FINAL REPORT NUMBER: SINCAP-TRC-14-003

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

Daimler AG Stuttgart
2014 Ford Fiesta 4-Door Sedan
NHTSA NUMBER: M20140201

PREPARED BY:
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Report Date: March 6, 2014

FINAL REPORT

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

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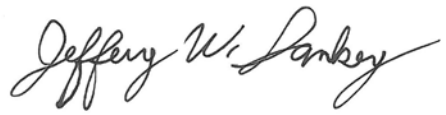
Report Prepared By: ILO Project Operations Group

Report Approved By: 

Jeffery W. Sankey, Manager, Project Operations

Approval Date: March 6, 2014

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

Technical Report Documentation Page

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15. Supplemental Notes		

16. Abstract

This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject vehicle, a 2014 Ford Fiesta 4-Door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on January 9, 2014.

The impact velocity of the Moving Deformable Barrier (MDB) was 61.94 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 21° C. The target vehicle post-test maximum crush was 218 mm at Level 2. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	N/A	1000	102
Maximum Thoracic Rib Deflection	mm	44	32.9
Total Abdominal Force	N	2500	1102.2
Pubic Symphysis Force	N	6000	2040.1

Passenger ATD (SID-IIs)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	N/A	1000	322
Lower Spine Resultant Acceleration	g's	82	90.8
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	5839.2
Maximum Thoracic Rib Deflection	mm	38*	36.1
Maximum Abdominal Rib Deflection	mm	45*	35.1

* Proposed IARV

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

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

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TABLE OF CONTENTS

Section		Page No.
1	Test Purpose and Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information	4
Appendix		
A	Photographs	A-1
B	Vehicle and Dummy Response Data Plots	B-1
C	Dummy Performance Calibration Test Data	C-1
D	Test Equipment and Instrumentation Calibration Data	D-1
Data Sheet No.		Page No.
1	General Test and Vehicle Parameter Data	5
2	Seat, Seat Belt, Steering Wheel Adjustment and Fuel Systems Data	8
3	Dummy Longitudinal Clearance Dimensions	11
4	Dummy Lateral Clearance Dimensions	12
5	Camera and Instrumentation Data	13
6	Test Vehicle Accelerometer Locations	14
7	MDB Accelerometer Locations	15
8	Post-Test Observations	16
9	MDB Summary of Results	18
10	Test Vehicle Profile Measurements	19
11	Test Vehicle Exterior Crush Measurements	20
12	MDB Exterior Static Crush Measurements	23
13	FMVSS No. 301 Static Rollover Results	24
14	Dummy/Vehicle Temperature and Humidity Stabilization	25

SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2014 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00125. The purpose of this test is to generate comparative side impact performance in a 2014 Ford Fiesta 4-Door Sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2013.

SECTION 2

SUMMARY OF TEST RESULTS

A 2014 Ford Fiesta 4-Door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.94 km/h (38.49 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on January 9, 2014. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

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

The dummies were instrumented in the following manner:

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

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

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	102[1]
Maximum Thoracic Rib Deflection	mm	44	32.9
Combined Abdominal Force	N	2500	1102.2
Pubic Symphysis Force	N	6000	2040.1

[1] HIC calculated using redundant Y-axis.

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	322
Lower Spine (T12) Resultant Acceleration	G	82	90.8
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	5839.2
Maximum Thoracic Rib Deflection	mm	38*	36.1
Maximum Abdominal Rib Deflection	mm	45*	35.1

* Proposed IARV

Supplemental Restraint Information is given below:

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

GENERAL COMMENTS

All doors remained closed throughout the test. No fuel spillage occurred during the impact or the static rollover test which followed. Injury values for both ATDs were within the established performance thresholds. The restraint system performed as expected. The vehicle had secondary impact with the cart on the left front bumper and fender.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20140201	Traction Control System (TCS)	Yes
Model Year	2014	Auto-Leveling System	No
Make	Ford	Automatic Door Locks (ADL)	Yes
Model	Fiesta	Power Window Auto-Reverse	No
Body Style	Sedan	Other Optional Feature	N/A
VIN	3FADP4AJ9EM122801	Driver Front Airbag	Yes
Body Color	Silver	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	55 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	1.6	Driver Torso Airbag	No
Type/No. Cylinders	4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Front/Transverse	Driver Pelvis Airbag	No
Transmission Type	Manual	Driver Knee Airbag	Yes
Transmission Speeds	5	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	FWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Passenger Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Passenger Load Limiter	No
		Other Safety Restraint	N/A

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	1642
Date of Manufacture	07/13	GAWR Front (kg)	839
Vehicle Type	Passenger Car	GAWR Rear (kg)	816

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

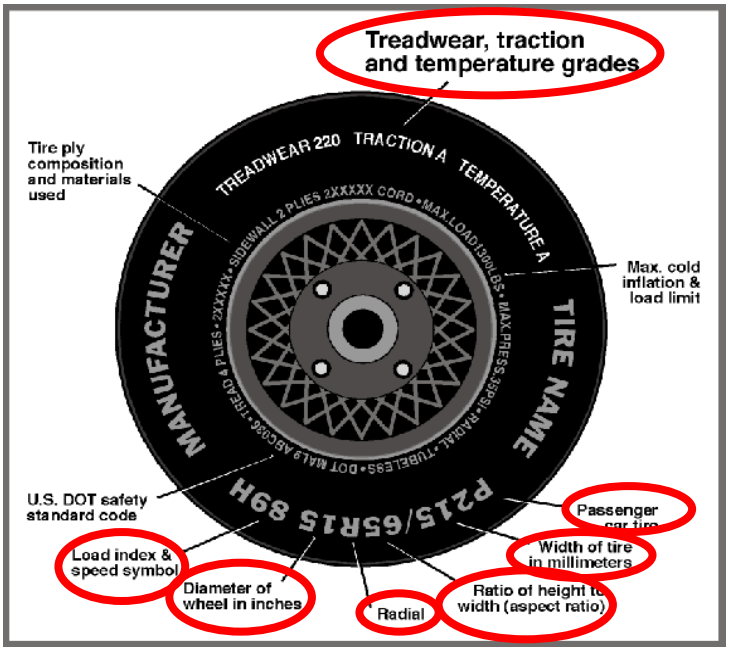
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity DSC)	2	3	N/A	5
Capacity Weight (VCW) (kg)				375
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				34.8

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	185/60R15	185/60R15
Tire Size on Vehicle	185/60R15	185/60R15
Tire Manufacturer	Hankook	Hankook
Tire Model	Optimo H426	Optimo H426
Treadwear	320	320
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1	1
Tire Plies Body	4	4
Load Index/Speed Symbol	84H	84H
Tire Material	Steel, Polyester, Nylon	Steel, Polyester, Nylon
DOT Safety Code Left	5MBT PDL H1613	5MBT PDL H1613
DOT Safety Code Right	5MBT PDL H1613	5MBT PDL H1413

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

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	234	234	241	234
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	241	241	241	241
As Tested	kPa	220	220	220	220

MDB TIRE SPECIFICATIONS

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	342.6	251.2		370.8	305.6		395.8	298.6	
Right	kg	333.8	237.6		352.4	289.6		344.2	290.2	
Ratio	%	58.1	41.9		54.9	45.1		55.7	44.3	
Totals	kg	676.4	488.8	1165.2	723.2	595.2	1318.4	740.0	588.8	1328.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1165.2	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	34.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1325.0	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement
LF	mm	626	632	Yes
RF	mm	631	634	Yes
RR	mm	624	622	Yes
LR	mm	616	613	Yes
Vehicle CG (Aft of Front Axle)	mm	1104	1124	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+33	+19	

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast : None	None
Removed: Trunk lid and liner and right tail light	42.6

DATA SHEET NO. 2

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

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201

Test Program: NCAP Side Impact Test Date: 1/09/14

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	15.0	9.8	12.4
Front Passenger Seat	N/A	N/A	15.5
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	10.5
Non-Struck Side Rear Seat	Fixed	N/A	9.6
Rear Center Seat*	Fixed	N/A	12.2

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	12.4	176	Max	N/A	N/A	N/A
			Mid	165	176	186
			Min	N/A	N/A	N/A
Front Passenger Seat	15.5	164	Max	N/A	N/A	N/A
			Mid	154	164	174
			Min	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	10.5	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	9.6	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	12.2	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

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

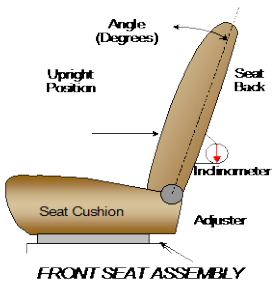
Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	240	25	120	13
Front Passenger Seat	240	25	120	13
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Non-Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Rear Center Seat*	Fixed	N/A	Fixed	N/A

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	55.8	22	12.3	10
Front Passenger Seat	55.6	22	12.5	8
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	Fixed	N/A	26.5	N/A
Non-Struck Side Rear Seat	Fixed	N/A	26.5	N/A
Rear Center Seat*	Fixed	N/A	24.0	N/A

SEAT BELT ANCHORAGE ADJUSTMENT

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

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

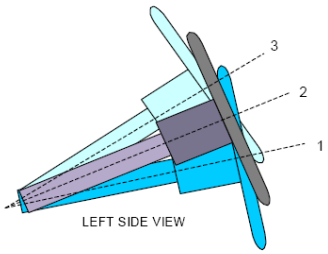
	Total # of Positions	Placed in Position #
Driver Seat	3, Numbered from 0 to 2	0, Uppermost
Rear Seat	3, Numbered from 0 to 2	2, Lowermost

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

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

STEERING COLUMN ADJUSTMENT

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

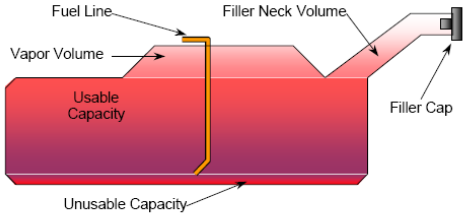


STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	21.0	0
Geometric Center, Position No. 2	23.0	0
Uppermost, Position No. 3	24.9	0
Telescoping Steering Wheel Travel		40
Test Position	22.9	20

FUEL PUMP

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



VEHICLE FUEL TANK ASSEMBLY

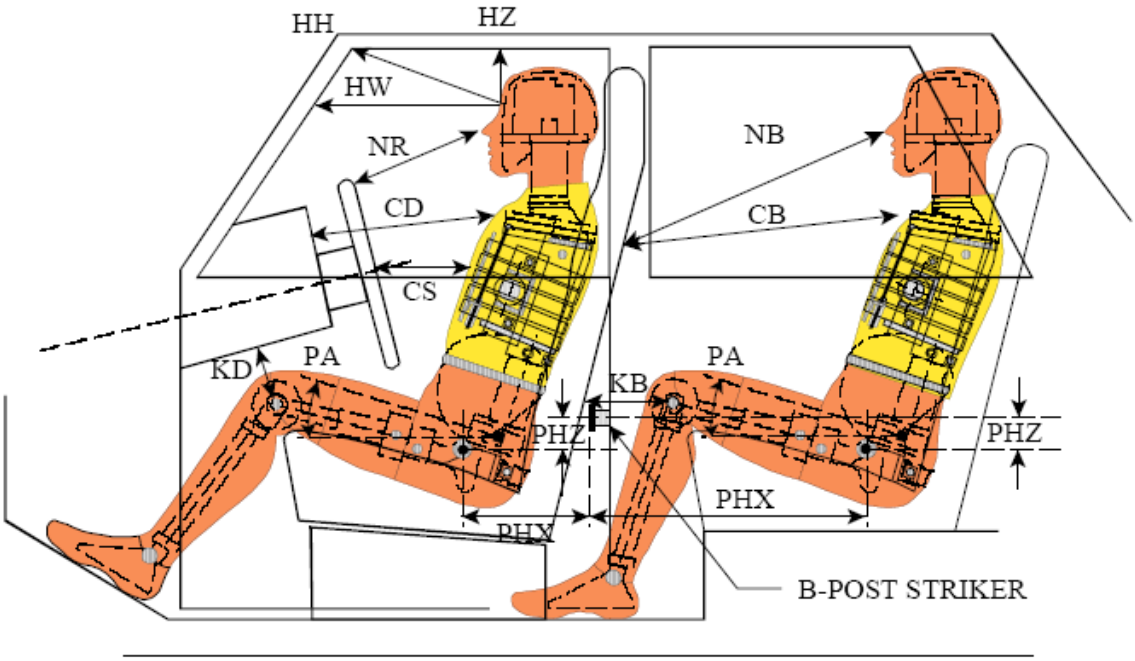
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	46.9
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	48.0
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	43.5
Actual Amount of Solvent Used in Test	43.5
1/3 of Usable Capacity	14.5

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



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

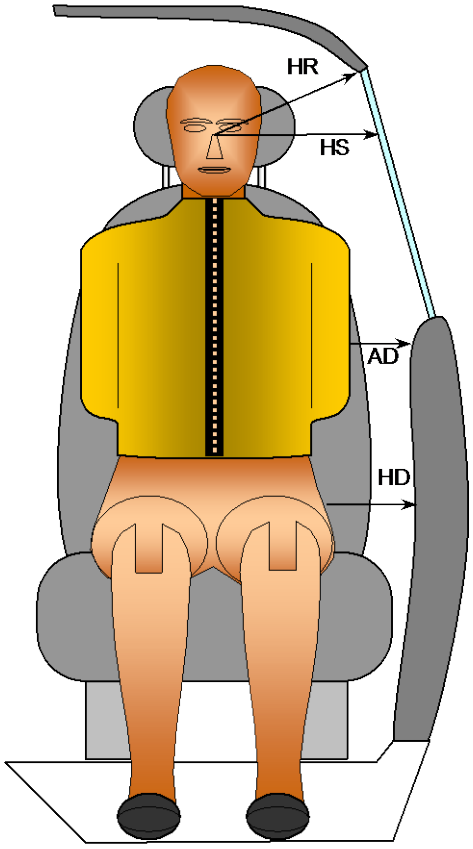
LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	365			
HW		Header to Windshield	634			
HZ	HZ	Head to Roof Liner	147		227	
NR	NB	Nose to Rim/Seat Back	410		493	
CD	CB	Chest to Dash/Seat Back	543		474	
CS		Chest to Steering Wheel	276			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	146	27.0	221	8.0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	117	27.0	227	8.0
PAX°	PAX°	Pelvic Tilt Angle X		1.2		0.3
	PAY°	Pelvic Tilt Angle Y				21.1
PHX	PHX	Hip Point to Striker (X-Axis)	176		270	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	125		331	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

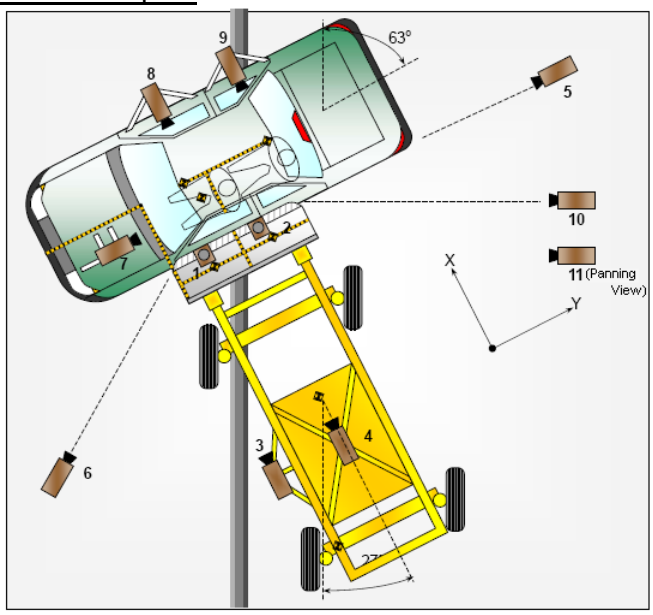


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	160	219
HS	Head to Side Window	mm	283	348
AD	Arm to Door	mm	76	97
HD	H-Point to Door	mm	142	156

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	840	-5714	8.5	1000
2	Overhead Close-up	0	460	-5714	16	1000
3	Left Impact Point (MDB)	-1823	-855	-824	25	1000
4	Side Overall (MDB)	-2465	0	-1437	8.5	1000
5	Rear	223	7465	-1277	Zoom	1000
6	Left Front	-3075	-5140	-1142	Zoom	1000
7	Driver Front (OB)				8.5	1000
8	Driver Side (OB)				8.5	1000
9	Passenger Side (OB)				8.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

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

*All measurements accurate to ± 6 mm.

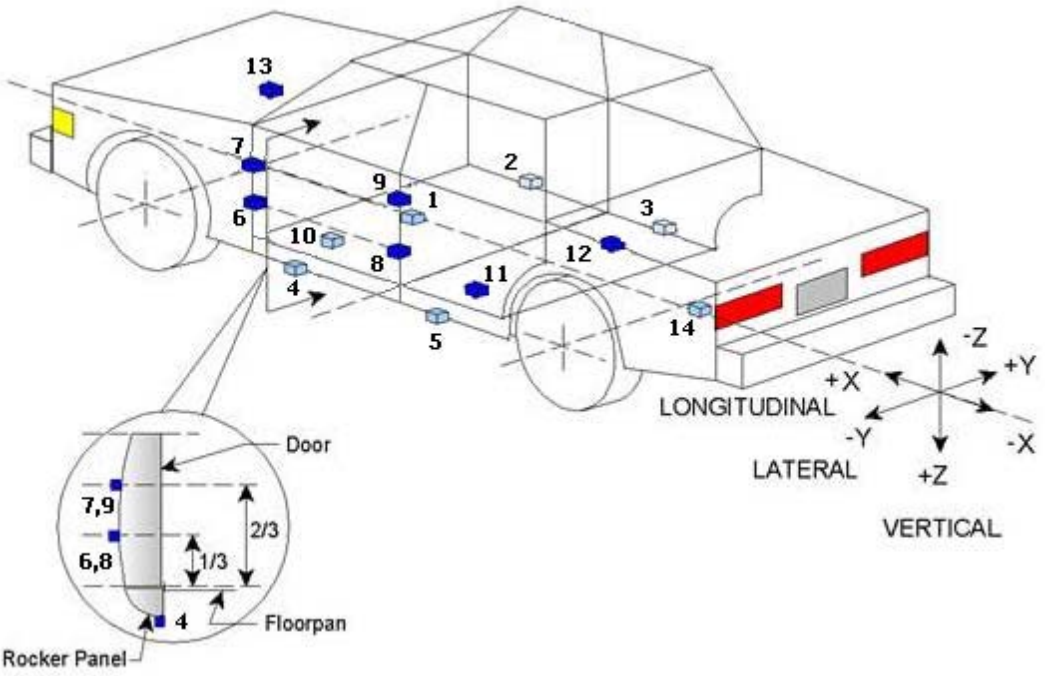
If applicable, explain why camera(s) did not operate as intended:

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



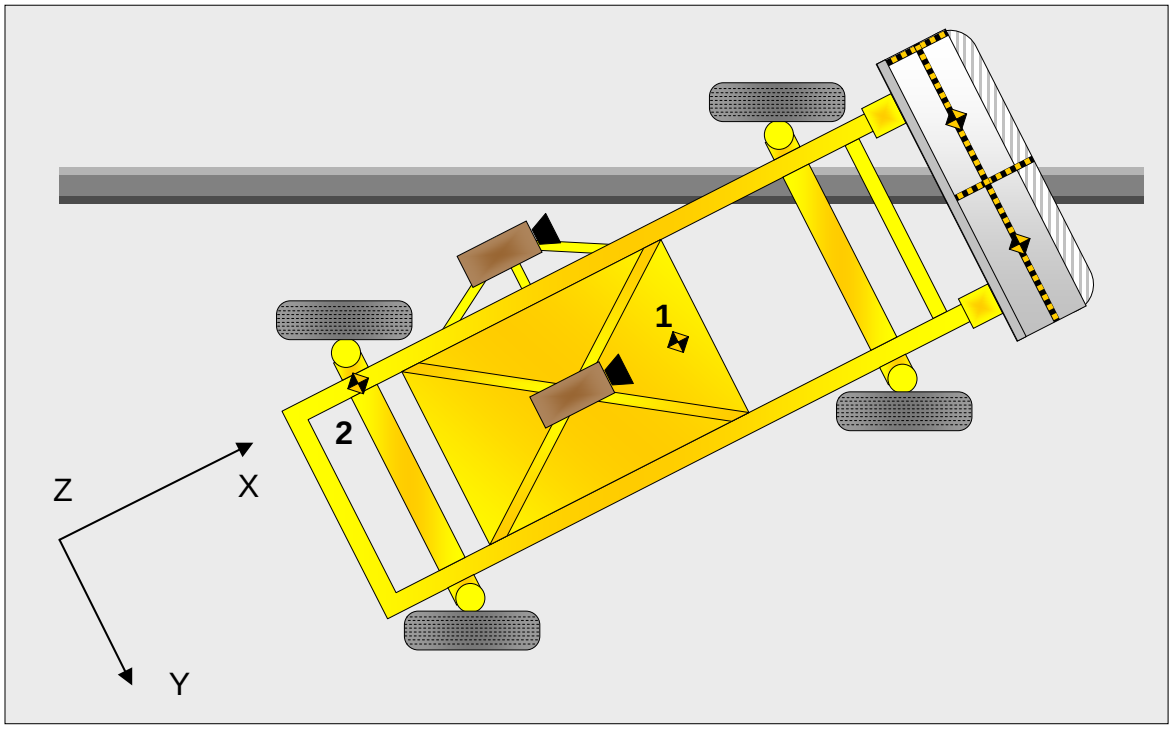
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2410	100	-363
2	Right Sill at Front Seat	2410	590	-304
3	Right Sill at Rear Seat	1605	615	-322
4	Left Sill at Front Door	2410	-590	-306
5	Left Sill at Rear Door	1610	-615	-306
6	A-Post Lower	2852	-760	-500
7	A-Post Middle	2862	-741	-839
8	B-Post Lower	1782	-765	-476
9	B-Post Middle	1760	-750	-888
10	Front Seat Track	2247	-515	-328
11	Rear Seat Structure	1187	-358	-347
12	Right Rear Occ. Compartment	1440	480	-336
13	Engine Block	3408	-10	-774
14	Rear Above Axle	895	1495	-455

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

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan
Test Program: NCAP Side Impact
NHTSA No.: M20140201
Test Date: 1/09/14



MDB ACCELEROMETER LOCATIONS

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

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB	SCAB, Headliner
Top of Head	SCAB, Headliner	SCAB, Headliner
Left Side of Head	SCAB	SCAB
Back of Head	SCAB, Headliner	Headliner
Left Shoulder	Torso/Pelvis Bag	Door Panel
Upper Torso	Torso/Pelvis Bag	Door Panel
Lower Torso	Torso/Pelvis Bag	Door Panel
Left Hip	Door Panel	Door Panel
Left Knee	Window Crank	Door Panel

POST TEST DOOR PERFORMANCE

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

POST TEST SEAT PERFORMANCE

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

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Major Deformation
Sill Separation	None
Windshield Damage	None
Side Window Damage	Left front and left rear Shattered
Other Notable Effects	N/A

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2490
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		306
Actual Impact Point (Aft of Front Axle)	mm		308
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	-2
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-1

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2591
C.G. Location aft of Front Axle	1111

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	395.6	286.2	681.8
Right	kg	385.4	300.6	686.0
Ratio	%	57.1	42.9	100
Totals	kg	781	586.8	1367.8

SPEED AND IMPACT ANGLE DATA

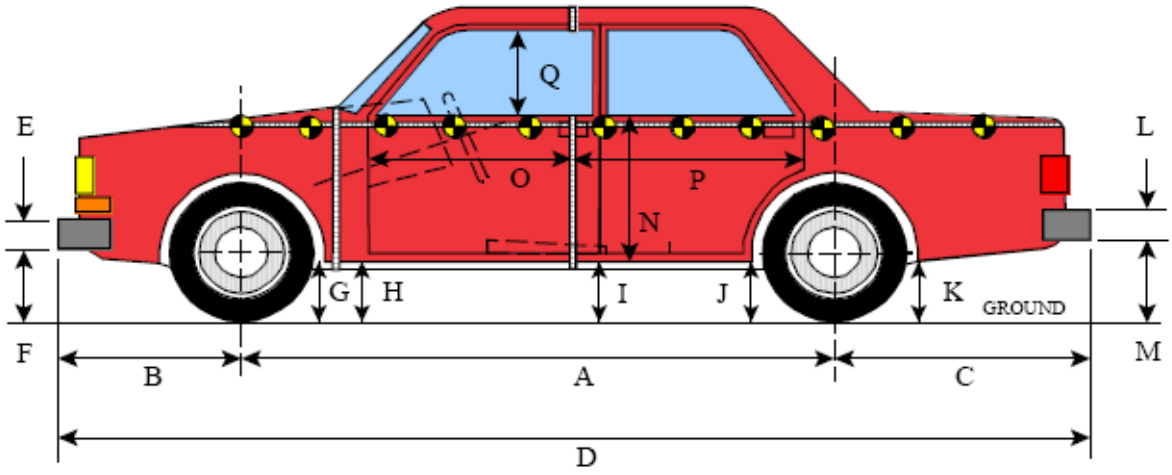
Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.94
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.91
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27.0

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	700	Left	-174
B	Top of Bumper	533	300	Right	-373
C	Mid-Level	686	800	Left	-124
D	Top of Stack	813	800	Left	-166

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



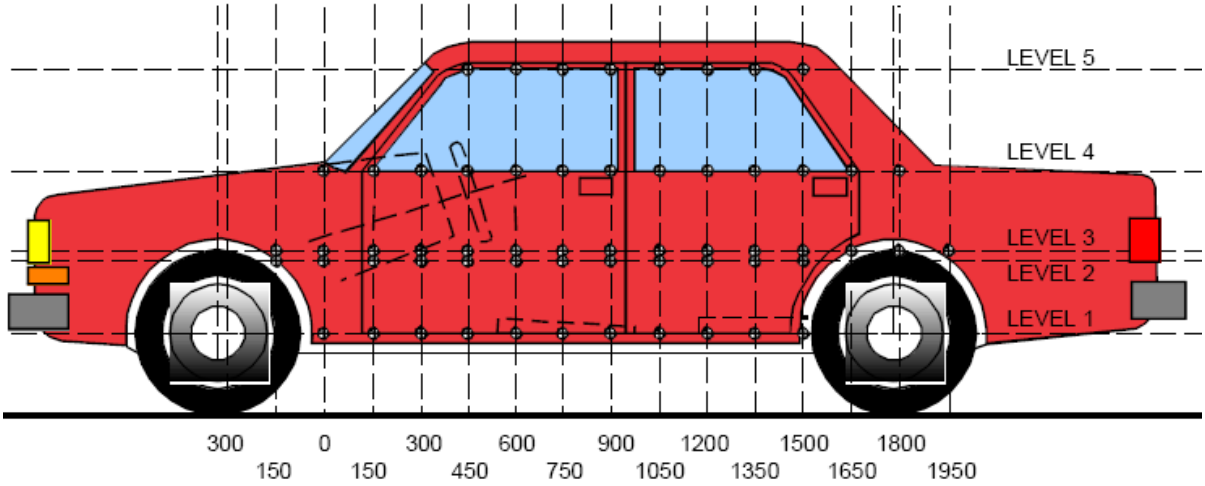
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2490	2500	-10
B	Front Axle to Front Surface of Vehicle	850	890	-40
C	Rear Axle to Rear Surface of Vehicle	1075	1067	8
D	Total Length at Centerline	4415	4420	-5
E	Front Bumper Thickness	92	92	0
F	Front Bumper Bottom to Ground	376	432	-56
G	Sill Height at Front Wheel Well	245	278	-33
H	Sill Height at Front Door Leading Edge	244	289	-45
I	Sill Height at B-Pillar	242	325	-83
J1	Sill Height at Rear Wheel Well	250	318	-68
J2	Pinch Weld Height at Rear Wheel Well	184	223	-39
K	Sill Height Aft of Rear Wheel Well	260	307	-47
L	Rear Bumper Thickness	78	78	0
M	Rear Bumper Bottom to Ground	535	581	-46
N	Sill Height to Window Bottom Sill	708	638	70
O	Front Door Leading Edge to Impact CL	743	725	18
P	Rear Door Trailing Edge to Impact CL	1294	982	312
Q	Front Window Opening	377	361	16
R	Right Side Length	4260	4260	0
S	Left Side Length	4260	4280	-20
T	Vehicle Width at B Pillar	1695	1572	123

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	340	127	750
2	Driver Hip Point	552	218	1500
3	Mid-Door	608	215	1500
4	Window Sill	858	177	1650
5	Window Top	1386	-2	1350

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

DATA SHEET NO. 11 (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

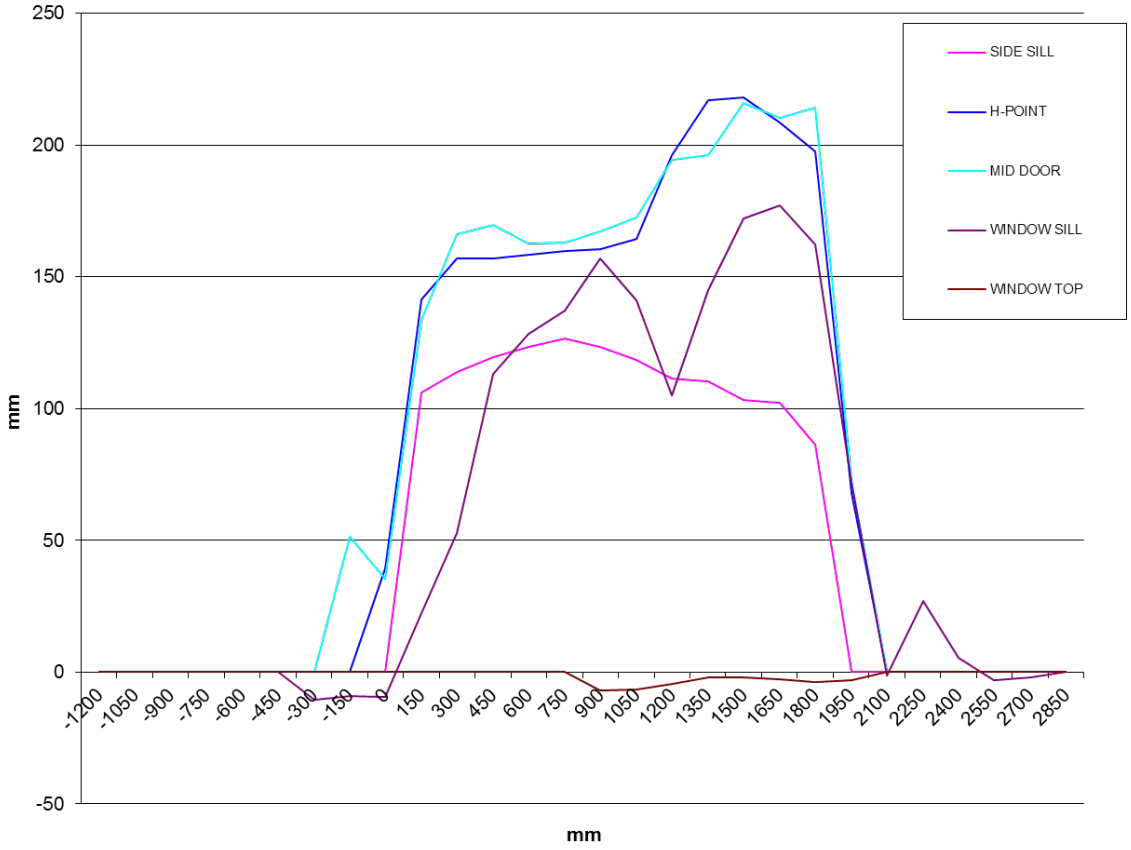
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	0	0	740	0	0	0	0	750	0	0	0	0	-10	0
-150	0	0	851	762	0	0	0	800	771	0	0	0	51	-9	0
0	0	847	844	770	0	0	807	809	779	0	0	40	35	-9	0
150	825	834	831	783	0	719	693	698	761	0	106	141	133	22	0
300	830	837	836	797	0	716	680	670	745	0	114	157	166	52	0
450	834	840	840	810	0	714	683	670	697	0	120	157	170	113	0
600	834	842	842	820	0	710	683	680	692	0	124	159	162	128	0
750	833	842	844	827	0	706	683	681	690	0	127	159	163	137	0
900	830	842	844	822	547	707	682	677	665	554	123	160	167	157	-7
1050	826	841	843	845	566	708	677	671	704	573	118	164	172	141	-7
1200	821	838	841	831	568	710	642	647	726	573	111	196	194	105	-5
1350	813	834	837	823	564	703	617	641	678	566	110	217	196	145	-2
1500	804	829	832	816	560	700	611	617	644	562	104	218	215	172	-2
1650	801	823	827	812	554	699	615	616	635	557	102	208	211	177	-3
1800	815	829	827	808	541	729	632	613	646	545	86	197	214	162	-4
1950	0	843	843	802	519	0	775	771	730	522	0	68	72	72	-3
2100	0	0	0	793	0	0	0	0	794	0	0	0	0	-1	0
2250	0	0	0	784	0	0	0	0	757	0	0	0	0	27	0
2400	0	0	0	770	0	0	0	0	765	0	0	0	0	5	0
2550	0	0	0	756	0	0	0	0	759	0	0	0	0	-3	0
2700	0	0	0	737	0	0	0	0	739	0	0	0	0	-2	0
2850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition.

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

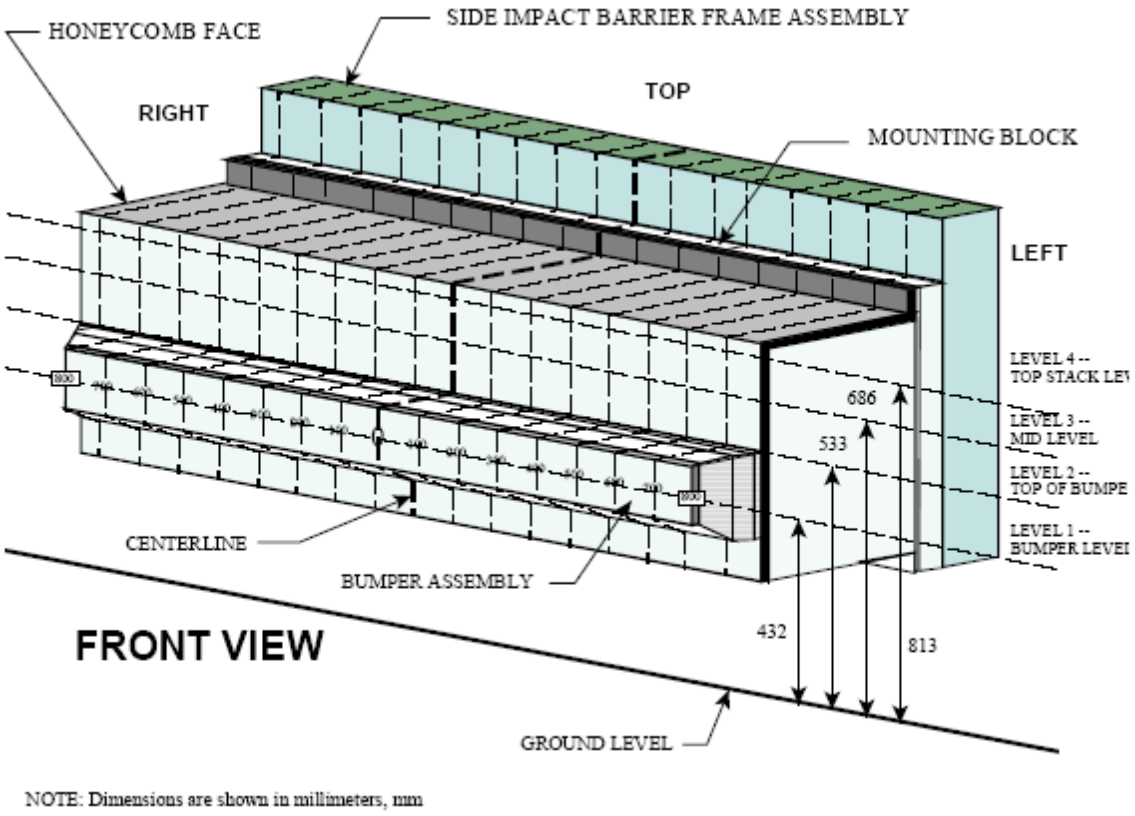
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	-15	-2	-2	-15	-36	-65	-64	-44	-48	-43	-36	-41	-46	-51	-76	-129	-166
2	6	2	-5	-10	-12	-27	-49	-40	-19	-14	-14	-16	-22	-28	-40	-66	-124
3	-59	-61	-64	-68	-68	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	-73	-75	-76	-78	-81	-88
4	-144	-147	-150	-151	-153	-162	-153	-153	-154	-152	-153	-154	-154	-156	-158	-174	-173

[1] Measurement point missing post-test.

