FINAL REPORT NUMBER: SPNCAP-TRC-13-003

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

Chrysler Group LLC
2013 Jeep Patriot Sport FWD
NHTSA NUMBER: MD0311

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

Report Date: January 3, 2013

FINAL REPORT

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

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: _____

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date: _____

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date: _____

Technical Report Documentation Page

1. Report No. SPNCAP-TRC-13-003	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of 2013 Jeep Patriot Sport FWD MPV, NHTSA No.: MD0311		5. Report Date January 3, 2013 6. Performing Organization Code TRC Inc.
7. Author(s) Margaret Susan, Project Manager		8. Performing Organization Report No. 121018
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 Mail Code NVS-111 1200 New Jersey Ave, SE, Room W43-410 Washington, DC 20590		13. Type of Report and Period Covered Final Test Report October 18, 2012 - November 1, 2012 14. Sponsoring Agency Code NVS-111
15. Supplemental Notes		

16. Abstract

A 32.2 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject vehicle, a 2013 Jeep Patriot Sport FWD MPV, in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on October 18, 2012

The impact velocity was 32.26 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22° C. The test vehicle's post-test maximum crush was 373 mm at Level 3.

The test or target vehicle's performance is given below:

	Unit	Threshold	Front SID-IIs
Head Injury Criteria (HIC_{36}):	NA	1000	608
Resultant Lower Spine Acceleration:	g's	82	75.2
Total Pelvic Force: (sum of acetabular and iliac forces)	N	5525	4503.8
Maximum Thoracic Rib Deflection	mm	38	36.9
Maximum Abdomen Rib Deflection	mm	45	49.9

The door struck by the pole did not totally separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. Number of Pages 121	22. Price

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY13 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00125. The purpose of this test is to generate comparative side impact performance in a 2013 Jeep Patriot Sport FWD MPV manufactured by Chrysler Group LLC. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated September 2012.

SECTION 2
SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a model year 2013 Jeep Patriot Sport FWD. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.26 km/h. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, OH, on October 18, 2012. Pre-test and post-test photographs of the test vehicle and the side impact dummy (SID-IIs) are included in Appendix A of this report.

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

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

Head CG Triaxial Accelerometers
Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
Abdomen Upper and Lower Rib Displacement Potentiometers
Lower Spine (T12) Triaxial Accelerometers
Iliac Load Cell
Acetabulum Load Cell

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

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

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})	NA	1000	608
Resultant Lower Spine Acceleration	G	82	75.2
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4503.8
Maximum Thoracic Rib Deflection	mm	38*	36.9
Maximum Abdominal Rib Deflection	mm	45*	49.9

* Proposed IARV

Supplemental restraint information is given below:

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

GENERAL COMMENTS

All doors remained closed throughout the test. No fuel spillage occurred during the impact or the static rollover test which followed. Injury values for the ATD was 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: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MD0311	Anti-Lock Brakes	Yes
Model Year	2013	All-Wheel Drive	No
Make	Jeep	Power Steering	Yes
Model	Patriot Sport	Driver Front Airbag	Yes
Body Style	MPV	Driver Side Torso Airbag	No
VIN	1C4NJPBB7DD116658	Driver Side Head Airbag	No
Body Color	Gray Metallic	Driver Curtain Airbag	Yes
Delivery Date	9/27/2012	Driver Knee Airbag	No
Odometer Reading (km/mi)	12 mi	Driver Head/Torso Combo Airbag	No
Dealer	Frank Boucher Chrysler, Dodge	Rear Pass. Front Airbag	No
Transmission	Automatic CVT	Rear Pass. Side Torso Airbag	No
Final Drive	Rear	Rear Pass. Side Head Airbag	No
Type/No. Cylinders	Inline 4	Rear Pass. Curtain Airbag	Yes
Engine Displacement (L)	2.4	Rear Pass. Combo Airbag	No
Engine Placement	Transverse	Pretensioners	Yes
Roof Rack	Yes	Load Limiters	No
Sunroof/T-Top	No	Air Conditioning	Yes
Tinted Glass	Yes	AM/FM CD	Yes
Traction Control	Yes	Tilt Steering	Yes
Power Brakes	Yes	Automatic Door Locks	Yes
Front Disc	Yes	Power Windows	Yes
Rear Disc	No	Power Seats	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Group LLC	GVWR (kg)	2012
Date of Manufacture	9/12	GAWR Front (kg)	1080
Vehicle Type	MPV	GAWR Rear (kg)	1044

VEHICLE SEATING AND WEIGHT CAPACITY DATA

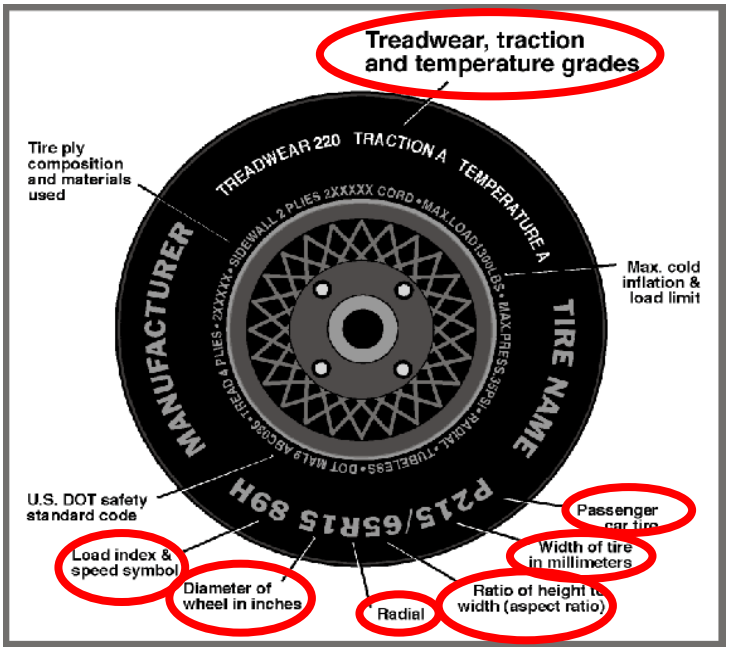
	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	0	5
Vehicle Capacity Weight (VCW) (kg)				419.0
DSC x 68.04 kg				340.2
Rated Cargo and Luggage Weight (RCLW) (kg)				78.8

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	Yes	No	No		No	Yes	No
Rear or Second Row Seat	No	No	Yes	No	Yes	No	No
Third Row Seat	NA	NA	NA	NA	NA	NA	NA

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

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P205/70R16	P205/70R16
Tire Size on Vehicle	P205/70R16	P205/70R16
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle LS2	Eagle LS2
Treadwear	400	400
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	2	2
Load Index/Speed Symbol	96T	96T
Tire Material	Polyester & Steel	Polyester & Steel
DOT Safety Code Left	M60W CUER 3212	M60W CUER 3212
DOT Safety Code Right	M60W CUER 3212	M60W CUER 3212

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

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	240	240	240	240
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

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	428.8	308.8		464.6	321.2		450.6	376.0	
Right	kg	419.6	290.0		455.8	328.2		415.8	346.4	
Ratio	%	58.6	41.4		58.6	41.4		54.5	45.5	
Totals	kg	848.4	598.8	1447.2	920.4	649.4	1569.8	866.4	722.4	1588.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1447.2	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	49.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	78.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1575.0	(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)? X YES □ NO

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast)	0.0
Removed: Rear seat cushion, left rear seat back, tail lights and right rear	
Door seal	18.2

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	Deg.	0.2	-0.5	0.1	No
Front Passenger Sill Angle (front-to-rear)*	Deg.	0.1	-0.5	0.2	No
Front Bumper-Line Angle (left-to-right)**	Deg.	0.4	0.0	0.4	No
Rear Bumper-Line Angle (left-to-right)**	Deg.	0.1	-0.1	0.4	Yes
Vehicle CG (Aft of Front Axle)	mm	1092	1092	1200	
Vehicle CG (Left (+) / Right (-) from longitudinal Centerline)	mm	-13	-1	27	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)
*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for "Meets Requirements".

DATA SHEET NO. 2

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

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

SEAT POSITIONING

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

SCRL ANGLE RANGE

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

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	12.9	265	Max.	NA	NA	NA
			Mid	242	253	265
			Min.	NA	NA	NA
Front Passenger Seat	12.9	265	Max.	NA	NA	NA
			Mid	242	253	265
			Min.	NA	NA	NA
Front Center Seat*	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Struck Side Rear Seat	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Non-Struck Side Rear Seat	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Rear Center Seat*	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA

* If applicable.

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

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

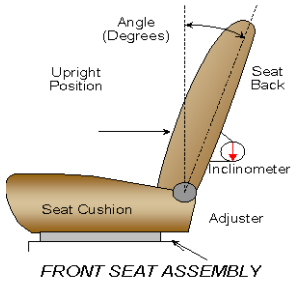
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	39	0	1
Front Passenger Seat	260	39	0	1
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat	Fixed	NA	NA	NA
Non-Struck Side Rear Seat	Fixed	NA	NA	NA
Rear Center Seat*	Fixed	NA	NA	NA

* If applicable.

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/ Seated Dummy	77.4	39	2	2
Front Passenger Seat	77.3	39	3	3
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat	Fixed	NA	NA	NA
Non-Struck Side Rear Seat	Fixed	NA	NA	NA
Rear Center Seat*	Fixed	NA	NA	NA

* If applicable.

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4	1

HEAD RESTRAINT ADJUSTMENT

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

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

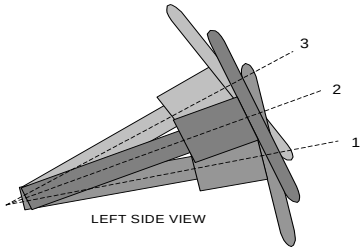
DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

STEERING COLUMN ADJUSTMENT

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

	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	69	No feature
Geometric Center, Position No. 2	66	No feature
Uppermost, Position No. 3	63	No feature
Telescoping Steering Wheel Travel		No feature
Test Position	66	No feature

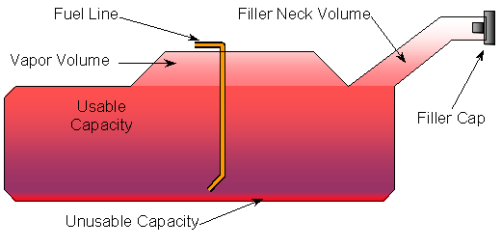


STEERING COLUMN ASSEMBLY

FUEL PUMP

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

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



VEHICLE FUEL TANK ASSEMBLY

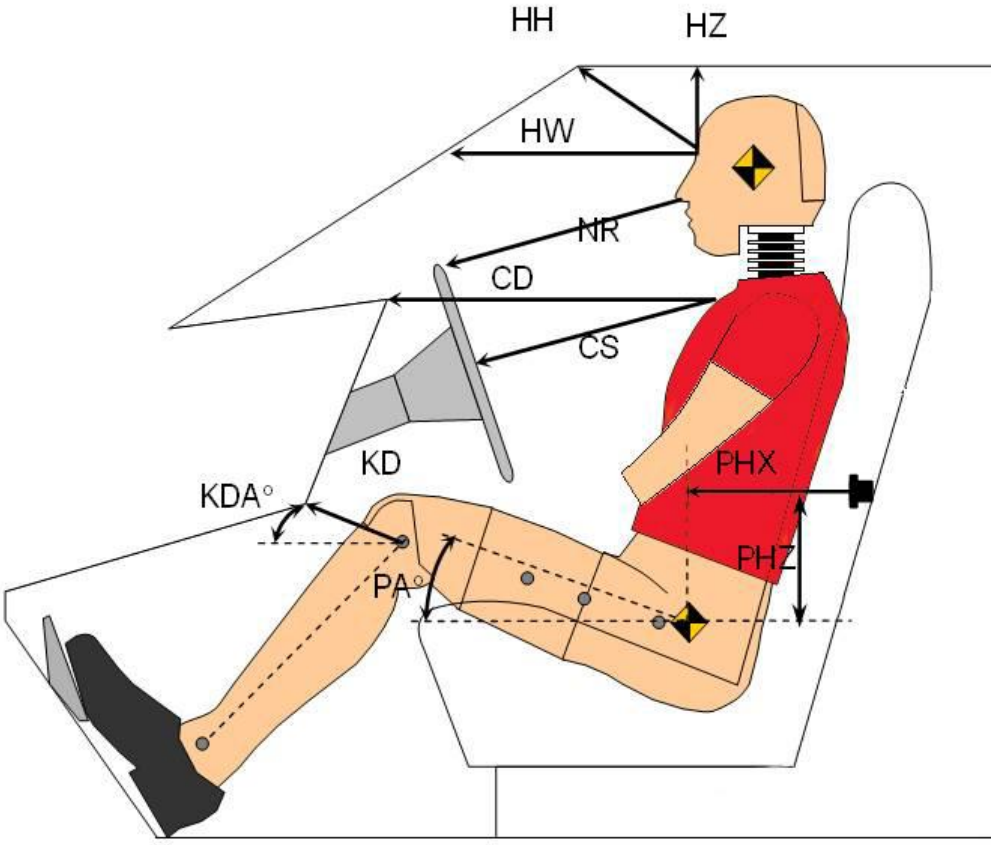
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	51.5
Usable Capacity of "Optional" Tank (see Form No. 1)	NA
Usable Capacity of Standard Tank (see Owner's Manual)	51.5
Usable Capacity of Optional Tank (see Owner's Manual)	NA
93% of Usable Capacity	47.9
Actual Amount of Solvent Used in Test	47.7
1/3 of Usable Capacity	17.2

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

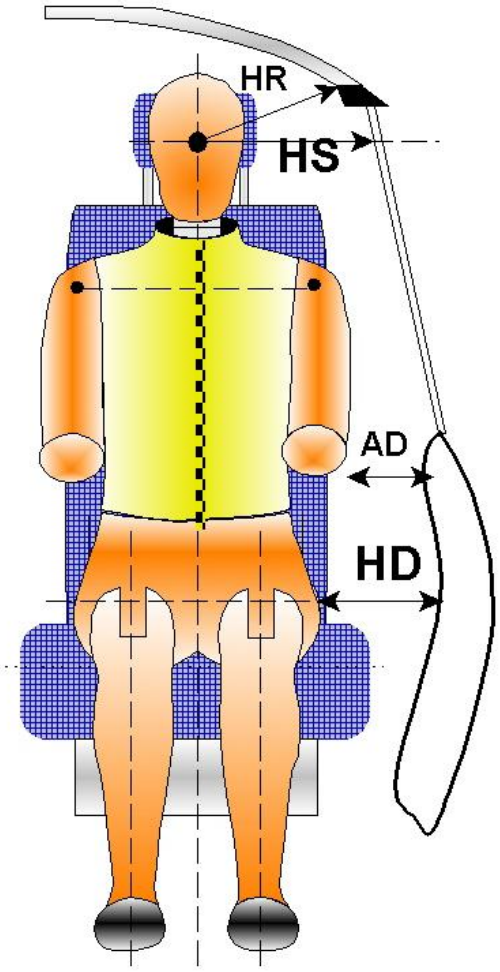
Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	480	
HW	Head to Windshield	696	
HZ	Head to Roof Liner	289	
NR	Nose to Rim	256	
CD	Chest to Dashboard	446	
CS	Chest to Steering Wheel	185	
KDL/KDLA°	Left Knee to Dash	74	40.5
KDR/KDRA°	Right Knee to Dash	77	40.5
PAX°	Pelvic Tilt Angle (X-axis)		20.9
PAY°	Pelvic Tilt Angle (Y-axis)		.7
PHX	Hip Point to Striker (X-Axis)	297	
PHZ	Hip Point to Striker (Z-Axis)	112	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

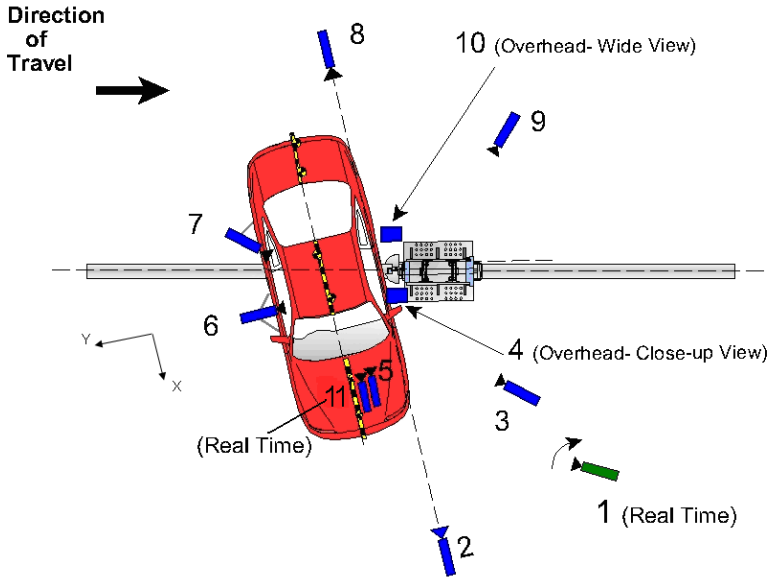
Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



Code	Measurement Description	Length (mm)
HR	Head to Side Header	254
HS	Head to Side Window	401
AD	Arm to Door	90
HD	Hip Point to Door	155

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



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

Camera No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real time (24-30 fps) pan view of impact				zoom	30
2	Front ground level – impact view	4425	152	-1312	8.5	1000
3	Impact side 45° – forward pole view	4131	-930	-1322	16	1000
4	Overhead Close-up view of impact	0	0	-5641	50	1000
5	Onboard – dummy front view				12.5	1000
6	Onboard – dummy side view				8.5	1000
7	Onboard – dummy rear oblique view				8.5	1000
8	Rear ground level – impact view	-6241	0	-1318	12.5	1000
9	Impact side 45° – rearward pole view	-3261	-2106	-1249	8.5	1000
10	Overhead wide view of impact	0	349	-5641	8.5	1000
11	Real time dummy front view				Zoom	30

All measurements accurate to +/- 6 mm.
NOTE: Vehicle was at a 75° angle to the rigid pole.

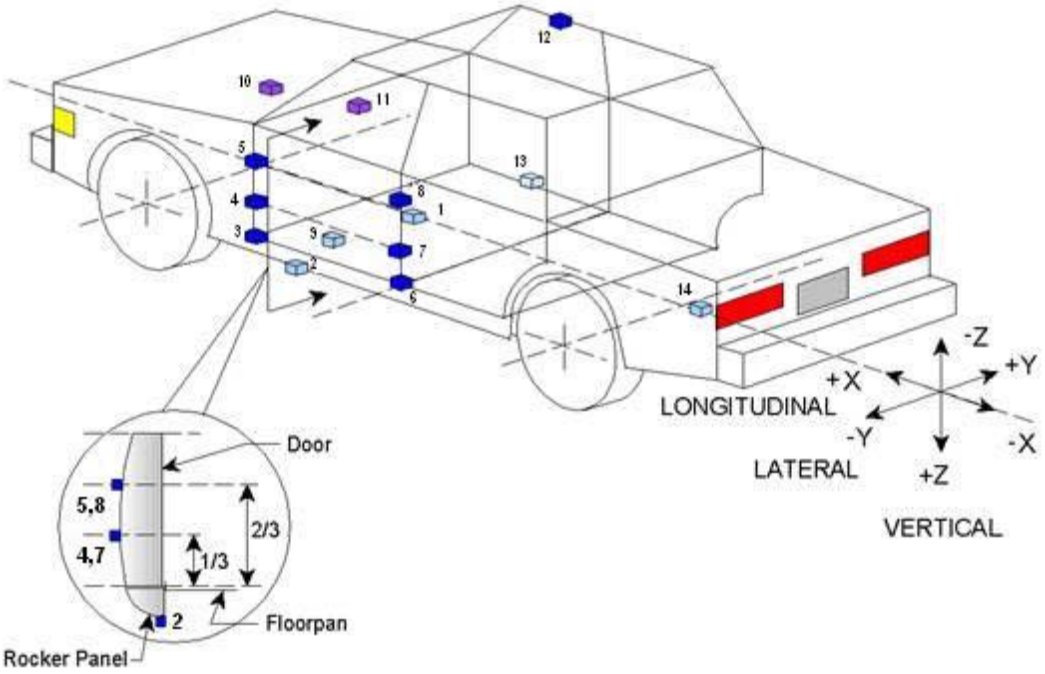
If applicable, explain why camera(s) did not run: Not Applicable

INSTRUMENTATION

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

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



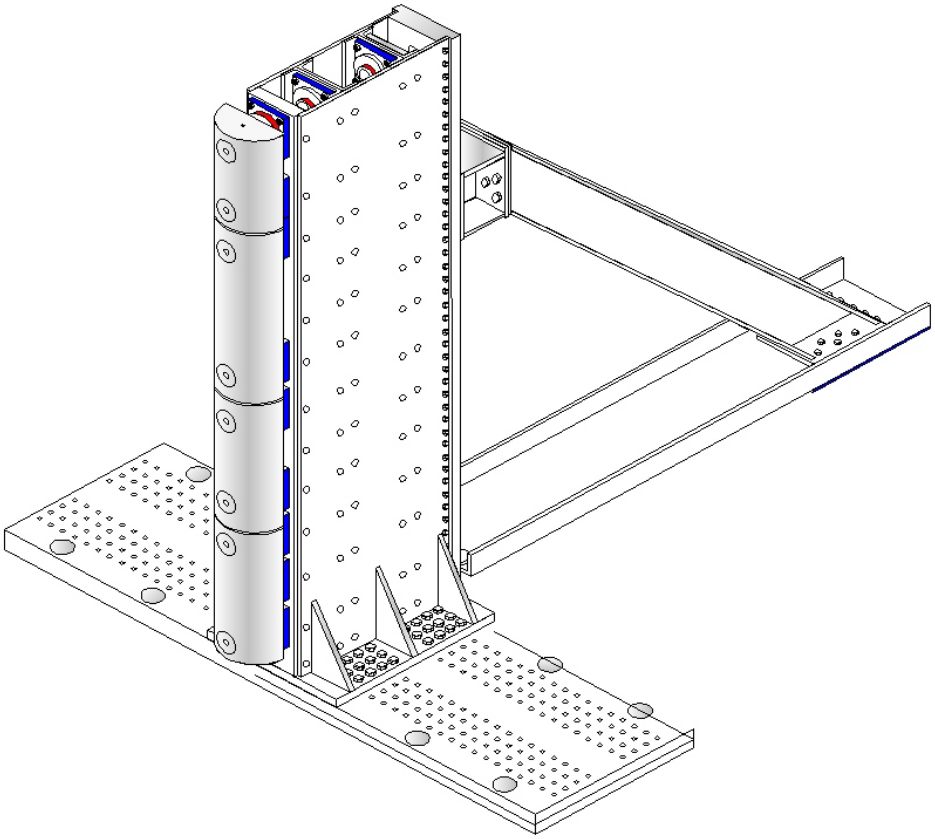
	Accelerometer/Sensor Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3485	0	-448
2	Left Floor Sill	3100	-650	-374
3	A-Pillar Sill	3387	-650	-374
4	A-Pillar Low	3470	-785	-643
5	A-Pillar Mid	3470	-780	-970
6	B-Pillar Sill	2415	-650	-374
7	B-Pillar Low	2475	-790	-684
8	B-Pillar Mid	2460	-780	-1003
9	Driver Seat Track	2555	-550	-449
10	Engine Top	4205	45	-870
11	Firewall	4030	20	-1045
12	Right Roof	2920	625	-1468
13	Right Floor Sill	2890	675	-402
14	Rear Floorpan	1445	0	-591

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

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

FOIL 300K RIGID POLE



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

DATA SHEET NO. 8
POST TEST OBSERVATIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	None
Top of Head	None
Left Side of Head	SCAB
Back of Head	None
Left Shoulder	Door Panel
Upper Torso	Door Panel
Lower Torso	Door Panel
Left Hip	Door Panel
Left Knee	Door Panel

POST TEST DOOR PERFORMANCE

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

* Indicate “Yes”, “No”, or “NA”.

POST-TEST SEAT PERFORMANCE

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

* Indicate “Yes”, “No”, or “NA”.

