

FINAL REPORT NUMBER: SINCAP-TRC-12-005

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

**Toyota Motor Mfg.
2012 Toyota Corolla
NHTSA NUMBER: MC5100**

**PREPARED BY:
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Report Date: March 23, 2012

FINAL REPORT

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

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Approval Date: March 23, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2012 Toyota Corolla 4-door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on March 9, 2012. The impact velocity of the Moving Deformable Barrier (MDB) was 61.1 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 211 mm at Level 2. The test vehicle's performance was as follows: <table border="1"> <thead> <tr> <th colspan="4">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>NA</td> <td>1000</td> <td>145</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>44</td> <td>23.3</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>963.2</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>2055.3</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="4">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>NA</td> <td>1000</td> <td>302</td> </tr> <tr> <td>Lower Spine Acceleration</td> <td>g's</td> <td>82</td> <td>78.2</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>4254.8</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>45.4</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45*</td> <td>21.2</td> </tr> </tbody> </table> * Proposed IARV The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.				Driver ATD (ES-2re)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	NA	1000	145	Maximum Thoracic Rib Deflection	mm	44	23.3	Total Abdominal Force	N	2500	963.2	Pubic Symphysis Force	N	6000	2055.3	Passenger ATD (SID-IIs)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	NA	1000	302	Lower Spine Acceleration	g's	82	78.2	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4254.8	Maximum Thoracic Rib Deflection	mm	38*	45.4	Maximum Abdominal Rib Deflection	mm	45*	21.2
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SECTION 1

TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2012 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 2012 Toyota Corolla 4-door Sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated August 2011.

SECTION 2

SUMMARY OF TEST RESULTS

A 2012 Toyota Corolla 4-door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.1 km/h (37.99 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, OH, on March 9, 2012. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

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

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

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

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

Lower spine (T12) tri-axial accelerometers

Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

Primary and redundant head CG triaxial accelerometers

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

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (T12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	145
Maximum Thoracic Rib Deflection	mm	44	23.3
Combined Abdominal Force	N	2500	963.2
Pubic Symphysis Force	N	6000	2055.3

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	302
Lower Spine (T12) Resultant Acceleration	G	82	78.2
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4254.8
Maximum Thoracic Rib Deflection	mm	38*	45.4
Maximum Abdominal Rib Deflection	mm	45*	21.2

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	N/A		
Side Airbag 1 Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 Torso	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Unknown	Yes	Unknown
Seat Belt Load Limiter	Yes	Unknown	Yes	Unknown
Other	N/A	N/A	N/A	N/A

GENERAL COMMENTS

The driver and passenger doors remained latched during impact. No fluid spilled from the fuel system.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC5100	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Toyota	Automatic Door Locks (ADL)	Yes
Model	Corolla	Power Window Auto-Reverse	No
Body Style	4-door Sedan	Other Optional Feature	No
VIN	2T1BU4EE9CC767882	Driver Frontal Airbag	Yes
Body Color	Gray	Driver Curtain Airbag	Yes
Odometer Reading (miles)	36	Driver Head/Torso Airbag	No
Engine Displacement (L)	1.8	Driver Torso Airbag	Yes
Number of Cylinders	4	Driver Torso/Pelvis Airbag	No
Engine Placement	Transverse	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	4	Rear Passenger Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front wheel drive	Rear Passenger Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof / T-Top	No	Rear Passenger Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rr. Pass. Seat Belt Pretensioner	Yes
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Passenger Load Limiter	Yes
All-Wheel Drive (AWD)	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 Mfg.	GVWR (kg)	1742
Date of Manufacture	1/12	GAWR Front (kg)	948
Vehicle Type	4-door Sedan	GAWR Rear (kg)	839

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	N/A	5	
Capacity Weight (VCW) (kg)				366	(A)
DSC x 68.08 (kg)				5	(B)
Cargo Weight (RCLW) (kg)				26.0	(A-B)

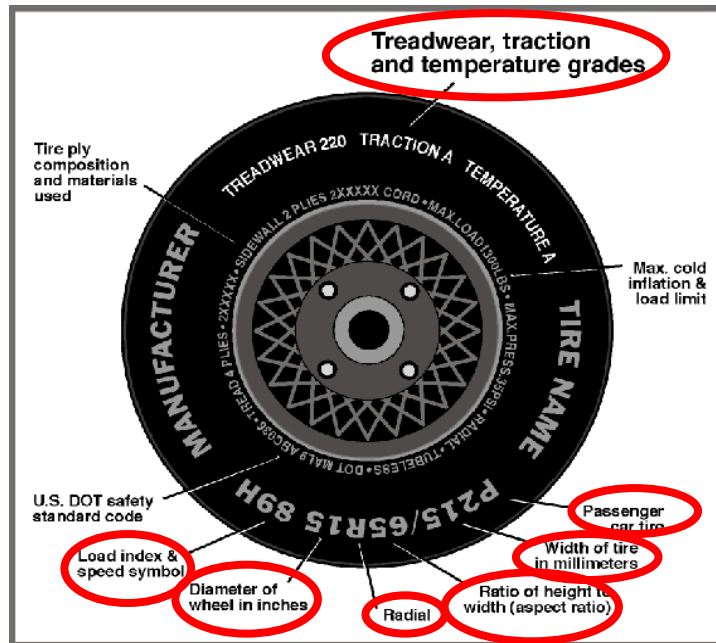
VEHICLE SEAT TYPE

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

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

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	210	210
Recommended Tire Size	P195/65R15	P195/65R15

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P195/65R15	P195/65R15
Tire Manufacturer	Firestone	Firestone
Tire Name	Affinity	Affinity
Tire Type	195	195
Tire Width	65	65
Aspect Ratio	Yes	Yes
Radial	15	15
Wheel Diameter	89S	89S
Load Index/ Speed Symbol	500	500
Treadwear	A	A
Traction Grade	B	B
Temperature Grade	Rubber	Rubber
Tire Material	195	195

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

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	300	300	300	300
Tire Placard	kPa	210	210	210	210
Owner's Manual	kPa	210	210	210	210
As Tested	kPa	207	207	207	207

MDB TIRE SPECIFICATIONS

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	384.4	251.2		420.2	300.2		427.8	316.4	
Right	kg	375.6	245.0		388.4	291.8		390.8	292.4	
Ratio	%	60.5	39.5		57.7	42.3		57.3	42.7	
Totals	kg	760.0	496.2	1256.2	808.6	592.0	1400.6	818.6	608.8	1427.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total As Delivered Weight (UVW)	kg	1256.2
Actual Weight of 2 P572 ATDs Used	kg	125.0
Rated Cargo/Luggage Weight (RCLW)	kg	26.0
Calculated Vehicle Target Weight (TVTW)	kg	1407.2

(A)
 (B)
 (C)
 (A+B+C)

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast (if any) None	0.0
Front bumper beam and fascia, rear bumper beam and fascia, trunk lid, head lights, tail lights, wheel covers, right outside mirror, and air cleaner assembly.	42.4

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

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	674	679	Yes
RF	mm	678	679	Yes
RR	mm	682	680	Yes
LR	mm	670	674	Yes
Vehicle CG (Aft of Front Axle)	mm	1109	1099	
Vehicle CG (Left+)/Right (-) from Longitudinal centerline	mm	-38	-25	

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

DATA SHEET NO. 2

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

Test Vehicle: 2012 Toyota Corolla 4-door Sedan

NHTSA No.: MC5100

Test Program: NCAP Side Impact

Test Date: 03/09/12

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	6.1	0.0	3.05
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	N/A fixed	N/A fixed	N/A fixed
Non-Struck Side Rear Seat	N/A fixed	N/A fixed	N/A fixed
Rear Center Seat*	N/A fixed	N/A fixed	N/A fixed

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rearmost	Mid- Fore/Aft	Forward- Most
Driver Seat	3.05	136	Max.	144	154	163
			Mid	127	136	141
			Min.	123	133	143
Front Passenger Seat	N/A	N/A	Max.	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min.	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	Max.	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min.	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	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	Fixed	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*	Fixed	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: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

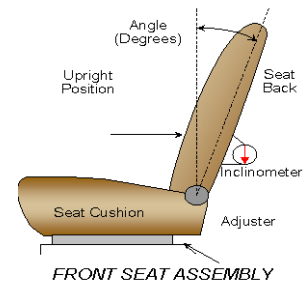
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	238	17	119	9
Front Passenger Seat	235	17	117	9*
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	N/A fixed	N/A fixed	N/A fixed	N/A fixed
Non-Struck Side Rear Seat	N/A fixed	N/A fixed	N/A fixed	N/A fixed
Rear Center Seat*	N/A fixed	N/A fixed	N/A fixed	N/A fixed

* If applicable.

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/ Seated Dummy	52.7	27	3.1	5
Front Passenger Seat	51.7	27	3.8	5
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	N/A fixed	N/A fixed	N/A fixed	N/A fixed
Non-Struck Side Rear Seat	N/A fixed	N/A fixed	N/A fixed	N/A fixed
Rear Center Seat*	N/A fixed	N/A fixed	N/A fixed	N/A fixed

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

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

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MC5100
Test Date: 03/09/12

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4	1
Rear Seat	1, Fixed	N/A

HEAD RESTRAINT ADJUSTMENT

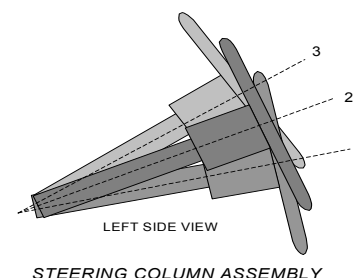
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	4	4, Uppermost
Rear Seat	3	1, Lowermost

STEERING COLUMN ADJUSTMENT

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

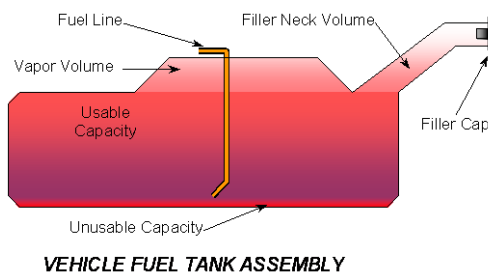
	Degrees	Fore/Aft Position, mm
Lowermost, Position 1	67.2	219
Geometric Center, Position 2	65.6	219
Uppermost, Position 3	64.2	219
Telescoping Steering Wheel Travel		38
Test Position	65.6	219



FUEL PUMP

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

The fuel tank is located under the rear seat area. The fuel filler neck enters on the left side of the fuel tank. The fuel filler cap is located on the left rear quarter panel. The fuel lines run along the inside of the left sub frame.



DATA SHEET NO. 2 (CONTINUED)**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**Test Vehicle: 2012 Toyota Corolla 4-door SedanNHTSA No.: MC5100Test Program: NCAP Side ImpactTest Date: 03/09/12**FUEL TANK CAPACITY**

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	50.0
Usable Capacity of "Optional" Tank (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	50.0
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	46.9
Actual Amount of Solvent Used in Test	46.9
1/3 of Usable Capacity	15.5

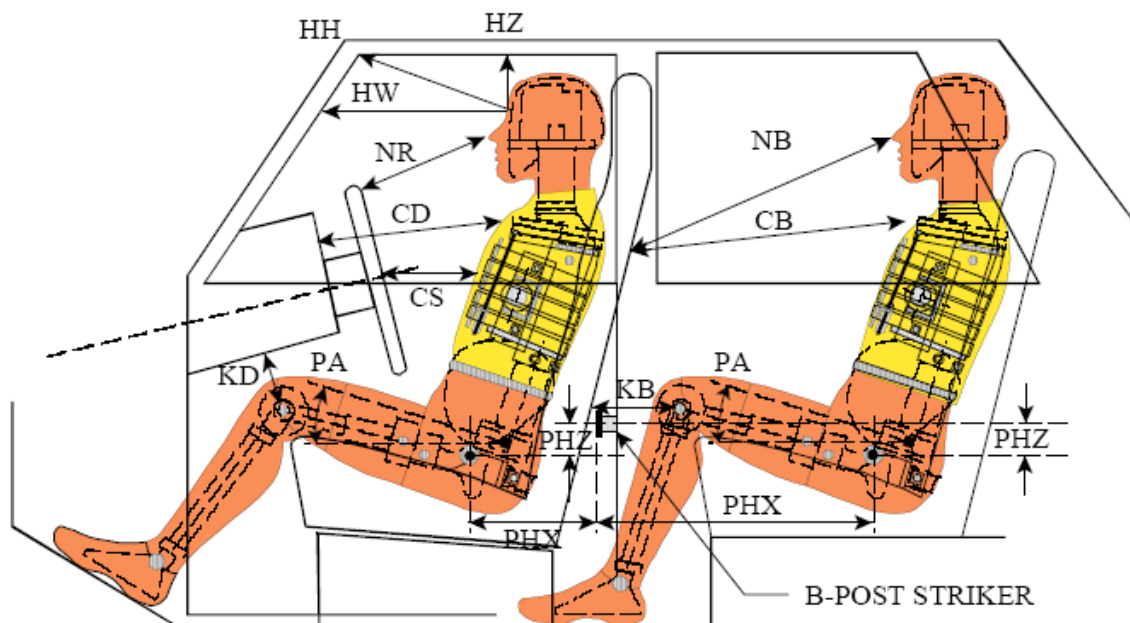
Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated on Form No. 1? ☐ YES ☒ NO

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MC5100
Test Date: 03/09/12



LEFT SIDE VIEW

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

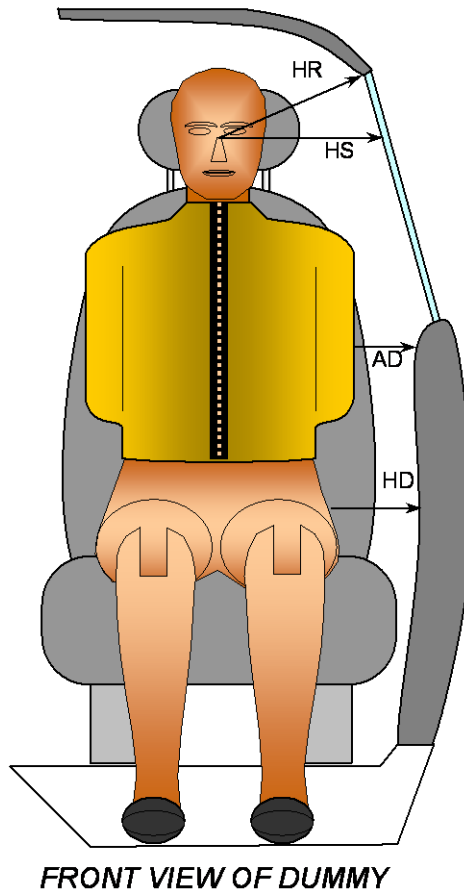
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Head to Header	360			
HW		Head to Windshield	599			
HZ	HZ	Head to Roof Liner	147		245	
NR	NB	Nose to Rim/Seat Back	420		564	
CD	CB	Chest to Dash/Seat Back	545		546	
CS		Chest to Steering Wheel	278			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	135	68.5	280	0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	115	65.5	290	0
PAX°	PAX°	Pelvic Tilt Angle X		N/A		20.4
	PHY°	Pelvic Tilt Angle Y				N/A
PHX	PHX	Hip Point to Striker (X-Axis)	224		298	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	212		314	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

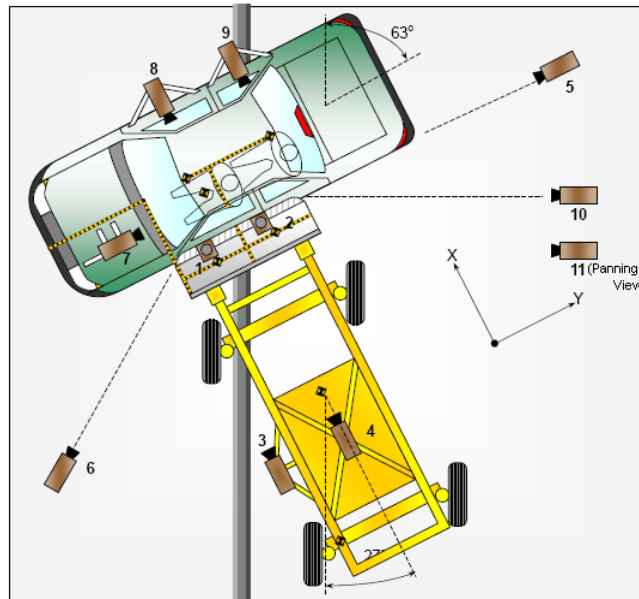


Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	182	240
HS	Head to Side Window	mm	308	360
AD	Arm to Door	mm	110	170
HD	H-Point to Door	mm	151	172

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	-250	5650	8.5	30
2	Overhead Close-up	0	250	5650	25	1000
3	Left Impact Point (MDB)	1680	0	830	8.5	1000
4	Side Overall (MDB)	2320	700	1470	12.5	1000
5	Rear	0	7400	1030	16	1000
6	Left Front	4800	5000	1200	25	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:

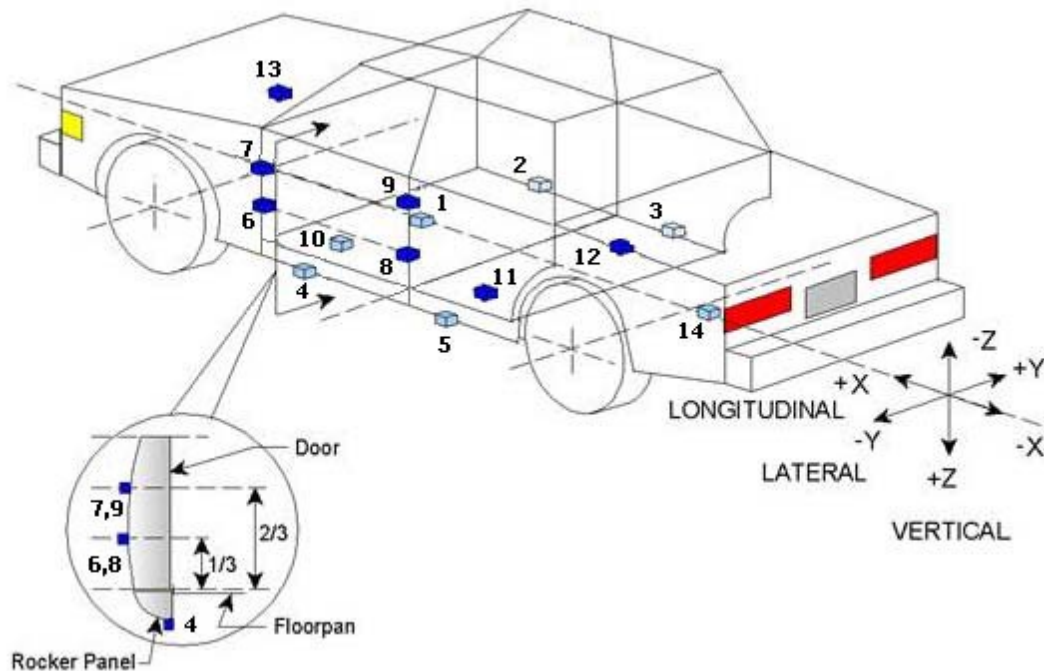
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	5
TOTAL	60

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12



TEST VEHICLE ACCELEROMETER LOCATIONS

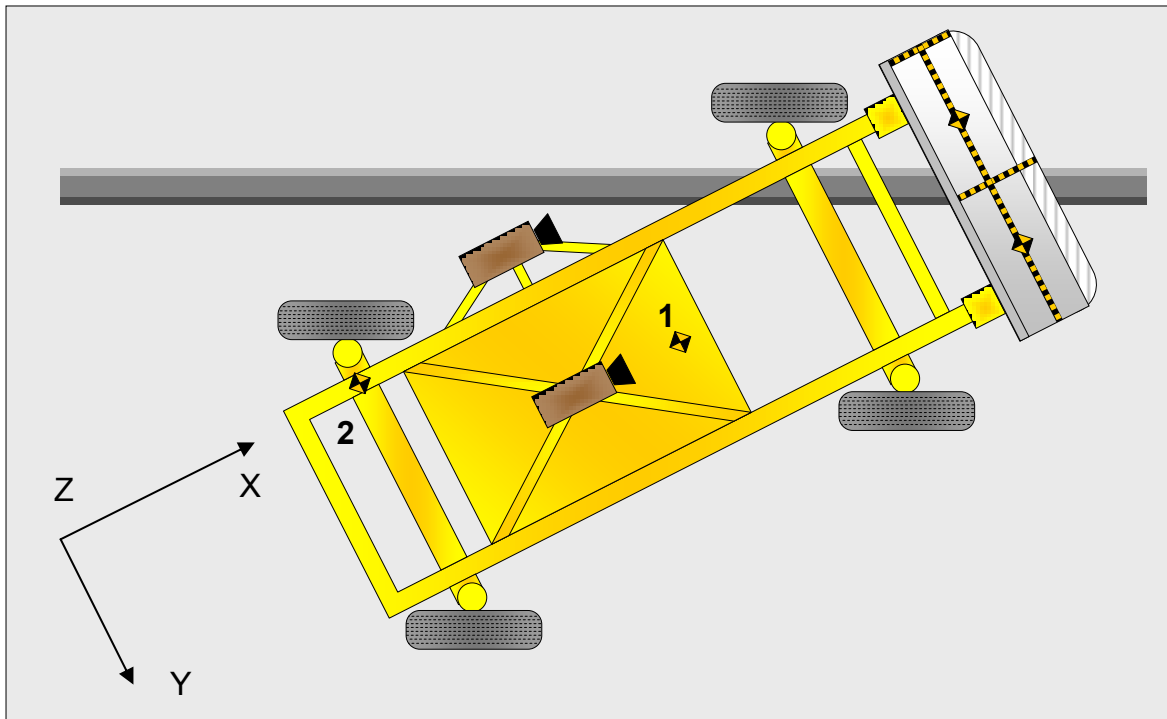
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2955	0	-370
2	Right Sill at Front Seat	2312	672	-300
3	Right Sill at Rear Seat	3200	660	-295
4	Left Sill at Front Door	3208	-672	-297
5	Left Sill at Rear Door	2320	-660	-295
6	A-Post Lower	3545	-770	-528
7	A-Post Middle	3560	-770	-847
8	B-Post Lower	2495	-810	-525
9	B-Post Middle	2470	-785	-882
10	Front Seat Track	2720	-595	-260
11	Rear Seat Structure	1965	-590	-405
12	Right Rear Occ. Compartment	1965	610	-320
13	Engine Block	4168	55	-848
14	Rear Above Axle	1468	0	-486

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: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12



MDB ACCELEROMETER LOCATIONS

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

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MC5100
Test Date: 03/09/12

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	N/A	Curtain Bag
Top of Head	N/A	Header, Curtain Bag
Left Side of Head	Header, Curtain Bag	Curtain Bag
Back of Head	Head Restraint	Head Restraint, Seat Back
Left Shoulder	Torso Bag, Window	Curtain Bag
Upper Torso	Torso Airbag	Door Panel
Lower Torso	Torso Bag	Door Panel
Left Hip	Door Panel	Door Panel
Left Knee	Door Panel	Door Panel

POST TEST DOOR PERFORMANCE

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

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

POST TEST SEAT PERFORMANCE

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

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

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	B-Pillar deformation, intact
Sill Separation	Deformation, intact
Windshield Damage	None
Side Window Damage	Broken
Other Notable Effects	Rear window broken

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side (Driver)		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Knee Airbag	No	No		
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso)	Yes	Yes	N/A	Yes
Seat Belt Pretensioner	Yes	No	N/A	Yes
Seat Belt Load Limiter	Yes	No	N/A	Yes
Other	N/A	N/A	N/A	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2600
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		360
Actual Impact Point (Aft of Front Axle)	mm		363
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+3
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	0

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1880
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2592
C.G. Location aft of Front Axle	1104

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	439.8	240.6	
Right	kg	342.8	340.0	
Ratio	%	57.4	42.6	
Totals	kg	782.6	580.6	1363.2

SPEED AND IMPACT ANGLE DATA

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

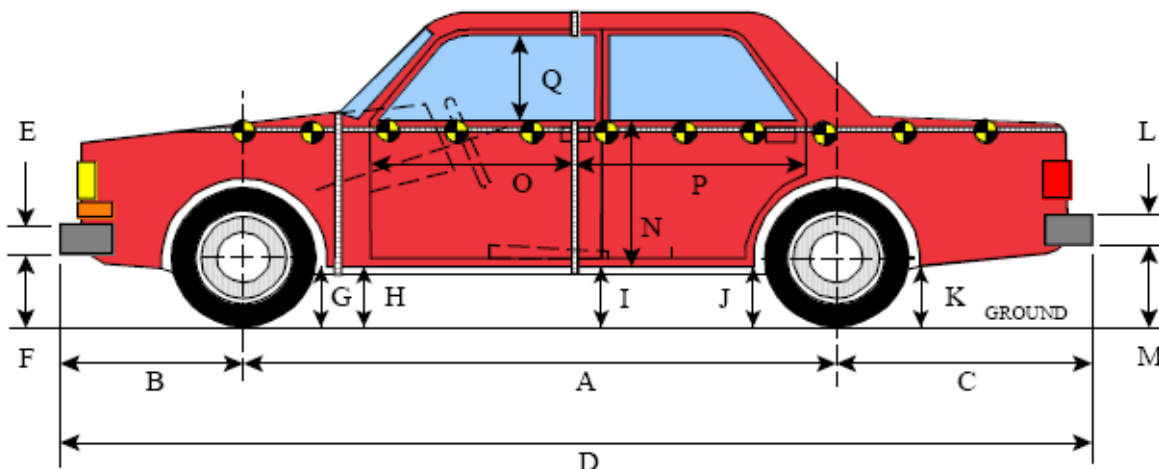
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	192
B	Top of Bumper	533	700	Left	96
C	Mid-Level	686	800	Left	89
D	Top of Stack	813	800	Left	125

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12



LEFT SIDE VIEW

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

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2600	2605	-5
B	Front Axle to Front Surface of Vehicle	920	N/A	N/A
C	Rear Axle to Rear Surface of Vehicle	1020	N/A	N/A
D	Total Length at Centerline	4520	N/A	N/A
E	Front Bumper Thickness	95	N/A	N/A
F	Front Bumper Bottom to Ground	428	N/A	N/A
G	Sill Height at Front Wheel Well	240	320	-80
H	Sill Height at Front Door Leading Edge	241	322	-81
I	Sill Height at B-Pillar	241	340	-99
J1	Sill Height at Rear Wheel Well	248	326	-78
J2	Pinch Weld Height at Rear Wheel Well	175	233	-58
K	Sill Height Aft of Rear Wheel Well	296	N/A	N/A
L	Rear Bumper Thickness	170	N/A	N/A
M	Rear Bumper Bottom to Ground	428	N/A	N/A
N	Sill Height to Window Bottom Sill	750	698	52
O	Front Door Leading Edge to Impact CL	790	730	60
P	Rear Door Trailing Edge to Impact CL	1326	1287	39
Q	Front Window Opening	380	368	12
R	Right Side Length	4330	N/A	N/A
S	Left Side Length	4330	N/A	N/A
T	Vehicle Width at B Pillar	1305	1205	100

DATA SHEET NO. 11

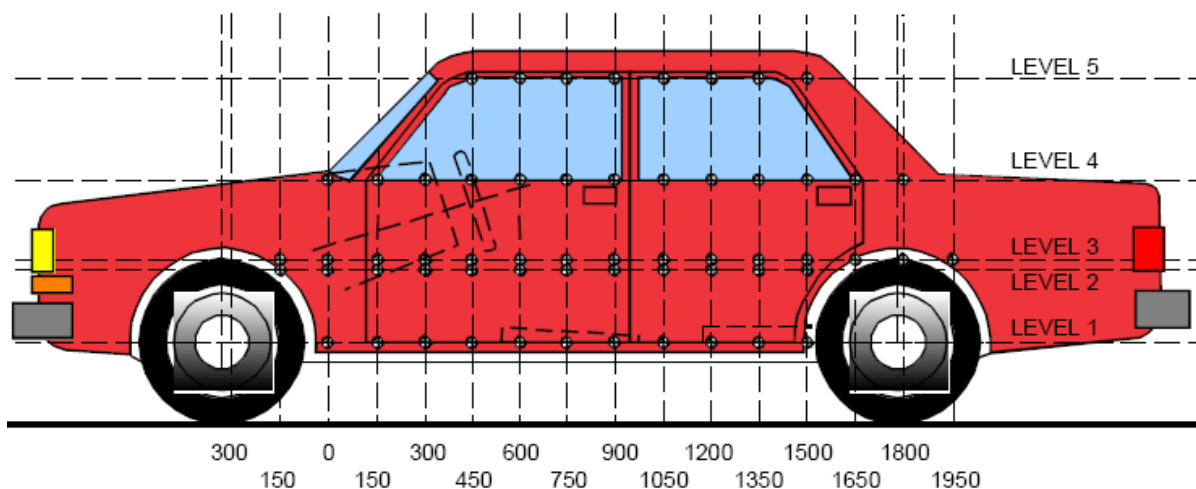
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan

NHTSA No.: MC5100

Test Program: NCAP Side Impact

Test Date: 03/09/12



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	336	94	450
2	Driver Hip Point	553	211	1200
3	Mid-Door	642	203	600
4	Window Sill	912	127	1650
5	Window Top	1374	18	1350

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

DATA SHEET NO. 11 (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	0	0	774	0	0	0	0	769	0	0	0	0	5	0
-150	0	0	876	788	0	0	0	839	779	0	0	0	37	9	0
0	0	873	870	799	0	0	839	837	788	0	0	34	33	11	0
150	841	862	863	806	0	764	680	693	765	0	77	182	170	41	0
300	833	860	863	809	0	741	654	667	753	0	92	206	196	56	0
450	831	862	866	811	0	737	653	668	740	0	94	209	198	71	0
600	831	864	869	815	0	742	658	666	722	0	89	206	203	93	0
750	832	866	871	821	544	746	660	681	714	543	86	206	190	107	1
900	832	868	873	825	560	751	658	682	702	557	81	210	191	123	3
1050	832	869	874	830	570	756	669	682	732	562	76	200	192	98	8
1200	830	868	874	833	574	767	657	687	735	558	63	211	187	98	16
1350	830	867	873	836	575	771	656	687	714	557	59	211	186	122	18
1500	831	866	872	838	570	774	672	693	712	556	57	194	179	126	14
1650	832	866	870	839	562	784	692	692	712	555	48	174	178	127	7
1800	844	869	871	839	549	815	727	710	717	546	29	142	161	122	3
1950	0	0	876	851	532	0	0	822	781	530	0	0	54	70	2
2100	0	0	0	830	0	0	0	0	804	0	0	0	0	26	0
2250	0	0	0	824	0	0	0	0	794	0	0	0	0	30	0
2400	0	0	0	815	0	0	0	0	802	0	0	0	0	13	0
2550	0	0	0	804	0	0	0	0	801	0	0	0	0	3	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.

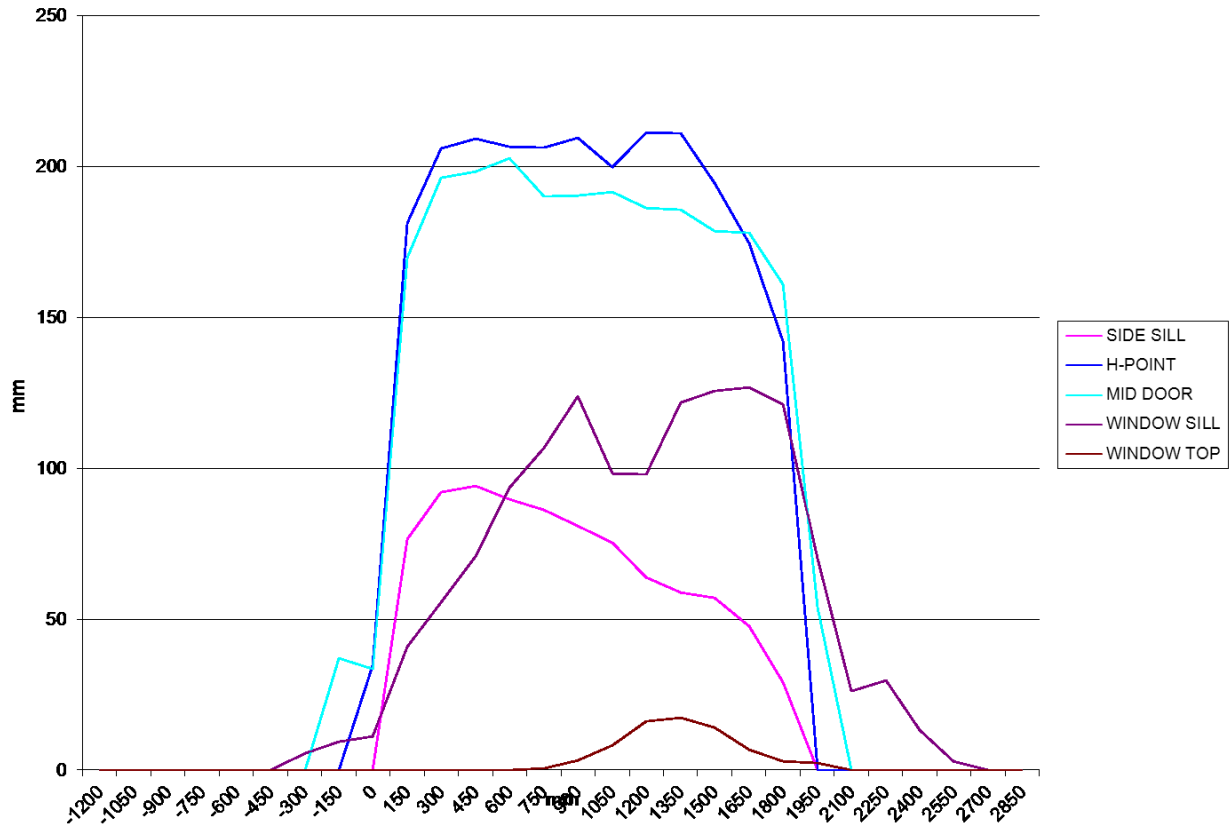
Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

DATA SHEET NO. 11 (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MC5100
Test Date: 03/09/12

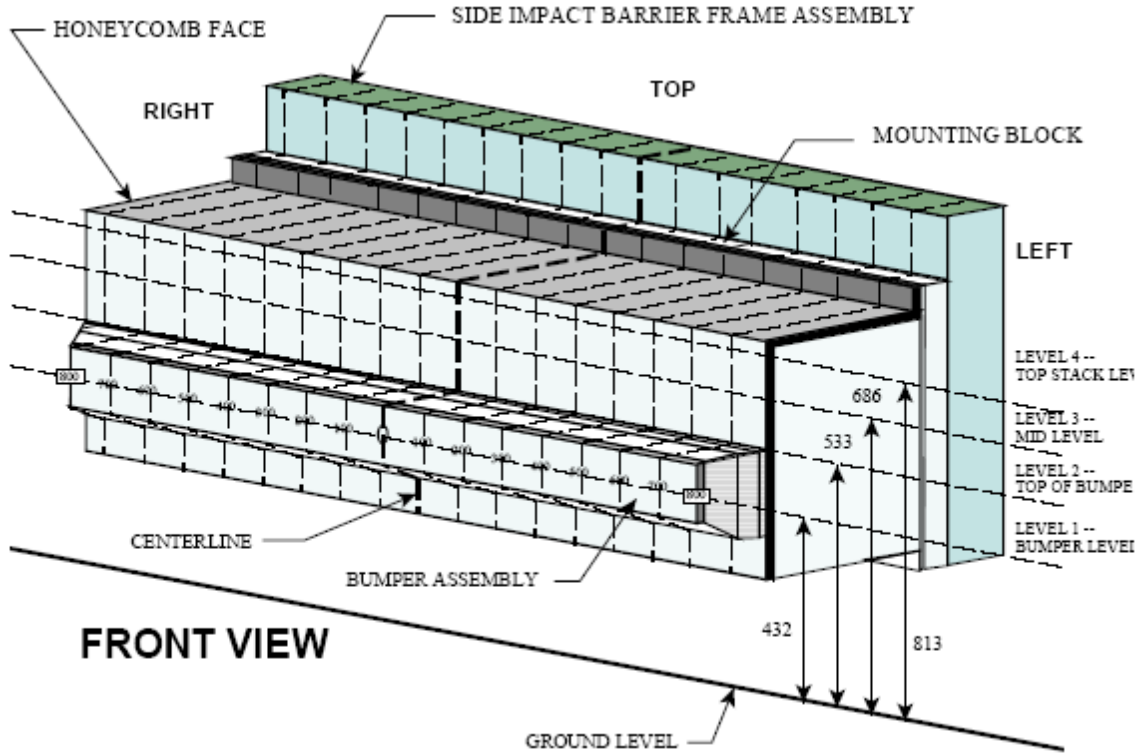


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MC5100
Test Date: 03/09/12



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	-45	-36	-34	-36	-42	-66	-104	-98	-74	-49	-32	-35	-44	-53	-72	-90	-125
2	-71	-54	-41	-35	-34	-42	-73	-73	-46	-29	-20	-17	-18	-24	-42	-55	-89
3	-96	-91	-88	-84	-85	-82	0	0	-79	-69	-62	-63	-62	-59	-58	-64	-77
4	-192	-185	-174	-168	-166	-169	-163	-158	-153	-148	-144	-141	-139	-136	-136	-150	-166

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

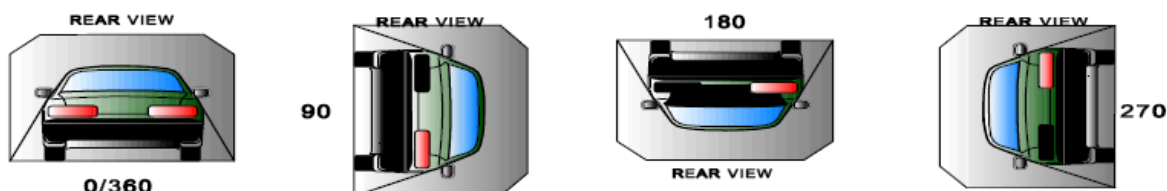
Test Vehicle: 2012 Toyota Corolla 4-door Sedan
 Test Program: NCAP Side Impact

NHTSA No.: MC5100
 Test Date: 03/09/12

Test Time: 15:07 **Temperature:** 22

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum allowable is 1 ounce)
- B. For the 5 minute period after motion ceases: 0 oz.
 (Maximum allowable is 5 ounces)
- C. For the following 25 minutes: 0 oz.
 (Maximum allowable is 1 ounce/minute)
- D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

