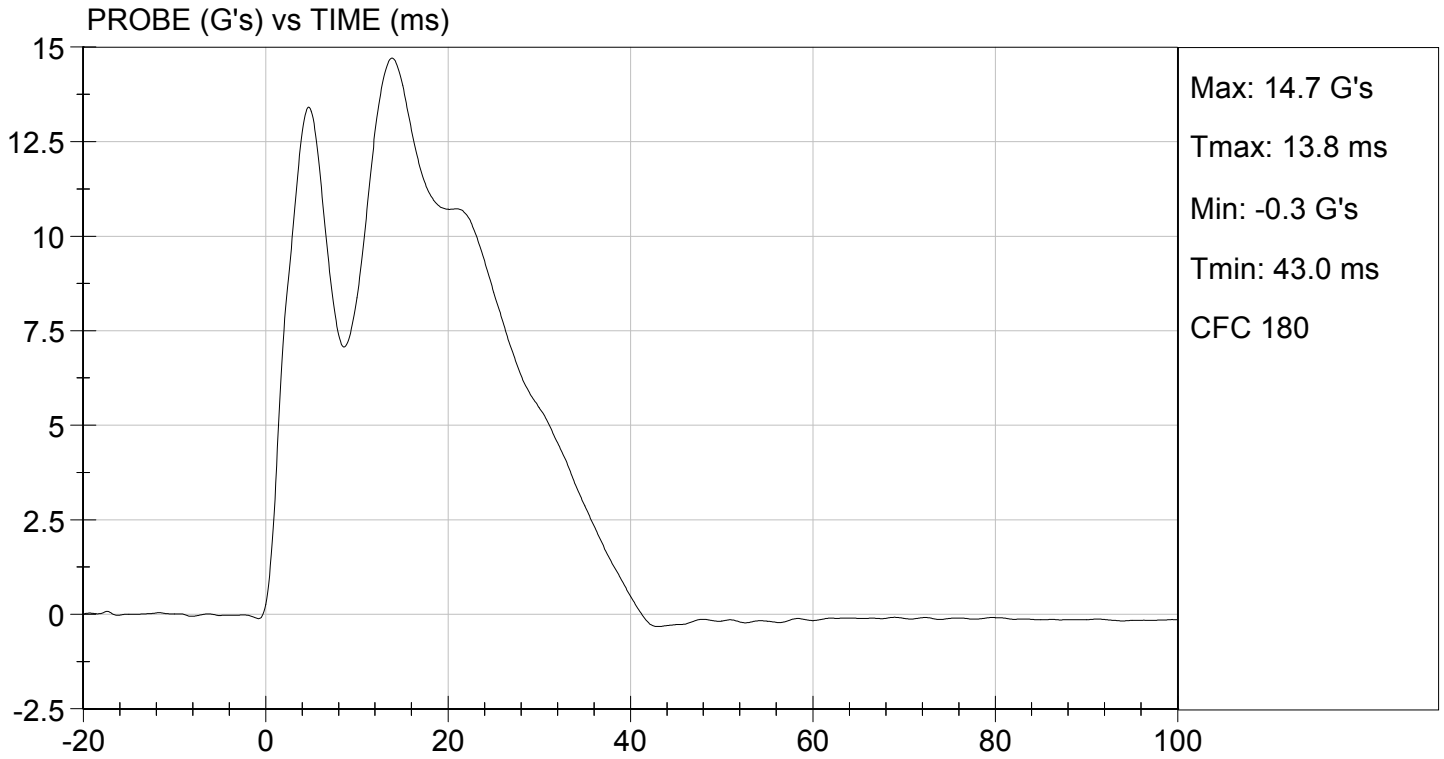
Test Date

Jessica Hall
Approved By



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

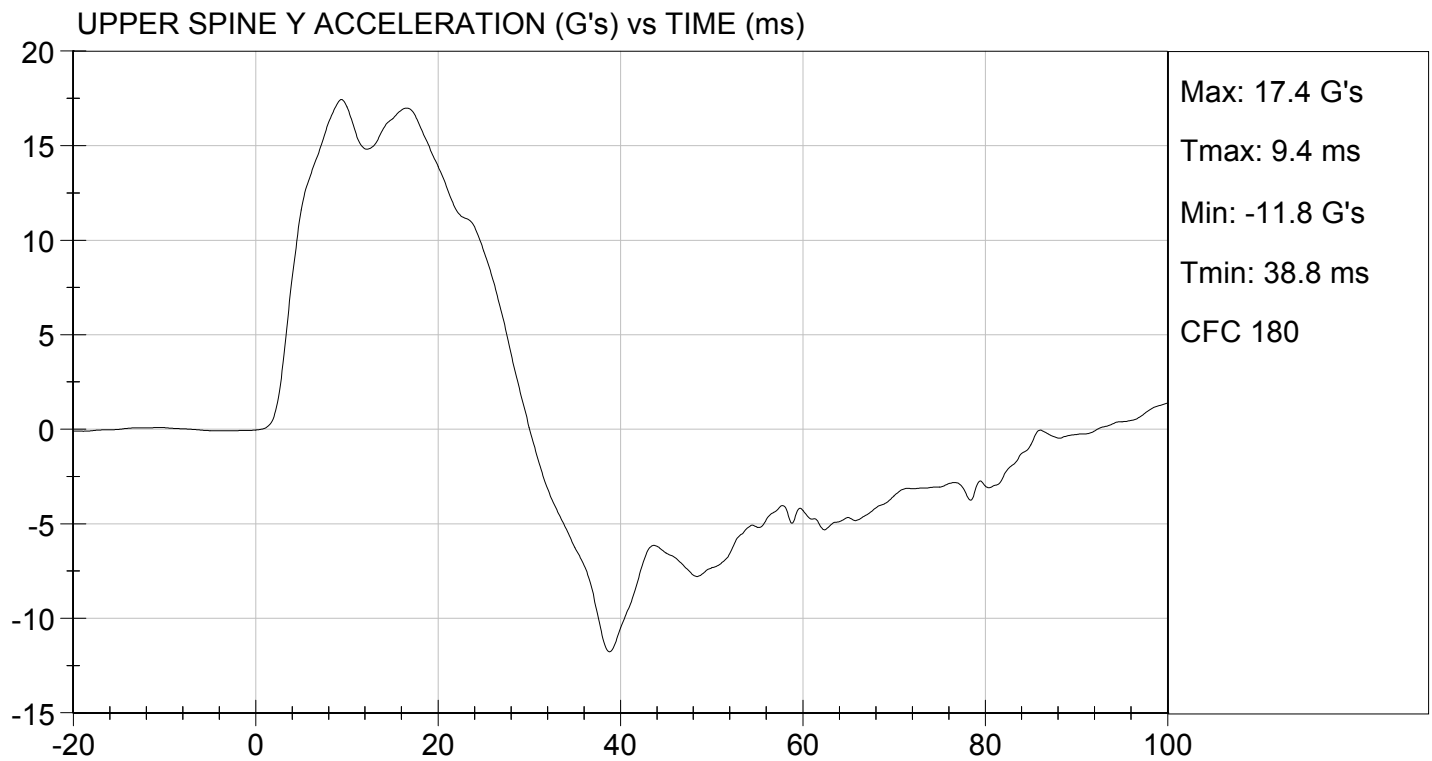
TEST DATE: 11/19/2014
TEST #: D144103





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

TEST DATE: 11/19/2014
TEST #: D144103



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

ATD Serial No: 296

Test I.D: D144104

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.1	Pass
Humidity	%	10 to 70	17	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	30 to 36	30	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	33	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	36	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	30	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

11/20/2014

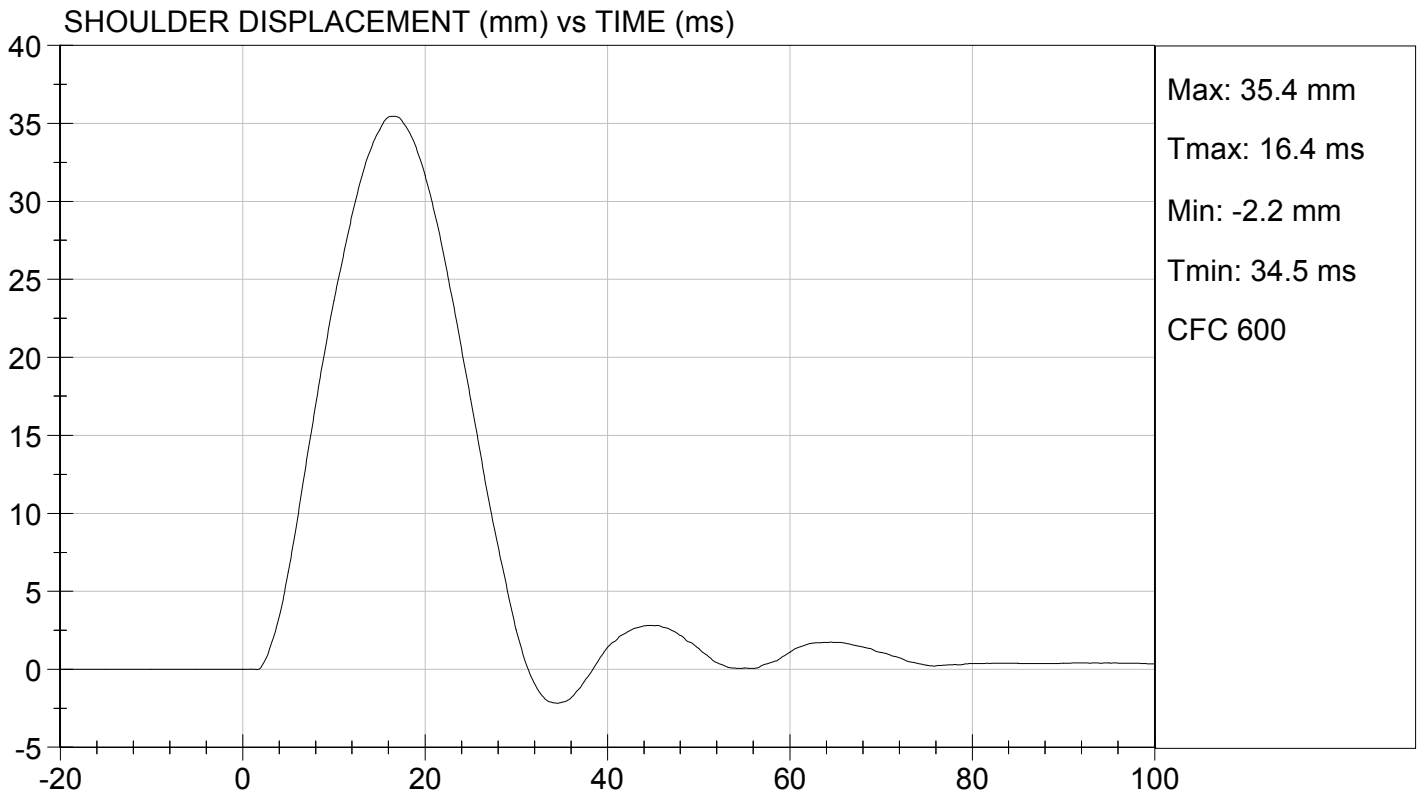
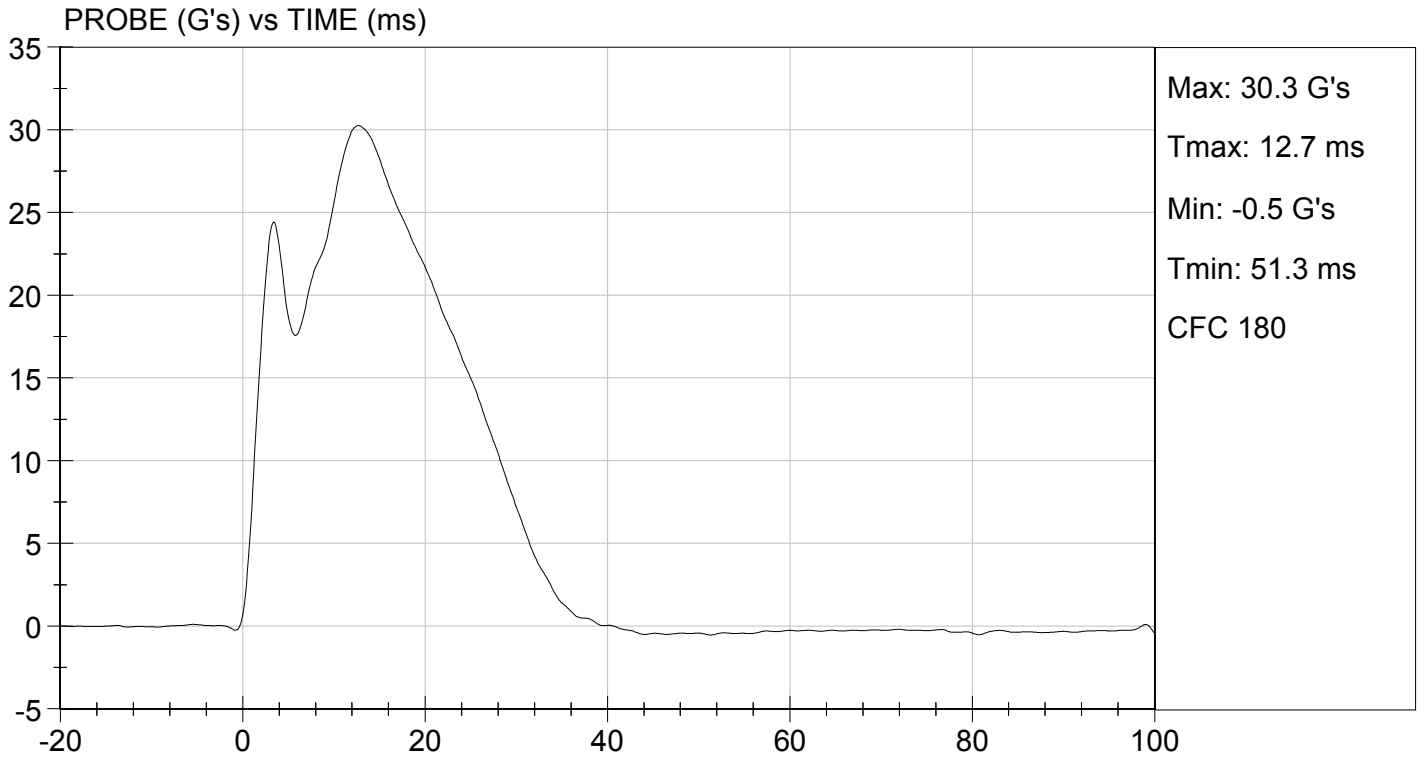
Test Date

Jessica Hall
Approved By



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

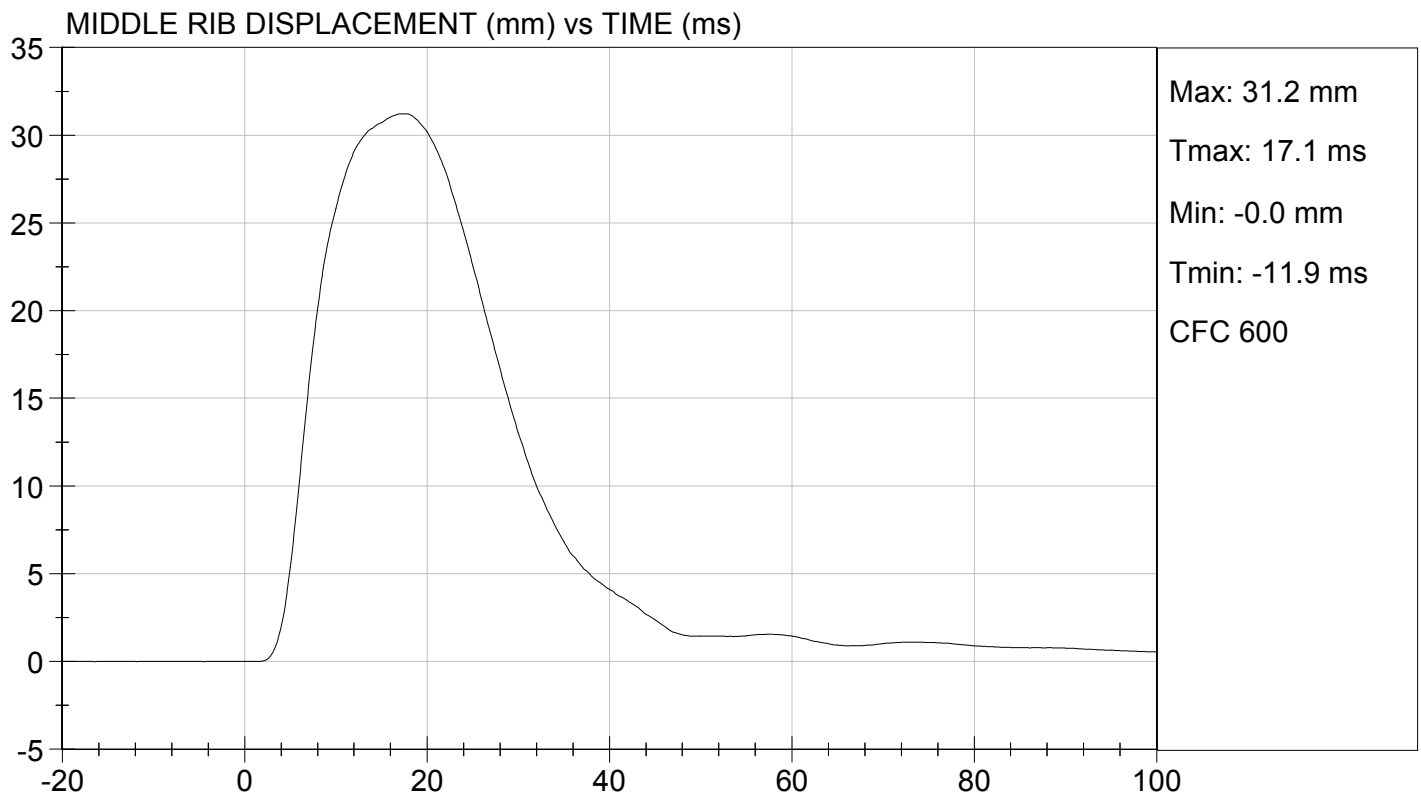
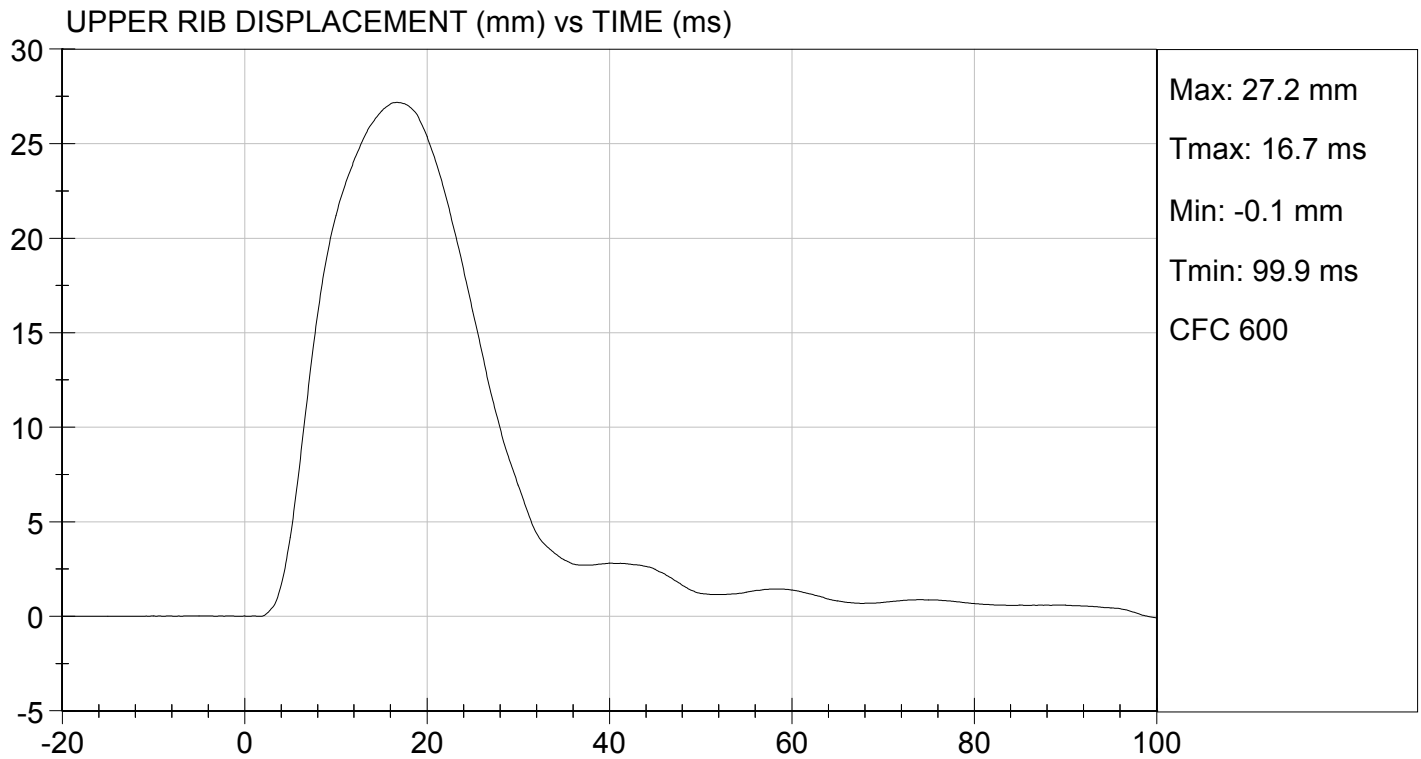
TEST DATE: 11/20/2014
TEST #: D144104





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

TEST DATE: 11/20/2014
TEST #: D144104

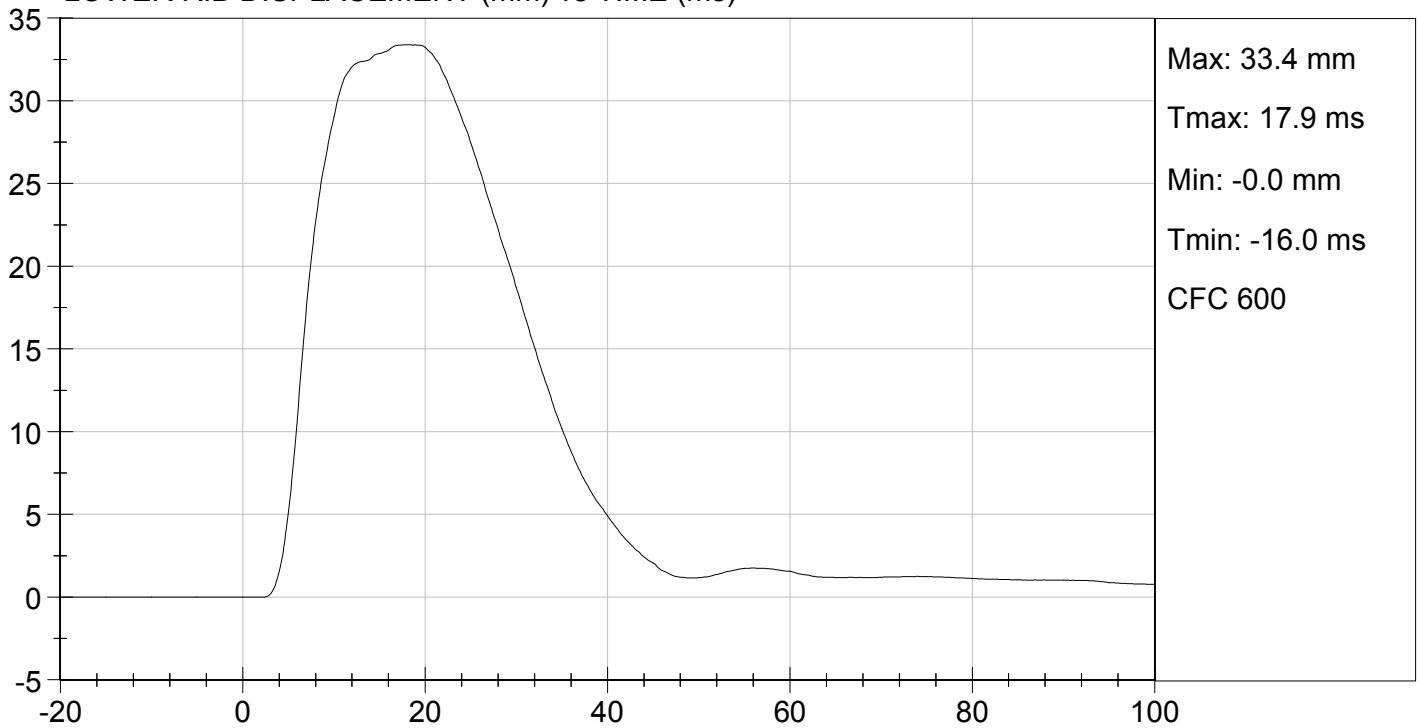




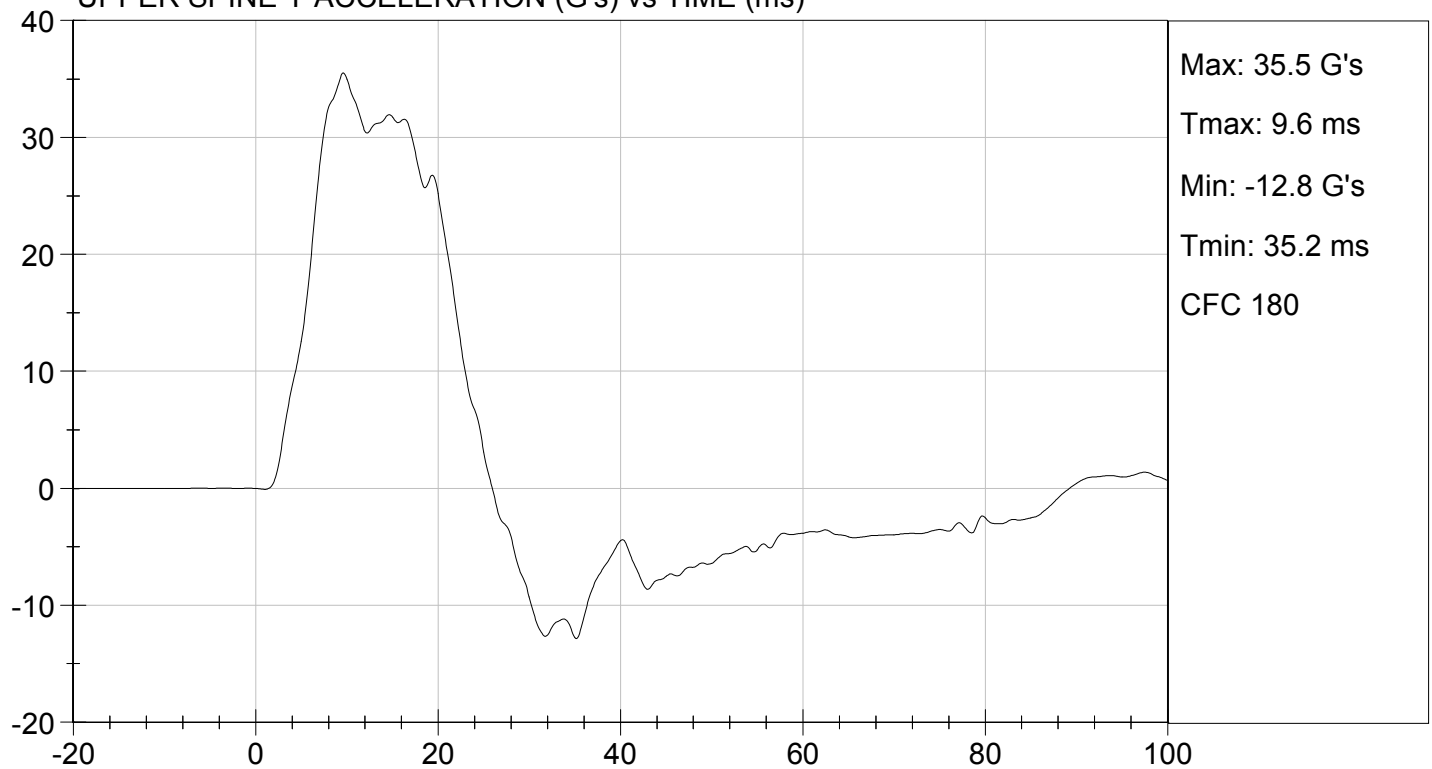
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.93 ft/s, 6.68 m/s

