REPORT NUMBER: SINCAP-MGA-2012-052

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

SUZUKI MOTOR CORPORATION
2012 Suzuki SX4 LE 4-Dr Sedan
NHTSA No.: MC0525

MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105

Test Date: January 10, 2012

Final Report Date: March 2, 2012

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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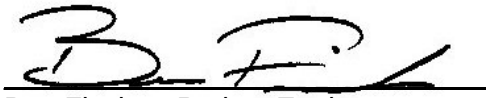
Prepared by: 
Donna Janovicz, Project Manager

Approved by: 
Ben Fischer, Project Engineer

Approval Date: March 2, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

1. Report No. SINCAP-MGA-2012-052	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2012 Suzuki SX4 LE 4-Dr Sedan; NHTSA No.: MC0525		*5. Report Date* March 2, 2012 *6. Performing Organization Code* MGA
7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		*8. Performing Organization Report No.* SINCAP-MGA-2012-052
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		*10. Work Unit No.* *11. Contract or Grant No.* DTNH22-09-D-00124
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590		*13. Type of Report and Period Covered:* Final Test Report January 10 to March 2, 2012 *14. Sponsoring Agency Code* NVS-111
15. Supplementary Notes		

16. Abstract

A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2012 Suzuki SX4 LE 4-Dr Sedan 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 January 10, 2012.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.1°C. The target vehicle post-test maximum crush was 235 mm at level 3. The test vehicle's performance was as follows:

		Driver ATD (ES-2re)	
Measurement Description	**Units**	**Threshold**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	119
Maximum Thorax Rib Deflection	mm	44	28
Total Abdominal Force	N	2500	1257
Pubic Symphysis Force	N	6000	2249

	Passenger ATD (SID-IIs)		
Measurement Description	**Units**	**Threshold**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	237
Resultant Lower Spine Acceleration	Gs	82	64
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	5524
Maximum Thoracic Rib Deflection	mm	38*	37
Maximum Abdomen Rib Deflection	mm	45*	30

*Proposed IARV

The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE, Room E12-100 Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833

19. Security Classification of Report Unclassified	*20. Security Classification of Page* Unclassified	*21. No. of Pages* 209	22. Price

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SECTION 1
TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2012 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 2012 Suzuki SX4 LE 4-Dr Sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated August 2011.

SECTION 2
SUMMARY OF TEST RESULTS

A 2012 Suzuki SX4 LE 4-Dr Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.1 km/h (38.6 mph). 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 January 10, 2012. Pretest 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 August 2011. 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	119
Maximum Thorax Rib Deflection	mm	44	28
Total Abdominal Force	N	2500	1257
Pubic Symphysis Force	N	6000	2249

	Passenger ATD (SID-IIs)		
Measurement Description	**Units**	**Threshold**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	237
Resultant Lower Spine Acceleration	Gs	82	64
Total Pelvic Force	N	5525	5524
Maximum Thoracic Rib Deflection	mm	38*	37
Maximum Abdomen Rib Deflection	mm	45*	30

*Proposed IARV

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No			
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Abdomen/Pelvis Airbag	Yes	Yes		
Side Torso Airbag			Yes	Yes
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

There was no valid data collected for:

Left Lower A-Post Y
Left Mid A-Post Y
Left Lower B-Post Y
Left Mid B-Post Y

Left Rear Sill Y is questionable from 1-5 msec.
Driver Seat Track Y is questionable from 9-15 and 18-22 msec.

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: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0525	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Suzuki	Automatic Door Locks (ADL)	No
Model	SX4	Power Window Auto-Reverse	No
Body Style	Sedan	Other Optional Feature	N/A
VIN	JS2YC5A37C6300318	Driver Front Airbag	Yes
Body Color	Crimson Red Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	45 / 28	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.0	Driver Torso Airbag	No
Type/No. Cylinders	4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Manual	Driver Knee Airbag	No
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	No	Rear Pass. Head/Torso Airbag	No
Final Drive	Front	Rear Pass. Torso Airbag	Yes
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
All Wheel Drive (AWD)	No	Other Safety Restraint	N/A
Does owner's manual provide instruction to turn off automatic door locks?			N/A

DATA FROM CERTIFICATION LABEL

Manufactured By	Suzuki Motor Corporation	GVWR (kg)	1715
Date of Manufacture	06/11	GAWR Front (kg)	960
Vehicle Type	Passenger Car	GAWR Rear (kg)	870

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				385	(A)
DSC x 68.04 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW)				45	(A-B)

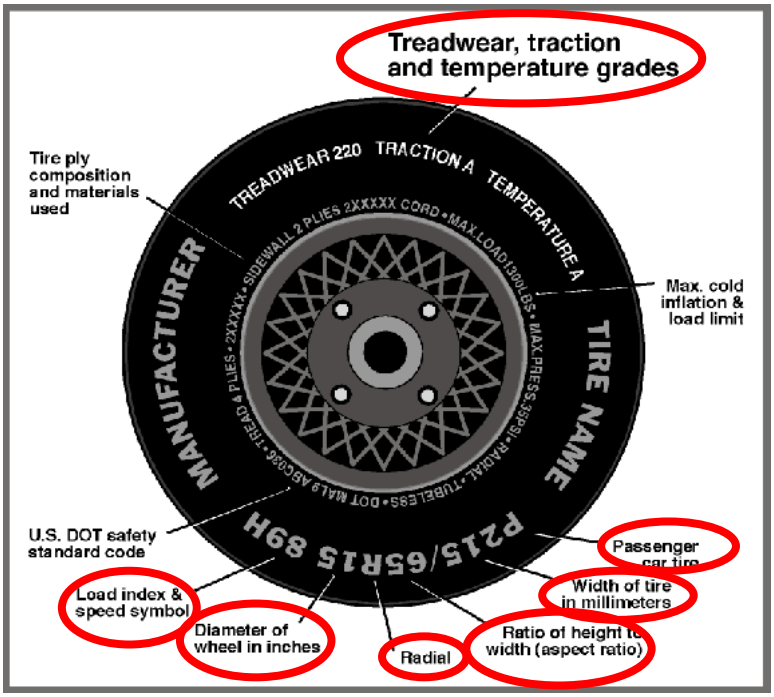
VEHICLE SEAT TYPE

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

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

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

VEHICLE TIRE INFORMATION



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	230	230
Recommended Tire Size	P195/65R15	P195/65R15

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P195/65R15	P195/65R15
Tire Manufacturer	Yokohama	Yokohama
Tire Name	Avid	Avid
Tire Type	Passenger	Passenger
Tire Width	195	195
Aspect Ratio	65	65
Radial	Yes	Yes
Wheel Diameter	15	15
Load Index/Speed Symbol	89H	89H
Treadwear	200	200
Traction Grade	B	B
Temperature Grade	A	A
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	230	230	230	230
Tire Placard	kpa	230	230	230	230
Owner's Manual	kpa				
As Tested	kpa	230	230	230	230

MDB TIRE SPECIFICATIONS

	Requirement	Units	LF	RF	LR	RR
Tire Size	P205/75R15	N/A	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire	200 ± 21	kpa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

		As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
	Units	Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	379.2	252.7		419.1	318.0		412.8	336.1	
Right	kg	379.7	245.8		386.5	301.2		386.5	296.2	
Ratio	%	60.4	39.6		56.5	43.5		55.8	44.2	
Totals	kg	758.9	498.5	1257.4	805.6	619.2	1424.8	799.3	632.3	1431.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1257.4	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	45	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1431.7	(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**

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Weight of Ballast, if any	10.0
Spare tire, jack & tools, right side mirror, right taillight, hub caps, trunk carpet.	20.0

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

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

TEST VEHICLE ATTITUDES AND CG

	Units	Fully Loaded	As Tested	Meets Requirement***
Left Front	mm	692	693	Yes
Right Front	mm	701	701	Yes
Right Rear	mm	677	684	Yes
Left Rear	mm	663	673	Yes
Vehicle CG (Aft of Front Axle)	mm	1107	1089	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	34	26	

*** 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.

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

Test Vehicle:	2012 Suzuki SX4 LE 4-Dr Sedan	NHTSA No.	MC0525
Test Program:	NCAP Side MDB Impact Test	Test Date:	1/10/2012

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	13.4	8.1	10.8
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rear-most	Mid-Fore/Aft	Forward-Most
Driver Seat	10.8	Fixed	Max	Fixed	Fixed	Fixed
	10.8	Fixed	Mid	Fixed	Fixed	Fixed
	10.8	Fixed	Min	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed

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

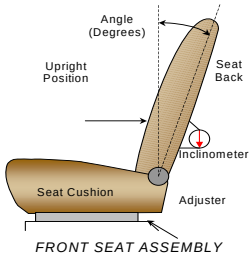
Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	210	15 (1st as 1)	105	7th (1st as 0)
Front Passenger Seat	210	15 (1st as 1)	105	7th (1st 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 fixed. The rear center and non-struck side rear outboard seat backs are also fixed.



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents	Degrees	Detent
Driver Seat w/Seated Dummy	60.0		5.7	4th (1st as 0)
Front Passenger Seat	53.9		5.7	3rd (1st as 0)
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	17.6*	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	17.6*	Fixed
Rear Center Seat	Fixed	Fixed	17.6*	Fixed

*Seat back was fixed, angle measured on seatback.

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

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

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 (1st as 1)	1 (uppermost as 0)
Rear Seat	Fixed	Not Applicable

HEAD RESTRAINT ADJUSTMENT

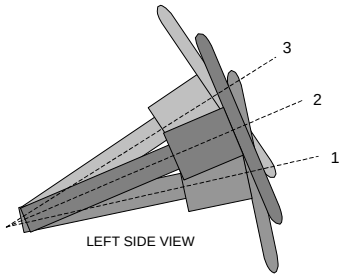
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	6	Highest
Rear Seat	3	Lowest

STEERING COLUMN ADJUSTMENT

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

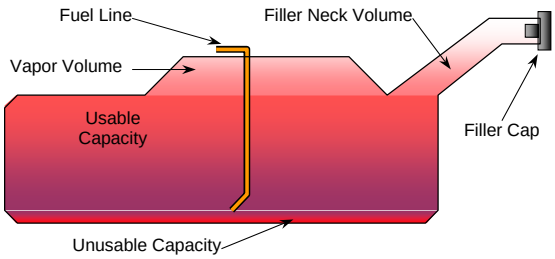
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	68.4	
Geometric Center, Position 2	64.9	
Uppermost, Position 3	61.4	
Telescoping Steering Wheel Travel		
Test Position	64.9	



STEERING COLUMN ASSEMBLY

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 fuel pump starts pumping fuel when the vehicle ignition key is turned to the ON position. The fuel pipe is on the left side.



VEHICLE FUEL TANK ASSEMBLY

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

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

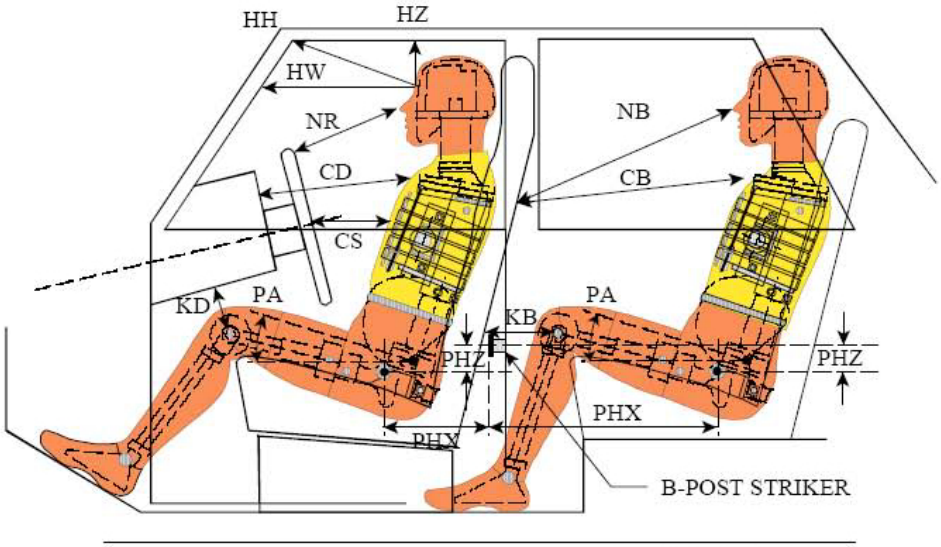
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard" Tank (see Form No. 1)	50.0
Usable Capacity of "Optional" Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	50.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	46.5
Actual Amount of Solvent Used	46.5
1/3 of Usable Capacity	16.7

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



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

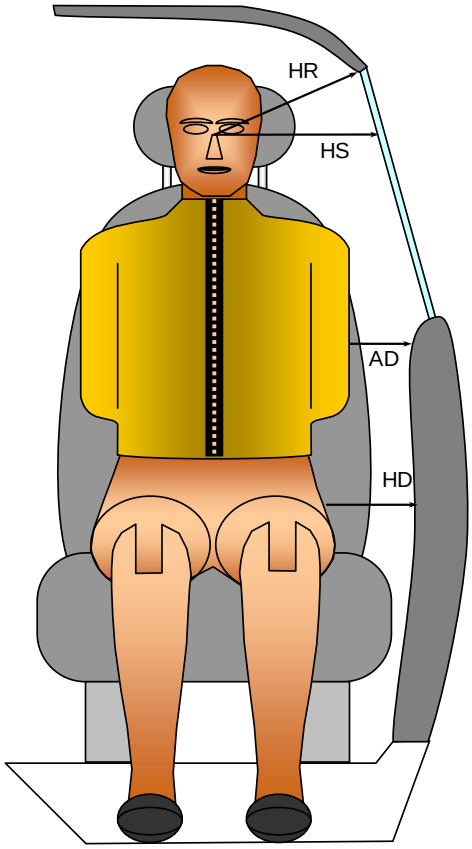
LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver S/N 032		Passenger S/N 306	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	323	17.3		
HW		Head to Windshield	541			
HZ	HZ	Head to Roof Liner	177		240	
NR	NB	Nose to Rim/Seat Back	417	17.8	541	14.3
CD	CB	Chest to Dashboard/Seat Back	535	9.7	524	10.5
CS		Chest to Steering Wheel	336	13.1		
KDL	KBL	Left Knee to Dash/Seat Back	137	31.7	246	27.0
KDR	KBR	Right Knee to Dash/Seat Back	133	29.3	248	24.9
PAX	PAX	Pelvic Tilt Angle X		17.0		20.4
	PAY	Pelvic Tilt Angle Y		-1.4		-0.4
PHX	PHX	Hip Point to Striker (X-Axis)	181		236	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	160		238	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



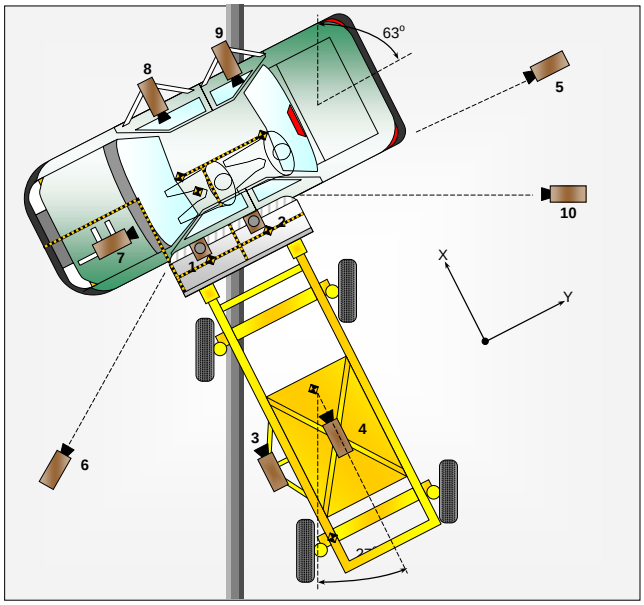
FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver S/N 032	Passenger S/N 306
HR	Head to Side Header	mm	174	218
HS	Head to Side Window	mm	302	342
AD	Arm to Door	mm	105	172
HD	Hip Point to Door	mm	150	202

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	100	180	-4920	14	1000
2	Overhead Close-Up	100	280	-4860	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	70	4670	-1070	24	1000
6	Left Front	1900	-4090	-1080	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

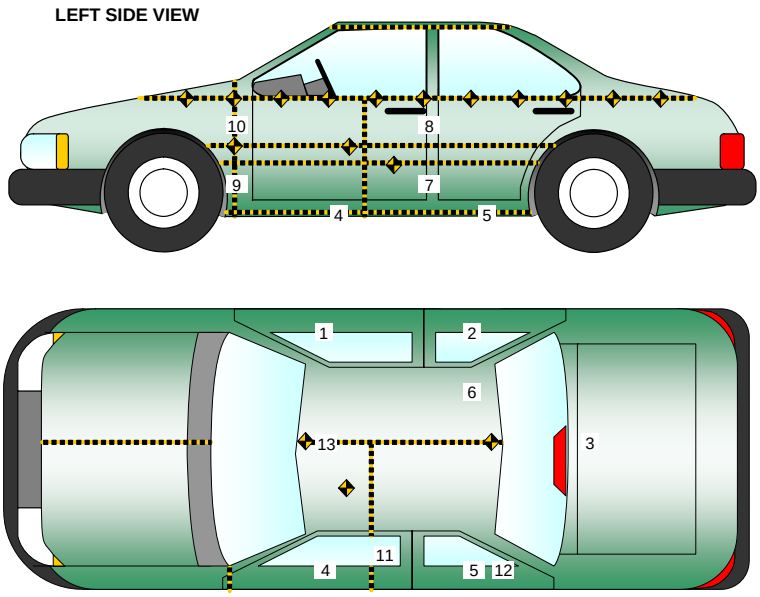
Explain why camera(s) did not operate as intended: Not Applicable

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



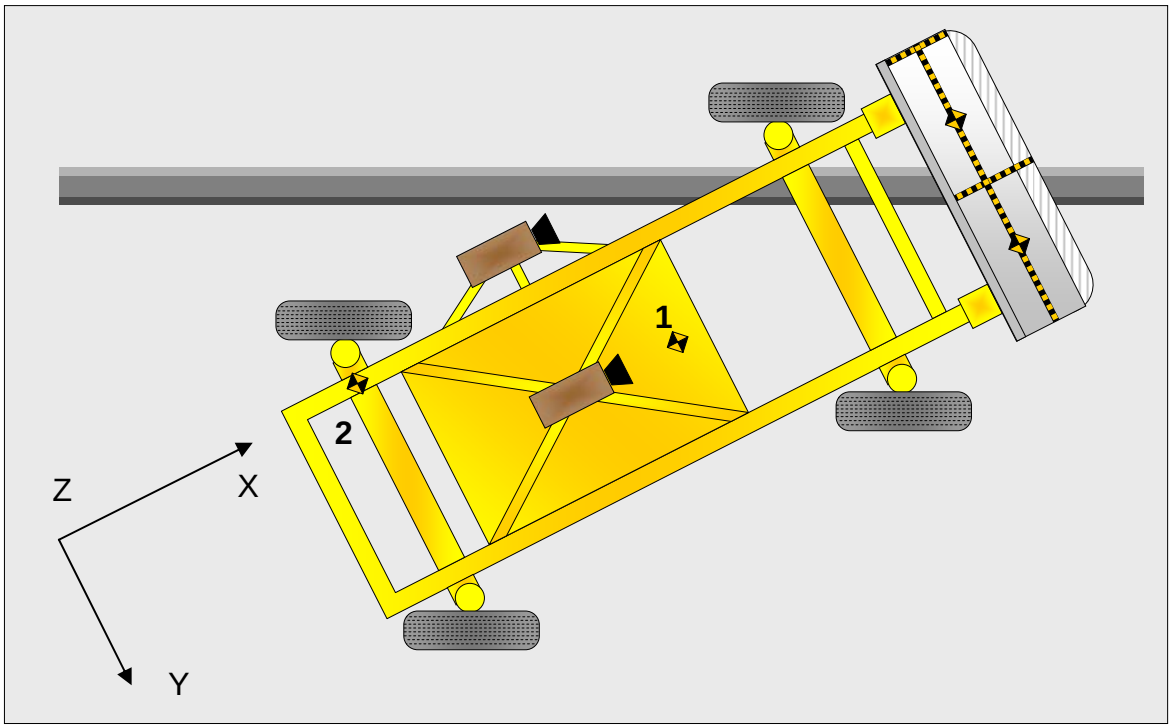
TEST VEHICLE ACCELEROMETER LOCATIONS

Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2548	-185	-235
2	Right Sill at Front Seat	2473	672	-220
3	Right Sill at Rear Seat	1745	675	-230
4	Left Sill at Front Door	2567	-672	-215
5	Left Sill at Rear Door	1948	-675	-222
6	Left Lower A-Post	3038	-697	-492
7	Left Middle A-Post	3042	-764	-778
8	Left Lower B-Post	2200	-673	-597
9	Left Middle B-Post	2143	-673	-797
10	Front Seat Track	2442	-543	-402
11	Rear Seat Structure	1828	-305	-476
12	Rt. Rear Occ. Compartment	1816	350	-281
13	Engine Block	3632	0	-778
14	Rear Above Axle	1183	0	-517

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:	2012 Suzuki SX4 LE 4-Dr Sedan	NHTSA No.	MC0525
Test Program:	NCAP Side MDB Impact Test	Test Date:	1/10/2012



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: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	Curtain Airbag
Top of Head	Curtain Airbag, Side Header	Curtain Airbag, Side Header
Left Side of Head	Curtain Airbag	Curtain Airbag
Back of Head	Curtain Airbag, Headrest	Curtain Airbag, Side Header, Headrest
Left Shoulder	Curtain Airbag	Side Airbag, Door Panel
Upper Torso	Side Airbag, Seatback	Side Airbag
Lower Torso	Side Airbag, Seatback	Side Airbag
Left Hip	Side Airbag, Seat Cushion	Side Airbag, Seat Cushion, Door Panel
Left Knee	Door Panel	Door Panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	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

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

POST-TEST STRUCTURAL OBSERVATIONS

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

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

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No			
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Abdomen/Pelvis Airbag	Yes	Yes		
Side Torso Airbag			Yes	Yes
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		2506
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		313
Actual Impact Point (Aft of Front Axle)	mm		297
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	+16
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	-6

DATA SHEET NO. 9

MDB SUMMARY OF RESULTS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheelbase of Framework Carriage	2592
CG Location aft of Front Axle	1129

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	411.8	281.6	
Right	kg	356.8	311.3	
Ratio	%	56.5	43.5	
Totals	kg	768.6	592.9	1361.5

SPEED AND ANGLE AT IMPACT DATA

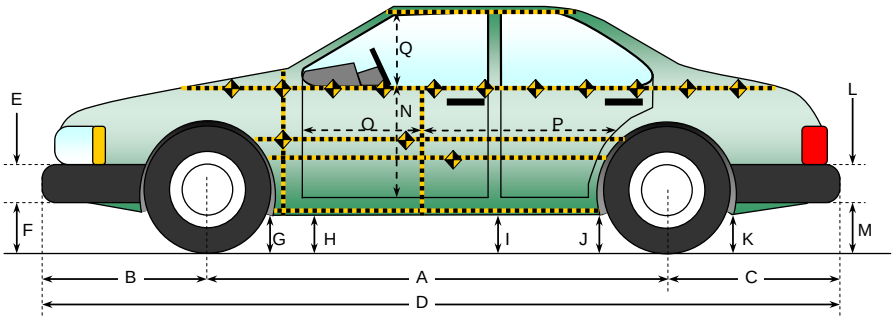
Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.1
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.3
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.9
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.2
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	26.8

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	700	Left	169
B	Top of Bumper	533	800	Left	118
C	Mid-Level	686	800	Left	130
D	Top of Stack	813	800	Left	193

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



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

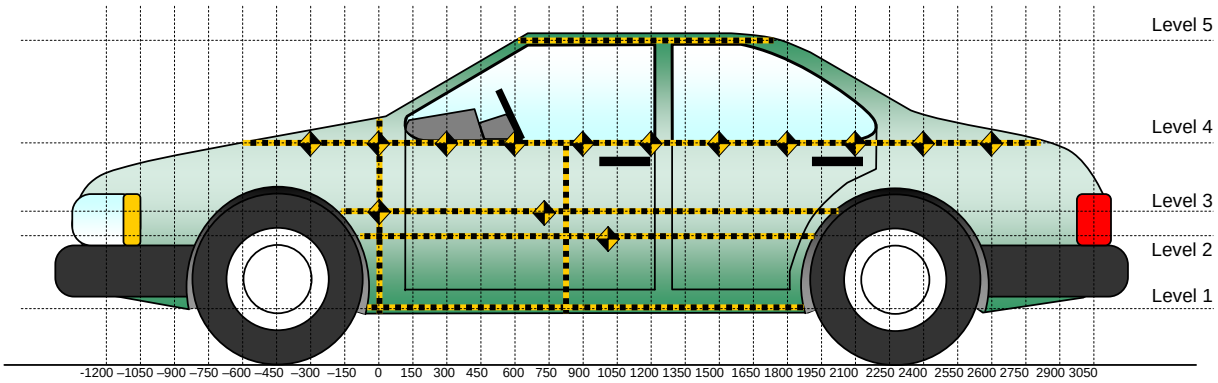
LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2506	2500	6
B	Front Axle to FSOV	888	888	0
C	Rear Axle to RSOV	1094	1094	0
D	Total Length at Centerline	4488	4482	6
E	Front Bumper Thickness	126	126	0
F	Front Bumper Bottom to Ground	249	259	-10
G	Sill Height at Front Wheel Well	185	194	-9
H	Sill Height at Front Door Leading Edge	173	173	0
I	Sill Height at B Pillar	190	180	10
J1	Sill Height at Rear Wheel Well	165	168	-3
J2	Pinch Weld Height at Rear Wheel Well	160	149	11
K	Sill Height Aft of Rear Wheel Well	242	216	26
L	Rear Bumper Thickness	105	105	0
M	Rear Bumper Bottom to Ground	330	321	9
N	Sill Height to Window Bottom Sill	690	615	75
O	Front Door Leading Edge to Impact CL	690	685	5
P	Rear Door Trailing Edge to Impact CL	1070	1060	10
Q	Front Window Opening	491	492	-1
R	Right Side Length	3405	3413	-8
S	Left Side Length	3405	3373	32
T	Vehicle Width at B Post	1706	1540	166

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



All Measurements Shown in mm

LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEAUREMENTS

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	280	80	1500
2	Occupant Hip Point	590	228	1350
3	Mid Door	632	235	1500
4	Window Sill	894	164	1350
5	Window Top	1458	15	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: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

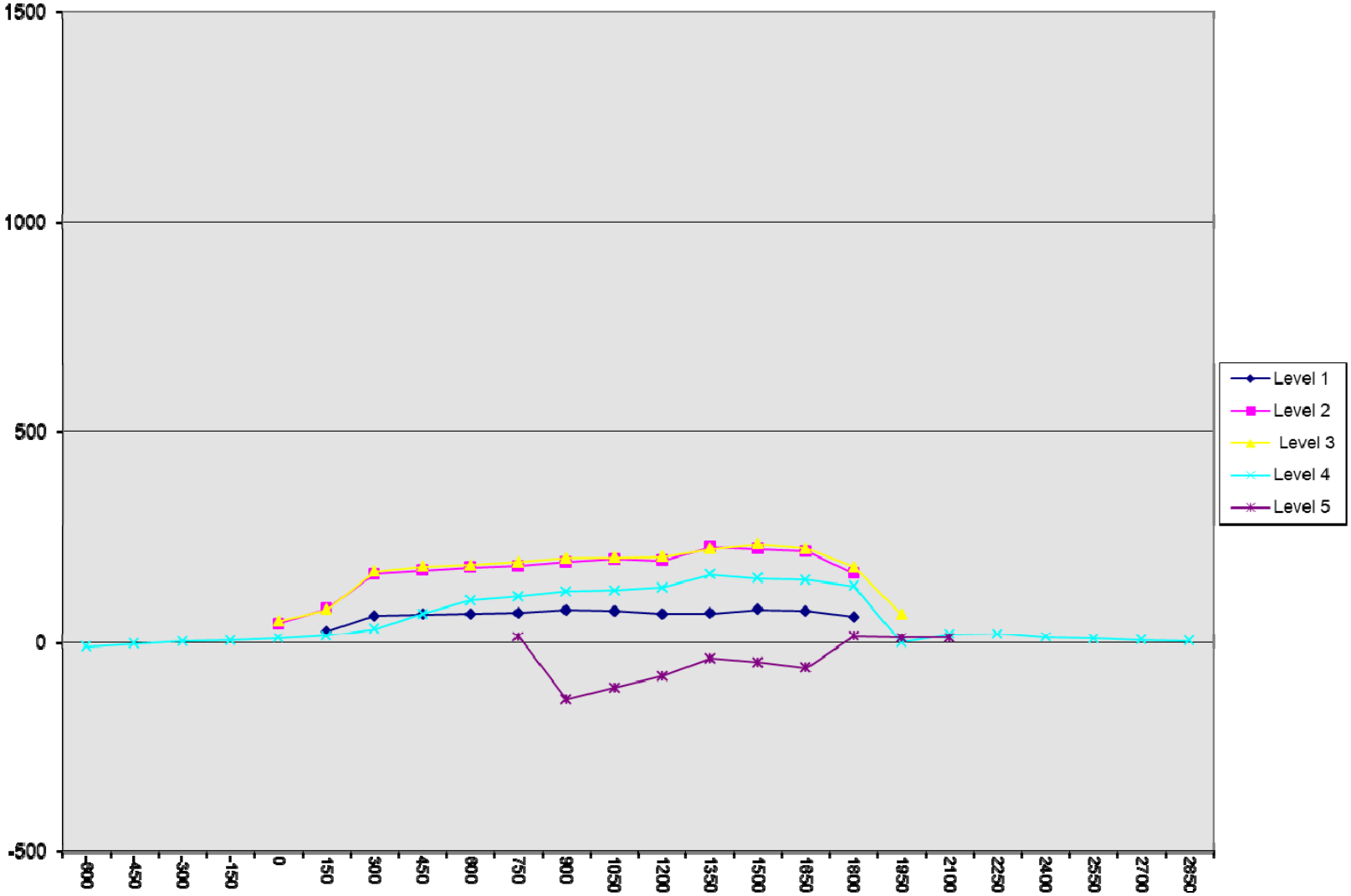
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-600				386					375					-11	
-450				359					355					-4	
-300				338					340					2	
-150				323					327					4	
0		241	247	316			287	299	326			46	52	10	
150	300	261	260	315		328	343	340	331		28	82	80	16	
300	305	258	257	300		370	423	427	333		65	165	170	33	
450	302	255	254	287		370	428	436	356		68	173	182	69	
600	302	253	251	277		372	433	437	379		70	180	186	102	
750	302	251	250	271	546	374	434	442	382	560	72	183	192	111	14
900	301	251	248	267	539	380	444	450	390	404	79	193	202	123	-135
1050	298	251	247	265	531	375	450	450	390	424	77	199	203	125	-107
1200	299	253	249	264	527	368	449	454	396	448	69	196	205	132	-79
1350	299	254	251	264	527	370	482	475	428	490	71	228	224	164	-37
1500	297	256	253	266	527	377	480	488	420	480	80	224	235	154	-47
1650	296	257	255	266	529	373	475	480	417	470	77	218	225	151	-59
1800	287	248	252	268	534	350	414	433	404	549	63	166	181	136	15
1950			237	*	540			305	*	552			68	*	12
2100				273	562				293	573				20	11
2250				279					300					21	
2400				287					300					13	
2550				298					307					9	
2700				312					318					6	
2850				332					335					3	

*Door Handle

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.

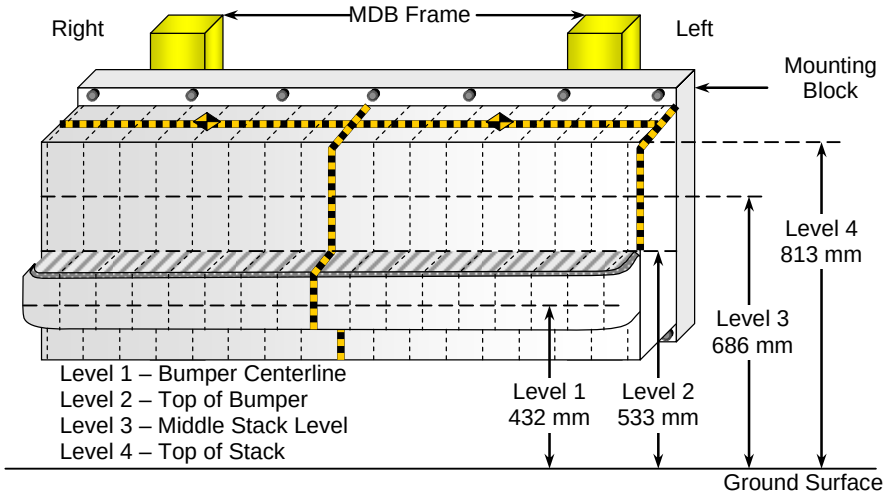
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012



FRONT VIEW

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C_L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
4	19	10	12	14	26	55	70	51	37	37	40	41	59	82	108	150	193
3	18	5	9	13	15	28	48	39	21	17	17	17	24	38	57	98	130
2	95	92	90	85	77	63	56	65	70	83	86	86	88	88	93	103	118
1	157	147	139	141	141	139	137	139	139	139	140	140	140	142	149	169	164

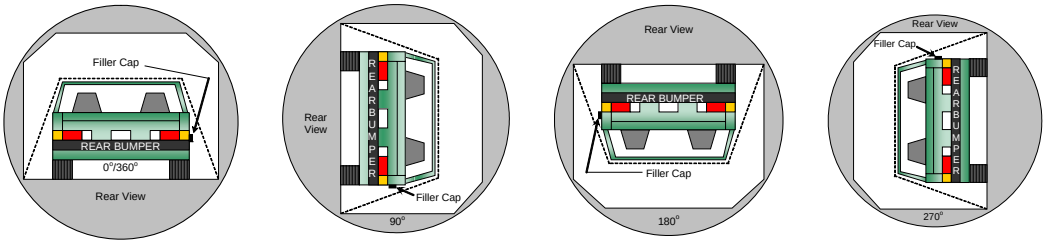
DATA SHEET NO. 13
FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2012 Suzuki SX4 LE 4-Dr Sedan NHTSA No. MC0525
Test Program: NCAP Side MDB Impact Test Test Date: 1/10/2012

Test Time: 10:43 am Temperature: 21.1° 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



0°/360° 90° 180° 270°

ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	119	300	419
90° to 180°	110	300	410
180° to 270°	105	300	405
270° to 360°	111	300	411

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

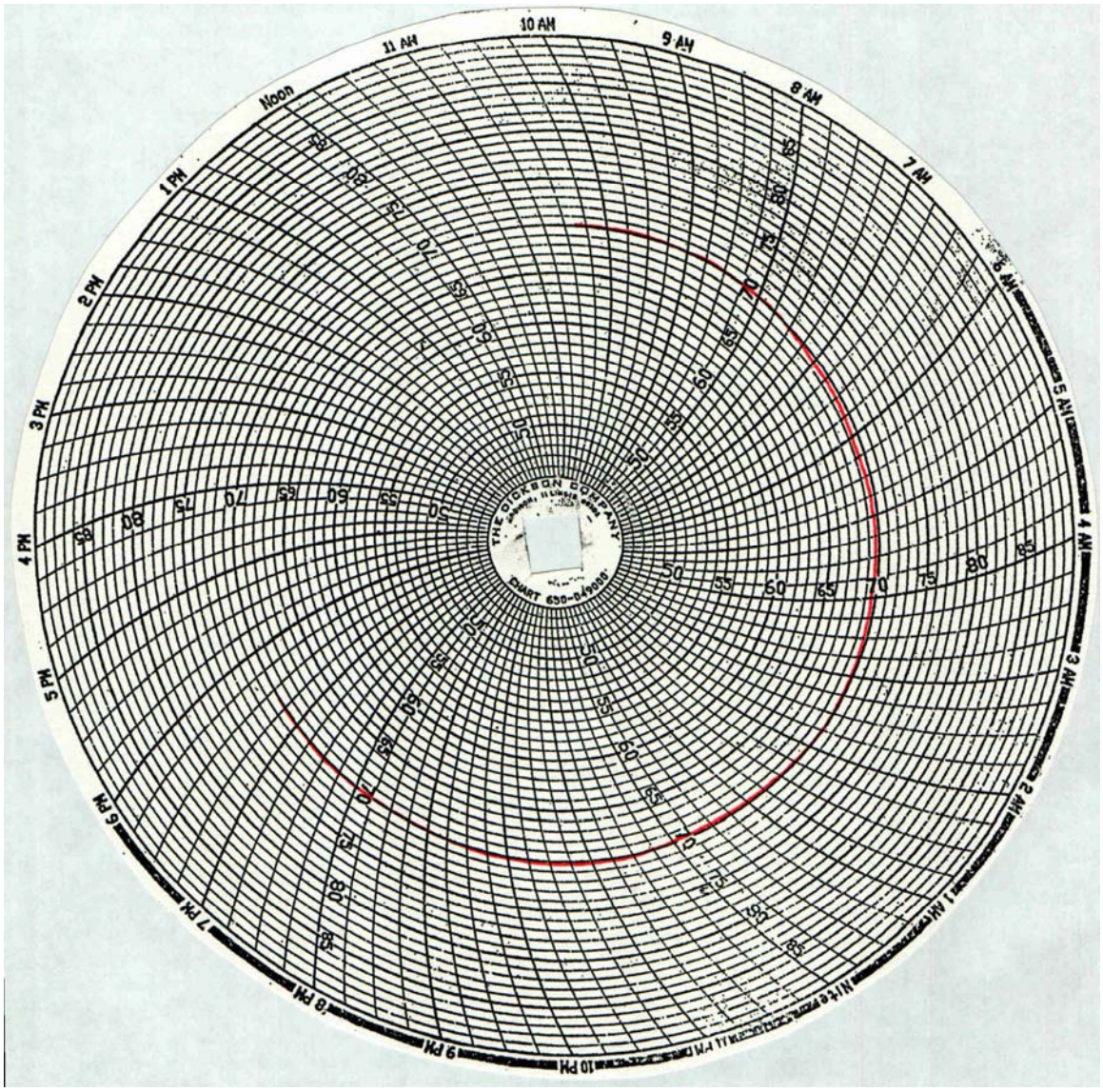
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 14
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle:	2012 Suzuki SX4 LE 4-Dr Sedan	NHTSA No.	MC0525
Test Program:	NCAP Side MDB Impact Test	Test Date:	1/10/2012



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

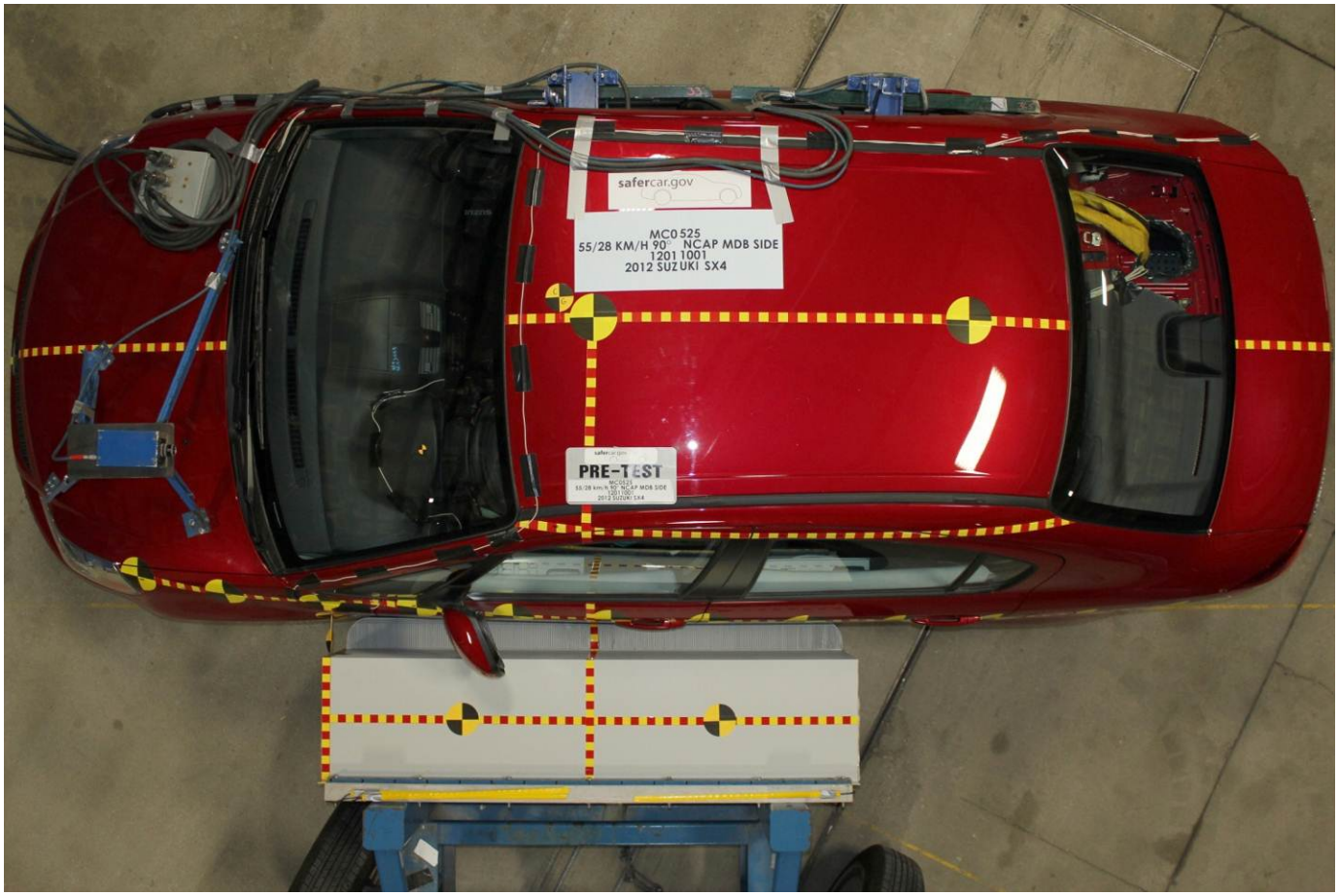
Post-Test Left Three-Quarter Rear View of Test Vehicle

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

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

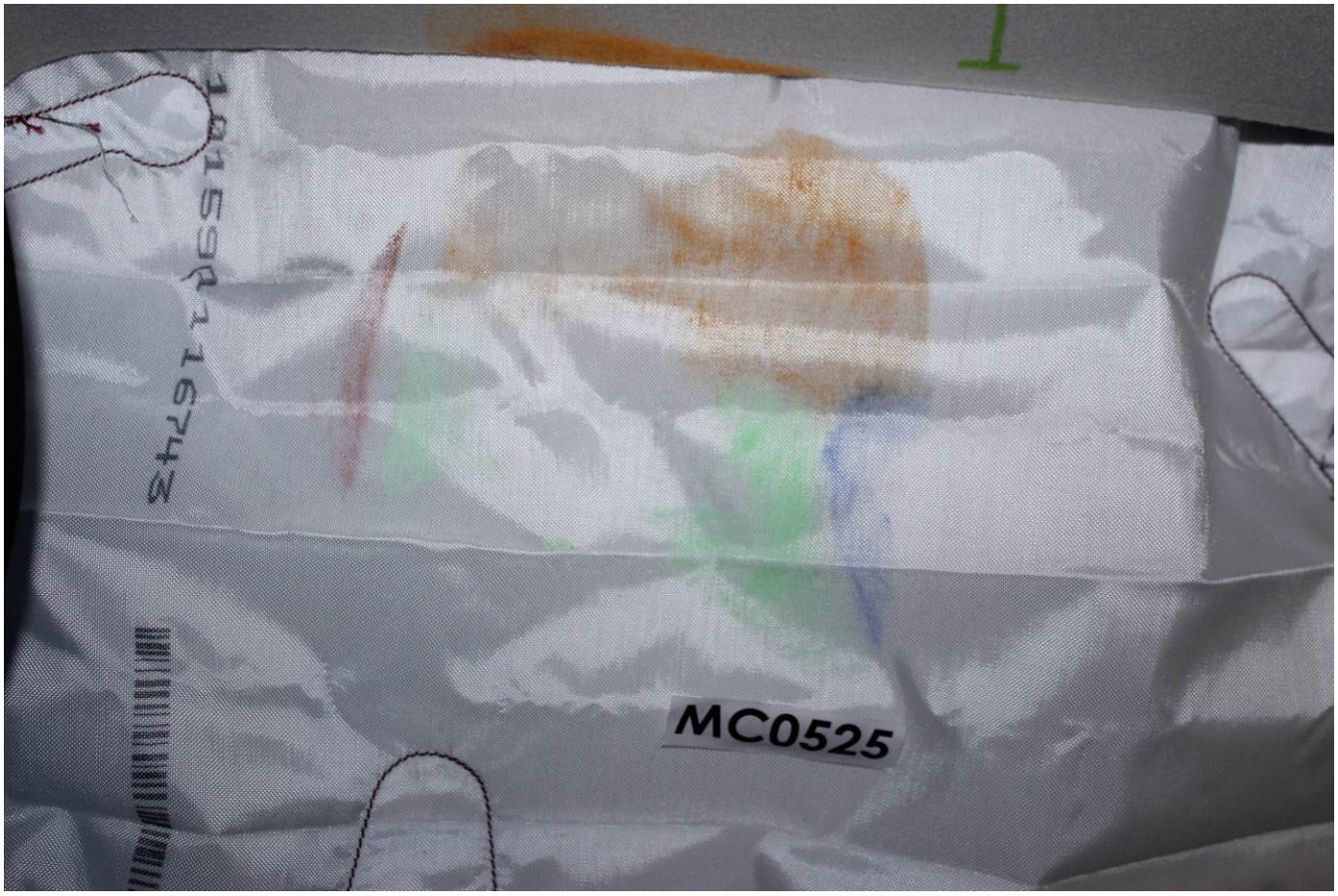
Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

Pre-Test Driver Inner Door Panel View

Post-Test Driver Inner Door Panel View

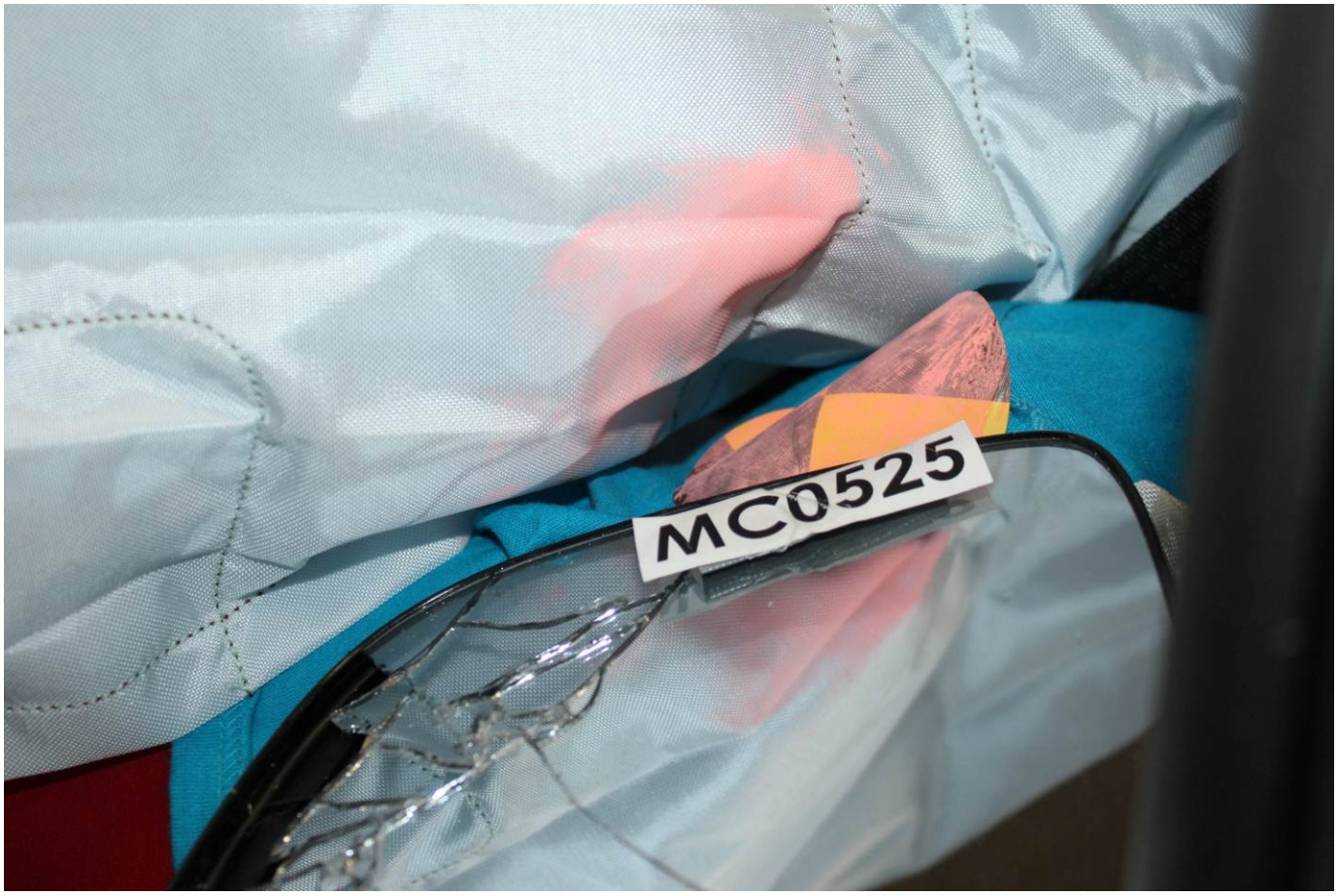
Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View

Post-Test Driver Dummy Close-up Head Contact with 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

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

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

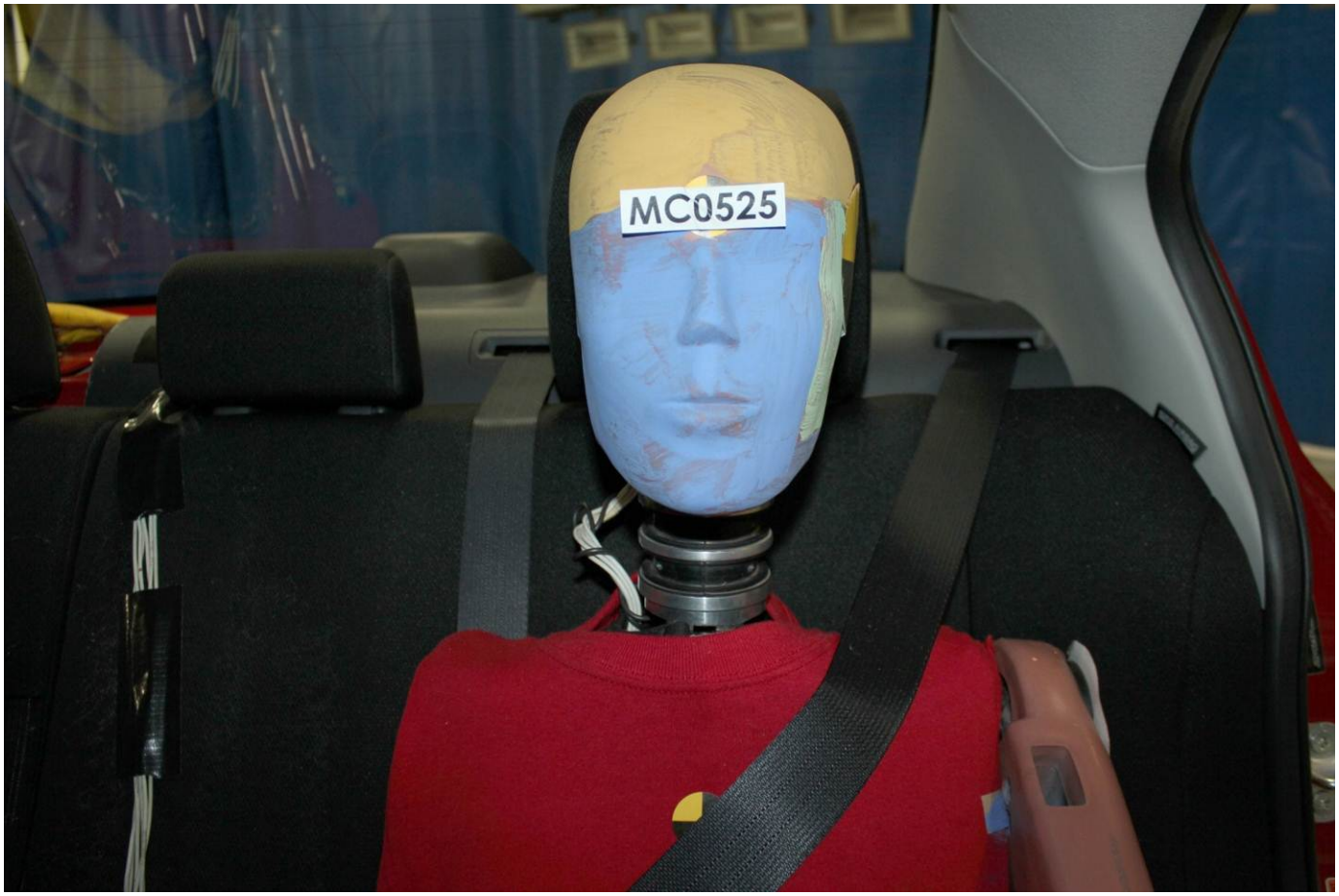
Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View

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

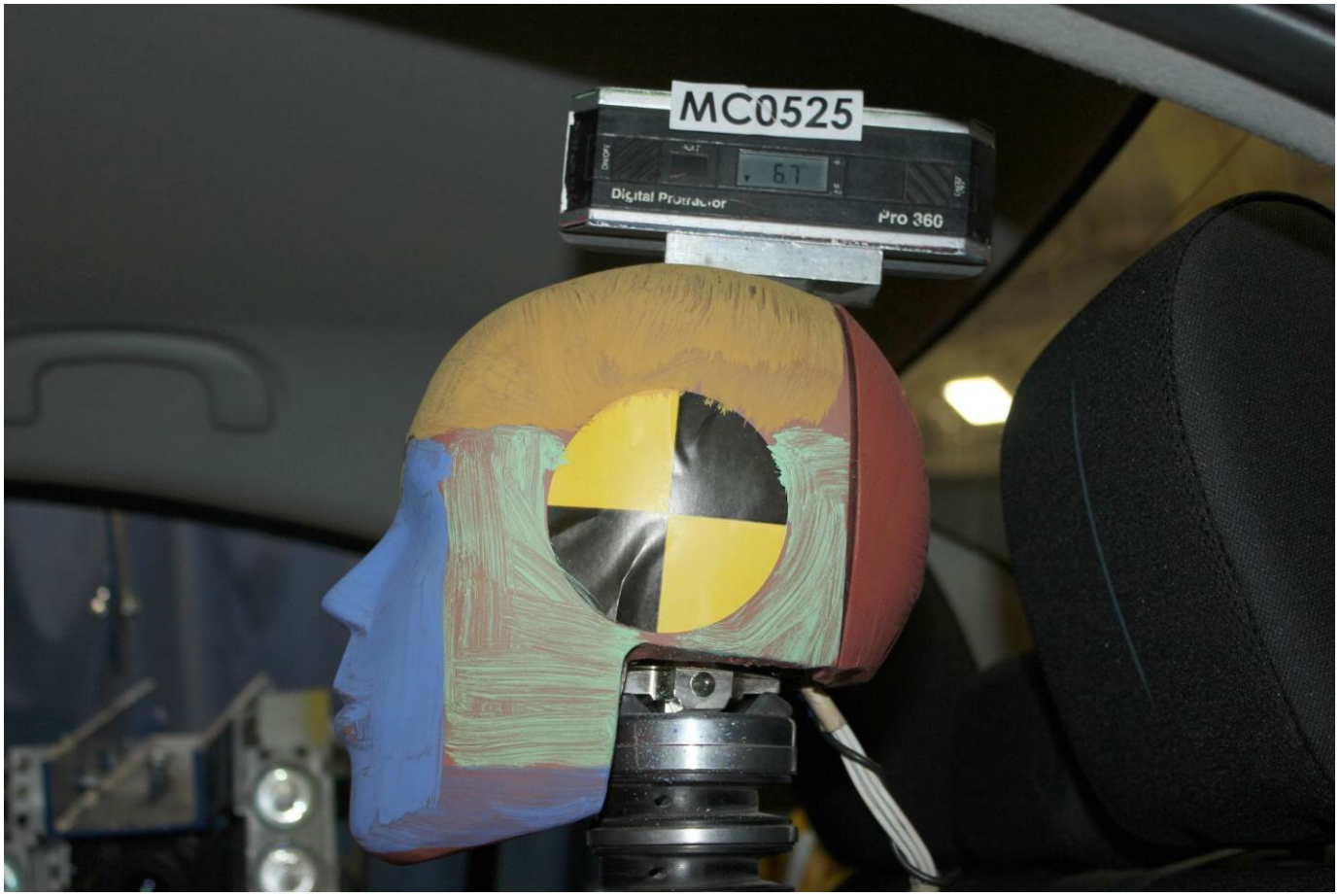


Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

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



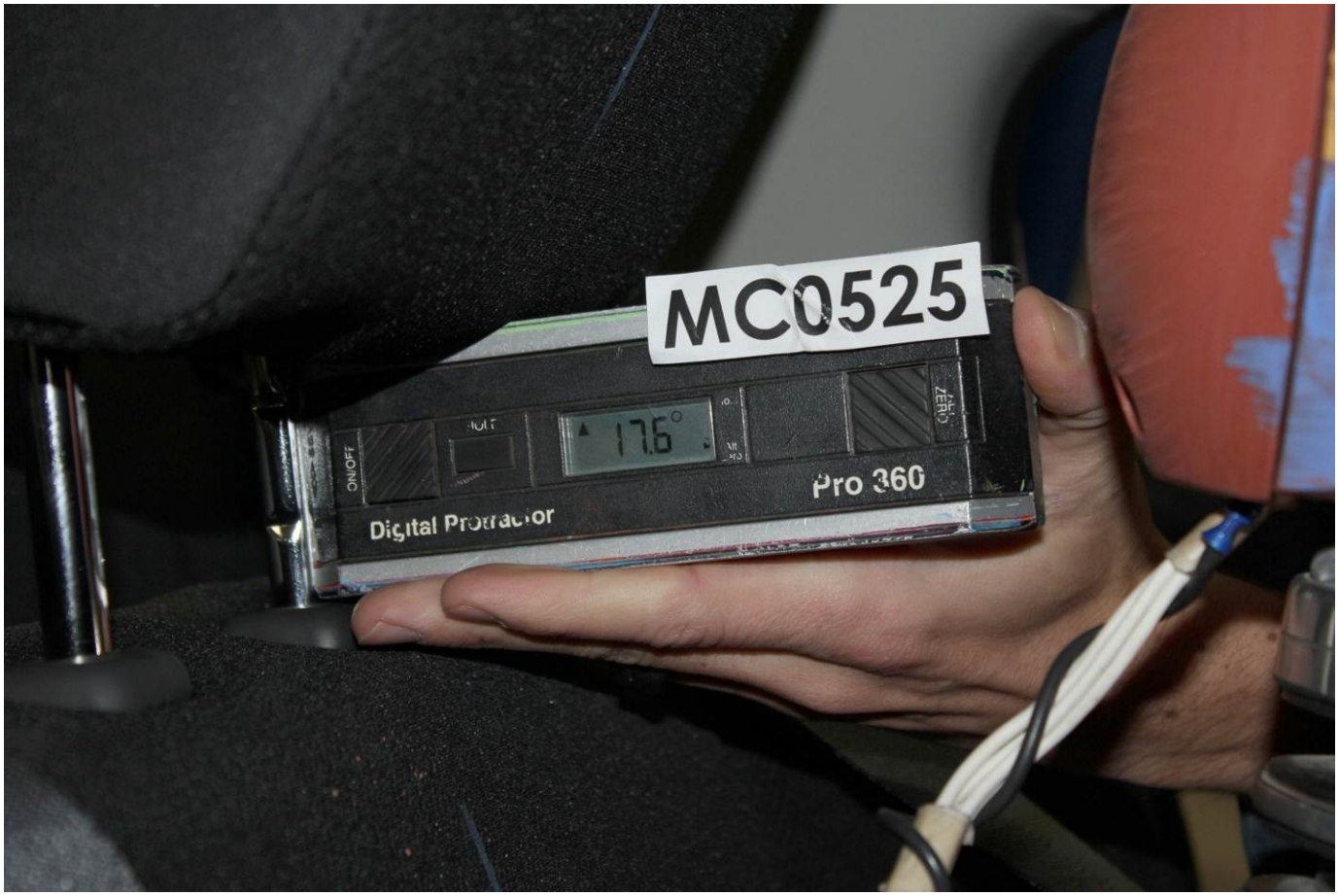
Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level

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

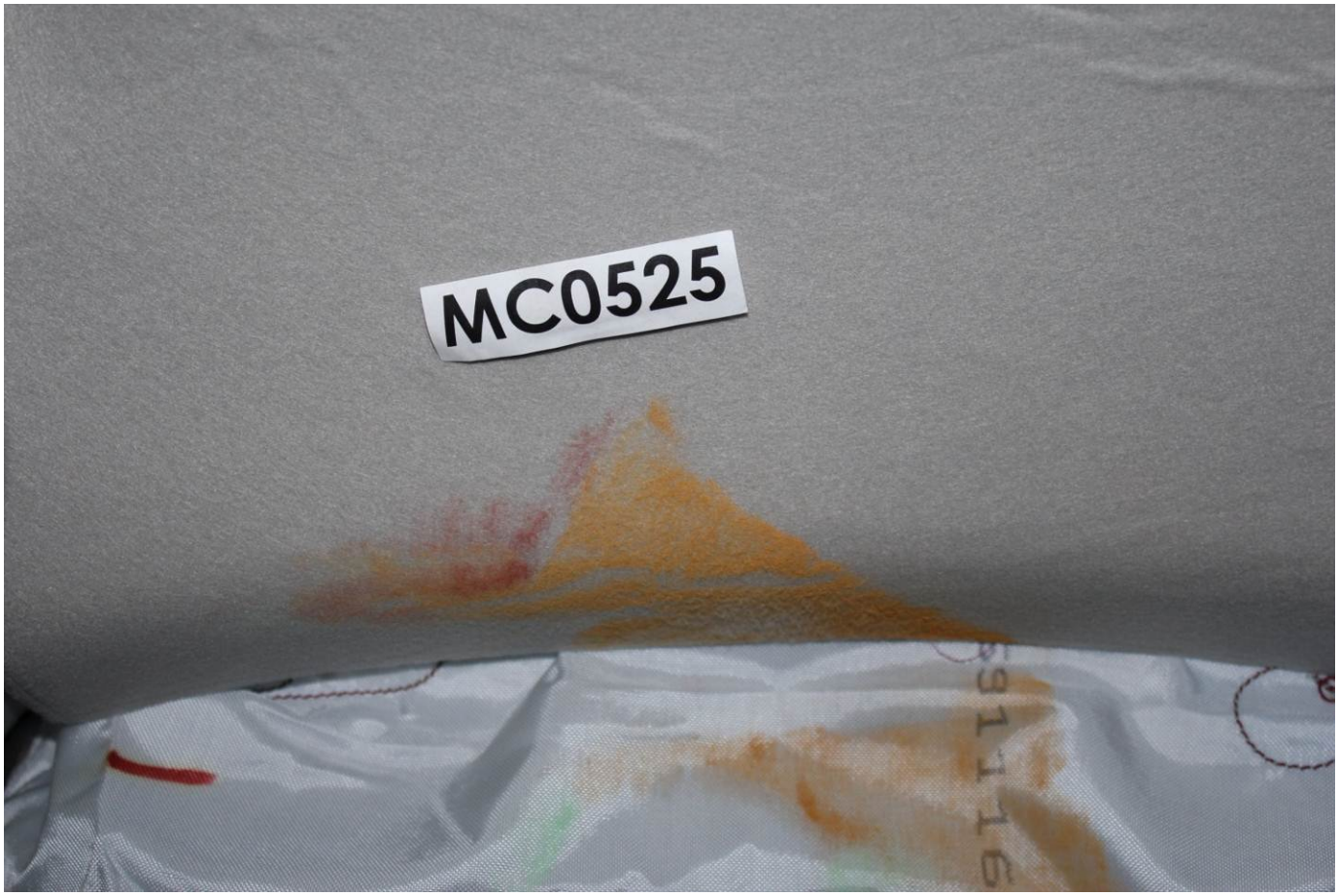
Post-Test Rear Passenger Dummy and Door Clearance View

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

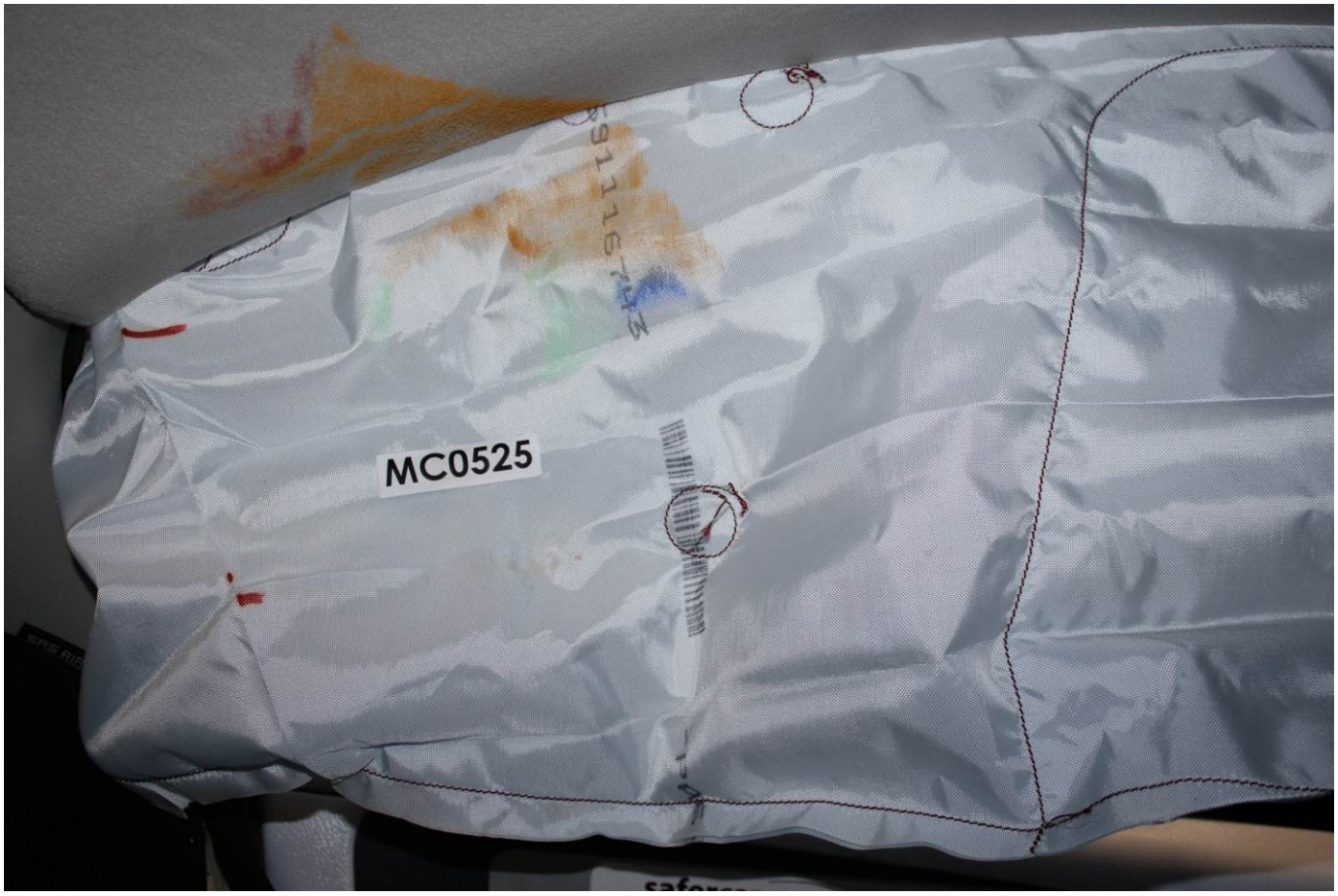
Pre-Test Rear Passenger Inner Door Panel View

