

FINAL REPORT NUMBER: SINCAP-TRC-13-002

**NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST**

**General Motors LLC
2013 Buick Verano
NHTSA NUMBER: MD0107**

**PREPARED BY:
Transportation Research Center Inc.
10820 State Route 347
P. O. Box B-67
East Liberty, OH 43319**



Report Date: January 7, 2013

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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Prepared By: ILO Project Operations Team

Approved By: Margaret Susan

Approval Date: January 7, 2013

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2013 Buick Verano 4-door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on October 4, 2012. The impact velocity of the Moving Deformable Barrier (MDB) was 62.3 km/h, and the ambient temperature at the struck side of the target vehicle at the time of impact was 23° C. The target vehicle post-test maximum crush was 188 mm at Level 3. The test vehicle's performance was as follows: <table border="1"> <thead> <tr> <th colspan="4">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>NA</td><td>1000</td><td>89</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>44</td><td>25.3</td></tr> <tr> <td>Total Abdominal Force</td><td>N</td><td>2500</td><td>865.3</td></tr> <tr> <td>Pubic Symphysis Force</td><td>N</td><td>6000</td><td>1358.7</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="4">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>NA</td><td>1000</td><td>284</td></tr> <tr> <td>Lower Spine Acceleration</td><td>g's</td><td>82</td><td>27.6</td></tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td><td>N</td><td>5525</td><td>1946.4</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>38*</td><td>22.9</td></tr> <tr> <td>Maximum Abdominal Rib Deflection</td><td>mm</td><td>45*</td><td>17.7</td></tr> </tbody> </table> * Proposed IARV The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.				Driver ATD (ES-2re)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	NA	1000	89	Maximum Thoracic Rib Deflection	mm	44	25.3	Total Abdominal Force	N	2500	865.3	Pubic Symphysis Force	N	6000	1358.7	Passenger ATD (SID-IIs)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	NA	1000	284	Lower Spine Acceleration	g's	82	27.6	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1946.4	Maximum Thoracic Rib Deflection	mm	38*	22.9	Maximum Abdominal Rib Deflection	mm	45*	17.7
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Test Purpose and Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information	4
<u>Appendix</u>		
A	Photographs	A-1
B	Vehicle and Dummy Response Data Plots	B-1
C	Dummy Performance Calibration Test Data	C-1
D	Test Equipment and Instrumentation Calibration Data	D-1
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	5
2	Seat, Seat Belt, Steering Wheel Adjustment and Fuel Systems Data	9
3	Dummy Longitudinal Clearance Dimensions	13
4	Dummy Lateral Clearance Dimensions	14
5	Camera and Instrumentation Data	15
6	Test Vehicle Accelerometer Locations	16
7	MDB Accelerometer Locations	17
8	Post-Test Observations	18
9	MDB Summary of Results	20
10	Test Vehicle Profile Measurements	21
11	Test Vehicle Exterior Crush Measurements	22
12	MDB Exterior Static Crush Measurements	25
13	FMVSS No. 301 Static Rollover Results	26
14	Dummy/Vehicle Temperature and Humidity Stabilization	27

SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2013 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00125. The purpose of this test is to generate comparative side impact performance in a 2013 Buick Verano 4-door Sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2012.

SECTION 2

SUMMARY OF TEST RESULTS

A 2013 Buick Verano 4-door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.3 km/h (38.72 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, OH, on October 4, 2012. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated August 2011. The side impact event was documented by 10 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen forward, middle, and rear y-axis load cells

Lower spine (T12) tri-axial accelerometers

Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

Primary and redundant head CG triaxial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (T12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

APPENDIX B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in APPENDIX C of this report.

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	NA	1000	89
Maximum Thoracic Rib Deflection	mm	44	25.3
Combined Abdominal Force	N	2500	865.3
Pubic Symphysis Force	N	6000	1358.7

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	NA	1000	284
Lower Spine (T12) Resultant Acceleration	G	82	27.6
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1946.4
Maximum Thoracic Rib Deflection	mm	38*	22.9
Maximum Abdominal Rib Deflection	mm	45*	17.7

* 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
Front Airbag	Yes	No	NA	NA
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	Yes	Yes
Knee Airbag	Yes	No	NA	NA
Seat Belt Pretensioner	Yes	No	NA	NA
Seat Belt Load Limiter	Yes	No	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.

Please note the unintentional omission of the speed trap photos and inclusion in the documentation video.

Driver dummy arm was set into a lower position than the required test position prior to test.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2013 Buick Verano 4-door SedanNHTSA No.: MD0107Test Program: NCAP Side ImpactTest Date: 10/04/12**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	MD0107	Traction Control System (TCS)	Yes
Model Year	2013	Power Steering	Yes
Make	Buick	Power Window Auto-Reverse	No
Model	Verano	Driver Frontal Airbag	Yes
Body Style	4-door Sedan	Driver Curtain Airbag	Yes
VIN	1G4PP5SK6D4106226	Driver Head/Torso Airbag	No
Body Color	Bronze	Driver Torso Airbag	No
Odometer Reading (miles)	8	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.4	Driver Pelvis Airbag	No
Number of Cylinders	4	Driver Knee Airbag	Yes
Engine Placement	Transverse	Rear Pass. Frontal Airbag	No
Transmission Type	Automatic	Rear Passenger Curtain Airbag	Yes
Transmission Speeds	6	Rear Pass. Head/Torso Airbag	No
Overdrive	Yes	Rear Passenger Torso Airbag	No
Final Drive	Front	Rear Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Rear Passenger Pelvis Airbag	No
Sunroof / T-Top	No	Driver Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	No	Rear Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Passenger Load Limiter	Yes
Automatic Door Locks (ADL)	Yes	Other	No

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC	GVWR (kg)	1977
Date of Manufacture	8/12	GAWR Front (kg)	1060
Vehicle Type	MPV	GAWR Rear (kg)	917

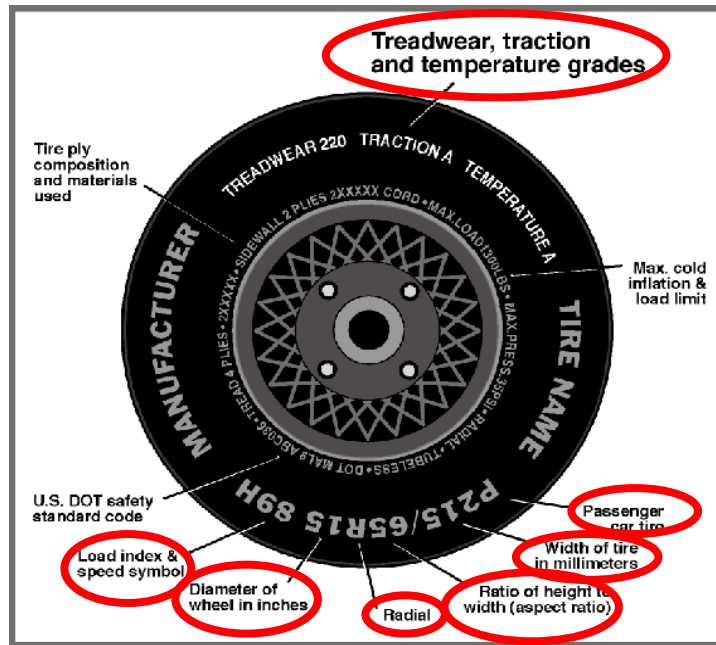
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				400
Cargo Weight (RCLW) (kg)				59.80

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

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P235/45R18	P235/45R18
Tire Size on Vehicle	P235/45R18	P235/45R18
Tire Manufacturer	Continental	Continental
Tire Model	ContiPro Contact	ContiPro Contact
Treadwear	500	500
Traction	AA	AA
Temperature Grades	A	A
Tire Plies Sidewall	1	1
Tire Plies Body	4	4
Load Index/Speed Symbol	94H	94H
Tire Material	Polyester, steel, polyamide	Polyester, steel, polyamide
DOT Safety Code Left	A3X6 BNH 3212	A3X6 BNH 3212
DOT Safety Code Right	A3X6 BNH 3212	A3X6 BNH 3212

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	220	220	220	220
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	221	221	221	221

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 +/- 21	193	193	193	193

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	489.2	302.4		531.2	357.8		535.8	394.2	
Right	kg	457.2	299.2		474.6	360.6		460.0	365.4	
Ratio	%	61.1	38.9		58.3	41.7		56.7	43.3	
Totals	kg	946.4	601.6	1548.0	1005.8	718.4	1724.2	995.8	759.6	1755.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total As Delivered Weight (UVW)	kg	1548.0
Actual Weight of 2 P572 ATDs Used	kg	125.0
Rated Cargo/Luggage Weight (RCLW)	kg	59.8
Calculated Vehicle Target Weight (TVTW)	kg	1732.8

(A)
(B)
(C)
(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 1.4 kg mounted in rear cargo area	1.4

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

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	695	700	Yes
RF	mm	700	704	Yes
RR	mm	689	691	Yes
LR	mm	679	688	Yes
Vehicle CG (Aft of Front Axle)	mm	1164	1121	
Vehicle CG (Left(+)/Right (-) from Longitudinal centerline	mm	38	23.9	

***The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well. Indicate "Yes" or "No" for "Meets Requirement".

DATA SHEET NO. 2

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

Test Vehicle: 2013 Buick Verano 4-door Sedan

NHTSA No.: MD0107

Test Program: NCAP Side Impact

Test Date: 10/04/12

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	11.0	0	5.5
Front Passenger Seat	11.4	0	5.7
Front Center Seat*	NA	NA	NA
Struck Side Rear Seat	Fixed	NA	NA
Non-Struck Side Rear Seat	Fixed	NA	NA
Rear Center Seat*	Fixed	NA	NA

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	5.5	127	Max.	186	193	201
			Mid	150	160	168
			Min.	115	127	137
Front Passenger Seat	5.7	122	Max.	180	188	196
			Mid	144	154	165
			Min.	108	122	132
Front Center Seat*	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Struck Side Rear Seat	Fixed	Fixed	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Non-Struck Side Rear Seat	Fixed	Fixed	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Rear Center Seat*	Fixed	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 SYSTEM DATA

Test Vehicle: 2013 Buick Verano 4-door Sedan

NHTSA No.: MD0107

Test Program: NCAP Side Impact

Test Date: 10/04/12

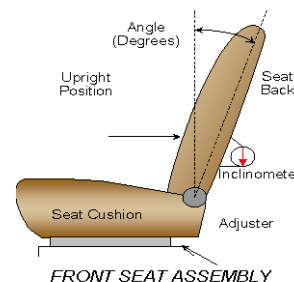
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	265	54	135	28
Front Passenger Seat	245	50	125	26
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat	Fixed	NA	Fixed	NA
Non-Struck Side Rear Seat	Fixed	NA	Fixed	NA
Rear Center Seat*	Fixed	NA	Fixed	NA

* If applicable.

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated seat back angle. 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 seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as 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	92	44	8.0	20
Front Passenger Seat	92	44	8.0	20
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat w/ Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed	Fixed

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

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

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12

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	5	1
Rear Seat	Fixed	N/A

HEAD RESTRAINT ADJUSTMENT

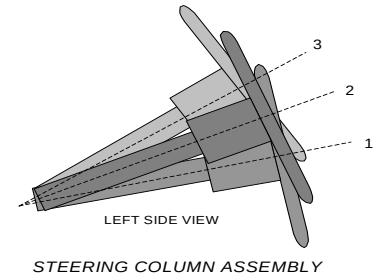
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	5
Rear Seat	5	1

STEERING COLUMN ADJUSTMENT

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

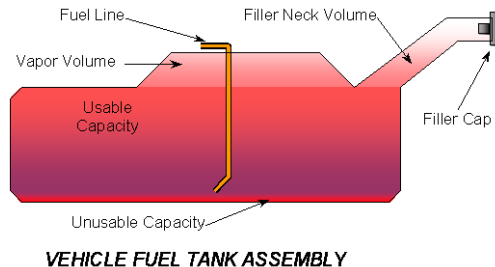
	Degrees	Fore/Aft Position, mm
Lowermost, Position 1	70.7	200
Geometric Center, Position 2	68.7	226
Uppermost, Position 3	66.8	252
Telescoping Steering Wheel Travel		226
Test Position	68.7	226



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 under the rear seat area in front of the rear axle. The fuel filler neck enters the right rear corner of the fuel tank. The fuel filler cap is located on the right rear quarter panel. The fuel lines run along the inside of the right sub frame.



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

Test Vehicle: 2013 Buick Verano 4-door Sedan

NHTSA No.: MD0107Test Program: NCAP Side ImpactTest Date: 10/04/12**FUEL TANK CAPACITY**

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	59.1
Usable Capacity of "Optional" Tank (see Form No. 1)	NA
Usable Capacity of Standard Tank (see Owner's Manual)	59.1
Usable Capacity of Optional Tank (see Owner's Manual)	NA
Percent of Usable Capacity	95
Actual Amount of Solvent Used in Test	54.9
1/3 of Usable Capacity	19.7

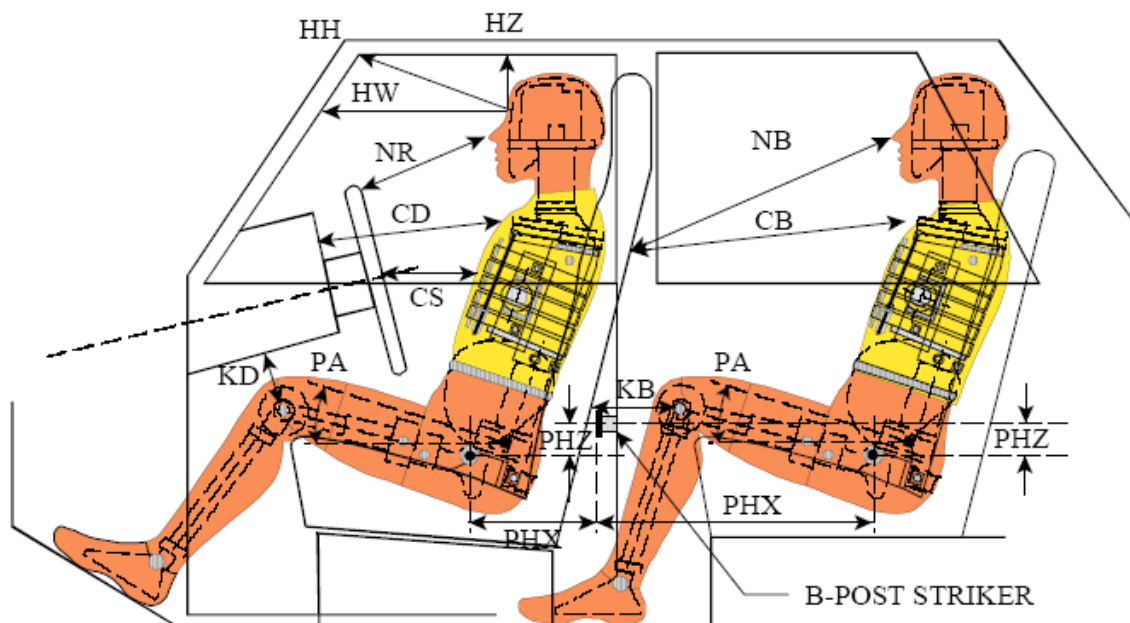
Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated on Form No. 1? ☒ YES ☐ NO

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

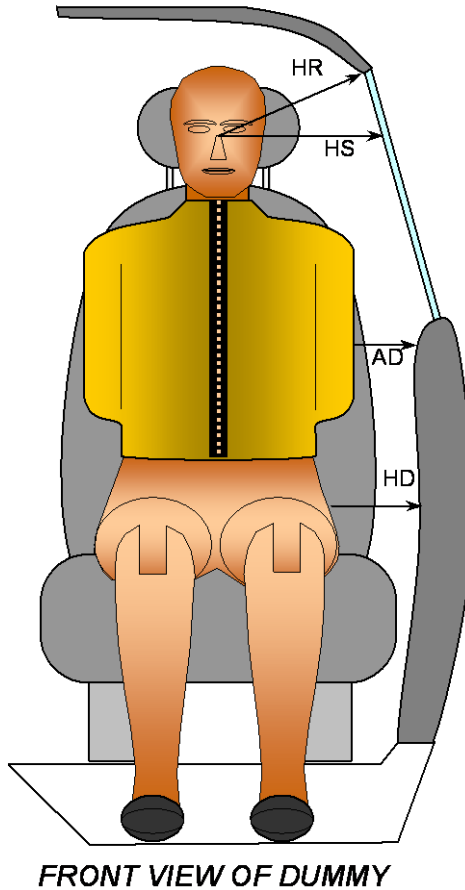
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Head to Header	505			
HW		Head to Windshield	786			
HZ	HZ	Head to Roof Liner	174		273	
NR	NB	Nose to Rim/Seat Back	503		453	
CD	CB	Chest to Dash/Seat Back	638		426	
CS		Chest to Steering Wheel	367			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	271	29.4	175	23.0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	22.6	28.8	185	23.0
PAX°	PAX°	Pelvic Tilt Angle X		NA		22.5
	PHY°	Pelvic Tilt Angle Y				NA
PHX	PHX	Hip Point to Striker (X-Axis)	143		215	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	183		245	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12

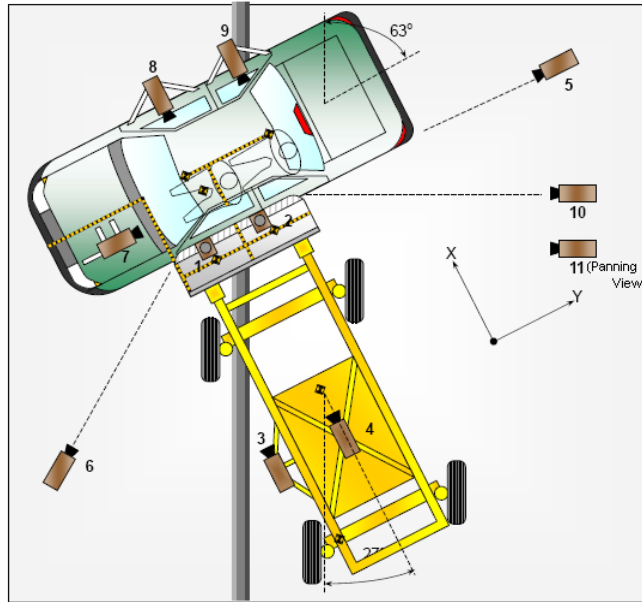


Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	183	221
HS	Head to Side Window	mm	318	344
AD	Arm to Door	mm	104	142
HD	H-Point to Door	mm	171	157

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-520	840	-5731	8.5	30
2	Overhead Close-up	-520	1330	-5708	25	1000
3	Left Impact Point (MDB)	1781	-856	-823	16	1000
4	Side Overall (MDB)	2448	0	1413	8.5	1000
5	Rear	0	8605	1313	12.5	1000
6	Left Front	1090	-3947	1305	12.5	1000
7	Driver Front (OB)				12.5	1000
8	Driver Side (OB)				8.5	1000
9	Passenger Side (OB)				8.5	1000
10	Real-time Left Rear				zoom	30
11	Real-time Inrun				zoom	30

Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down

*All measurements accurate to ± 6 mm.

If applicable, explain why camera(s) did not operate as intended:

INSTRUMENTATION

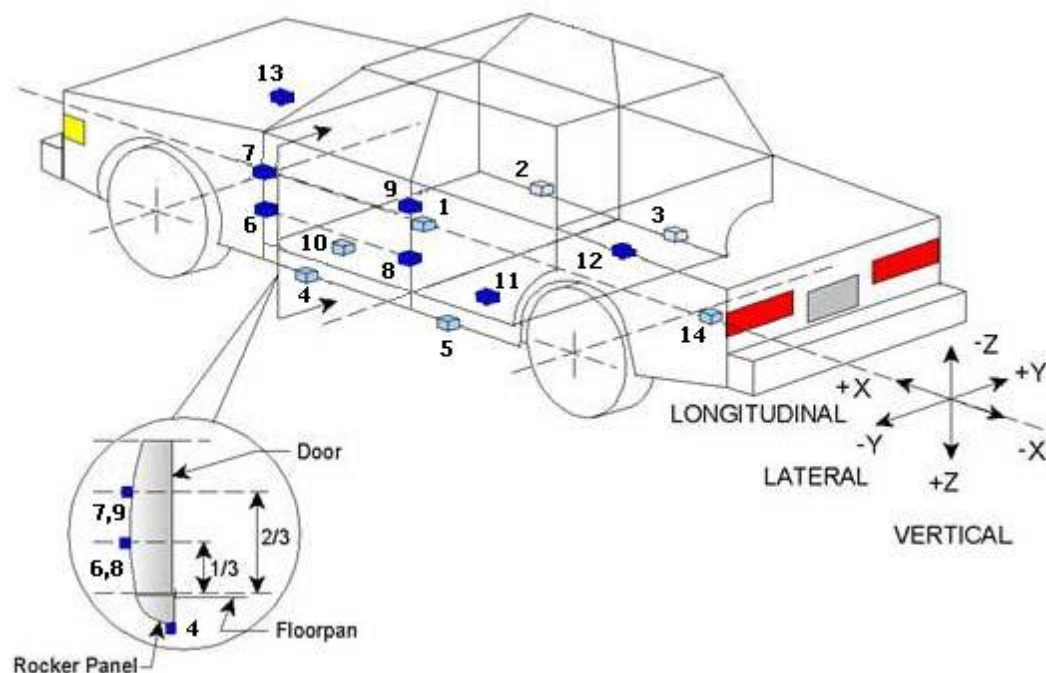
Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	7
TOTAL	62

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12



TEST VEHICLE ACCELEROMETER LOCATIONS

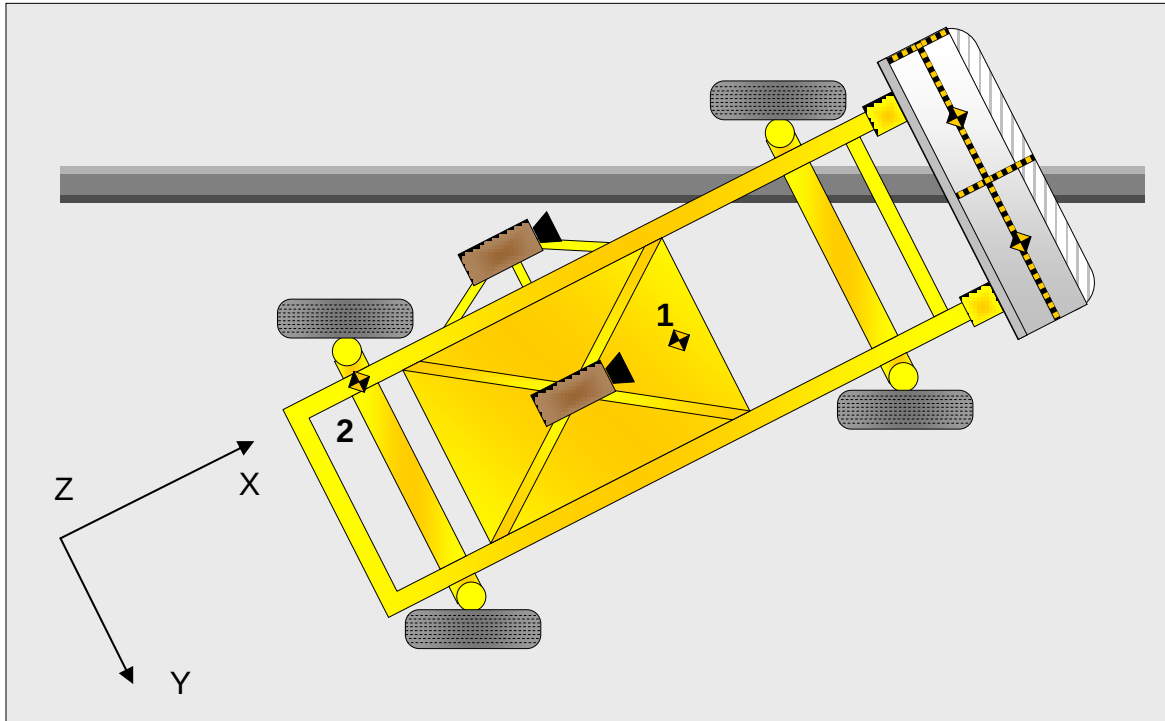
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2715	10	-342
2	Right Sill at Front Seat	3075	685	-290
3	Right Sill at Rear Seat	2275	670	-270
4	Left Sill at Front Door	3090	-685	-291
5	Left Sill at Rear Door	2270	-670	-300
6	A-Post Lower	3480	-760	-490
7	A-Post Middle	3475	742	-833
8	B-Post Lower	2490	-810	-564
9	B-Post Middle	2470	-800	-898
10	Front Seat Track	2555	-560	-241
11	Rear Seat Structure	1810	-520	-363
12	Right Rear Occ. Compartment	2115	630	-340
13	Engine Block	4230	20	-186
14	Rear Above Axle	1400	0	-473

Reference: X - Rear surface of vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-2260	0	-520
2	MDB Rear	-3703	-677	-625

Reference : X - Face of MDB (+ forward)
 Y - MDB Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	NA	NA
Top of Head	NA	NA
Left Side of Head	SCAB, headliner	SCAB
Back of Head	NA	NA
Left Shoulder	Torso/Pelvis Airbag	Torso/Pelvis Airbag
Upper Torso	Torso/Pelvis Airbag	Torso/Pelvis Airbag
Lower Torso	Torso/Pelvis Airbag	Torso/Pelvis Airbag
Left Hip	Door Panel	Door Panel
Left Knee	Door Panel	Door Panel

POST TEST DOOR PERFORMANCE

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

* Indicate "Yes", "No", or "N/A".

POST TEST SEAT PERFORMANCE

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

* Indicate "Yes", "No", or "N/A".

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Intact, deformation occurred
Sill Separation	None
Windshield Damage	None
Side Window Damage	Broken
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2690
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		402
Actual Impact Point (Aft of Front Axle)	mm		399
Horizontal Offset rearward	mm	+/- 50 of Intended Impact point	3
Vertical Offset up	mm	+/- 20 of Intended Impact point	1

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2587
C.G. Location aft of Front Axle	1121

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	415.6	269.4	
Right	kg	367.8	314.4	
Ratio	%	57.3	42.7	
Totals	kg	783.4	583.8	1367.2

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.3
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.4
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

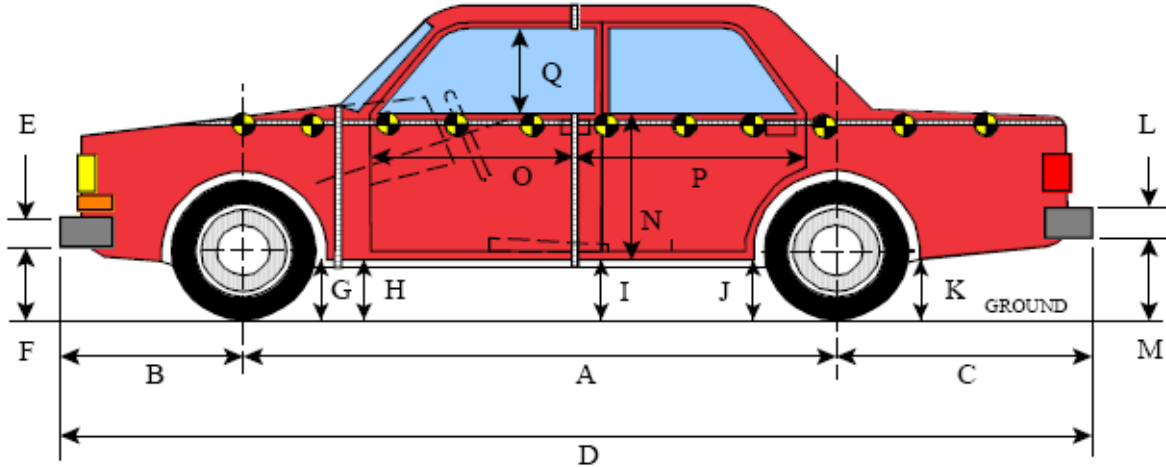
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	221
B	Top of Bumper	533	800	Right	136
C	Mid-Level	686	800	Left	148
D	Top of Stack	813	800	Left	157

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12



LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF $\pm 3\text{mm}$

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2690	2680	10
B	Front Axle to Front Surface of Vehicle	990	990	0
C	Rear Axle to Rear Surface of Vehicle	990	990	0
D	Total Length at Centerline	4670	4655	15
E	Front Bumper Thickness	165	165	0
F	Front Bumper Bottom to Ground	393	420	-27
G	Sill Height at Front Wheel Well	230	290	-60
H	Sill Height at Front Door Leading Edge	236	300	-64
I	Sill Height at B-Pillar	238	305	-67
J1	Sill Height at Rear Wheel Well	183	220	-37
J2	Pinch Weld Height at Rear Wheel Well	163	205	-42
K	Sill Height Aft of Rear Wheel Well	300	344	-44
L	Rear Bumper Thickness	260	260	0
M	Rear Bumper Bottom to Ground	391	428	-37
N	Sill Height to Window Bottom Sill	780	730	50
O	Front Door Leading Edge to Impact CL	734	720	14
P	Rear Door Trailing Edge to Impact CL	1228	1210	18
Q	Front Window Opening	420	393	27
R	Right Side Length	4405	4405	0
S	Left Side Length	4405	4385	20
T	Vehicle Width at B Pillar	1290	1270	20

DATA SHEET NO. 11

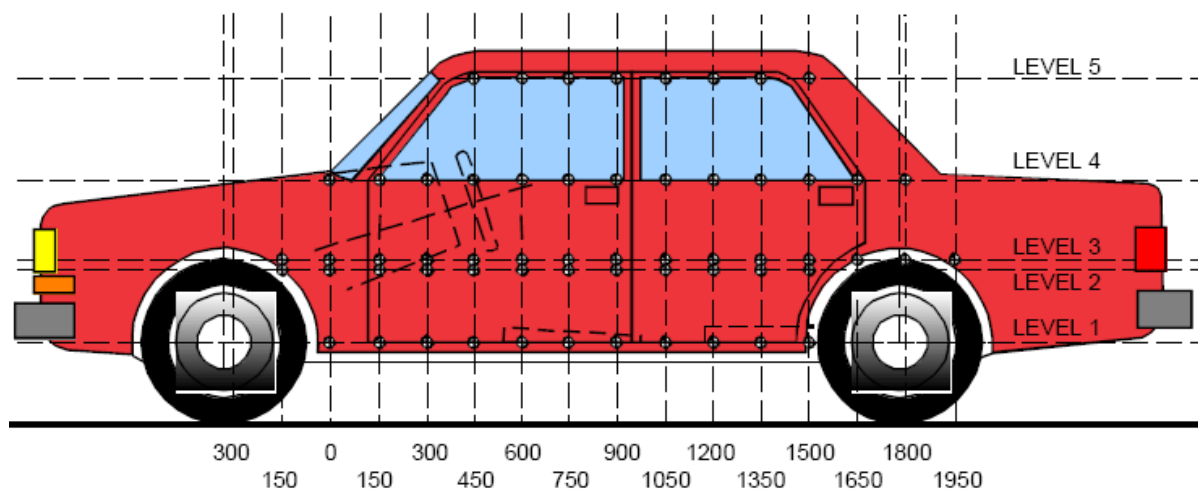
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Buick Verano 4-door Sedan

NHTSA No.: MD0107

Test Program: NCAP Side Impact

Test Date: 10/04/12



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	351	110	1650
2	Driver Hip Point	509	168	450
3	Mid-Door	634	188	1650
4	Window Sill	906	154	1350
5	Window Top	1413	4	1350

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. 11 (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	0	0	802	0	0	0	0	797	0	0	0	0	5	0
-150	0	0	893	810	0	0	0	885	803	0	0	0	8	7	0
0	864	887	886	817	0	864	874	868	818	0	0	13	18	-1	0
150	861	882	884	824	0	760	765	780	803	0	101	117	104	21	0
300	862	883	887	829	0	768	721	760	798	0	94	162	127	31	0
450	864	884	889	836	0	768	716	757	796	0	96	168	132	40	0
600	865	884	890	839	0	766	724	733	791	0	99	160	157	48	0
750	866	883	891	843	556	763	736	704	786	559	103	147	187	57	-3
900	867	882	890	847	571	762	729	719	773	571	105	153	171	74	0
1050	867	881	889	851	572	762	721	726	787	571	105	160	163	64	1
1200	867	877	886	857	572	767	727	735	758	568	100	150	151	99	4
1350	867	874	884	860	569	766	721	722	706	565	101	153	162	154	4
1500	868	870	880	860	565	761	730	698	725	563	107	140	182	135	2
1650	868	867	876	858	560	758	712	688	736	559	110	155	188	122	1
1800	867	878	874	876	542	808	754	705	764	542	59	124	169	112	0
1950	0	0	886	869	0	0	0	848	771	0	0	0	38	98	0
2100	0	0	0	848	0	0	0	0	842	0	0	0	0	6	0
2250	0	0	0	845	0	0	0	0	838	0	0	0	0	7	0
2400	0	0	0	837	0	0	0	0	833	0	0	0	0	4	0
2550	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition.