TEST DATE: 11/20/2014
TEST #: D144104

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



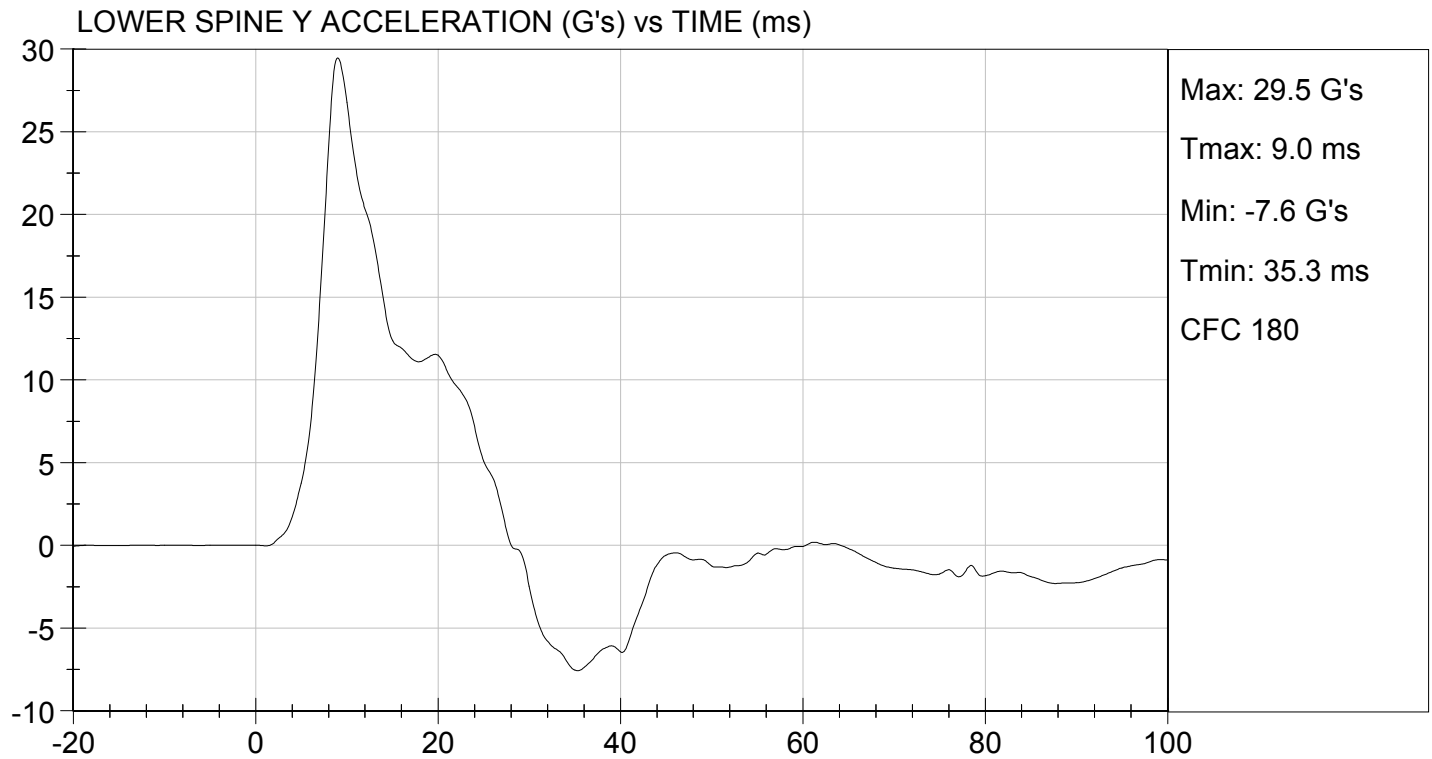
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





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

TEST DATE: 11/20/2014
TEST #: D144104



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

ATD Serial No: 296

Test I.D: D144105

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	15	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	33	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

11/19/2014

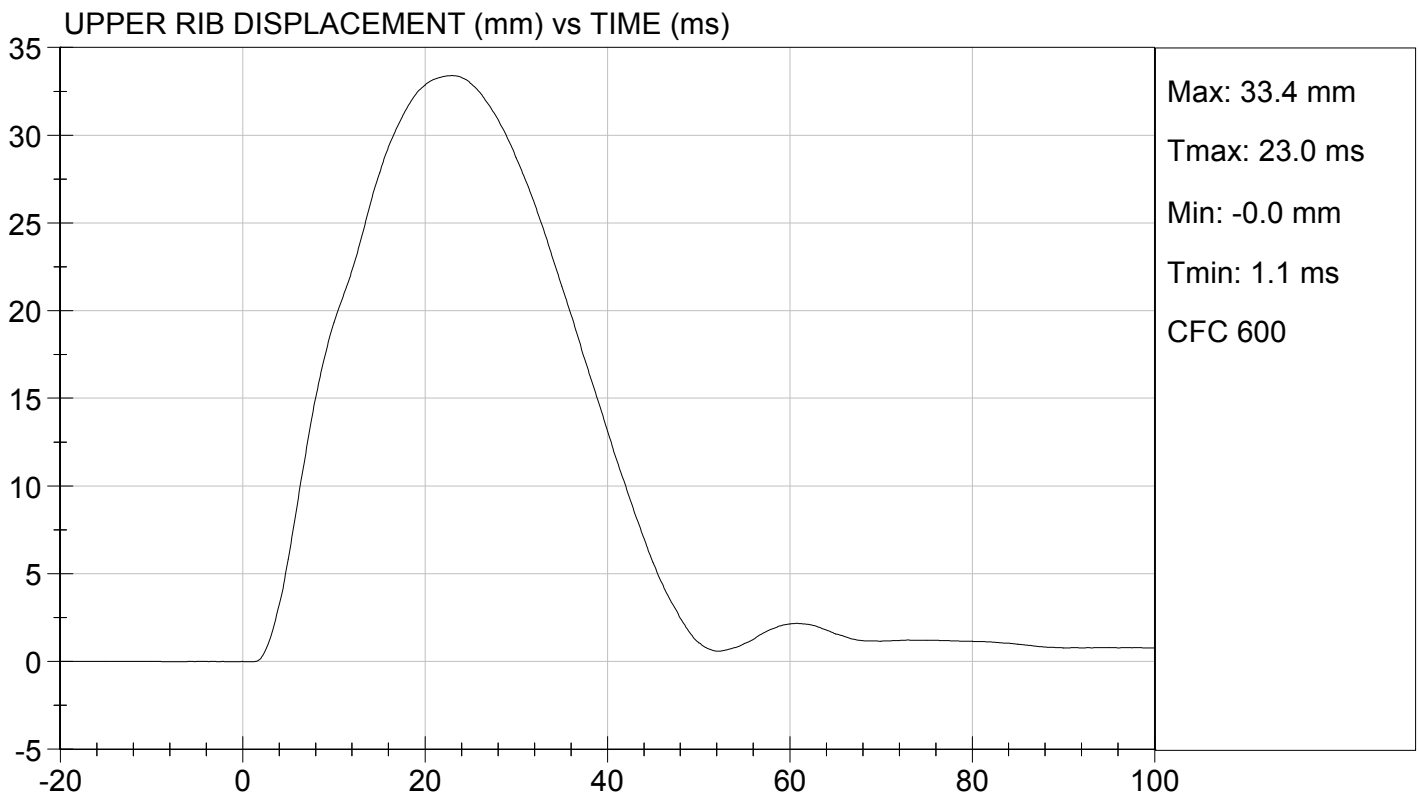
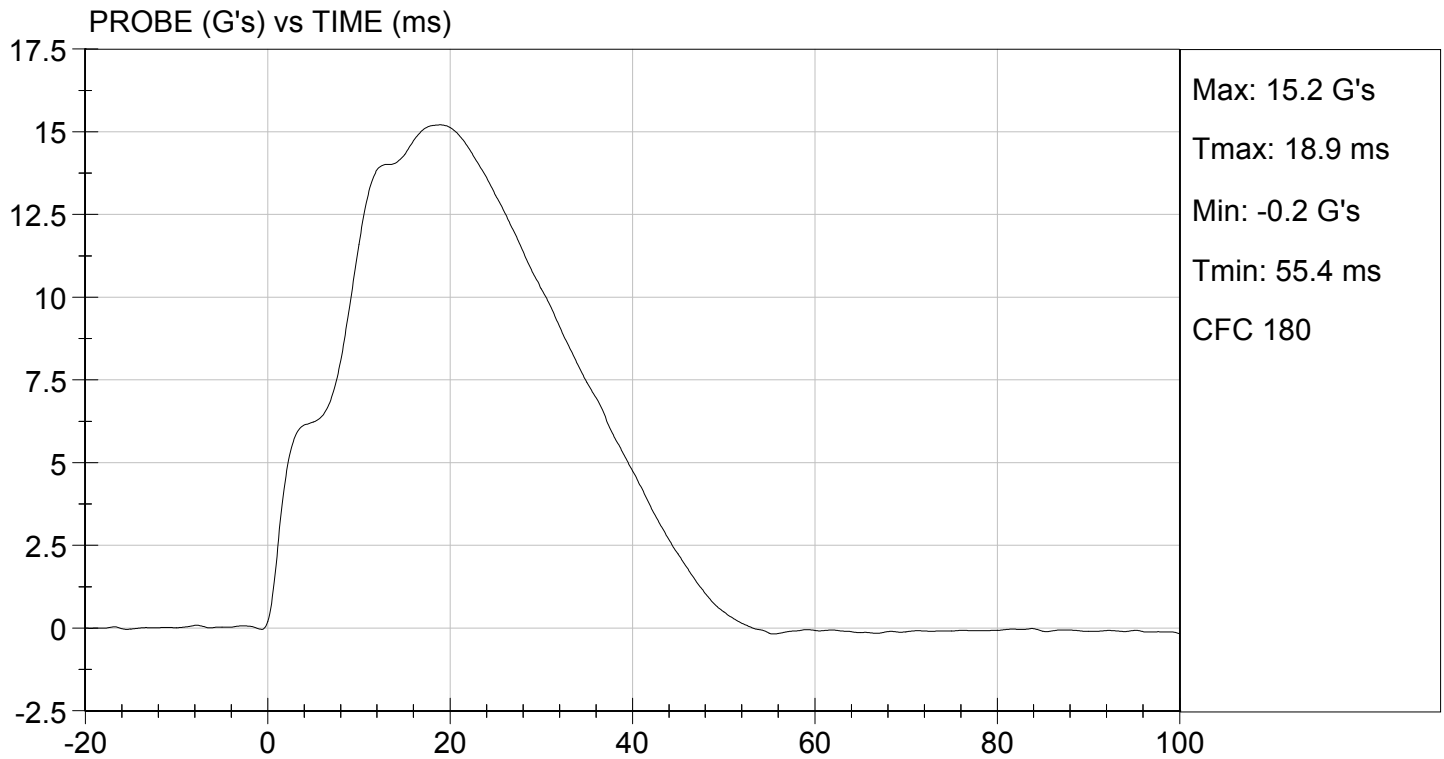
Test Date

Jessica Hall
Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.89 ft/s, 4.23 m/s

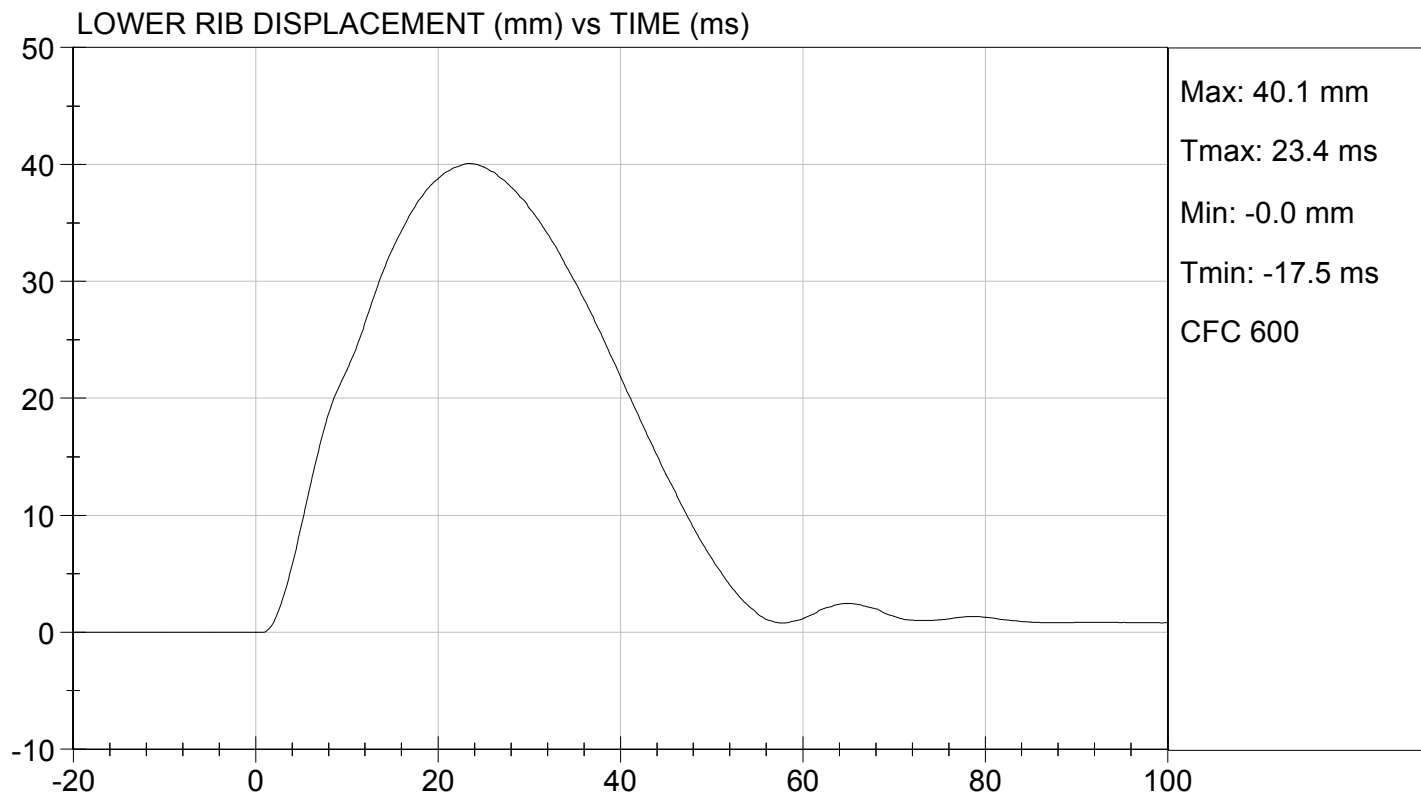
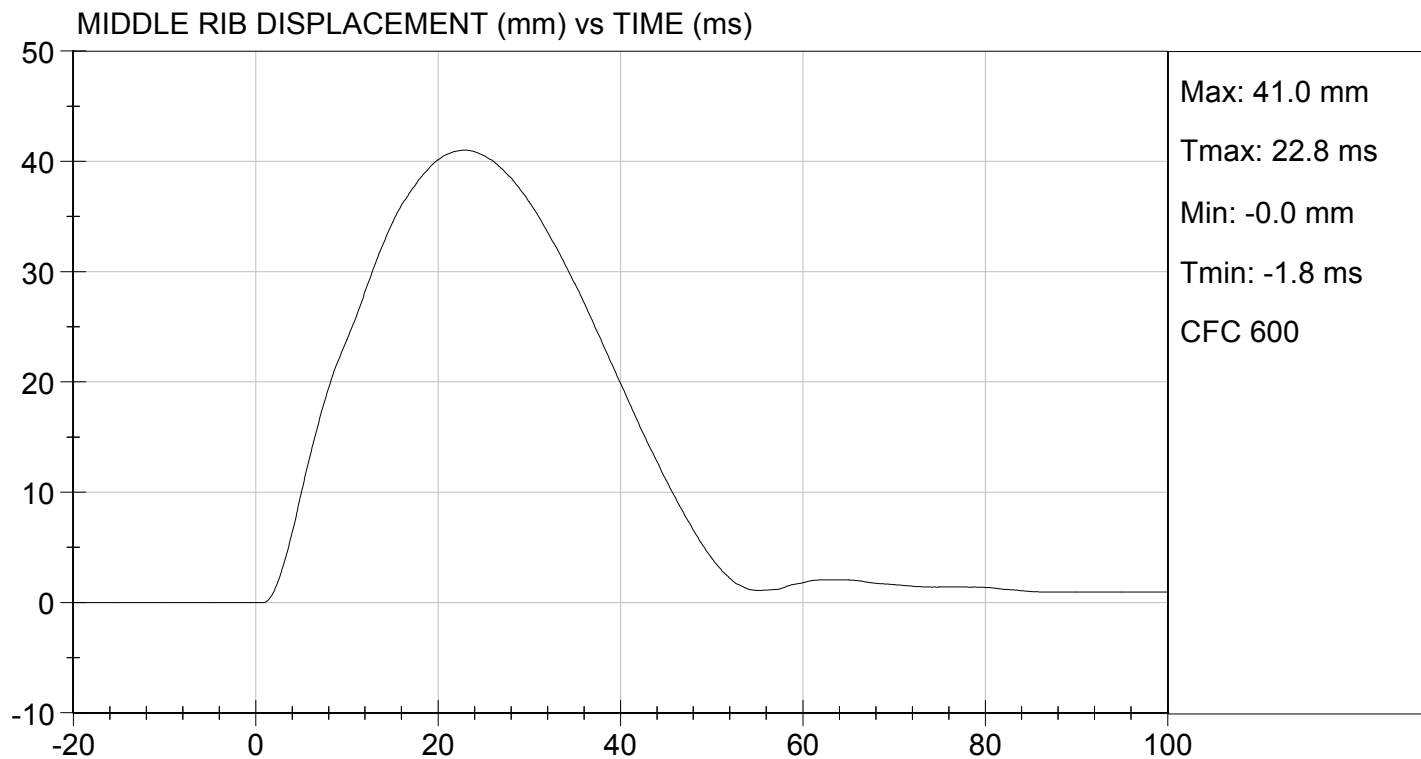
TEST DATE: 11/19/2014
TEST #: D144105





TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 11/19/2014
TEST #: D144105

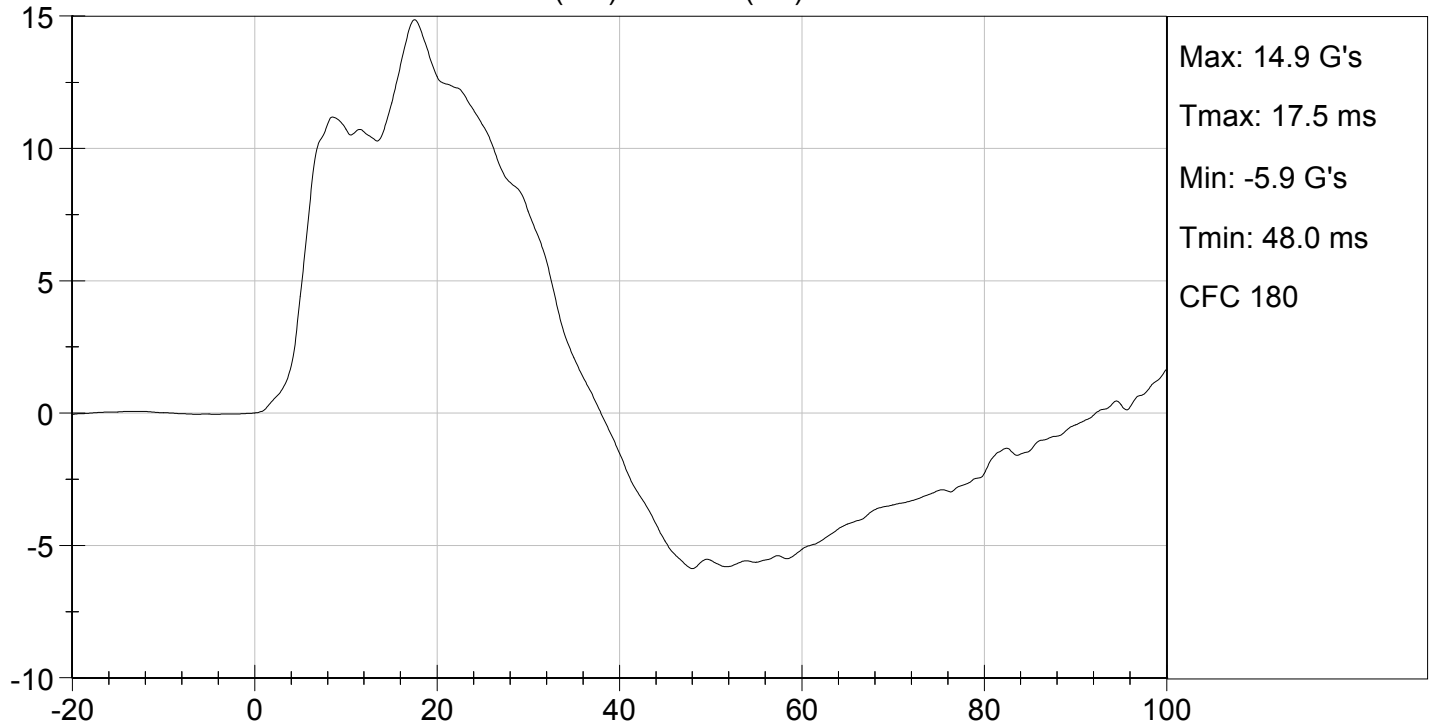




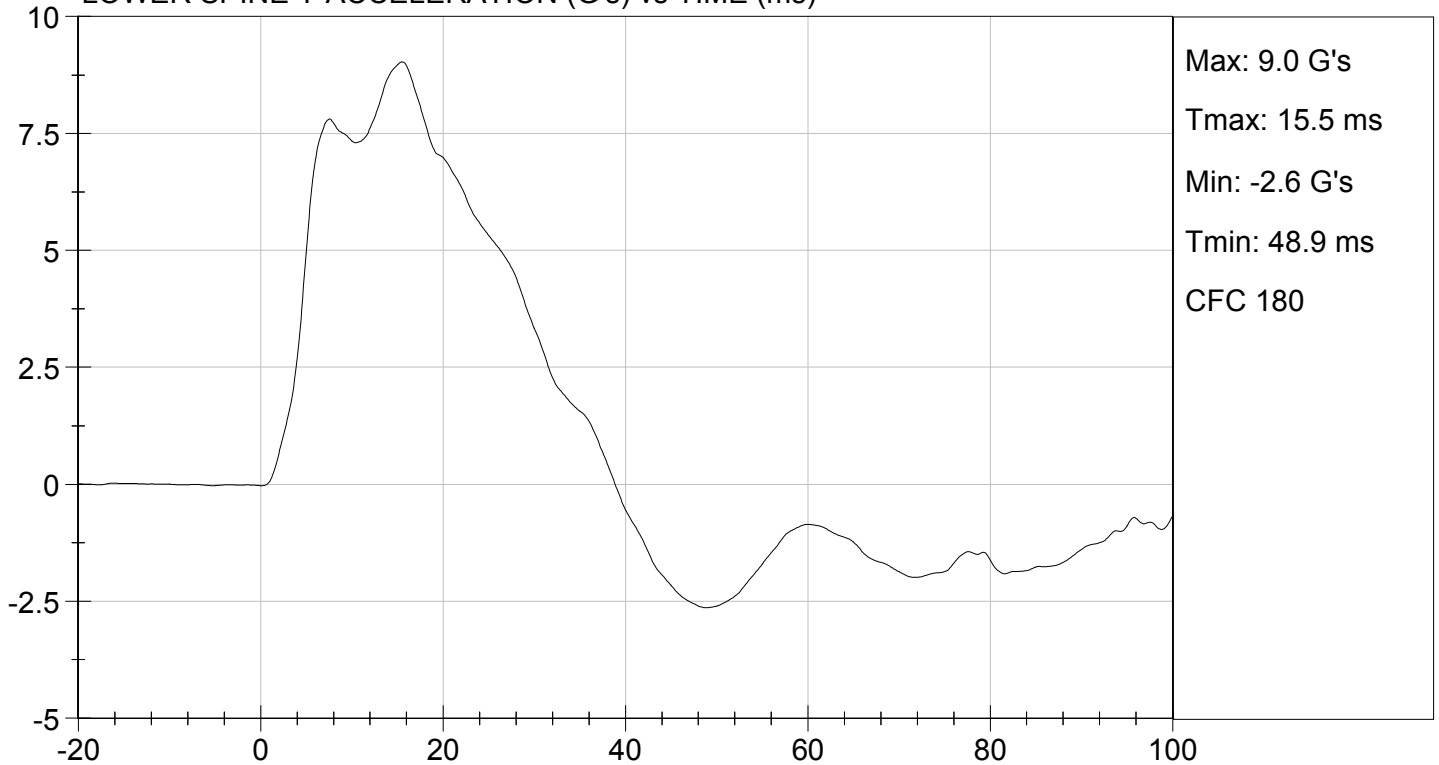
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 11/19/2014
TEST #: D144105

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: D144106

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	15	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	40	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

