REPORT NUMBER: SPNCAP-MCW-13-005

NEW CAR ASSESSMENT PROGRAM (SPNCAP)
SIDE IMPACT POLE TEST

CHRYSLER GROUP, LLC
2013 RAM 1500 4-DOOR QUAD CAB PICKUP
NHTSA NUMBER: MD 0315

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

TEST DATE: 13 DECEMBER 2012

REPORT DATE: 26 DECEMBER 2012

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

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Date: 3/6/13

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Date: 6 MAR 2013

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

Technical Report Documentation Page

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4. Title and Subtitle Final report of New Car Assessment Program Side Impact Pole Testing of a 2013 Ram 1500 4-Door Quad Cab Pickup NHTSA No. MD 0315		*5. Report Date* December 26, 2012 *6. Performing Organization Code* MCW
7. Author(s) Frank Pintar, Project Manager Mark Meyer, Project Engineer		*8. Performing Organization Report No.* MCW-13-005
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:* December 13 to December 26 *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 2013 Ram 1500 4-Door Quad Cab Pickup 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 13 December 2012.

The impact velocity was 31.93 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 603 mm at level 2. The test vehicle's occupant performance is as follows:

		Driver ATD (SID-IIs)	
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/a	1000	483
Resultant Lower Spine Acceleration	G's	82	48
Total Pelvic Force (Acetabular & Pelvic)	NWT	5525	3029
Maximum Thoracic Rib Deflection	mm	38	31
Maximum Abdomen Rib Deflection	mm	45	32

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

17. Key Words New Car Assessment Program (NCAP) Side impact Pole Part 572V SID-IIs		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division 1200 New Jersey Ave, SE Washington, D.C. 20590	
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Form DOT F1700.7 (8-72)

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SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2013 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 2013 Ram 1500 4-Door Quad Cab Pickup. 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 2013 Ram 1500 4-Door Quad Cab Pickup. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 31.93 km/h. The test was conducted at the Medical College of Wisconsin, in Milwaukee, Wisconsin, on 13 December 2012. 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	483
Resultant Lower Spine Acceleration	G's	82	48
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	NWT	5525	3029
Maximum Thoracic Rib Deflection	mm	38*	31
Maximum Abdominal Rib Deflection	mm	45*	32

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 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/Pelvis 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

All placards say "Dodge" Ram 1500, and should say Ram 1500

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

VEHICLE INFORMATION	
NHTSA No.	MD 0315
Model Year	2013
Make	Ram
Model	1500
Body Style	Quad Cab Pickup
VIN	1C6RR6FTXDS513338
Body Color	Deep Cherry Red
Odometer Reading (km/mi)	28 mi.
Engine Displacement (L)	5.7
Type/No. of Cylinders	8
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
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)	Yes
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	No
Driver Torso/Pelvis Airbag	Yes
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	Yes
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

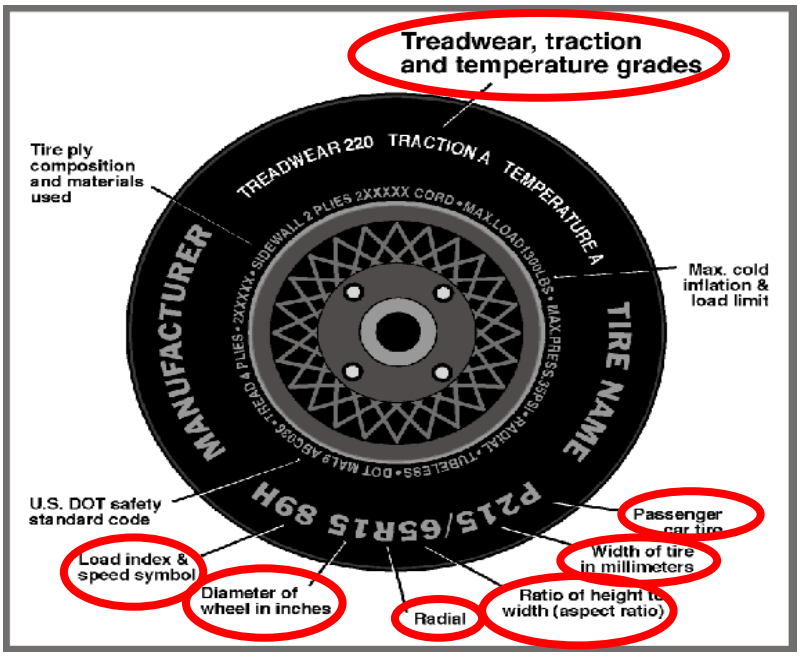
DATA FROM CERTIFICATION LABEL			
Manufactured By	Chrysler Group, LLC	GVWR (kg)	3040
Date of Manufacture	September 2012	GAWR Front(kg)	1679
Vehicle Type	Pickup	GAWR Rear (kg)	1770

VEHICLE SEATING AND WEIGHT CAPACITY DATA					
	Front	**Rear**	**Third**	**Total**	
Designated Seating Capacity (DSC)	3	3	0	6	
Capacity Weight (VCW) kg				704	(A)
DSC X 68.04 kg				408.2	(B)
Rated Cargo Weight (RCLW)				295.6	(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**
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	270	270
Recommended Tire Size	P275/60R20	P275/60R20
Tire Size on Vehicle	P275/60R20	P275/60R20
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler	Wrangler
Treadwear	500	500
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	4	4
Load Index/Speed Symbol	114S	114S
Tire Material	Polyester & Steel	Polyester & Steel
DOT Safety Code Left	M6YN JD1R 3612	M6YN JD1R 3612
DOT Safety Code Right	M6YN JD1R 3612	M6YN JD1R 3612

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

TIRE PRESSURES					
	Units	**LF**	**RF**	**LR**	**RR**
As Delivered	kpa	284.6	283.7	281.7	282.1
Tire Placard	kpa	270	270	270	270
Owner's Manual	kpa	270	270	270	270
As Tested	kpa	270	270	270	270

TEST VEHICLE AXLE WEIGHTS										
	Units	**As Delivered (UVW)**			**As Tested (ATW)**			**Fully Loaded**		
		Front	**Rear**	**Total**	**Front**	**Rear**	**Total**	**Front**	**Rear**	**Total**
Left	kg	666.8	521.6		688.1	595.1		695.5	597.1	
Right	kg	665.9	489.0		663.2	570.6		673.3	557.6	
Ratio	%	56.9	43.1		53.7	46.3		54.2	45.8	
Totals	kg	1332.7	1010.6	2343.3	1351.3	1165.7	2517.0	1368.8	1154.7	2523.5

TARGET TEST WEIGHT CALCULATION			
	Units		
Total Delivered Weight (UVW)	kg	2343.3	(A)
Sum of Actual Weight of 1 P572 ATDs (SID-IIs) Used	kg	44.1	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136.1	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2523.5	(A + B + C)

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW	
Ballast	**Weight (kg)**
Front & rear passenger door panel, front & rear passenger window, front & rear passenger window trim	16.0

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.	1.2	1.2	1.2	Yes
Front Pass. Door Sill Angle (Front to Rear)*	Deg.	2.0	1.9	1.9	Yes
Front Bumper Angle (Left to Right)	Deg.	0.2	0.2	0.3	Yes
Rear Bumper Angle (Left to Right)	Deg.	0.1	0	0	Yes
Vehicle CG (Aft of Front Axle)	mm	1539.6	1653.4	1633.6	
Vehicle CG Left (+) / Right (-) from Long. Centerline)	mm	14.4	19.8	24.9	

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	-290.4	Mid	-276.3	-282.5	-290.4
	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	Not Measured	Mid	Not Measured	Not Measured	Not Measured
	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			

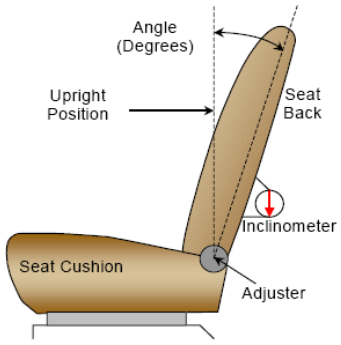
*If applicable

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	230	24	0	0 (w/ Full Forward = 0)
Front Passenger Seat	230	24	0	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	55.8°	29	5.1°	4
Front Passenger Seat	55.8°	29	5.0°	4
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

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.

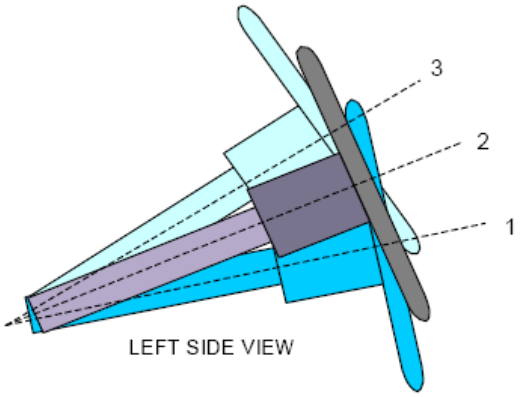
SEAT BELT ANCHORAGE ADJUSTMENT (D-RING)		
	Total No. of Positions	**Placement**
Driver Seat	5	H

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	3	Lowest Position

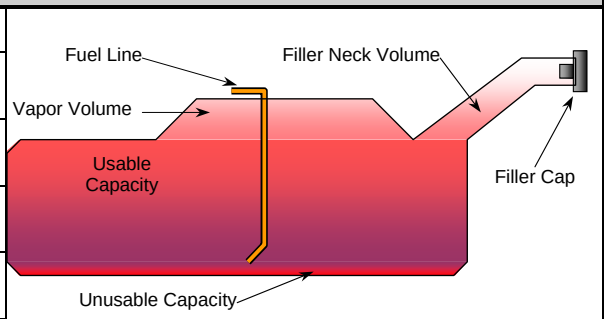
Steering Column Adjustment
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.

STEERING COLUMN ADJUSTMENT			
	Degrees	**Fore/Aft Position (mm)**	
Lowermost, Pos. No. 1	14.8°	Non-Adjustable	
Geometric Center, Pos. No. 2	23.2	Non-Adjustable	
Uppermost, Pos. No. 3	31.6°	Non-Adjustable	
Telescoping Steering Wheel Travel	N/a	N/a	
Test Position	22.2°	As Positioned	



STEERING COLUMN ASSEMBLY

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

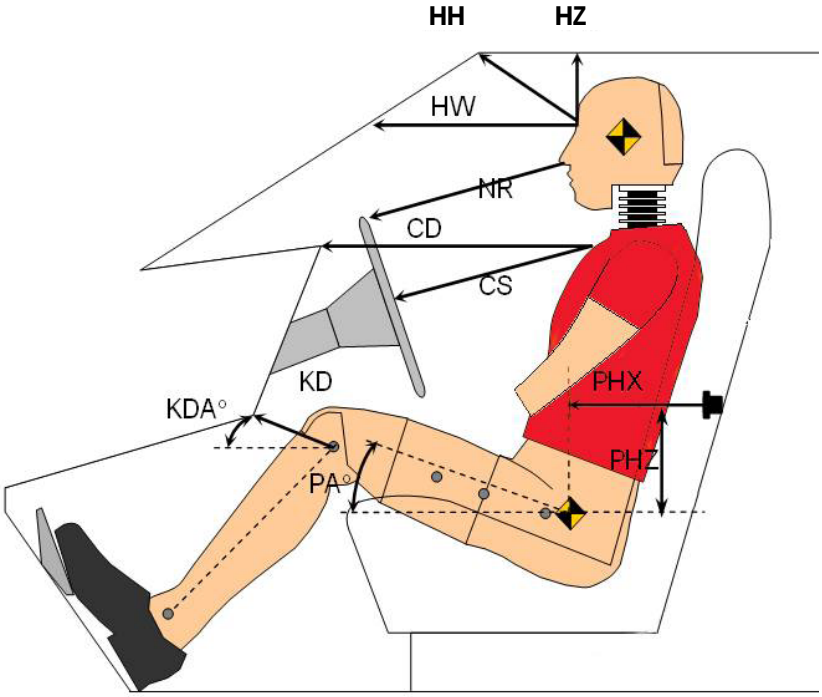
FUEL TANK CAPACITY DATA			
Description	**Units**	**Value**	
Usable Capacity of Standard Equipment Fuel Tank	L	98.4	
Usable Capacity of Optional Equipment Fuel Tank	L	N/a	
Usable Capacity of Standard Tank as Specified in Owner's Manual	L	98.4	
Usable Capacity of Optional Tank as Specified in Owner's Manual	L	N/a	
Amount of Stoddard Added for Test	L	91.5	
% Usable Capacity (92%-94%)	%	93.0	
1/3 of Usable Capacity	40.4		

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.

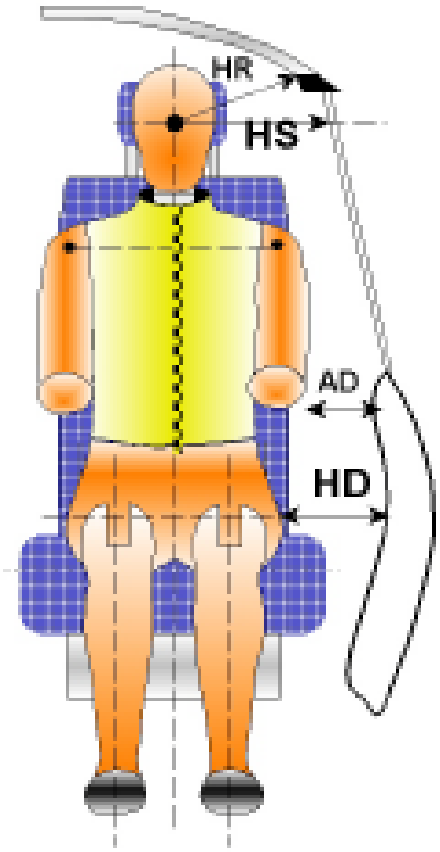
Is the Actual Amount of Solvent Used in the test equal to 93% +/- 1% of the Usable Capacity stated in on Form No. 1? Yes

DATA SHEET NUMBER NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS



Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	338	
HW	Head to Windshield	674	
HZ	Head to Roof	254	
NR	Nose to Rim	306	
CD	Chest to Dashboard	440	
CS	Chest to Steering Wheel	227	
KDL	Left Knee to Dash	105	
KDAL	Left Knee to Dash		26.1°
KDR	Right Knee to Dash	89	
KDAR	Right Knee to Dash		24.6°
PAX	Pelvic Tilt Angle (X-Axis)		0.0°
PAY	Pelvic Tilt Angle (Y-Axis)		18.5°
PHX	H-Point to Striker (X-Axis)	332.8	
PHZ	H-Point to Striker (Z-Axis)	-9.1	

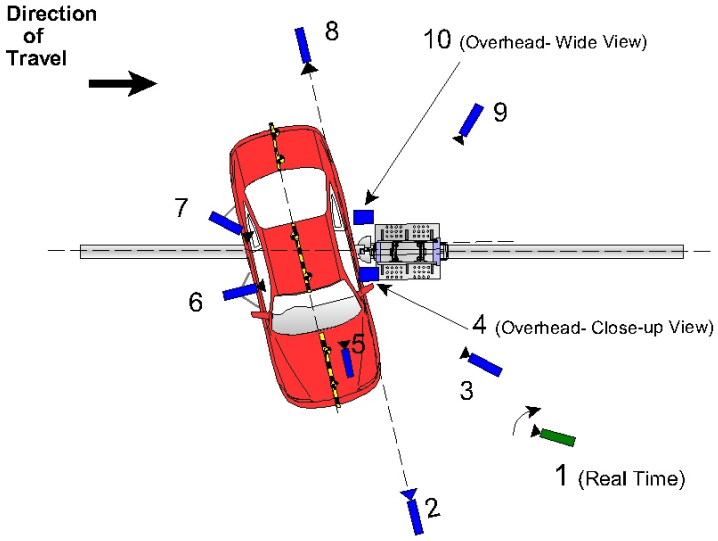
DATA SHEET NUMBER NO. 4
DUMMY LATERALL CLEARANCE DIMENSIONS



DUMMY LATERAL CLEARANCE DIMENSIONS		
Code	**Measurement Description**	**Length (mm)**
HR	Head to Side Header	265
HS	Head to Side Window	362
AD	Arm to Door	239
HD	Hip Point to Door	175

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	8467	-2811	-1262	35	1000
3	Impact Side 45° - Forward View of Pole	5924	-3808	-1408	25	1000
4	Overhead Close – Up View of Impact	160	352	-5864	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	-7814	-2296	-1275	25	1000
9	Impact Side 45° - Rearward Pole View	-8912	-3607	-1488	35	1000
10	Overhead Wide – View Impact	162	44	-5473	10	1000
11	Real – Time (24 – 30 fps)Dummy Front View				N/a	30

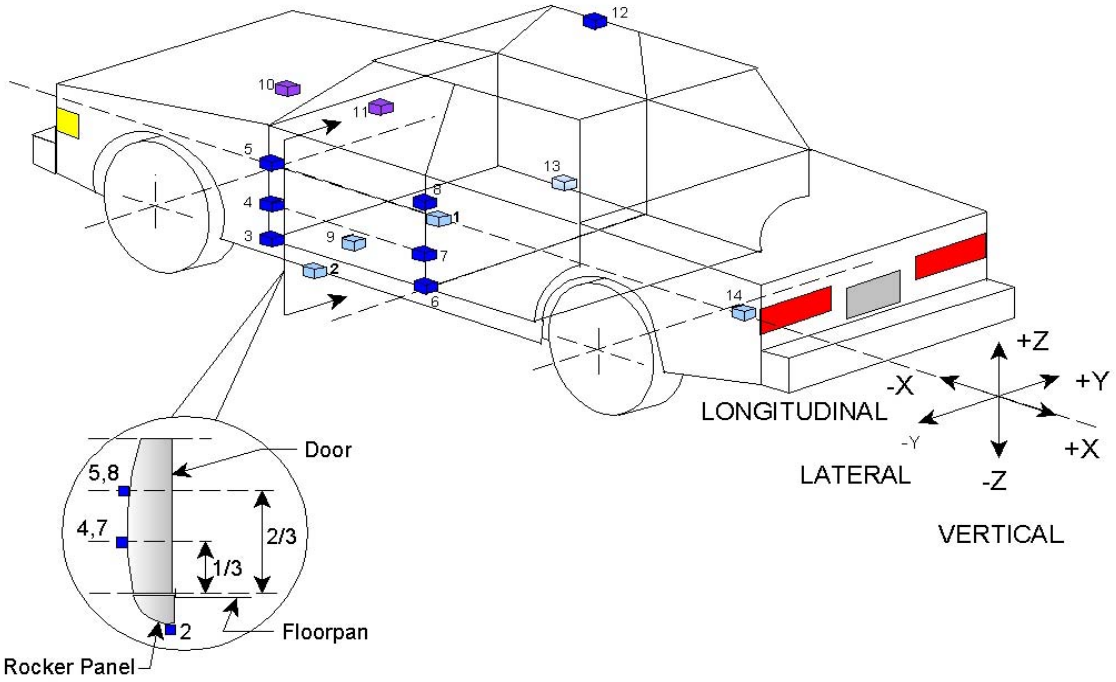
Origin		Orientation	
X	Impact Point	X	+(X) Forward
Y	Impact Point	Y	+(Y) Right
Z	Ground	Z	+(Z) Down

**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

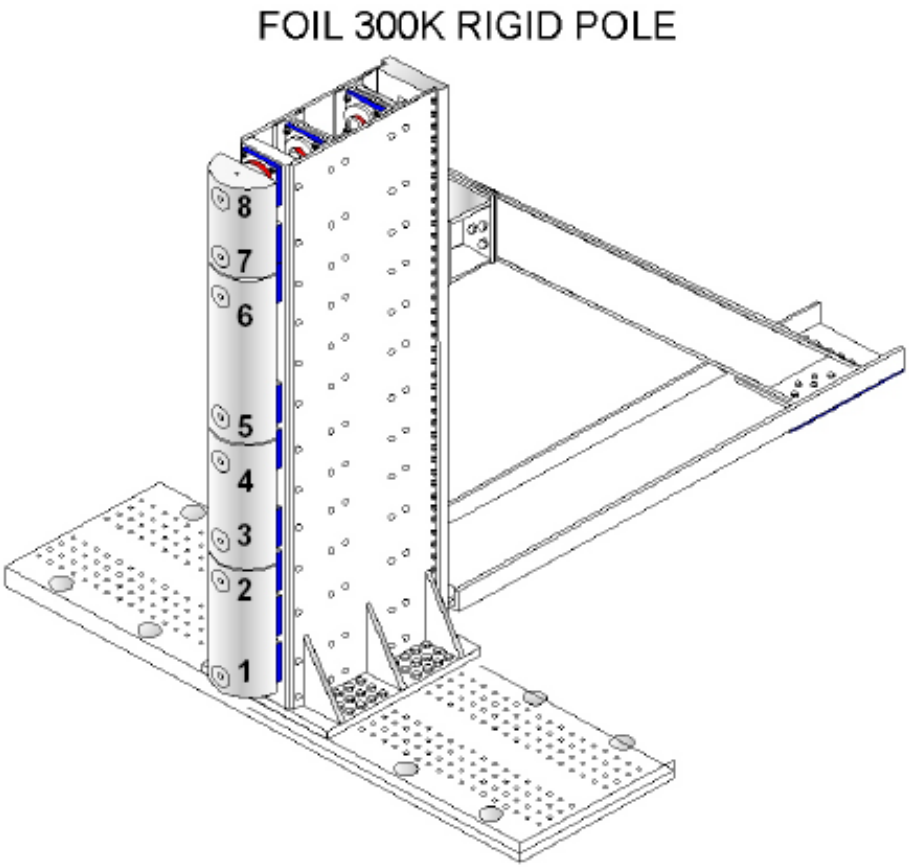
DATA SHEET NO. 6
VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER/SENSOR LOCATION				
Loc. no.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3814.0	180.8	-118.6
2	Left Floor Sill	3868.6	-832.8	211.7
3	A-Pillar Sill	4219.7	-845.8	218.1
4	A-Pillar Low	4167.2	-944.9	-194.2
5	A-Pillar Mid	4176.5	-940.4	-345.4
6	B-Pillar Sill	3046.5	-931.9	49.2
7	B-Pillar Low	3078.5	-931.8	-221.7
8	B-Pillar Mid	3084.9	-925.8	-483.9
9	Driver Seat Track	3466.2	-674.6	-103.1
10	Engine Top	5073.6	67.3	-502.6
11	Firewall	4467.0	527.9	-490.2
12	Right Roof	3133.3	680.5	-1282.8
13	Right Floor Sill	3170.0	796.1	183.3
14	Rear Floorpan	1285.2	-6.03	-245.7

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 NUMBER 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	To Side Curtain Airbag
Left Shoulder	To Torso/Pelvis Bag
Upper Torso	To Torso/Pelvis Bag and Seat Back Wing
Lower Torso	To Torso/Pelvis Bag and Seat Back Wing
Left Hip	To Torso/Pelvis Bag and Seat Back Wing
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