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

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14

Test Time: 15:06 **Temperature:** 21.0°

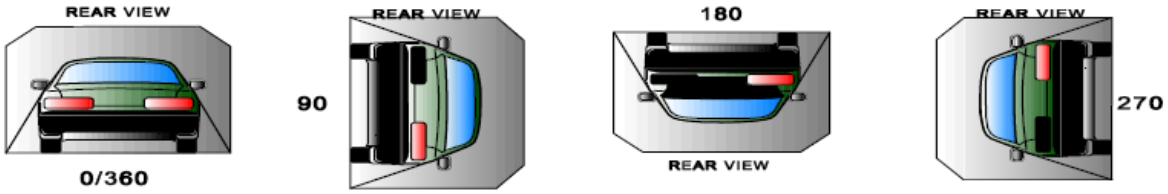
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

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

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

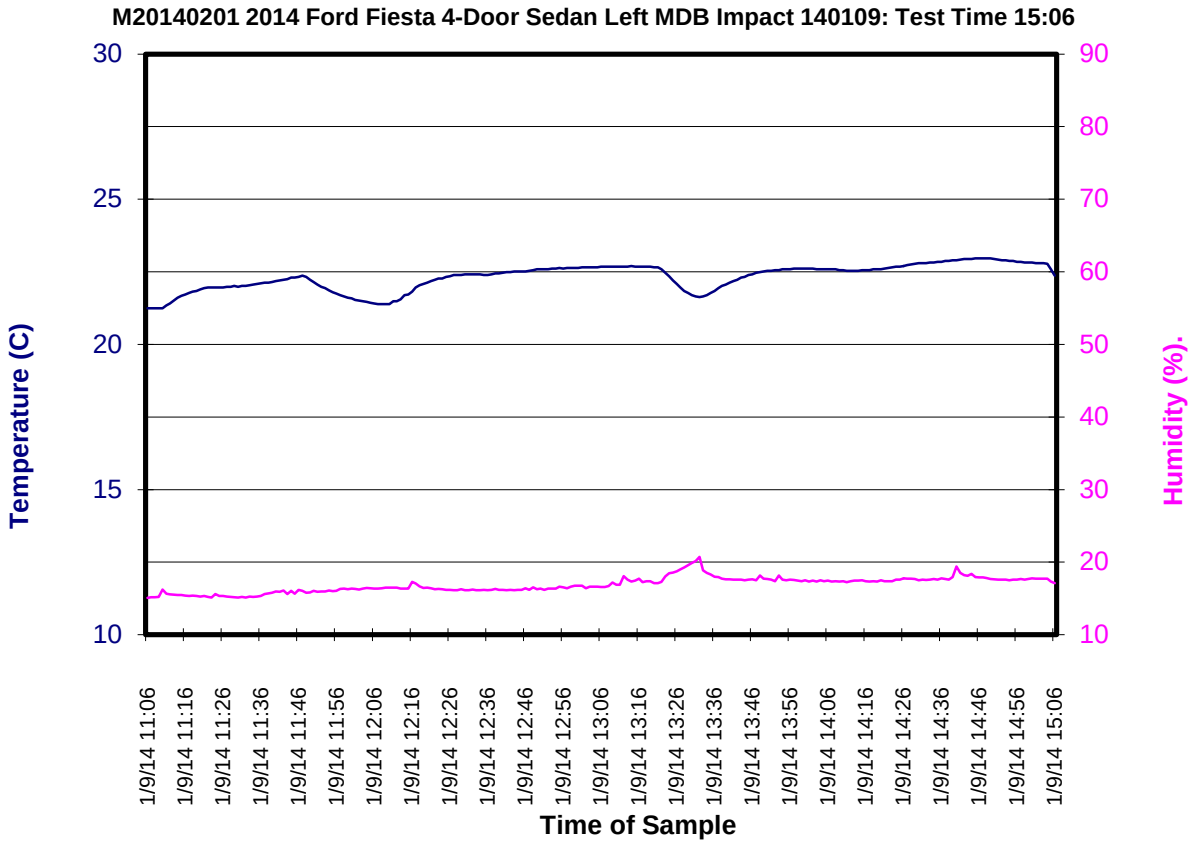
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

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

Test Vehicle: 2014 Ford Fiesta 4-Door Sedan NHTSA No.: M20140201
Test Program: NCAP Side Impact Test Date: 1/09/14



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

No.	Description	Page
001	As-Delivered Right Front ¾ View of Test Vehicle	**A-6**
002	As-Delivered Left Rear ¾ View of Test Vehicle	**A-6**
003	Pre-Test Front View of Test Vehicle	**A-7**
004	Post-Test Front View of Test Vehicle	**A-7**
005	Pre-Test Left Front ¾ View of Test Vehicle	**A-8**
006	Post-Test Left Front ¾ View of Test Vehicle	**A-8**
007	Pre-Test Left Side View of Test Vehicle	**A-9**
008	Post-Test Left Side View of Test Vehicle	**A-9**
009	Pre-Test Left Rear ¾ View of Test Vehicle	**A-10**
010	Post-Test Left Rear ¾ View of Test Vehicle	**A-10**
011	Pre-Test Rear View of Test Vehicle	**A-11**
012	Post-Test Rear View of Test Vehicle	**A-11**
013	Pre-Test Right Side View of Test Vehicle	**A-12**
014	Post-Test Right Side View of Test Vehicle	**A-12**
015	Pre-Test Overhead View of Test Area	**A-13**
016	Post-Test Overhead View of Test Area	**A-13**
017	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	**A-14**
018	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	**A-14**
019	Pre-Test Close-up View of Impact Point Target	**A-15**
020	Post-Test Close-up View of Impact Point Target	**A-15**
021	Pre-Test Left Front Door Latch Close-up	**A-16**
022	Post-Test Left Front Door Latch Close-up	**A-16**
023	Pre-Test Left Rear Door Latch Close-up	**A-17**
024	Post-Test Left Rear Door Latch Close-up	**A-17**
025	Pre-Test Front Close-up View of Driver Dummy	**A-18**
026	Post-Test Front Close-up View of Driver Dummy	**A-18**
027	Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking	**A-19**
028	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top	**A-19**
029	Post-Test Left Side View of Driver Dummy Shoulder and Door Top	**A-20**
030	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	**A-20**
031	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	**A-21**
032	Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning	**A-21**
033	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	**A-22**
034	Pre-Test Placement of Driver Dummy's Feet	**A-22**
035	Pre-Test View of Belt Anchorage for Driver Dummy	**A-23**
036	Pre-Test Left Side View of Steering Wheel	**A-23**

TABLE OF PHOTOGRAPHS (CONTINUED)

No.	Description	Page
037	View of Disengaged Parking Brake	A-24
038	Pre-Test View of Parking Brake	A-24
039	Pre-Test Close-Up Left Side View of Driver Seat Track	A-25
040	Pre-Test Close-Up Left Side View of Driver Seat Back	A-25
041	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-26
042	Pre-Test Driver Dummy and Door Clearance View	A-26
043	Post-Test Driver Dummy and Door Clearance View	A-27
044	Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-27
045	Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-28
046	Pre-Test Driver Inner Door Panel View	A-28
047	Post-Test Driver Inner Door Panel View	A-29
048	Post-Test Driver Dummy Close-Up Head Contact with Vehicle View	A-29
049	Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View	A-30
050	Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View	A-30
051	Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View	A-31
052	Post-Test Driver Dummy Close-Up Pelvis Contact View	A-31
053	Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View	A-32
054	Post-Test Driver Dummy Close-Up Knee Contact View	A-32
055	Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking	A-33
056	Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View	A-33
057	Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View	A-34
058	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-34
059	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-35
060	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-35
061	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-36
062	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-36
063	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-37
064	Pre-Test Placement of Rear Passenger Dummy's Feet	A-37
065	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-38
066	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-38
067	Pre-Test Close-Up Left Side View of Rear Passenger Seat Back	A-39

TABLE OF PHOTOGRAPHS (CONTINUED)

No.	Description	Page
068	Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint	**A-39**
069	Pre-Test Passenger Dummy and Door Clearance View	**A-40**
070	Post-Test Passenger Dummy and Door Clearance View	**A-40**
071	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	**A-41**
072	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	**A-41**
073	Pre-Test Passenger Inner Door Panel View	**A-42**
074	Post-Test Passenger Inner Door Panel View	**A-42**
075	Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View	**A-43**
076	Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View	**A-43**
077	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View	**A-44**
078	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View	**A-44**
079	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View	**A-45**
080	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View	**A-45**
081	Post-Test Rear Passenger Dummy Close-Up Knee Contact View	**A-46**
082	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	**A-46**
083	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	**A-47**
084	Pre-Test Front View of MDB Impactor Face	**A-47**
085	Post-Test Front View of MDB Impactor Face	**A-48**
086	Pre-Test Top View of MDB Impactor Face	**A-48**
087	Post-Test Top View of MDB Impactor Face	**A-49**
088	Pre-Test Left Side View of MDB Impactor Face	**A-49**
089	Post-Test Left Side View of MDB Impactor Face	**A-50**
090	Pre-Test Right Side View of MDB Impactor Face	**A-50**
091	Post-Test Right Side View of MDB Impactor Face	**A-51**
092	Close-Up View of Vehicle’s Certification Label	**A-51**
093	Close-Up View of Vehicle’s Tire Information Placard or Label	**A-52**
094	Pre-Test Ballast View	**A-52**
095	Post-Test Primary and Redundant Speed Trap Read-Out	**A-53**

TABLE OF PHOTOGRAPHS (CONTINUED)

No.	Description	Page
096	FMVSS No. 301 Static Rollover 0 Degrees	**A-53**
097	FMVSS No. 301 Static Rollover 90 Degrees	**A-54**
098	FMVSS No. 301 Static Rollover 180 Degrees	**A-54**
099	FMVSS No. 301 Static Rollover 270 Degrees	**A-55**
100	FMVSS No. 301 Static Rollover 360 Degrees	**A-55**
101	Impact Event	**A-56**
102	Monroney Label	**A-56**
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	**A-57**
104	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	**A-57**

001 As-Delivered Right Front ¾ View of Test Vehicle

002 As-Delivered Left Rear ¾ View of Test Vehicle

003 Pre-Test Front View of Test Vehicle

004 Post-Test Front View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

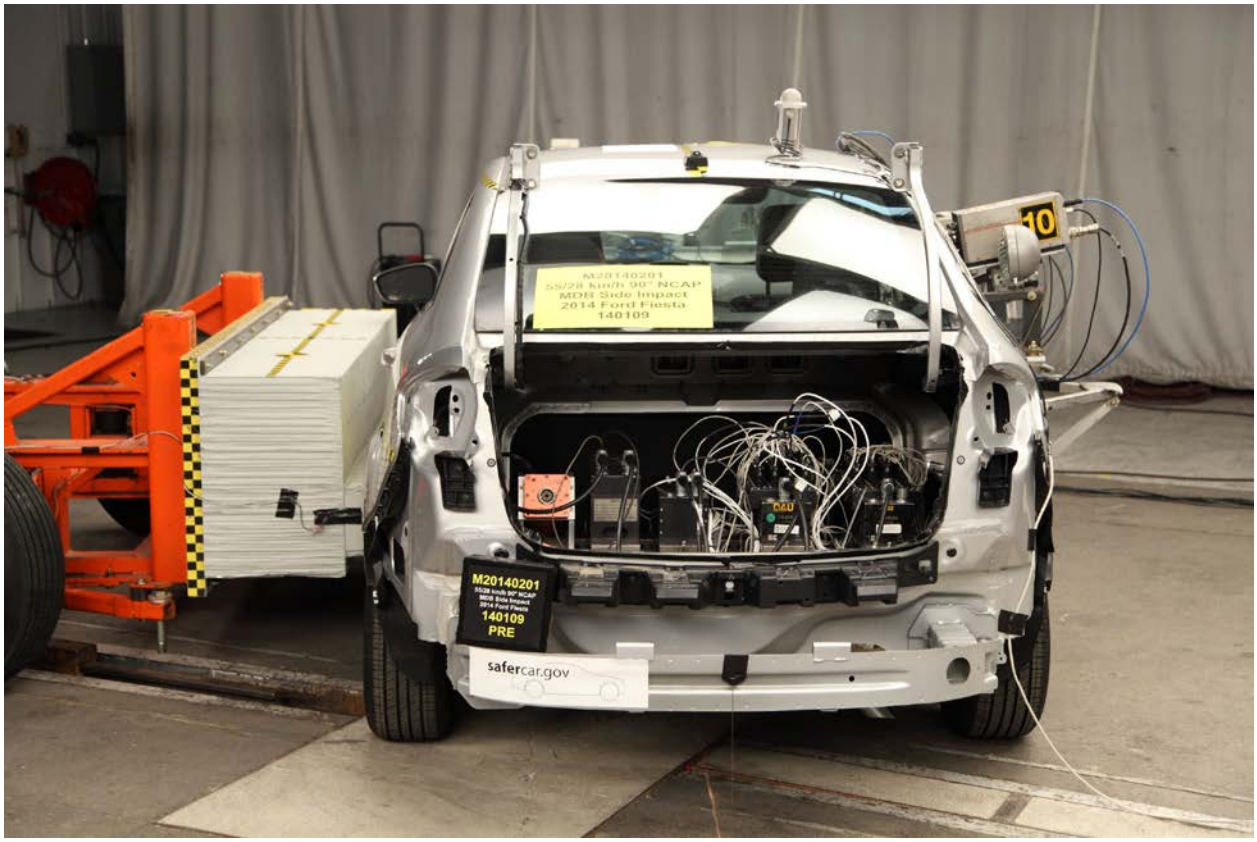
006 Post-Test Left Front ¾ View of Test Vehicle

007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear ¾ View of Test Vehicle

010 Post-Test Left Rear ¾ View of Test Vehicle



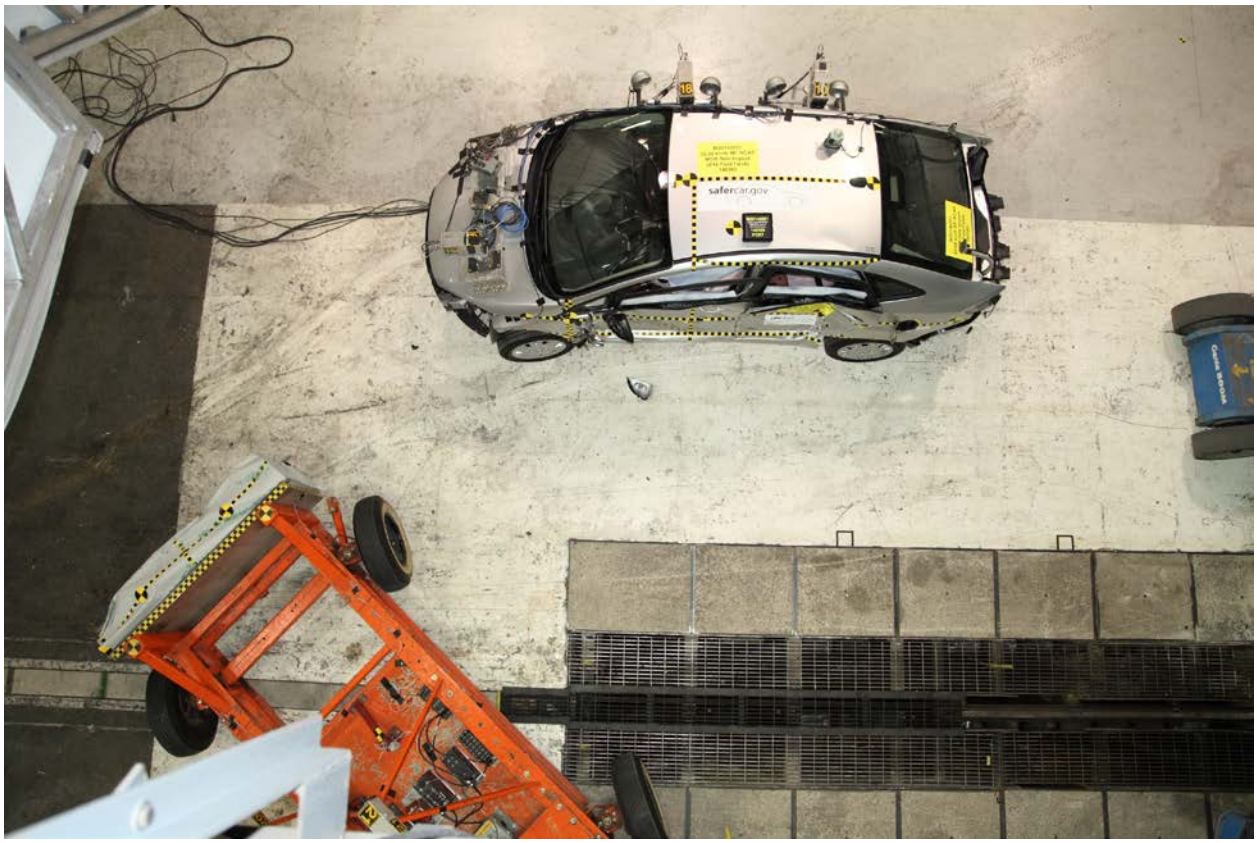
011 Pre-Test Rear View of Test Vehicle

012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle

015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

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

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

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

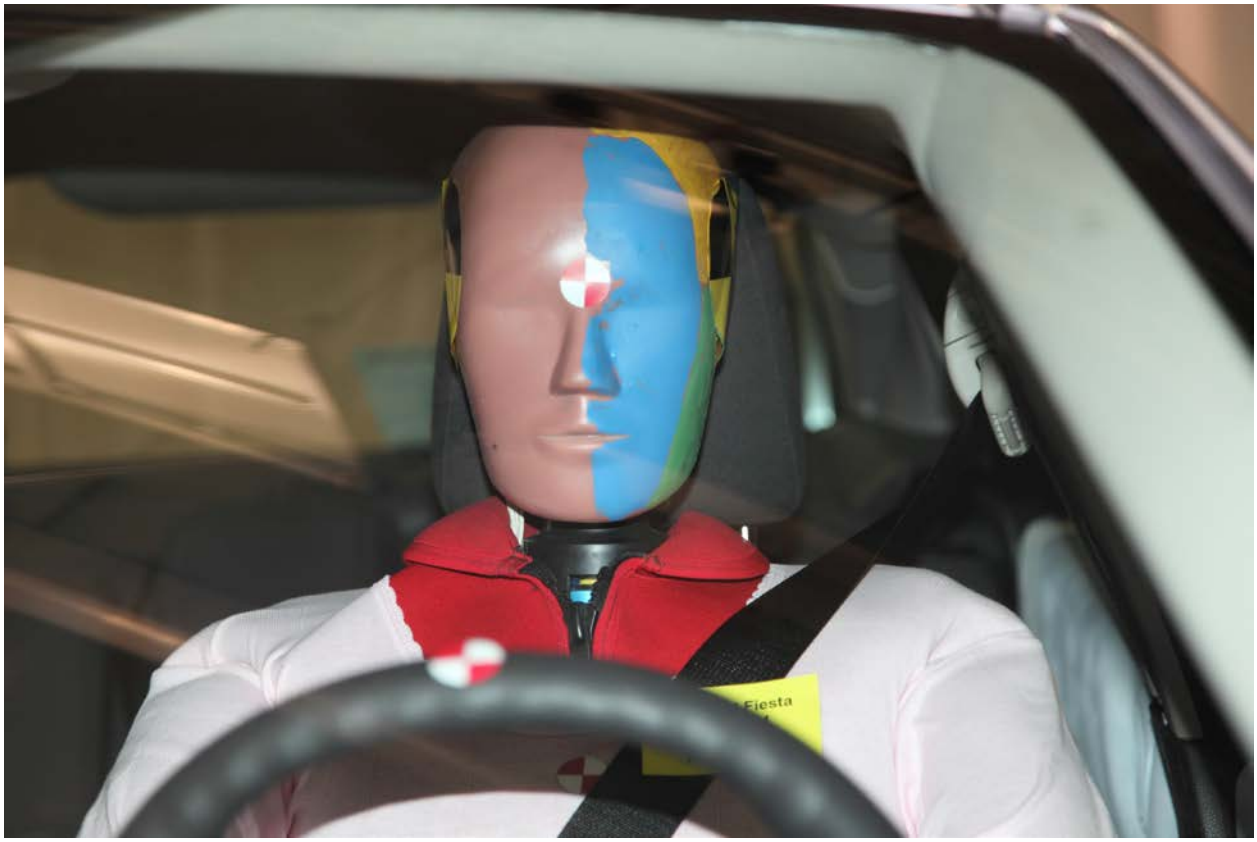
020 Post-Test Close-up View of Impact Point Target

021 Pre-Test Left Front Door Latch Close-up

022 Post-Test Left Front Door Latch Close-up

023 Pre-Test Left Rear Door Latch Close-up

024 Post-Test Left Rear Door Latch Close-up



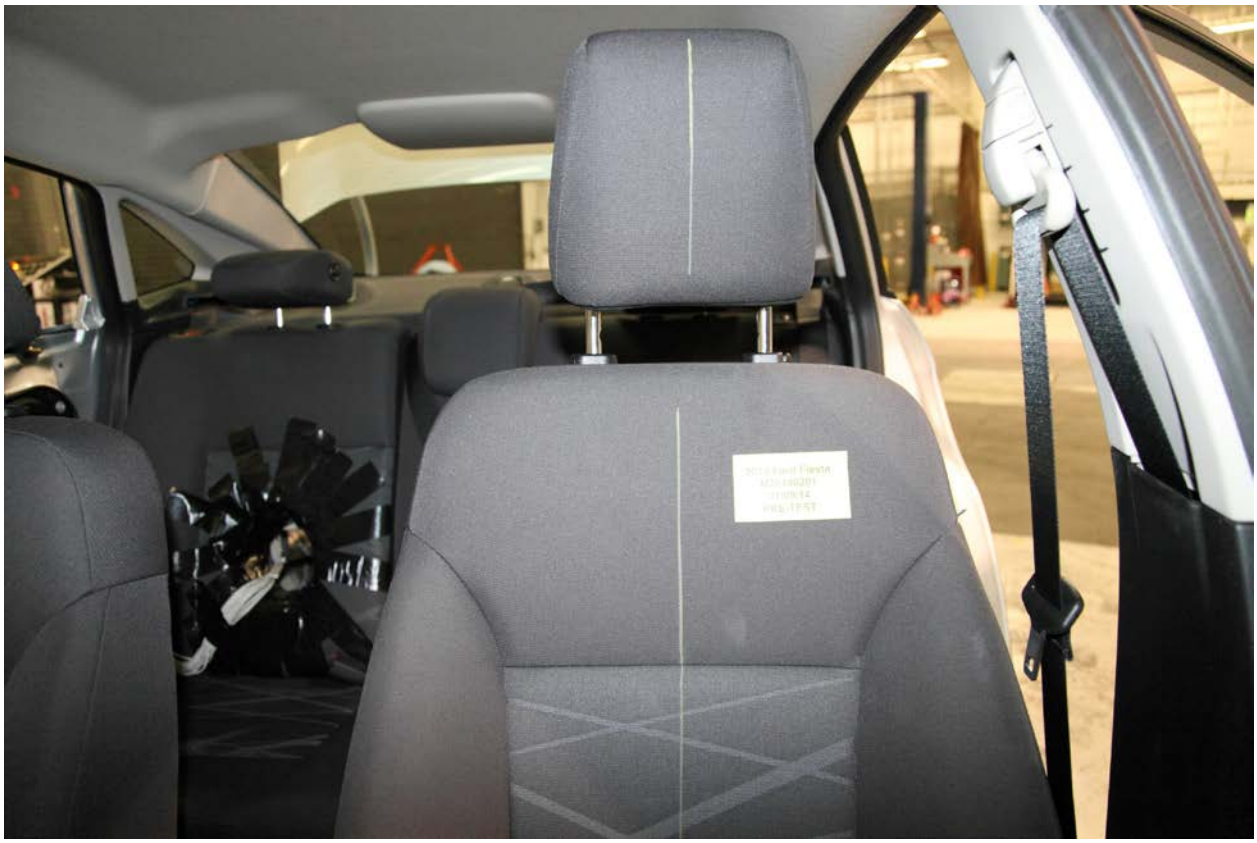
025 Pre-Test Front Close-up View of Driver Dummy

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

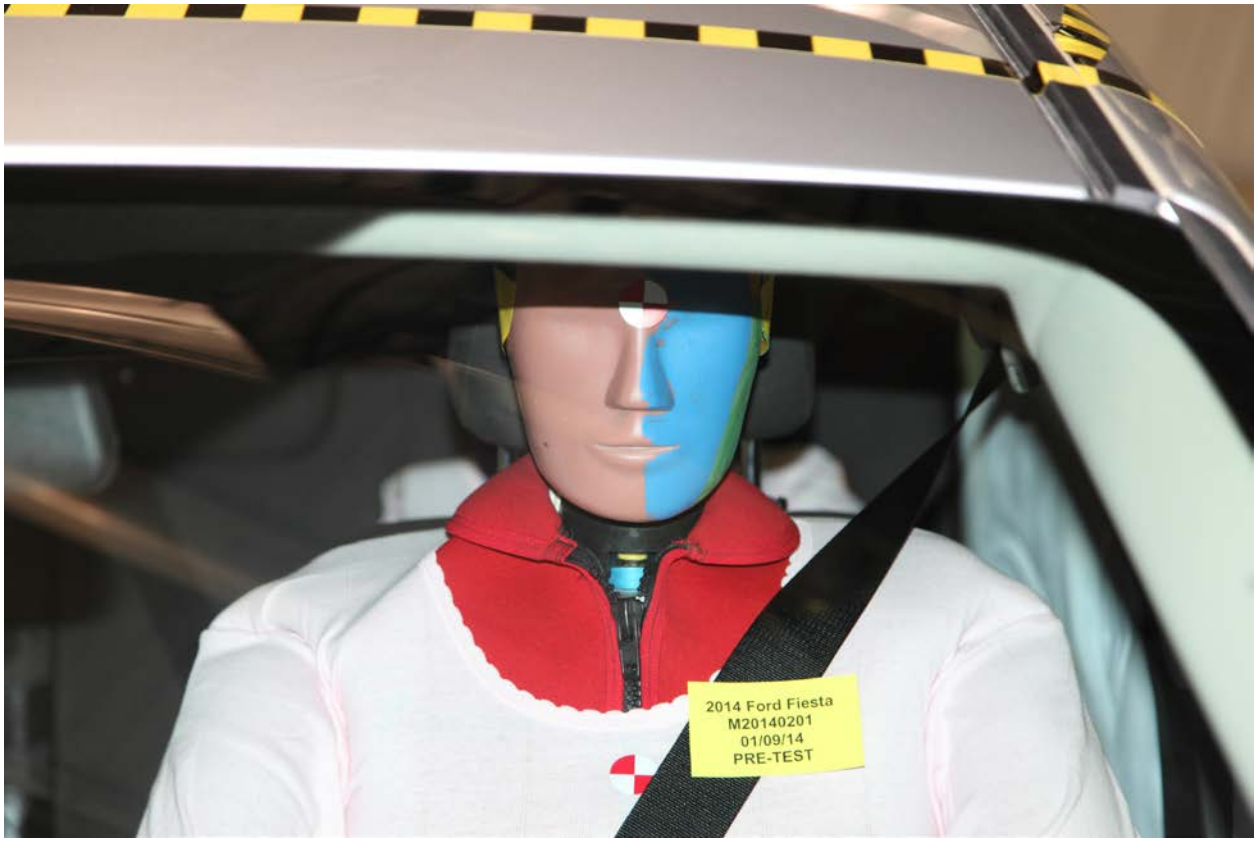
027 Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking

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

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



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

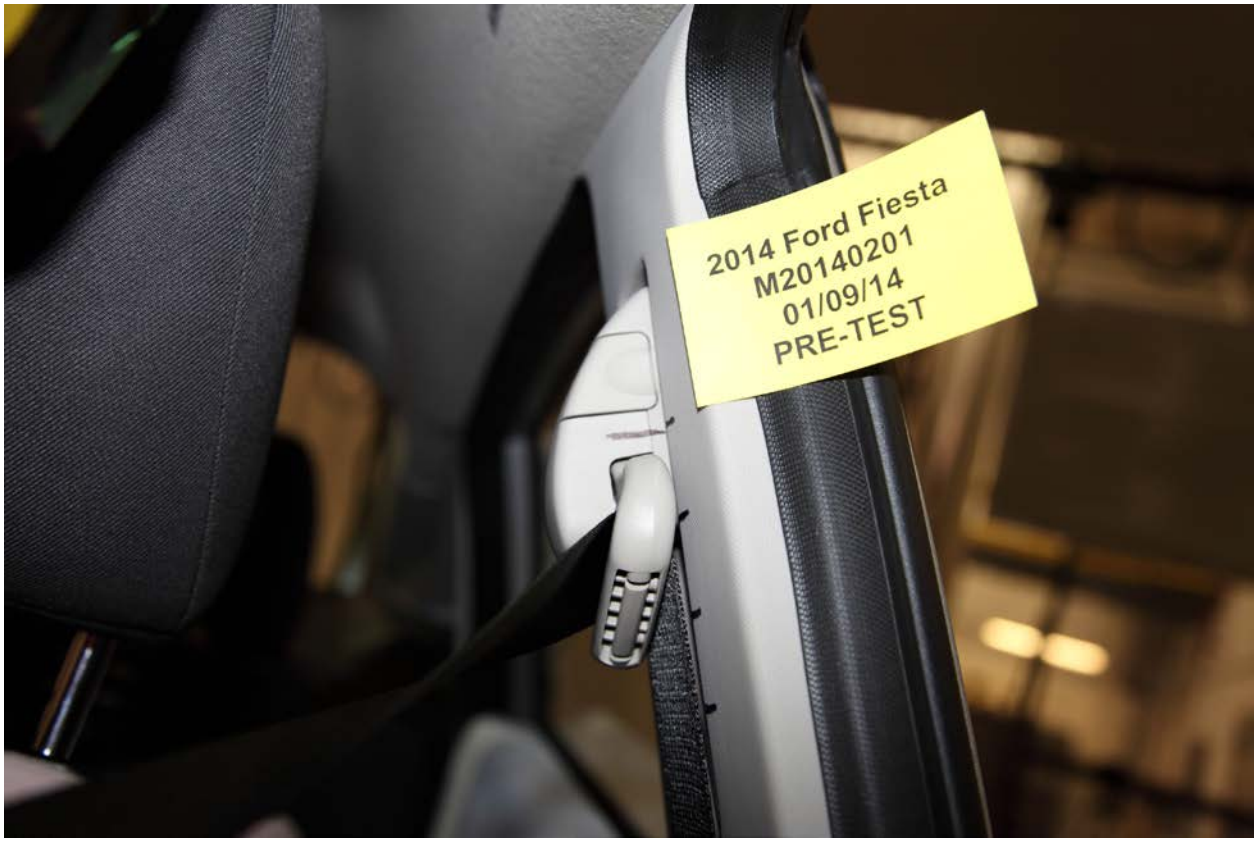


031 Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint

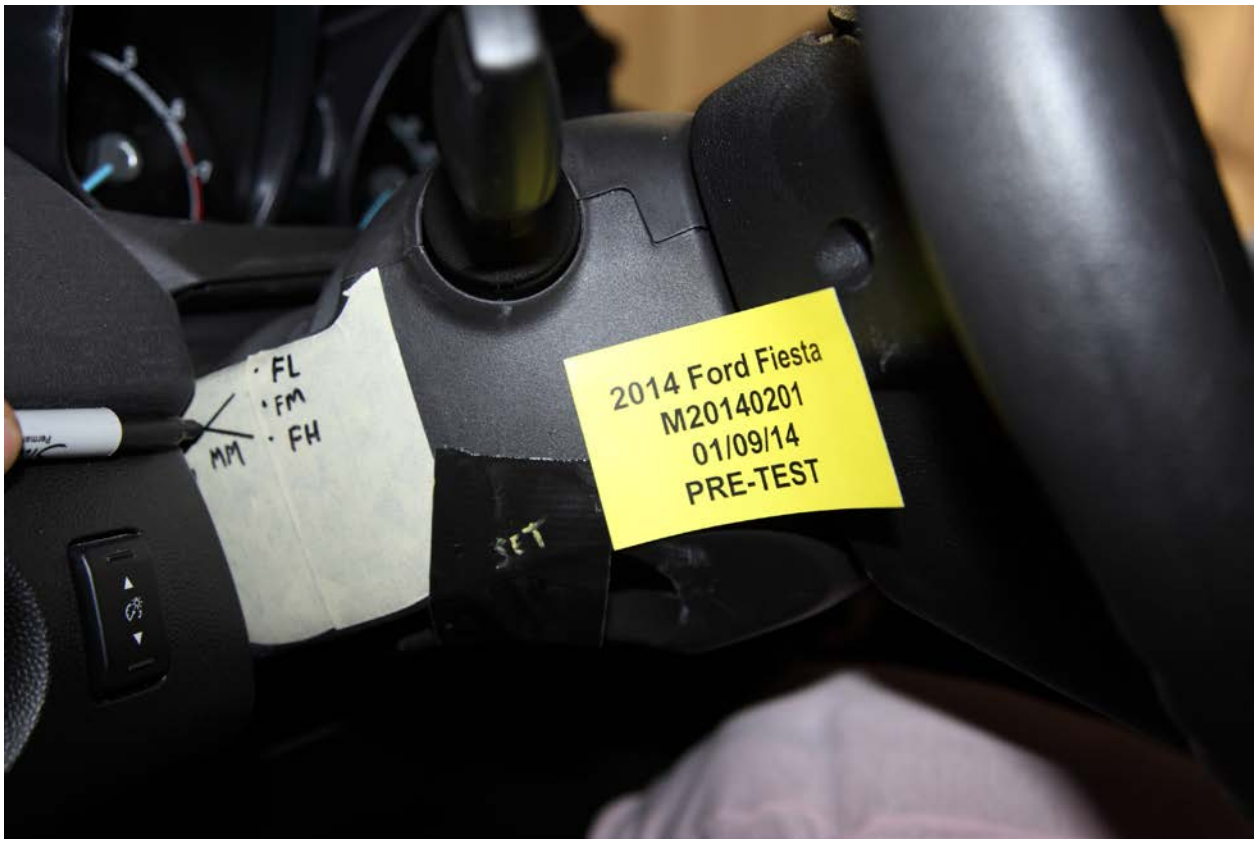
032 Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning

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

034 Pre-Test Placement of Driver Dummy Feet



035 Pre-Test View of Belt Anchorage for Driver Dummy



036 Pre-Test Left Side View of Steering Wheel

037 View of Disengaged Parking Brake

038 Pre-Test View of Parking Brake

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

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

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

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View

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

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

046 Pre-Test Driver Inner Door Panel View

047 Post-Test Driver Inner Door Panel View

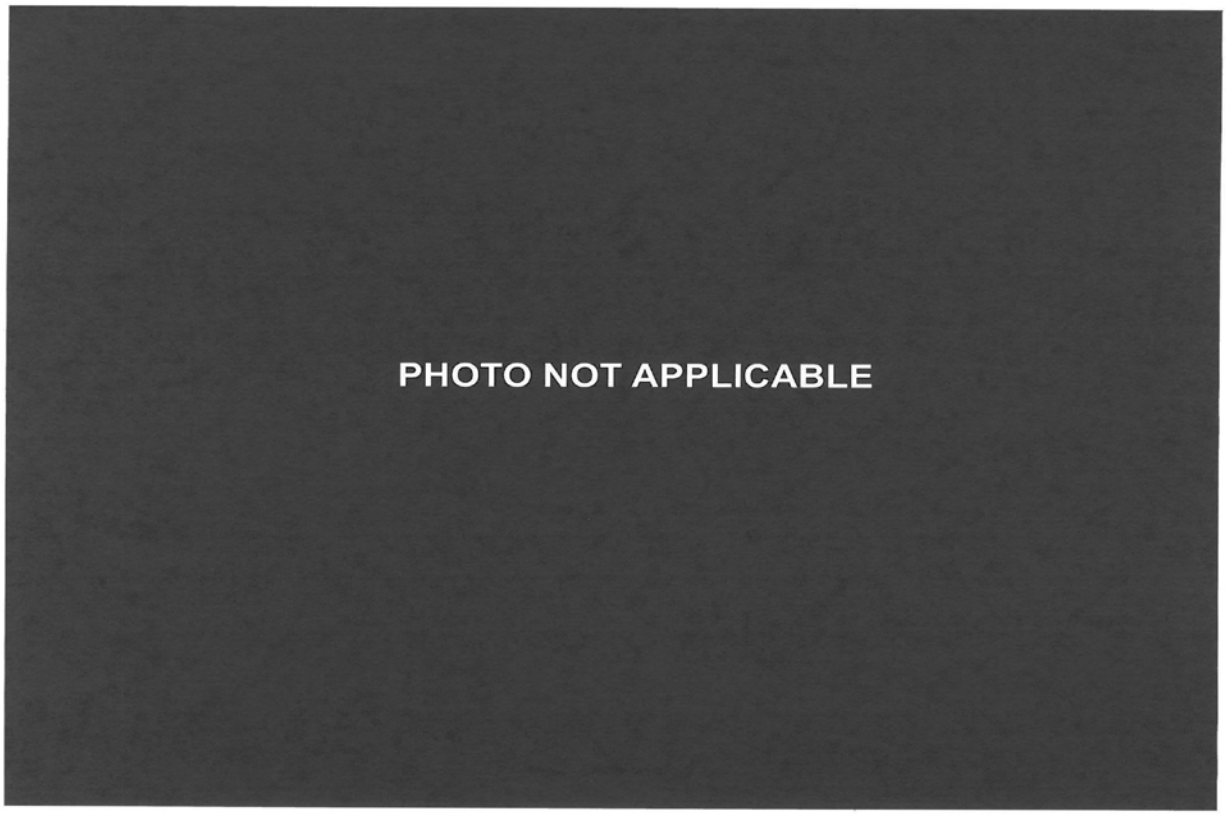
048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View