11/19/2014

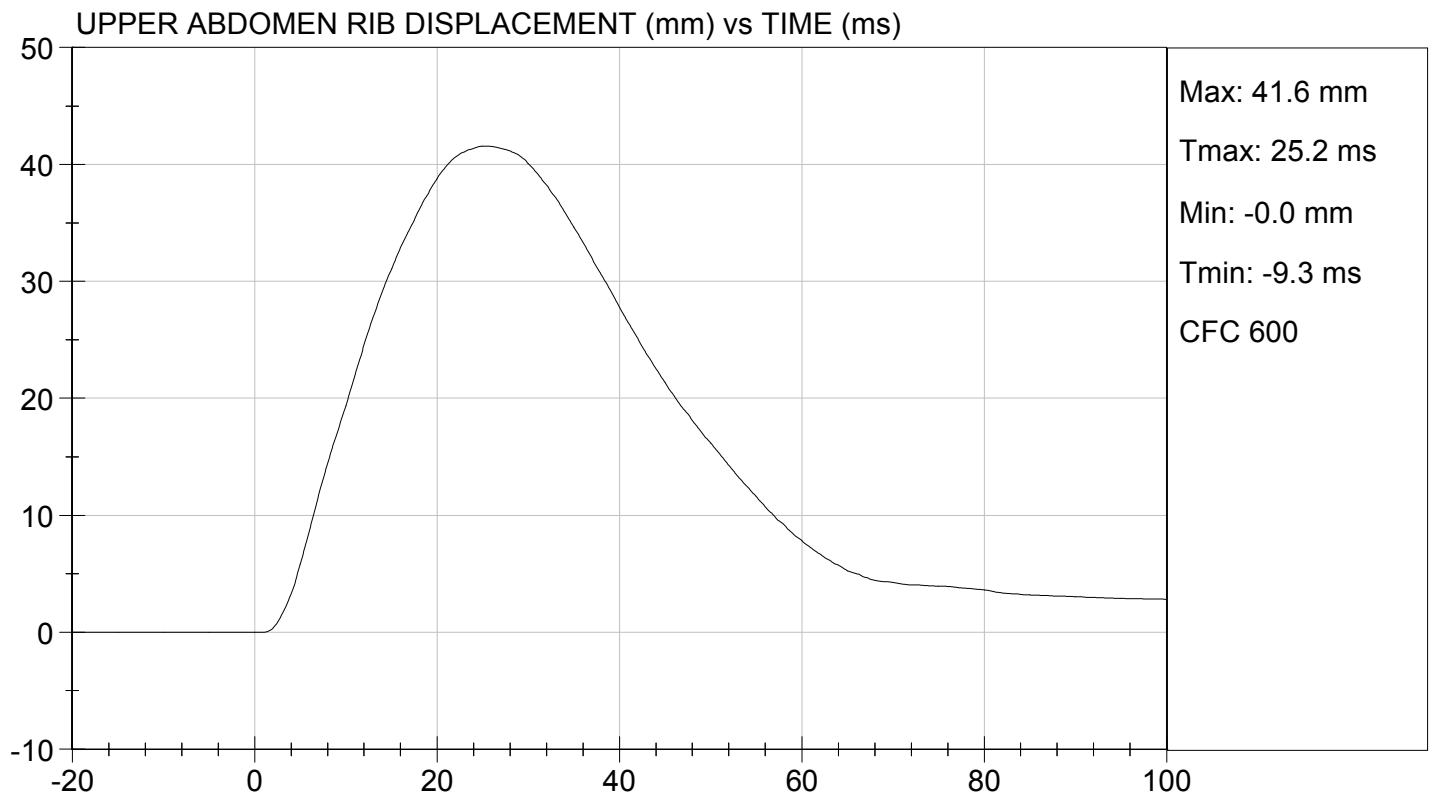
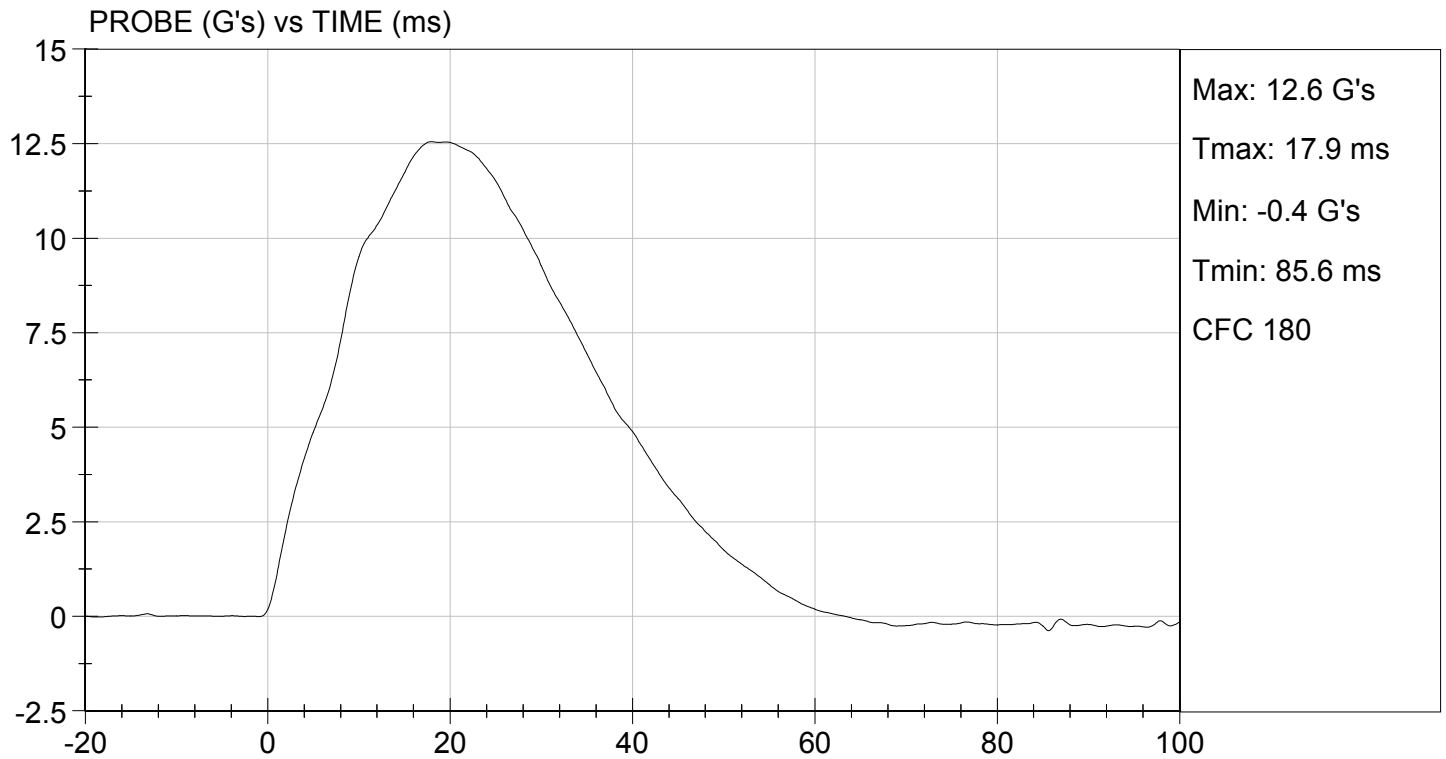
Test Date

Jessica Hall
Approved By



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

TEST DATE: 11/19/2014
TEST #: D144106

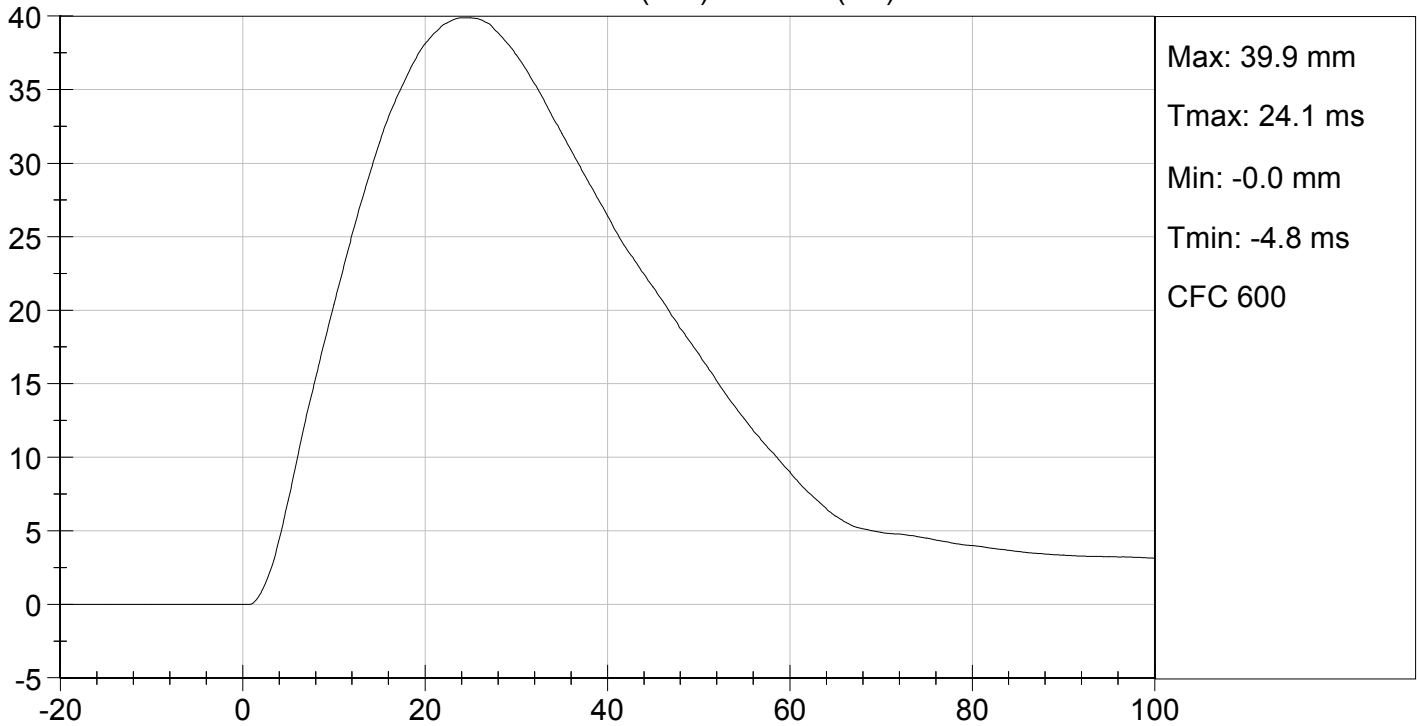




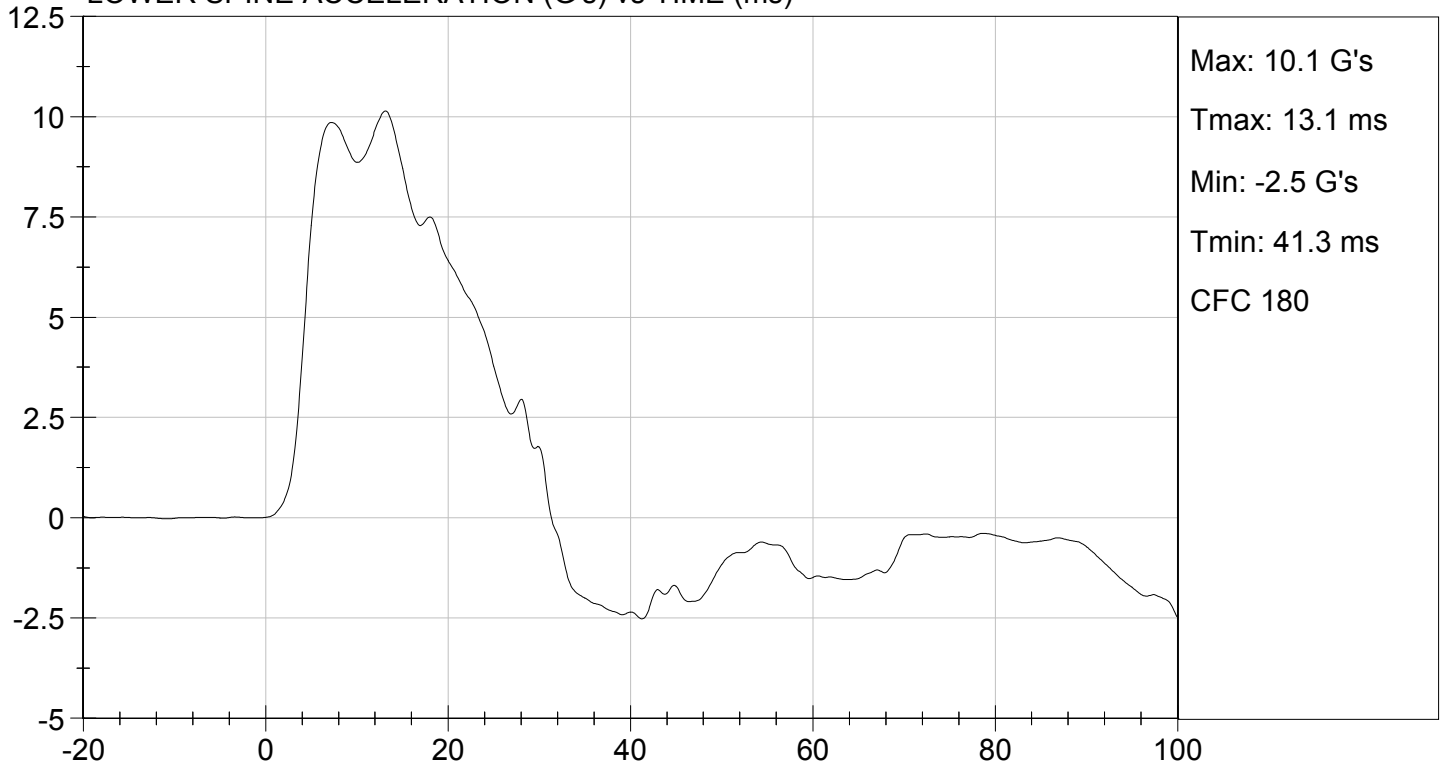
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 11/19/2014
TEST #: D144106

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: D144107

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	15	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	40	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	4,121	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

11/19/2014

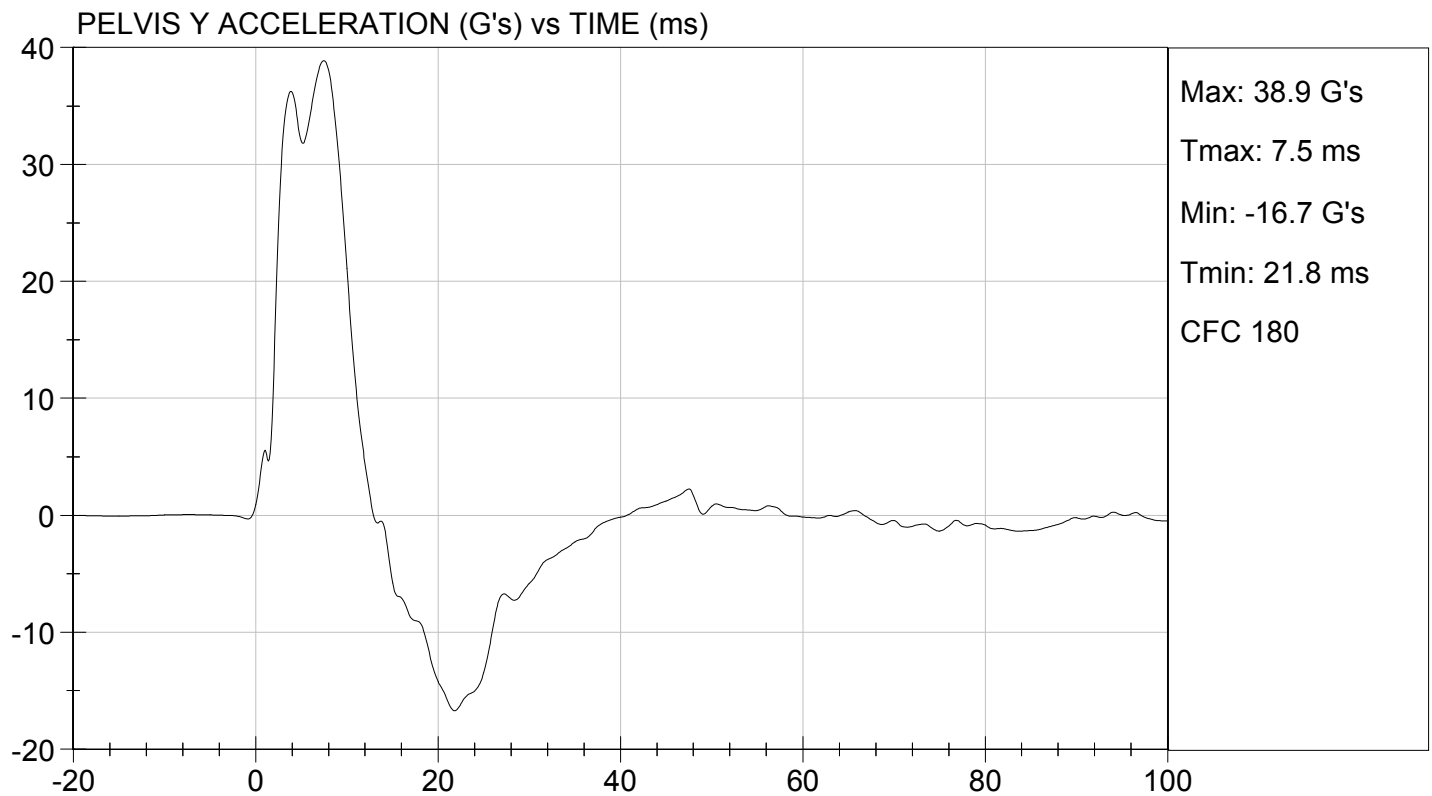
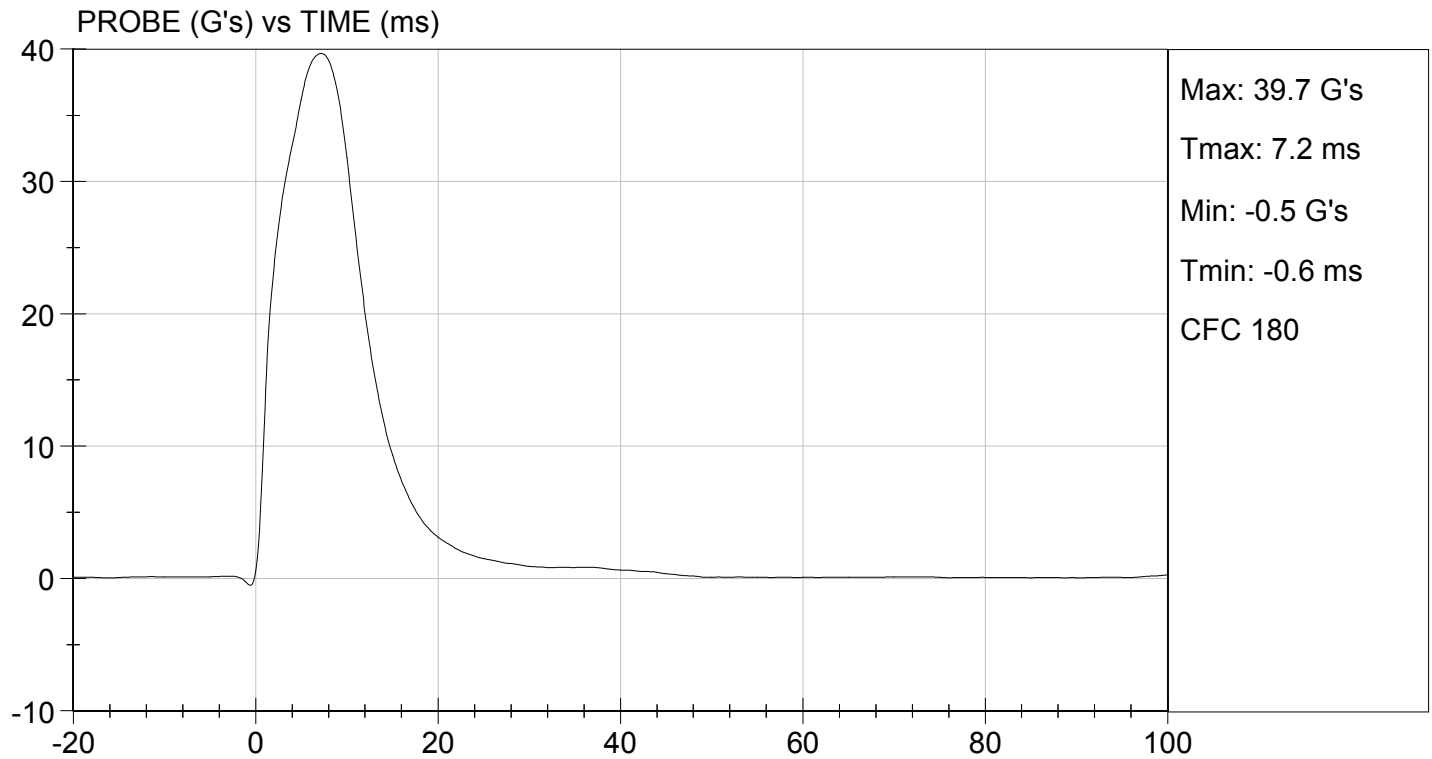
Test Date

Jessica Hall
Approved By



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

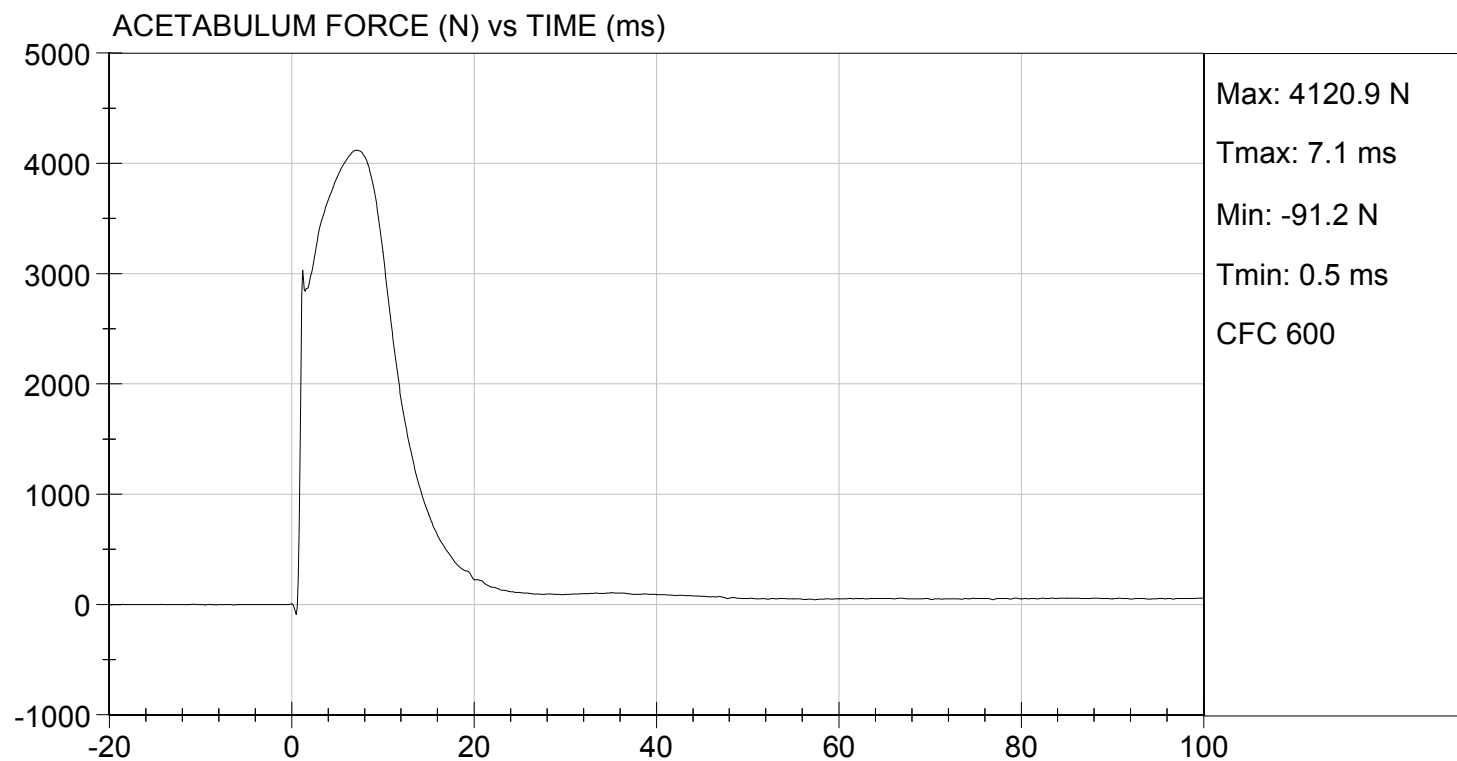
TEST DATE: 11/19/2014
TEST #: D144107





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

TEST DATE: 11/19/2014
TEST #: D144107



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D144108

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	15	Pass
Impact Velocity	m/s	4.20 to 4.40	4.20	Pass
Maximum Probe Acceleration	G's	36 to 45	41	Pass
Pelvis Y Acceleration	G's	28 to 39	31	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,860	Pass
Overall Test Results				Pass

David Schoedel

Laboratory Technician

11/19/2014

Test Date

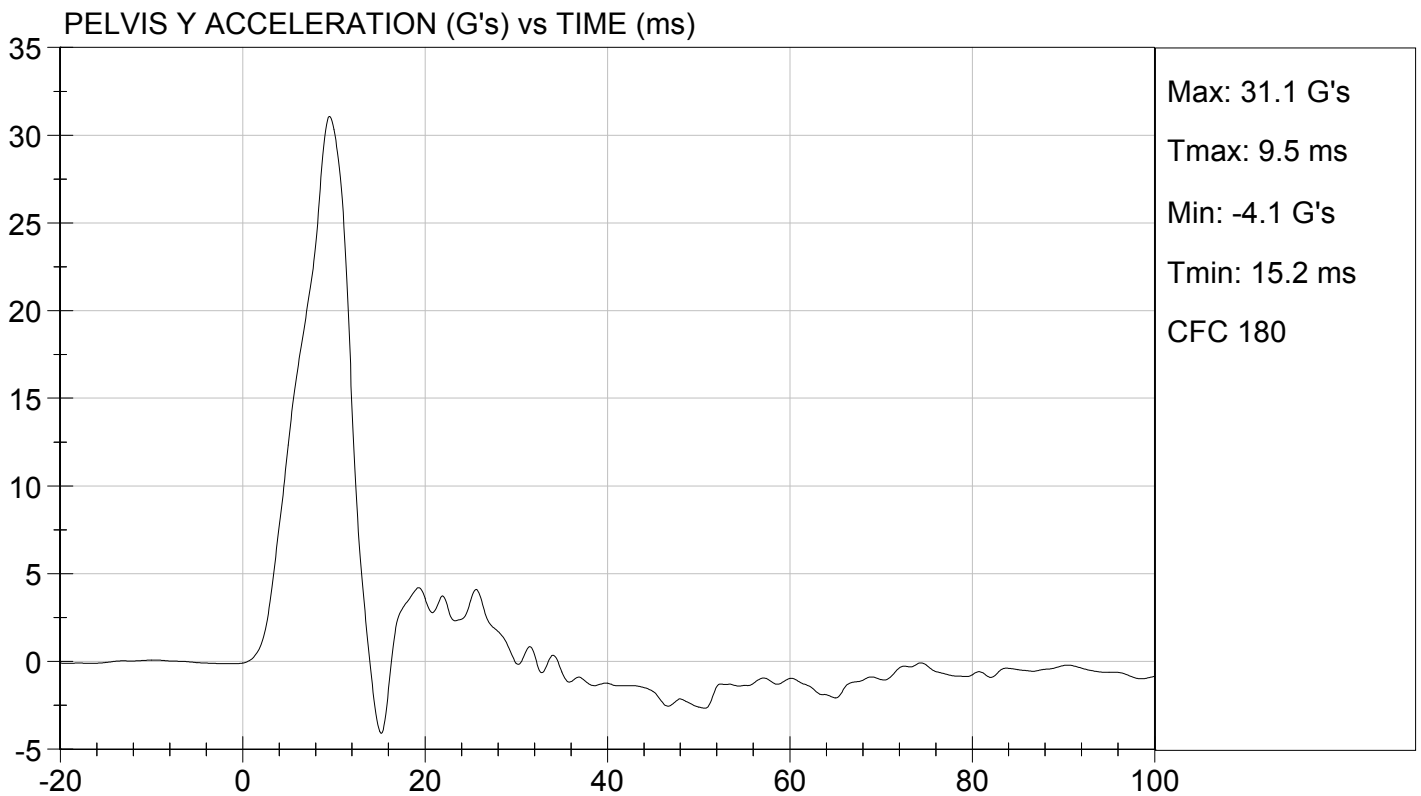
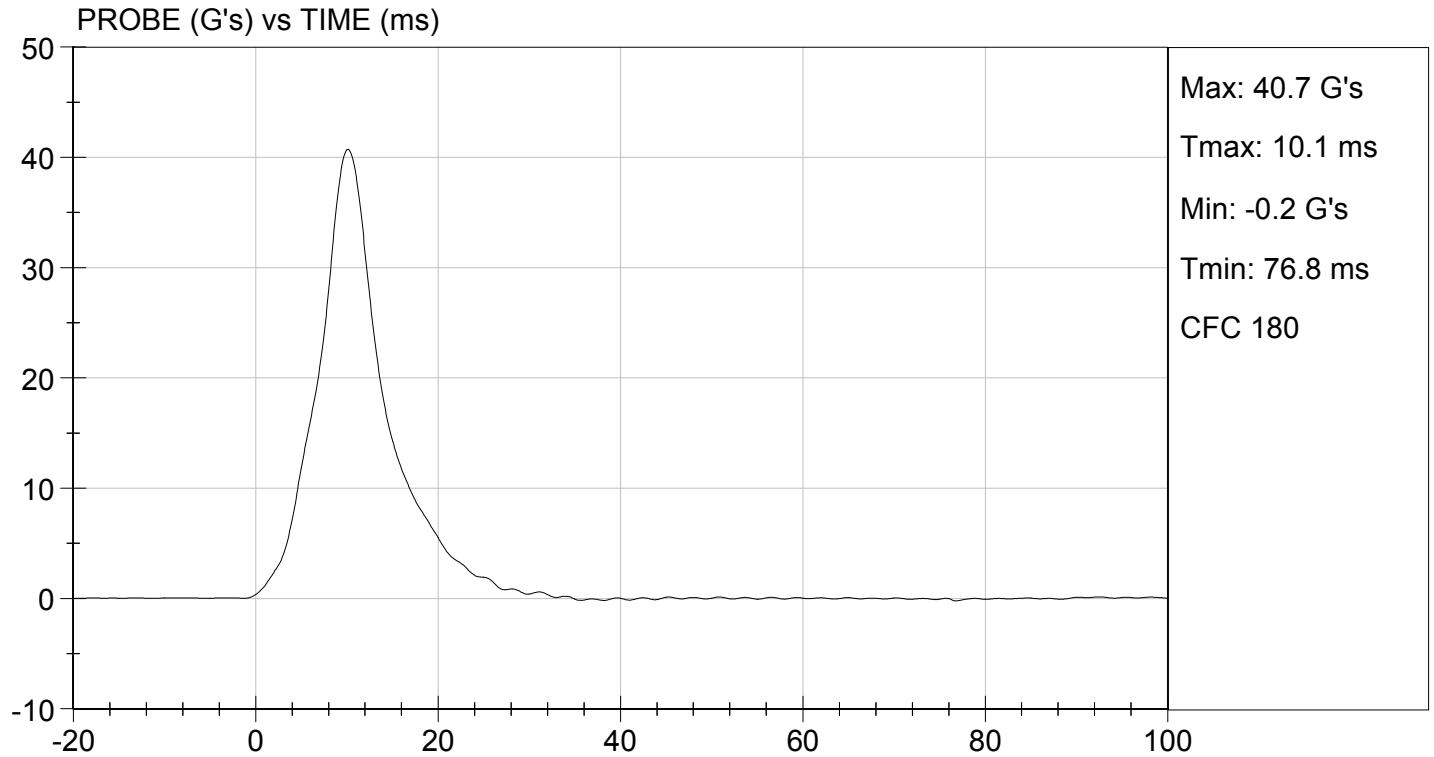
Jessica Hall