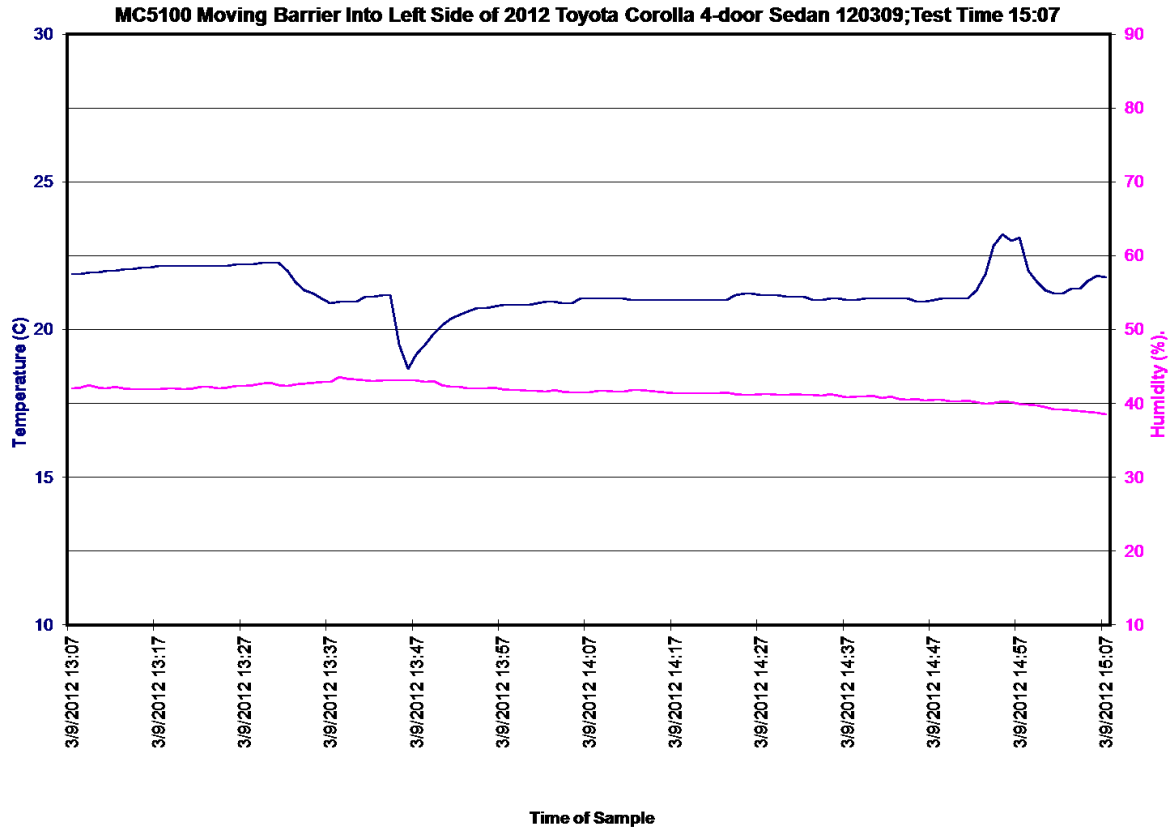
Test Phase	Spillage Location
0 to 90	0
90 to 180	0
180 to 270	0
270 to 360	0

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2012 Toyota Corolla 4-door Sedan
Test Program: NCAP Side Impact

NHTSA No.: MC5100
Test Date: 03/09/12



APPENDIX A
PHOTOGRAPHS

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



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



003 Pre-Test Front View of Test Vehicle



004 Post-Test Front View of Test Vehicle



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



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



007 Pre-Test Left Side View of Test Vehicle



008 Post-Test Left Side View of Test Vehicle



009 Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



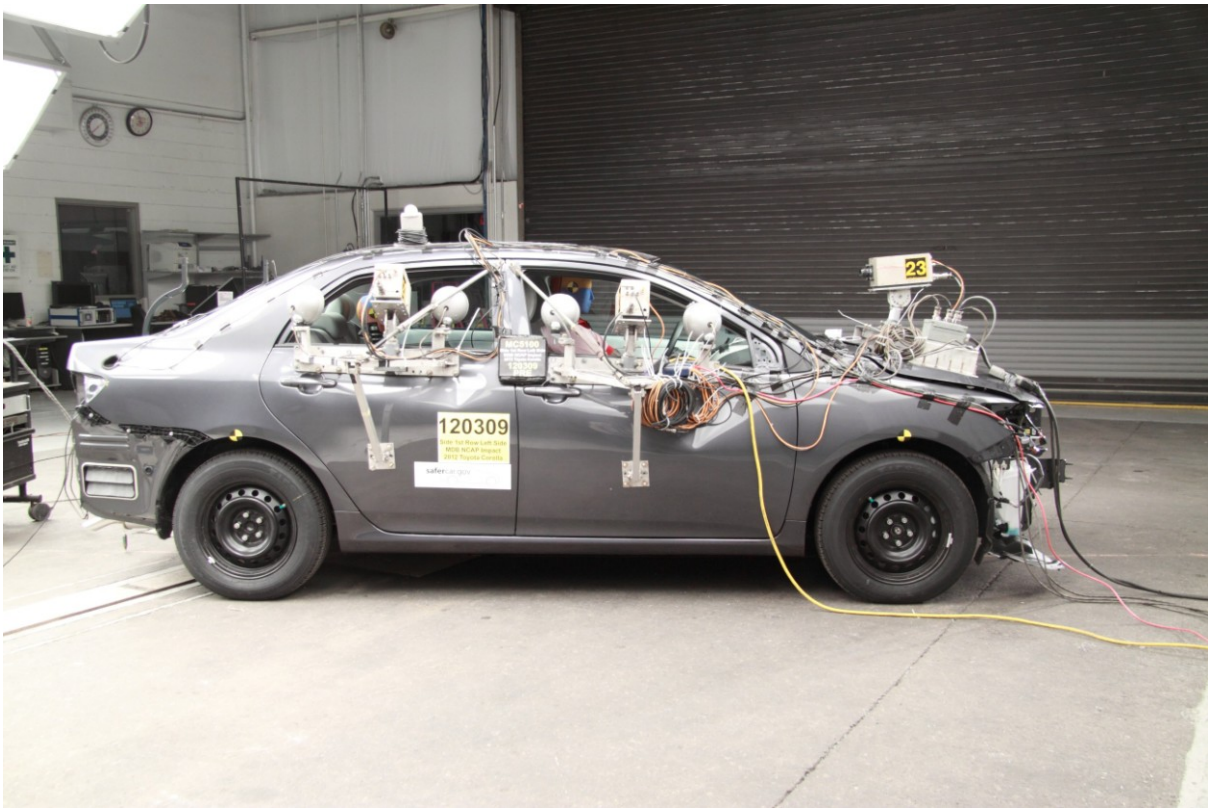
010 Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



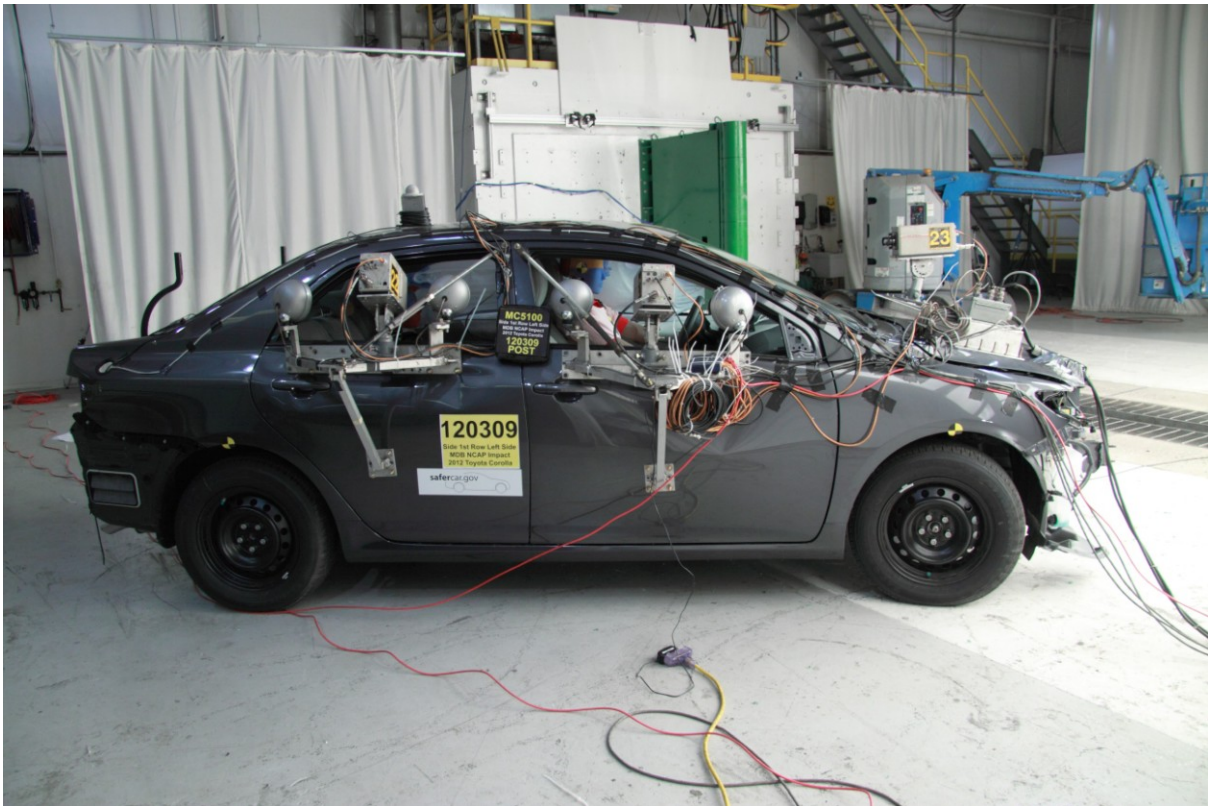
011 Pre-Test Rear View of Test Vehicle



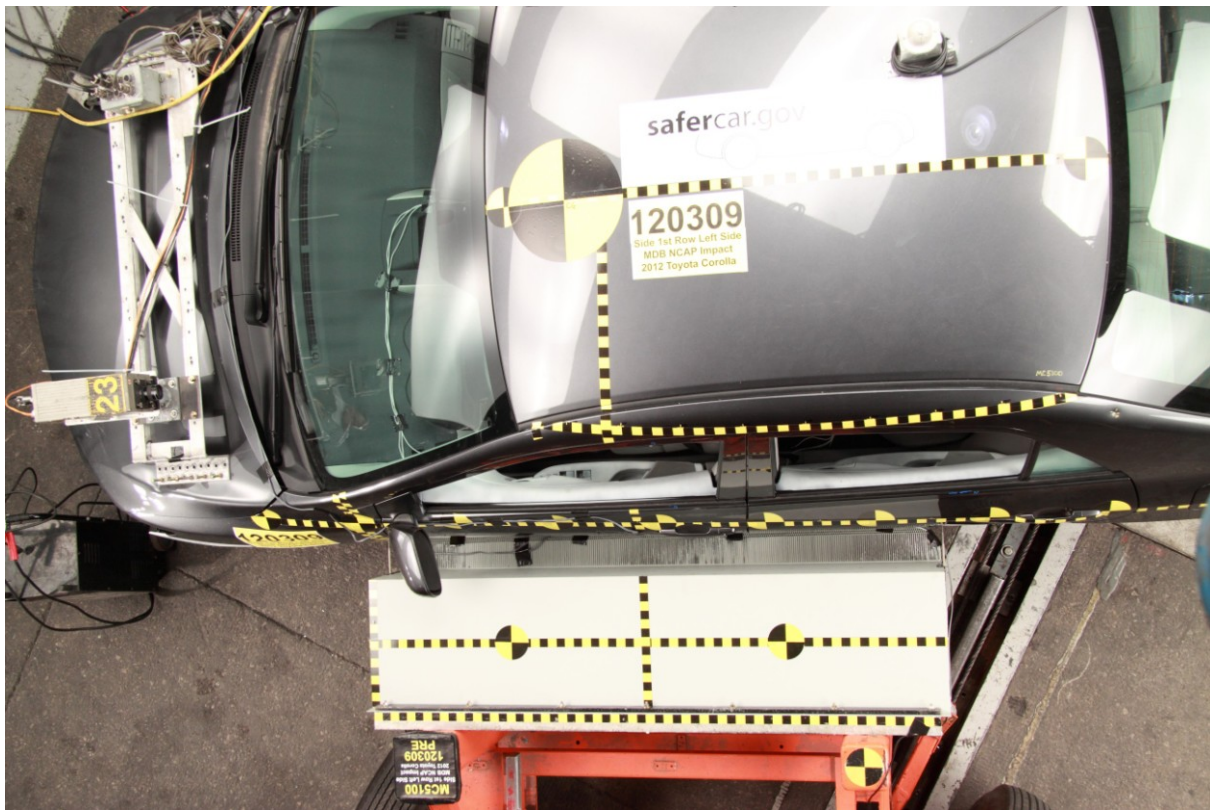
012 Post-Test Rear View of Test Vehicle



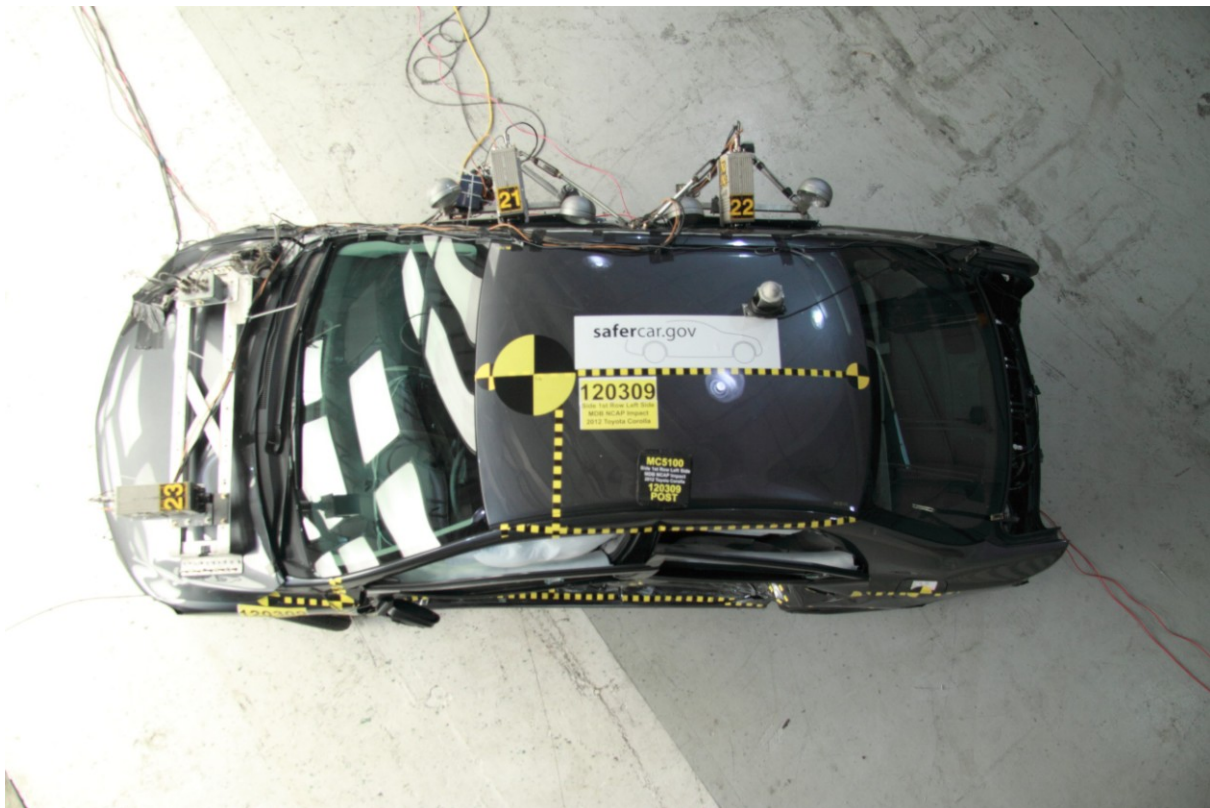
013 Pre-Test Right Side View of Test Vehicle



014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area



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



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



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



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



021 Pre-Test Left Front Door Latch Close-up



022 Post-Test Left Front Door Latch Close-up



023 Pre-Test Right Front Door Latch Close-up



024 Post-Test Right Front 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



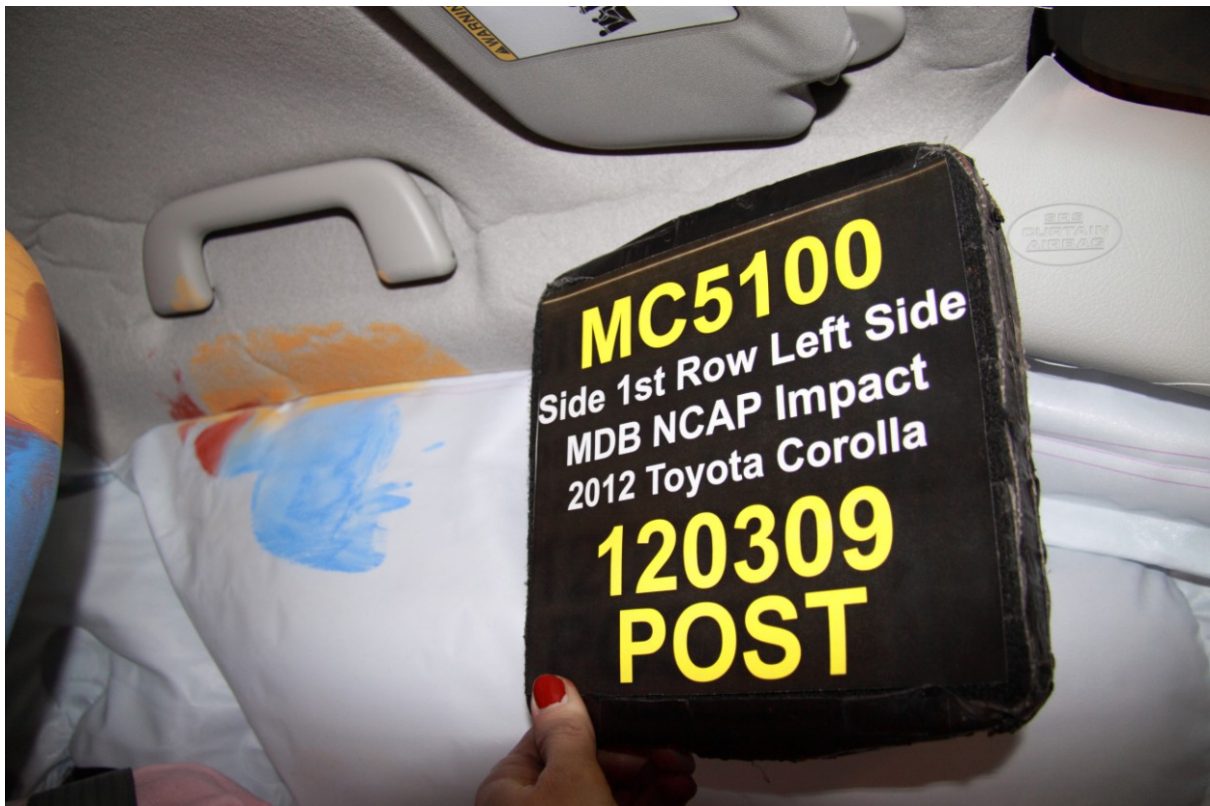
045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



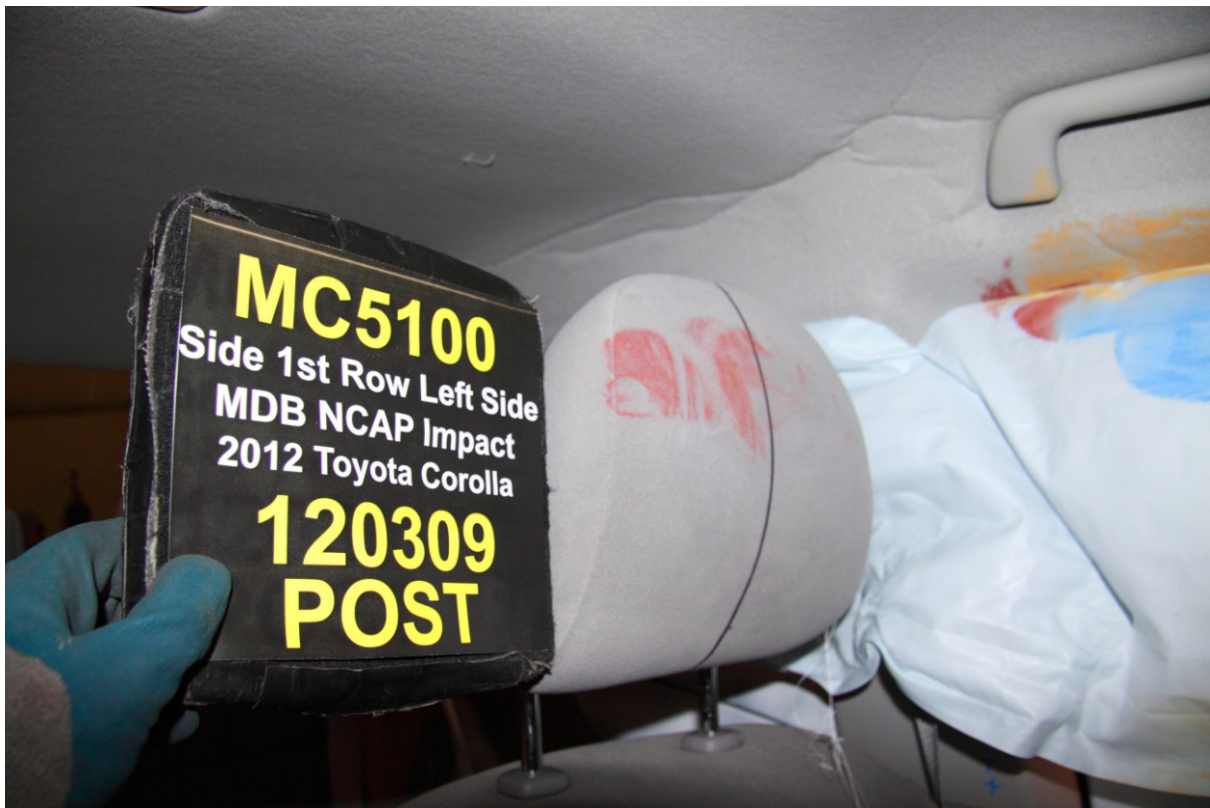
046 Pre-Test Driver Inner Door Panel View



047 Post-Test Driver Inner Door Panel View



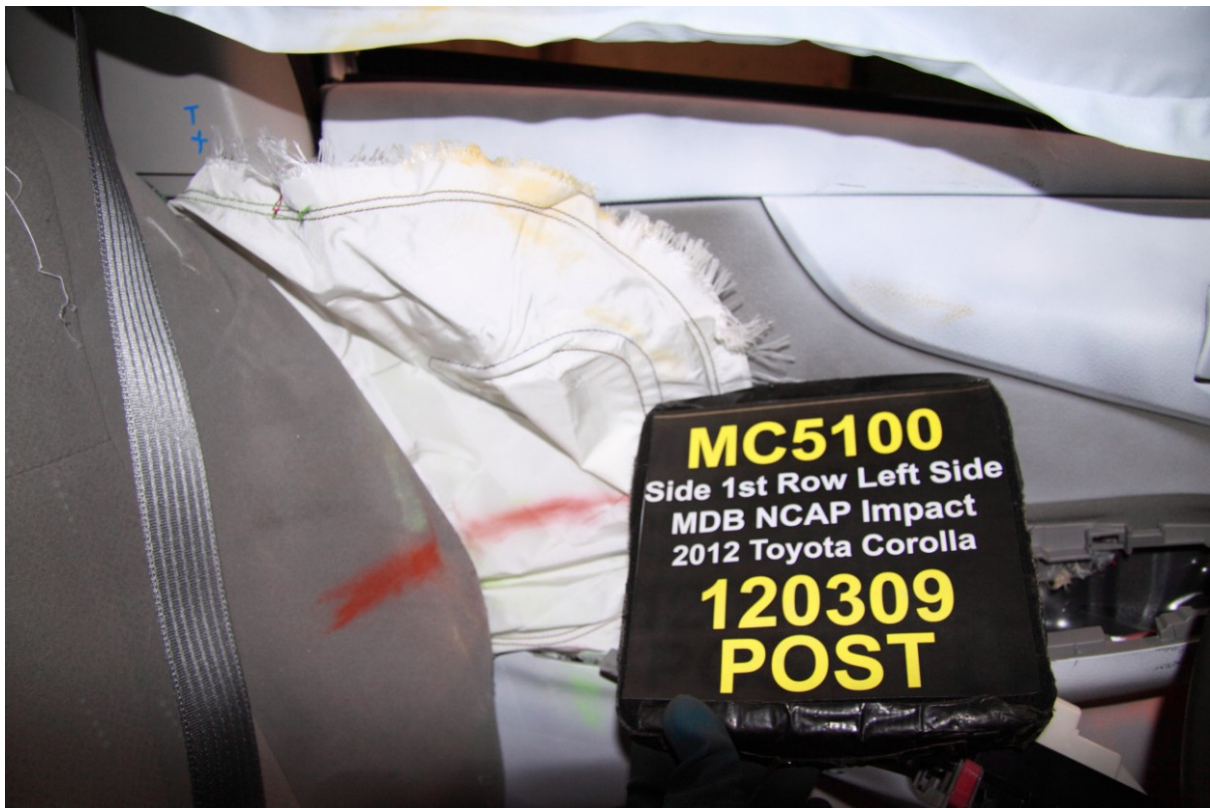
048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View



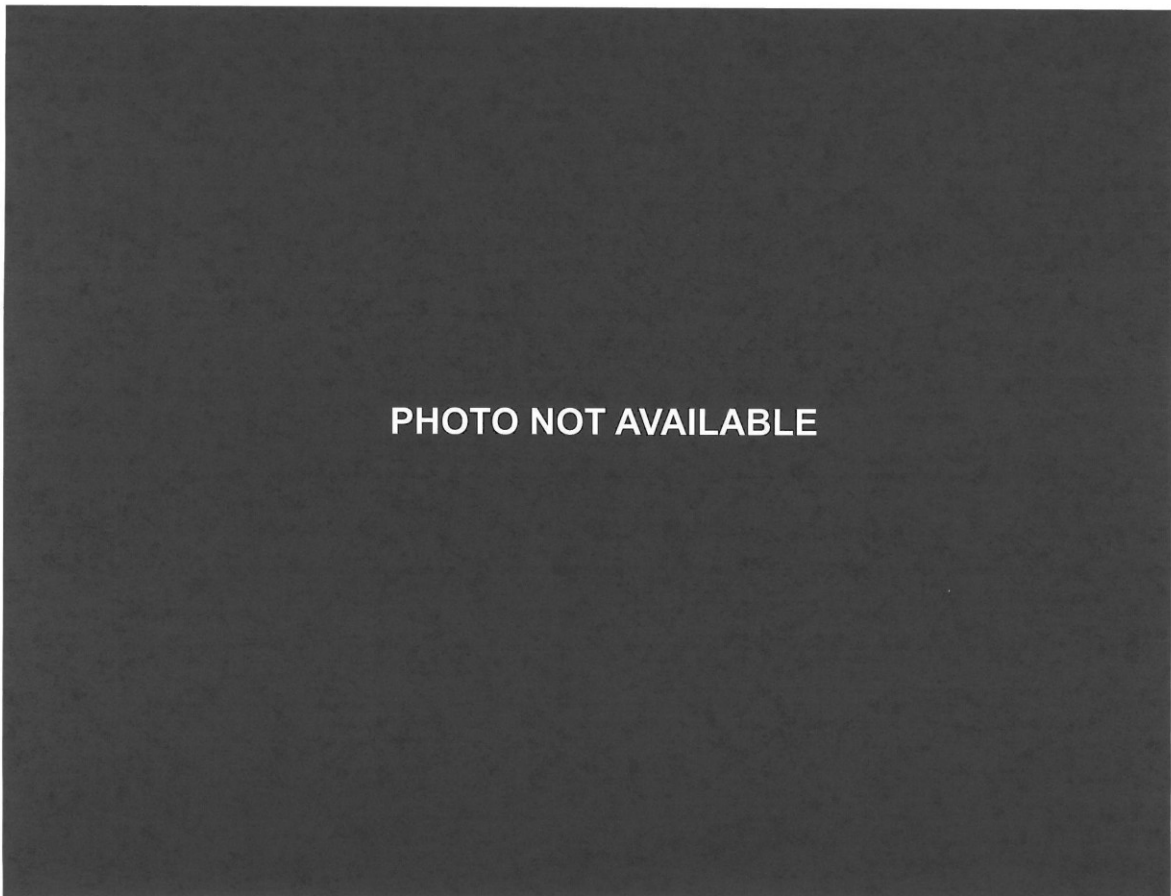
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



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 with Vehicle Interior View

PHOTO NOT AVAILABLE

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



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



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



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



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



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



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



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



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



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



063 Pre-Test Placement of Rear Passenger Dummy Feet



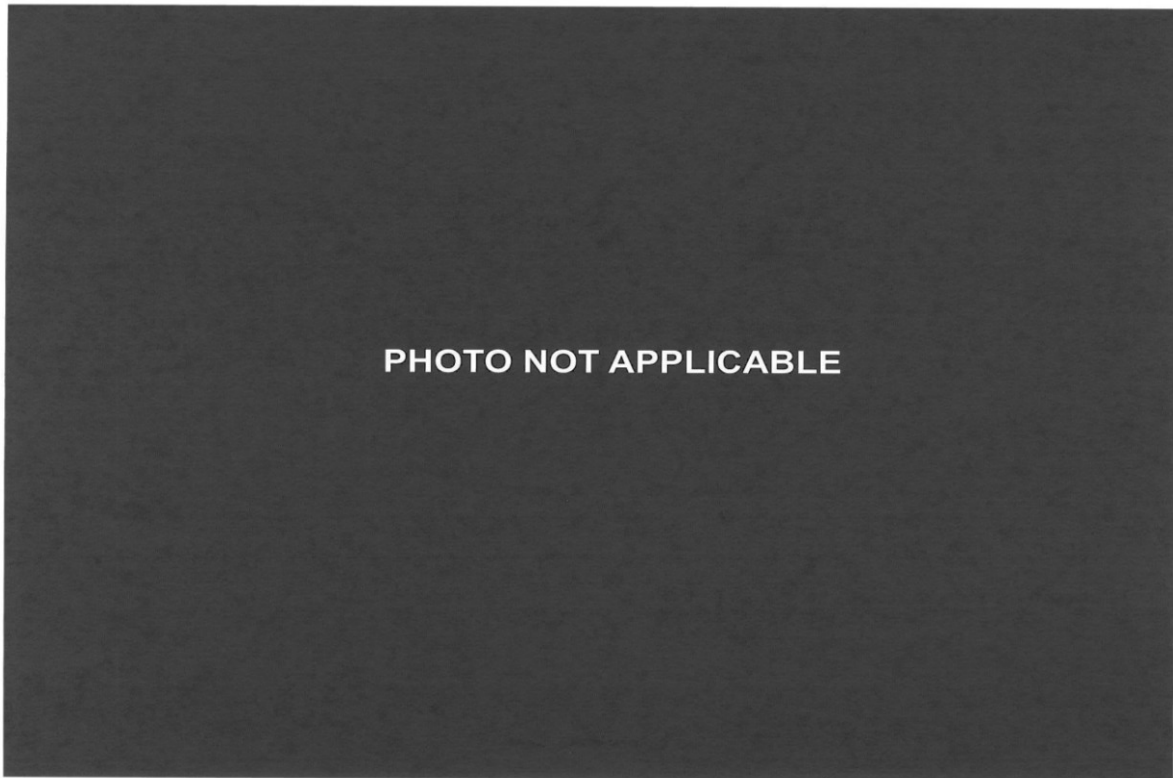
064 Pre-Test View of Belt Anchorage for Rear Passenger Dummy

PHOTO NOT APPLICABLE

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

PHOTO NOT APPLICABLE

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



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



068 Pre-Test Passenger Dummy and Door Clearance View



069 Post-Test Passenger Dummy and Door Clearance View



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



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



072 Pre-Test Passenger Inner Door Panel View



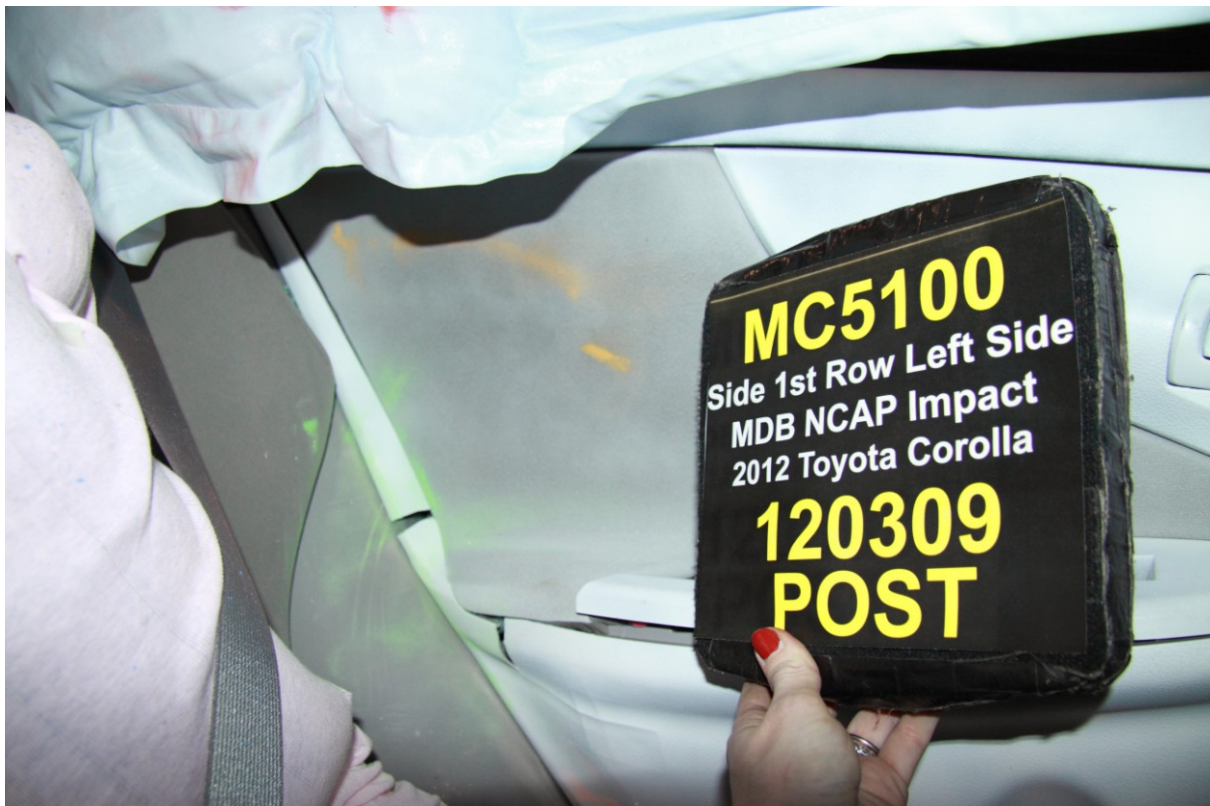
073 Post-Test Passenger Inner Door Panel View



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



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



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

PHOTO NOT APPLICABLE

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



078 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Vehicle Interior View

PHOTO NOT APPLICABLE

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



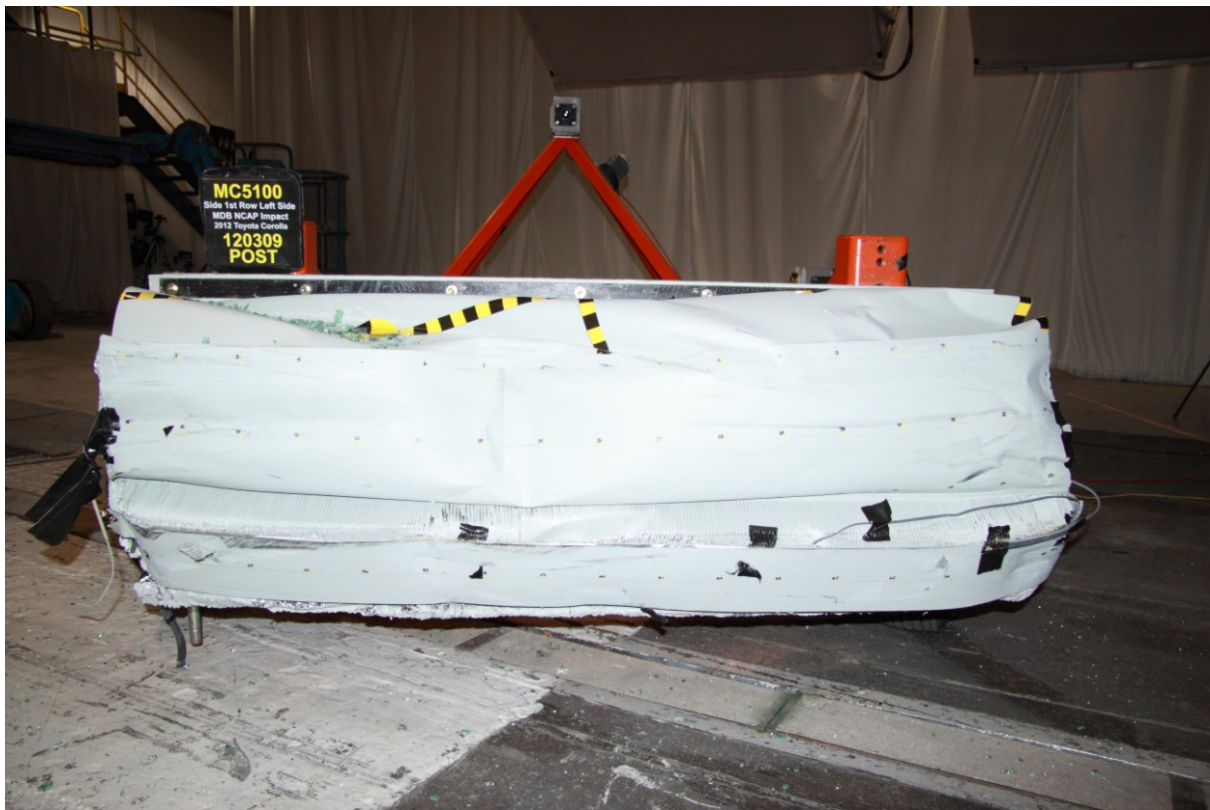
080 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



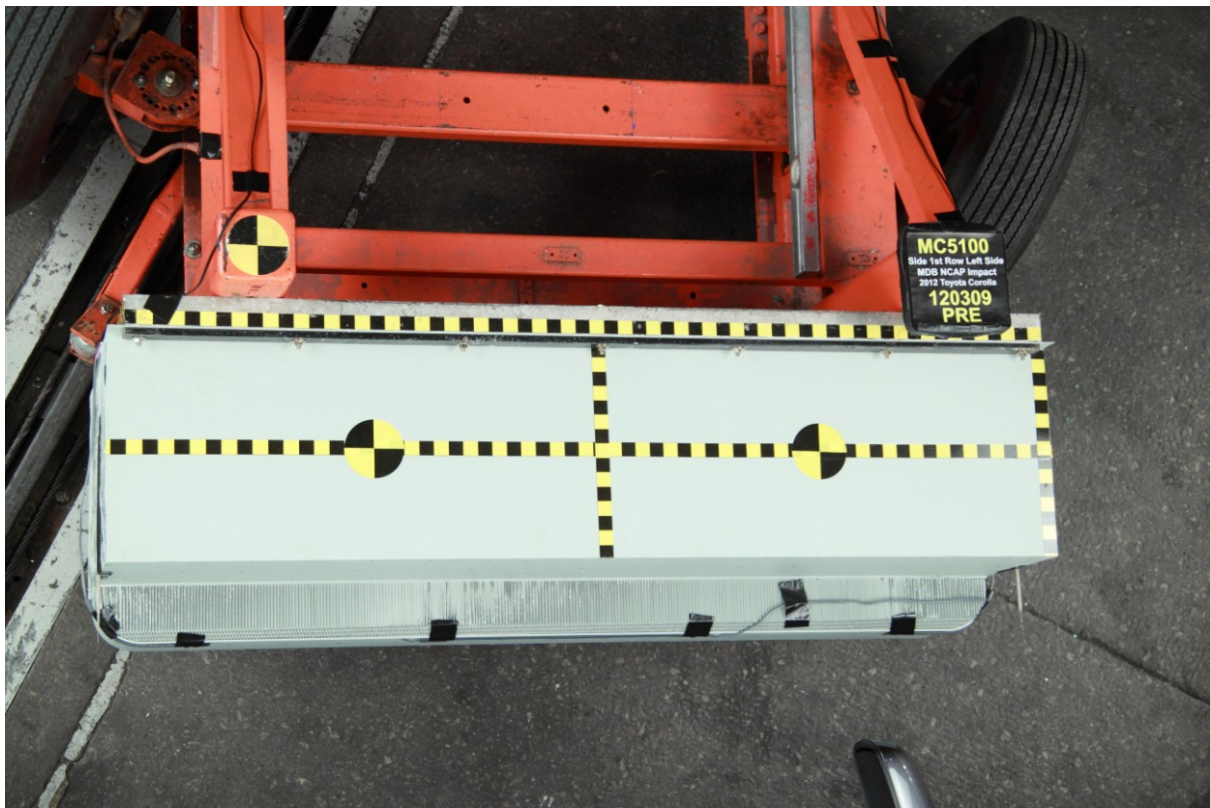
081 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



