

FINAL REPORT NUMBER: SINCAP-TRC-12-001

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

**Ford Motor Company
2012 Ford Expedition XL SUV
NHTSA NUMBER: MC0214**

**PREPARED BY:
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Report Date: March 15, 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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Prepared By: IL Project Operations Team

Approved By: *Margaret Swan*

Approval Date: March 15, 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 <p>This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2012 Ford Expedition XL SUV in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on December 5, 2011.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 61.4 km/h and the ambient temperature at the struck (driver's side) side of the target vehicle at the time of impact was 22° C. The target vehicle post-test maximum crush was 189 mm at Level 1. The test vehicle's performance was as follows:</p> <table border="0" style="margin-left: 40px;"> <thead> <tr> <th colspan="4" style="text-align: center;">Driver ATD (ES-2re)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">IARV</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">NA</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">23</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">44</td> <td style="text-align: center;">17.3</td> </tr> <tr> <td>Total Abdominal Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">2500</td> <td style="text-align: center;">-280.2</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">6000</td> <td style="text-align: center;">-679.9</td> </tr> </tbody> </table> <table border="0" style="margin-left: 40px;"> <thead> <tr> <th colspan="4" style="text-align: center;">Passenger ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">IARV</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">NA</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">64</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">82</td> <td style="text-align: center;">22.0</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">1997.8</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38*</td> <td style="text-align: center;">8.5</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45*</td> <td style="text-align: center;">27.8</td> </tr> </tbody> </table> <p>* Proposed IARV</p> <p>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.</p>				Driver ATD (ES-2re)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	NA	1000	23	Maximum Thoracic Rib Deflection	mm	44	17.3	Total Abdominal Force	N	2500	-280.2	Pubic Symphysis Force	N	6000	-679.9	Passenger ATD (SID-IIs)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	NA	1000	64	Resultant Lower Spine Acceleration	g's	82	22.0	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1997.8	Maximum Thoracic Rib Deflection	mm	38*	8.5	Maximum Abdominal Rib Deflection	mm	45*	27.8
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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 Ford Expedition XL SUV. 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 Ford Expedition XL SUV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.4 km/h (38.16 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 December 5, 2011. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

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

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

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

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

Lower spine (T12) tri-axial accelerometers

Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

Primary and redundant head CG triaxial accelerometers

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

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (T12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	NA	1000	23
Maximum Thoracic Rib Deflection	mm	44	17.3
Combined Abdominal Force	N	2500	-280.2
Pubic Symphysis Force	N	6000	-679.9

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	NA	1000	64
Lower Spine (T12) Resultant Acceleration	G	82	22.0
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1997.8
Maximum Thoracic Rib Deflection	mm	38*	8.5
Maximum Abdominal Rib Deflection	mm	45*	27.8

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	NA		
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso)	Yes	Yes	No	NA
Side Airbag 3	NA	NA	No	NA
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	NA	NA	NA	NA
Other	NA	NA	NA	NA

GENERAL COMMENTS

The doors remained closed and latched throughout the test. No fuel spillage occurred during or after impact. The restraints system performed as expected. Injury values did not exceed the thresholds.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

**DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2012 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0214	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Ford	Automatic Door Locks (ADL)	Yes
Model	Expedition XL	Power Window Auto-Reverse	Yes
Body Style	SUV	Other Optional Feature	NA
VIN	1FMJU1F53CEF02618	Driver Frontal Airbag	Yes
Body Color	Dark Blue	Driver Curtain Airbag	Yes
Odometer Reading (miles)	88.6	Driver Head/Torso Airbag	No
Engine Displacement (L)	5.4	Driver Torso Airbag	Yes
Number of Cylinders	8	Driver Torso/Pelvis Airbag	No
Engine Placement	Longitudinally-placed	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	RWD	Rear Passenger Torso Airbag	No
Roof Rack	Yes	Rear Pass. Torso/Pelvis Airbag	No
Sunroof / T-Top	No	Rear Passenger Pelvis Airbag	No
Running Boards	Yes	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rr. Pass. Seat Belt Pretensioner	No
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	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	3311
Date of Manufacture	9-11	GAWR Front (kg)	1497
Vehicle Type	SUV	GAWR Rear (kg)	1928

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	3	8	
Capacity Weight (VCW) (kg)				741	(A)
DSC x 68.08 (kg)				545	(B)
Cargo Weight (RCLW) (kg)				196	(A-B)

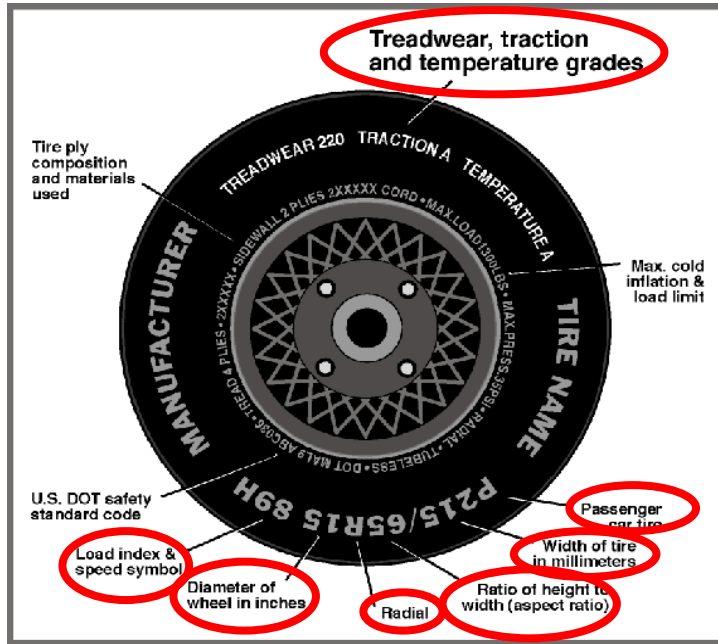
VEHICLE SEAT TYPE

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	No	No	Yes	No
Third Row Seat	No	No	Yes	No	Yes	No	No

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

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	240	240
Recommended Tire Size	P265/70R17	P265/70R17

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P265/70R17	P265/70R17
Tire Manufacturer	Continental	Continental
Tire Name	ContiTrac SUV	ContiTrac SUV
Tire Type	Highway All-season	Highway All-season
Tire Width	265	265
Aspect Ratio	70	70
Radial	Yes	YES
Wheel Diameter	17	17
Load Index/ Speed Symbol	113S	113S
Treadwear	520	520
Traction Grade	A	A
Temperature Grade	B	B
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	NA	NA	NA	NA
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	241	241	241	241
As Tested	kPa	241	241	241	241

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	221	221	221	221

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	640.2	630.4		679.4	759.8		660.0	775.0	
Right	kg	615.6	654.2		614.8	741.6		615.6	739.2	
Ratio	%	49.4	50.6		46.3	53.7		45.7	54.3	
Totals	kg	1255.8	1284.6	2540.4	1294.2	1501.4	2795.6	1275.6	1514.2	2789.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2540.4	(A)
Actual Weight of 2 P572 ATDs Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	(C)
Calculated Vehicle Target Weight (TVT _W)	kg	2801.4	(A+B+C)

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Steel plate mounted in cargo area	90.7
	NA
	NA

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

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	910	913	Yes
RF	mm	920	919	Yes
RR	mm	888	893	Yes
LR	mm	875	876	Yes
Vehicle CG (Aft of Front Axle)	mm	1634	1617	
Vehicle CG (Left (+) / Right (-) from longitudinal Centerline)	mm	25	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 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11

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	NA	NA	NA
Front Passenger Seat	NA	NA	NA
Front Center Seat*	NA	NA	NA
Struck Side Rear Seat	NA	NA	NA
Non-Struck Side Rear Seat	NA	NA	NA
Rear Center Seat*	NA	NA	NA

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear-Most	Mid-Fore/Aft	Forward-Most
Driver Seat	Mid ¹	Mid ¹	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Front Passenger Seat	Mid ¹	Mid ¹	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Front Center Seat*	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Struck Side Rear Seat	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Non-Struck Side Rear Seat	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Rear Center Seat*	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA

* If applicable.

¹ Measurements were not recorded.

DATA SHEET NO. 2 (CONTINUED)

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

Test Vehicle: 2012 Ford Expedition XL SUV

NHTSA No.: MC0214

Test Program: NCAP Side Impact

Test Date: 12/05/11

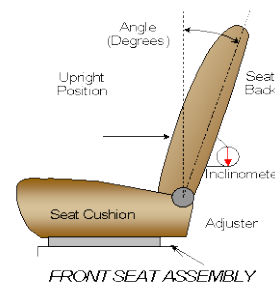
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	233	44	167	22
Front Passenger Seat	233	44	167	22
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat	NA	NA	NA	NA
Non-Struck Side Rear Seat	NA	NA	NA	NA
Rear Center Seat*	NA	NA	NA	NA

* If applicable.

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/ Seated Dummy	NA	NA	22	NA
Front Passenger Seat	NA	NA	22	NA
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat w/ Seated Dummy	NA	NA	21	NA
Non-Struck Side Rear Seat	NA	NA	21	NA
Rear Center Seat*	NA	NA	NA	NA

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

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

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	5	3
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

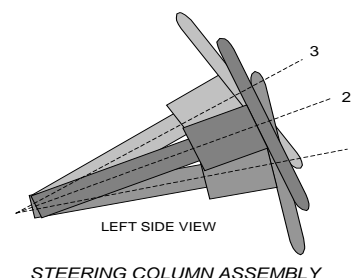
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	3	3
Rear Seat	Fixed	Fixed

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.

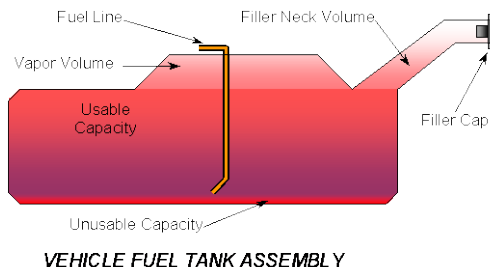
	Degrees	Fore/Aft Position, mm
Lowermost, Position 1	11.0	NA
Geometric Center, Position 2	21.2	NA
Uppermost, Position 3	31.3	NA
Telescoping Steering Wheel Travel		No feature
Test Position	Mid	NA



FUEL PUMP

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

Fuel tank is in front of the rear axle between the left frame rail and prop-shaft. The fuel filler neck enters the top rear center of the fuel tank. The fuel filler cap is on the left rear quarter panel. The fuel lines run along the inside of the left frame rail.



DATA SHEET NO. 2 (CONTINUED)

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

Test Vehicle: 2012 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11

FUEL TANK CAPACITY

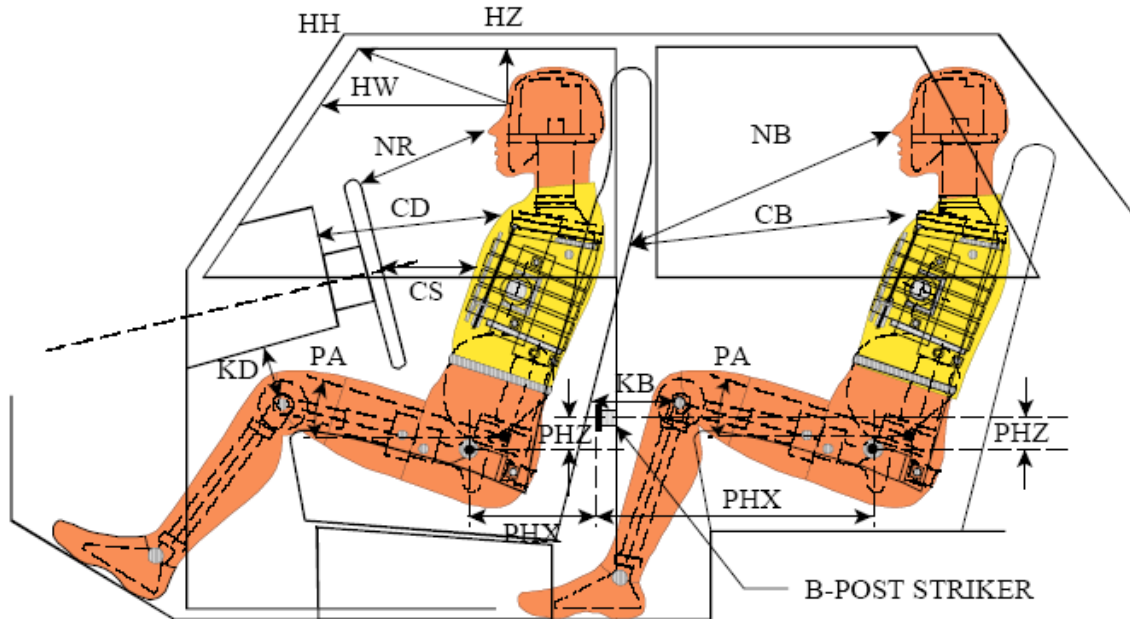
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	106.0
Usable Capacity of "Optional" Tank (see Form No. 1)	126.8
Usable Capacity of Standard Tank (see Owner's Manual)	106.0
Usable Capacity of Optional Tank (see Owner's Manual)	126.8
93% of Usable Capacity	98.6
Actual Amount of Solvent Used in Test	98.4
1/3 of Usable Capacity	35.3

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

**DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11



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

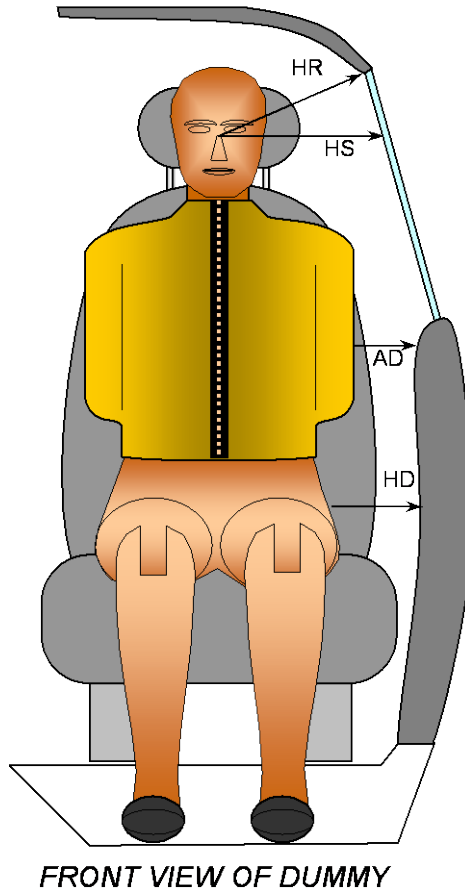
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Passenger Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Head to Header	497			
HW		Head to Windshield	699			
HZ	HZ	Head to Roof Liner	203		307	
NR	NB	Nose to Rim/Seat Back	501		526	
CD	CB	Chest to Dash/Seat Back	646		525	
CS		Chest to Steering Wheel	334			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	102	25.5	238	0.0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	85	25.3	241	0.0
PAX°	PAX°	Pelvic Tilt Angle X		0.5		21.7
	PHY°	Pelvic Tilt Angle Y				0.0
PHX	PHX	Hip Point to Striker (X-Axis)	229		297	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	323		125	

**DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11

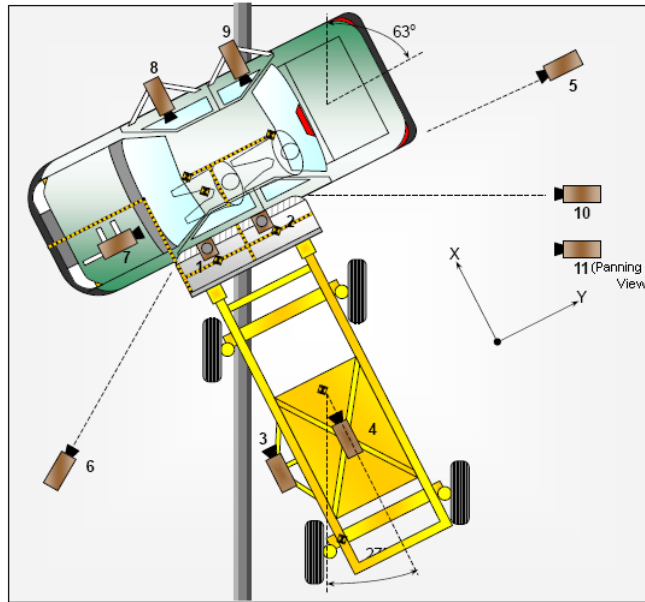


Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	203	258
HS	Head to Side Window	mm	251	324
AD	Arm to Door	mm	78	131
HD	H-Point to Door	mm	174	158

**DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2012 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	0	1600	8.5	1000
2	Overhead Close-up	0	200	1600	16	1000
3	Left Impact Point (MDB)	1700	0	820	12.5	1000
4	Side Overall (MDB)	2400	-770	1440	12.5	1000
5	Rear	0	9250	1340	16	1000
6	Left Front	-3000	5350	1220	16	1000
7	Driver Front (OB)				16	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:

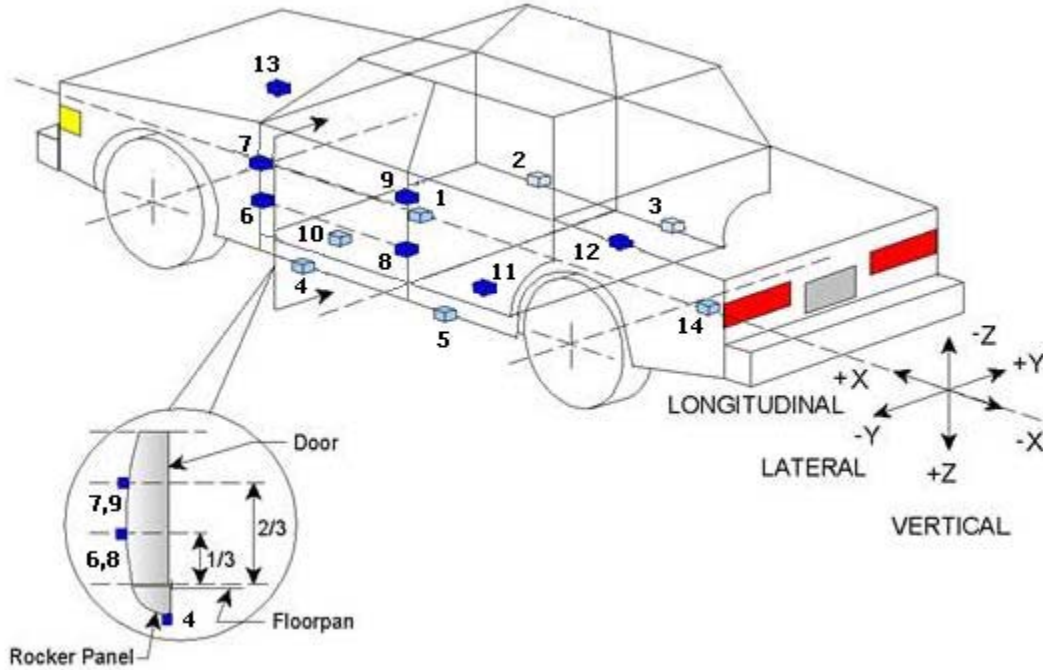
INSTRUMENTATION

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 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11



TEST VEHICLE ACCELEROMETER LOCATIONS

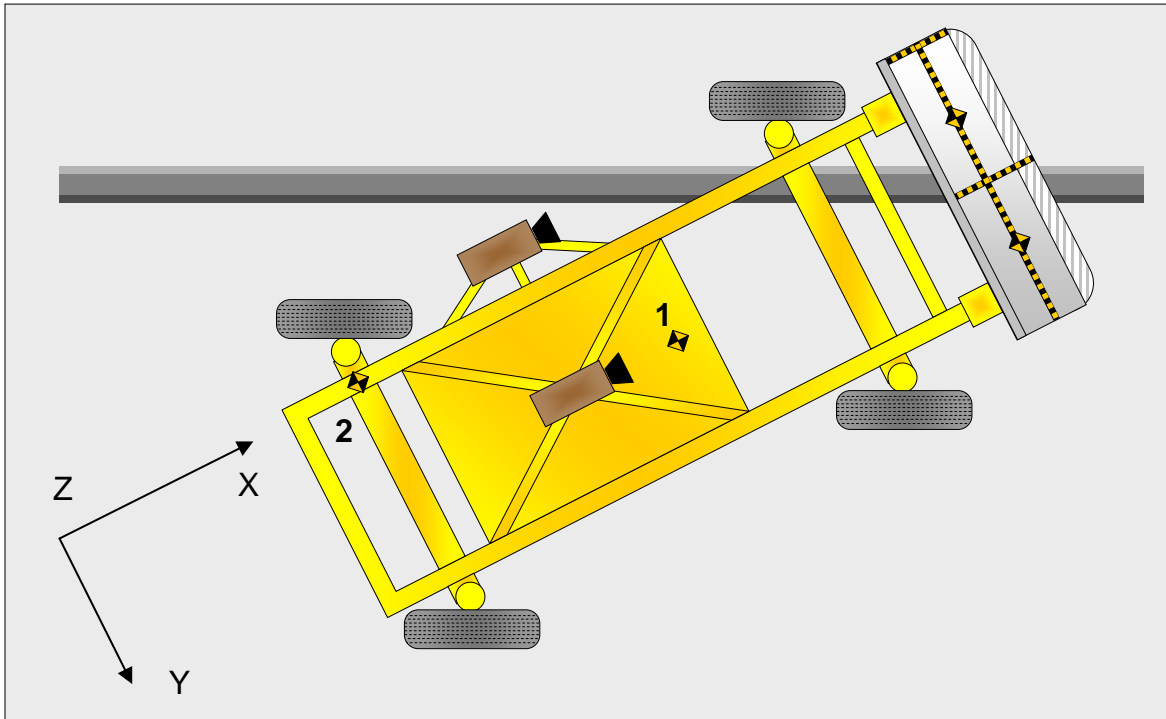
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3540	150	-652
2	Right Sill at Front Seat	3720	730	-526
3	Right Sill at Rear Seat	2580	750	-586
4	Left Sill at Front Door	3700	-730	-552
5	Left Sill at Rear Door	3975	-890	-758
6	A-Post Lower	4010	-860	-1151
7	A-Post Middle	2295	-610	-576
8	B-Post Lower	2836	-900	-751
9	B-Post Middle	2852	-900	-1111
10	Front Seat Track	3134	-630	-668
11	Rear Seat Structure	4696	-200	-952
12	Right Rear Occ. Compartment	2390	640	-610
13	Engine Block	2520	760	-606
14	Rear Above Axle	1420	0	-715

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 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11



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 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	Curtain bag	NA
Top of Head	Side Header	NA
Left Side of Head	Curtain bag	Curtain bag
Back of Head	Head restraint	NA
Left Shoulder	Curtain bag	NA
Upper Torso	Side airbag	Door panel
Lower Torso	Seat bolster, torso airbag	Door panel
Left Hip	Door panel	Door panel
Left Knee	None	None

POST-TEST DOOR PERFORMANCE

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

* Indicate "Yes", "No", or "NA".

POST-TEST SEAT PERFORMANCE

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

* Indicate "Yes", "No", or "NA".

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Intact
Sill Separation	No
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	None

**DATA SHEET NO. 8 (CONTINUED)
POST-TEST OBSERVATIONS**

Test Vehicle: 2012 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11

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	No	No
Side Airbag 1 (Indicate Type, if App.)	NA	NA	NA	NA
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other	NA	NA	NA	NA

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3010
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		519
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	11
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	6

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

Test Vehicle: 2012 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2587
C.G. Location aft of Front Axle	1097

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	400.6	278.8	
Right	kg	385.2	300.0	
Ratio	%	57.6	42.4	
Totals	kg	785.8	578.8	1364.6

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.4
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.4
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

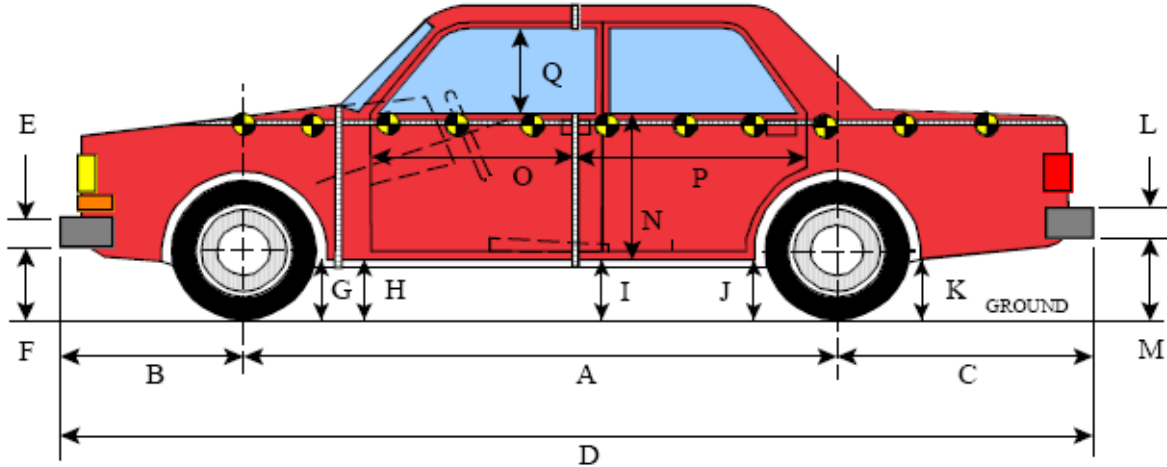
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Row	Vertical Location		From Centerline		Maximum Crush
	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	262
B	Top of Bumper	533	700	Right	225
C	Mid-Level	686	800	Right	185
D	Top of Stack	813	800	Right	167

**DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2012 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11



LEFT SIDE VIEW

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

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

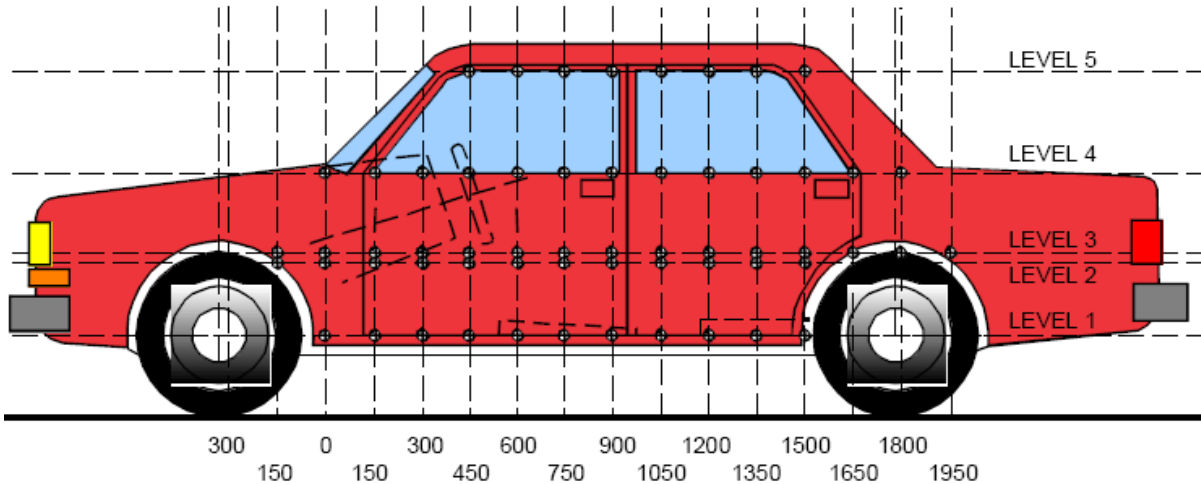
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3010	3000	10
B	Front Axle to Front Surface of Vehicle	990	990	0
C	Rear Axle to Rear Surface of Vehicle	1200	1200	0
D	Total Length at Centerline	5200	5205	-5
E	Front Bumper Thickness	210	210	0
F	Front Bumper Bottom to Ground	455	440	15
G	Sill Height at Front Wheel Well	410	404	6
H	Sill Height at Front Door Leading Edge	422	423	-1
I	Sill Height at B-Pillar	434	525	-91
J1	Sill Height at Rear Wheel Well	432	444	-12
J2	Pinch Weld Height at Rear Wheel Well	400	445	-45
K	Sill Height Aft of Rear Wheel Well	464	485	-21
L	Rear Bumper Thickness	112	112	0
M	Rear Bumper Bottom to Ground	558	580	-22
N	Sill Height to Window Bottom Sill	828	805	23
O	Front Door Leading Edge to Impact CL	759	760	-1
P	Rear Door Trailing Edge to Impact CL	1472	1414	58
Q	Front Window Opening	538	535	3
R	Right Side Length	4965	4944	21
S	Left Side Length	4970	4930	40
T	Vehicle Width at B-Pillar	1565	1505	60

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	508	176	1500
2	Driver Hip Point	883	162	1500
3	Mid-Door	874	164	1500
4	Window Sill	1164	62	1350
5	Window Top	1780	119	1950

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 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11

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	1005	1006	934	0	0	997	996	944	0	0	8	10	-10	0
-150	0	998	999	938	0	0	984	984	943	0	0	14	15	-5	0
0	992	988	989	943	941	930	969	969	942	941	62	19	20	1	0
150	984	993	993	948	893	860	939	936	940	909	124	54	56	9	-17
300	988	996	996	954	853	818	915	917	937	893	171	81	79	17	-40
450	989	999	999	958	808	822	898	898	936	871	167	101	101	22	-64
600	989	1001	1002	962	756	834	895	893	933	844	155	106	109	29	-87
750	990	1003	1003	966	714	849	887	883	930	815	141	116	120	35	-101
900	990	1004	1004	968	704	859	879	875	926	806	131	124	129	42	-102
1050	990	1004	1005	970	702	862	873	868	922	802	128	131	137	48	-101
1200	991	1004	1004	971	701	858	854	847	916	799	133	150	157	55	-98
1350	990	1002	1003	973	701	801	865	860	911	777	189	138	143	62	-76
1500	989	1001	1003	974	702	812	840	838	925	789	176	162	164	49	-87
1650	988	1000	1001	975	705	833	850	848	935	801	155	150	153	40	-96
1800	989	998	1000	975	705	861	872	868	945	813	128	126	132	30	-108
1950	989	996	998	974	706	934	887	883	953	825	55	109	115	21	-119
2100	0	998	1001	973	705	0	930	930	957	700	0	68	71	16	5
2250	0	1008	1010	971	704	0	967	968	960	698	0	40	42	10	6
2400	0	1007	0	968	701	0	987	0	946	699	0	20	0	23	2
2550	0	0	0	967	699	0	0	0	948	698	0	0	0	18	1
2700	0	0	0	963	698	0	0	0	949	697	0	0	0	14	1
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 Ford Expedition XL SUV
Test Program: NCAP Side Impact

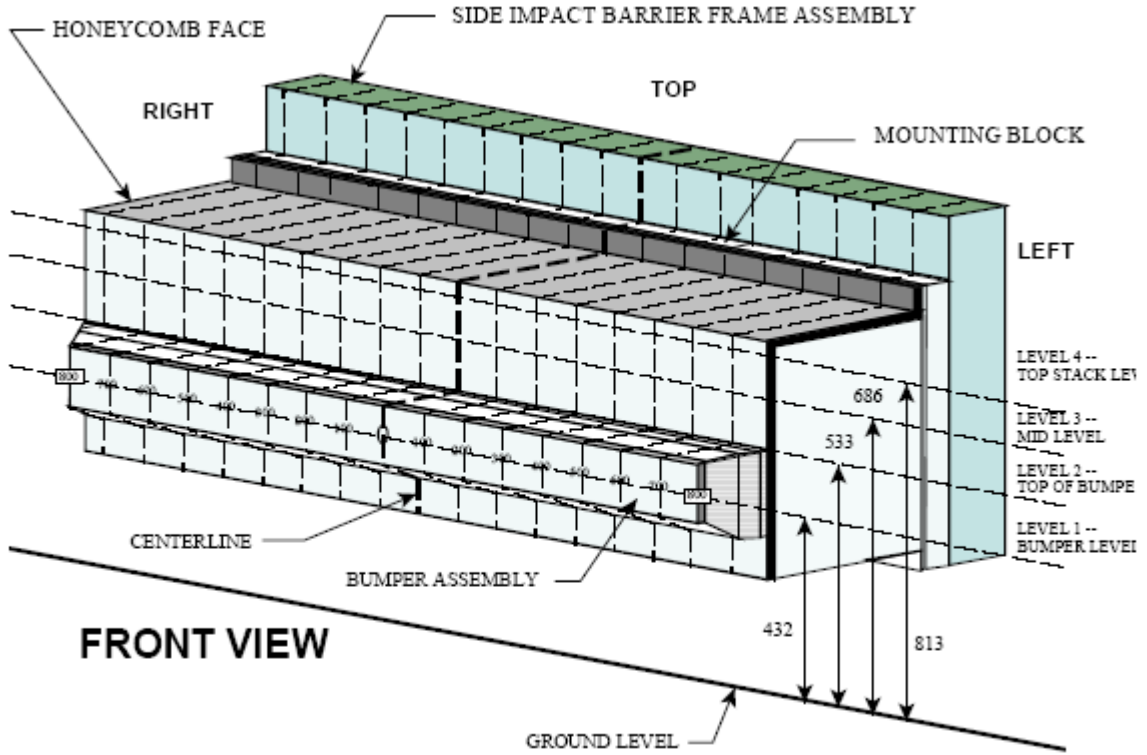
NHTSA No.: MC0214
Test Date: 12/05/11



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Expedition XL SUV
 Test Program: NCAP Side Impact

NHTSA No.: MC0214
 Test Date: 12/05/11



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center									C/L	Distance Left of Center								
	800	700	600	500	400	300	200	100	0		100	200	300	400	500	600	700	800	
1	-167	-144	-123	-111	-106	-122	-155	-143	-104	-92	-90	-88	-94	-97	-117	-131	-148		
2	-185	-140	-123	-109	-104	-110	-132	-128	-110	-96	-89	-83	-77	-73	-73	-81	-108		
3	-225	-217	-209	0	0	0	0	0	0	-189	-177	-170	-160	-151	-141	-132	-123		
4	-262	-247	-228	-211	-204	-200	-203	-209	-213	-214	-201	-184	-168	-155	-147	-140	-133		

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

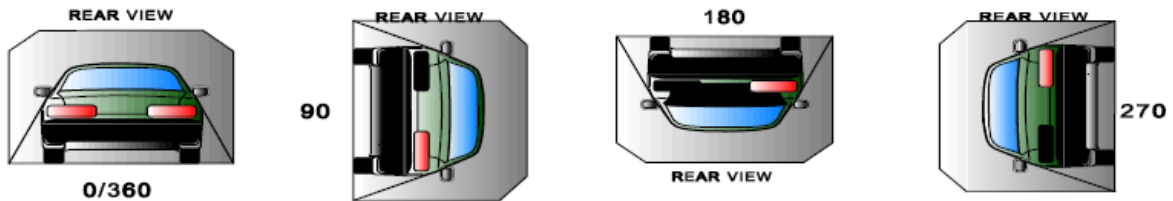
Test Vehicle: 2012 Ford Expedition XL SUV
Test Program: NCAP Side Impact

NHTSA No.: MC0214
Test Date: 12/05/11

Test Time: 16:54 **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	NA
90 to 180	0	0	0	NA
180 to 270	0	0	0	NA
270 to 360	0	0	0	NA

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0 to 90	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 Ford Expedition XL SUV

NHTSA No.: MC0214

Test Program: NCAP Side Impact

Test Date: 12/05/11

No alarms signaling conditions outside of corridor were indicated during test period. The permanent record of temperature and humidity data was lost during download.