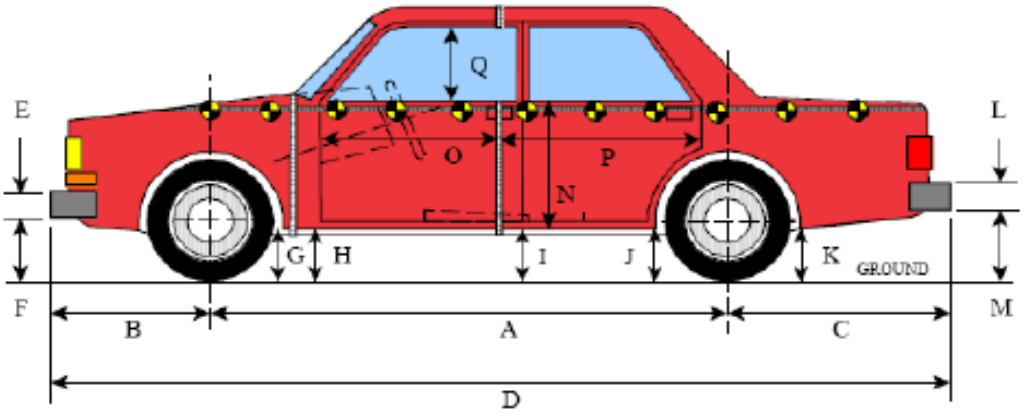
DATA SHEET NUMBER NO. 8
POST TEST OBSERVATIONS (CONTINUED)

POST TEST STRUCTURAL OBSERVATIONS	
Critical Areas of Performance	**Observations/Conclusions**
Pillar Performance	No Separation
Sill Separation	Max Sill Separation of ~165 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/Pelvis Airbag	Yes	Yes	No	N/a
Seat Belt Pretensioner	Yes	Yes	Yes	No
Seat Belt Load Limiter	Yes	N/a	No	N/a
Other	No	N/a	No	N/a

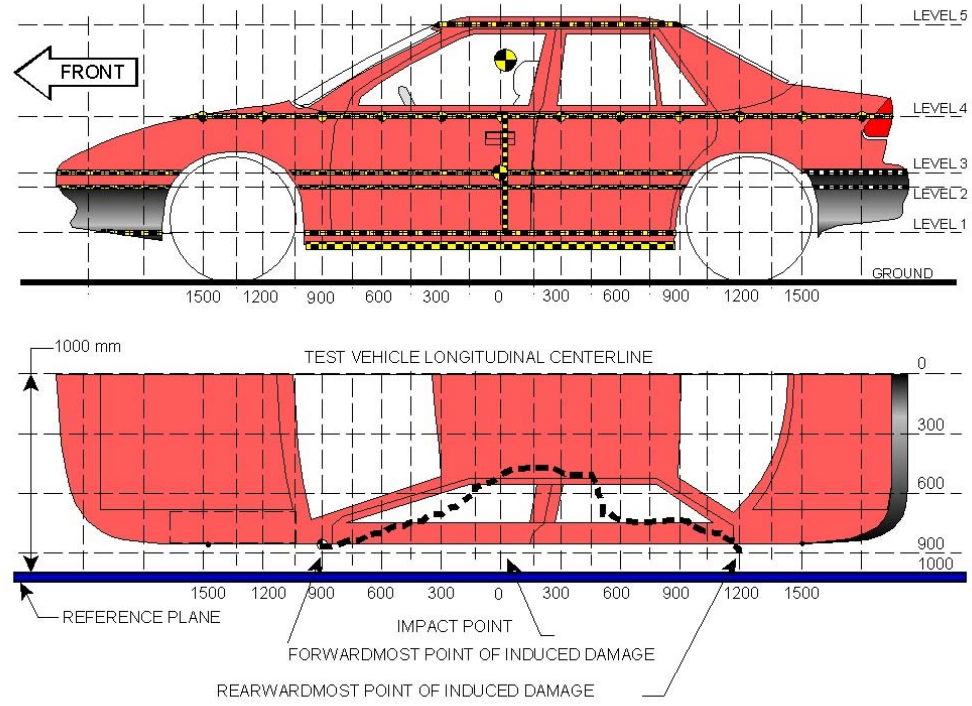
IMPACT SPEED			
Measured Parameter	**Units**	**Tolerance**	**Value**
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1209
Actual Impact Point (Aft of Front Axle)	mm		1214
Horizontal Offset (+ forward / - rear)	mm	+/- 38 of Intended Impact Point	-5
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	31.93
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	31.91

DATA SHEET NUMBER NO. 9
VEHICLE PROFILE MEASURMENTS



VEHICLE PRE- AND POST- TEST MEASUREMENT INFORMATION				
Code	**Description**	**Pre Test**	**Post Test**	**Difference**
		mm	**mm**	**mm**
A	Wheelbase	3570	3380	-190
B	Front Axle to FSOV	787	886	99
C	Rear Axle to RSOV	1138	1159	21
D	Total Length at Centerline	5819	5801	-18
E	Front Bumper Thickness	305	305	0
F	Front Bumper Bottom to Ground	403	445	42
G	Sill Height at Front Wheel Well	427	425	-2
H	Sill Height at Front Door Leading Edge	412	417	5
I	Sill Height at B-Pillar	427	419	-8
J1	Sill Height at Rear Wheel Well	399	400	1
J2	Pinch Weld Height at Rear Wheel Well	433	432	-1
K	Sill Height Aft of Rear Wheel Well	527	571	44
L	Rear Bumper Thickness	51	51	0
M	Rear Bumper Bottom to Ground	564	591	27
N	Sill Height to Window Bottom Sill	868	868	0
O	Front Door Leading Edge to Impact C/L	1115	787	-328
P	Rear Door Trailing Edge to Impact C/L	808	820	12
Q	Front Window Opening	480	450	-30
R	Right Side Length	5495	5510	15
S	Left Side Length	5495	5425	-70
T	Vehicle Width at B-Pillar	2017	1864	-153

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	459	525	0
2	Occupant Hip Point	965	603	150
3	Mid-Door	883	598	150
4	Window Sill	1278	534	150
5	Window Top	1846	371	150

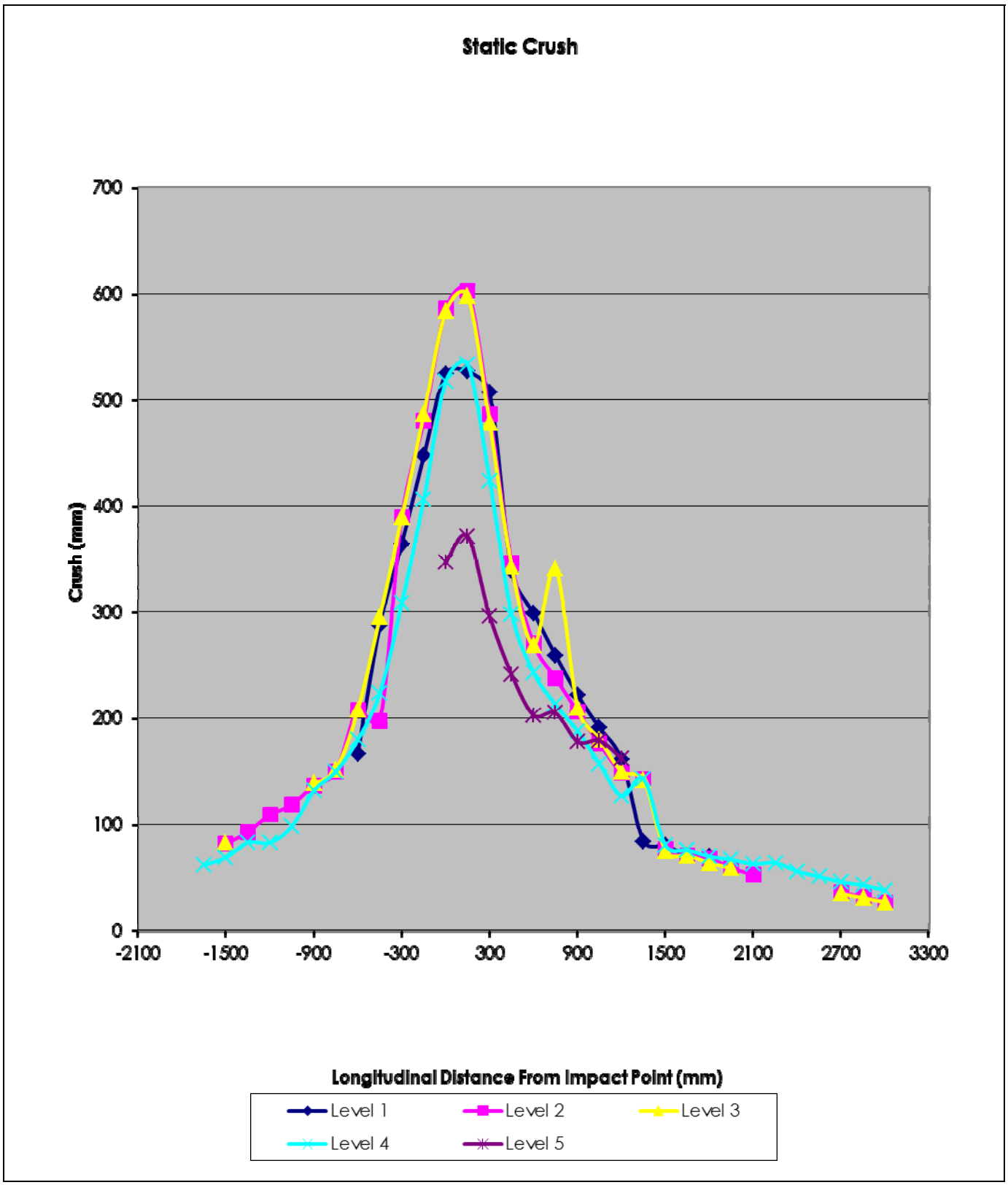
Note: All vehicle measurements taken at the vertical impact reference line.

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		
		459			965			883			1278			1846		
		Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush
DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT	-1800															
	-1650										492	554	62			
	-1500				270	352	82	267	350	83	460	529	69			
	-1350				264	357	93				427	510	83			
	-1200				257	366	109				406	489	83			
	-1050				255	374	119				390	488	98			
	-900				250	387	137	256	395	139	373	505	132			
	-750				250	400	150	253	405	152	363	513	150			
	-600	320	487	167	247	455	208	255	463	208	352	532	180			
	-450	321	608	287	250	447	197	257	552	295	350	574	224			
	-300	319	683	364	257	646	389	258	647	389	344	652	308			
	-150	317	764	447	257	737	480	257	743	486	339	745	406			
	0	320	845	525	257	843	586	256	840	584	335	853	518	556	903	347
	150	319	846	527	257	860	603	257	855	598	332	866	534	551	922	371
	300	318	825	507	255	741	486	255	733	478	329	753	424	549	845	296
	450	316	655	339	253	599	346	254	597	343	324	622	298	547	788	241
	600	315	614	299	254	524	270	255	524	269	326	569	243	547	750	203
	750	315	574	259	254	492	238	255	596	341	324	537	213	545	750	205
	900	318	540	222	253	459	206	254	464	210	321	509	188	545	723	178
	1050	324	515	191	254	430	176	255	435	180	319	476	157	544	723	179
	1200	325	486	161	254	403	149	255	405	150	317	444	127	543	705	162
	1350	335	419	84	284	427	143	285	427	142	346	489	143			
	1500	339	419	80	263	340	77	265	340	75	319	399	80			
	1650	345	416	71	259	330	71	262	333	71	315	391	76			
	1800	350	420	70	256	324	68	260	324	64	313	383	70			
	1950				254	313	59	260	319	59	312	379	67			
	2100				257	310	53				309	372	63			
	2250										306	370	64			
	2400										309	365	56			
	2550										310	361	51			
	2700				262	298	36	267	302	35	312	358	46			
	2850				266	298	32	269	300	31	316	359	43			
	3000				273	300	27	275	302	27	322	360	38			

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

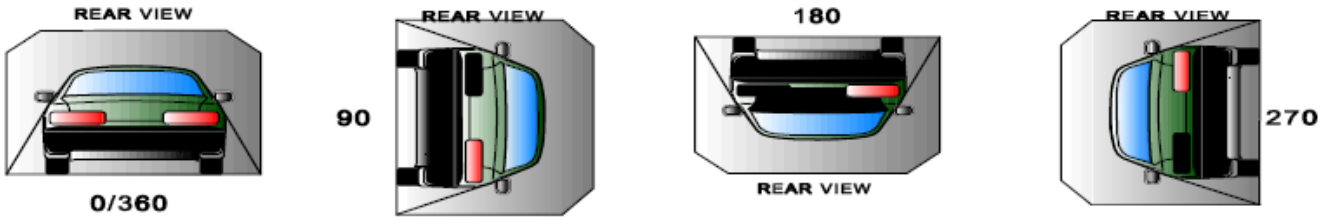


DATA SHEET NO. 11
FMVSS 301 STATIC ROLLOVER RESULTS

Temperature at Time of Impact: 20° C Test Time: 11:45 am

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



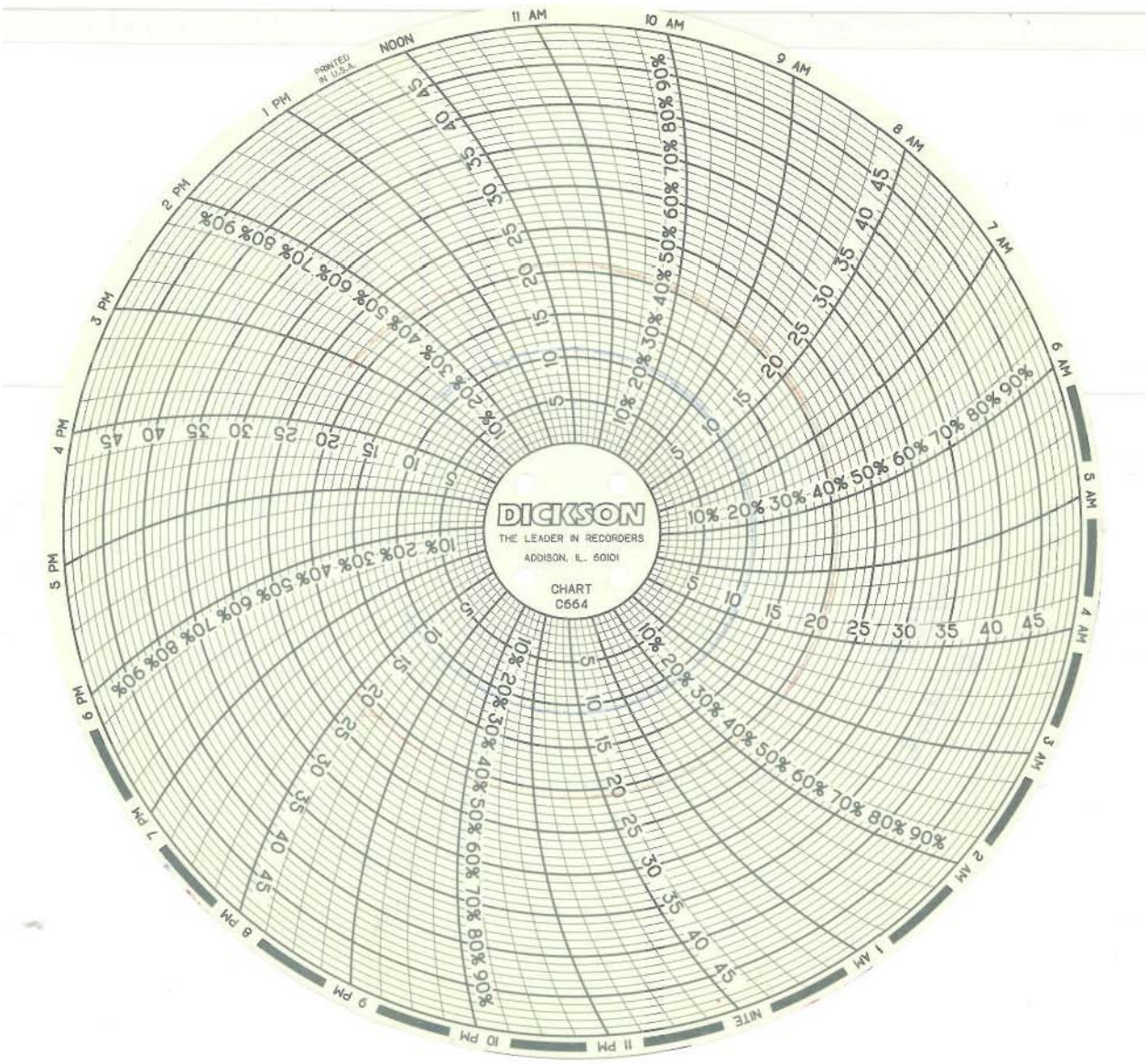
ROLLOVER SOLVENT COLLECTION TIME TABLE			
Test phase	**Rotation Time (sec.)**	**Hold Time (sec.)**	**Total Time (sec.)**
0° to 90°	63	300	363
90° to 180°	67	300	367
180° to 270°	66	300	366
270° to 360°	67	300	367