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	None
Sill Separation	None
Windshield Damage	Numerous cracks
Side Window Damage	Shattered
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

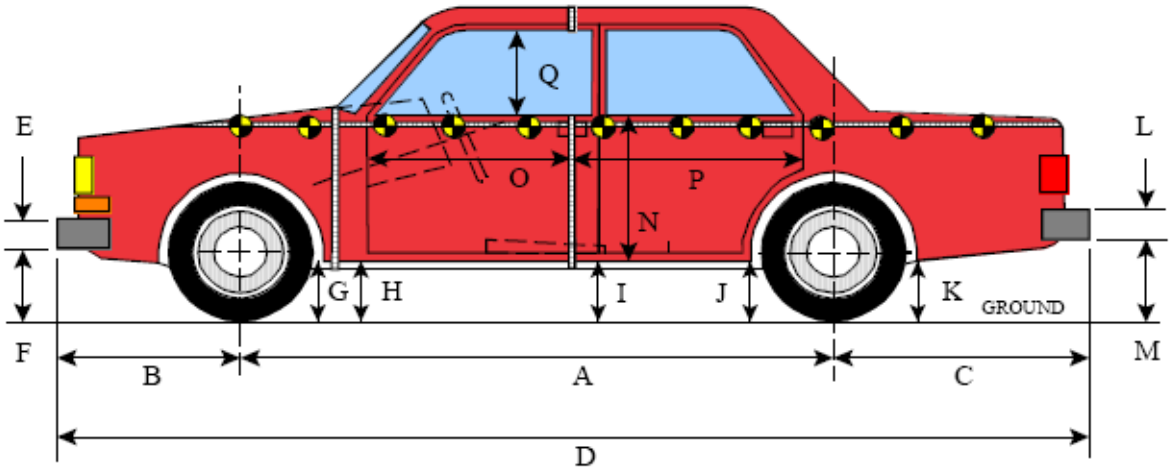
Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear Passenger Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso Airbag	No	No	No	No
Knee Airbag	No	No	No	No
Seat Belt Pretensioner	Yes	Yes	Yes	NA
Seat Belt Load Limiter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

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

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1125
Actual Impact Point (Aft of Front Axle)	mm		1128
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 of Intended Impact point	-3
Angle Between Vehicle's Longitudinal Centerline and Line of Motion	degrees	75 +/- 3	77
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.26
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.27

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



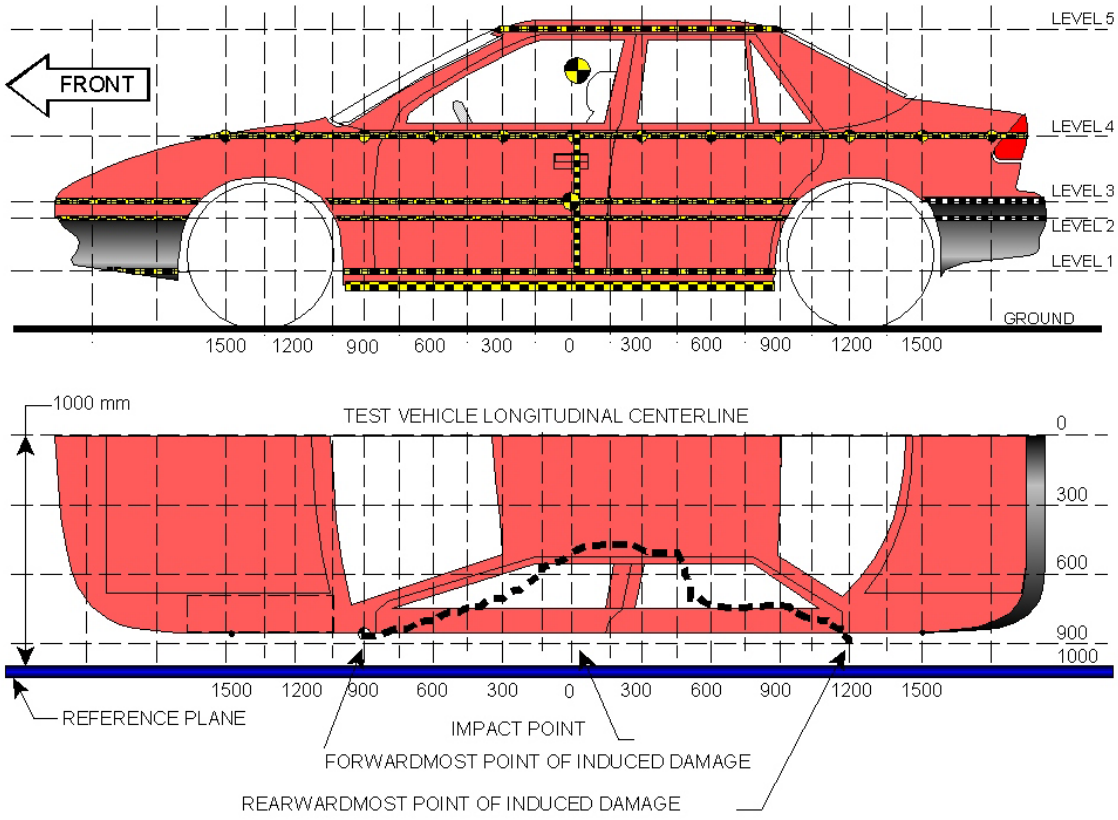
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2640	2555	85
B	Front Axle to Front Surface of Vehicle	890	890	0
C	Rear Axle to Rear Surface of Vehicle	885	885	0
D	Total Length at Centerline	4415	4360	55
E	Front Bumper Thickness	100	100	0
F	Front Bumper Bottom to Ground	512	550	-38
G	Sill Height at Front Wheel Well	262	267	-5
H	Sill Height at Front Door Leading Edge	295	304	-9
I	Sill Height at B-Pillar	287	328	-41
J1	Sill Height at Rear Wheel Well	254	308	-54
J2	Pinch Weld Height at Rear Wheel Well	242	290	-48
K	Sill Height Aft of Rear Wheel Well	340	394	-54
L	Rear Bumper Thickness	177	177	0
M	Rear Bumper Bottom to Ground	475	530	-55
N	Sill Height to Bottom of Front Window Sill	793	812	-19
O	Front Door Leading Edge to Impact CL	672	615	57
P	Rear Door Trailing Edge to Impact CL	1235	1170	65
Q	Front Window Opening	390	381	9
R	Right Side Length	4190	4194	-4
S	Left Side Length	4213	4105	108
T	Vehicle Width at "B" Pillars	1350	1153	197

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



NOTE: All measurements are in millimeters (mm)

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	421	329	0
2	Occupant H-Point	672	369	0
3	Mid-Door	733	373	0
4	Window Sill	1021	371	0
5	Window Top	1578	207	0

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

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

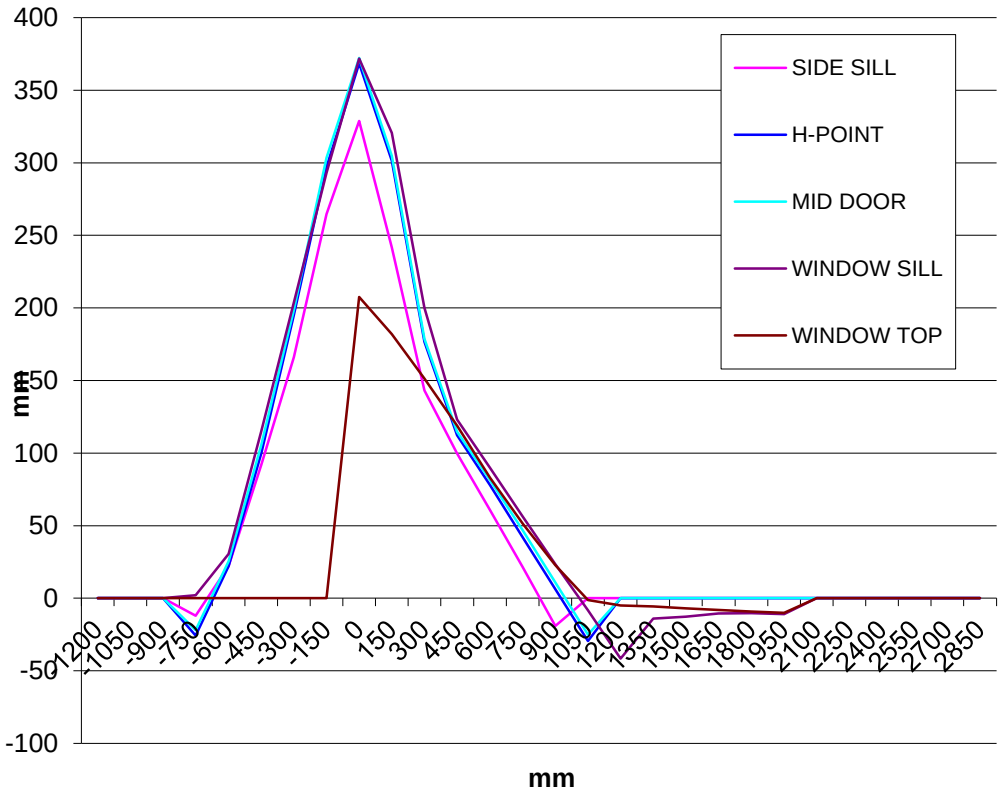
Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

	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	842	869	864	789	0	854	895	886	786	0	-12	-26	-22	3	0
-600	827	851	855	800	0	805	829	829	770	0	22	22	26	30	0
-450	838	853	857	814	0	747	753	751	699	0	91	100	106	115	0
-300	840	857	858	826	0	674	661	660	622	0	166	196	198	204	0
-150	842	860	860	836	0	577	563	556	543	0	265	297	304	293	0
0	843	862	862	844	600	514	494	489	473	393	329	368	373	371	207
150	844	864	863	852	614	602	563	558	531	432	242	301	305	321	182
300	844	866	864	854	625	701	689	686	654	474	143	177	178	200	151
450	844	865	862	854	630	744	753	748	731	511	100	112	114	123	119
600	844	865	861	854	630	783	787	780	764	547	61	78	81	90	83
750	844	864	860	853	630	822	822	813	797	579	22	42	47	56	51
900	836	864	859	852	629	855	857	848	829	606	-19	7	11	23	23
1050	0	881	879	851	627	0	910	904	859	629	0	-29	-25	-8	-2
1200	0	0	0	848	623	0	0	0	889	628	0	0	0	-41	-5
1350	0	0	0	840	619	0	0	0	854	625	0	0	0	-14	-6
1500	0	0	0	834	615	0	0	0	847	622	0	0	0	-13	-7
1650	0	0	0	826	609	0	0	0	836	617	0	0	0	-10	-8

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

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

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12



DATA SHEET NO. 11
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

Test Time: 13:31 **Temperature:** 22

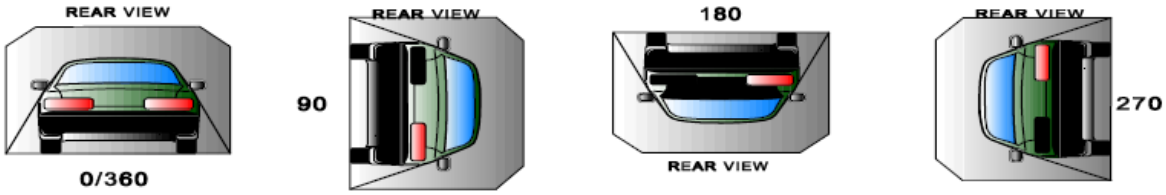
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

B. For the 5 minute period after motion ceases: 0
(Maximum allowable is 5 ounces)

C. For the following 25 minutes: 0
(Maximum allowable is 1 ounce/minute)

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

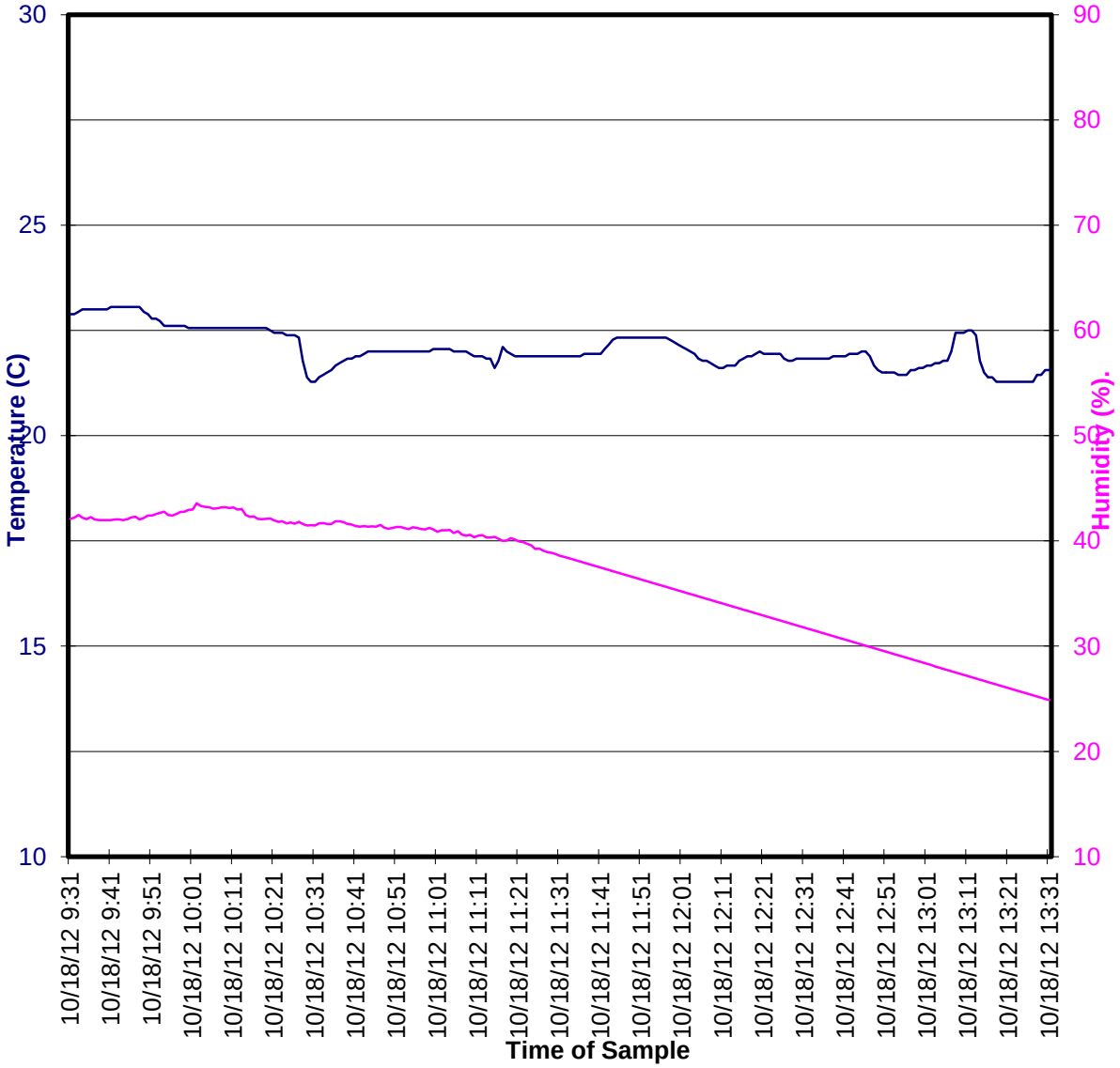
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 12
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD NHTSA No.: MD0311
Test Program: SPNCAP Side Impact Test Date: 10/18/12

MD0311 75º Oblique Pole NCAP of 2013 Jeep Patriot Sport FWD
121018; Test Time 13:31



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

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

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

003 Pre-Test Frontal View of Test Vehicle

004 Post-Test Frontal View of Test Vehicle

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

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

007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

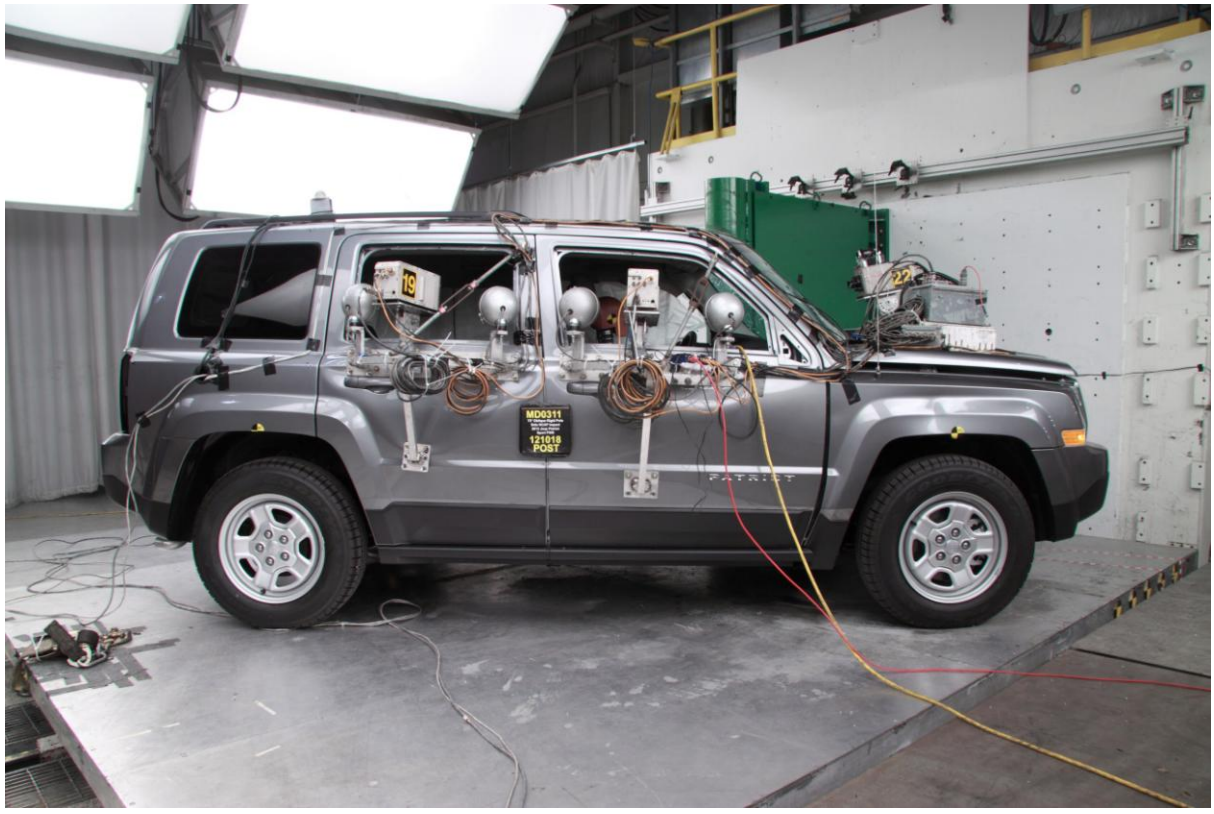
009 Pre-Test Left Rear 3/4 View of Test Vehicle

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

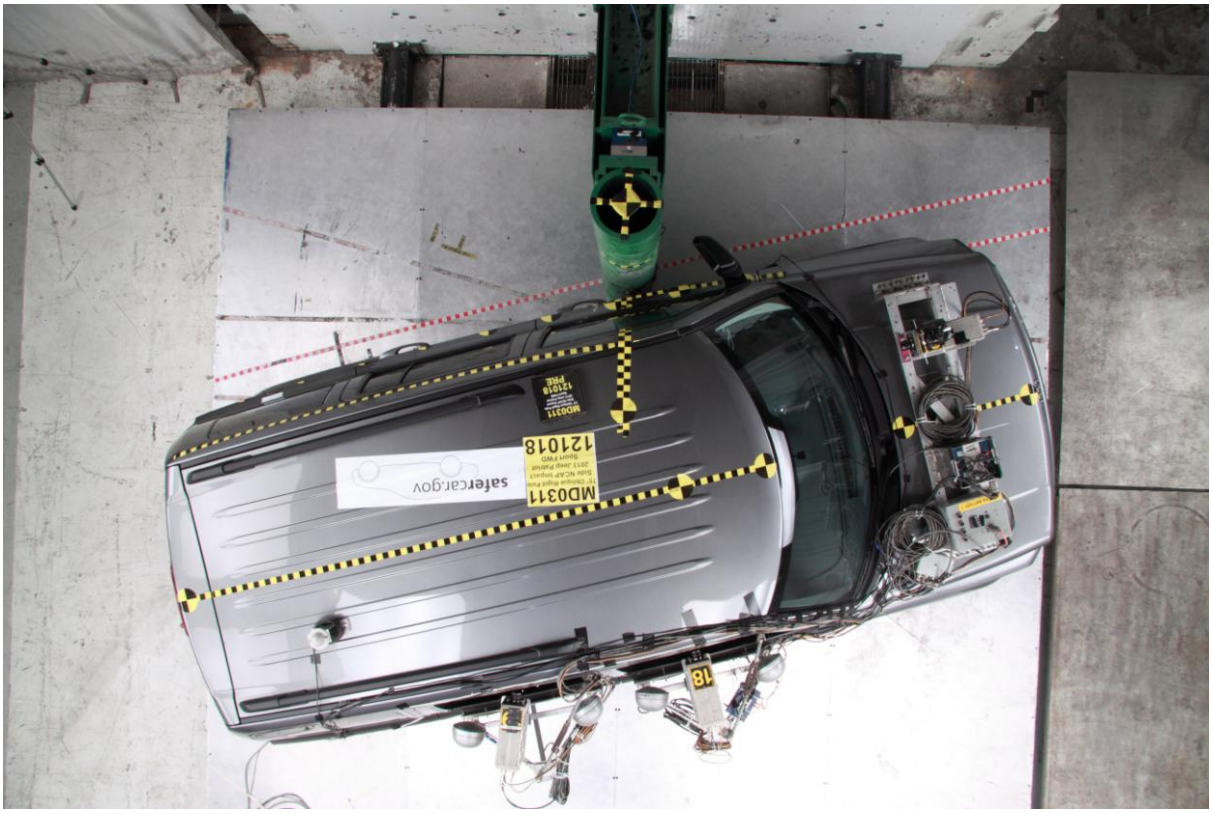
011 Pre-Test Rear View of Test Vehicle

012 Post-Test Rear View of Test Vehicle

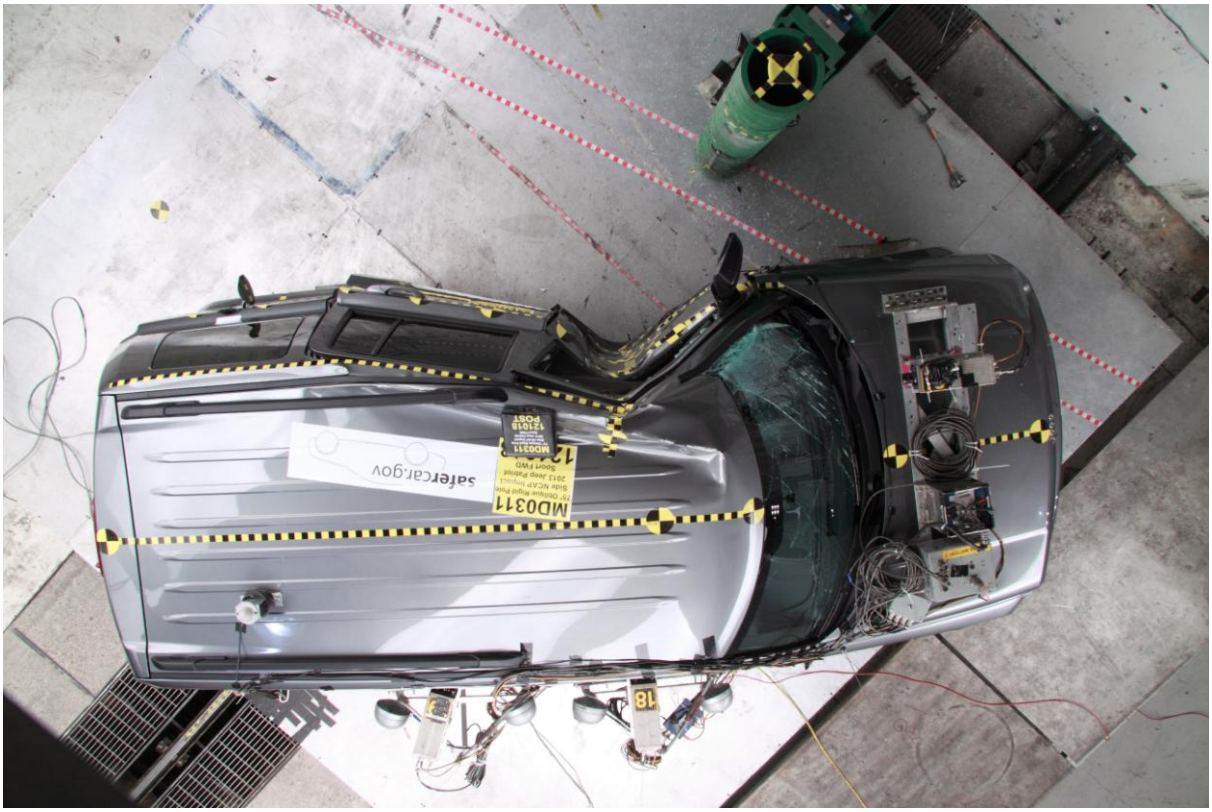
013 Pre-Test Right Side View of Test Vehicle