**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



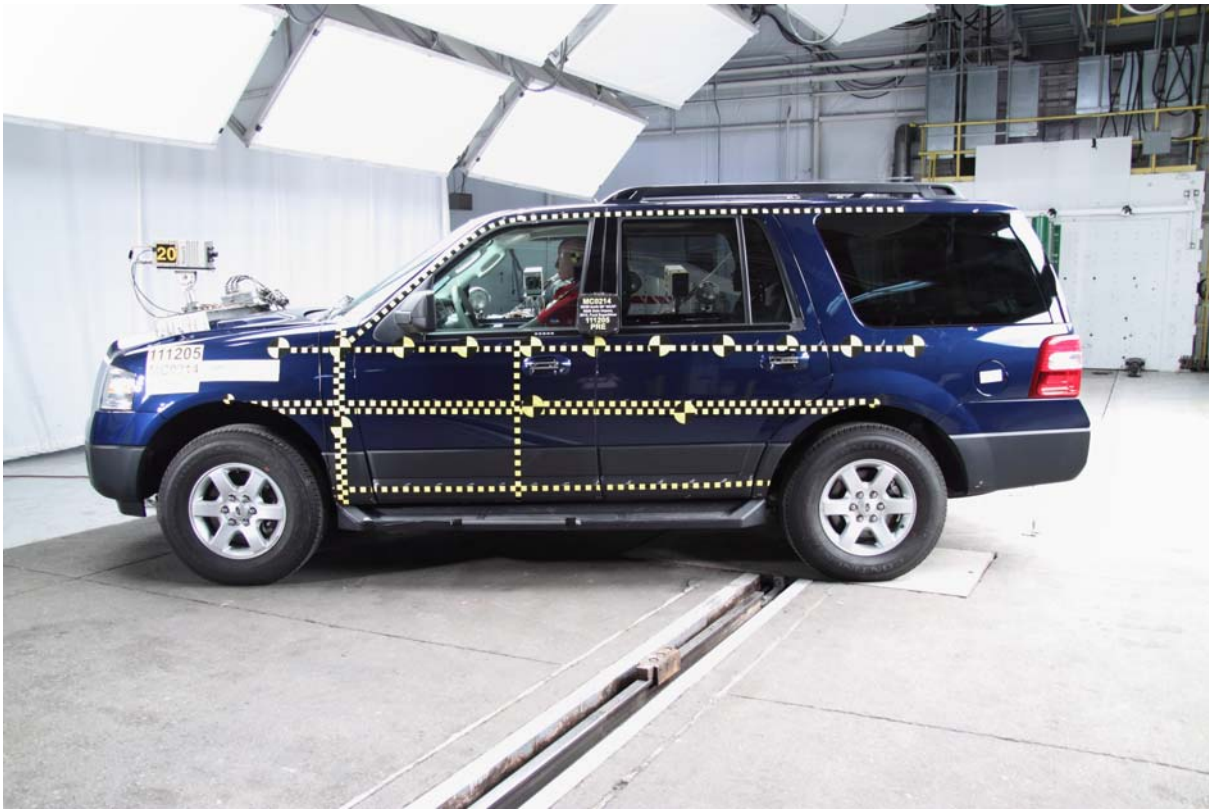
004 Post-Test Front View of Test Vehicle



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



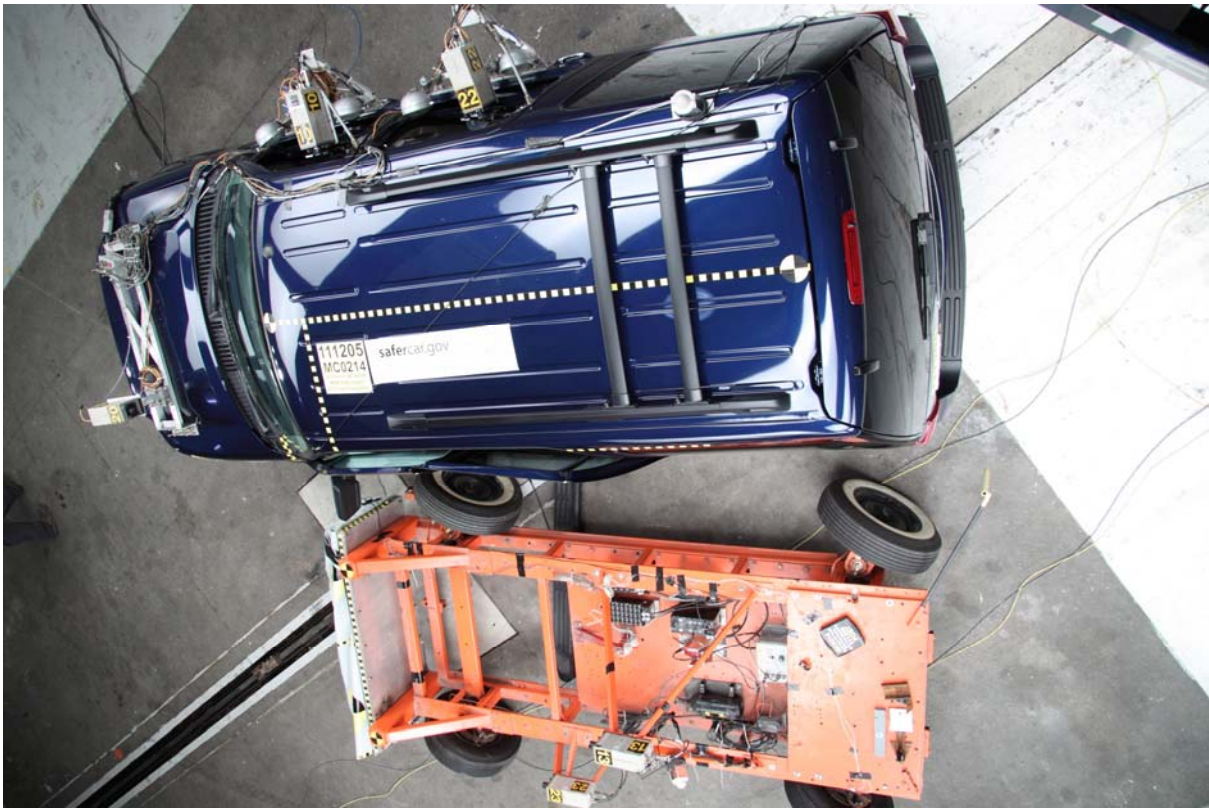
013 Pre-Test Right Side View of Test Vehicle



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



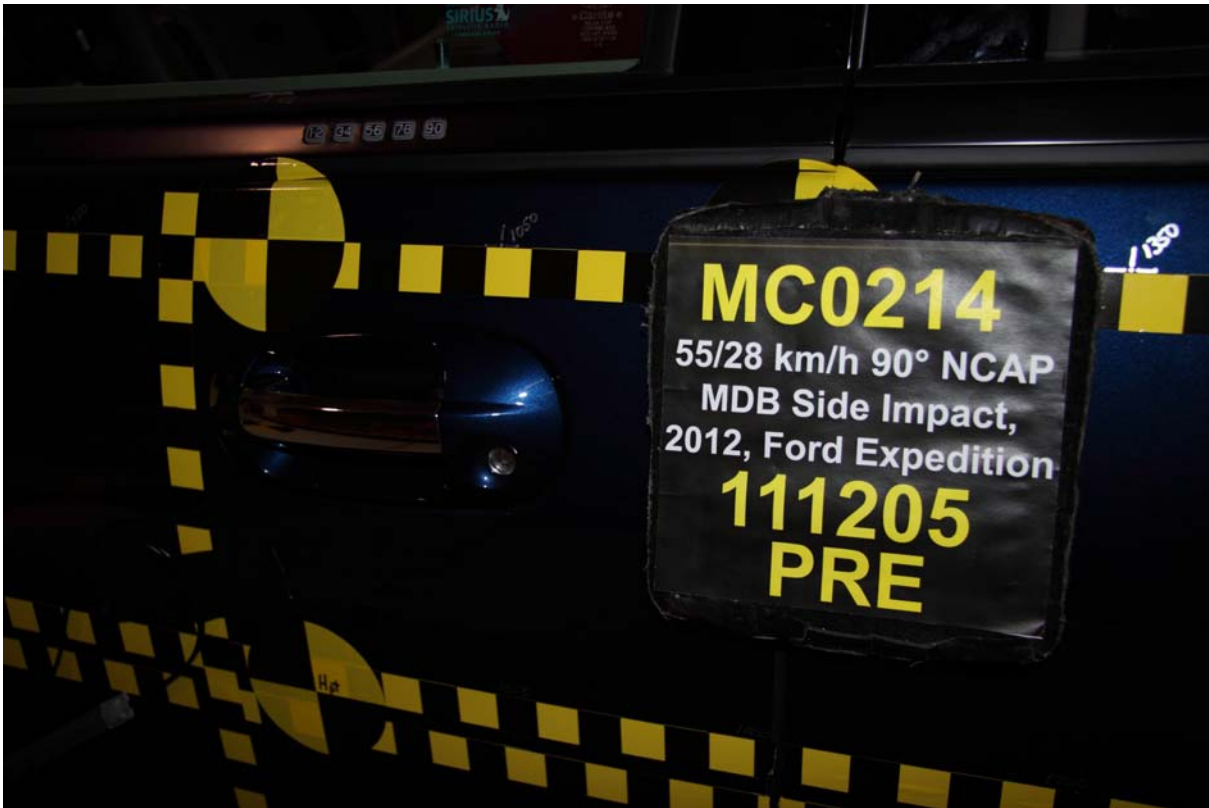
018 Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle



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



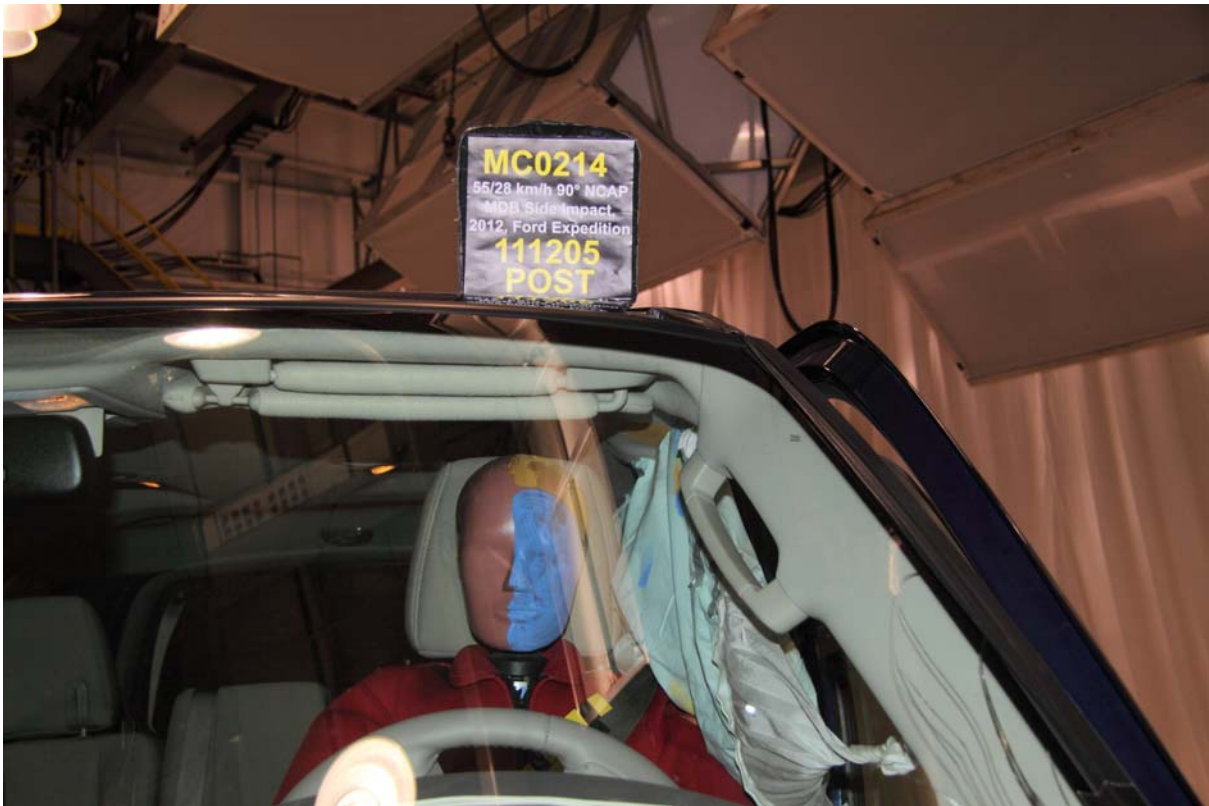
023 Pre-Test Right Front Door Latch Close-up



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



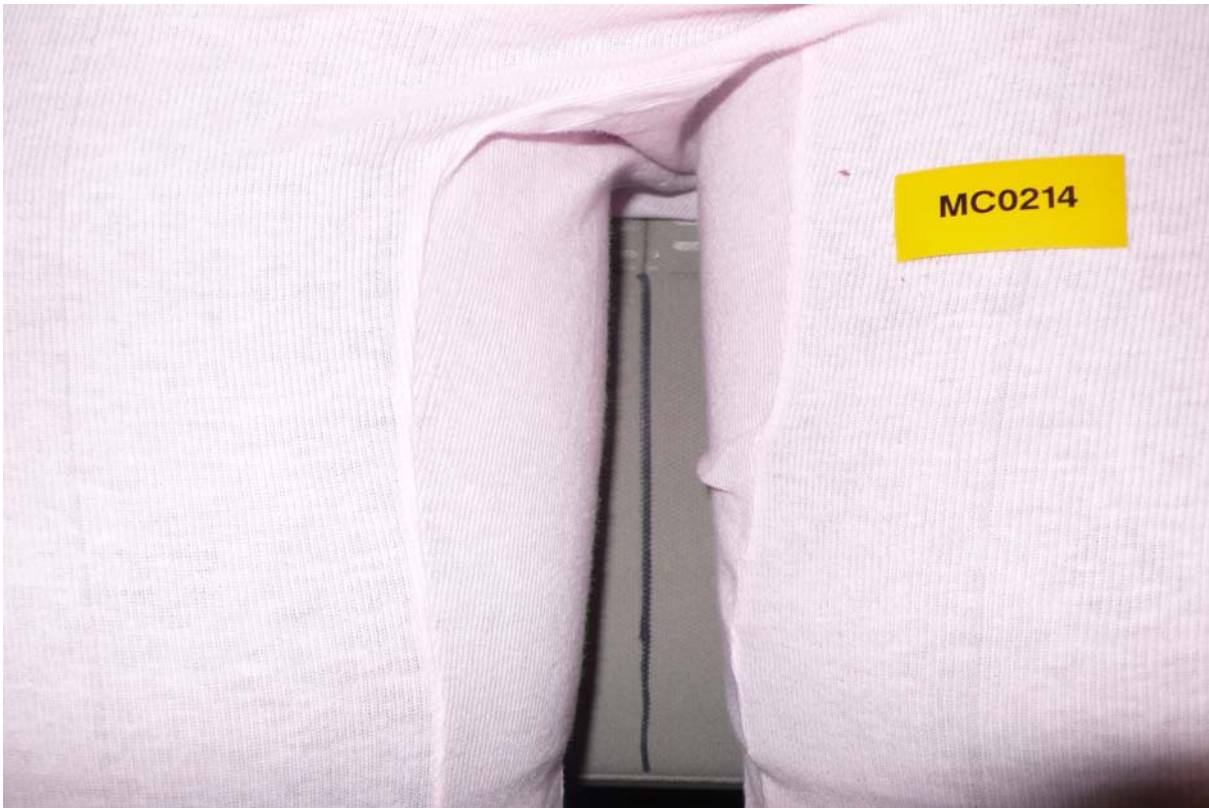
030 Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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

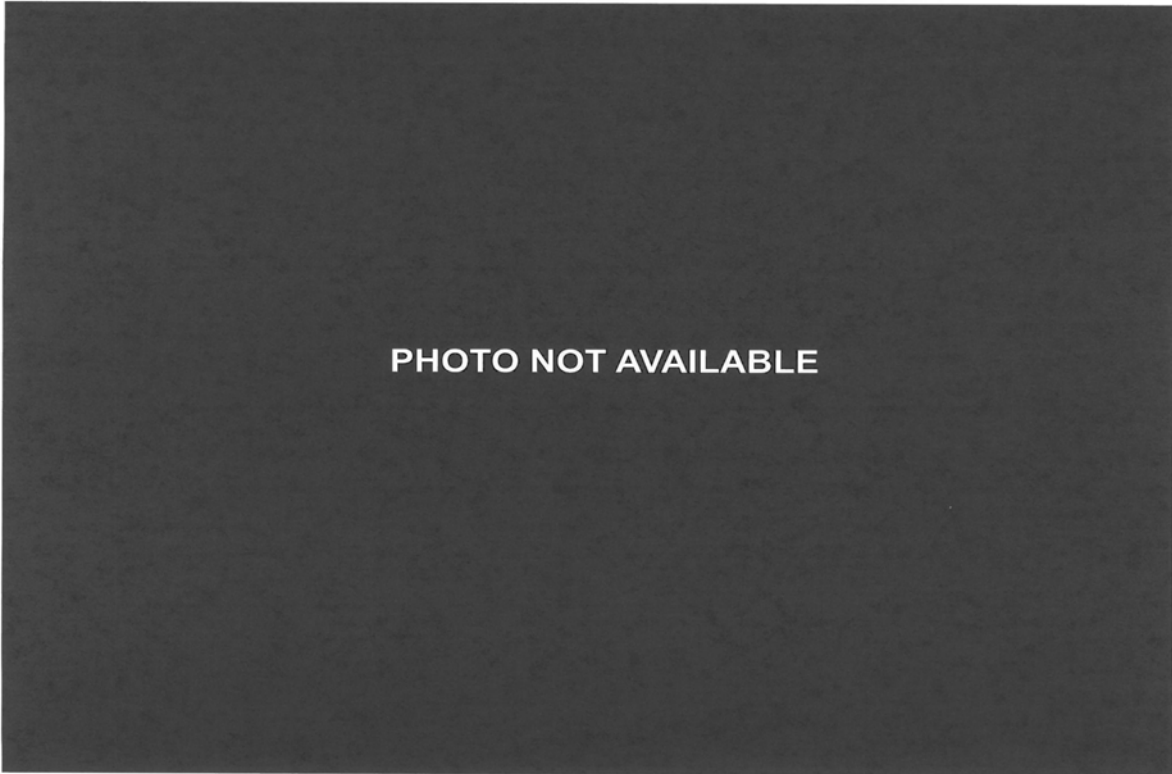


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037 View of Disengaged Parking Brake



038 Pre-Test View of Parking Brake



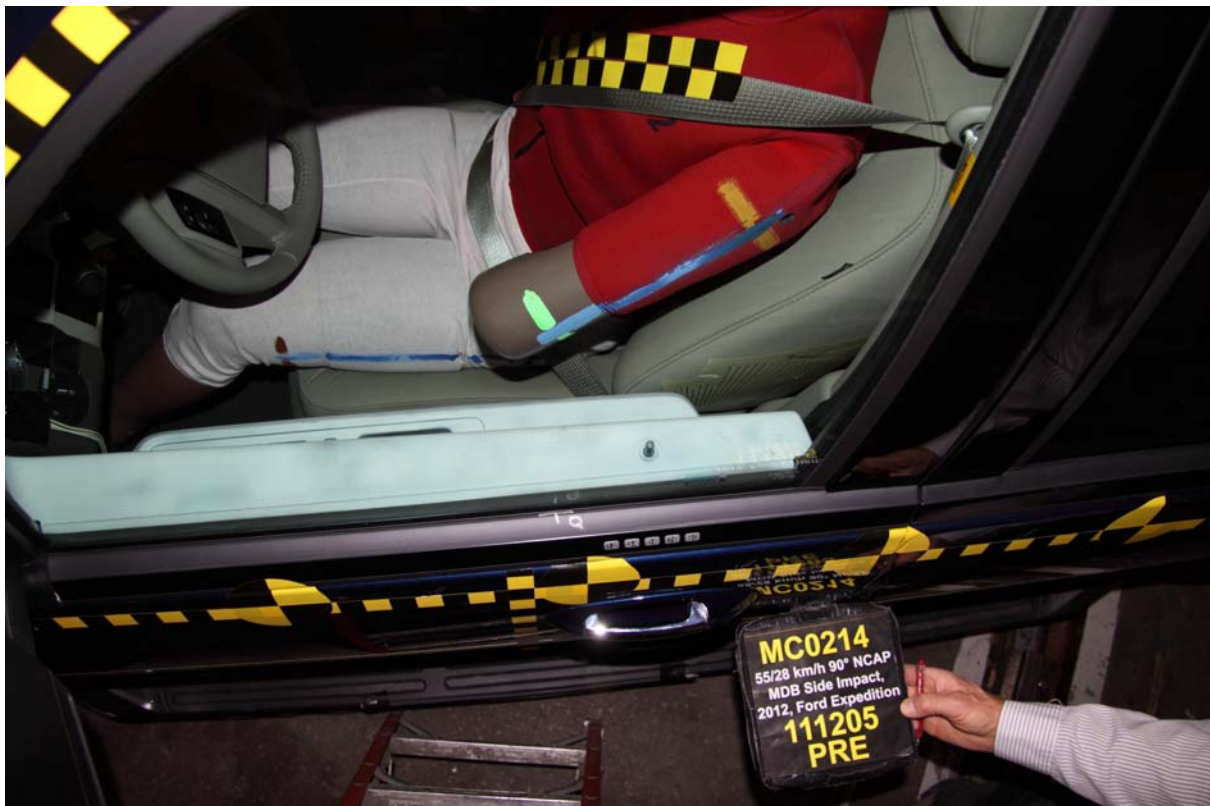
039 Pre-Test Close-Up Left Side View of Driver Seat Track



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



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



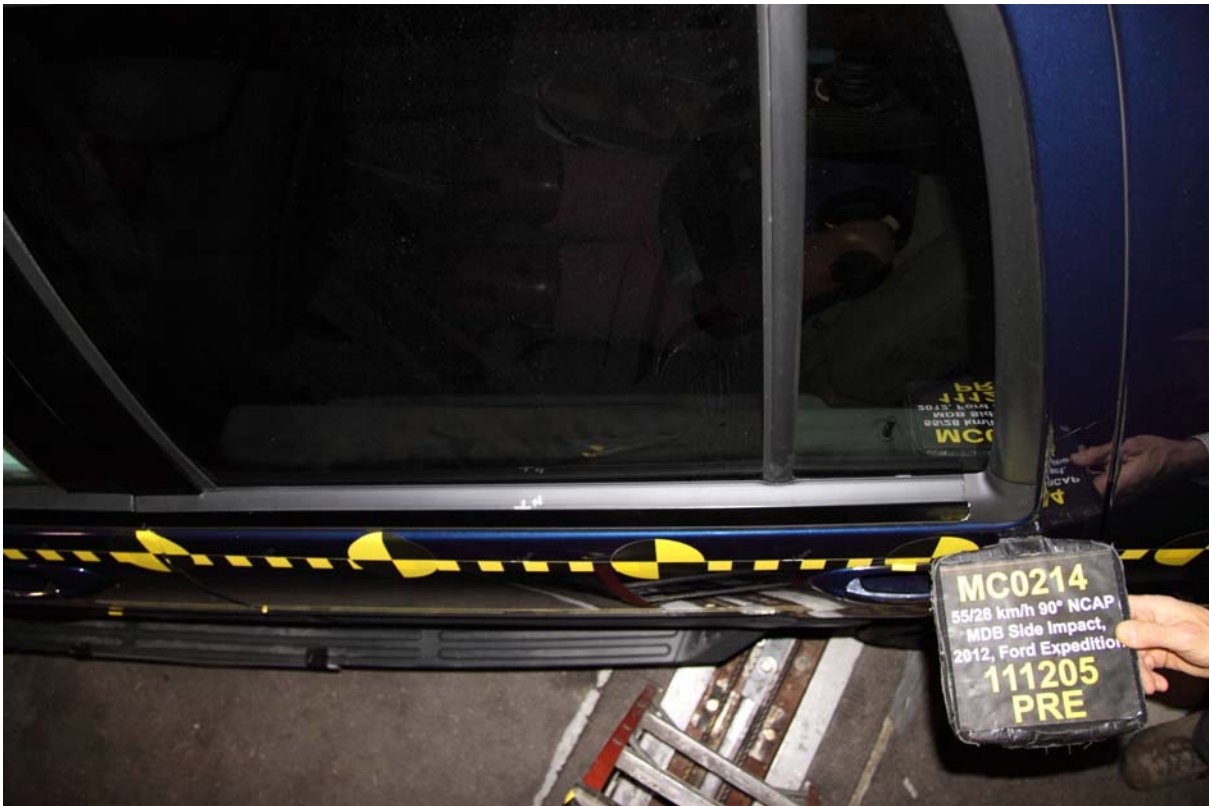
065 Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



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



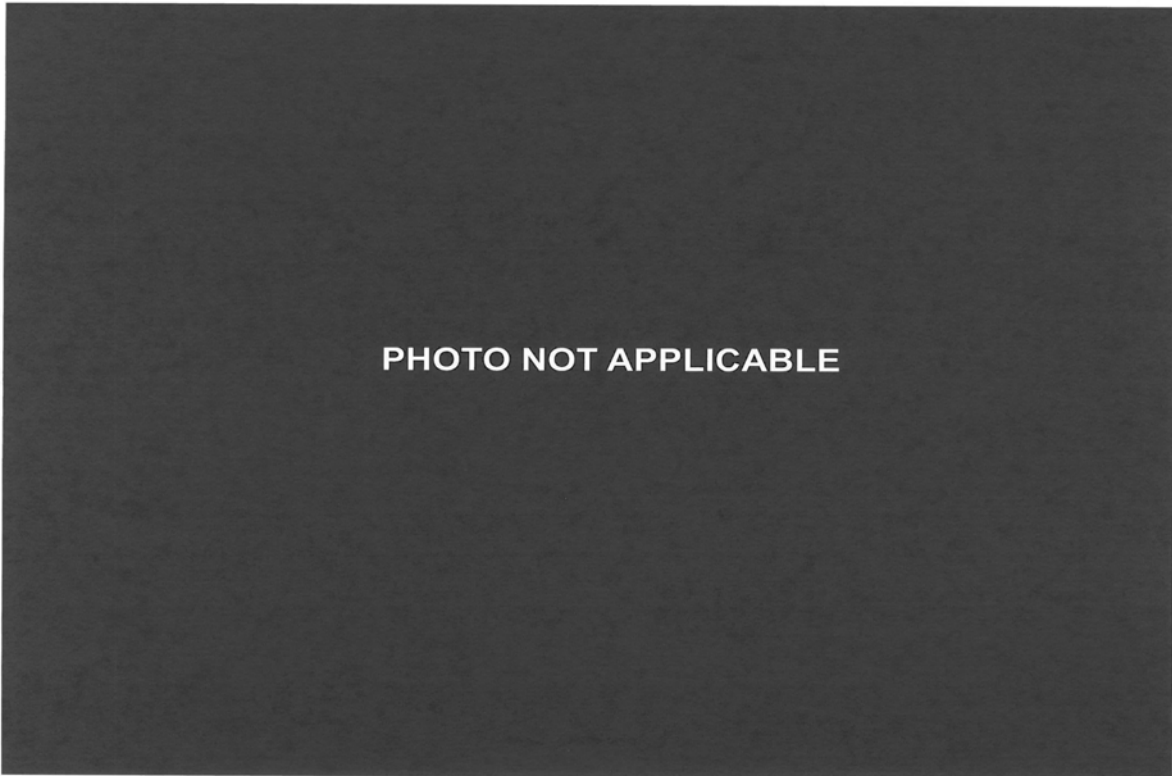
074 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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



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 AVAILABLE

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



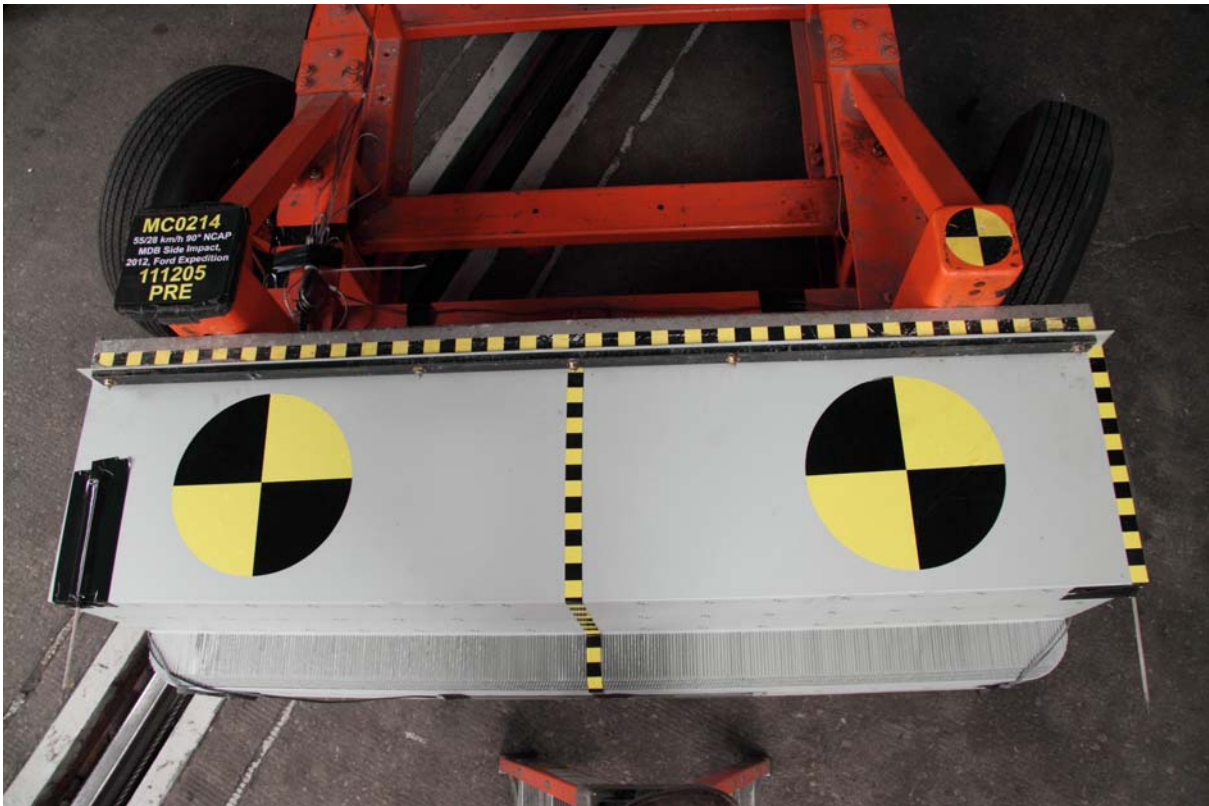
081 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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



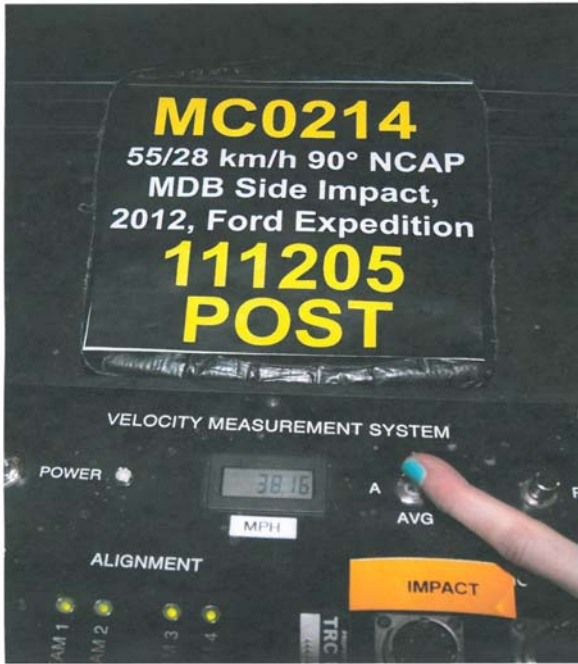
088 Pre-Test Right Side View of MDB Impactor Face



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



092 Pre-Test Ballast View



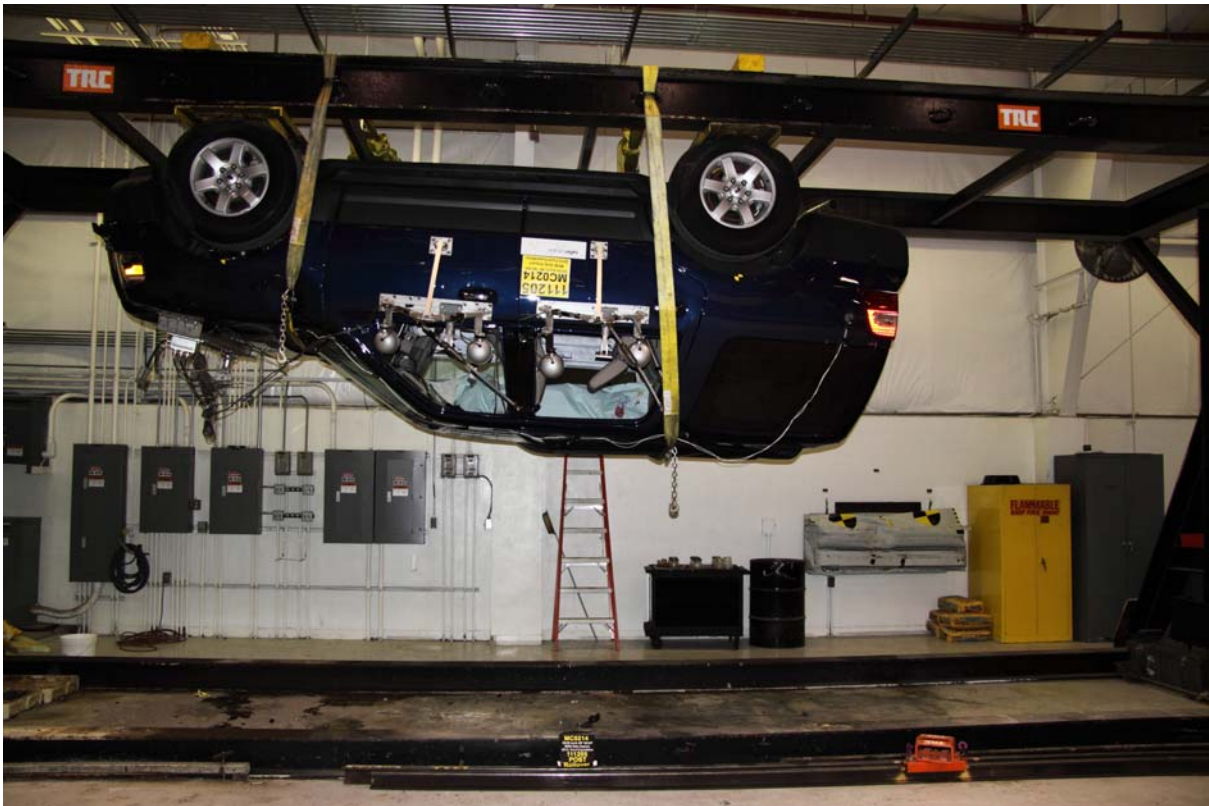
093 Post-Test Primary and Redundant Speed Trap Read-Out



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

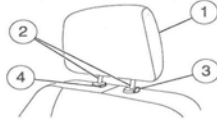
Ford		VEHICLE DESCRIPTION		2012 EXP XL 4X2 XL 8-PASSENGER 2.0L SOHC I4 ENGINE 6-SPEED AUTOMATIC O/D TRANS		EXTERIOR DARK BLUE PEARL METALLIC INTERIOR STONE CLOTH BUCKET SEATS		CR F02618	
EXPEDITION									
www.fordvehicles.com									
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE					PRICE INFORMATION				
EXTERIOR * GRILLE & BAR CHROME * RUNNING BOARDS * LUGGAGE RACK AND CROSSBARS * LIFTGATE WITH FLIP-UP GLASS * REAR INT WIPER/WASH/DEFYST * FOG LAMP/AUTO ON/OFF HOLDUP * REAR WIPER/AUTO ON/OFF HOLDUP * TIE TIE WIP WASH/CSU CTL * AUXILIARY AUDIO IMPV TANK * CLOTH BUCKET FRONT SEATS * 2ND ROW BENCH SEAT * FLOORMATS 1ST AND 2ND ROW * SLIDING DOOR * ANTER PREMIUM SOUND SYS * 21.0 L/CV/MP5 W/SPARKPLUGS * FRONT/REAR 4WD SUSPENSION					INCLUDED IN THIS VEHICLE * OPTIONAL AUDIO CD/6 SEAT * STEEL RADI W/6 MDS SVC * CALIFORNIA EMISSIONS SYSTEM * TOTAL OPTIONS				
SAFETY/SECURITY * ADVANCED TRAC WITH ESC * AIRBAGS * SAFETY CANOPY * 4-WHEEL DISC BRAKES W/ABS * SECURITY LOCK PASS ANTI THEFT * SECURITY KEYLESS REMOVAL * WARRANTY * 3YR/50,000 BUMPER / BUMPER * 3YR/60,000 POWERTRAIN * 3YR/60,000 ROADSIDE ASSIST					STANDARD VEHICLE PRICE \$36,305.00				
EPA Fuel Economy Estimates GASOLINE CITY MPG 14 Expected range for most drivers 11 to 17 MPG *Fuel economy when operating on E85 and yield different values than gasoline. See Fuel Economy Guide for more information.					Gasoline Highway MPG 20 Expected range for most drivers 16 to 24 MPG *Your actual mileage will vary depending on how you drive and maintain your vehicle.				
Dual Fuel Vehicle* Gasoline-Ethanol(E85) Estimated Annual Fuel Cost \$3,469 based on 15,000 miles at \$3.70 per gallon of gasoline Combined Gasoline Fuel Economy This Vehicle 16 All SUVs					TOTAL MSRP \$38,370.00				
See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov									
OLD TO 27B 039 Bob Hall Ford 1720 Blaine Hwy Glen Burnie MD 21061		ONE DEALER NO RA03 27B 039		METHOD OF TRANSP RAIL TRK # 27-5300 Q/T 2		This vehicle qualifies for auto insurance discounts, call 1-888-367-3111 or visit www.fordautoinsurance.com for availability to your state.		GOVERNMENT SAFETY RATINGS	
HP TO or other non-27B		TWO		1F8MJJ1F53CF02618		Frontal Crash Driver Not Rated Passenger Not Rated *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.	
SHIP THROUGH		FINAL ASSEMBLY POINT KTP LT. TRK.		BH301 N RB 2X 215 001551 08 20 11		Rollover *** *Star ratings based on the risk of rollover in a single vehicle crash.		*Star ratings range from 1 to 5 stars (*****), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or call 1-888-327-4236	
Ford Extended Service Plan is the only service contract backed by Ford and honored at all Ford and Lincoln Mercury Dealers. Ask your dealer for prices and additional details or see our website at gen.sfp.ford.com .									

100 Monroney Label

Seating and Safety Restraints

The adjustable head restraints consist of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a guide sleeve unlock/remove button (4).



To adjust the head restraint, do the following:

1. Adjust the seatback to an upright driving/riding position.
2. Raise the head restraint by pulling up on the head restraint.



3. Lower the head restraint by pressing and holding the guide sleeve adjust/release button and pushing down on the head restraint.



Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

137

Seating and Safety Restraints

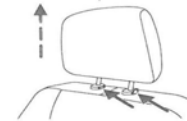
WARNING: The adjustable head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied.