Approved By



TEST DESC: ILLIAC
VELOCITY: 13.77 ft/s, 4.20 m/s

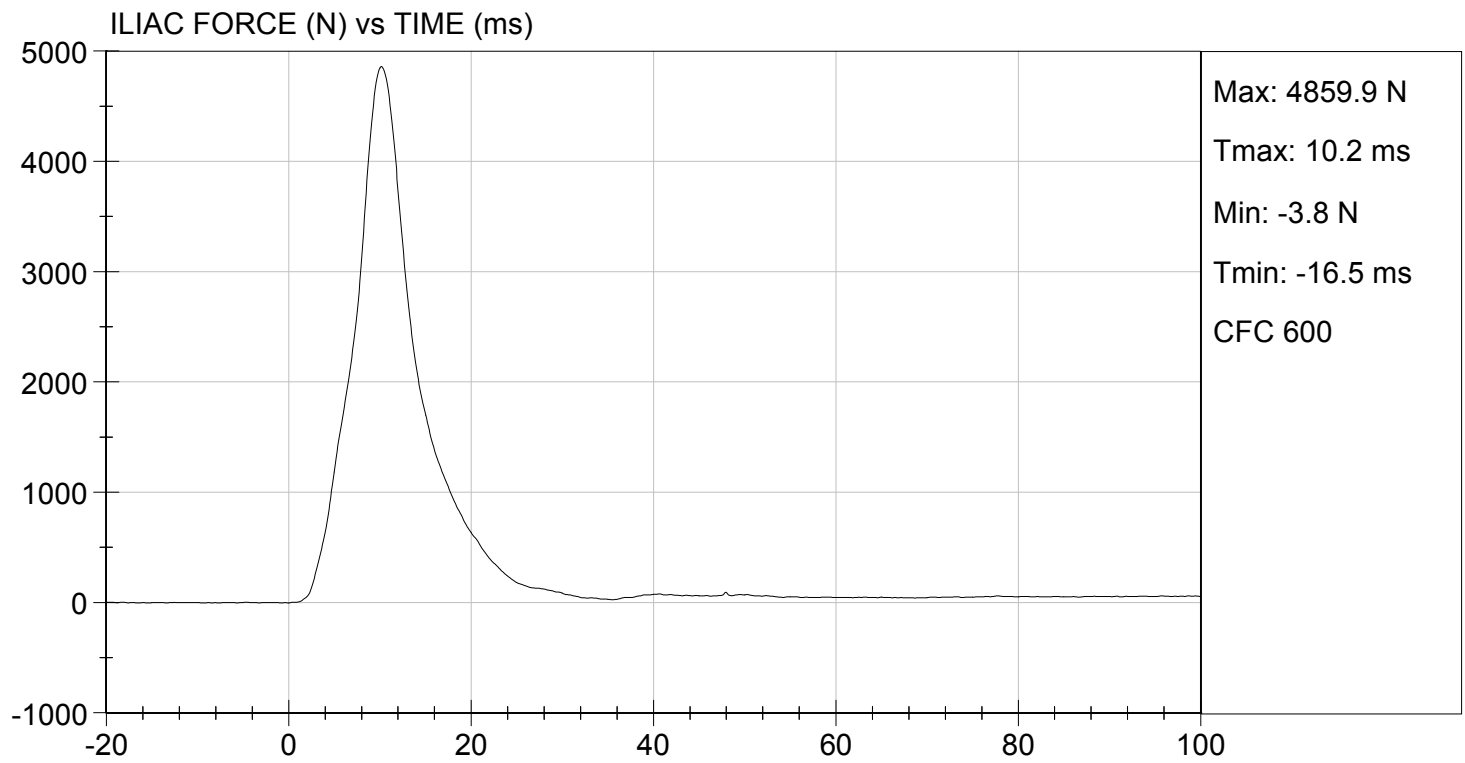
TEST DATE: 11/19/2014
TEST #: D144108





TEST DESC: ILLIAC
VELOCITY: 13.77 ft/s, 4.20 m/s

TEST DATE: 11/19/2014
TEST #: D144108



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

ATD Serial No: 296

Test ID: D144281

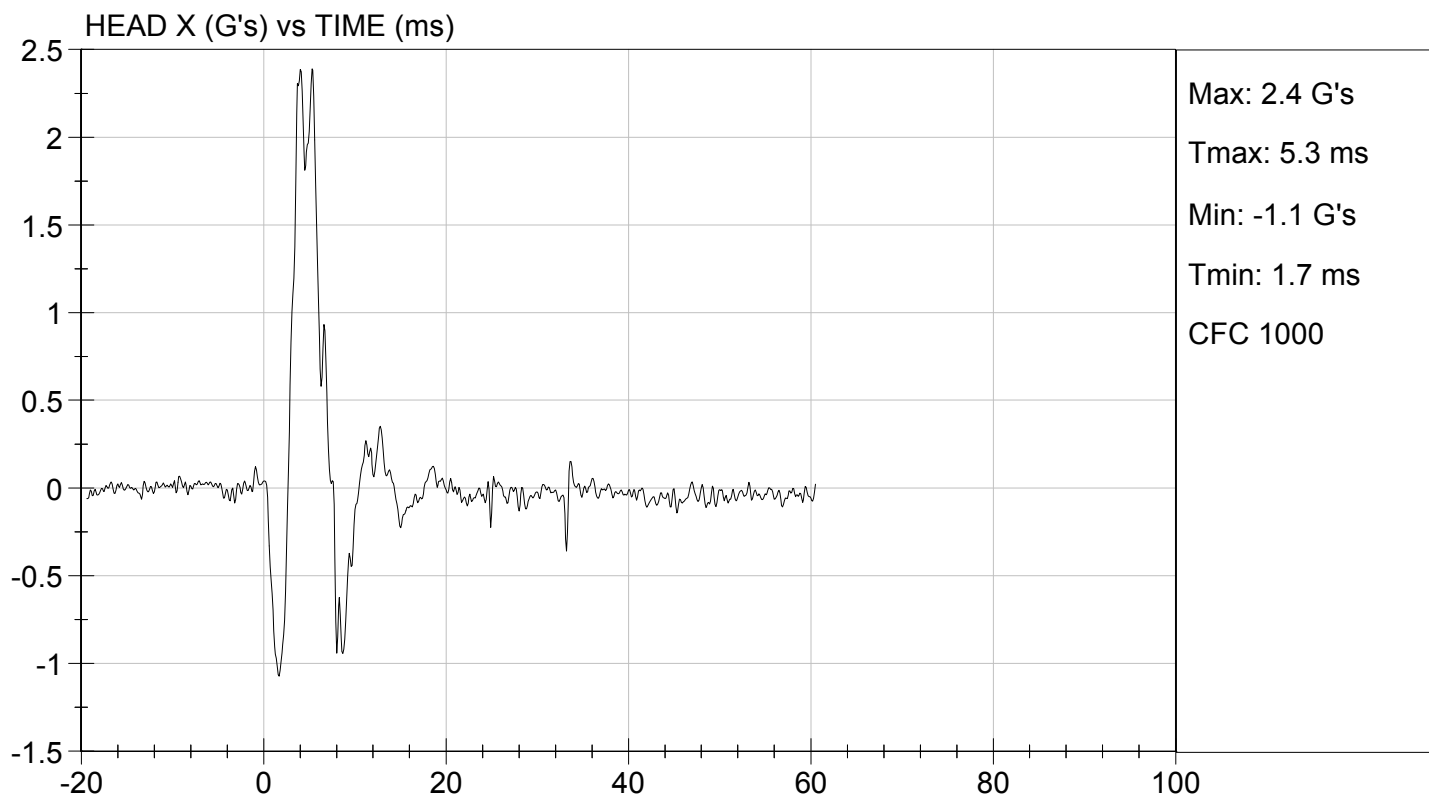
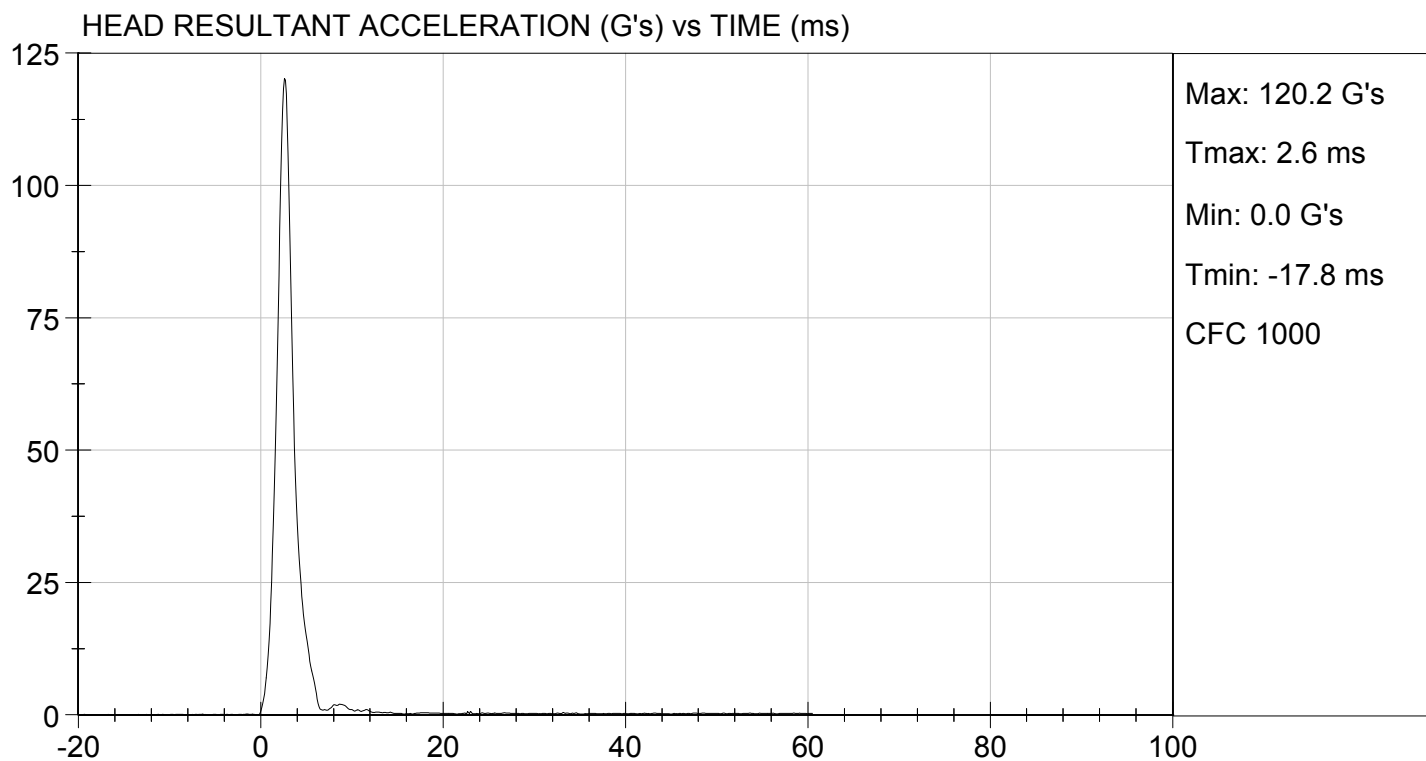
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	115 to 137	120	Pass
Peak Longitudinal Acceleration	G's	+/- 15	2.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results			Pass	

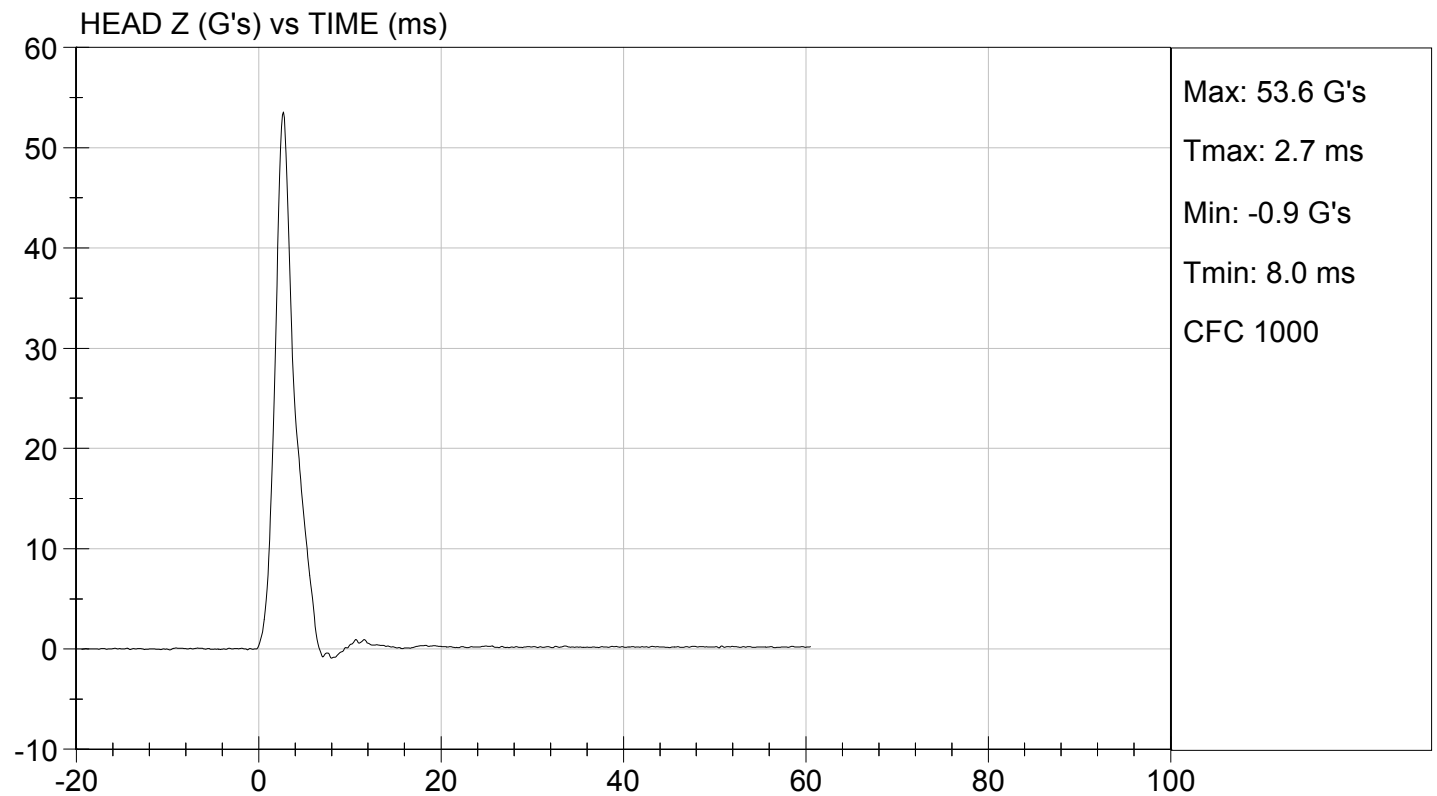
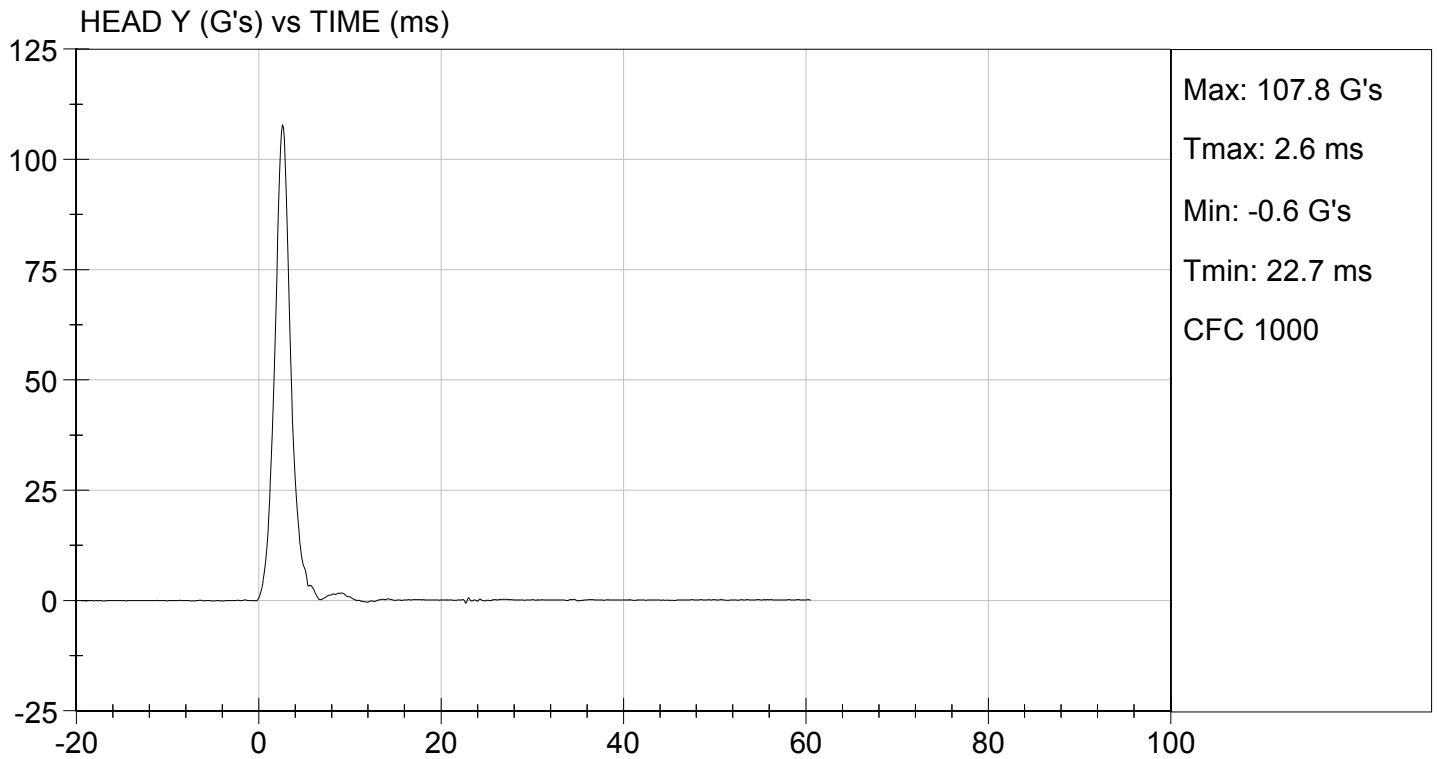
Maxime Chamberland
Laboratory Technician

12/03/2014

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: D144282

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	22.0	Pass
Humidity		%	10 to 70	19	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.61	Pass
	15 ms	m/s	3.30 to 4.10	3.65	Pass
	20 ms	m/s	4.40 to 5.40	4.82	Pass
	25 ms	m/s	5.40 to 6.10	5.57	Pass
	25-100 ms	m/s	5.50 to 6.20	5.57	Pass
Maximum D-Plane Rotation		deg	71 to 81	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	57	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-41	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	112	Pass
Overall Test Results					Pass

Maxime Chamberland
Laboratory Technician

12/03/2014

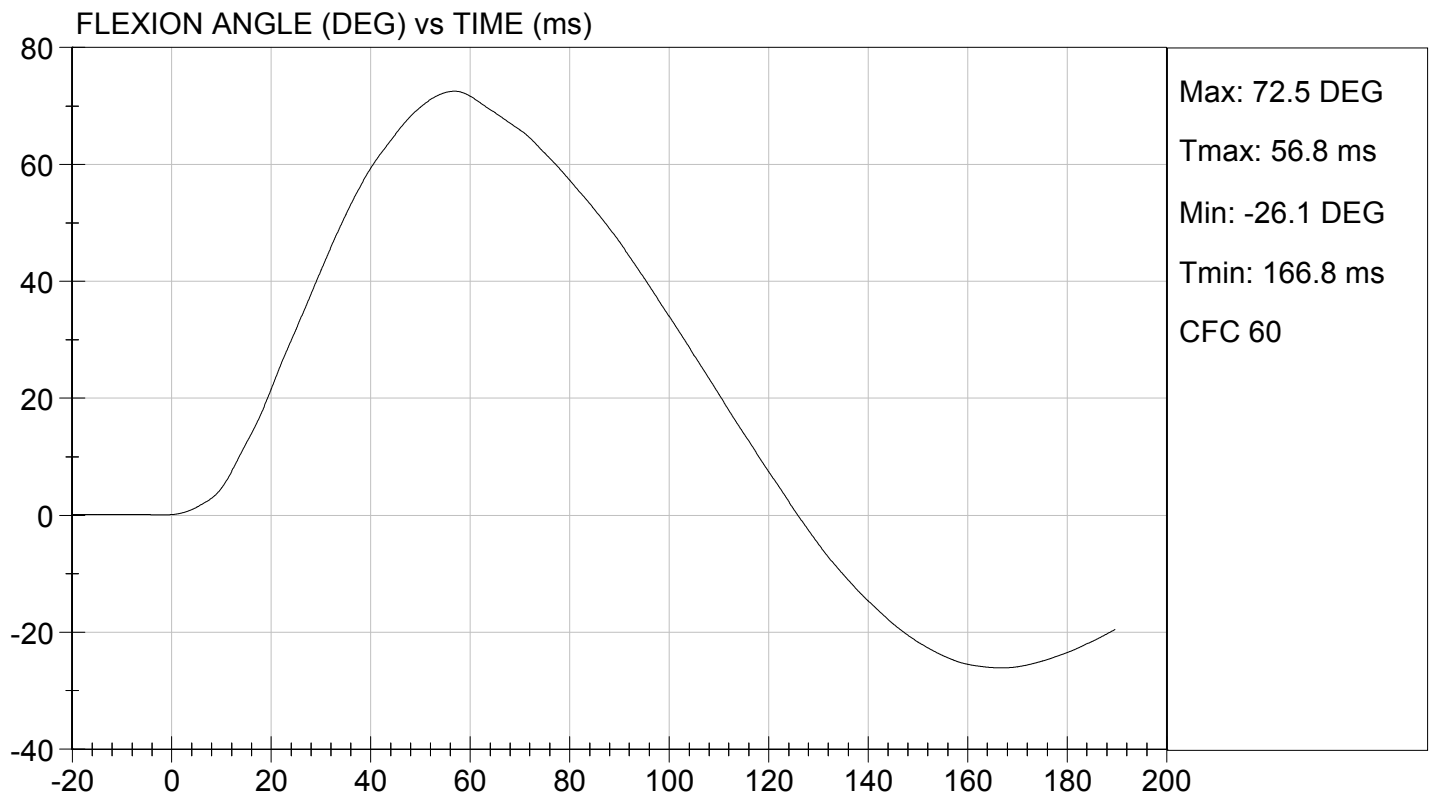
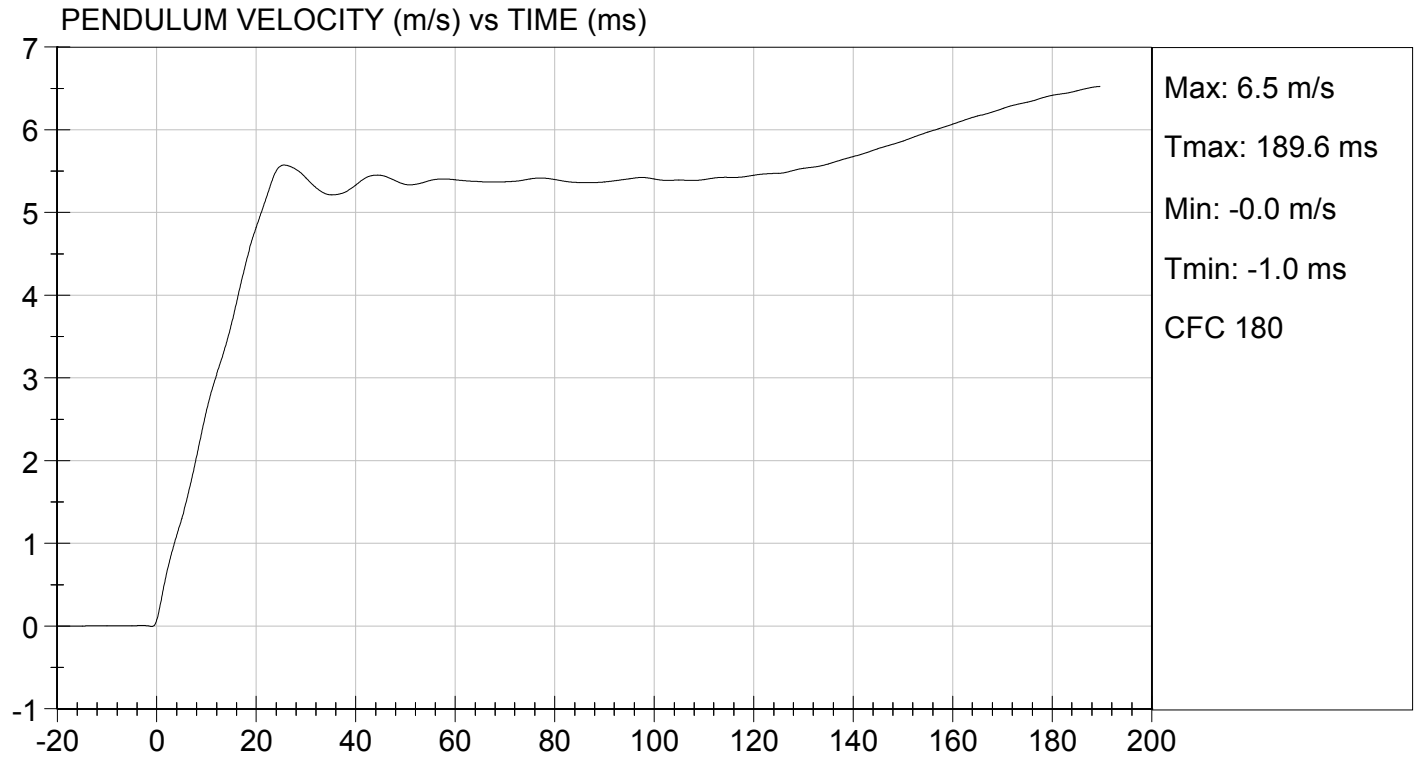
Test Date

