

FINAL REPORT NUMBER: SPNCAP-TRC-13-001

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**General Motors LLC
2013 Chevrolet Silverado 2500 2WD LT EXT
NHTSA NUMBER: MD0115**

**PREPARED BY:
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Report Date: October 12, 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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Report Approved By: 
Margaret Susan, Project Manager

Approval Date: October 12, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

Technical Report Documentation Page

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16. Abstract A 32.2 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject vehicle, a 2013 Chevrolet Silverado 2500 2WD LT EXT 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. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on September 27, 2012. The impact velocity was 32.1 km/h, and the ambient temperature at the struck side of the target vehicle at the time of impact was 22° C. The test vehicle's post-test maximum crush was 546 mm at Level 3. The test or target vehicle's performance is given below: <table border="1"> <thead> <tr> <th></th><th>Unit</th><th>Threshold</th><th>Front SID-IIs</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆):</td><td>NA</td><td>1000</td><td>11870</td></tr> <tr> <td>Resultant Lower Spine Acceleration:</td><td>g's</td><td>82</td><td>73.3</td></tr> <tr> <td>Total Pelvic Force: (sum of acetabular and iliac forces)</td><td>N</td><td>5525</td><td>3683.4</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>38</td><td>44.1</td></tr> <tr> <td>Maximum Abdomen Rib Deflection</td><td>mm</td><td>45</td><td>48.8</td></tr> </tbody> </table> The door struck by the pole did not totally separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					Unit	Threshold	Front SID-IIs	Head Injury Criteria (HIC ₃₆):	NA	1000	11870	Resultant Lower Spine Acceleration:	g's	82	73.3	Total Pelvic Force: (sum of acetabular and iliac forces)	N	5525	3683.4	Maximum Thoracic Rib Deflection	mm	38	44.1	Maximum Abdomen Rib Deflection	mm	45	48.8
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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, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																									
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SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY13 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00125. The purpose of this test is to generate comparative side impact performance in a 2013 Chevrolet Silverado 2500 2WD LT EXT Pickup manufactured by General Motors LLC. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated August 30, 2011.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a model year 2013 Chevrolet Silverado 2500 2WD LT EXT. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.1 km/h. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, OH, on September 27, 2012. Pre-test and post-test photographs of the test vehicle and the side impact dummy (SID-IIs) are included in Appendix A of this report.

One 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 August 30, 2011. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly: OCWS Side NCAP Pole Laboratory Test Procedure

- Head CG Triaxial Accelerometers
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper and Lower Rib Displacement Potentiometers
- Lower Spine (T12) Triaxial Accelerometers
- Iliac 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.

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

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)	NA	1000	11870
Lower Spine Acceleration	G	82	73.3
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3683.4
Maximum Thoracic Rib Deflection	Mm	38*	44.1
Maximum Abdominal Rib Deflection	mm	45*	48.8

* Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear Passenger Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Stg Wheel	No		
Knee Airbag	NA	NA		
Side Airbag 1 (Indicate Type)	NA	NA	NA	NA
Side Airbag 2 (Indicate Type, if applicable)	NA	NA	NA	NA
Side Airbag 3 (Indicate Type, if applicable)	NA	NA	NA	NA
Seat Belt Pretensioner	NA	NA	NA	NA
Seat Belt Load Limiter	NA	NA	NA	NA
Other	NA	NA	NA	NA

GENERAL COMMENTS

All doors remained closed throughout the test. No fuel spillage occurred during the impact or the static rollover test which followed. Injury values for both ATDs were within the established performance thresholds.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXTNHTSA No.: MD0115Test Program: SPNCAP Side ImpactTest Date: 09/27/12**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	MD0115	Traction Control System (TCS)	Yes
Model Year	2013	Auto-Leveling System	ND
Make	Chevrolet	Automatic Door Locks (ADL)	Yes
Model	Silverado 2500 2WD LT EXT	Power Window Auto-Reverse	Yes
Body Style	Pickup	Other Optional Feature	NA
VIN	1GC2CXCG4DZ101819	Driver Frontal Airbag	Yes
Body Color	Red Metallic	Driver Curtain Airbag	No
Odometer Reading (miles)	8	Driver Head/Torso Airbag	No
Engine Displacement (L)	6	Driver Torso Airbag	No
Number of Cylinders	8	Driver Torso/Pelvis Airbag	No
Engine Placement	Longitudinally-placed	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	6	Rear Passenger Curtain Airbag	No
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Rear	Rear Passenger Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof / T-Top	No	Rear Passenger Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rr. Pass. Seat Belt Pretensioner	No
Power Seats	Yes	Driver Load Limiter	No
Anti-Lock Brakes (ABS)	Yes	Rear Passenger Load Limiter	No
All-Wheel Drive (AWD)	No	Other Safety Restraint	NA

Does owner's manual provide instructions to turn off automatic door locks?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC	GVWR (kg)	4309
Date of Manufacture	6/12	GAWR Front (kg)	1996
Vehicle Type	Truck	GAWR Rear (kg)	2812

VEHICLE SEATING AND WEIGHT CAPACITY DATA

	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	NA	5
Vehicle Capacity Weight (VCW) (kg)				1468.0
DSC x 68.04 kg				340.2
Rated Cargo and Luggage Weight (RCLW) (kg)				1127.8

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	Yes	No	No		No	Yes	No
Rear or Second Row Seat	No	No	Yes	No	No	Yes	No
Third Row Seat	NA	NA	NA	NA	NA	NA	NA

DATA SHEET NO. 1 (CONTINUED)

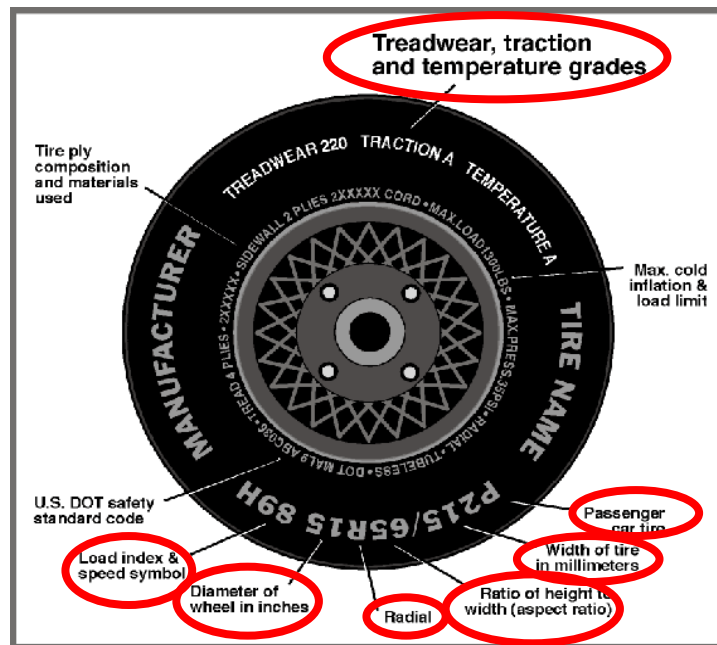
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT

NHTSA No.: MD0115

Test Program: SPNCAP Side Impact

Test Date: 09/27/12



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	420	480
Recommended Tire Size	LT 265/70R18E R	LT 265/70R18E R

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Tire Size on Vehicle	LT265/70R18	LT265/70R18
Tire Manufacturer	Michelin	Michelin
Tire Name	LTX AT	LTX AT
Tire Type	All-season on-off road	All-season on-off road
Tire Width	265	265
Aspect Ratio	70	70
Radial	Yes	Yes
Wheel Diameter	18	18
Load Index/ Speed Symbol	124/121R	124/121R
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	B	B
Tire Material	Rubber	Rubber

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

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
 Test Date: 09/27/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	414	414	483	483
Tire Placard	kPa	420	420	480	480
Owner's Manual	kPa	420	420	480	480
As Tested	kPa	414	414	483	483

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	777.4	642.4		801.4	684.8		806.8	732.4	
Right	kg	762.2	619.8		787.6	705.0		766.8	689.2	
Ratio	%	55.0	45.0		53.3	46.7		52.5	47.5	
Totals	kg	1539.6	1262.2	2801.8	1589.0	1389.8	2978.8	1573.6	1421.6	2995.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2801.8	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	49.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2986.8	(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 ☐ NO

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast; steel plate mounted in truck bed	102.1

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	Deg.	0.8	1	0.5	No
Front Passenger Sill Angle (front-to-rear)*	Deg.	0.9	1	0.8	No
Front Bumper-Line Angle (left-to-right)**	Deg.	0.9	0.5	0.6	No
Rear Bumper-Line Angle (left-to-right)**	Deg.	0	0.4	0.2	No
Vehicle CG (Aft of Front Axle)	mm	1649	1708	1737	
Vehicle CG (Left (+) / Right (-) from longitudinal Centerline)	mm	-10	-3	-22	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for "Meets Requirements".

DATA SHEET NO. 2

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT

NHTSA No.: MD0115

Test Program: SPNCAP Side Impact

Test Date: 09/27/12

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	NA	NA	11.1
Front Passenger Seat	NA	NA	12.9
Front Center Seat*	NA Fixed	NA Fixed	10.1
Struck Side Rear Seat	NA Fixed	NA Fixed	NA Fixed
Non-Struck Side Rear Seat	NA Fixed	NA Fixed	NA Fixed
Rear Center Seat*	NA Fixed	NA Fixed	NA Fixed

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rearmost	Mid- Fore/Aft	Forward- Most
Driver Seat	11.1	318	Max.	ND	ND	ND
			Mid	321	318	311
			Min.	ND	ND	ND
Front Passenger Seat	11.1	318	Max.	ND	ND	ND
			Mid	316	318	320
			Min.	ND	ND	ND
Front Center Seat*	NA Fixed	NA Fixed	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Struck Side Rear Seat	NA Fixed	NA Fixed	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Non-Struck Side Rear Seat	NA Fixed	NA Fixed	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Rear Center Seat*	NA Fixed	NA Fixed	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT

NHTSA No.: MD0115

Test Program: SPNCAP Side Impact

Test Date: 09/27/12

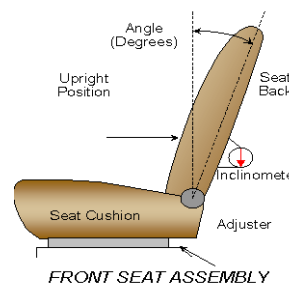
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	240	25	120	13
Front Passenger Seat	210	22	110	12
Front Center Seat*	NA Fixed	NA Fixed	NA Fixed	NA Fixed
Struck Side Rear Seat	NA Fixed	NA Fixed	NA Fixed	NA Fixed
Non-Struck Side Rear Seat	NA Fixed	NA Fixed	NA Fixed	NA Fixed
Rear Center Seat*	NA Fixed	NA Fixed	NA Fixed	NA Fixed

* 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.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/ Seated Dummy	50	25	7.4	9
Front Passenger Seat	50	26	7.4	9
Front Center Seat*	NA Fixed	NA Fixed	NA Fixed	NA Fixed
Struck Side Rear Seat	17.2	NA Fixed	17.2	NA Fixed
Non-Struck Side Rear Seat	NA Fixed	NA Fixed	NA Fixed	NA Fixed
Rear Center Seat*	NA Fixed	NA Fixed	NA Fixed	NA Fixed

* If applicable.

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted with the information provided by the manufacturer on Form No. 1

	Total # of Positions	Placed in Position #
Driver Seat	3	2

HEAD RESTRAINT ADJUSTMENT

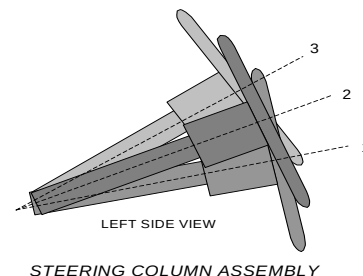
Head restraints are adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	1	Fixed

DATA SHEET NO. 2 (CONTINUED)**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA**Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXTNHTSA No.: MD0115Test Program: SPNCAP Side ImpactTest Date: 09/27/12**STEERING COLUMN ADJUSTMENT**

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

	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	10.8	NA
Geometric Center, Position No. 2	20.8	NA
Uppermost, Position No. 3	30.8	NA
Telescoping Steering Wheel Travel		No feature
Test Position	20.8	NA

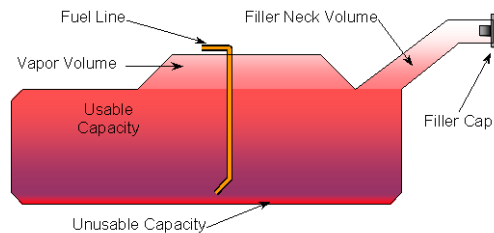
**FUEL PUMP**

Describe the fuel pump type, details about how it operates and the location of the fuel filler neck:

The fuel tank is located in front of the rear axle between the left frame rail and prop shaft. The fuel filler neck enters the left front top of the fuel tank.

The fuel filler cap is located on the left front of the

bed. The fuel lines run along the inside of the left frame rail.

**VEHICLE FUEL TANK ASSEMBLY****FUEL TANK CAPACITY**

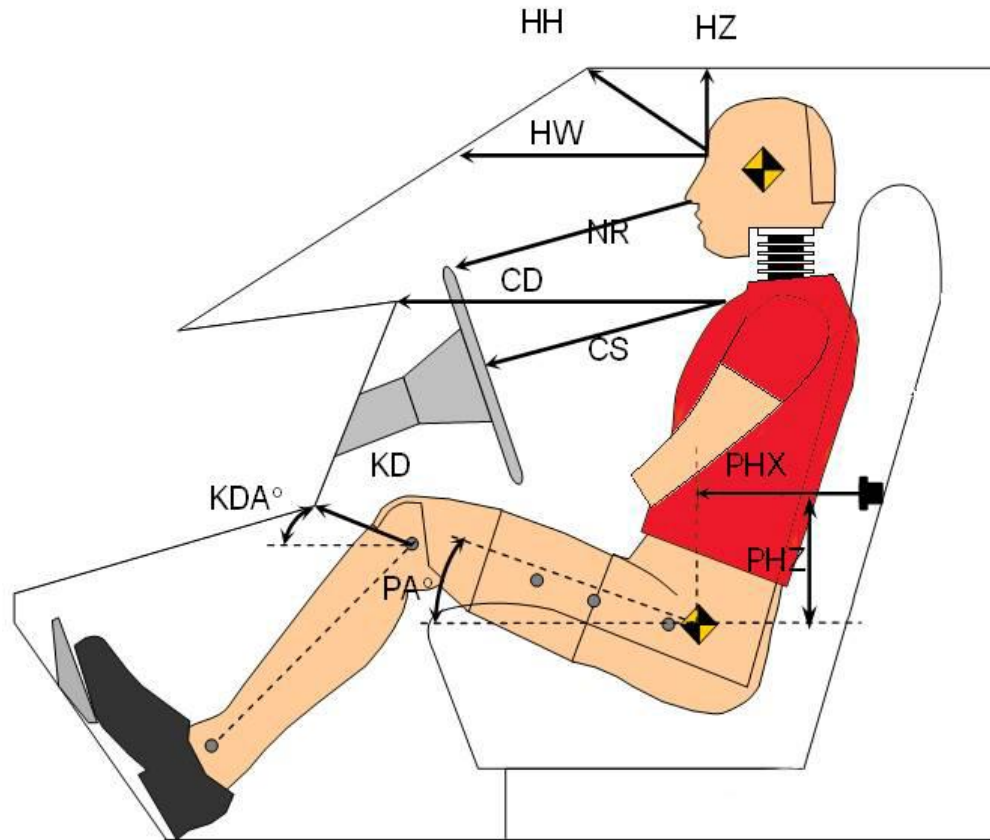
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	136.7
Usable Capacity of "Optional" Tank (see Form No. 1)	NA
Usable Capacity of Standard Tank (see Owner's Manual)	136.3
Usable Capacity of Optional Tank (see Owner's Manual)	NA
93% of Usable Capacity	127.2
Actual Amount of Solvent Used in Test	127.2
1/3 of Usable Capacity	45.6

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
 Test Date: 09/27/12

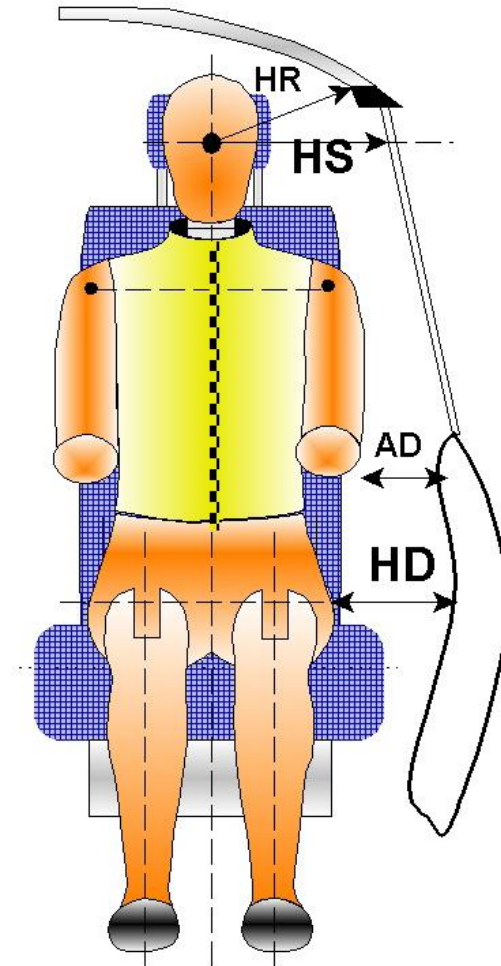


Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	346	
HW	Head to Windshield	606	
HZ	Head to Roof Liner	234	
NR	Nose to Rim	200	
CD	Chest to Dashboard	383	
CS	Chest to Steering Wheel	163	
KDL/KDLA°	Left Knee to Dash	103	26.9
KDR/KDRA°	Right Knee to Dash	98	45.0
PAX°	Pelvic Tilt Angle (X-axis)		21.9
PAY°	Pelvic Tilt Angle (Y-axis)		NA
PHX	Hip Point to Striker (X-Axis)	446	
PHZ	Hip Point to Striker (Z-Axis)	0	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
Test Date: 09/27/12

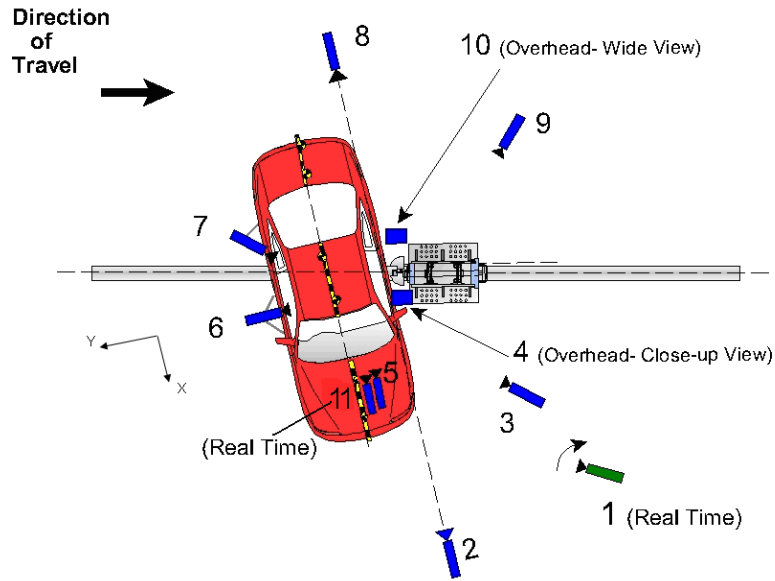


Code	Measurement Description	Length (mm)
HR	Head to Side Header	263
HS	Head to Side Window	368
AD	Arm to Door	179
HD	Hip Point to Door	166

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
 Test Date: 09/27/12



REFERENCE: (from point of impact for X and Y; from ground for Z)
 + X = Forward of vehicle, + Y = Right of vehicle, + Z = Down

Camera No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real time (24-30 fps) pan view of impact				zoom	30
2	Front ground level – impact view	6015	0	-1310	12.5	1000
3	Impact side 45° – forward pole view	3738	-702	-1305	12.5	1000
4	Overhead Close-up view of impact	-254	-305	-5632	50	1000
5	Onboard – dummy front view				12.5	1000
6	Onboard – dummy side view				8.5	1000
7	Onboard – dummy rear oblique view				8.5	1000
8	Rear ground level – impact view	-6473	0	-1302	8.5	1000
9	Impact side 45° – rearward pole view	-3436	-2404	-1371	8.5	1000
10	Overhead wide view of impact	-295	-305	-5632	12.5	1000
11	Real time dummy front view				8.5	30

All measurements accurate to +/- 6 mm.

NOTE: Vehicle was at a 75° angle to the rigid pole.

If applicable, explain why camera(s) did not run: _____

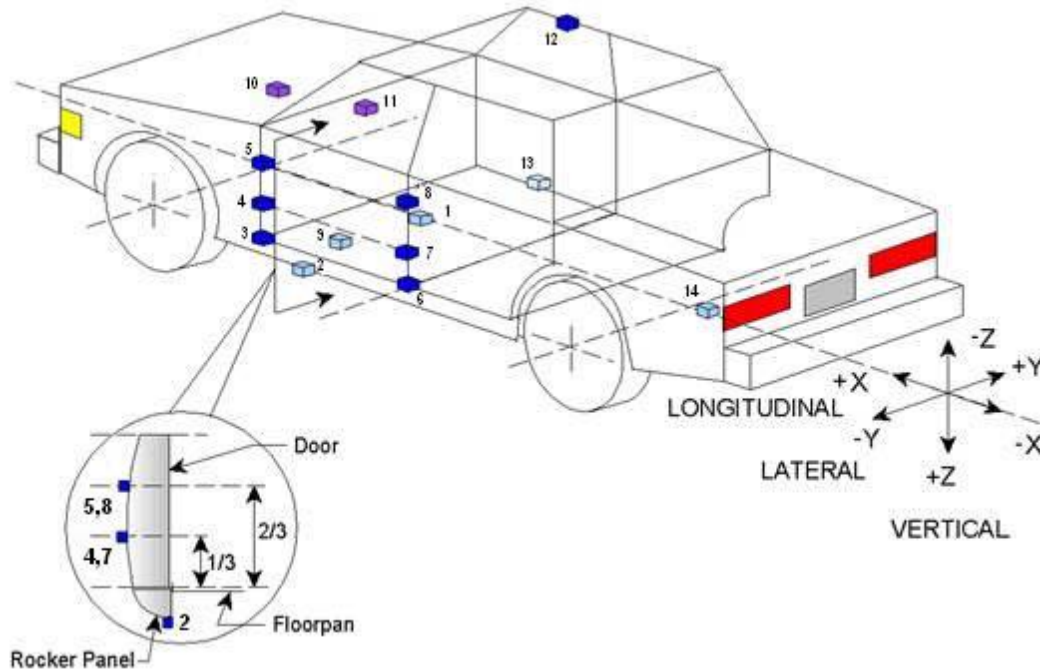
INSTRUMENTATION

	Number of Channels
Driver Dummy	19
Vehicle Structure	18
Pole Load Cells	8
TOTAL	45

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

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	Accelerometer/Sensor Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	4283	0	-796
2	Left Floor Sill	4170	-695	-643
3	A-Pillar Sill	4590	-730	-638
4	A-Pillar Low	4652	-882	-842
5	A-Pillar Mid	4660	-870	-1205
6	B-Pillar Sill	3494	-735	-664
7	B-Pillar Low	3517	-840	-835
8	B-Pillar Mid	3517	-840	-1145
9	Driver Seat Track	3769	-650	-670
10	Engine Top	5014	40	-1154
11	Firewall	5022	20	-1306
12	Right Roof	3886	680	-1842
13	Right Floor Sill	3997	790	-622
14	Rear Floorpan	1555	0	-824

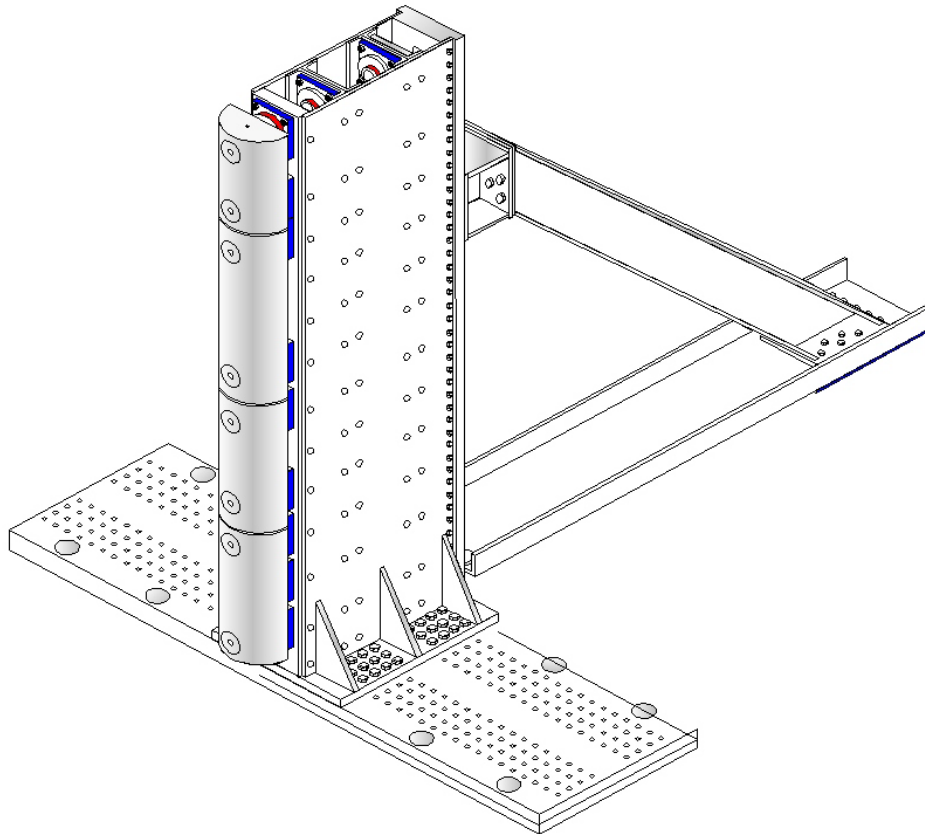
Reference: X - Test Vehicle Rear Bumper (+ forward)
 Y - Test Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
Test Date: 09/27/12

FOIL 300K RIGID POLE



Load Cell Locations	
ID	Height From Top of Carrier (mm)
1	87
2	468
3	648
4	978
5	1168
6	1651
7	1816
8	2057

DATA SHEET NO. 8
POST TEST OBSERVATIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
Test Date: 09/27/12

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	NA
Top of Head	NA
Left Side of Head	Door glass, pole
Back of Head	NA
Left Shoulder	Door Panel
Upper Torso	Door panel
Lower Torso	Door panel
Left Hip	Door Panel
Left Knee	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)	NA	NA	NA	NA	NA

* Indicate "Yes", "No", or "NA".

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

* Indicate "Yes", "No", or "NA".