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

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

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

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



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

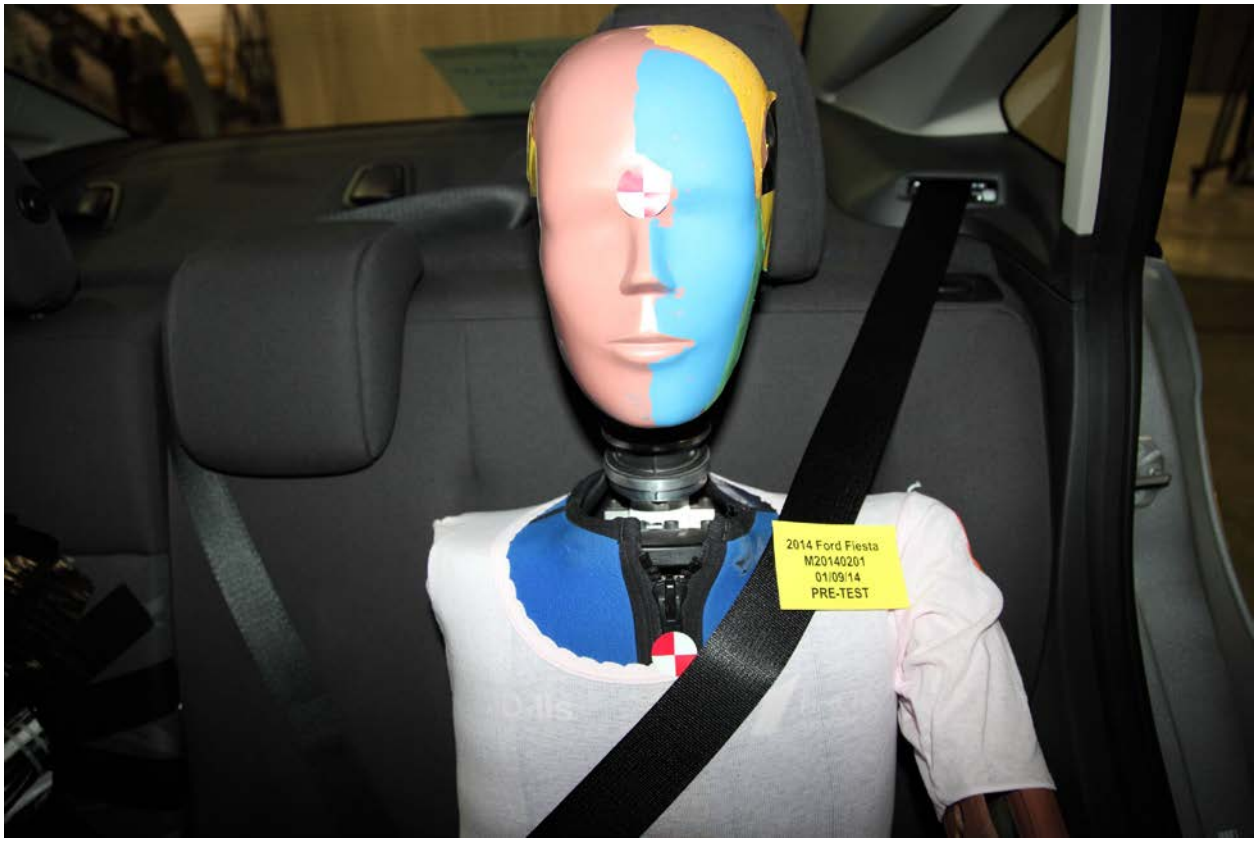
054 Post-Test Driver Dummy Close-Up Knee Contact View

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

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

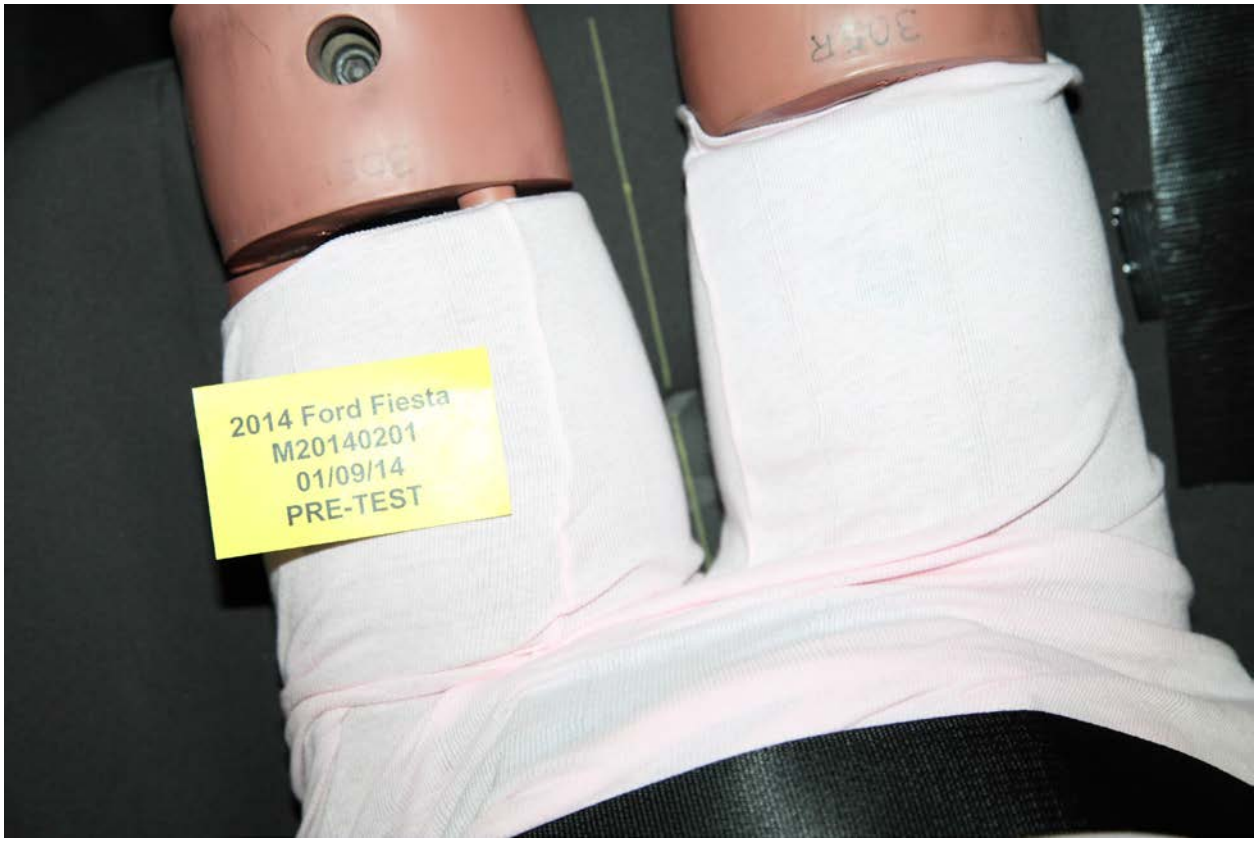
057 Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View

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



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

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



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

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

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

064 Pre-Test Placement of Rear Passenger Dummy Feet

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

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

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

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

069 Pre-Test Passenger Dummy and Door Clearance View

070 Post-Test Passenger Dummy and Door Clearance View

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

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

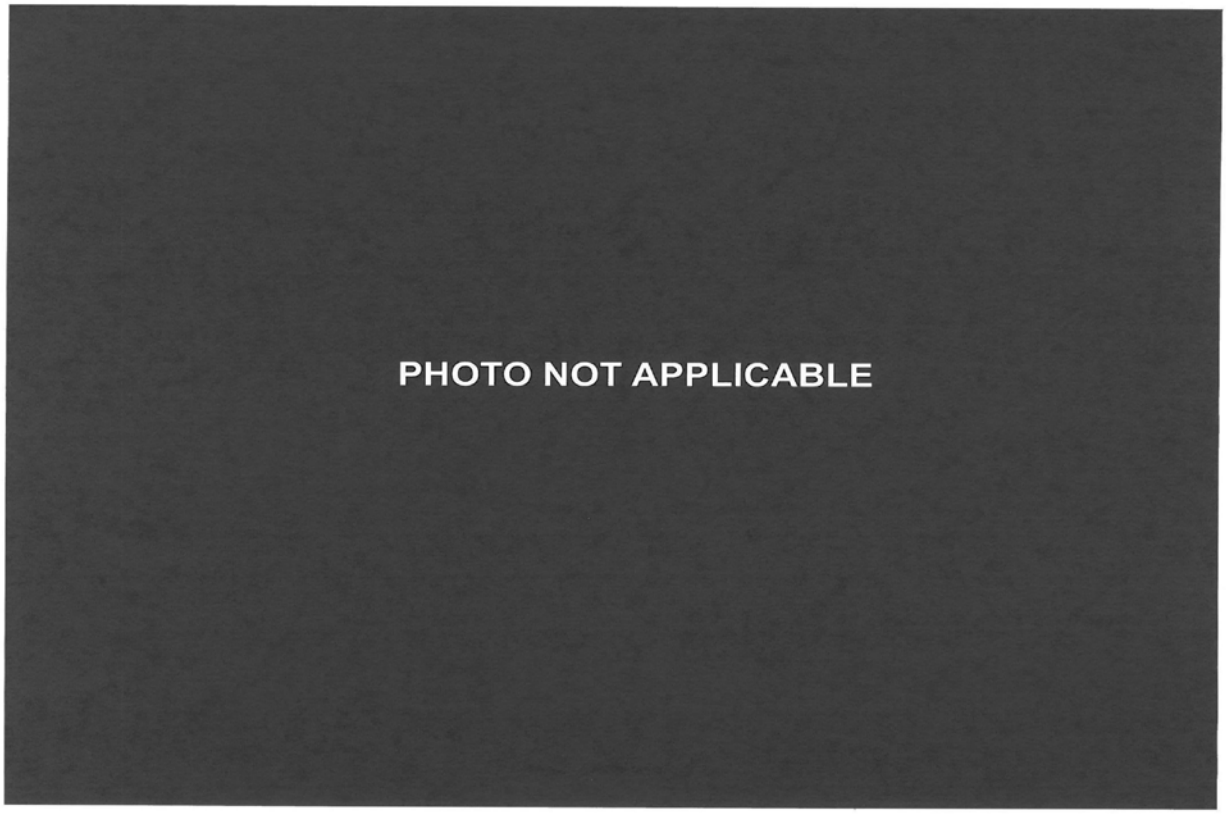
073 Pre-Test Passenger Inner Door Panel View

074 Post-Test Passenger Inner Door Panel View

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

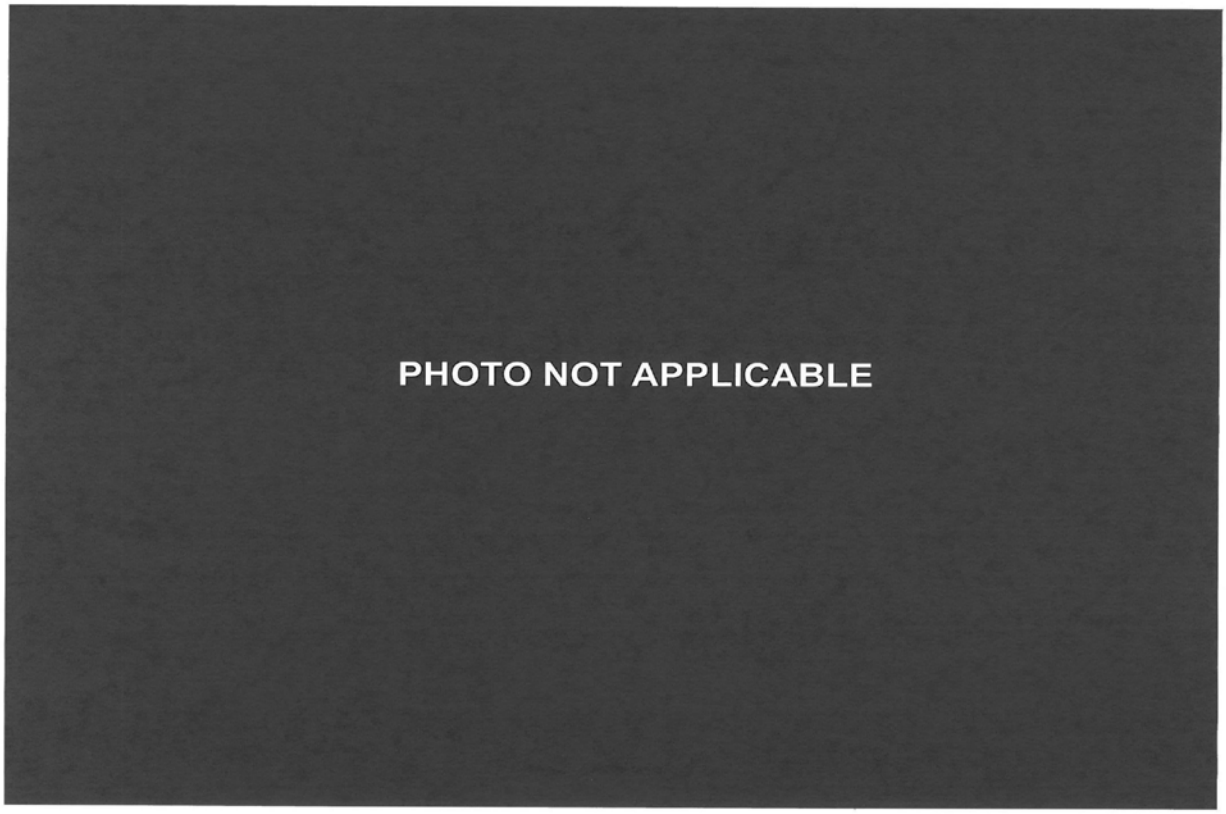
076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

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



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

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



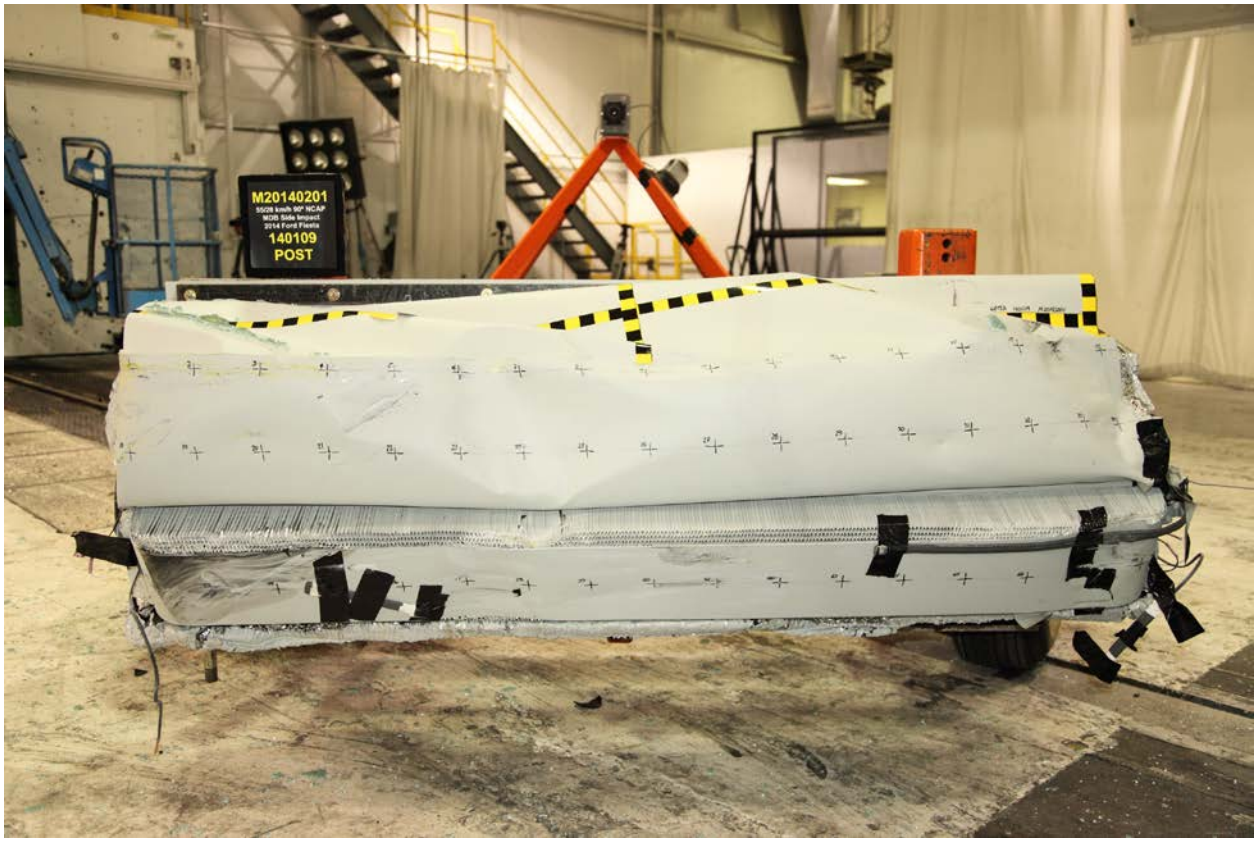
080 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View

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

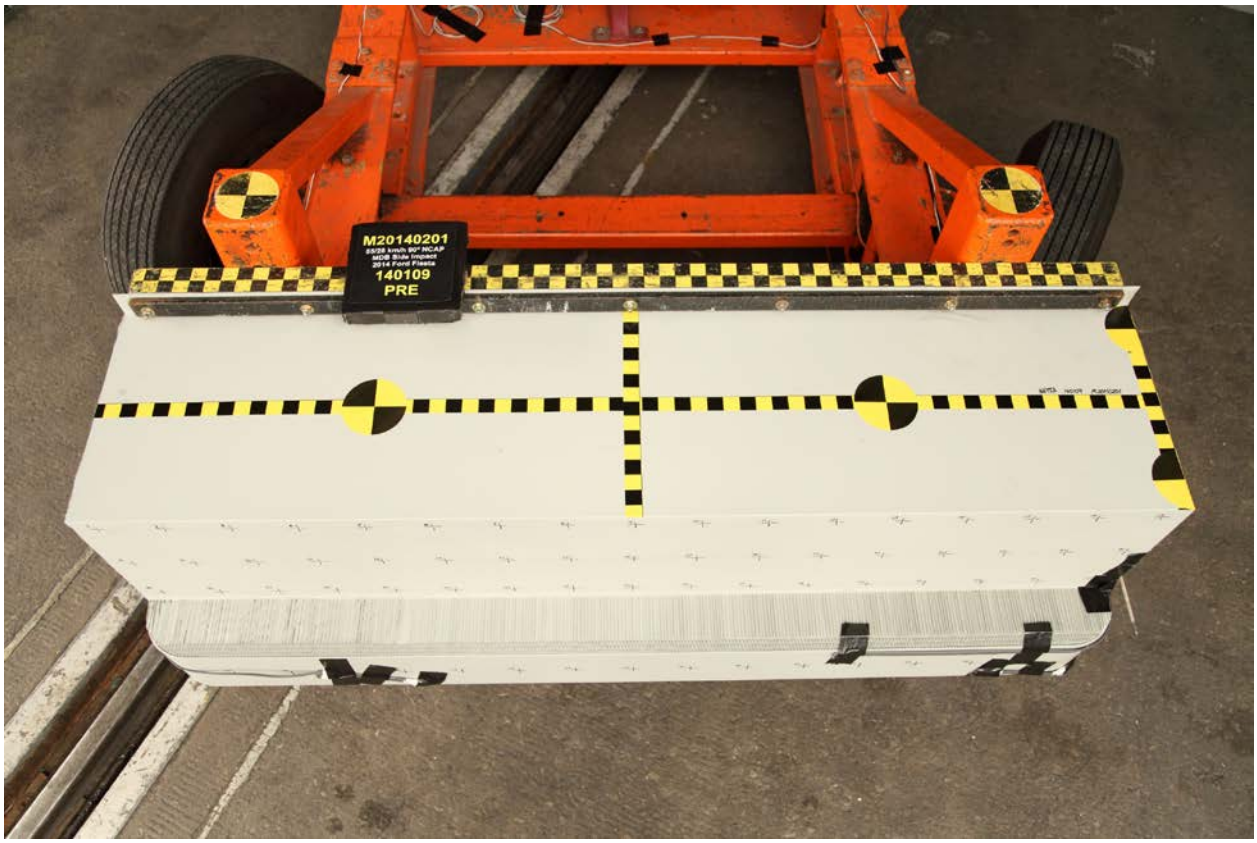
082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

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

084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face

087 Post-Test Top View of MDB Impactor Face

088 Pre-Test Left Side View of MDB Impactor Face

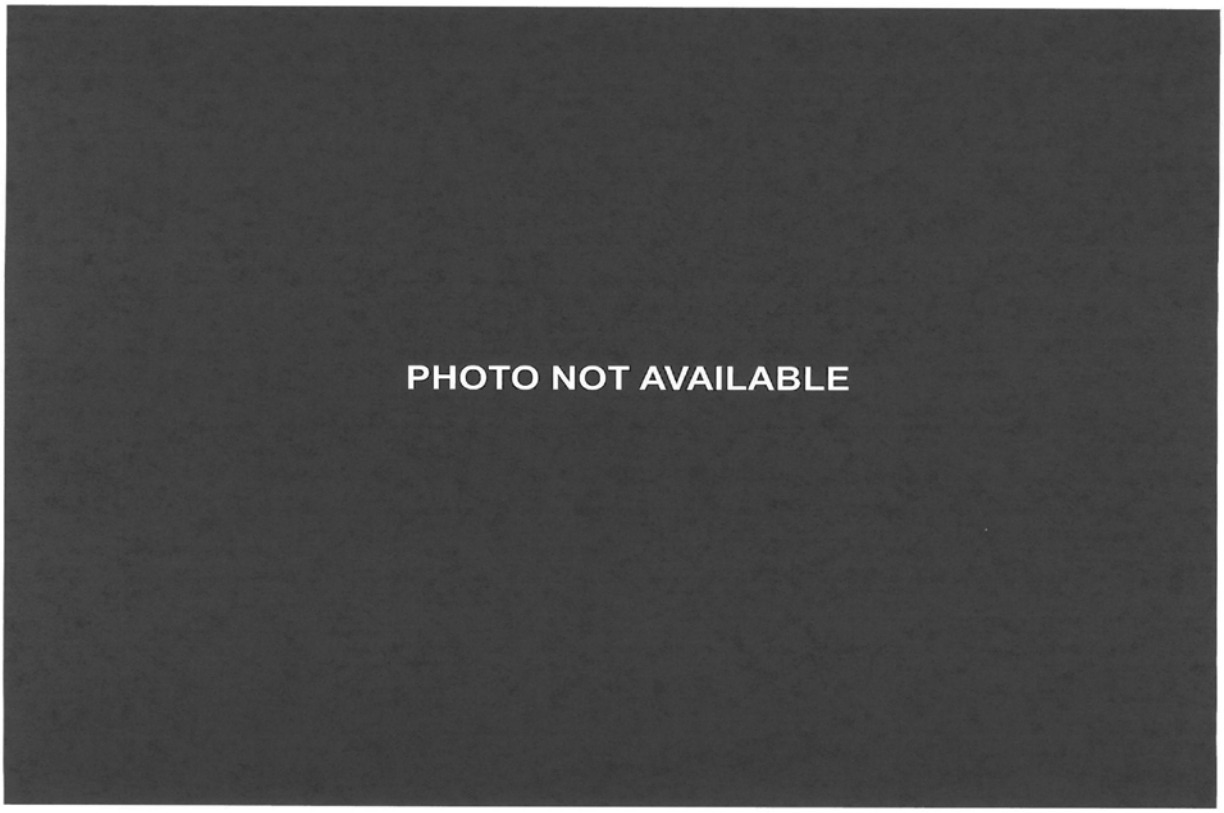
089 Post-Test Left Side View of MDB Impactor Face

090 Pre-Test Right Side View of MDB Impactor Face

091 Post-Test Right Side View of MDB Impactor Face

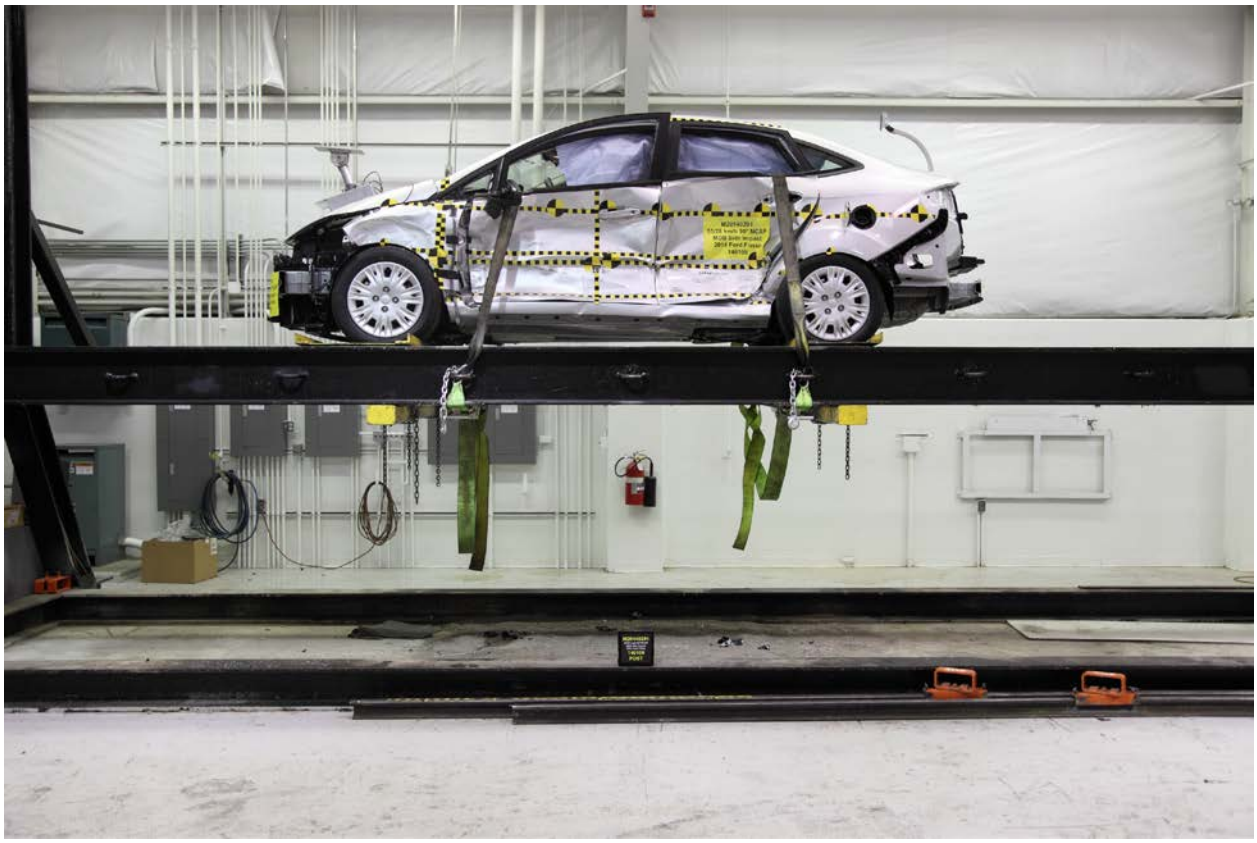
092 Close-Up View of Vehicle Certification Label

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



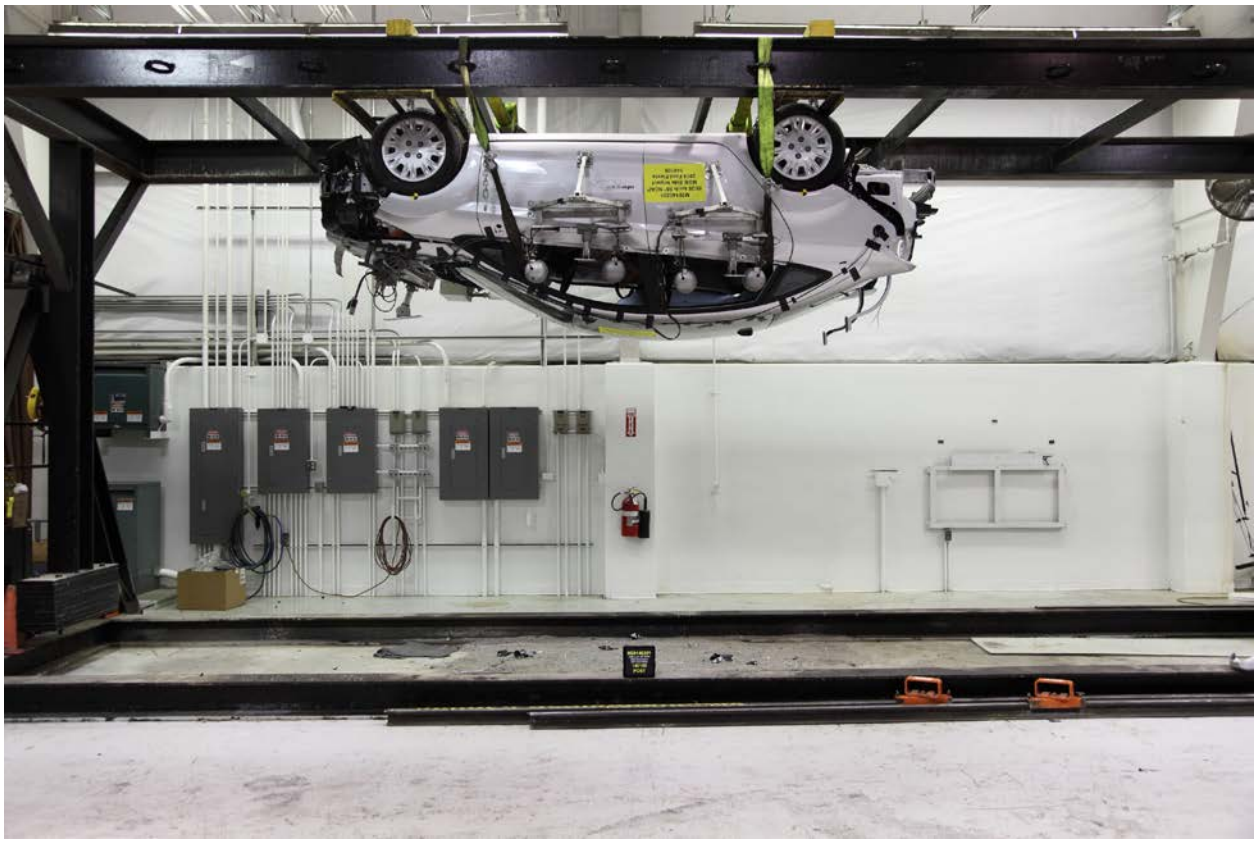
094 Pre-Test Ballast View

095 Post-Test Primary Speed Trap Read-Out

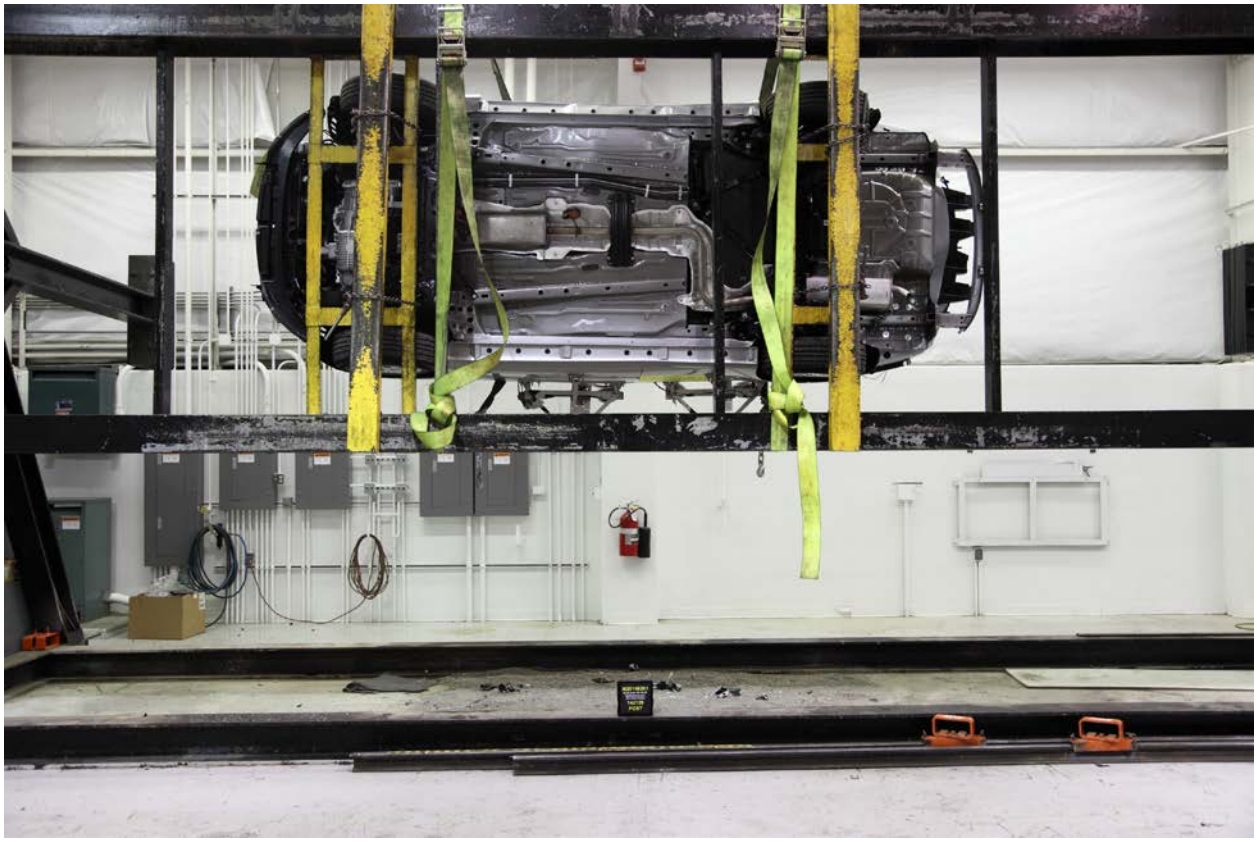


096 FMVSS No. 301 Static Rollover 0 Degrees

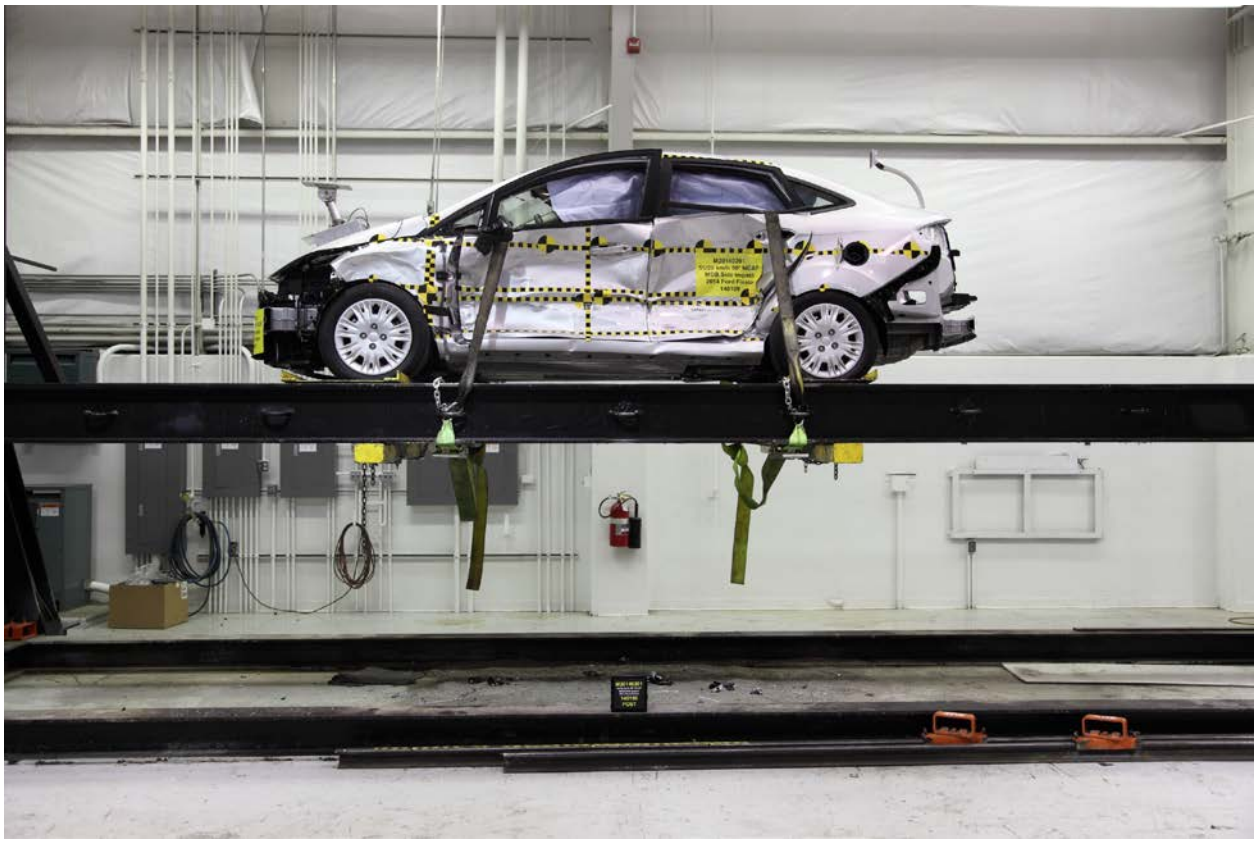
097 FMVSS No. 301 Static Rollover 90 Degrees



