FINAL REPORT NUMBER: SINCAP-TRC-14-007

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

Toyota Motor Manufacturing, Texas, Inc.
2014 Toyota Tundra Double Cab
NHTSA NUMBER: M20145120

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

Report Date: April 30, 2014

FINAL REPORT

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

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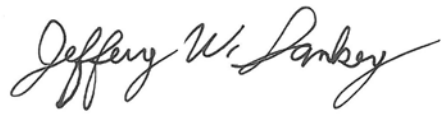
Report Prepared By: ILO Project Operations Group

Report Approved By: 

Jeffery W. Sankey, Manager, Project Operations

Approval Date: April 30, 2014

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:_____

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

Date:_____

Technical Report Documentation Page

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15. Supplemental Notes		

16. Abstract

This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2014 Toyota Tundra Double Cab in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on February 6, 2014.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.17 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22° C. The target vehicle post-test maximum crush was 168 mm at Level 1. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	N/A	1000	20
Maximum Thoracic Rib Deflection	mm	44	16.6
Total Abdominal Force	N	2500	445.6
Pubic Symphysis Force	N	6000	-506.7

Passenger ATD (SID-IIs)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	N/A	1000	49
Lower Spine Resultant Acceleration	g's	82	18.0
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2092.8
Maximum Thoracic Rib Deflection	mm	38*	3.6
Maximum Abdominal Rib Deflection	mm	45*	9.8

* Proposed IARV

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

17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

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TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

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

SECTION 2

SUMMARY OF TEST RESULTS

A 2014 Toyota Tundra Double Cab was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.17 km/h (38.63 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on February 6, 2014. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated September 2013. The side impact event was documented by 11 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)
Primary and redundant head CG tri-axial accelerometers
Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
Abdomen forward, middle, and rear y-axis load cells
Lower spine (T12) tri-axial accelerometers
Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)
Primary and redundant head CG triaxial accelerometers
Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
Abdomen upper rib and lower rib y-axis displacement potentiometers
Lower spine (T12) tri-axial accelerometers
Acetabulum and iliac wing y-axis load cells

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	20
Maximum Thoracic Rib Deflection	mm	44	16.6
Combined Abdominal Force	N	2500	445.6
Pubic Symphysis Force	N	6000	-506.7

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	49
Lower Spine (T12) Resultant Acceleration	G	82	18.0
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2092.8
Maximum Thoracic Rib Deflection	mm	38*	3.6
Maximum Abdominal Rib Deflection	mm	45*	9.8

* Proposed IARV

Supplemental Restraint Information is given below:

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

GENERAL COMMENTS

All doors remained closed throughout the test. No fuel spillage occurred during the impact or the static rollover test which followed. Injury values for both ATDs were within the established performance thresholds. The restraint system performed as expected. Right rear tire dismounted from rim during impact.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20145120
Model Year	2014
Make	Toyota
Model	Tundra
Body Style	Pickup/Double Cab
VIN	5TFRM5F10EX070248
Body Color	Blue
Odometer Reading (km/mi)	41 mi
Engine Displacement (L)	4.6
Type/No. Cylinders	Gas/8
Engine Placement	Front/Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufacturing, Texas Inc.
Date of Manufacture	09/13
Vehicle Type	Truck

GVWR (kg)	3035
GAWR Front (kg)	1765
GAWR Rear (kg)	1810

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity DSC)	3	3	N/A	6
Capacity Weight (VCW) (kg)				632
DSC x 68.04 (kg)				408.2
Cargo Weight (RCLW) (kg)				136.0[1]

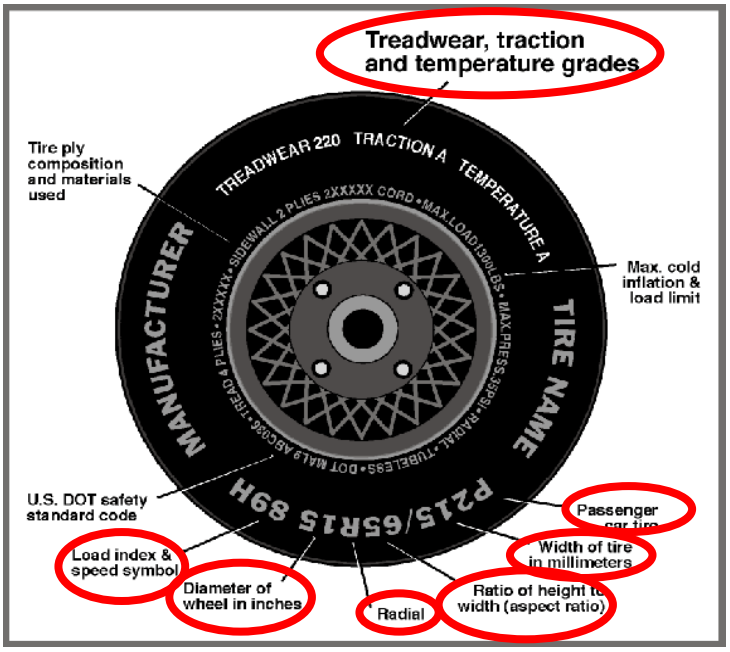
VEHICLE SEAT TYPE

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

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

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

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	210	230
Recommended Tire Size	P255/70R18	P255/70R18
Tire Size on Vehicle	P255/70R18	P255/70R18
Tire Manufacturer	Michelin	Michelin
Tire Model	LTX M/S^2	LTX M/S^2
Treadwear	720	720
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	112T	112T
Tire Material	Polyester, Polyemide & Steel	Polyester, Polyemide & Steel
DOT Safety Code Left	APYU 003X 3513	APYU 003X 3513
DOT Safety Code Right	APYU 003X 3513	APYU 003X 3513

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

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	221	221	248	248
Tire Placard	kPa	210	210	230	230
Owner's Manual	kPa	N/A	N/A	N/A	N/A
As Tested	kPa	210	210	230	230

MDB TIRE SPECIFICATIONS

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	677.4	507.8		740.2	593.4		733.2	615.2	
Right	kg	642.4	480.6		660.8	568.2		652.2	572.2	
Ratio	%	57.2	42.8		54.7	45.3		53.8	46.2	
Totals	kg	1319.8	988.4	2308.2	1401	1161.6	2562.6	1385.4	1187.4	2572.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2308.2	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2569.2	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? ☒ YES ☐ NO

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement
LF	mm	928	922	Yes
RF	mm	935	929	Yes
RR	mm	988	989	Yes
LR	mm	975	984	Yes
Vehicle CG (Aft of Front Axle)	mm	1708	1677	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+42	+35	

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: 132lbs plate on bed floor	59.9
Removed: None	

DATA SHEET NO. 2

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

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	N/A	N/A	14.9
Front Passenger Seat	N/A	N/A	14.9
Front Center Seat*	N/A	N/A	12.4
Struck Side Rear Seat	N/A	N/A	16.2
Non-Struck Side Rear Seat	N/A	N/A	15.6
Rear Center Seat*	N/A	N/A	15.7

* 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	14.9	323	Max	N/A	N/A	N/A
			Mid	321	323	325
			Min	N/A	N/A	N/A
Front Passenger Seat	14.9	328	Max	N/A	N/A	N/A
			Mid	326	328	329
			Min	N/A	N/A	N/A
Front Center Seat*	12.4	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	16.2	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	15.6	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	15.7	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

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

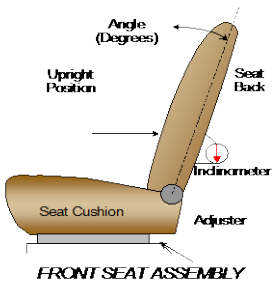
Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

SEAT FORE/AFT POSITION

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

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated seat back angle. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck side rear seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	56.5	29	3.9	7
Front Passenger Seat	56.4	29	3.7	7
Front Center Seat*	14.0	8	8.8	0
Struck Side Rear Seat w/ Seated Dummy	Fixed	N/A	13.5	N/A
Non-Struck Side Rear Seat	Fixed	N/A	13.5	N/A
Rear Center Seat*	Fixed	N/A	21.4	N/A

SEAT BELT ANCHORAGE ADJUSTMENT

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

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

HEAD RESTRAINT ADJUSTMENT

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

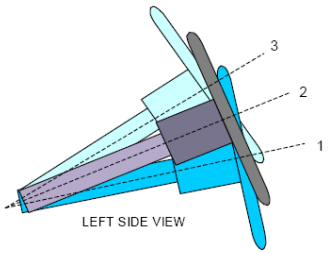
	Total # of Positions	Placed in Position #
Driver Seat	3, Numbered from 0 to 2	0, Uppermost
Rear Seat	1	1, Fixed

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

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

STEERING COLUMN ADJUSTMENT

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

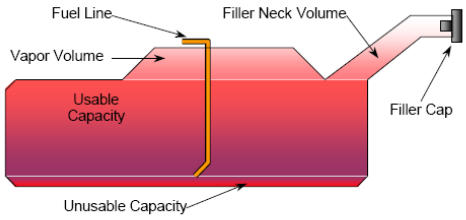


STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	24.5	Fixed
Geometric Center, Position No. 2	27.6	Fixed
Uppermost, Position No. 3	30.6	Fixed
Telescoping Steering Wheel Travel		Fixed
Test Position	27.6	Fixed

FUEL PUMP

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



VEHICLE FUEL TANK ASSEMBLY

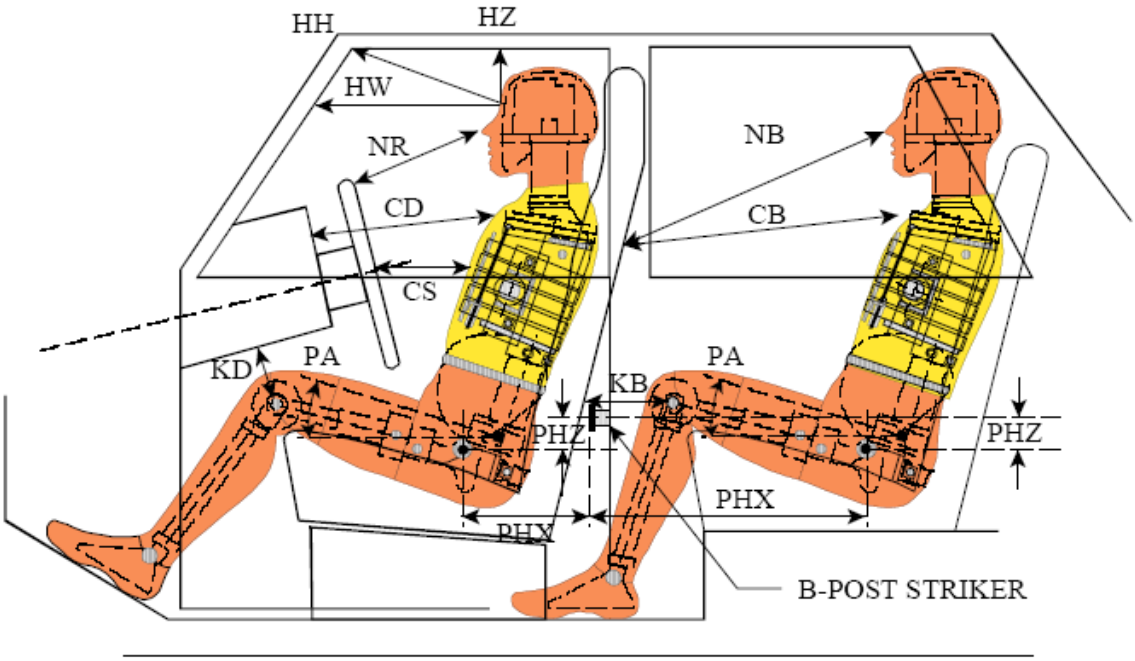
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	99.9
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	100.0
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	92.9
Actual Amount of Solvent Used in Test	92.9
1/3 of Usable Capacity	33.3

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



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

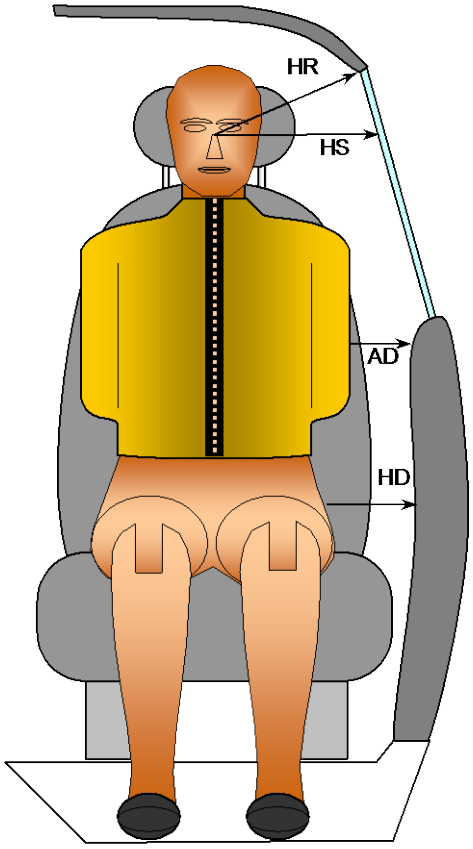
LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	518			
HW		Header to Windshield	701			
HZ	HZ	Head to Roof Liner	189		283	
NR	NB	Nose to Rim/Seat Back	517		506	
CD	CB	Chest to Dash/Seat Back	624		495	
CS		Chest to Steering Wheel	343			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	176	35.5	243	20.0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	186	31.0	245	20.0
PAX°	PAX°	Pelvic Tilt Angle X		0.7		0.1
	PAY°	Pelvic Tilt Angle Y				19.6
PHX	PHX	Hip Point to Striker (X-Axis)	232		230	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	135		94	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



FRONT VIEW OF DUMMY

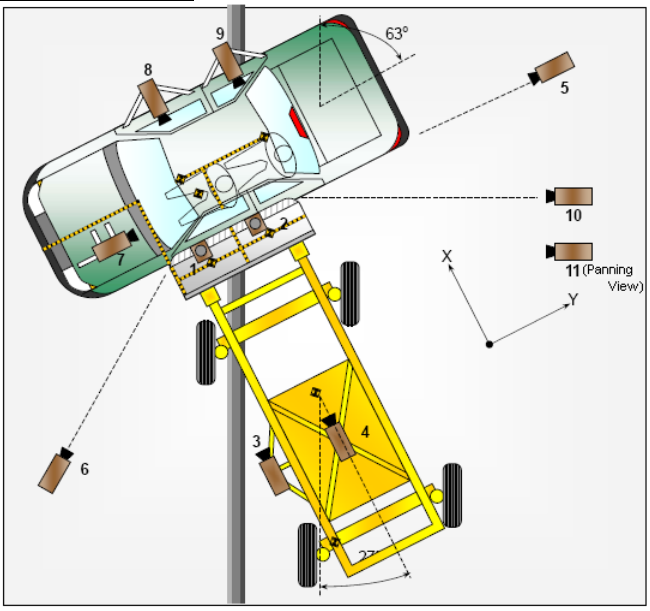
Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	246	276
HS	Head to Side Window[1]	mm	357	340
AD	Arm to Door	mm	108	164
HD	H-Point to Door	mm	182	180

[1] Actual measurement was to the door trim not side window.

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	950	-5716	8.5	1000
2	Overhead Close-up	0	1330	-5716	25	1000
3	Left Impact Point (MDB)	-1755	-860	-825	25	1000
4	Side Overall (MDB)	-2434	0	1445	8.5	1000
5	Rear	325	8351	-1310	Zoom	1000
6	Left Front	-3308	-4582	-1352	16	1000
7	Driver Front (OB)				12.5	1000
8	Driver Side (OB)				8.5	1000
9	Passenger Side (OB)				8.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

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

*All measurements accurate to ± 6 mm.

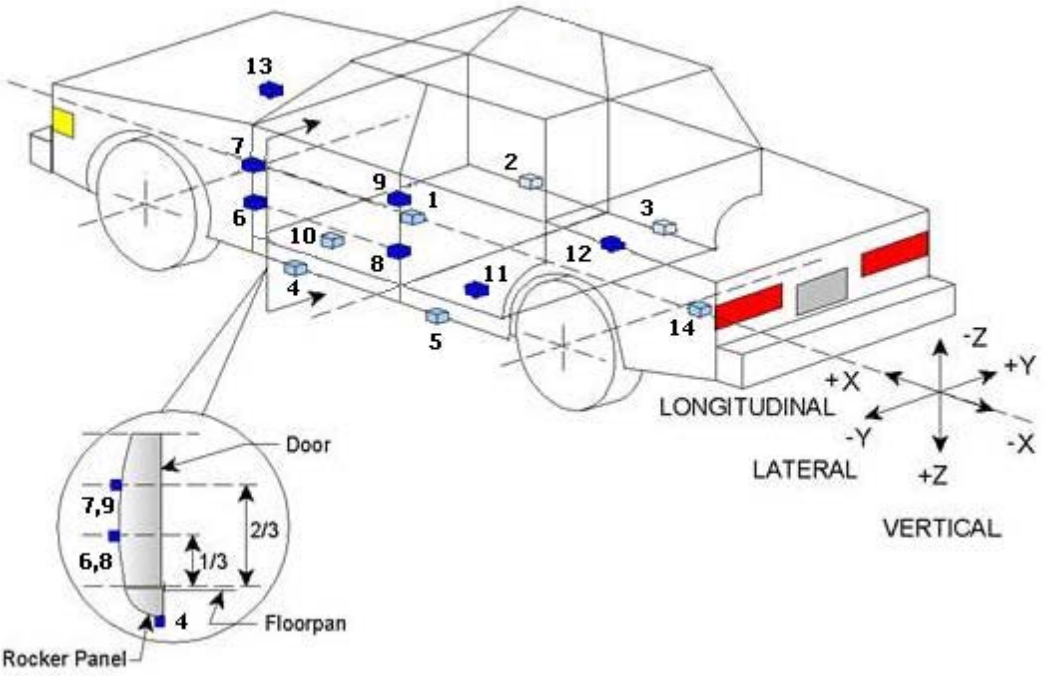
If applicable, explain why camera(s) did not operate as intended:

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



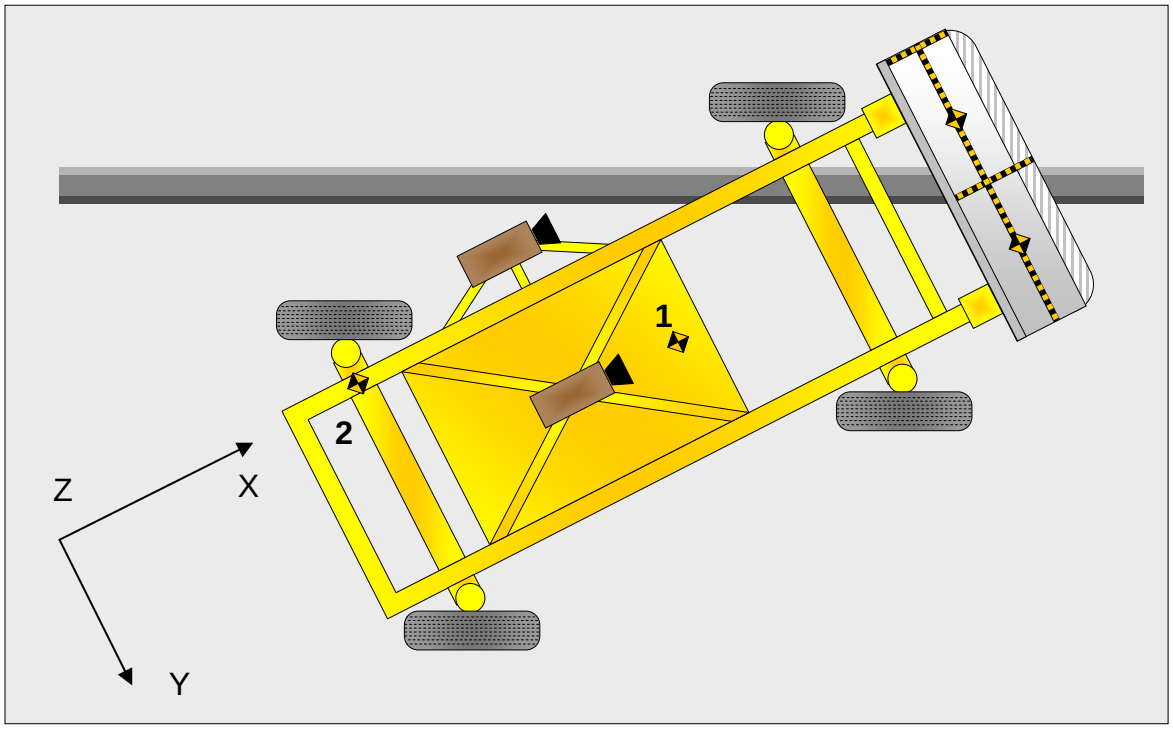
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	4045	0	-753
2	Right Sill at Front Seat	3970	805	-522
3	Right Sill at Rear Seat	2883	805	-528
4	Left Sill at Front Door	3952	-805	-513
5	Left Sill at Rear Door	2862	-805	-531
6	A-Post Lower	4330	-915	-718
7	A-Post Middle	4340	-910	-1155
8	B-Post Lower	3187	-920	-660
9	B-Post Middle	3165	-910	-1215
10	Front Seat Track	3481	-660	-550
11	Rear Seat Structure	2783	-570	-533
12	Right Rear Occ. Compartment	2785	565	-678
13	Engine Block	5023	-15	-1108
14	Rear Above Axle	1000	0	-810

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

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



MDB ACCELEROMETER LOCATIONS

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

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB	SCAB
Top of Head	Headliner	SCAB
Left Side of Head	SCAB	SCAB
Back of Head	N/A	N/A
Left Shoulder	SCAB	SCAB
Upper Torso	Seat Side Bolster	N/A
Lower Torso	Seat Side Bolster	Door Panel
Left Hip	Seat Side Bolster, Seat Belt	Door Panel, Seat Cushion
Left Knee	Door Panel, Knee Airbag	Door Panel

POST TEST DOOR PERFORMANCE

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

POST TEST SEAT PERFORMANCE

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

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Major Deformation
Sill Separation	None Visible
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	Right rear tire separated from rim

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3700
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		508
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	0
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-3

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2591
C.G. Location aft of Front Axle	1105.4

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	429.6	253.0	682.6
Right	kg	354.6	330.6	685.2
Ratio	%	57.3	42.7	100
Totals	kg	784.2	583.6	1367.8

SPEED AND IMPACT ANGLE DATA

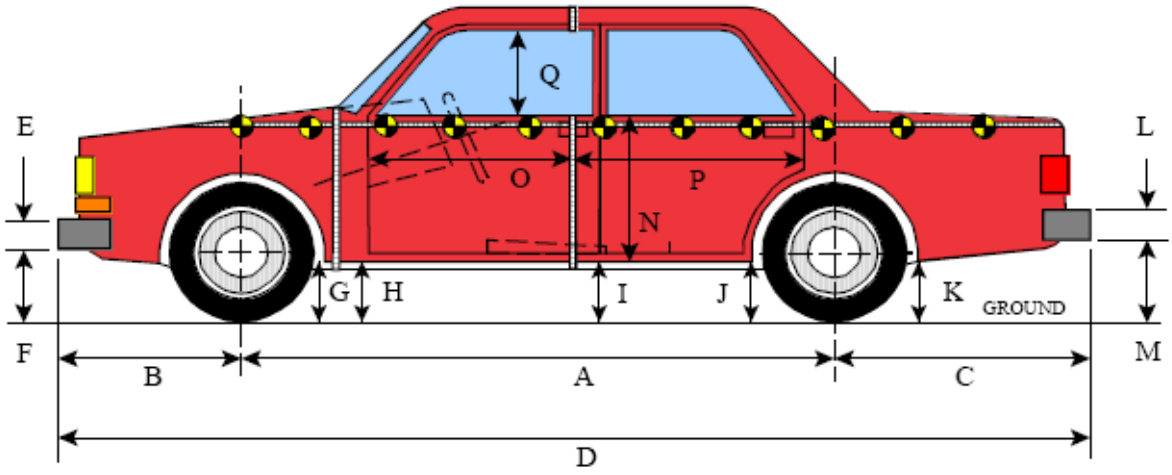
Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.17
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.16
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	-155
B	Top of Bumper	533	700	Left	-151
C	Mid-Level	686	200	Right	-154
D	Top of Stack	813	800	Right	-188

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



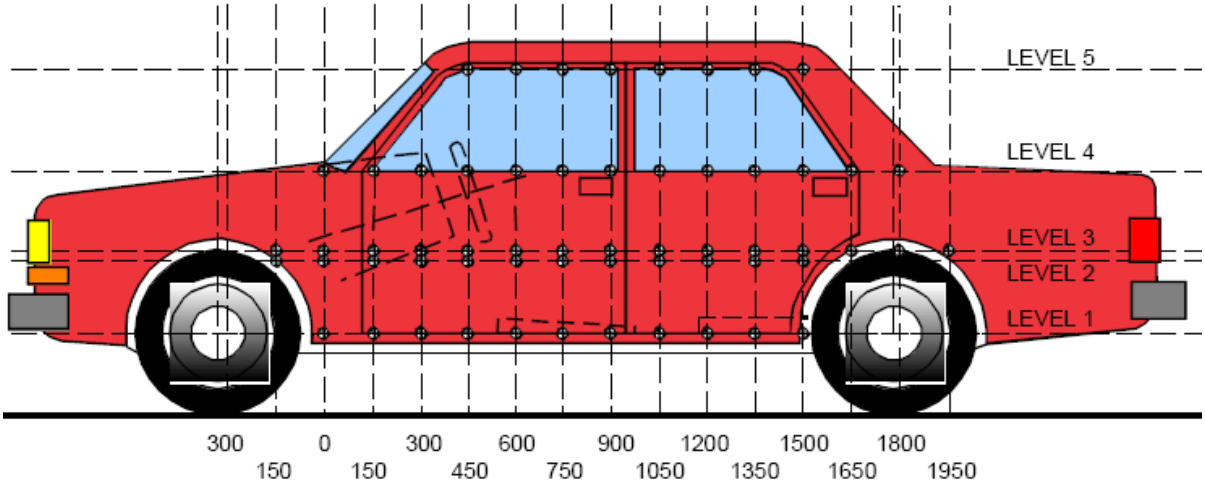
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3700	3700	0
B	Front Axle to Front Surface of Vehicle	890	900	-10
C	Rear Axle to Rear Surface of Vehicle	1210	1205	5
D	Total Length at Centerline	5800	5805	-5
E	Front Bumper Thickness	258	258	0
F	Front Bumper Bottom to Ground	410	414	-4
G	Sill Height at Front Wheel Well	395	398	-3
H	Sill Height at Front Door Leading Edge	398	404	-6
I	Sill Height at B-Pillar	434	470	-36
J1	Sill Height at Rear Wheel Well	440	467	-27
J2	Pinch Weld Height at Rear Wheel Well	400	422	-22
K	Sill Height Aft of Rear Wheel Well	448	487	-39
L	Rear Bumper Thickness	215	215	0
M	Rear Bumper Bottom to Ground	497	540	-43
N	Sill Height to Window Bottom Sill	930	900	30
O	Front Door Leading Edge to Impact CL	811	805	6
P	Rear Door Trailing Edge to Impact CL	1237	1217	20
Q	Front Window Opening	480	475	5
R	Right Side Length	5720	5728	-8
S	Left Side Length	5720	5715	5
T	Vehicle Width at B Pillar	2030	2030	0

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	523	168	1800
2	Driver Hip Point	950	146	1650
3	Mid-Door	867	133	1650
4	Window Sill	1275	26	1200
5	Window Top	1863	1	900

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

DATA SHEET NO. 11 (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

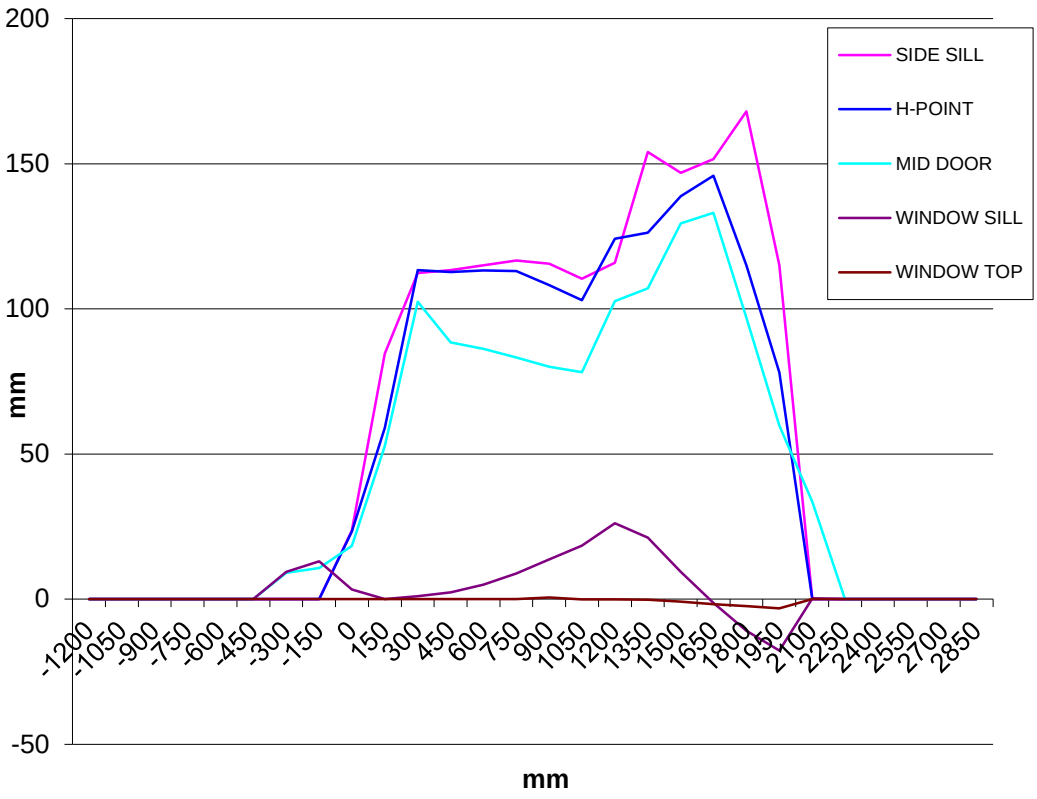
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	0	1018	886	0	0	0	1009	876	0	0	0	9	10	0
-150	0	0	1018	903	0	0	0	1008	890	0	0	0	10	13	0
0	992	1019	1015	916	0	969	996	997	913	0	23	23	18	3	0
150	981	1010	1010	925	0	896	951	958	925	0	85	59	52	0	0
300	967	1003	1010	933	0	855	889	908	932	0	112	114	102	1	0
450	969	1003	1012	940	0	855	890	923	937	0	114	113	89	3	0
600	969	1004	1013	945	0	854	891	927	940	0	115	113	86	5	0
750	970	1004	1014	951	0	853	891	931	942	0	117	113	83	9	0
900	970	1005	1015	956	677	854	897	935	942	676	116	108	80	14	1
1050	969	1006	1015	961	692	859	903	937	942	692	110	103	78	19	0
1200	968	1006	1015	965	700	853	882	912	939	700	115	124	103	26	0
1350	967	1006	1015	966	703	813	879	908	945	703	154	127	107	21	0
1500	966	1005	1014	968	704	819	866	885	959	704	147	139	129	9	0
1650	964	1004	1013	970	701	812	858	880	972	703	152	146	133	-2	-2
1800	962	1003	1012	971	694	794	888	915	982	696	168	115	97	-11	-2
1950	959	1002	1011	970	677	844	924	951	988	681	115	78	60	-18	-4
2100	950	998	1007	967	0	928	952	973	967	0	22	46	34	0	0
2250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2550	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

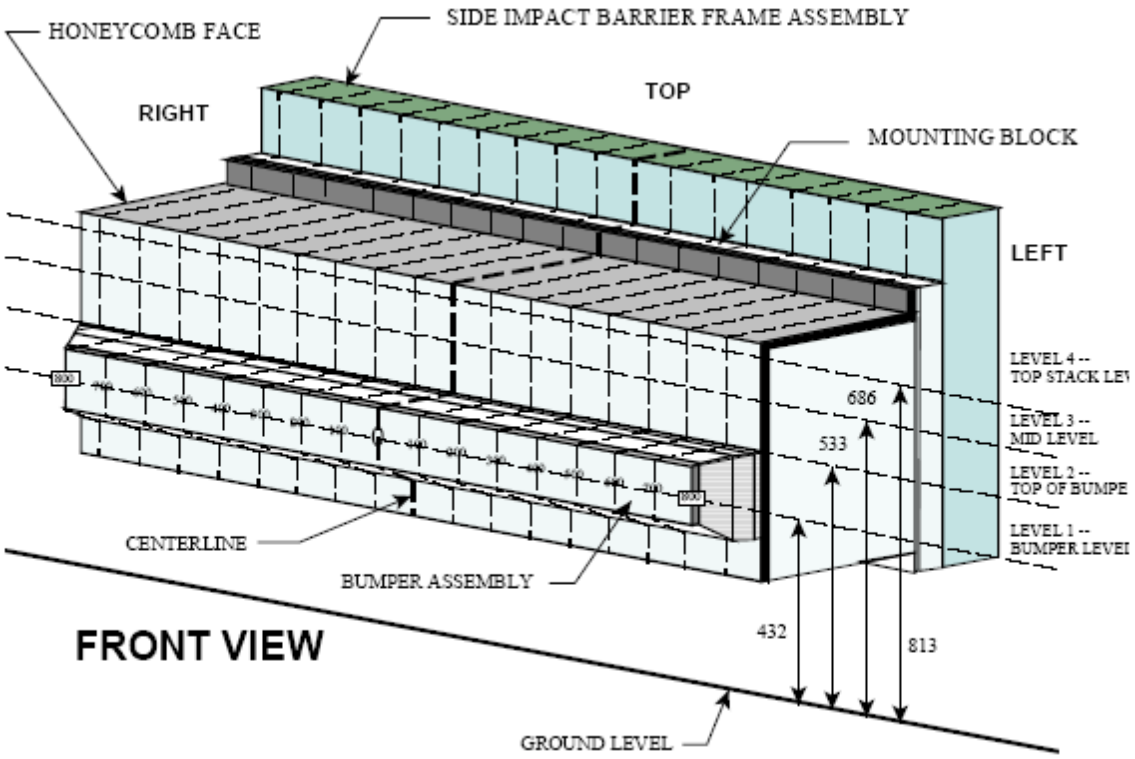
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	188	167	149	135	125	116	136	156	150	143	138	134	133	134	140	153	169
2	129	102	89	84	100	125	154	137	126	108	96	90	88	90	95	105	126
3	128	131	132	132	134	132	134	137	136	140	142	147	150	150	150	151	149
4	126	124	126	127	129	130	132	133	135	136	137	139	141	142	145	150	155

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

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14

Test Time: 14:56 **Temperature:** 22.2°C

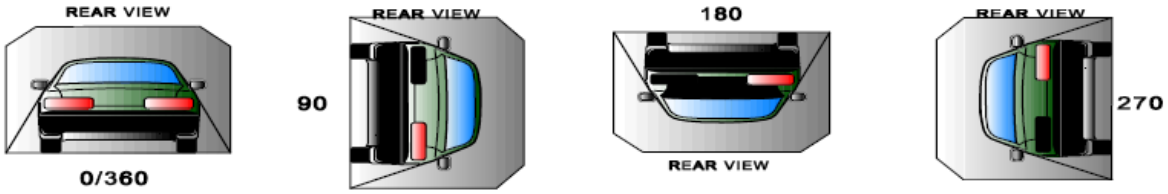
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

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

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	90	330	420
90 to 180	90	330	840
180 to 270	90	330	1260
270 to 360	90	330	1680

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

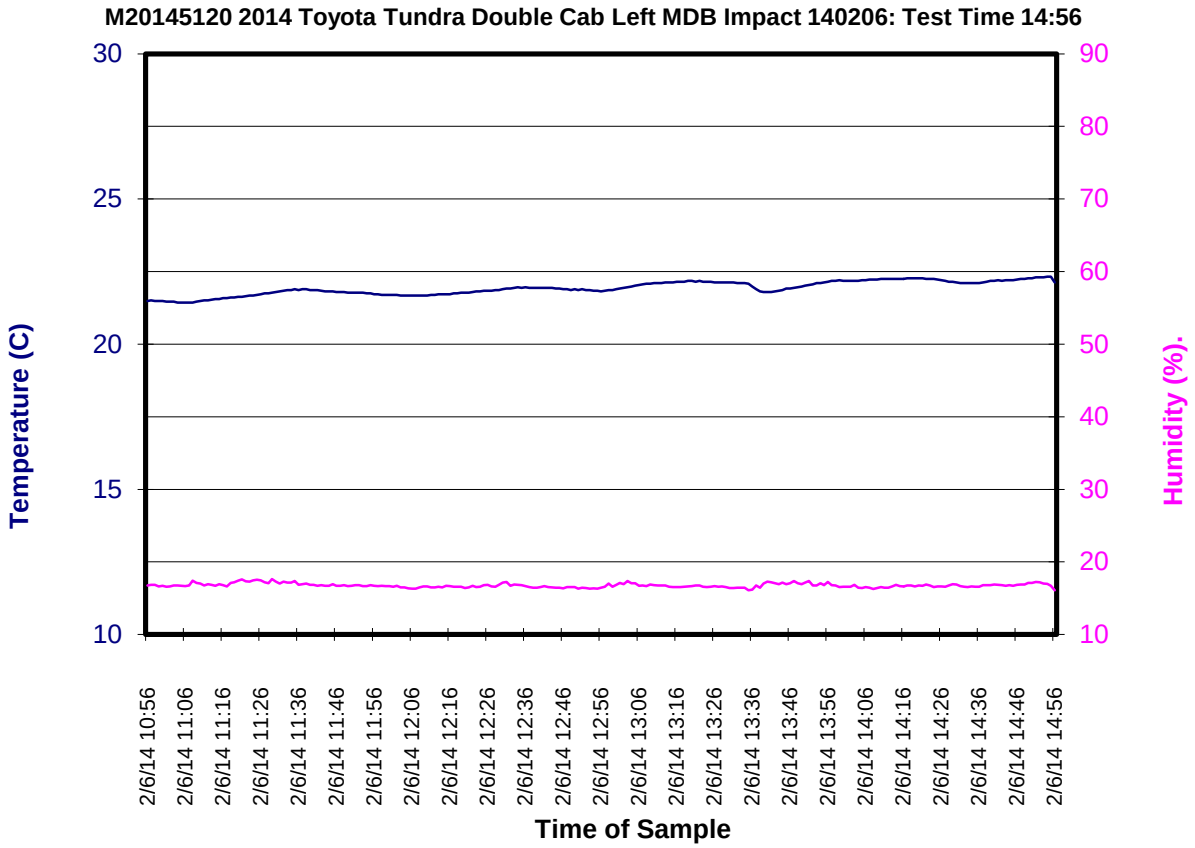
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 14
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2014 Toyota Tundra Double Cab NHTSA No.: M20145120
Test Program: NCAP Side Impact Test Date: 2/6/14



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

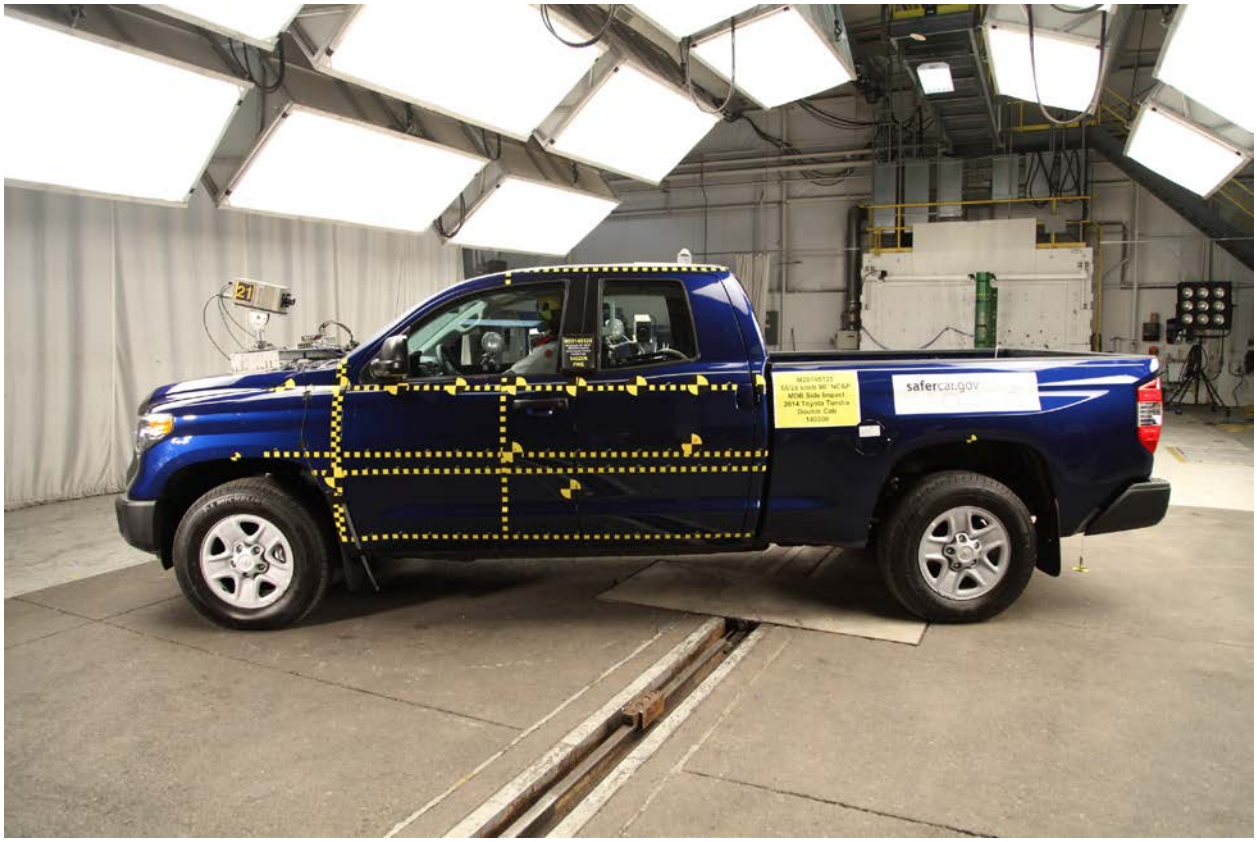
002 As-Delivered Left Rear ¾ View of Test Vehicle