082 Pre-Test Front View of MDB Impactor Face



083 Post-Test Front View of MDB Impactor Face



084 Pre-Test Top View of MDB Impactor Face



085 Post-Test Top View of MDB Impactor Face



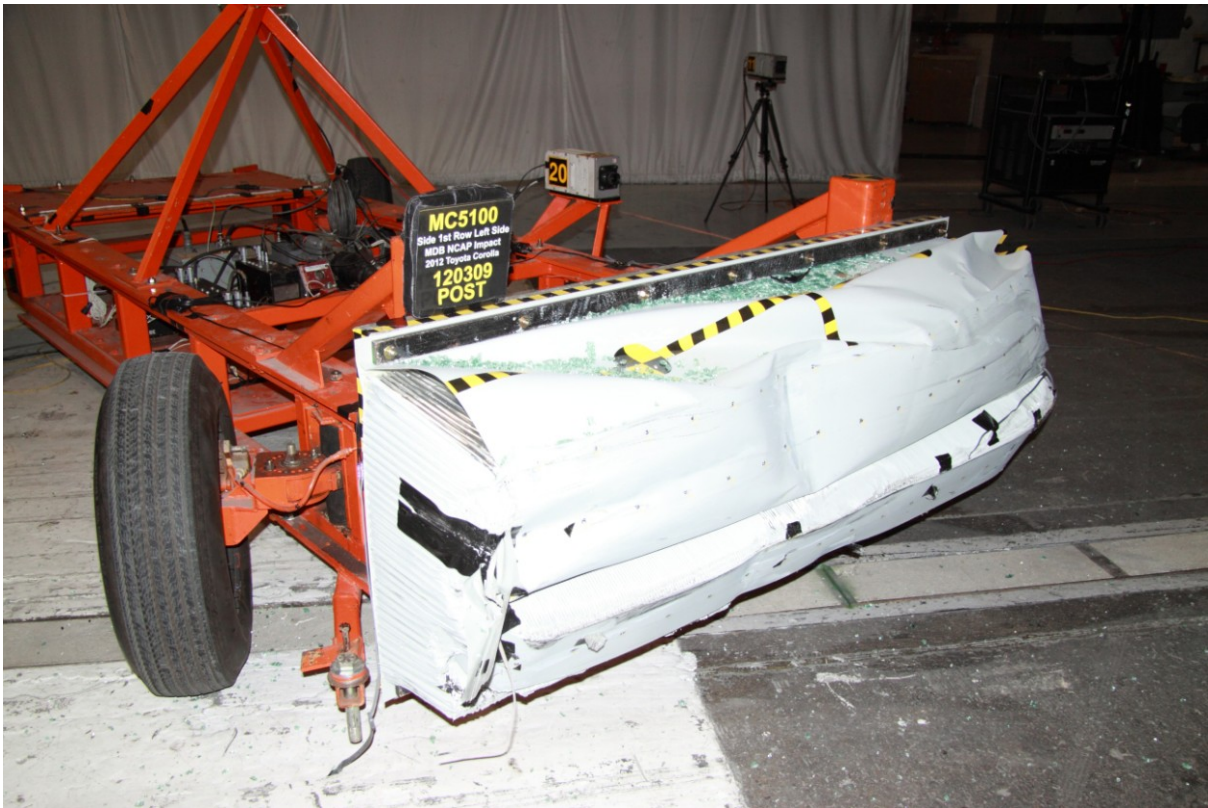
086 Pre-Test Left Side View of MDB Impactor Face



087 Post-Test Left Side View of MDB Impactor Face



088 Pre-Test Right Side View of MDB Impactor Face



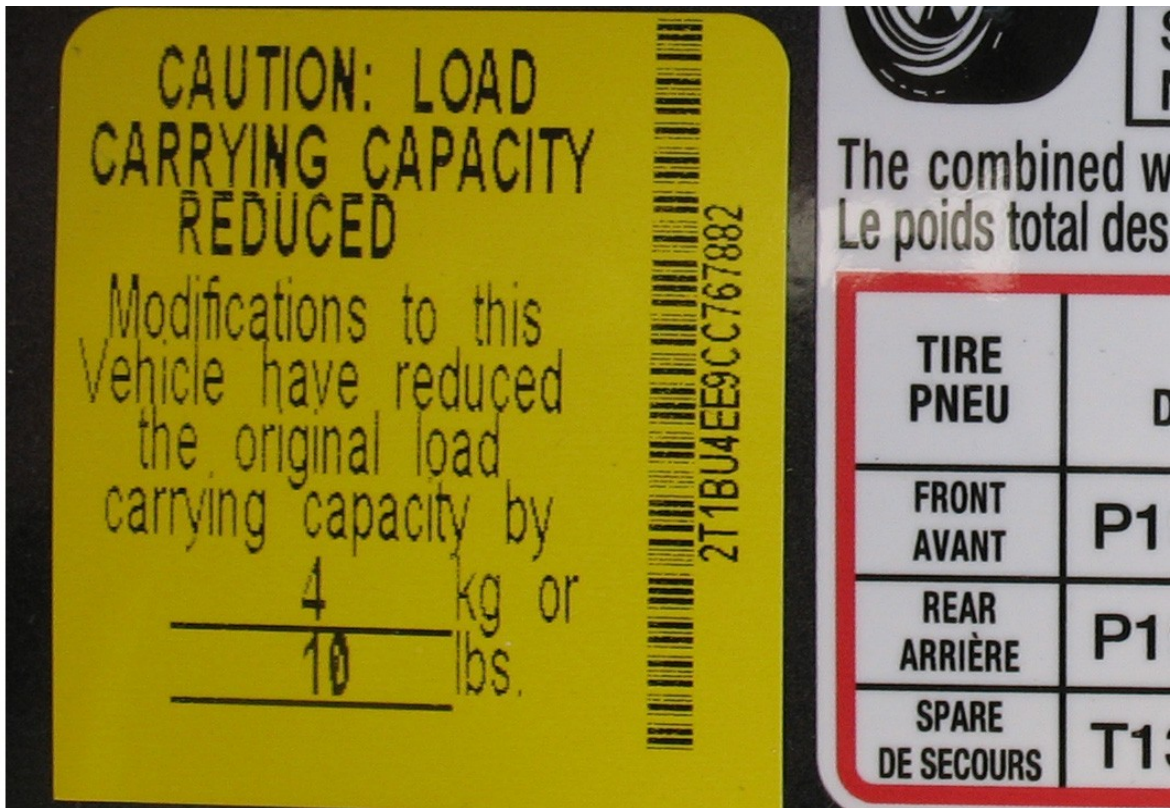
089 Post-Test Right Side View of MDB Impactor Face



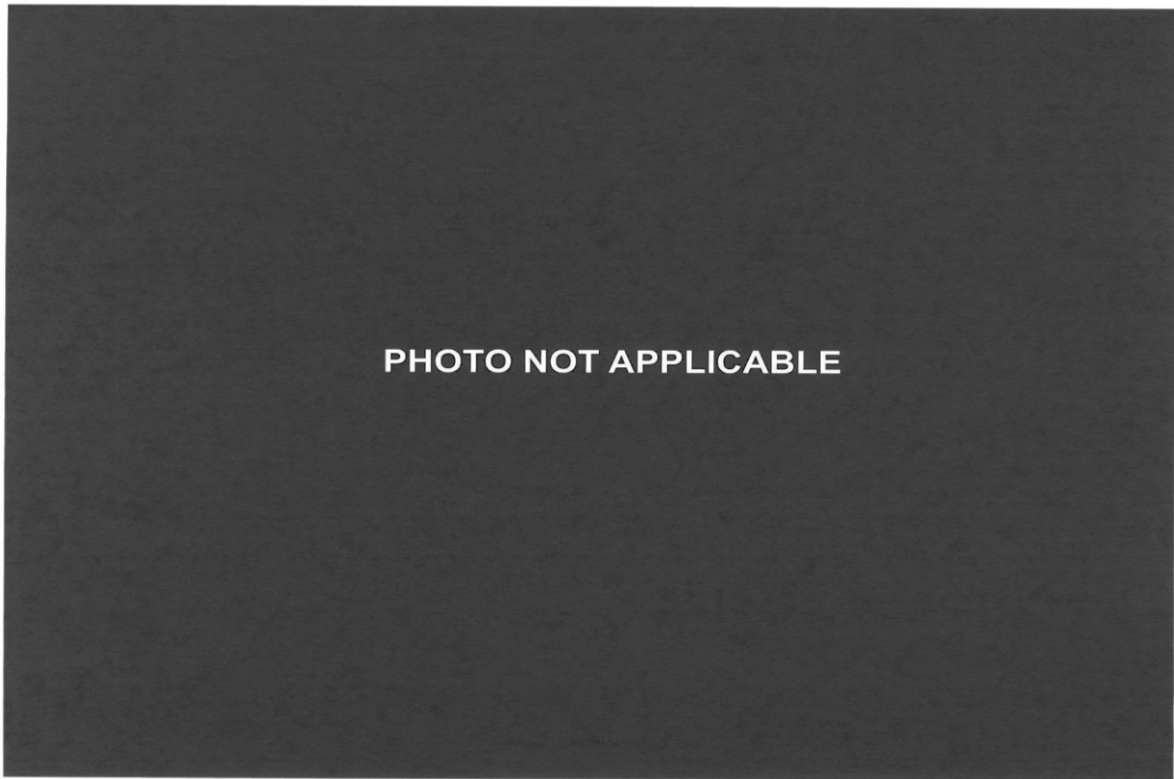
090 Close-Up View of Vehicle Certification Label



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



091a Reduce Load Carrying Capacity Sticker



092 Pre-Test Ballast View



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



094 FMVSS No. 301 Static Rollover 0 Degrees



095 FMVSS No. 301 Static Rollover 90 Degrees



096 FMVSS No. 301 Static Rollover 180 Degrees



097 FMVSS No. 301 Static Rollover 270 Degrees



098 FMVSS No. 301 Static Rollover 360 Degrees



099 Impact Event

TOYOTA
moving forward

DESC: **COROLLA** 4-DOOR SEDAN
VIN: **2T1BU4EE9CC767882**
YR/MDL: 2012/1832A
CLR: MAGNETIC GRAY MET/FA16 (B1G3/16)
PORT/PLANT: Detroit, MI/TMMC RAILHEAD:

STANDARD EQUIPMENT

MECHANICAL & PERFORMANCE

- 1.8L 4-cyl DOHC 16-Valve Dual VVT-i
- 4-Speed Automatic Transmission
- Front Wheel Drive
- Indep MacPherson Strut Front Suspension and Torsion Beam Rear Suspension
- Electric Power Steering (EPS)
- Ventilated Front Disc/Rear Drum Brakes
- 15" Steel Wheels with Wheel Covers and P185SR16 85S Tires

SAFETY & CONVENIENCE

- Star Safety System includes: VSC, TRAC, Anti-lock Brake System, EBD, Brake Assist & Smart Stop Technology (SST)
- 8 Airbags: Dr & Fr Pass Adv Airbag Sys, Dr & Fr Pass Seat-Mounted Side Airbags, Front & Rear Side Curtain Airbags
- Driver & Front Pass Active Headrests
- 3-Point Seatbelts in All Seat Positions & Front Seatbelt Pretensioners
- LATCH (Lar Anchors&Tethers for Children) for Outboard Rear Seating Positions Only
- Tire Pressure Monitor System (TPMS)
- Engine Immobilizer
- Daytime Running Lights

EXTERIOR

- Multi-Reflector Halogen Headlamps
- Color-Keyed Power Outside Mirrors
- Intermittent Windshield Wipers
- Color-Keyed Outside Door Handles

INTERIOR

- Air Conditioning with Air Filter
- AM/FM/CD MP3/WMA Player w/4 Speakers, Aux, Audio Jack & Auto Sound Leveling
- Tilt/Telescopic Steering Wheel
- 8-way Adj. Dr Seat, 4-way Adj. Pass Seat
- 60/40 Split Fold-Down Rear Seat
- Remote Keyless Entry w/Lock/Unlock Panic
- Power Windows w/ Driver-Side Auto Down
- Power Door Locks w/ 1/2-Inch-Activated Lock
- Day/Night Rearview Mirror
- Center Console with Storage Compartment
- 12V Auxiliary Power Outlet
- **Full Tank of Gas**

MANUFACTURER'S SUGGESTED RETAIL PRICE \$16,960.00

OPTIONAL EQUIPMENT

FE 50 State Emissions 225.00
CF Carpet Floor Mats & Trunk Mat

GOVERNMENT SAFETY RATINGS

Frontal Crash Driver **★★★★★** Passenger **★★★★★**
Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.

Side Crash Front seat **Not Rated** Rear seat **Not Rated**
Star ratings based on the risk of injury in a side impact.

Rollover **★★★★★**
Star ratings based on the risk of rollover in a single vehicle crash.

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

EPA Fuel Economy Estimates

CITY MPG 26
Expected range for most drivers 21 to 31 MPG

Estimated Annual Fuel Cost \$1,900
based on 15,000 miles at \$3.70 per gallon

Combined Fuel Economy This Vehicle 29

HIGHWAY MPG 34
Expected range for most drivers 28 to 40 MPG

Your actual mileage will vary depending on how you drive and maintain your vehicle.

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

DELIVERY PROCESSING AND HANDLING FEE 760.00

TOTAL \$17,945.00

The New Vehicle Limited Warranty provides 3 Year/50,000 mile basic coverage. 3 Year/50,000 mile power-train coverage. 3 Year/50,000 mile corrosion perforation coverage. See Warranty and Maintenance Guide for details. An extended service contract may be available for this vehicle. Ask dealer for details. Manufacturer's suggested retail price includes manufacturer's suggested price delivery service. Excludes taxes, license and title fees, registration, dealer and used vehicle. MSRP does not include destination charge and accessories are not included in the manufacturer's suggested retail price. Toyota Care, which covers normal factory scheduled maintenance for two years or 25,000 miles, whichever comes first, is included as part of the sales price of the vehicle for qualifying buyers. See participating dealer for eligibility and coverage details.

Dealer Name / Address: 12102 Ship to: ARLINGTON TOYOTA 2000 N. RAND ROAD PALATINE IL 60074

100 Monroney Label

1-3. Adjustable components (seats, mirrors, steering wheel)

Head restraints

Head restraints are provided for all seats.

► Front seats

1 Up
Pull the head restraints up.

2 Down
Push the head restraint down while pushing the lock release button.

► Rear seats

1 Up
Pull the head restraints up.

2 Down
Push the head restraint down while pushing the lock release button.

► Removing the head restraints

Pull the head restraint up while pressing the lock release button.

► Installing the head restraints

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.

► Adjusting the height of the head restraints

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 rear center seat head restraint

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

CAUTION

Head restraint precautions

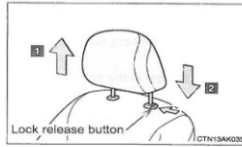
Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- 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.

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

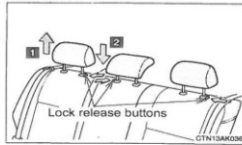
Head restraints are provided for all seats.

► Front seats



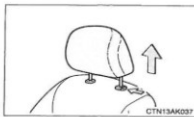
- 1 Up
Pull the head restraints up.
- 2 Down
Push the head restraint down while pushing the lock release button.

► Rear seats



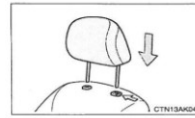
- 1 Up
Pull the head restraints up.
- 2 Down
Push the head restraint down while pushing the lock release button.

■ Removing the head restraints



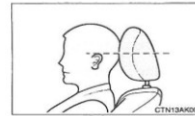
Pull the head restraint up while pressing the lock release button.

■ Installing the head restraints



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.

■ Adjusting the height of the head restraints



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 rear center seat head restraint

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

⚠ 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.

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

NHTSA

Test Lab: CTF

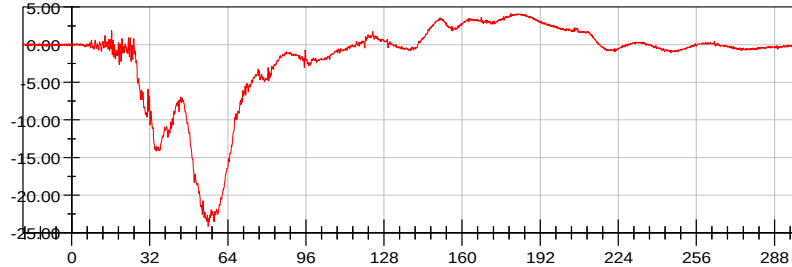
Test Number: 120309 (MC5100)

Test Date: 03/09/2012

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

Position #4 SID IIs Dummy (305)

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



<Max>

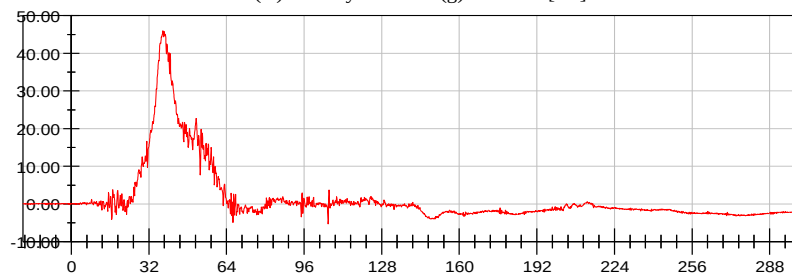
4.17 g at 180.00 ms

<Min>

-24.15 g at 55.92 ms

CFC_1000

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



<Max>

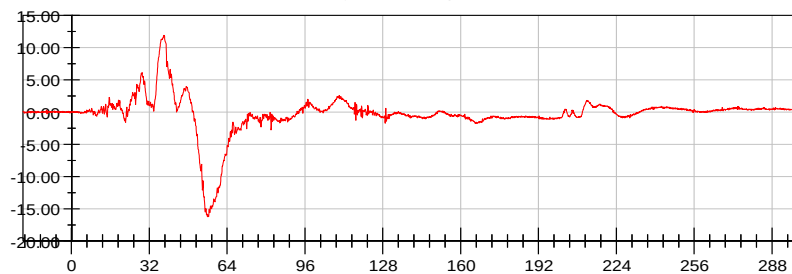
46.00 g at 37.76 ms

<Min>

-5.40 g at 105.92 ms

CFC_1000

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



<Max>

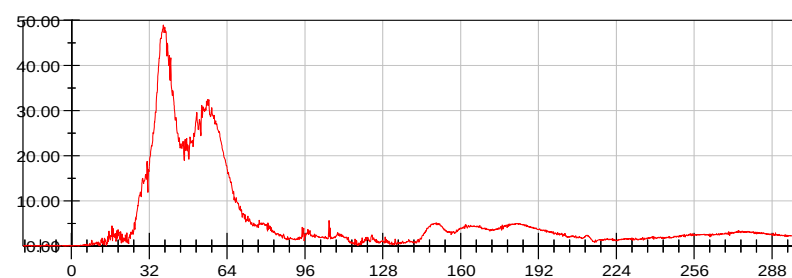
11.94 g at 38.08 ms

<Min>

-16.24 g at 55.92 ms

CFC_1000

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



<Max>

48.95 g at 37.76 ms

<Min>

0.02 g at -18.96 ms

CFC_1000



NHTSA

Test Lab: CTF

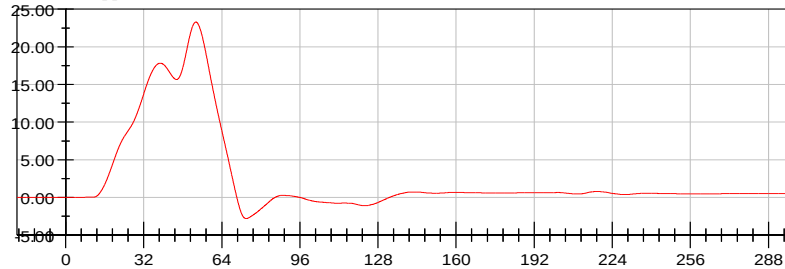
Test Number: 120309 (MC5100)

Test Date: 03/09/2012

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

Position #4 SID IIs Dummy (305)

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



<Max>

23.29 mm at 53.36 ms

<Min>

-2.81 mm at 74.00 ms

CFC_180

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



<Max>

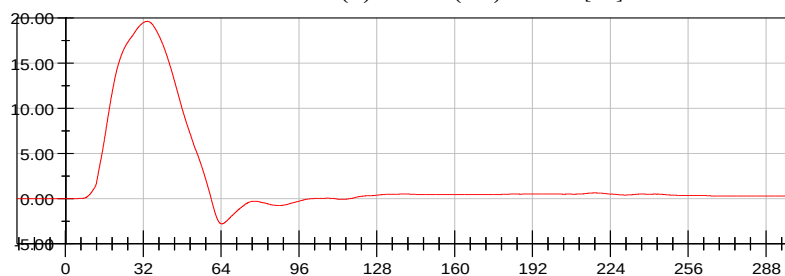
13.89 mm at 34.96 ms

<Min>

-3.85 mm at 65.60 ms

CFC_180

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



<Max>

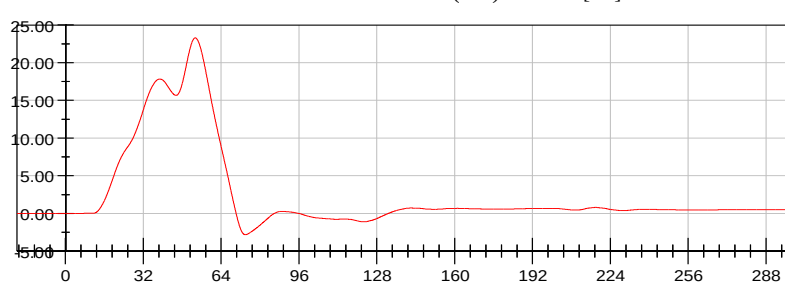
19.64 mm at 33.68 ms

<Min>

-2.80 mm at 64.24 ms

CFC_180

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



<Max>

23.29 mm at 53.36 ms

<Min>

-2.81 mm at 74.00 ms

CFC_180



NHTSA

Test Lab: CTF

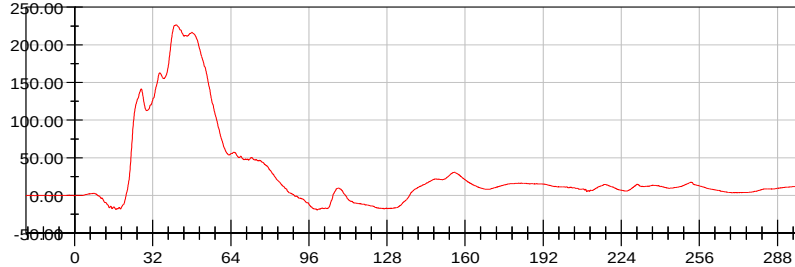
Test Number: 120309 (MC5100)

Test Date: 03/09/2012

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

Position #4 SID IIs Dummy (305)

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



<Max>

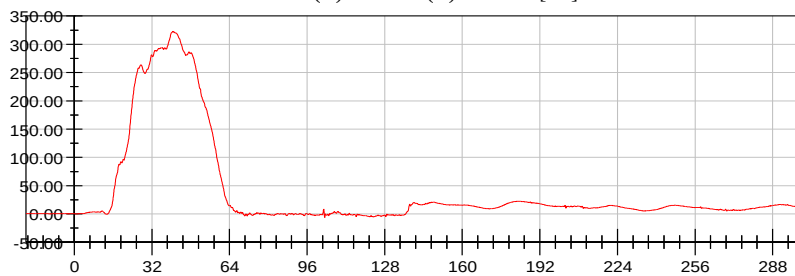
226.59 N at 41.68 ms

<Min>

-19.31 N at 99.36 ms

CFC_600

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



<Max>

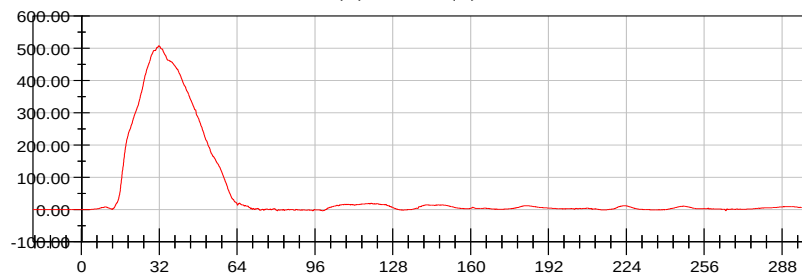
322.71 N at 40.64 ms

<Min>

-6.55 N at 103.28 ms

CFC_600

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



<Max>

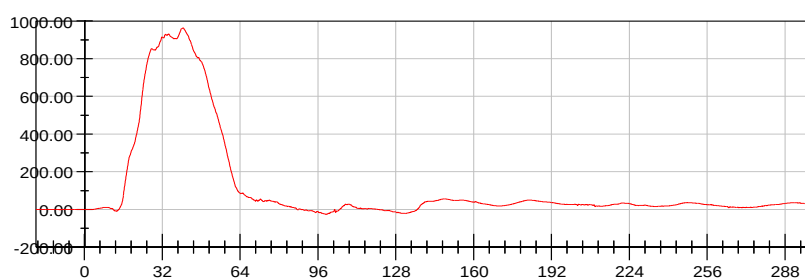
507.82 N at 31.84 ms

<Min>

-4.13 N at 99.20 ms

CFC_600

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



<Max>

963.22 N at 40.56 ms

<Min>

-26.18 N at 99.28 ms

CFC_600



NHTSA

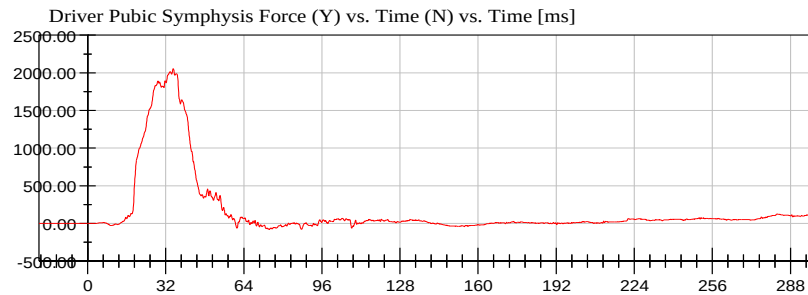
Test Lab: CTF

Test Number: 120309 (MC5100)

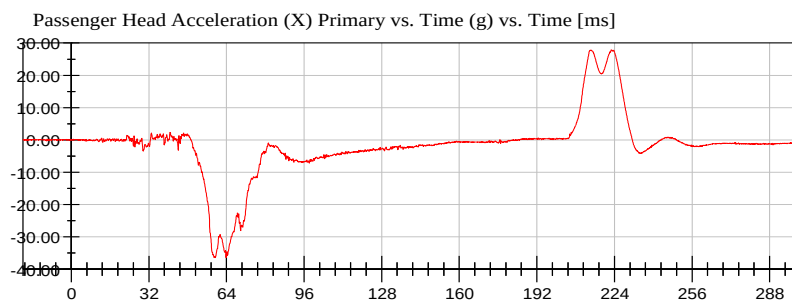
Test Date: 03/09/2012

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

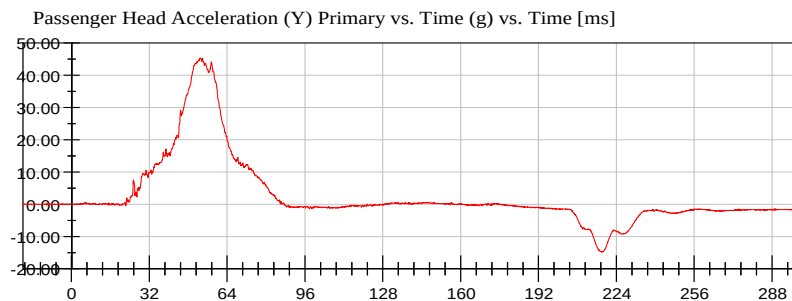
Position #4 SID IIs Dummy (305)



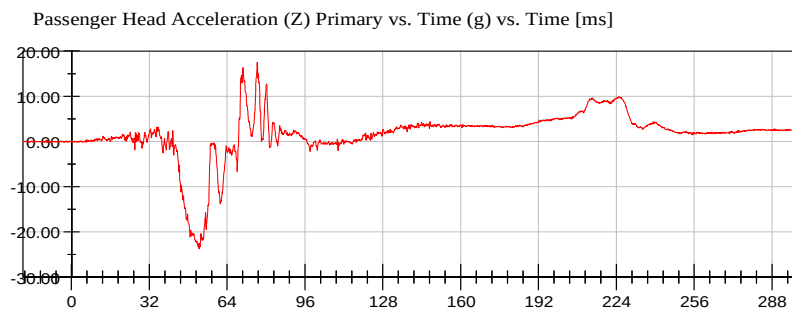
<Max>
2,055.31 N at 35.12 ms
<Min>
-79.49 N at 74.48 ms
CFC_600



<Max>
27.89 g at 222.64 ms
<Min>
-36.53 g at 63.84 ms
CFC_1000



<Max>
45.33 g at 52.72 ms
<Min>
-14.87 g at 217.84 ms
CFC_1000



<Max>
17.51 g at 76.40 ms
<Min>
-23.71 g at 52.48 ms
CFC_1000



NHTSA

Test Lab: CTF

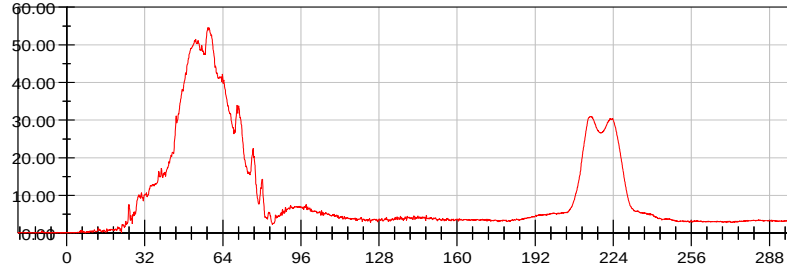
Test Number: 120309 (MC5100)

Test Date: 03/09/2012

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

Position #4 SID IIs Dummy (305)

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



<Max>

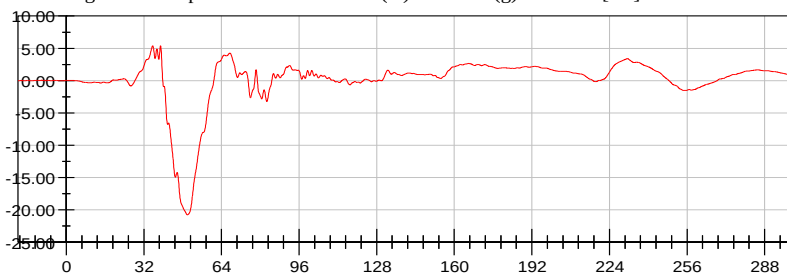
54.57 g at 57.92 ms

<Min>

0.02 g at -20.00 ms

CFC_1000

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



<Max>

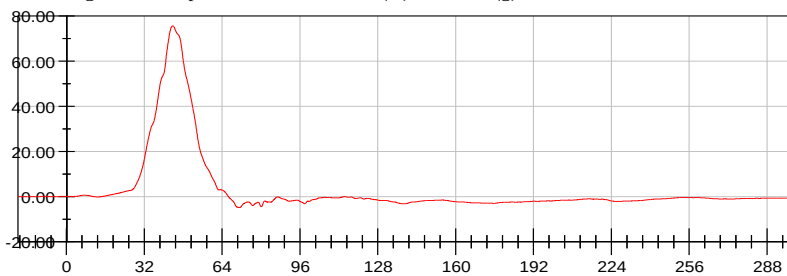
5.40 g at 38.88 ms

<Min>

-20.81 g at 49.92 ms

CFC_180

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



<Max>

75.68 g at 43.76 ms

<Min>

-4.89 g at 71.12 ms

CFC_180

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



<Max>

19.40 g at 52.88 ms

<Min>

-17.12 g at 39.60 ms

CFC_180



NHTSA

Test Lab: CTF

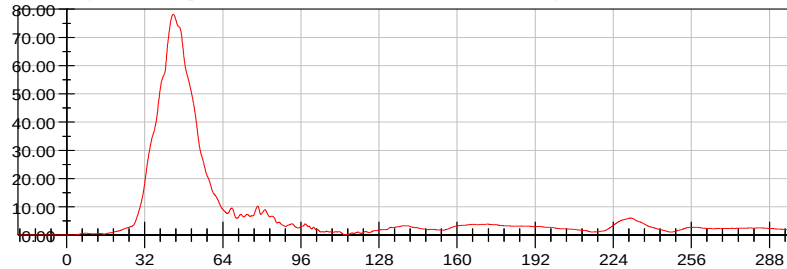
Test Number: 120309 (MC5100)

Test Date: 03/09/2012

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

Position #4 SID IIs Dummy (305)

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



<Max>

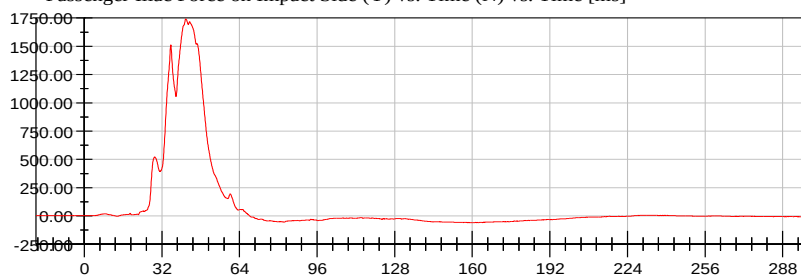
78.17 g at 43.76 ms

<Min>

0.01 g at -16.80 ms

CFC_180

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



<Max>

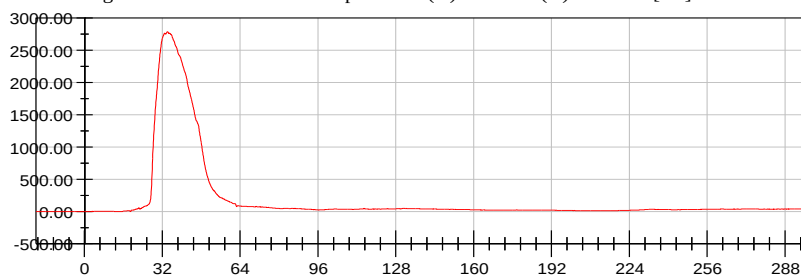
1,740.75 N at 41.84 ms

<Min>

-61.33 N at 159.92 ms

CFC_600

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



<Max>

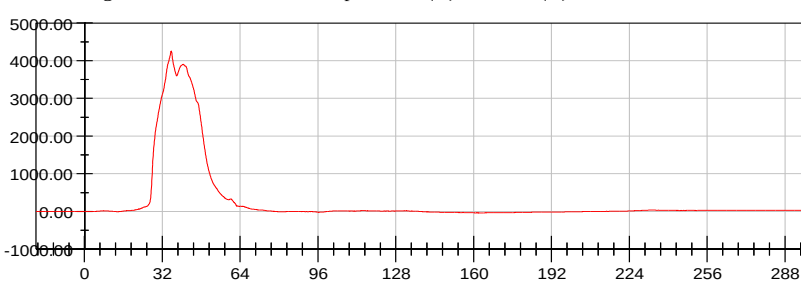
2,788.90 N at 34.16 ms

<Min>

-1.65 N at 14.32 ms

CFC_600

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



<Max>

4,254.82 N at 35.68 ms

<Min>

-37.09 N at 162.72 ms

CFC_600



APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

Table 1. External Measurements

Table 2. Head Drop Test

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

Table 3 Neck Pendulum Test

Pendulum Velocity (m/s) vs. Time (ms)
Flexion Angle (°) vs. Time (ms)
Potentiometer A (°) vs. Time (ms)
Potentiometer B (°) vs. Time (ms)
Potentiometer C (°) vs. Time (ms)

Table 4. Shoulder Impact Test

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

Table 5. Thorax – Upper Rib Drop Test

Upper Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Upper Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 6. Thorax – Middle Rib Drop Test

Middle Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Middle Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 7. Thorax – Lower Rib Drop Test

Lower Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Lower Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 8. Thorax – Full Body Impact Test

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

Table 9. Abdomen Impact Test

Impactor Force (kN) vs. Time (ms)
Total Abdomen Force (kN) vs. Time (ms)
Front Abdomen Force (kN) vs. Time (ms)
Middle Abdomen Force (kN) vs. Time (ms)
Rear Abdomen Force (kN) vs. Time (ms)

Table 10. Lumbar Spine Flexion Test

Pendulum Velocity (m/s) vs. Time (ms)
Spine Flexion Angle (°) vs. Time (ms)
Potentiometer A (°) vs. Time (ms)
Potentiometer B (°) vs. Time (ms)
Potentiometer C (°) vs. Time (ms)

Table 11. Pelvis Impact Test

Pendulum Acceleration (G's) vs. Time (ms)
Impactor Force (kN) vs. Time (ms)
Pubic Symphysis (Y) Force (kN) vs. Time (ms)

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Table 1. External Measurements

Table 2. Head Drop Test

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

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

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

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

Table 3. Lateral Neck Pendulum Test

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

Flexion Angle (°) vs. Time (ms)

Moment About Occipital Condyle (Nm) vs. Time (ms)

Table 4. Shoulder Impact Test

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

Shoulder Displacement (mm) vs. Time (ms)

Upper Spine Acceleration (G's) vs. Time (ms)

Table 5. Thorax (With Arm) Impact Test

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

Shoulder Displacement (mm) vs. Time (ms)

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

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

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

Upper Spine Acceleration (G's) vs. Time (ms)

Lower Spine Acceleration (G's) vs. Time (ms)

Table 6. Thorax (Without Arm) Impact Test

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

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

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

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

Upper Spine Acceleration (G's) vs. Time (ms)

Lower Spine Acceleration (G's) vs. Time (ms)

Table 7. Abdomen Impact Test

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

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

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

Lower Spine Acceleration (G's) vs. Time (ms)

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

Table 9. Pelvis Acetabulum Impact Test

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

Pelvis (Y) Acceleration (G's) vs. Time (ms)

Acetabulum Force (N) vs. Time (ms)

Table 10. Pelvis Iliac Impact Test

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

Pelvis (Y) Acceleration (G's) vs. Time (ms)

Iliac Force (N) vs. Time (ms)

Pre-Test Calibration Sheets
Driver S/N F030

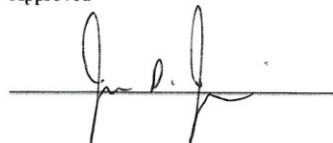
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 04
Date: 01/12/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	97	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	450	Yes
6	Head Width	152.0 - 158.0	154	Yes
7	Shoulder/Arm Width	461.0 - 479.0	472	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	284	Yes
10	Pelvis Lap Width	359.0 - 373.0	365	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	202	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	604	Yes