Jessica Hall
Approved By



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

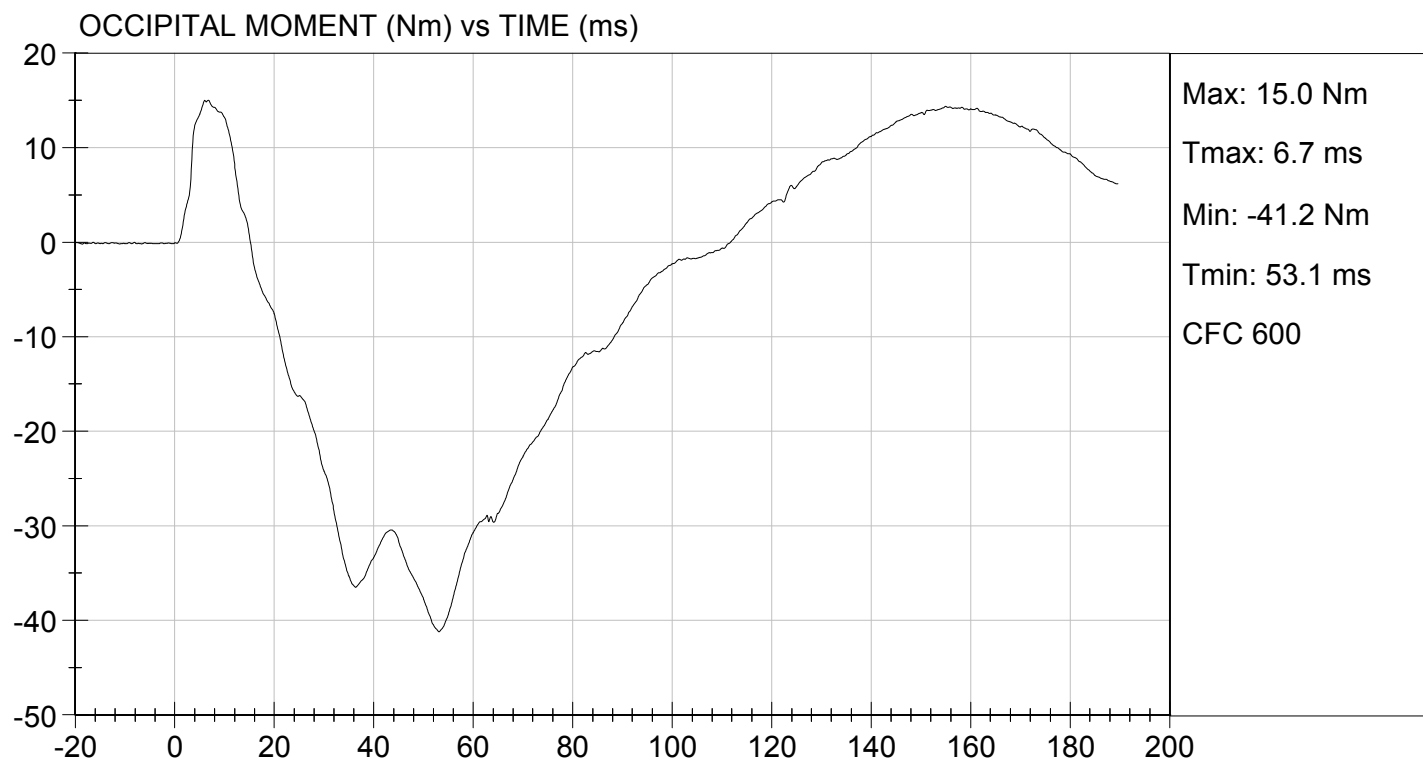
TEST DATE: 12/03/2014
TEST #: D144282





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

TEST DATE: 12/03/2014
TEST #: D144282



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

ATD Serial No: 296

Test ID: D144283

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	18	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results			Pass	

David Schoedel
Laboratory Technician

12/03/2014

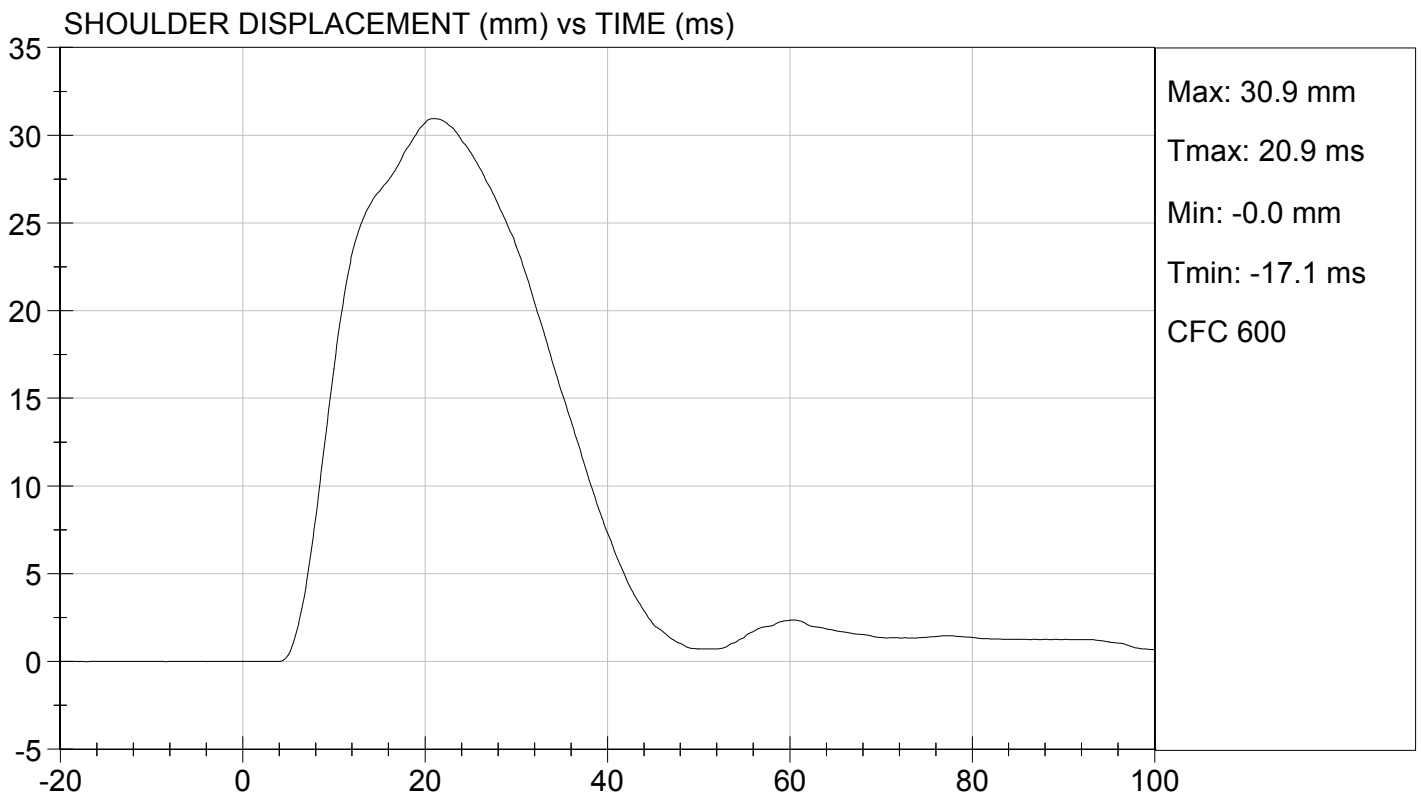
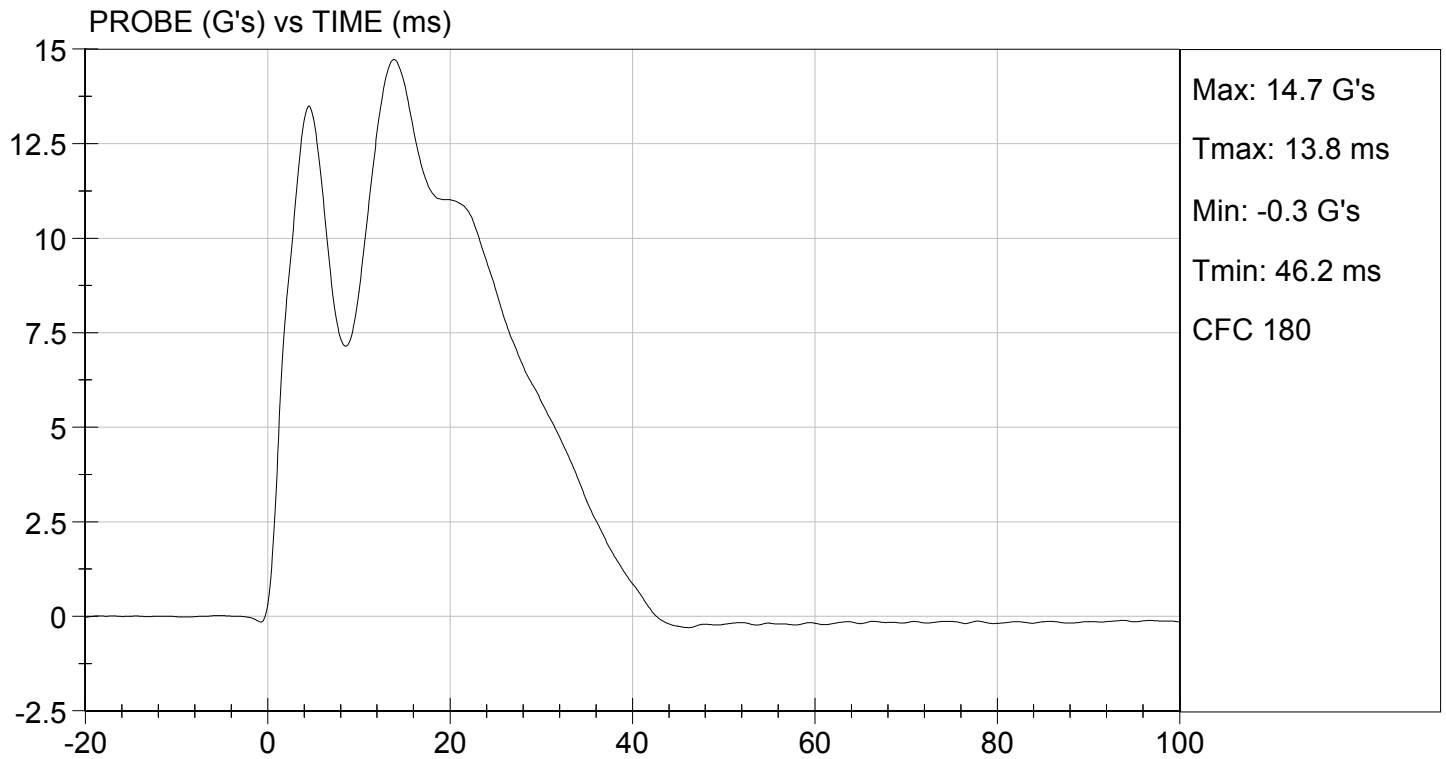
Test Date

Jessica Hall
Approved By



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

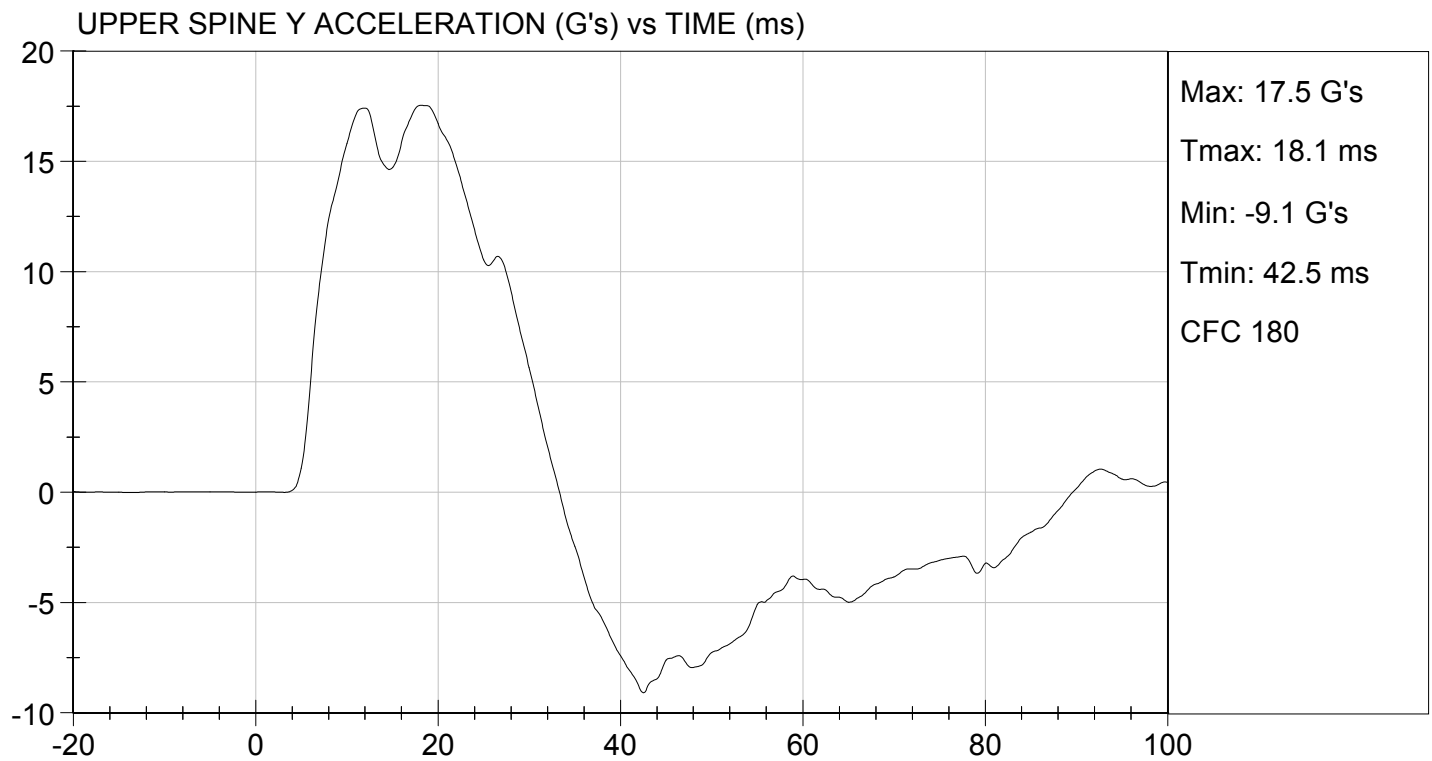
TEST DATE: 12/03/2014
TEST #: D144283





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

TEST DATE: 12/03/2014
TEST #: D144283



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

ATD Serial No: 296

Test I.D: D144284

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	18	Pass
Impact Velocity	m/s	6.60 to 6.80	6.60	Pass
Maximum Probe Acceleration	G's	30 to 36	31	Pass
Shoulder Displacement	mm	31 to 40	37	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	34	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	29	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

12/03/2014

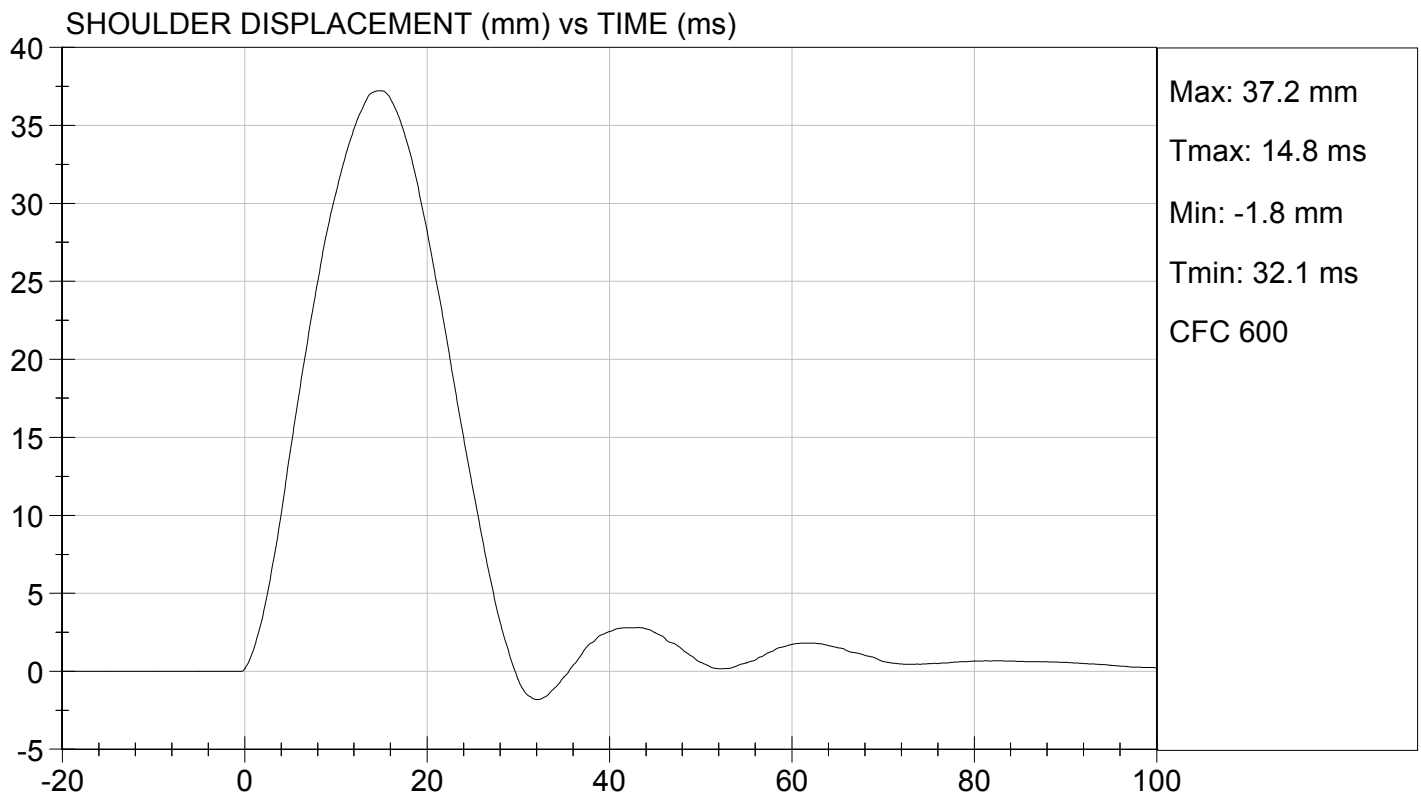
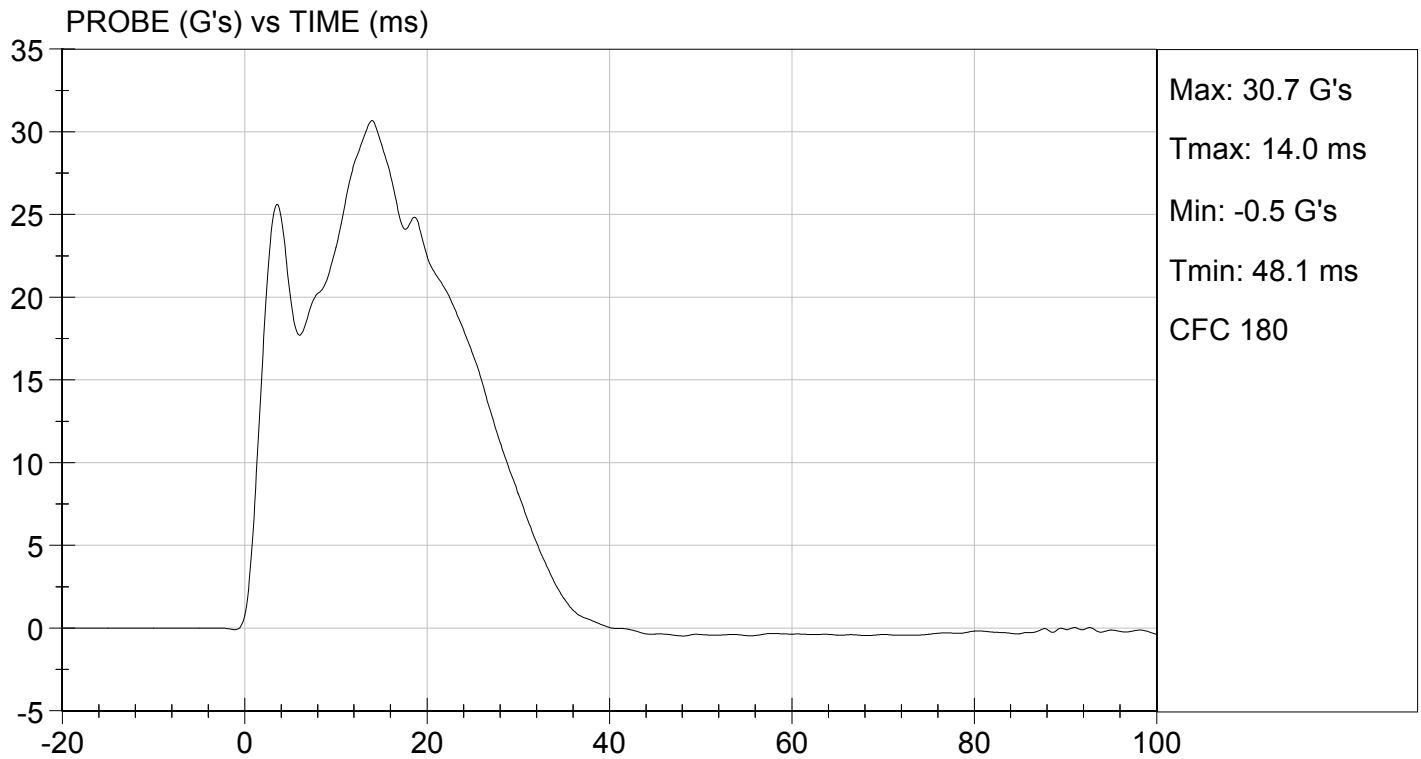
Test Date

Jessica Hall
Approved By



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.65 ft/s, 6.60 m/s

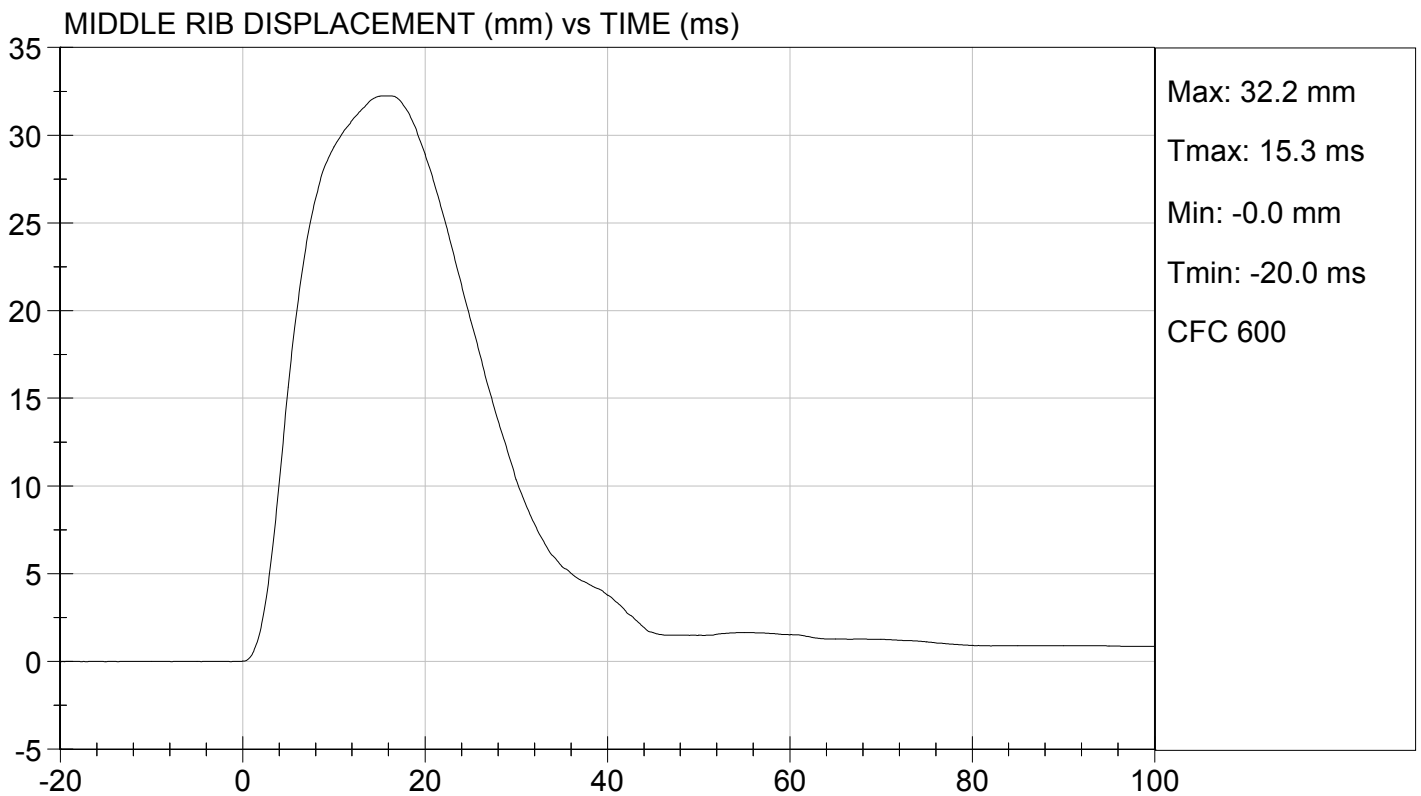
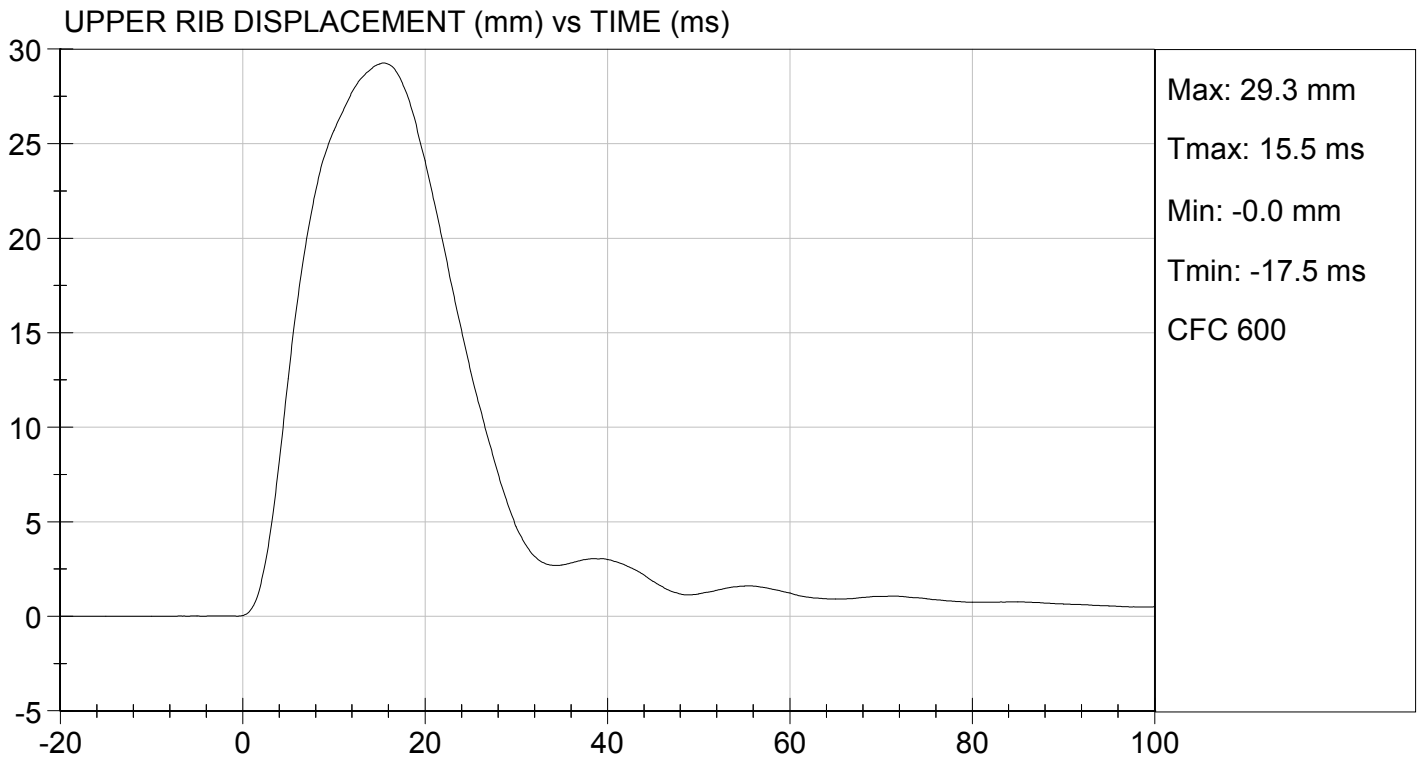
TEST DATE: 12/03/2014
TEST #: D144284