003 Pre-Test Front View of Test Vehicle

004 Post-Test Front View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

006 Post-Test Left Front ¾ 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 ¾ View of Test Vehicle

010 Post-Test Left Rear ¾ View of Test Vehicle

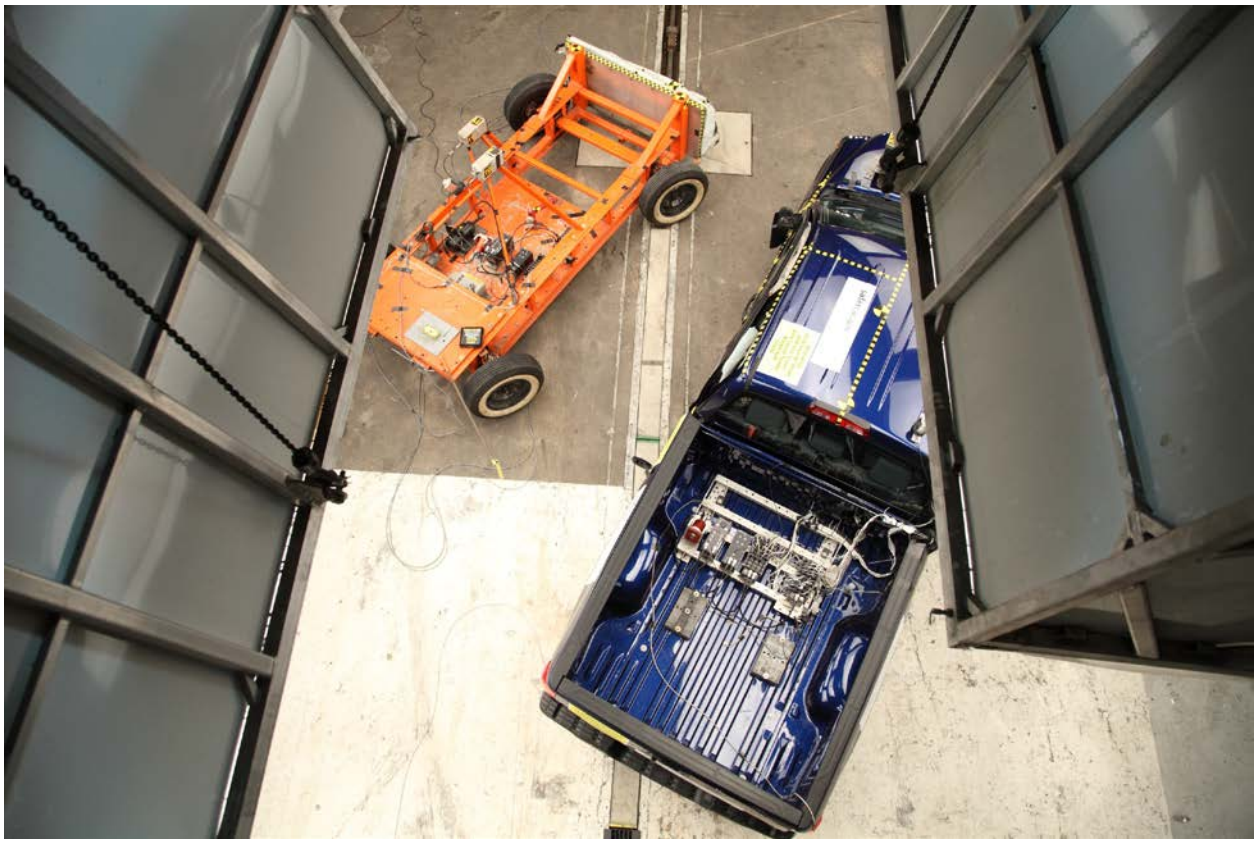
011 Pre-Test Rear View of Test Vehicle

012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle

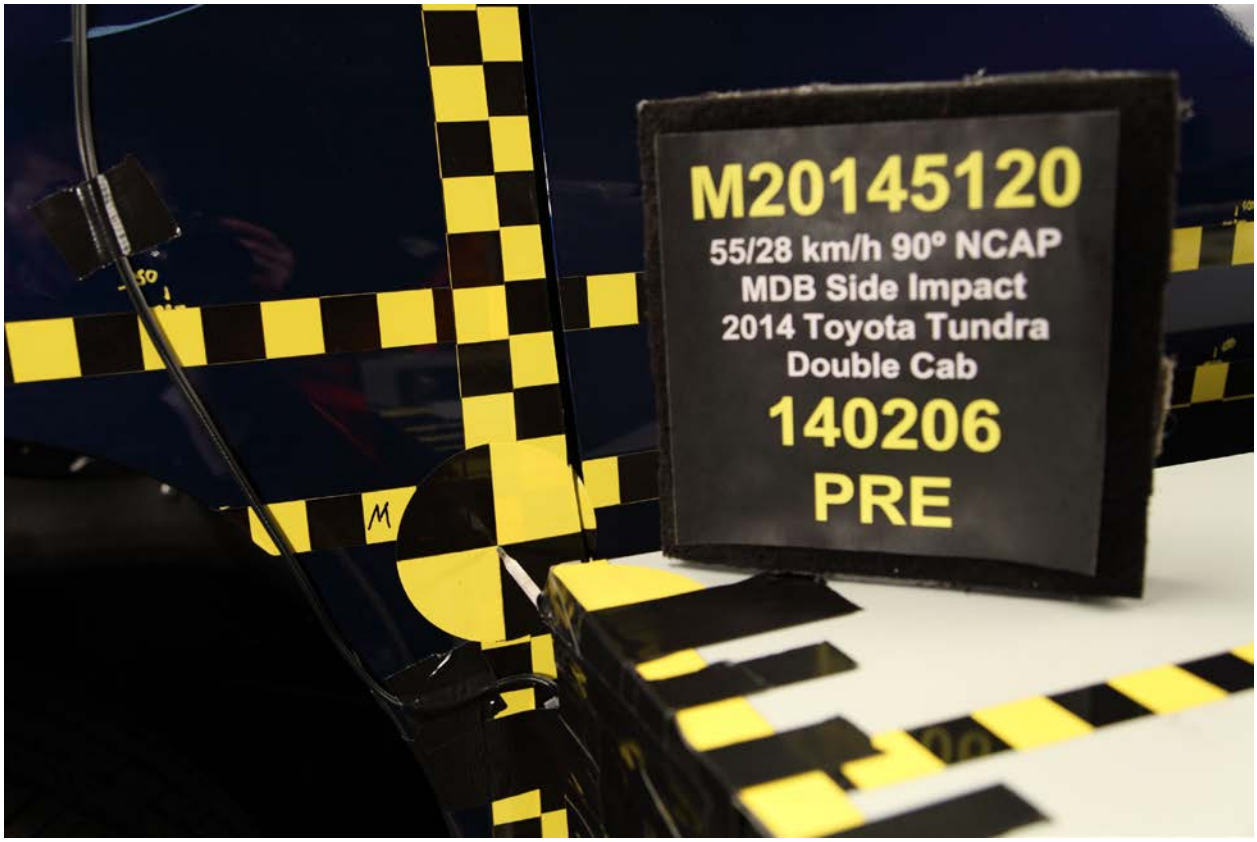
015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

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

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



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

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

021 Pre-Test Left Front Door Latch Close-up

022 Post-Test Left Front Door Latch Close-up

023 Pre-Test Left Rear Door Latch Close-up

024 Post-Test Left Rear Door Latch Close-up

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

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

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

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

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

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

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

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

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

034 Pre-Test Placement of Driver Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy

036 Pre-Test Left Side View of Steering Wheel

037 View of Disengaged Parking Brake

038 Pre-Test View of Parking Brake

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

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

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

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View

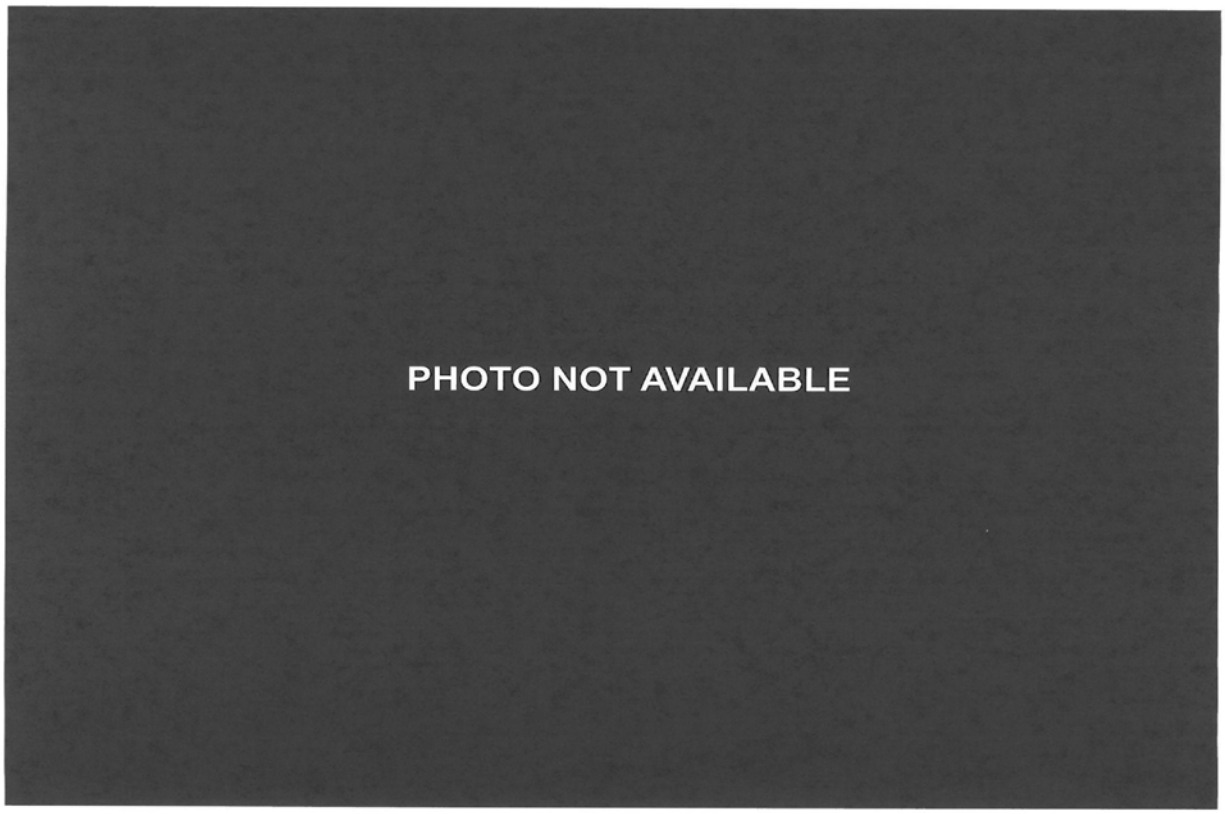
044 Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

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

046 Pre-Test Driver Inner Door Panel View

047 Post-Test Driver Inner Door Panel View

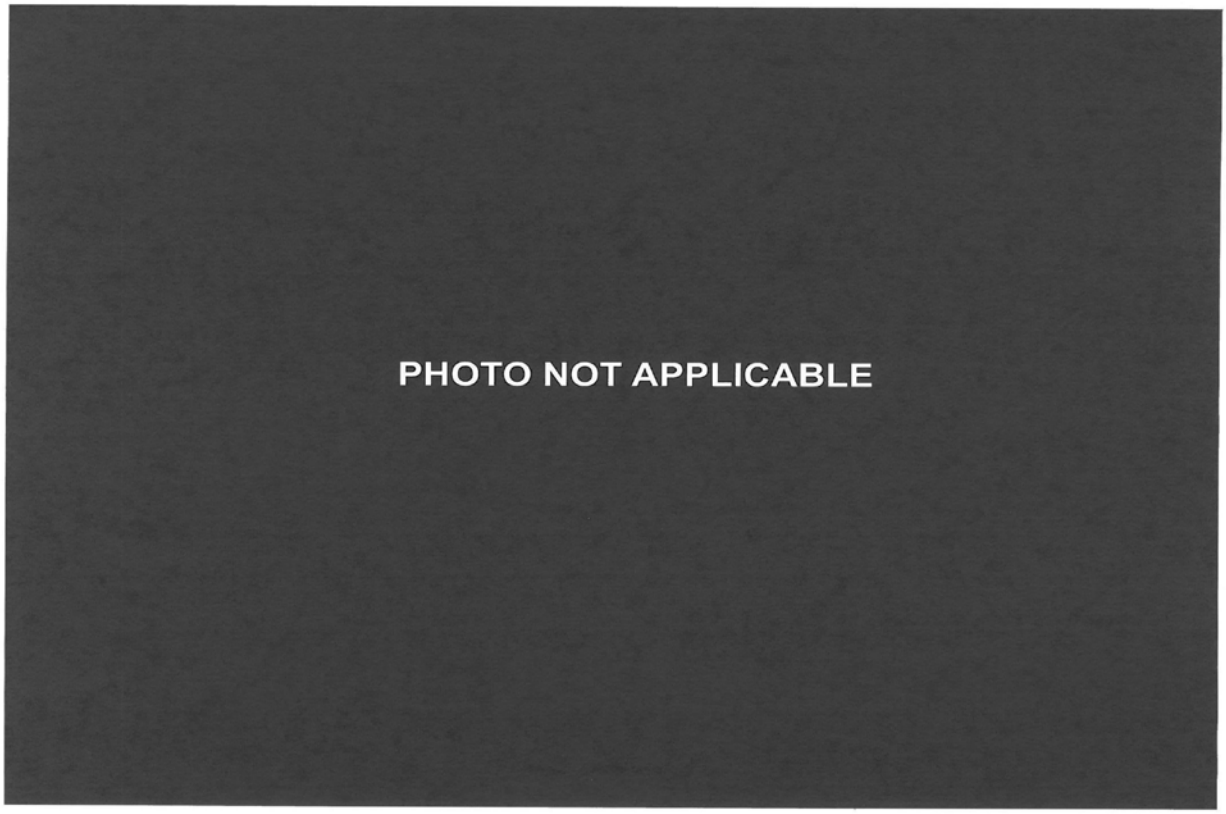
048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View



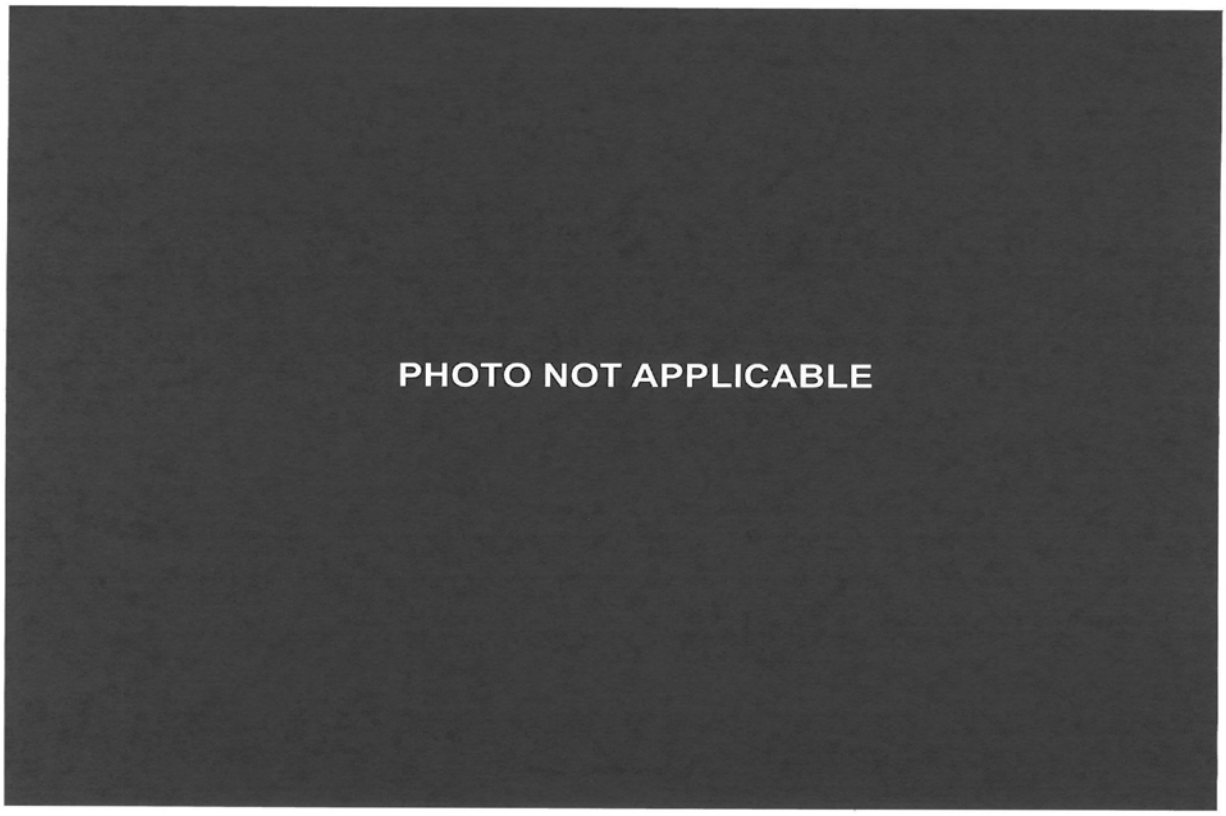
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

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

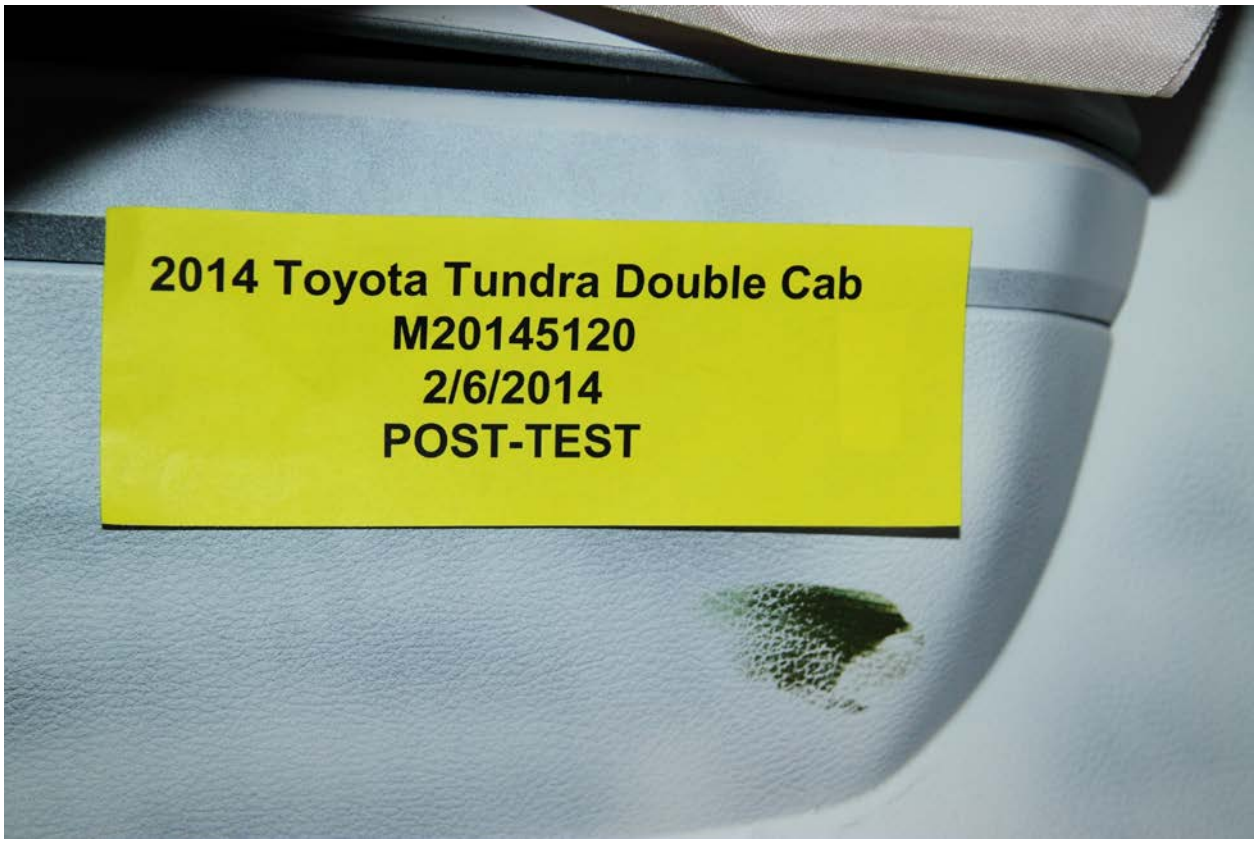
051 Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



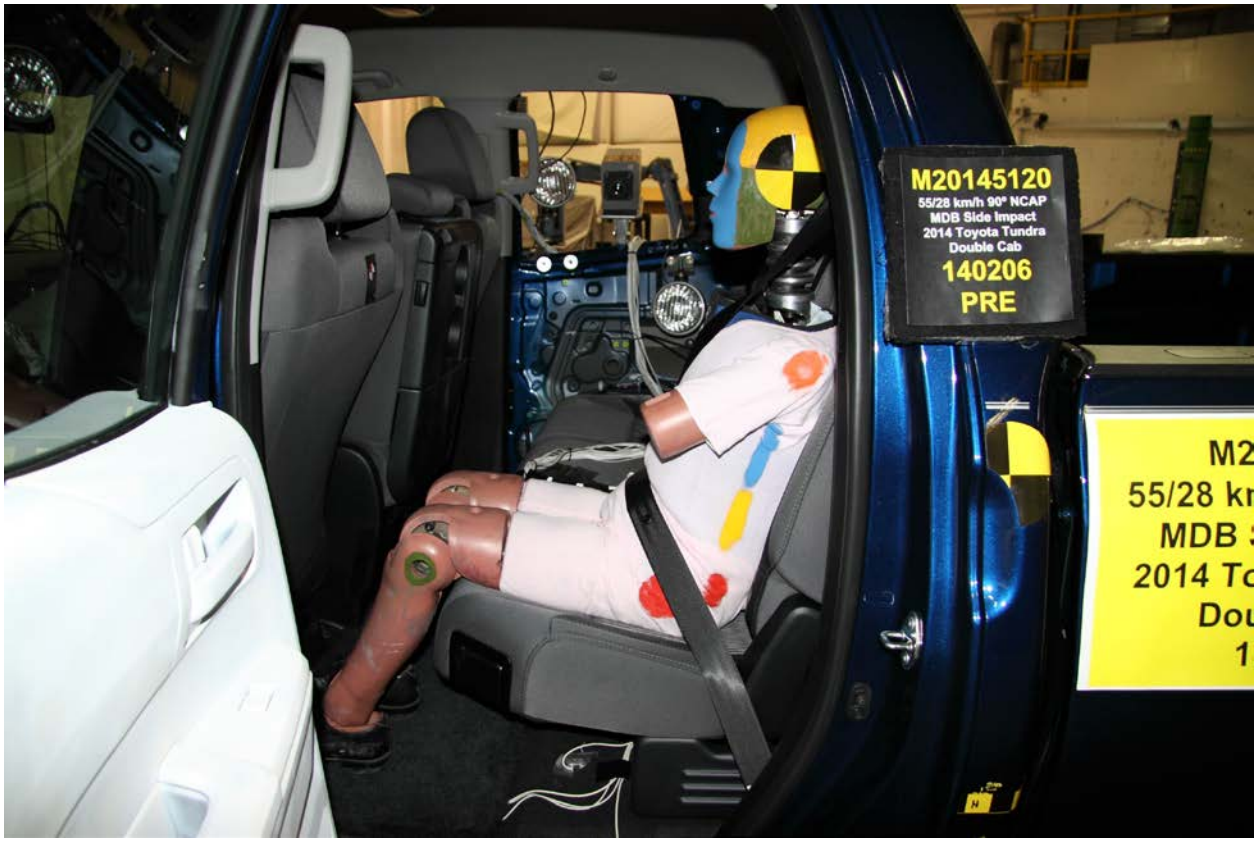
052 Post-Test Driver Dummy Close-Up Pelvis Contact View



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



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

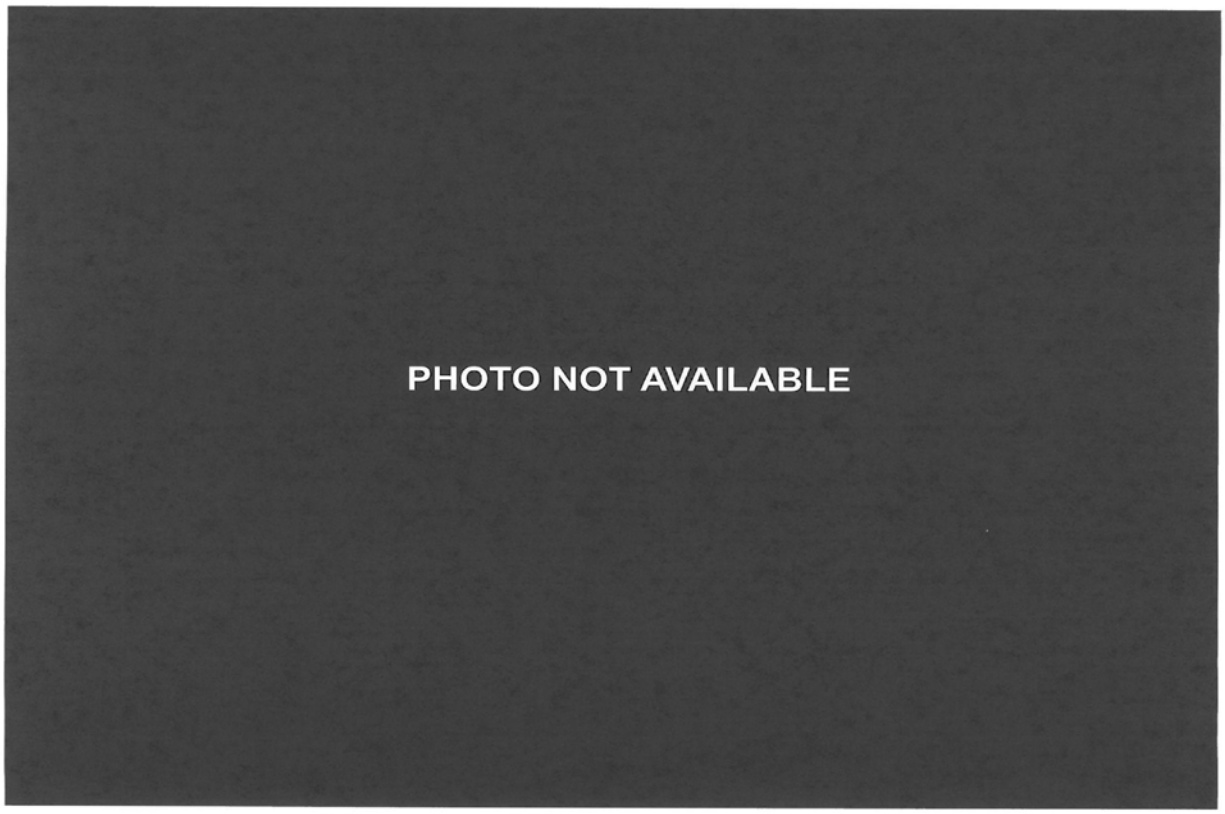


055 Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking

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

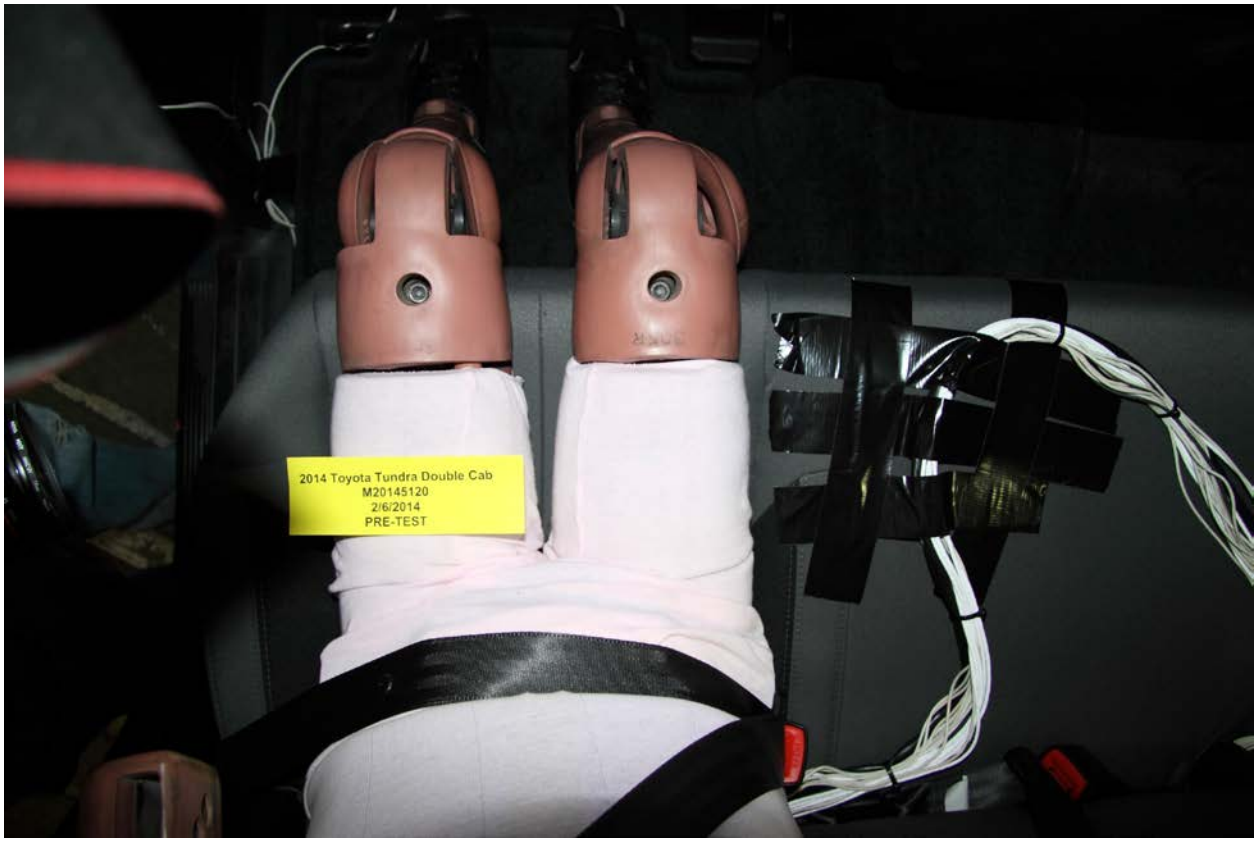
057 Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View

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



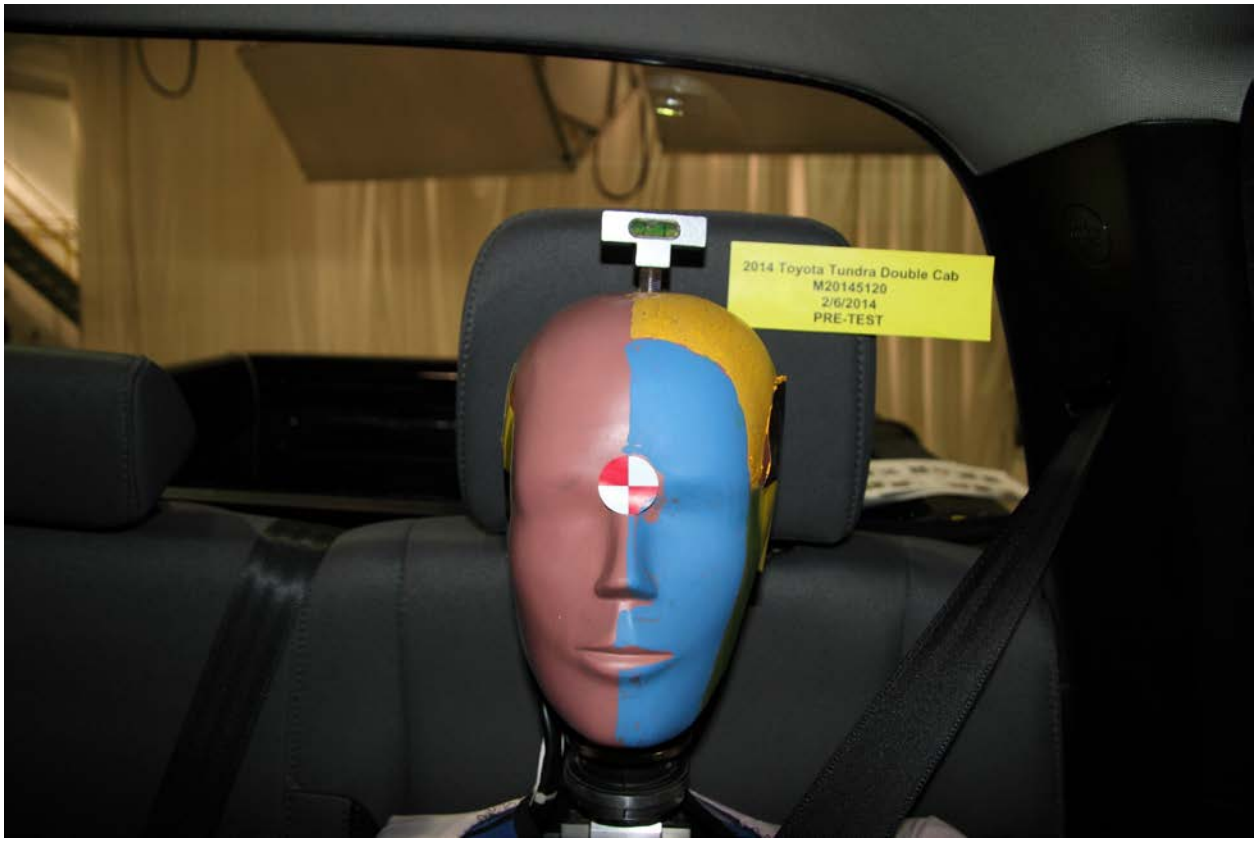
059 Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

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

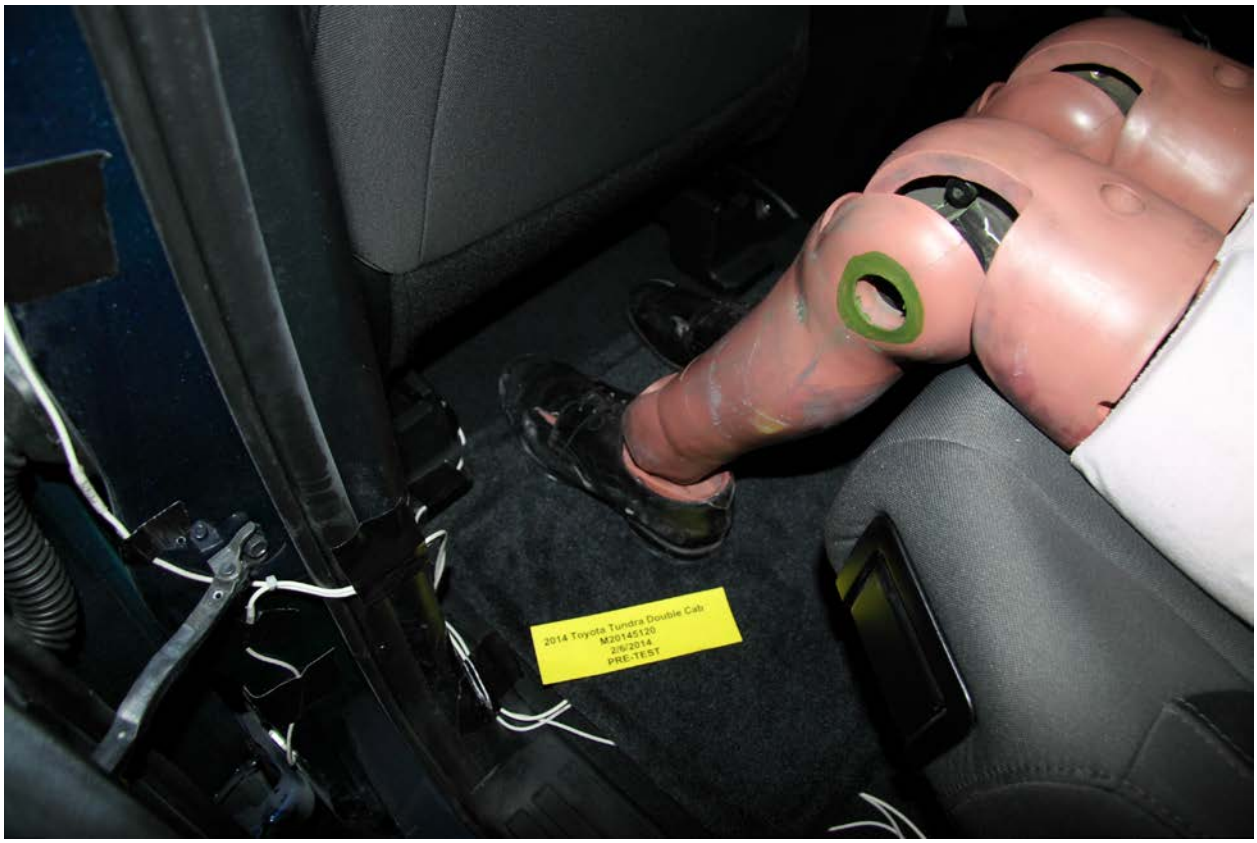


061 Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

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



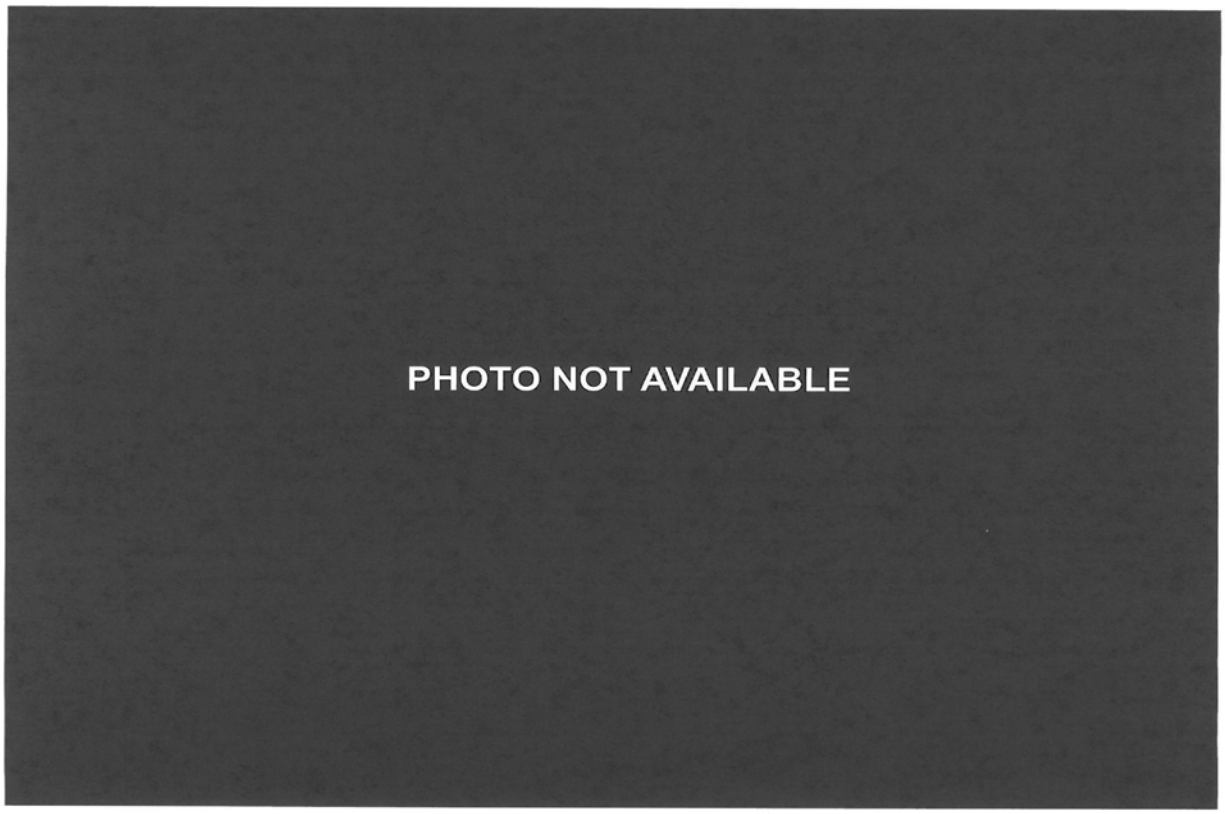
063 Pre-Test View of Rear Passenger Dummy Head Showing Dummy Head is Level