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A- and B-Pillar deformation
Sill Separation	No
Windshield Damage	Broken
Side Window Damage	Shattered
Other Notable Effects	Vehicle rolled off flying floor after impact .

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
 Test Date: 09/27/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side (Driver)		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Knee Airbag	NA	NA		
Side Airbag 1 (Indicate Type)	NA	NA	NA	NA
Side Airbag 2 (Indicate Type, if App.)	NA	NA	NA	NA
Side Airbag 1 (Indicate Type, if App.)	NA	NA	NA	NA
Seat Belt Pretensioner	Yes	No	NA	Yes
Seat Belt Load Limiter	NA	NA	NA	NA
Other	NA	NA	NA	NA

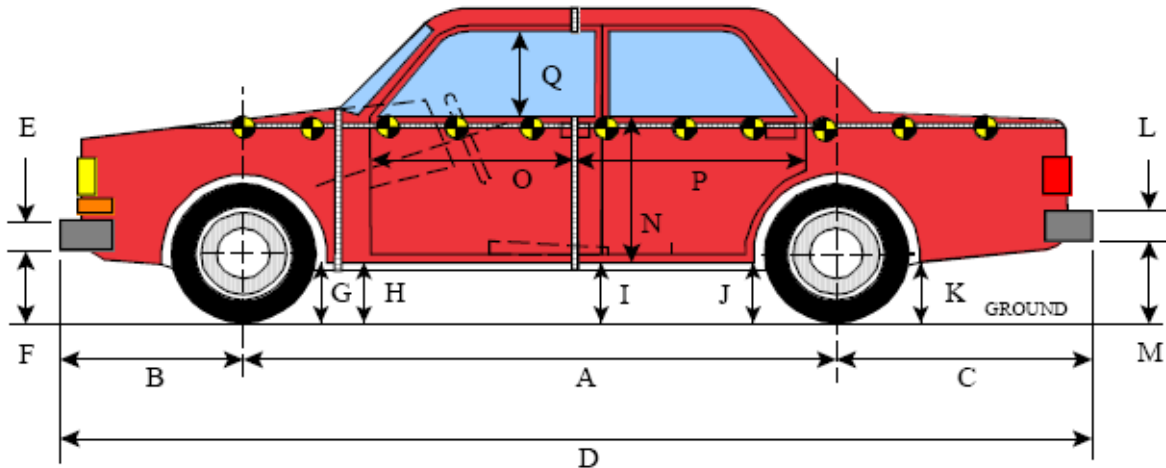
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

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		1208
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 of Intended Impact point	1
Angle Between Vehicle's Longitudinal Centerline and Line of Motion	degrees	75 +/- 3	76
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.1
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	0.0

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
 Test Date: 09/27/12



LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

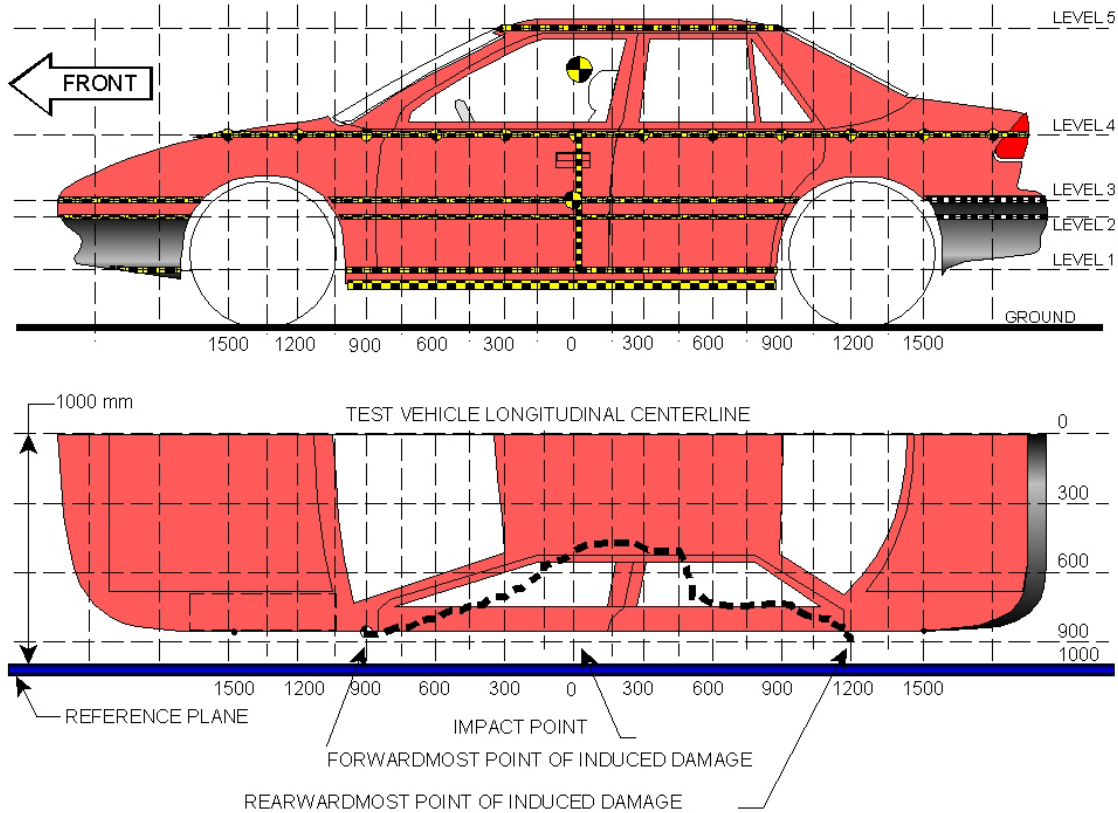
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3660	3585	75
B	Front Axle to Front Surface of Vehicle	975	975	0
C	Rear Axle to Rear Surface of Vehicle	1195	1195	0
D	Total Length at Centerline	5830	5810	20
E	Front Bumper Thickness	200	200	0
F	Front Bumper Bottom to Ground	562	595	-33
G	Sill Height at Front Wheel Well	520	542	-22
H	Sill Height at Front Door Leading Edge	517	550	-33
I	Sill Height at B-Pillar	552	578	-26
J1	Sill Height at Rear Wheel Well	580	605	-25
J2	Pinch Weld Height at Rear Wheel Well	510	525	-15
K	Sill Height Aft of Rear Wheel Well	629	682	-53
L	Rear Bumper Thickness	170	170	0
M	Rear Bumper Bottom to Ground	633	690	-57
N	Sill Height to Bottom of Front Window Sill	880	800	80
O	Front Door Leading Edge to Impact CL	685	635	50
P	Rear Door Trailing Edge to Impact CL	1218	1040	178
Q	Front Window Opening	500	478	22
R	Right Side Length	5710	5710	0
S	Left Side Length	5710	5665	45
T	Vehicle Width at "B" Pillars	1600	1517	83

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
 Test Date: 09/27/12



NOTE: All measurements are in millimeters (mm)

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	602	517	0
2	Occupant H-Point	990	544	0
3	Mid-Door	928	546	0
4	Window Sill	1277	486	0
5	Window Top	1860	242	0

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

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

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
 Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
 Test Date: 09/27/12

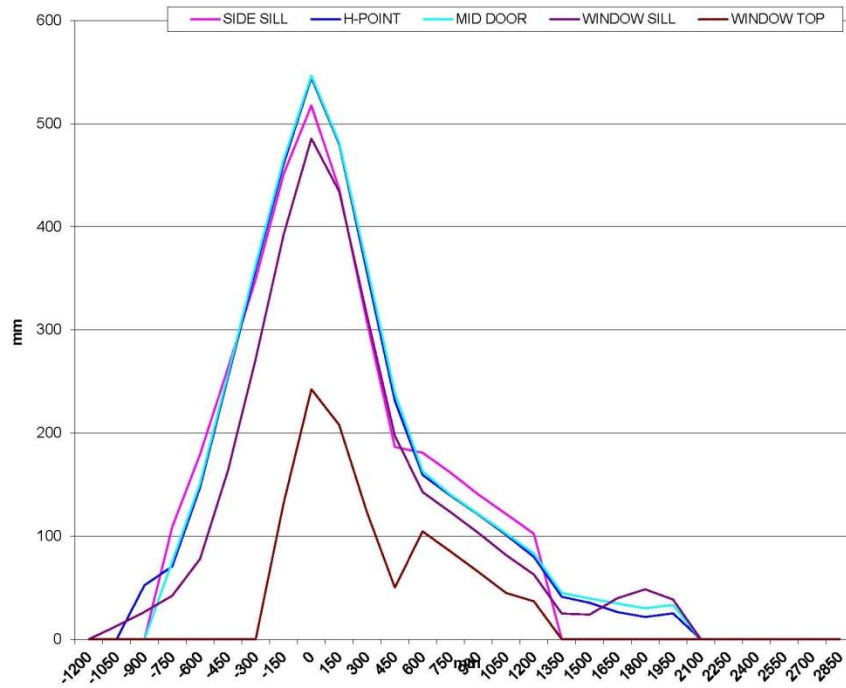
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	1013	0	932	0	0	960	0	906	0	0	53	0	26	0
-750	959	995	1001	930	0	850	925	926	888	0	109	70	75	42	0
-600	944	980	982	935	0	764	833	831	857	0	180	147	151	78	0
-450	943	982	984	939	0	680	729	728	775	0	263	253	256	164	0
-300	942	984	986	942	0	593	626	623	670	0	349	358	363	272	0
-150	942	986	987	946	716	491	526	522	554	585	451	460	465	392	131
0	941	988	988	949	732	424	444	442	463	490	517	544	546	486	242
150	941	987	988	950	735	505	507	507	516	527	436	480	481	434	208
300	940	988	989	953	734	632	633	628	639	611	308	355	361	314	123
450	939	989	990	954	734	752	757	752	757	684	187	232	238	197	50
600	935	987	989	956	734	754	828	827	814	629	181	159	162	142	105
750	934	988	987	958	734	772	849	847	834	649	162	139	140	124	85
900	930	989	987	958	734	789	868	866	855	669	141	121	121	103	65
1050	928	988	987	958	734	806	887	885	877	689	122	101	102	81	45
1200	925	985	986	959	732	823	906	903	896	695	102	79	83	63	37
1350	0	975	977	951	0	0	934	932	926	0	0	41	45	25	0
1500	0	978	980	954	0	0	943	940	931	0	0	35	40	23	0
1650	0	981	982	957	0	0	955	948	918	0	0	26	34	39	0

NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.

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

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT
Test Program: SPNCAP Side Impact

NHTSA No.: MD0115
Test Date: 09/27/12



DATA SHEET NO. 11

FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT

NHTSA No.: MD0115

Test Program: SPNCAP Side Impact

Test Date: 09/27/12

Test Time: 14:54 Temperature: 22

A. From impact until vehicle motion ceases: 0 oz.

(Maximum allowable is 1 ounce)

B. For the 5 minute period after motion ceases: 0

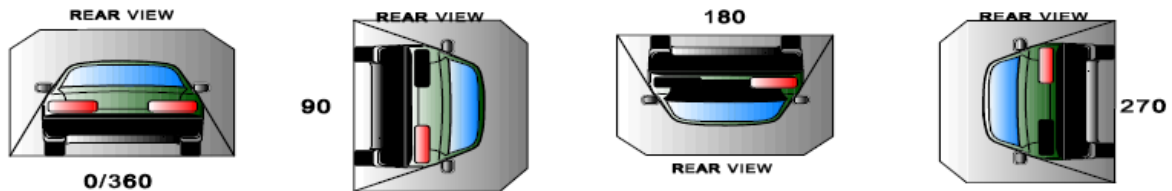
(Maximum allowable is 5 ounces)

C. For the following 25 minutes: 0

(Maximum allowable is 1 ounce/minute)

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	120	300	420
90 to 180	120	300	840
180 to 270	120	300	1260
270 to 360	120	300	1680

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	NA
90 to 180	0	0	0	NA
180 to 270	0	0	0	NA
270 to 360	0	0	0	NA

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DATA SHEET NO. 12

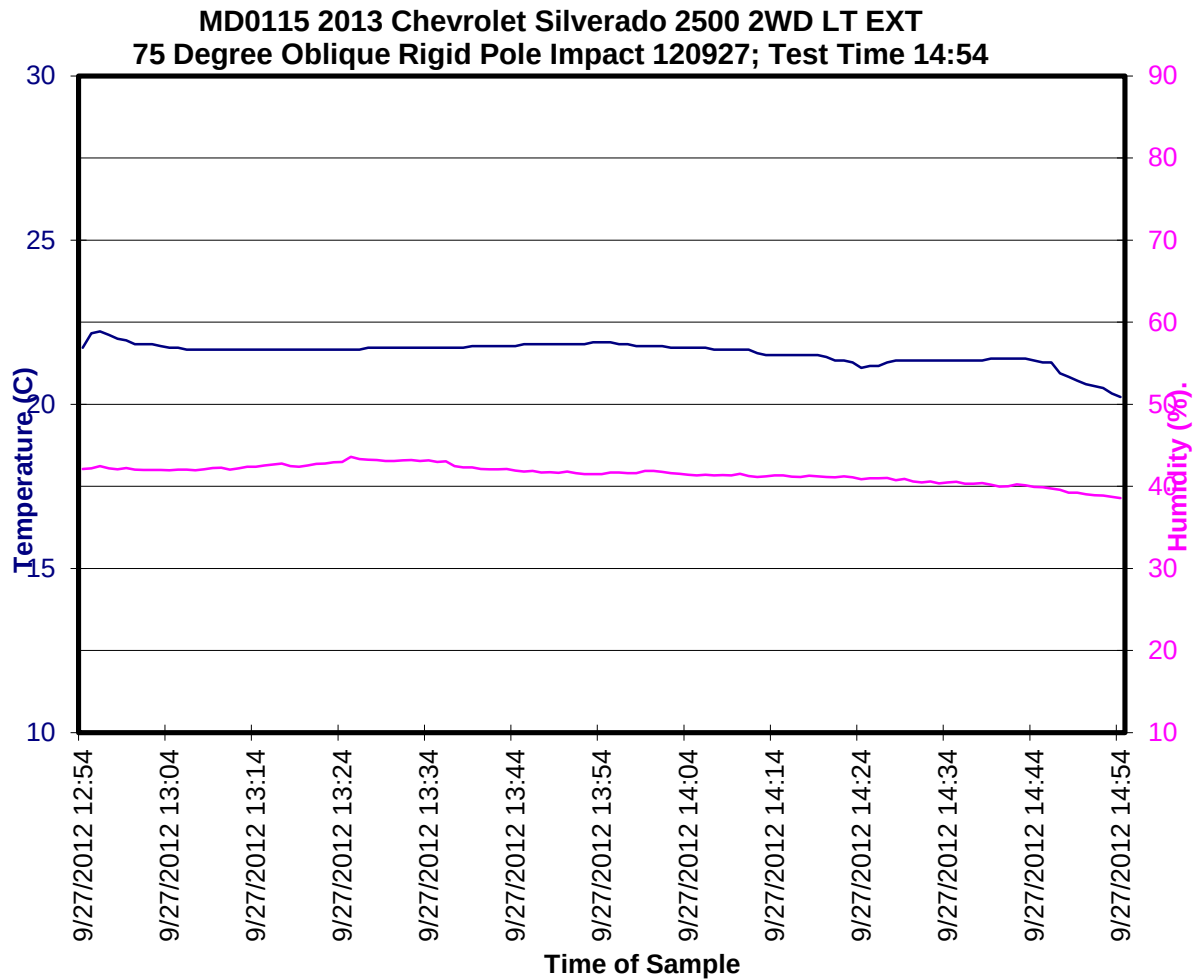
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 2WD LT EXT

NHTSA No.: MD0115

Test Program: SPNCAP Side Impact

Test Date: 09/27/12



APPENDIX A
PHOTOGRAPHS

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6	Post-Test Left Front 3/4 View of Test Vehicle	A-6
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28	Pre-Test Front View of Seat Pan Prior to Dummy Positioning	A-17
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38	Pre-Test Close-Up Left Side View of Driver Seat Back	A-22
39	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-23
40	Pre-Test Dummy and Door Clearance View	A-23
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60	Pre-Test Pole Barrier Side View	A-33
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61b	Pre-Test Ballast View	A-34
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71	Post-Test View of Shattered Vehicle Inner Door Panel	A-39



001 As Delivered Right Front 3/4 View of Test Vehicle



002 As Delivered Left Rear 3/4 View of Test Vehicle



003 Pre-Test Frontal View of Test Vehicle



004 Post-Test Frontal View of Test Vehicle



005 Pre-Test Left Front 3/4 View of Test Vehicle



006 Post-Test Left Front 3/4 View of Test Vehicle



007 Pre-Test Left Side View of Test Vehicle



008 Post-Test Left Side View of Test Vehicle



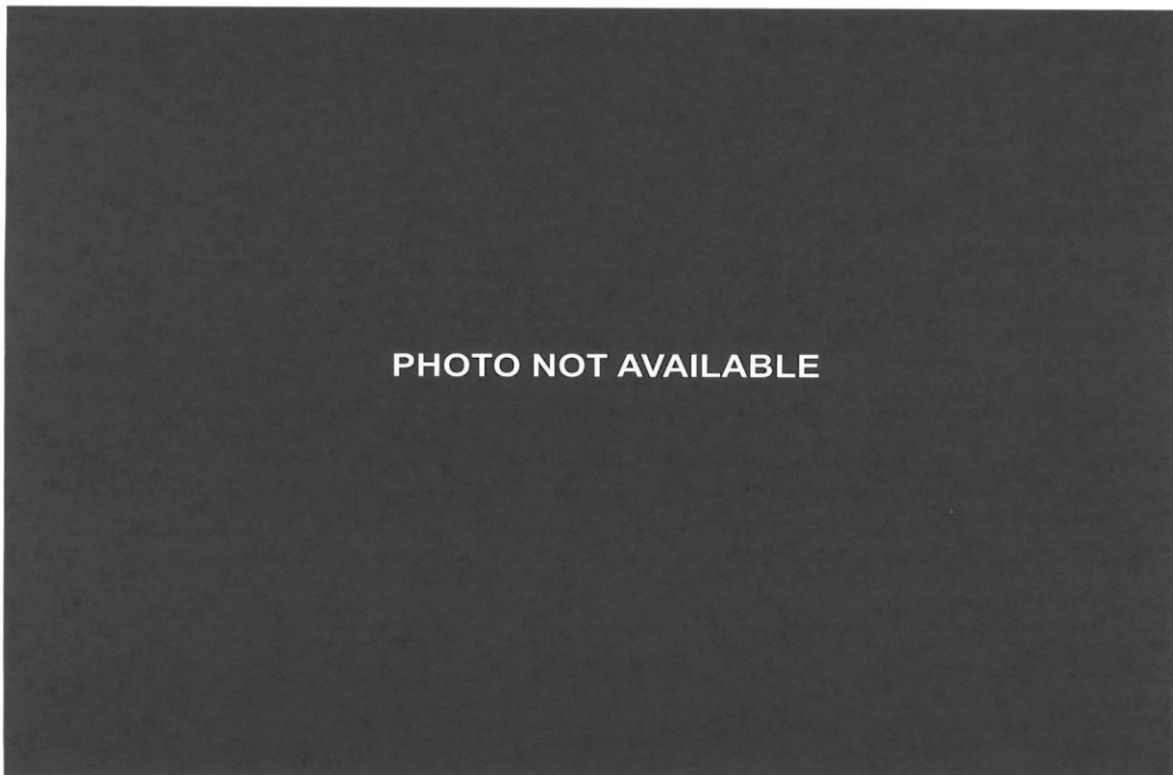
009 Pre-Test Left Rear 3/4 View of Test Vehicle



010 Post-Test Left Rear 3/4 View of Test Vehicle



011 Pre-Test Rear View of Test Vehicle



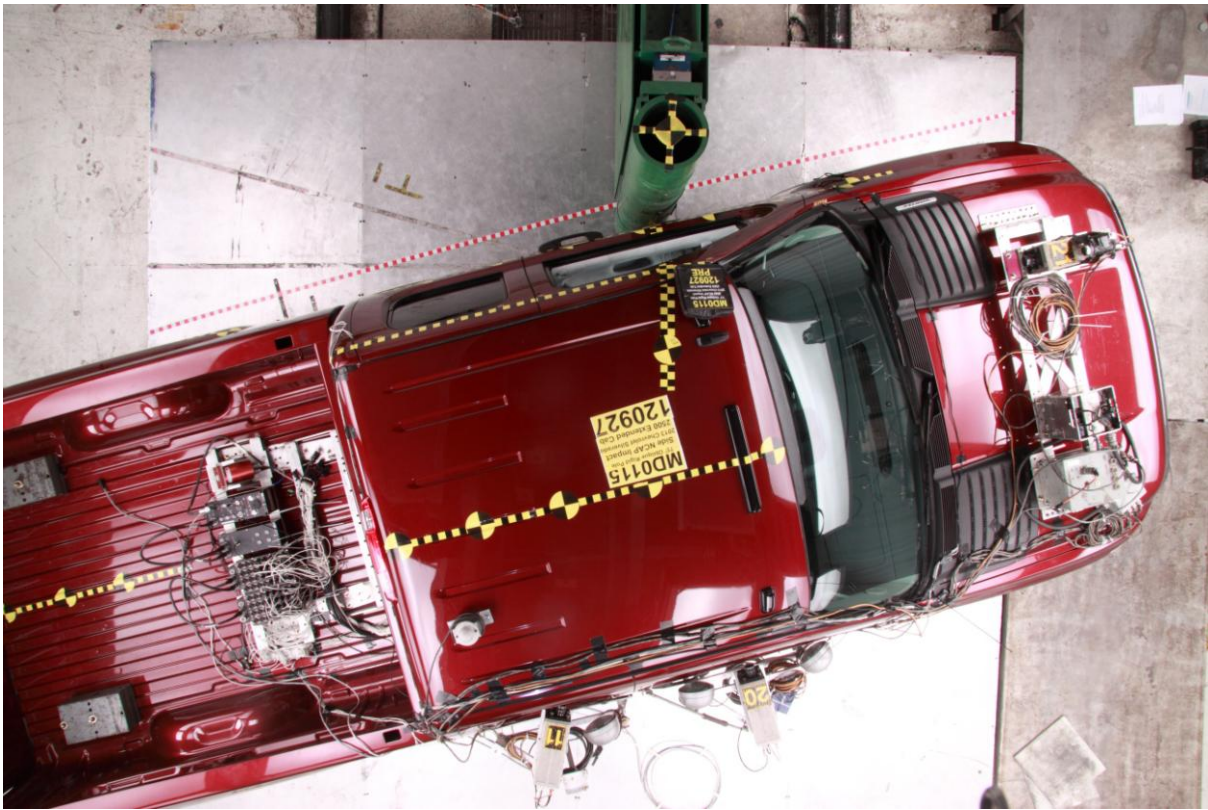
012 Post-Test Rear View of Test Vehicle



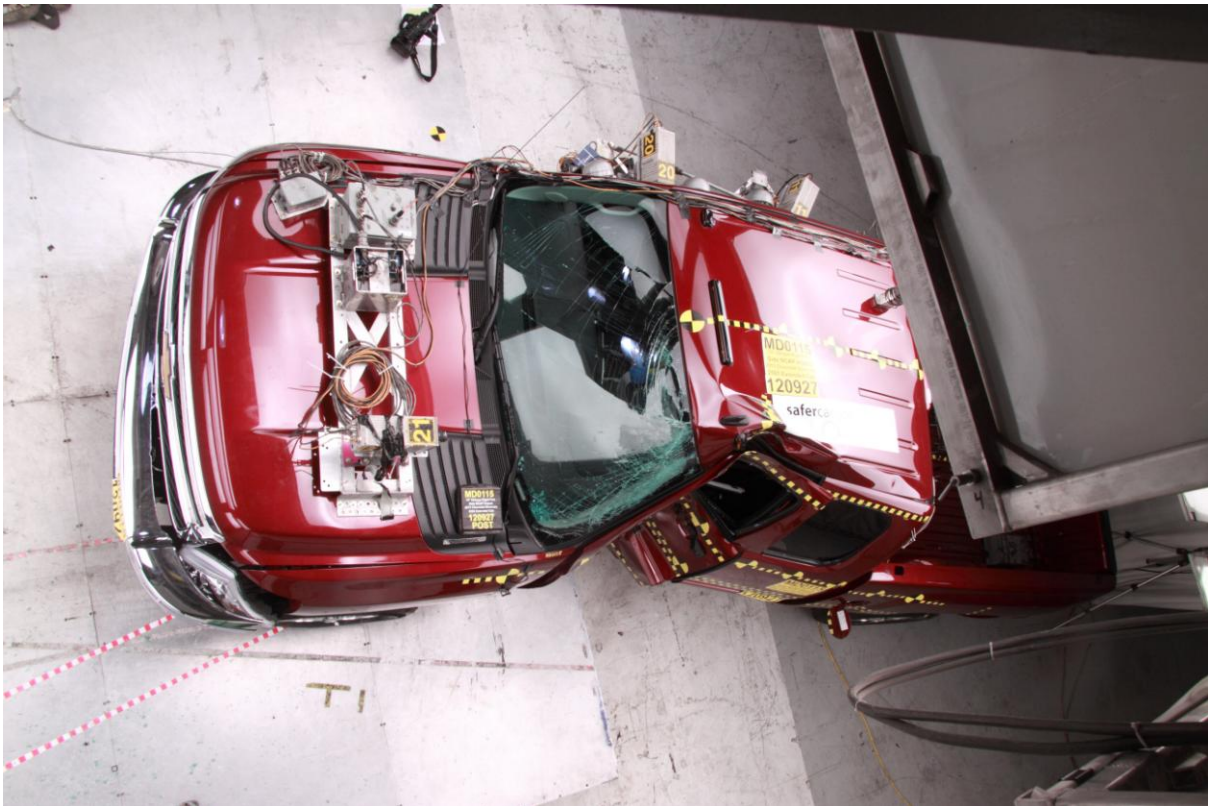
013 Pre-Test Right Side View of Test Vehicle