098 FMVSS No. 301 Static Rollover 180 Degrees



099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event

VEHICLE DESCRIPTION

FIESTA EM **122801**

2014 4-DOOR SEDAN S
5-PASSENGER
1.6L TIVCT DURATEC DOHC I4
5-SPD MANUAL TRANSMISSION

EXTERIOR
INGOT SILVER METALLIC
INTERIOR
CHARCOAL BLACK CLOTH SEATS

Ford
Go Further
ford.com

STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE

EXTERIOR
- 15" STEEL WHEELS
- DUAL POWER MIRRORS
- EASY FUEL CAPLESS FILLER
- GRILLE - 5 BAR, CHROME
- INTEGRATED SPOTTER MIRRORS

INTERIOR
- BUCKET SEATS-MANUAL 6-WAY DRIVER, 4-WAY FRONT PASS
- 60/40 SPLIT FOLD REAR SEAT
- DUAL VANITY MIRRORS
- FRONT FLOOR MATS
- TILT/TELESCOPE COLUMN

FUNCTIONAL
- ADVANCETRAC W/ESC
- AIR CONDITIONING
- AM/FM SINGLE CD/MP3, 6SPKR
- DOME LAMP & MAP LIGHTS
- FRONT DISC REAR DRUM BRAKES (ABS)
- MESSAGE CENTER
- POWER LOCKS
- 12V POWERPOINT
- POWER STEERING W/EPAS
- REAR WINDOW DEFROSTER
- SYNC
- VARIABLE INTERVAL WIPERS

SAFETY/SECURITY
- ADJUSTABLE SAFETY BELTS
- AIRBAG - DRIVER KNEE
- AIRBAGS - DUAL STAGE FRONT
- AIRBAGS - FRONT SEAT MOUNTED SIDE IMPACT
- AIRBAGS - SIDE AIR CURTAIN
- CHILDPROOF REAR DOOR LOCKS
- SECURITY ANTI-THEFT ENGINE IMMOBILIZER
- TIRE PRESSURE MONITOR SYS

WARRANTY
- 3YR/36,000 BUMPER / BUMPER
- 5YR/60,000 POWERTRAIN
- 5YR/60,000 ROADSIDE ASSIST

INCLUDED ON THIS VEHICLE	(MSRP)
EQUIPMENT GROUP 100A	
OPTIONAL EQUIPMENT	
SYNC VOICE ACTIVATED SYSTEMS	
FRONT LICENSE PLATE BRACKET	NO CHARGE
CALIFORNIA EMISSIONS SYSTEM	NO CHARGE

PRICE INFORMATION	(MSRP)
BASE PRICE	$14,000.00
TOTAL OPTIONS	
TOTAL VEHICLE & OPTIONS	14,000.00
DESTINATION & DELIVERY	795.00

SOLD TO: Royal Ford Motors, Inc. 3064 Waverly Road Owego NY 13827 — 13V 563
SHIP TO:
SHIP THROUGH:
RAMP ONE: RA43
RAMP TWO:
METHOD OF TRANSP.: RAIL
DEALER NO.: 13V 563
FINAL ASSEMBLY PLANT: CUAUTITLAN
ITEM #: 13-Z300 O/T 2
DF243 N RA 2X 415 001154 06 24 13

TOTAL MSRP $14,795.00

This label is affixed pursuant to the Federal Automobile Information Disclosure Act. Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.

EPA DOT **Fuel Economy and Environment** — Gasoline Vehicle

Fuel Economy: **31** MPG combined city/hwy — 27 city, 38 highway
Subcompacts range from 14 to 112 MPG. The best vehicle rates 121 MPGe.
3.2 gallons per 100 miles

You **save** **$3,000** in fuel costs over 5 years compared to the average new vehicle.

Annual fuel **cost** **$1,700**

Fuel Economy & Greenhouse Gas Rating (1=poor, 10=best): 8
Smog Rating (1=poor, 10=best): 6
This vehicle emits 286 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs $11,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.50 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score ★★★★½
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.
Safety Concern: Visit www.safercar.gov or call 1-888-327-4236 for more details.

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

Side Crash — Front seat ★★★★ — Rear seat ★★★★★½
Based on the risk of injury in a side impact.

Rollover ★★★★
Based on the risk of rollover in a single-vehicle crash.

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

IIHS Ratings
Top Safety Pick Award Winner

Frontal Offset	GOOD
Side Impact	GOOD
Rear Impact	GOOD
Roof Strength	GOOD

The Institute rates vehicles Good, Acceptable, Marginal, or Poor based on performance.

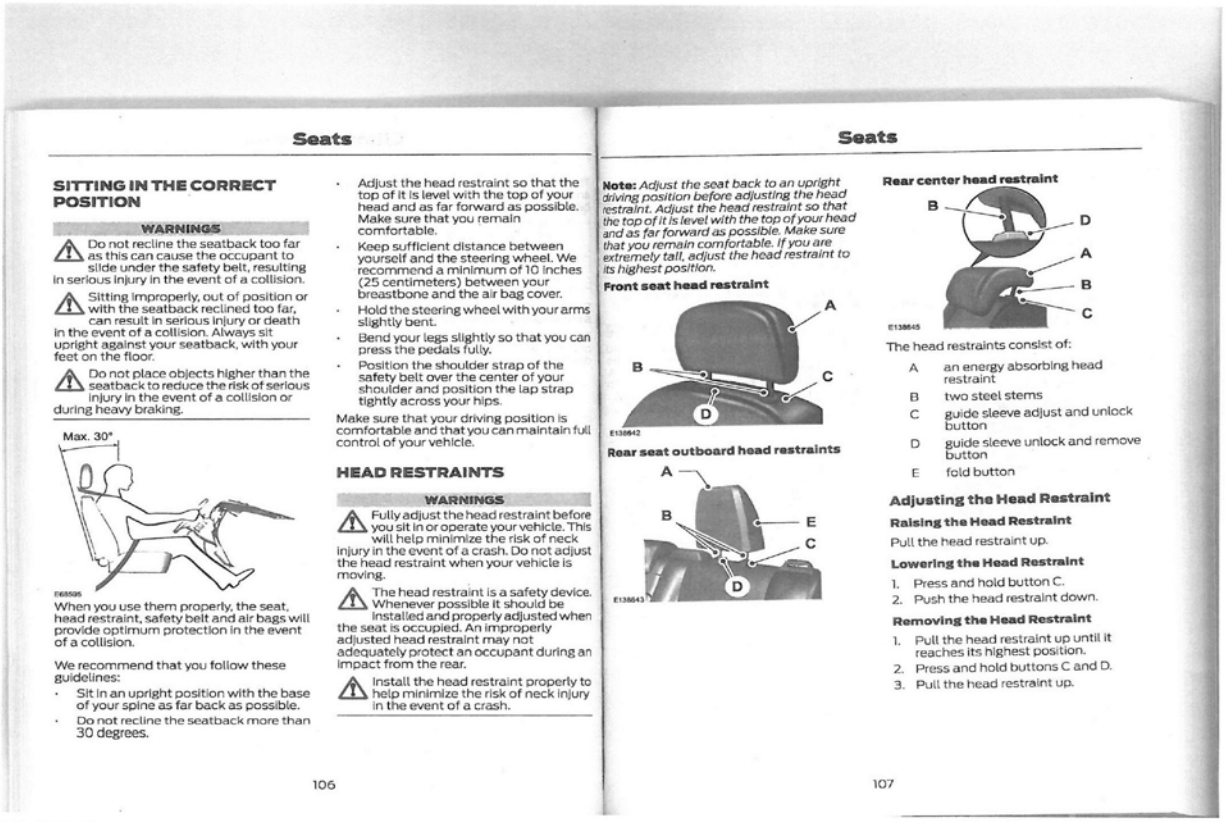
3FADP4AJ9EM122801

Scan this code to experience this vehicle or text 3FEM122901 to 69029
or Visit ford.com/windowsticker
Standard messaging & data plan rates may apply.

Ford Extended Service Plan — Ford ESP is the only extended service plan honored at every Ford dealership in the U.S. and Canada. See your dealer for additional details or visit www.FordOwner.com for more information.

FordCredit — Choose the vehicle you want. Whether you decide to lease or finance, you'll find the choices that are right for you. See your Ford Dealer for details or visit www.FordCredit.com.

102 Monroney Label



Seats

SITTING IN THE CORRECT POSITION

WARNINGS

Do not recline the seatback too far as this can cause the occupant to slide under the safety belt, resulting in serious injury in the event of a collision.

Sitting improperly, out of position or with the seatback reclined too far, can result in serious injury or death in the event of a collision. Always sit upright against your seatback, with your feet on the floor.

Do not place objects higher than the seatback to reduce the risk of serious injury in the event of a collision or during heavy braking.

Max. 30°

E68595

When you use them properly, the seat, head restraint, safety belt and air bags will provide optimum protection in the event of a collision.

We recommend that you follow these guidelines:

- Sit in an upright position with the base of your spine as far back as possible.
- Do not recline the seatback more than 30 degrees.
- Adjust the head restraint so that the top of it is level with the top of your head and as far forward as possible. Make sure that you remain comfortable.
- Keep sufficient distance between yourself and the steering wheel. We recommend a minimum of 10 inches (25 centimeters) between your breastbone and the air bag cover.
- Hold the steering wheel with your arms slightly bent.
- Bend your legs slightly so that you can press the pedals fully.
- Position the shoulder strap of the safety belt over the center of your shoulder and position the lap strap tightly across your hips.

Make sure that your driving position is comfortable and that you can maintain full control of your vehicle.

HEAD RESTRAINTS

WARNINGS

Fully adjust the head restraint before you sit in or operate your vehicle. This will help minimize the risk of neck injury in the event of a crash. Do not adjust the head restraint when your vehicle is moving.

The head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied. An improperly adjusted head restraint may not adequately protect an occupant during an impact from the rear.

Install the head restraint properly to help minimize the risk of neck injury in the event of a crash.

106

Seats

Note: *Adjust the seat back to an upright driving position before adjusting the head restraint. Adjust the head restraint so that the top of it is level with the top of your head and as far forward as possible. Make sure that you remain comfortable. If you are extremely tall, adjust the head restraint to its highest position.*

Front seat head restraint

E138642

Rear seat outboard head restraints

E138643

Rear center head restraint

E138645

The head restraints consist of:

A	an energy absorbing head restraint
B	two steel stems
C	guide sleeve adjust and unlock button
D	guide sleeve unlock and remove button
E	fold button

Adjusting the Head Restraint

Raising the Head Restraint

Pull the head restraint up.

Lowering the Head Restraint

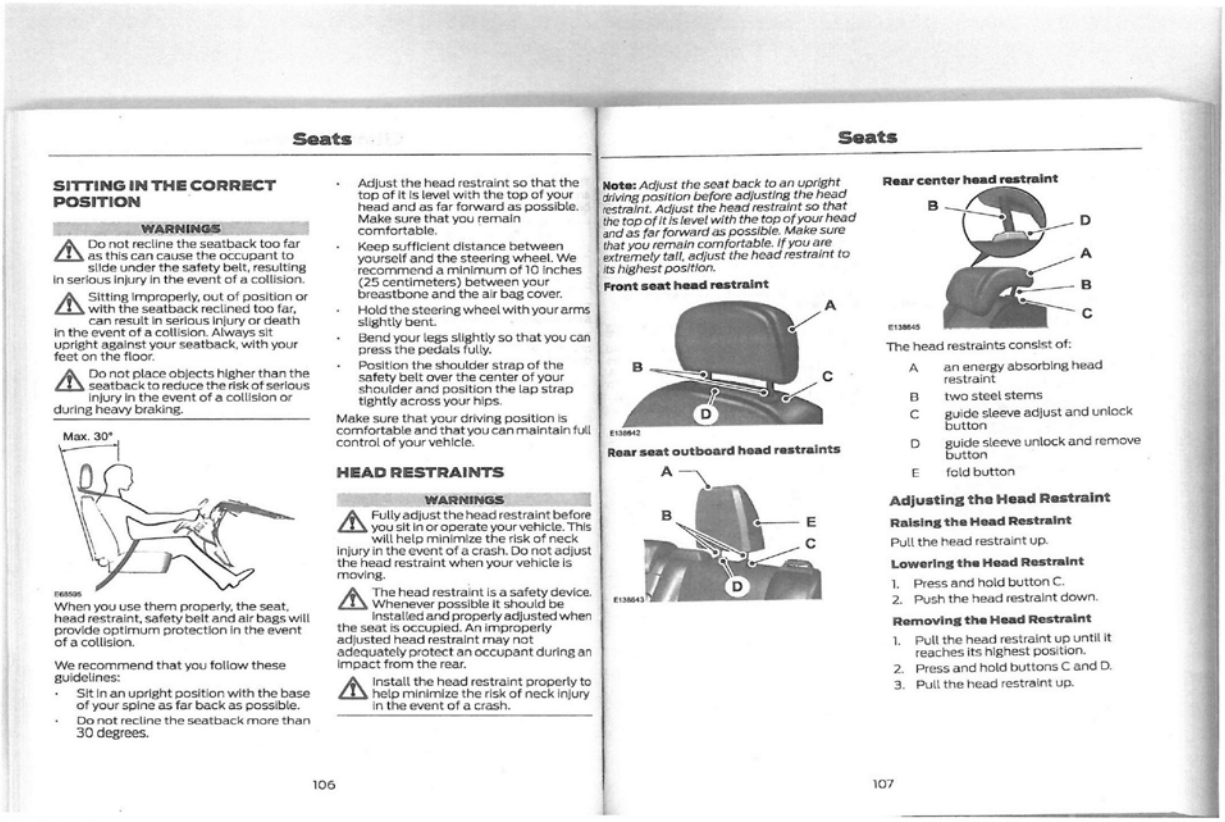
1. Press and hold button C.
2. Push the head restraint down.

Removing the Head Restraint

1. Pull the head restraint up until it reaches its highest position.
2. Press and hold buttons C and D.
3. Pull the head restraint up.

107

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



Seats

SITTING IN THE CORRECT POSITION

WARNINGS

Do not recline the seatback too far as this can cause the occupant to slide under the safety belt, resulting in serious injury in the event of a collision.

Sitting improperly, out of position or with the seatback reclined too far, can result in serious injury or death in the event of a collision. Always sit upright against your seatback, with your feet on the floor.

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- Keep sufficient distance between yourself and the steering wheel. We recommend a minimum of 10 inches (25 centimeters) between your breastbone and the air bag cover.
- Hold the steering wheel with your arms slightly bent.
- Bend your legs slightly so that you can press the pedals fully.
- Position the shoulder strap of the safety belt over the center of your shoulder and position the lap strap tightly across your hips.

Make sure that your driving position is comfortable and that you can maintain full control of your vehicle.

HEAD RESTRAINTS

WARNINGS

Fully adjust the head restraint before you sit in or operate your vehicle. This will help minimize the risk of neck injury in the event of a crash. Do not adjust the head restraint when your vehicle is moving.

The head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied. An improperly adjusted head restraint may not adequately protect an occupant during an impact from the rear.

Install the head restraint properly to help minimize the risk of neck injury in the event of a crash.

106

Seats

Note: *Adjust the seat back to an upright driving position before adjusting the head restraint. Adjust the head restraint so that the top of it is level with the top of your head and as far forward as possible. Make sure that you remain comfortable. If you are extremely tall, adjust the head restraint to its highest position.*

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C	guide sleeve adjust and unlock button
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E	fold button

Adjusting the Head Restraint

Raising the Head Restraint

Pull the head restraint up.

Lowering the Head Restraint

1. Press and hold button C.
2. Push the head restraint down.

Removing the Head Restraint

1. Pull the head restraint up until it reaches its highest position.
2. Press and hold buttons C and D.
3. Pull the head restraint up.

107

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

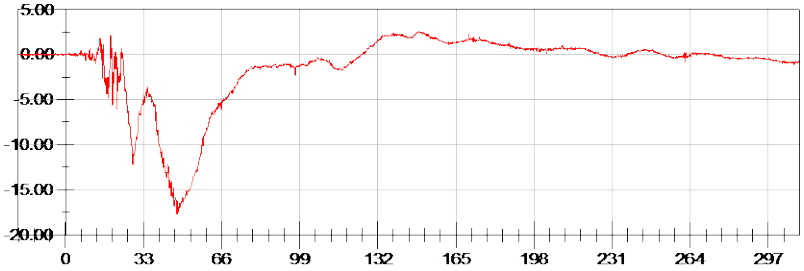
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

NHTSA

Test Lab: CTF
Test Number: 140109 (M20140201)

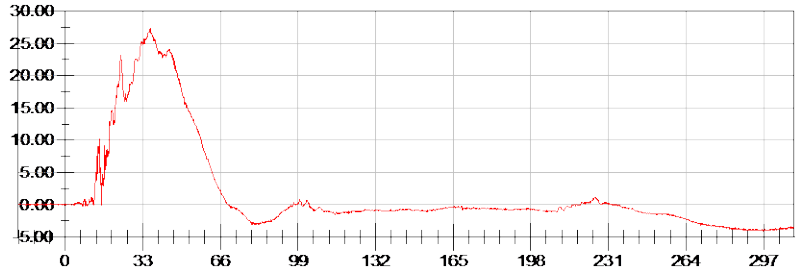
Test Date: 01/09/2014
Position #1 ES-2 Dummy with Rib Extension (F030)
Position #4 SID IIs Dummy (305)

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



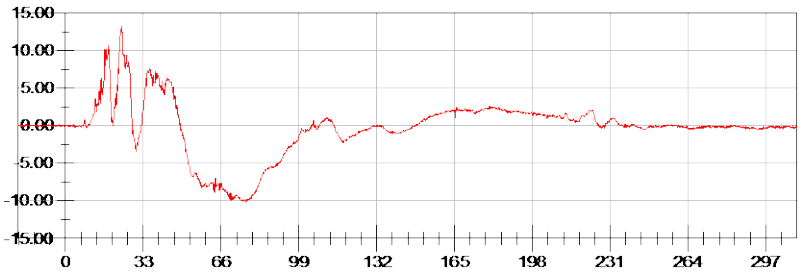
<Max>
2.60 g at 149.20 ms
<Min>
-17.68 g at 47.12 ms
CFC_1000

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



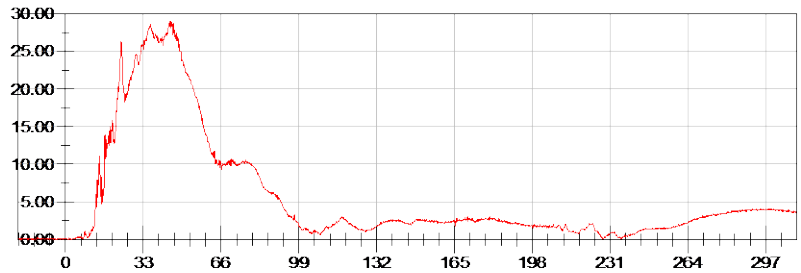
<Max>
27.40 g at 36.16 ms
<Min>
-4.06 g at 292.88 ms
CFC_1000

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



<Max>
13.18 g at 24.00 ms
<Min>
-10.26 g at 76.48 ms
CFC_1000

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



<Max>
29.09 g at 44.48 ms
<Min>
0.03 g at -19.60 ms
CFC_1000

NHTSA

Test Date: 01/09/2014

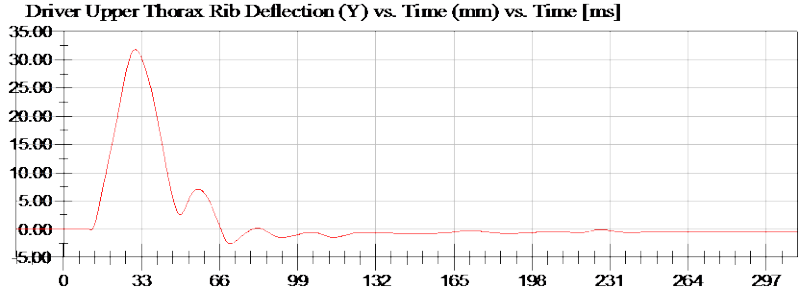
Test Lab: CTF

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

Test Number: 140109 (M20140201)

Position #4 SID IIs Dummy (305)

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



<Max>

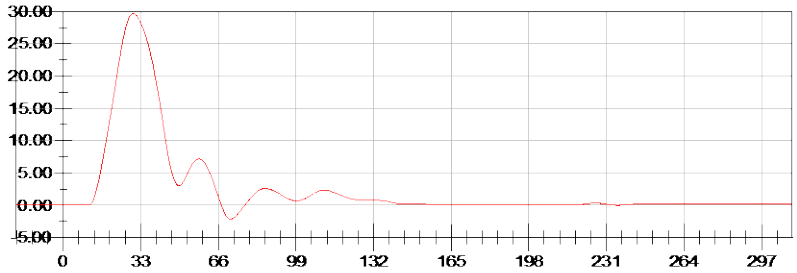
31.81 mm at 30.32 ms

<Min>

-2.56 mm at 70.56 ms

CFC_180

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



<Max>

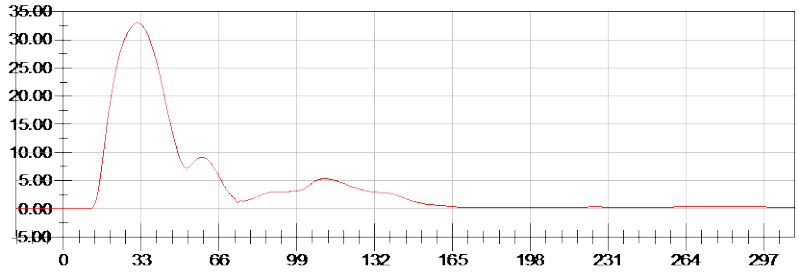
29.69 mm at 29.76 ms

<Min>

-2.21 mm at 71.20 ms

CFC_180

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



<Max>

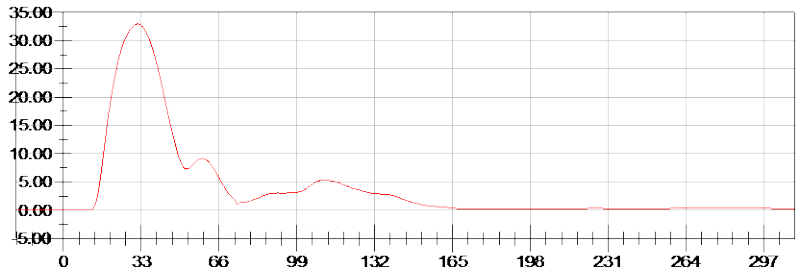
32.93 mm at 31.52 ms

<Min>

0.00 mm at -11.92 ms

CFC_180

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



<Max>

32.93 mm at 31.52 ms

<Min>

0.00 mm at -11.92 ms

CFC_180

NHTSA

Test Date: 01/09/2014

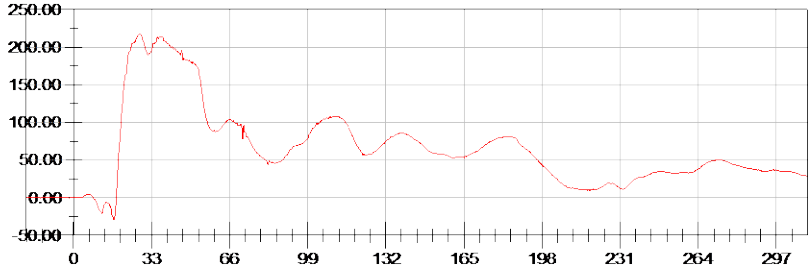
Test Lab: CTF

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

Test Number: 140109 (M20140201)

Position #4 SID IIs Dummy (305)

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



<Max>

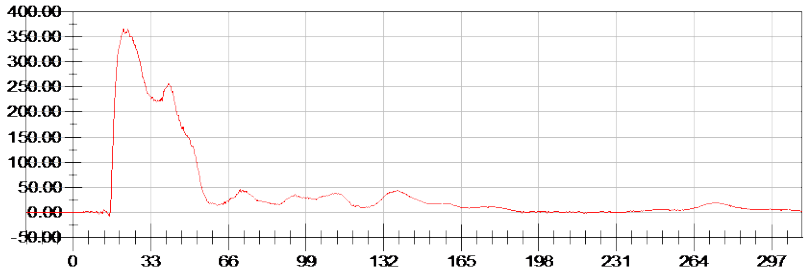
217.39 N at 28.24 ms

<Min>

-28.90 N at 17.12 ms

CFC_600

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



<Max>

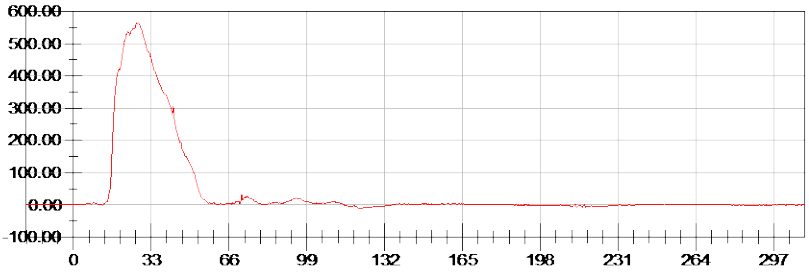
365.53 N at 21.44 ms

<Min>

-7.98 N at 15.36 ms

CFC_600

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



<Max>

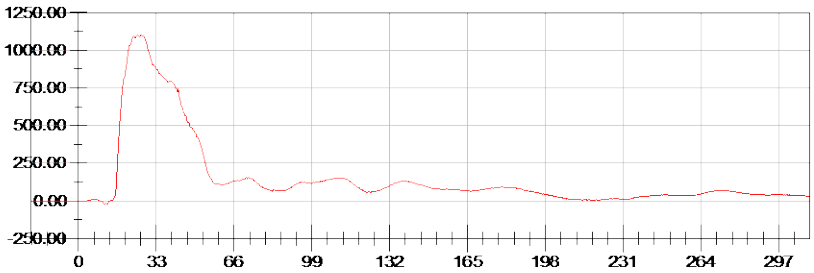
564.68 N at 27.60 ms

<Min>

-12.34 N at 121.44 ms

CFC_600

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



<Max>

1,102.18 N at 26.64 ms

<Min>

-23.81 N at 12.32 ms

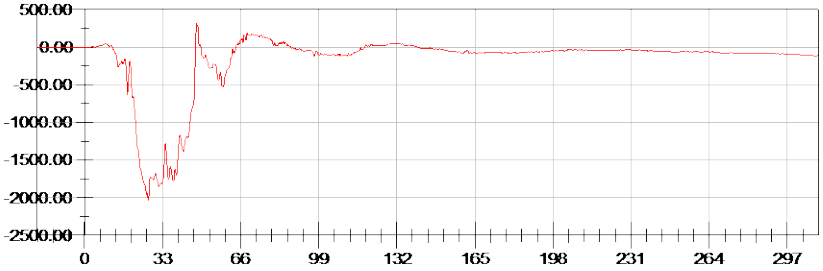
CFC_600

NHTSA

Test Lab: CTF
Test Number: 140109 (M20140201)

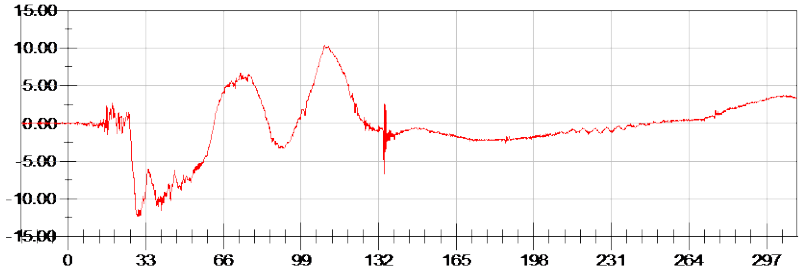
Test Date: 01/09/2014
Position #1 ES-2 Dummy with Rib Extension (F030)
Position #4 SID IIs Dummy (305)

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



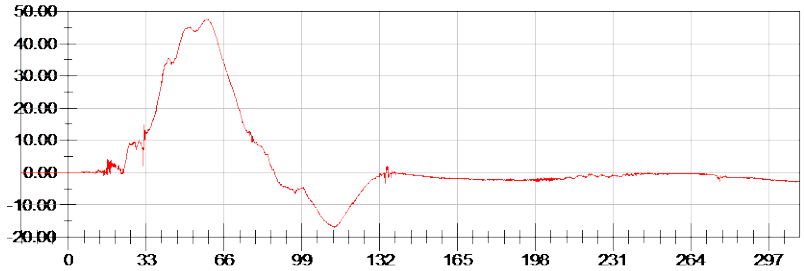
<Max>
314.51 N at 47.36 ms
<Min>
-2,040.12 N at 27.04 ms
CFC_600

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



<Max>
10.41 g at 109.20 ms
<Min>
-12.36 g at 29.60 ms
CFC_1000

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



<Max>
47.64 g at 58.56 ms
<Min>
-16.94 g at 112.64 ms
CFC_1000

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

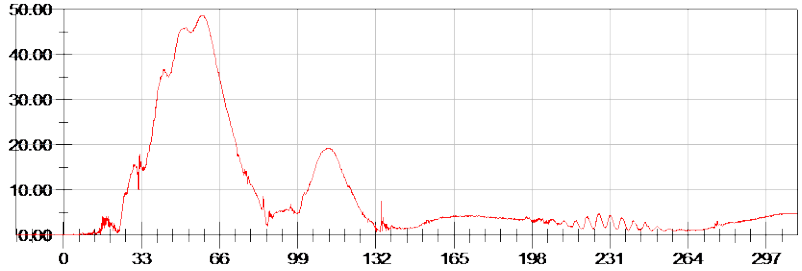
<Max>
6.34 g at 84.40 ms
<Min>
-10.16 g at 61.04 ms
CFC_1000

NHTSA

Test Lab: CTF
Test Number: 140109 (M20140201)

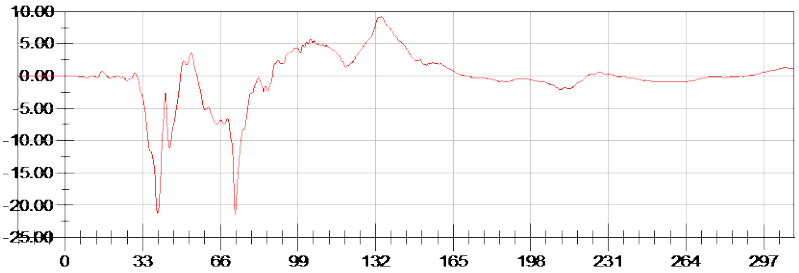
Test Date: 01/09/2014
Position #1 ES-2 Dummy with Rib Extension (F030)
Position #4 SID IIs Dummy (305)

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



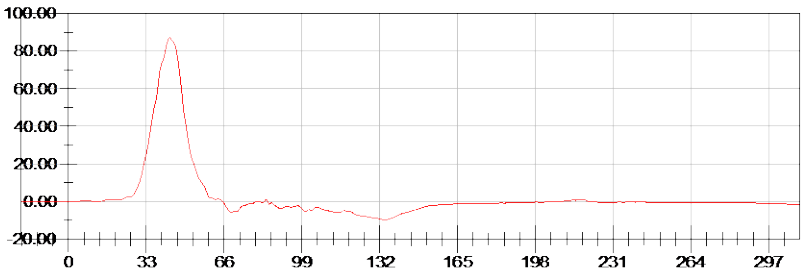
<Max>
48.74 g at 58.56 ms
<Min>
0.05 g at -20.00 ms
CFC_1000

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



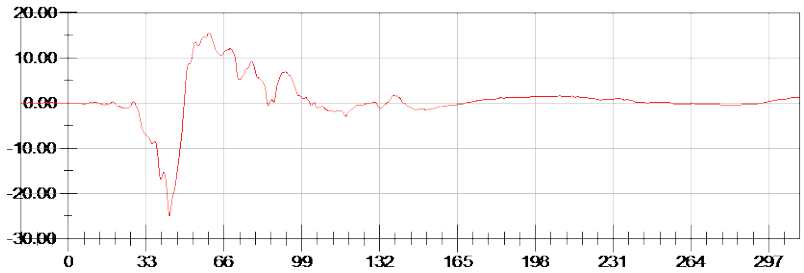
<Max>
9.18 g at 134.48 ms
<Min>
-21.46 g at 72.32 ms
CFC_180

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



<Max>
87.18 g at 42.96 ms
<Min>
-9.79 g at 134.40 ms
CFC_180

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



<Max>
15.45 g at 59.68 ms
<Min>
-25.02 g at 42.88 ms
CFC_180

NHTSA

Test Date: 01/09/2014

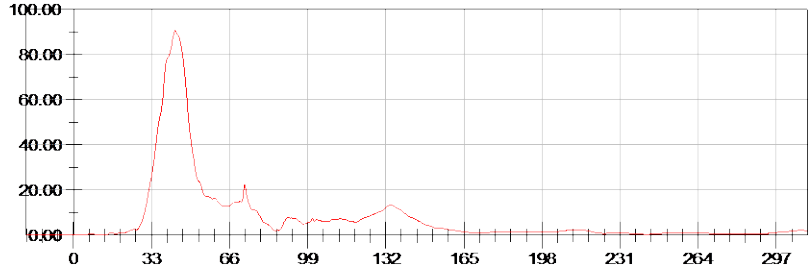
Test Lab: CTF

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

Test Number: 140109 (M20140201)

Position #4 SID IIs Dummy (305)