064 Pre-Test Placement of Rear Passenger Dummy Feet

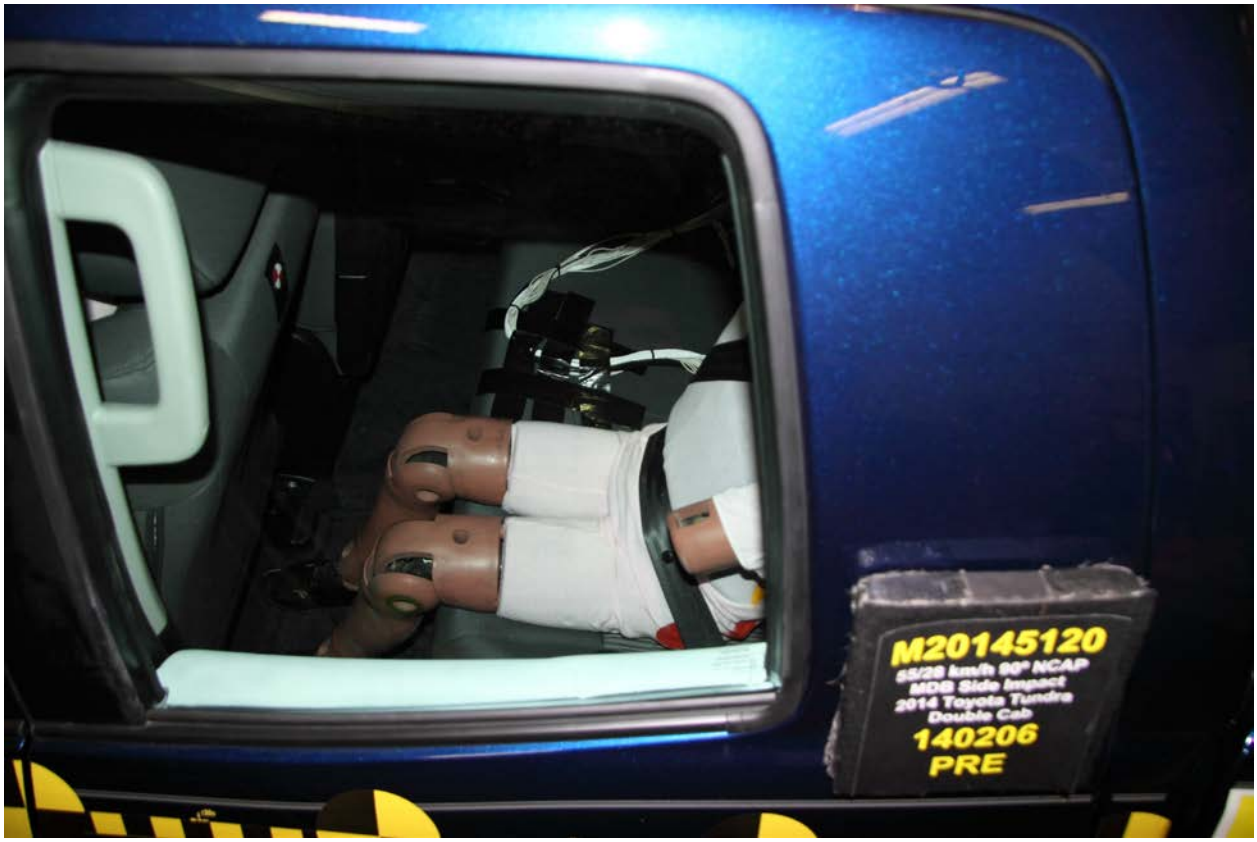
065 Pre-Test View of Belt Anchorage for Rear Passenger Dummy

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



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

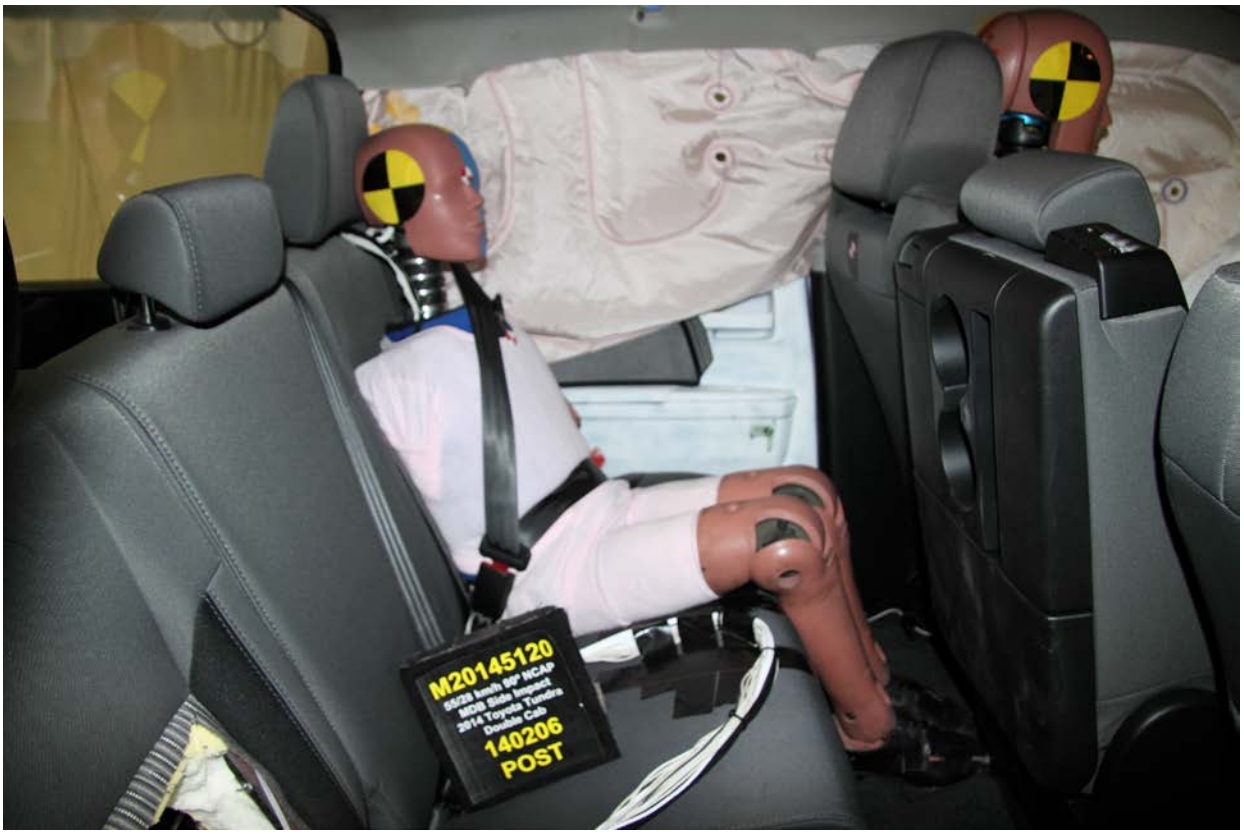
068 Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



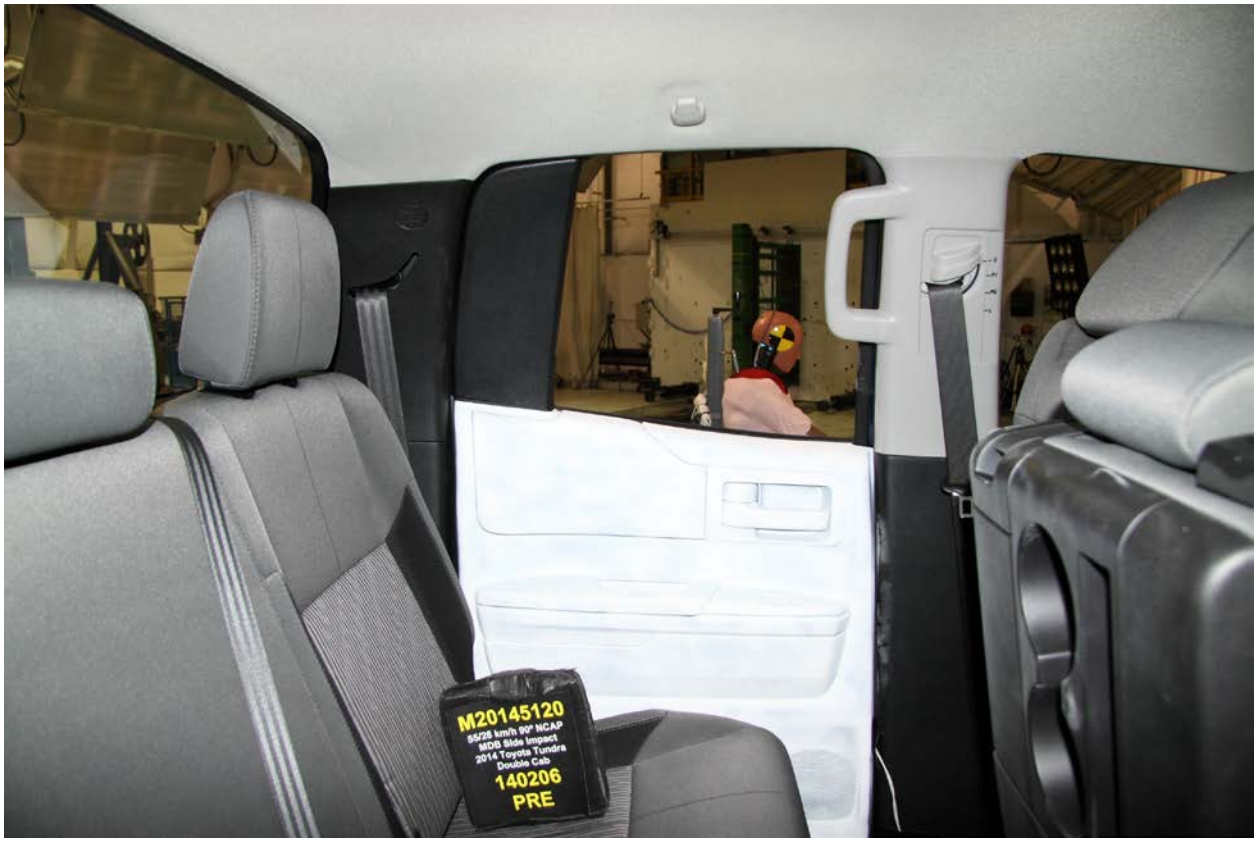
069 Pre-Test Passenger Dummy and Door Clearance View

070 Post-Test Passenger Dummy and Door Clearance View

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

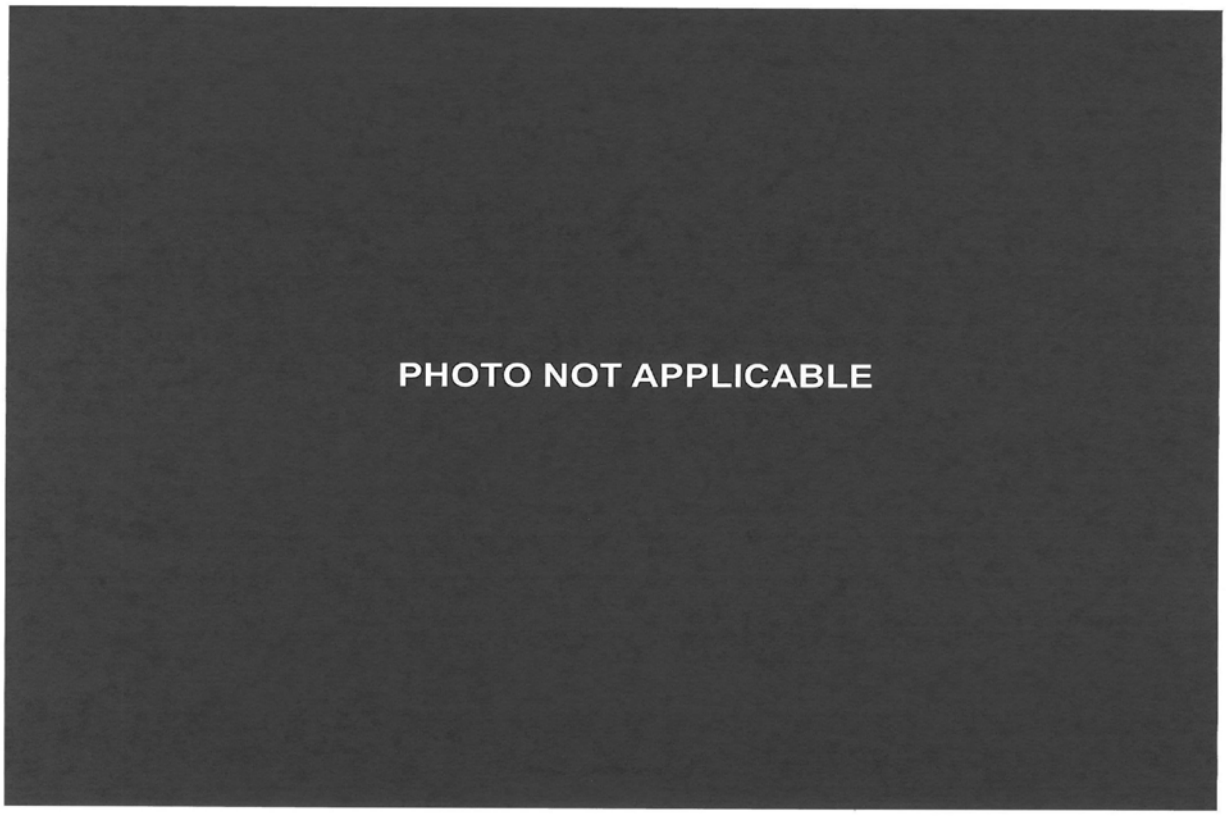


072 Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



073 Pre-Test Passenger Inner Door Panel View

074 Post-Test Passenger Inner Door Panel View



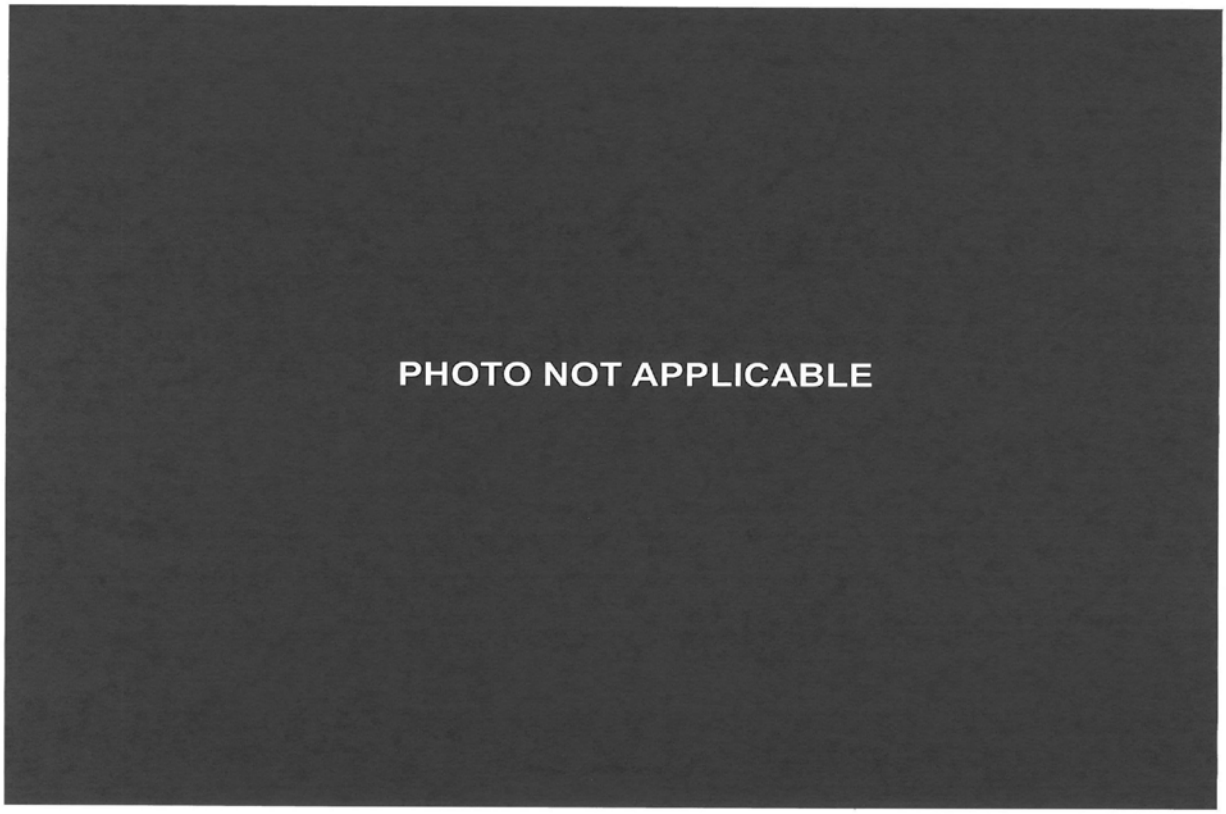
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View

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

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

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

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



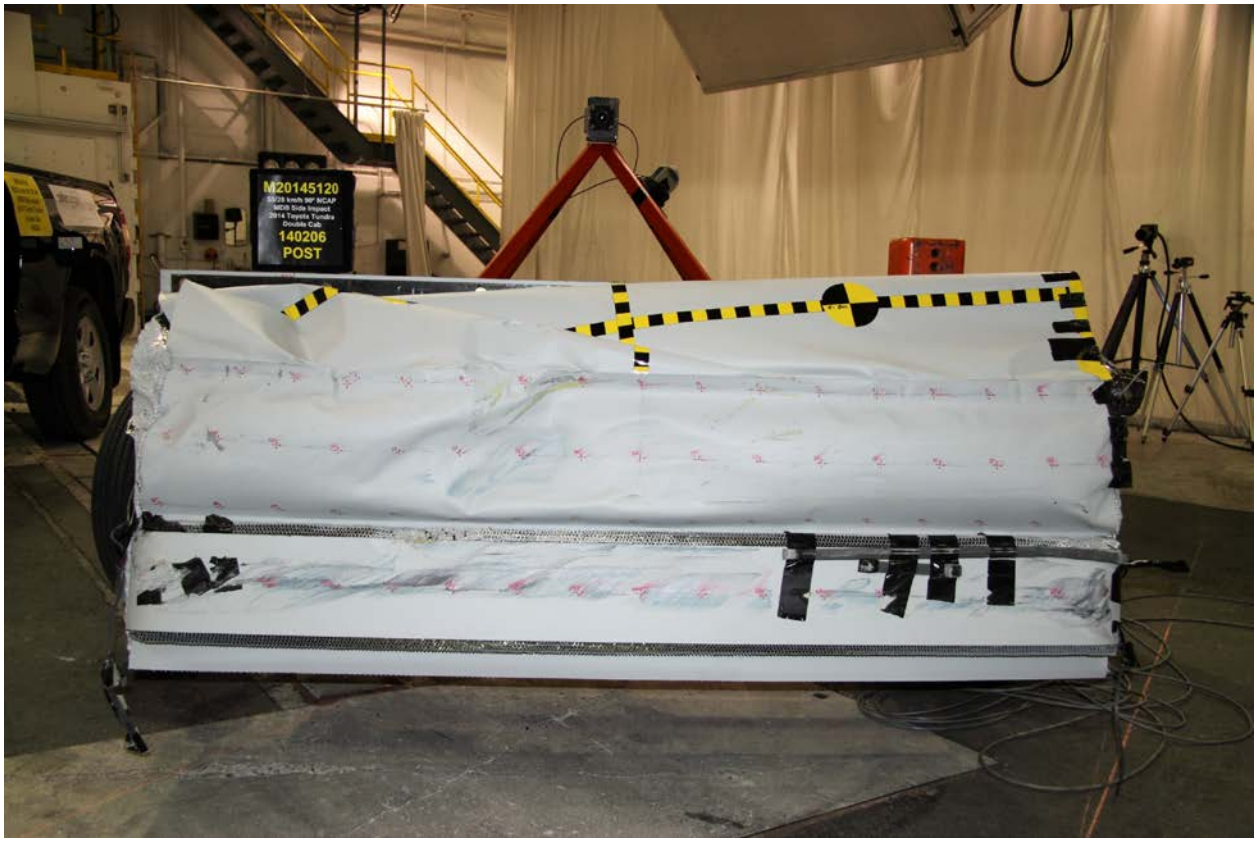
080 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View

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

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

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

084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face

086 Pre-Test Top View of MDB Impactor Face

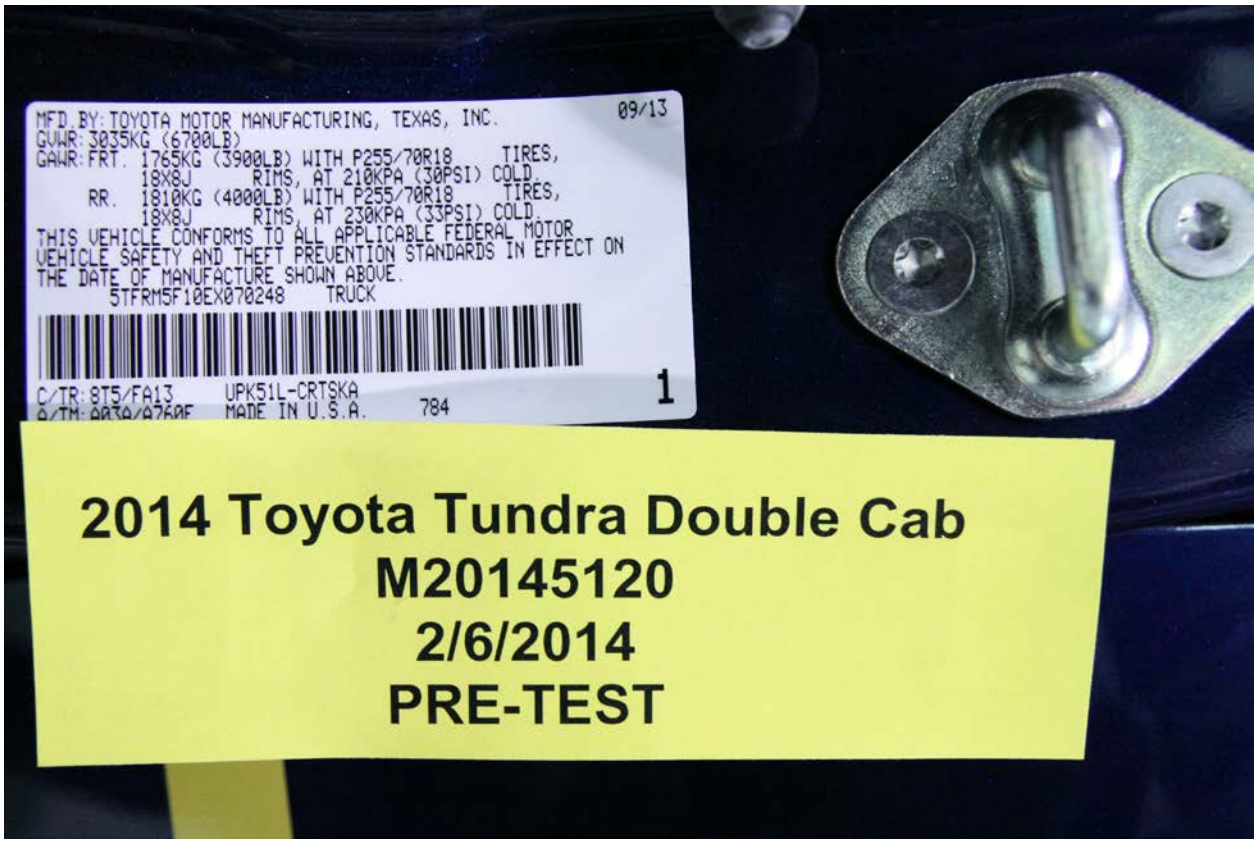
087 Post-Test Top View of MDB Impactor Face

088 Pre-Test Left Side View of MDB Impactor Face

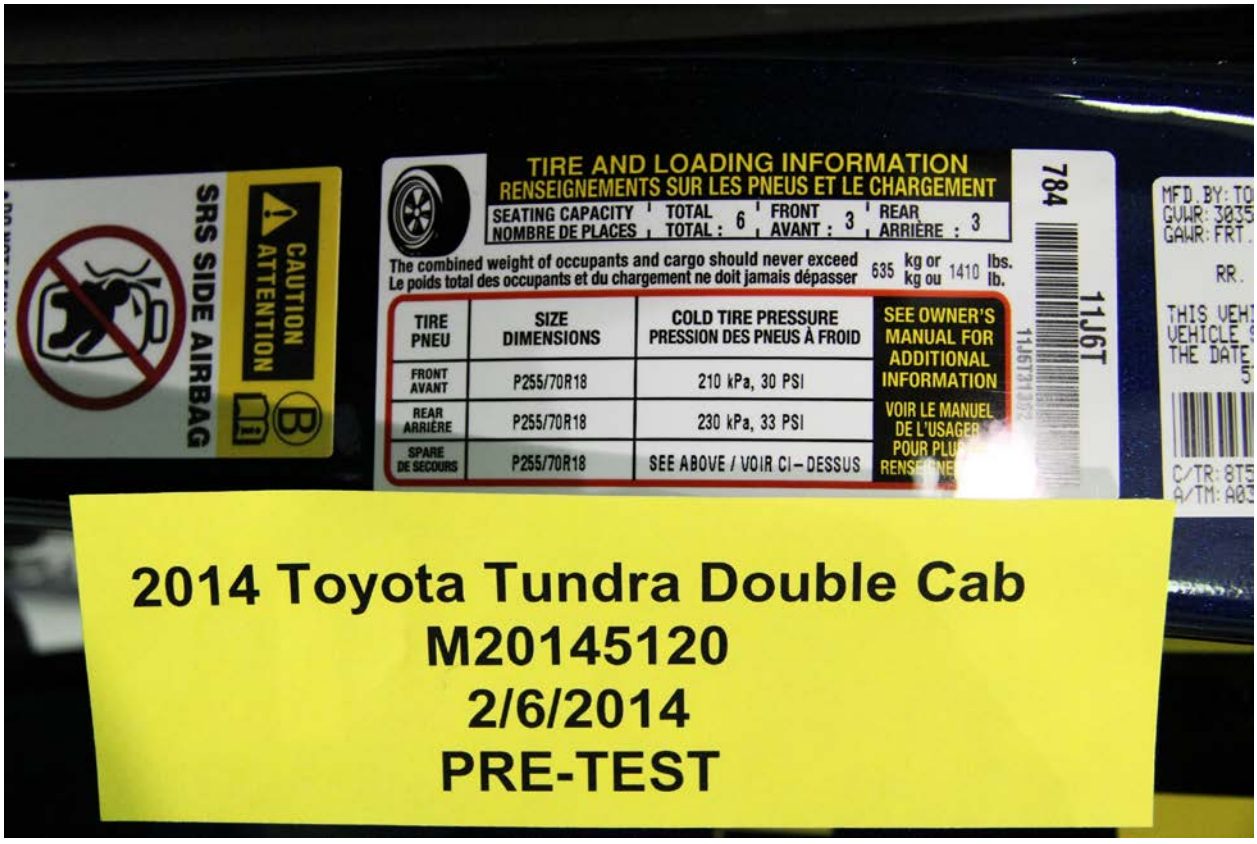
089 Post-Test Left Side View of MDB Impactor Face

090 Pre-Test Right Side View of MDB Impactor Face

091 Post-Test Right Side View of MDB Impactor Face

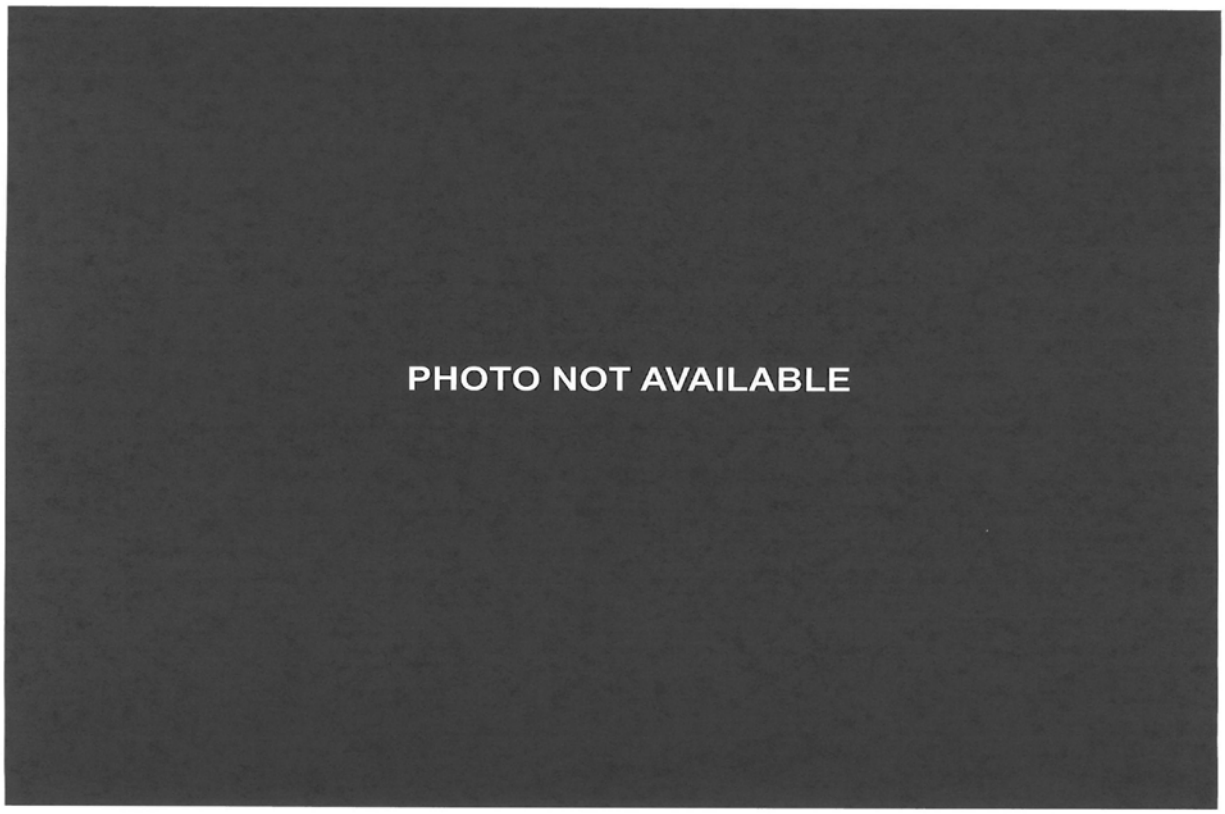


092 Close-Up View of Vehicle Certification Label

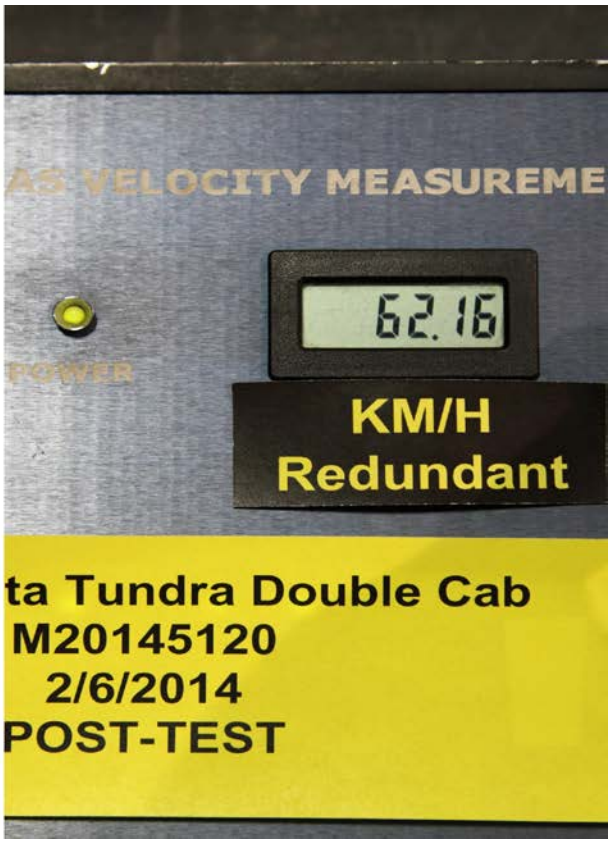


093 Close-Up View of Vehicle Tire Information Placard or Label

093a Close-Up View of Vehicle Reduced Load Carrying Capacity Label

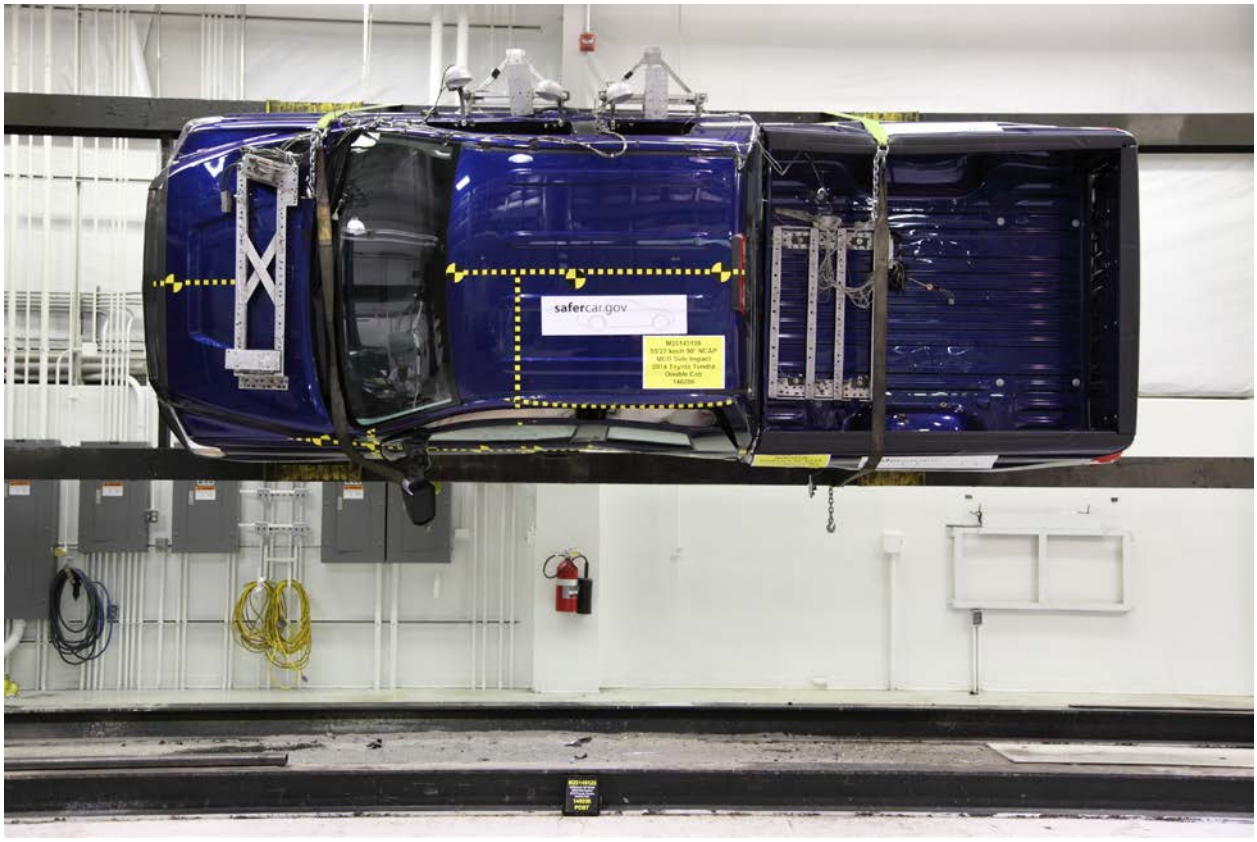


094 Pre-Test Ballast View

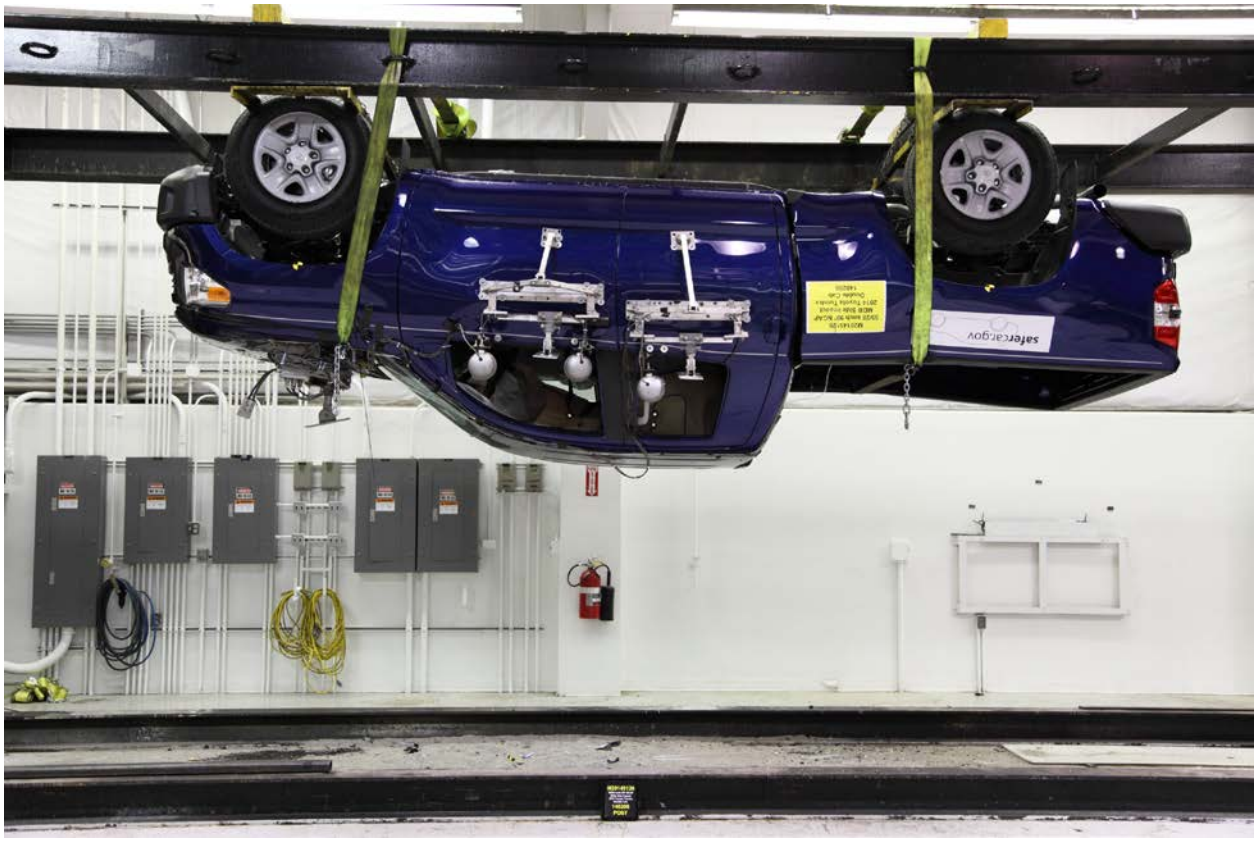


095 Post-Test Primary Speed Trap Read-Out

096 FMVSS No. 301 Static Rollover 0 Degrees



097 FMVSS No. 301 Static Rollover 90 Degrees

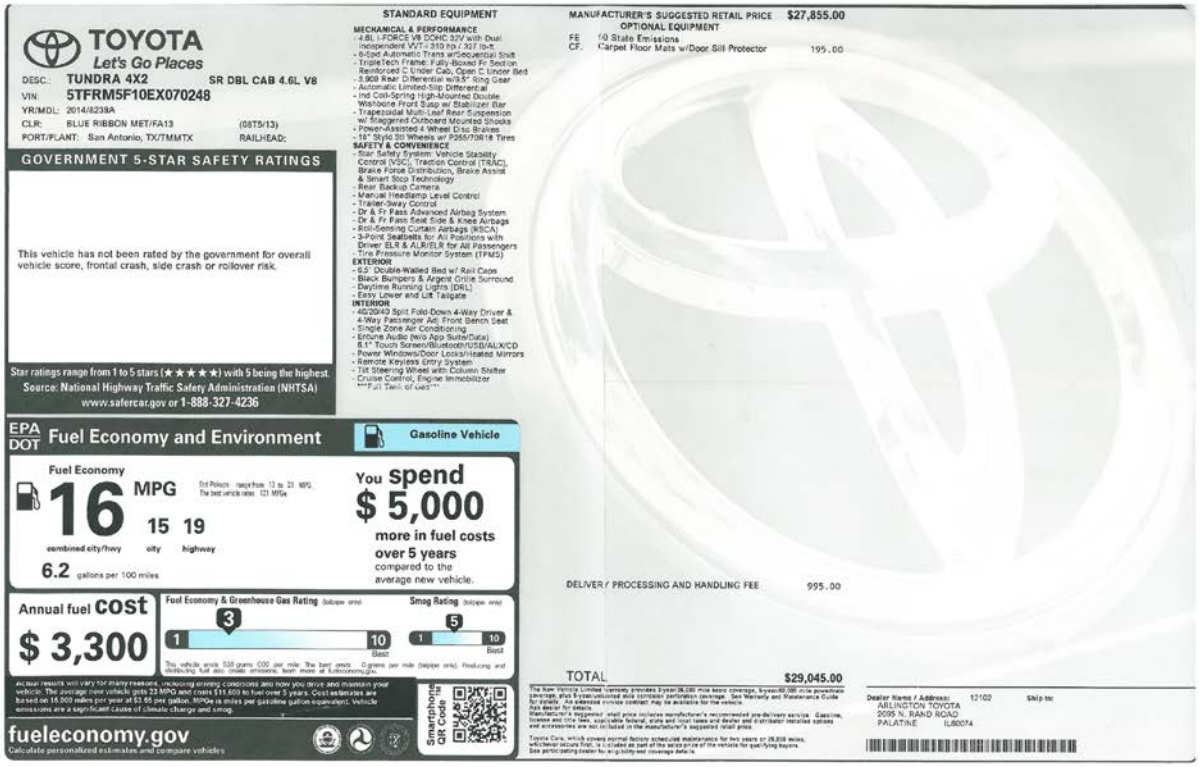


098 FMVSS No. 301 Static Rollover 180 Degrees

099 FMVSS No. 301 Static Rollover 270 Degrees

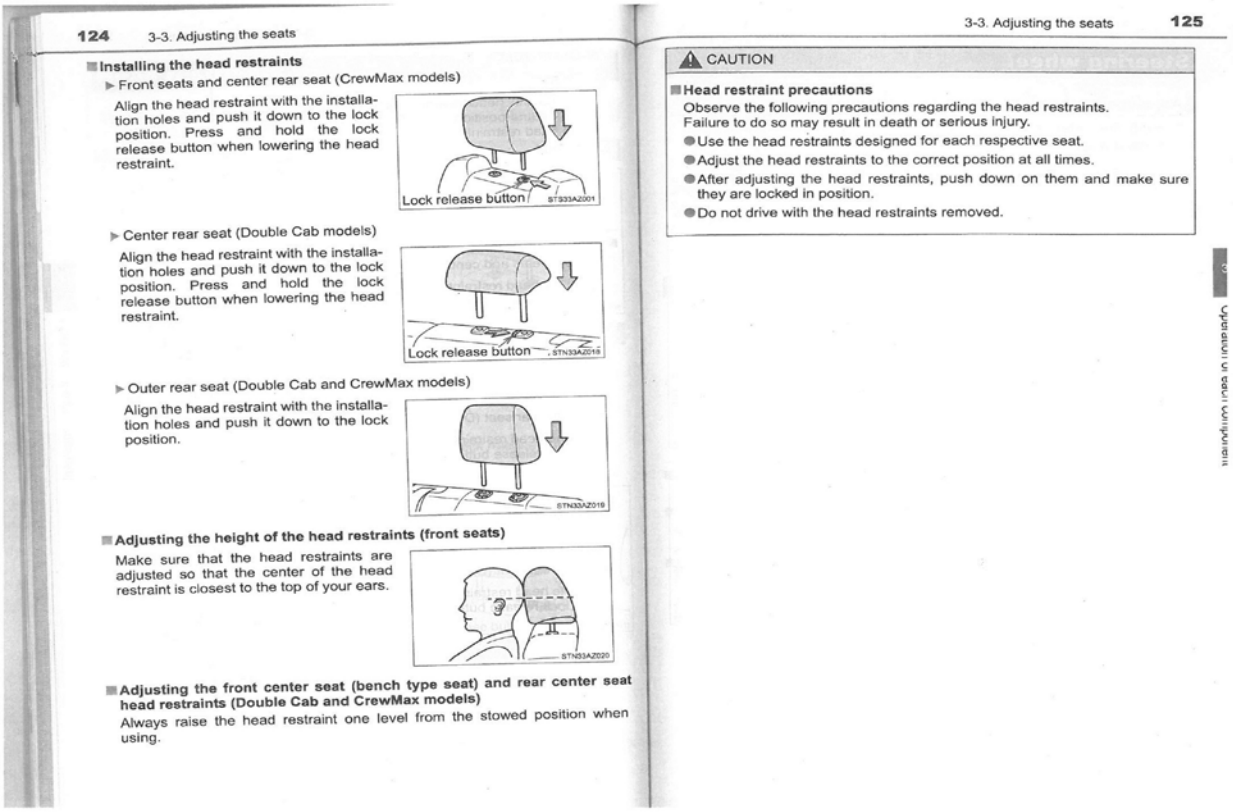
100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event



102 Monroney Label

Intentionally Left Bank



124 3-3. Adjusting the seats

Installing the head restraints

▶ Front seats and center rear seat (CrewMax models)

Align the head restraint with the installation holes and push it down to the lock position. Press and hold the lock release button when lowering the head restraint.

