

FINAL REPORT NUMBER: SINCAP-TRC-14-008

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

**Nissan Motor Co., LTD.
2014 Nissan Rogue SUV
NHTSA NUMBER: M20145208**

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



Report Date: April 8, 2014

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE, Room W43-410
Washington, D.C. 20590**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement.

Report Prepared By: ILO Project Operations Group

Report Approved By: 
Jeffery W. Sankey, Manager, Project Operations

Approval Date: April 8, 2014

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

1. Report No. SINCAP-TRC-14-008	2. Government Accession No.	3. Recipient's Catalog No.																																													
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2014 Nissan Rogue SUV NHTSA No.: M20145208		5. Report Date April 8, 2014																																													
		6. Performing Organization Code TRC Inc.																																													
7. Author(s) Jeffery W. Sankey, Manager, Project Operations		8. Performing Organization Report Number 140220																																													
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		10. Work Unit No.																																													
		11. Contract or Grant No. DTNH22-09-D-00125																																													
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave, SE, Room W43-410 Washington, DC 20590		13. Type of Report and Period Covered Final Test Report February 20, 2014 – April 8, 2014																																													
		14. Sponsoring Agency Code NVS-111																																													
15. Supplemental Notes																																															
16. Abstract This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2014 Nissan Rogue SUV 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 February 20, 2014. The impact velocity of the Moving Deformable Barrier (MDB) was 61.21 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22° C. The target vehicle post-test maximum crush was 168 mm at Level 1. The test vehicle's performance was as follows: Driver ATD (ES-2re) <table border="1"> <thead> <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>N/A</td><td>1000</td><td>69</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>44</td><td>25.5</td></tr> <tr> <td>Total Abdominal Force</td><td>N</td><td>2500</td><td>898.6</td></tr> <tr> <td>Pubic Symphysis Force</td><td>N</td><td>6000</td><td>-2120.1</td></tr> </tbody> </table> Passenger ATD (SID-IIs) <table border="1"> <thead> <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>N/A</td><td>1000</td><td>142</td></tr> <tr> <td>Lower Spine Resultant Acceleration</td><td>g's</td><td>82</td><td>51.3</td></tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td><td>N</td><td>5525</td><td>3482.3</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>38*</td><td>11.9</td></tr> <tr> <td>Maximum Abdominal Rib Deflection</td><td>mm</td><td>45*</td><td>25.2</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.				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	69	Maximum Thoracic Rib Deflection	mm	44	25.5	Total Abdominal Force	N	2500	898.6	Pubic Symphysis Force	N	6000	-2120.1	Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	142	Lower Spine Resultant Acceleration	g's	82	51.3	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3482.3	Maximum Thoracic Rib Deflection	mm	38*	11.9	Maximum Abdominal Rib Deflection	mm	45*	25.2
Measurement Description	Units	IARV	Result																																												
Head Injury Criteria (HIC ₃₆)	N/A	1000	69																																												
Maximum Thoracic Rib Deflection	mm	44	25.5																																												
Total Abdominal Force	N	2500	898.6																																												
Pubic Symphysis Force	N	6000	-2120.1																																												
Measurement Description	Units	IARV	Result																																												
Head Injury Criteria (HIC ₃₆)	N/A	1000	142																																												
Lower Spine Resultant Acceleration	g's	82	51.3																																												
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3482.3																																												
Maximum Thoracic Rib Deflection	mm	38*	11.9																																												
Maximum Abdominal Rib Deflection	mm	45*	25.2																																												
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																																													
19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. Number of Pages 210	22. Price																																												

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	8
3	Dummy Longitudinal Clearance Dimensions	11
4	Dummy Lateral Clearance Dimensions	12
5	Camera and Instrumentation Data	13
6	Test Vehicle Accelerometer Locations	14
7	MDB Accelerometer Locations	15
8	Post-Test Observations	16
9	MDB Summary of Results	18
10	Test Vehicle Profile Measurements	19
11	Test Vehicle Exterior Crush Measurements	20
12	MDB Exterior Static Crush Measurements	23
13	FMVSS No. 301 Static Rollover Results	24
14	Dummy/Vehicle Temperature and Humidity Stabilization	25

SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2014 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00125. The purpose of this test is to generate comparative side impact performance in a 2014 Nissan Rogue SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2013.

SECTION 2

SUMMARY OF TEST RESULTS

A 2014 Nissan Rogue SUV 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 61.21 km/h (38.03 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, Ohio, on February 20, 2014. 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 September 2013. The side impact event was documented by 11 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG 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)	N/A	1000	69
Maximum Thoracic Rib Deflection	mm	44	25.5
Combined Abdominal Force	N	2500	898.6
Pubic Symphysis Force	N	6000	-2120.1

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	142
Lower Spine (T12) Resultant Acceleration	G	82	51.3
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3482.3
Maximum Thoracic Rib Deflection	mm	38*	11.9
Maximum Abdominal Rib Deflection	mm	45*	25.2

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	No	No	N/A
Other	N/A	N/A	N/A	N/A

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. The restraint system performed as expected.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Nissan Rogue SUV
Test Program: NCAP Side Impact

NHTSA No.: M20145208
Test Date: 2/20/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20145208
Model Year	2014
Make	Nissan
Model	Rogue
Body Style	SUV
VIN	5N1AT2MT2EC765157
Body Color	Silver
Odometer Reading (km/mi)	83 mi
Engine Displacement (L)	2.5
Type/No. Cylinders	Gas/4
Engine Placement	Front/Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., LTD.
Date of Manufacture	12/13
Vehicle Type	MPV

GVWR (kg)	2036
GAWR Front (kg)	1040
GAWR Rear (kg)	1027

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	N/A	5
Capacity Weight (VCW) (kg)				408
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				67.8

VEHICLE SEAT TYPE

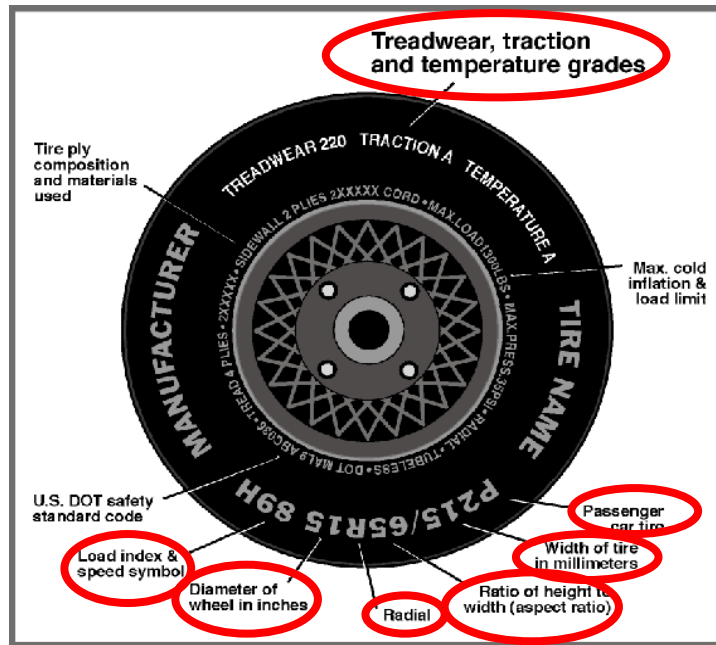
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes	N/A	Yes		N/A	Yes	N/A
Rear or Second Row Seat	N/A	N/A	Yes	Yes	N/A	Yes	N/A
Third Row Seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

¹ Rated cargo and luggage weight is limited to 136.0 kg or 300 lbs.

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

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	225/65R17	225/65R17
Tire Size on Vehicle	225/65R17	225/65R17
Tire Manufacturer	Hankook	Hankook
Tire Model	Dynapro HT	Dynapro HT
Treadwear	380	380
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	102H	102H
Tire Material	Steel, Polyester & Nylon	Steel, Polyester & Nylon
DOT Safety Code Left	T7H1 HU H 2613	T7H1 HU H 2613
DOT Safety Code Right	T7H1 HU H 2613	T7H1 HU H 2613

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Nissan Rogue SUV
Test Program: NCAP Side Impact

NHTSA No.: M20145208
Test Date: 2/20/14

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	290	276	276	276
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	N/A	N/A	N/A	N/A
As Tested	kPa	230	230	230	230

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	207	207	207	207	207

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	450.0	334.0		496.6	392.2		500.4	425.2	
Right	kg	452.6	308.0		475.6	367.0		451.4	362.2	
Ratio	%	58.4	41.6		56.2	43.8		54.7	45.3	
Totals	kg	902.6	642.0	1544.6	972.2	759.2	1731.4	951.8	787.4	1739.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1544.6	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	67.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1737.4	(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

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement
LF	mm	778	772	Yes
RF	mm	793	786	Yes
RR	mm	791	789	Yes
LR	mm	774	775	Yes
Vehicle CG (Aft of Front Axle)	mm	1225	1186	
Vehicle CG (Left+)/Right(-) from Longitudinal Centerline)	mm	+51	+21	

***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".

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: None	0.0
Removed: Right rear door window regulator and speaker, right rear tail light, and rear hatch interior trim panel.	5.0

DATA SHEET NO. 2

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

Test Vehicle: 2014 Nissan Rogue SUV

NHTSA No.: M20145208

Test Program: NCAP Side Impact

Test Date: 2/20/14

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	14.2	11.1	12.65
Front Passenger Seat	N/A	N/A	13.2
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	N/A	N/A	9.0
Non-Struck Side Rear Seat	N/A	N/A	9.2
Rear Center Seat*	N/A	N/A	10.2

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rearmost	Mid- Fore/Aft	Forward- Most
Driver Seat	12.7	220	Max	N/A	N/A	N/A
			Mid	212	220	227
			Min	N/A	N/A	N/A
Front Passenger Seat	13.2	215	Max	N/A	N/A	N/A
			Mid	208	215	222
			Min	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	9.0	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	9.2	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	10.2	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

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

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

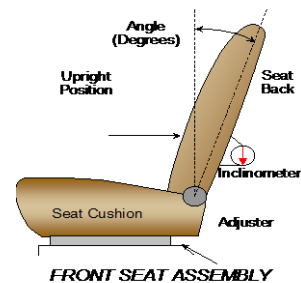
NHTSA No.: M20145208
 Test Date: 2/20/14

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	240	25	120	12
Front Passenger Seat	240	25	120	12
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	225	15	225	14
Non-Struck Side Rear Seat	225	15	225	14
Rear Center Seat*	225	15	225	14

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	67.9	36	1.7 rwd	9
Front Passenger Seat	67.9	36	2.5 rwd	9
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	18.5	10	12.7	3
Non-Struck Side Rear Seat	18.1	10	12.7	3
Rear Center Seat*	18.5	10	12.7	3

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4, Numbered from 0 to 3	0, Uppermost
Rear Seat	1	1, Fixed

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	3, Numbered from 0 to 2	0, Uppermost
Rear Seat	1	1, Fixed

DATA SHEET NO. 2 (CONTINUED)

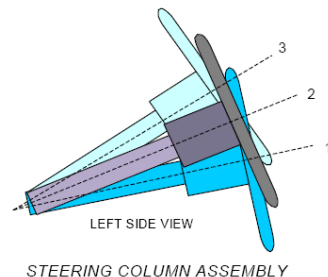
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14

STEERING COLUMN ADJUSTMENT

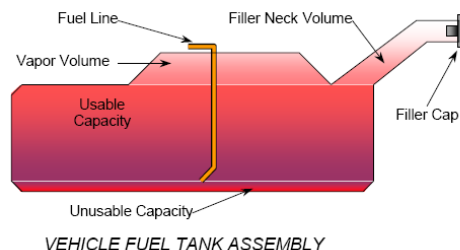
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	25.7	0
Geometric Center, Position No. 2	27.9	0
Uppermost, Position No. 3	30	0
Telescoping Steering Wheel Travel		46
Test Position	27.8	23

FUEL PUMP

Pump operates a few seconds after ignition switch is turned ON. After that, pump operates only while engine is running.



FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	54.9
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	55.0
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	51.1
Actual Amount of Solvent Used in Test	51.1
1/3 of Usable Capacity	17.0

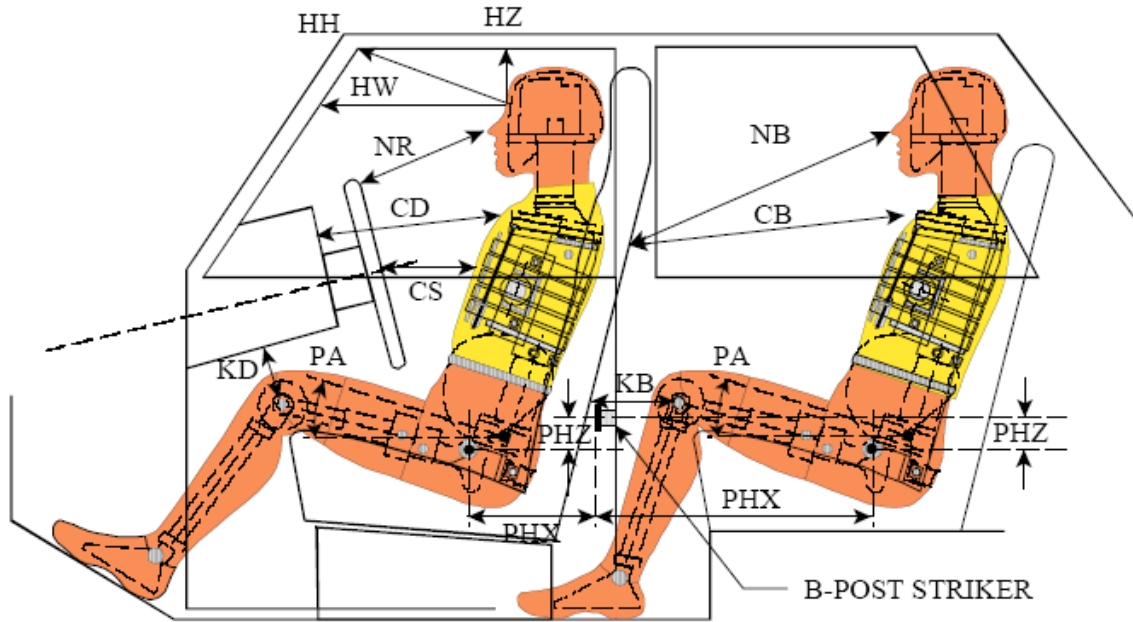
Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in on Form No. 1? ☒ YES ☐ NO

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



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

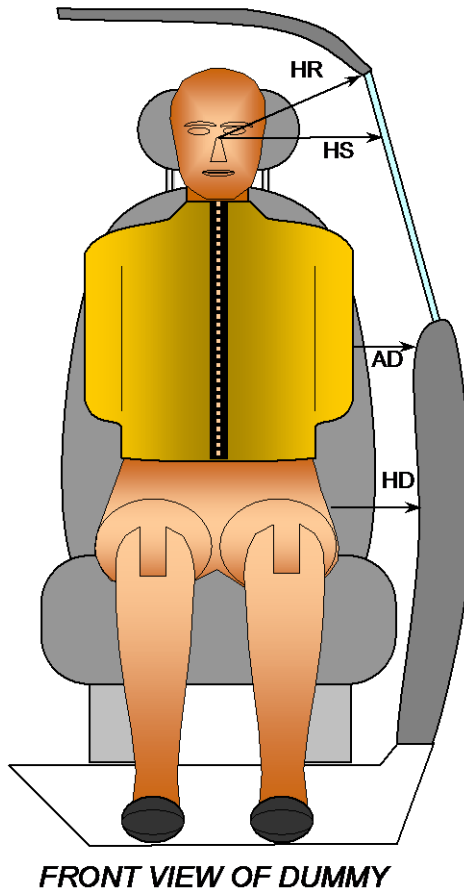
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	366			
HW		Header to Windshield	581			
HZ	HZ	Head to Roof Liner	182		274	
NR	NB	Nose to Rim/Seat Back	445		637	
CD	CB	Chest to Dash/Seat Back	551		626	
CS		Chest to Steering Wheel	280			
KD(L)/KDA(L) ⁰	KB(L)/KBA(L) ⁰	Left Knee to Dash/Seat Back	116	28.0	350	9.0
KD(R)/KDA(R) ⁰	KB(R)/KBA(R) ⁰	Right Knee to Dash/Seat Back	80	16.0	350	9.0
PAX ⁰	PAX ⁰	Pelvic Tilt Angle X		0.1		0.3
	PAY ⁰	Pelvic Tilt Angle Y				16.0
PHX	PHX	Hip Point to Striker (X-Axis)	275		256	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	95		200	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14

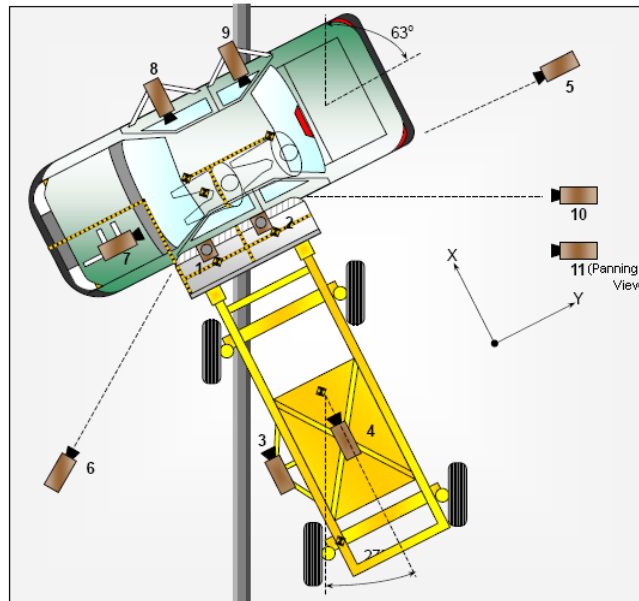


Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	205	202
HS	Head to Side Window ¹	mm	327	324
AD	Arm to Door	mm	102	114
HD	H-Point to Door	mm	156	131

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	-840	-5709	16	1000
2	Overhead Close-up	0	-1145	-5709	8.5	1000
3	Left Impact Point (MDB)	-1755	-860	-825	25	1000
4	Side Overall (MDB)	-2434	0	-1445	8.5	1000
5	Rear	-385	7401	-1317	Zoom	1000
6	Left Front	-2897	-4583	-1316	Zoom	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

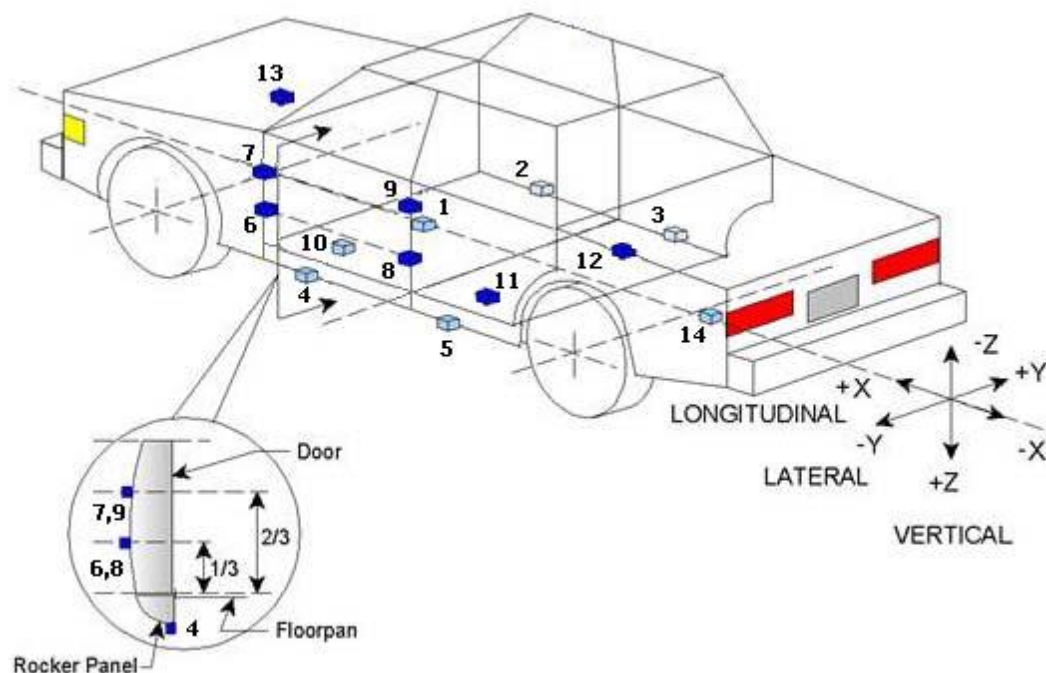
Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	7
TOTAL	62

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



TEST VEHICLE ACCELEROMETER LOCATIONS

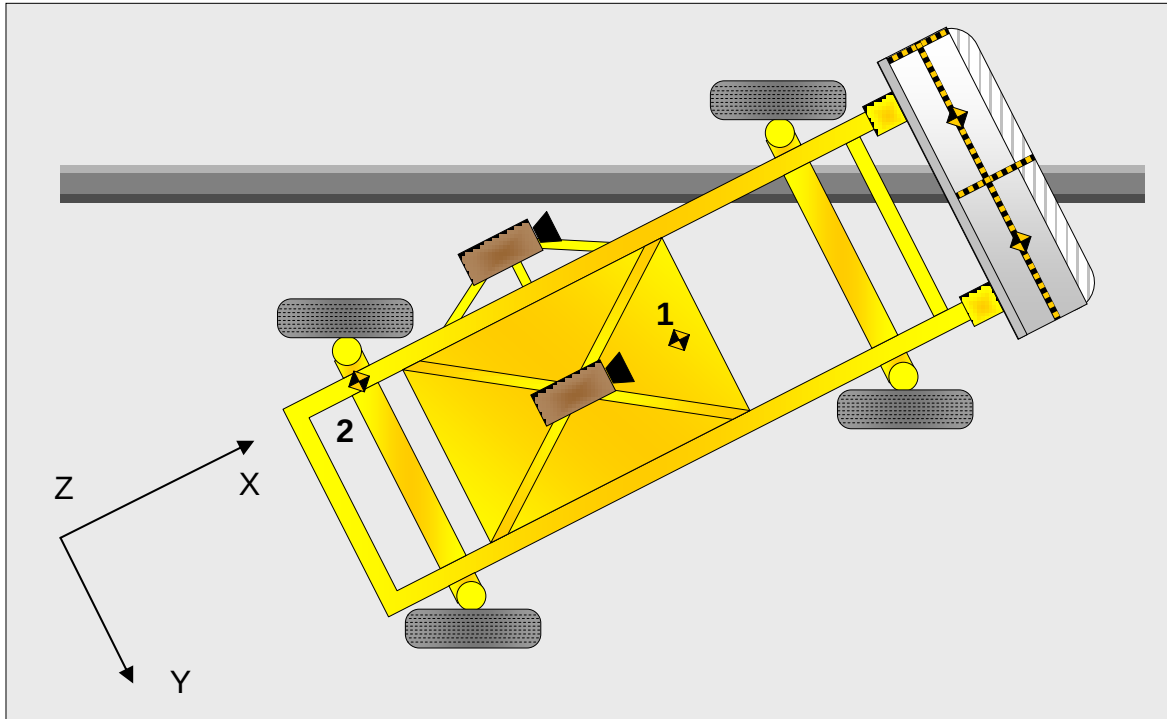
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3006	110	-395
2	Right Sill at Front Seat	2768	690	-388
3	Right Sill at Rear Seat	1883	690	-410
4	Left Sill at Front Door	2790	-690	-385
5	Left Sill at Rear Door	1887	-690	-408
6	A-Post Lower	3230	-800	-500
7	A-Post Middle	3245	-780	-930
8	B-Post Lower	2125	-830	-660
9	B-Post Middle	2100	-805	-1025
10	Front Seat Track	2464	-560	-375
11	Rear Seat Structure	1637	-610	-465
12	Right Rear Occ. Compartment	1665	640	-414
13	Engine Block	3890	60	-832
14	Rear Above Axle	1140	25	-628

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: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-2179	0	-505
2	MDB Rear	-3648	-650	-618

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2014 Nissan Rogue SUV
Test Program: NCAP Side Impact

NHTSA No.: M20145208
Test Date: 2/20/14

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB	SCAB
Top of Head	SCAB	SCAB
Left Side of Head	SCAB	SCAB
Back of Head	SCAB	SCAB
Left Shoulder	SCAB/Torso Bag	Door Panel
Upper Torso	Torso/Pelvis Bag	None
Lower Torso	Torso/Pelvis Bag	Door Panel
Left Hip	Torso/Pelvis Bag	Door Panel
Left Knee	None	Door Panel

POST TEST DOOR PERFORMANCE

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

POST TEST SEAT PERFORMANCE

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

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Major Deformation
Sill Separation	None Visible
Windshield Damage	None
Side Window Damage	Rear Shattered
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	N/A		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	No	No	N/A
Other	N/A	N/A	N/A	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2705
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		412
Actual Impact Point (Aft of Front Axle)	mm		418
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	-6
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	+4

**DATA SHEET NO. 9
MDB SUMMARY OF RESULTS**

Test Vehicle: 2014 Nissan Rogue SUV
Test Program: NCAP Side Impact

NHTSA No.: M20145208
Test Date: 2/20/14

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2591
C.G. Location aft of Front Axle	1109

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	437.2	243.0	680.2
Right	kg	344.8	342.6	687.4
Ratio	%	57.2	42.8	100.0
Totals	kg	782.0	585.6	1367.6

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.21
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.21
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

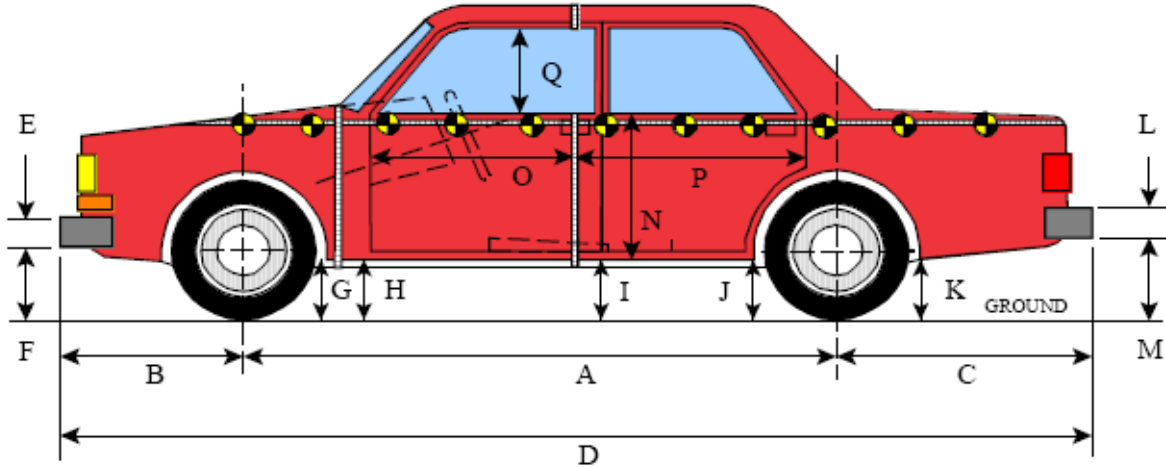
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	227
B	Top of Bumper	533	800	Right	106
C	Mid-Level	686	800	Right	106
D	Top of Stack	813	800	Left	142

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



LEFT SIDE VIEW

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

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

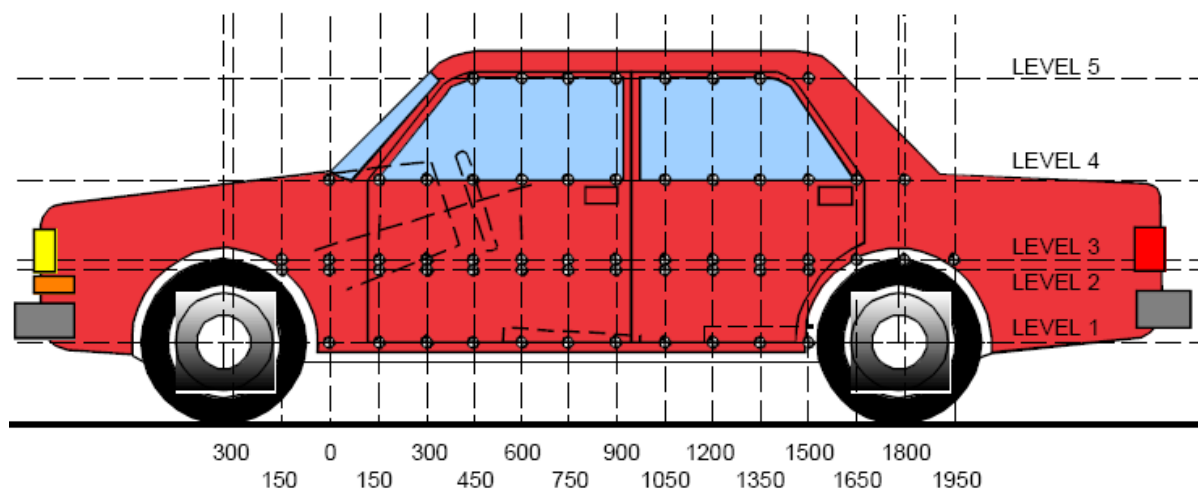
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2705	2690	15
B	Front Axle to Front Surface of Vehicle	929	944	-15
C	Rear Axle to Rear Surface of Vehicle	1005	1015	-10
D	Total Length at Centerline	4643	4655	-12
E	Front Bumper Thickness	110	110	0
F	Front Bumper Bottom to Ground	517	514	3
G	Sill Height at Front Wheel Well	382	386	-4
H	Sill Height at Front Door Leading Edge	378	392	-14
I	Sill Height at B-Pillar	405	481	-76
J1	Sill Height at Rear Wheel Well	414	505	-91
J2	Pinch Weld Height at Rear Wheel Well	270	304	-34
K	Sill Height Aft of Rear Wheel Well	462	477	-15
L	Rear Bumper Thickness	90	90	0
M	Rear Bumper Bottom to Ground	537	553	-16
N	Sill Height to Window Bottom Sill	780	688	92
O	Front Door Leading Edge to Impact CL	804	740	64
P	Rear Door Trailing Edge to Impact CL	1388	1080	308
Q	Front Window Opening	415	413	2
R	Right Side Length	4600	4604	-4
S	Left Side Length	4595	4590	5
T	Vehicle Width at B Pillar	1830	1835	-5

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	413	168	1800
2	Driver Hip Point	690	133	1650
3	Mid-Door	742	146	1650
4	Window Sill	1069	26	1200
5	Window Top	1601	1	900

NOTE: The above measurements were 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: 2014 Nissan Rogue SUV

NHTSA No.: M20145208

Test Program: NCAP Side Impact

Test Date: 2/20/14

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

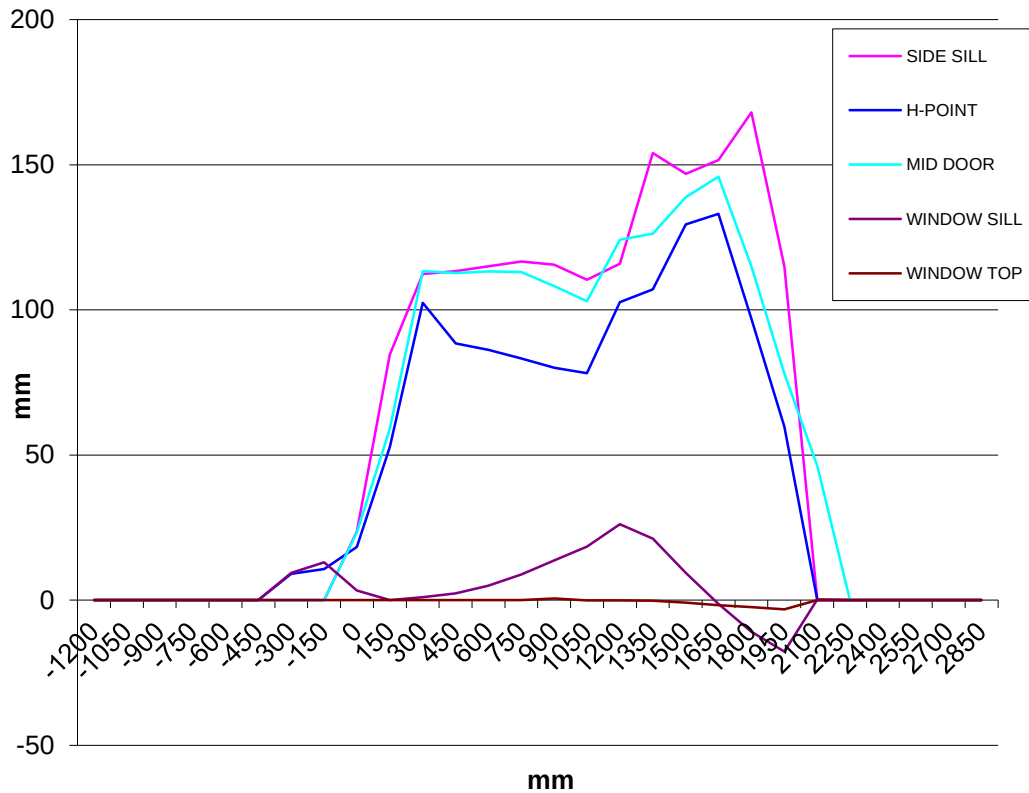
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	1018	0	886	0	0	1009	0	876	0	0	9	0	10	0
-150	0	1018	0	903	0	0	1008	0	890	0	0	10	0	13	0
0	992	1015	1019	916	0	969	997	996	913	0	23	18	23	3	0
150	981	1010	1010	925	0	896	958	951	925	0	85	52	59	0	0
300	967	1010	1003	933	0	855	908	889	932	0	112	102	114	1	0
450	969	1012	1003	940	0	855	923	890	937	0	114	89	113	3	0
600	969	1013	1004	945	0	854	927	891	940	0	115	86	113	5	0
750	970	1014	1004	951	0	853	931	891	942	0	117	83	113	9	0
900	970	1015	1005	956	677	854	935	897	942	676	116	80	108	14	1
1050	969	1015	1006	961	692	859	937	903	942	692	110	78	103	19	0
1200	968	1015	1006	965	700	853	912	882	939	700	115	103	124	26	0
1350	967	1015	1006	966	703	813	908	879	945	703	154	107	127	21	0
1500	966	1014	1005	968	704	819	885	866	959	704	147	129	139	9	0
1650	964	1013	1004	970	701	812	880	858	972	703	152	133	146	-2	-2
1800	962	1012	1003	971	694	794	915	888	982	696	168	97	115	-11	-2
1950	959	1011	1002	970	677	844	951	924	988	681	115	60	78	-18	-4
2100	950	1007	998	967	0	928	973	952	967	0	22	34	46	0	0
2250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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: 2014 Nissan Rogue SUV
Test Program: NCAP Side Impact

NHTSA No.: M20145208
Test Date: 2/20/14

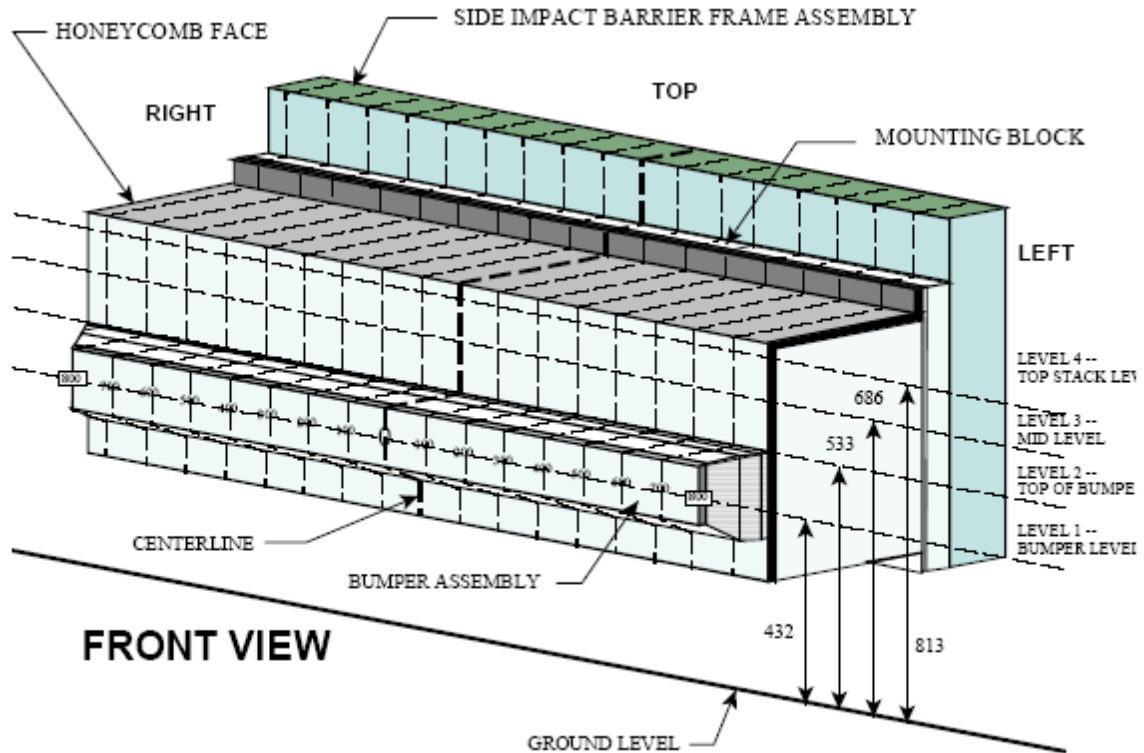


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14



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	83	64	54	66	75	110	108	86	64	61	59	64	64	74	83	95	142
2	106	78	49	47	60	88	95	79	57	42	36	31	34	38	45	58	100
3	106	99	99	96	--- ¹	--- ¹	--- ¹	--- ¹	81	77	71	65	63	61	60	60	71
4	227	224	221	217	214	212	207	204	200	197	193	190	186	184	180	178	176

¹Faro points missing post test.