Post-Test Rear Passenger Inner Door Panel View



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

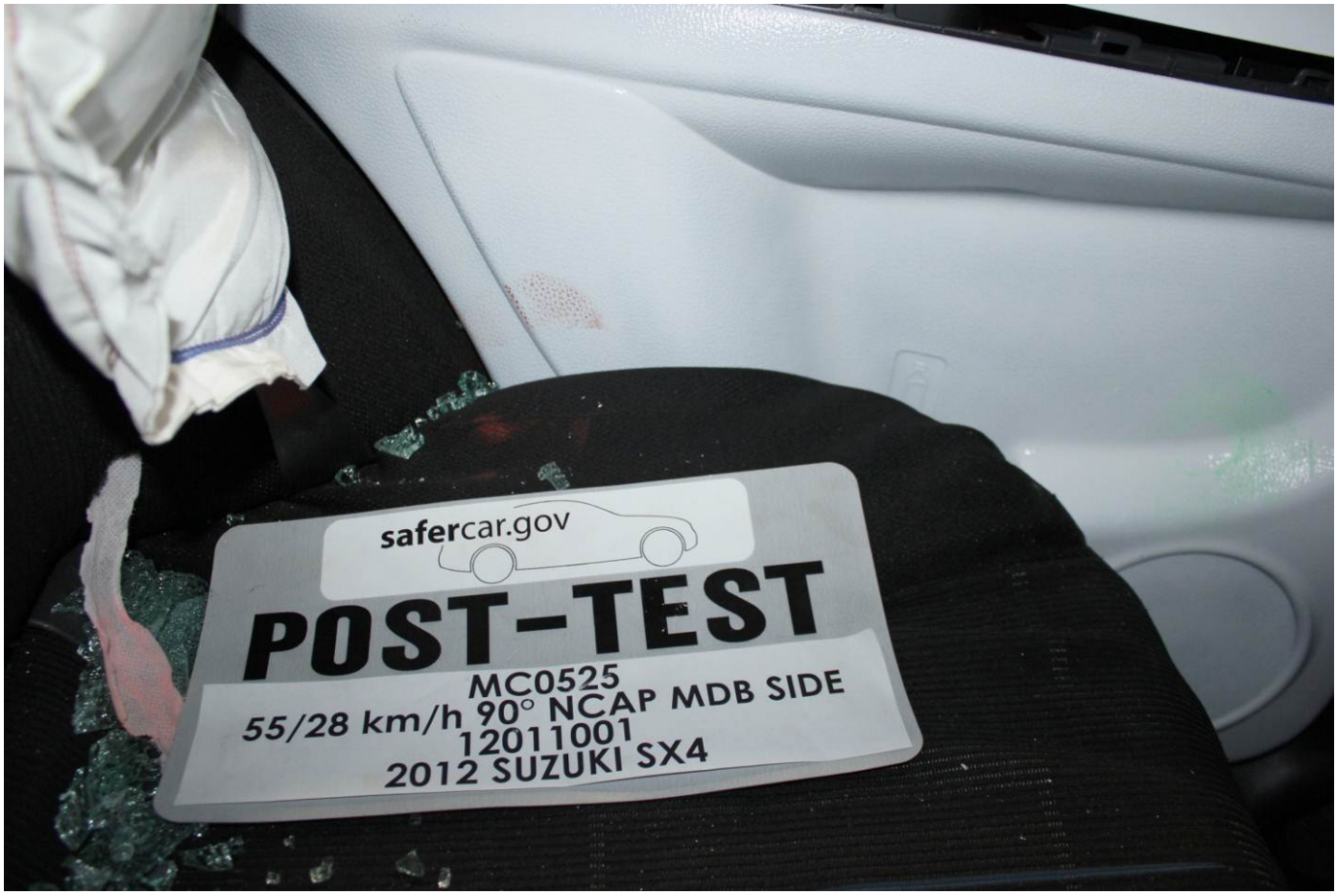
Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View



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

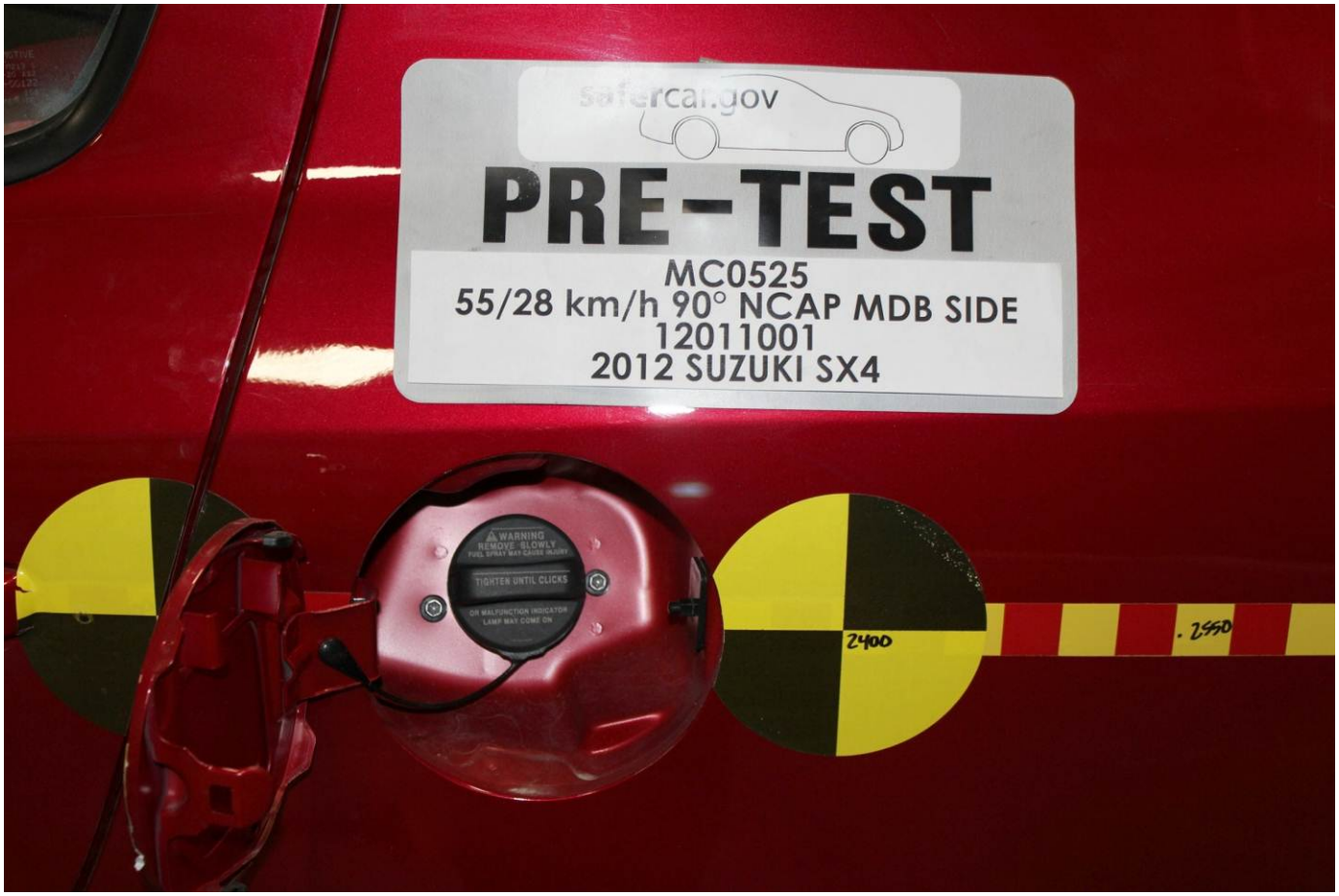
Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View

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



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

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

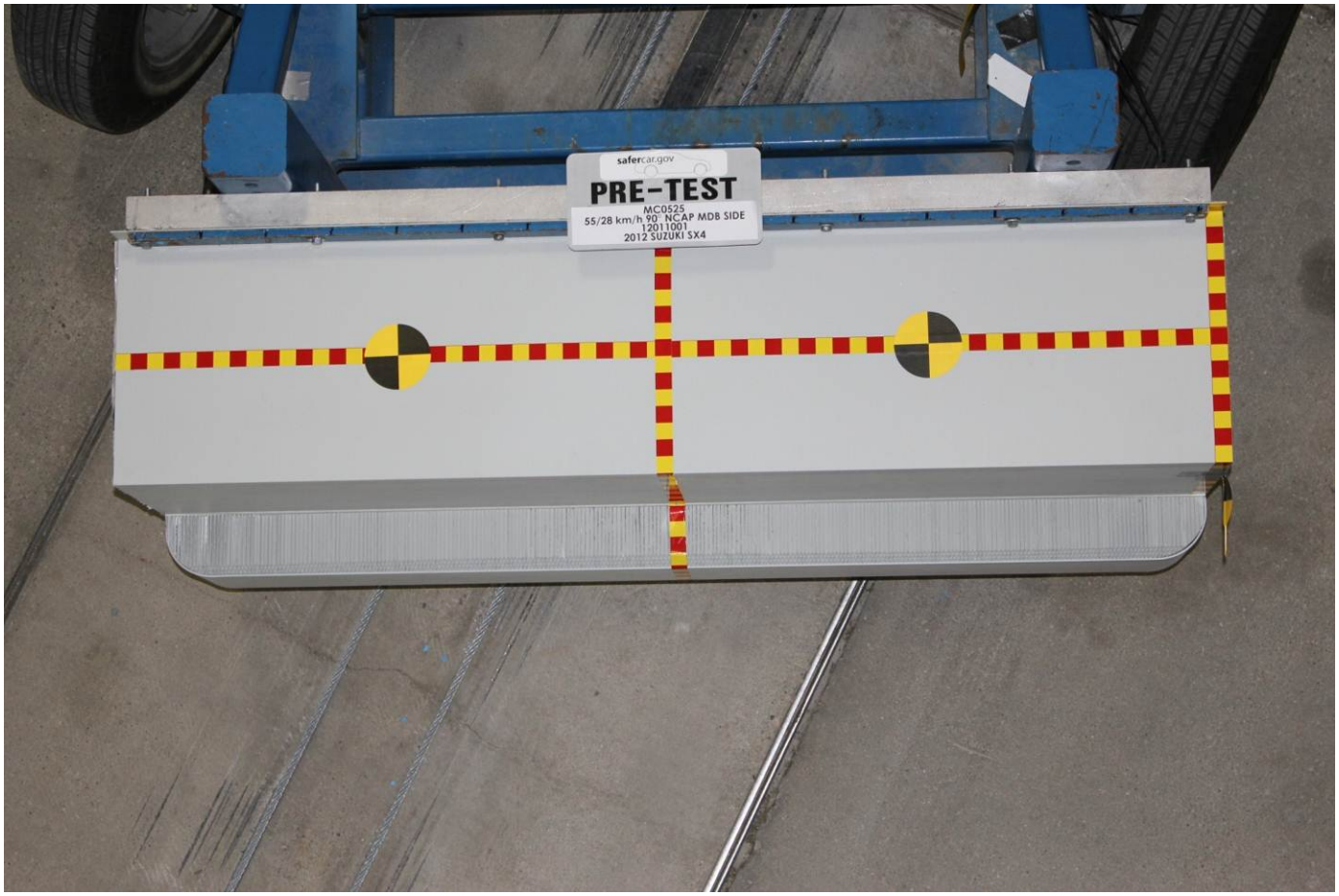


Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

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

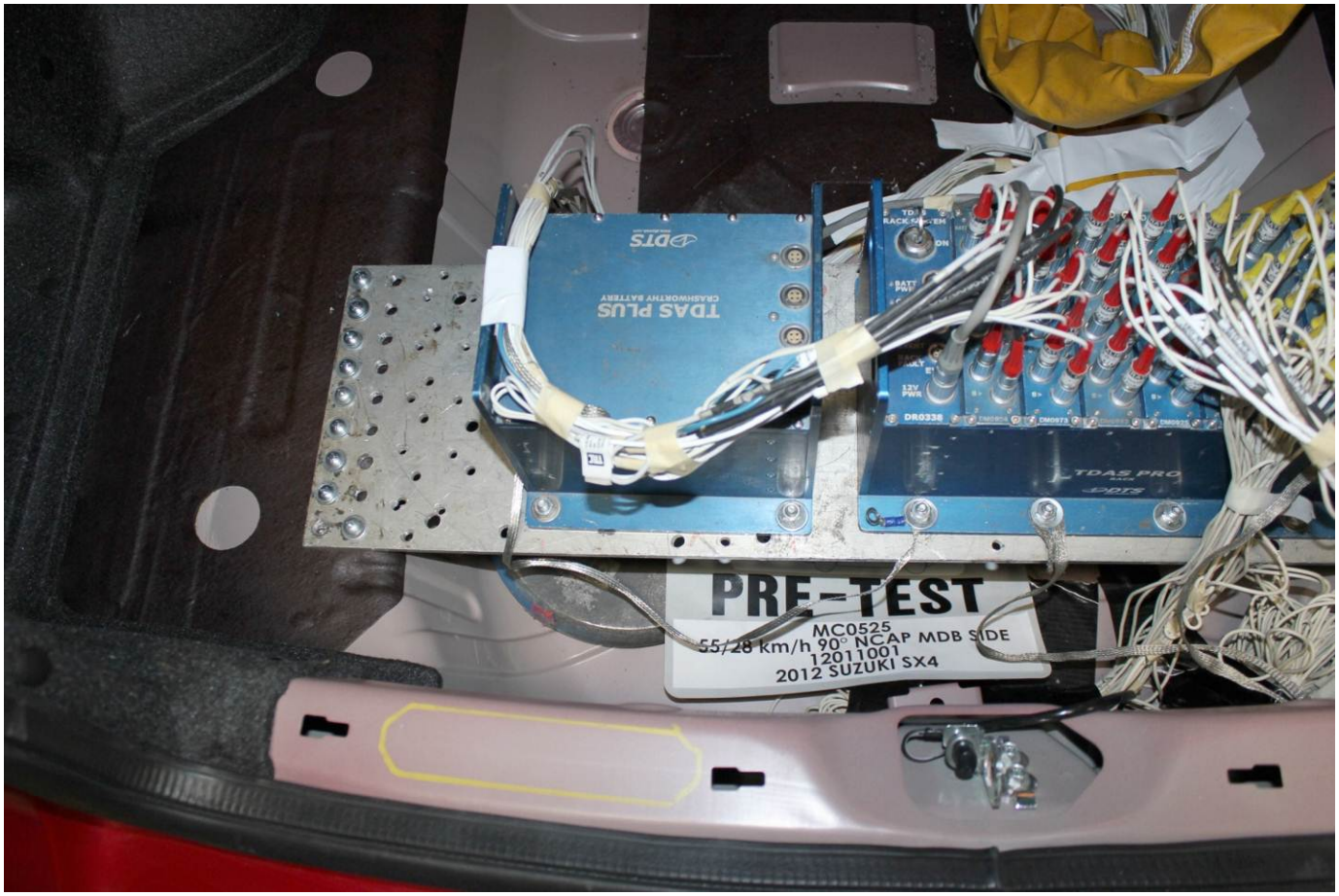
Post-Test Left Side View of MDB Impactor Face

Pre-Test Right Side View of MDB Impactor Face

Post-Test Right Side View of MDB Impactor Face

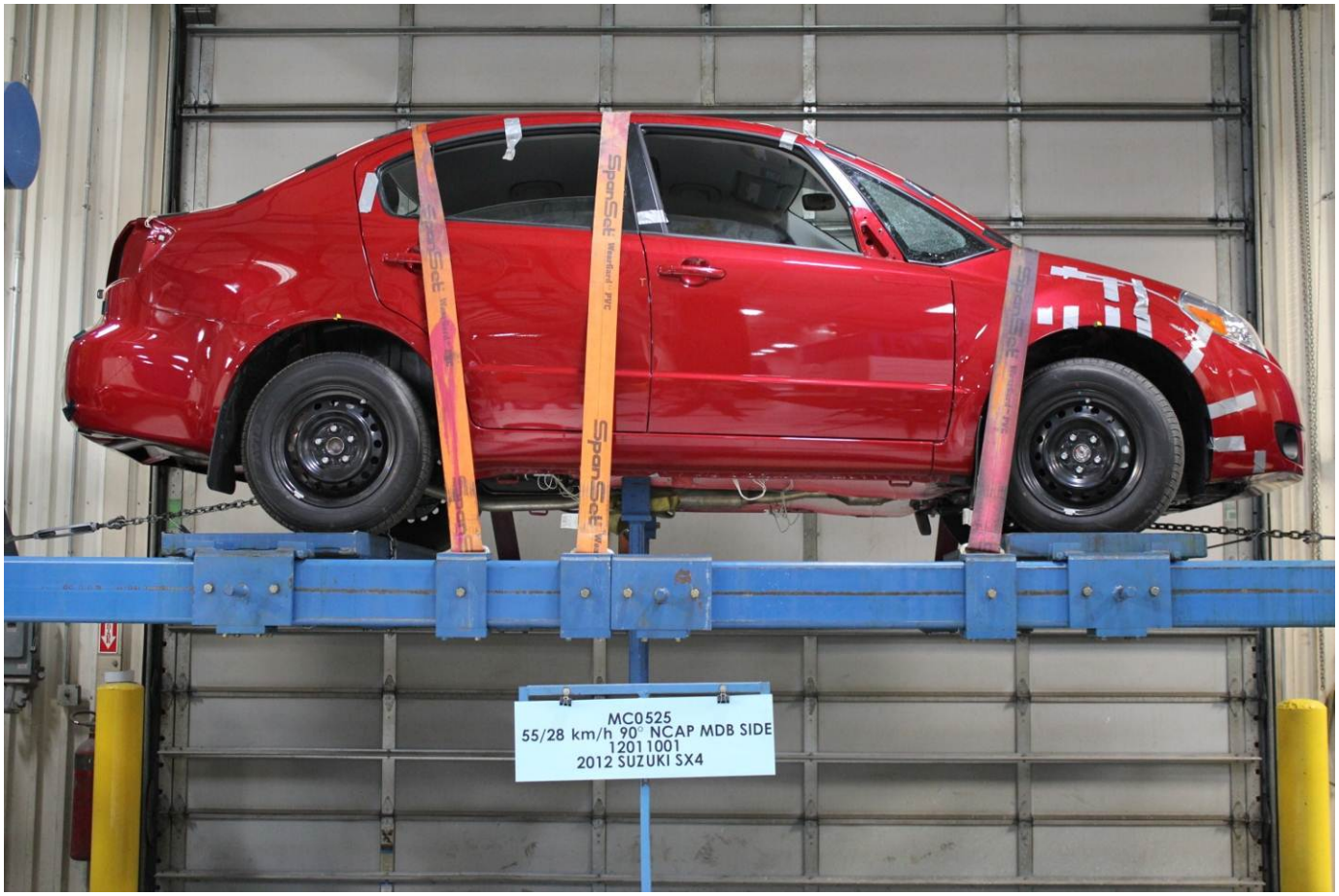
Close-Up View of Vehicle's Certification Label

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



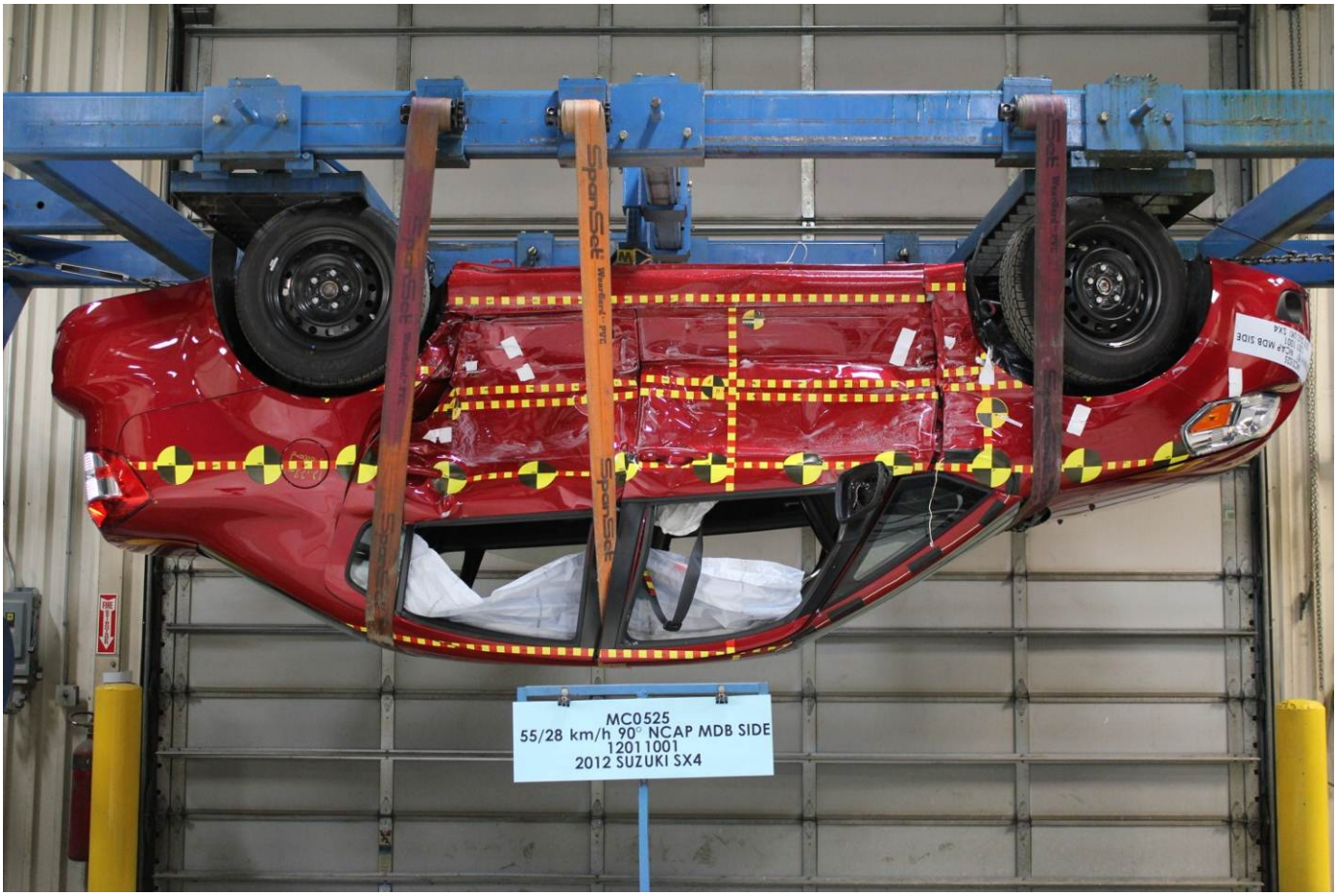
Pre-Test Ballast View

Post-Test Primary and Redundant Speed Trap Read-Out

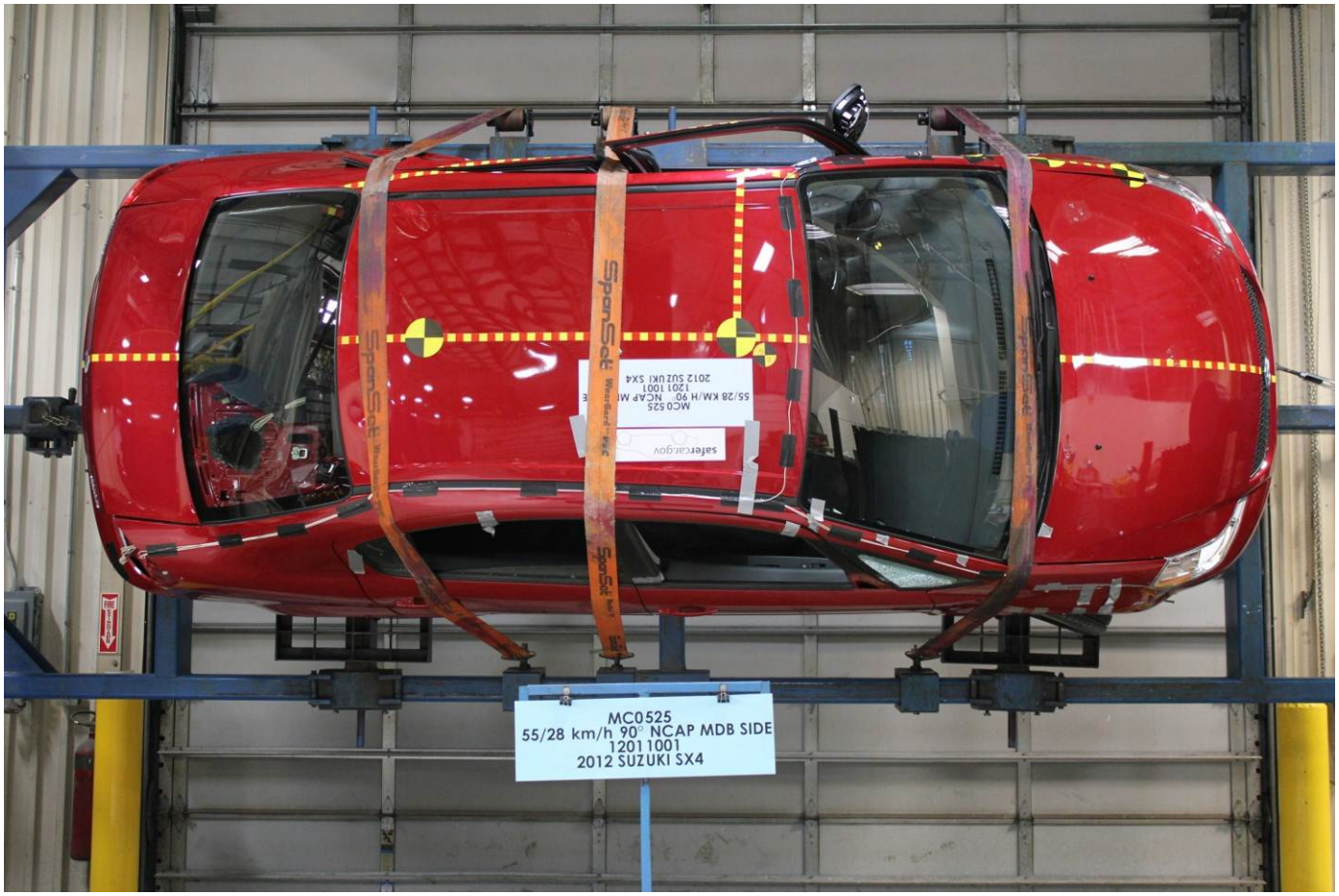


FMVSS No. 301 Static Rollover 0 Degrees

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

SUZUKI
SuzukiAuto.com

America's #1 Warranty
100,000 Miles/7 Yr Powertrain Limited Warranty • No Deductible • Fully Transferable

2012 SX4 SEDAN LE
COLOR: CRIMSON RED METALLIC TRANSMISSION: MANUAL

MANUFACTURER'S SUGGESTED RETAIL PRICE $15,495.00

BEST VALUE FEATURES:

PERFORMANCE:

2.0L DOHC 16 Valve I-4 Engine 150 HP @ 6,200 RPM 140 LB-FT @ 4,000 RPM	INCLUDED
6-Speed Manual Transmission	INCLUDED
Zero Maintenance Timing Chain	INCLUDED
P195/65R15 All-Season Tires	INCLUDED
4-Wheel Disc Brakes	INCLUDED

SAFETY & SECURITY:

Electronic Stability Control	INCLUDED
Anti-Lock Brakes With EBD	INCLUDED
8 Standard Airbags Dual Front Facing Front Side Seat Mounted Rear Side Seat Mounted Front & Rear Head Curtain	INCLUDED
Tire Pressure Monitoring System (TPMS)	INCLUDED
LATCH System for Child Seats	INCLUDED
Rear Door Child Safety Locks	INCLUDED
Daytime Running Lamps	INCLUDED
Front Seat Belt Pretensioners	INCLUDED
Front & Rear Impact Door Beams	INCLUDED
Height Adjustable Driver & Front Pass. Safety Belts	INCLUDED

COMFORT & CONVENIENCE:

Air Conditioning	INCLUDED
Power Windows/Door Locks	INCLUDED
Power Mirrors	INCLUDED
CD/AM/FM Audio & MP3 AUX Jack	INCLUDED
Multi-Function Trip Computer	INCLUDED
Outside Temperature Gauge	INCLUDED
Tilt Steering Column	INCLUDED
Height Adjustable Driver Seat	INCLUDED
Split Folding Rear Seats	INCLUDED
Intermittent Multi-SPD Wipers	INCLUDED
12V Power Outlet	INCLUDED
Front & Rear Cupholders	INCLUDED
Aluminum Interior Accents	INCLUDED

OPEN ROAD PROMISE:

*100,000 Mile 7YR Transferable Powertrain Limited Warranty	INCLUDED
*24/7/365 Roadside Assistance *Fleet Vehicles Excluded	INCLUDED

ADDITIONAL FEATURES:

Floor Mats	$125.00
Keyless Entry w/ Panic Alarm	$160.00
Premium Metallic Paint	$130.00

Destination and Handling	$765.00
VEHICLE PRICE	**$16,675.00**
TOTAL VEHICLE PRICE	**$16,675.00**

EPA Fuel Economy Estimates

CITY MPG **23** Expected range for most drivers **19** to **27** MPG

Estimated Annual Fuel Cost $2,137 based on 15,000 miles at $3.70 per gallon

Combined Fuel Economy

This Vehicle 26

14 — 41

All Compact Cars

HIGHWAY MPG **33** Expected range for most drivers **27** to **39** MPG

Your actual mileage will vary depending on how you drive and maintain your vehicle

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 0 %

MAJOR SOURCES OF FOREIGN PARTS CONTENT:
JAPAN 82 %

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

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: SAGARA, JAPAN
COUNTRY OF ORIGIN:
ENGINE: JAPAN
TRANSMISSION: JAPAN

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver	Not Rated
	Passenger	Not Rated

Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat	Not Rated
	Rear seat	Not Rated

Star ratings based on the risk of injury in a side impact.

Rollover ★★★★

Star ratings based on the risk of rollover in a single vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)

www.safercar.gov or 1-888-327-4236

PORT OF ENTRY: TACOMA
TRANSPORTATION MODE: Rail

SOLD TO: 412619
RAY SUZUKI

SHIP TO:
RAY SUZUKI
23 N ROUTE 12
FOX LAKE, IL 60020

VIN: JS2YC5A37C6300318

* See dealer for complete details.

Environmental Performance

Protect the environment, choose vehicles with higher scores:

Global Warming Score 7 (1 — Average new vehicle — 10 Cleanest)

Smog Score 4 (1 — Average new vehicle — 10 Cleanest)

Vehicle emissions are a primary contributor to global warming and smog. Scores are determined by the California Air Resources Board based on this vehicle's measured emissions. Please visit www.DriveClean.ca.gov for more information. California Environmental Protection Agency AIR RESOURCES BOARD

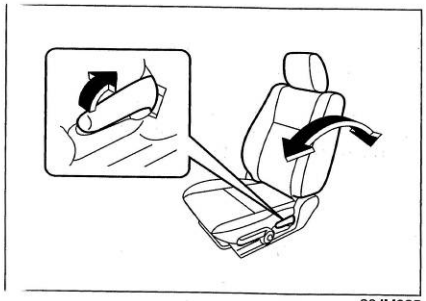
Monroney Label

Adjusting Seatbacks

⚠ WARNING

If the seatbacks are not in an upright position when driving, seat belt effectiveness may be reduced.

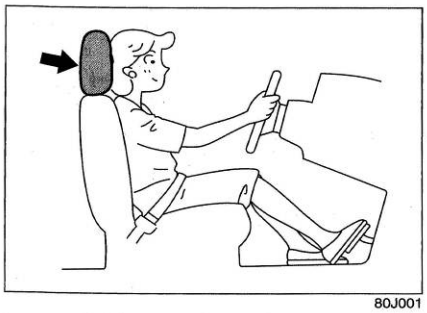
Make sure that all seatbacks are in an upright position when driving.



80JM025

To adjust the seatback angle of front seats, pull up the lever on the outboard side of the seat, move the seatback to the desired position, and release the lever to lock the seatback in place. After adjustment, try moving the seatback to make sure it is securely locked.

Head Restraints



80J001

Head restraints are designed to help reduce the risk of neck injuries in case of an accident.
Adjust the head restraint to the position which places the center of the head restraint closest to the top of your ears. If this is not possible for very tall passengers, adjust the head restraint as high as possible.

⚠ WARNING

Failure to place the head restraints in their proper positions can result in neck injury in the event of a crash.

All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a crash.

⚠ WARNING

If you do not reinstall head restraints after they have been removed, vehicle occupants will not be properly protected.

Be sure to reinstall all head restraints after removal to properly protect vehicle occupants.

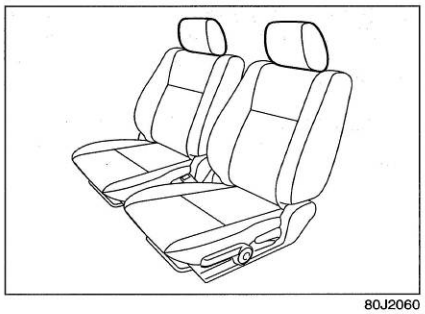
Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

⚠ WARNING

There is an increased risk of injury in a sudden stop or collision if occupants' head restraints are not installed and properly adjusted. If you attempt to adjust the head restraint while driving, you could lose control of the vehicle.

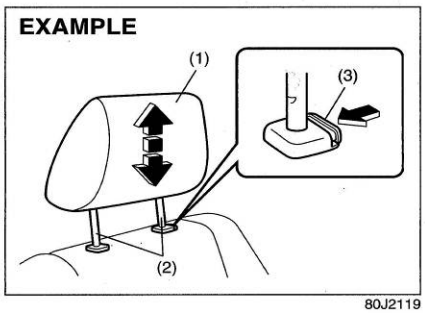
- **Never drive the vehicle with head restraints removed.**
- **Do not attempt to adjust the head restraint while driving.**

Front



80J2060

Each front seats is equipped with a head restraint.

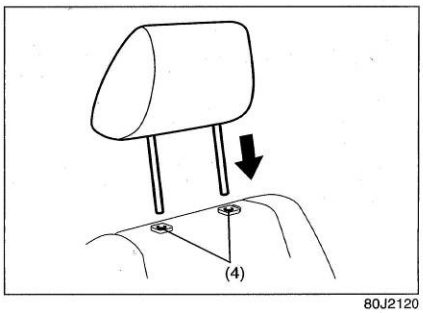


80J2119

(1) head restraint
(2) bars
(3) release knob

To raise the head restraint, pull upward on the restraint until it clicks. To lower the restraint, push down on the restraint while holding in the release knob (3). If a head restraint must be removed (for cleaning, replacement, etc.), push in the release knob and pull the head restraint all the way out.

NOTE:
It may be necessary to recline the seatback to provide enough overhead clearance to remove the head restraint.



80J2120

To reinstall the head restraint, insert the head restraint bars into the holes (4) and push the head restraint down.

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

Rear Seats

Head Restraints

Head restraints are designed to help reduce the risk of neck injuries in the case of an accident.

⚠ WARNING

Failure to place the head restraints in their proper positions can result in neck injury in the event of a crash.

All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a crash.

⚠ WARNING

If you do not reinstall head restraints after they have been removed, vehicle occupants will not be properly protected.

Be sure to reinstall all head restraints after removal to properly protect vehicle occupants.

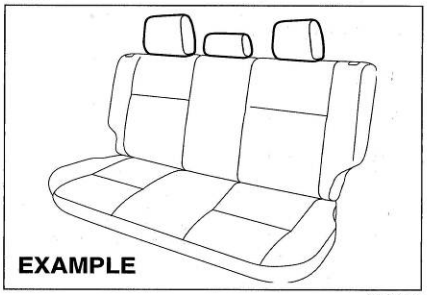
⚠ WARNING

There is an increased risk of injury in a sudden stop or collision if occupants' head restraints are not installed and properly adjusted. If you attempt to adjust the head restraint while driving, you could lose control of the vehicle.

- **Never drive the vehicle with head restraints removed.**
- **Do not attempt to adjust the head restraint while driving.**

Adjust the head restraint to the position which places the center of the head restraint closest to the top of your ears. If this is not possible for very tall passengers, adjust the head restraint as high as possible.

Rear

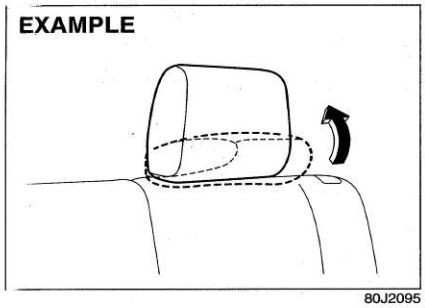


80J2094

Your vehicle is equipped with three head restraints on the rear seat.

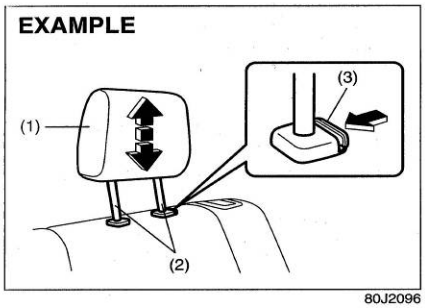
Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Left and right seating position



80J2095

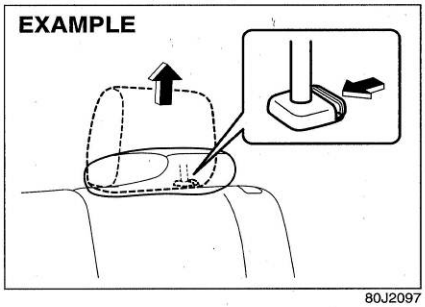
To use the head restraint, raise it upright if it is tipped forward.



80J2096

(1) head restraint
(2) bars
(3) release knob

To raise the head restraint, pull upward on the restraint until it clicks. To lower the restraint, push down on the restraint while holding in the release knob (3).



80J2097

If a head restraint must be removed (for cleaning, replacement, etc.), tip the head restraint forward and then pull it up while holding the release knob pushed in.

NOTE:
You cannot remove the head restraint without tipping it forward; in the upright position, the head restraint touches the cabin ceiling before it can be removed.

⚠ WARNING

There is an increased risk of injury in a sudden stop or collision if a rear seat occupant's head restraint is removed or tipped forward.

Never allow anyone to sit on the rear seat with the head restraint removed or tipped forward.

⚠ WARNING

If removed head restraints are not secured in the vehicle, they may fly around in a sudden stop or collision injuring vehicle occupants.

Make sure that any removed head restraints are secured in the vehicle.

To reinstall the head restraints, do the following:
For the left and right seating places, insert the head restraint while still in its forward-tipped position (do not face the backside forward) into the seatback until it locks.
Then tilt it back to the normal position. The height of the reinstalled head restraints must be adjusted properly before use.

Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

⚠ WARNING

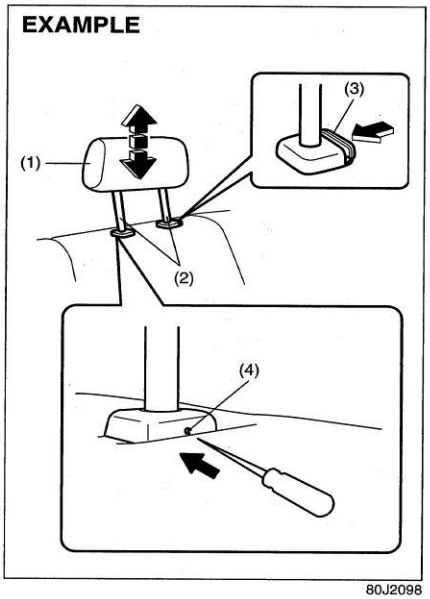
If the head restraints are not firmly installed in the proper position, they will not provide the intended protection. If head restraints are installed with the backside facing forward, their height cannot be adjusted.

When reinstalling head restraints, make sure that they are firmly installed in the proper position.

NOTE:
When there is no occupant in the rear seat, it is recommended to tilt the head restraints forward to have a better rearward view.

When installing a child restraint system, raise the head restraint to the most upper position.

Center seating position



80J2098

(1) head restraint
(2) bars
(3) release knob
(4) hole

To raise the head restraint, pull upward on the restraint until it clicks. To lower the restraint, push down on the restraint while holding in the release knob (3).
If the head restraint must be removed (for cleaning, replacement, etc.), use the following procedure.

1) Insert a sharp-pointed tool into the small hole (4). Push the tip into the hole (4) and hold it while pushing in the release knob (3).
2) Pull the head restraint all the way out while pushing the release knob (3) and holding the tip in the hole (4).

⚠ WARNING

If removed head restraints are not secured in the vehicle, they may fly around in a sudden stop or collision injuring vehicle occupants.

Make sure that any removed head restraints are secured in the vehicle.

To reinstall the head restraints, do the following:
With the correct side facing forward, insert the head restraint into the seat until it is locked at a height. Then adjust the height as desired.

2-29

Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

⚠ WARNING

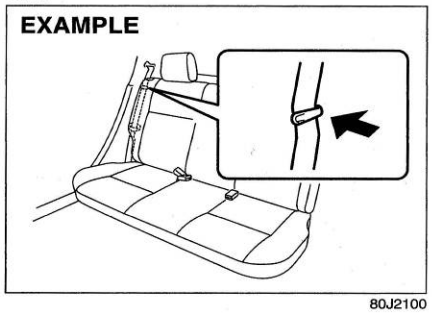
If the head restraints are not firmly installed in the proper position, they will not provide the intended protection. If head restraints are installed with the backside facing forward, their height cannot be adjusted.

When reinstalling head restraints, make sure that they are firmly installed in the proper position.

Folding Rear Seats
The rear seats of your vehicle can be folded forward to provide additional cargo space.

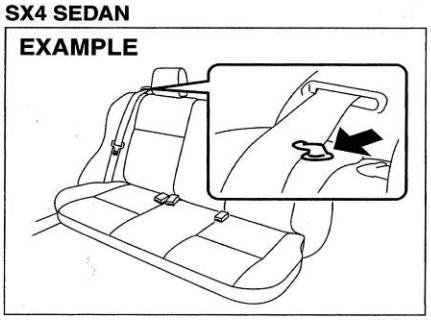
To fold the rear seats forward:

SX4



80J2100

SX4 SEDAN



80J2101

1) Hook the webbing of the outboard lap-shoulder belts in the belt hangers.

NOTICE

If the seat belt webbing is not hooked in the seat belt hanger, the seat belts may get caught in the seatback, seat hinge or seat latch and be damaged when you move the seatback.

Make sure the seat belt webbing is hooked in the seat belt hangers, and does not get twisted when you move the seatback.

2) Tip forward the head restraints for left and right seating position.

2-30

Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Post-Test Driver Dummy Knee Contact with Vehicle Interior View

Post-Test Rear Passenger Dummy Knee Contact with Vehicle Interior View

APPENDIX B

DUMMY RESPONSE DATA PLOTS

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Driver Dummy Instrumentation Plots

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Figure No. 21.	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
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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)

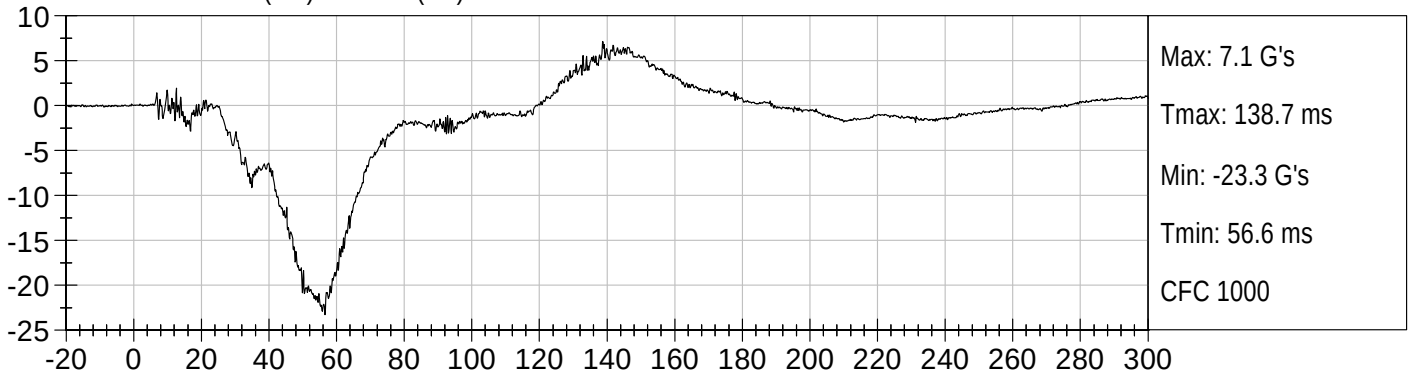
Left MDB Contact Switch

Right MDB Contact Switch

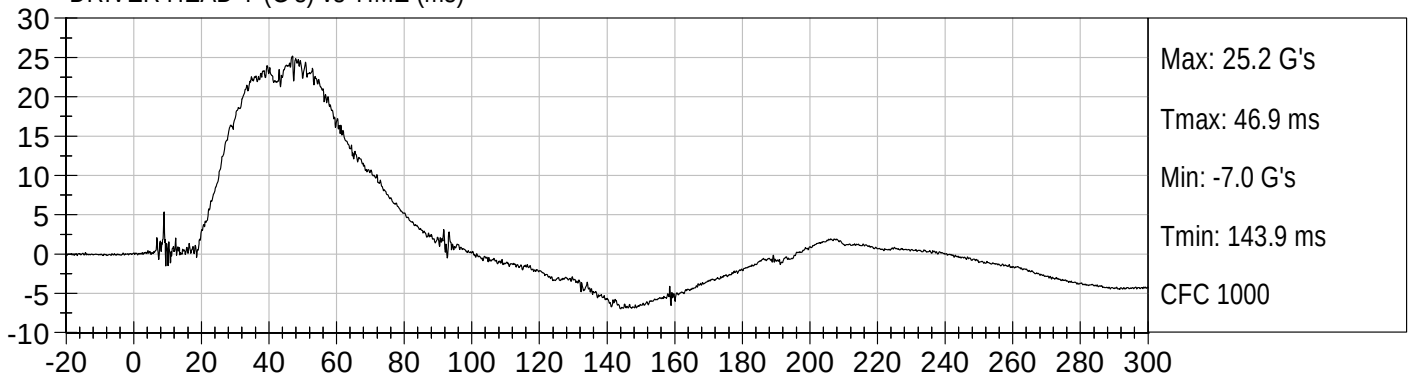
55/28 km/h 90° MDB Side Impact
2012 Suzuki SX4 - MC0525

Test Date: 01/10/2012
Speed: 38.6 mph (62.1 km/h)

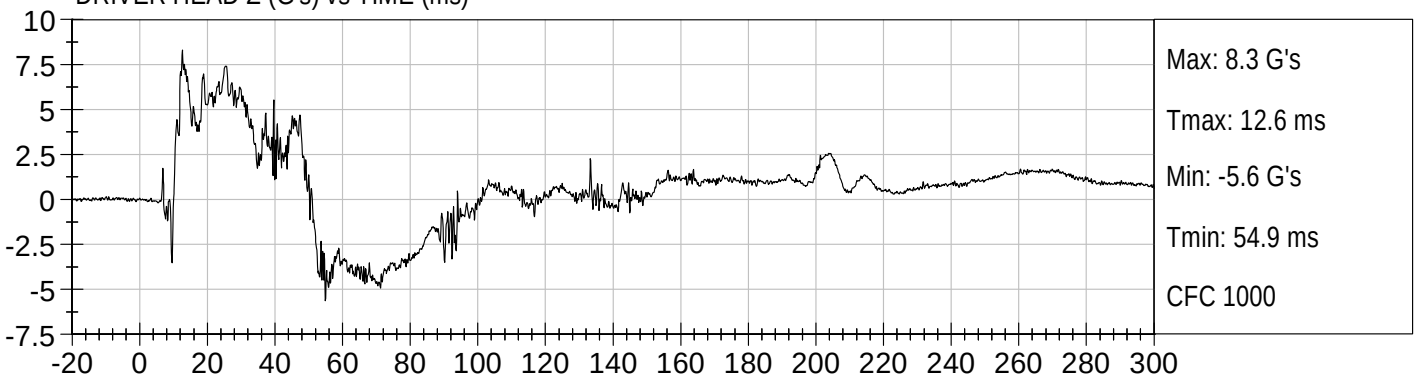
DRIVER HEAD X (G's) vs TIME (ms)



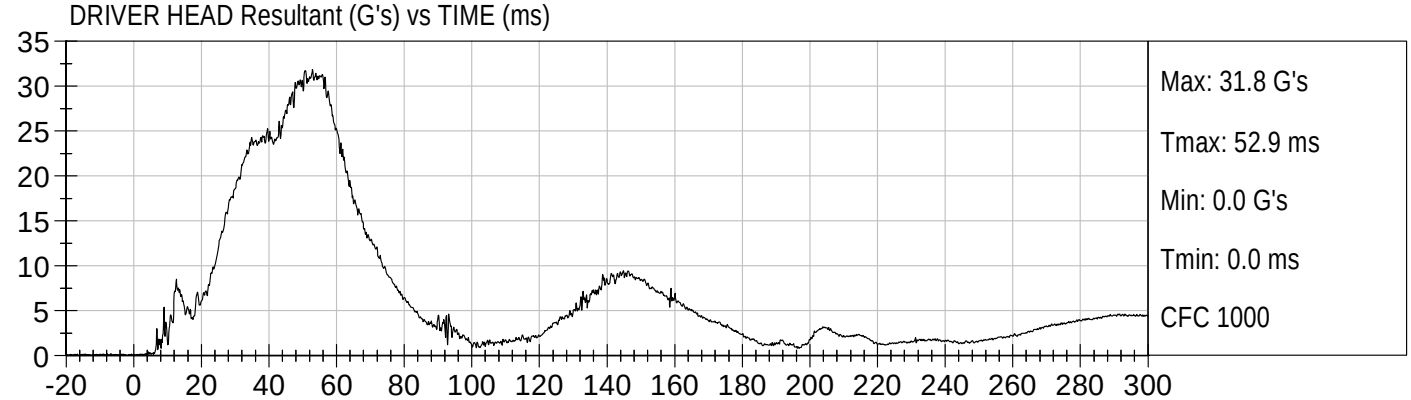
DRIVER HEAD Y (G's) vs TIME (ms)



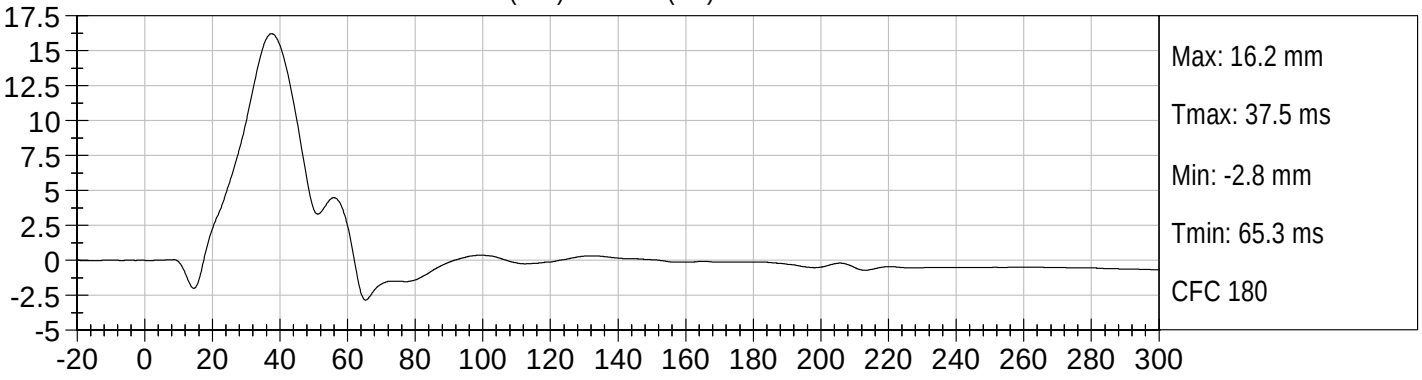
DRIVER HEAD Z (G's) vs TIME (ms)



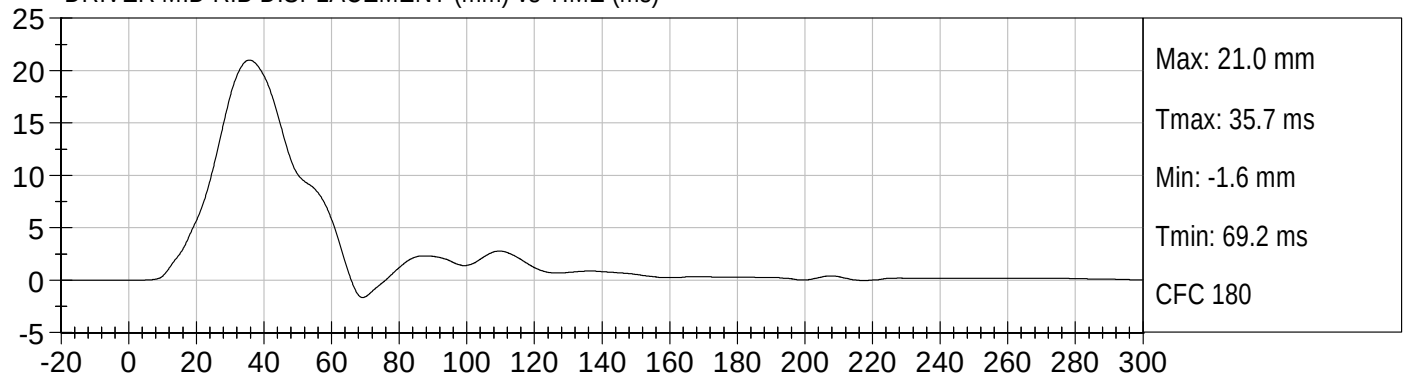
DRIVER HEAD Resultant (G's) vs TIME (ms)



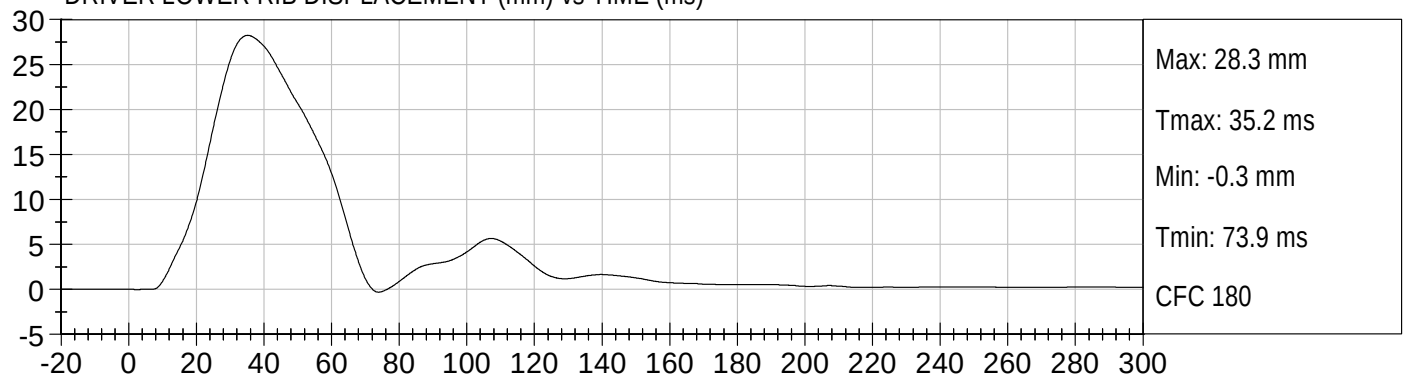
DRIVER UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



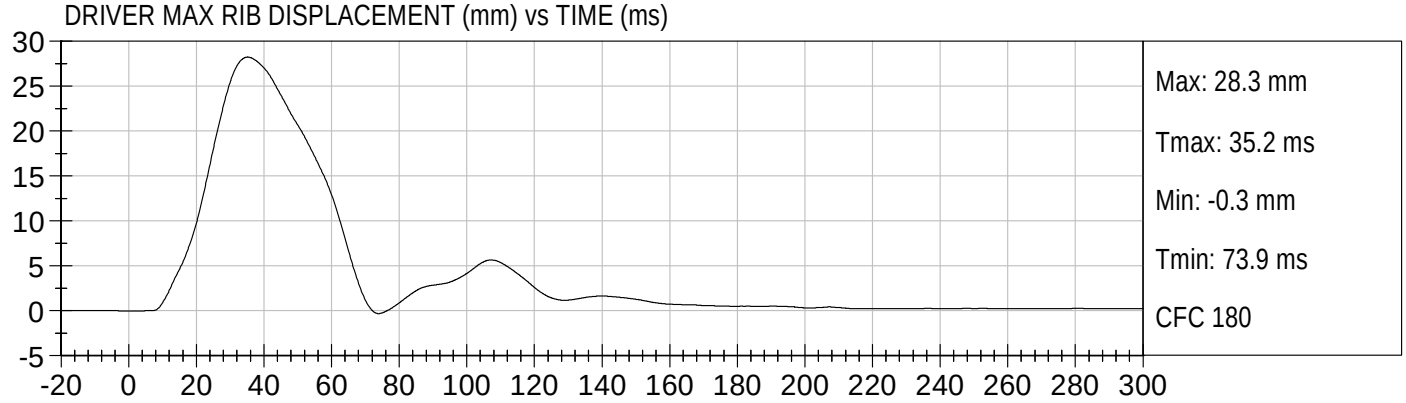
DRIVER MID RIB DISPLACEMENT (mm) vs TIME (ms)



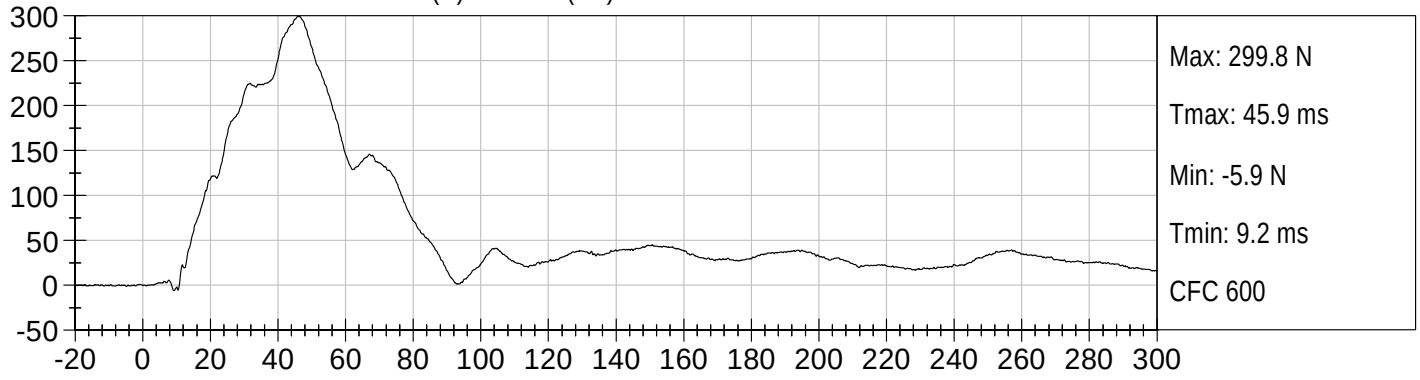
DRIVER LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



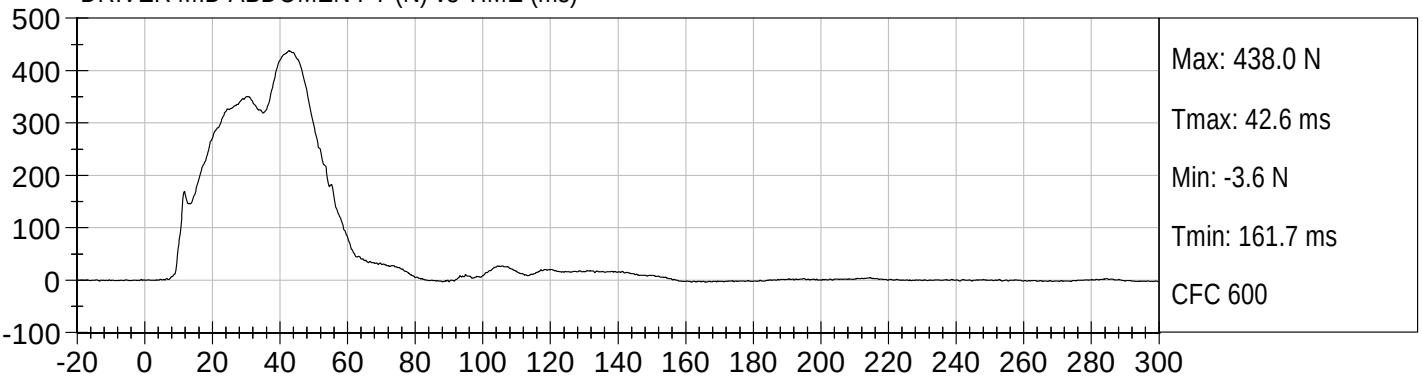
DRIVER MAX RIB DISPLACEMENT (mm) vs TIME (ms)



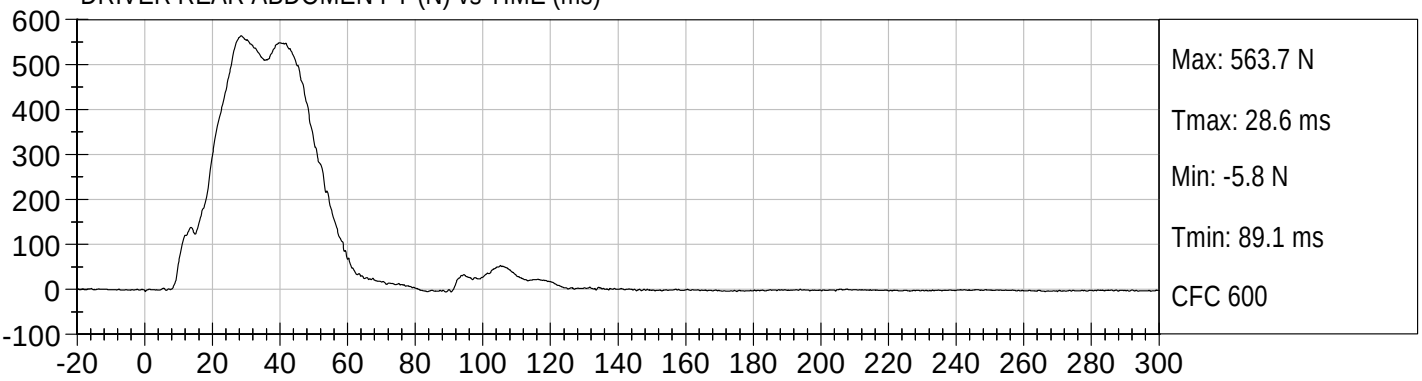
DRIVER FRONT ABDOMEN FY (N) vs TIME (ms)



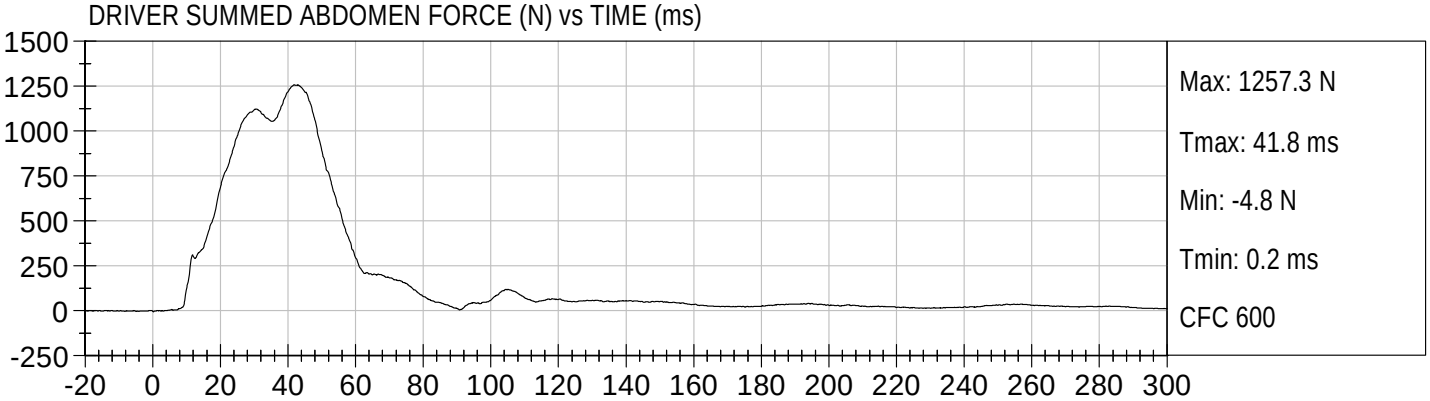
DRIVER MID ABDOMEN FY (N) vs TIME (ms)



DRIVER REAR ABDOMEN FY (N) vs TIME (ms)

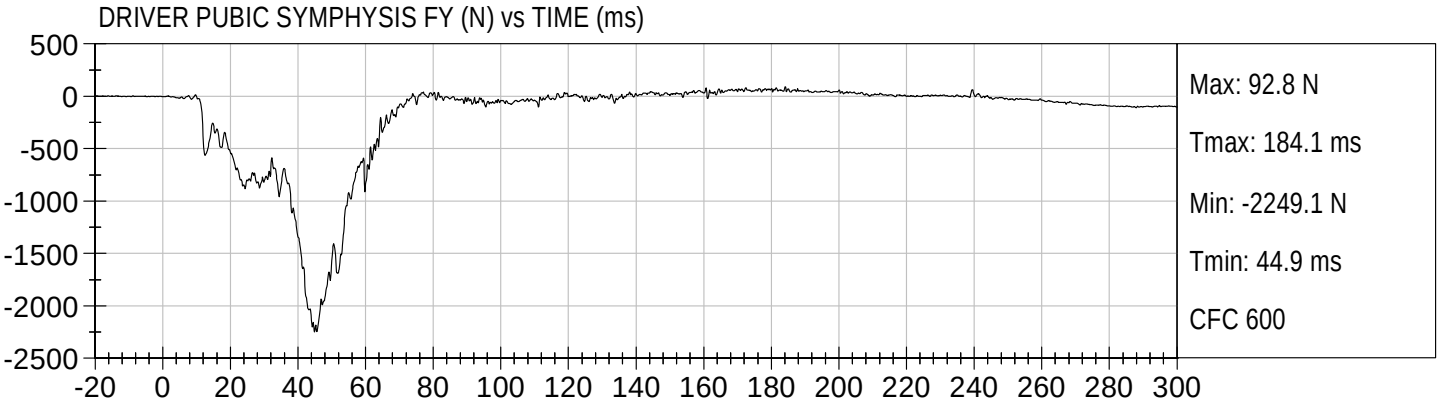


DRIVER SUMMED ABDOMEN FORCE (N) vs TIME (ms)



55/28 km/h 90° MDB Side Impact
2012 Suzuki SX4 - MC0525

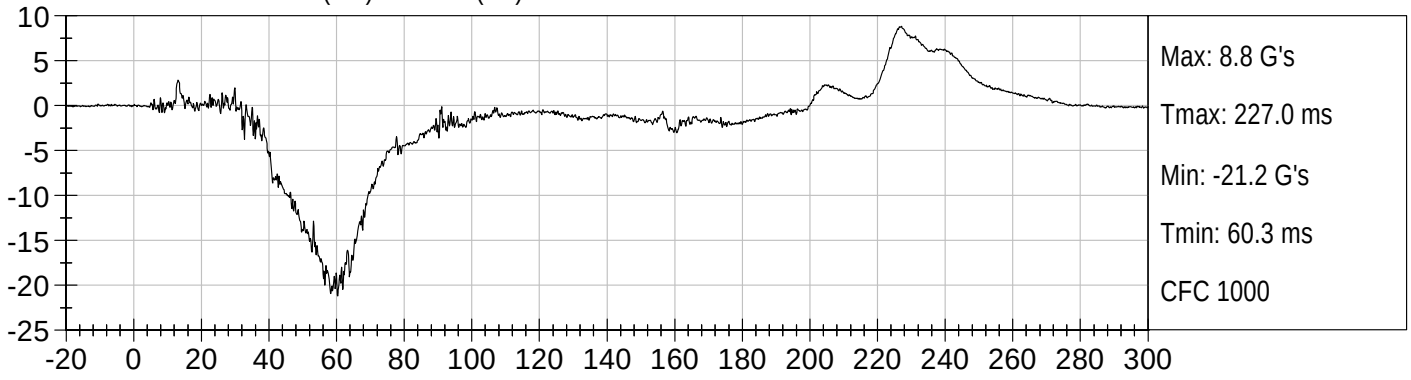
Test Date: 01/10/2012
Speed: 38.6 mph (62.1 km/h)