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

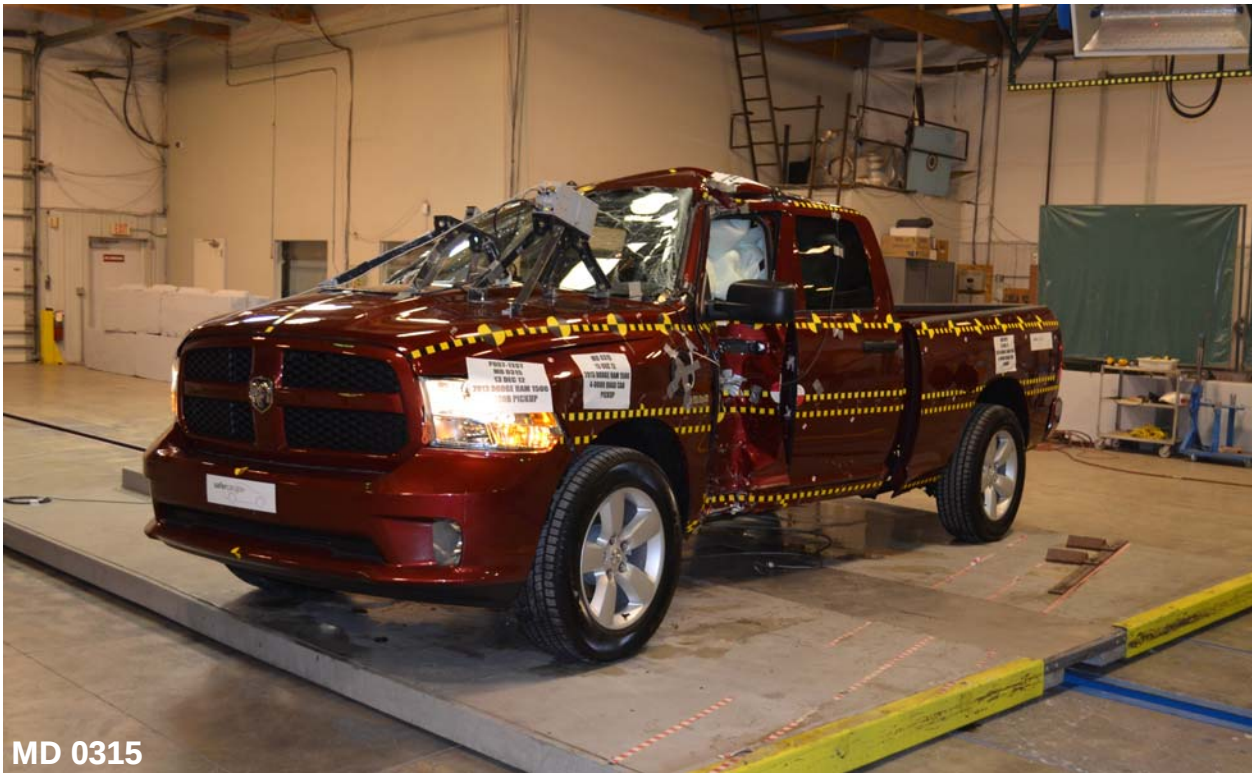


Figure 006: Post-Test Left Front 3-4 View of Test Vehicle

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

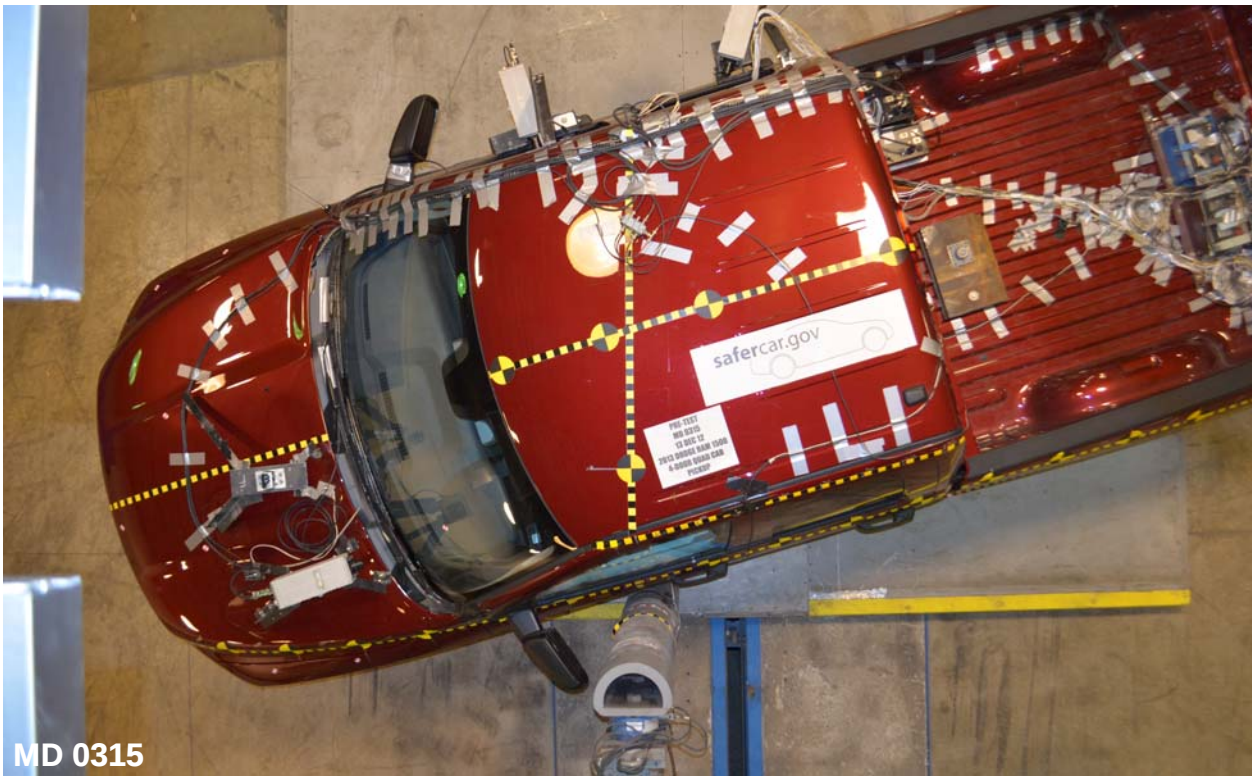


Figure 015: Pre-Test Overhead View of Test Area

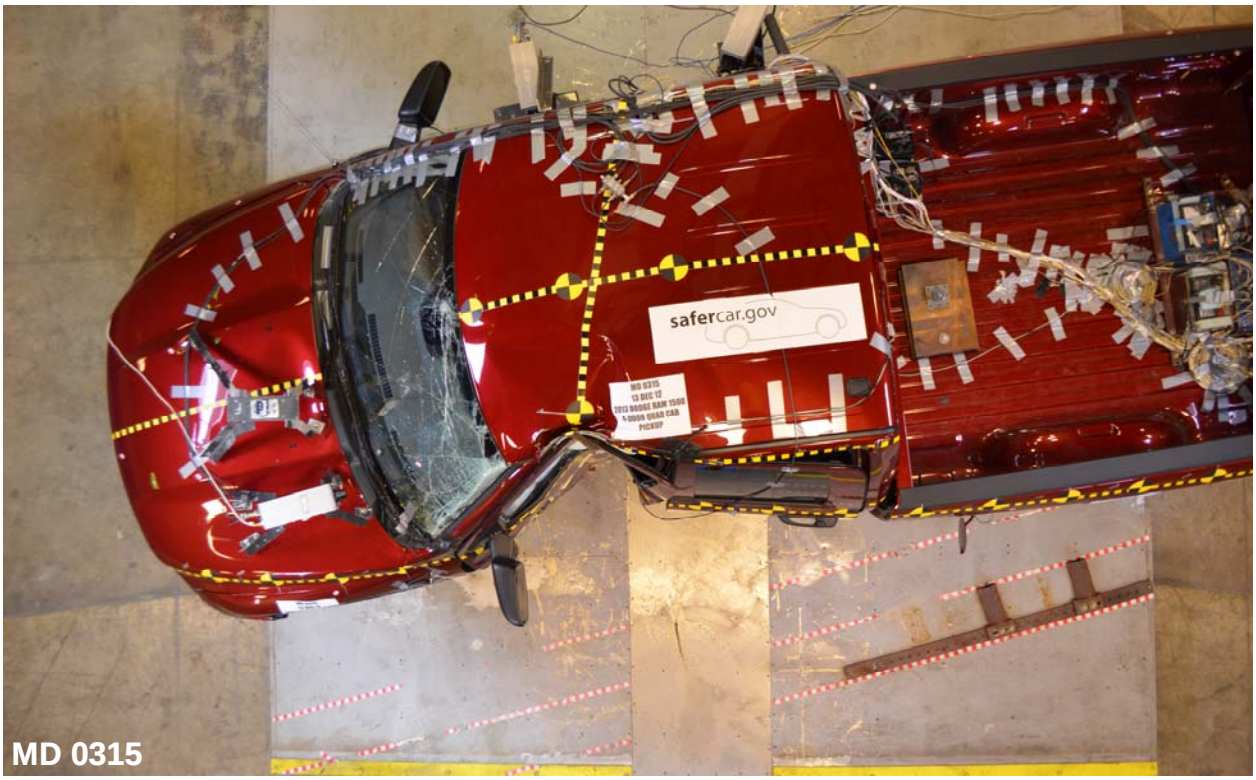


Figure 016: Post-Test Overhead View of Test Area

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

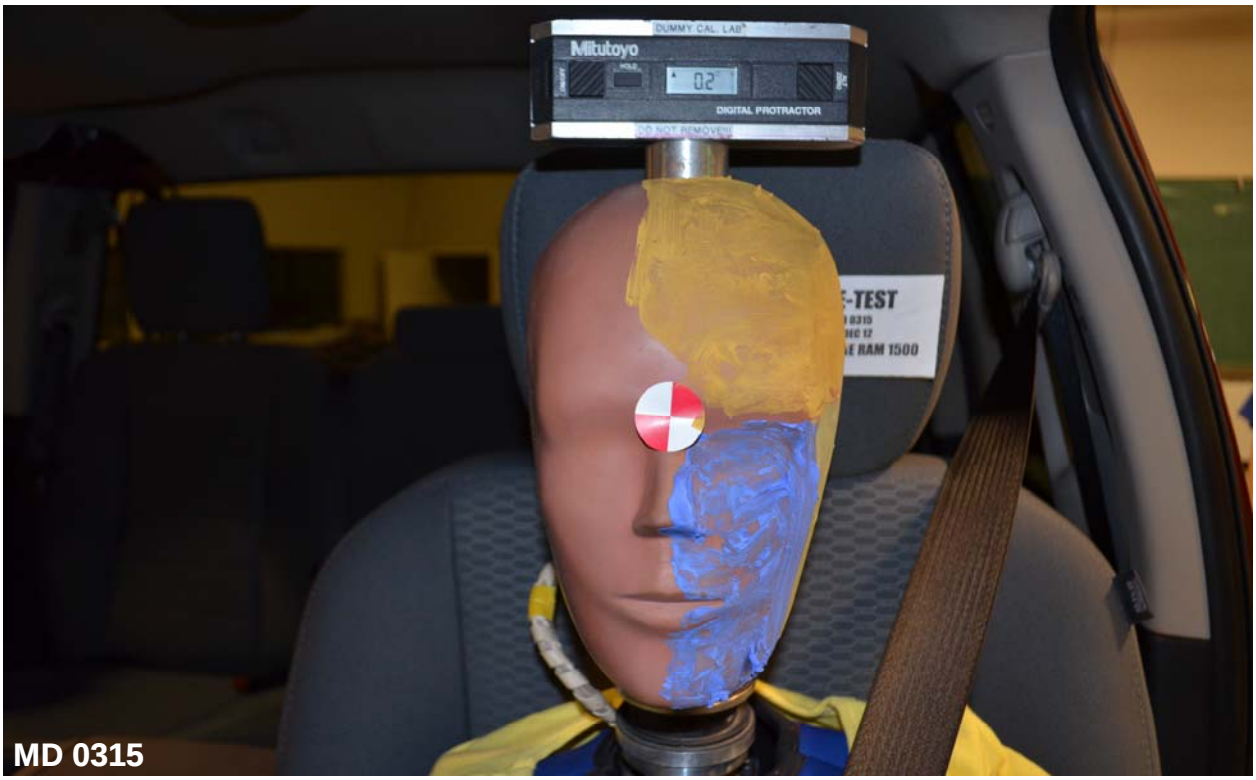


Figure 027: Pre-Test Frontal Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint

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

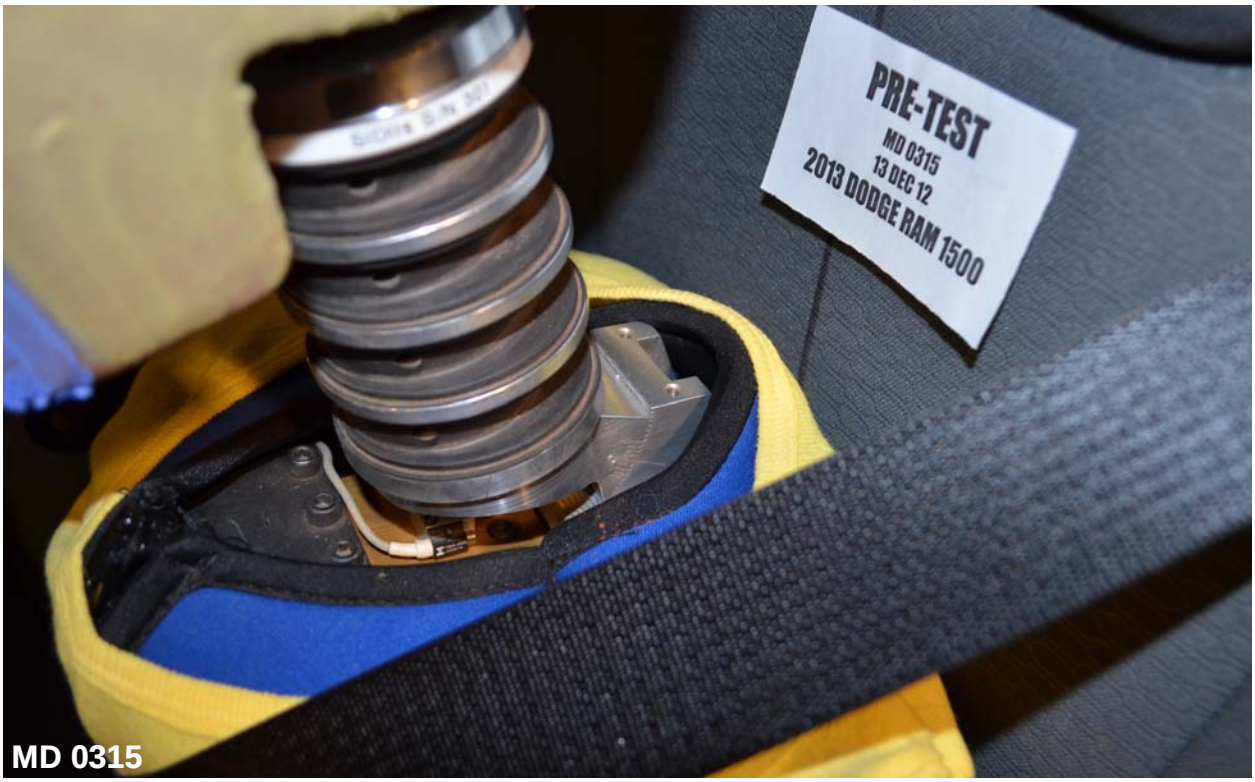


Figure 030: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket

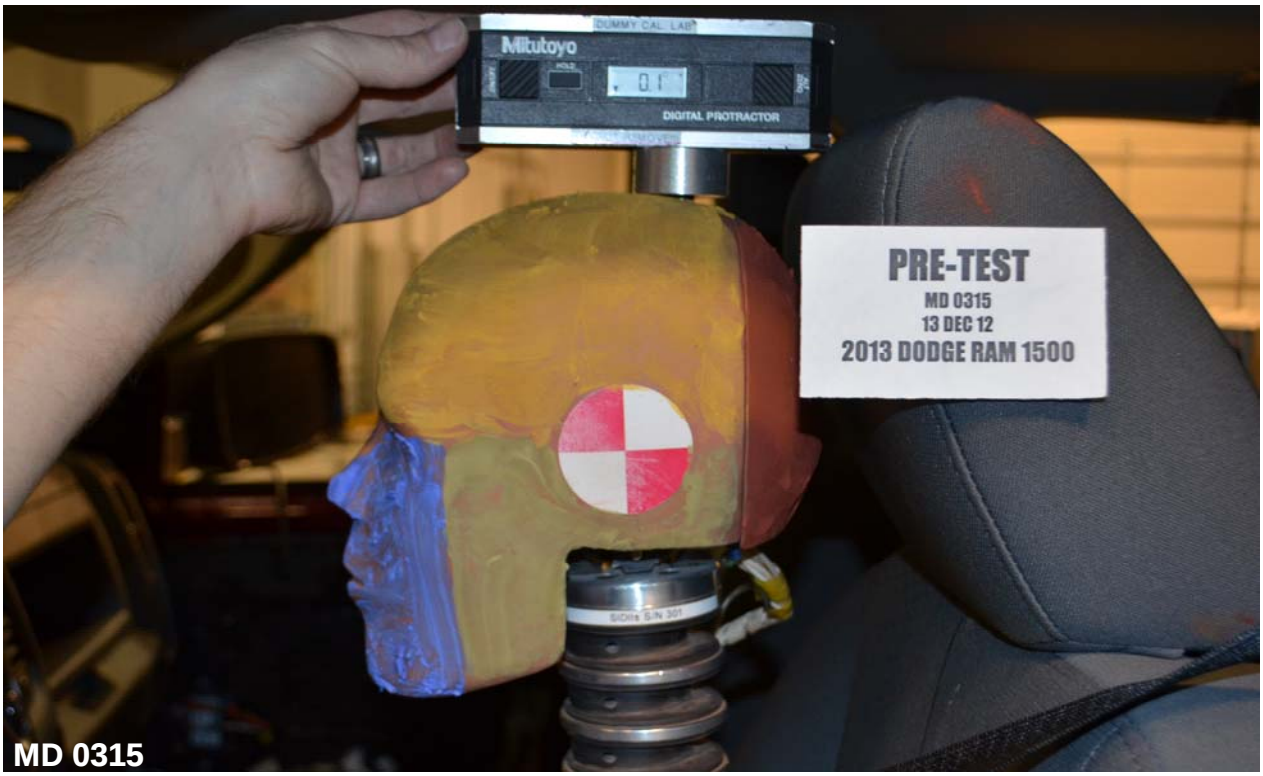


Figure 031: Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level

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

Figure 036: Pre-Test View of Parking Brake

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

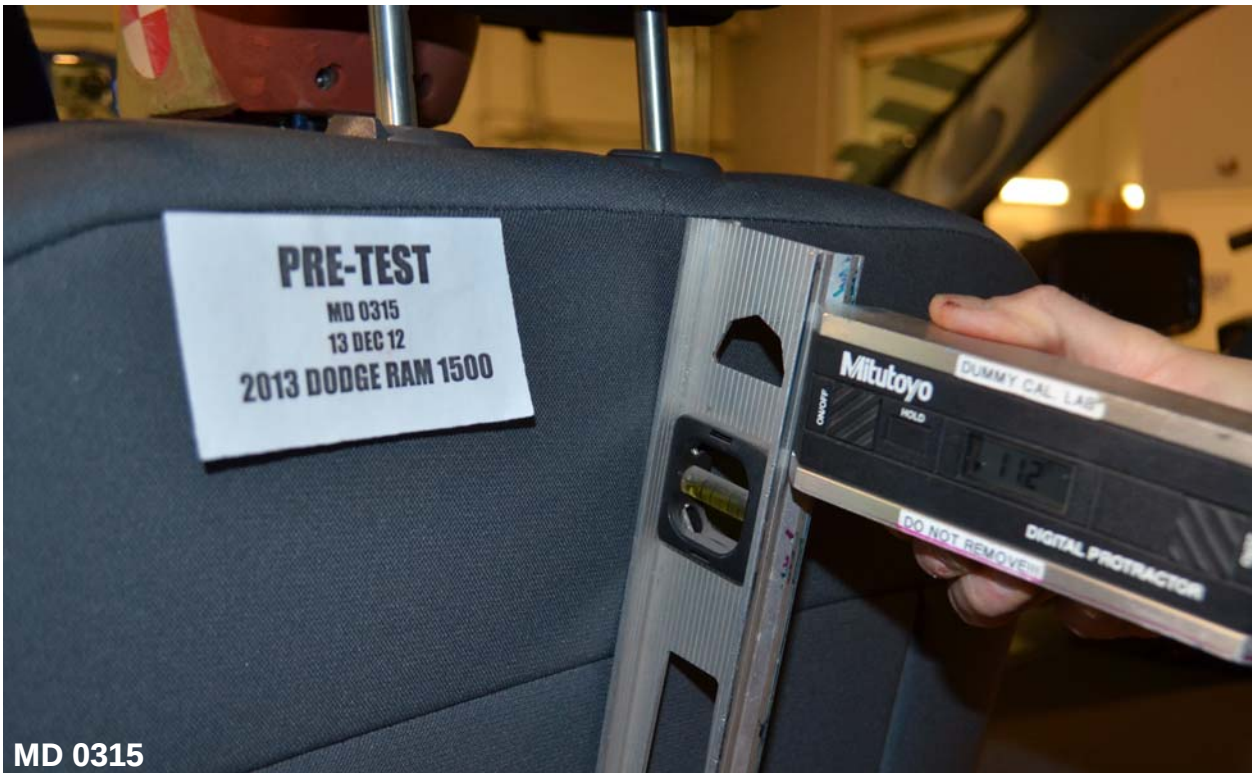


Figure 039: Pre-Test Close-Up View of Driver Seat Back or Head Restraint

Figure 040: Pre-Test Dummy and Door Clearance View

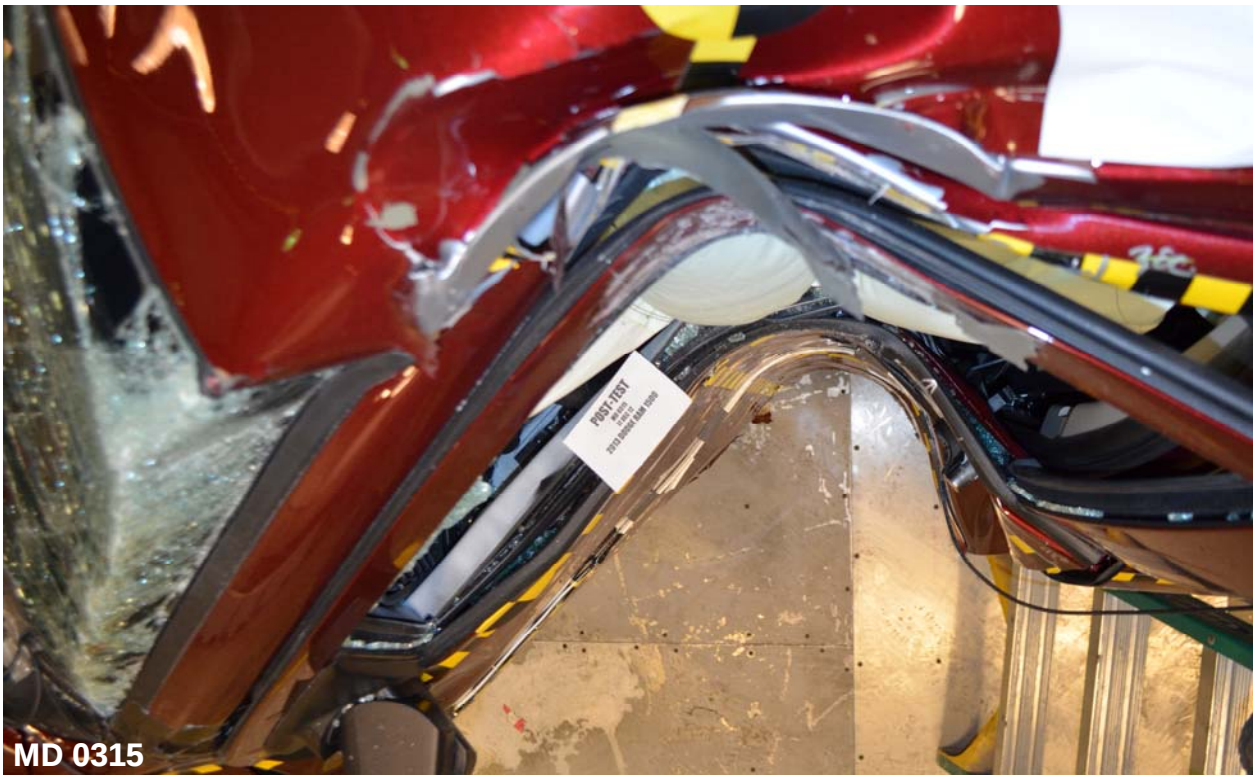


Figure 041: Post-Test Dummy and Door Clearance View

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

Not Applicable

MD 0315

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

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

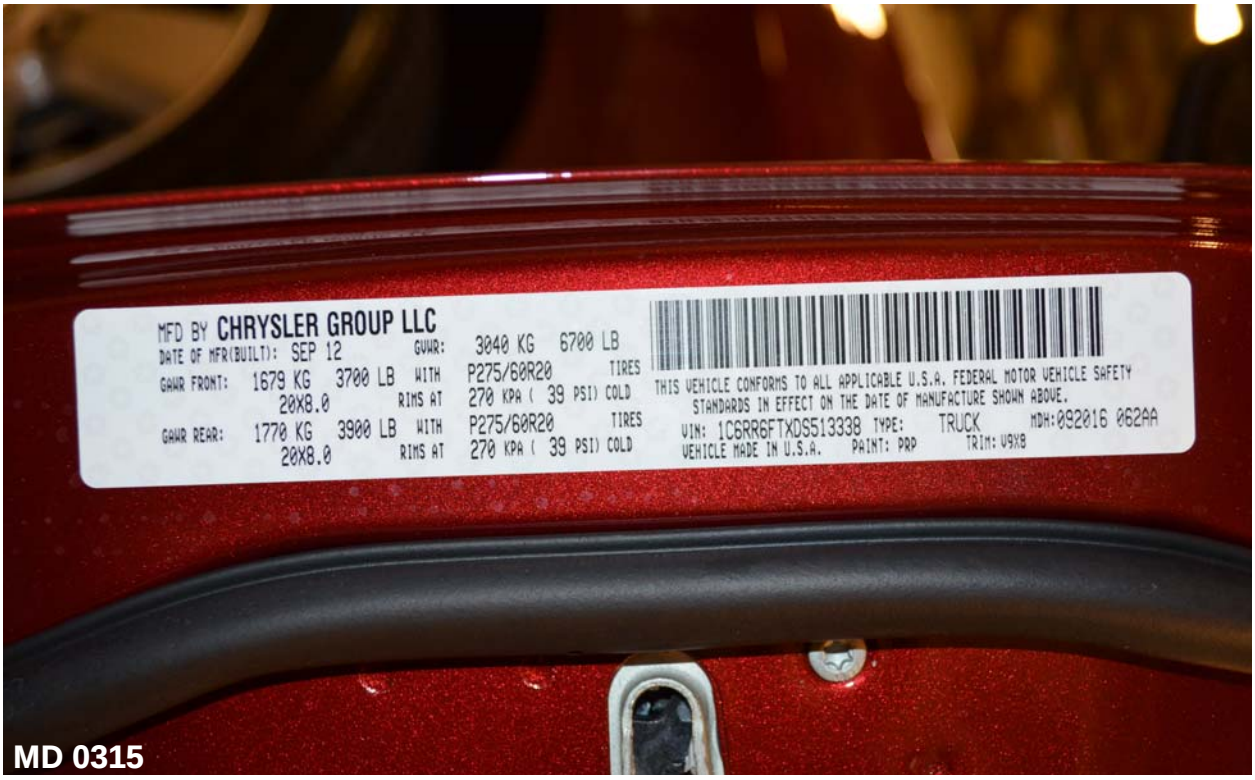


Figure 055: Close-Up View of Vehicle's Certification Label

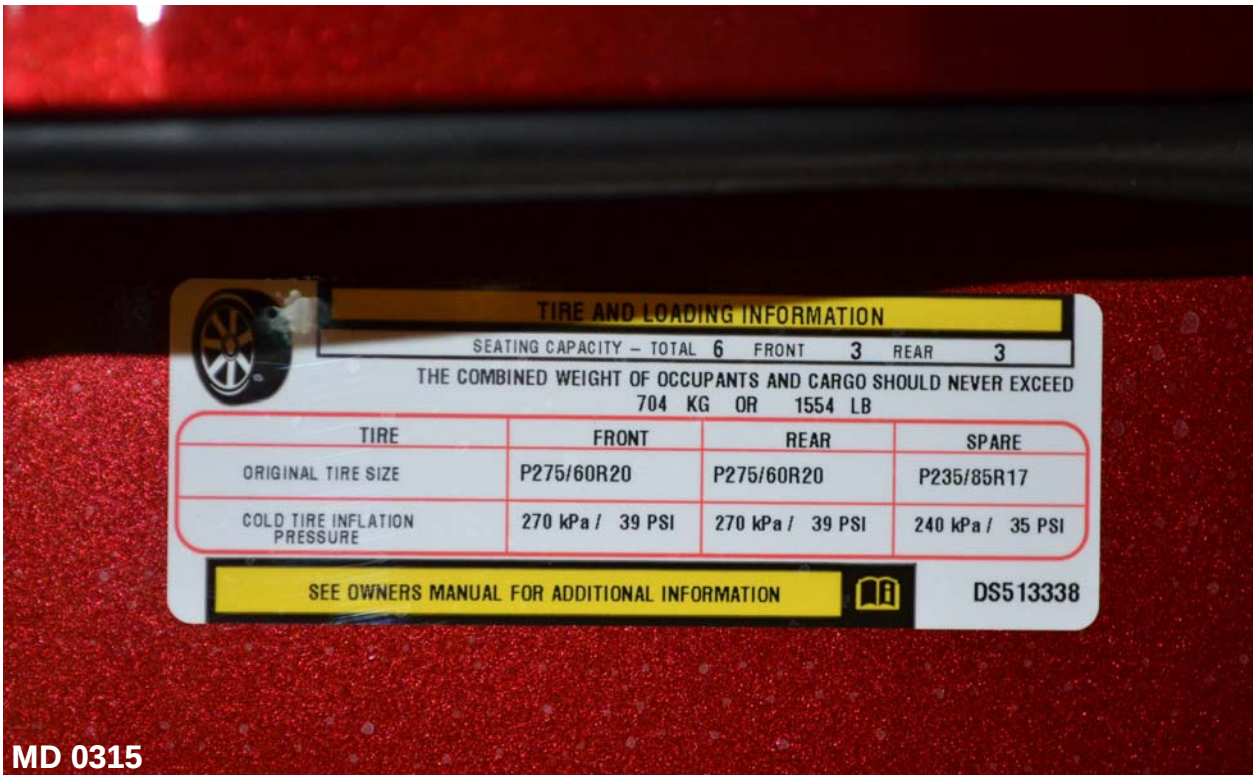


Figure 056: Close-Up View of Vehicle's Tire Information Placard or Label

Figure 057: No. 057 - Pre-Test Pole Barrier Front View

Figure 058: Post-Test Pole Barrier Front View

Figure 059: Pre-Test Pole Barrier Side View

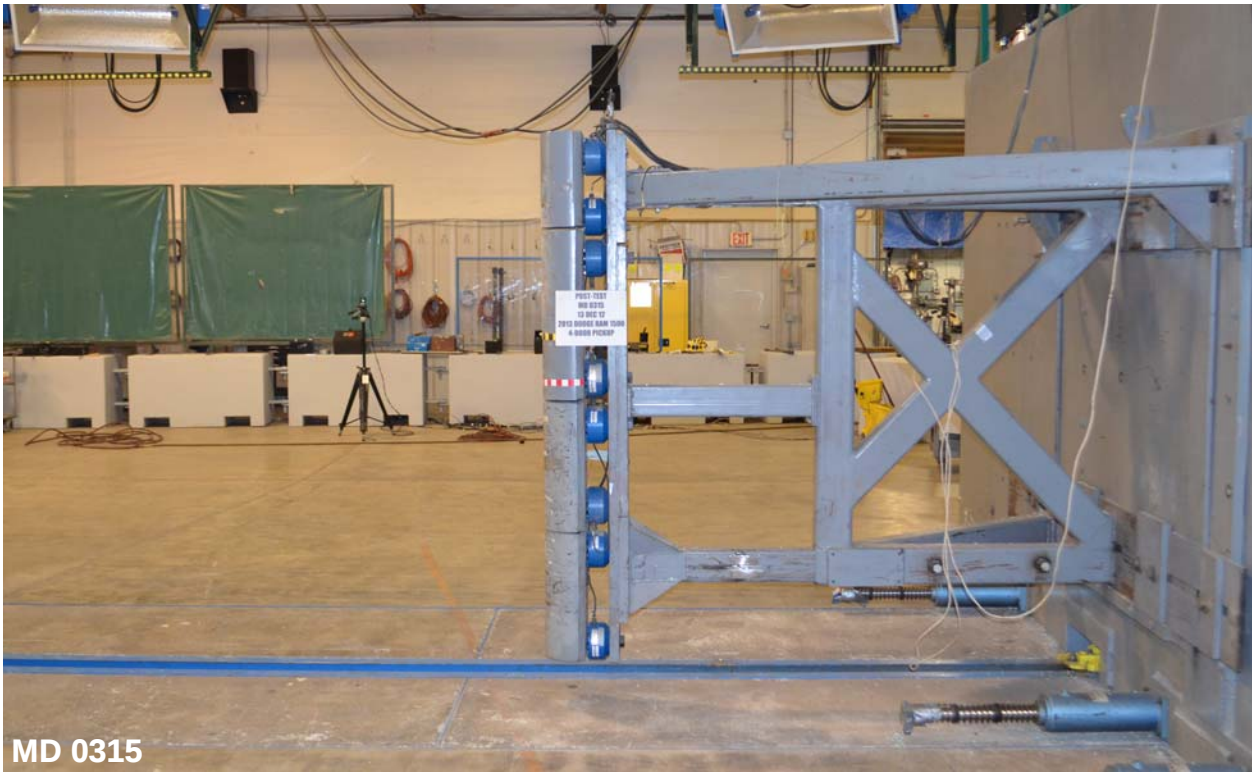


Figure 060: Post-Test Pole Barrier Side View

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

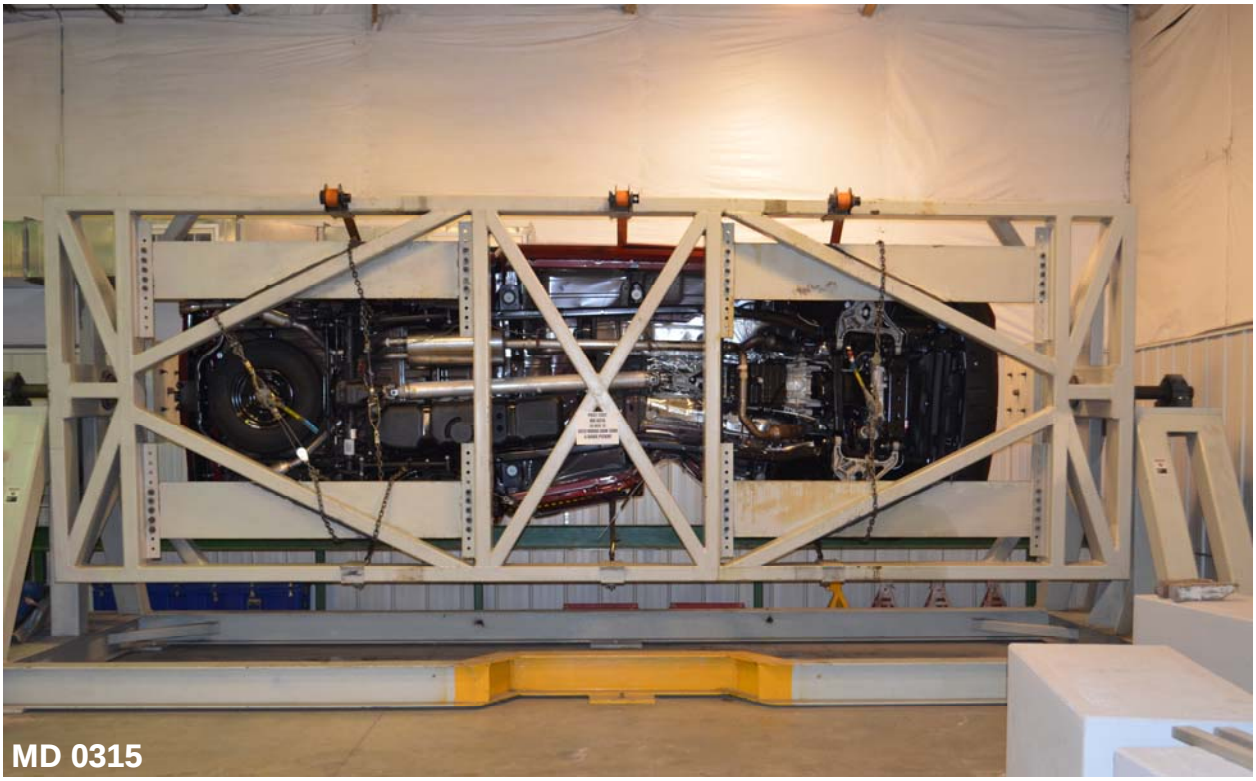


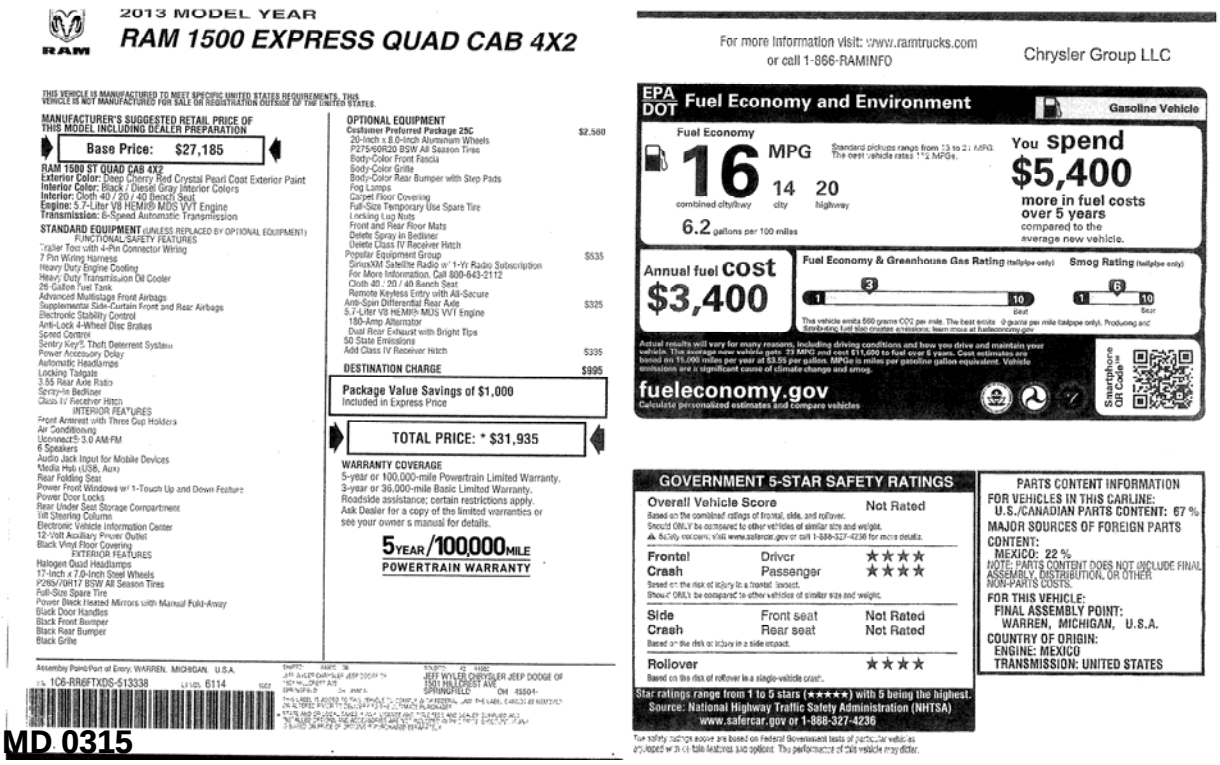
Figure 064: FMVSS No. 301 Static Rollover 90 Degrees

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



2013 MODEL YEAR
RAM 1500 EXPRESS QUAD CAB 4X2

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: $27,185

RAM 1500 ST QUAD CAB 4X2
Exterior Color: Deep Cherry Red Crystal Pearl Coat Exterior Paint
Interior Color: Black / Diesel Gray Interior Colors
Interior: Cloth 40 / 20 / 40 Bench Seat
Engine: 5.7-Liter V8 HEMI® MDS VVT Engine
Transmission: 6-Speed Automatic Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)
FUNCTIONAL/SAFETY FEATURES
Trailer Tow with 4-Pin Connector Wiring
7 Pin Wiring Harness
Heavy Duty Engine Cooling
Heavy Duty Transmission Oil Cooler
26 Gallon Fuel Tank
Advanced Multistage Front Airbags
Supplemental Side-Curtain Front and Rear Airbags
Electronic Stability Control
Anti-Lock 4-Wheel Disc Brakes
Speed Control
Sentry Key® Theft Deterrent System
Power Accessory Delay
Automatic Headlamps
Locking Tailgate
3.55 Rear Axle Ratio
Sentry-In Bedliner
Class IV Receiver Hitch
INTERIOR FEATURES
Front Armrest with Three Cup Holders
Air Conditioning
Uconnect® 3.0 AM/FM
6 Speakers
Audio Jack Input for Mobile Devices
Media Hub (USB, Aux)
Rear Folding Seat
Power Front Windows w/ 1-Touch Up and Down Feature
Power Door Locks
Rear Under Seat Storage Compartment
Tilt Steering Column
Electronic Vehicle Information Center
12-Volt Auxiliary Power Outlet
Black Vinyl Floor Covering
EXTERIOR FEATURES
Halogen Quad Headlamps
17-Inch x 7.0-Inch Steel Wheels
P265/70R17 BSW All Season Tires
Full-Size Spare Tire
Power Black Heated Mirrors with Manual Fold-Away
Black Door Handles
Black Front Bumper
Black Rear Bumper
Black Grille

OPTIONAL EQUIPMENT
Customer Preferred Package 25C $2,580
20-Inch x 8.0-Inch Aluminum Wheels
P275/60R20 BSW All Season Tires
Body-Color Front Fascia
Body-Color Grille
Body-Color Rear Bumper with Step Pads
Fog Lamps
Carpet Floor Covering
Full-Size Temporary Use Spare Tire
Locking Lug Nuts
Front and Rear Floor Mats
Delete Spray in Bedliner
Delete Class IV Receiver Hitch
Popular Equipment Group $535
SiriusXM Satellite Radio w/ 1-Yr Radio Subscription
For More Information, Call 800-643-2112
Cloth 40 / 20 / 40 Bench Seat
Remote Keyless Entry with All-Secure
Anti-Spin Differential Rear Axle $325
5.7-Liter V8 HEMI® MDS VVT Engine
180-Amp Alternator
Dual Rear Exhaust with Bright Tips
50 State Emissions
Add Class IV Receiver Hitch $335

DESTINATION CHARGE $995

Package Value Savings of $1,000
Included in Express Price

TOTAL PRICE: * $31,935

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: WARREN, MICHIGAN U.S.A.
1C6-RR6FTXD5-S13338
JEFF WYLER CHRYSLER JEEP DODGE OF SPRINGFIELD
1501 HILLCREST AVE
SPRINGFIELD OH 45504-

For more information visit: www.ramtrucks.com
or call 1-866-RAMINFO
Chrysler Group LLC

EPA DOT Fuel Economy and Environment
Gasoline Vehicle

Fuel Economy
16 MPG
combined city/hwy
14 city
20 highway
6.2 gallons per 100 miles
Standard pickups range from 13 to 21 MPG. The best vehicle rated 1**2 MPG*.

You spend $5,400 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $3,400

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 3
Smog Rating (tailpipe only) 6
This vehicle emits 560 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and

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 $11,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.55 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 QR Code

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated
Based on the combined ratings of frontal, side, and rollover.
Should ONLY be compared to other vehicles of similar size and weight.
Safety concern: visit www.safercar.gov or call 1-888-327-4236 for more details.

Frontal Crash — Driver ★★★★ — Passenger ★★★★
Based on the risk of injury in a frontal impact.
Should ONLY be compared to other vehicles of similar size and weight.

Side Crash — Front seat Not Rated — Rear seat Not Rated
Based on the risk of injury in a side impact.

Rollover ★★★★
Based on the risk of rollover in a single-vehicle crash.

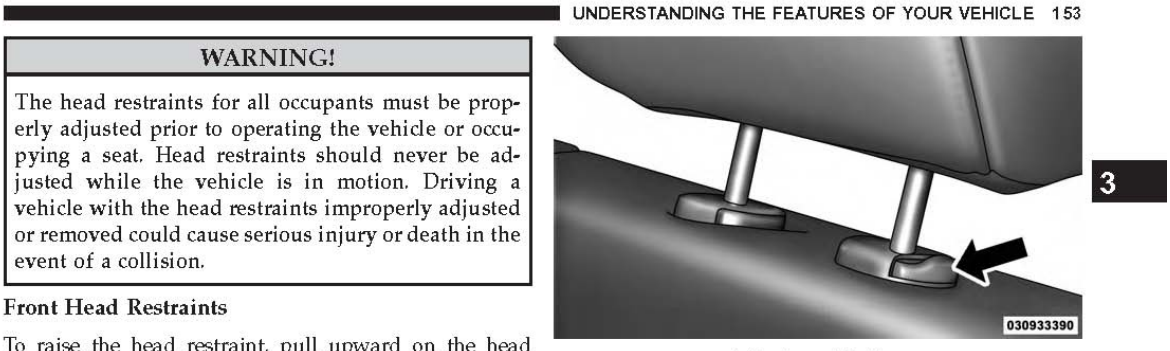
Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

The safety ratings above are based on Federal Government tests of particular vehicles and models sold in the United States and Canada. The performance of your vehicle may differ.

PARTS CONTENT INFORMATION
FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 67 %
MAJOR SOURCES OF FOREIGN PARTS CONTENT:
MEXICO: 22 %
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
WARREN, MICHIGAN, U.S.A.
COUNTRY OF ORIGIN:
ENGINE: MEXICO
TRANSMISSION: UNITED STATES

MD 0315

Figure 069: Monroney Label



UNDERSTANDING THE FEATURES OF YOUR VEHICLE 153

WARNING!

The head restraints for all occupants must be properly adjusted prior to operating the vehicle or occupying a seat. Head restraints should never be adjusted while the vehicle is in motion. Driving a vehicle with the head restraints improperly adjusted or removed could cause serious injury or death in the event of a collision.

Front Head Restraints

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, press the adjustment button, located on the base of the head restraint, and push downward on the head restraint.

Adjustment Button

3

MD 0315

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

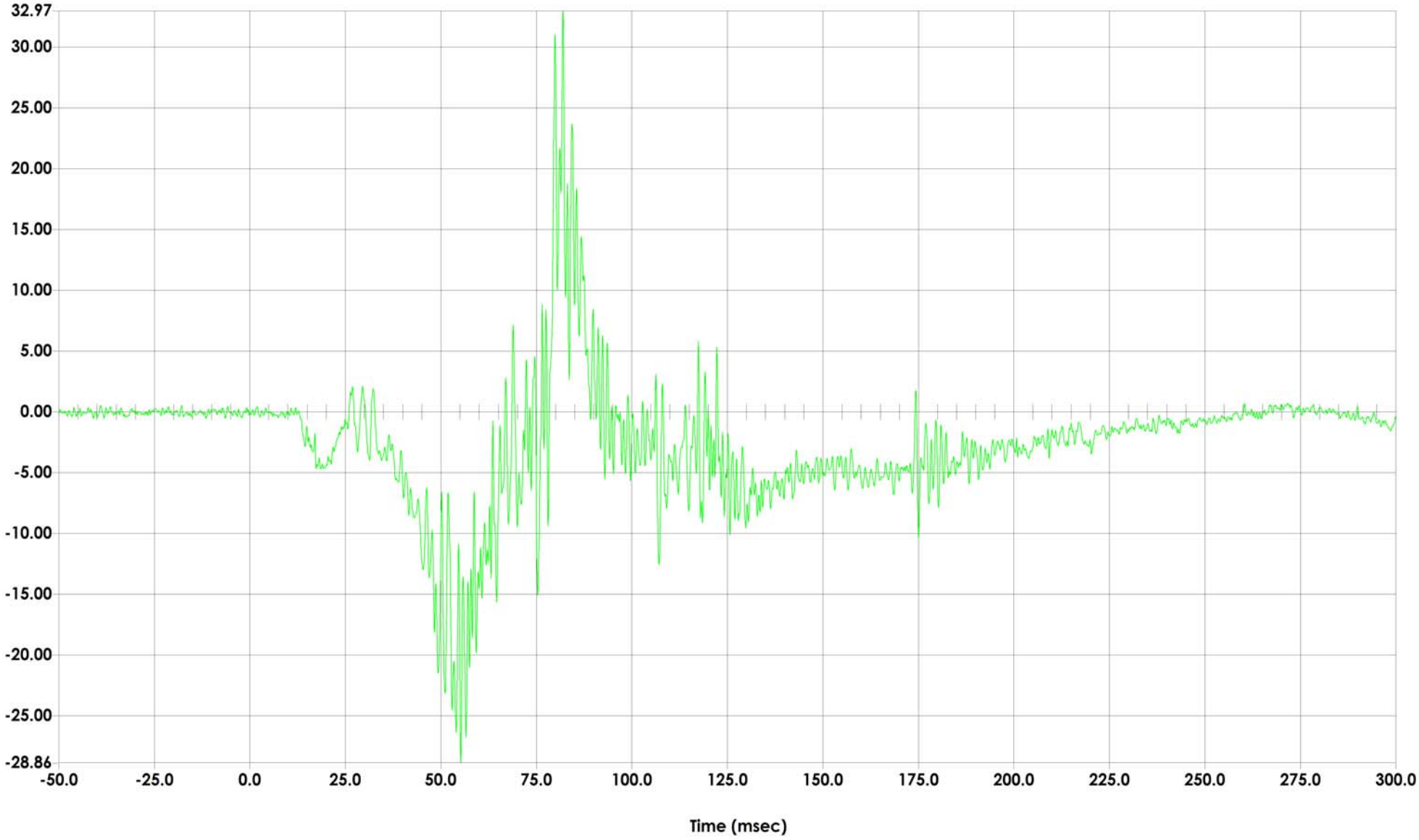
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	001
Units	G'S

Max	32.97	G'S
	82.00	msec
Min	-28.86	G'S
	55.28	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Head Acceleration (X) Primary vs. Time