▶ Center rear seat (Double Cab models)

Align the head restraint with the installation holes and push it down to the lock position. Press and hold the lock release button when lowering the head restraint.

▶ Outer rear seat (Double Cab and CrewMax models)

Align the head restraint with the installation holes and push it down to the lock position.

Adjusting the height of the head restraints (front seats)

Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.

Adjusting the front center seat (bench type seat) and rear center seat head restraints (Double Cab and CrewMax models)

Always raise the head restraint one level from the stowed position when using.

3-3. Adjusting the seats 125

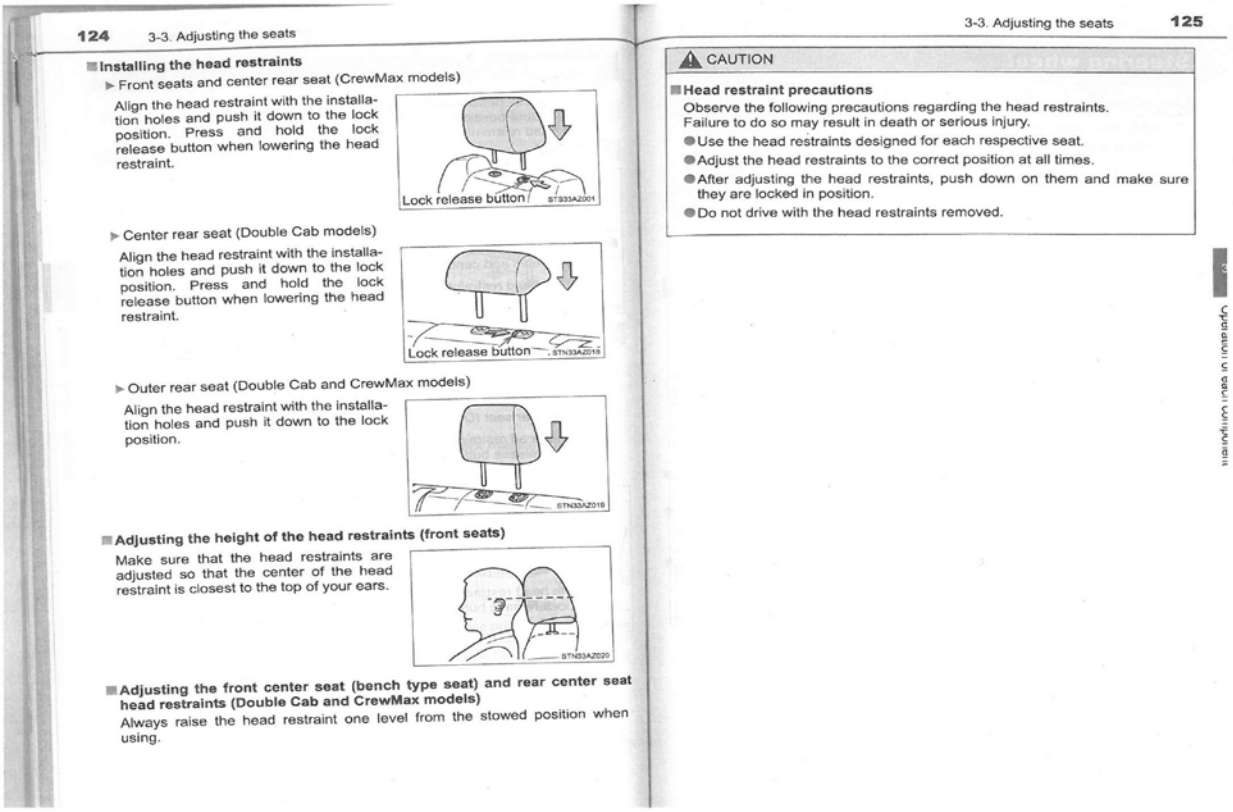
CAUTION

Head restraint precautions

Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.

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



124 3-3. Adjusting the seats

Installing the head restraints

▶ Front seats and center rear seat (CrewMax models)

Align the head restraint with the installation holes and push it down to the lock position. Press and hold the lock release button when lowering the head restraint.

Lock release button
ST333AZ001

▶ Center rear seat (Double Cab models)

Align the head restraint with the installation holes and push it down to the lock position. Press and hold the lock release button when lowering the head restraint.

Lock release button
STN33AZ018

▶ Outer rear seat (Double Cab and CrewMax models)

Align the head restraint with the installation holes and push it down to the lock position.

STN33AZ019

Adjusting the height of the head restraints (front seats)

Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.

STN33AZ020

Adjusting the front center seat (bench type seat) and rear center seat head restraints (Double Cab and CrewMax models)

Always raise the head restraint one level from the stowed position when using.

3-3. Adjusting the seats 125

CAUTION

Head restraint precautions

Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

NHTSA

Test Date: 02/06/2014

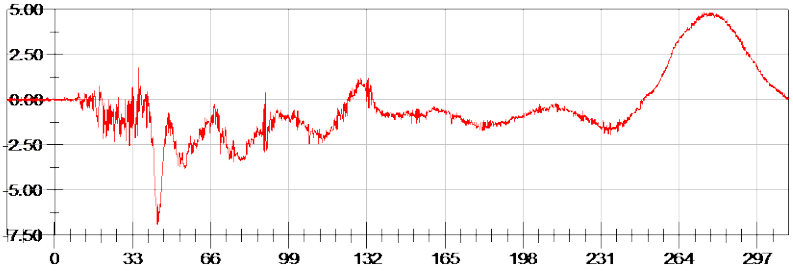
Test Lab: CTF

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

Test Number: 140206 (M20145120)

Position #4 SID IIs Dummy (305)

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



<Max>

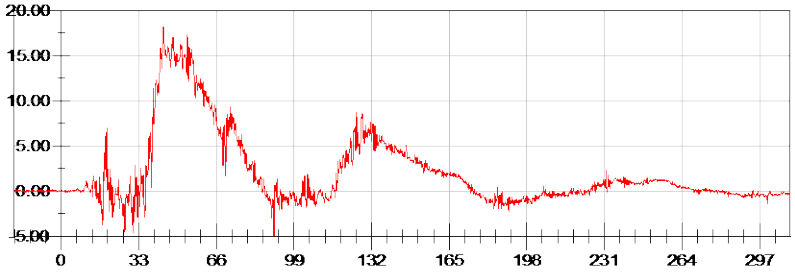
4.87 g at 274.40 ms

<Min>

-6.91 g at 43.44 ms

CFC_1000

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



<Max>

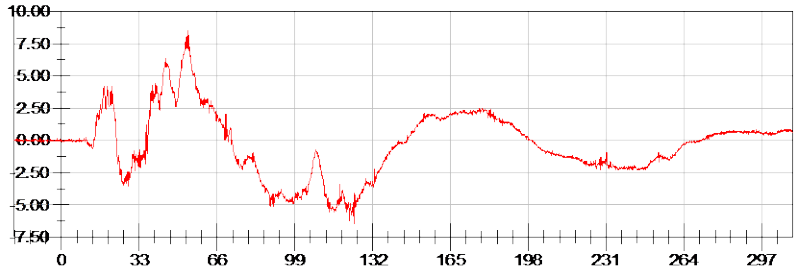
18.24 g at 43.52 ms

<Min>

-4.96 g at 90.48 ms

CFC_1000

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



<Max>

8.52 g at 53.84 ms

<Min>

-6.44 g at 124.08 ms

CFC_1000

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

<Max>

20.23 g at 43.52 ms

<Min>

0.03 g at -19.76 ms

CFC_1000

NHTSA

Test Date: 02/06/2014

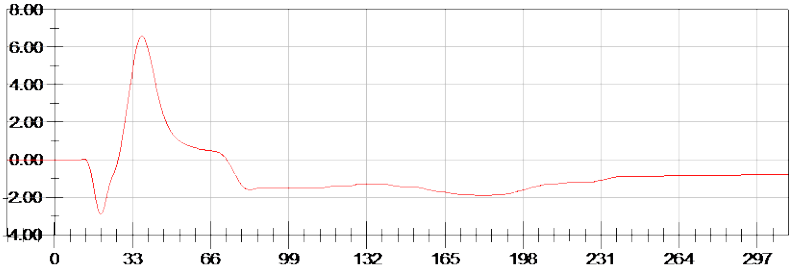
Test Lab: CTF

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

Test Number: 140206 (M20145120)

Position #4 SID IIs Dummy (305)

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



<Max>

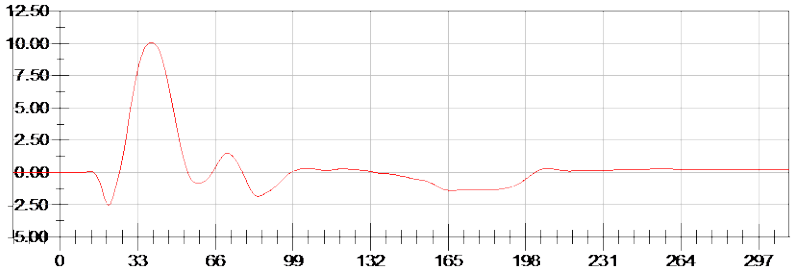
6.56 mm at 37.04 ms

<Min>

-2.88 mm at 19.52 ms

CFC_180

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



<Max>

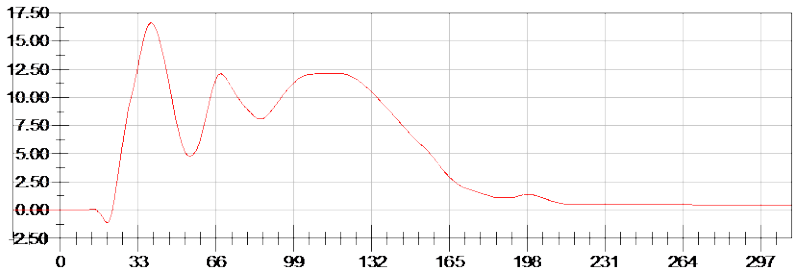
10.05 mm at 38.80 ms

<Min>

-2.54 mm at 20.64 ms

CFC_180

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



<Max>

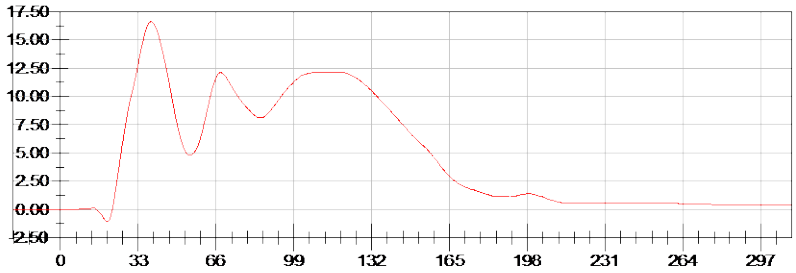
16.61 mm at 38.48 ms

<Min>

-1.10 mm at 19.92 ms

CFC_180

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



<Max>

16.61 mm at 38.48 ms

<Min>

-1.10 mm at 19.92 ms

CFC_180

NHTSA

Test Date: 02/06/2014

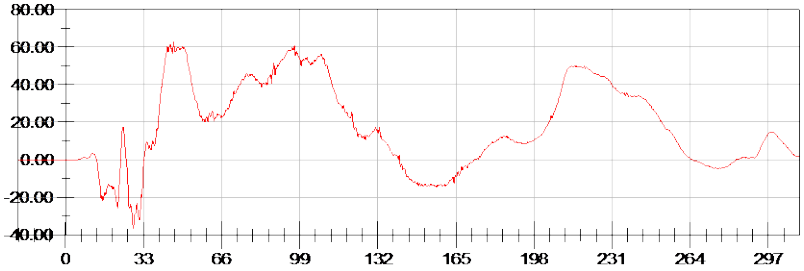
Test Lab: CTF

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

Test Number: 140206 (M20145120)

Position #4 SID IIs Dummy (305)

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



<Max>

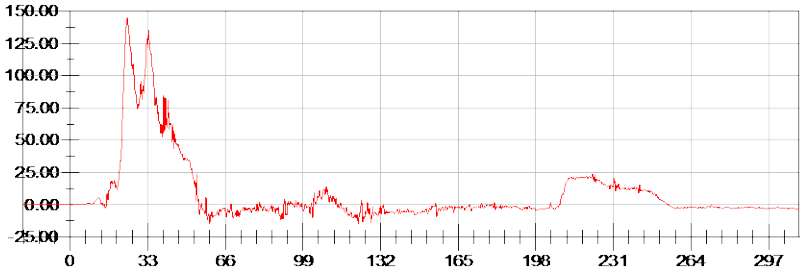
62.69 N at 45.76 ms

<Min>

-36.58 N at 28.64 ms

CFC_600

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



<Max>

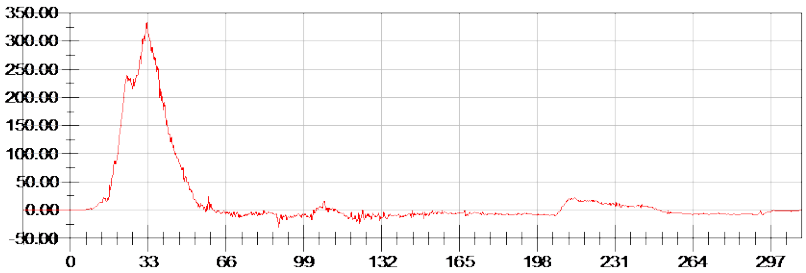
144.96 N at 24.32 ms

<Min>

-14.86 N at 122.48 ms

CFC_600

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



<Max>

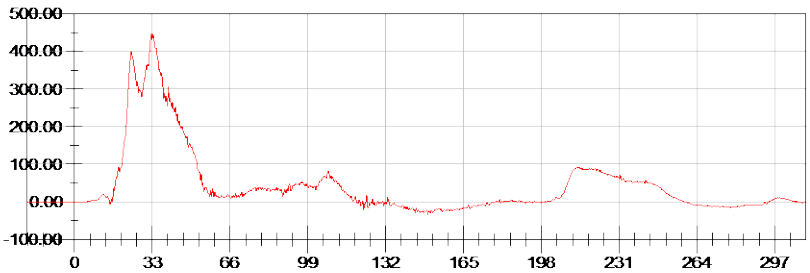
333.44 N at 32.40 ms

<Min>

-29.75 N at 88.40 ms

CFC_600

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



<Max>

445.64 N at 33.36 ms

<Min>

-32.49 N at 149.92 ms

CFC_600

NHTSA

Test Date: 02/06/2014

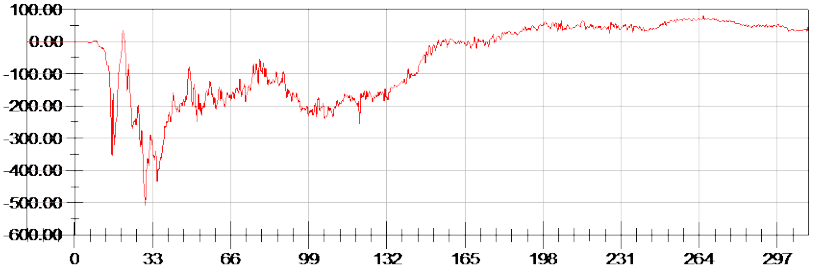
Test Lab: CTF

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

Test Number: 140206 (M20145120)

Position #4 SID IIs Dummy (305)

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



<Max>

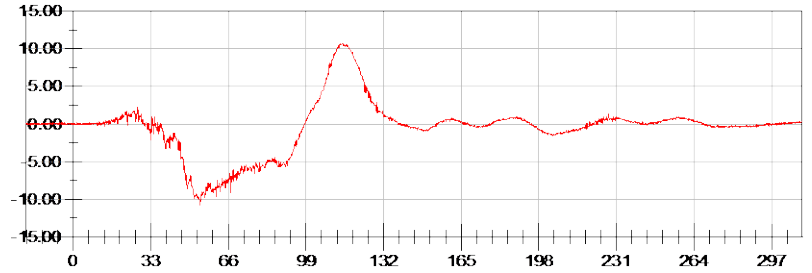
80.92 N at 265.76 ms

<Min>

-506.69 N at 29.92 ms

CFC_600

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



<Max>

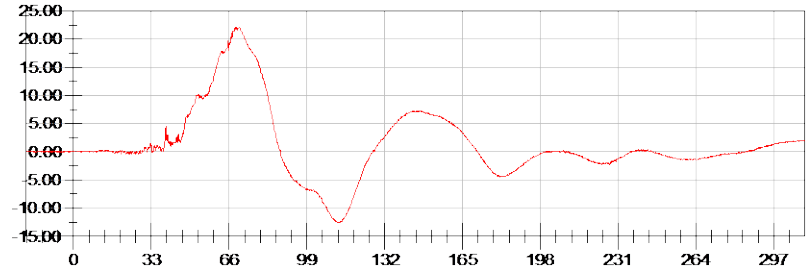
10.70 g at 113.52 ms

<Min>

-10.85 g at 54.00 ms

CFC_1000

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



<Max>

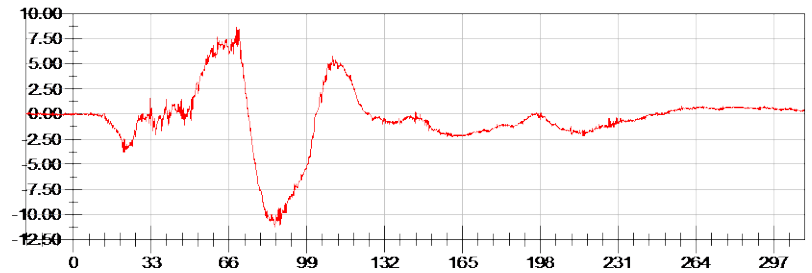
22.15 g at 68.96 ms

<Min>

-12.60 g at 112.88 ms

CFC_1000

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



<Max>

8.61 g at 69.12 ms

<Min>

-11.27 g at 85.44 ms

CFC_1000

NHTSA

Test Date: 02/06/2014

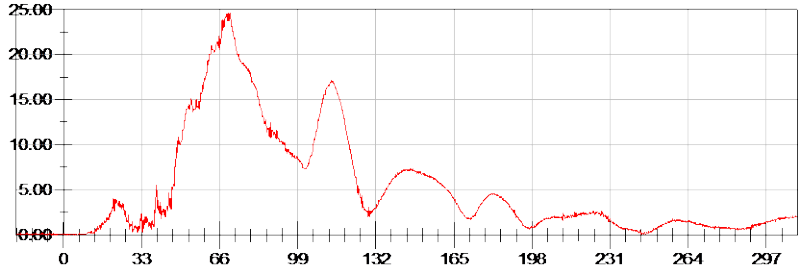
Test Lab: CTF

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

Test Number: 140206 (M20145120)

Position #4 SID IIs Dummy (305)

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



<Max>

24.61 g at 69.84 ms

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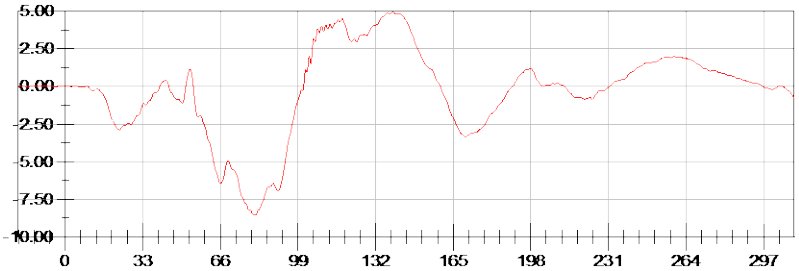
0.02 g at -15.44 ms

CFC_1000

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



<Max>

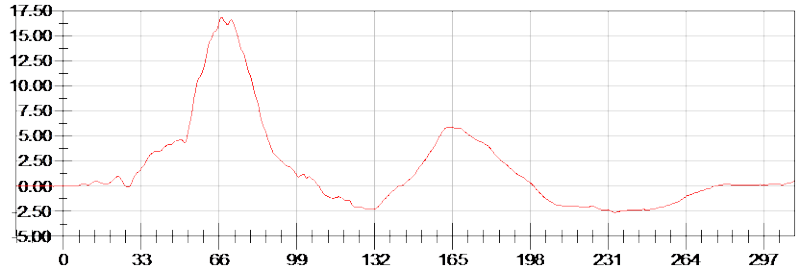
4.91 g at 139.28 ms

<Min>

-8.58 g at 80.96 ms

CFC_180

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



<Max>

16.85 g at 67.12 ms

<Min>

-2.61 g at 233.68 ms

CFC_180

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

<Max>

9.17 g at 78.24 ms

<Min>

-3.80 g at 46.48 ms

CFC_180

NHTSA

Test Date: 02/06/2014

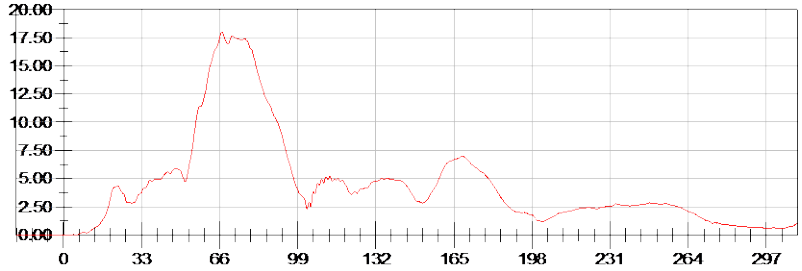
Test Lab: CTF

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

Test Number: 140206 (M20145120)

Position #4 SID IIs Dummy (305)

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



<Max>

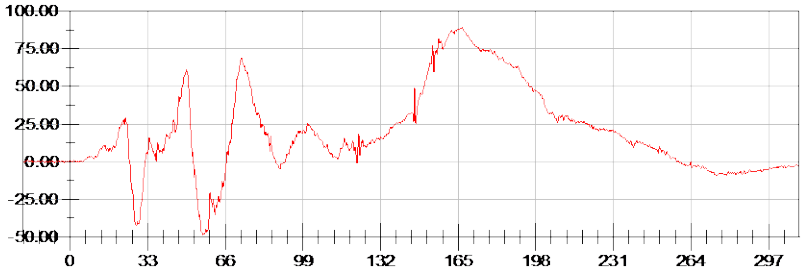
18.00 g at 66.96 ms

<Min>

0.00 g at -14.64 ms

CFC_180

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



<Max>

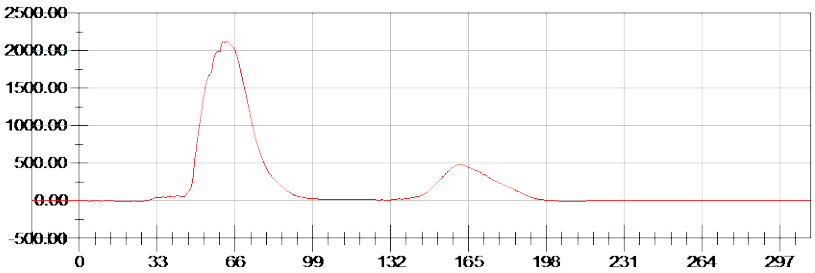
88.97 N at 166.64 ms

<Min>

-48.81 N at 56.56 ms

CFC_600

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



<Max>

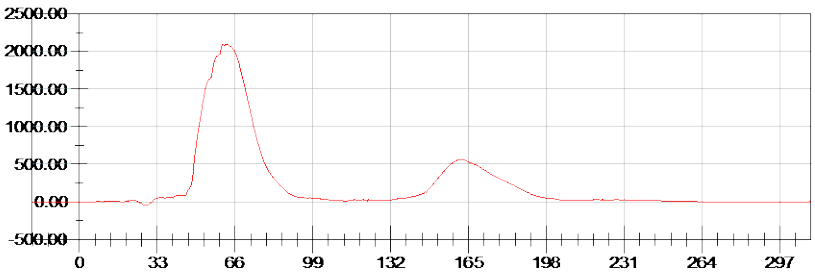
2,122.04 N at 62.40 ms

<Min>

-11.14 N at 24.48 ms

CFC_600

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



<Max>

2,092.84 N at 62.72 ms

<Min>

-42.71 N at 28.08 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 22
01/29/14

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	447	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	471	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	267	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	606	Yes

Technician

Approved

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Peak Resultant Acceleration	125 - 155 g	133.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.0 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

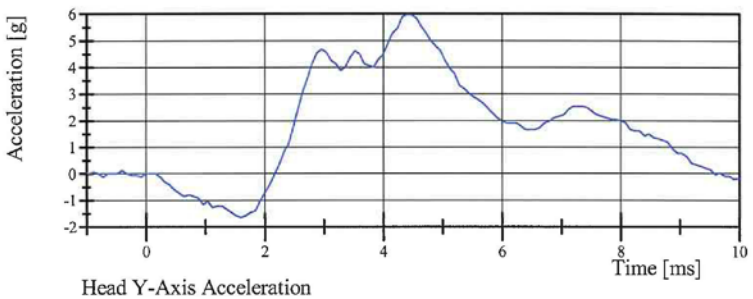
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 13:12:51 359

Transportation Research Center Inc.

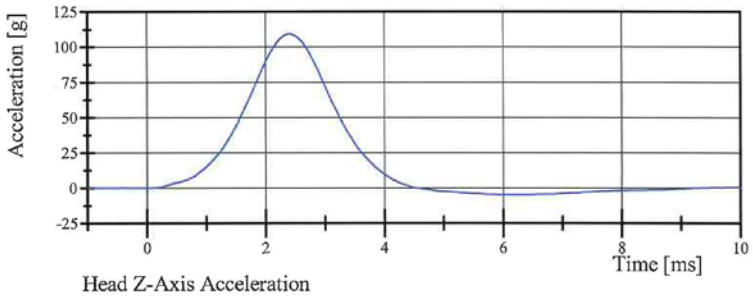
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Head X-Axis Acceleration



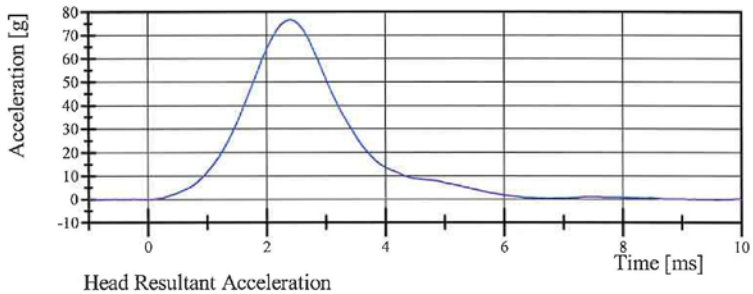
Filter Class: CFC_1000
Max: 6.0 g at 4.4 ms
Min: -1.6 g at 1.6 ms

Head Y-Axis Acceleration



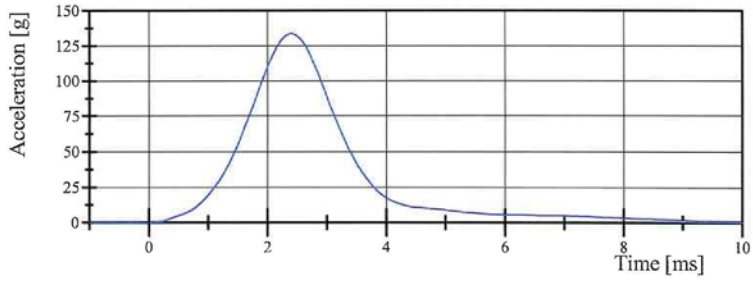
Filter Class: CFC_1000
Max: 109.7 g at 2.4 ms
Min: -4.9 g at 6.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 76.7 g at 2.4 ms
Min: -0.4 g at 9.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 133.9 g at 2.4 ms
Min: 0.0 g at -1.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 13:12:58 359

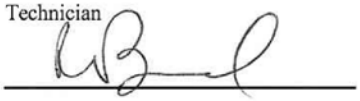
Transportation Research Center Inc.

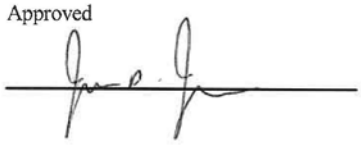
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.4 deg	Yes
Time of Peak	54 - 66 ms	56.6 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	65.9 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

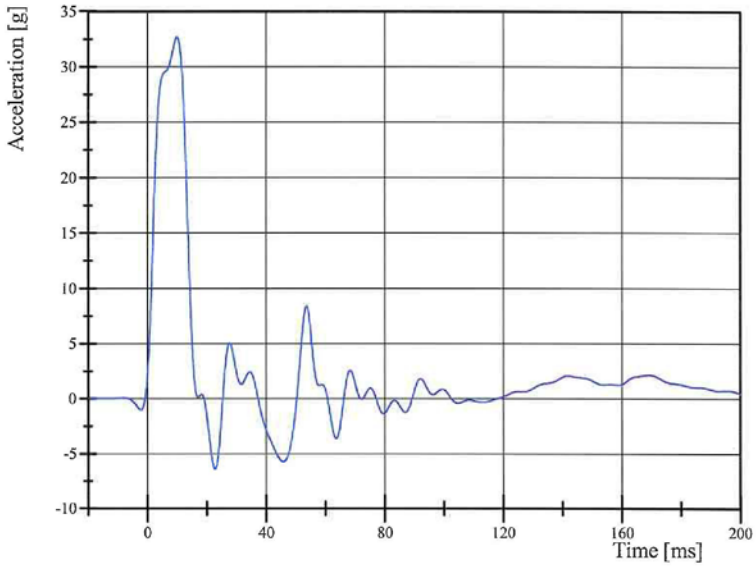
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 11:30:53 1310

Transportation Research Center Inc.

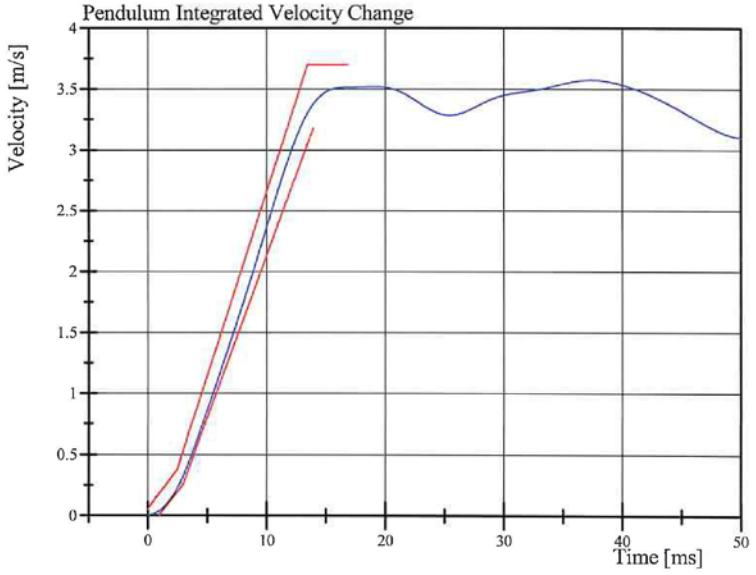
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Pendulum Acceleration



Filter Class: CFC_60
Max: 32.7 g at 10.0 ms
Min: -6.4 g at 22.8 ms

Pendulum Integrated Velocity Change



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

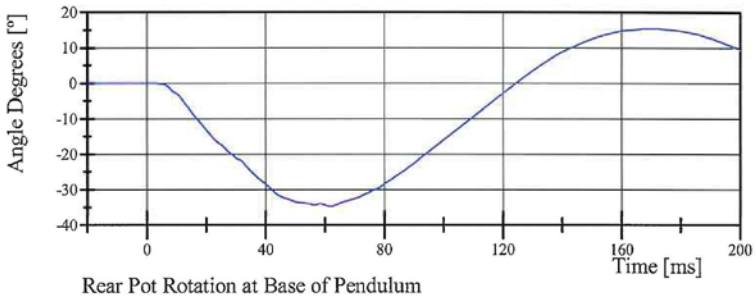
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 11:31:00 1310

Transportation Research Center Inc.

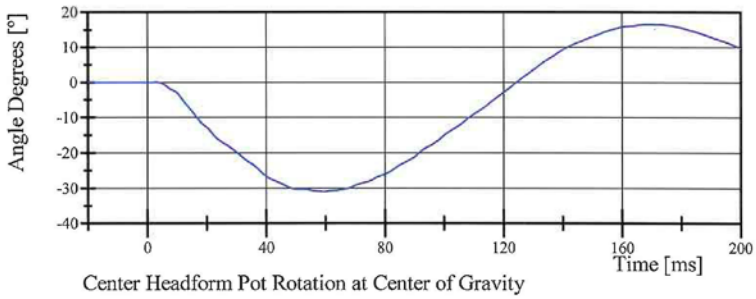
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Forward Pot Rotation at Base of Pendulum



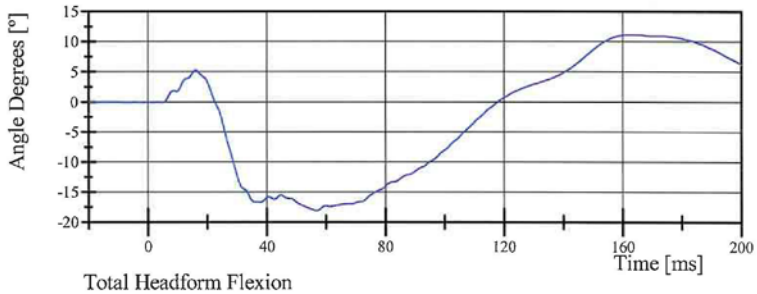
Filter Class: CFC_180
Max: 15.3 ° at 169.4 ms
Min: -34.7 ° at 62.0 ms

Rear Pot Rotation at Base of Pendulum



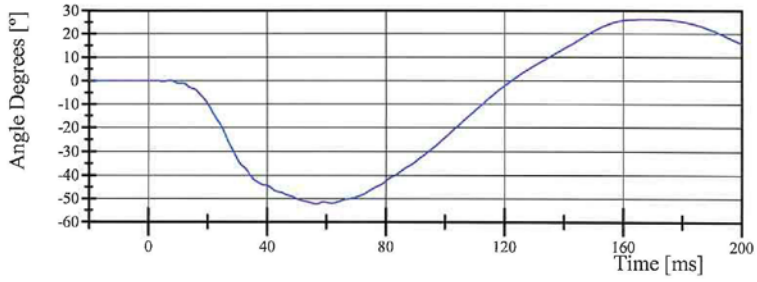
Filter Class: CFC_180
Max: 16.4 ° at 168.3 ms
Min: -31.0 ° at 59.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.1 ° at 163.8 ms
Min: -18.1 ° at 56.9 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 26.2 ° at 166.6 ms
Min: -52.4 ° at 56.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 11:31:01 1310

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.52 g	Yes

Test meets specifications.