014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area

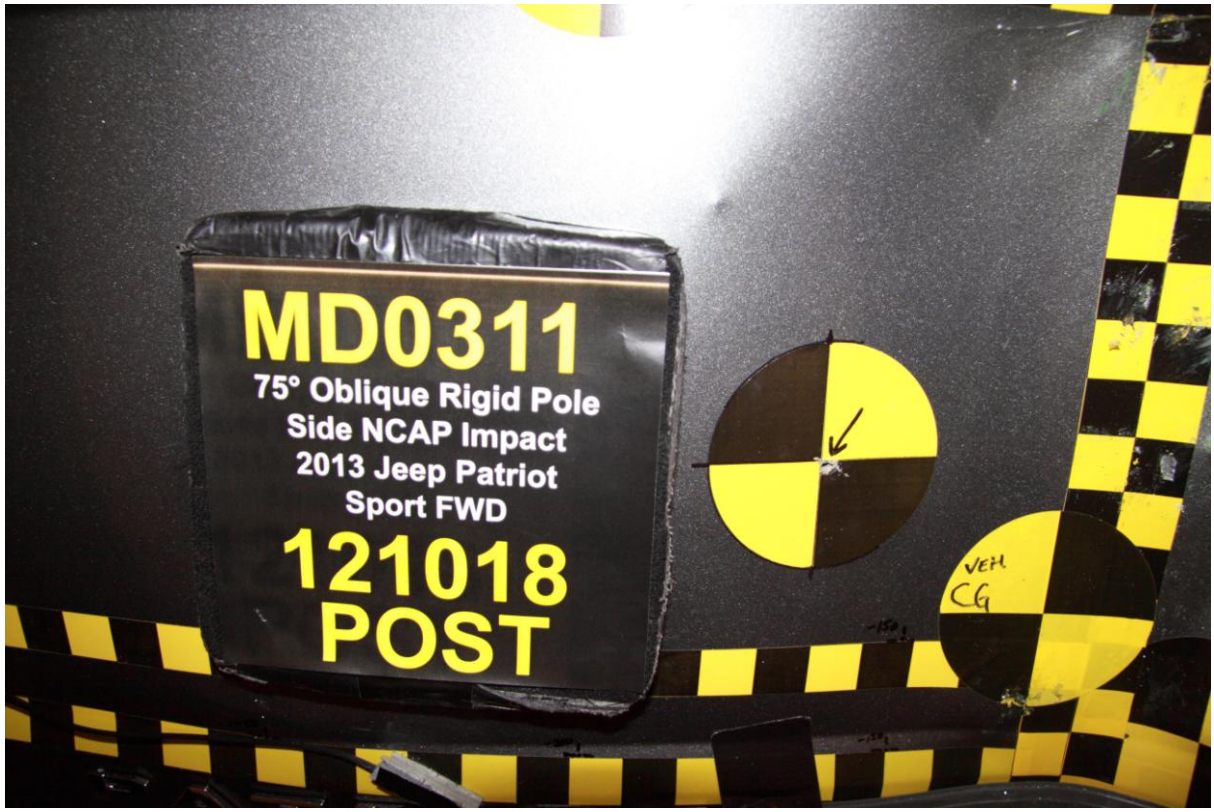


016 Post-Test Overhead View of Test Area

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

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

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



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

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

022 Post-Test Front Close-Up View of Dummy

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

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

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

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

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

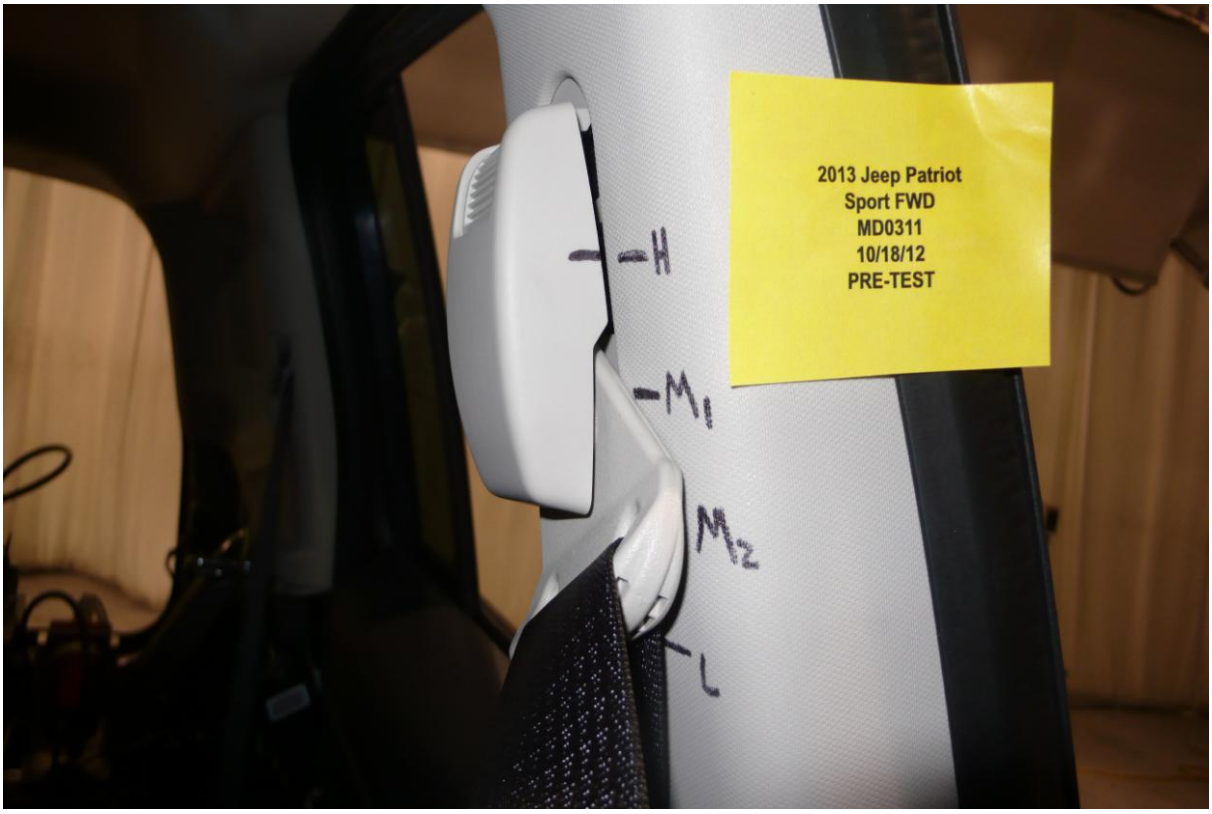
028 Pre-Test Front View of Seat Pan Prior to Dummy Positioning

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

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

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

032 Pre-Test Placement of Dummy Feet



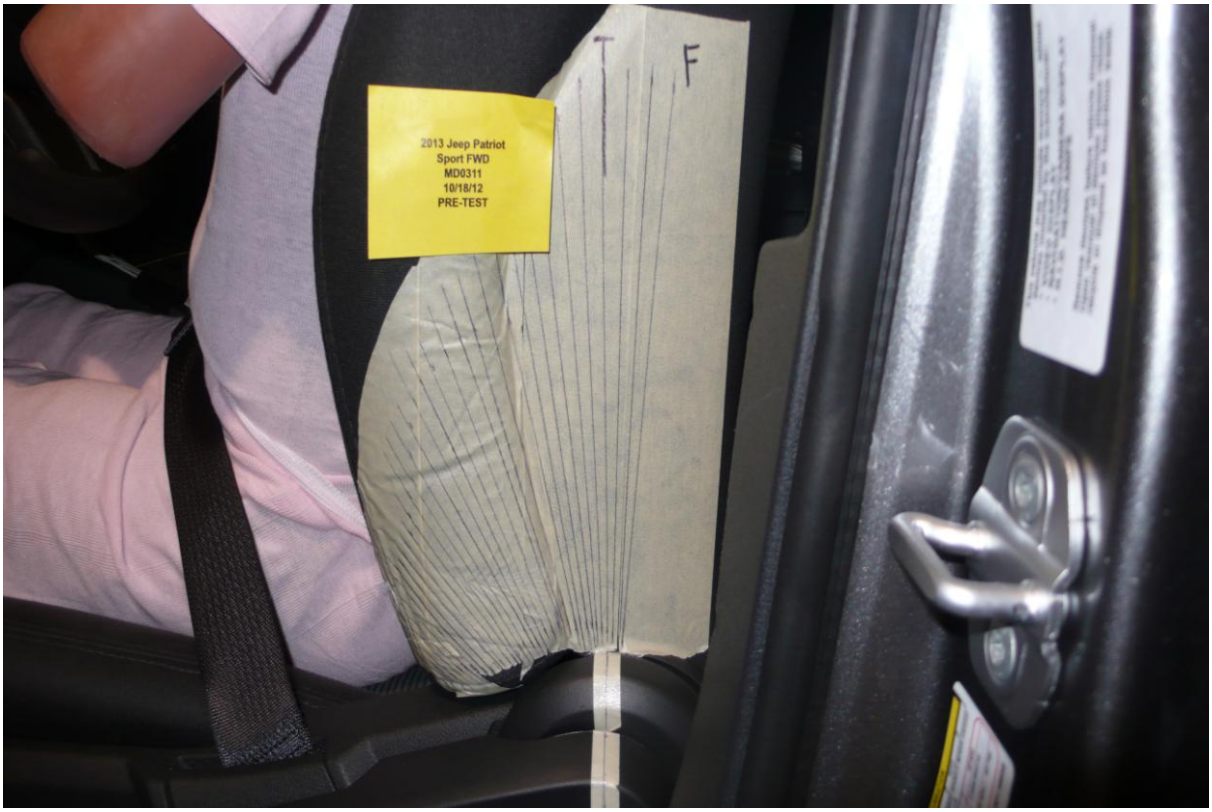
033 Pre-Test View of Belt Anchorage for Dummy

034 Pre-Test Left Side View of Steering Wheel

035 Pre-Test View of Disengaged Parking Brake

036 Pre-Test View of Parking Brake

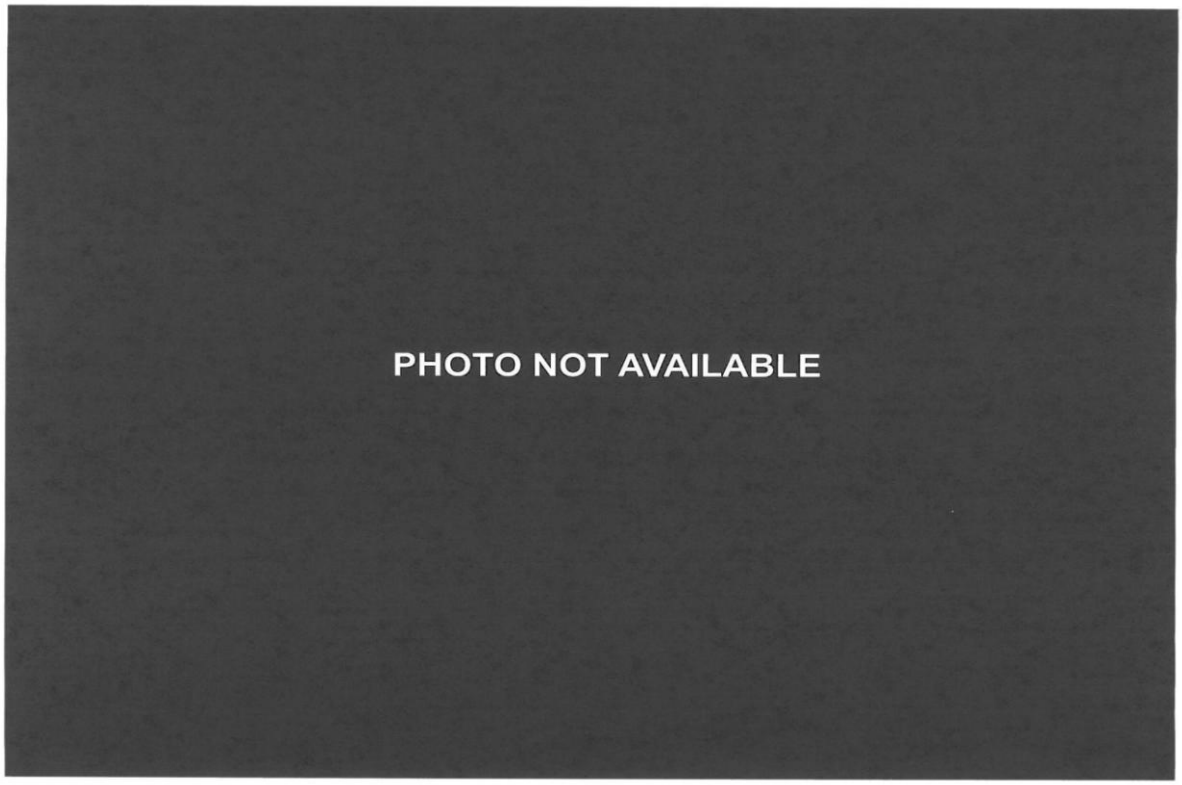
037 Pre-Test Close-Up Left Side View of Driver Seat Track



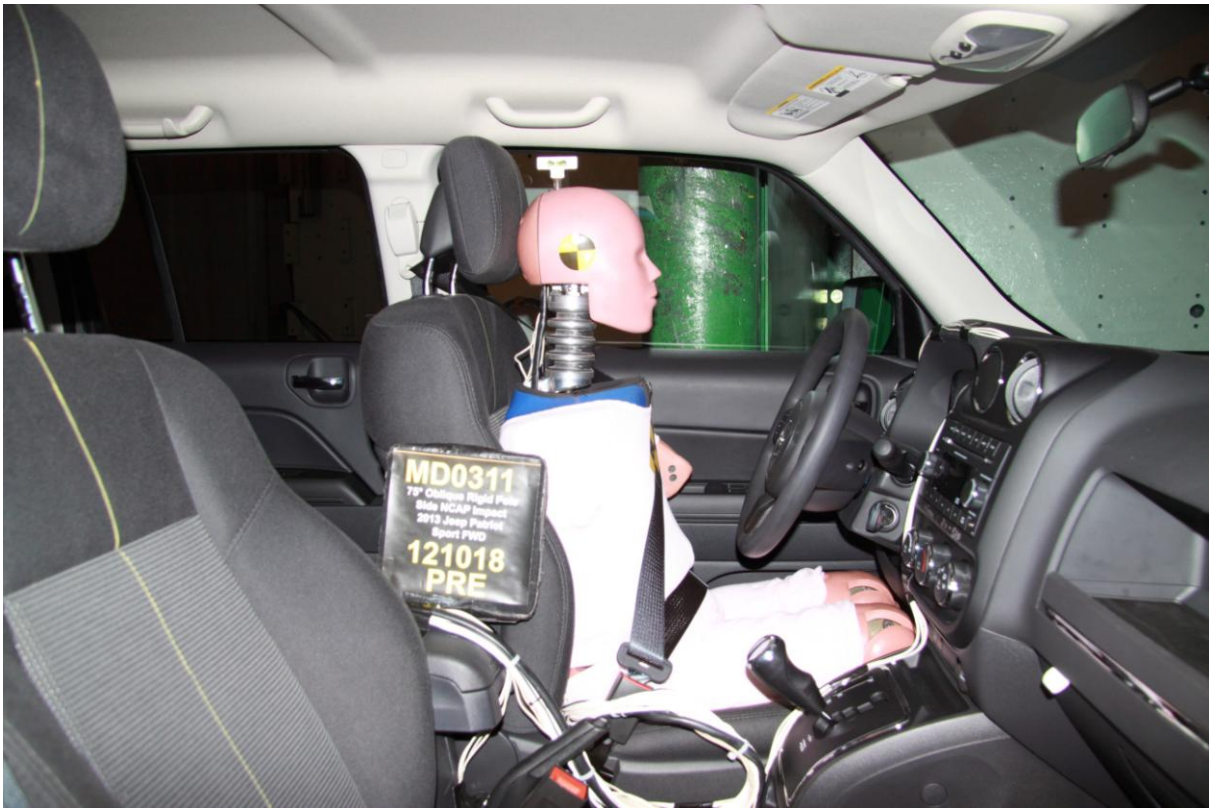
038 Pre-Test Close-Up Left Side View of Driver Seat Back

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

040 Pre-Test Dummy and Door Clearance View



041 Post-Test Dummy and Door Clearance View



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

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

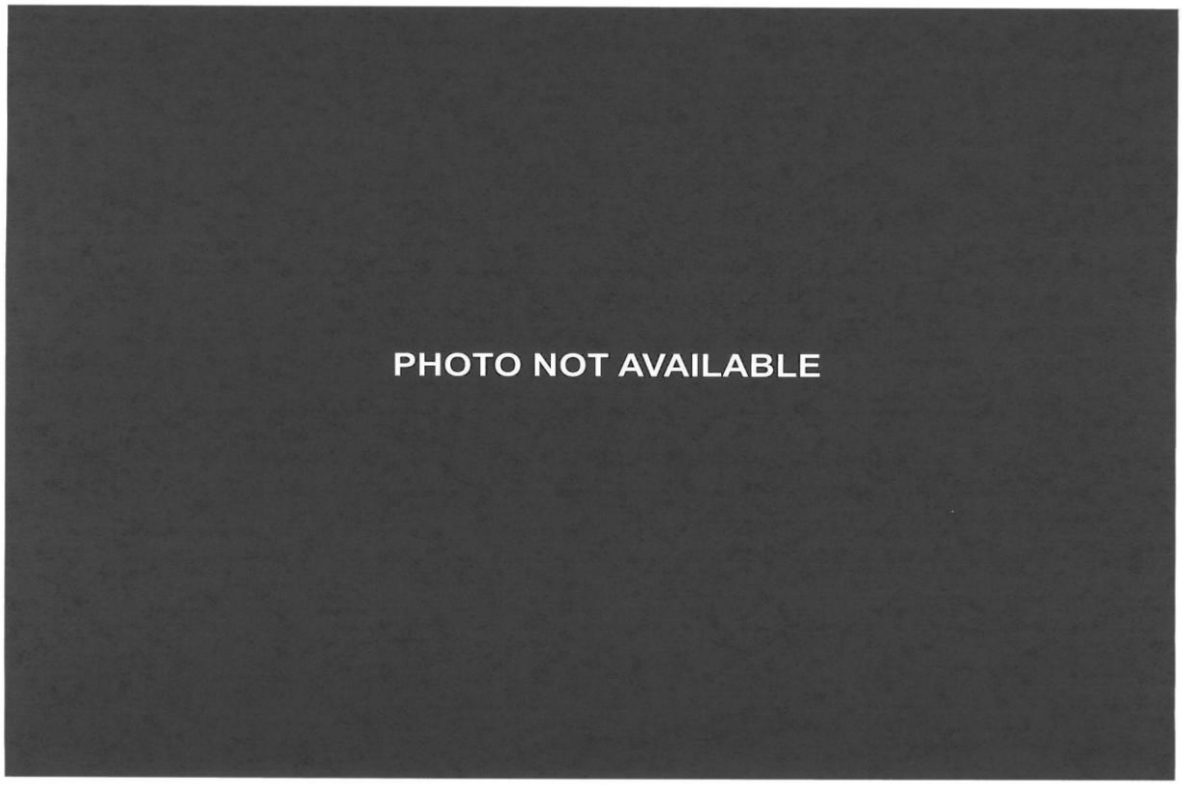
044 Pre-Test Inner Driver Door Panel View

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

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

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

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



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

050 Post-Test Dummy Close-Up Pelvis Contact View

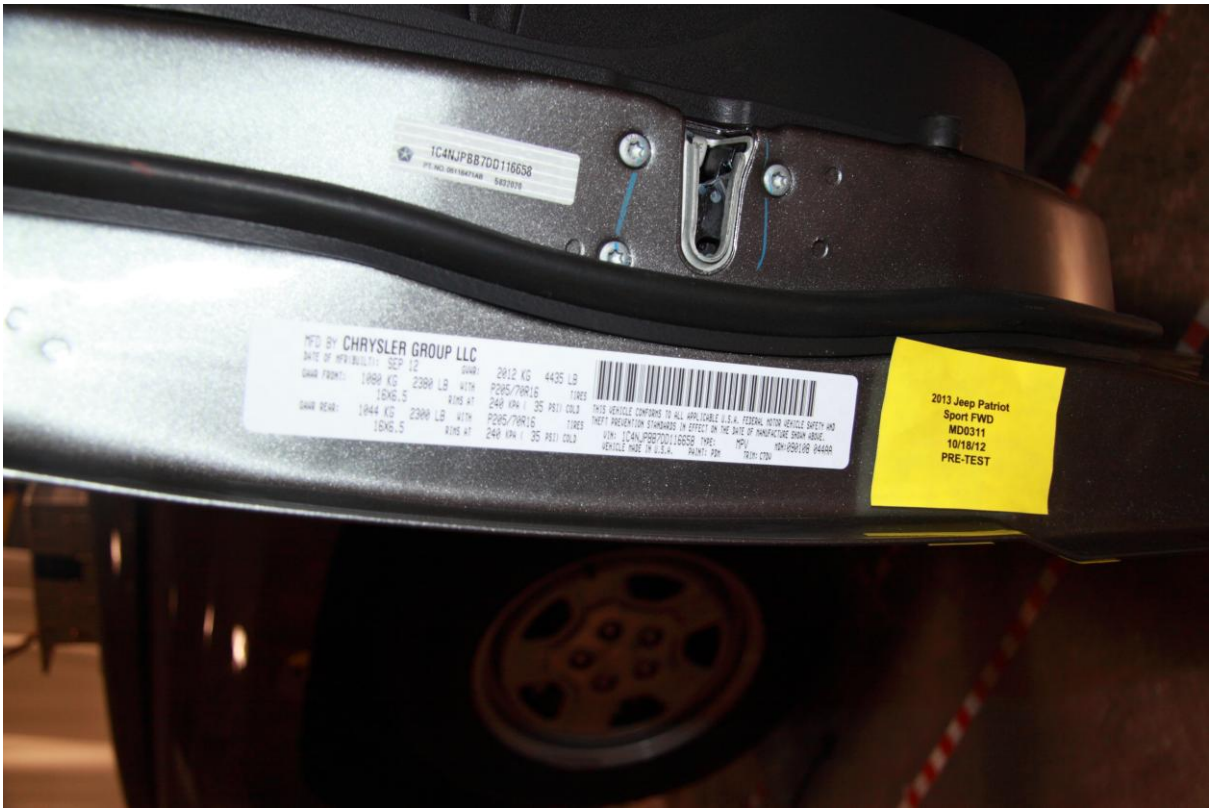
PHOTO NOT AVAILABLE

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

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

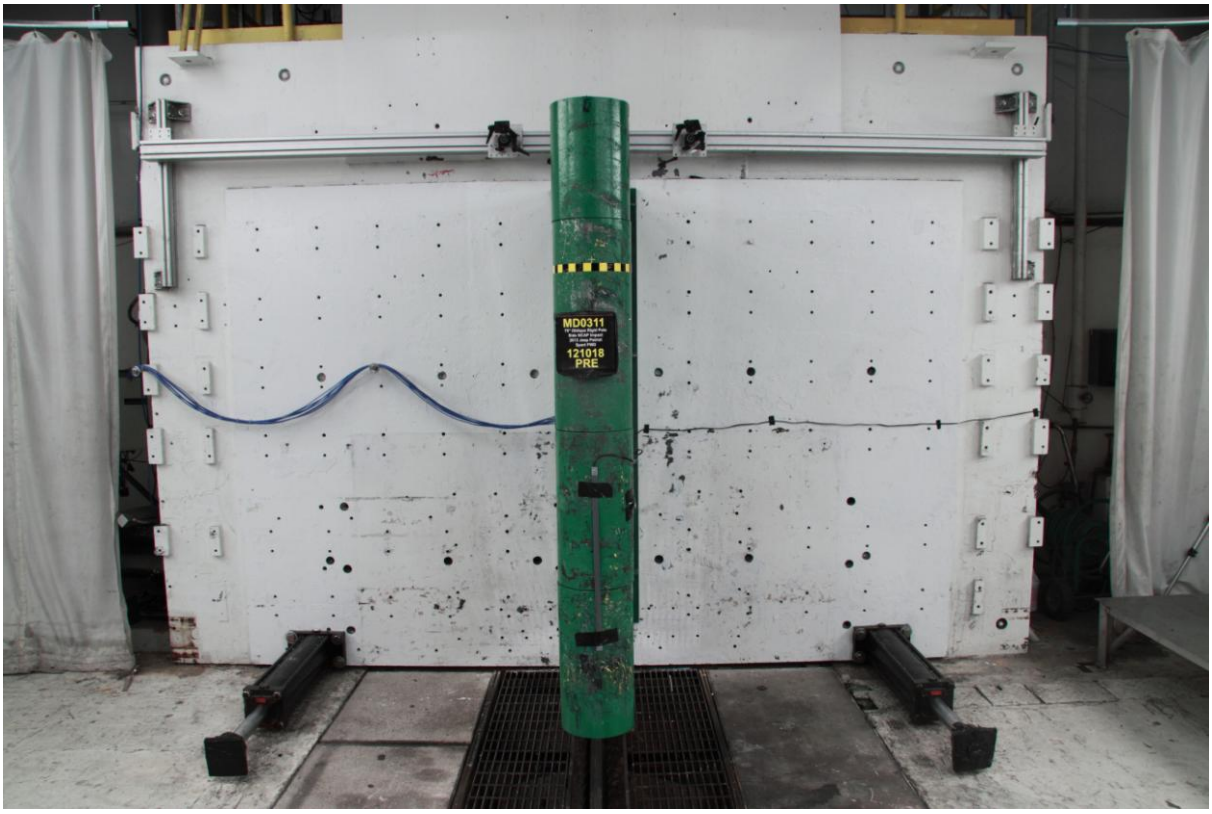
053 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

