REPORT NUMBER: SPNCAP-MCW-14-002

NEW CAR ASSESSMENT PROGRAM (SPNCAP)
SIDE IMPACT POLE TEST

CHRYSLER GROUP, LLC
2014 JEEP PATRIOT 5-DOOR SUV
NHTSA NUMBER: M20140307

PREPARED BY:
MEDICAL COLLEGE OF WISCONSIN
5000 WEST NATIONAL AVENUE
RESEARCH 151
MILWAUKEE, WISCONSIN 53295

TEST DATE: 14 NOVEMBER 2013

REPORT DATE: 13 JANUARY 2014

FINAL REPORT

PREPARED FOR:
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, D.C. 20590

Test Vehicle: 2014 Jeep Patriot 5-Door SUV
Test Program: SPNCAP

NHTSA Number: M20140307
Test Date: November 14, 2013

Prepared by: Mamik Mirza

Date: 3/19/14

Reviewed by: Brad D Stemper

Date: March 18, 2014

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. SPNCAP-MCW-14-002	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2014 Jeep Patriot 5-Door SUV NHTSA No. M20140307		*5. Report Date* January 13, 2014 *6. Performing Organization Code* MCW
7. Author(s) Brian Stemper, Project Manager Mark Meyer, Project Engineer		*8. Performing Organization Report No.* MCW-14-002
9. Performing Organization Name and Address Medical College of Wisconsin 5000 W. National Ave. Milwaukee, WI 53295		*10. Work Unit No.* *11. Contract or Grant No.* DTNH22-09-D-00123
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 Washington, D.C. 20590		*13. Type of Report and Period Covered:* November 14 to January 13 *14. Sponsoring Agency Code* NVS-111

15. Supplementary Notes

16. Abstract

A 32.20 km/h (20 mph), 75° oblique Side NCAP Test was conducted on the subject 2014 Jeep Patriot 5-Door SUV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the Medical College of Wisconsin (MCW) in Milwaukee, Wisconsin on 14 November 2013.

The impact velocity was 31.83 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 20 °C. The test vehicle's post-test maximum static crush was 478 mm at level 3. The test vehicle's occupant performance is as follows:

		Driver ATD (SID-IIs)	
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/a	1000	378
Resultant Lower Spine Acceleration	G's	82	50
Total Pelvic Force (Acetabular & Pelvic)	NWT	5525	3658
Maximum Thoracic Rib Deflection	mm	38	32
Maximum Abdomen Rib Deflection	mm	45	30

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 Pole Part 572V SID-IIs		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, D.C. 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833	
19. Security Classif. (of this report) Unclassified	*20. Security Classif. (of this page)* Unclassified	*21. No. of Pages* 106	22. Price

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2014 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00123. The purpose of this test is to generate comparative side impact performance in a 2014 Jeep Patriot 5-Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated September 2012.

SECTION 2
SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2014 Jeep Patriot 5-Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 31.83 km/h. The test was conducted at the Medical College of Wisconsin, in Milwaukee, Wisconsin, on 14 November 2013. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in APPENDIX A of this report.

One (1) Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated September 2012. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) Dummy was instrumented accordingly:

- Primary and Redundant Head CG Triaxial Accelerometers
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper and Lower Rib Displacement Potentiometers
- Lower Spine (T_{12}) Triaxial Accelerometers
- Illiac Load Cell
- Acetabulum Load Cell

APPENDIX B contains the vehicle and 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.

Injury readings for the SID-IIs dummy were recorded as follows:

OCCUPANT SUMMARY			
Head Injury Criteria (HIC_{36})	**Driver ATD (SID-IIs)**		
	Units	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/a	1000	378
Lower Spine Acceleration	G	82	50
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3658
Maximum Thoracic Rib Deflection	mm	38*	32
Maximum Abdominal Rib Deflection	mm	45*	30

Head Injury Criterion (HIC) is the standardized calculation using resultant head acceleration to assess head injury. Generally, a higher HIC represents an increase in the likelihood of a serious head injury. HIC_{36} specifies a time 'window' of 36 milliseconds over which the integral is calculated. T1 and T2 represent the time of the lower and upper bounds of the window in which the HIC is calculated.

The resultant lower spine acceleration is the single equivalent of the X, Y, and Z accelerations.

The sum of the pelvic forces is used to assess the likelihood of injury to the pelvis during a side impact crash. Higher pelvic forces correspond to an increase in the likelihood of sustaining a severe pelvis injury.

*Proposed IARV

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION		
Restraint Type	**Left Front (Driver) Occupant Location 01**	
	Mounted	Deployed
Frontal Airbag	Yes	No
Knee Airbag	No	N/a
Side Curtain Airbag	Yes	Yes
Side Torso Airbag	Yes	Yes
Seat Belt Pretensioner	Yes	Yes
Seat Belt Load Limiter	Yes	N/a
Other	No	N/a

These test data and report can be found in detail on the NHTSA website at www.nhtsa.dot.gov.

A brief summary of the crash test can be located at www.safercar.gov

TEST NOTES

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

VEHICLE INFORMATION	
NHTSA No.	M20140307
Model Year	2014
Make	Jeep
Model	Patriot
Body Style	SUV
VIN	1C4NJPBA2ED559910
Body Color	True Blue Pearl
Odometer Reading (km/mi)	5 mi.
Engine Displacement (L)	2.0
Type/No. of Cylinders	DOHC 16-Valve
Engine Placement	Lateral
Transmission Type	Manual
Transmission Speeds	5
Overdrive	Yes
Final Drive	FWD
Roof Rack	Yes
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

VEHICLE OPTIONS	
Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	No
Power Window Auto-Reverse	No
Other Optional Features	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	Yes
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	Yes

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

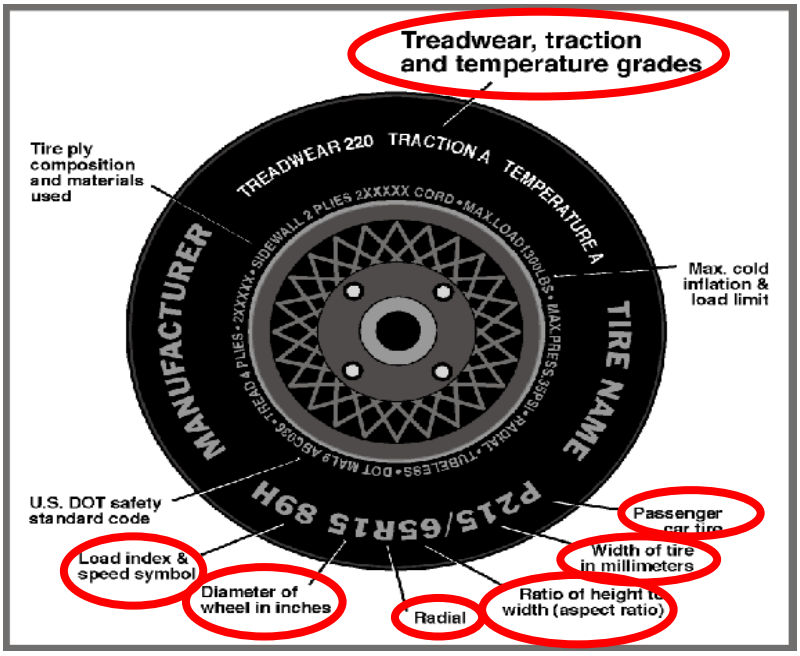
DATA FROM CERTIFICATION LABEL			
Manufactured By	Chrysler Group, LLC	GVWR (kg)	2012
Date of Manufacture	May 2013	GAWR Front(kg)	1080
Vehicle Type	SUV	GAWR Rear (kg)	1044

VEHICLE SEATING AND WEIGHT CAPACITY DATA					
	Front	**Rear**	**Third**	**Total**	
Designated Seating Capacity (DSC)	3	3	0	5	
Capacity Weight (VCW) kg				419.6	(A)
DSC X 68.04 kg				340.2	(B)
Rated Cargo Weight (RCLW)				79.4	(A-B)

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

VEHICLE SEAT TYPE							
Seating Location	**Type of Seat Pan**				**Type of Seat Back**		
	Bucket	**Bench**	**Split Bench**	**Contoured**	**Fixed**	**Adjustable**	
						W/ Lever	**W/ Knob**
Front Seat	X					X	
Rear or Second Row Seat			X	X	X	N/a	
Third Row Seat							

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



VEHICLE TIRE INFORMATION		
Measured Parameter	**Front**	**Rear**
Maximum Tire Pressure (kPa)	303.4	303.4
Cold Pressure (kPa)	241.3	241.3
Recommended Tire Size	P205/70R16	P205/70R16
Tire Size on Vehicle	P205/70R16	P205/70R16
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle LS2	Eagle LS2
Treadwear	400	400
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	4	4
Load Index/Speed Symbol	96T	96T
Tire Material	Steel & Polyester	Steel & Polyester
DOT Safety Code Left	M60W CUER	M60W CUER
DOT Safety Code Right	M60W CUER	M60W CUER

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

TIRE PRESSURES					
	Units	**LF**	**RF**	**LR**	**RR**
As Delivered	kpa	241.3	241.3	241.3	241.3
Tire Placard	kpa	241.3	241.3	241.3	241.3
Owner's Manual	kpa	241.3	241.3	241.3	241.3
As Tested	kpa	241.3	241.3	241.3	241.3

TEST VEHICLE AXLE WEIGHTS										
	Units	**As Delivered (UVW)**			**As Tested (ATW)**			**Fully Loaded**		
		Front	**Rear**	**Total**	**Front**	**Rear**	**Total**	**Front**	**Rear**	**Total**
Left	kg	404.2	304.4		439.1	339.3		420.7	363.0	
Right	kg	403.2	294.4		381.5	362.4		405.7	340.3	
Ratio	%	57.4	42.6		53.9	46.1		54.0	46.0	
Totals	kg	807.4	598.8	1406.2	820.6	701.7	1522.3	826.4	703.3	1529.7

TARGET TEST WEIGHT CALCULATION			
	Units		
Total Delivered Weight (UVW)	kg	1406.2	(A)
Actual Weight of 1 P572 ATDs (SID-IIs) Used	kg	44.1	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	79.4	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1529.7	(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

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

TEST VEHICLE ATTITUDES AND CG					
	Units	**As Delivered**	**As Tested**	**Fully Loaded**	**Meets Requirement**
Driver Door Sill Angle (Front to Rear)*	Deg.	-0.3	-0.2	-0.2	Yes
Front Pass. Door Sill Angle (Front to Rear)*	Deg.	-0.1	-0.1	-0.1	Yes
Front Bumper Angle (Left to Right)	Deg.	0	0	0	Yes
Rear Bumper Angle (Left to Right)	Deg.	-0.2	-0.2	-0.2	Yes
Vehicle CG (Aft of Front Axle)	mm	1122.1	1214.6	1211.5	
Vehicle CG Left (+) / Right (-) from Long. Centerline)	mm	6.9	20.0	21.7	

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW	
Ballast	**Weight (kg)**
Spare tire including floor cover, plastic covers, jack, and passenger side glass	28.6

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERIING WHEEL ADJUSTMENT, AND FUEL SYSTEMS DATA

SCRL ANGLE RANGE			
	SCRL (°)		
	Max	Min	Mid
Driver Seat**	0.0°	0.0°	0.0°
Front Passenger Seat**	0.0°	0.0°	0.0°
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat			

**Seat pan non-adjustable

SCRL ANGLE RANGE						
Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver's Seat	N/a	N/a	Max	N/a	N/a	N/a
	0.0	32	Mid	49	39	29
	N/a	N/a	Min	N/a	N/a	N/a
Front Passenger Seat	N/a	Fixed	Max	N/a	N/a	N/a
	0.0	28	Mid	45	34	23
	N/a	Fixed	Min	N/a	N/a	N/a
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*			Max			
			Mid			
			Min			

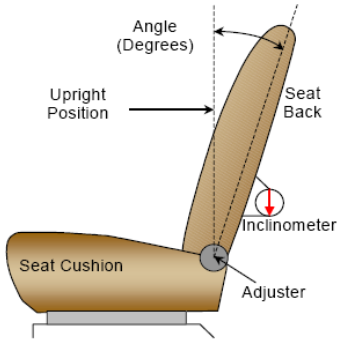
*If applicable

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

SEAT FORE/AFT TRAVEL				
Seat	**Total Fore/Aft Travel**		**Test Position from Forward-most Position**	
	mm	**Detents***	**mm**	**Detents***
Driver Seat	260	39	5	0 (w/ Full Forward = 0)
Front Passenger Seat	260	39	5	0 (w/ Full Forward = 0)
Front Center Seat*				
Struck Side Rear Seat	Fixed	N/a	N/a	N/a
Non-Struck Side Rear Seat	Fixed	N/a	N/a	N/a
Rear Center Seat*				

*If applicable

Seat Back Angle Adjustment
The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match the struck-side rear seat back.



FRONT SEAT ASSEMBLY

SEAT BACK ANGLE ADJUSTMENT				
Seat	**Total Seat Back Angle Range**		**Test Position from Most Upright**	
	Degrees	**Detents***	**Degrees**	**Detents***
Driver Seat w/ Seated Dummy	60°	41	1.0°***	1
Front Passenger Seat	60°	39	1.0°***	1
Front Center Seat*				
Struck Side Rear Seat	Fixed	N/a	Fixed	N/a
Non-Struck Side Rear Seat	Fixed	N/a	Fixed	N/a
Rear Center Seat*				

*If applicable
***Measure at the head-rest post

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

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

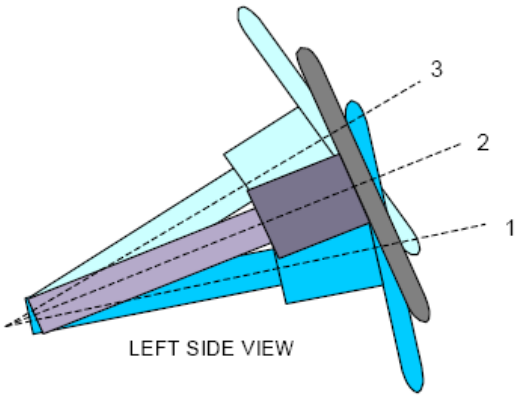
SEAT BELT ANCHORAGE ADJUSTMENT (D-RING)		
	Total No. of Positions	**Placement**
Driver Seat	4	H

Head Restraint Adjustment
Head restraints are adjusted to the lowest and most full forward in-use position.

HEAD RESTRAINT ADJUSTMENT		
	Total No. of Positions	**Placement**
Driver Seat	5	Lowest Position

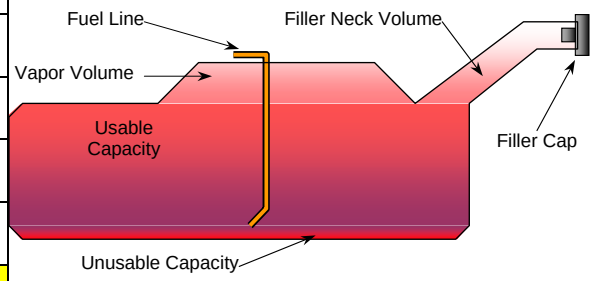
Steering Column Adjustment
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.

STEERING COLUMN ADJUSTMENT			
	Degrees	**Fore/Aft Position (mm)**	
Lowermost, Pos. No. 1	62.0°	N/a	
Geometric Center, Pos. No. 2	65.3°	N/a	
Uppermost, Pos. No. 3	68.6°	N/a	
Telescoping Steering Wheel Travel	Non-telescoping	N/a	
Test Position	65.3°	N/a	



STEERING COLUMN ASSEMBLY

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

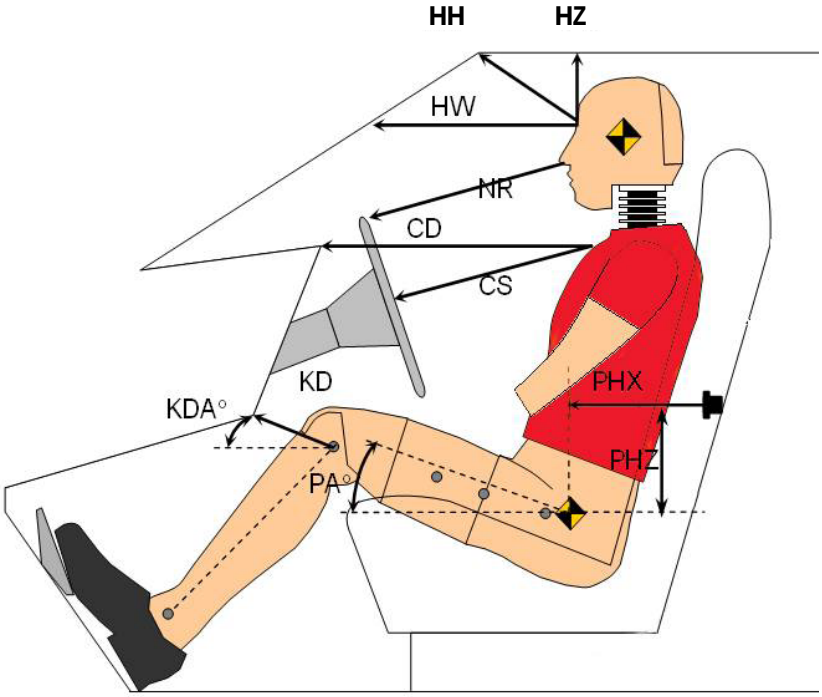
FUEL TANK CAPACITY DATA			
Description	**Units**	**Value**	
Usable Capacity of Standard Equipment Fuel Tank	L	51.5	
Usable Capacity of Optional Equipment Fuel Tank	L	51.1	
Usable Capacity of Standard Tank as Specified in Owner's Manual	L	51.5	
Usable Capacity of Optional Tank as Specified in Owner's Manual	L	51.1	
Amount of Stoddard Added for Test	L	47.9	
% Usable Capacity (92%-94%)	%	47.9	
1/3 of Usable Capacity	17.2		

VEHICLE FUEL TANK ASSEMBLY

Fuel Pump
The vehicle is equipped with an electronic fuel pump. Key is "ON" position. The fuel pump is on the left side.

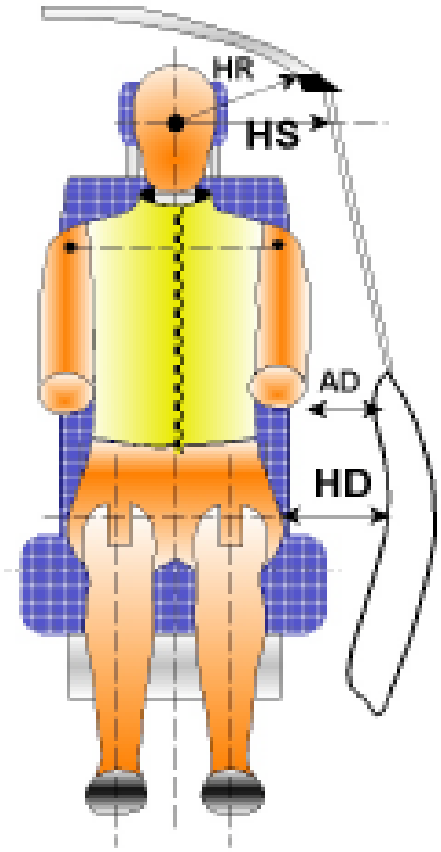
Is the Actual Amount of Solvent Used in the test equal to 93% +/- 1% of the Usable Capacity stated in on Form No. 1?	Yes

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS



Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	446	
HW	Head to Windshield	720	
HZ	Head to Roof Liner	295	
NR	Nose to Rim	291	
CD	Chest to Dashboard	443	
CS	Chest to Steering Wheel	193	
KDL	Left Knee to Dash	2	
KDAL	Left Knee to Dash		69.4°
KDR	Right Knee to Dash	5	
KDAR	Right Knee to Dash		68.3°
PAX	Pelvic Tilt Angle (X-Axis)		0.0°
PAY	Pelvic Tilt Angle (Y-Axis)		18.6°
PHX	H-Point to Striker (X-Axis)	304	
PHZ	H-Point to Striker (Z-Axis)	115	

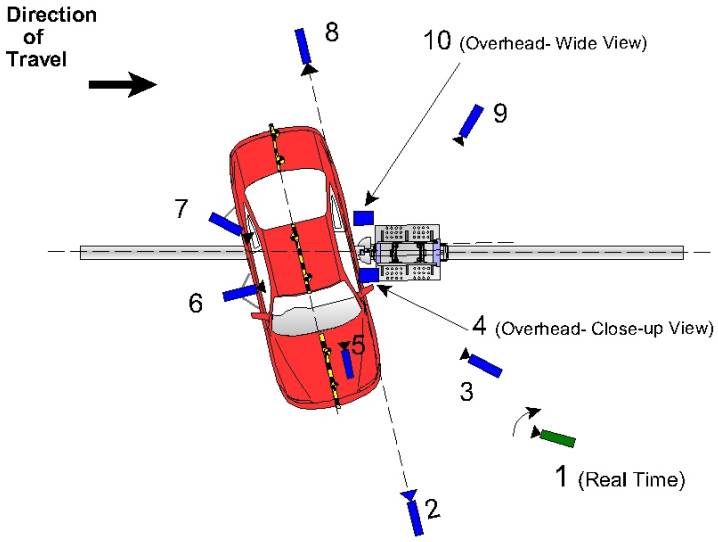
DATA SHEET NO. 4
DUMMY LATERALL CLEARANCE DIMENSIONS



DUMMY LATERAL CLEARANCE DIMENSIONS		
Code	**Measurement Description**	**Length (mm)**
HR	Head to Side Header	272
HS	Head to Side Window	394
AD	Arm to Door	230
HD	Hip Point to Door	149

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Camera Locations



	View	Coordinates †			Lens Length	Operating Frame Rate
		X	Y	Z		
		mm	mm	mm	mm	fps
1	Rear Time (24 – 30 fps) Pan View of Impact				N/a	30
2	Front ground Level – Impact View	7435	-845	-1315	50	1000
3	Impact Side 45° - Forward View of Pole	5844	-3674	-1450	25	1000
4	Overhead Close – Up View of Impact	2262	19	-5917	25	1000
5	Onboard – Dummy Front View				12.5	1000
6	Onboard – Dummy Side View				12.5	1000
7	Onboard – Dummy Rear Oblique View				12.5	1000
8	Rear Ground Level – Impact View	-6749	-902	-1480	35	1000
9	Impact Side 45° - Rearward Pole View	-4832	-3451	-1300	35	1000
10	Overhead Wide – View Impact	2175	63	-5893	12.5	1000
11	Real – Time (24 – 30 fps)Dummy Front View				N/a	30

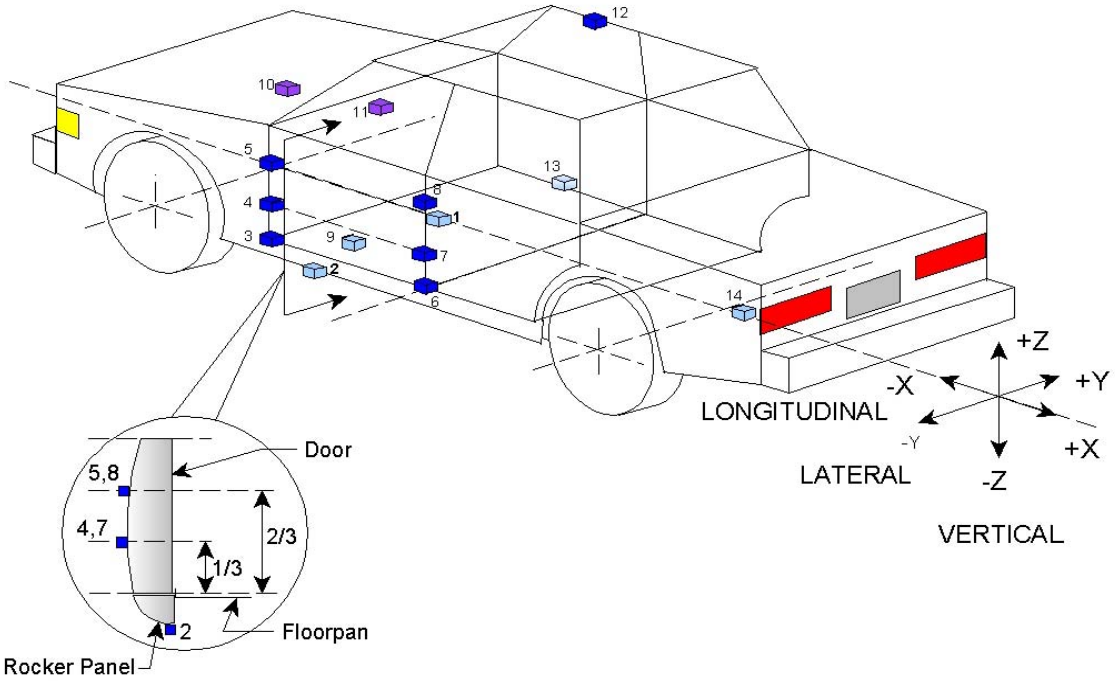
Origin		Orientation	
X	Impact Point	X	+(X) Forward
Y	Impact Point	Y	+(Y) Right
Z	Ground	Z	+(Z) Down

**All measurements accurate to +/- 6 mm*
Note: Vehicle was at a 15° angle to the rigid pole

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA (CONTINUED)