014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area



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



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



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



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



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



022 Post-Test Front Close-Up View of Dummy



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



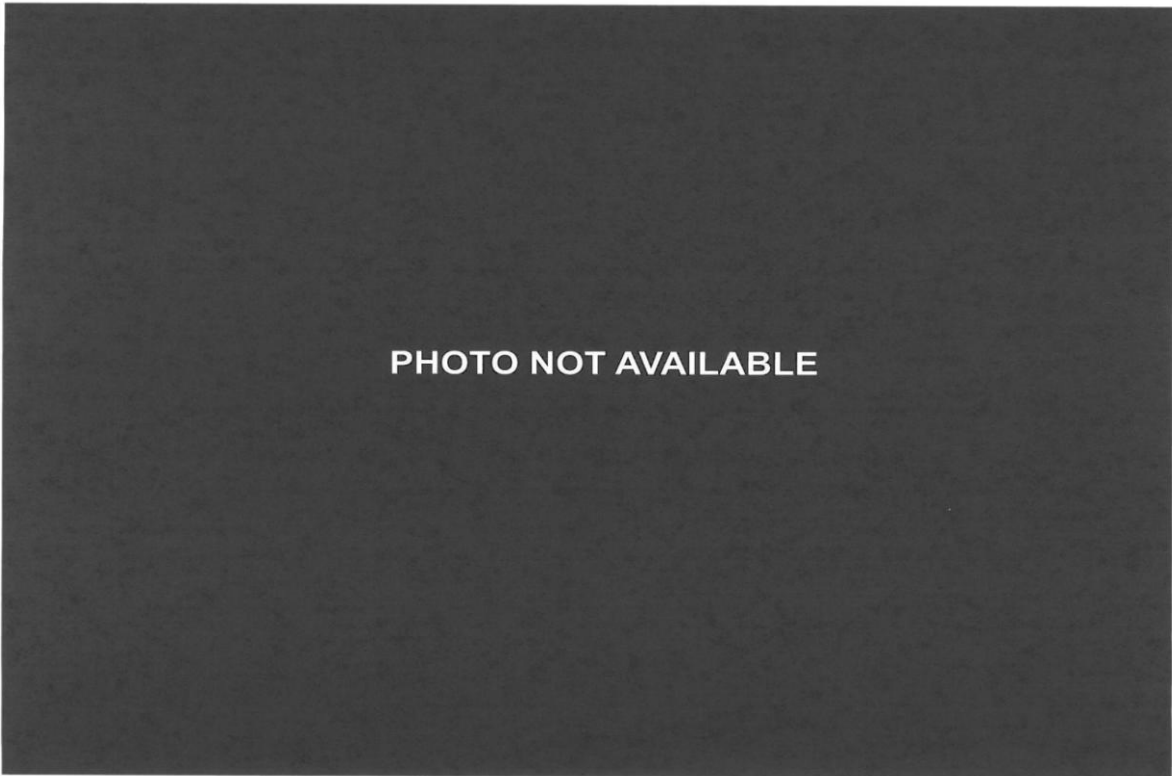
024 Pre-Test Left Side View of Dummy Shoulder and Door Top View



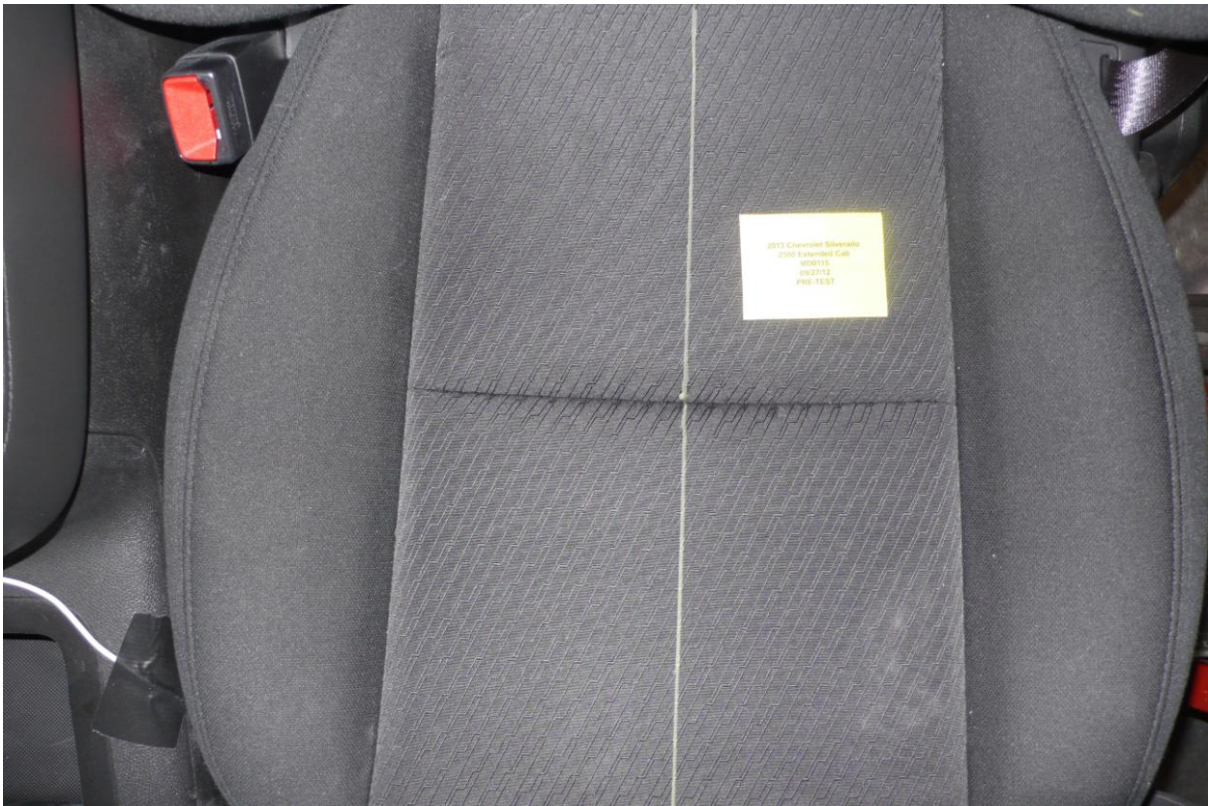
025 Post-Test Left Side View of Dummy Shoulder and Door Top View



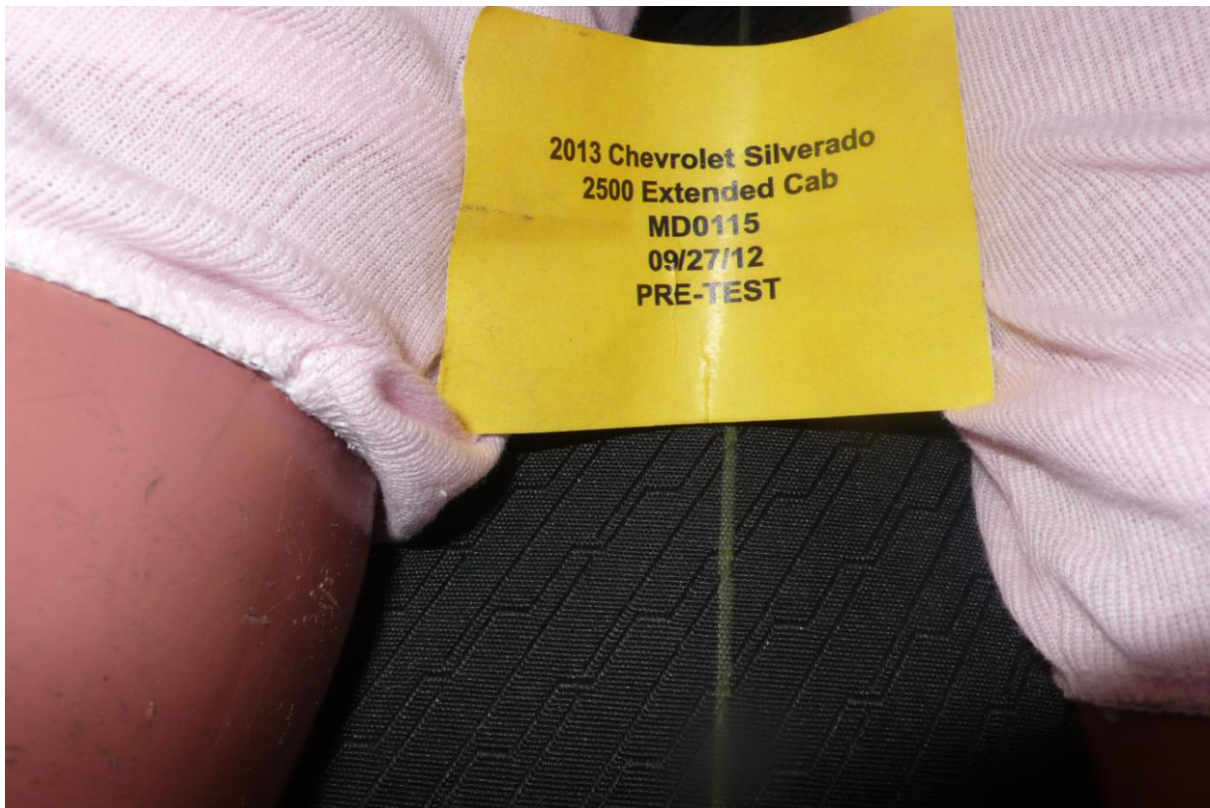
026 Pre-Test Front View of Seat Back Prior to Dummy Positioning



027 Pre-Test Front View of Dummy Head and Shoulders in Relation to Head Restraint



028 Pre-Test Front View of Seat Pan Prior to Dummy Positioning



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



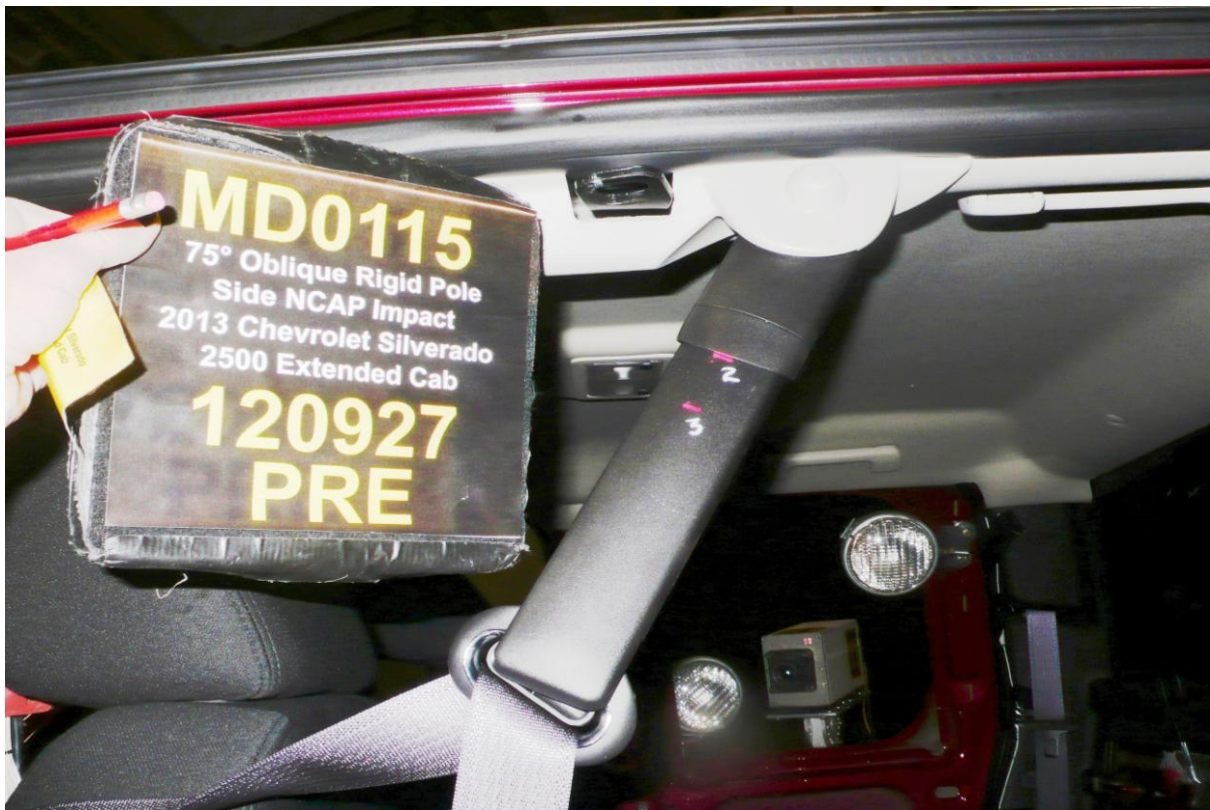
030 Pre-Test Left Side View of Dummy Neck Showing Position of Adjustable Neck Bracket



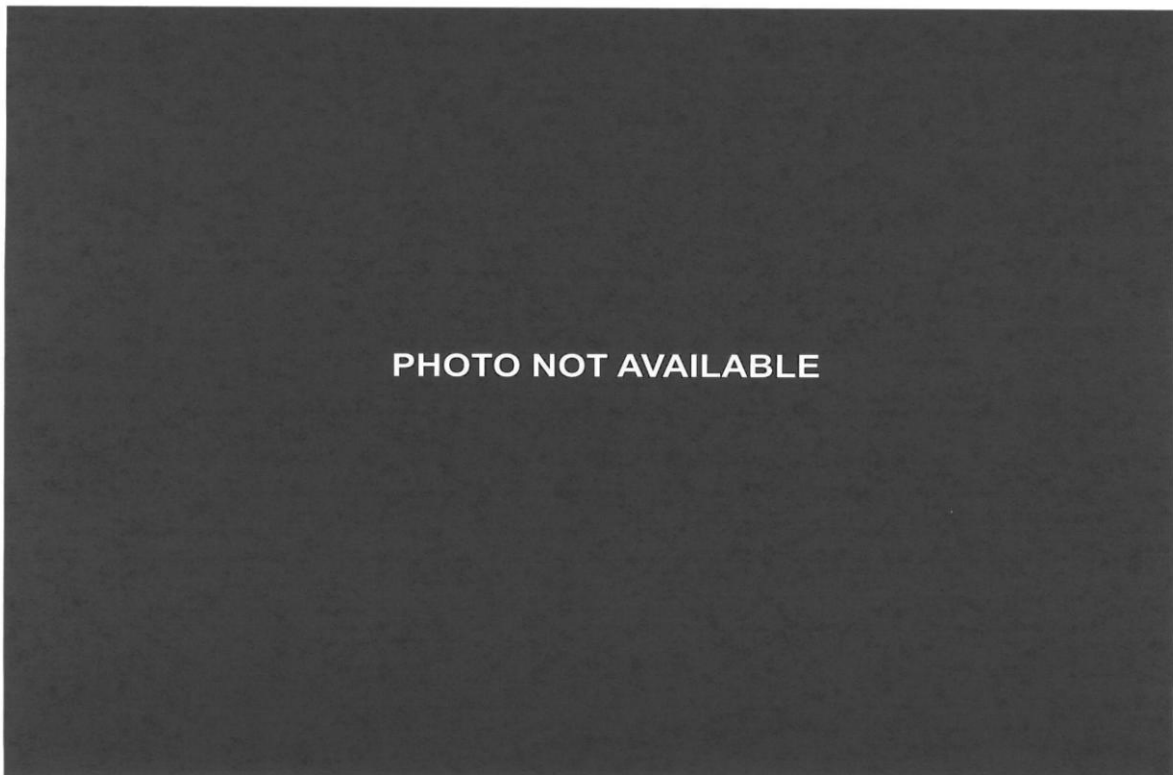
031 Pre-Test Left Side View of Dummy Head Showing Dummy Head is Level



032 Pre-Test Placement of Dummy Feet



033 Pre-Test View of Belt Anchorage for Dummy



034 Pre-Test Left Side View of Steering Wheel



035 Pre-Test View of Disengaged Parking Brake



036 Pre-Test View of Parking Brake



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



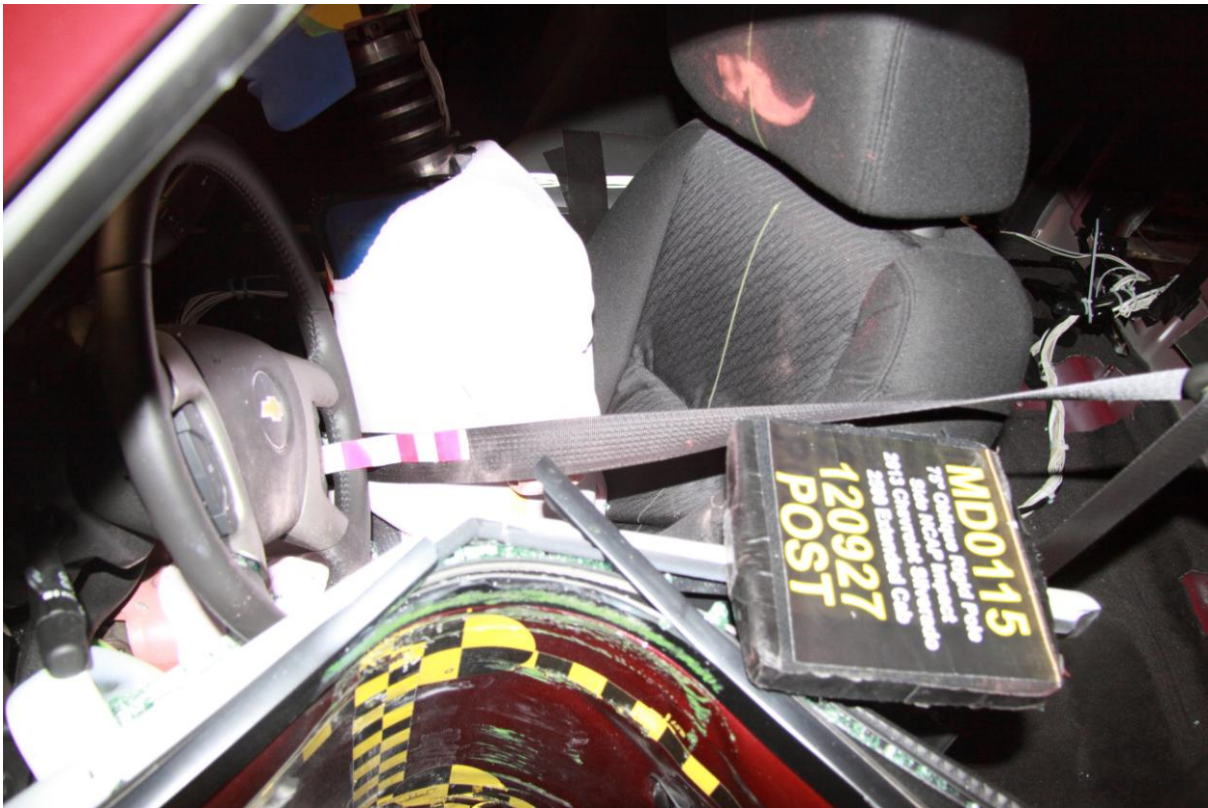
038 Pre-Test Close-Up Left Side View of Driver Seat Back



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



040 Pre-Test Dummy and Door Clearance View



041 Post-Test Dummy and Door Clearance View



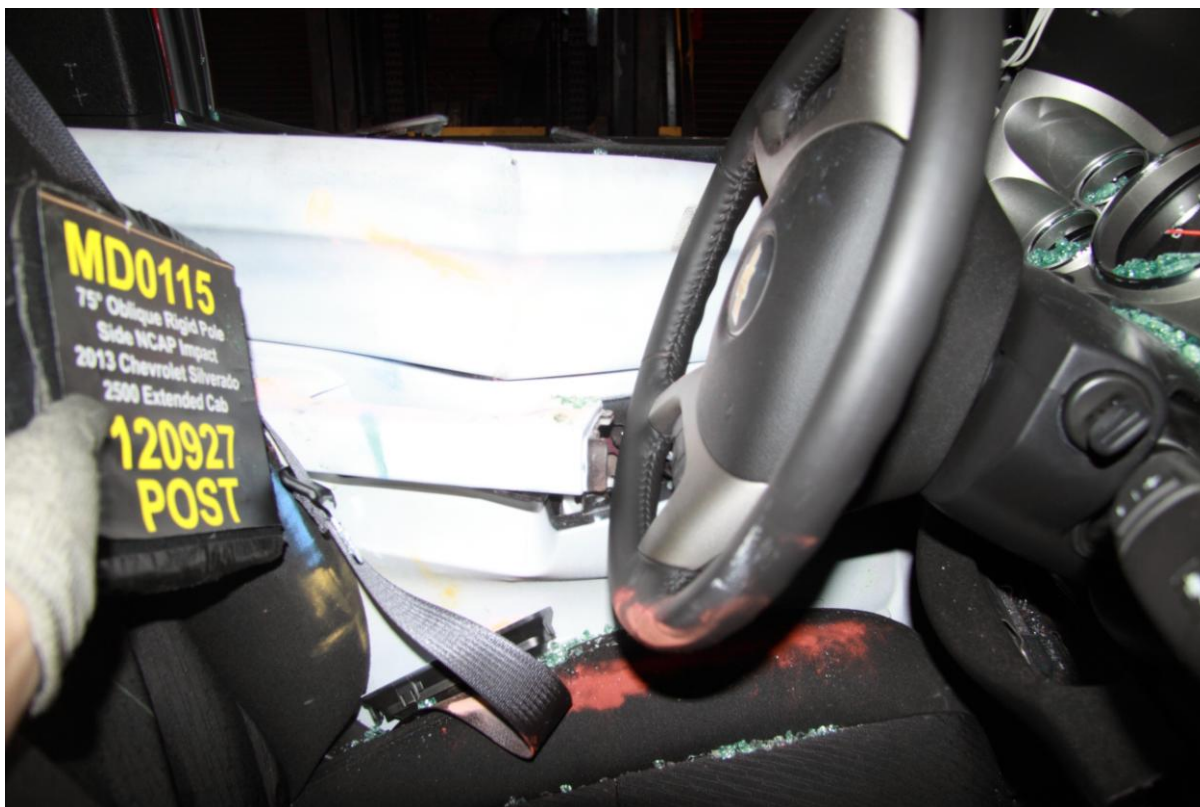
042 Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



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



044 Pre-Test Inner Driver Door Panel View



045 Post-Test Inner Driver Door Panel View Showing Dummy Contact Location



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

PHOTO NOT APPLICABLE

047 Post-Test Dummy Close-Up Head Contact with Side Airbag View



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

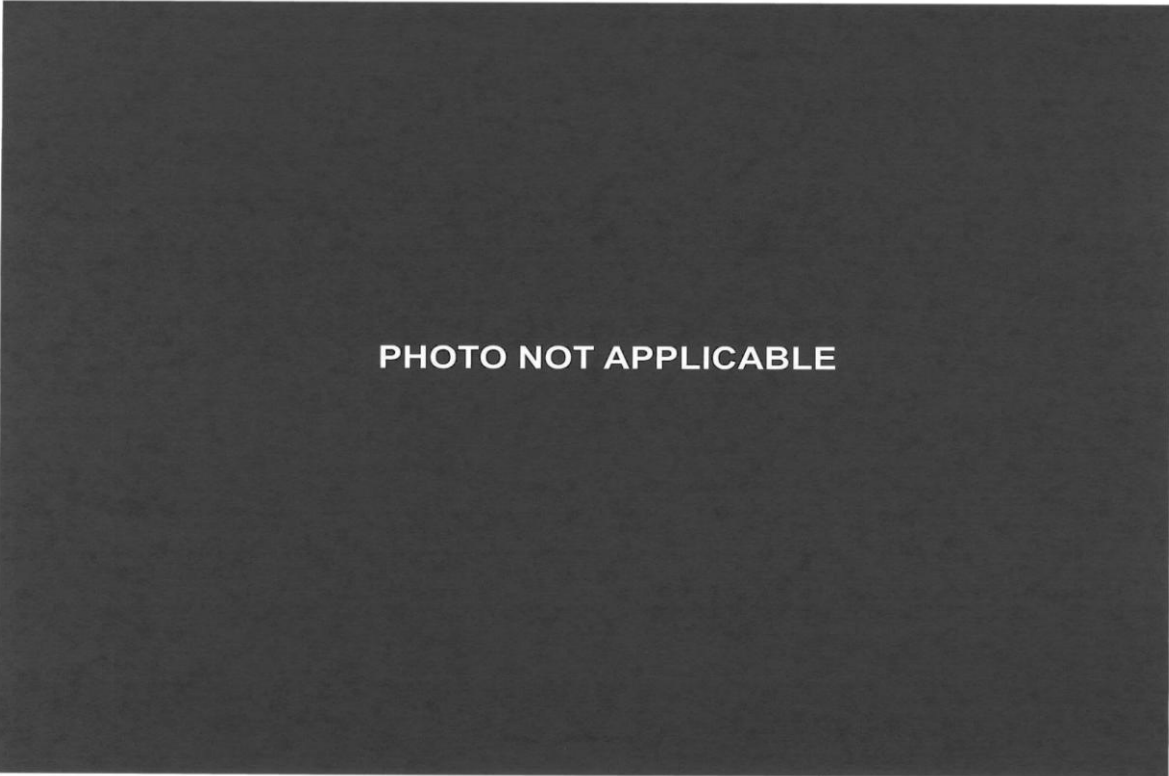


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049 Post-Test Dummy Close-Up Torso Contact with Side Airbag View

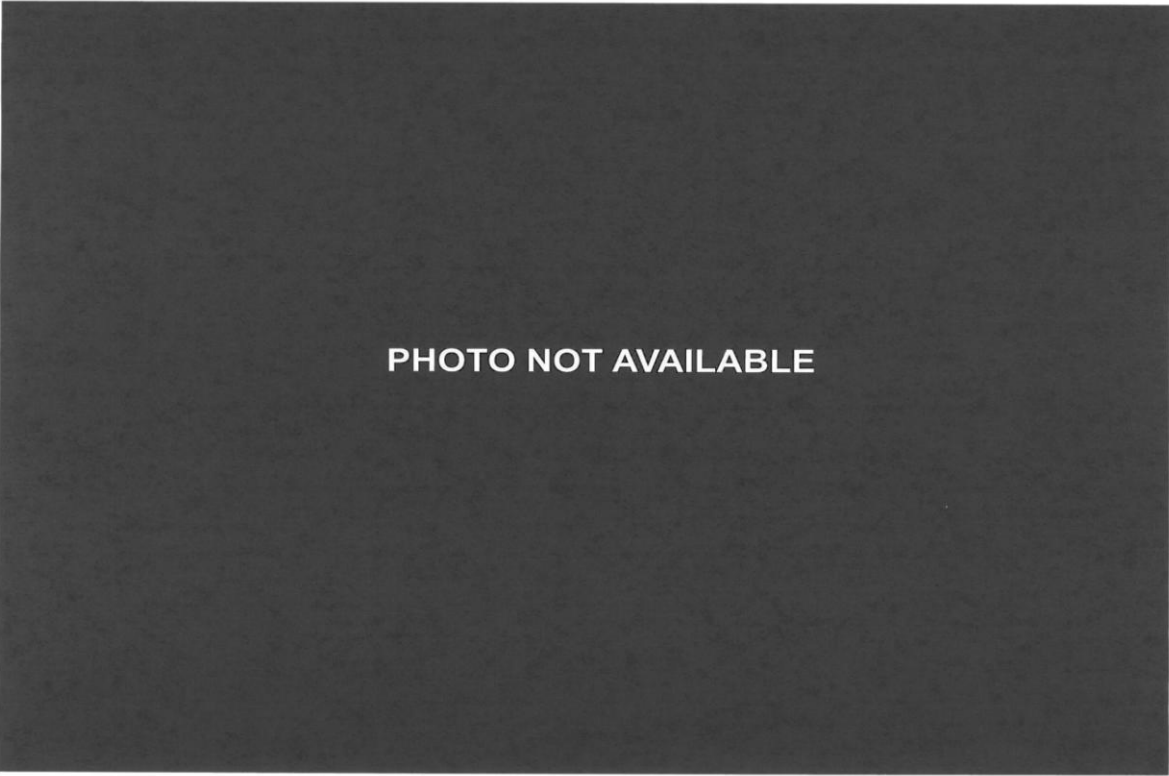


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050 Post-Test Dummy Close-Up Pelvis Contact View