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



055 Close-Up View of Vehicle Certification Label

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

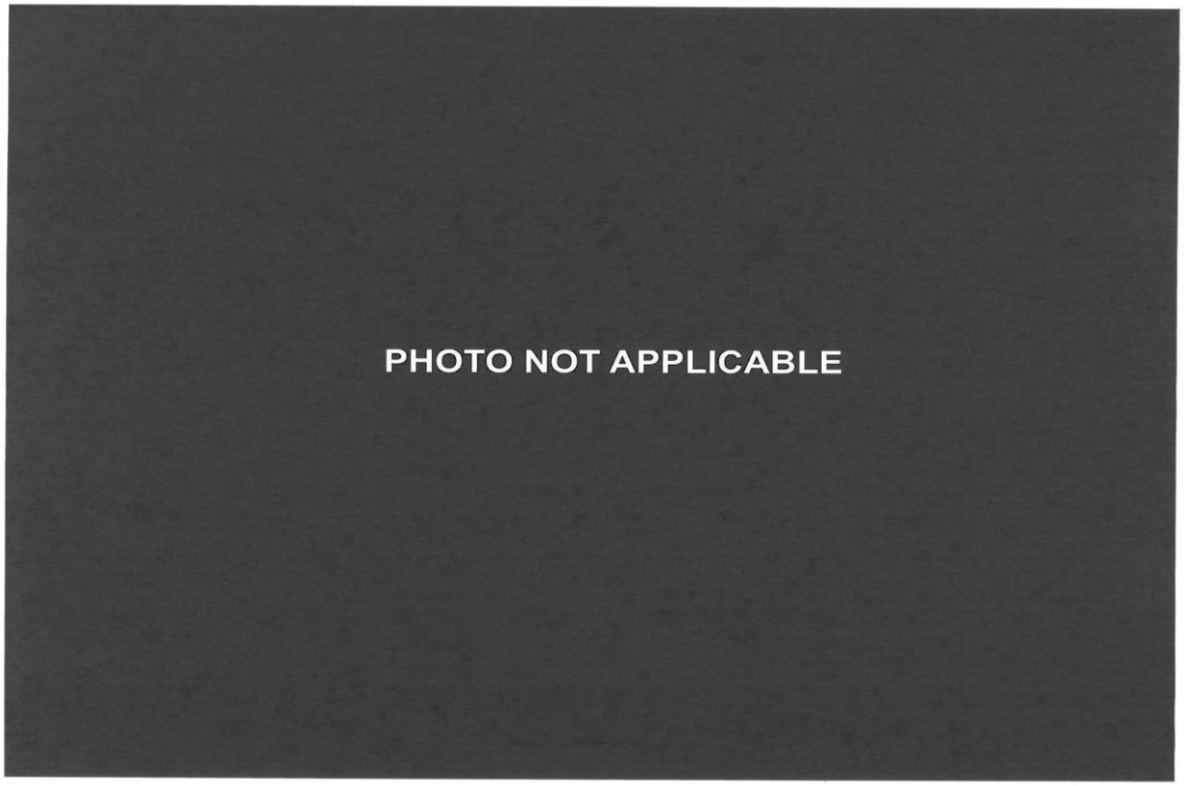


057 Pre-Test Pole Barrier Front View

058 Post-Test Pole Barrier Front View

059 Pre-Test Pole Barrier Side View

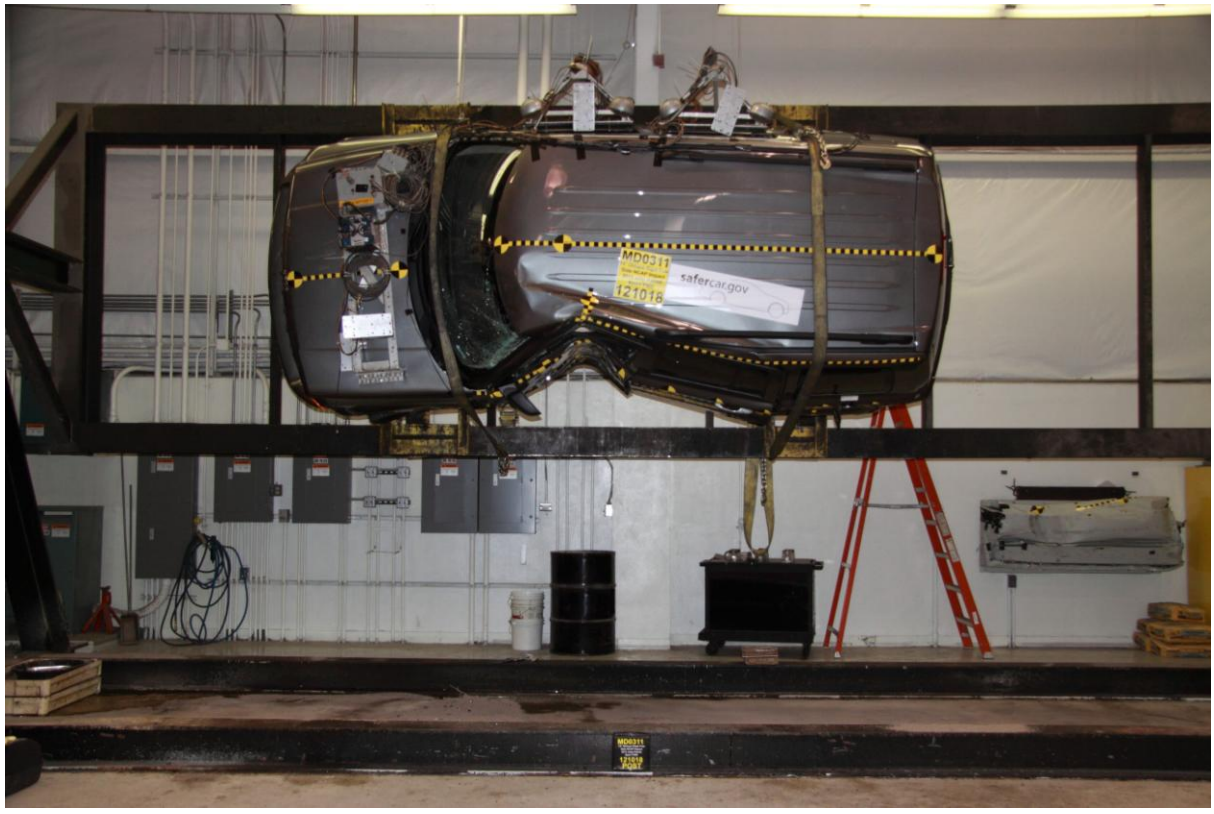
060 Post-Test Pole Barrier Side View



061 Pre-Test Ballast View

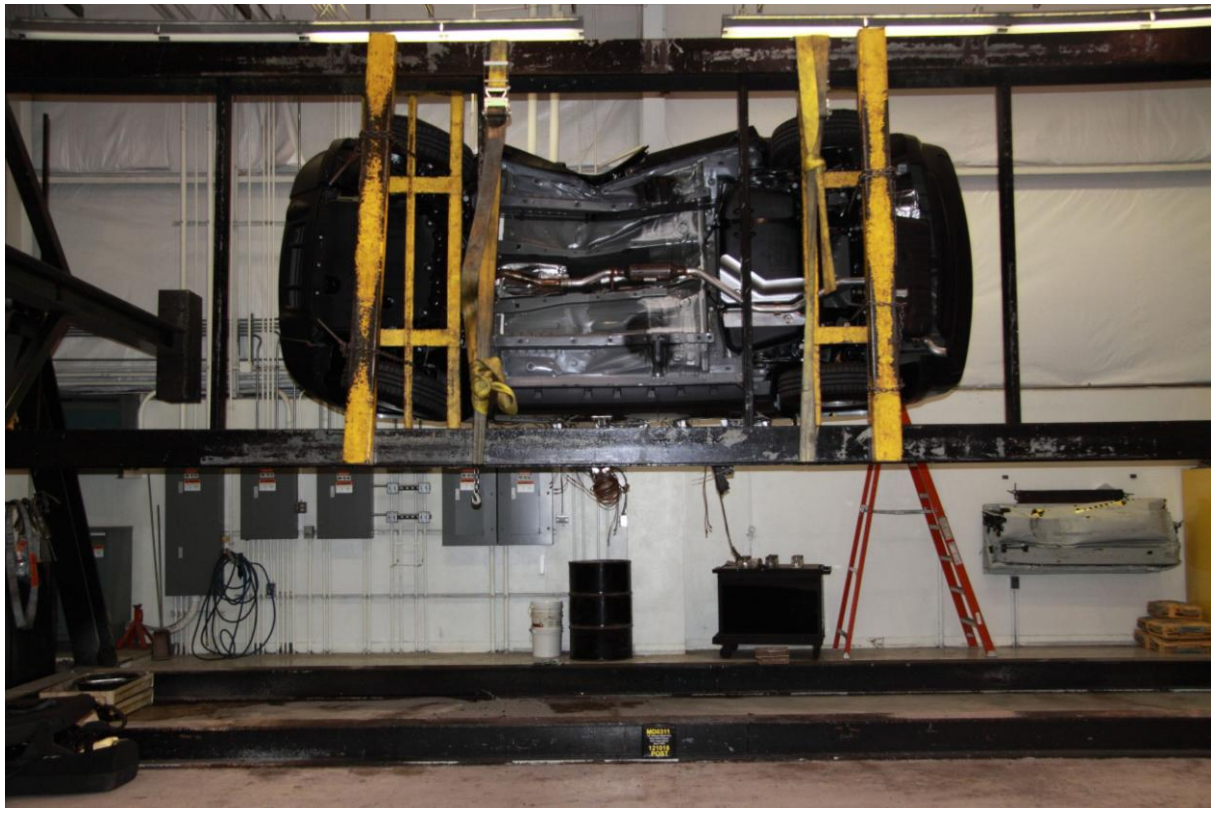
062 Post-Test Primary and Redundant Speed Trap Read-Out

063 FMVSS No. 301 Static Rollover 0 Degrees



064 FMVSS No. 301 Static Rollover 90 Degrees

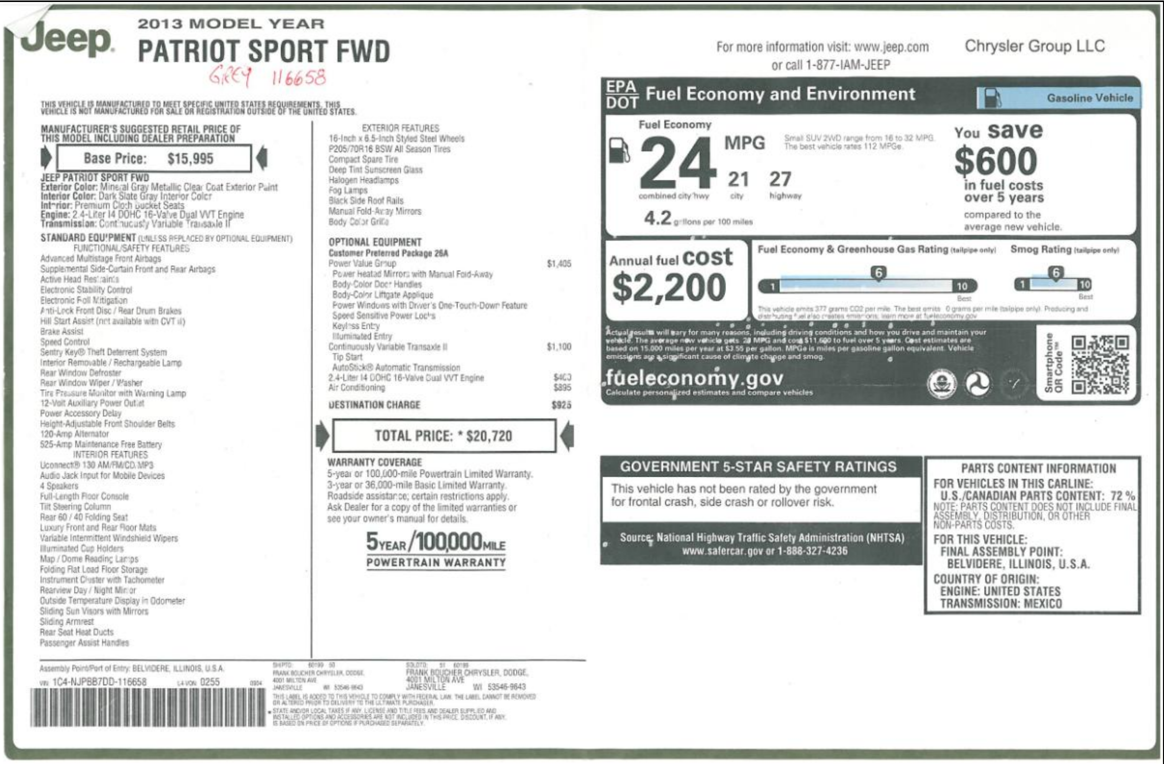
065 FMVSS No. 301 Static Rollover 180 Degrees



066 FMVSS No. 301 Static Rollover 270 Degrees

067 FMVSS No. 301 Static Rollover 360 Degrees

068 Impact Event



Jeep. 2013 MODEL YEAR

PATRIOT SPORT FWD

GREY 116658

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

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $15,995

JEEP PATRIOT SPORT FWD
Exterior Color: Mineral Gray Metallic Clear Coat Exterior Paint
Interior Color: Dark Slate Gray Interior Color
Interior: Premium Cloth Bucket Seats
Engine: 2.4-Liter I4 DOHC 16-Valve Dual VVT Engine
Transmission: Continuously Variable Transaxle II

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Airbags
Supplemental Side-Curtain Front and Rear Airbags
Active Head Restraints
Electronic Stability Control
Electronic Roll Mitigation
Anti-Lock Front Disc / Rear Drum Brakes
Hill Start Assist (not available with CVT II)
Brake Assist
Speed Control
Sentry Key® Theft Deterrent System
Interior Removable / Rechargeable Lamp
Rear Window Defroster
Rear Window Wiper / Washer
Tire Pressure Monitor with Warning Lamp
12-Volt Auxiliary Power Outlet
Power Accessory Delay
Height-Adjustable Front Shoulder Belts
120-Amp Alternator
525-Amp Maintenance Free Battery

INTERIOR FEATURES
Uconnect® 130 AM/FM/CD/MP3
Audio Jack Input for Mobile Devices
4 Speakers
Full-Length Floor Console
Tilt Steering Column
Rear 60 / 40 Folding Seat
Luxury Front and Rear Floor Mats
Variable Intermittent Windshield Wipers
Illuminated Cup Holders
Map / Dome Reading Lamps
Folding Flat Load Floor Storage
Instrument Cluster with Tachometer
Rearview Day / Night Mirror
Outside Temperature Display in Odometer
Sliding Sun Visors with Mirrors
Sliding Armrest
Rear Seat Heat Ducts
Passenger Assist Handles

EXTERIOR FEATURES
16-Inch x 6.5-Inch Styled Steel Wheels
P205/70R16 BSW All Season Tires
Compact Spare Tire
Deep Tint Sunscreen Glass
Halogen Headlamps
Fog Lamps
Black Side Roof Rails
Manual Fold-Away Mirrors
Body Color Grille

OPTIONAL EQUIPMENT

Customer Preferred Package 26A	
Power Value Group	$1,405
Power Heated Mirrors with Manual Fold-Away	
Body-Color Door Handles	
Body-Color Liftgate Applique	
Power Windows with Driver's One-Touch-Down Feature	
Speed Sensitive Power Locks	
Keyless Entry	
Illuminated Entry	
Continuously Variable Transaxle II	$1,100
Tip Start	
AutoStick® Automatic Transmission	
2.4-Liter I4 DOHC 16-Valve Dual VVT Engine	$400
Air Conditioning	$895
DESTINATION CHARGE	**$925**

TOTAL PRICE: * $20,720

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

5 YEAR/100,000 MILE POWERTRAIN WARRANTY

Assembly Point/Port of Entry: BELVIDERE, ILLINOIS, U.S.A.
VIN 1C4-NJPBB7DD-116658 L4-VON 0255

FRANK BOUCHER CHRYSLER, DODGE, 4001 MILTON AVE JANESVILLE WI 53546-9643

THIS LABEL IS AFFIXED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.

* STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

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

Chrysler Group LLC

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy
24 MPG combined city/hwy
21 city 27 highway
Small SUV 2WD range from 16 to 32 MPG. The best vehicle rates 112 MPGe.
4.2 gallons per 100 miles

You save $600 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $2,200

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 6 (1–10 Best)
Smog Rating (tailpipe only): 6 (1–10 Best)

This vehicle emits 377 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and costs $11,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.55 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code™

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

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

069 Monroney Label

Supplemental Active Head Restraints (AHR) — If Equipped

These head restraints are passive, deployable components, and vehicles with this equipment cannot be readily identified by any markings, only through visual inspection of the head restraint. The head restraint will be split in two halves, with the front half being soft foam and trim, the back half being decorative plastic.

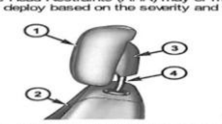
How The Active Head Restraints (AHR) Work

The Occupant Restraint Controller (ORC) determines whether the severity, or type of rear impact will require the Active Head Restraints (AHR) to deploy. If a rear impact requires deployment, both the driver and front passenger seat AHRs will be deployed.

When AHRs deploy during a rear impact, the front half of the head restraint extends forward to minimize the gap between the back of the occupant's head and the AHR. This system is designed to help prevent or reduce the extent of injuries to the driver and front passenger in certain types of rear impacts.

NOTE:

The Active Head Restraints (AHR) may or may not deploy in the event of a front or side impact. However if during a front impact, a secondary rear impact occurs, the AHR may deploy based on the severity and type of the impact.



Active Head Restraint (AHR) Components

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

CAUTION!

All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a collision.

NOTE:

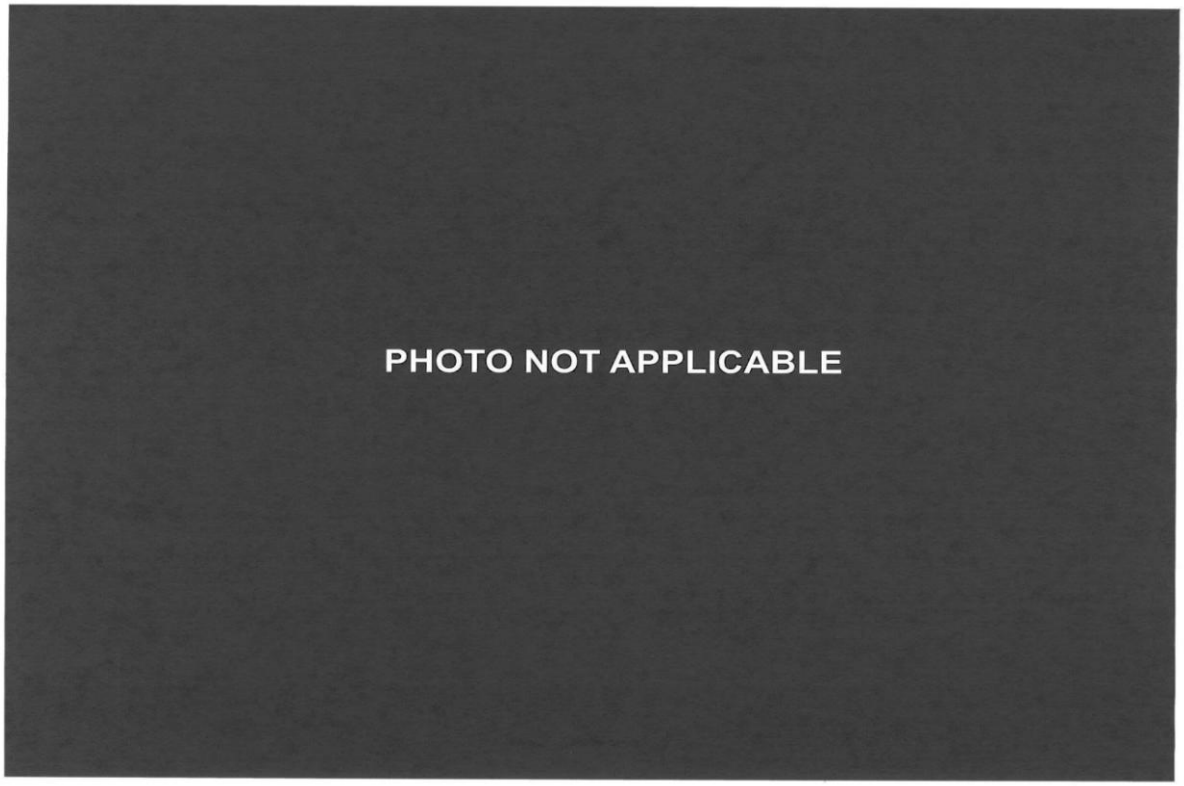
For more information on properly adjusting and positioning the head restraint, refer to "Adjusting Active Head Restraints" in "Understanding The Features Of Your Vehicle".