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



<Max>

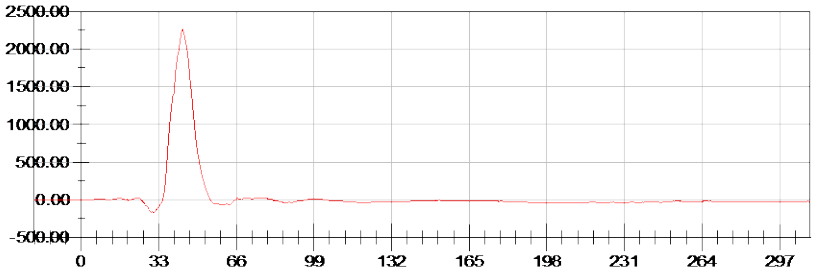
90.77 g at 42.96 ms

<Min>

0.01 g at 3.20 ms

CFC_180

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



<Max>

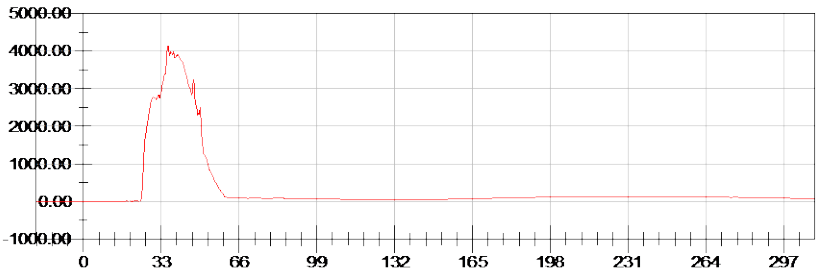
2,265.95 N at 43.12 ms

<Min>

-171.77 N at 30.80 ms

CFC_600

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



<Max>

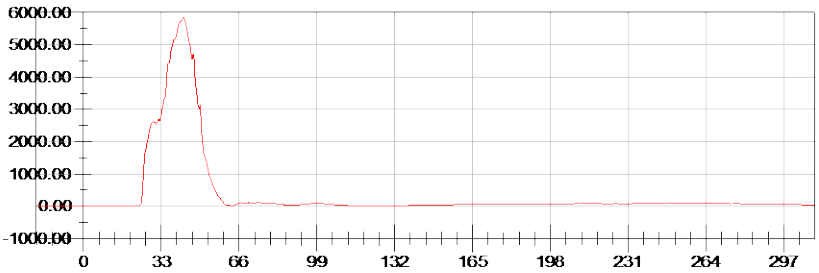
4,152.41 N at 35.84 ms

<Min>

-6.35 N at 13.52 ms

CFC_600

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



<Max>

5,839.15 N at 42.40 ms

<Min>

-6.82 N at 12.00 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

Table 1. External Measurements
Table 2. Head Drop Test
Resultant Head Acceleration (G's) vs. Time (ms)
Head (X) Acceleration (G's) vs. Time (ms)
Head (Y) Acceleration (G's) vs. Time (ms)
Head (Z) Acceleration (G's) vs. Time (ms)
Table 3 Neck Pendulum Test
Pendulum Velocity (m/s) vs. Time (ms)
Flexion Angle (°) vs. Time (ms)
Potentiometer A (°) vs. Time (ms)
Potentiometer B (°) vs. Time (ms)
Potentiometer C (°) vs. Time (ms)
Table 4. Shoulder Impact Test
Impactor Acceleration (G's) vs. Time (ms)
Table 5. Thorax – Upper Rib Drop Test
Upper Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Upper Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)
Table 6. Thorax – Middle Rib Drop Test
Middle Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Middle Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)
Table 7. Thorax – Lower Rib Drop Test
Lower Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Lower Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)
Table 8. Thorax – Full Body Impact Test
Pendulum Acceleration (G's) vs. Time (ms)
Impactor Force (kN) vs. Time (ms)
Upper Rib Displacement (mm) vs. Time (ms)
Middle Rib Displacement (mm) vs. Time (ms)
Lower Rib Displacement (mm) vs. Time (ms)
Table 9. Abdomen Impact Test
Impactor Force (kN) vs. Time (ms)
Total Abdomen Force (kN) vs. Time (ms)
Front Abdomen Force (kN) vs. Time (ms)
Middle Abdomen Force (kN) vs. Time (ms)
Rear Abdomen Force (kN) vs. Time (ms)
Table 10. Lumbar Spine Flexion Test
Pendulum Velocity (m/s) vs. Time (ms)
Spine Flexion Angle (°) vs. Time (ms)
Potentiometer A (°) vs. Time (ms)
Potentiometer B (°) vs. Time (ms)
Potentiometer C (°) vs. Time (ms)
Table 11. Pelvis Impact Test
Pendulum Acceleration (G's) vs. Time (ms)
Impactor Force (kN) vs. Time (ms)
Pubic Symphysis (Y) Force (kN) vs. Time (ms)

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Table 1. External Measurements
Table 2. Head Drop Test
Resultant Head Acceleration (G's) vs. Time (ms)
Head (X) Acceleration (G's) vs. Time (ms)
Head (Y) Acceleration (G's) vs. Time (ms)
Head (Z) Acceleration (G's) vs. Time (ms)
Table 3. Lateral Neck Pendulum Test
Pendulum Velocity (m/s) vs. Time (ms)
Flexion Angle (°) vs. Time (ms)
Moment About Occipital Condyle (Nm) vs. Time (ms)
Table 4. Shoulder Impact Test
Impactor Acceleration (G's) vs. Time (ms)
Shoulder Displacement (mm) vs. Time (ms)
Upper Spine Acceleration (G's) vs. Time (ms)
Table 5. Thorax (With Arm) Impact Test
Impactor Acceleration (G's) vs. Time (ms)
Shoulder Displacement (mm) vs. Time (ms)
Upper Rib Displacement (mm) vs. Time (ms)
Middle Rib Displacement (mm) vs. Time (ms)
Lower Rib Displacement (mm) vs. Time (ms)
Upper Spine Acceleration (G's) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)
Table 6. Thorax (Without Arm) Impact Test
Impactor Acceleration (G's) vs. Time (ms)
Upper Rib Displacement (mm) vs. Time (ms)
Middle Rib Displacement (mm) vs. Time (ms)
Lower Rib Displacement (mm) vs. Time (ms)
Upper Spine Acceleration (G's) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)
Table 7. Abdomen Impact Test
Impactor Acceleration (G's) vs. Time (ms)
Upper Abdominal Rib Displacement (mm) vs. Time (ms)
Lower Abdominal Rib Displacement (mm) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)
Table 8. Pelvis Plug Quasi-Static Test (Optional*)
Table 9. Pelvis Acetabulum Impact Test
Impactor Acceleration (G's) vs. Time (ms)
Pelvis (Y) Acceleration (G's) vs. Time (ms)
Acetabulum Force (N) vs. Time (ms)
Table 10. Pelvis Iliac Impact Test
Impactor Acceleration (G's) vs. Time (ms)
Pelvis (Y) Acceleration (G's) vs. Time (ms)
Iliac Force (N) vs. Time (ms)

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 18
11/16/13

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	447	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	470	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	268	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	605	Yes

Technician

Approved

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Resultant Acceleration	125 - 155 g	145.1 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	-6.9 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

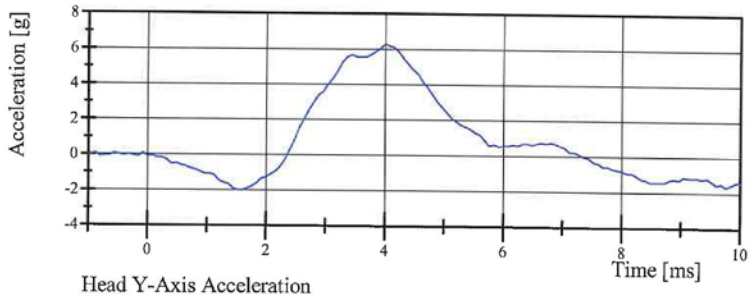
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 07:19:42 360

Transportation Research Center Inc.

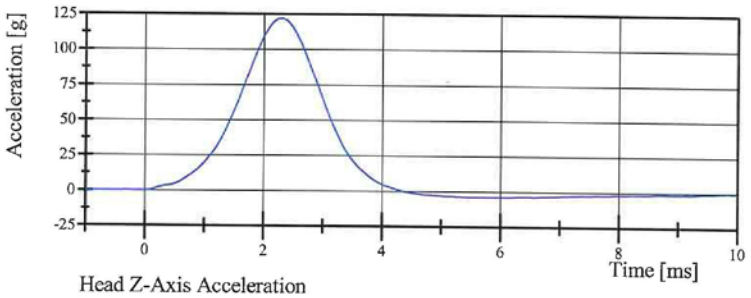
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Head X-Axis Acceleration



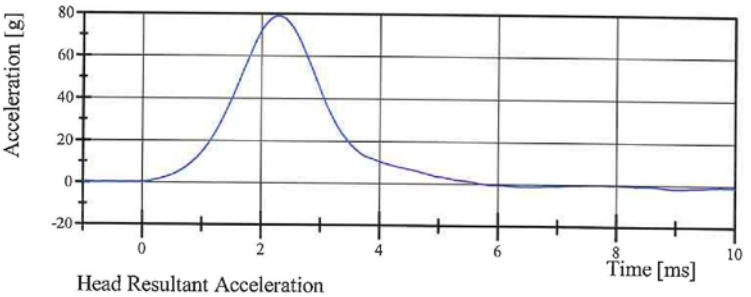
Filter Class: CFC_1000
Max: 6.3 g at 4.0 ms
Min: -2.0 g at 1.5 ms

Head Y-Axis Acceleration



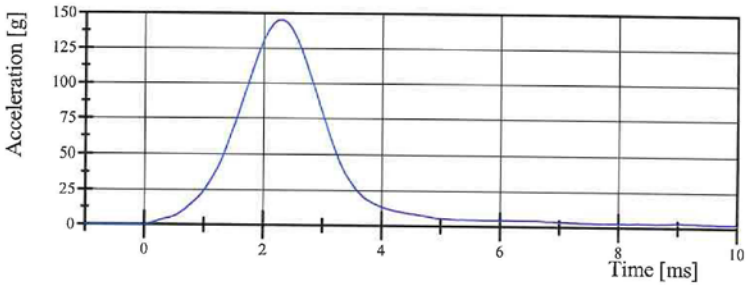
Filter Class: CFC_1000
Max: 121.9 g at 2.3 ms
Min: -4.2 g at 5.7 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 78.8 g at 2.2 ms
Min: -1.9 g at 9.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 145.1 g at 2.3 ms
Min: 0.0 g at -0.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 07:19:48 360

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.6 deg	Yes
Time of Peak	54 - 66 ms	59.0 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	64.3 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

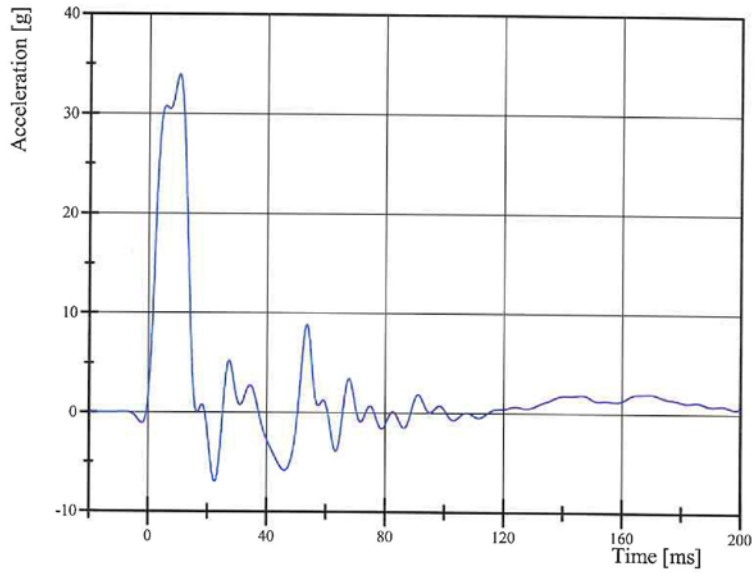
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 09:03:18 1310

Transportation Research Center Inc.

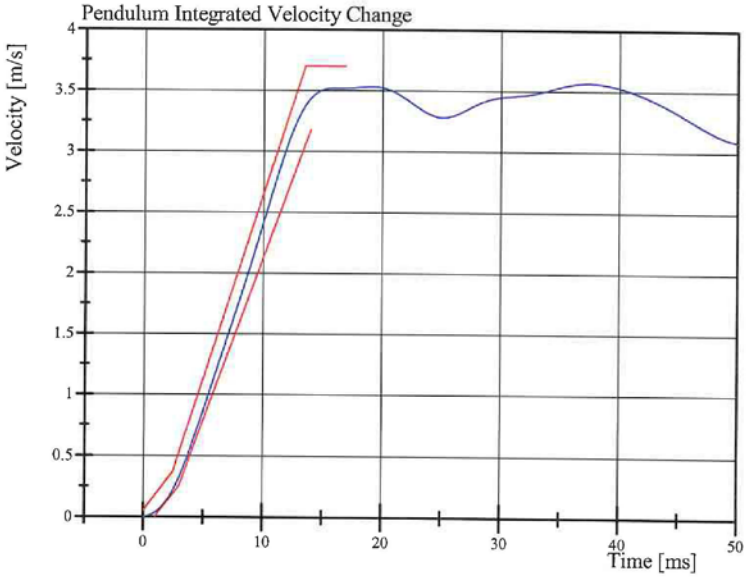
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Pendulum Acceleration



Filter Class: CFC_60
Max: 33.9 g at 10.2 ms
Min: -7.0 g at 22.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 37.3 ms
Min: 0.0 m/s at 0.0 ms

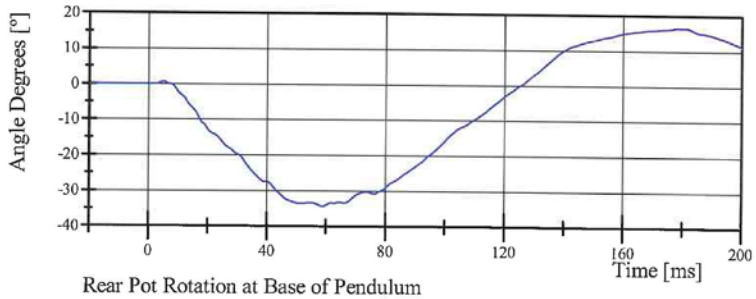
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 09:03:25 1310

Transportation Research Center Inc.

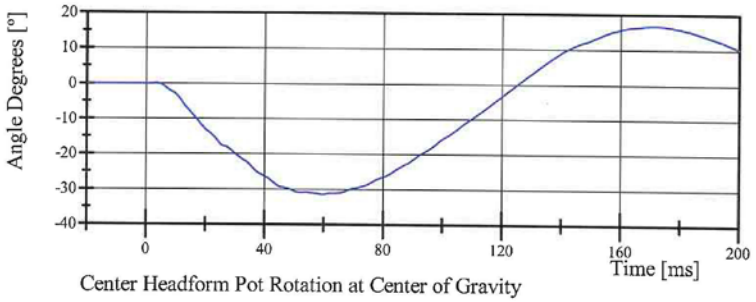
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Forward Pot Rotation at Base of Pendulum



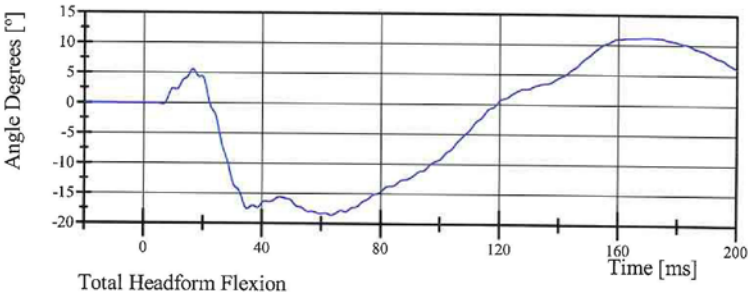
Filter Class: CFC_180
Max: 16.4 ° at 178.1 ms
Min: -34.4 ° at 58.8 ms

Rear Pot Rotation at Base of Pendulum



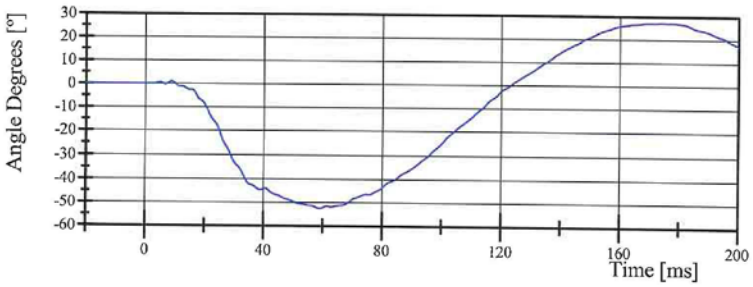
Filter Class: CFC_180
Max: 16.8 ° at 171.2 ms
Min: -31.4 ° at 59.7 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.2 ° at 170.2 ms
Min: -18.6 ° at 63.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 27.1 ° at 174.4 ms
Min: -52.6 ° at 59.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 09:03:26 1310

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.28 g	Yes

Test meets specifications.

Comments:

Technician

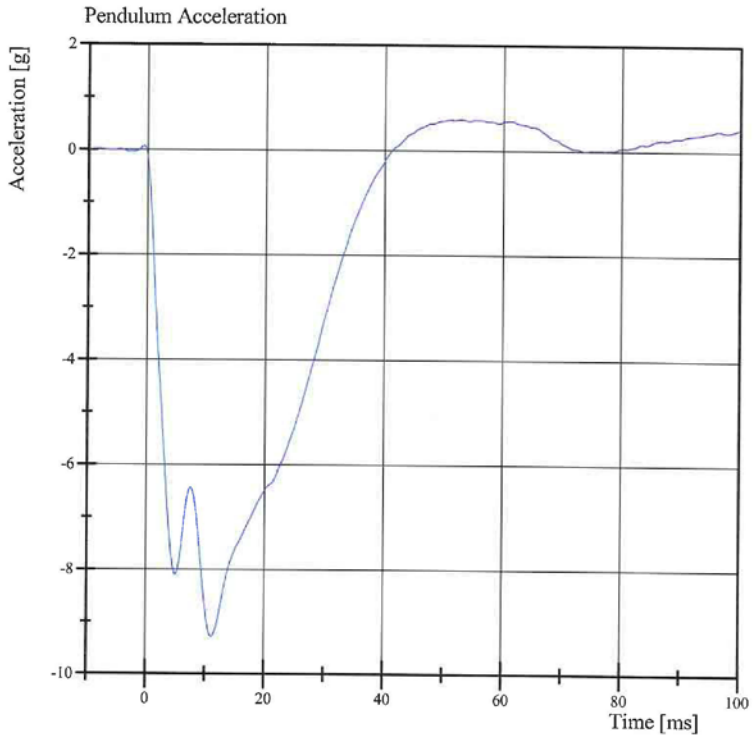
Approved

Specification Source: NHTSA final rule 8/15/2008

11.16.2013 10:49:26 586

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 0.6 g at 52.7 ms
Min: -9.3 g at 11.1 ms

Specification Source: NHTSA final rule 8/15/2008

11.16.2013 10:49:36 586

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.5 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

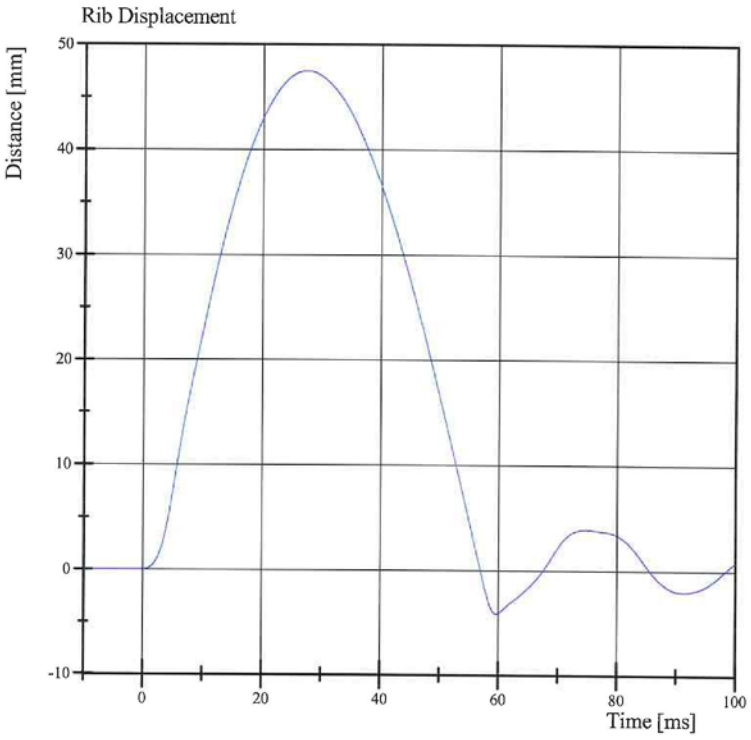
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:04:14 735

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 47.5 mm at 27.4 ms
Min: -4.2 mm at 59.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:04:22 735

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.5 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

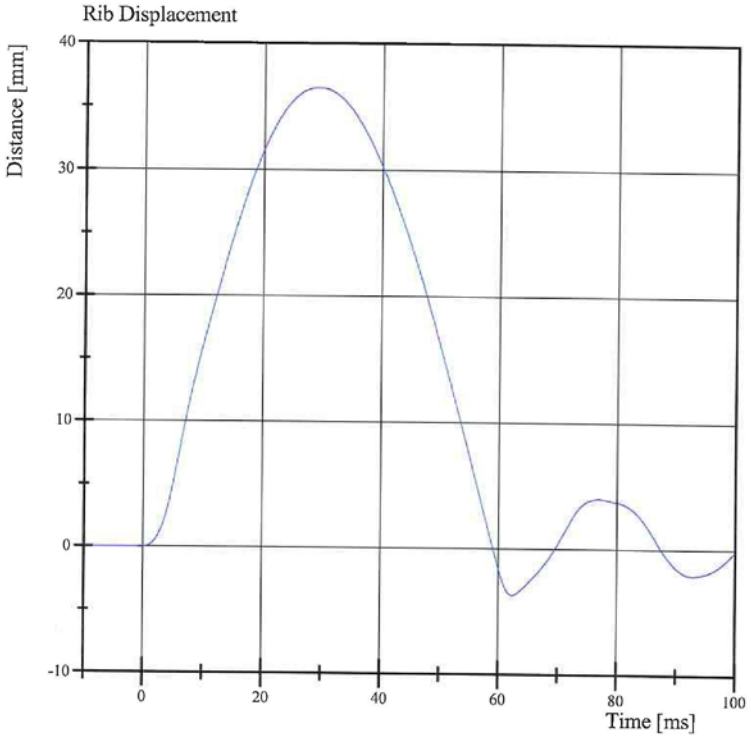
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:09:46 932

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 36.5 mm at 29.2 ms
Min: -3.7 mm at 62.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:09:53 932

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

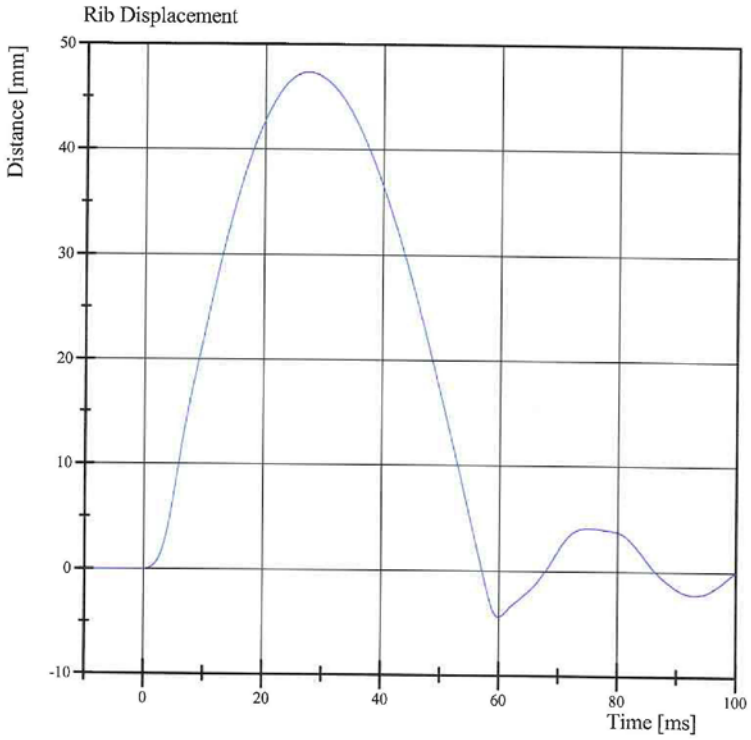
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:14:03 738

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 47.4 mm at 27.3 ms
Min: -4.4 mm at 59.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:14:11 738

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	35 %	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

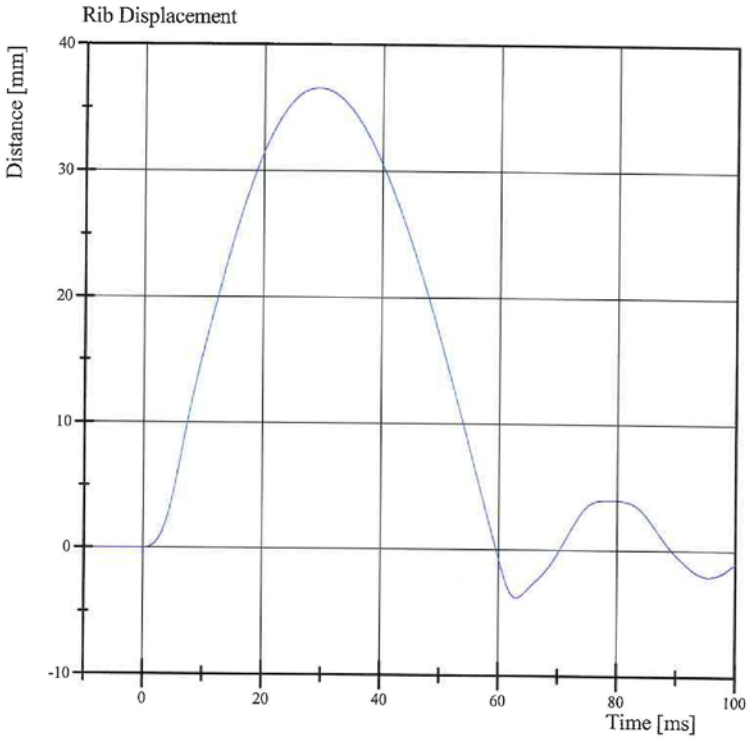
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:20:43 924

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 36.6 mm at 29.2 ms
Min: -3.8 mm at 63.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:20:51 924

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	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

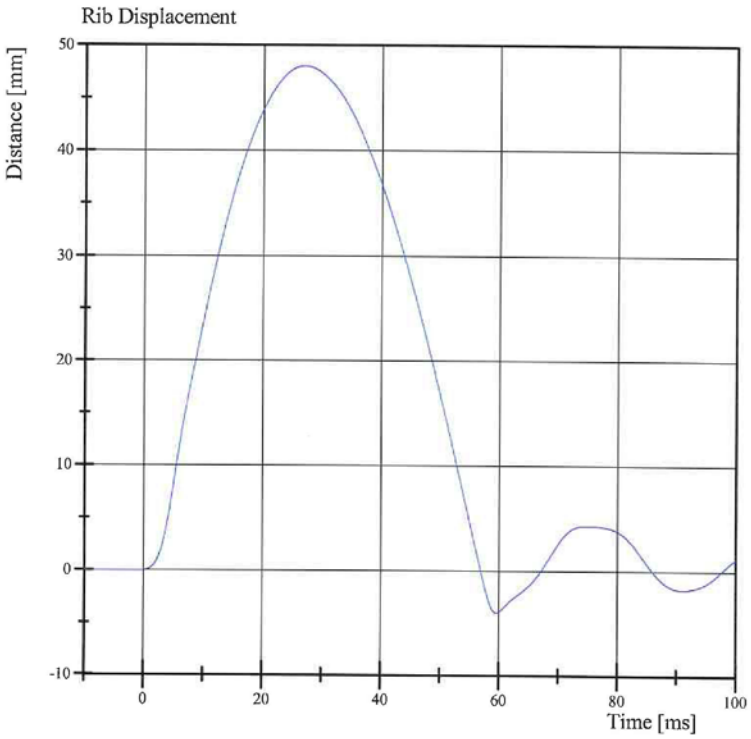
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:24:52 739

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 48.0 mm at 26.9 ms
Min: -4.0 mm at 59.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:25:00 739

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °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

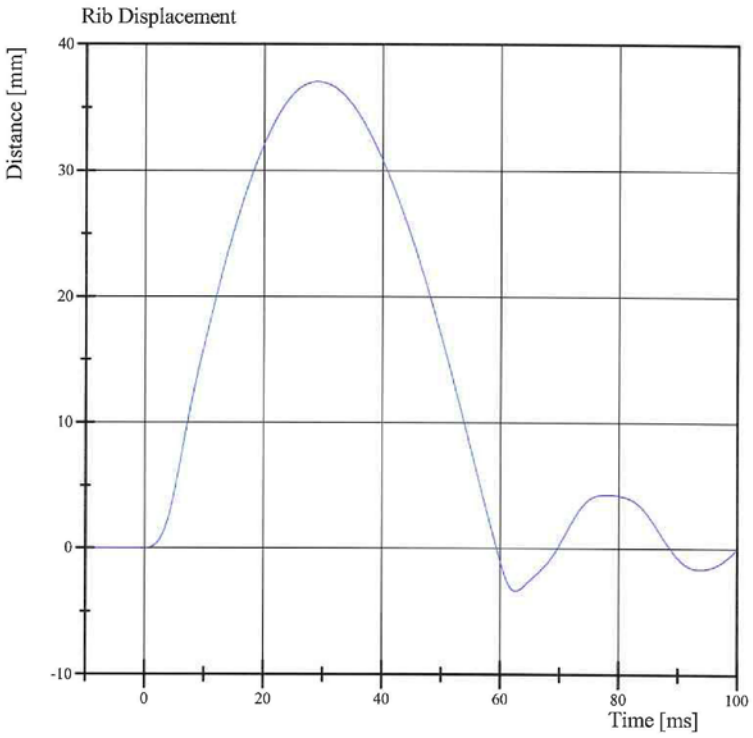
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:30:34 929

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 37.1 mm at 29.0 ms
Min: -3.4 mm at 62.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 08:30:46 929

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.468 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,457.0 N	Yes
Upper Rib Displacement	34 - 41 mm	37.1 mm	Yes
Center Rib Displacement	37 - 45 mm	40.1 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.7 mm	Yes

Test meets specifications.

Comments:

Technician

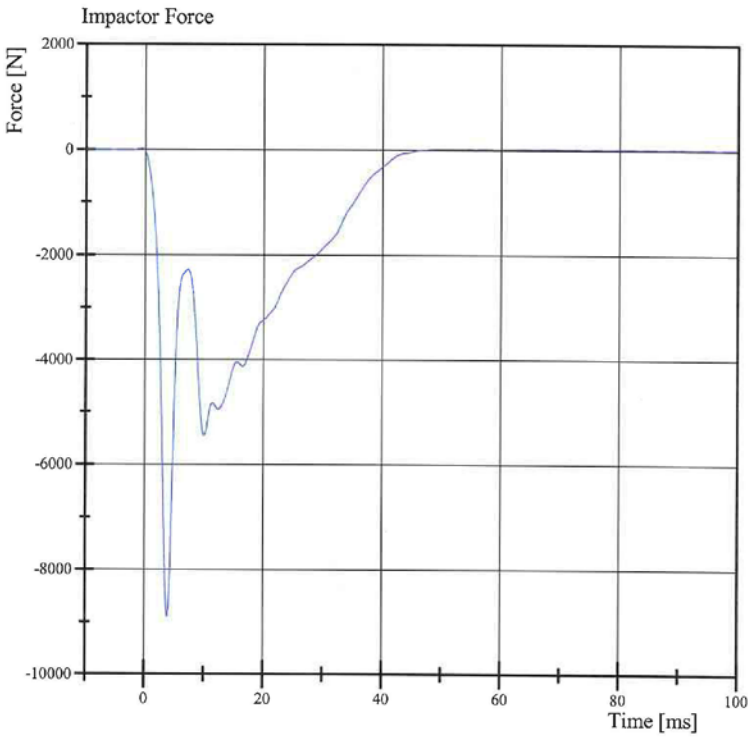
Approved

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

11.16.2013 11:02:27 486

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013



Filter Class: CFC_180
Max: 26.4 N at 67.4 ms
Min: -8,905.0 N at 3.8 ms

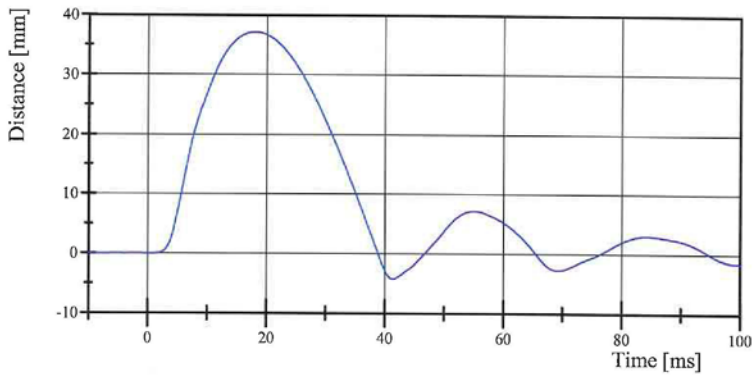
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

11.16.2013 11:02:41 486

Transportation Research Center Inc.

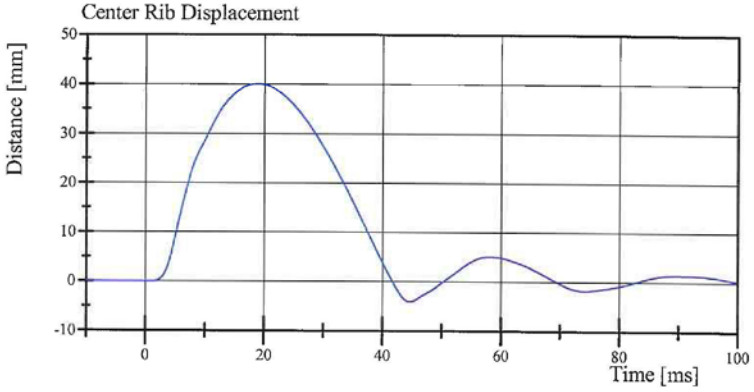
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Upper Rib Displacement



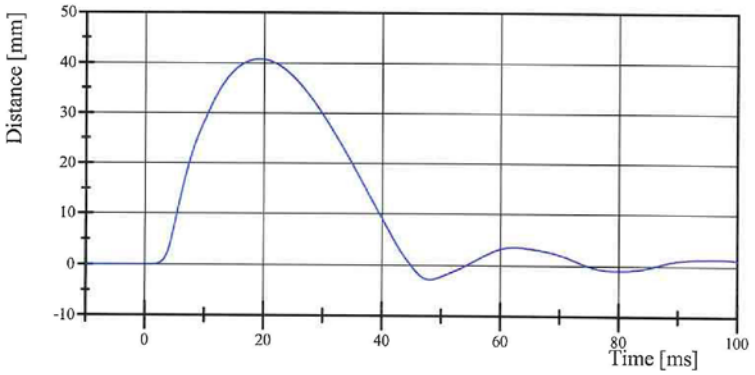
Filter Class: CFC_180
Max: 37.1 mm at 18.0 ms
Min: -4.3 mm at 41.4 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 40.1 mm at 18.9 ms
Min: -4.1 mm at 44.6 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.7 mm at 19.3 ms
Min: -2.8 mm at 48.1 ms

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

11.16.2013 11:02:42 486

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 18-3
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,223.2 N	Yes
Time of Peak	10.6 - 13.0 ms	10.64 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,656.8 N	Yes
Time of Peak	10.0 - 12.3 ms	10.08 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

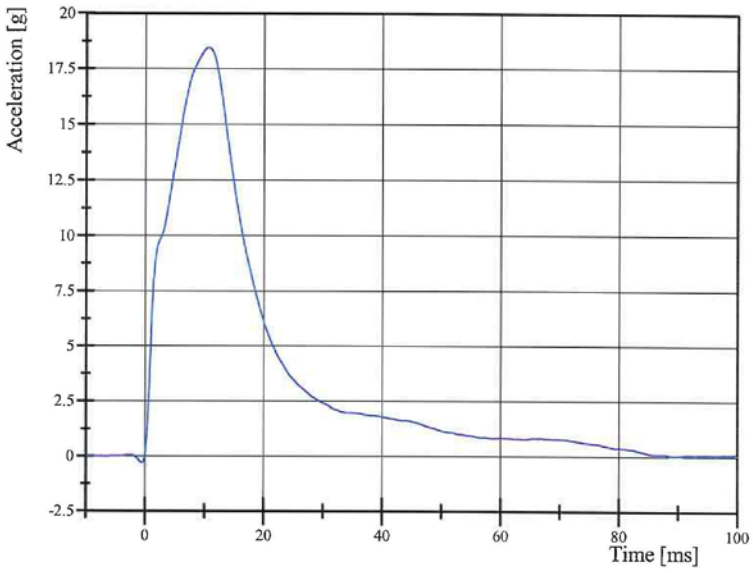
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 12:52:42 569

Transportation Research Center Inc.