INSTRUMENTATION	
	Number of channels
Driver Dummy	16
Vehicle Structure	18
Pole Load Cells	8
Total No. of Data Channels	42

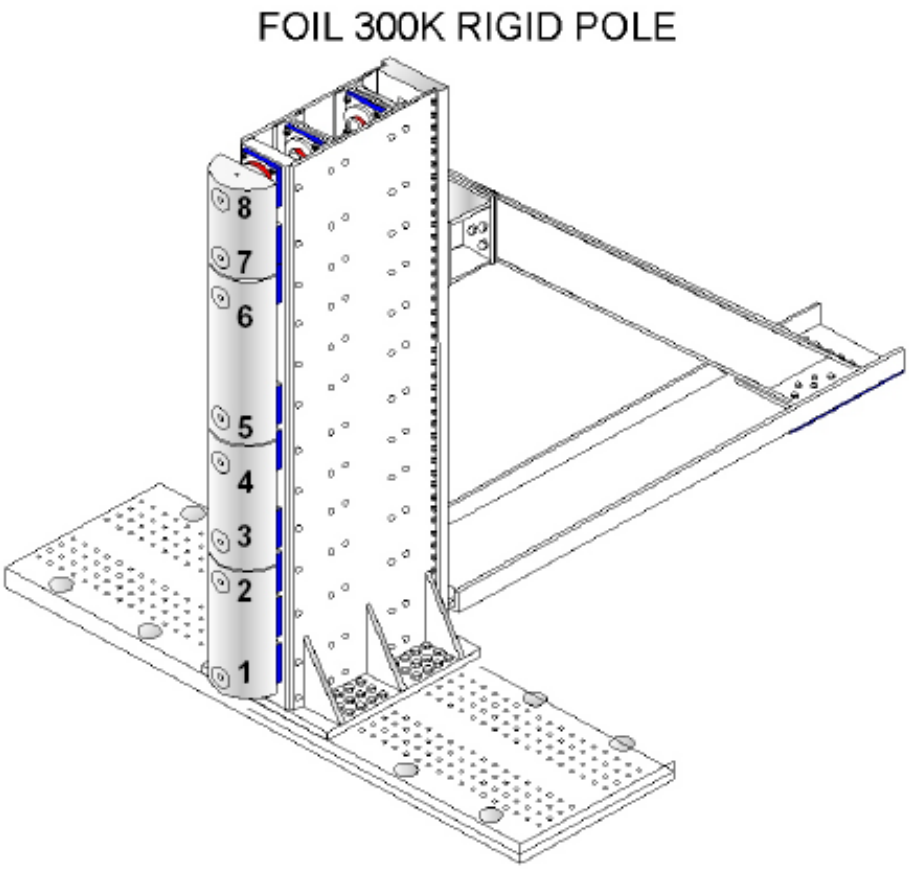
DATA SHEET NO. 6
VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER/SENSOR LOCATION				
Loc. no.	**ID**	**Coordinates (mm)**		
		X	**Y**	**Z**
1	Vehicle CG	2634.1	85.2	194.2
2	Left Floor Sill	2795.0	-709.5	427.2
3	A-Pillar Sill	3012.6	-710.0	420.0
4	A-Pillar Low	2969.6	-779.5	70.2
5	A-Pillar Mid	2980.7	-774.1	-182.7
6	B-Pillar Sill	2020.0	-711.9	417.5
7	B-Pillar Low	1977.4	-792.5	13.5
8	B-Pillar Mid	1957.1	-788.7	-225.8
9	Driver Seat Track	2266.1	-533.4	222.1
10	Engine Top	3728.1	169.3	-183.6
11	Firewall	3288.3	7.31	-85.8
12	Right Roof	2033.1	544.6	-912.8
13	Right Floor Sill	2056.4	714.0	415.0
14	Rear Floorpan	789.0	9.68	181.7

Origin		Orientation	
X	Test Vehicle Rear Bumper	X	+ Forward
Y	Test Vehicle Centerline	Y	+ Right
Z	Ground Plane	Z	+ Down

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA



LOAD CELL LOCATIONS	
ID	**Height From Ground (mm)**
1	77
2	477
3	632
4	969
5	1167
6	1638
7	1808
8	2030

*Measured From Top of Platform

DATA SHEET NO. 8
POST TEST OBSERVATIONS

TEST DUMMY INFORMATION AND CONTACT POINTS	
Dummy Body Part	**Driver SID-IIs Dummy**
Face	To Side Curtain Airbag
Top of Head	To Side Curtain Airbag
Left Side of Head	To Side Curtain Airbag
Back of Head	Along Head Rest To Side Curtain Airbag
Left Shoulder	To Side Torso Airbag
Upper Torso	To Side Torso Airbag Along Seat Back Wing
Lower Torso	To Side Torso Airbag Along Seat Back Wing
Left Hip	To Interior Door Panel
Left Knee	To Interior Door Panel

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

POST TEST SEAT PERFORMANCE				
Description	**Struck Side**		**Non-Struck Side**	
	Front	**Rear**	**Front**	**Rear**
Seat Movement Along Seat Track	No	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

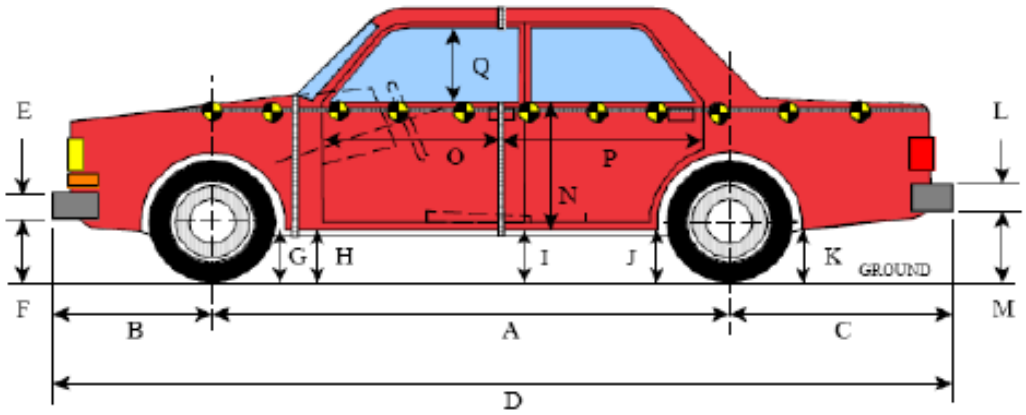
DATA SHEET NO. 8
POST TEST OBSERVATIONS (CONTINUED)

POST TEST STRUCTURAL OBSERVATIONS	
Critical Areas of Performance	**Observations/Conclusions**
Pillar Performance	No Separation
Sill Separation	Max Sill Separation of 77 mm at C-Pillar at Roof Line
Windshield Damage	Cracking Along Entire Windshield; Heaviest Concentration along Upper Impacted Side
Window Damage	Front Window Shattered at Impact
Other Notable Effects	None Noted

SUPPLEMENTAL RESTRAINT INFORMATION				
Restraint Type	**Struck Side Driver**		**Struck Side Rear Passenger**	
	Mounted	**Deployed**	**Mounted**	**Deployed**
Frontal Airbag	Yes	No		
Knee Airbag	No	N/a		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso Airbag	Yes	Yes	No	N/a
Seat Belt Pretensioner	Yes	Yes	No	N/a
Seat Belt Load Limiter	Yes	N/a	No	N/a
Other	No	N/a	No	N/a

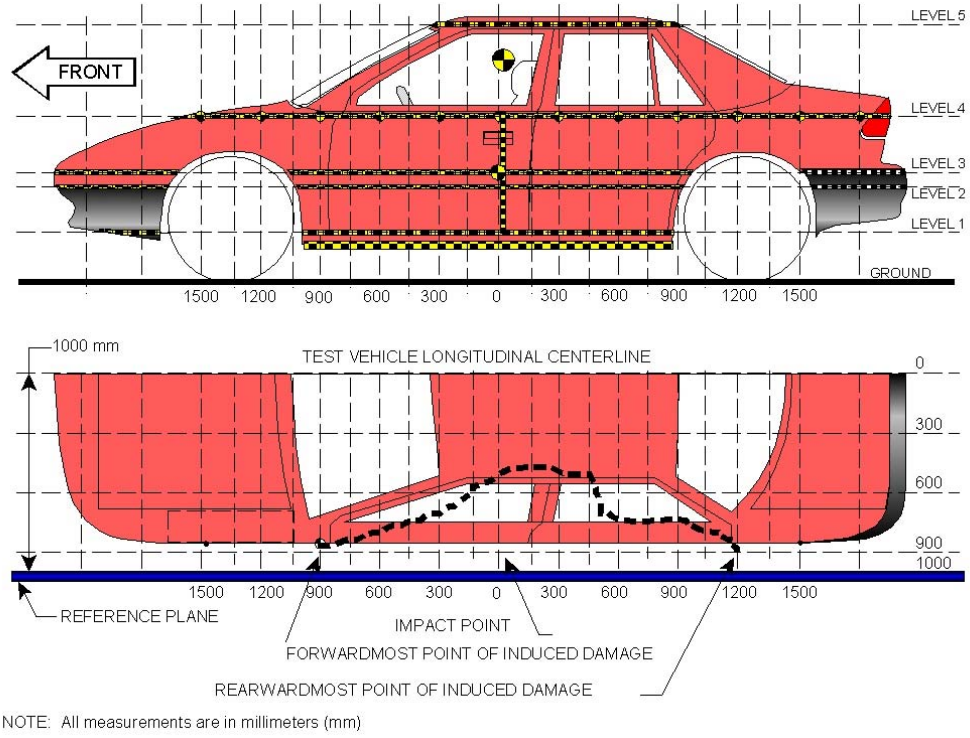
IMPACT SPEED			
Measured Parameter	**Units**	**Tolerance**	**Value**
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1168
Actual Impact Point (Aft of Front Axle)	mm		1172
Horizontal Offset (+ forward / - rear)	mm	+/- 38 of Intended Impact Point	-4
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	75.0
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	31.83
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	31.78

DATA SHEET NO. 9
VEHICLE PROFILE MEASURMENTS



VEHICLE PRE- AND POST- TEST MEASUREMENT INFORMATION				
Code	**Description**	**Pre Test**	**Post Test**	**Difference**
		mm	**mm**	**mm**
A	Wheelbase	2635	2530	-105
B	Front Axle to FSOV	712	698	-14
C	Rear Axle to RSOV	757	757	0
D	Total Length at Centerline	4415	4362	-53
E	Front Bumper Thickness	185	185	0
F	Front Bumper Bottom to Ground	430	459	29
G	Sill Height at Front Wheel Well	260	246	-14
H	Sill Height at Front Door Leading Edge	298	288	-10
I	Sill Height at B-Pillar	301	304	3
J1	Sill Height at Rear Wheel Well	264	260	-4
J2	Pinch Weld Height at Rear Wheel Well	269	265	-4
K	Sill Height Aft of Rear Wheel Well	367	352	-15
L	Rear Bumper Thickness	170	170	0
M	Rear Bumper Bottom to Ground	528	504	-24
N	Sill Height to Window Bottom Sill	760	760	0
O	Front Door Leading Edge to Impact C/L	1038	785	-253
P	Rear Door Trailing Edge to Impact C/L	867	867	0
Q	Front Window Opening	408	404	-4
R	Right Side Length	4104	4104	0
S	Left Side Length	4104	3985	-119
T	Vehicle Width at B-Pillar	1765	1599	-166

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS



NOTE: All measurements are in millimeters (mm)

MAXIMUM EXTERIOR CRUSH MEASUREMENTS				
Level	**Measurement Description**	**Height Above Ground (mm)**	**Maximum Exterior Static Crush (mm)**	**Distance from Impact (mm)**
1	Sill Top	325	396	0
2	Occupant Hip Point	680	468	0
3	Mid-Door	748	478	0
4	Window Sill	1076	435	0
5	Window Top	1549	342	0

Note: All vehicle measurements taken at the vertical impact reference line.

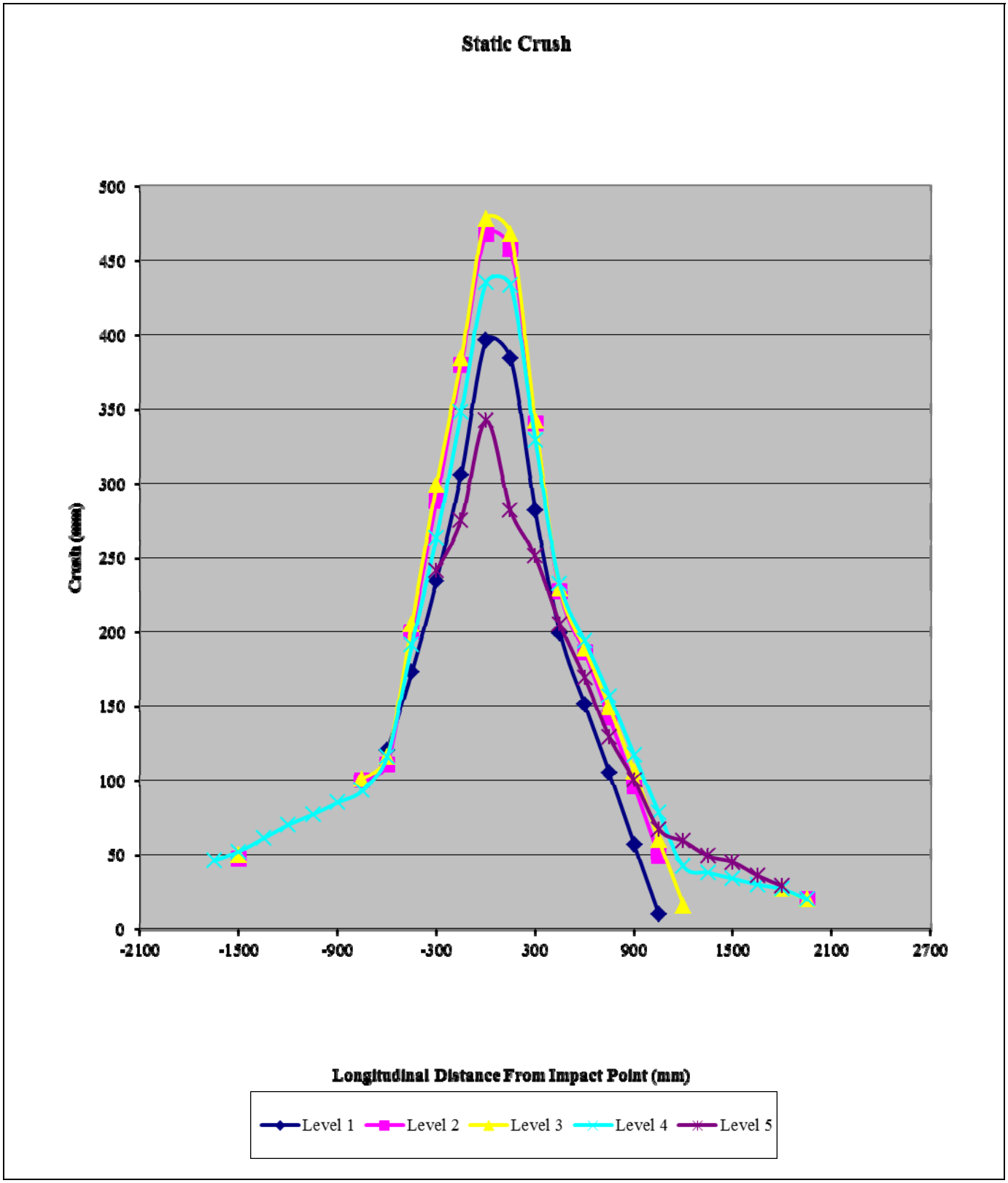
DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS
(CONTINUED)

Note: All dimensions are in millimeters with a tolerance of ±3 mm

TEST VEHICLE STATIC CRUSH

Level		1			2			3			4			5		
		325			680			748			1076			1549		
		Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush
DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT	-1800															
	-1650										491	537	46			
	-1500				296	343	47	296	346	50	472	524	52			
	-1350										453	514	61			
	-1200										437	507	70			
	-1050										417	494	77			
	-900										398	483	85			
	-750				278	378	100	276	377	101	387	480	93			
	-600	327	447	120	298	409	111	295	411	116	370	486	116			
	-450	330	503	173	295	495	200	291	496	205	357	548	191			
	-300	328	562	234	294	582	288	289	588	299	362	625	263	539	780	241
	-150	326	632	306	293	673	380	288	672	384	358	706	348	544	819	275
	0	326	722	396	291	759	468	288	766	478	354	789	435	541	883	342
	150	326	710	384	290	748	458	287	755	468	353	786	433	542	824	282
	300	327	609	282	289	629	340	286	628	342	351	680	329	541	792	251
	450	328	527	199	289	516	227	287	516	229	351	583	232	543	748	205
	600	330	481	151	287	473	186	289	478	189	350	544	194	540	709	169
	750	332	437	105	288	430	142	290	439	149	349	506	157	541	670	129
	900	335	392	57	289	385	96	291	397	106	348	465	117	542	642	100
	1050	338	348	10	289	338	49	293	353	60	347	425	78	544	611	67
	1200							267	283	16	348	390	42	546	605	59
	1350										350	388	38	551	600	49
	1500										353	387	34	555	600	45
	1650										359	389	30	561	597	36
	1800							281	308	27	363	390	27	570	599	29
	1950				310	330	20	312	332	20	373	393	20			
	2100															
	2250															
	2400															
	2550															
	2700															
	2850															
	3000															

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS
(CONTINUED)

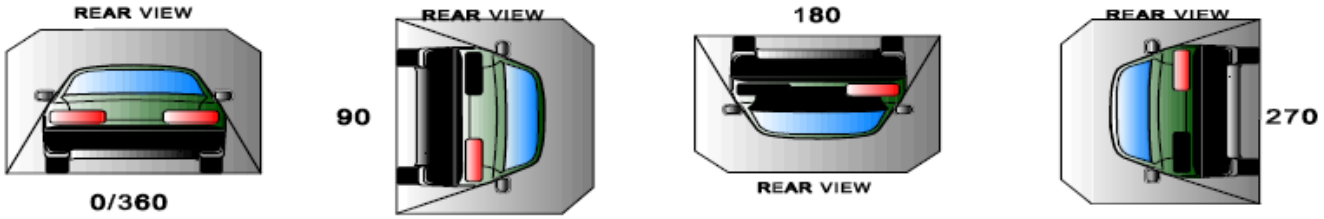


DATA SHEET NO. 11
FMVSS 301 STATIC ROLLOVER RESULTS

Temperature at Time of Impact: 20° C Test Time: 1:30 pm

STODDARD SOLVENT SPILLAGE MEASUREMENTS				
Period	**Description**	**Maximum Allowable Spillage**	**Spillage**	
			Amount	**Location**
A	From Impact Until Vehicle Motion Ceases	1 oz	0	N/a
B	5 Minutes After Vehicle Motion Ceases	5 oz	0	N/a
C	Next 25 Minutes	1 oz/minute	0	N/a
D				

FMVSS 301 STATIC ROLLOVER DATA



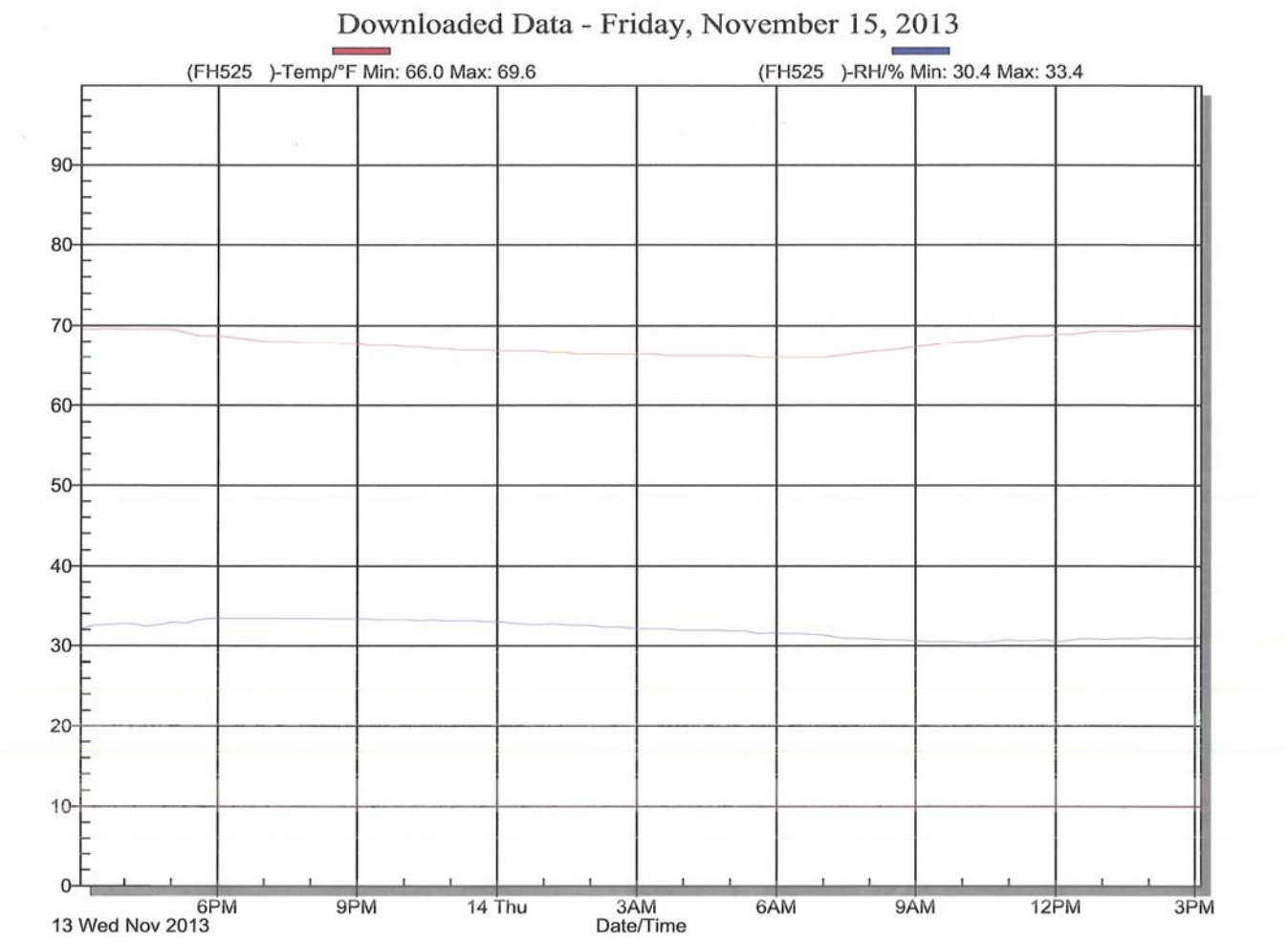
ROLLOVER SOLVENT COLLECTION TIME TABLE			
Test phase	**Rotation Time (sec.)**	**Hold Time (sec.)**	**Total Time (sec.)**
0° to 90°	63	300	363
90° to 180°	67	300	367
180° to 270°	66	300	366
270° to 360°	67	300	367

DATA SHEET NO. 11
FMVSS 301 STATIC ROLLOVER RESULTS (CONTINUED)

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE				
	First Five Minutes (oz)	**Sixth Minute (oz)**	**Seventh Minute (oz)**	**Eighth Minute (oz)**
0° to 90°	0	0	0	N/a
90° to 180°	0	0	0	N/a
180° to 270°	0	0	0	N/a
270° to 360°	0	0	0	N/a

SPILLAGE LOCATION	
0° to 90°	N/a
90° to 180°	N/a
180° to 270°	N/a
270° to 360°	N/a

DATA SHEET NO. 12
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS (CONTINUED)