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

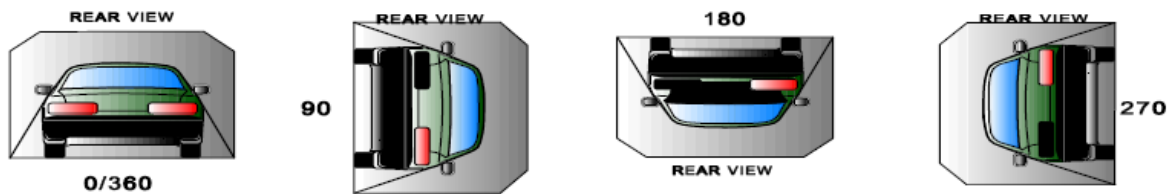
Test Vehicle: 2014 Nissan Rogue SUV
 Test Program: NCAP Side Impact

NHTSA No.: M20145208
 Test Date: 2/20/14

Test Time: 14:28 **Temperature:** 21.5°C

- 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	90	330	420
90 to 180	90	330	840
180 to 270	90	330	1260
270 to 360	90	330	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

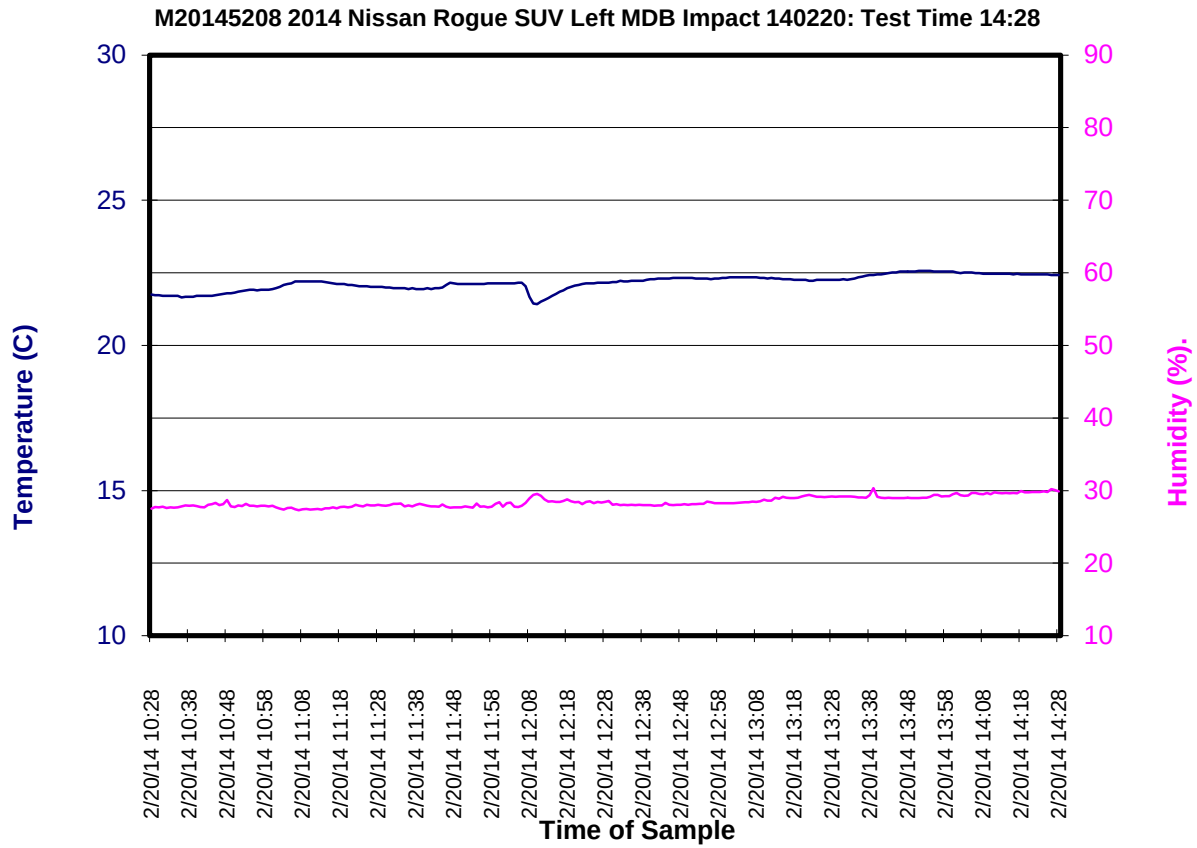
Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2014 Nissan Rogue SUV
Test Program: NCAP Side Impact

NHTSA No.: M20145208
Test Date: 2/20/14



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



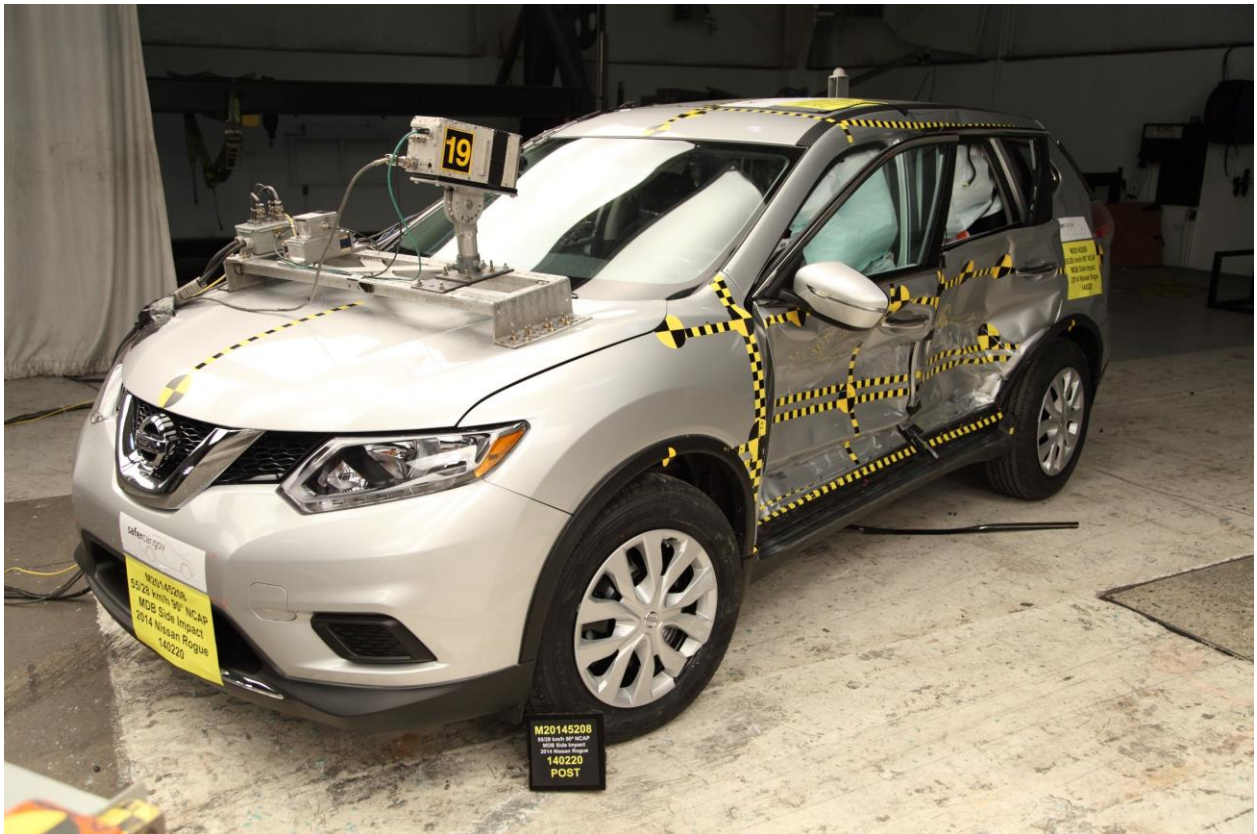
003 Pre-Test Front View of Test Vehicle



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



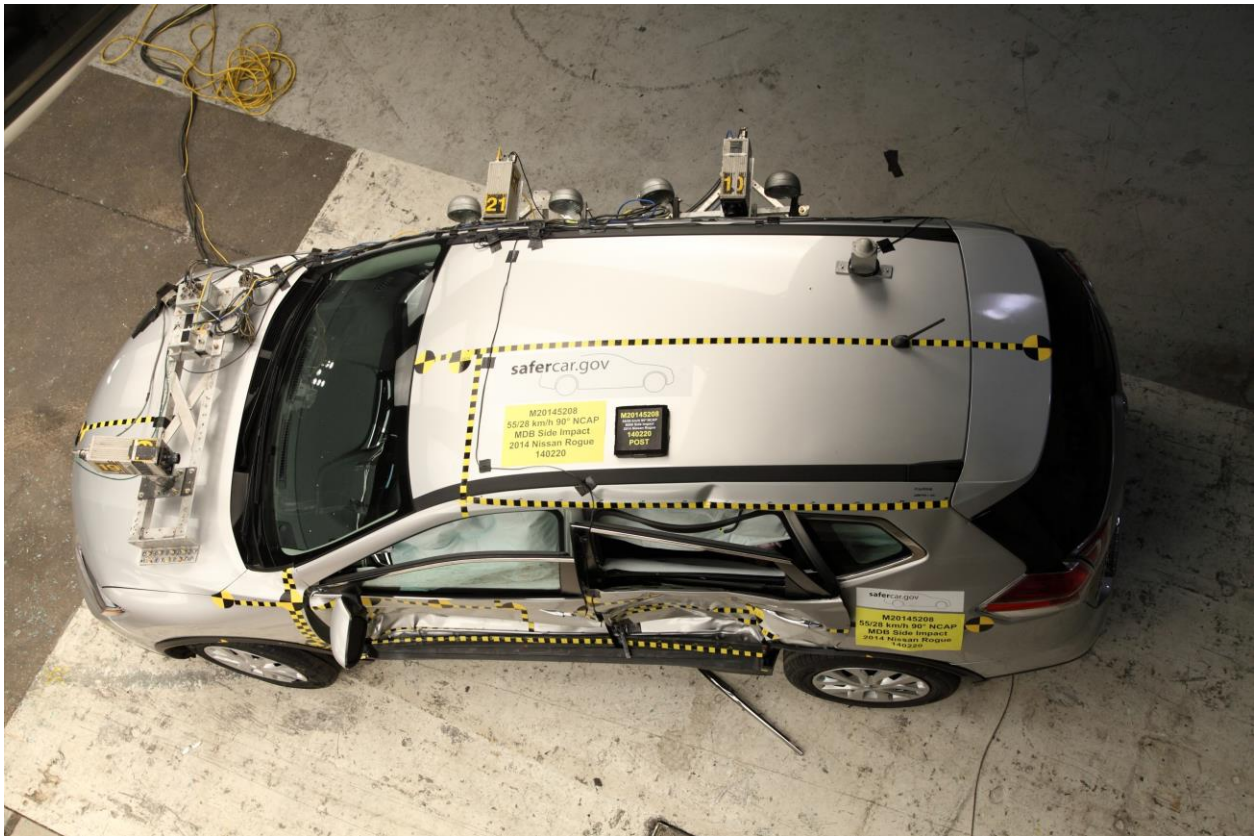
013 Pre-Test Right Side View of Test Vehicle



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 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



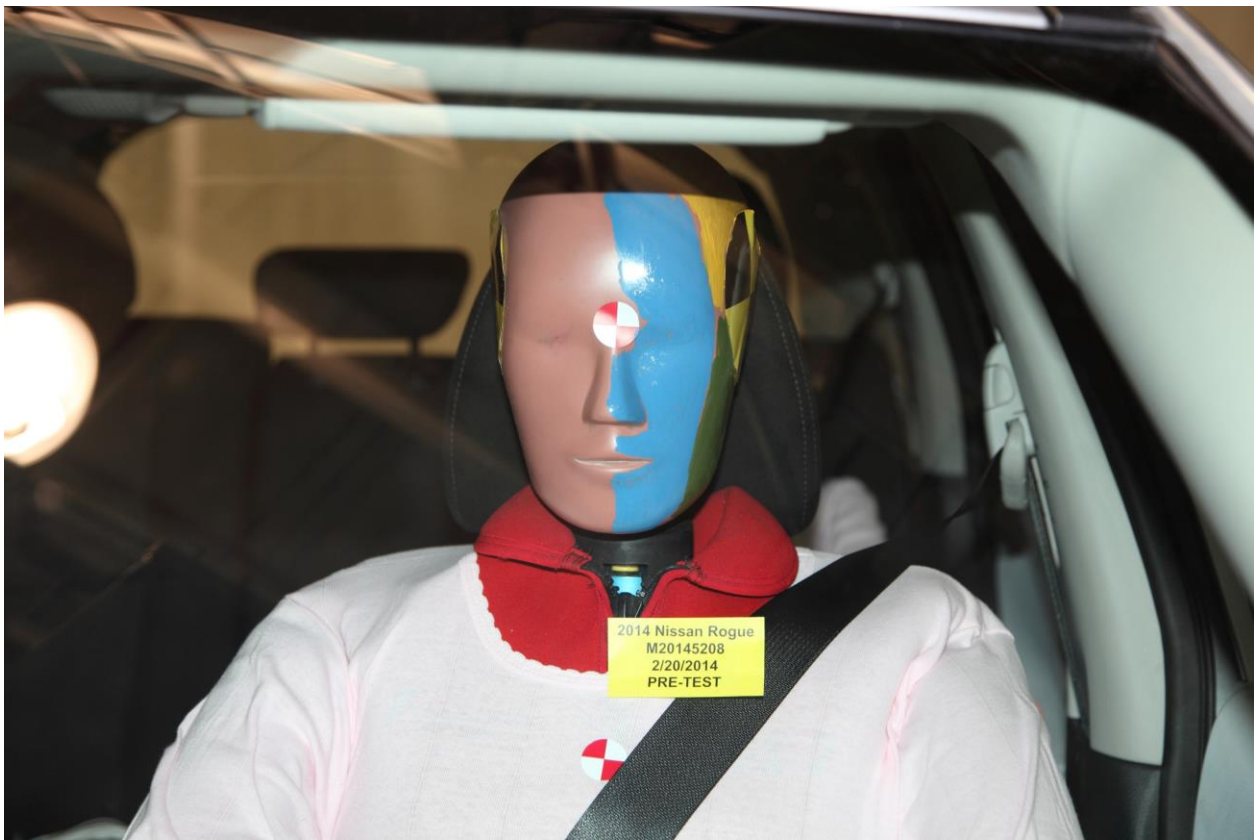
022 Post-Test Left Front Door Latch Close-up



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



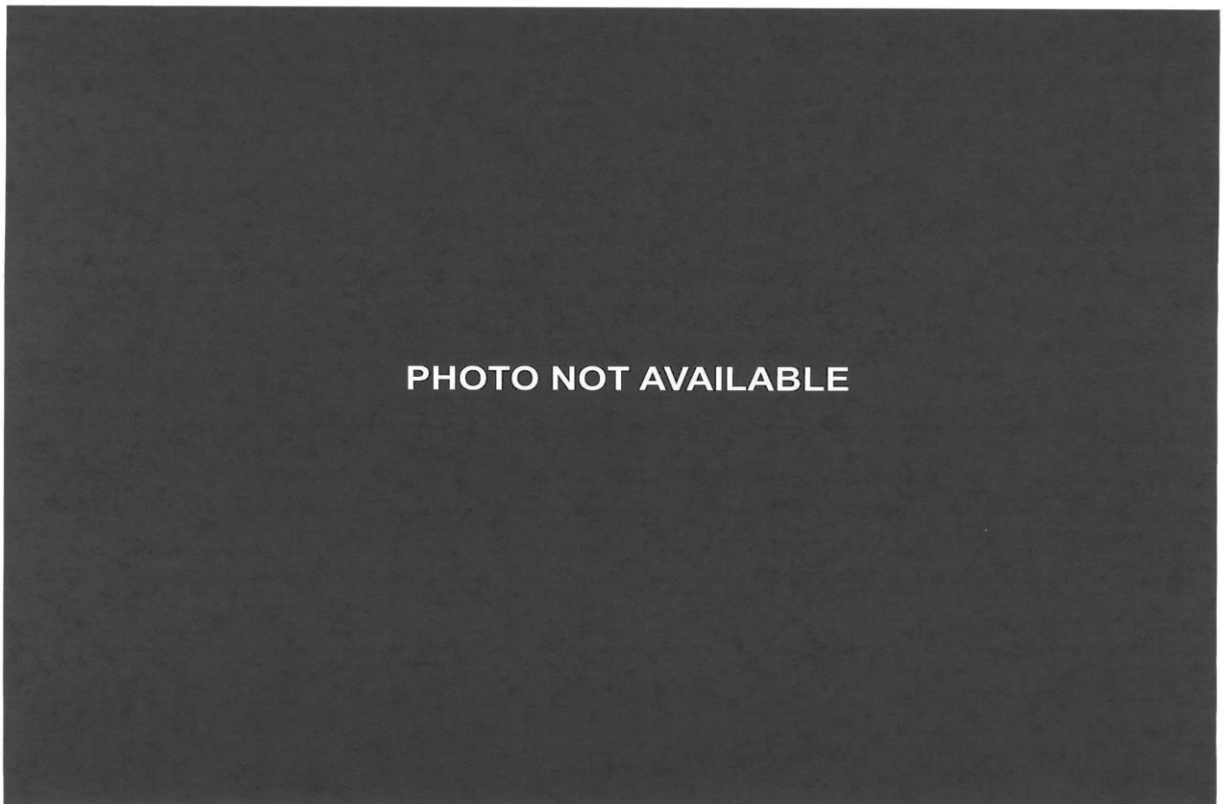
035 Pre-Test View of Belt Anchorage for Driver Dummy



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



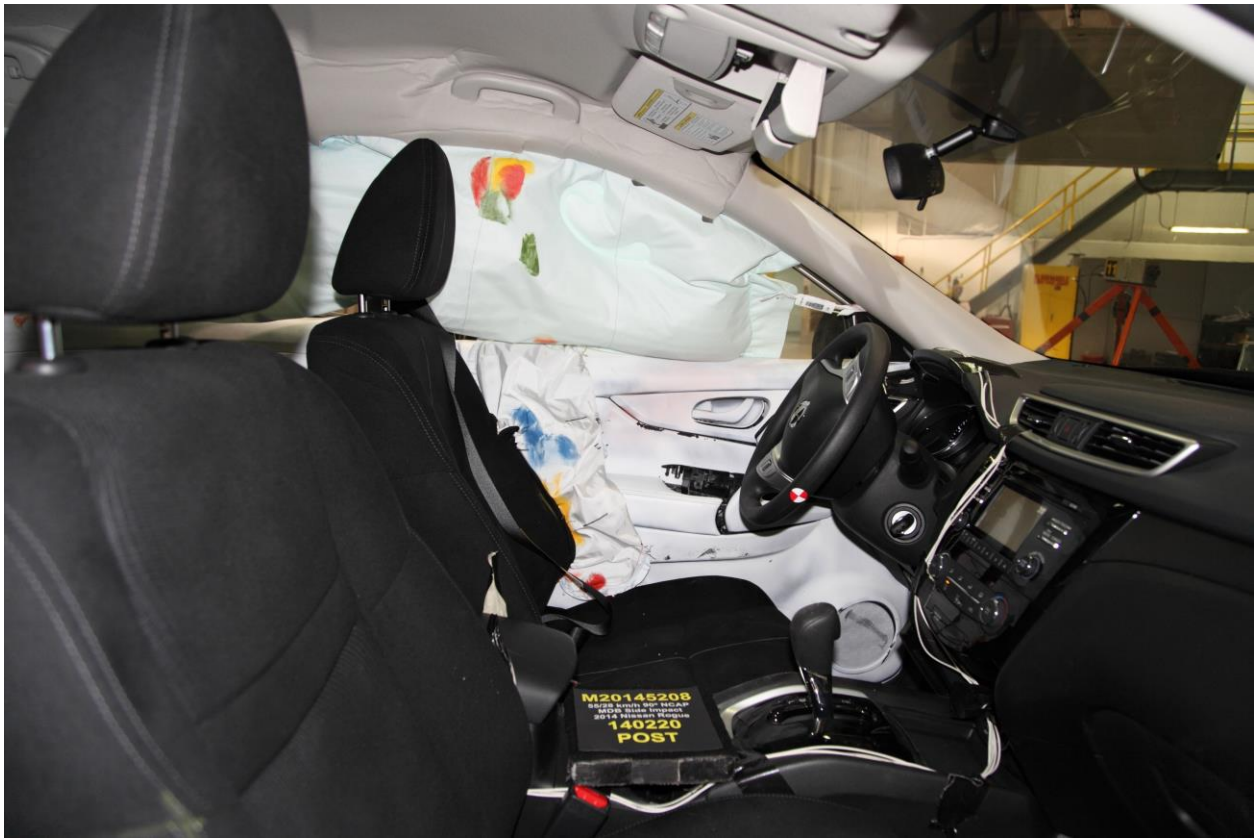
044 Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



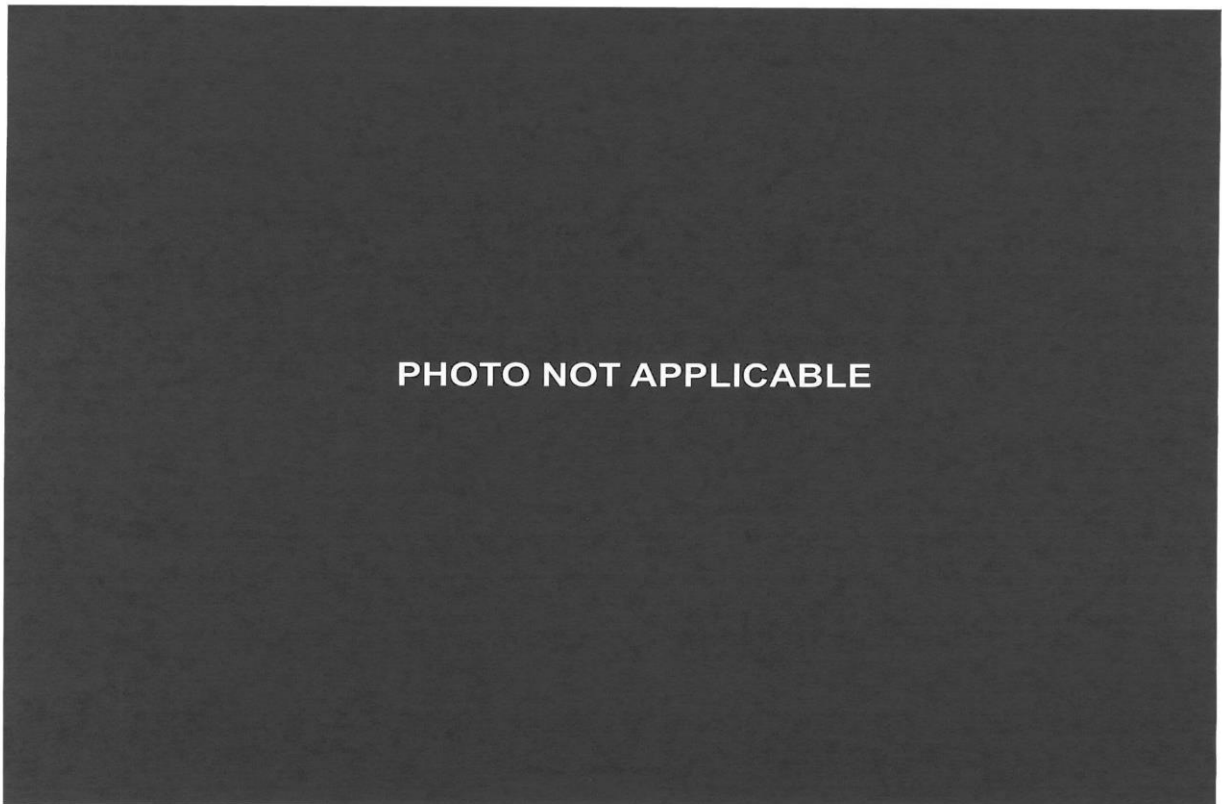
045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



046 Pre-Test Driver Inner Door Panel View



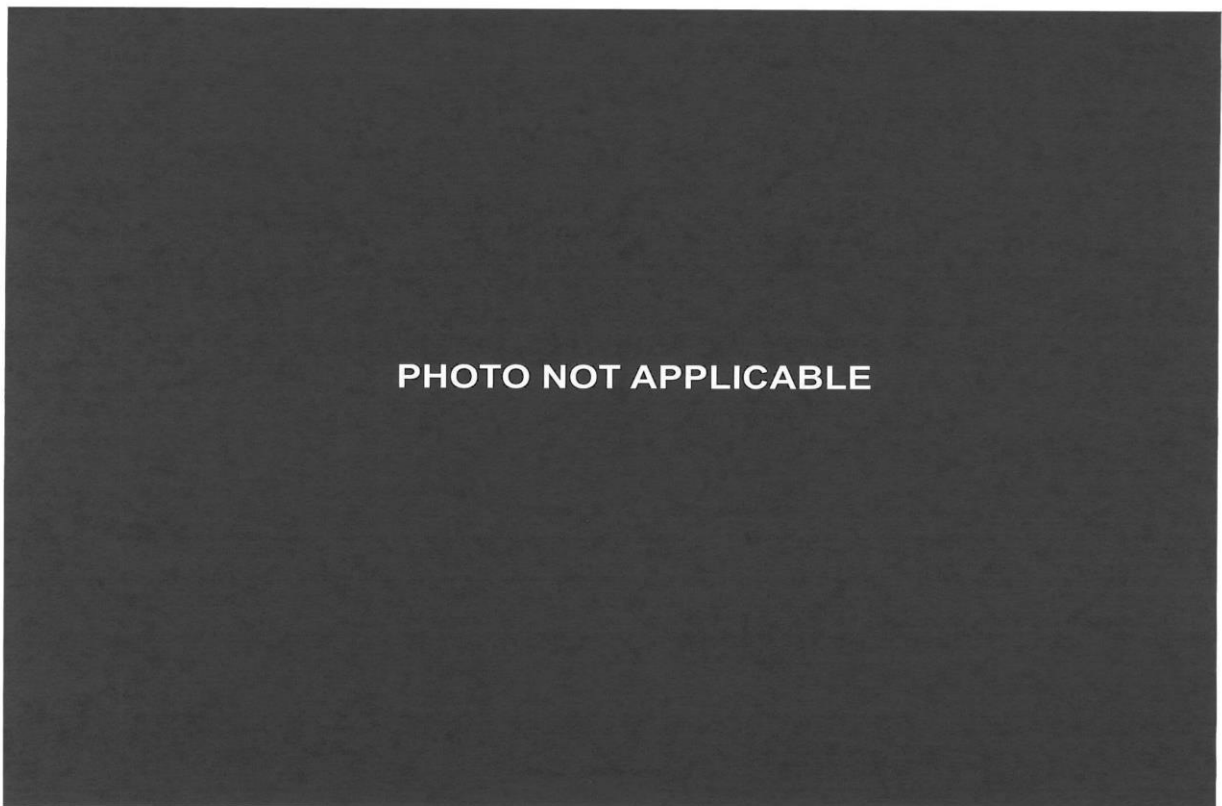
047 Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations



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



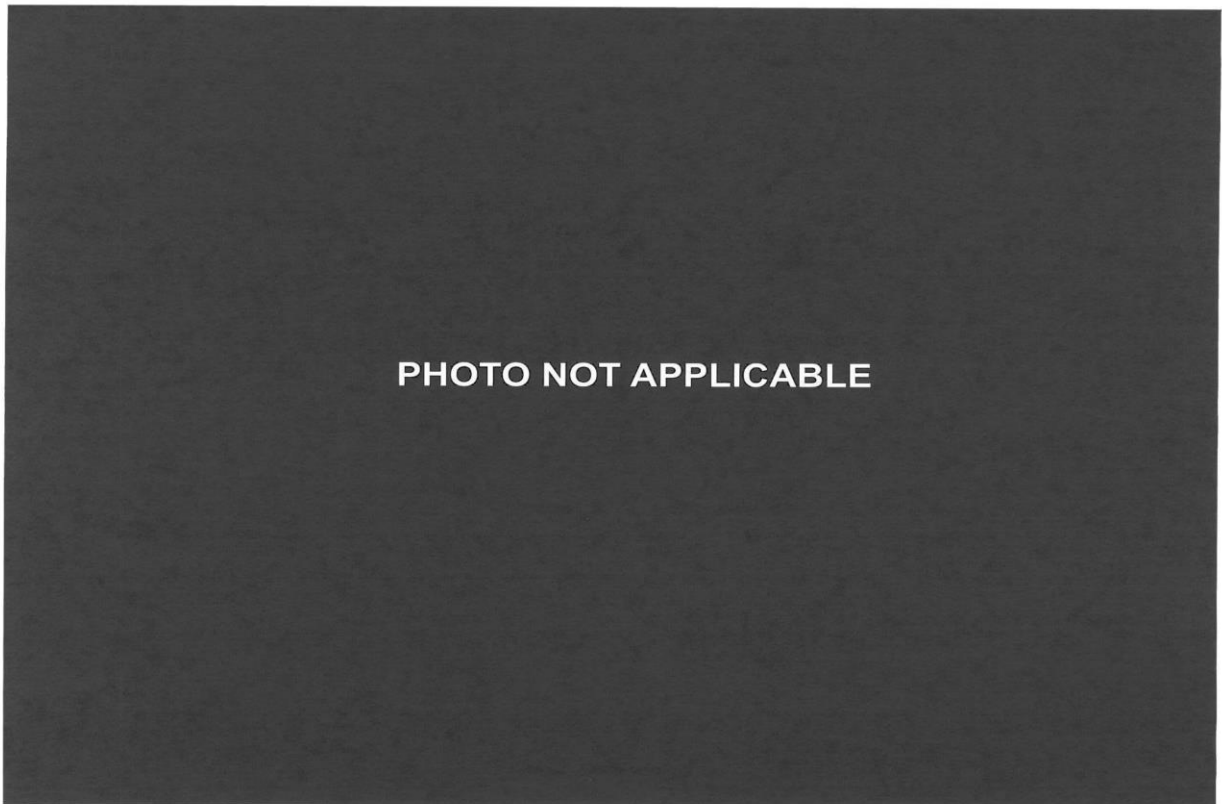
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



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



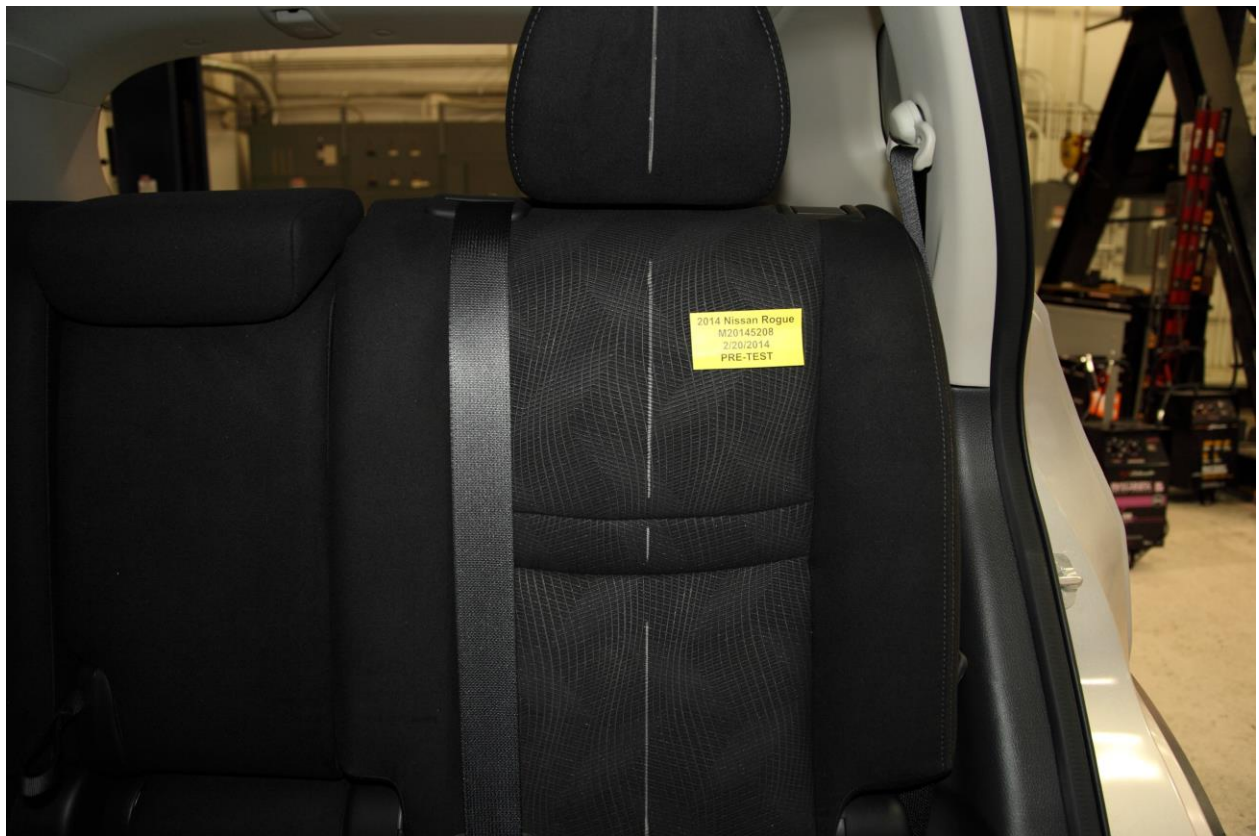
055 Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking



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

PHOTO NOT AVAILABLE

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 Showing

PHOTO NOT APPLICABLE

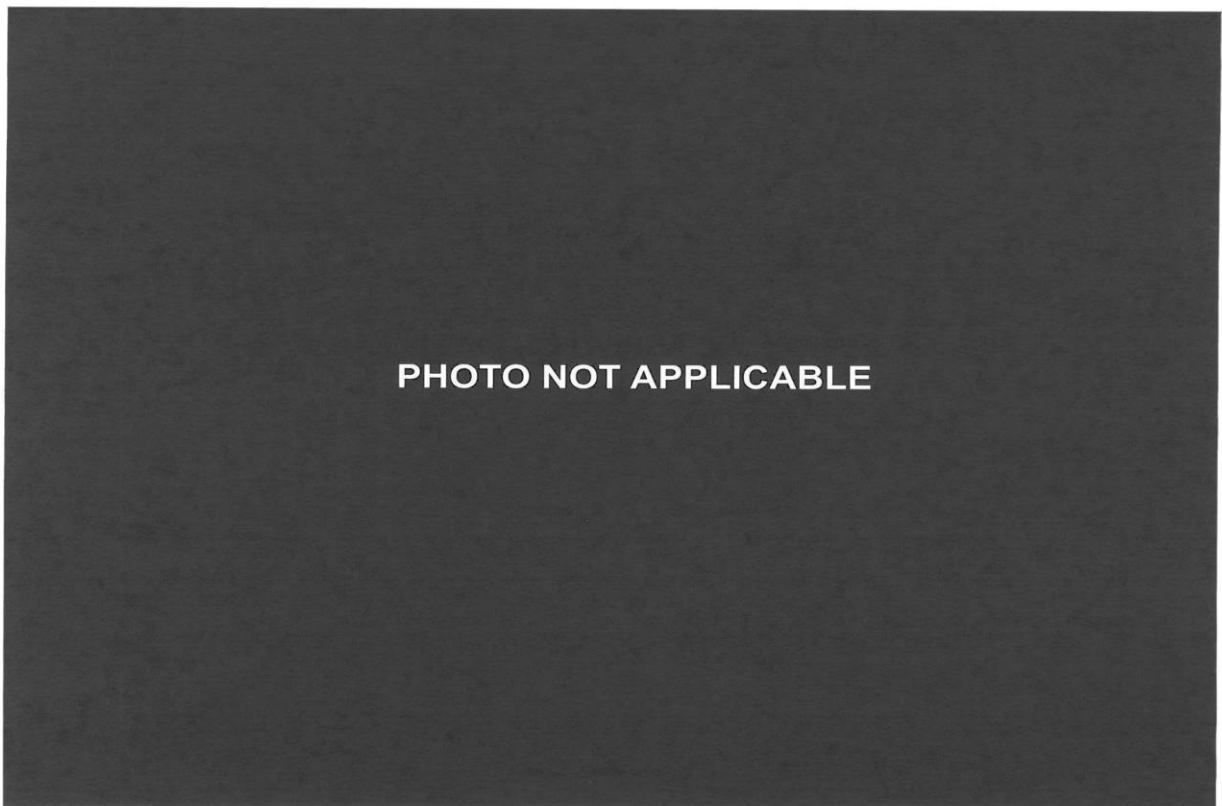
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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



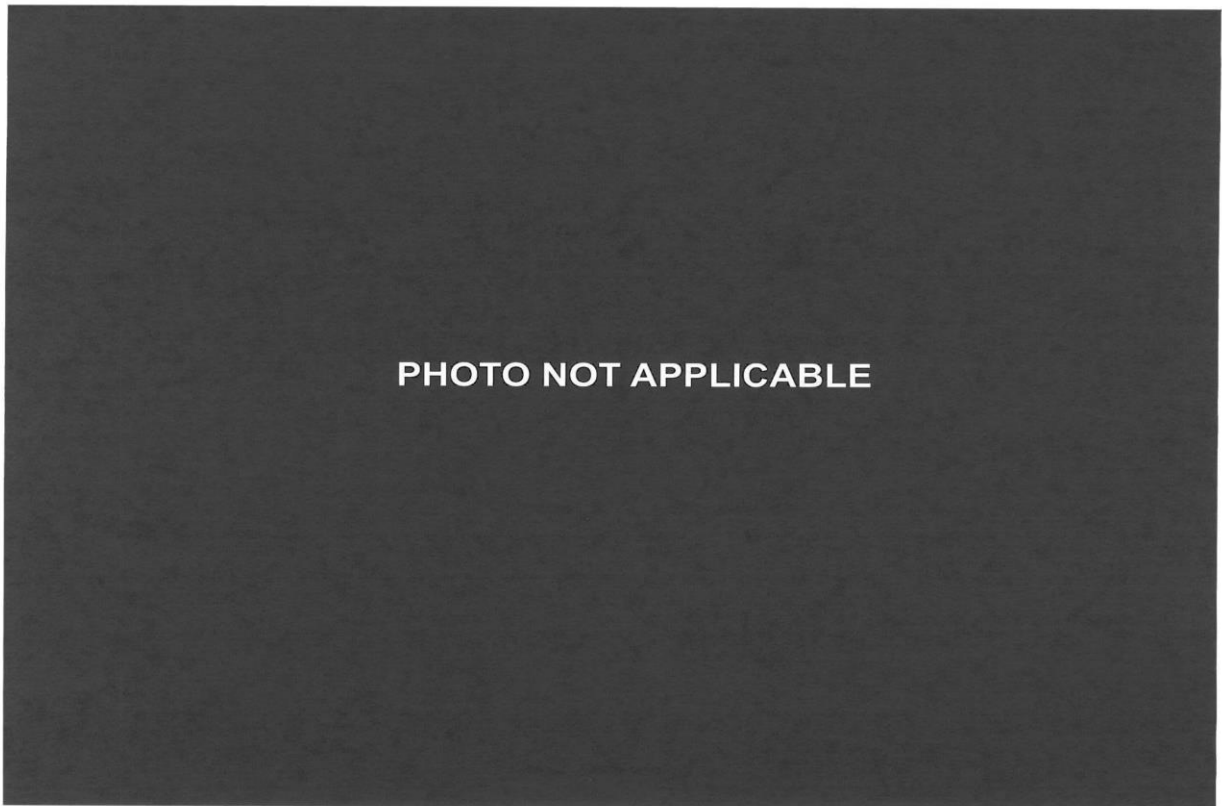
077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