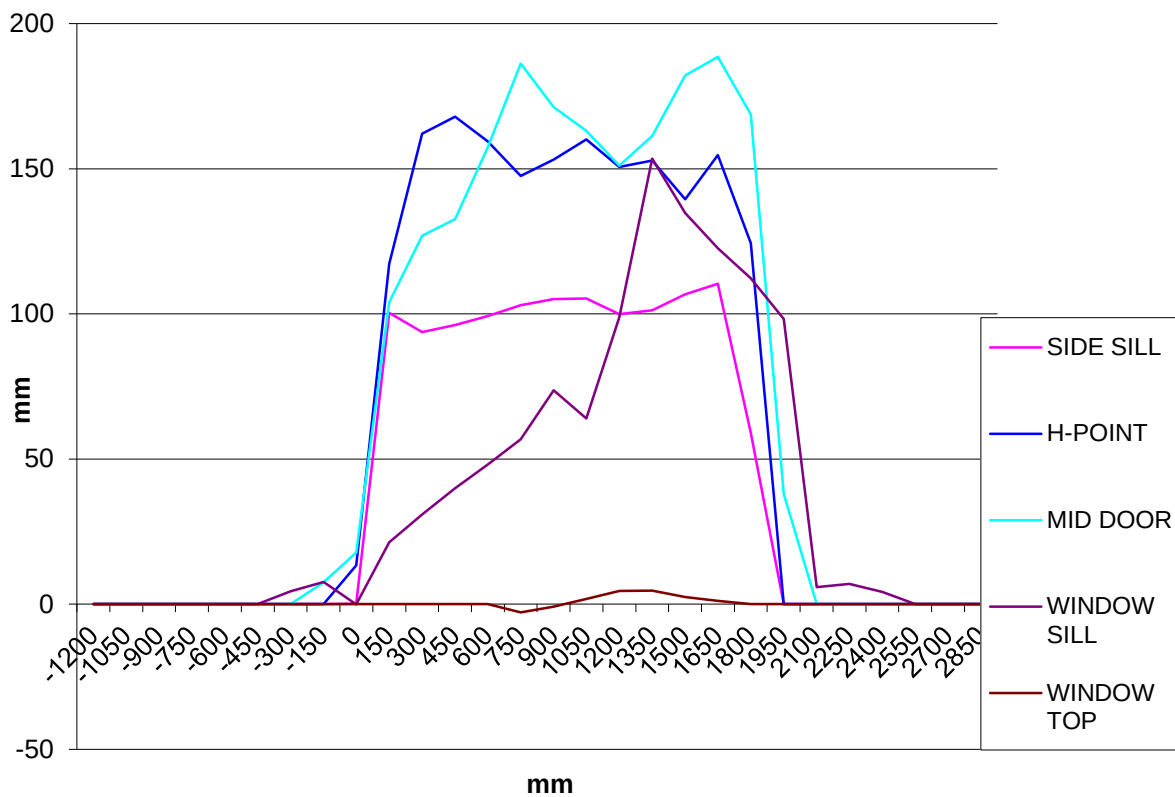
Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

DATA SHEET NO. 11 (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12

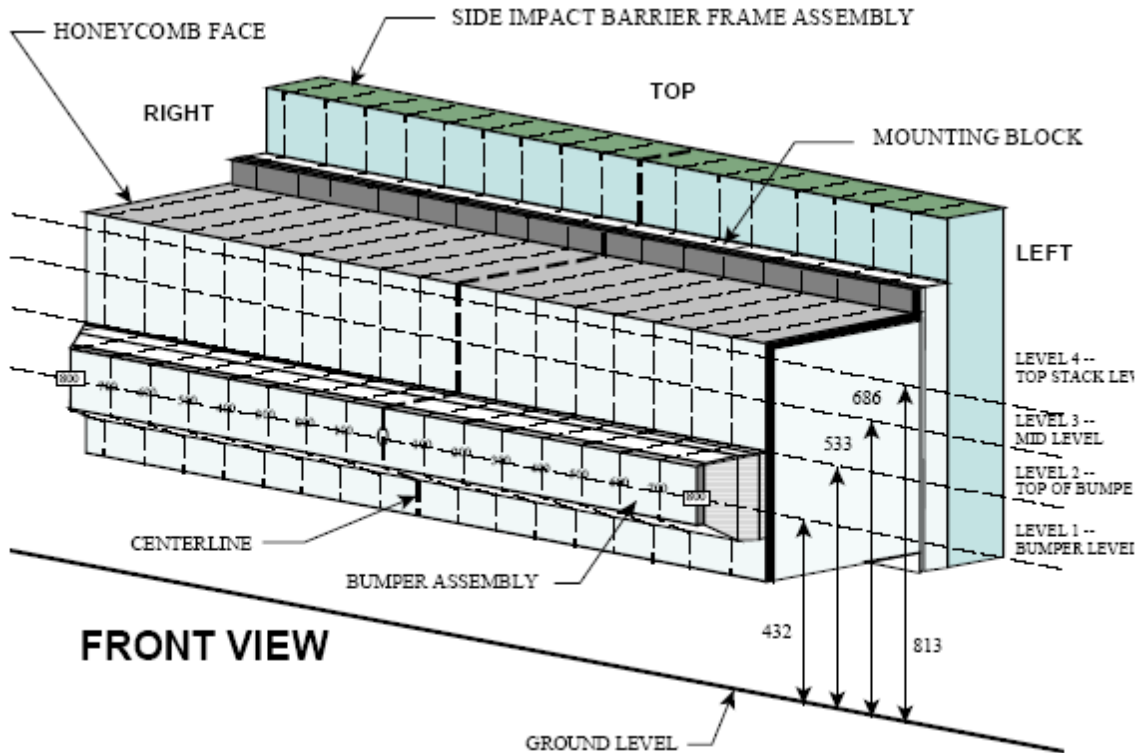


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	-48	-38	-29	-29	-41	-75	-101	-60	-56	-52	-54	-62	-70	-82	-99	-116	-157
2	-58	-44	-41	-44	-58	-68	-85	-71	-48	-35	-31	-34	-43	-60	-84	-116	-148
3	-136	-138	-137	-135	0	0	0	0	-117	-114	-109	-106	-104	-101	-100	-107	-127
4	-221	-217	-214	-220	-204	-207	-197	-191	-187	-182	-177	-173	-170	-167	-169	-186	-209

DATA SHEET NO. 13
FMVSS NO. 301 STATIC ROLLOVER RESULTS

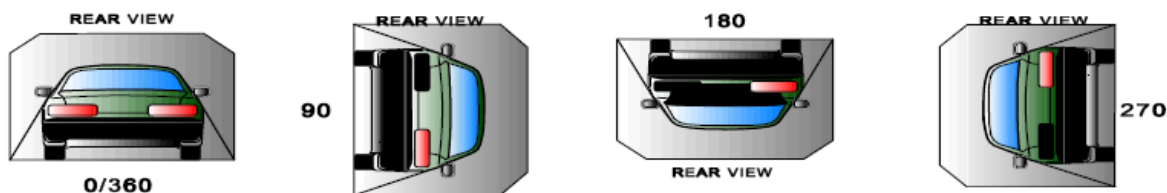
Test Vehicle: 2013 Buick Verano 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MD0107
 Test Date: 10/04/12

Test Time: 16:25 **Temperature:** 23

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum allowable is 1 ounce)
- B. For the 5 minute period after motion ceases: 0 oz.
 (Maximum allowable is 5 ounces)
- C. For the following 25 minutes: 0 oz.
 (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	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

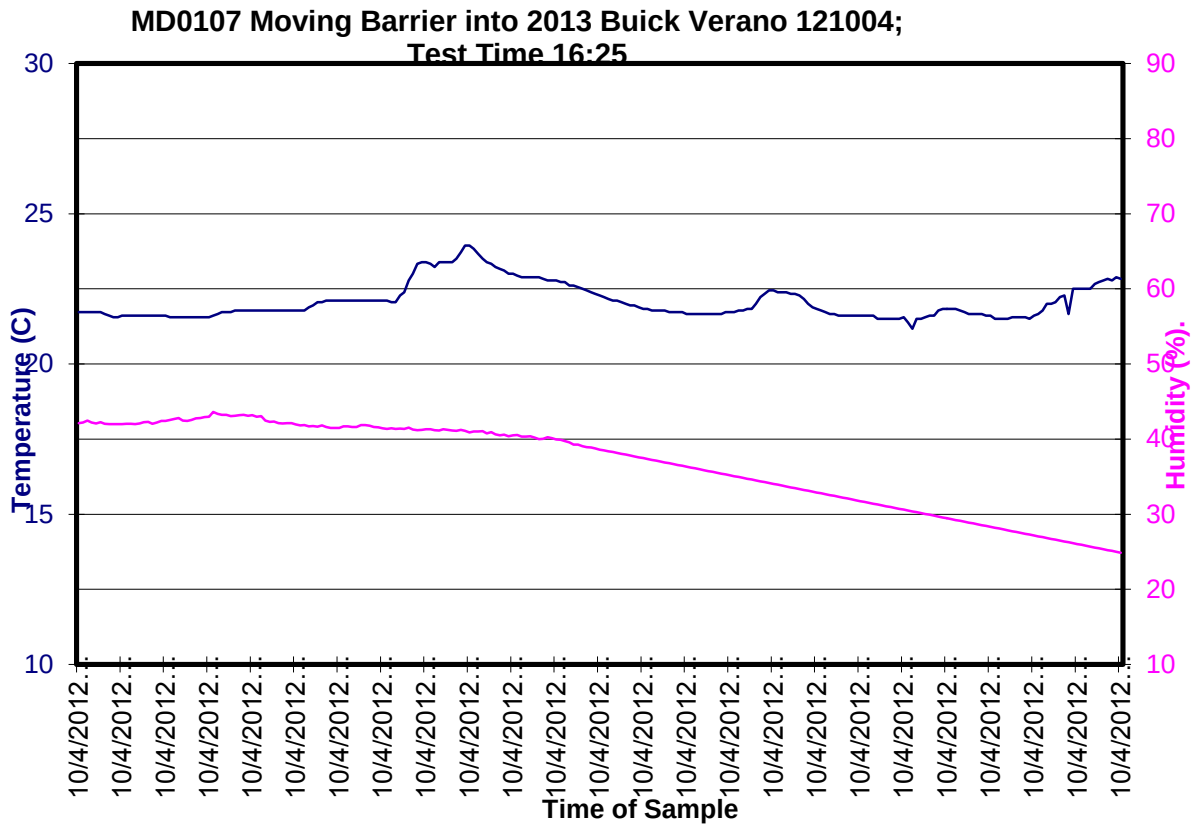
Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2013 Buick Verano 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MD0107
Test Date: 10/04/12



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

No.	Description	Page
001	As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle	A-6
002	As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	A-6
003	Pre-Test Front View of Test Vehicle	A-7
004	Post-Test Front View of Test Vehicle	A-7
005	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-8
006	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-8
007	Pre-Test Left Side View of Test Vehicle	A-9
008	Post-Test Left Side View of Test Vehicle	A-9
009	Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-10
010	Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-10
011	Pre-Test Rear View of Test Vehicle	A-11
012	Post-Test Rear View of Test Vehicle	A-11
013	Pre-Test Right Side View of Test Vehicle	A-12
014	Post-Test Right Side View of Test Vehicle	A-12
015	Pre-Test Overhead View of Test Area	A-13
016	Post-Test Overhead View of Test Area	A-13
017	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	A-14
018	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	A-14
019	Pre-Test Close-up View of Impact Point Target	A-15
020	Post-Test Close-up View of Impact Point Target	A-15
021	Pre-Test Left Front Door Latch Close-up	A-16
022	Post-Test Left Front Door Latch Close-up	A-16
023	Pre-Test Left Rear Door Latch Close-up	A-17
024	Post-Test Left Rear Door Latch Close-up	A-17
025	Pre-Test Front Close-up View of Driver Dummy	A-18
026	Post-Test Front Close-up View of Driver Dummy	A-18
027	Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking	A-19
028	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top	A-19
029	Post-Test Left Side View of Driver Dummy Shoulder and Door Top	A-20
030	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	A-20
031	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-21
032	Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning	A-21
033	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-22
034	Pre-Test Placement of Driver Dummy's Feet	A-22
035	Pre-Test View of Belt Anchorage for Driver Dummy	A-23
036	Pre-Test Left Side View of Steering Wheel	A-23

TABLE OF PHOTOGRAPHS (CONTINUED)

No.	Description	Page
037	View of Disengaged Parking Brake	A-24
038	Pre-Test View of Parking Brake	A-24
039	Pre-Test Close-Up Left Side View of Driver Seat Track	A-25
040	Pre-Test Close-Up Left Side View of Driver Seat Back	A-25
041	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-26
042	Pre-Test Driver Dummy and Door Clearance View	A-26
043	Post-Test Driver Dummy and Door Clearance View	A-27
044	Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-27
045	Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-28
046	Pre-Test Driver Inner Door Panel View	A-28
047	Post-Test Driver Inner Door Panel View	A-29
048	Post-Test Driver Dummy Close-Up Head Contact with Vehicle View	A-29
049	Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View	A-30
050	Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View	A-30
051	Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View	A-31
052	Post-Test Driver Dummy Close-Up Pelvis Contact View	A-31
053	Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View	A-32
054	Post-Test Driver Dummy Close-Up Knee Contact View	A-32
055	Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking	A-33
056	Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View	A-33
057	Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View	A-34
058	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-34
059	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-35
060	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-35
061	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-36
062	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-36
063	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-37
064	Pre-Test Placement of Rear Passenger Dummy's Feet	A-37
065	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-38
066	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-38
067	Pre-test Close-Up Left Side View of Rear Passenger Seat Back	A-39

TABLE OF PHOTOGRAPHS (CONTINUED)

No.	Description	Page
068	Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint	A-39
069	Pre-Test Passenger Dummy and Door Clearance View	A-40
070	Post-Test Passenger Dummy and Door Clearance View	A-40
071	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-41
072	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-41
073	Pre-Test Passenger Inner Door Panel View	A-42
074	Post-Test Passenger Inner Door Panel View	A-42
075	Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View	A-43
076	Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View	A-43
077	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View	A-44
078	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View	A-44
079	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View	A-45
080	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View	A-45
081	Post-Test Rear Passenger Dummy Close-Up Knee Contact View	A-46
082	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-46
083	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-47
084	Pre-Test Front View of MDB Impactor Face	A-47
085	Post-Test Front View of MDB Impactor Face	A-48
086	Pre-Test Top View of MDB Impactor Face	A-48
087	Post-Test Top View of MDB Impactor Face	A-49
088	Pre-Test Left Side View of MDB Impactor Face	A-49
089	Post-Test Left Side View of MDB Impactor Face	A-50
090	Pre-Test Right Side View of MDB Impactor Face	A-50
091	Post-Test Right Side View of MDB Impactor Face	A-51
092	Close-Up View of Vehicle's Certification Label	A-51
093	Close-Up View of Vehicle's Tire Information Placard or Label	A-52
094	Pre-Test Ballast View	A-52
095	Post-Test Primary and Redundant Speed Trap Read-Out	A-53

TABLE OF PHOTOGRAPHS (CONTINUED)

No.	Description	Page
096	FMVSS No. 301 Static Rollover 0 Degrees	A-53
097	FMVSS No. 301 Static Rollover 90 Degrees	A-54
098	FMVSS No. 301 Static Rollover 180 Degrees	A-54
099	FMVSS No. 301 Static Rollover 270 Degrees	A-55
100	FMVSS No. 301 Static Rollover 360 Degrees	A-55
101	Impact Event	A-56
102	Monroney Label	A-56
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-57
104	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-57



001 As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



002 As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



003 Pre-Test Front View of Test Vehicle



004 Post-Test Front View of Test Vehicle



005 Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



006 Post-Test Left Front $\frac{3}{4}$ 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 $\frac{3}{4}$ View of Test Vehicle



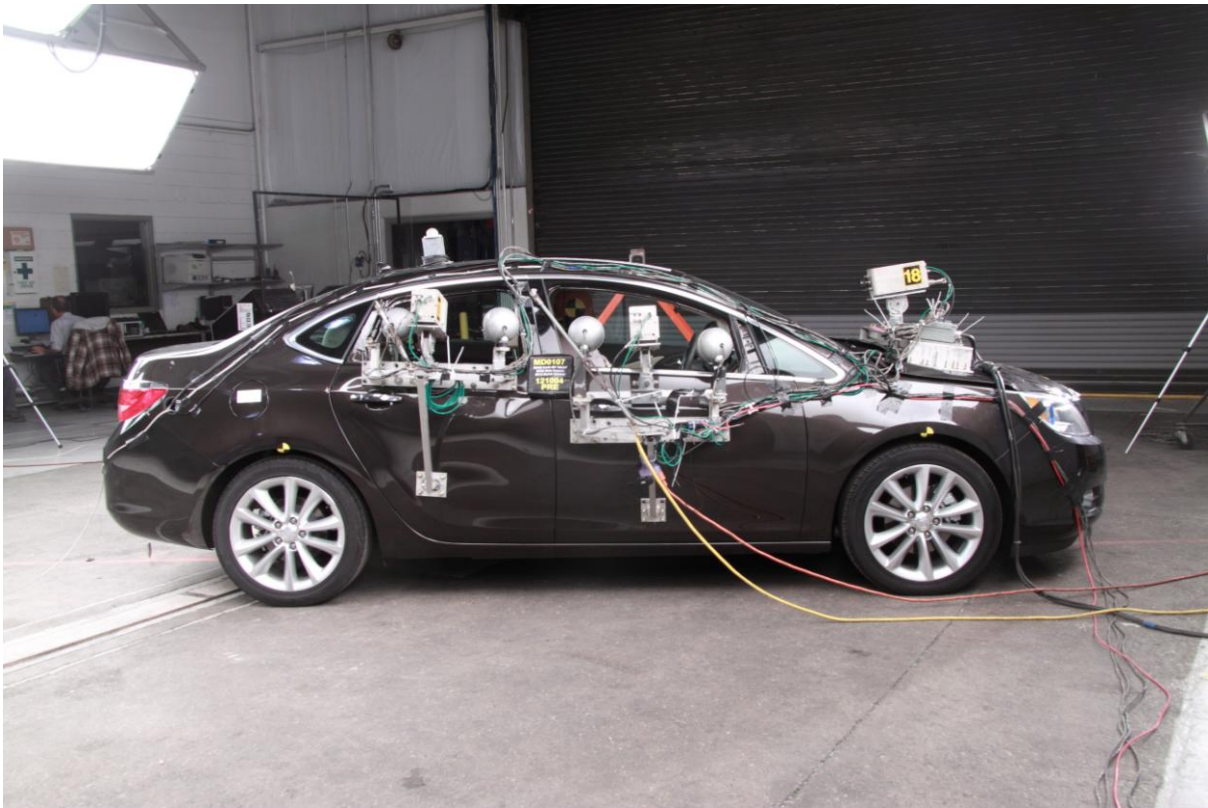
010 Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



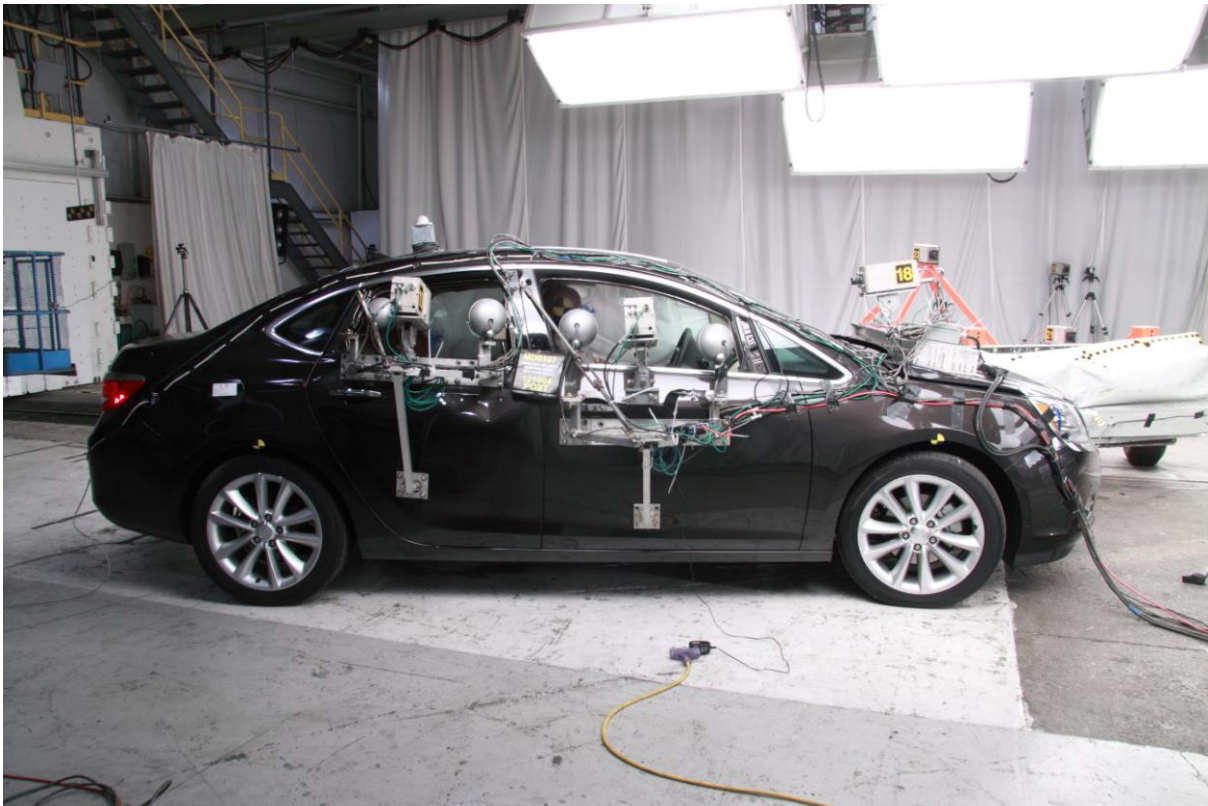
011 Pre-Test Rear View of Test Vehicle



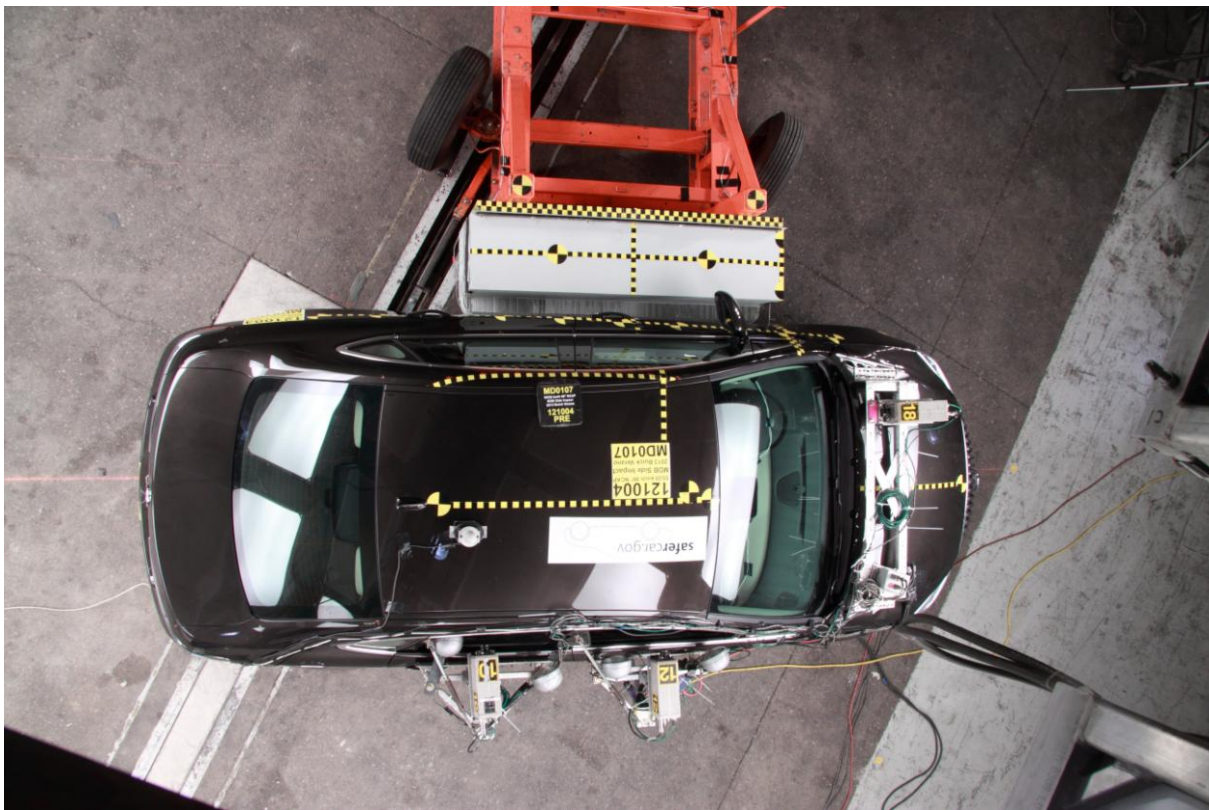
012 Post-Test Rear View of Test Vehicle



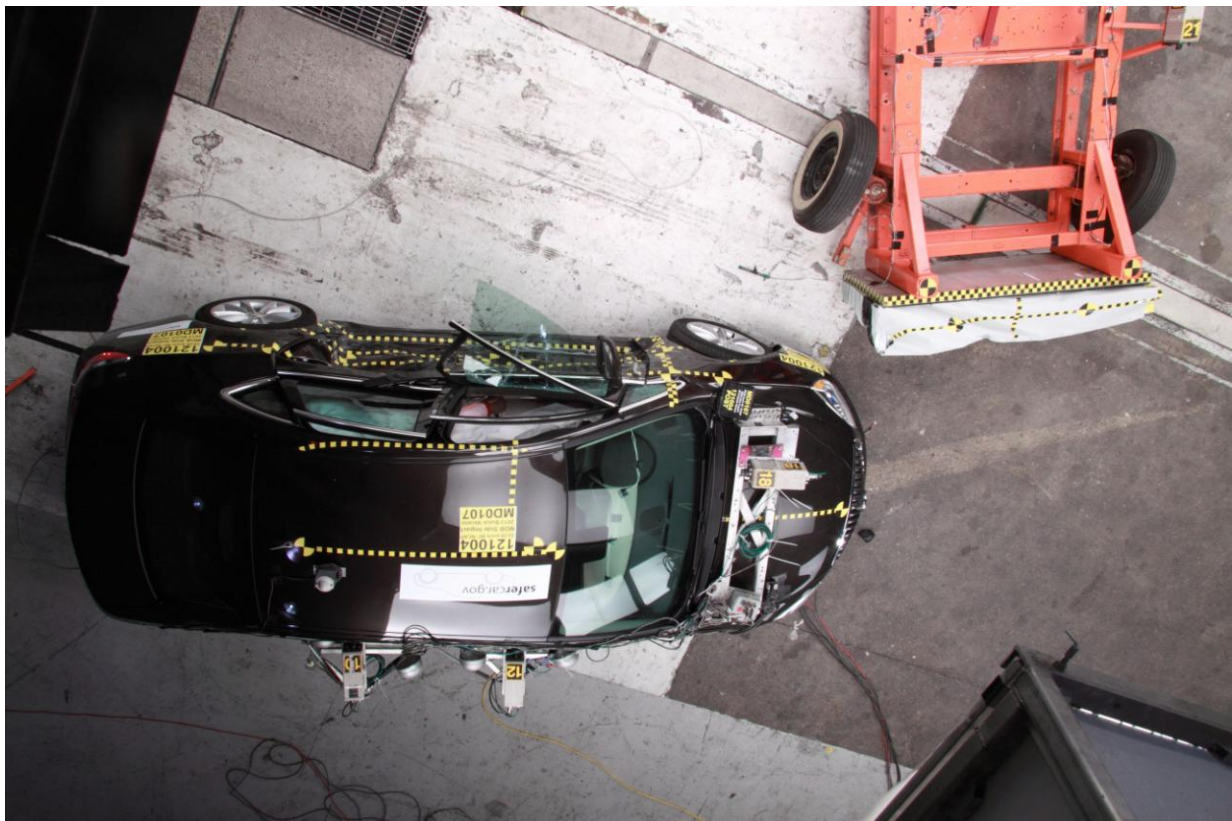
013 Pre-Test Right Side View of Test Vehicle



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 MDB Positioned Against Side of Test Vehicle



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



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



020 Post-Test Close-up View of Impact Point Target



021 Pre-Test Left Front Door Latch Close-up



022 Post-Test Left Front Door Latch Close-up



023 Pre-Test Left Rear Door Latch Close-up



024 Post-Test Left Rear Door Latch Close-up



025 Pre-Test Front Close-up View of Driver Dummy



026 Post-Test Front Close-up View of Driver Dummy



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



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



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



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



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



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



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



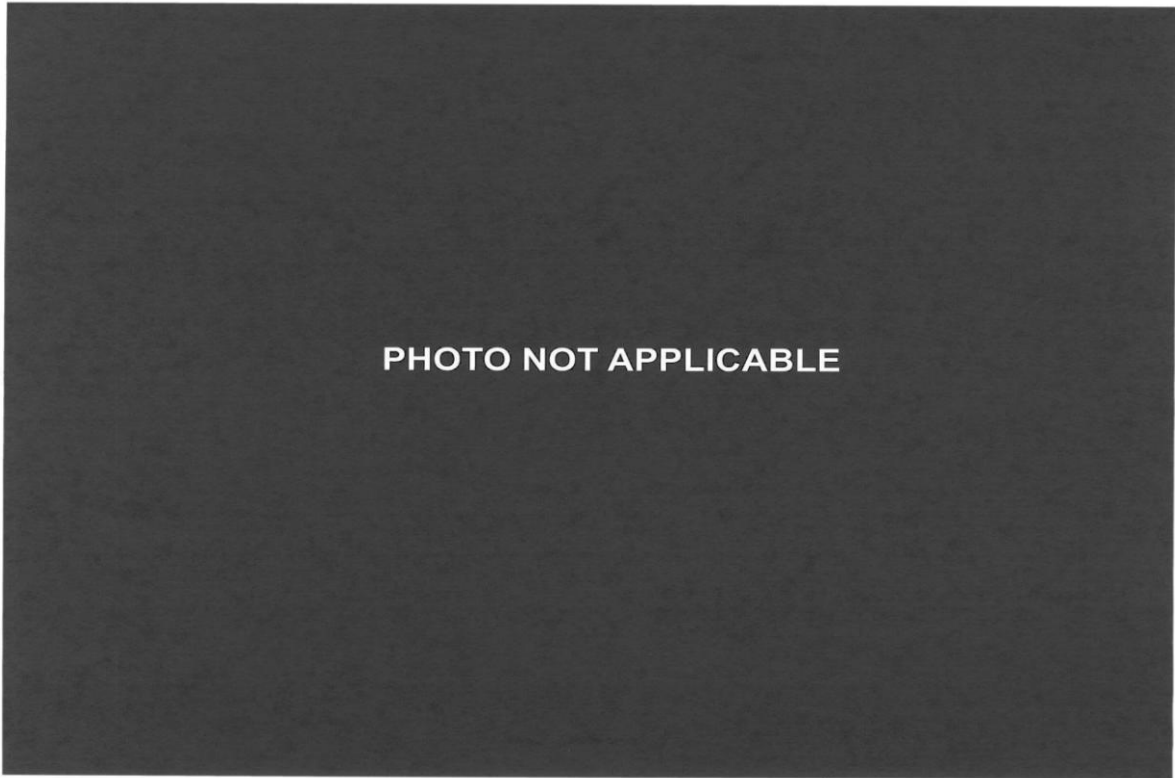
034 Pre-Test Placement of Driver Dummy Feet



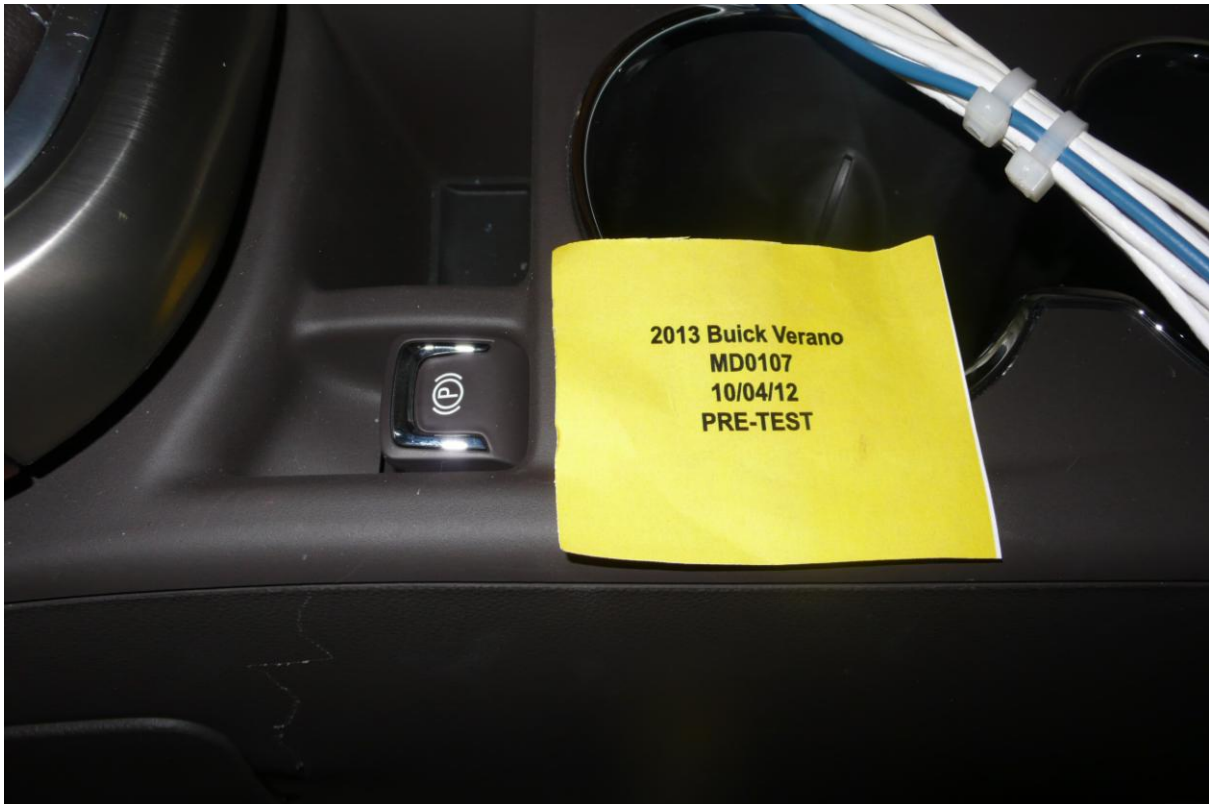
035 Pre-Test View of Belt Anchorage for Driver Dummy



036 Pre-Test Left Side View of Steering Wheel



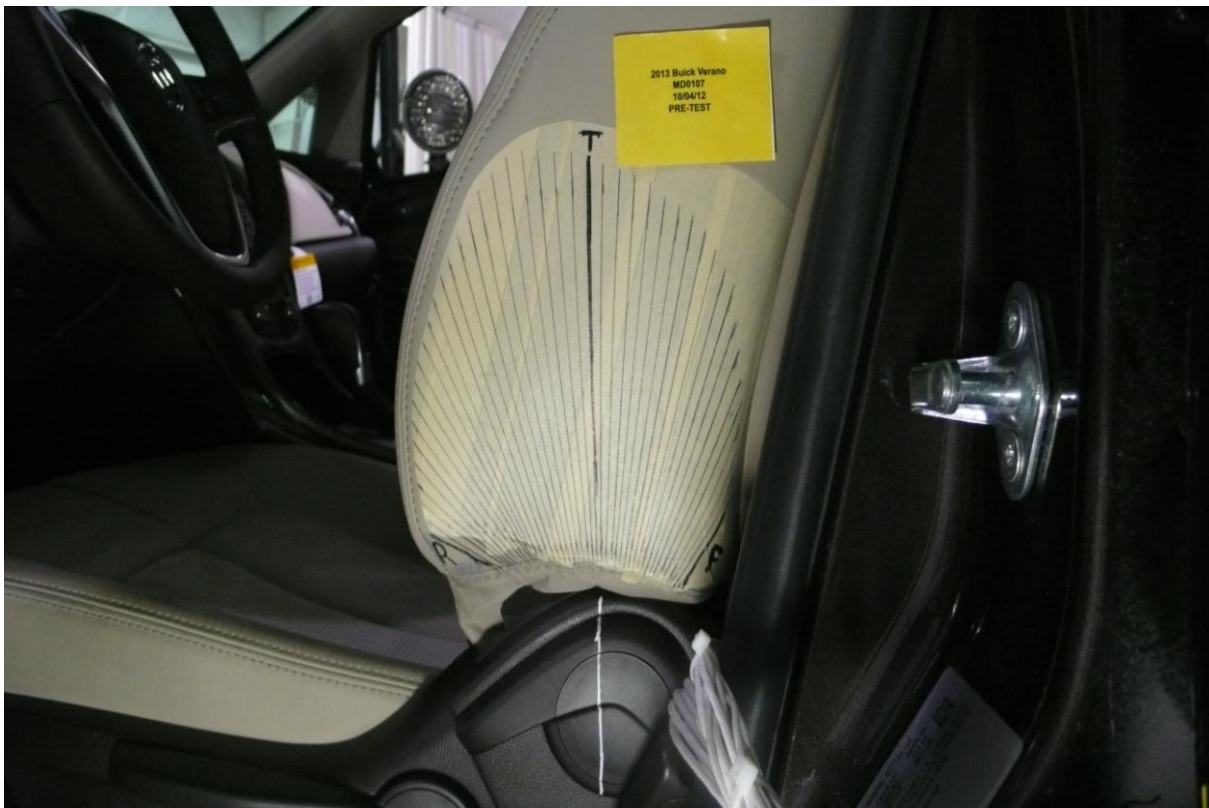
037 View of Disengaged Parking Brake



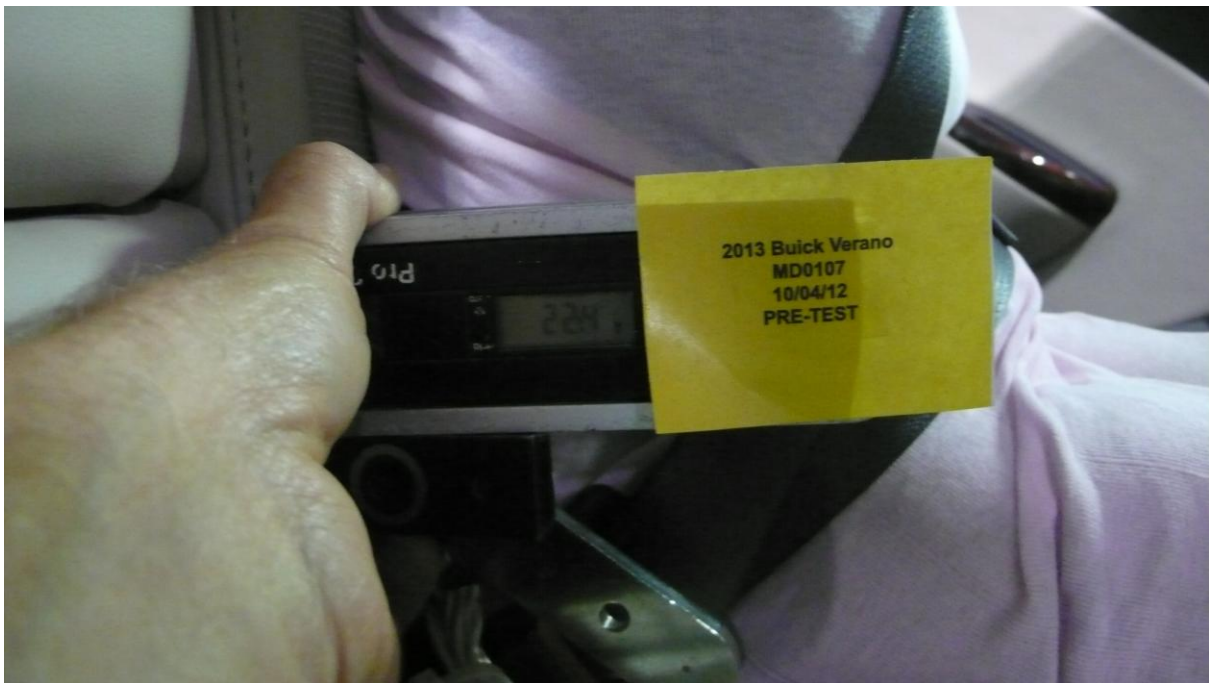
038 Pre-Test View of Parking Brake



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



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



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



042 Pre-Test Driver Dummy and Door Clearance View



043 Post-Test Driver Dummy and Door Clearance View



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



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



046 Pre-Test Driver Inner Door Panel View



047 Post-Test Driver Inner Door Panel View



048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View



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



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



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



052 Post-Test Driver Dummy Close-Up Pelvis Contact View



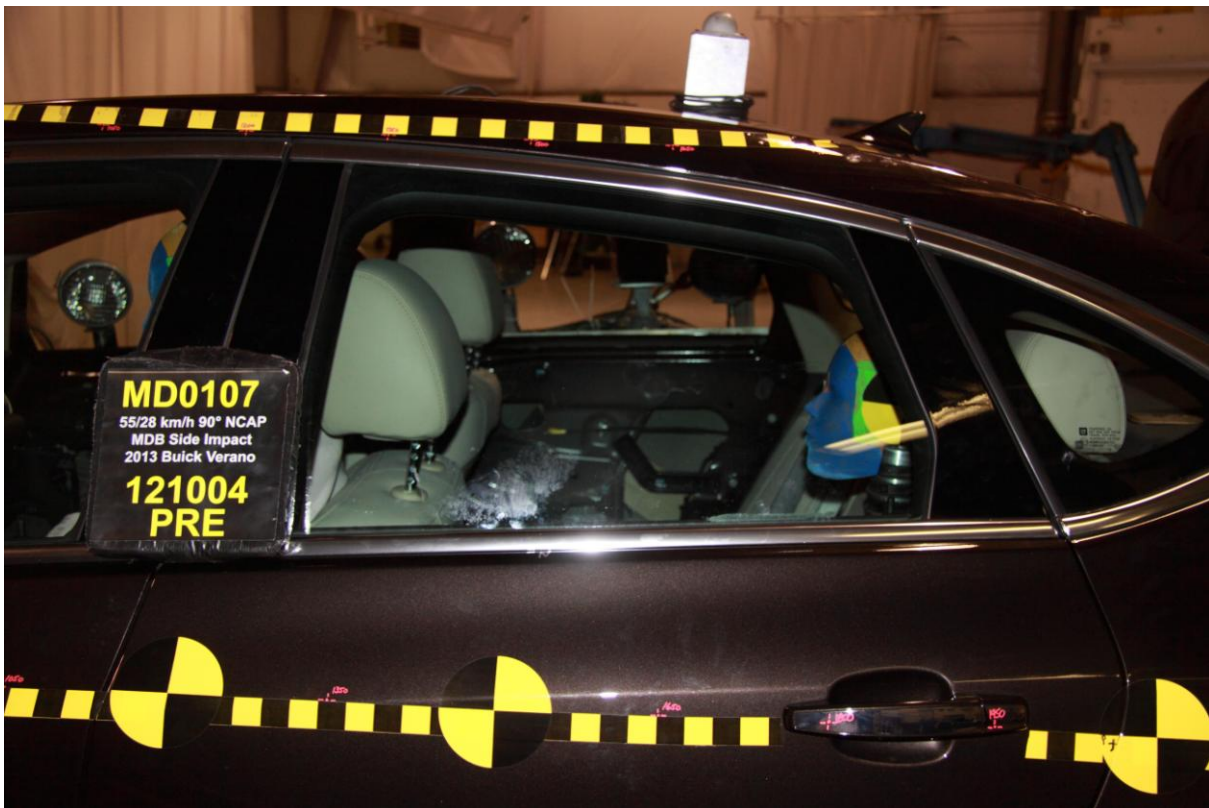
053 Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