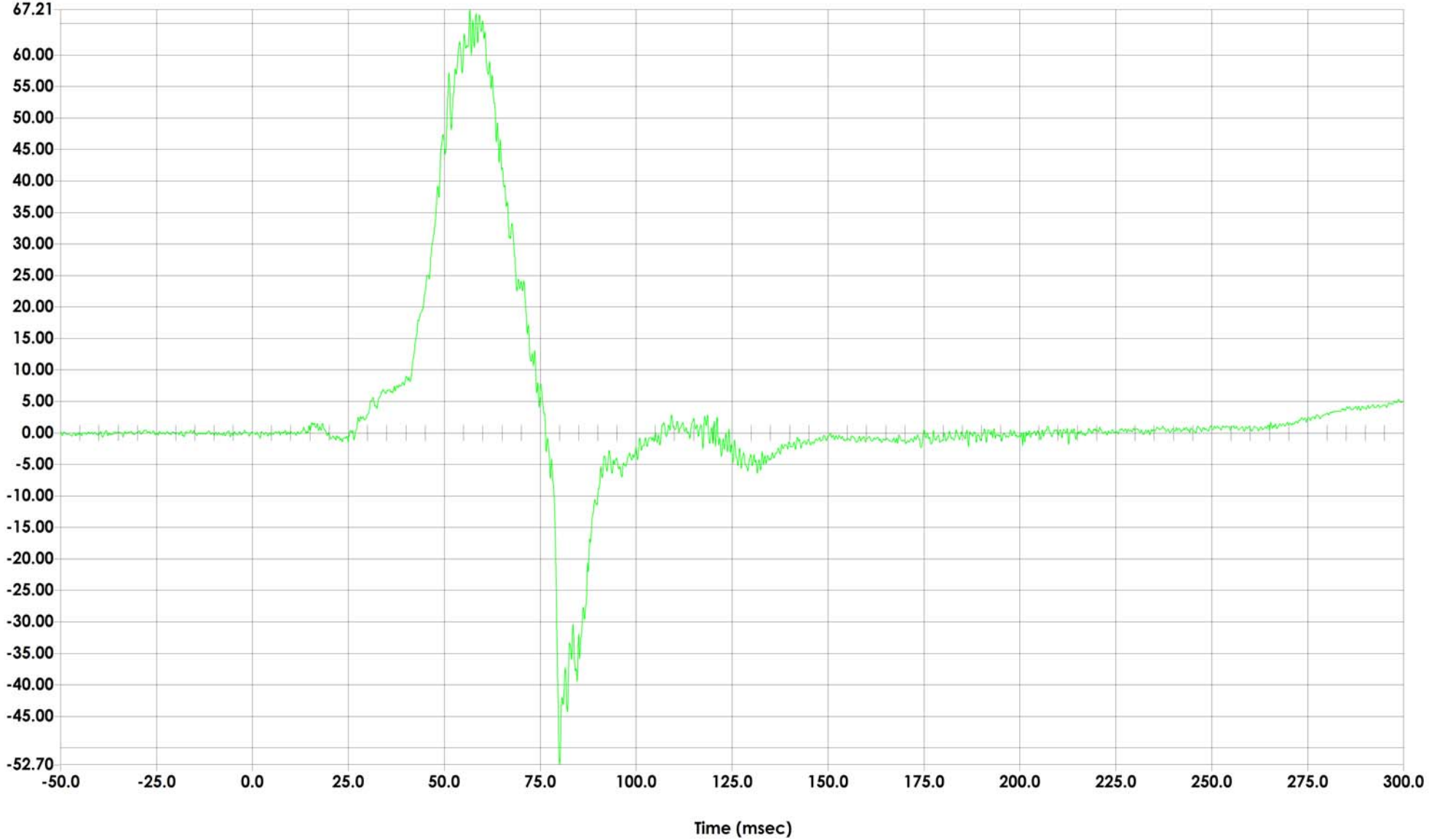


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	002
Units	G'S

Max	67.21	G'S
	56.64	msec
Min	-52.70	G'S
	80.08	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Head Acceleration (Y) Primary vs. Time

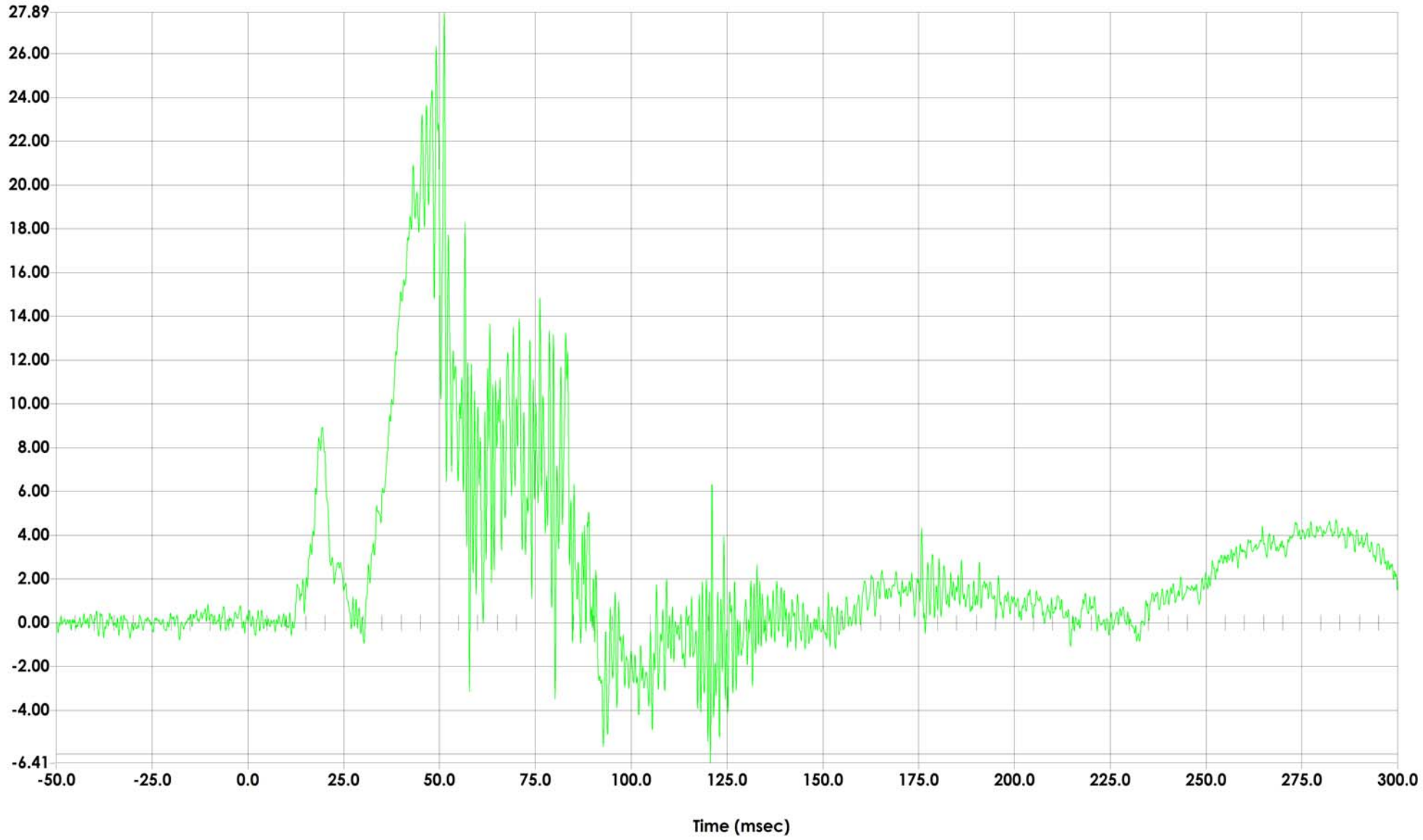


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	003
Units	G'S

Max	27.89	G'S
	51.20	msec
Min	-6.41	G'S
	120.72	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Head Acceleration (Z) Primary vs. Time

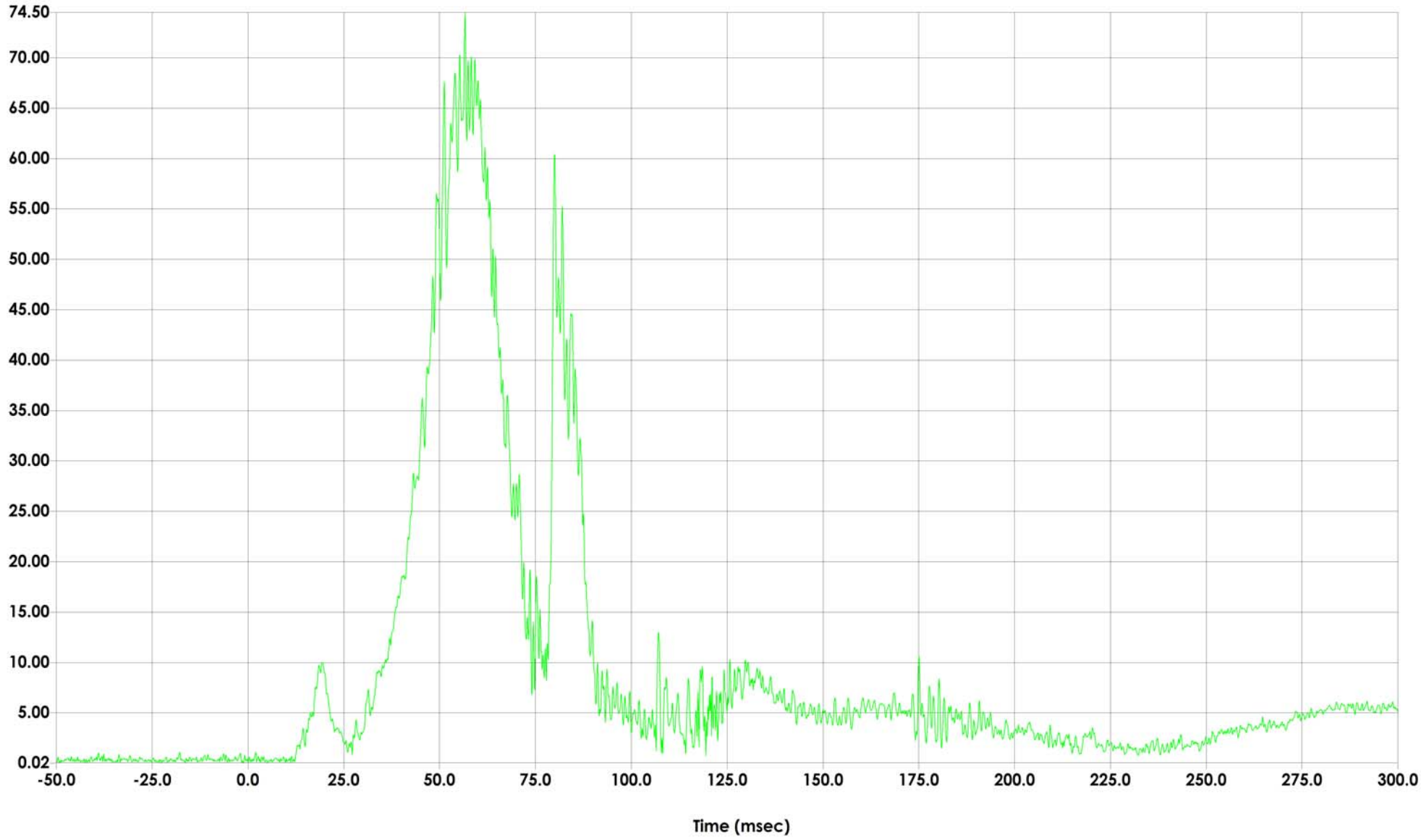


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC1000
Plot number	043
Units	G'S

Max	74.50	G'S
	56.64	msec
Min	0.02	G'S
	5.12	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Head Resultrant Acceleration Primary vs. Time

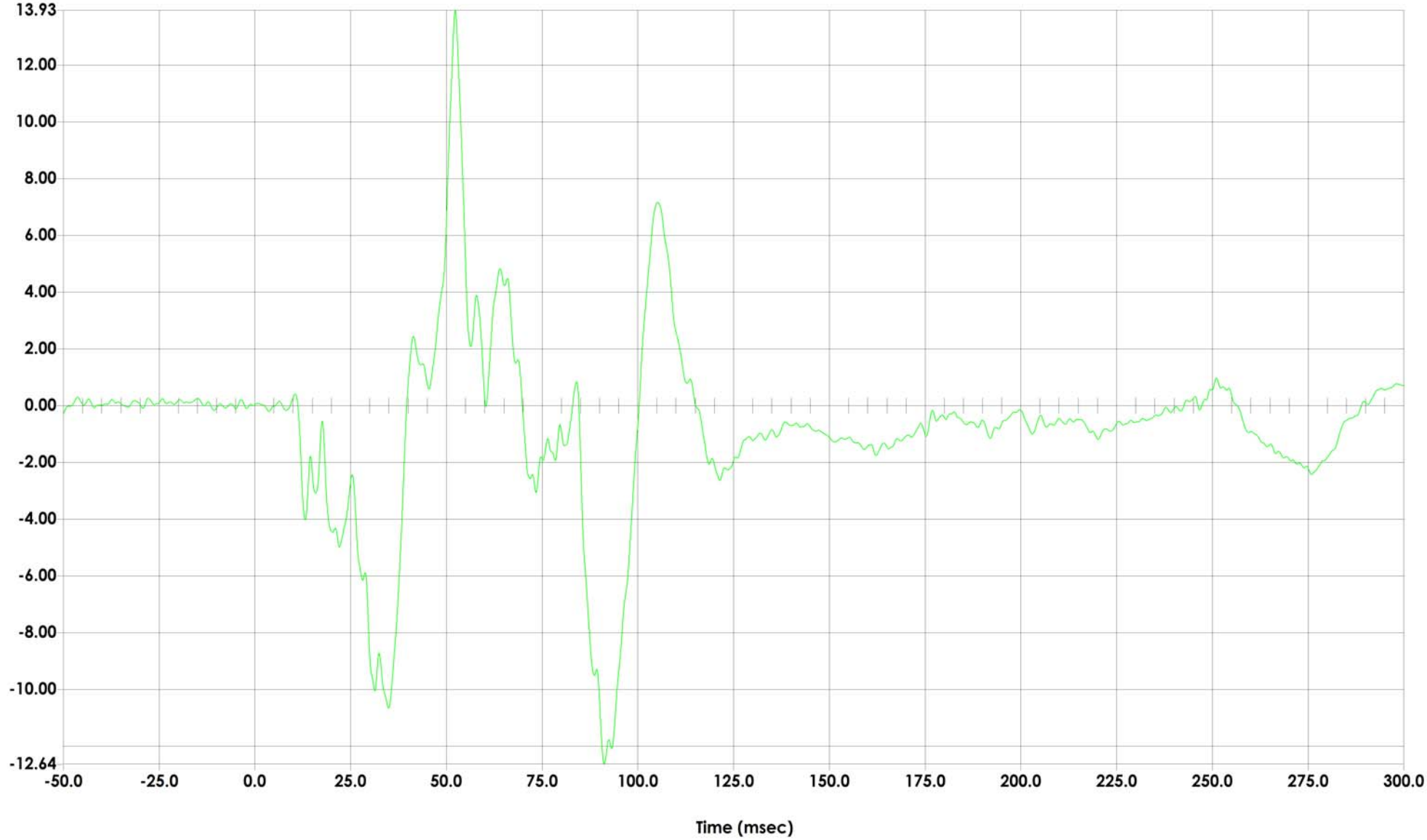


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	012
Units	G'S

Max	13.93	G'S
	52.32	msec
Min	-12.64	G'S
	91.20	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Lower Spine T12 Acceleration (X) vs. Time

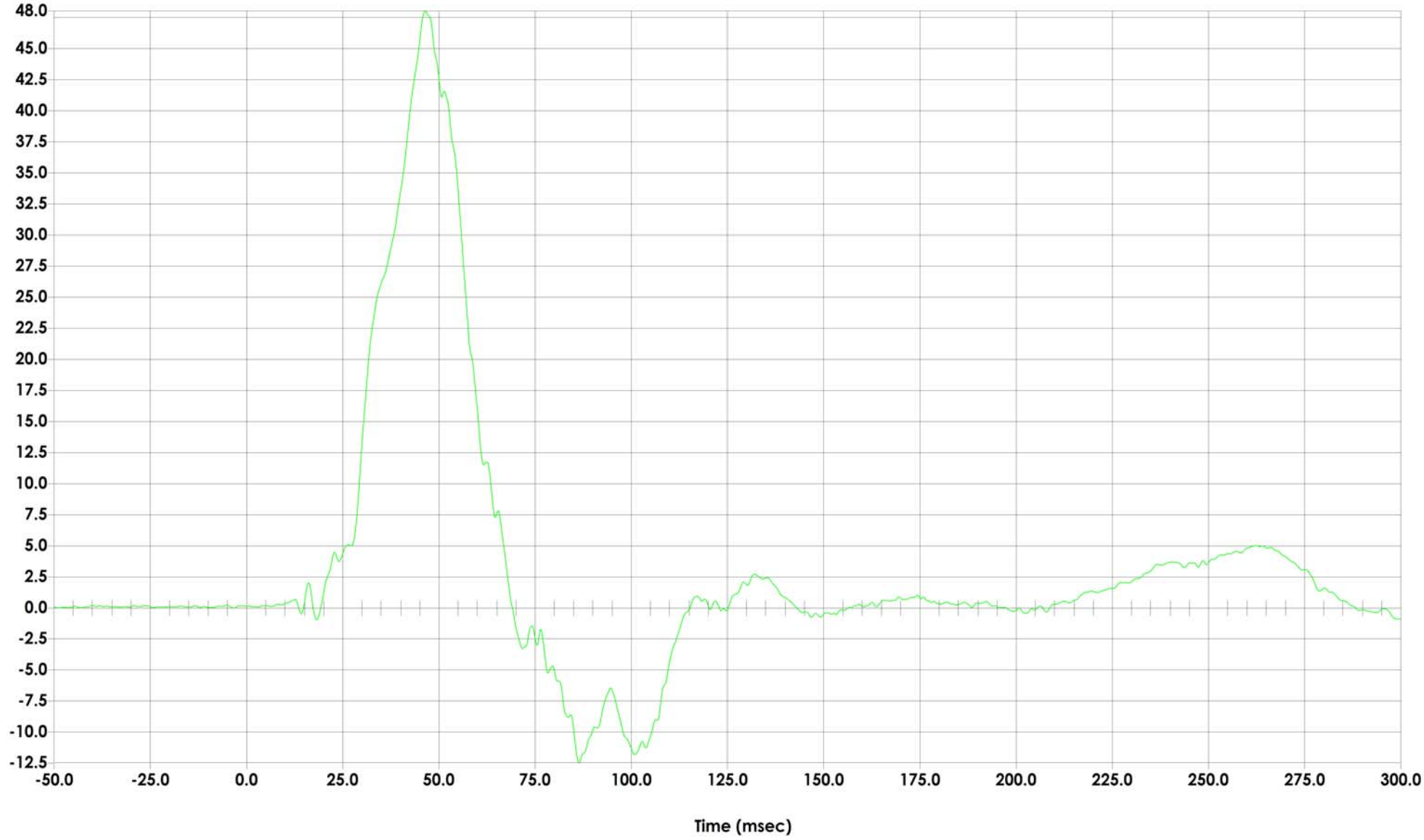


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	013
Units	G'S

Max	48.02	G'S
	46.40	msec
Min	-12.48	G'S
	86.40	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Lower Spine T12 Acceleration (Y) vs. Time

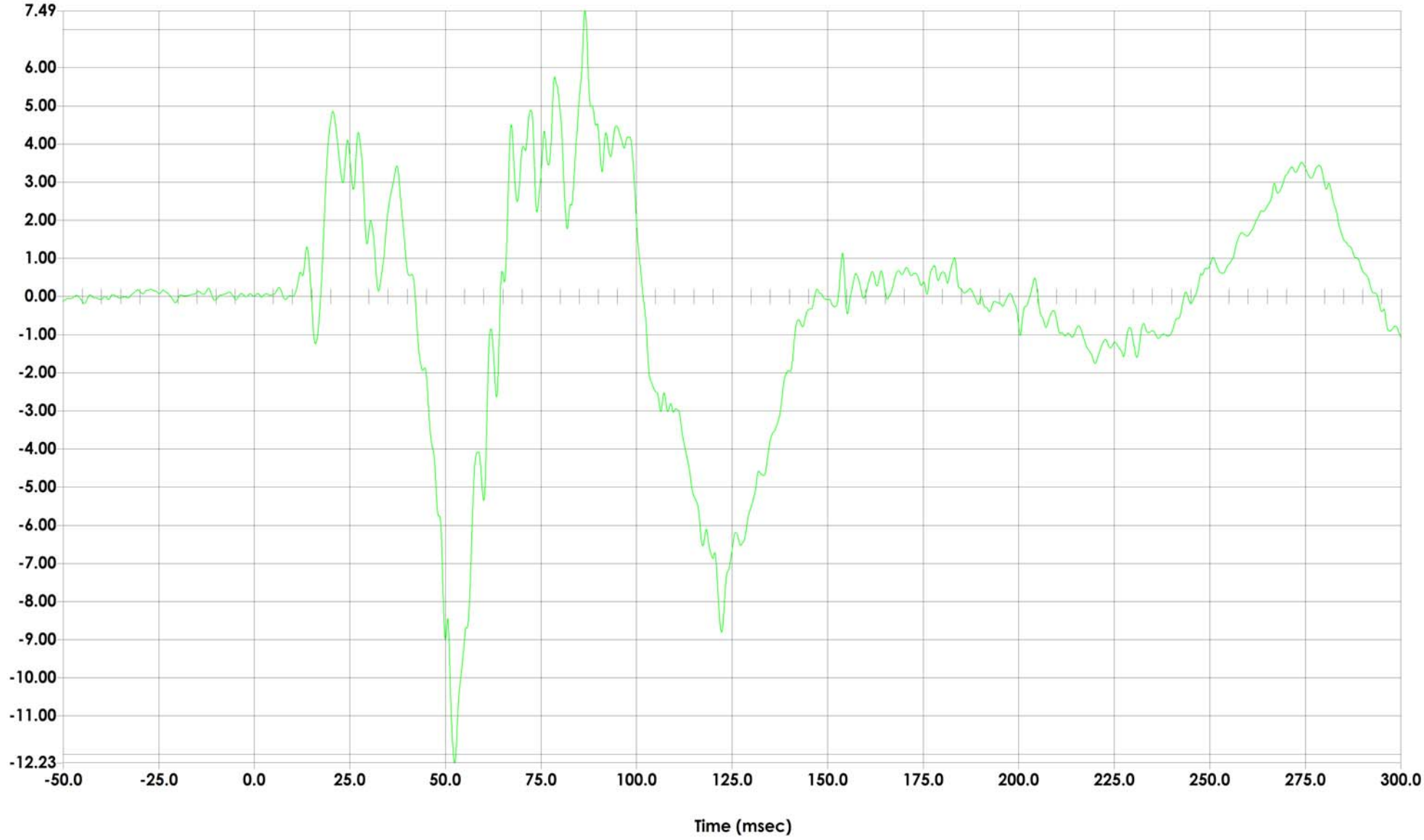


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	014
Units	G'S

Max	7.49	G'S
	86.48	msec
Min	-12.23	G'S
	52.40	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Lower Spine T12 Acceleration (Z) vs. Time