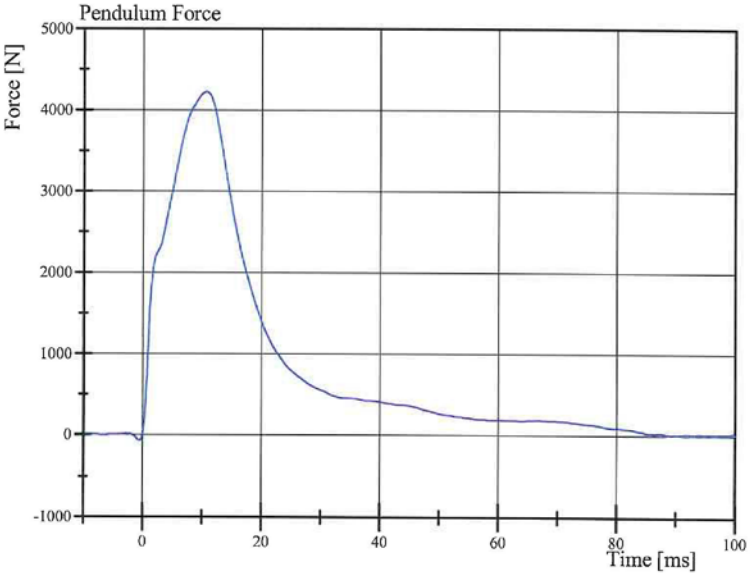
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 18-3
Test Date: 11/16/2013

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.4 g at 10.6 ms
Min: -0.3 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,223.2 N at 10.6 ms
Min: -71.5 N at -0.6 ms

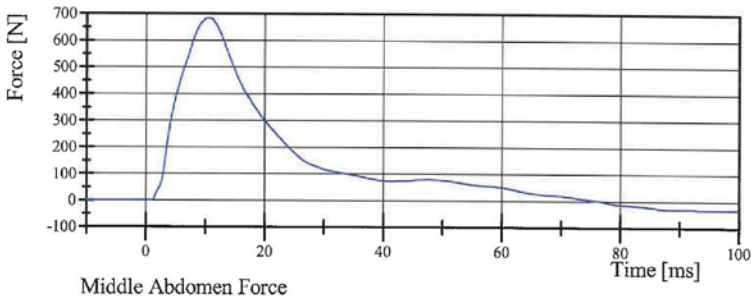
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 12:52:55 569

Transportation Research Center Inc.

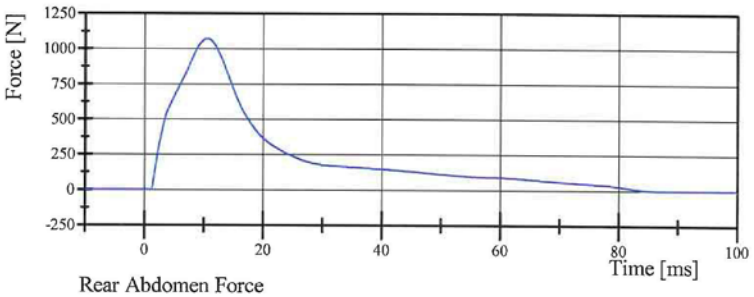
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 18-3
Test Date: 11/16/2013

Front Abdomen Force



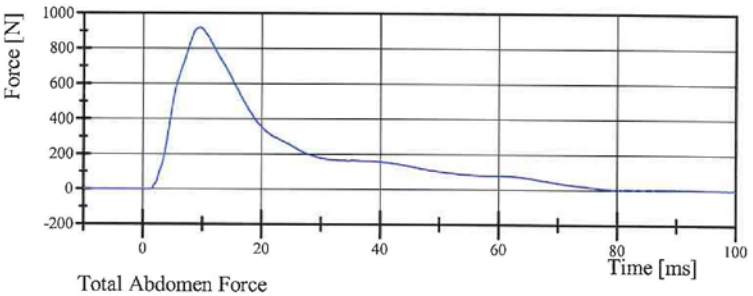
Filter Class: CFC_600
Max: 681.9 N at 10.3 ms
Min: -33.5 N at 100.0 ms

Middle Abdomen Force



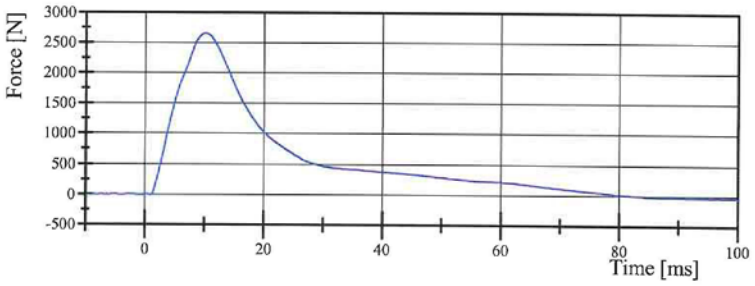
Filter Class: CFC_600
Max: 1,072.0 N at 10.4 ms
Min: -5.7 N at 97.6 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 917.9 N at 9.6 ms
Min: -3.4 N at 99.3 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,656.8 N at 10.1 ms
Min: -42.4 N at 99.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 12:52:57 569

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 18-4
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.027 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.3 deg	Yes
Time of Peak	39 - 53 ms	46.3 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.0 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

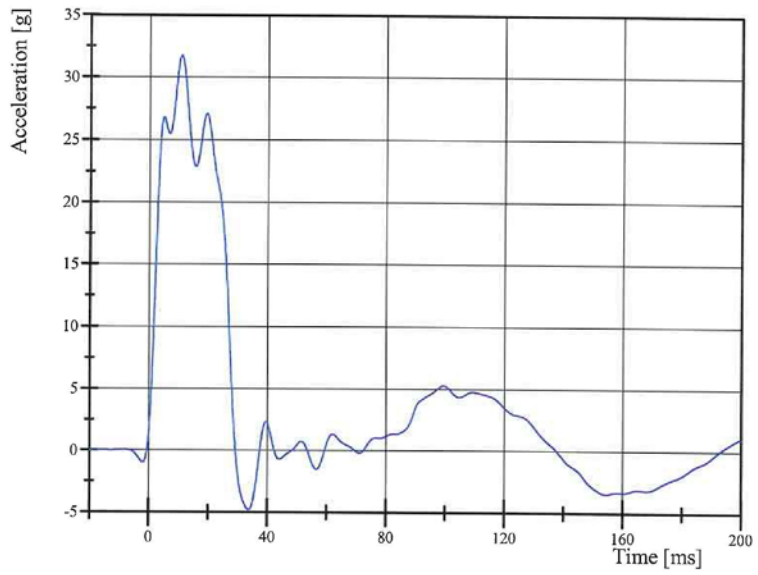
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 09:22:04 579

Transportation Research Center Inc.

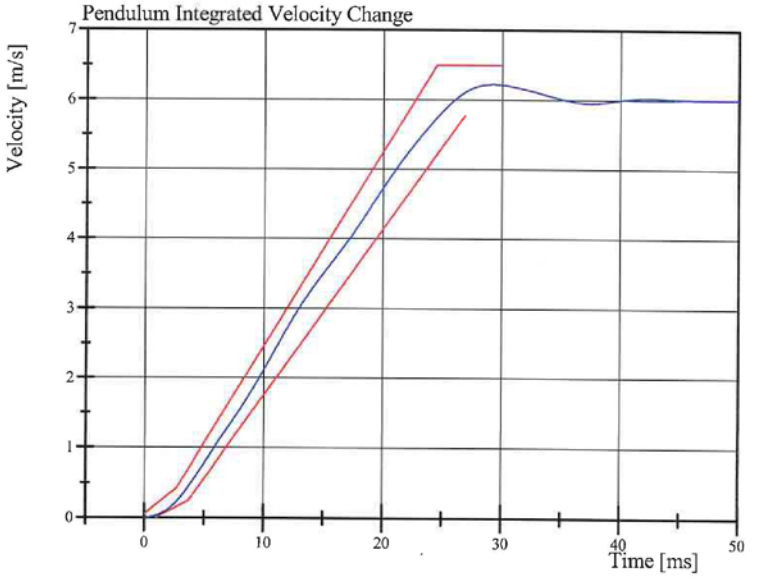
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 18-4
Test Date: 11/16/2013

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.7 g at 10.7 ms
Min: -4.8 g at 33.8 ms

Pendulum Integrated Velocity Change



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

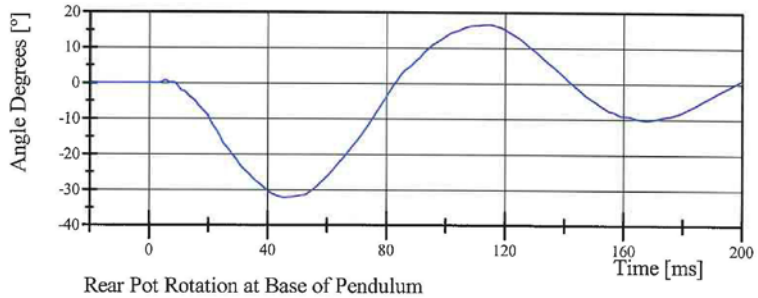
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 09:22:14 579

Transportation Research Center Inc.

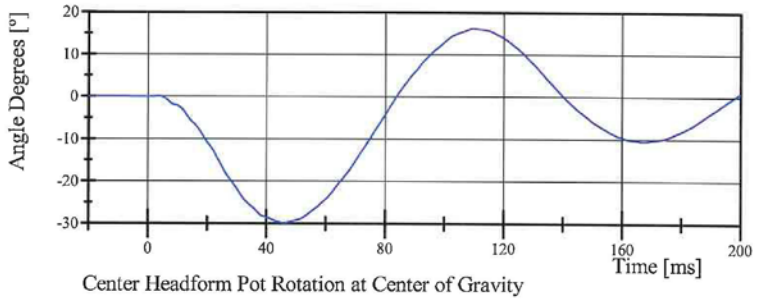
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 18-4
Test Date: 11/16/2013

Forward Pot Rotation at Base of Pendulum



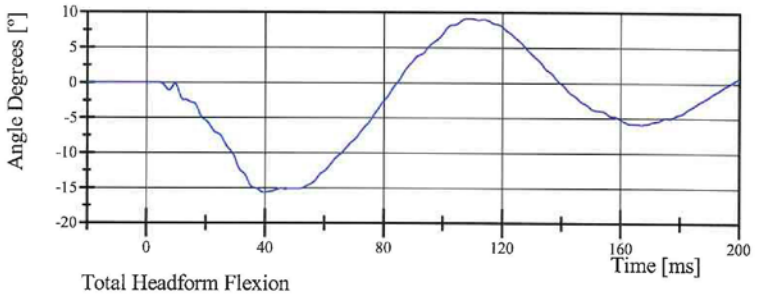
Filter Class: CFC_180
Max: 16.5 ° at 114.5 ms
Min: -32.2 ° at 45.6 ms

Rear Pot Rotation at Base of Pendulum



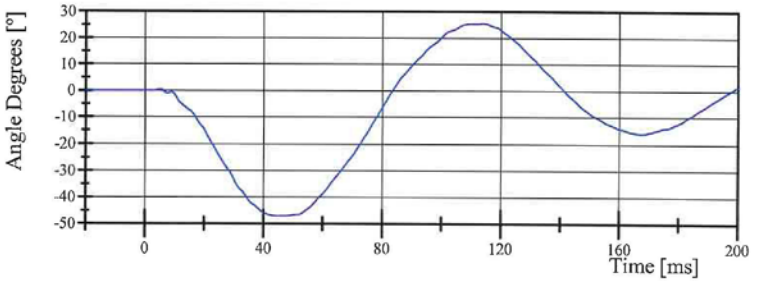
Filter Class: CFC_180
Max: 16.2 ° at 109.8 ms
Min: -30.0 ° at 45.8 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.1 ° at 108.6 ms
Min: -15.6 ° at 39.6 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.4 ° at 113.8 ms
Min: -47.3 ° at 46.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 09:22:15 579

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,176.9 N	Yes
Time of Peak	11.8 - 16.1 ms	13.04 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,291.8 N	Yes
Time of Peak	12.2 - 17.0 ms	14.00 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

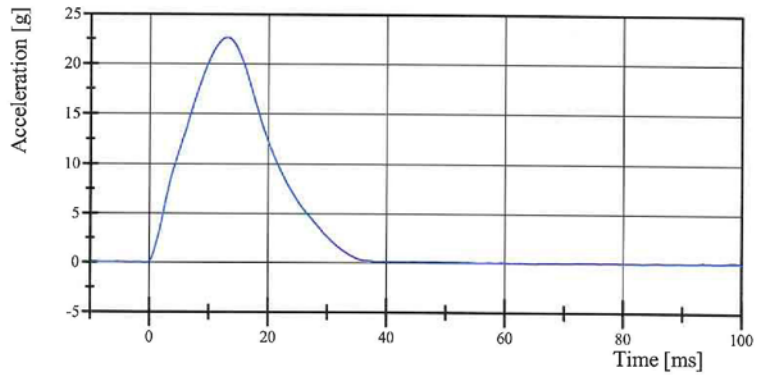
Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 11:35:43 537

Transportation Research Center Inc.

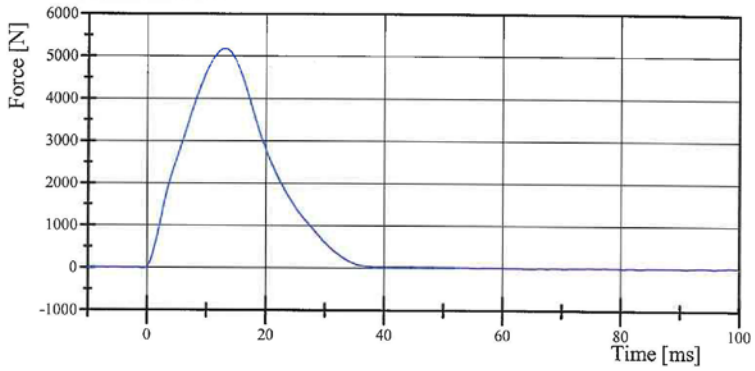
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 18-1
Test Date: 11/16/2013

Pendulum Acceleration



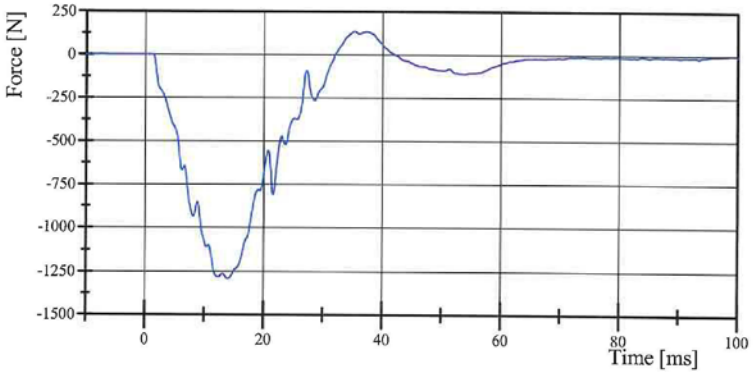
Filter Class: CFC_180
Max: 22.6 g at 13.0 ms
Min: -0.1 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,176.9 N at 13.0 ms
Min: -13.3 N at -0.6 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 136.0 N at 35.2 ms
Min: -1,291.8 N at 14.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.16.2013 11:35:53 537

Driver S/N F030

Post-Test Calibration Sheets

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 19
01/13/14

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	447	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	470	Yes
8	Thorax Width	322.0 - 332.0	326	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	267	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	606	Yes

Technician

Approved

Baseline 10/07/05

Transportation Research Center Inc.

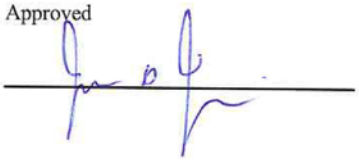
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Resultant Acceleration	125 - 155 g	146.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.1 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician 

Approved 

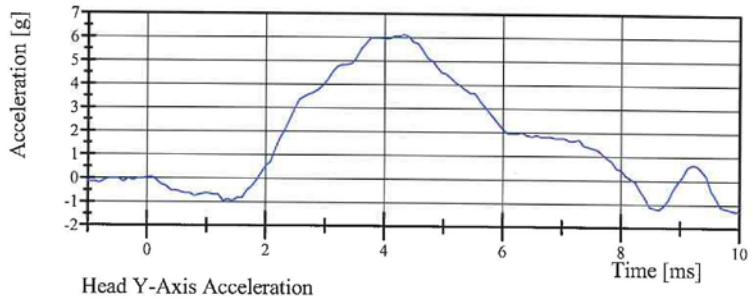
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 14:14:51 360

Transportation Research Center Inc.

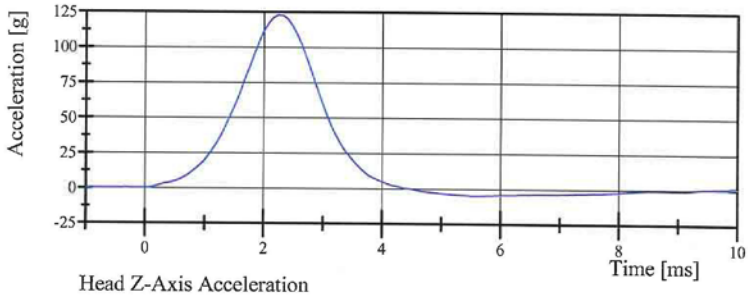
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Head X-Axis Acceleration



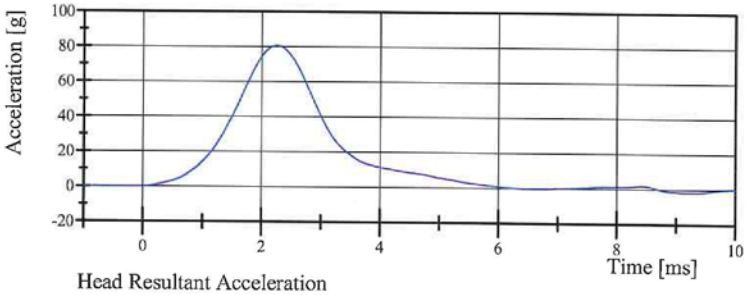
Filter Class: CFC_1000
Max: 6.1 g at 4.3 ms
Min: -1.3 g at 9.9 ms

Head Y-Axis Acceleration



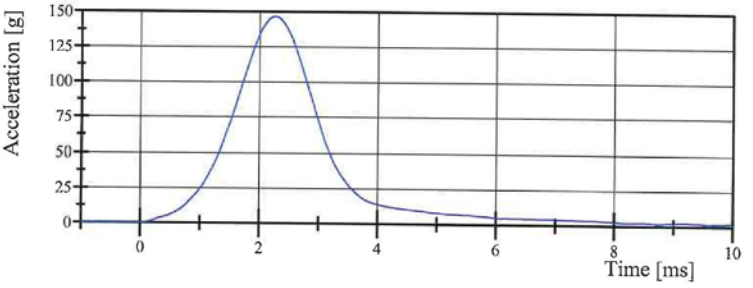
Filter Class: CFC_1000
Max: 122.8 g at 2.2 ms
Min: -5.0 g at 5.7 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 80.6 g at 2.2 ms
Min: -2.0 g at 9.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 146.9 g at 2.2 ms
Min: 0.1 g at -0.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 14:15:01 360

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.7 deg	Yes
Time of Peak	54 - 66 ms	56.3 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	66.5 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

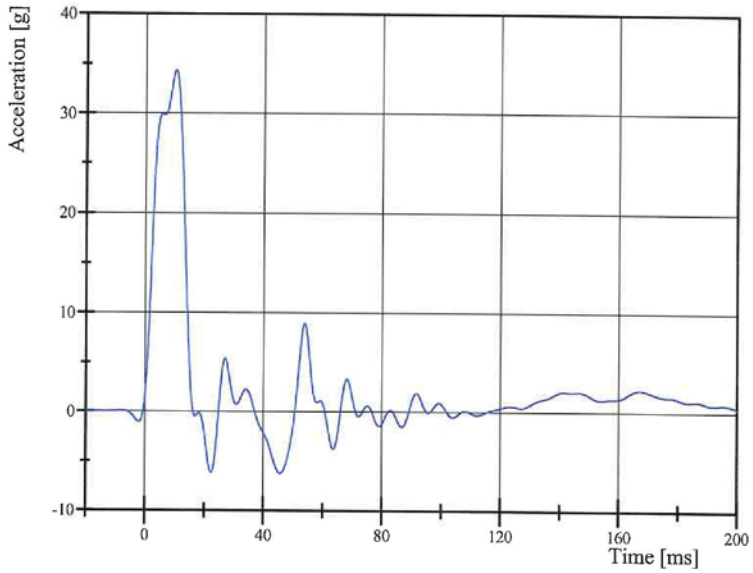
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 14:01:19 1310

Transportation Research Center Inc.

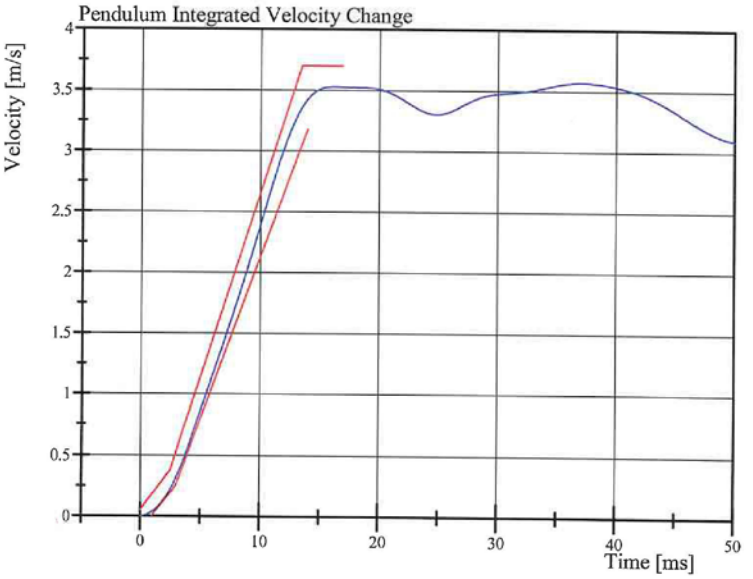
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Pendulum Acceleration



Filter Class: CFC_60
Max: 34.3 g at 10.1 ms
Min: -6.3 g at 45.7 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 37.0 ms
Min: 0.0 m/s at 0.0 ms

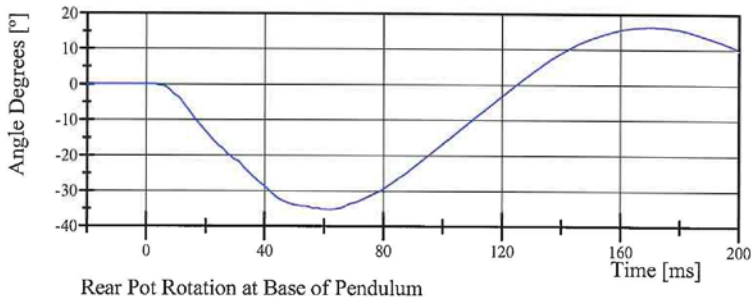
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 14:01:29 1310

Transportation Research Center Inc.

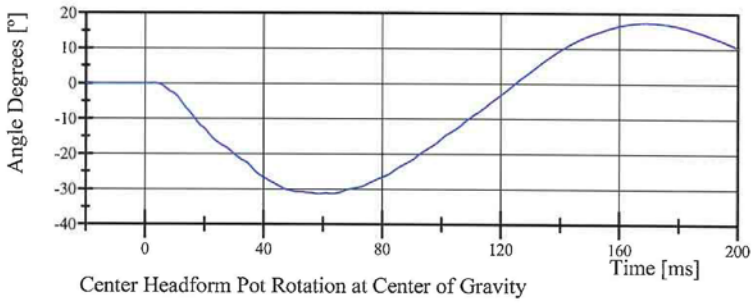
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Forward Pot Rotation at Base of Pendulum



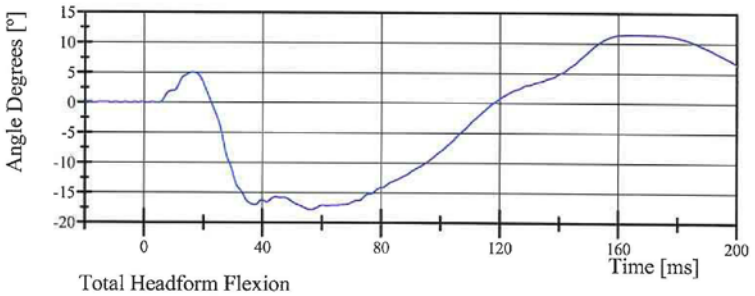
Filter Class: CFC_180
Max: 16.2 ° at 169.9 ms
Min: -35.4 ° at 61.8 ms

Rear Pot Rotation at Base of Pendulum



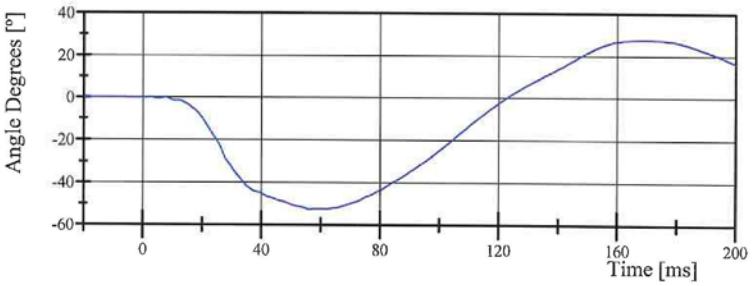
Filter Class: CFC_180
Max: 17.3 ° at 168.9 ms
Min: -31.4 ° at 57.9 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.4 ° at 163.0 ms
Min: -17.8 ° at 56.2 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 27.5 ° at 168.9 ms
Min: -52.7 ° at 56.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 14:01:30 1310

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.01 g	Yes

Test meets specifications.

Comments:

Technician

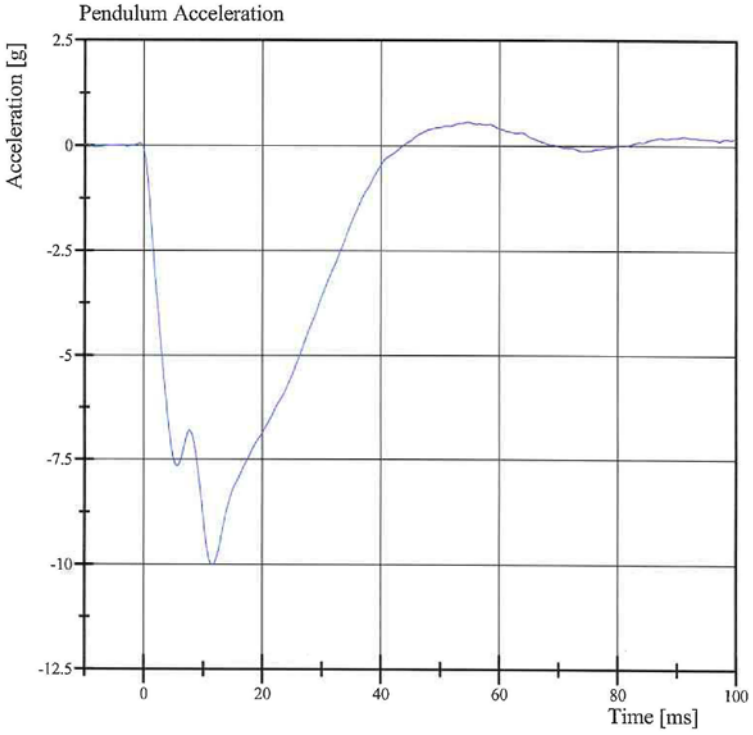
Approved

Specification Source: NHTSA final rule 8/15/2008

01.13.2014 17:40:12 597

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 0.6 g at 54.6 ms
Min: -10.0 g at 11.5 ms

Specification Source: NHTSA final rule 8/15/2008

01.13.2014 17:40:26 597

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.8 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

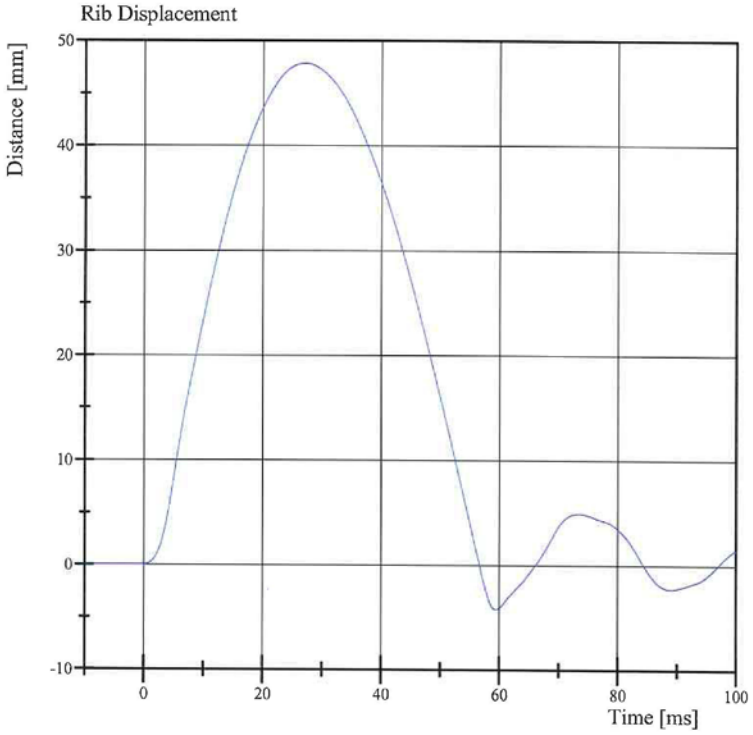
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 14:59:43 745

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 47.8 mm at 27.0 ms
Min: -4.3 mm at 59.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 14:59:55 745

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

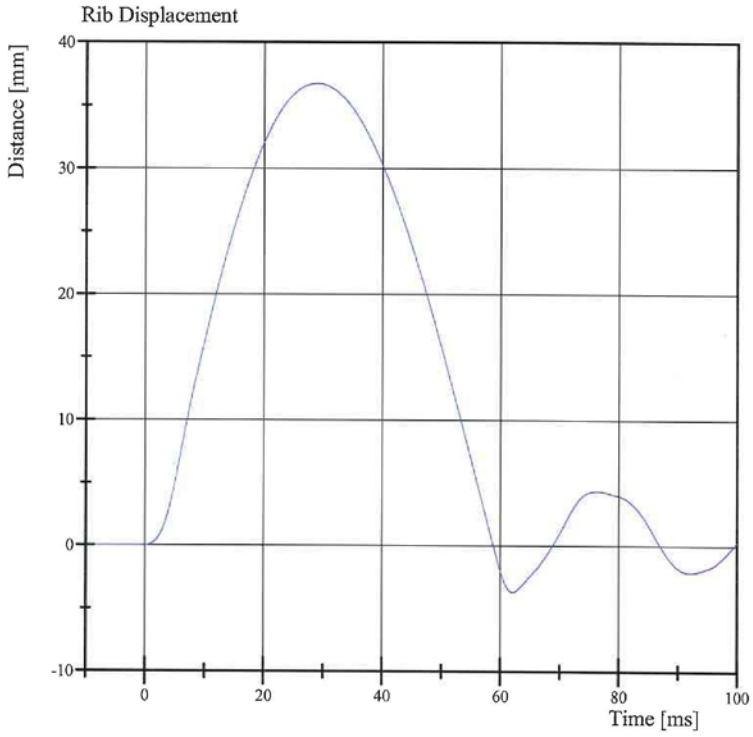
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:06:01 939

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 36.7 mm at 29.0 ms
Min: -3.7 mm at 62.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:06:20 939

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

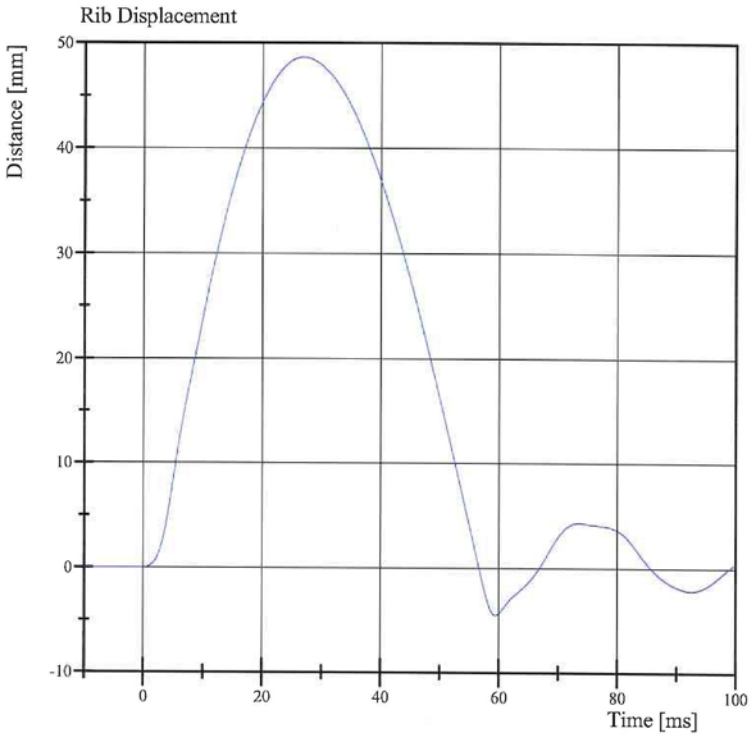
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:21:51 748

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 48.7 mm at 26.9 ms
Min: -4.5 mm at 59.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:22:02 748

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °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

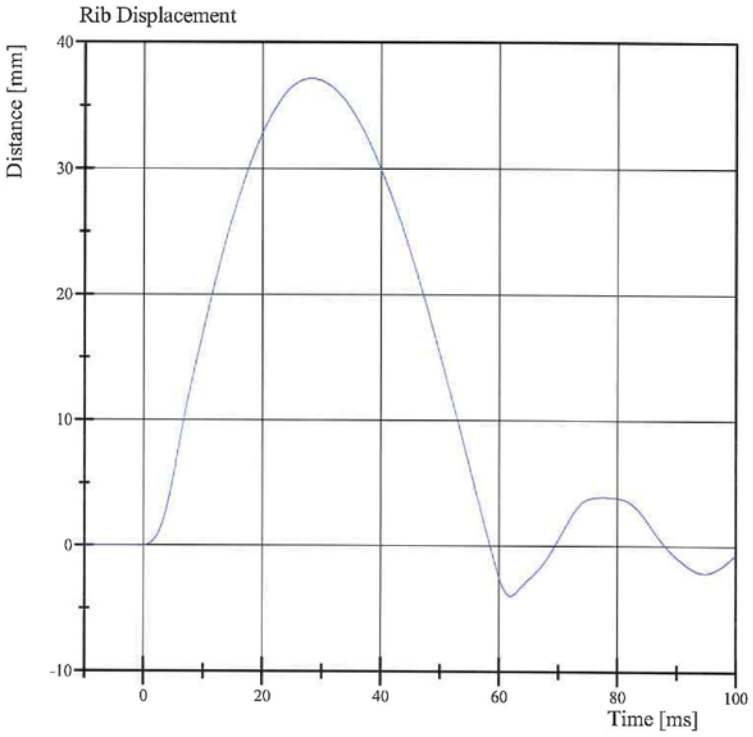
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:31:47 946

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 37.1 mm at 28.2 ms
Min: -4.0 mm at 61.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:32:12 946

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

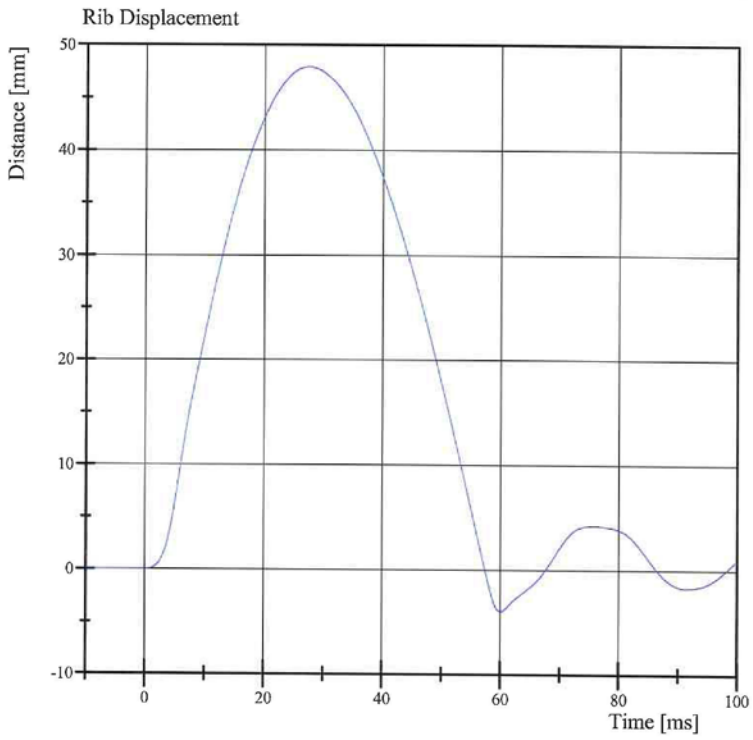
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:39:23 732

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 47.9 mm at 27.4 ms
Min: -4.0 mm at 60.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:39:36 732

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

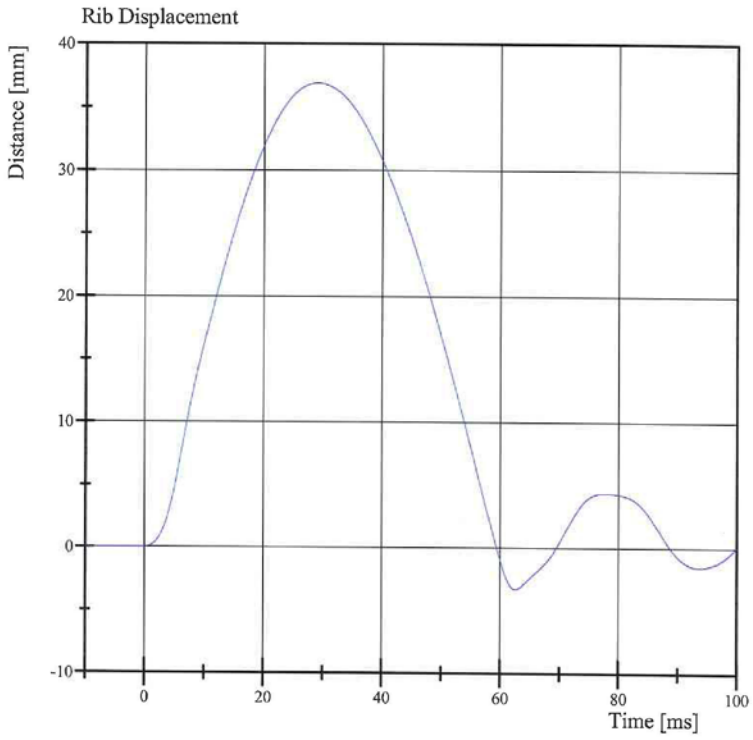
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:47:23 929

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 36.9 mm at 29.0 ms
Min: -3.3 mm at 62.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 15:47:35 929

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.464 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,590.8 N	Yes
Upper Rib Displacement	34 - 41 mm	36.0 mm	Yes
Center Rib Displacement	37 - 45 mm	39.2 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.3 mm	Yes

Test meets specifications.