054 Post-Test Driver Dummy Close-Up Knee Contact View



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



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



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



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



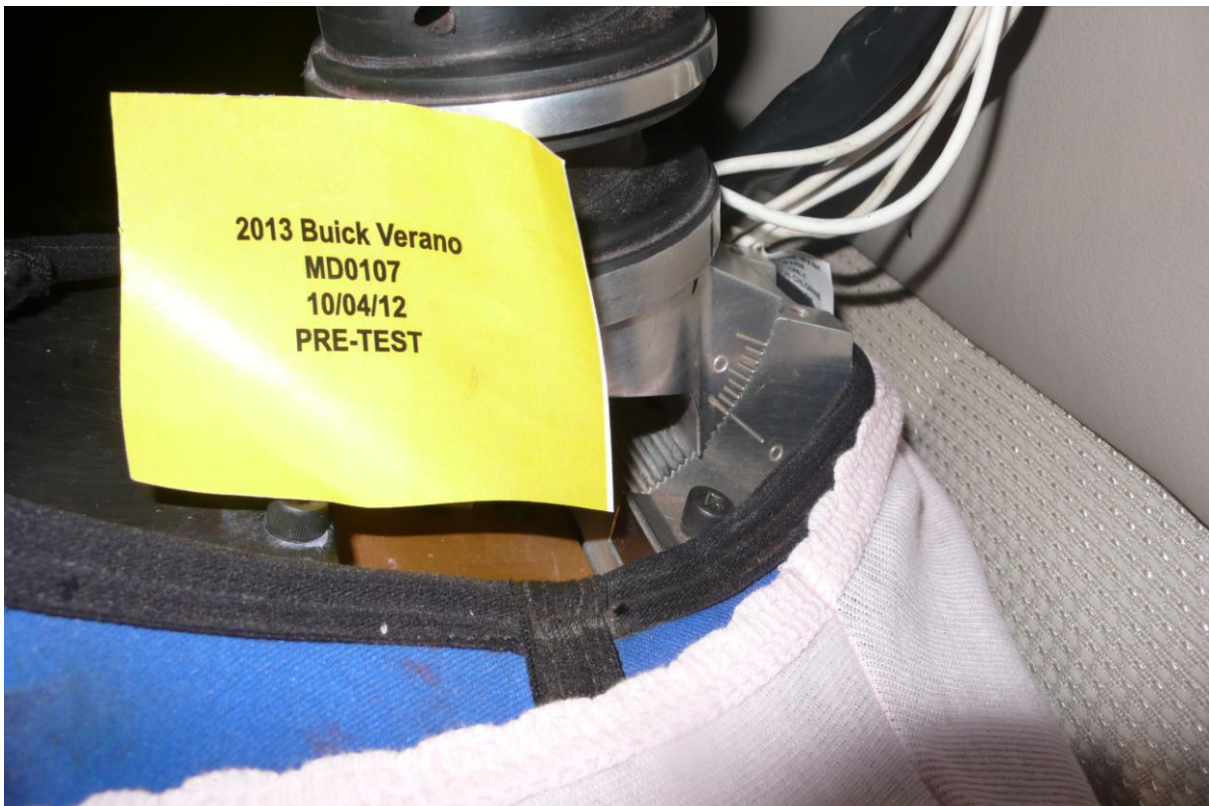
059 Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



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



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



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



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



064 Pre-Test Placement of Rear Passenger Dummy Feet



065 Pre-Test View of Belt Anchorage for Rear Passenger Dummy



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



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



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



069 Pre-Test Passenger Dummy and Door Clearance View



070 Post-Test Passenger Dummy and Door Clearance View



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



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



073 Pre-Test Passenger Inner Door Panel View



074 Post-Test Passenger Inner Door Panel View



075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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



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



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



079 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View



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



081 Post-Test Rear Passenger Dummy Close-Up Knee Contact View



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



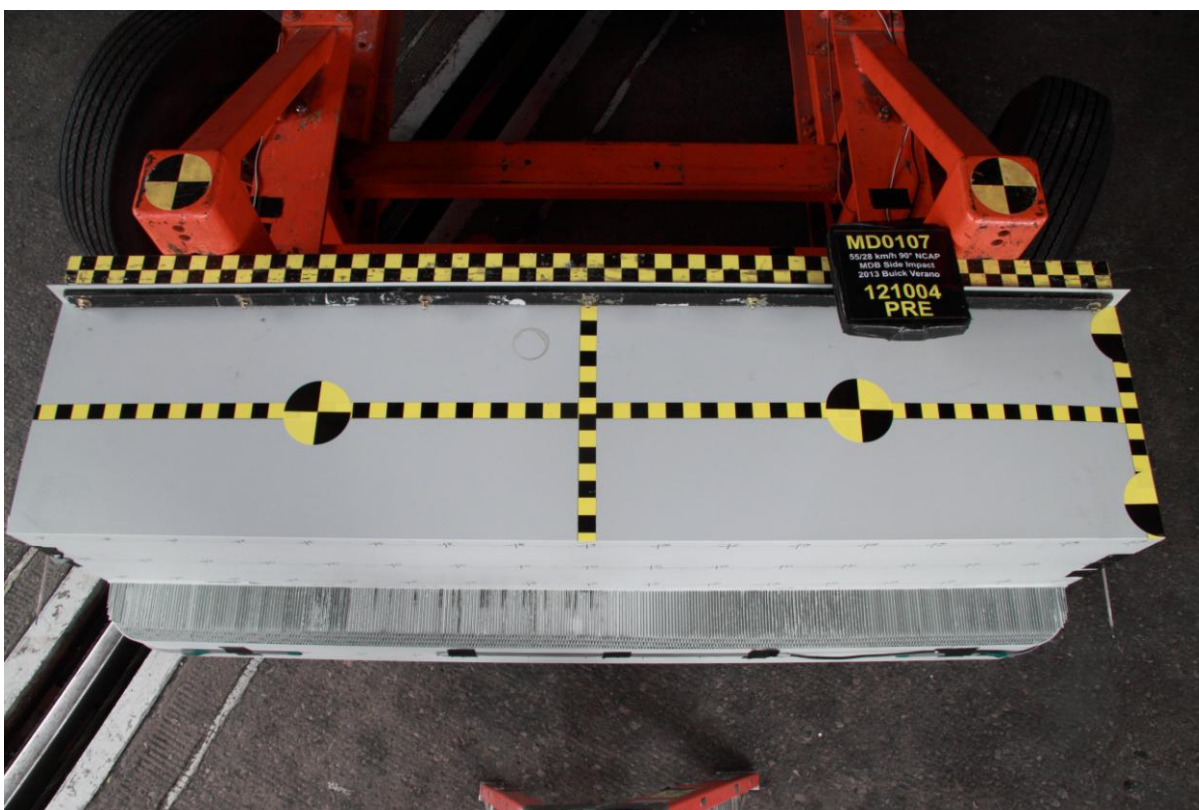
083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face



087 Post-Test Top View of MDB Impactor Face



088 Pre-Test Left Side View of MDB Impactor Face



089 Post-Test Left Side View of MDB Impactor Face



090 Pre-Test Right Side View of MDB Impactor Face



091 Post-Test Right Side View of MDB Impactor Face



092 Close-Up View of Vehicle Certification Label



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



094 Pre-Test Ballast View

PHOTO NOT AVAILABLE

095 Post-Test Primary Speed Trap Read-Out



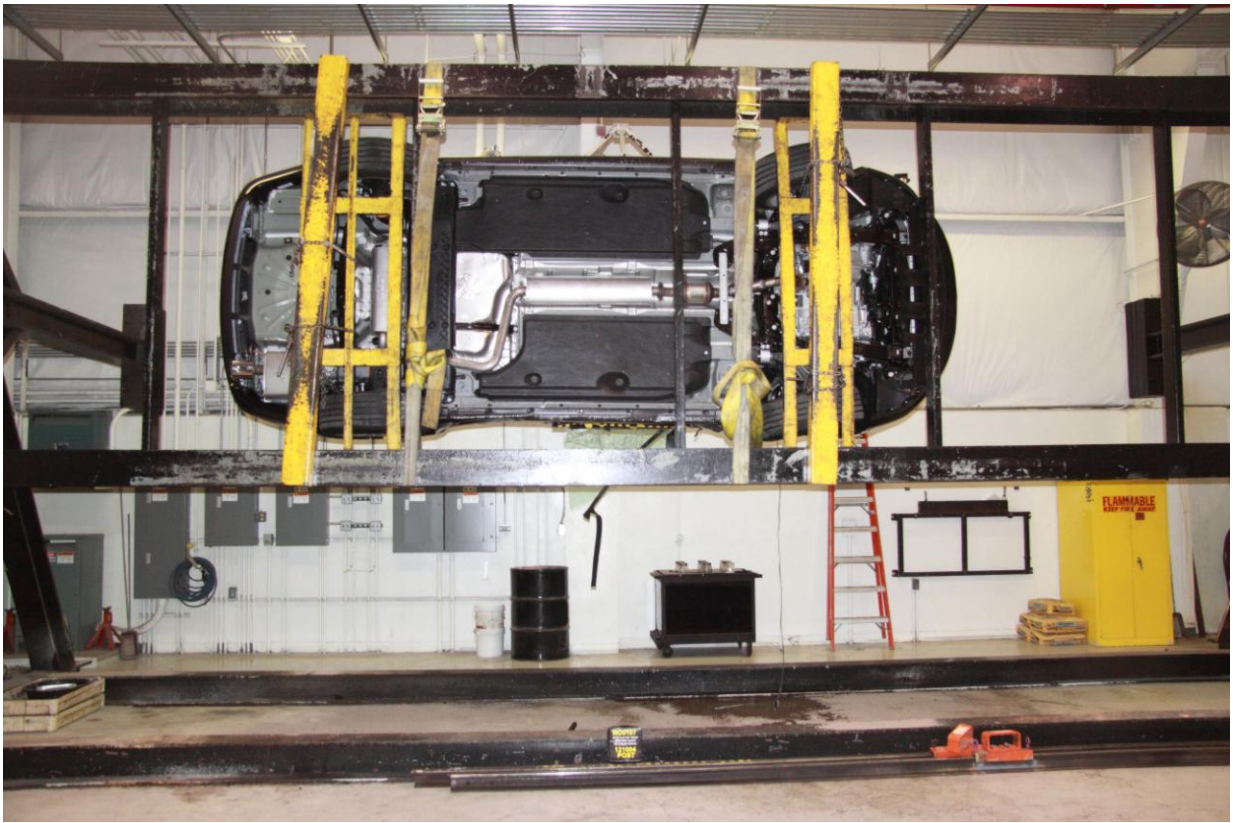
096 FMVSS No. 301 Static Rollover 0 Degrees



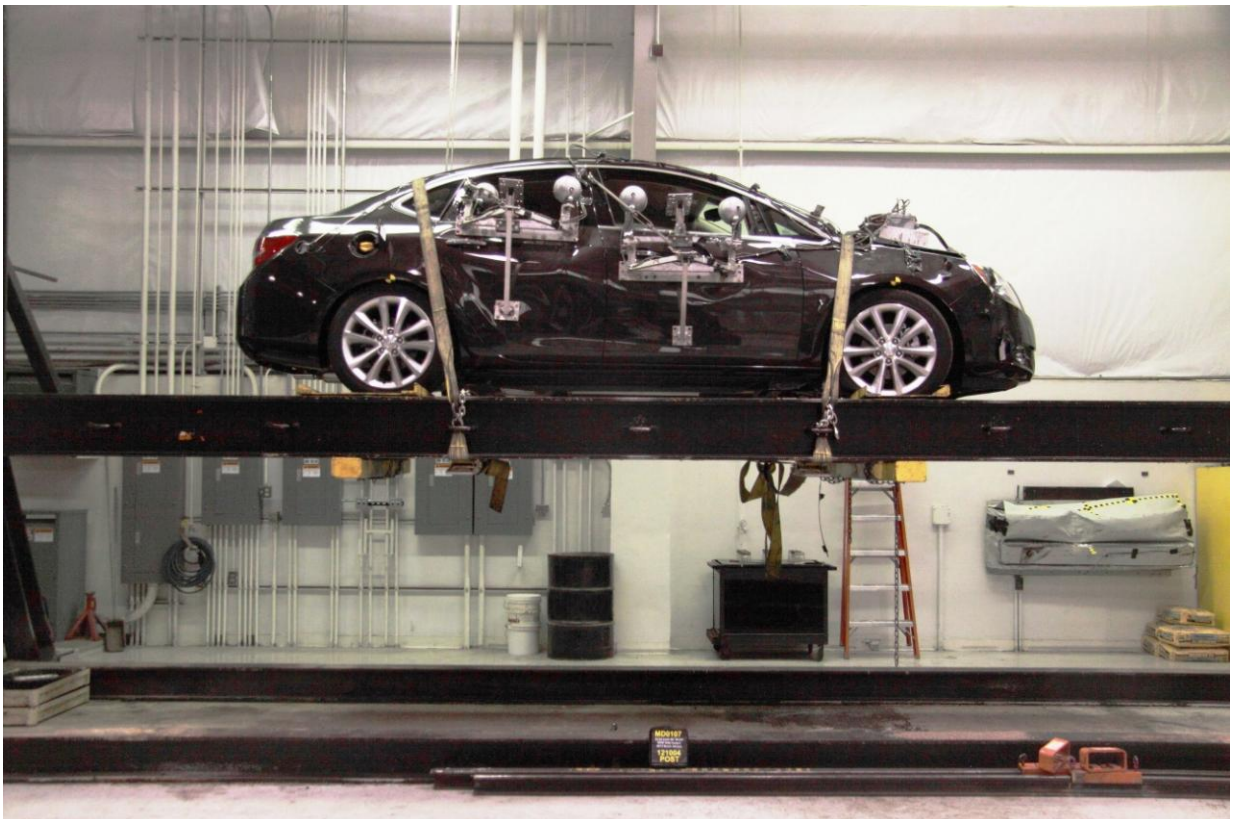
097 FMVSS No. 301 Static Rollover 90 Degrees



098 FMVSS No. 301 Static Rollover 180 Degrees



099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees



101 Impact View



BUICK

2013 VERANO FWD 1SD

EXTERIOR: MOCHA BRONZE METALLIC
INTERIOR: CASHMERE

ENGINE: 2.4L DOHC 4 CYL
TRANSMISSION: 6 SPD AUTOMATIC

STANDARD EQUIPMENT

STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN.

- 6 YEAR / 70,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS
- 4 YEAR/50,000 MILE BUMPER-TO-BUMPER WARRANTY SEE DEALER FOR DETAILS

MECHANICAL

- ENGINE, 2.4L DOHC 4 CYL WITH VVT
- TRANSMISSION, 6 SPD AUTOMATIC

SAFETY & SECURITY

- REAR VISION CAMERA SYSTEM
- REMOTE KEYLESS ENTRY
- AIRBAGS, DRIVER & FRONT PASSENGER
- IMPACT & HEAD CURTAIN, REAR OUTBOARD PASSENGER SIDE
- IMPACT & HEAD CURTAIN
- STABILITRAK-STABILITY CONTROL

SYSTEM W/ TRACTION CONTROL

- ANTI-LOCK BRAKE SYSTEM, 4 WHEEL DISC
- 6 MTBS ONSTAR DIRECTIONS AND CONNECTIONS WITH AUTOMATIC CRASH RESPONSE & TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)
- TIRE PRESSURE MONITOR (EXCL. SPARE TIRE)
- CONTENT THEFT ALARM, THEFT DETERRENT SYSTEM

INTERIOR

- SEATS, FRONT SPORT BUCKET
- SEAT TRIM, RIBBON FABRIC, LEATHERETTE BOLSTERS
- SEAT ADJUSTER, DRIVER 8 WAY MANUAL
- SEAT ADJUSTER, FRNT PASSENGER 8 WAY MANUAL
- SEAT, REAR 60-40 SPLIT-FOLD
- WINDOW, POWER WITH EXPRESS

UP/DOWN DRIVER DOOR

- WINDOW, POWER WITH EXPRESS DOWN ALL DOORS
- HEAD RESTRAINTS, 2 WAY ADJUSTABLE
- POWER DOOR LOCKS
- DOOR SILL PLATE
- REMOTE VEHICLE STARTER SYSTEM
- AIR CONDITIONING, AUTOMATIC DUAL ZONE CLIMATE CONTROL
- CRUISE CONTROL
- POWER OUTLET, FRONT AUXILIARY 12 V
- POWER OUTLET, REAR AUXILIARY
- SEATS, FRONT SPORT BUCKET
- LEATHER WRAP STEERING WHEEL
- LEATHER TRIMMED SHIFT LEVER
- STEERING COLUMN, TILT AND TELESCOPIC
- XM RADIO + SERVICE SUBSCRIPTION SOLD SEPARATELY BY SUBSCRIBER AFTER 3 MTBS
- DRIVER INFORMATION CENTER
- 7" COLOR TOUCH RADIO WITH

BUICK INTELLILINK, CD/MP3 PLAYER, AUX INPUT AND USB PORT

- BLUETOOTH FOR PHONE AND MUSIC
- AUDIO SYSTEM, 6 SPEAKER
- STEERING WHEEL CONTROLS

EXTERIOR

- GLASS, SOLAR TINTED
- DOOR HANDLES, BODY-COLOR CHROME STRIP
- OUTSIDE MIRRORS, POWER ADJUSTABLE
- EXHAUST TIP, CHROME
- TIRE, COMPACT SPARE & WHEEL
- WHEELS, 18" MACHINE FACED ALLOY
- FRONT FOG LAMPS
- HEADLAMPS, PROJECTOR BEAM HALOGEN
- HEADLAMP CONTROL, AUTOMATIC ON & OFF

Visit us at www.buick.com

STANDARD VEHICLE PRICE \$23,080.00

TOTAL VEHICLE PRICE* \$23,965.00

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN.

TOTAL OPTIONS \$0.00

TOTAL VEHICLE & OPTIONS \$23,080.00

DESTINATION CHARGE \$885.00

TOTAL VEHICLE PRICE* \$23,965.00

EPA DOT Fuel Economy and Environment

Fuel Economy

25 MPG

Compact cars range from 14 to 60 MPG. The best vehicle rates 112 MPG. Values are based on gasoline and do not reflect performance and ratings based on E85.

21 city **32 highway** **4.1 gallons per 100 miles**

Driving Range

Estimated 290 miles

Annual fuel cost \$2,150

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

6

This vehicle emits 361 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fuelconomy.gov.

Smog Rating (tailpipe only)

6

Best

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

GOVERNMENT 5-STAR SAFETY RATINGS

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

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 56%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:

FINAL ASSEMBLY POINT: LAKE ORION, MI U.S.A.

COUNTRY OF ORIGIN: U.S.A.

ENGINE: UNITED STATES

TRANSMISSION: UNITED STATES

ORDER NO. 0000000000 SALES CODE E SALES MODEL CODE 0P000 EXTERIOR COLOR LAKE ORION, MI U.S.A. VIN 1G4PP05K6D4106226

DEALER TO KNOW DELIVERED BROUWER BUICK GMC 2145 E MORELAND RD WAUKESHA, WI 53186-4020

LR 1GA0139136

3-2 Seats and Restraints

Head Restraints

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.

Front Seats

The vehicle's front seats have adjustable "bac" restraints in the outboard seating positions.



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 head restraint down. Try to move the head restraint after the button is released to make sure that it is locked in place.

If you are installing a child restraint in the rear seat, use "Securing a Child Restraint Designed for the LATCH System" under *Lower Anchors and Tethers for Children (LATCH System)* on page 3-36.

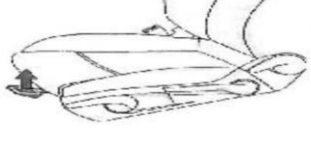
3-3 Seats and Restraints

Front Seats

Seat Adjustment

WARNING

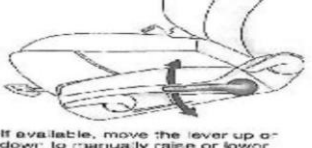
You can lose control of the vehicle if you try to adjust a driver seat while the vehicle is moving. Adjust the driver seat only when the vehicle is not moving.



To adjust a manual seat:

1. Lift the handle at the front of the seat.
2. Slide the seat to the desired position and release the handle.
3. Try to move the seat back and forth to be sure it is locked in place.

Seat Height Adjuster



If available, move the lever up or down to manually raise or lower the seat.

103 Driver Head Restraint Use and Adjustment Information from Vehicle Owner Manual

3-2 Seats and Restraints

Head Restraints

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.

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If you are installing a child restraint in the rear seat, use "Securing a Child Restraint Designed for the LATCH System" under *Lower Anchors and Tethers for Children (LATCH System)* on page 3-36.

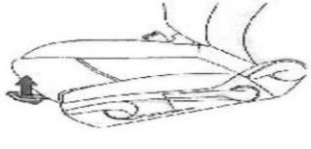
3-3 Seats and Restraints

Front Seats

Seat Adjustment

WARNING

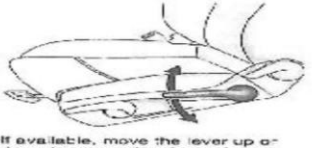
You can lose control of the vehicle if you try to adjust a driver seat while the vehicle is moving. Adjust the driver seat only when the vehicle is not moving.



To adjust a manual seat:

1. Lift the handle at the front of the seat.
2. Slide the seat to the desired position and release the handle.
3. Try to move the seat back and forth to be sure it is locked in place.

Seat Height Adjuster



If available, move the lever up or down to manually raise or lower the seat.

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

No.	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-5
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration (Z) Primary vs. Time	B-5
4	Driver Head Resultant Acceleration Primary vs. Time	B-5
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-6
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-6
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-6
8	Driver Thorax Rib Deflection Maximum vs. Time	B-6
9	Driver Anterior Abdominal Force (Y) vs. Time	B-7
10	Driver Middle Abdominal Force (Y) vs. Time	B-7
11	Driver Posterior Abdominal Force (Y) vs. Time	B-7
12	Driver Total Abdominal Force (Y) vs. Time	B-7
13	Driver Pubic Symphysis Force (Y) vs. Time	B-8
14	Passenger Head Acceleration (X) vs. Time Primary	B-8
15	Passenger Head Acceleration (Y) vs. Time Primary	B-8
16	Passenger Head Acceleration (Z) vs. Time Primary	B-8
17	Passenger Head Resultant Acceleration Primary vs. Time	B-9
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-9
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-9
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-9
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-10
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-10
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-10
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-10

The following additional data can be obtained from the Research and Development section of the NHTSA website (<http://www.nhtsa.dot.gov>)

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Structure Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

NHTSA

Test Lab: CTF

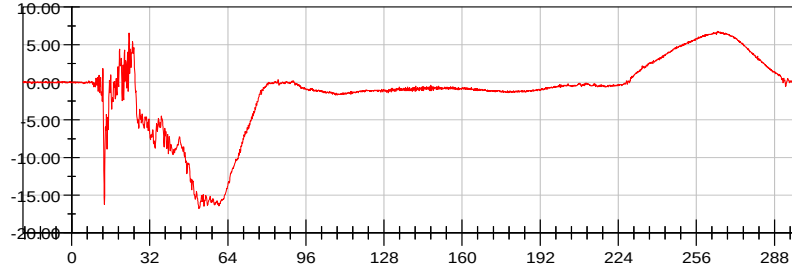
Test Number: 121004 (MD0107)

Test Date: 10/04/2012

Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (305)

Driver Head Acceleration (X) Primary vs. Time (g) vs. Time [ms]



<Max>

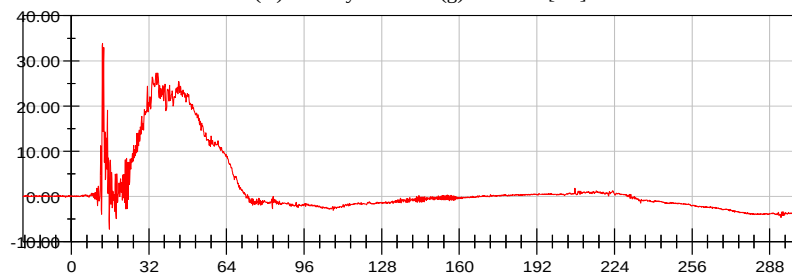
6.79 g at 264.72 ms

<Min>

-16.80 g at 52.16 ms

CFC_1000

Driver Head Acceleration (Y) Primary vs. Time (g) vs. Time [ms]



<Max>

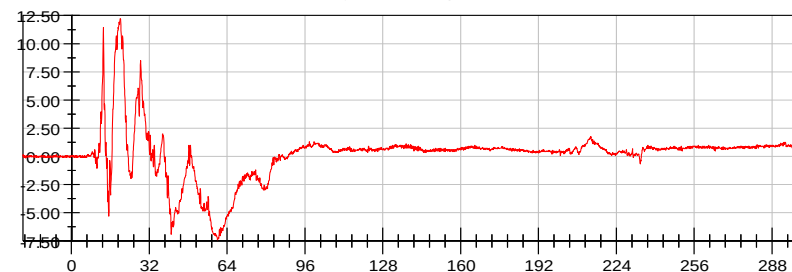
33.84 g at 12.88 ms

<Min>

-7.33 g at 15.68 ms

CFC_1000

Driver Head Acceleration (Z) Primary vs. Time (g) vs. Time [ms]



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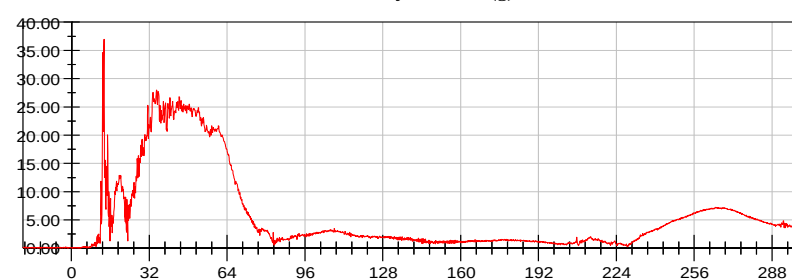
12.23 g at 20.08 ms

<Min>

-7.42 g at 60.00 ms

CFC_1000

Driver Head Resultant Acceleration Primary vs. Time (g) vs. Time [ms]



<Max>

36.94 g at 13.36 ms

<Min>

0.04 g at -17.76 ms

CFC_1000



NHTSA

Test Lab: CTF

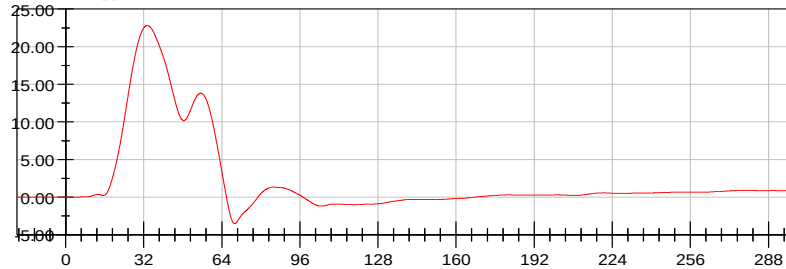
Test Number: 121004 (MD0107)

Test Date: 10/04/2012

Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (305)

Driver Upper Thorax Rib Deflection (Y) vs. Time (mm) vs. Time [ms]



<Max>

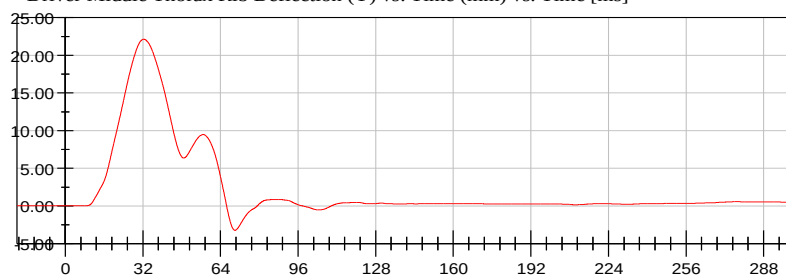
22.81 mm at 33.52 ms

<Min>

-3.50 mm at 69.28 ms

CFC_180

Driver Middle Thorax Rib Deflection (Y) vs. Time (mm) vs. Time [ms]



<Max>

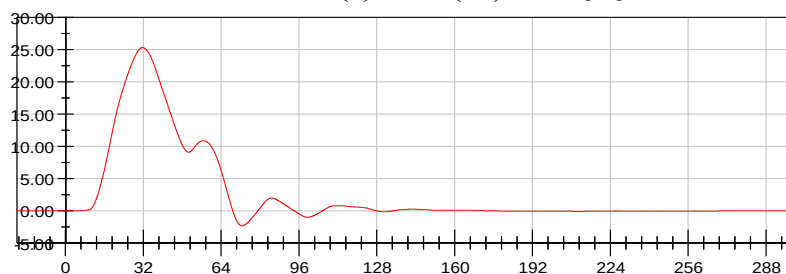
22.13 mm at 32.32 ms

<Min>

-3.25 mm at 70.00 ms

CFC_180

Driver Lower Thorax Rib Deflection (Y) vs. Time (mm) vs. Time [ms]



<Max>

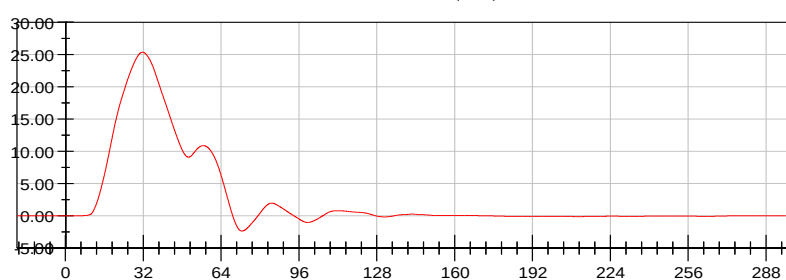
25.34 mm at 31.68 ms

<Min>

-2.34 mm at 72.56 ms

CFC_180

Driver Thorax Rib Deflection Maximum vs. Time (mm) vs. Time [ms]



<Max>

25.34 mm at 31.68 ms

<Min>

-2.34 mm at 72.56 ms

CFC_180



NHTSA

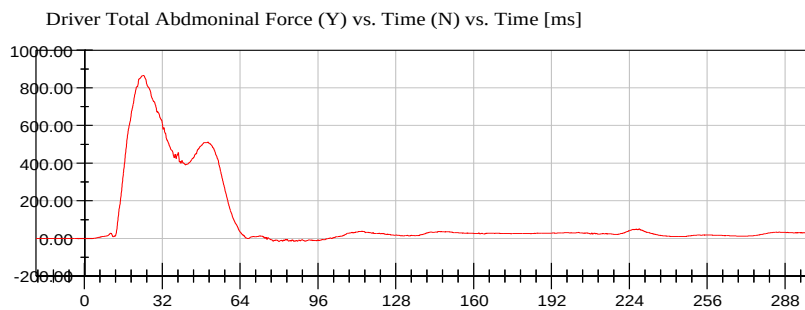
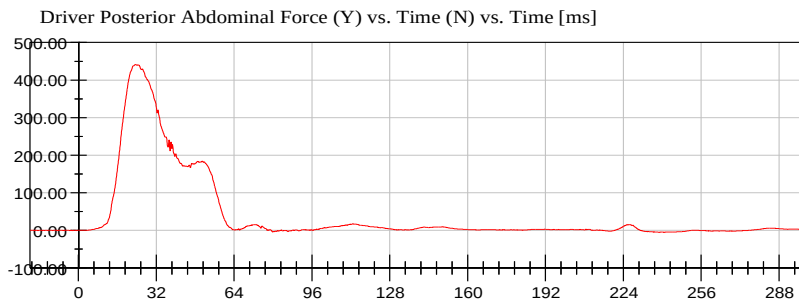
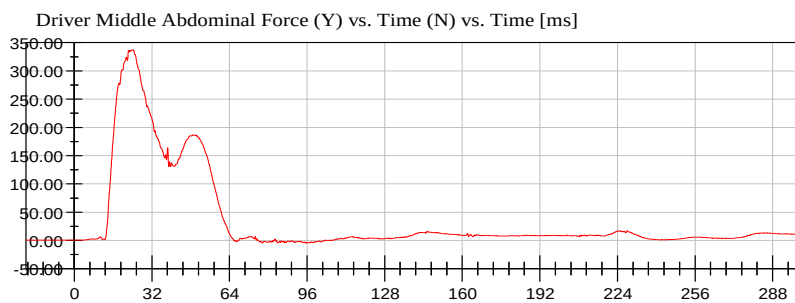
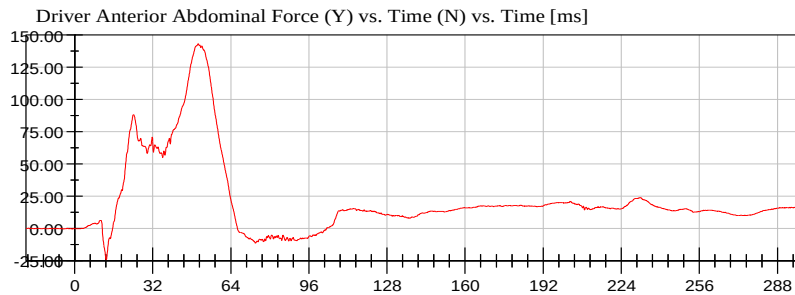
Test Lab: CTF

Test Number: 121004 (MD0107)

Test Date: 10/04/2012

Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (305)



NHTSA

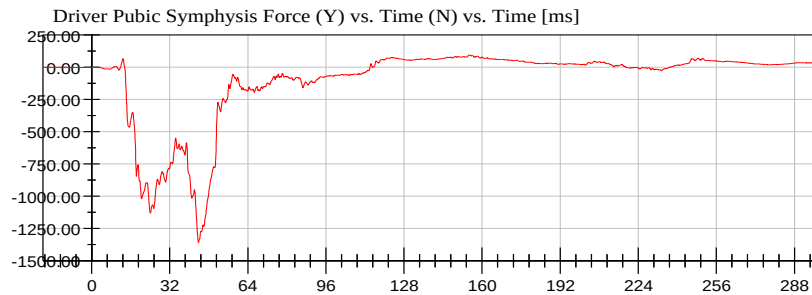
Test Lab: CTF

Test Number: 121004 (MD0107)

Test Date: 10/04/2012

Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (305)



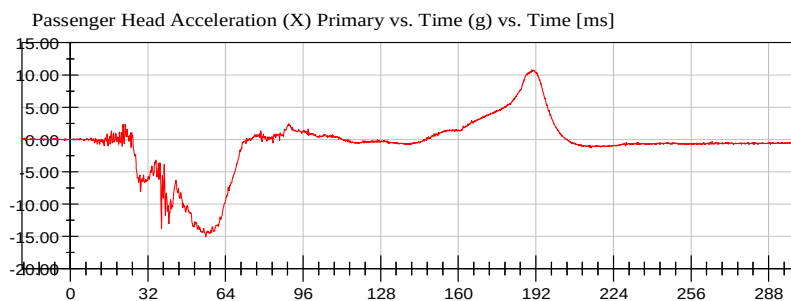
<Max>

95.28 N at 154.72 ms

<Min>

-1,358.70 N at 43.76 ms

CFC_600



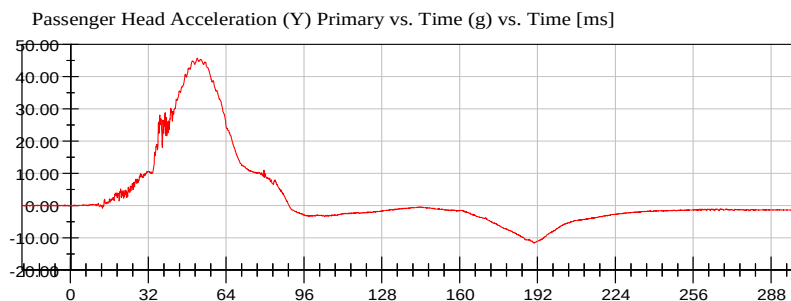
<Max>

10.81 g at 190.32 ms

<Min>

-15.10 g at 55.84 ms

CFC_1000



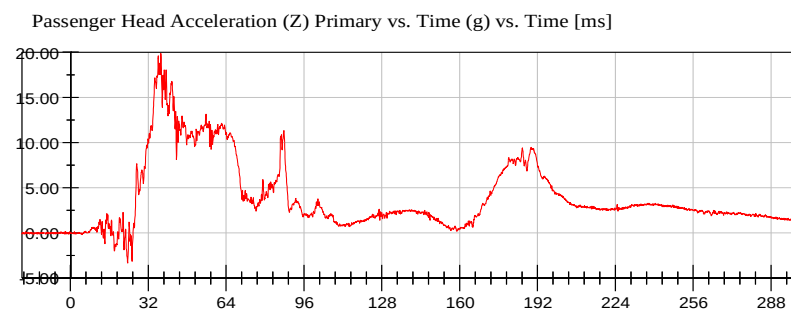
<Max>

45.81 g at 52.00 ms

<Min>

-11.63 g at 190.56 ms

CFC_1000



<Max>

19.85 g at 37.20 ms

<Min>

-3.32 g at 23.52 ms

CFC_1000



NHTSA

Test Lab: CTF

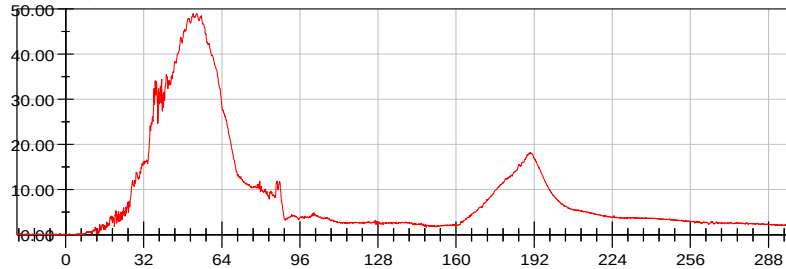
Test Number: 121004 (MD0107)

Test Date: 10/04/2012

Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (305)

Passenger Head Resultant Acceleration Primary vs. Time (g) vs. Time [ms]