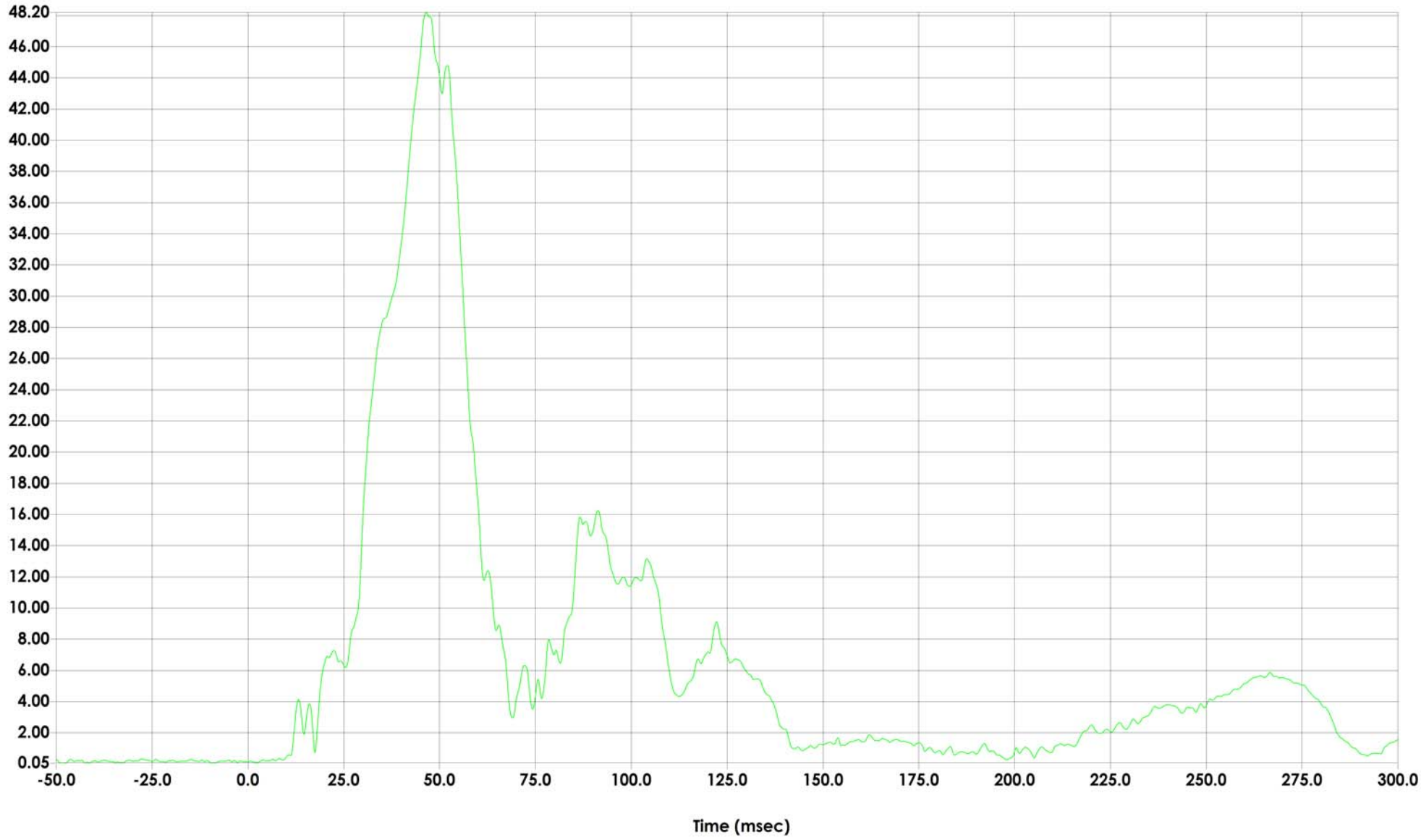


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC180
Plot number	044
Units	G'S

Max	48.20	G'S
	46.48	msec
Min	0.05	G'S
	-42.48	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Lower Spine T12 Resultant Acceleration vs. Time

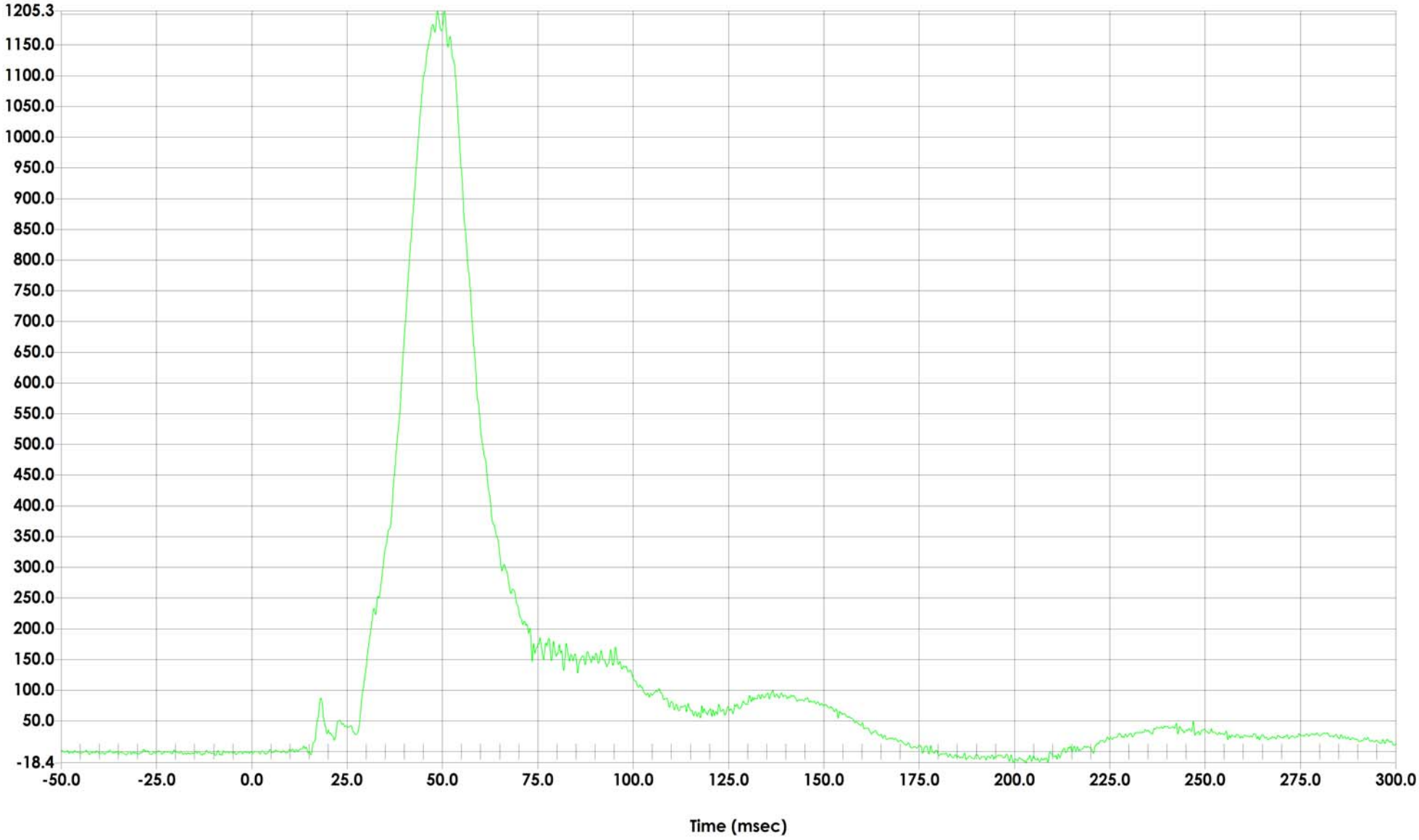


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC600
Plot number	015
Units	NWT

Max	1205.27	NWT
	50.48	msec
Min	-18.37	NWT
	203.04	msec

MEDICAL COLLEGE OF WISCONSIN

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

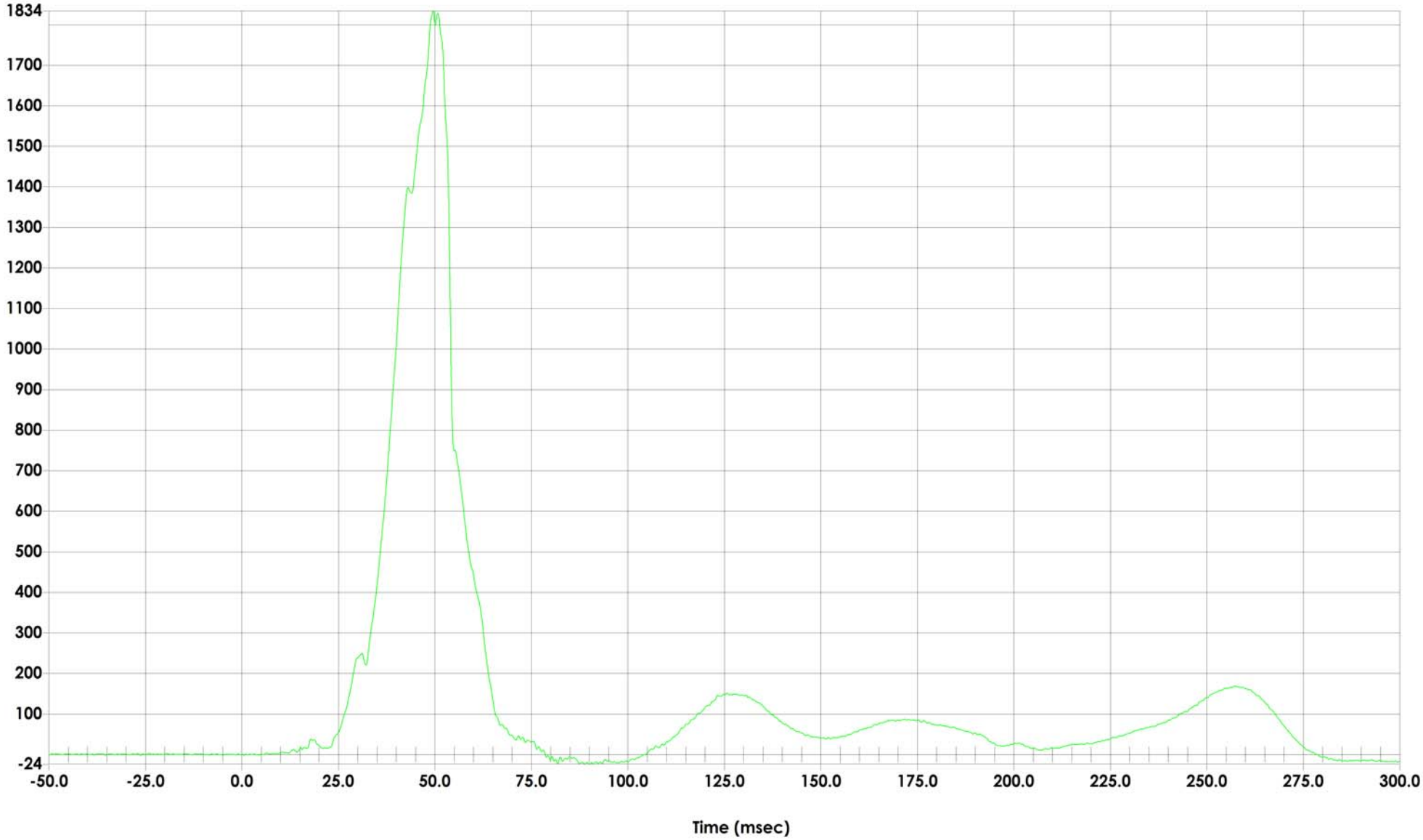


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC600
Plot number	016
Units	NWT

Max	1833.60	NWT
	49.52	msec
Min	-24.06	NWT
	90.08	msec

MEDICAL COLLEGE OF WISCONSIN

Driver Acetabulum Force on Impact Side (Y) vs. Time

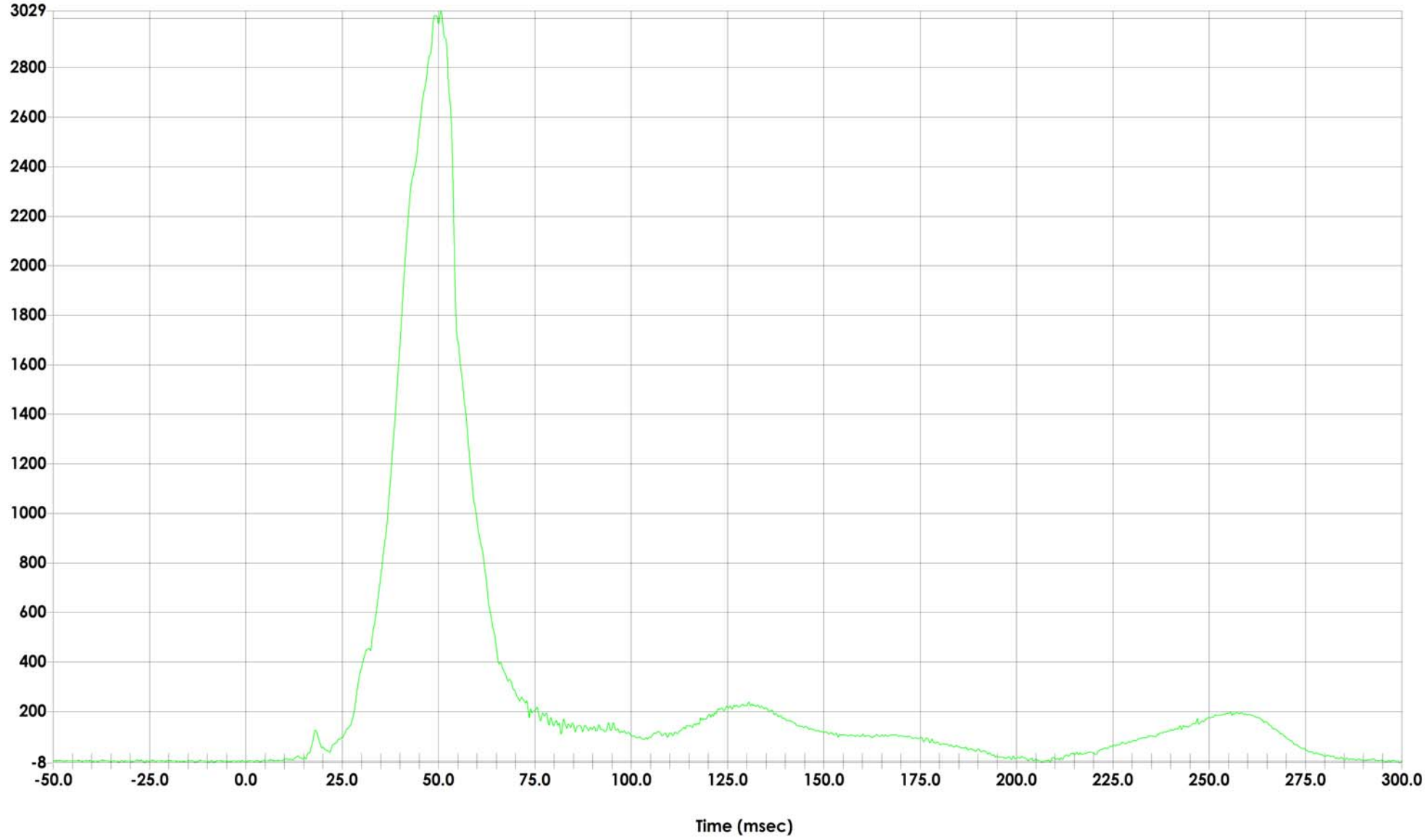


Test ID	MD 0315
Sampling Rate (Hz)	12500
Filter	CFC600
Plot number	045
Units	NWT

Max	3028.81	NWT
	50.64	msec
Min	-7.91	NWT
	299.44	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 2 & 3

TEST PARAMETER	SPEC.	PRE		POST	
Date	-	12-5-12		12-17-12	
Sequential Test Number	-	2		3	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature (°C)	**20.6-22.2**	21.1	Pass	20.8	Pass
Relative Humidity (%)	**10-70**	22.6	Pass	42.7	Pass
Sitting Height	**772 – 788**	778	Pass	778	Pass
Shoulder Pivot Height	**437 – 453**	439	Pass	440	Pass
H-Point Height	**79 – 89**	85	Pass	83	Pass
H-Point from Seat Back	**141 – 151**	146	Pass	150	Pass
Shoulder Pivot from Backline	**97 – 107**	103	Pass	100	Pass
Thigh Clearance	**119 – 135**	123	Pass	123	Pass
Head Breadth	**140 – 148**	142	Pass	143	Pass
Head Back from Backline	**40 – 46**	42	Pass	44	Pass
Head Depth	**178 – 188**	182	Pass	181	Pass
Head Circumference	**541 – 551**	544	Pass	545	Pass
Buttock to Knee Length	**514 – 540**	523	Pass	527	Pass
Popliteal Height	**343 – 369**	351	Pass	347	Pass
Knee Pivot to Floor Height	**392 – 409**	402	Pass	400	Pass
Buttock Popliteal Length	**416 – 442**	430	Pass	426	Pass
Chest Depth w/o Jacket	**195 – 211**	210	Pass	208	Pass
Foot Length	**216 – 232**	223	Pass	224	Pass
Hip Breadth	**313 – 323**	319	Pass	319	Pass
Arm Length	**249 – 259**	253	Pass	254	Pass
Knee Joint to Seat Back	**477 – 493**	483	Pass	490	Pass
Shoulder Width	**341 – 357**	350	Pass	350	Pass
Foot Width	**78 – 94**	82	Pass	87	Pass
Chest Circumference w/Jacket	**851 – 881**	855	Pass	860	Pass
Waist Circumference	**761 – 791**	775	Pass	775	Pass

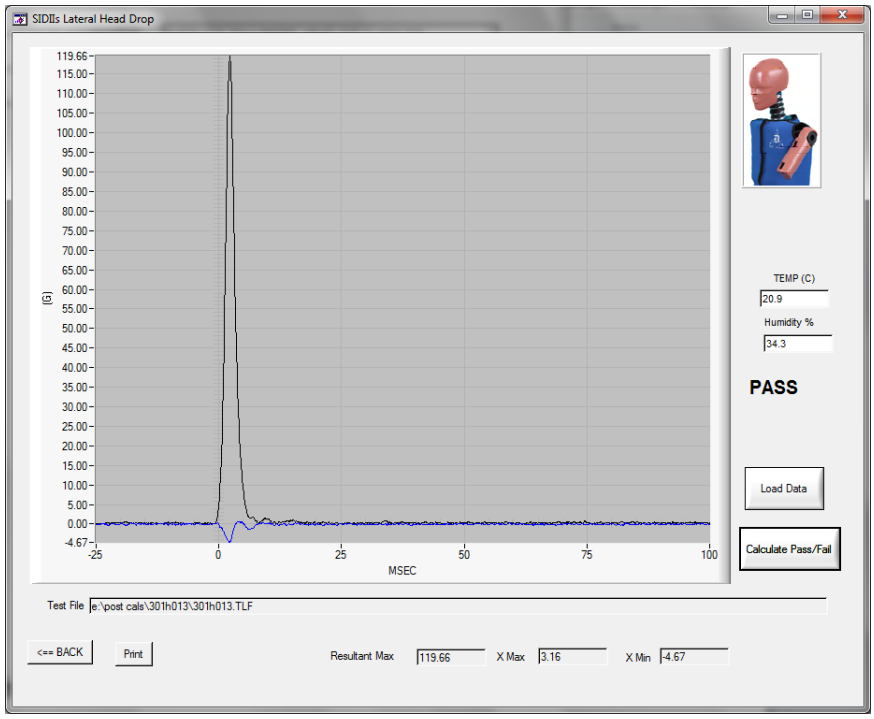
TABLE 2
HEAD DROP TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-1-12		12-14-12	
Sequential Test Number		-	2		3	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Head Soak Time (min)		**≥ 240**	240	Pass	240	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	20.9	Pass	21.1	Pass
	Min		20.8	Pass	20.9	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	34.3	Pass	35.7	Pass
	Min		34.2	Pass	31.2	Pass
Temperature – During Test (°C)		**20.6-22.2**	20.9	Pass	21.1	Pass
Humidity – During Test (%)		**10-70**	34.3	Pass	35.7	Pass
Peak Head Resultant Acceleration (G)		**115-137**	119.7	Pass	120.5	Pass
Peak Head X Acceleration (G)		**<15**	3.2	Pass	4.4	Pass
Unimodal (Oscillation) (Yes/No)		**<15%**	-	Yes	-	Yes

TABLE 2
HEAD DROP TEST (CONTINUED)

PRE-TEST



POST-TEST

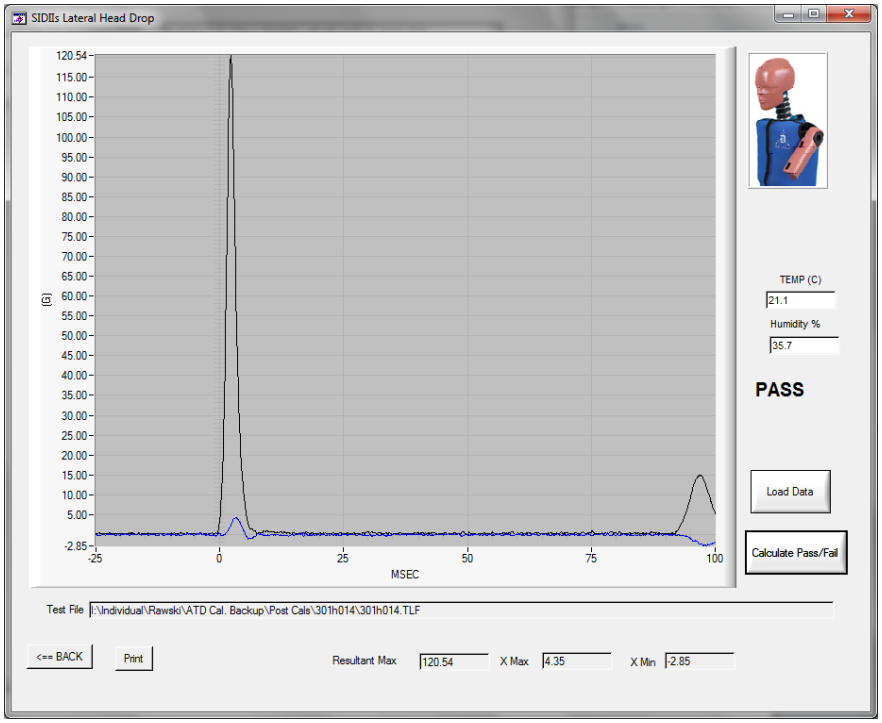


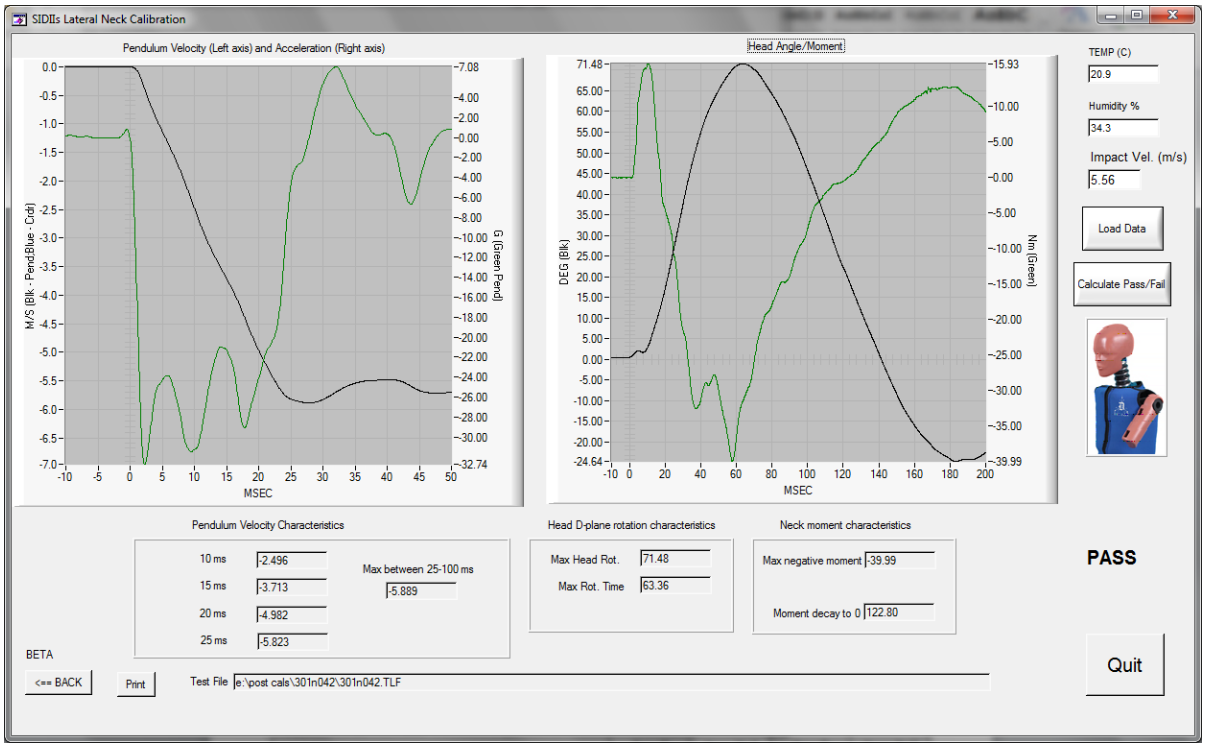
TABLE 3
LATERAL NECK PENDULUM TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-1-12		12-14-12	
Sequential Test Number		-	2		3	
			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**	20.9	Pass	21.1	Pass
	Min		20.8	Pass	20.9	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	34.3	Pass	35.7	Pass
	Min		34.2	Pass	31.2	Pass
Temperature – During Test (°C)		**20.6-22.2**	20.9	Pass	21.1	Pass
Humidity – During Test (%)		**10-70**	34.3	Pass	35.7	Pass
Pendulum Velocity (m/s)		**5.51-5.63**	5.56	Pass	5.56	Pass
Pendulum Deceleration (G)	10 ms	**2.20-2.80**	2.50	Pass	2.65	Pass
	15 ms	**3.30-4.10**	3.71	Pass	3.95	Pass
	20 ms	**4.40-5.40**	4.98	Pass	5.35	Pass
	25 ms	**5.40-6.10**	5.82	Pass	5.76	Pass
	25-100 ms	**5.50-6.20**	5.89	Pass	5.79	Pass
Maximum D-Plane rotation (deg)		**71-81**	71.5	Pass	73.0	Pass
Time of Maximum D-Plane Rotation (ms)		**50-70**	63.4	Pass	62.4	Pass
Peak Occ. Condyle Moment (Nm)		**36-44**	40.0	Pass	41.1	Pass
Time of Moment Decay (ms)		**102-126**	122.8	Pass	119.5	Pass