To remove the adjustable head restraint, do the following:

1. Pull up the head restraint until it reaches the highest adjustment position.



2. Simultaneously press and hold both the adjust/release button and the unlock/remove button, then pull up on the head restraint.



To reinstall the adjustable head restraint, do the following:

1. Insert the two stems into the guide sleeve collars.
2. Push the head restraint down until it locks.



138

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

Seating and Safety Restraints

The adjustable head restraints consist of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a guide sleeve unlock/remove button (4).



To adjust the head restraint, do the following:

1. Adjust the seatback to an upright driving/riding position.
2. Raise the head restraint by pulling up on the head restraint.



3. Lower the head restraint by pressing and holding the guide sleeve adjust/release button and pushing down on the head restraint.



Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

137

Seating and Safety Restraints

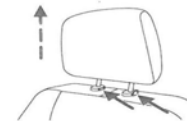
WARNING: The adjustable head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied.

To remove the adjustable head restraint, do the following:

1. Pull up the head restraint until it reaches the highest adjustment position.



2. Simultaneously press and hold both the adjust/release button and the unlock/remove button, then pull up on the head restraint.



To reinstall the adjustable head restraint, do the following:

1. Insert the two stems into the guide sleeve collars.
2. Push the head restraint down until it locks.



138

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

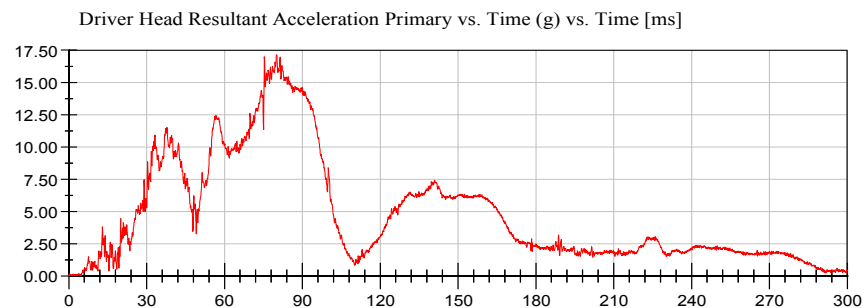
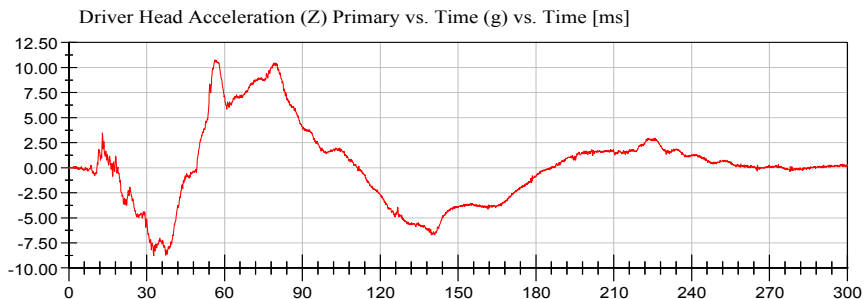
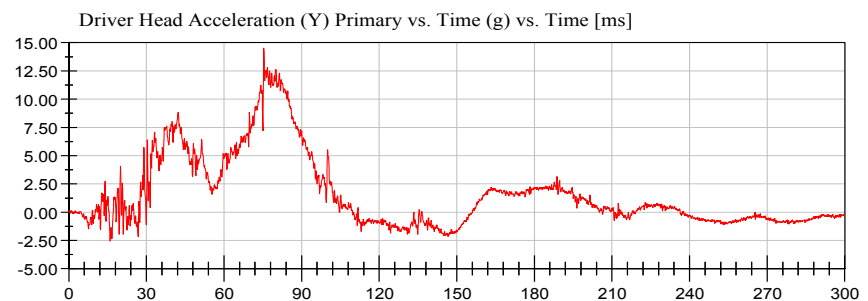
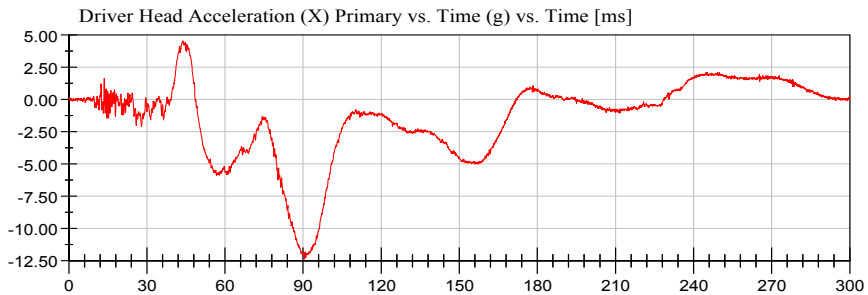
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Test Number: 111205 (MC0214)

Test Date: 12/05/2011

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

Position #4 SID IIs Dummy (33)



NHTSA

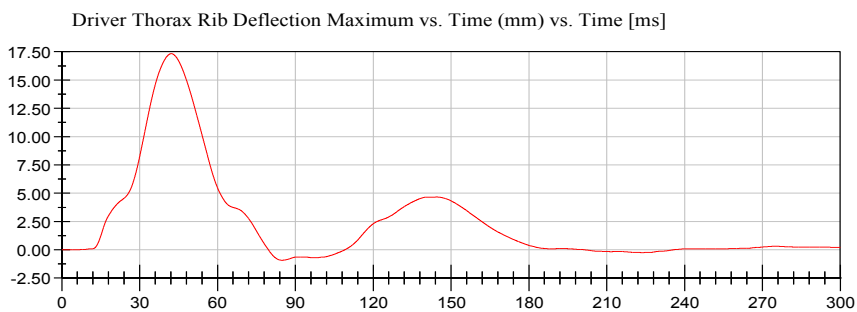
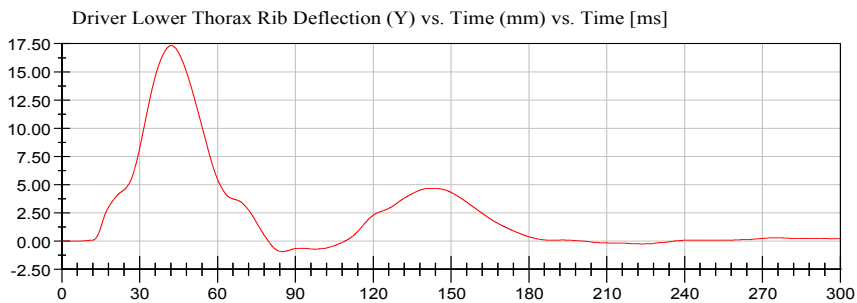
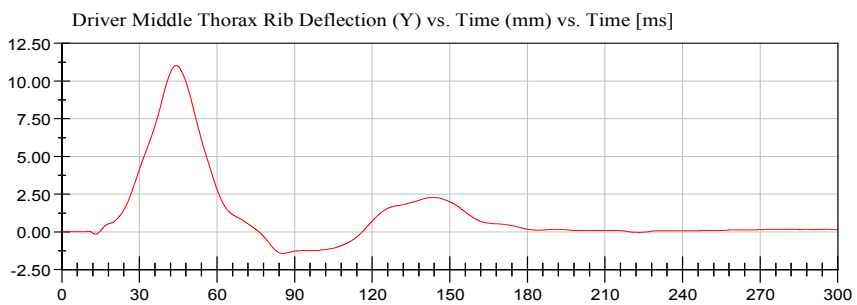
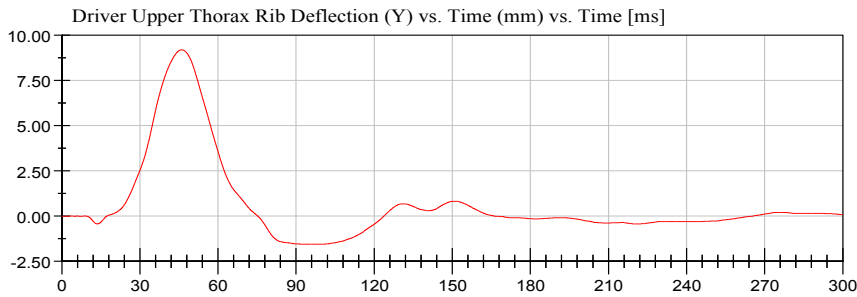
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Test Number: 111205 (MC0214)

Test Date: 12/05/2011

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

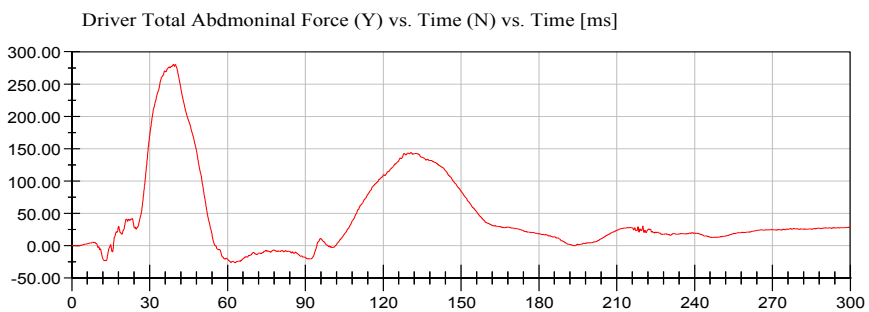
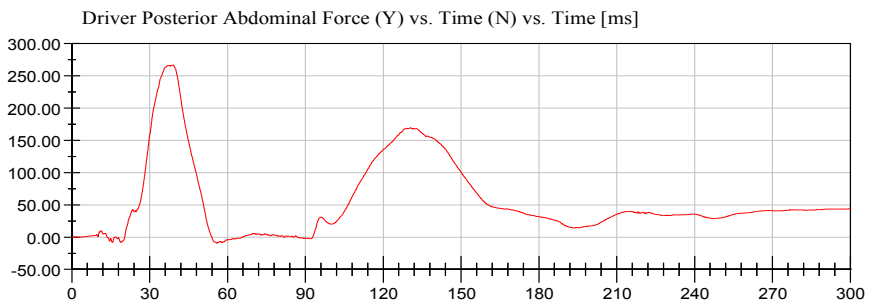
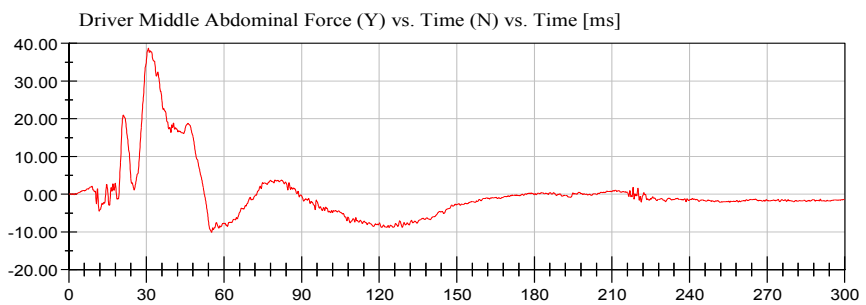
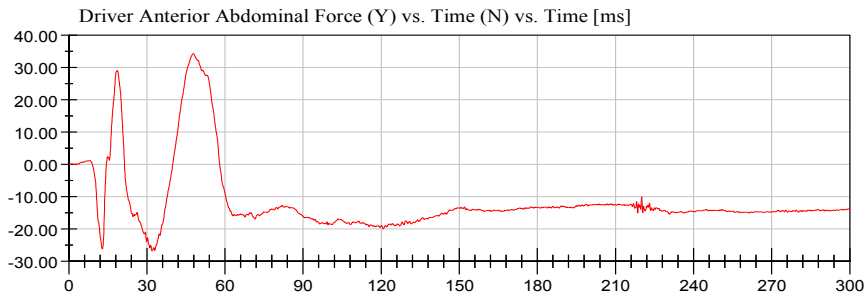
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NHTSA

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Test Number: 111205 (MC0214)

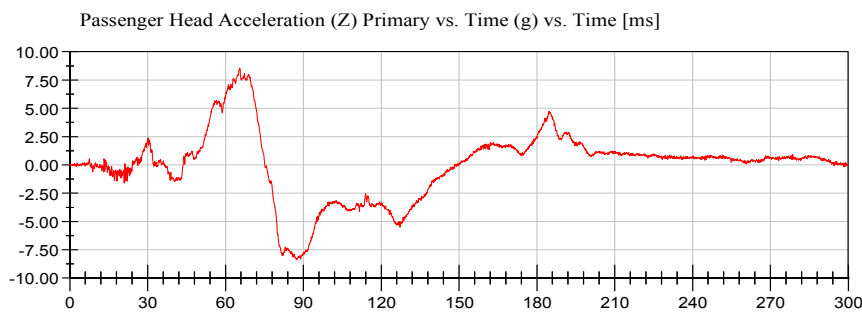
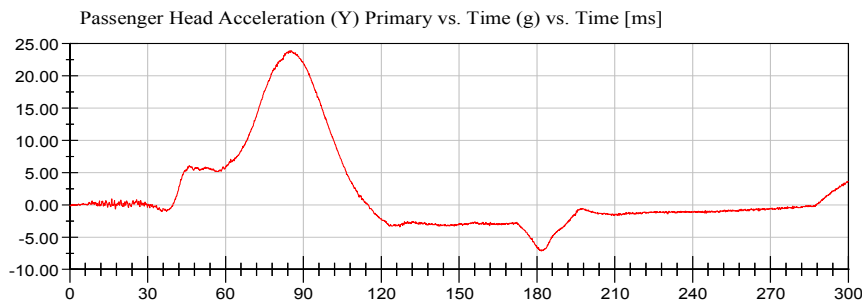
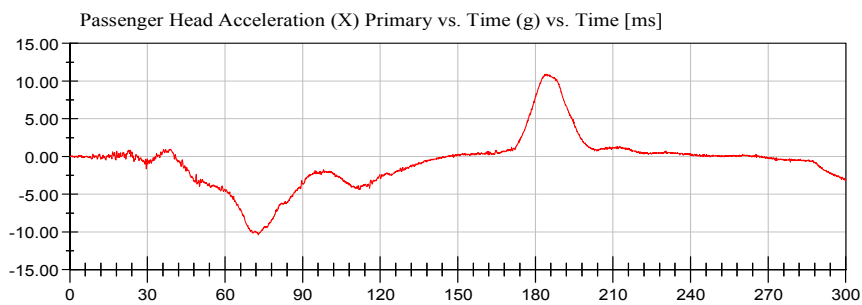
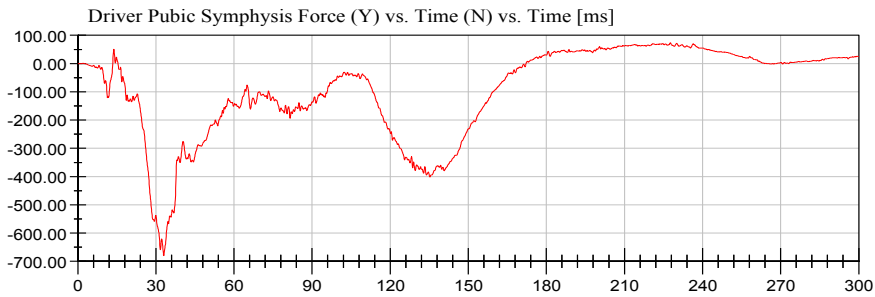
Test Date: 12/05/2011
Position #1 ES-2 Dummy with Rib Extension (F030)
Position #4 SID IIs Dummy (33)



NHTSA

Test Lab: CTF
Test Number: 111205 (MC0214)

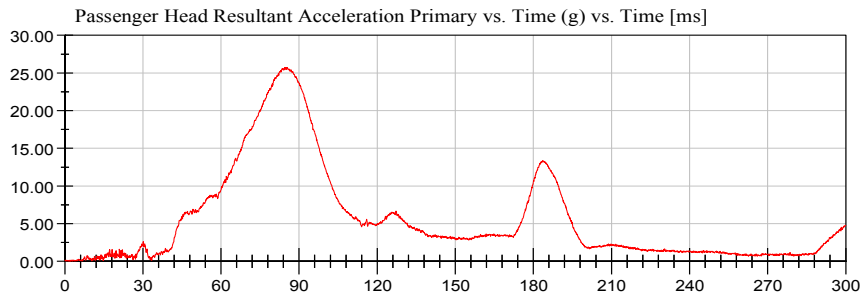
Test Date: 12/05/2011
Position #1 ES-2 Dummy with Rib Extension (F030)
Position #4 SID IIs Dummy (33)



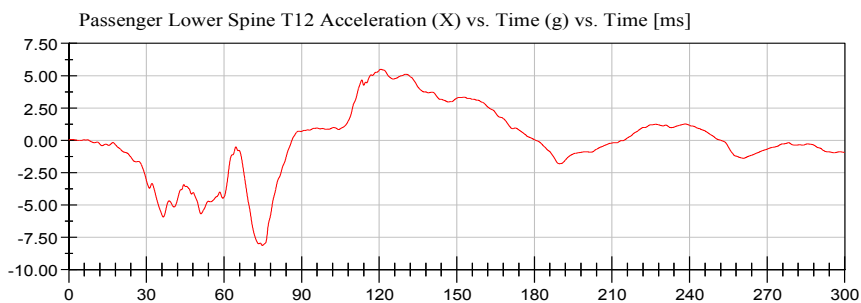
NHTSA

Test Lab: CTF
Test Number: 111205 (MC0214)

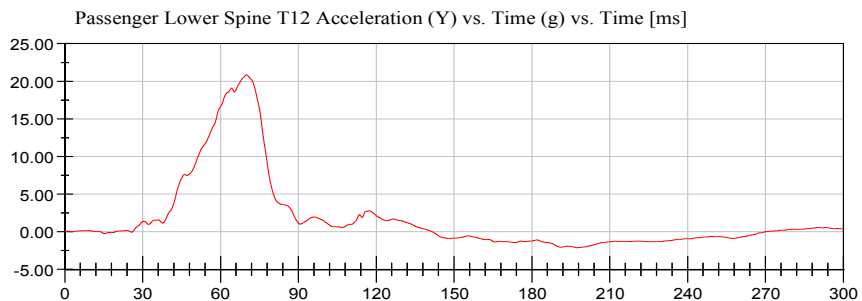
Test Date: 12/05/2011
Position #1 ES-2 Dummy with Rib Extension (F030)
Position #4 SID IIs Dummy (33)



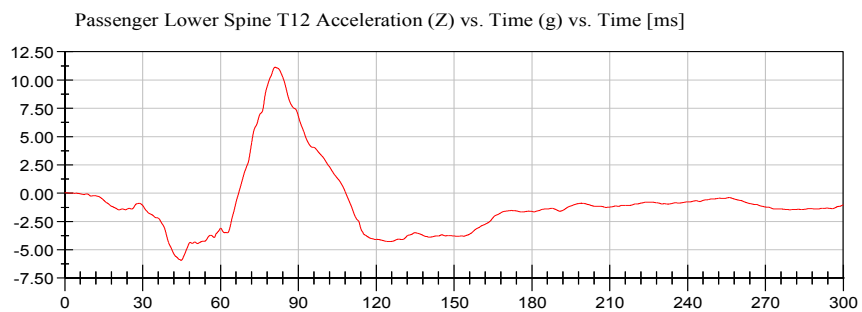
<Max>
25.73 g at 84.80 ms
<Min>
0.02 g at 1.76 ms
CFC_1000



<Max>
5.49 g at 120.64 ms
<Min>
-8.15 g at 74.80 ms
CFC_180



<Max>
20.85 g at 70.00 ms
<Min>
-2.12 g at 197.52 ms
CFC_180



<Max>
11.14 g at 81.04 ms
<Min>
-5.94 g at 44.88 ms
CFC_180



NHTSA

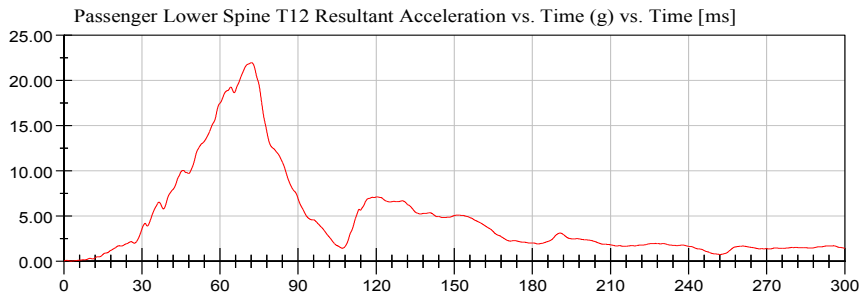
Test Lab: CTF

Test Number: 111205 (MC0214)

Test Date: 12/05/2011

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

Position #4 SID IIs Dummy (33)

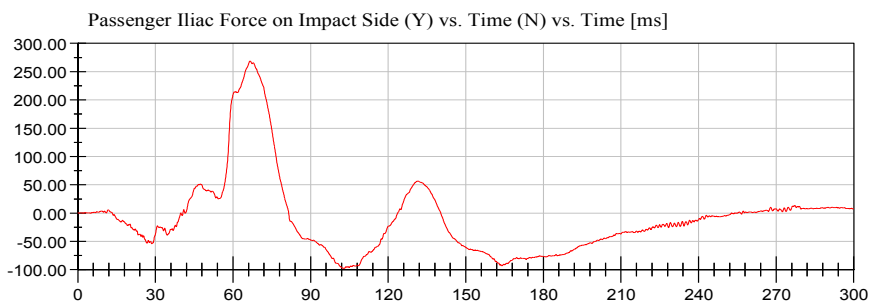


<Max>

21.98 g at 72.16 ms

<Min>

0.03 g at 2.80 ms

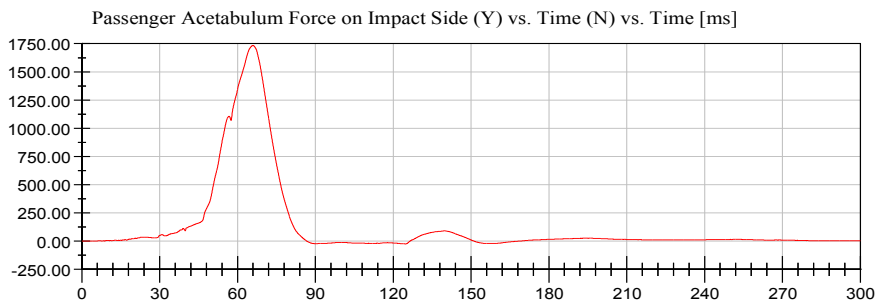


<Max>

268.58 N at 66.56 ms

<Min>

-98.26 N at 102.88 ms

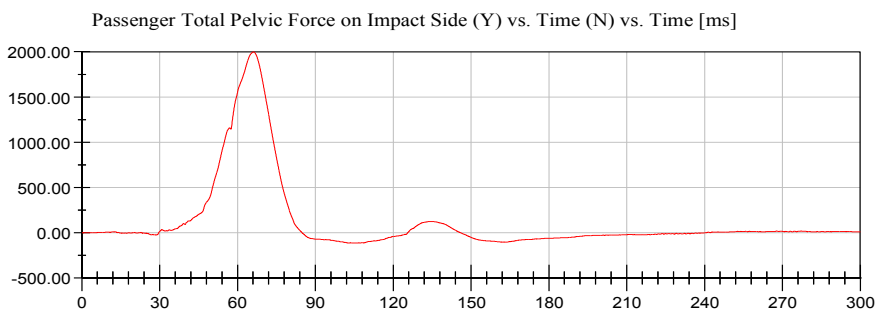


<Max>

1,733.02 N at 65.92 ms

<Min>

-23.86 N at 124.80 ms



<Max>

1,997.78 N at 66.24 ms

<Min>

-113.81 N at 104.96 ms



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

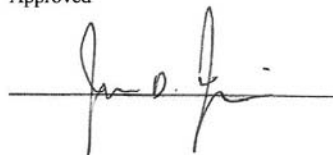
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 02
Date: 12/01/11

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	100	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	474	Yes
8	Thorax Width	322.0 - 332.0	323	Yes
9	Abdomen Width	273.0 - 287.0	281	Yes
10	Pelvis Lap Width	359.0 - 373.0	370	Yes
11	Head Depth	196.0 - 206.0	199	Yes
12	Thorax Depth	262.0 - 272.0	270	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	602	Yes

Technician



Approved



Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop

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

Test Date: 11/28/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Resultant Acceleration	125 - 155 g	139.3 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	-6.4 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

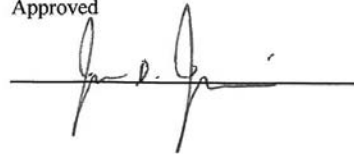
Test meets specifications.

Comments:

Technician



Approved



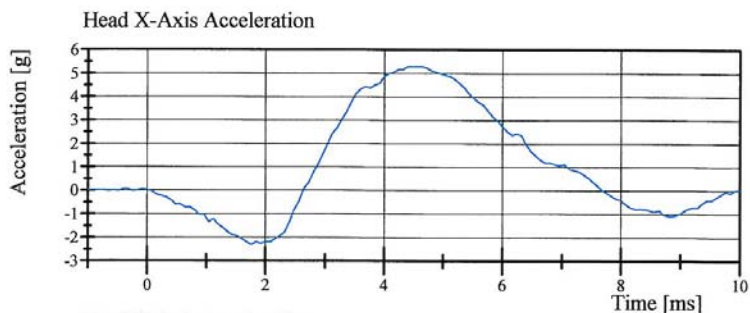
Specification Source: NHTSA Final Rule 8/15/2008

11.28.2011 14:30:45 359

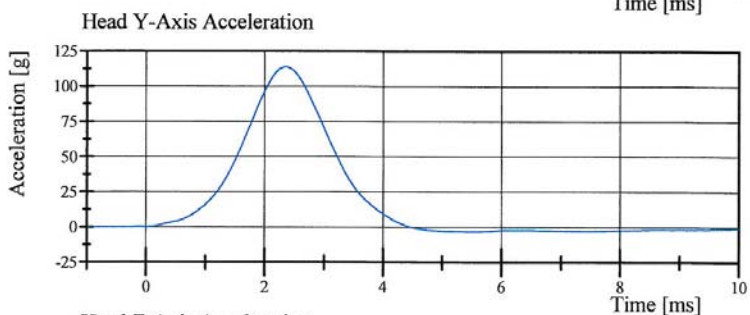


Transportation Research Center Inc.

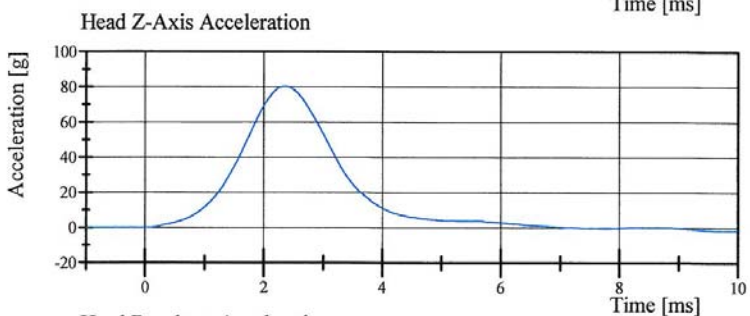
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011



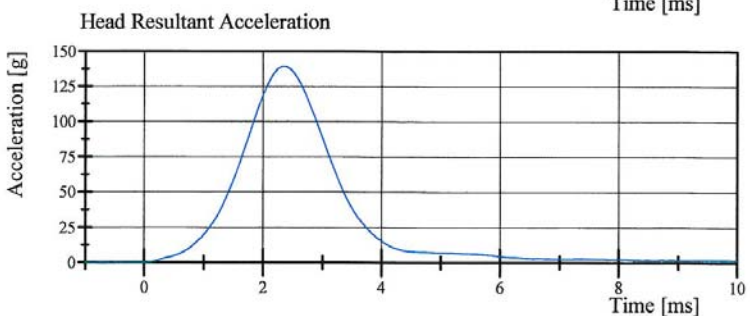
Filter Class: CFC_1000
Max: 5.3 gn at 4.4 ms
Min: -2.3 gn at 1.8 ms



Filter Class: CFC_1000
Max: 113.8 gn at 2.3 ms
Min: -3.2 gn at 5.4 ms



Filter Class: CFC_1000
Max: 80.3 gn at 2.3 ms
Min: -1.6 gn at 9.7 ms



Filter Class: CFC_1000
Max: 139.3 gn at 2.3 ms
Min: 0.0 gn at -1.0 ms



Transportation Research Center Inc.

Left Lateral Neck

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

Test Date: 12/1/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-50.3 deg	Yes
Time of Peak	54 - 66 ms	57.0 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	58.9 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

12.01.2011 10:15:01 1311

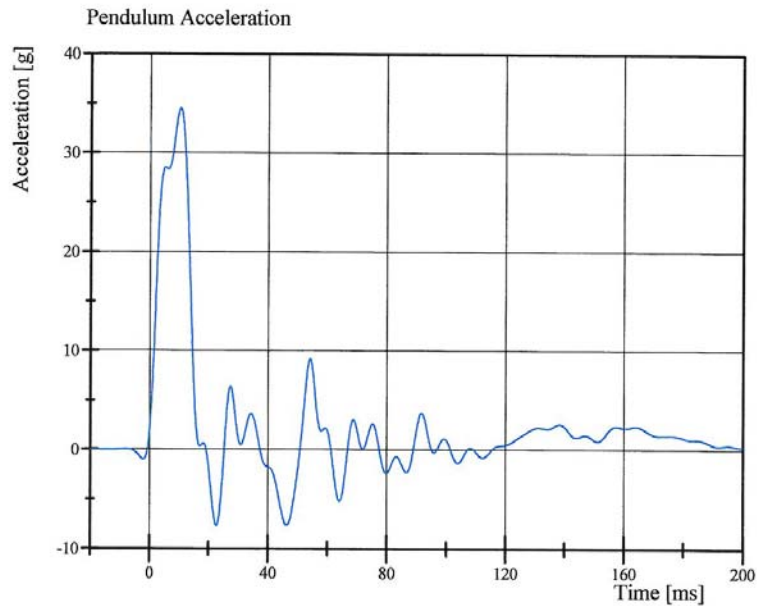


Transportation Research Center Inc.

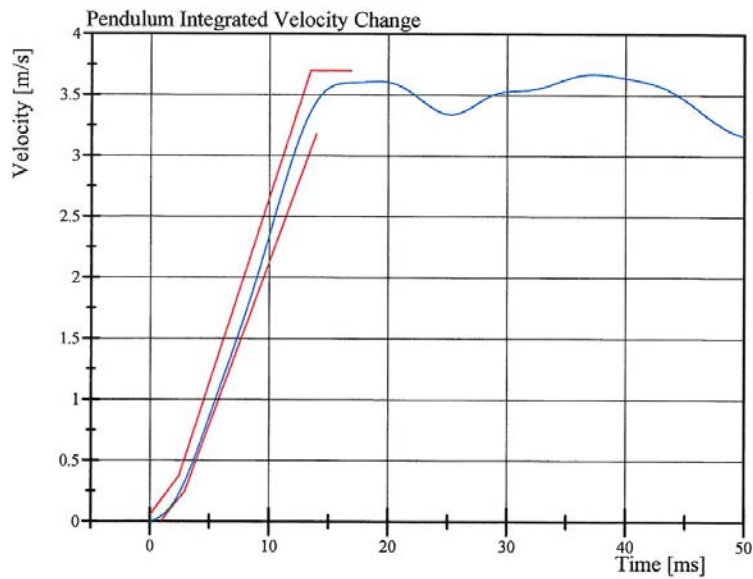
Left Lateral Neck

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

Test Date: 12/1/2011



Filter Class: CFC_60
Max: 34.5 gn at 10.3 ms
Min: -7.7 gn at 22.7 ms



Filter Class: CFC_60
Max: 3.7 m/s at 37.4 ms
Min: 0.0 m/s at 0.0 ms

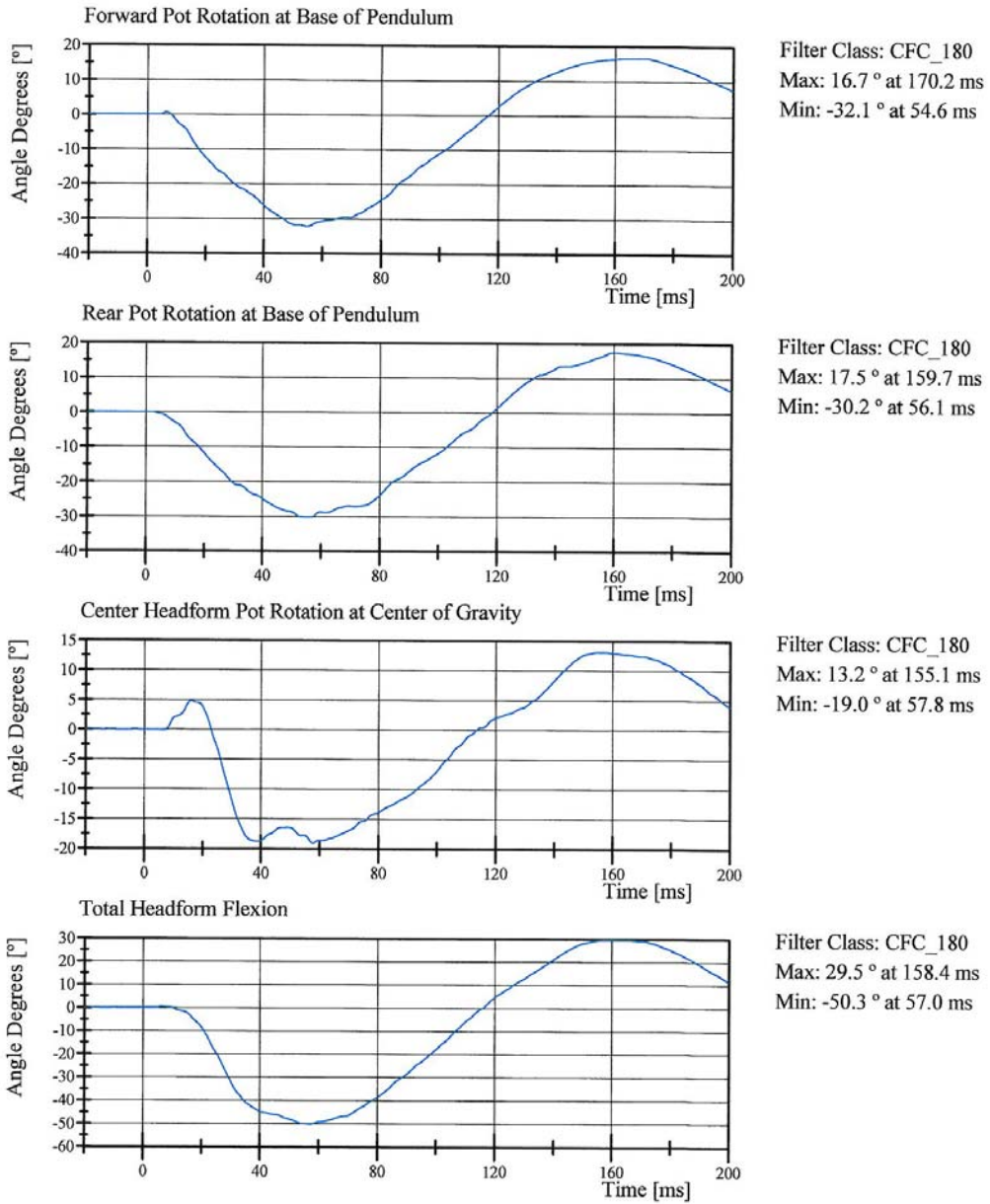
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2011 10:15:09 1311



Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 2-5
Test Date: 12/1/2011



Specification Source: NHTSA Final Rule 8/15/2008

12.01.2011 10:15:09 1311



Transportation Research Center Inc.

Left Lateral Shoulder

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

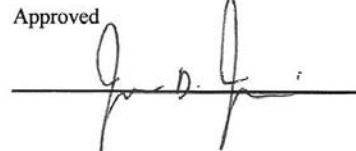
Test Date: 12/1/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.58 g	Yes

Test meets specifications.

Comments:

Technician


Approved


Specification Source: NHTSA final rule 8/15/2008

12.01.2011 16:39:25 585

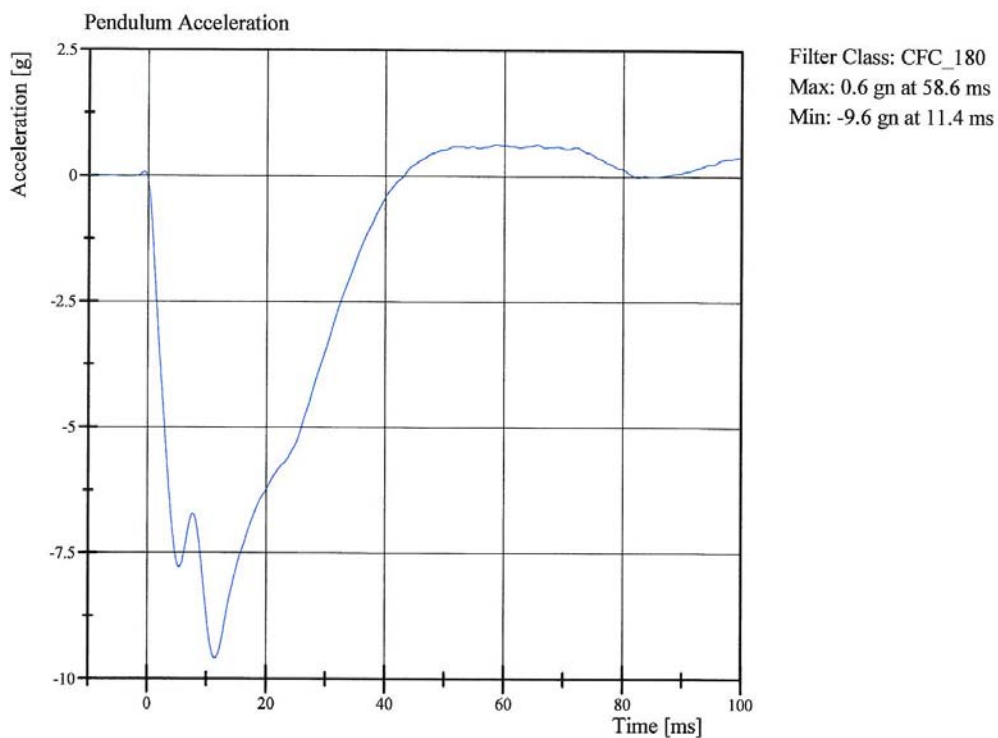


Transportation Research Center Inc.