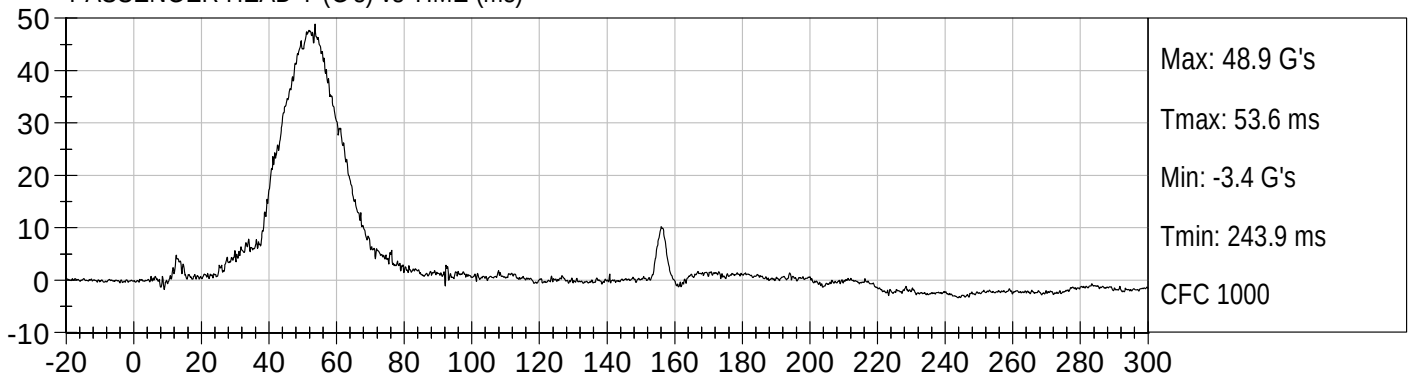
55/28 km/h 90° MDB Side Impact
2012 Suzuki SX4 - MC0525

Test Date: 01/10/2012
Speed: 38.6 mph (62.1 km/h)

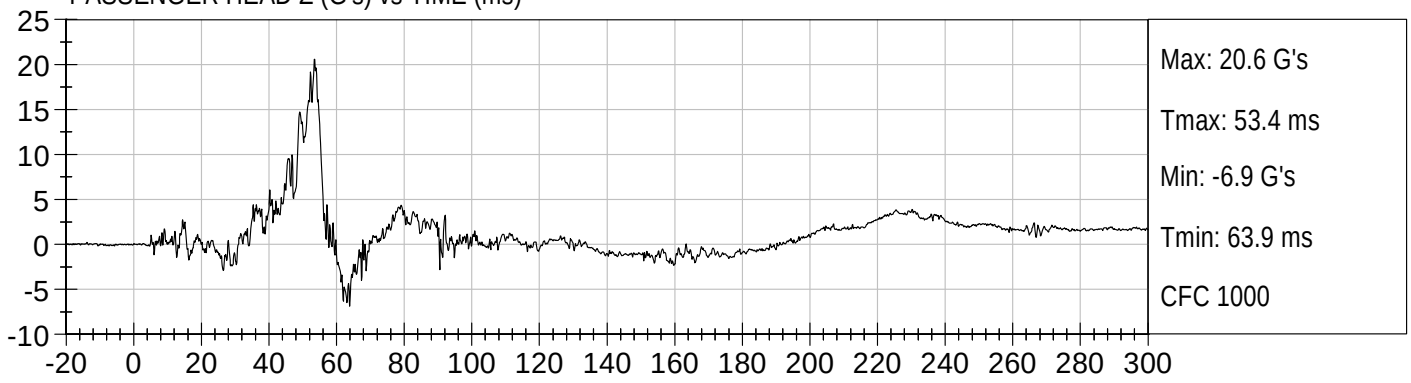
PASSENGER HEAD X (G's) vs TIME (ms)



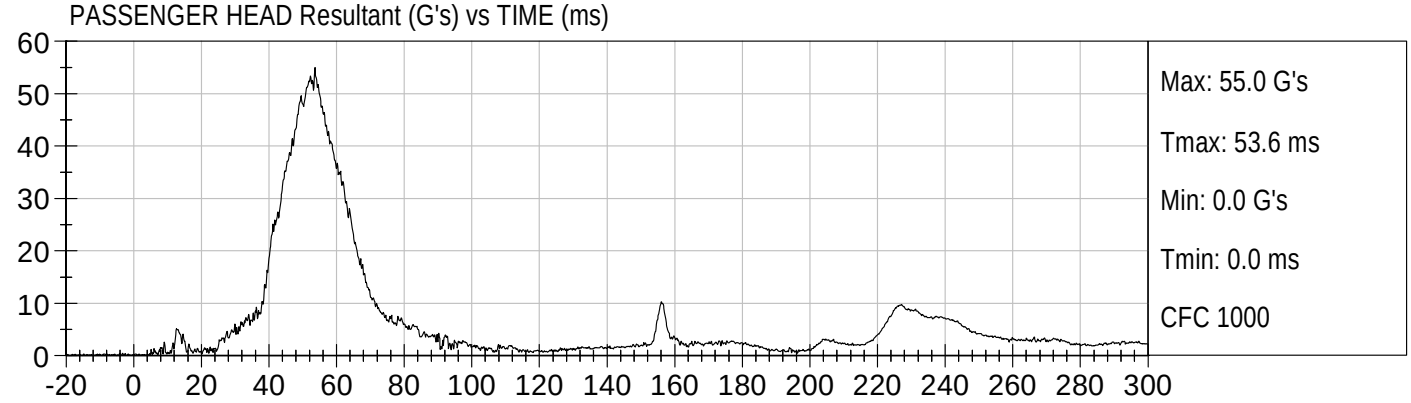
PASSENGER HEAD Y (G's) vs TIME (ms)



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



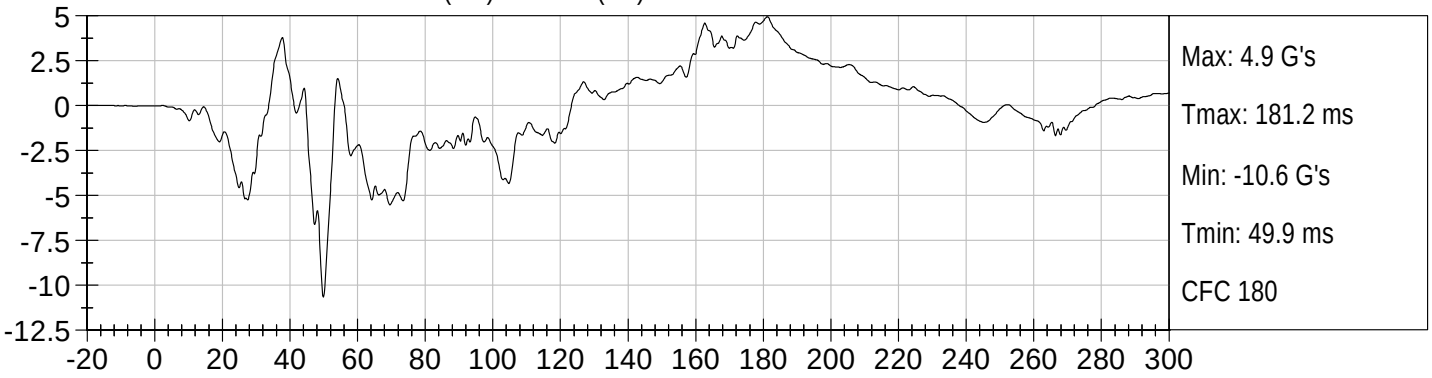
PASSENGER HEAD Resultant (G's) vs TIME (ms)



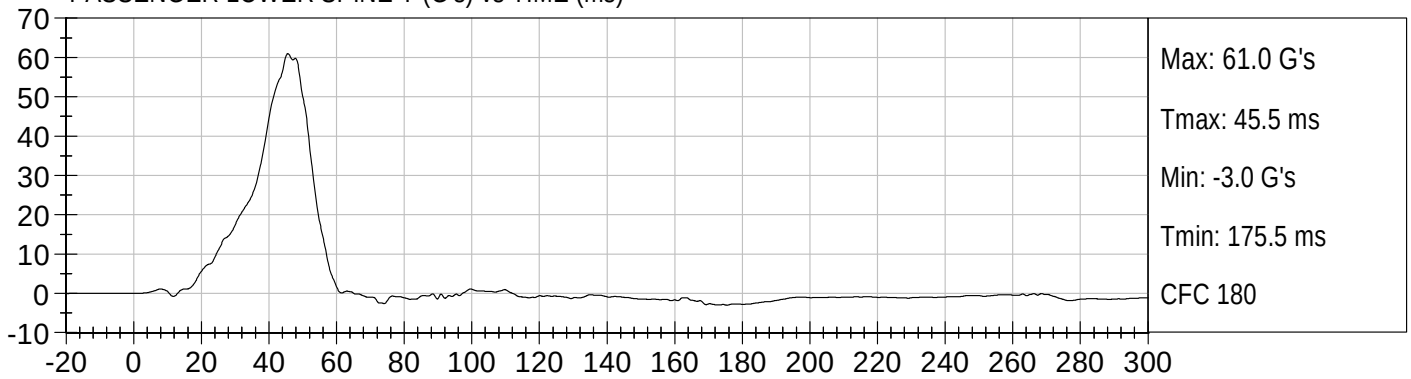
55/28 km/h 90° MDB Side Impact
2012 Suzuki SX4 - MC0525

Test Date: 01/10/2012
Speed: 38.6 mph (62.1 km/h)

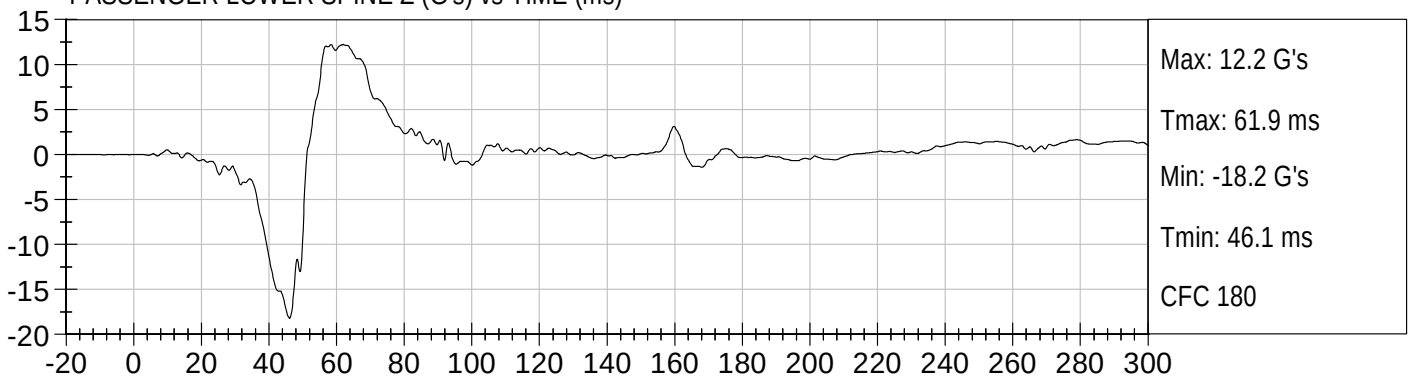
PASSENGER LOWER SPINE X (G's) vs TIME (ms)



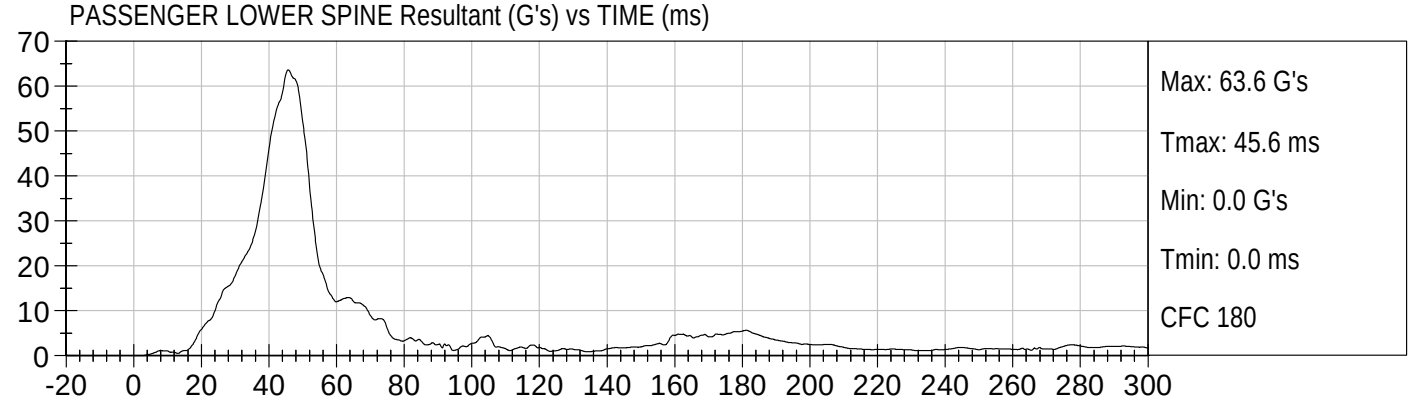
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



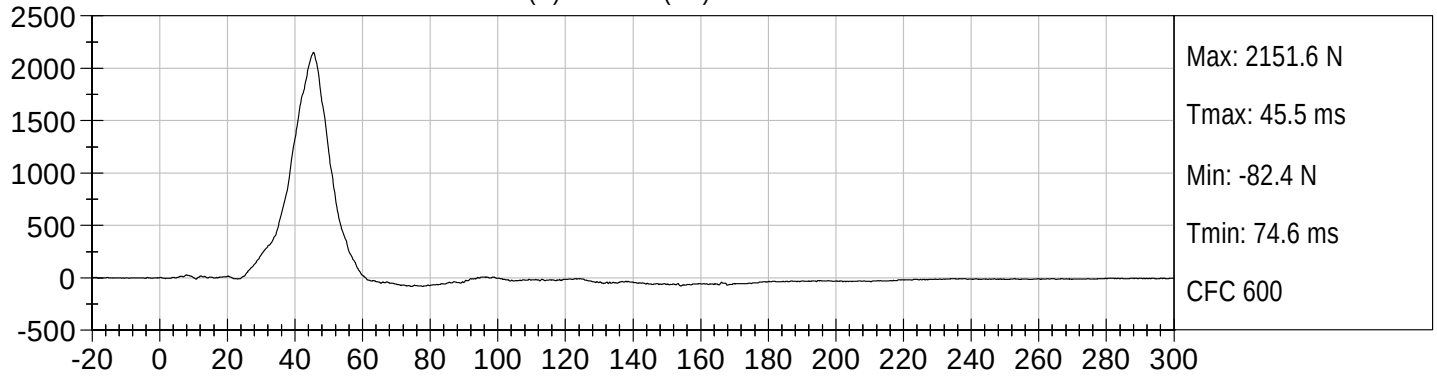
PASSENGER LOWER SPINE Z (G's) vs TIME (ms)



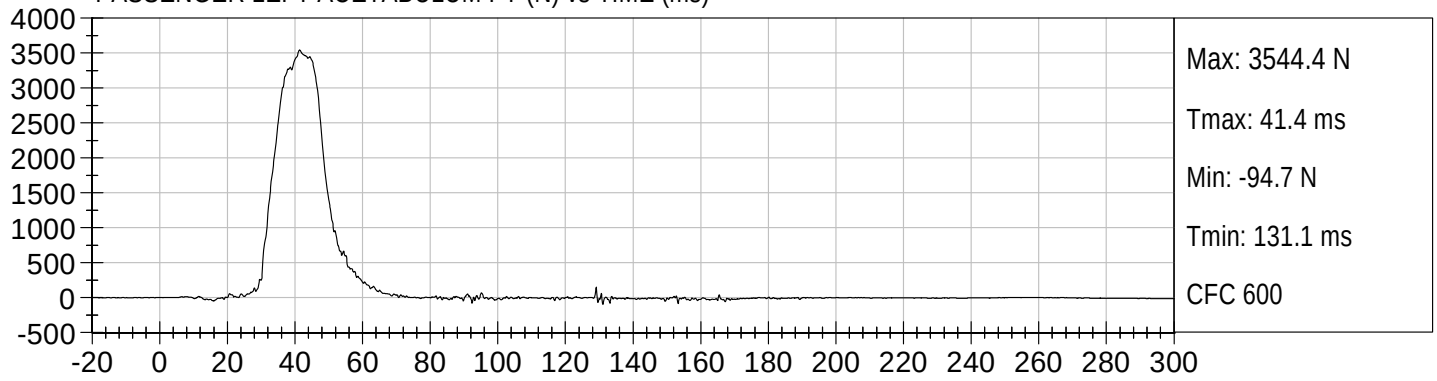
PASSENGER LOWER SPINE Resultant (G's) vs TIME (ms)



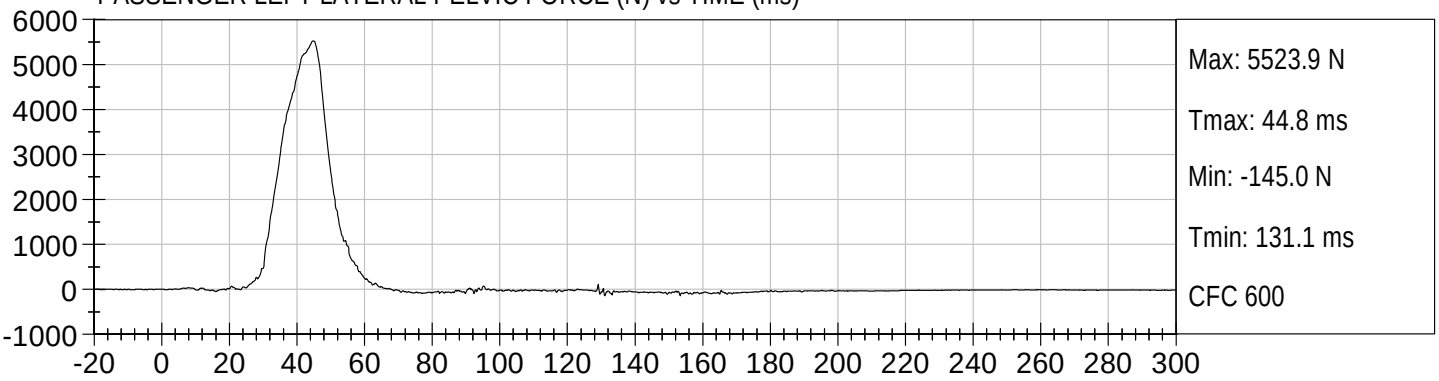
PASSENGER LEFT ILLIUM CREST FY (N) vs TIME (ms)



PASSENGER LEFT ACETABULUM FY (N) vs TIME (ms)



PASSENGER LEFT LATERAL PELVIC FORCE (N) vs TIME (ms)



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

ES-2re External Measurements
SN: 032

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

MGA RESEARCH CORPORATION

HEAD DROP TEST

ES-2re DUMMY

ATD Serial No: 032 **Test ID:** D12041

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Peak Resultant Acceleration	G's	125 to 155	150	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-12.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

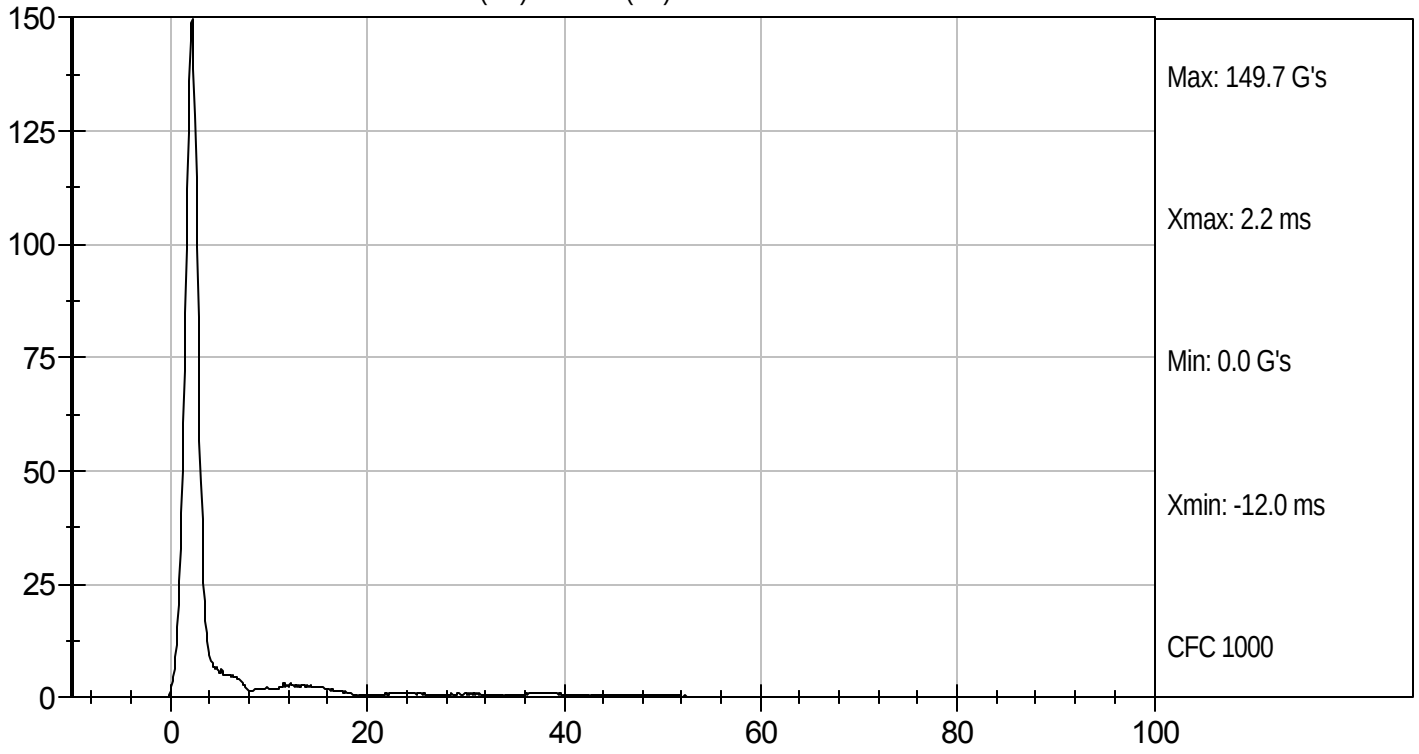
1/6/12
Test Date

David Winkelbauer
Approved By

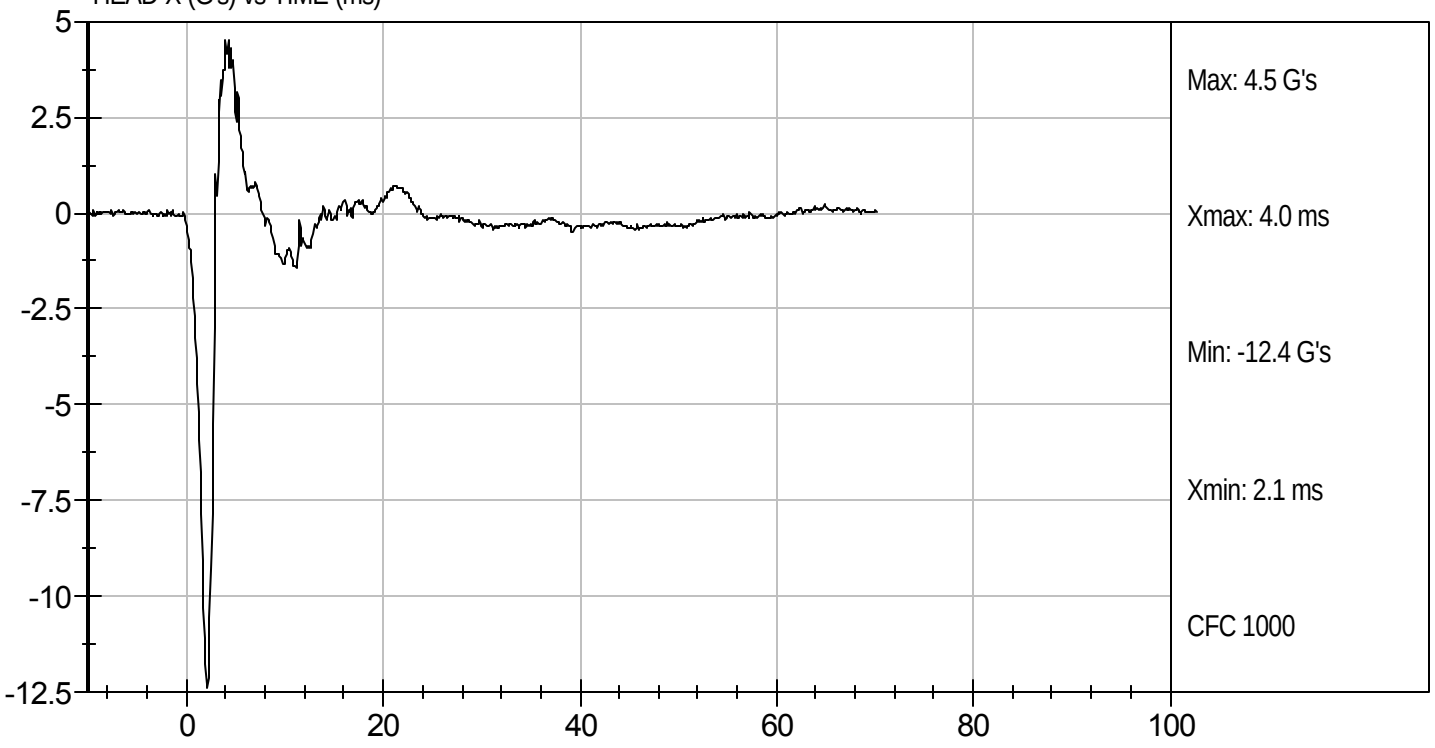
Test Desc: Head Drop
Component ID: D12041

Test Date: 1/6/12
Velocity: 0 ft/s, 0 m/s

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



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



MGA RESEARCH CORPORATION

NECK PENDULUM TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12042

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	24	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.4	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.02	Pass
	3 ms	m/s	-0.25 to -0.375	-0.34	Pass
	14 ms	m/s	-3.20 to -3.70	-3.32	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.5	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	60.8	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	57.8	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

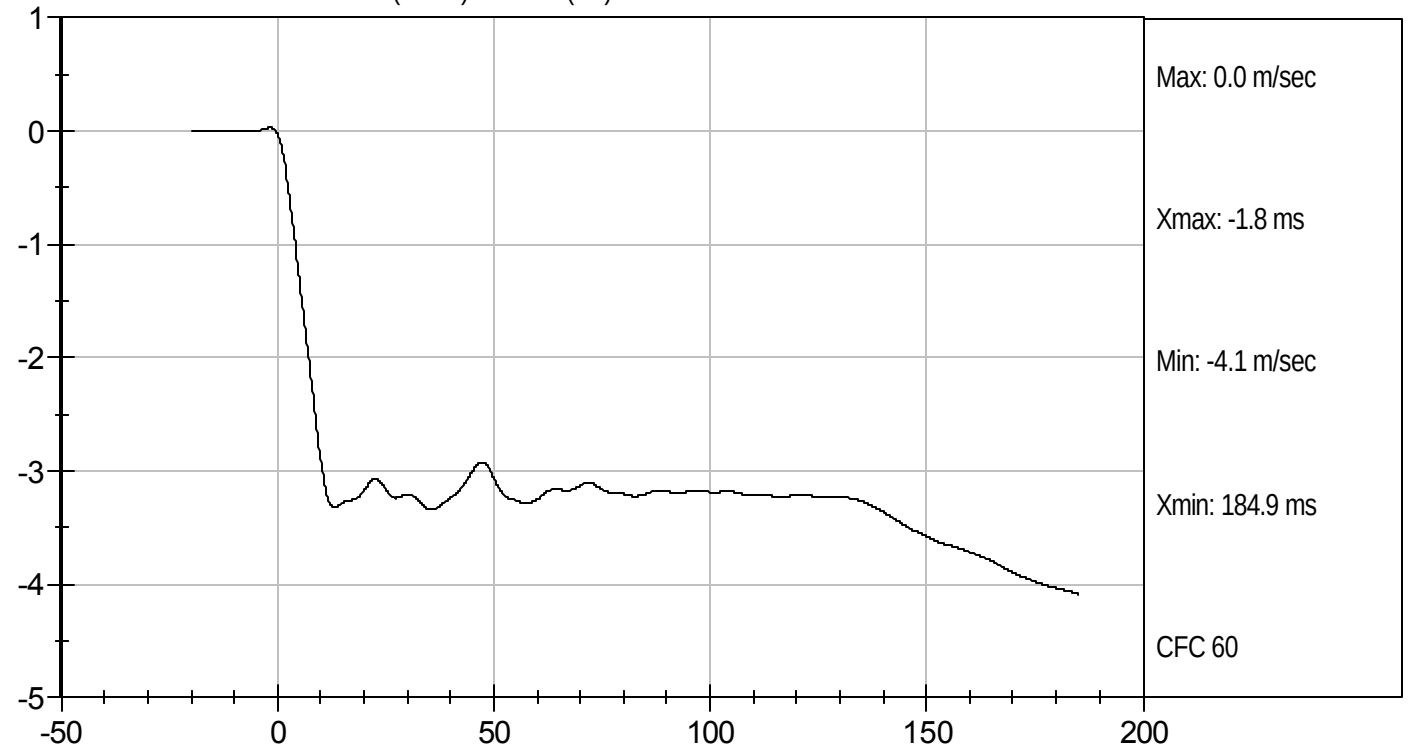
1/6/12
Test Date

David Winkelbauer
Approved By

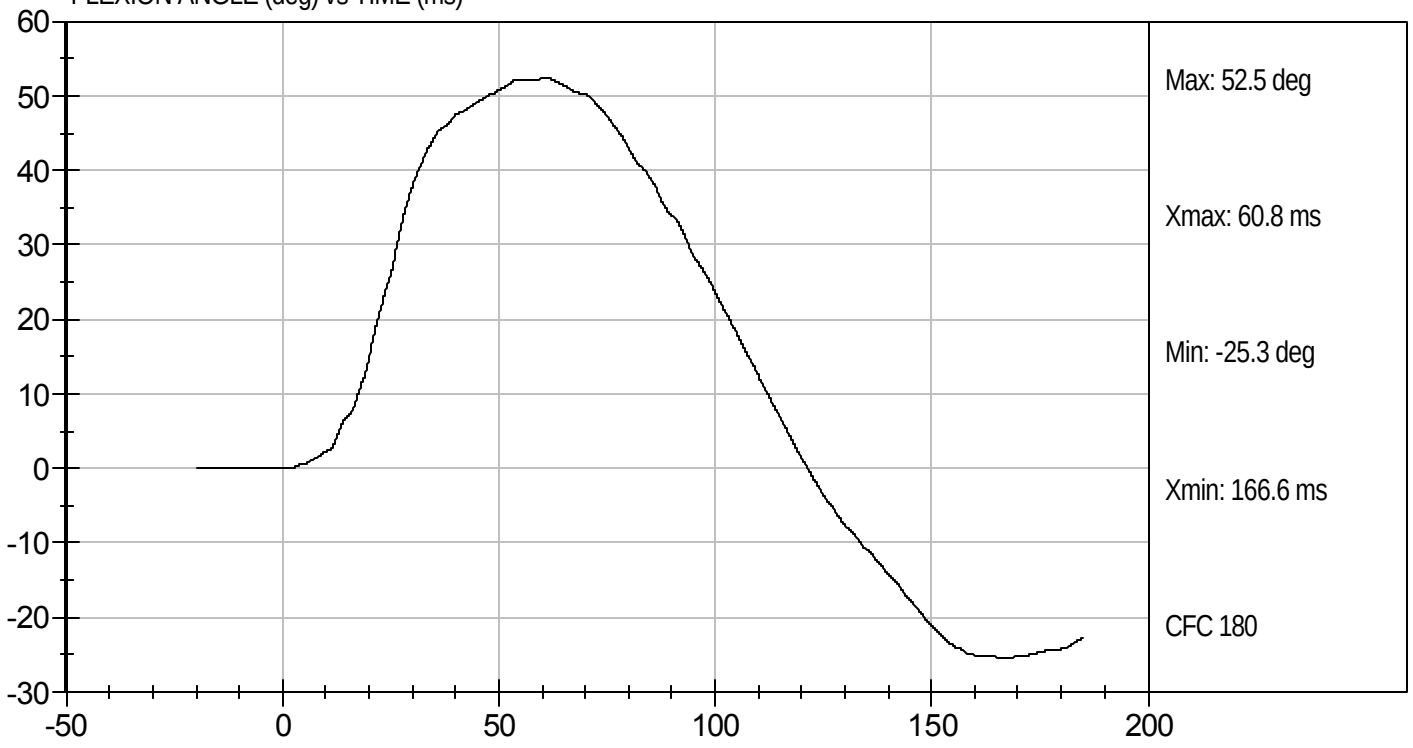
Test Desc: Neck Bending
Component ID: D12042

Test Date: 1/6/12
Velocity: 11.11 ft/s, 3.39 m/s

PENDULUM DECELERATION (m/sec) vs TIME (ms)

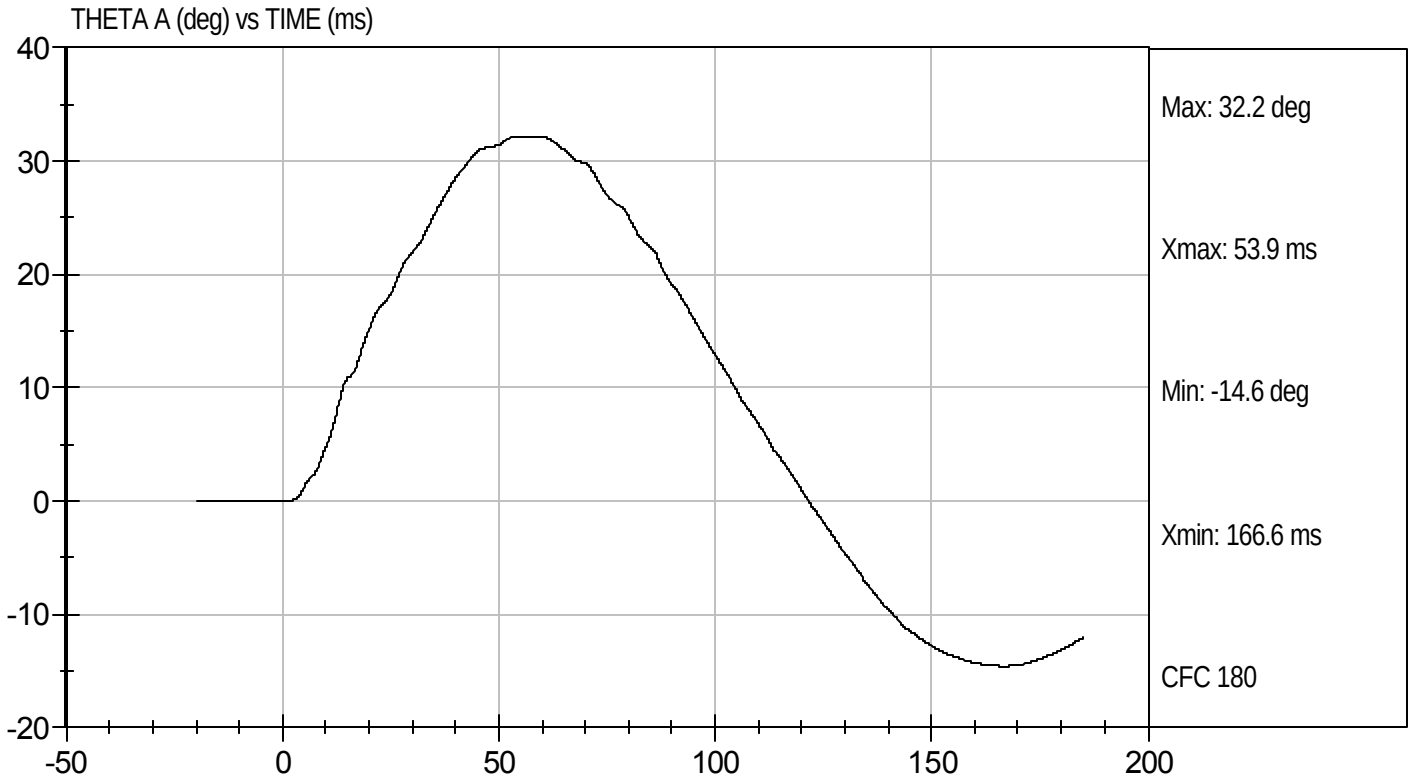


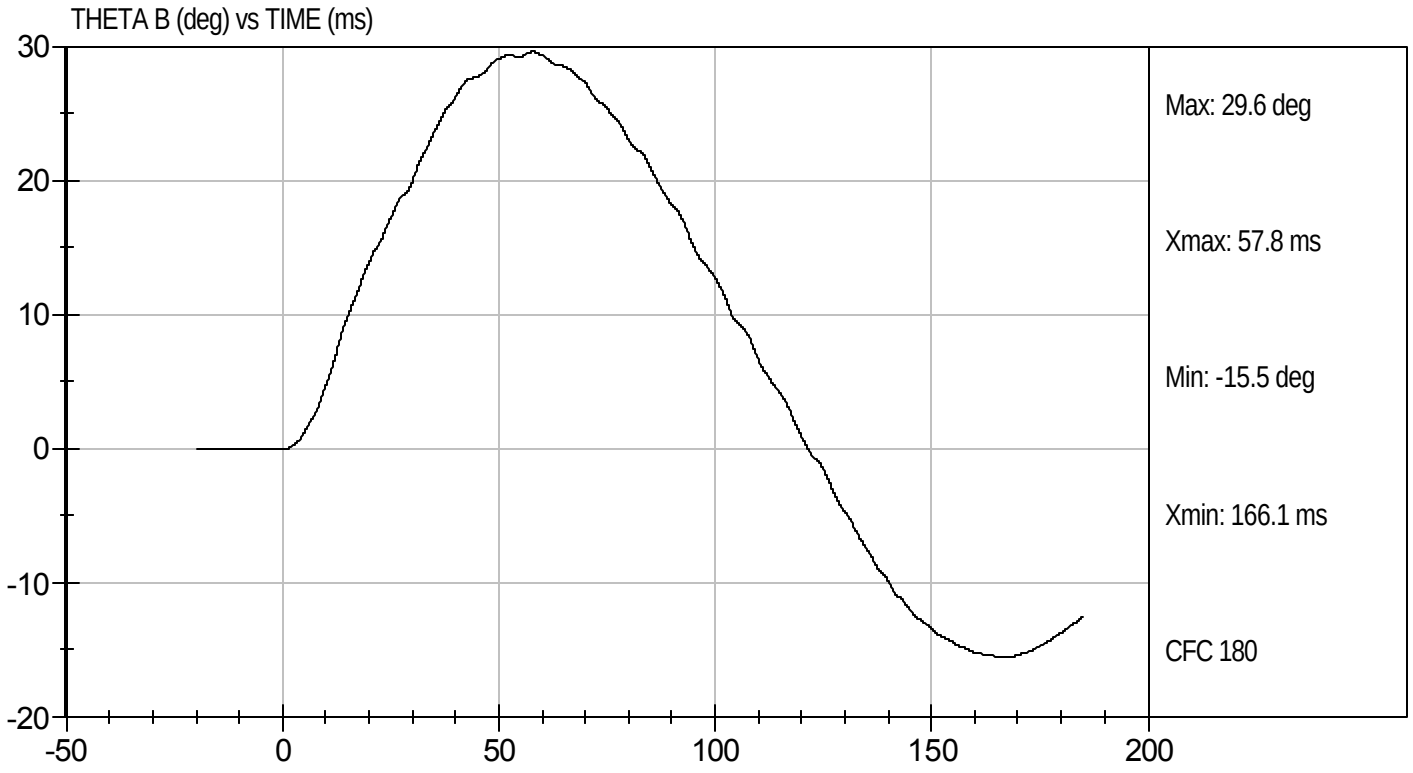
FLEXION ANGLE (deg) vs TIME (ms)



Test Desc: Neck Bending
Component ID: D12042

Test Date: 1/6/12
Velocity: 11.11 ft/s, 3.39 m/s





MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12043

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.0	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.3	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

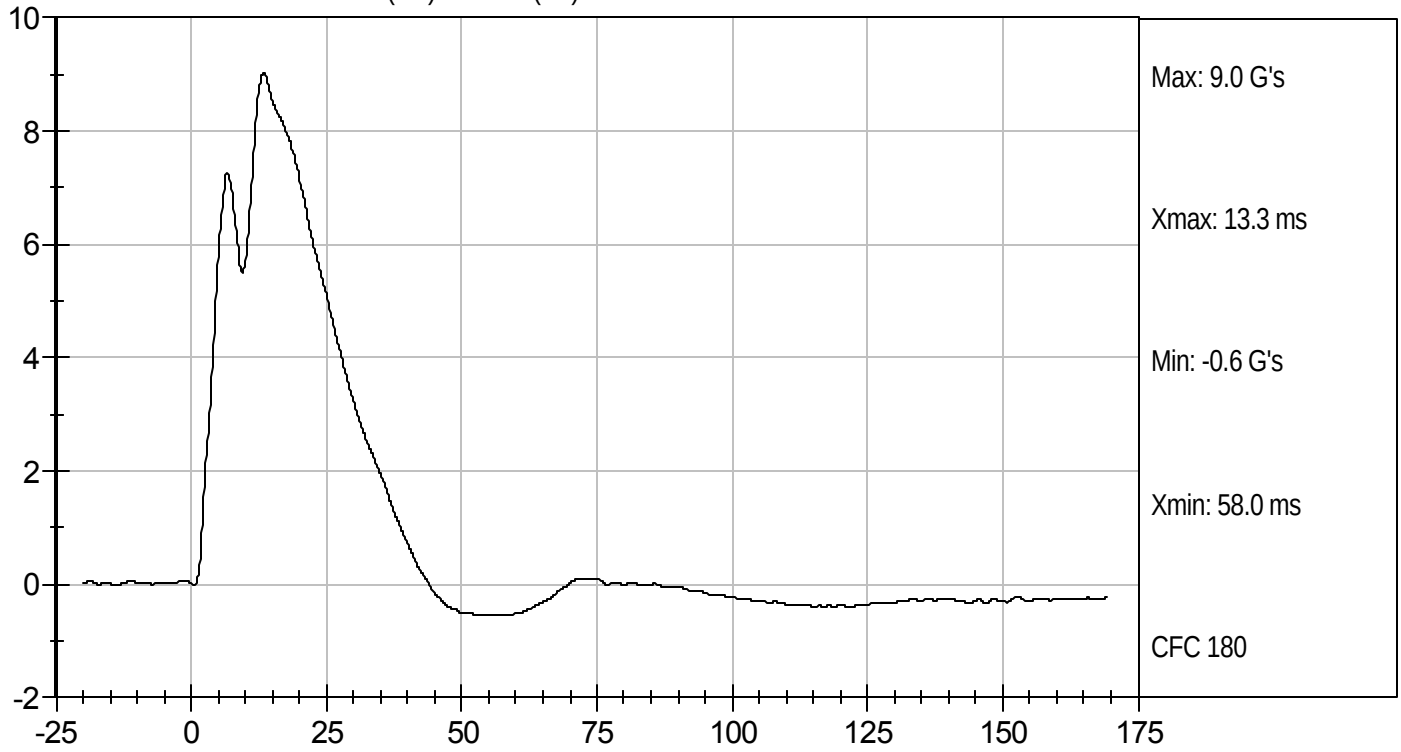
1/6/12
Test Date

David Winkelbauer
Approved By

Test Desc: Shoulder Impact
Component ID: D12043

Test Date: 1/6/12
Velocity: 14.12 ft/s, 4.3 m/s

SHOULDER ACCELERATION (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12044

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.6	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.2	Pass
		Overall Test Results		Pass

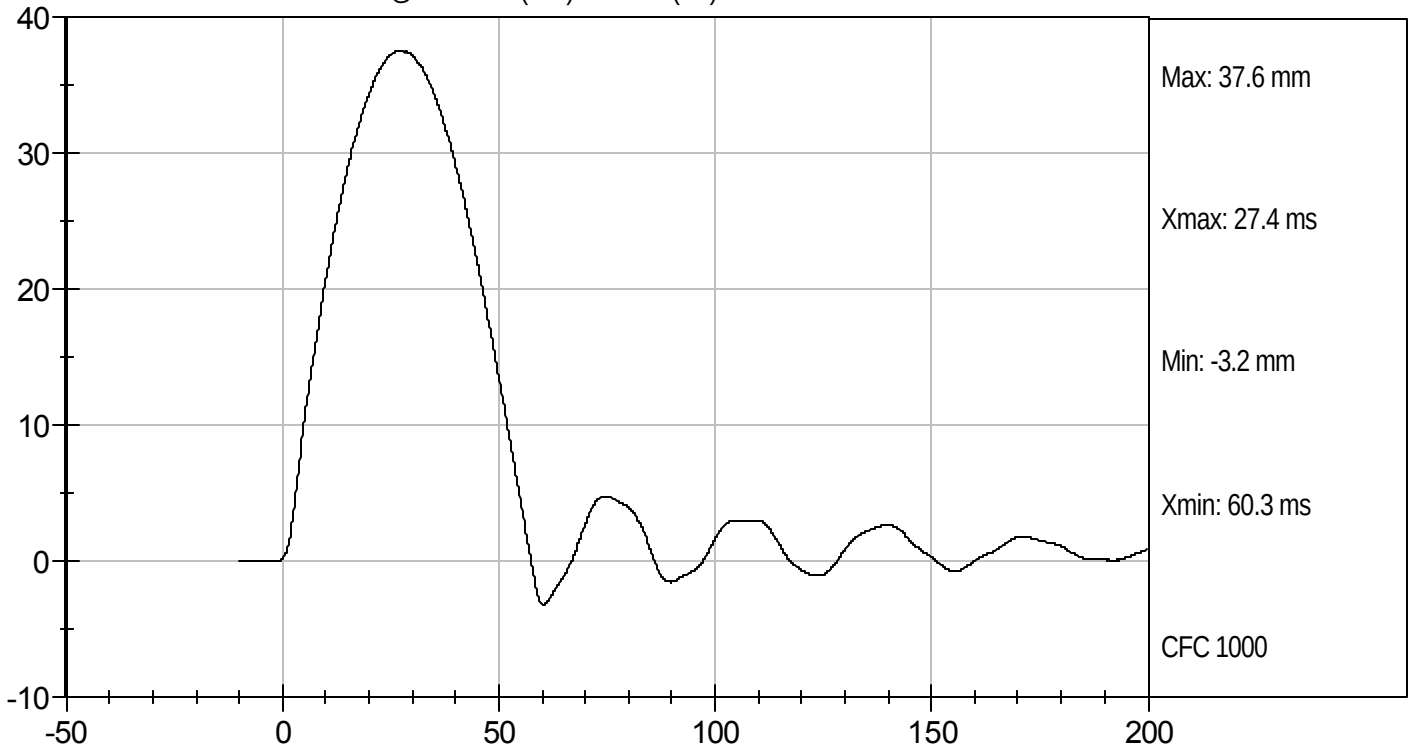
Jessica Gall
Laboratory Technician

1/6/12
Test Date

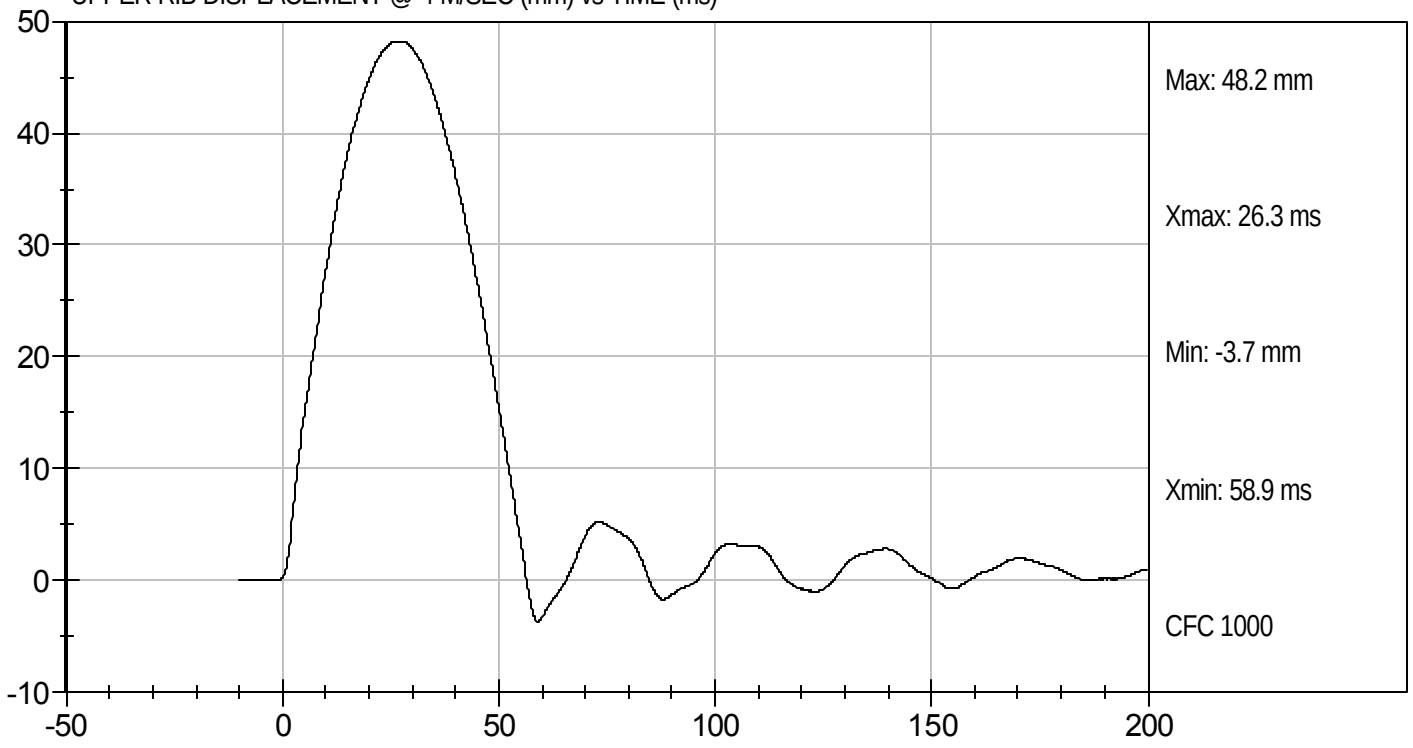
David Winkelbauer
Approved By

Test Desc: Rib Impact - Upper
Component ID: D12044
Test Date: 1/6/12

UPPER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

MID RIB TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12045

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.3	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.6	Pass
		Overall Test Results		Pass

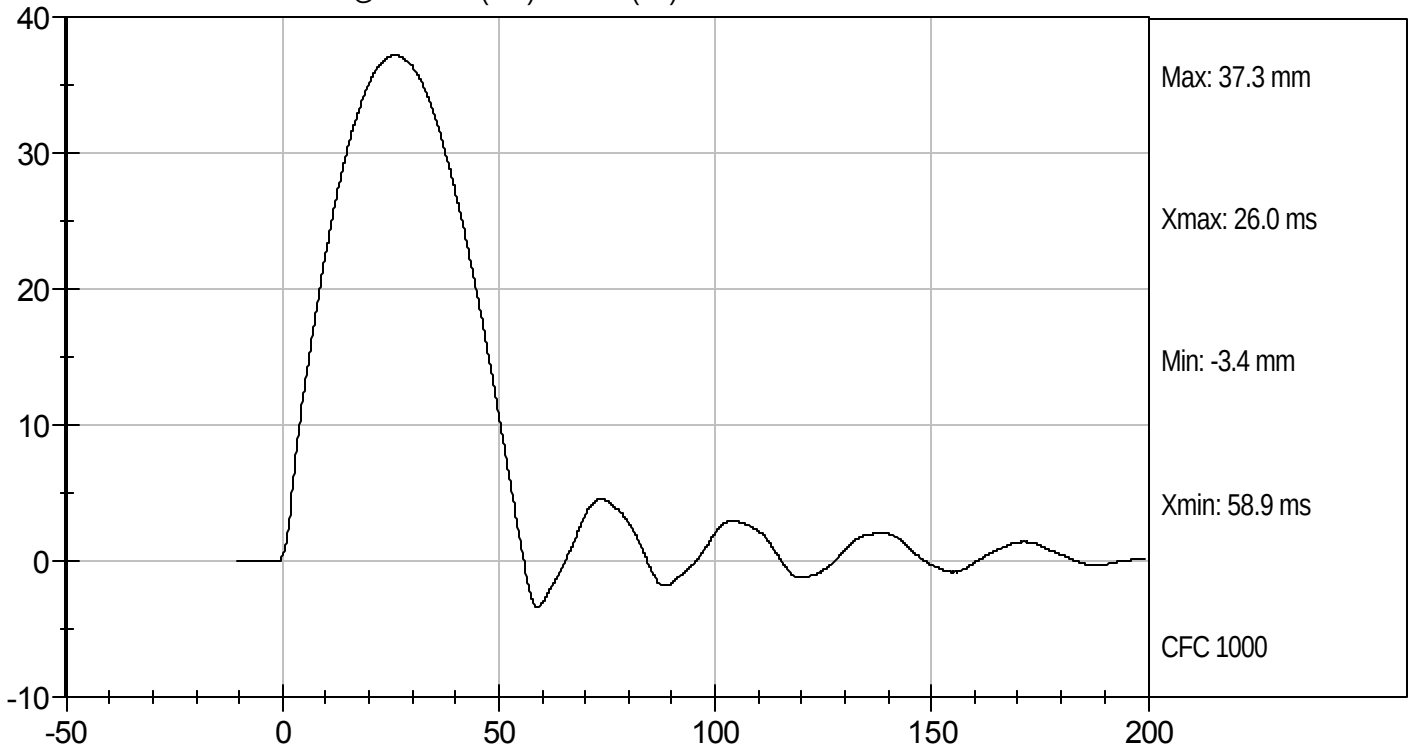
Jessica Hall
Laboratory Technician

1/6/12
Test Date

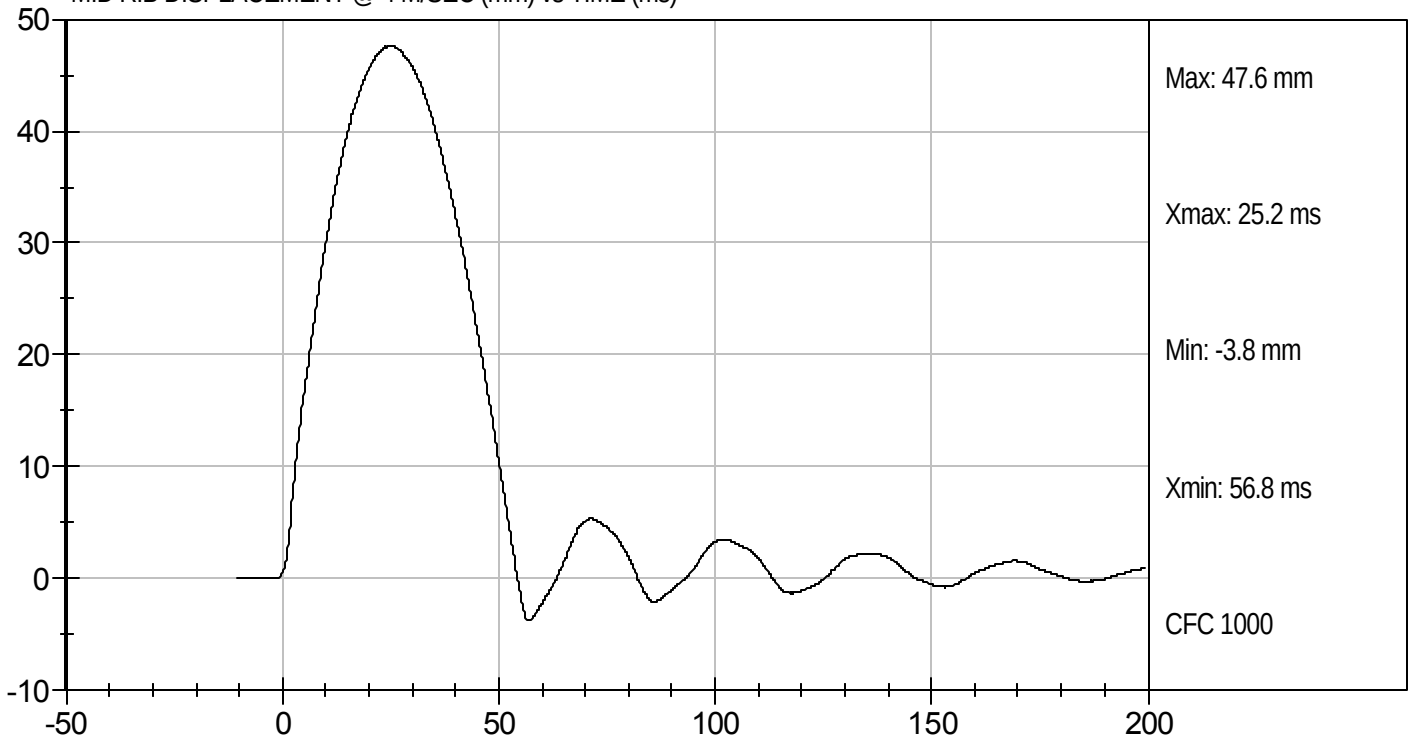
David Winkelbauer
Approved By

Test Desc: Rib Impact - Mid
Component ID: D12045
Test Date: 1/6/12

MID RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



MID RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12046

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.8	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.6	Pass
		Overall Test Results		Pass

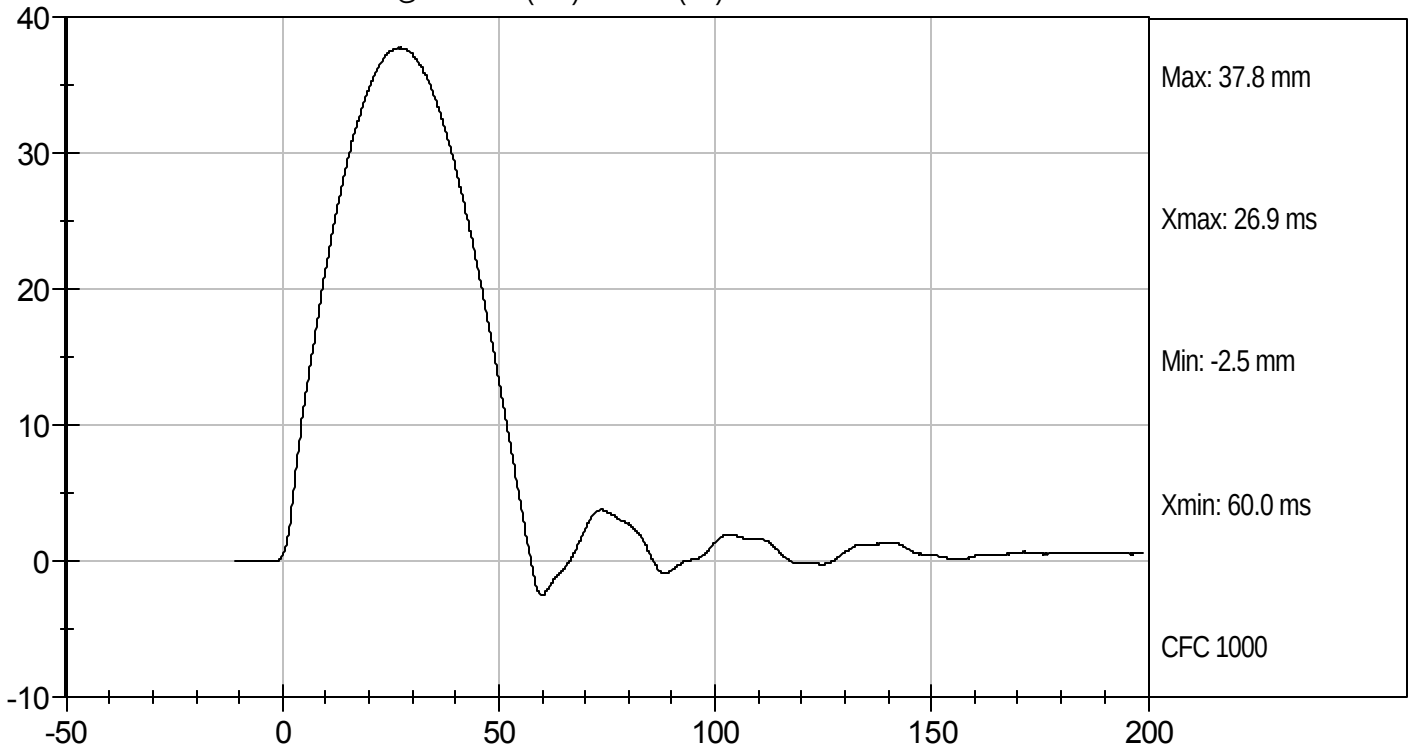
Jessica Hall
Laboratory Technician

1/6/12
Test Date

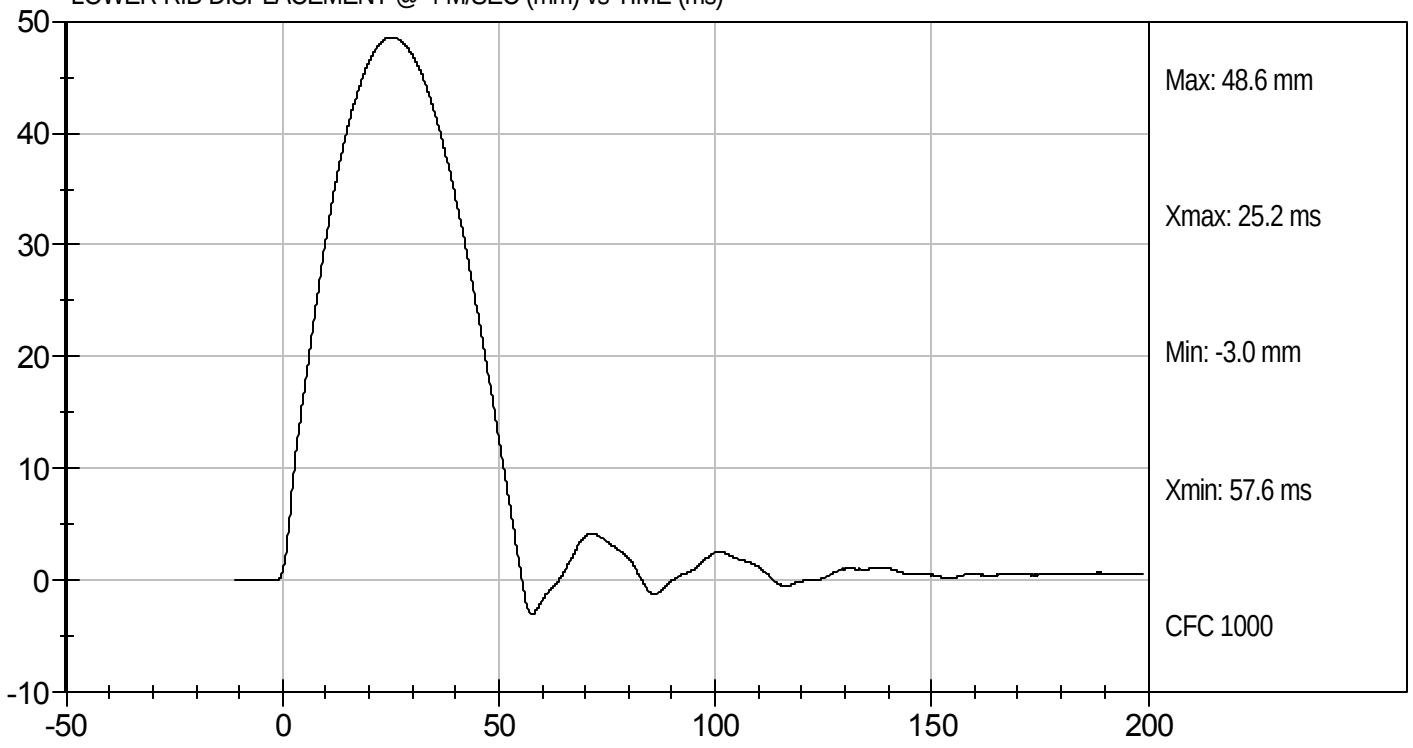
David Winkelbauer
Approved By

Test Desc: Rib Impact - Lower
Component ID: D12046
Test Date: 1/6/12

LOWER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

FULL BODY THORAX IMPACT TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12040

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.1	Pass
Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	kN	5.10 to 6.20	5.14	Pass
Upper Rib Displacement	mm	34.0 to 41.0	37.1	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.6	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.7	Pass
		Overall Test Results		Pass

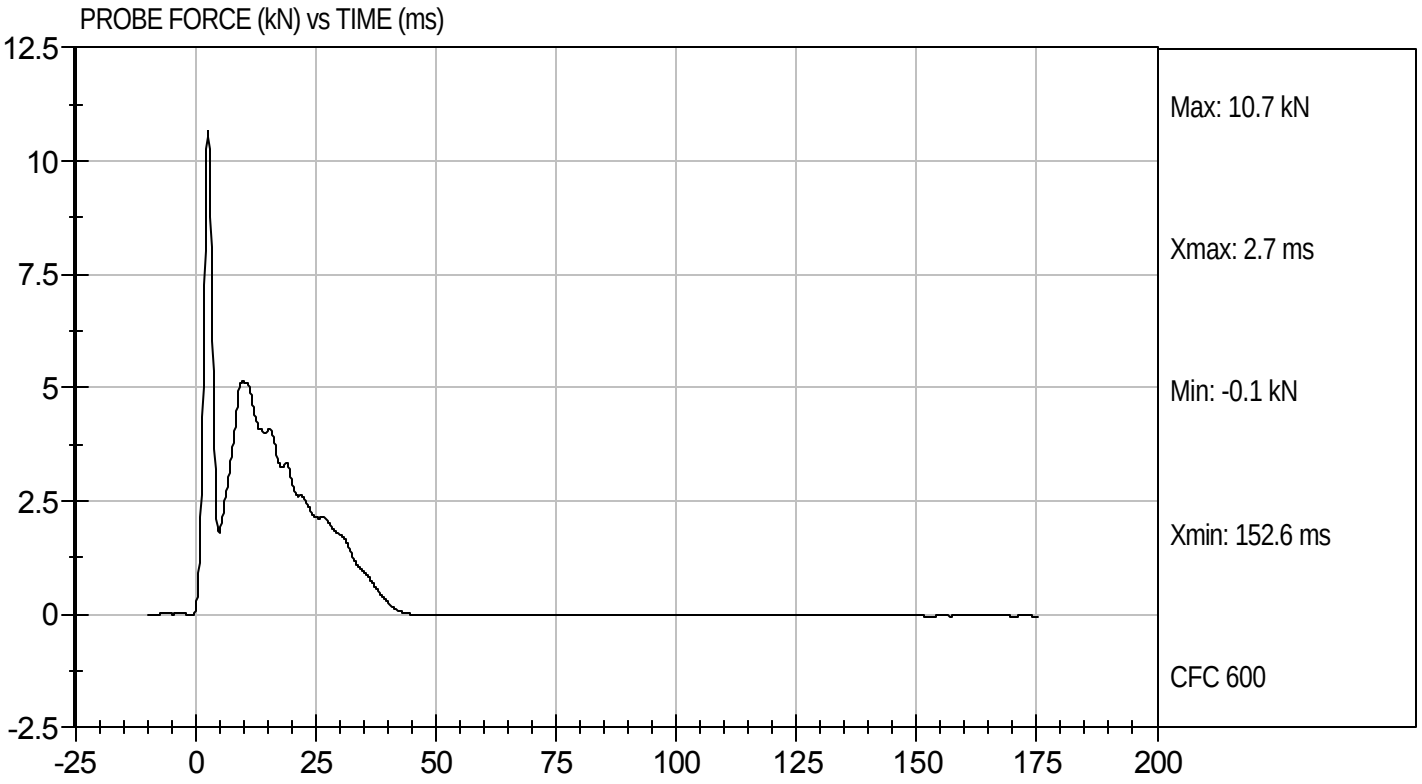
Jessica Hall
Laboratory Technician

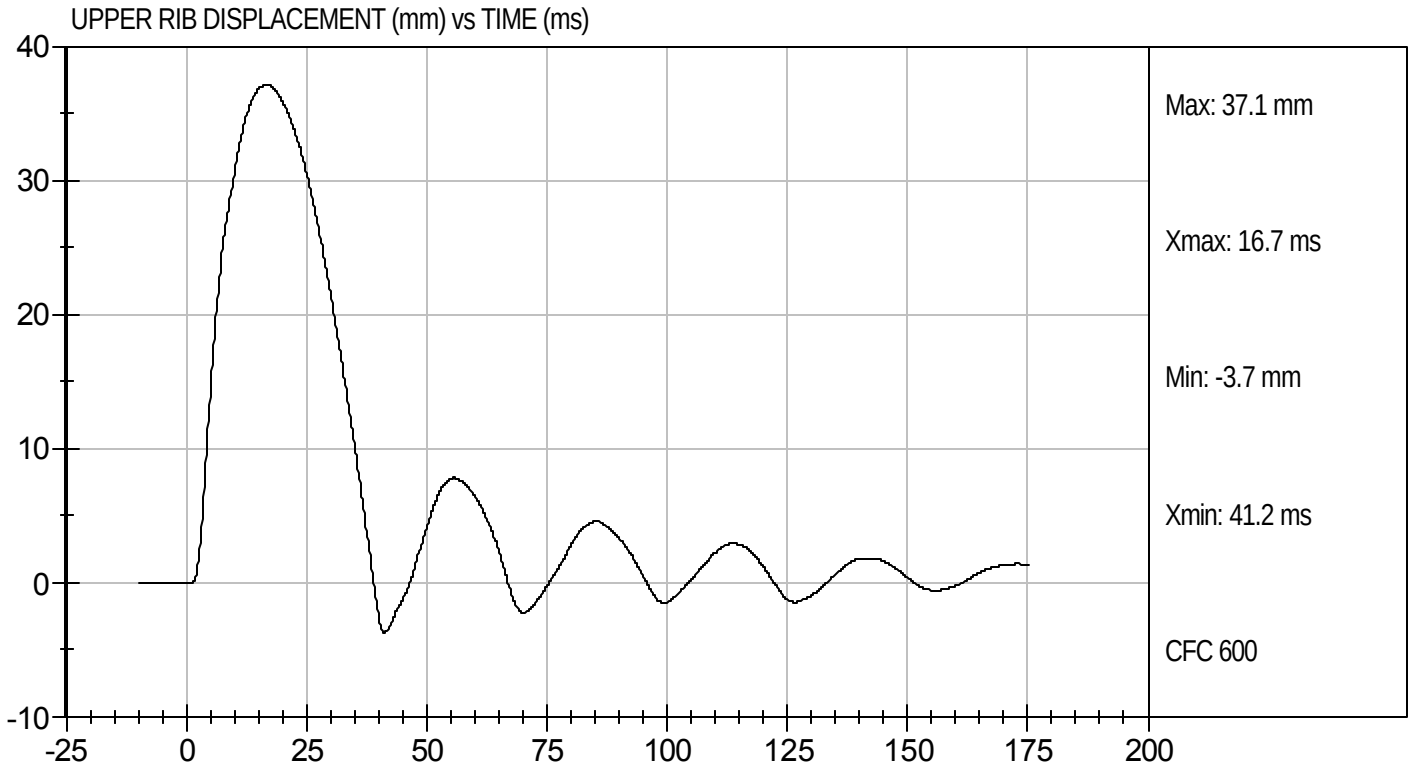
1/6/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D12040