Comments:

Technician

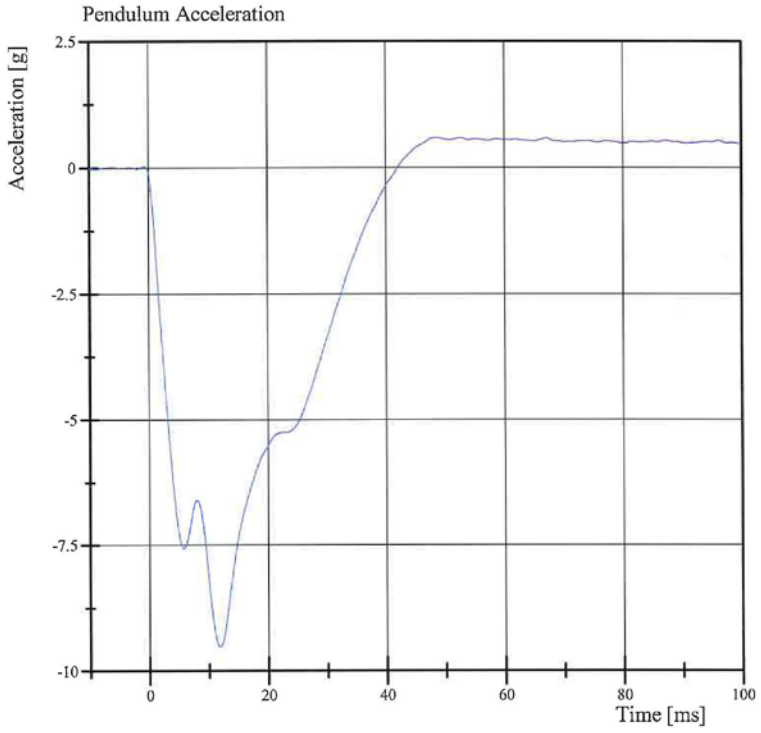
Approved

Specification Source: NHTSA final rule 8/15/2008

01.29.2014 13:24:47 582

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 0.6 g at 48.3 ms
Min: -9.5 g at 11.8 ms

Specification Source: NHTSA final rule 8/15/2008

01.29.2014 13:25:12 582

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

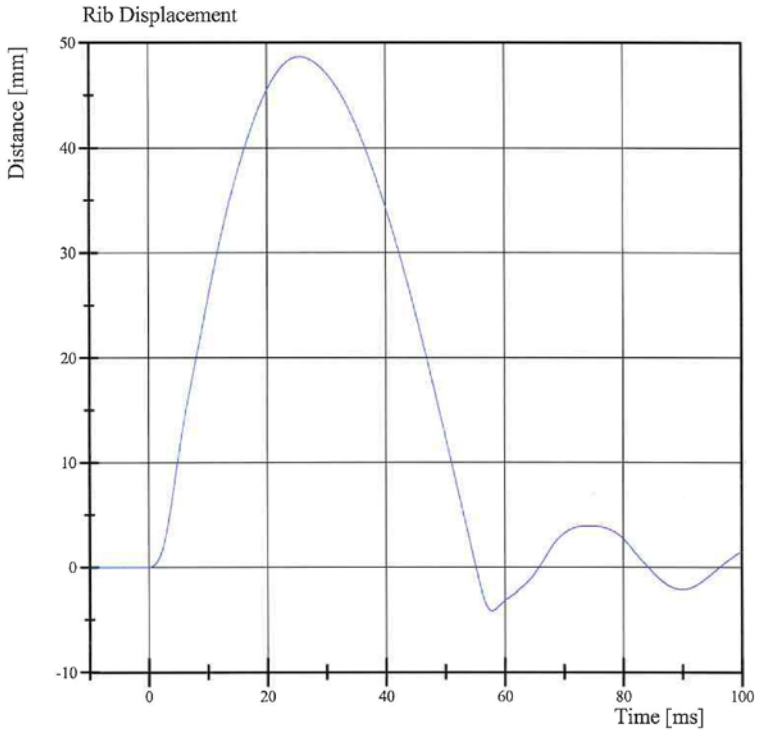
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:37:05 732

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 48.7 mm at 25.6 ms
Min: -4.2 mm at 57.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:37:41 732

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

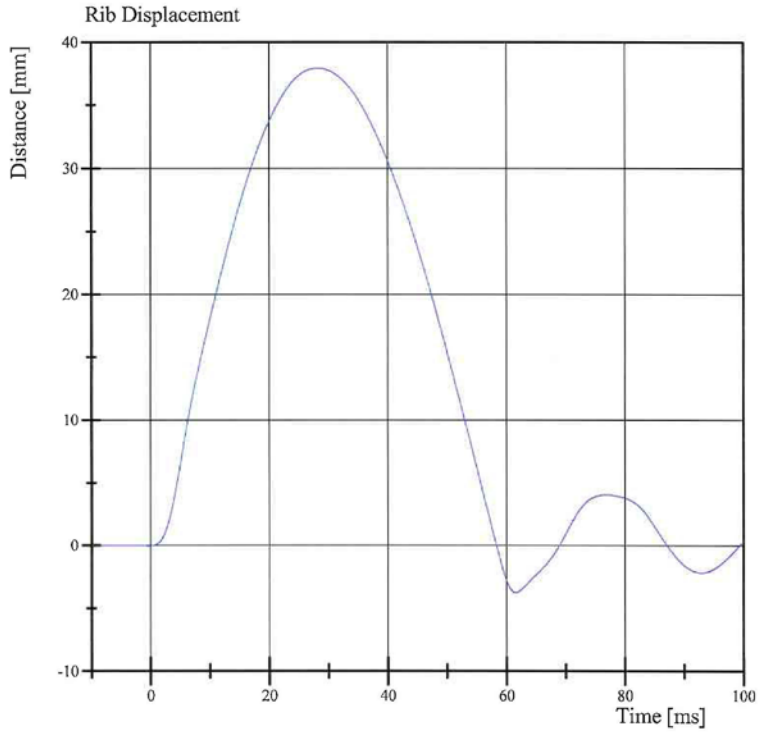
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:43:29 922

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 38.0 mm at 28.2 ms
Min: -3.7 mm at 61.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:43:39 922

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

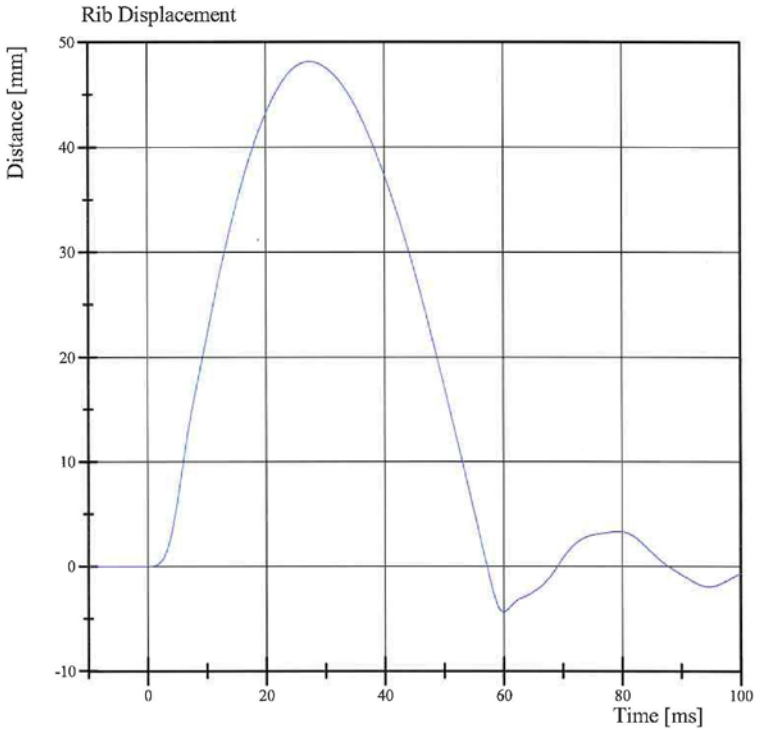
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:51:43 732

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 48.2 mm at 27.4 ms
Min: -4.4 mm at 60.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:51:51 732

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

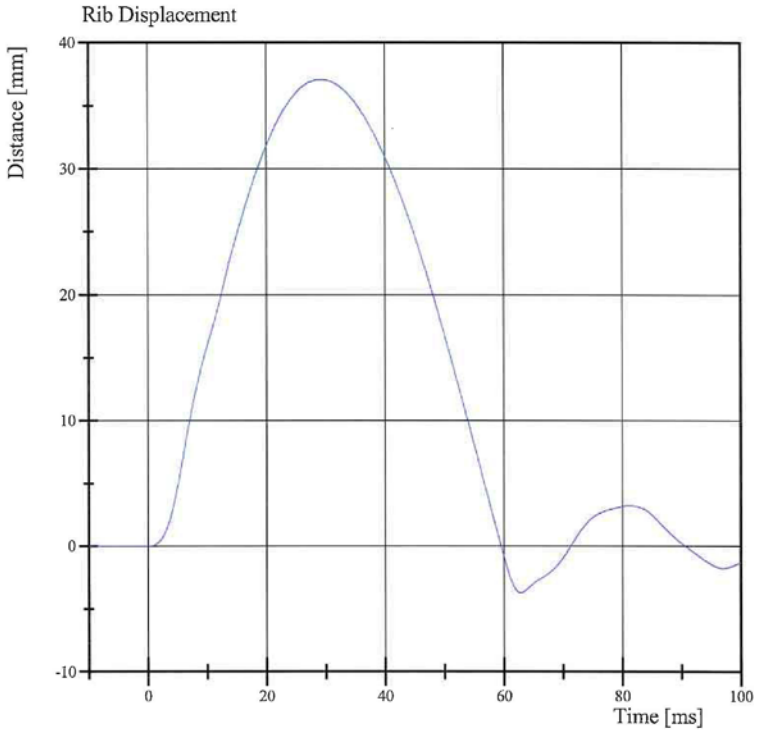
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:58:21 906

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 37.1 mm at 29.2 ms
Min: -3.7 mm at 62.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 08:58:29 906

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.6 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

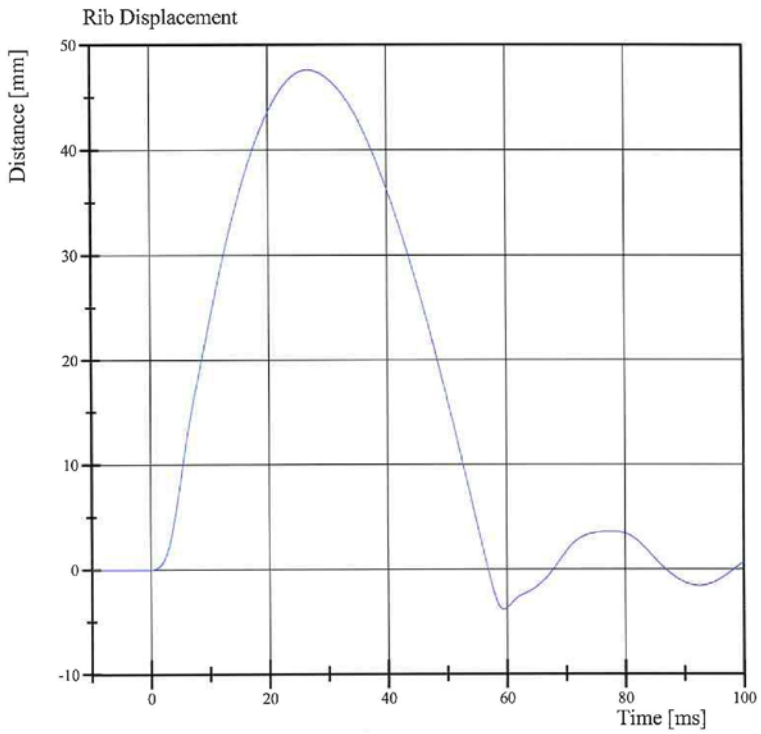
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 09:02:31 729

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 47.6 mm at 26.8 ms
Min: -3.8 mm at 59.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 09:02:42 729

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.8 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

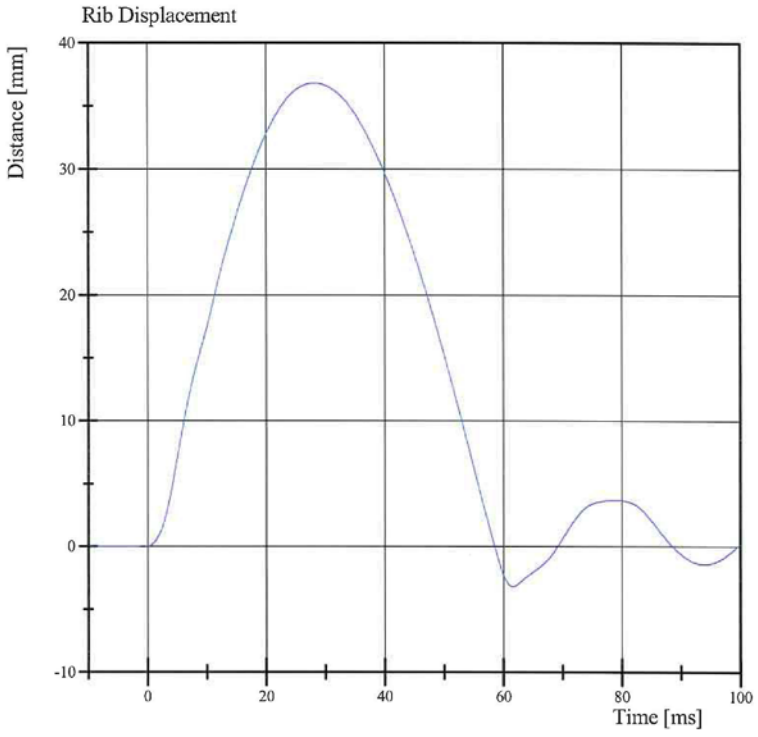
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 09:07:41 916

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 36.8 mm at 28.2 ms
Min: -3.2 mm at 61.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 09:07:49 916

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.469 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,432.0 N	Yes
Upper Rib Displacement	34 - 41 mm	38.2 mm	Yes
Center Rib Displacement	37 - 45 mm	41.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.0 mm	Yes

Test meets specifications.

Comments:

Technician

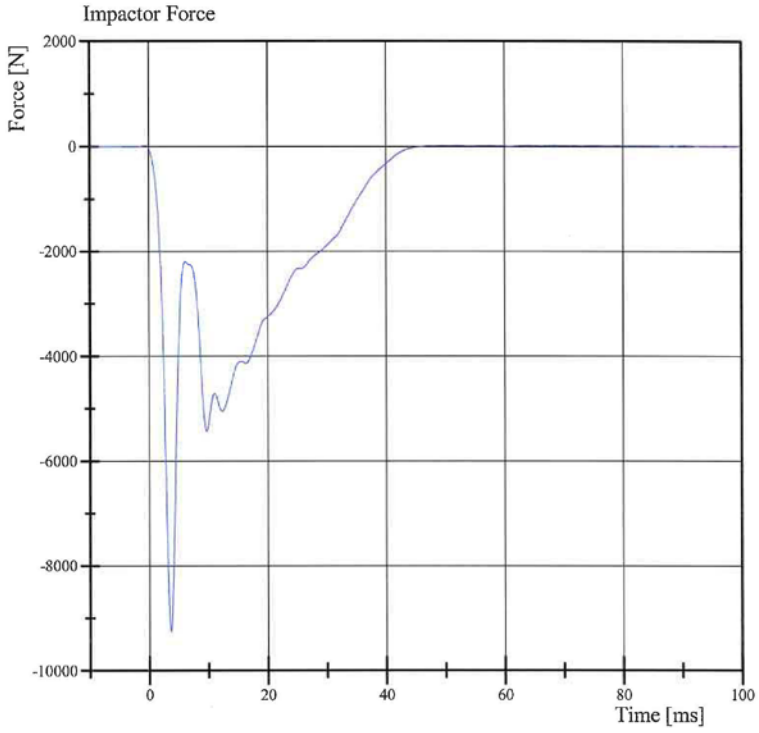
Approved

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

01.29.2014 13:35:53 489

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014



Filter Class: CFC_180
Max: 24.8 N at 52.0 ms
Min: -9,262.1 N at 3.7 ms

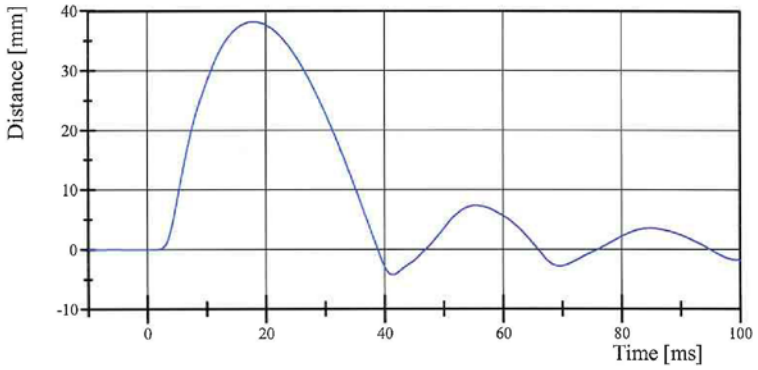
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

01.29.2014 13:36:00 489

Transportation Research Center Inc.

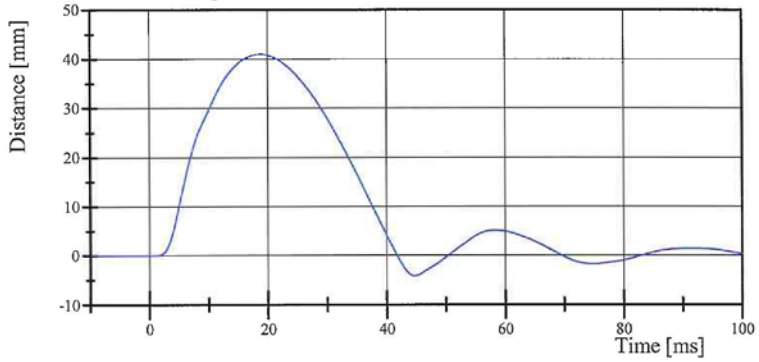
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Upper Rib Displacement



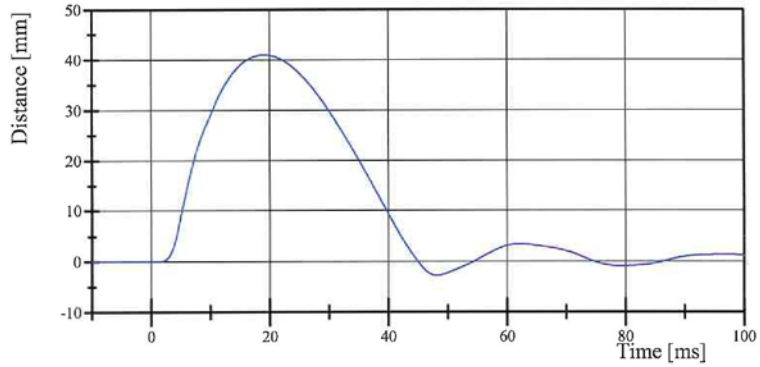
Filter Class: CFC_180
Max: 38.2 mm at 17.9 ms
Min: -4.2 mm at 41.4 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.0 mm at 18.8 ms
Min: -4.2 mm at 44.7 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 41.0 mm at 19.1 ms
Min: -2.8 mm at 48.2 ms

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

01.29.2014 13:36:00 489

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 22-2
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,138.8 N	Yes
Time of Peak	10.6 - 13.0 ms	11.36 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,664.4 N	Yes
Time of Peak	10.0 - 12.3 ms	10.40 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

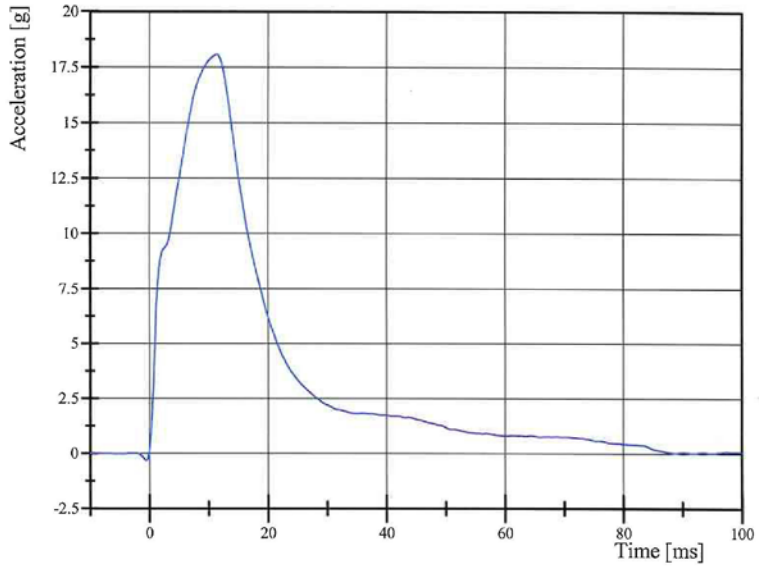
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 14:48:30 610

Transportation Research Center Inc.

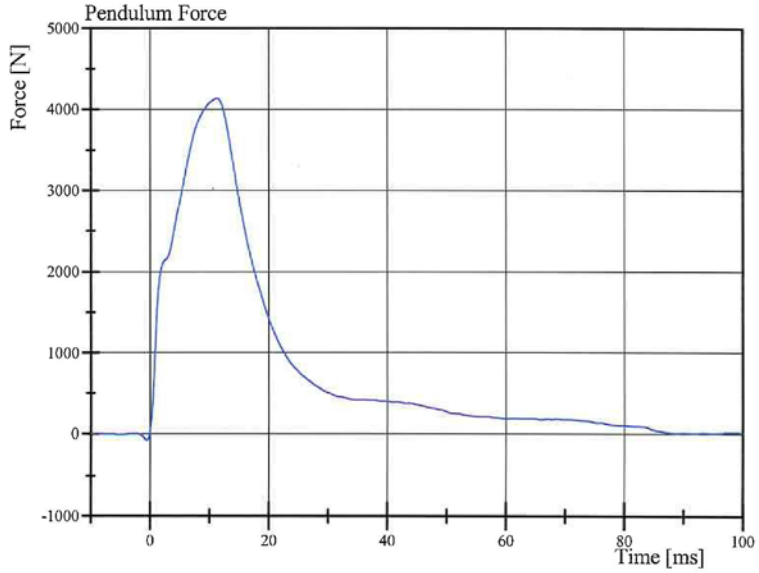
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 22-2
Test Date: 1/29/2014

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.1 g at 11.4 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,138.8 N at 11.4 ms
Min: -70.0 N at -0.5 ms

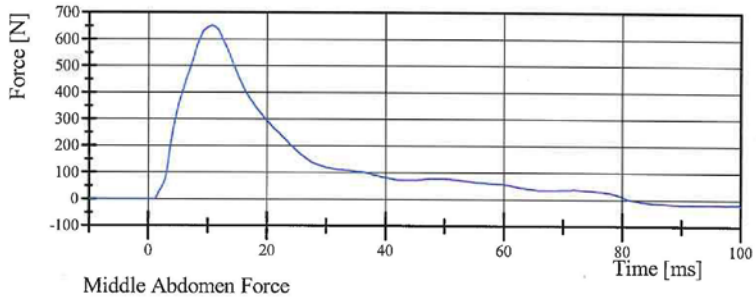
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 14:48:36 610

Transportation Research Center Inc.

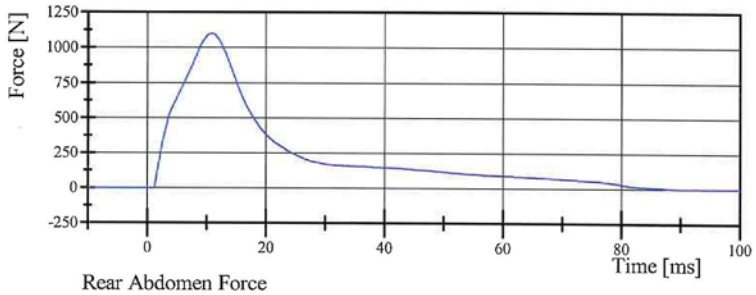
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 22-2
Test Date: 1/29/2014

Front Abdomen Force



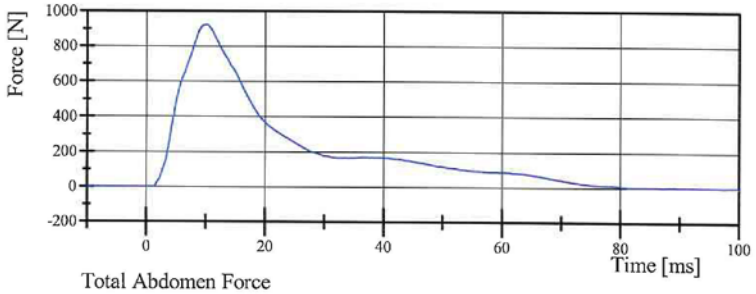
Filter Class: CFC_600
Max: 651.4 N at 10.7 ms
Min: -20.4 N at 100.0 ms

Middle Abdomen Force



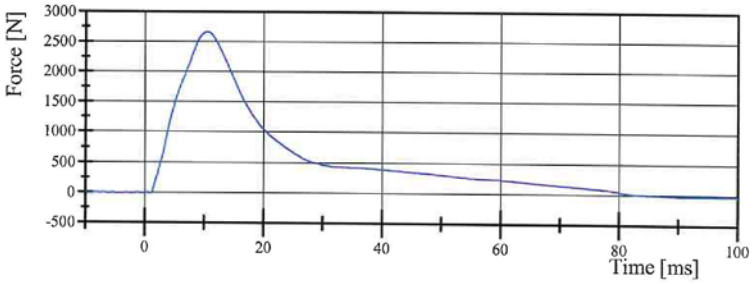
Filter Class: CFC_600
Max: 1,099.8 N at 10.9 ms
Min: -3.1 N at 100.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 923.2 N at 10.2 ms
Min: -3.2 N at 97.4 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,664.4 N at 10.4 ms
Min: -26.5 N at 97.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 14:48:37 610

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 22-3
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.012 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-49.5 deg	Yes
Time of Peak	39 - 53 ms	45.0 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	38.6 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

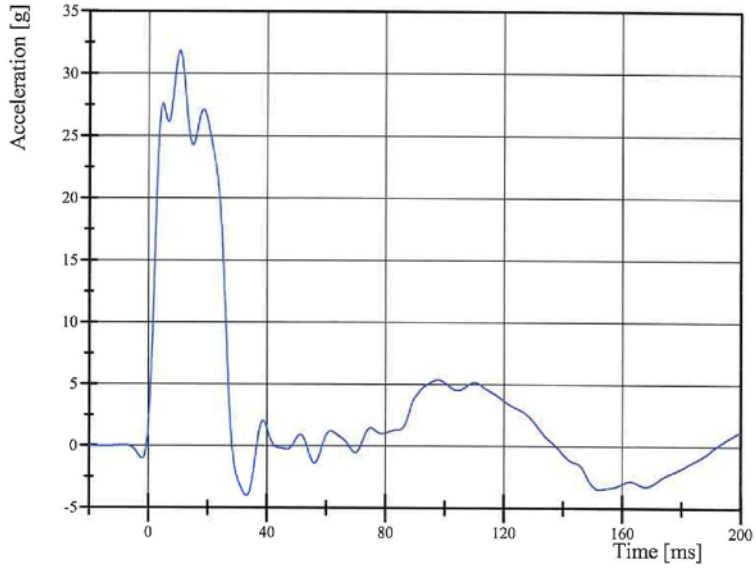
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 11:02:51 580

Transportation Research Center Inc.

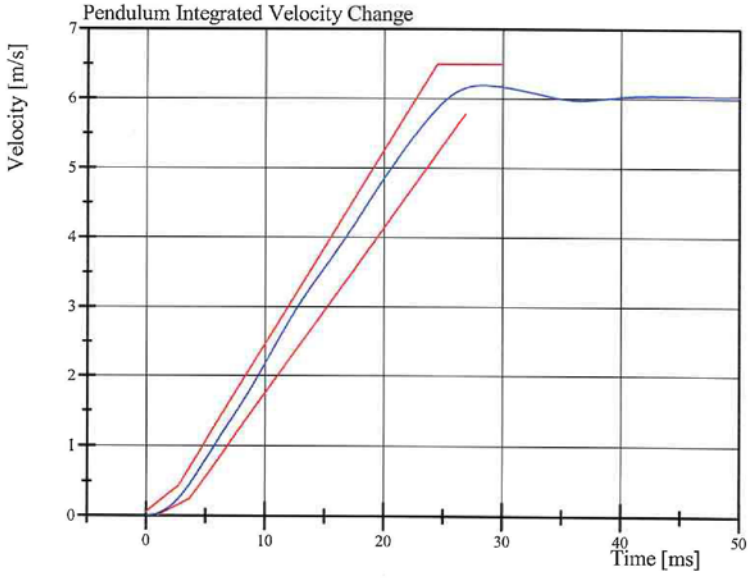
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 22-3
Test Date: 1/29/2014

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.8 g at 10.6 ms
Min: -4.0 g at 33.2 ms

Pendulum Integrated Velocity Change



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

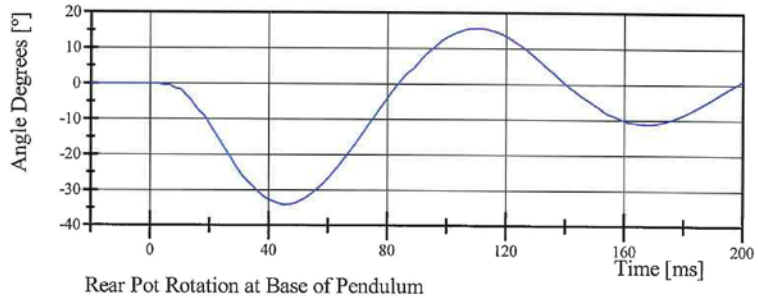
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 11:02:58 580

Transportation Research Center Inc.

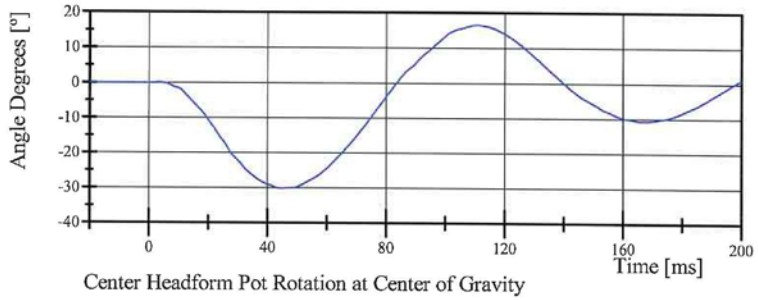
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 22-3
Test Date: 1/29/2014

Forward Pot Rotation at Base of Pendulum



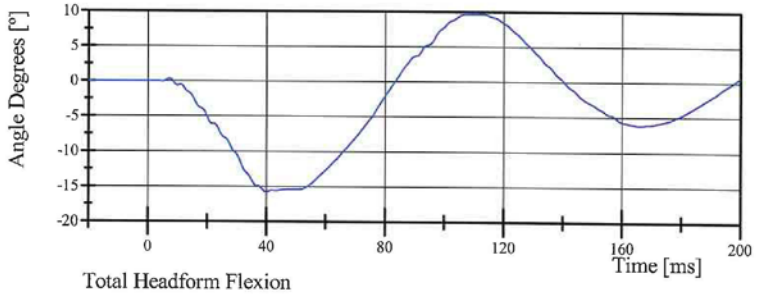
Filter Class: CFC_180
Max: 15.6 ° at 111.2 ms
Min: -34.0 ° at 45.3 ms

Rear Pot Rotation at Base of Pendulum



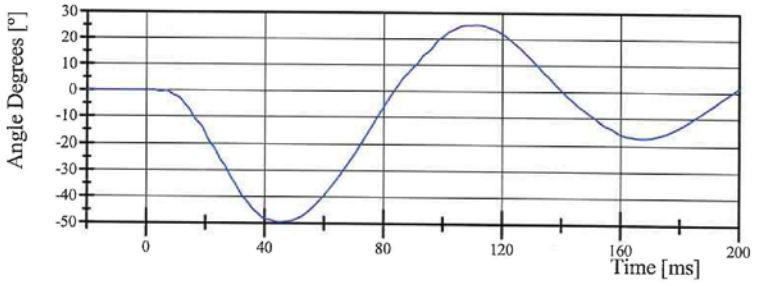
Filter Class: CFC_180
Max: 16.5 ° at 110.6 ms
Min: -30.2 ° at 44.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.7 ° at 112.7 ms
Min: -15.8 ° at 40.0 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.3 ° at 111.5 ms
Min: -49.5 ° at 45.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 11:02:58 580

Transportation Research Center Inc.

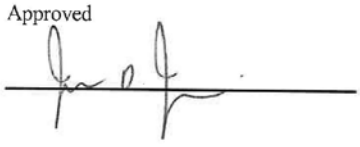
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,239.4 N	Yes
Time of Peak	11.8 - 16.1 ms	12.88 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,334.4 N	Yes
Time of Peak	12.2 - 17.0 ms	12.96 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

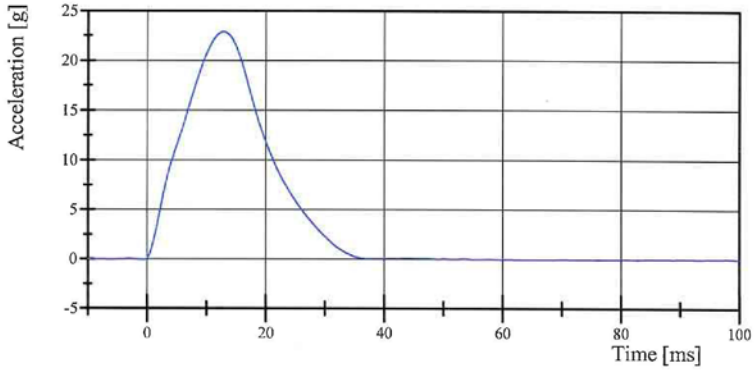
Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 13:58:39 552

Transportation Research Center Inc.

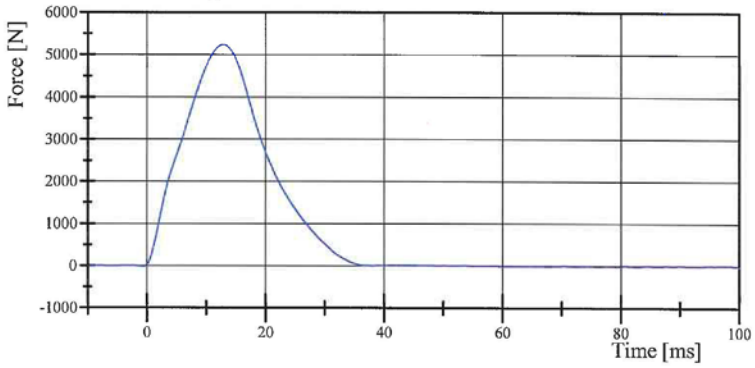
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 22-1
Test Date: 1/29/2014

Pendulum Acceleration



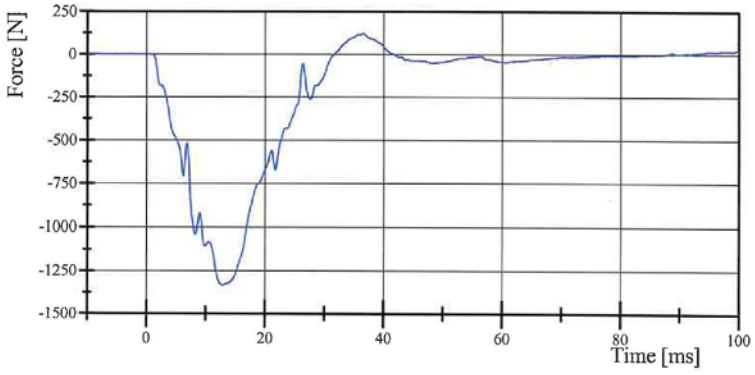
Filter Class: CFC_180
Max: 22.9 g at 12.9 ms
Min: -0.1 g at 76.2 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,239.4 N at 12.9 ms
Min: -18.1 N at 76.2 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 122.2 N at 36.6 ms
Min: -1,334.4 N at 13.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.29.2014 13:58:46 552

Driver S/N F030

Post-Test Calibration Sheets

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

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	471	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	267	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	606	Yes

Technician

Approved

TRC

Baseline 10/07/05

Transportation Research Center Inc.

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

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	130.2 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.0 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

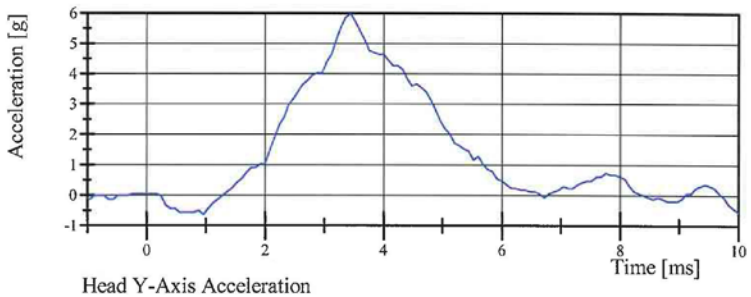
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 09:09:23 358

Transportation Research Center Inc.

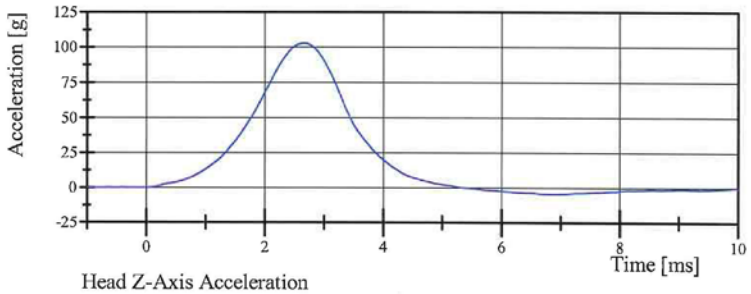
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Head X-Axis Acceleration



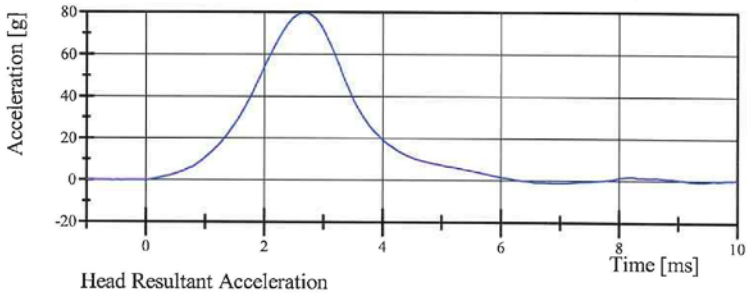
Filter Class: CFC_1000
Max: 6.0 g at 3.4 ms
Min: -0.6 g at 1.0 ms

Head Y-Axis Acceleration



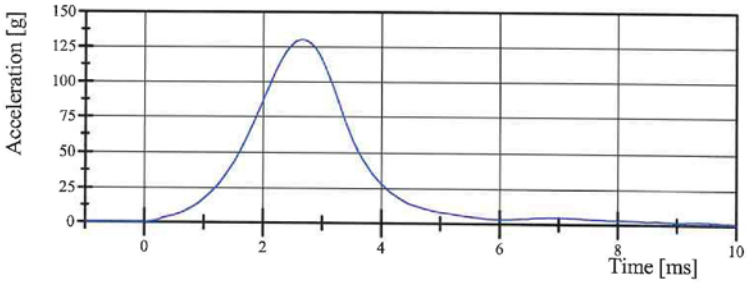
Filter Class: CFC_1000
Max: 103.0 g at 2.6 ms
Min: -4.6 g at 7.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 79.6 g at 2.6 ms
Min: -1.1 g at 7.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 130.2 g at 2.6 ms
Min: 0.0 g at -0.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 09:09:33 358

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

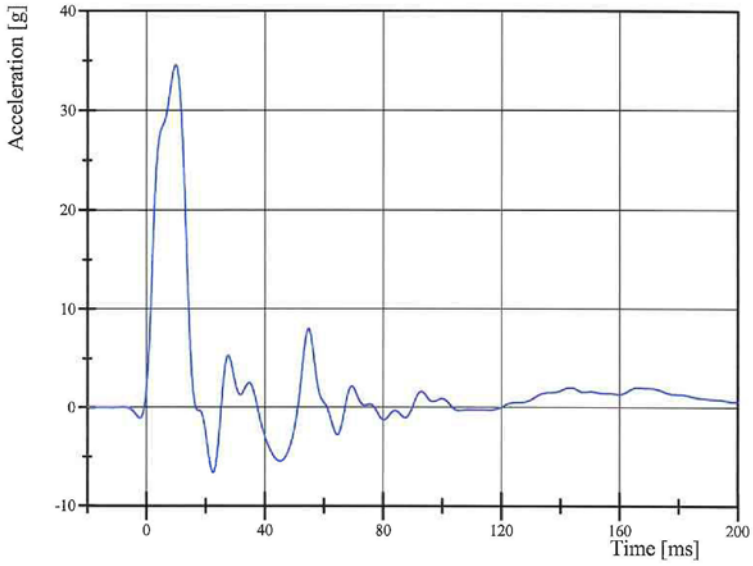
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:33:31 1315

Transportation Research Center Inc.