Left Lateral Shoulder

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

Test Date: 12/1/2011



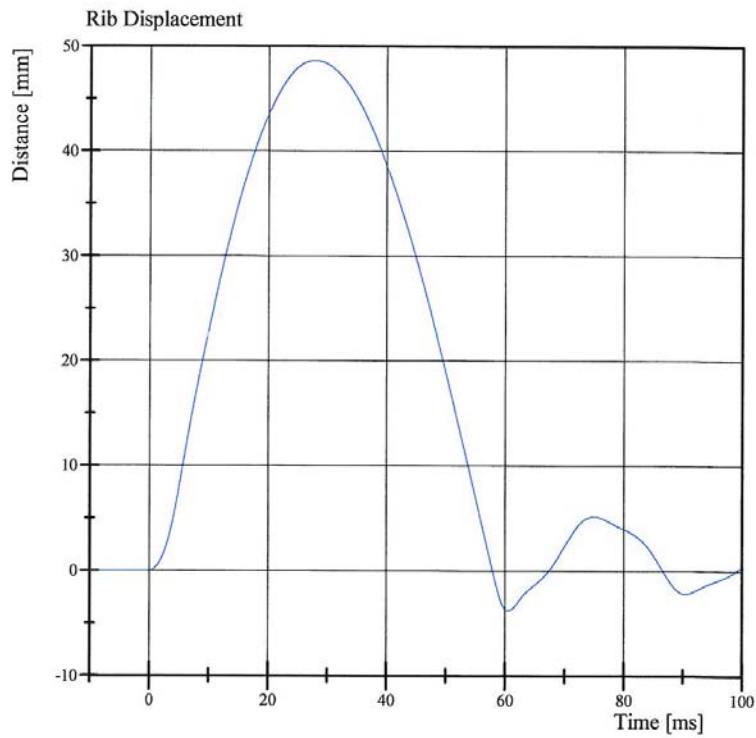
Specification Source: NHTSA final rule 8/15/2008

12.01.2011 16:39:32 585



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011



Filter Class: CFC_180
Max: 48.6 mm at 27.8 ms
Min: -3.8 mm at 60.5 ms

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011

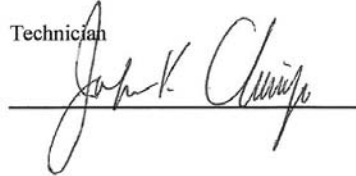
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



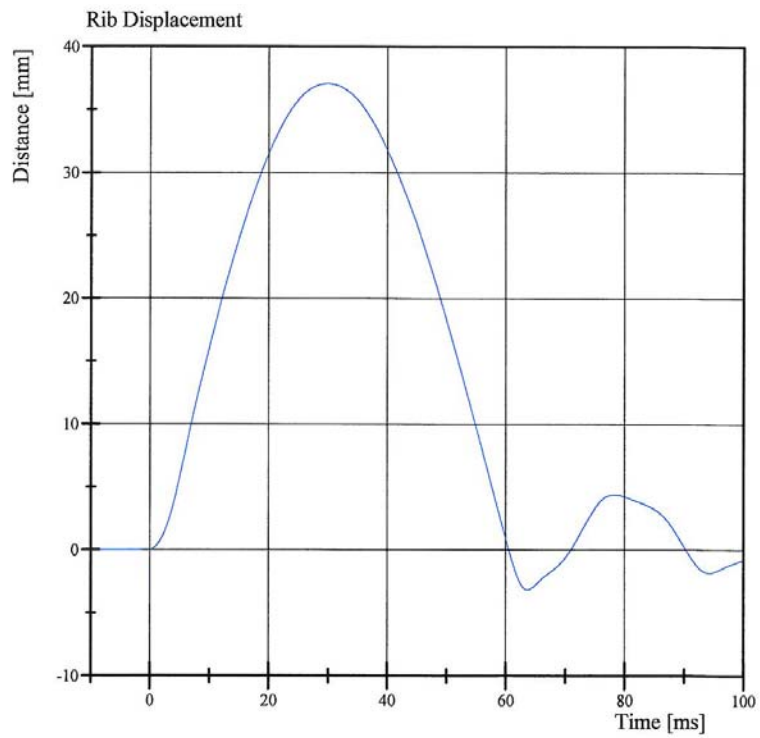
Specification Source: NHTSA Final Rule 8/15/2008

11.28.2011 15:27:54 956



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011



Filter Class: CFC_180
Max: 37.1 mm at 29.8 ms
Min: -3.1 mm at 63.6 ms



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011

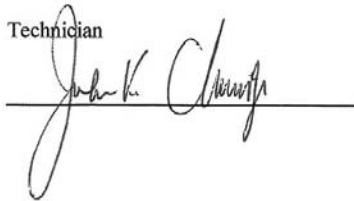
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.4 mm	Yes

Test meets specifications.

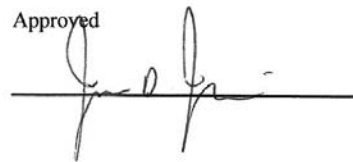
Comments:

Drop Height: 816

Technician



Approved



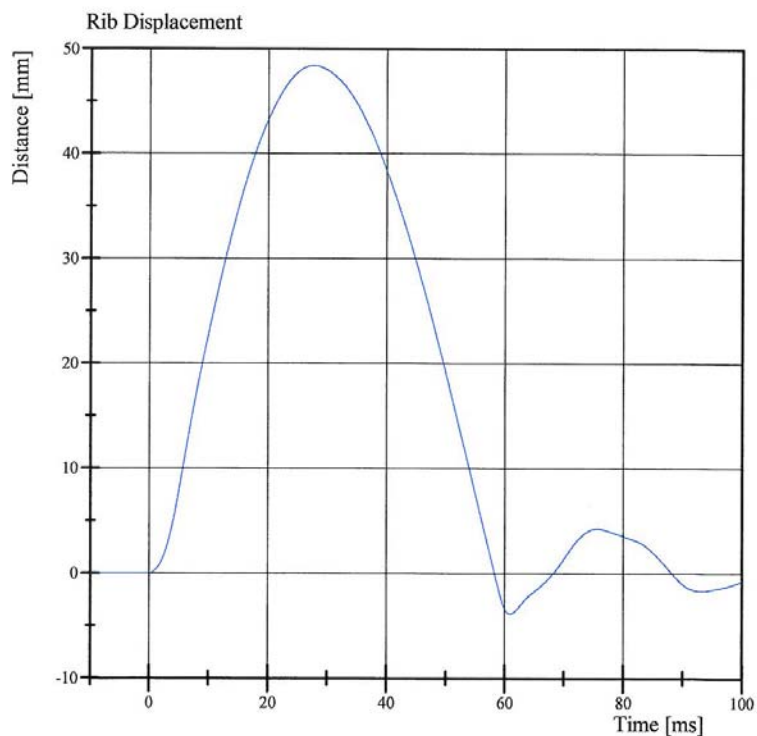
Specification Source: NHTSA Final Rule 8/15/2008

11.28.2011 15:39:39 741



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011



Filter Class: CFC_180
Max: 48.4 mm at 27.6 ms
Min: -3.9 mm at 60.9 ms



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.0 mm	Yes

Test meets specifications.

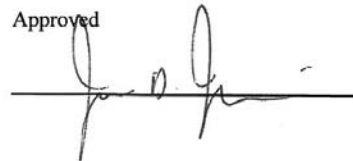
Comments:

Drop Height: 462

Technician



Approved



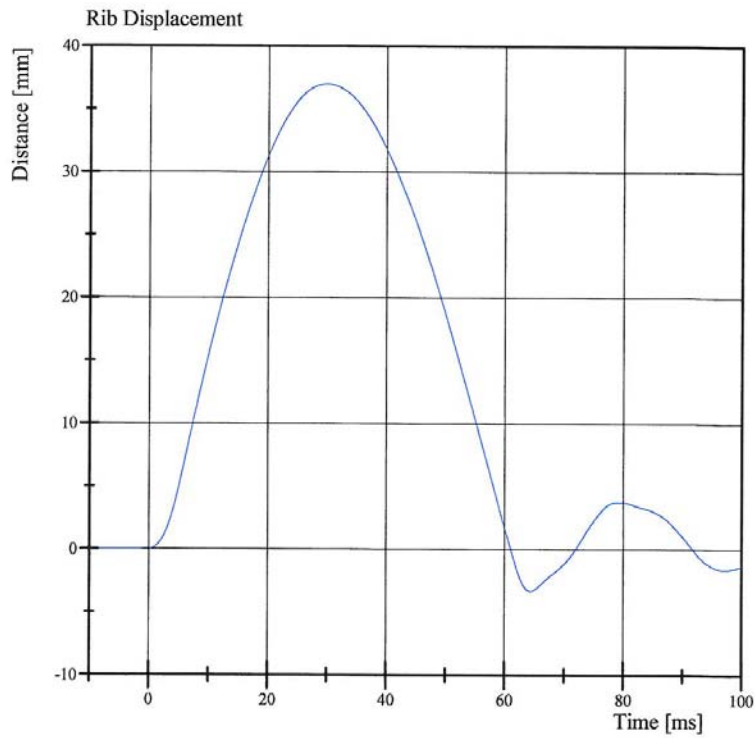
Specification Source: NHTSA Final Rule 8/15/2008

11.28.2011 15:49:31 938



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011



Filter Class: CFC_180
Max: 37.0 mm at 29.8 ms
Min: -3.3 mm at 64.3 ms

Transportation Research Center Inc.

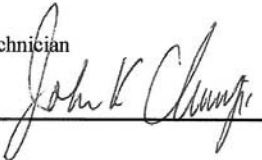
4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011

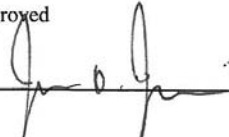
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician


Approved


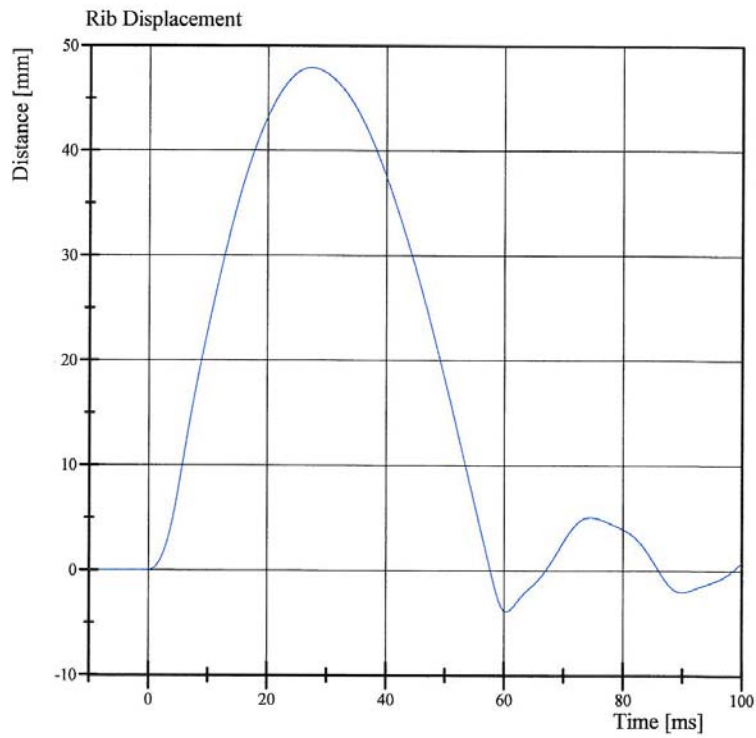
Specification Source: NHTSA Final Rule 8/15/2008

11.28.2011 16:19:54 750



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011



Filter Class: CFC_180
Max: 47.9 mm at 27.4 ms
Min: -3.9 mm at 60.3 ms



Transportation Research Center Inc.

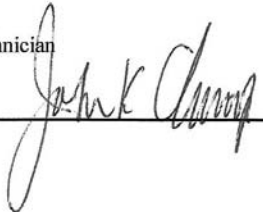
3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011

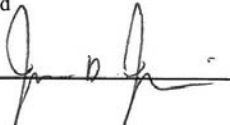
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician


Approved


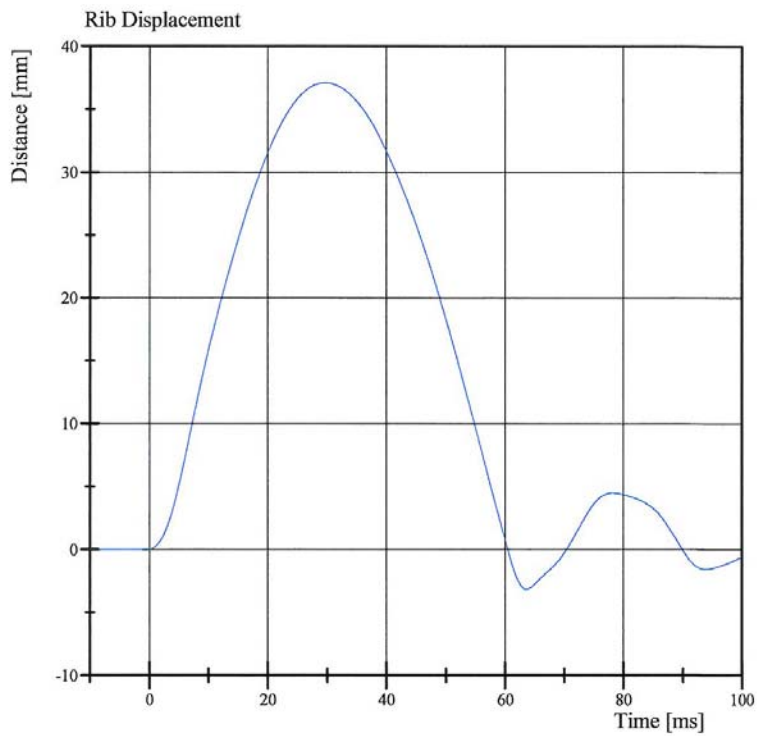
Specification Source: NHTSA Final Rule 8/15/2008

11.28.2011 16:27:13 937



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 11/28/2011



Filter Class: CFC_180
Max: 37.1 mm at 29.7 ms
Min: -3.2 mm at 63.6 ms



Transportation Research Center Inc.

Left Lateral Thorax

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

Test Date: 12/1/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.460 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,452.0 N	Yes
Upper Rib Displacement	34 - 41 mm	35.8 mm	Yes
Center Rib Displacement	37 - 45 mm	39.2 mm	Yes
Lower Rib Displacement	37 - 44 mm	39.9 mm	Yes

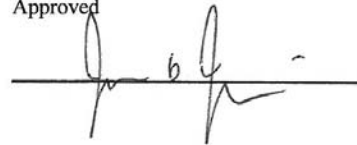
Test meets specifications.

Comments:

Technician



Approved



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

12.01.2011 16:52:27 449

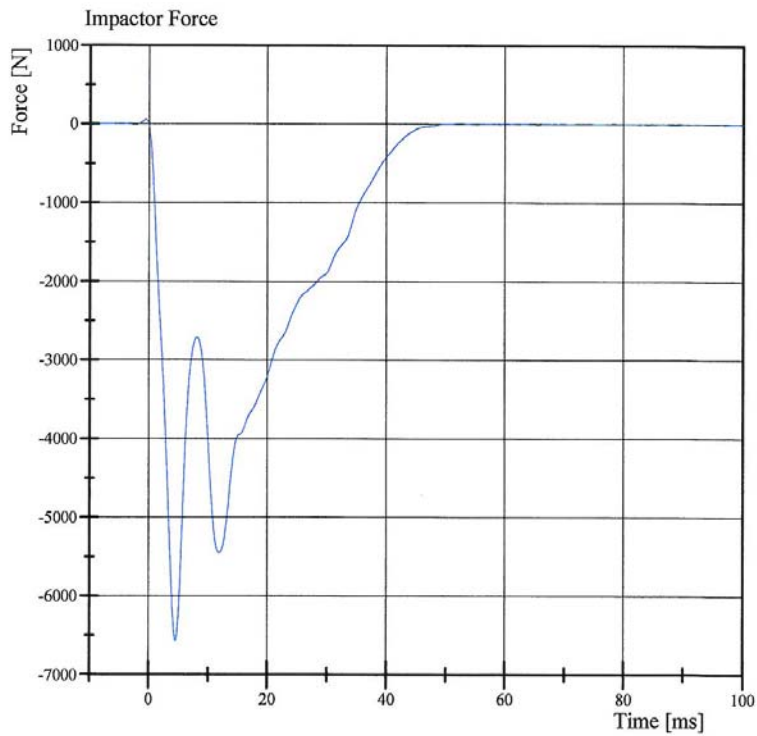


Transportation Research Center Inc.

Left Lateral Thorax

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

Test Date: 12/1/2011



Filter Class: CFC_180
Max: 56.1 N at -0.6 ms
Min: -6,573.0 N at 4.6 ms

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

12.01.2011 16:52:35 449

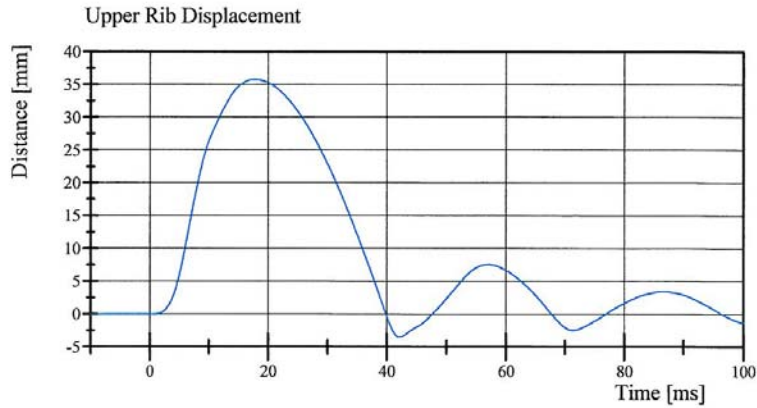


Transportation Research Center Inc.

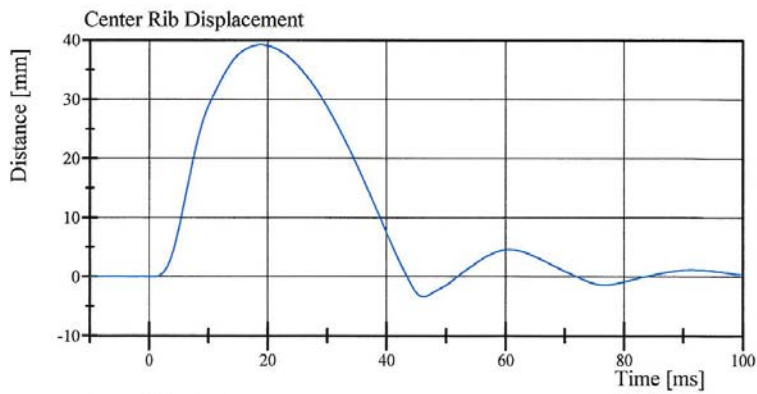
Left Lateral Thorax

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

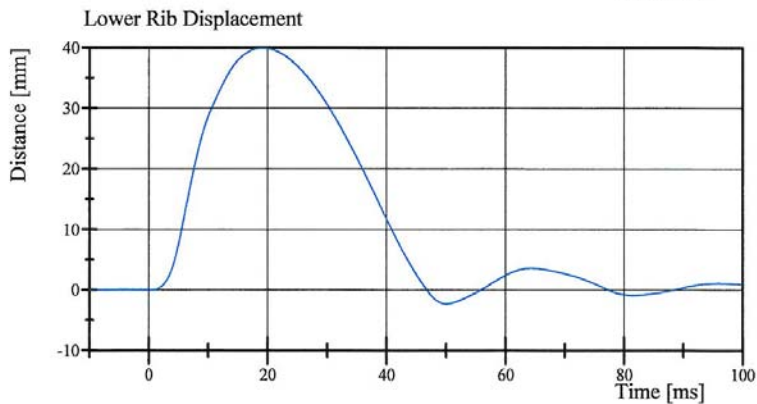
Test Date: 12/1/2011



Filter Class: CFC_180
Max: 35.8 mm at 17.7 ms
Min: -3.5 mm at 42.2 ms



Filter Class: CFC_180
Max: 39.2 mm at 18.8 ms
Min: -3.4 mm at 46.2 ms



Filter Class: CFC_180
Max: 39.9 mm at 19.1 ms
Min: -2.3 mm at 50.1 ms

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

12.01.2011 16:52:36 449



Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 2-3
Test Date: 12/1/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.049 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.5 deg	Yes
Time of Peak	39 - 53 ms	44.6 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	37.8 ms	Yes

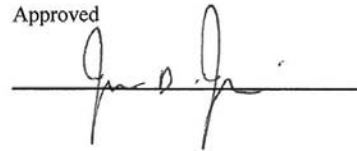
Test meets specifications.

Comments:

Technician



Approved



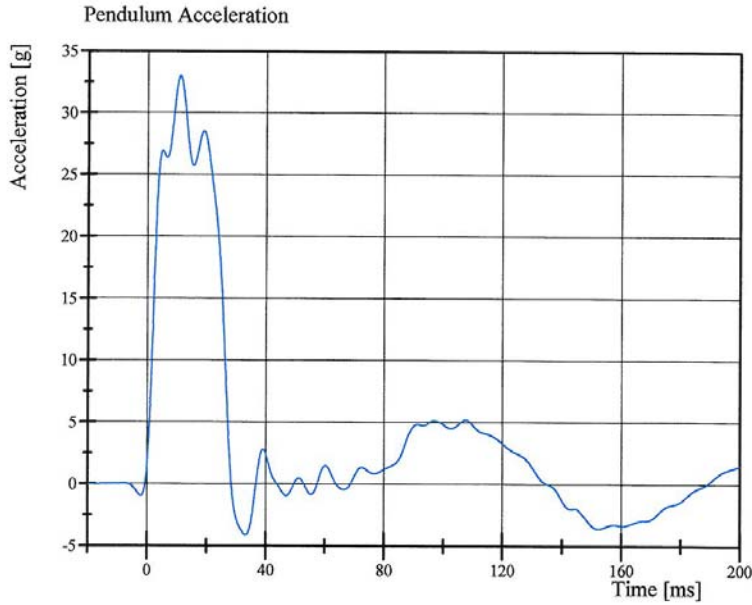
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2011 12:01:24 576

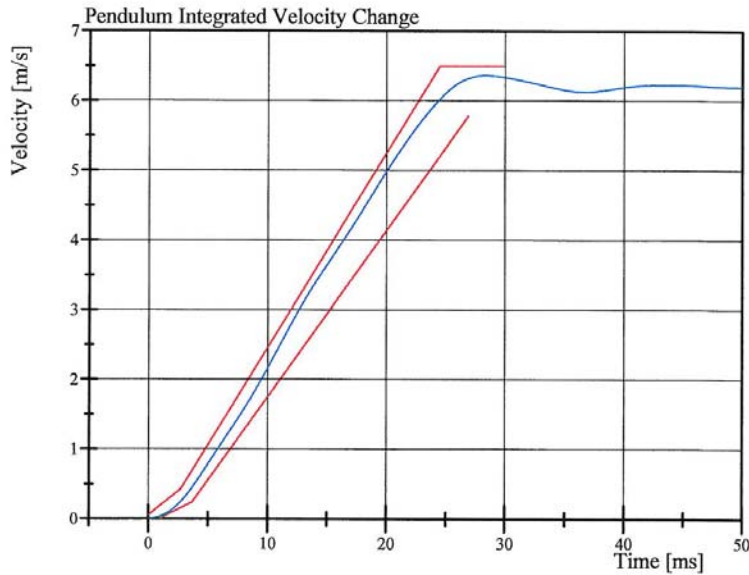


Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 2-3
Test Date: 12/1/2011



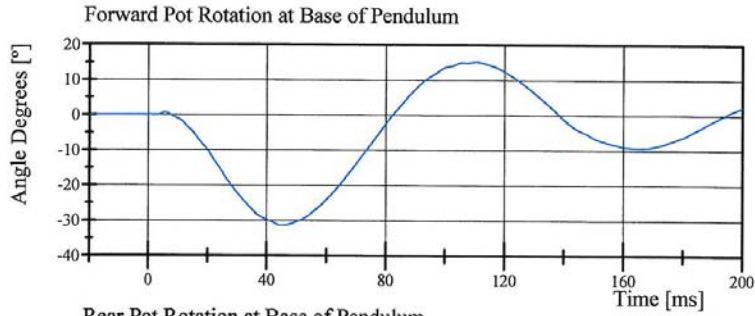
Filter Class: CFC_60
Max: 33.0 gn at 11.0 ms
Min: -4.1 gn at 33.3 ms



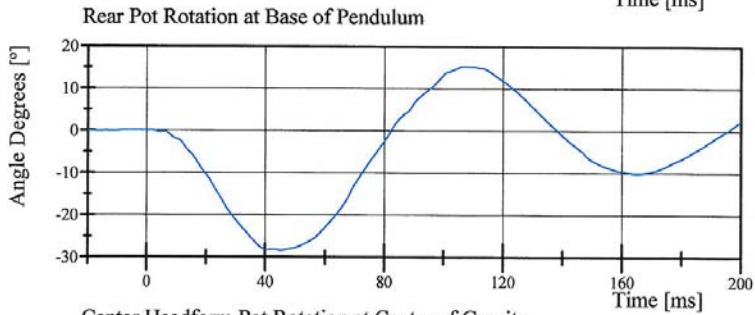
Filter Class: CFC_60
Max: 6.4 m/s at 28.4 ms
Min: 0.0 m/s at 0.0 ms

Transportation Research Center Inc.

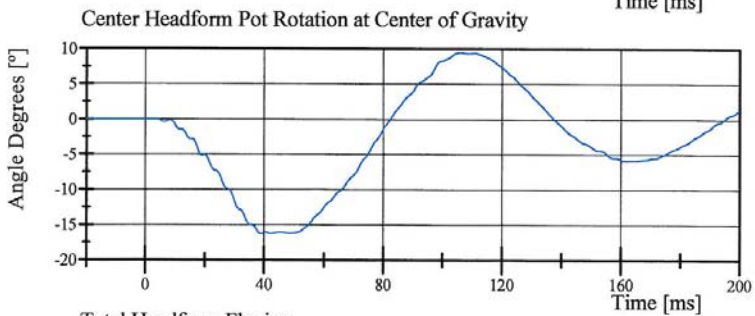
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 2-3
Test Date: 12/1/2011



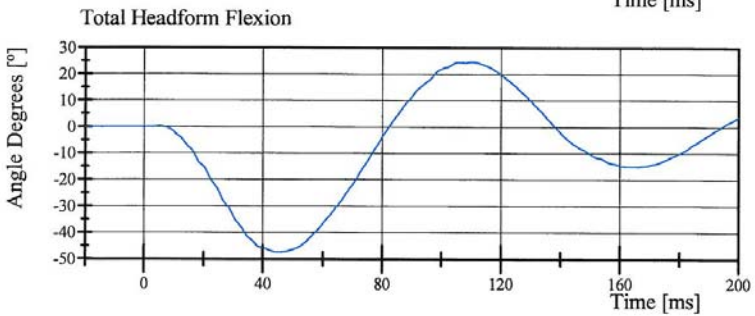
Filter Class: CFC_180
Max: 15.2 ° at 110.3 ms
Min: -31.4 ° at 44.6 ms



Filter Class: CFC_180
Max: 15.3 ° at 106.8 ms
Min: -28.4 ° at 45.3 ms



Filter Class: CFC_180
Max: 9.5 ° at 105.8 ms
Min: -16.3 ° at 38.9 ms



Filter Class: CFC_180
Max: 24.6 ° at 110.5 ms
Min: -47.5 ° at 44.6 ms

Transportation Research Center Inc.

Left Lateral Abdomen

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

Test Date: 12/1/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.7 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,081.5 N	Yes
Time of Peak	10.6 - 13.0 ms	10.96 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,595.9 N	Yes
Time of Peak	10.0 - 12.3 ms	10.00 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



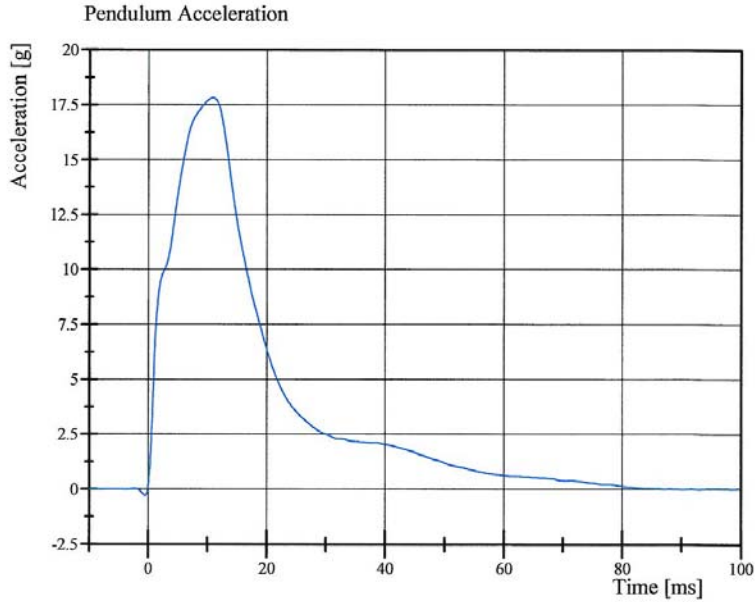
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2011 17:05:01 598

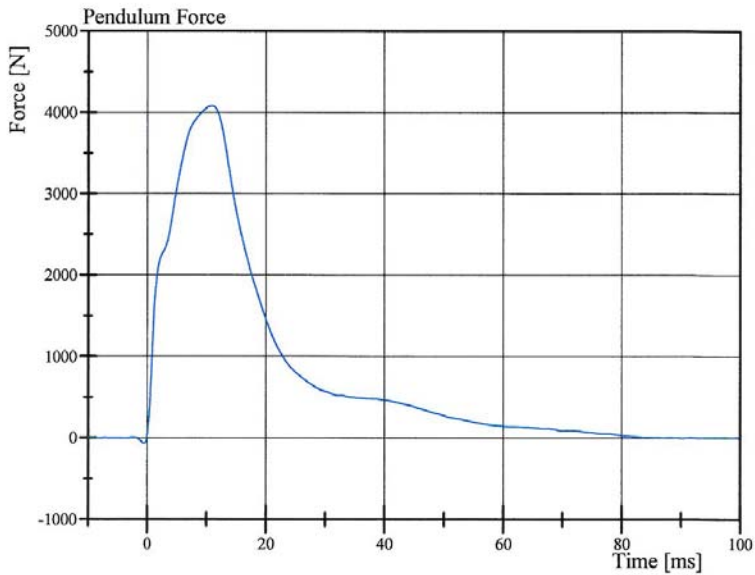


Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 2-1
Test Date: 12/1/2011



Filter Class: CFC_180
Max: 17.8 gn at 11.0 ms
Min: -0.3 gn at -0.6 ms



Filter Class: CFC_180
Max: 4,081.5 N at 11.0 ms
Min: -67.4 N at -0.6 ms

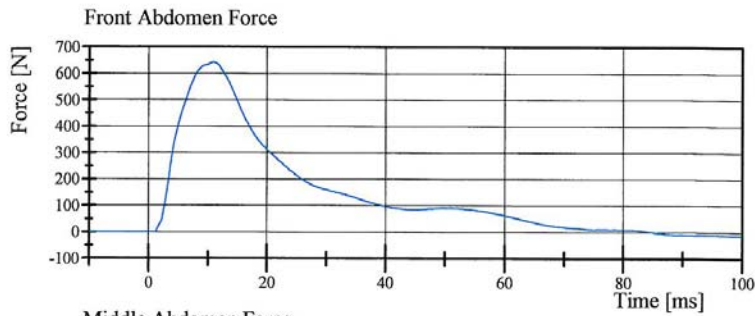


Transportation Research Center Inc.

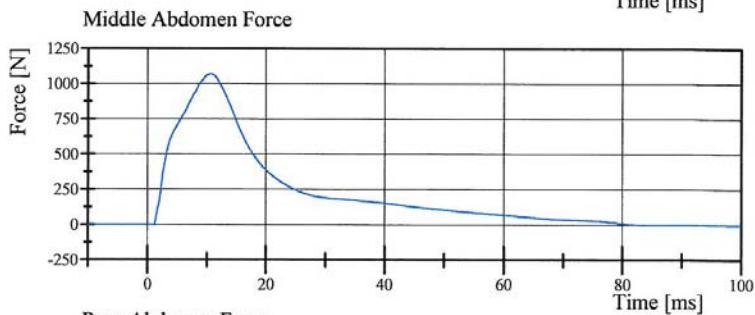
Left Lateral Abdomen

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

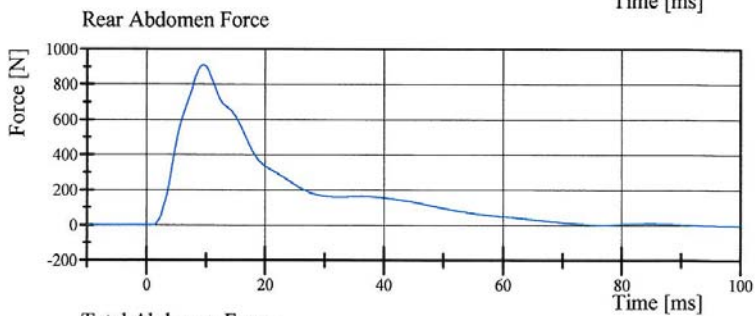
Test Date: 12/1/2011



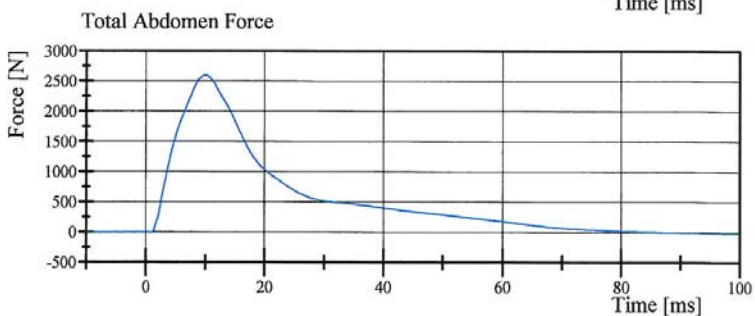
Filter Class: CFC_600
Max: 643.1 N at 10.8 ms
Min: -11.6 N at 99.3 ms



Filter Class: CFC_600
Max: 1,069.8 N at 10.6 ms
Min: -2.6 N at 1.0 ms



Filter Class: CFC_600
Max: 909.9 N at 9.5 ms
Min: -2.8 N at 100.0 ms



Filter Class: CFC_600
Max: 2,595.9 N at 10.0 ms
Min: -16.5 N at 99.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.01.2011 17:05:09 598



Transportation Research Center Inc.

Left Lateral Pelvis

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

Test Date: 12/1/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.22 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,058.8 N	Yes
Time of Peak	11.8 - 16.1 ms	12.64 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,345.6 N	Yes
Time of Peak	12.2 - 17.0 ms	12.88 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

12.01.2011 17:32:22 524

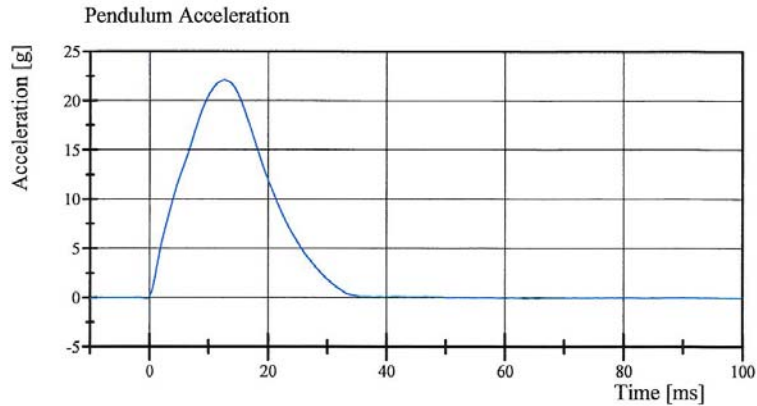


Transportation Research Center Inc.