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



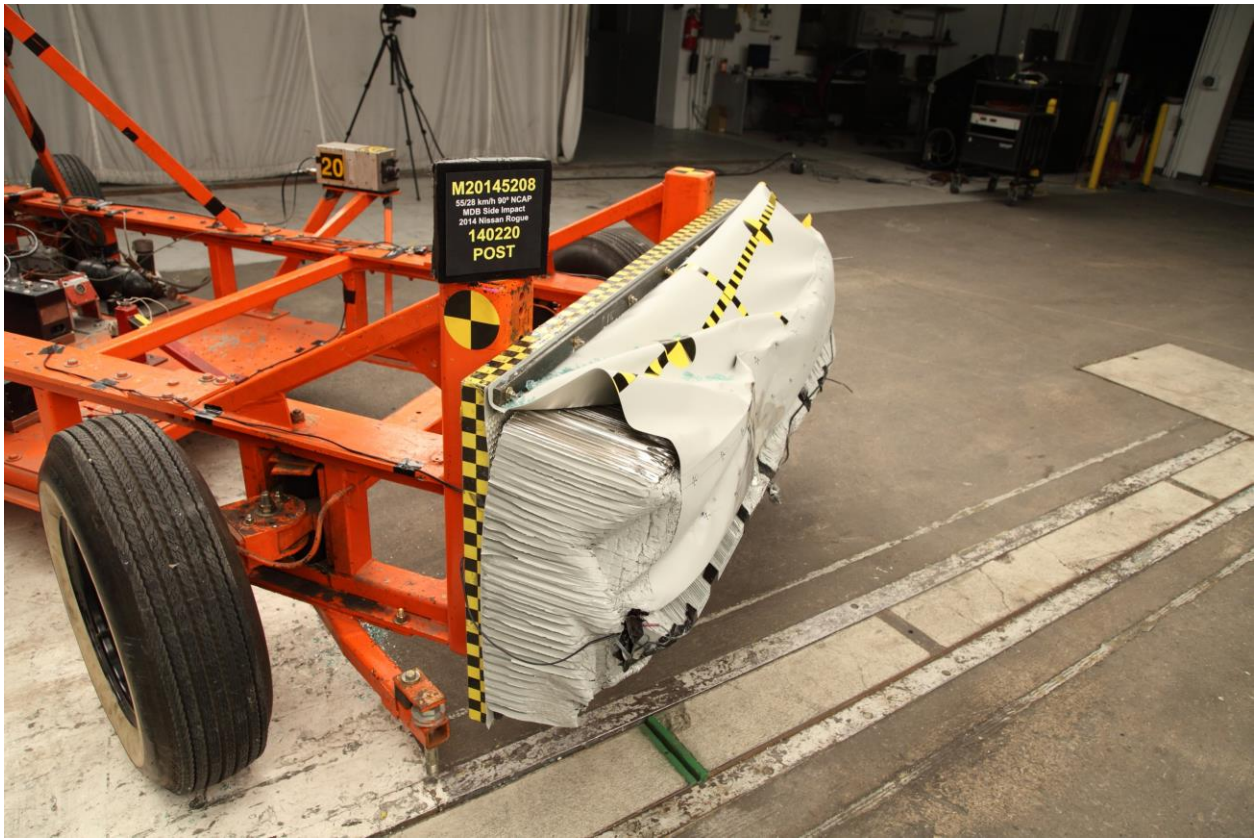
088 Pre-Test Left Side View of MDB Impactor Face



089 Post-Test Left Side View of MDB Impactor Face



090 Pre-Test Right Side View of MDB Impactor Face



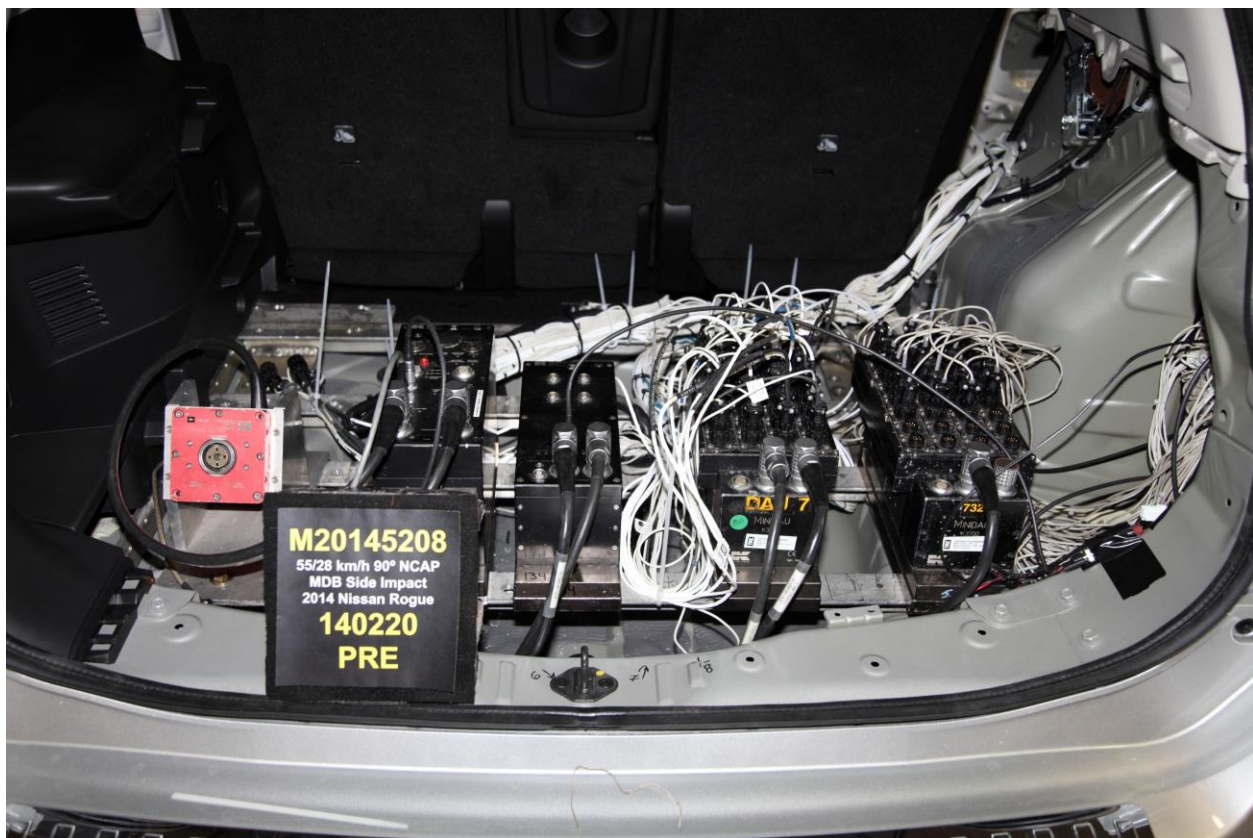
091 Post-Test Right Side View of MDB Impactor Face



092 Close-Up View of Vehicle Certification Label



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



094 Pre-Test Ballast View



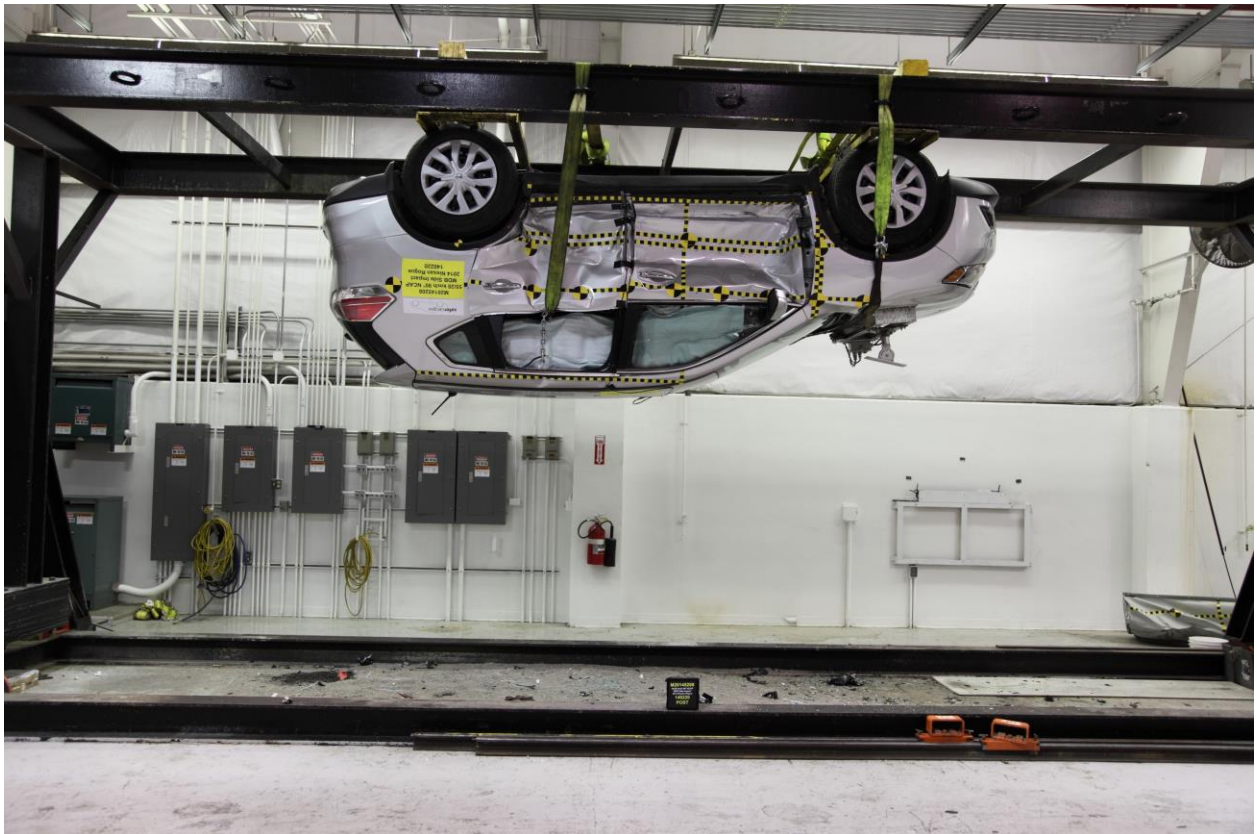
095 Post-Test Primary Speed Trap Read-Out



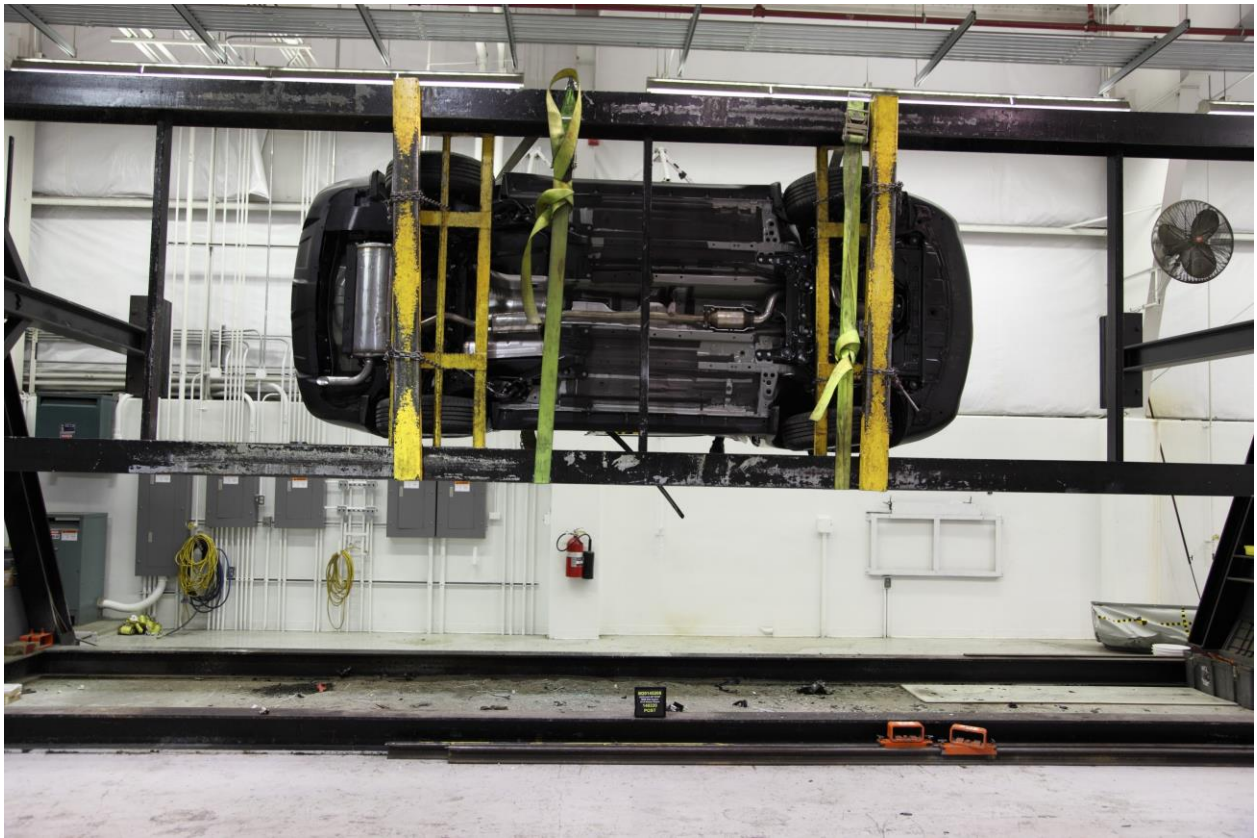
096 FMVSS No. 301 Static Rollover 0 Degrees



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 Event



2014 ROGUE S FWD

Scan QR code for general model information & options

THE ALL-NEW ROGUE

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
 2.5-liter DHC 14 Engine
 170 Horsepower and 175 lb-ft of Torque
 Xtronic CVT (Continuously Variable Transmission) with Sport Mode Switch
 Front-Wheel Drive
 4-Wheel Front and Rear Disc Brakes
 17" Steel Wheels with Full Wheel Covers
 All Season Tires/Temporary Spare Tire
 Hill Start Assist

SAFETY & SECURITY
 Driver & Front Passenger Side-Impact, Curtain Air Bags
 Lower Anchors and Tethers for Children (LATCH)
 4-Wheel Anti-Lock Braking System
 Vehicle Dynamic Control (VDC) with Traction Control System (TCS)
 Electronic Brake Force Distribution (EBD) and Brake Assist (BA)
 Nissan Vehicle Immobilizer System
 Vehicle Security System
 Tire Pressure Monitoring System (TPMS) with position monitoring
 TPMS with Easy Fill Tire Alert

COMFORT & CONVENIENCE
 6-Way Manual Driver Seat
 4-Way Manual Front Passenger Seat
 EZ Flex® Seating System
 40/20/40 Folding and Reclining 60/40 Sliding 2nd Row
 4-Speaker AM/FM/CD Audio System
 Auxiliary Audio Input Jack
 NissanConnect™
 5" Color Audio Display
 USB connection port for iPod® interface and other compatible devices
 Bluetooth® Hands-free Phone System
 Streaming Audio via Bluetooth®
 Hands-free text messaging assistant
 Advanced Drive-Assist® Display
 3 12-volt power points
 Rear View Monitor

COMFORT & CONVENIENCE CONT.
 2nd row seat A/C vents
 Illuminated Visor Vanity Mirrors with visor extenders
 Divide-N-Hide® Cargo System
 Power Door Locks w/ Auto Locking Feature
 Power Windows w/ DR Auto Up/Down
 Active Trace Control
 Active Engine Braking
 Active Ride Control

EXTERIOR
 LED Daytime Running Lights
 Halogen Headlights w/ Auto Off Function
 Body Color Outside Mirrors w/ Integrated LED Turn Signals
 Rear Window Wiper w/ Reverse Wiper Link

Manufacturer's Suggested Retail Base Price: \$22,490.00
Options Included by Manufacturer:
 SPLASH GUARDS \$135.00
 REAR BUMPER PROTECTOR \$85.00
 FLOOR MATS (2-PC FRONT & 2-PC 2ND ROW) \$25.00
DESTINATION CHARGES: \$650.00
Total: \$23,695.00

DEALER'S SPECIAL:
 \$1,900 off MSRP
 \$21,795.00

Fuel Economy and Environment

Fuel Economy
28 MPG
 combined city/hwy
 26 city
 33 highway
 3.6 gallons per 100 miles

Annual fuel cost
\$1,900

Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only)
 7 5
 1 10 1 10
 Best Worst

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score To Be Rated
 Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

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

Side Crash Front seat Rear seat To Be Rated
 Based on the risk of injury in a side impact.

Rollover To Be Rated
 Based on the risk of rollover in a single-vehicle crash.

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

DELIVERY

VEHICLE COLORS:
 EXT: BRILLIANT SILVER
 INT: CHARCOAL

FINAL ASSEMBLY POINT:
 SMYRNA

TRANSPORT METHOD:
 TRUCK

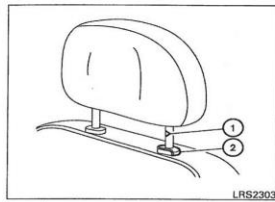
DEALER:
 GERALD NISSAN OF N AURORA
 213 HANSEN BLVD
 NORTH AURORA IL
 60542

VIN: 5N1AT2MT2C765157
 EMS: 50 STATE EMISSIONS
 MDL: 22114-765157 K23-G
 OPT: F-892893C03LR2

2013/10/20/24/35A/3510

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

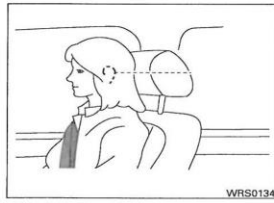
102 Monroney Label



LRS2303

Install

1. Align the head restraint/headrest stalks with the holes in the seat. Make sure the head restraint/headrest is facing the correct direction. The stalk with the notch (notches) ① must be installed in the hole with the lock knob ②.
2. Push and hold the lock knob and push the head restraint/headrest down.
3. Properly adjust the head restraint/headrest before an occupant uses the seating position.

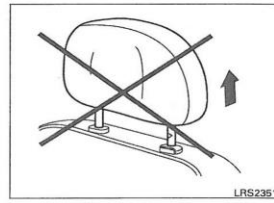


WRS0134

Adjust

For adjustable head restraint/headrest

Adjust the head restraint/headrest so the center is level with the center of your ears. If your ear position is still higher than the recommended alignment, place the head restraint/headrest at the highest position.



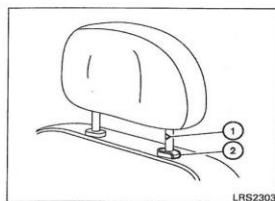
LRS2351

For non-adjustable head restraint/headrest

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

Safety—Seats, seat belts and supplemental restraint system 1-9

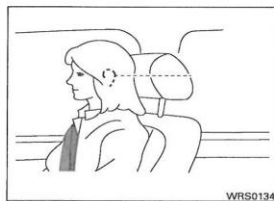
103 Driver Head Restraint Use and Adjustment Information from Vehicle Owner Manual



LRS2303

Install

1. Align the head restraint/headrest stalks with the holes in the seat. Make sure the head restraint/headrest is facing the correct direction. The stalk with the notch (notches) ① must be installed in the hole with the lock knob ②.
2. Push and hold the lock knob and push the head restraint/headrest down.
3. Properly adjust the head restraint/headrest before an occupant uses the seating position.

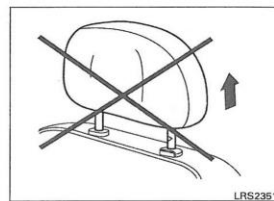


WRS0134

Adjust

For adjustable head restraint/headrest

Adjust the head restraint/headrest so the center is level with the center of your ears. If your ear position is still higher than the recommended alignment, place the head restraint/headrest at the highest position.



LRS2351

For non-adjustable head restraint/headrest

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

Safety—Seats, seat belts and supplemental restraint system 1-9

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) Primary vs. Time	B-8
15	Passenger Head Acceleration (Y) Primary vs. Time	B-8
16	Passenger Head Acceleration (Z) Primary vs. Time	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

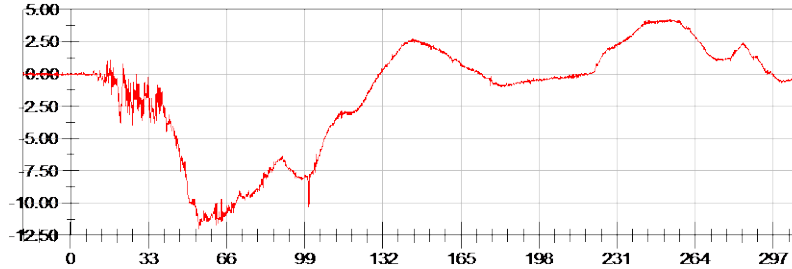
Test Number: 140220 (M20145208)

Test Date: 02/20/2014

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>

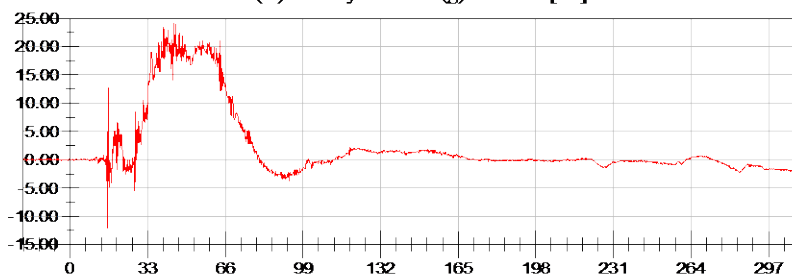
4.24 g at 252.16 ms

<Min>

-12.01 g at 54.24 ms

CFC_1000

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



<Max>

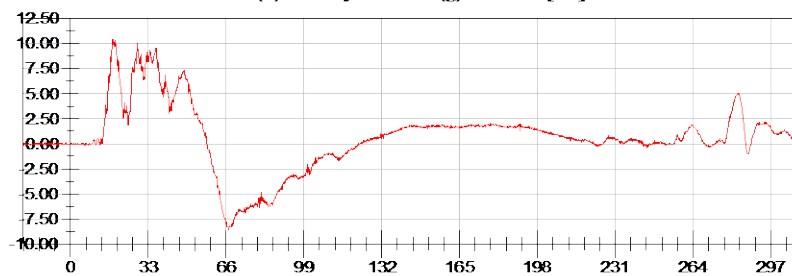
24.21 g at 44.16 ms

<Min>

-12.17 g at 15.92 ms

CFC_1000

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



<Max>

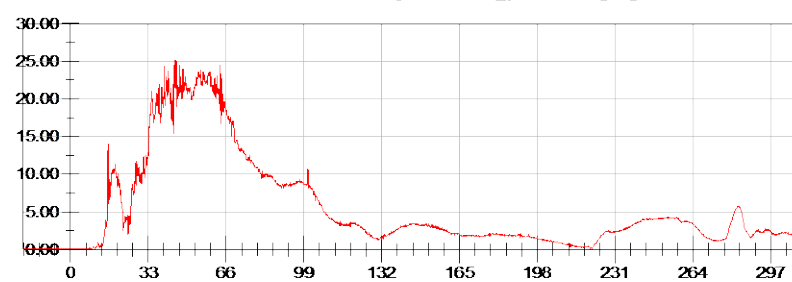
10.43 g at 18.00 ms

<Min>

-8.58 g at 67.04 ms

CFC_1000

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



<Max>

25.13 g at 44.16 ms

<Min>

0.04 g at -20.00 ms

CFC_1000



NHTSA

Test Lab: CTF

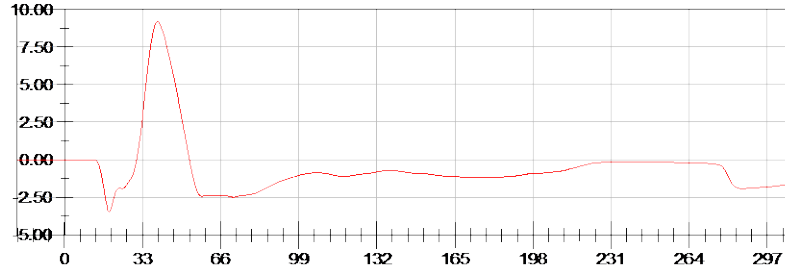
Test Number: 140220 (M20145208)

Test Date: 02/20/2014

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>

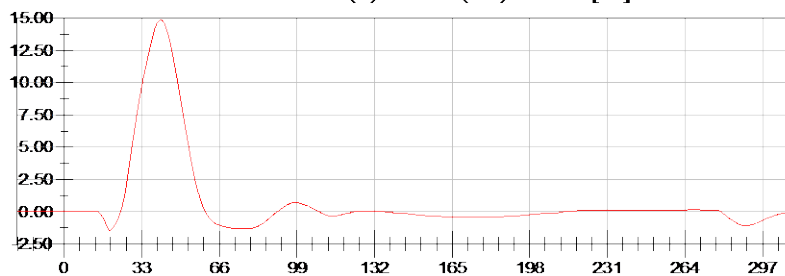
9.18 mm at 39.28 ms

<Min>

-3.46 mm at 18.88 ms

CFC_180

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



<Max>

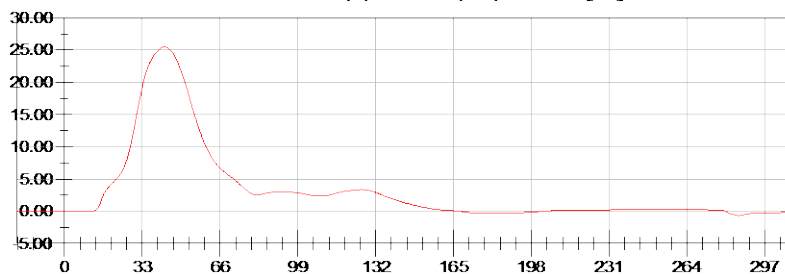
14.86 mm at 41.12 ms

<Min>

-1.46 mm at 19.36 ms

CFC_180

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



<Max>

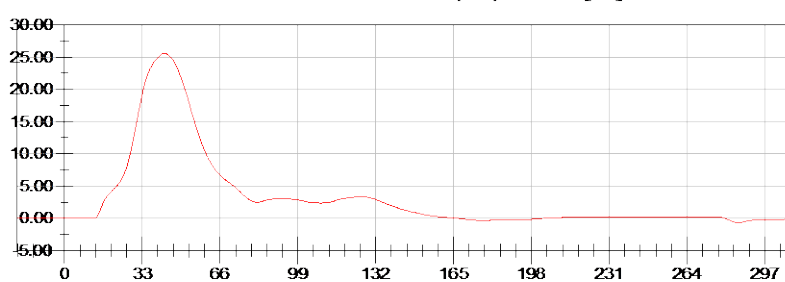
25.51 mm at 42.48 ms

<Min>

-0.68 mm at 285.92 ms

CFC_180

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



<Max>

25.51 mm at 42.48 ms

<Min>

-0.68 mm at 285.92 ms

CFC_180



NHTSA

Test Lab: CTF

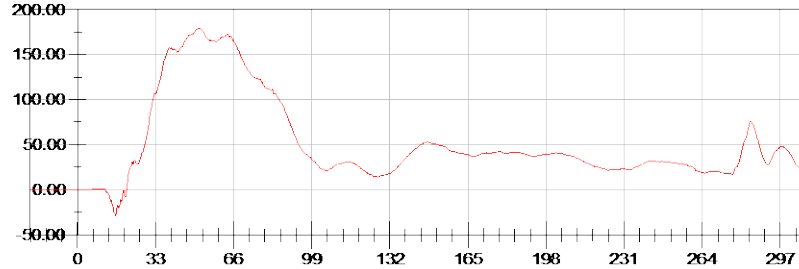
Test Number: 140220 (M20145208)

Test Date: 02/20/2014

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

Position #4 SID IIs Dummy (305)

Driver Anterior Abdominal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

179.11 N at 51.28 ms

<Min>

-28.63 N at 16.16 ms

CFC_600

Driver Middle Abdominal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

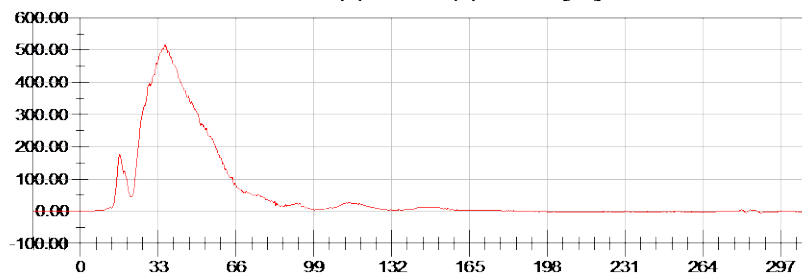
252.86 N at 36.88 ms

<Min>

-4.38 N at 278.80 ms

CFC_600

Driver Posterior Abdominal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

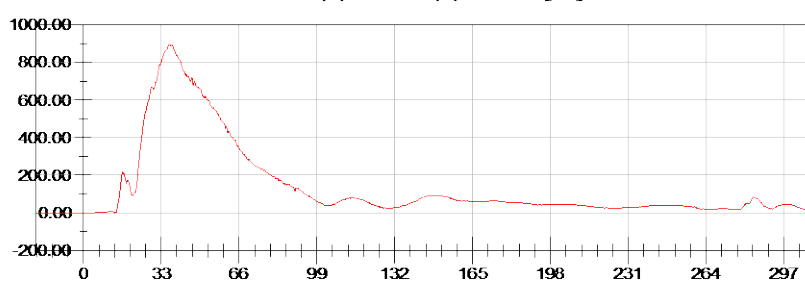
516.37 N at 35.92 ms

<Min>

-7.14 N at 288.40 ms

CFC_600

Driver Total Abdominal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

898.60 N at 36.64 ms

<Min>

-1.08 N at -4.96 ms

CFC_600



NHTSA

Test Lab: CTF

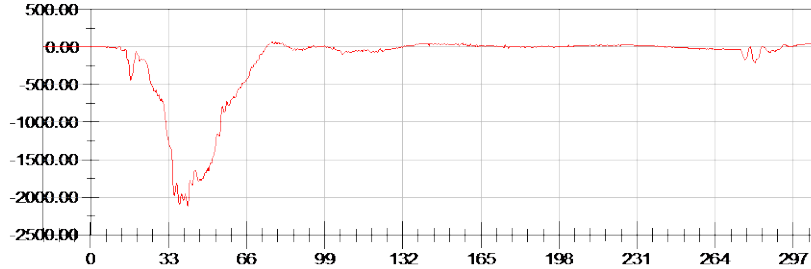
Test Number: 140220 (M20145208)

Test Date: 02/20/2014

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

Position #4 SID IIs Dummy (305)

Driver Pubic Symphysis Force (Y) vs. Time (N) vs. Time [ms]



<Max>

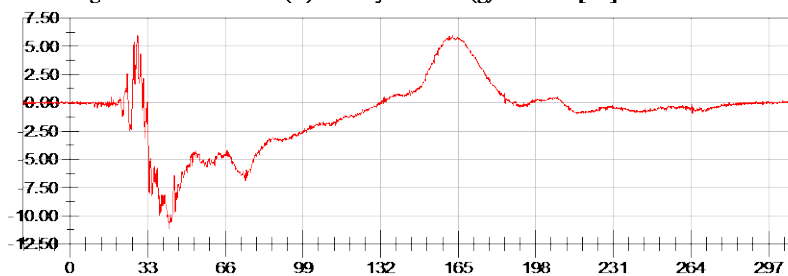
74.91 N at 76.88 ms

<Min>

-2,120.14 N at 41.20 ms

CFC_600

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



<Max>

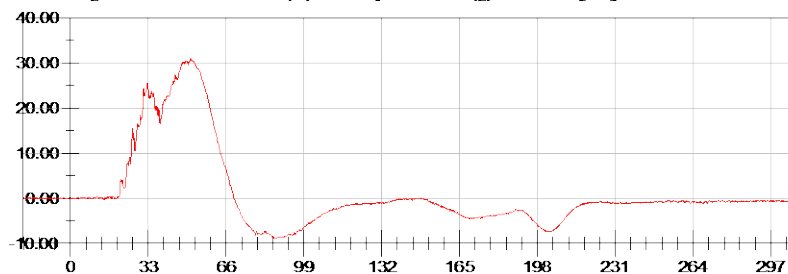
6.01 g at 28.48 ms

<Min>

-11.18 g at 42.08 ms

CFC_1000

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



<Max>

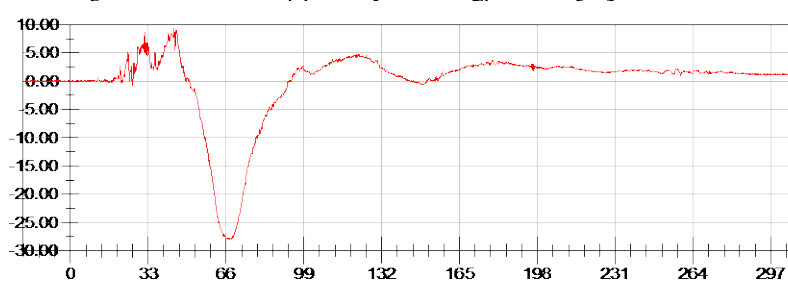
31.13 g at 50.88 ms

<Min>

-8.93 g at 87.60 ms

CFC_1000

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



<Max>

9.36 g at 44.00 ms

<Min>

-28.07 g at 67.76 ms

CFC_1000



NHTSA

Test Lab: CTF

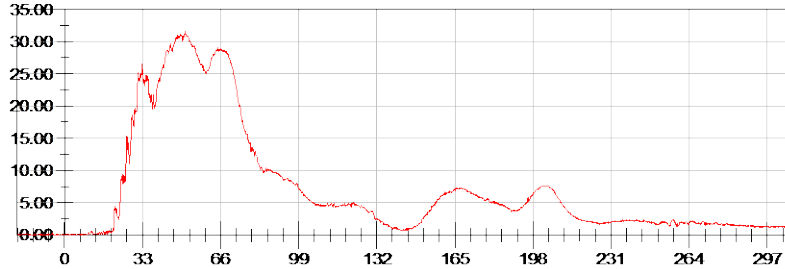
Test Number: 140220 (M20145208)

Test Date: 02/20/2014

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>

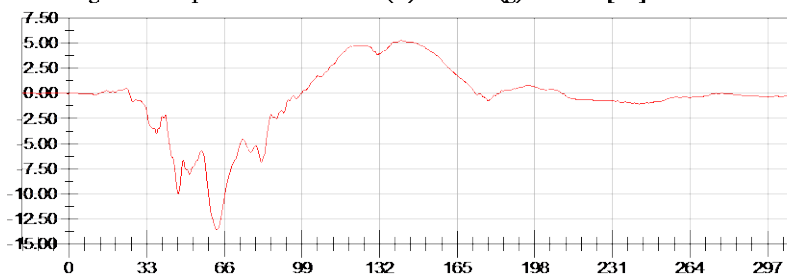
31.66 g at 50.88 ms

<Min>

0.03 g at -18.56 ms

CFC 1000

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



<Max>

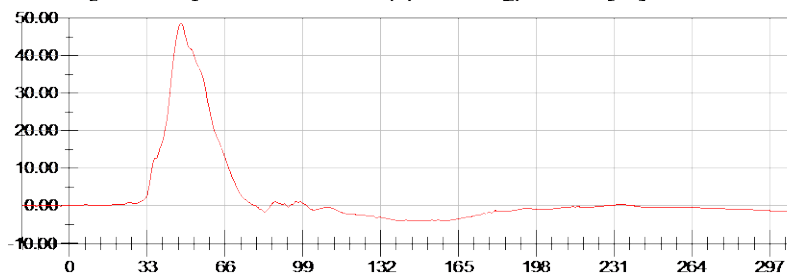
5.26 g at 141.04 ms

<Min>

-13.60 g at 62.80 ms

CFC 180

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



<Max>

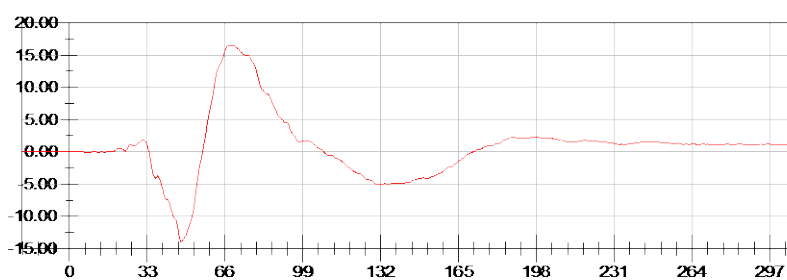
48.59 g at 47.36 ms

<Min>

-4.00 g at 152.00 ms

CFC 180

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



<Max>

16.43 g at 67.76 ms

<Min>

-13.95 g at 47.36 ms

CFC 180



NHTSA

Test Lab: CTF

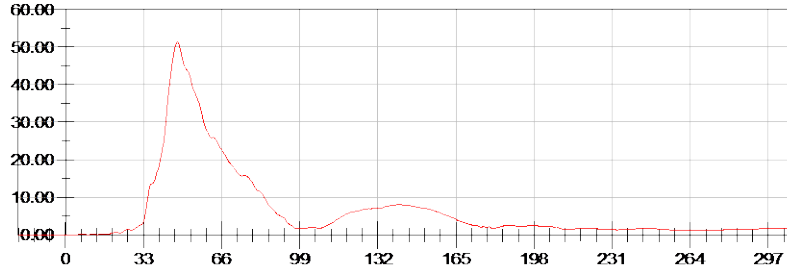
Test Number: 140220 (M20145208)