<Max>

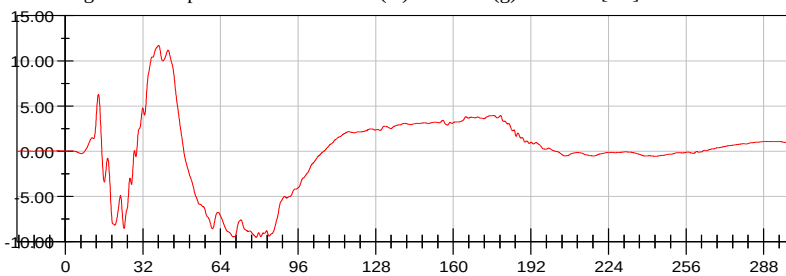
48.98 g at 53.84 ms

<Min>

0.04 g at -19.44 ms

CFC_1000

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



<Max>

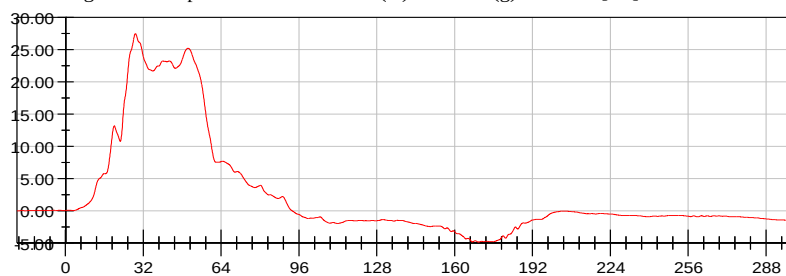
11.72 g at 38.48 ms

<Min>

-9.55 g at 78.72 ms

CFC_180

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



<Max>

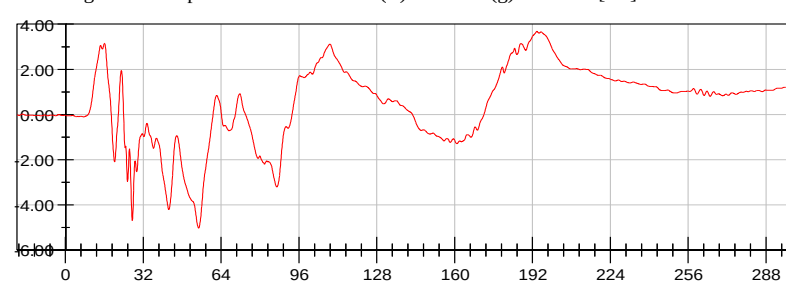
27.49 g at 28.80 ms

<Min>

-4.86 g at 169.84 ms

CFC_180

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



<Max>

3.68 g at 193.76 ms

<Min>

-5.02 g at 54.80 ms

CFC_180



NHTSA

Test Lab: CTF

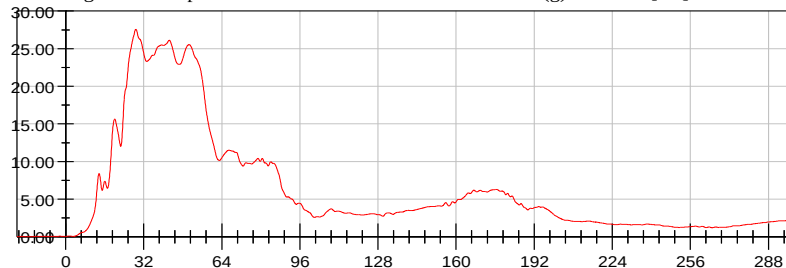
Test Number: 121004 (MD0107)

Test Date: 10/04/2012

Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (305)

Passenger Lower Spine T12 Resultant Acceleration vs. Time (g) vs. Time [ms]



<Max>

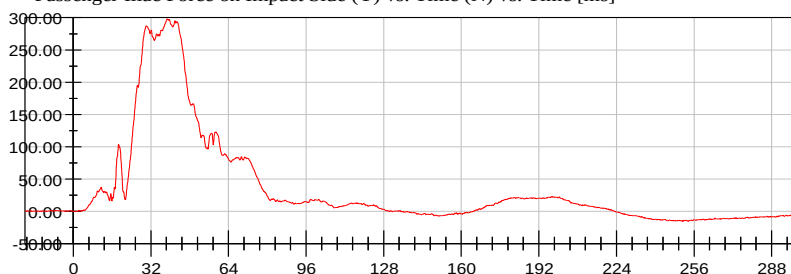
27.57 g at 28.80 ms

<Min>

0.01 g at -16.96 ms

CFC_180

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



<Max>

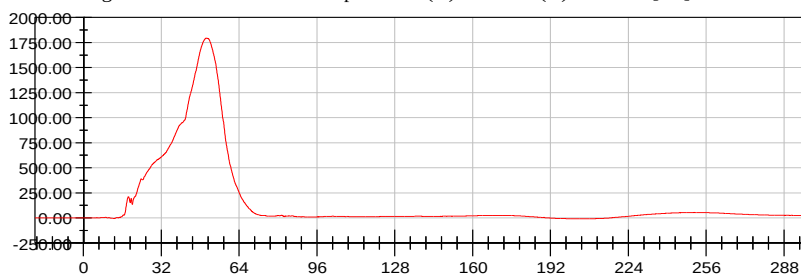
298.04 N at 38.72 ms

<Min>

-15.65 N at 253.60 ms

CFC_600

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



<Max>

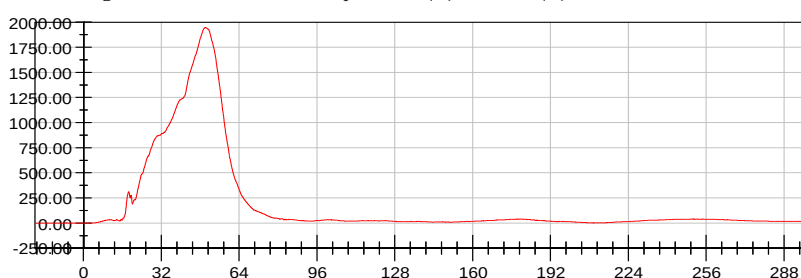
1,794.88 N at 50.40 ms

<Min>

-8.77 N at 204.48 ms

CFC_600

Passenger Total Pelvic Force on Impact Side (Y) vs. Time (N) vs. Time [ms]



<Max>

1,946.44 N at 50.16 ms

<Min>

-0.86 N at 0.24 ms

CFC_600



APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (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 Neck Pendulum Test

Pendulum Velocity (m/s) vs. Time (ms)

Flexion Angle (°) vs. Time (ms)

Potentiometer A (°) vs. Time (ms)

Potentiometer B (°) vs. Time (ms)

Potentiometer C (°) vs. Time (ms)

Table 4. Shoulder Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Table 5. Thorax – Upper Rib Drop Test

Upper Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)

Upper Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 6. Thorax – Middle Rib Drop Test

Middle Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)

Middle Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 7. Thorax – Lower Rib Drop Test

Lower Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)

Lower Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 8. Thorax – Full Body Impact Test

Pendulum Acceleration (G's) vs. Time (ms)

Impactor Force (kN) vs. Time (ms)

Upper Rib Displacement (mm) vs. Time (ms)

Middle Rib Displacement (mm) vs. Time (ms)

Lower Rib Displacement (mm) vs. Time (ms)

Table 9. Abdomen Impact Test

Impactor Force (kN) vs. Time (ms)

Total Abdomen Force (kN) vs. Time (ms)

Front Abdomen Force (kN) vs. Time (ms)

Middle Abdomen Force (kN) vs. Time (ms)

Rear Abdomen Force (kN) vs. Time (ms)

Table 10. Lumbar Spine Flexion Test

Pendulum Velocity (m/s) vs. Time (ms)

Spine Flexion Angle (°) vs. Time (ms)

Potentiometer A (°) vs. Time (ms)

Potentiometer B (°) vs. Time (ms)

Potentiometer C (°) vs. Time (ms)

Table 11. Pelvis Impact Test

Pendulum Acceleration (G's) vs. Time (ms)

Impactor Force (kN) vs. Time (ms)

Pubic Symphysis (Y) Force (kN) vs. Time (ms)

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) 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 F030

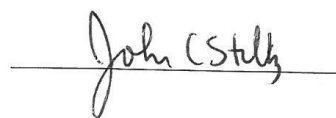
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 07
Date: 10/02/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	448	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	472	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	268	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	604	Yes

Technician



Approved



Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Peak Resultant Acceleration	125 - 155 g	138.4 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	-11.3 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

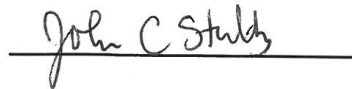
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 10:24:53 360

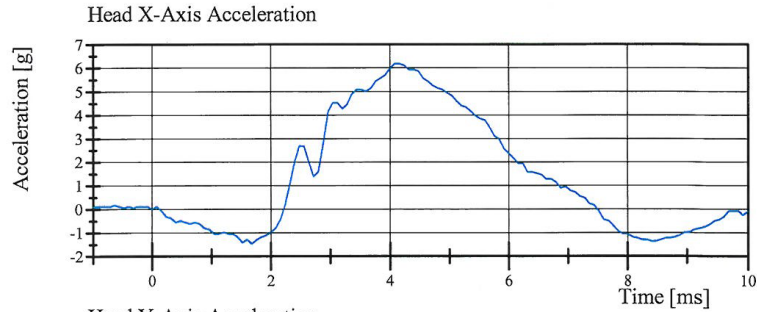


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 7-1

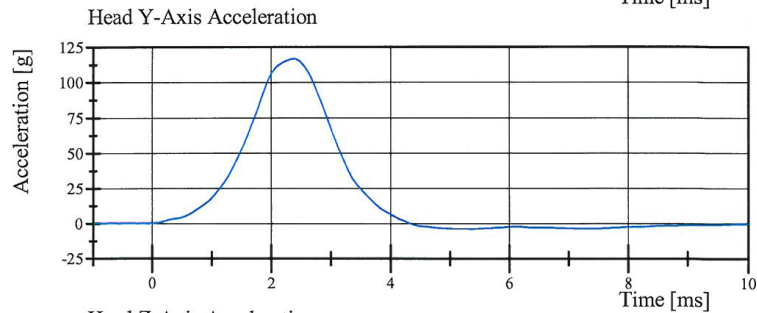
Test Date: 10/1/2012



Filter Class: CFC_1000

Max: 6.2 gn at 4.1 ms

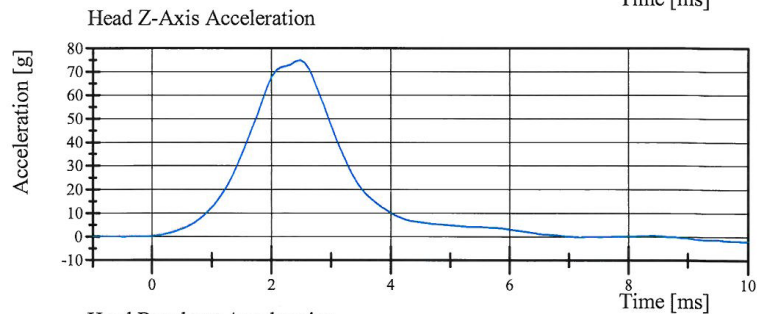
Min: -1.5 gn at 1.7 ms



Filter Class: CFC_1000

Max: 116.8 gn at 2.4 ms

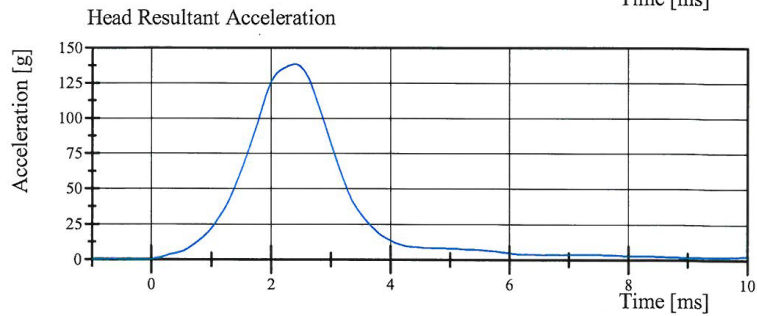
Min: -4.0 gn at 5.4 ms



Filter Class: CFC_1000

Max: 74.9 gn at 2.5 ms

Min: -2.1 gn at 9.9 ms



Filter Class: CFC_1000

Max: 138.4 gn at 2.4 ms

Min: 0.1 gn at -0.3 ms

Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 7-3

Test Date: 10/1/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-53.9 deg	Yes
Time of Peak	54 - 66 ms	58.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	66.7 ms	Yes

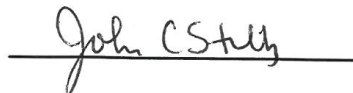
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 12:12:35 1311

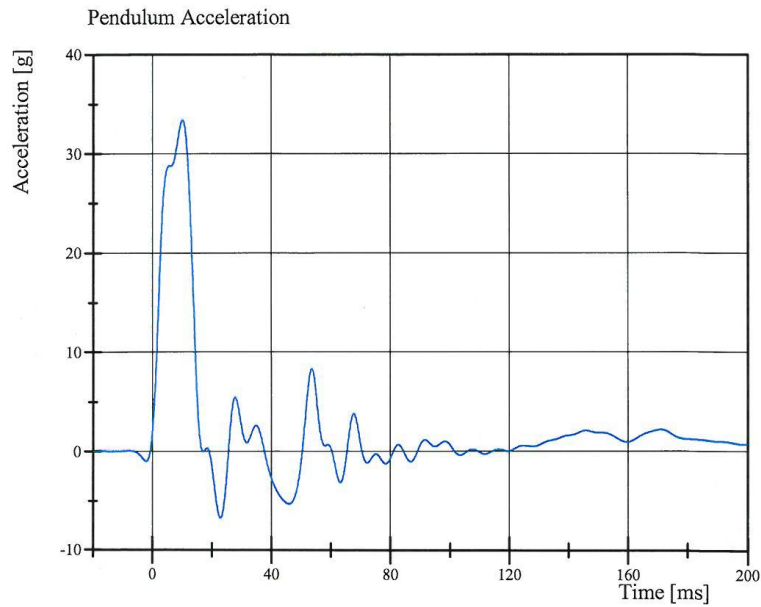


Transportation Research Center Inc.

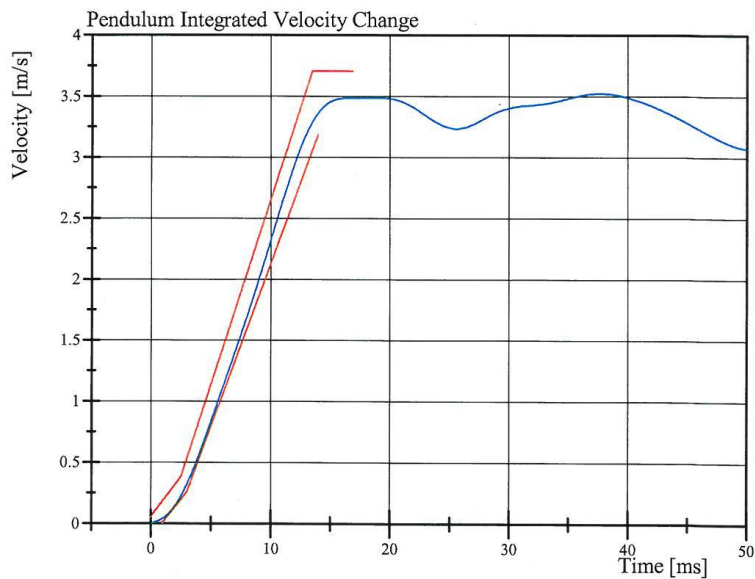
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 7-3

Test Date: 10/1/2012



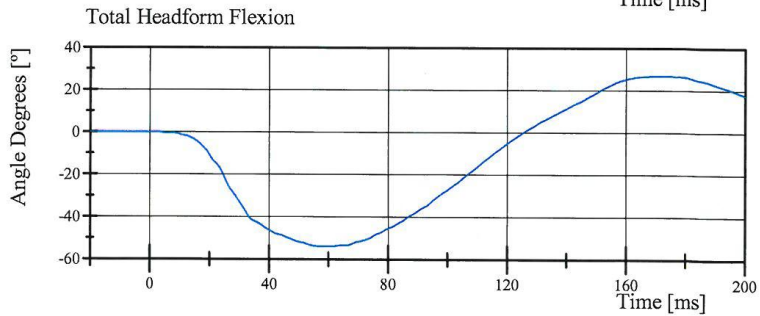
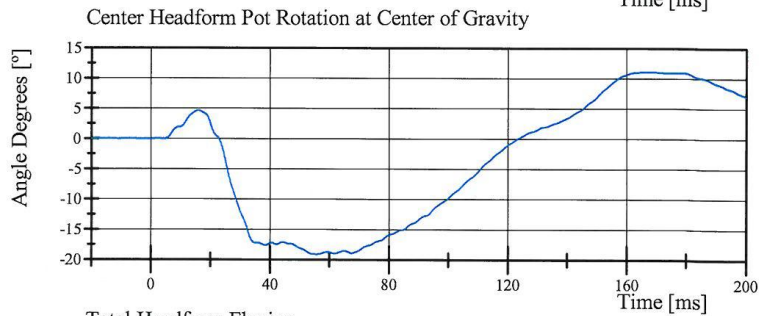
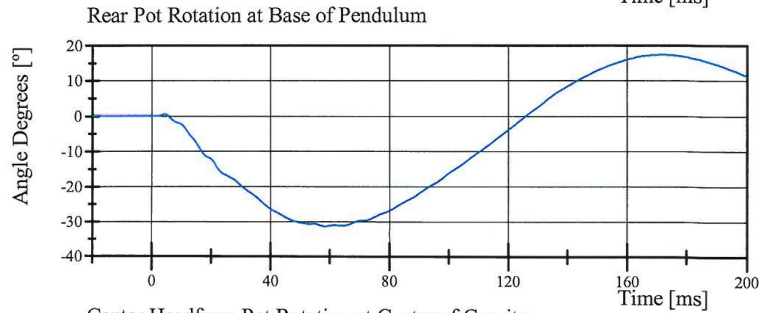
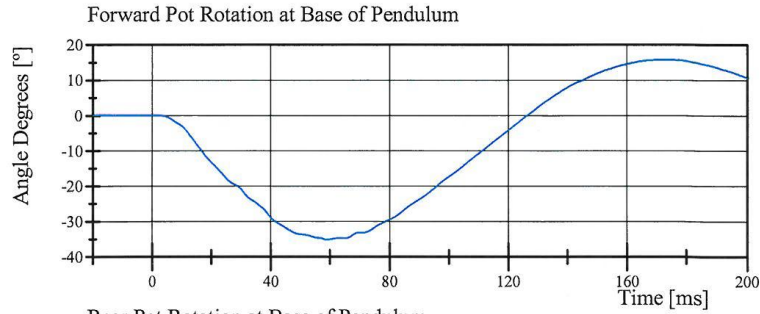
Filter Class: CFC_60
Max: 33.3 gn at 10.1 ms
Min: -6.8 gn at 22.9 ms



Filter Class: CFC_60
Max: 3.5 m/s at 37.7 ms
Min: 0.0 m/s at 0.0 ms

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 7-3
Test Date: 10/1/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 12:12:43 1311



Transportation Research Center Inc.

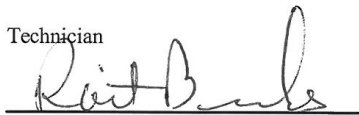
Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.72 g	Yes

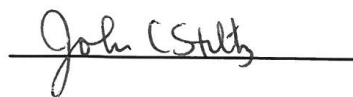
Test meets specifications.

Comments:

Technician



Approved



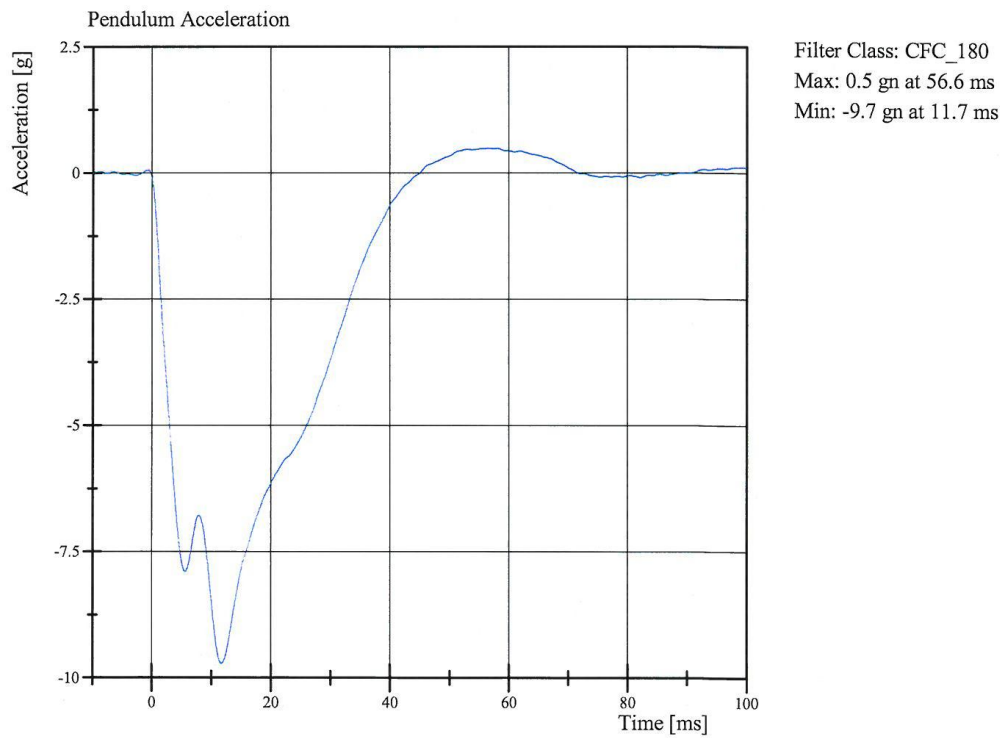
Specification Source: NHTSA final rule 8/15/2008

10.01.2012 14:07:50 564



Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012



Specification Source: NHTSA final rule 8/15/2008

10.01.2012 14:08:02 564



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.0 mm	Yes

Test meets specifications.

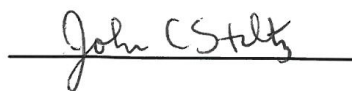
Comments:

Drop Height: 816

Technician



Approved



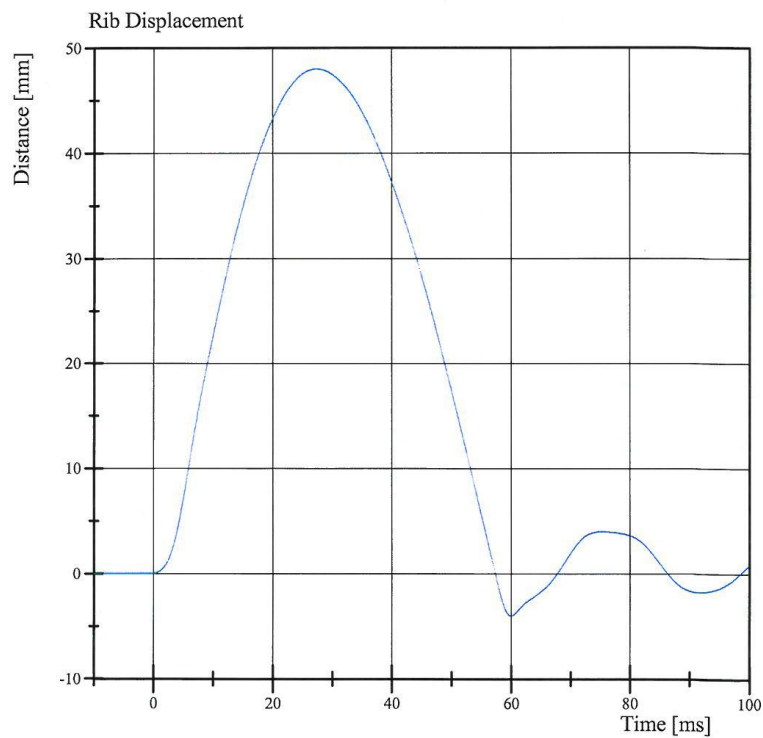
Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 10:32:19 744



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012



Filter Class: CFC_180
Max: 48.0 mm at 27.4 ms
Min: -4.0 mm at 59.9 ms

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012

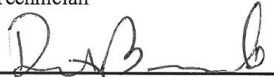
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.6 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.7 mm	Yes

Test meets specifications.

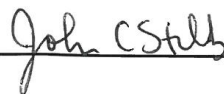
Comments:

Drop Height: 462

Technician



Approved



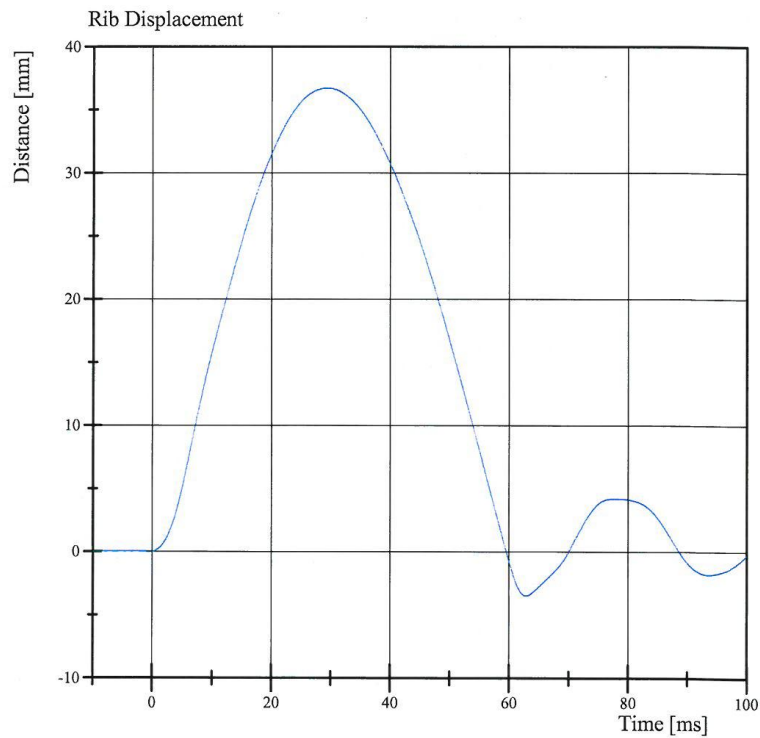
Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 10:40:44 951



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012



Filter Class: CFC_180
Max: 36.7 mm at 29.4 ms
Min: -3.5 mm at 62.8 ms

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

Test meets specifications.

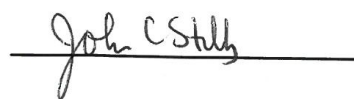
Comments:

Drop Height: 816

Technician



Approved



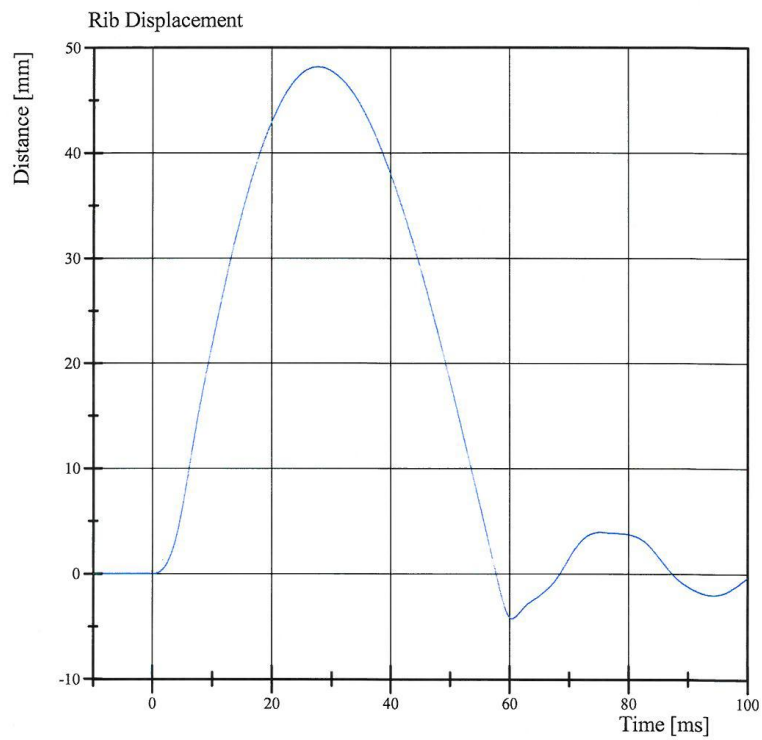
Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 10:46:18 725



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012



Filter Class: CFC_180
Max: 48.2 mm at 27.7 ms
Min: -4.3 mm at 60.4 ms

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.8 mm	Yes

Test meets specifications.

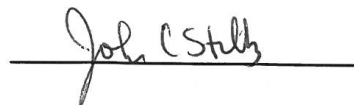
Comments:

Drop Height: 462

Technician



Approved



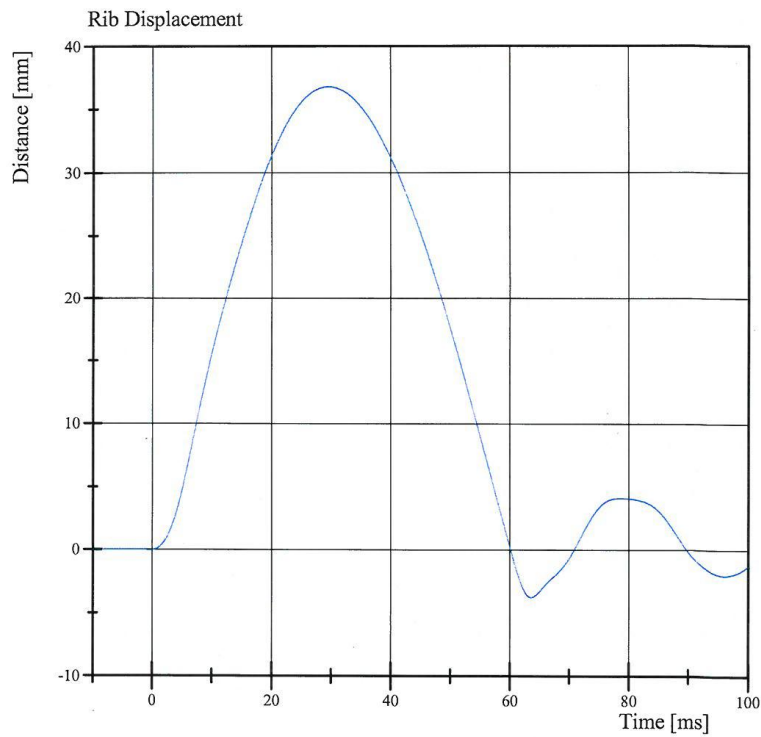
Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 10:54:08 933



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012



Filter Class: CFC_180
Max: 36.8 mm at 29.6 ms
Min: -3.7 mm at 63.5 ms

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 7-1

Test Date: 10/1/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.7 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.9 mm	Yes

Test meets specifications.

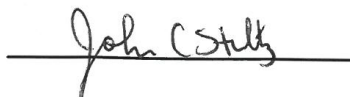
Comments:

Drop Height: 816

Technician



Approved



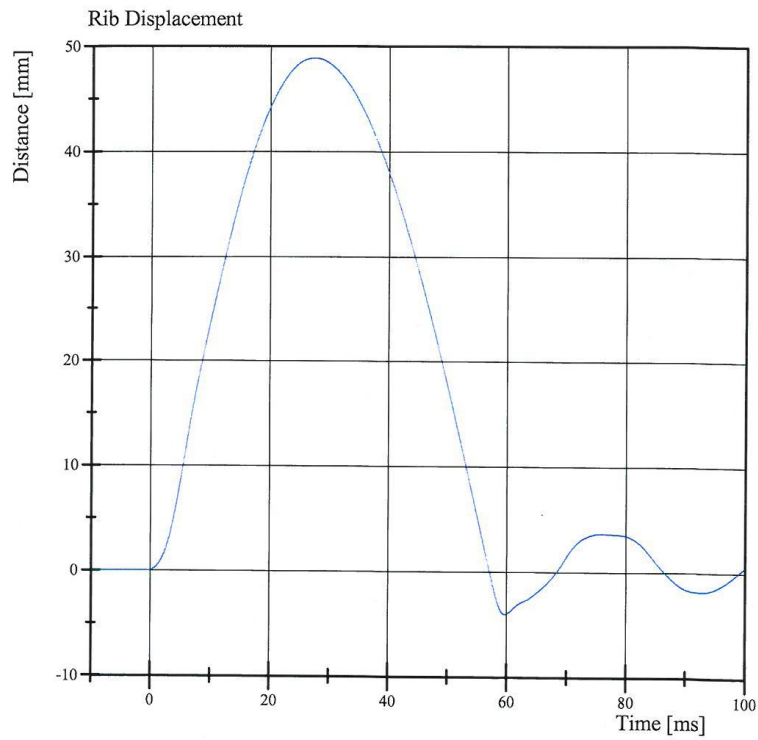
Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 11:00:48 748



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012



Filter Class: CFC_180
Max: 48.9 mm at 27.4 ms
Min: -4.0 mm at 59.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 11:01:00 748



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 7-1

Test Date: 10/1/2012

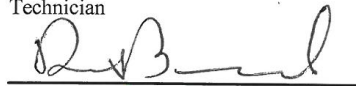
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.1 mm	Yes

Test meets specifications.