Test Date: 1/6/12
Velocity: 18.31 ft/s, 5.58 m/s

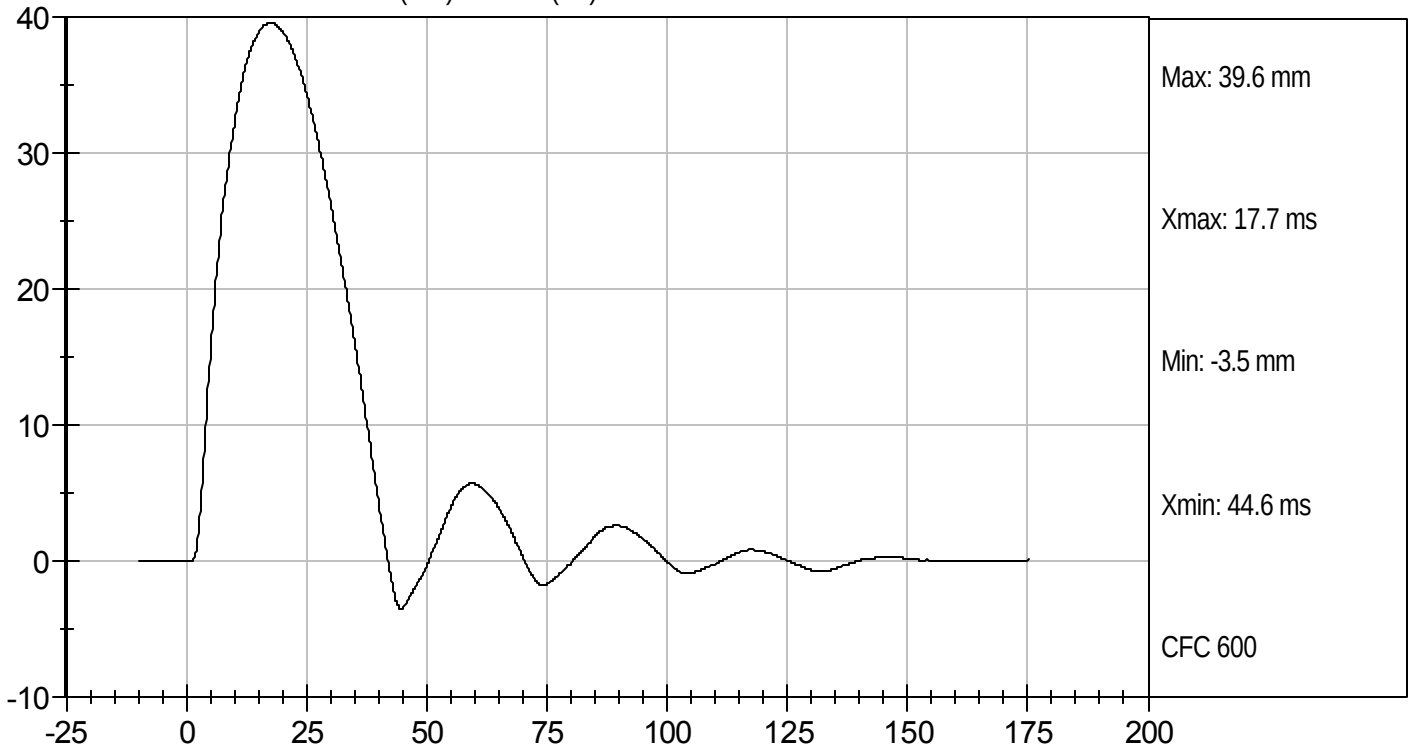




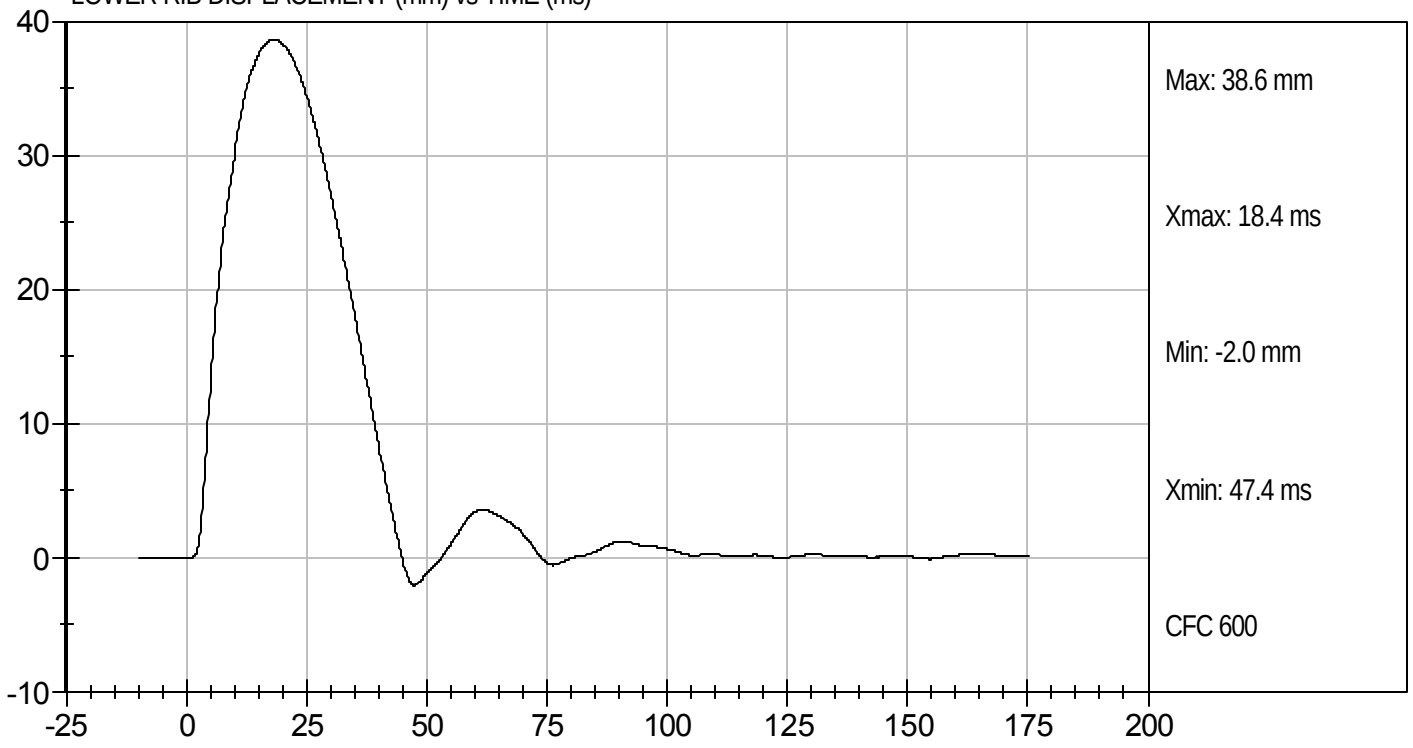
Test Desc: Thorax Impact
Component ID: D12040

Test Date: 1/6/12
Velocity: 18.31 ft/s, 5.58 m/s

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:** D12047

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	3.90 to 4.10	4.03	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.35	Pass
Time of Maximum Impactor Force	ms	10.60 to 13.00	10.90	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.42	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.10	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

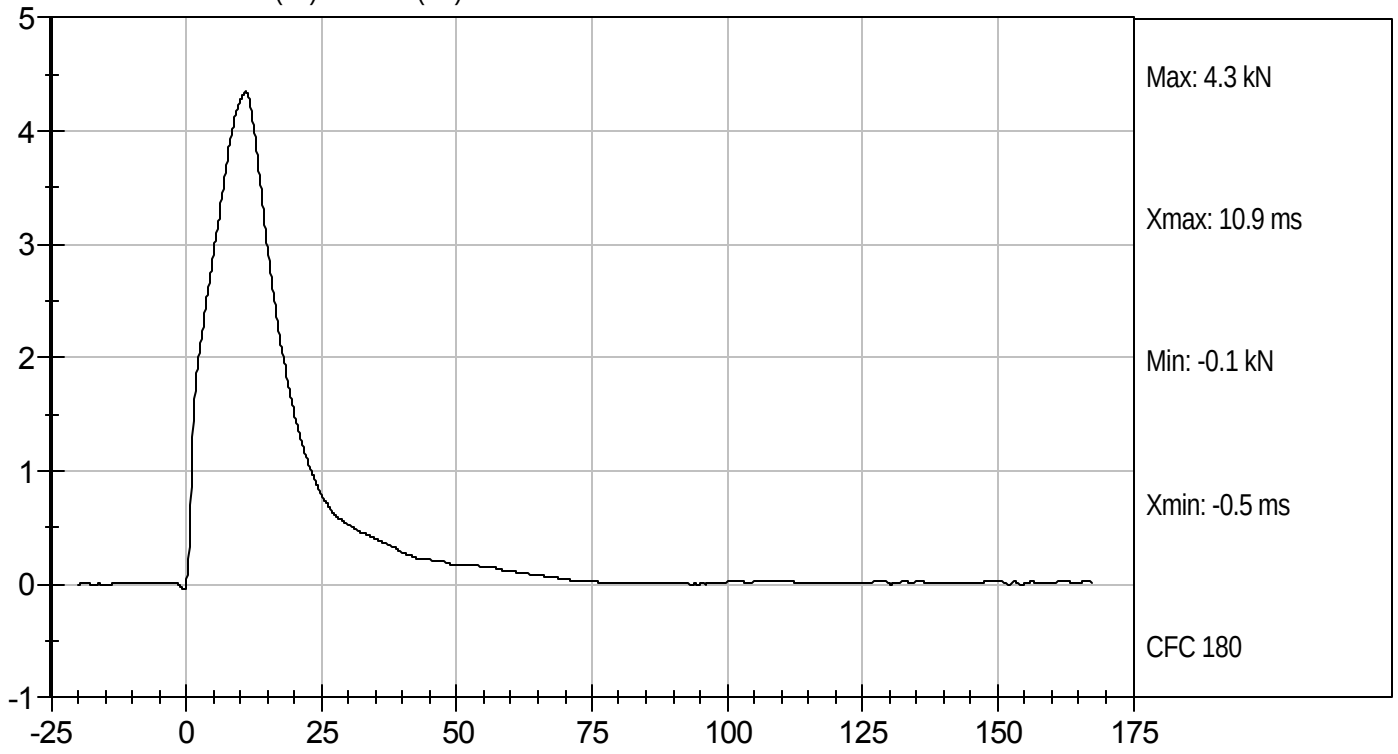
1/6/12
Test Date

David Winkelbauer
Approved By

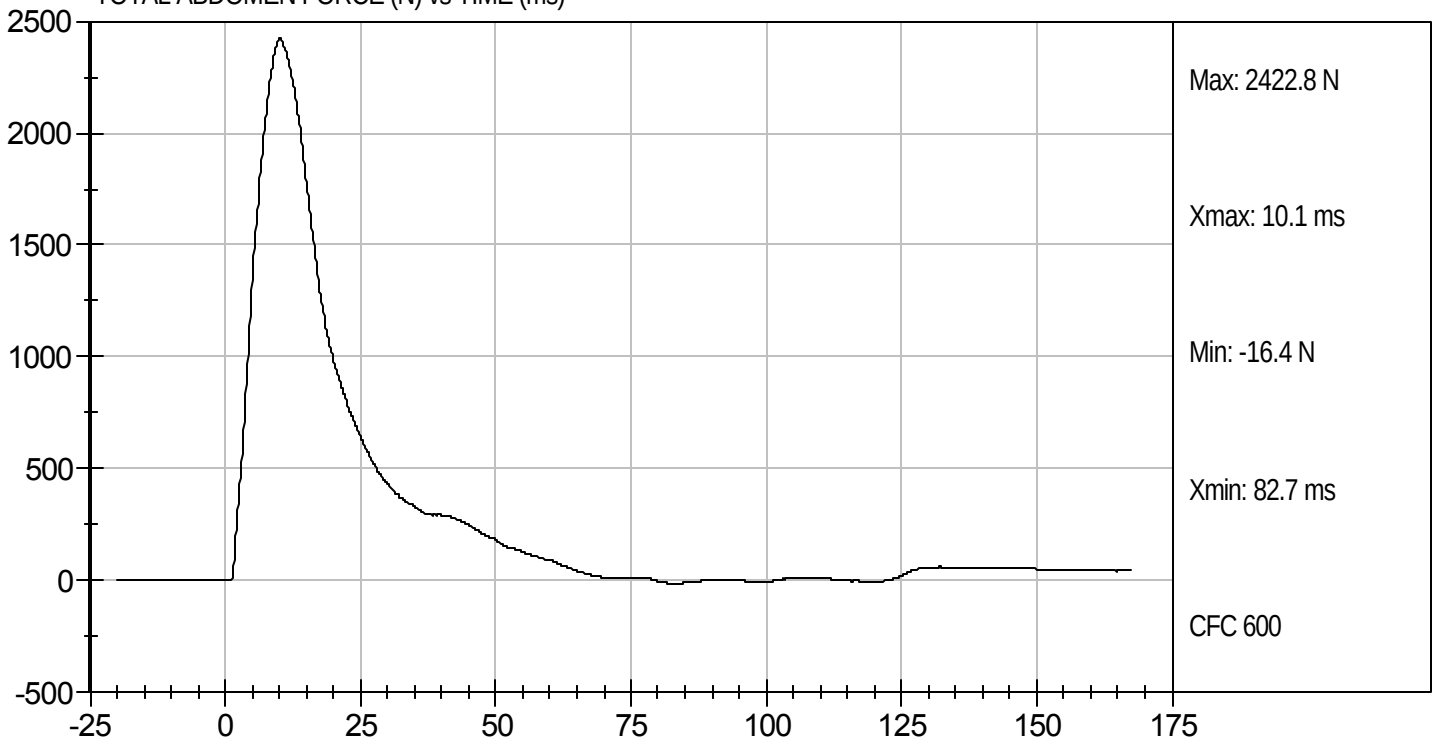
Test Desc: Abdomen Impact
Component ID: D12047

Test Date: 1/6/12
Velocity: 13.22 ft/s, 4.03 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



TOTAL ABDOMEN FORCE (N) vs TIME (ms)



MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12048

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	24	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Deceleration	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.40	Pass
	27 ms	m/s	-6.50 to -5.80	-5.93	Pass
	30 ms	m/s	>= -6.5	-5.82	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	46.3	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	43.4	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	43	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

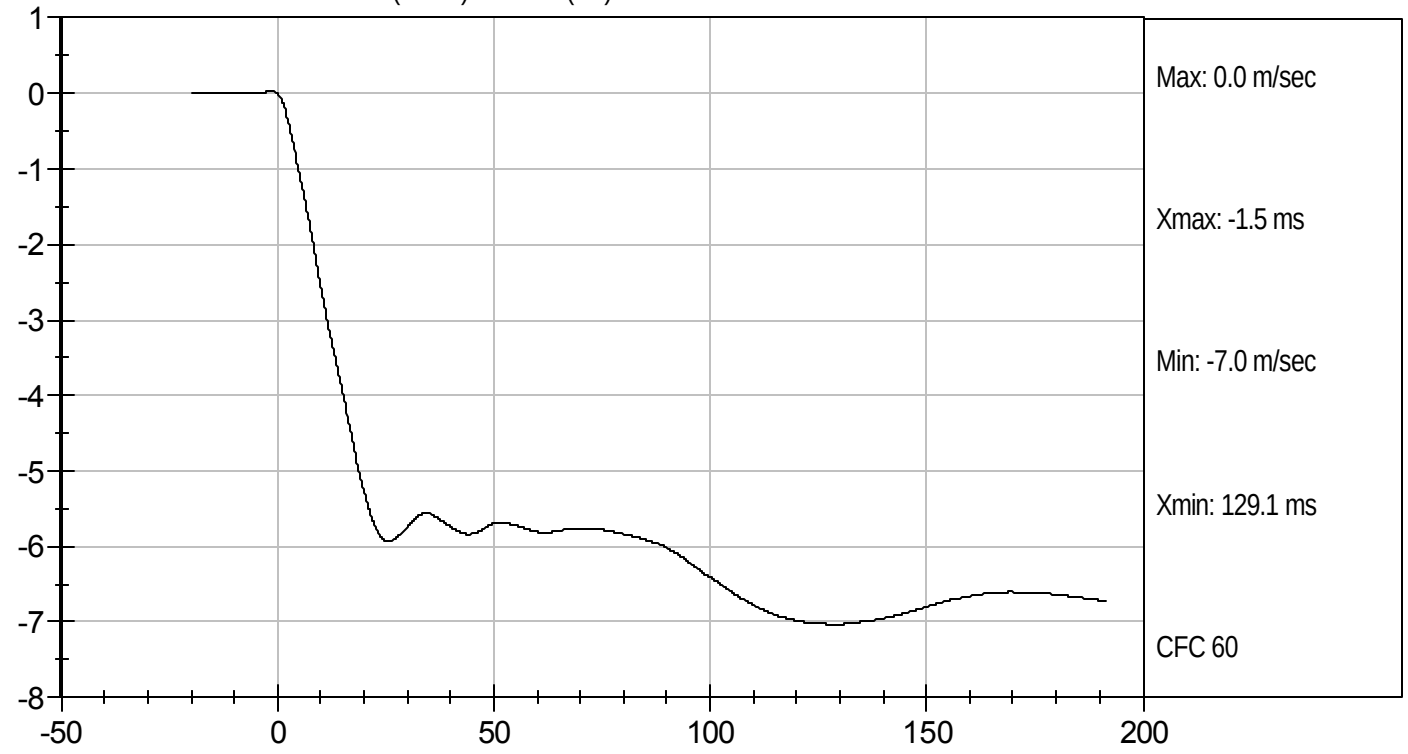
1/6/12
Test Date

David Winkelbauer
Approved By

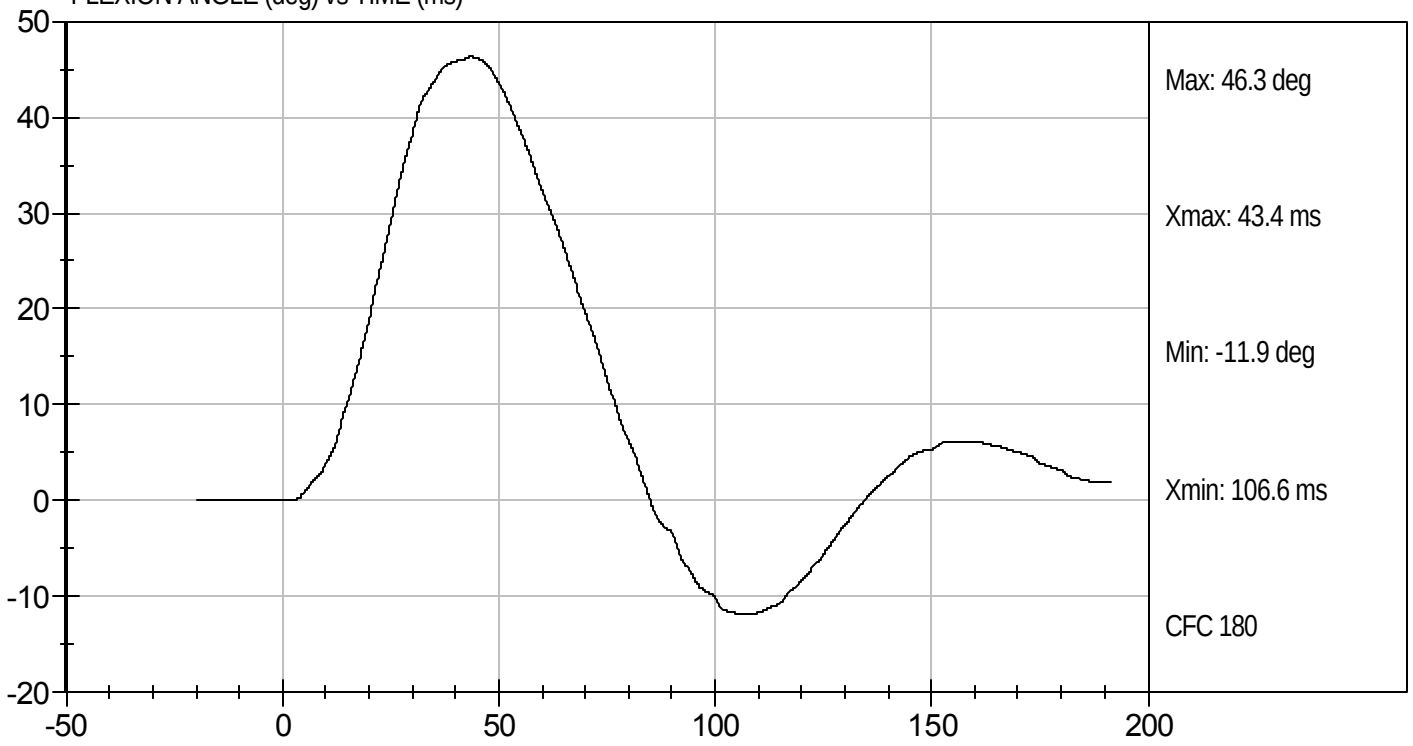
Test Desc: Lumbar Bending
Component ID: D12048

Test Date: 1/6/12
Velocity: 20.08 ft/s, 6.12 m/s

PENDULUM DECELERATION (m/sec) vs TIME (ms)

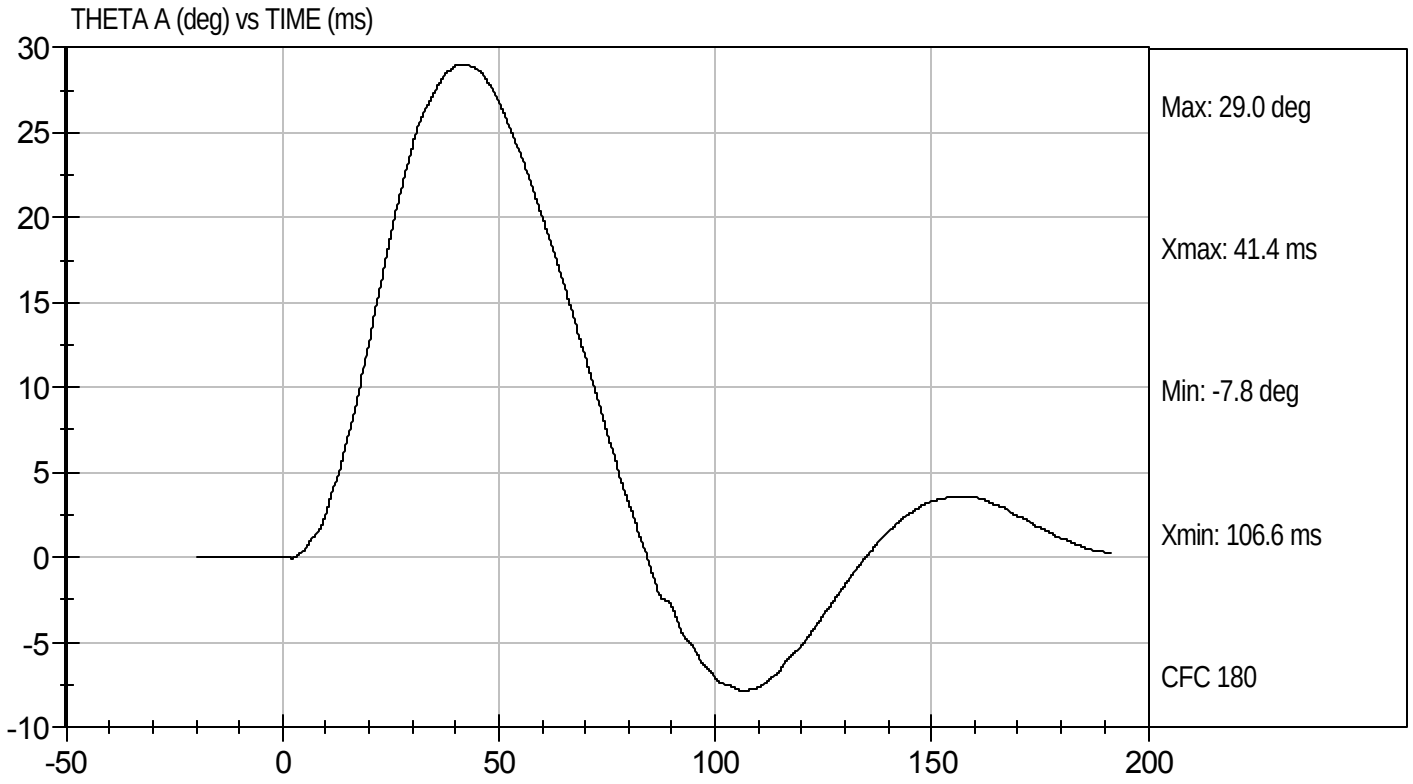


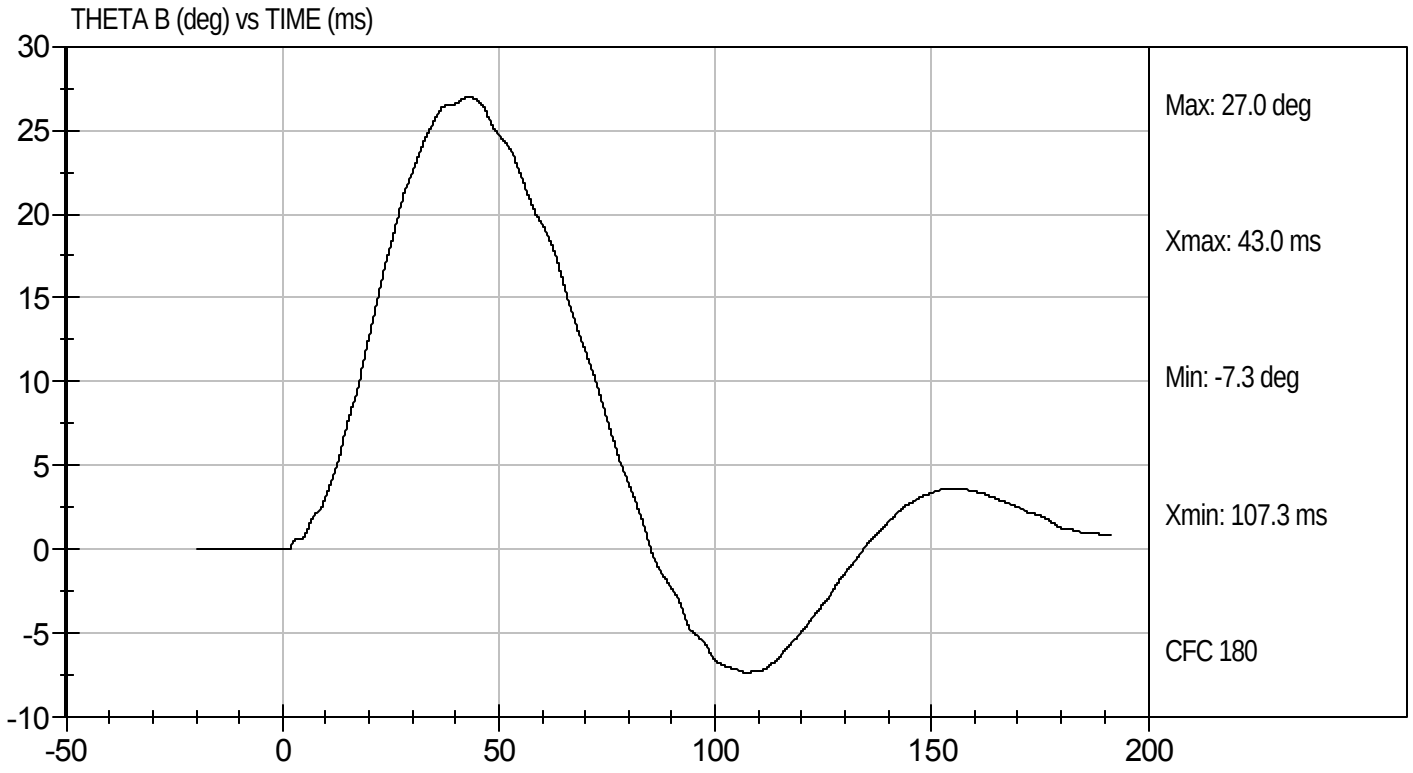
FLEXION ANGLE (deg) vs TIME (ms)



Test Desc: Lumbar Bending
Component ID: D12048

Test Date: 1/6/12
Velocity: 20.08 ft/s, 6.12 m/s





MGA RESEARCH CORPORATION

PELVIS TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12049

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.87	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.20	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.28	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	14.60	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

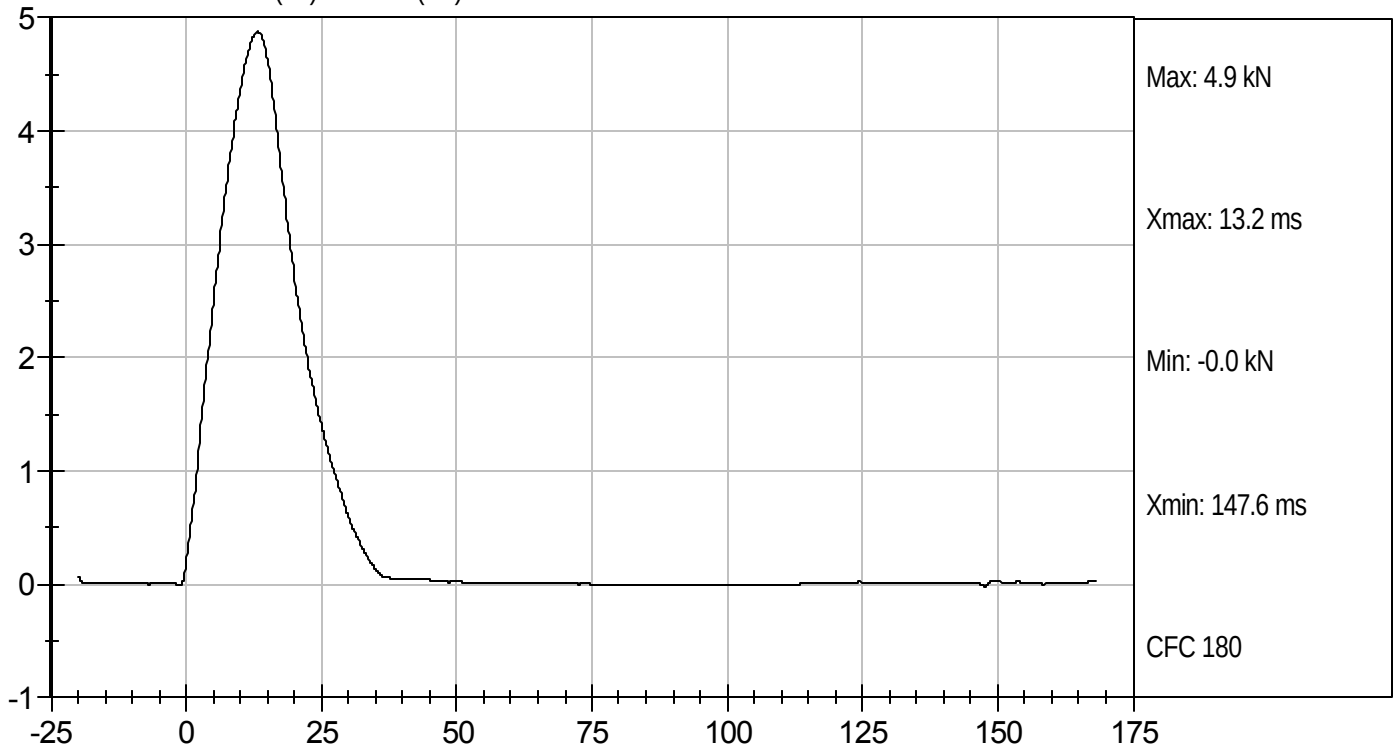
1/6/12
Test Date

David Winkelbauer
Approved By

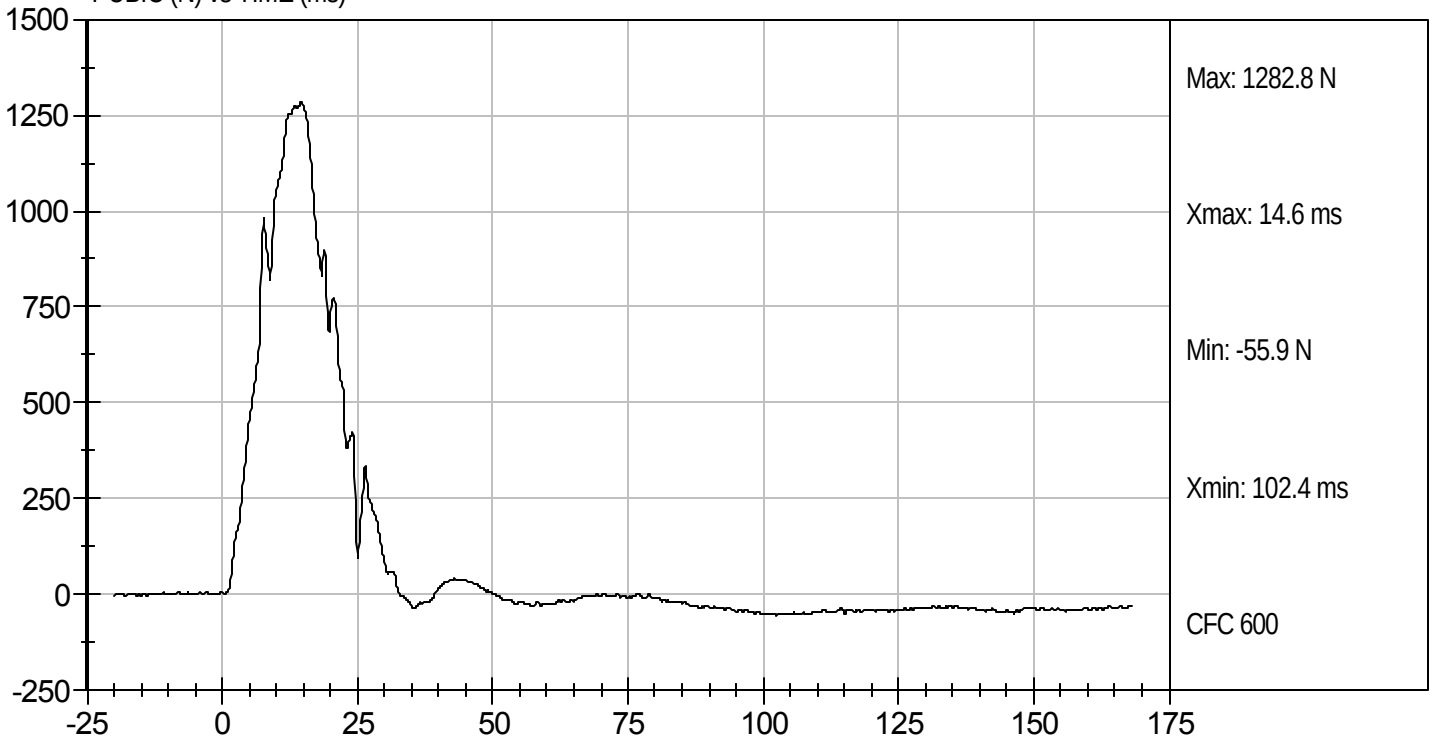
Test Desc: Pelvis Impact
Component ID: D12049

Test Date: 1/6/12
Velocity: 14.12 ft/s, 4.3 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



PUBIC (N) vs TIME (ms)



MGA RESEARCH CORPORATION

HEAD DROP TEST

ES-2re DUMMY

ATD Serial No: 032 **Test ID:** D12091

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Peak Resultant Acceleration	G's	125 to 155	149	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-9.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

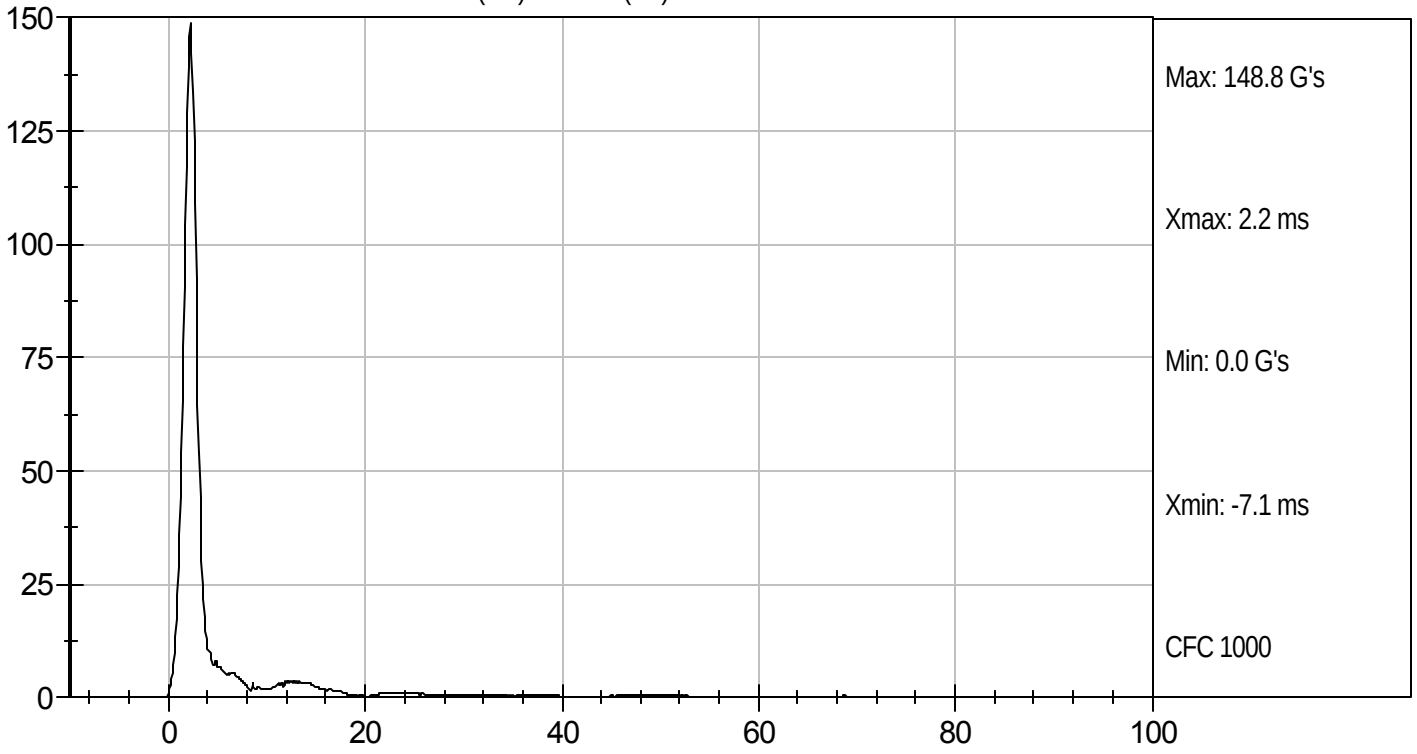
1/10/12
Test Date

David Winkelbauer
Approved By

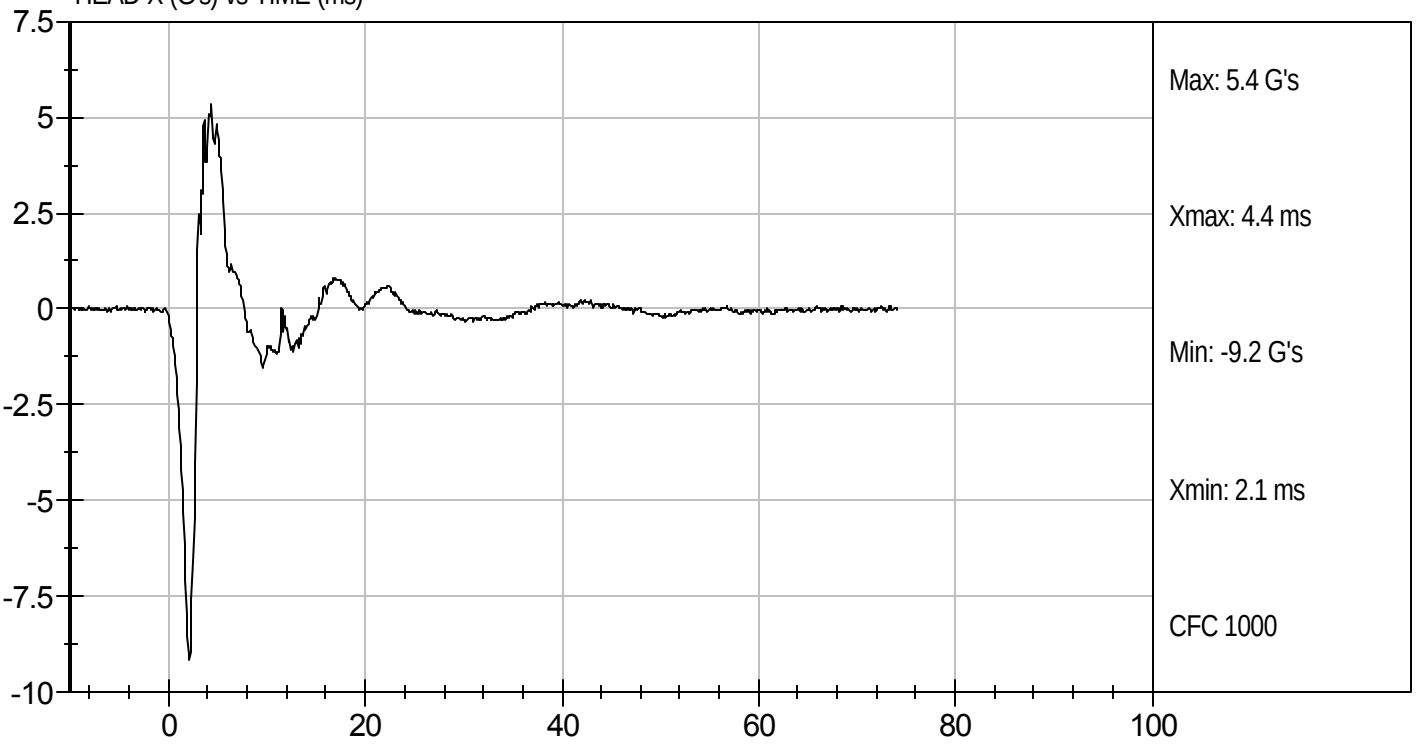
Test Desc: Head Drop
Component ID: D12091

Test Date: 1/10/12
Velocity: 0 ft/s, 0 m/s

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



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



MGA RESEARCH CORPORATION

NECK PENDULUM TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12092

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.5	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.03	Pass
	3 ms	m/s	-0.25 to -0.375	-0.34	Pass
	14 ms	m/s	-3.20 to -3.70	-3.28	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.8	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	56.6	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

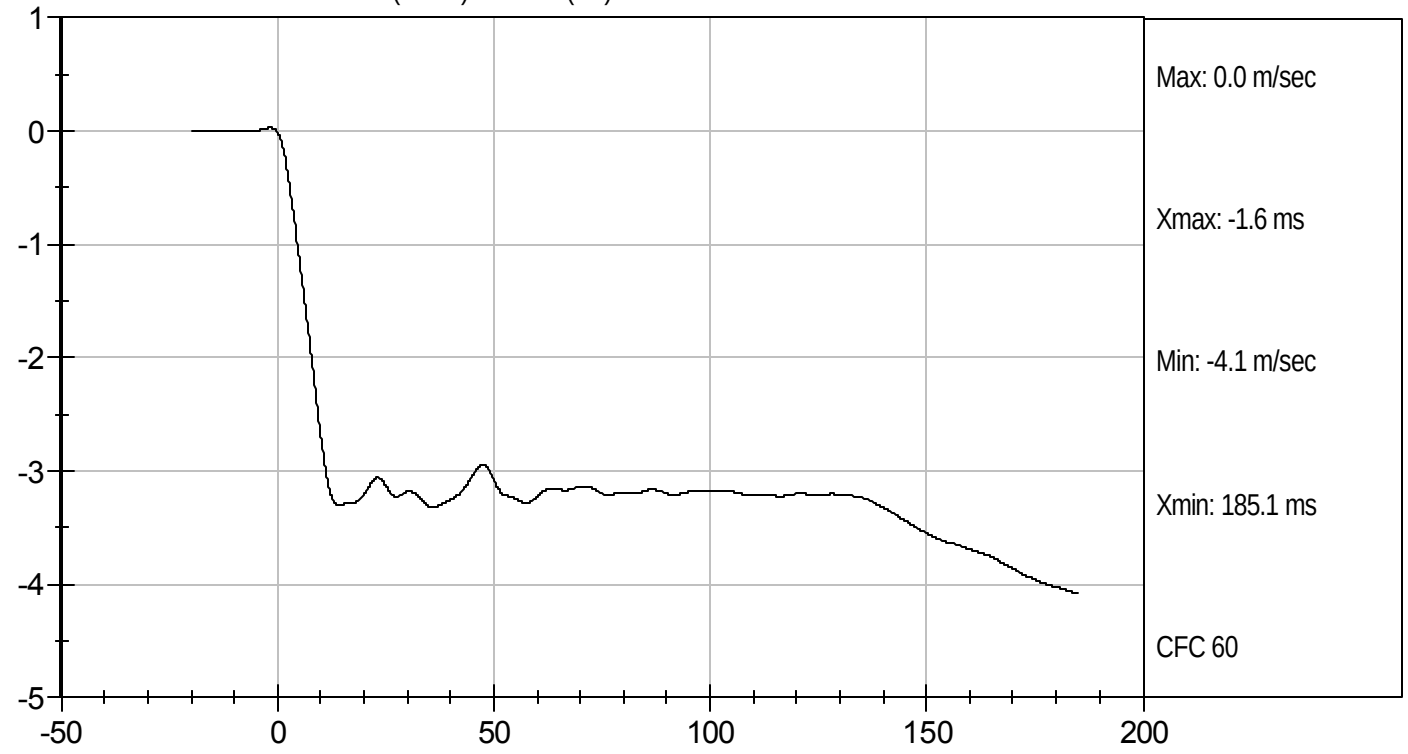
1/10/12
Test Date

David Winkelbauer
Approved By

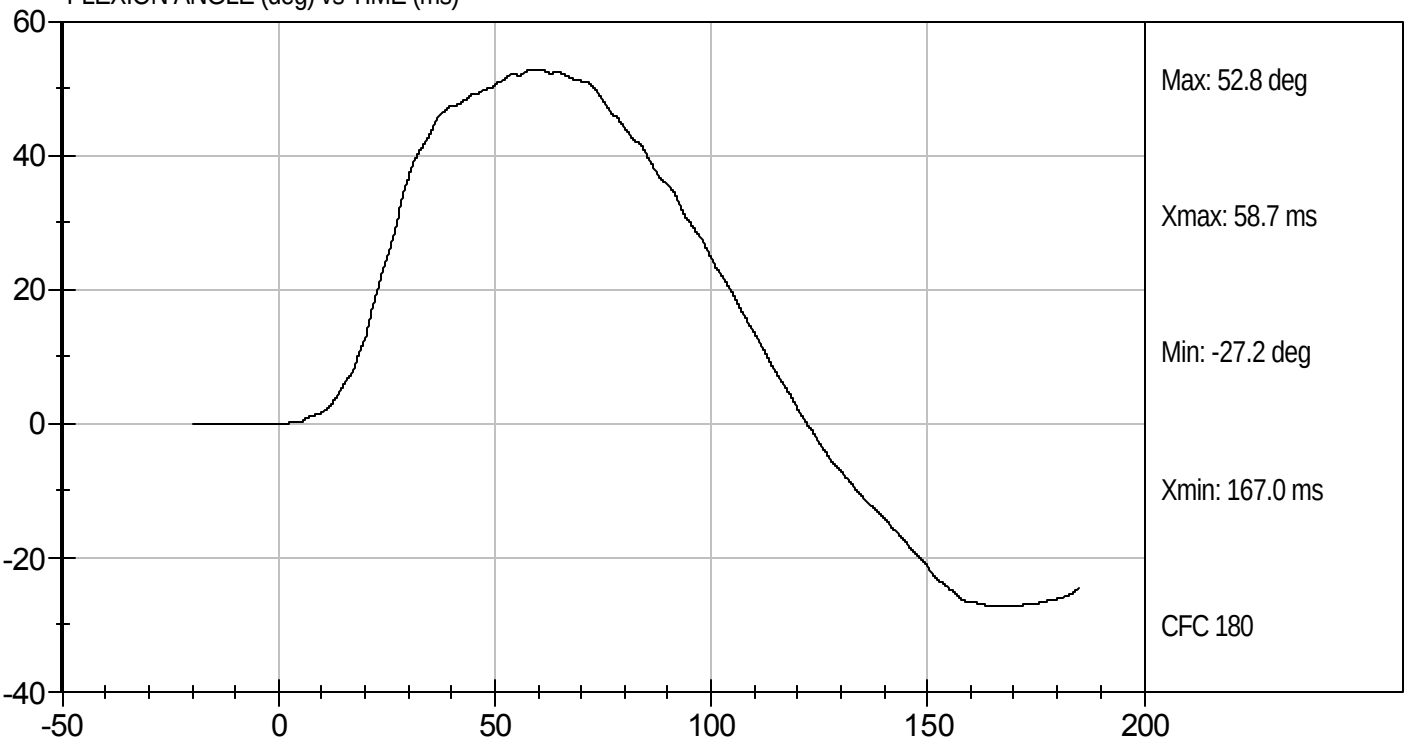
Test Desc: Neck Bending
Component ID: D12092

Test Date: 1/10/12
Velocity: 11.42 ft/s, 3.48 m/s

PENDULUM DECELERATION (m/sec) vs TIME (ms)

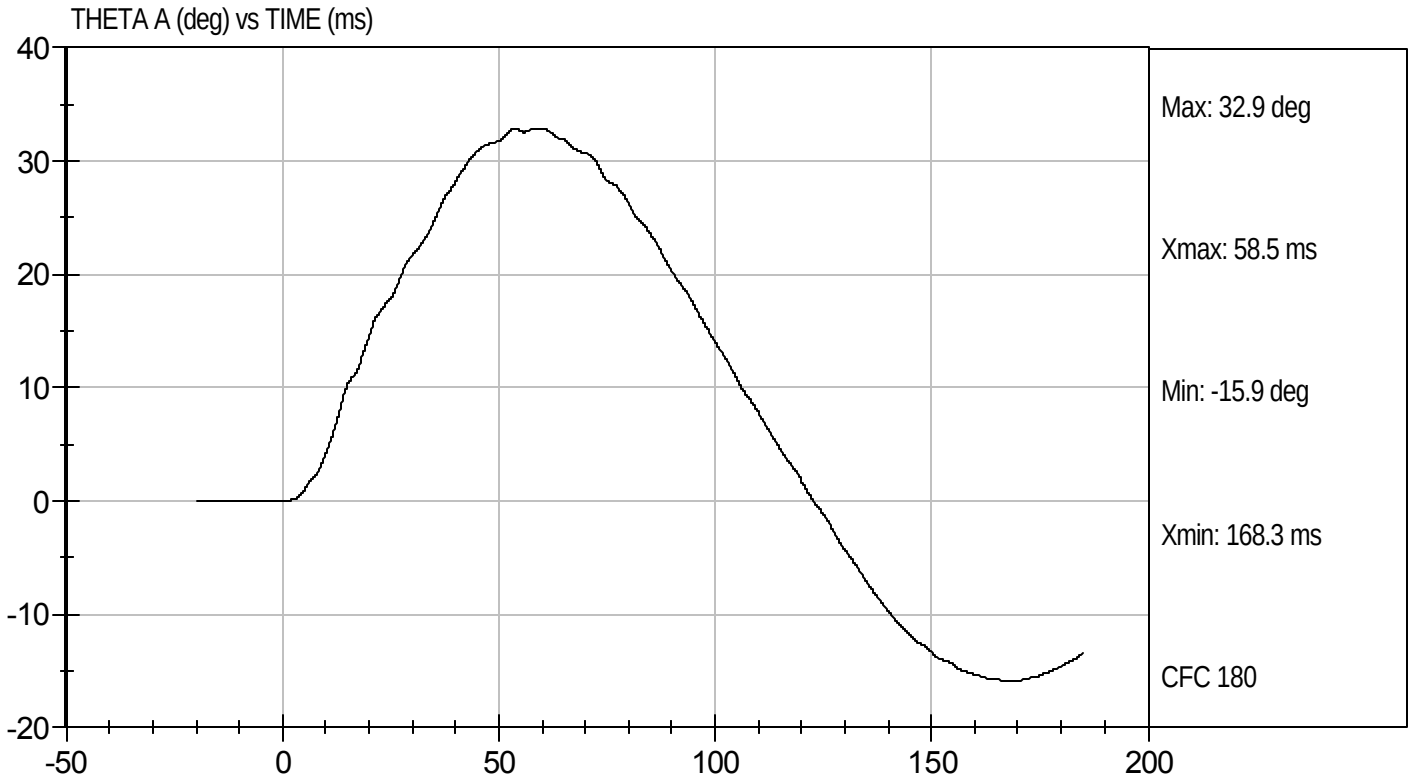


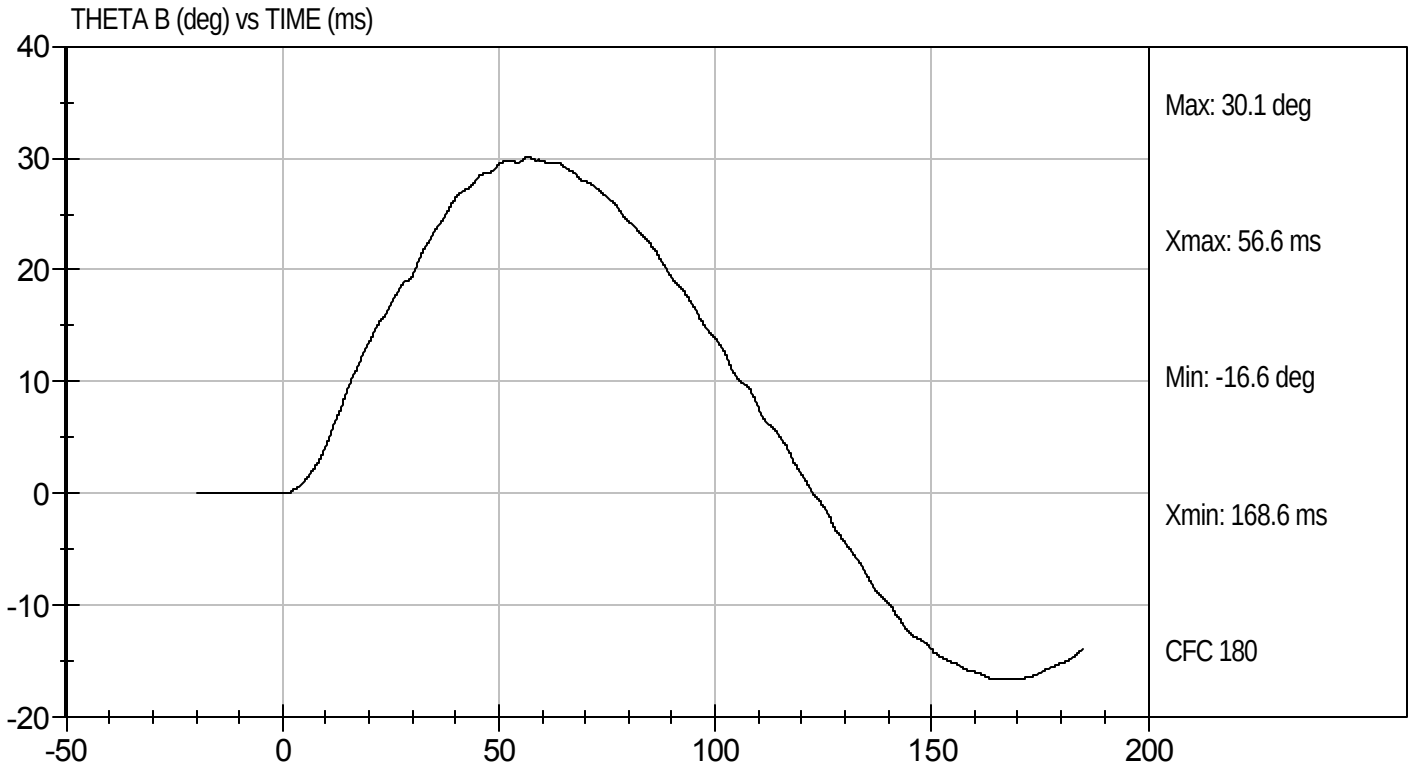
FLEXION ANGLE (deg) vs TIME (ms)



Test Desc: Neck Bending
Component ID: D12092

Test Date: 1/10/12
Velocity: 11.42 ft/s, 3.48 m/s





MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12093

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.6	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.3	Pass
		Overall Test Results		Pass

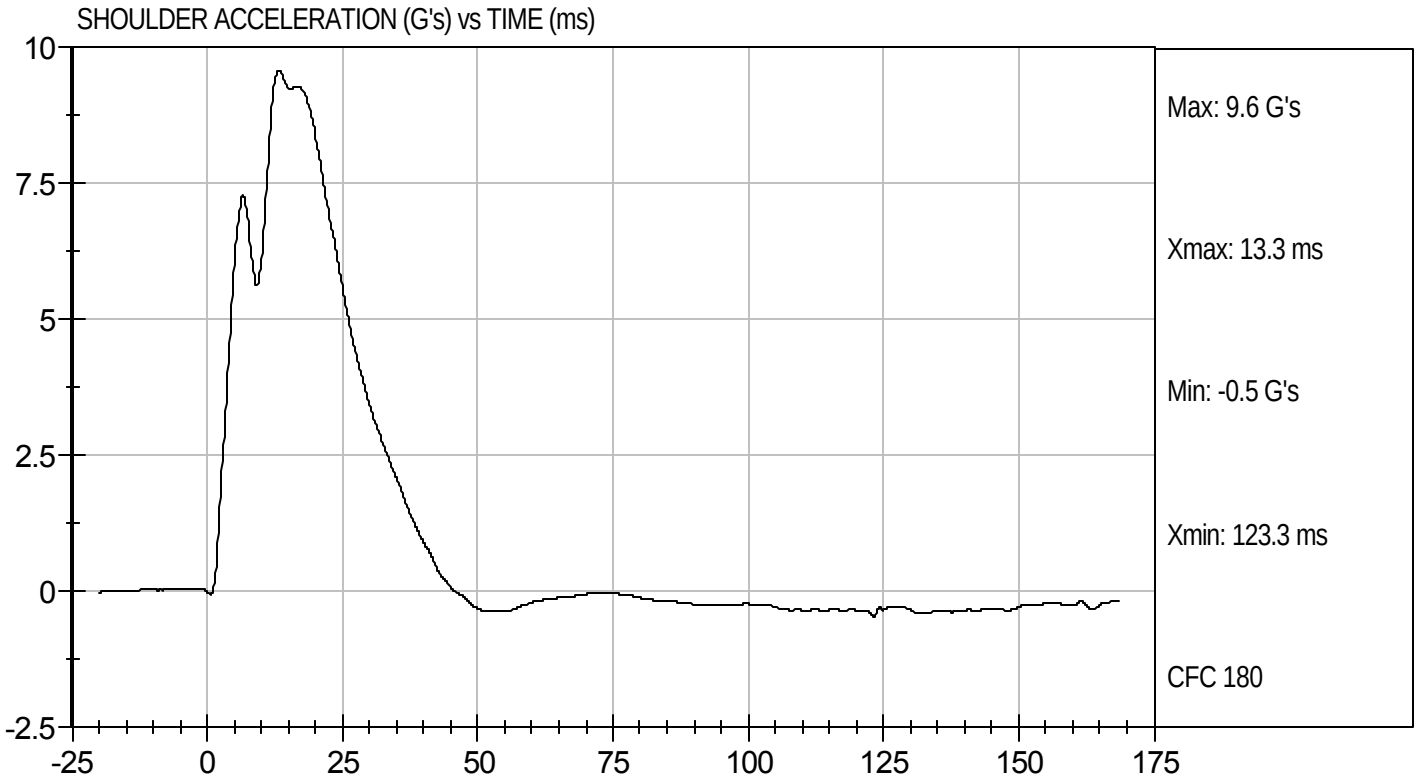
Jessica Hall
Laboratory Technician

1/11/12
Test Date

David Winkelbauer
Approved By

Test Desc: Shoulder Impact
Component ID: D12093

Test Date: 1/11/12
Velocity: 14.12 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12094

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	23	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.1	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.3	Pass
		Overall Test Results		Pass

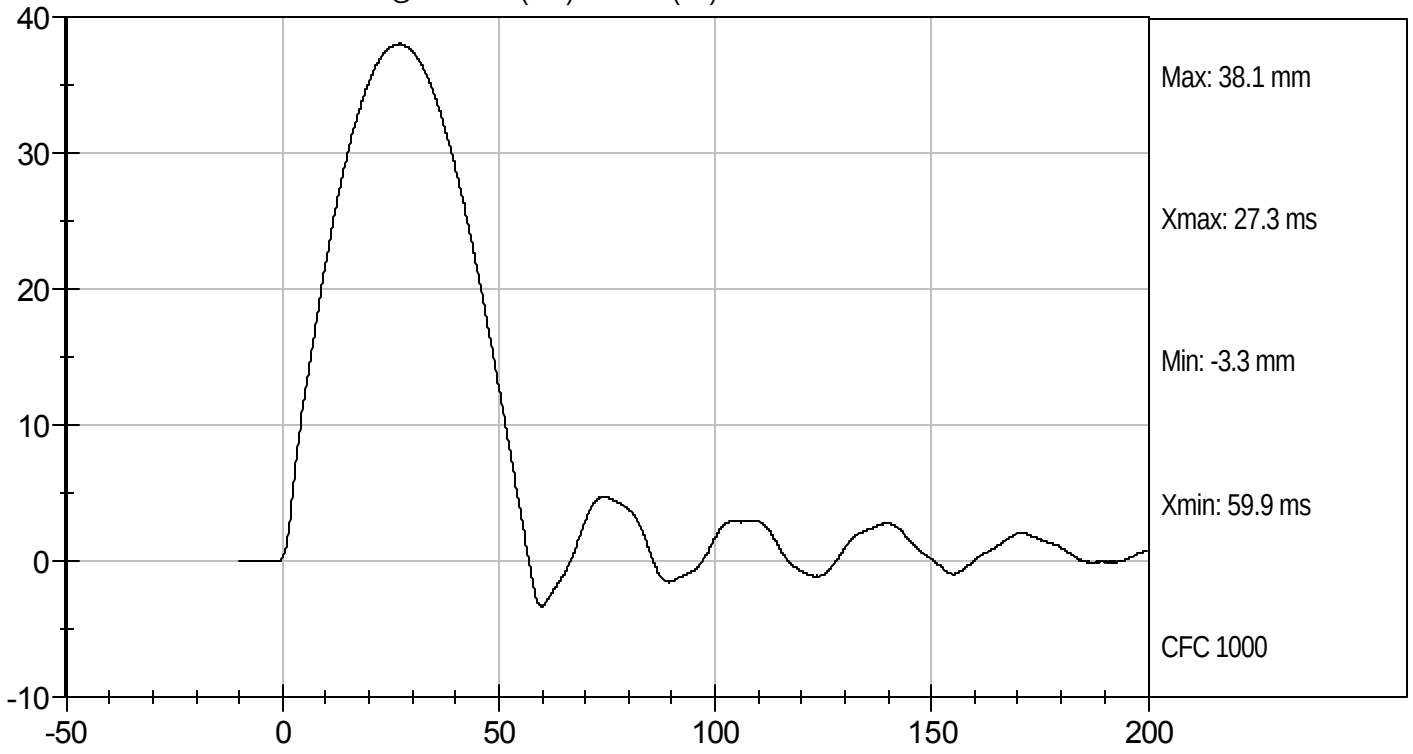
Jessica Hall
Laboratory Technician

1/10/12
Test Date

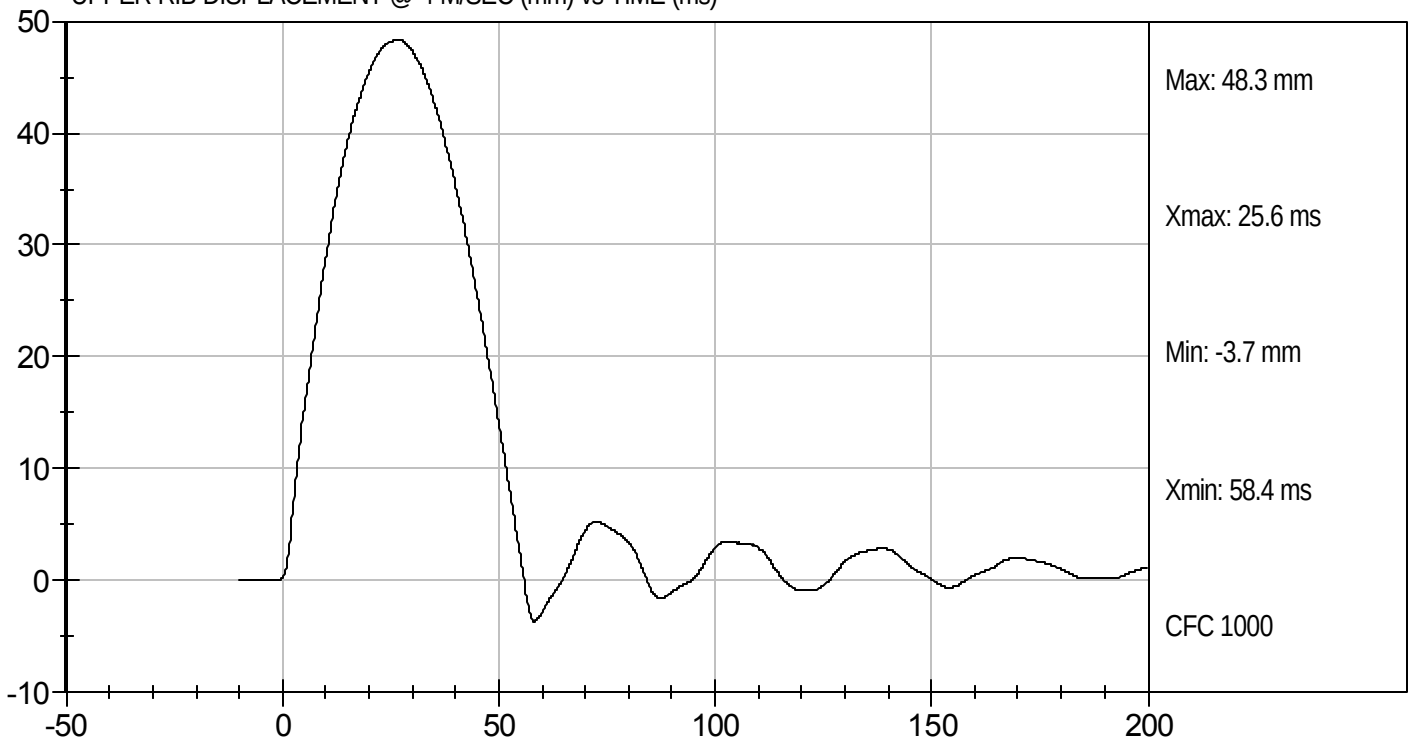
David Winkelbauer
Approved By

Test Desc: Rib Impact - Upper
Component ID: D12094
Test Date: 1/10/12

UPPER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

MID RIB TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12095

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	23	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.2	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.1	Pass
		Overall Test Results		Pass