Resetting Active Head Restraints (AHR)

Parent topic: OCCUPANT RESTRAINTS

Related information +/-

070 Head Restraint Use and Adjustment Information from Vehicle Owner Manual



071 Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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

Additional Driver Dummy Instrumentation Data

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

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

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

NHTSA

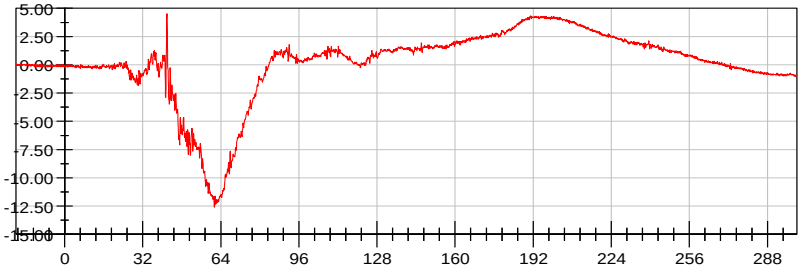
Test Date: 10/18/2012

Position #1 SID IIs Dummy ('033)

Test Lab: CTF

Test Number: 121018 (MD0311)

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



<Max>

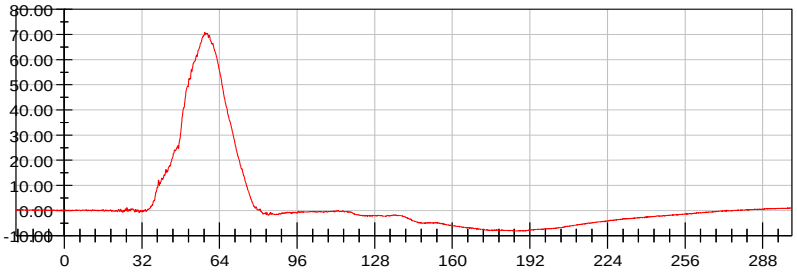
4.52 g at 41.92 ms

<Min>

-12.59 g at 61.36 ms

CFC_1000

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



<Max>

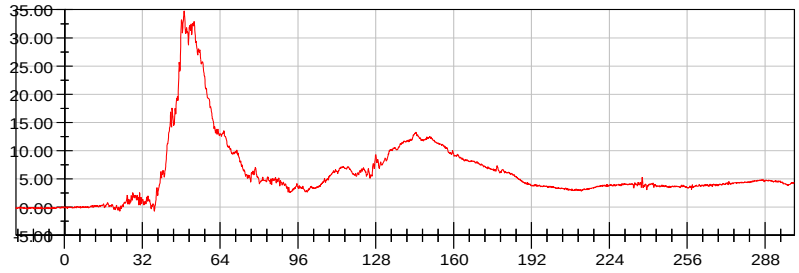
70.82 g at 57.92 ms

<Min>

-8.32 g at 187.92 ms

CFC_1000

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



<Max>

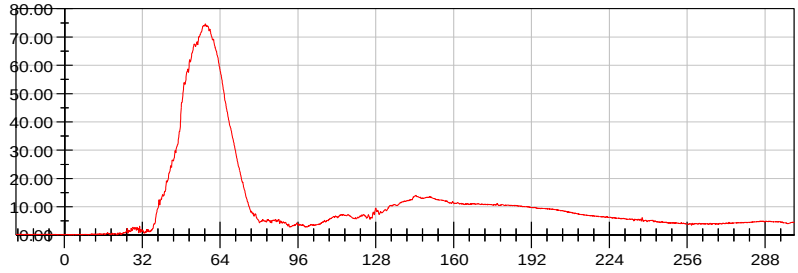
34.75 g at 49.20 ms

<Min>

-0.71 g at 22.72 ms

CFC_1000

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



<Max>

74.68 g at 57.92 ms

<Min>

0.04 g at -0.72 ms

CFC_1000

NHTSA

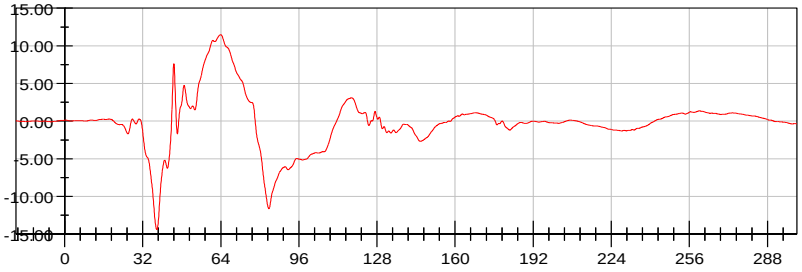
Test Date: 10/18/2012

Position #1 SID IIs Dummy ('033)

Test Lab: CTF

Test Number: 121018 (MD0311)

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



<Max>

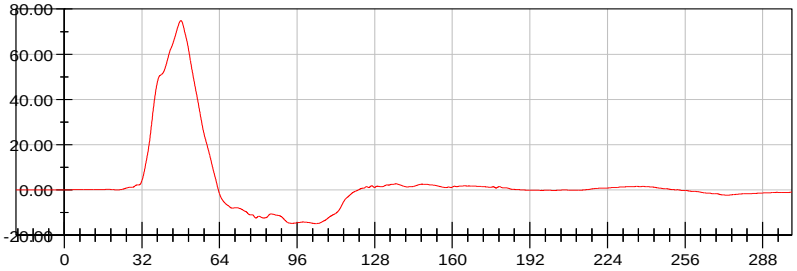
11.48 g at 64.00 ms

<Min>

-14.41 g at 37.76 ms

CFC_180

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



<Max>

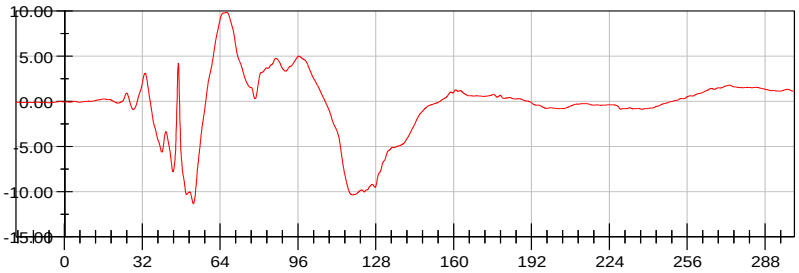
74.90 g at 48.08 ms

<Min>

-15.00 g at 103.68 ms

CFC_180

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



<Max>

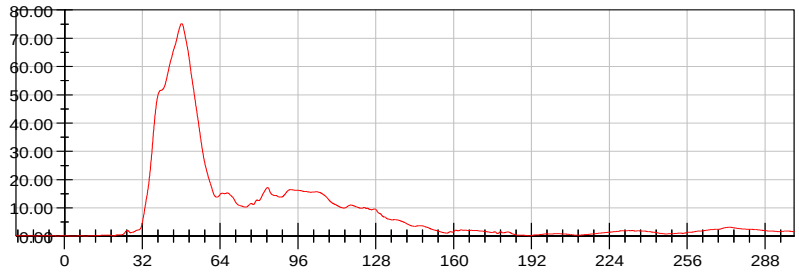
9.85 g at 66.64 ms

<Min>

-11.35 g at 52.96 ms

CFC_180

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



<Max>

75.22 g at 48.16 ms

<Min>

0.04 g at 3.36 ms

CFC_180

NHTSA

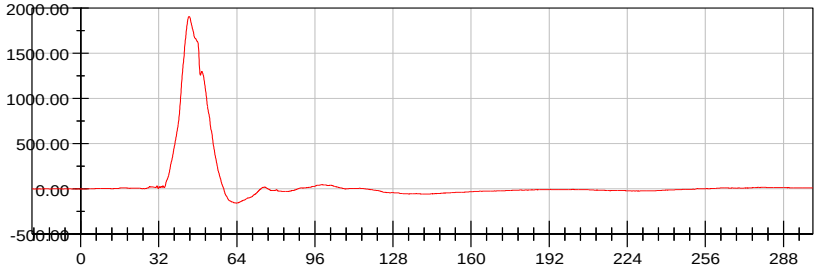
Test Date: 10/18/2012

Position #1 SID IIs Dummy ('033)

Test Lab: CTF

Test Number: 121018 (MD0311)

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



<Max>

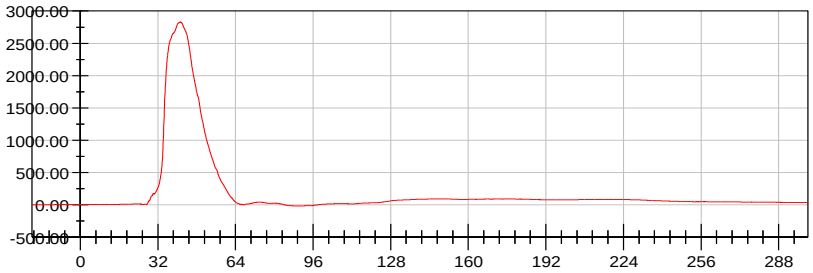
1,908.22 N at 44.40 ms

<Min>

-156.37 N at 63.84 ms

CFC_600

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



<Max>

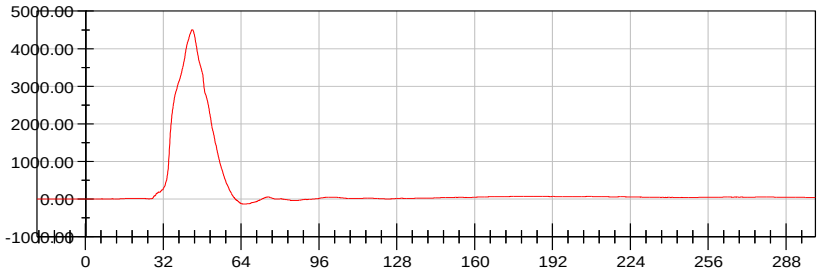
2,831.89 N at 41.28 ms

<Min>

-20.00 N at 88.32 ms

CFC_600

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



<Max>

4,503.84 N at 43.92 ms

<Min>

-131.18 N at 65.76 ms

CFC_600

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

Table 1. External Measurements
Table 2. Head Drop Test
- Resultant Head Acceleration (G's) vs. Time (ms)
- Head (X) Acceleration (G's) vs. Time (ms)
- Head (Y) Acceleration (G's) vs. Time (ms)
- Head (Z) Acceleration (G's) vs. Time (ms)

Table 3. Lateral Neck Pendulum Test
- Pendulum Velocity (m/s) vs. Time (ms)
- Flexion Angle (°) vs. Time (ms)
- Moment About Occipital Condyle (Nm) vs. Time (ms)

Table 4. Shoulder Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Shoulder Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)

Table 5. Thorax (With Arm) Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Shoulder Displacement (mm) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 6. Thorax (Without Arm) Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 7. Abdomen Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Upper Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 8. Pelvis Plug Quasi-Static Test (Optional*)
Table 9. Pelvis Acetabulum Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Pelvis (Y) Acceleration (G's) vs. Time (ms)
- Acetabulum Force (N) vs. Time (ms)

Table 10. Pelvis Iliac Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Pelvis (Y) Acceleration (G's) vs. Time (ms)
- Iliac Force (N) vs. Time (ms)

Pre-Test Calibration Sheets
Driver S/N 033

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 033 Calibration No.13
Date: 10/16/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	781	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	533	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	399	Yes
N	Buttock Popliteal Length	416.0 - 442.0	431	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	316	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	483	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	781	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	23 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	121.9 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	6.8 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

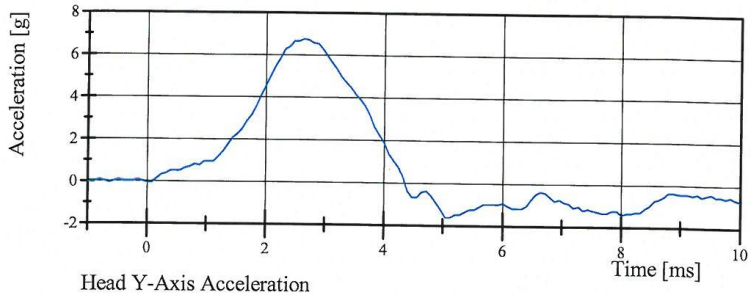
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.11.2012 09:24:48 233

Transportation Research Center Inc.

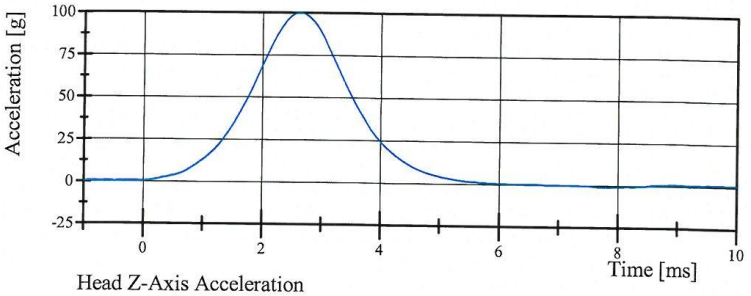
Left Lateral Head Drop
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/11/2012

Head X-Axis Acceleration



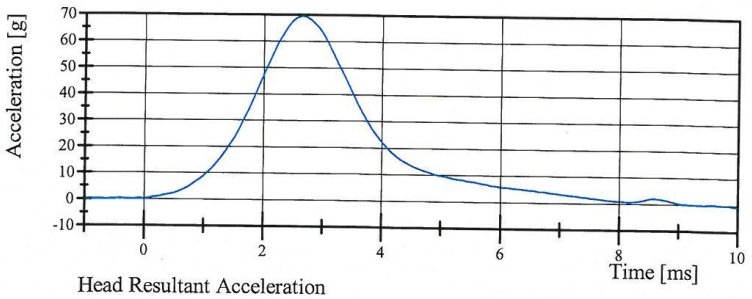
Filter Class: CFC_1000
Max: 6.8 gn at 2.6 ms
Min: -1.6 gn at 5.0 ms

Head Y-Axis Acceleration



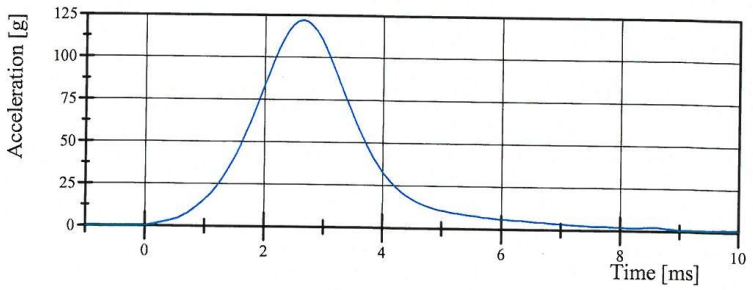
Filter Class: CFC_1000
Max: 100.0 gn at 2.6 ms
Min: -1.2 gn at 7.8 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 69.4 gn at 2.6 ms
Min: -0.6 gn at 10.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 121.9 gn at 2.6 ms
Min: 0.0 gn at -0.3 ms

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

10.11.2012 09:24:55 233

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 033 Certification No. 13-4
Test Date: 10/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.580 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.386 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.531 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.819 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.751 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.792 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-72.0 deg	Yes
Time of Peak	50 - 70 ms	65.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	43.8 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	111.9 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

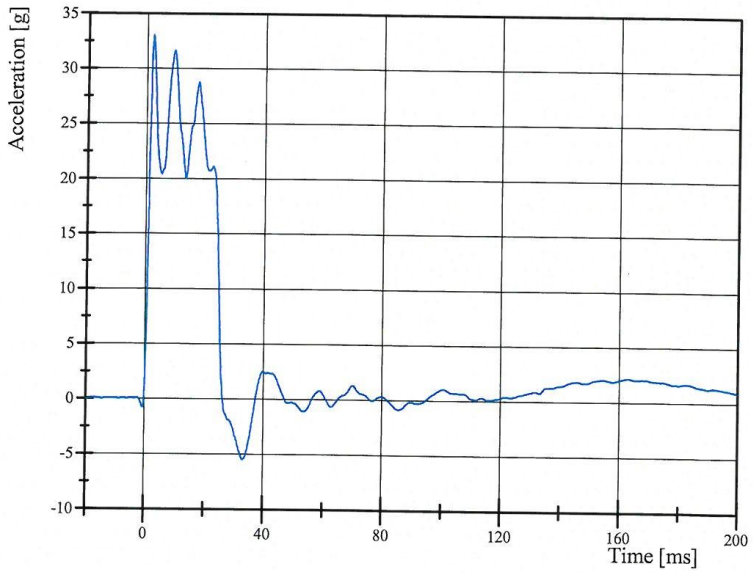
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.11.2012 12:58:32 639

Transportation Research Center Inc.

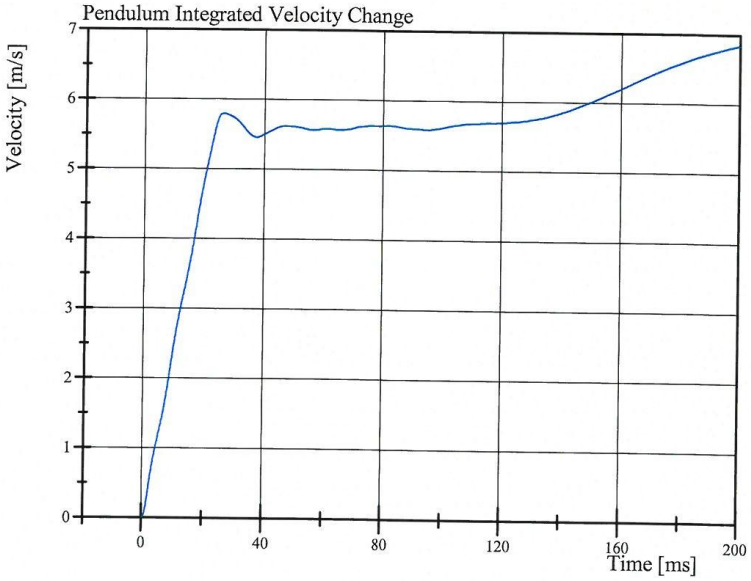
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 13-4
Test Date: 10/11/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 33.0 gn at 2.2 ms
Min: -5.5 gn at 33.1 ms

Pendulum Integrated Velocity Change



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

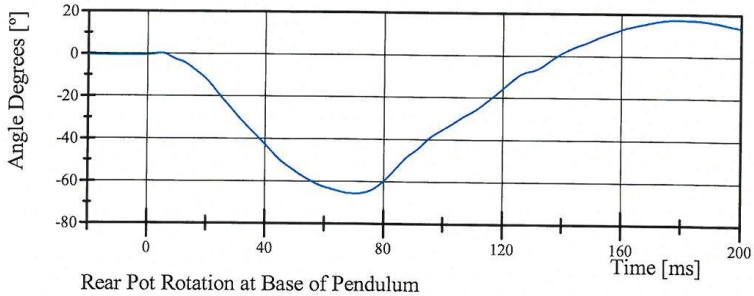
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.11.2012 12:58:42 639

Transportation Research Center Inc.

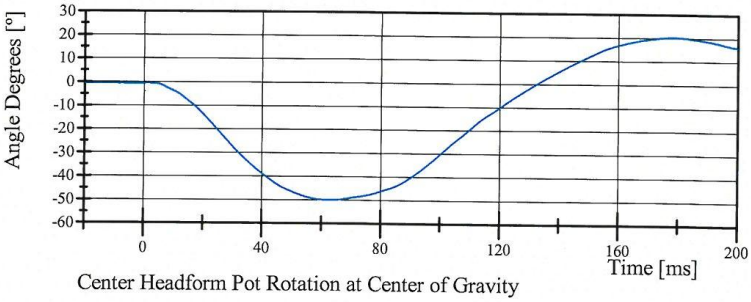
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 13-4
Test Date: 10/11/2012

Forward Pot Rotation at Base of Pendulum



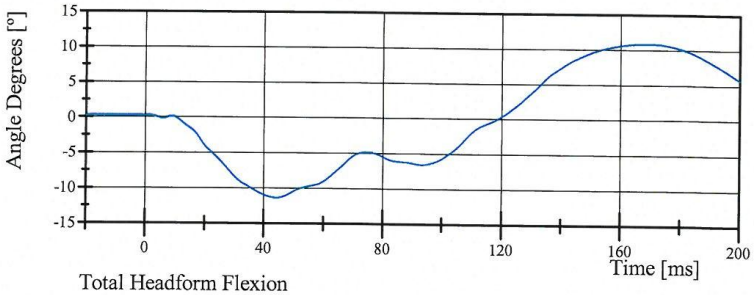
Filter Class: CFC_60
Max: 17.3 ° at 178.6 ms
Min: -65.7 ° at 70.3 ms

Rear Pot Rotation at Base of Pendulum



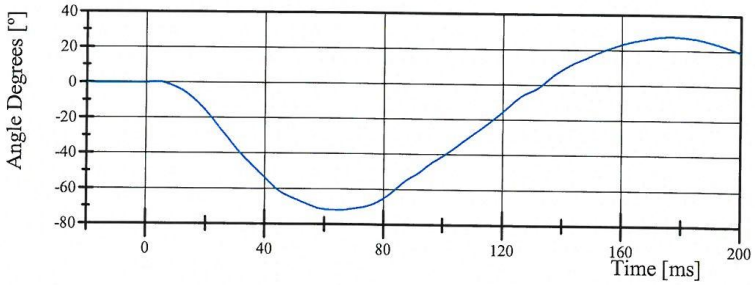
Filter Class: CFC_60
Max: 20.3 ° at 178.2 ms
Min: -50.1 ° at 63.1 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 10.8 ° at 169.6 ms
Min: -11.4 ° at 44.3 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 27.7 ° at 176.2 ms
Min: -72.0 ° at 65.0 ms

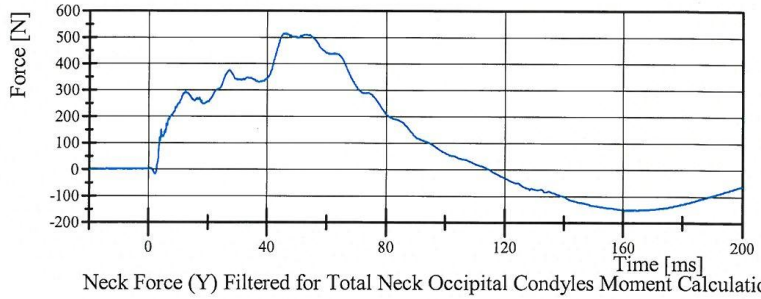
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.11.2012 12:58:43 639

Transportation Research Center Inc.

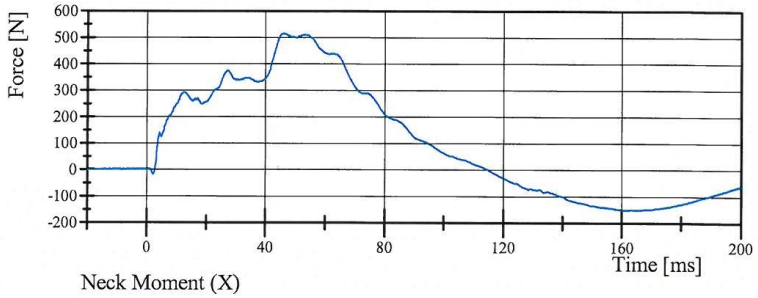
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 13-4
Test Date: 10/11/2012

Neck Force (Y)



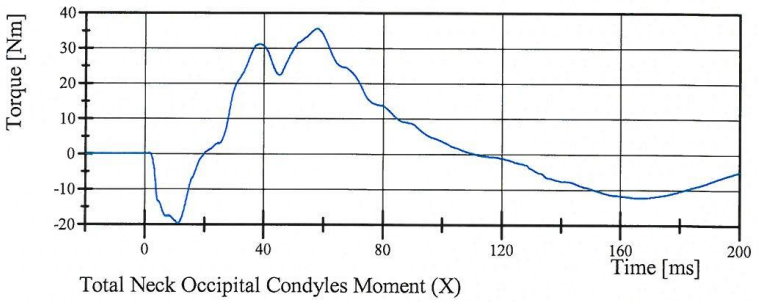
Filter Class: CFC_1000
Max: 514.2 N at 46.1 ms
Min: -153.2 N at 161.1 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyles Moment Calculation



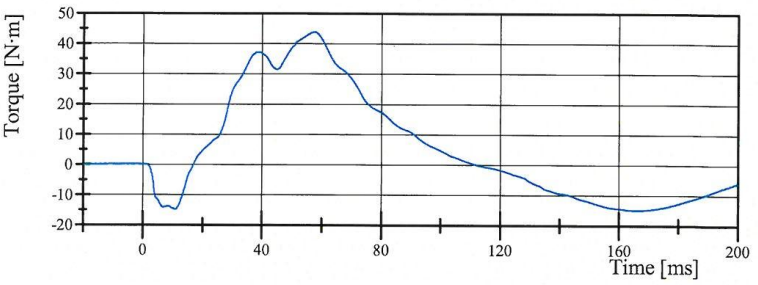
Filter Class: CFC_600
Max: 513.5 N at 46.2 ms
Min: -152.9 N at 160.5 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 35.5 Nm at 57.8 ms
Min: -19.7 Nm at 11.2 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Consta
Max: 43.8 N·m at 57.4 ms
Min: -15.0 N·m at 167.1 ms

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

10.11.2012 12:58:44 639

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.5 g	Yes
Shoulder Displacement	28 - 37 mm	32.2 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.6 g	Yes

Test meets specifications.

Comments:

Technician

Approved

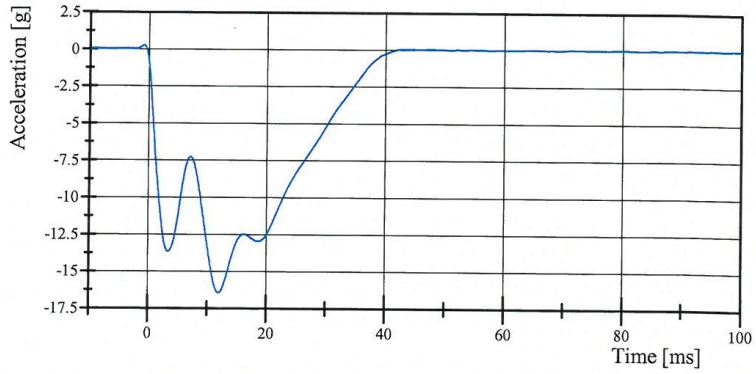
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 15:24:48 853

Transportation Research Center Inc.