Comments:

Technician

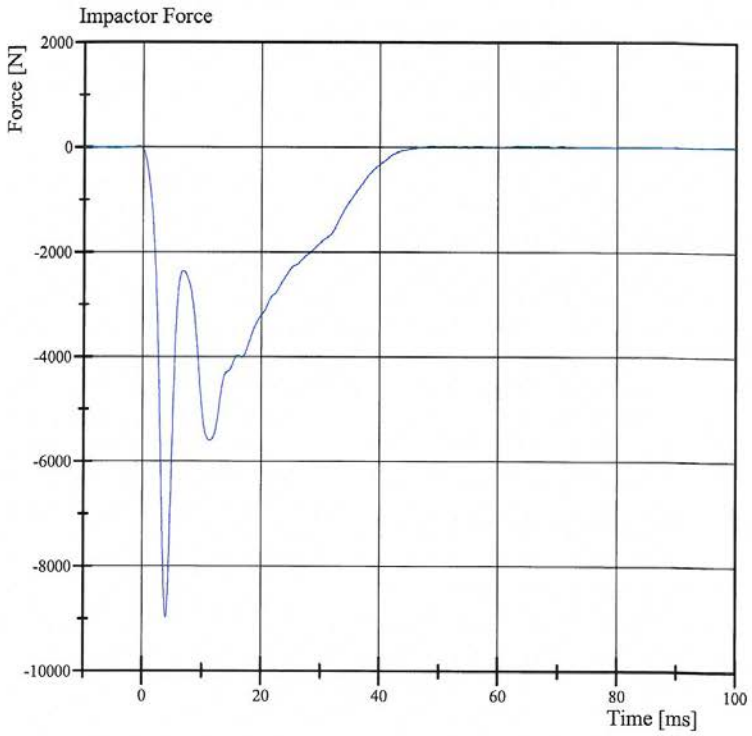
Approved

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

01.13.2014 17:47:20 453

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014



Filter Class: CFC_180
Max: 28.1 N at 63.4 ms
Min: -8,983.8 N at 4.0 ms

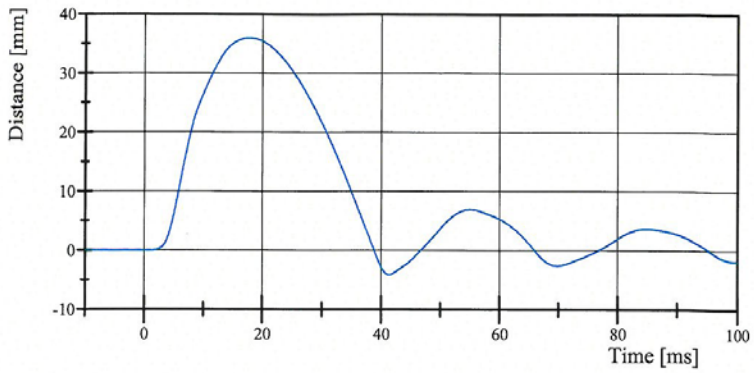
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

01.13.2014 17:47:56 453

Transportation Research Center Inc.

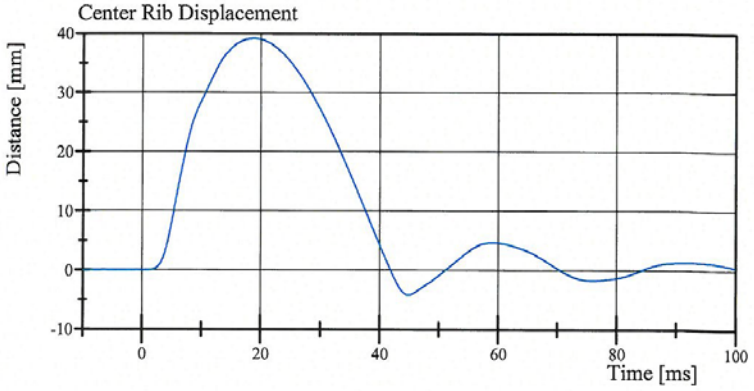
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 19-1
Test Date: 1/13/2014

Upper Rib Displacement



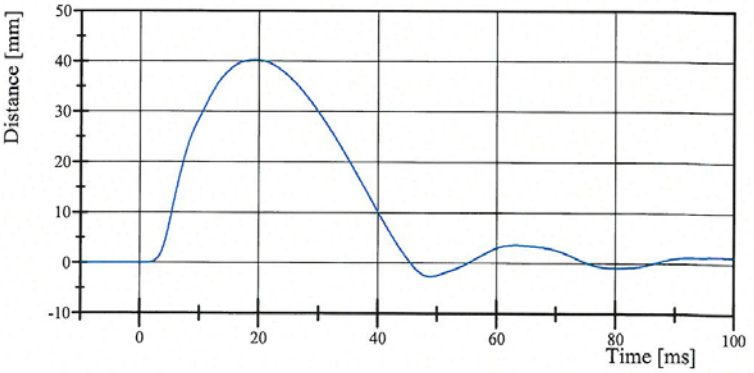
Filter Class: CFC_180
Max: 36.0 mm at 17.8 ms
Min: -4.1 mm at 41.4 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 39.2 mm at 18.8 ms
Min: -4.2 mm at 44.9 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.3 mm at 19.3 ms
Min: -2.6 mm at 48.9 ms

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

01.13.2014 17:47:56 453

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.94 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,137.2 N	Yes
Time of Peak	10.6 - 13.0 ms	10.96 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,647.2 N	Yes
Time of Peak	10.0 - 12.3 ms	10.56 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

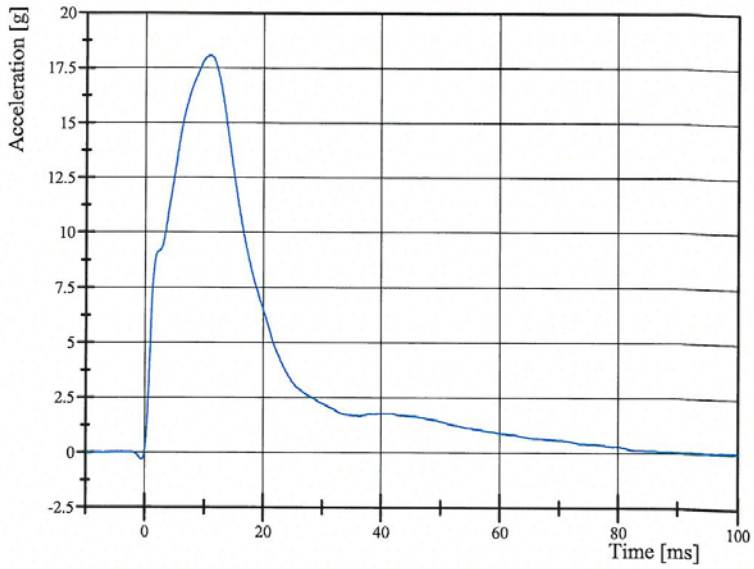
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 18:06:37 590

Transportation Research Center Inc.

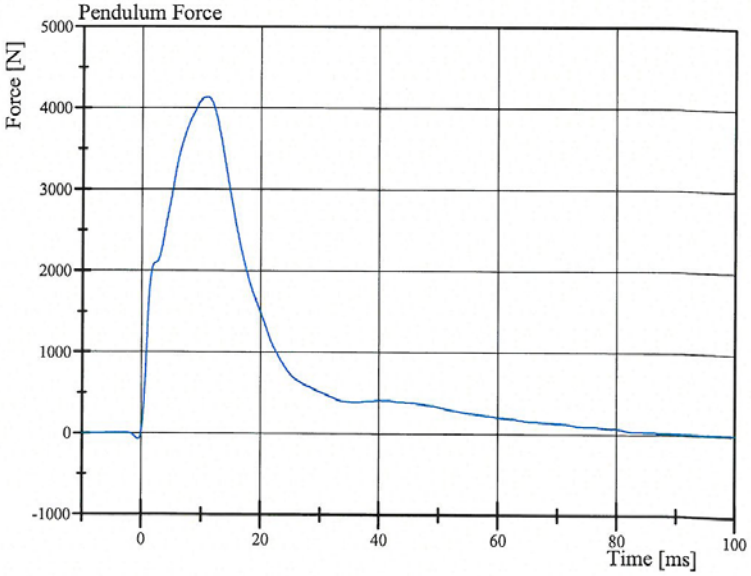
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.1 g at 11.0 ms
Min: -0.3 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,137.2 N at 11.0 ms
Min: -73.8 N at -0.6 ms

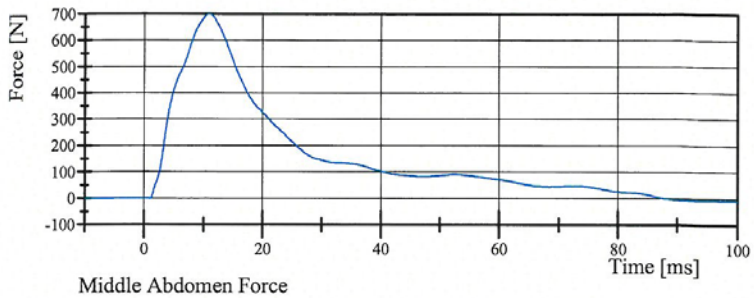
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 18:06:52 590

Transportation Research Center Inc.

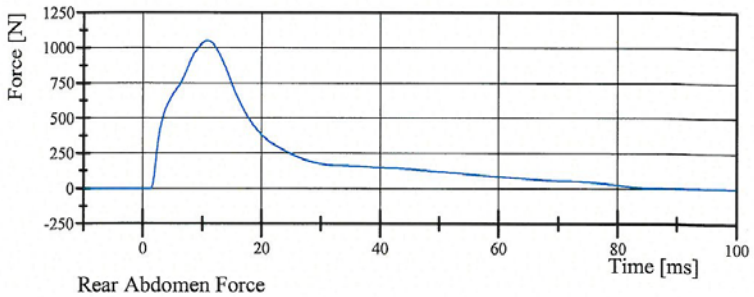
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Front Abdomen Force



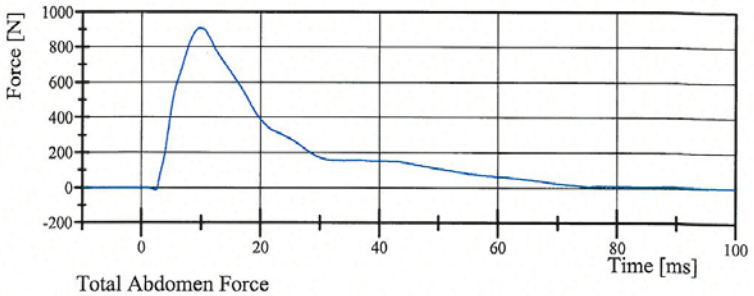
Filter Class: CFC_600
Max: 699.6 N at 11.1 ms
Min: -9.3 N at 98.9 ms

Middle Abdomen Force



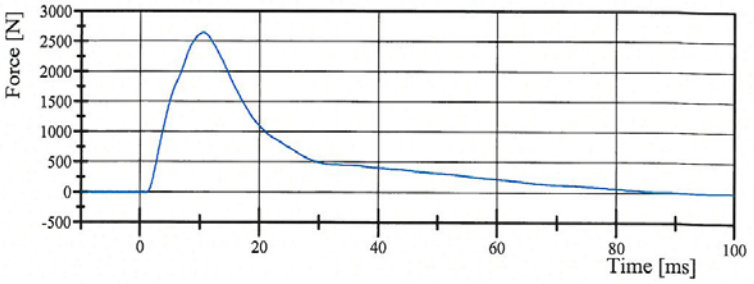
Filter Class: CFC_600
Max: 1,051.6 N at 10.8 ms
Min: -1.8 N at 1.4 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 907.3 N at 9.8 ms
Min: -13.1 N at 2.5 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,647.2 N at 10.6 ms
Min: -9.5 N at 98.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 18:06:52 590

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.017 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-46.9 deg	Yes
Time of Peak	39 - 53 ms	43.0 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	38.9 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

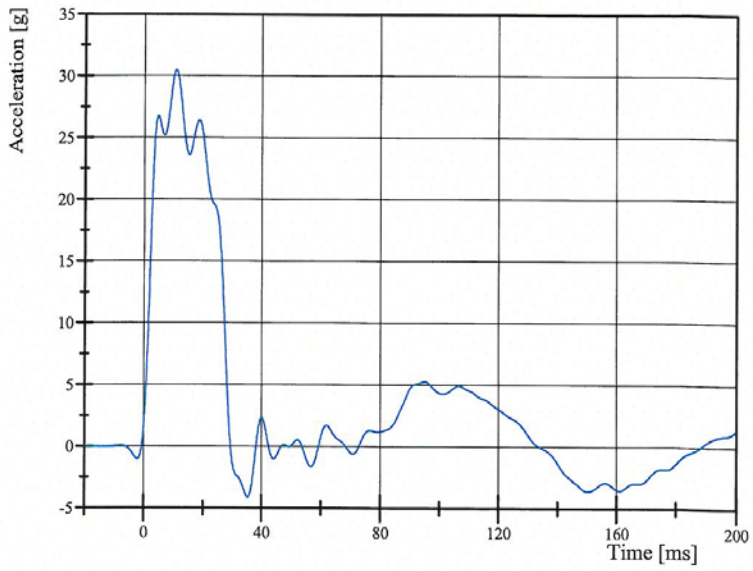
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 12:56:01 580

Transportation Research Center Inc.

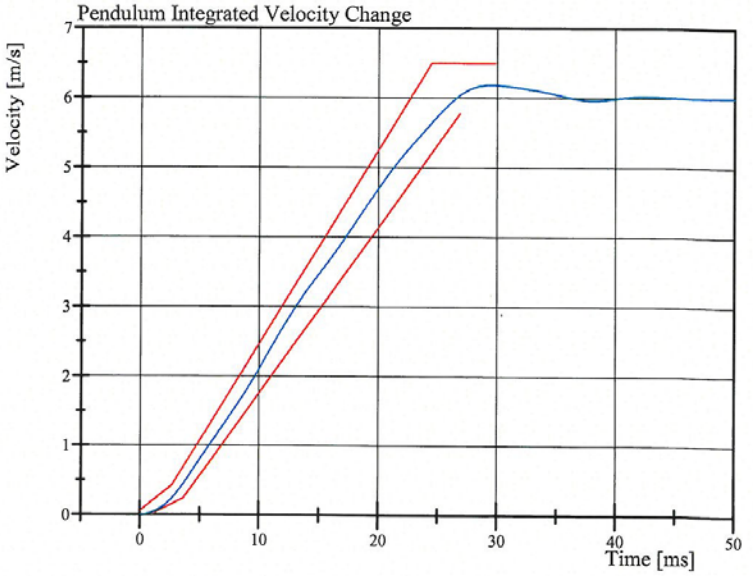
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Pendulum Acceleration



Filter Class: CFC_60
Max: 30.5 g at 10.8 ms
Min: -4.1 g at 35.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.2 m/s at 29.5 ms
Min: 0.0 m/s at 0.0 ms

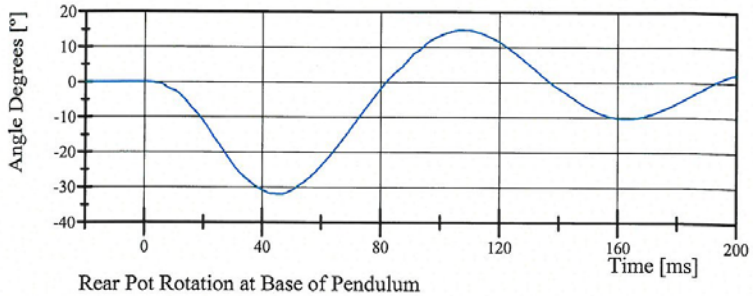
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 12:56:12 580

Transportation Research Center Inc.

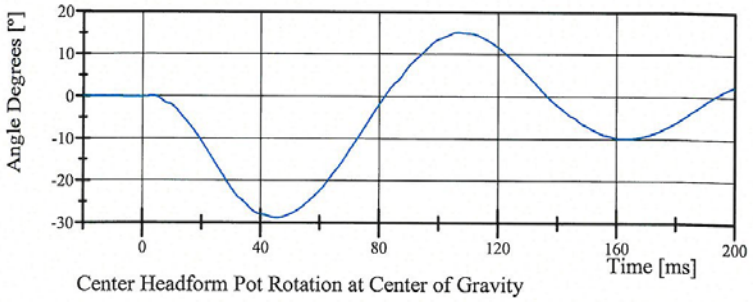
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Forward Pot Rotation at Base of Pendulum



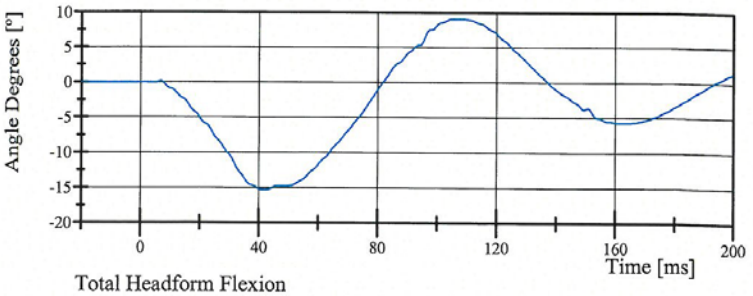
Filter Class: CFC_180
Max: 14.8 ° at 106.5 ms
Min: -31.9 ° at 46.2 ms

Rear Pot Rotation at Base of Pendulum



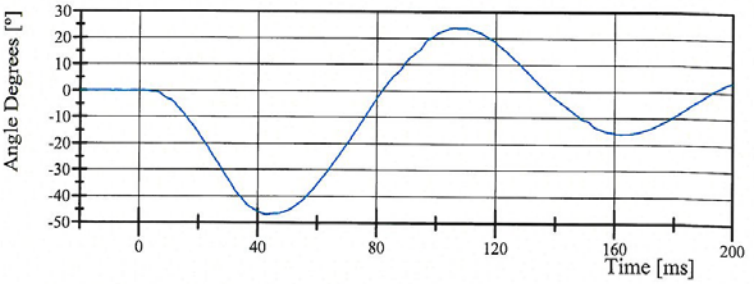
Filter Class: CFC_180
Max: 15.2 ° at 106.2 ms
Min: -28.8 ° at 45.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.1 ° at 105.2 ms
Min: -15.2 ° at 42.7 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 23.9 ° at 106.1 ms
Min: -46.9 ° at 43.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 12:56:13 580

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.94 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,137.2 N	Yes
Time of Peak	10.6 - 13.0 ms	10.96 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,647.2 N	Yes
Time of Peak	10.0 - 12.3 ms	10.56 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

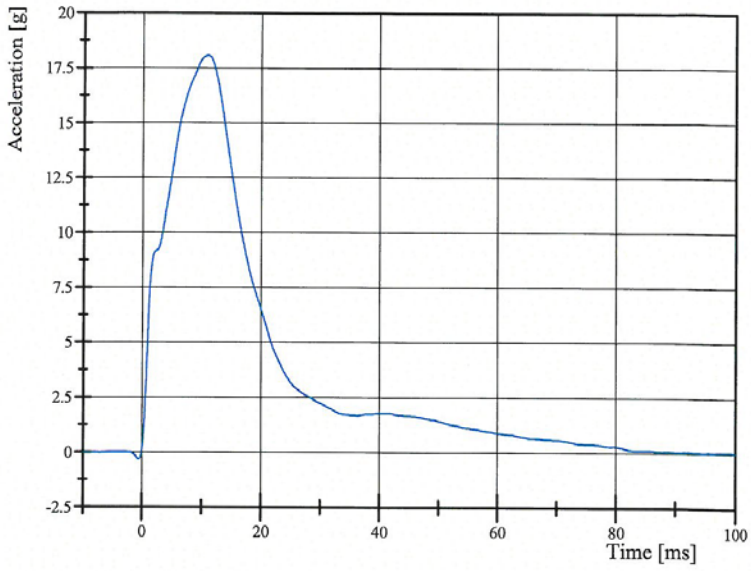
Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 18:06:37 590

Transportation Research Center Inc.

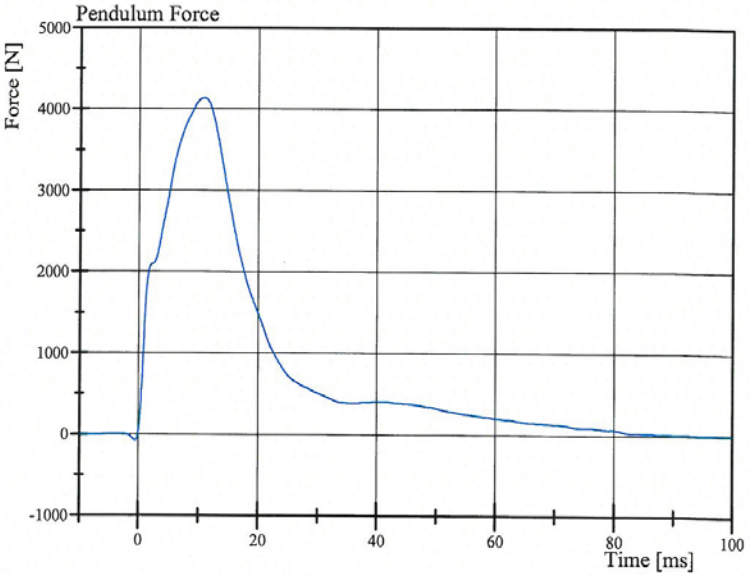
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 19-2
Test Date: 1/13/2014

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.1 g at 11.0 ms
Min: -0.3 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,137.2 N at 11.0 ms
Min: -73.8 N at -0.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.13.2014 18:06:52 590

Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.023

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	444	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	102	Yes
F	Thigh Clearance	119.0 - 135.0	130	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	529	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	317	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	348	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	867	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	124.0 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.8 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

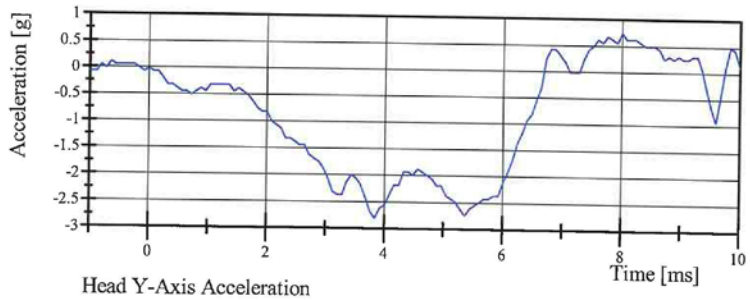
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 13:48:25 232

Transportation Research Center Inc.

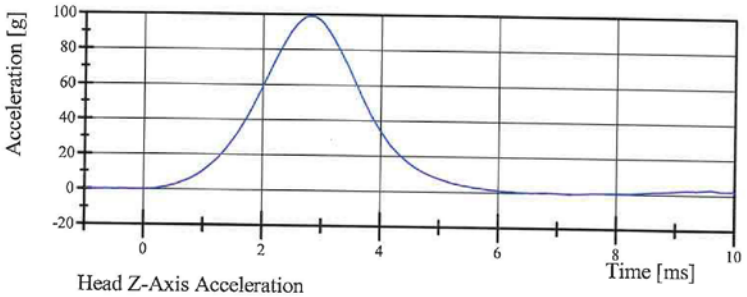
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Head X-Axis Acceleration



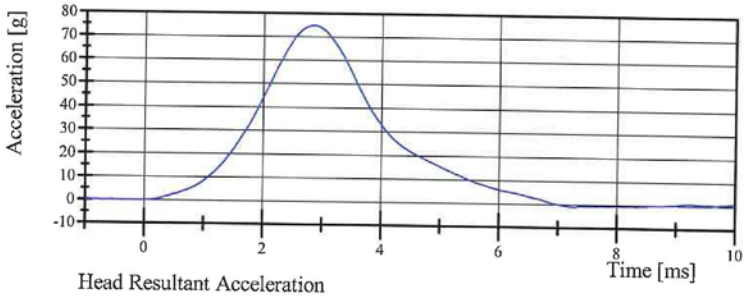
Filter Class: CFC_1000
Max: 0.7 g at 8.0 ms
Min: -2.8 g at 3.8 ms

Head Y-Axis Acceleration



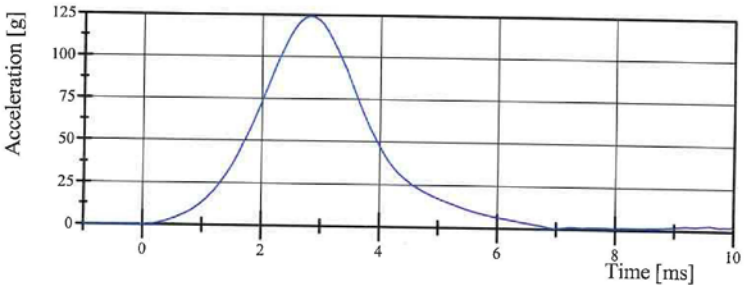
Filter Class: CFC_1000
Max: 99.0 g at 2.8 ms
Min: -0.5 g at 7.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 74.8 g at 2.9 ms
Min: -1.1 g at 7.3 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 124.0 g at 2.8 ms
Min: 0.0 g at -0.7 ms

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

11.16.2013 13:48:34 232

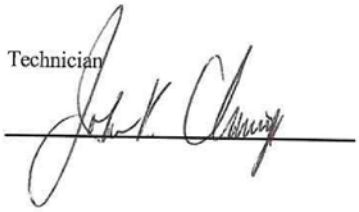
Transportation Research Center Inc.

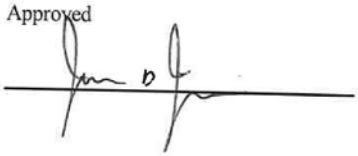
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.608 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.551 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.740 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.998 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.833 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.845 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.1 deg	Yes
Time of Peak	50 - 70 ms	66.5 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	39.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	120.5 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

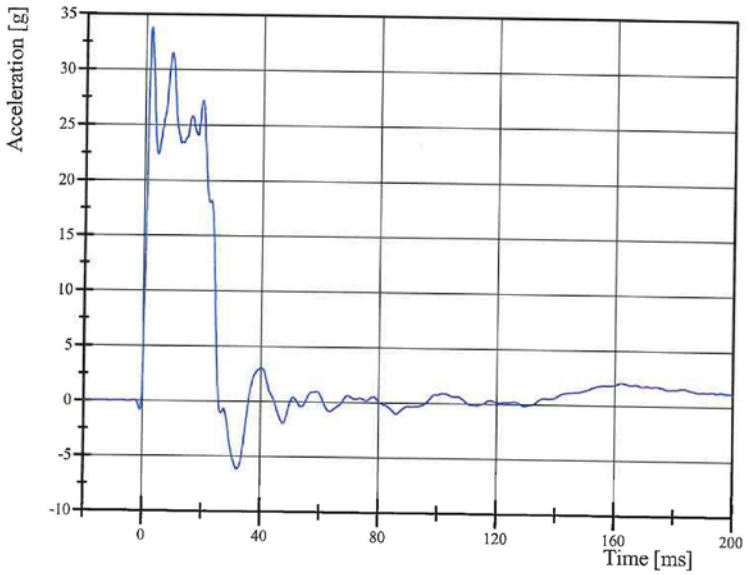
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 14:30:13 640

Transportation Research Center Inc.

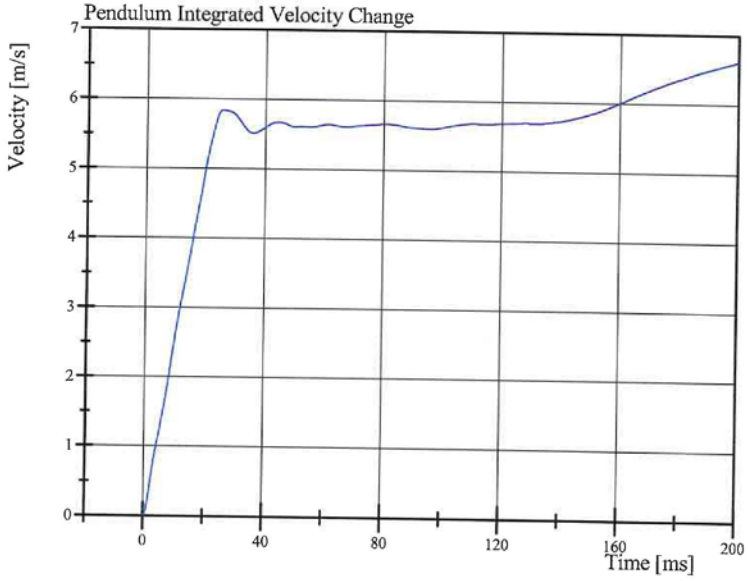
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Pendulum Acceleration



Filter Class: CFC_180
Max: 33.8 g at 2.0 ms
Min: -6.2 g at 32.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.6 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

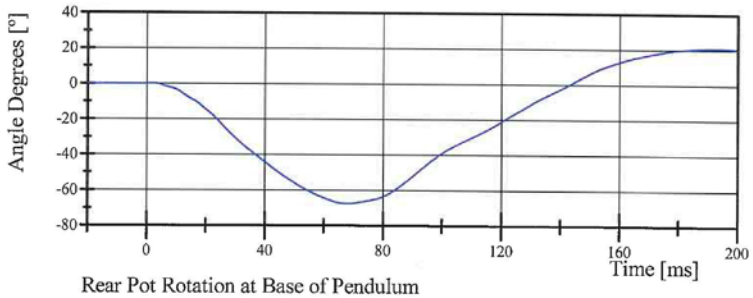
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 14:30:23 640

Transportation Research Center Inc.

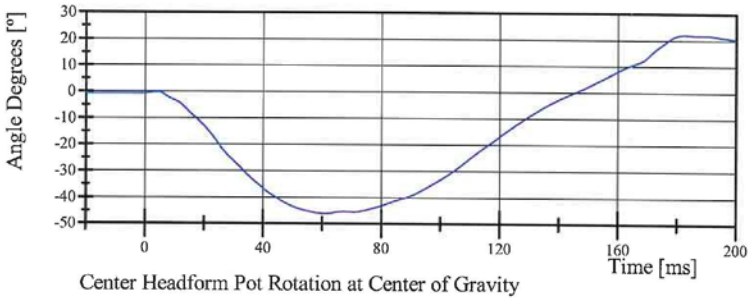
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Forward Pot Rotation at Base of Pendulum



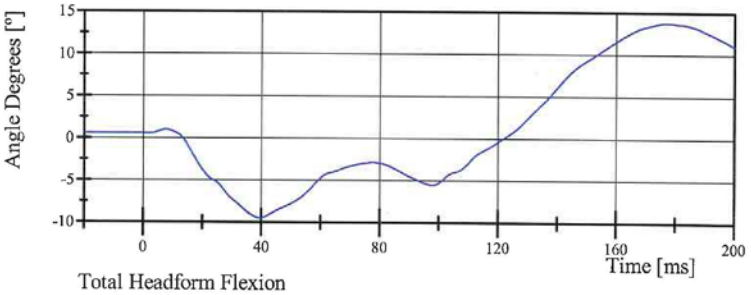
Filter Class: CFC_60
Max: 20.8 ° at 192.8 ms
Min: -67.5 ° at 67.8 ms

Rear Pot Rotation at Base of Pendulum



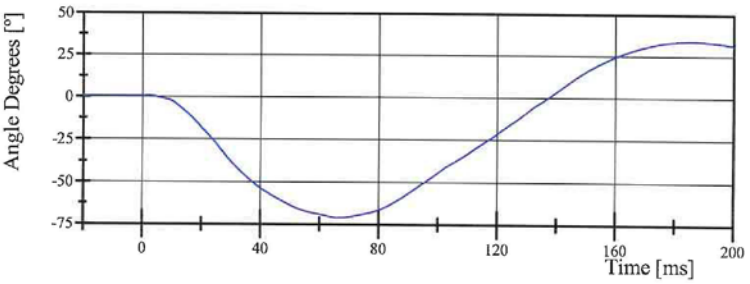
Filter Class: CFC_60
Max: 21.9 ° at 182.3 ms
Min: -46.1 ° at 60.9 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.8 ° at 177.2 ms
Min: -9.5 ° at 39.5 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 33.8 ° at 185.8 ms
Min: -71.1 ° at 66.5 ms

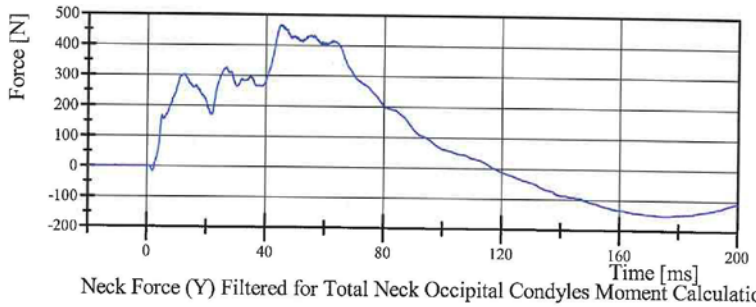
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 14:30:24 640

Transportation Research Center Inc.