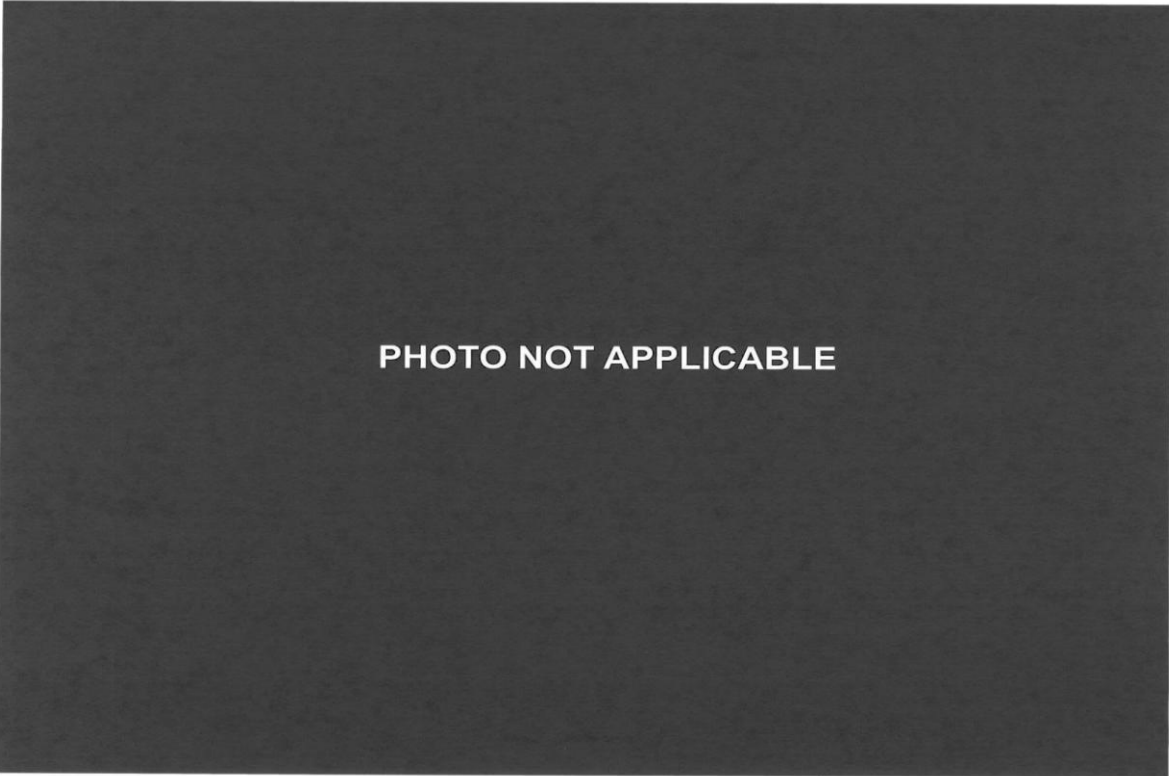


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051 Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View

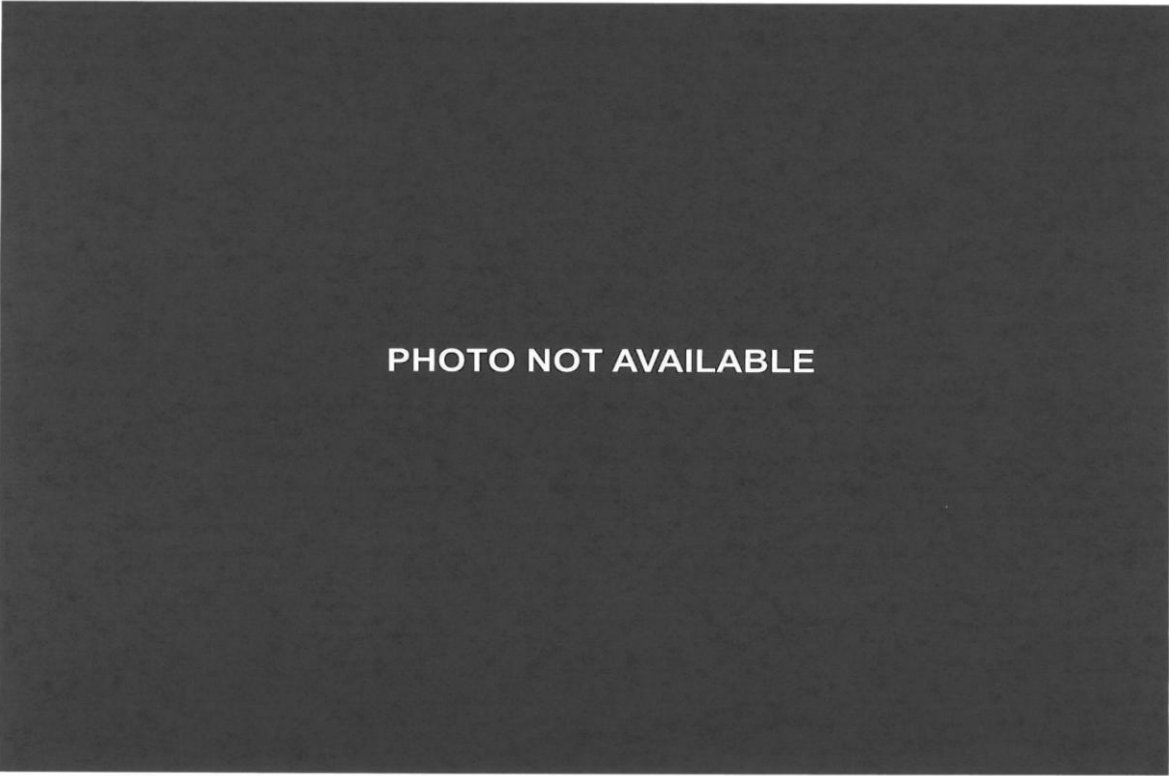


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052 Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



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



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



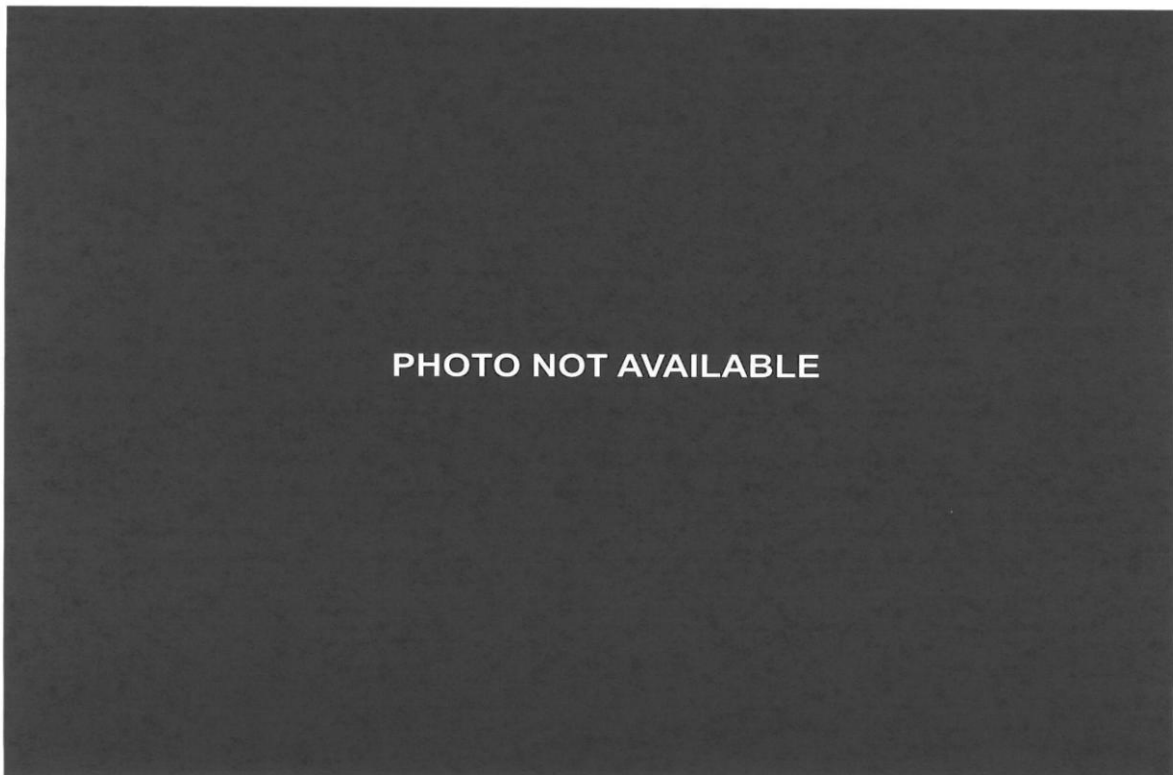
055 Close-Up View of Vehicle Certification Label



056 Close-Up View of Vehicle Tire Information Placard or Label



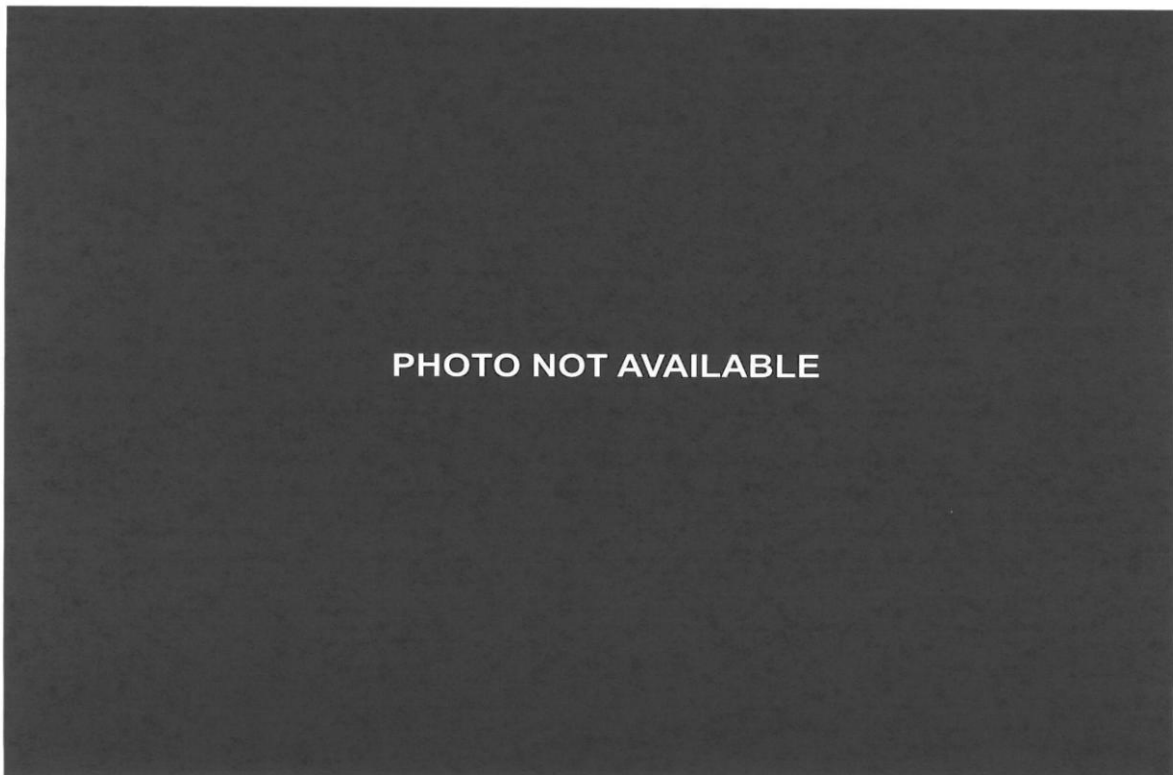
057 Pre-Test Pole Barrier Front View



058 Post-Test Pole Barrier Front View



059 Pre-Test Pole Barrier Side View



060 Post-Test Pole Barrier Side View



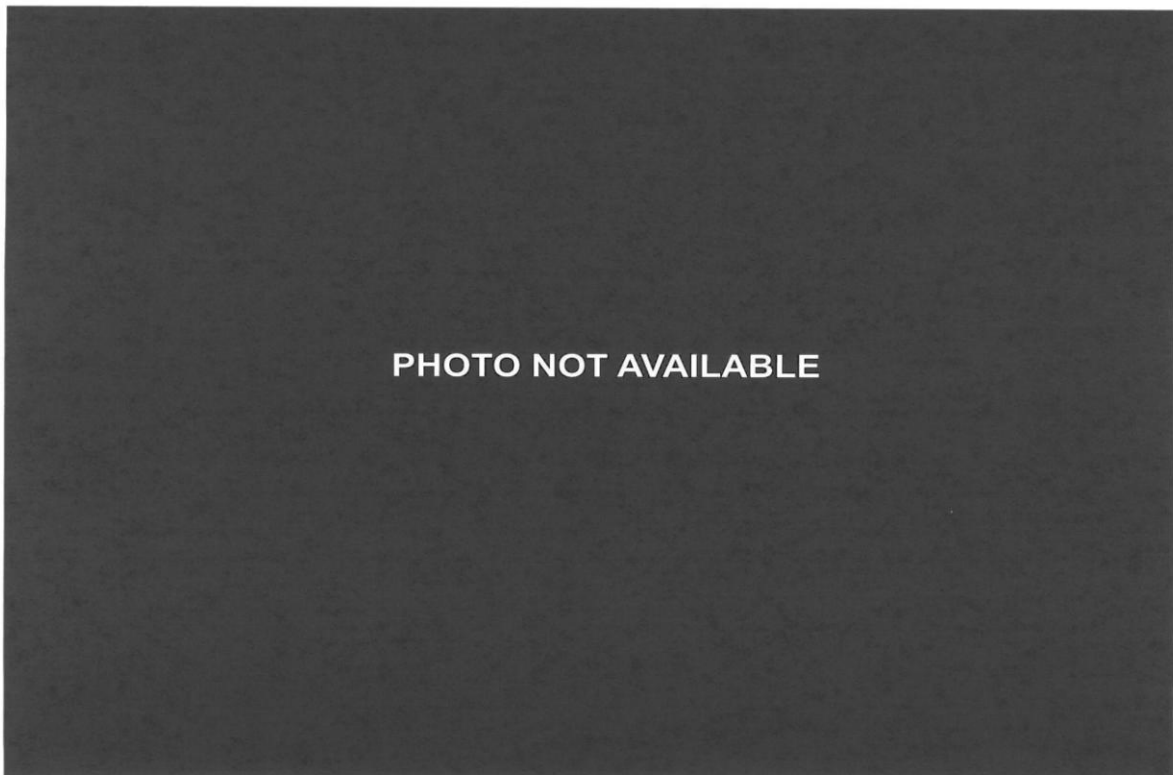
061a Pre-Test Ballast View



061b Pre-Test Ballast View



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



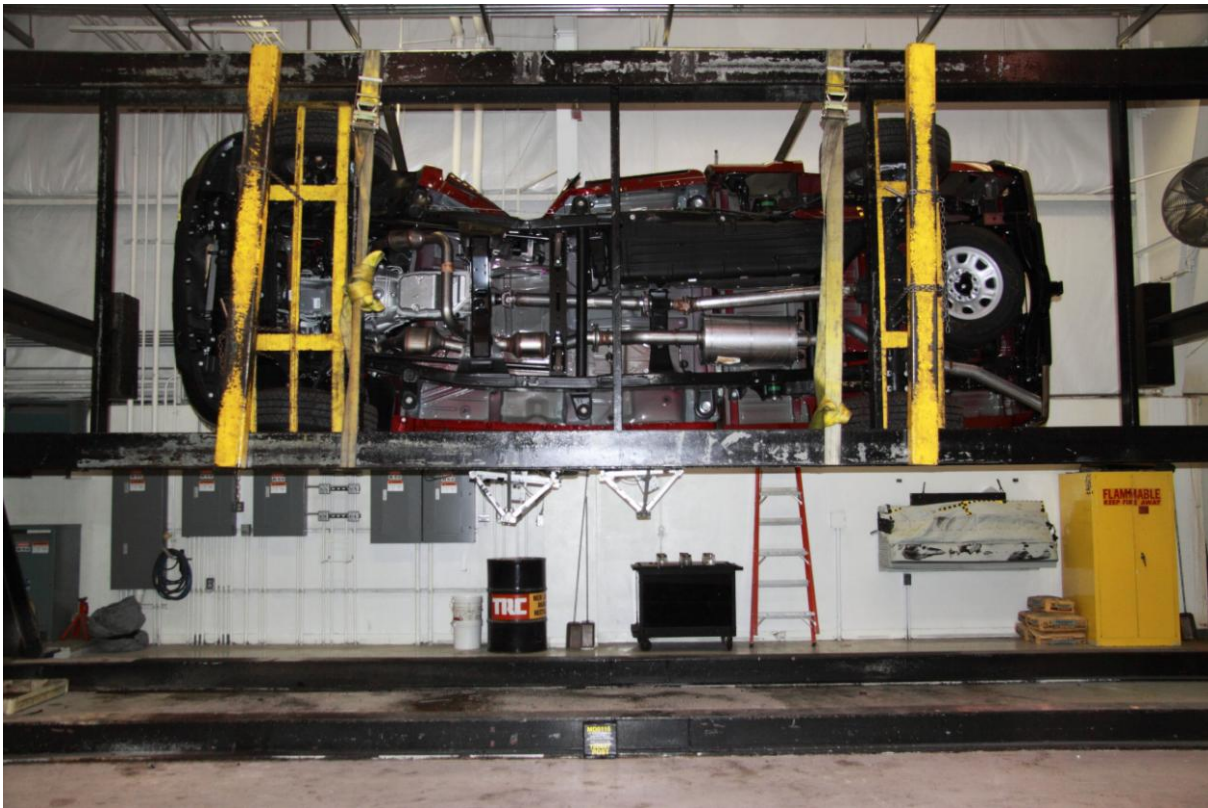
063 FMVSS No. 301 Static Rollover 0 Degrees



064 FMVSS No. 301 Static Rollover 90 Degrees



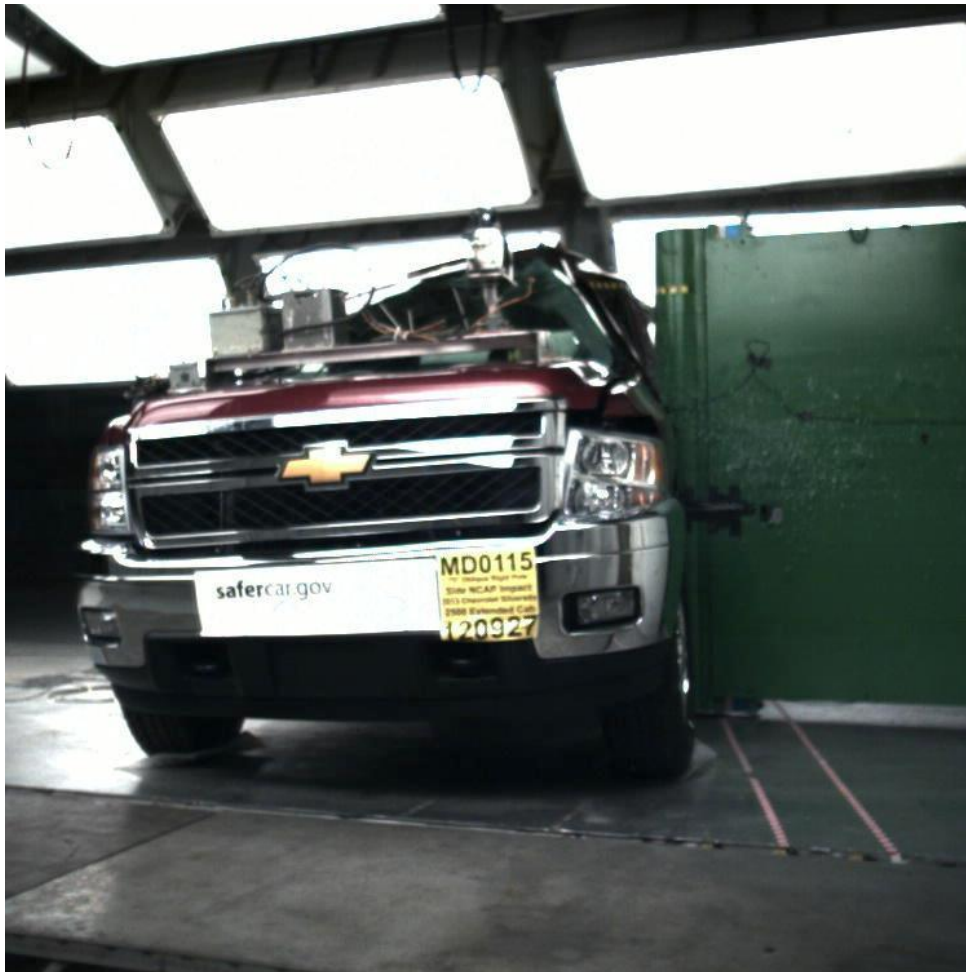
065 FMVSS No. 301 Static Rollover 180 Degrees



066 FMVSS No. 301 Static Rollover 270 Degrees



067 FMVSS No. 301 Static Rollover 360 Degrees



068 Impact Event



2013 SILVERADO 2500 2WD LT EXT CAB

**EXTERIOR: DEEP RUBY METALLIC
INTERIOR: EBONY**

**VORTEC 6.0L V8 SFI GAS ENGINE
6-SPEED AUTOMATIC TRANSMISSION**

STANDARD EQUIPMENT		MECHANICAL		SAFETY & SECURITY		EXTERIOR		INTERIOR		CARGO BOX ILLUMINATION		OPTIONS & PRICING		TOTAL VEHICLE PRICE*	
(STANDARD EQUIPMENT IS INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE OPTION.) • 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS		• VORTEC 6.0L V8 ENGINE • 6-SPEED H.D. AUTO TRANSMISSION • TORSION BAR FRONT SUSPENSION • MULTILINK REAR SPRING SUSP. • 285 HANDLING TRAILERING SUSP. • FULLY BOXED FRAME DESIGN • 125 AMP ALTERNATOR • HE-DRIVE/STEERING		• 4-WHEEL ABS BRAKES • DRIVER AND RIGHT FRONT AIR BAGS • THEFT DETECTION SYSTEM • REMOTE KEYLESS ENTRY • DAYTIME RUNNING LAMPS		• CHROME REAR BUMPER • 170 DEGREE WIDE OPENING REAR DOORS • 17" ALUMINUM WHEELS • 17" ALL-SEASON TIRES • FRONT RECOVERY HOOPS • DUAL PWR HEATED GSV MIRRORS • BODYSIDE MOLDINGS • CHROME SURROUND GRILLE		• CARGO BOX ILLUMINATION • SOLAR RAY DEEP TINTED GLASS • AIR CONDITIONING • POWER WINDOWS • LEATHER WRAPPED STEERING WHEEL • ILLUMINATED VANITY MIRRORS • UP/LEVEL FRT SPLIT BENCH SEATS • WIDR LUMBAR & LOCKING STORAGE • 60/40 SPLIT REAR SEATING • DUAL GLOVE BOX STORAGE • AM/FM STEREO WITH CD PLAYER • XM RADIO + SERVICE • SUBSCRIPTION SOLD SEPARATELY BY SRI/SLM AFTER 3 MONTHS • DRIVER INFO CENTER DISPLAY • INTERMITTENT WIPERS • 6-GAUGE CLUSTER WITH ODOMETER • 12-VOLT AUX PWR OUTLET • TILT STEERING WHEEL • CRUISE CONTROL		• CARPETED FLOOR COVERING WITH VINYL MATS • BATTERY RUN DOWN PROTECTION • OIL LIFE MONITOR SYSTEM • 24-HOUR ROADSIDE ASSISTANCE		• HD TRAILERING EQUIPMENT PKG. • LOCKING REAR DIFFERENTIAL • INTEGRATED TRAILER BRAKE CONTROLLER • FRONT BUCKET SEATS INCLUDING: PWR SEAT ADJUST, DRIVER 6-WAY PWR SEAT ADJUST, FRONT PASS. 18" FORGED POLISHED ALUM WHEELS MIRRORS, CAMPER STYLE, HEATED, POWER ADJUSTABLE (REPLACES STD/OPT MIRRORS) 18" ALL-TERRAIN BLACKHALL TIRES INSIDE REARVIEW MIRROR, AUTO- DIMMING ROOF MARKER LAMPS GVW RATING - 9,500 LBS REAR AXLE - 3.73 RATIO VORTEC 6.0L V8 SFI GAS ENGINE INC.		TOTAL VEHICLE PRICE* \$39,695.00	
STANDARD VEHICLE PRICE \$39,695.00 OPTIONAL EQUIPMENT IS INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE OPTION.		INTERIOR PLUS PACKAGE: 720.00 • AUTO DUAL ZONE A/C • STEERING WHEEL RADIO CONTROL • CD PLAYER W/ USB PORT • BLUE TOOTH FOR PHONE • FOG LAMPS • LOCKING TAILGATE • EZ LIFT TAILGATE		TOTAL OPTIONS \$3,695.00 TOTAL VEHICLE & OPTIONS \$38,700.00 DESTINATION CHARGE 995.00		TOTAL VEHICLE PRICE* \$39,695.00									

EPA DOT Fuel Economy and Environment		GOVERNMENT 5-STAR SAFETY RATINGS		This label has been applied pursuant to Federal Motor Vehicle Safety Act of 1966, as amended, and is not to be removed or altered prior to delivery to the ultimate purchaser. Vehicle information is provided for informational purposes only. Dealer to provide information on vehicle features and accessories not listed above, such as those on separate tags.	
NOT APPLICABLE TO THIS VEHICLE		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.		This label has been applied pursuant to Federal Motor Vehicle Safety Act of 1966, as amended, and is not to be removed or altered prior to delivery to the ultimate purchaser. Vehicle information is provided for informational purposes only. Dealer to provide information on vehicle features and accessories not listed above, such as those on separate tags.	
		Frontal Crash Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		Driver Not Rated Passenger Not Rated	
		Side Crash Based on the risk of injury in a side impact.		Front seat Not Rated Rear seat Not Rated	
		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		EXPIRY NO CHANGING - SALES CODE E DEALER MODEL CODE C00070 DEALER NO. 000000 DEALER ADDRESS: U.S.A. VIN 1G2C2XG04D2101819 DEALER TO WHOM DELIVERED FORREST CHEVROLET, INC. PO BOX 106 CENTRALIA, MO 65240-0106	

069 Monroney Label

Head Restraints**Front Seats**

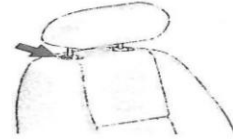
The front seats have adjustable head restraints in the outboard seating positions.

WARNING

With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.



Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chance of a neck injury in a crash.