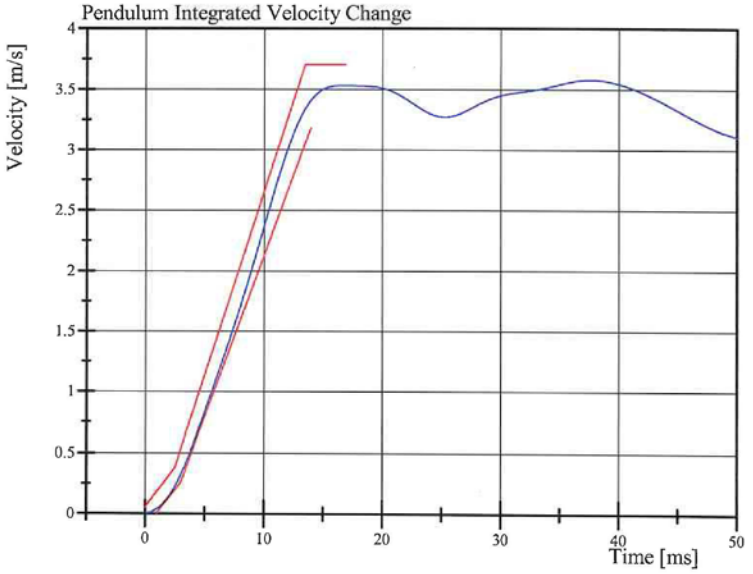
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Pendulum Acceleration



Filter Class: CFC_60
Max: 34.5 g at 9.8 ms
Min: -6.6 g at 22.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 37.5 ms
Min: 0.0 m/s at 0.0 ms

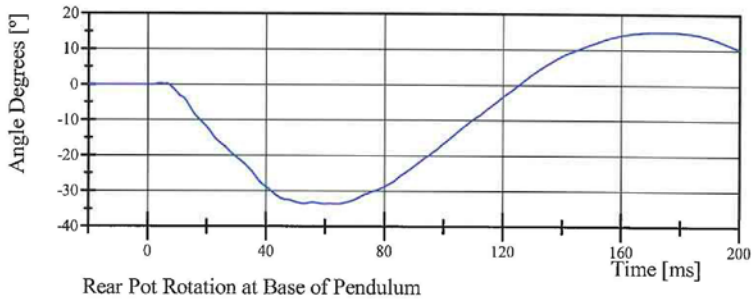
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:33:39 1315

Transportation Research Center Inc.

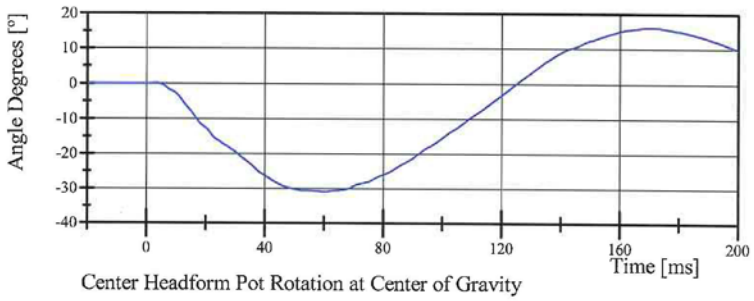
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Forward Pot Rotation at Base of Pendulum



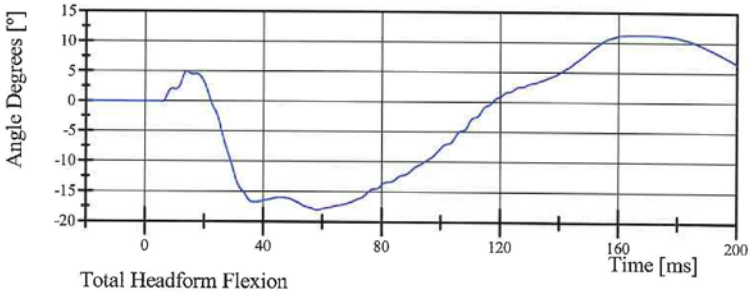
Filter Class: CFC_180
Max: 14.9 ° at 173.1 ms
Min: -33.6 ° at 63.5 ms

Rear Pot Rotation at Base of Pendulum



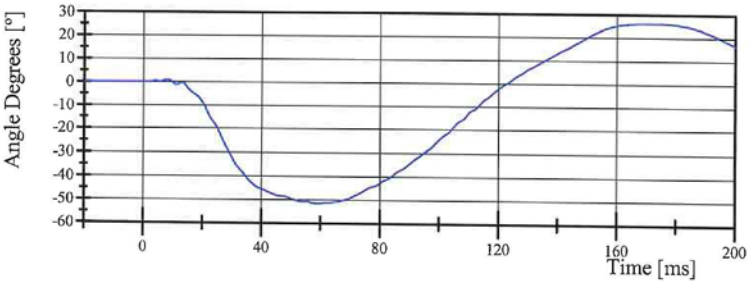
Filter Class: CFC_180
Max: 16.0 ° at 170.1 ms
Min: -31.0 ° at 60.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.2 ° at 167.7 ms
Min: -18.1 ° at 58.2 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 26.1 ° at 171.0 ms
Min: -51.6 ° at 59.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:33:39 1315

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

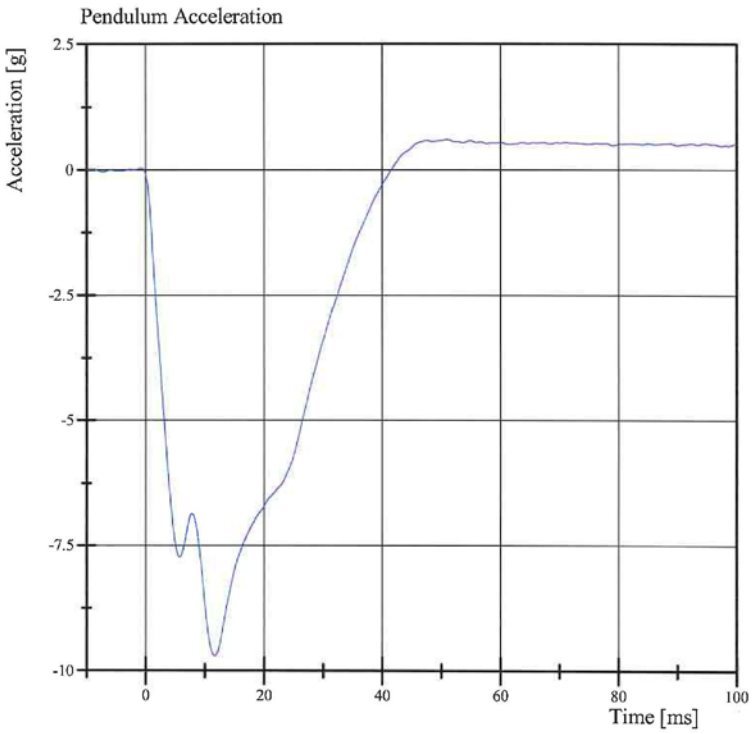
Approved

Specification Source: NHTSA final rule 8/15/2008

02.07.2014 12:49:36 540

Transportation Research Center Inc.

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



Filter Class: CFC_180
Max: 0.6 g at 50.9 ms
Min: -9.7 g at 11.7 ms

Specification Source: NHTSA final rule 8/15/2008

02.07.2014 12:49:42 540

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Drop Height: 816

Technician

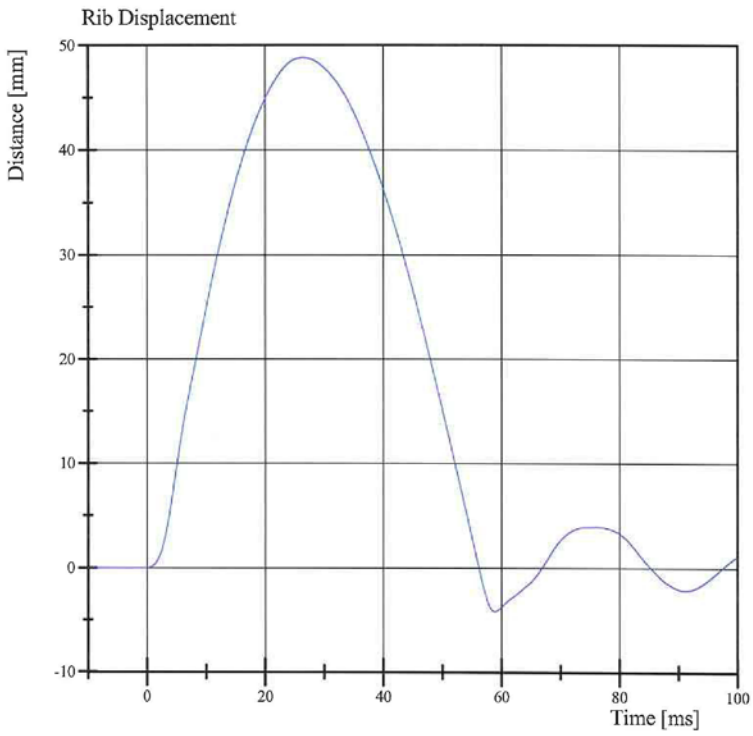
Approved

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:58:58 730

Transportation Research Center Inc.

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



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:59:05 730

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Drop Height: 462

Technician

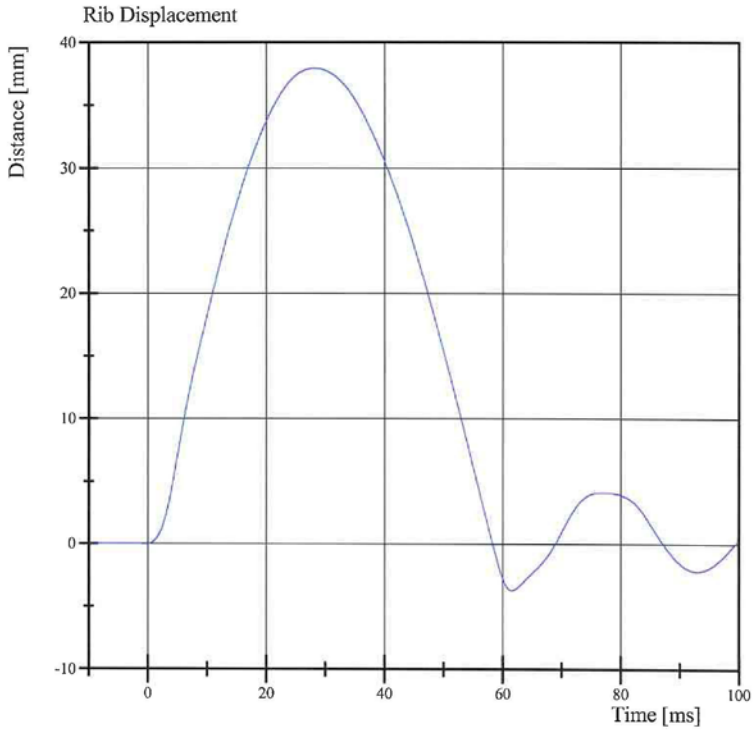
Approved

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:04:57 909

Transportation Research Center Inc.

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



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:05:06 909

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Drop Height: 816

Technician

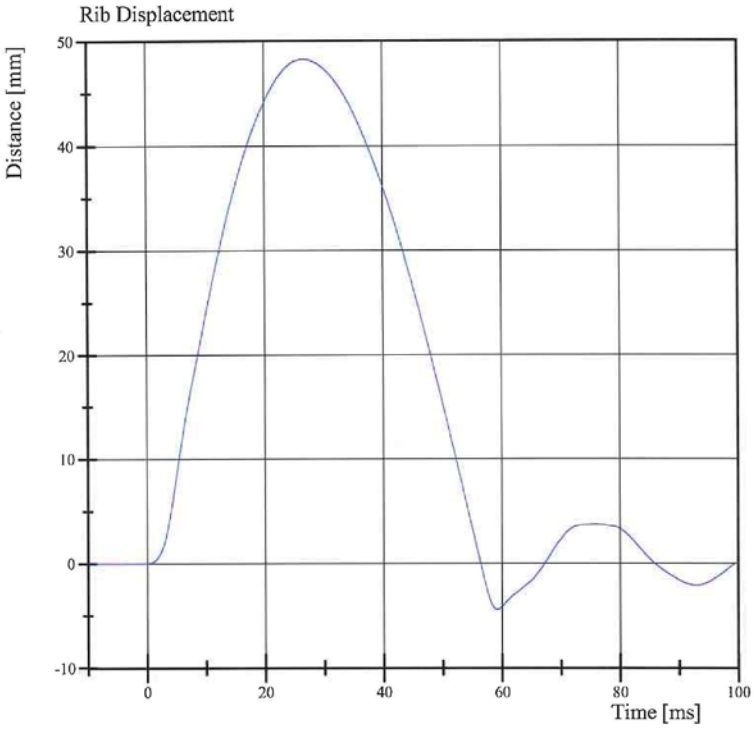
Approved

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:09:17 718

Transportation Research Center Inc.

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



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:09:24 718

Transportation Research Center Inc.

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

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

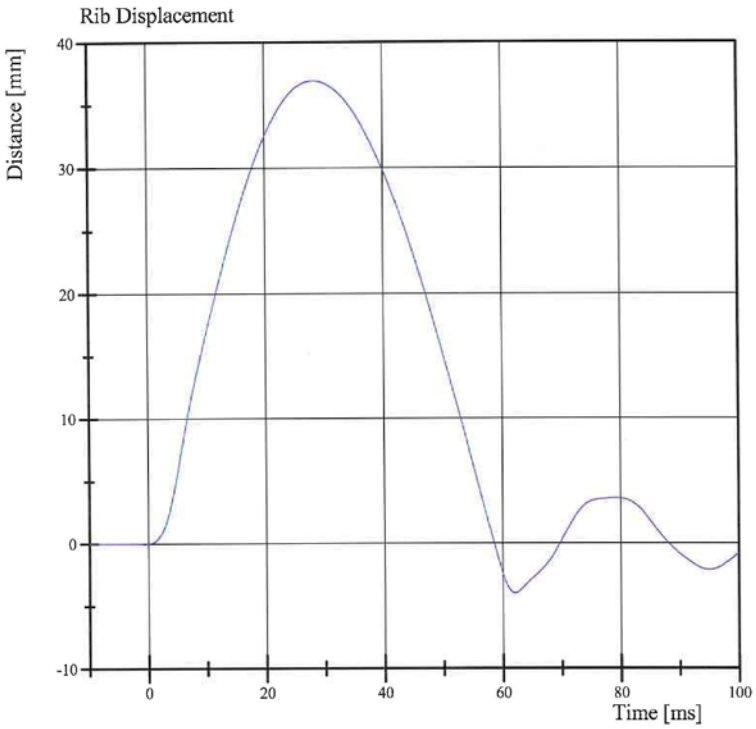
Approved

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:15:02 906

Transportation Research Center Inc.

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



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:15:09 906

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Drop Height: 816

Technician

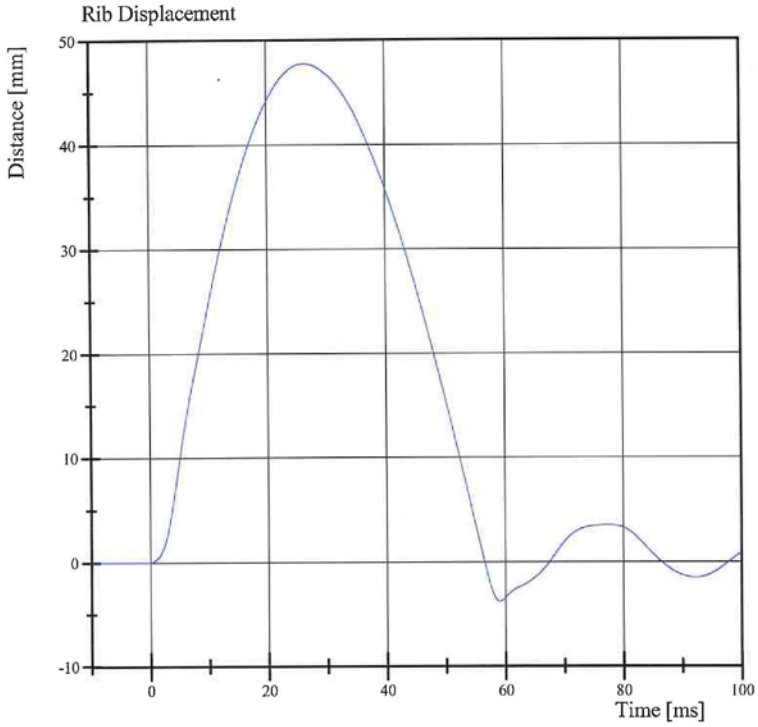
Approved

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:19:27 721

Transportation Research Center Inc.

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



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:19:34 721

Transportation Research Center Inc.

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

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

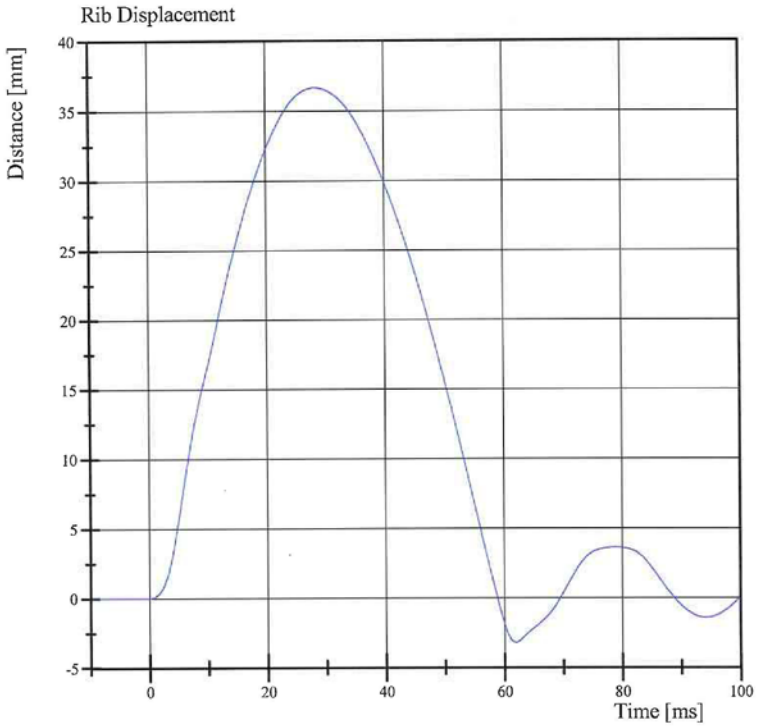
Approved

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:25:11 917

Transportation Research Center Inc.

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



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 11:25:18 917

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

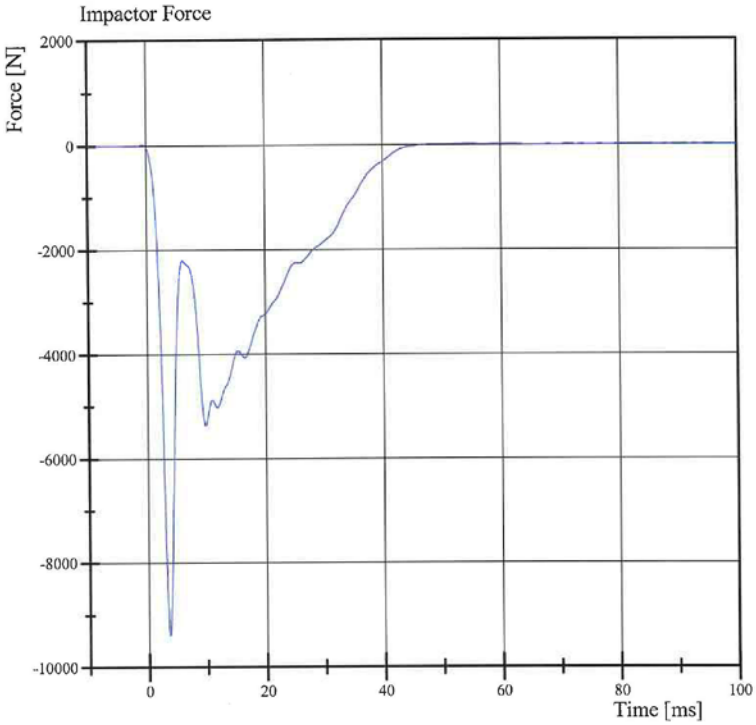
Approved

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

02.07.2014 12:55:20 439

Transportation Research Center Inc.

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



Filter Class: CFC_180
Max: 26.9 N at -0.6 ms
Min: -9,391.2 N at 3.5 ms

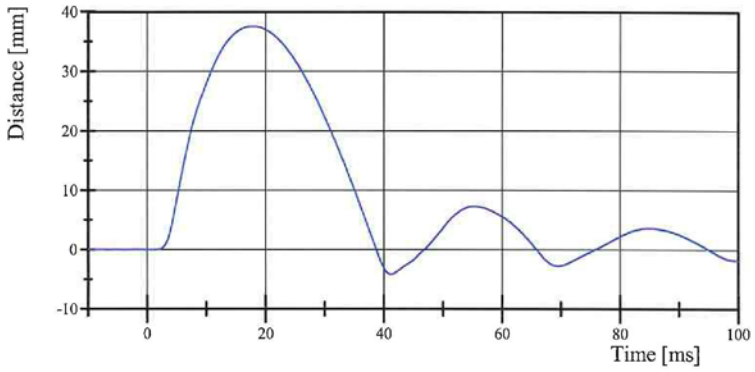
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

02.07.2014 12:55:27 439

Transportation Research Center Inc.

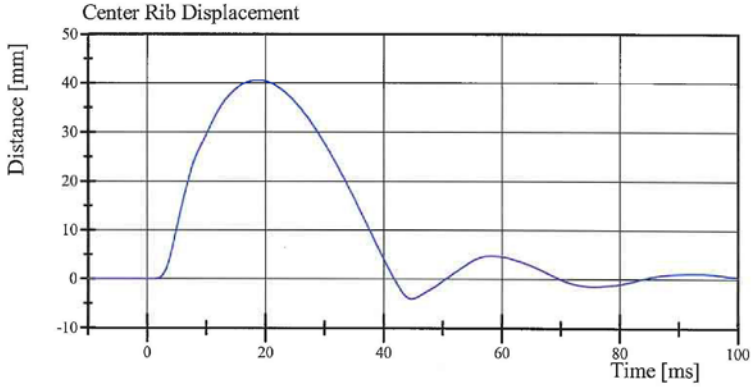
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Upper Rib Displacement



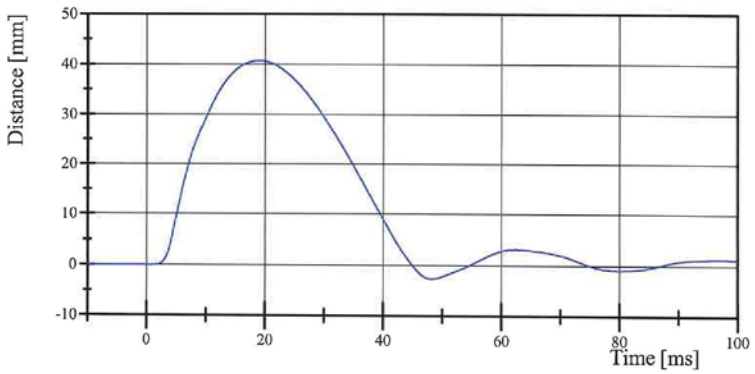
Filter Class: CFC_180
Max: 37.5 mm at 17.8 ms
Min: -4.2 mm at 41.2 ms

Center Rib Displacement



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

Lower Rib Displacement



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

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

02.07.2014 12:55:28 439

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

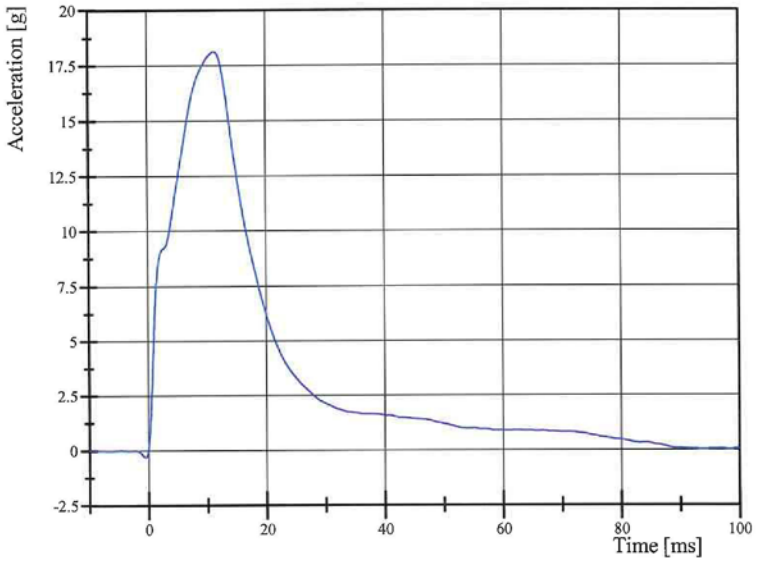
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:57:17 582

Transportation Research Center Inc.

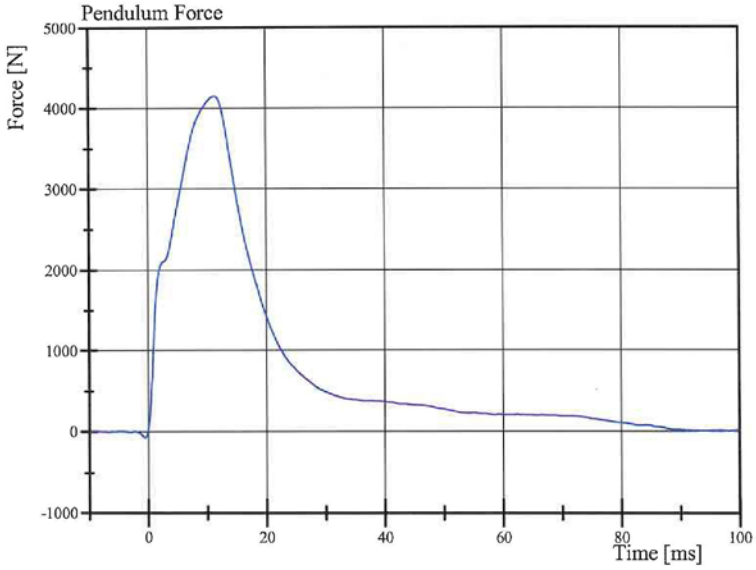
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 23-2
Test Date: 2/7/2014

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.1 g at 11.4 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,149.3 N at 11.4 ms
Min: -69.3 N at -0.5 ms

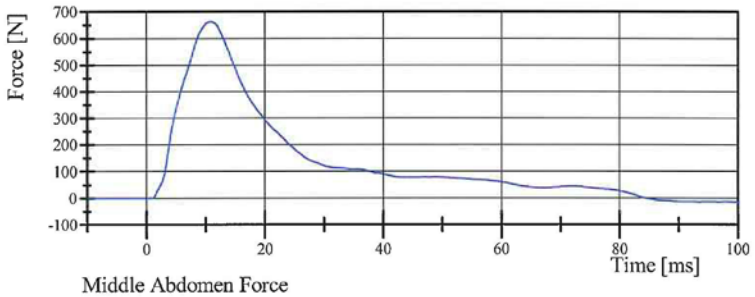
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:57:24 582

Transportation Research Center Inc.

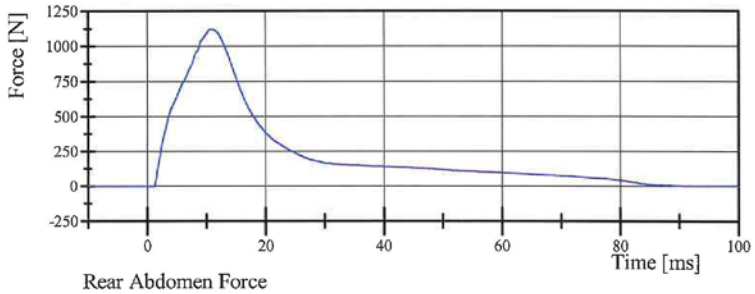
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 23-2
Test Date: 2/7/2014

Front Abdomen Force



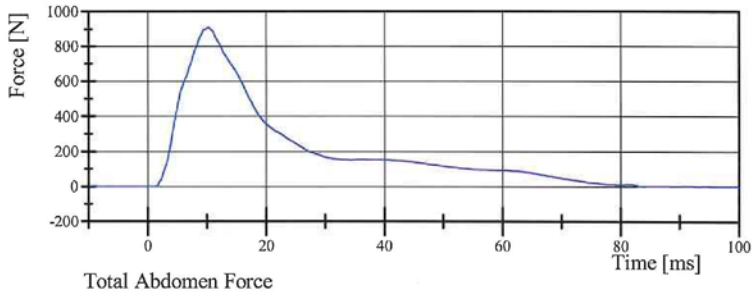
Filter Class: CFC_600
Max: 662.7 N at 10.8 ms
Min: -16.3 N at 100.0 ms

Middle Abdomen Force



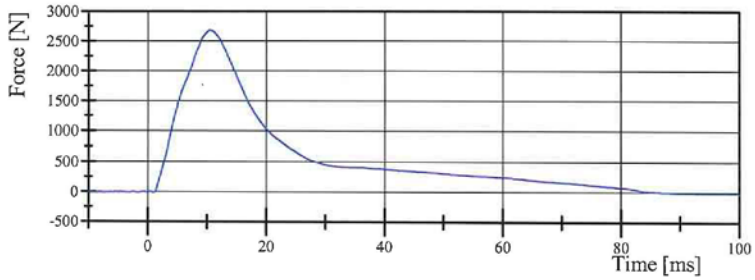
Filter Class: CFC_600
Max: 1,121.4 N at 10.6 ms
Min: -2.4 N at 1.0 ms

Rear Abdomen Force



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

Total Abdomen Force



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:57:24 582

Transportation Research Center Inc.

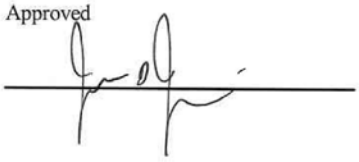
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 23-2
Test Date: 2/7/2014

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

Test meets specifications.

Comments:

Technician 

Approved 

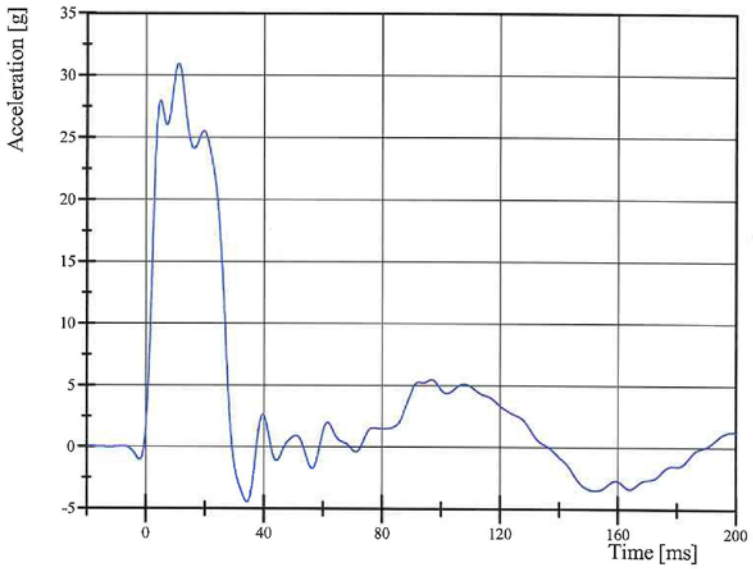
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:11:38 576

Transportation Research Center Inc.

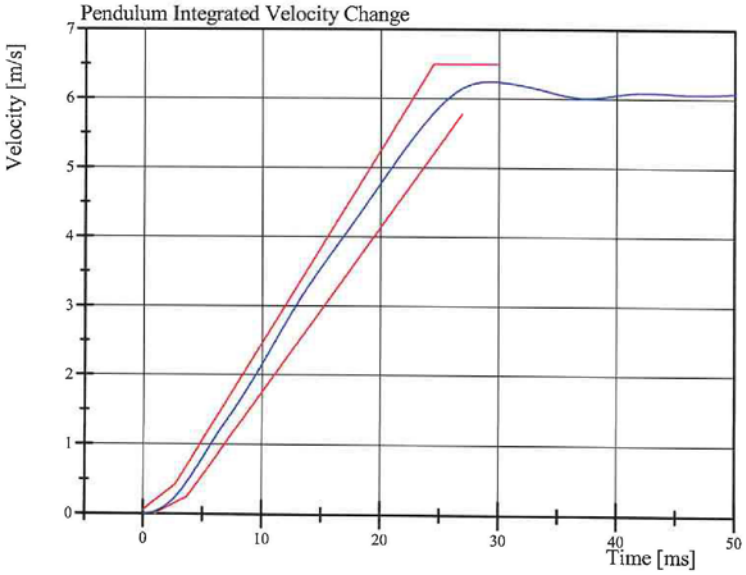
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 23-2
Test Date: 2/7/2014

Pendulum Acceleration



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

Pendulum Integrated Velocity Change



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

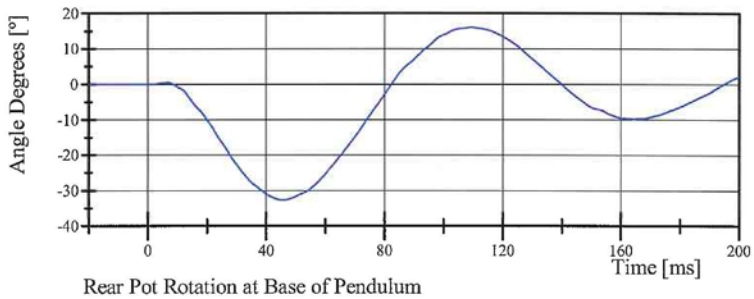
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:11:52 576

Transportation Research Center Inc.

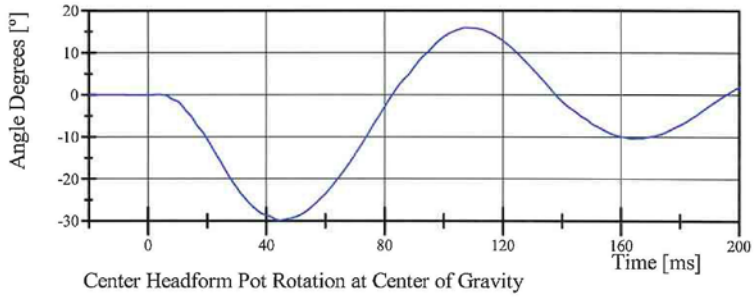
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 23-2
Test Date: 2/7/2014

Forward Pot Rotation at Base of Pendulum



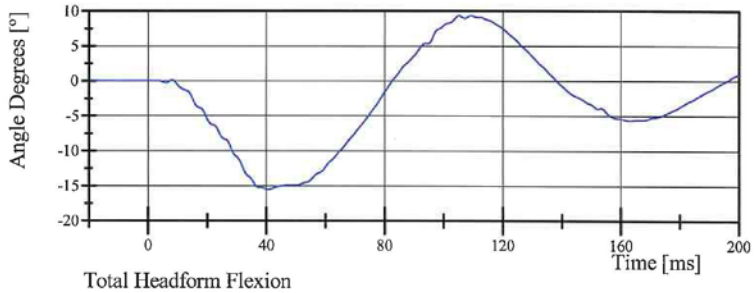
Filter Class: CFC_180
Max: 16.0 ° at 109.3 ms
Min: -32.7 ° at 45.8 ms

Rear Pot Rotation at Base of Pendulum



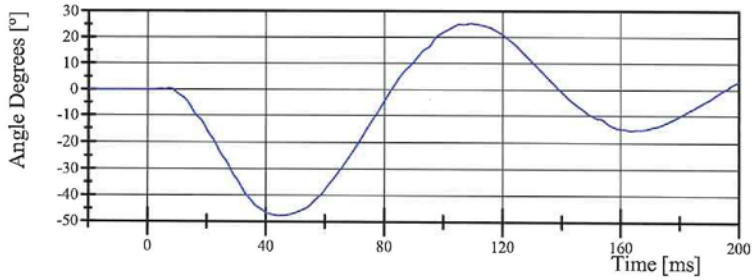
Filter Class: CFC_180
Max: 15.9 ° at 107.5 ms
Min: -29.8 ° at 44.6 ms

Center Headform Pot Rotation at Center of Gravity



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

Total Headform Flexion



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 10:11:53 576

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician 

Approved 

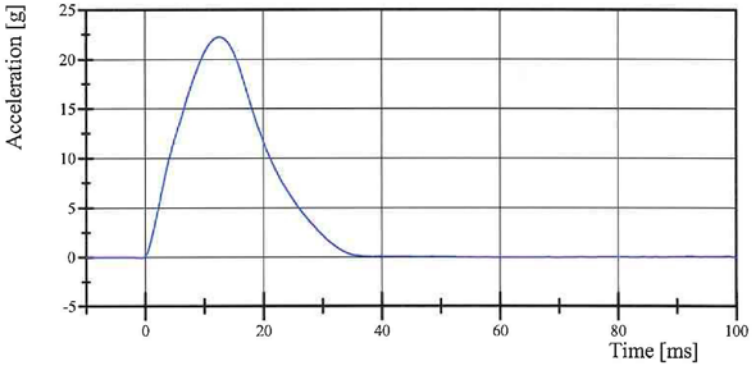
Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:18:41 492

Transportation Research Center Inc.

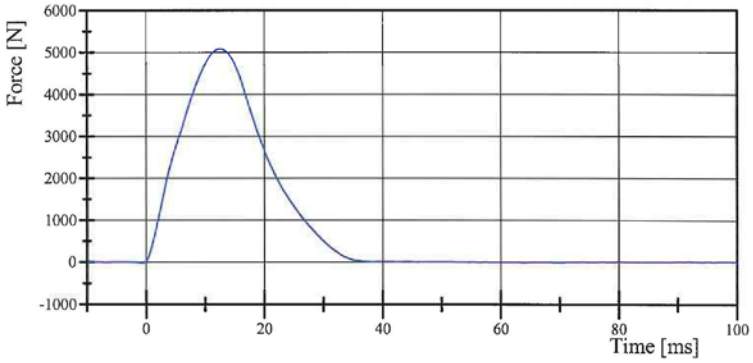
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 23-1
Test Date: 2/7/2014

Pendulum Acceleration



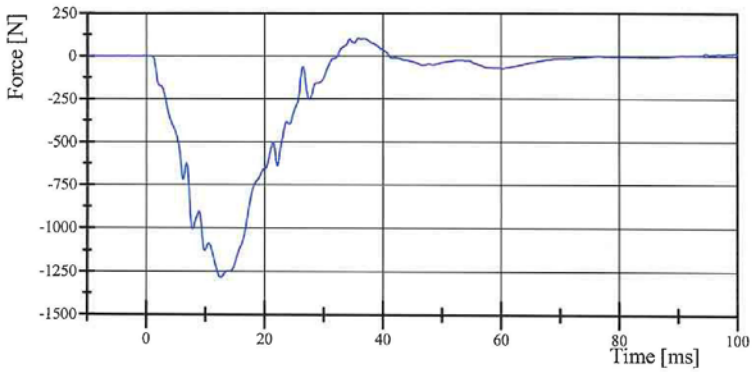
Filter Class: CFC_180
Max: 22.2 g at 12.6 ms
Min: -0.1 g at -0.7 ms

Pendulum Force



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

Pubic Symphysis Force



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

Specification Source: NHTSA Final Rule 8/15/2008

02.07.2014 13:18:47 492

Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.027

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	444	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	102	Yes
F	Thigh Clearance	119.0 - 135.0	126	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	526	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	427	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	866	Yes
Z	Waist Circumference	761.0 - 791.0	776	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	122.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

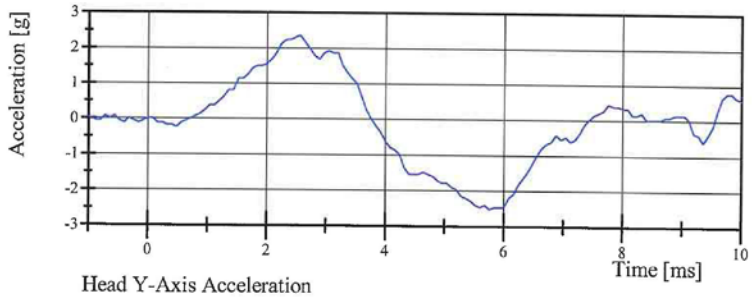
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 13:22:39 232

Transportation Research Center Inc.