Test Date: 02/20/2014

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>

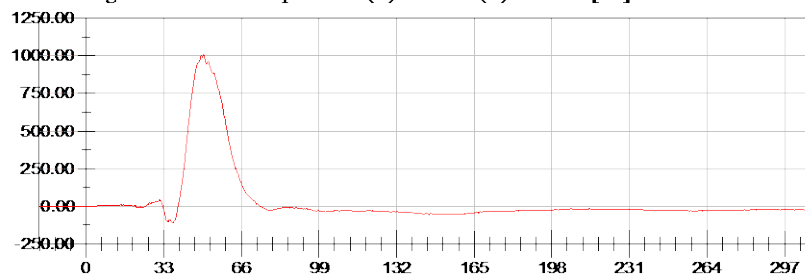
51.33 g at 47.28 ms

<Min>

0.01 g at -7.12 ms

CFC_180

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



<Max>

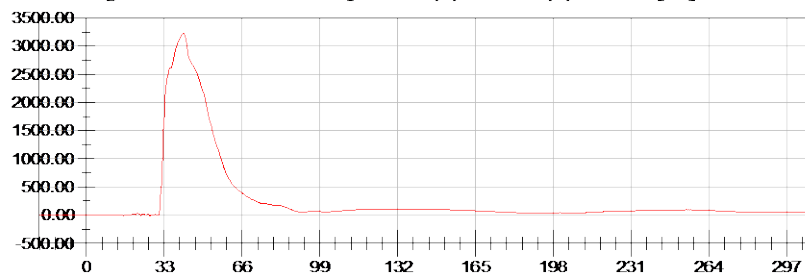
1,007.93 N at 49.92 ms

<Min>

-114.94 N at 36.96 ms

CFC_600

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



<Max>

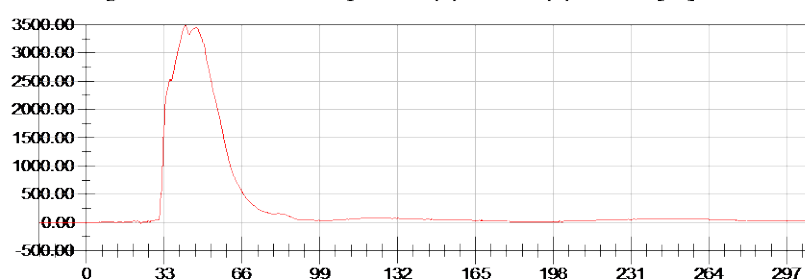
3,229.01 N at 41.28 ms

<Min>

-18.16 N at 23.20 ms

CFC_600

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



<Max>

3,482.28 N at 41.92 ms

<Min>

-19.76 N at 23.20 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

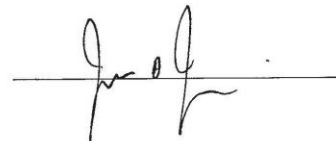
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 23
02/07/14

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	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	471	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	267	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	606	Yes

Technician



Approved




Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 23-1

Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	130.2 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.0 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

02.07.2014 09:09:23 358

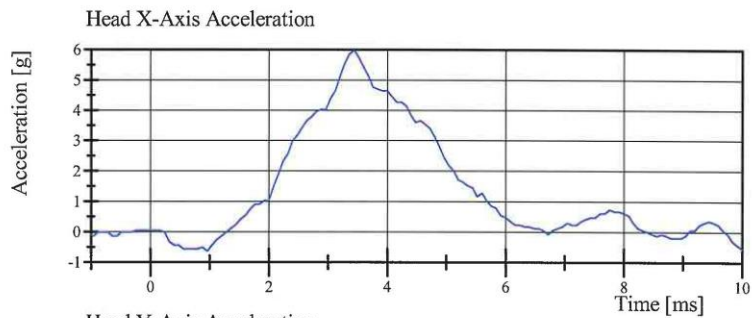


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 23-1

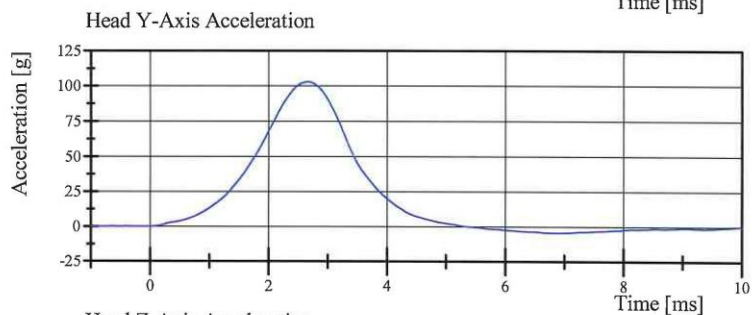
Test Date: 2/7/2014



Filter Class: CFC_1000

Max: 6.0 g at 3.4 ms

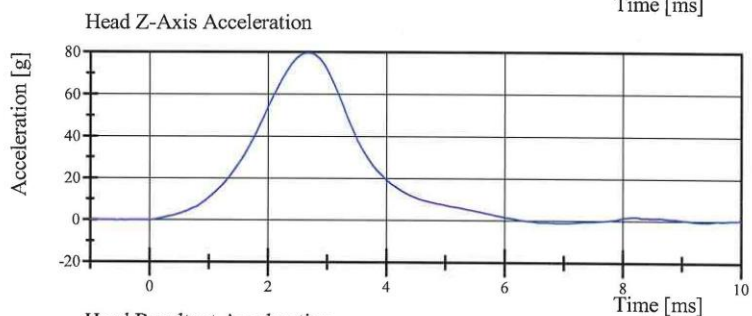
Min: -0.6 g at 1.0 ms



Filter Class: CFC_1000

Max: 103.0 g at 2.6 ms

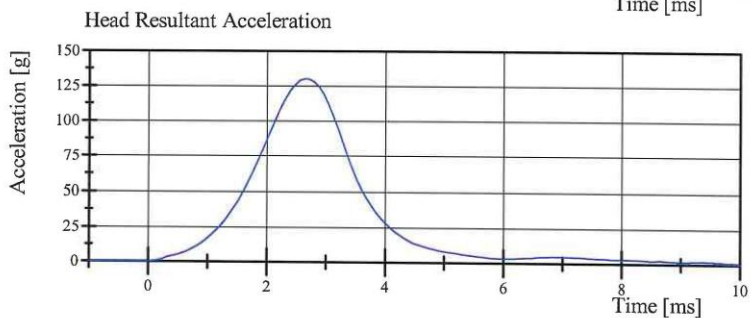
Min: -4.6 g at 7.0 ms



Filter Class: CFC_1000

Max: 79.6 g at 2.6 ms

Min: -1.1 g at 7.0 ms



Filter Class: CFC_1000

Max: 130.2 g at 2.6 ms

Min: 0.0 g at -0.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 09:09:33 358



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 23-1

Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.35 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-51.6 deg	Yes
Time of Peak	54 - 66 ms	59.1 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	63.8 ms	Yes

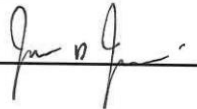
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:33:31 1315

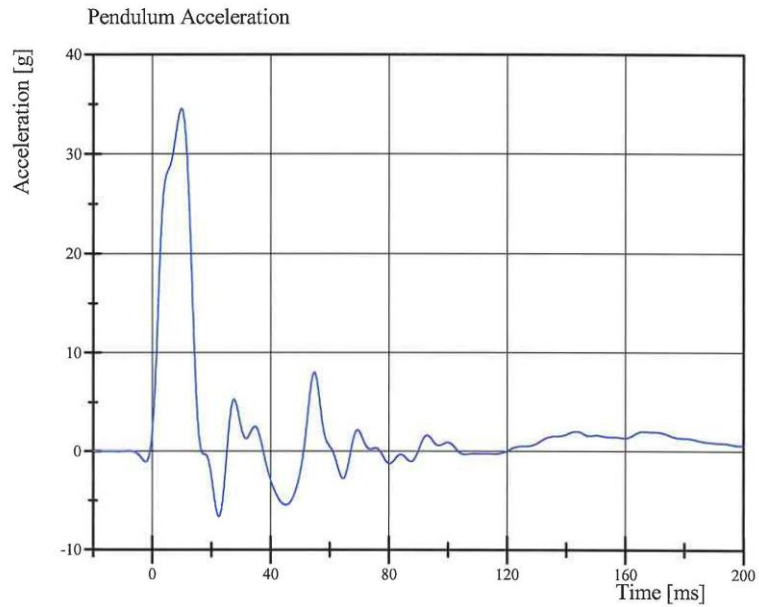


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 23-1

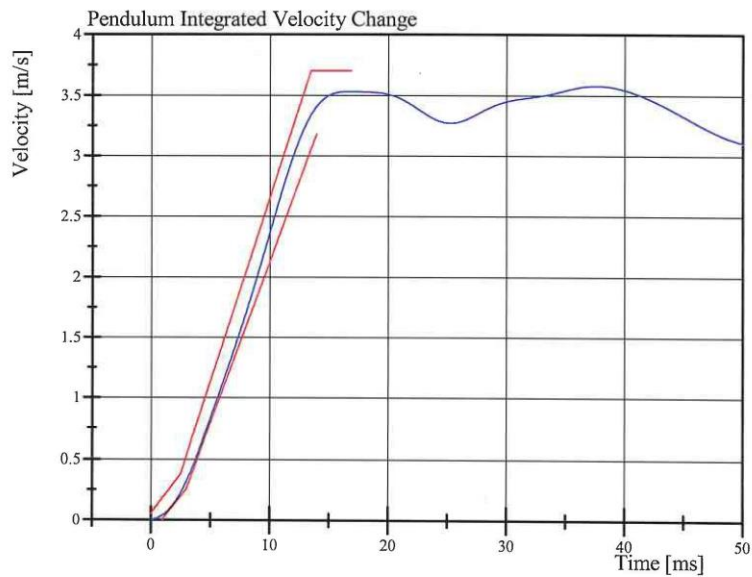
Test Date: 2/7/2014



Filter Class: CFC_60

Max: 34.5 g at 9.8 ms

Min: -6.6 g at 22.6 ms



Filter Class: CFC_60

Max: 3.6 m/s at 37.5 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:33:39 1315

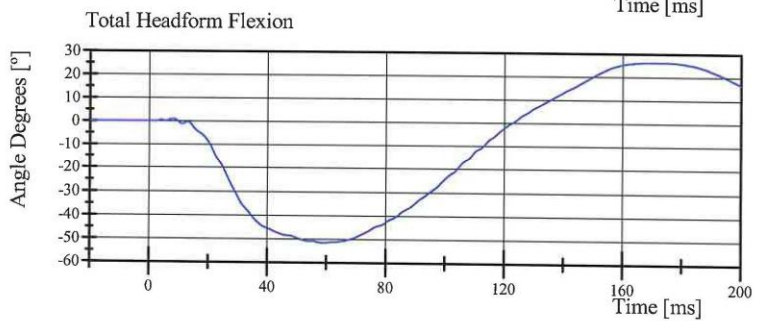
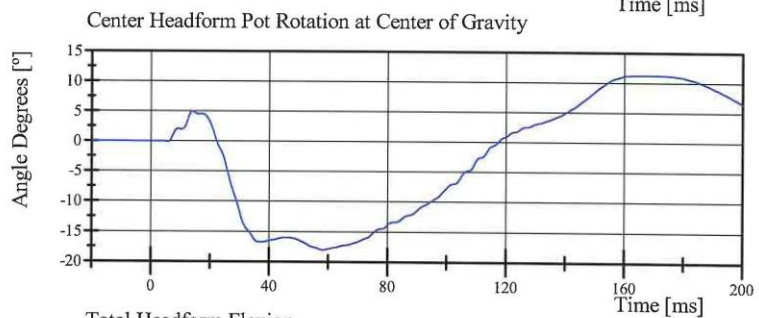
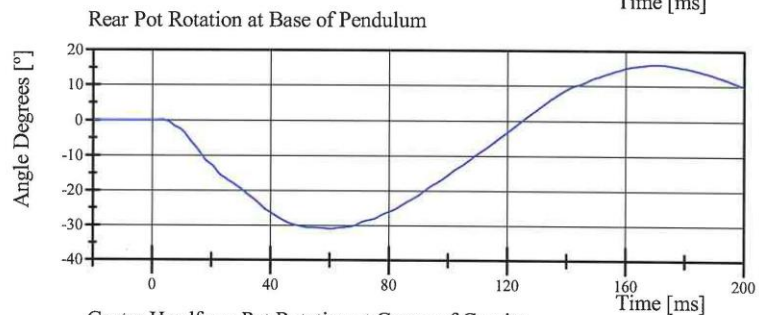
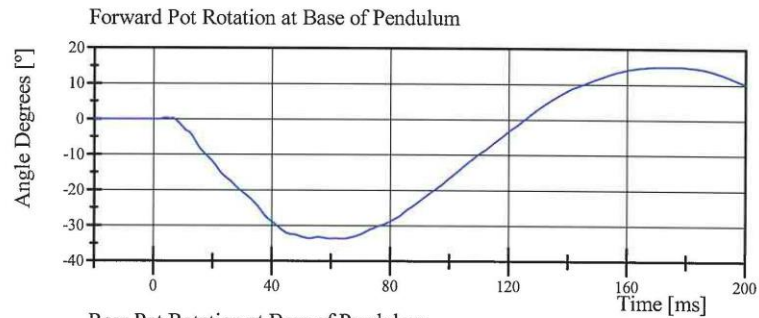


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 23-1

Test Date: 2/7/2014



Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:33:39 1315



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 23-1

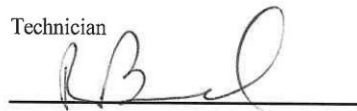
Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.70 g	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA final rule 8/15/2008

02.07.2014 12:49:36 540

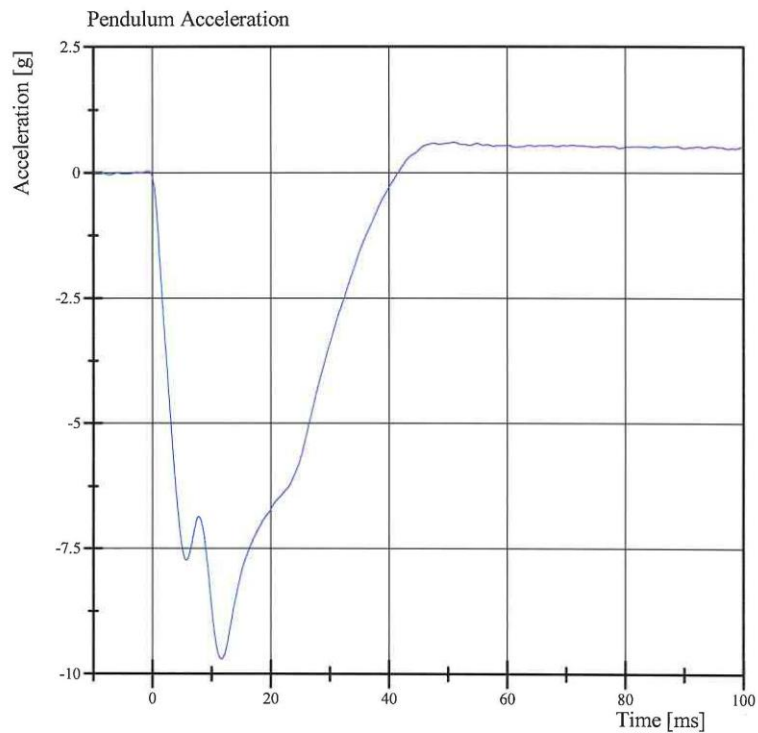


Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 23-1

Test Date: 2/7/2014



Filter Class: CFC_180

Max: 0.6 g at 50.9 ms

Min: -9.7 g at 11.7 ms

Specification Source: NHTSA final rule 8/15/2008

02.07.2014 12:49:42 540



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.8 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



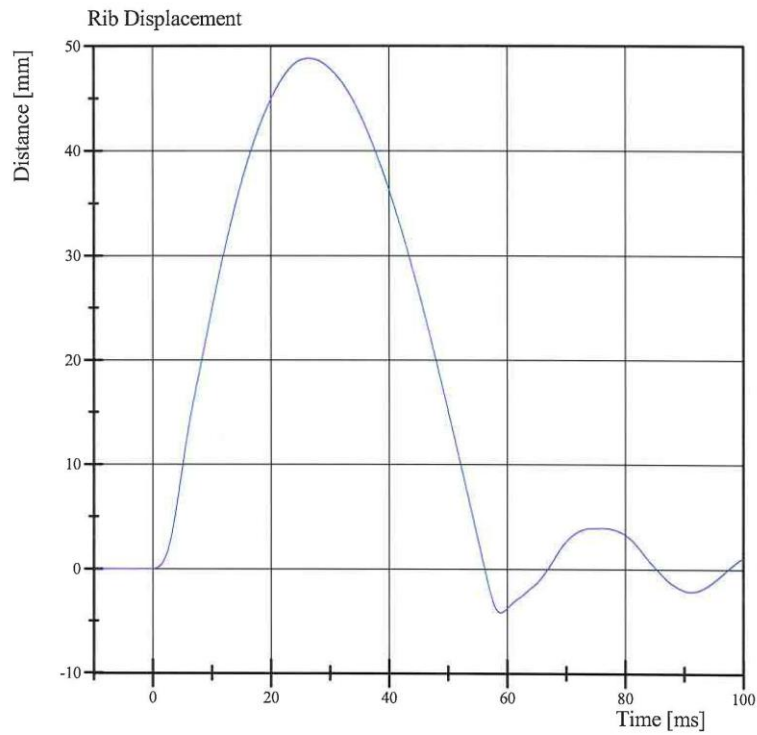
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:58:58 730



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 48.8 mm at 26.4 ms
Min: -4.2 mm at 58.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:59:05 730



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

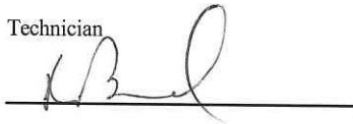
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



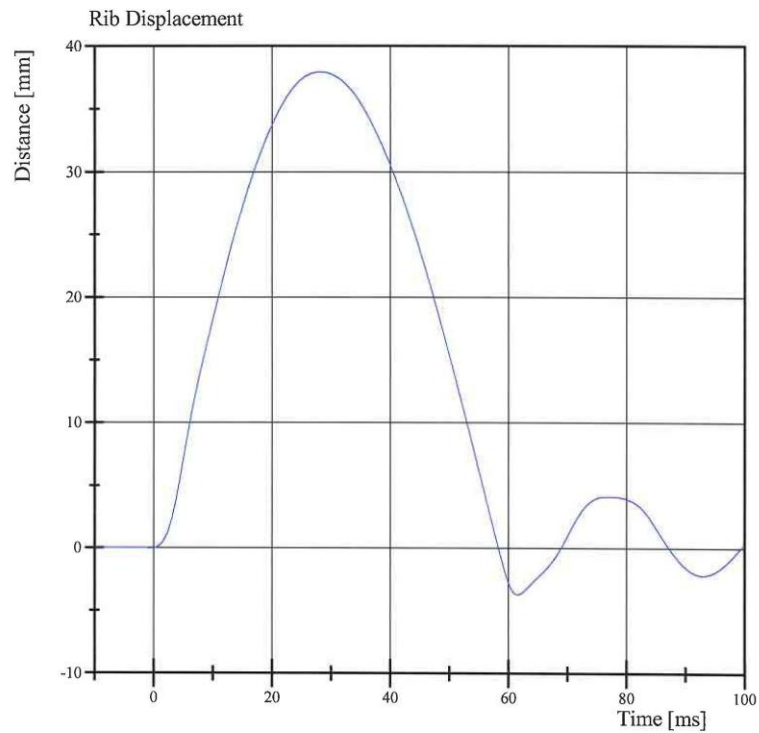
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:04:57 909



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 37.9 mm at 28.2 ms
Min: -3.7 mm at 61.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:05:06 909



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



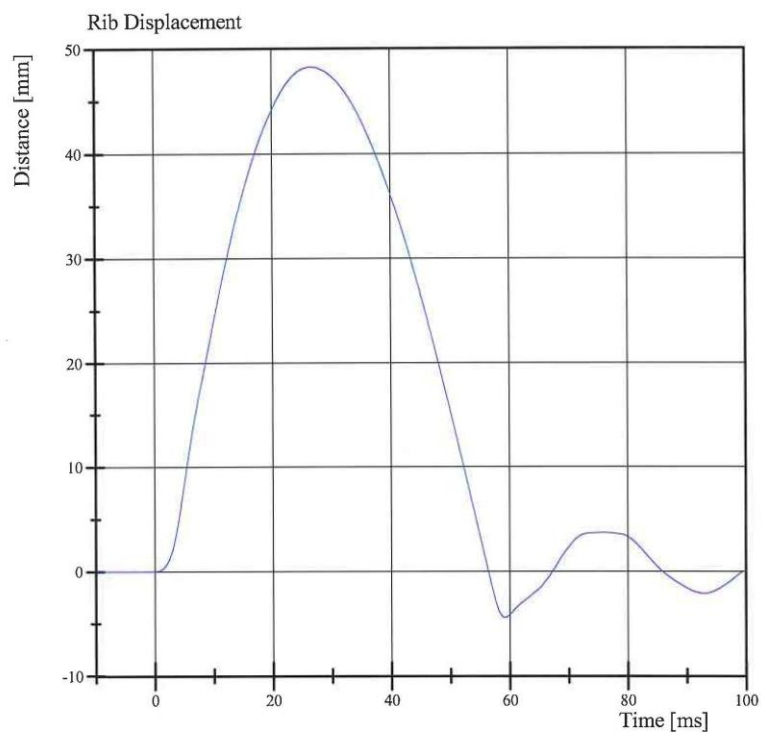
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:09:17 718



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 48.3 mm at 26.7 ms
Min: -4.4 mm at 59.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:09:24 718



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	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



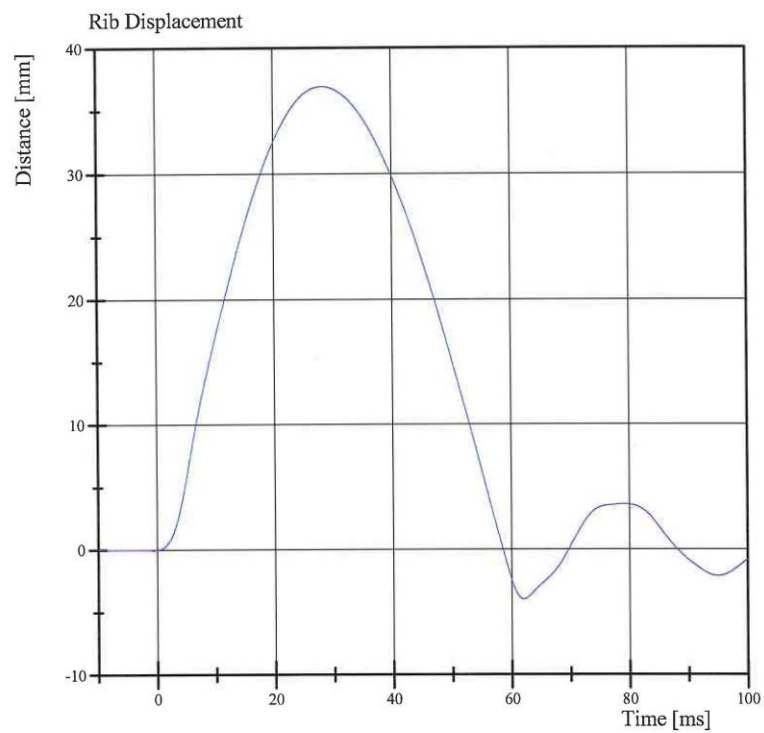
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:15:02 906



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 36.9 mm at 28.3 ms
Min: -4.0 mm at 62.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:15:09 906



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

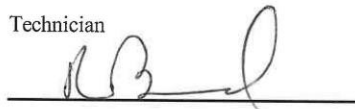
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



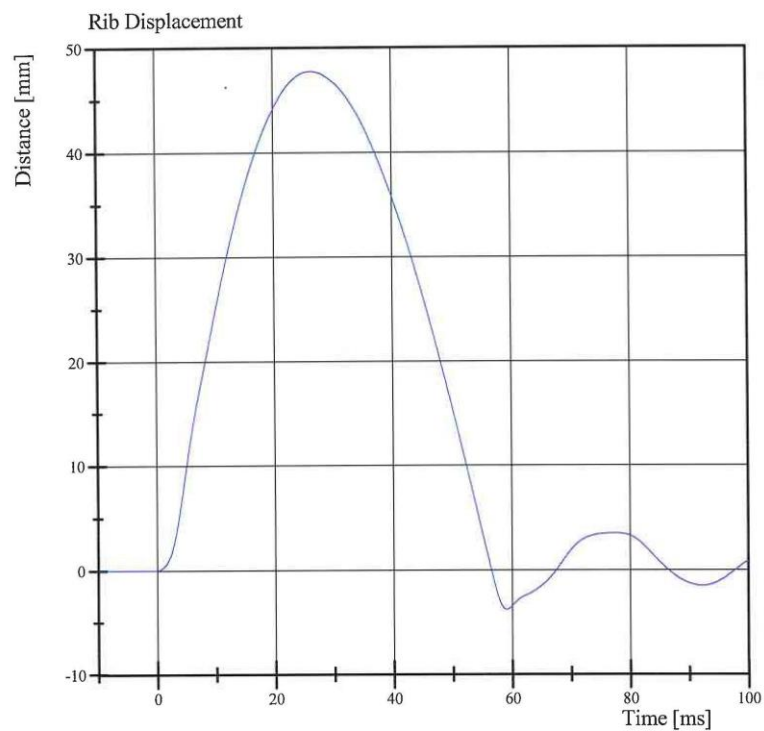
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:19:27 721



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 47.7 mm at 26.4 ms
Min: -3.8 mm at 59.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:19:34 721



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	32 %	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



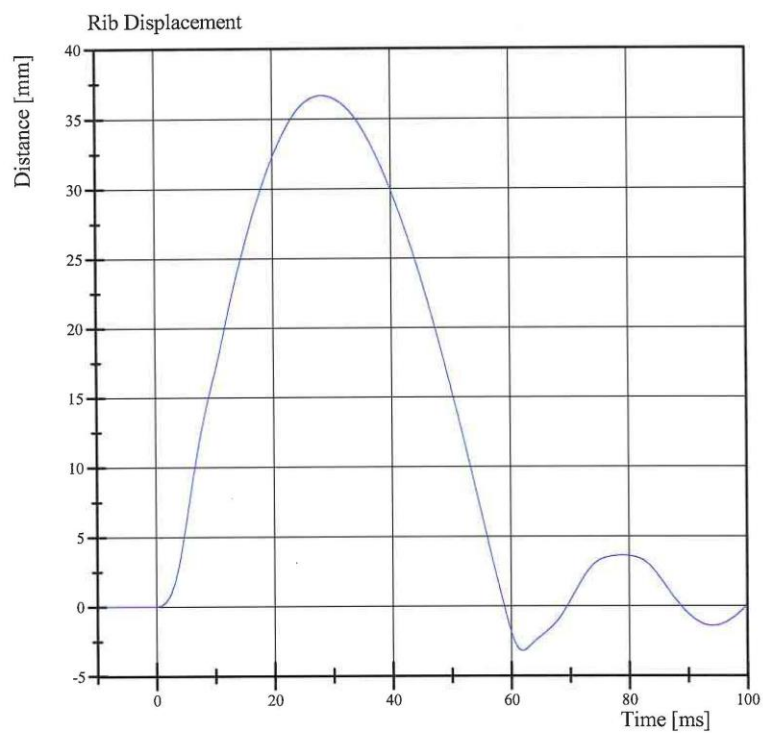
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:25:11 917



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 36.7 mm at 28.4 ms
Min: -3.2 mm at 61.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:25:18 917



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 23-1

Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.462 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,368.2 N	Yes
Upper Rib Displacement	34 - 41 mm	37.5 mm	Yes
Center Rib Displacement	37 - 45 mm	40.6 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.7 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.

02.07.2014 12:55:20 439

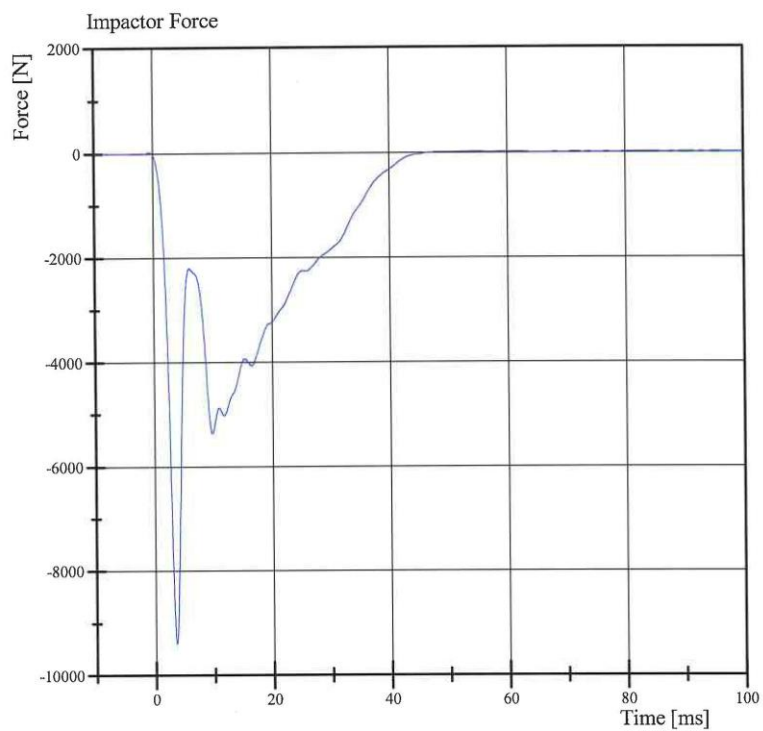


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 23-1

Test Date: 2/7/2014



Filter Class: CFC_180

Max: 26.9 N at -0.6 ms

Min: -9391.2 N at 3.5 ms

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

02.07.2014 12:55:27 439

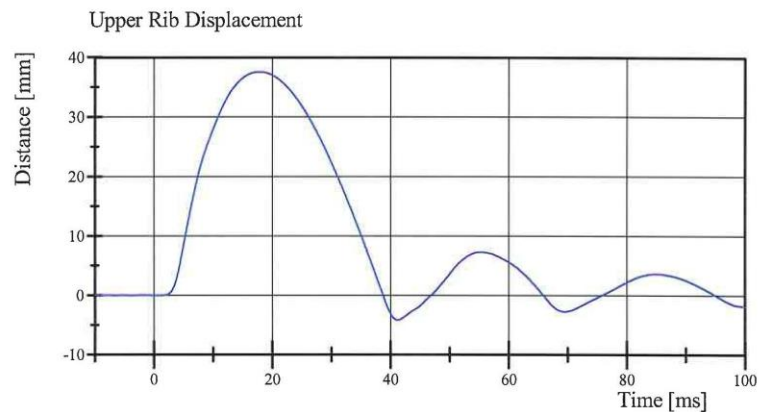


Transportation Research Center Inc.

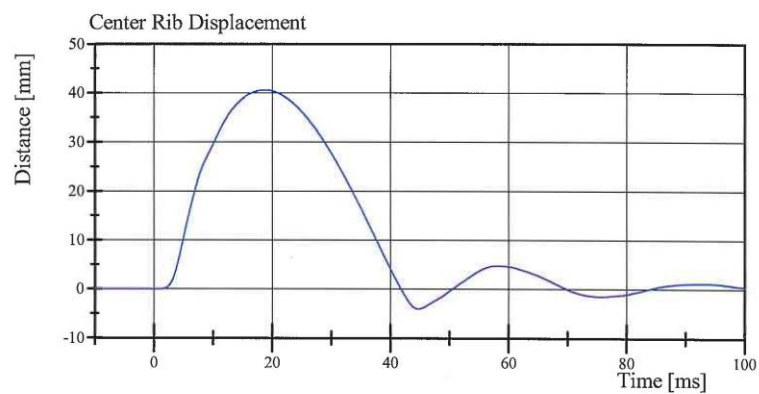
Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 23-1

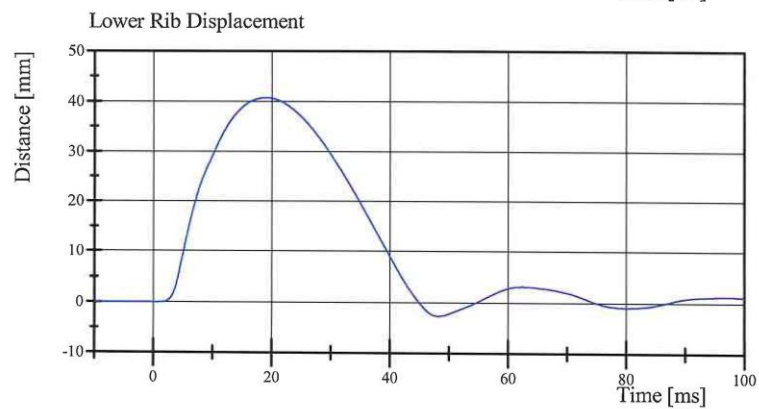
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 37.5 mm at 17.8 ms
Min: -4.2 mm at 41.2 ms



Filter Class: CFC_180
Max: 40.6 mm at 18.7 ms
Min: -4.1 mm at 44.7 ms



Filter Class: CFC_180
Max: 40.7 mm at 19.0 ms
Min: -2.6 mm at 48.2 ms

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

02.07.2014 12:55:28 439



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 23-2

Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,149.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.36 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,686.0 N	Yes
Time of Peak	10.0 - 12.3 ms	10.48 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:57:17 582

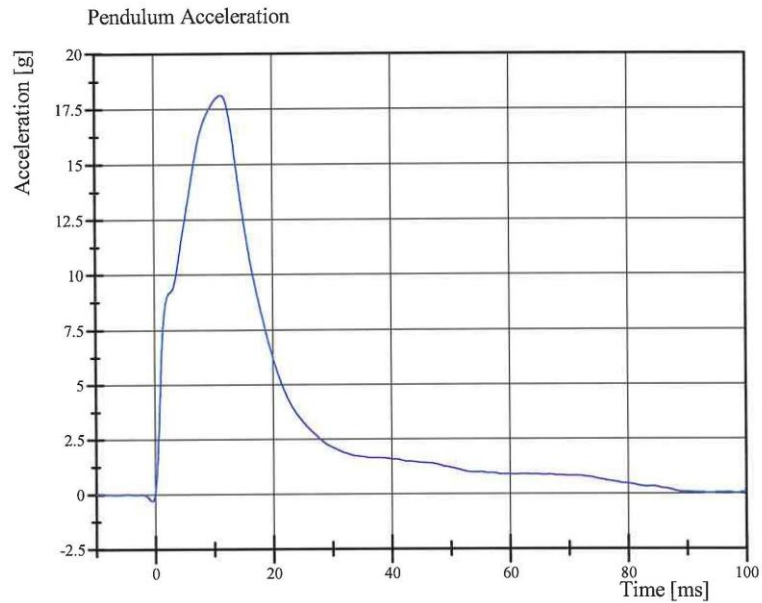


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 23-2

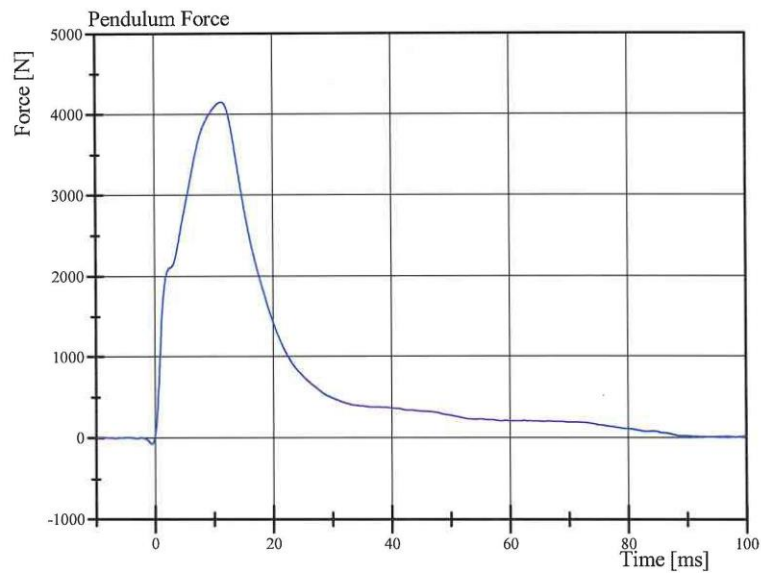
Test Date: 2/7/2014



Filter Class: CFC_180

Max: 18.1 g at 11.4 ms

Min: -0.3 g at -0.5 ms



Filter Class: CFC_180

Max: 4,149.3 N at 11.4 ms

Min: -69.3 N at -0.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:57:24 582

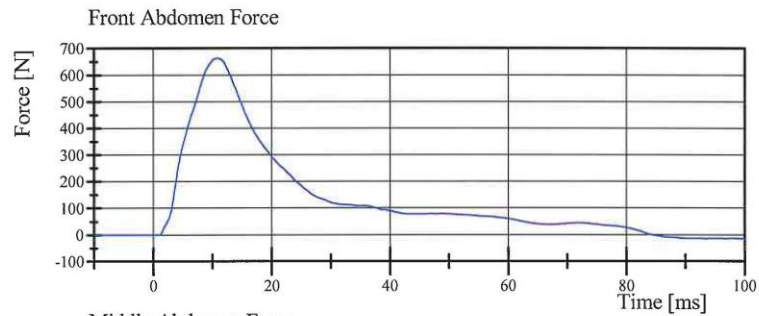


Transportation Research Center Inc.