TABLE 3
LATERAL NECK PENDULUM TEST (CONTINUED)

PRE-TEST



POST-TEST

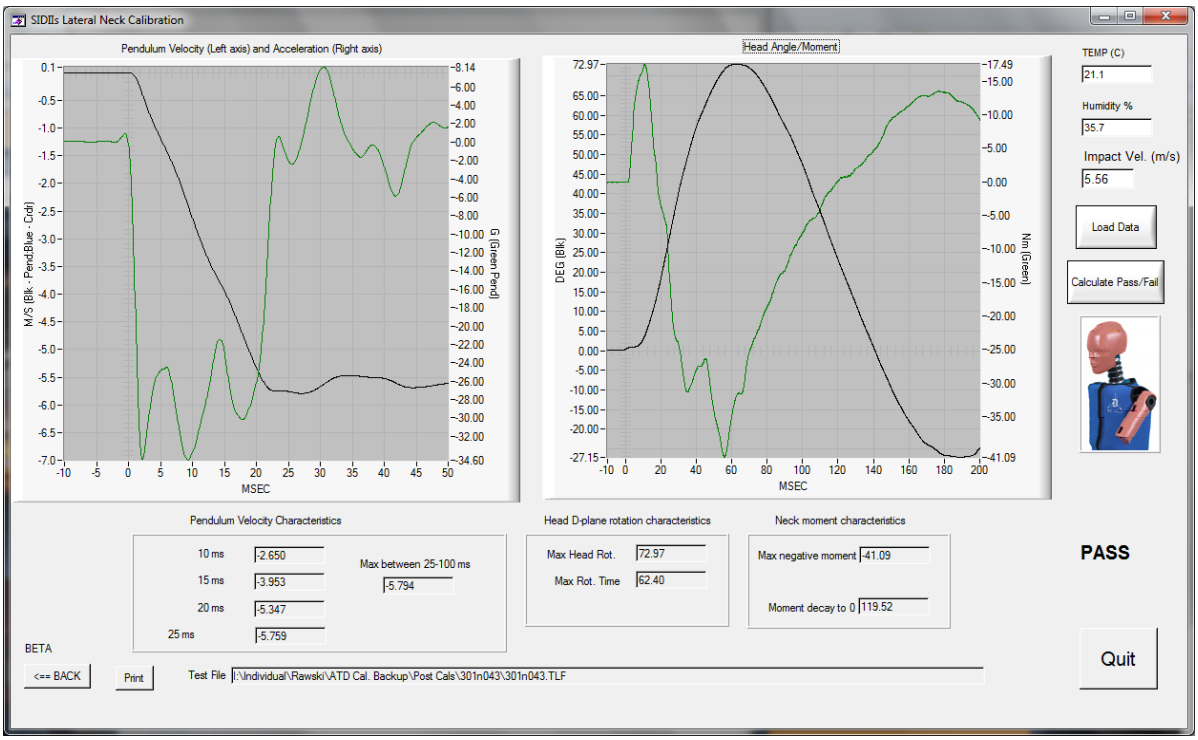


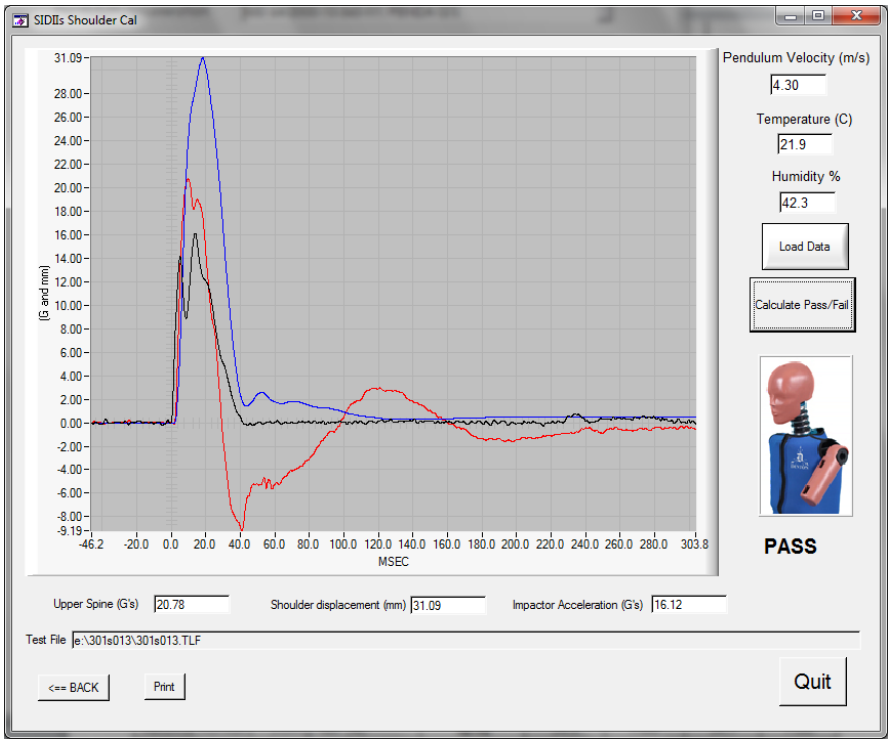
TABLE 4
SHOULDER IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-3-12		12-17-12	
Sequential Test Number		-	2		3	
			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	21.0	Pass
	Min		20.8	Pass	20.8	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	42.3	Pass	34.5	Pass
	Min		34.1	Pass	31.3	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.9	Pass	21.0	Pass
Relative Humidity – During Test (%)		**10-70**	42.3	Pass	34.5	Pass
Impactor Velocity (m/s)		**4.2-4.4**	4.30	Pass	4.30	Pass
Peak Shoulder Deflection (mm)		**28-37**	31.1	Pass	31.4	Pass
Peak Lateral Spine (T1) Acceleration Y (G)		**17-22**	20.8	Pass	20.4	Pass
Peak Impactor Acceleration (G)		**13-18**	16.1	Pass	16.2	Pass

TABLE 4
SHOULDER IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

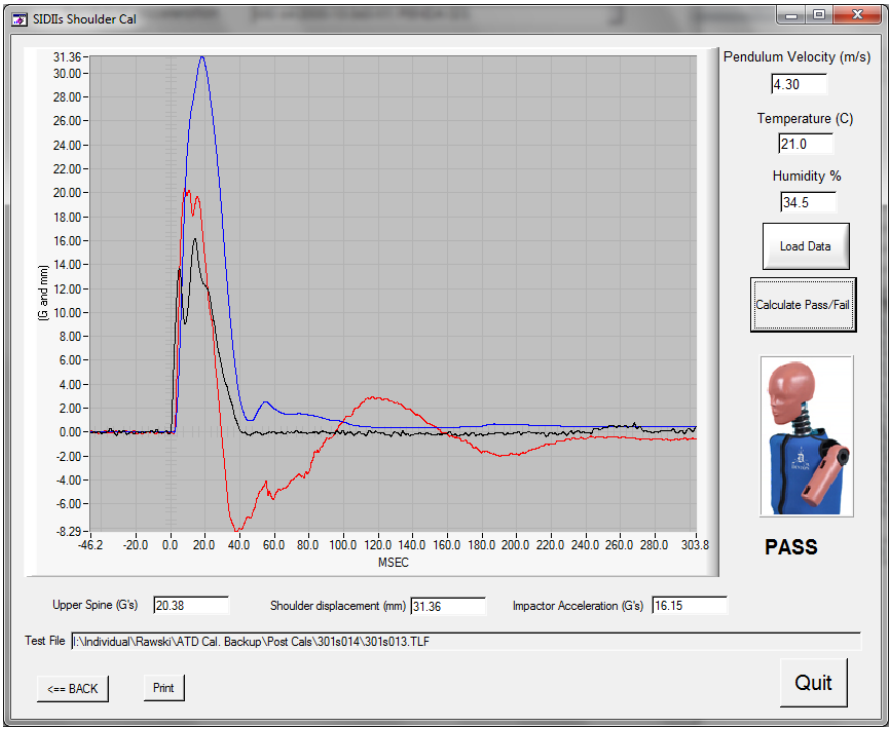


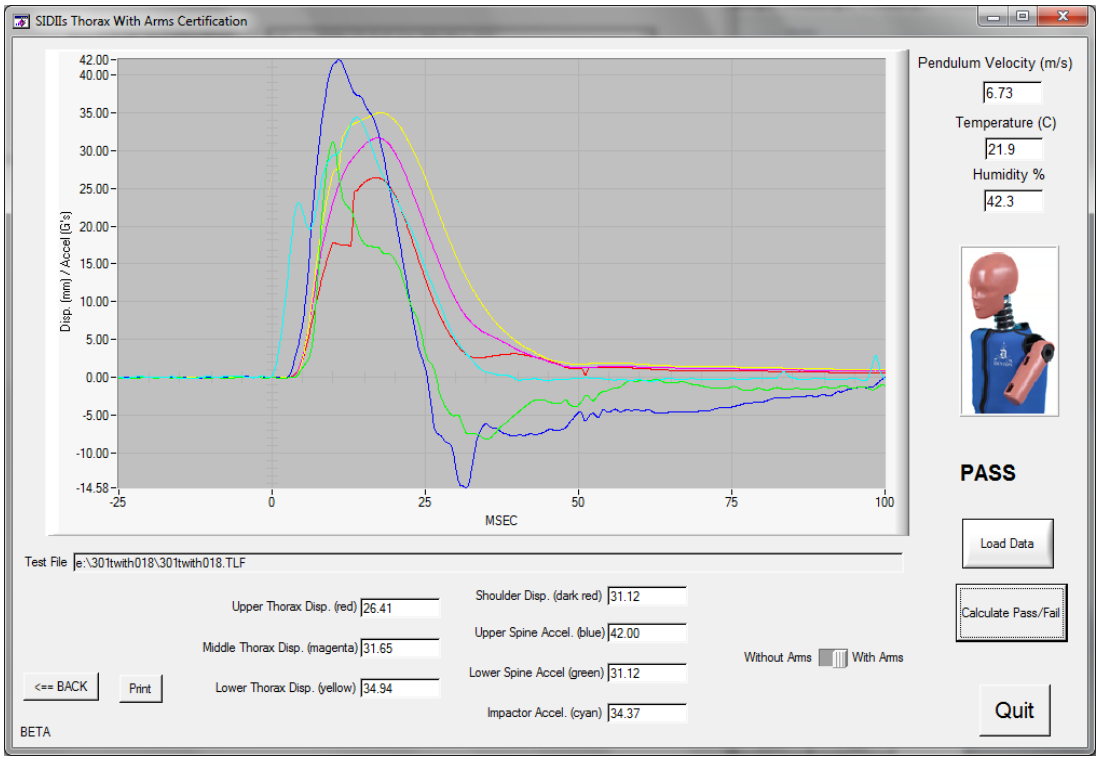
TABLE 5
THORAX (WITH ARM) IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-4-12		12-17-12	
Sequential Test Number		-	2		3	
			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	21.0	Pass
	Min		20.8	Pass	20.8	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	42.3	Pass	34.5	Pass
	Min		34.1	Pass	31.3	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.9	Pass	21.0	Pass
Relative Humidity – During Test (%)		**10-70**	42.3	Pass	34.5	Pass
Impactor Velocity (m/s)		**6.6-6.8**	6.73	Pass	6.73	Pass
Peak Shoulder Deflection (mm)		**31-40**	31.1	Pass	32.6	Pass
Peak Upper Rib Deflection (mm)		**25-32**	26.4	Pass	28.0	Pass
Peak Middle Rib Deflection (mm)		**30-36**	31.7	Pass	32.0	Pass
Peak Lower Rib Deflection (mm)		**32-38**	34.9	Pass	34.0	Pass
Peak Upper Spine (T1) Acceleration Y (G)		**34-43**	42.0	Pass	42.6	Pass
Peak Lower Spine (T12) Acceleration Y (G)		**29-37**	31.1	Pass	32.6	Pass
Peak Impactor Acceleration (G)		**30-36**	34.4	Pass	34.6	Pass

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

PRE-TEST



POST-TEST

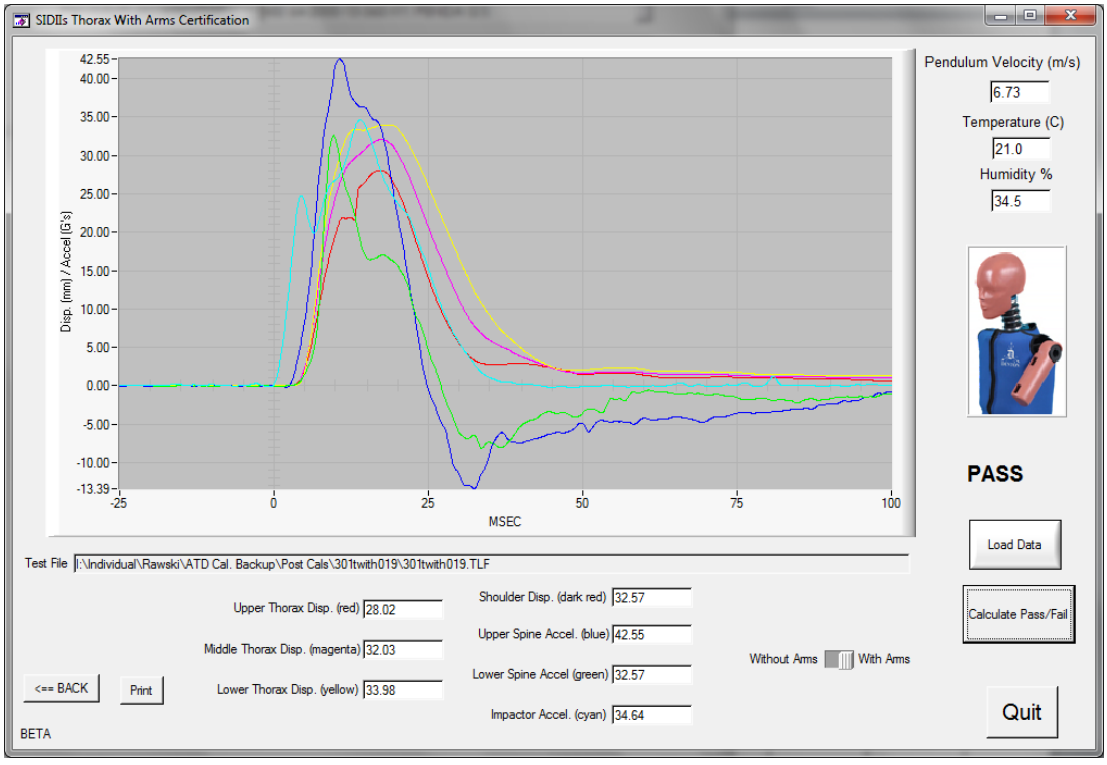


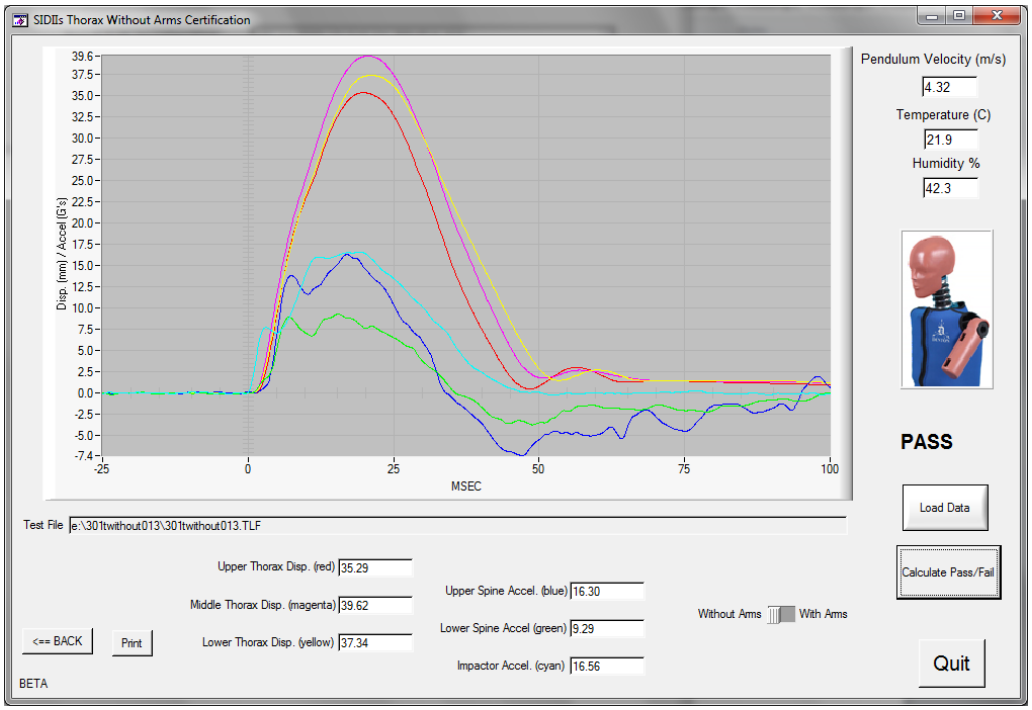
TABLE 6
THORAX (WITHOUT ARM) IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-4-12		12-17-12	
Sequential Test Number		-	2		3	
			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	21.0	Pass
	Min		20.8	Pass	20.8	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	42.3	Pass	34.5	Pass
	Min		34.2	Pass	31.3	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.9	Pass	21.0	Pass
Relative Humidity – During Test (%)		**10-70**	42.3	Pass	34.5	Pass
Impactor Velocity (m/s)		**4.2-4.4**	4.32	Pass	4.32	Pass
Peak Upper Rib Deflection (mm)		**32-40**	35.3	Pass	33.1	Pass
Peak Middle Rib Deflection (mm)		**39-45**	39.6	Pass	40.0	Pass
Peak Lower Rib Deflection (mm)		**35-43**	37.3	Pass	40.0	Pass
Peak Upper Spine (T1) Acceleration Y (G)		**13-17**	16.3	Pass	15.5	Pass
Peak Lower Spine (T12) Acceleration Y (G)		**7-11**	9.3	Pass	9.9	Pass
Peak Impactor Acceleration (G)		**14-18**	16.6	Pass	16.6	Pass