Figure 001: As Delivered Right Front 3-4 View of Test Vehicle

Figure 002: As Delivered Left Rear 3-4 View of Test Vehicle

Figure 003: Pre-Test Frontal View of Test Vehicle

Figure 004: Post-Test Frontal View of Test Vehicle

Figure 005: Pre-Test Left Front 3-4 View of Test Vehicle

Figure 006: Post-Test Left Front 3-4 View of Test Vehicle

Figure 007: Pre-Test Left Side View of Test Vehicle

Figure 008: Post-Test Left Side View of Test Vehicle

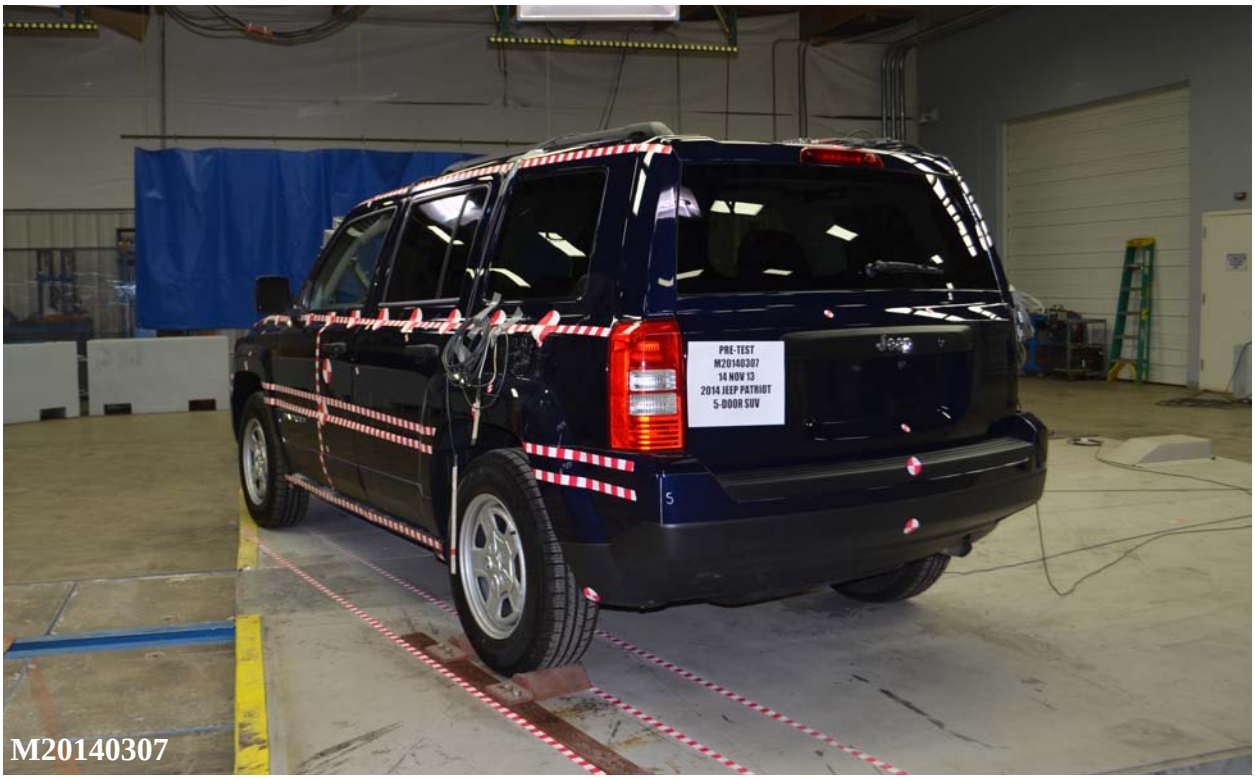


Figure 009: Pre-Test Left Rear 3-4 View of Test Vehicle

Figure 010: Post-Test Left Rear 3-4 View of Test Vehicle

Figure 011: Pre-test rear view of test vehicle

Figure 012: Post-Test Rear View of Test Vehicle

Figure 013: Pre-Test Right Side View of Test Vehicle

Figure 014: Post-Test Right Side View of Test Vehicle

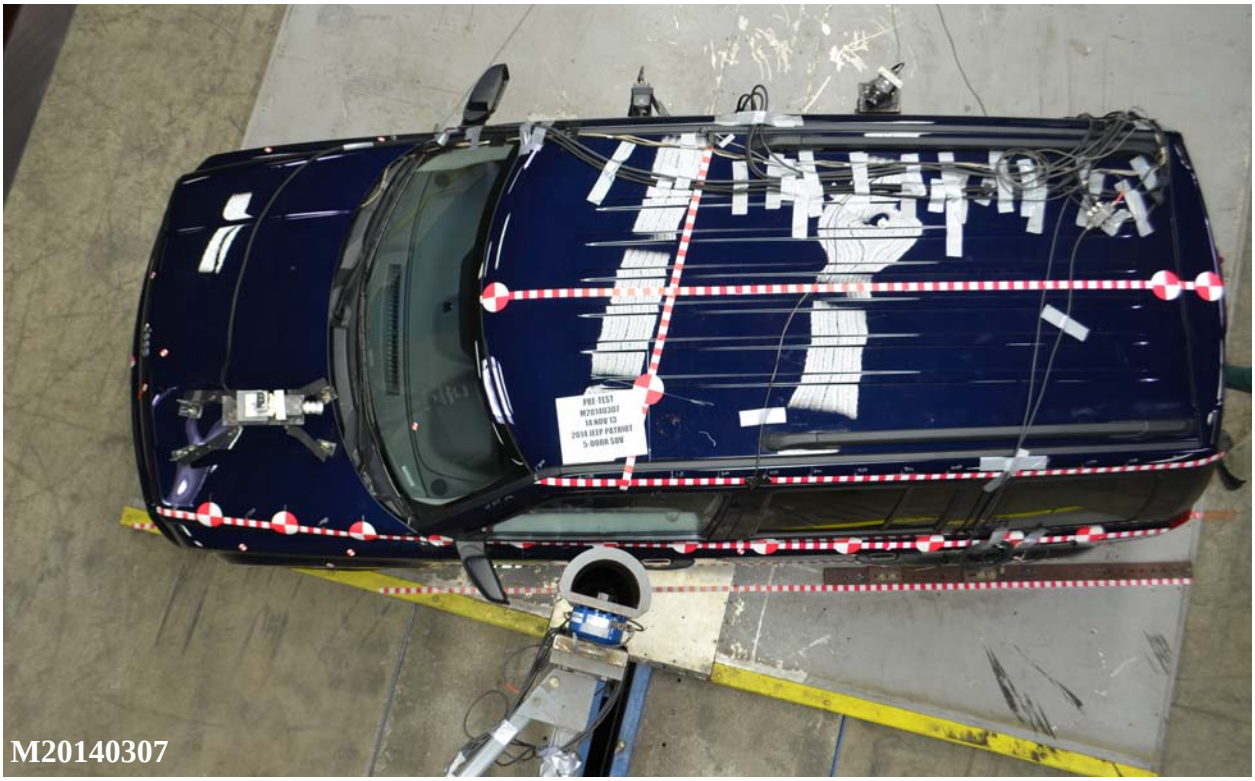


Figure 015: Pre-Test Overhead View of Test Area

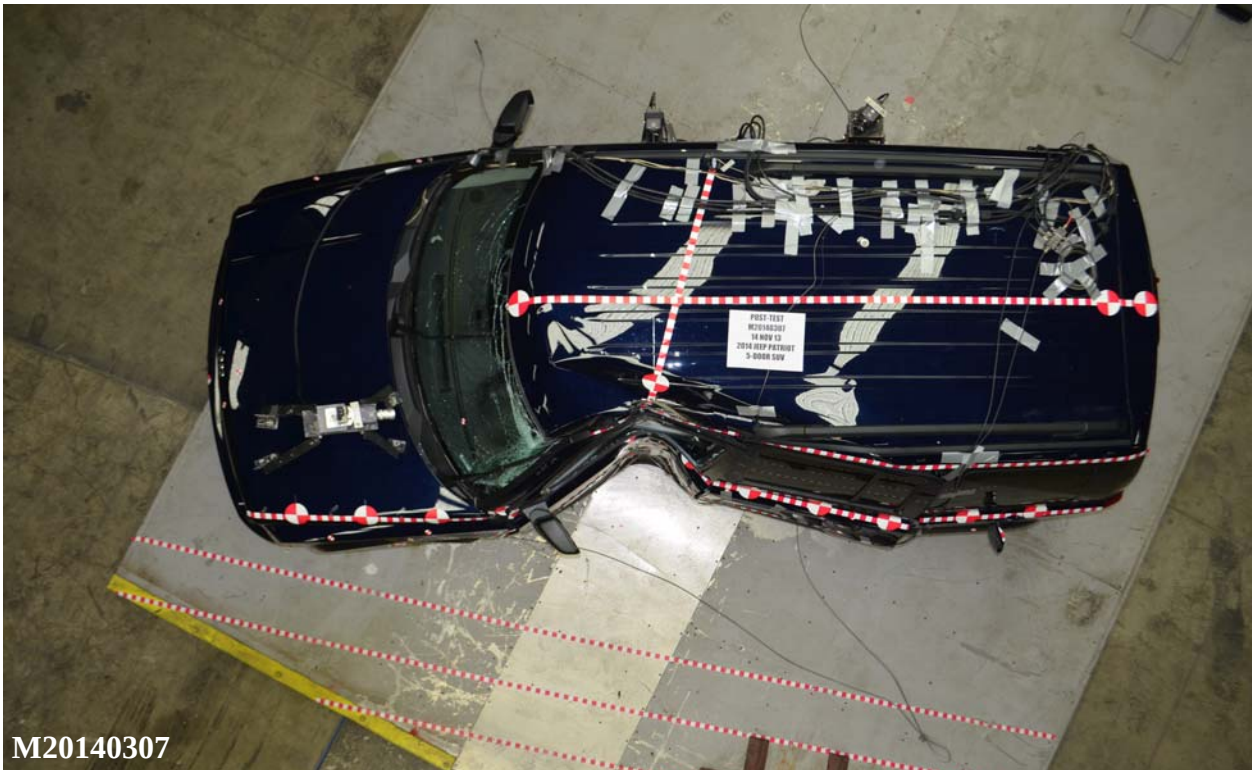


Figure 016: Post-Test Overhead View of Test Area

Figure 017: Pre-Test Left Side View of Pole Positioned Against Side of Vehicle

Figure 018: Pre-Test Right Side View of Pole Positioned Against Side of Vehicle

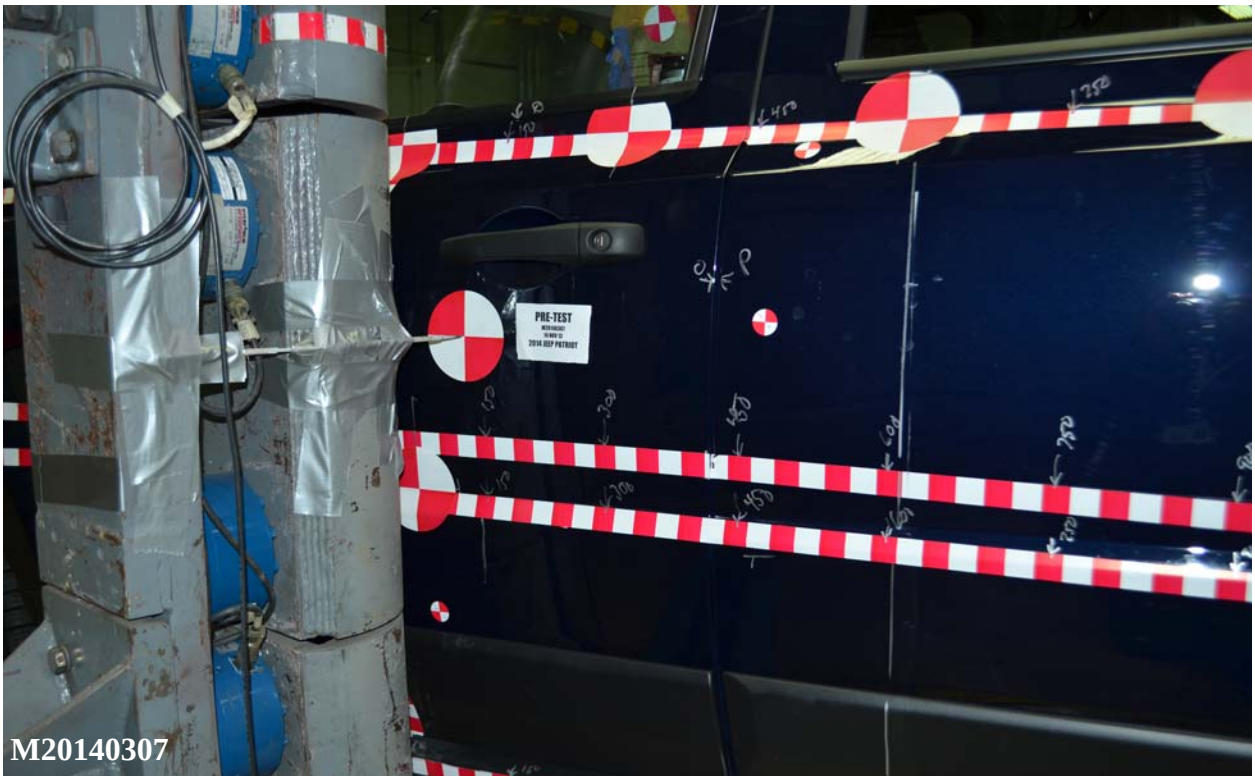


Figure 019: Pre-Test Close-Up View of Impact Point Target

Figure 020: Post-Test Close-Up View of Impact Point Target Showing Impact Location

Figure 021: Pre-Test Front Close-Up View of Dummy Head and Chest

Figure 022: Post-Test Front Close-Up View of Dummy

Figure 023: Pre-Test Left Side View of Dummy Showing Belt and Chalking

Figure 024: Pre-Test Left Side View of Dummy Shoulder and Door Top View

Figure 025: Post-Test Left Side View of Dummy Shoulder and Door Top View

Figure 026: Pre-Test Frontal View of Seat Back Prior to Dummy Positioning

Figure 027: Pre-Test Frontal Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint

Figure 028: Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning

Figure 029: Pre-Test Overhead View of Dummy Thighs on Seat Pan

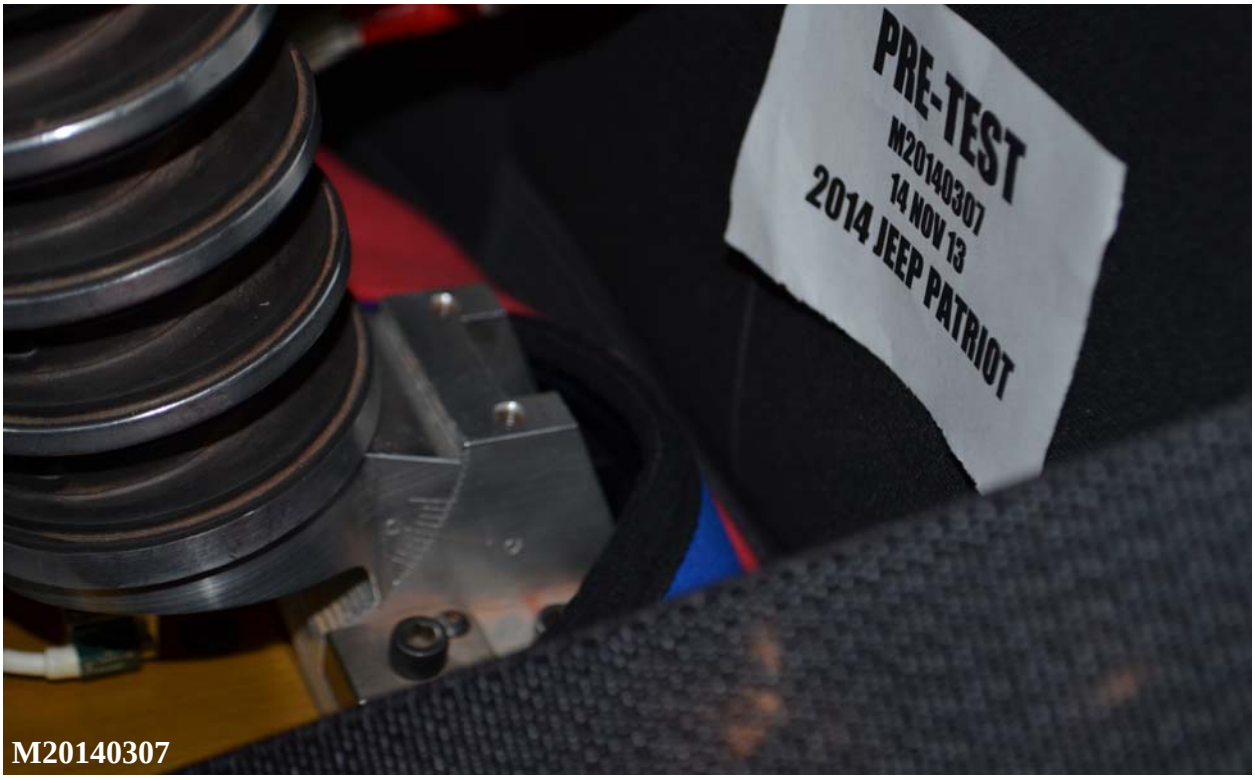


Figure 030: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket

Figure 031: Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level

Figure 032: Pre-Test Placement of Dummy's Feet

Figure 033: Pre-Test View of Belt Anchorage for Dummy

Figure 034: Pre-Test Left Side View of Steering Wheel

Figure 035: Pre-Test View of Disengaged Parking Brake

Not Taken

M20140307

Figure 036: Pre-Test View of Parking Brake- Not Taken

Figure 037: Pre-Test Close-Up Left Side View of Drive Seat Track

Figure 038: Pre-Test Close-Up Left Side View of Driver Seat Back

Figure 039: Pre-Test Close-Up View of Driver Seat Back or Head Restraint

Figure 040: Pre-Test Dummy and Door Clearance View

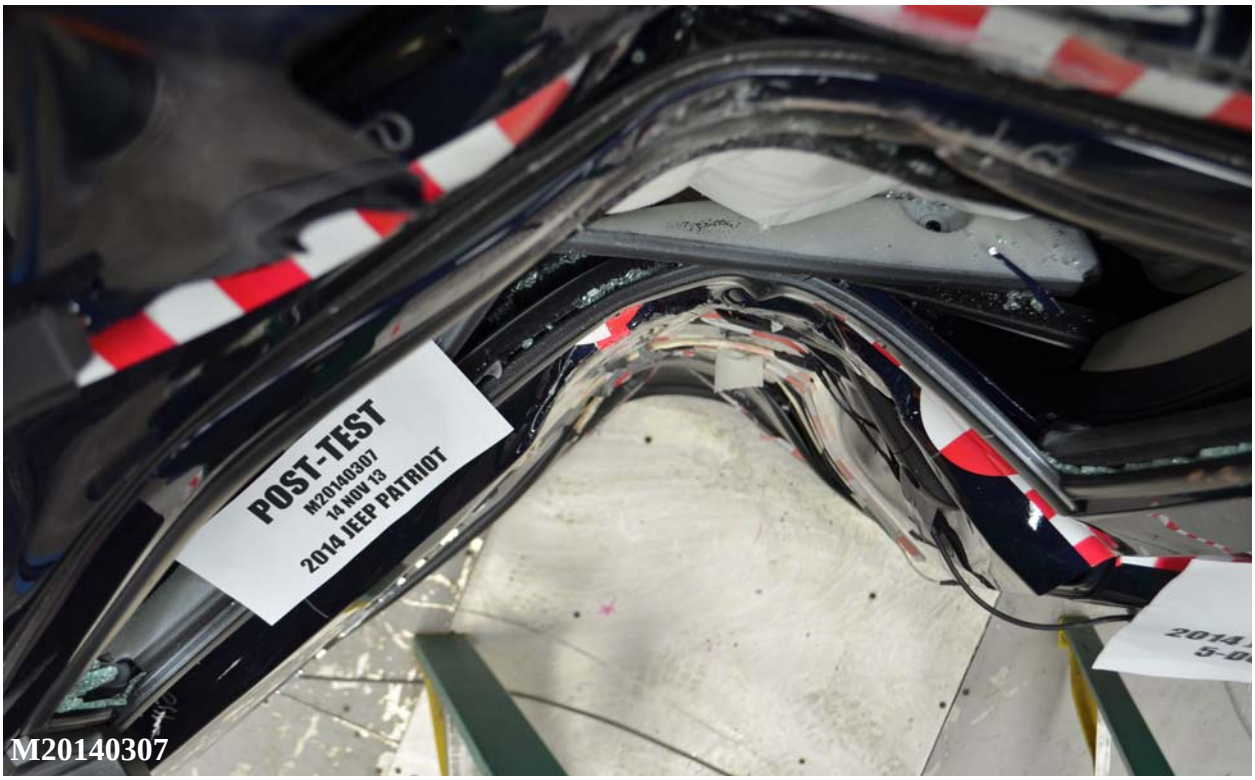


Figure 041: Post-Test Dummy and Door Clearance View

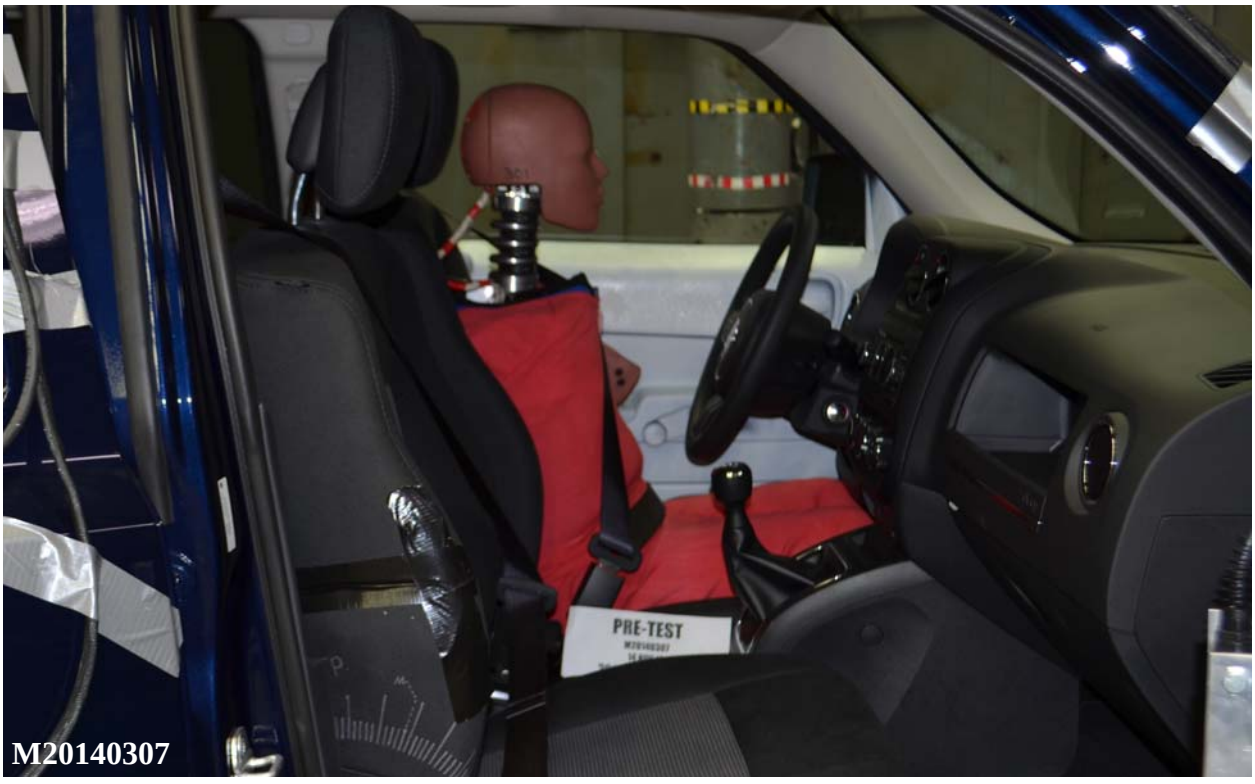


Figure 042: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment

Figure 043: Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment

Figure 044: Pre-Test Inner Door Panel View

Figure 045: Post-Test Inner Door Panel View Showing Dummy Contact Locations

Figure 046 Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

Figure 047: Post-Test Dummy Close-Up Head Contact with Side Air bag View

Figure 048: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View

Figure 049: Post-Test Dummy Close-Up Torso Contact with Side Air bag View

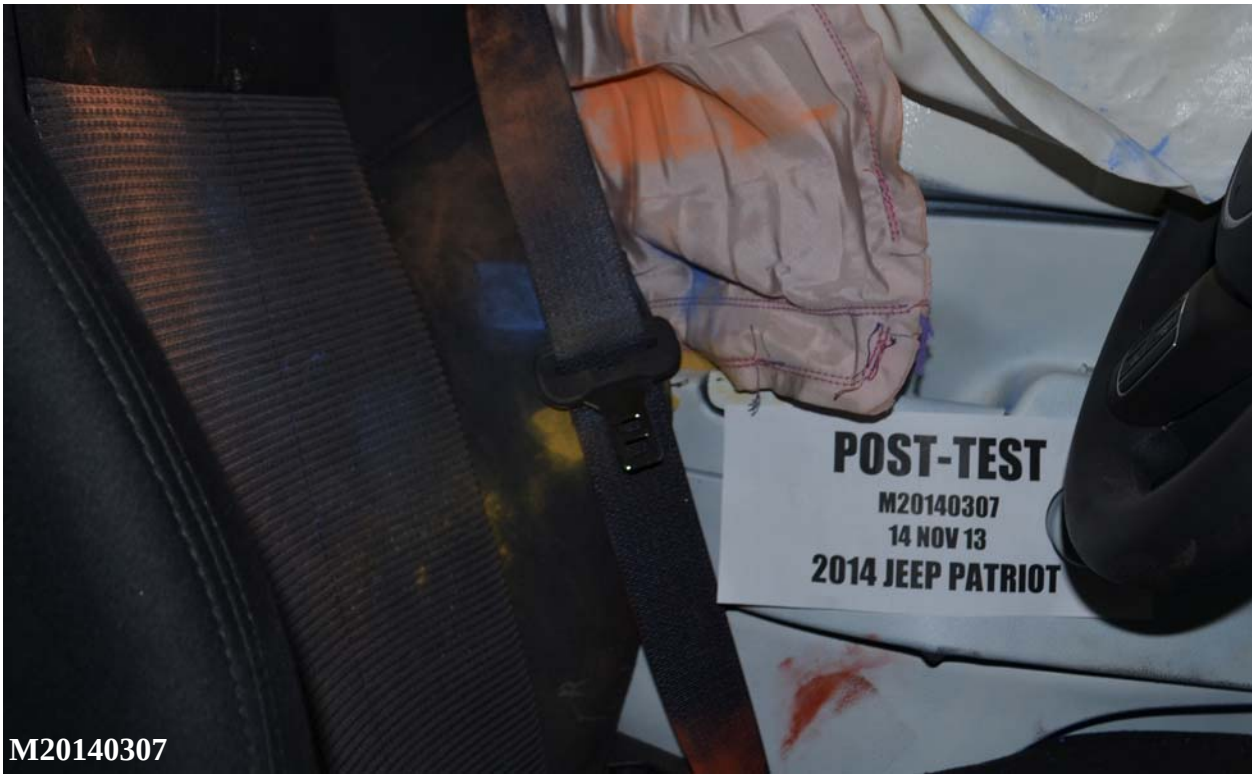


Figure 050: Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View

Not Applicable

M20140307

Figure 051: Post-Test Dummy Close-Up Pelvis Contact with Side Air bag View

Figure 052: Post-Test Dummy Close-Up Contact with Vehicle Interior View

Figure 053: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

Figure 054: Post-Test View of Fuel Filler Cap or Fuel Filler Neck

Figure 055: Close-Up View of Vehicle's Certification Label

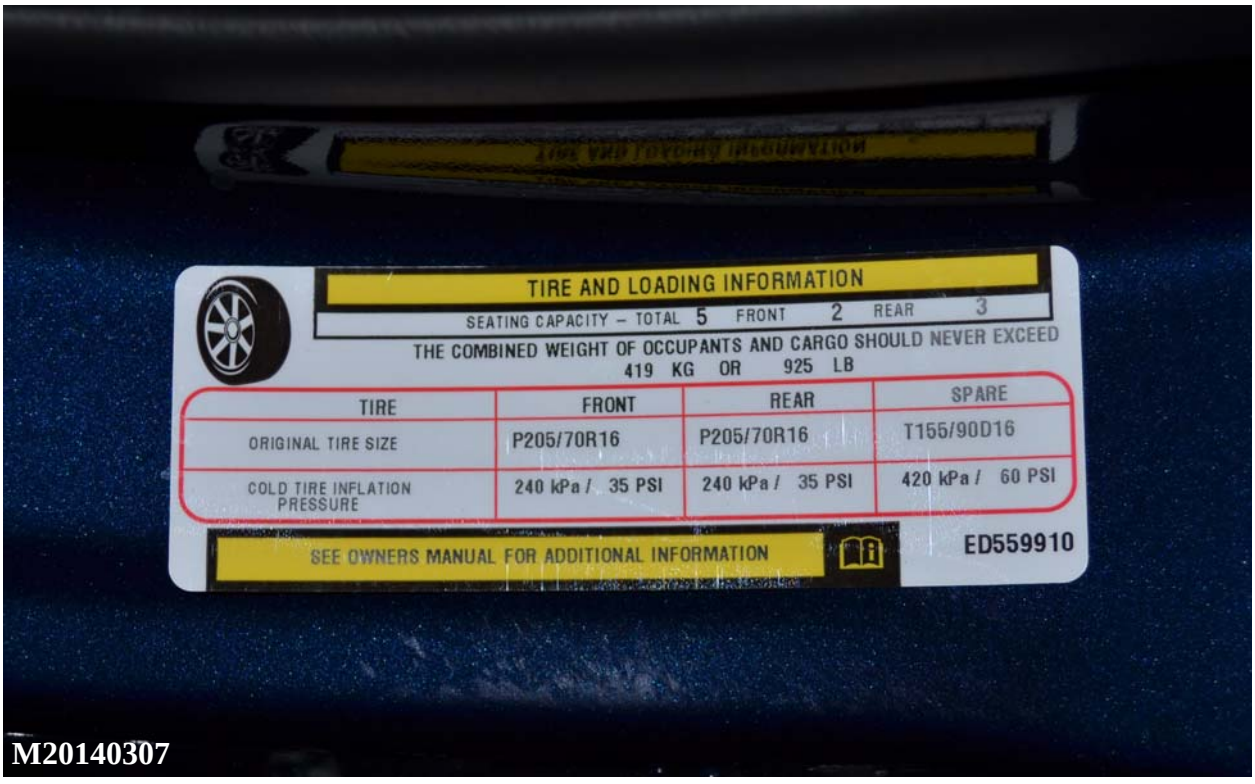


Figure 056: Close-Up View of Vehicle's Tire Information Placard or Label

Figure 057: Pre-Test Pole Barrier Front View

Figure 058: Post-Test Pole Barrier Front View

Figure 059: Pre-Test Pole Barrier Side View

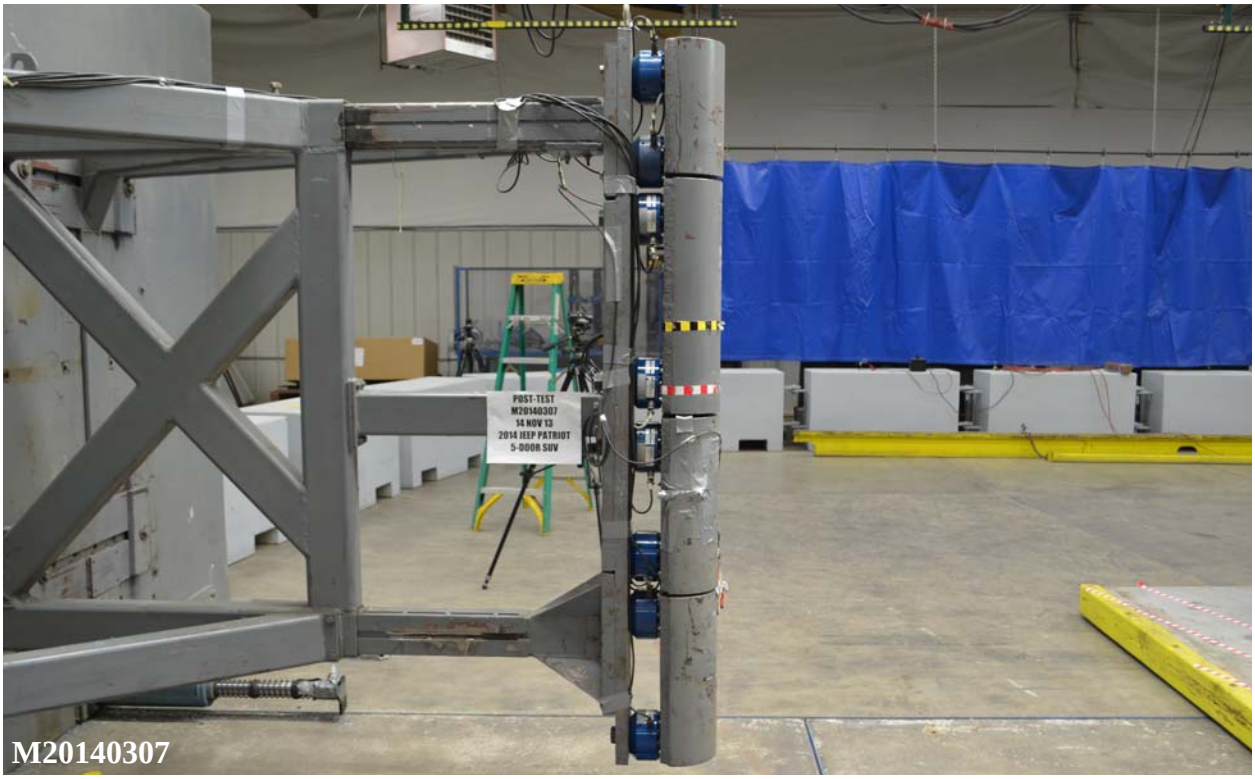


Figure 060: Post-Test Pole Barrier Side View

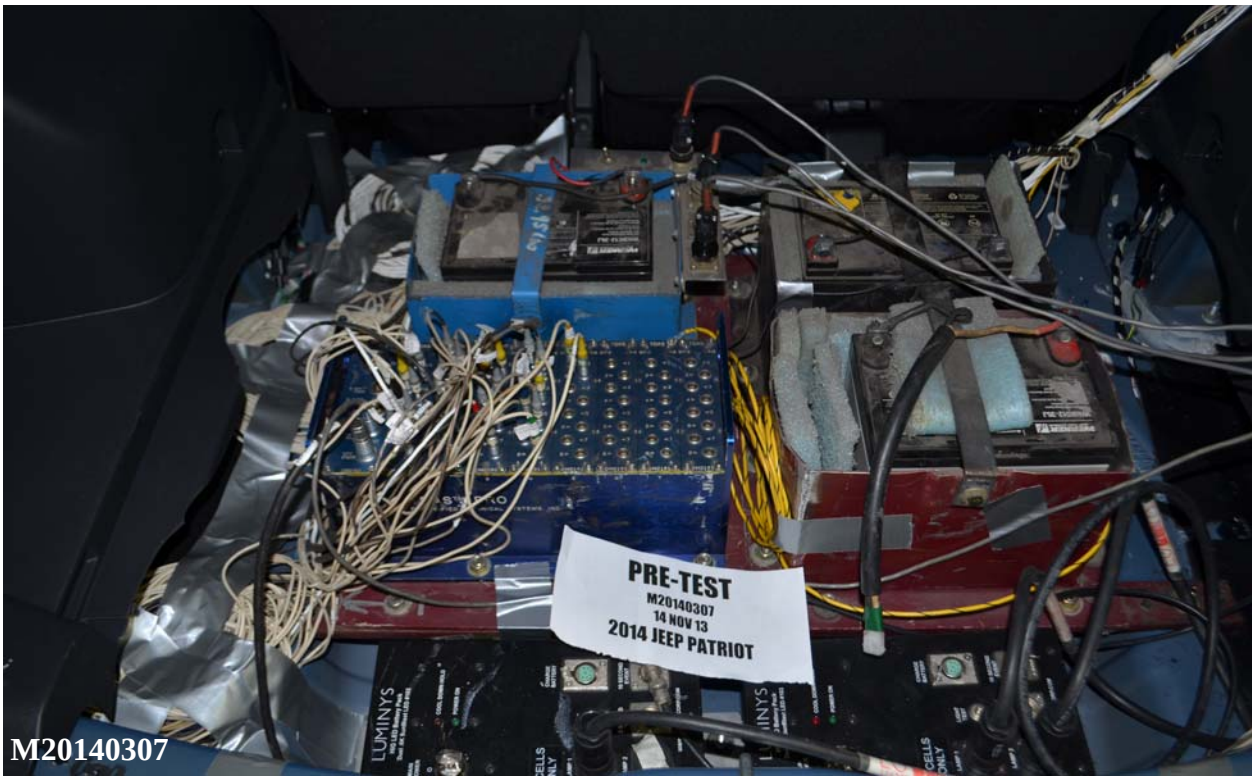


Figure 061: Pre-Test Ballast View

Figure 062: Post-Test Primary and Redundant Speed Trap Read-Out

Figure 063: FMVSS No. 301 Static Rollover 0 Degrees

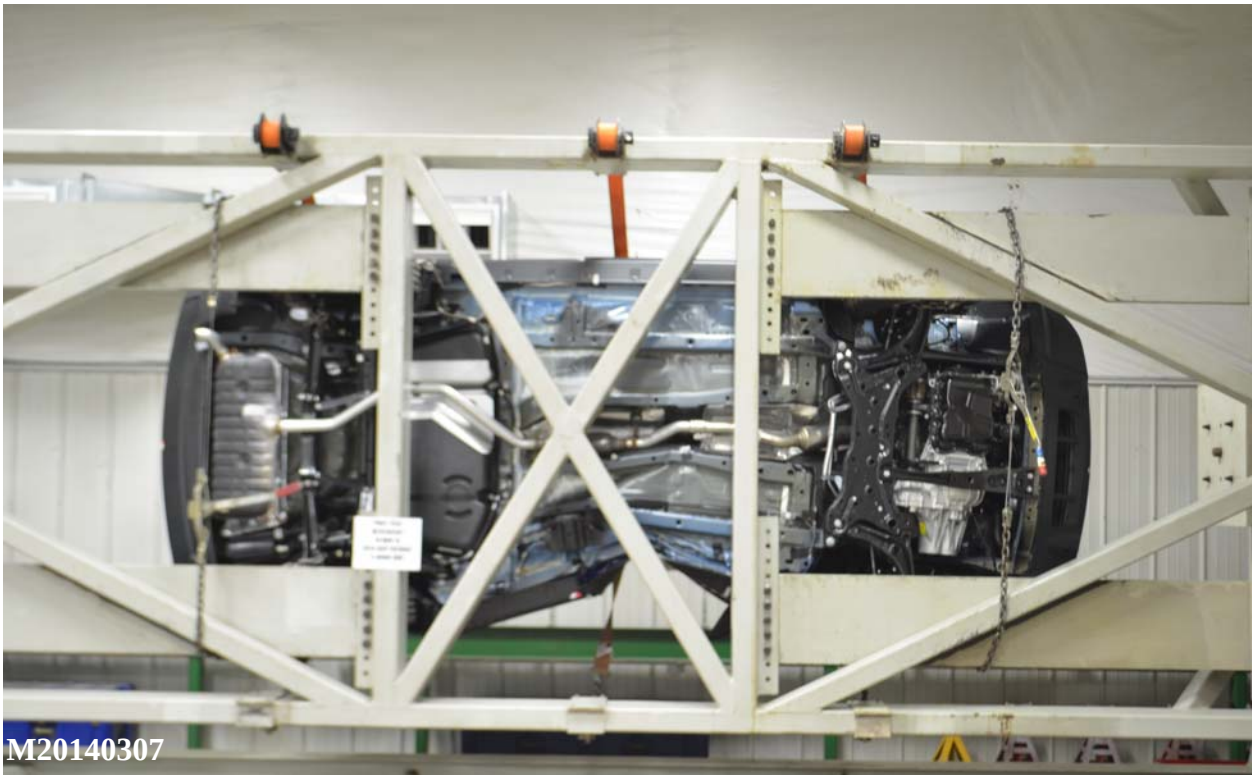


Figure 064: FMVSS No. 301 Static Rollover 90 Degrees

Figure 065: FMVSS No. 301 Static Rollover 180 Degrees

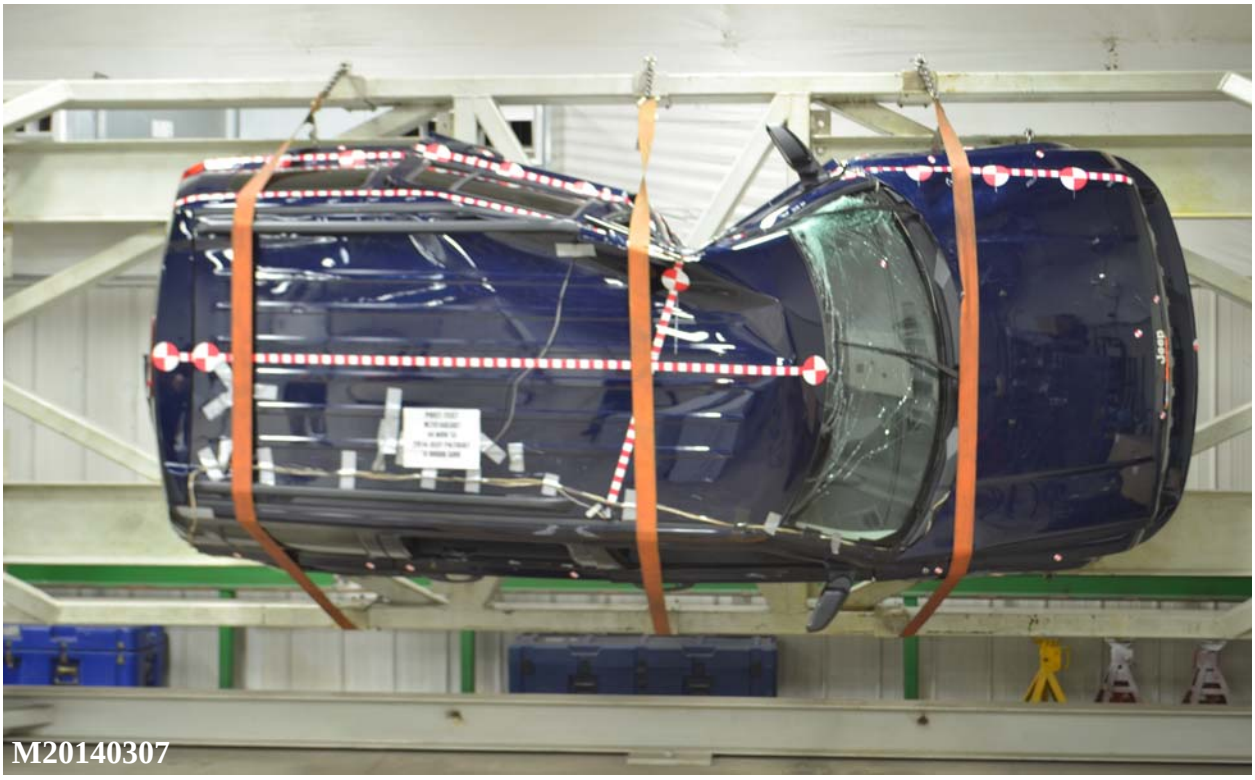
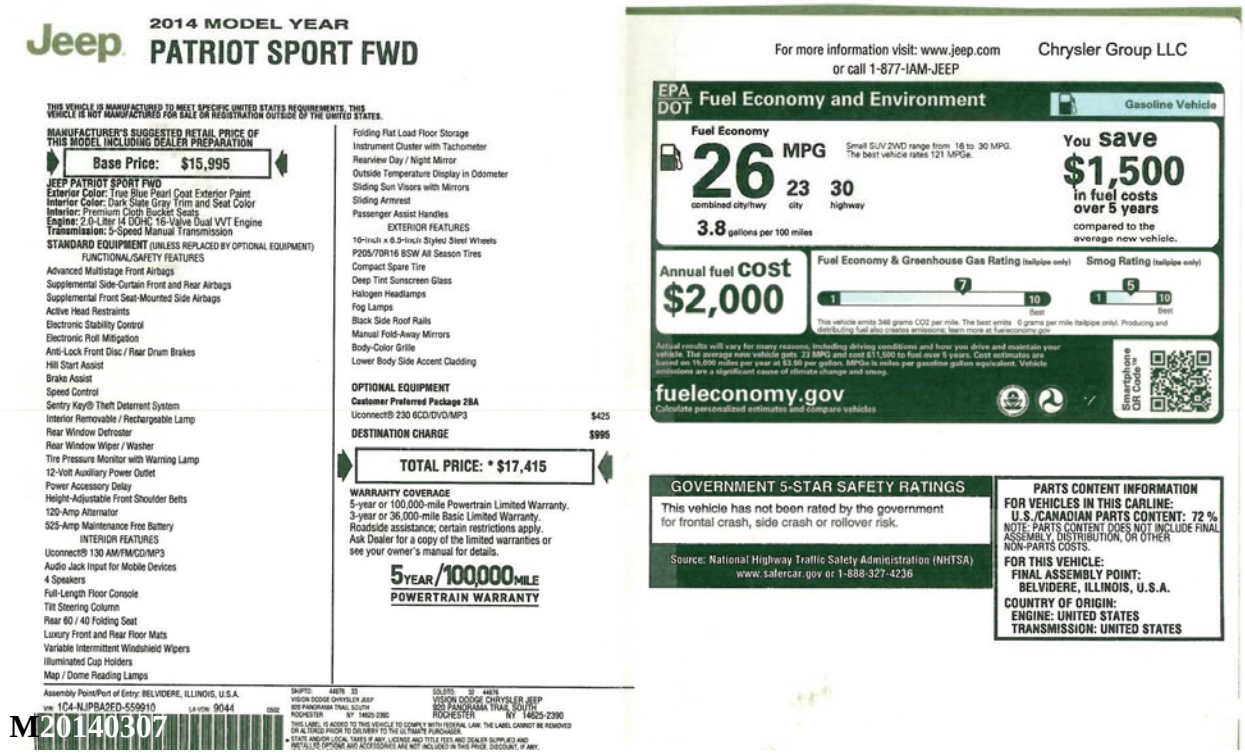


Figure 066: FMVSS No. 301 Static Rollover 270 Degrees

Figure 067: FMVSS No. 301 Static Rollover 360 Degrees

Figure 068: Impact Event



2014 MODEL YEAR
Jeep PATRIOT SPORT FWD

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION
Base Price: $15,995

JEEP PATRIOT SPORT FWD
Exterior Color: True Blue Pearl Coat Exterior Paint
Interior Color: Dark Slate Gray Trim and Seat Color
Interior: Premium Cloth Bucket Seats
Engine: 2.0-Liter I4 DOHC 16-Valve Dual VVT Engine
Transmission: 5-Speed Manual Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)
FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Airbags
Supplemental Side-Curtain Front and Rear Airbags
Supplemental Front Seat-Mounted Side Airbags
Active Head Restraints
Electronic Stability Control
Electronic Roll Mitigation
Anti-Lock Front Disc / Rear Drum Brakes
Hill Start Assist
Brake Assist
Speed Control
Sentry Key® Theft Deterrent System
Interior Removable / Rechargeable Lamp
Rear Window Defroster
Rear Window Wiper / Washer
Tire Pressure Monitor with Warning Lamp
12-Volt Auxiliary Power Outlet
Power Accessory Delay
Height-Adjustable Front Shoulder Belts
120-Amp Alternator
525-Amp Maintenance Free Battery
INTERIOR FEATURES
Uconnect® 130 AM/FM/CD/MP3
Audio Jack Input for Mobile Devices
4 Speakers
Full-Length Floor Console
Tilt Steering Column
Rear 60 / 40 Folding Seat
Luxury Front and Rear Floor Mats
Variable Intermittent Windshield Wipers
Illuminated Cup Holders
Map / Dome Reading Lamps
Folding Flat Load Floor Storage
Instrument Cluster with Tachometer
Rearview Day / Night Mirror
Outside Temperature Display in Odometer
Sliding Sun Visors with Mirrors
Sliding Armrest
Passenger Assist Handles
EXTERIOR FEATURES
16-Inch x 6.5-Inch Styled Steel Wheels
P205/70R16 BSW All Season Tires
Compact Spare Tire
Deep Tint Sunscreen Glass
Halogen Headlamps
Fog Lamps
Black Side Roof Rails
Manual Fold-Away Mirrors
Body-Color Grille
Lower Body Side Accent Cladding

OPTIONAL EQUIPMENT
Customer Preferred Package 28A
Uconnect® 230 6CD/DVD/MP3 $425
DESTINATION CHARGE $995
TOTAL PRICE: * $17,415

WARRANTY COVERAGE
5-year or 100,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
Roadside assistance; certain restrictions apply.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.
5 YEAR/100,000 MILE POWERTRAIN WARRANTY

Assembly Point/Port of Entry: BELVIDERE, ILLINOIS, U.S.A.
VIN: 1C4-NJPBA2ED-559910 LA-VIN: 9044
SHIPTO: 44676 33 VISION DODGE CHRYSLER JEEP 920 PANORAMA TRAIL SOUTH ROCHESTER NY 14625-2390
SOLDTO: 30 44676 VISION DODGE CHRYSLER JEEP 920 PANORAMA TRAIL SOUTH ROCHESTER NY 14625-2390
THIS LABEL IS ADDED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.
* STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY.

For more information visit: www.jeep.com or call 1-877-IAM-JEEP
Chrysler Group LLC

EPA DOT Fuel Economy and Environment
Gasoline Vehicle

Fuel Economy
26 MPG combined city/hwy
23 city
30 highway
Small SUV 2WD range from 16 to 30 MPG. The best vehicle rates 121 MPGe.
3.8 gallons per 100 miles

You save $1,500 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $2,000

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 7 (1 Worst, 10 Best)
Smog Rating (tailpipe only) 5 (1 Worst, 10 Best)
This vehicle emits 348 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and cost $11,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.66 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

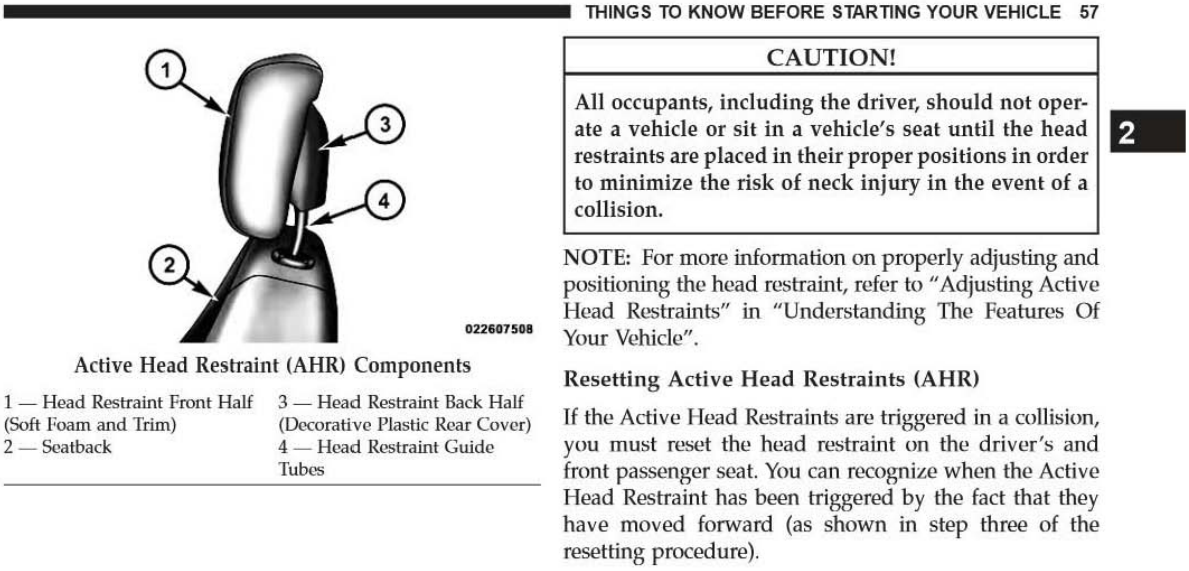
Smartphone OR Code

GOVERNMENT 5-STAR SAFETY RATINGS
This vehicle has not been rated by the government for frontal crash, side crash or rollover risk.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION
FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 72 %
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
BELVIDERE, ILLINOIS, U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

M20140307

Figure 069: Monroney Label



THINGS TO KNOW BEFORE STARTING YOUR VEHICLE 57

Active Head Restraint (AHR) Components

1 — Head Restraint Front Half (Soft Foam and Trim)
2 — Seatback
3 — Head Restraint Back Half (Decorative Plastic Rear Cover)
4 — Head Restraint Guide Tubes

CAUTION!