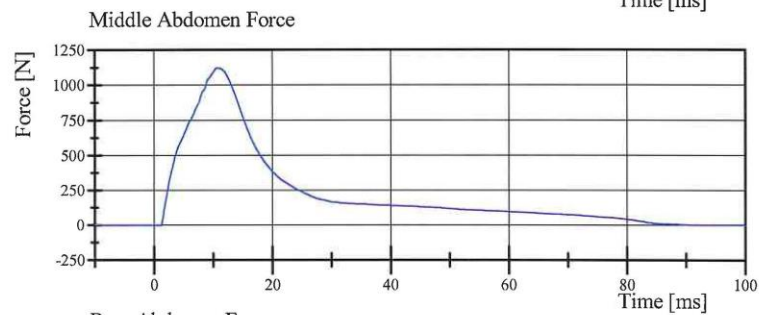
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 23-2

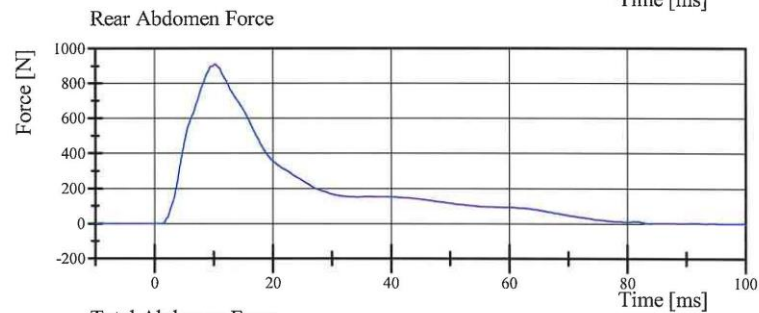
Test Date: 2/7/2014



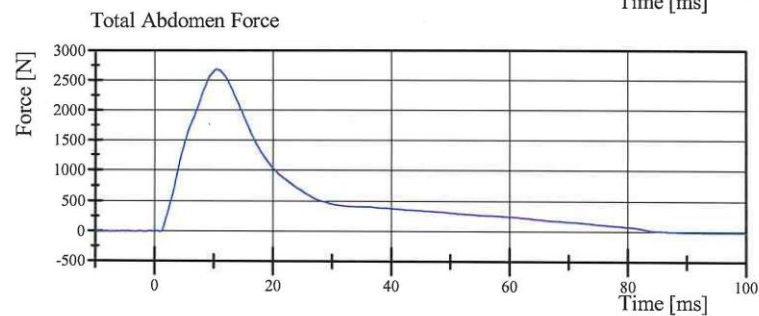
Filter Class: CFC_600
Max: 662.7 N at 10.8 ms
Min: -16.3 N at 100.0 ms



Filter Class: CFC_600
Max: 1,121.4 N at 10.6 ms
Min: -2.4 N at 1.0 ms



Filter Class: CFC_600
Max: 911.3 N at 10.2 ms
Min: -2.4 N at 96.9 ms



Filter Class: CFC_600
Max: 2,686.0 N at 10.5 ms
Min: -20.2 N at 100.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:57:24 582



Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 23-2

Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.059 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.7 deg	Yes
Time of Peak	39 - 53 ms	44.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	37.8 ms	Yes

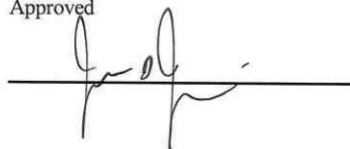
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:11:38 576

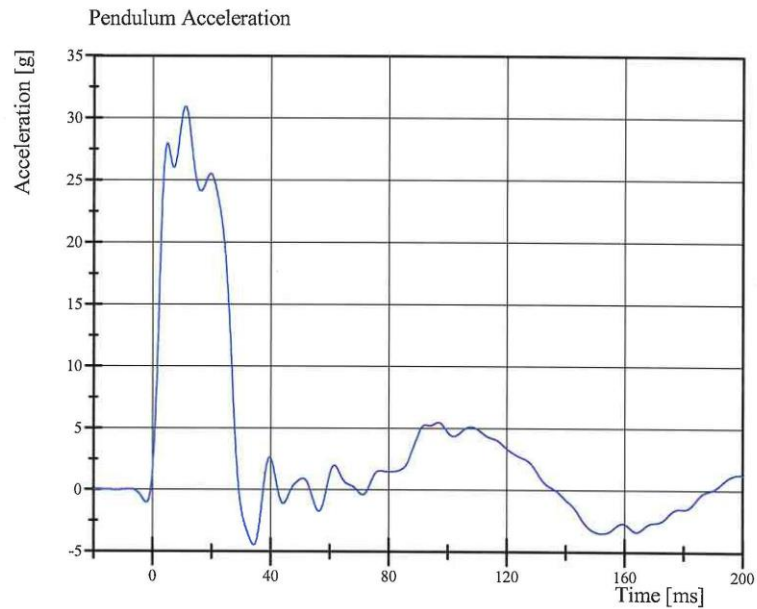


Transportation Research Center Inc.

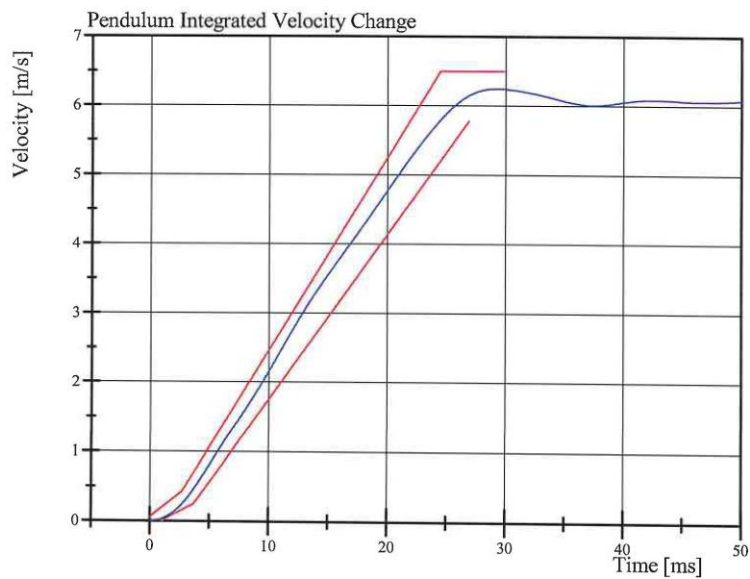
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 23-2

Test Date: 2/7/2014



Filter Class: CFC_60
Max: 30.9 g at 11.0 ms
Min: -4.4 g at 34.2 ms



Filter Class: CFC_60
Max: 6.2 m/s at 29.2 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:11:52 576

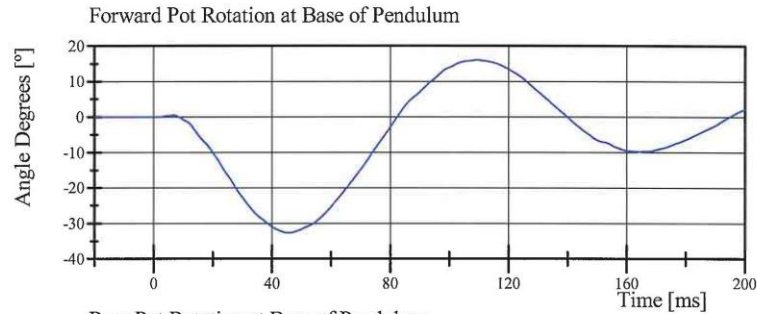


Transportation Research Center Inc.

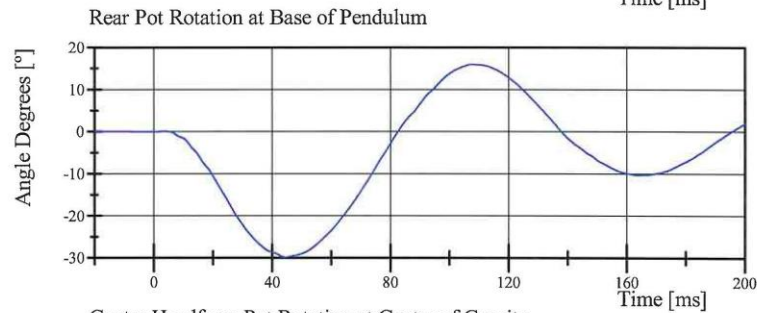
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 23-2

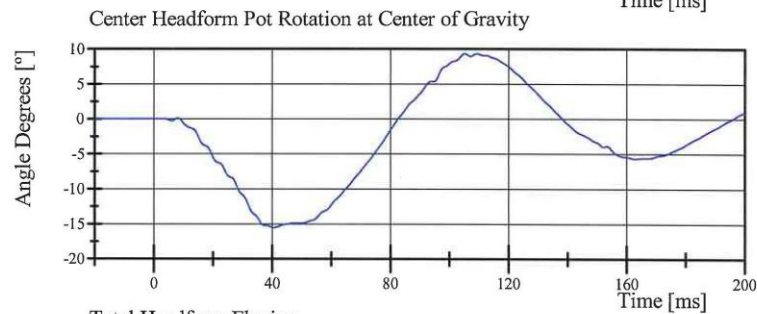
Test Date: 2/7/2014



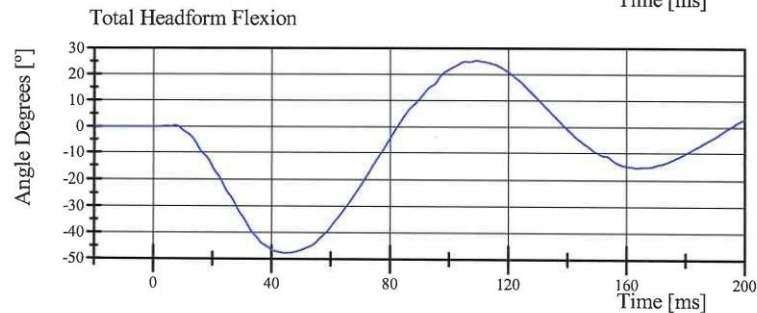
Filter Class: CFC_180
Max: 16.0 ° at 109.3 ms
Min: -32.7 ° at 45.8 ms



Filter Class: CFC_180
Max: 15.9 ° at 107.5 ms
Min: -29.8 ° at 44.6 ms



Filter Class: CFC_180
Max: 9.3 ° at 105.1 ms
Min: -15.5 ° at 40.5 ms



Filter Class: CFC_180
Max: 25.3 ° at 109.2 ms
Min: -47.7 ° at 44.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:11:53 576



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 23-1

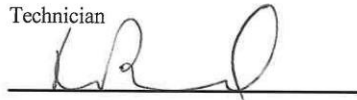
Test Date: 2/7/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,089.6 N	Yes
Time of Peak	11.8 - 16.1 ms	12.56 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,284.3 N	Yes
Time of Peak	12.2 - 17.0 ms	12.56 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



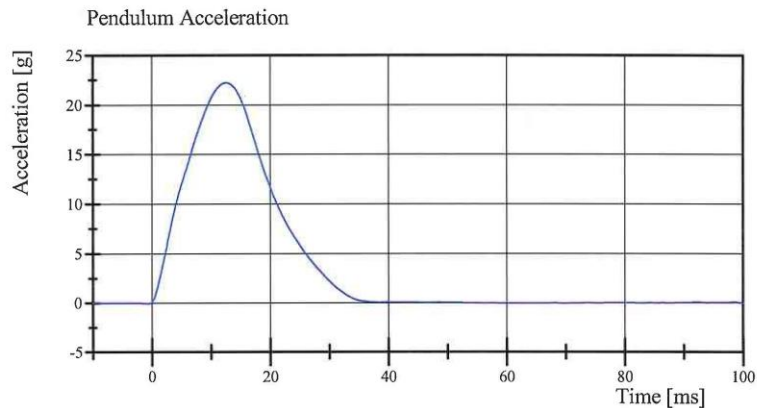
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:18:41 492

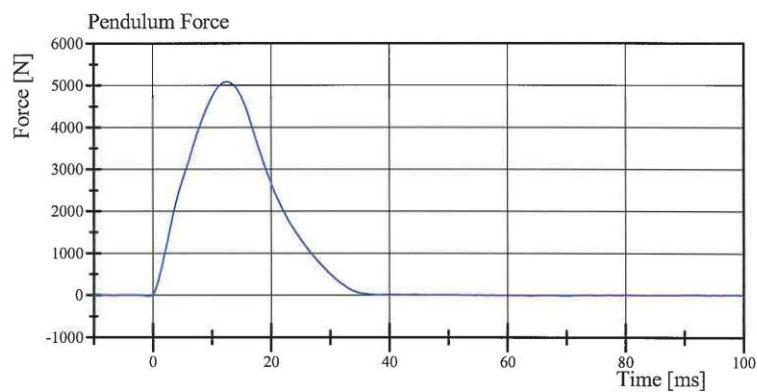


Transportation Research Center Inc.

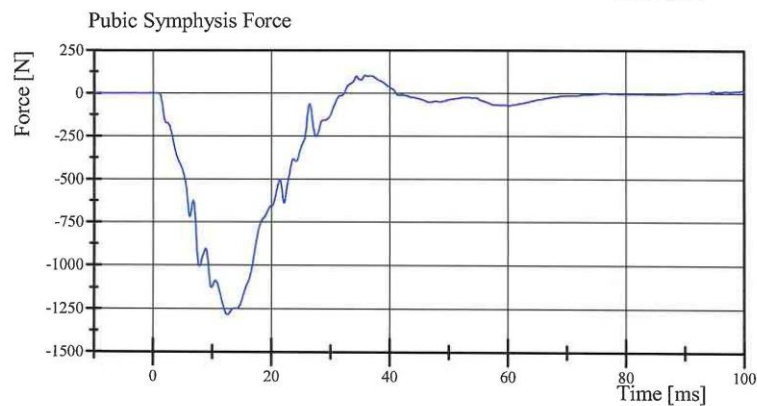
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014



Filter Class: CFC_180
Max: 22.2 g at 12.6 ms
Min: -0.1 g at -0.7 ms



Filter Class: CFC_180
Max: 5,089.6 N at 12.6 ms
Min: -15.7 N at -0.7 ms



Filter Class: CFC_600
Max: 103.2 N at 35.8 ms
Min: -1,284.3 N at 12.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:18:47 492



Driver S/N F030

Post-Test Calibration Sheets

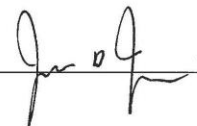
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 24
02/21/14

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	444	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	471	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	366	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	267	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	158	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	606	Yes

Technician



Approved



Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Resultant Acceleration	125 - 155 g	130.4 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.7 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

02.21.2014 08:13:42 358

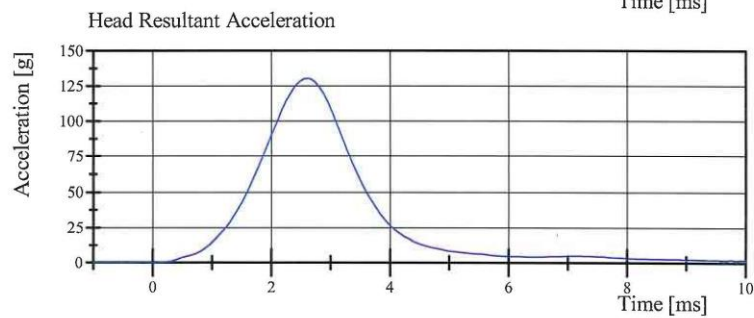
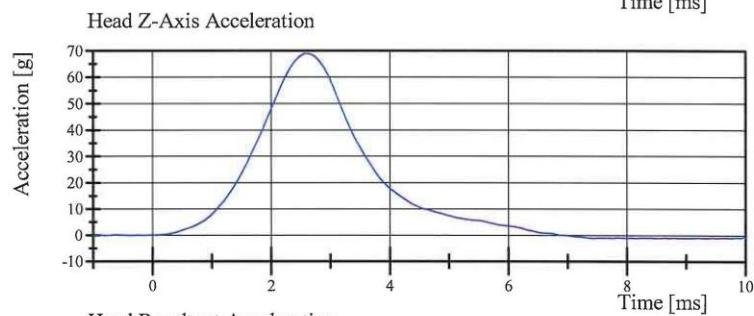
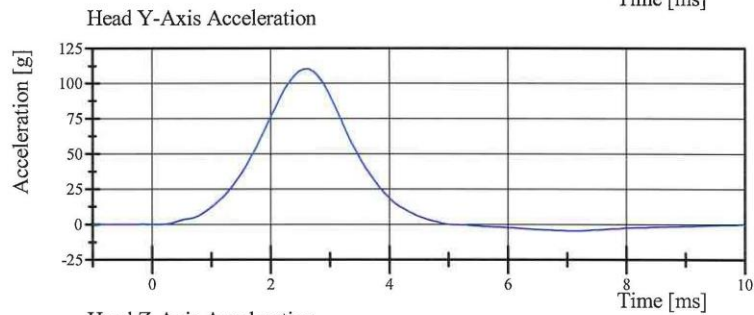
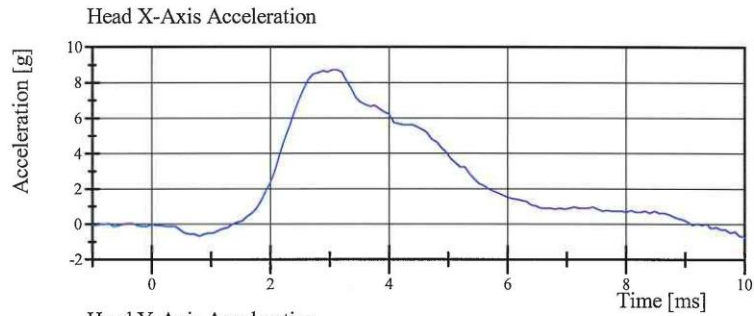


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014



Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:13:52 358



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 24-1

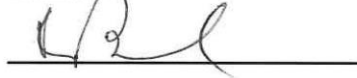
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.8 deg	Yes
Time of Peak	54 - 66 ms	58.0 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	65.1 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:43:49 1309

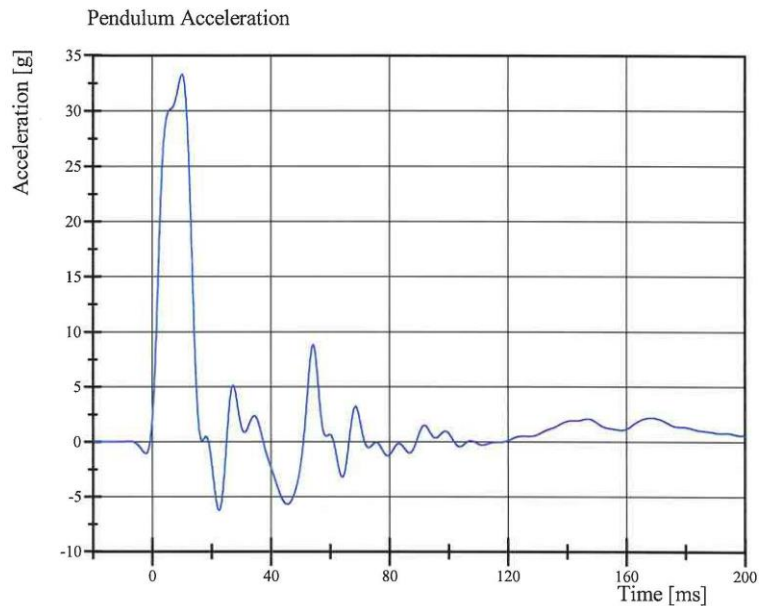


Transportation Research Center Inc.

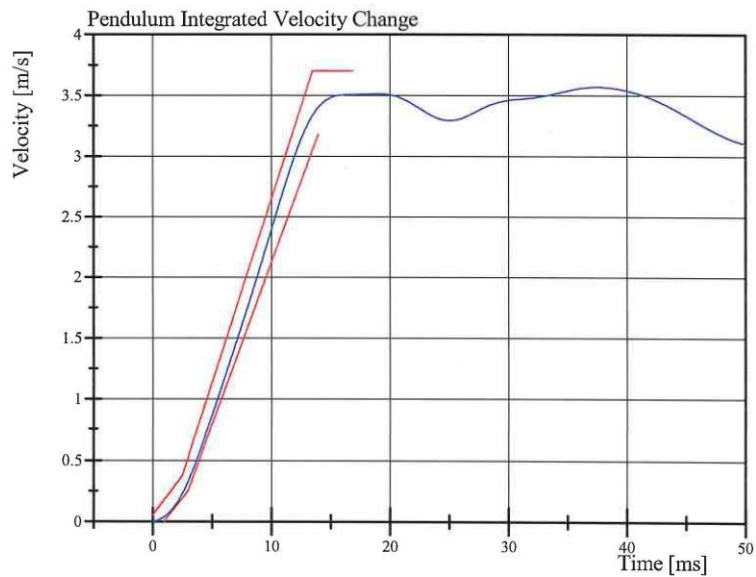
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014



Filter Class: CFC_60
Max: 33.2 g at 10.0 ms
Min: -6.2 g at 22.5 ms



Filter Class: CFC_60
Max: 3.6 m/s at 37.4 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:44:01 1309

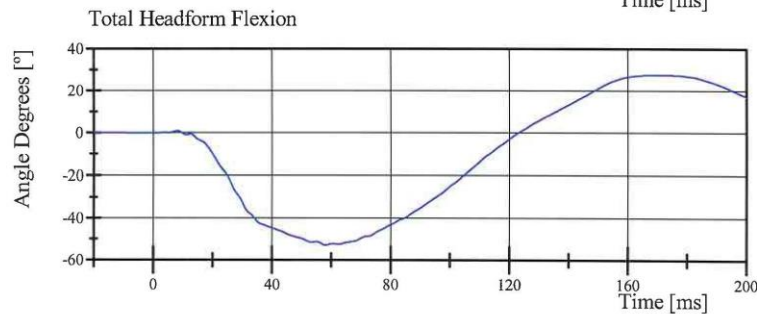
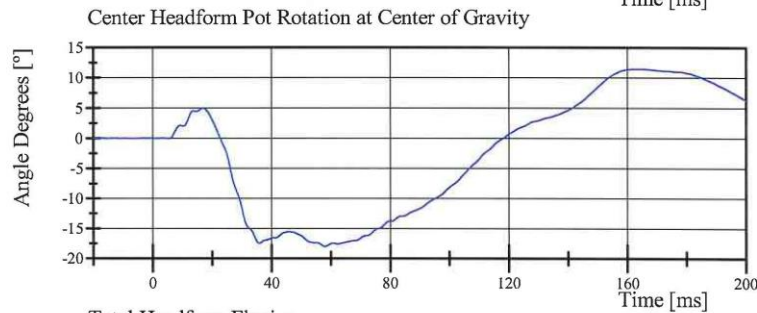
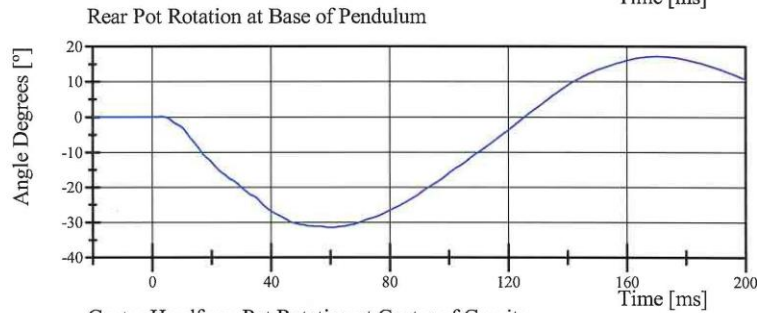
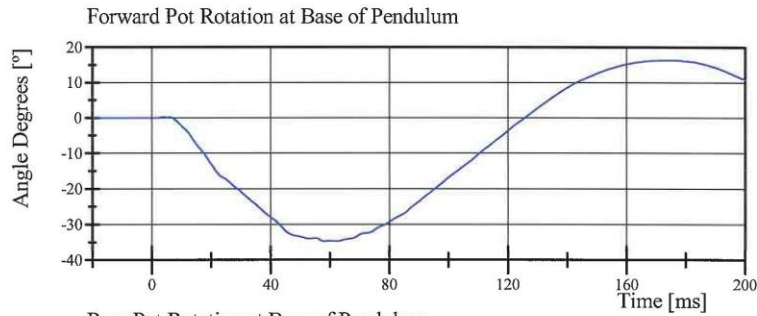


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014



Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:44:01 1309



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.10 g	Yes

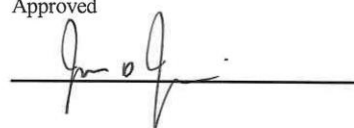
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA final rule 8/15/2008

02.21.2014 10:55:20 527

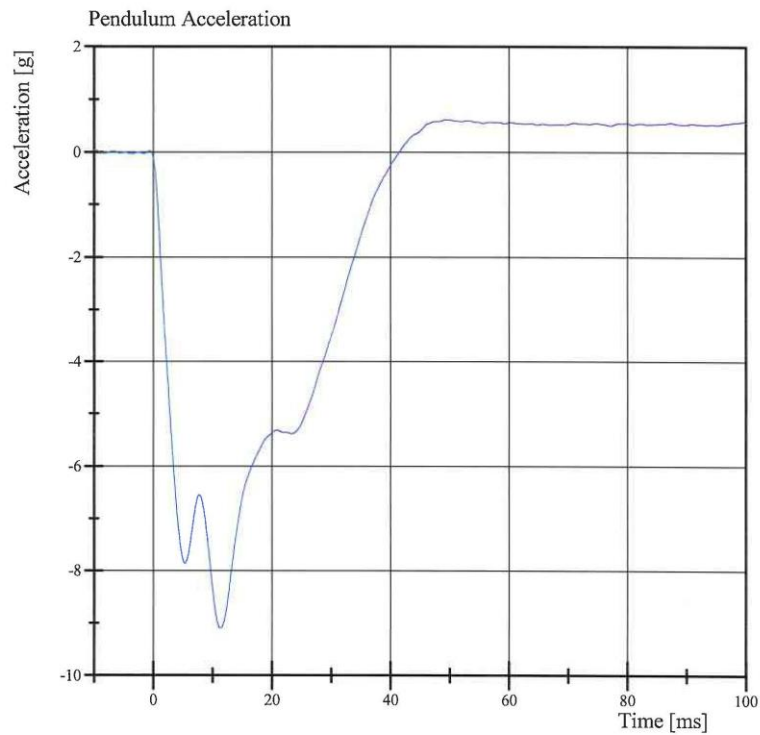


Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014



Filter Class: CFC_180

Max: 0.6 g at 49.5 ms

Min: -9.1 g at 11.3 ms

Specification Source: NHTSA final rule 8/15/2008

02.21.2014 10:55:28 527



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.9 mm	Yes

Test meets specifications.

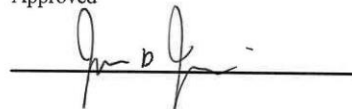
Comments:

Drop Height: 816

Technician



Approved



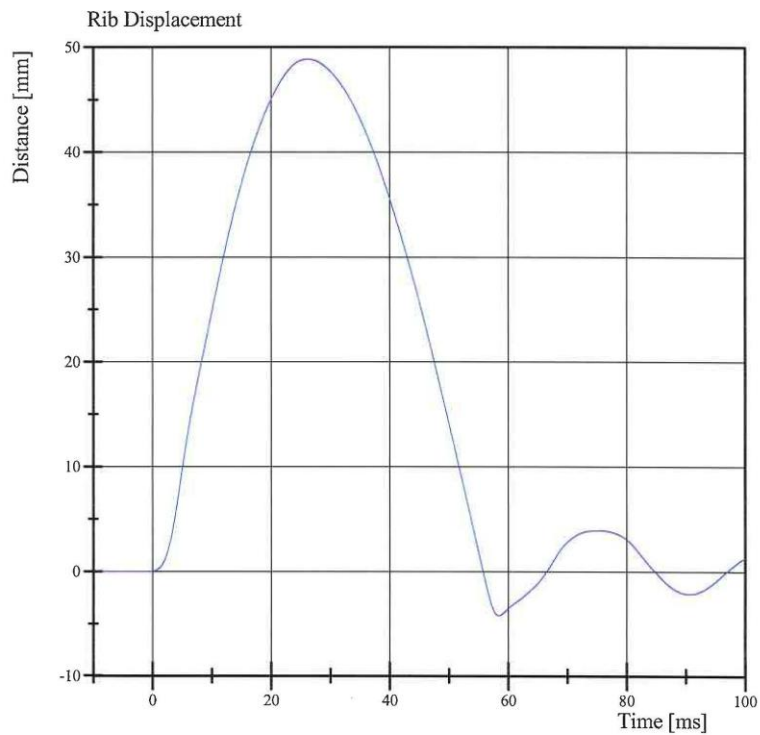
Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:40:46 727



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 48.9 mm at 26.2 ms
Min: -4.2 mm at 58.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:40:53 727



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



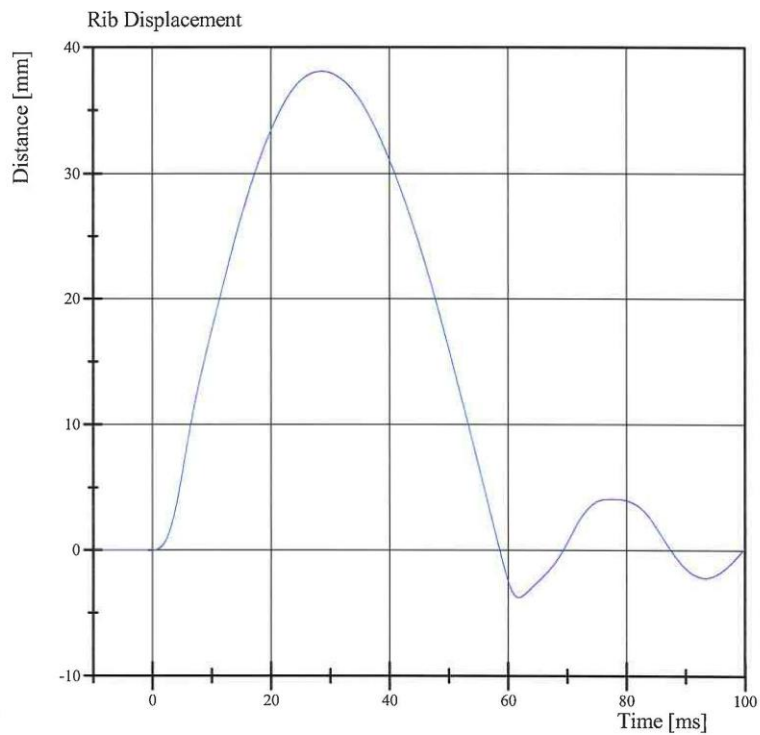
Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:46:01 904



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 38.1 mm at 28.6 ms
Min: -3.8 mm at 61.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:46:09 904



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014

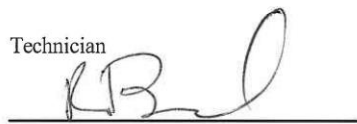
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



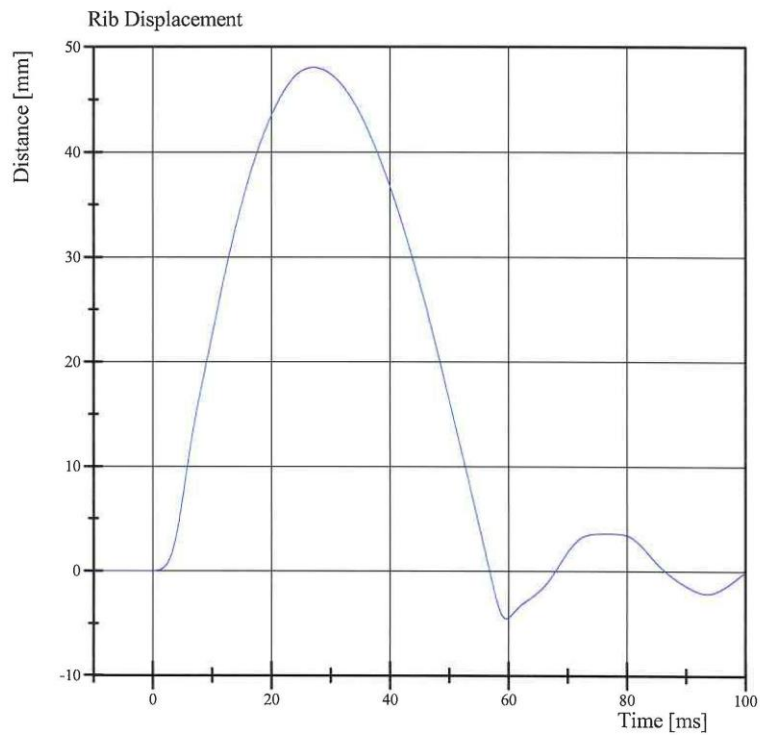
Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:53:00 717



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 48.1 mm at 27.1 ms
Min: -4.5 mm at 59.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:53:08 717



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014

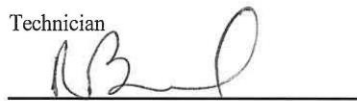
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



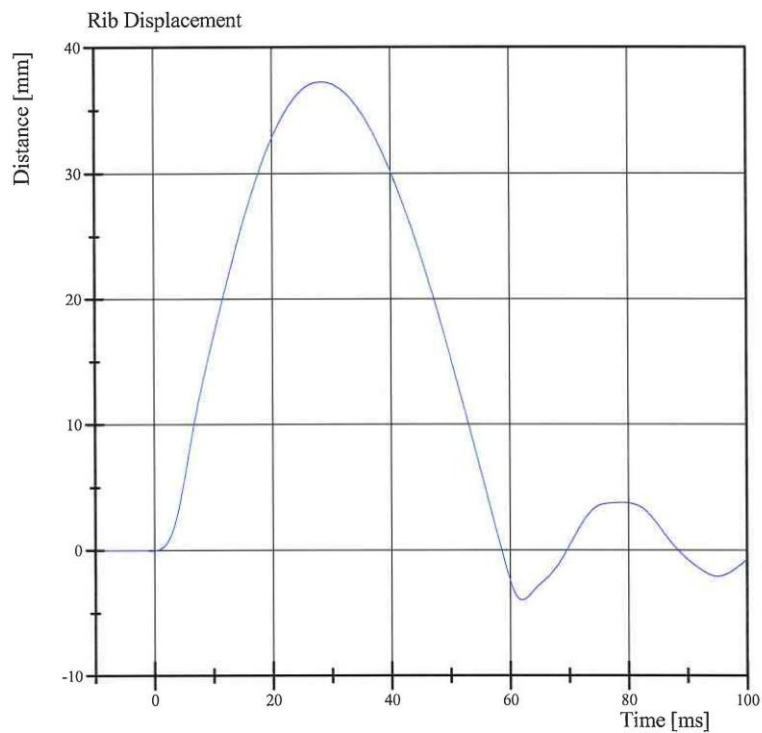
Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:59:35 904



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 37.3 mm at 28.3 ms
Min: -4.0 mm at 62.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 08:59:43 904



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014

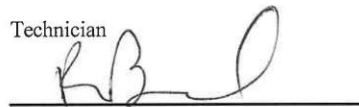
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.8 mm	Yes

Test meets specifications.

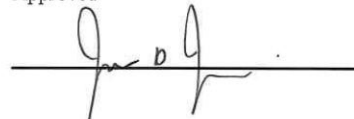
Comments:

Drop Height: 816

Technician



Approved



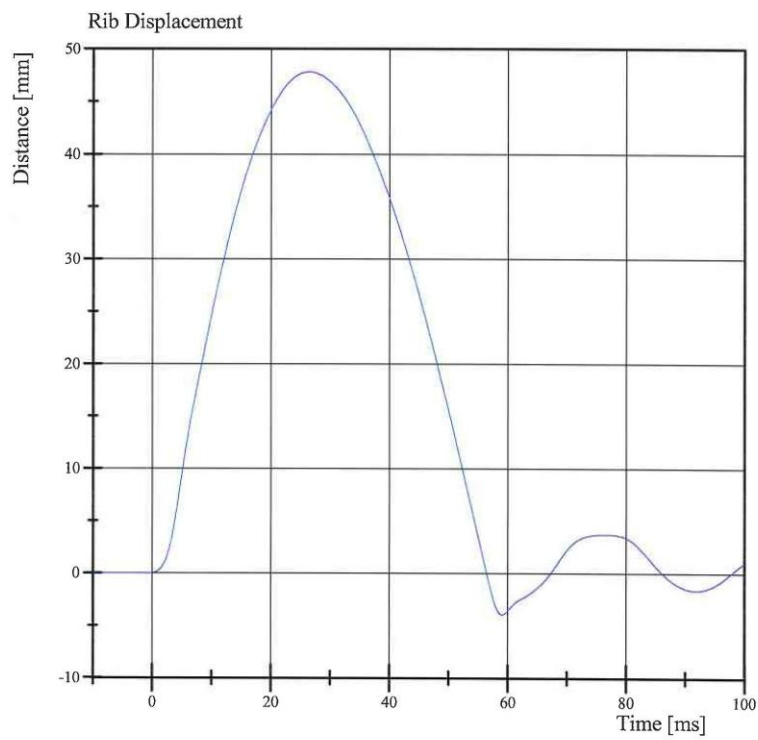
Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:03:57 732



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 47.8 mm at 26.4 ms
Min: -4.0 mm at 59.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:04:09 732



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



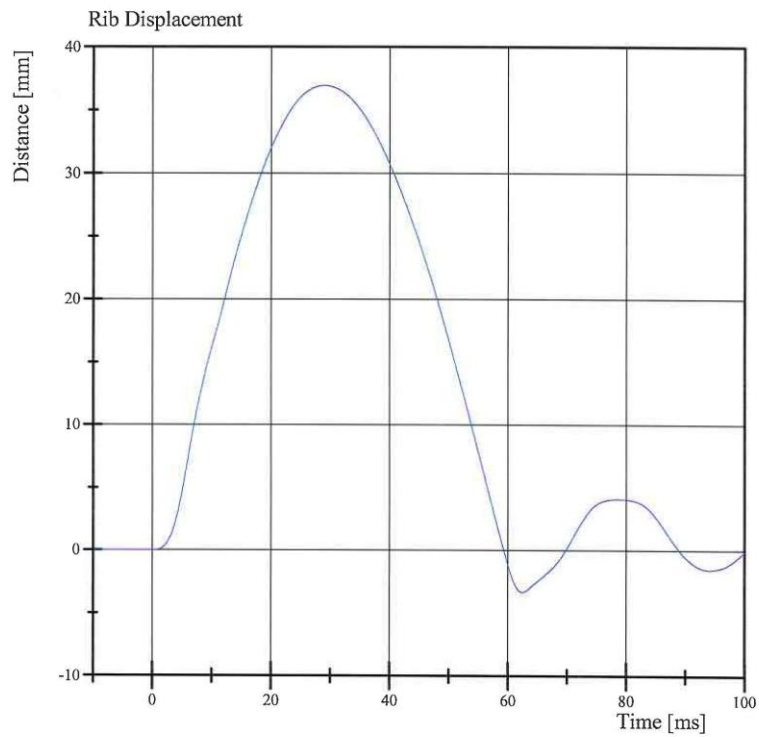
Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:09:58 913



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 37.0 mm at 29.0 ms
Min: -3.3 mm at 62.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:10:07 913



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.466 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,423.7 N	Yes
Upper Rib Displacement	34 - 41 mm	38.1 mm	Yes
Center Rib Displacement	37 - 45 mm	40.9 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.2 mm	Yes

Test meets specifications.