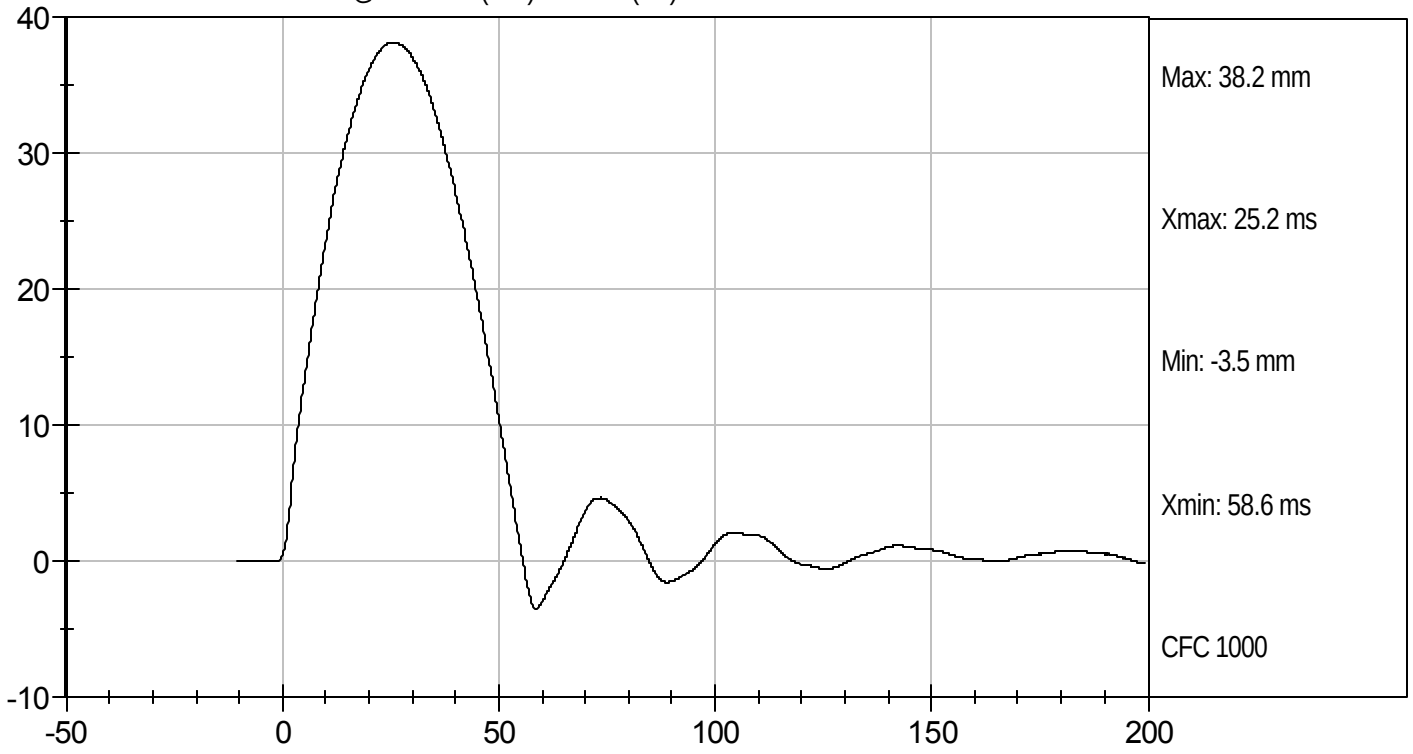
Jessica Hall
Laboratory Technician

1/10/12
Test Date

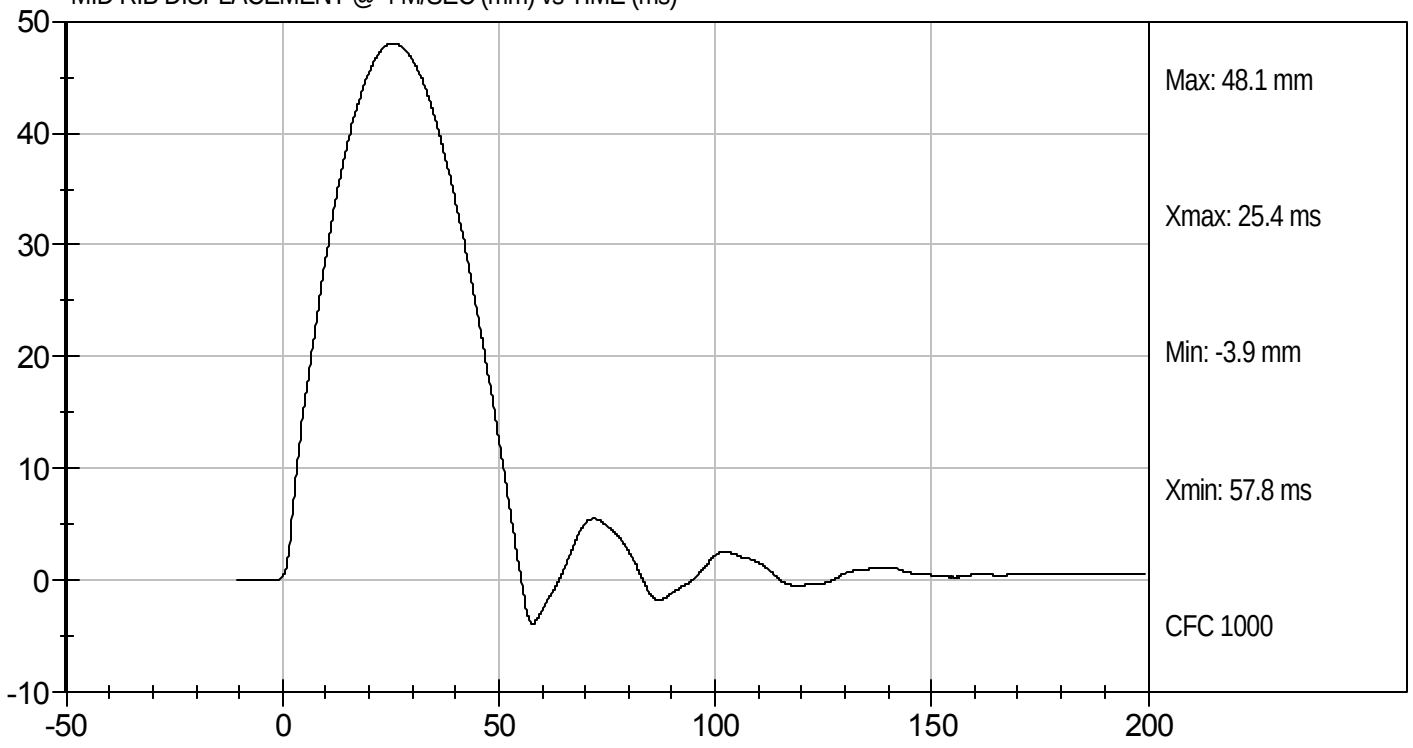
David Winkelbauer
Approved By

Test Desc: Rib Impact - Mid
Component ID: D12095
Test Date: 1/10/12

MID RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



MID RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12096

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	23	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	39.0	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.9	Pass
		Overall Test Results		Pass

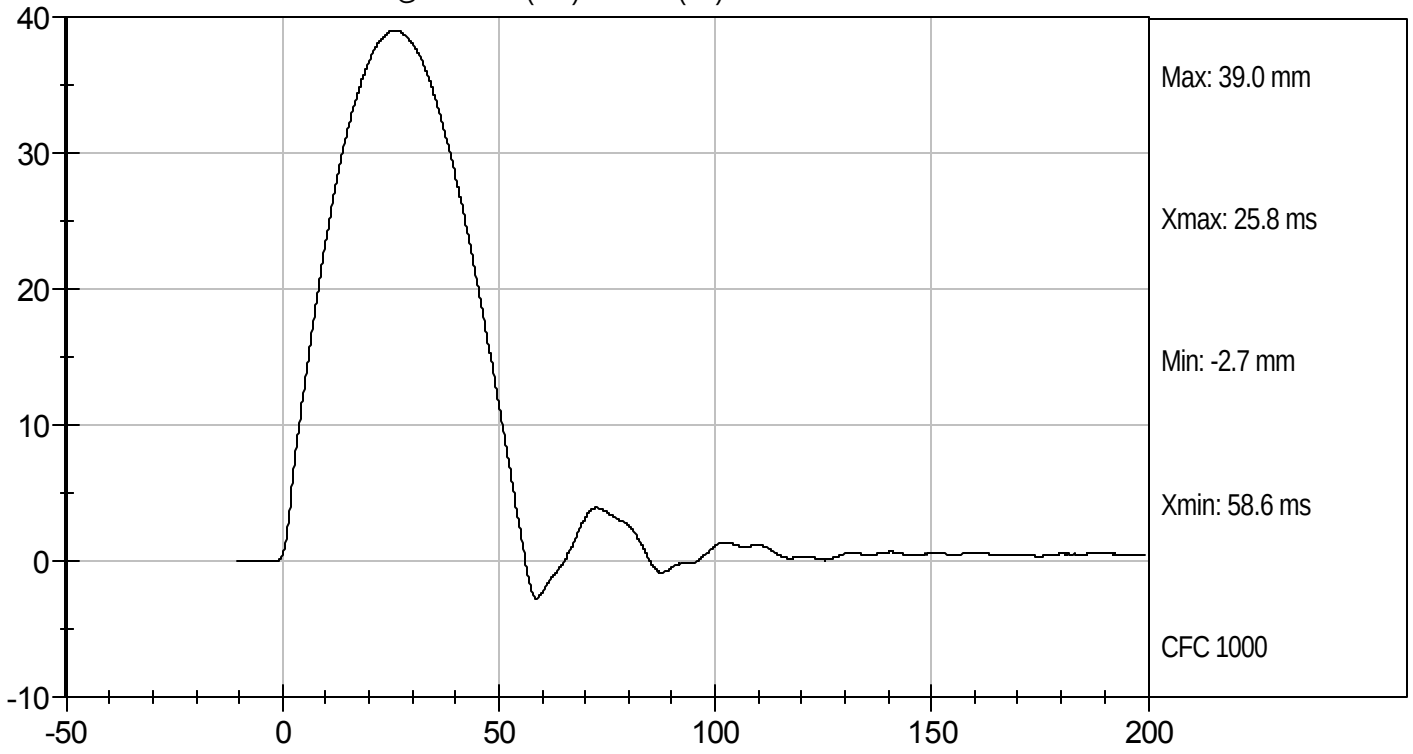
Jessica Gall
Laboratory Technician

1/10/12
Test Date

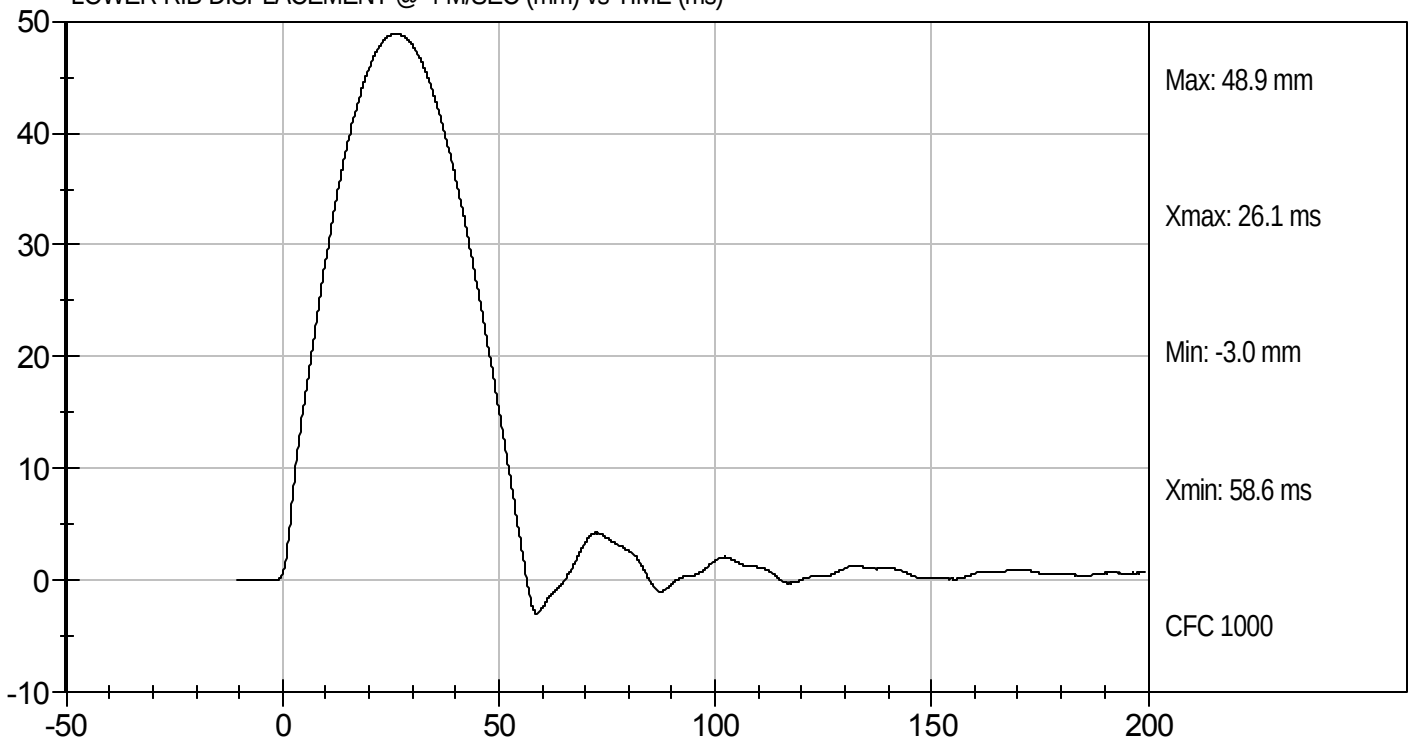
David Winkelbauer
Approved By

Test Desc: Rib Impact - Lower
Component ID: D12096
Test Date: 1/10/12

LOWER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

FULL BODY THORAX IMPACT TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12090

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	kN	5.10 to 6.20	5.31	Pass
Upper Rib Displacement	mm	34.0 to 41.0	36.5	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.1	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.5	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

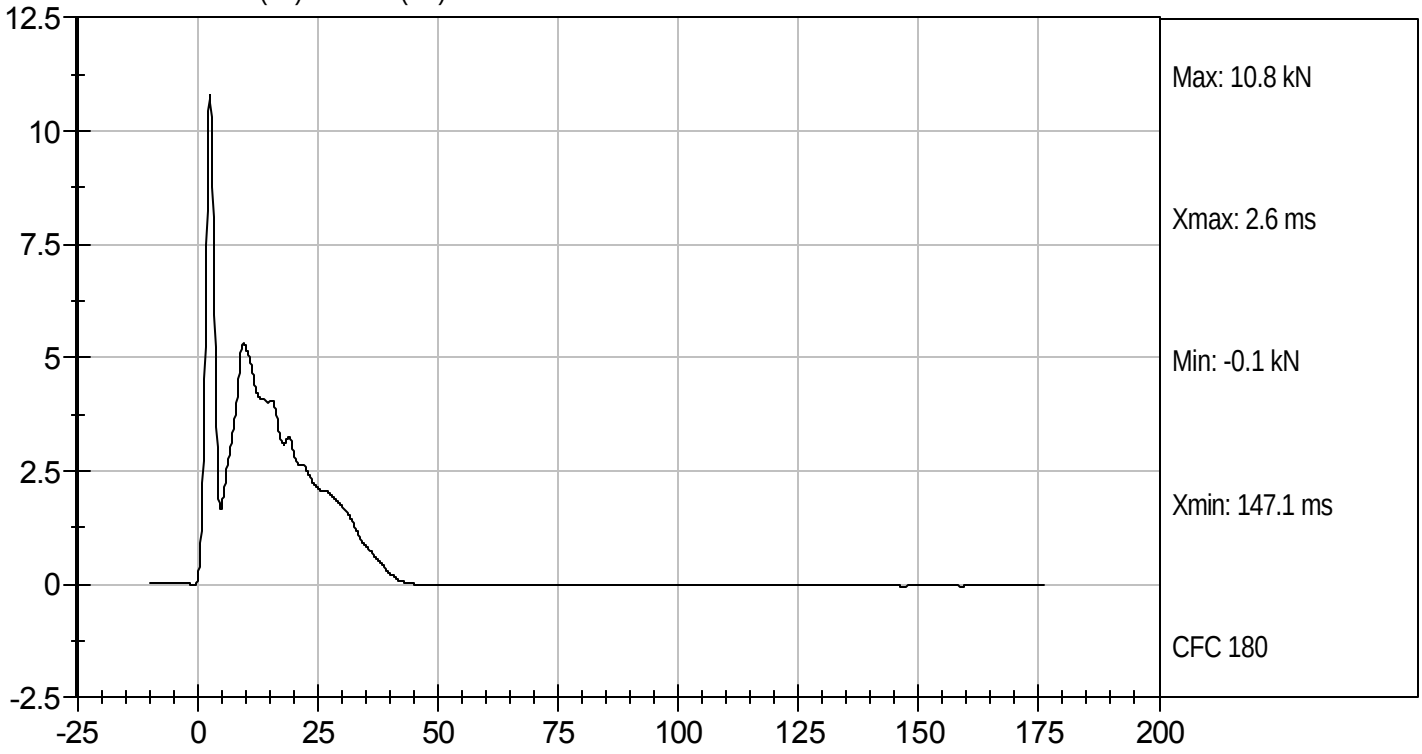
1/11/12
Test Date

David Winkelbauer
Approved By

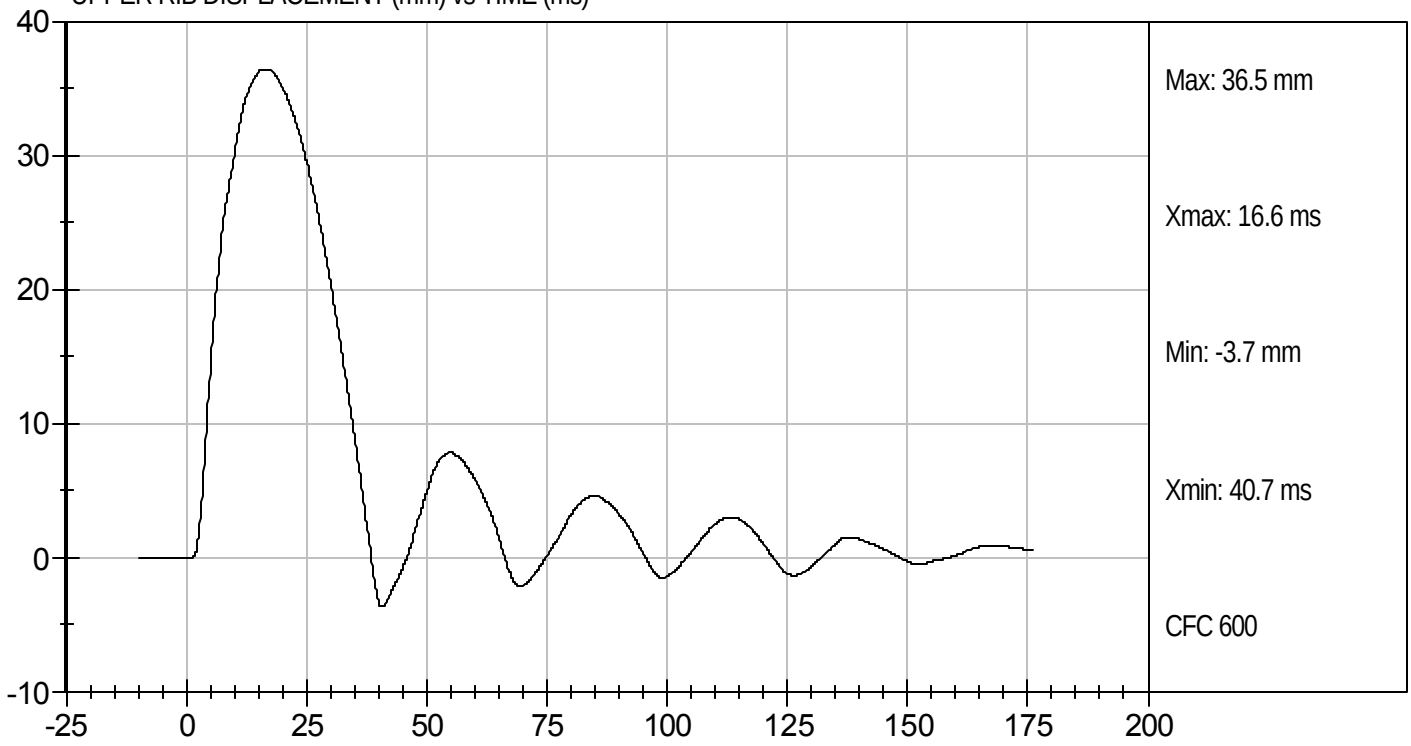
Test Desc: Thorax Impact
Component ID: D12090

Test Date: 1/11/12
Velocity: 18.32 ft/s, 5.58 m/s

PROBE FORCE (kN) vs TIME (ms)



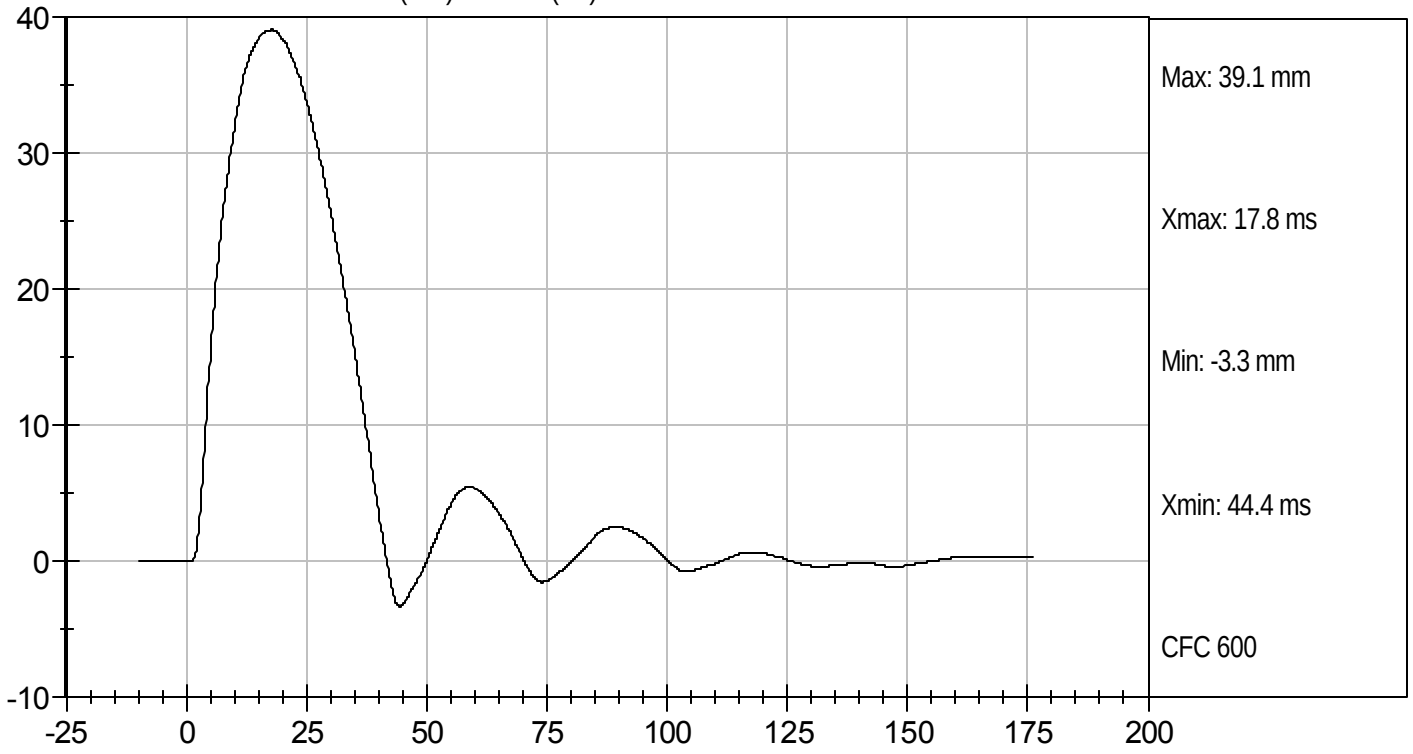
UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



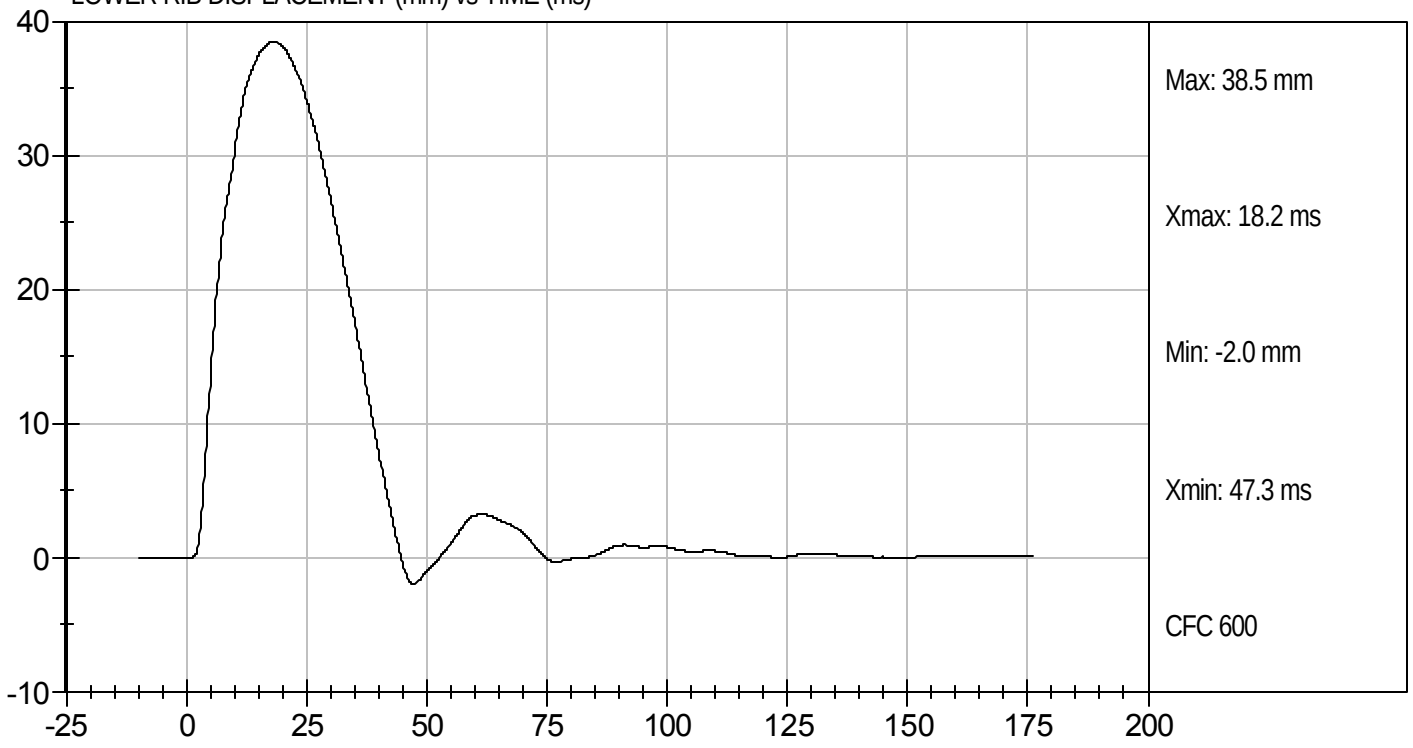
Test Desc: Thorax Impact
Component ID: D12090

Test Date: 1/11/12
Velocity: 18.32 ft/s, 5.58 m/s

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:** D12097

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.29	Pass
Time of Maximum Impactor Force	ms	10.60 to 13.00	10.90	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.46	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.20	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

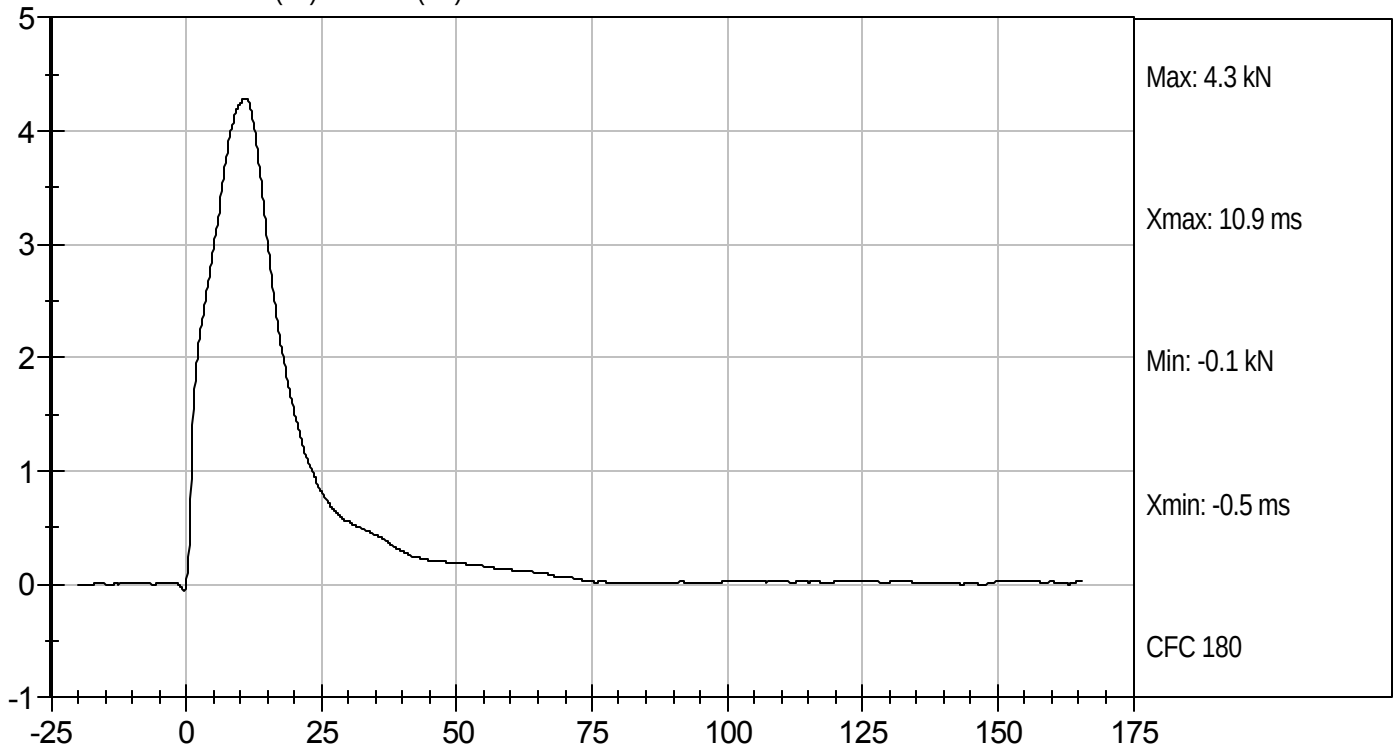
1/11/12
Test Date

David Winkelbauer
Approved By

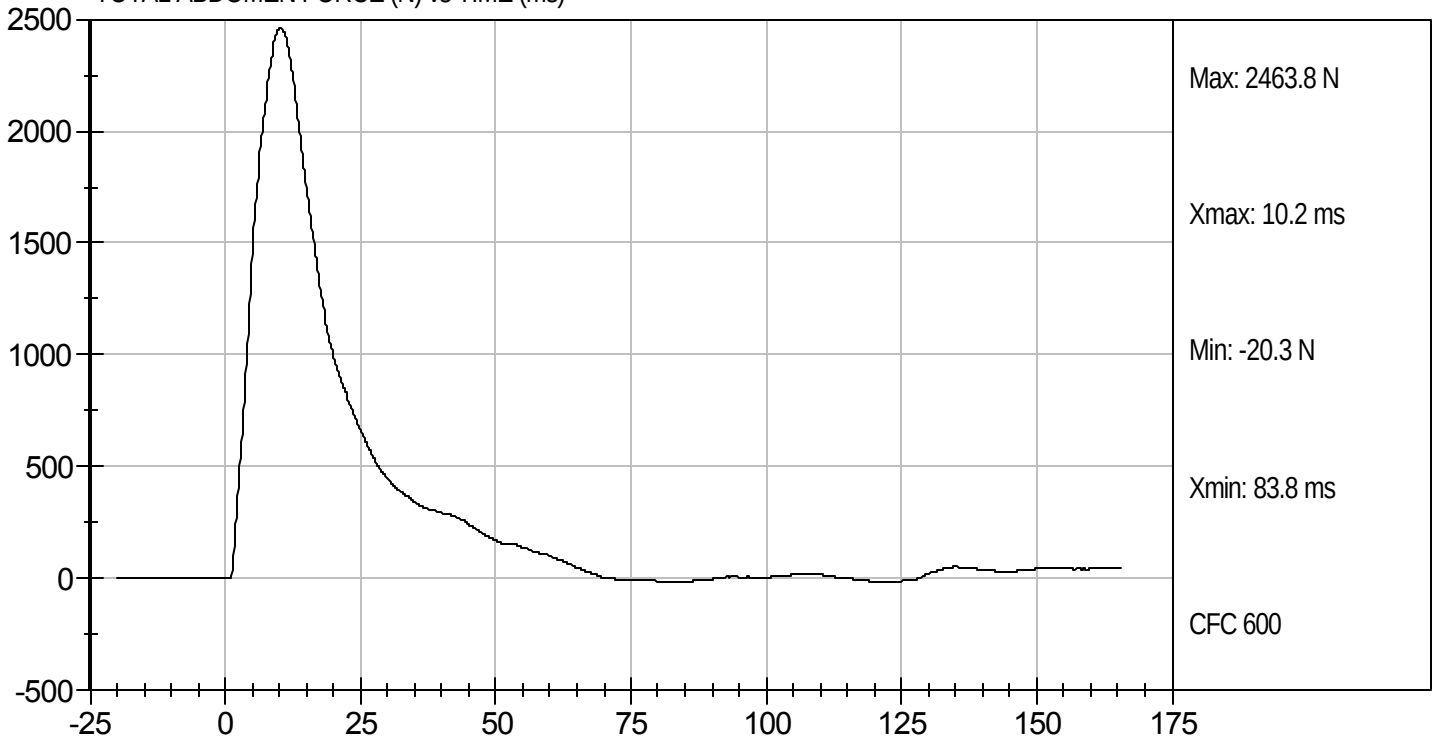
Test Desc: Abdomen Impact
Component ID: D12097

Test Date: 1/11/12
Velocity: 13.44 ft/s, 4.1 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



TOTAL ABDOMEN FORCE (N) vs TIME (ms)



MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12098

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	24	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Deceleration	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.42	Pass
	27 ms	m/s	-6.50 to -5.80	-5.83	Pass
	30 ms	m/s	>= -6.5	-5.70	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	46.5	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	43.0	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	42	Pass
			Overall Results		Pass

Jessica Hall
Laboratory Technician

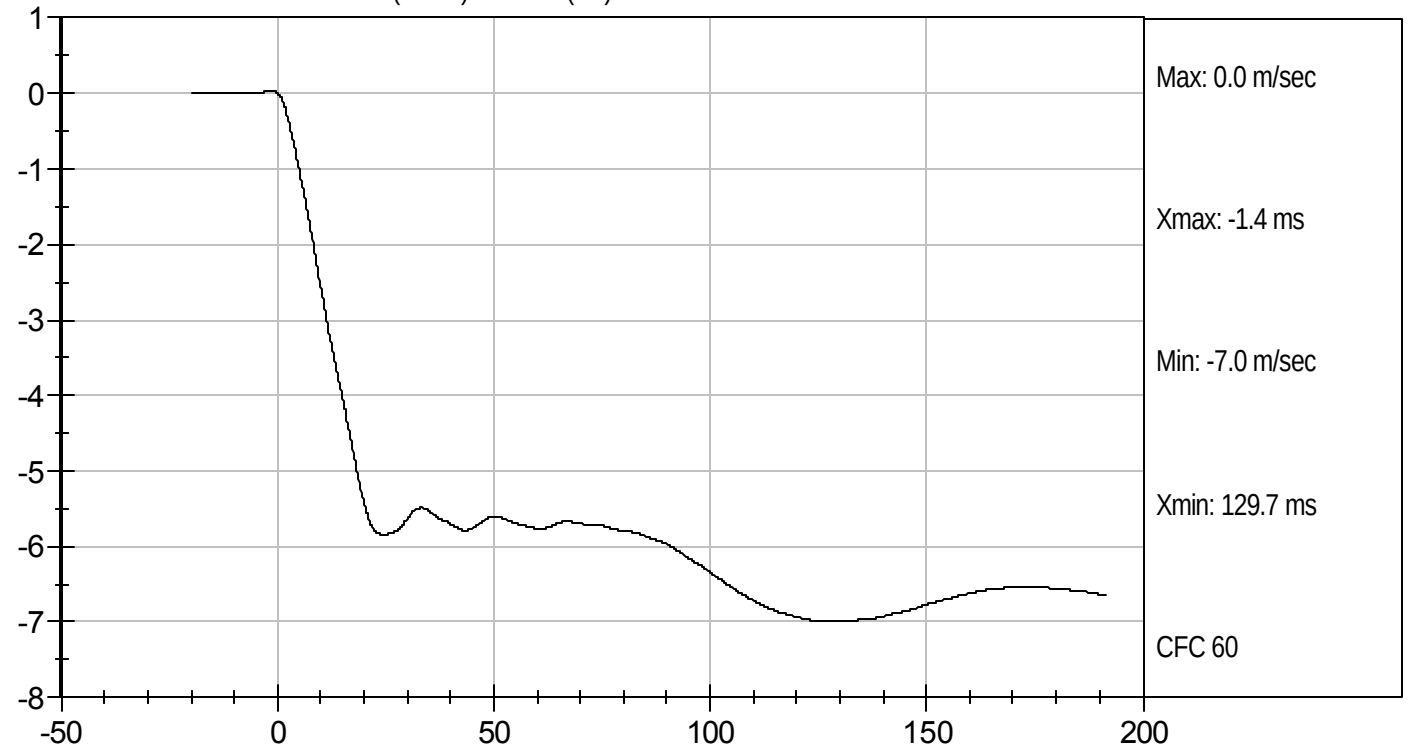
1/10/12
Test Date

David Winkelbauer
Approved By

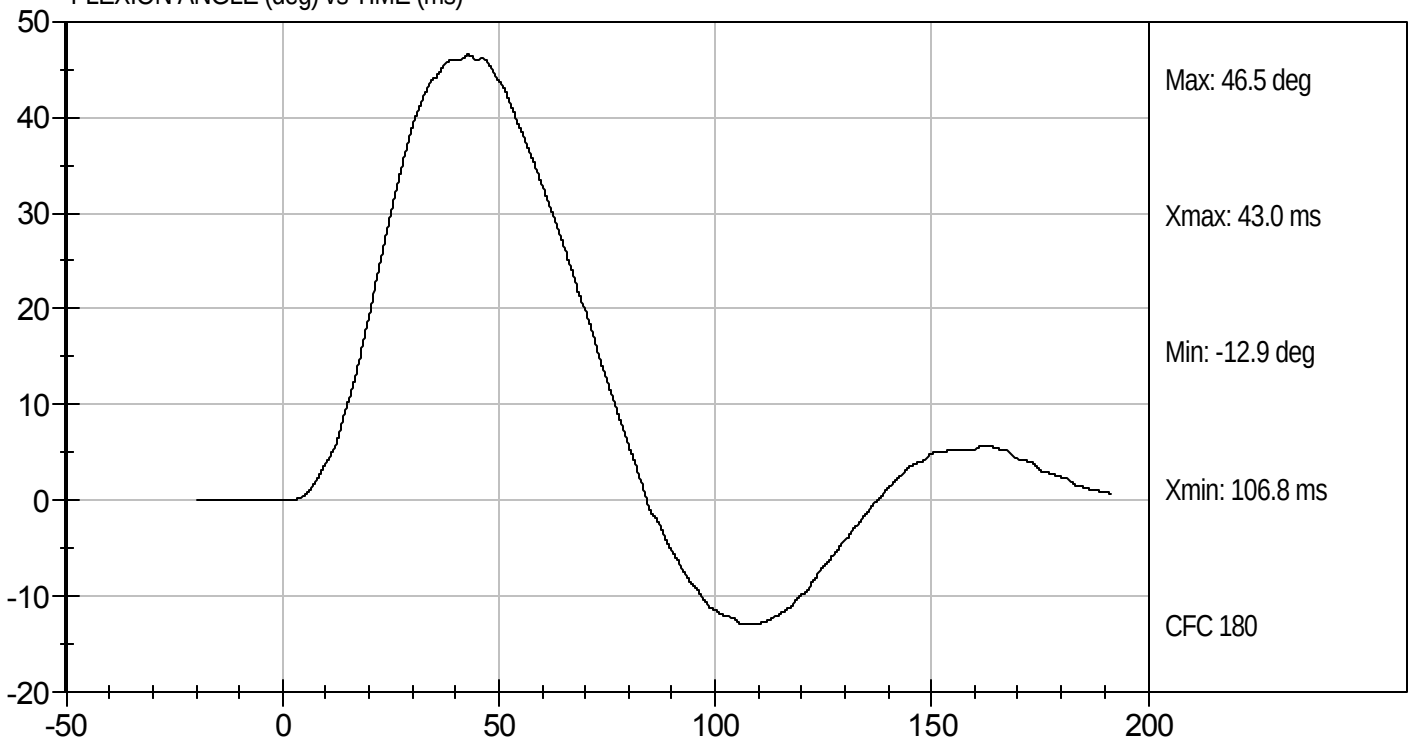
Test Desc: Lumbar Bending
Component ID: D12098

Test Date: 1/10/12
Velocity: 20.08 ft/s, 6.12 m/s

PENDULUM DECELERATION (m/sec) vs TIME (ms)

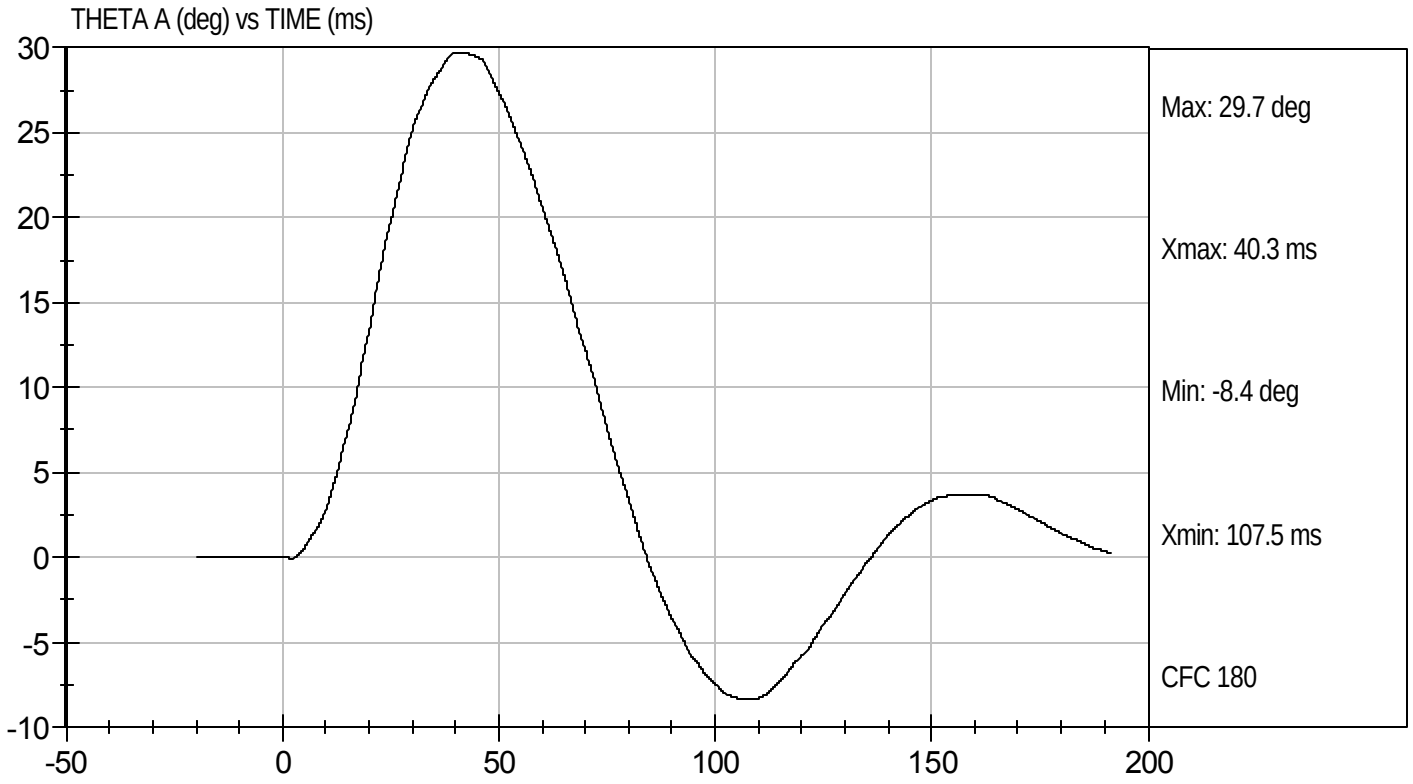


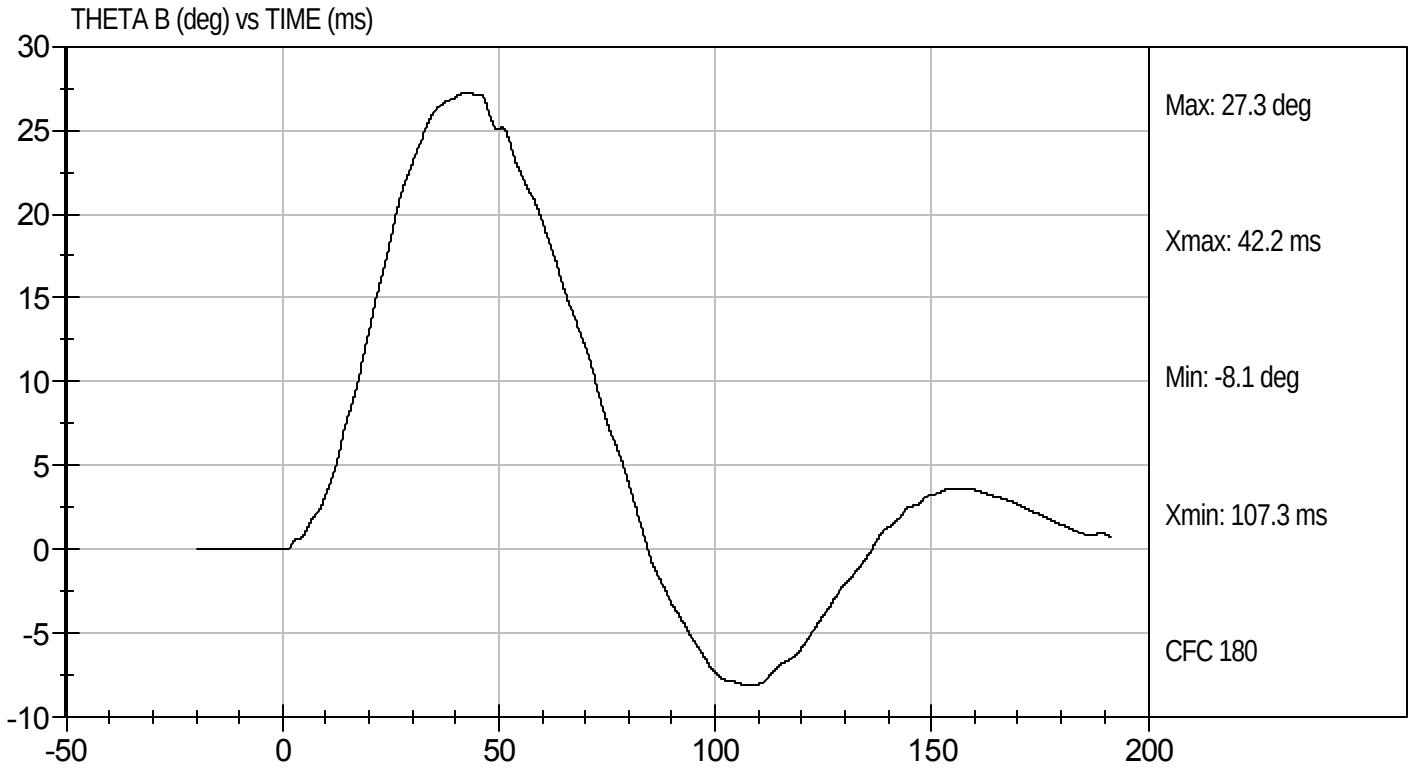
FLEXION ANGLE (deg) vs TIME (ms)



Test Desc: Lumbar Bending
Component ID: D12098

Test Date: 1/10/12
Velocity: 20.08 ft/s, 6.12 m/s





MGA RESEARCH CORPORATION

PELVIS TEST

ES-2re DUMMY

ATD Serial No: 032 **Test I.D:** D12099

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.86	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.10	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.34	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	13.40	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

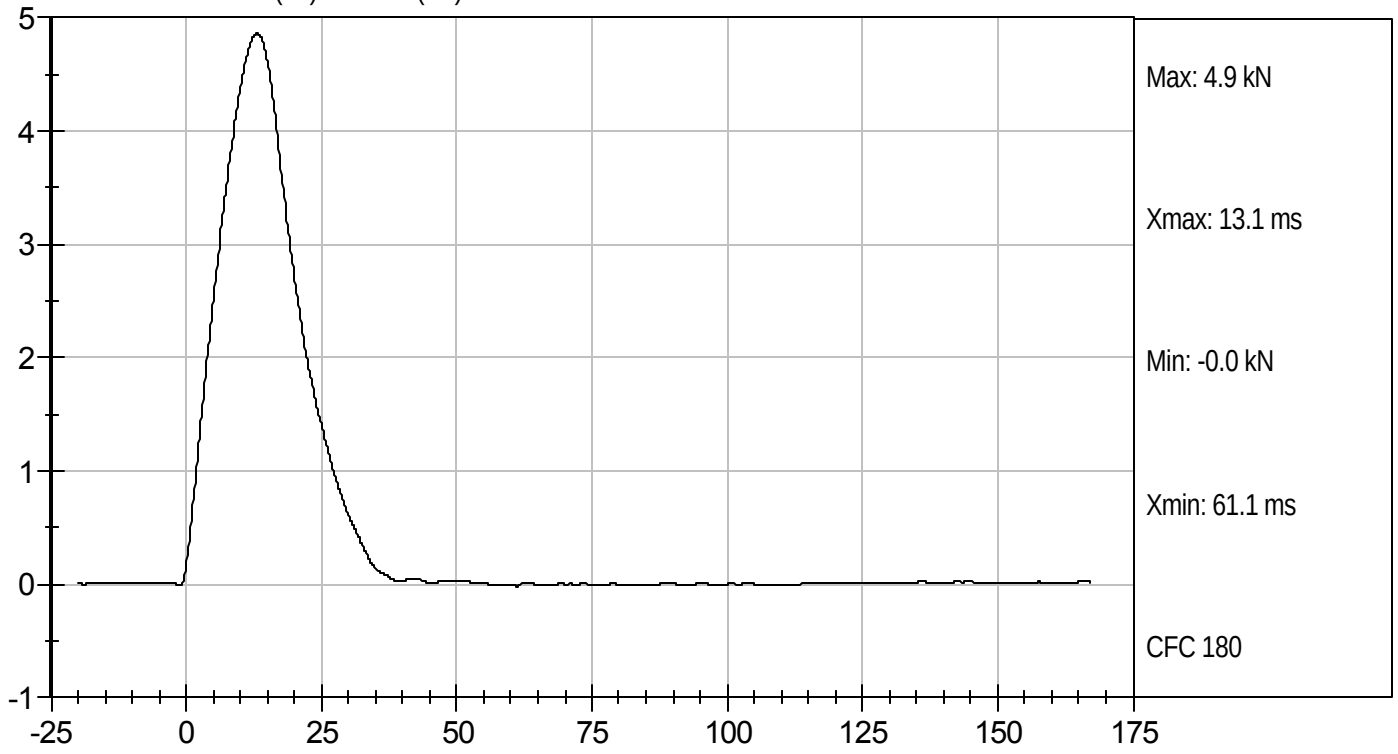
1/11/12
Test Date

David Winkelbauer
Approved By

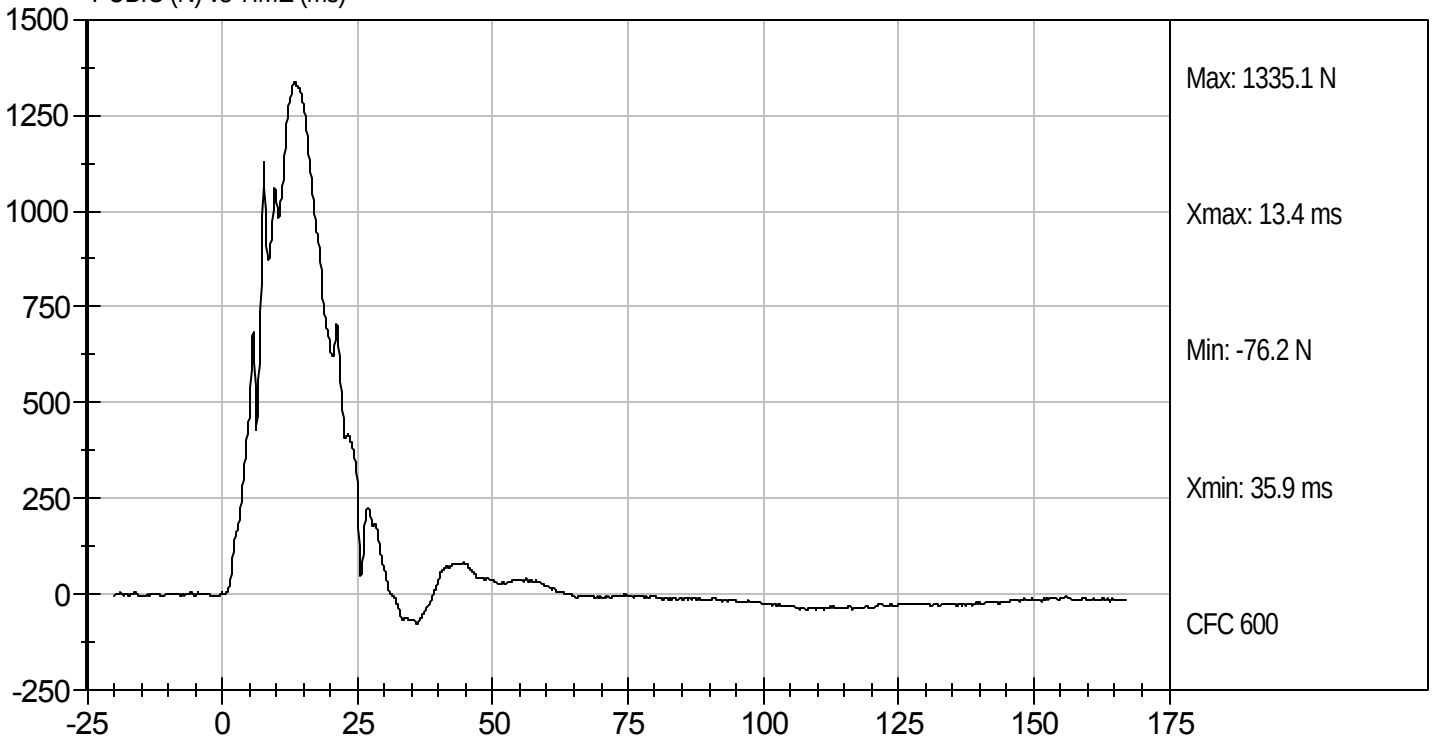
Test Desc: Pelvis Impact
Component ID: D12099

Test Date: 1/11/12
Velocity: 14.12 ft/s, 4.3 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



PUBIC (N) vs TIME (ms)



SID-IIsD External Measurements
SN: 306

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

MGA RESEARCH CORPORATION

HEAD DROP TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D12031

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Peak Resultant Acceleration	G's	115 to 137	121	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-2.3	Pass
Unimodal	N/A	<15%	Yes	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

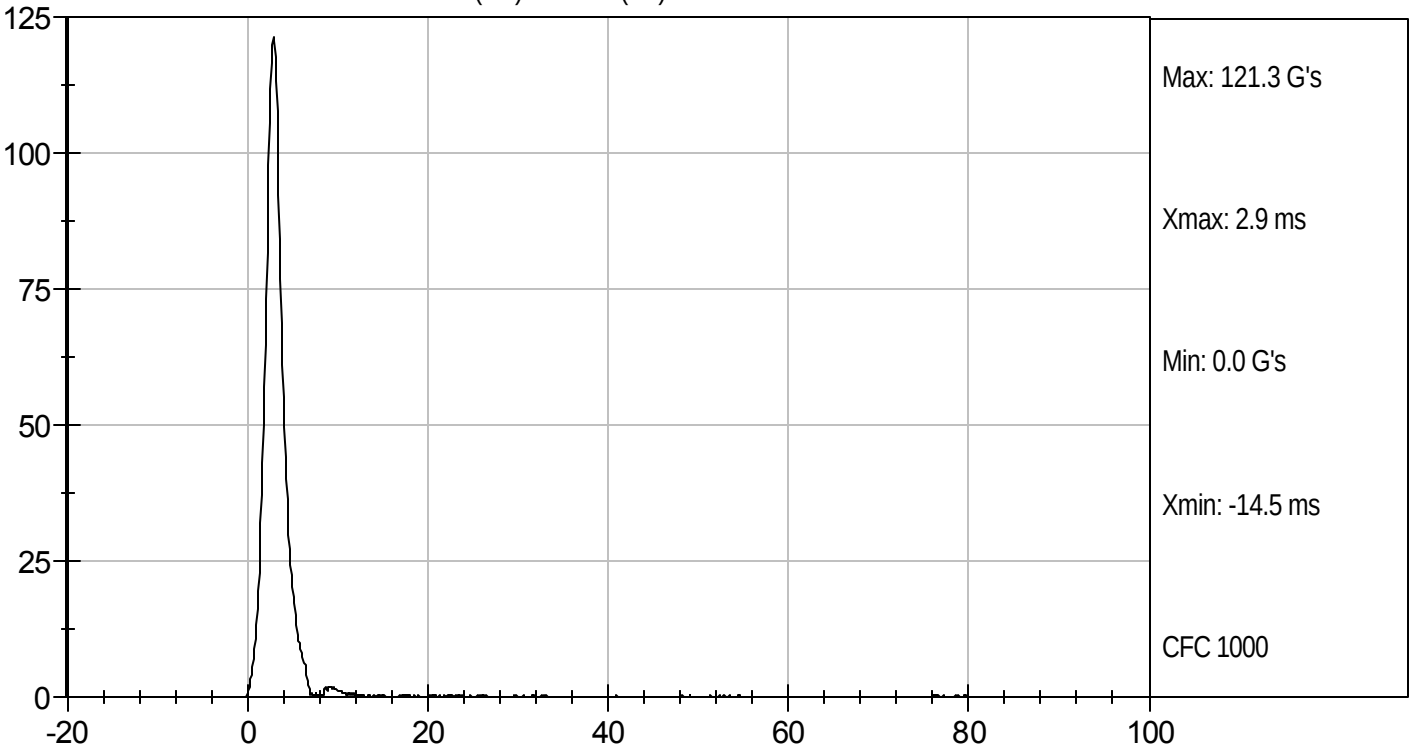
1/6/12
Test Date

David Winkelbauer
Approved By

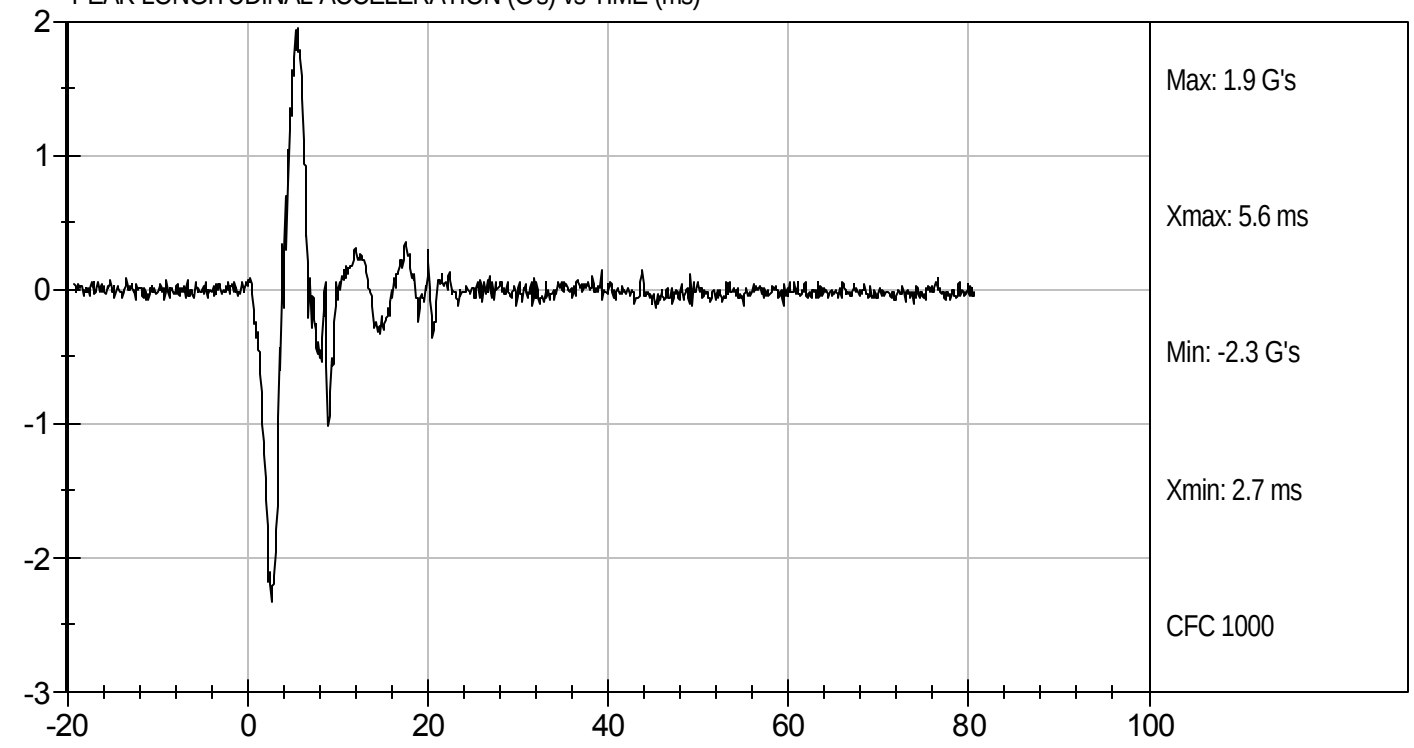
Test Desc: Head Drop
Component ID: D12031

Test Date: 1/6/12
Velocity: 0 ft/s, 0 m/s

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



PEAK LONGITUDINAL ACCELERATION (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

LATERAL NECK PENDULUM TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12032

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.4	Pass
Humidity		%	10 to 70	23	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.72	Pass
	15 ms	m/s	3.30 to 4.10	3.93	Pass
	20 ms	m/s	4.40 to 5.40	5.18	Pass
	25 ms	m/s	5.40 to 6.10	5.51	Pass
	25-100 ms	m/s	5.50 to 6.20	5.56	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	59	Pass
Maximum Occipital Condyle Moment during Rotation Interval		Nm	-44 to -36	-43	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	115	Pass
			Overall Test Results		Pass

Jessica Gall
Laboratory Technician

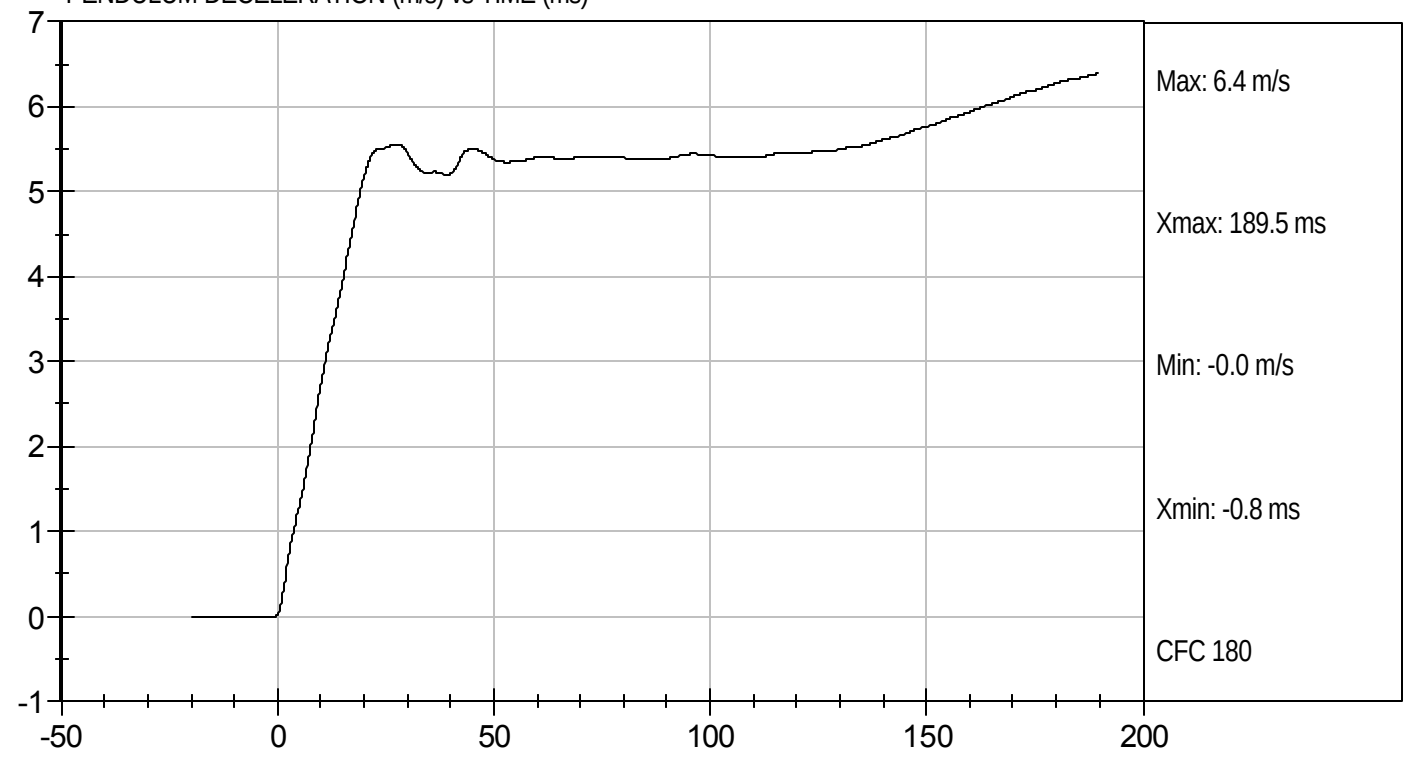
1/6/12
Test Date

David Winkelbauer
Approved By

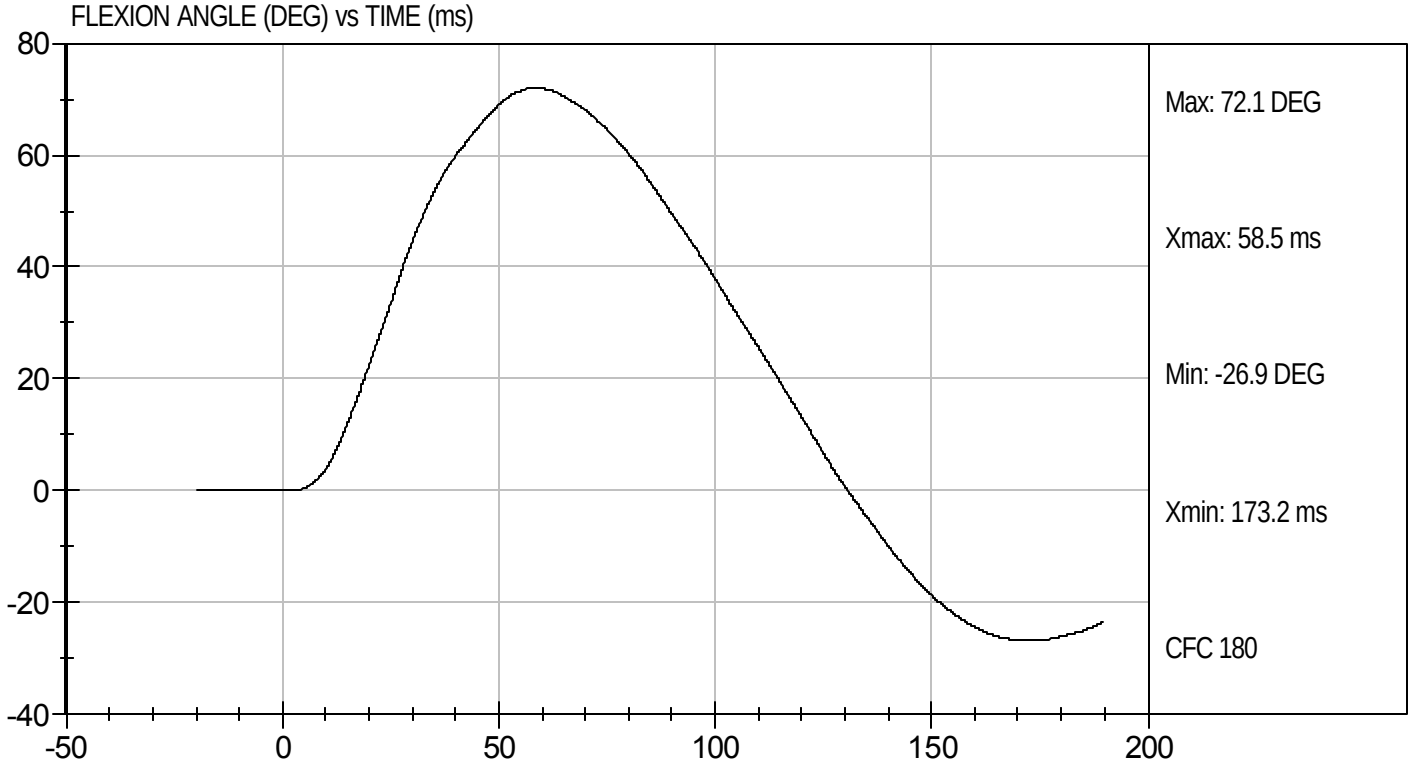
Test Desc: Neck Bending
Component ID: D12032