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.65 ft/s, 6.60 m/s

TEST DATE: 12/03/2014
TEST #: D144284

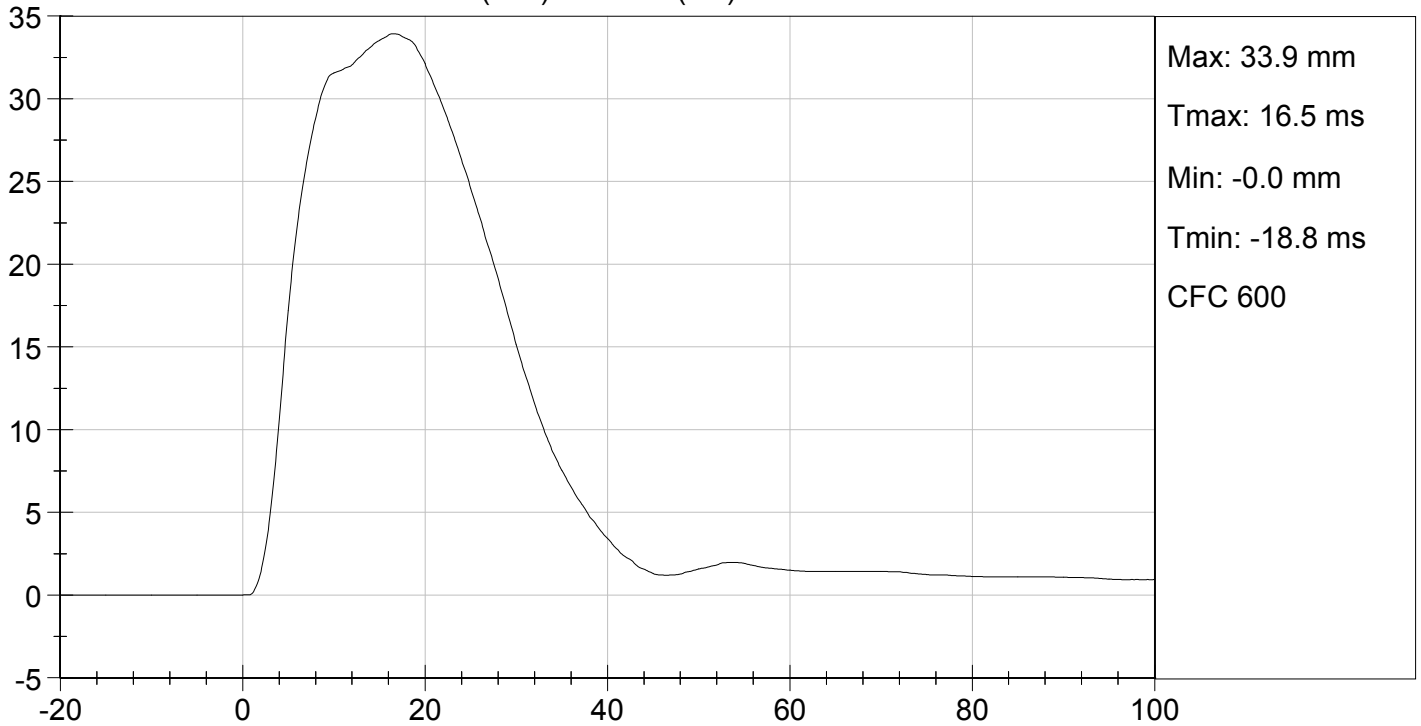




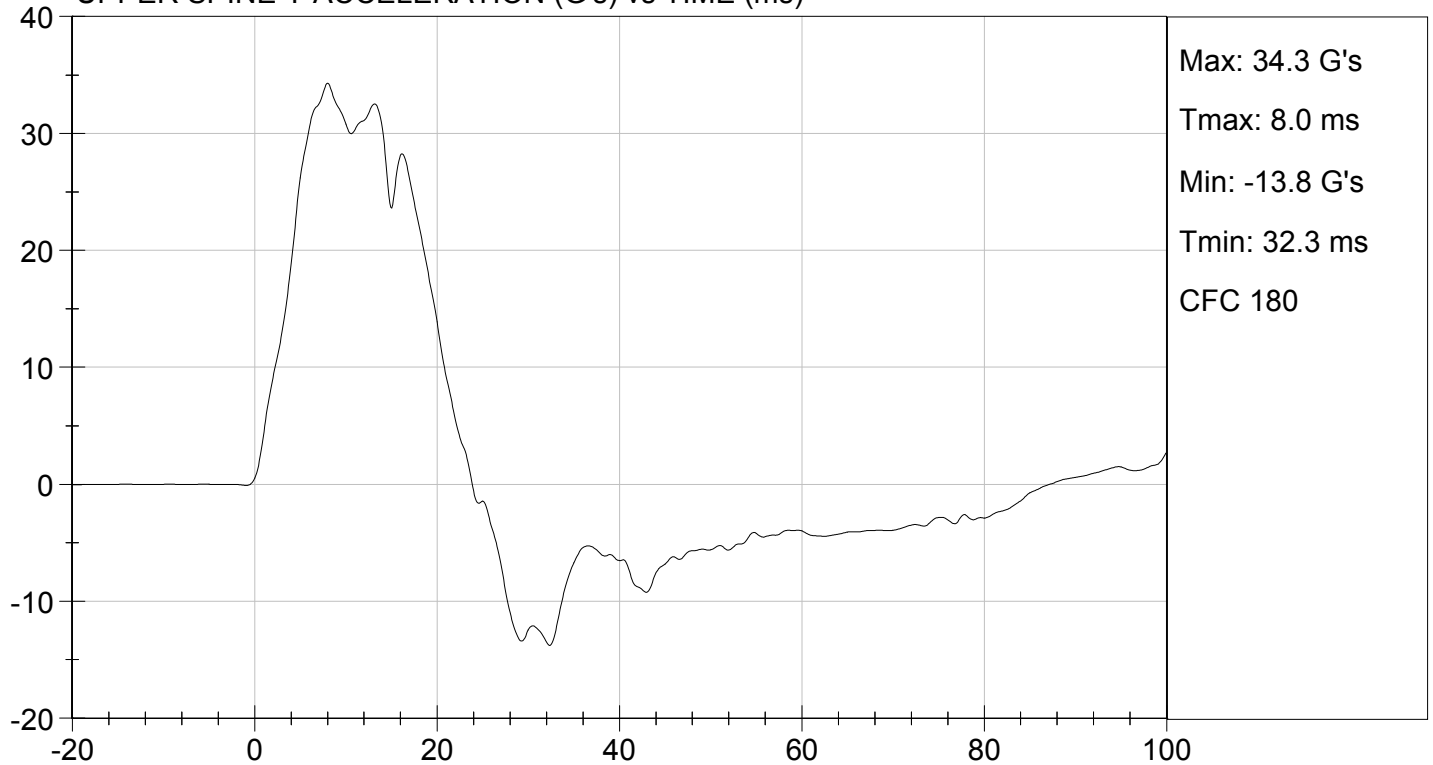
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.65 ft/s, 6.60 m/s

TEST DATE: 12/03/2014
TEST #: D144284

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



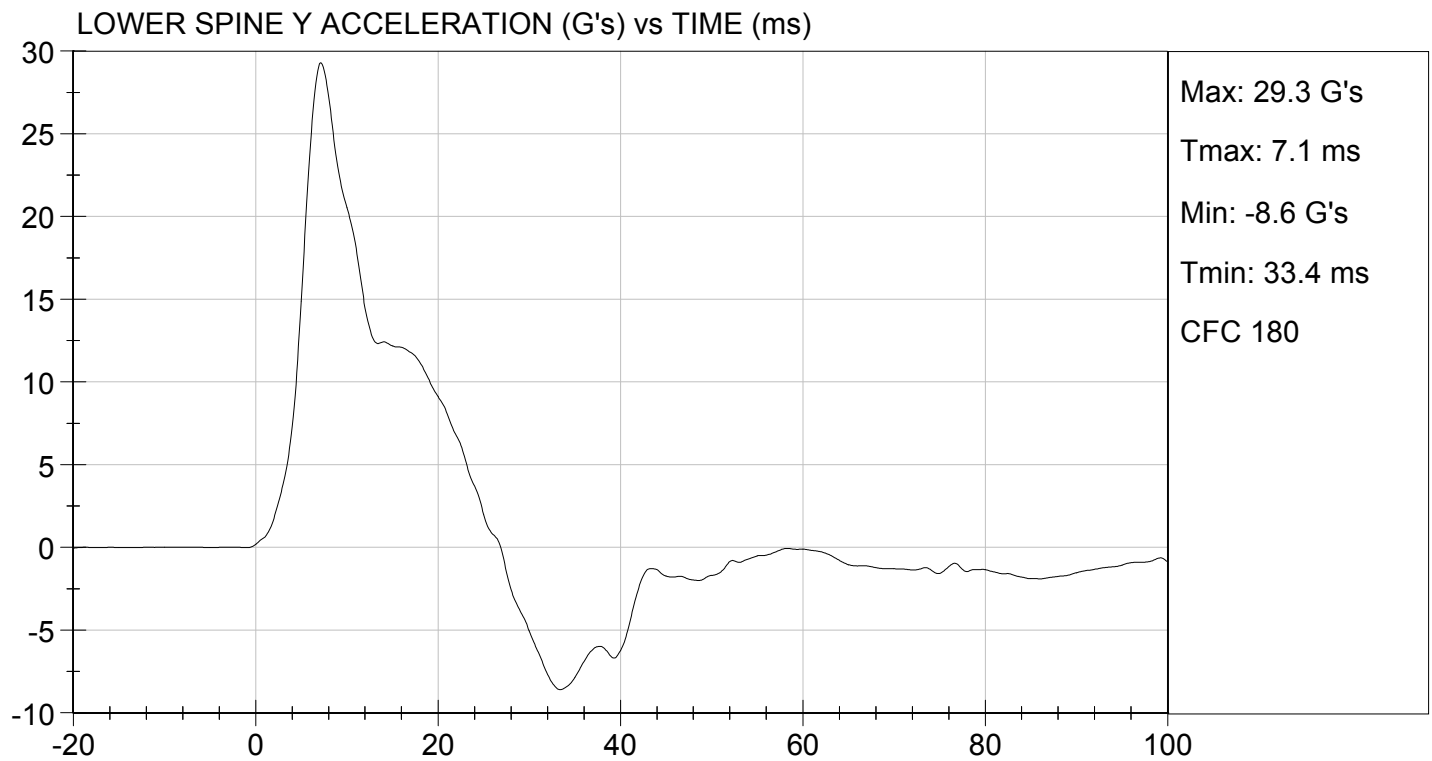
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 21.65 ft/s, 6.60 m/s

TEST DATE: 12/03/2014
TEST #: D144284



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

ATD Serial No: 296

Test I.D: D144285

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	18	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	37	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	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

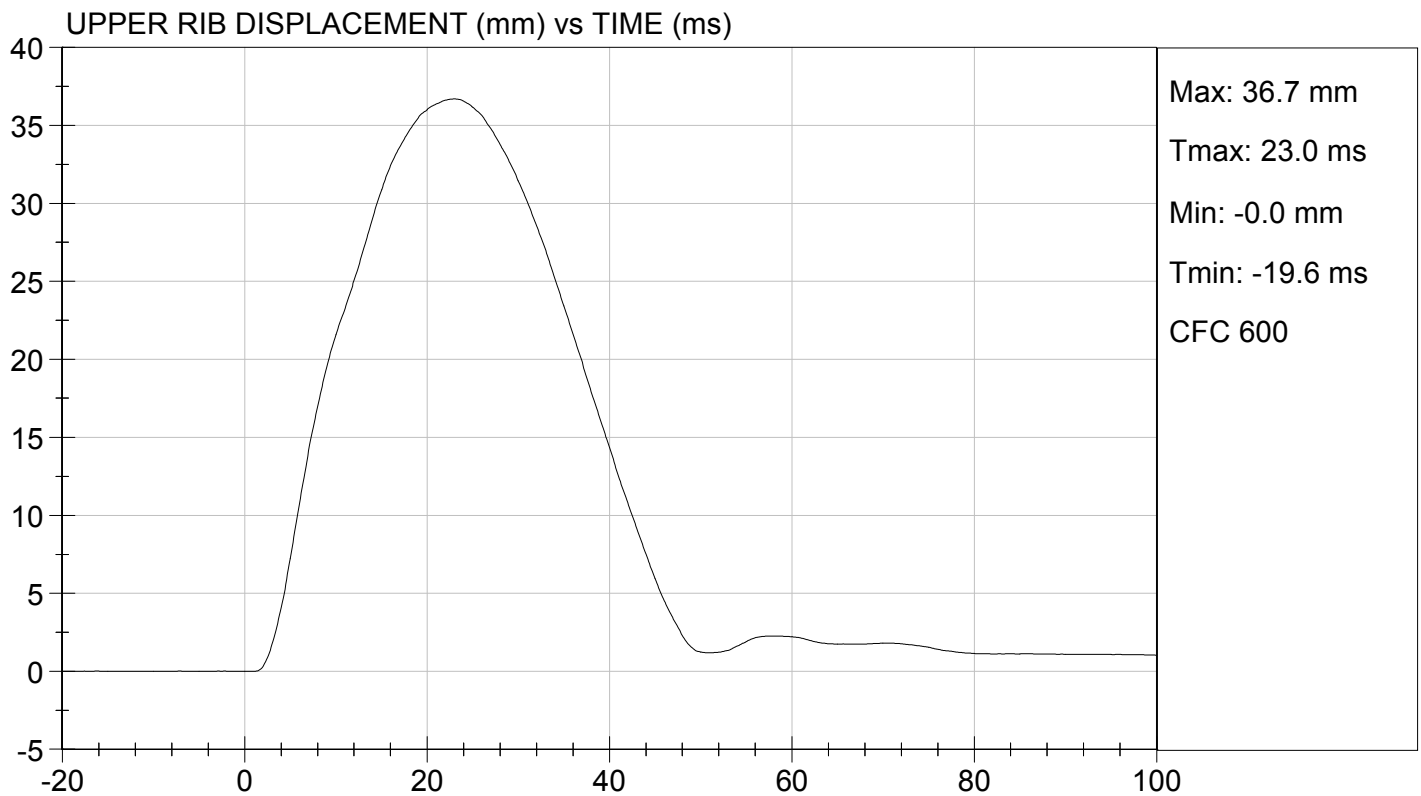
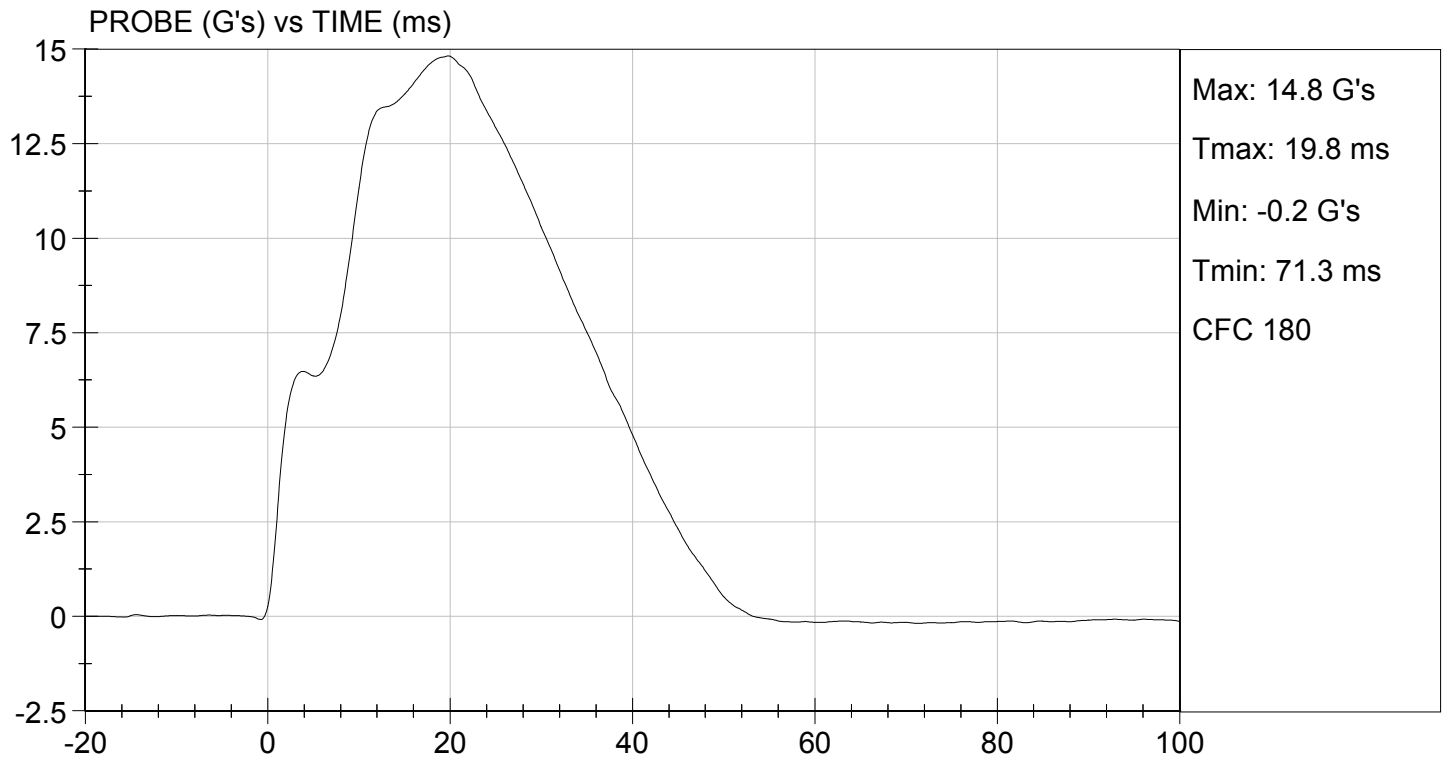
12/03/2014
Test Date

Jessica Hall
Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.24 ft/s, 4.34 m/s

TEST DATE: 12/03/2014
TEST #: D144285

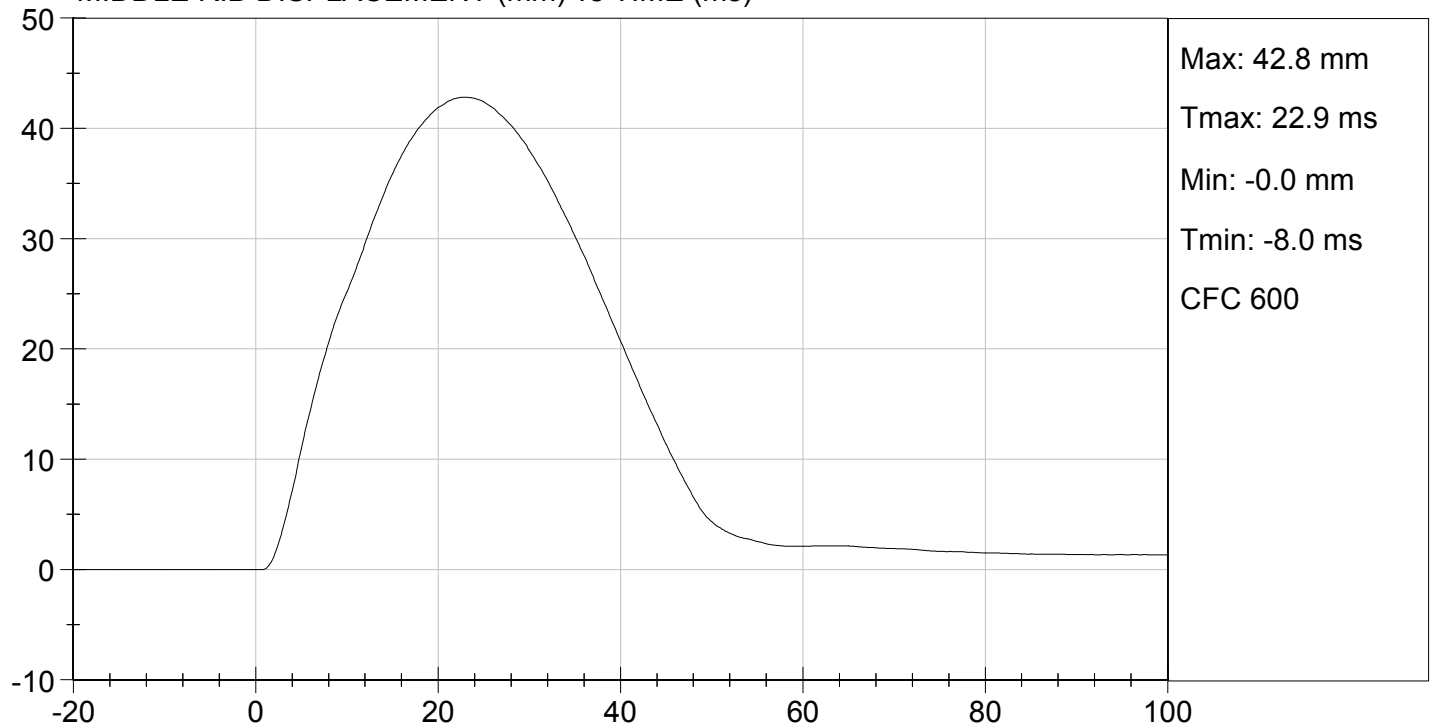




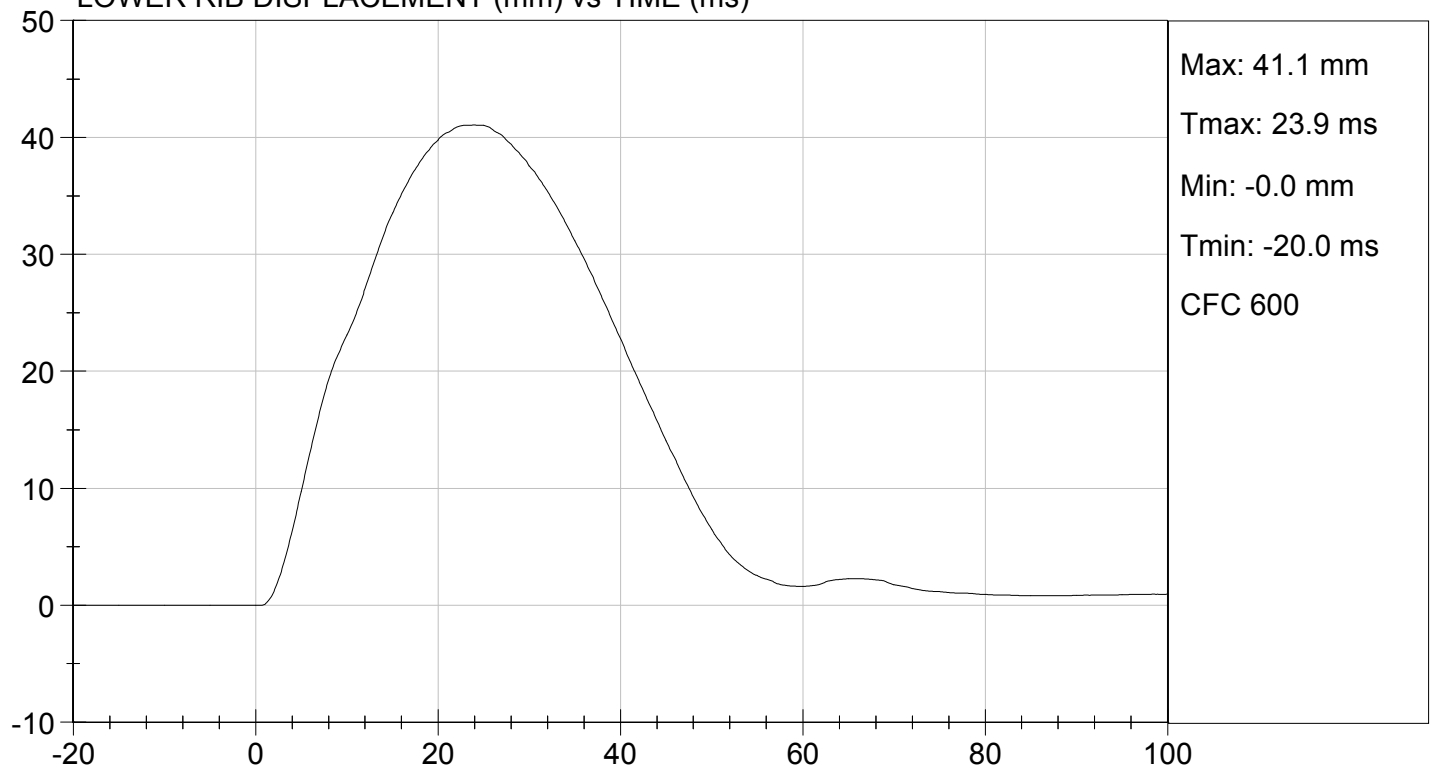
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.24 ft/s, 4.34 m/s