Technician



Approved




Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/12/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Resultant Acceleration	125 - 155 g	139.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	7.0 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

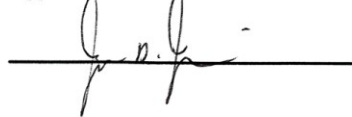
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

01.12.2012 07:20:14 359

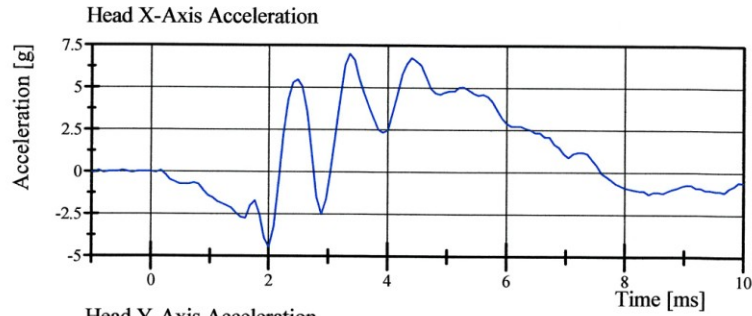


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 4-1

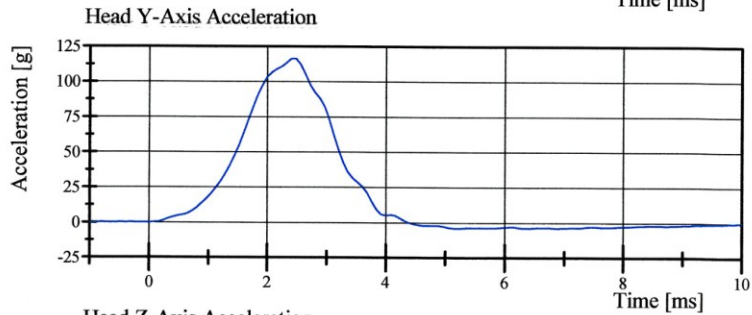
Test Date: 1/12/2012



Filter Class: CFC_1000

Max: 7.0 gn at 3.4 ms

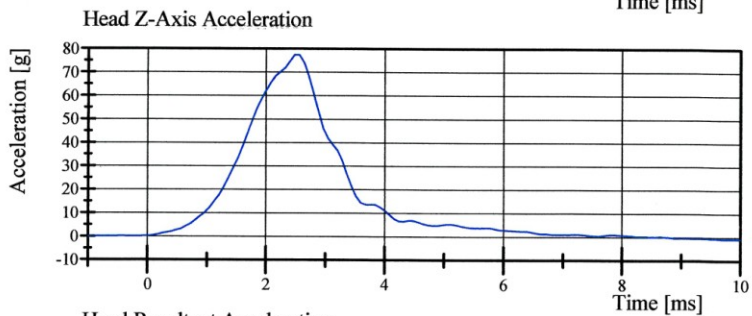
Min: -4.5 gn at 2.0 ms



Filter Class: CFC_1000

Max: 116.4 gn at 2.5 ms

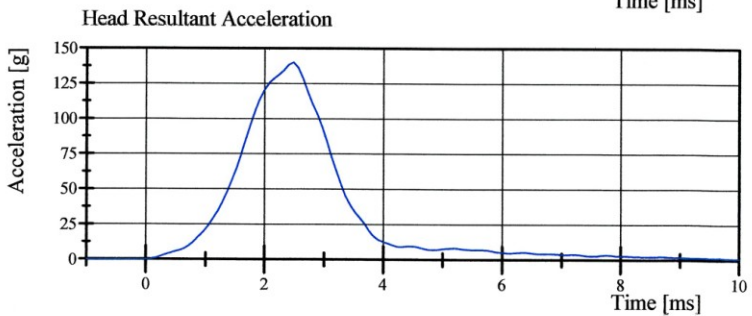
Min: -4.2 gn at 5.2 ms



Filter Class: CFC_1000

Max: 77.5 gn at 2.5 ms

Min: -0.9 gn at 10.0 ms



Filter Class: CFC_1000

Max: 139.9 gn at 2.5 ms

Min: 0.0 gn at -0.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.12.2012 07:20:23 359



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-50.6 deg	Yes
Time of Peak	54 - 66 ms	58.2 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	57.9 ms	Yes

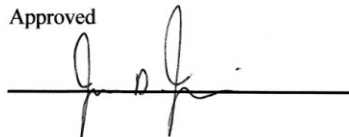
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 15:42:58 1308

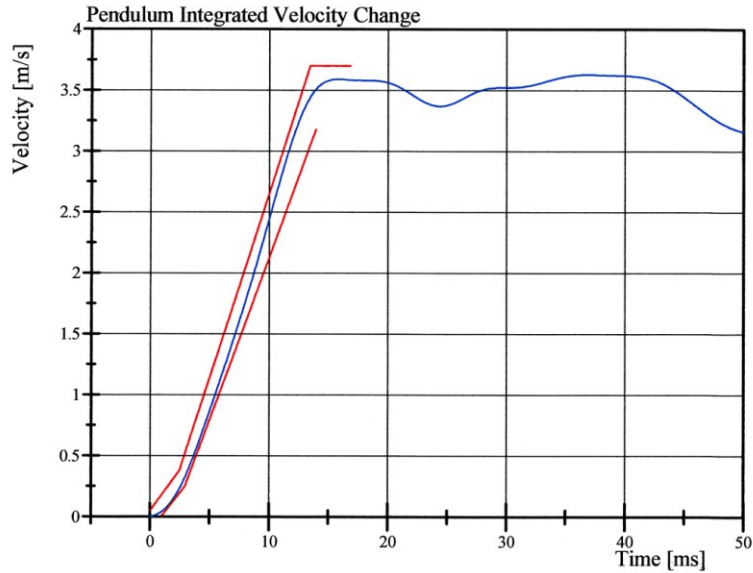
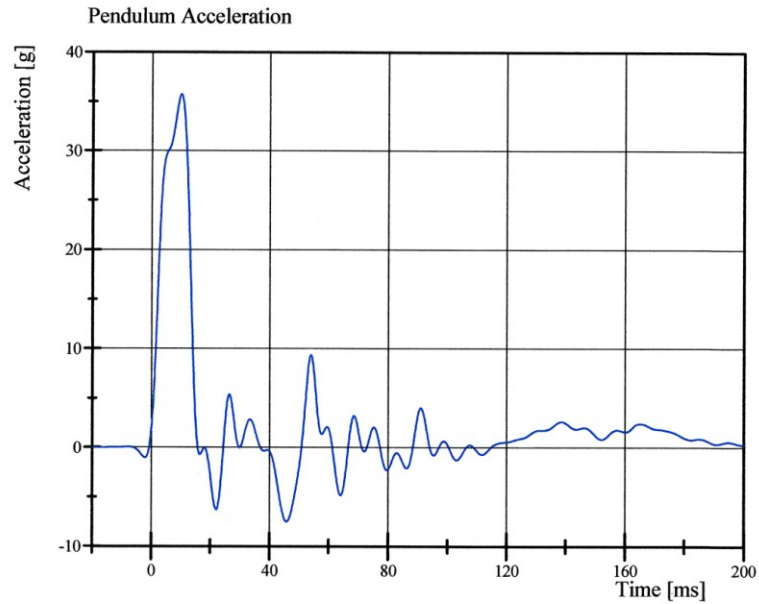


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/11/2012



Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 15:43:05 1308

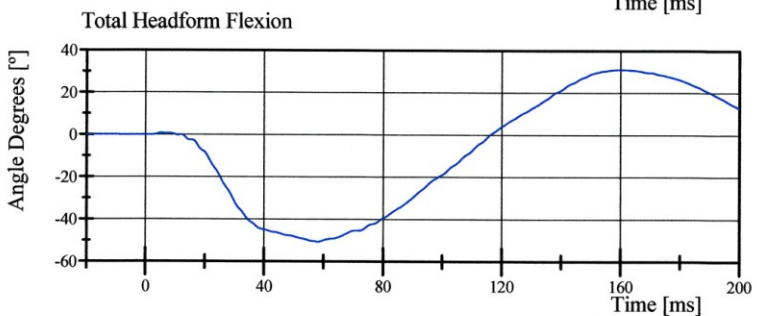
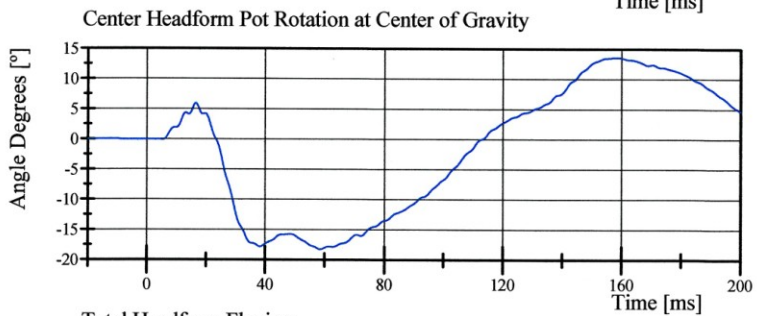
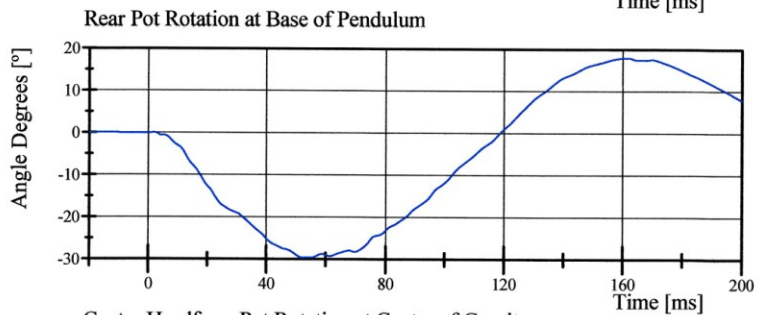
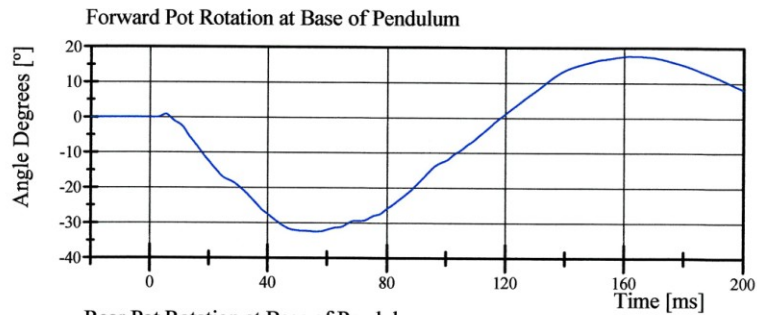


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/11/2012



Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 15:43:06 1308



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 4-2

Test Date: 1/12/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.37 g	Yes

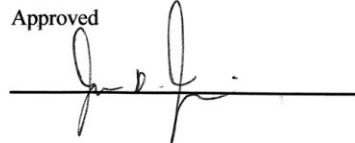
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA final rule 8/15/2008

01.12.2012 08:58:44 566

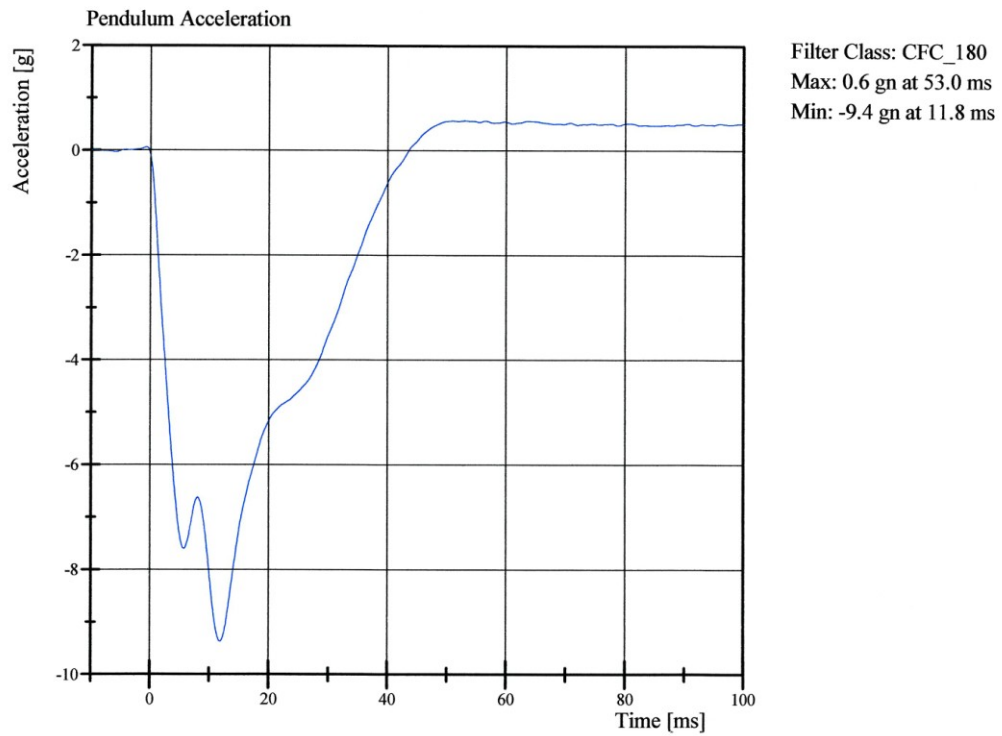


Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 4-2

Test Date: 1/12/2012



Specification Source: NHTSA final rule 8/15/2008

01.12.2012 08:58:54 566



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

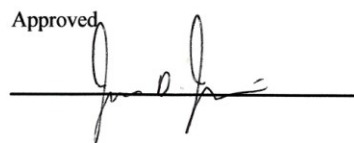
Comments:

Drop Height: 816

Technician



Approved



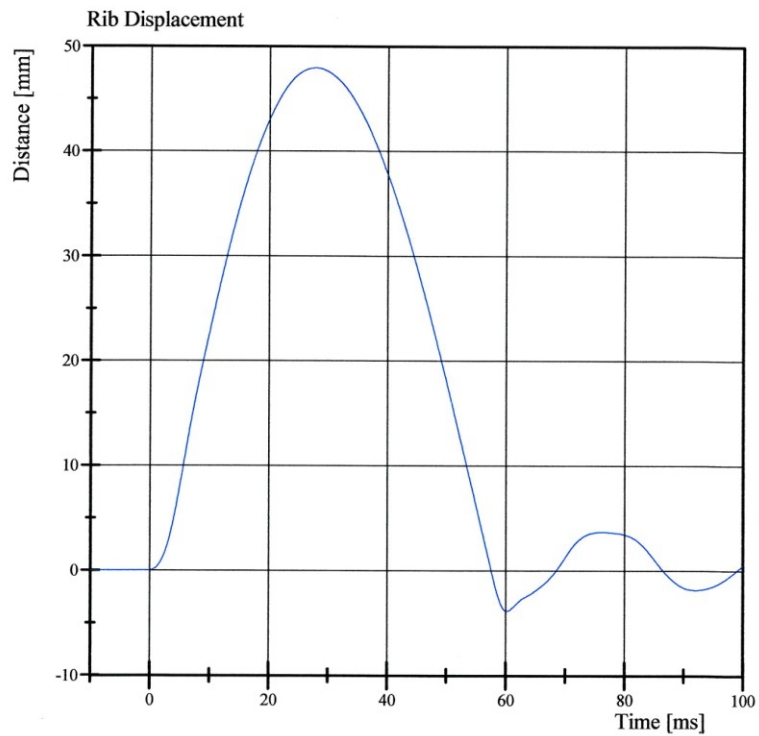
Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 13:49:21 697



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 47.9 mm at 27.8 ms
Min: -3.9 mm at 60.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 13:49:30 697



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.6 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



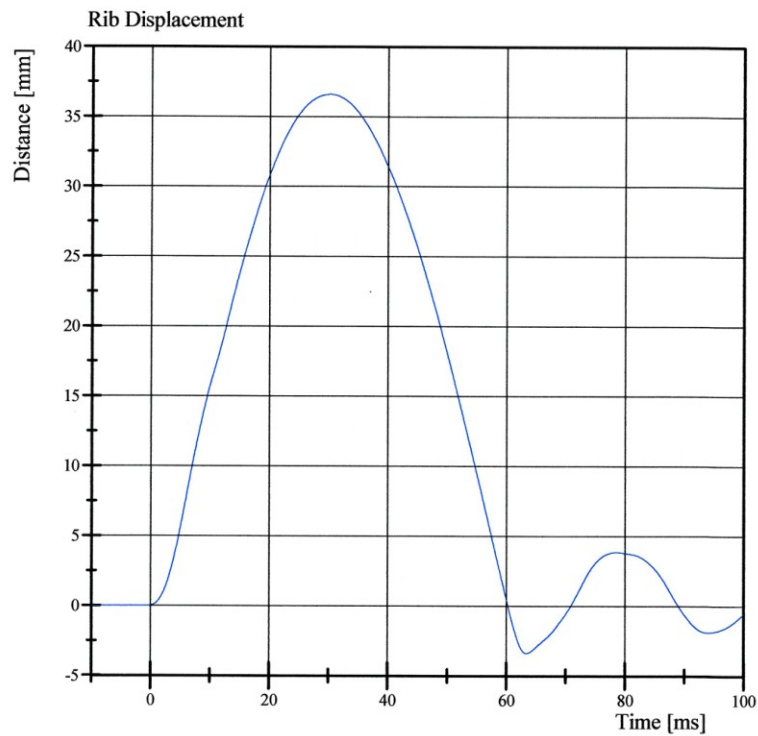
Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 13:54:42 881



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 36.6 mm at 30.2 ms
Min: -3.4 mm at 63.4 ms

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.8 mm	Yes

Test meets specifications.

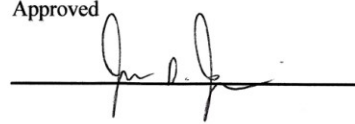
Comments:

Drop Height: 816

Technician



Approved



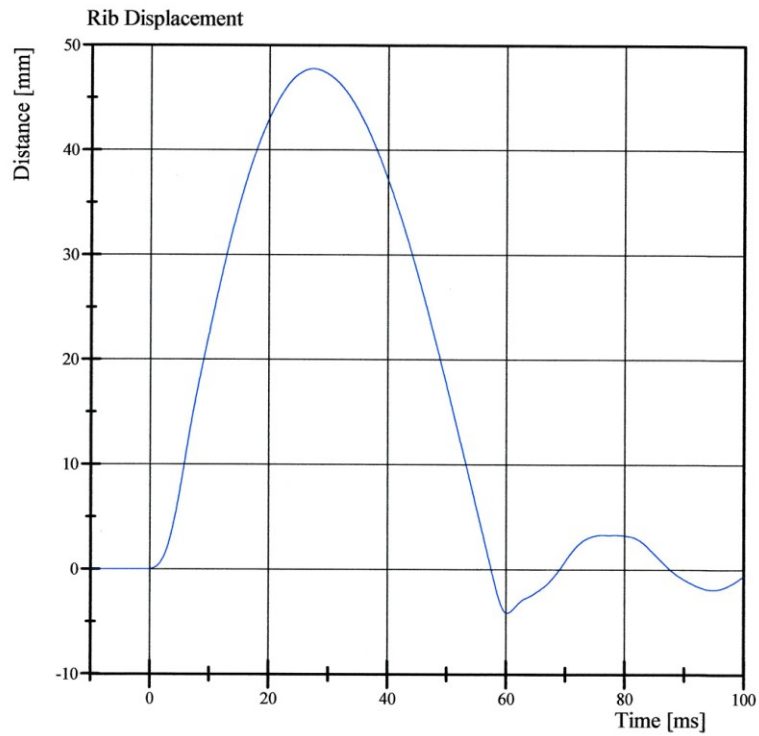
Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 14:02:25 689



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 47.8 mm at 27.4 ms
Min: -4.2 mm at 60.2 ms

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.5 mm	Yes

Test meets specifications.

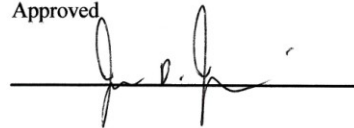
Comments:

Drop Height: 816

Technician



Approved



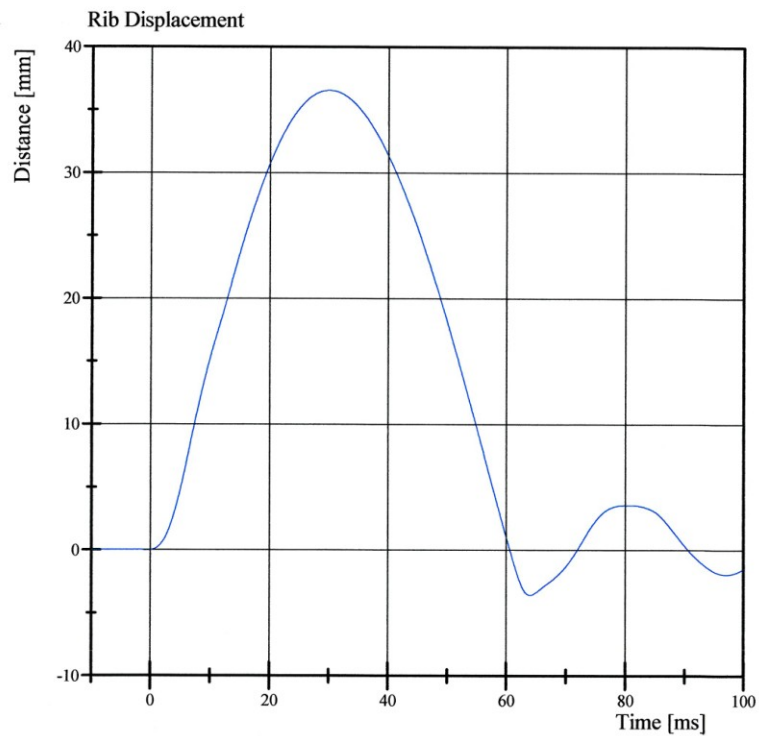
Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 14:08:14 868



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 36.5 mm at 30.0 ms
Min: -3.6 mm at 64.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 14:08:36 868



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.7 mm	Yes

Test meets specifications.

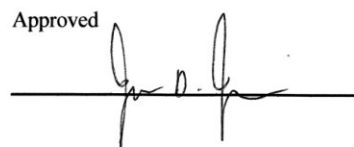
Comments:

Drop Height: 816

Technician



Approved



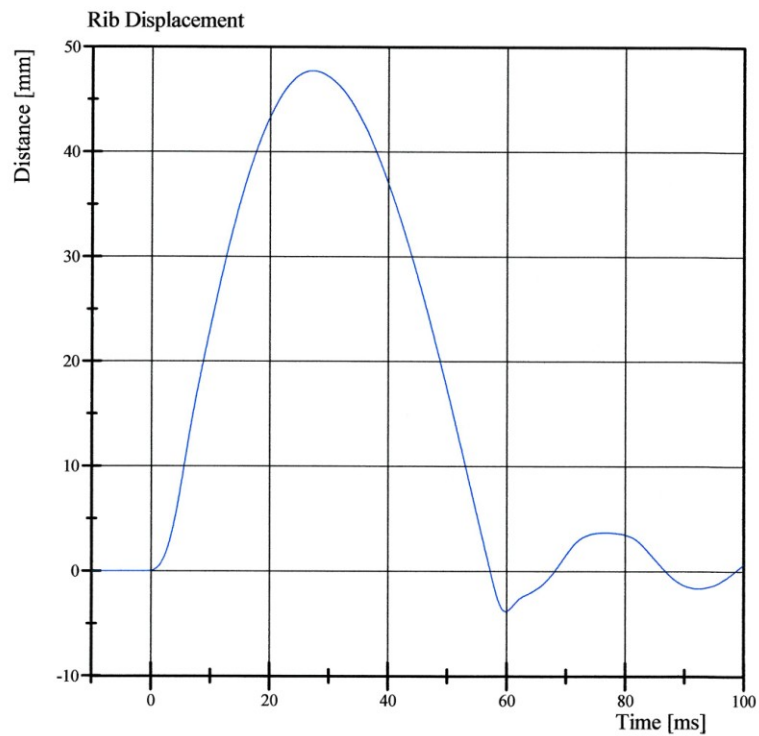
Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 14:44:35 699



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 47.7 mm at 27.2 ms
Min: -3.8 mm at 59.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 14:44:46 699



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.5 mm	Yes

Test meets specifications.

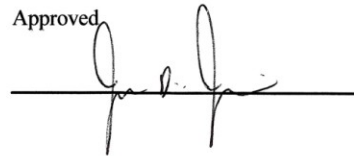
Comments:

Drop Height: 462

Technician



Approved



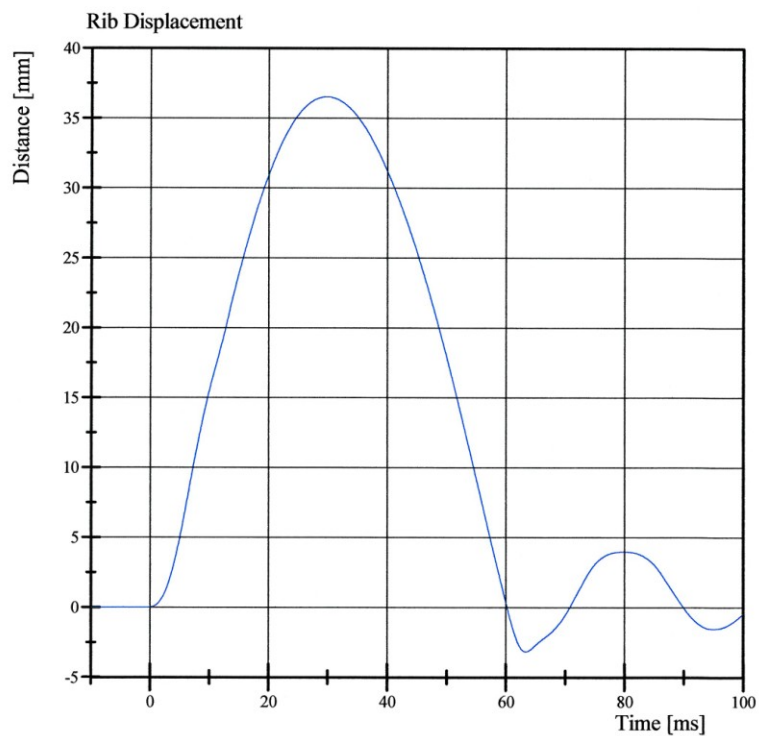
Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 14:52:15 862



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 36.5 mm at 29.8 ms
Min: -3.2 mm at 63.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 14:52:24 862



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 4-1

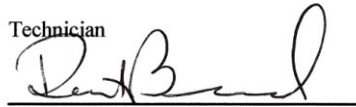
Test Date: 1/12/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.464 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,407.3 N	Yes
Upper Rib Displacement	34 - 41 mm	36.7 mm	Yes
Center Rib Displacement	37 - 45 mm	40.6 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.4 mm	Yes

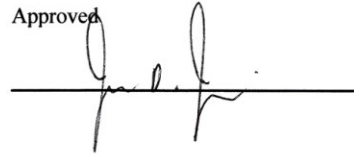
Test meets specifications.

Comments:

Technician



Approved



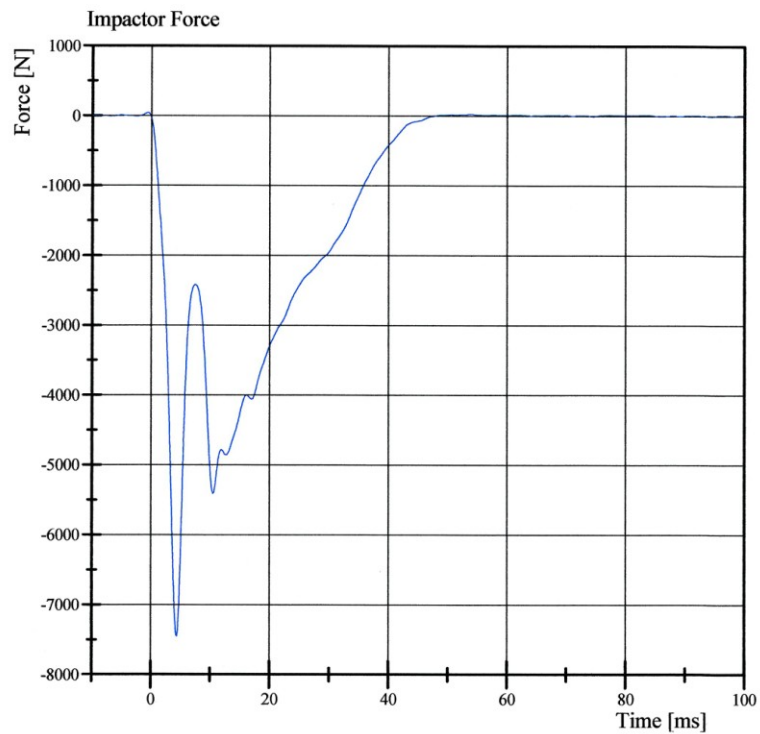
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

01.12.2012 08:37:08 464



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/12/2012



Filter Class: CFC_180
Max: 41.1 N at -0.6 ms
Min: -7,453.2 N at 4.4 ms

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

01.12.2012 08:37:23 464

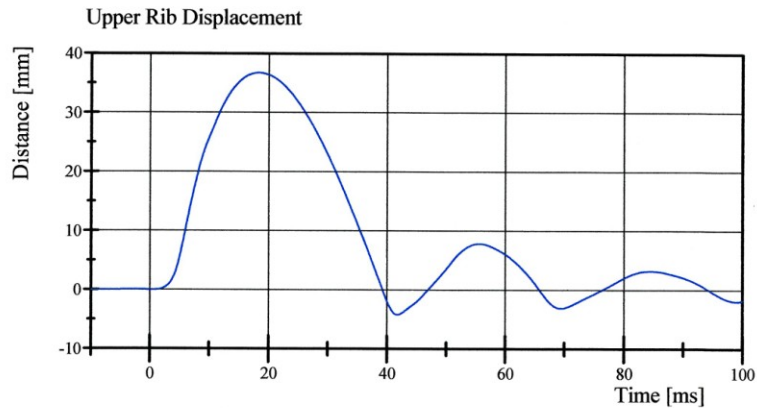


Transportation Research Center Inc.

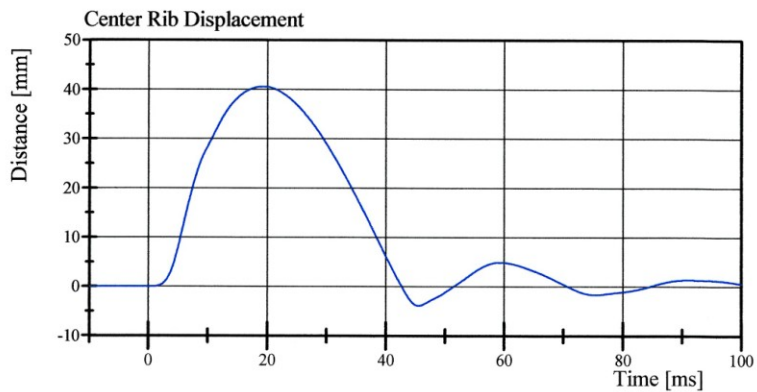
Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 4-1

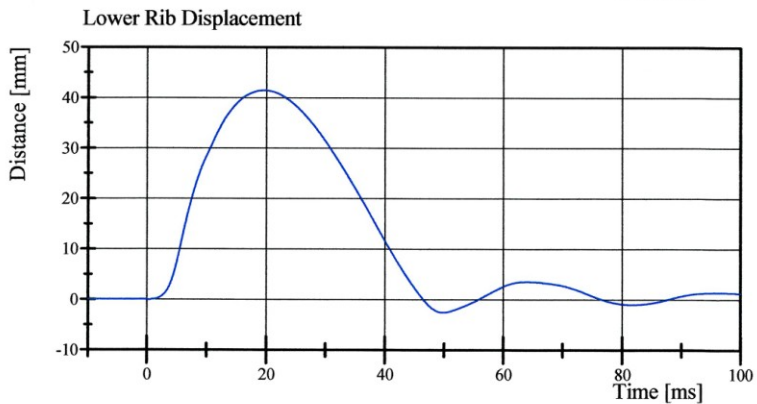
Test Date: 1/12/2012



Filter Class: CFC_180
Max: 36.7 mm at 18.3 ms
Min: -4.2 mm at 41.7 ms



Filter Class: CFC_180
Max: 40.6 mm at 19.2 ms
Min: -3.9 mm at 45.5 ms



Filter Class: CFC_180
Max: 41.4 mm at 19.6 ms
Min: -2.6 mm at 49.8 ms

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

01.12.2012 08:37:24 464



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/12/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.92 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,214.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.12 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,607.1 N	Yes
Time of Peak	10.0 - 12.3 ms	10.24 ms	Yes

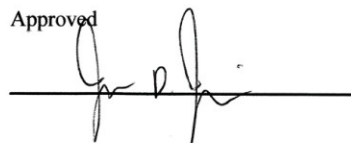
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

01.12.2012 10:13:36 618

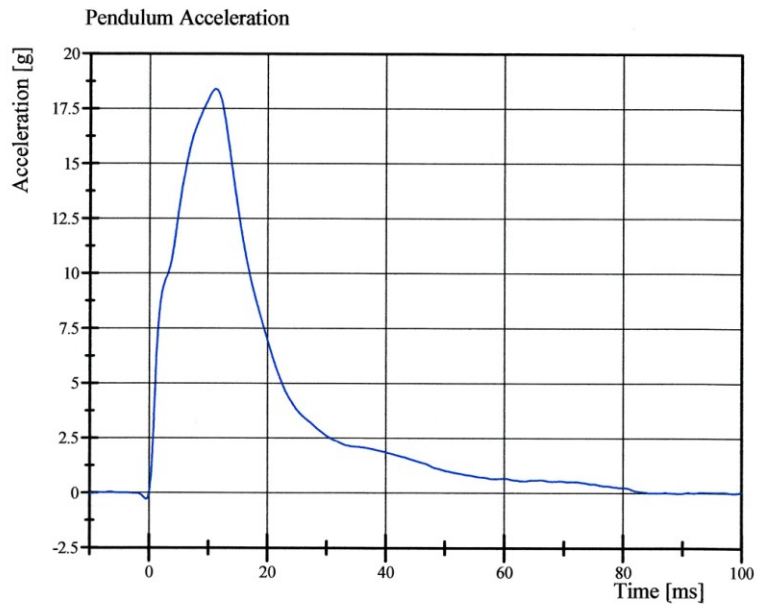


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 4-1

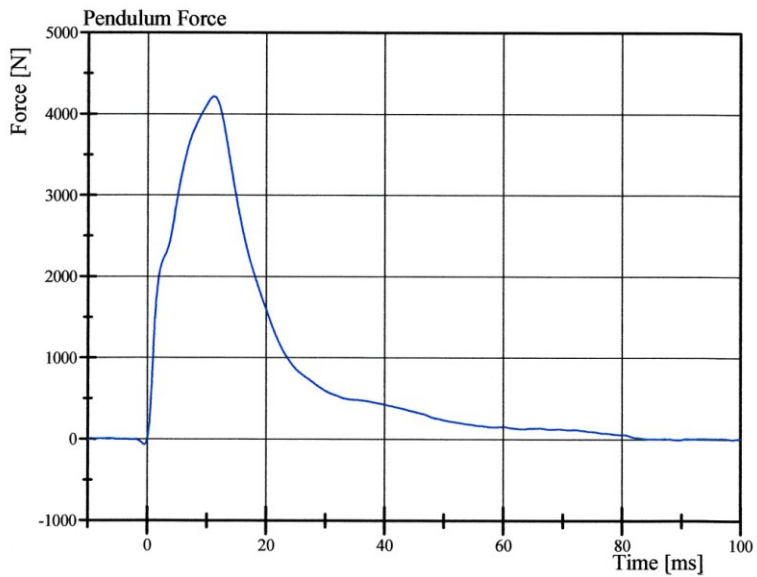
Test Date: 1/12/2012



Filter Class: CFC_180

Max: 18.4 gn at 11.1 ms

Min: -0.3 gn at -0.5 ms



Filter Class: CFC_180

Max: 4,214.3 N at 11.1 ms

Min: -65.9 N at -0.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.12.2012 10:13:45 618

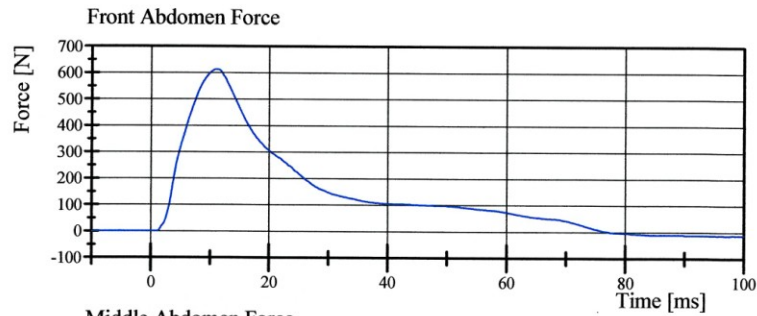


Transportation Research Center Inc.

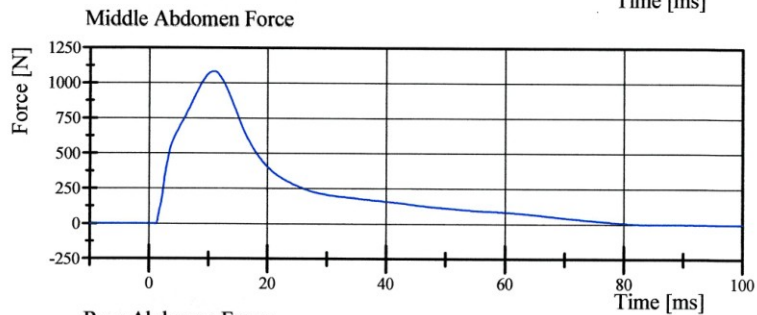
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 4-1

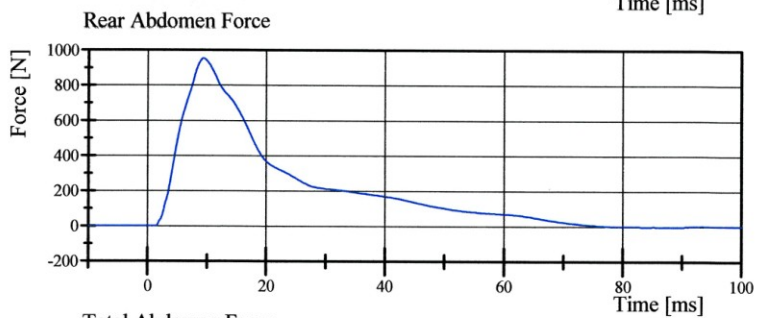
Test Date: 1/12/2012



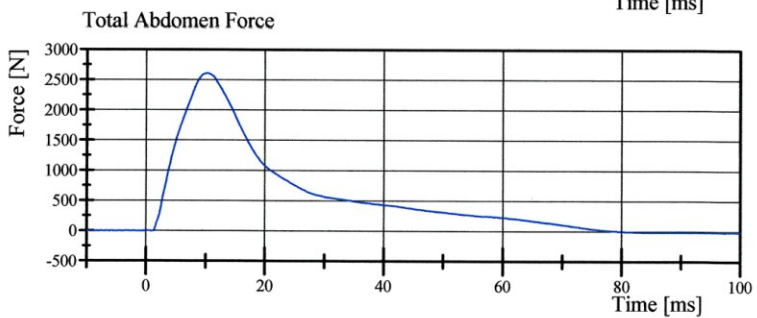
Filter Class: CFC_600
Max: 612.5 N at 11.0 ms
Min: -12.6 N at 97.4 ms



Filter Class: CFC_600
Max: 1,081.8 N at 10.9 ms
Min: -3.2 N at 97.4 ms



Filter Class: CFC_600
Max: 953.6 N at 9.4 ms
Min: -1.9 N at 89.8 ms



Filter Class: CFC_600
Max: 2,607.1 N at 10.2 ms
Min: -15.1 N at 97.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.12.2012 10:13:46 618



Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 4-1
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-5.972 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.3 deg	Yes
Time of Peak	39 - 53 ms	45.2 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	37.3 ms	Yes

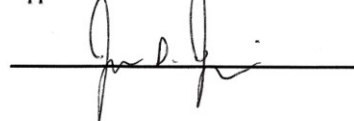
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 15:20:54 582

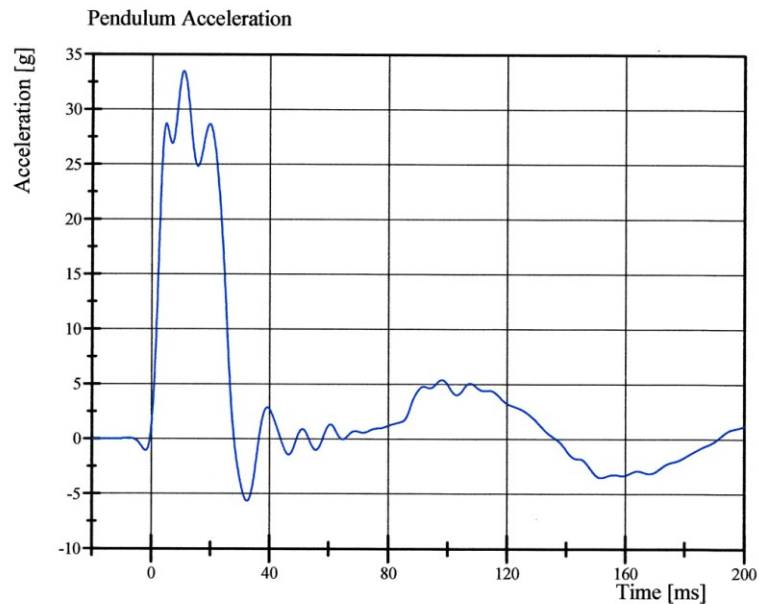


Transportation Research Center Inc.