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

PRE-TEST



POST-TEST

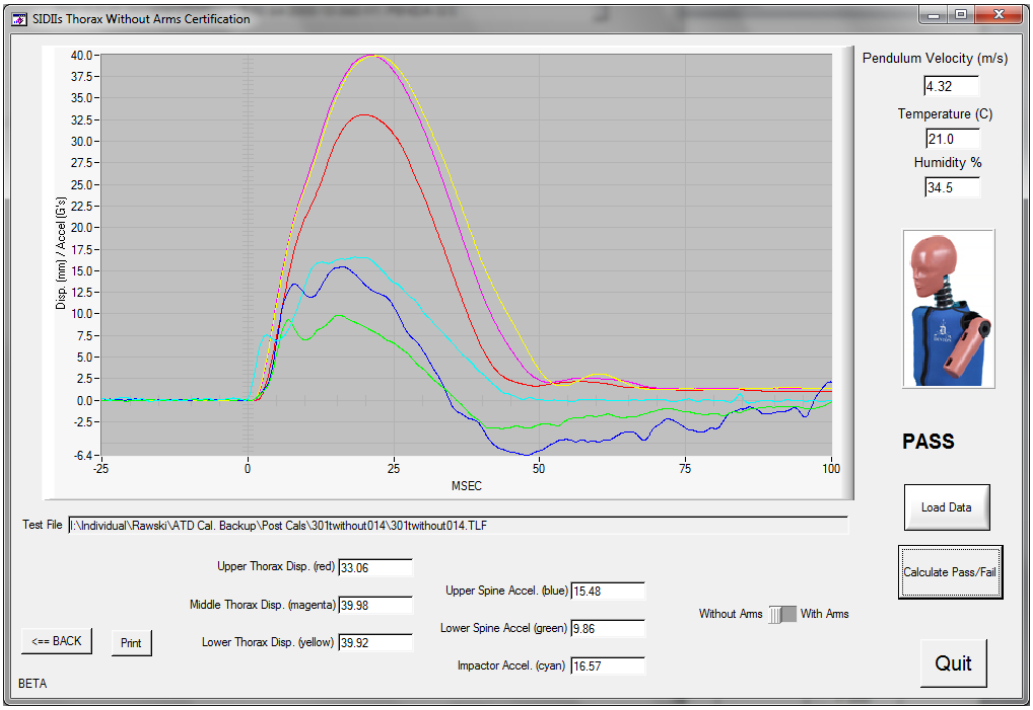


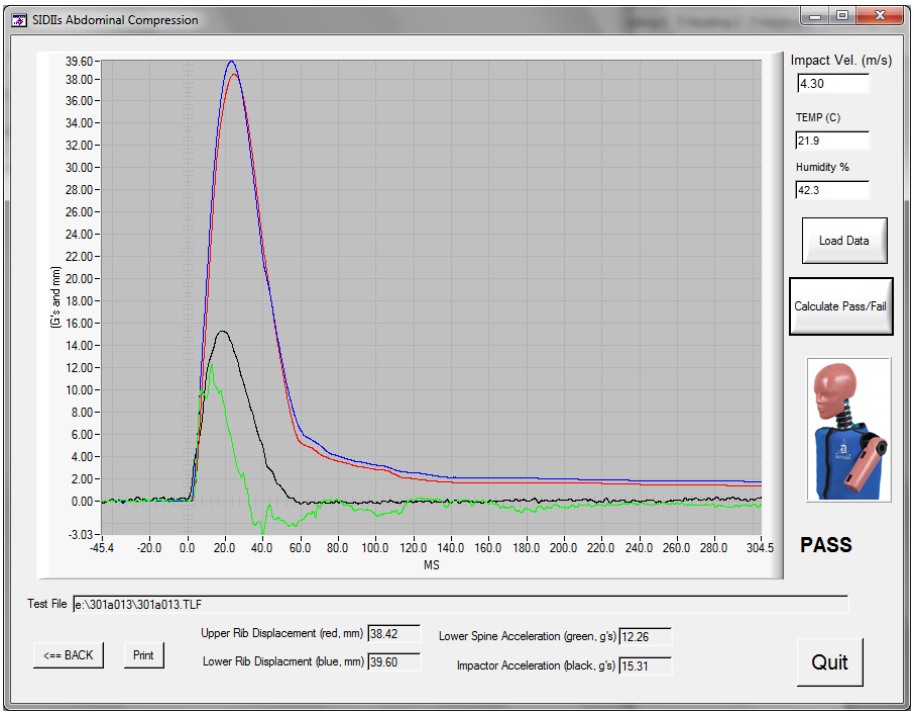
TABLE 7
ABDOMEN IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-4-12		12-17-12	
Sequential Test Number		-	2		3	
			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	21.0	Pass
	Min		20.8	Pass	20.8	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	42.3	Pass	34.5	Pass
	Min		34.1	Pass	31.3	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.9	Pass	21.0	Pass
Relative Humidity – During Test (%)		**10-70**	42.3	Pass	34.5	Pass
Impactor Velocity (m/s)		**4.2-4.4**	4.30	Pass	4.30	Pass
Peak Upper Abdominal Rib Deflection (mm)		**36-47**	38.4	Pass	38.7	Pass
Peak Lower Abdominal Rib Deflection (mm)		**33-44**	39.6	Pass	37.0	Pass
Peak Lower Spine (T12) Acceleration Y (G)		**9-14**	12.3	Pass	11.5	Pass
Peak Impactor Acceleration (G)		**12-16**	15.3	Pass	15.5	Pass

TABLE 7
ABDOMEN IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

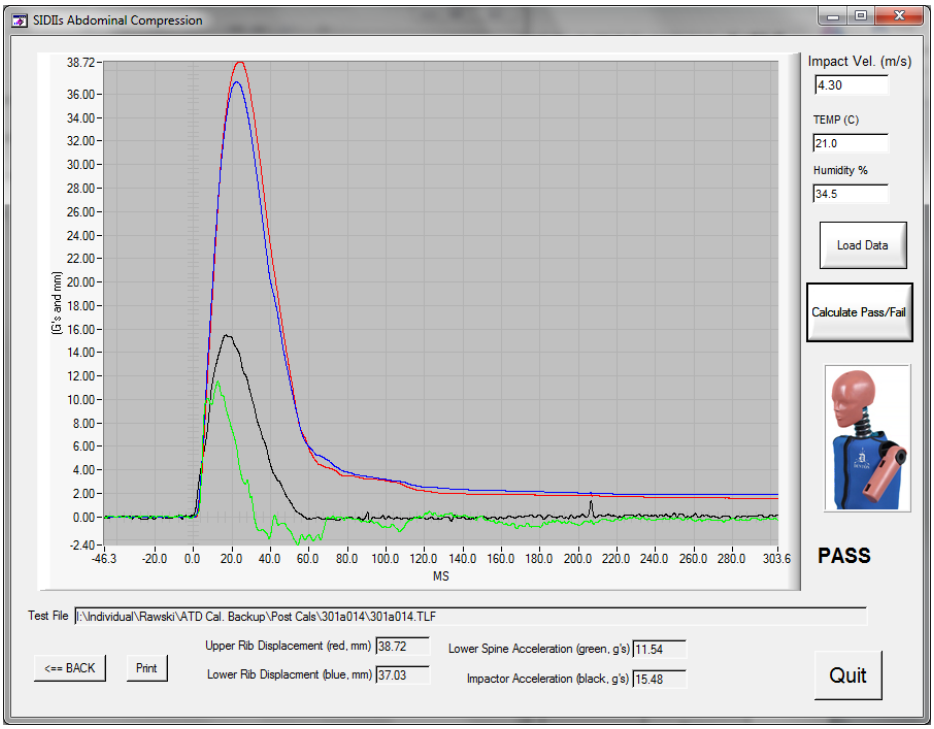
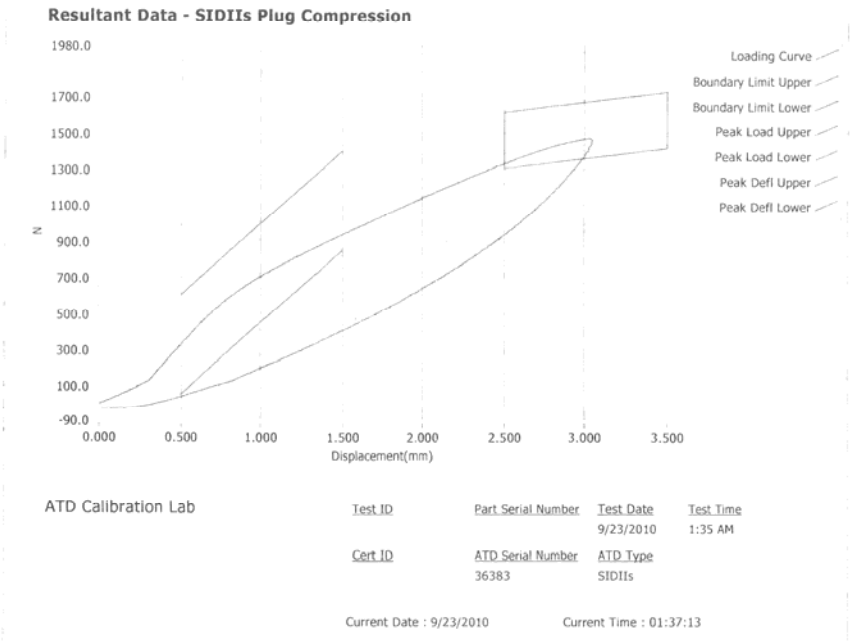


TABLE 8
PELVIS PLUG QUASI-STATIC TEST

PRE-TEST



POST-TEST

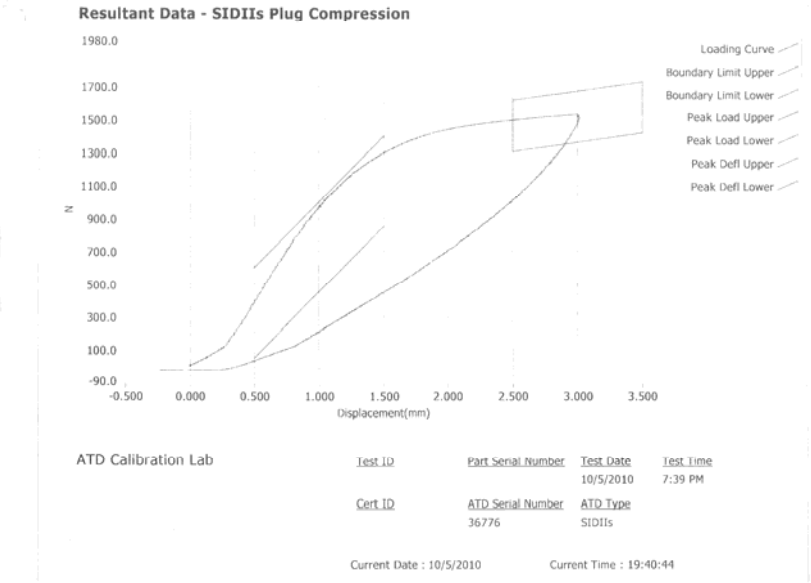


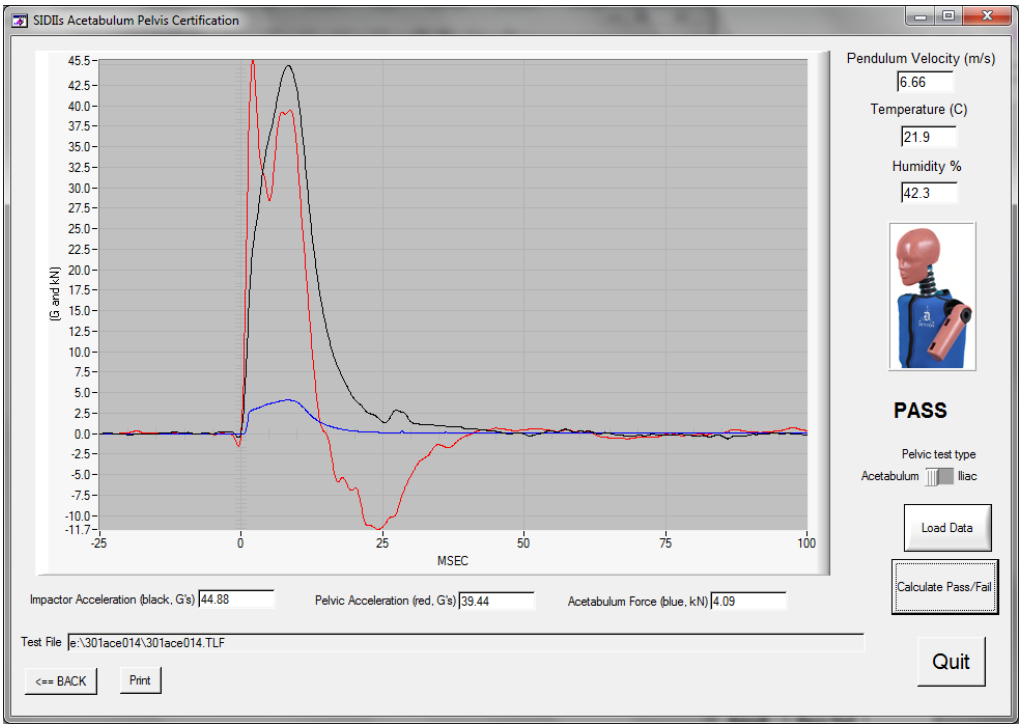
TABLE 9
PELVIS ACETABULUM IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-4-12		12-17-12	
Sequential Test Number		-	2		3	
			Result	**Pass/Fail**	**Results**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.9	Pass	21.0	Pass
	Min		20.8	Pass	20.8	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	42.3	Pass	34.5	Pass
	Min		34.1	Pass	31.3	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.9	Pass	21.0	Pass
Humidity – During Test (%)		**10-70**	42.3	Pass	34.5	Pass
Impactor Velocity (m/s)		**6.6-6.8**	6.66	Pass	6.65	Pass
Peak Impactor Acceleration (G)		**38-47**	44.9	Pass	45.0	Pass
Pelvis Acceleration Y after 6ms (G)		**34-42**	39.4	Pass	40.0	Pass
Peak Acetabulum Force (kN)		**3.60-4.30**	4.1	Pass	4.00	Pass
Pelvis Plug Serial No. 36383 (Pre) No. 36776 (Post)						

TABLE 9
PELVIS ACETABULUM IMPACT TEST (CONTINUED)

PRE-TEST



POST-TEST

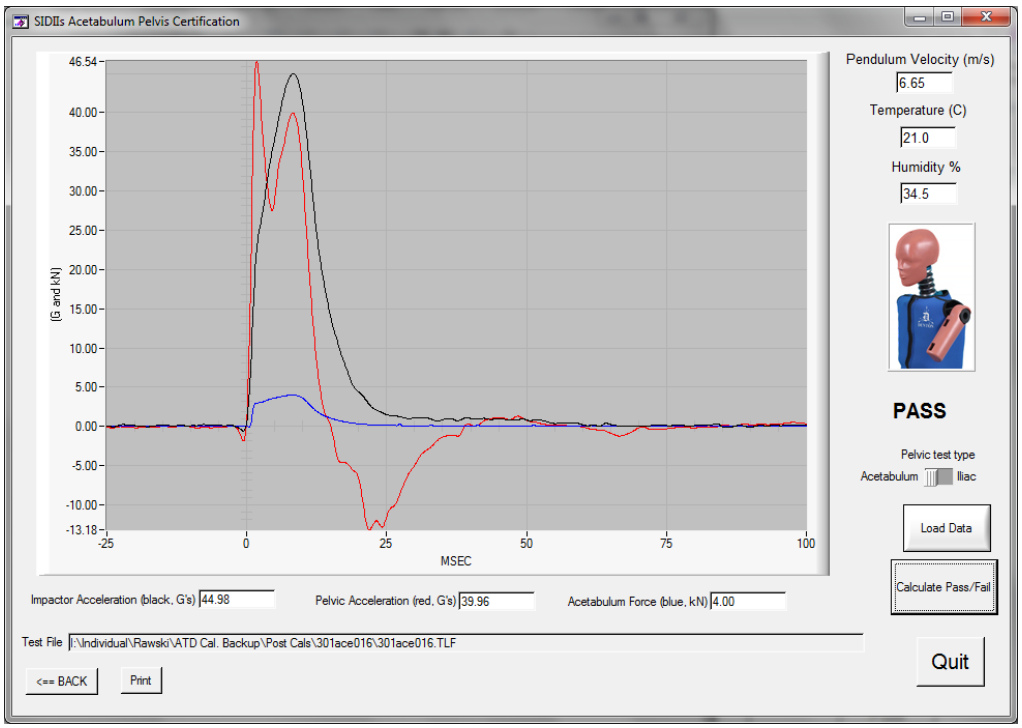


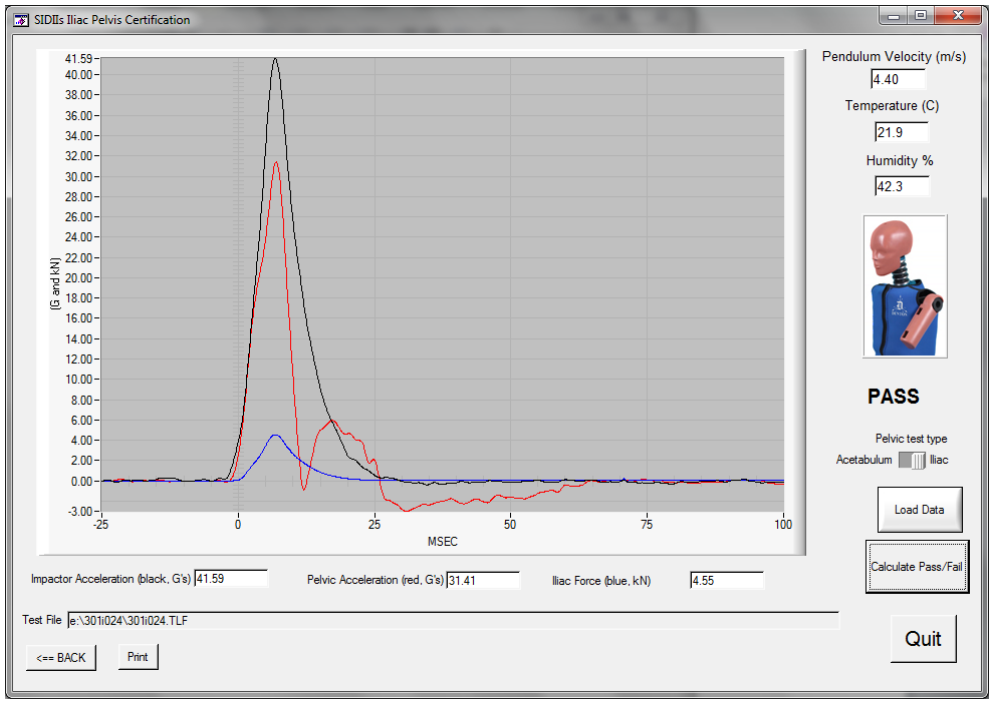
TABLE 10
PELVIS ILIAC IMPACT TEST

SIDIIs Serial Number 301 Test Sequences 2 & 3

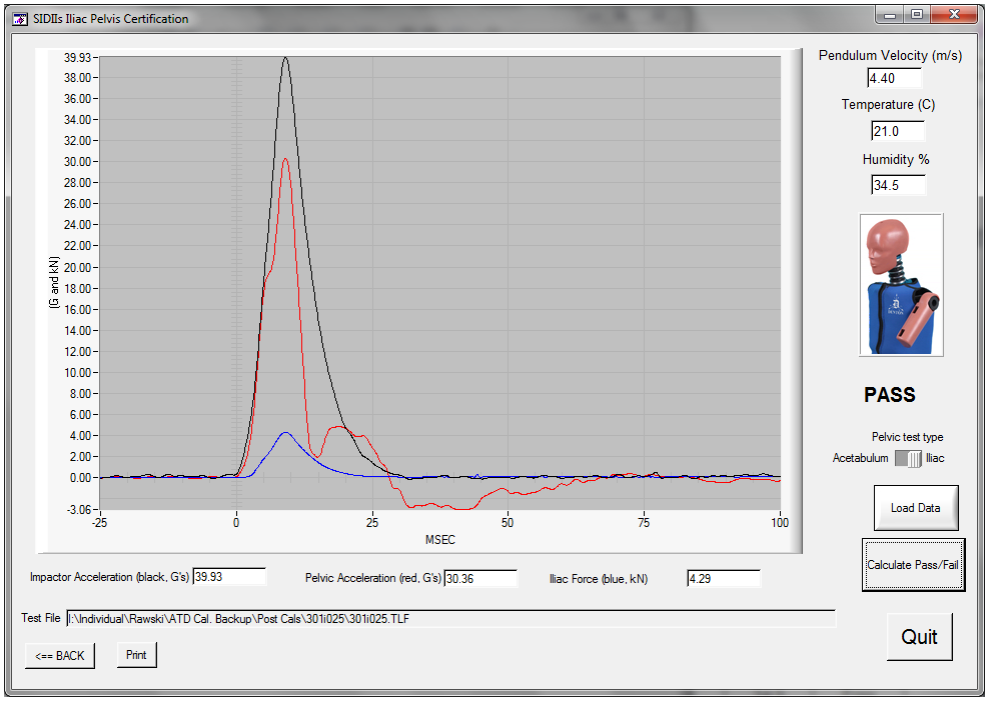
TEST PARAMETER		SPEC.	PRE		POST	
Date		-	12-4-12		12-17-12	
Sequential Test Number		-	2		3	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Dummy Soak Time (min)		**≥ 180**	180	Pass	180	Pass
Temperature(°C) – During Soak	Max	**20.6-22.2**	21.9	Pass	21.0	Pass
	Min		20.8	Pass	20.8	Pass
Humidity(%) – During Soak	Max	**10.0-70.0**	42.3	Pass	34.5	Pass
	Min		34.1	Pass	31.3	Pass
Temperature – During Test (°C)		**20.6-22.2**	21.9	Pass	21.0	Pass
Humidity – During Test (%)		**10-70**	42.3	Pass	34.5	Pass
Pendulum Velocity (m/s)		**4.2-4.4**	4.4	Pass	4.4	Pass
Peak Impactor Acceleration (G)		**36-46**	41.6	Pass	40.0	Pass
Pelvis Acceleration Y (G)		**29-39**	31.4	Pass	30.4	Pass
Peak Iliac Force Y (N)		**4.00-5.20**	4.6	Pass	4.3	Pass
Pelvis Plug Serial No. 36383 (Pre) No. 36776 (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	J43444	Endevco	15/JUNE/2011
			Y	J43739	Endevco	15/JUNE/2011
			Z	P21673	Endevco	15/JUNE/2011
			X_R	J43808	Endevco	15/JUNE/2011
			Y_R	12136	Endevco	15/JUNE/2011
			Z_R	P59119	Endevco	15/JUNE/2011
Displacement Potentiometers	Thoracic Rib	Upper	Y	1142	FTSS	16/APR/2012
		Middle	Y	014	Servo	27/OCT/2012
		Lower	Y	1155	FTSS	16/APR/2012
	Abdominal Rib	Upper	Y	1205	FTSS	16/APR/2012
		Lower	Y	1237	FTSS	16/APR/2012
Lower Spine Accelerometers (T_{12})			X	B13098	Endevco	15/JUNE/2011
			Y	J22318	Endevco	15/JUNE/2011
			Z	J22189	Endevco	15/JUNE/2011
Acetabulum Load Cell			Y	IF-520_115	FTSS	20/APR/2012
Iliac Wing Load Cell			Y	IF-520_DI4284	FTSS	19/APR/2012
Pelvis Plug (Struck-Side)				36383	FTSS	23/SEP/11
Pelvis Plug (Non-Struck-Side)				36403	FTSS	23/SEP/11

TABLE 2 - VEHICLE INSTRUMENTATION				
		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A010890	MSI	15/OCT/2012
Vehicle Center of Gravity	Y	A011335	MSI	15/OCT/2012
Vehicle Center of Gravity	Z	98F98E11-K07	Endevco	15/OCT/2012
Left Floor Sill	Y	A086988	MSI	15/OCT/2012
A-Pillar Sill	Y	A086977	MSI	15/OCT/2012
A-Pillar Low	Y	A086968	MSI	15/OCT/2012
A-Pillar Mid	Y	A011655	MSI	15/OCT/2012
B-Pillar Sill	Y	A086980	MSI	15/OCT/2012
B-Pillar Low	Y	A086966	MSI	15/OCT/2012
B-Pillar Mid	Y	P13491	Endevco	15/OCT/2012
Driver Seat	Y	P59120	Endevco	15/OCT/2012
Engine Top	X	12110	Endevco	15/OCT/2012
Engine Top	Y	A011334	MSI	15/OCT/2012
Firewall	Y	A007267	MSI	15/OCT/2012
Right Roof	Y	DT54J	Endevco	15/OCT/2012
Right Floor Sill	Y	J43797	Endevco	15/OCT/2012
Rear Floorpan	X	P21785	Endevco	15/OCT/2012
Rear Floorpan	Y	P21608	Endevco	15/OCT/2012

TABLE 3 - POLE INSTRUMENTATION				
		Serial Number	Manufacturer	Calibration Date
Load Cell 1	Y	332420	Interface	30/MAY/12
Load Cell 2	Y	332407	Interface	30/MAY/12
Load Cell 3	Y	332400	Interface	30/MAY/12
Load Cell 4	Y	352865	Interface	30/MAY/12
Load Cell 5	Y	332403	Interface	30/MAY/12
Load Cell 6	Y	334238	Interface	30/MAY/12
Load Cell 7	Y	330824	Interface	30/MAY/12
Load Cell 8	Y	330834	Interface	30/MAY/12