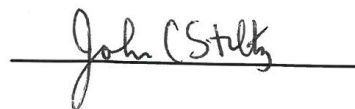
Comments:

Drop Height: 462

Technician



Approved



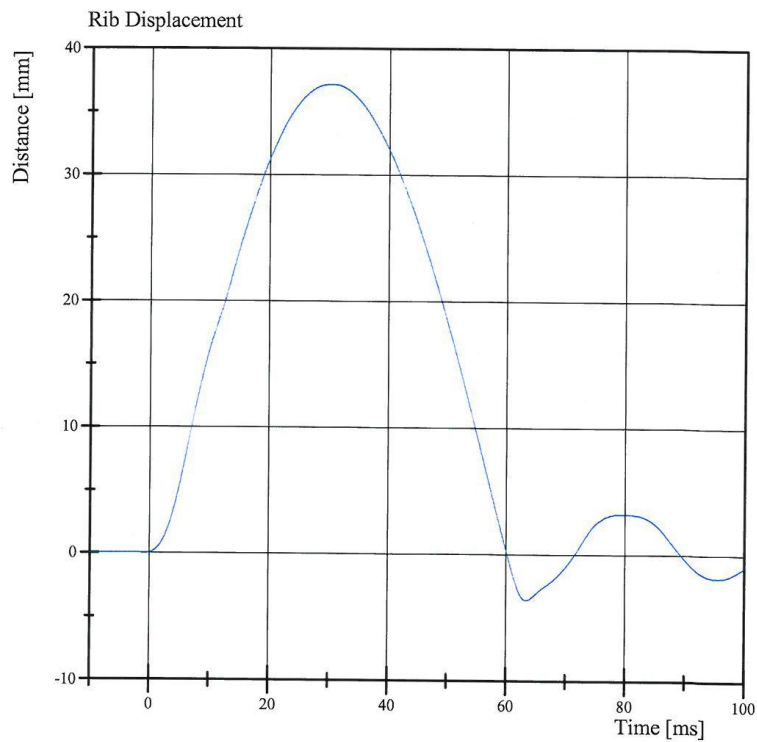
Specification Source: NHTSA Final Rule 8/15/2008

10.01.2012 11:06:57 933



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/1/2012



Filter Class: CFC_180
Max: 37.1 mm at 30.4 ms
Min: -3.6 mm at 63.4 ms

Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 7-1

Test Date: 10/2/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.469 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,473.0 N	Yes
Upper Rib Displacement	34 - 41 mm	36.7 mm	Yes
Center Rib Displacement	37 - 45 mm	40.1 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.0 mm	Yes

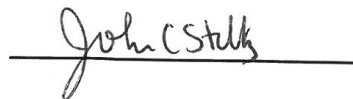
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.02.2012 09:12:03 435

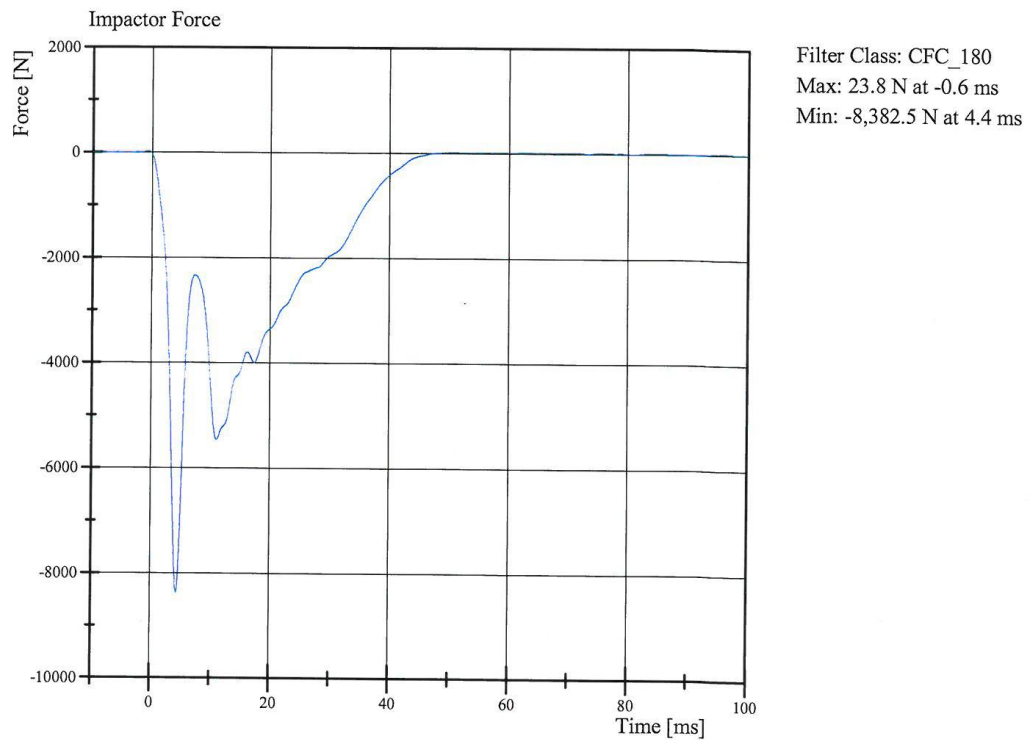


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 7-1

Test Date: 10/2/2012



Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.02.2012 09:12:11 435

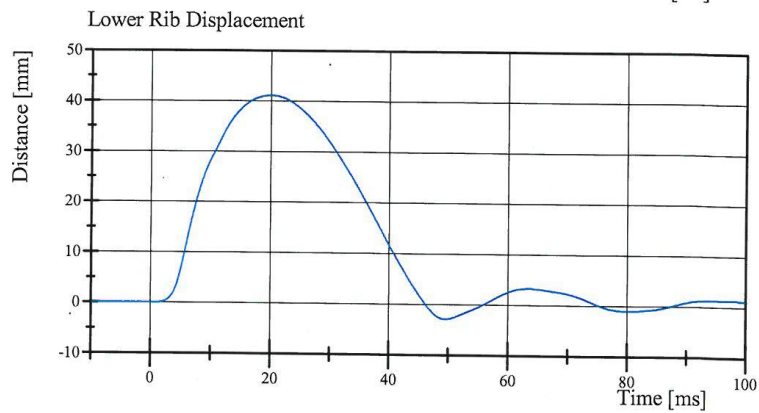
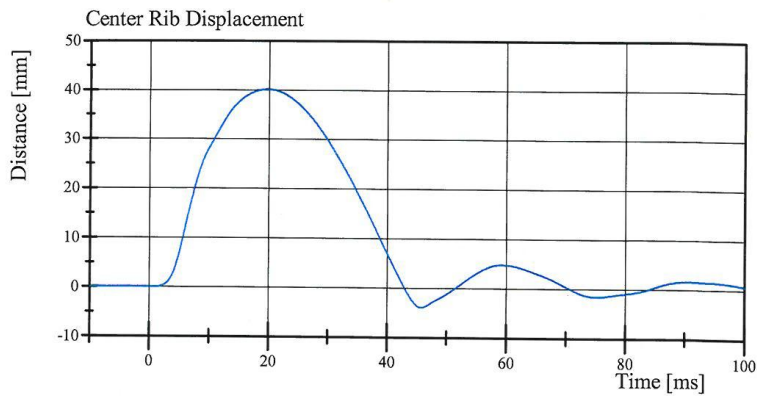
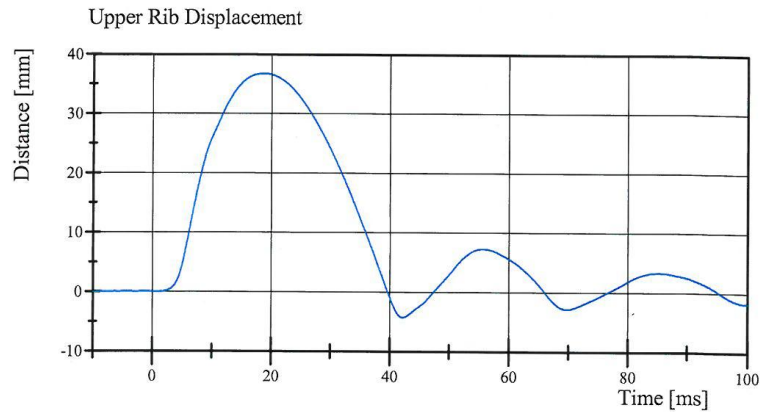


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 7-1

Test Date: 10/2/2012



Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.02.2012 09:12:11 435



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 7-1

Test Date: 10/2/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,045.9 N	Yes
Time of Peak	10.6 - 13.0 ms	11.52 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,480.7 N	Yes
Time of Peak	10.0 - 12.3 ms	10.88 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



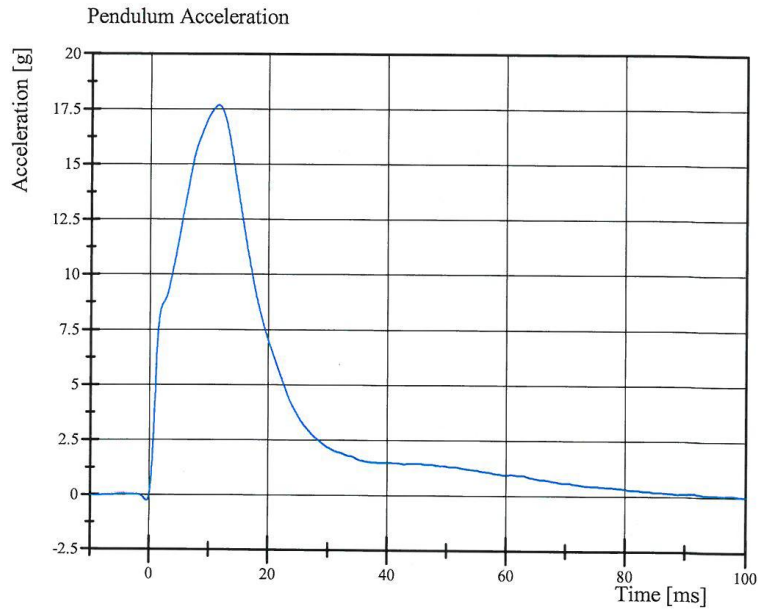
Specification Source: NHTSA Final Rule 8/15/2008

10.02.2012 09:38:59 587

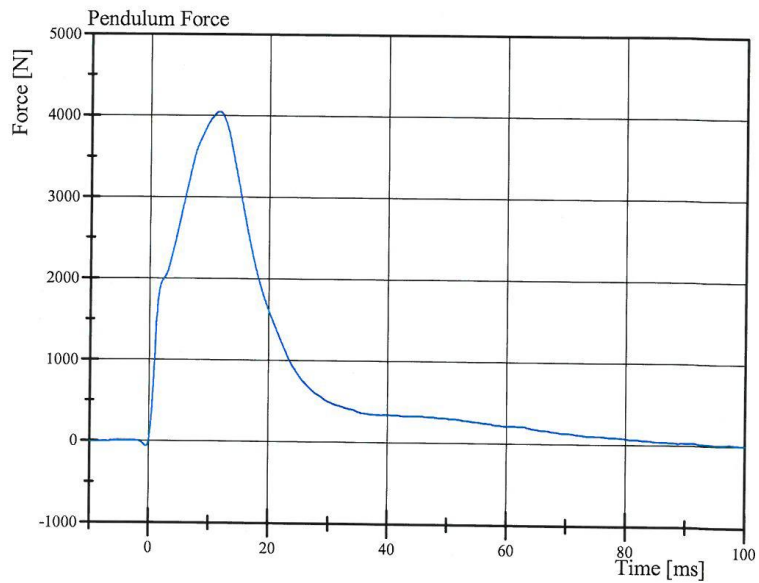


Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/2/2012



Filter Class: CFC_180
Max: 17.7 gn at 11.5 ms
Min: -0.3 gn at -0.5 ms



Filter Class: CFC_180
Max: 4,045.9 N at 11.5 ms
Min: -62.8 N at -0.5 ms

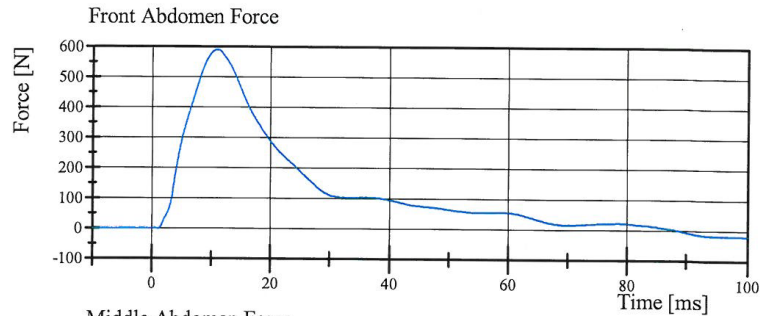
Specification Source: NHTSA Final Rule 8/15/2008

10.02.2012 09:39:06 587

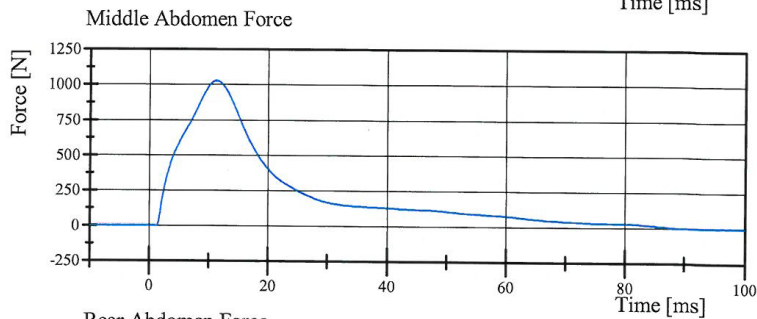


Transportation Research Center Inc.

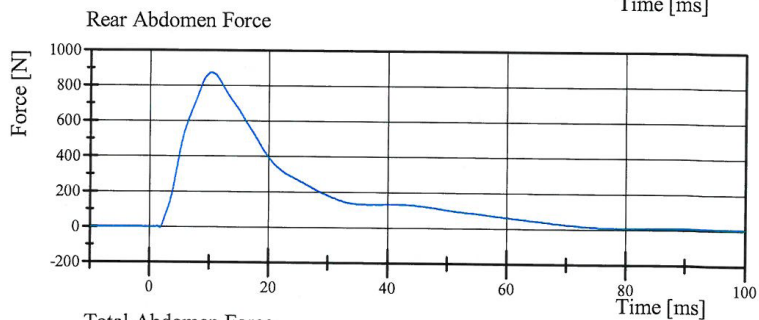
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/2/2012



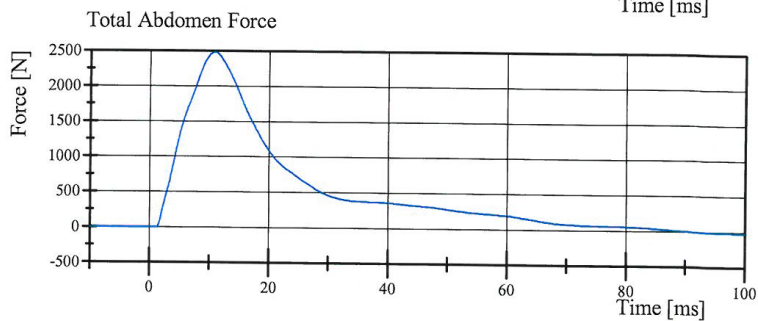
Filter Class: CFC_600
Max: 590.0 N at 10.8 ms
Min: -19.0 N at 99.1 ms



Filter Class: CFC_600
Max: 1,027.8 N at 11.2 ms
Min: -3.0 N at 98.4 ms



Filter Class: CFC_600
Max: 874.0 N at 10.2 ms
Min: -6.5 N at 1.8 ms



Filter Class: CFC_600
Max: 2,480.7 N at 10.9 ms
Min: -19.1 N at 98.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.02.2012 09:39:06 587



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 7-1

Test Date: 10/2/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	4,976.9 N	Yes
Time of Peak	11.8 - 16.1 ms	13.76 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,305.4 N	Yes
Time of Peak	12.2 - 17.0 ms	14.00 ms	Yes

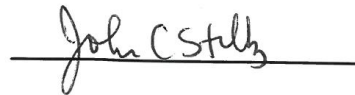
Test meets specifications.

Comments:

Technician



Approved



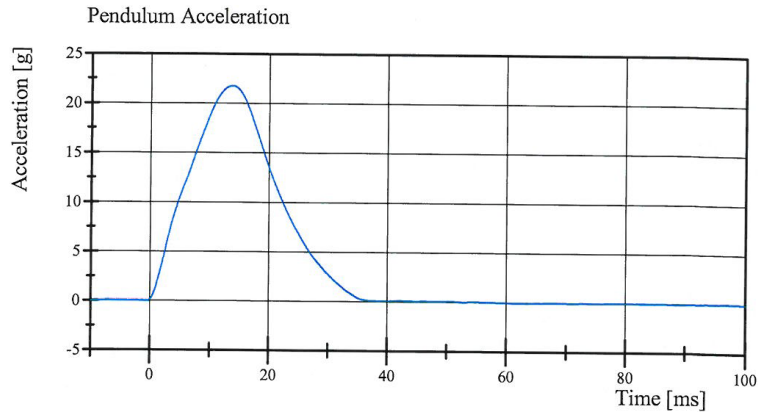
Specification Source: NHTSA Final Rule 8/15/2008

10.02.2012 10:49:34 545

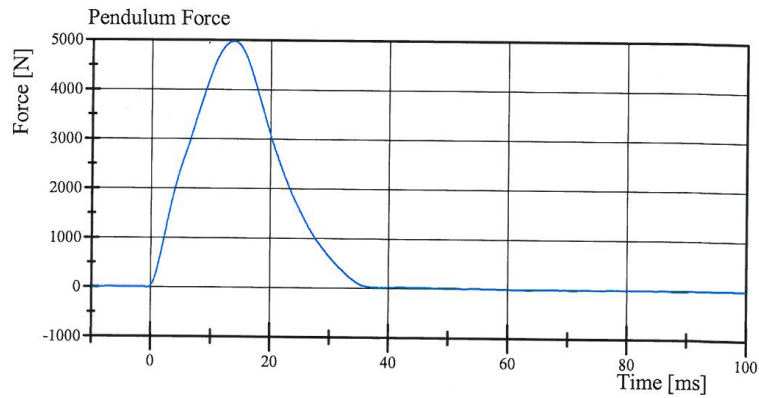


Transportation Research Center Inc.

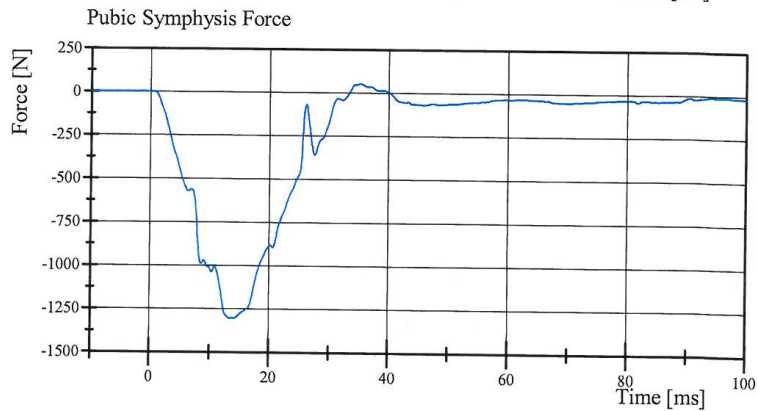
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 7-1
Test Date: 10/2/2012



Filter Class: CFC_180
Max: 21.7 gn at 13.8 ms
Min: -0.1 gn at 89.4 ms



Filter Class: CFC_180
Max: 4,976.9 N at 13.8 ms
Min: -20.5 N at 89.4 ms



Filter Class: CFC_600
Max: 52.1 N at 35.1 ms
Min: -1,305.4 N at 14.0 ms

Driver S/N F030

Post-Test Calibration Sheets

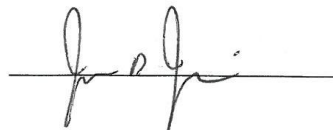
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 08
Date: 10/09/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	447	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	472	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	268	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	604	Yes

Technician



Approved




Baseline 10/07/05

Transportation Research Center Inc.

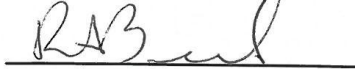
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Peak Resultant Acceleration	125 - 155 g	154.6 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.2 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

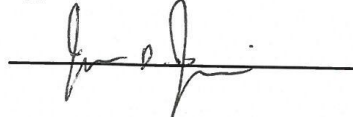
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:45:55 353

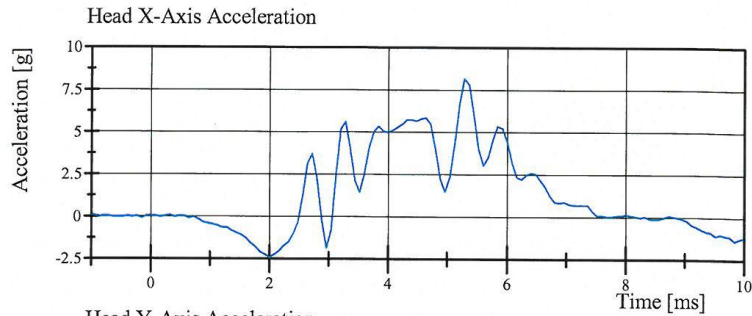


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 8-1

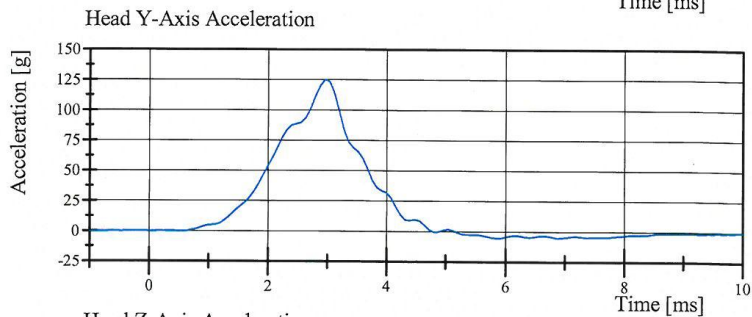
Test Date: 10/9/2012



Filter Class: CFC_1000

Max: 8.2 gn at 5.3 ms

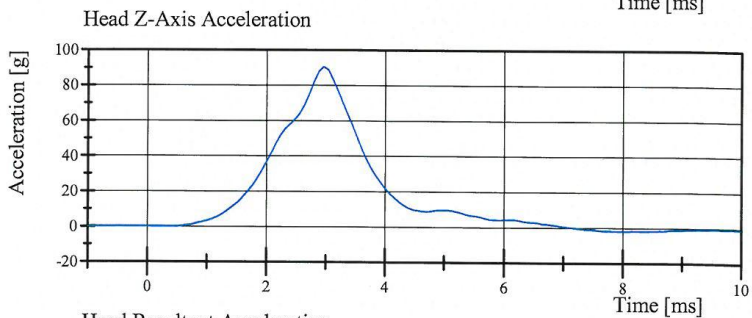
Min: -2.4 gn at 2.0 ms



Filter Class: CFC_1000

Max: 125.3 gn at 3.0 ms

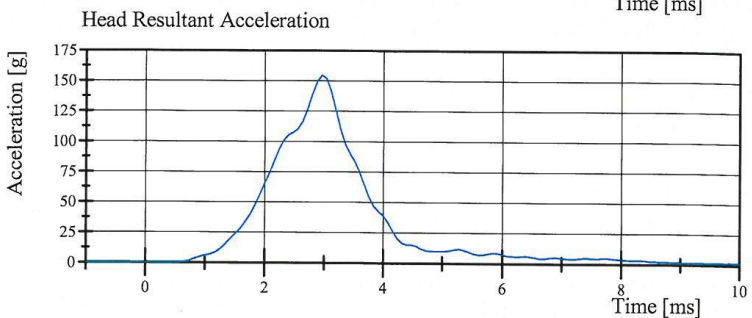
Min: -5.2 gn at 5.8 ms



Filter Class: CFC_1000

Max: 90.6 gn at 3.0 ms

Min: -2.0 gn at 8.1 ms



Filter Class: CFC_1000

Max: 154.6 gn at 3.0 ms

Min: 0.0 gn at -0.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:46:02 353



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 8-1

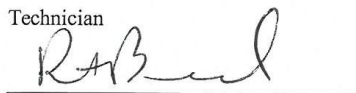
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-54.1 deg	Yes
Time of Peak	54 - 66 ms	58.5 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	66.2 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 08:43:47 1312

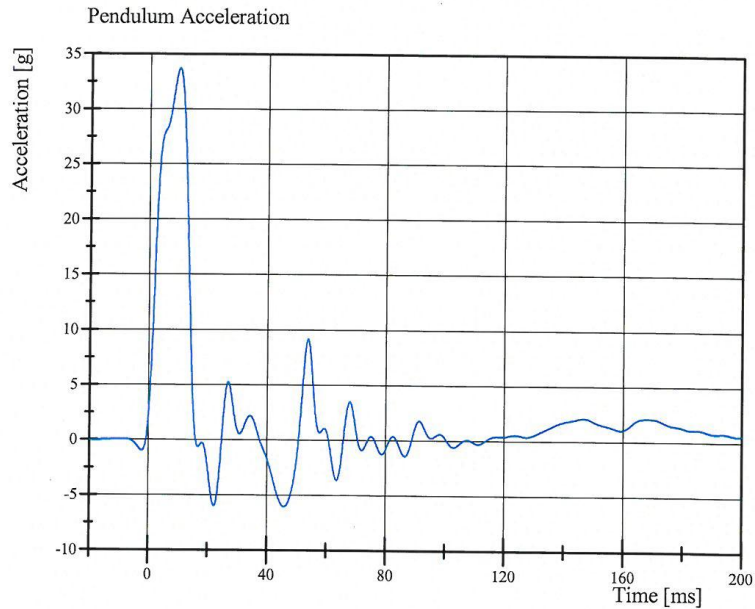


Transportation Research Center Inc.

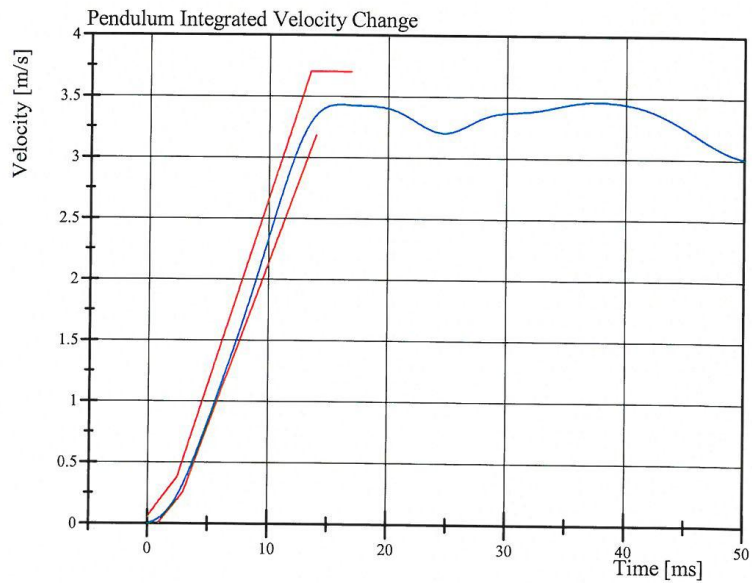
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012



Filter Class: CFC_60
Max: 33.7 gn at 10.0 ms
Min: -6.0 gn at 45.8 ms



Filter Class: CFC_60
Max: 3.5 m/s at 37.5 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 08:43:54 1312

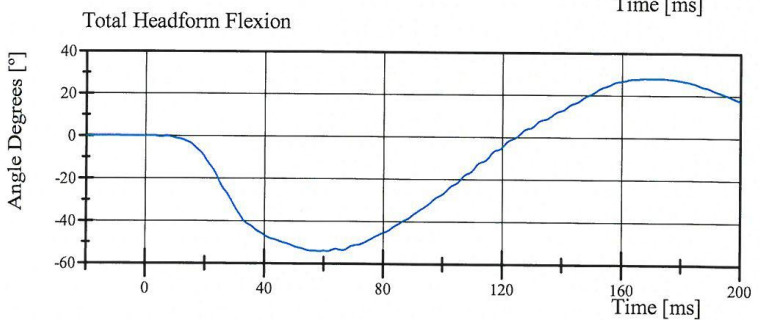
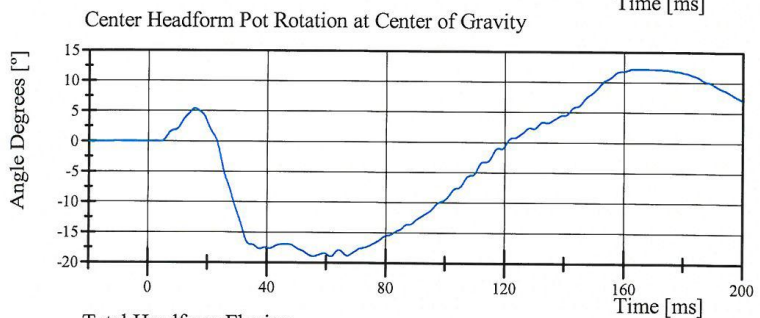
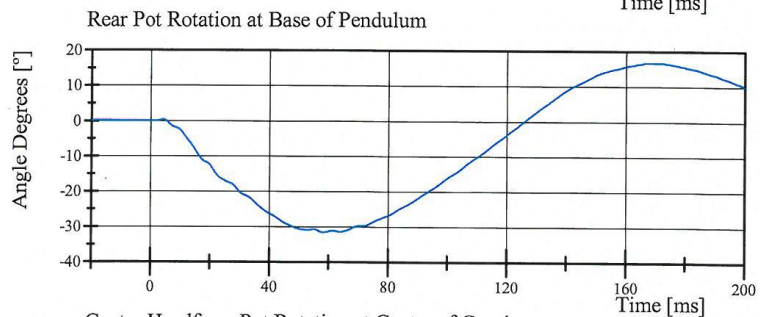
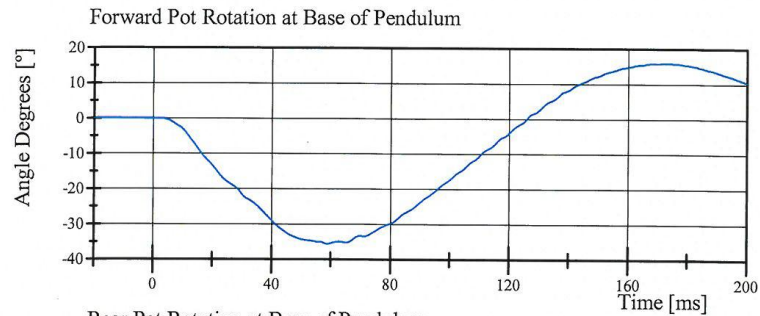


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 08:43:55 1312



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.67 g	Yes

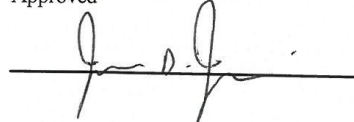
Test meets specifications.

Comments:

Technician



Approved



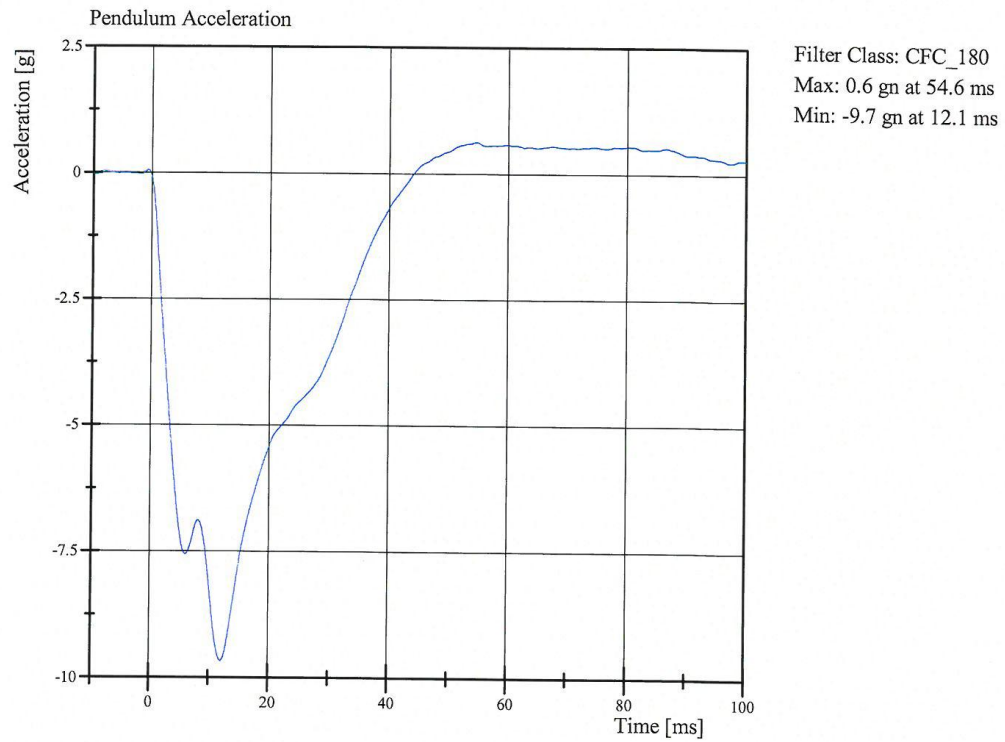
Specification Source: NHTSA final rule 8/15/2008

10.09.2012 15:03:27 563



Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Specification Source: NHTSA final rule 8/15/2008

10.09.2012 15:03:34 563



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.4 mm	Yes

Test meets specifications.

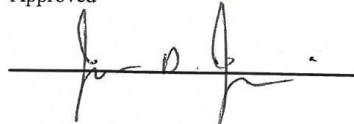
Comments:

Drop Height: 816

Technician



Approved



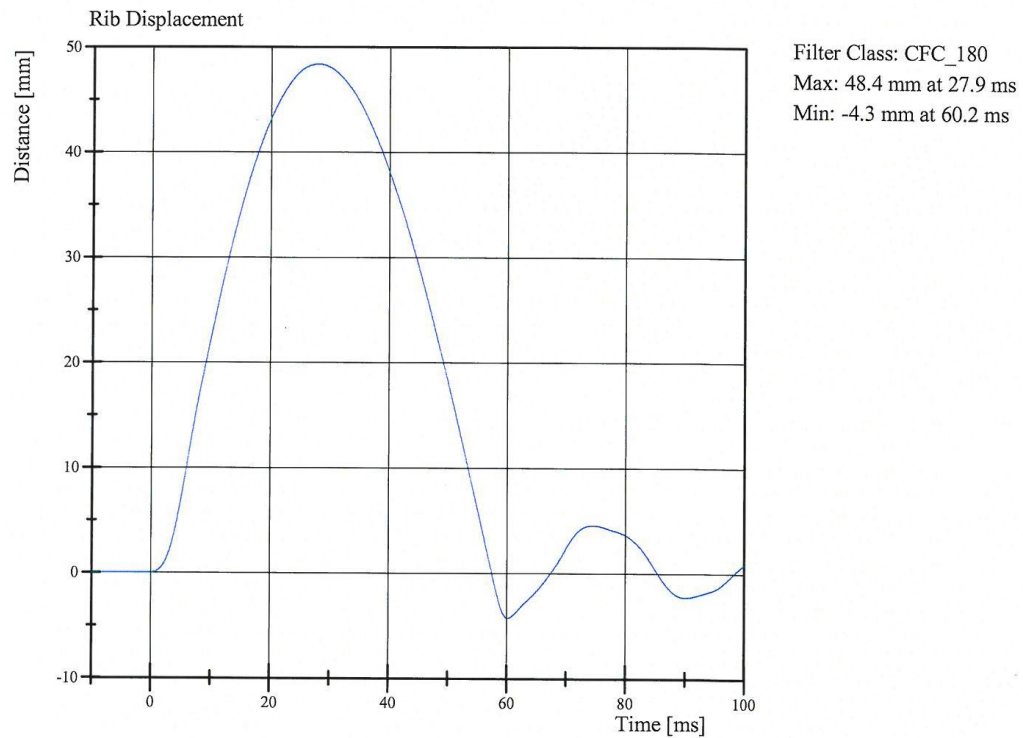
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:53:15 724



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:53:24 724



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.2 mm	Yes

Test meets specifications.

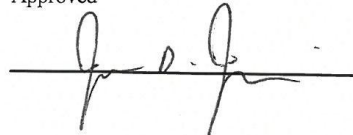
Comments:

Drop Height: 462

Technician



Approved



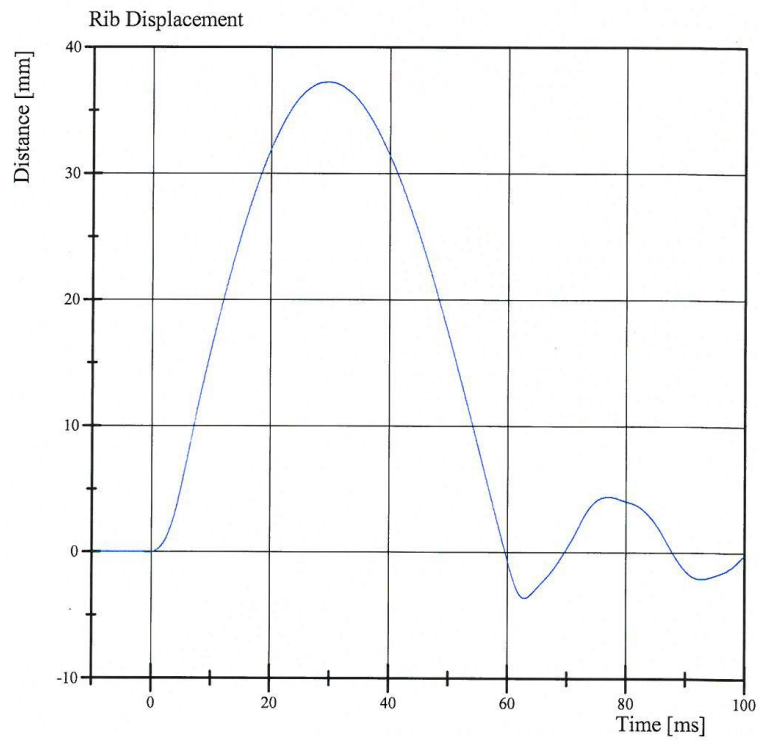
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:59:44 932



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 37.2 mm at 29.6 ms
Min: -3.6 mm at 62.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:59:52 932



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

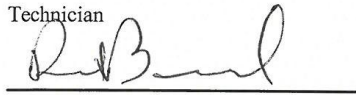
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.1 mm	Yes

Test meets specifications.

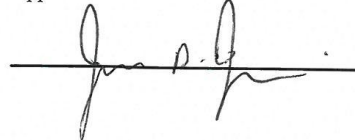
Comments:

Drop Height: 816

Technician



Approved



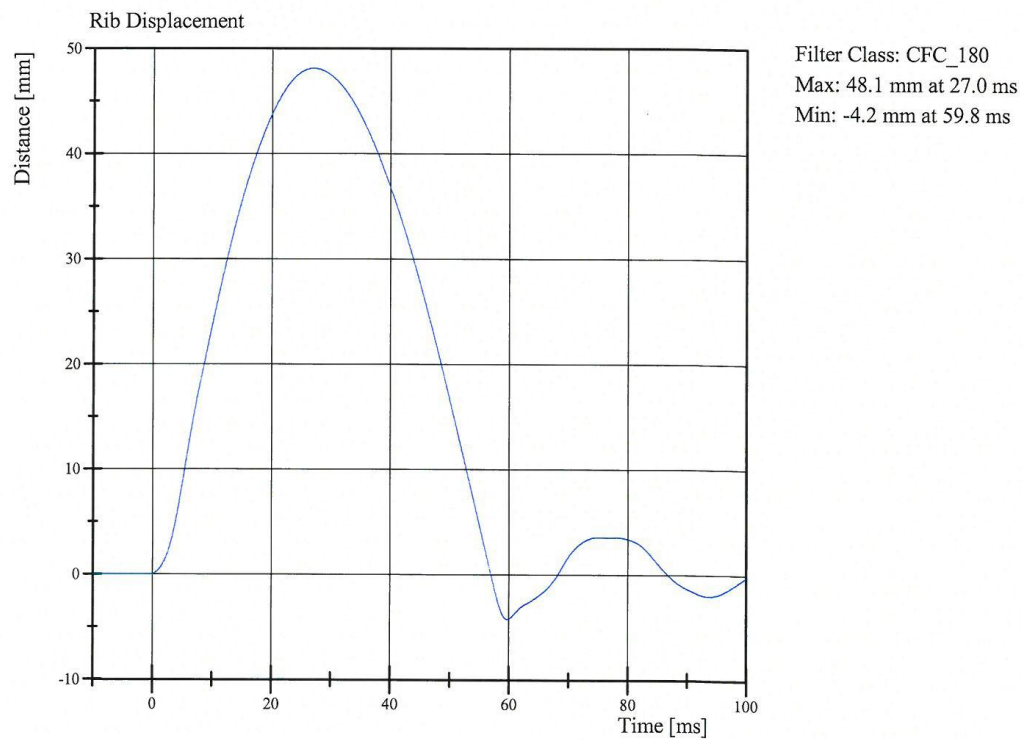
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:04:23 732



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:04:31 732



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.8 mm	Yes

Test meets specifications.

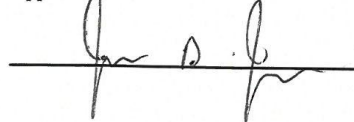
Comments:

Drop Height: 462

Technician



Approved



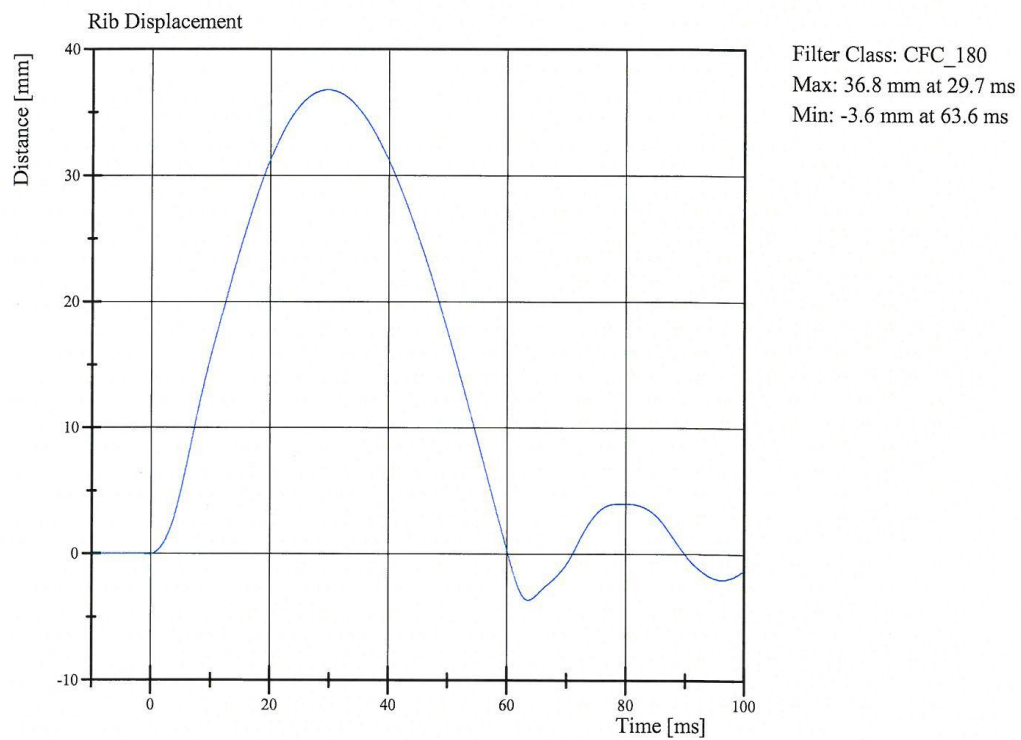
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:11:01 929



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:11:10 929



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



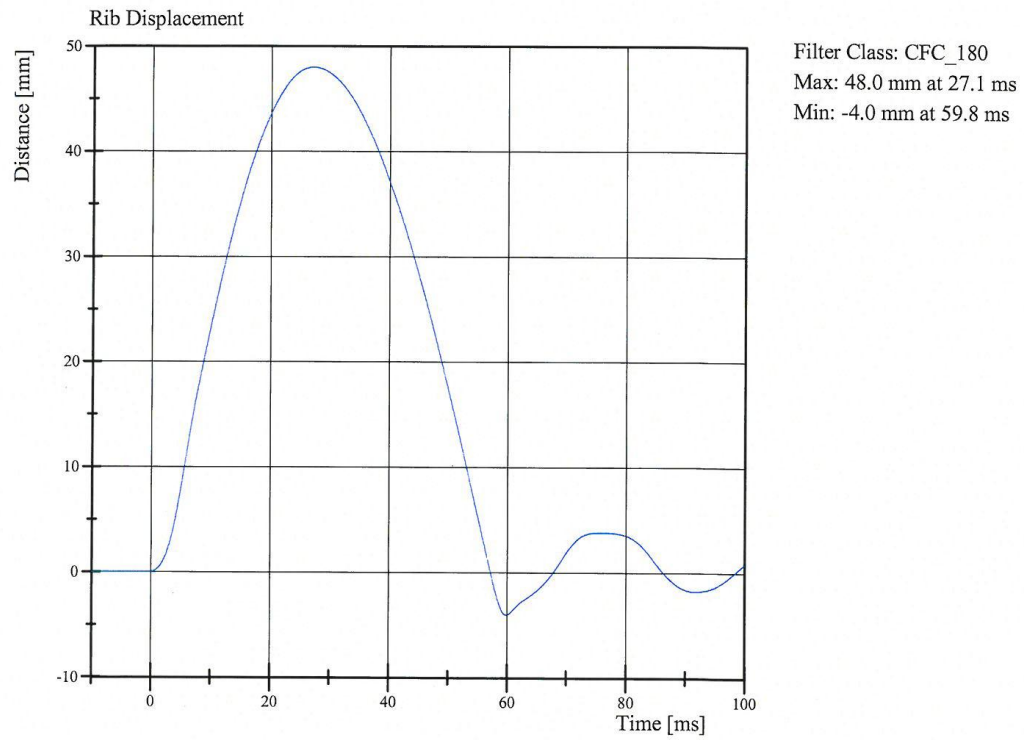
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:15:19 737



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:15:26 737



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.9 mm	Yes

Test meets specifications.