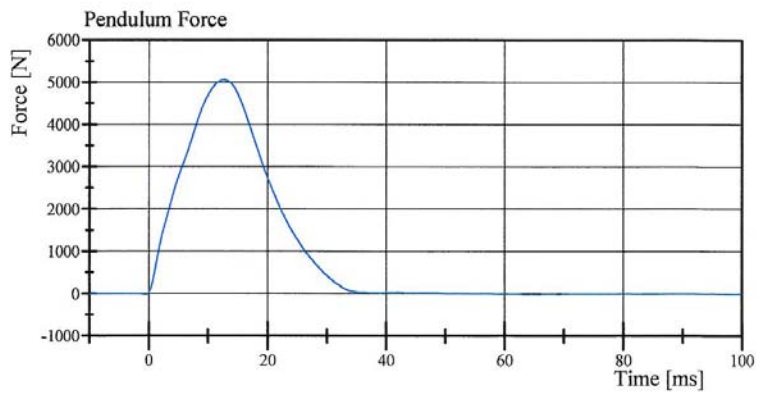
Left Lateral Pelvis

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

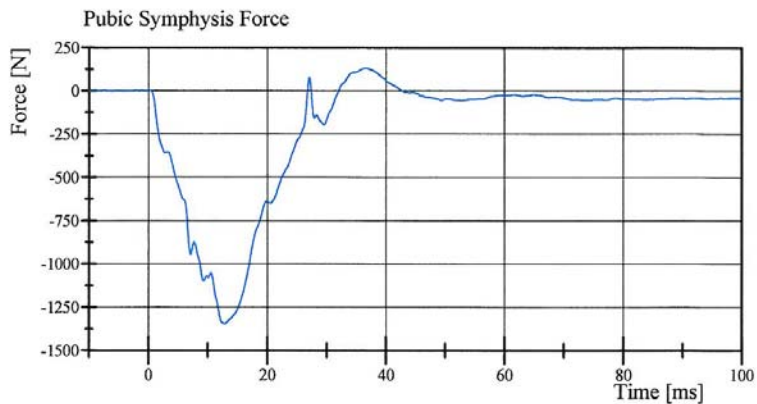
Test Date: 12/1/2011



Filter Class: CFC_180
Max: 22.1 gn at 12.6 ms
Min: -0.1 gn at -0.6 ms



Filter Class: CFC_180
Max: 5,058.8 N at 12.6 ms
Min: -21.0 N at -0.6 ms



Filter Class: CFC_600
Max: 130.9 N at 36.6 ms
Min: -1,345.6 N at 12.9 ms




Post-Test Calibration Sheets
Driver s/n F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 03
Date: 12/07/11

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	153	Yes
7	Shoulder/Arm Width	461.0 - 479.0	470	Yes
8	Thorax Width	322.0 - 332.0	330	Yes
9	Abdomen Width	273.0 - 287.0	285	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	265	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. 3-1

Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Peak Resultant Acceleration	125 - 155 g	137.4 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.2 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

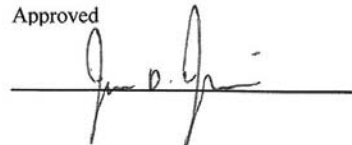
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

12.07.2011 07:46:06 359

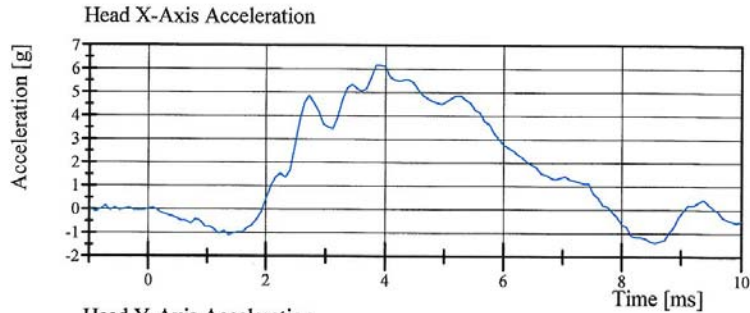


Transportation Research Center Inc.

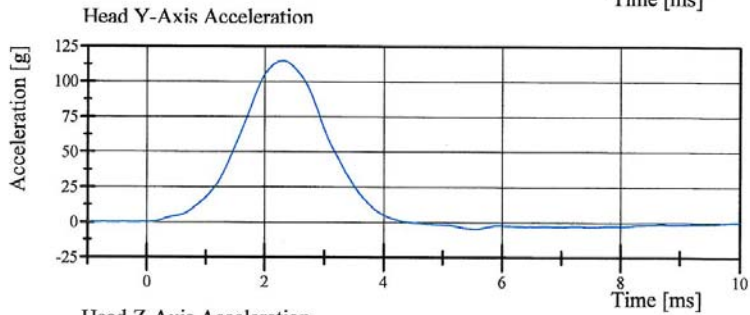
Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 3-1

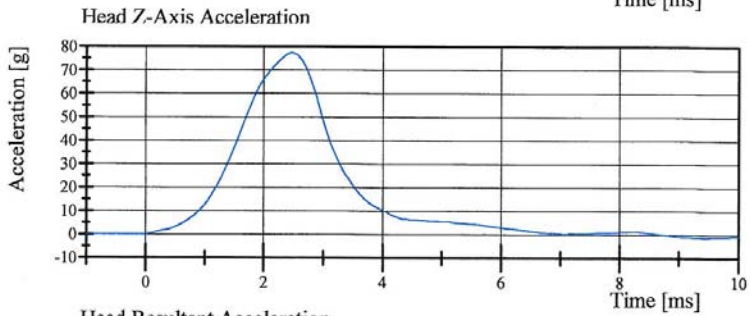
Test Date: 12/7/2011



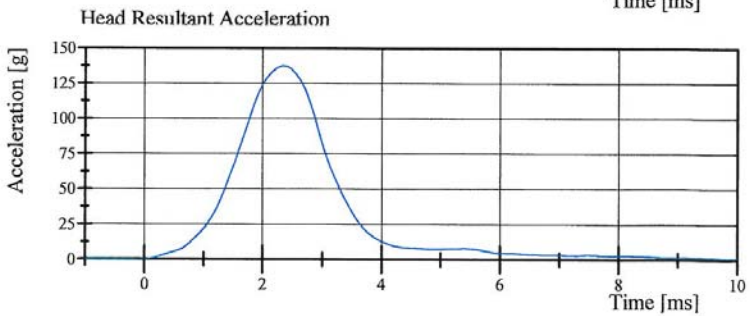
Filter Class: CFC_1000
Max: 6.2 gn at 3.8 ms
Min: -1.4 gn at 8.6 ms



Filter Class: CFC_1000
Max: 114.9 gn at 2.3 ms
Min: -4.6 gn at 5.5 ms



Filter Class: CFC_1000
Max: 77.5 gn at 2.5 ms
Min: -1.2 gn at 9.4 ms



Filter Class: CFC_1000
Max: 137.4 gn at 2.3 ms
Min: 0.0 gn at -0.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.07.2011 07:46:14 359



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 3-1

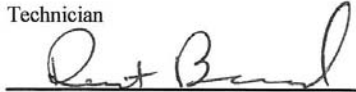
Test Date: 12/6/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.38 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-50.3 deg	Yes
Time of Peak	54 - 66 ms	58.2 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	57.4 ms	Yes

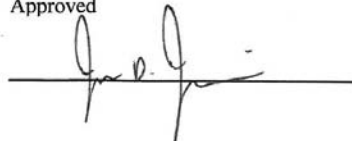
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 17:29:27 1304

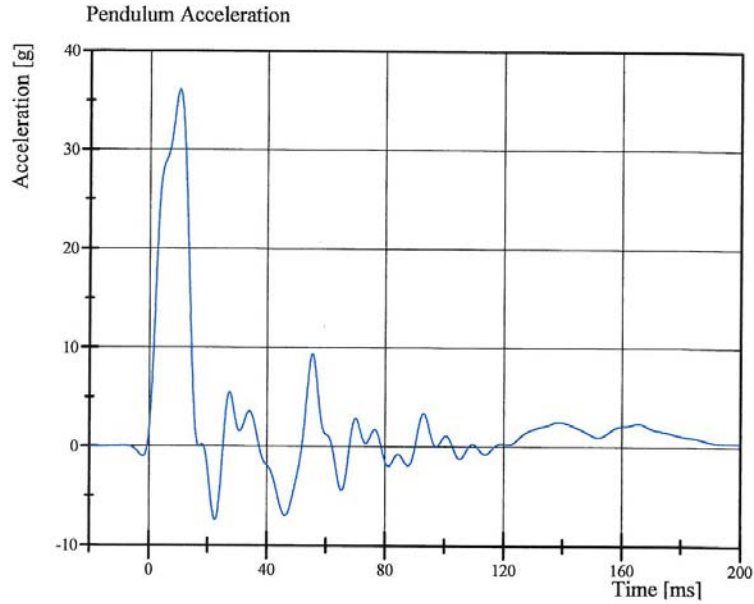


Transportation Research Center Inc.

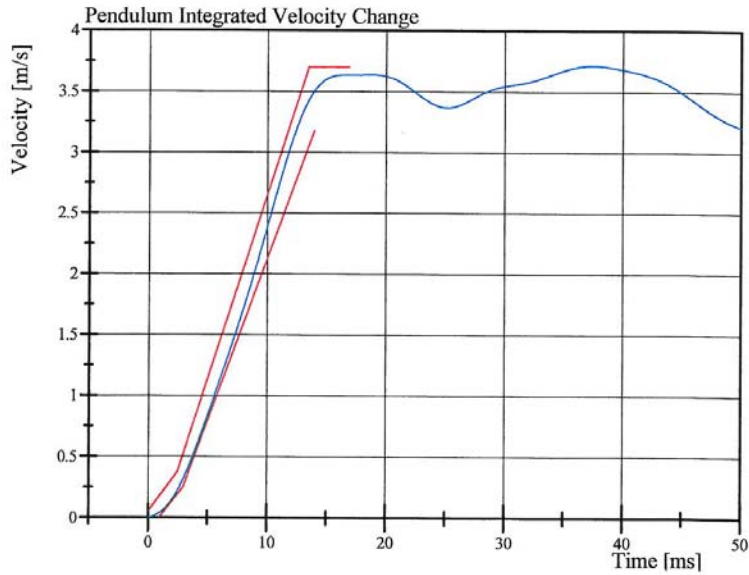
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/6/2011



Filter Class: CFC_60
Max: 36.1 gn at 10.2 ms
Min: -7.4 gn at 22.5 ms



Filter Class: CFC_60
Max: 3.7 m/s at 37.4 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 17:29:35 1304

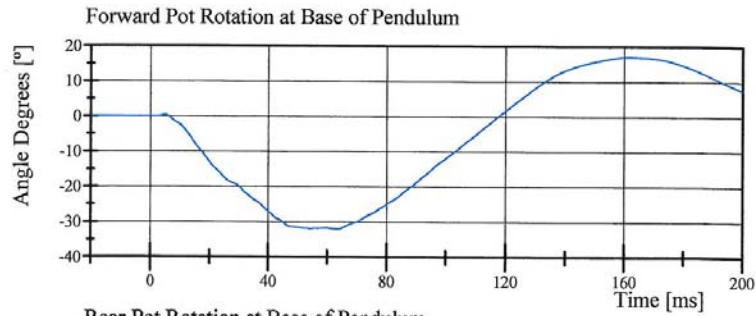


Transportation Research Center Inc.

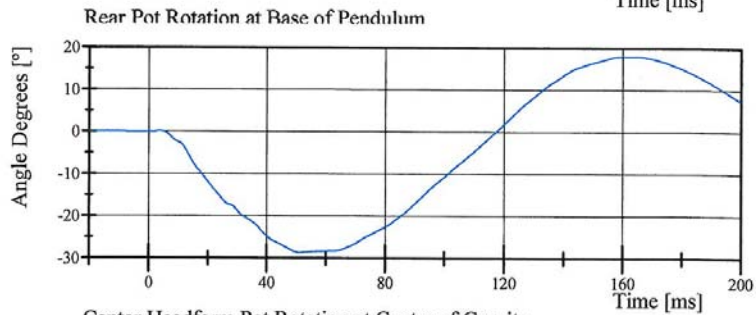
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 3-1

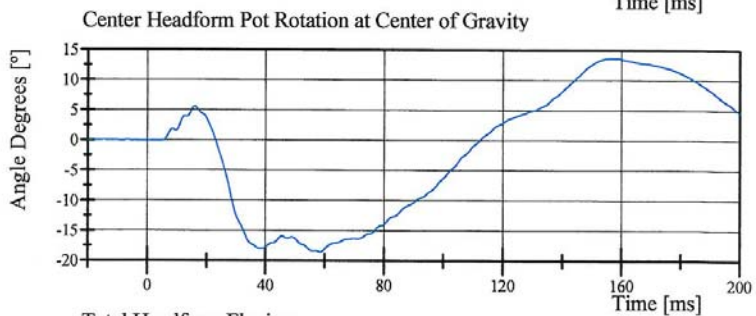
Test Date: 12/6/2011



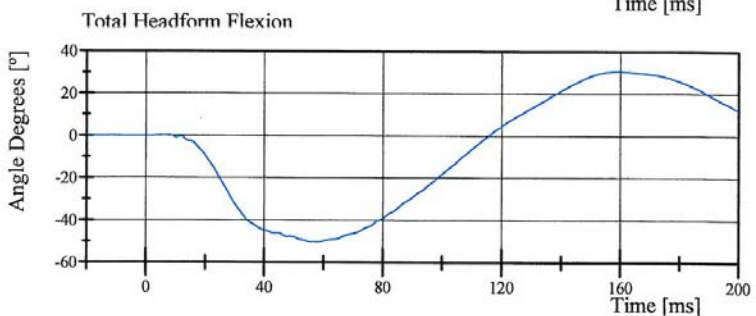
Filter Class: CFC_180
Max: 17.1 ° at 162.2 ms
Min: -32.0 ° at 63.4 ms



Filter Class: CFC_180
Max: 18.0 ° at 164.8 ms
Min: -28.6 ° at 51.0 ms



Filter Class: CFC_180
Max: 13.7 ° at 157.8 ms
Min: -18.5 ° at 58.6 ms



Filter Class: CFC_180
Max: 30.7 ° at 159.1 ms
Min: -50.3 ° at 58.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 17:29:35 1304



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.81 g	Yes

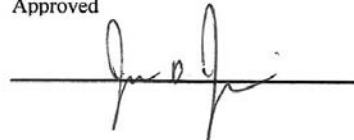
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA final rule 8/15/2008

12.07.2011 08:14:09 543

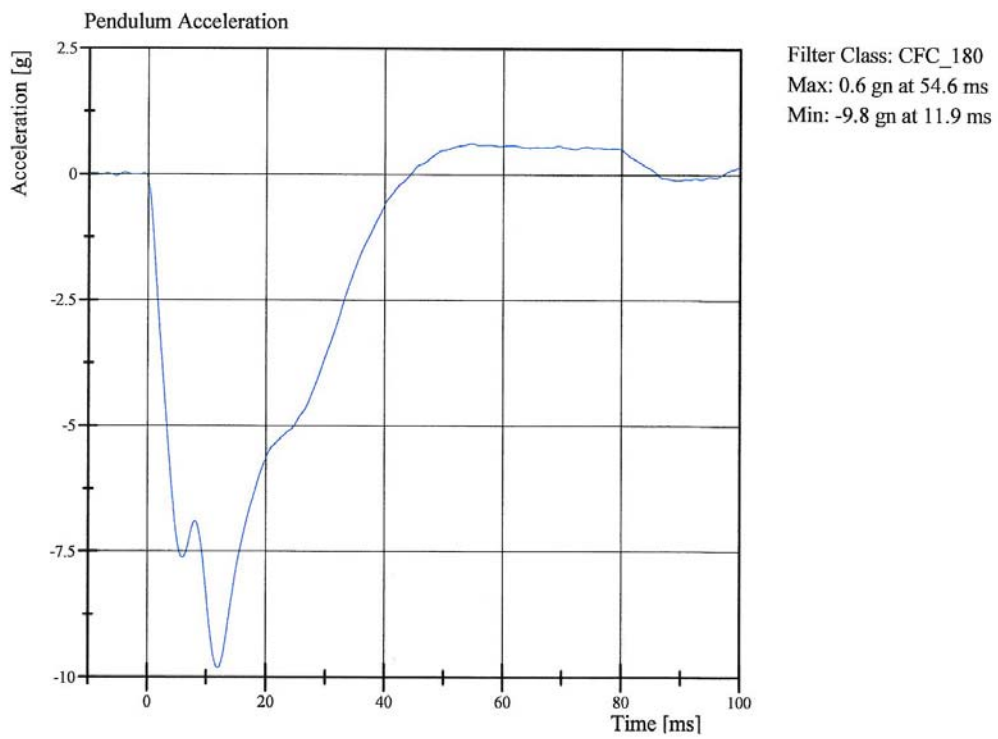


Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/7/2011



Specification Source: NHTSA final rule 8/15/2008

12.07.2011 08:14:15 543



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.0 mm	Yes

Test meets specifications.

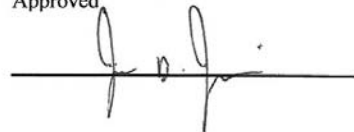
Comments:

Drop Height: 816

Technician



Approved



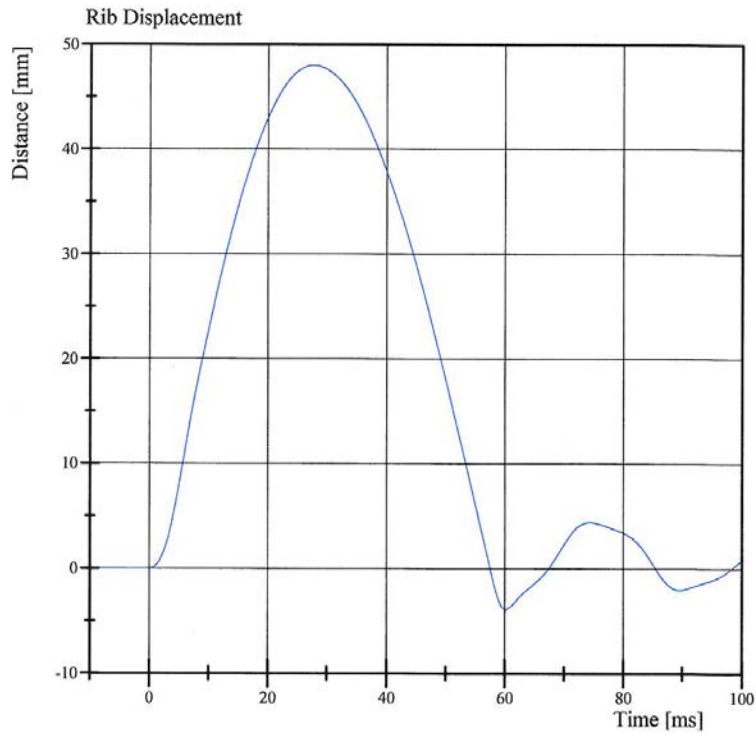
Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 12:20:17 695



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011



Filter Class: CFC_180
Max: 48.0 mm at 27.8 ms
Min: -3.9 mm at 60.2 ms



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.4 mm	Yes

Test meets specifications.

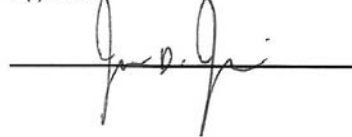
Comments:

Drop Height: 462

Technician



Approved



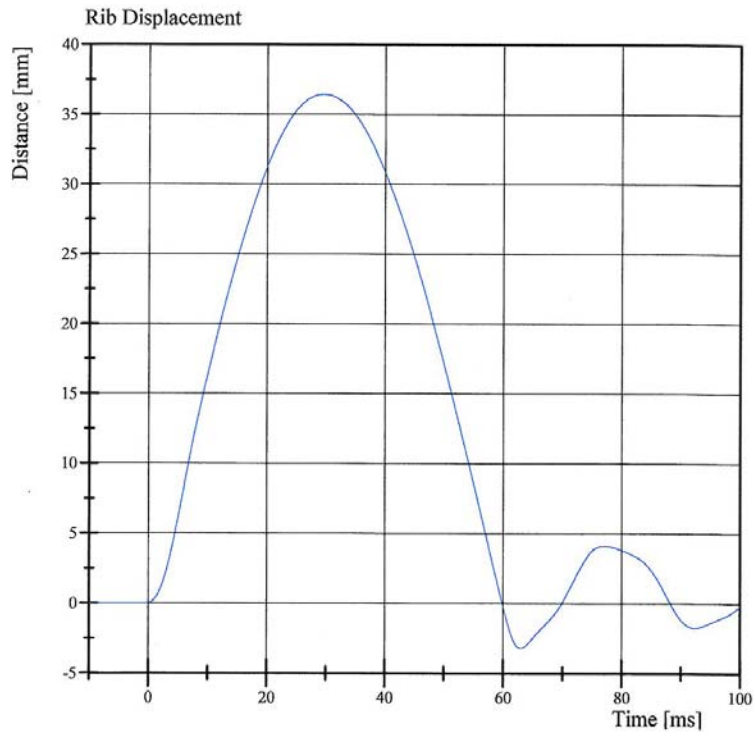
Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 12:27:08 885



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011



Filter Class: CFC_180
Max: 36.4 mm at 29.5 ms
Min: -3.2 mm at 63.0 ms

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/6/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.7 mm	Yes

Test meets specifications.

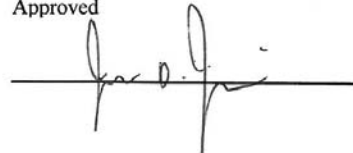
Comments:

Drop Height: 816

Technician



Approved



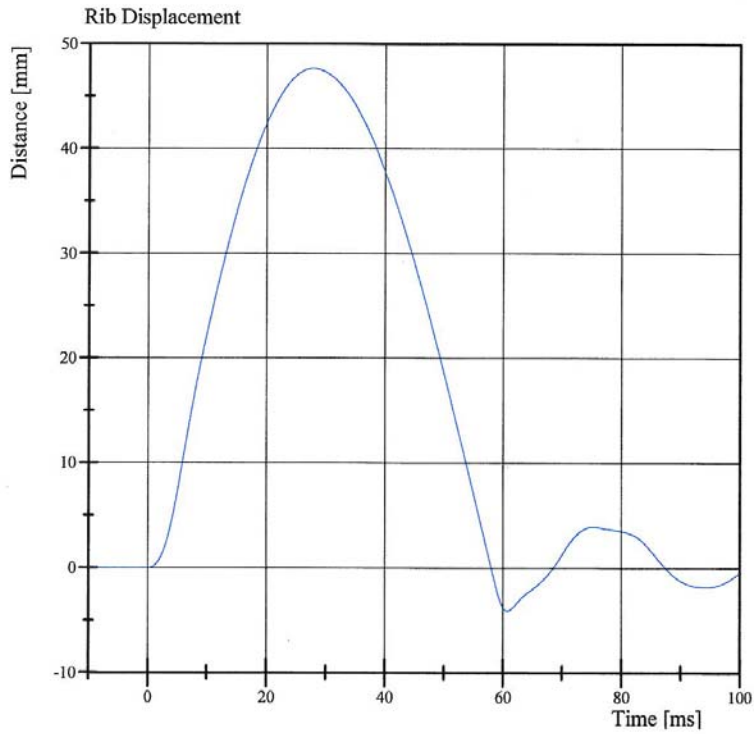
Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 12:39:43 696



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011



Filter Class: CFC_180
Max: 47.7 mm at 27.8 ms
Min: -4.1 mm at 60.7 ms

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011

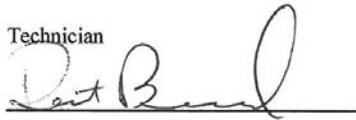
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.4 mm	Yes

Test meets specifications.

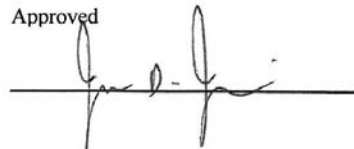
Comments:

Drop Height: 462

Technician



Approved



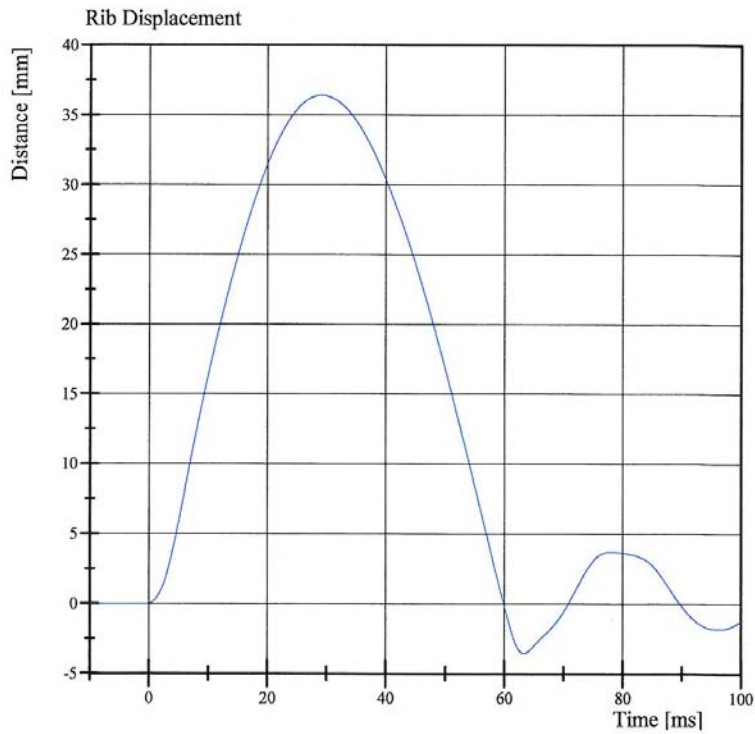
Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 12:49:33 888



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011



Filter Class: CFC_180
Max: 36.4 mm at 29.1 ms
Min: -3.5 mm at 63.4 ms

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/6/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.7 mm	Yes

Test meets specifications.

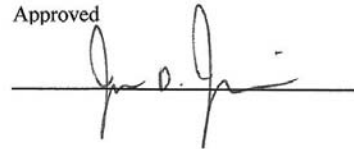
Comments:

Drop Height: 816

Technician



Approved



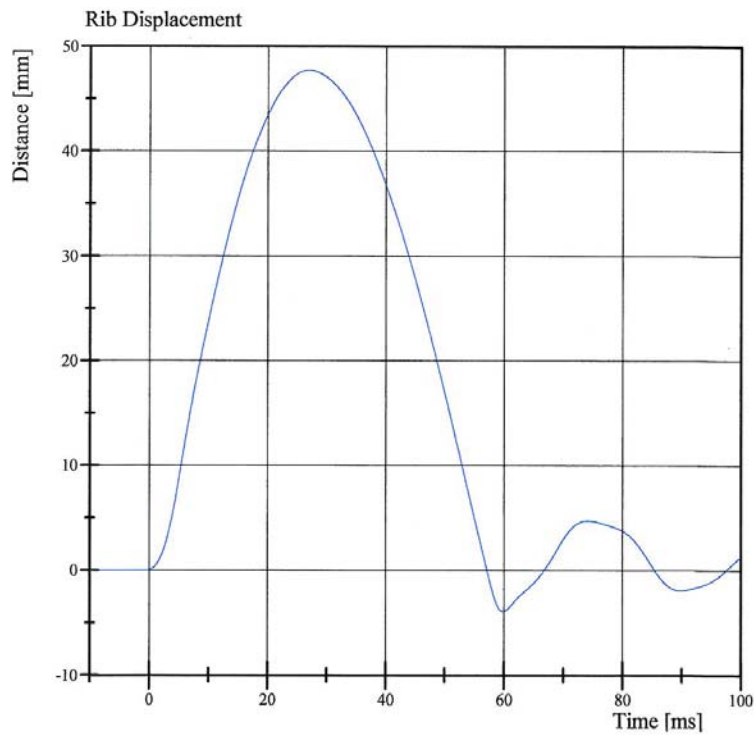
Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 12:56:38 707



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011



Filter Class: CFC_180
Max: 47.7 mm at 27.0 ms
Min: -3.9 mm at 59.8 ms



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.6 mm	Yes

Test meets specifications.

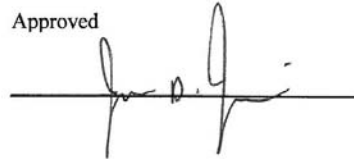
Comments:

Drop Height: 462

Technician



Approved



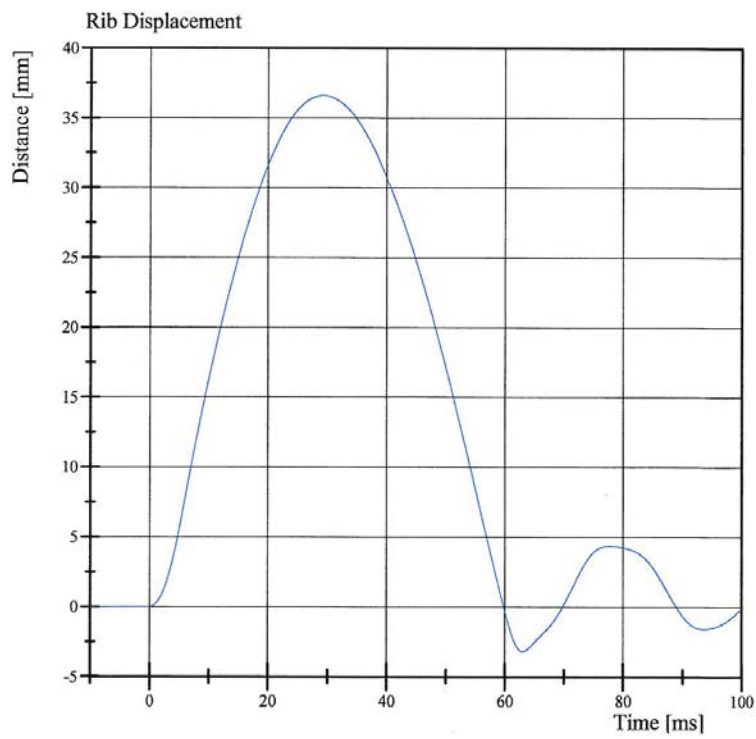
Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 13:06:09 882



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011



Filter Class: CFC_180
Max: 36.6 mm at 29.2 ms
Min: -3.2 mm at 63.0 ms



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 3-1

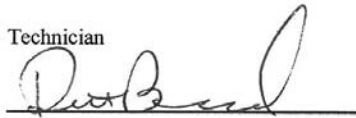
Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.460 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,521.4 N	Yes
Upper Rib Displacement	34 - 41 mm	37.5 mm	Yes
Center Rib Displacement	37 - 45 mm	40.9 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.5 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.

12.07.2011 08:33:34 431

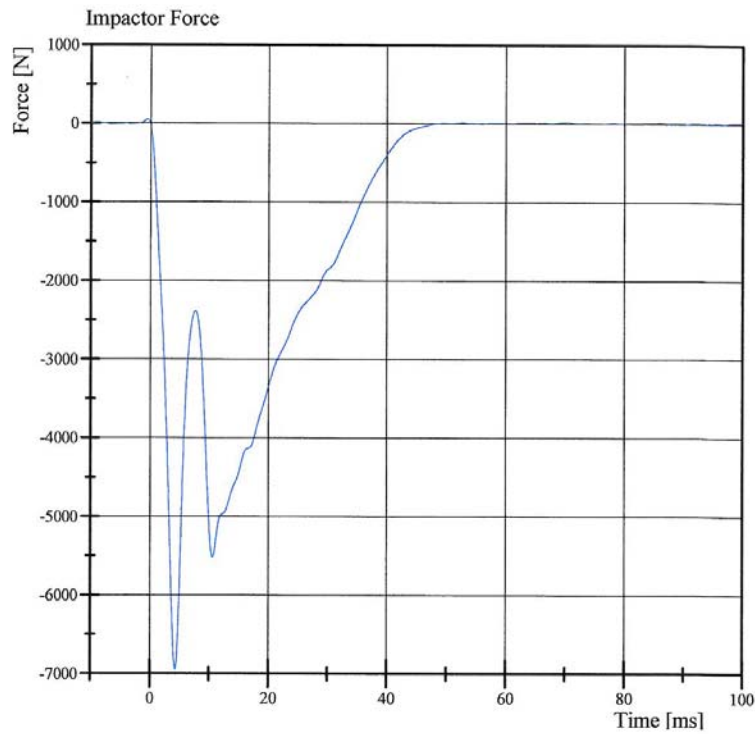


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/7/2011



Filter Class: CFC_180
Max: 48.4 N at -0.6 ms
Min: -6,952.5 N at 4.3 ms

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

12.07.2011 08:33:58 431

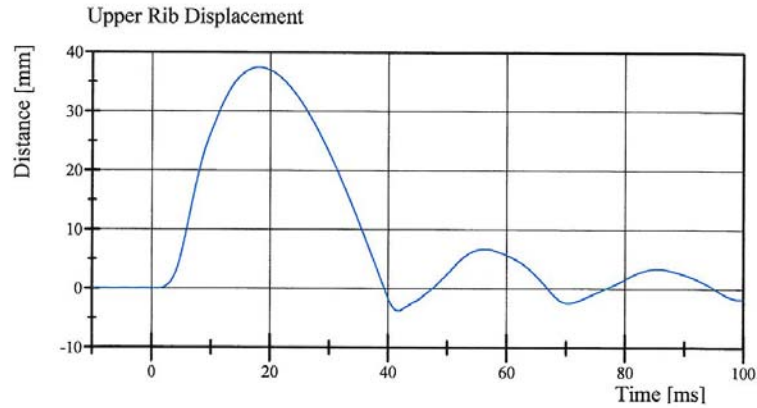


Transportation Research Center Inc.

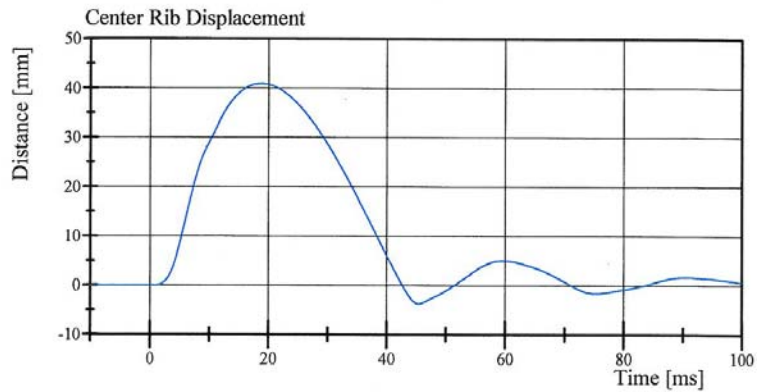
Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 3-1

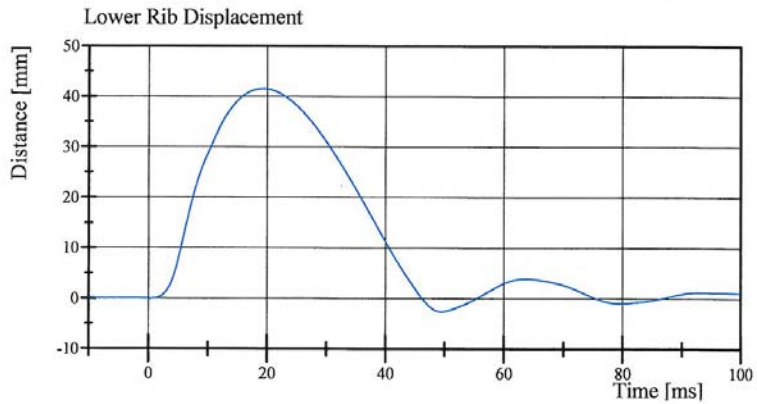
Test Date: 12/7/2011



Filter Class: CFC_180
Max: 37.5 mm at 18.1 ms
Min: -3.7 mm at 41.7 ms



Filter Class: CFC_180
Max: 40.9 mm at 18.7 ms
Min: -3.7 mm at 45.4 ms



Filter Class: CFC_180
Max: 41.5 mm at 19.3 ms
Min: -2.6 mm at 49.4 ms

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

12.07.2011 08:34:00 431



Transportation Research Center Inc.

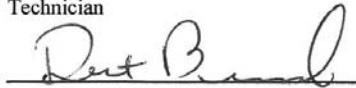
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.008 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-48.2 deg	Yes
Time of Peak	39 - 53 ms	45.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	37.4 ms	Yes

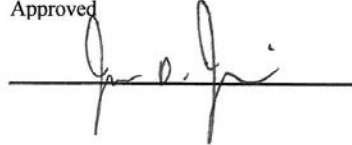
Test meets specifications.