The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure that it is locked in place.

To lower the head restraint, press the button, located on the top of the seatback, and push the restraint down. Try to move the head restraint after the button is released to make sure that it is locked in place.

The front seat outboard head restraints are not designed to be removed.

Rear Seats

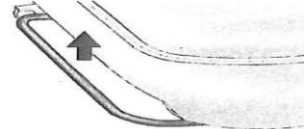
The rear seat has adjustable headrests in the outboard seating positions.

The height of the headrest can be adjusted. Pull the headrest up to raise it. To lower the headrest, push down on the headrest.

Rear outboard headrests are not designed to be removed.

Front Seats**Seat Adjustment****WARNING**

You can lose control of the vehicle if you try to adjust a driver seat while the vehicle is moving. Adjust the driver seat only when the vehicle is not moving.

**Split Bench or Bucket Seat**

To adjust the seat:

1. Lift the bar to unlock the seat.
2. Slide the seat to the desired position and release the bar.
3. Try to move the seat back and forth to be sure the seat is locked in place.

Some vehicles have a folding front bench seat.

070 Head Restraint Use and Adjustment Information from Vehicle Owner Manual

PHOTO NOT AVAILABLE

071 Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

No.	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-4
2	Driver Head Acceleration (Y) Primary vs. Time	B-4
3	Driver Head Acceleration (Z) Primary vs. Time	B-4
4	Driver Head Acceleration Resultant Primary vs. Time	B-4
5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-5
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-5
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-5
8	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-5
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-6
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-6
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-7

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at:

www.nhtsa.dot.gov.

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration (X) Redundant
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)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
 Left Floor Sill Acceleration (Y)
 Left A-Pillar Sill Acceleration (Y)
 Left Lower A-Pillar Acceleration (Y)
 Left Mid A-Pillar Acceleration (Y)
 Left B-Pillar Sill Acceleration (Y)
 Left Lower B-Pillar Acceleration (Y)
 Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip 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)

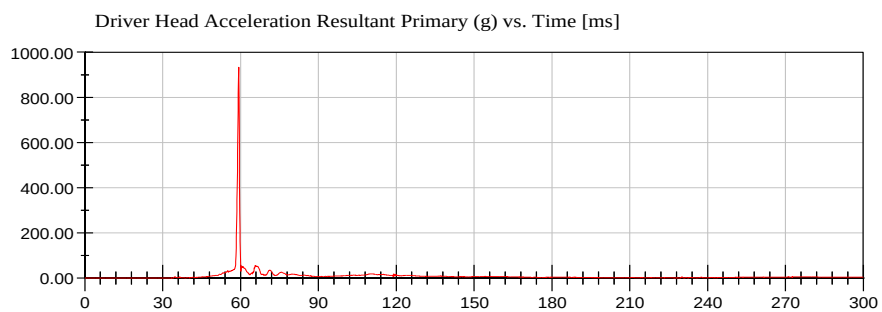
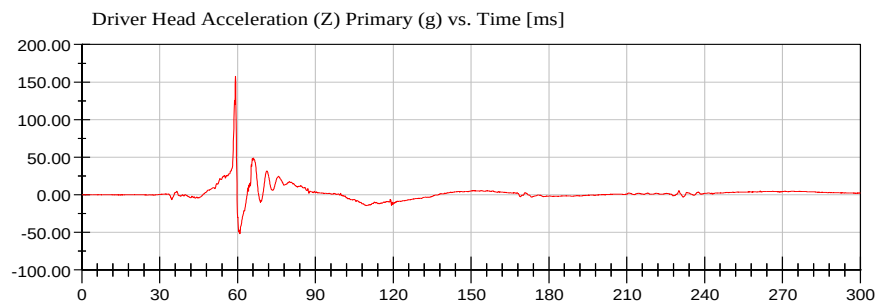
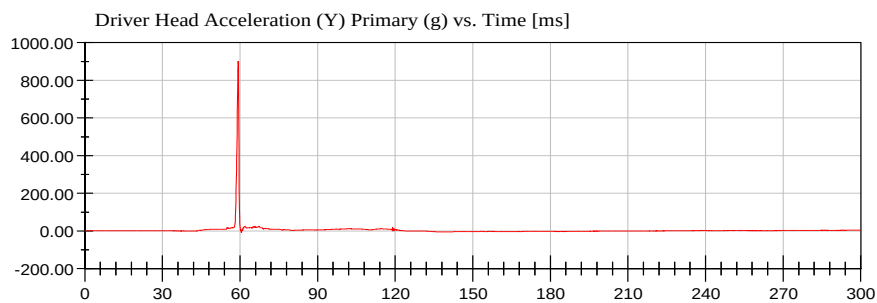
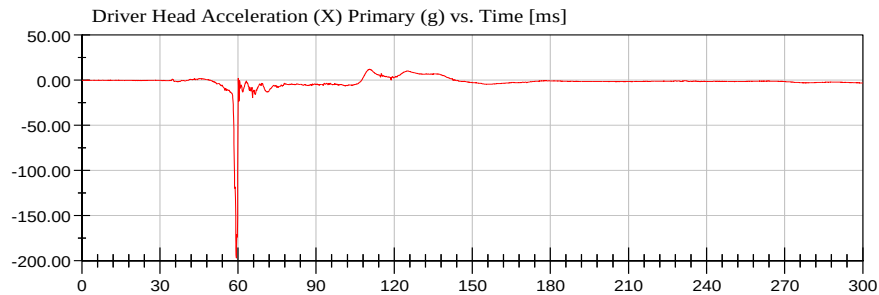
NHTSA

Test Lab: CTF

Test Number: 120927 (MD0115)

Position #1 SID II's Dummy (033)

Test Date: 09/27/2012



NHTSA

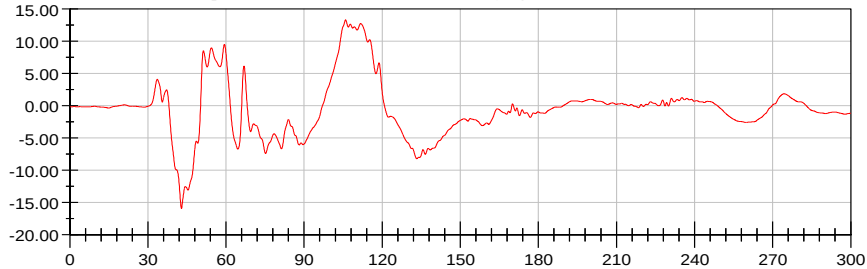
Test Lab: CTF

Test Number: 120927 (MD0115)

Position #1 SID II's Dummy (033)

Test Date: 09/27/2012

Driver Lower Spine T12 Acceleration (X) Primary (g) vs. Time [ms]



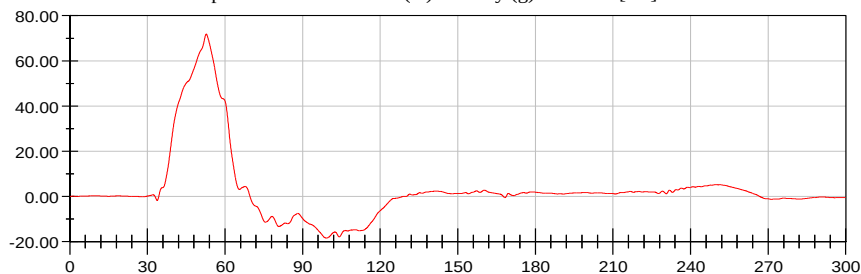
<Max>

13.32 g at 105.92 ms

<Min>

-15.94 g at 42.88 ms

Driver Lower Spine T12 Acceleration (Y) Primary (g) vs. Time [ms]



<Max>

71.84 g at 52.72 ms

<Min>

-18.47 g at 99.20 ms

Driver Lower Spine T12 Acceleration (Z) Primary (g) vs. Time [ms]



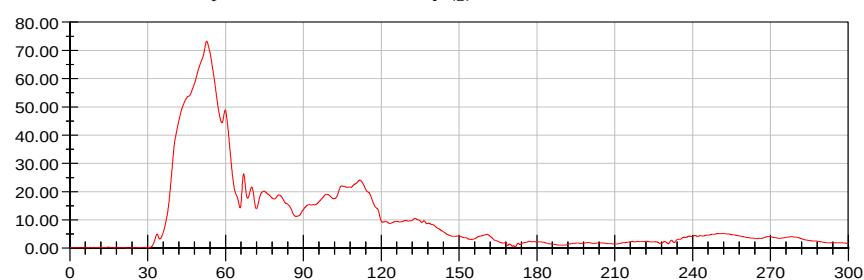
<Max>

25.26 g at 67.04 ms

<Min>

-14.37 g at 40.48 ms

Driver Lower Spine T12 Resultant Primary (g) vs. Time [ms]



<Max>

73.27 g at 52.72 ms

<Min>

0.04 g at 22.48 ms



NHTSA

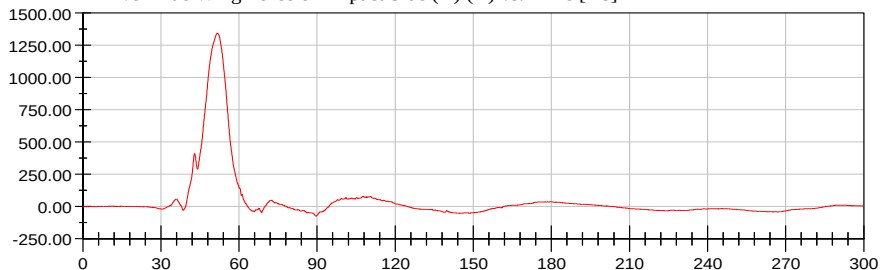
Test Lab: CTF

Test Number: 120927 (MD0115)

Position #1 SID II's Dummy (033)

Test Date: 09/27/2012

Driver Iliac Wing Force on Impact Side (Y) (N) vs. Time [ms]



<Max>

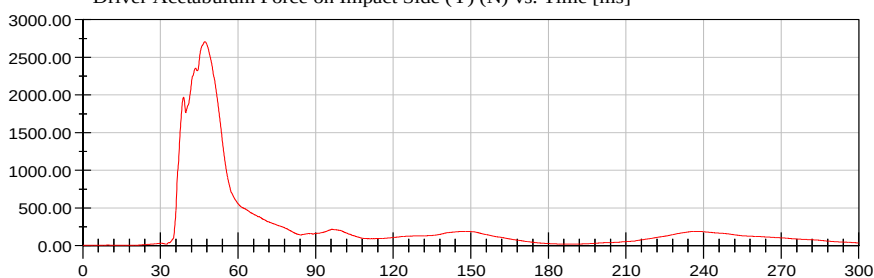
1,341.48 N at 51.52 ms

<Min>

-73.83 N at 89.60 ms

CFC_600

Driver Acetabulum Force on Impact Side (Y) (N) vs. Time [ms]



<Max>

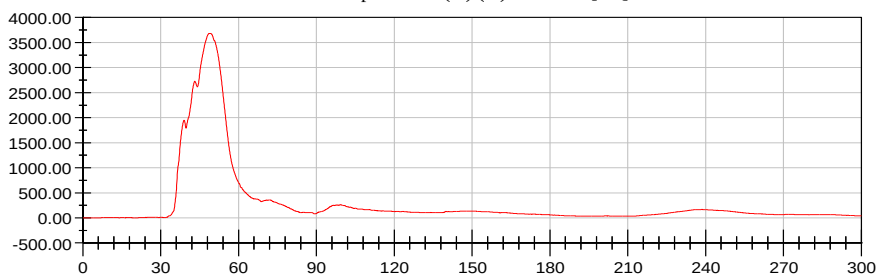
2,706.66 N at 47.20 ms

<Min>

0.26 N at 0.08 ms

CFC_600

Driver Total Pelvis Force on Impact Side (Y) (N) vs. Time [ms]



<Max>

3,683.44 N at 48.72 ms

<Min>

-0.77 N at 0.16 ms

CFC_600



APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS
SID-IIs (Driver) Dummy
Description

Table 1. External Measurements

Table 2. Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)
Head (X) Acceleration (G's) vs. Time (ms)
Head (Y) Acceleration (G's) vs. Time (ms)
Head (Z) Acceleration (G's) vs. Time (ms)

Table 3. Lateral Neck Pendulum Test

Pendulum Velocity (m/s) vs. Time (ms)
Flexion Angle (°) vs. Time (ms)
Moment About Occipital Condyle (Nm) vs. Time (ms)

Table 4. Shoulder Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Shoulder Displacement (mm) vs. Time (ms)
Upper Spine Acceleration (G's) vs. Time (ms)

Table 5. Thorax (With Arm) Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Shoulder Displacement (mm) vs. Time (ms)
Upper Rib Displacement (mm) vs. Time (ms)
Middle Rib Displacement (mm) vs. Time (ms)
Lower Rib Displacement (mm) vs. Time (ms)
Upper Spine Acceleration (G's) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)

Table 6. Thorax (Without Arm) Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Upper Rib Displacement (mm) vs. Time (ms)
Middle Rib Displacement (mm) vs. Time (ms)
Lower Rib Displacement (mm) vs. Time (ms)
Upper Spine Acceleration (G's) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)

Table 7. Abdomen Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Upper Abdominal Rib Displacement (mm) vs. Time (ms)
Lower Abdominal Rib Displacement (mm) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)

Table 8. Pelvis Plug Quasi-Static Test (Optional*)

Table 9. Pelvis Acetabulum Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Pelvis (Y) Acceleration (G's) vs. Time (ms)
Acetabulum Force (N) vs. Time (ms)

Table 10. Pelvis Iliac Impact Test

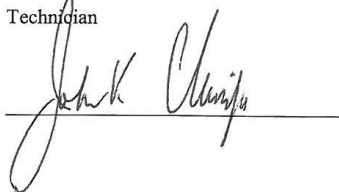
Impactor Acceleration (G's) vs. Time (ms)
Pelvis (Y) Acceleration (G's) vs. Time (ms)
Iliac Force (N) vs. Time (ms)

Pre-Test Calibration Sheets
Driver S/N 305

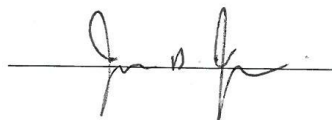
Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 033 Calibration No.11
Date: 09/26/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	778	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	127	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	533	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	399	Yes
N	Buttock Popliteal Length	416.0 - 442.0	431	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	314	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	481	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	869	Yes
Z	Waist Circumference	761.0 - 791.0	777	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 033 Certification No. 11-1

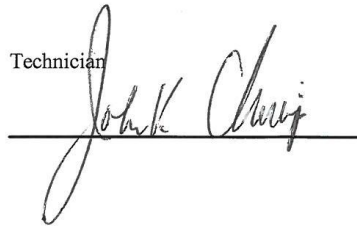
Test Date: 9/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	127.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.1 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

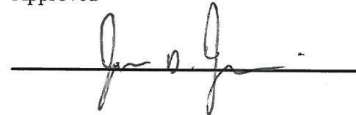
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:09:03 233

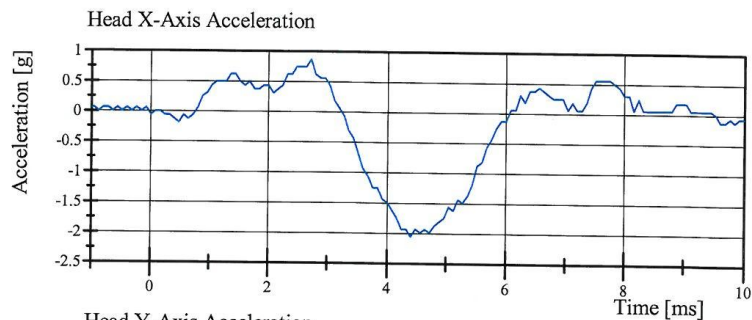


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 033 Certification No. 11-1

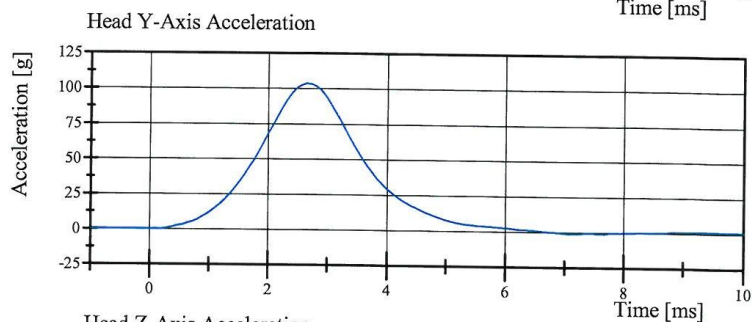
Test Date: 9/25/2012



Filter Class: CFC_1000

Max: 0.9 gn at 2.7 ms

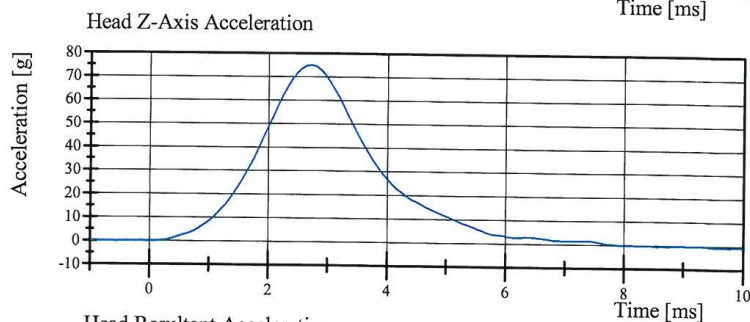
Min: -2.1 gn at 4.4 ms



Filter Class: CFC_1000

Max: 103.6 gn at 2.6 ms

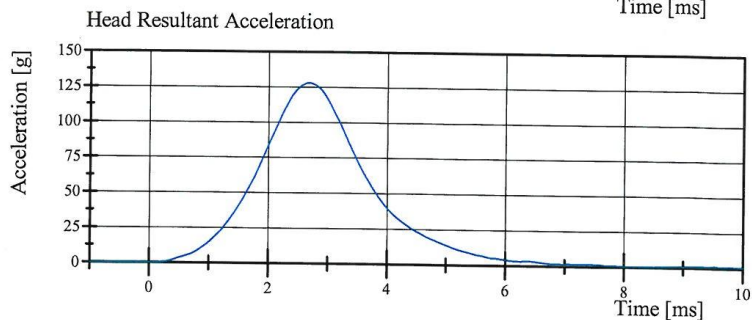
Min: -0.9 gn at 7.2 ms



Filter Class: CFC_1000

Max: 75.1 gn at 2.7 ms

Min: -0.6 gn at 9.8 ms



Filter Class: CFC_1000

Max: 127.8 gn at 2.7 ms

Min: 0.0 gn at -0.6 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:09:26 233



Transportation Research Center Inc.

Left Lateral Neck

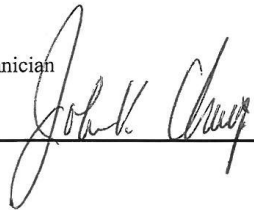
SID IIs Serial No. 033 Certification No. 11-1

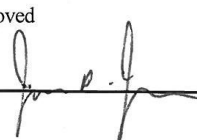
Test Date: 9/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.581 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.378 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.468 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.712 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.706 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.789 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-72.4 deg	Yes
Time of Peak	50 - 70 ms	59.9 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.4 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	115.5 ms	Yes

Test meets specifications.

Comments:

Technician


Approved


Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:19:18 641



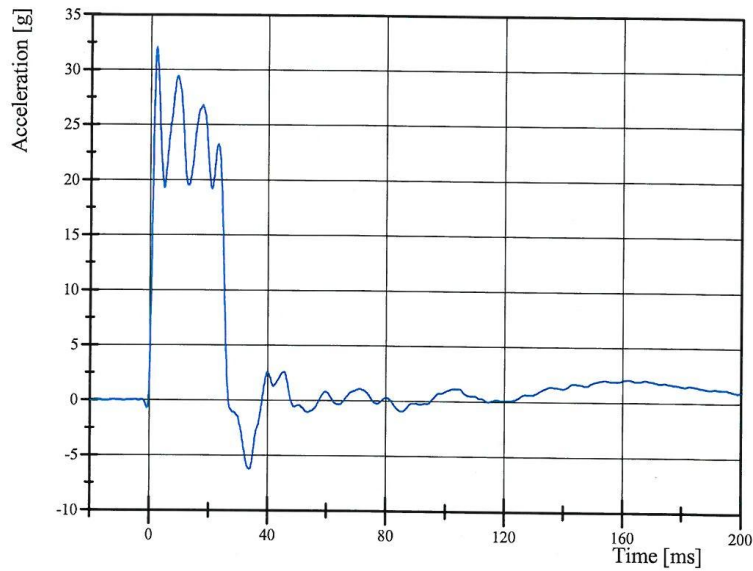
Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 033 Certification No. 11-1

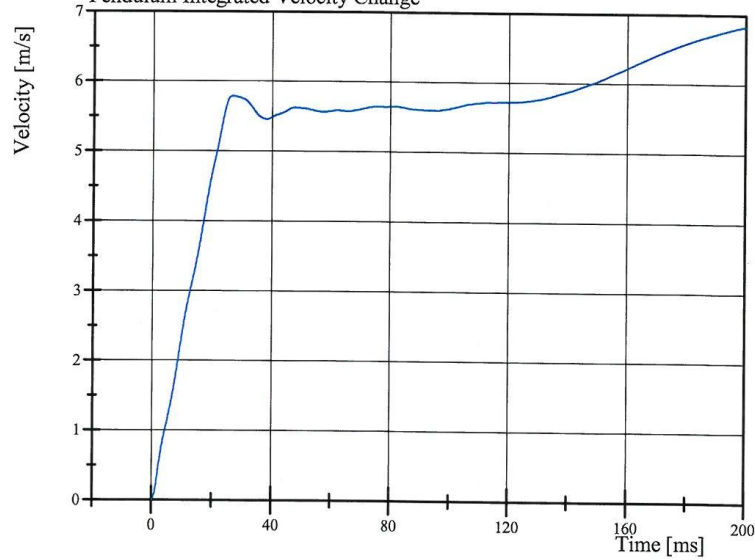
Test Date: 9/25/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 32.0 gn at 2.0 ms
Min: -6.2 gn at 33.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.8 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:19:29 641

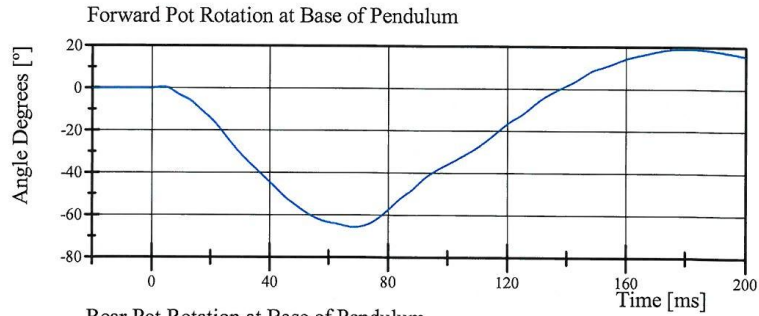


Transportation Research Center Inc.

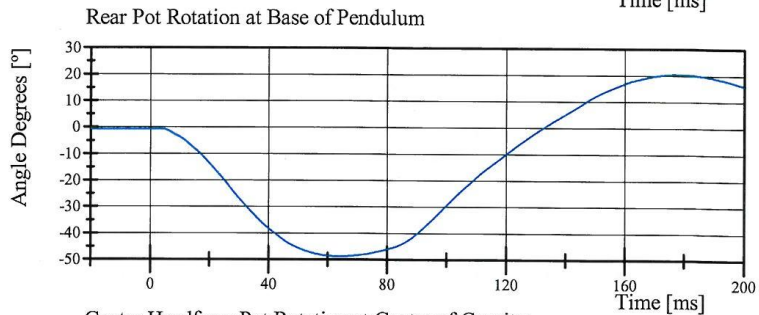
Left Lateral Neck

SID IIs Serial No. 033 Certification No. 11-1

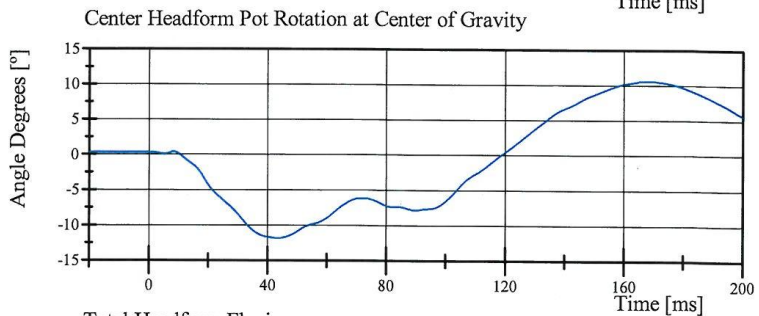
Test Date: 9/25/2012



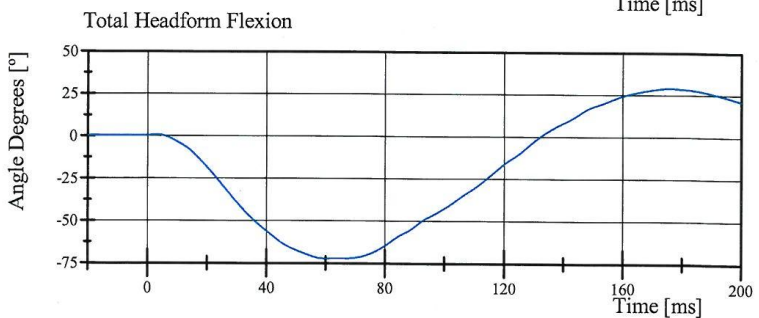
Filter Class: CFC_60
Max: 18.9 ° at 179.0 ms
Min: -65.7 ° at 68.6 ms



Filter Class: CFC_60
Max: 20.4 ° at 176.6 ms
Min: -48.8 ° at 63.8 ms



Filter Class: CFC_60
Max: 10.6 ° at 167.8 ms
Min: -11.8 ° at 43.3 ms



Filter Class: CFC_60
Max: 29.0 ° at 175.5 ms
Min: -72.4 ° at 59.9 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:19:29 641

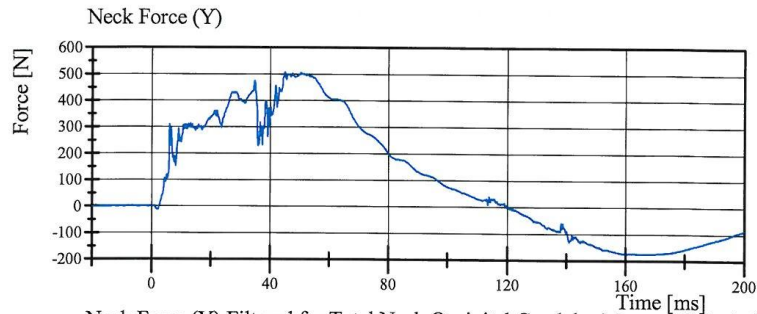


Transportation Research Center Inc.