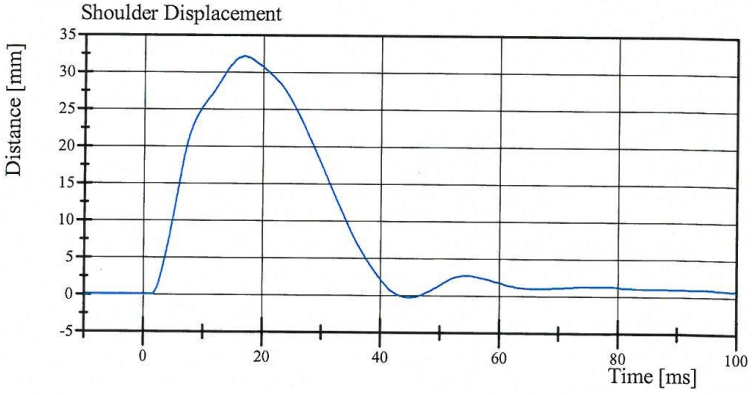
Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



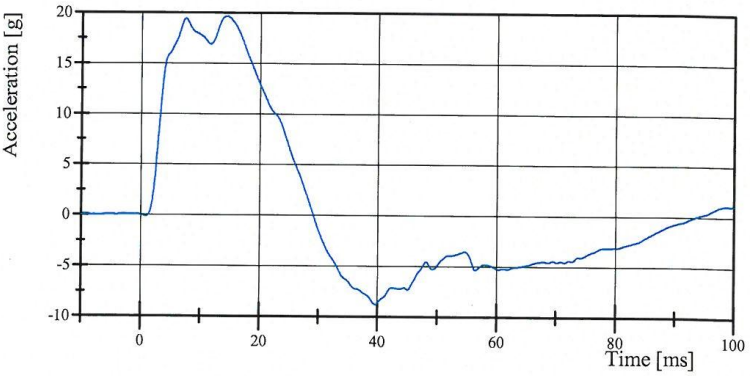
Filter Class: CFC_180
Max: 0.2 gn at -0.9 ms
Min: -16.5 gn at 11.9 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 32.2 mm at 16.8 ms
Min: -0.3 mm at 44.8 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.6 gn at 14.3 ms
Min: -8.8 gn at 39.6 ms

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

10.09.2012 15:24:56 853

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.715 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.9 g	Yes
Shoulder Displacement	31 - 40 mm	34.3 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.8 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.0 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	35.3 g	Yes

Test meets specifications.

Comments:

Technician

Approved

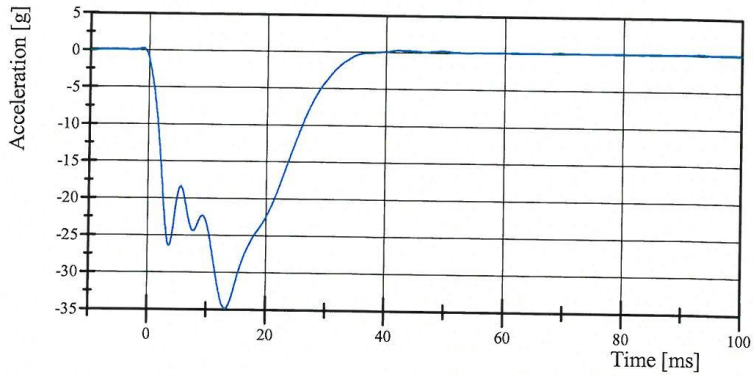
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 16:02:32 620

Transportation Research Center Inc.

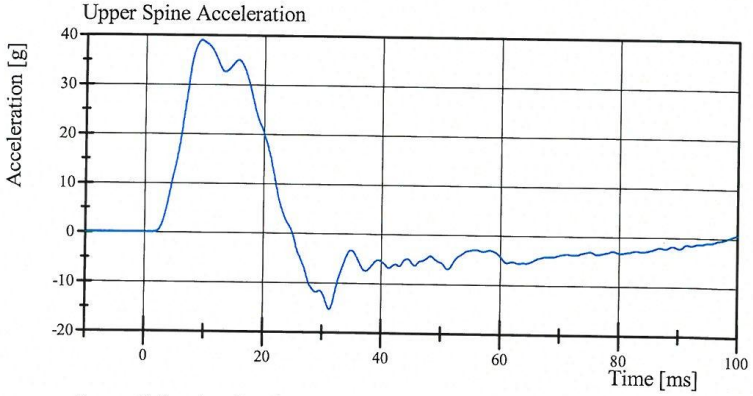
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



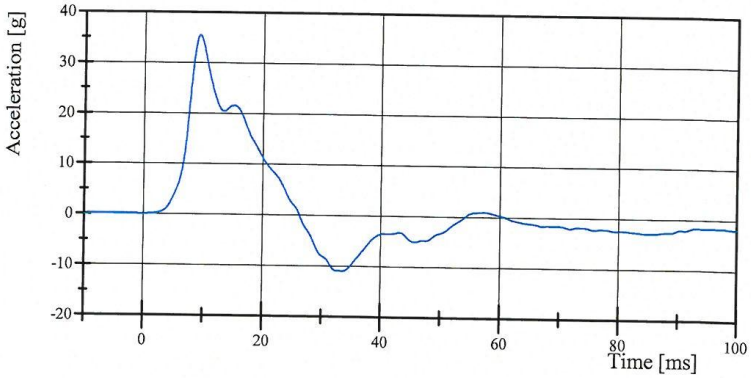
Filter Class: CFC_180
Max: 0.2 gn at 42.1 ms
Min: -34.9 gn at 13.2 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 39.0 gn at 9.4 ms
Min: -15.3 gn at 31.2 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 35.3 gn at 9.3 ms
Min: -11.0 gn at 33.4 ms

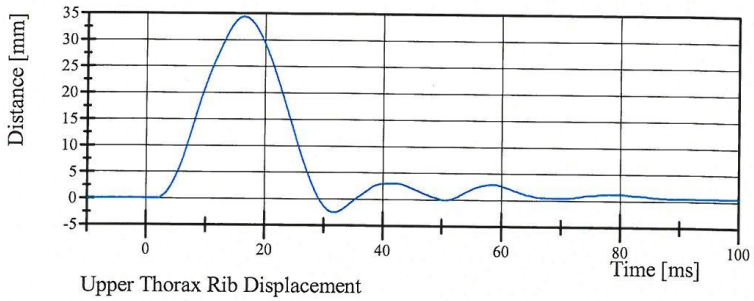
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 16:02:50 620

Transportation Research Center Inc.

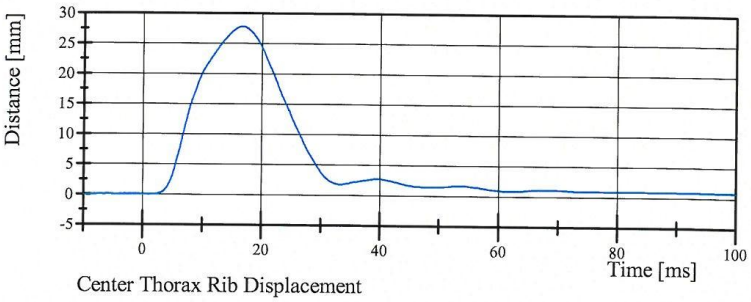
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/9/2012

Shoulder Rib Displacement



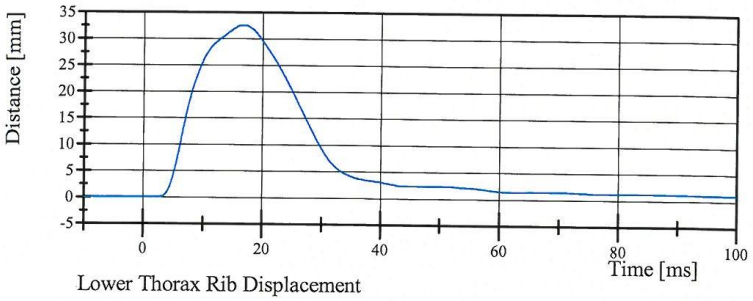
Filter Class: CFC_600
Max: 34.3 mm at 16.3 ms
Min: -2.5 mm at 31.7 ms

Upper Thorax Rib Displacement



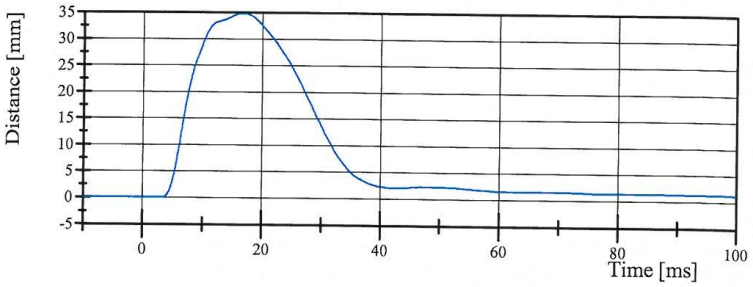
Filter Class: CFC_600
Max: 27.8 mm at 16.6 ms
Min: -0.0 mm at -8.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.5 mm at 16.8 ms
Min: -0.0 mm at 1.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.8 mm at 16.8 ms
Min: -0.0 mm at 3.3 ms

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

10.09.2012 16:02:50 620

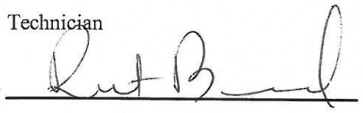
Transportation Research Center Inc.

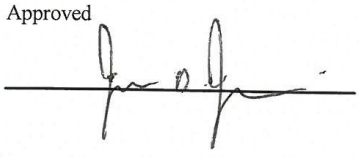
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 13-2
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.316 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.2 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	33.9 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.1 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	39.3 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.0 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.9 g	Yes

Test meets specifications.

Comments:

Technician 

Approved 

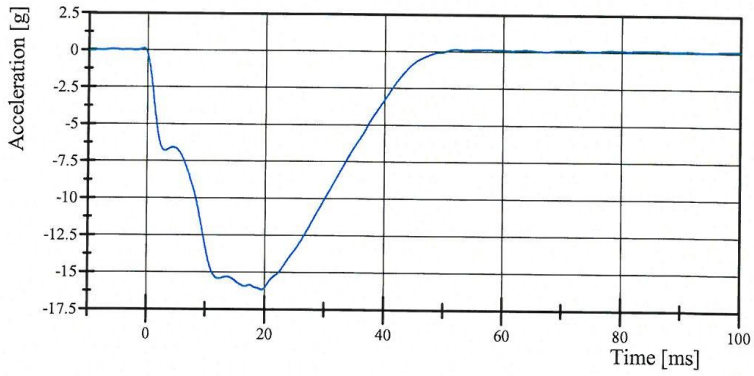
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 17:23:42 837

Transportation Research Center Inc.

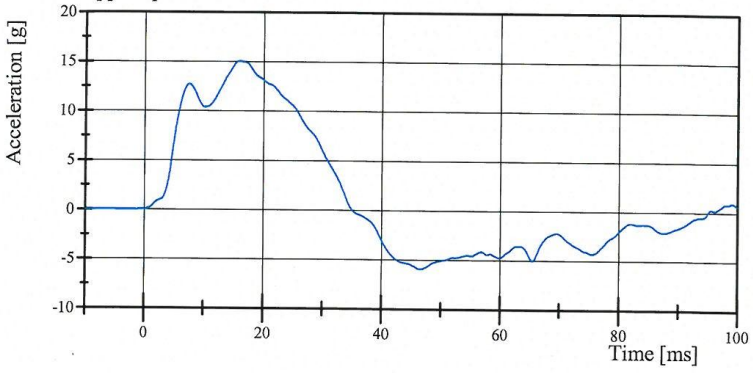
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 13-2
Test Date: 10/9/2012

Probe Acceleration



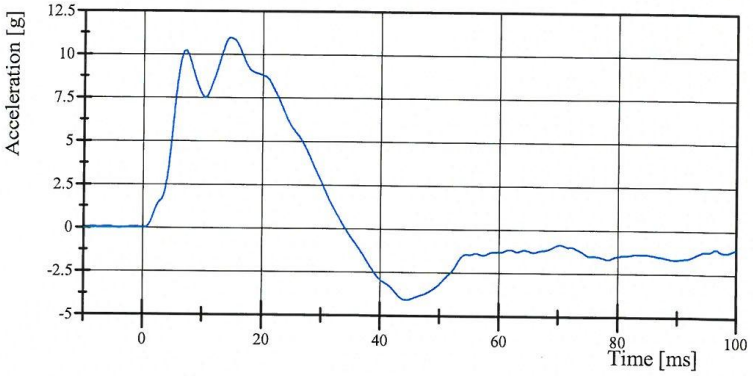
Filter Class: CFC_180
Max: 0.1 gn at 55.7 ms
Min: -16.2 gn at 19.5 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.0 gn at 15.9 ms
Min: -6.0 gn at 46.5 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.9 gn at 14.6 ms
Min: -4.1 gn at 44.5 ms

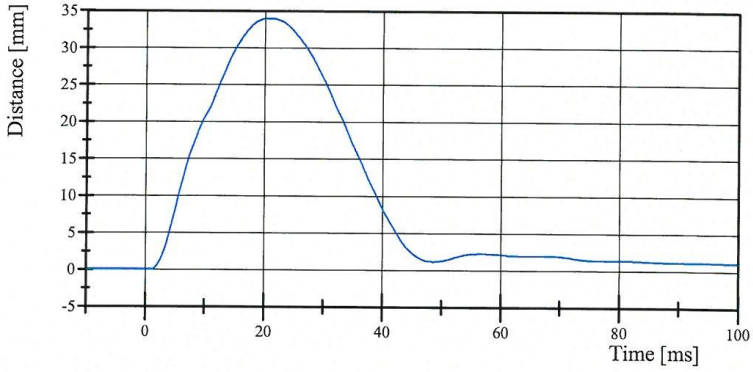
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 17:23:56 837

Transportation Research Center Inc.

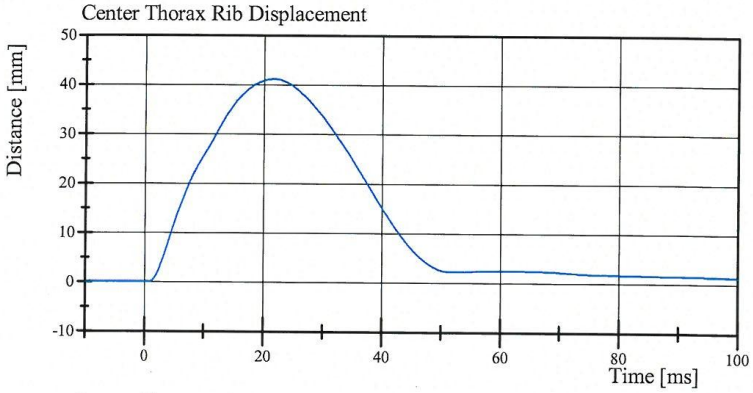
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 13-2
Test Date: 10/9/2012

Upper Thorax Rib Displacement



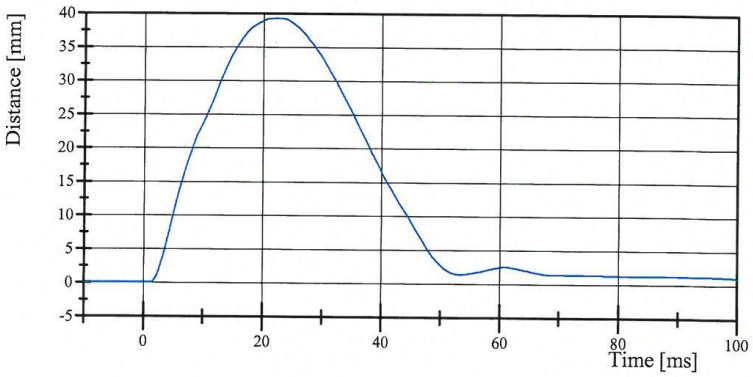
Filter Class: CFC_600
Max: 33.9 mm at 21.0 ms
Min: -0.0 mm at 1.0 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.1 mm at 21.7 ms
Min: -0.0 mm at 0.7 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.3 mm at 22.2 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.

10.09.2012 17:23:57 837

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/10/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.5 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.94 g	Yes

Test meets specifications.

Comments:

Technician

Approved

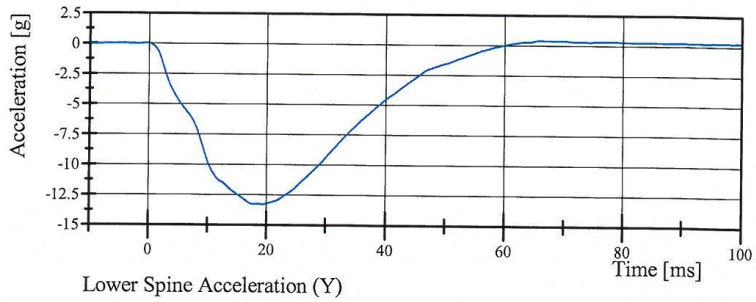
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.10.2012 06:58:46 623

Transportation Research Center Inc.

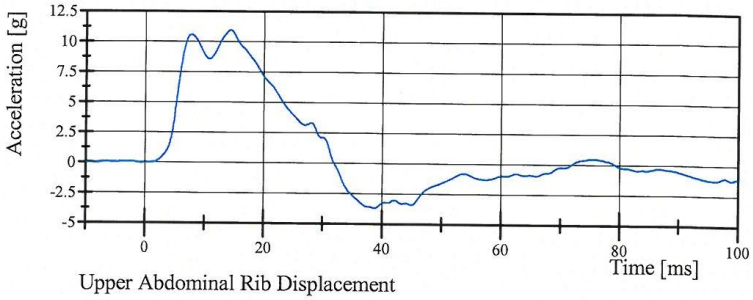
Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 13-1
Test Date: 10/10/2012

Probe Acceleration



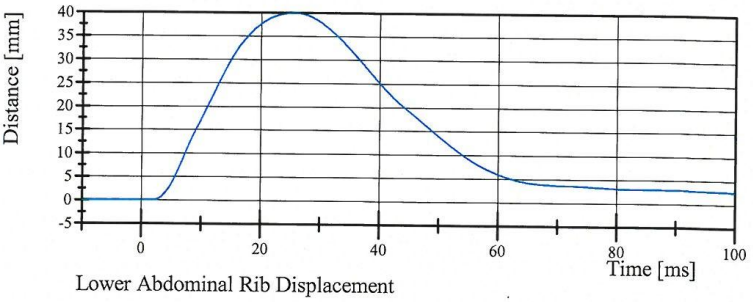
Filter Class: CFC_180
Max: 0.4 gn at 65.9 ms
Min: -13.3 gn at 19.4 ms

Lower Spine Acceleration (Y)



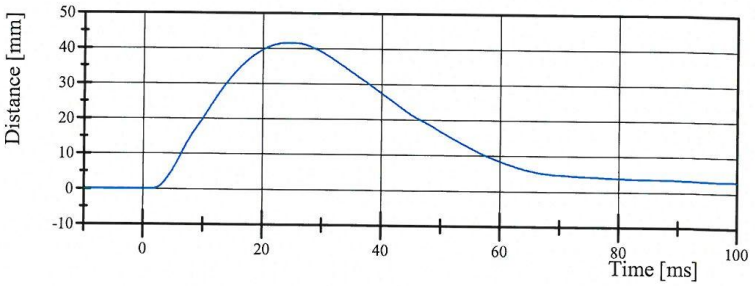
Filter Class: CFC_180
Max: 10.9 gn at 14.3 ms
Min: -3.7 gn at 38.7 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 40.0 mm at 25.6 ms
Min: -0.0 mm at 0.8 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.5 mm at 24.4 ms
Min: -0.0 mm at 1.8 ms

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

10.10.2012 06:58:54 623

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 033 Certification No. 13-2
Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.67 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-45.34 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	41.1 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,778.9 N	Yes

Test meets specifications.

Comments:

Technician

Approved

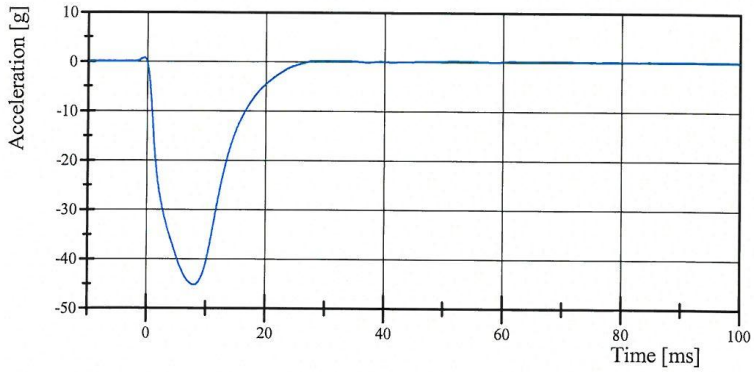
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2012 18:07:15 433

Transportation Research Center Inc.

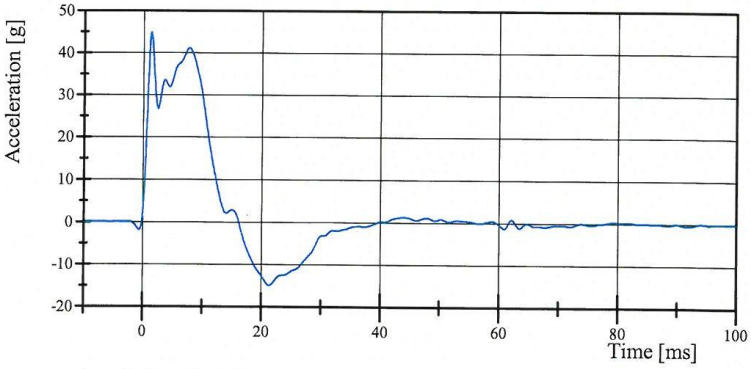
Left Lateral Pelvis
SID IIs Serial No. 033 Certification No. 13-2
Test Date: 10/16/2012

Probe Acceleration



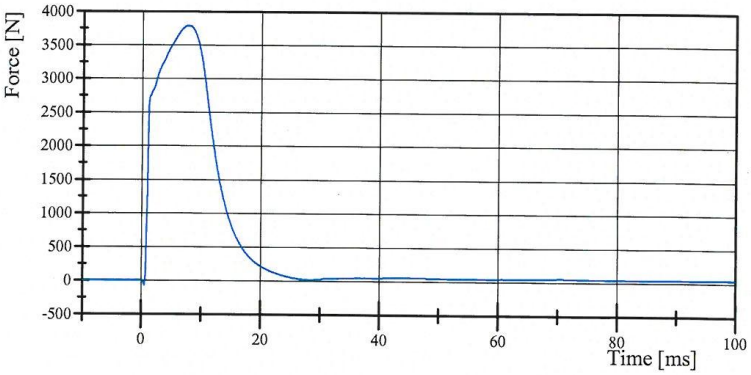
Filter Class: CFC_180
Max: 0.7 gn at -0.6 ms
Min: -45.3 gn at 8.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 44.8 gn at 1.4 ms
Min: -15.0 gn at 21.4 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,778.9 N at 7.8 ms
Min: -73.6 N at 0.5 ms

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

10.16.2012 18:07:22 433

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 033 Certification No. 13-7
Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.40 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.6 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	28.9 g	Yes
Iliac Force	4,100 - 5,100 N	4,599.9 N	Yes

Test meets specifications.

Comments:

Technician

Approved

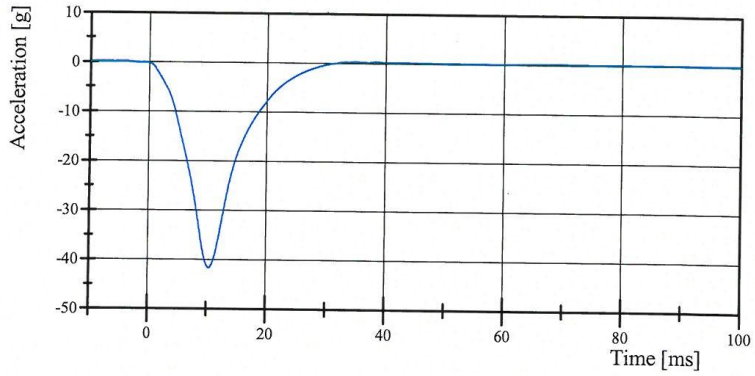
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2012 15:02:54 665

Transportation Research Center Inc.