Test Date: 1/6/12
Velocity: 18.32 ft/s, 5.58 m/s

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

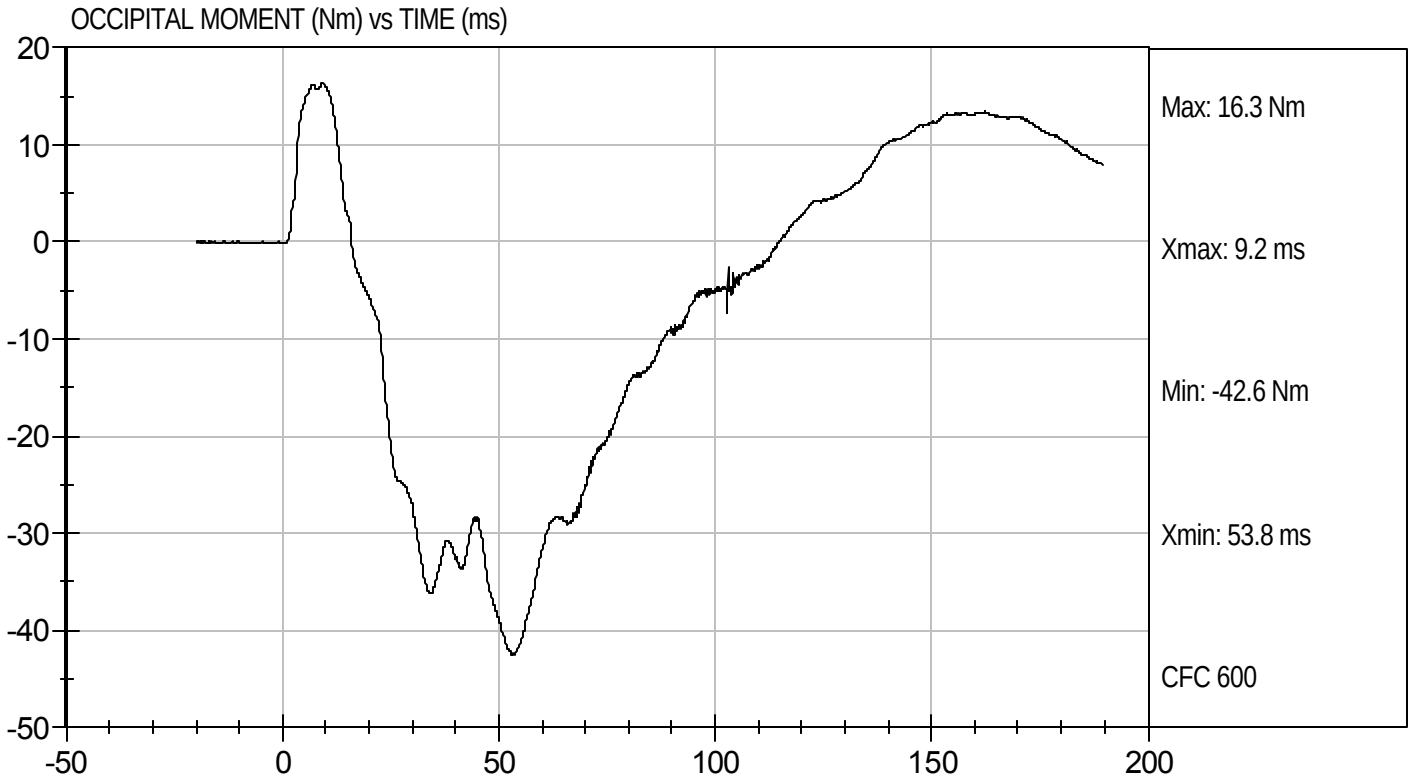


FLEXION ANGLE (DEG) vs TIME (ms)



Test Desc: Neck Bending
Component ID: D12032

Test Date: 1/6/12
Velocity: 18.32 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D12033

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	22	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
		Overall Test Results		Pass

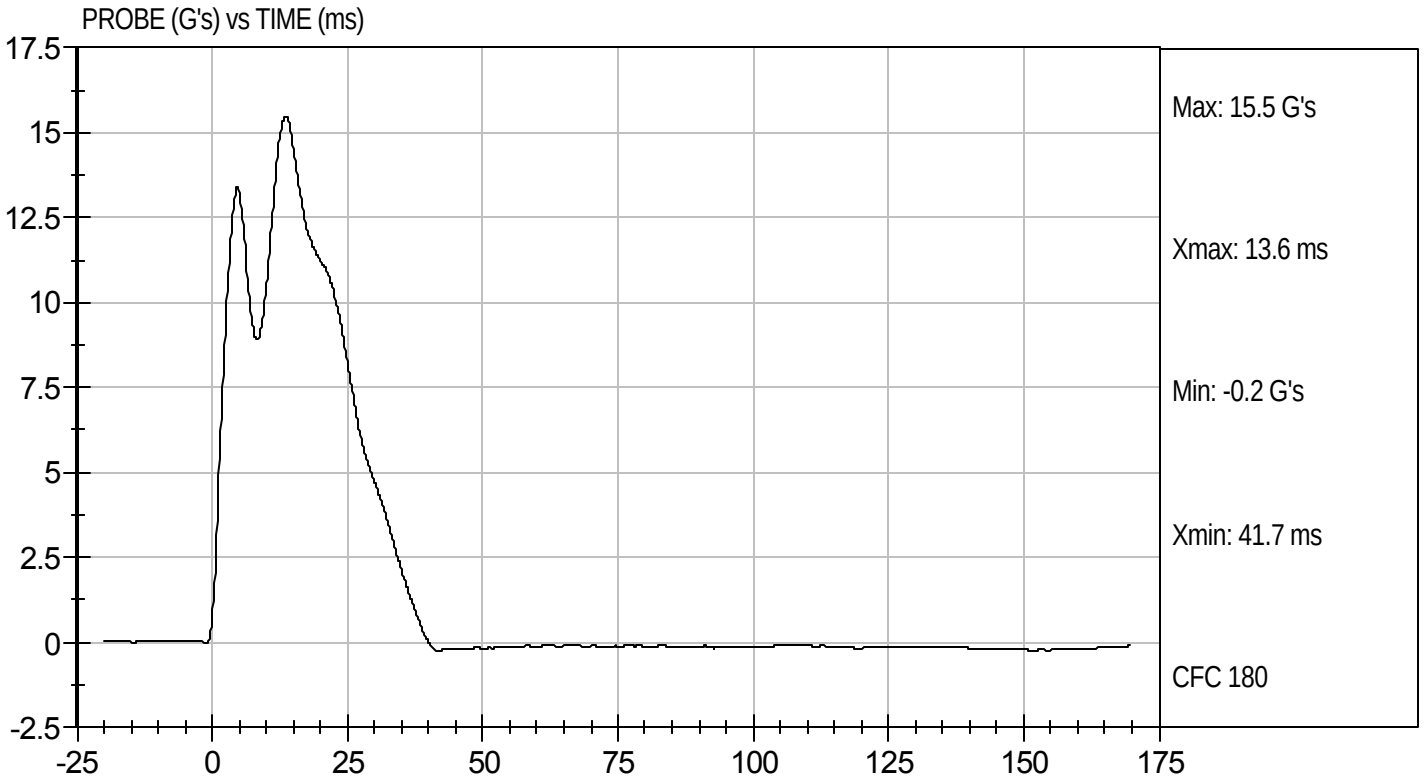
Jessica Hall
Laboratory Technician

1/5/12
Test Date

David Winkelbauer
Approved By

Test Desc: Shoulder Impact
Component ID: D12033

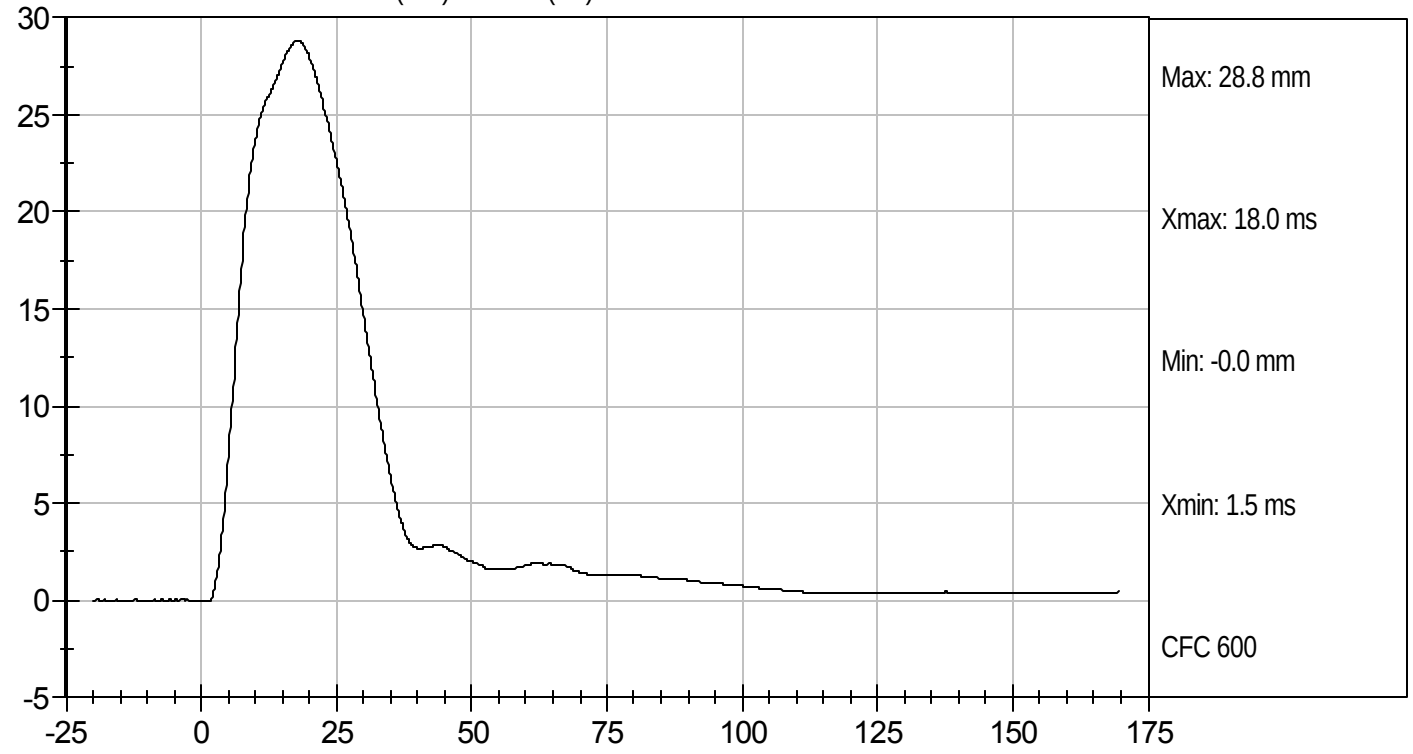
Test Date: 1/5/12
Velocity: 14.24 ft/s, 4.34 m/s



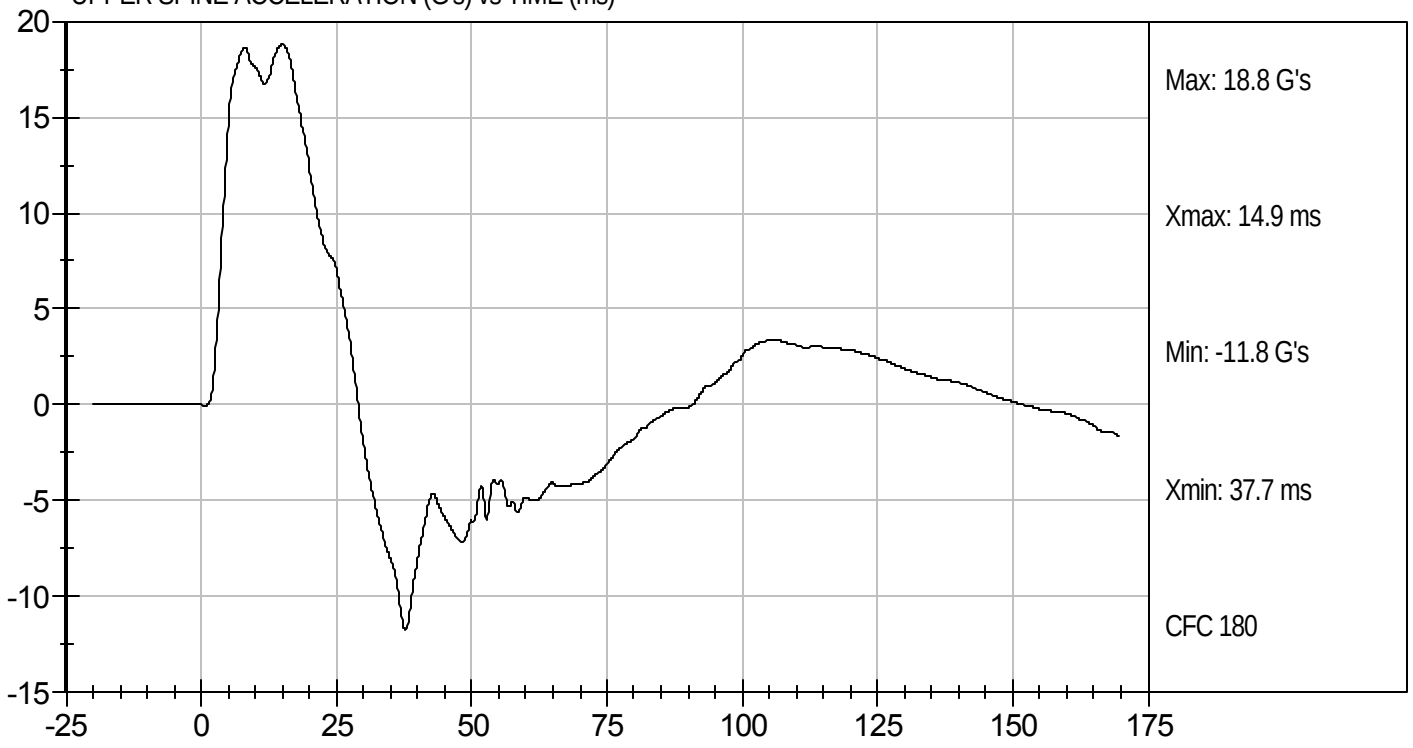
Test Desc: Shoulder Impact
Component ID: D12033

Test Date: 1/5/12
Velocity: 14.24 ft/s, 4.34 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



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



MGA RESEARCH CORPORATION

THORAX (WITH ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12034

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	34	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	26	Pass
Middle Rib Displacement	mm	30 to 36	30	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	34	Pass
		Overall Test Results		Pass

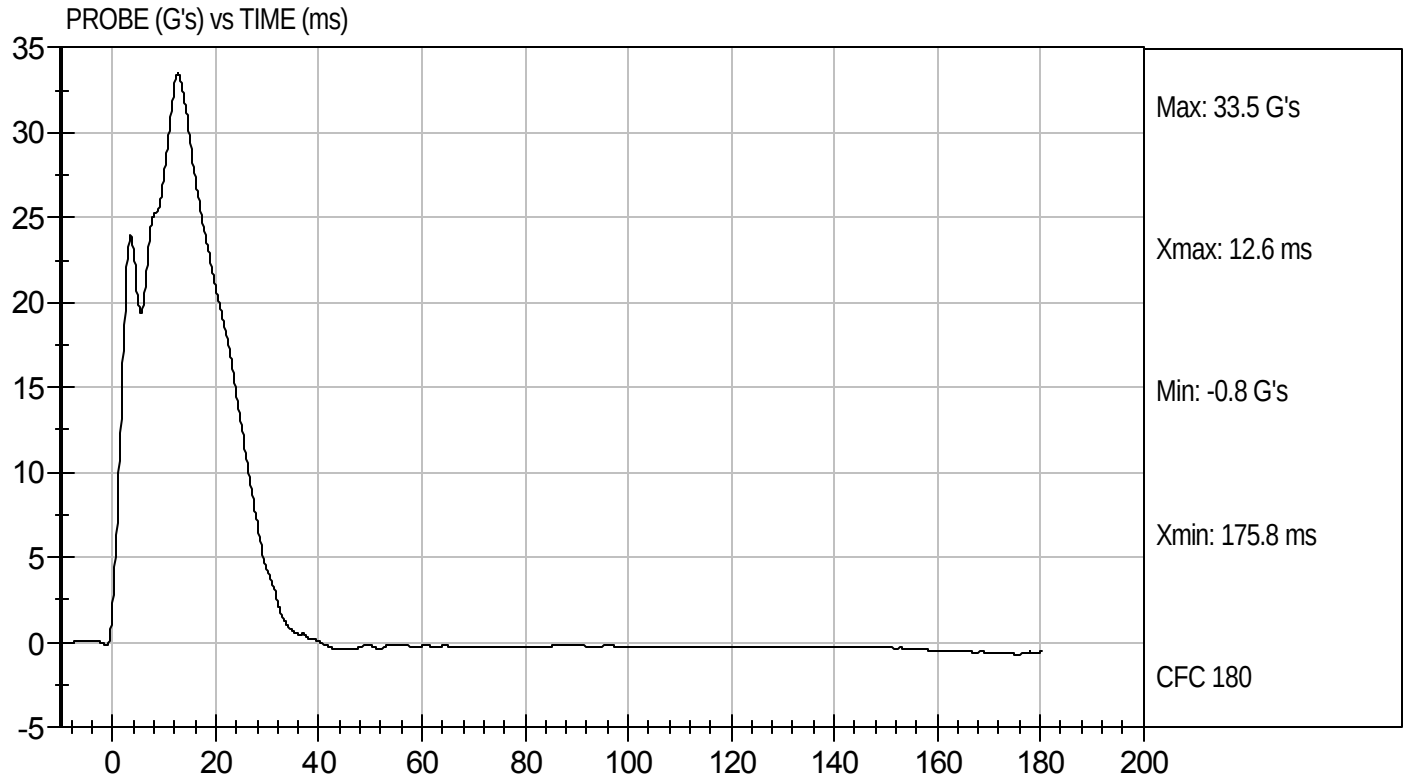
Jessica Hall
Laboratory Technician

1/5/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax With Arm
Component ID: D12034

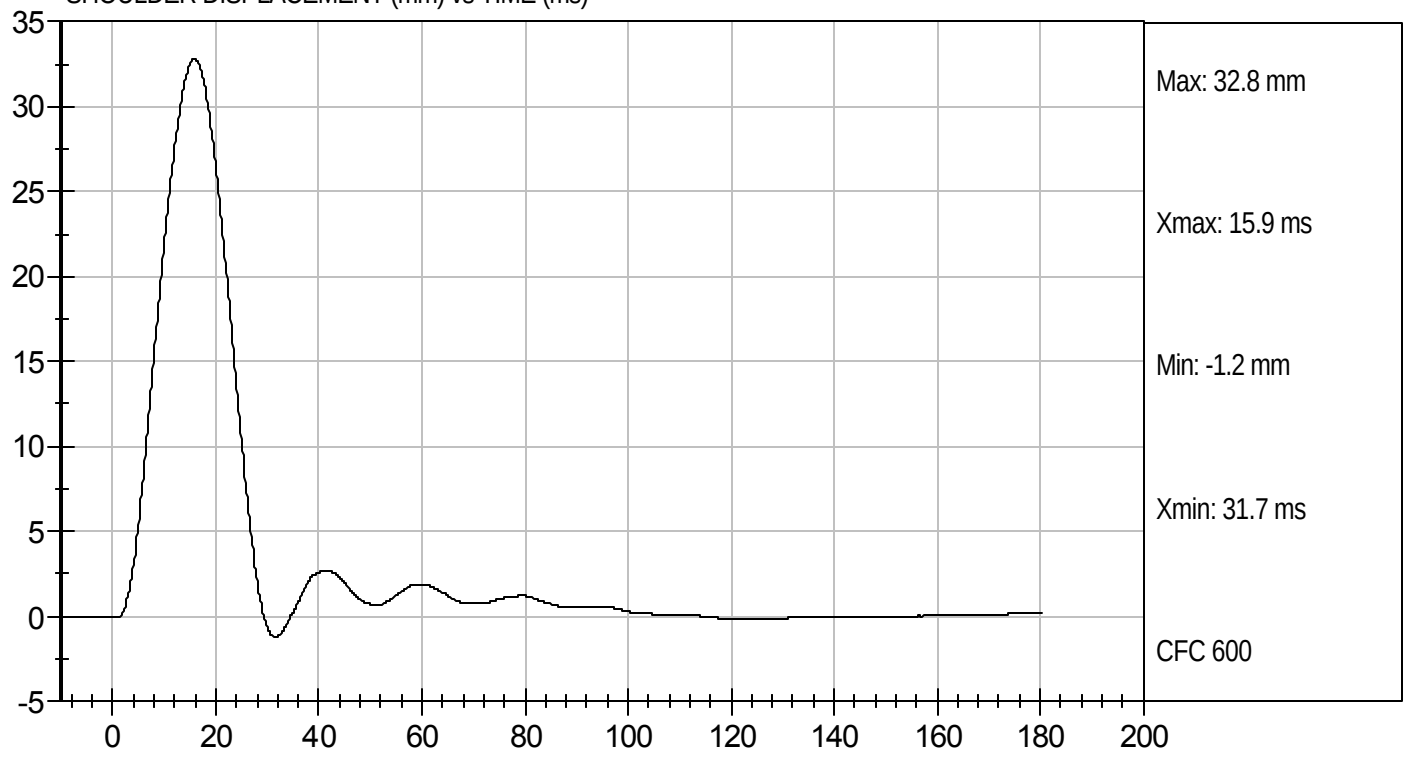
Test Date: 1/5/12
Velocity: 22.22 ft/s, 6.77 m/s



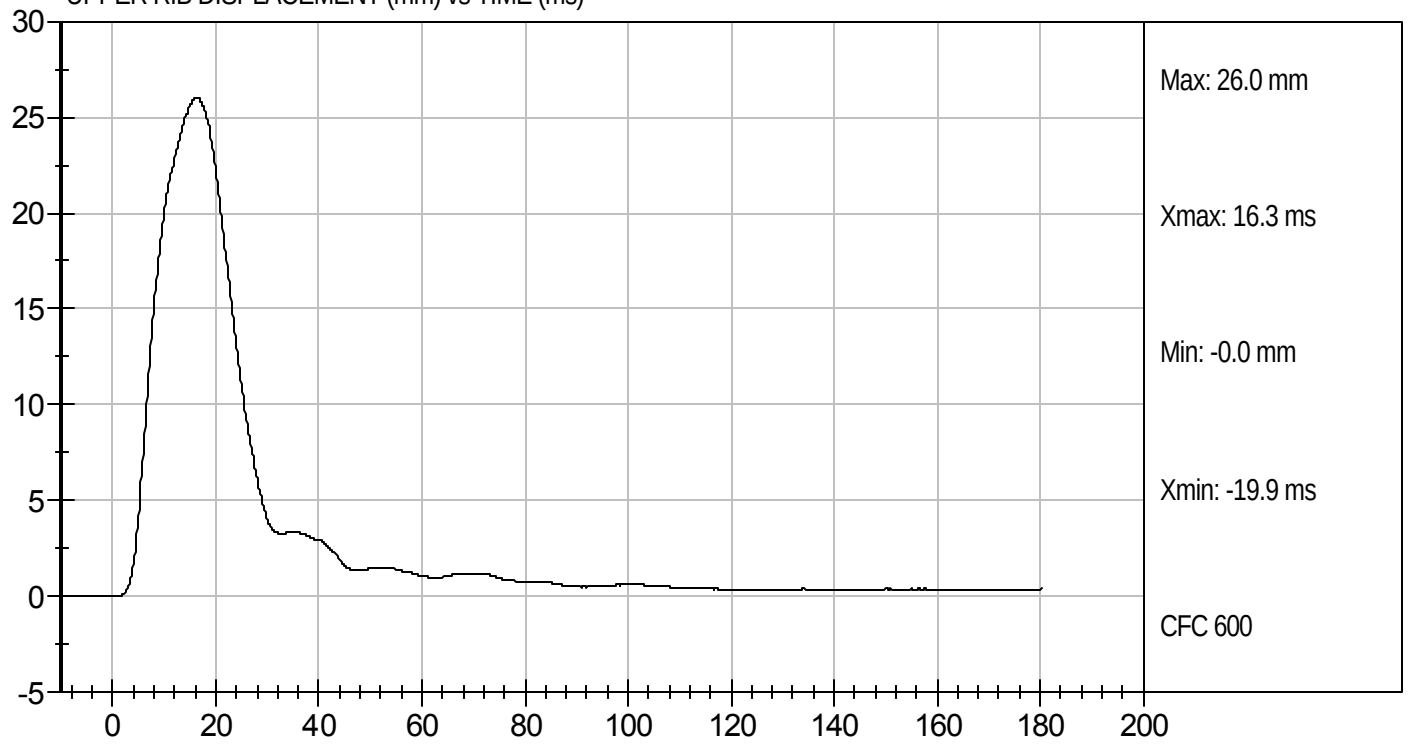
Test Desc: Thorax With Arm
Component ID: D12034

Test Date: 1/5/12
Velocity: 22.22 ft/s, 6.77 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



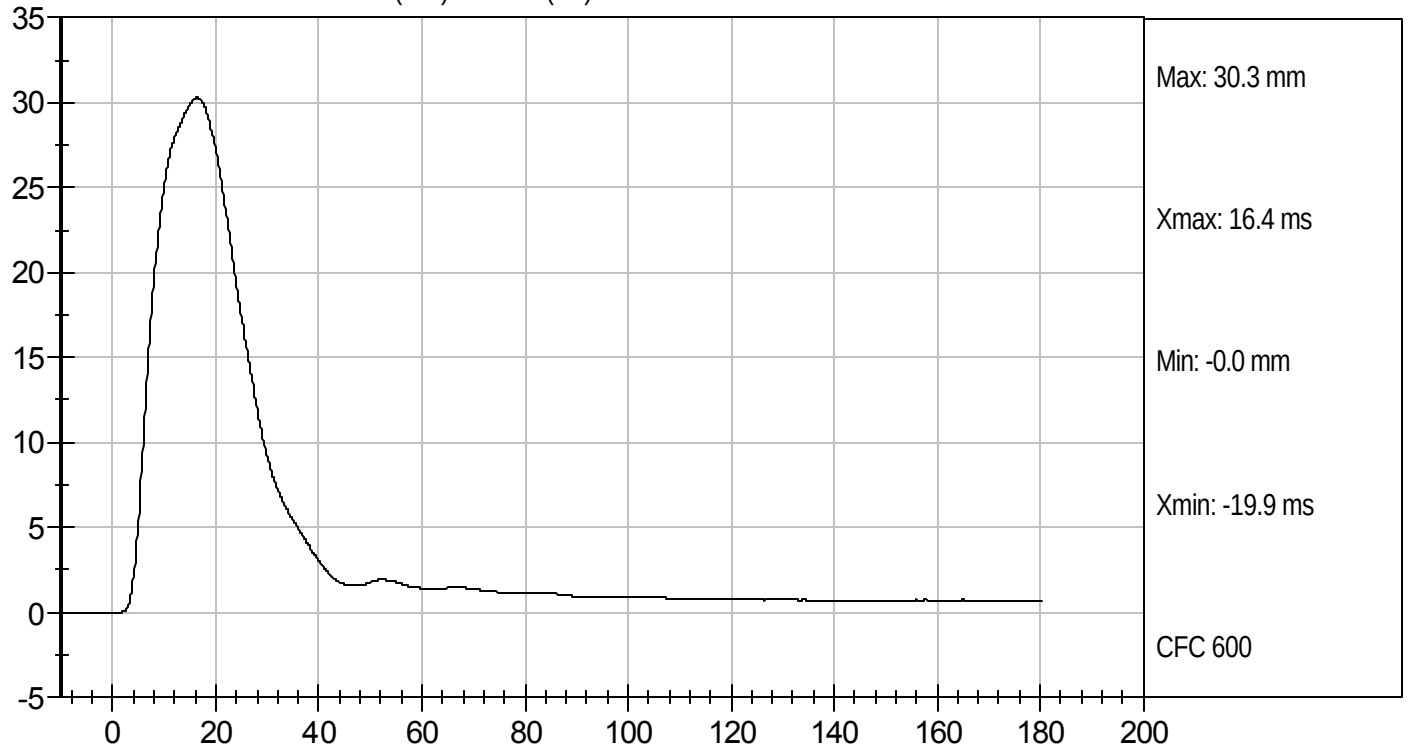
UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



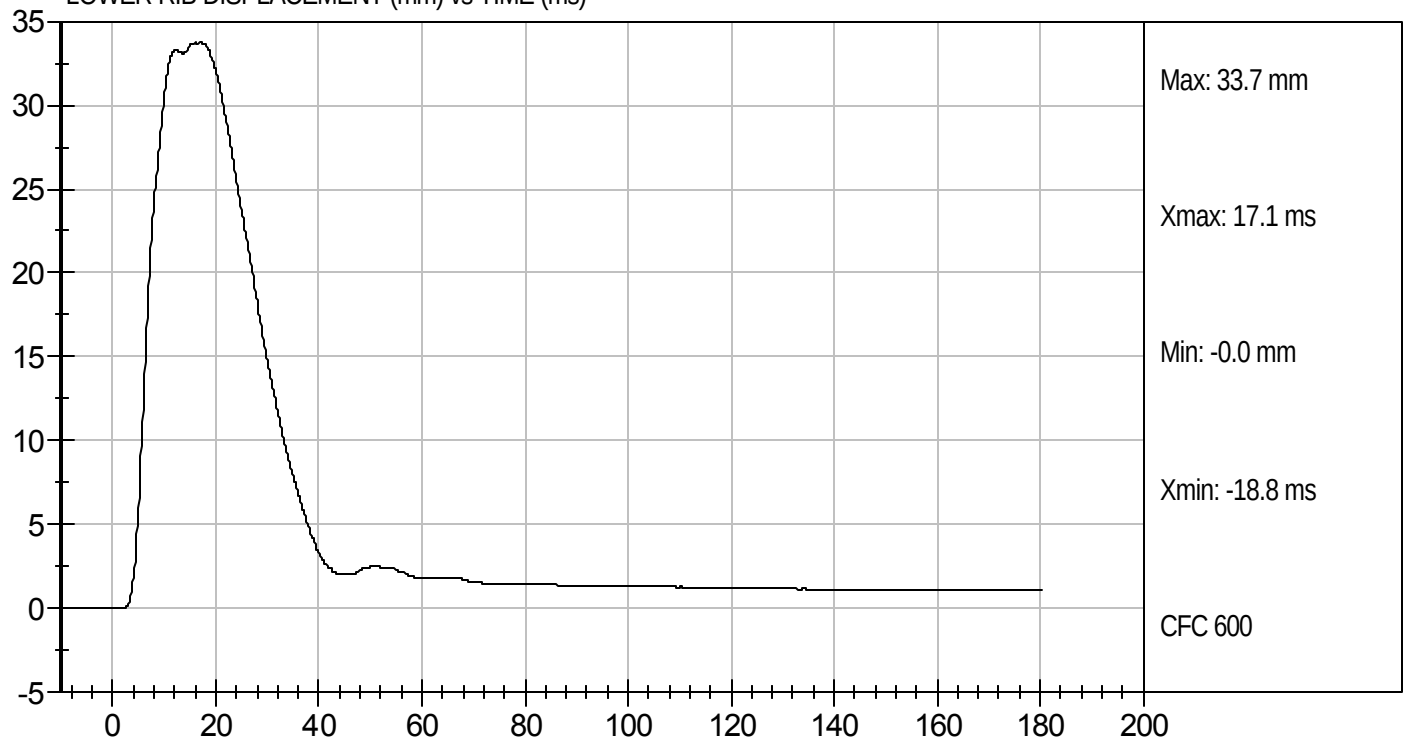
Test Desc: Thorax With Arm
Component ID: D12034

Test Date: 1/5/12
Velocity: 22.22 ft/s, 6.77 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



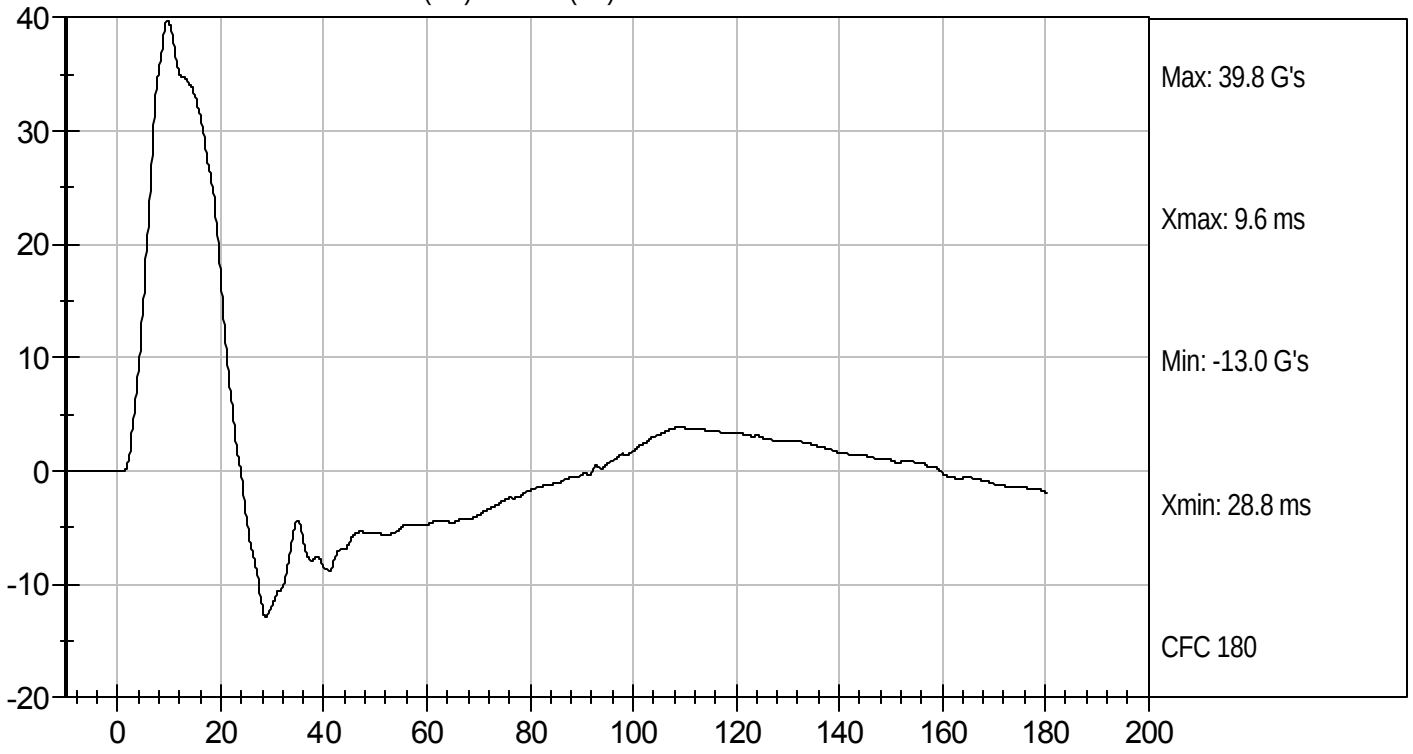
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



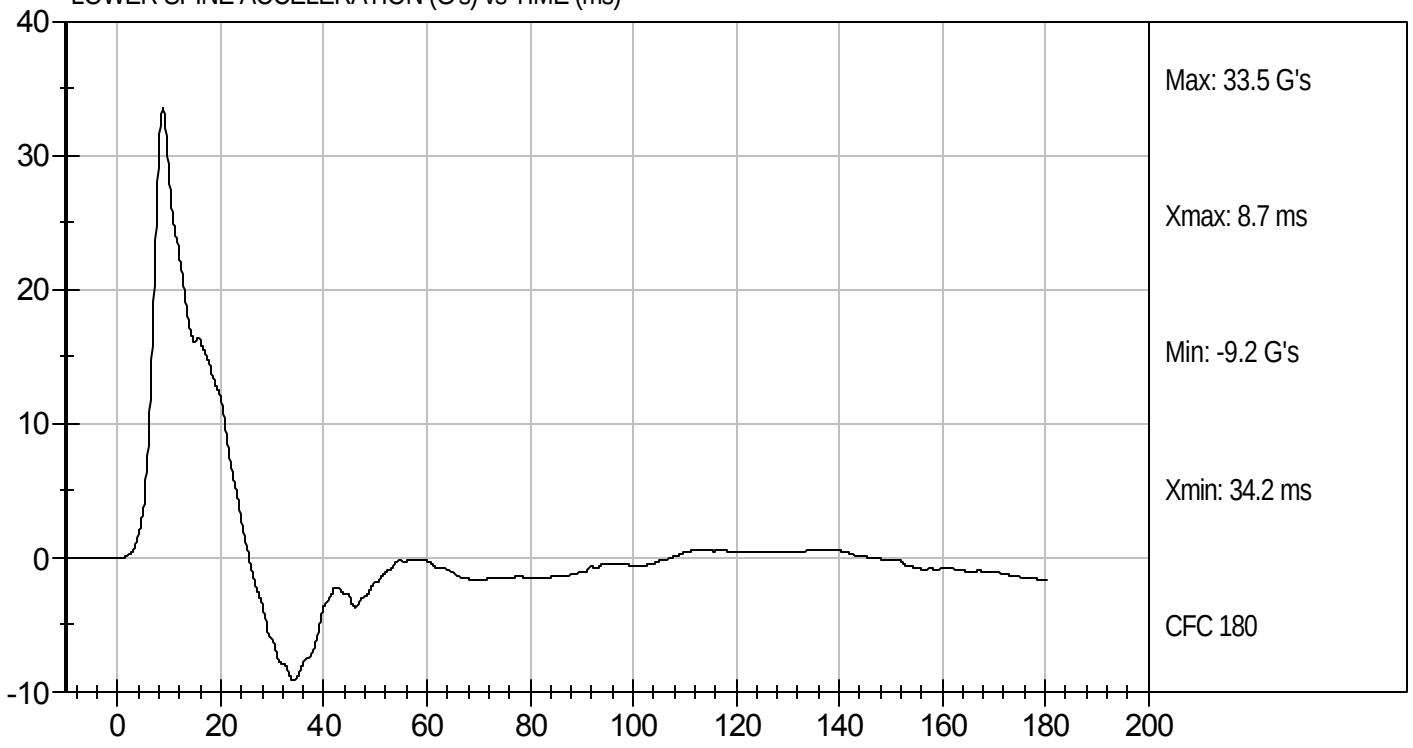
Test Desc: Thorax With Arm
Component ID: D12034

Test Date: 1/5/12
Velocity: 22.22 ft/s, 6.77 m/s

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



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



MGA RESEARCH CORPORATION

THORAX (WITHOUT ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12035

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	36	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
		Overall Test Results		Pass

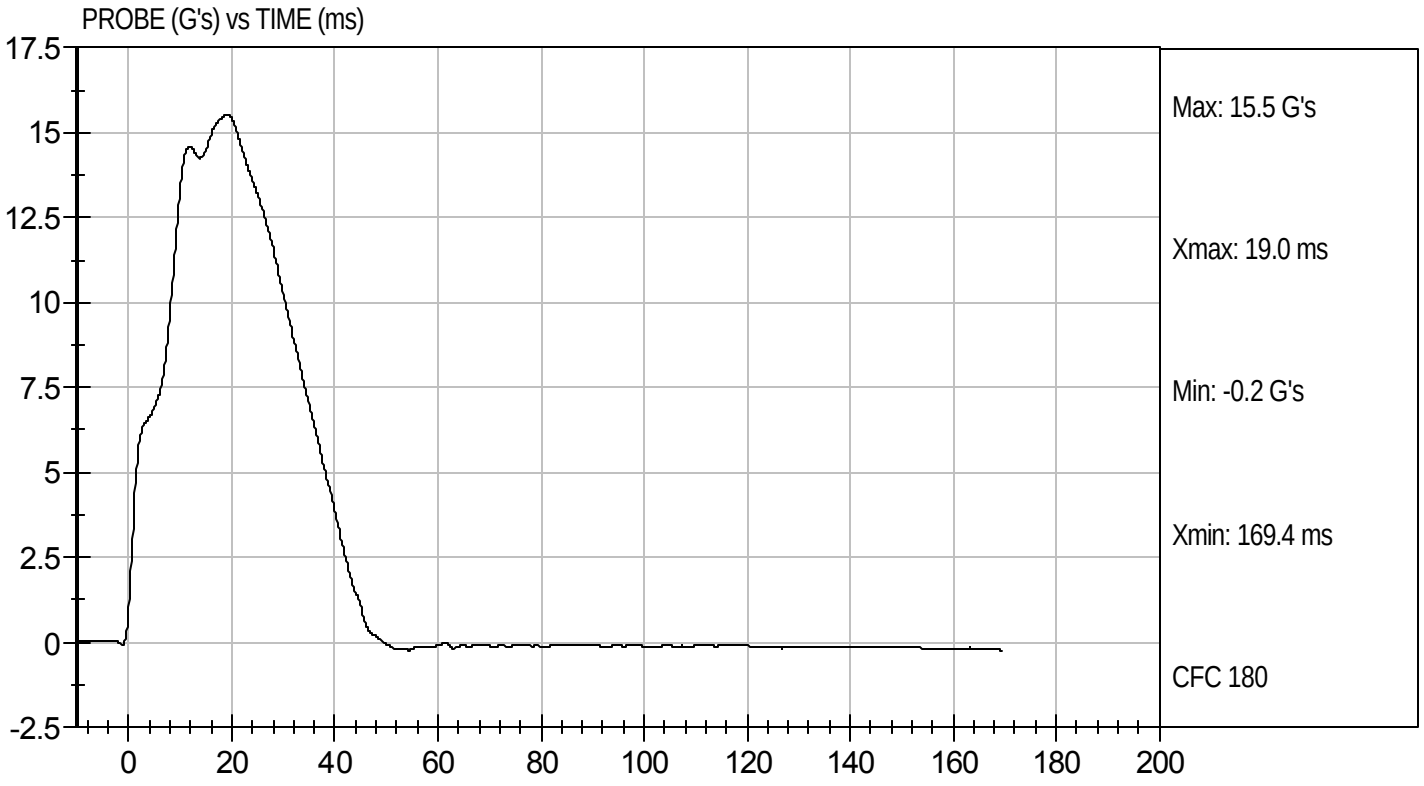
Jessica Hall
Laboratory Technician

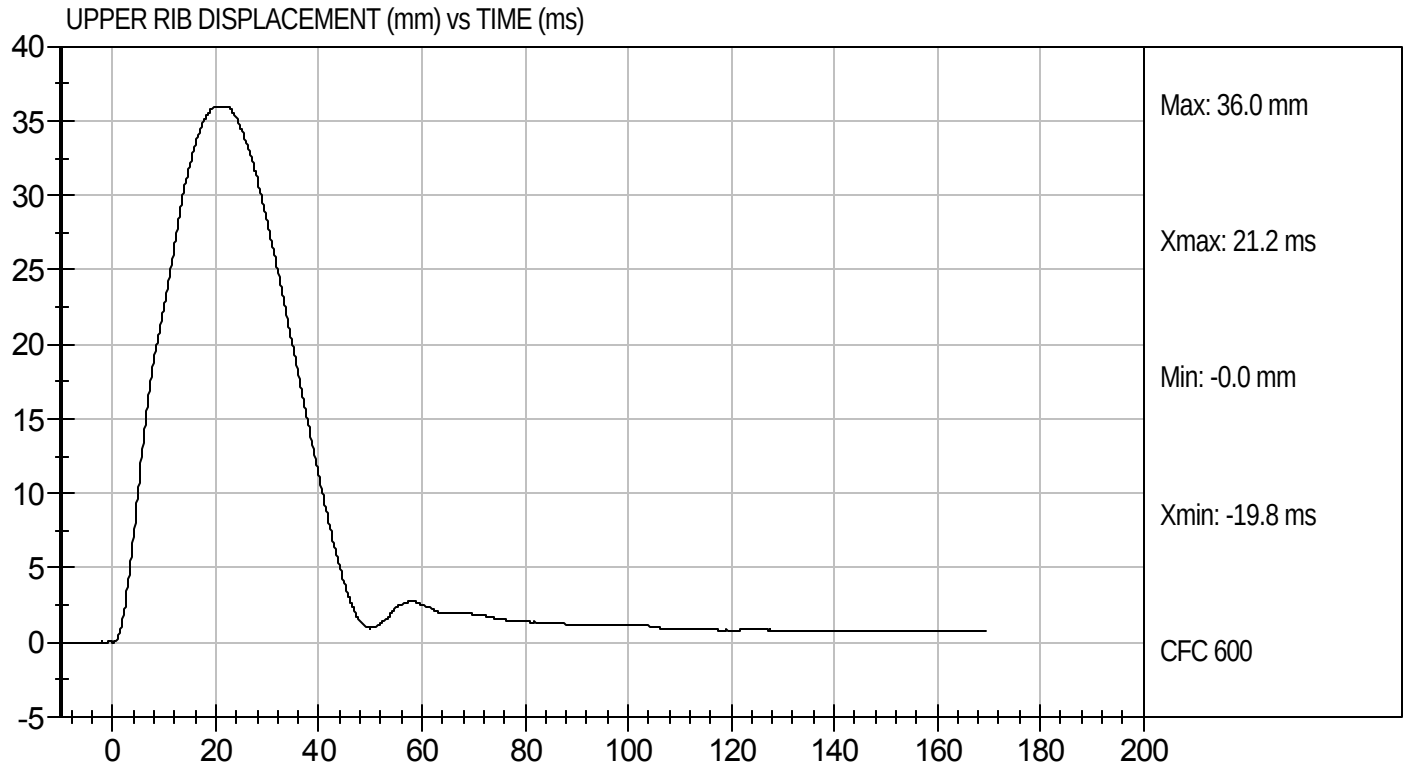
1/5/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Without Arm
Component ID: D12035

Test Date: 1/5/12
Velocity: 14.24 ft/s, 4.34 m/s

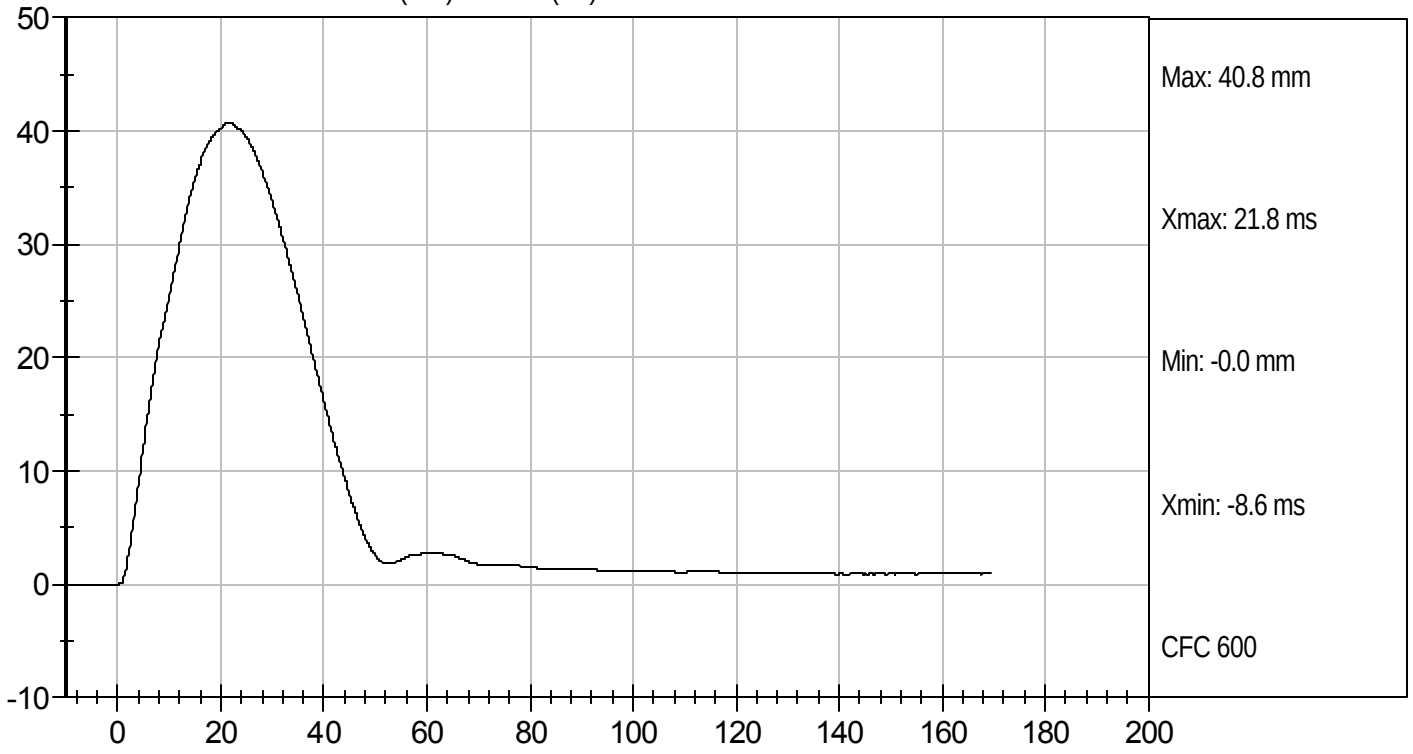




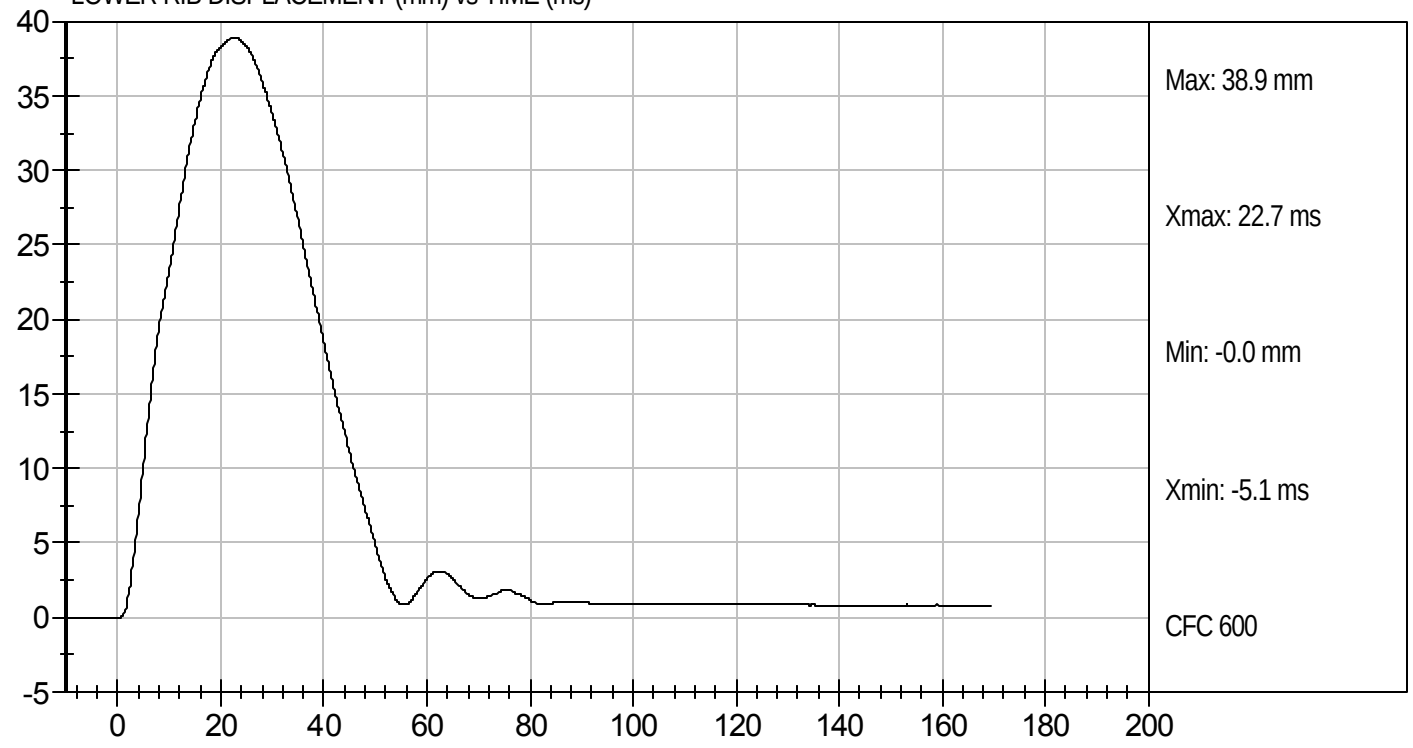
Test Desc: Thorax Without Arm
Component ID: D12035

Test Date: 1/5/12
Velocity: 14.24 ft/s, 4.34 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



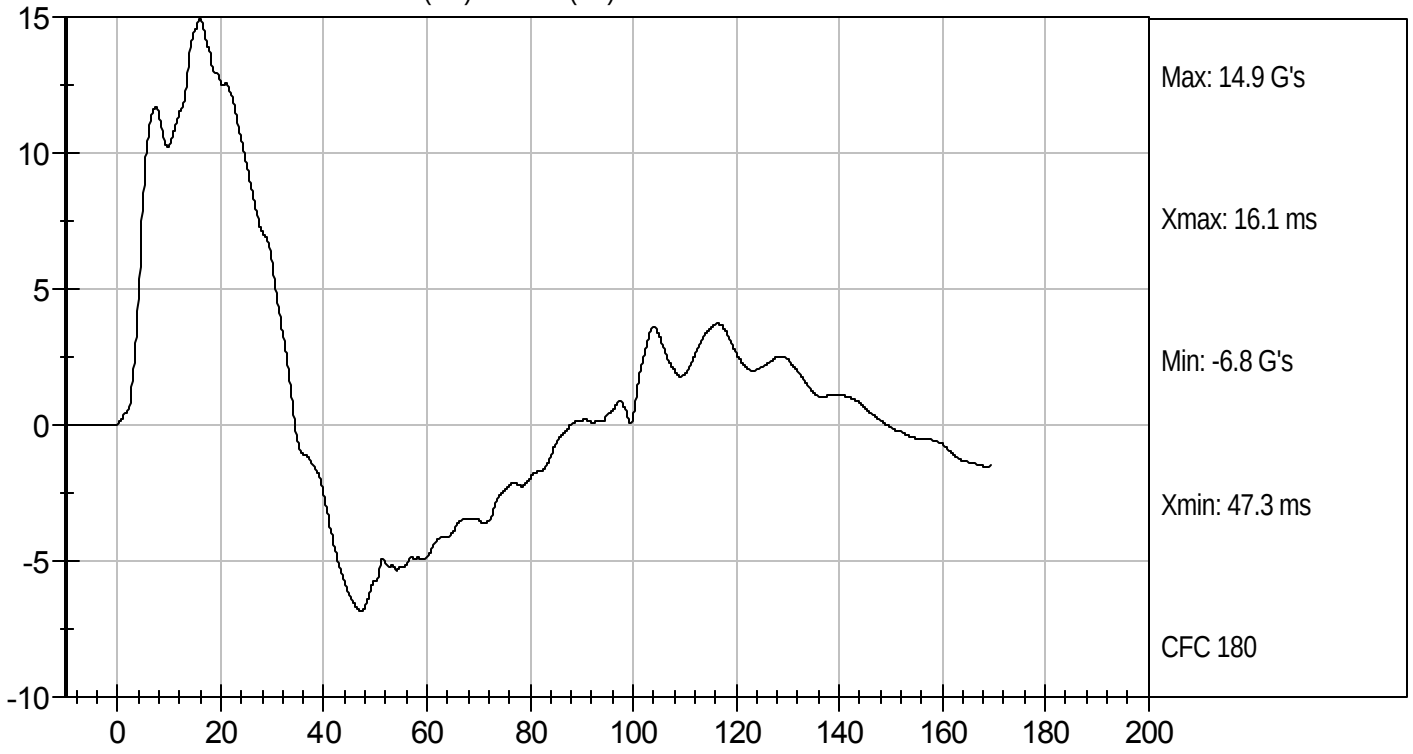
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



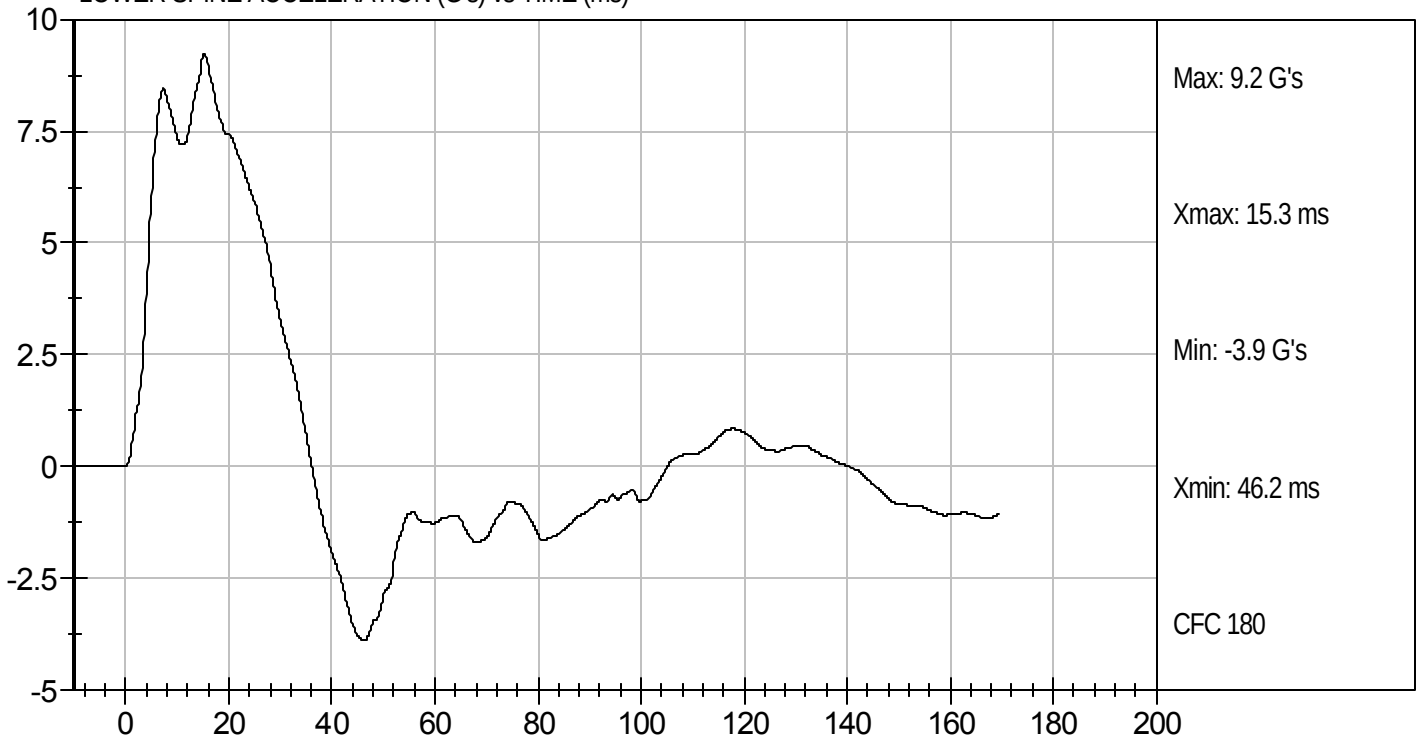
Test Desc: Thorax Without Arm
Component ID: D12035

Test Date: 1/5/12
Velocity: 14.24 ft/s, 4.34 m/s

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



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



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12036

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	38	Pass
Lower Rib Displacement	mm	33 to 44	35	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
		Overall Test Results		Pass

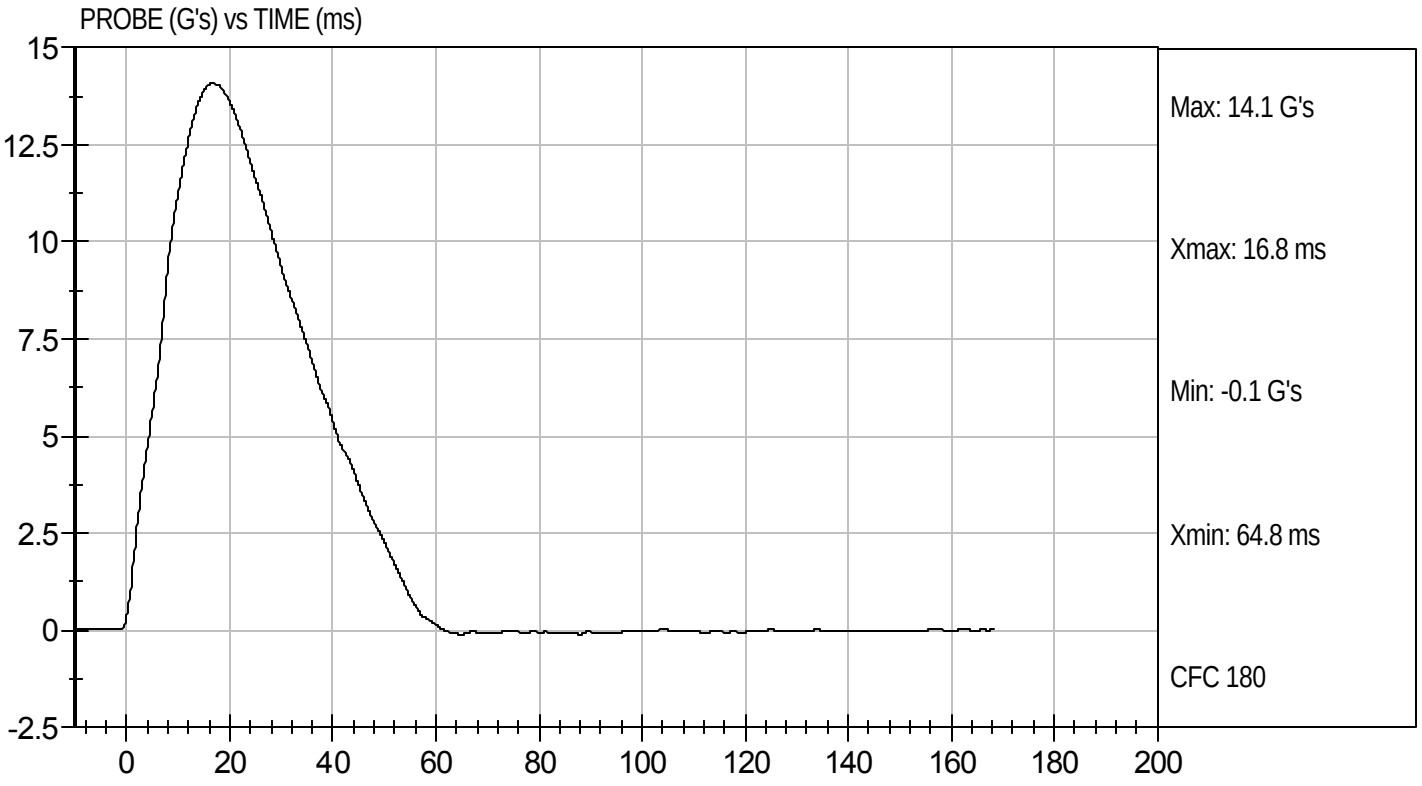
Jessica Hall
Laboratory Technician

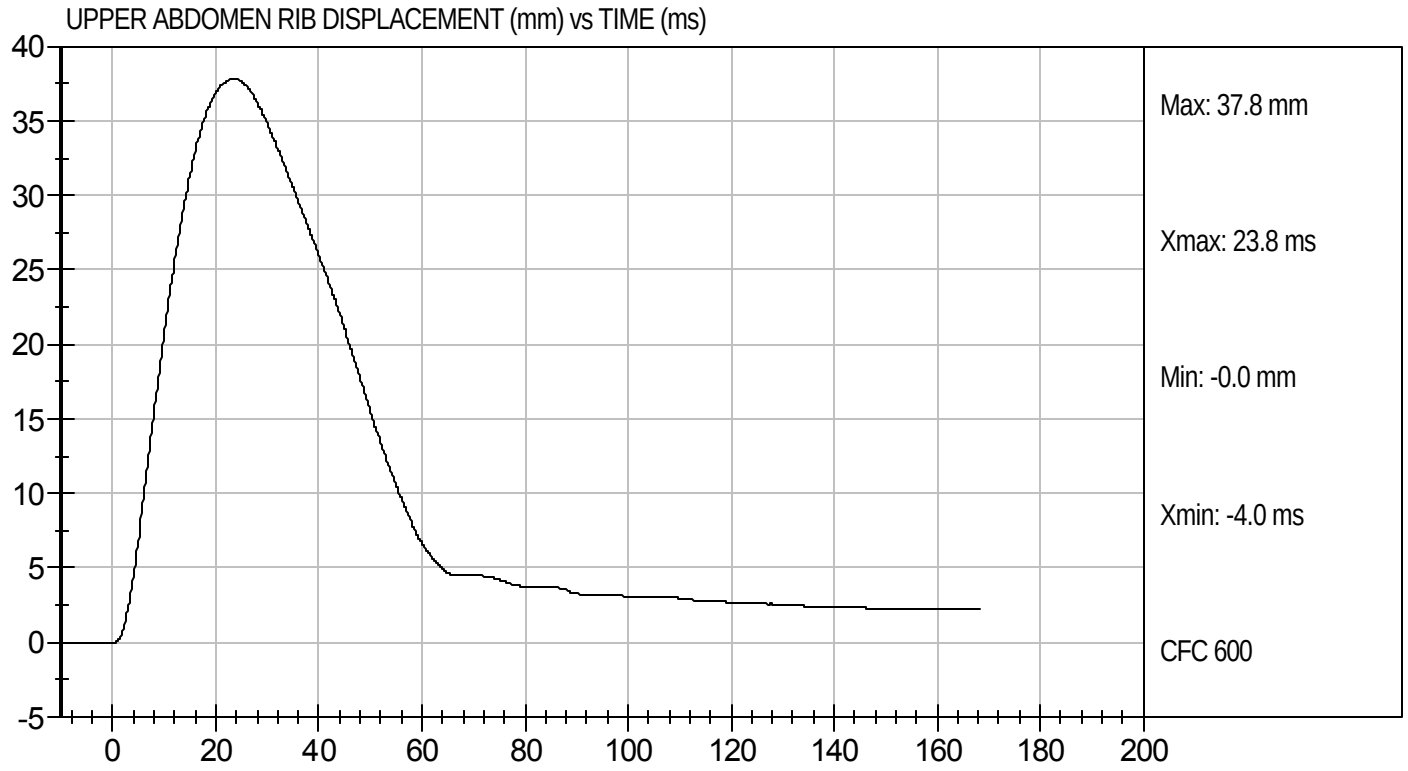
1/5/12
Test Date

David Winkelbauer
Approved By

Test Desc: Abdomen Impact
Component ID: D12036

Test Date: 1/5/12
Velocity: 14.12 ft/s, 4.30 m/s

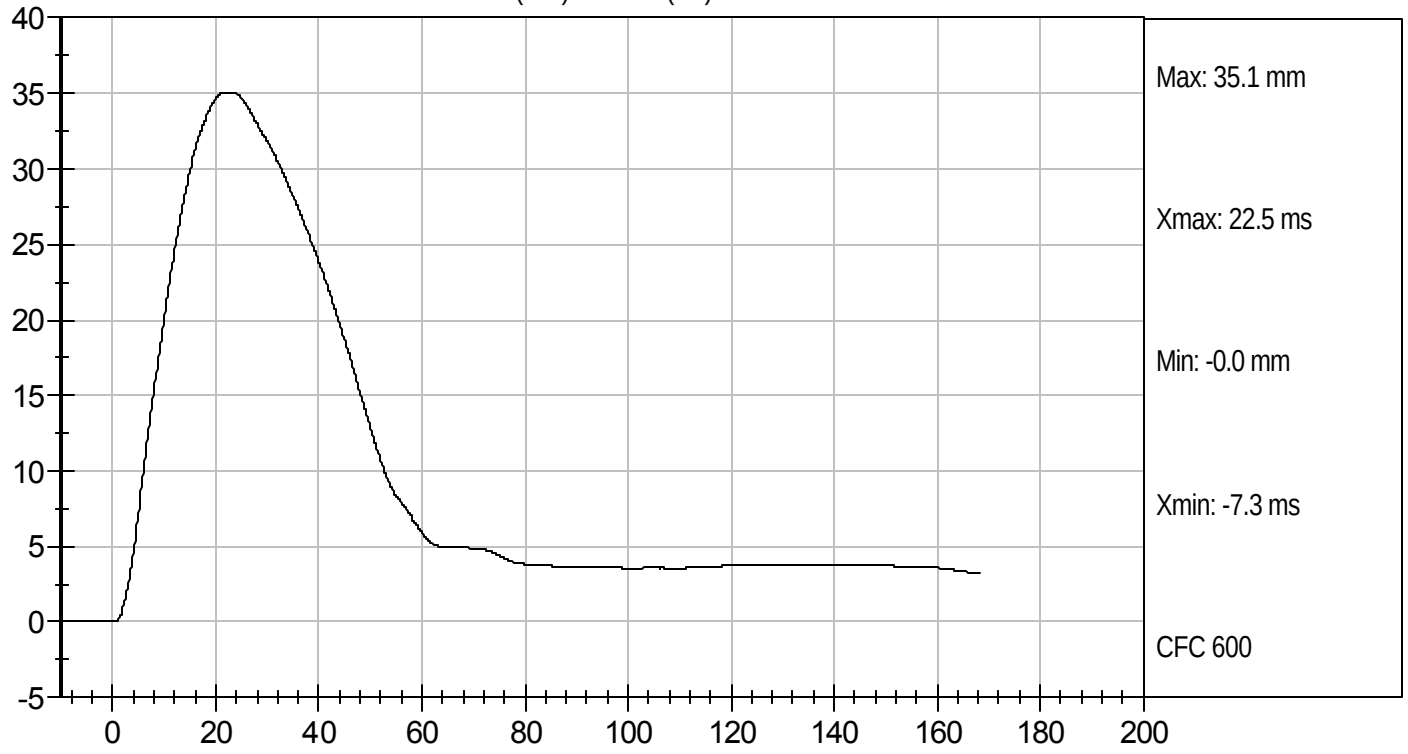




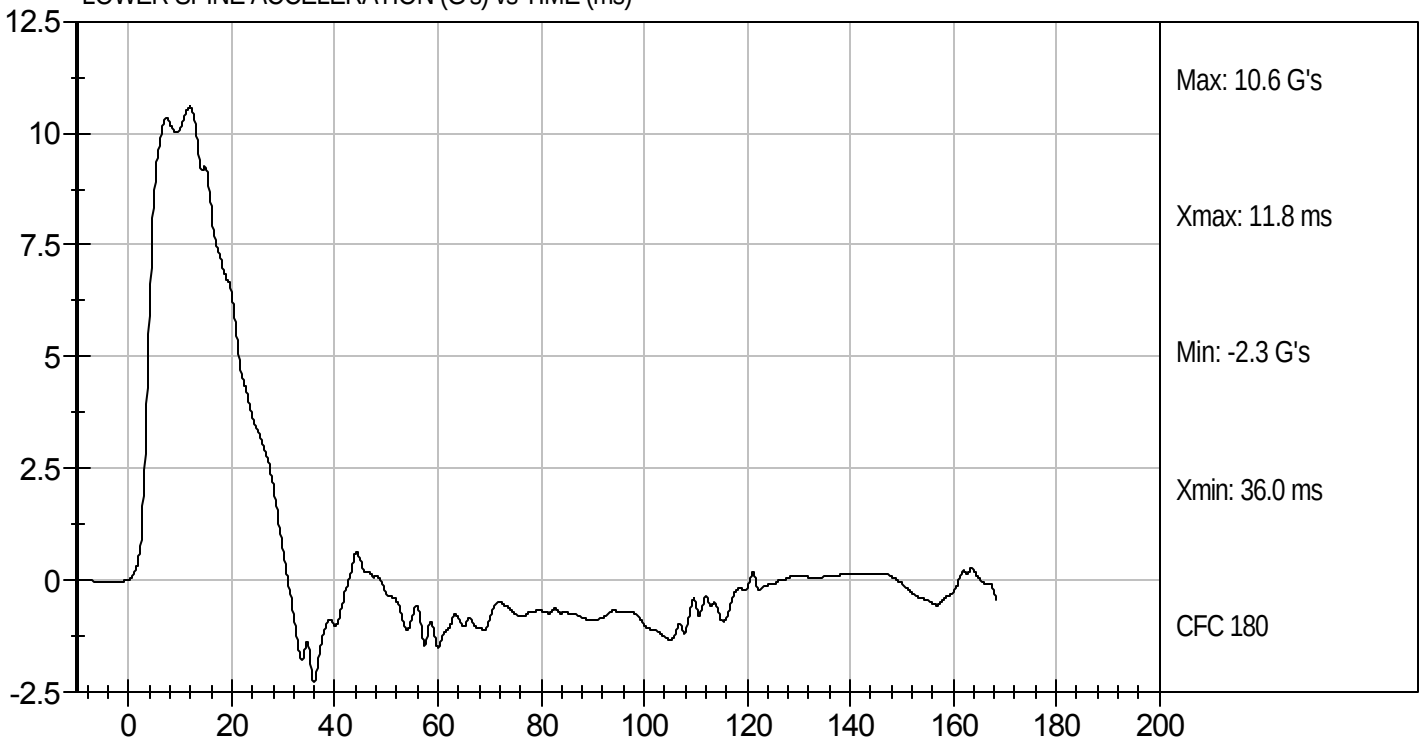
Test Desc: Abdomen Impact
Component ID: D12036