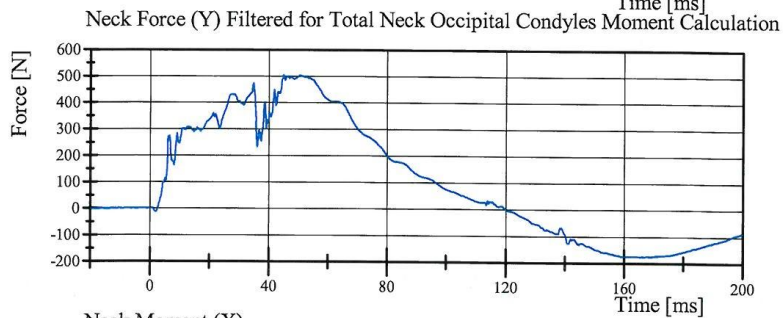
Left Lateral Neck

SID IIa Serial No. 033 Certification No. 11-1

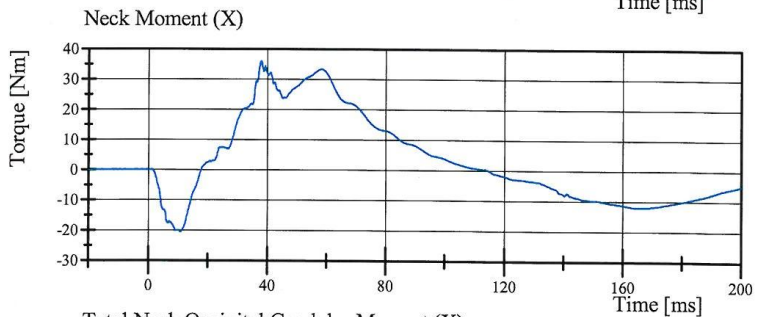
Test Date: 9/25/2012



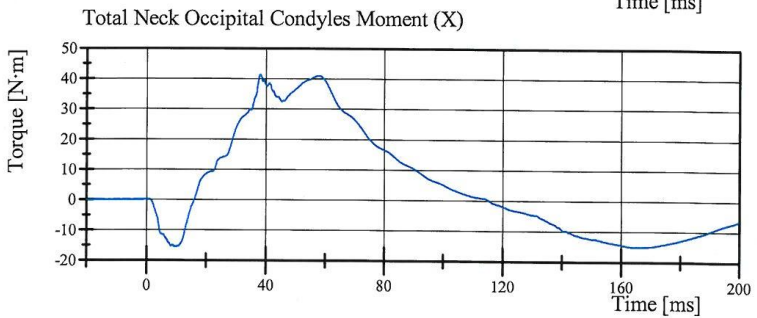
Filter Class: CFC_1000
Max: 507.3 N at 45.0 ms
Min: -175.3 N at 165.0 ms



Filter Class: CFC_600
Max: 504.4 N at 45.0 ms
Min: -175.0 N at 165.3 ms



Filter Class: CFC_600
Max: 35.9 Nm at 37.8 ms
Min: -20.6 Nm at 10.7 ms



Filter Class: Without (Constant)
Max: 41.4 N·m at 38.0 ms
Min: -15.6 N·m at 9.8 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:19:30 641



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 033 Certification No. 11-1

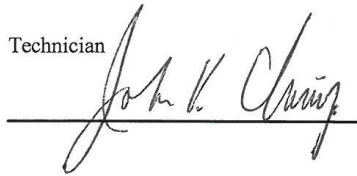
Test Date: 9/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.4 g	Yes
Shoulder Displacement	28 - 37 mm	30.7 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	20.4 g	Yes

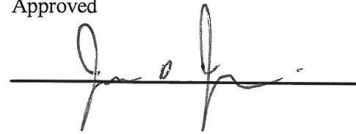
Test meets specifications.

Comments:

Technician



Approved



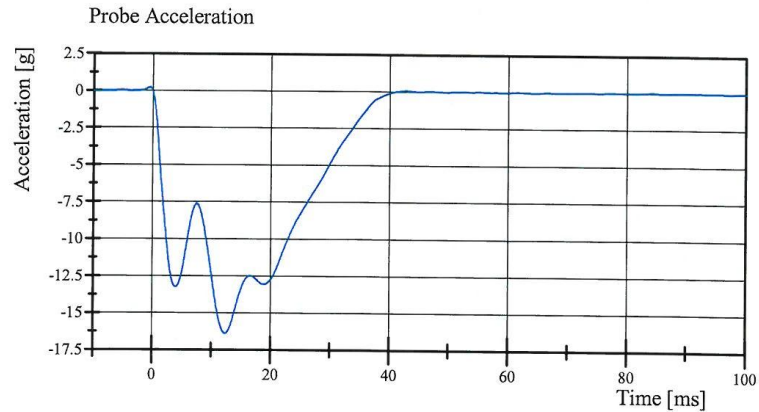
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:00:06 837

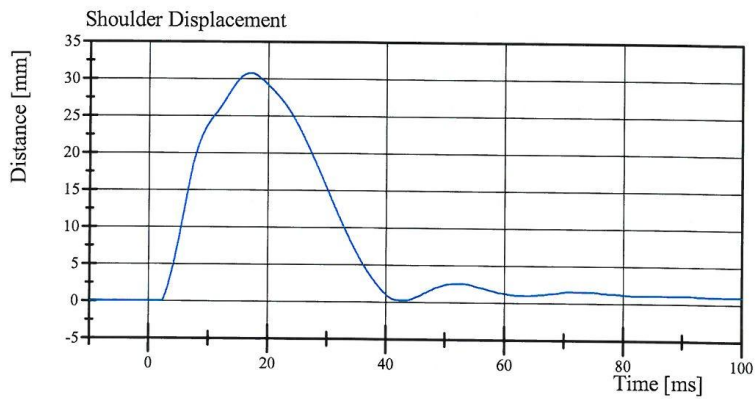


Transportation Research Center Inc.

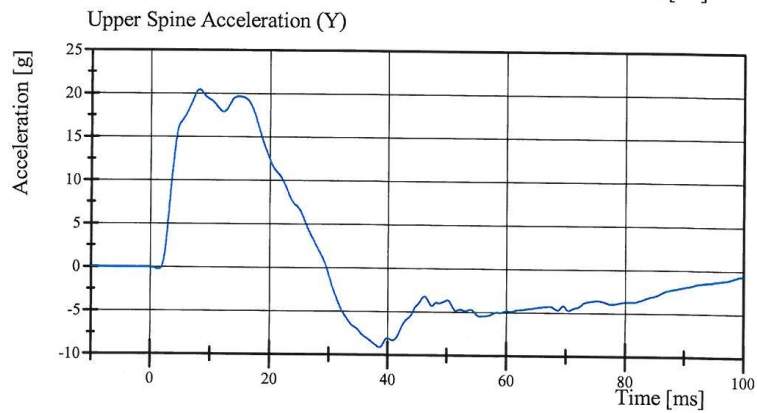
Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 11-1
Test Date: 9/25/2012



Filter Class: CFC_180
Max: 0.2 gn at -0.6 ms
Min: -16.4 gn at 12.3 ms



Filter Class: CFC_600
Max: 30.7 mm at 17.1 ms
Min: -0.0 mm at 2.0 ms



Filter Class: CFC_180
Max: 20.4 gn at 8.1 ms
Min: -9.1 gn at 38.6 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 13:00:16 837



Transportation Research Center Inc.

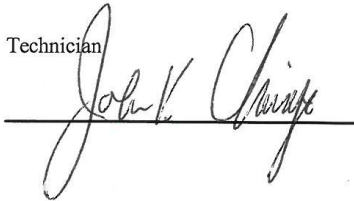
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 11-1
Test Date: 9/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.720 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-35.2 g	Yes
Shoulder Displacement	31 - 40 mm	34.6 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.1 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.6 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	40.8 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	36.8 g	Yes

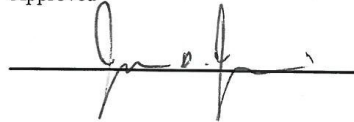
Test meets specifications.

Comments:

Technician



Approved



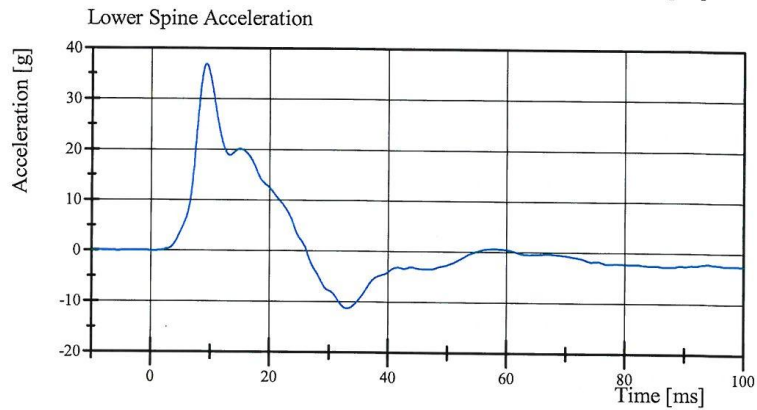
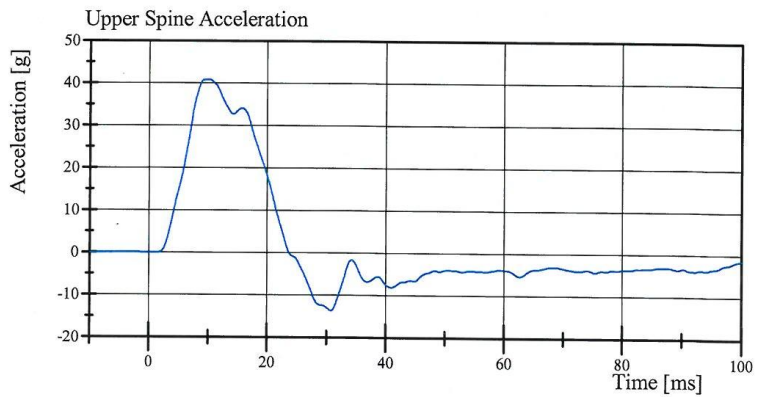
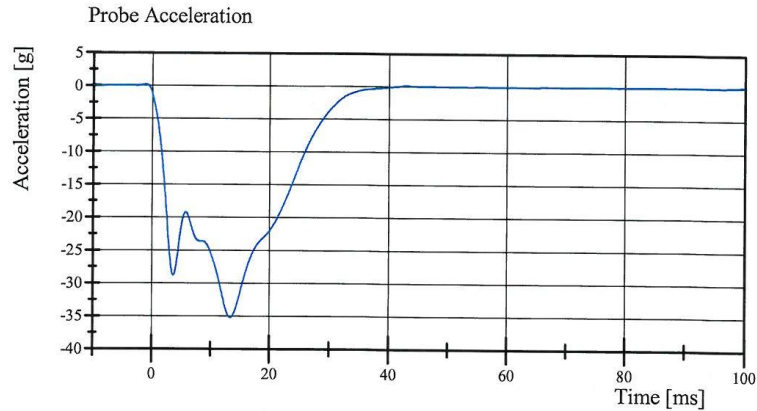
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 14:25:57 606



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID II_s Serial No. 033 Certification No. 11-1
Test Date: 9/25/2012



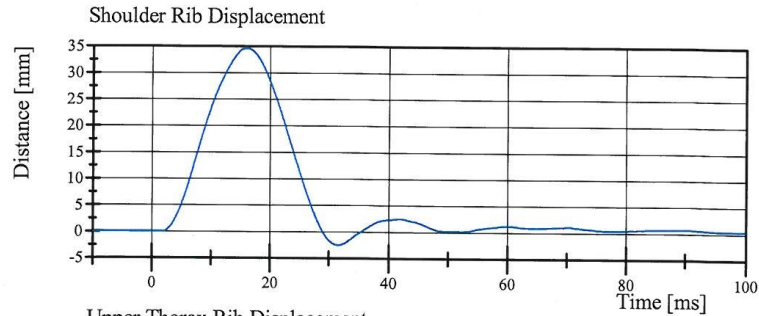
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 14:26:09 606

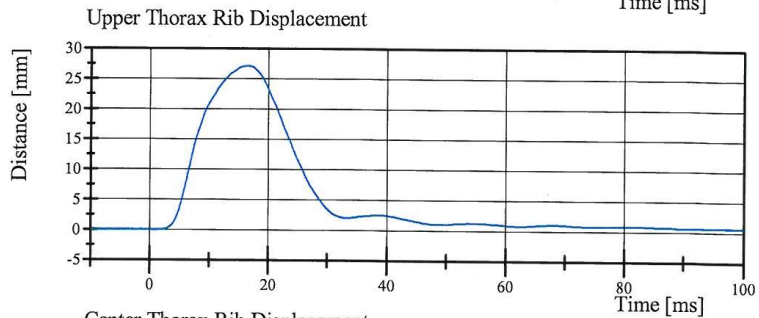


Transportation Research Center Inc.

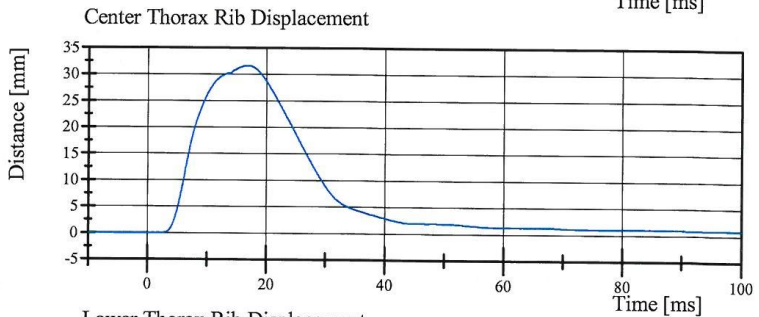
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 11-1
Test Date: 9/25/2012



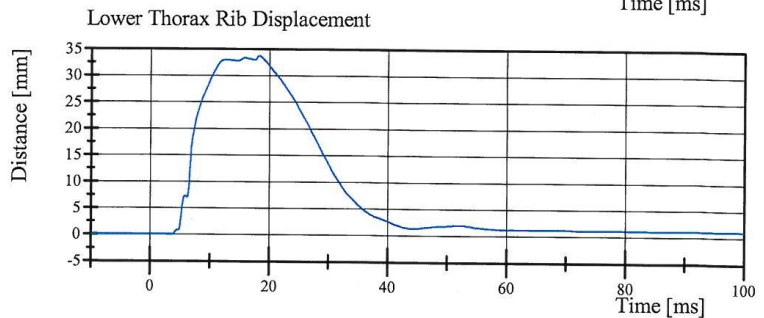
Filter Class: CFC_600
Max: 34.6 mm at 16.0 ms
Min: -2.5 mm at 31.6 ms



Filter Class: CFC_600
Max: 27.1 mm at 16.4 ms
Min: -0.0 mm at -1.0 ms



Filter Class: CFC_600
Max: 31.6 mm at 16.6 ms
Min: -0.0 mm at -8.9 ms



Filter Class: CFC_600
Max: 33.8 mm at 18.2 ms
Min: -0.0 mm at 3.6 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 14:26:10 606



Transportation Research Center Inc.

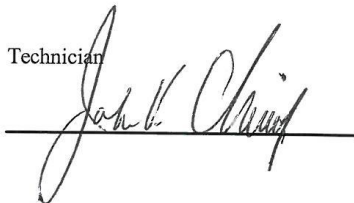
Left Lateral Thorax without Arm
SID II_s Serial No. 033 Certification No. 11-2
Test Date: 9/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.329 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.1 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.4 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	35.1 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.9 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.4 g	Yes

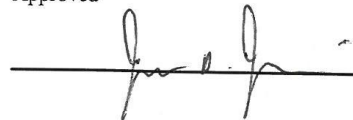
Test meets specifications.

Comments:

Technician



Approved



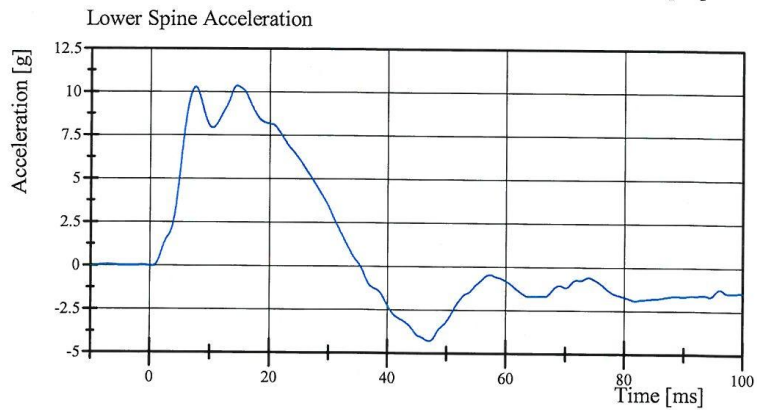
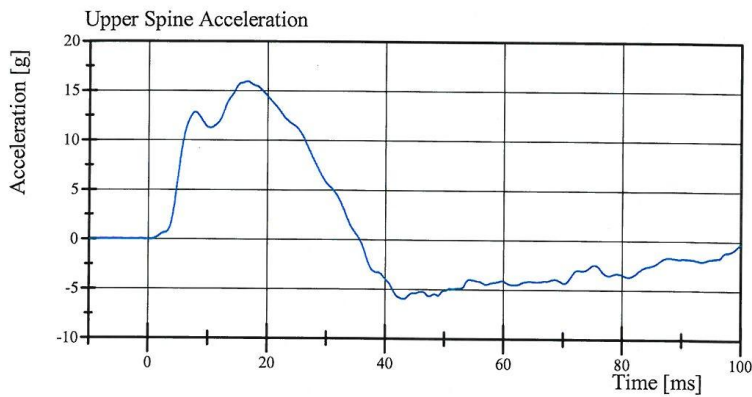
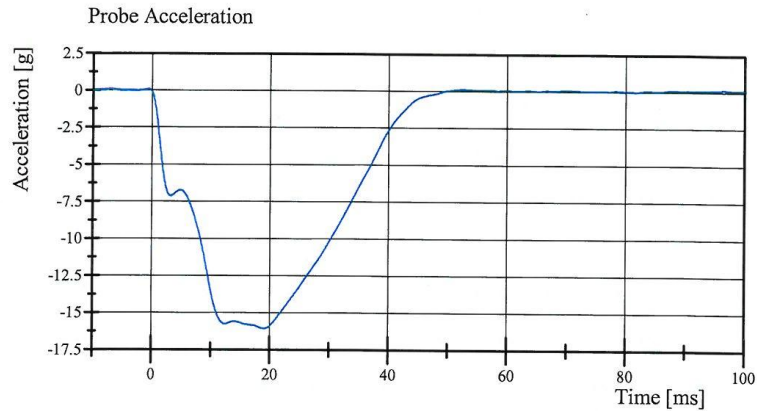
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 15:29:08 851



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID II_s Serial No. 033 Certification No. 11-2
Test Date: 9/25/2012



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

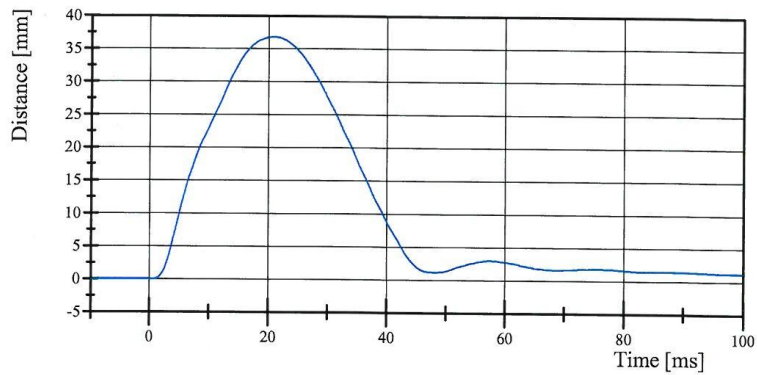
09.25.2012 15:29:16 851



Transportation Research Center Inc.

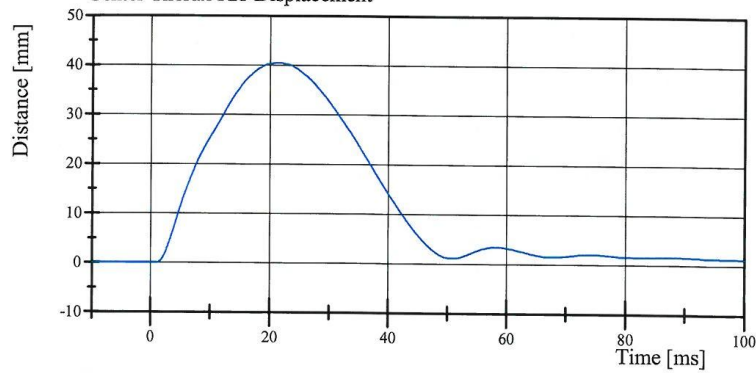
Left Lateral Thorax without Arm
SID IIa Serial No. 033 Certification No. 11-2
Test Date: 9/25/2012

Upper Thorax Rib Displacement



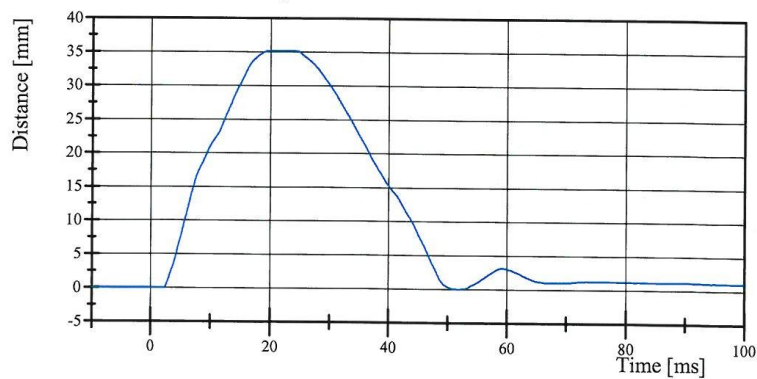
Filter Class: CFC_600
Max: 36.8 mm at 20.9 ms
Min: -0.0 mm at 0.9 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.4 mm at 21.3 ms
Min: -0.0 mm at 0.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 35.1 mm at 23.4 ms
Min: -0.0 mm at 2.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 15:29:17 851



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 033 Certification No. 11-1

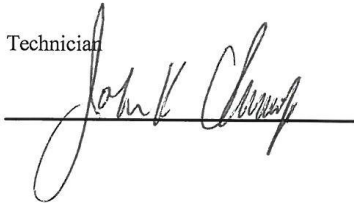
Test Date: 9/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.4 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	41.6 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	36.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.34 g	Yes

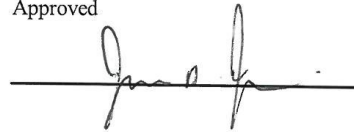
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 15:47:10 687

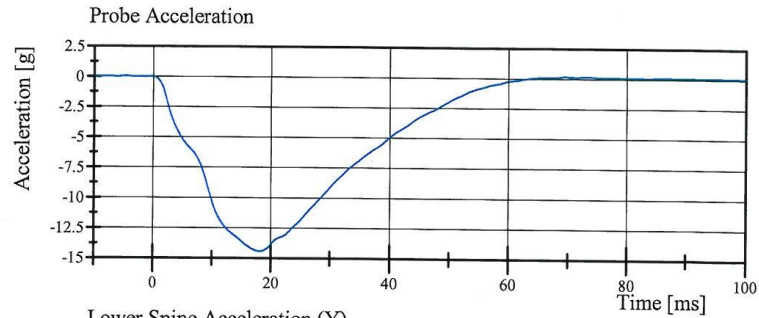


Transportation Research Center Inc.