Comments:

Technician



Approved



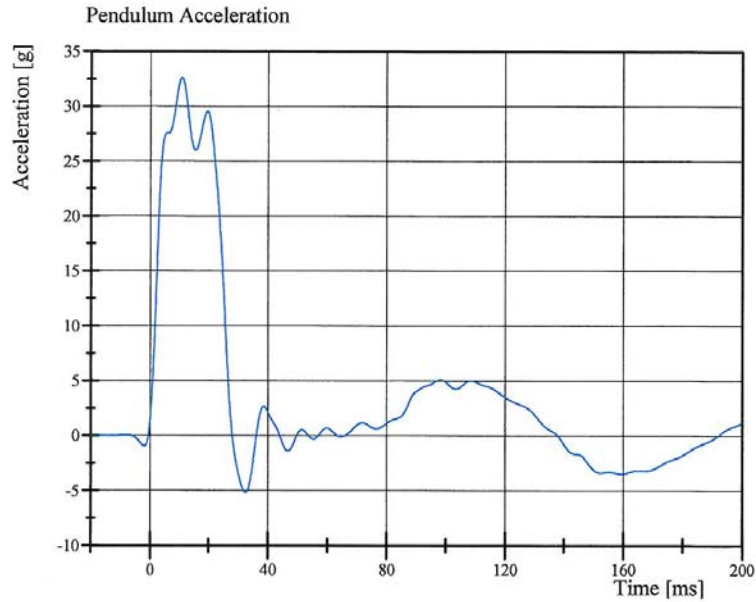
Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 14:56:44 579

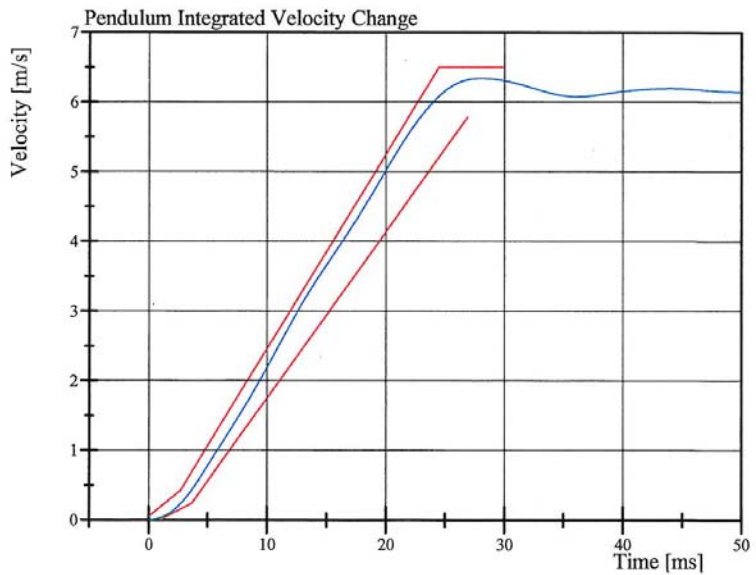


Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/6/2011



Filter Class: CFC_60
Max: 32.6 gn at 10.8 ms
Min: -5.2 gn at 32.5 ms



Filter Class: CFC_60
Max: 6.3 m/s at 28.1 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.06.2011 14:56:53 579

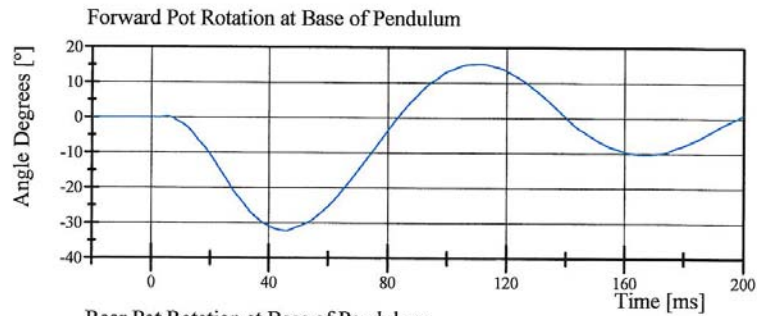


Transportation Research Center Inc.

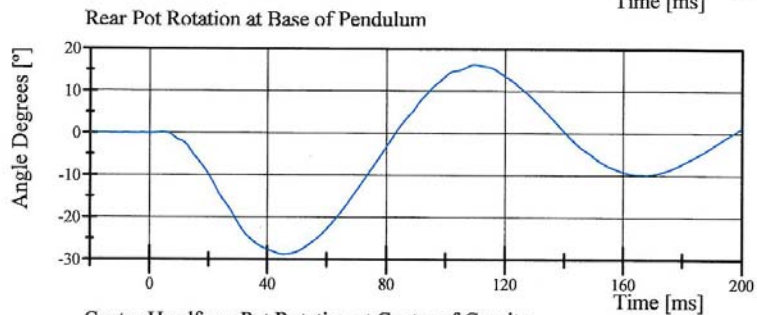
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 3-1

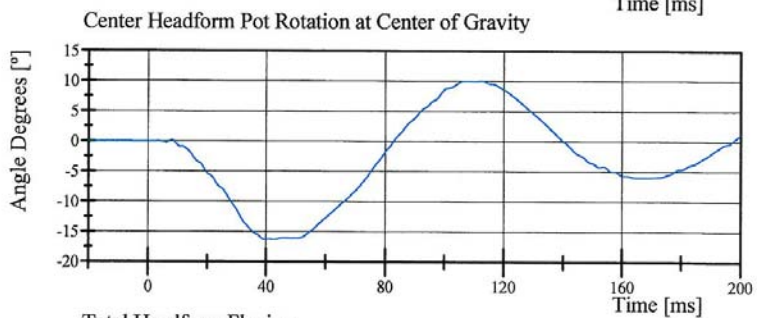
Test Date: 12/6/2011



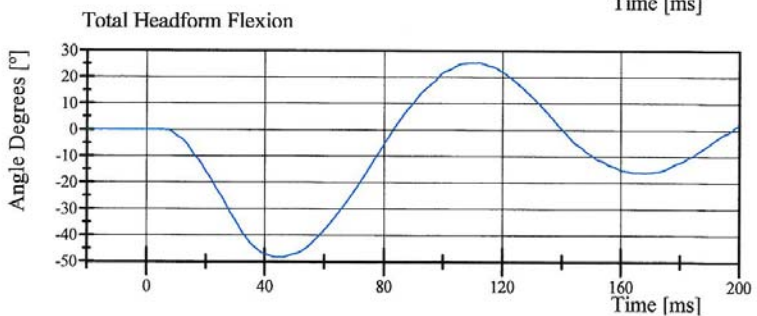
Filter Class: CFC_180
Max: 15.4 ° at 111.4 ms
Min: -32.2 ° at 45.6 ms



Filter Class: CFC_180
Max: 16.2 ° at 109.8 ms
Min: -28.7 ° at 45.4 ms



Filter Class: CFC_180
Max: 10.1 ° at 112.4 ms
Min: -16.3 ° at 42.6 ms



Filter Class: CFC_180
Max: 25.5 ° at 112.1 ms
Min: -48.2 ° at 45.7 ms

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 3-1
Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.92 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,163.1 N	Yes
Time of Peak	10.6 - 13.0 ms	10.88 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,596.9 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

12.07.2011 09:14:59 586

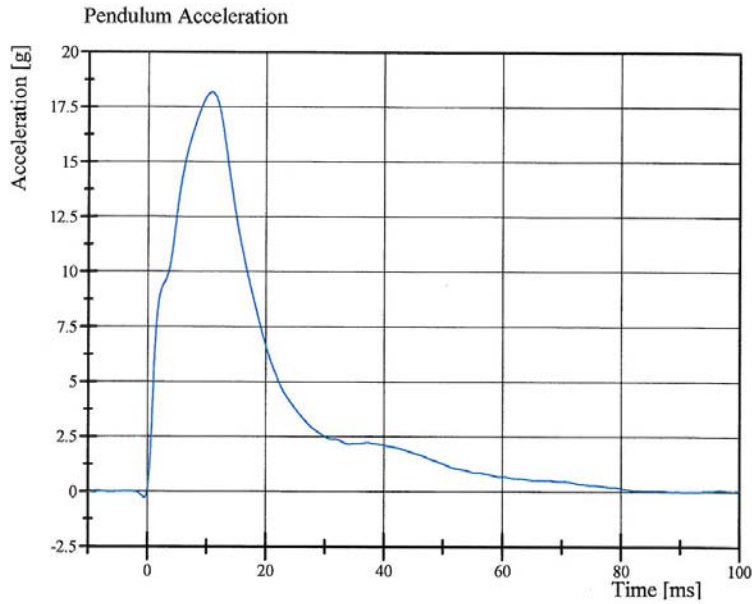


Transportation Research Center Inc.

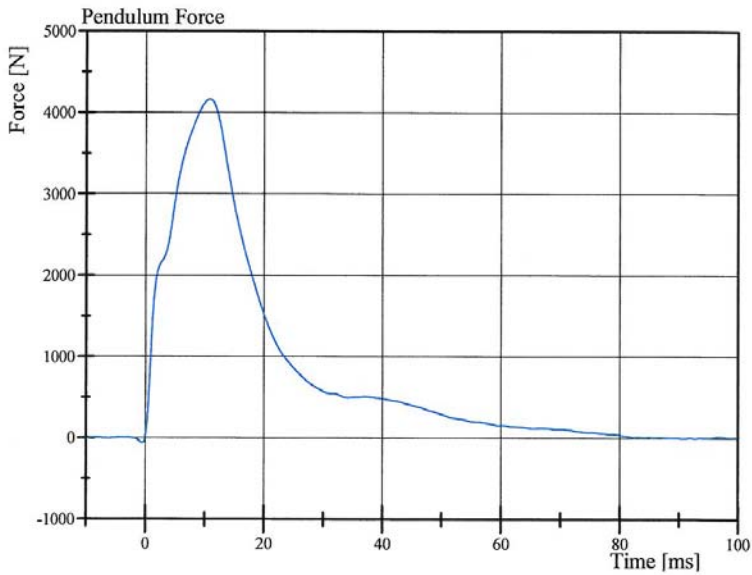
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/7/2011



Filter Class: CFC_180
Max: 18.2 gn at 10.9 ms
Min: -0.3 gn at -0.6 ms



Filter Class: CFC_180
Max: 4,163.1 N at 10.9 ms
Min: -63.6 N at -0.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.07.2011 09:15:06 586

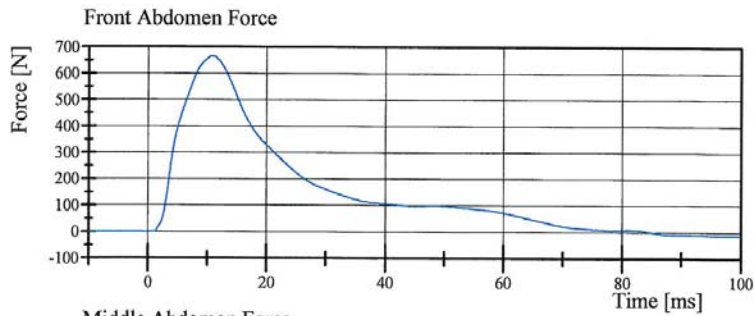


Transportation Research Center Inc.

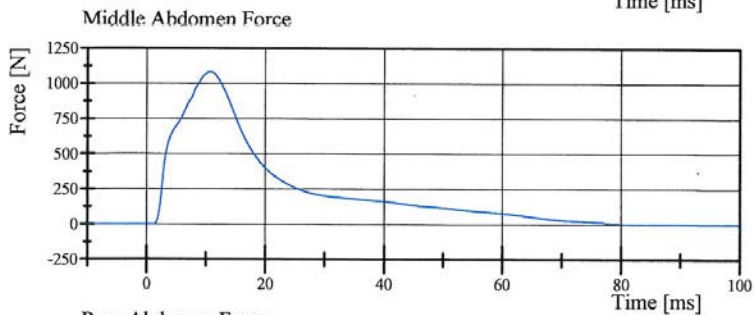
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 3-1

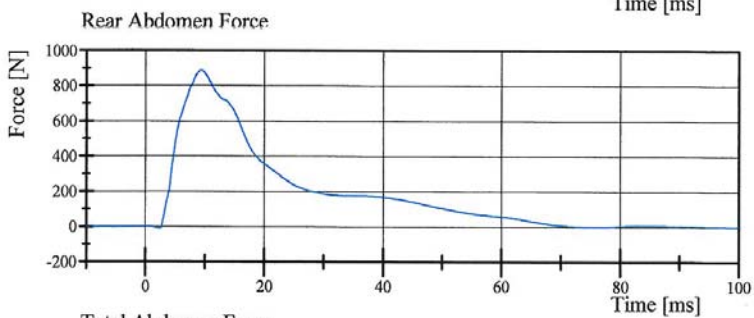
Test Date: 12/7/2011



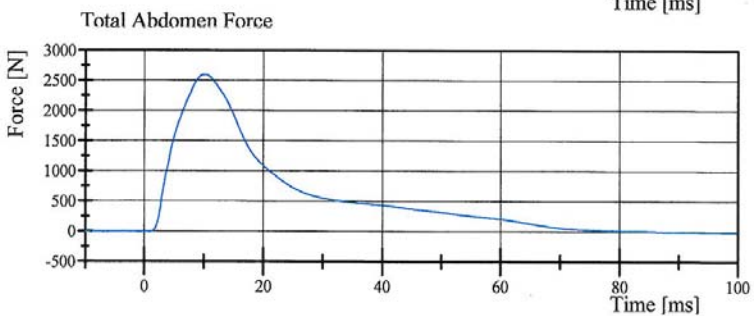
Filter Class: CFC_600
Max: 666.3 N at 10.7 ms
Min: -11.7 N at 99.0 ms



Filter Class: CFC_600
Max: 1,082.5 N at 10.6 ms
Min: -1.0 N at 99.0 ms



Filter Class: CFC_600
Max: 887.6 N at 9.4 ms
Min: -11.4 N at 2.4 ms



Filter Class: CFC_600
Max: 2,596.9 N at 10.3 ms
Min: -13.0 N at 99.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.07.2011 09:15:06 586



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 3-1

Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.22 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,122.9 N	Yes
Time of Peak	11.8 - 16.1 ms	12.64 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,271.7 N	Yes
Time of Peak	12.2 - 17.0 ms	13.20 ms	Yes

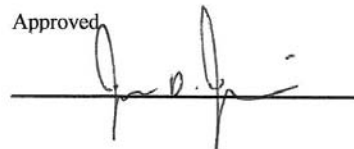
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

12.07.2011 09:32:28 551

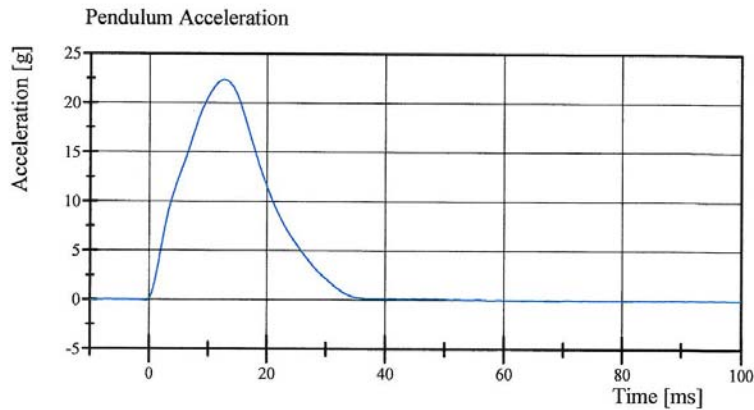


Transportation Research Center Inc.

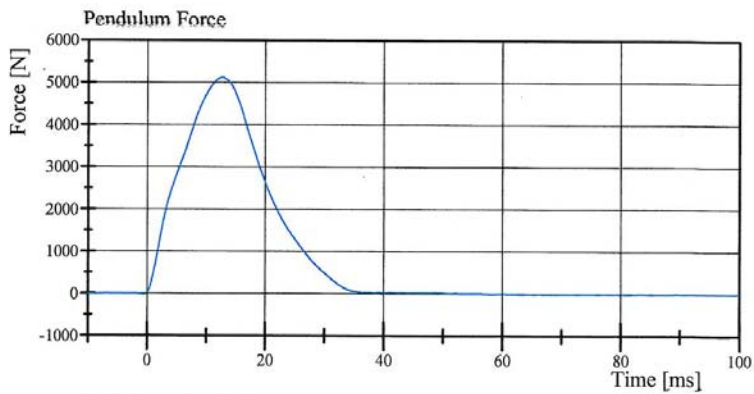
Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 3-1

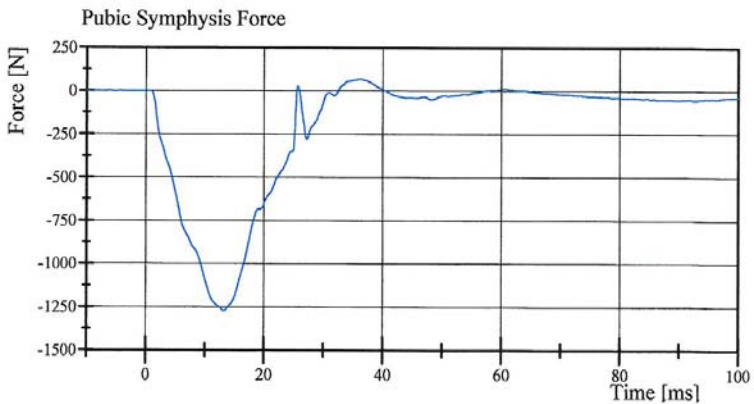
Test Date: 12/7/2011



Filter Class: CFC_180
Max: 22.4 gn at 12.6 ms
Min: -0.1 gn at -0.6 ms



Filter Class: CFC_180
Max: 5,122.9 N at 12.6 ms
Min: -17.5 N at -0.6 ms



Filter Class: CFC_600
Max: 70.3 N at 36.2 ms
Min: -1,271.7 N at 13.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.07.2011 09:32:36 551



Pre-Test Calibration Sheets
Passenger s/n 033

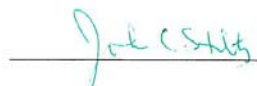
Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 033 Calibration No.07
Date: 11/28/11

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	778	Yes
B	Shoulder Pivot Height	437.0 - 453.0	442	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	133	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	533	Yes
L	Popliteal Height	343.0 - 369.0	352	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	207	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	352	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	869	Yes
Z	Waist Circumference	761.0 - 791.0	778	Yes

Technician



Approved





Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 033 Certification No. 7-1
Test Date: 11/23/2011

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	129.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.2 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.

11.23.2011 17:09:20 234

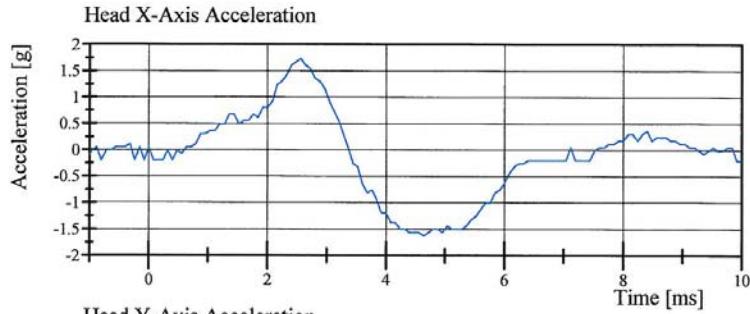


Transportation Research Center Inc.

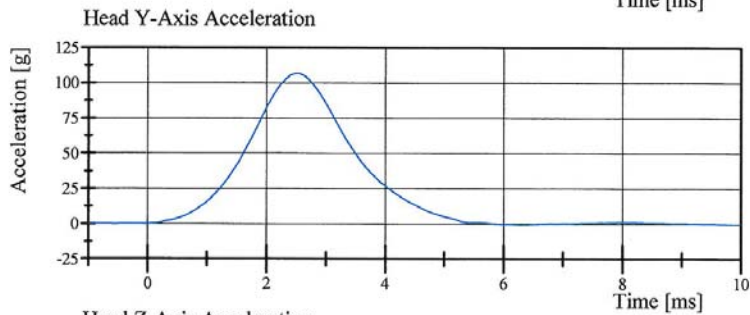
Left Lateral Head Drop

SID IIs Serial No. 033 Certification No. 7-1

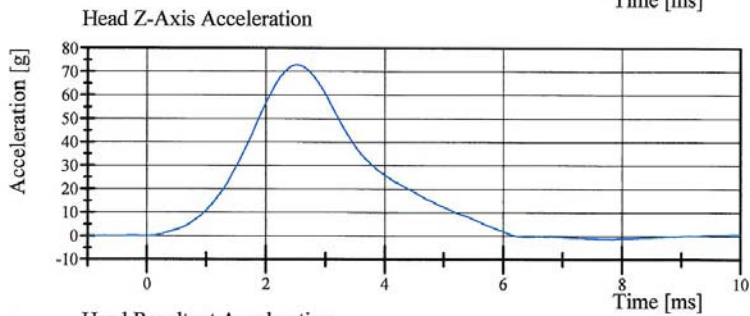
Test Date: 11/23/2011



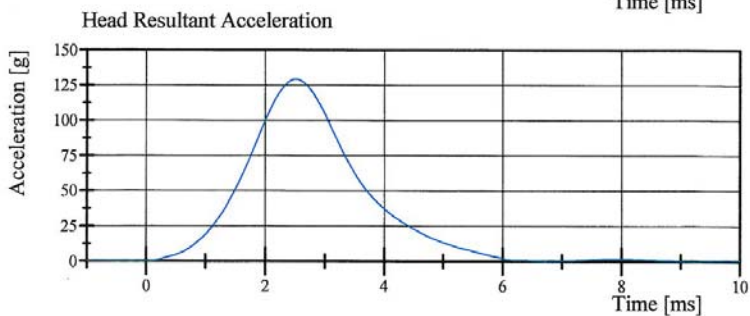
Filter Class: CFC_1000
Max: 1.7 gn at 2.6 ms
Min: -1.6 gn at 4.6 ms



Filter Class: CFC_1000
Max: 106.7 gn at 2.5 ms
Min: -0.7 gn at 6.3 ms



Filter Class: CFC_1000
Max: 72.9 gn at 2.6 ms
Min: -1.3 gn at 7.8 ms



Filter Class: CFC_1000
Max: 129.2 gn at 2.5 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.

11.23.2011 17:09:33 234



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 033 Certification No. 7-2

Test Date: 11/25/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.585 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.351 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.503 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.727 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.693 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.877 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-73.4 deg	Yes
Time of Peak	50 - 70 ms	65.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N-m	38.2 N-m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N-m	102 - 126 ms	122.1 ms	Yes

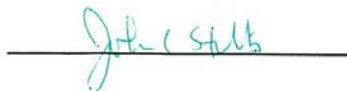
Test meets specifications.

Comments:

Technician



Approved



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

11.25.2011 06:23:07 639

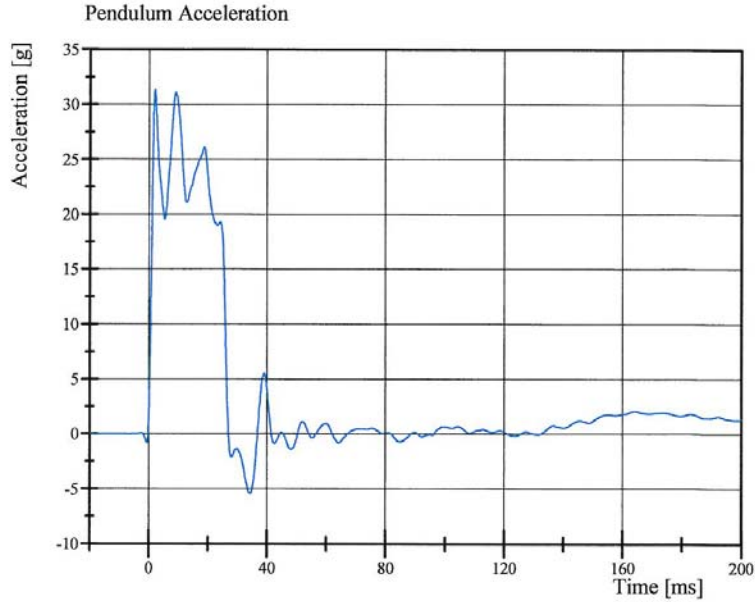


Transportation Research Center Inc.

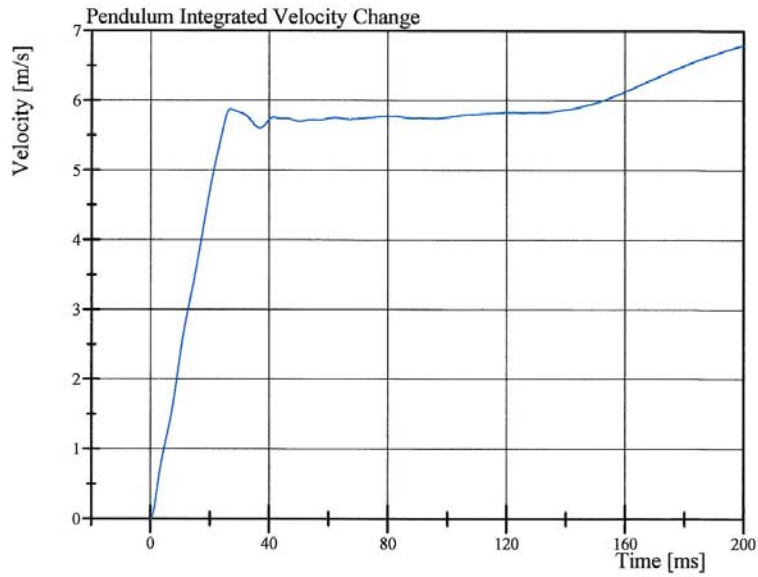
Left Lateral Neck

SID IIs Serial No. 033 Certification No. 7-2

Test Date: 11/25/2011



Filter Class: CFC_180
Max: 31.3 gn at 2.0 ms
Min: -5.4 gn at 34.5 ms



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

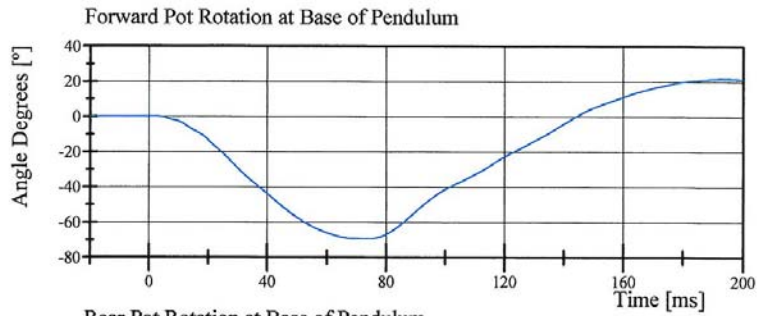
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 06:23:17 639

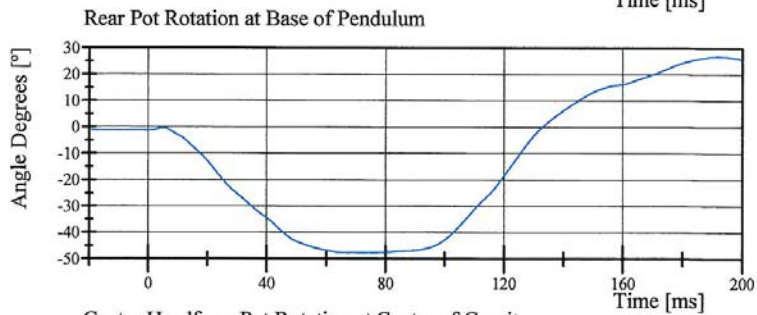


Transportation Research Center Inc.

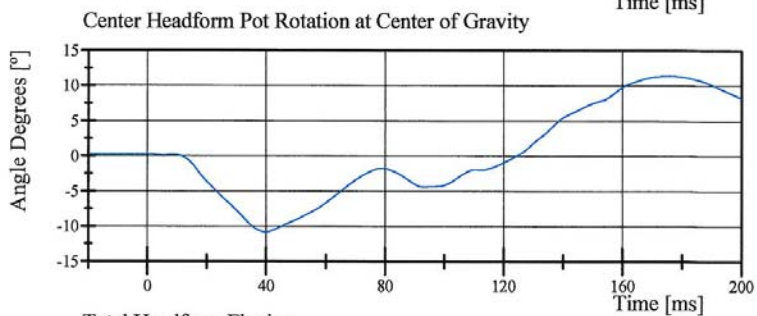
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 7-2
Test Date: 11/25/2011



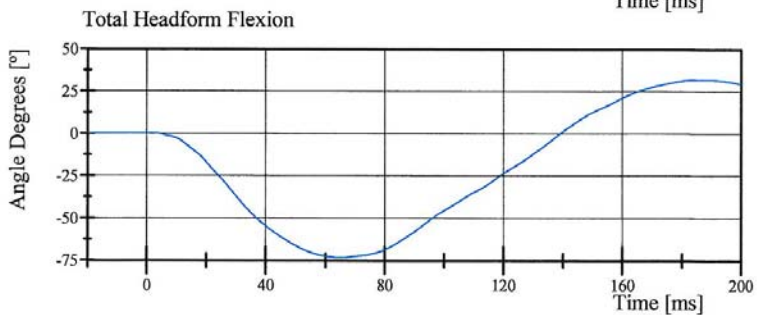
Filter Class: CFC_60
Max: 21.9 ° at 193.8 ms
Min: -69.4 ° at 73.4 ms



Filter Class: CFC_60
Max: 26.8 ° at 191.9 ms
Min: -47.6 ° at 66.3 ms



Filter Class: CFC_60
Max: 11.4 ° at 175.8 ms
Min: -10.8 ° at 39.8 ms



Filter Class: CFC_60
Max: 32.0 ° at 186.6 ms
Min: -73.4 ° at 65.2 ms

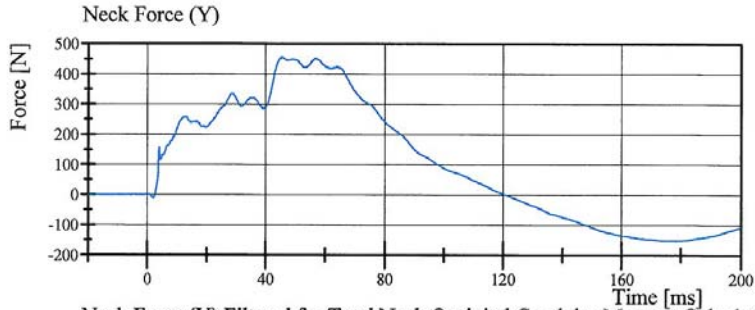
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 06:23:18 639

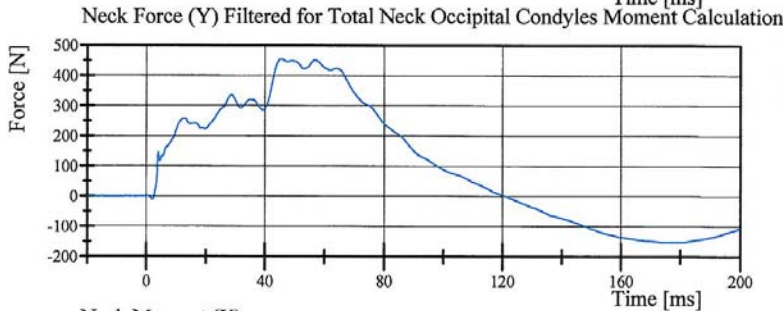


Transportation Research Center Inc.

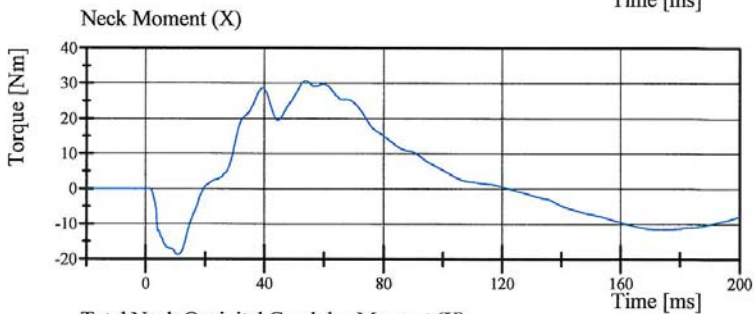
Left Lateral Neck
SID IIs Serial No. 033 Certification No. 7-2
Test Date: 11/25/2011



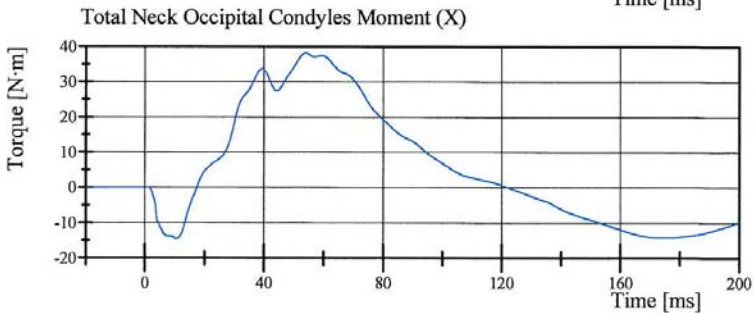
Filter Class: CFC_1000
Max: 456.5 N at 45.4 ms
Min: -152.6 N at 178.3 ms



Filter Class: CFC_600
Max: 455.9 N at 45.4 ms
Min: -151.9 N at 178.3 ms



Filter Class: CFC_600
Max: 30.7 Nm at 53.8 ms
Min: -18.8 Nm at 10.9 ms



Filter Class: Without_(Consta
Max: 38.2 N·m at 53.8 ms
Min: -14.6 N·m at 10.6 ms

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

11.25.2011 06:23:18 639



Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 7-1
Test Date: 11/25/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.7 g	Yes
Shoulder Displacement	28 - 37 mm	29.7 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	20.5 g	Yes

Test meets specifications.

Comments:

Technician



Approved



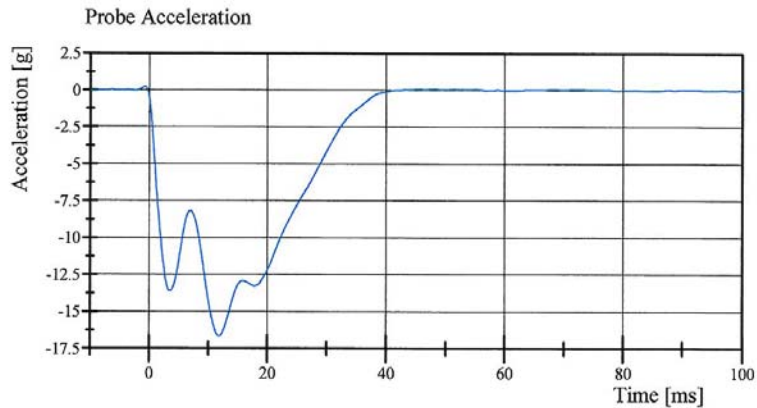
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 06:57:47 807

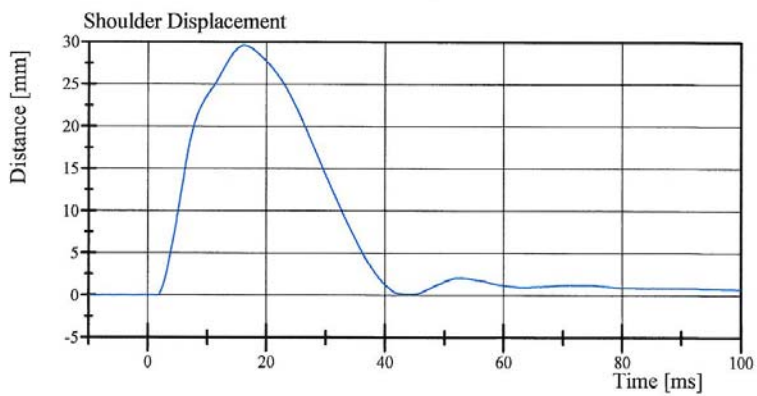


Transportation Research Center Inc.

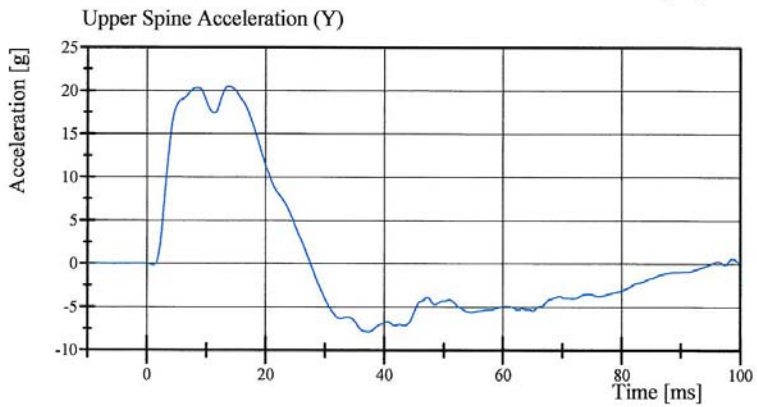
Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 7-1
Test Date: 11/25/2011



Filter Class: CFC_180
Max: 0.2 gn at -0.8 ms
Min: -16.7 gn at 11.8 ms



Filter Class: CFC_600
Max: 29.7 mm at 16.2 ms
Min: -0.0 mm at 1.5 ms



Filter Class: CFC_180
Max: 20.5 gn at 13.7 ms
Min: -7.8 gn at 37.3 ms

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

11.25.2011 06:57:55 807



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 7-6
Test Date: 11/25/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.658 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.6 g	Yes
Shoulder Displacement	31 - 40 mm	33.1 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.1 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.1 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.5 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	37.0 g	Yes

Test meets specifications.

Comments:

Technician



Approved



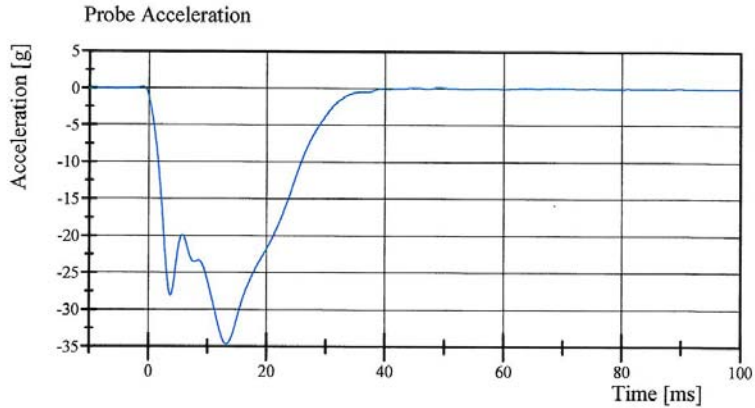
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 11:25:45 615

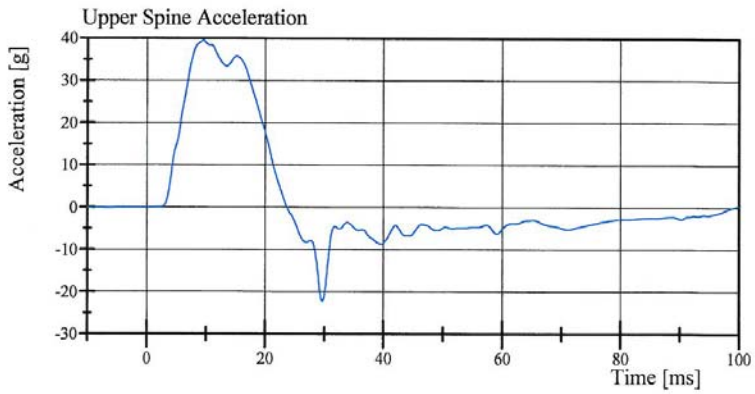


Transportation Research Center Inc.