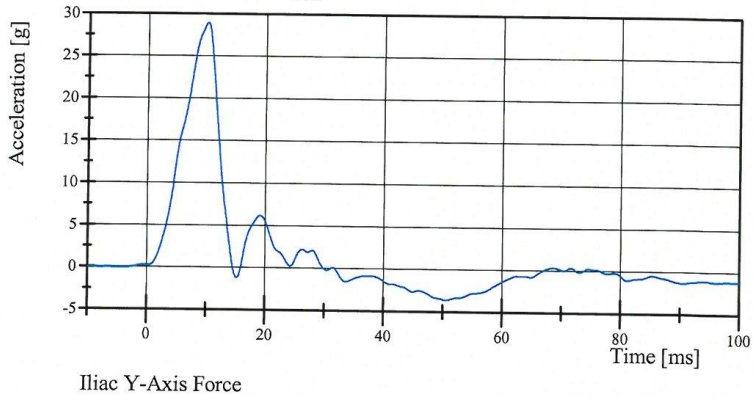
Left Lateral Iliac
SID IIs Serial No. 033 Certification No. 13-7
Test Date: 10/16/2012

Probe Acceleration



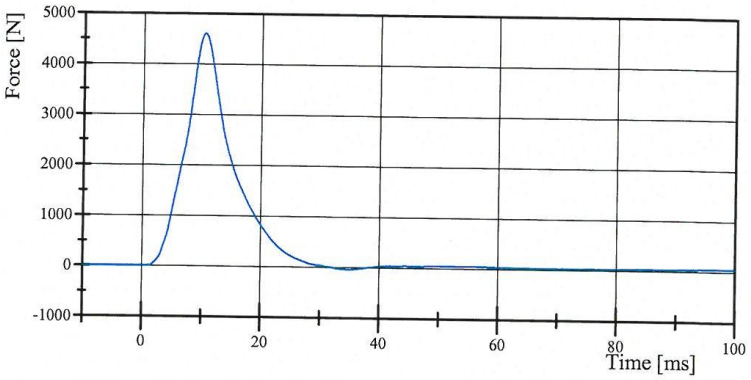
Filter Class: CFC_180
Max: 0.3 gn at 35.0 ms
Min: -41.6 gn at 10.4 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 28.9 gn at 10.1 ms
Min: -3.6 gn at 50.6 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,599.9 N at 10.4 ms
Min: -34.5 N at 35.1 ms

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

10.16.2012 15:03:03 665

Driver S/N 033

Post-Test Calibration Sheets

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 033 Calibration No.14
Date: 10/20/12

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	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	533	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	431	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	316	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	483	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	781	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	134.7 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	10.1 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

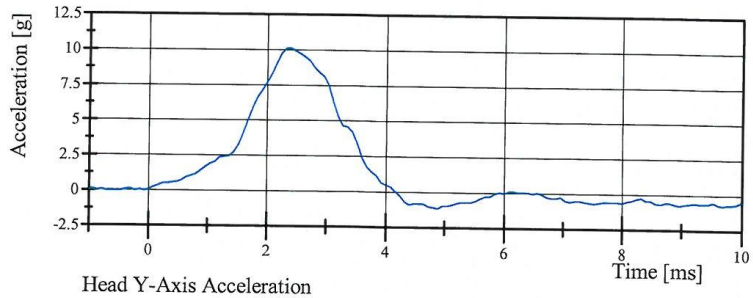
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 09:37:03 234

Transportation Research Center Inc.

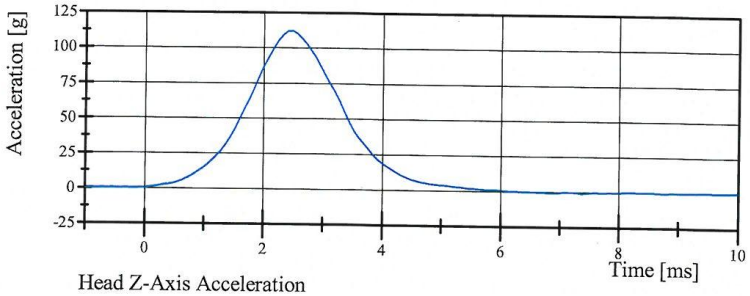
Left Lateral Head Drop
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Head X-Axis Acceleration



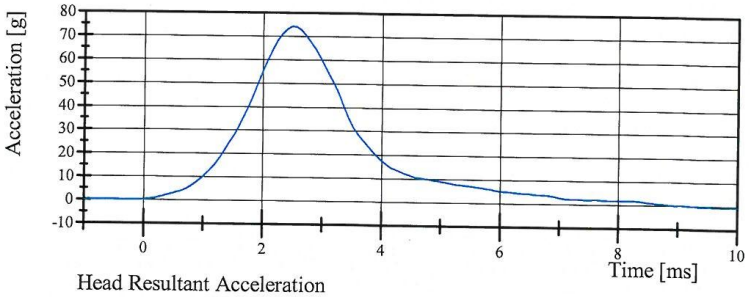
Filter Class: CFC_1000
Max: 10.1 gn at 2.3 ms
Min: -1.2 gn at 4.9 ms

Head Y-Axis Acceleration



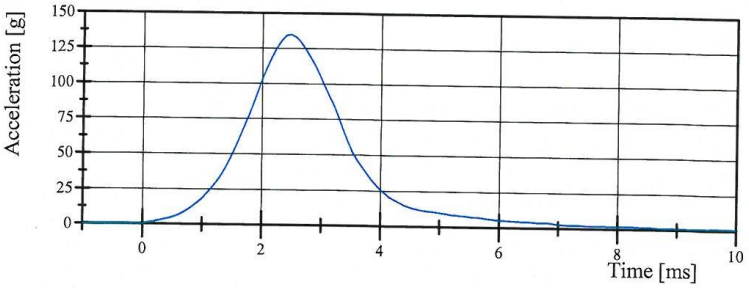
Filter Class: CFC_1000
Max: 112.1 gn at 2.5 ms
Min: -0.9 gn at 7.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 74.1 gn at 2.5 ms
Min: -0.6 gn at 9.8 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 134.7 gn at 2.5 ms
Min: 0.0 gn at -0.8 ms

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

10.19.2012 09:37:10 234

Transportation Research Center Inc.

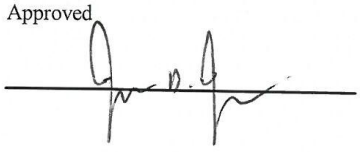
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 14-3
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.580 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.606 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.856 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.217 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.783 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.793 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.1 deg	Yes
Time of Peak	50 - 70 ms	62.6 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	42.4 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	122.2 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

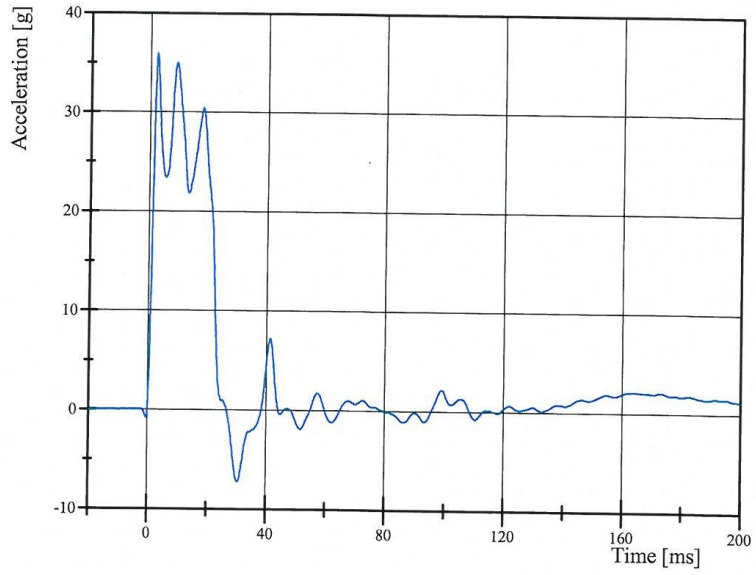
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 19:07:24 638

Transportation Research Center Inc.

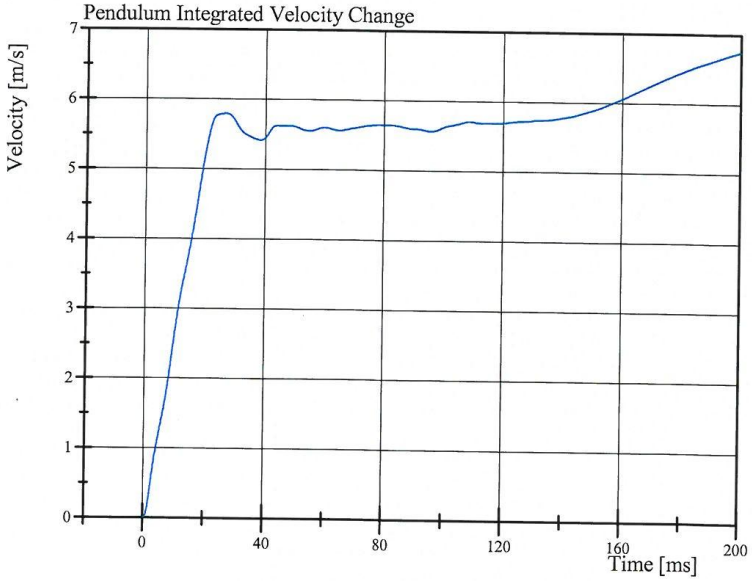
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 14-3
Test Date: 10/19/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 35.9 gn at 2.4 ms
Min: -7.3 gn at 30.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.7 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

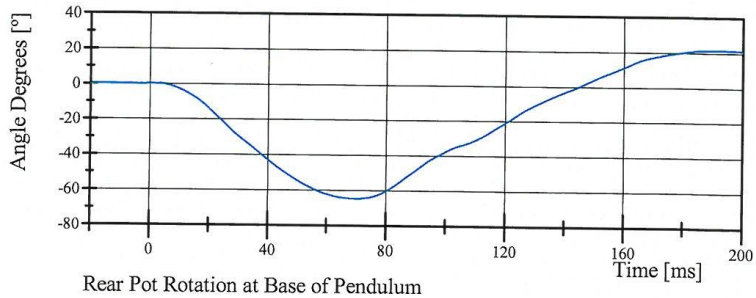
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 19:07:31 638

Transportation Research Center Inc.

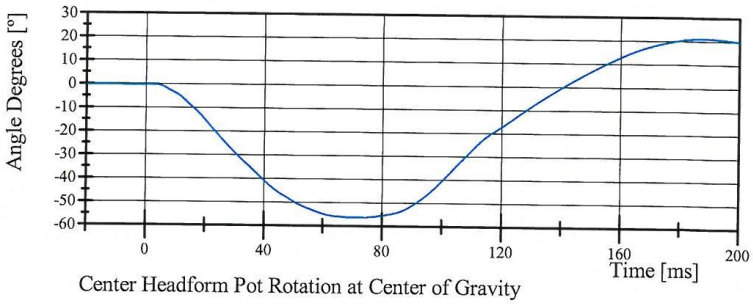
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 14-3
Test Date: 10/19/2012

Forward Pot Rotation at Base of Pendulum



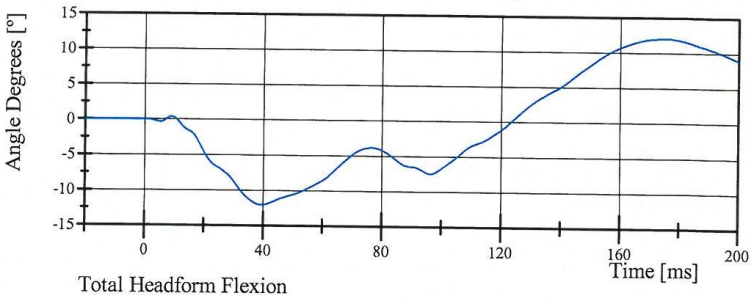
Filter Class: CFC_60
Max: 21.3 ° at 193.1 ms
Min: -64.7 ° at 69.8 ms

Rear Pot Rotation at Base of Pendulum



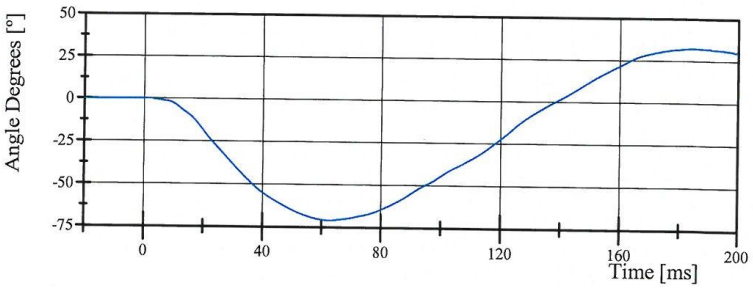
Filter Class: CFC_60
Max: 21.2 ° at 187.7 ms
Min: -56.4 ° at 72.7 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.0 ° at 175.2 ms
Min: -12.1 ° at 39.4 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 32.3 ° at 185.0 ms
Min: -71.1 ° at 62.6 ms

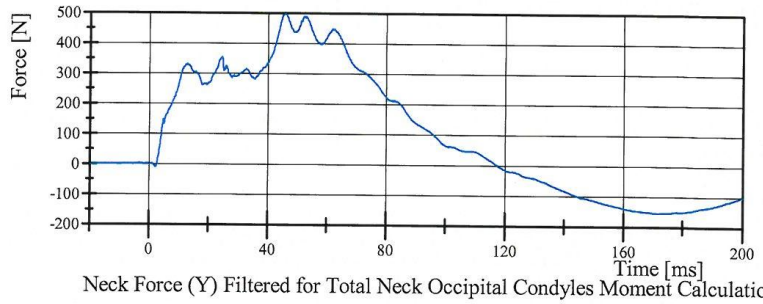
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 19:07:31 638

Transportation Research Center Inc.

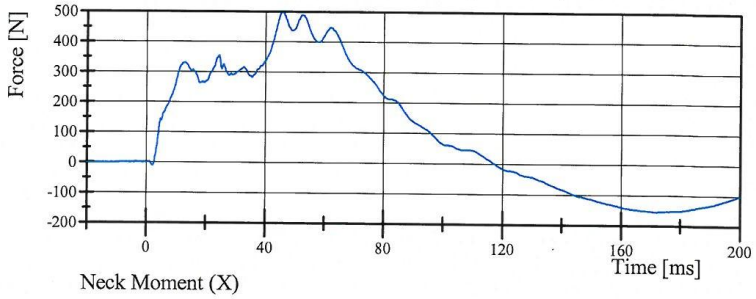
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 14-3
Test Date: 10/19/2012

Neck Force (Y)



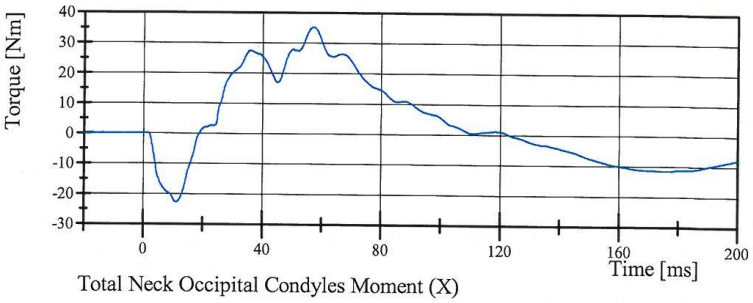
Filter Class: CFC_1000
Max: 498.8 N at 46.0 ms
Min: -155.2 N at 171.4 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyles Moment Calculation



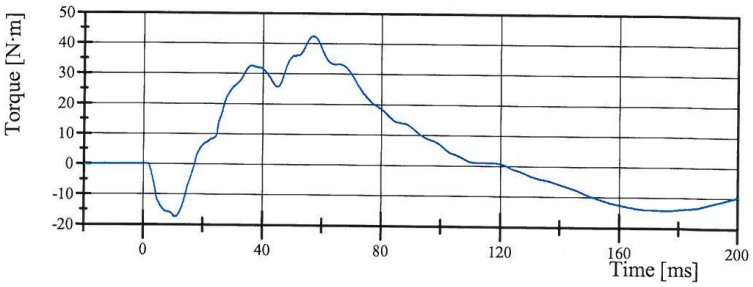
Filter Class: CFC_600
Max: 498.1 N at 46.0 ms
Min: -154.8 N at 171.5 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 35.3 Nm at 57.1 ms
Min: -22.8 Nm at 11.2 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constai
Max: 42.4 N·m at 57.0 ms
Min: -17.4 N·m at 10.8 ms

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

10.19.2012 19:07:32 638

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 14-4
Test Date: 10/22/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.4 g	Yes
Shoulder Displacement	28 - 37 mm	31.9 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.2 g	Yes

Test meets specifications.

Comments:

Technician

Approved

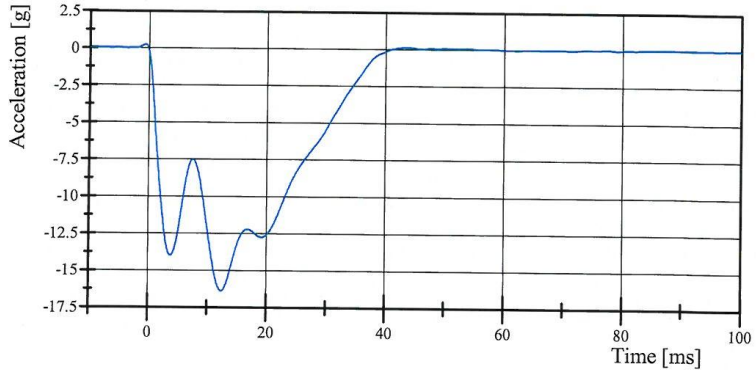
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.22.2012 14:46:15 820

Transportation Research Center Inc.

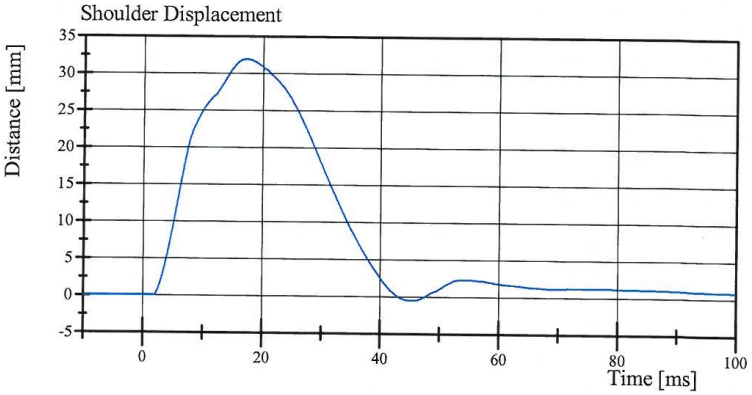
Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 14-4
Test Date: 10/22/2012

Probe Acceleration



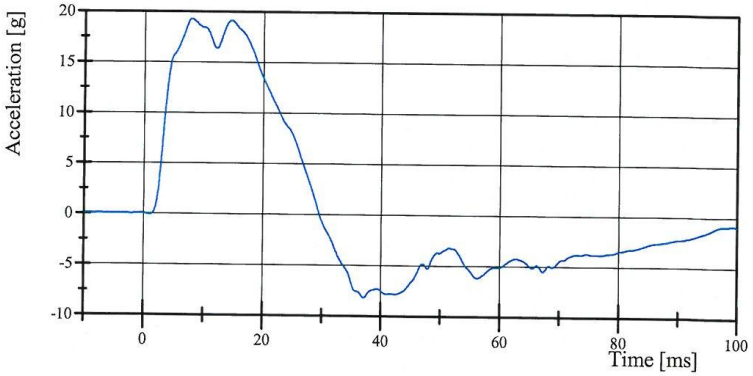
Filter Class: CFC_180
Max: 0.2 gn at -0.6 ms
Min: -16.4 gn at 12.4 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.9 mm at 17.2 ms
Min: -0.5 mm at 45.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.2 gn at 7.8 ms
Min: -8.2 gn at 37.1 ms

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

10.22.2012 14:46:22 820

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 14-2
Test Date: 10/22/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.724 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.9 g	Yes
Shoulder Displacement	31 - 40 mm	32.8 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.3 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	33.4 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	37.3 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.6 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.7 g	Yes

Test meets specifications.

Comments:

Technician

Approved

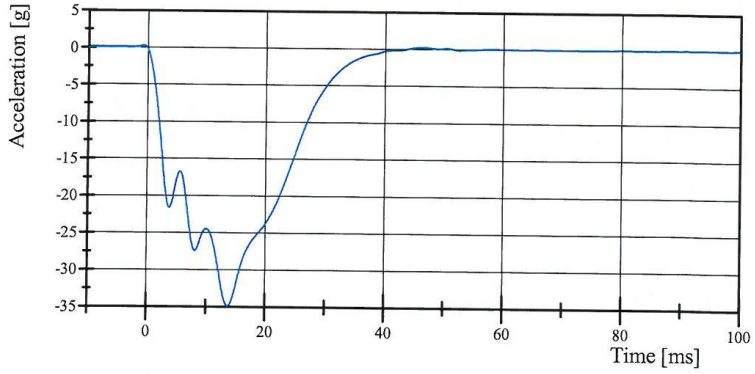
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.22.2012 15:36:52 585

Transportation Research Center Inc.

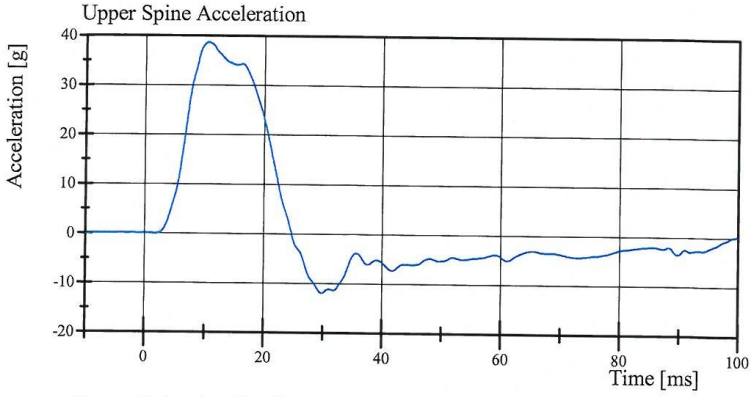
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 14-2
Test Date: 10/22/2012

Probe Acceleration



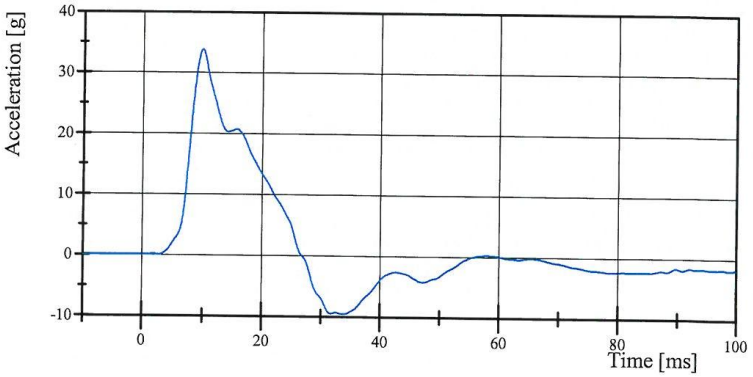
Filter Class: CFC_180
Max: 0.2 gn at 46.1 ms
Min: -34.9 gn at 13.7 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 38.6 gn at 10.4 ms
Min: -12.0 gn at 29.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 33.7 gn at 9.8 ms
Min: -9.6 gn at 33.8 ms

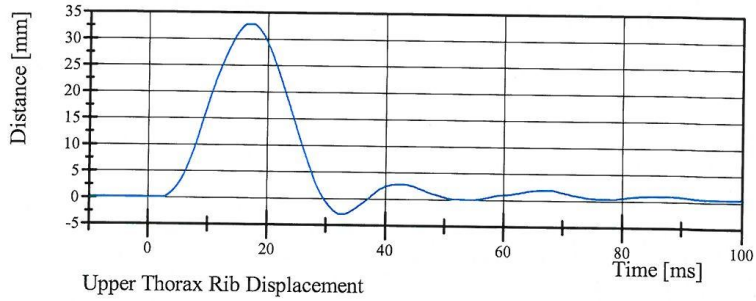
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.22.2012 15:37:00 585

Transportation Research Center Inc.