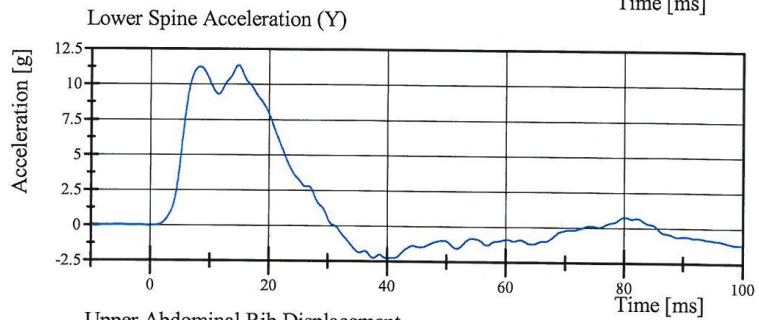
Left Lateral Abdomen

SID IIs Serial No. 033 Certification No. 11-1

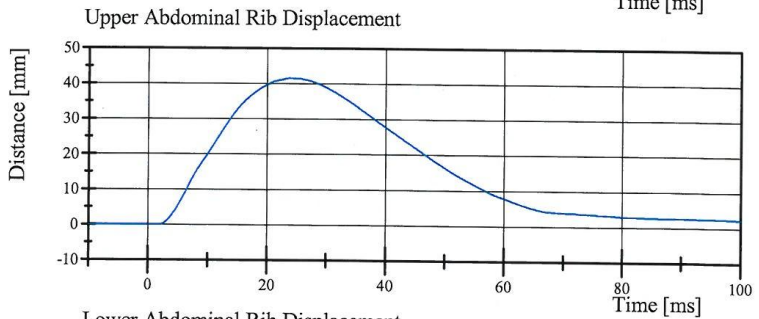
Test Date: 9/25/2012



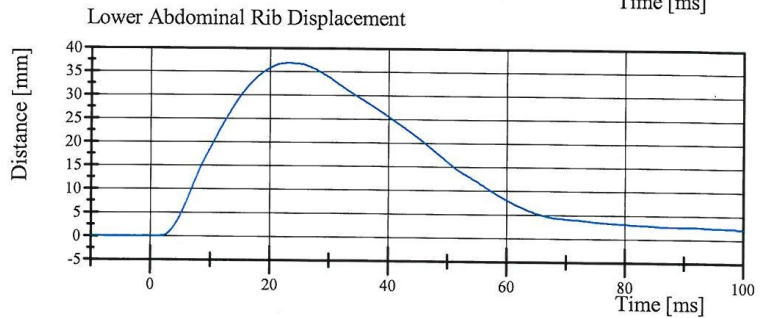
Filter Class: CFC_180
Max: 0.2 gn at 69.4 ms
Min: -14.4 gn at 18.1 ms



Filter Class: CFC_180
Max: 11.3 gn at 14.8 ms
Min: -2.3 gn at 39.9 ms



Filter Class: CFC_600
Max: 41.6 mm at 24.2 ms
Min: -0.0 mm at 1.8 ms



Filter Class: CFC_600
Max: 36.8 mm at 23.0 ms
Min: -0.0 mm at -1.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 15:47:18 687



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 033 Certification No. 11-1

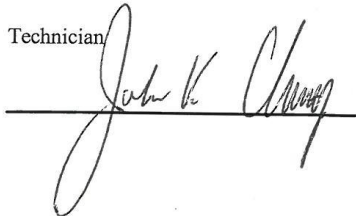
Test Date: 9/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.68 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.19 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	42.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,953.3 N	Yes

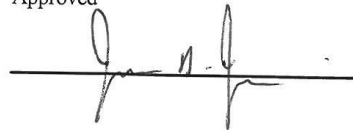
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 16:02:54 449

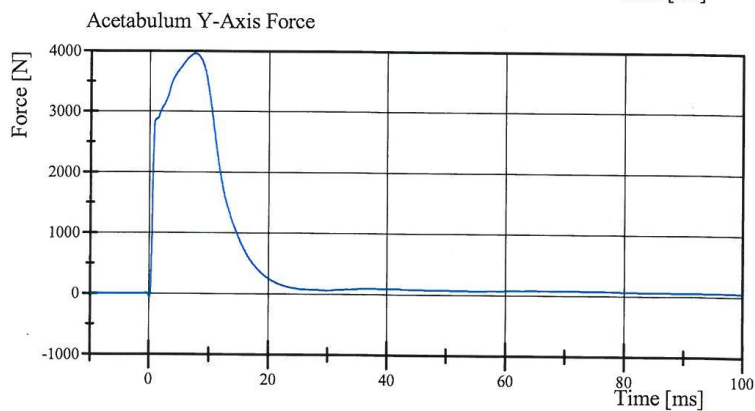
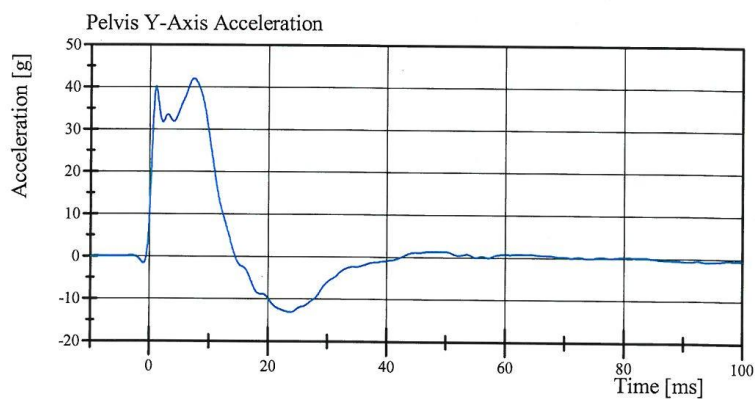
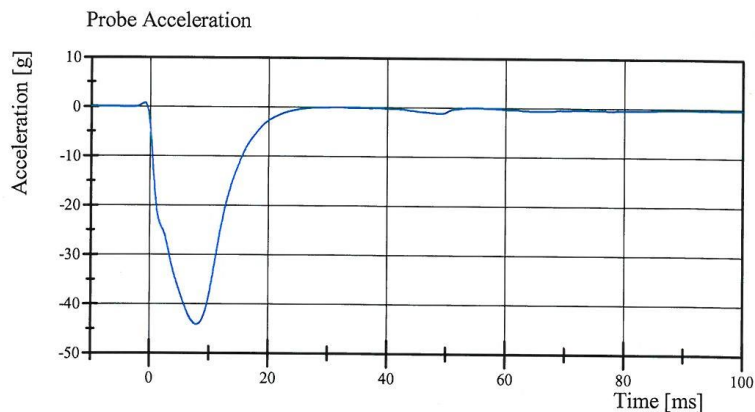


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 033 Certification No. 11-1

Test Date: 9/25/2012



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.25.2012 16:03:01 449



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 033 Certification No. 11-2

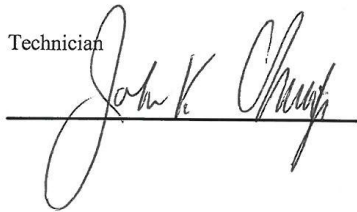
Test Date: 9/26/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.39 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-39.3 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.4 g	Yes
Iliac Force	4,100 - 5,100 N	4,424.6 N	Yes

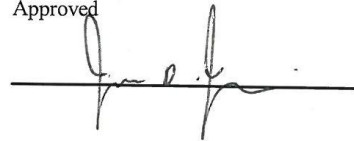
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.26.2012 09:13:58 643

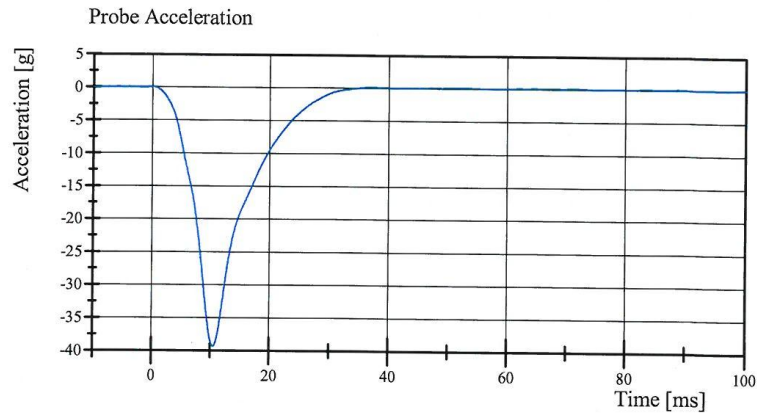


Transportation Research Center Inc.

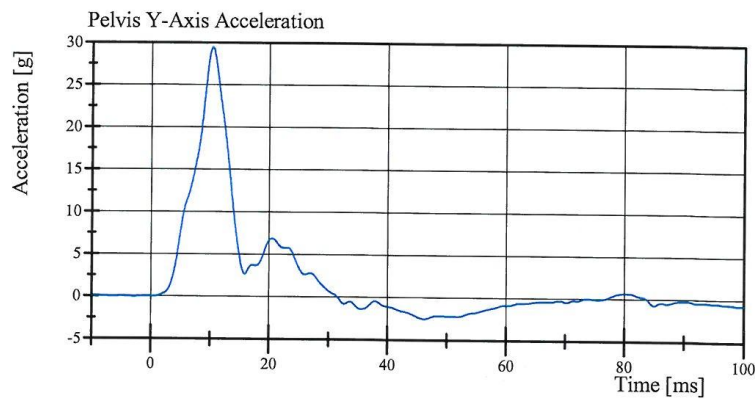
Left Lateral Iliac

SID IIs Serial No. 033 Certification No. 11-2

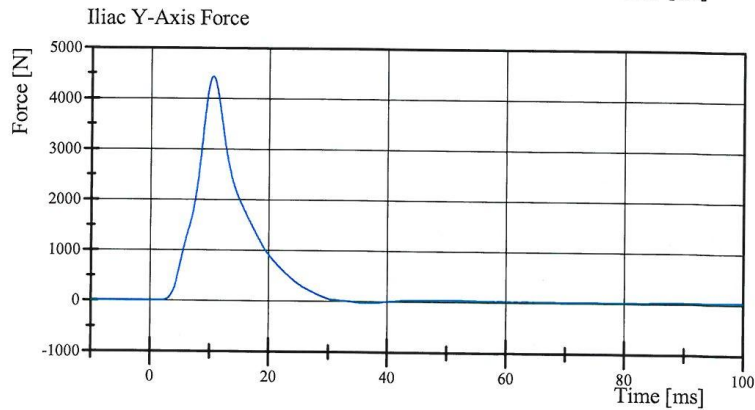
Test Date: 9/26/2012



Filter Class: CFC_180
Max: 0.1 gn at 71.5 ms
Min: -39.3 gn at 10.5 ms



Filter Class: CFC_180
Max: 29.4 gn at 10.3 ms
Min: -2.5 gn at 46.2 ms



Filter Class: CFC_600
Max: 4,424.6 N at 10.5 ms
Min: -25.3 N at 36.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.26.2012 09:14:06 643



Driver S/N 033

Post-Test Calibration Sheets

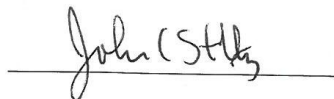
Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 033 Calibration No.12
Date: 10/04/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	441	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	127	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	533	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	399	Yes
N	Buttock Popliteal Length	416.0 - 442.0	431	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	314	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	483	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 033 Certification No. 12-1

Test Date: 10/3/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	117.5 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	3.9 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

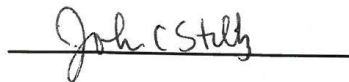
Test meets specifications.

Comments:

Technician



Approved



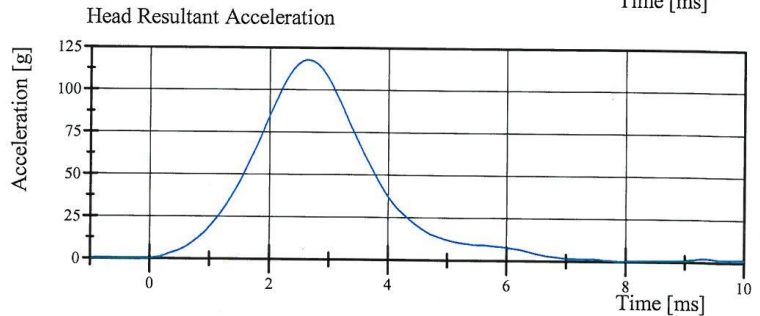
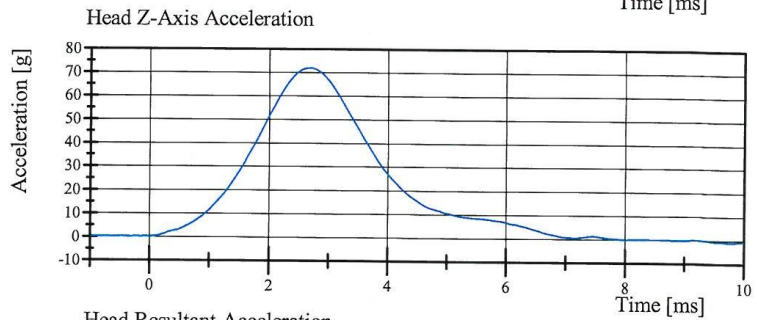
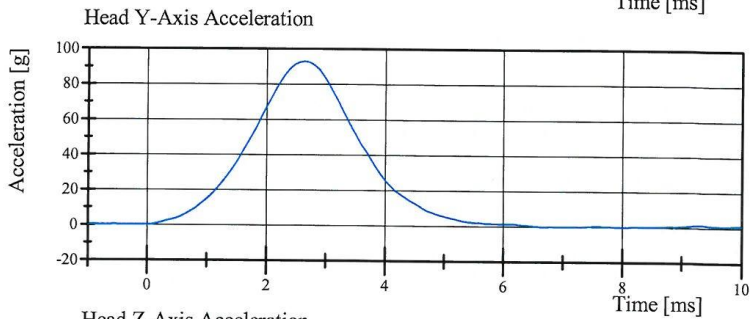
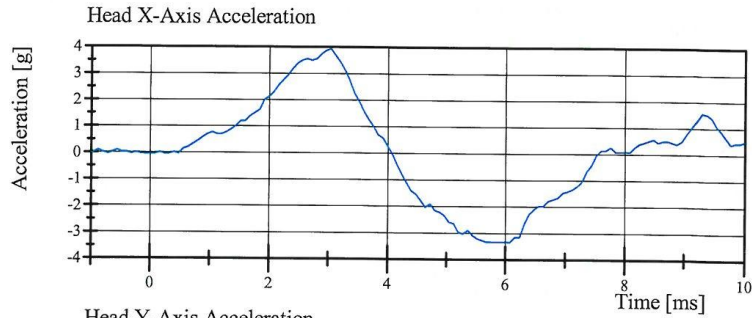
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 13:39:10 234



Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 13:39:22 234



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 033 Certification No. 12-2

Test Date: 10/3/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.581 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.345 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.377 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.564 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.542 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.750 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-73.8 deg	Yes
Time of Peak	50 - 70 ms	58.6 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.8 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	114.5 ms	Yes

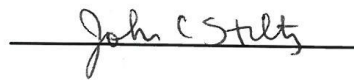
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 15:24:08 642

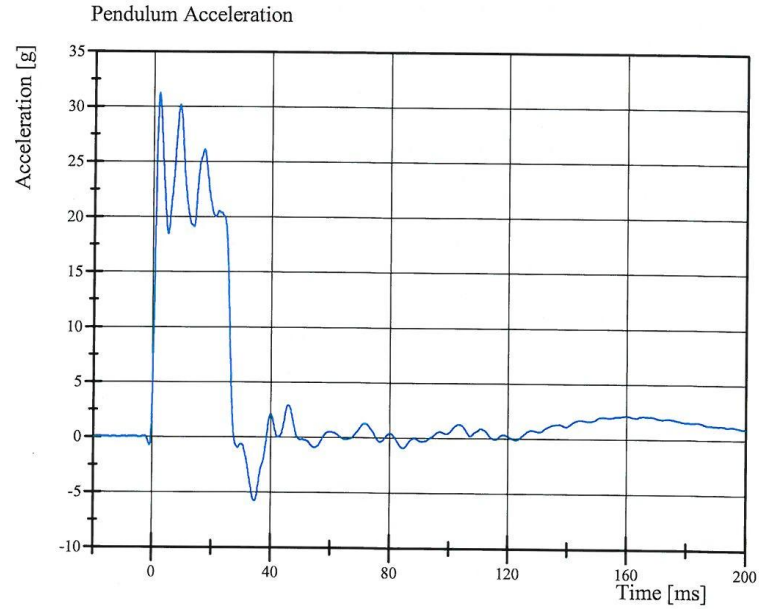


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 033 Certification No. 12-2

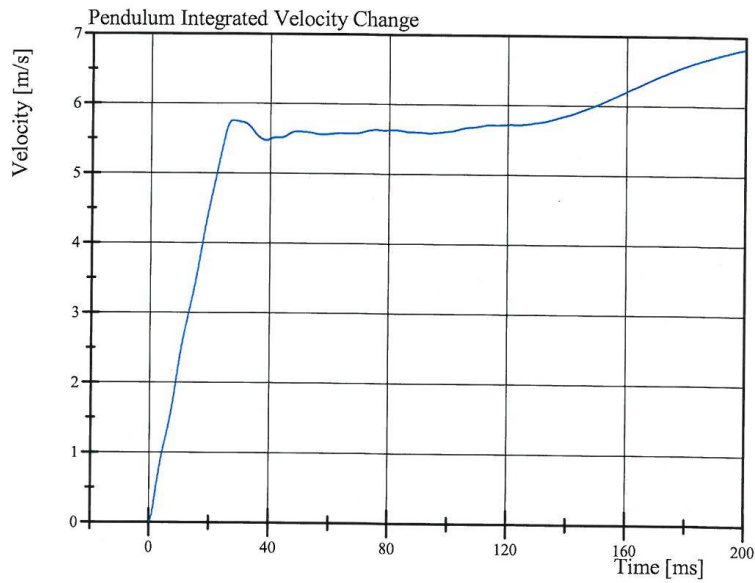
Test Date: 10/3/2012



Filter Class: CFC_180

Max: 31.2 gn at 2.0 ms

Min: -5.8 gn at 34.6 ms



Filter Class: CFC_180

Max: 6.8 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 15:24:16 642

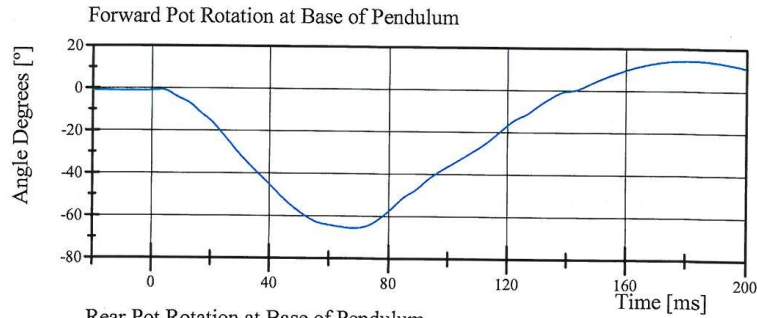


Transportation Research Center Inc.

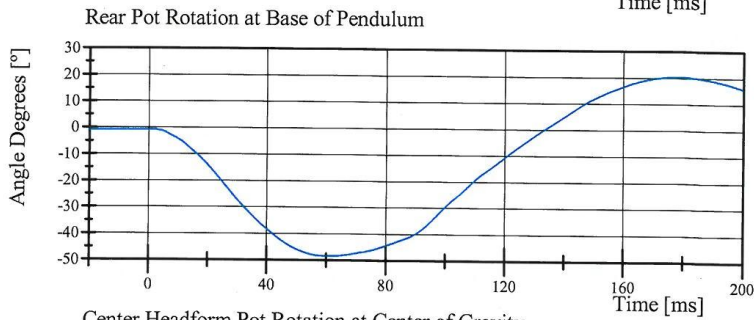
Left Lateral Neck

SID IIs Serial No. 033 Certification No. 12-2

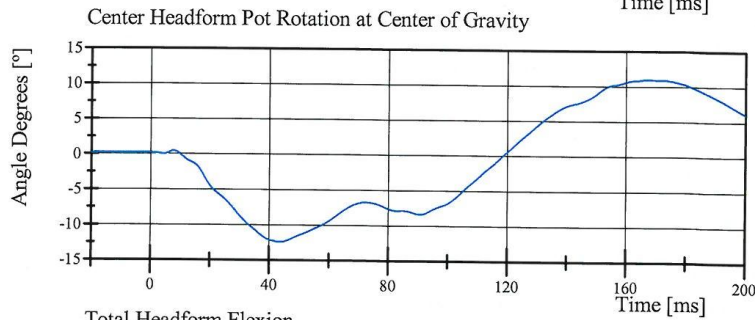
Test Date: 10/3/2012



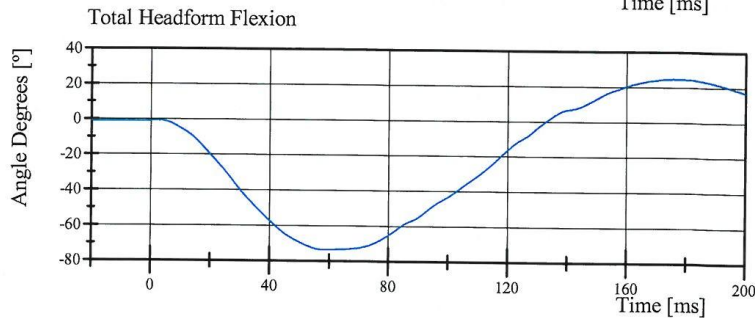
Filter Class: CFC_60
Max: 14.4 ° at 182.3 ms
Min: -65.8 ° at 68.4 ms



Filter Class: CFC_60
Max: 20.2 ° at 177.1 ms
Min: -48.5 ° at 60.6 ms



Filter Class: CFC_60
Max: 10.9 ° at 167.7 ms
Min: -12.4 ° at 43.8 ms



Filter Class: CFC_60
Max: 24.7 ° at 175.6 ms
Min: -73.8 ° at 58.6 ms

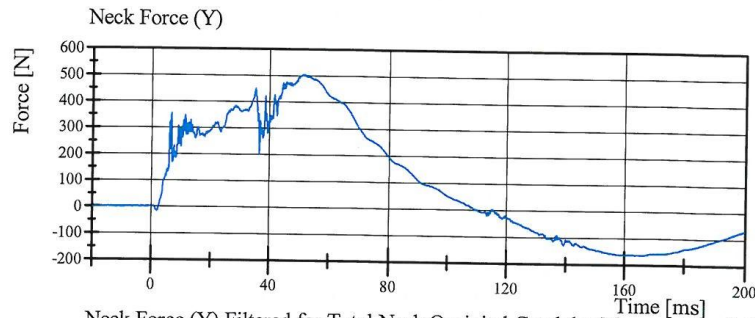
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 15:24:17 642

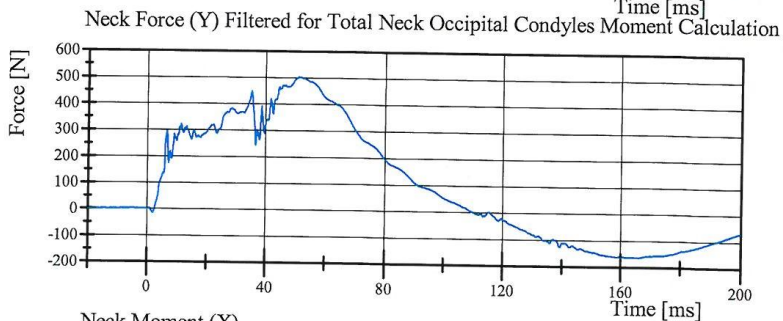


Transportation Research Center Inc.

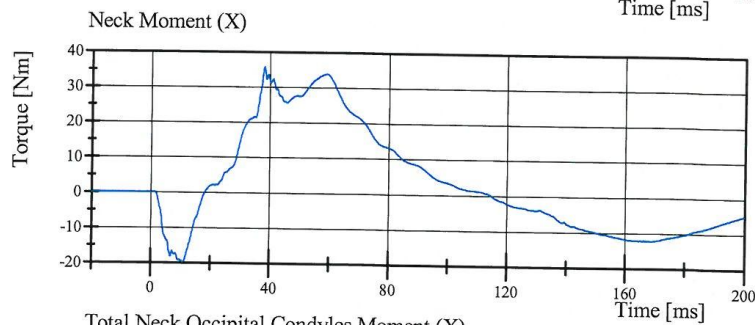
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 12-2
Test Date: 10/3/2012



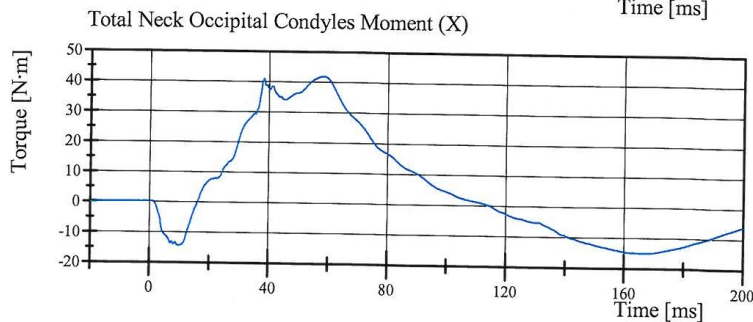
Filter Class: CFC_1000
Max: 502.9 N at 51.1 ms
Min: -164.4 N at 164.9 ms



Filter Class: CFC_600
Max: 501.7 N at 51.1 ms
Min: -164.0 N at 165.0 ms



Filter Class: CFC_600
Max: 35.8 Nm at 38.2 ms
Min: -19.8 Nm at 10.8 ms



Filter Class: Without_(Consta
Max: 41.8 N·m at 58.2 ms
Min: -15.1 N·m at 168.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 15:24:18 642



Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.6 g	Yes
Shoulder Displacement	28 - 37 mm	31.9 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	21.1 g	Yes

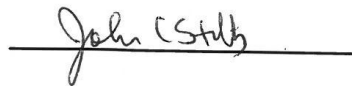
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 09:35:22 867

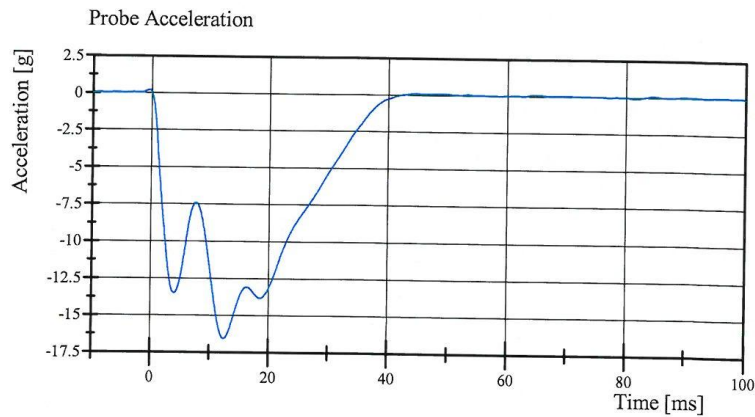


Transportation Research Center Inc.

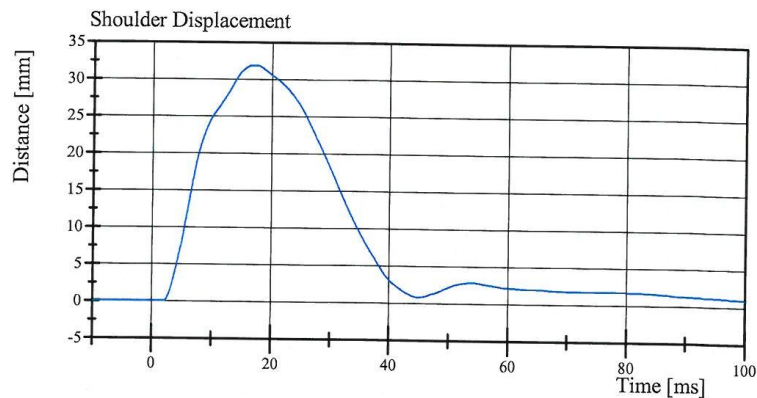
Left Lateral Shoulder

SID IIs Serial No. 033 Certification No. 12-1

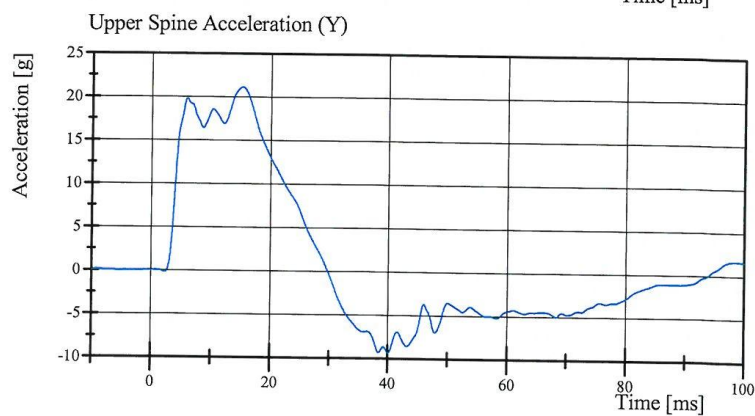
Test Date: 10/3/2012



Filter Class: CFC_180
Max: 0.2 gn at -0.4 ms
Min: -16.6 gn at 12.4 ms



Filter Class: CFC_600
Max: 31.9 mm at 16.8 ms
Min: -0.0 mm at 1.9 ms



Filter Class: CFC_180
Max: 21.1 gn at 15.2 ms
Min: -9.4 gn at 40.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 09:35:29 867



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	61 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.707 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.6 g	Yes
Shoulder Displacement	31 - 40 mm	34.5 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.4 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.6 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	35.3 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.2 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.3 g	Yes

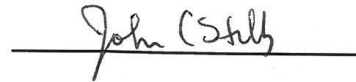
Test meets specifications.