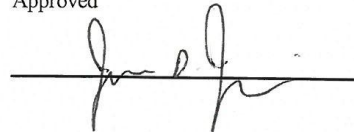
Comments:

Drop Height: 462

Technician



Approved



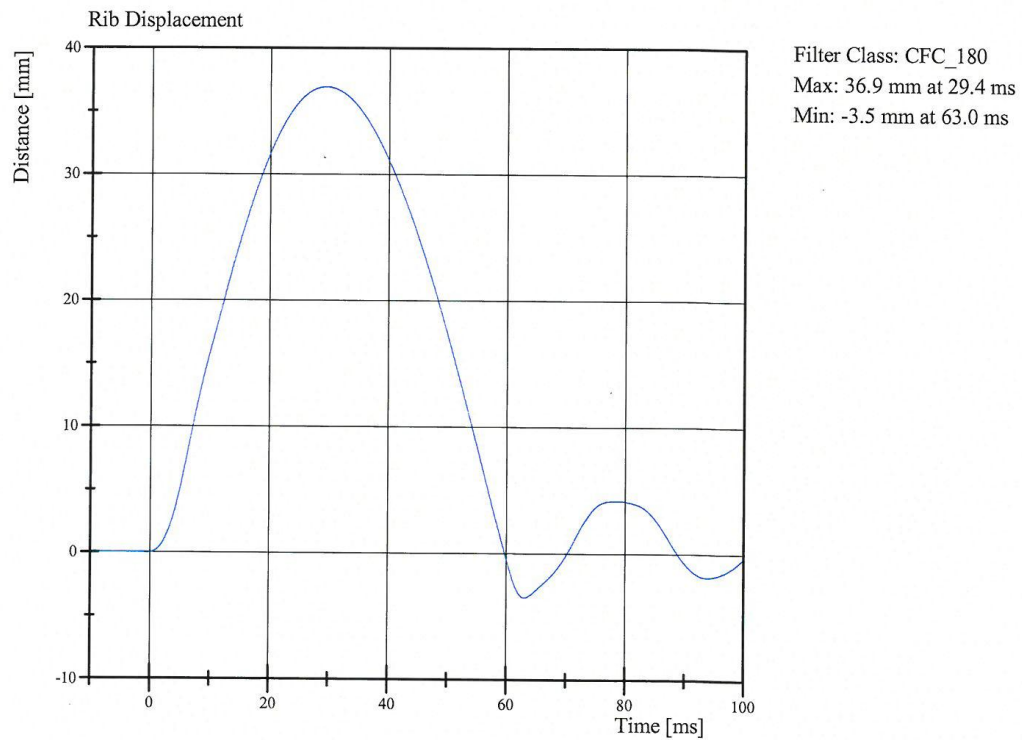
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:20:51 923



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:21:02 923



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.479 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,467.5 N	Yes
Upper Rib Displacement	34 - 41 mm	37.1 mm	Yes
Center Rib Displacement	37 - 45 mm	40.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.8 mm	Yes

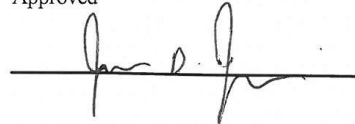
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.09.2012 15:10:21 443

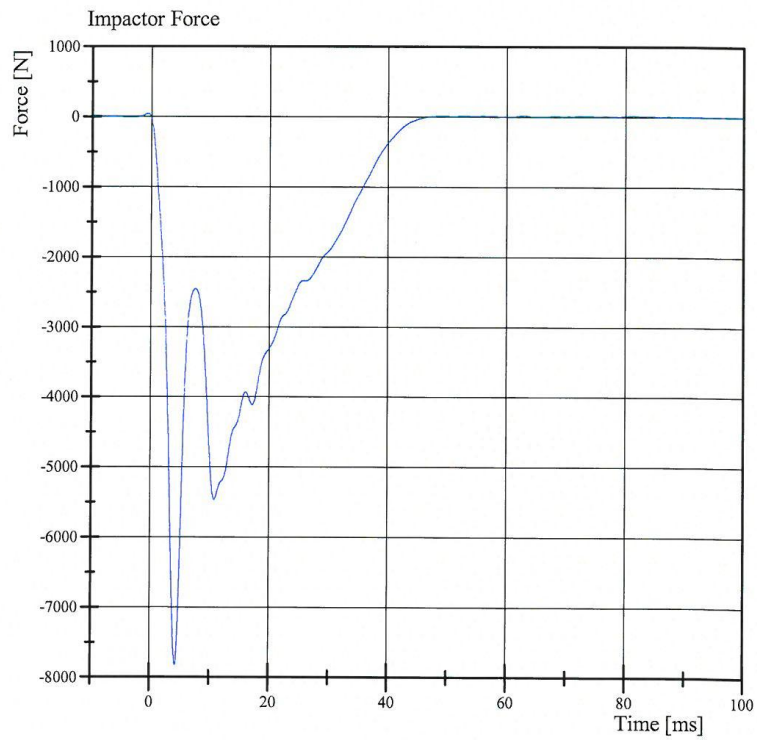


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012



Filter Class: CFC_180

Max: 37.4 N at -0.6 ms

Min: -7,828.7 N at 4.3 ms

Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.09.2012 15:10:28 443



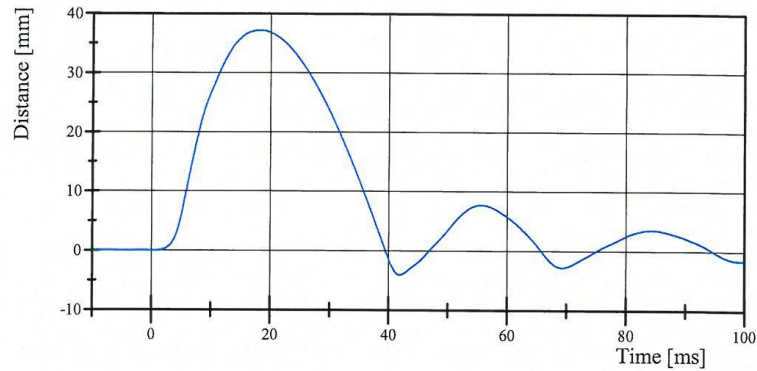
Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 8-1

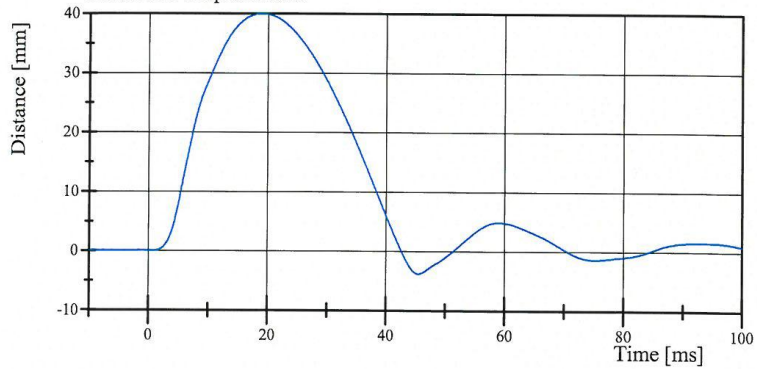
Test Date: 10/9/2012

Upper Rib Displacement



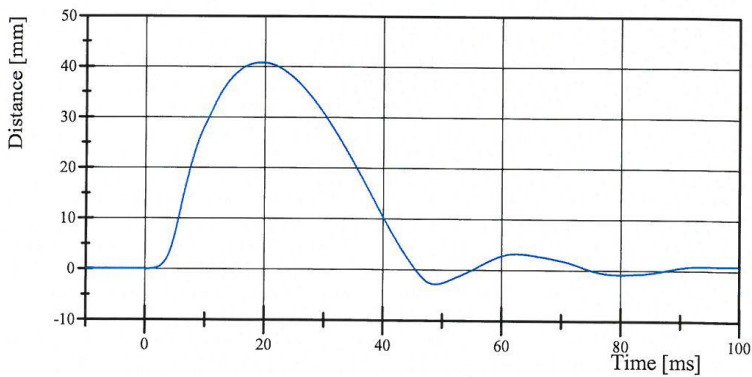
Filter Class: CFC_180
Max: 37.1 mm at 18.2 ms
Min: -4.0 mm at 41.9 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 40.0 mm at 19.0 ms
Min: -3.8 mm at 45.5 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.8 mm at 19.5 ms
Min: -2.8 mm at 48.9 ms

Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.09.2012 15:10:29 443



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,022.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.28 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,575.6 N	Yes
Time of Peak	10.0 - 12.3 ms	10.16 ms	Yes

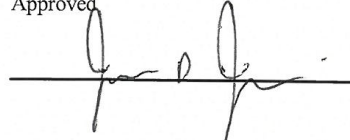
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:19:14 616

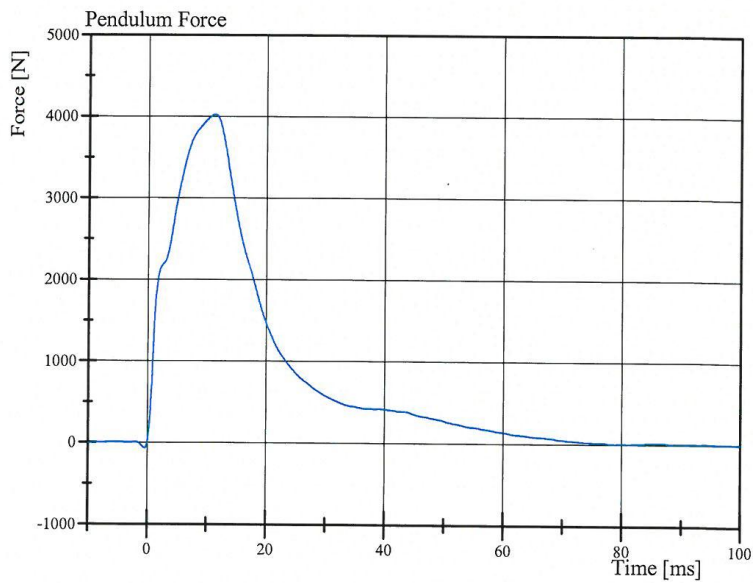
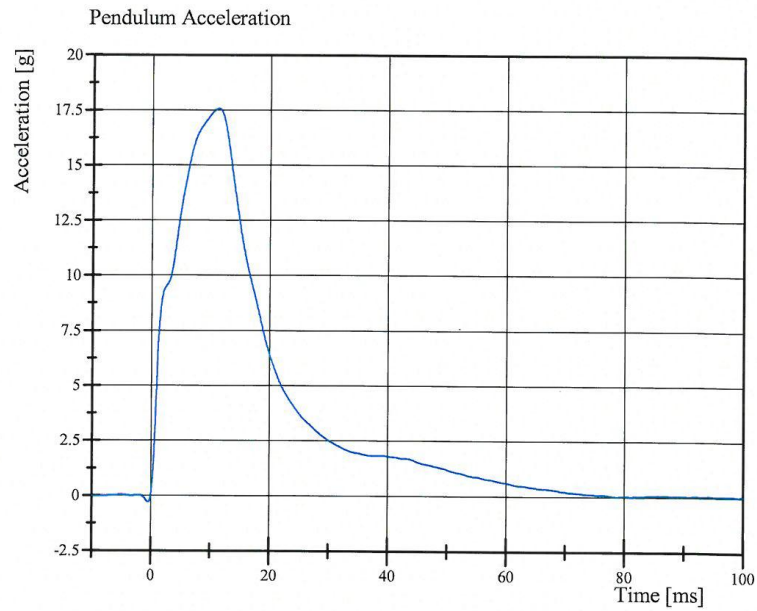


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:19:21 616

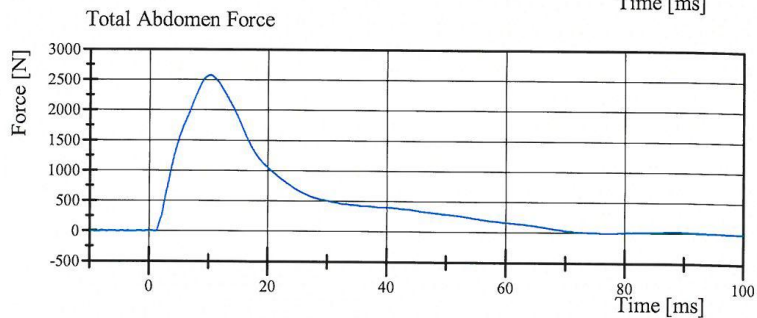
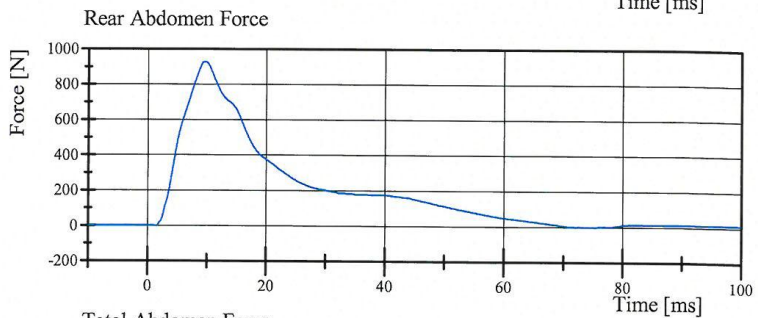
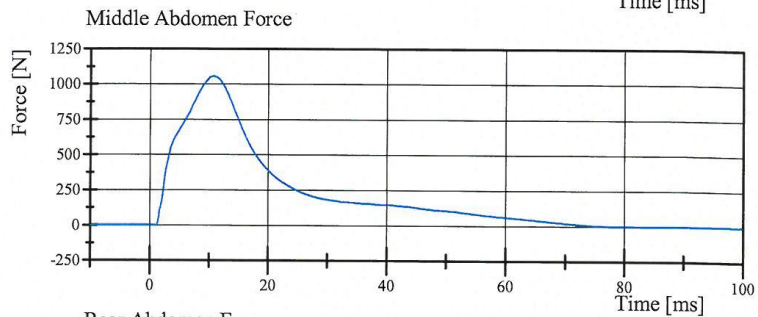
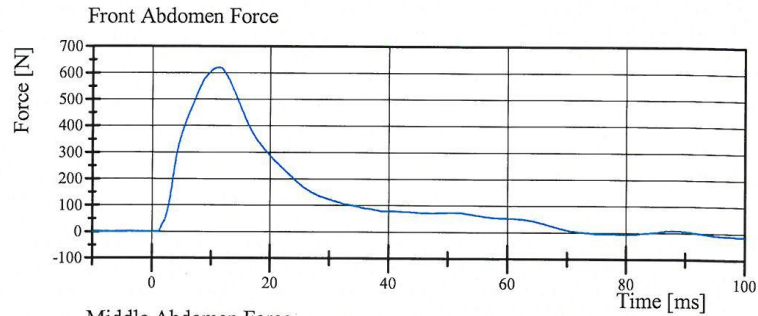


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:19:22 616



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 8-1

Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.22 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	4,875.7 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,317.9 N	Yes
Time of Peak	12.2 - 17.0 ms	13.36 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:35:19 561

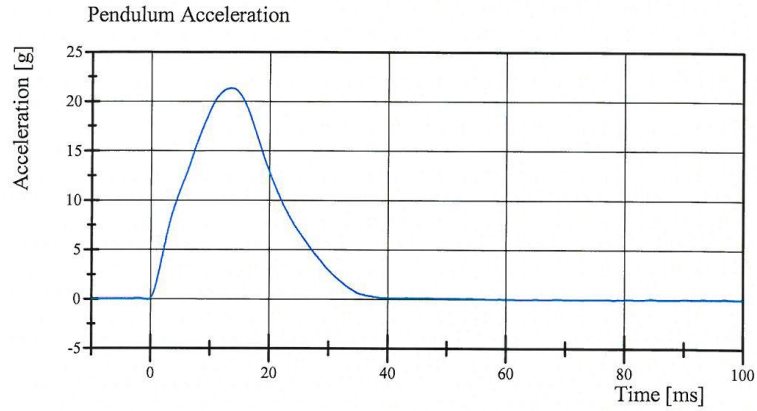


Transportation Research Center Inc.

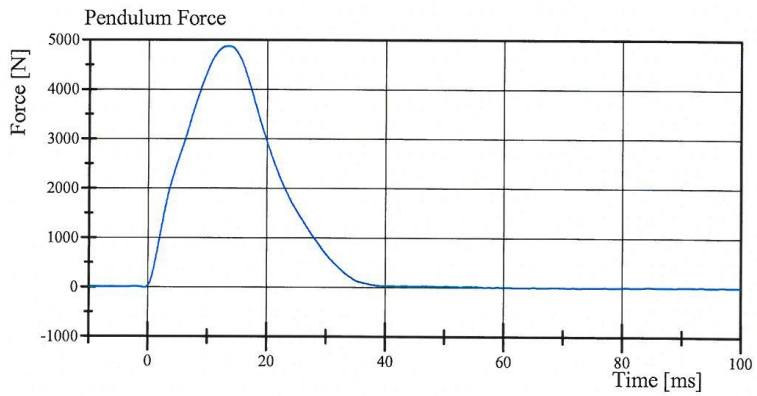
Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 8-1

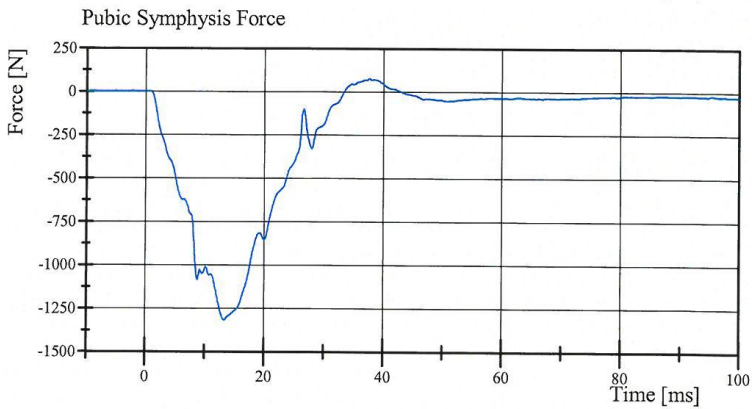
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 21.3 gn at 13.5 ms
Min: -0.1 gn at -0.6 ms



Filter Class: CFC_180
Max: 4,875.7 N at 13.5 ms
Min: -12.3 N at -0.6 ms



Filter Class: CFC_600
Max: 76.9 N at 37.6 ms
Min: -1,317.9 N at 13.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:35:26 561

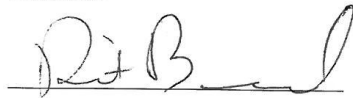


Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.012

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	103	Yes
F	Thigh Clearance	119.0 - 135.0	134	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	535	Yes
L	Popliteal Height	343.0 - 369.0	354	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	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	313	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	865	Yes
Z	Waist Circumference	761.0 - 791.0	779	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.7 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	121.6 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	4.3 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

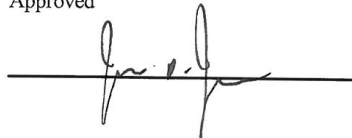
Test meets specifications.

Comments:

Technician



Approved



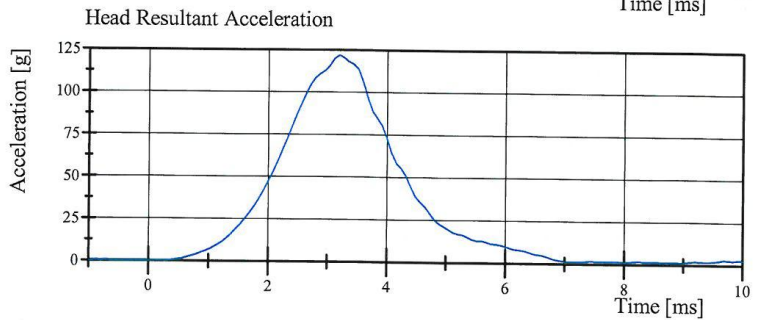
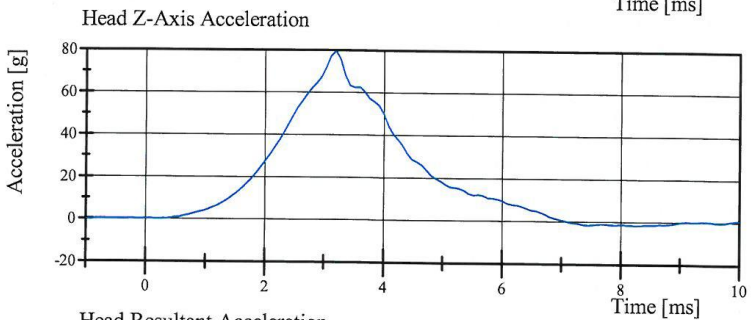
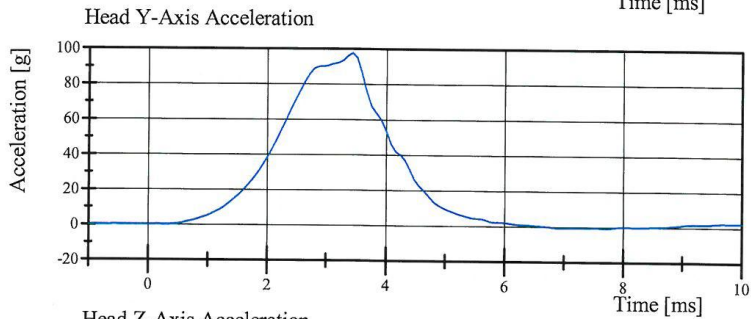
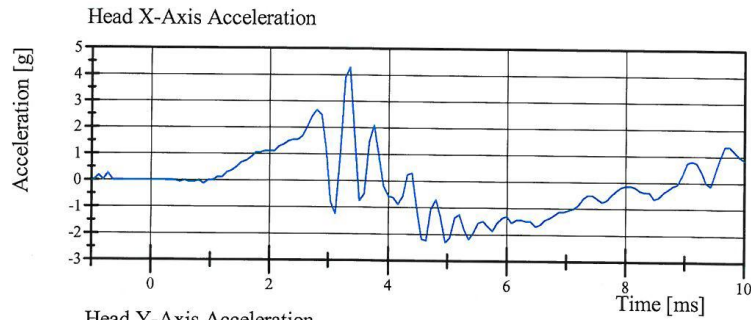
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 10:28:35 228



Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



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

09.27.2012 10:28:42 228



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 12-1

Test Date: 9/27/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.606 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.494 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.684 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.944 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.801 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.821 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-77.3 deg	Yes
Time of Peak	50 - 70 ms	64.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.9 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	120.2 ms	Yes

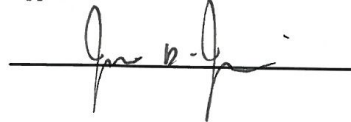
Test meets specifications.

Comments:

Technician



Approved



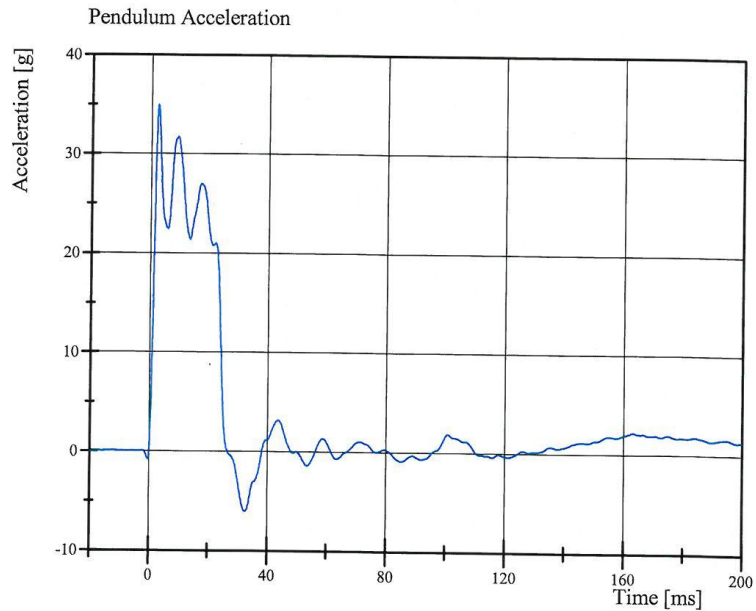
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 13:09:30 635

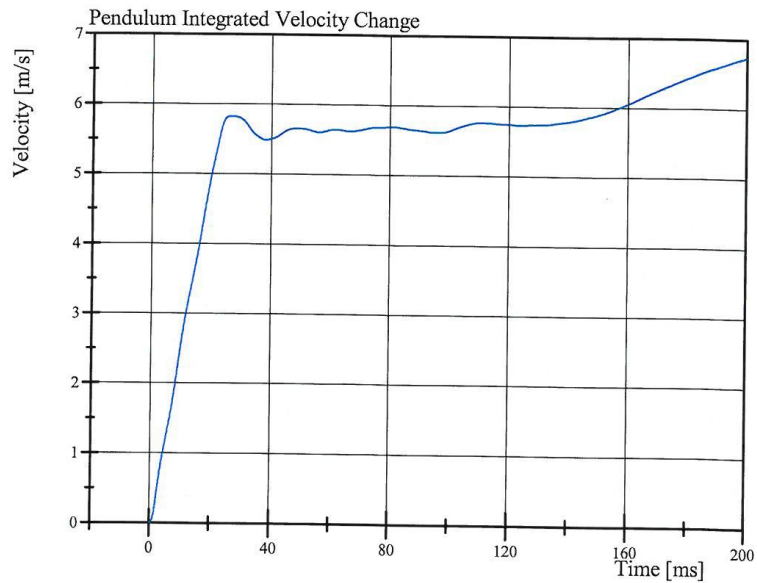


Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



Filter Class: CFC_180
Max: 34.9 gn at 2.4 ms
Min: -6.0 gn at 32.6 ms



Filter Class: CFC_180
Max: 6.7 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.

09.27.2012 13:09:37 635

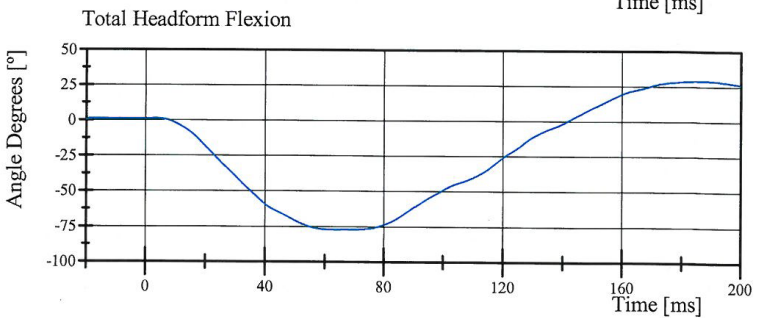
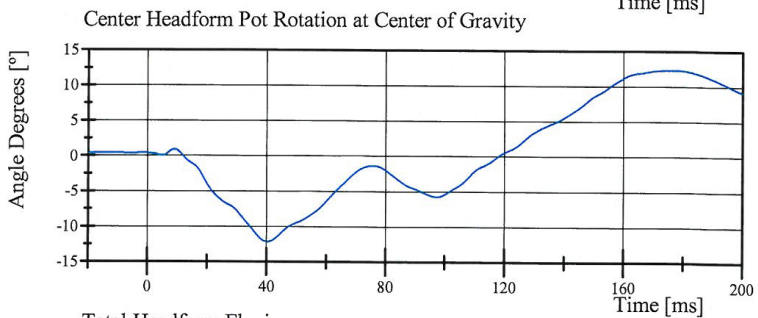
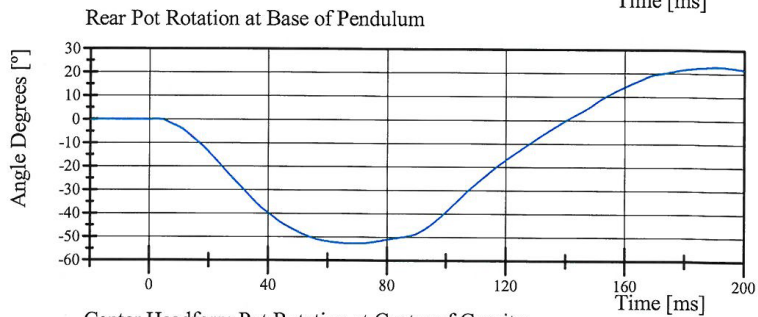
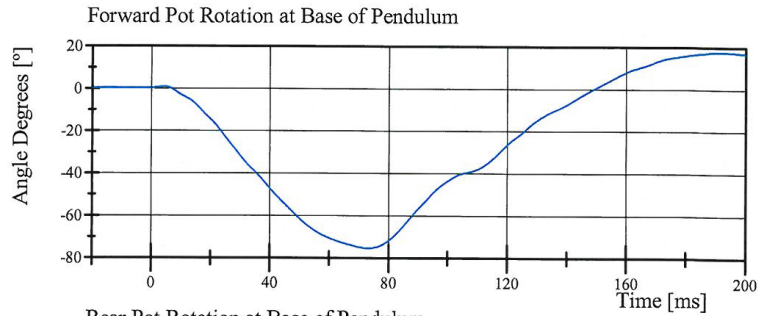


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 12-1

Test Date: 9/27/2012



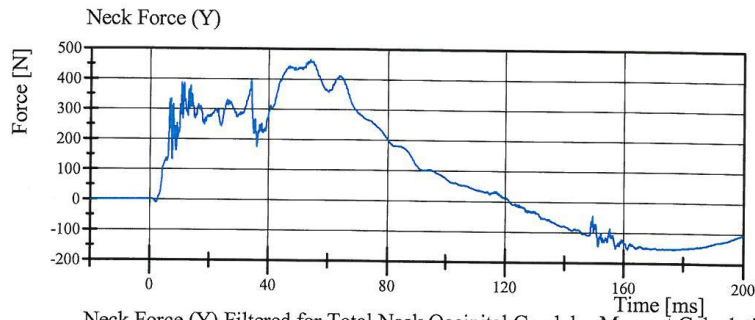
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 13:09:38 635

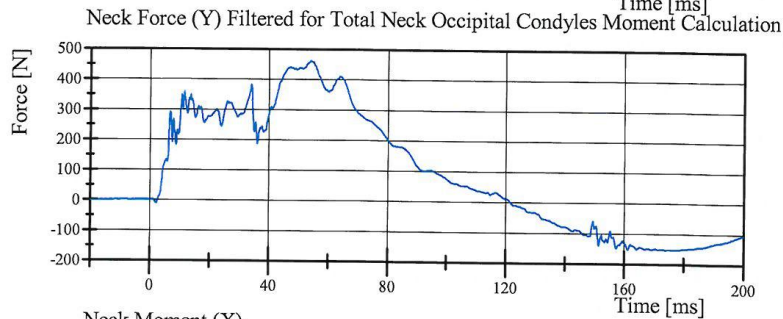


Transportation Research Center Inc.

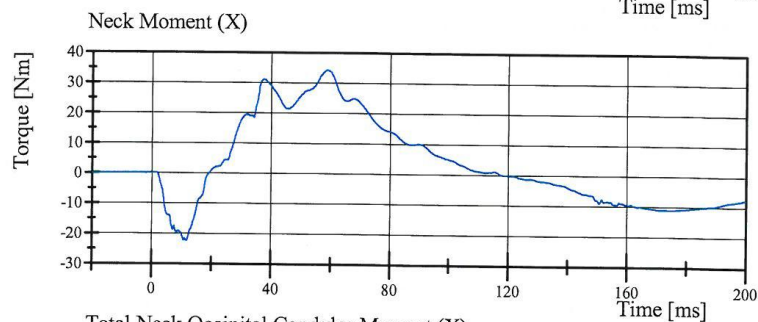
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



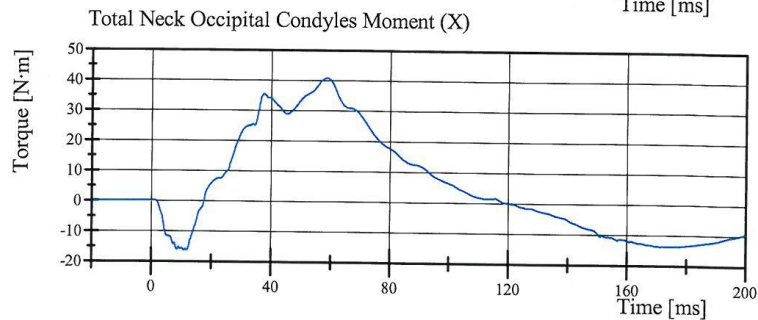
Filter Class: CFC_1000
Max: 464.2 N at 54.1 ms
Min: -154.8 N at 161.4 ms



Filter Class: CFC_600
Max: 462.0 N at 54.1 ms
Min: -154.1 N at 173.7 ms



Filter Class: CFC_600
Max: 34.3 Nm at 58.8 ms
Min: -22.5 Nm at 11.5 ms



Filter Class: Without_(Consta
Max: 40.9 N·m at 58.7 ms
Min: -16.5 N·m at 11.0 ms

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

09.27.2012 13:09:39 635



Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.0 g	Yes
Shoulder Displacement	28 - 37 mm	31.0 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.8 g	Yes

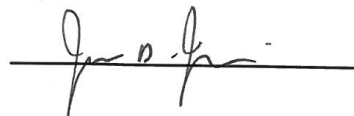
Test meets specifications.

Comments:

Technician



Approved



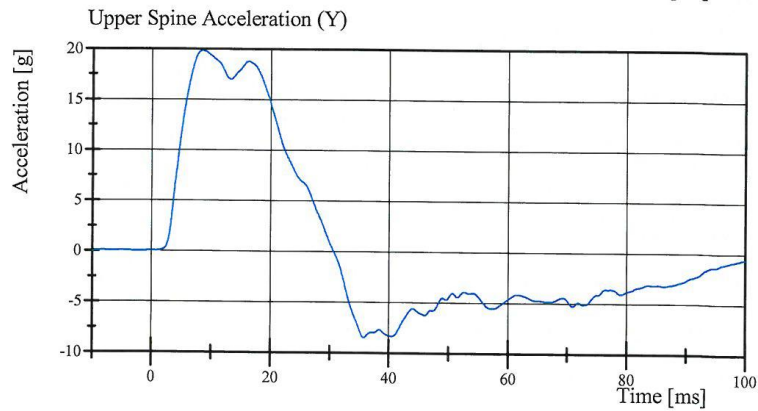
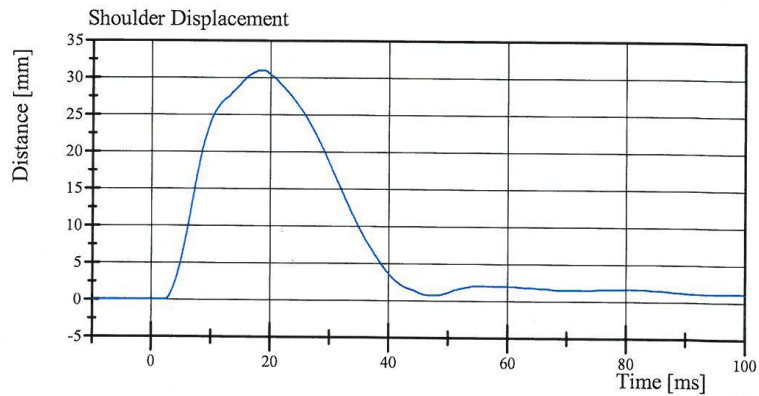
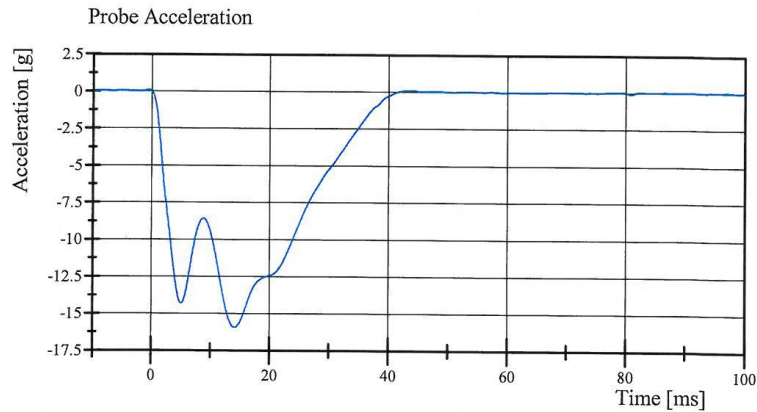
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 11:01:42 826



Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



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

09.27.2012 11:01:49 826



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.4 °C	No
Relative Humidity	10 - 70 %	66 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.796 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.4 g	Yes
Shoulder Displacement	31 - 40 mm	34.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.9 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.4 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.6 g	Yes

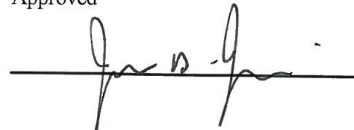
Test does not meet specifications.