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 collision.

2

NOTE: For more information on properly adjusting and positioning the head restraint, refer to "Adjusting Active Head Restraints" in "Understanding The Features Of Your Vehicle".

Resetting Active Head Restraints (AHR)

If the Active Head Restraints are triggered in a collision, you must reset the head restraint on the driver's and front passenger seat. You can recognize when the Active Head Restraint has been triggered by the fact that they have moved forward (as shown in step three of the resetting procedure).

M20140307

Figure 070: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
ATD AND VEHICLE RESPONSE DATA

The following plots are provided in the test report

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 Dummy Instrumentation Data

Driver Head Acceleration (X) Primary
Driver Head Acceleration (Y) Redundant
Driver Head Acceleration (Z) Redundant
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper abdomen rib deflection (Y)
Driver Lower abdomen rib deflection (Y)
Driver Shoulder Contact Switch
Driver Pelvis Contact Switch

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Vehicle Center of Gravity Angular Rate About X (Roll)
Vehicle Center of Gravity Angular Rate About Y (Pitch)
Vehicle Center of Gravity Angular Rate About Z (Yaw)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Middle A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Middle B-Pillar Acceleration (Y)
Driver Seat Track at Dummy H-Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

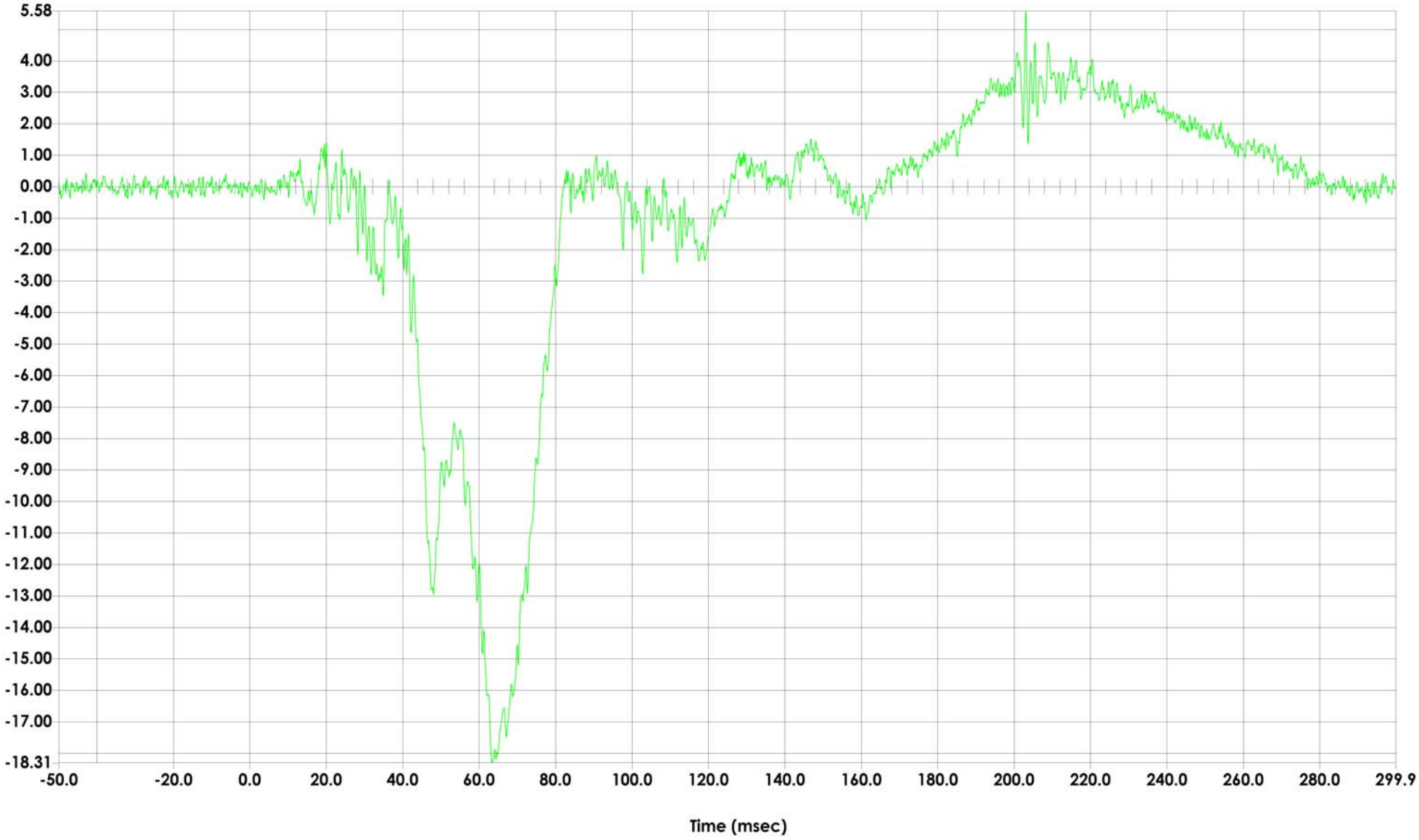
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	001
Units	G'S

Max	5.58	G'S
	203.04	msec
Min	-18.31	G'S
	63.36	msec

MEDICAL COLLEGE OF WISCONSIN

Head Acceleration (X) Primary vs. Time

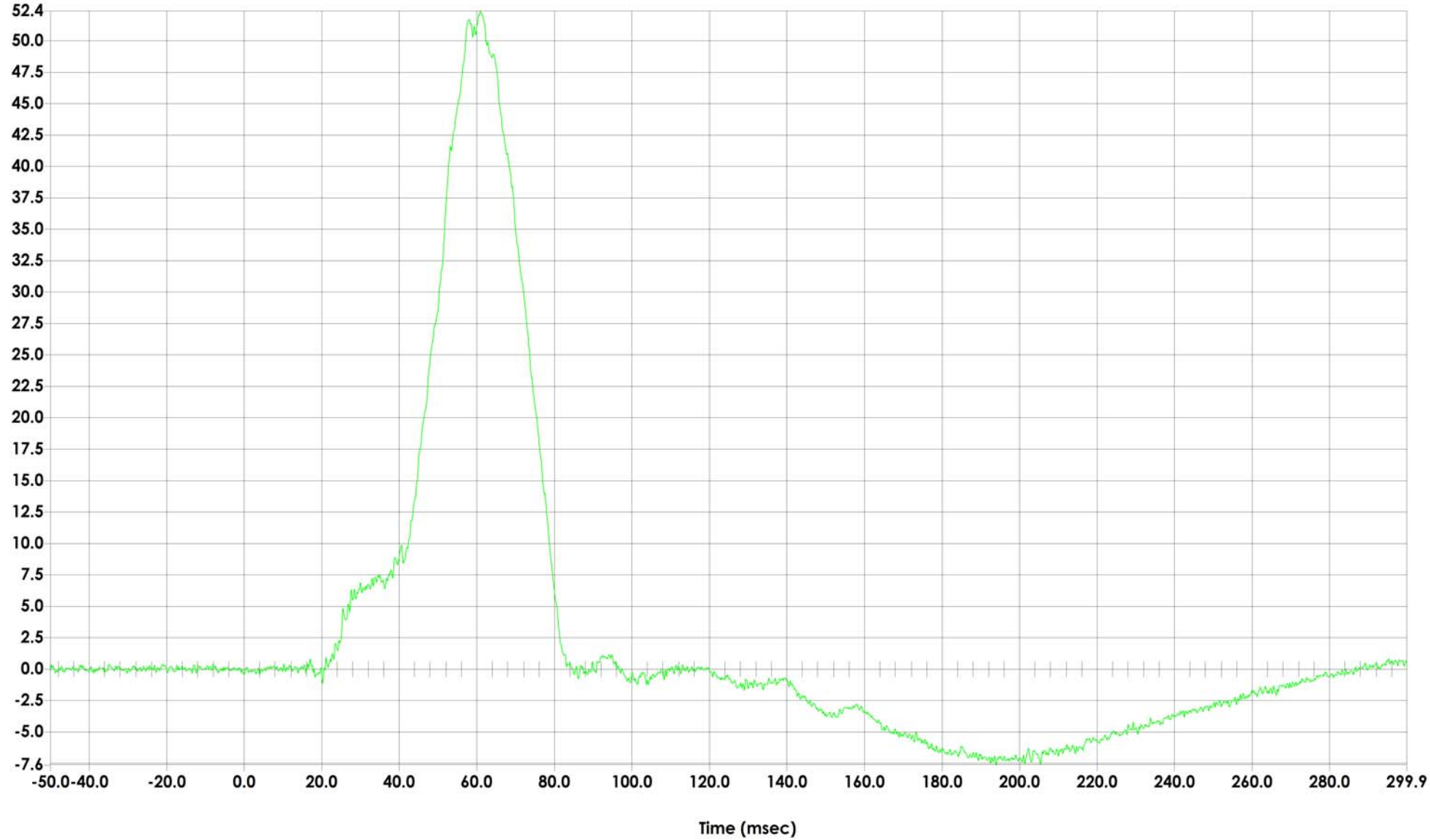


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	002
Units	G'S

Max	52.37	G'S
	60.88	msec
Min	-7.63	G'S
	194.00	msec

MEDICAL COLLEGE OF WISCONSIN

Head Acceleration (Y) Primary vs. Time

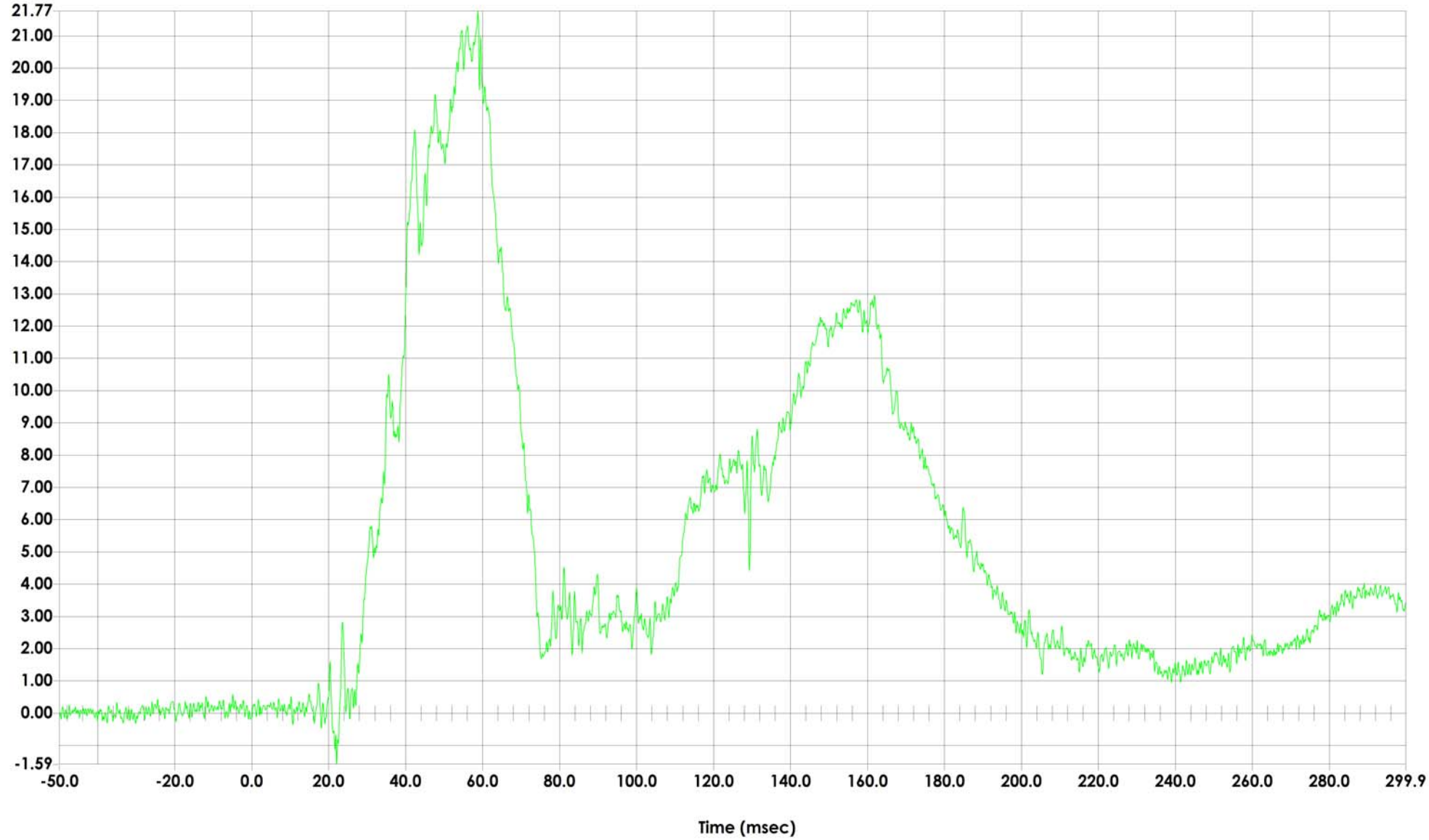


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	003
Units	G'S

Max	21.77	G'S
	58.80	msec
Min	-1.59	G'S
	22.08	msec

MEDICAL COLLEGE OF WISCONSIN

Head Acceleration (Z) Primary vs. Time

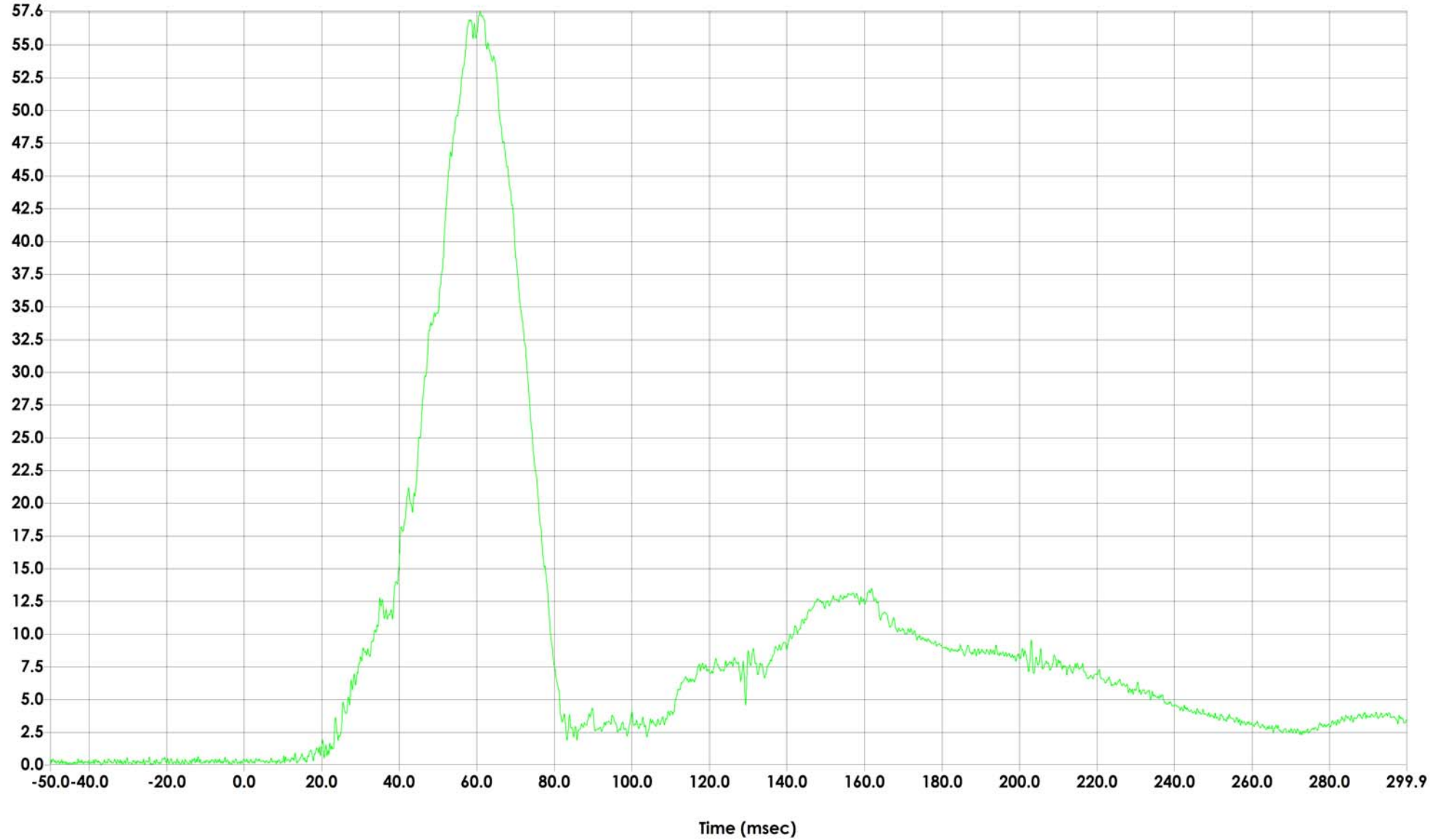


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	035
Units	G'S

Max	57.60	G'S
	60.88	msec
Min	0.01	G'S
	-36.88	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Head Resultrant Acceleration Primary vs. Time