Comments:

Technician



Approved



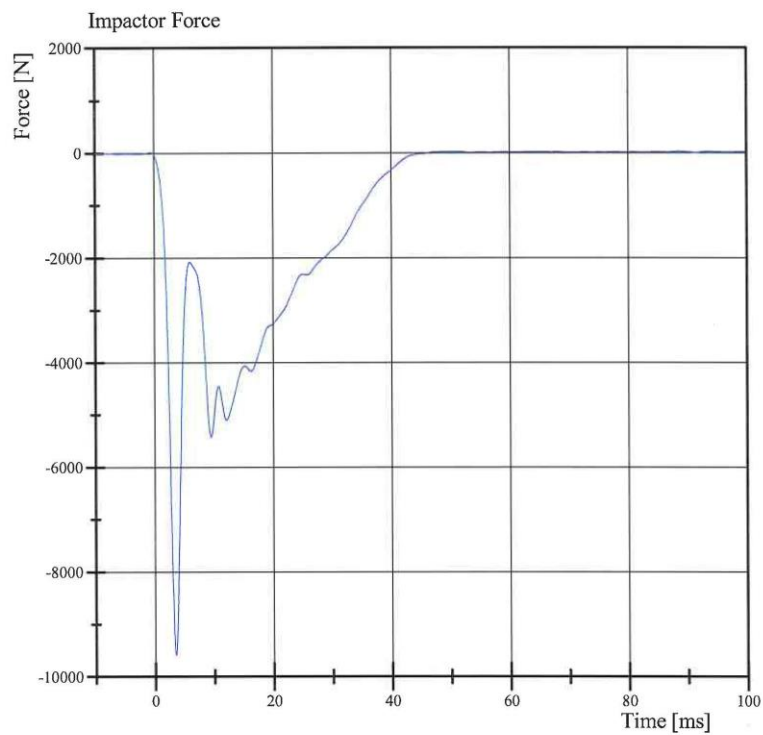
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

02.21.2014 10:58:56 465



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 31.0 N at 49.4 ms
Min: -9,597.1 N at 3.4 ms

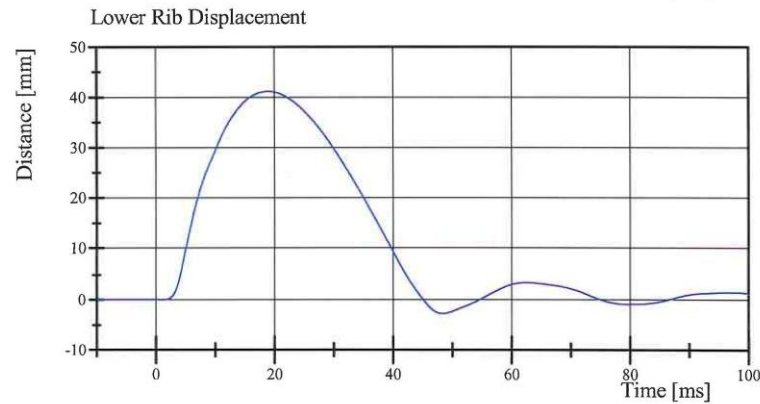
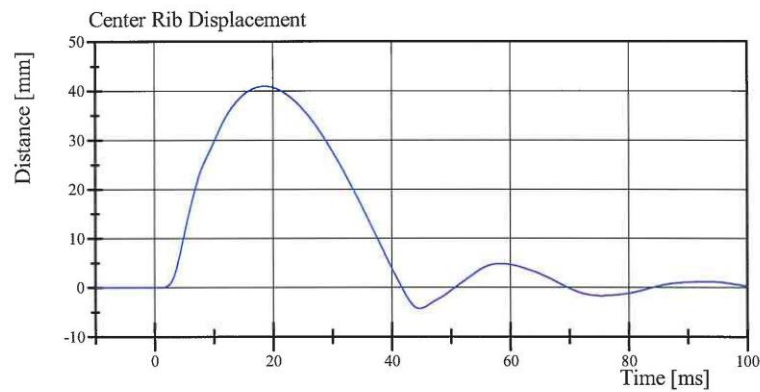
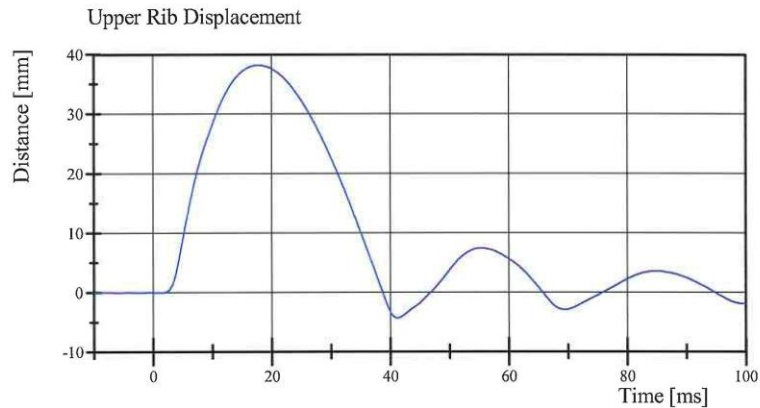
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

02.21.2014 10:59:10 465



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



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

02.21.2014 10:59:10 465



Transportation Research Center Inc.

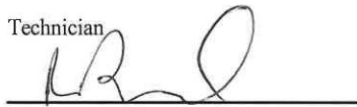
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 24-2
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.94 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,135.1 N	Yes
Time of Peak	10.6 - 13.0 ms	10.88 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,671.2 N	Yes
Time of Peak	10.0 - 12.3 ms	10.32 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 11:36:51 582

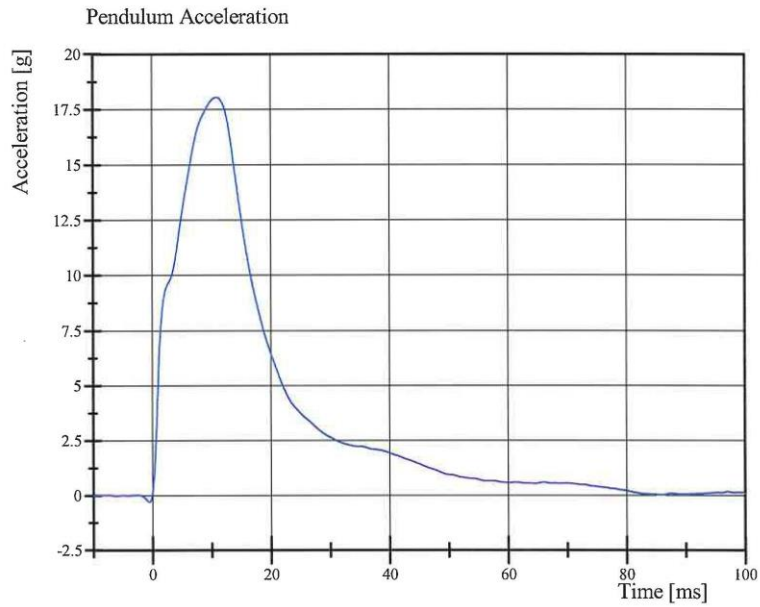


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 24-2

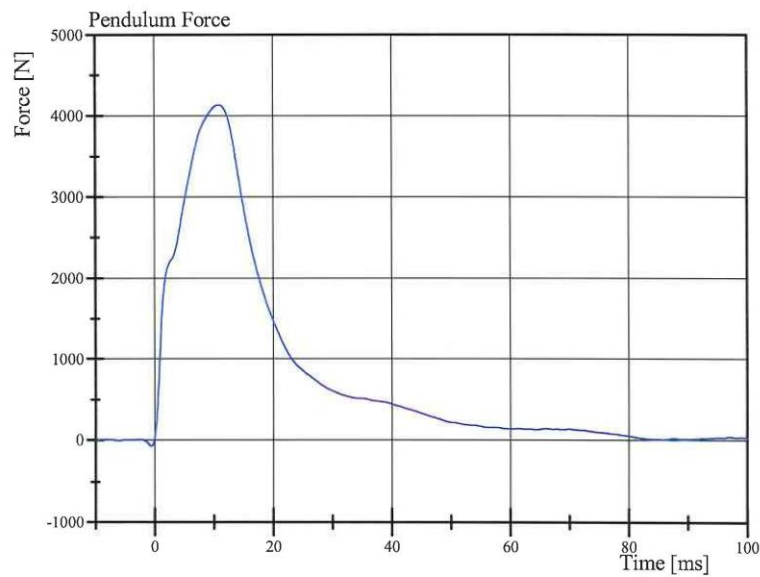
Test Date: 2/21/2014



Filter Class: CFC_180

Max: 18.0 g at 10.9 ms

Min: -0.3 g at -0.6 ms



Filter Class: CFC_180

Max: 4,135.1 N at 10.9 ms

Min: -68.6 N at -0.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 11:37:01 582

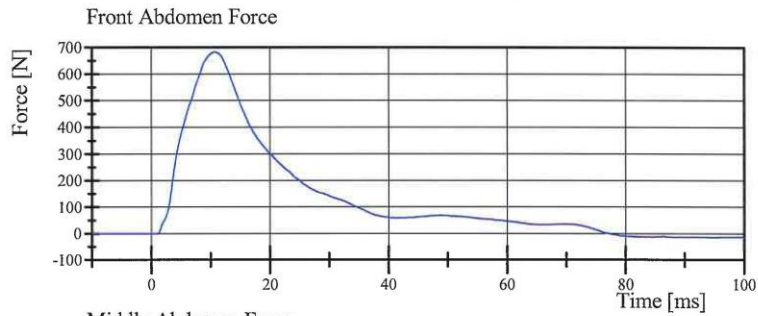


Transportation Research Center Inc.

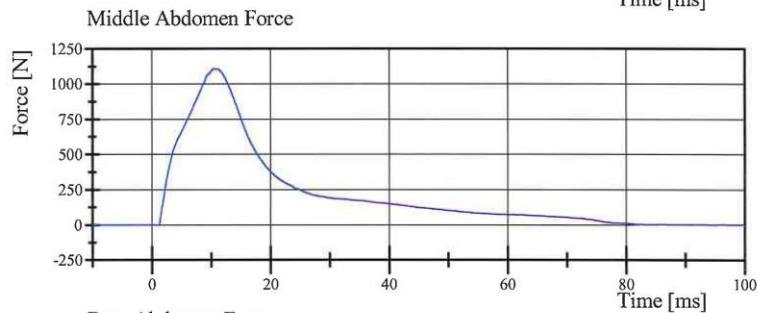
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 24-2

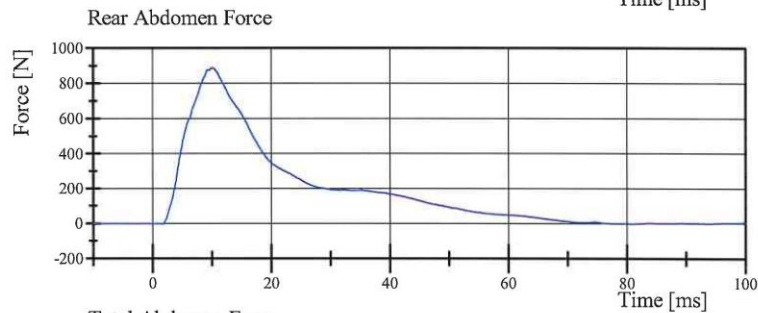
Test Date: 2/21/2014



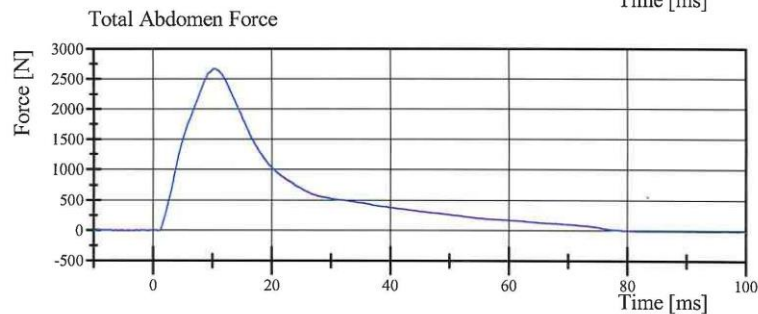
Filter Class: CFC_600
Max: 682.3 N at 10.7 ms
Min: -15.8 N at 95.1 ms



Filter Class: CFC_600
Max: 1,109.5 N at 10.5 ms
Min: -2.7 N at 1.0 ms



Filter Class: CFC_600
Max: 887.2 N at 10.1 ms
Min: -4.0 N at 1.7 ms



Filter Class: CFC_600
Max: 2,671.2 N at 10.3 ms
Min: -19.8 N at 94.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 11:37:01 582



Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 24-1

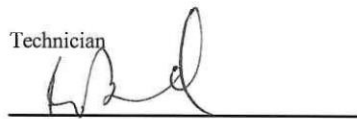
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.057 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.8 deg	Yes
Time of Peak	39 - 53 ms	43.8 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	38.2 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:22:24 573

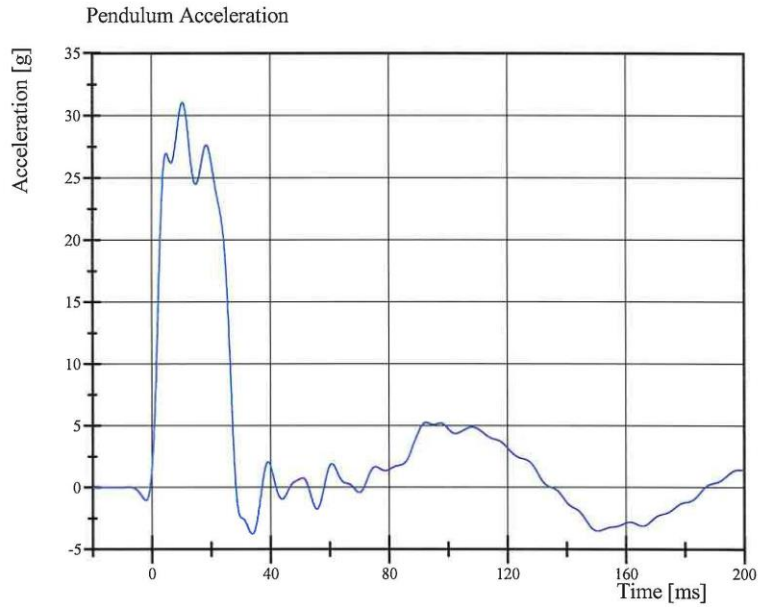


Transportation Research Center Inc.

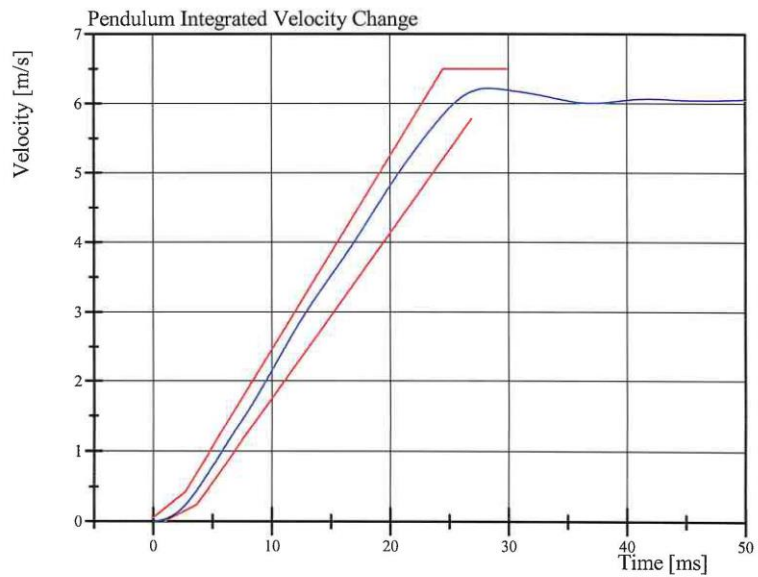
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 24-1

Test Date: 2/21/2014



Filter Class: CFC_60
Max: 31.0 g at 10.4 ms
Min: -3.7 g at 33.8 ms



Filter Class: CFC_60
Max: 6.2 m/s at 28.3 ms
Min: 0.0 m/s at 0.0 ms

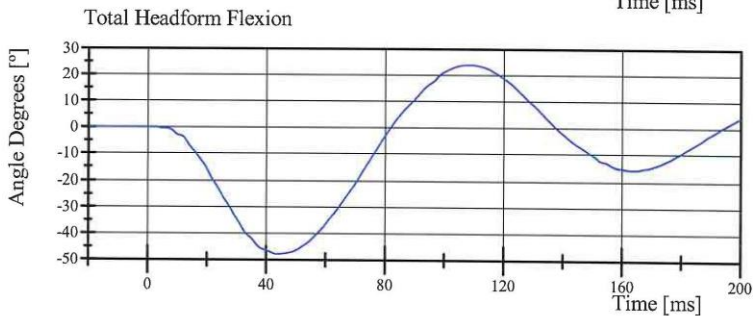
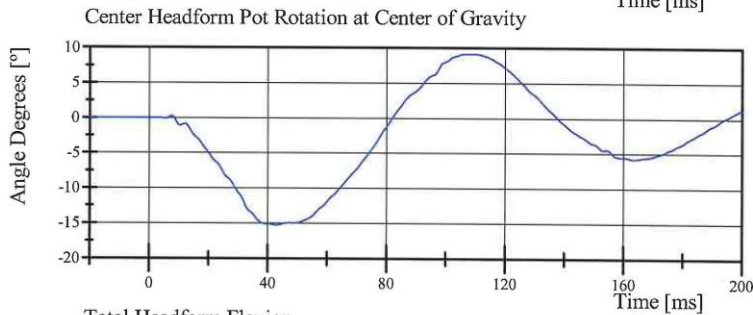
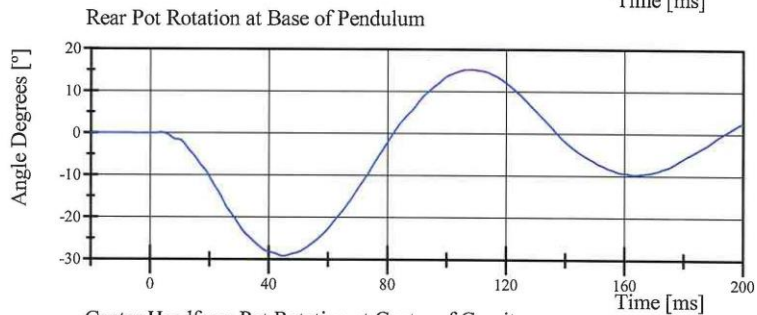
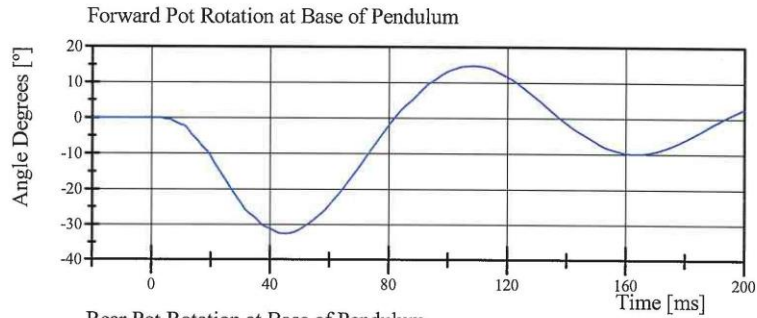
Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:22:31 573



Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 24-1
Test Date: 2/21/2014



Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 09:22:31 573



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 24-2

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,188.8 N	Yes
Time of Peak	11.8 - 16.1 ms	12.88 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,271.6 N	Yes
Time of Peak	12.2 - 17.0 ms	12.64 ms	Yes

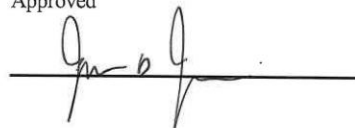
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 11:41:28 543

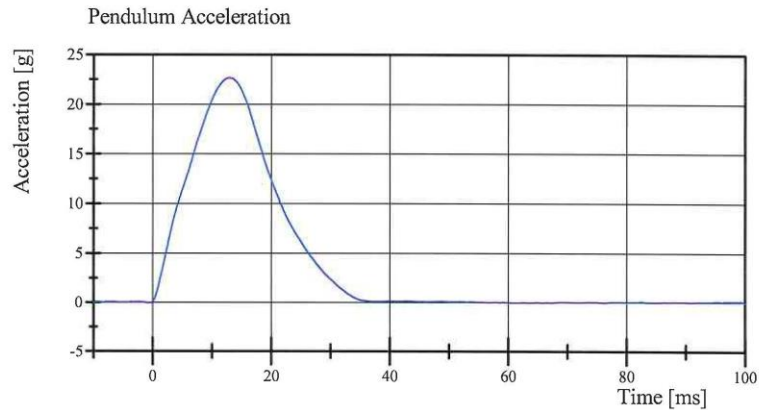


Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 24-2

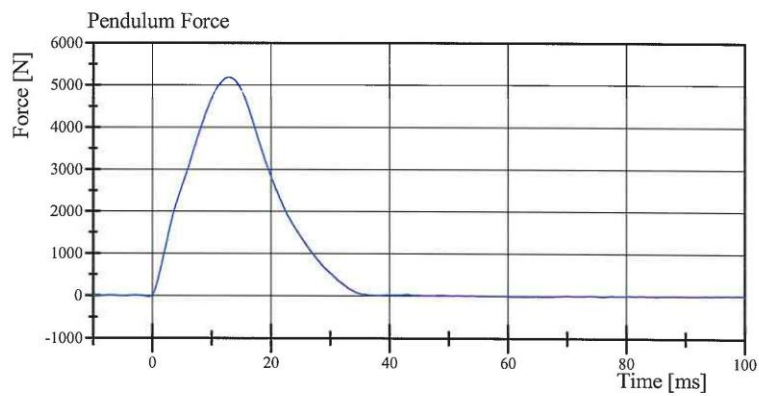
Test Date: 2/21/2014



Filter Class: CFC_180

Max: 22.6 g at 12.9 ms

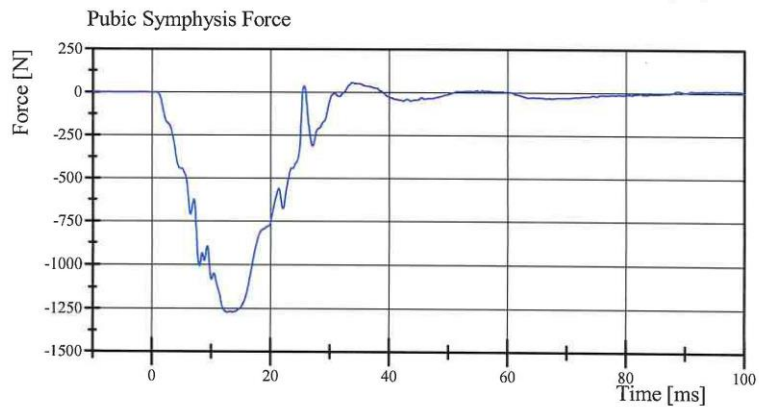
Min: -0.1 g at -0.6 ms



Filter Class: CFC_180

Max: 5,188.8 N at 12.9 ms

Min: -16.8 N at -0.6 ms



Filter Class: CFC_600

Max: 57.7 N at 33.8 ms

Min: -1,271.6 N at 12.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.21.2014 11:41:38 543

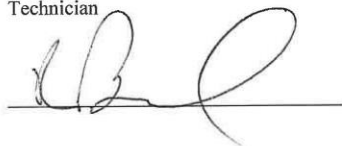


Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.028

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	102	Yes
F	Thigh Clearance	119.0 - 135.0	126	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	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	527	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	427	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	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	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	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	777	Yes

Technician



Approved




Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 28-1

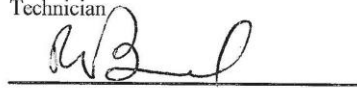
Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	16 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	122.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	3.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

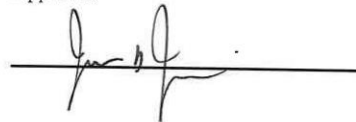
Test meets specifications.

Comments:

Technician



Approved



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

02.10.2014 08:45:23 230

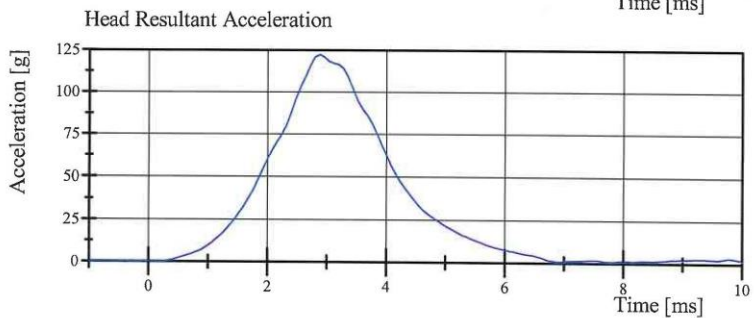
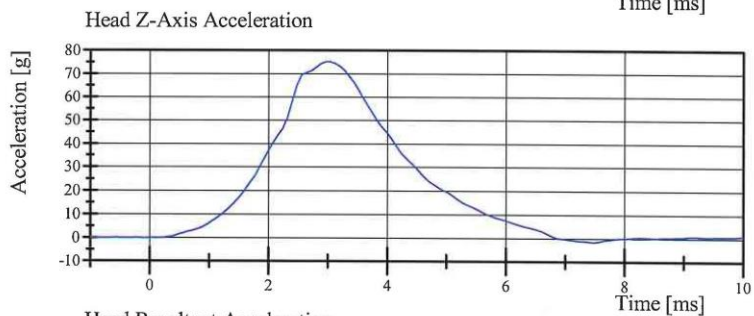
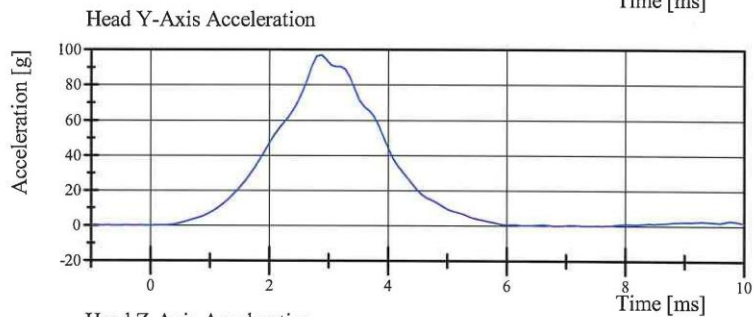
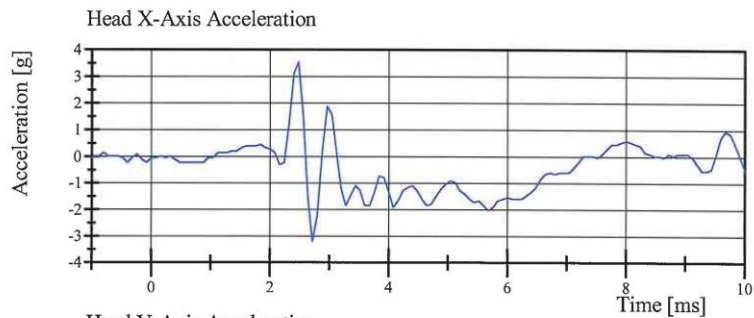


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 28-1

Test Date: 2/10/2014



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

02.10.2014 08:45:33 230



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 28-3

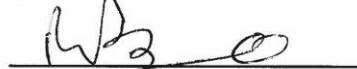
Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.602 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.698 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.972 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.331 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.809 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.810 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-78.8 deg	Yes
Time of Peak	50 - 70 ms	68.8 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.8 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	121.9 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.

02.10.2014 12:32:54 635

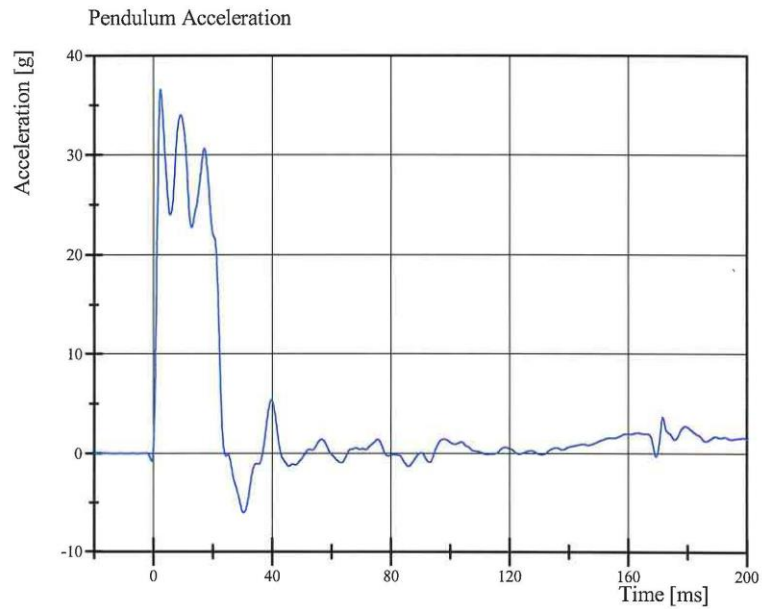


Transportation Research Center Inc.

Left Lateral Neck

SID II_s Serial No. 305 Certification No. 28-3

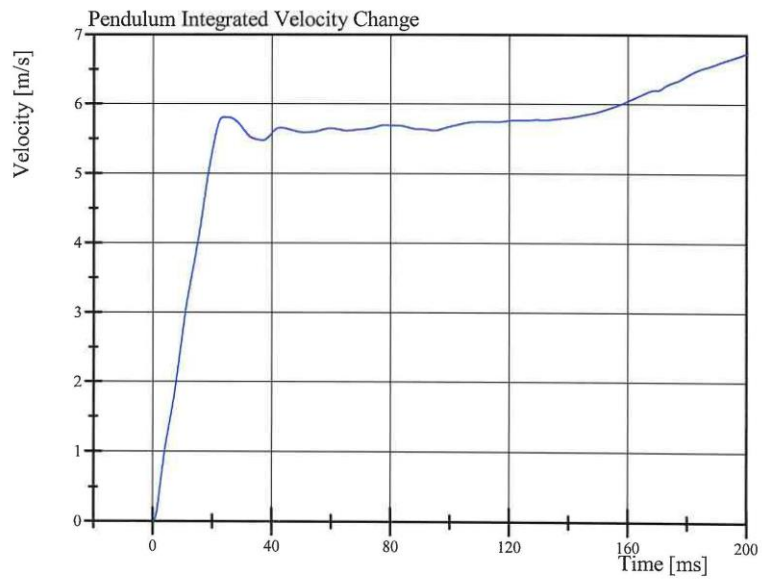
Test Date: 2/10/2014



Filter Class: CFC_180

Max: 36.6 g at 2.4 ms

Min: -6.0 g at 30.3 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.

02.10.2014 12:33:01 635

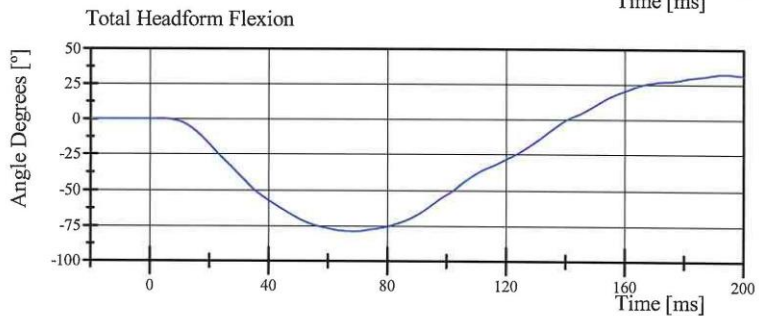
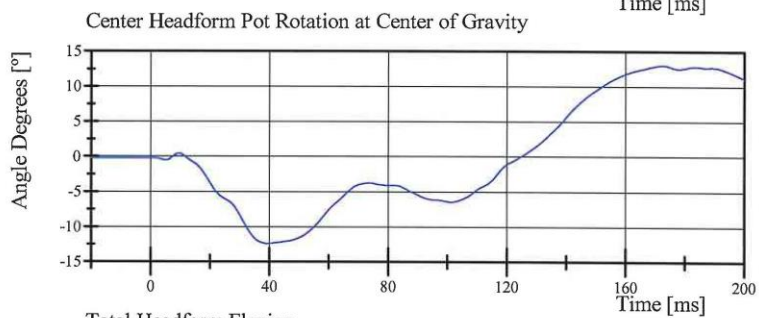
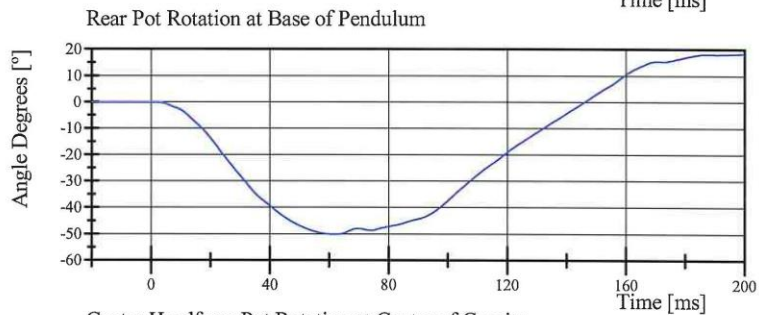
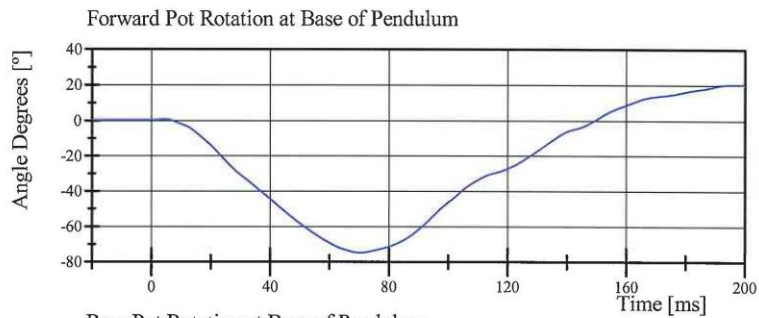


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 28-3

Test Date: 2/10/2014



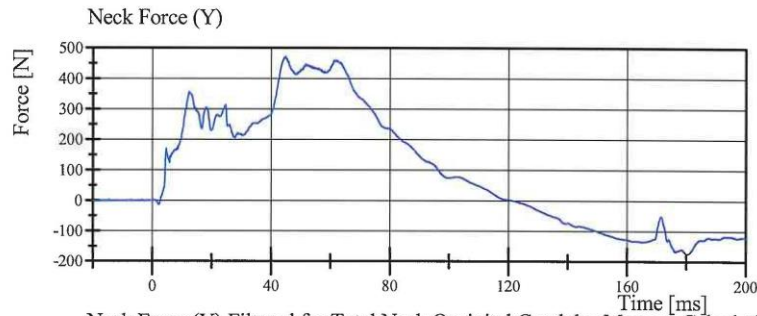
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 12:33:02 635

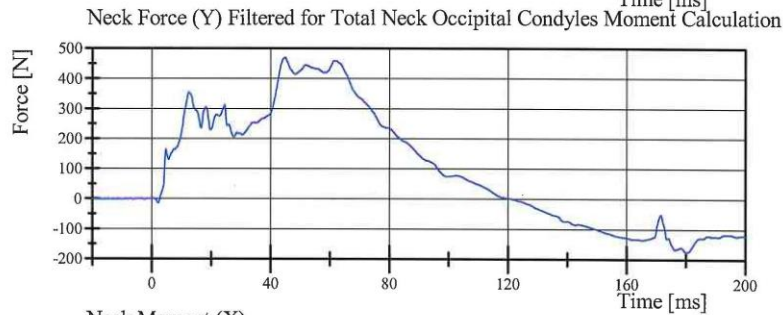


Transportation Research Center Inc.

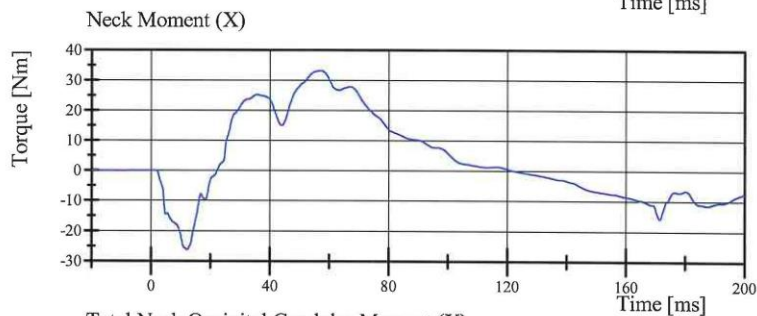
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 28-3
Test Date: 2/10/2014



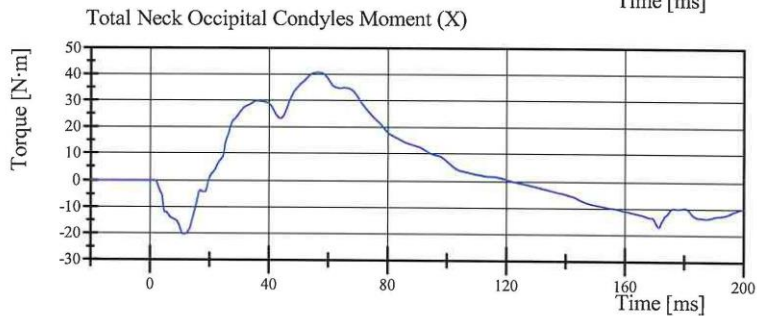
Filter Class: CFC_1000
Max: 472.0 N at 44.9 ms
Min: -175.9 N at 180.2 ms



Filter Class: CFC_600
Max: 469.7 N at 44.9 ms
Min: -175.6 N at 180.2 ms



Filter Class: CFC_600
Max: 33.2 Nm at 56.7 ms
Min: -26.3 Nm at 12.2 ms



Filter Class: Without_(Consta
Max: 40.8 N·m at 56.6 ms
Min: -20.3 N·m at 11.2 ms

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

02.10.2014 12:33:02 635



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 28-1

Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.8 g	Yes
Shoulder Displacement	28 - 37 mm	30.8 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.3 g	Yes

Test meets specifications.