Test Date: 1/5/12
Velocity: 14.12 ft/s, 4.30 m/s

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12037

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Impactor Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	42	Pass
Peak Acetabulum Force	N	3600 to 4300	3810	Pass
		Overall Test Results		Pass

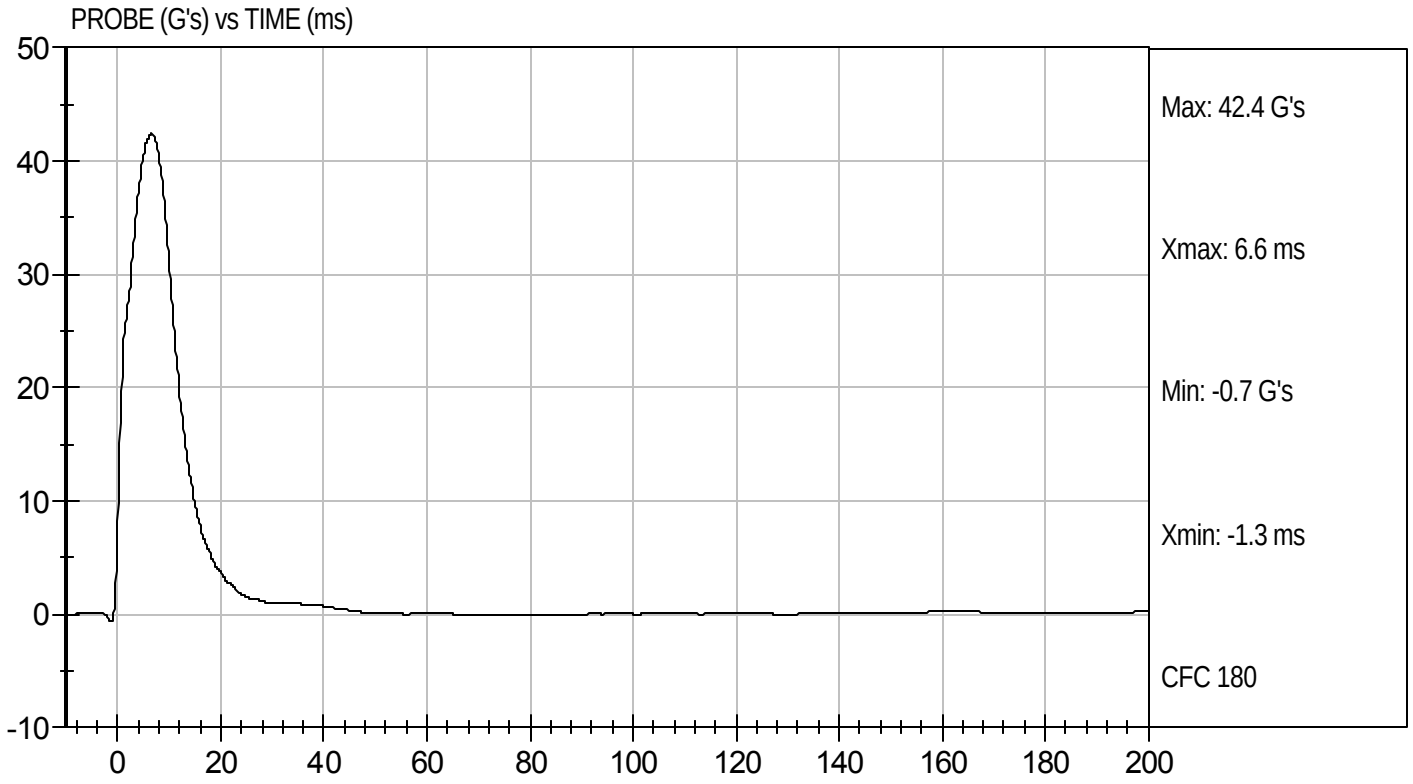
Jessica Hall
Laboratory Technician

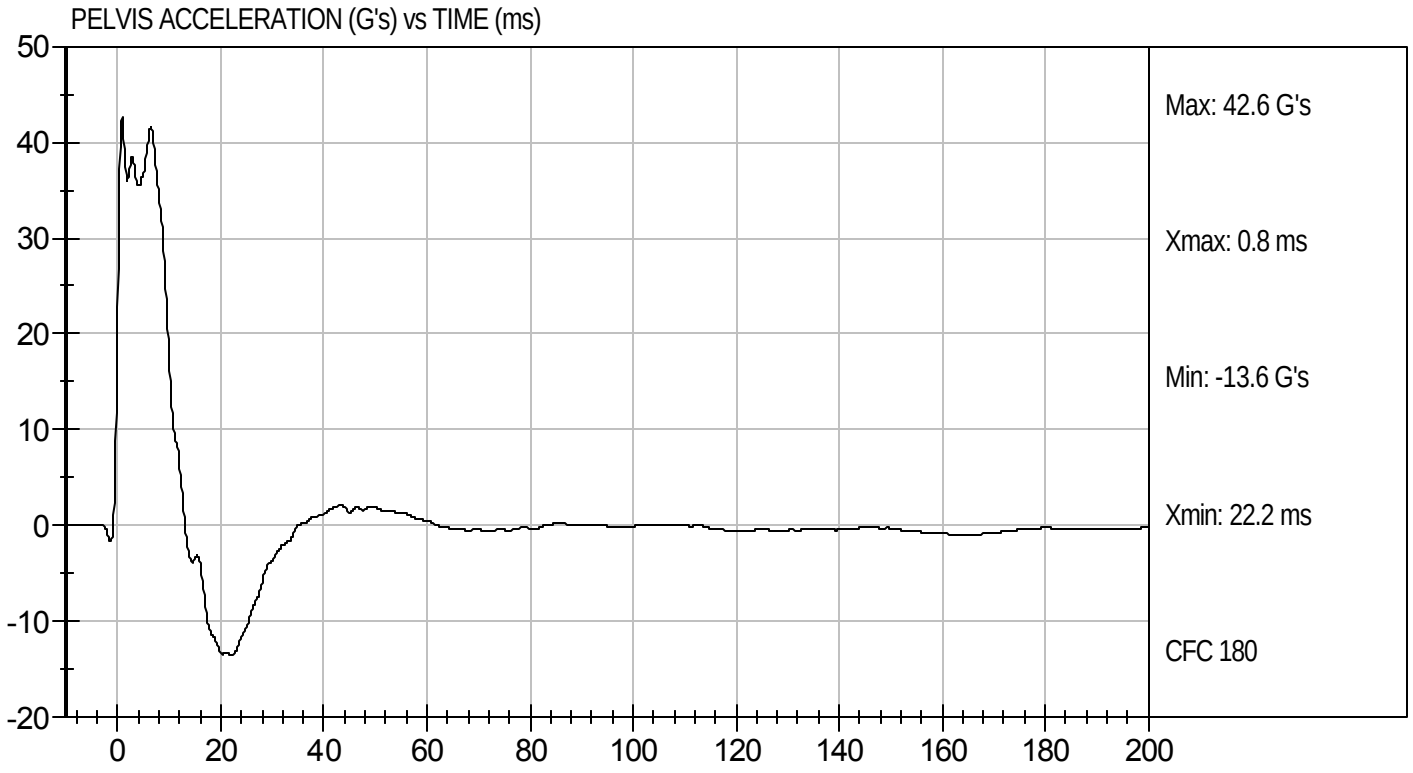
1/5/12
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D12037

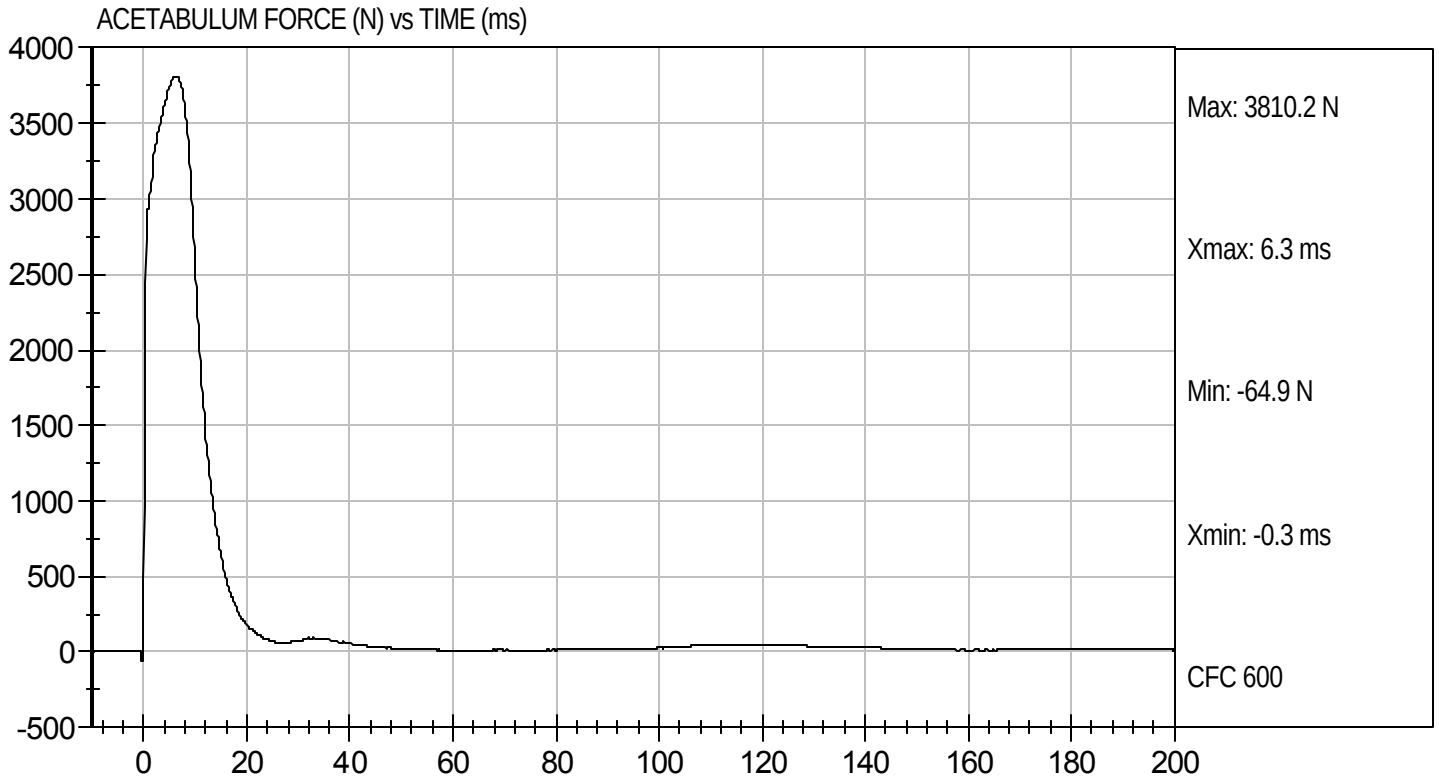
Test Date: 1/5/12
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Pelvis Impact
Component ID: D12037

Test Date: 1/5/12
Velocity: 21.9 ft/s, 6.68 m/s



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12038

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	22	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	35	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4912	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

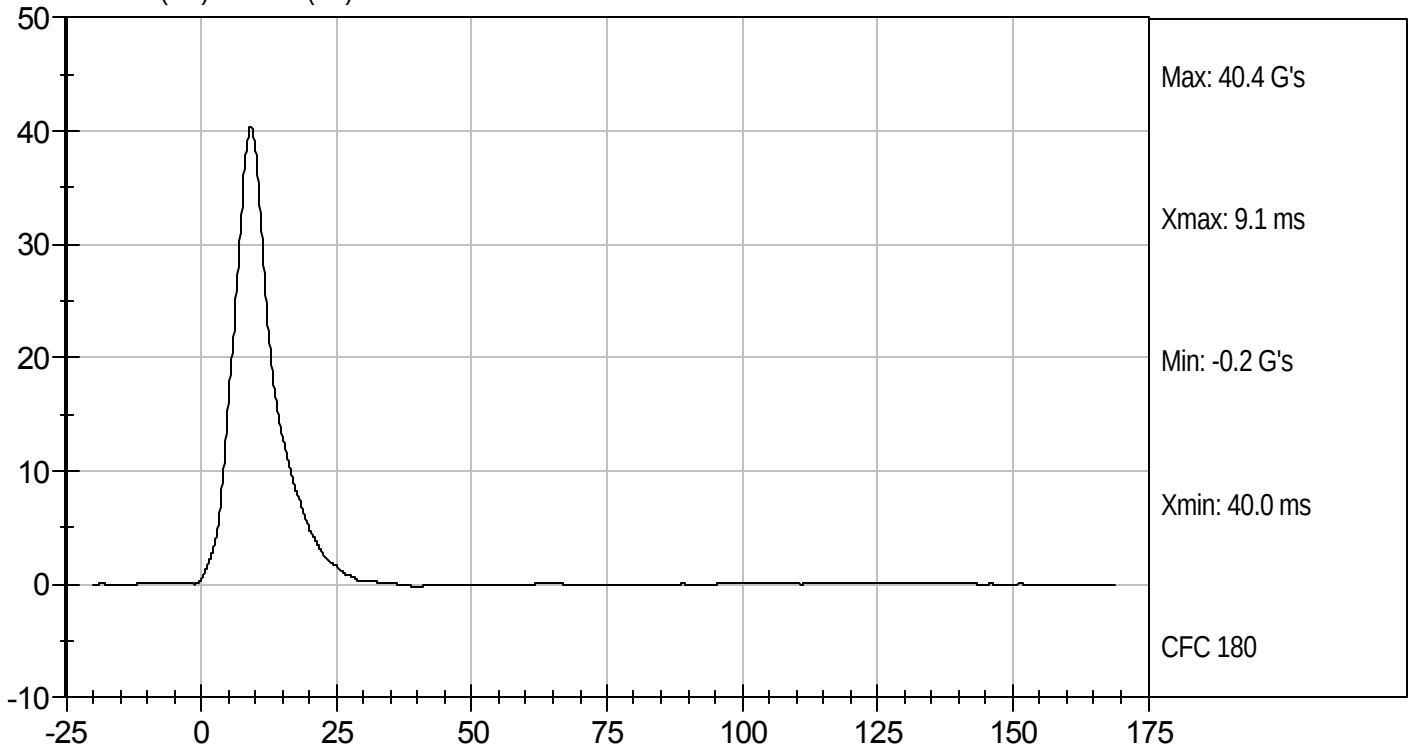
1/5/12
Test Date

David Winkelbauer
Approved By

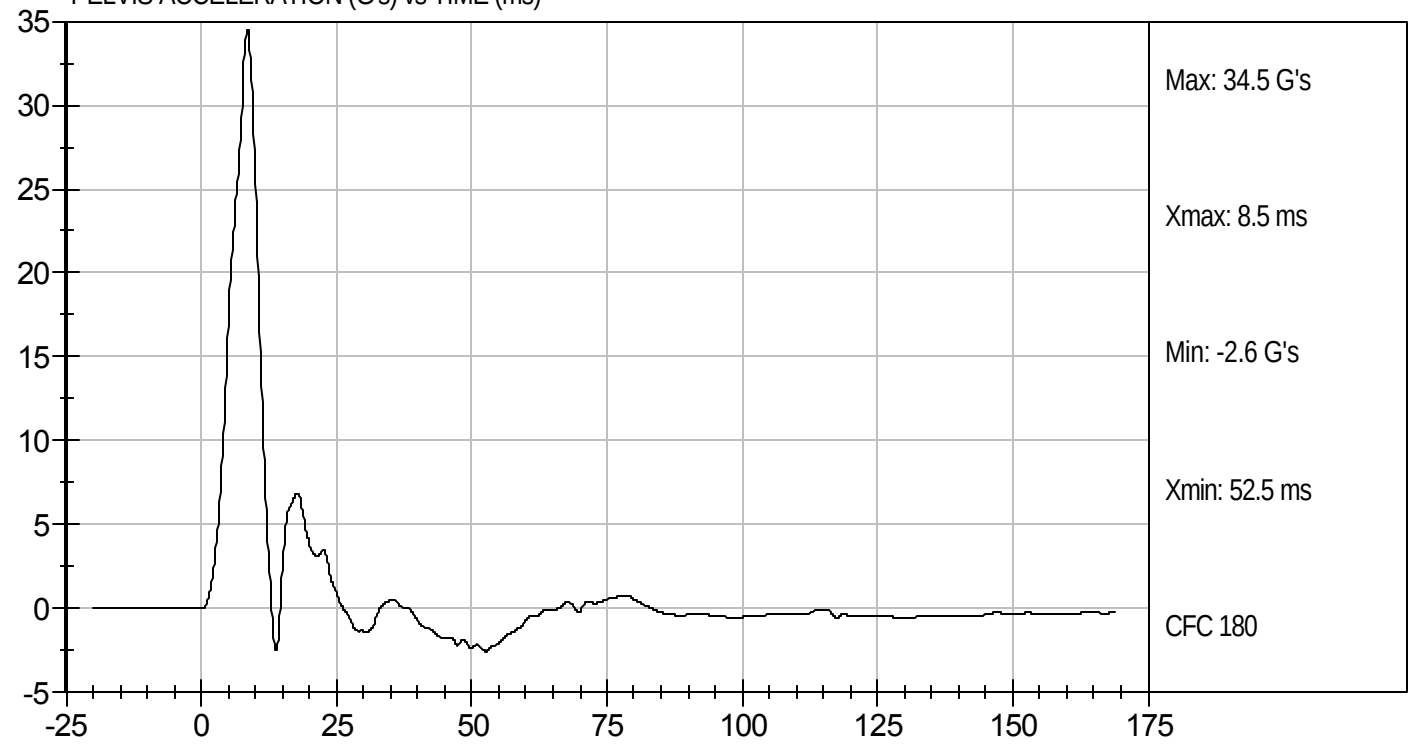
Test Desc: Iliac Impact
Component ID: D12038

Test Date: 1/5/12
Velocity: 14.36 ft/s, 4.38 m/s

PROBE (G's) vs TIME (ms)

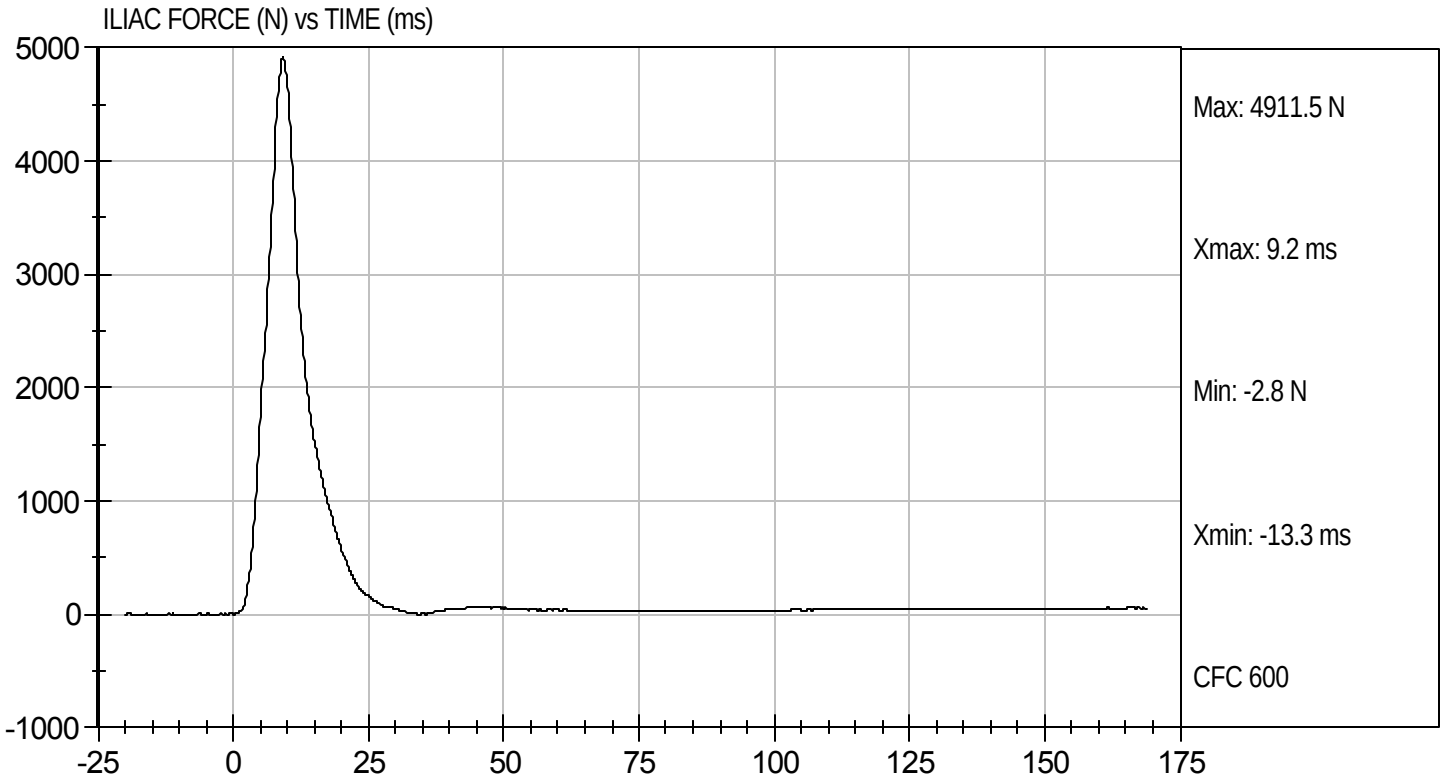


PELVIS ACCELERATION (G's) vs TIME (ms)



Test Desc: Iliac Impact
Component ID: D12038

Test Date: 1/5/12
Velocity: 14.36 ft/s, 4.38 m/s



MGA RESEARCH CORPORATION

HEAD DROP TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D12101

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	21	Pass
Peak Resultant Acceleration	G's	115 to 137	120	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-2.7	Pass
Unimodal	N/A	<15%	Yes	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

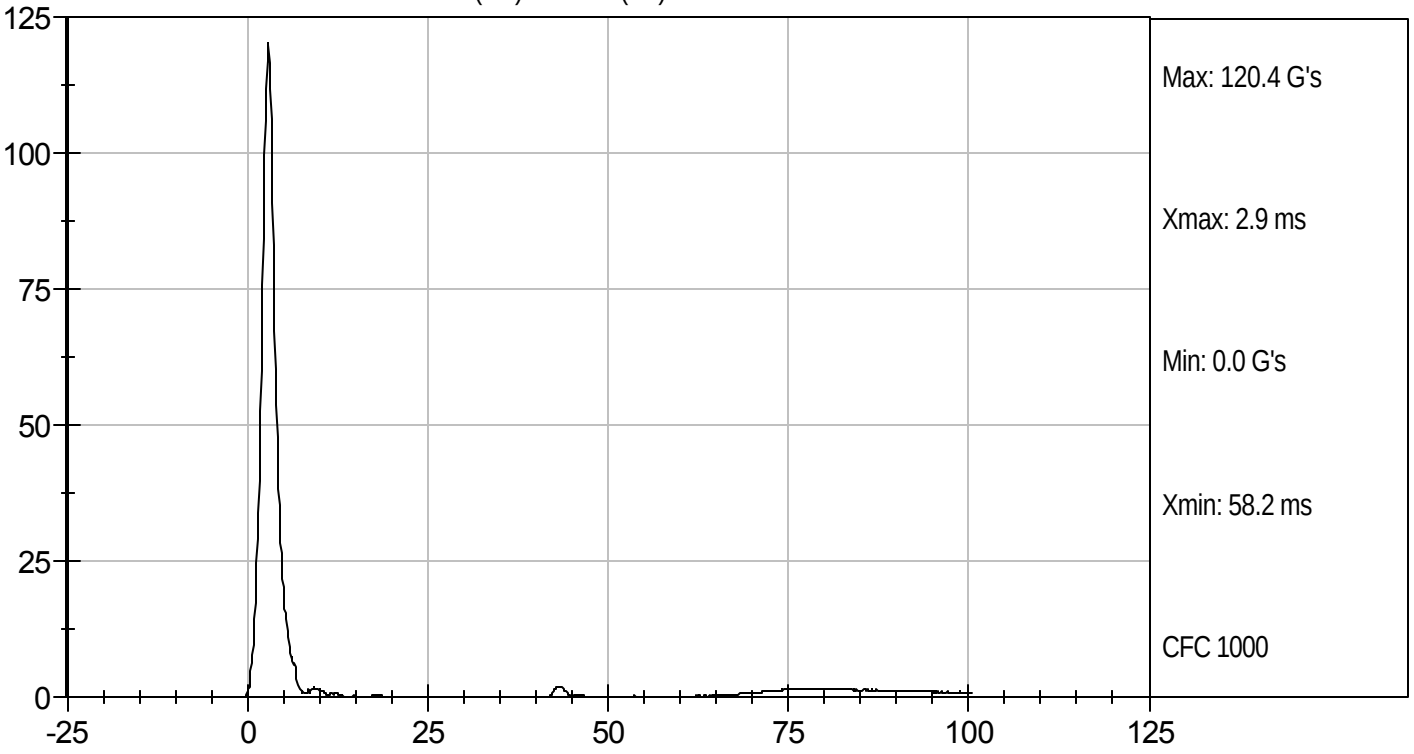
1/11/12
Test Date

David Winkelbauer
Approved By

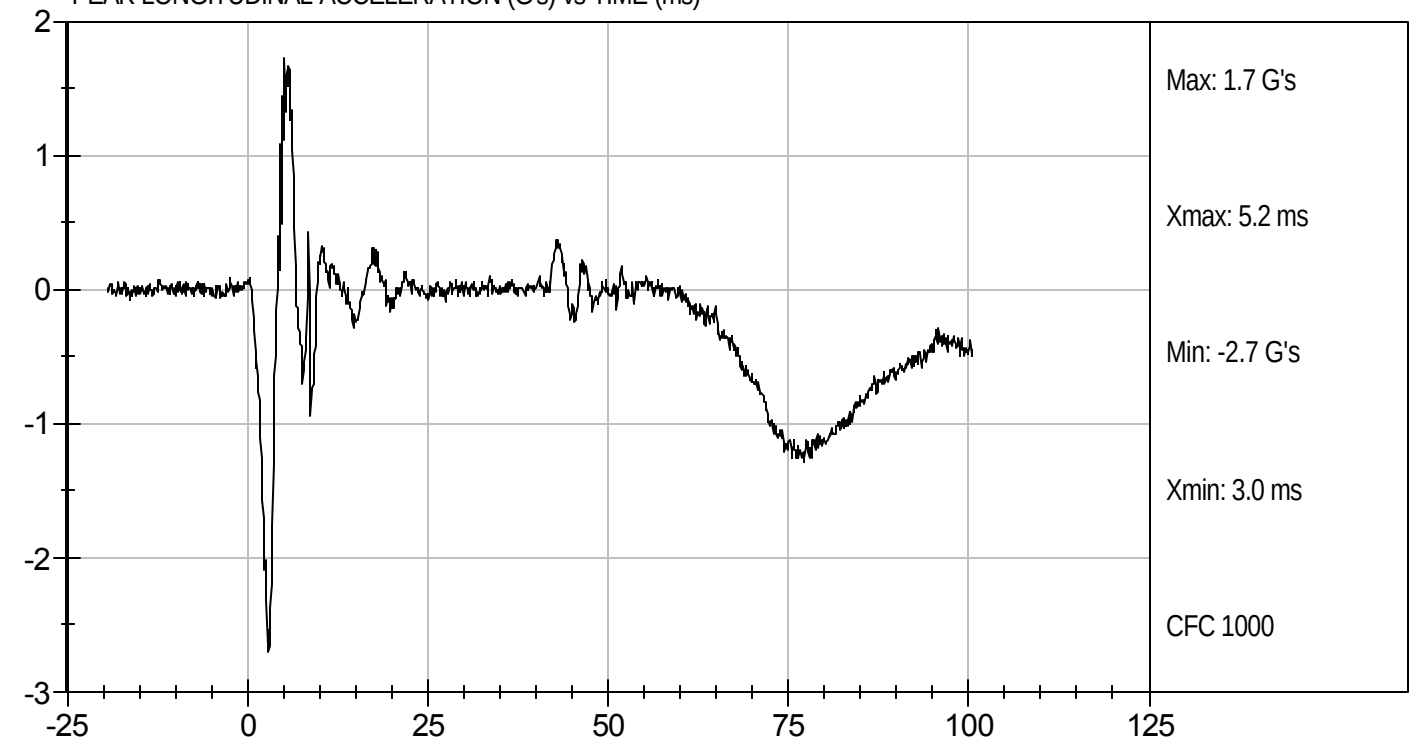
Test Desc: Head Drop
Component ID: D12101

Test Date: 1/11/12
Velocity: 0 ft/s, 0 m/s

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



PEAK LONGITUDINAL ACCELERATION (G's) vs TIME (ms)



MGA RESEARCH CORPORATION

LATERAL NECK PENDULUM TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12102

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	20.8	Pass
Humidity		%	10 to 70	21	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.69	Pass
	15 ms	m/s	3.30 to 4.10	3.87	Pass
	20 ms	m/s	4.40 to 5.40	5.21	Pass
	25 ms	m/s	5.40 to 6.10	5.54	Pass
	25-100 ms	m/s	5.50 to 6.20	5.55	Pass
Maximum D-Plane Rotation		deg	71 to 81	77	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	62	Pass
Maximum Occipital Condyle Moment during Rotation Interval		Nm	-44 to -36	-42	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	119	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

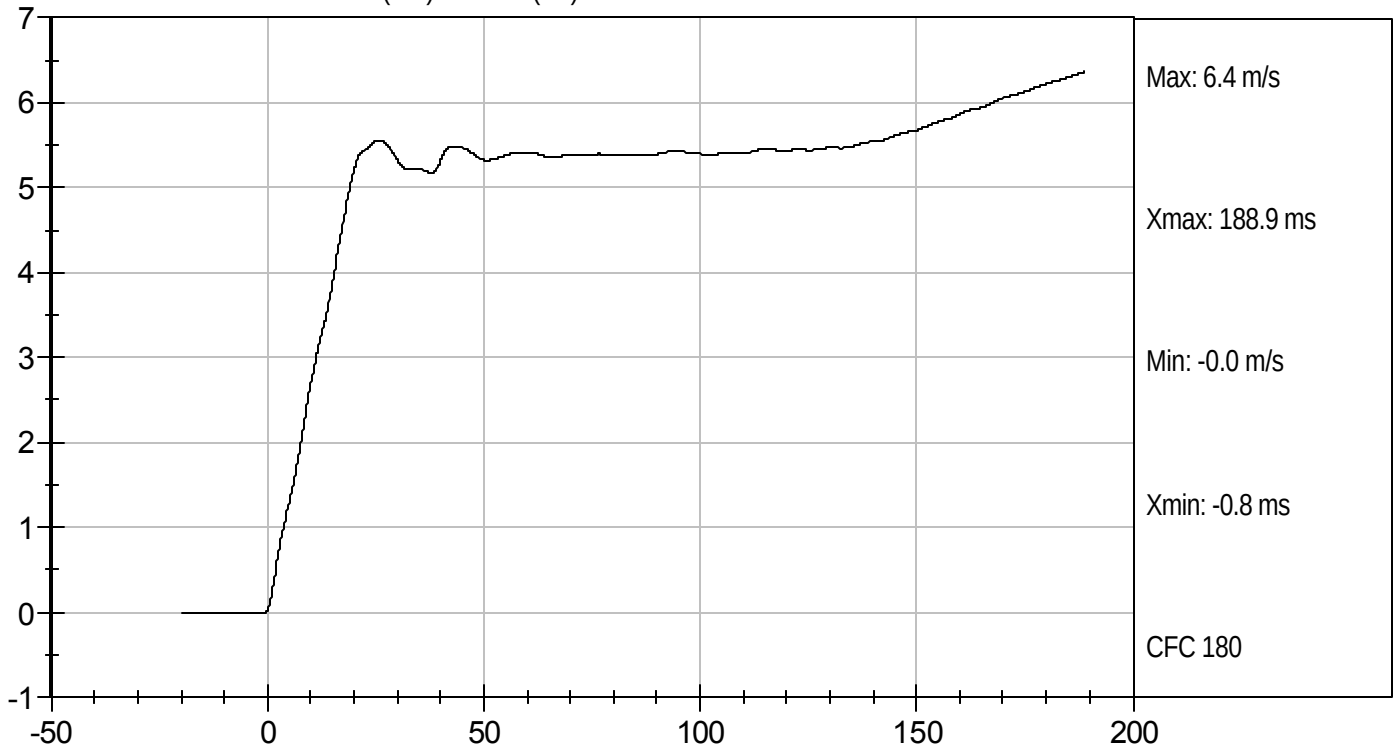
1/11/12
Test Date

David Winkelbauer
Approved By

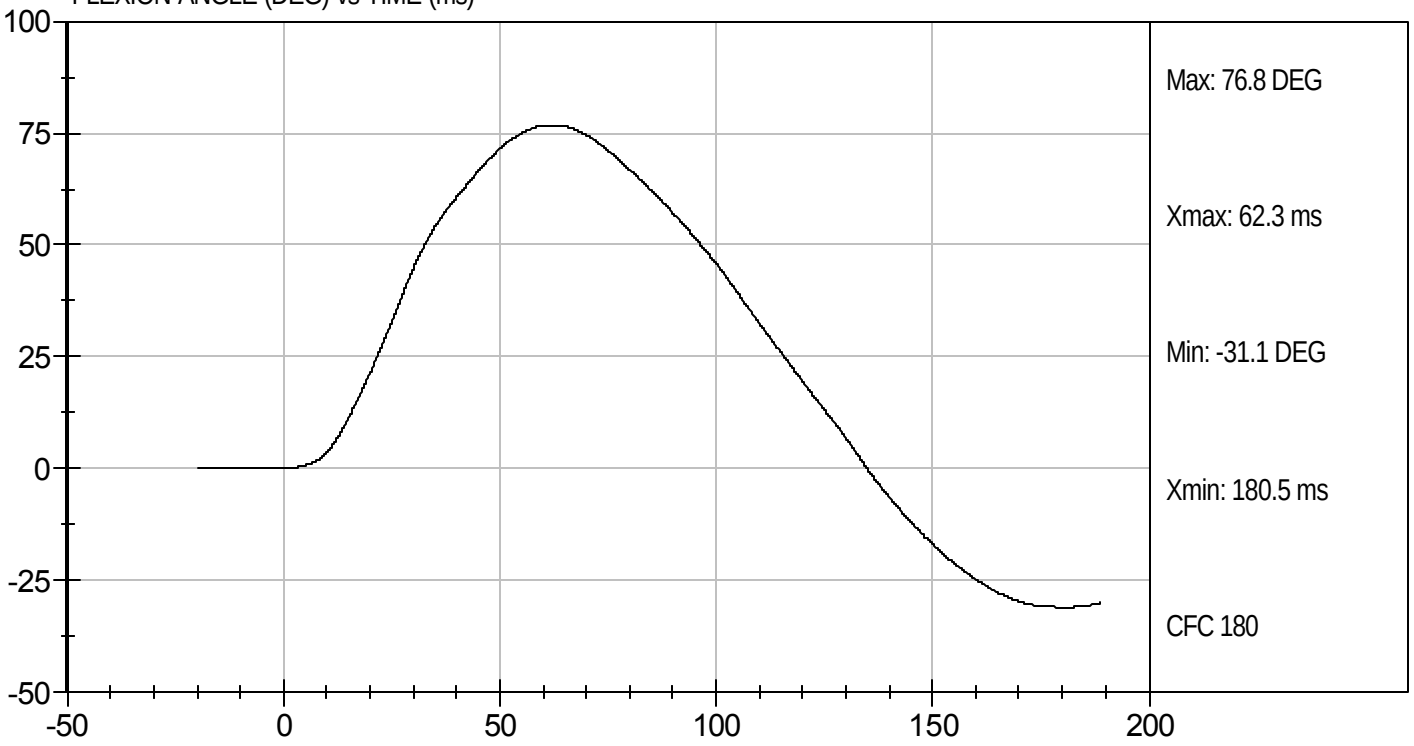
Test Desc: Neck Bending
Component ID: D12102

Test Date: 1/11/12
Velocity: 18.31 ft/s, 5.58 m/s

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

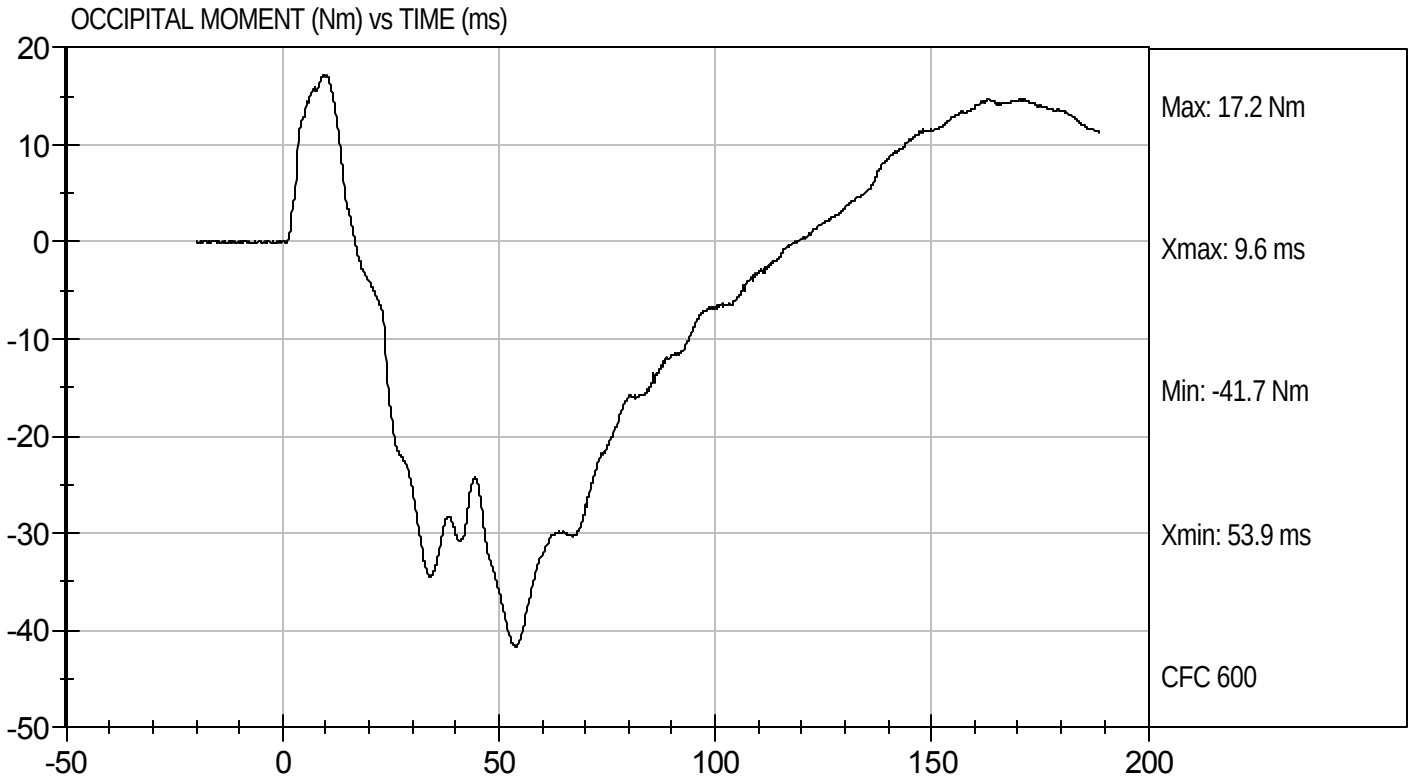


FLEXION ANGLE (DEG) vs TIME (ms)



Test Desc: Neck Bending
Component ID: D12102

Test Date: 1/11/12
Velocity: 18.31 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test ID:** D12103

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	23	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
		Overall Test Results		Pass

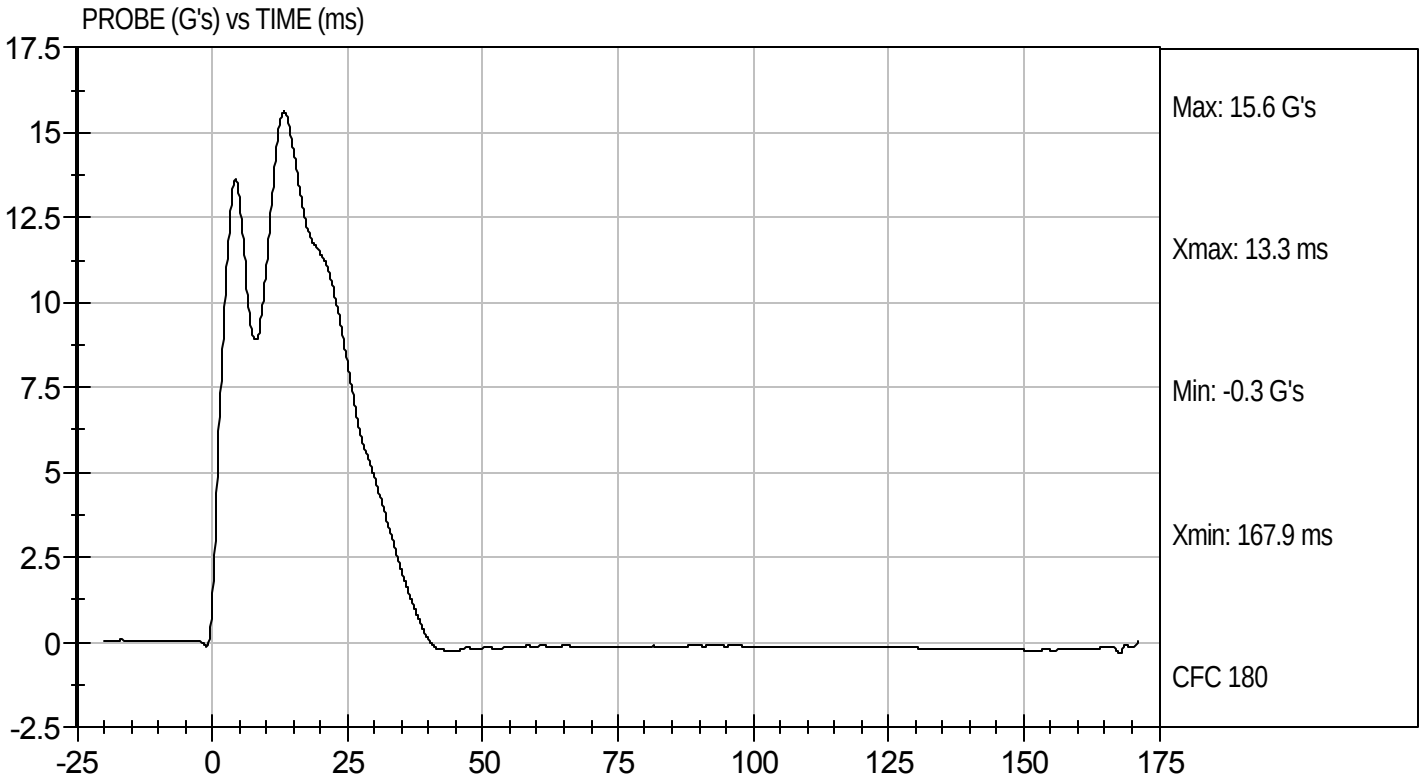
Jessica Gall
Laboratory Technician

1/10/12
Test Date

David Winkelbauer
Approved By

Test Desc: Shoulder Impact
Component ID: D12103

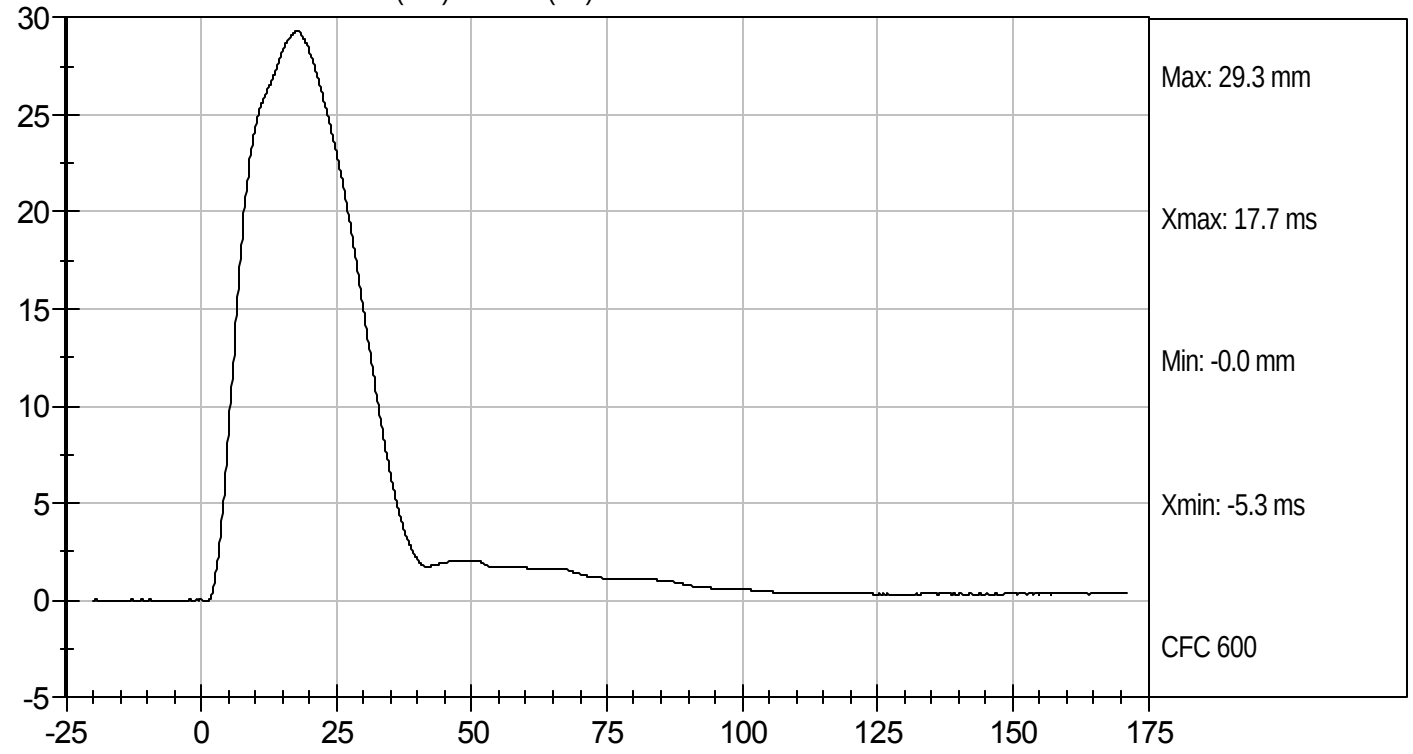
Test Date: 1/10/12
Velocity: 14.24 ft/s, 4.34 m/s



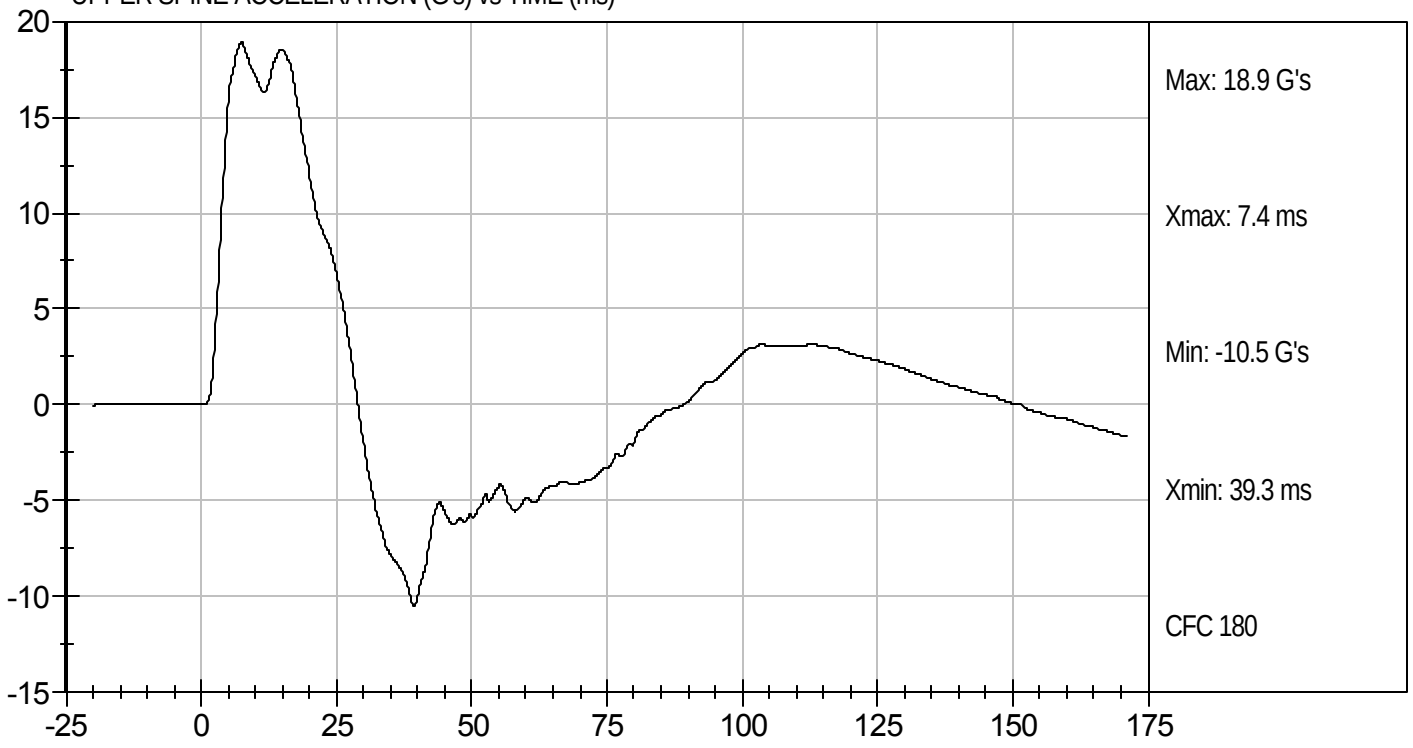
Test Desc: Shoulder Impact
Component ID: D12103

Test Date: 1/10/12
Velocity: 14.24 ft/s, 4.34 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



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



MGA RESEARCH CORPORATION

THORAX (WITH ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12104

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Impactor Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	34	Pass
Upper Rib Displacement	mm	25 to 32	26	Pass
Middle Rib Displacement	mm	30 to 36	30	Pass
Lower Rib Displacement	mm	32 to 38	33	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
		Overall Test Results		Pass

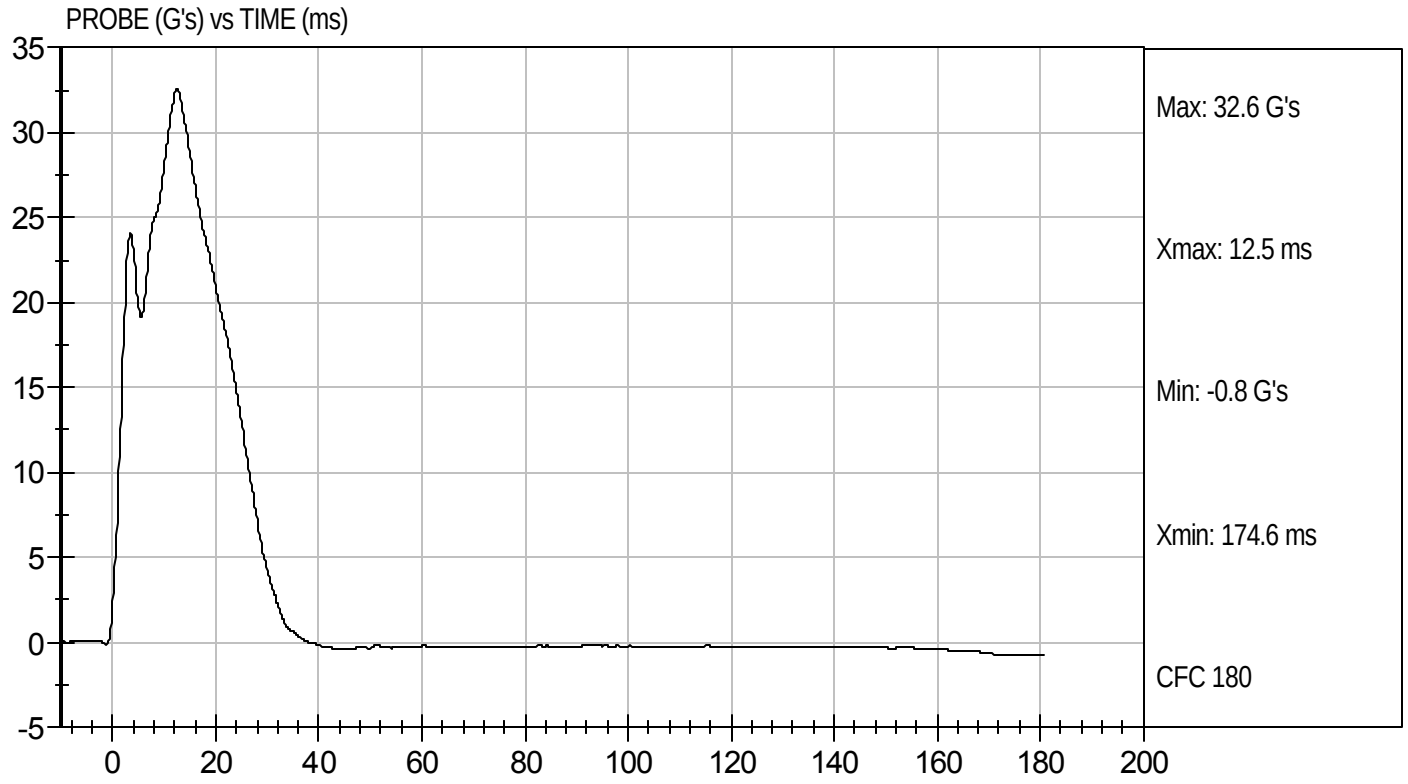
Jessica Gall
Laboratory Technician

1/10/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax With Arm
Component ID: D12104

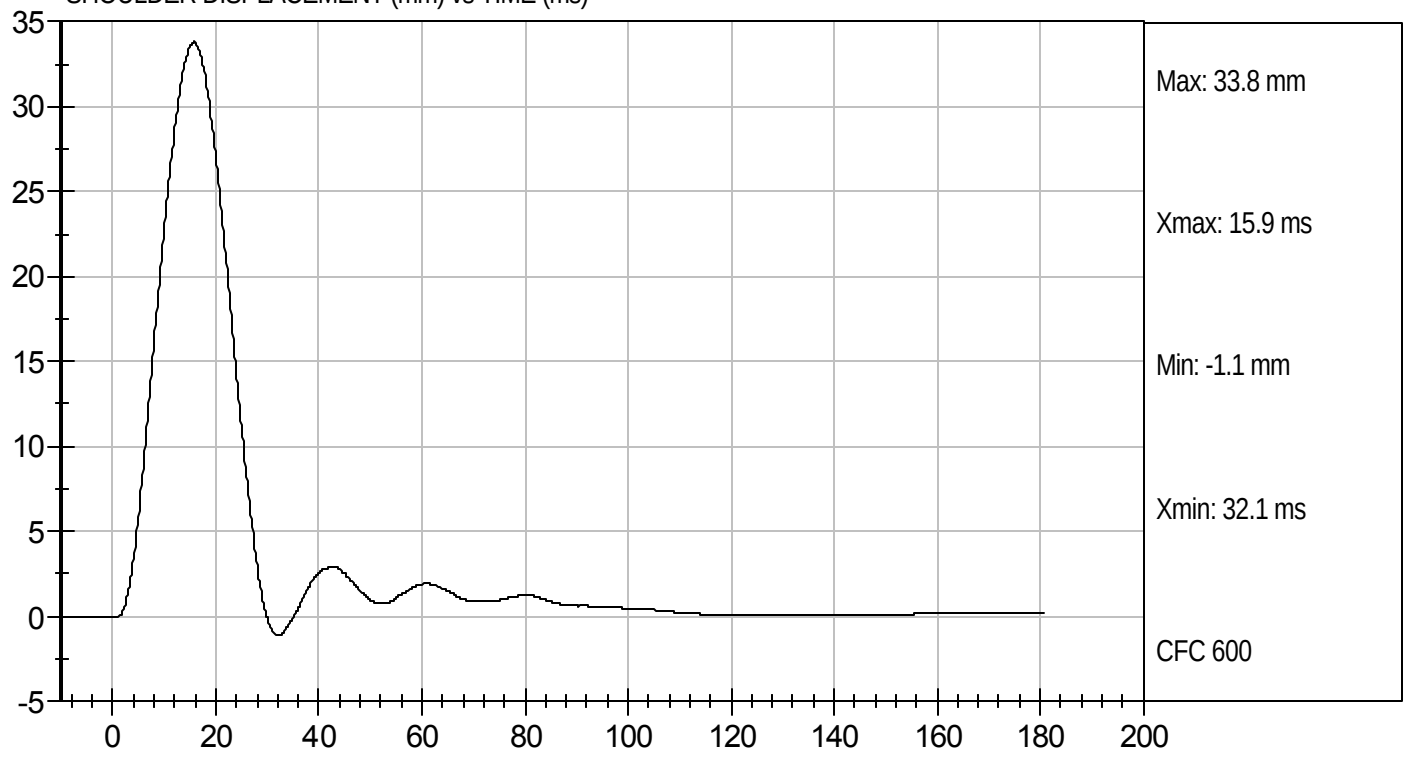
Test Date: 1/10/12
Velocity: 21.9 ft/s, 6.68 m/s



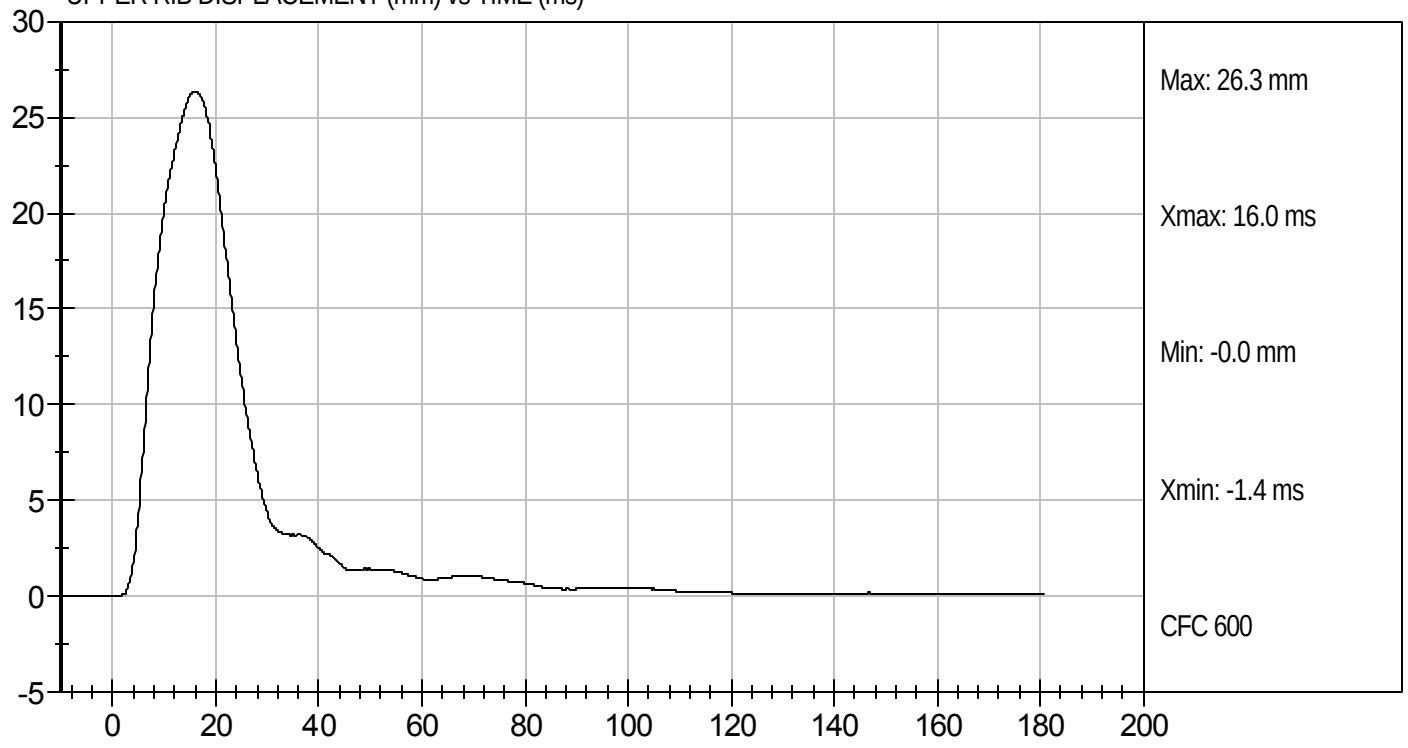
Test Desc: Thorax With Arm
Component ID: D12104

Test Date: 1/10/12
Velocity: 21.9 ft/s, 6.68 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