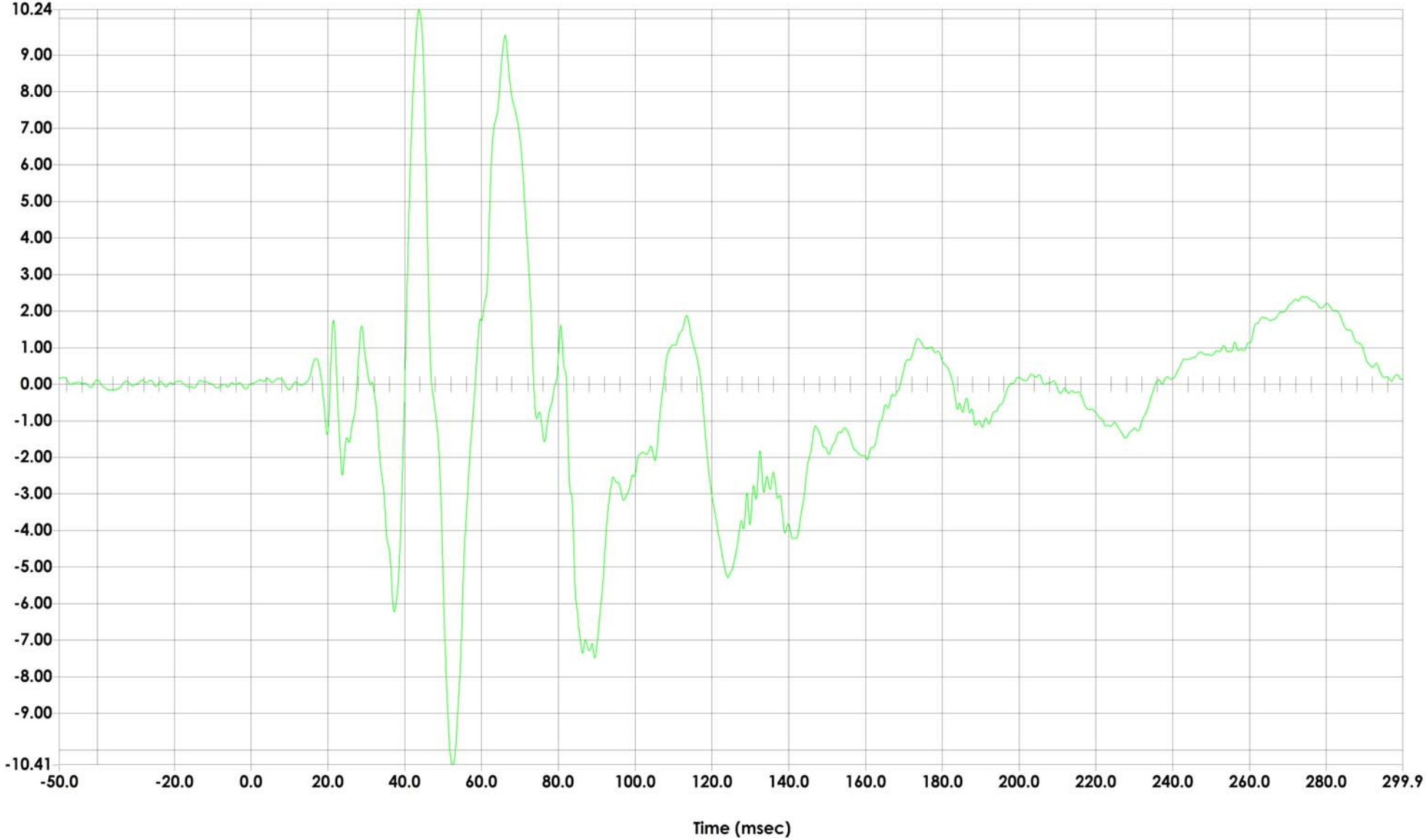


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	012
Units	G'S

Max	10.24	G'S
	43.68	msec
Min	-10.41	G'S
	52.48	msec

MEDICAL COLLEGE OF WISCONSIN

Lower Spine T12 Acceleration (X) vs. Time

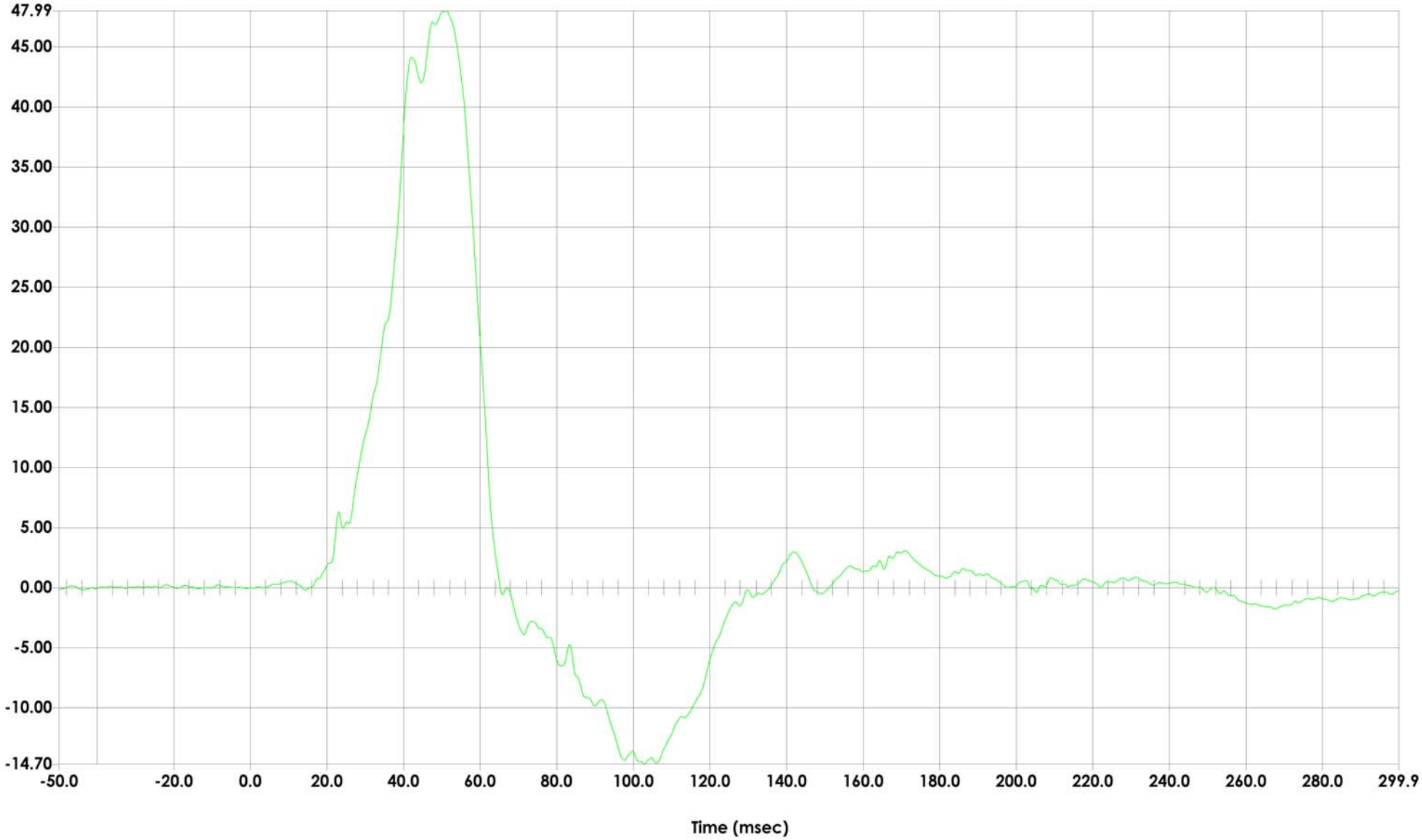


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	013
Units	G'S

Max	47.99	G'S
	51.12	msec
Min	-14.70	G'S
	102.96	msec

MEDICAL COLLEGE OF WISCONSIN

Lower Spine T12 Acceleration (Y) vs. Time

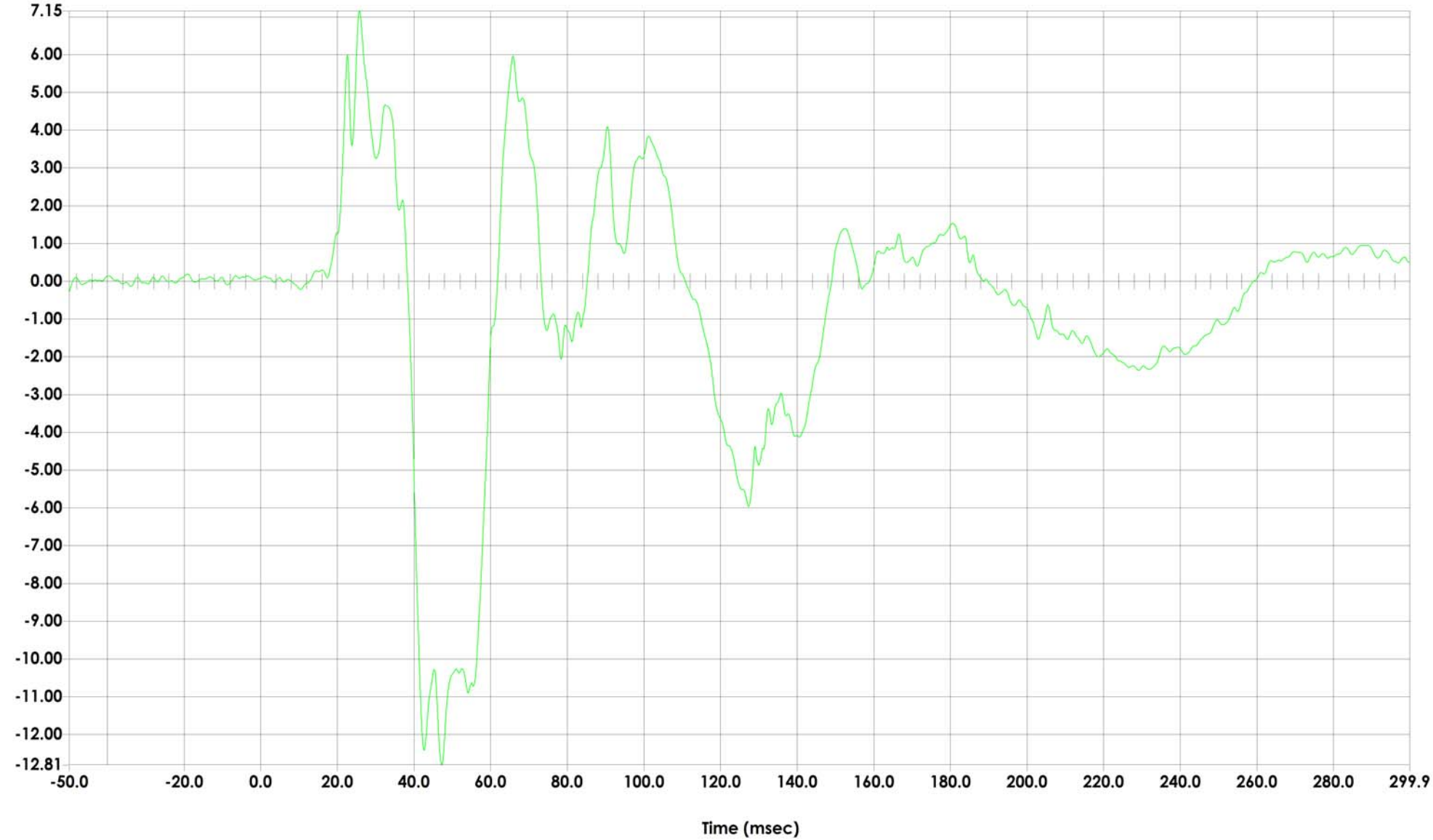


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	014
Units	G'S

Max	7.15	G'S
	25.76	msec
Min	-12.81	G'S
	47.28	msec

MEDICAL COLLEGE OF WISCONSIN

Lower Spine T12 Acceleration (Z) vs. Time

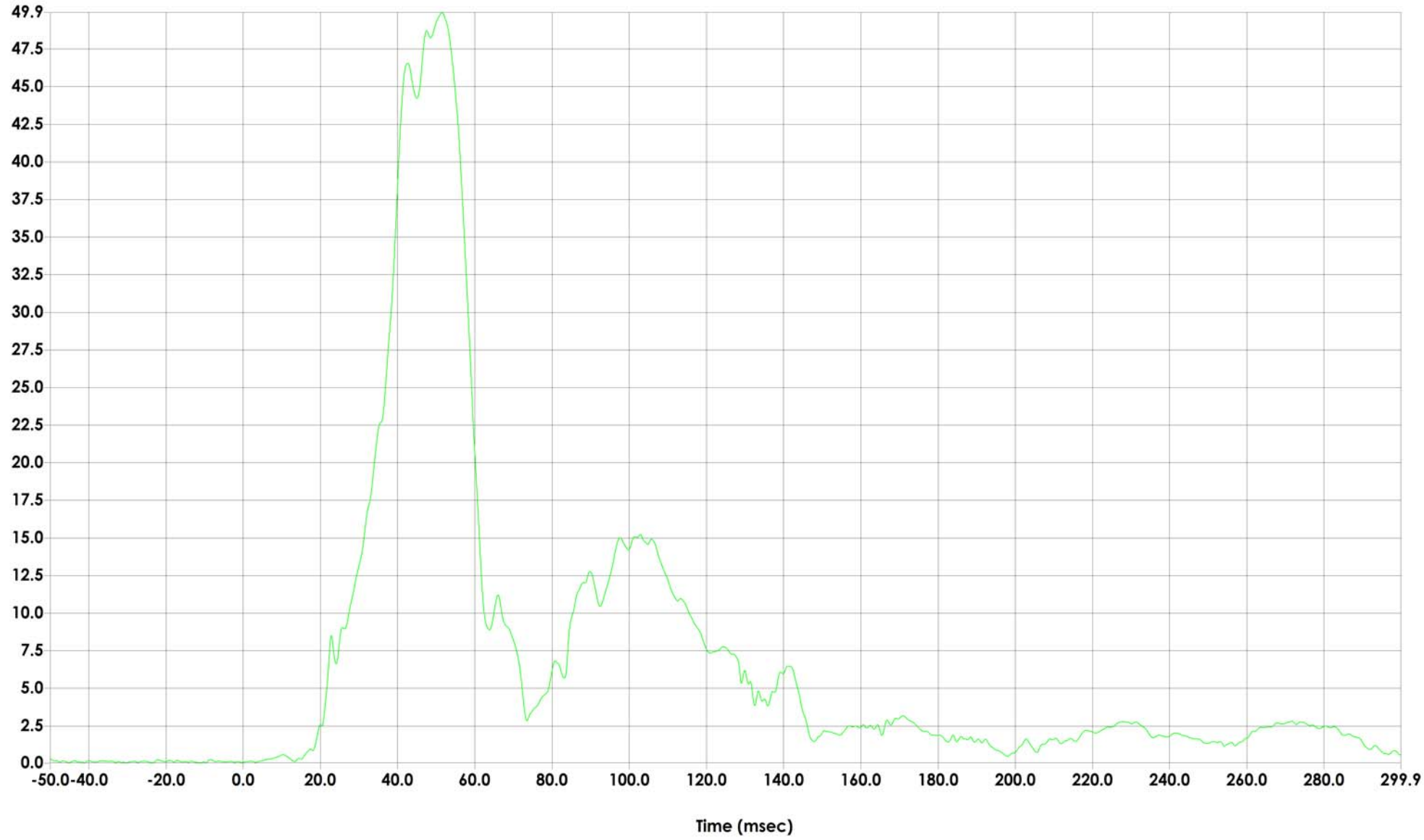


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	036
Units	G'S

Max	49.93	G'S
	51.44	msec
Min	0.03	G'S
	-41.12	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Lower Spine T12 Resultant Acceleration vs. Time

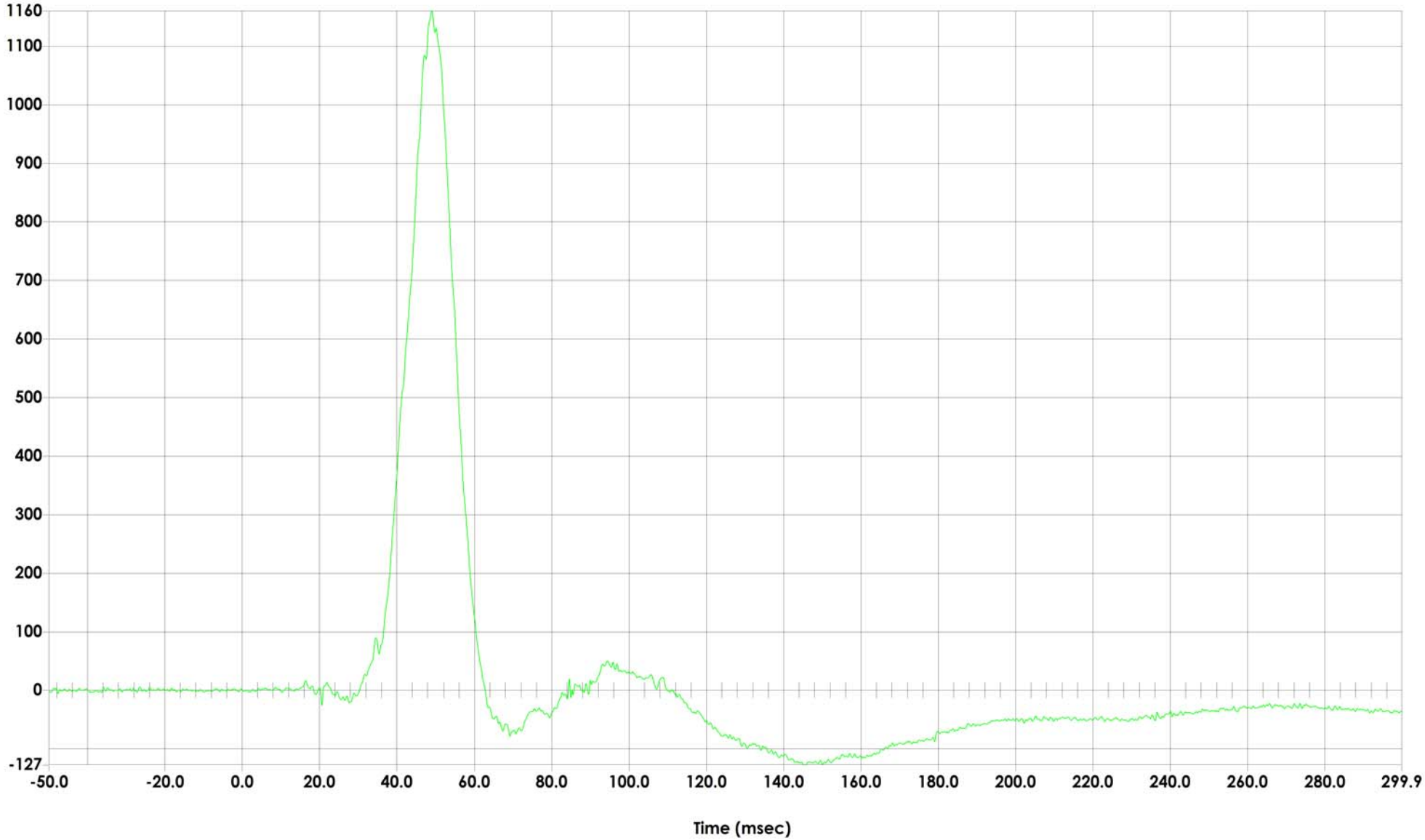


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC600
Plot number	015
Units	NWT

Max	1160.01	NWT
	48.96	msec
Min	-127.34	NWT
	145.20	msec

MEDICAL COLLEGE OF WISCONSIN

Iliac Wing Force on Impact Side (Y) vs. Time

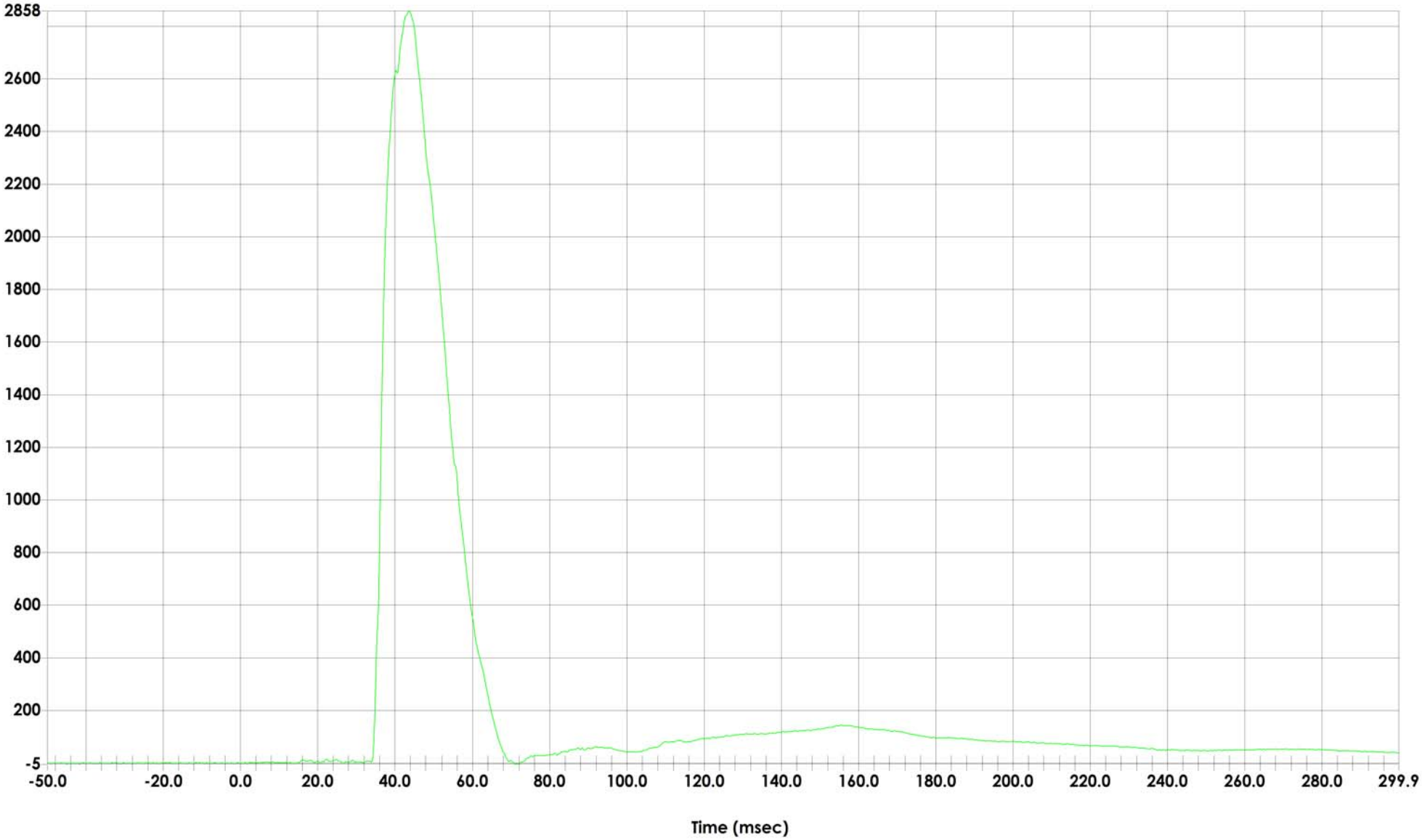


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC600
Plot number	016
Units	NWT

Max	2857.98	NWT
	43.68	msec
Min	-4.84	NWT
	72.00	msec

MEDICAL COLLEGE OF WISCONSIN

Acetabulum Force on Impact Side (Y) vs. Time

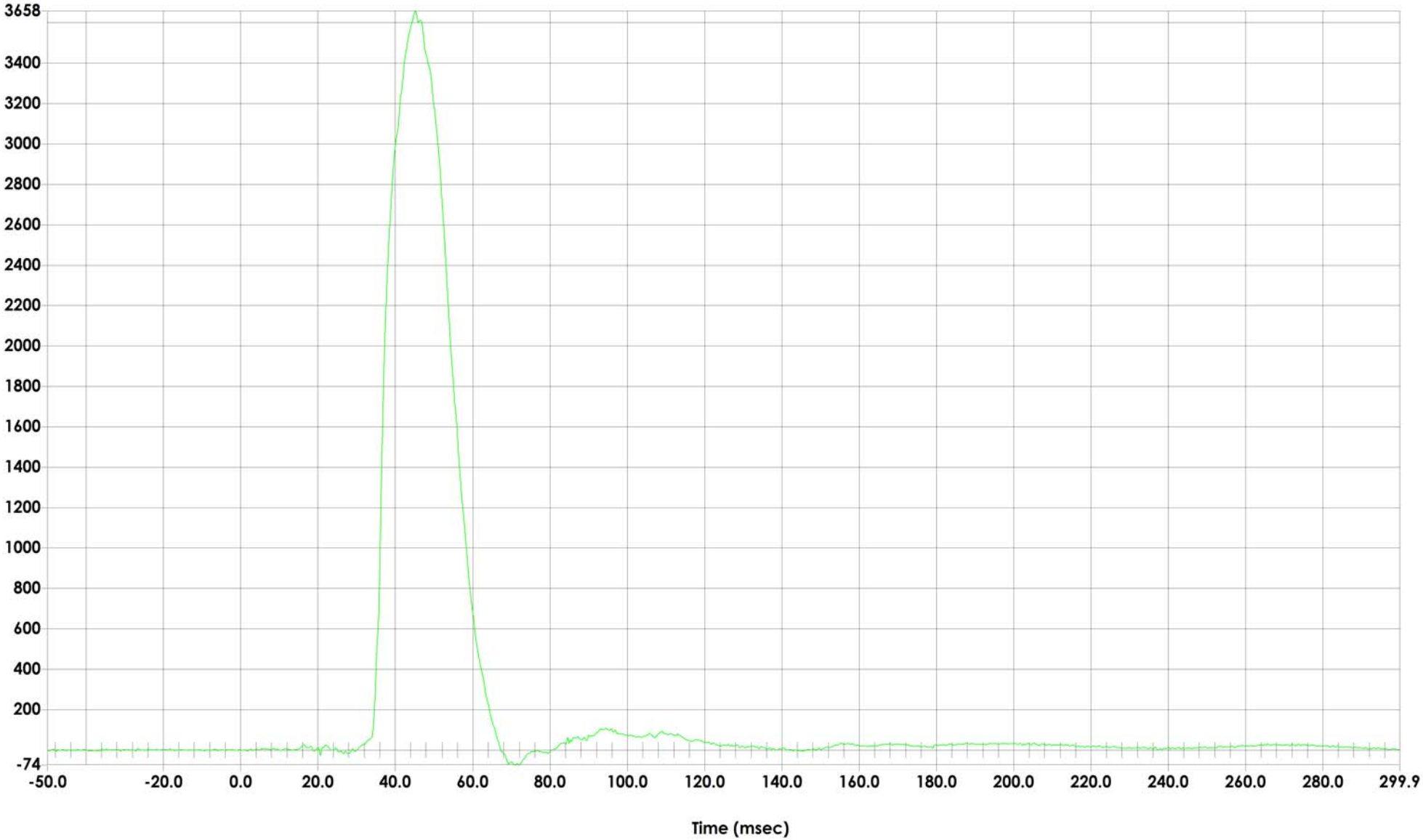


Test ID	M20140307
Sampling Rate (Hz)	12500
Filter	CFC600
Plot number	037
Units	NWT

Max	3657.98	NWT
	45.20	msec
Min	-73.72	NWT
	72.08	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Total Pelvis Force on Impact Side (Y) vs. Time



APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE DATA

TABLE 1
EXTERNAL MEASUREMENTS

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER	SPEC.	PRE		POST	
Date	-	11-11-13		11-19-13	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature (°C)	**20.6-22.2**	20.9	Pass	20.9	Pass
Relative Humidity (%)	**10-70**	33.1	Pass	29.8	Pass
Sitting Height	**772 – 788**	778	Pass	773	Pass
Shoulder Pivot Height	**437 – 453**	450	Pass	450	Pass
H-Point Height	**79 – 89**	87	Pass	85	Pass
H-Point from Seat Back	**141 – 151**	148	Pass	148	Pass
Shoulder Pivot from Backline	**97 – 107**	100	Pass	101	Pass
Thigh Clearance	**119 – 135**	124	Pass	124	Pass
Head Breadth	**140 – 148**	143	Pass	142	Pass
Head Back from Backline	**40 – 46**	44	Pass	42	Pass
Head Depth	**178 – 188**	182	Pass	184	Pass
Head Circumference	**541 – 551**	543	Pass	543	Pass
Buttock to Knee Length	**514 – 540**	521	Pass	520	Pass
Popliteal Height	**343 – 369**	352	Pass	353	Pass
Knee Pivot to Floor Height	**392 – 409**	402	Pass	405	Pass
Buttock Popliteal Length	**416 – 442**	435	Pass	431	Pass
Chest Depth w/o Jacket	**195 – 211**	204	Pass	208	Pass
Foot Length	**216 – 232**	226	Pass	226	Pass
Hip Breadth	**313 – 323**	321	Pass	320	Pass
Arm Length	**249 – 259**	253	Pass	251	Pass
Knee Joint to Seat Back	**477 – 493**	489	Pass	490	Pass
Shoulder Width	**341 – 357**	348	Pass	348	Pass
Foot Width	**78 – 94**	88	Pass	88	Pass
Chest Circumference w/Jacket	**851 – 881**	858	Pass	860	Pass
Waist Circumference	**761 – 791**	771	Pass	770	Pass

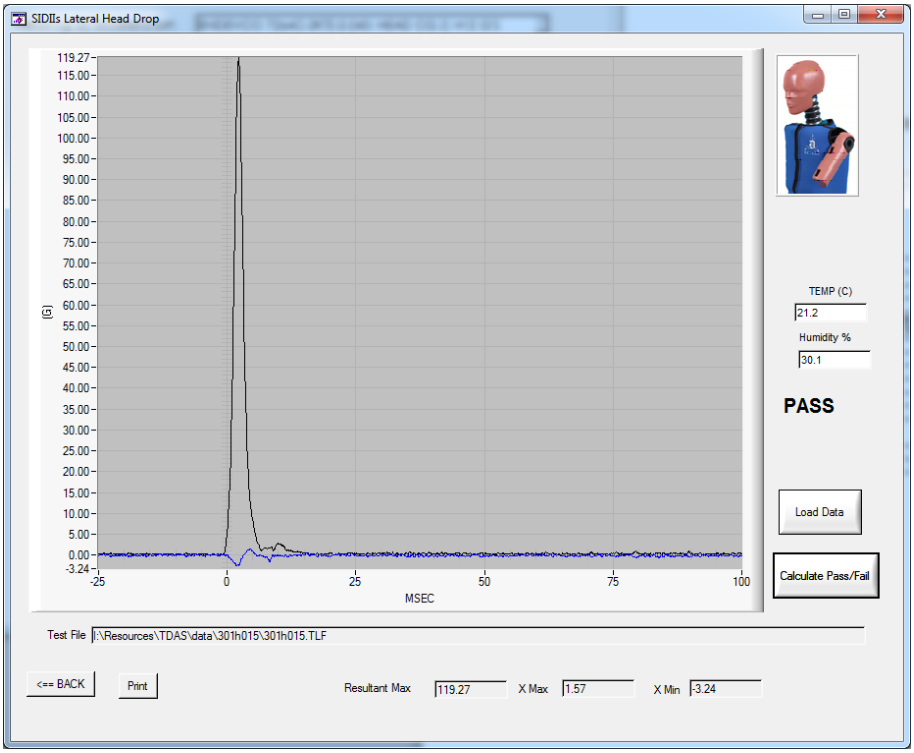
TABLE 2
HEAD DROP TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-9-13		11-16-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Head Soak Time (min)		**≥ 240**	240	Pass	240	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.2	Pass	20.9	Pass
	Min		20.7	Pass	20.6	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	30.1	Pass	33.4	Pass
	Min		27.3	Pass	30.5	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.2	Pass	20.9	Pass
Humidity – During Test (%)		**10-70**	30.1	Pass	33.4	Pass
Peak Head Resultant Acceleration (G)		**115-137**	119.3	Pass	123.0	Pass
Peak Head X Acceleration (G)		**<15**	1.6	Pass	2.3	Pass
Unimodal (Oscillation) (Yes/No)		**<15%**	-	Yes	-	Yes

TABLE 2
HEAD DROP TEST (CONTINUED)