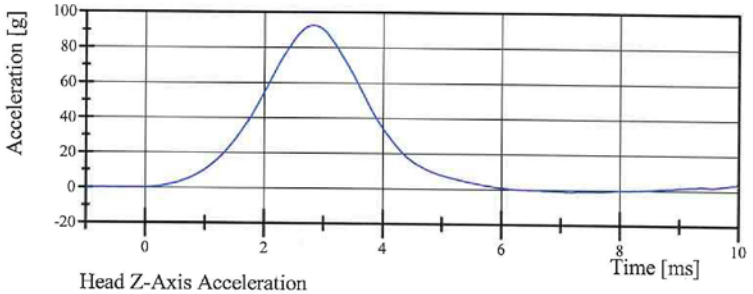
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Head X-Axis Acceleration



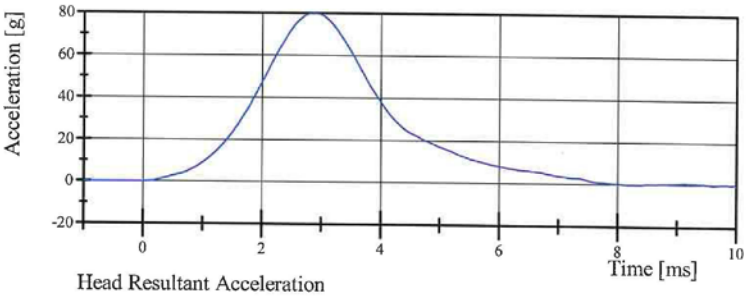
Filter Class: CFC_1000
Max: 2.4 g at 2.6 ms
Min: -2.5 g at 5.8 ms

Head Y-Axis Acceleration



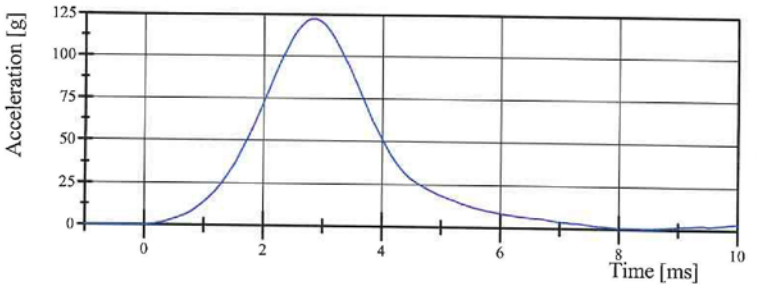
Filter Class: CFC_1000
Max: 92.5 g at 2.8 ms
Min: -1.3 g at 7.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 80.0 g at 2.9 ms
Min: -0.3 g at 9.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 122.2 g at 2.9 ms
Min: 0.0 g at 0.0 ms

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

01.30.2014 13:22:48 232

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.598 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.585 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.755 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.066 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.811 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.816 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-77.0 deg	Yes
Time of Peak	50 - 70 ms	65.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.6 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	119.8 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

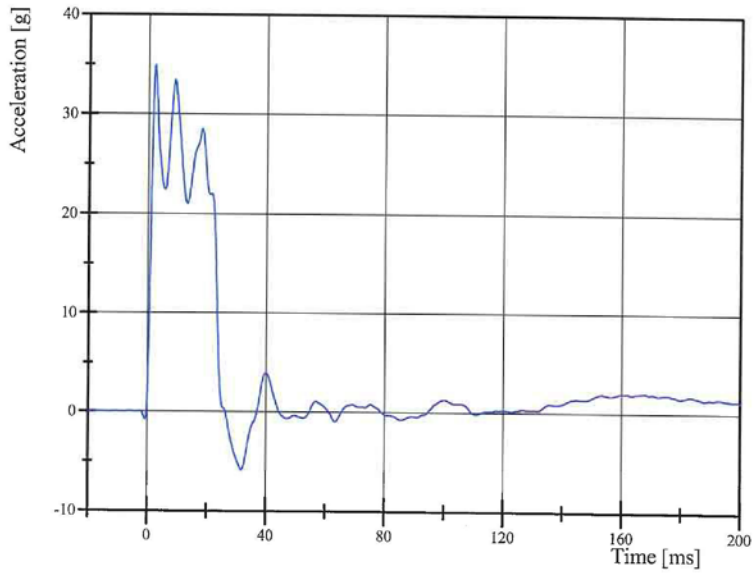
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 13:55:25 638

Transportation Research Center Inc.

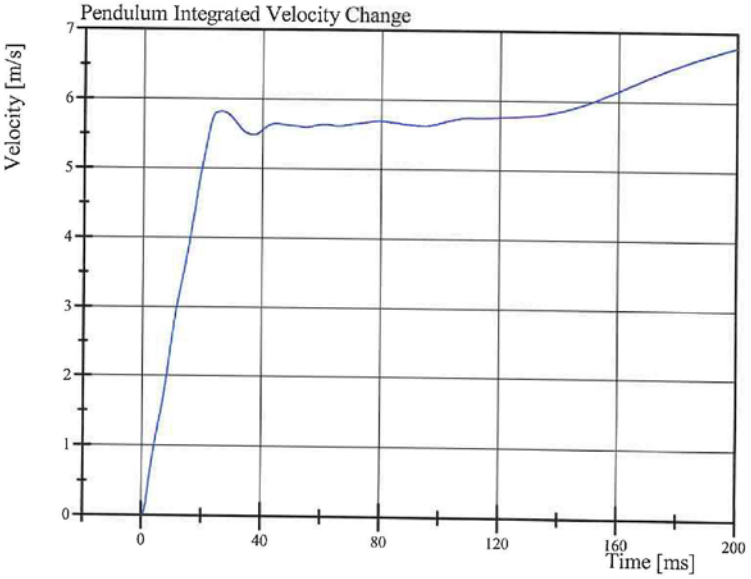
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Pendulum Acceleration



Filter Class: CFC_180
Max: 34.9 g at 2.2 ms
Min: -5.8 g at 31.8 ms

Pendulum Integrated Velocity Change



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

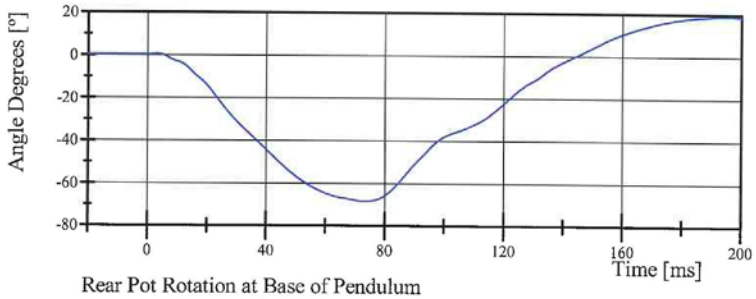
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 13:55:35 638

Transportation Research Center Inc.

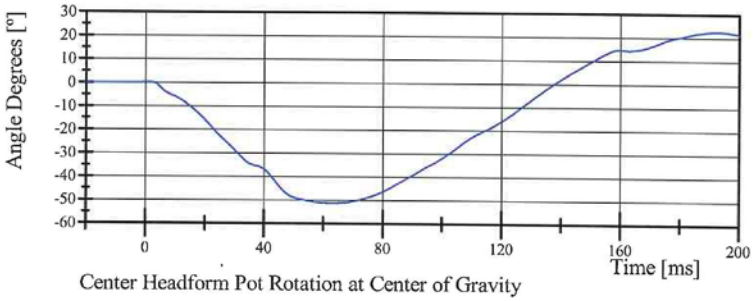
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Forward Pot Rotation at Base of Pendulum



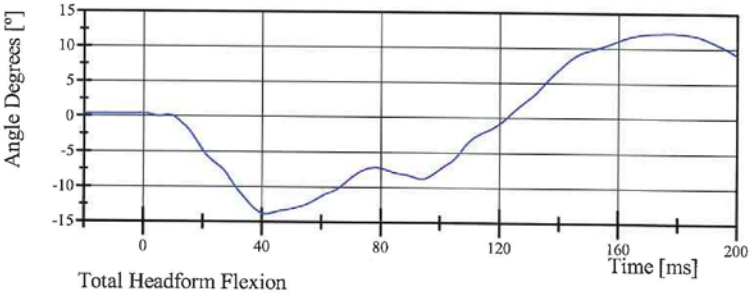
Filter Class: CFC_60
Max: 19.0 ° at 194.1 ms
Min: -68.4 ° at 73.5 ms

Rear Pot Rotation at Base of Pendulum



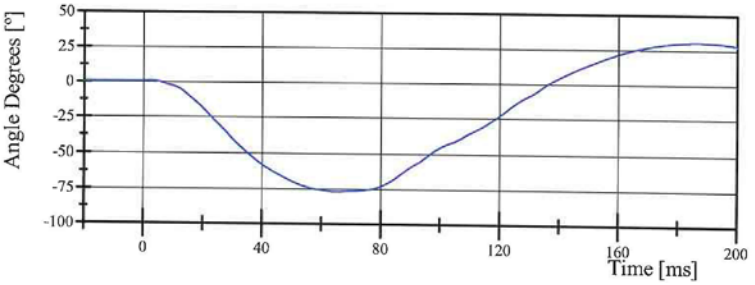
Filter Class: CFC_60
Max: 22.5 ° at 192.6 ms
Min: -51.4 ° at 63.0 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.2 ° at 177.0 ms
Min: -13.9 ° at 41.3 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 30.2 ° at 186.1 ms
Min: -77.0 ° at 65.0 ms

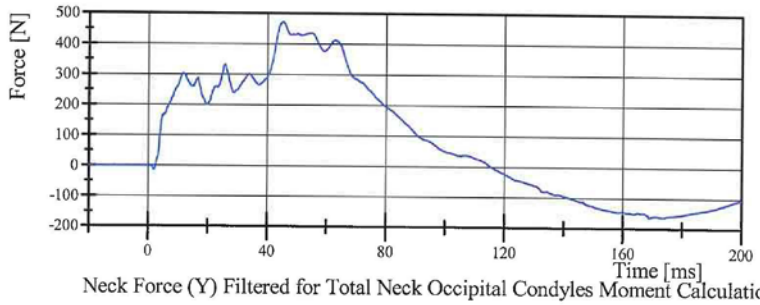
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 13:55:36 638

Transportation Research Center Inc.

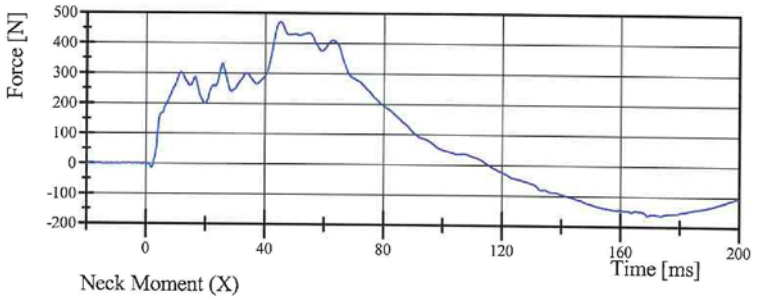
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Neck Force (Y)



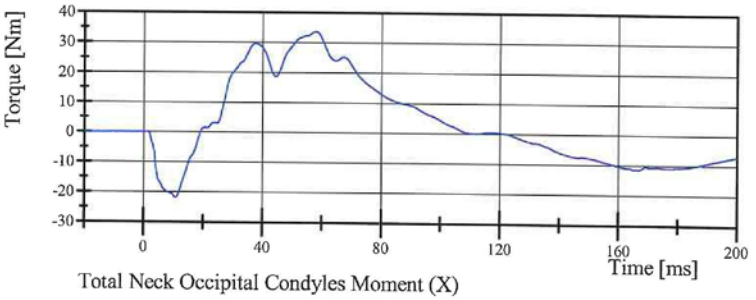
Filter Class: CFC_1000
Max: 471.5 N at 45.3 ms
Min: -165.0 N at 169.2 ms

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



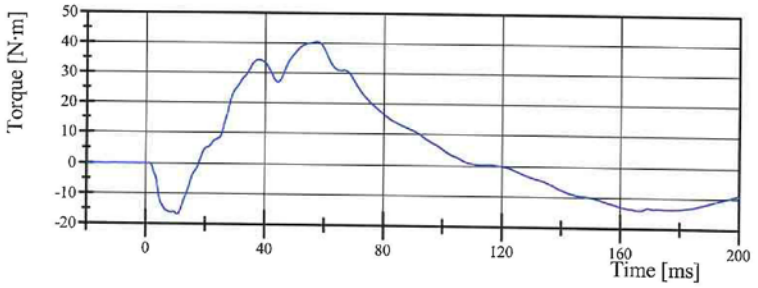
Filter Class: CFC_600
Max: 471.1 N at 45.1 ms
Min: -164.4 N at 169.0 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.6 Nm at 57.8 ms
Min: -21.9 Nm at 10.8 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Consta
Max: 40.6 N·m at 57.3 ms
Min: -16.8 N·m at 10.6 ms

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

01.30.2014 13:55:37 638

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °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	-16.1 g	Yes
Shoulder Displacement	28 - 37 mm	30.4 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	20.4 g	Yes

Test meets specifications.

Comments:

Technician

Approved

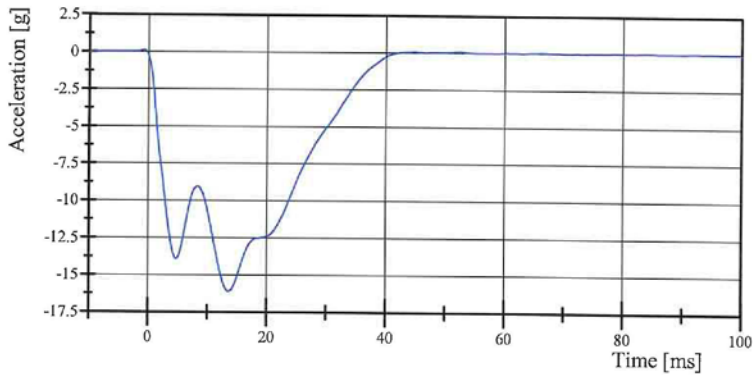
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 15:58:10 850

Transportation Research Center Inc.

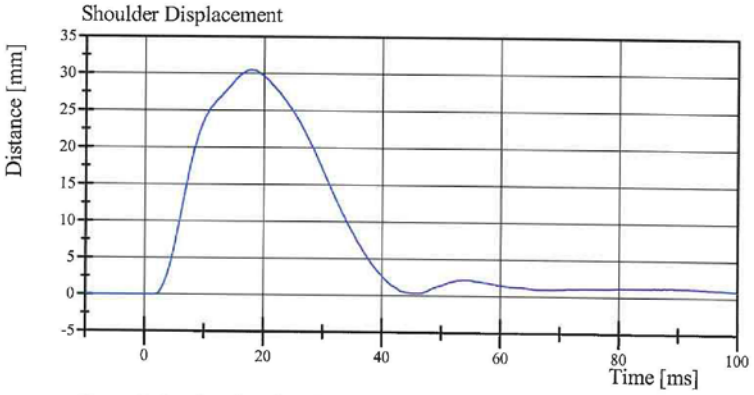
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Probe Acceleration



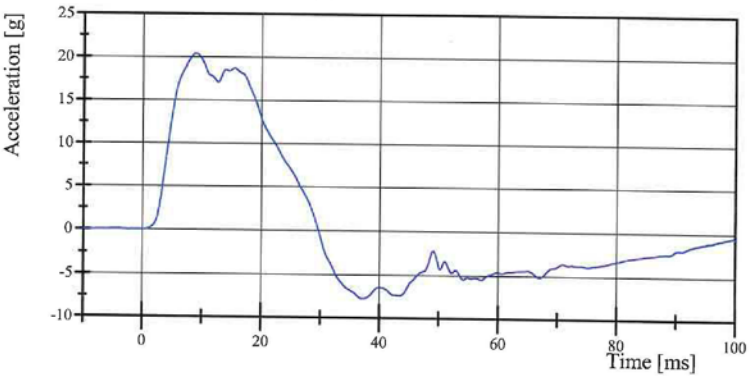
Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -16.1 g at 13.6 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 30.4 mm at 17.7 ms
Min: -0.0 mm at 1.3 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 20.4 g at 8.9 ms
Min: -7.7 g at 37.3 ms

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

01.30.2014 15:59:00 850

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.707 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.3 g	Yes
Shoulder Displacement	31 - 40 mm	34.8 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.4 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.0 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.0 g	Yes

Test meets specifications.

Comments:

Technician

Approved

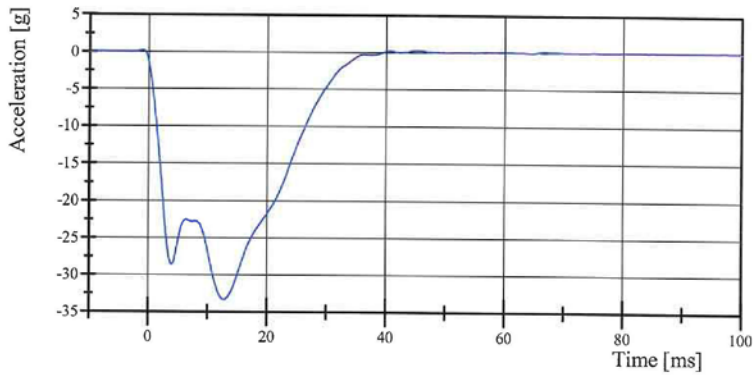
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 16:29:14 602

Transportation Research Center Inc.

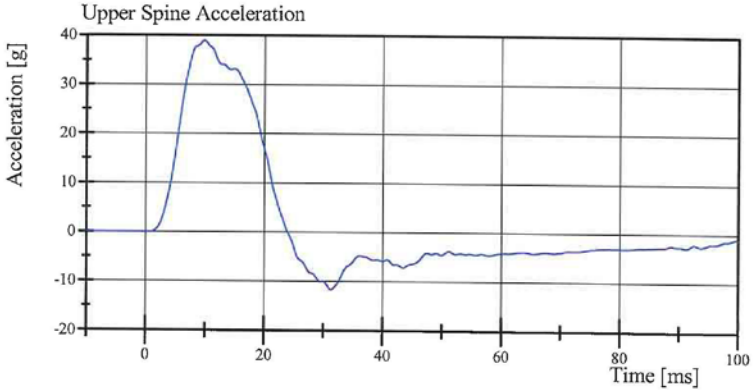
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Probe Acceleration



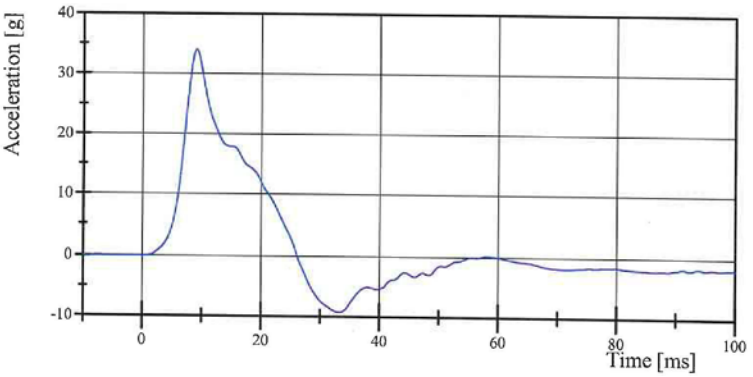
Filter Class: CFC_180
Max: 0.3 g at 45.2 ms
Min: -33.3 g at 12.8 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 39.0 g at 9.8 ms
Min: -11.7 g at 31.3 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.0 g at 9.0 ms
Min: -9.3 g at 33.3 ms

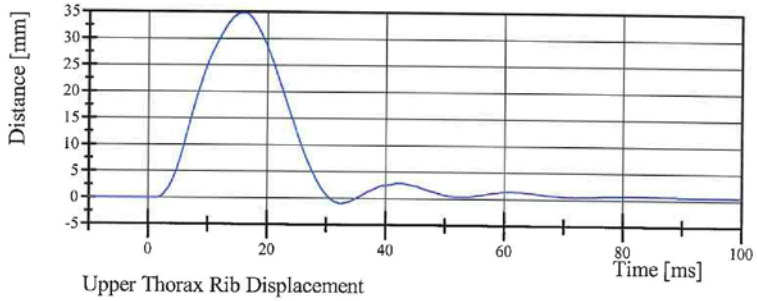
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 16:29:25 602

Transportation Research Center Inc.

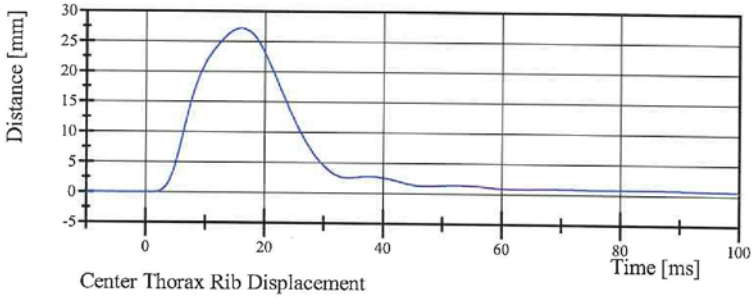
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Shoulder Rib Displacement



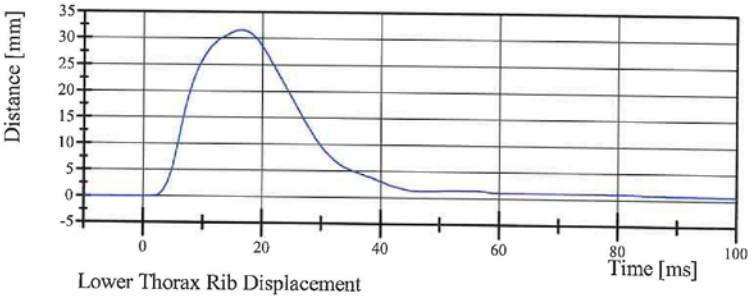
Filter Class: CFC_600
Max: 34.8 mm at 16.0 ms
Min: -1.0 mm at 32.5 ms

Upper Thorax Rib Displacement



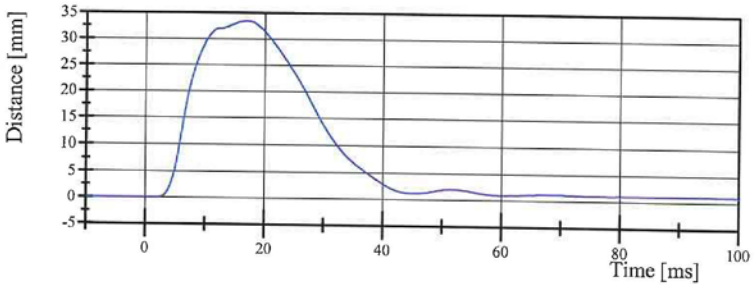
Filter Class: CFC_600
Max: 27.2 mm at 16.0 ms
Min: -0.0 mm at 0.9 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.5 mm at 16.3 ms
Min: -0.0 mm at 0.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.4 mm at 17.0 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.

01.30.2014 16:29:26 602

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/31/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.383 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.1 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.8 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.8 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.3 g	Yes

Test meets specifications.

Comments:

Technician

Approved

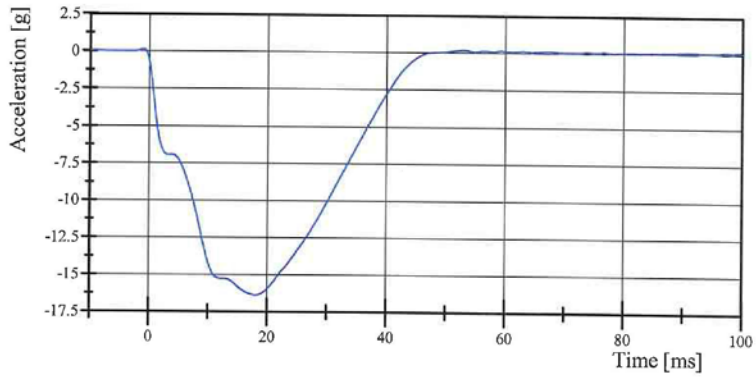
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.31.2014 07:38:25 842

Transportation Research Center Inc.

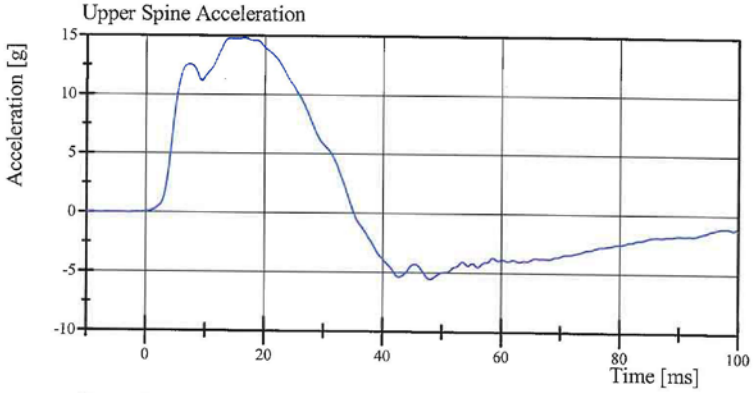
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/31/2014

Probe Acceleration



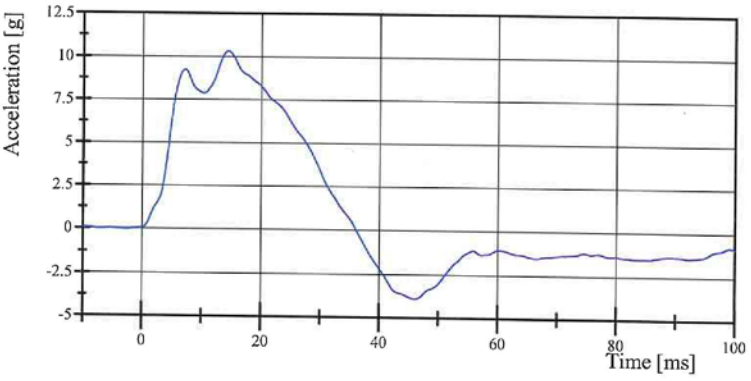
Filter Class: CFC_180
Max: 0.2 g at 52.9 ms
Min: -16.4 g at 18.1 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.8 g at 16.5 ms
Min: -5.5 g at 48.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.3 g at 14.4 ms
Min: -3.9 g at 46.1 ms

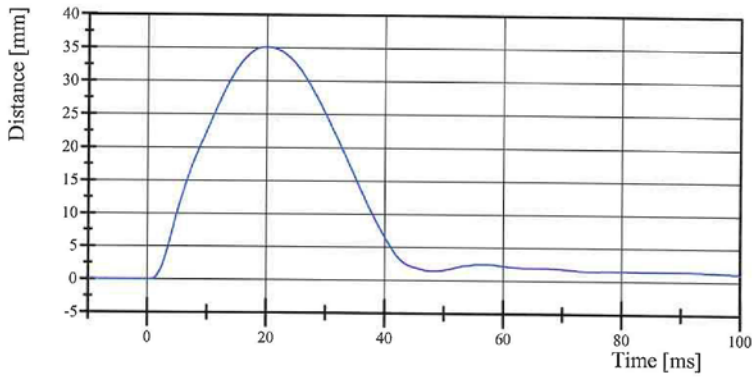
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.31.2014 07:38:34 842

Transportation Research Center Inc.

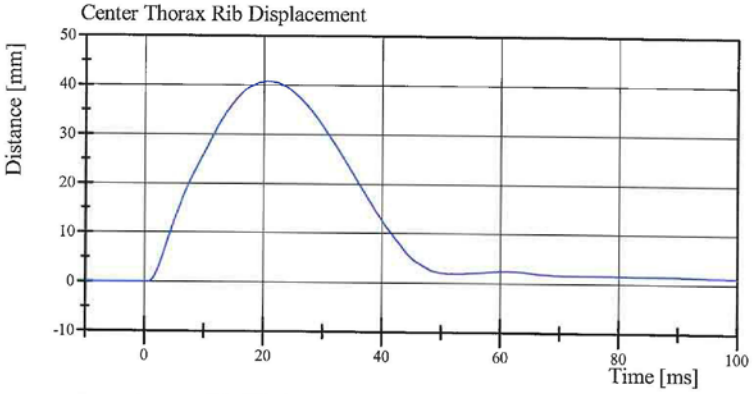
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/31/2014

Upper Thorax Rib Displacement



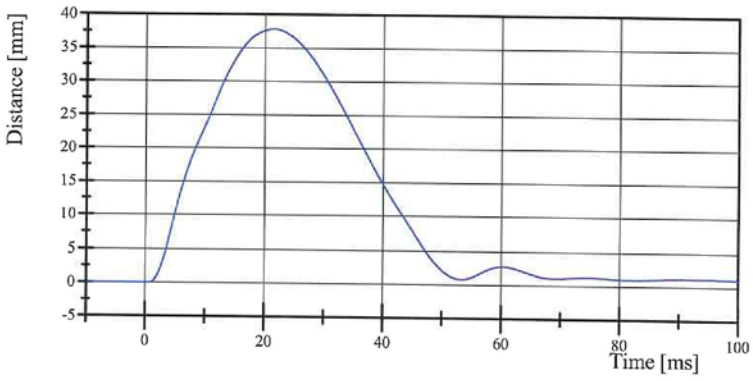
Filter Class: CFC_600
Max: 35.1 mm at 19.8 ms
Min: -0.0 mm at -7.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.8 mm at 20.7 ms
Min: -0.0 mm at -7.5 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.8 mm at 21.4 ms
Min: -0.0 mm at -3.0 ms

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

01.31.2014 07:38:34 842

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.5 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	44.1 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	35.9 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.38 g	Yes

Test meets specifications.

Comments:

Technician

Approved

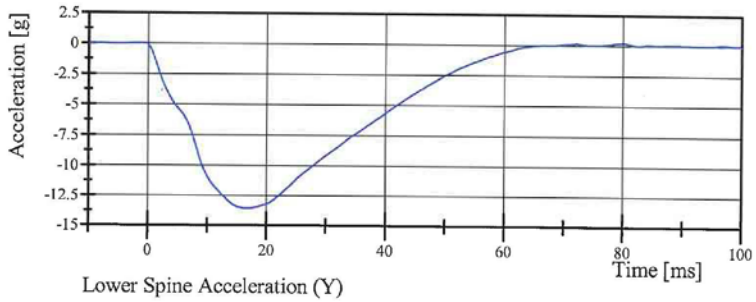
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.30.2014 16:41:45 664

Transportation Research Center Inc.

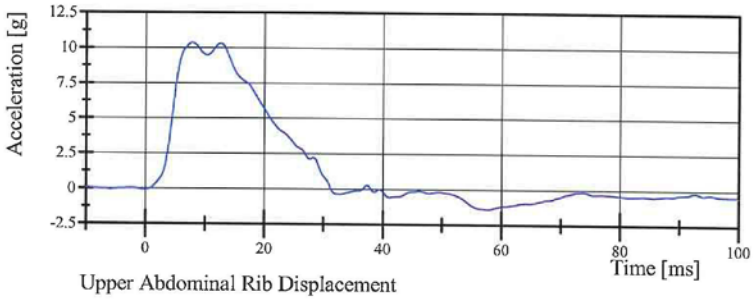
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/30/2014

Probe Acceleration



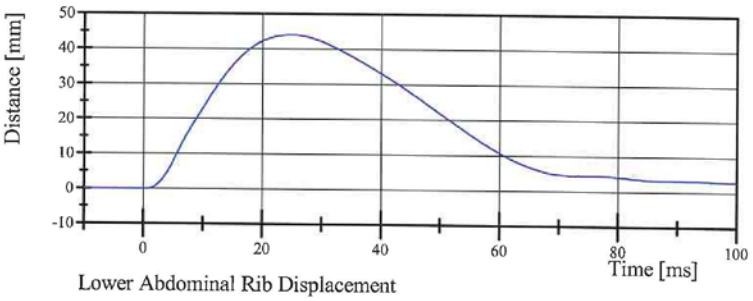
Filter Class: CFC_180
Max: 0.2 g at 79.8 ms
Min: -13.5 g at 16.9 ms

Lower Spine Acceleration (Y)



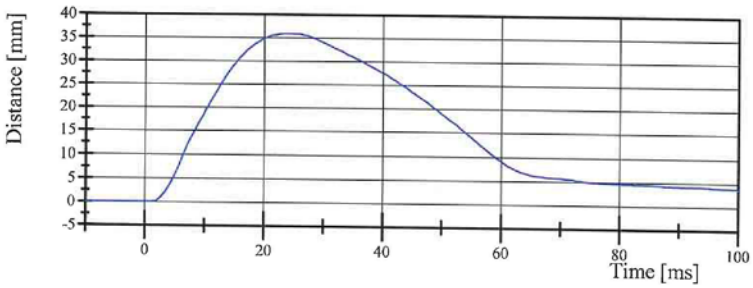
Filter Class: CFC_180
Max: 10.4 g at 7.8 ms
Min: -1.4 g at 57.6 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 44.1 mm at 24.6 ms
Min: -0.0 mm at 0.6 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 35.9 mm at 23.9 ms
Min: -0.0 mm at -6.8 ms

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

01.30.2014 16:41:52 664

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 27-2
Test Date: 1/31/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.64 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-42.53 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.8 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,177.6 N	Yes

Test meets specifications.

Comments:

Technician

Approved

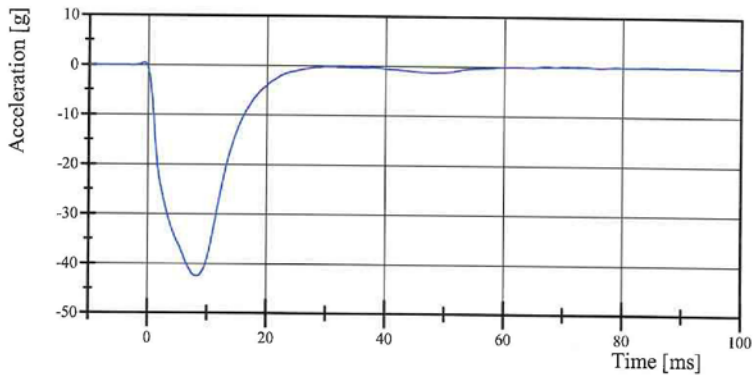
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.31.2014 10:52:18 455

Transportation Research Center Inc.

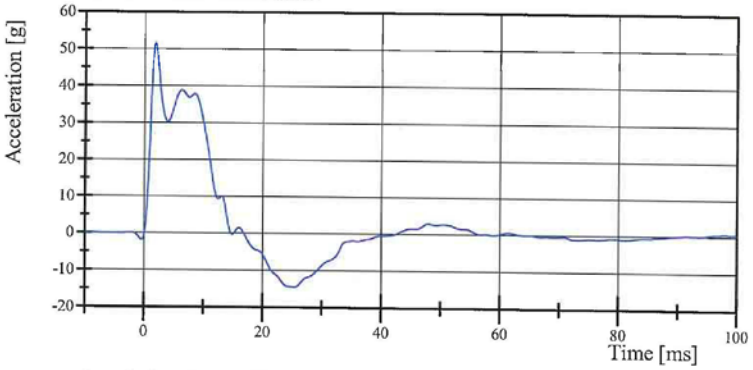
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 27-2
Test Date: 1/31/2014

Probe Acceleration



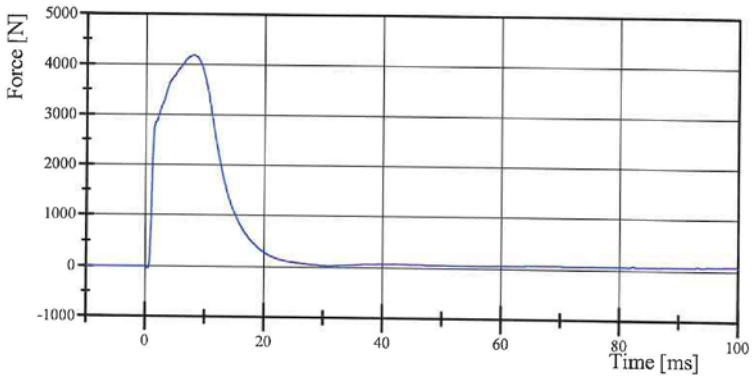
Filter Class: CFC_180
Max: 0.5 g at -0.6 ms
Min: -42.5 g at 8.2 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 51.7 g at 1.8 ms
Min: -14.5 g at 25.4 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,177.6 N at 8.0 ms
Min: -34.8 N at 0.5 ms

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

01.31.2014 10:52:29 455

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/31/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.5 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	32.8 g	Yes
Iliac Force	4,100 - 5,100 N	5,050.4 N	Yes

Test meets specifications.

Comments:

Technician

Approved

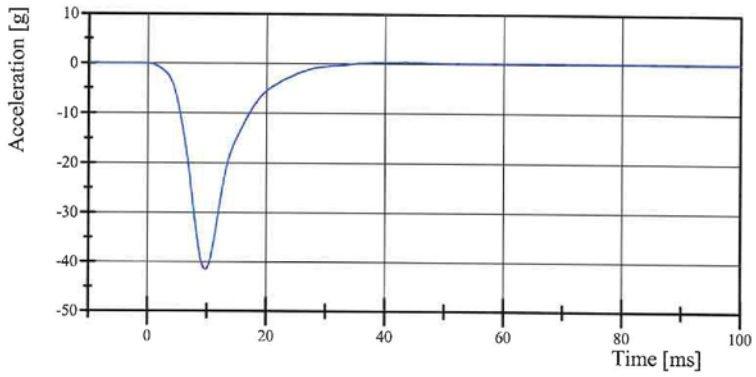
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.31.2014 07:22:22 680

Transportation Research Center Inc.

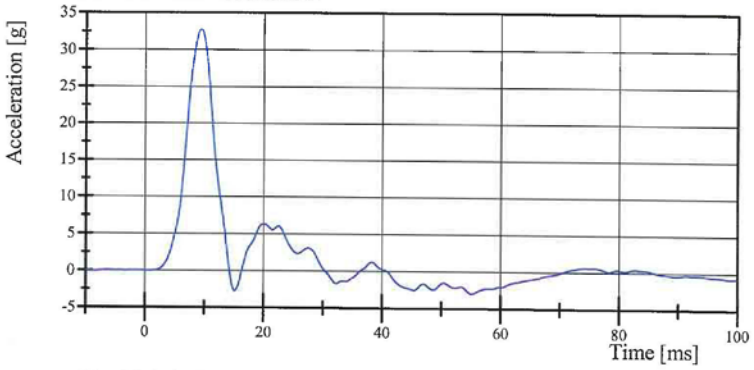
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 27-1
Test Date: 1/31/2014

Probe Acceleration



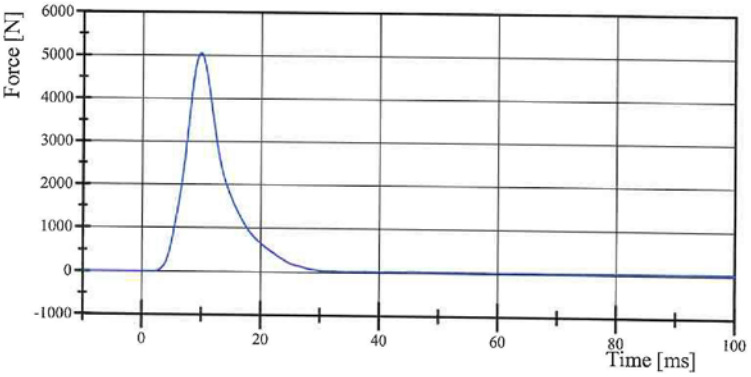
Filter Class: CFC_180
Max: 0.3 g at 43.4 ms
Min: -41.5 g at 9.8 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 32.8 g at 9.4 ms
Min: -2.9 g at 55.1 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 5,050.4 N at 9.8 ms
Min: -1.1 N at -8.1 ms

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

01.31.2014 07:22:29 680

Post-Test Calibration Sheets
Passenger S/N 305

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

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	102	Yes
F	Thigh Clearance	119.0 - 135.0	126	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	527	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	427	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	866	Yes
Z	Waist Circumference	761.0 - 791.0	777	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

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

Test meets specifications.

Comments:

Technician

Approved

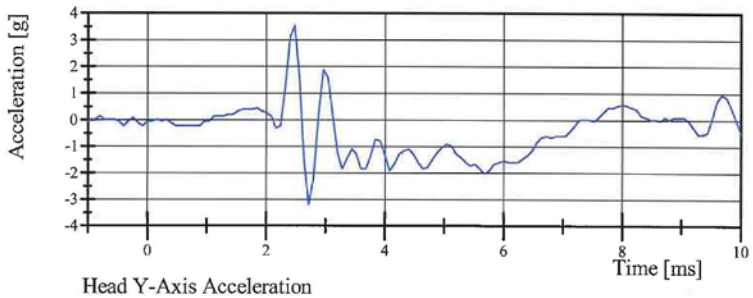
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 08:45:23 230

Transportation Research Center Inc.