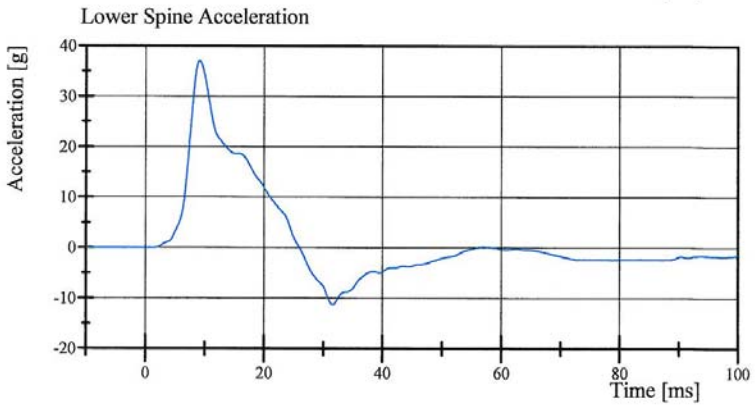
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 7-6
Test Date: 11/25/2011



Filter Class: CFC_180
Max: 0.2 gn at -1.0 ms
Min: -34.6 gn at 13.2 ms



Filter Class: CFC_180
Max: 39.5 gn at 9.5 ms
Min: -22.3 gn at 29.7 ms



Filter Class: CFC_180
Max: 37.0 gn at 9.1 ms
Min: -11.3 gn at 31.6 ms

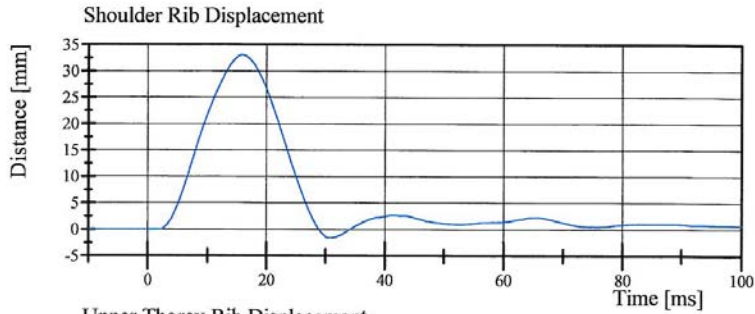
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 11:26:00 615

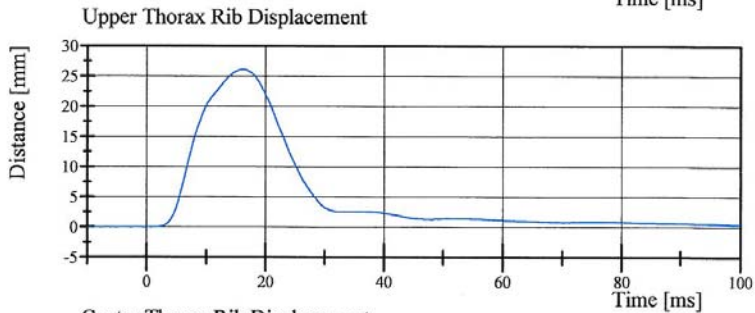


Transportation Research Center Inc.

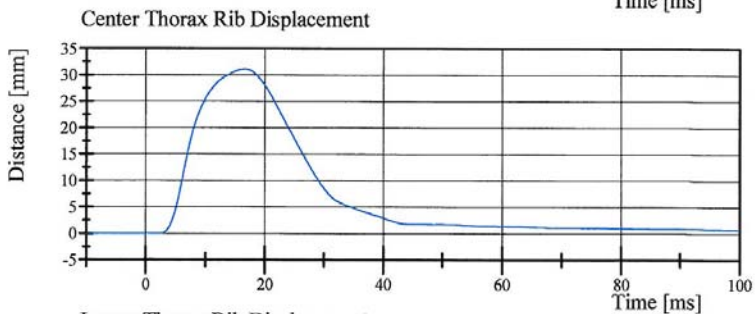
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 7-6
Test Date: 11/25/2011



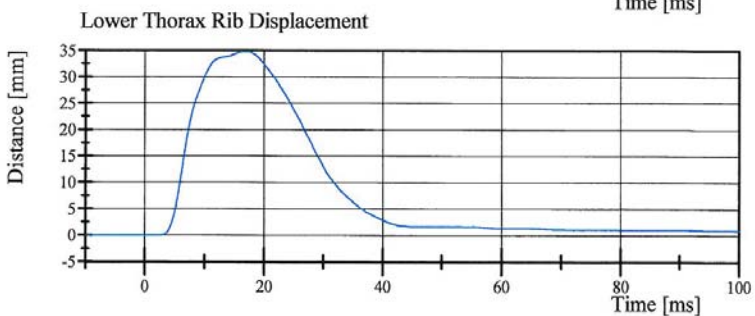
Filter Class: CFC_600
Max: 33.1 mm at 15.8 ms
Min: -1.6 mm at 30.6 ms



Filter Class: CFC_600
Max: 26.1 mm at 16.2 ms
Min: -0.0 mm at -2.7 ms



Filter Class: CFC_600
Max: 31.1 mm at 16.6 ms
Min: -0.0 mm at -10.0 ms



Filter Class: CFC_600
Max: 34.8 mm at 16.6 ms
Min: -0.0 mm at -3.8 ms

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

11.25.2011 11:26:01 615



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 7-1
Test Date: 11/25/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.358 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	33.7 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	39.8 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.9 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.2 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.8 g	Yes

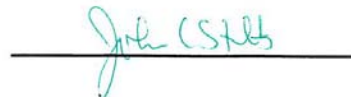
Test meets specifications.

Comments:

Technician



Approved



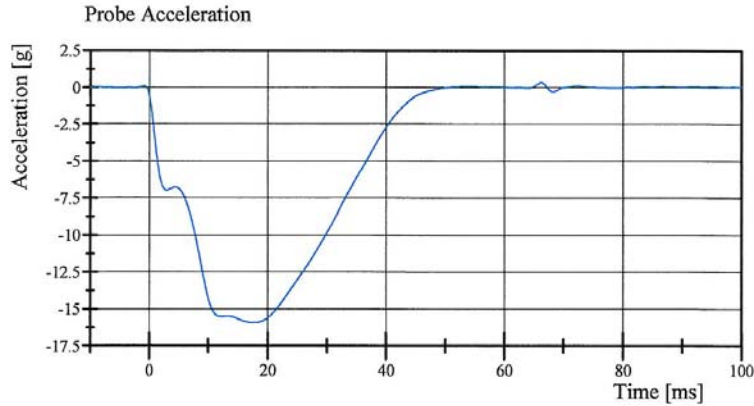
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 09:39:13 797

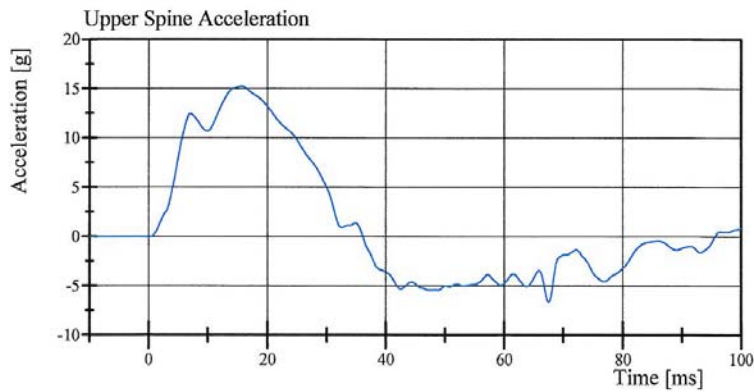


Transportation Research Center Inc.

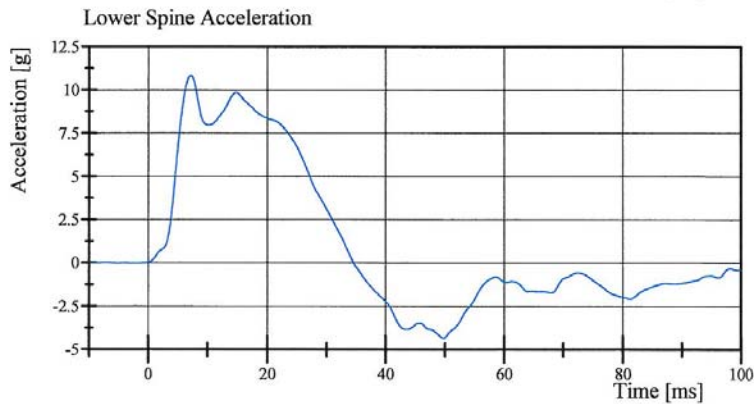
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 7-1
Test Date: 11/25/2011



Filter Class: CFC_180
Max: 0.3 gn at 66.2 ms
Min: -15.9 gn at 17.8 ms



Filter Class: CFC_180
Max: 15.2 gn at 15.7 ms
Min: -6.6 gn at 67.5 ms



Filter Class: CFC_180
Max: 10.8 gn at 7.2 ms
Min: -4.4 gn at 49.8 ms

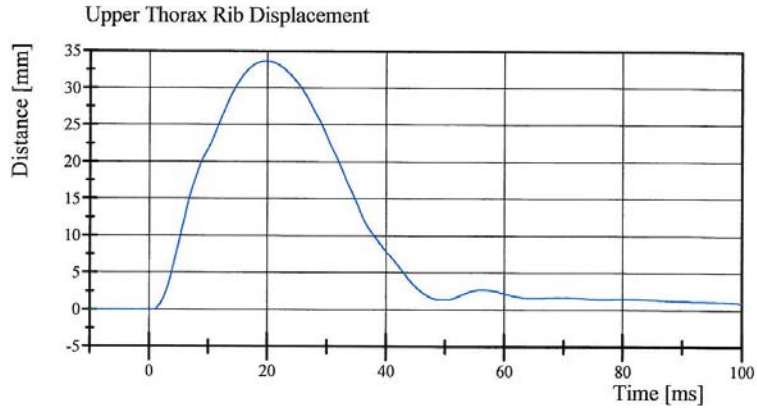
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 09:39:21 797

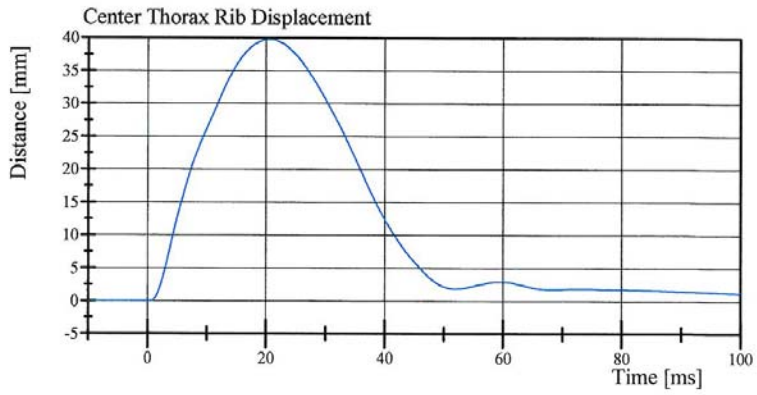


Transportation Research Center Inc.

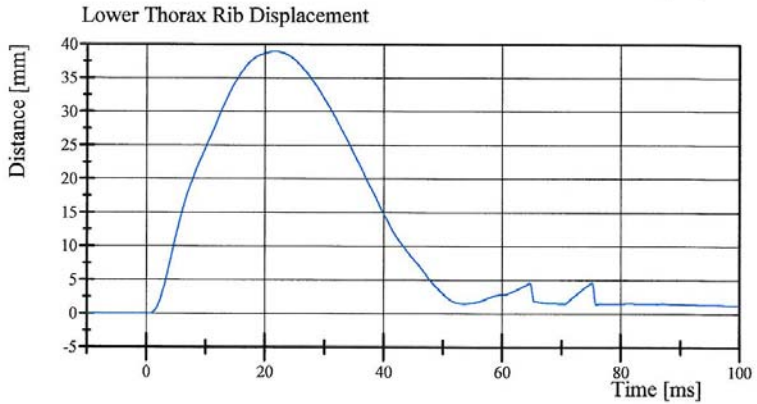
Left Lateral Thorax without Arm
SID IIs Serial No. 033 Certification No. 7-1
Test Date: 11/25/2011



Filter Class: CFC_600
Max: 33.7 mm at 19.8 ms
Min: -0.0 mm at 0.6 ms



Filter Class: CFC_600
Max: 39.8 mm at 20.6 ms
Min: -0.0 mm at 0.6 ms



Filter Class: CFC_600
Max: 38.9 mm at 21.8 ms
Min: -0.0 mm at 0.5 ms

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

11.25.2011 09:39:22 797



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 033 Certification No. 7-1

Test Date: 11/25/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.9 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	39.2 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.9 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.13 g	Yes

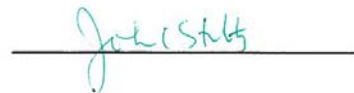
Test meets specifications.

Comments:

Technician



Approved



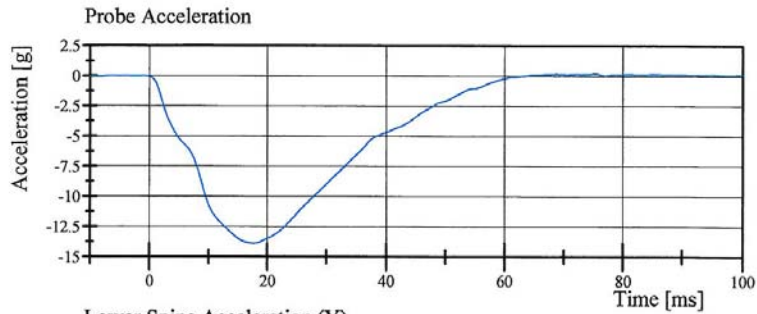
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 08:41:41 628

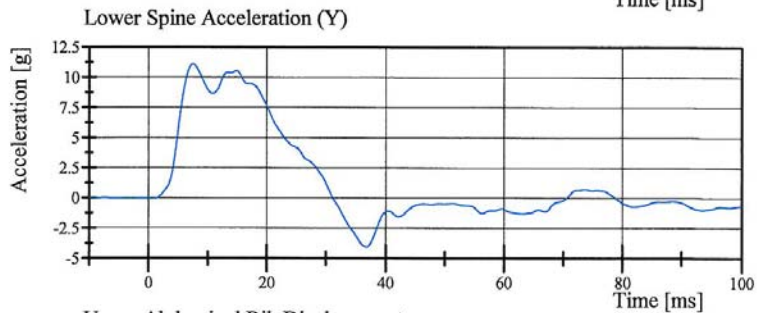


Transportation Research Center Inc.

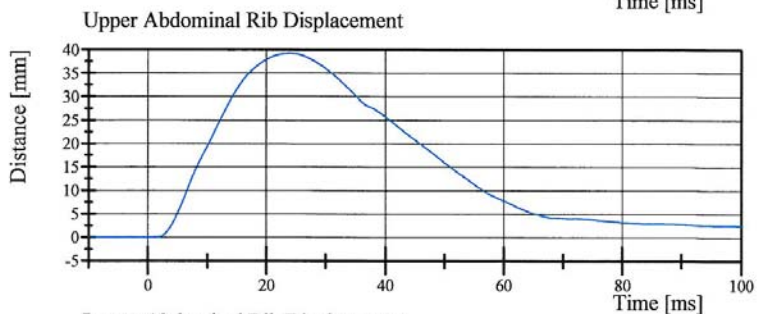
Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 7-1
Test Date: 11/25/2011



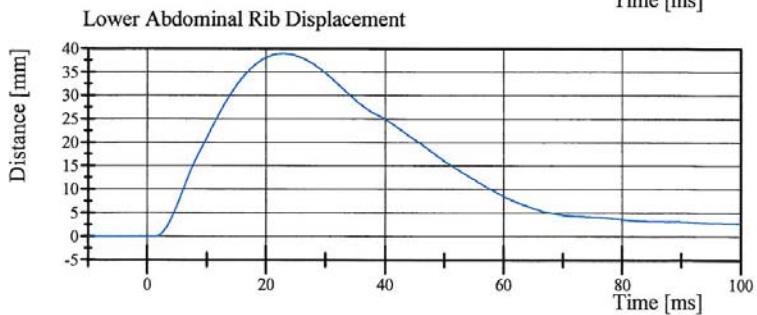
Filter Class: CFC_180
Max: 0.2 gn at 75.4 ms
Min: -13.9 gn at 17.6 ms



Filter Class: CFC_180
Max: 11.1 gn at 7.4 ms
Min: -4.0 gn at 36.8 ms



Filter Class: CFC_600
Max: 39.2 mm at 23.9 ms
Min: -0.0 mm at 1.6 ms



Filter Class: CFC_600
Max: 38.9 mm at 22.9 ms
Min: -0.0 mm at -9.0 ms

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

11.25.2011 08:41:48 628



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 033 Certification No. 7-3

Test Date: 11/25/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.60 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.25 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	39.3 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,148.3 N	Yes

Test meets specifications.

Comments:

Technician



Approved



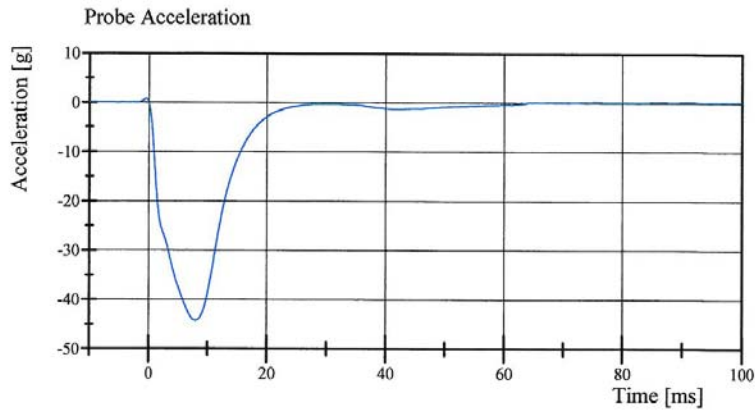
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.25.2011 15:07:10 432

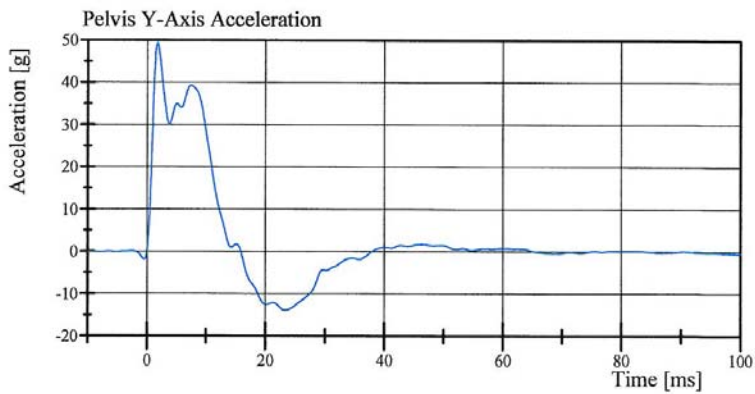


Transportation Research Center Inc.

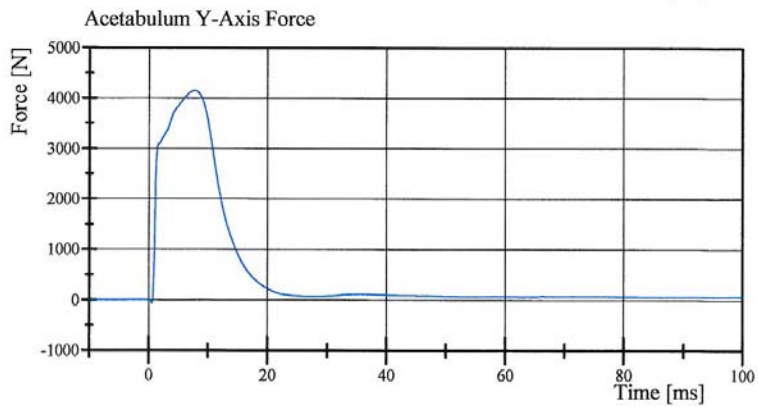
Left Lateral Pelvis
SID IIs Serial No. 033 Certification No. 7-3
Test Date: 11/25/2011



Filter Class: CFC_180
Max: 0.7 gn at -0.5 ms
Min: -44.3 gn at 8.0 ms



Filter Class: CFC_180
Max: 49.4 gn at 1.8 ms
Min: -13.9 gn at 23.3 ms



Filter Class: CFC_600
Max: 4,148.3 N at 7.8 ms
Min: -67.9 N at 0.6 ms

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

11.25.2011 15:07:17 432



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 033 Certification No. 7-2

Test Date: 11/28/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.40 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.7 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.8 g	Yes
Iliac Force	4,100 - 5,100 N	4,414.1 N	Yes

Test meets specifications.

Comments:

Technician



Approved



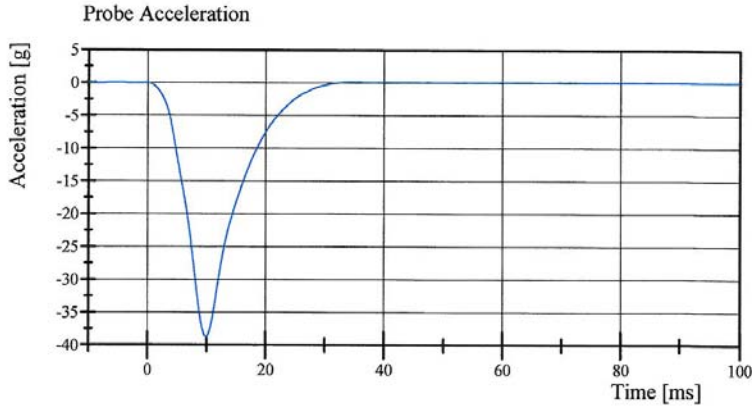
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.28.2011 07:32:32 632

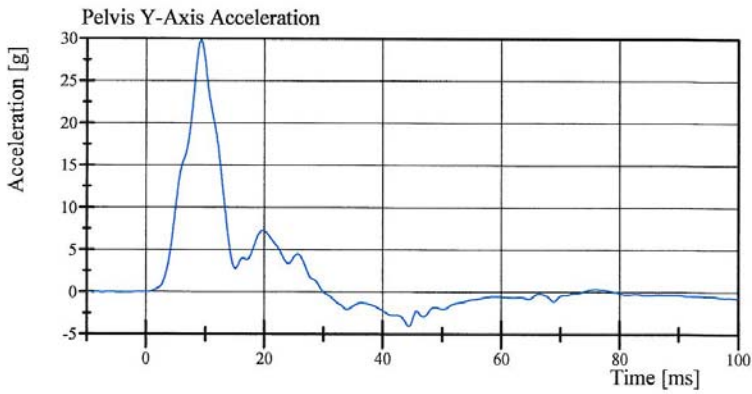


Transportation Research Center Inc.

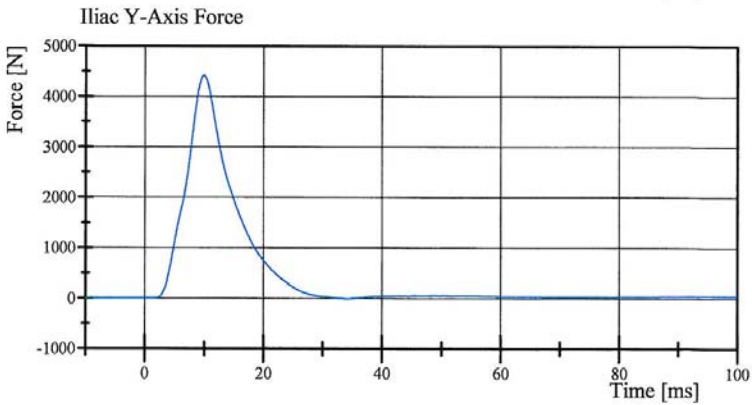
Left Lateral Iliac
SID IIs Serial No. 033 Certification No. 7-2
Test Date: 11/28/2011



Filter Class: CFC_180
Max: 0.2 gn at 34.6 ms
Min: -38.7 gn at 9.9 ms



Filter Class: CFC_180
Max: 29.8 gn at 9.3 ms
Min: -4.1 gn at 44.4 ms



Filter Class: CFC_600
Max: 4,414.1 N at 9.9 ms
Min: -3.6 N at 34.1 ms

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

11.28.2011 07:32:42 632



Post-Test Calibration Sheets
Passenger s/n 033

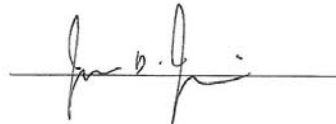
Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 033 Calibration No.08
Date: 12/09/11

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	778	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	134	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	352	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	429	Yes
O	Chest Depth without Jacket	195.0 - 211.0	209	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	351	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	778	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 033 Certification No. 8-3

Test Date: 12/8/2011

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	119.0 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-3.2 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

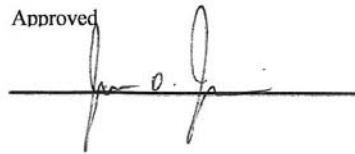
Test meets specifications.

Comments:

Technician



Approved



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

12.08.2011 16:51:22 231

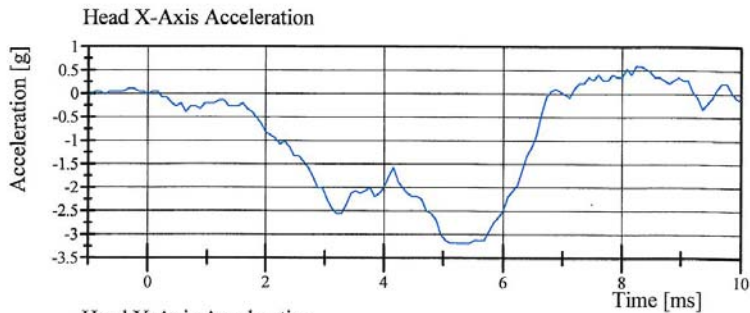


Transportation Research Center Inc.

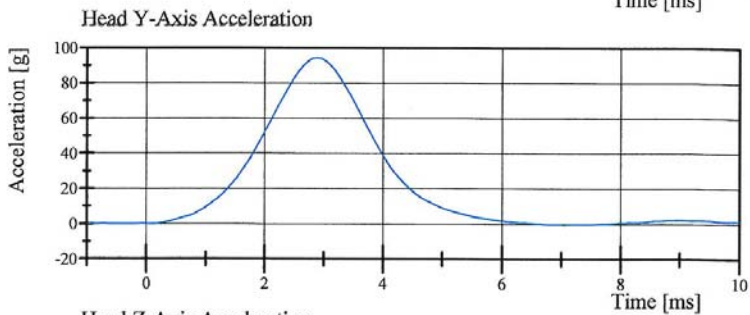
Left Lateral Head Drop

SID IIs Serial No. 033 Certification No. 8-3

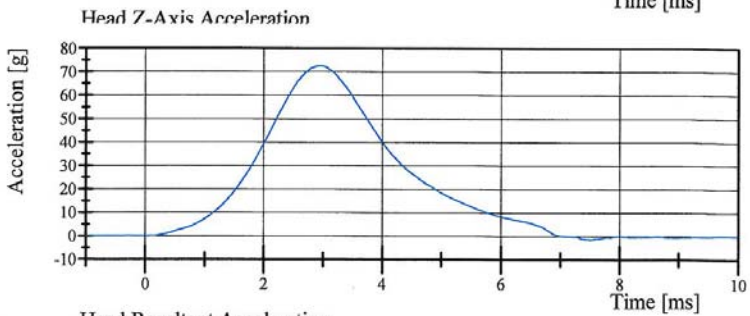
Test Date: 12/8/2011



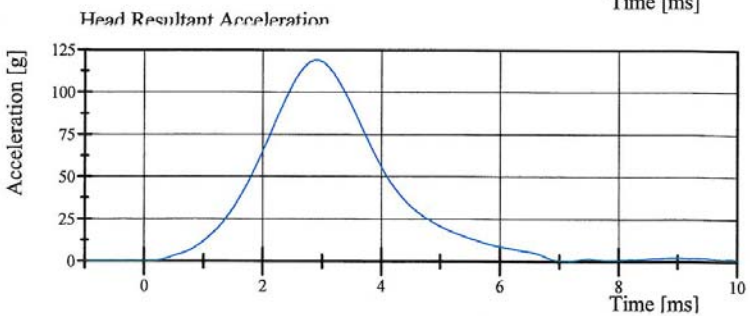
Filter Class: CFC_1000
Max: 0.6 gn at 8.2 ms
Min: -3.2 gn at 5.1 ms



Filter Class: CFC_1000
Max: 94.4 gn at 2.9 ms
Min: -0.5 gn at 7.0 ms



Filter Class: CFC_1000
Max: 72.6 gn at 3.0 ms
Min: -1.5 gn at 7.5 ms



Filter Class: CFC_1000
Max: 119.0 gn at 2.9 ms
Min: 0.0 gn at 0.0 ms

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

12.08.2011 16:51:30 231



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 033 Certification No. 8-2

Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.589 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.250 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.409 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.609 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.634 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.890 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-72.2 deg	Yes
Time of Peak	50 - 70 ms	63.6 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N-m	39.9 N-m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N-m	102 - 126 ms	119.3 ms	Yes

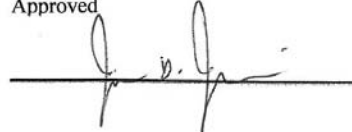
Test meets specifications.

Comments:

Technician



Approved



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

12.07.2011 13:49:08 636

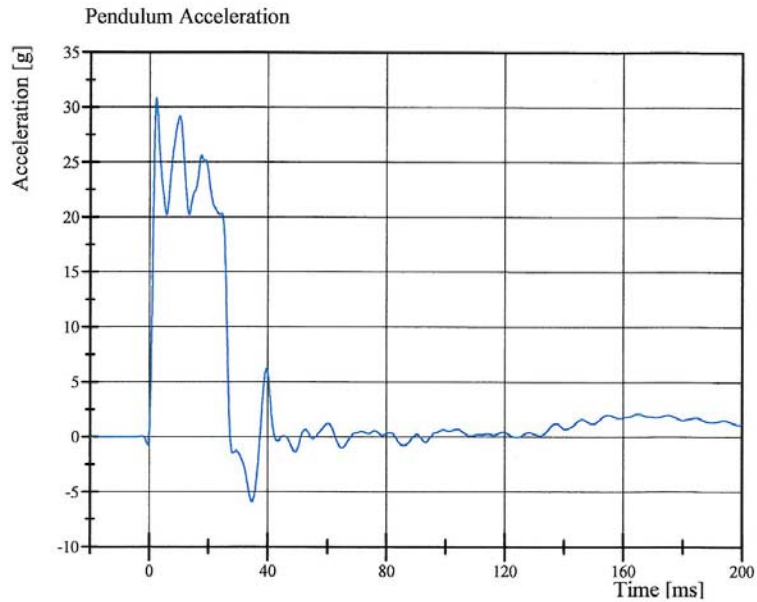


Transportation Research Center Inc.

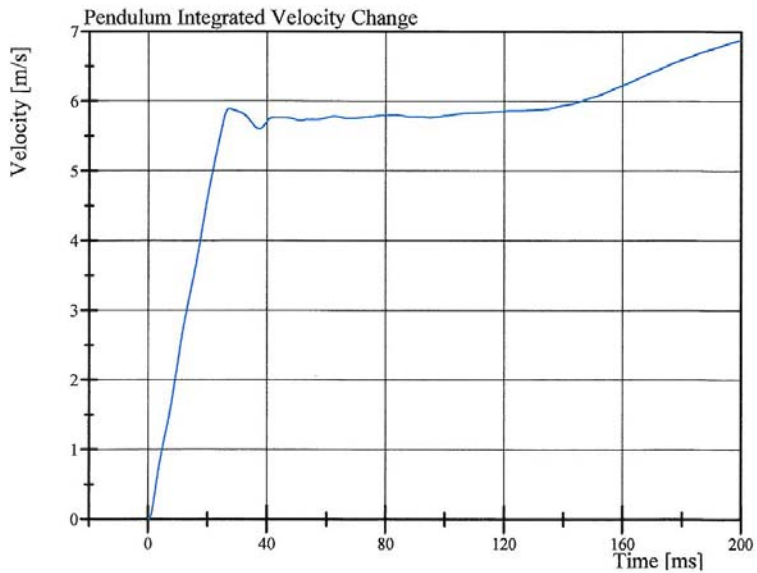
Left Lateral Neck

SID IIs Serial No. 033 Certification No. 8-2

Test Date: 12/7/2011



Filter Class: CFC_180
Max: 30.8 gn at 2.2 ms
Min: -5.9 gn at 34.8 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.

12.07.2011 13:49:16 636

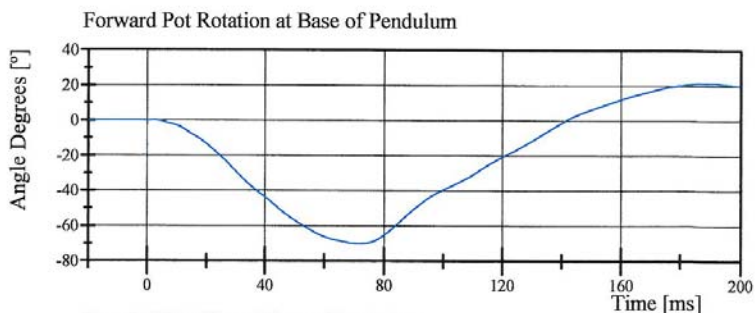


Transportation Research Center Inc.

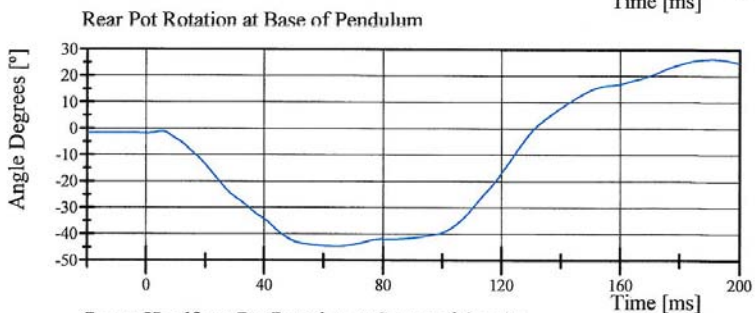
Left Lateral Neck

SID IIs Serial No. 033 Certification No. 8-2

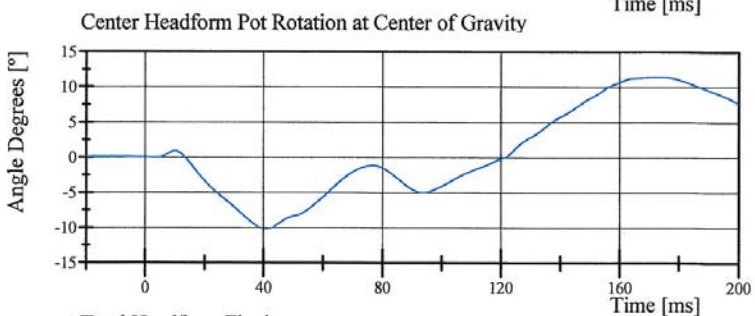
Test Date: 12/7/2011



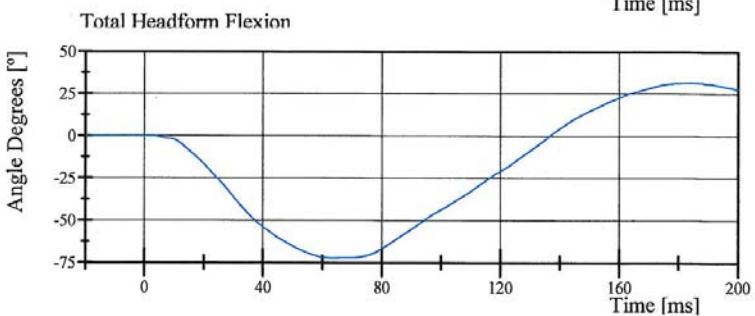
Filter Class: CFC_60
Max: 21.5 ° at 188.2 ms
Min: -70.2 ° at 71.6 ms



Filter Class: CFC_60
Max: 26.5 ° at 191.0 ms
Min: -44.6 ° at 64.2 ms



Filter Class: CFC_60
Max: 11.5 ° at 173.5 ms
Min: -10.2 ° at 41.0 ms



Filter Class: CFC_60
Max: 31.6 ° at 184.4 ms
Min: -72.2 ° at 63.6 ms

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

12.07.2011 13:49:16 636

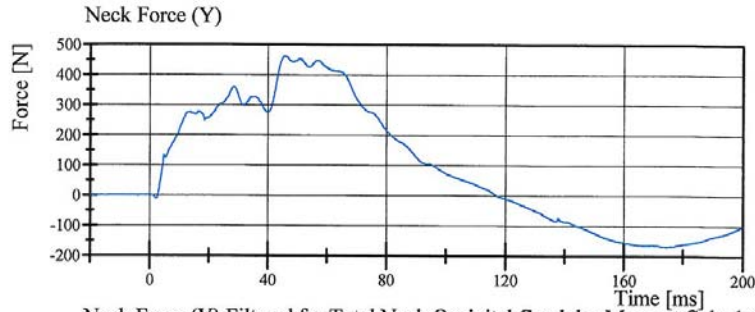


Transportation Research Center Inc.