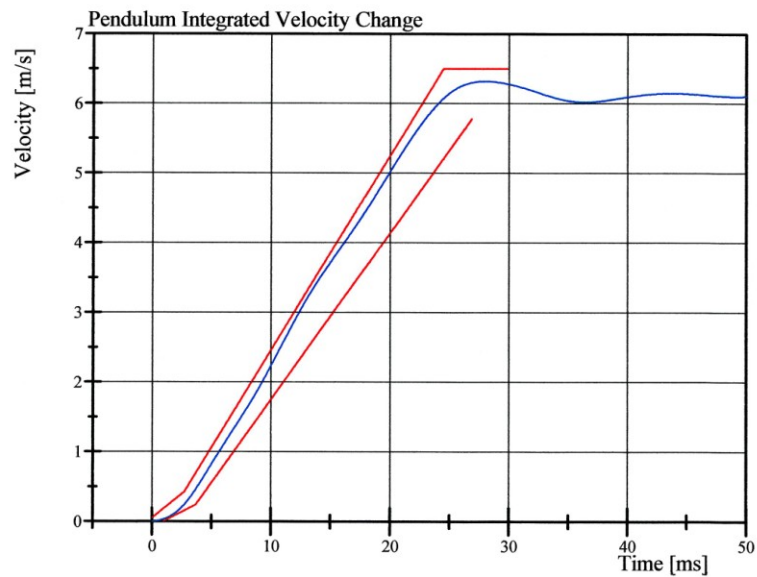
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/11/2012



Filter Class: CFC_60
Max: 33.5 gn at 10.7 ms
Min: -5.7 gn at 32.4 ms



Filter Class: CFC_60
Max: 6.3 m/s at 28.0 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 15:21:09 582

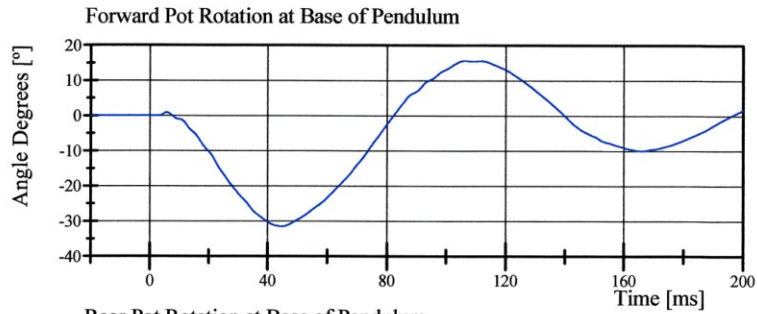


Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 4-1

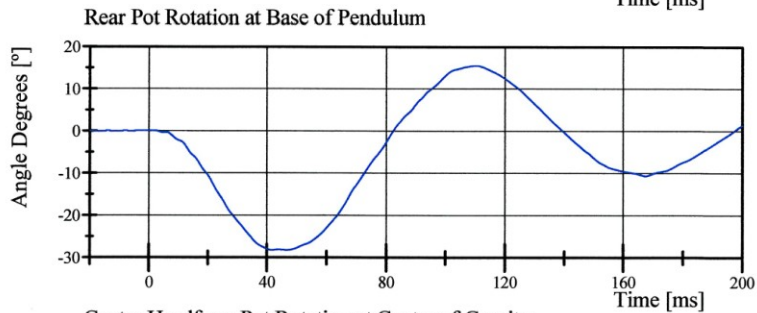
Test Date: 1/11/2012



Filter Class: CFC_180

Max: 15.6 ° at 106.1 ms

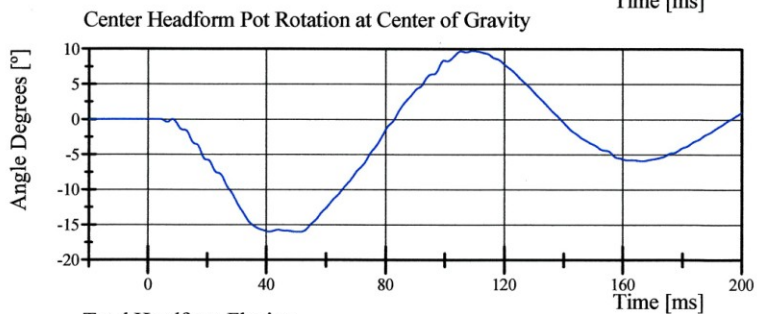
Min: -31.5 ° at 44.7 ms



Filter Class: CFC_180

Max: 15.5 ° at 110.4 ms

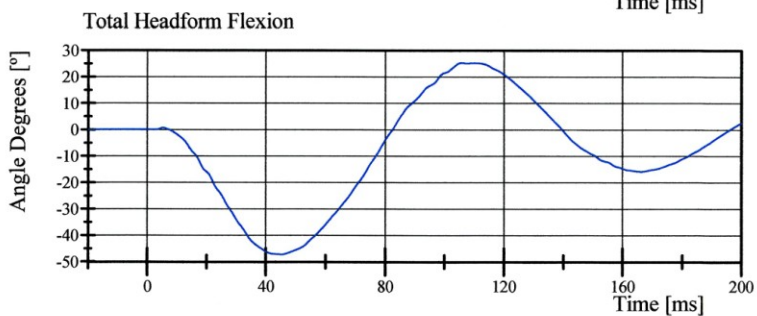
Min: -28.2 ° at 41.6 ms



Filter Class: CFC_180

Max: 9.7 ° at 109.3 ms

Min: -16.0 ° at 50.9 ms



Filter Class: CFC_180

Max: 25.3 ° at 105.7 ms

Min: -47.3 ° at 45.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.11.2012 15:21:09 582



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 4-1

Test Date: 1/12/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.22 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,116.9 N	Yes
Time of Peak	11.8 - 16.1 ms	12.64 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,260.3 N	Yes
Time of Peak	12.2 - 17.0 ms	13.36 ms	Yes

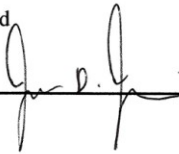
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

01.12.2012 10:30:26 559

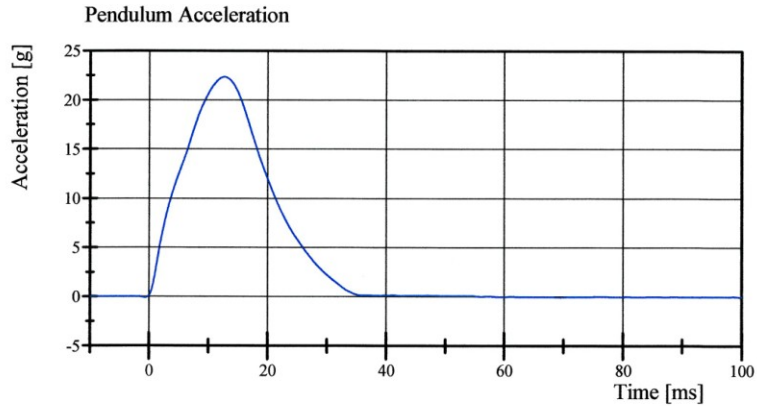


Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 4-1

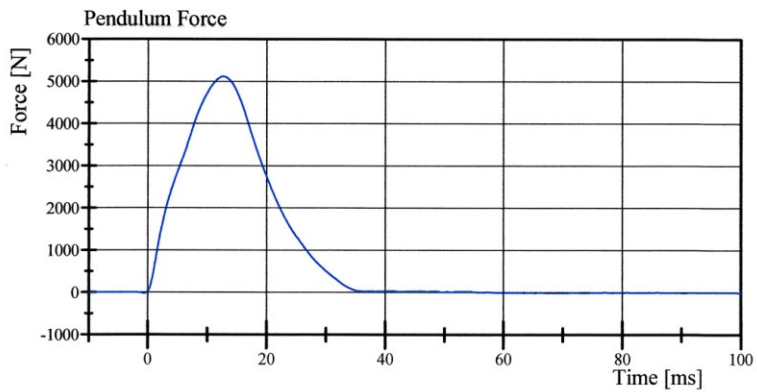
Test Date: 1/12/2012



Filter Class: CFC_180

Max: 22.3 gn at 12.6 ms

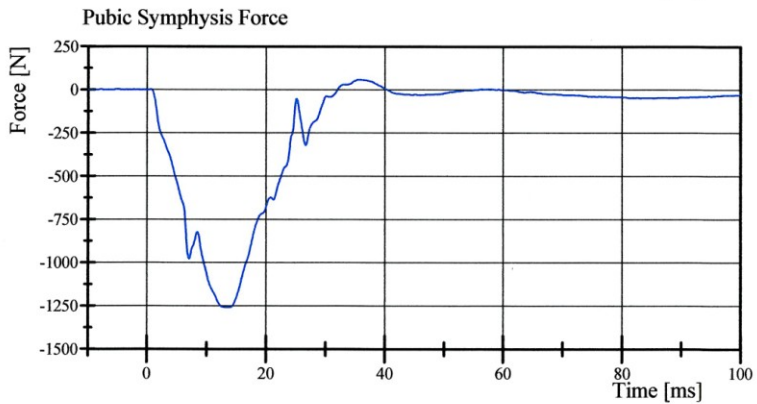
Min: -0.1 gn at -0.6 ms



Filter Class: CFC_180

Max: 5,116.9 N at 12.6 ms

Min: -19.4 N at -0.6 ms



Filter Class: CFC_600

Max: 57.0 N at 35.6 ms

Min: -1,260.3 N at 13.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.12.2012 10:30:33 559



Driver S/N F030

Post-Test Calibration Sheets

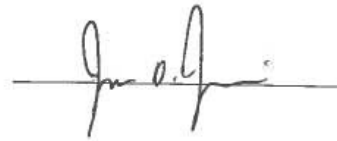
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 05
Date: 03/14/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	447	Yes
6	Head Width	152.0 - 158.0	154	Yes
7	Shoulder/Arm Width	461.0 - 479.0	472	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	283	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	201	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	604	Yes

Technician



Approved



Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Peak Resultant Acceleration	125 - 155 g	138.1 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

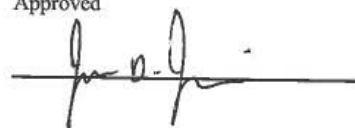
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 12:36:07 360

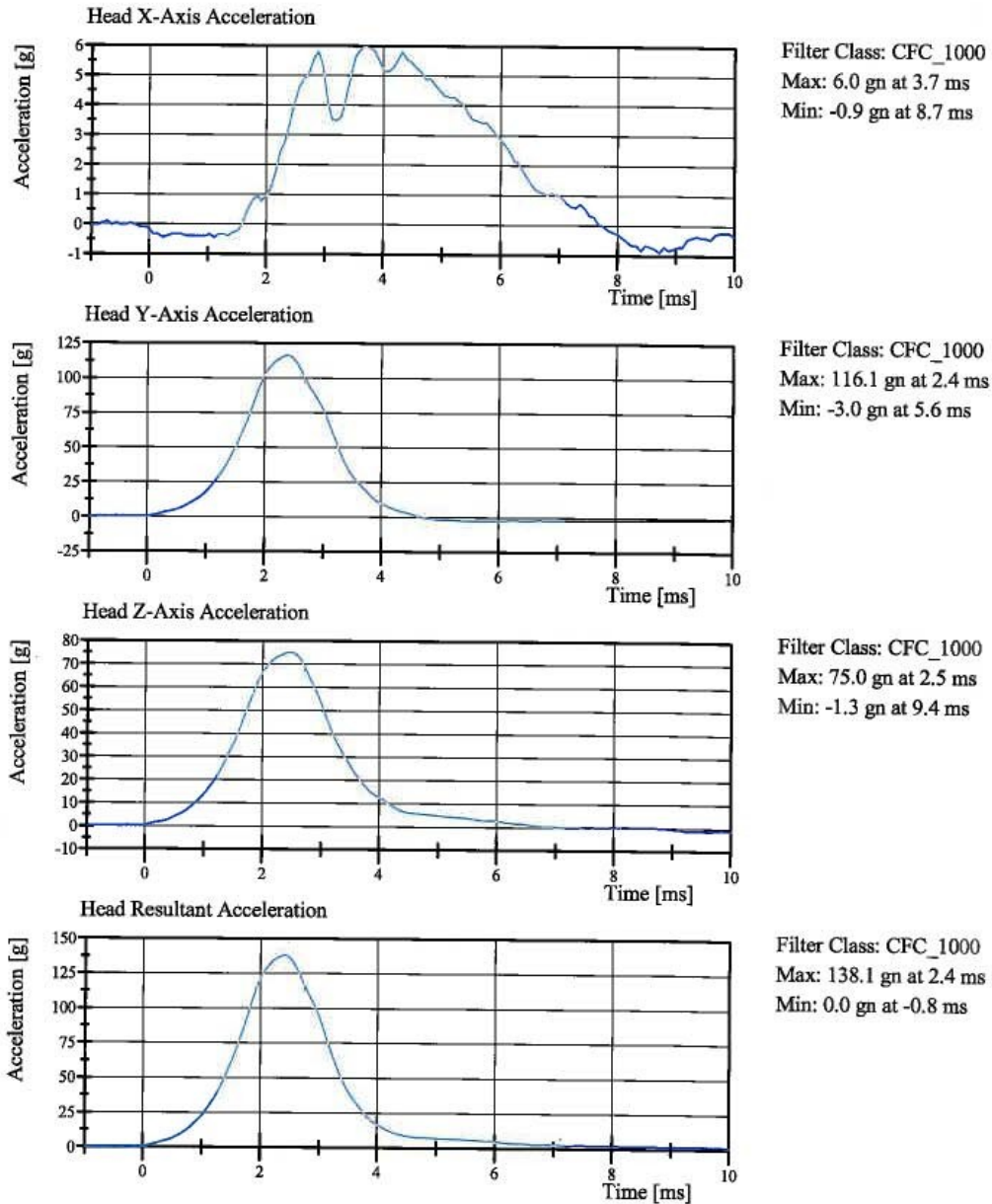


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/13/2012



Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 12:36:14 360



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-49.8 deg	Yes
Time of Peak	54 - 66 ms	58.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	57.6 ms	Yes

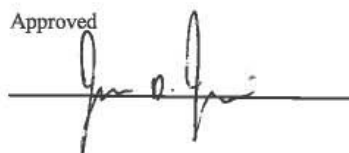
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 13:06:25 1308

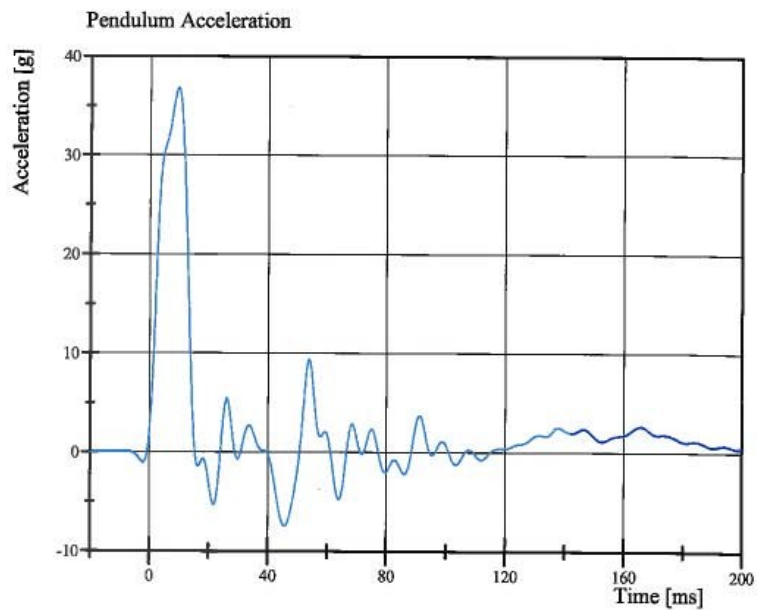


Transportation Research Center Inc.

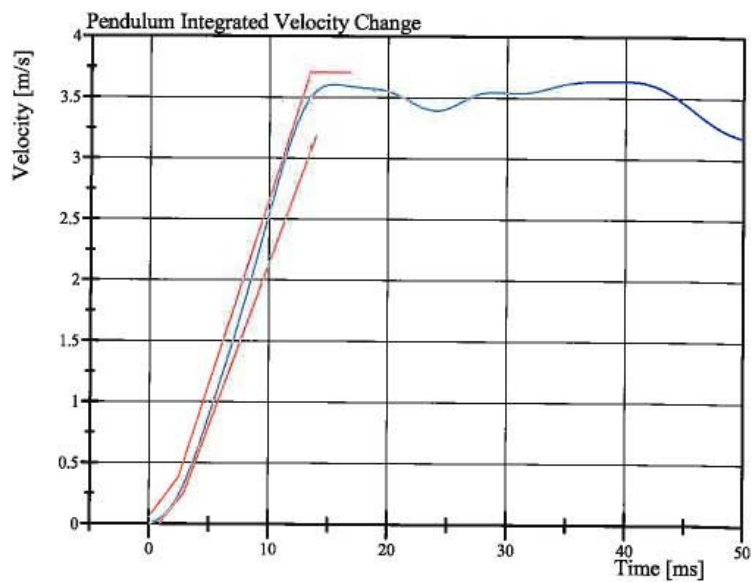
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012



Filter Class: CFC_60
Max: 36.7 gn at 9.7 ms
Min: -7.5 gn at 45.7 ms



Filter Class: CFC_60
Max: 3.6 m/s at 39.4 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 13:06:36 1308

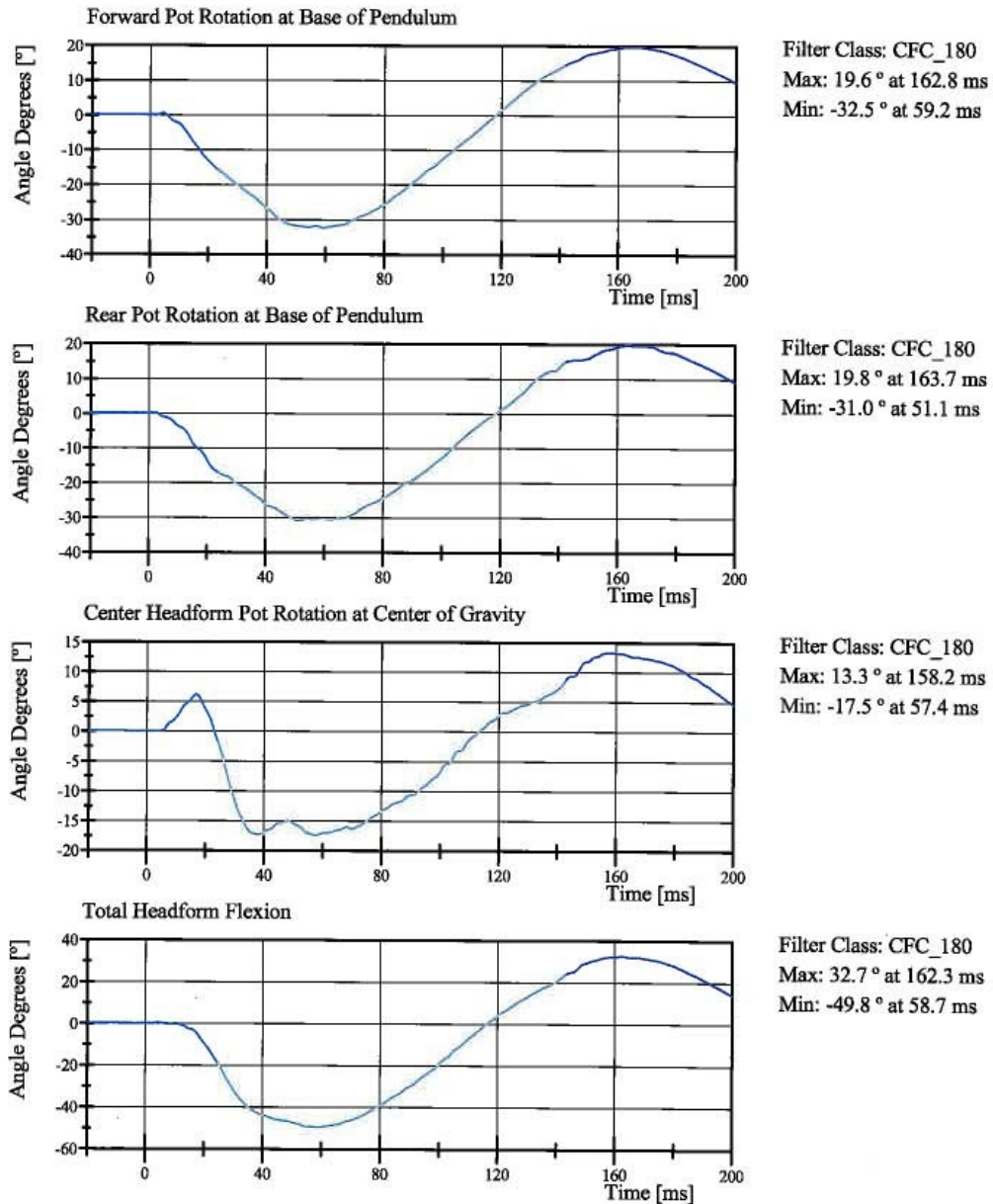


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012



Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 13:06:36 1308



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.2 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.62 g	Yes

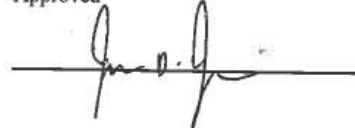
Test meets specifications.

Comments:

Technician



Approved



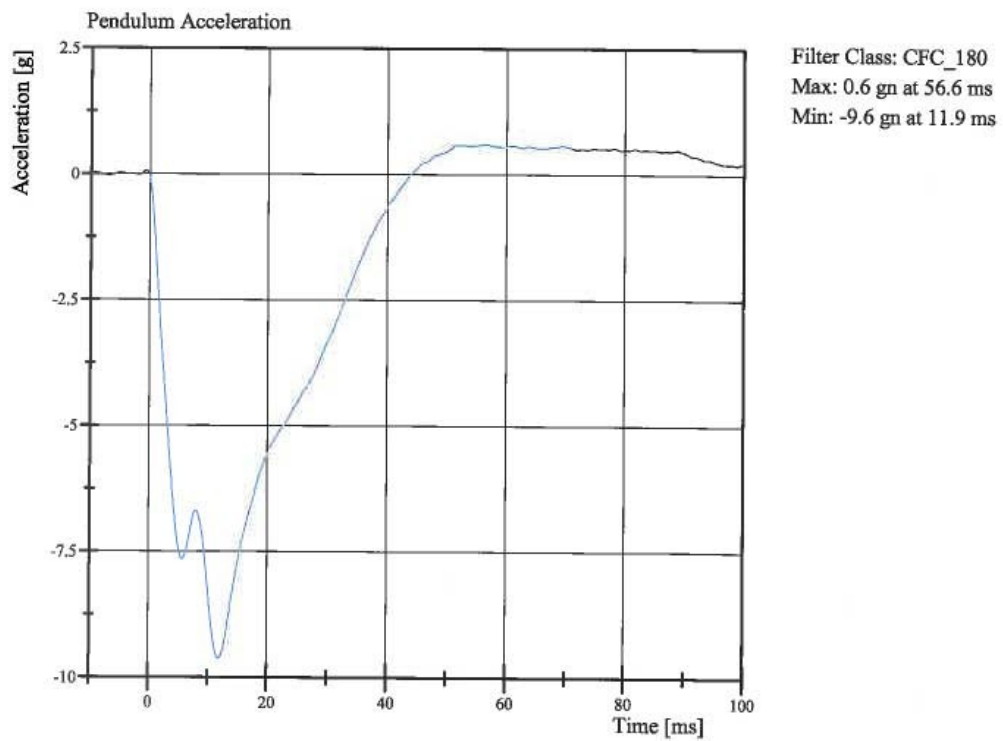
Specification Source: NHTSA final rule 8/15/2008

03.14.2012 14:41:09 553



Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/14/2012



Specification Source: NHTSA final rule 8/15/2008

03.14.2012 14:41:17 553



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



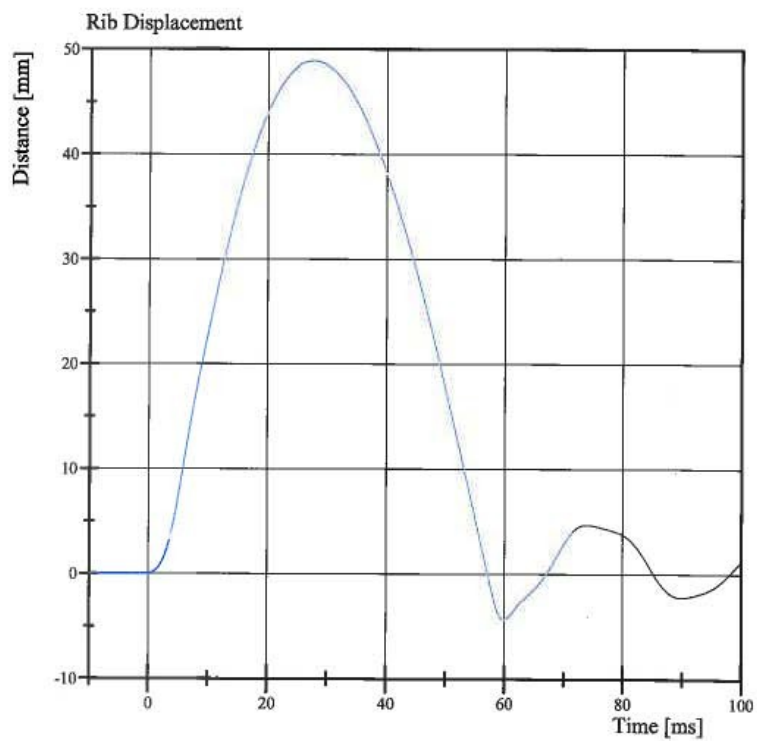
Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 09:11:23 746



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012



Filter Class: CFC_180
Max: 48.9 mm at 27.7 ms
Min: -4.3 mm at 59.9 ms

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



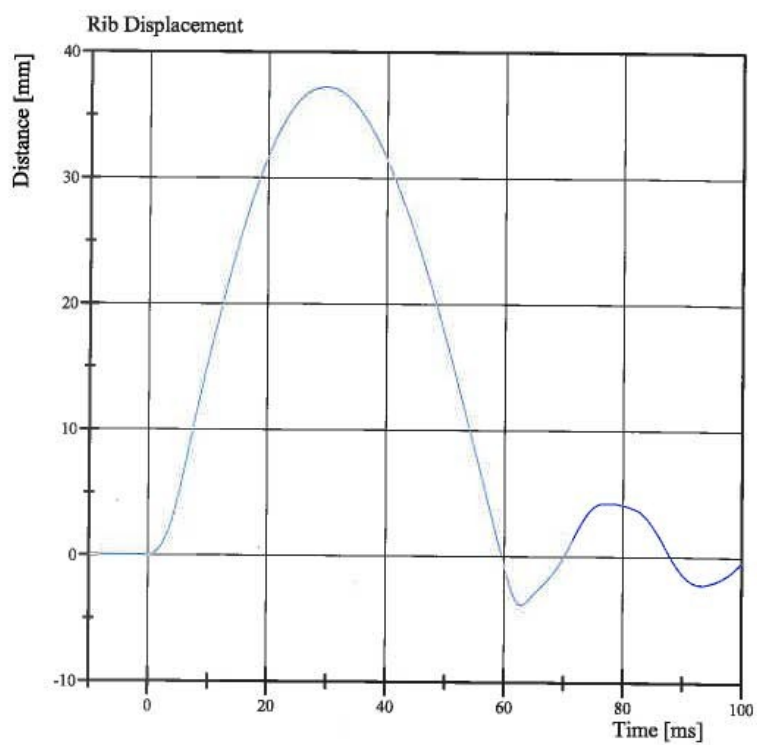
Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 09:19:04 949



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012



Filter Class: CFC_180
Max: 37.2 mm at 29.7 ms
Min: -3.8 mm at 62.9 ms

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.3 mm	Yes

Test meets specifications.

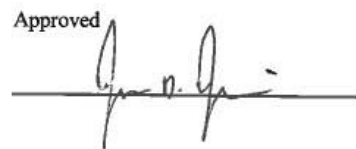
Comments:

Drop Height: 816

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 10:15:49 757

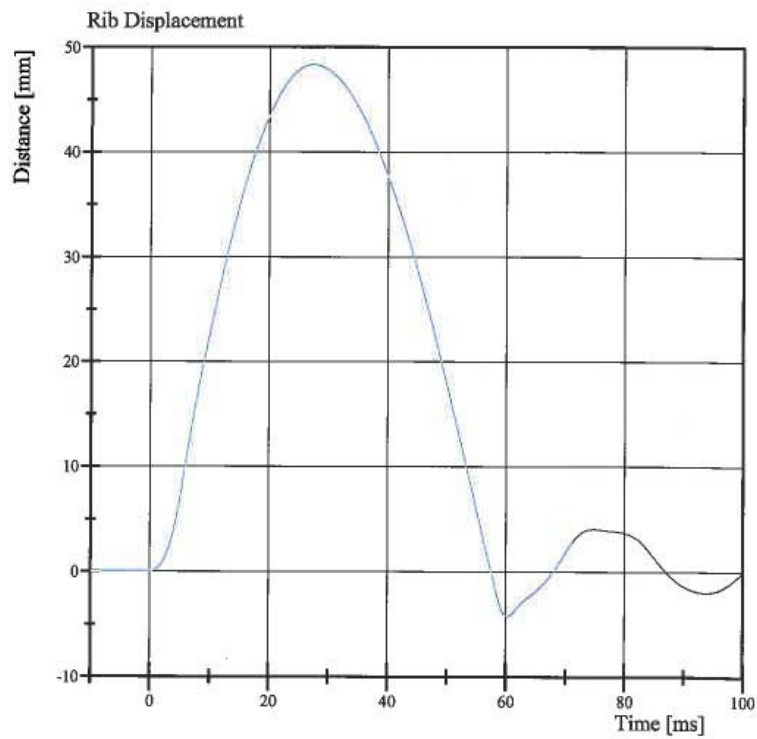


Transportation Research Center Inc.

4.0 m/s Center Full Rib Module

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/13/2012



Filter Class: CFC_180
Max: 48.3 mm at 27.4 ms
Min: -4.3 mm at 60.2 ms

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012

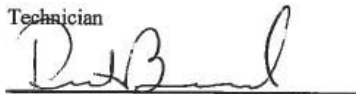
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



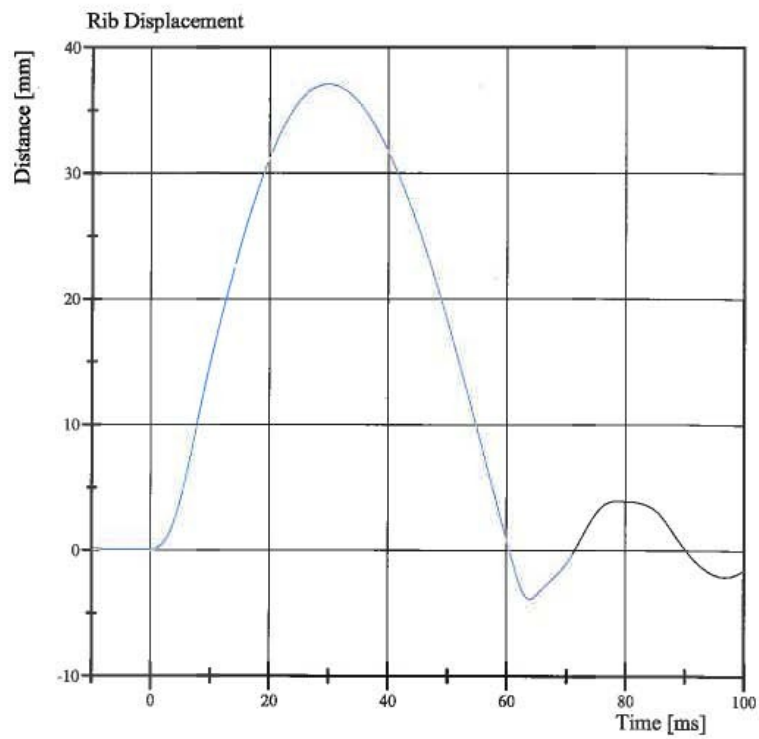
Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 10:23:49 958



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012



Filter Class: CFC_180
Max: 37.0 mm at 29.8 ms
Min: -3.9 mm at 63.8 ms

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

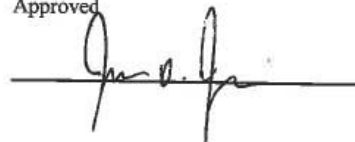
Comments:

Drop Height: 816

Technician



Approved



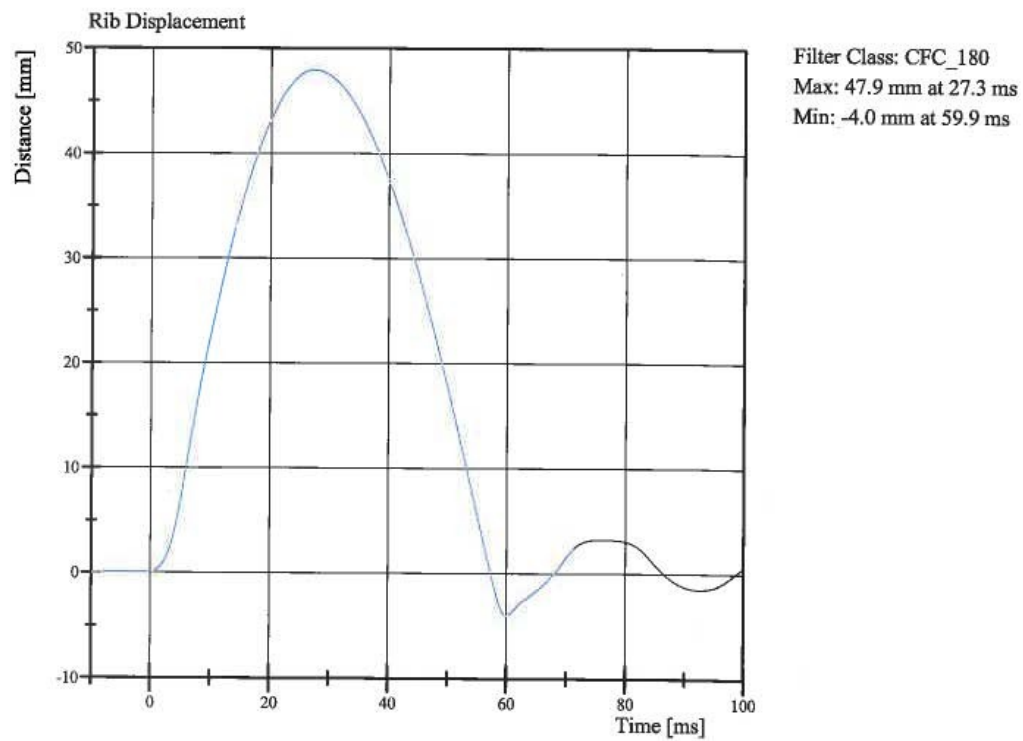
Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 10:31:24 748



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012



Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 10:31:35 748



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	48 %	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

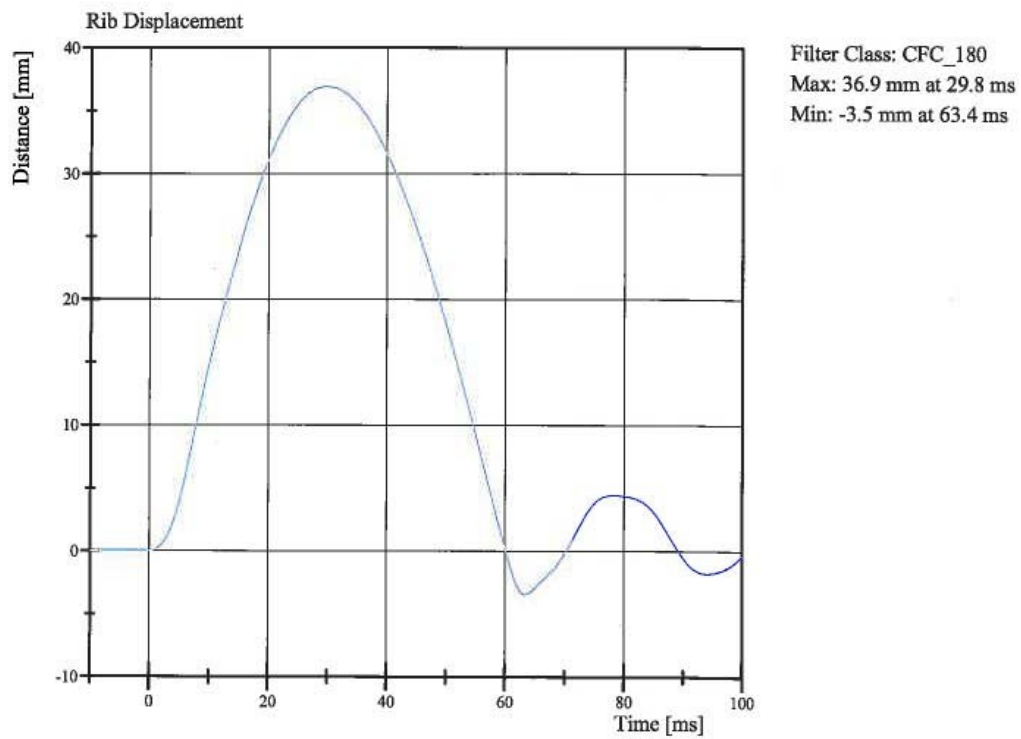

Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 10:38:59 939



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 5-1
Test Date: 3/13/2012



Specification Source: NHTSA Final Rule 8/15/2008

03.13.2012 10:39:07 939



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.466 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,447.3 N	Yes
Upper Rib Displacement	34 - 41 mm	37.0 mm	Yes
Center Rib Displacement	37 - 45 mm	40.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.6 mm	Yes

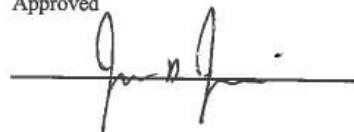
Test meets specifications.