Comments:

Technician



Approved



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

02.10.2014 10:15:55 822

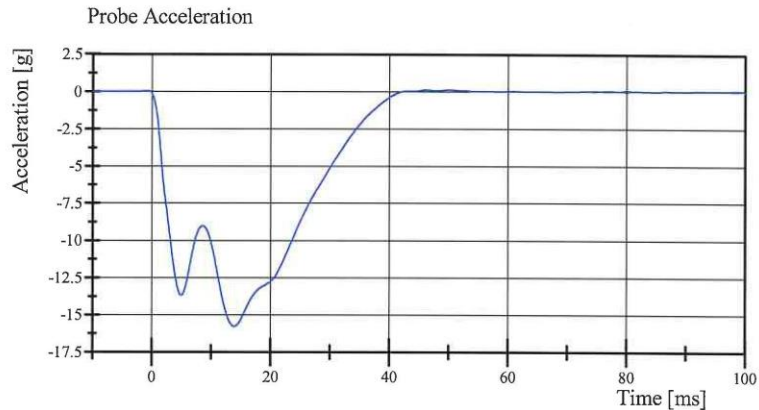


Transportation Research Center Inc.

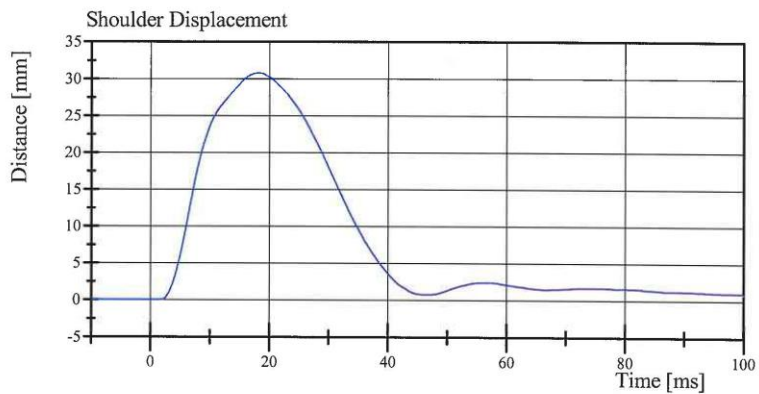
Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 28-1

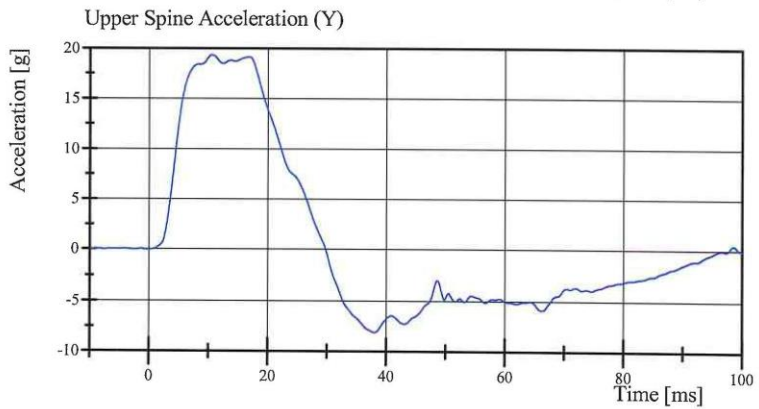
Test Date: 2/10/2014



Filter Class: CFC_180
Max: 0.1 g at 50.2 ms
Min: -15.8 g at 13.9 ms



Filter Class: CFC_600
Max: 30.8 mm at 18.0 ms
Min: -0.0 mm at -0.3 ms



Filter Class: CFC_180
Max: 19.3 g at 10.6 ms
Min: -8.1 g at 38.0 ms

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

02.10.2014 10:16:02 822



Transportation Research Center Inc.

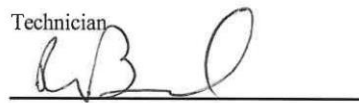
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.713 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-32.4 g	Yes
Shoulder Displacement	31 - 40 mm	33.0 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.9 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.1 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.2 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.4 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	32.6 g	Yes

Test meets specifications.

Comments:

Technician



Approved



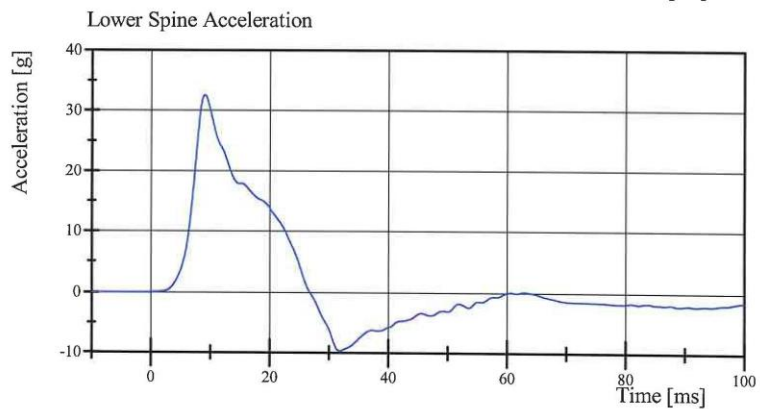
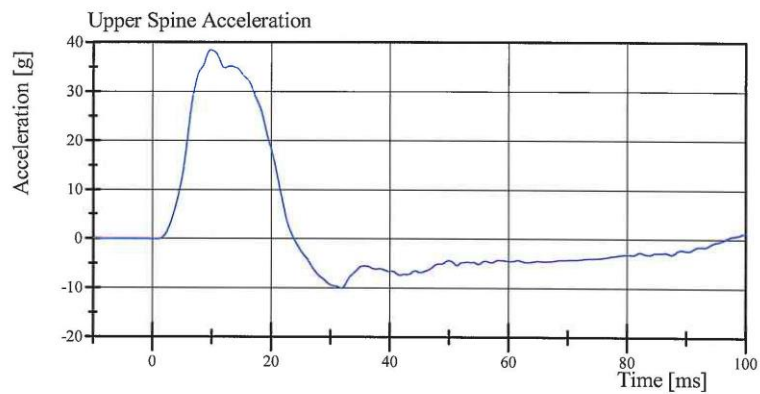
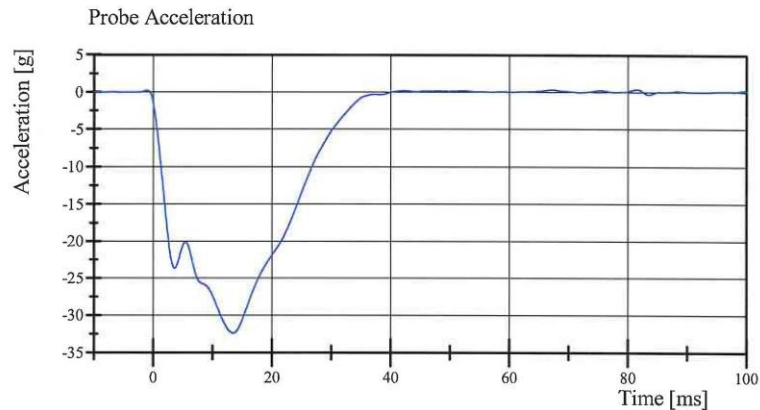
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 11:24:45 613



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID II_s Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014



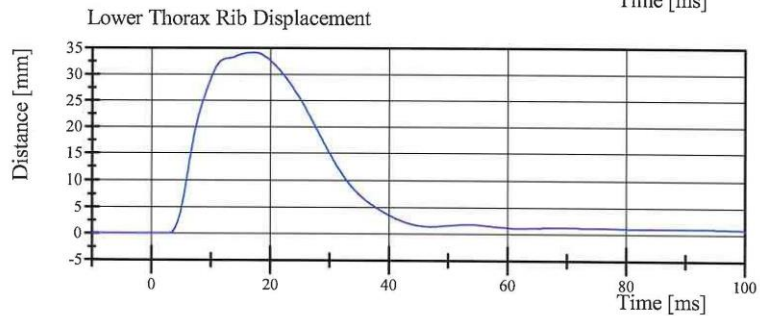
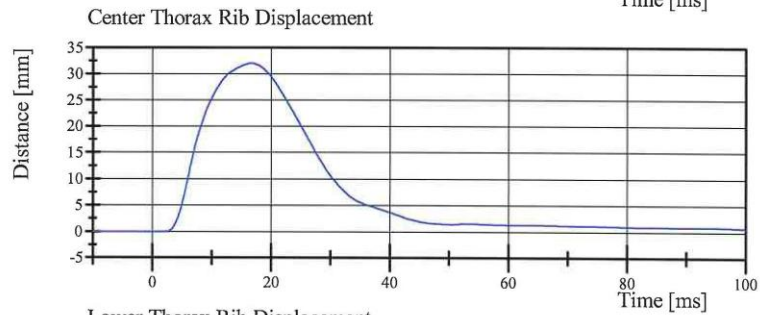
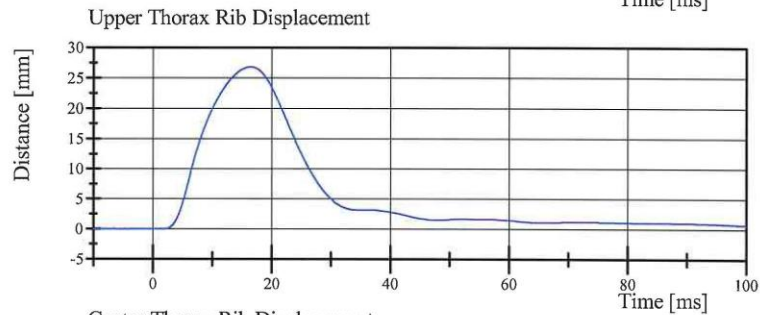
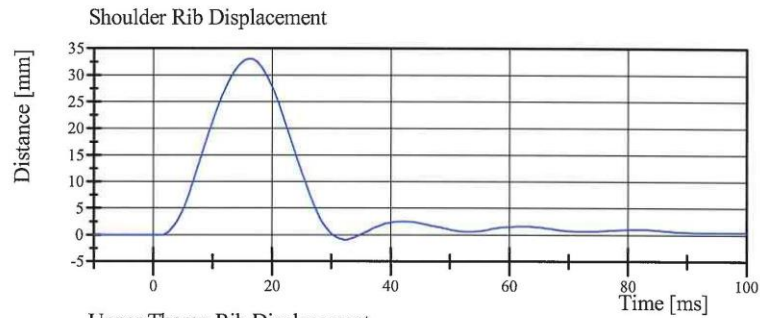
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 11:24:53 613



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID II_s Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014



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

02.10.2014 11:24:54 613



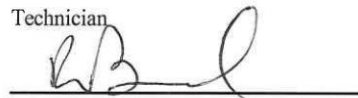
Transportation Research Center Inc.

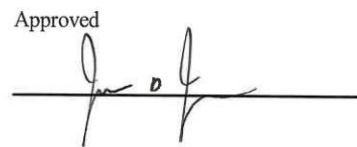
Left Lateral Thorax without Arm
SID II_s Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.384 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.1 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.6 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.4 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.1 g	Yes

Test meets specifications.

Comments:

Technician


Approved


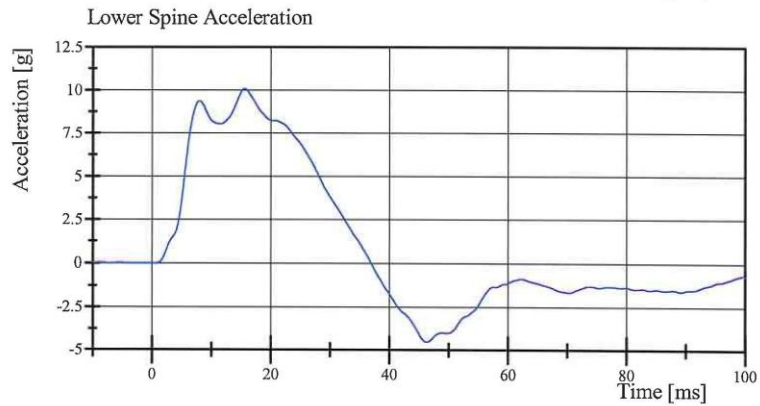
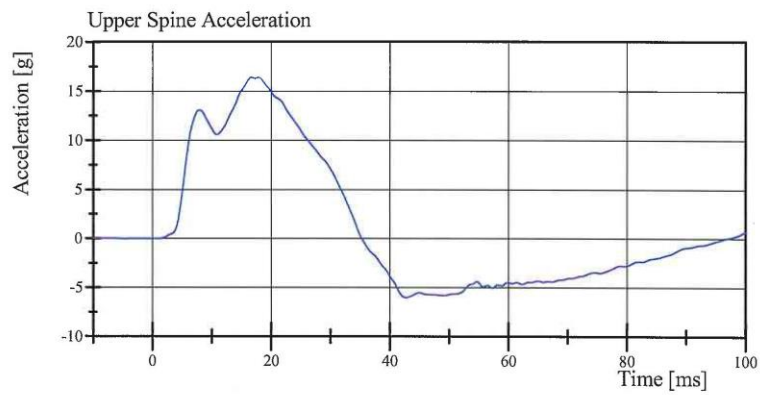
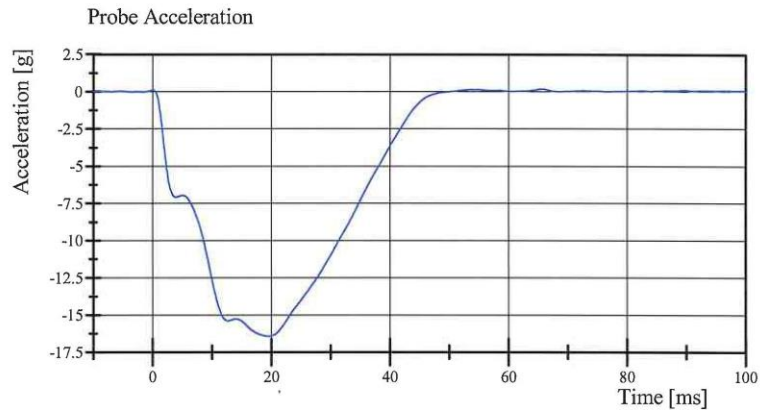
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 10:51:54 816



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID II_s Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014



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

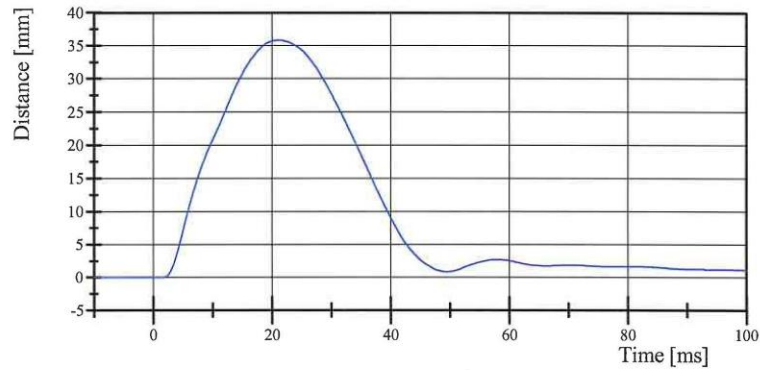
02.10.2014 10:52:02 816



Transportation Research Center Inc.

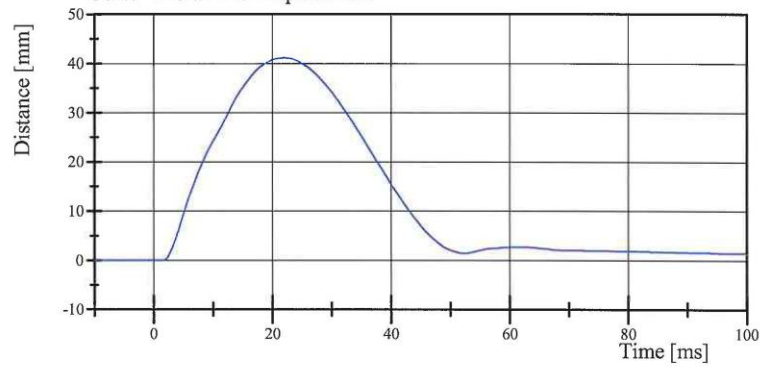
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Upper Thorax Rib Displacement



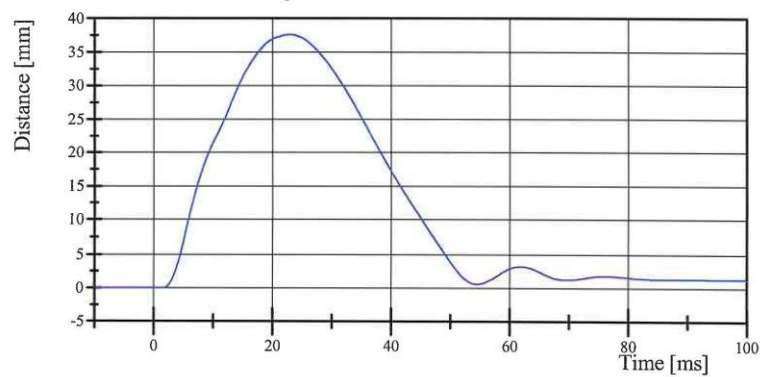
Filter Class: CFC_600
Max: 35.8 mm at 21.1 ms
Min: -0.0 mm at -9.7 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.1 mm at 22.0 ms
Min: -0.0 mm at -9.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.6 mm at 23.0 ms
Min: -0.0 mm at -9.7 ms

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

02.10.2014 10:52:03 816



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 28-1

Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.6 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.4 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.33 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.

02.10.2014 11:09:02 642

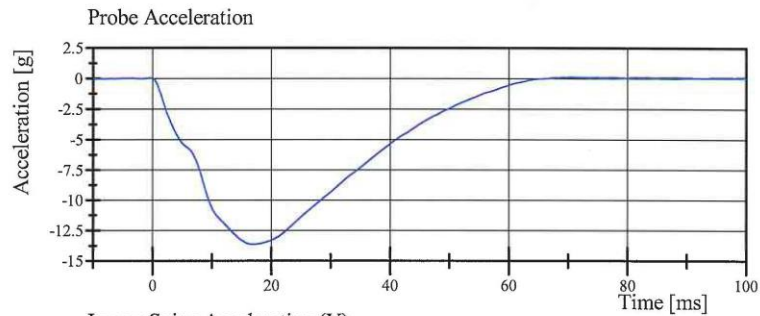


Transportation Research Center Inc.

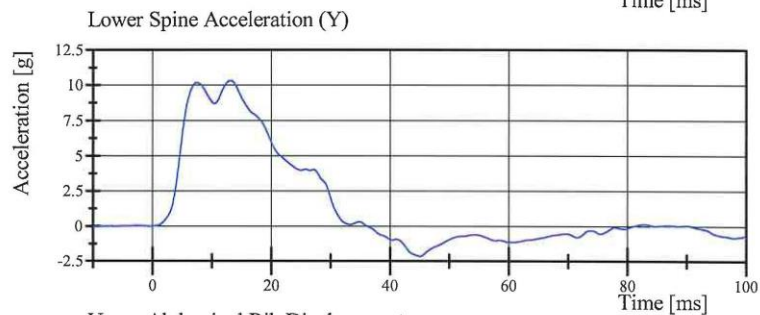
Left Lateral Abdomen

SID II_s Serial No. 305 Certification No. 28-1

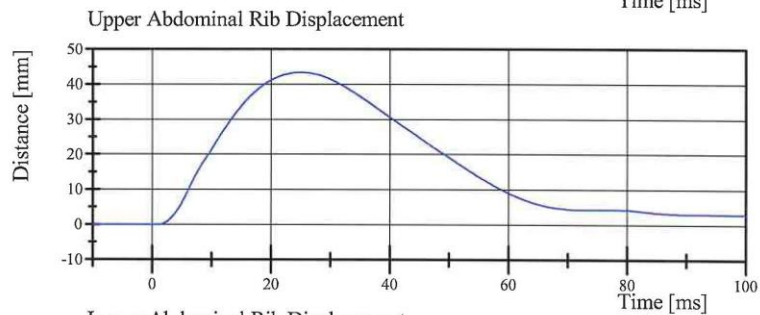
Test Date: 2/10/2014



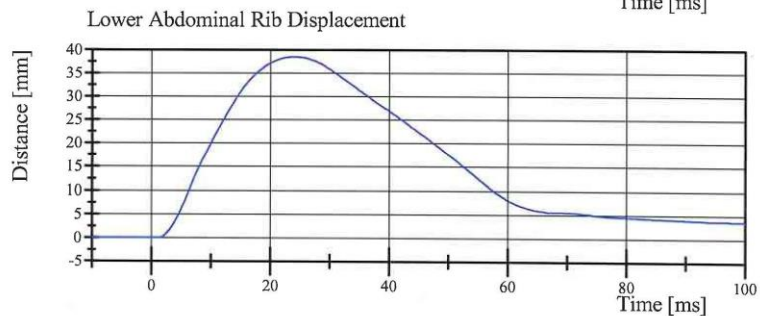
Filter Class: CFC_180
Max: 0.1 g at 70.6 ms
Min: -13.6 g at 17.0 ms



Filter Class: CFC_180
Max: 10.3 g at 13.1 ms
Min: -2.2 g at 45.0 ms



Filter Class: CFC_600
Max: 43.3 mm at 25.0 ms
Min: -0.0 mm at 1.0 ms



Filter Class: CFC_600
Max: 38.4 mm at 23.9 ms
Min: -0.0 mm at -1.0 ms

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

02.10.2014 11:09:10 642



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 28-2

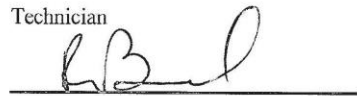
Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.64 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-42.32 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	39.4 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,300.0 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.

02.10.2014 14:54:21 446

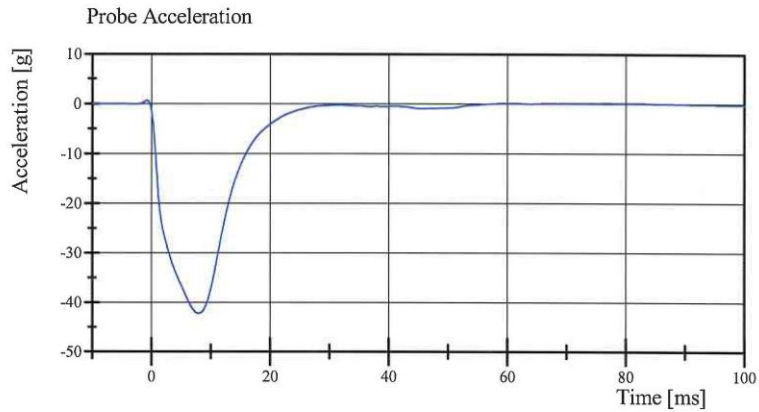


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 28-2

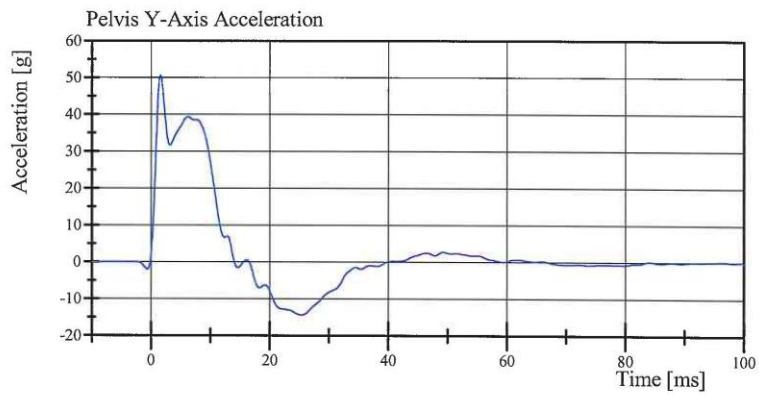
Test Date: 2/10/2014



Filter Class: CFC_180

Max: 0.6 g at -0.7 ms

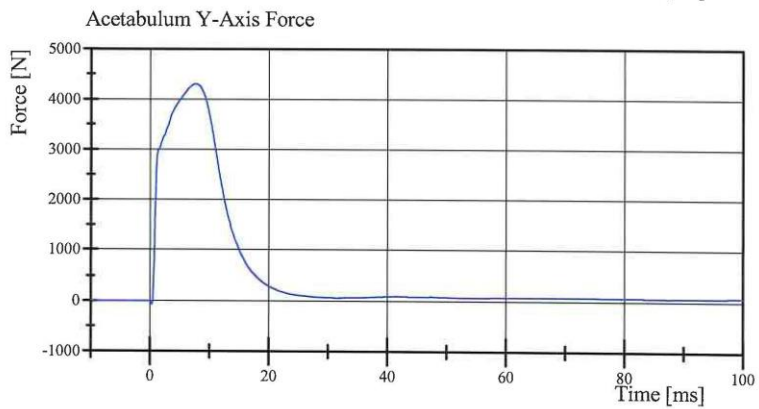
Min: -42.3 g at 7.9 ms



Filter Class: CFC_180

Max: 50.7 g at 1.6 ms

Min: -14.4 g at 25.4 ms



Filter Class: CFC_600

Max: 4,300.0 N at 7.7 ms

Min: -61.6 N at 0.3 ms

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

02.10.2014 14:54:28 446



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 28-1

Test Date: 2/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	18 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-37.1 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	28.6 g	Yes
Iliac Force	4,100 - 5,100 N	4,513.9 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.

02.10.2014 07:42:35 663

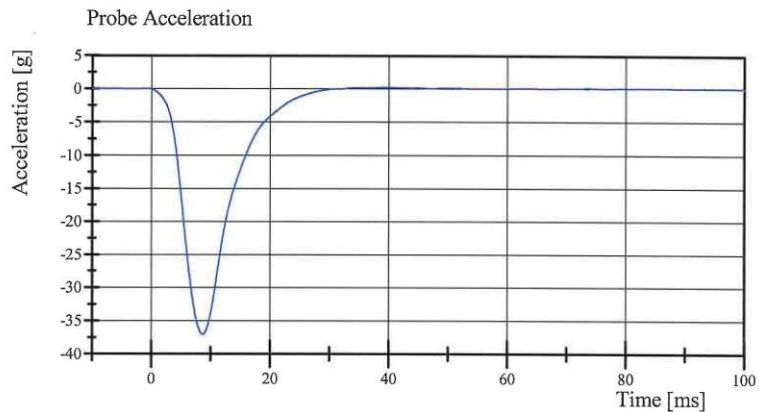


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 28-1

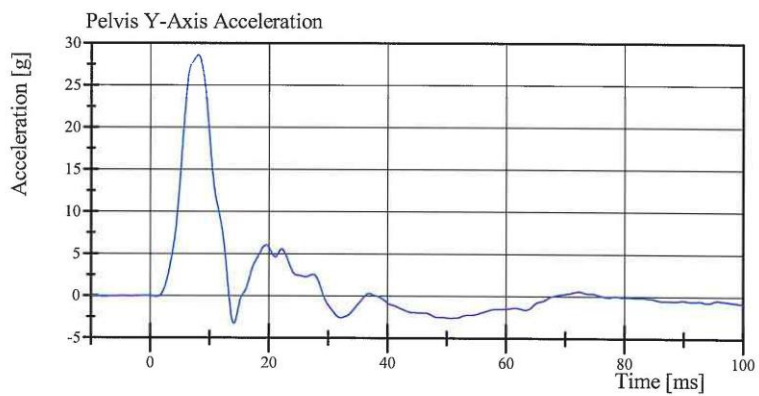
Test Date: 2/10/2014



Filter Class: CFC_180

Max: 0.2 g at 39.8 ms

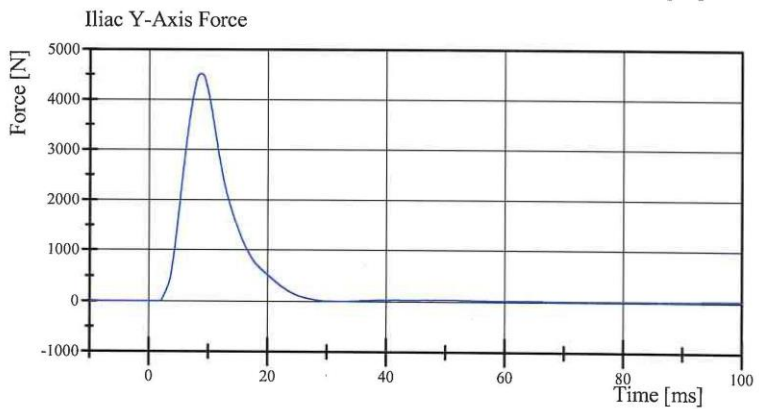
Min: -37.1 g at 8.6 ms



Filter Class: CFC_180

Max: 28.6 g at 8.1 ms

Min: -3.2 g at 14.2 ms



Filter Class: CFC_600

Max: 4,513.9 N at 8.8 ms

Min: -0.9 N at -3.8 ms

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

02.10.2014 07:42:43 663



Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDI's Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.029

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	444	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	102	Yes
F	Thigh Clearance	119.0 - 135.0	126	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	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	526	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	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	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	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	777	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 29-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	122.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.1 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



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

02.21.2014 08:29:01 232

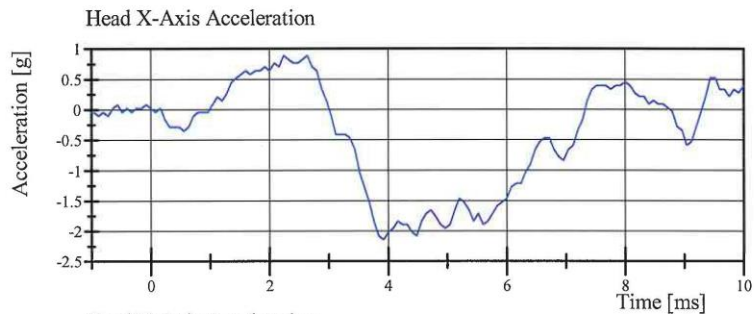


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 29-1

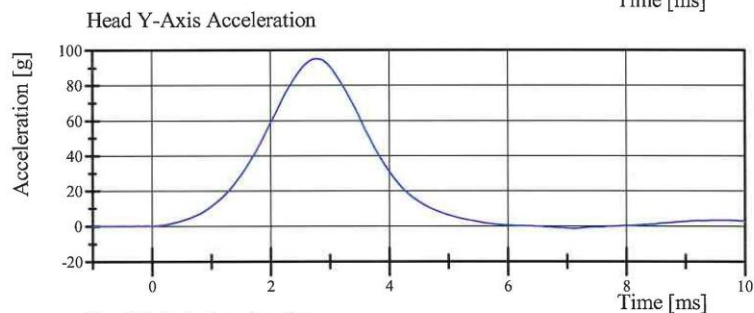
Test Date: 2/21/2014



Filter Class: CFC_1000

Max: 0.9 g at 2.2 ms

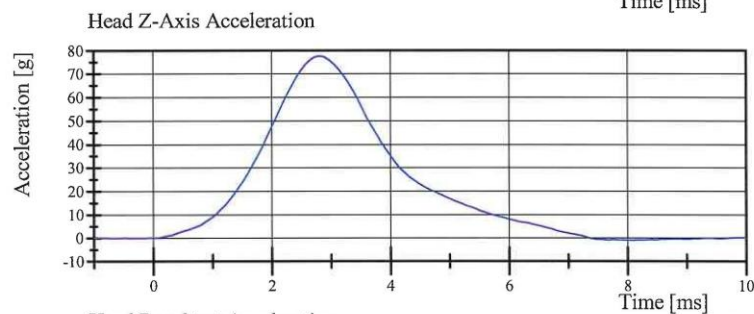
Min: -2.1 g at 3.9 ms



Filter Class: CFC_1000

Max: 95.2 g at 2.8 ms

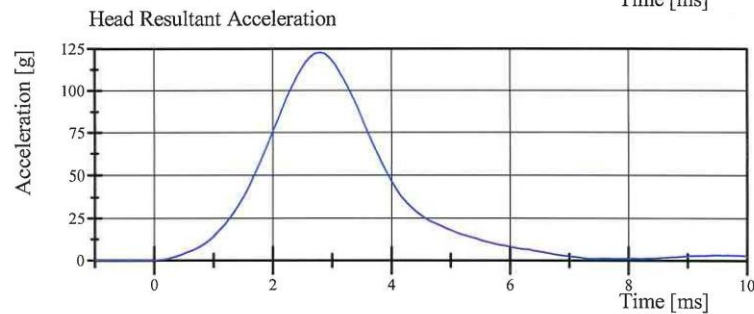
Min: -1.5 g at 7.1 ms



Filter Class: CFC_1000

Max: 77.6 g at 2.8 ms

Min: -1.1 g at 8.1 ms



Filter Class: CFC_1000

Max: 122.8 g at 2.8 ms

Min: 0.0 g at -0.6 ms

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

02.21.2014 08:29:11 232



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 29-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.608 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.616 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.752 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.018 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.799 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.801 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-76.6 deg	Yes
Time of Peak	50 - 70 ms	70.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.6 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	118.4 ms	Yes

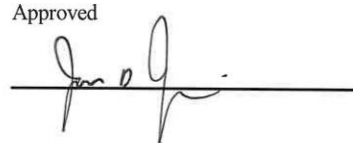
Test meets specifications.

Comments:

Technician



Approved



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

02.21.2014 08:50:17 640

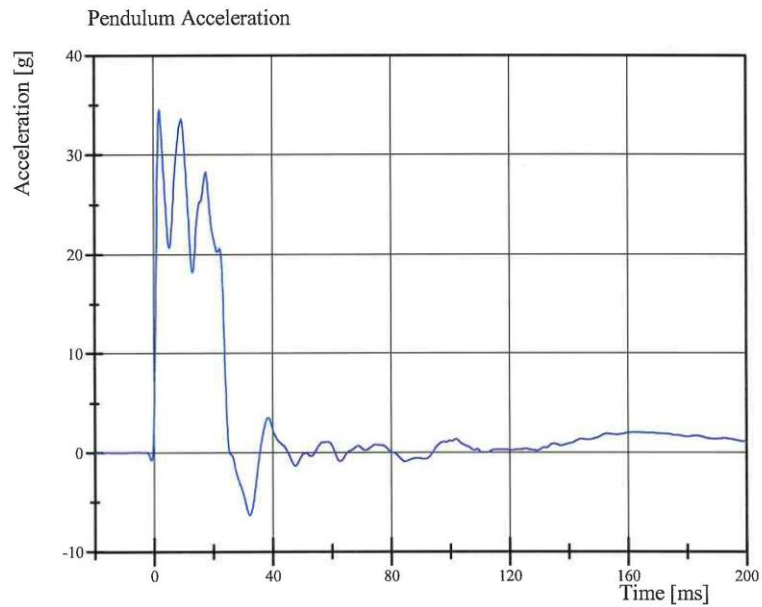


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 29-1

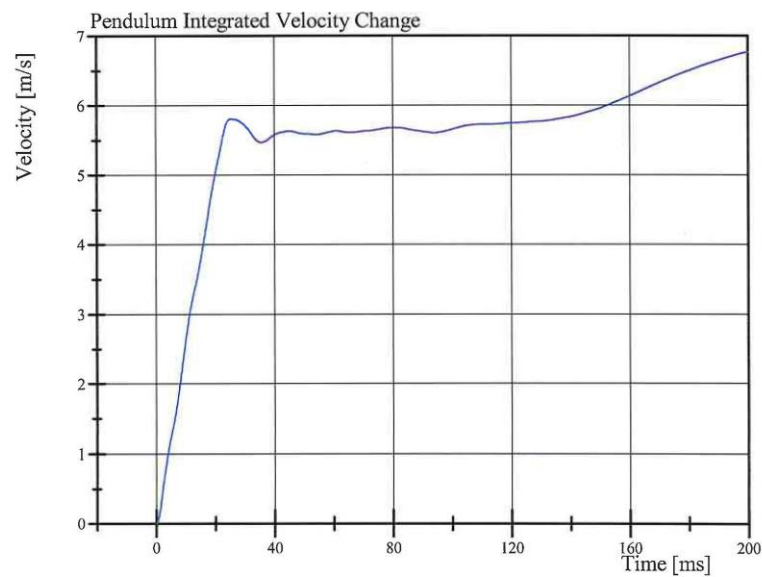
Test Date: 2/21/2014



Filter Class: CFC_180

Max: 34.5 g at 2.0 ms

Min: -6.4 g at 32.2 ms



Filter Class: CFC_180

Max: 6.8 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

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

02.21.2014 08:50:24 640

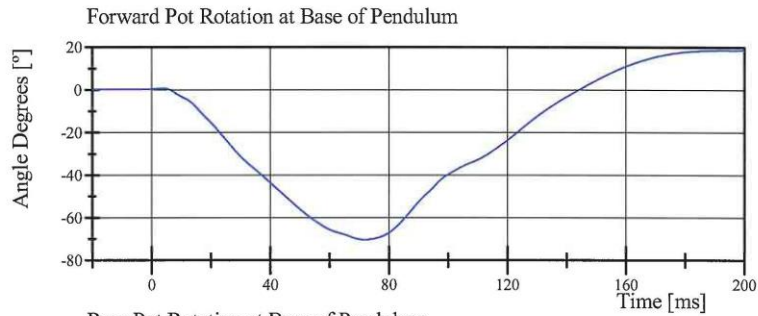


Transportation Research Center Inc.