TEST DATE: 12/03/2014
TEST #: D144285

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

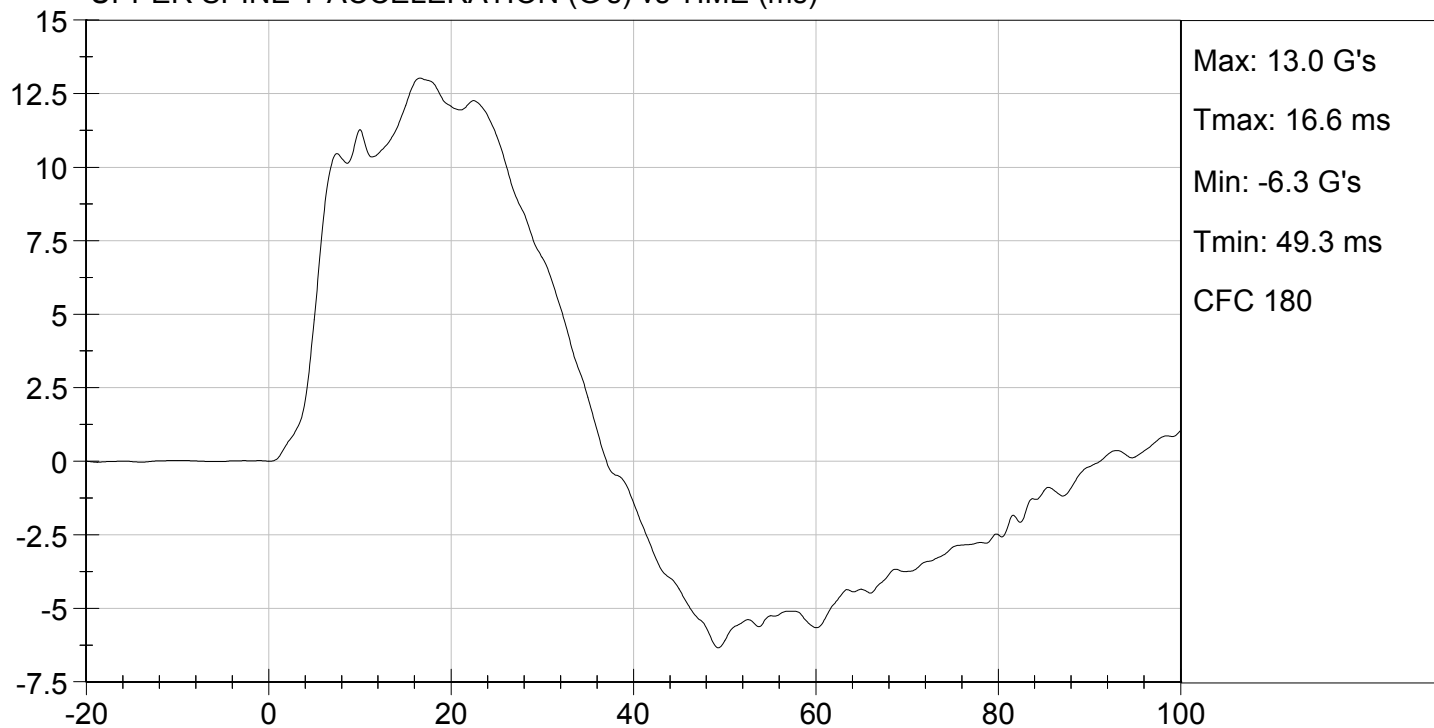




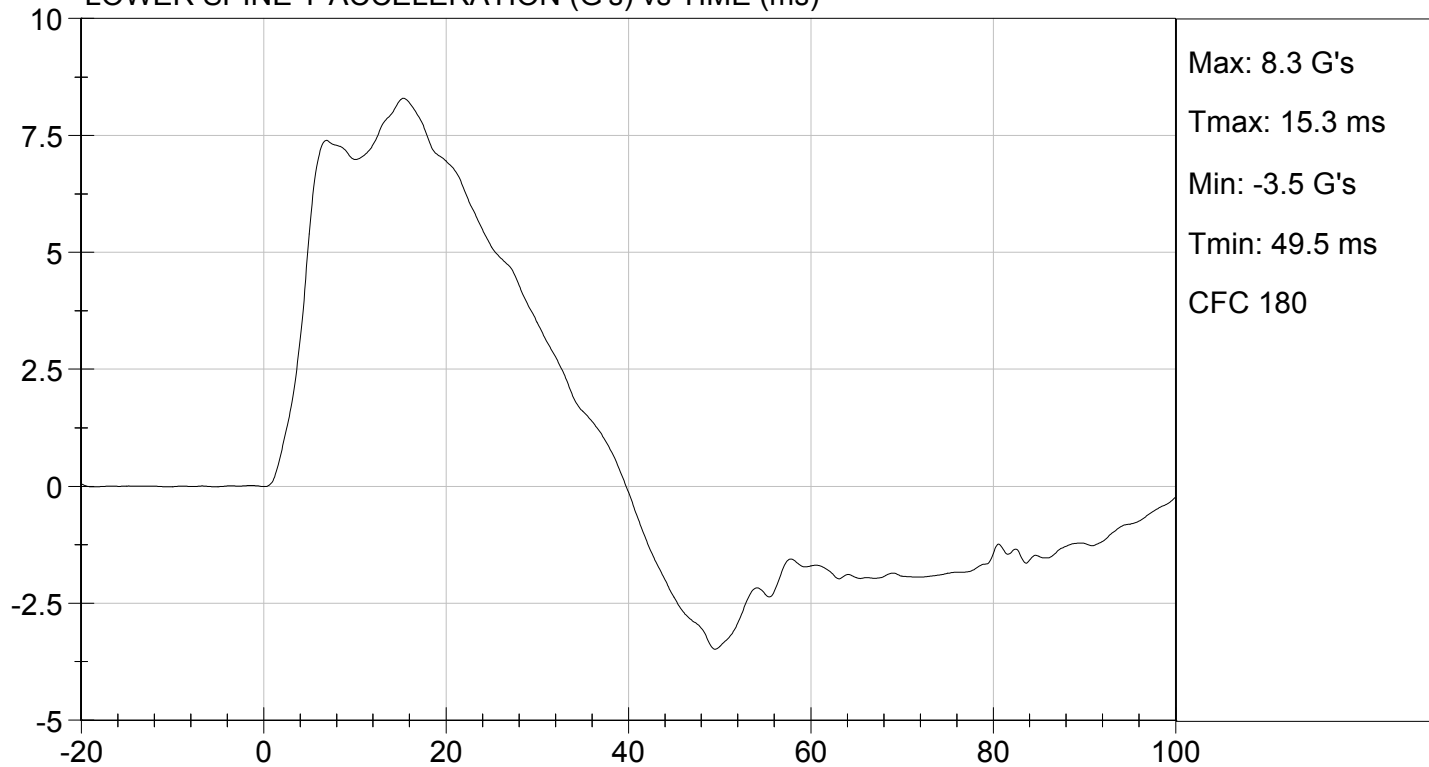
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.24 ft/s, 4.34 m/s

TEST DATE: 12/03/2014
TEST #: D144285

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: D144286

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	18	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	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	40	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

12/03/2014

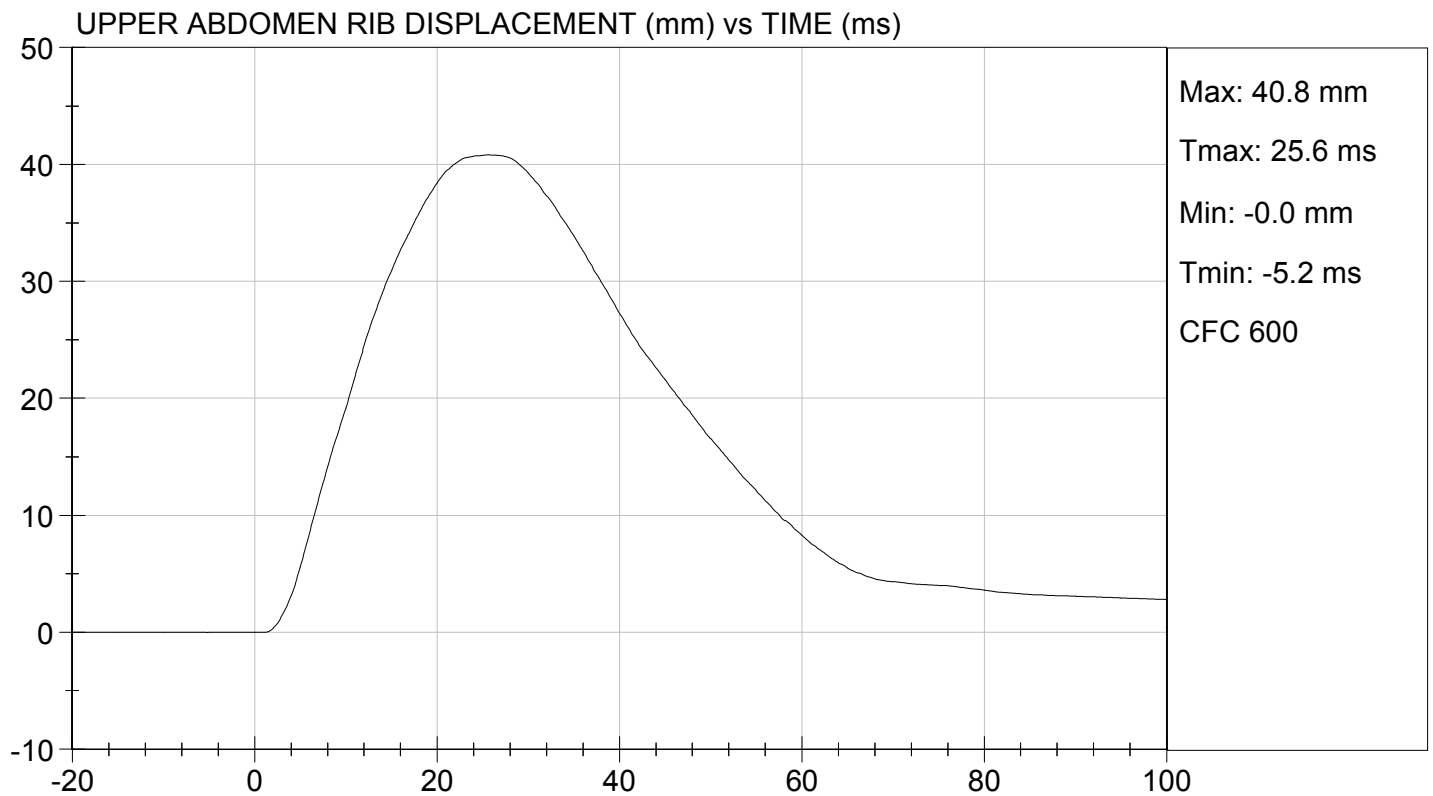
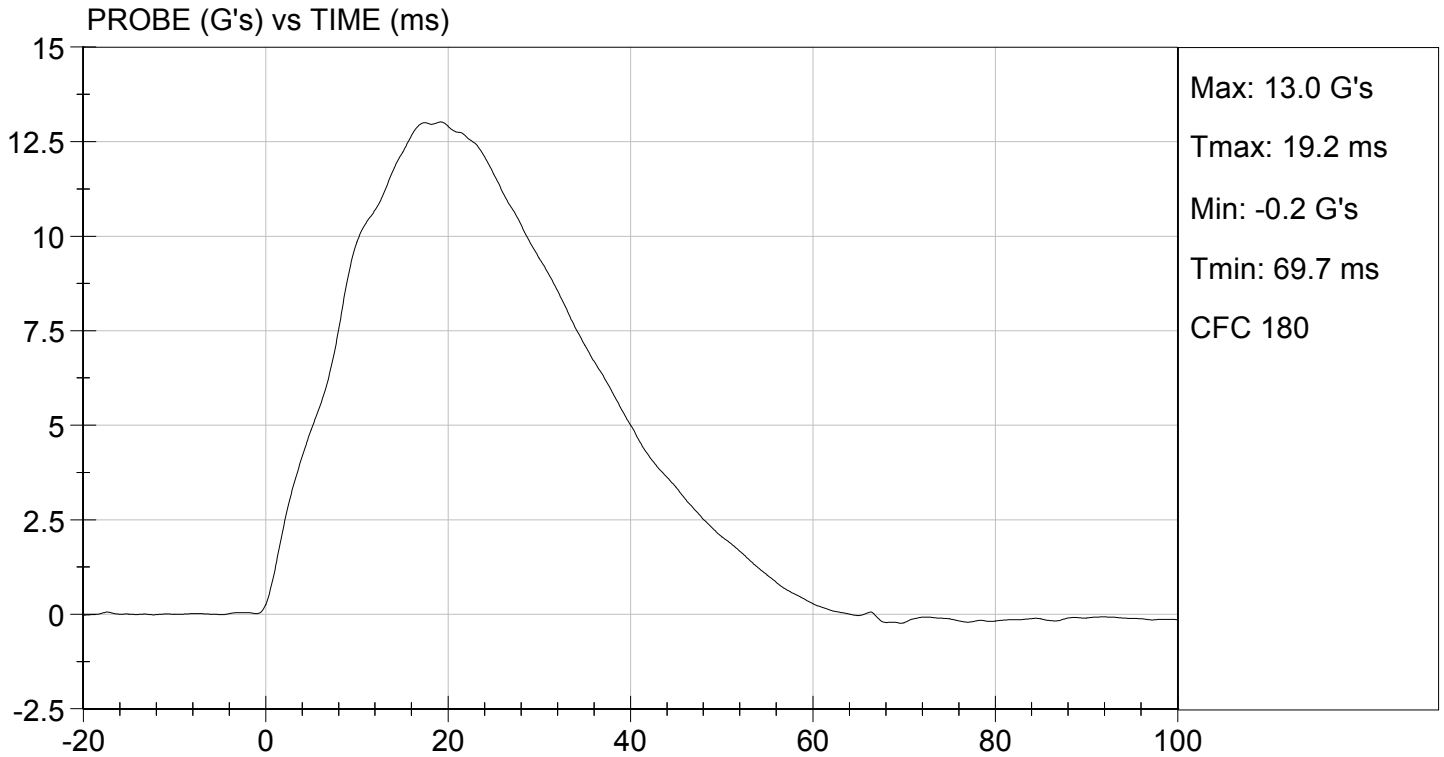
Test Date

Jessica Hall
Approved By



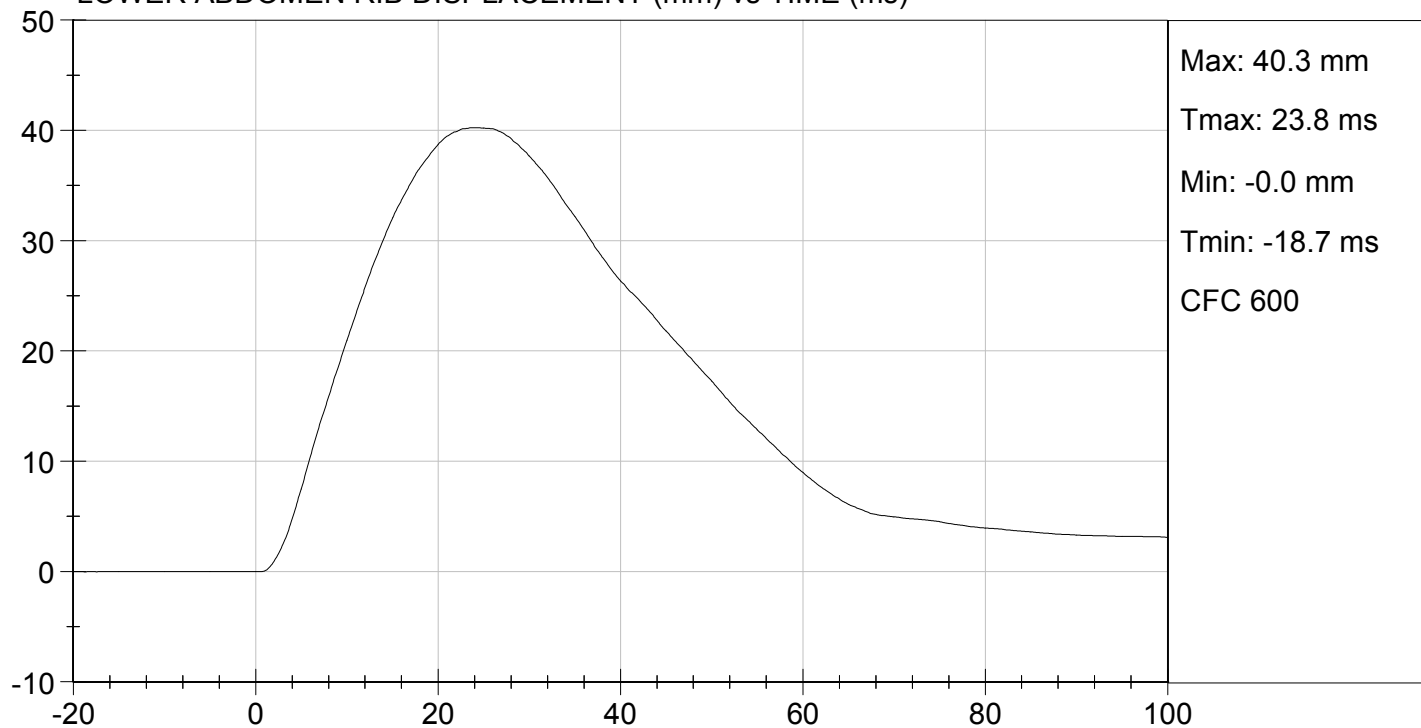
TEST DESC: ABDOMEN IMPACT
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 12/03/2014
TEST #: D144286

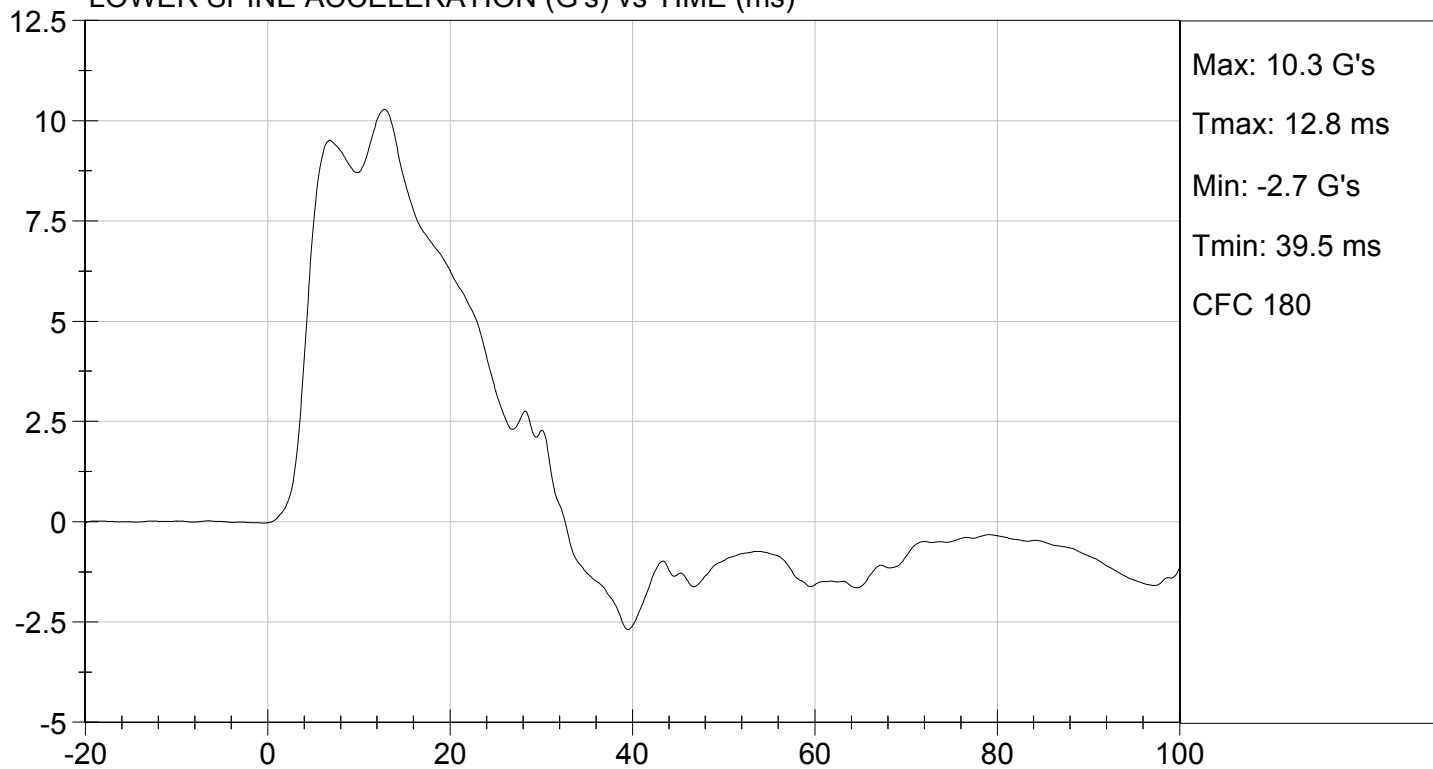




LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



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: D144287

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	18	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	40	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	38	Pass
Peak Acetabulum Force	N	3600 to 4300	4,122	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

12/03/2014

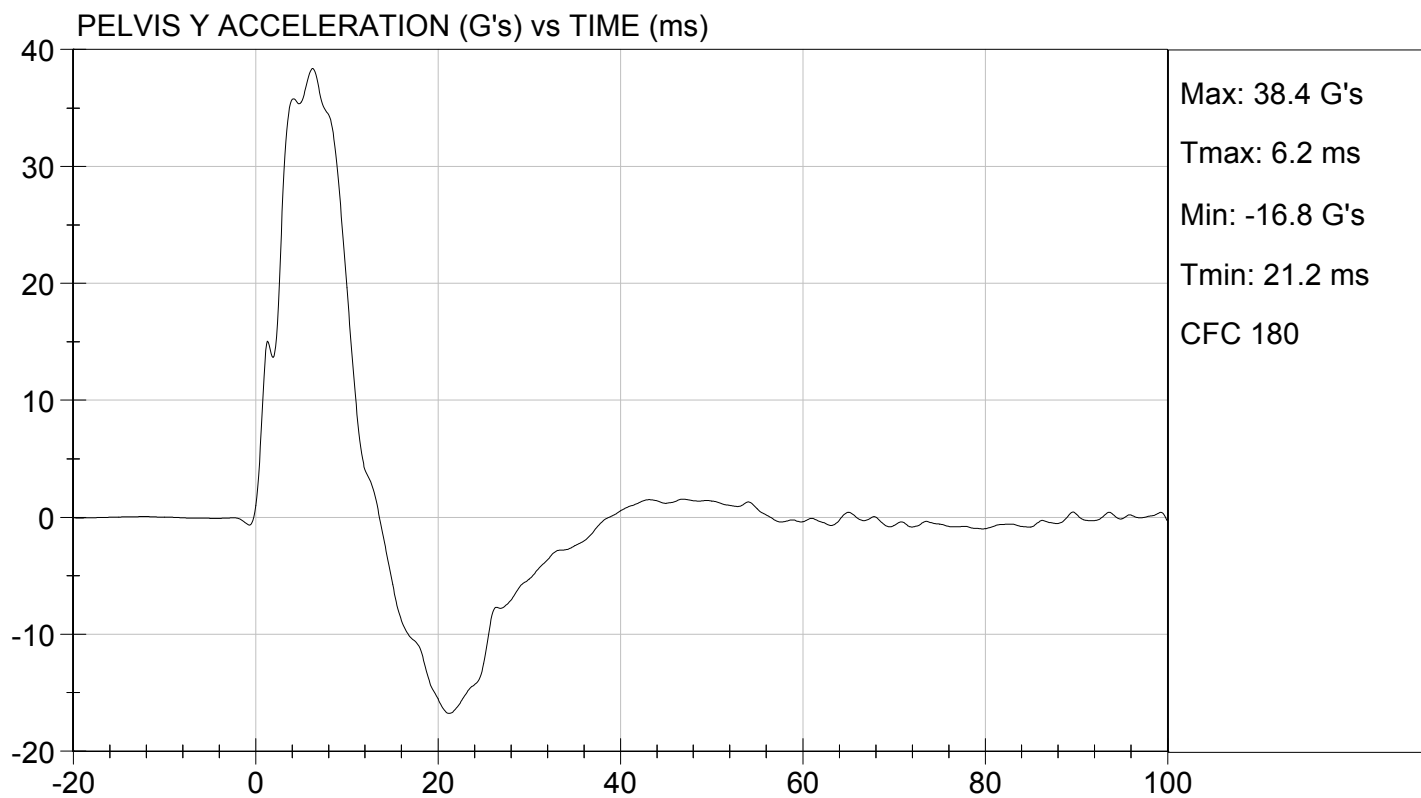
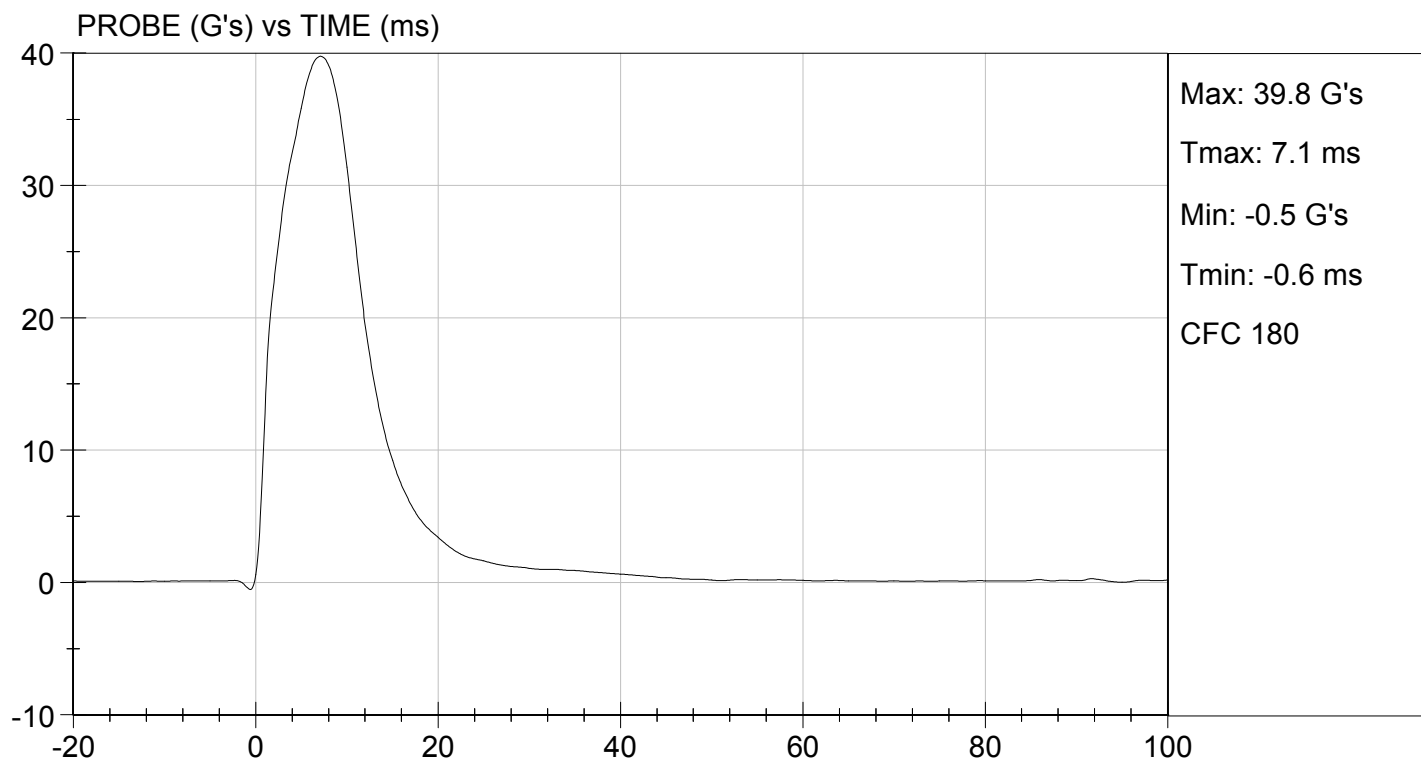
Test Date