Comments:

Technician



Approved



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

03.14.2012 15:17:03 450

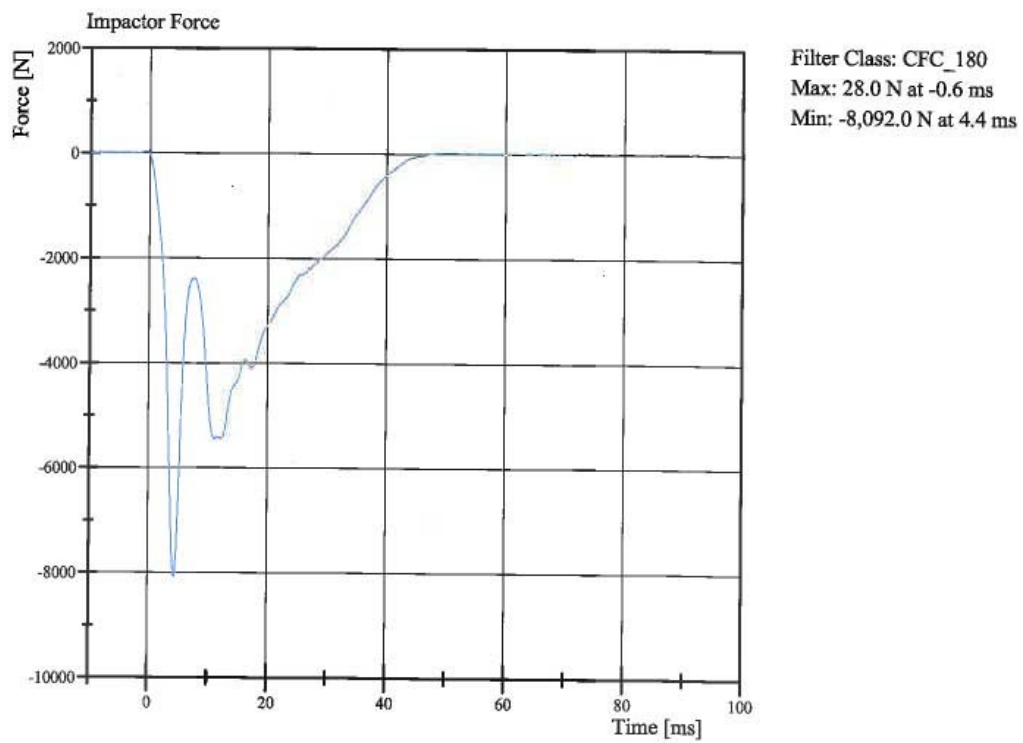


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012



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

03.14.2012 15:17:12 450

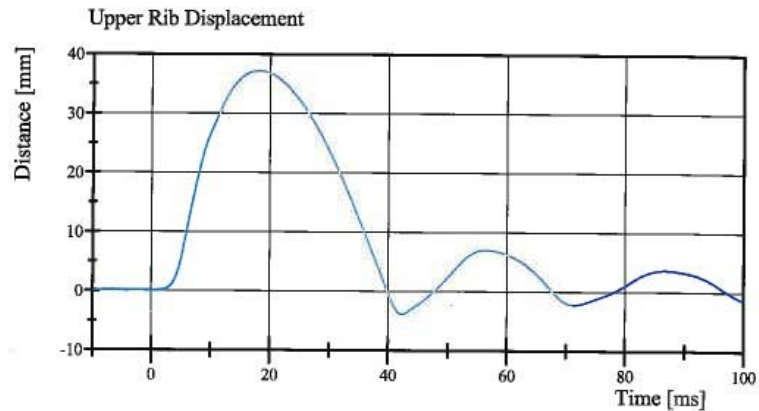


Transportation Research Center Inc.

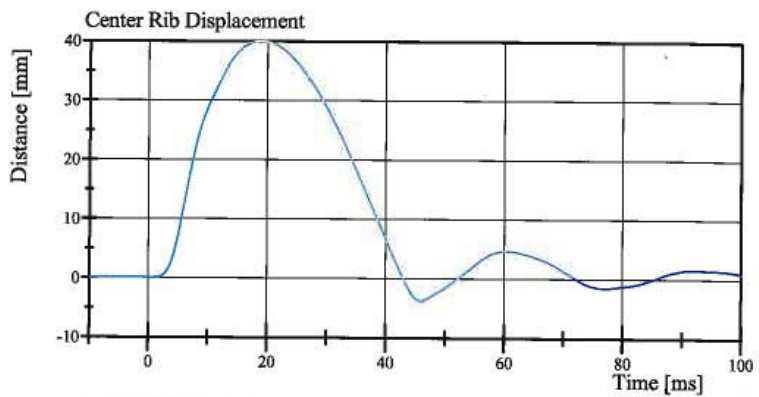
Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 5-1

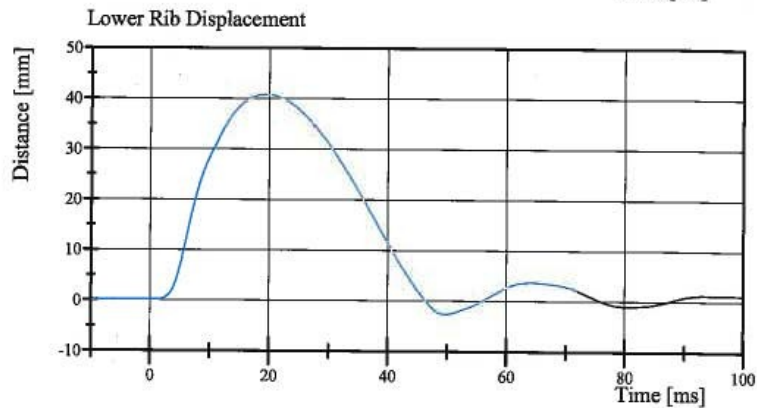
Test Date: 3/14/2012



Filter Class: CFC_180
Max: 37.0 mm at 18.2 ms
Min: -3.9 mm at 42.3 ms



Filter Class: CFC_180
Max: 40.0 mm at 19.0 ms
Min: -3.9 mm at 45.9 ms



Filter Class: CFC_180
Max: 40.6 mm at 19.5 ms
Min: -2.7 mm at 49.7 ms

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

03.14.2012 15:17:13 450



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,010.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.44 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,598.6 N	Yes
Time of Peak	10.0 - 12.3 ms	10.32 ms	Yes

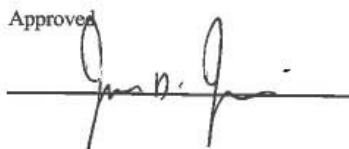
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 15:37:56 706

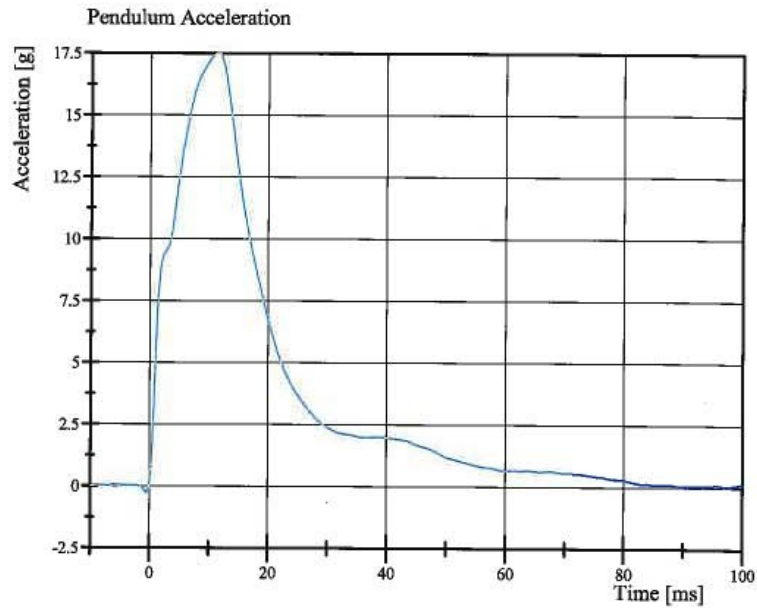


Transportation Research Center Inc.

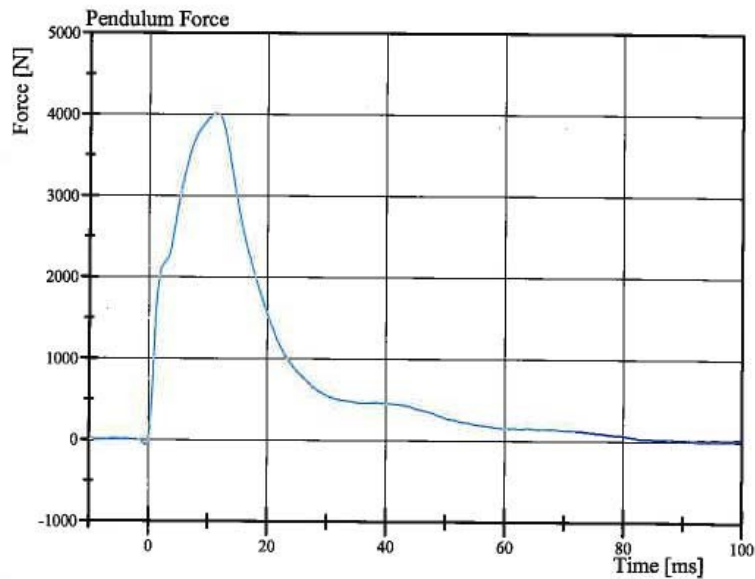
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 5-1

Test Date: 3/14/2012



Filter Class: CFC_180
Max: 17.5 gn at 11.4 ms
Min: -0.3 gn at -0.6 ms



Filter Class: CFC_180
Max: 4,010.3 N at 11.4 ms
Min: -66.1 N at -0.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 15:38:03 706

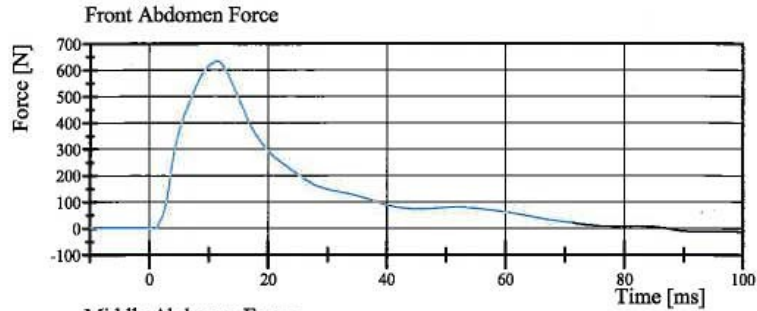


Transportation Research Center Inc.

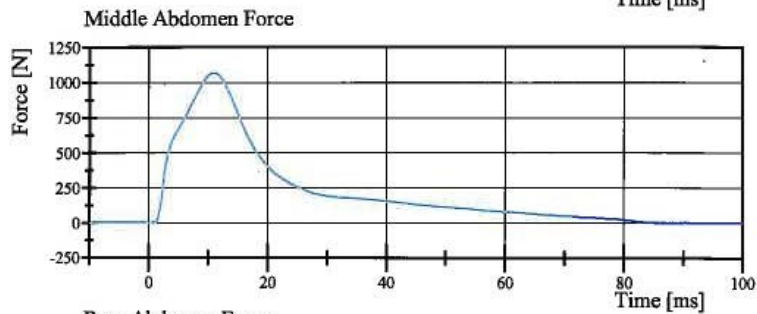
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 5-1

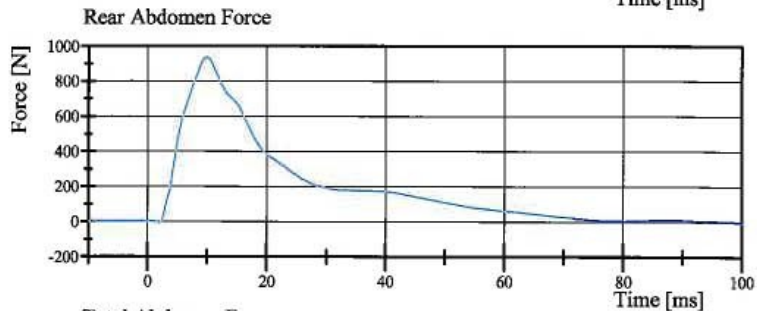
Test Date: 3/14/2012



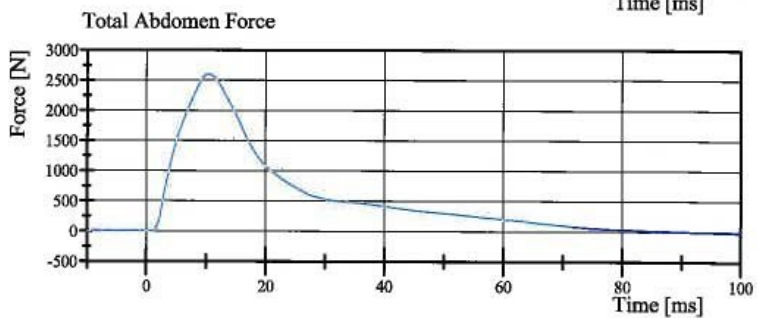
Filter Class: CFC_600
Max: 631.5 N at 11.5 ms
Min: -12.6 N at 99.0 ms



Filter Class: CFC_600
Max: 1,064.2 N at 11.0 ms
Min: -1.7 N at 1.1 ms



Filter Class: CFC_600
Max: 932.2 N at 9.9 ms
Min: -10.2 N at 1.8 ms



Filter Class: CFC_600
Max: 2,598.6 N at 10.3 ms
Min: -15.1 N at 99.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 15:38:04 706



Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 5-8

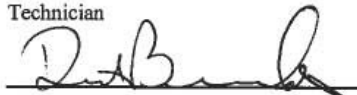
Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.042 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-48.4 deg	Yes
Time of Peak	39 - 53 ms	45.8 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	39.3 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 11:23:20 573

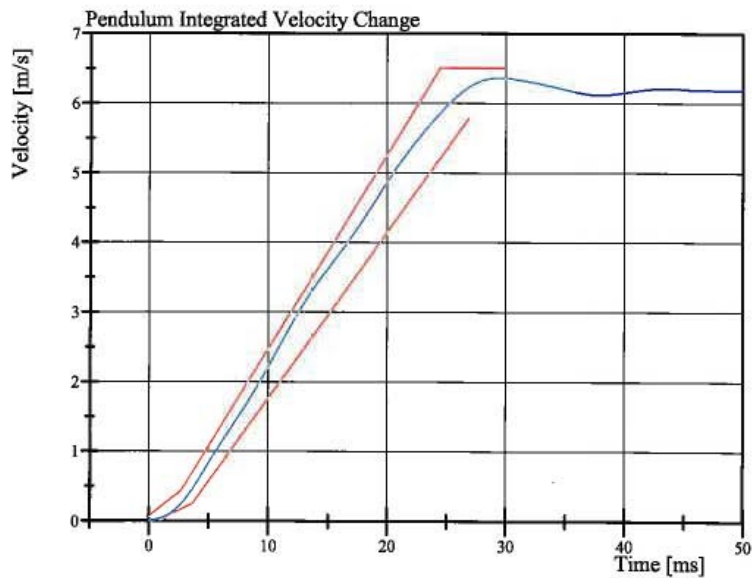
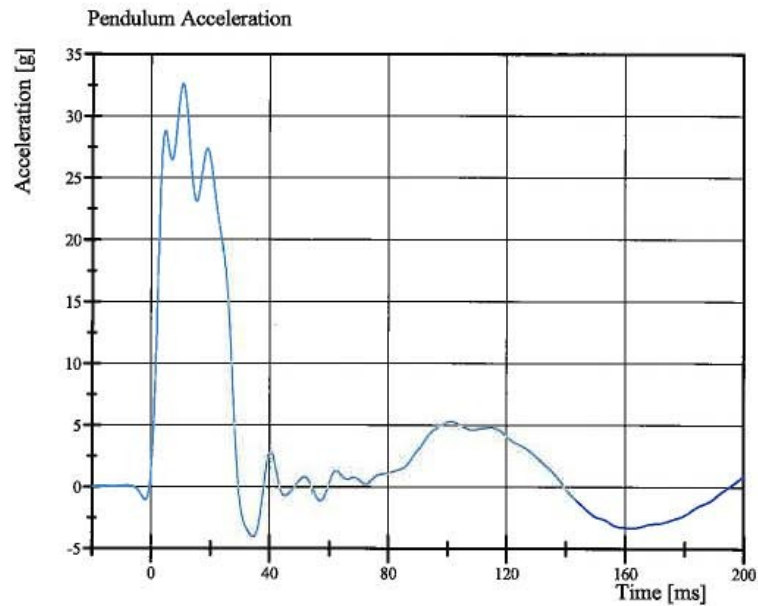


Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 5-8

Test Date: 3/14/2012



Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 11:23:28 573

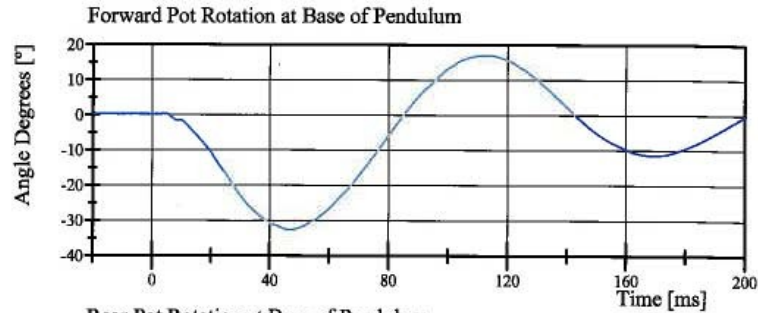


Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 5-8

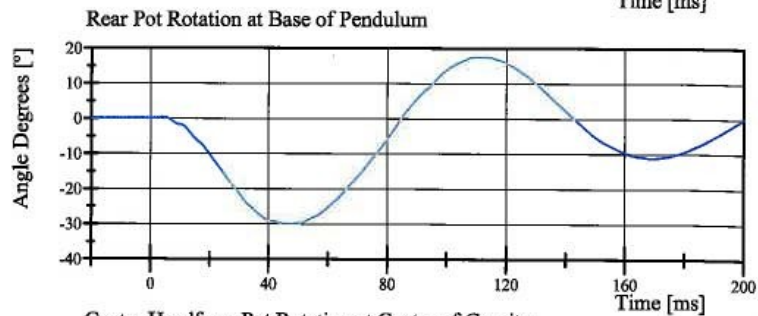
Test Date: 3/14/2012



Filter Class: CFC_180

Max: 16.9 ° at 112.2 ms

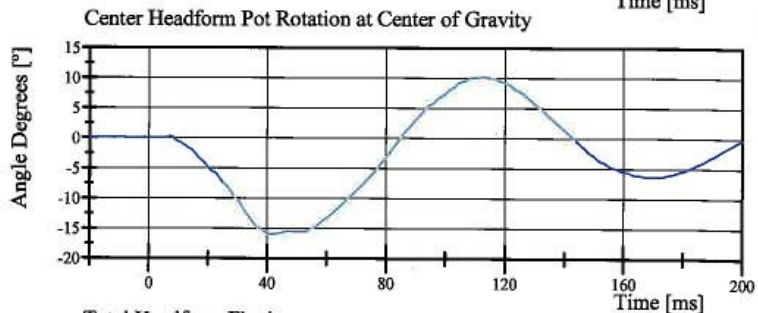
Min: -32.8 ° at 46.6 ms



Filter Class: CFC_180

Max: 17.4 ° at 109.2 ms

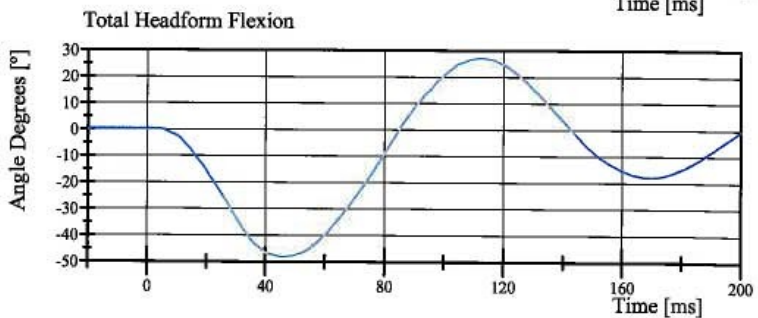
Min: -30.1 ° at 45.8 ms



Filter Class: CFC_180

Max: 10.1 ° at 112.6 ms

Min: -16.0 ° at 41.4 ms



Filter Class: CFC_180

Max: 27.0 ° at 112.4 ms

Min: -48.4 ° at 45.8 ms

Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 5-1

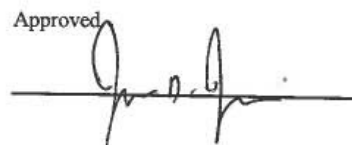
Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,267.8 N	Yes
Time of Peak	11.8 - 16.1 ms	12.80 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,256.6 N	Yes
Time of Peak	12.2 - 17.0 ms	14.40 ms	Yes

Test meets specifications.

Comments:

Technician


Approved


Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 16:09:07 602

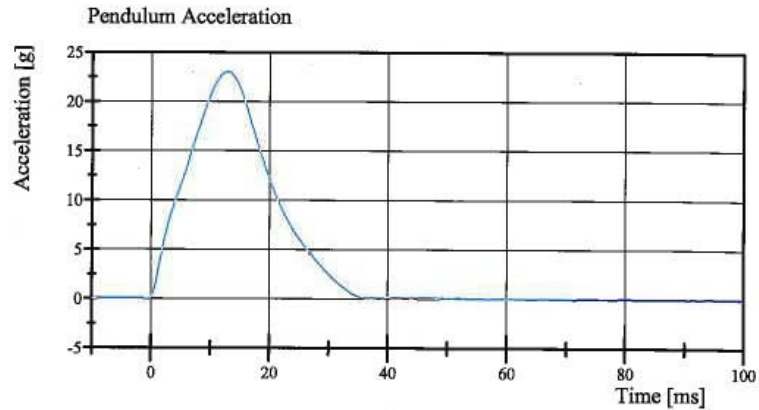


Transportation Research Center Inc.

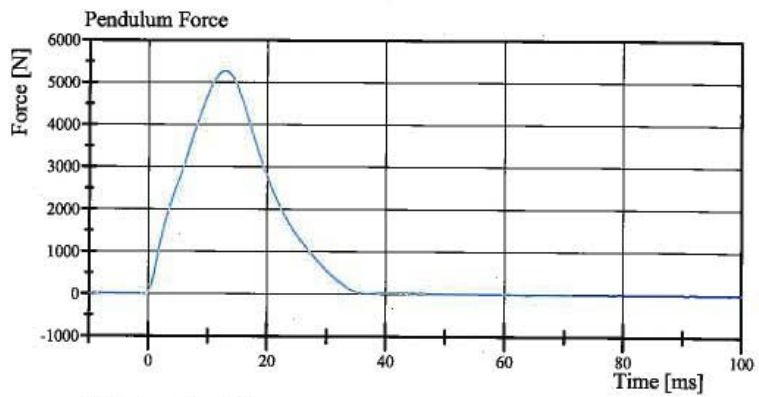
Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 5-1

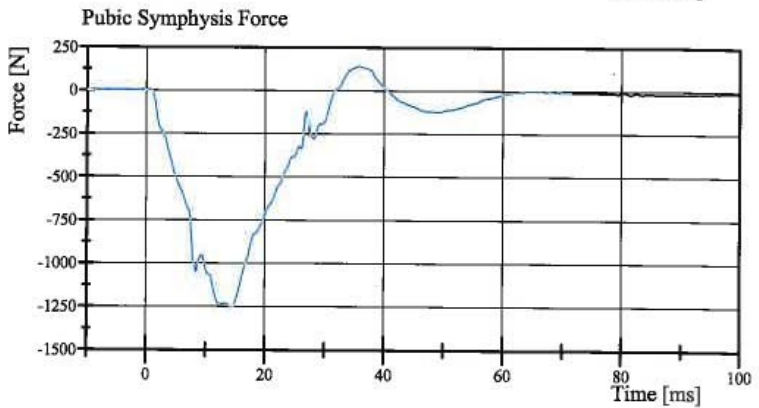
Test Date: 3/14/2012



Filter Class: CFC_180
Max: 23.0 gn at 12.8 ms
Min: -0.1 gn at -0.6 ms



Filter Class: CFC_180
Max: 5,267.8 N at 12.8 ms
Min: -25.3 N at -0.6 ms



Filter Class: CFC_600
Max: 138.3 N at 35.8 ms
Min: -1,256.6 N at 14.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.14.2012 16:09:15 602



Pre-Test Calibration Sheets
Passenger S/N 305

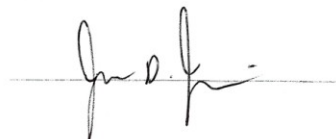
Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.09
Date: 01/12/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	778	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	135	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	354	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	206	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	313	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	481	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	868	Yes
Z	Waist Circumference	761.0 - 791.0	779	Yes

Technician



Approved




Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 9-1

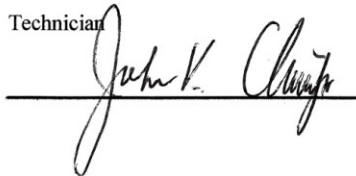
Test Date: 1/12/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	116.1 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	4.0 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

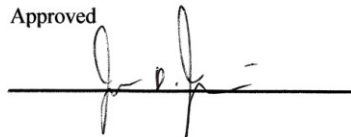
Test meets specifications.

Comments:

Technician



Approved



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

01.12.2012 12:08:57 229

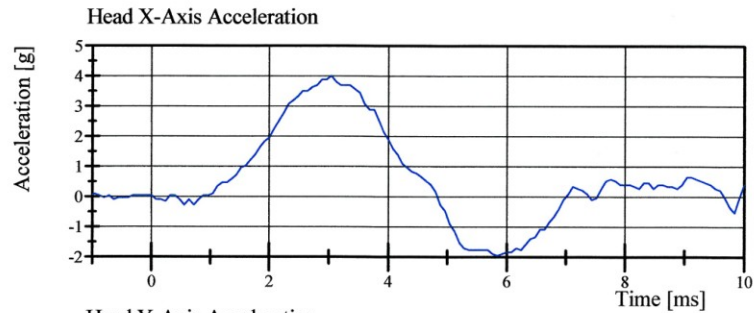


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 9-1

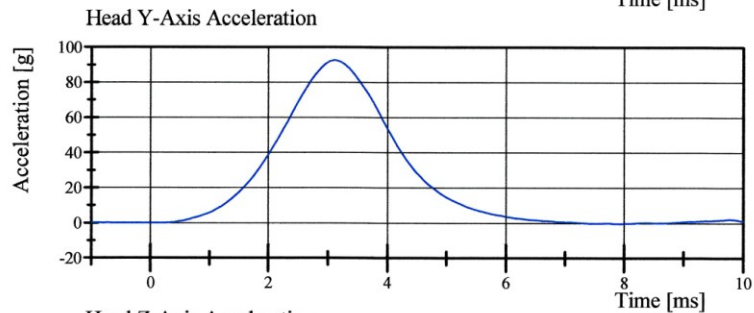
Test Date: 1/12/2012



Filter Class: CFC_1000

Max: 4.0 gn at 3.0 ms

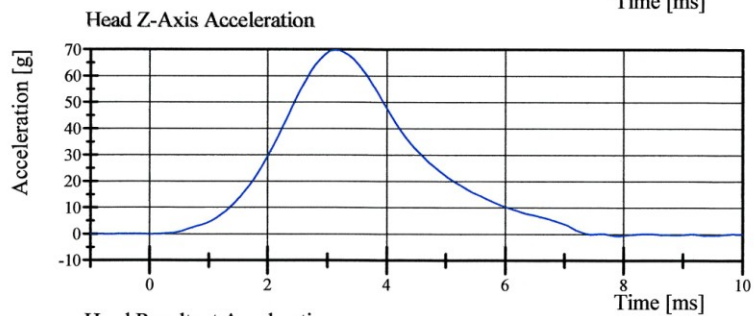
Min: -2.0 gn at 5.8 ms



Filter Class: CFC_1000

Max: 92.7 gn at 3.1 ms

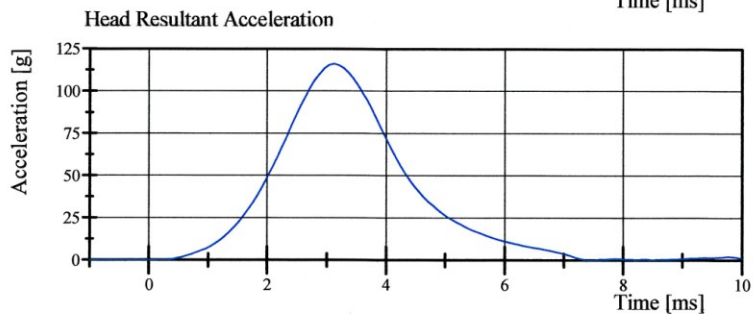
Min: -0.3 gn at 7.8 ms



Filter Class: CFC_1000

Max: 69.9 gn at 3.1 ms

Min: -0.7 gn at 7.9 ms



Filter Class: CFC_1000

Max: 116.1 gn at 3.1 ms

Min: 0.0 gn at -0.8 ms

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

01.12.2012 12:09:08 229



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 9-2

Test Date: 1/12/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.611 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.598 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.851 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.140 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.968 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.975 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-76.6 deg	Yes
Time of Peak	50 - 70 ms	65.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.3 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	122.9 ms	Yes

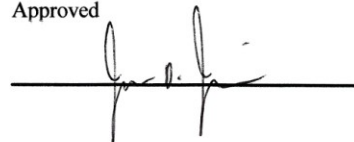
Test meets specifications.

Comments:

Technician



Approved



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

01.12.2012 17:15:20 635

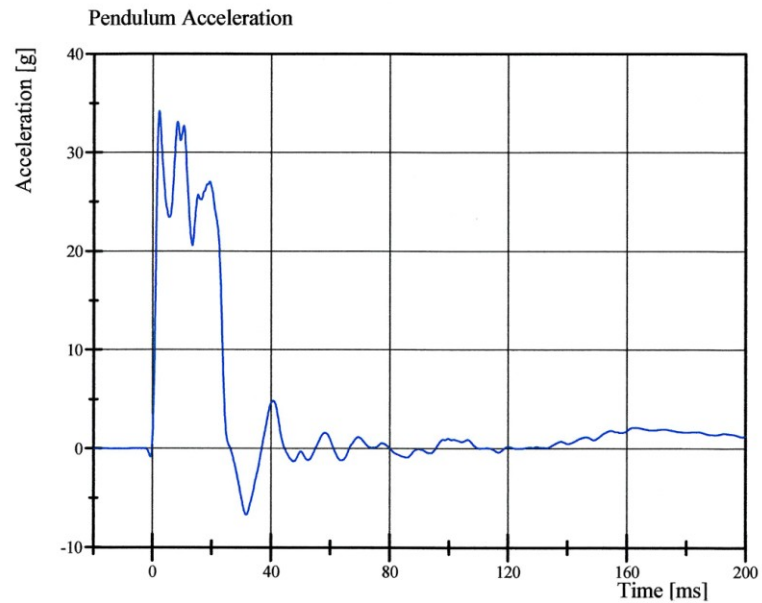


Transportation Research Center Inc.

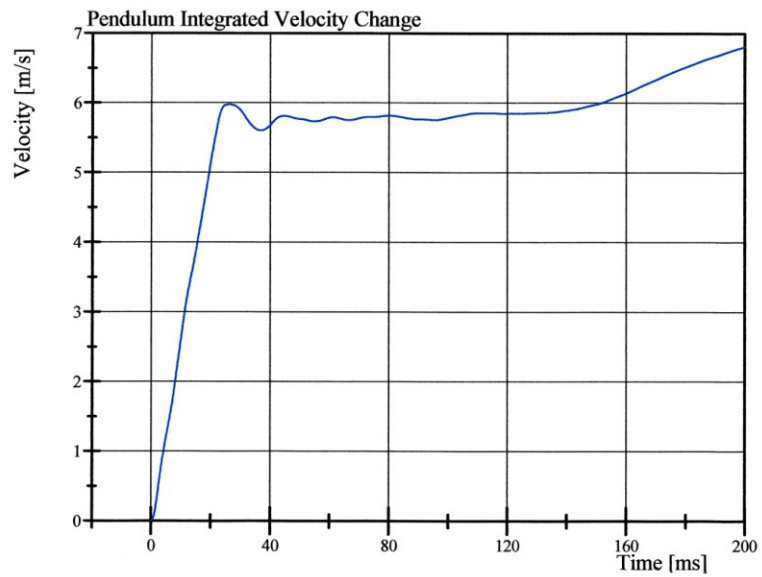
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 9-2

Test Date: 1/12/2012



Filter Class: CFC_180
Max: 34.2 gn at 2.2 ms
Min: -6.7 gn at 31.7 ms



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

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

01.12.2012 17:15:27 635

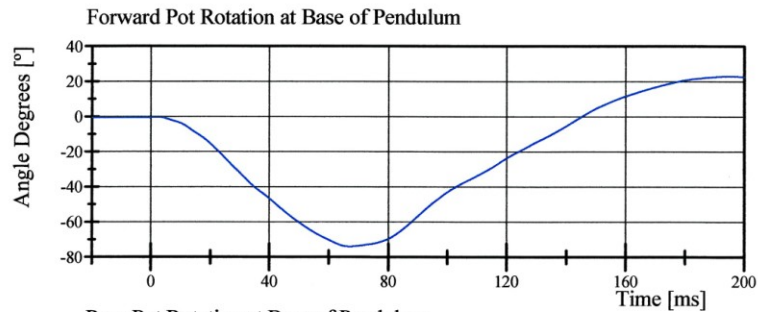


Transportation Research Center Inc.

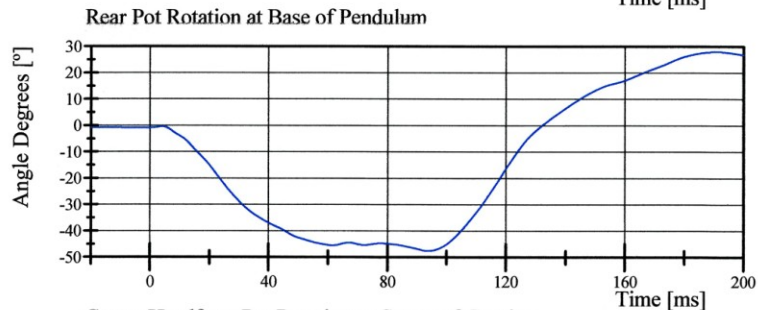
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 9-2

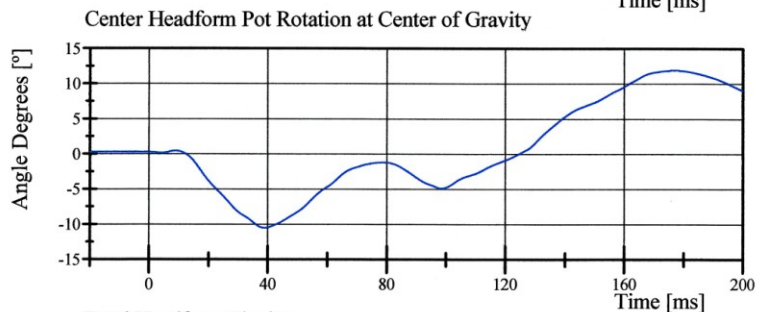
Test Date: 1/12/2012



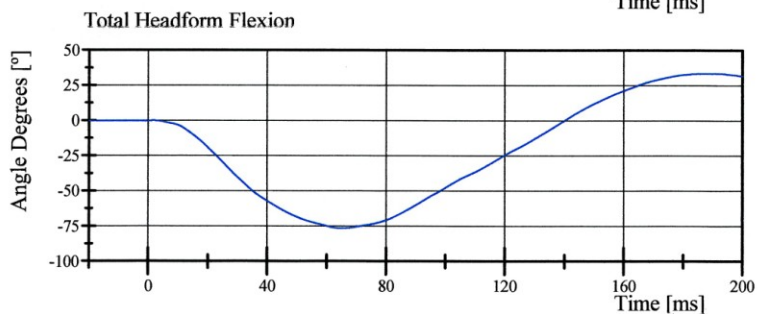
Filter Class: CFC_60
Max: 23.0 ° at 195.2 ms
Min: -74.0 ° at 67.1 ms



Filter Class: CFC_60
Max: 28.0 ° at 190.9 ms
Min: -47.6 ° at 93.7 ms



Filter Class: CFC_60
Max: 11.9 ° at 177.0 ms
Min: -10.5 ° at 38.9 ms



Filter Class: CFC_60
Max: 33.5 ° at 189.8 ms
Min: -76.6 ° at 65.2 ms

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

01.12.2012 17:15:27 635

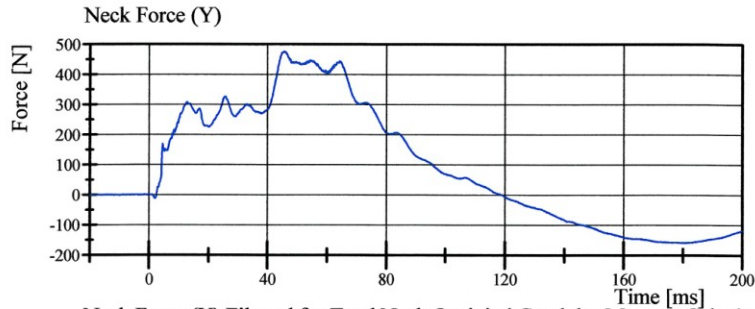


Transportation Research Center Inc.

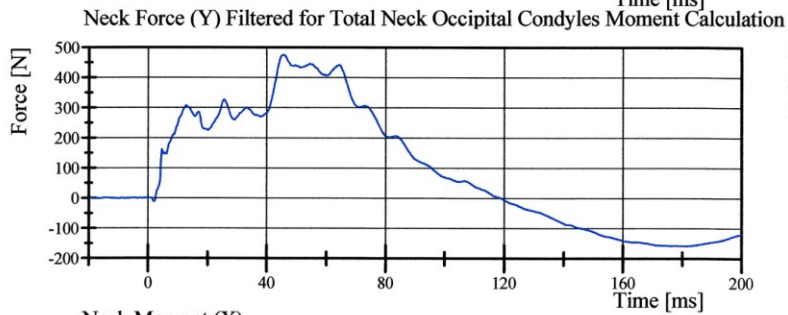
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 9-2

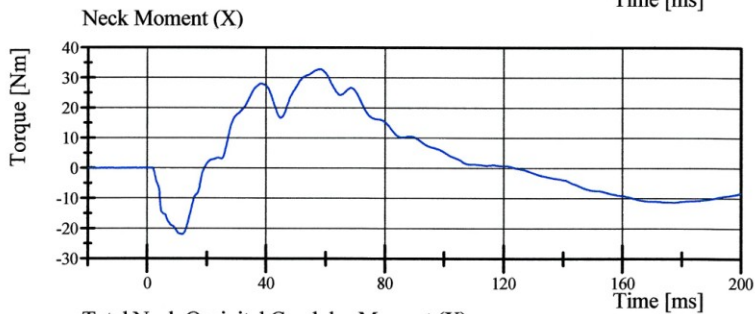
Test Date: 1/12/2012



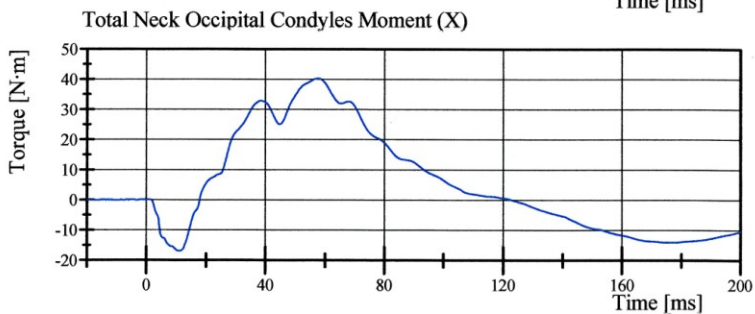
Filter Class: CFC_1000
Max: 476.2 N at 45.5 ms
Min: -158.9 N at 181.4 ms



Filter Class: CFC_600
Max: 475.5 N at 45.5 ms
Min: -158.3 N at 181.4 ms



Filter Class: CFC_600
Max: 32.9 Nm at 58.2 ms
Min: -22.0 Nm at 11.6 ms



Filter Class: Without_(Consta
Max: 40.3 N·m at 57.4 ms
Min: -16.9 N·m at 10.8 ms

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

01.12.2012 17:15:28 635



Transportation Research Center Inc.