Comments:

Technician



Approved



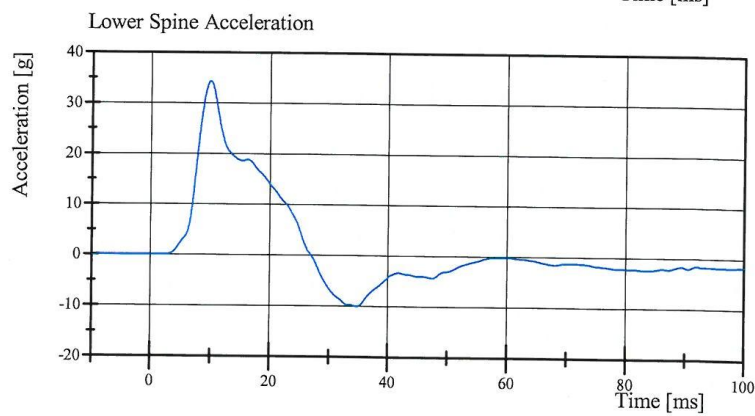
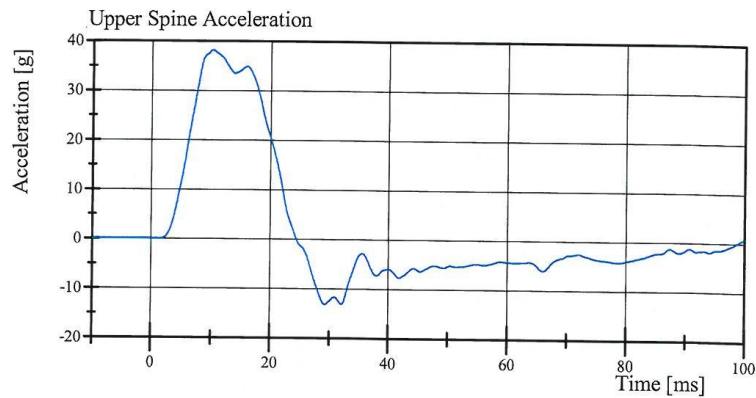
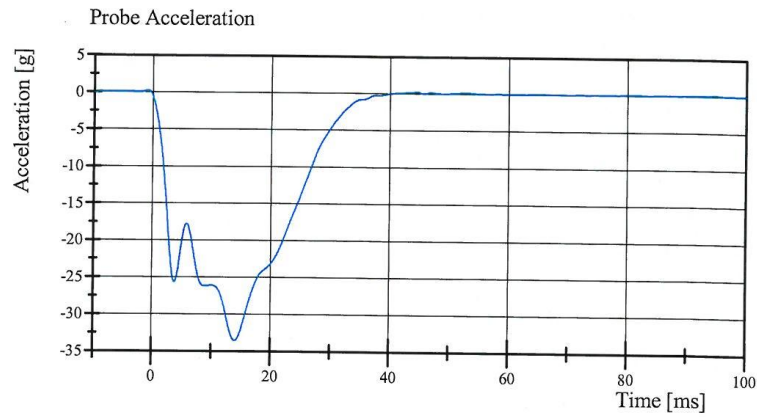
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 10:43:56 666



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012



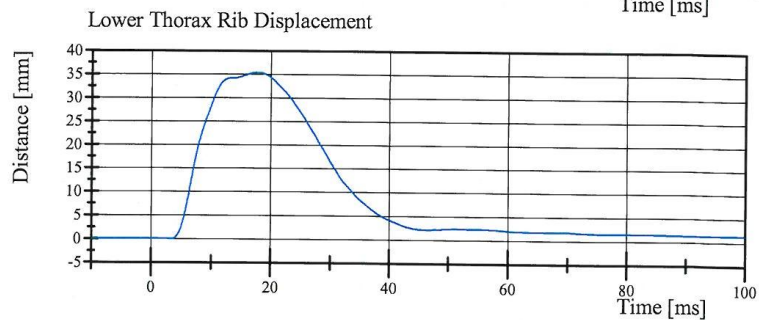
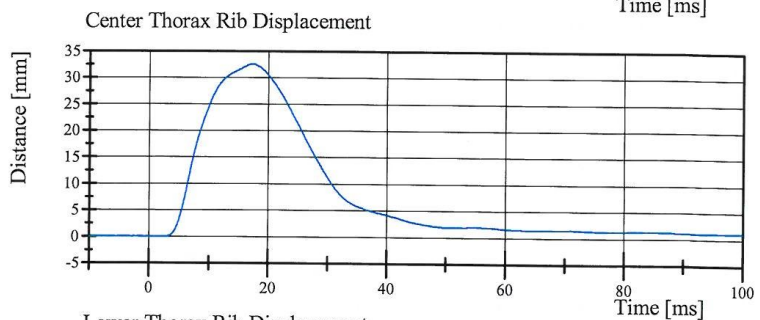
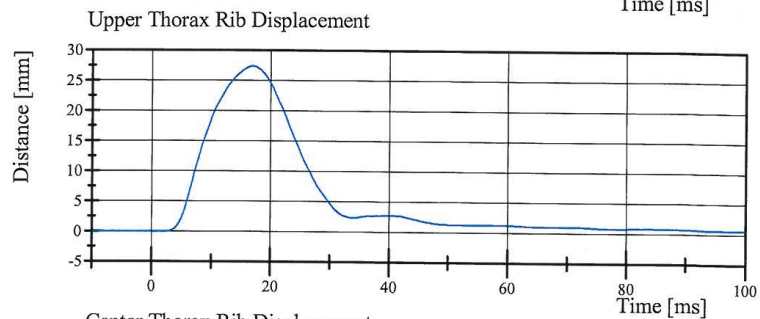
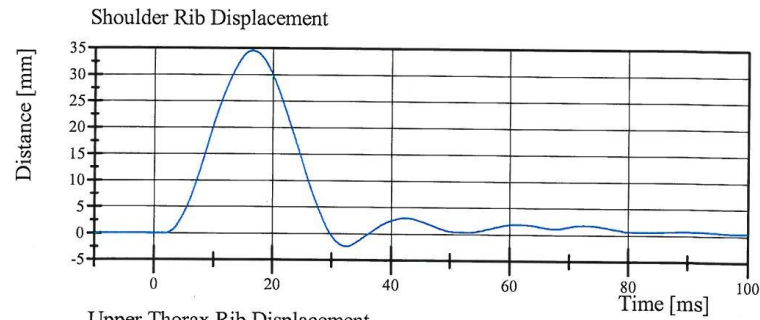
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 10:44:05 666



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 10:44:06 666



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.336 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.6 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.9 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.1 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.5 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.0 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.8 g	Yes

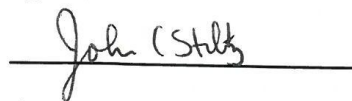
Test meets specifications.

Comments:

Technician



Approved



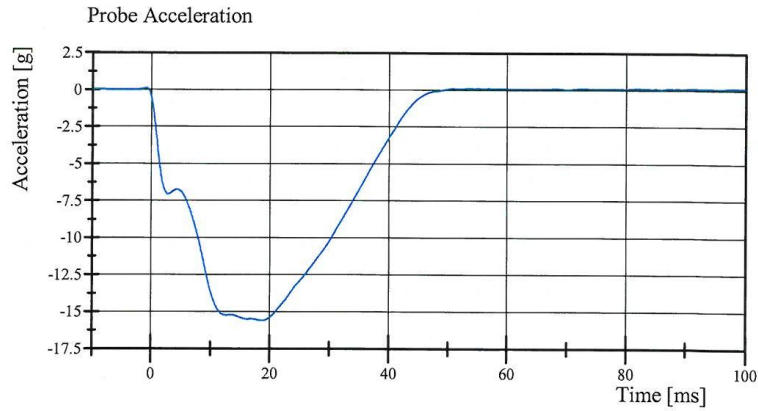
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 11:15:38 839

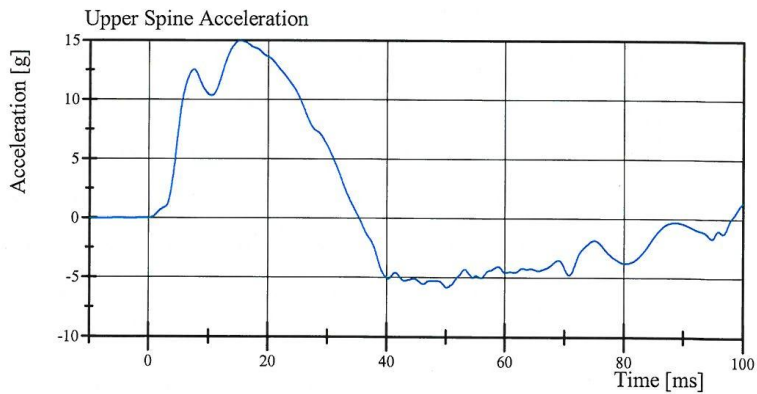


Transportation Research Center Inc.

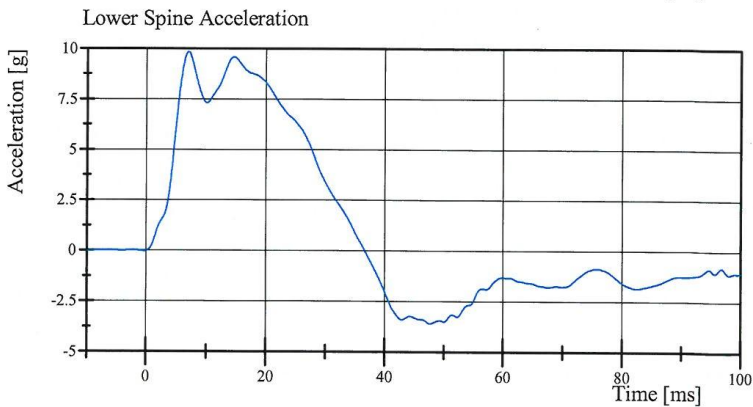
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012



Filter Class: CFC_180
Max: 0.1 gn at 97.7 ms
Min: -15.6 gn at 18.6 ms



Filter Class: CFC_180
Max: 15.0 gn at 15.2 ms
Min: -5.8 gn at 50.2 ms



Filter Class: CFC_180
Max: 9.8 gn at 7.0 ms
Min: -3.6 gn at 47.7 ms

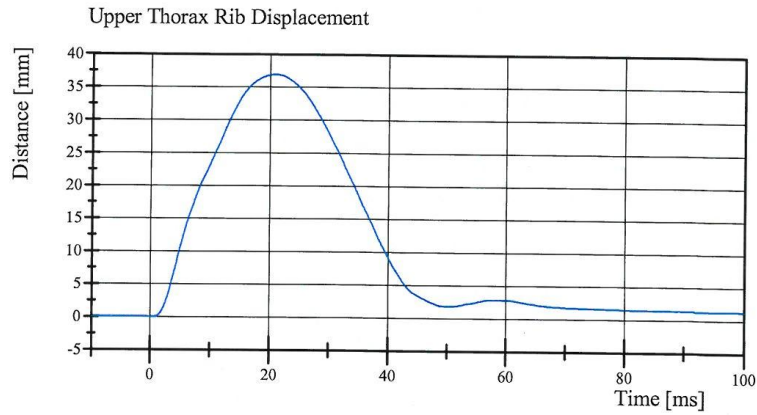
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 11:15:55 839

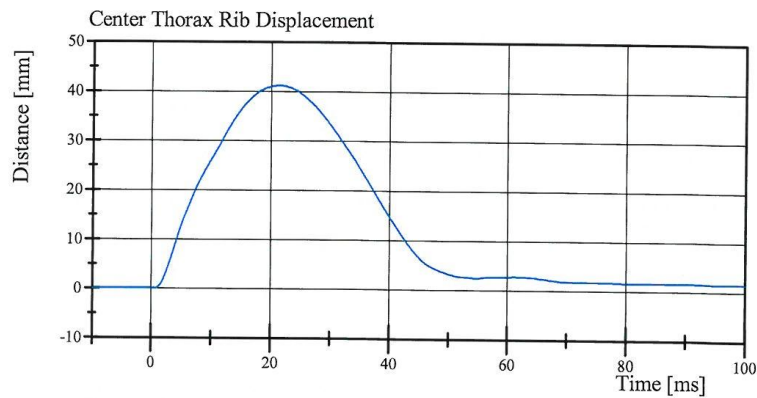


Transportation Research Center Inc.

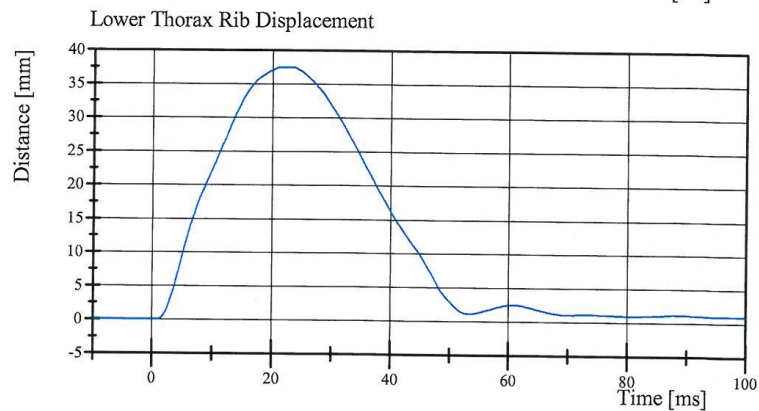
Left Lateral Thorax without Arm
SID II_s Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012



Filter Class: CFC_600
Max: 36.9 mm at 20.9 ms
Min: -0.0 mm at 0.8 ms



Filter Class: CFC_600
Max: 41.1 mm at 21.4 ms
Min: -0.0 mm at 0.6 ms



Filter Class: CFC_600
Max: 37.5 mm at 22.2 ms
Min: -0.0 mm at 0.9 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 11:15:55 839



Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.6 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	40.3 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.70 g	Yes

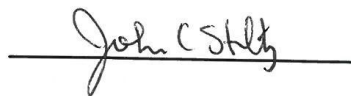
Test meets specifications.

Comments:

Technician



Approved



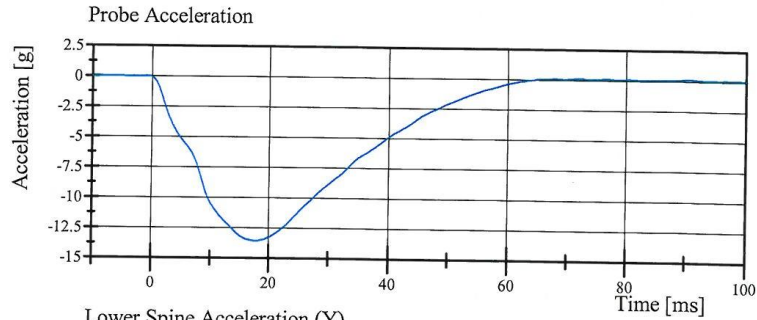
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 11:25:06 659

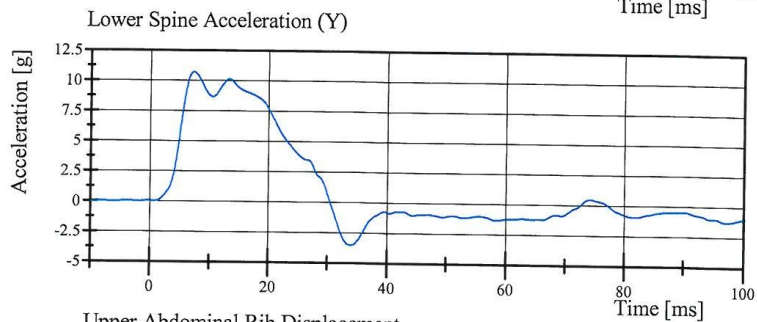


Transportation Research Center Inc.

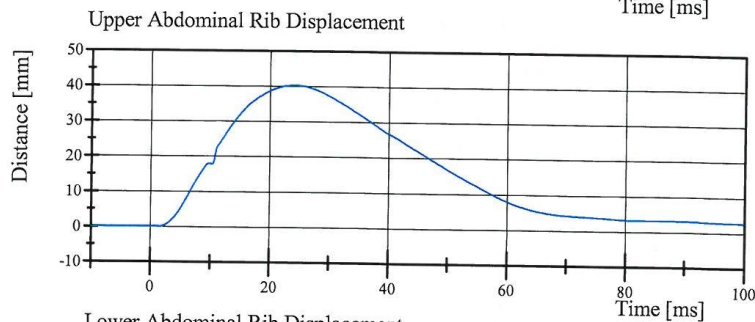
Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 12-1
Test Date: 10/3/2012



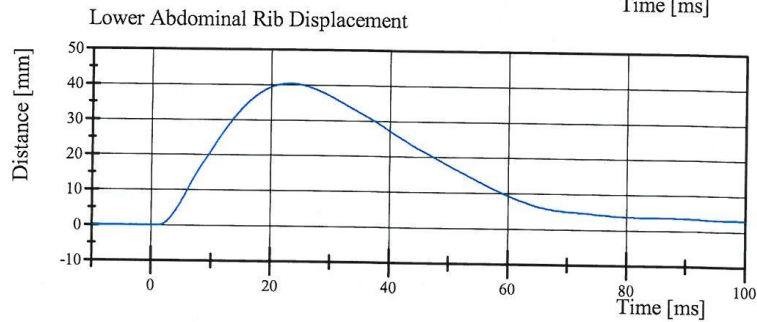
Filter Class: CFC_180
Max: 0.2 gn at 90.4 ms
Min: -13.6 gn at 17.8 ms



Filter Class: CFC_180
Max: 10.7 gn at 7.3 ms
Min: -3.5 gn at 34.0 ms



Filter Class: CFC_600
Max: 40.3 mm at 24.1 ms
Min: -0.0 mm at 1.5 ms



Filter Class: CFC_600
Max: 40.3 mm at 23.5 ms
Min: -0.0 mm at 1.3 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 11:25:15 659



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 033 Certification No. 12-1

Test Date: 10/3/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	61 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.66 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.53 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	41.3 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,984.8 N	Yes

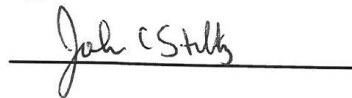
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 12:35:20 445

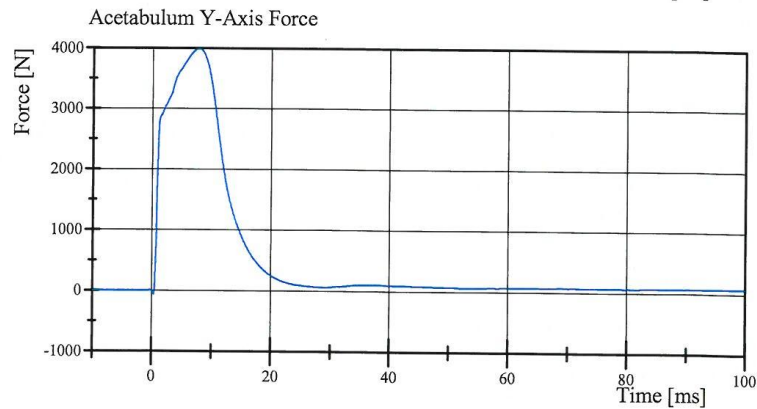
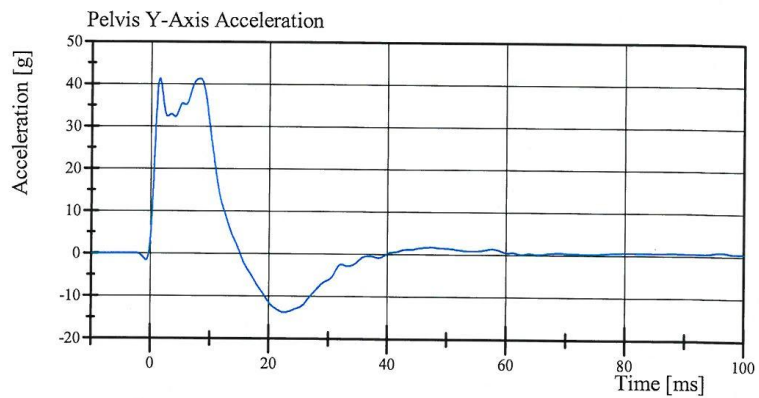
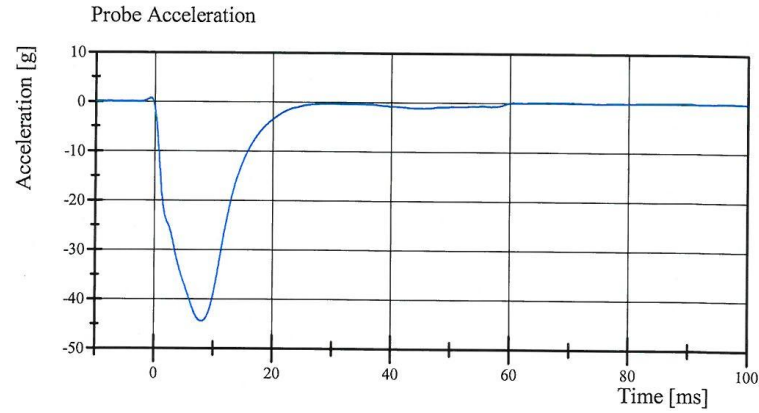


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 033 Certification No. 12-1

Test Date: 10/3/2012



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.03.2012 12:35:46 445



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 033 Certification No. 12-2

Test Date: 10/4/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.40 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-39.8 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.1 g	Yes
Iliac Force	4,100 - 5,100 N	4,457.6 N	Yes

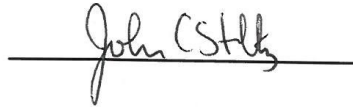
Test meets specifications.

Comments:

Technician



Approved



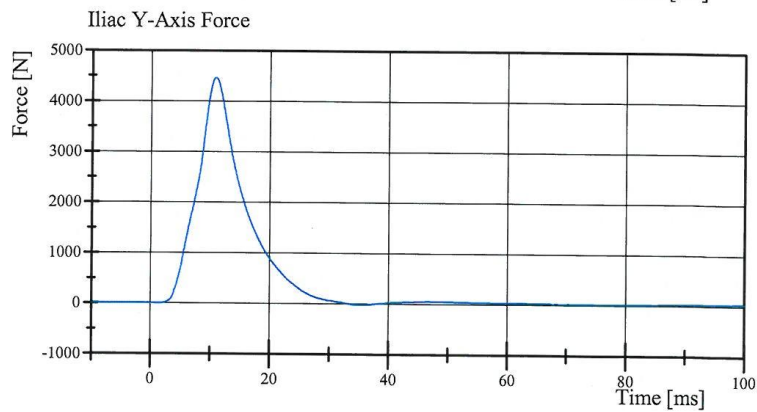
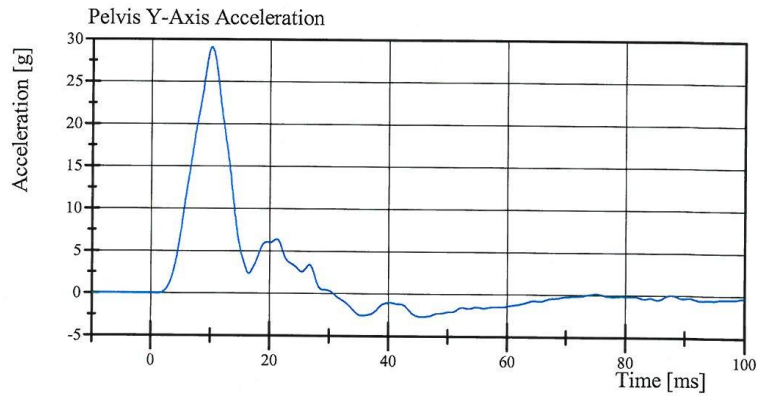
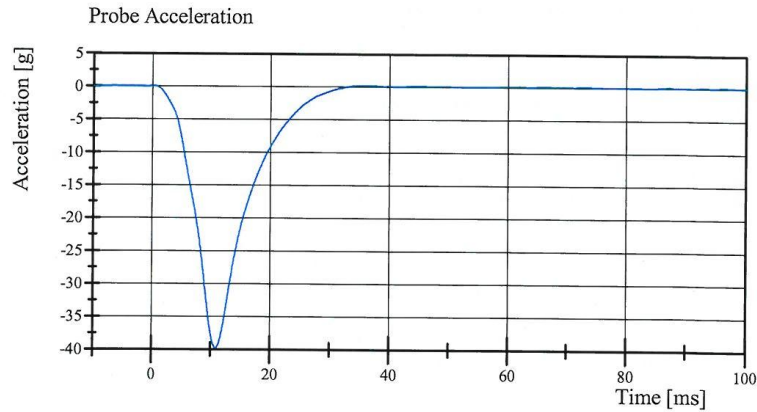
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.04.2012 07:32:40 637



Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 033 Certification No. 12-2
Test Date: 10/4/2012



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.04.2012 07:32:47 637



APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N 033			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers			X	J32214	Endevco	16-Nov-11
			Y	J27040	Endevco	16-Nov-11
			Z	AGAC4	Endevco	16-Nov-11
Displacement Potentiometers	Shoulder		Y	NA	NA	NA
	Thoracic Rib	Upper	Y	592	Servo	16-Nov-11
		Middle	Y	213	Servo	16-Nov-11
		Lower	Y	714	Servo	16-Nov-11
	Abdominal Rib	Upper	Y	918	Servo	16-Nov-11
		Lower	Y	904	Servo	16-Nov-11
Lower Spine Accelerometers (T12)			X	00L13-F05	Entran	16-Nov-11
			Y	P63998	Endevco	9-Nov-11
			Z	04J04I20-A17	Entran	16-Nov-11
Acetabulum Load Cell			Y	235-FY	FTSS	16-Nov-11
Iliac Wing Load Cell			Y	113-FY	FTSS	16-Nov-11
Pelvis Plug (struck side)				36182	FTSS	
Pelvis Plug (non-struck side)				36463	FTSS	

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P74484	Endevco	24-Jul-12
Vehicle Center of Gravity	Y	P73581	Endevco	17-Aug-12
Vehicle Center of Gravity	Z	P75536	Endevco	7-Aug-12
Left Floor Sill	Y	P75718	Endevco	14-Sep-12
A-Pillar Sill	Y	P75099	Endevco	4-Sep-12
A-Pillar Low	Y	P75997	Endevco	4-Sep-12
A-Pillar Mid	Y	P75571	Endevco	4-Sep-12
B-Pillar Sill	Y	P75251	Endevco	23-Apr-12
B-Pillar Low	Y	P75116	Endevco	14-Apr-12
B-Pillar Mid	Y	P75758	Endevco	10-Sep-12
Driver Seat	Y	P76108	Endevco	10-Sep-12
Engine Top	X	P75574	Endevco	17-Aug-12
Engine Top	Y	P74850	Endevco	19-Jul-12
Firewall	Y	P74525	Endevco	1-May-12
Right Roof	Y	P74431	Endevco	30-Apr-12
Right Floor Sill	Y	P61720	Endevco	27-Jul-12
Rear Floor Pan	X	P75104	Endevco	4-Sep-12
Rear Floor Pan	Y	P75526	Endevco	6-Aug-12

TABLE 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	5764-77-FX	Denton	23-Jul-12
Load Cell 2	5764-89-FX	Denton	23-Jul-12
Load Cell 3	5763-77-FX	Denton	23-Jul-12
Load Cell 4	5763-89-FX	Denton	20-Jul-12
Load Cell 5	5763-88-FX	Denton	20-Jul-12
Load Cell 6	5763-92-FX	Denton	23-Jul-12
Load Cell 7	5763-90-FX	Denton	23-Jul-12
Load Cell 8	5763-78-FX	Denton	23-Jul-12