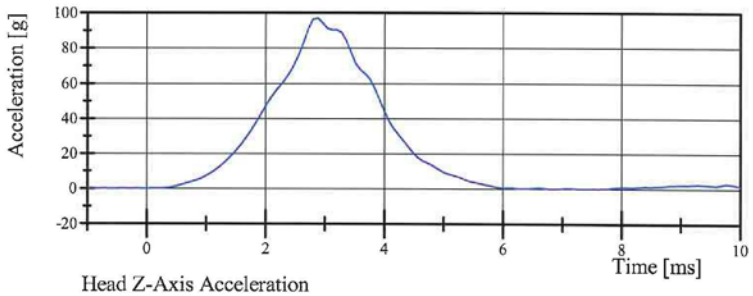
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Head X-Axis Acceleration



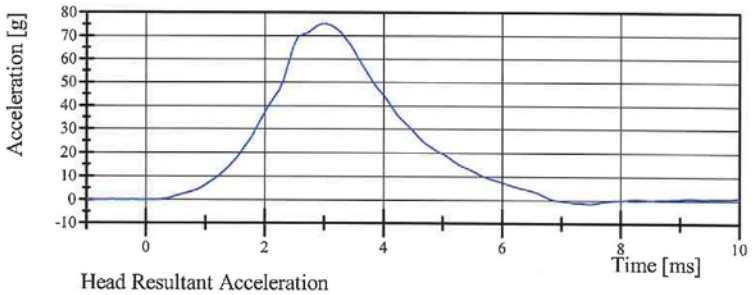
Filter Class: CFC_1000
Max: 3.5 g at 2.5 ms
Min: -3.2 g at 2.7 ms

Head Y-Axis Acceleration



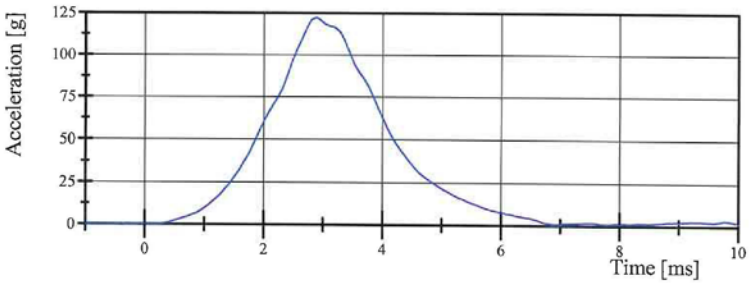
Filter Class: CFC_1000
Max: 97.1 g at 2.9 ms
Min: -0.2 g at 6.8 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 75.2 g at 3.0 ms
Min: -1.6 g at 7.4 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 122.2 g at 2.9 ms
Min: 0.0 g at -0.9 ms

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

02.10.2014 08:45:33 230

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

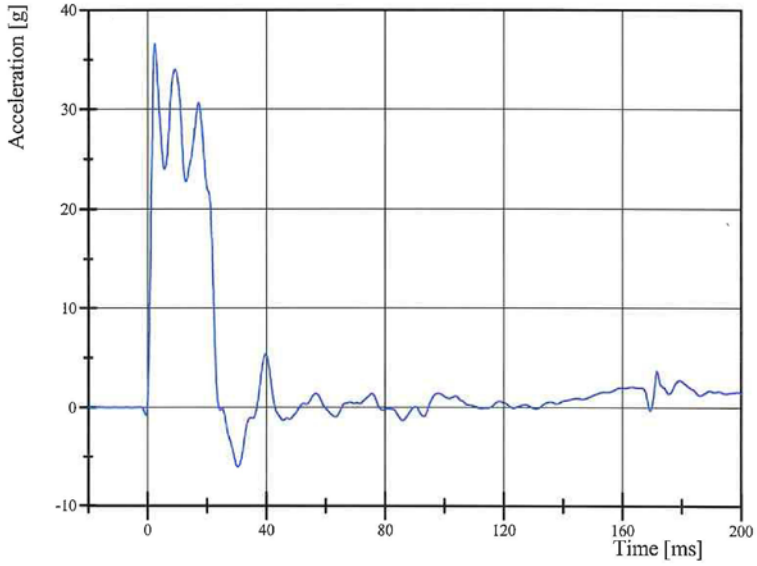
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 12:32:54 635

Transportation Research Center Inc.

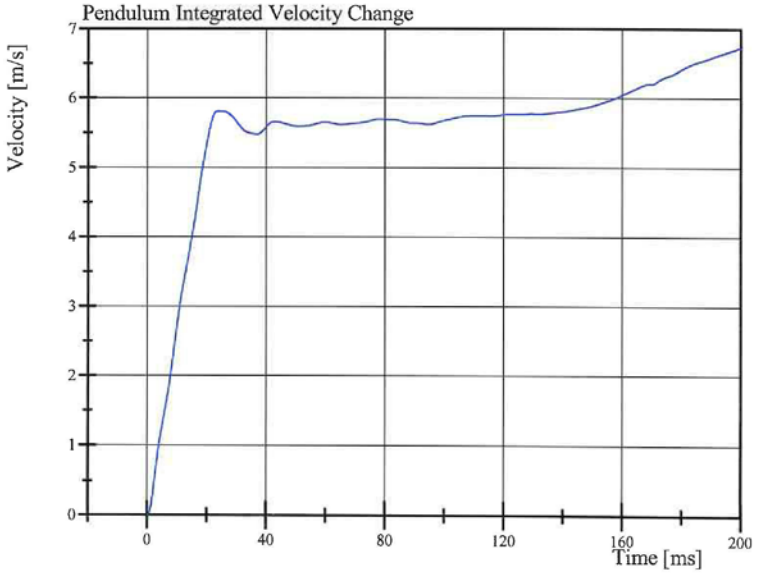
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 28-3
Test Date: 2/10/2014

Pendulum Acceleration



Filter Class: CFC_180
Max: 36.6 g at 2.4 ms
Min: -6.0 g at 30.3 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

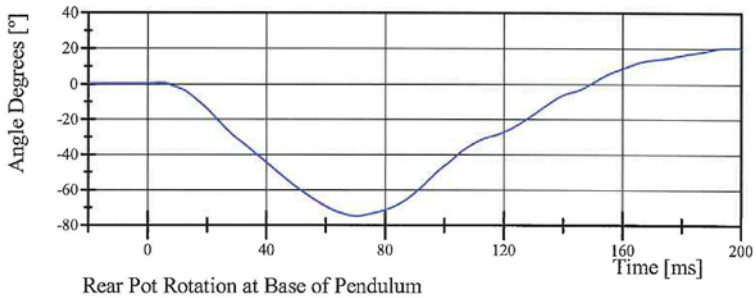
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 12:33:01 635

Transportation Research Center Inc.

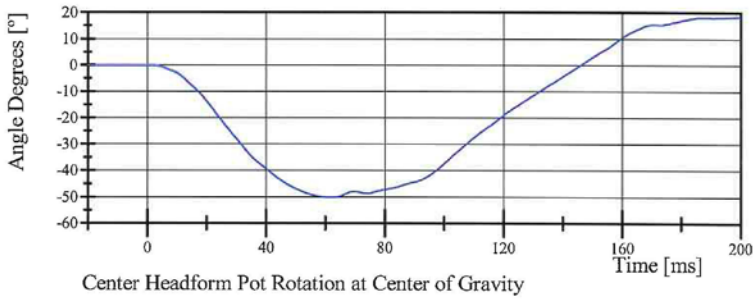
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 28-3
Test Date: 2/10/2014

Forward Pot Rotation at Base of Pendulum



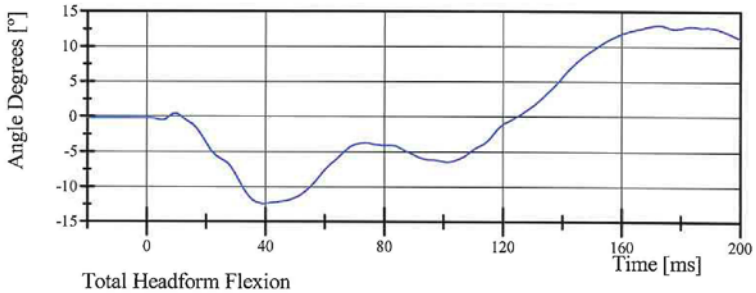
Filter Class: CFC_60
Max: 20.1 ° at 195.7 ms
Min: -74.8 ° at 70.3 ms

Rear Pot Rotation at Base of Pendulum



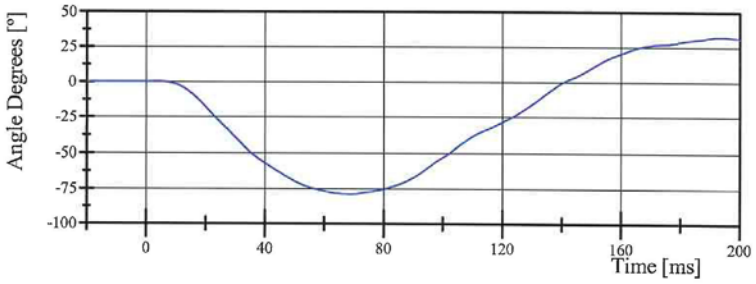
Filter Class: CFC_60
Max: 18.2 ° at 199.1 ms
Min: -50.1 ° at 62.1 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.0 ° at 172.6 ms
Min: -12.4 ° at 39.3 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 32.2 ° at 193.6 ms
Min: -78.8 ° at 68.8 ms

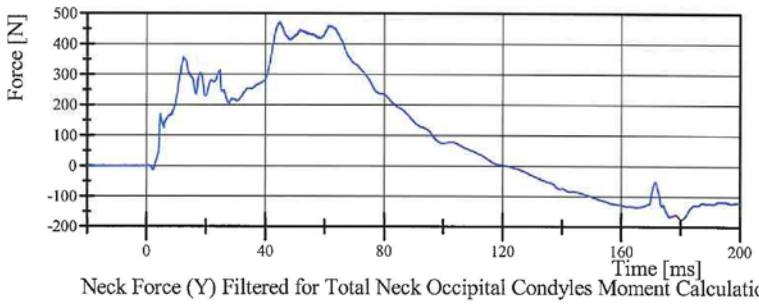
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 12:33:02 635

Transportation Research Center Inc.

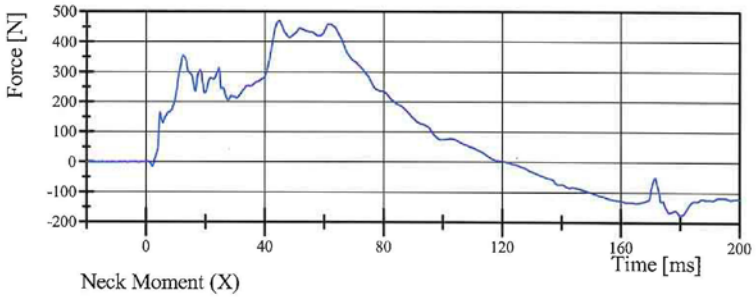
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 28-3
Test Date: 2/10/2014

Neck Force (Y)



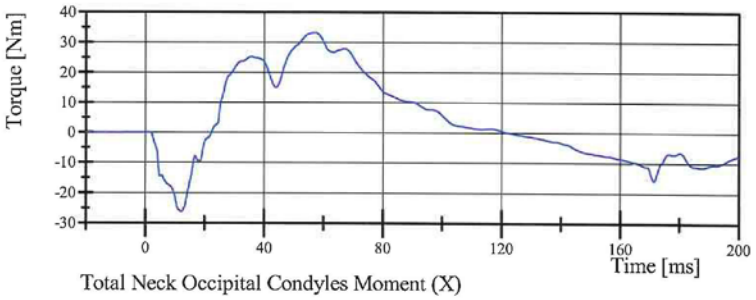
Filter Class: CFC_1000
Max: 472.0 N at 44.9 ms
Min: -175.9 N at 180.2 ms

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



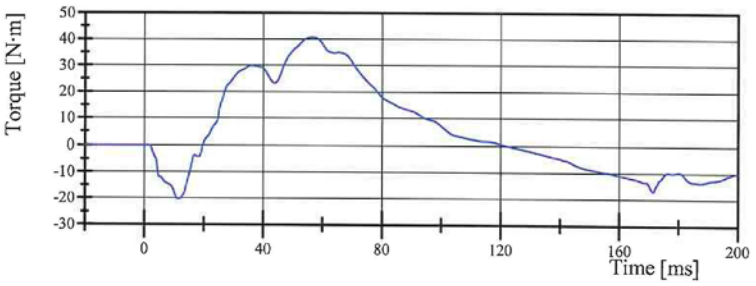
Filter Class: CFC_600
Max: 469.7 N at 44.9 ms
Min: -175.6 N at 180.2 ms

Neck Moment (X)



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

Total Neck Occipital Condyles Moment (X)



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

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

02.10.2014 12:33:02 635

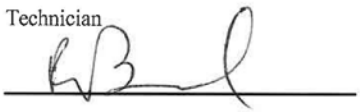
Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician 

Approved 

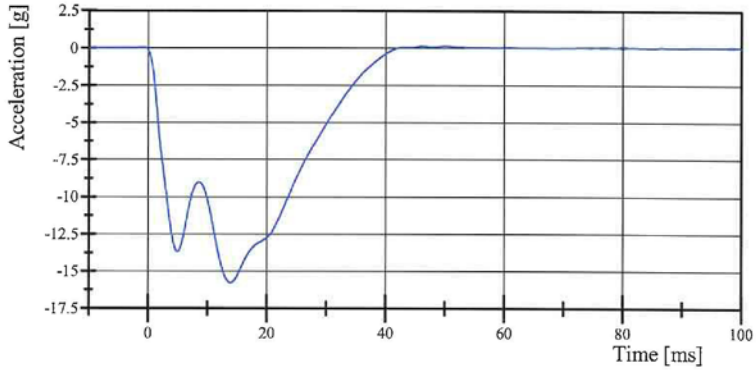
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 10:15:55 822

Transportation Research Center Inc.

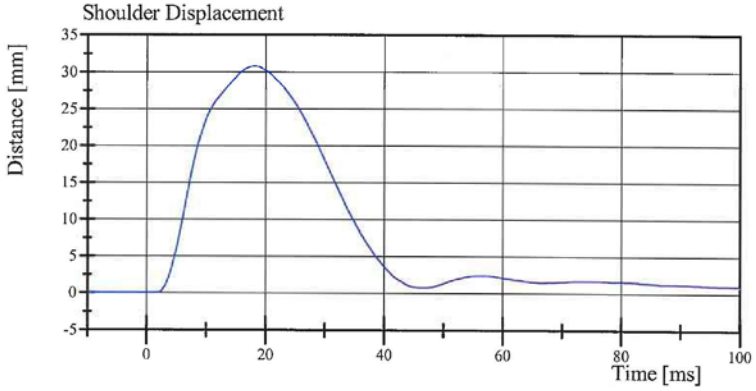
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Probe Acceleration



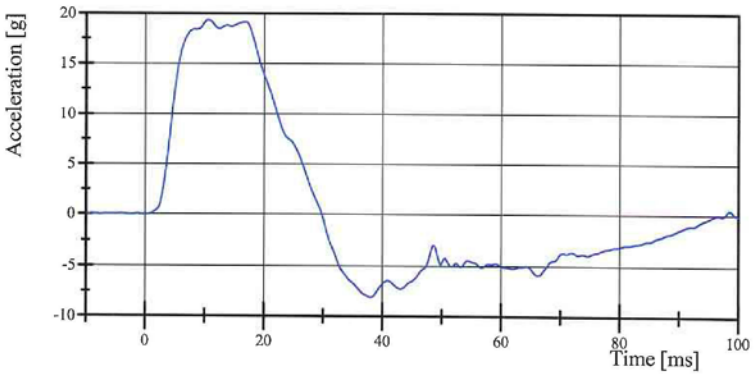
Filter Class: CFC_180
Max: 0.1 g at 50.2 ms
Min: -15.8 g at 13.9 ms

Shoulder Displacement



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

Upper Spine Acceleration (Y)



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

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

02.10.2014 10:16:02 822

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

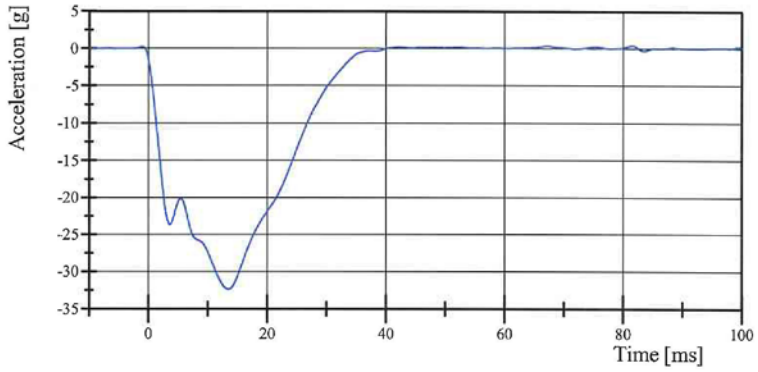
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 11:24:45 613

Transportation Research Center Inc.

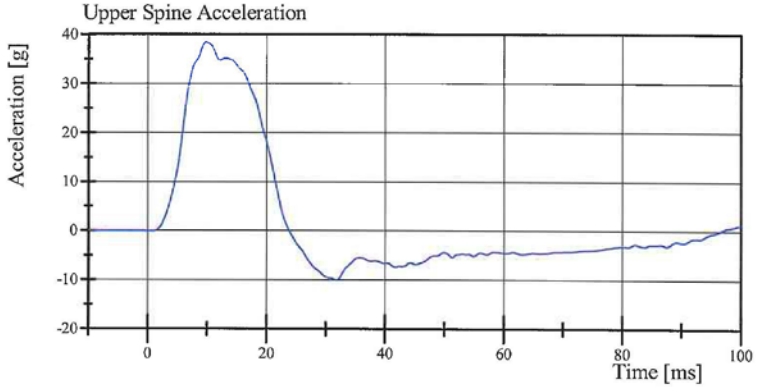
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Probe Acceleration



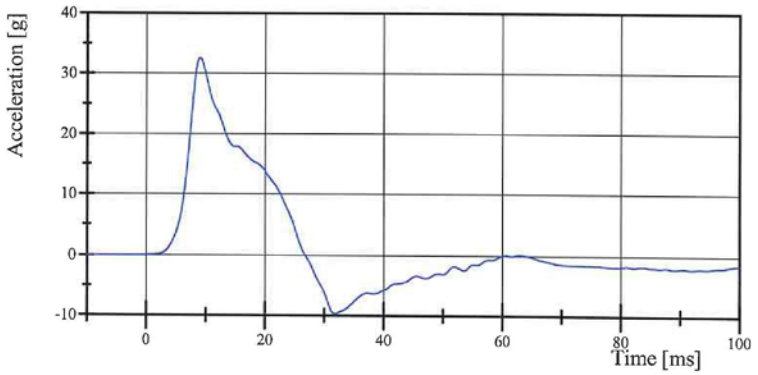
Filter Class: CFC_180
Max: 0.3 g at 81.5 ms
Min: -32.4 g at 13.5 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 38.4 g at 9.8 ms
Min: -10.0 g at 31.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 32.6 g at 9.0 ms
Min: -9.7 g at 31.8 ms

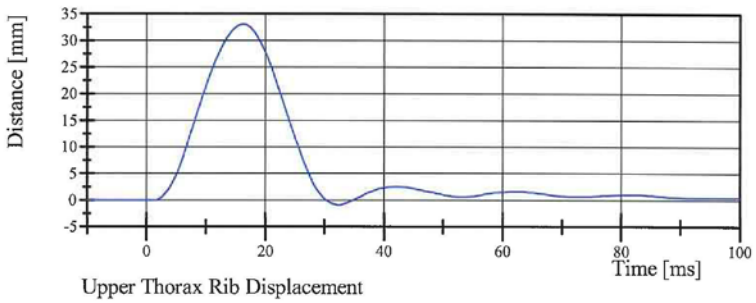
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 11:24:53 613

Transportation Research Center Inc.

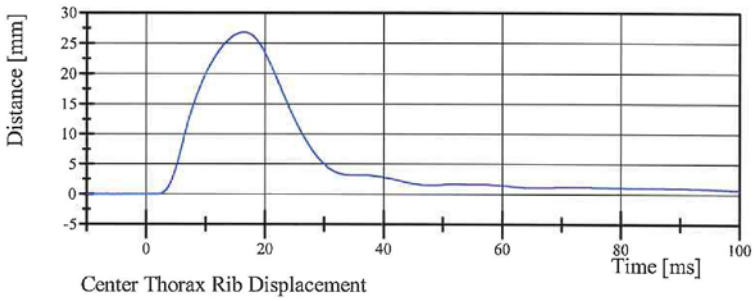
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Shoulder Rib Displacement



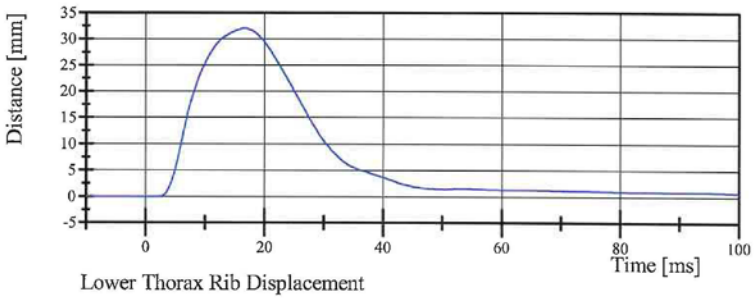
Filter Class: CFC_600
Max: 33.0 mm at 16.4 ms
Min: -0.9 mm at 32.4 ms

Upper Thorax Rib Displacement



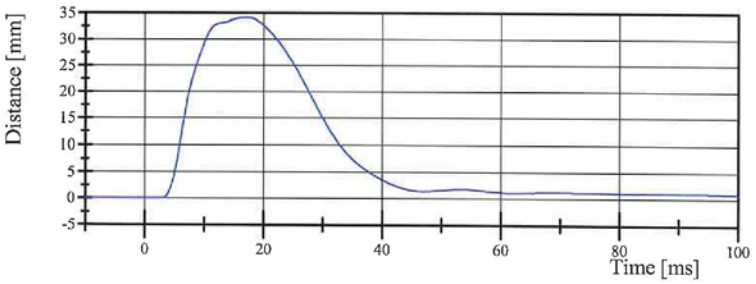
Filter Class: CFC_600
Max: 26.9 mm at 16.4 ms
Min: -0.0 mm at -9.0 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.1 mm at 16.6 ms
Min: -0.0 mm at -9.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.2 mm at 17.4 ms
Min: -0.0 mm at -9.3 ms

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

02.10.2014 11:24:54 613

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

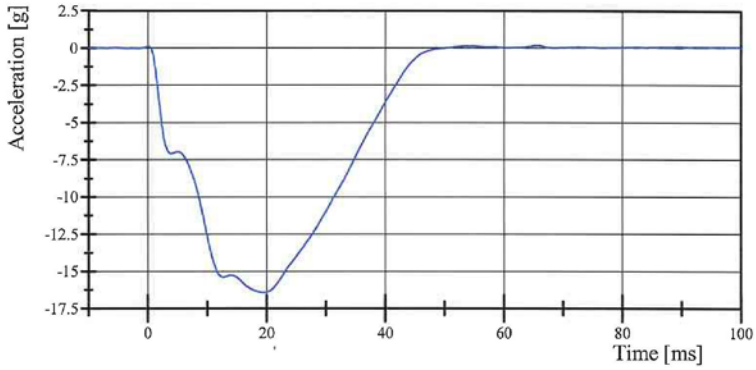
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 10:51:54 816

Transportation Research Center Inc.

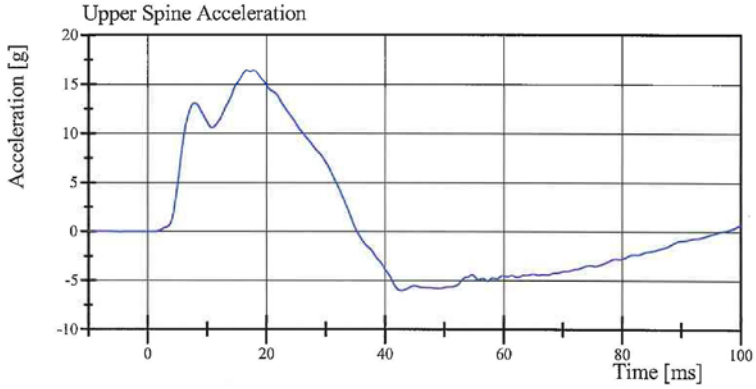
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Probe Acceleration



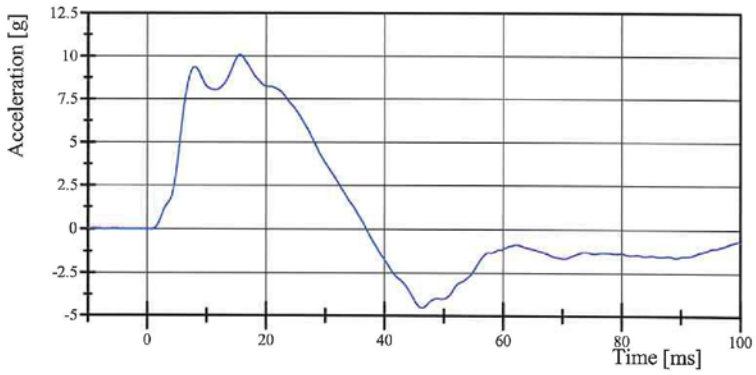
Filter Class: CFC_180
Max: 0.2 g at 65.6 ms
Min: -16.4 g at 19.4 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 16.4 g at 17.8 ms
Min: -6.0 g at 42.7 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.1 g at 15.6 ms
Min: -4.5 g at 46.2 ms

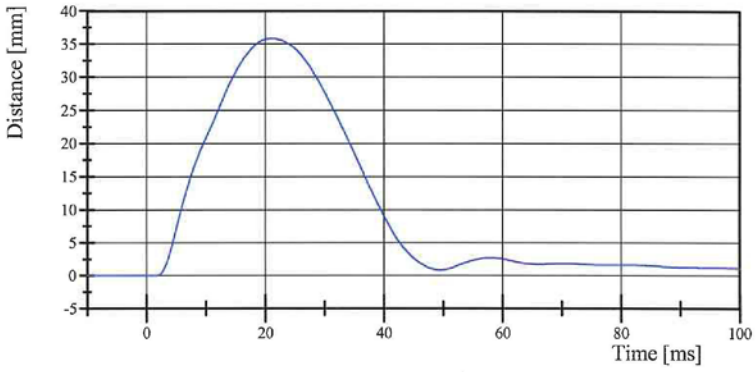
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 10:52:02 816

Transportation Research Center Inc.

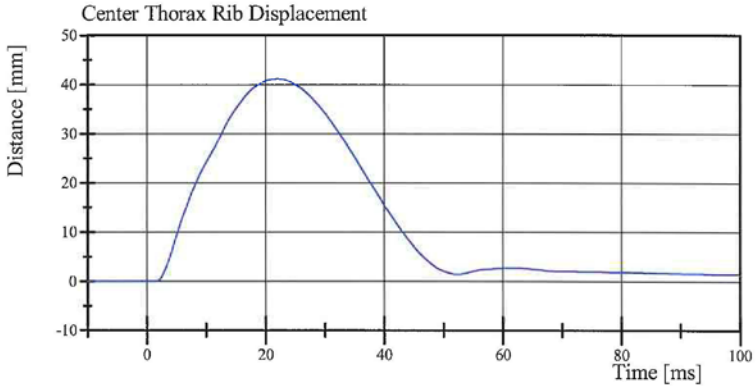
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Upper Thorax Rib Displacement



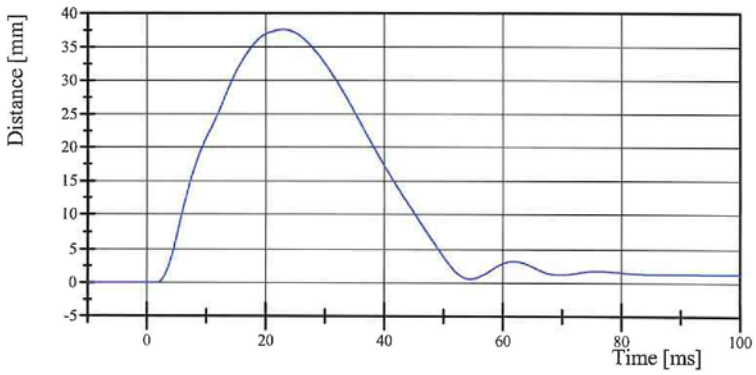
Filter Class: CFC_600
Max: 35.8 mm at 21.1 ms
Min: -0.0 mm at -9.7 ms

Center Thorax Rib Displacement



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

Lower Thorax Rib Displacement



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

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

02.10.2014 10:52:03 816

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

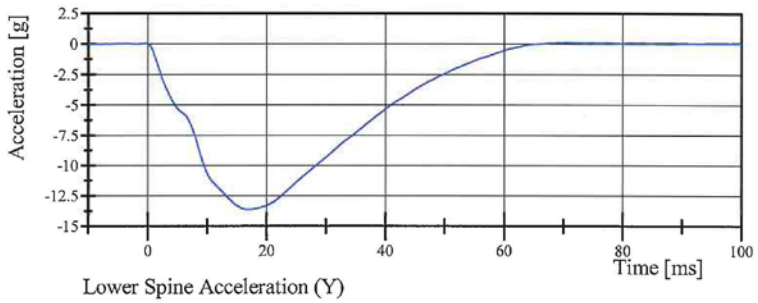
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 11:09:02 642

Transportation Research Center Inc.

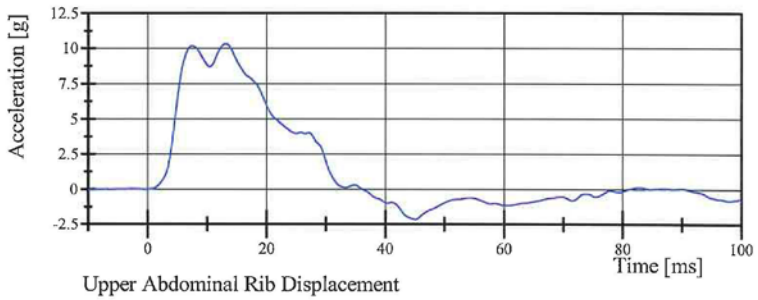
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Probe Acceleration



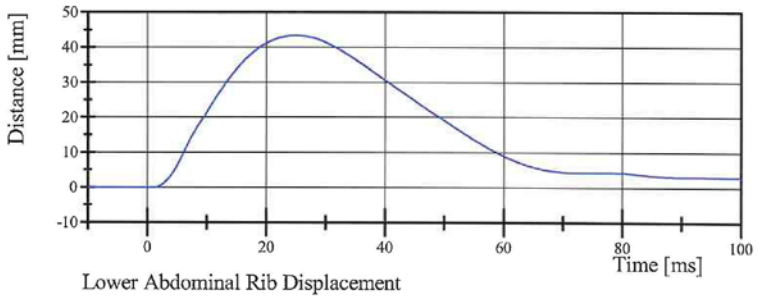
Filter Class: CFC_180
Max: 0.1 g at 70.6 ms
Min: -13.6 g at 17.0 ms

Lower Spine Acceleration (Y)



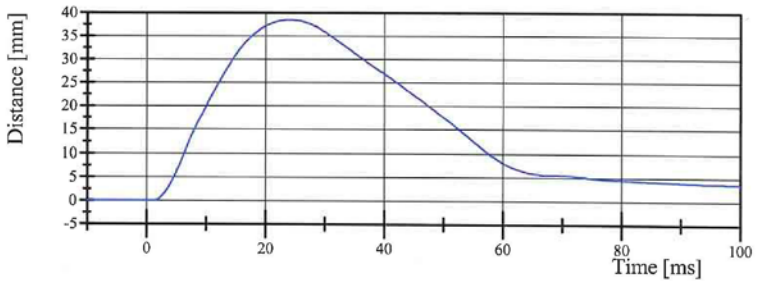
Filter Class: CFC_180
Max: 10.3 g at 13.1 ms
Min: -2.2 g at 45.0 ms

Upper Abdominal Rib Displacement



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

Lower Abdominal Rib Displacement



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

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

02.10.2014 11:09:10 642

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

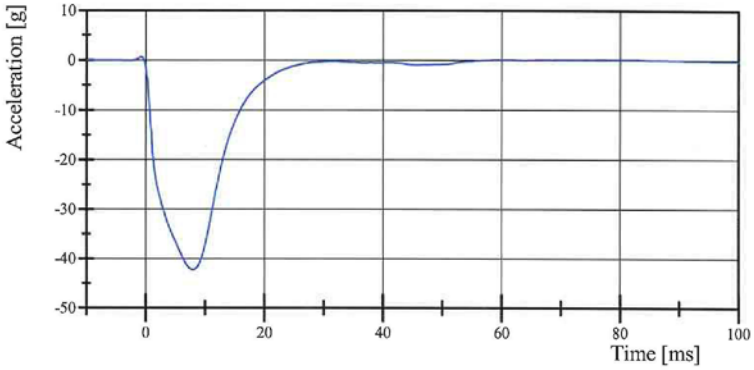
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 14:54:21 446

Transportation Research Center Inc.

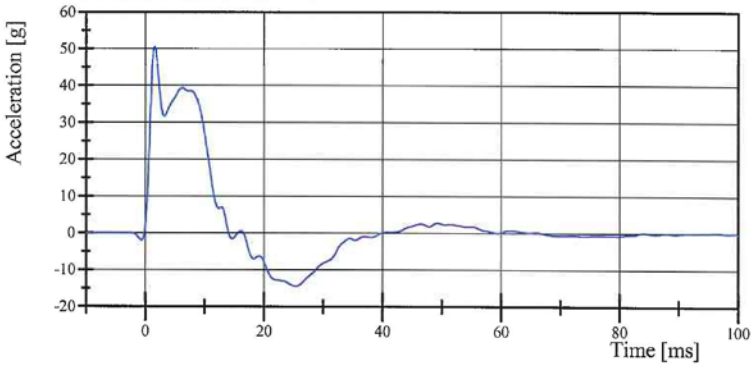
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 28-2
Test Date: 2/10/2014

Probe Acceleration



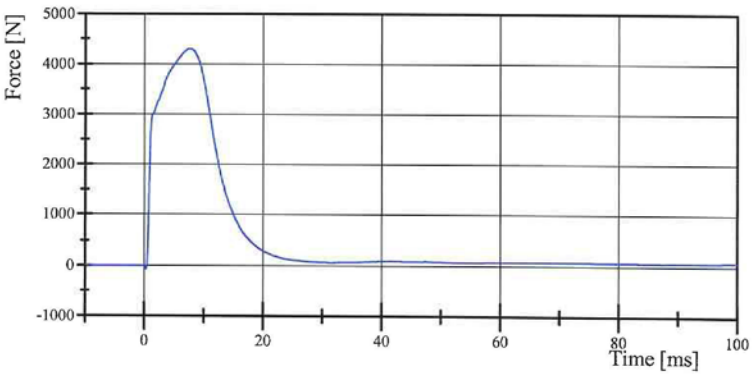
Filter Class: CFC_180
Max: 0.6 g at -0.7 ms
Min: -42.3 g at 7.9 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 50.7 g at 1.6 ms
Min: -14.4 g at 25.4 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,300.0 N at 7.7 ms
Min: -61.6 N at 0.3 ms

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

02.10.2014 14:54:28 446

Transportation Research Center Inc.

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

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

Test meets specifications.

Comments:

Technician

Approved

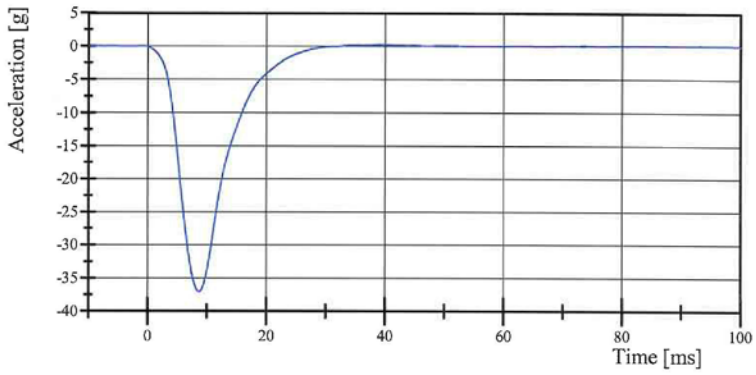
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.10.2014 07:42:35 663

Transportation Research Center Inc.

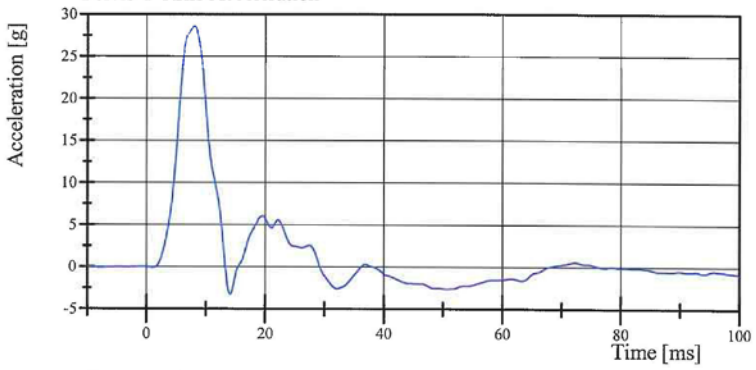
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 28-1
Test Date: 2/10/2014

Probe Acceleration



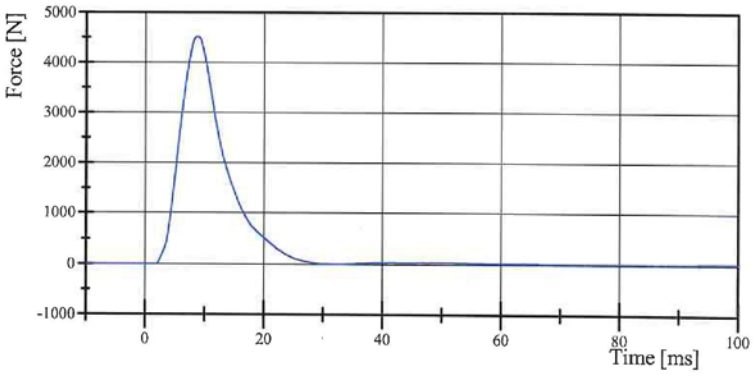
Filter Class: CFC_180
Max: 0.2 g at 39.8 ms
Min: -37.1 g at 8.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 28.6 g at 8.1 ms
Min: -3.2 g at 14.2 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,513.9 N at 8.8 ms
Min: -0.9 N at -3.8 ms

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

02.10.2014 07:42:43 663

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F030		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers		X	P58890	Endevco	9-Dec-13
		Y	P51702	Endevco	9-Dec-13
		Z	P52083	Endevco	9-Dec-13
Thoracic Rib Displacement Potentiometers	Upper	Y	111	FTSS	27-Jan-14
	Middle	Y	174	FTSS	10-Dec-13
	Lower	Y	173	FTSS	10-Dec-13
Abdomen Load Cells	Front	Y	1441	Denton	21-Oct-13
	Middle	Y	1436	Denton	21-Oct-13
	Rear	Y	1437	Denton	21-Oct-13
Lower Spine Accelerometers (T12)		X	P15954	Endevco	9-Dec-13
		Y	P68599	Endevco	9-Dec-13
		Z	P59005	Endevco	9-Dec-13
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	21-Oct-13

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	P51719	Endevco	11-Dec-13
			Y	P51272	Endevco	11-Dec-13
			Z	P58862	Endevco	11-Dec-13
Displacement Potentiometers	Shoulder		Y	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	12-Dec-13
		Middle	Y	1161	Servo	12-Dec-13
		Lower	Y	037	Servo	21-Jan-14
	Abdominal Rib	Upper	Y	1295	Servo	12-Dec-13
		Lower	Y	1136	Servo	12-Dec-13
Lower Spine Accelerometers (T12)			X	P50068	Endevco	12-Dec-13
			Y	P52051	Endevco	12-Dec-13
			Z	P51710	Endevco	12-Dec-13
Acetabulum Load Cell			Y	D14283-FY	FTSS	13-Jan-14
Iliac Wing Load Cell			Y	287-FY	FTSS	28-Oct-13
Pelvis Plug (struck side)				63390	FTSS	18-Jan-13
Pelvis Plug (non-struck side)				36473	FTSS	23-Sep-10

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P78093	Endevco	15-Jan-14
	Vehicle Center of Gravity	Y	P77746	Endevco	15-Jan-14
	Vehicle Center of Gravity	Z	P77675	Endevco	15-Jan-14
2	Right Sill at Front Seat	X	P81091	Endevco	5-Nov-13
	Right Sill at Front Seat	Y	P81635	Endevco	14-Nov-13
	Right Sill at Front Seat	Z	P80616	Endevco	14-Nov-13
3	Right Sill at Rear Seat	X	P75240	Endevco	15-Nov-13
	Right Sill at Rear Seat	Y	P82062	Endevco	4-Nov-13
	Right Sill at Rear Seat	Z	P81994	Endevco	5-Nov-13
4	Left Sill at Front Door	Y	MS23128	Measurement Specialties	21-Jan-14
5	Left Sill at Rear Door	Y	MS23099	Measurement Specialties	21-Jan-14
6	Left A-Post Lower	Y	P81537	Endevco	5-Nov-13
7	Left A-Post Middle	Y	P81096	Endevco	5-Nov-13
8	Left B-Post Lower	Y	P81476	Endevco	14-Nov-13
9	B-Post Middle	Y	P81475	Endevco	14-Nov-13
10	Front Seat Track	Y	MS23110	Measurement Specialties	21-Jan-14
11	Rear Seat Track or Structure	Y	P81095	Endevco	5-Nov-13
12	Right Rear Occupant Compartment	Y	P81052	Endevco	10-Sep-13
13	Engine Block	X	P78202	Endevco	15-Sep-13
	Engine Block	Y	P76187	Endevco	15-Jan-14
14	Rear Floorpan Above Axle	X	P82017	Endevco	15-Nov-13
	Rear Floorpan Above Axle	Y	P81643	Endevco	15-Nov-13
	Rear Floorpan Above Axle	Z	P81990	Endevco	15-Nov-13

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P80206	Endevco	4-Feb-14
MDB Center of Gravity	Y	P80482	Endevco	4-Feb-14
MDB Center of Gravity	Z	P75515	Endevco	15-Jan-14
Left Frame Rail at Rear Axle Centerline	X	P80472	Endevco	15-Oct-13
Left Frame Rail at Rear Axle Centerline	Y	P81596	Endevco	13-Nov-13