Left Lateral Shoulder

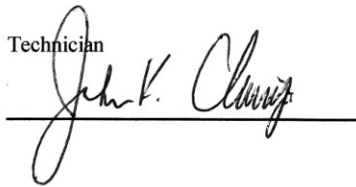
SID IIs Serial No. 305 Certification No. 9-1

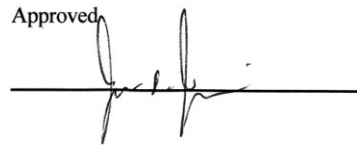
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.8 g	Yes
Shoulder Displacement	28 - 37 mm	31.6 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	20.9 g	Yes

Test meets specifications.

Comments:

Technician


Approved


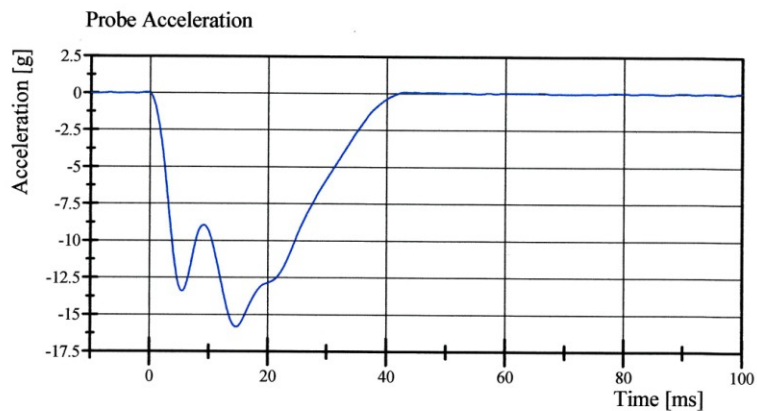
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.11.2012 08:48:17 804

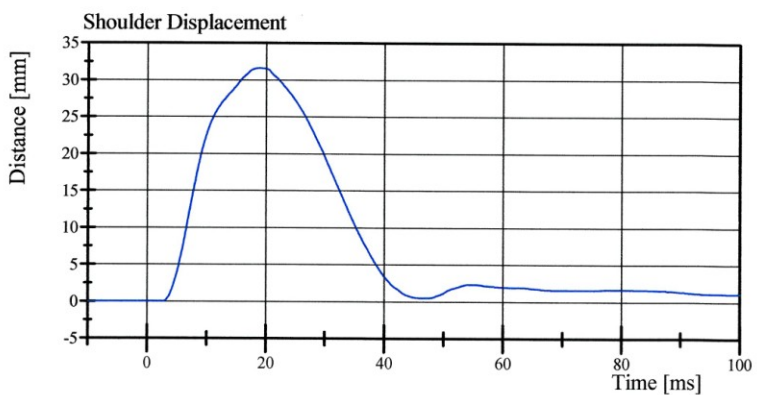


Transportation Research Center Inc.

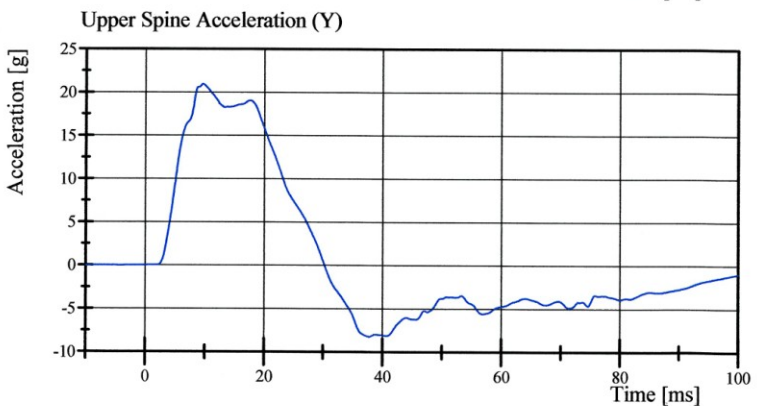
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 9-1
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 0.1 gn at 43.1 ms
Min: -15.8 gn at 14.6 ms



Filter Class: CFC_600
Max: 31.6 mm at 18.8 ms
Min: -0.0 mm at 2.7 ms



Filter Class: CFC_180
Max: 20.9 gn at 9.6 ms
Min: -8.2 gn at 37.8 ms

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

01.11.2012 08:48:35 804



Transportation Research Center Inc.

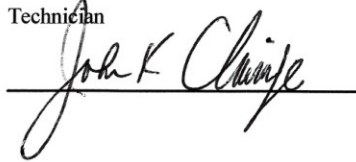
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 9-1
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.738 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.5 g	Yes
Shoulder Displacement	31 - 40 mm	34.0 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.6 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.1 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.3 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.1 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.7 g	Yes

Test meets specifications.

Comments:

Technician



Approved



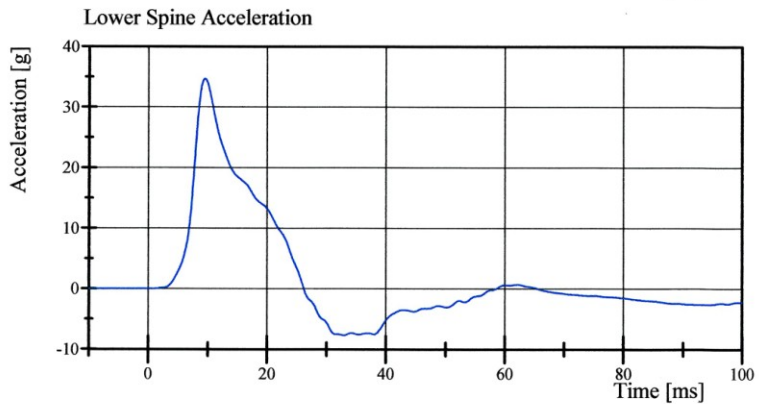
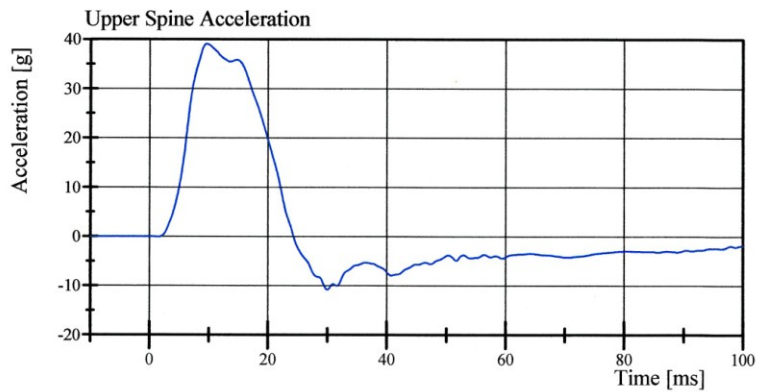
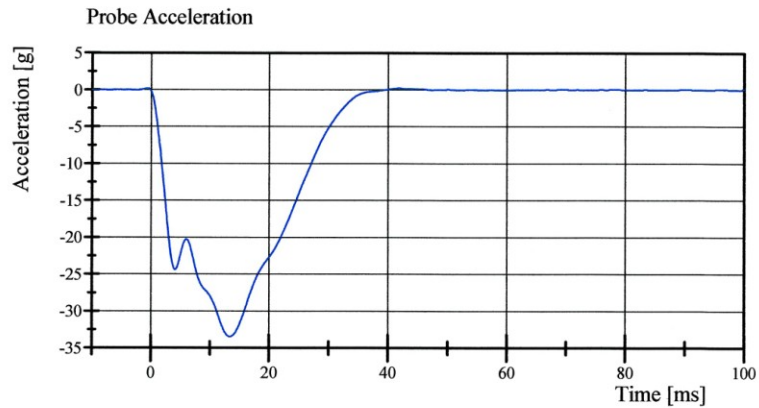
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.11.2012 10:05:20 600



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 9-1
Test Date: 1/11/2012



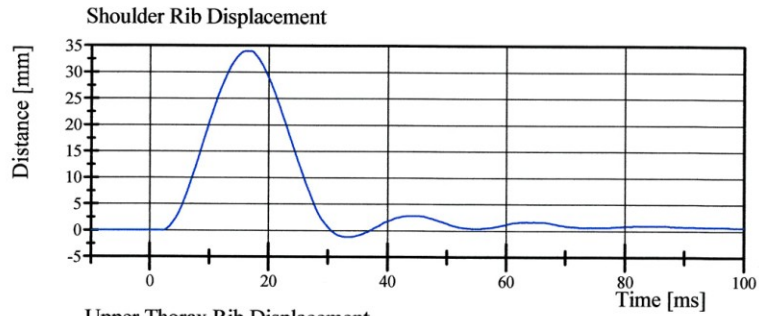
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.11.2012 10:05:34 600

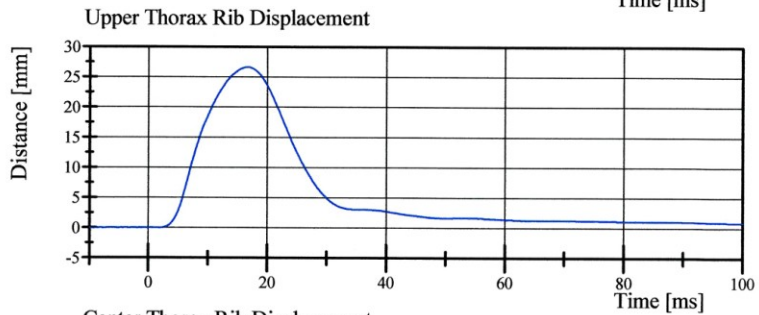


Transportation Research Center Inc.

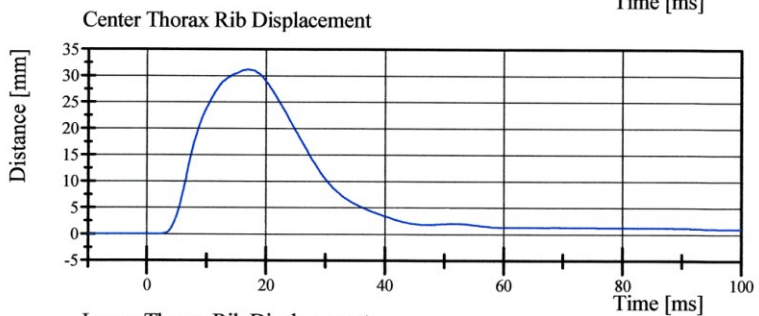
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 9-1
Test Date: 1/11/2012



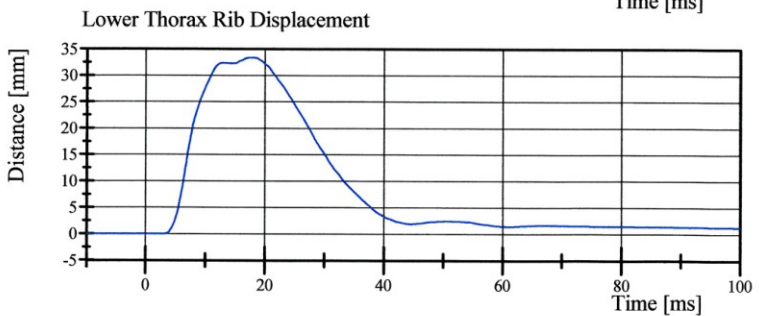
Filter Class: CFC_600
Max: 34.0 mm at 17.0 ms
Min: -1.2 mm at 33.4 ms



Filter Class: CFC_600
Max: 26.6 mm at 16.6 ms
Min: -0.0 mm at -8.7 ms



Filter Class: CFC_600
Max: 31.1 mm at 17.0 ms
Min: -0.0 mm at 0.3 ms



Filter Class: CFC_600
Max: 33.3 mm at 18.0 ms
Min: -0.0 mm at 1.7 ms

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

01.11.2012 10:05:35 600



Transportation Research Center Inc.

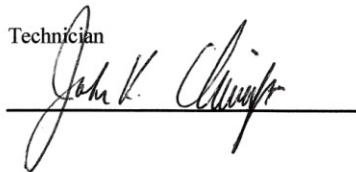
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 9-3
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.382 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.3 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.7 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.4 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	35.9 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.3 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.8 g	Yes

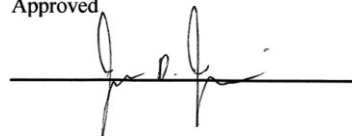
Test meets specifications.

Comments:

Technician



Approved



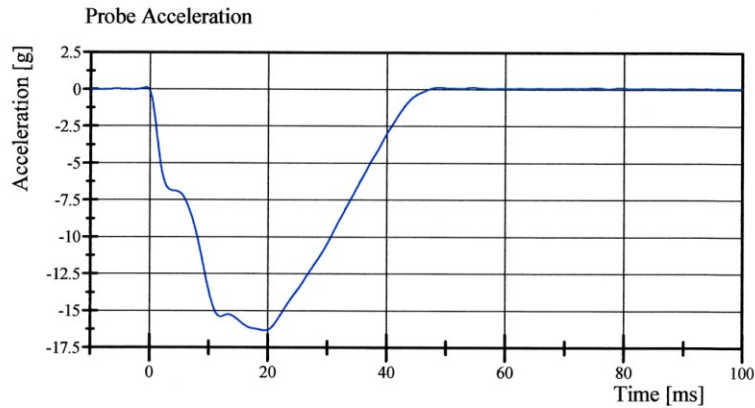
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.11.2012 11:38:59 807

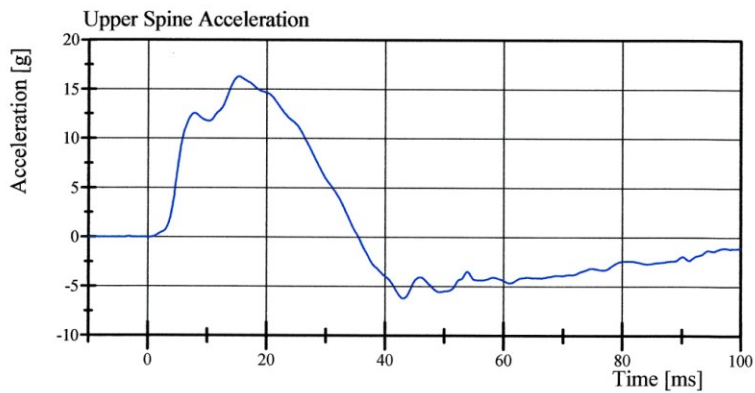


Transportation Research Center Inc.

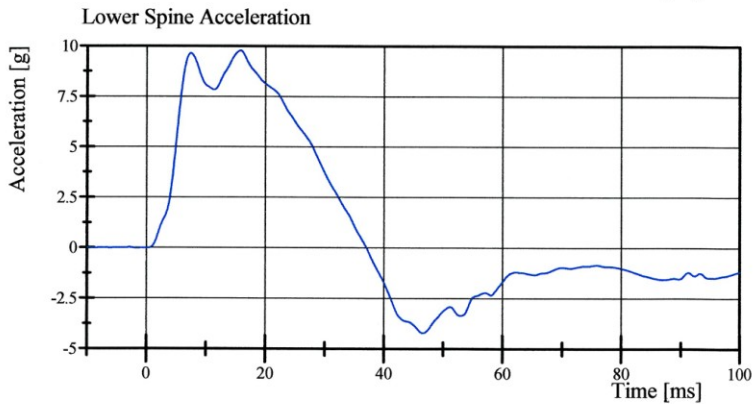
Left Lateral Thorax without Arm
SID II_s Serial No. 305 Certification No. 9-3
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 0.1 gn at 54.6 ms
Min: -16.3 gn at 19.4 ms



Filter Class: CFC_180
Max: 16.3 gn at 15.4 ms
Min: -6.2 gn at 43.0 ms



Filter Class: CFC_180
Max: 9.8 gn at 15.8 ms
Min: -4.2 gn at 46.6 ms

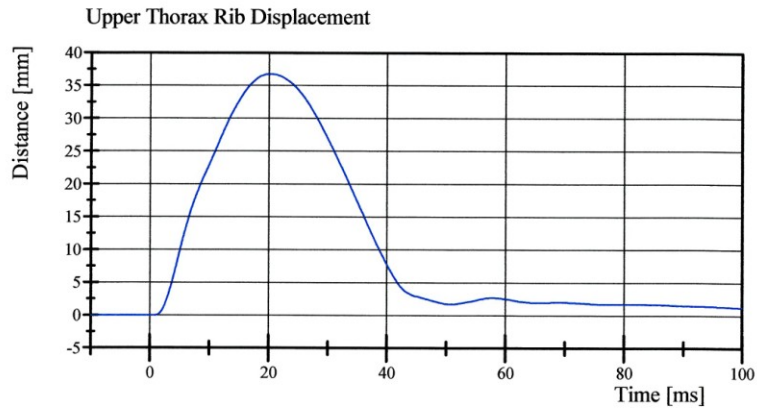
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.11.2012 11:39:15 807

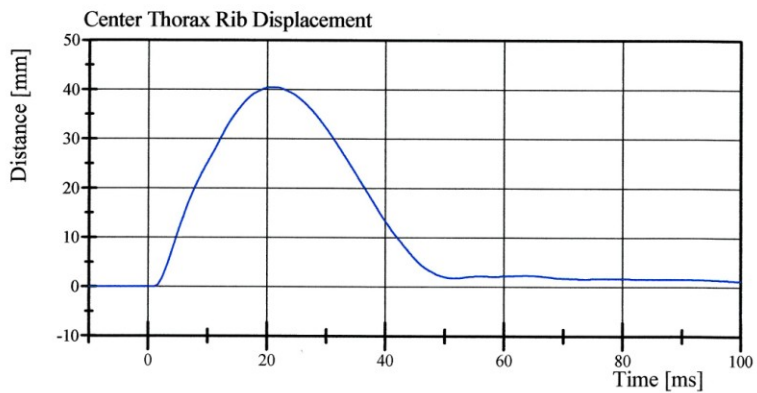


Transportation Research Center Inc.

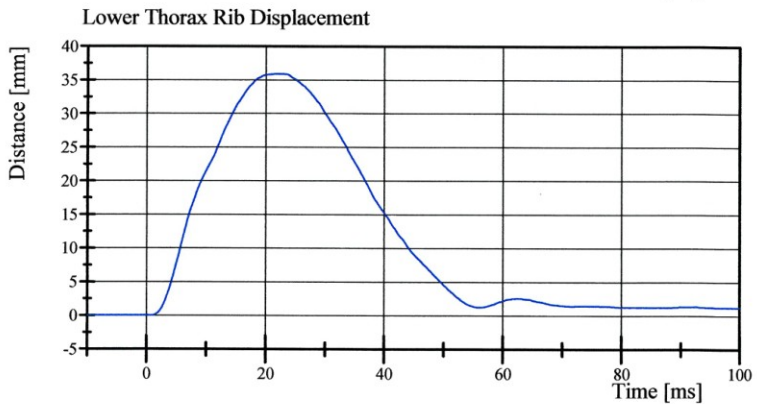
Left Lateral Thorax without Arm
SID II_s Serial No. 305 Certification No. 9-3
Test Date: 1/11/2012



Filter Class: CFC_600
Max: 36.7 mm at 20.2 ms
Min: -0.0 mm at 0.9 ms



Filter Class: CFC_600
Max: 40.4 mm at 21.0 ms
Min: -0.0 mm at -1.2 ms



Filter Class: CFC_600
Max: 35.9 mm at 22.6 ms
Min: -0.0 mm at -4.6 ms

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

01.11.2012 11:39:15 807



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 9-1

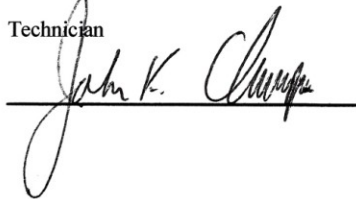
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.9 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.9 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	35.9 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	12.21 g	Yes

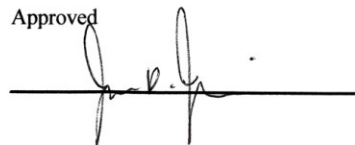
Test meets specifications.

Comments:

Technician



Approved



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

01.11.2012 12:45:39 659

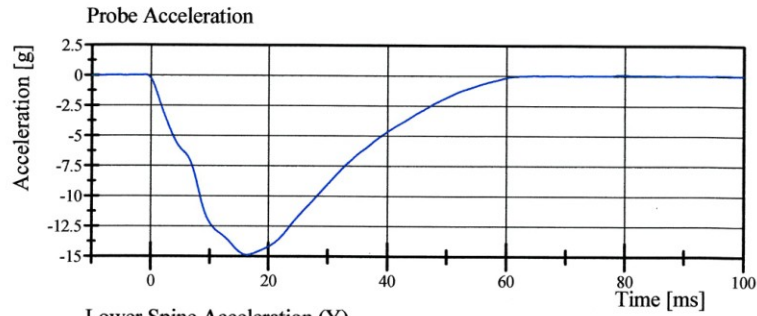


Transportation Research Center Inc.

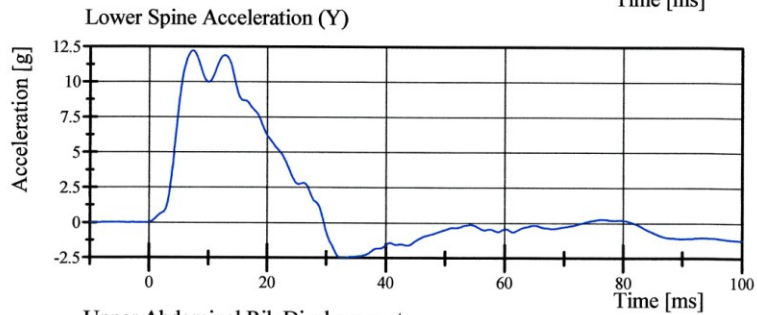
Left Lateral Abdomen

SID II_s Serial No. 305 Certification No. 9-1

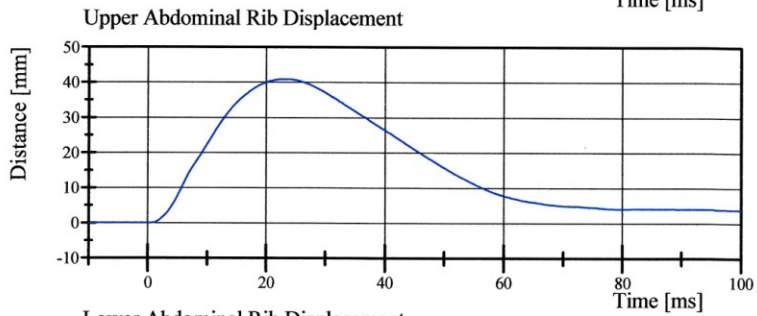
Test Date: 1/11/2012



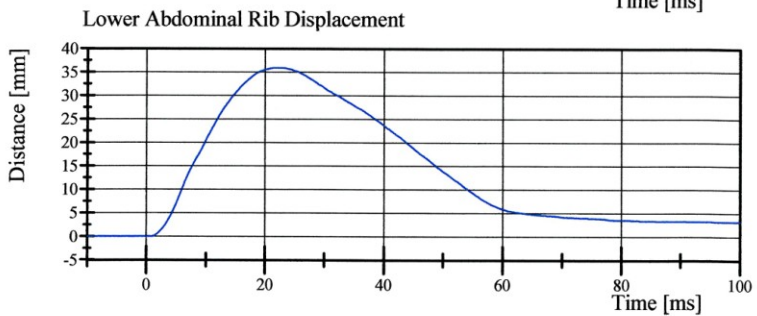
Filter Class: CFC_180
Max: 0.1 gn at 79.4 ms
Min: -14.9 gn at 16.3 ms



Filter Class: CFC_180
Max: 12.2 gn at 7.4 ms
Min: -2.5 gn at 32.6 ms



Filter Class: CFC_600
Max: 40.9 mm at 23.0 ms
Min: -0.0 mm at 0.2 ms



Filter Class: CFC_600
Max: 35.9 mm at 22.2 ms
Min: -0.0 mm at 0.8 ms

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

01.11.2012 12:45:54 659



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 9-1

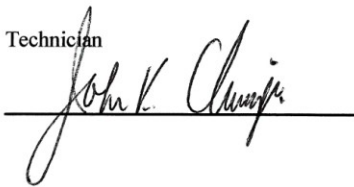
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.27 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	36.7 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,962.3 N	Yes

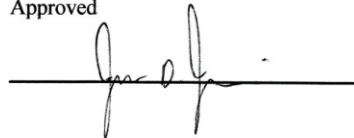
Test meets specifications.

Comments:

Technician



Approved



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

01.11.2012 13:28:18 453

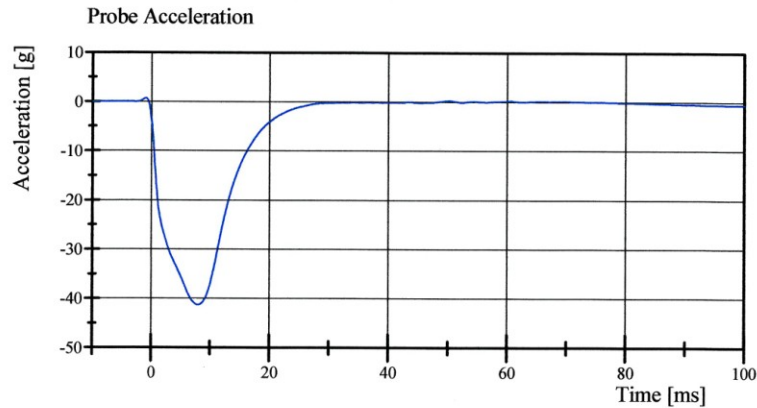


Transportation Research Center Inc.

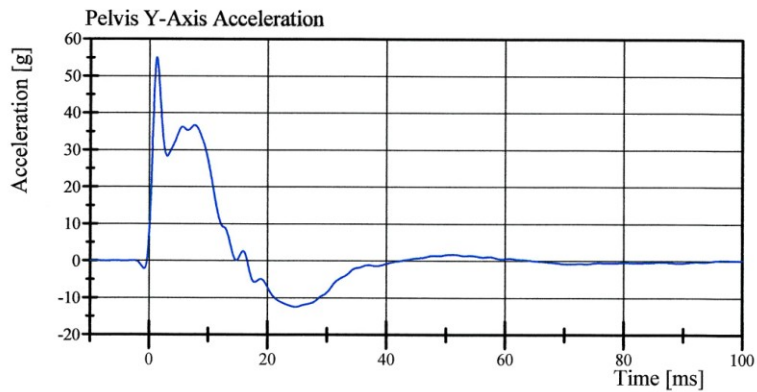
Left Lateral Pelvis

SID II_s Serial No. 305 Certification No. 9-1

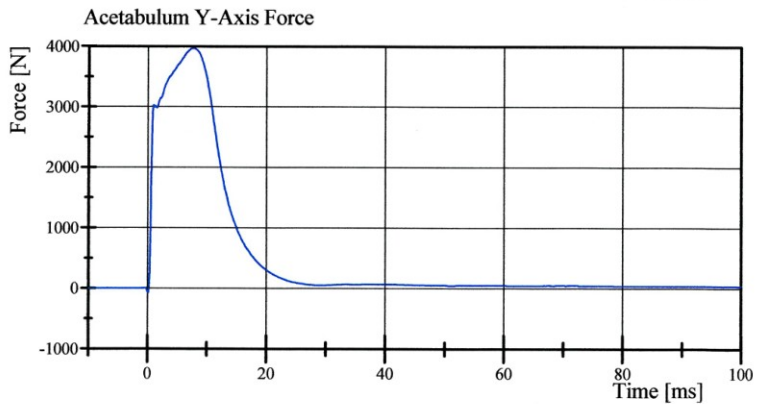
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 0.7 gn at -1.0 ms
Min: -41.3 gn at 8.0 ms



Filter Class: CFC_180
Max: 55.0 gn at 1.3 ms
Min: -12.5 gn at 24.7 ms



Filter Class: CFC_600
Max: 3,962.3 N at 7.7 ms
Min: -81.0 N at 0.1 ms

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

01.11.2012 13:28:30 453



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 9-1

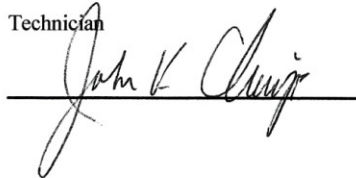
Test Date: 1/11/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.24 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.0 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	34.4 g	Yes
Iliac Force	4,100 - 5,100 N	4,991.1 N	Yes

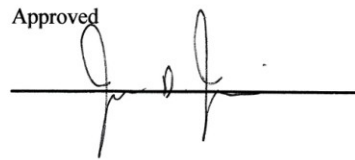
Test meets specifications.

Comments:

Technician



Approved



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

01.11.2012 15:34:36 635

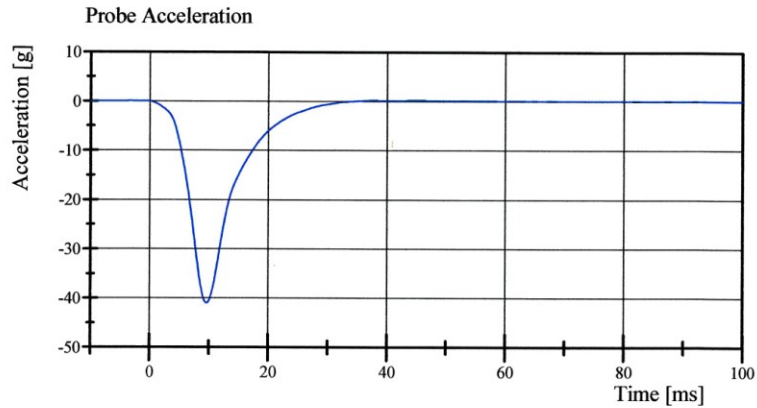


Transportation Research Center Inc.

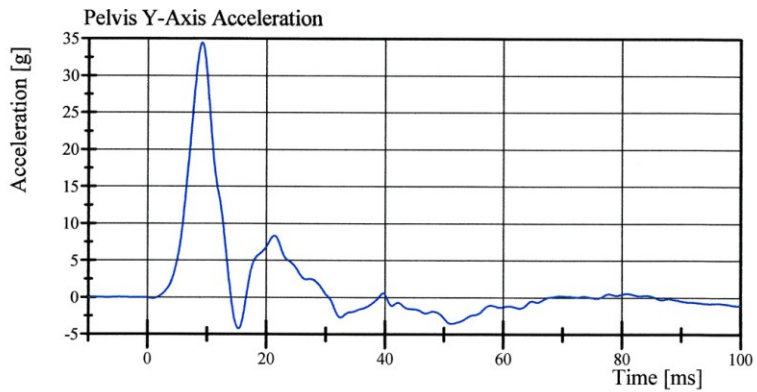
Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 9-1

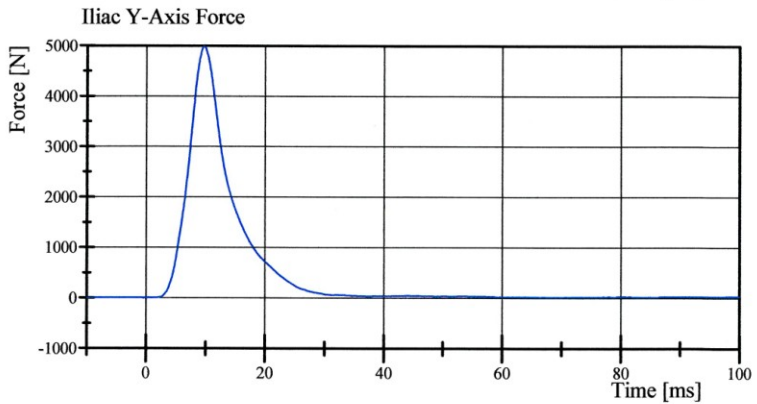
Test Date: 1/11/2012



Filter Class: CFC_180
Max: 0.2 gn at 37.5 ms
Min: -41.0 gn at 9.6 ms



Filter Class: CFC_180
Max: 34.4 gn at 9.1 ms
Min: -4.2 gn at 15.4 ms



Filter Class: CFC_600
Max: 4,991.1 N at 9.7 ms
Min: -1.0 N at -0.4 ms

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

01.11.2012 15:34:49 635



Post-Test Calibration Sheets
Passenger S/N 305

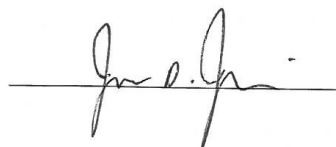
Transportation Research Center Inc.
SIDI's Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.010

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	102	Yes
F	Thigh Clearance	119.0 - 135.0	135	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	535	Yes
L	Popliteal Height	343.0 - 369.0	354	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	313	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	481	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	868	Yes
Z	Waist Circumference	761.0 - 791.0	779	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 10-1
Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	22.2 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	116.1 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.7 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



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

04.17.2012 10:33:07 231

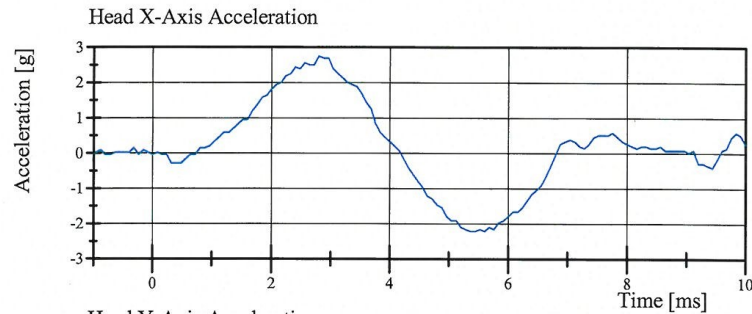


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 10-1

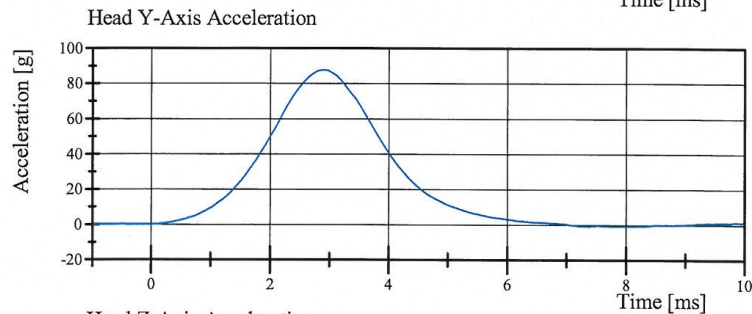
Test Date: 3/13/2012



Filter Class: CFC_1000

Max: 2.7 gn at 2.8 ms

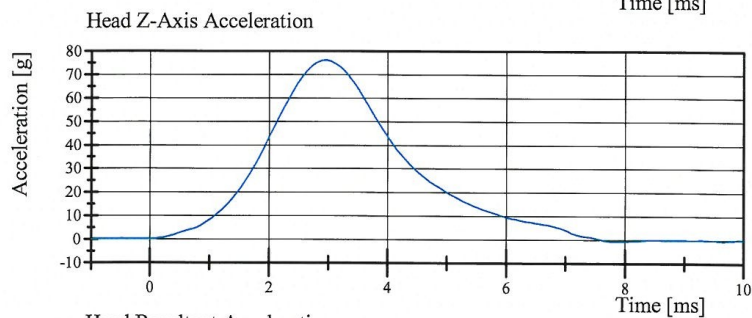
Min: -2.2 gn at 5.4 ms



Filter Class: CFC_1000

Max: 87.7 gn at 2.9 ms

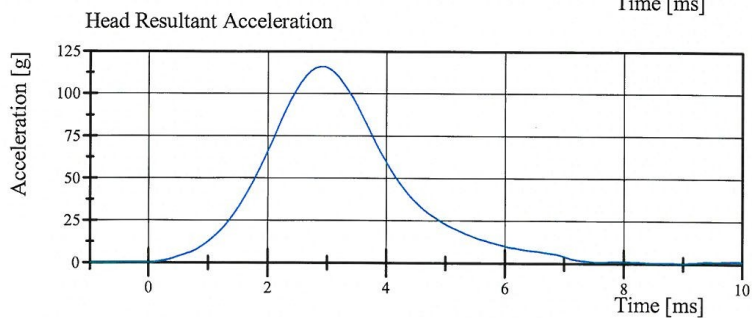
Min: -0.8 gn at 7.3 ms



Filter Class: CFC_1000

Max: 76.2 gn at 3.0 ms

Min: -0.8 gn at 7.9 ms



Filter Class: CFC_1000

Max: 116.1 gn at 2.9 ms

Min: 0.0 gn at -0.6 ms

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

04.17.2012 10:33:16 231



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 10-1

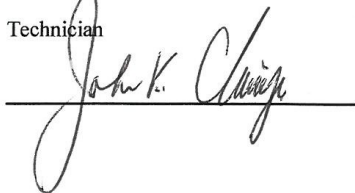
Test Date: 3/13/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.616 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.668 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.903 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.258 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.972 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.977 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-78.0 deg	Yes
Time of Peak	50 - 70 ms	62.1 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.1 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	120.0 ms	Yes

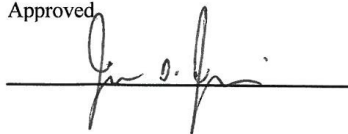
Test meets specifications.

Comments:

Technician



Approved



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

03.13.2012 12:55:45 636

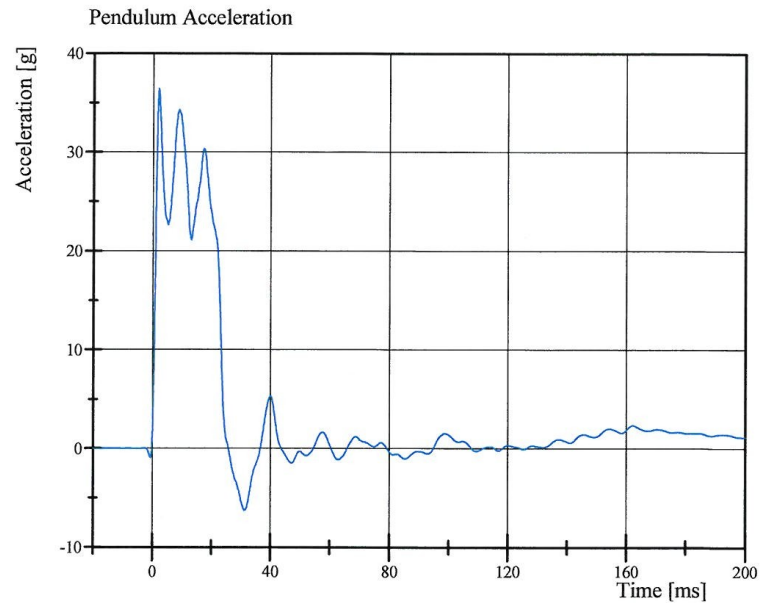


Transportation Research Center Inc.