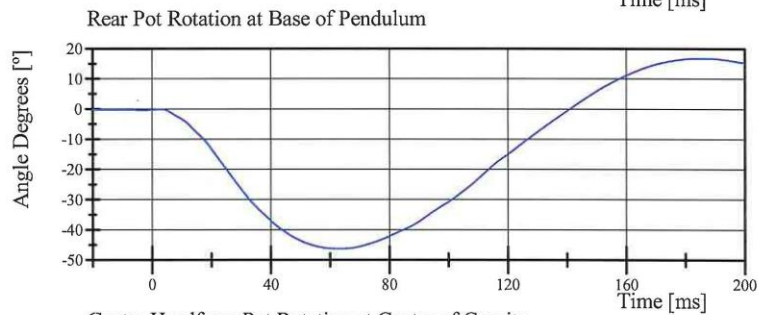
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 29-1

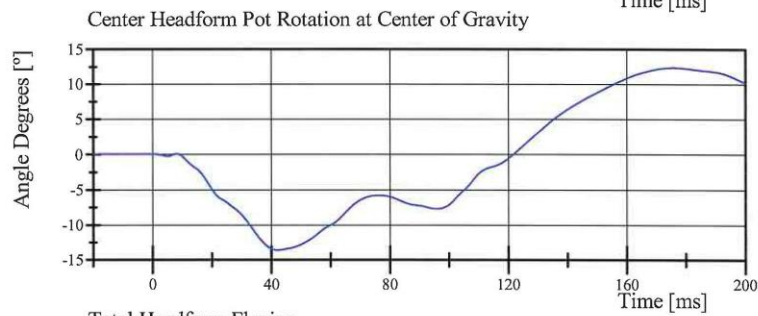
Test Date: 2/21/2014



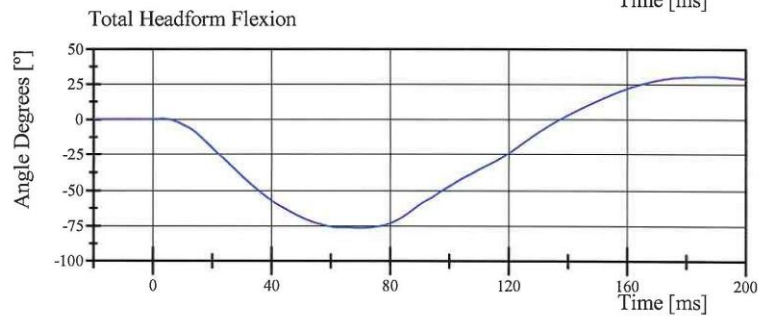
Filter Class: CFC_60
Max: 18.5 ° at 199.5 ms
Min: -70.4 ° at 71.8 ms



Filter Class: CFC_60
Max: 16.7 ° at 185.2 ms
Min: -46.3 ° at 63.0 ms



Filter Class: CFC_60
Max: 12.3 ° at 175.6 ms
Min: -13.6 ° at 42.0 ms



Filter Class: CFC_60
Max: 30.1 ° at 189.0 ms
Min: -76.6 ° at 70.0 ms

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

02.21.2014 08:50:25 640

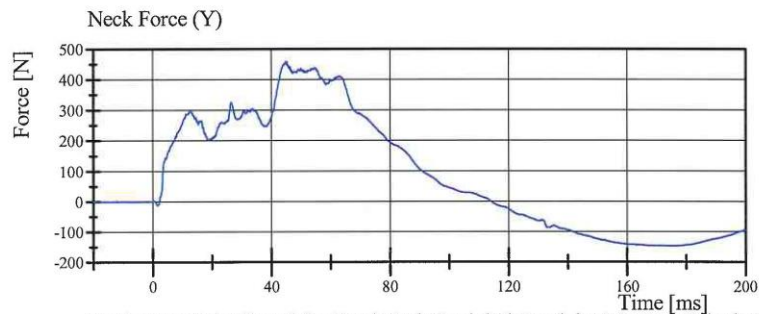


Transportation Research Center Inc.

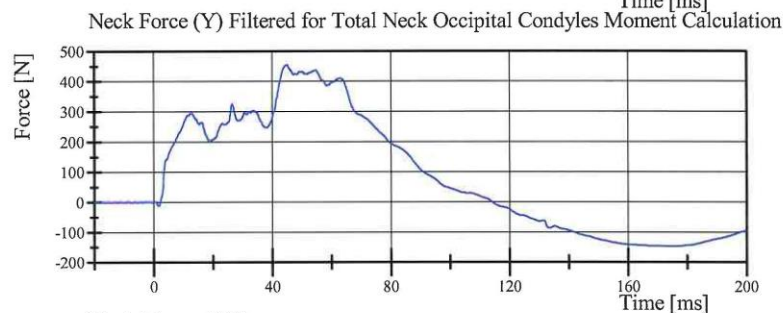
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 29-1

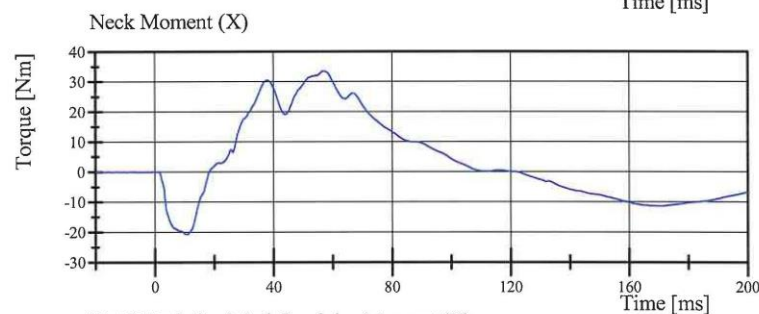
Test Date: 2/21/2014



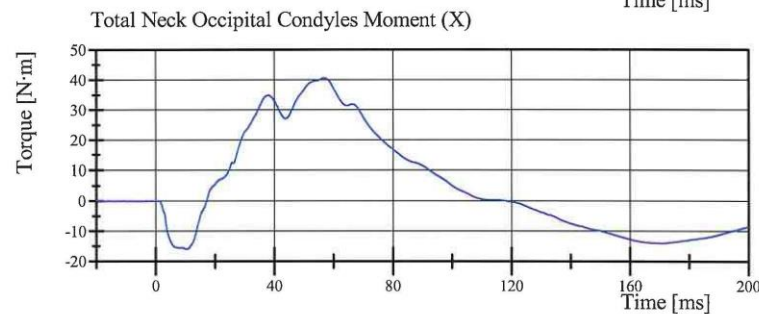
Filter Class: CFC_1000
Max: 458.1 N at 45.2 ms
Min: -148.7 N at 173.9 ms



Filter Class: CFC_600
Max: 454.4 N at 45.2 ms
Min: -148.3 N at 173.4 ms



Filter Class: CFC_600
Max: 33.5 Nm at 57.3 ms
Min: -20.8 Nm at 11.0 ms



Filter Class: Without_(Consta
Max: 40.6 N·m at 56.6 ms
Min: -16.0 N·m at 10.2 ms

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

02.21.2014 08:50:26 640



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 29-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.0 g	Yes
Shoulder Displacement	28 - 37 mm	31.1 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.1 g	Yes

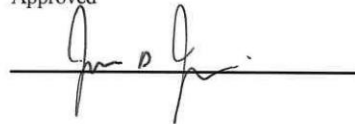
Test meets specifications.

Comments:

Technician



Approved



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

02.21.2014 07:57:18 820

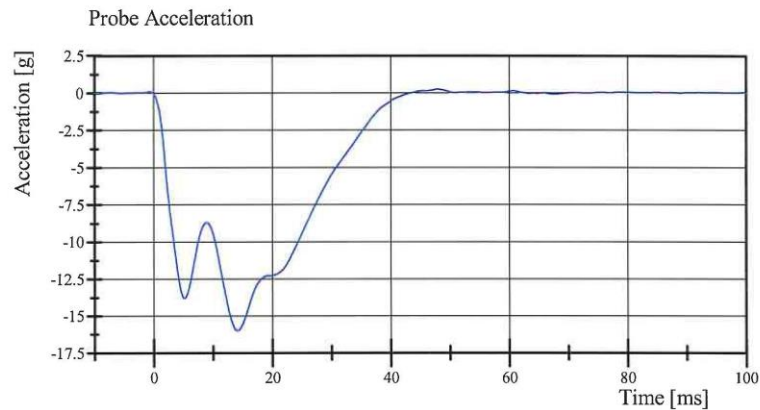


Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 29-1

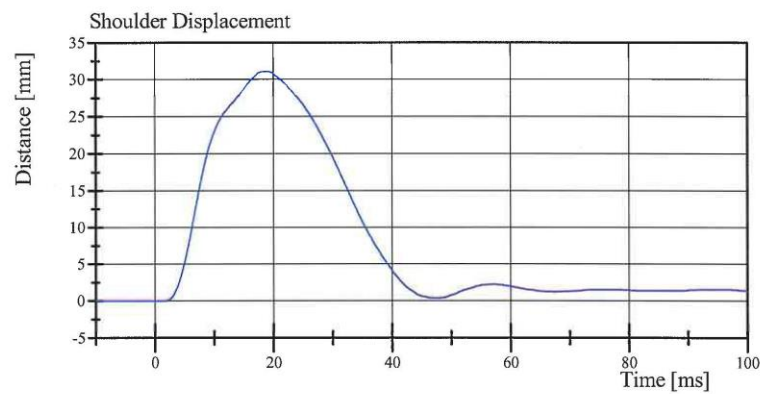
Test Date: 2/21/2014



Filter Class: CFC_180

Max: 0.2 g at 47.8 ms

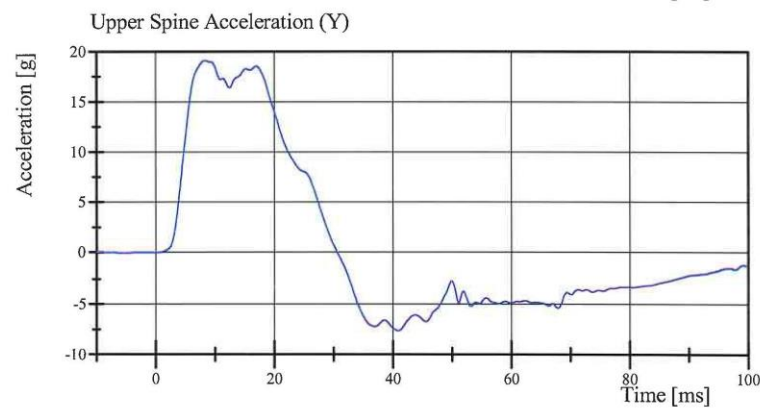
Min: -16.0 g at 14.1 ms



Filter Class: CFC_600

Max: 31.1 mm at 18.8 ms

Min: -0.0 mm at -5.1 ms



Filter Class: CFC_180

Max: 19.1 g at 8.3 ms

Min: -7.6 g at 40.8 ms

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

02.21.2014 07:57:24 820



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 29-1
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.705 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.0 g	Yes
Shoulder Displacement	31 - 40 mm	32.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.7 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.1 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	32.9 g	Yes

Test meets specifications.

Comments:

Technician



Approved



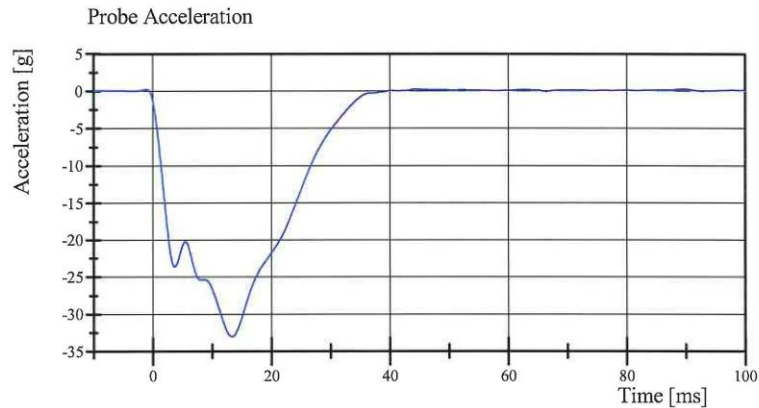
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.21.2014 09:12:11 636

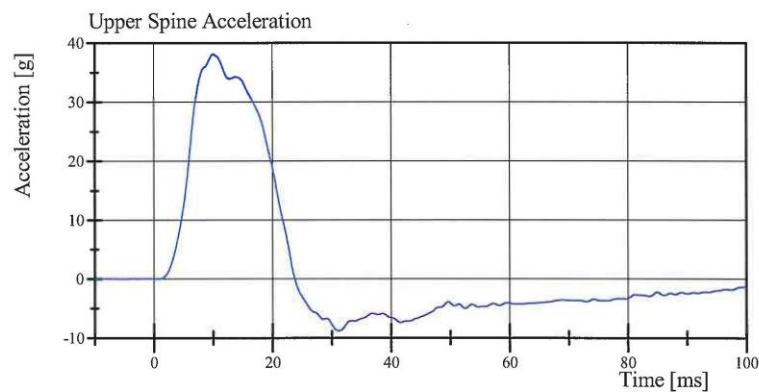


Transportation Research Center Inc.

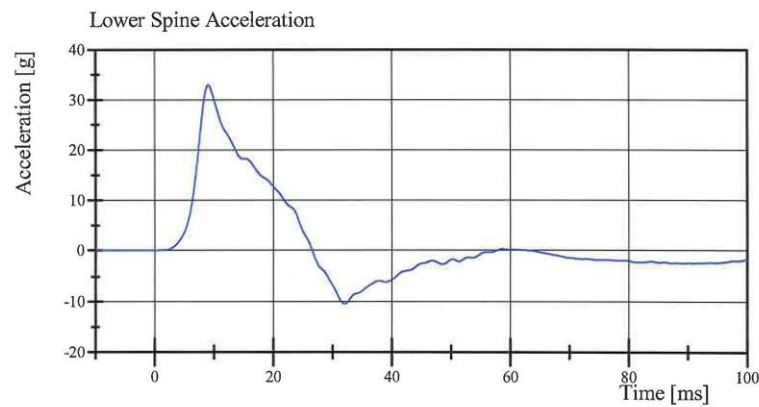
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 29-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 0.2 g at 44.2 ms
Min: -33.0 g at 13.4 ms



Filter Class: CFC_180
Max: 38.1 g at 10.0 ms
Min: -8.8 g at 31.1 ms



Filter Class: CFC_180
Max: 32.9 g at 9.0 ms
Min: -10.4 g at 32.0 ms

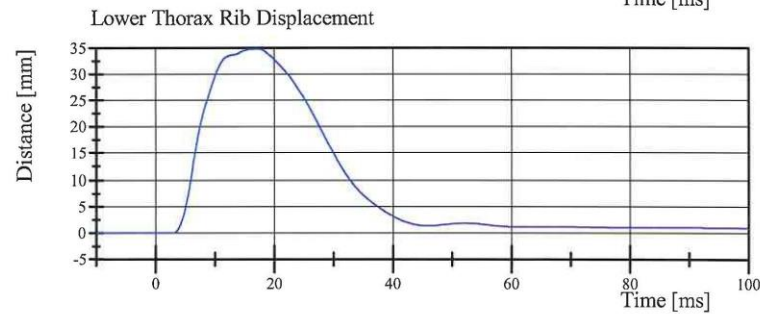
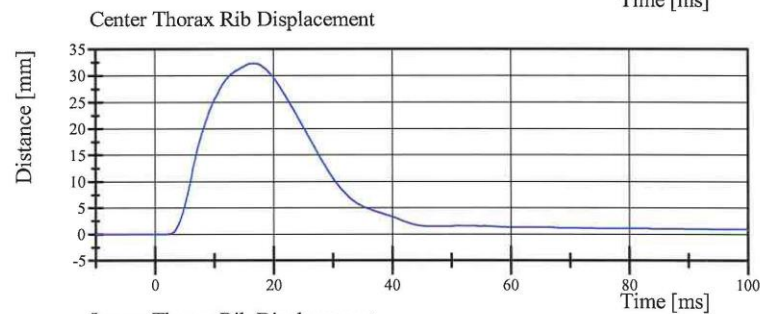
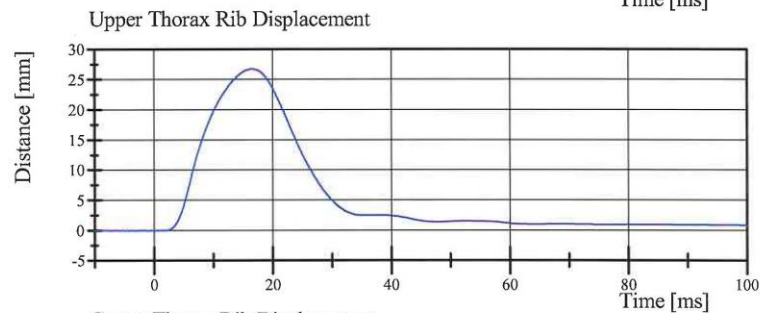
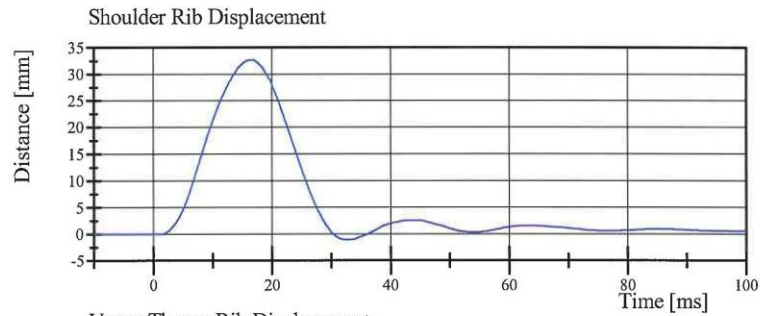
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.21.2014 09:12:22 636



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 29-1
Test Date: 2/21/2014



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

02.21.2014 09:12:23 636



Transportation Research Center Inc.

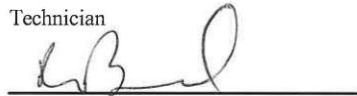
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 29-1
Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.6 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.385 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.3 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.7 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.6 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.6 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.3 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.9 g	Yes

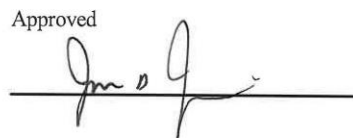
Test meets specifications.

Comments:

Technician



Approved



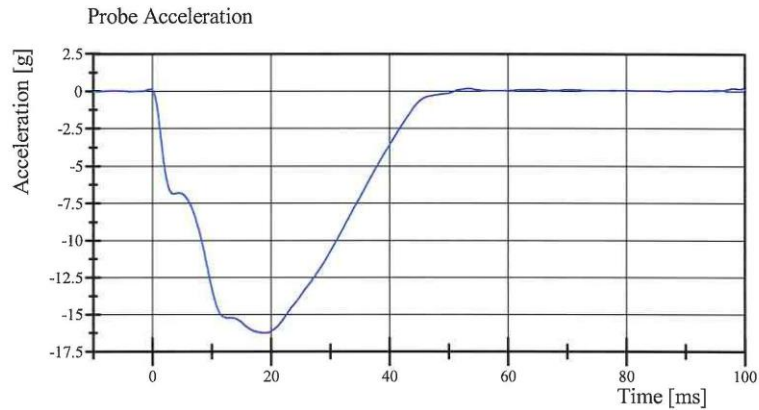
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.21.2014 08:33:36 830

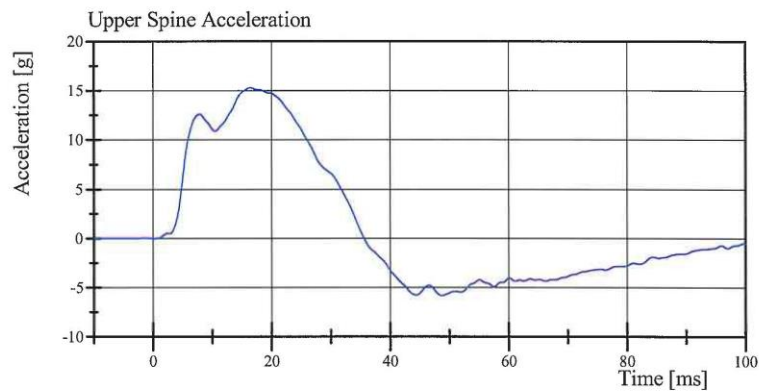


Transportation Research Center Inc.

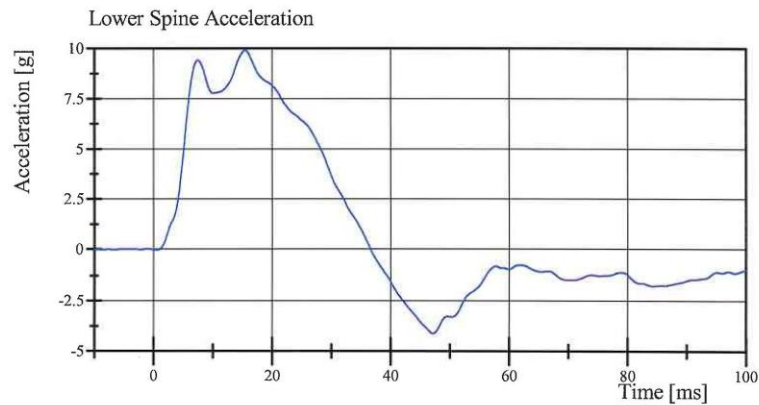
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 29-1
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 0.2 g at 53.3 ms
Min: -16.3 g at 19.0 ms



Filter Class: CFC_180
Max: 15.3 g at 16.4 ms
Min: -5.8 g at 48.7 ms



Filter Class: CFC_180
Max: 9.9 g at 15.4 ms
Min: -4.1 g at 47.1 ms

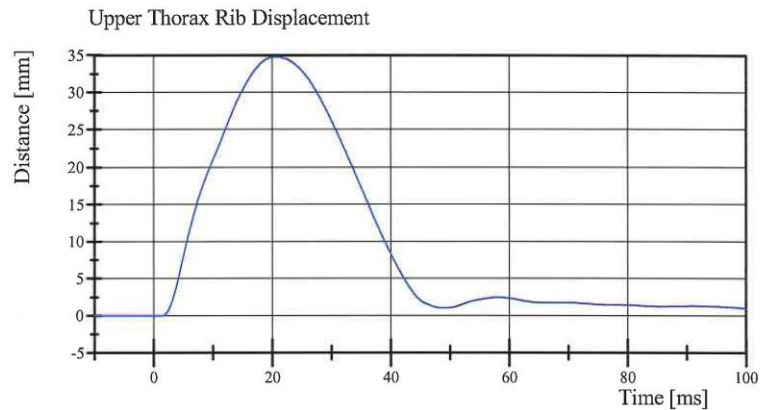
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.21.2014 08:33:44 830

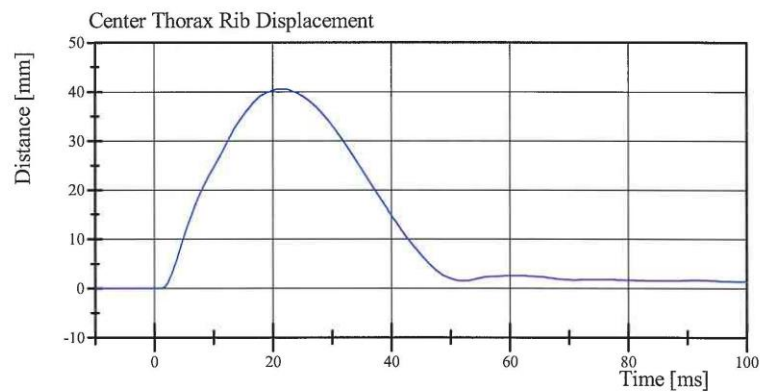


Transportation Research Center Inc.

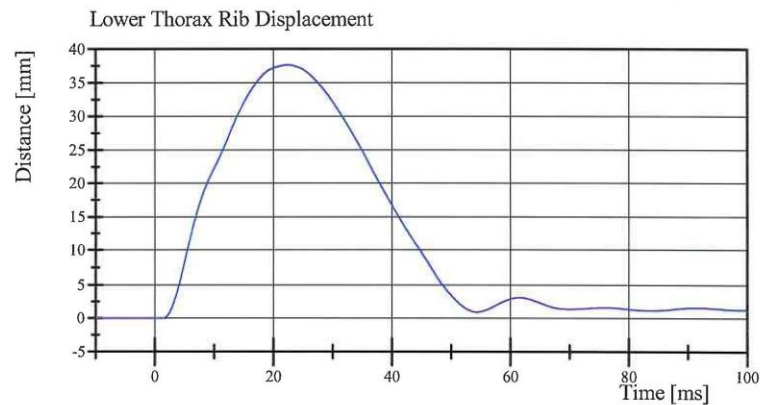
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 29-1
Test Date: 2/21/2014



Filter Class: CFC_600
Max: 34.7 mm at 20.6 ms
Min: -0.0 mm at 1.1 ms



Filter Class: CFC_600
Max: 40.6 mm at 21.7 ms
Min: -0.0 mm at -3.4 ms



Filter Class: CFC_600
Max: 37.6 mm at 22.4 ms
Min: -0.0 mm at -10.0 ms

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

02.21.2014 08:33:44 830



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 29-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.0 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	44.7 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	37.0 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.50 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.

02.21.2014 08:09:58 687

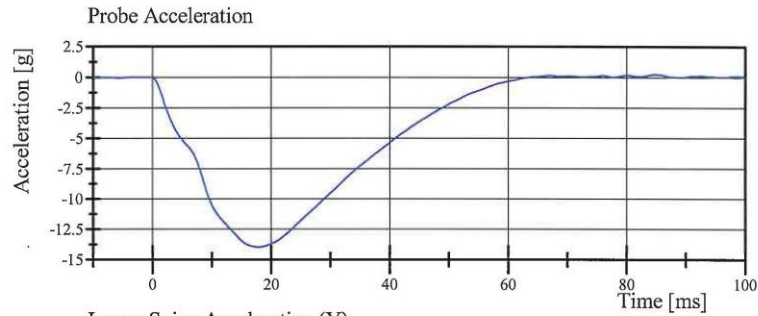


Transportation Research Center Inc.

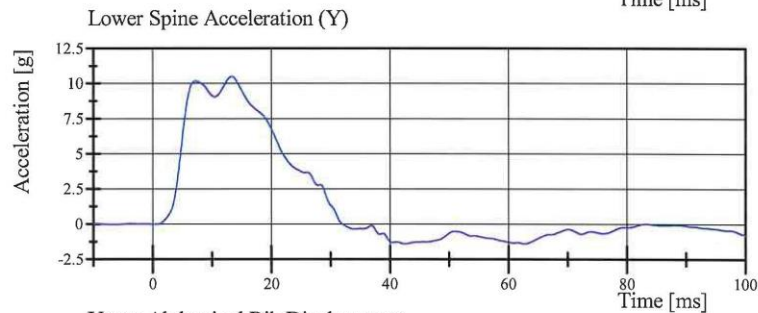
Left Lateral Abdomen

SID IIa Serial No. 305 Certification No. 29-1

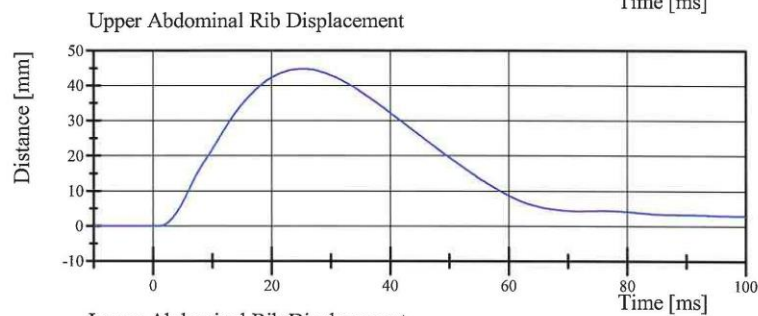
Test Date: 2/21/2014



Filter Class: CFC_180
Max: 0.2 g at 84.8 ms
Min: -14.0 g at 17.8 ms



Filter Class: CFC_180
Max: 10.5 g at 13.3 ms
Min: -1.4 g at 42.6 ms



Filter Class: CFC_600
Max: 44.7 mm at 25.2 ms
Min: -0.0 mm at 1.0 ms



Filter Class: CFC_600
Max: 37.0 mm at 24.2 ms
Min: -0.0 mm at 1.2 ms

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

02.21.2014 08:10:11 687



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 29-1

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.3 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.9 g	Yes
Iliac Force	4,100 - 5,100 N	5,020.0 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.

02.21.2014 07:40:58 657

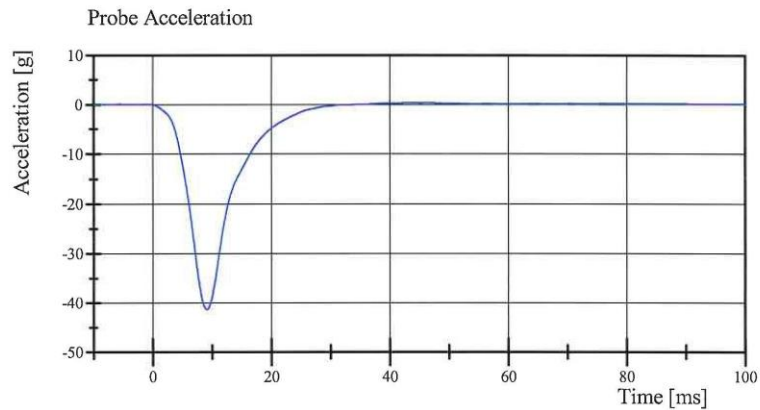


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 29-1

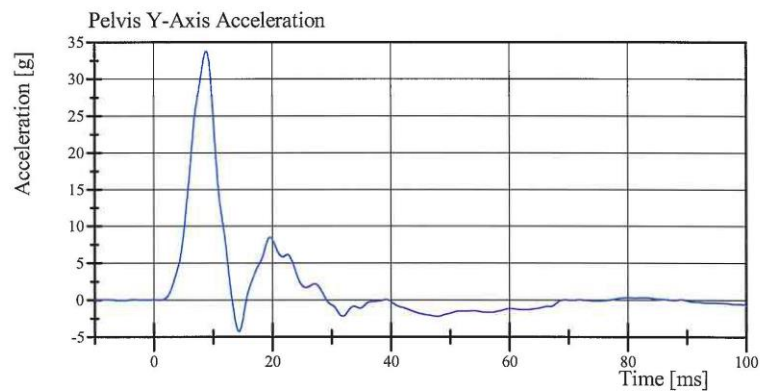
Test Date: 2/21/2014



Filter Class: CFC_180

Max: 0.3 g at 46.4 ms

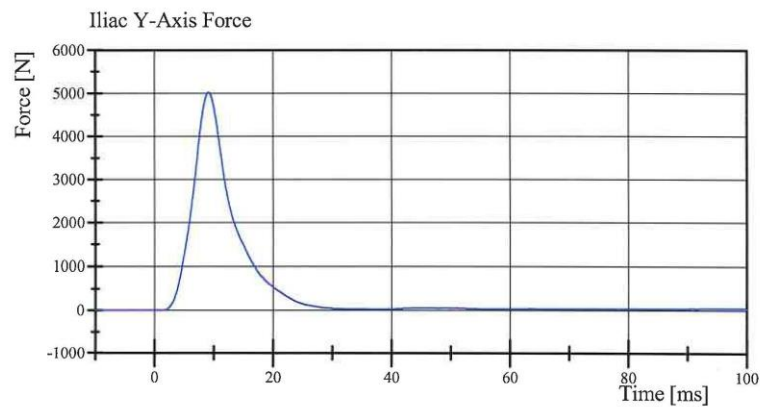
Min: -41.3 g at 9.1 ms



Filter Class: CFC_180

Max: 33.9 g at 8.9 ms

Min: -4.3 g at 14.3 ms



Filter Class: CFC_600

Max: 5,020.0 N at 9.1 ms

Min: -0.7 N at -8.5 ms

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

02.21.2014 07:41:06 657



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 29-2

Test Date: 2/21/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.63 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.80 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,263.2 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.

02.21.2014 12:59:32 450

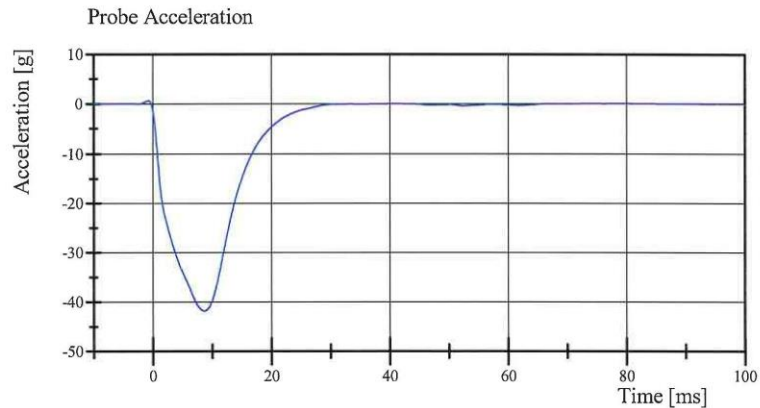


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 29-2

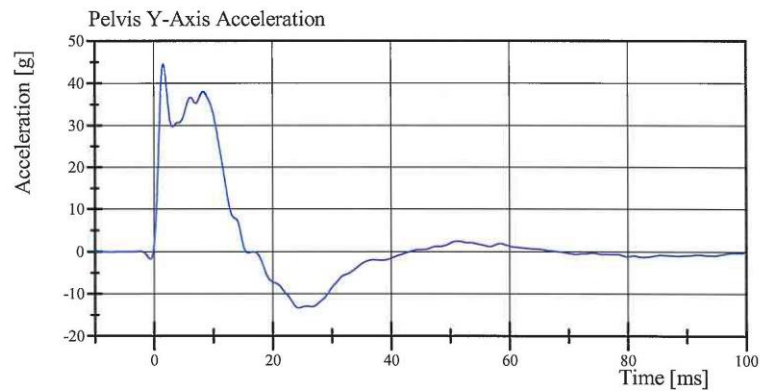
Test Date: 2/21/2014



Filter Class: CFC_180

Max: 0.6 g at -0.7 ms

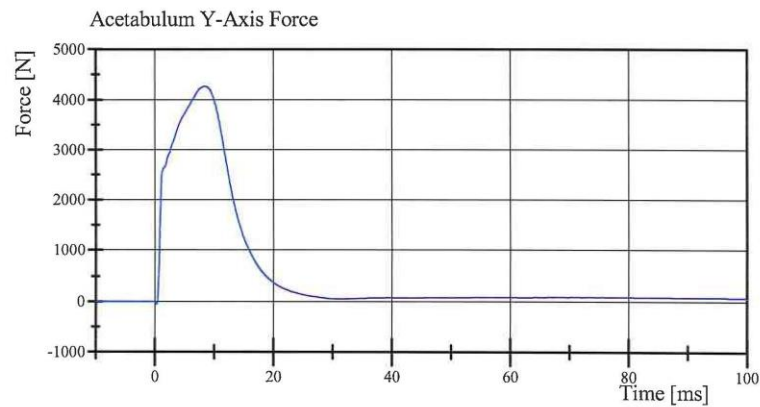
Min: -41.8 g at 8.6 ms



Filter Class: CFC_180

Max: 44.8 g at 1.6 ms

Min: -13.3 g at 24.4 ms



Filter Class: CFC_600

Max: 4,263.2 N at 8.4 ms

Min: -48.9 N at 0.3 ms

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

02.21.2014 12:59:47 450



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	9-Dec-13
		Y	P51702	Endevco	9-Dec-13
		Z	P52083	Endevco	9-Dec-13
Thoracic Rib Displacement Potentiometers	Upper	Y	111	FTSS	27-Jan-14
	Middle	Y	174	FTSS	10-Dec-13
	Lower	Y	173	FTSS	10-Dec-13
Abdomen Load Cells	Front	Y	1441	Denton	21-Oct-13
	Middle	Y	1436	Denton	21-Oct-13
	Rear	Y	1437	Denton	21-Oct-13
Lower Spine Accelerometers (T12)		X	P15954	Endevco	9-Dec-13
		Y	P68599	Endevco	9-Dec-13
		Z	P59005	Endevco	9-Dec-13
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	21-Oct-13

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305			
				Serial Number	Manufacturer	Calibration Date	
Head Accelerometers				X	P51719	Endevco	11-Dec-13
				Y	P51272	Endevco	11-Dec-13
				Z	P58862	Endevco	11-Dec-13
Displacement Potentiometers	Shoulder		Y	N/A	N/A	N/A	
	Thoracic Rib	Upper	Y	007	Servo	12-Dec-13	
		Middle	Y	1161	Servo	12-Dec-13	
		Lower	Y	037	Servo	21-Jan-14	
	Abdominal Rib	Upper	Y	1295	Servo	12-Dec-13	
		Lower	Y	1136	Servo	12-Dec-13	
Lower Spine Accelerometers (T12)				X	P50068	Endevco	12-Dec-13
				Y	P52051	Endevco	12-Dec-13
				Z	P51710	Endevco	12-Dec-13
Acetabulum Load Cell				Y	D14283-FY	FTSS	13-Jan-14
Iliac Wing Load Cell				Y	287-FY	FTSS	28-Oct-13
Pelvis Plug (struck side)					63492	FTSS	4-Feb-13
Pelvis Plug (non-struck side)					36473	FTSS	23-Sep-10

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P82284	Endevco	13-Nov-13
	Vehicle Center of Gravity	Y	P82281	Endevco	12-Nov-13
	Vehicle Center of Gravity	Z	P81660	Endevco	14-Nov-13
2	Right Sill at Front Seat	X	P80488	Endevco	4-Feb-14
	Right Sill at Front Seat	Y	P81641	Endevco	5-Nov-13
	Right Sill at Front Seat	Z	P81087	Endevco	5-Nov-13
3	Right Sill at Rear Seat	X	P81547	Endevco	5-Nov-13
	Right Sill at Rear Seat	Y	P81657	Endevco	17-Nov-13
	Right Sill at Rear Seat	Z	P82001	Endevco	5-Nov-13
4	Left Sill at Front Door	Y	P80933	Endevco	5-Nov-13
5	Left Sill at Rear Door	Y	P80140	Endevco	18-Feb-14
6	Left A-Post Lower	Y	P81598	Endevco	13-Nov-13
7	Left A-Post Middle	Y	P81041	Endevco	17-Sep-13
8	Left B-Post Lower	Y	P78111	Endevco	15-Nov-13
9	B-Post Middle	Y	P78116	Endevco	9-Jan-14
10	Front Seat Track	Y	P80478	Endevco	15-Oct-13
11	Rear Seat Track or Structure	Y	P79310	Endevco	10-Feb-14
12	Right Rear Occupant Compartment	Y	P82275	Endevco	12-Nov-13
13	Engine Block	X	P81992	Endevco	14-Nov-13
	Engine Block	Y	P81493	Endevco	14-Nov-13
14	Rear Floorpan Above Axle	X	P82286	Endevco	13-Nov-13
	Rear Floorpan Above Axle	Y	P81649	Endevco	14-Nov-13
	Rear Floorpan Above Axle	Z	P80813	Endevco	14-Nov-13

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P81635	Endevco	14-Nov-13
MDB Center of Gravity	Y	P81091	Endevco	5-Nov-13
MDB Center of Gravity	Z	P80616	Endevco	14-Nov-13
Left Frame Rail at Rear Axle Centerline	X	P78093	Endevco	15-Jan-14
Left Frame Rail at Rear Axle Centerline	Y	P77746	Endevco	15-Jan-14