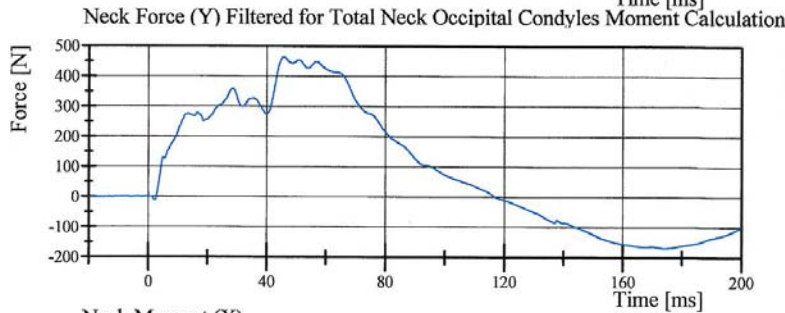
Left Lateral Neck

SID IIa Serial No. 033 Certification No. 8-2

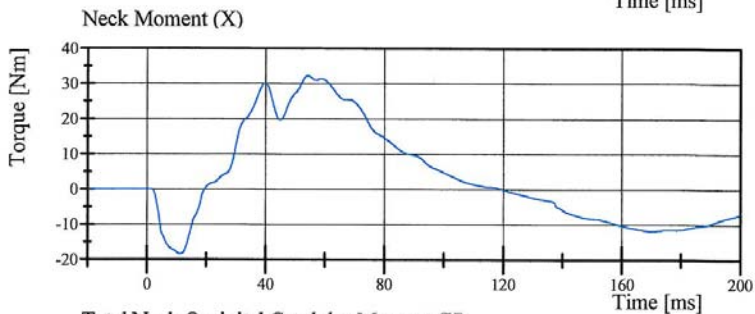
Test Date: 12/7/2011



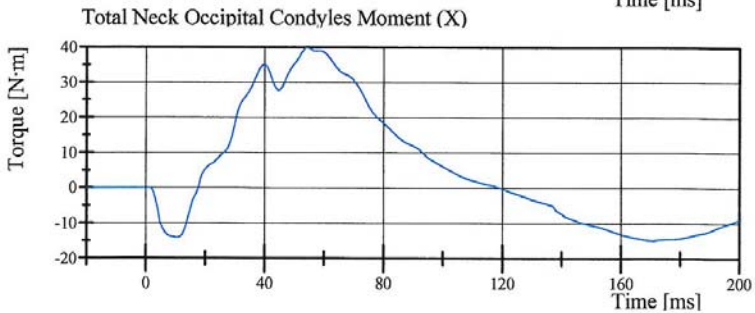
Filter Class: CFC_1000
Max: 463.4 N at 45.4 ms
Min: -168.0 N at 174.3 ms



Filter Class: CFC_600
Max: 462.7 N at 45.4 ms
Min: -167.8 N at 174.4 ms



Filter Class: CFC_600
Max: 32.3 Nm at 54.2 ms
Min: -18.4 Nm at 11.4 ms



Filter Class: Without (Consta
Max: 39.9 N·m at 54.3 ms
Min: -14.7 N·m at 170.6 ms

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

12.07.2011 13:49:17 636



Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 033 Certification No. 8-1
Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.7 g	Yes
Shoulder Displacement	28 - 37 mm	29.4 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.

12.07.2011 15:41:28 806

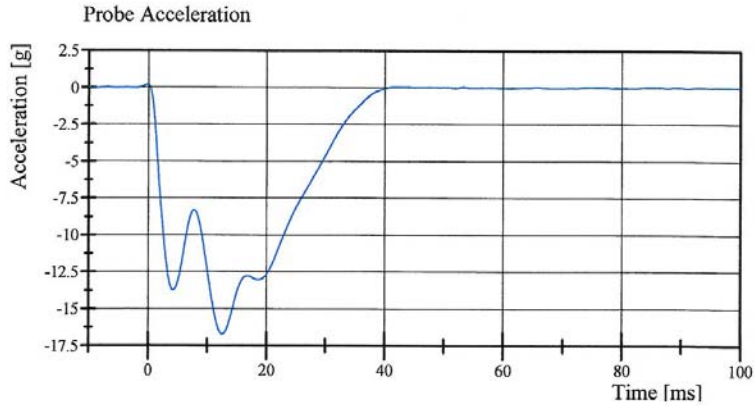


Transportation Research Center Inc.

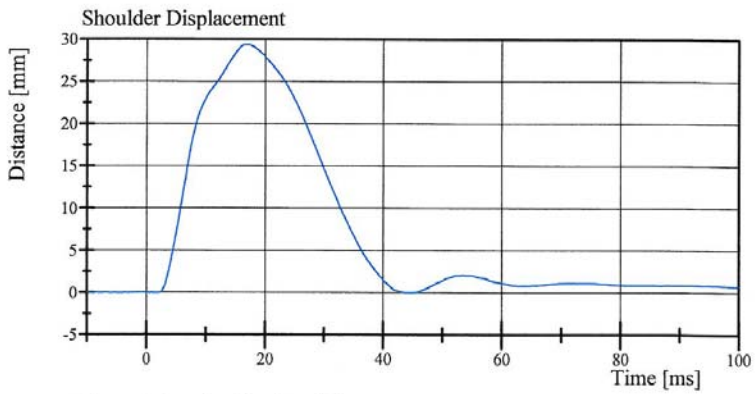
Left Lateral Shoulder

SID IIs Serial No. 033 Certification No. 8-1

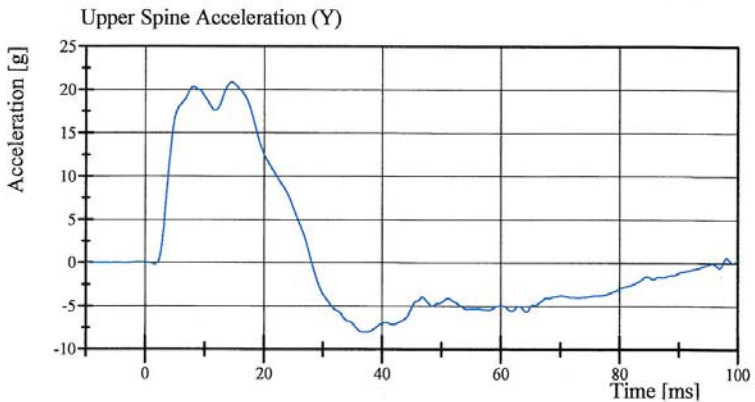
Test Date: 12/7/2011



Filter Class: CFC_180
Max: 0.2 gn at -0.2 ms
Min: -16.7 gn at 12.6 ms



Filter Class: CFC_600
Max: 29.4 mm at 17.0 ms
Min: -0.0 mm at 2.2 ms



Filter Class: CFC_180
Max: 20.9 gn at 14.6 ms
Min: -8.0 gn at 37.1 ms

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

12.07.2011 15:41:36 806



Transportation Research Center Inc.

Left Lateral Thorax without Arm

SID II_s Serial No. 033 Certification No. 8-10

Test Date: 12/8/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.331 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	37.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.1 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	36.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.6 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.3 g	Yes

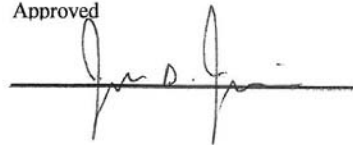
Test meets specifications.

Comments:

Technician



Approved



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

12.08.2011 16:03:20 834

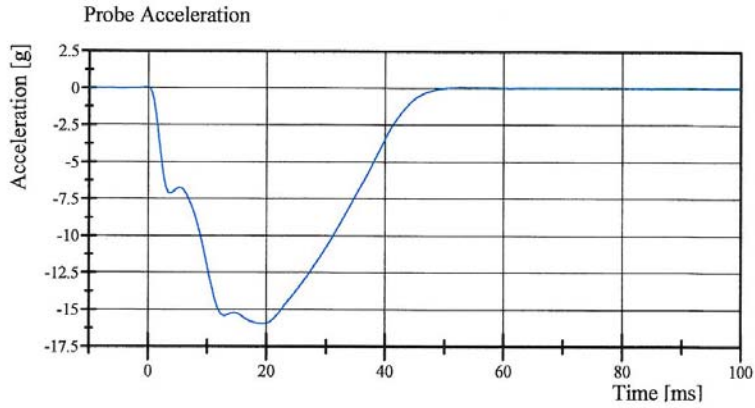


Transportation Research Center Inc.

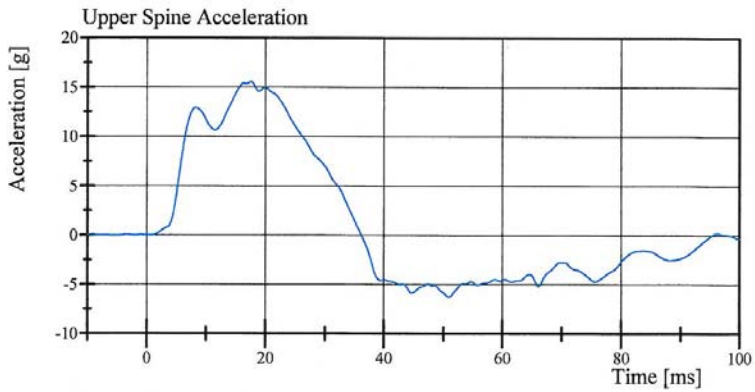
Left Lateral Thorax without Arm

SID IIa Serial No. 033 Certification No. 8-10

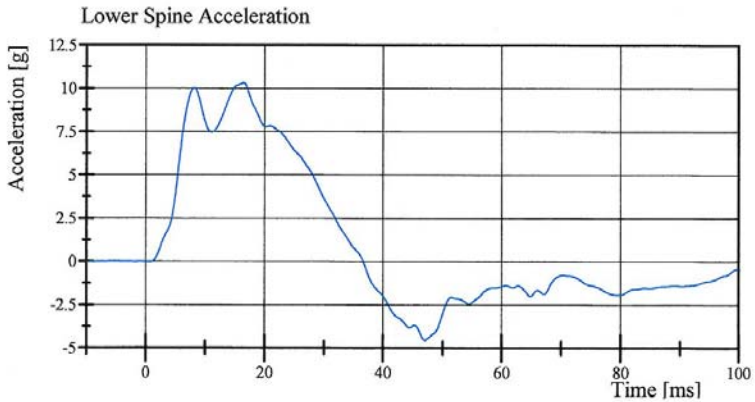
Test Date: 12/8/2011



Filter Class: CFC_180
Max: 0.1 gn at 52.9 ms
Min: -15.9 gn at 19.4 ms



Filter Class: CFC_180
Max: 15.6 gn at 17.6 ms
Min: -6.3 gn at 51.0 ms



Filter Class: CFC_180
Max: 10.3 gn at 16.5 ms
Min: -4.5 gn at 47.0 ms

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

12.08.2011 16:04:00 834

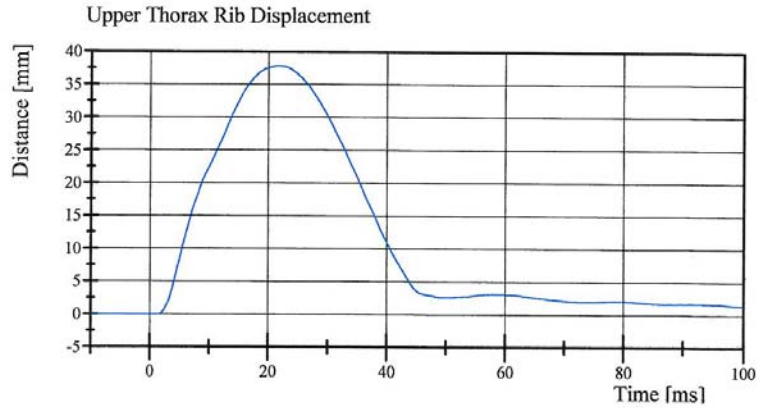


Transportation Research Center Inc.

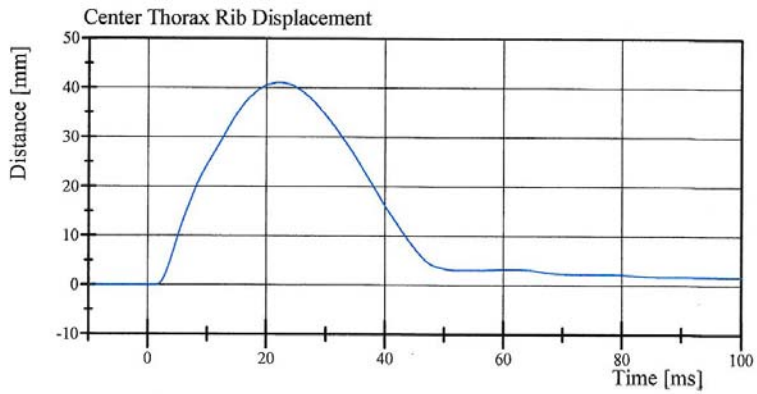
Left Lateral Thorax without Arm

SID II_s Serial No. 033 Certification No. 8-10

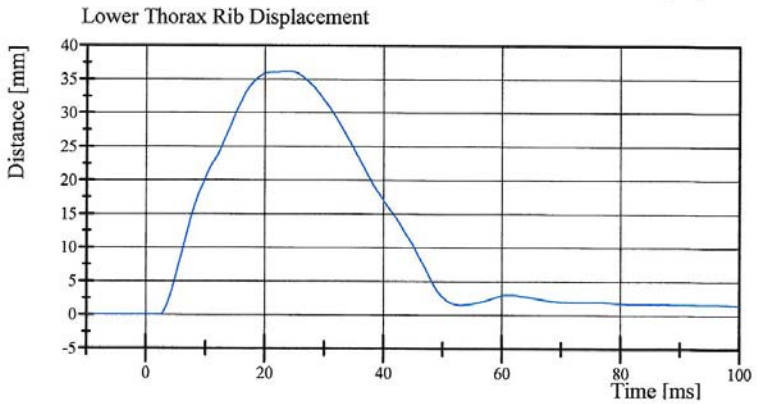
Test Date: 12/8/2011



Filter Class: CFC_600
Max: 37.8 mm at 21.9 ms
Min: -0.0 mm at -9.4 ms



Filter Class: CFC_600
Max: 41.1 mm at 22.2 ms
Min: -0.0 mm at 1.4 ms



Filter Class: CFC_600
Max: 36.2 mm at 24.1 ms
Min: -0.0 mm at 2.3 ms

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

12.08.2011 16:04:01 834



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 8-11
Test Date: 12/9/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.653 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.9 g	Yes
Shoulder Displacement	31 - 40 mm	33.3 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.0 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	30.7 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.0 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	41.5 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	35.8 g	Yes

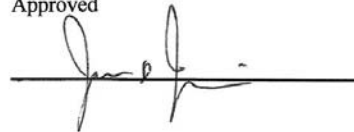
Test meets specifications.

Comments:

Technician



Approved



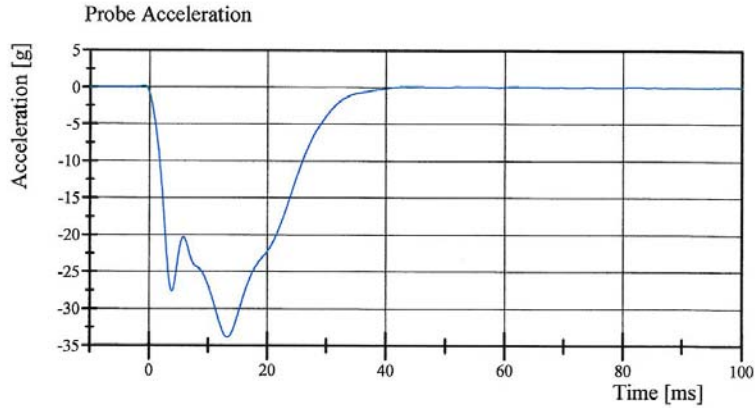
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.09.2011 10:02:38 614

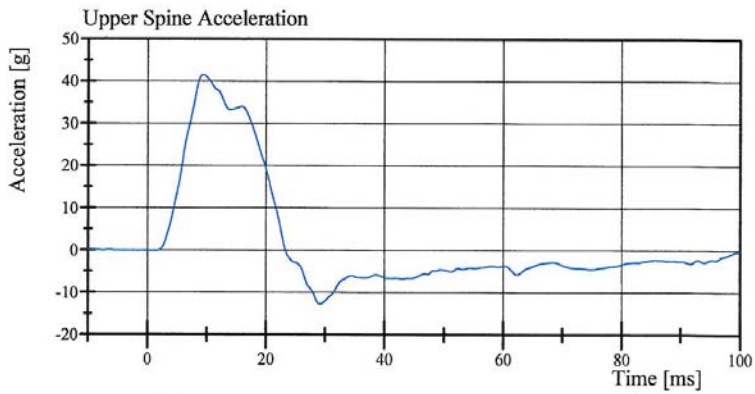


Transportation Research Center Inc.

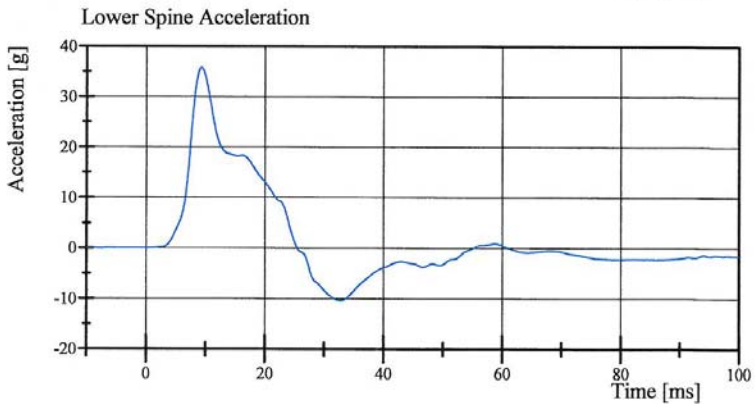
Left Lateral Thorax with Arm
SID II_s Serial No. 033 Certification No. 8-11
Test Date: 12/9/2011



Filter Class: CFC_180
Max: 0.2 gn at -0.9 ms
Min: -33.9 gn at 13.2 ms



Filter Class: CFC_180
Max: 41.5 gn at 9.3 ms
Min: -12.7 gn at 29.2 ms



Filter Class: CFC_180
Max: 35.8 gn at 9.3 ms
Min: -10.4 gn at 32.8 ms

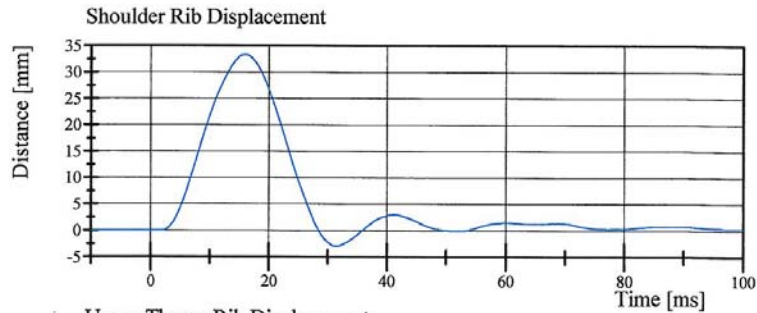
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.09.2011 10:02:48 614

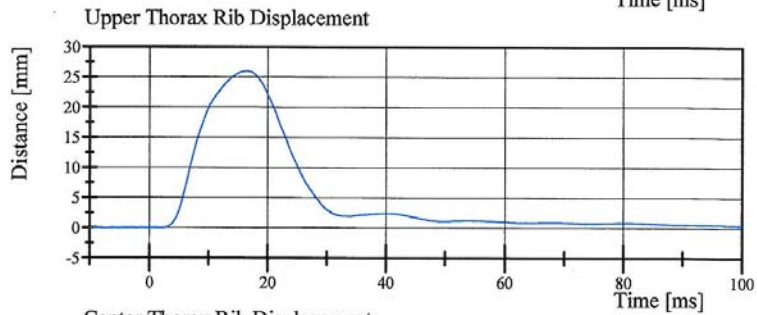


Transportation Research Center Inc.

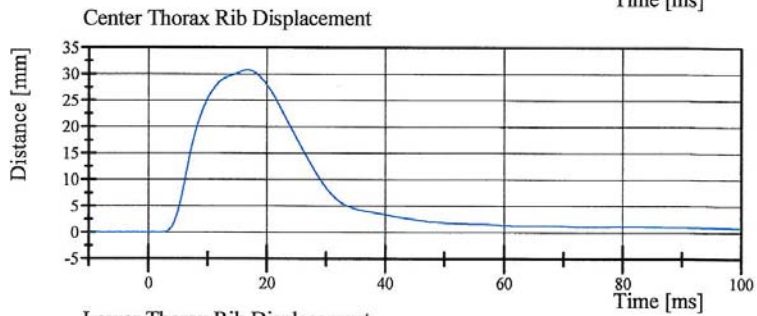
Left Lateral Thorax with Arm
SID IIs Serial No. 033 Certification No. 8-11
Test Date: 12/9/2011



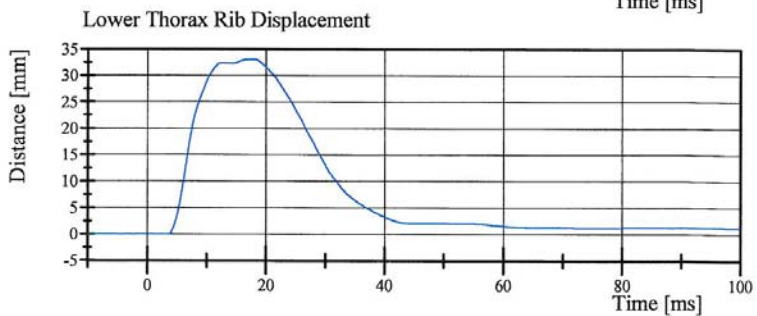
Filter Class: CFC_600
Max: 33.3 mm at 16.0 ms
Min: -2.9 mm at 31.4 ms



Filter Class: CFC_600
Max: 26.0 mm at 16.4 ms
Min: -0.0 mm at -7.2 ms



Filter Class: CFC_600
Max: 30.7 mm at 16.7 ms
Min: -0.0 mm at -3.2 ms



Filter Class: CFC_600
Max: 33.0 mm at 17.8 ms
Min: -0.0 mm at 3.4 ms

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

12.09.2011 10:02:49 614



Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 033 Certification No. 8-1
Test Date: 12/7/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.0 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	39.6 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.7 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	12.87 g	Yes

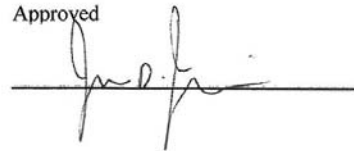
Test meets specifications.

Comments:

Technician



Approved



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

12.07.2011 17:20:30 653

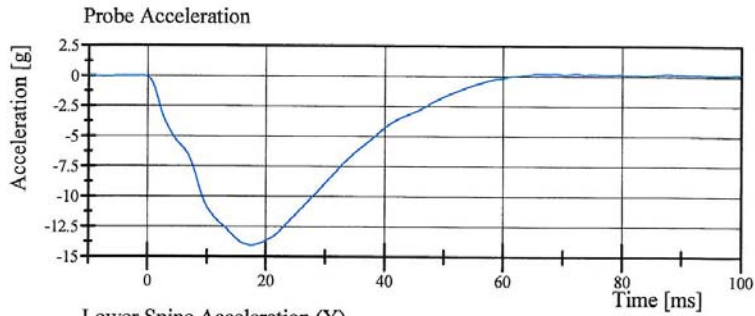


Transportation Research Center Inc.

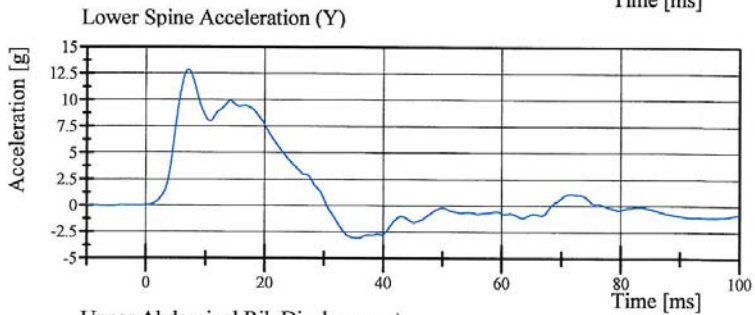
Left Lateral Abdomen

SID IIs Serial No. 033 Certification No. 8-1

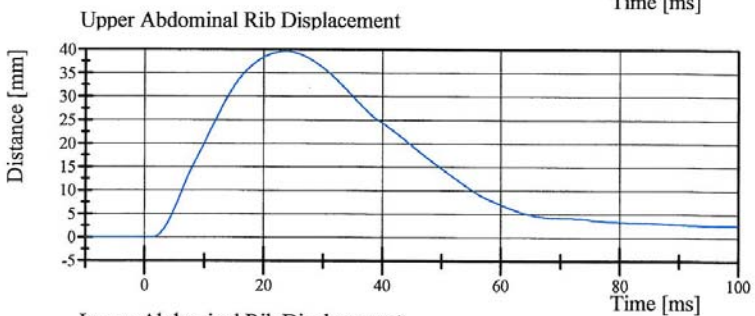
Test Date: 12/7/2011



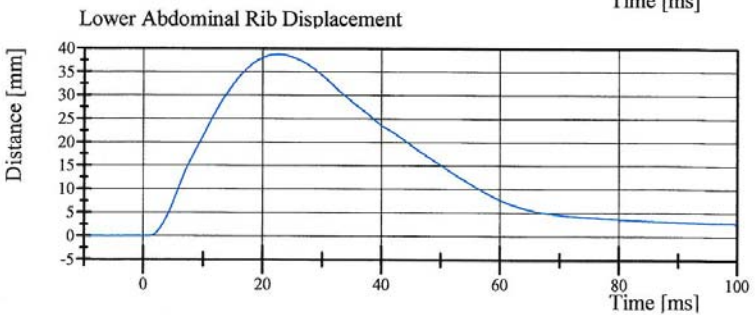
Filter Class: CFC_180
Max: 0.2 gn at 72.0 ms
Min: -14.0 gn at 17.5 ms



Filter Class: CFC_180
Max: 12.9 gn at 7.0 ms
Min: -3.1 gn at 35.8 ms



Filter Class: CFC_600
Max: 39.6 mm at 23.8 ms
Min: -0.0 mm at 1.4 ms



Filter Class: CFC_600
Max: 38.7 mm at 22.6 ms
Min: -0.0 mm at 1.1 ms

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

12.07.2011 17:20:38 653



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 033 Certification No. 8-2

Test Date: 12/8/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-43.99 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	42.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,047.5 N	Yes

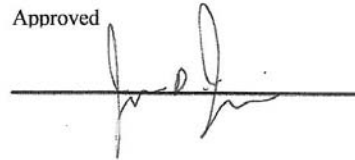
Test meets specifications.

Comments:

Technician



Approved



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

12.08.2011 08:58:40 455

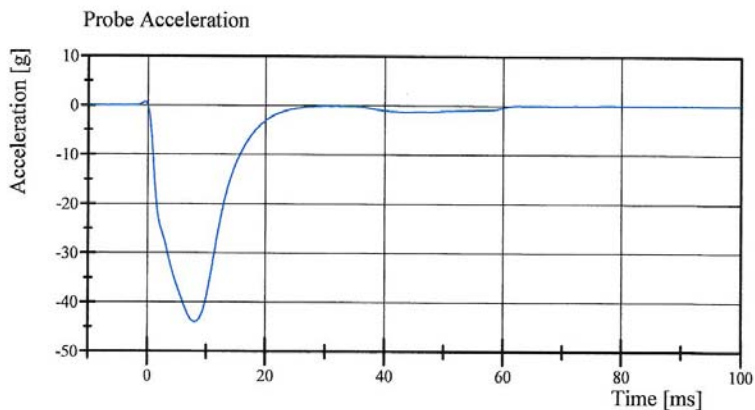


Transportation Research Center Inc.

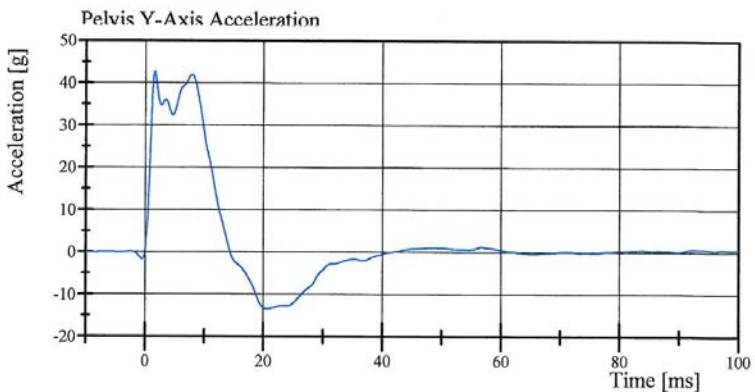
Left Lateral Pelvis

SID IIs Serial No. 033 Certification No. 8-2

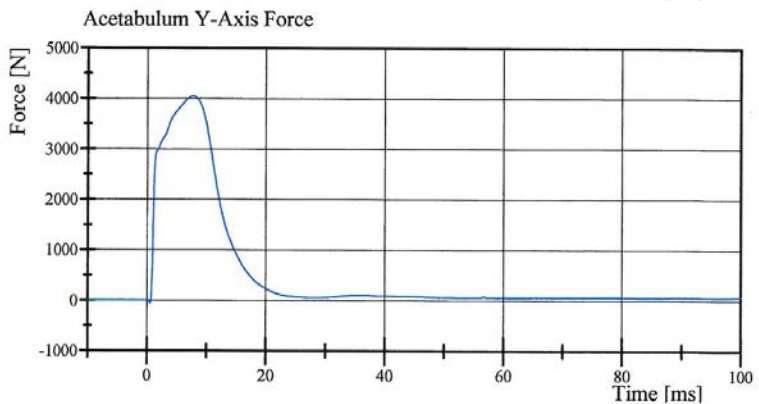
Test Date: 12/8/2011



Filter Class: CFC_180
Max: 0.7 gn at -0.5 ms
Min: -44.0 gn at 8.0 ms



Filter Class: CFC_180
Max: 42.7 gn at 1.6 ms
Min: -13.4 gn at 20.6 ms



Filter Class: CFC_600
Max: 4,047.5 N at 7.8 ms
Min: -62.9 N at 0.6 ms

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

12.08.2011 08:58:48 455



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 033 Certification No. 8-3

Test Date: 12/9/2011

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.39 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-40.5 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	28.7 g	Yes
Iliac Force	4,100 - 5,100 N	4,675.0 N	Yes

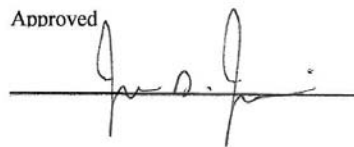
Test meets specifications.

Comments:

Technician



Approved



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

12.09.2011 07:30:48 642

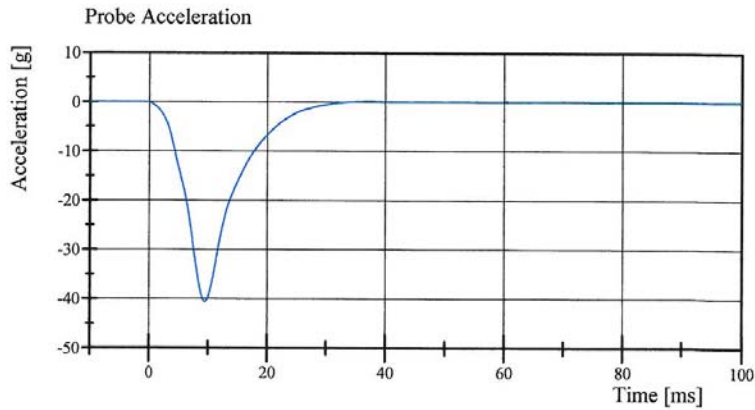


Transportation Research Center Inc.

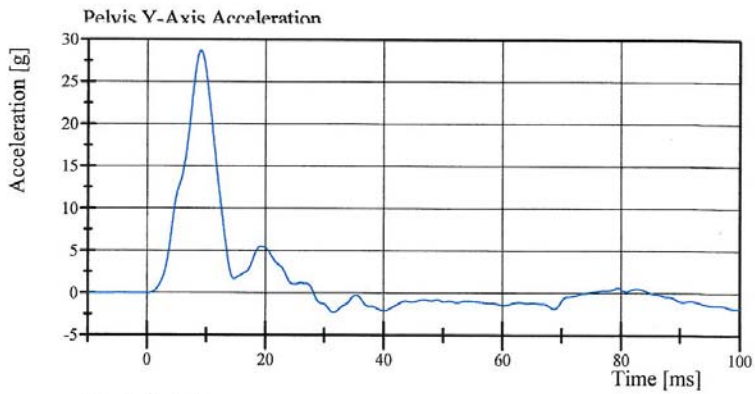
Left Lateral Iliac

SID IIs Serial No. 033 Certification No. 8-3

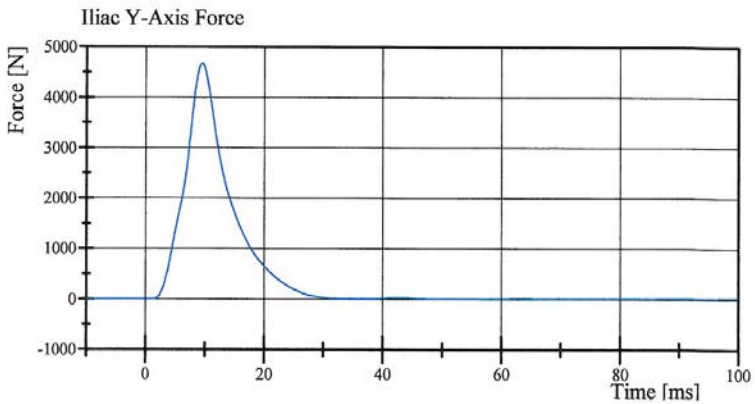
Test Date: 12/9/2011



Filter Class: CFC_180
Max: 0.2 gn at 37.0 ms
Min: -40.5 gn at 9.5 ms



Filter Class: CFC_180
Max: 28.7 gn at 9.0 ms
Min: -2.3 gn at 31.6 ms



Filter Class: CFC_600
Max: 4,675.0 N at 9.5 ms
Min: -1.0 N at -3.8 ms

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

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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	NA	NA	NA
Pubic Symphysis Load Cell		Y	457	Denton	16-Nov-11

TABLE 2 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N 033			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers		X	J32214	Endevco	16-Nov-11	
		Y	J27040	Endevco	16-Nov-11	
		Z	AGAC4	Endevco	16-Nov-11	
Displacement Potentiometers	Shoulder		Y	NA	NA	
	Thoracic Rib	Upper	Y	592	Servo	16-Nov-11
		Middle	Y	213	Servo	16-Nov-11
		Lower	Y	714	Servo	16-Nov-11
	Abdominal Rib	Upper	Y	918	Servo	16-Nov-11
		Lower	Y	904	Servo	16-Nov-11
Lower Spine Accelerometers (T12)		X	00L13-F05	Entran	16-Nov-11	
		Y	03D03D16-F04	Entran	16-Nov-11	
		Z	04J04I20-A17	Entran	16-Nov-11	
Acetabulum Load Cell		Y	113	FTSS	16-Nov-11	
Iliac Wing Load Cell		Y	235	FTSS	16-Nov-11	
Pelvis Plug (struck side)			NA	NA	NA	
Pelvis Plug (non-struck side)			NA	NA	NA	

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P57151	Endevco	6-Jun-11
	Vehicle Center of Gravity	Y	P67031	Endevco	31-Oct-11
	Vehicle Center of Gravity	Z	P66698	Endevco	19-Jul-11
2	Right Sill at Front Seat	X	P61997	Endevco	6-Jun-11
	Right Sill at Front Seat	Y	P73582	Endevco	16-Aug-11
	Right Sill at Front Seat	Z	P57155	Endevco	6-Jun-11
3	Right Sill at Rear Seat	X	P66883	Endevco	31-Oct-11
	Right Sill at Rear Seat	Y	P69091	Endevco	19-Aug-11
	Right Sill at Rear Seat	Z	P63176	Endevco	17-Aug-11
4	Left Sill at Front Door	Y	P69381	Endevco	22-Nov-11
5	Left Sill at Rear Door	Y	P73604	Endevco	23-Nov-11
6	Left A-Post Lower	Y	P61720	Endevco	17-Aug-11
7	Left A-Post Middle	Y	P68752	Endevco	1-Dec-11
8	Left B-Post Lower	Y	P73380	Endevco	9-Aug-11
9	B-Post Middle	Y	P73388	Endevco	11-Aug-11
10	Front Seat Track	Y	P66706	Endevco	1-Dec-11
11	Rear Seat Track or Structure	Y	P73597	Endevco	22-Nov-11
12	Right Rear Occupant Compartment	Y	P73622	Endevco	18-Aug-11
13	Engine Block	X	P73283	Endevco	23-Nov-11
	Engine Block	Y	P73285	Endevco	23-Nov-11
14	Rear Floorpan Above Axle	X	P61726	Endevco	29-Nov-11
	Rear Floorpan Above Axle	Y	P64893	Endevco	29-Nov-11
	Rear Floorpan Above Axle	Z	P57904	Endevco	17-Aug-11

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P54532	Endevco	17-Aug-11
MDB Center of Gravity	Y	P45699	Endevco	17-Aug-11
MDB Center of Gravity	Z	P73624	Endevco	16-Aug-11
Left Frame Rail at Rear Axle Centerline	X	P66747	Endevco	15-Jul-11
Left Frame Rail at Rear Axle Centerline	Y	P64906	Endevco	5-Dec-11