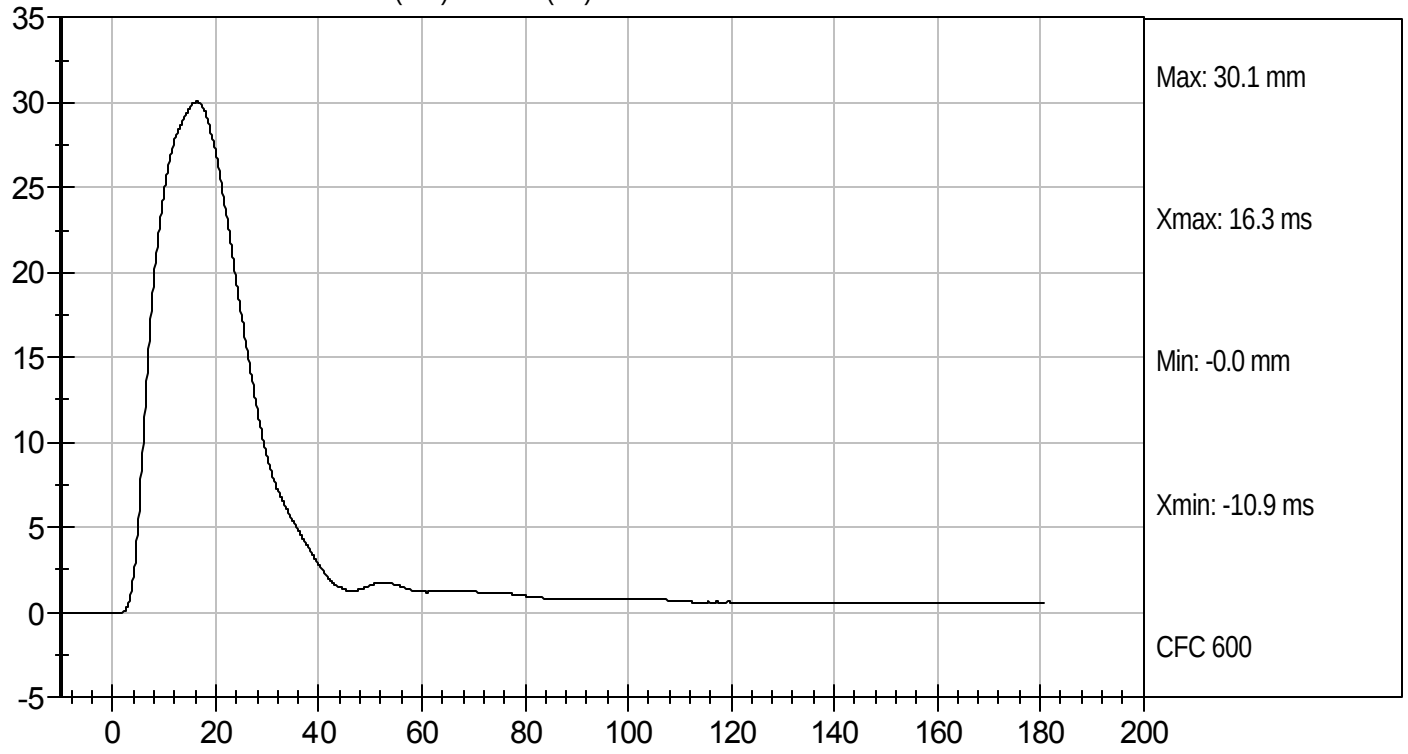
UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



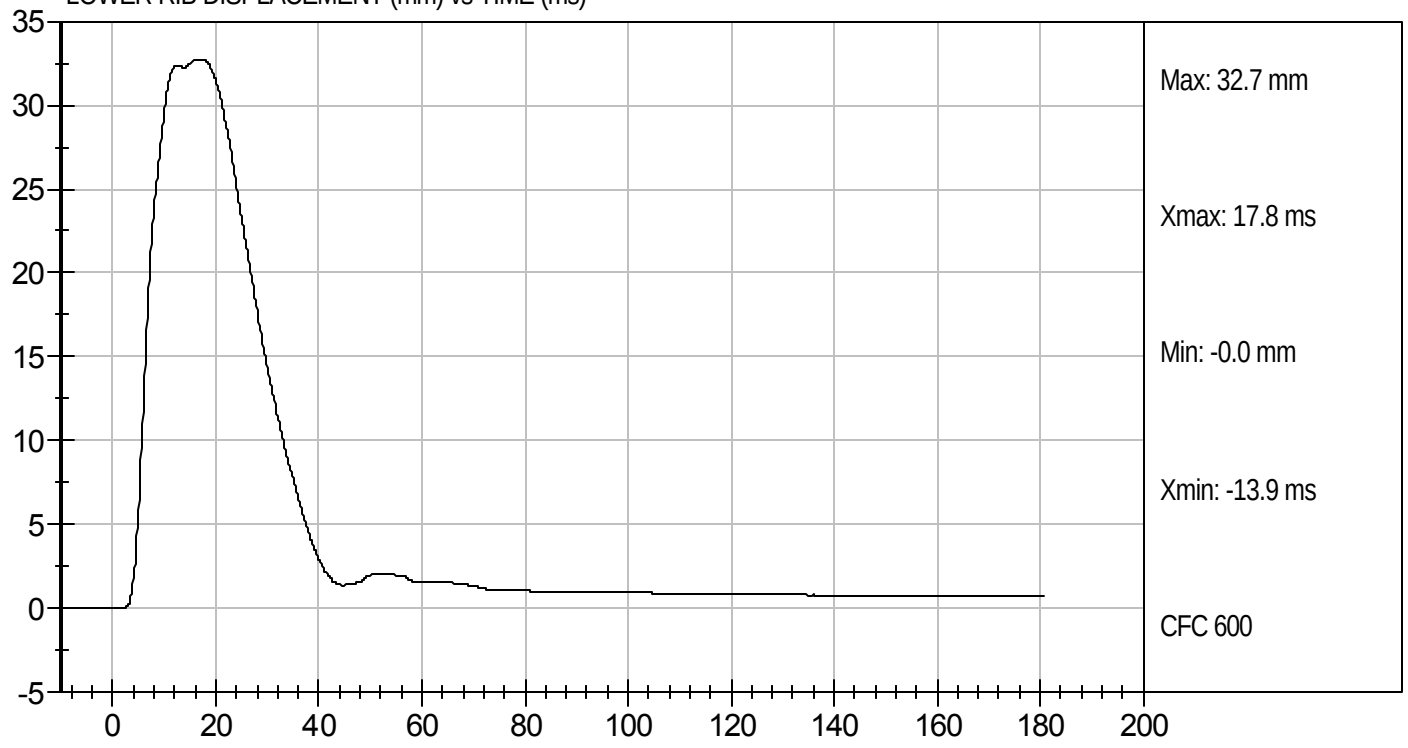
Test Desc: Thorax With Arm
Component ID: D12104

Test Date: 1/10/12
Velocity: 21.9 ft/s, 6.68 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



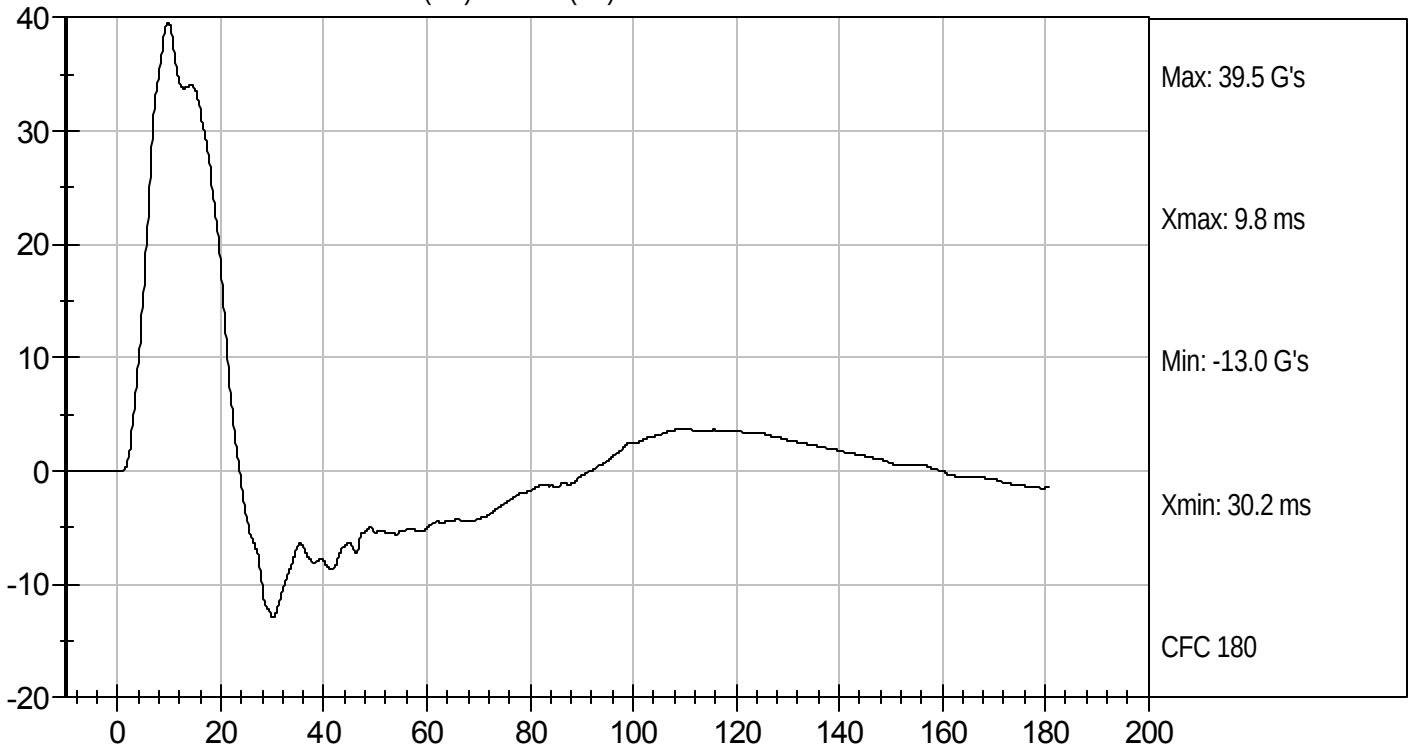
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



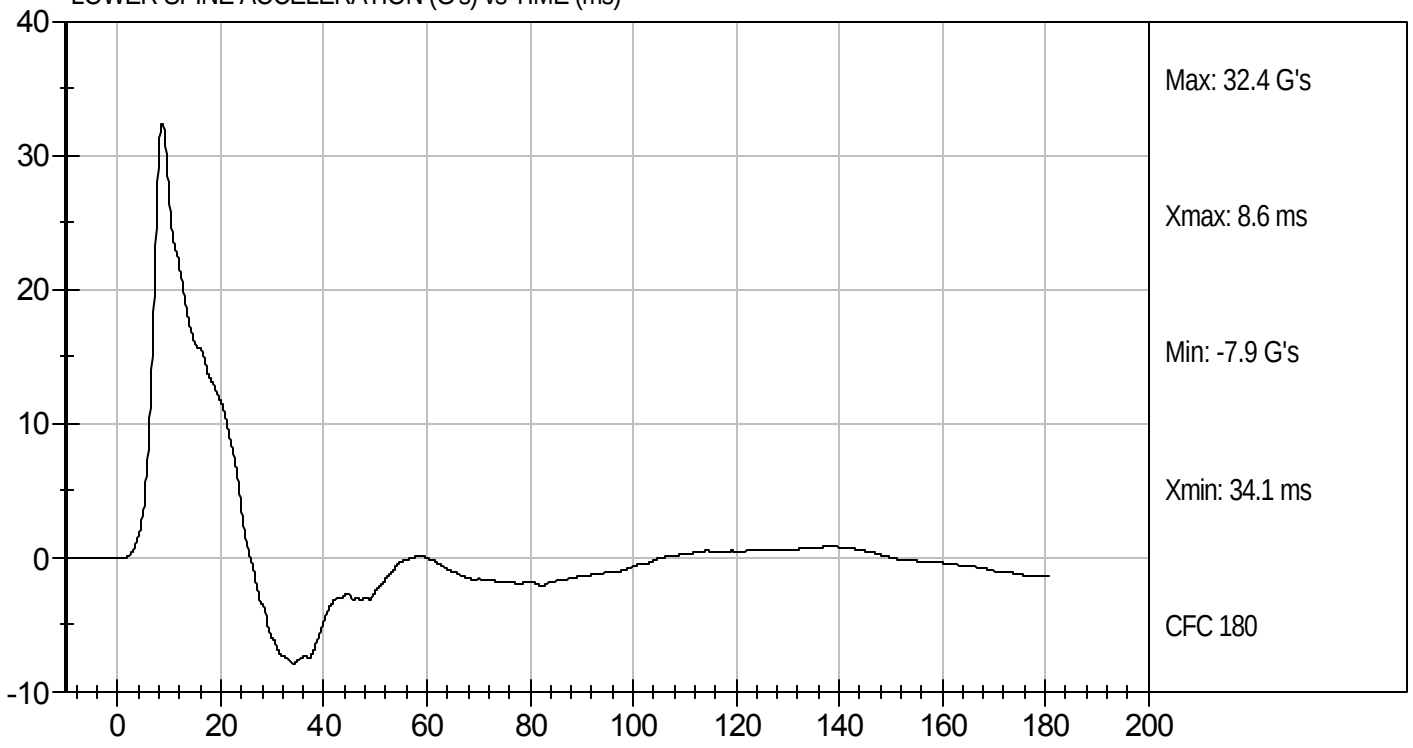
Test Desc: Thorax With Arm
Component ID: D12104

Test Date: 1/10/12
Velocity: 21.9 ft/s, 6.68 m/s

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



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



MGA RESEARCH CORPORATION

THORAX (WITHOUT ARM) IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12105

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	36	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

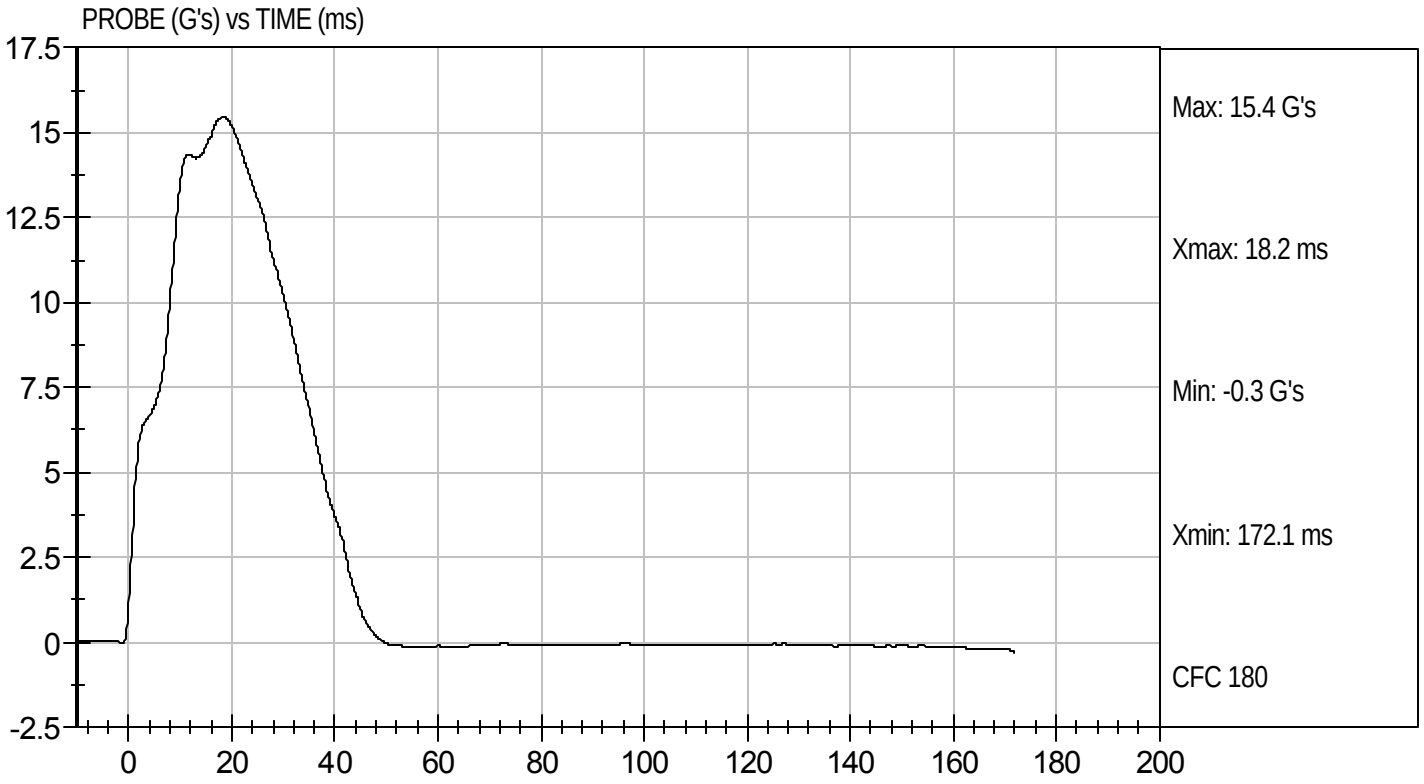
Jessica Gall
Laboratory Technician

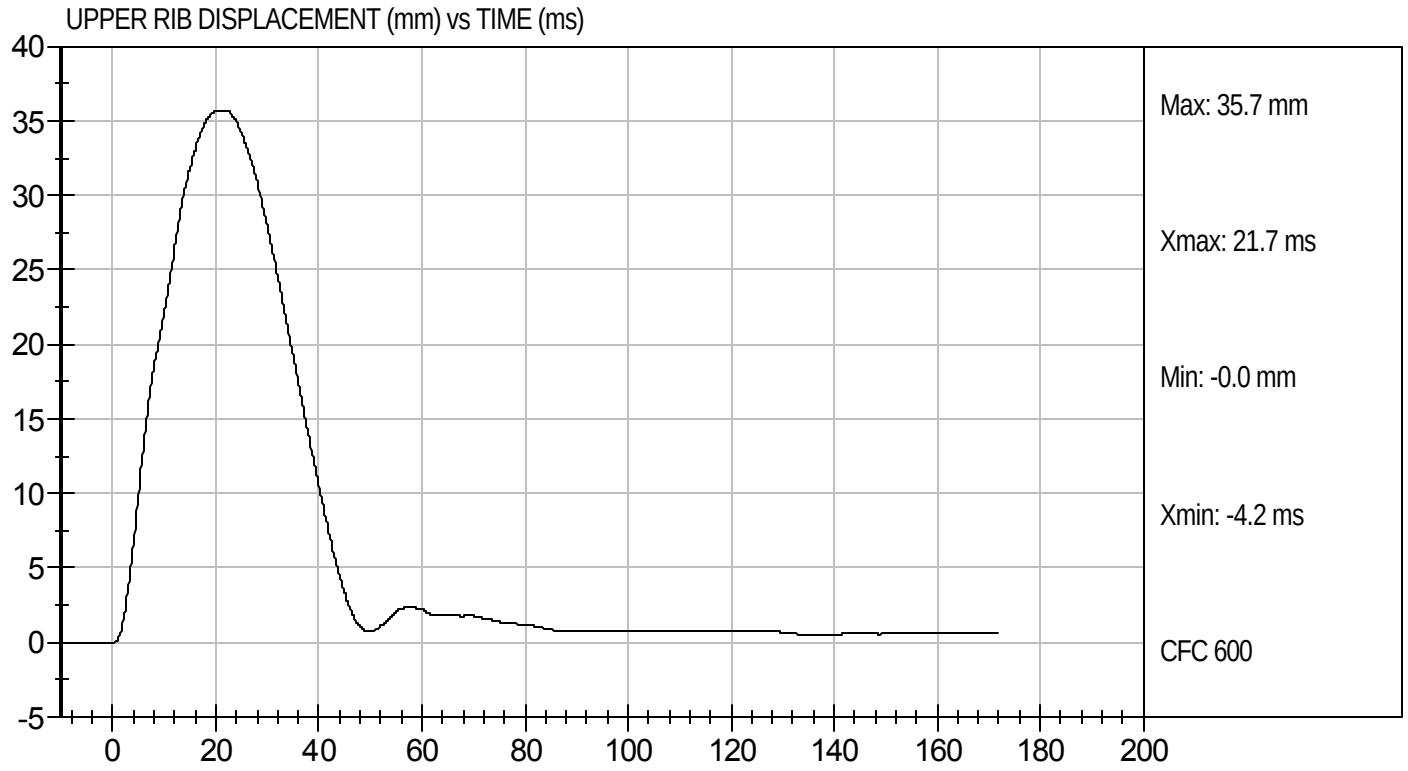
1/10/12
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Without Arm
Component ID: D12105

Test Date: 1/10/12
Velocity: 14.24 ft/s, 4.34 m/s

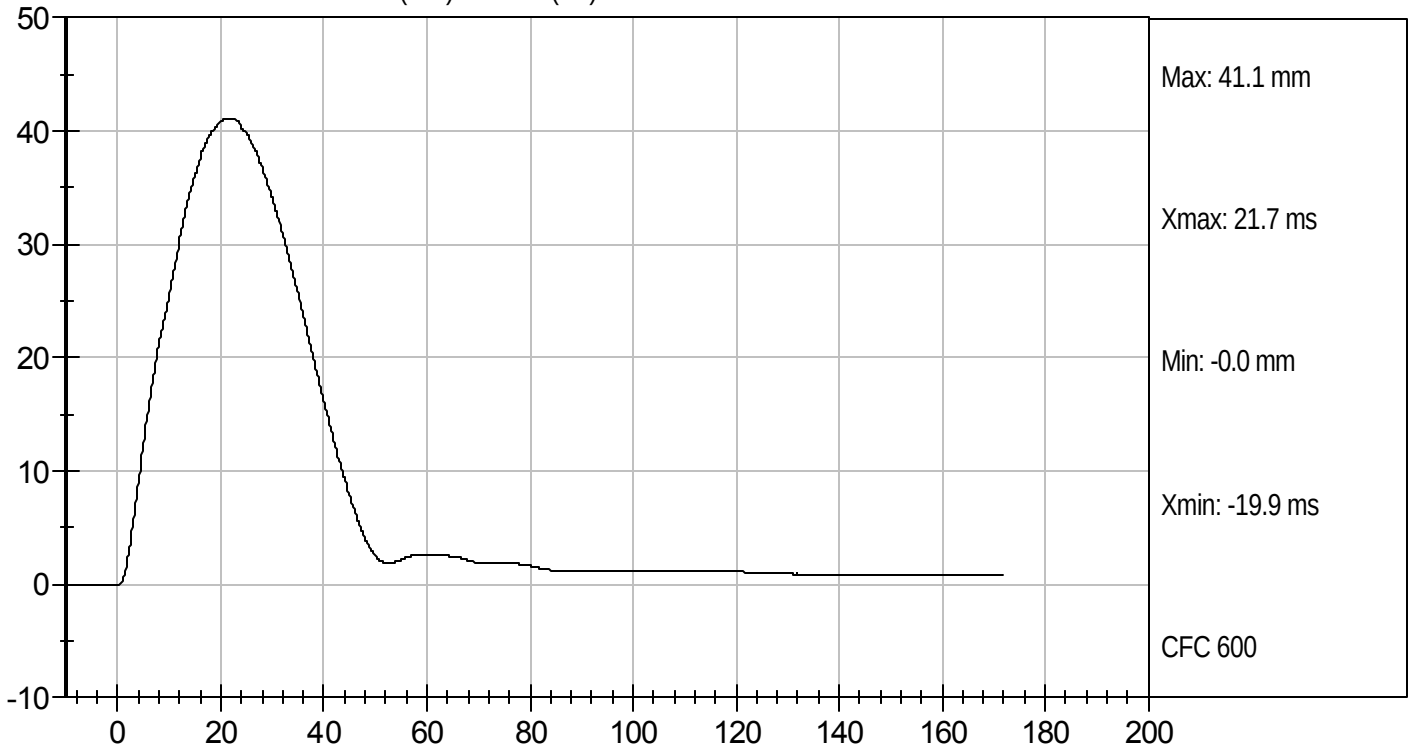




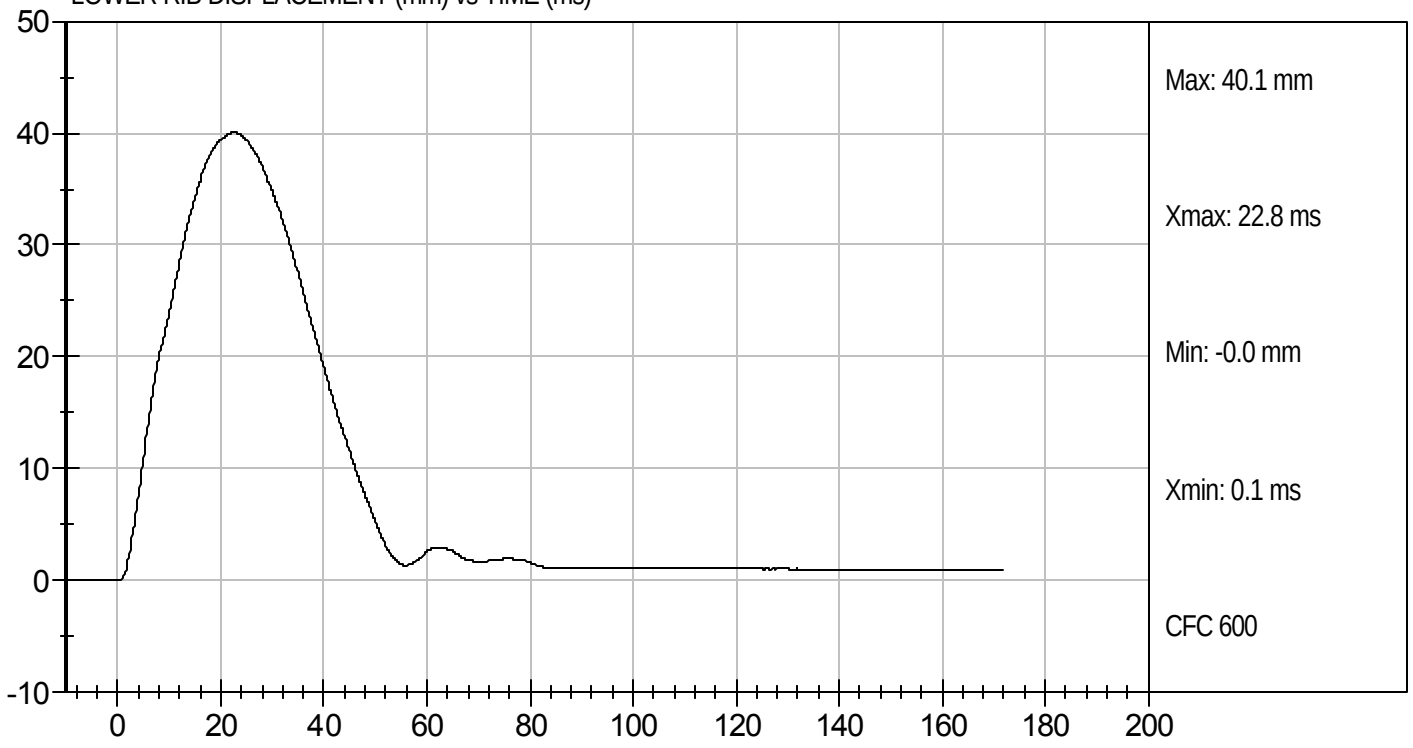
Test Desc: Thorax Without Arm
Component ID: D12105

Test Date: 1/10/12
Velocity: 14.24 ft/s, 4.34 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



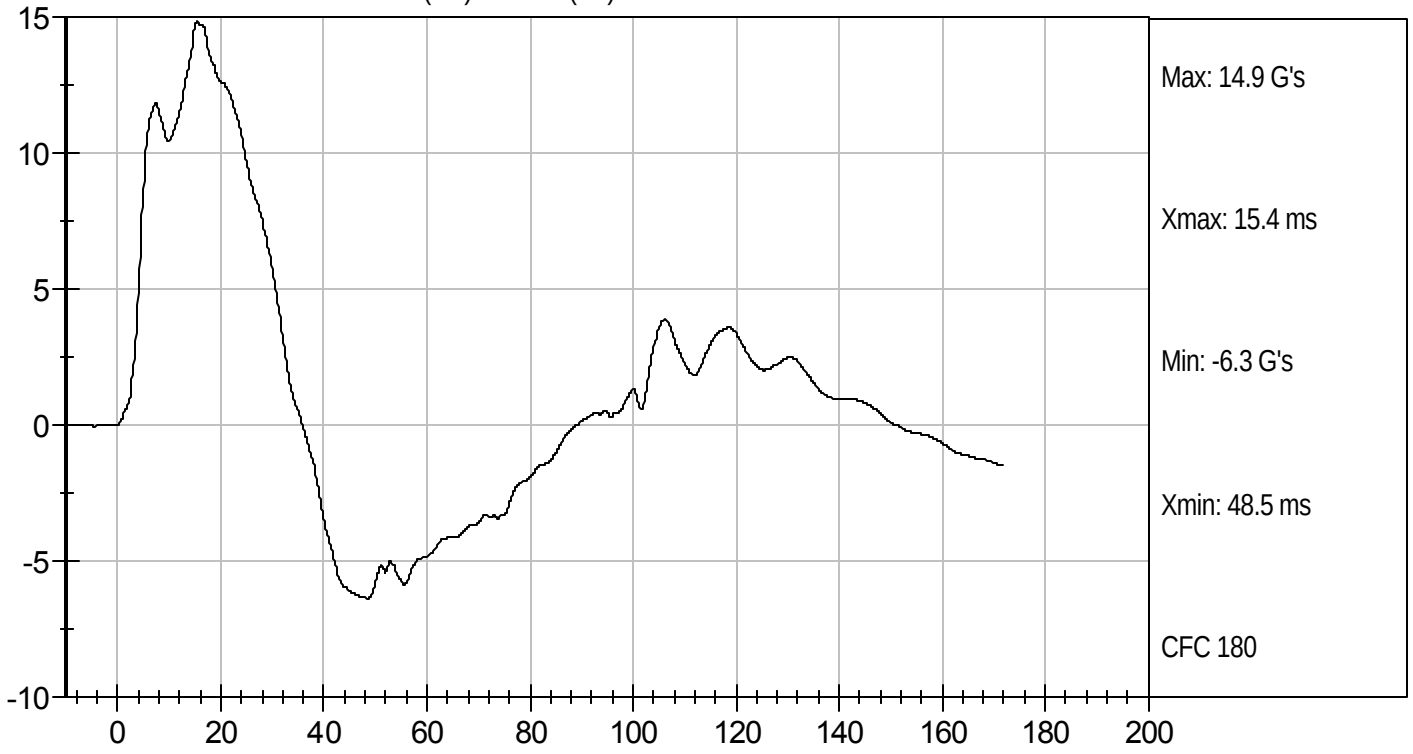
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



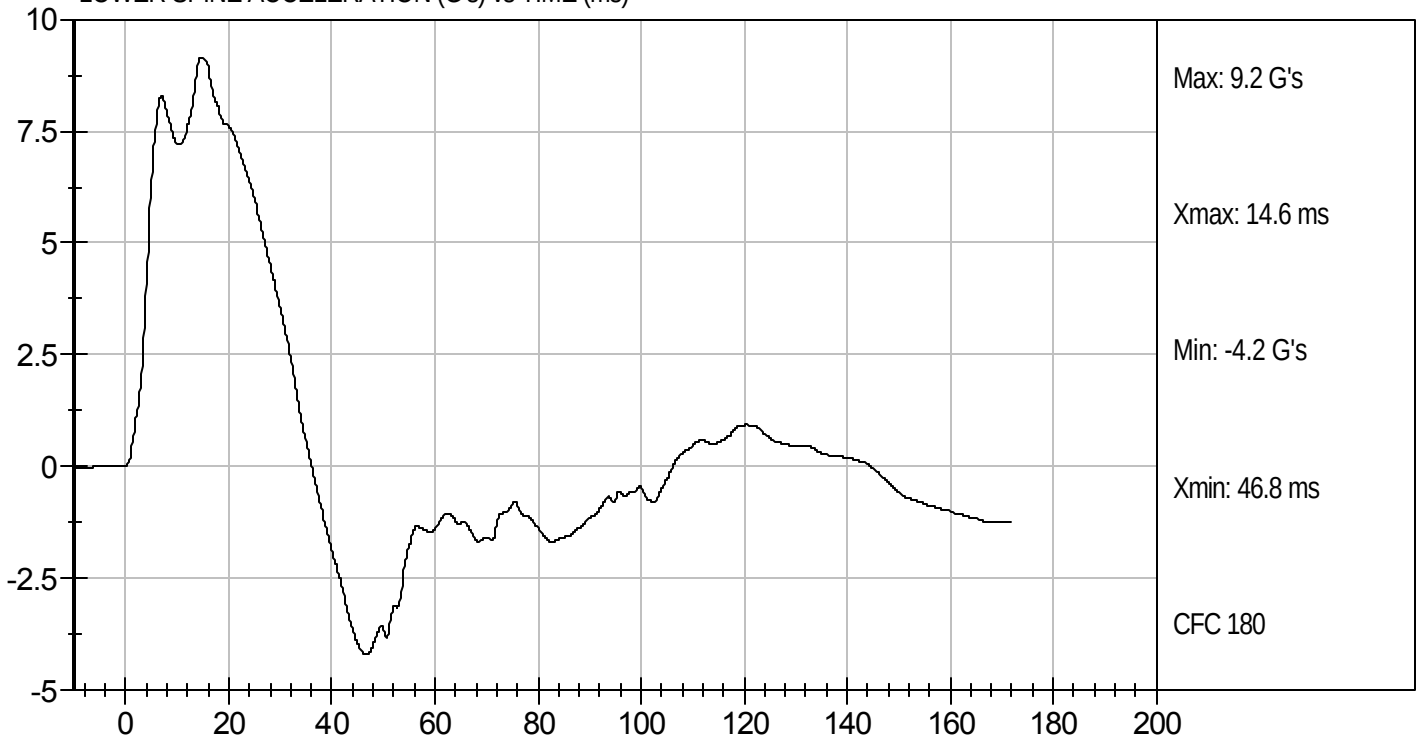
Test Desc: Thorax Without Arm
Component ID: D12105

Test Date: 1/10/12
Velocity: 14.24 ft/s, 4.34 m/s

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



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



MGA RESEARCH CORPORATION

ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12106

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	38	Pass
Lower Rib Displacement	mm	33 to 44	39	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

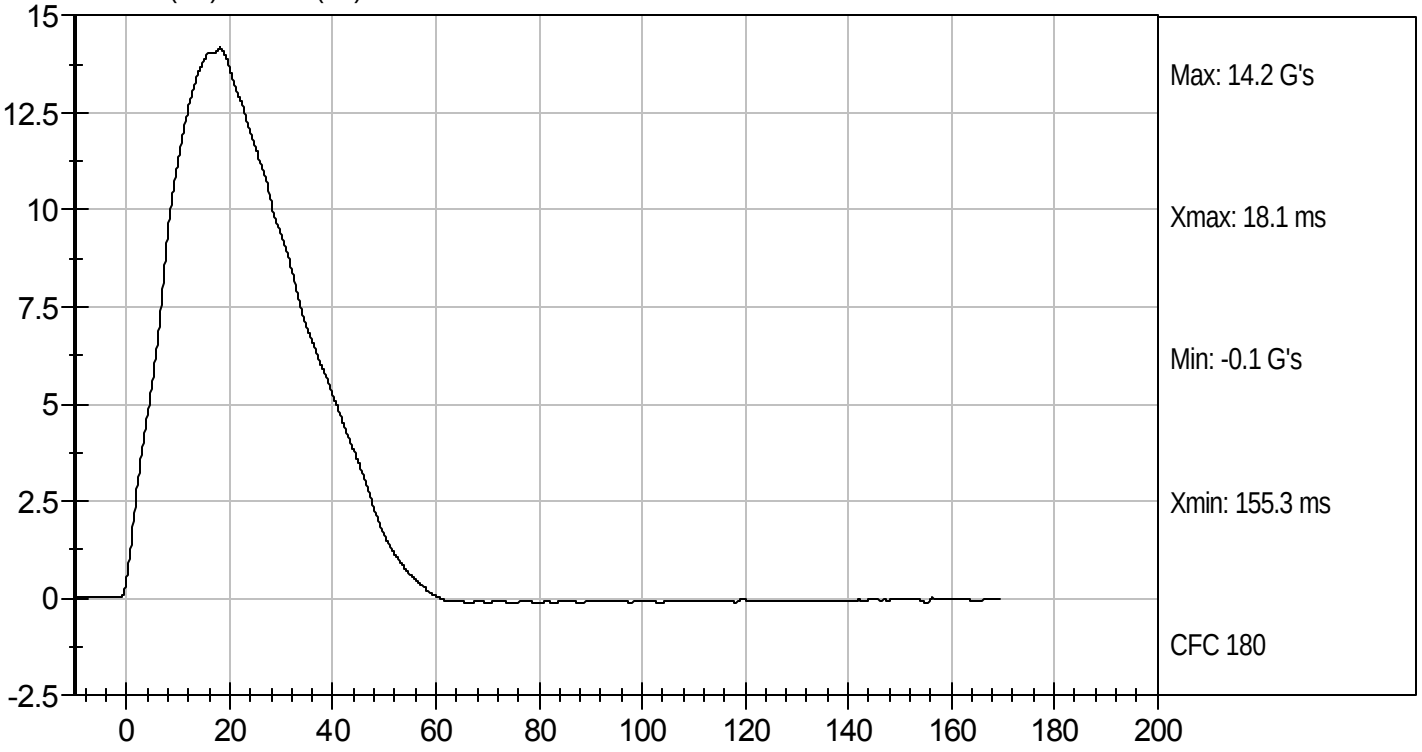
1/10/12
Test Date

David Winkelbauer
Approved By

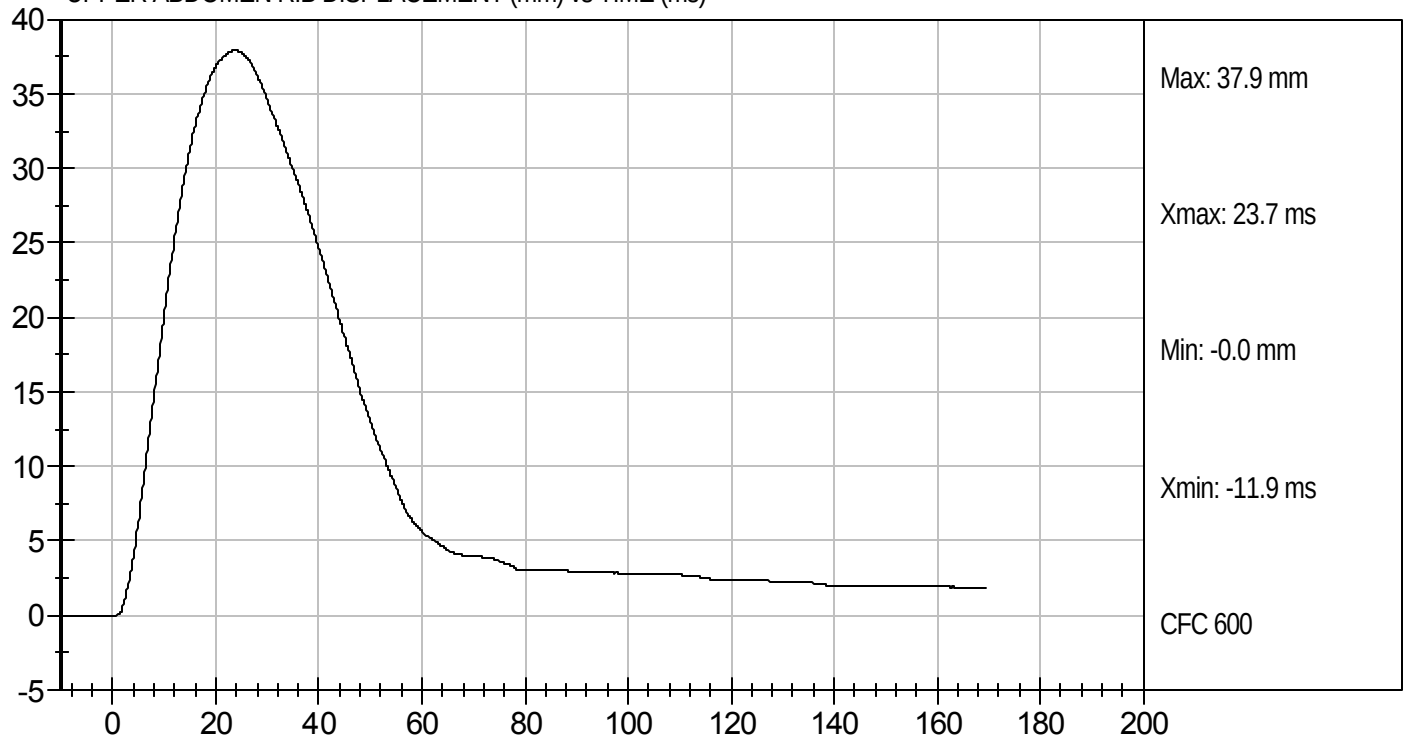
Test Desc: Abdomen Impact
Component ID: D12106

Test Date: 1/10/12
Velocity: 14.12 ft/s, 4.30 m/s

PROBE (G's) vs TIME (ms)



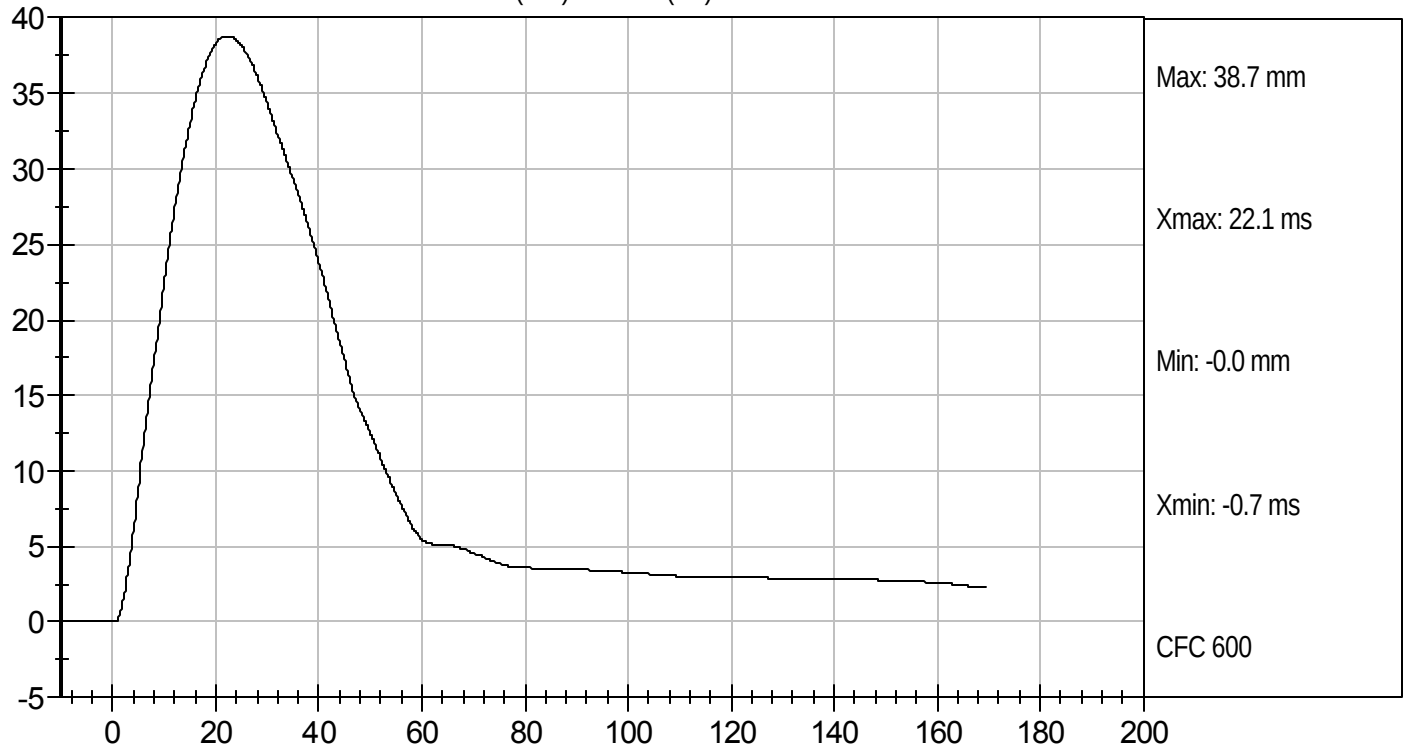
UPPER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



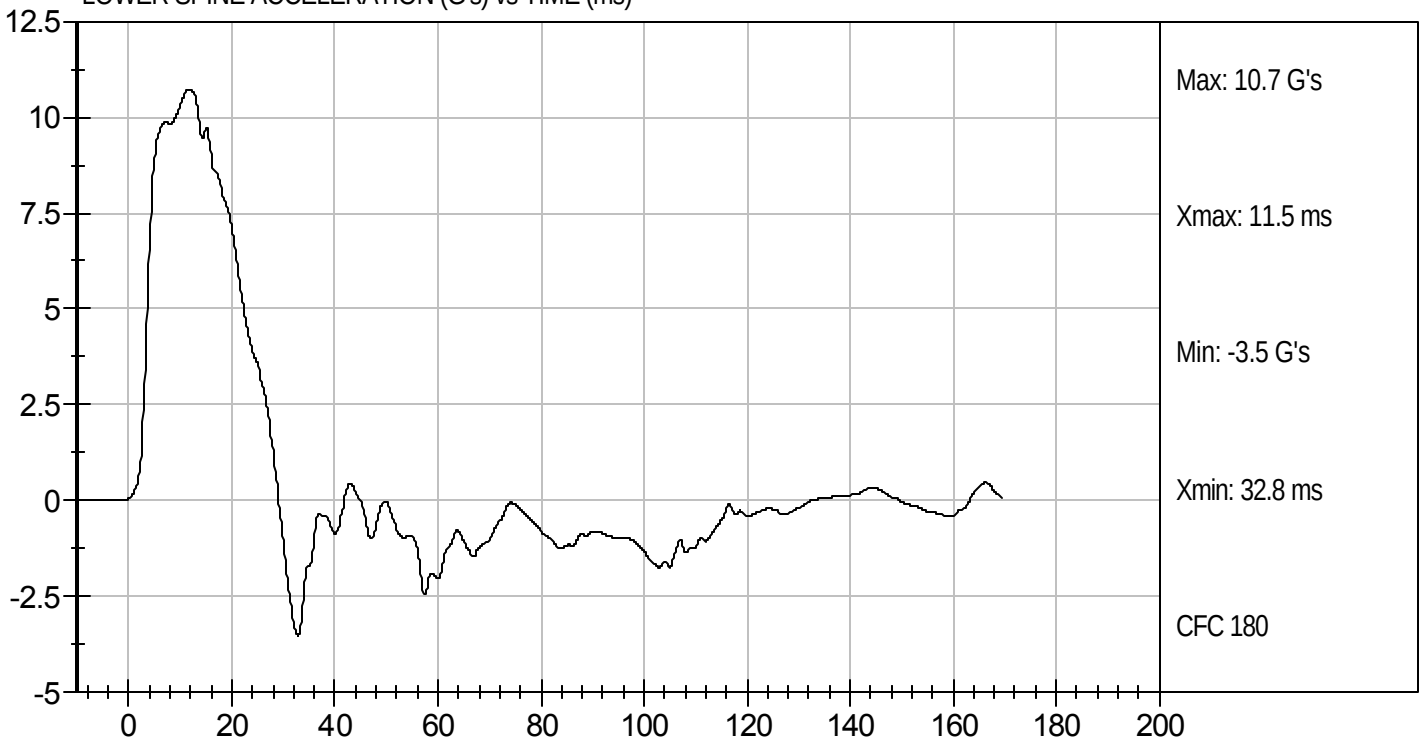
Test Desc: Abdomen Impact
Component ID: D12106

Test Date: 1/10/12
Velocity: 14.12 ft/s, 4.30 m/s

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12107B

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Impactor Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	42	Pass
Peak Acetabulum Force	N	3600 to 4300	3884	Pass
		Overall Test Results		Pass

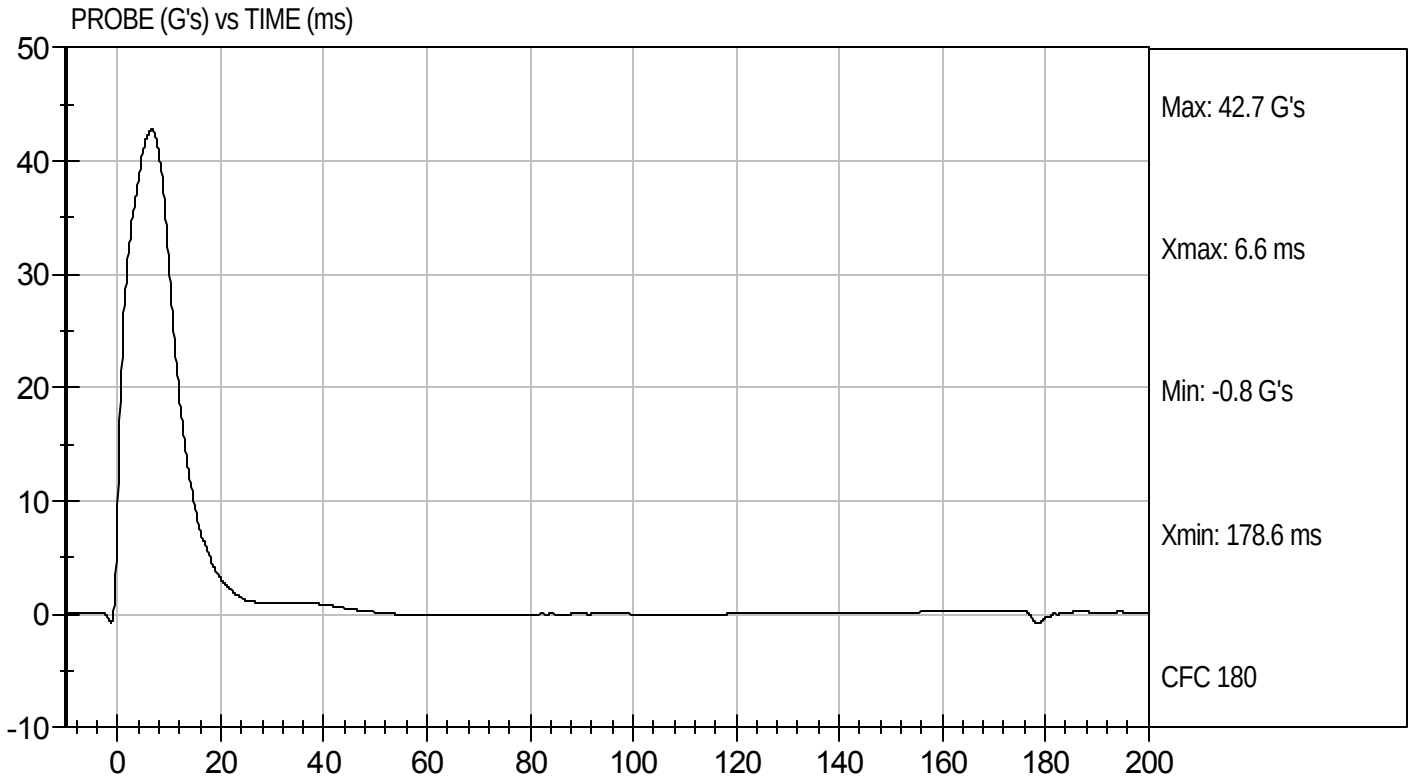
Jessica Hall
Laboratory Technician

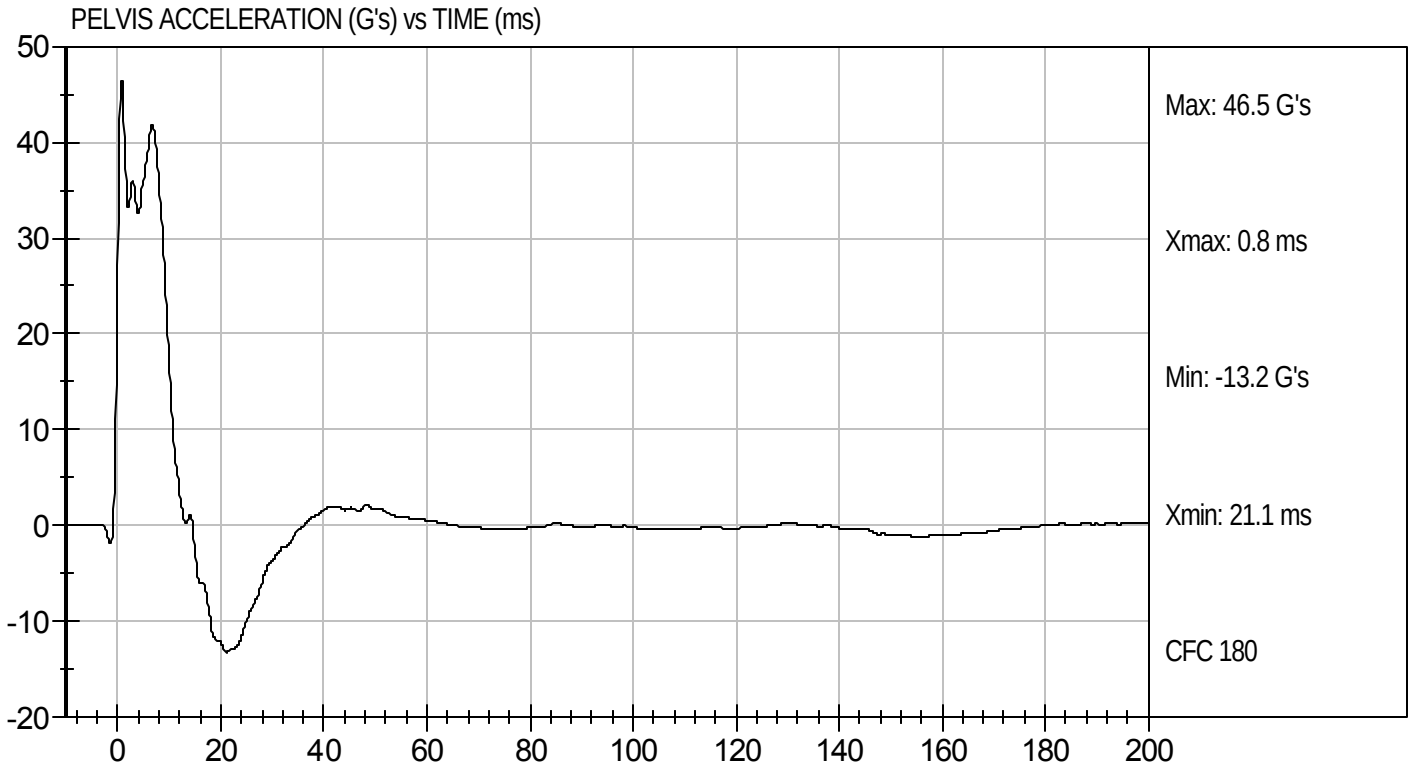
1/10/12
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D12107B

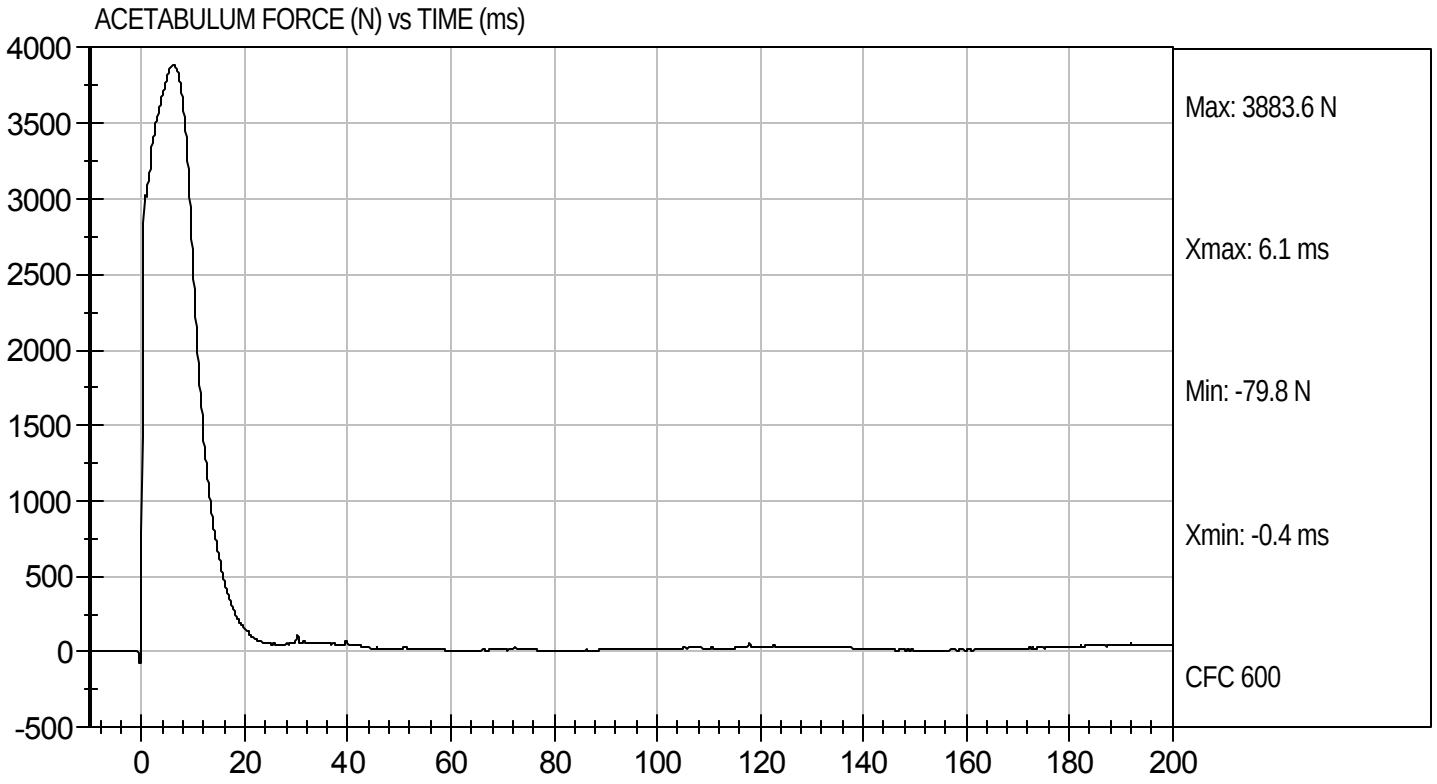
Test Date: 1/10/12
Velocity: 21.93 ft/s, 6.68 m/s





Test Desc: Pelvis Impact
Component ID: D12107B

Test Date: 1/10/12
Velocity: 21.93 ft/s, 6.68 m/s



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306 **Test I.D:** D12108

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4656	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

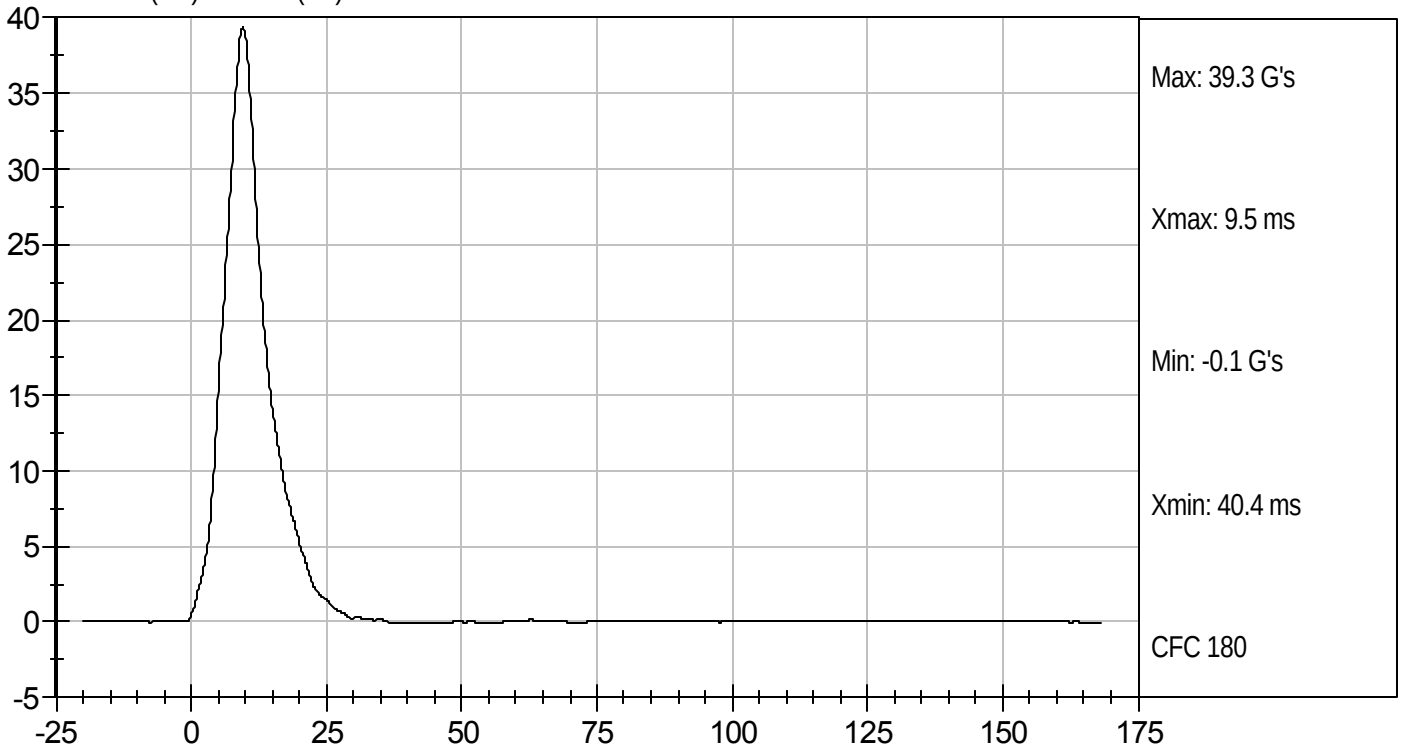
1/10/12
Test Date

David Winkelbauer
Approved By

Test Desc: Iliac Impact
Component ID: D12108

Test Date: 1/10/12
Velocity: 14.24 ft/s, 4.34 m/s

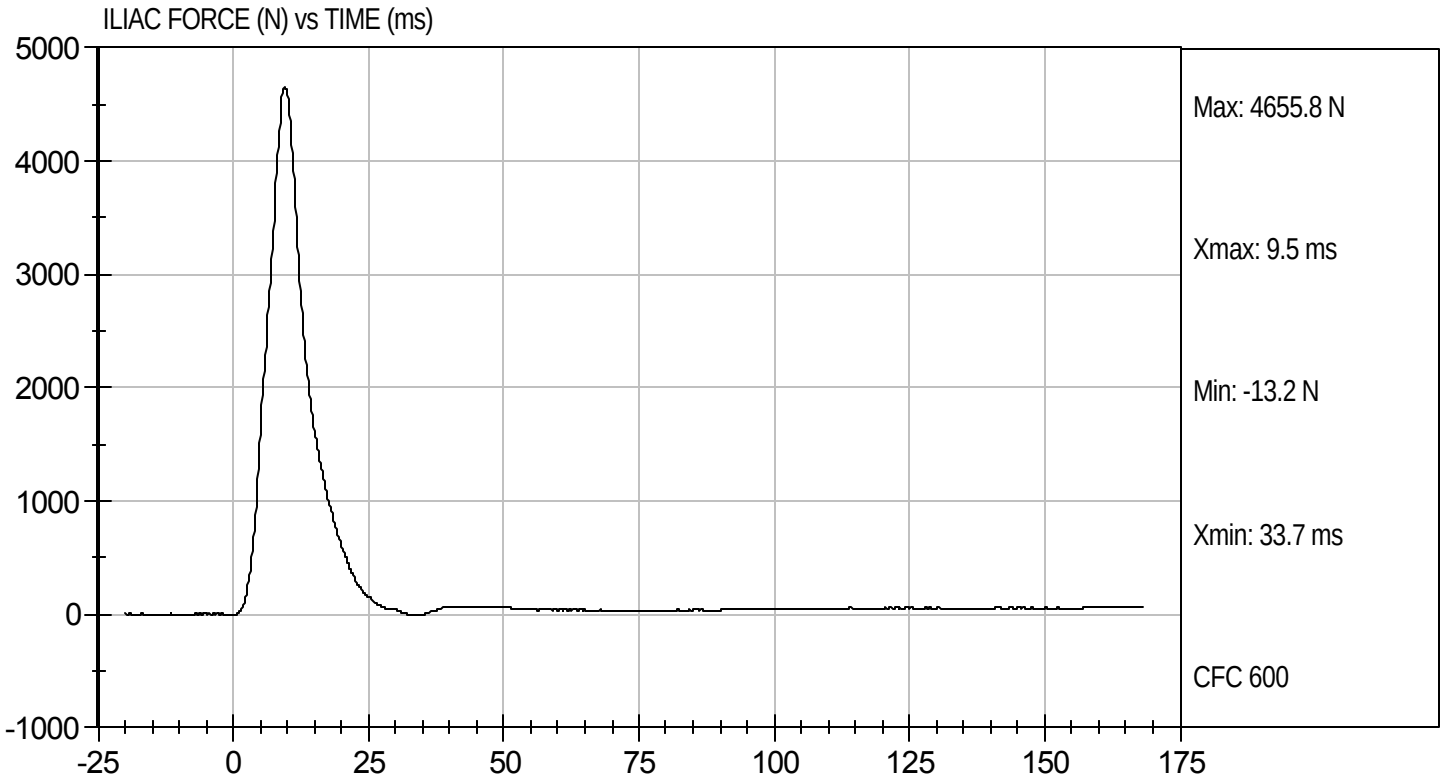
PROBE (G's) vs TIME (ms)



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

Test Desc: Iliac Impact
Component ID: D12108

Test Date: 1/10/12
Velocity: 14.24 ft/s, 4.34 m/s



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 Accelerometers		X	P73737	Endevco	10/04/11
		Y	P73738	Endevco	10/04/11
		Z	P73740	Endevco	10/04/11
Head Accelerometers		Xr	P66627	Endevco	10/10/11
		Yr	P73753	Endevco	10/04/11
		Zr	P73754	Endevco	10/04/11
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	10/12/11
	Middle	Y	G169	Honeywell	10/12/11
	Lower	Y	G164	Honeywell	10/12/11
Abdomen Load Cells	Forward	Y	ABG1513	Denton	05/20/11
	Middle	Y	ABG1531	Denton	05/20/11
	Rear	Y	ABG1536	Denton	05/20/11
Lower Spine Accelerometers (T12)		X	P73742	Endevco	10/04/11
		Y	P73743	Endevco	10/04/11
		Z	P73749	Endevco	10/04/11
Pubic Symphysis Load Cell		Y	PG462	Denton	05/20/11

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 306		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	P67884	Endevco	12/06/11
			Y	P67886	Endevco	12/06/11
			Z	P67887	Endevco	12/06/11
Head Accelerometers			X	P67888	Endevco	12/06/11
			Y	P67889	Endevco	12/06/11
			Z	P67890	Endevco	12/06/11
Displacement Potentiometers	Thoracic Rib	Upper	Y	G1187	FTSS	12/06/11
		Middle	Y	G1261	FTSS	12/06/11
		Lower	Y	G1270	FTSS	12/06/11
	Abdominal Rib	Upper	Y	G1287	FTSS	12/06/11
		Lower	Y	G1304	FTSS	12/06/11
Lower Spine Accelerometers (T12)			X	P67893	Endevco	12/06/11
			Y	P67894	Endevco	12/06/11
			Z	P67895	Endevco	12/06/11
Acetabulum Load Cell			Y	ACG111	FTSS	05/20/11
Iliac Wing Load Cell			Y	IWG226	FTSS	05/20/11
Pelvis Plug (struck side)				46441	FTSS	09/22/11
Pelvis Plug (non-struck side)				46425	FTSS	09/22/11

Table 3 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P59264	Endevco	08/22/11
Vehicle Center of Gravity	Y	P59265	Endevco	08/22/11
Vehicle Center of Gravity	Z	P59266	Endevco	08/22/11
Right Sill at Front Seat	X	P63503	Endevco	10/25/11
Right Sill at Front Seat	Y	P63505	Endevco	10/25/11
Right Sill at Front Seat	Z	P63504	Endevco	10/25/11
Right Sill at Rear Seat	X	P59624	Endevco	09/13/11
Right Sill at Rear Seat	Y	P59623	Endevco	09/13/11
Right Sill at Rear Seat	Z	P59625	Endevco	09/13/11
Left Sill at Front Door	Y	P63401	Endevco	11/04/11
Left Sill at Rear Door	Y	P63226	Endevco	10/20/11
Left A-Post Lower	Y	P63414	Endevco	11/04/11
Left A-Post Middle	Y	P47111	Endevco	09/12/11
Left B-Post Lower	Y	P59222	Endevco	09/12/11
Left B-Post Middle	Y	P52170	Endevco	10/20/11
Front Seat Track	Y	P59275	Endevco	11/04/11
Rear Seat Track or Structure	Y	P63279	Endevco	11/04/11
Right Rear Occ. Compartment	Y	P55699	Endevco	09/12/11
Engine Block	X	P63390	Endevco	09/13/11
Engine Block	Y	P63389	Endevco	09/13/11
Rear Floorpan Above Axle	X	P59331	Endevco	08/22/11
Rear Floorpan Above Axle	Y	P59332	Endevco	08/22/11
Rear Floorpan Above Axle	Z	P59330	Endevco	08/22/11

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P59379	Endevco	12/14/11
MDB Center of Gravity	Y	P59380	Endevco	12/14/11
MDB Center of Gravity	Z	P59381	Endevco	12/14/11
Left Frame at Rear Axle Centerline	X	P59279	Endevco	12/13/11
Left Frame at Rear Axle Centerline	Y	P59280	Endevco	12/13/11