Jessica Hall
Approved By



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

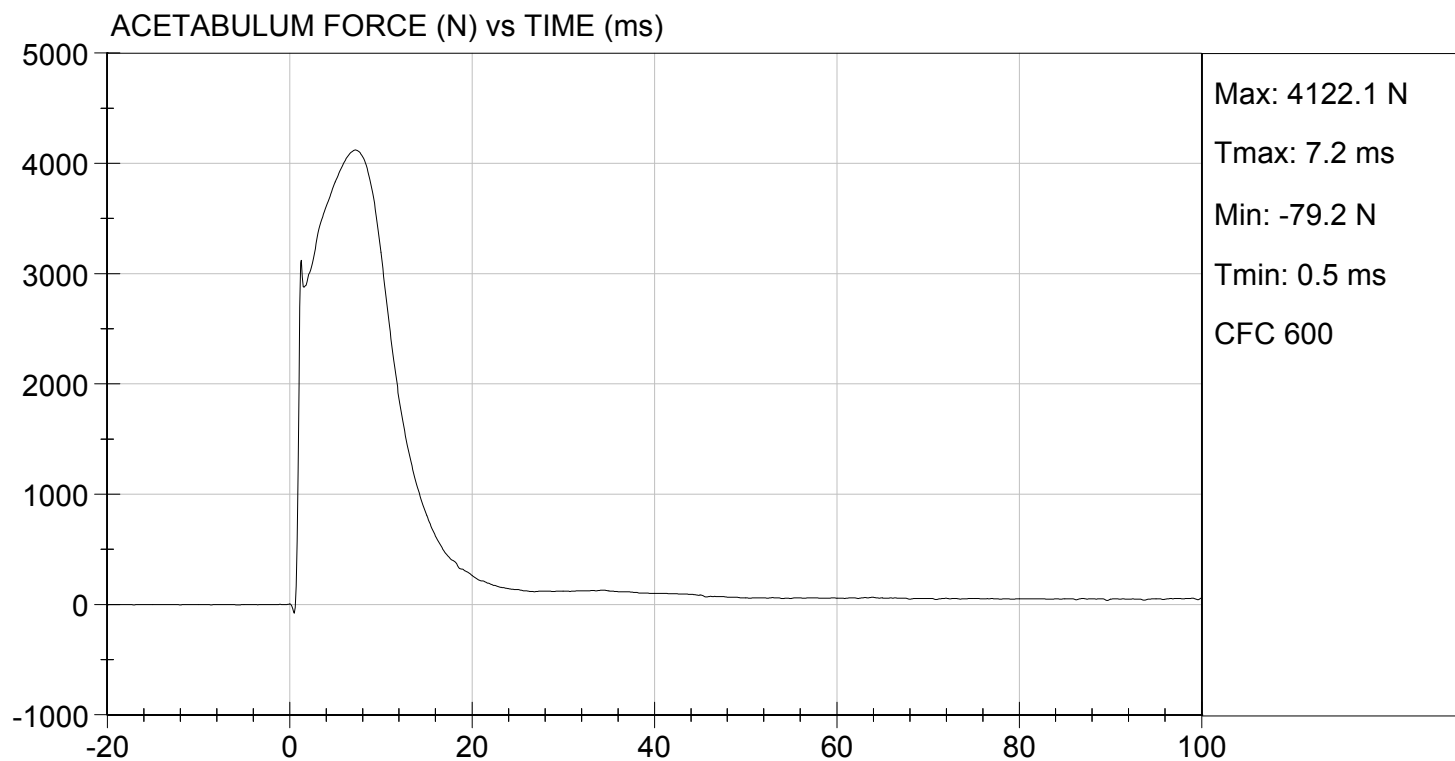
TEST DATE: 12/03/2014
TEST #: D144287





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

TEST DATE: 12/03/2014
TEST #: D144287



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D144288

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	18	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	30	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,679	Pass
Overall Test Results				Pass

David Schoedel
Laboratory Technician

12/03/2014

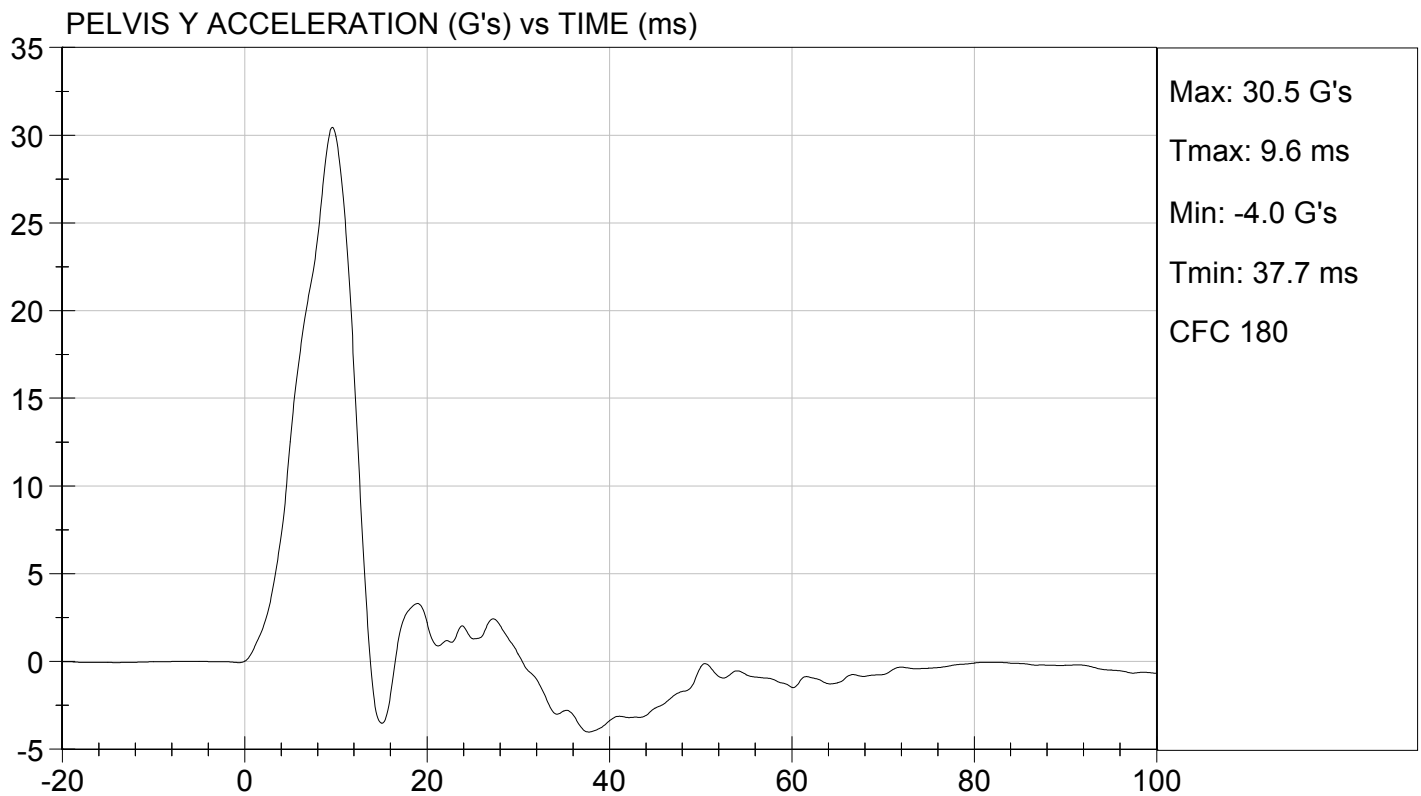
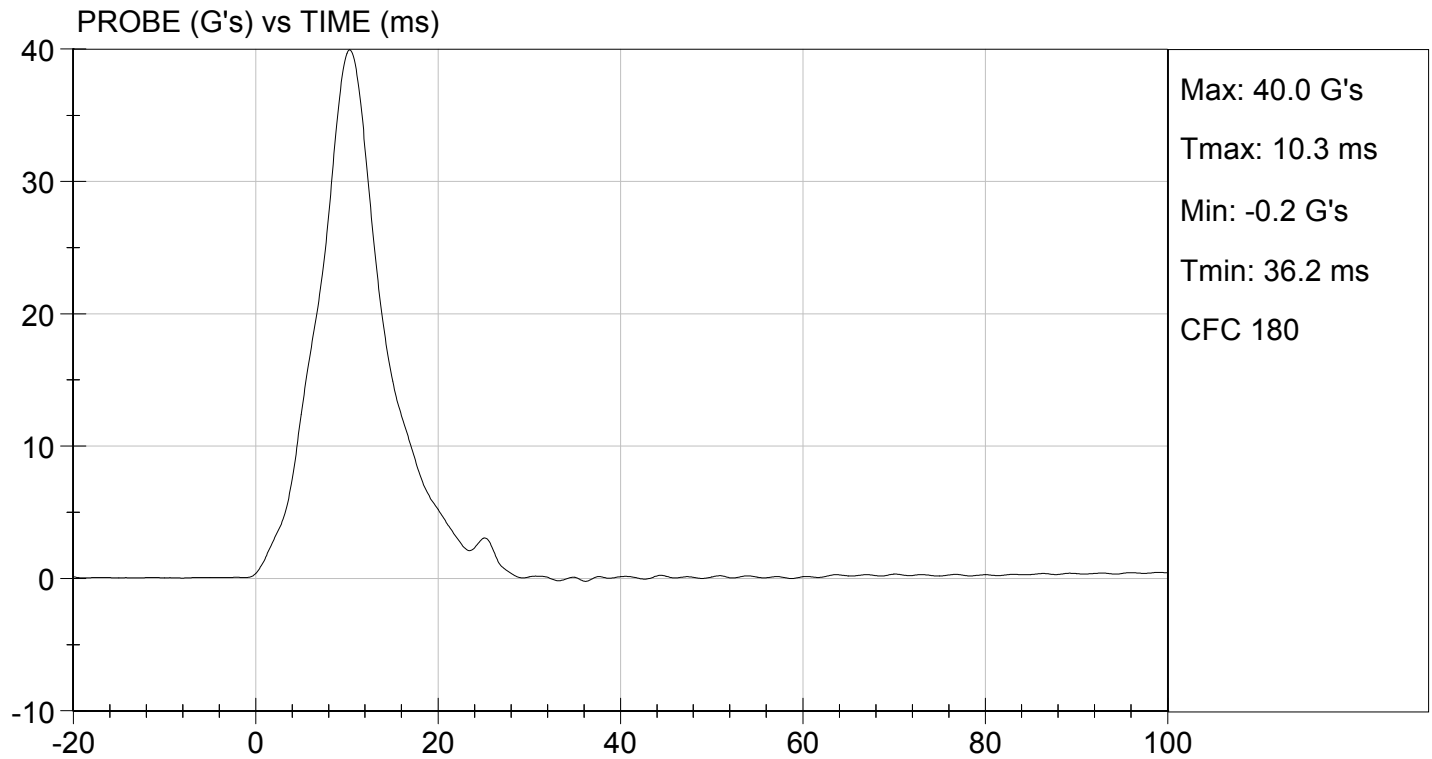
Test Date

Jessica Hall
Approved By



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

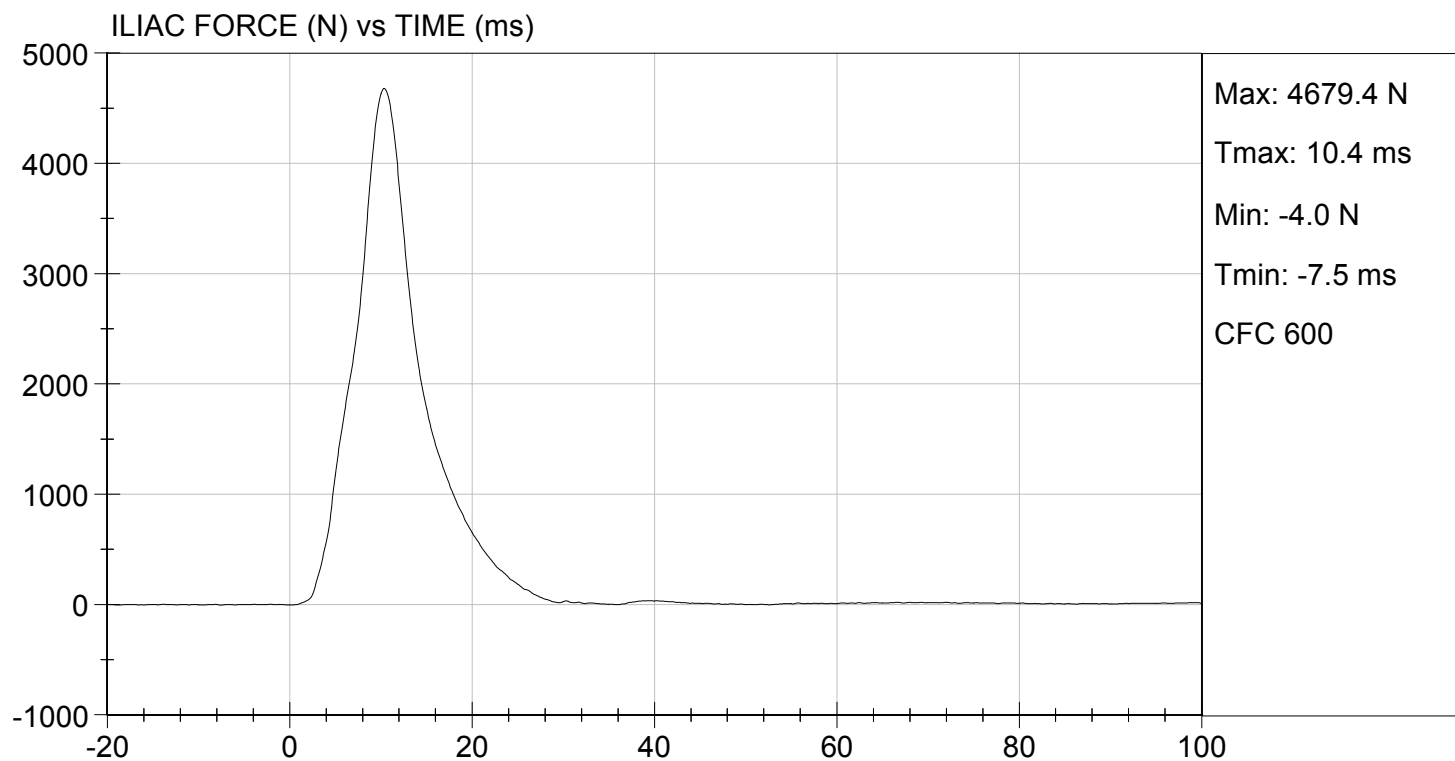
TEST DATE: 12/03/2014
TEST #: D144288



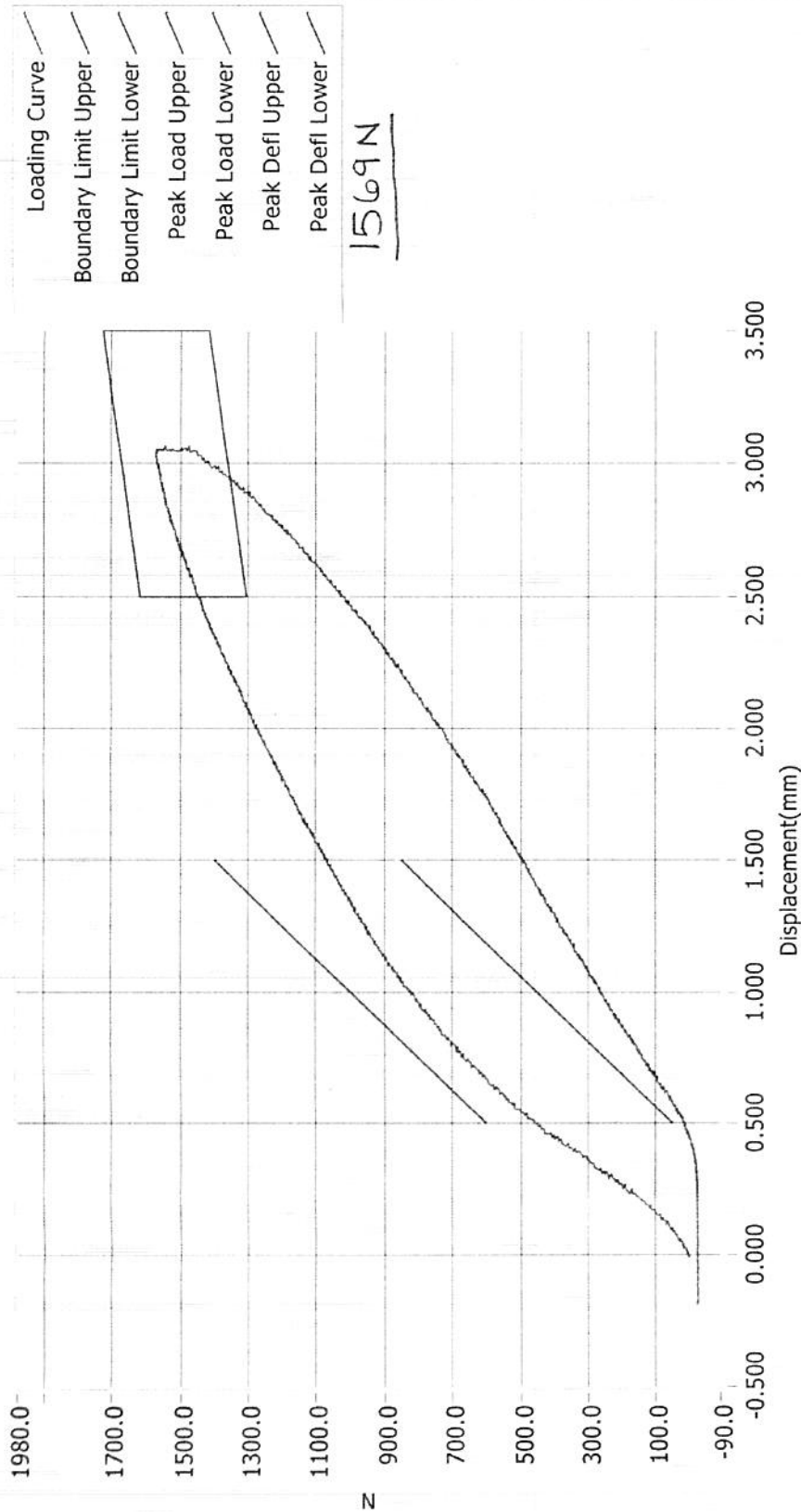


TEST DESC: ILLIAC
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 12/03/2014
TEST #: D144288



Resultant Data - SIDIIs Plug Compression



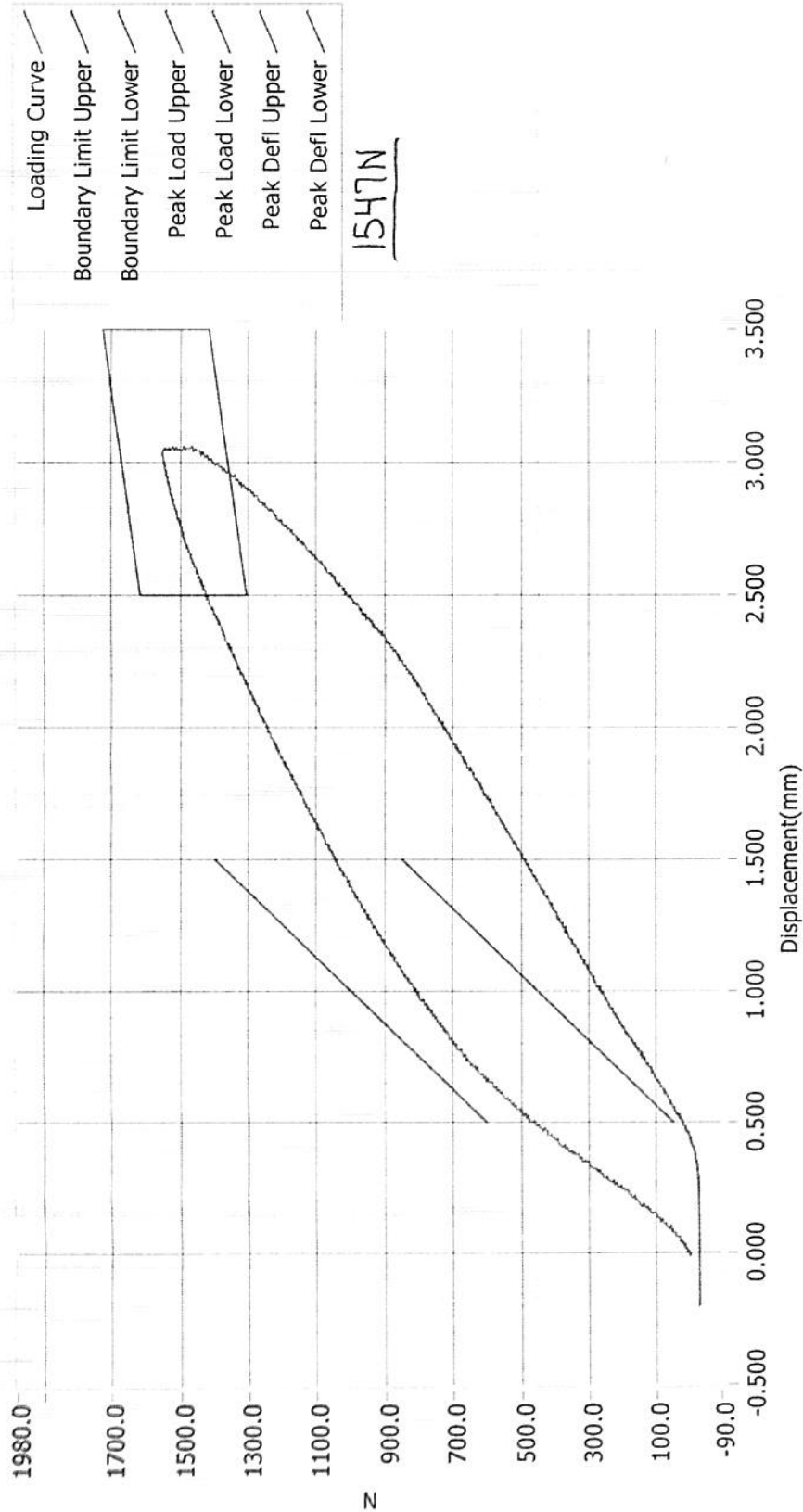
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	70610	12/12/2013	7:56 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 12/12/2013

Current Time : 19:57:34

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	70593	12/12/2013	7:40 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 12/12/2013

Current Time : 19:41:24

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	P79575	Endevco	08/11/14
		Y	P79577	Endevco	08/11/14
		Z	P79578	Endevco	08/11/14
		Xr	P79799	Endevco	08/11/14
		Yr	P79802	Endevco	08/11/14
		Zr	P79803	Endevco	08/11/14
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	08/11/14
	Middle	Y	G169	Honeywell	08/11/14
	Lower	Y	G164	Honeywell	08/11/14
Abdomen Load Cells	Forward	Y	ABG1532	Denton	01/09/14
	Middle	Y	ABG1534	Denton	01/09/14
	Rear	Y	ABG1535	Denton	01/09/14
Lower Spine Accelerometers (T12)		X	P78853	Endevco	08/08/14
		Y	P78861	Endevco	08/08/14
		Z	P78863	Endevco	08/08/14
Public Symphysis Load Cell		Y	PG461	Denton	01/09/14

Table 2 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N 296			
			Serial Number	Manufacturer	Calibration Date	
Head CG Accelerometers			X	P84436	Endevco	08/11/14
			Y	P84439	Endevco	08/11/14
			Z	P84440	Endevco	08/11/14
			Xr	P84450	Endevco	08/11/14
			Yr	P84456	Endevco	08/11/14
			Zr	P84457	Endevco	08/11/14
Displacement Potentiometers	Thoracic Rib	Upper	Y	G012	Servo	08/12/14
		Middle	Y	G1163	FTSS	08/12/14
		Lower	Y	G1158	FTSS	08/12/14
	Abdominal Rib	Upper	Y	G1146	FTSS	08/12/14
		Lower	Y	G1126	FTSS	08/12/14
Lower Spine Accelerometers (T12)			X	P84437	Endevco	08/11/14
			Y	P84442	Endevco	08/11/14
			Z	P84443	Endevco	08/11/14
Acetabulum Load Cell			Y	ACG268	Denton	01/09/14
Iliac Wing Load Cell			Y	IWG282	Denton	01/09/14
Pelvis Plug (struck side)				70610	FTSS	12/12/13
Pelvis Plug (non-struck side)				70593	FTSS	12/12/13

Table 3 – Vehicle Instrumentation

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P67533	Endevco	09/18/14
	Vehicle Center of Gravity	Y	P67534	Endevco	09/18/14
	Vehicle Center of Gravity	Z	P67532	Endevco	09/18/14
2	Right Sill at Front Seat	X	P74567	Endevco	07/16/14
	Right Sill at Front Seat	Y	P74568	Endevco	07/16/14
	Right Sill at Front Seat	Z	P74566	Endevco	07/16/14
3	Right Sill at Rear Seat	X	P73997	Endevco	09/04/14
	Right Sill at Rear Seat	Y	P73998	Endevco	09/04/14
	Right Sill at Rear Seat	Z	P73996	Endevco	09/04/14
4	Left Sill at Front Door	Y	P77581	Endevco	08/21/14
5	Left Sill at Rear Door	Y	P74653	Endevco	07/16/14
6	Left A-Post Lower	Y	P73763	Endevco	07/28/14
7	Left A-Post Middle	Y	P73158	Endevco	08/21/14
8	Left B-Post Lower	Y	P85148	Endevco	08/21/14
9	Left B-Post Middle	Y	P72856	Endevco	10/02/14
10	Front Seat Track	Y	P78696	Endevco	11/11/14
11	Rear Seat Track or Structure	Y	P73126	Endevco	11/11/14
12	Right Rear Occ. Compartment	Y	P68889	Endevco	09/08/14
13	Engine Block	X	P73737	Endevco	11/11/14
	Engine Block	Y	P73738	Endevco	11/11/14
14	Rear Floorpan Above Axle	X	P73884	Endevco	09/08/14
	Rear Floorpan Above Axle	Y	P73886	Endevco	09/08/14
	Rear Floorpan Above Axle	Z	P73885	Endevco	09/08/14

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P85036	Endevco	08/08/14
MDB Center of Gravity	Y	P85038	Endevco	08/08/14
MDB Center of Gravity	Z	P85037	Endevco	08/08/14
Left Frame at Rear Axle Centerline	X	P67517	Endevco	08/18/14
Left Frame at Rear Axle Centerline	Y	P67518	Endevco	08/18/14