PRE-TEST



POST-TEST

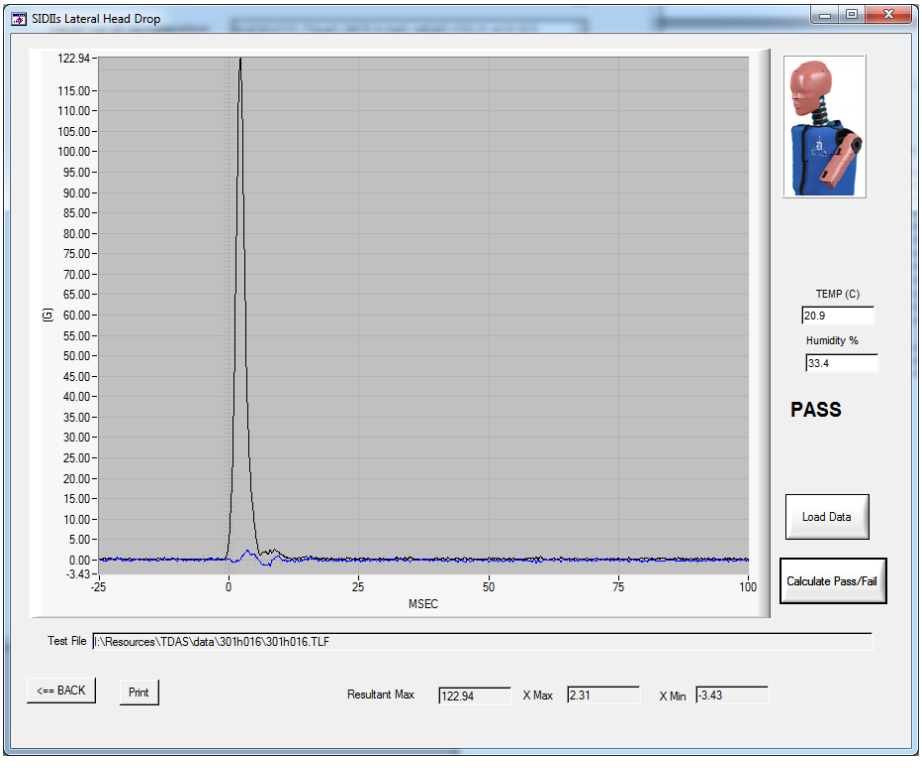


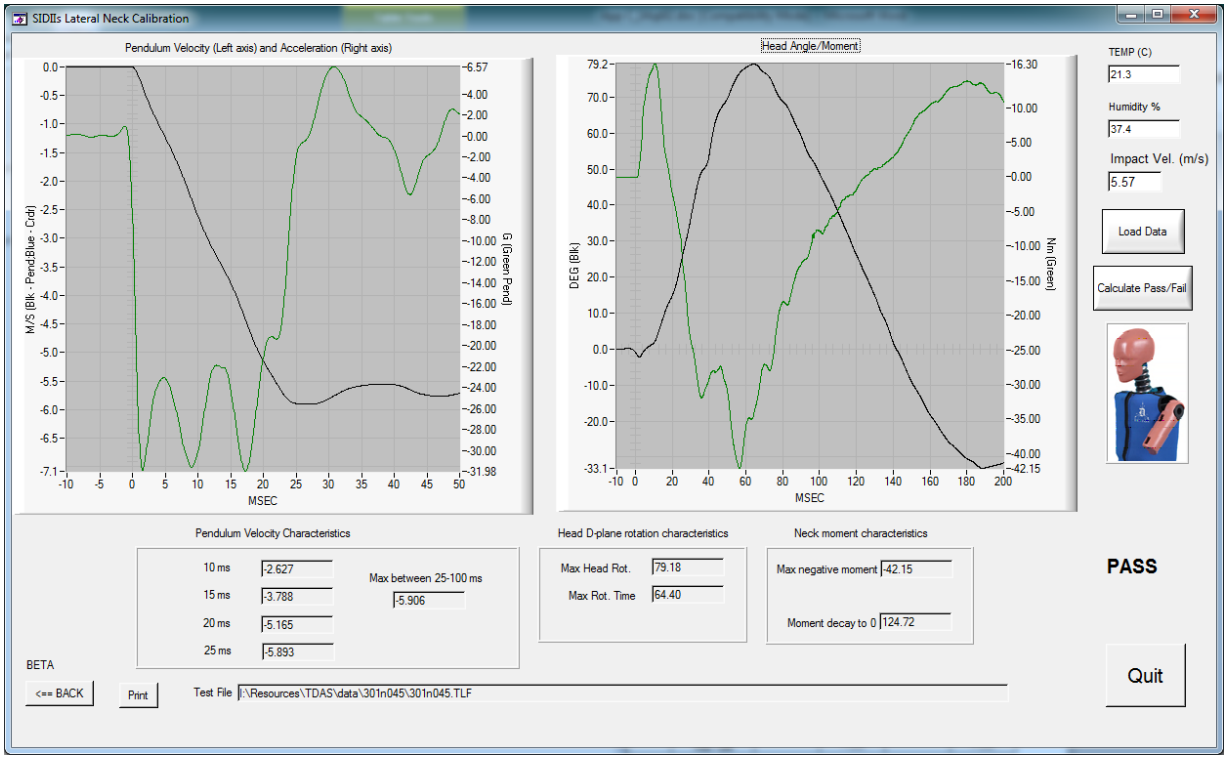
TABLE 3
LATERAL NECK PENDULUM TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-4-13		11-18-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Neck Assembly Soak Time (min)		**≥ 240**	240	Pass	240	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.3	Pass	20.8	Pass
	Min		20.8	Pass	20.6	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	37.4	Pass	34.8	Pass
	Min		30.1	Pass	29.1	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.3	Pass	20.8	Pass
Humidity – During Test (%)		**10-70**	37.4	Pass	34.8	Pass
Pendulum Velocity (m/s)		**5.51-5.63**	5.57	Pass	5.58	Pass
Pendulum Deceleration (G)	10 ms	**2.20-2.80**	2.63	Pass	2.29	Pass
	15 ms	**3.30-4.10**	3.79	Pass	3.34	Pass
	20 ms	**4.40-5.40**	5.17	Pass	4.55	Pass
	25 ms	**5.40-6.10**	5.89	Pass	5.57	Pass
	25-100 ms	**5.50-6.20**	5.91	Pass	5.89	Pass
Maximum D-Plane rotation (deg)		**71-81**	79.2	Pass	75.1	Pass
Time of Maximum D-Plane Rotation (ms)		**50-70**	64.4	Pass	64.2	Pass
Peak Occ. Condyle Moment (Nm)		**36-44**	42.4	Pass	40.1	Pass
Time of Moment Decay (ms)		**102-126**	124.7	Pass	118.9	Pass

TABLE 3
LATERAL NECK PENDULUM TEST (CONTINUED)

PRE-TEST



POST-TEST

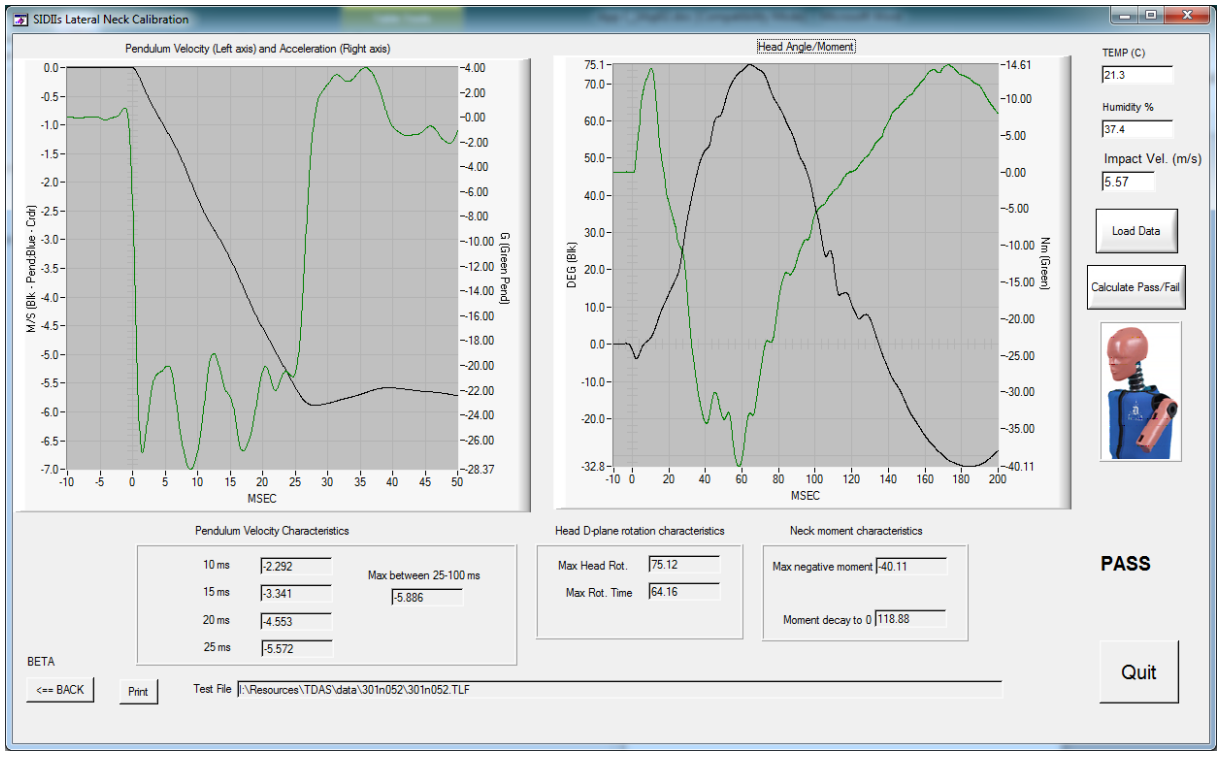


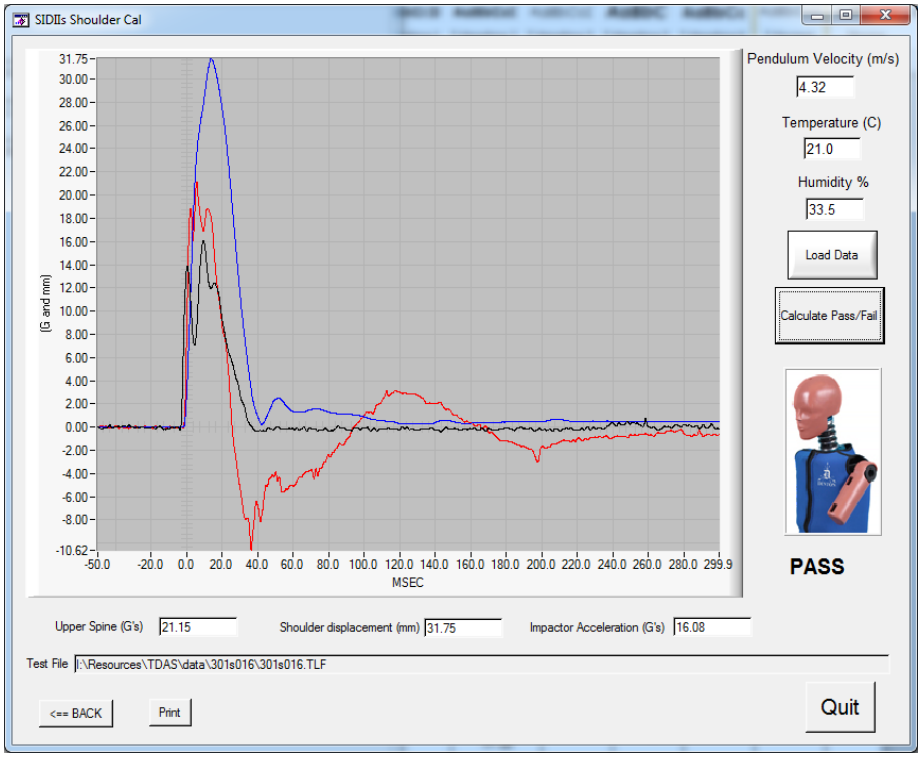
TABLE 4
SHOULDER IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-11-13		11-19-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.0	Pass	20.9	Pass
	Min		20.7	Pass	20.6	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	33.5	Pass	30.0	Pass
	Min		29.6	Pass	28.6	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.0	Pass	20.9	Pass
Relative Humidity – During Test (%)		**10-70**	33.5	Pass	30.0	Pass
Impactor Velocity (m/s)		**4.2-4.4**	4.32	Pass	4.32	Pass
Peak Shoulder Deflection (mm)		**28-37**	31.8	Pass	32.1	Pass
Peak Lateral Spine (T1) Acceleration Y (G)		**17-22**	21.2	Pass	20.3	Pass
Peak Impactor Acceleration (G)		**13-18**	16.1	Pass	16.8	Pass

TABLE 4
SHOULDER IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

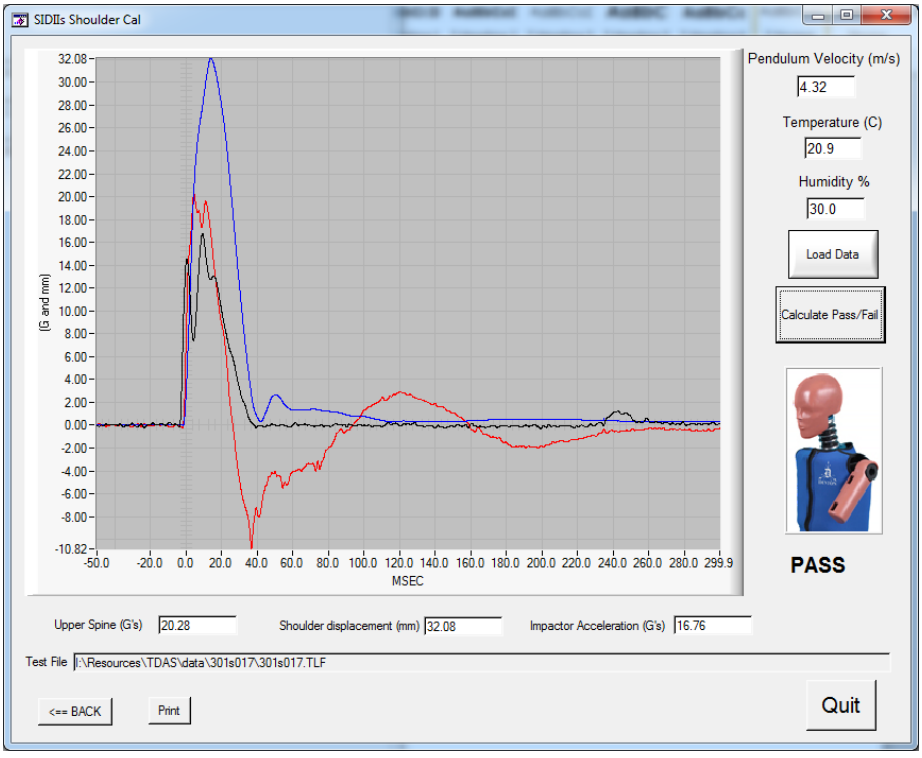


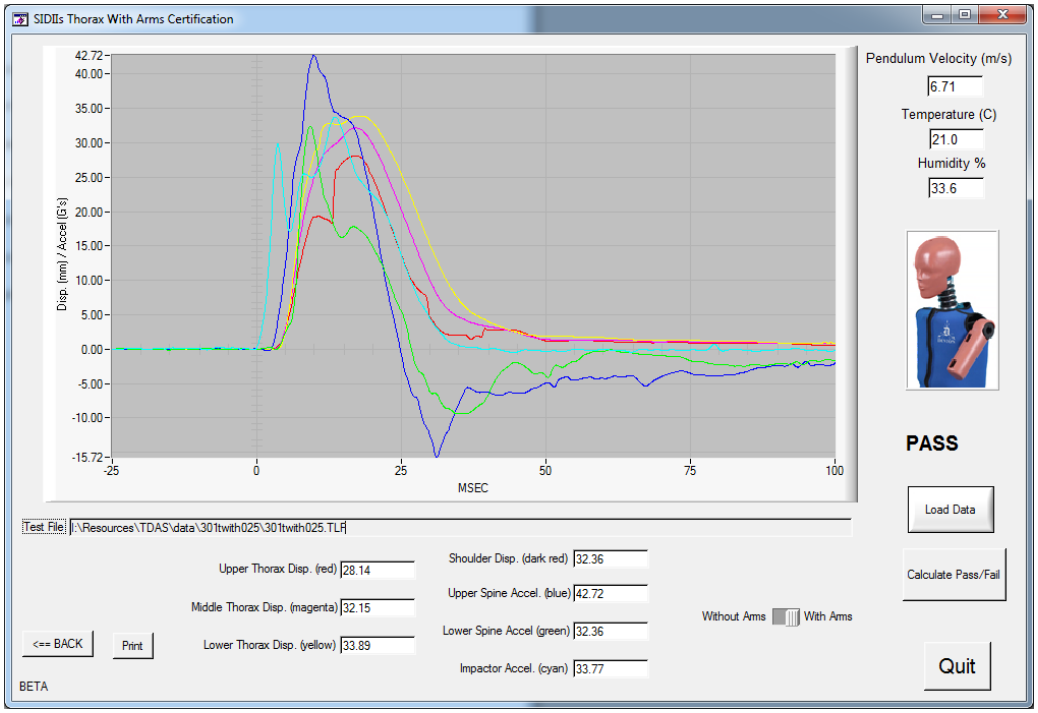
TABLE 5
THORAX (WITH ARM) IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-11-13		11-19-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.0	Pass	21.2	Pass
	Min		20.7	Pass	20.8	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	33.6	Pass	33.7	Pass
	Min		29.8	Pass	30.5	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.0	Pass	21.2	Pass
Relative Humidity – During Test (%)		**10-70**	33.6	Pass	33.7	Pass
Impactor Velocity (m/s)		**6.6-6.8**	6.7	Pass	6.7	Pass
Peak Shoulder Deflection (mm)		**31-40**	32.4	Pass	32.3	Pass
Peak Upper Rib Deflection (mm)		**25-32**	28.1	Pass	27.8	Pass
Peak Middle Rib Deflection (mm)		**30-36**	32.2	Pass	31.9	Pass
Peak Lower Rib Deflection (mm)		**32-38**	33.9	Pass	33.8	Pass
Peak Upper Spine (T1) Acceleration Y (G)		**34-43**	42.7	Pass	42.4	Pass
Peak Lower Spine (T12) Acceleration Y (G)		**29-37**	32.4	Pass	32.3	Pass
Peak Impactor Acceleration (G)		**30-36**	33.8	Pass	34.8	Pass

TABLE 5
THORAX (WITH ARM) IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

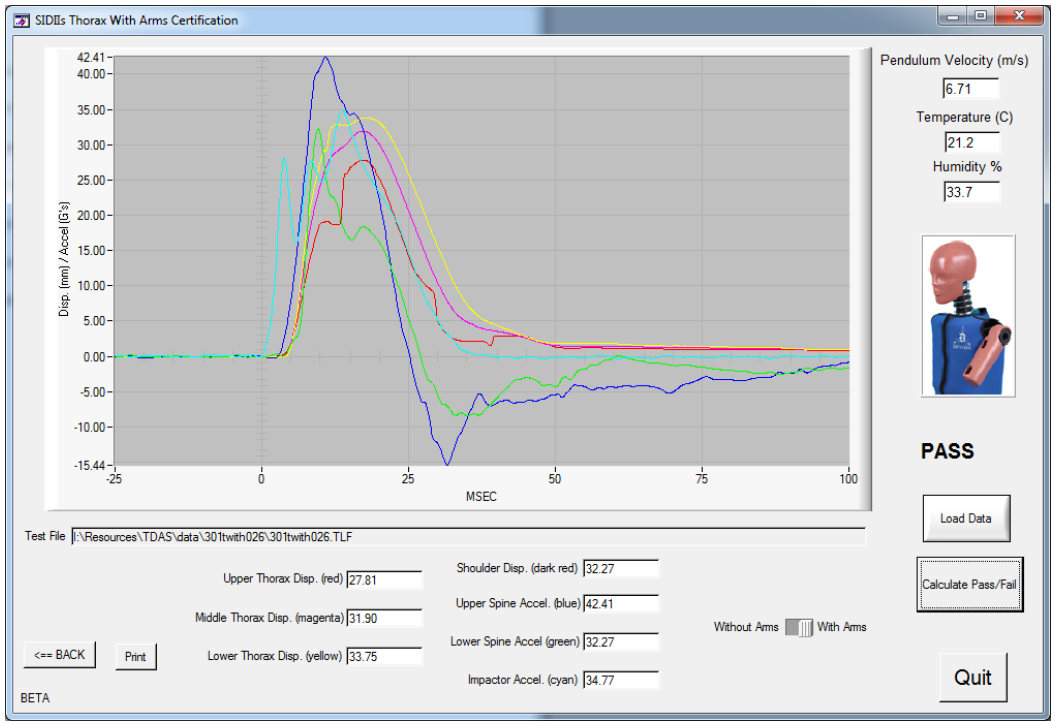


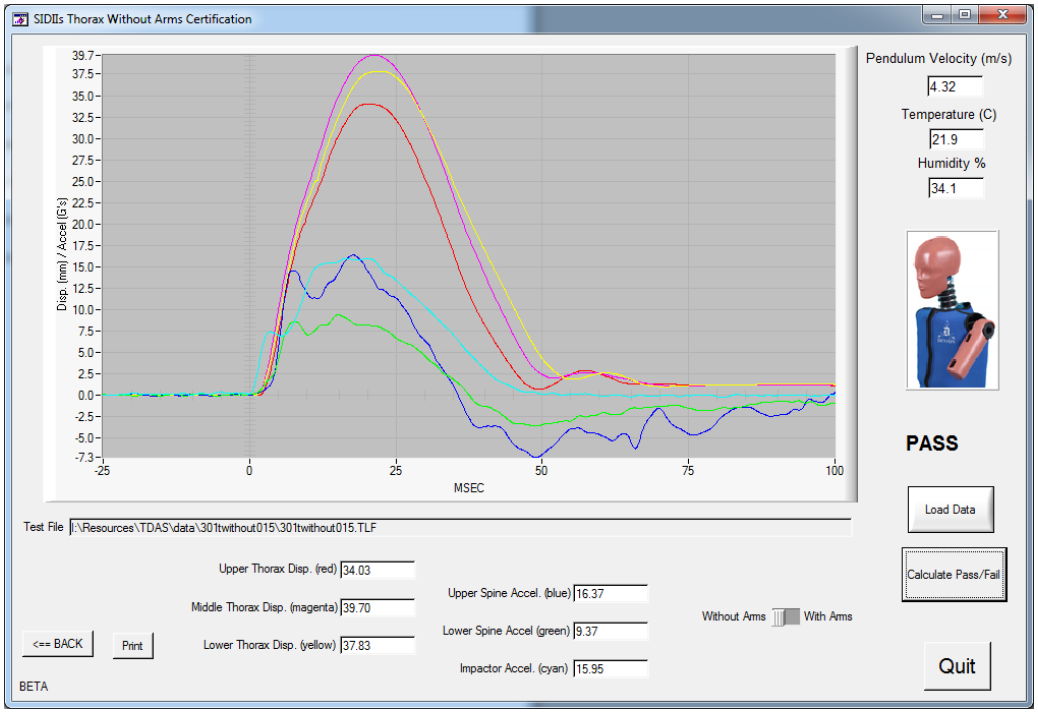
TABLE 6
THORAX (WITHOUT ARM) IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-11-13		11-19-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.9	Pass	22.0	Pass
	Min		20.7	Pass	21.2	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	34.1	Pass	33.6	Pass
	Min		30.3	Pass	31.2	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.9	Pass	22.0	Pass
Relative Humidity – During Test (%)		**10-70**	34.1	Pass	33.6	Pass
Impactor Velocity (m/s)		**4.2-4.4**	4.32	Pass	4.32	Pass
Peak Upper Rib Deflection (mm)		**32-40**	34.0	Pass	35.0	Pass
Peak Middle Rib Deflection (mm)		**39-45**	39.7	Pass	39.7	Pass
Peak Lower Rib Deflection (mm)		**35-43**	37.8	Pass	35.9	Pass
Peak Upper Spine (T1) Acceleration Y (G)		**13-17**	16.4	Pass	16.2	Pass
Peak Lower Spine (T12) Acceleration Y (G)		**7-11**	9.4	Pass	8.4	Pass
Peak Impactor Acceleration (G)		**14-18**	16.0	Pass	15.9	Pass

TABLE 6
THORAX (WITHOUT ARM) IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