Comments:

Technician



Approved



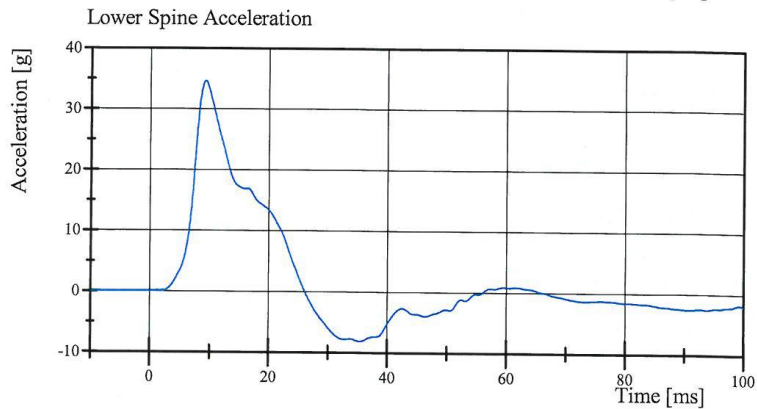
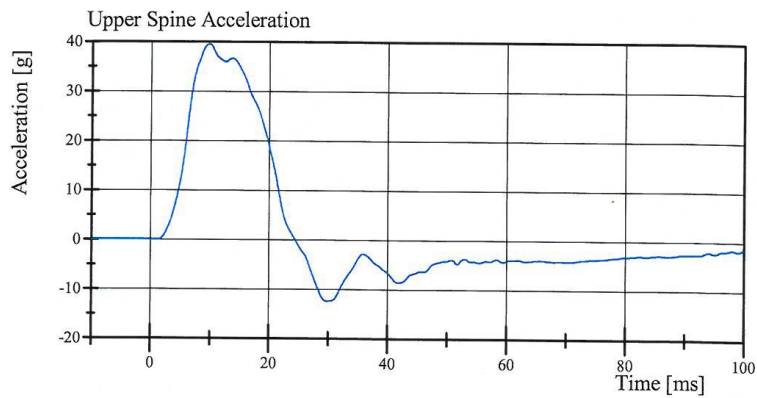
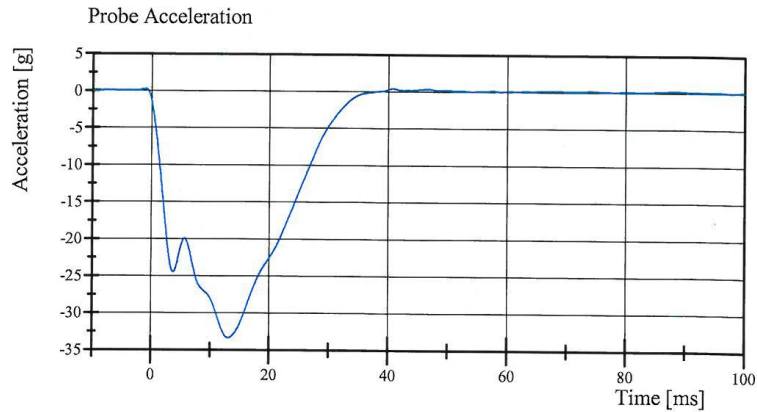
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 11:37:08 613



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



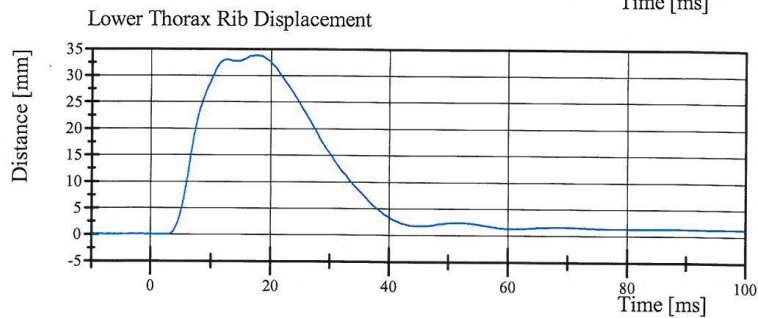
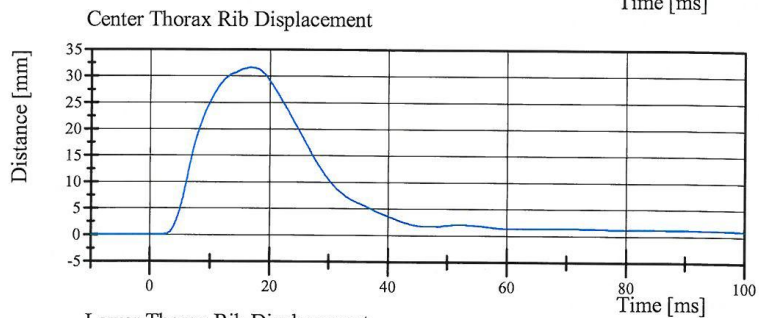
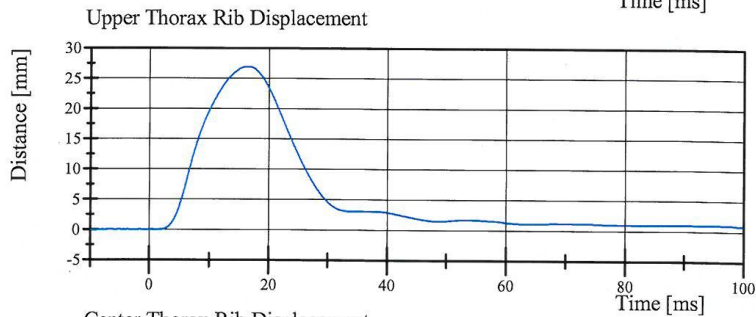
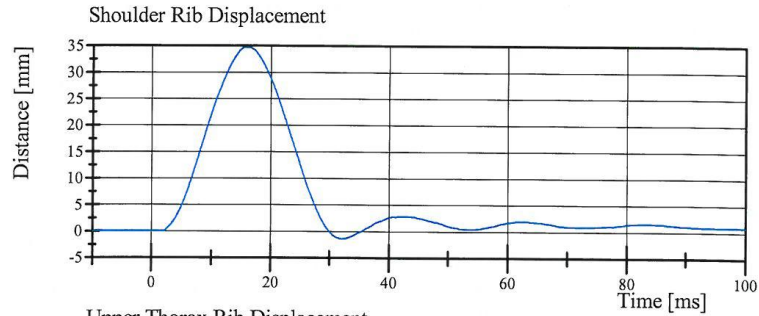
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 11:37:18 613



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID II_s Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



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

09.27.2012 11:37:19 613



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.384 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.7 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.2 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.2 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.3 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.1 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.4 g	Yes

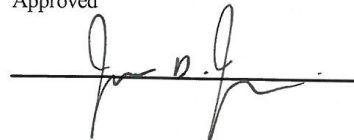
Test meets specifications.

Comments:

Technician



Approved



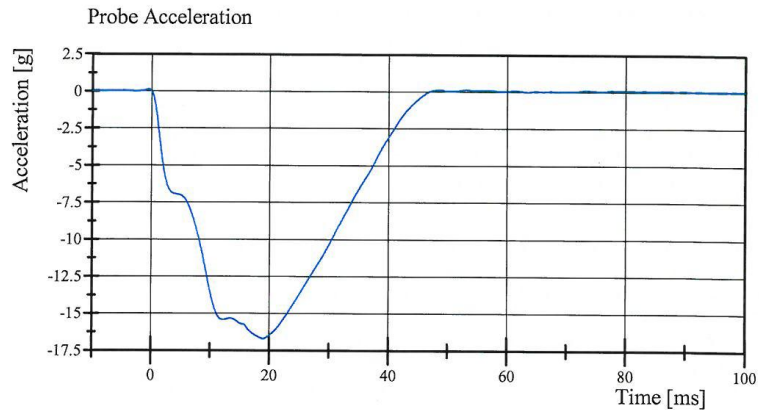
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 12:22:02 810

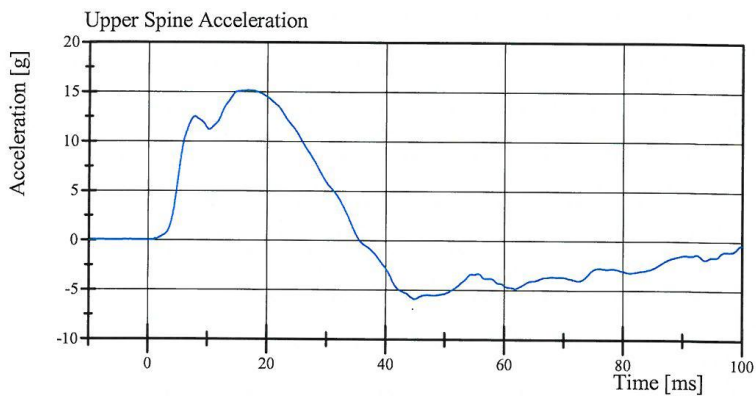


Transportation Research Center Inc.

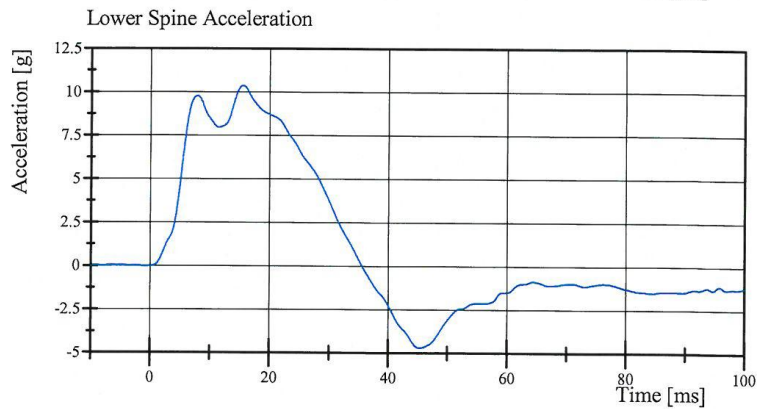
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



Filter Class: CFC_180
Max: 0.1 gn at 53.0 ms
Min: -16.7 gn at 19.0 ms



Filter Class: CFC_180
Max: 15.1 gn at 16.9 ms
Min: -5.9 gn at 44.9 ms



Filter Class: CFC_180
Max: 10.4 gn at 15.5 ms
Min: -4.7 gn at 45.3 ms

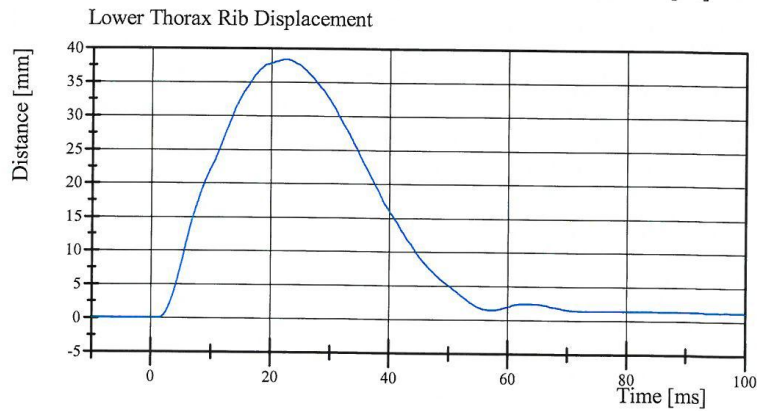
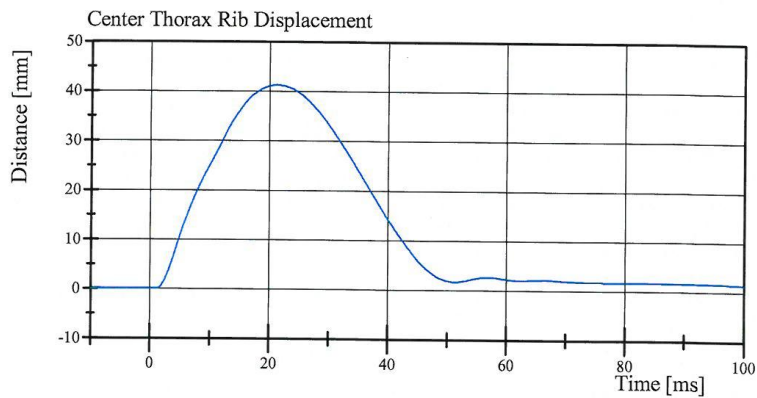
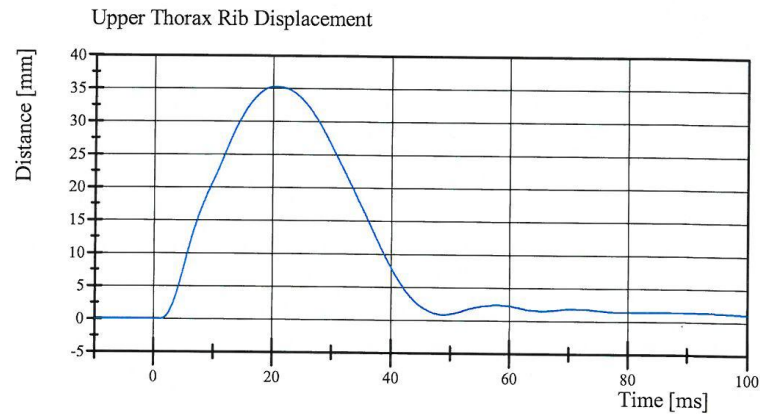
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 12:22:10 810



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



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

09.27.2012 12:22:11 810



Transportation Research Center Inc.

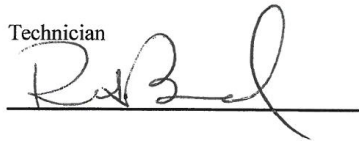
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-15.0 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.6 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	34.7 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	12.32 g	Yes

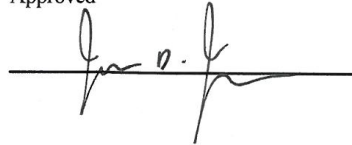
Test meets specifications.

Comments:

Technician



Approved



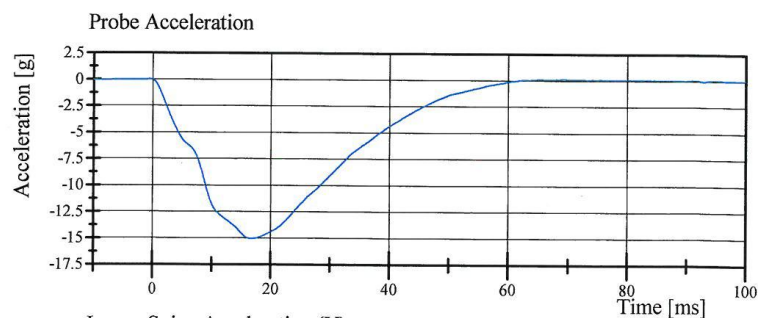
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.01.2012 08:22:26 650

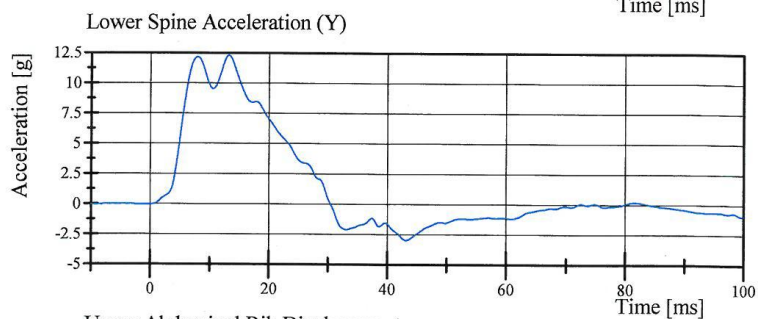


Transportation Research Center Inc.

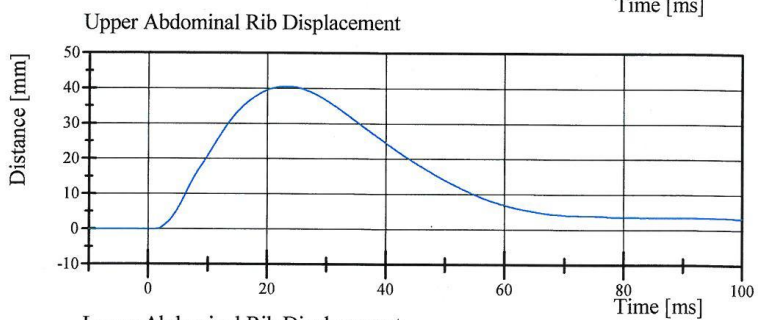
Left Lateral Abdomen
SID II_s Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



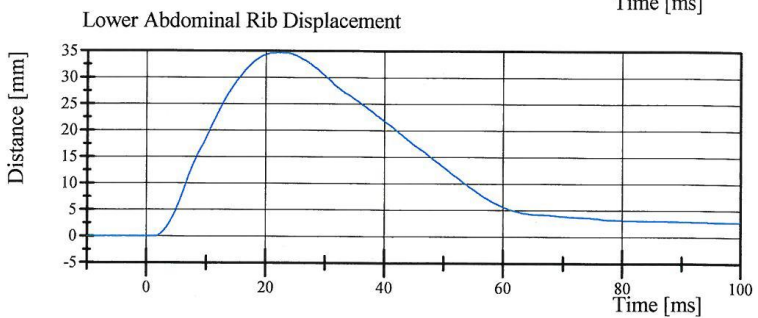
Filter Class: CFC_180
Max: 0.2 gn at 69.4 ms
Min: -15.0 gn at 16.7 ms



Filter Class: CFC_180
Max: 12.3 gn at 13.2 ms
Min: -3.0 gn at 43.1 ms



Filter Class: CFC_600
Max: 40.6 mm at 23.2 ms
Min: -0.0 mm at -8.5 ms



Filter Class: CFC_600
Max: 34.7 mm at 22.4 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.

10.01.2012 08:22:35 650



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 12-1

Test Date: 9/27/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	66 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.69 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.85 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,021.0 N	Yes

Test meets specifications.

Comments:

Technician



Approved



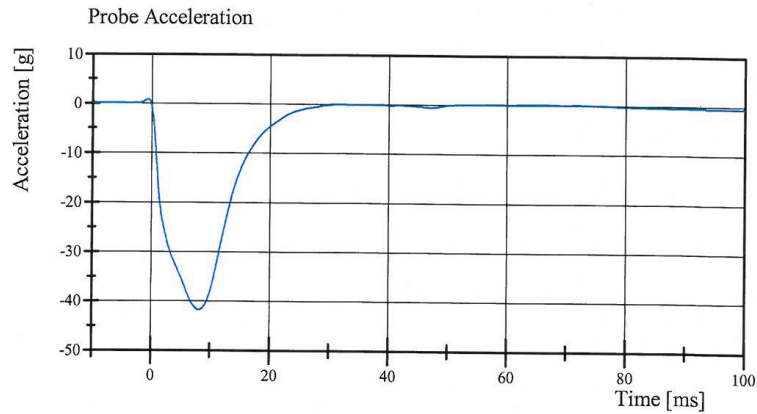
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

09.27.2012 12:35:26 429

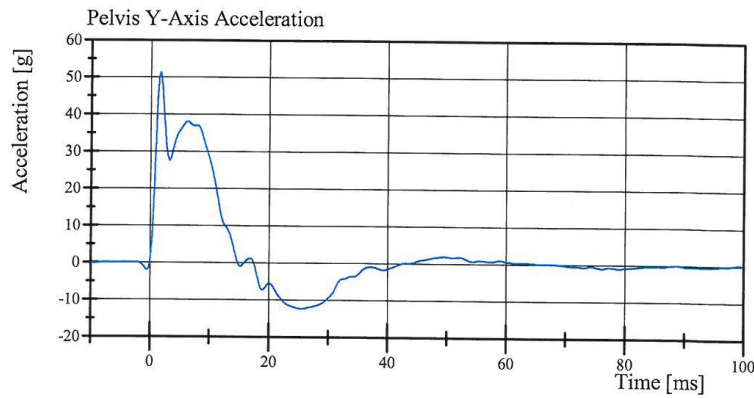


Transportation Research Center Inc.

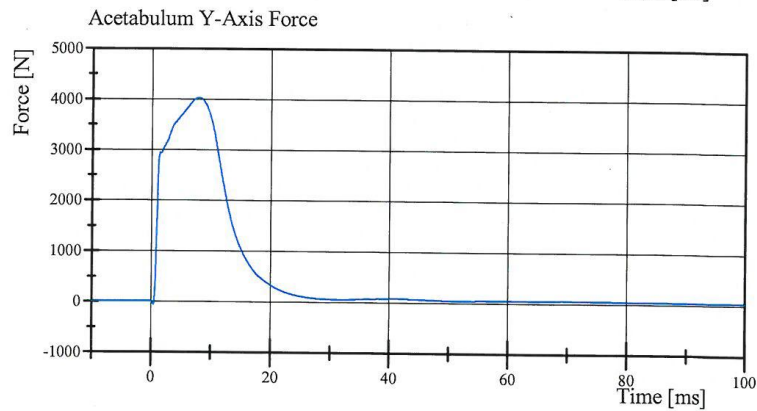
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 12-1
Test Date: 9/27/2012



Filter Class: CFC_180
Max: 0.7 gn at -0.6 ms
Min: -41.9 gn at 8.2 ms



Filter Class: CFC_180
Max: 51.2 gn at 1.6 ms
Min: -12.4 gn at 25.4 ms



Filter Class: CFC_600
Max: 4,021.0 N at 7.8 ms
Min: -62.1 N at 0.4 ms

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

09.27.2012 12:35:34 429



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 12-1

Test Date: 9/28/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.24 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.6 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.4 g	Yes
Iliac Force	4,100 - 5,100 N	4,585.1 N	Yes

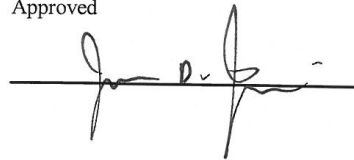
Test meets specifications.

Comments:

Technician



Approved



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

09.28.2012 11:08:38 640

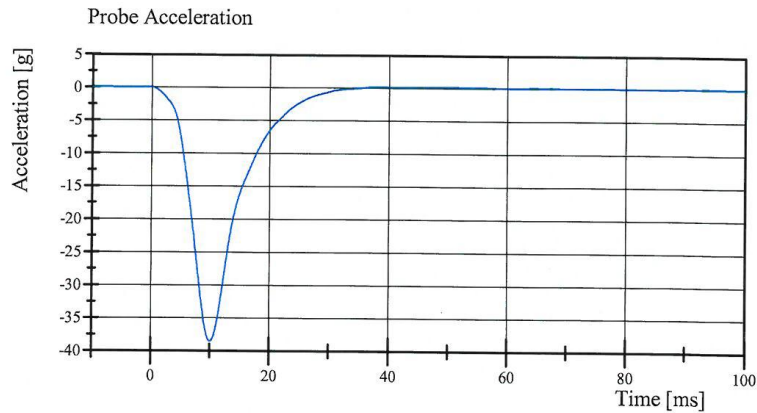


Transportation Research Center Inc.

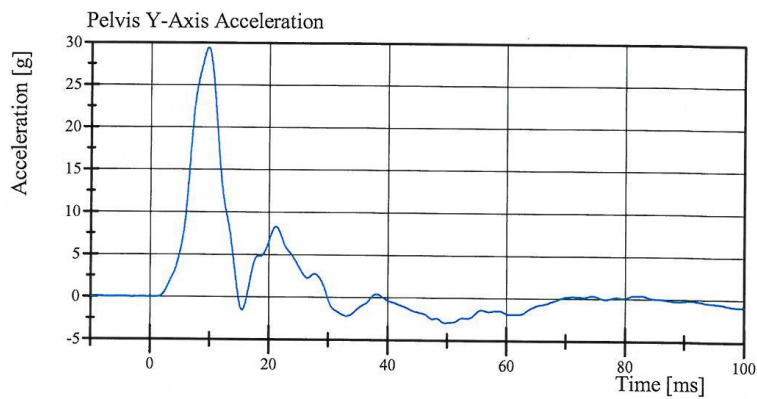
Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 12-1

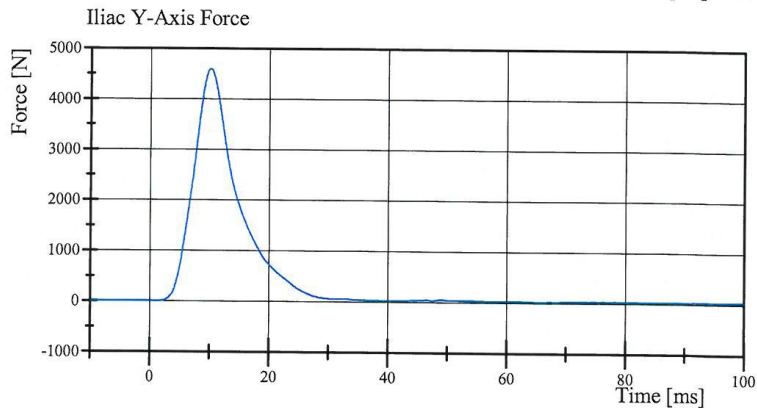
Test Date: 9/28/2012



Filter Class: CFC_180
Max: 0.2 gn at 49.4 ms
Min: -38.6 gn at 10.0 ms



Filter Class: CFC_180
Max: 29.4 gn at 9.7 ms
Min: -2.9 gn at 49.7 ms



Filter Class: CFC_600
Max: 4,585.1 N at 10.1 ms
Min: -0.8 N at -3.3 ms

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

09.28.2012 11:08:45 640

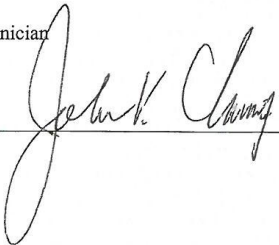


Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.013

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	103	Yes
F	Thigh Clearance	119.0 - 135.0	134	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	534	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	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	866	Yes
Z	Waist Circumference	761.0 - 791.0	779	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 13-1

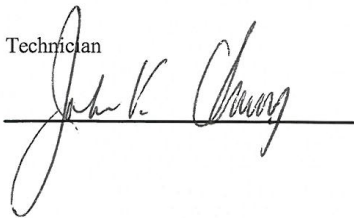
Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	118.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.7 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

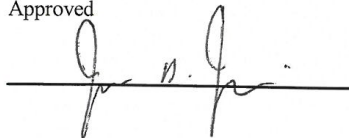
Test meets specifications.

Comments:

Technician



Approved



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

10.08.2012 14:40:19 229

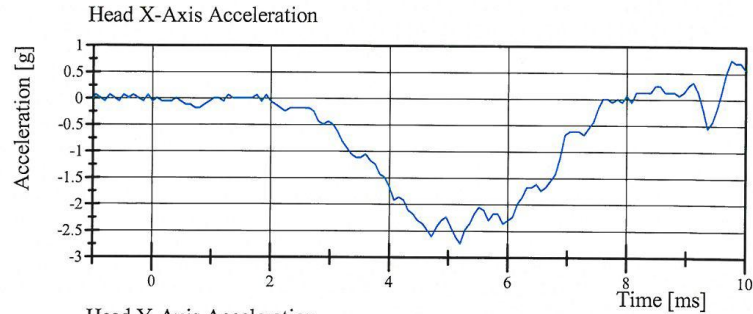


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 13-1

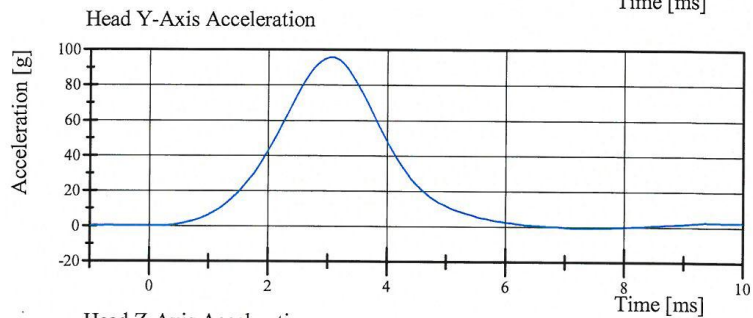
Test Date: 10/8/2012



Filter Class: CFC_1000

Max: 0.7 gn at 9.8 ms

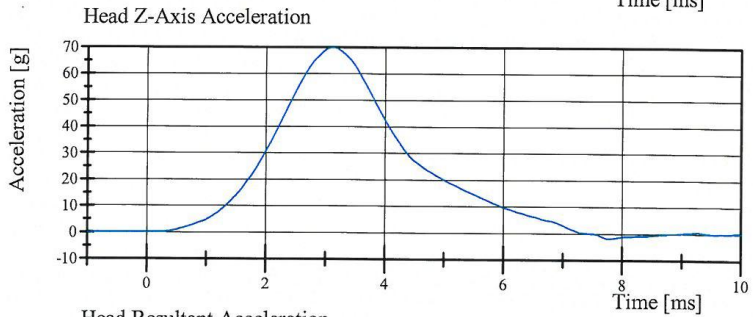
Min: -2.7 gn at 5.2 ms



Filter Class: CFC_1000

Max: 95.8 gn at 3.0 ms

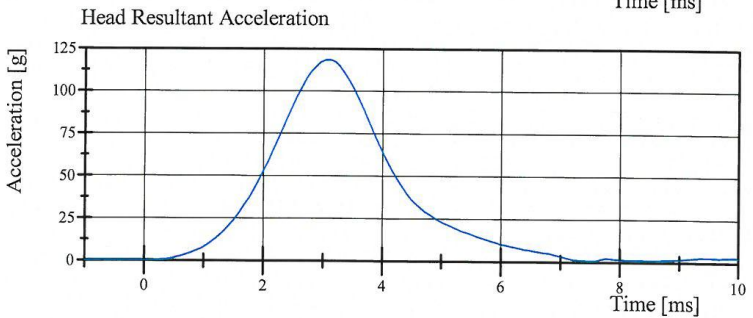
Min: -0.8 gn at 7.2 ms



Filter Class: CFC_1000

Max: 70.0 gn at 3.1 ms

Min: -1.9 gn at 7.8 ms



Filter Class: CFC_1000

Max: 118.4 gn at 3.0 ms

Min: 0.0 gn at -0.9 ms

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

10.08.2012 14:40:25 229



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 13-1

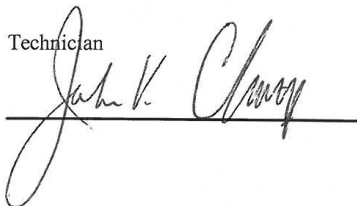
Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.612 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.322 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.530 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.803 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.632 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.641 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-74.9 deg	Yes
Time of Peak	50 - 70 ms	61.7 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	119.4 ms	Yes

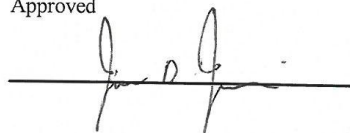
Test meets specifications.

Comments:

Technician



Approved



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

10.08.2012 15:59:54 638

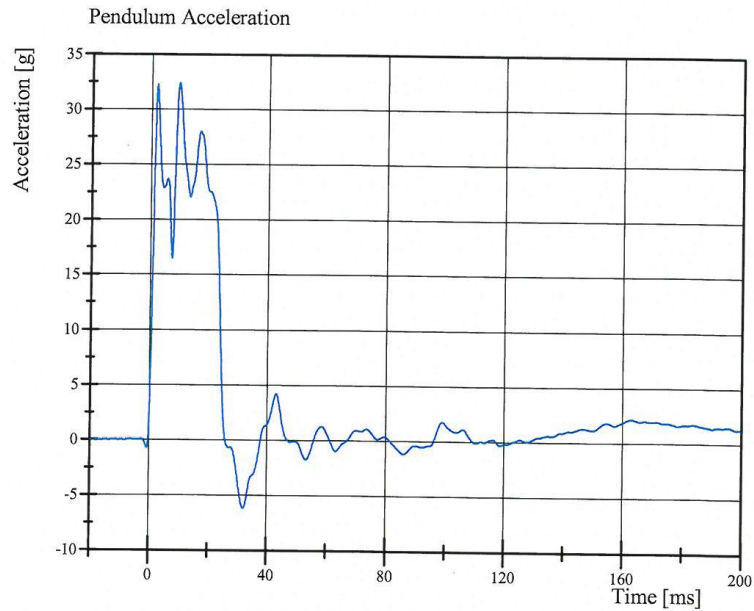


Transportation Research Center Inc.

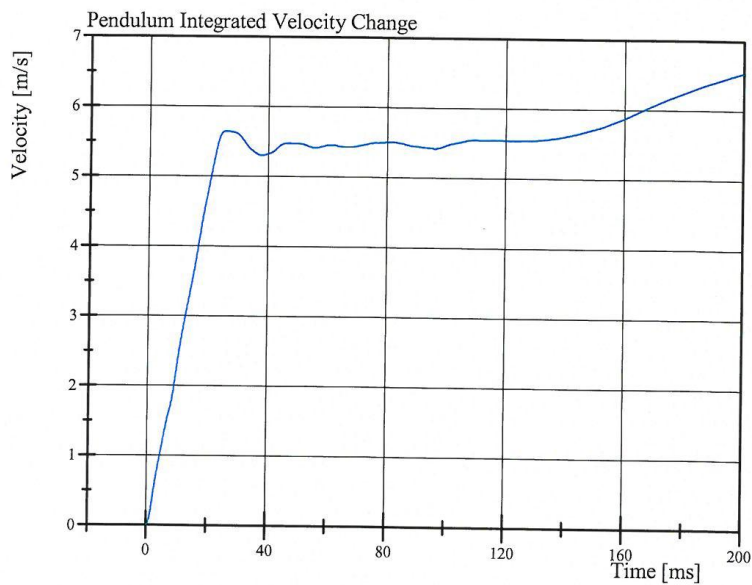
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 13-1

Test Date: 10/8/2012



Filter Class: CFC_180
Max: 32.4 gn at 9.4 ms
Min: -6.2 gn at 32.1 ms



Filter Class: CFC_180
Max: 6.5 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.

10.08.2012 16:00:06 638

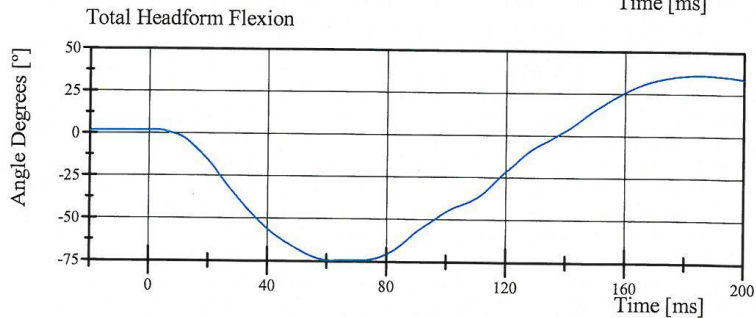
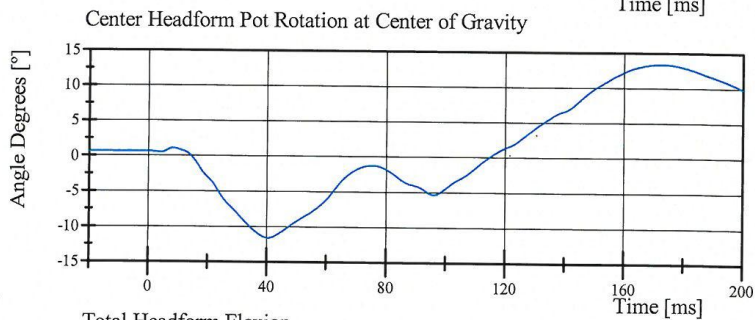
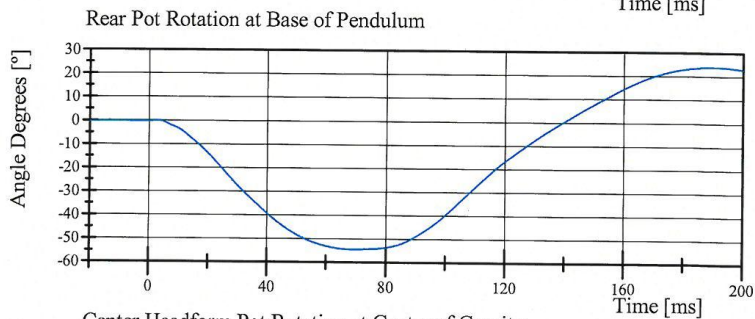
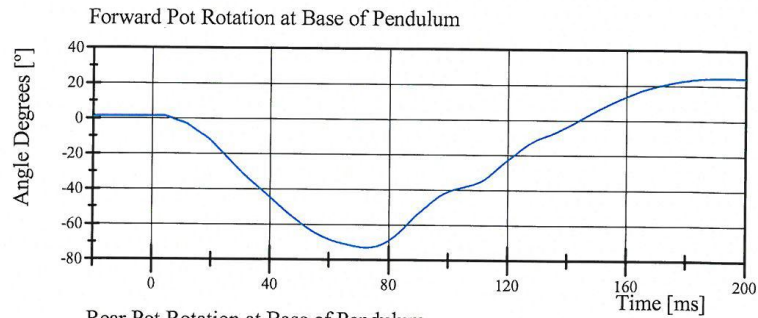


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 13-1

Test Date: 10/8/2012



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

10.08.2012 16:00:07 638

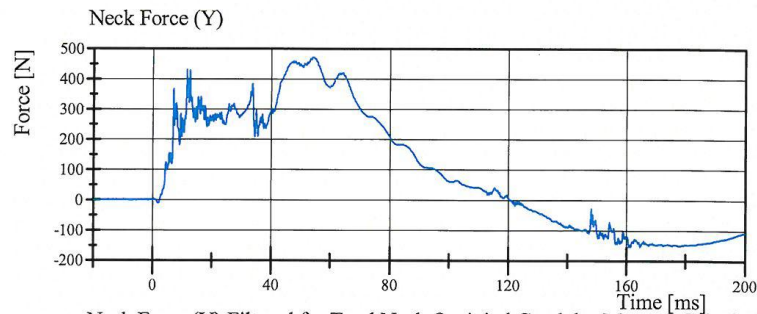


Transportation Research Center Inc.