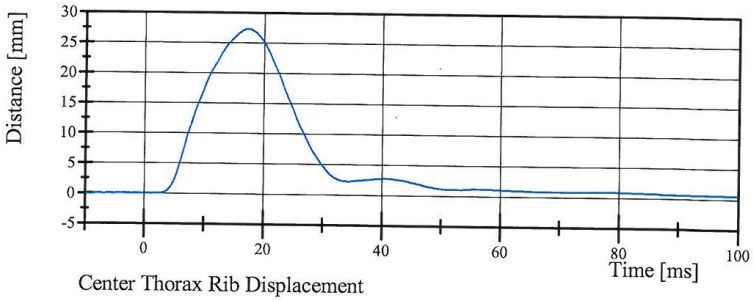
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 14-2
Test Date: 10/22/2012

Shoulder Rib Displacement



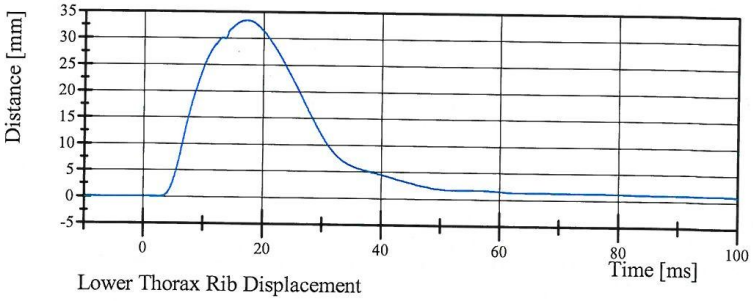
Filter Class: CFC_600
Max: 32.8 mm at 17.2 ms
Min: -3.0 mm at 32.6 ms

Upper Thorax Rib Displacement



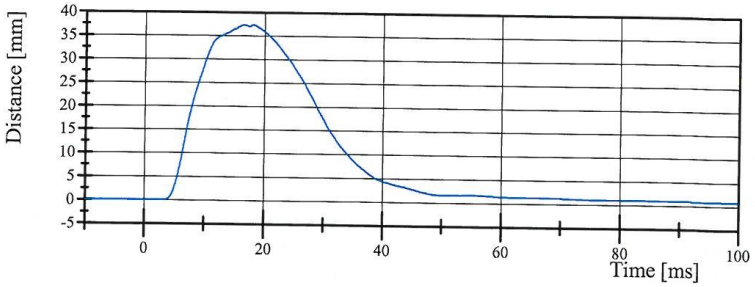
Filter Class: CFC_600
Max: 27.3 mm at 17.3 ms
Min: -0.0 mm at 0.2 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.4 mm at 17.2 ms
Min: -0.0 mm at 2.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.3 mm at 18.0 ms
Min: -0.0 mm at 3.5 ms

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

10.22.2012 15:37:01 585

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.316 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.1 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	32.7 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.6 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	39.7 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.4 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.7 g	Yes

Test meets specifications.

Comments:

Technician

Approved

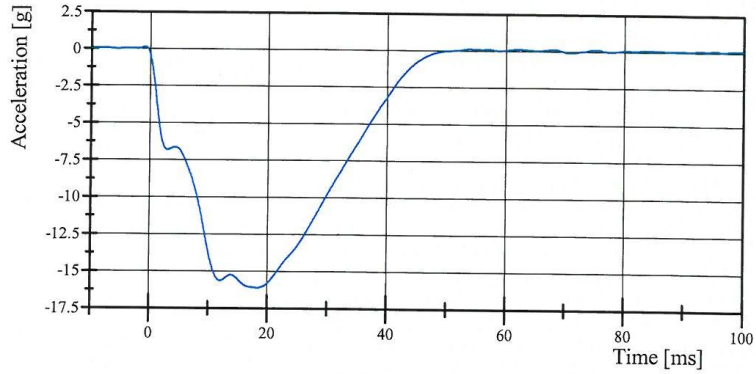
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 17:41:27 842

Transportation Research Center Inc.

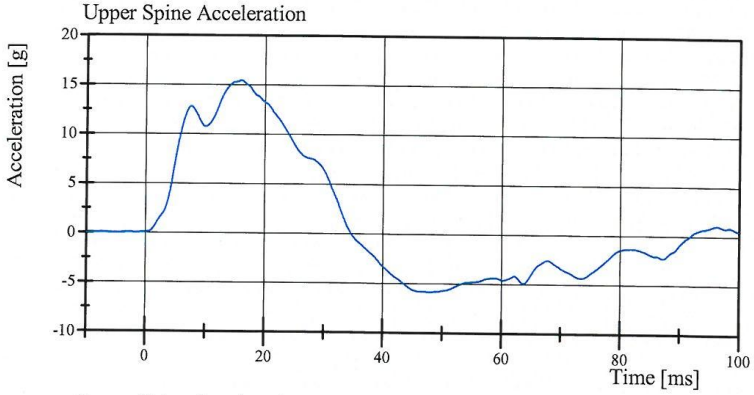
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



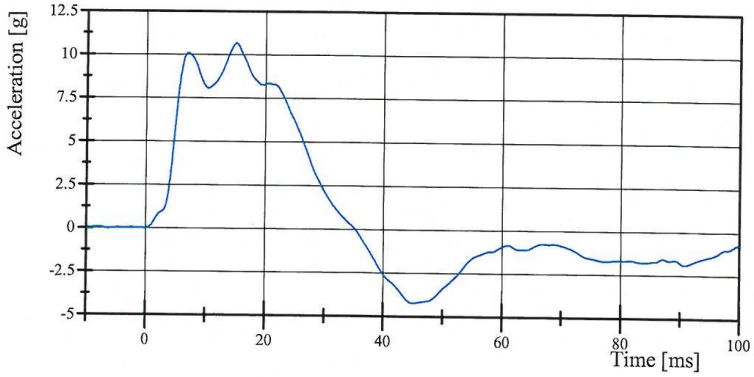
Filter Class: CFC_180
Max: 0.1 gn at 62.2 ms
Min: -16.1 gn at 18.2 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.4 gn at 15.9 ms
Min: -5.9 gn at 47.9 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.7 gn at 15.0 ms
Min: -4.2 gn at 45.1 ms

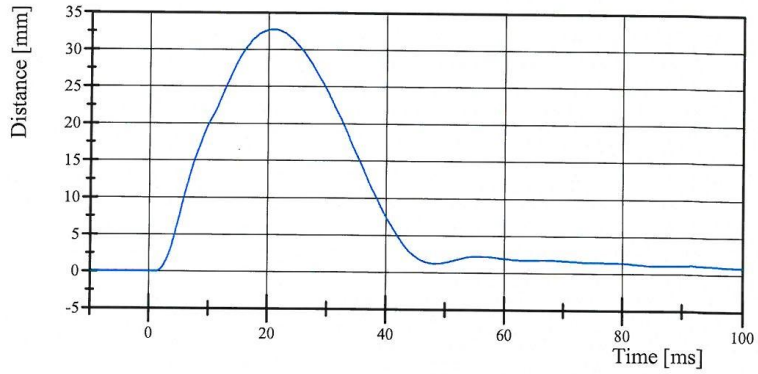
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 17:41:35 842

Transportation Research Center Inc.

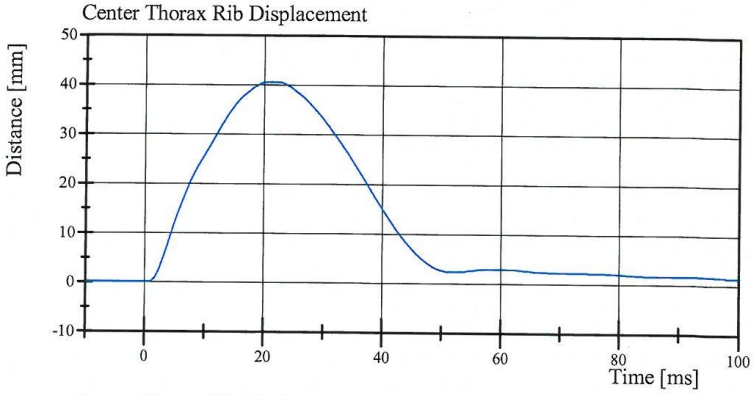
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Upper Thorax Rib Displacement



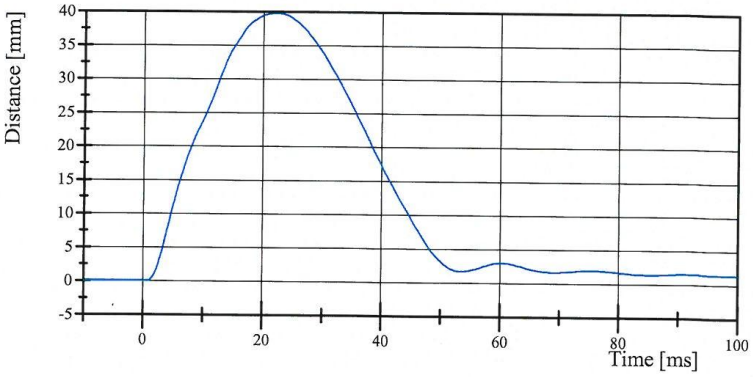
Filter Class: CFC_600
Max: 32.7 mm at 20.8 ms
Min: -0.0 mm at 1.1 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.6 mm at 21.5 ms
Min: -0.0 mm at 0.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.7 mm at 22.2 ms
Min: -0.0 mm at 0.6 ms

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

10.19.2012 17:41:36 842

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.6 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	41.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.7 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.87 g	Yes

Test meets specifications.

Comments:

Technician

Approved

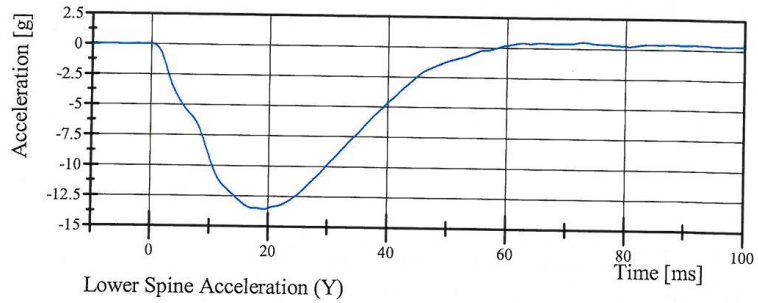
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 13:04:49 660

Transportation Research Center Inc.

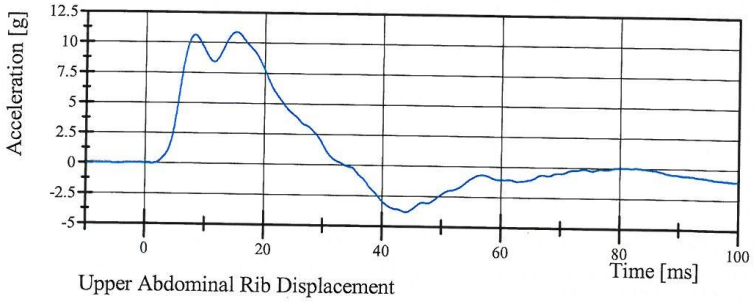
Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



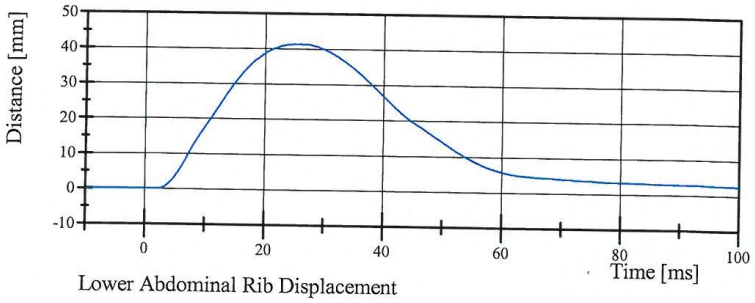
Filter Class: CFC_180
Max: 0.5 gn at 72.7 ms
Min: -13.6 gn at 19.2 ms

Lower Spine Acceleration (Y)



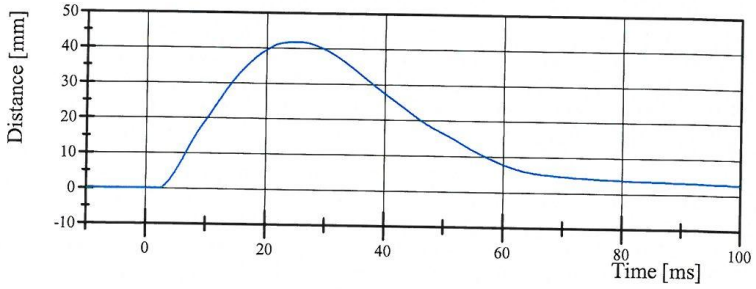
Filter Class: CFC_180
Max: 10.9 gn at 15.1 ms
Min: -3.8 gn at 43.9 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.3 mm at 25.8 ms
Min: -0.0 mm at 2.3 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.7 mm at 24.6 ms
Min: -0.0 mm at 2.5 ms

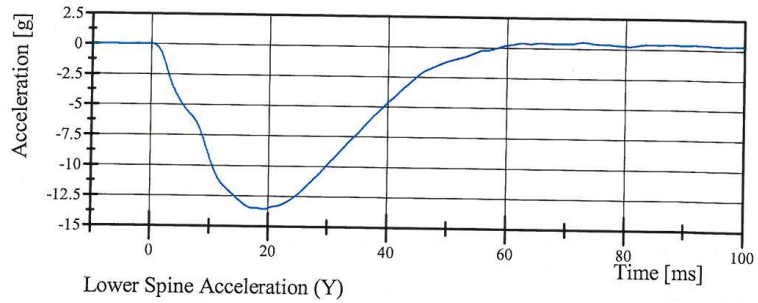
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 13:04:56 660

Transportation Research Center Inc.

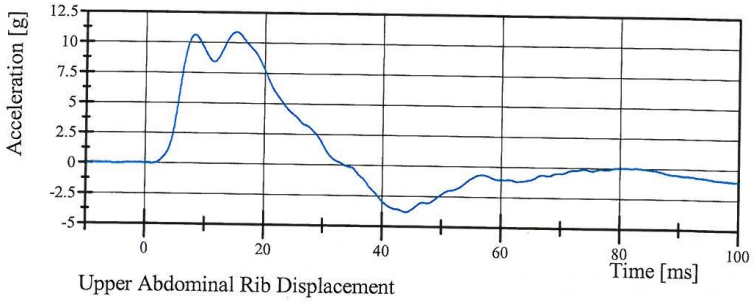
Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



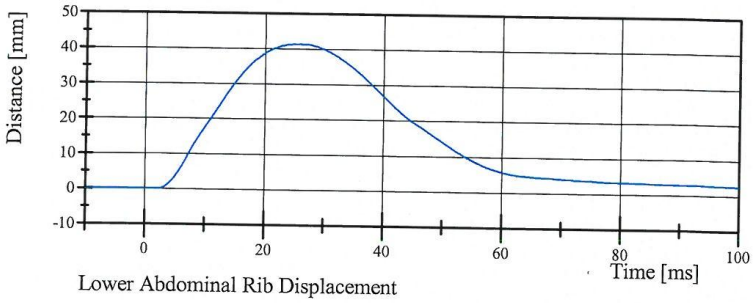
Filter Class: CFC_180
Max: 0.5 gn at 72.7 ms
Min: -13.6 gn at 19.2 ms

Lower Spine Acceleration (Y)



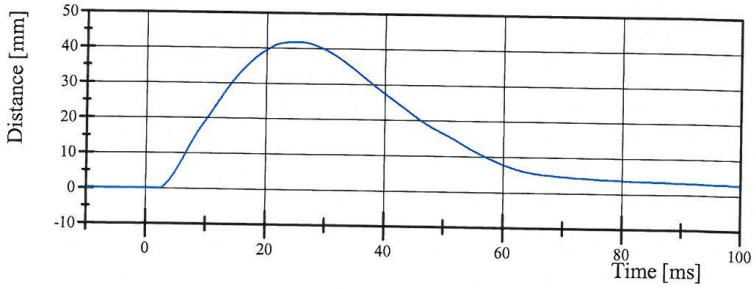
Filter Class: CFC_180
Max: 10.9 gn at 15.1 ms
Min: -3.8 gn at 43.9 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.3 mm at 25.8 ms
Min: -0.0 mm at 2.3 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.7 mm at 24.6 ms
Min: -0.0 mm at 2.5 ms

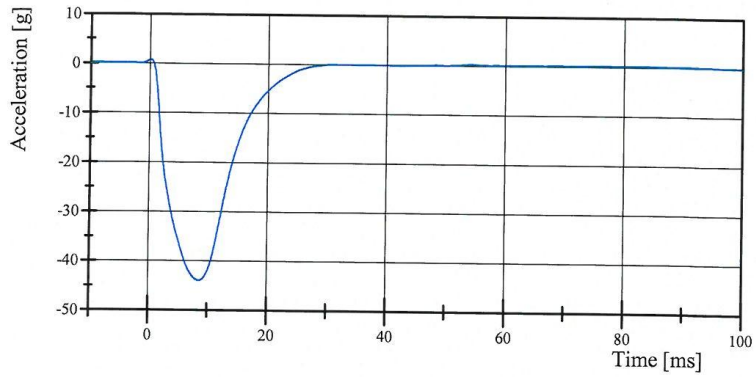
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 13:04:56 660

Transportation Research Center Inc.

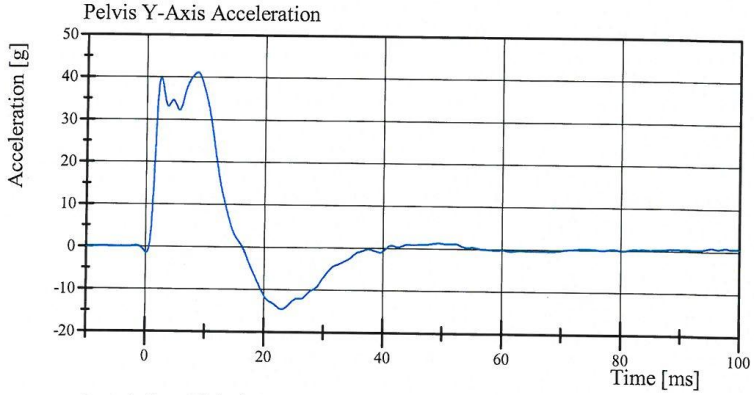
Left Lateral Pelvis
SID IIs Serial No. 033 Certification No. 14-2
Test Date: 10/19/2012

Probe Acceleration



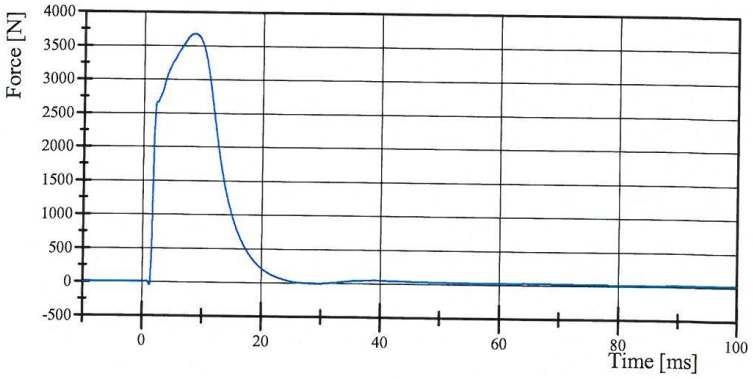
Filter Class: CFC_180
Max: 0.6 gn at 0.2 ms
Min: -44.0 gn at 8.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 41.1 gn at 8.6 ms
Min: -14.6 gn at 23.0 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,672.2 N at 8.5 ms
Min: -55.8 N at 1.2 ms

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

10.19.2012 17:00:25 438

Transportation Research Center Inc.

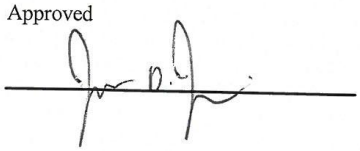
Left Lateral Iliac
SID IIs Serial No. 033 Certification No. 14-2
Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.40 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-40.5 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	30.2 g	Yes
Iliac Force	4,100 - 5,100 N	4,526.7 N	Yes

Test meets specifications.

Comments:

Technician 

Approved 

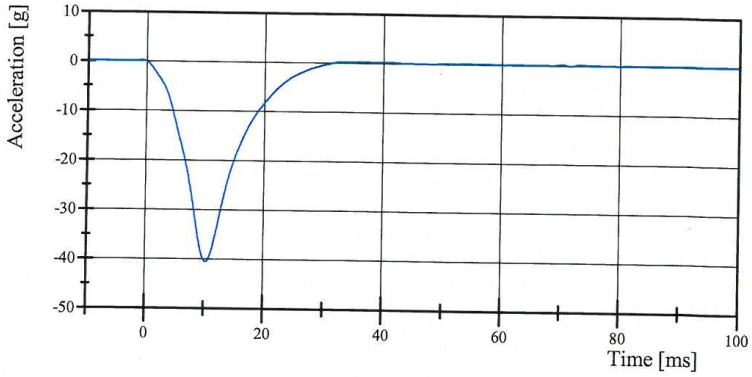
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.20.2012 07:22:37 641

Transportation Research Center Inc.

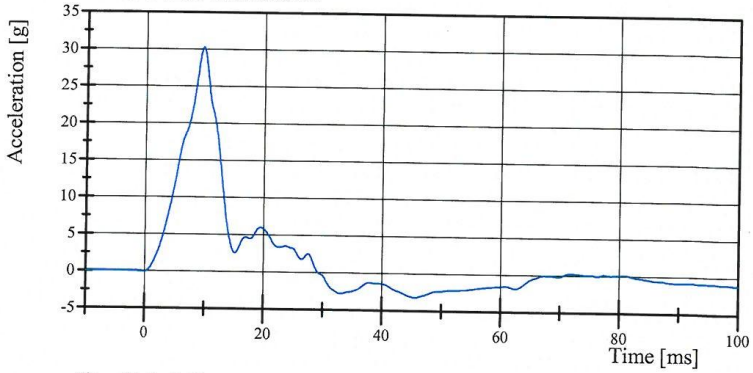
Left Lateral Iliac
SID IIs Serial No. 033 Certification No. 14-2
Test Date: 10/20/2012

Probe Acceleration



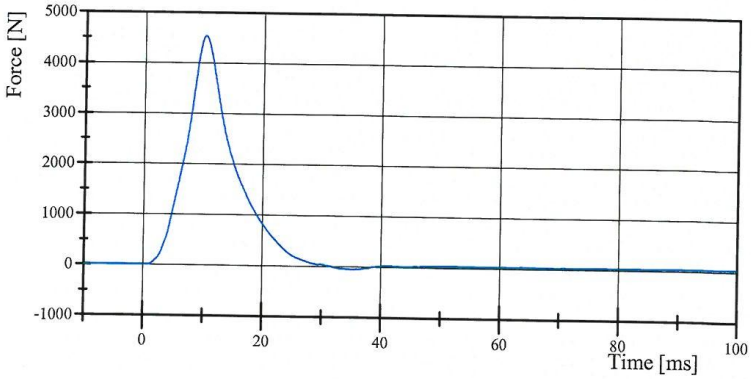
Filter Class: CFC_180
Max: 0.2 gn at 36.7 ms
Min: -40.5 gn at 10.3 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 30.2 gn at 9.7 ms
Min: -3.2 gn at 45.6 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,526.7 N at 10.2 ms
Min: -50.2 N at 35.0 ms

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

10.20.2012 07:22:46 641

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 033		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers			X	J32214	Endevco	1-Oct-12
			Y	J27040	Endevco	1-Oct-12
			Z	AGAC4	Endevco	1-Oct-12
Displacement Potentiometers	Shoulder		Y	NA	NA	NA
	Thoracic Rib	Upper	Y	592	Servo	16-Nov-11
		Middle	Y	213	Servo	16-Nov-11
		Lower	Y	714	Servo	16-Nov-11
	Abdominal Rib	Upper	Y	918	Servo	16-Nov-11
		Lower	Y	904	Servo	16-Nov-11
Lower Spine Accelerometers (T12)			X	00L13-F05	Entran	1-Oct-12
			Y	P63998	Endevco	1-Oct-12
			Z	04J04I20-A17	Entran	1-Oct-12
Acetabulum Load Cell			Y	235-FY	FTSS	2-Oct-12
Iliac Wing Load Cell			Y	113-FY	FTSS	2-Oct-12
Pelvis Plug (struck side)				36485	FTSS	
Pelvis Plug (non-struck side)				36463	FTSS	

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P74484	Endevco	24-Jul-12
Vehicle Center of Gravity	Y	P73581	Endevco	17-Aug-12
Vehicle Center of Gravity	Z	P75536	Endevco	7-Aug-12
Left Floor Sill	Y	P76395	Endevco	10-Oct-12
A-Pillar Sill	Y	P74084	Endevco	1-May-12
A-Pillar Low	Y	P74811	Endevco	27-Jun-12
A-Pillar Mid	Y	P74521	Endevco	17-Aug-12
B-Pillar Sill	Y	P75567	Endevco	13-Sep-12
B-Pillar Low	Y	P75244	Endevco	10-Oct-12
B-Pillar Mid	Y	P75242	Endevco	10-Oct-12
Driver Seat	Y	P74431	Endevco	30-Apr-12
Engine Top	X	P76398	Endevco	10-Oct-12
Engine Top	Y	P74457	Endevco	5-Sep-12
Firewall	Y	P74796	Endevco	13-Jun-12
Right Roof	Y	P74519	Endevco	17-Aug-12
Right Floor Sill	Y	P74438	Endevco	27-Jul-12
Rear Floor Pan	X	P74518	Endevco	19-Jul-12
Rear Floor Pan	Y	P75718	Endevco	14-Sep-12

TABLE 3 – Pole Instrumentation

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