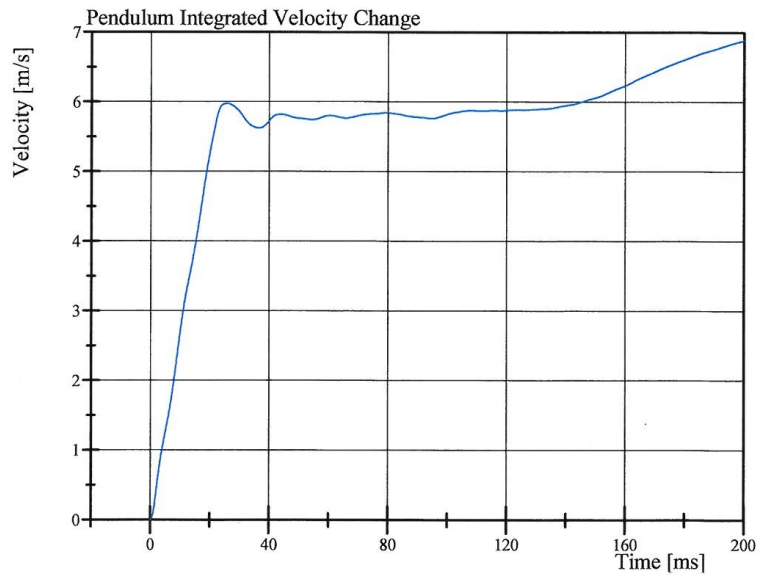
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 10-1

Test Date: 3/13/2012



Filter Class: CFC_180
Max: 36.4 gn at 2.0 ms
Min: -6.3 gn at 31.3 ms



Filter Class: CFC_180
Max: 6.9 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.

03.13.2012 12:55:55 636

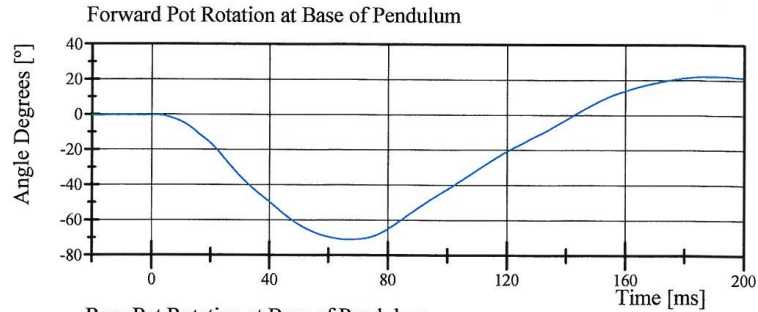


Transportation Research Center Inc.

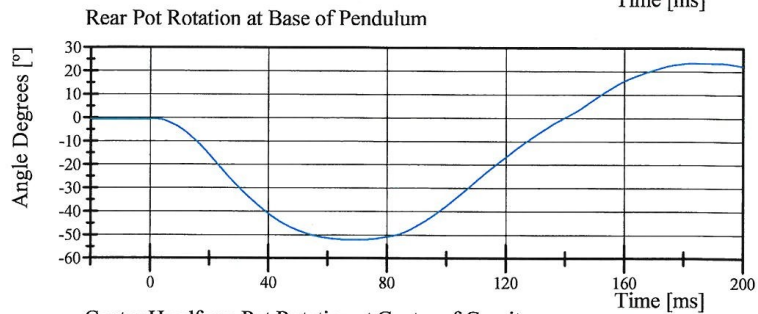
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 10-1

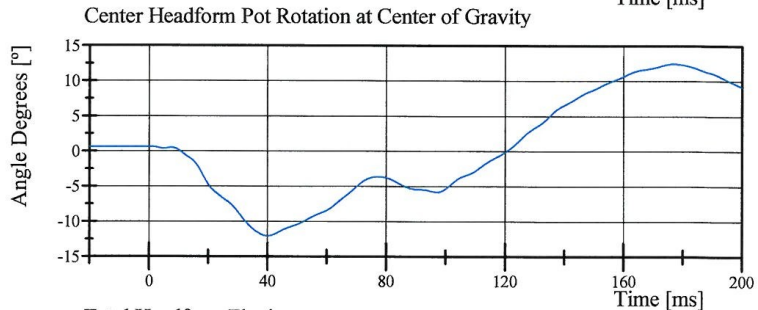
Test Date: 3/13/2012



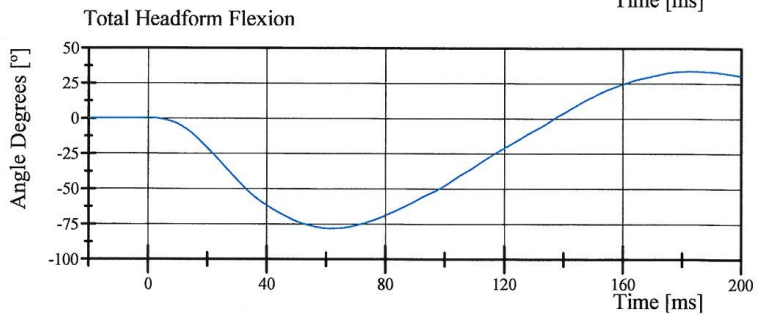
Filter Class: CFC_60
Max: 22.3 ° at 190.6 ms
Min: -71.0 ° at 66.8 ms



Filter Class: CFC_60
Max: 23.7 ° at 190.8 ms
Min: -52.0 ° at 69.2 ms



Filter Class: CFC_60
Max: 12.5 ° at 176.7 ms
Min: -12.1 ° at 40.0 ms



Filter Class: CFC_60
Max: 34.0 ° at 183.4 ms
Min: -78.0 ° at 62.1 ms

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

03.13.2012 12:55:56 636

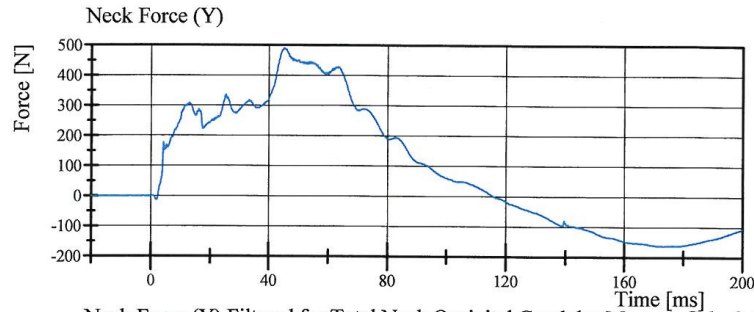


Transportation Research Center Inc.

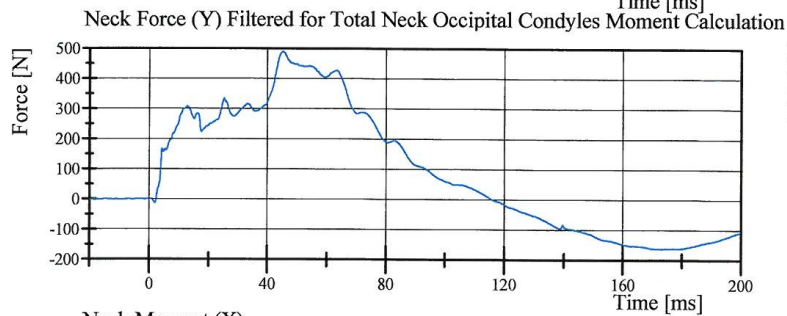
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 10-1

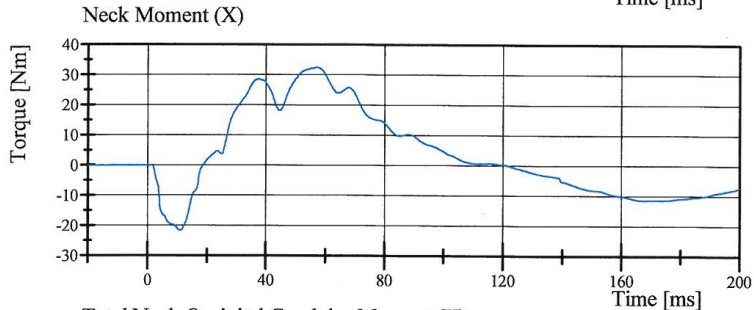
Test Date: 3/13/2012



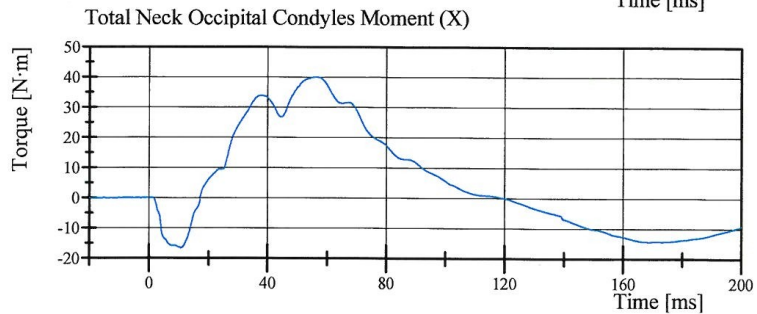
Filter Class: CFC_1000
Max: 491.9 N at 45.2 ms
Min: -162.2 N at 173.0 ms



Filter Class: CFC_600
Max: 491.0 N at 45.2 ms
Min: -161.7 N at 173.1 ms



Filter Class: CFC_600
Max: 32.5 Nm at 56.7 ms
Min: -21.6 Nm at 11.1 ms



Filter Class: Without_(Consta
Max: 40.1 N·m at 56.6 ms
Min: -16.5 N·m at 10.8 ms

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

03.13.2012 12:55:57 636



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 10-1

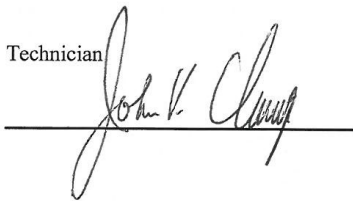
Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.0 g	Yes
Shoulder Displacement	28 - 37 mm	31.2 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.9 g	Yes

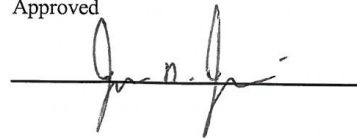
Test meets specifications.

Comments:

Technician



Approved



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

03.14.2012 16:43:29 826

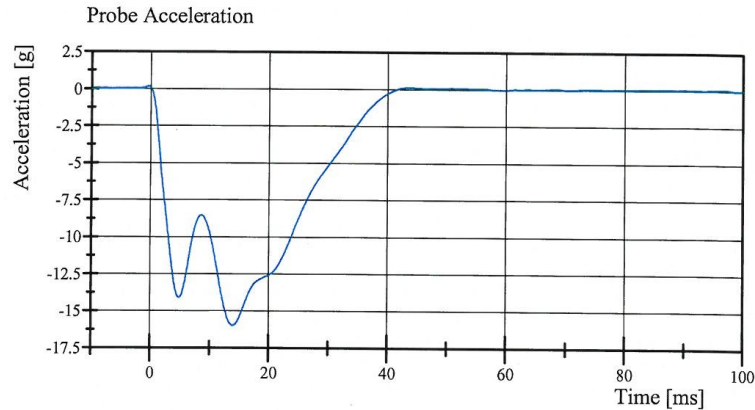


Transportation Research Center Inc.

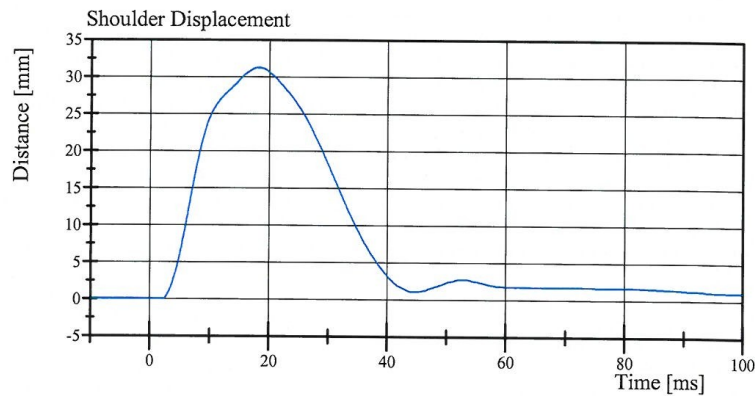
Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 10-1

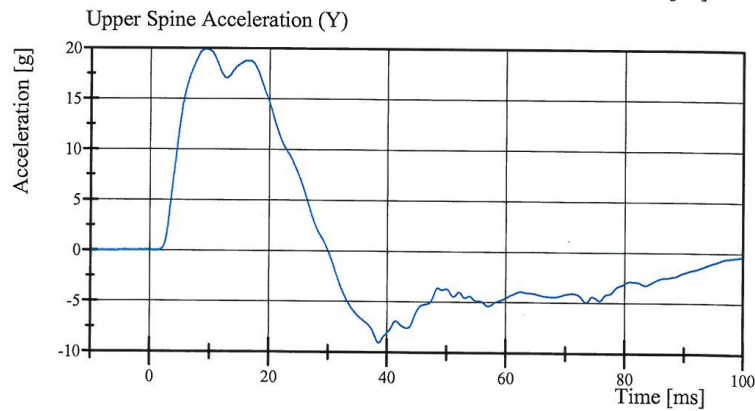
Test Date: 3/14/2012



Filter Class: CFC_180
Max: 0.1 gn at -0.3 ms
Min: -16.0 gn at 13.9 ms



Filter Class: CFC_600
Max: 31.2 mm at 18.2 ms
Min: -0.0 mm at 2.2 ms



Filter Class: CFC_180
Max: 19.9 gn at 9.3 ms
Min: -9.1 gn at 38.6 ms

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

03.14.2012 16:45:16 826



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 10-1
Test Date: 3/14/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.781 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.9 g	Yes
Shoulder Displacement	31 - 40 mm	35.1 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.5 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.1 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.2 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.4 g	Yes

Test meets specifications.

Comments:

Technician



Approved



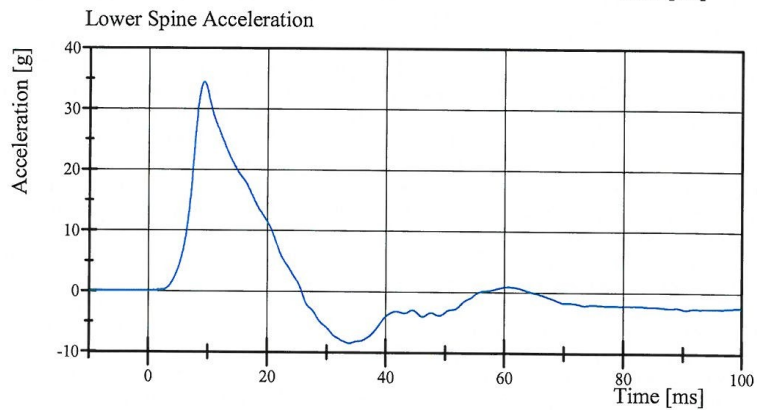
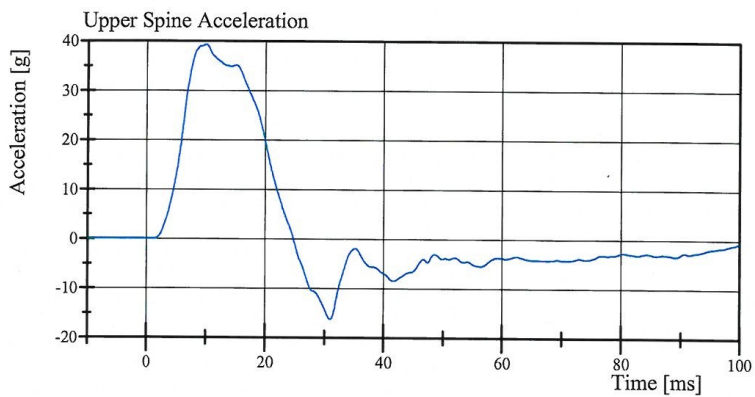
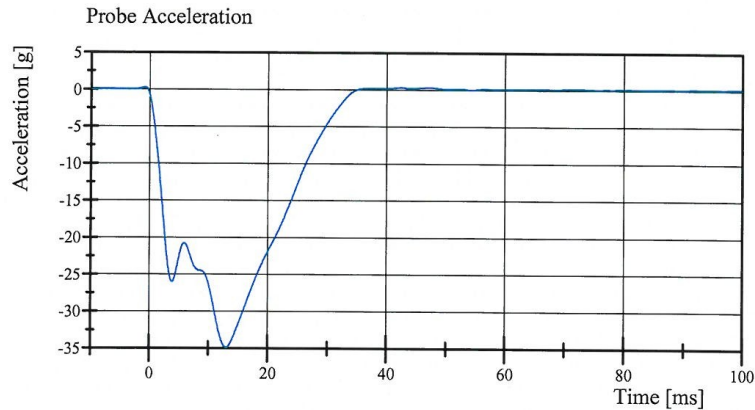
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.14.2012 17:16:16 598



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID II_s Serial No. 305 Certification No. 10-1
Test Date: 3/14/2012



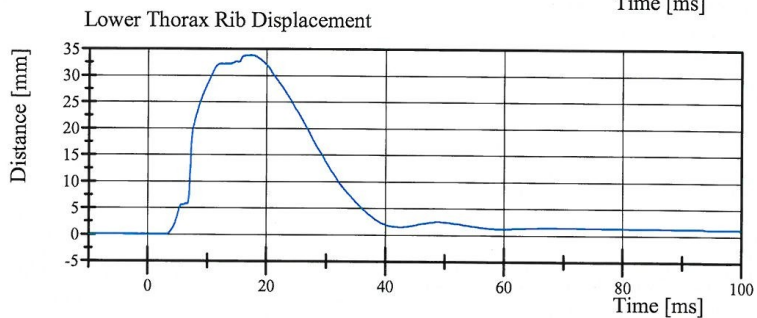
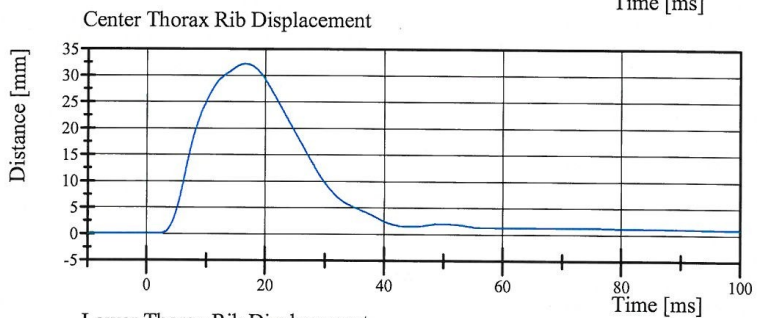
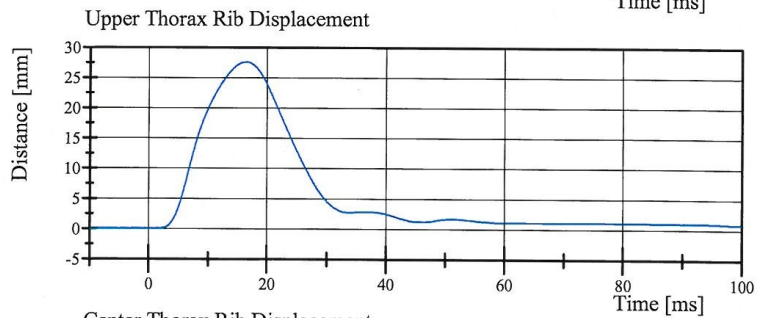
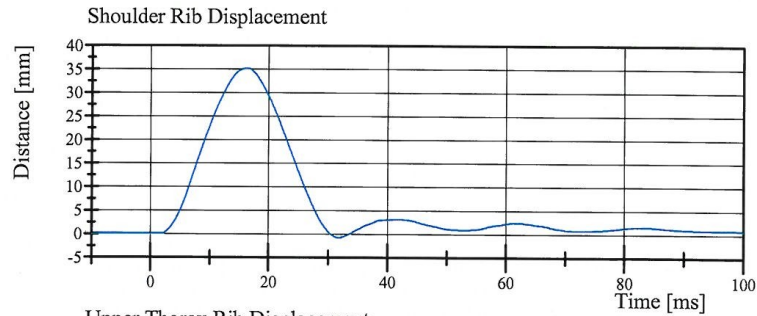
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.14.2012 17:16:30 598



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID II_s Serial No. 305 Certification No. 10-1
Test Date: 3/14/2012



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

03.14.2012 17:16:30 598



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID II_s Serial No. 305 Certification No. 10-1
Test Date: 3/15/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.392 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.9 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.2 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	36.9 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.8 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.7 g	Yes

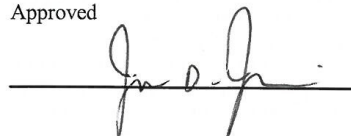
Test meets specifications.

Comments:

Technician



Approved



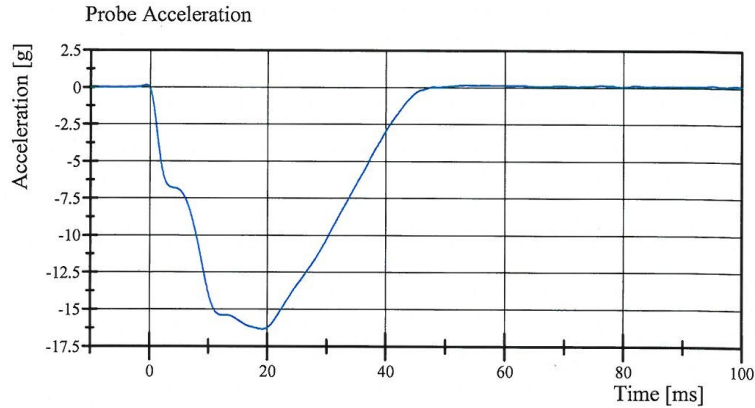
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.15.2012 10:14:11 809

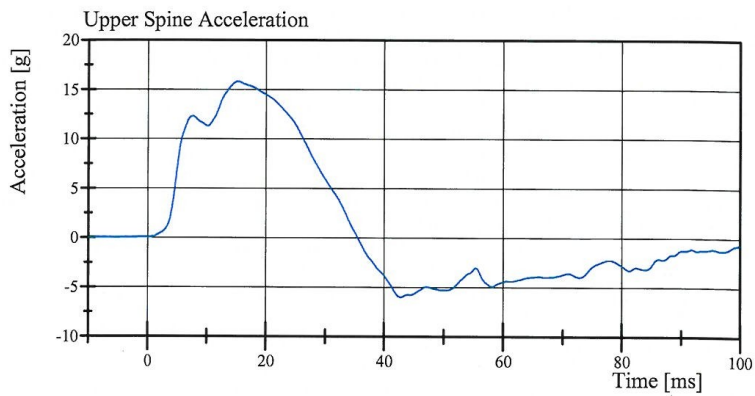


Transportation Research Center Inc.

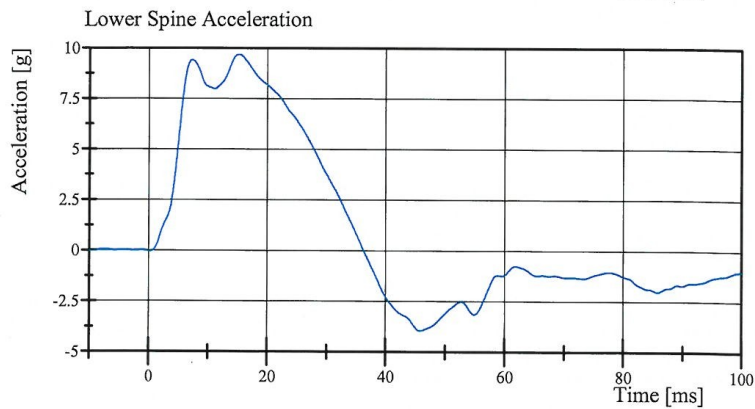
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 10-1
Test Date: 3/15/2012



Filter Class: CFC_180
Max: 0.1 gn at 56.6 ms
Min: -16.4 gn at 19.2 ms



Filter Class: CFC_180
Max: 15.8 gn at 15.3 ms
Min: -6.0 gn at 42.8 ms



Filter Class: CFC_180
Max: 9.7 gn at 15.2 ms
Min: -4.0 gn at 45.8 ms

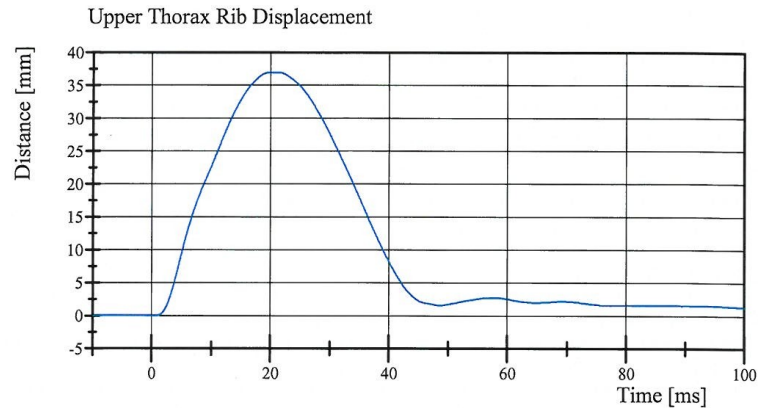
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.15.2012 10:14:20 809

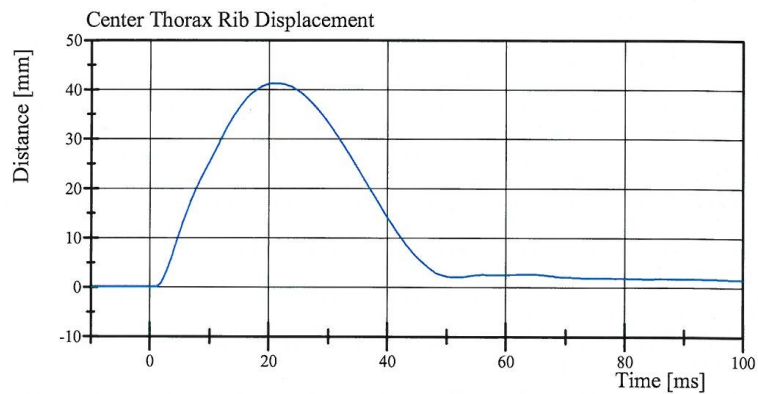


Transportation Research Center Inc.

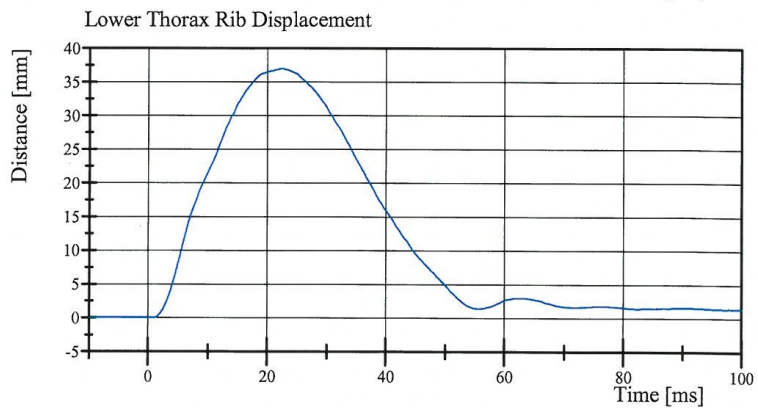
Left Lateral Thorax without Arm
SID II_s Serial No. 305 Certification No. 10-1
Test Date: 3/15/2012



Filter Class: CFC_600
Max: 36.9 mm at 20.3 ms
Min: -0.0 mm at -3.2 ms



Filter Class: CFC_600
Max: 41.2 mm at 21.0 ms
Min: -0.0 mm at -2.7 ms



Filter Class: CFC_600
Max: 36.9 mm at 22.4 ms
Min: -0.0 mm at -6.2 ms

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

03.15.2012 10:14:20 809



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 10-1

Test Date: 3/15/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.66 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.21 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.6 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,891.6 N	Yes

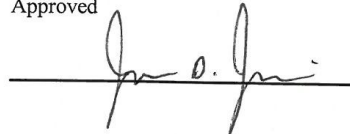
Test meets specifications.

Comments:

Technician



Approved



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

03.15.2012 08:43:56 434

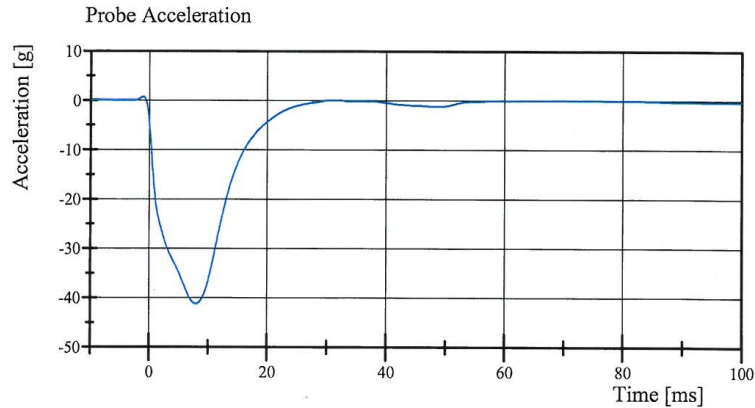


Transportation Research Center Inc.

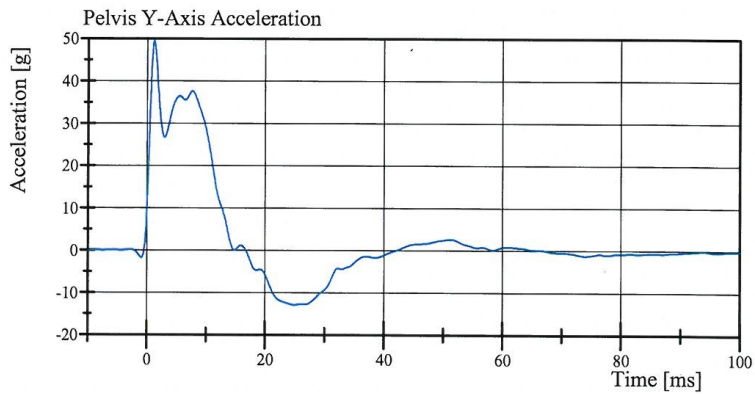
Left Lateral Pelvis

SID IIa Serial No. 305 Certification No. 10-1

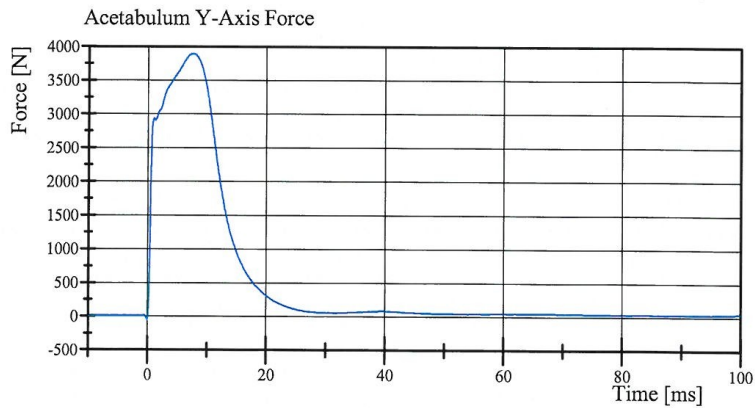
Test Date: 3/15/2012



Filter Class: CFC_180
Max: 0.6 gn at -1.0 ms
Min: -41.2 gn at 7.9 ms



Filter Class: CFC_180
Max: 49.5 gn at 1.2 ms
Min: -12.9 gn at 25.0 ms



Filter Class: CFC_600
Max: 3,891.6 N at 7.6 ms
Min: -58.4 N at 0.0 ms

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

03.15.2012 08:44:03 434



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 10-1

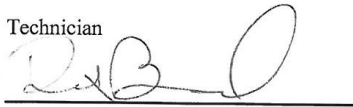
Test Date: 3/15/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.24 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.0 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.9 g	Yes
Iliac Force	4,100 - 5,100 N	4,523.0 N	Yes

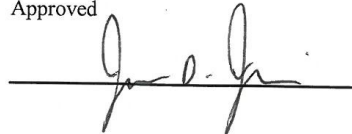
Test meets specifications.

Comments:

Technician



Approved



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

03.15.2012 12:28:32 656

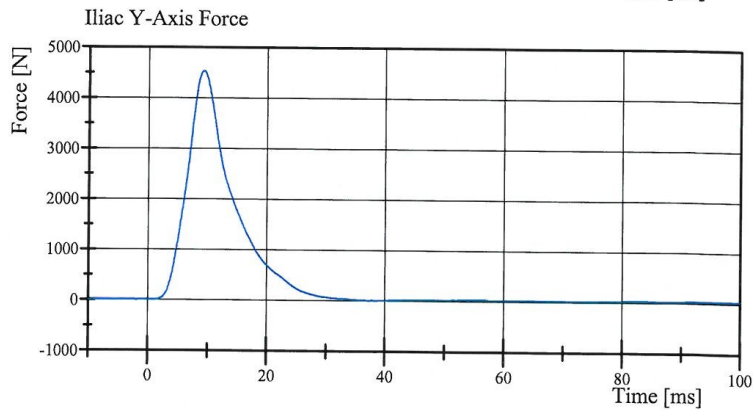
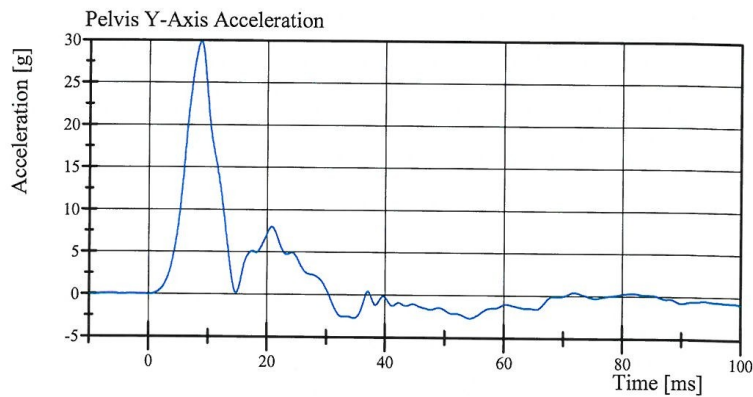
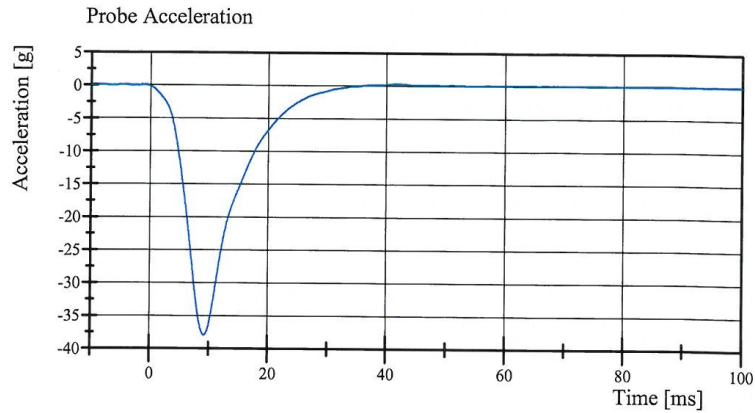


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 10-1

Test Date: 3/15/2012



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

03.15.2012 12:28:42 656



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	16-Nov-11
		Y	P51702	Endevco	16-Nov-11
		Z	P52083	Endevco	16-Nov-11
Thoracic Rib Displacement Potentiometers	Upper	Y	175	FTSS	16-Nov-11
	Middle	Y	174	FTSS	16-Nov-11
	Lower	Y	173	FTSS	16-Nov-11
Abdomen Load Cells	Upper	Y	1441	Denton	16-Nov-11
	Middle	Y	1436	Denton	16-Nov-11
	Lower	Y	1437	Denton	16-Nov-11
Lower Spine Accelerometers (T12)		X	P73381	Endevco	16-Aug-11
		Y	P73580	Endevco	16-Aug-11
		Z	P59005	Endevco	16-Nov-11
Acetabulum Load Cell		Y			
Pubic Symphysis Load Cell		Y	457-FY	Denton	16-Nov-11

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305			
				Serial Number	Manufacturer	Calibration Date	
Head Accelerometers				X	P51719	Endevco	9-Nov-11
				Y	P51272	Endevco	9-Nov-11
				Z	P58862	Endevco	9-Nov-11
Displacement Potentiometers	Shoulder			Y			
	Thoracic Rib	Upper	Y	007	Servo	9-Dec-11	
		Middle	Y	1161	Servo	9-Nov-11	
		Lower	Y	1279	Servo	9-Nov-11	
	Abdominal Rib	Upper	Y	1295	Servo	9-Nov-11	
		Lower	Y	1136	Servo	9-Nov-11	
Lower Spine Accelerometers (T12)				X	P50068	Endevco	9-Nov-11
				Y	P52051	Endevco	9-Nov-11
				Z	P51710	Endevco	9-Nov-11
Acetabulum Load Cell				Y	287-FY	FTSS	10-Nov-11
Iliac Wing Load Cell				Y	103-FY	FTSS	10-Nov-11
Pelvis Plug (struck side)							
Pelvis Plug (non-struck side)							

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P73290	Endevco	28-Nov-11
	Vehicle Center of Gravity	Y	P69048	Endevco	19-Jan-12
	Vehicle Center of Gravity	Z	P73599	Endevco	28-Nov-11
2	Right Sill at Front Seat	X	P74082	Endevco	27-Feb-12
	Right Sill at Front Seat	Y	P74520	Endevco	27-Feb-12
	Right Sill at Front Seat	Z	P74521	Endevco	27-Feb-12
3	Right Sill at Rear Seat	X	P69085	Endevco	9-Jan-12
	Right Sill at Rear Seat	Y	P73565	Endevco	14-Feb-12
	Right Sill at Rear Seat	Z	P73568	Endevco	14-Feb-12
4	Left Sill at Front Door	Y	P74434	Endevco	27-Jan-12
5	Left Sill at Rear Door	Y	P74451	Endevco	26-Jan-10
6	Left A-Post Lower	Y	P74809	Endevco	25-Feb-12
7	Left A-Post Middle	Y	P74804	Endevco	25-Feb-12
8	Left B-Post Lower	Y	P74428	Endevco	21-Feb-12
9	B-Post Middle	Y	P74435	Endevco	18-Feb-12
10	Front Seat Track	Y	P73596	Endevco	15-Feb-12
11	Rear Seat Track or Structure	Y	P74078	Endevco	27-Feb-12
12	Right Rear Occupant Compartment	Y	P49789	Endevco	28-Feb-12
13	Engine Block	X	P74806	Endevco	25-Feb-12
	Engine Block	Y	P74803	Endevco	25-Feb-12
14	Rear Floorpan Above Axle	X	P74523	Endevco	27-Jan-12
	Rear Floorpan Above Axle	Y	P71491	Endevco	19-Jan-12
	Rear Floorpan Above Axle	Z	P57178	Endevco	19-Jan-12

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P74446	Endevco	27-Feb-12
MDB Center of Gravity	Y	P72308	Endevco	27-Feb-12
MDB Center of Gravity	Z	P74081	Endevco	27-Feb-12
Left Frame Rail at Rear Axle Centerline	X	P73601	Endevco	28-Nov-11
Left Frame Rail at Rear Axle Centerline	Y	P73380	Endevco	16-Feb-12