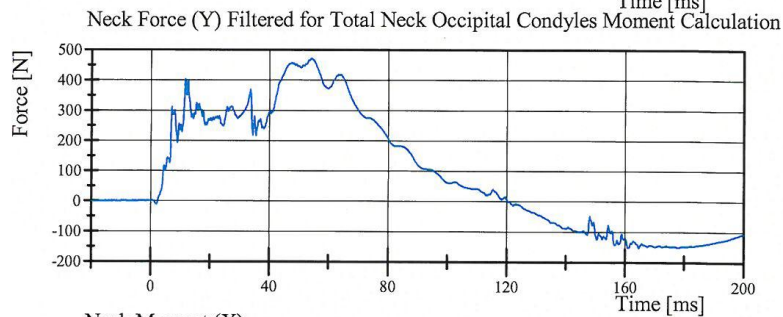
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 13-1

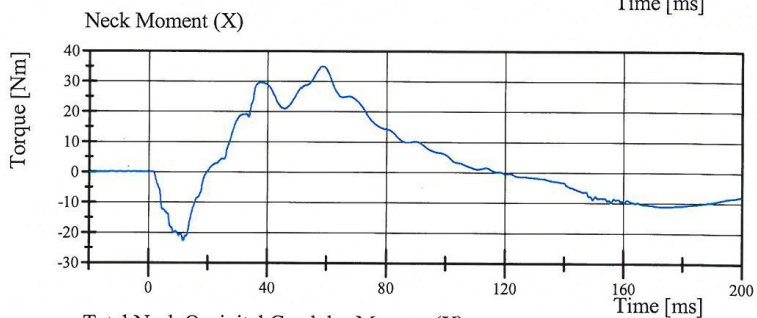
Test Date: 10/8/2012



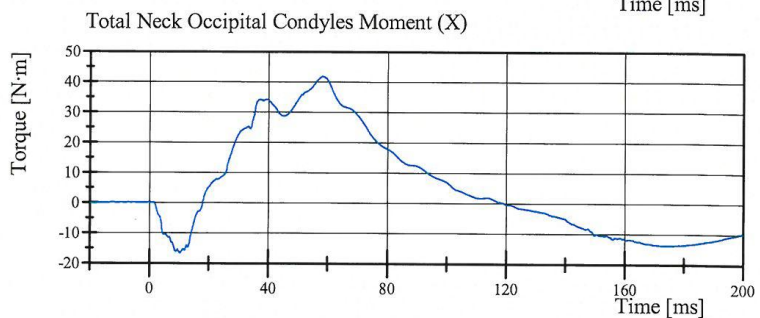
Filter Class: CFC_1000
Max: 472.1 N at 54.2 ms
Min: -154.2 N at 160.9 ms



Filter Class: CFC_600
Max: 471.7 N at 54.2 ms
Min: -151.6 N at 164.7 ms



Filter Class: CFC_600
Max: 35.0 Nm at 58.6 ms
Min: -22.8 Nm at 11.8 ms



Filter Class: Without_(Consta
Max: 41.8 N·m at 58.2 ms
Min: -16.7 N·m at 10.4 ms

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

10.08.2012 16:00:08 638



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 13-1

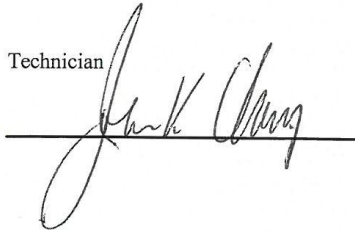
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.7 g	Yes
Shoulder Displacement	28 - 37 mm	29.5 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.8 g	Yes

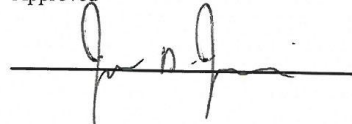
Test meets specifications.

Comments:

Technician



Approved



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

10.09.2012 09:08:02 837

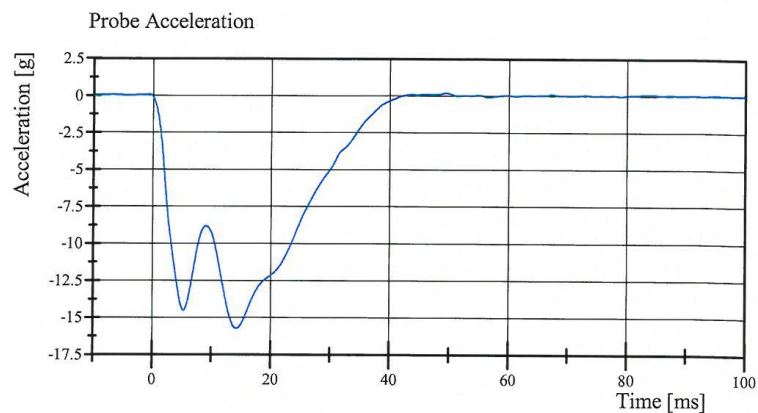


Transportation Research Center Inc.

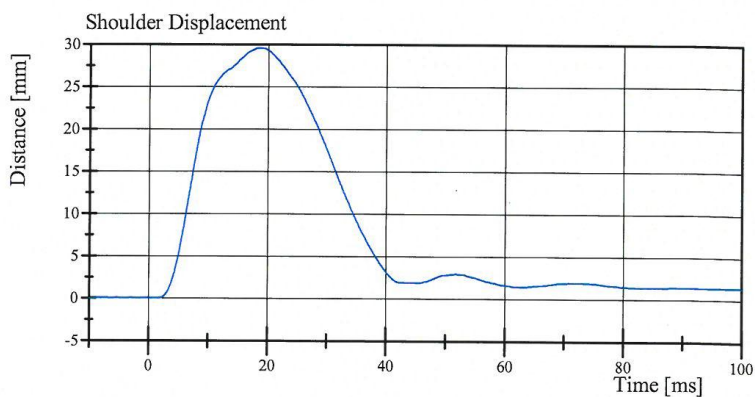
Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 13-1

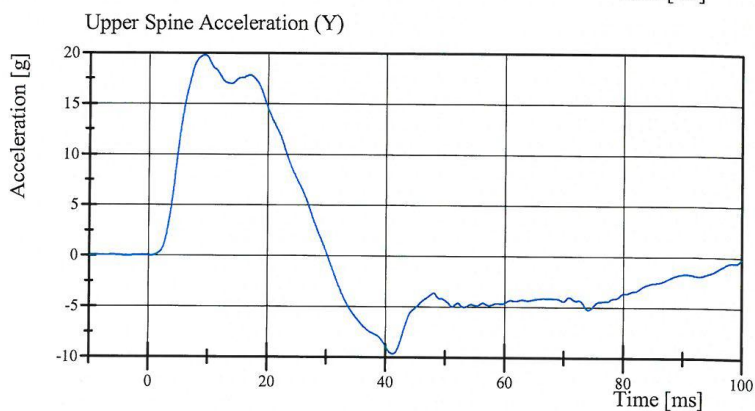
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 0.2 gn at 49.4 ms
Min: -15.7 gn at 14.2 ms



Filter Class: CFC_600
Max: 29.5 mm at 18.4 ms
Min: -0.0 mm at 1.7 ms



Filter Class: CFC_180
Max: 19.8 gn at 9.4 ms
Min: -9.7 gn at 41.2 ms

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

10.09.2012 09:08:11 837



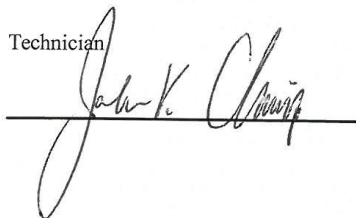
Transportation Research Center Inc.

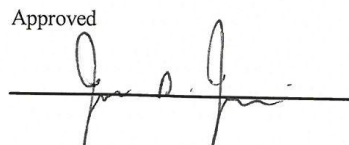
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.775 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.4 g	Yes
Shoulder Displacement	31 - 40 mm	32.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.1 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.1 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	32.6 g	Yes

Test meets specifications.

Comments:

Technician


Approved


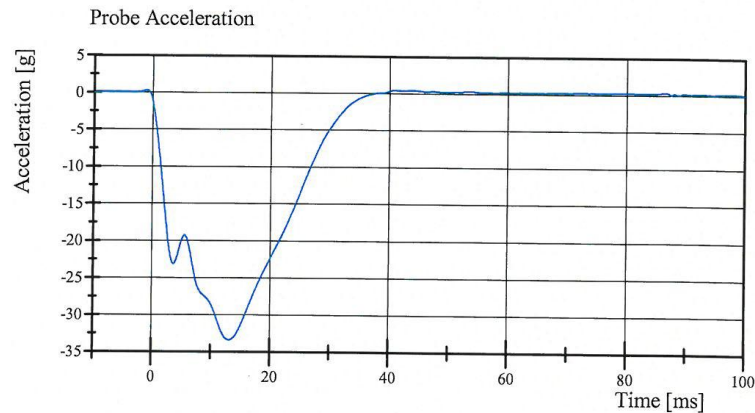
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 09:44:15 627

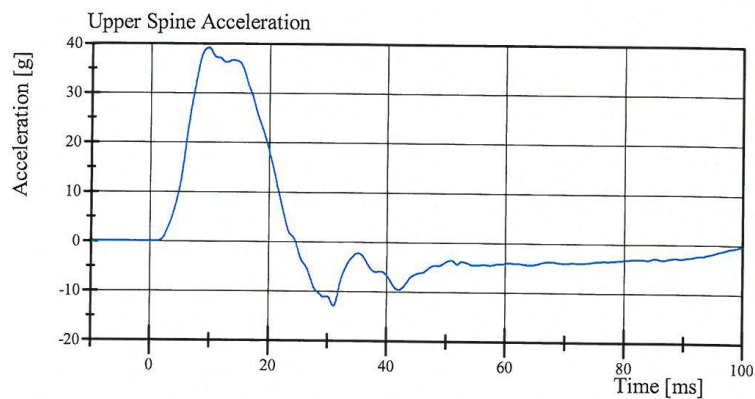


Transportation Research Center Inc.

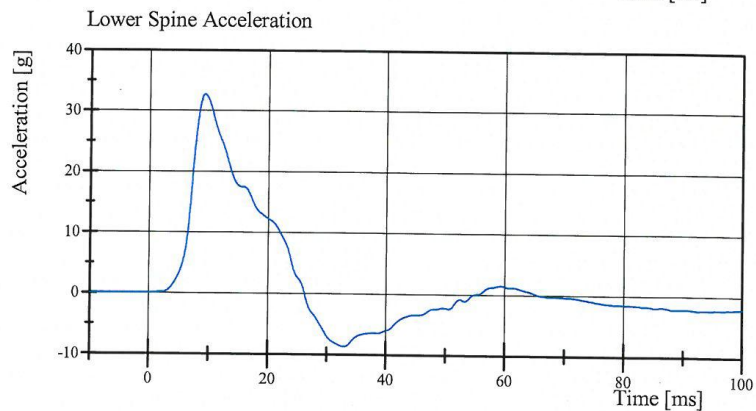
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 0.4 gn at 40.7 ms
Min: -33.4 gn at 13.1 ms



Filter Class: CFC_180
Max: 39.1 gn at 9.6 ms
Min: -13.0 gn at 31.0 ms



Filter Class: CFC_180
Max: 32.6 gn at 9.2 ms
Min: -8.7 gn at 33.0 ms

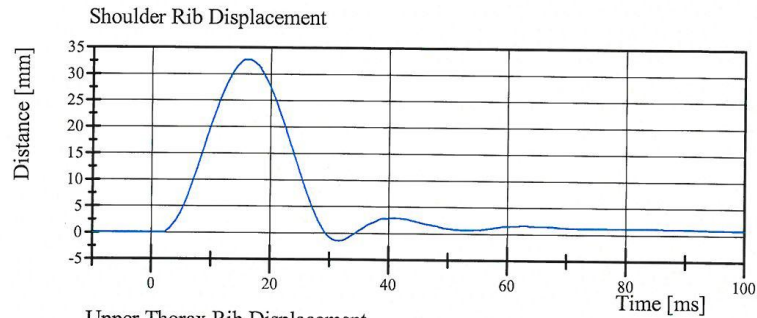
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 09:44:26 627

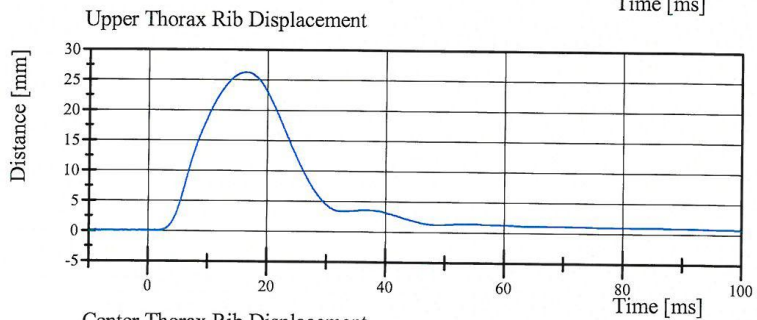


Transportation Research Center Inc.

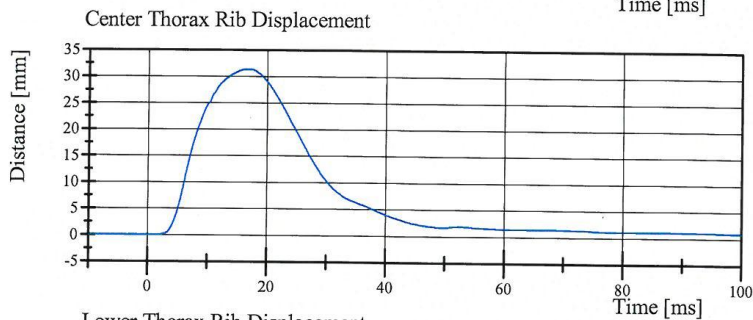
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012



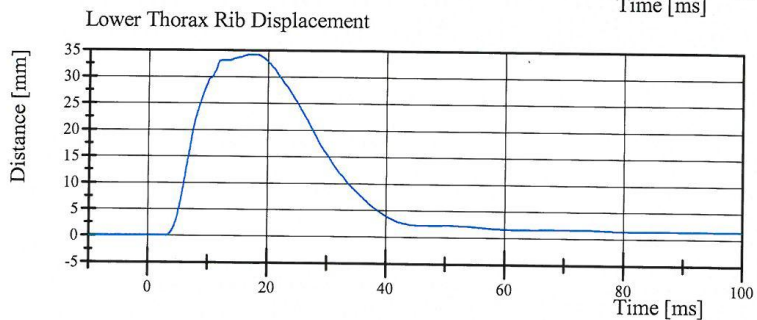
Filter Class: CFC_600
Max: 32.7 mm at 15.8 ms
Min: -1.5 mm at 31.6 ms



Filter Class: CFC_600
Max: 26.2 mm at 16.5 ms
Min: -0.0 mm at 1.7 ms



Filter Class: CFC_600
Max: 31.3 mm at 16.6 ms
Min: -0.0 mm at -9.2 ms



Filter Class: CFC_600
Max: 34.1 mm at 17.4 ms
Min: -0.0 mm at -3.1 ms

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

10.09.2012 09:44:27 627



Transportation Research Center Inc.

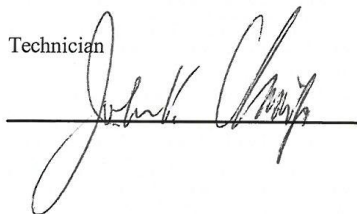
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.388 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	38.0 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	36.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.4 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.7 g	Yes

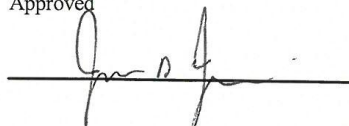
Test meets specifications.

Comments:

Technician



Approved



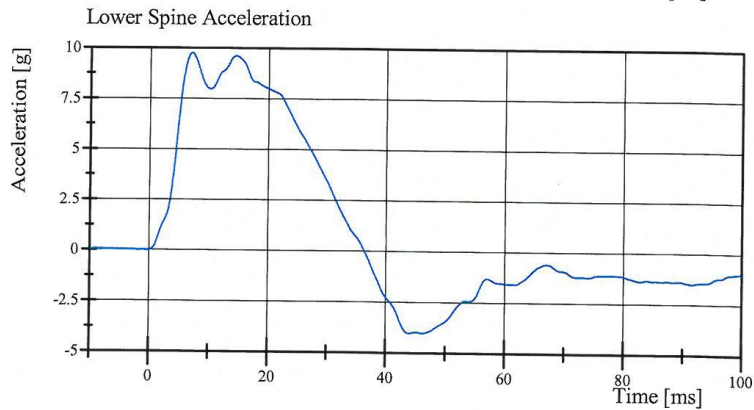
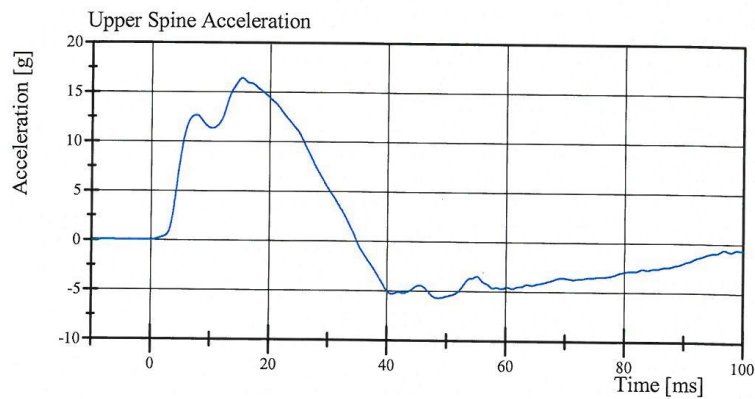
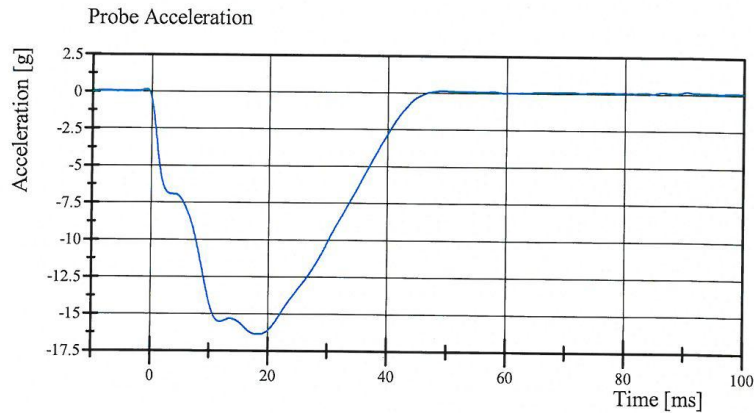
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 10:54:31 857



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012



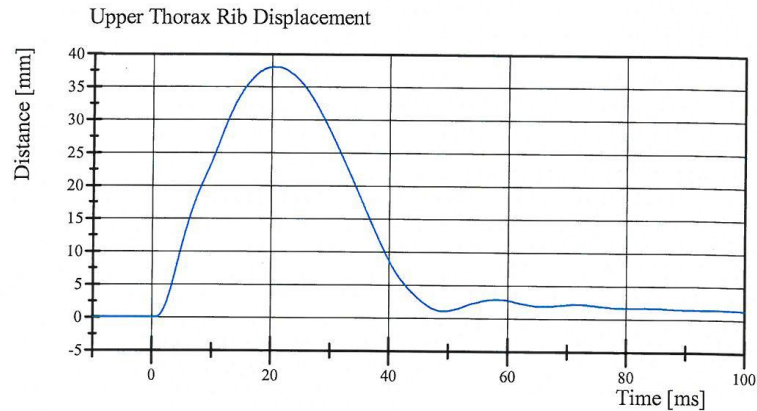
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 10:54:43 857

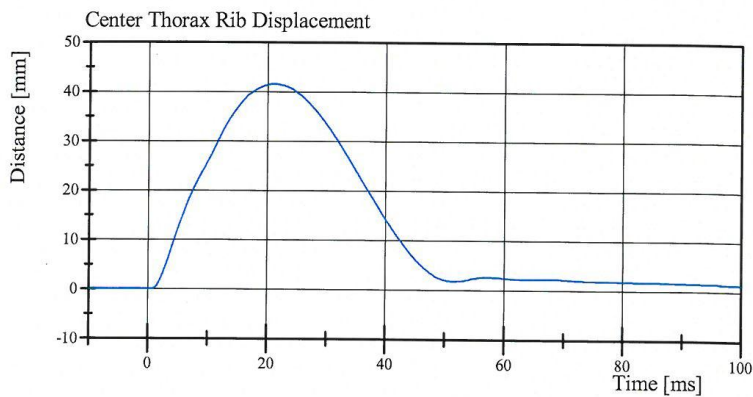


Transportation Research Center Inc.

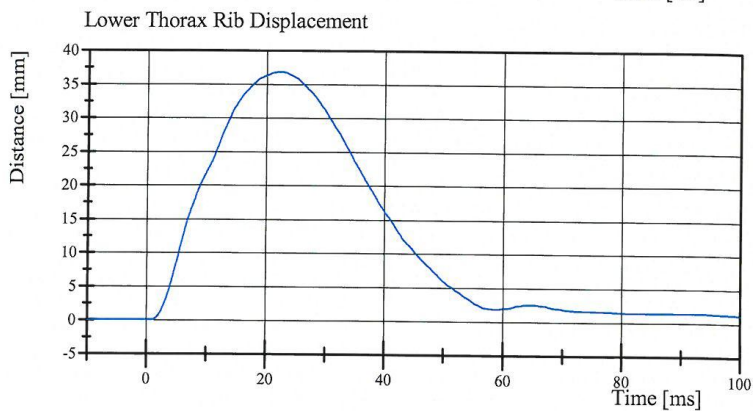
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012



Filter Class: CFC_600
Max: 38.0 mm at 20.6 ms
Min: -0.0 mm at 0.6 ms



Filter Class: CFC_600
Max: 41.5 mm at 21.0 ms
Min: -0.0 mm at -3.2 ms



Filter Class: CFC_600
Max: 36.8 mm at 22.2 ms
Min: -0.0 mm at 0.8 ms

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

10.09.2012 10:54:44 857



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 13-1

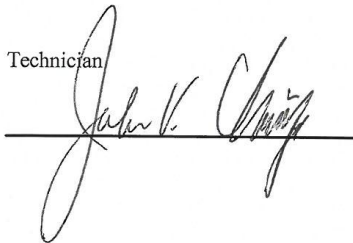
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.9 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	41.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.5 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	12.04 g	Yes

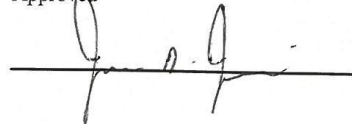
Test meets specifications.

Comments:

Technician



Approved



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

10.09.2012 11:19:18 659

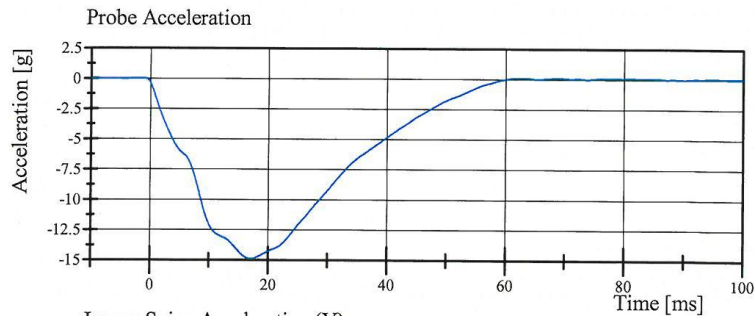


Transportation Research Center Inc.

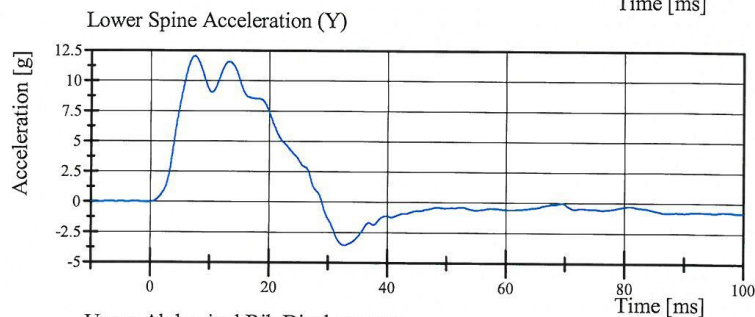
Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 13-1

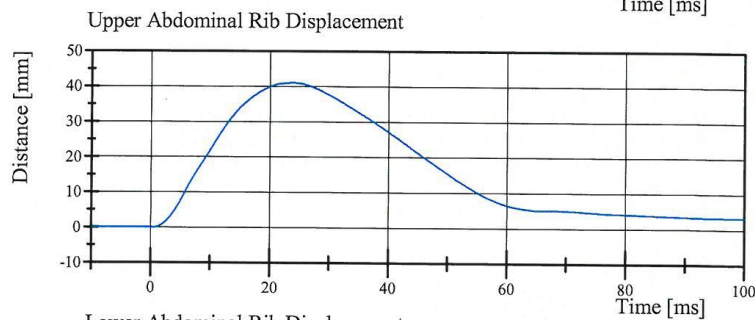
Test Date: 10/9/2012



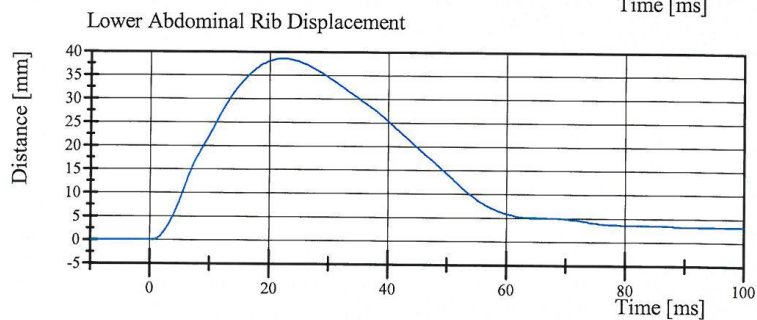
Filter Class: CFC_180
Max: 0.1 gn at 61.6 ms
Min: -14.9 gn at 17.0 ms



Filter Class: CFC_180
Max: 12.0 gn at 7.4 ms
Min: -3.5 gn at 32.7 ms



Filter Class: CFC_600
Max: 41.0 mm at 23.8 ms
Min: -0.0 mm at -1.4 ms



Filter Class: CFC_600
Max: 38.5 mm at 21.9 ms
Min: -0.0 mm at 0.5 ms

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

10.09.2012 11:19:29 659



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 13-1

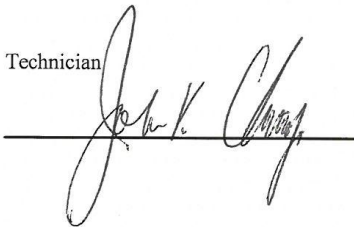
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.4 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.4 g	Yes
Iliac Force	4,100 - 5,100 N	4,531.4 N	Yes

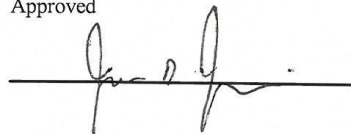
Test meets specifications.

Comments:

Technician



Approved



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

10.09.2012 08:17:44 715

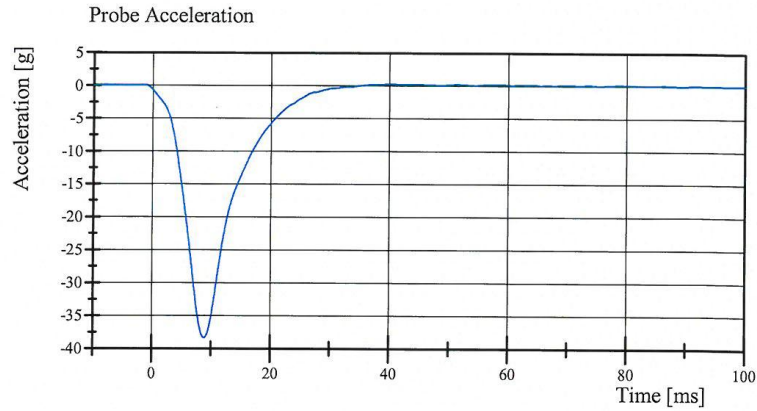


Transportation Research Center Inc.

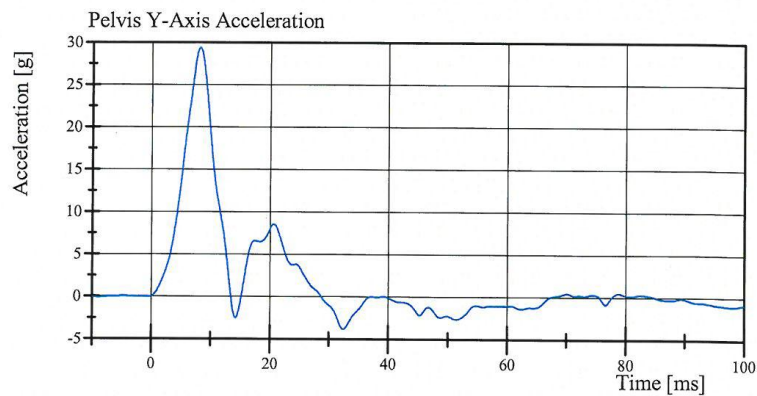
Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 13-1

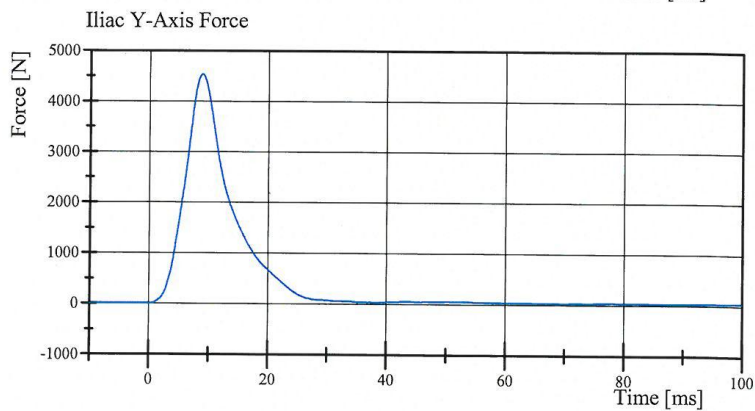
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 0.3 gn at 40.1 ms
Min: -38.4 gn at 8.8 ms



Filter Class: CFC_180
Max: 29.4 gn at 8.1 ms
Min: -3.8 gn at 32.5 ms



Filter Class: CFC_600
Max: 4,531.4 N at 8.9 ms
Min: -0.8 N at -2.3 ms

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

10.09.2012 08:17:53 715



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 13-1

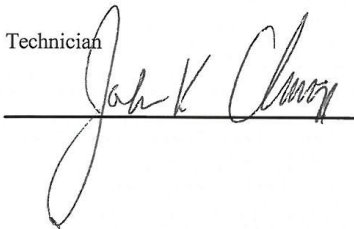
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.69 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.20 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	35.4 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,113.3 N	Yes

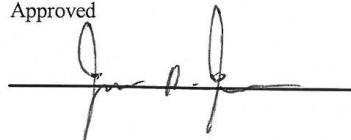
Test meets specifications.

Comments:

Technician



Approved



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

10.09.2012 11:37:27 462

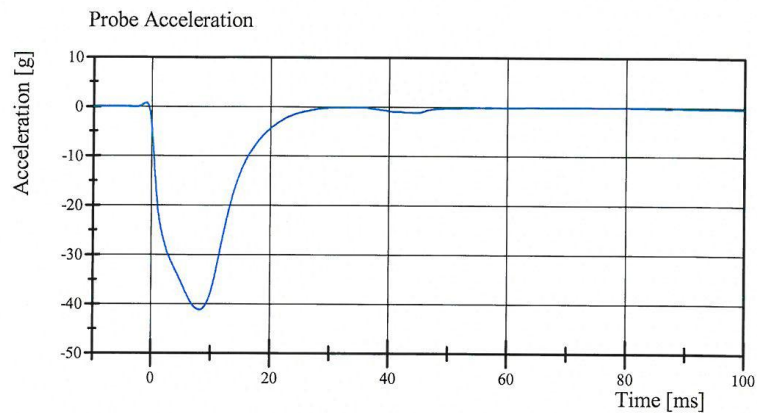


Transportation Research Center Inc.

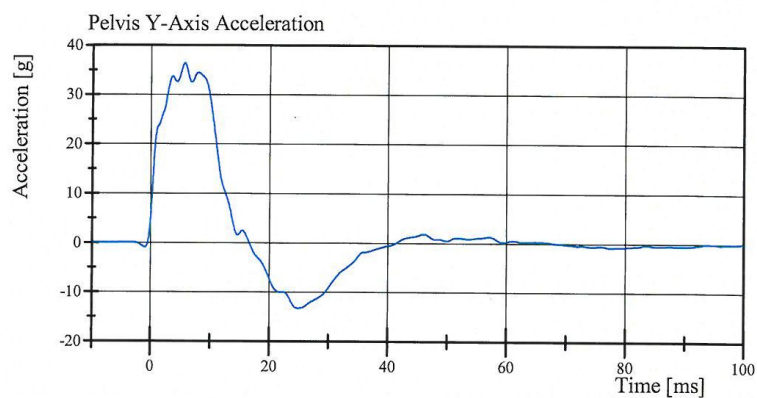
Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 13-1

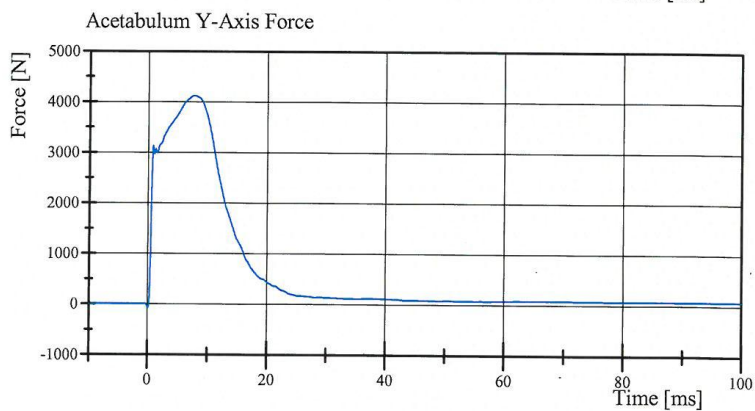
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 0.7 gn at -1.0 ms
Min: -41.2 gn at 8.2 ms



Filter Class: CFC_180
Max: 36.3 gn at 5.6 ms
Min: -13.3 gn at 24.9 ms



Filter Class: CFC_600
Max: 4,113.3 N at 7.8 ms
Min: -81.7 N at 0.1 ms

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

10.09.2012 11:37:38 462



APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F030		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers		X	P58890	Endevco	28-Sep-12
		Y	P51702	Endevco	28-Sep-12
		Z	P52083	Endevco	28-Sep-12
Thoracic Rib Displacement Potentiometers	Upper	Y	175	FTSS	27-Sep-12
	Middle	Y	174	FTSS	27-Sep-12
	Lower	Y	173	FTSS	27-Sep-12
Abdomen Load Cells	Upper	Y	1441	Denton	28-Sep-12
	Middle	Y	1436	Denton	28-Sep-12
	Lower	Y	1437	Denton	28-Sep-12
Lower Spine Accelerometers (T12)		X	P73381	Endevco	28-Sep-12
		Y	P73580	Endevco	28-Sep-12
		Z	P59005	Endevco	28-Sep-11
Acetabulum Load Cell		Y	NA	NA	NA
Pubic Symphysis Load Cell		Y	457-FY	Denton	16-Nov-11

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305			
				Serial Number	Manufacturer	Calibration Date	
Head Accelerometers				X	P51719	Endevco	27-Sep-12
				Y	P51272	Endevco	27-Sep-12
				Z	P58862	Endevco	27-Sep-12
Displacement Potentiometers	Shoulder		Y	NA	NA	NA	
	Thoracic Rib	Upper	Y	007	Servo	27-Sep-12	
		Middle	Y	1161	Servo	27-Sep-12	
		Lower	Y	1279	Servo	27-Sep-12	
	Abdominal Rib	Upper	Y	1295	Servo	27-Sep-12	
		Lower	Y	1136	Servo	27-Sep-12	
Lower Spine Accelerometers (T12)				X	P50068	Endevco	28-Sep-12
				Y	P52051	Endevco	28-Sep-12
				Z	P51710	Endevco	28-Sep-12
Acetabulum Load Cell				Y	103-FY	FTSS	27-Sep-12
Iliac Wing Load Cell				Y	287-FY	FTSS	27-Sep-12
Pelvis Plug (struck side)					36446	FTSS	
Pelvis Plug (non-struck side)					NA	NA	NA

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P74799	Endevco	20-Aug-12
	Vehicle Center of Gravity	Y	P74441	Endevco	20-Aug-12
	Vehicle Center of Gravity	Z	P74496	Endevco	5-Sep-12
2	Right Sill at Front Seat	X	P76063	Endevco	7-Sep-12
	Right Sill at Front Seat	Y	P72279	Endevco	18-Jul-12
	Right Sill at Front Seat	Z	P74816	Endevco	27-Jul-12
3	Right Sill at Rear Seat	X	P75717	Endevco	14-Sep-12
	Right Sill at Rear Seat	Y	P75754	Endevco	10-Sep-12
	Right Sill at Rear Seat	Z	P76386	Endevco	14-Sep-12
4	Left Sill at Front Door	Y	P74248	Endevco	1-Oct-12
5	Left Sill at Rear Door	Y	P74525	Endevco	1-May-12
6	Left A-Post Lower	Y	P75570	Endevco	10-Sep-12
7	Left A-Post Middle	Y	P75776	Endevco	10-Sep-12
8	Left B-Post Lower	Y	P75758	Endevco	10-Sep-12
9	B-Post Middle	Y	P75116	Endevco	14-Apr-12
10	Front Seat Track	Y	P76335	Endevco	18-Sep-12
11	Rear Seat Track or Structure	Y	P75770	Endevco	17-Aug-12
12	Right Rear Occupant Compartment	Y	P75993	Endevco	25-Jul-12
13	Engine Block	X	P76393	Endevco	19-Sep-12
	Engine Block	Y	P75099	Endevco	4-Sep-12
14	Rear Floorpan Above Axle	X	P74455	Endevco	15-May-12
	Rear Floorpan Above Axle	Y	P75515	Endevco	20-Jul-12
	Rear Floorpan Above Axle	Z	P74495	Endevco	24-Jul-12

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P73581	Endevco	17-Aug-12
MDB Center of Gravity	Y	P74484	Endevco	24-Jul-12
MDB Center of Gravity	Z	P75536	Endevco	7-Aug-12
Left Frame Rail at Rear Axle Centerline	X	P76452	Endevco	27-Sep-12
Left Frame Rail at Rear Axle Centerline	Y	P76453	Endevco	27-Jul-12