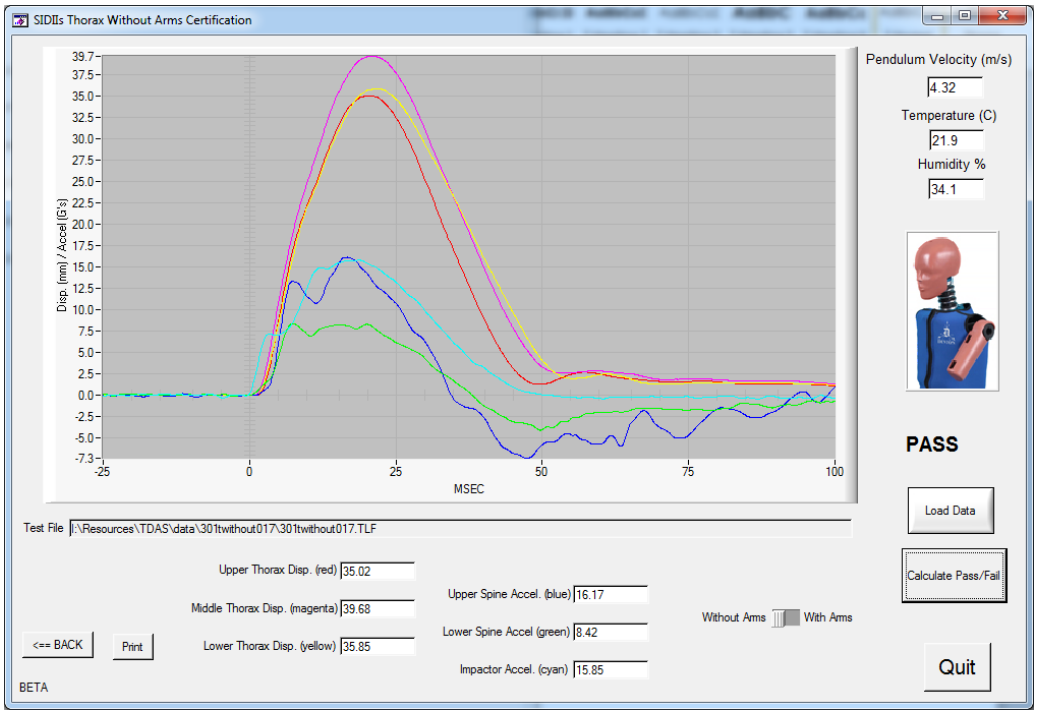


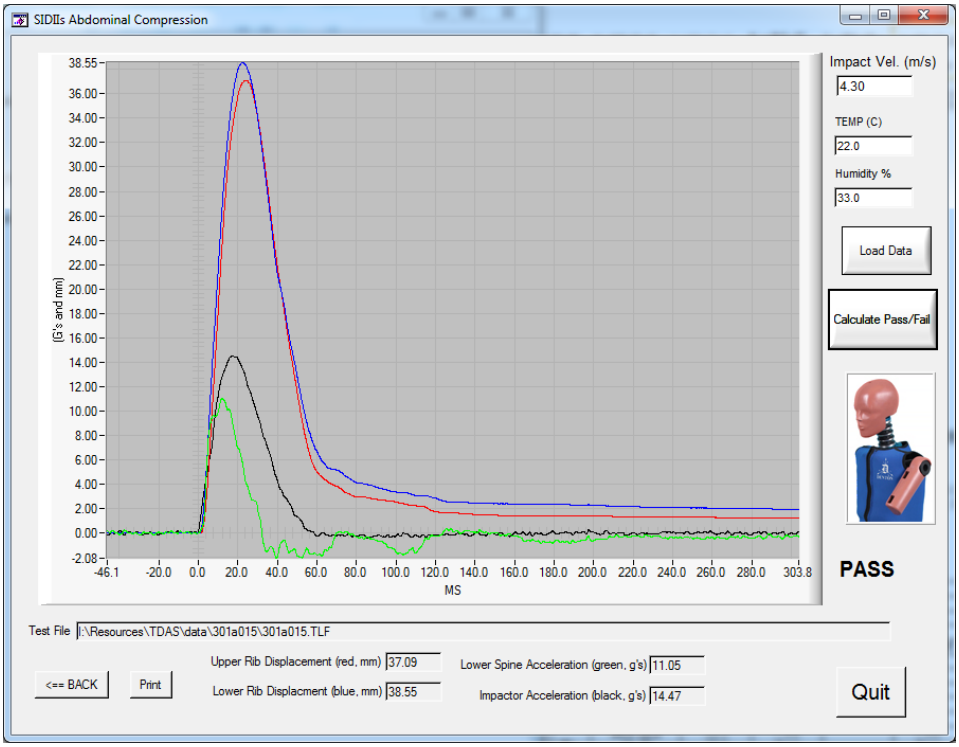
TABLE 7
ABDOMEN IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-11-13		11-19-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	22.0	Pass	20.9	Pass
	Min		21.4	Pass	20.6	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	33.0	Pass	30.0	Pass
	Min		29.5	Pass	29.1	Pass
Temperature – During Test (°C)		**20.6-22.2**	22.0	Pass	20.9	Pass
Relative Humidity – During Test (%)		**10-70**	33.0	Pass	30.0	Pass
Impactor Velocity (m/s)		**4.2-4.4**	4.3	Pass	4.3	Pass
Peak Upper Abdominal Rib Deflection (mm)		**36-47**	37.1	Pass	38.8	Pass
Peak Lower Abdominal Rib Deflection (mm)		**33-44**	38.9	Pass	36.8	Pass
Peak Lower Spine (T12) Acceleration Y (G)		**9-14**	11.1	Pass	11.4	Pass
Peak Impactor Acceleration (G)		**12-16**	14.5	Pass	14.9	Pass

TABLE 7
ABDOMEN IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

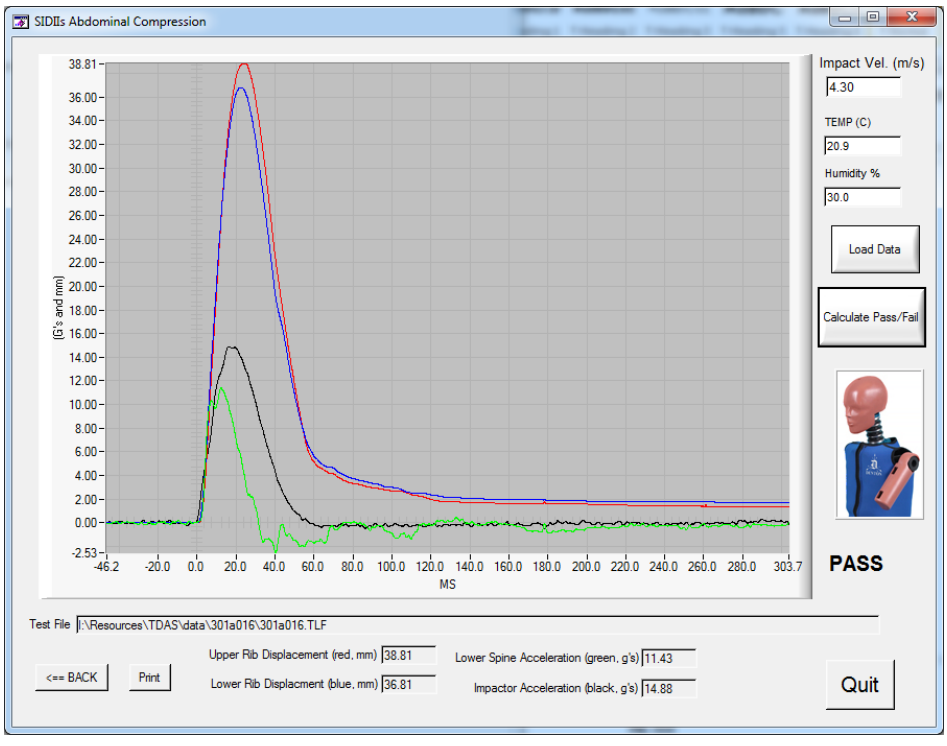
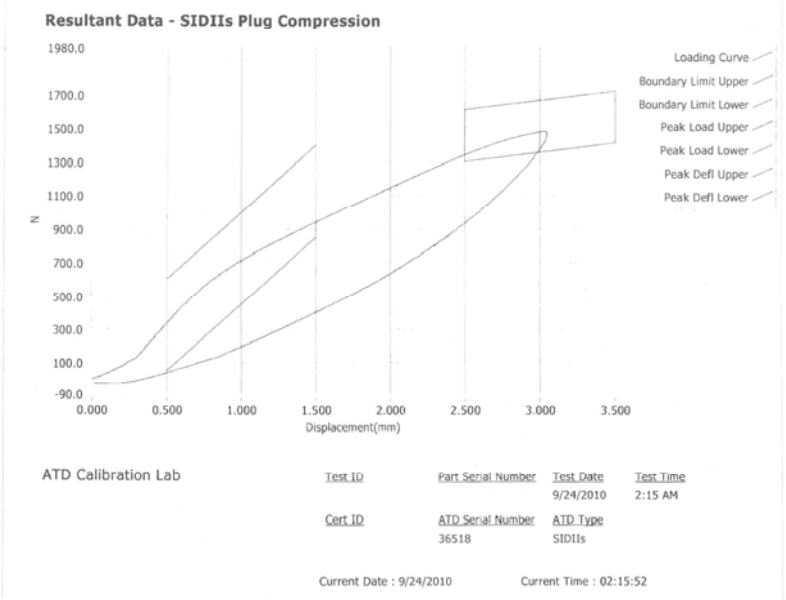


TABLE 8
PELVIS PLUG QUASI-STATIC TEST

PRE-TEST



POST-TEST

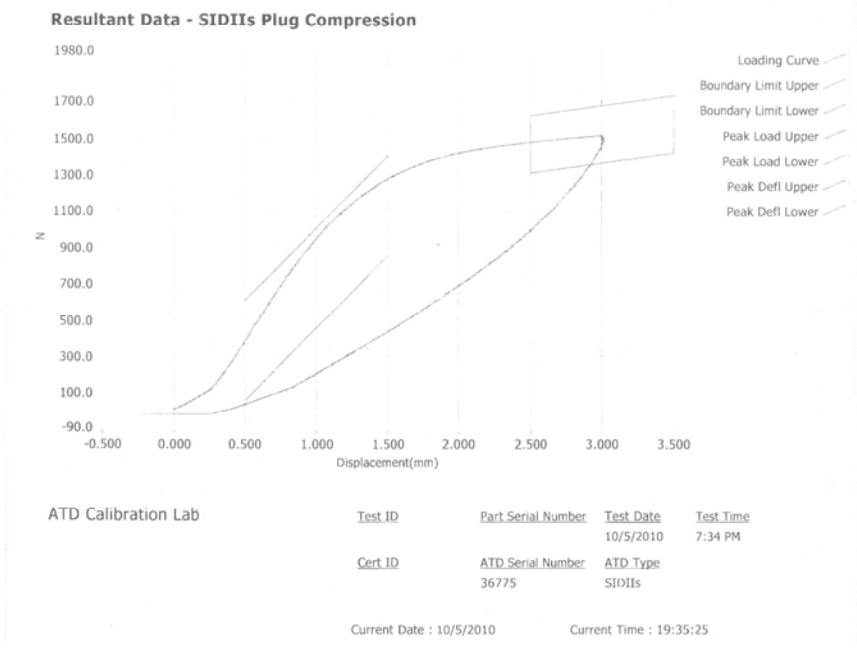


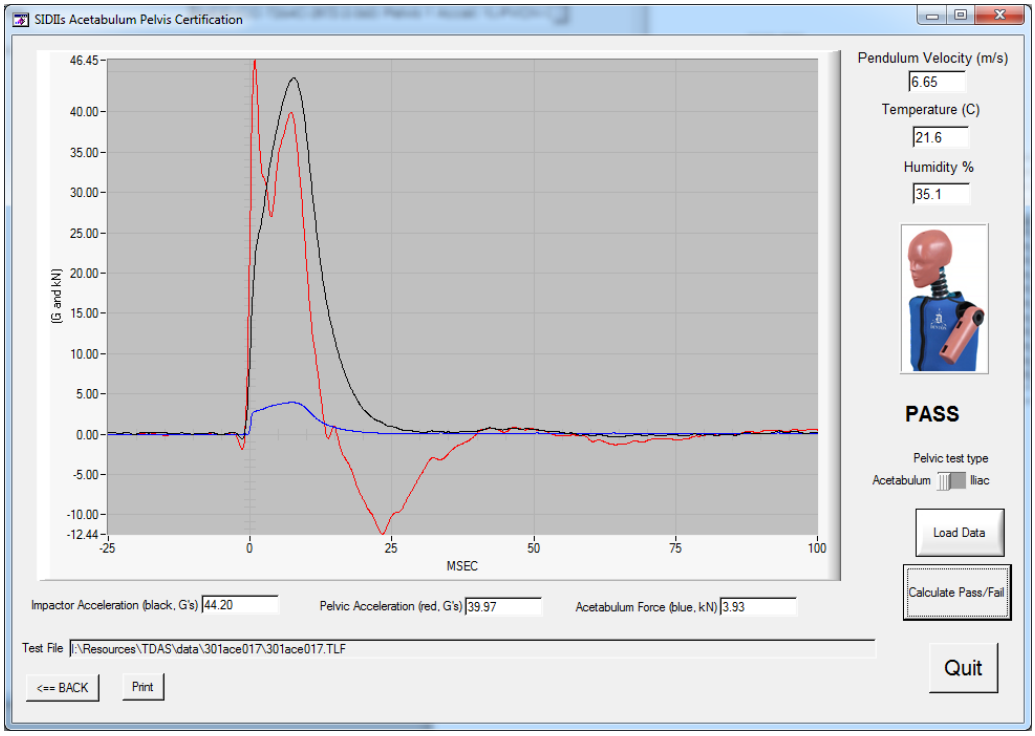
TABLE 9
PELVIS ACETABULUM IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-11-13		11-19-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Results**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.6	Pass	20.9	Pass
	Min		20.8	Pass	20.6	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	35.1	Pass	30.0	Pass
	Min		30.1	Pass	28.4	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.6	Pass	20.9	Pass
Humidity – During Test (%)		**10-70**	35.1	Pass	30.0	Pass
Impactor Velocity (m/s)		**6.6-6.8**	6.65	Pass	6.65	Pass
Peak Impactor Acceleration (G)		**38-47**	44.2	Pass	45.3	Pass
Pelvis Acceleration Y after 6ms (G)		**34-42**	40.0	Pass	40.0	Pass
Peak Acetabulum Force (kN)		**3.60-4.30**	3.9	Pass	4.1	Pass
Pelvis Plug Serial No. 36518 (Pre) 36775 (Post)						

TABLE 9
PELVIS ACETABULUM IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

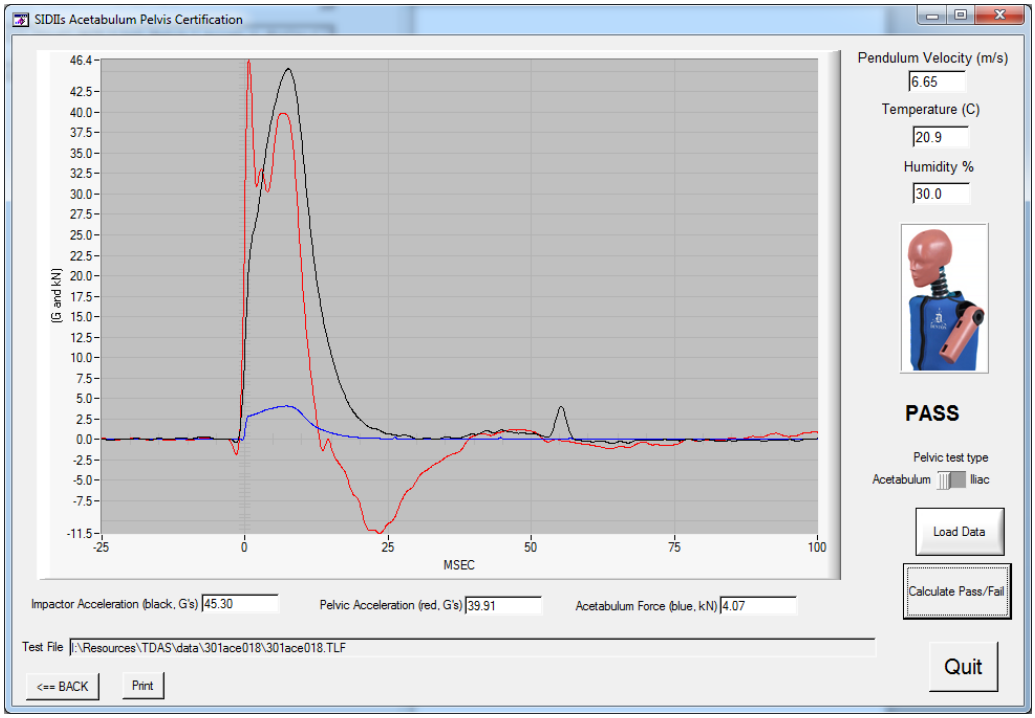


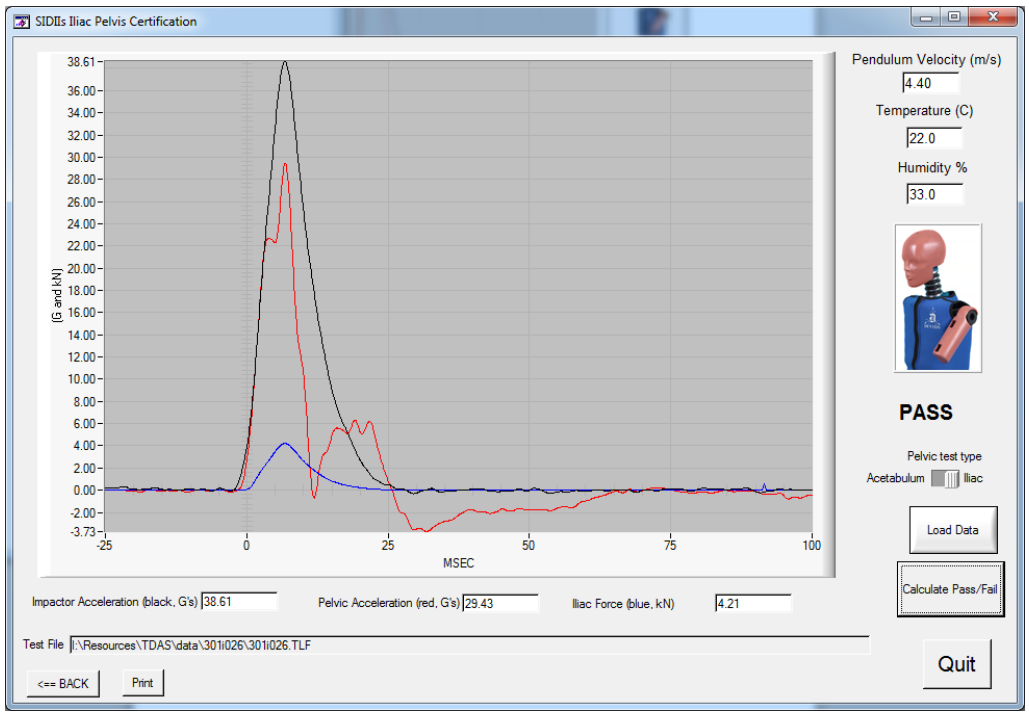
TABLE 10
PELVIS ILIAC IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 1 & 2

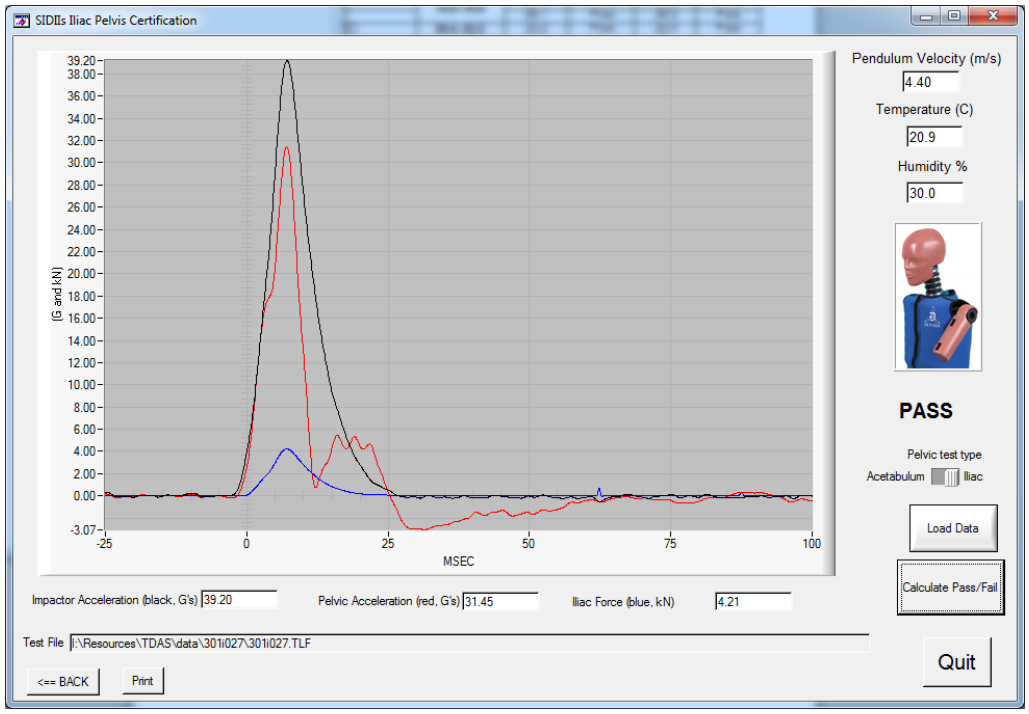
TEST PARAMETER		SPEC.	PRE		POST	
Date		-	11-11-13		11-19-13	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	22.0	Pass	20.9	Pass
	Min		20.9	Pass	20.7	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	33.0	Pass	30.0	Pass
	Min		28.1	Pass	28.3	Pass
Temperature – During Test (°C)		**20.6-22.2**	22.0	Pass	20.9	Pass
Humidity – During Test (%)		**10-70**	33.0	Pass	30.0	Pass
Pendulum Velocity (m/s)		**4.2-4.4**	4.4	Pass	4.4	Pass
Peak Impactor Acceleration (G)		**36-46**	38.6	Pass	39.2	Pass
Pelvis Acceleration Y (G)		**29-39**	29.4	Pass	31.5	Pass
Peak Iliac Force Y (N)		**4.00-5.20**	4.2	Pass	4.2	Pass
Pelvis Plug Serial No. 36518 (Pre) 36775 (Post)						

TABLE 10
PELVIS ILIAC IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST



APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 - DUMMY INSTRUMENTATION

				SID-IIs S/N: 301		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers			X	P24562	Endevco	25/APR/2013
			Y	P59121	Endevco	25/APR/2013
			Z	P21151	Endevco	25/APR/2013
			X_R	12095	Endevco	15/JUNE/2013
			Y_R	12116	Endevco	15/JUNE/2013
			Z_R	12100	Endevco	06/AUG/2013
Displacement Potentiometers	Thoracic Rib	Upper	Y	1142	FTSS	24/MAY/2013
		Middle	Y	014	Servo	24/MAY/2013
		Lower	Y	1155	FTSS	24/MAY/2013
	Abdominal Rib	Upper	Y	1205	FTSS	24/MAY/2013
		Lower	Y	1237	FTSS	03/MAY/2013
Lower Spine Accelerometers (T_{12})			X	P22230	Endevco	15/OCT/2013
			Y	P22315	Endevco	15/ OCT /2013
			Z	P14233	Endevco	15/ OCT /2013
Acetabulum Load Cell			Y	IF-520_DI4284	FTSS	07/MAY/2013
Iliac Wing Load Cell			Y	IF-507_115	FTSS	07/MAY/2013
Pelvis Plug (Struck-Side)				36518	FTSS	23/SEP/2013
Pelvis Plug (Non-Struck-Side)				36403	FTSS	23/SEP/2013

TABLE 2 - VEHICLE INSTRUMENTATION				
		Serial Number	**Manufacturer**	**Calibration Date**
Vehicle Center of Gravity	X	P22230	MSI	15/OCT/2013
Vehicle Center of Gravity	Y	P22315	MSI	15/OCT/2013
Vehicle Center of Gravity	Z	P14233	Endevco	30/NOV/2013
Left Floor Sill	Y	A086969	MSI	15/ NOV/2013
A-Pillar Sill	Y	A086989	MSI	15/ NOV/2013
A-Pillar Low	Y	A119074	MSI	15/OCT/2013
A-Pillar Mid	Y	A119077	MSI	15/ NOV/2013
B-Pillar Sill	Y	A011644	MSI	15/ NOV/2013
B-Pillar Low	Y	A119072	MSI	15/NOV/2013
B-Pillar Mid	Y	A119078	MSI	15/ NOV /2013
Driver Seat	Y	J43478	Endevco	28/MAY/2013
Engine Top	X	P21820	Endevco	15/OCT/2013
Engine Top	Y	J43474	Endevco	15/OCT/2013
Firewall	Y	A007227	MSI	15/OCT/2013
Right Roof	Y	J44018	Endevco	28/MAY/2013
Right Floor Sill	Y	04A04A07-J13	Endevco	15/OCT/2013
Rear Floorpan	X	P12746	Endevco	28/MAY/2013
Rear Floorpan	Y	P13835	Endevco	15/OCT/2013

TABLE 3 - POLE INSTRUMENTATION				
		Serial Number	**Manufacturer**	**Calibration Date**
Load Cell 1	Y	332420	Interface	03/SEPT/2013
Load Cell 2	Y	332407	Interface	03/SEPT/2013
Load Cell 3	Y	332400	Interface	03/SEPT/2013
Load Cell 4	Y	352865	Interface	03/SEPT/2013
Load Cell 5	Y	332403	Interface	03/SEPT/2013
Load Cell 6	Y	330824	Interface	03/SEPT/2013
Load Cell 7	Y	334238	Interface	03/SEPT/2013
Load Cell 8	Y	330834	Interface	03/SEPT/2013