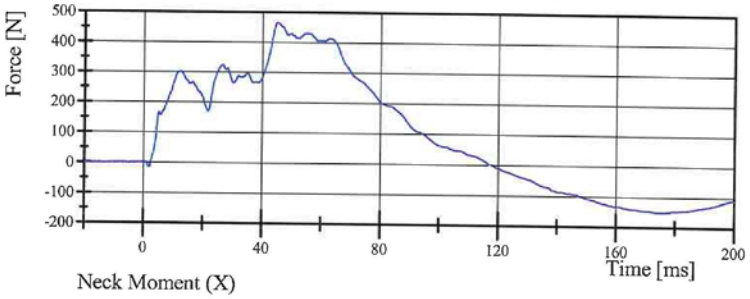
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Neck Force (Y)



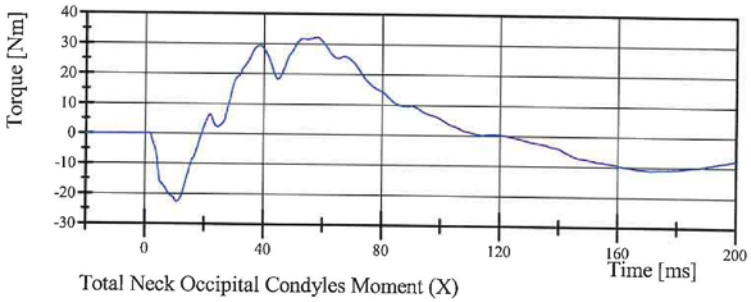
Filter Class: CFC_1000
Max: 465.9 N at 44.9 ms
Min: -152.9 N at 173.6 ms

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



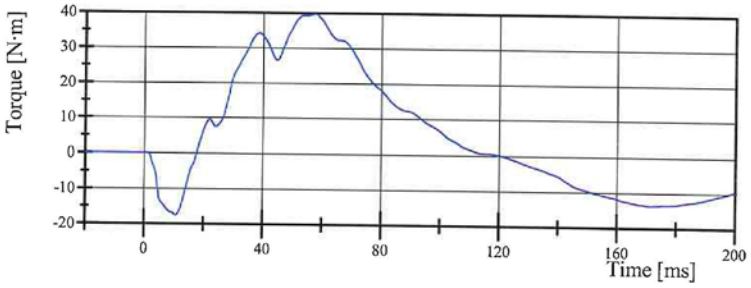
Filter Class: CFC_600
Max: 465.0 N at 44.9 ms
Min: -152.7 N at 176.6 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 32.3 Nm at 57.5 ms
Min: -22.7 Nm at 10.9 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constai
Max: 39.7 N·m at 57.4 ms
Min: -17.6 N·m at 10.6 ms

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

11.16.2013 14:30:25 640

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.9 g	Yes
Shoulder Displacement	28 - 37 mm	31.1 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.2 g	Yes

Test meets specifications.

Comments:

Technician

Approved

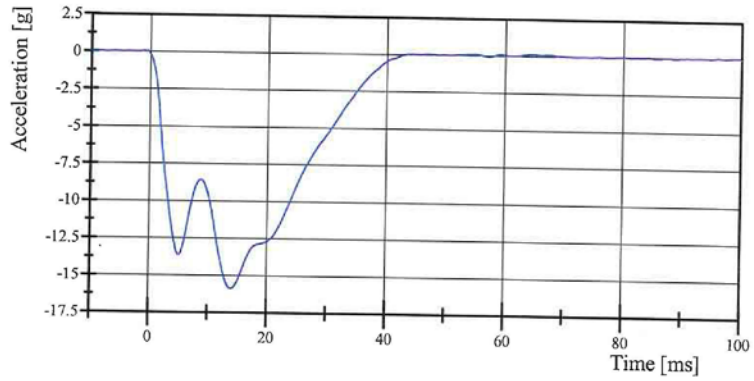
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 09:32:27 824

Transportation Research Center Inc.

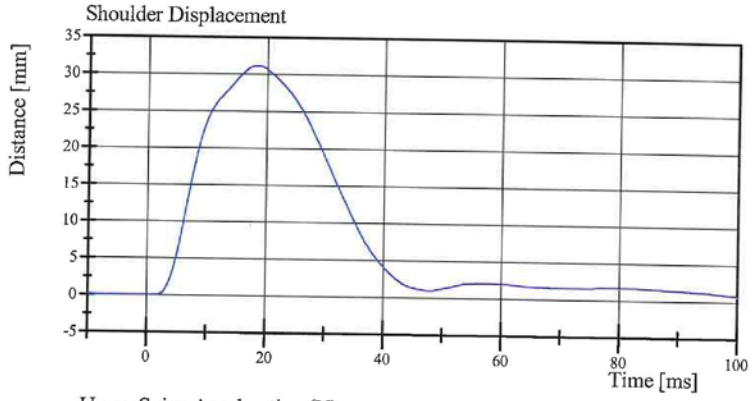
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Probe Acceleration



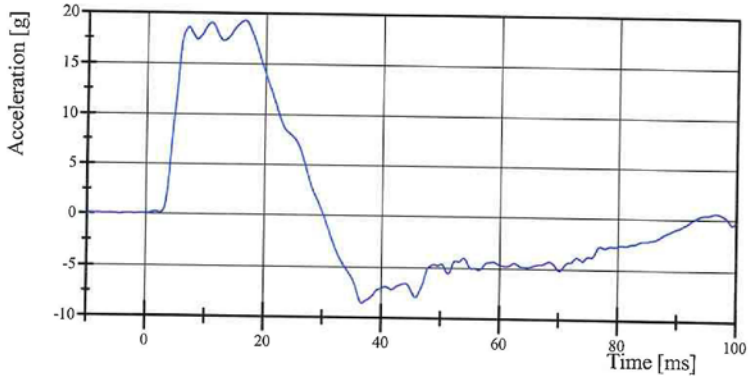
Filter Class: CFC_180
Max: 0.1 g at 64.4 ms
Min: -15.9 g at 13.9 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.1 mm at 18.3 ms
Min: -0.0 mm at -3.7 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.2 g at 16.4 ms
Min: -8.6 g at 36.7 ms

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

11.16.2013 09:32:38 824

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 23-2
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.710 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.4 g	Yes
Shoulder Displacement	31 - 40 mm	35.1 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.3 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.2 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.5 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.3 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.9 g	Yes

Test meets specifications.

Comments:

Technician

Approved

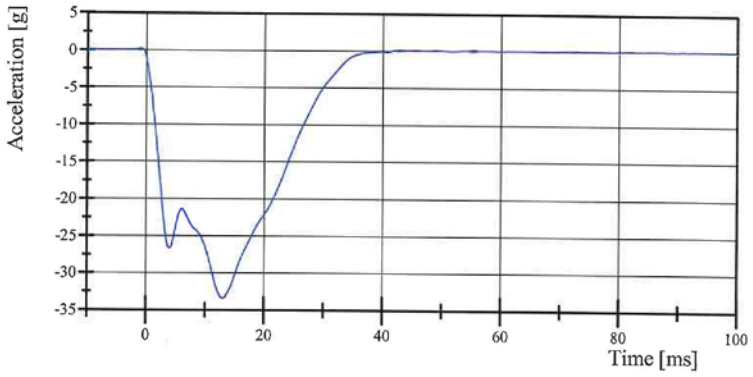
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 11:29:12 601

Transportation Research Center Inc.

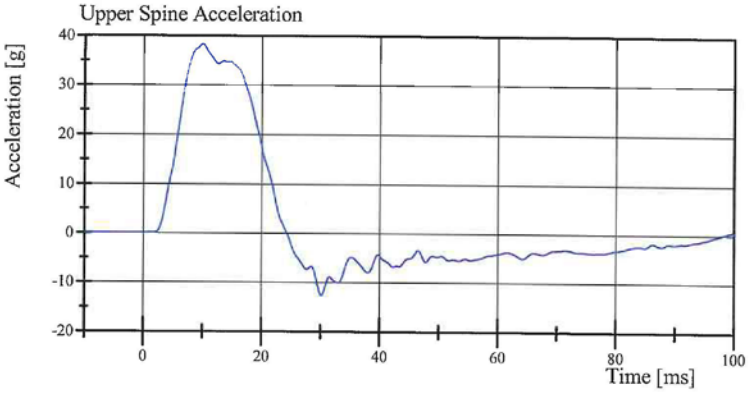
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 23-2
Test Date: 11/16/2013

Probe Acceleration



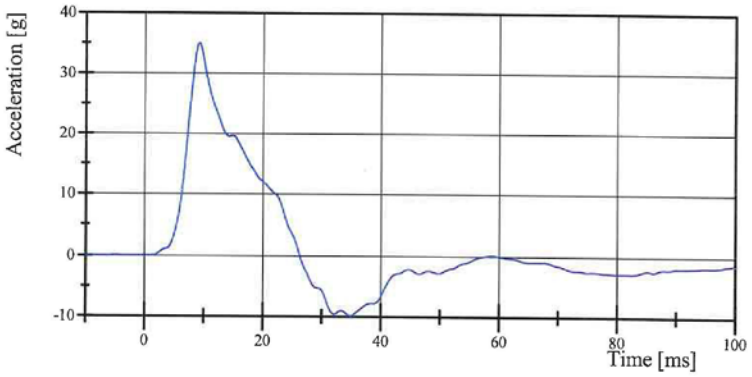
Filter Class: CFC_180
Max: 0.2 g at -1.0 ms
Min: -33.4 g at 13.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 38.3 g at 10.0 ms
Min: -12.6 g at 30.2 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.9 g at 9.2 ms
Min: -9.9 g at 34.8 ms

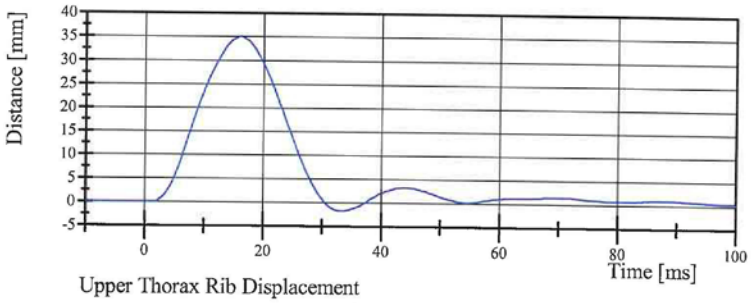
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 11:29:34 601

Transportation Research Center Inc.

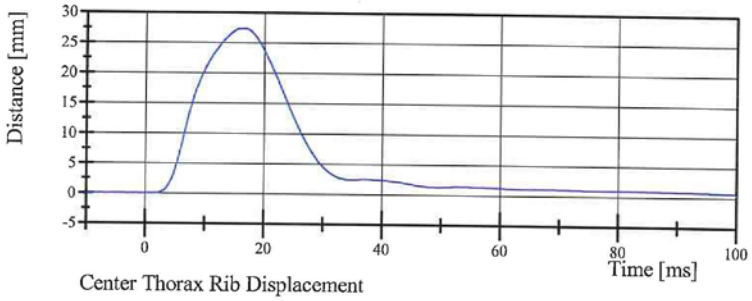
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 23-2
Test Date: 11/16/2013

Shoulder Rib Displacement



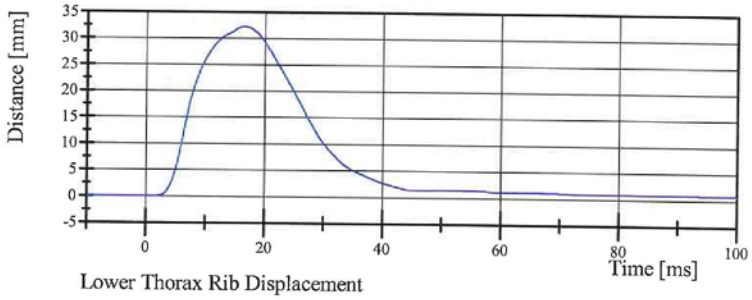
Filter Class: CFC_600
Max: 35.1 mm at 16.1 ms
Min: -1.8 mm at 33.2 ms

Upper Thorax Rib Displacement



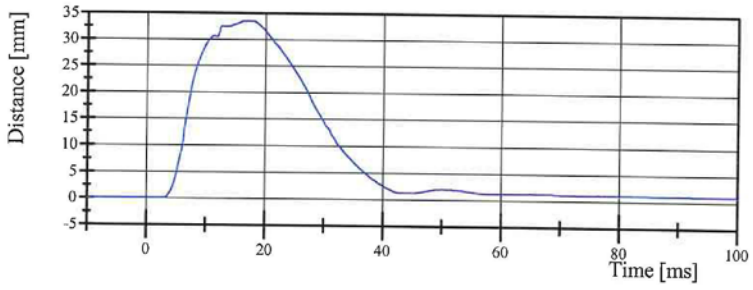
Filter Class: CFC_600
Max: 27.3 mm at 16.4 ms
Min: -0.0 mm at -0.8 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.2 mm at 16.5 ms
Min: -0.0 mm at -0.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.5 mm at 16.9 ms
Min: -0.0 mm at -0.8 ms

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

11.16.2013 11:29:35 601

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.392 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.2 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.2 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	36.5 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.6 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.9 g	Yes

Test meets specifications.

Comments:

Technician John K. Chung

Approved

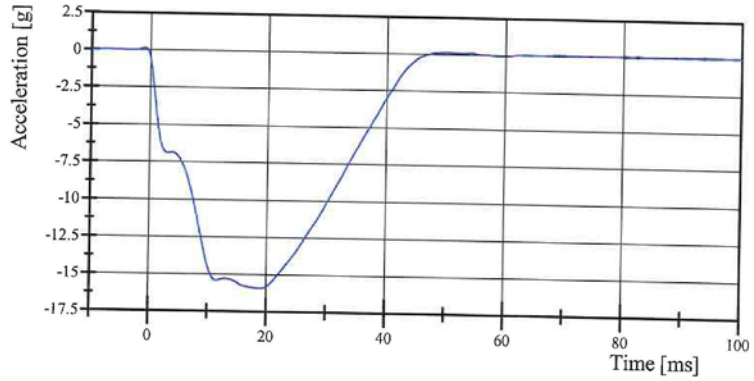
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 11:45:07 823

Transportation Research Center Inc.

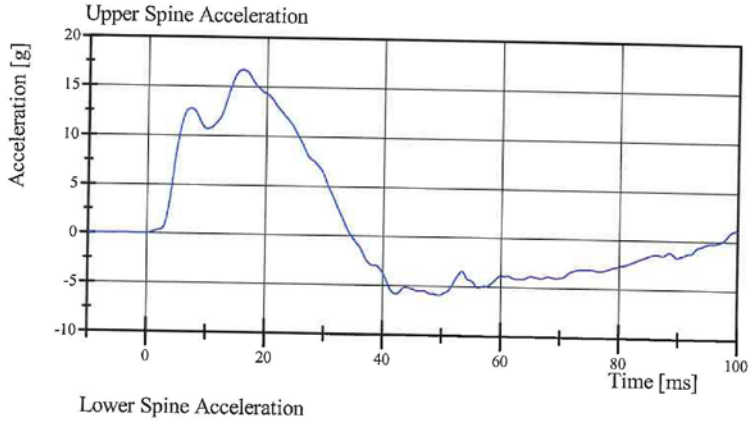
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Probe Acceleration



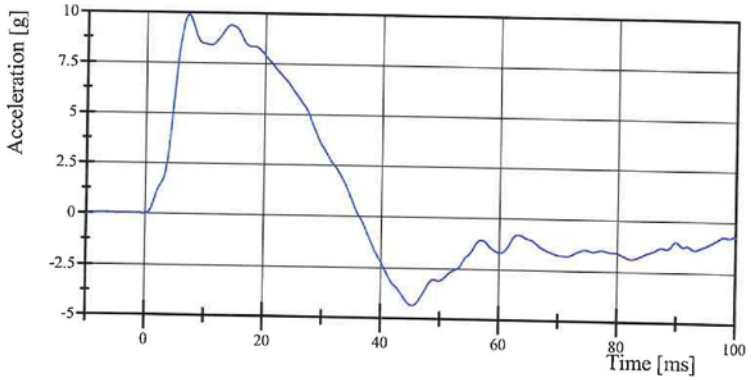
Filter Class: CFC_180
Max: 0.1 g at -1.0 ms
Min: -15.9 g at 19.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 16.6 g at 15.8 ms
Min: -5.9 g at 49.5 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.9 g at 7.0 ms
Min: -4.4 g at 45.4 ms

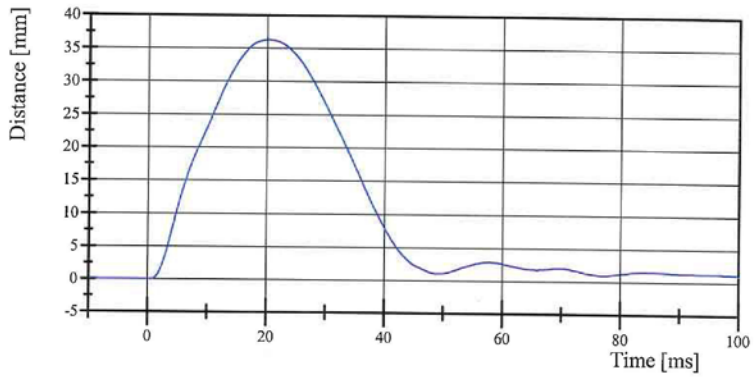
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 11:45:21 823

Transportation Research Center Inc.

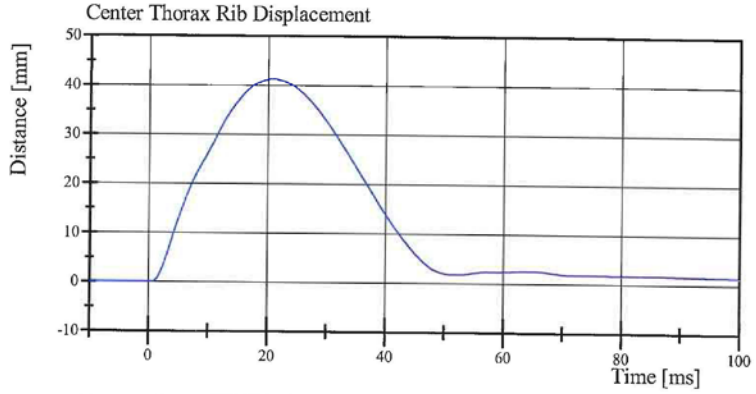
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Upper Thorax Rib Displacement



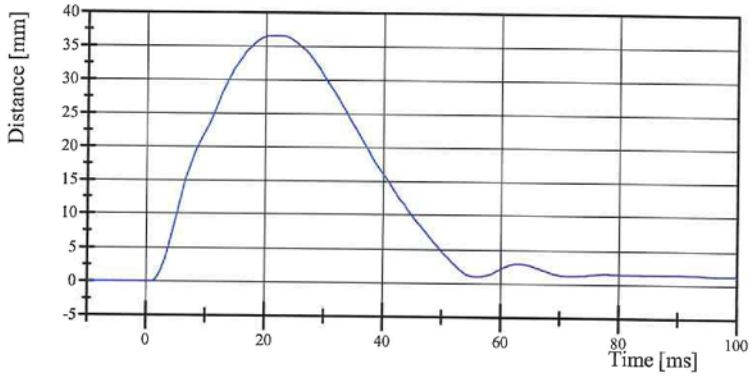
Filter Class: CFC_600
Max: 36.2 mm at 20.2 ms
Min: -0.0 mm at -4.4 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.2 mm at 20.8 ms
Min: -0.0 mm at -4.2 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 36.5 mm at 21.8 ms
Min: -0.0 mm at -6.2 ms

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

11.16.2013 11:45:22 823

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.6 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.5 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.6 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.86 g	Yes

Test meets specifications.

Comments:

Technician

Approved

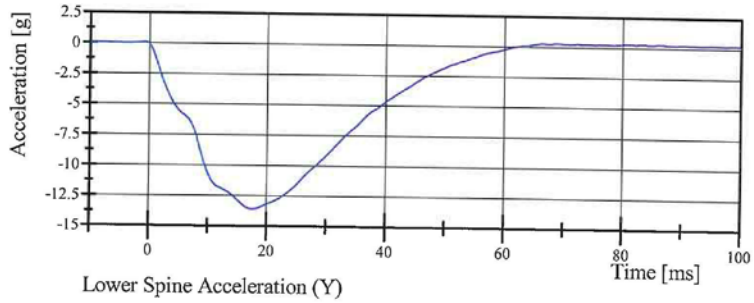
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.16.2013 10:35:29 657

Transportation Research Center Inc.

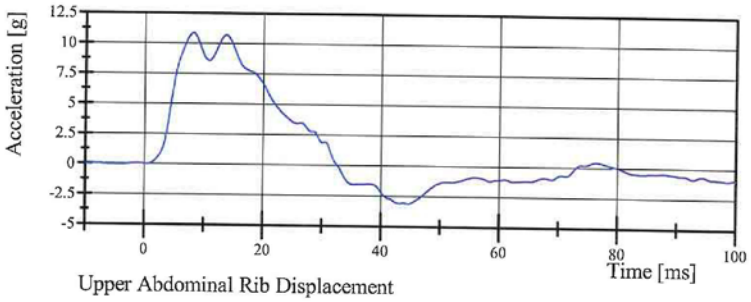
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/16/2013

Probe Acceleration



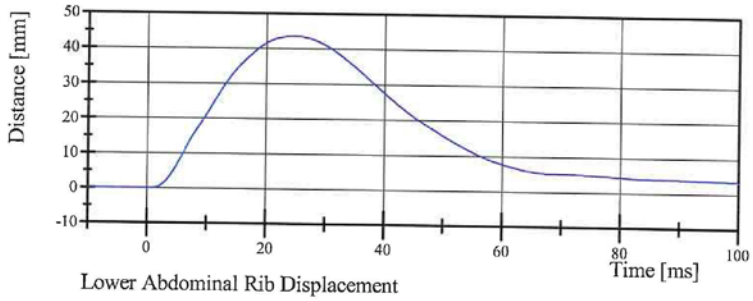
Filter Class: CFC_180
Max: 0.3 g at 68.8 ms
Min: -13.6 g at 17.5 ms

Lower Spine Acceleration (Y)



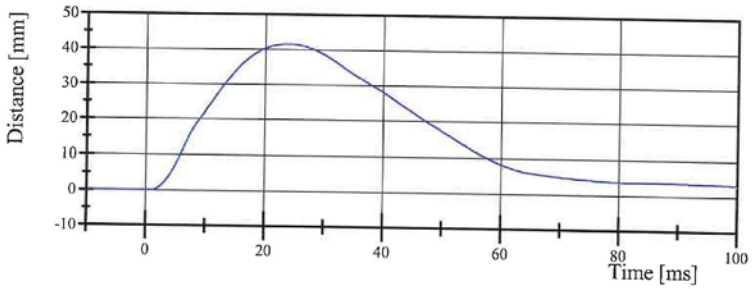
Filter Class: CFC_180
Max: 10.9 g at 8.1 ms
Min: -3.1 g at 44.6 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 43.5 mm at 24.6 ms
Min: -0.0 mm at 0.6 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.6 mm at 23.9 ms
Min: -0.0 mm at 1.0 ms

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

11.16.2013 10:35:42 657

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 23-3
Test Date: 11/17/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.67 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-38.65 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	34.2 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,036.7 N	Yes

Test meets specifications.

Comments:

Technician

Approved

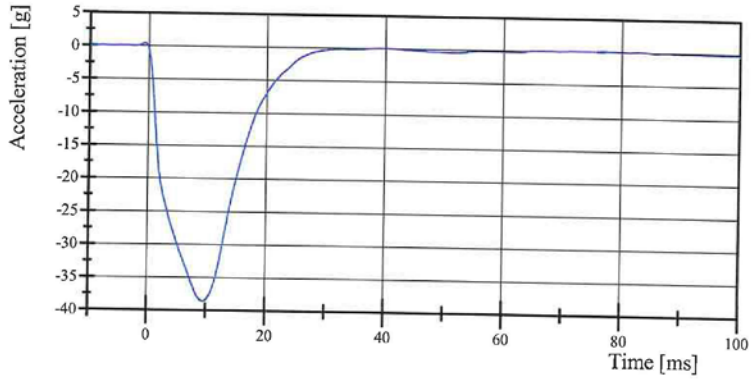
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.17.2013 13:15:20 445

Transportation Research Center Inc.

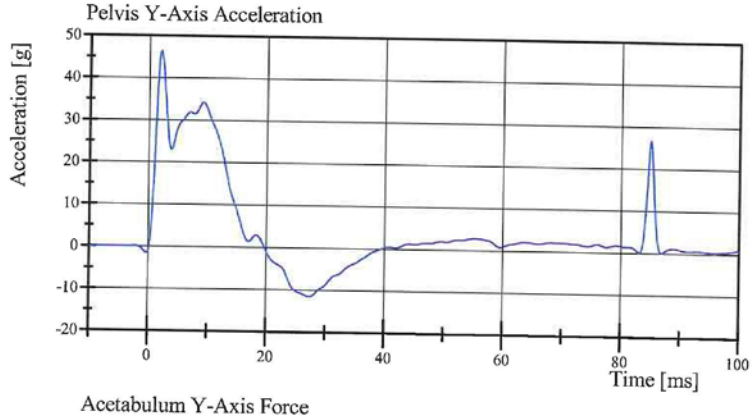
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 23-3
Test Date: 11/17/2013

Probe Acceleration



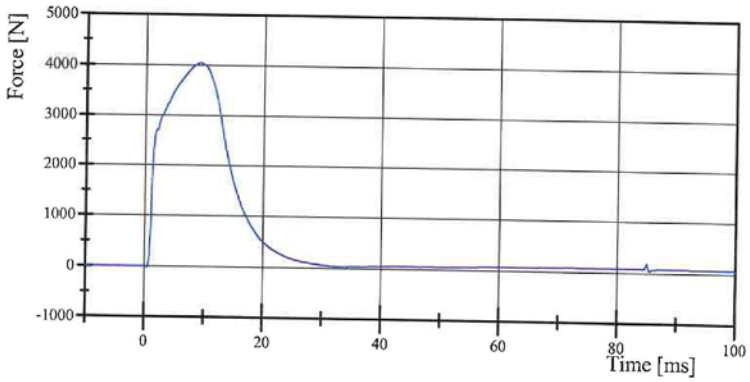
Filter Class: CFC_180
Max: 0.4 g at -0.7 ms
Min: -38.7 g at 9.5 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 46.2 g at 1.9 ms
Min: -11.6 g at 27.4 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,036.7 N at 9.1 ms
Min: -19.6 N at 0.4 ms

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

11.17.2013 13:15:37 445

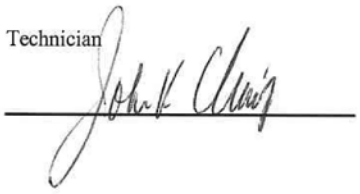
Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/17/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-39.3 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	30.8 g	Yes
Iliac Force	4,100 - 5,100 N	4,826.6 N	Yes

Test meets specifications.

Comments:

Technician 

Approved 

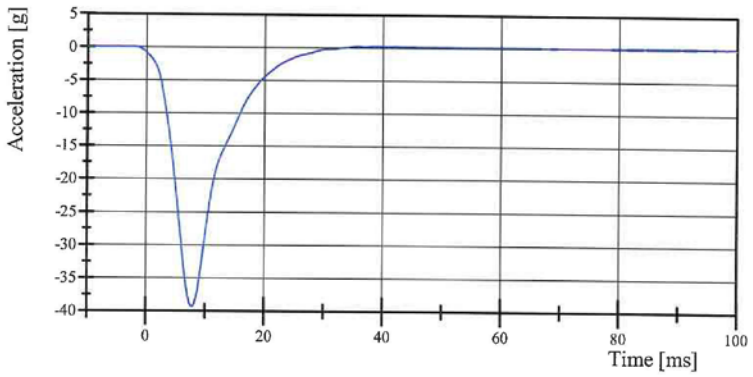
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.17.2013 15:35:05 698

Transportation Research Center Inc.

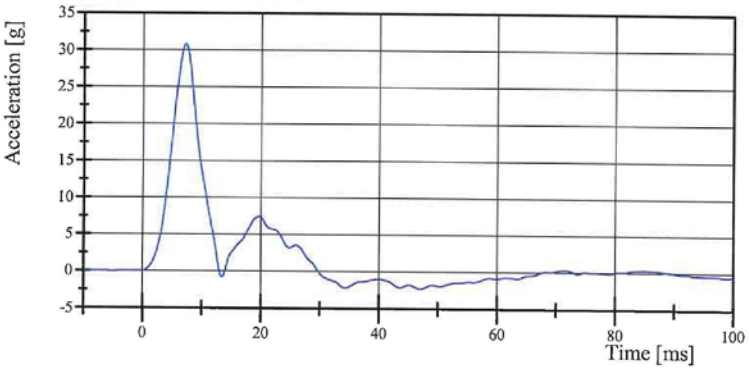
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 23-1
Test Date: 11/17/2013

Probe Acceleration



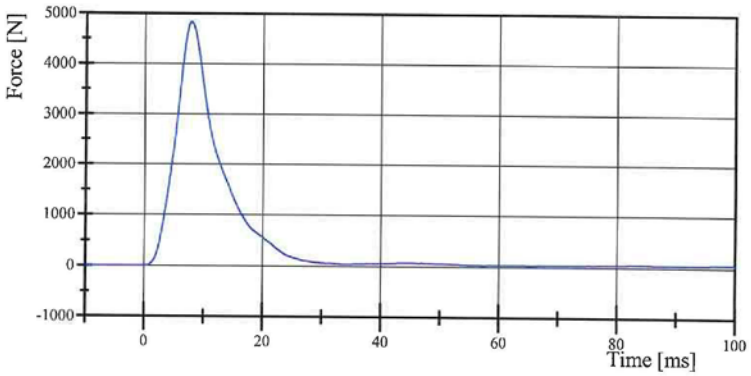
Filter Class: CFC_180
Max: 0.3 g at 38.6 ms
Min: -39.3 g at 7.8 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 30.8 g at 7.2 ms
Min: -2.3 g at 47.0 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,826.6 N at 7.8 ms
Min: -0.7 N at -5.0 ms

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

11.17.2013 15:35:15 698

Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.024

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	444	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	102	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	528	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	317	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	348	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	867	Yes
Z	Waist Circumference	761.0 - 791.0	779	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	119.5 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.6 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

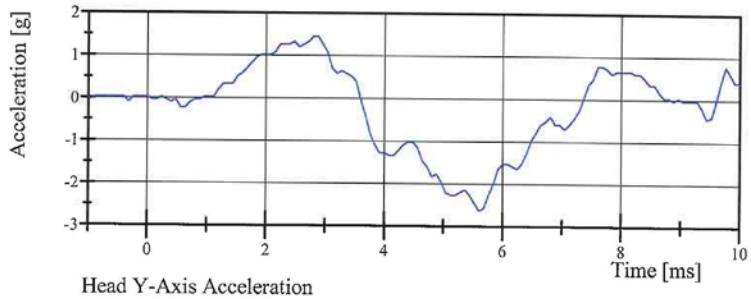
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 11:08:19 232

Transportation Research Center Inc.

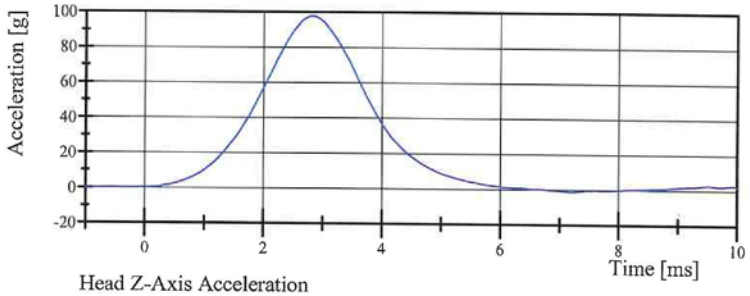
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Head X-Axis Acceleration



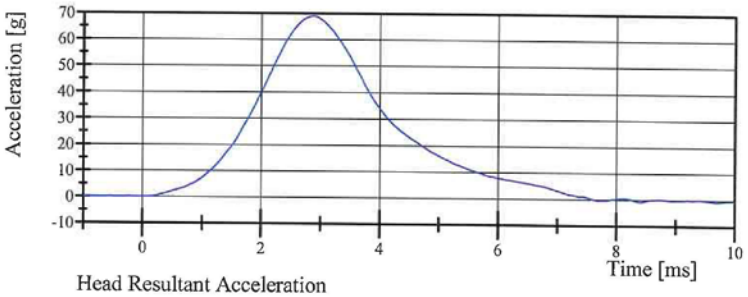
Filter Class: CFC_1000
Max: 1.4 g at 2.8 ms
Min: -2.6 g at 5.6 ms

Head Y-Axis Acceleration



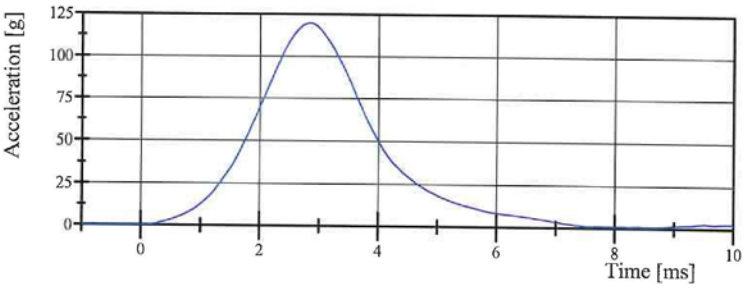
Filter Class: CFC_1000
Max: 97.8 g at 2.8 ms
Min: -1.3 g at 7.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 69.0 g at 2.9 ms
Min: -0.9 g at 8.4 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 119.5 g at 2.8 ms
Min: 0.0 g at -1.0 ms

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

01.10.2014 11:08:29 232

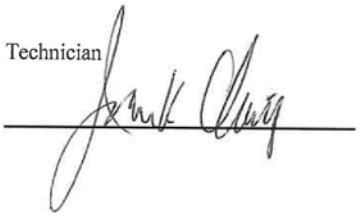
Transportation Research Center Inc.

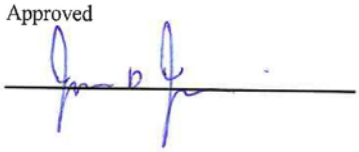
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.604 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.486 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.614 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.850 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.783 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.800 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-75.0 deg	Yes
Time of Peak	50 - 70 ms	66.1 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.1 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	115.8 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

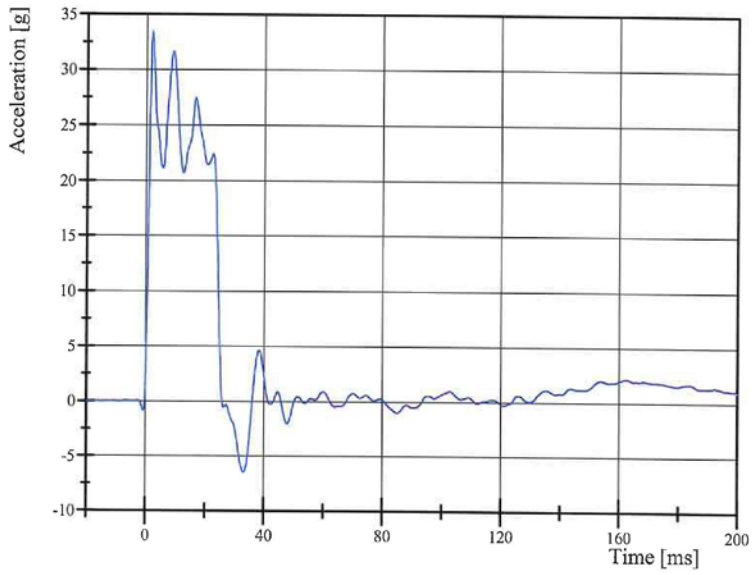
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 12:05:03 641

Transportation Research Center Inc.

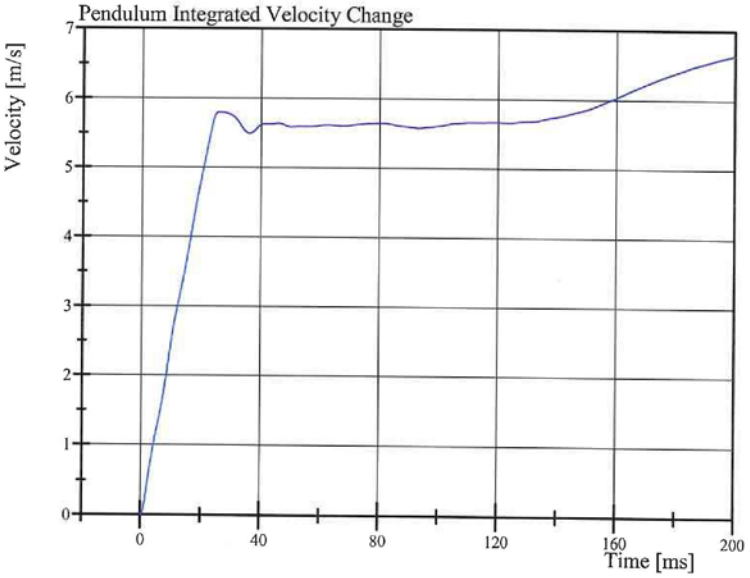
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Pendulum Acceleration



Filter Class: CFC_180
Max: 33.4 g at 2.0 ms
Min: -6.5 g at 33.2 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.6 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

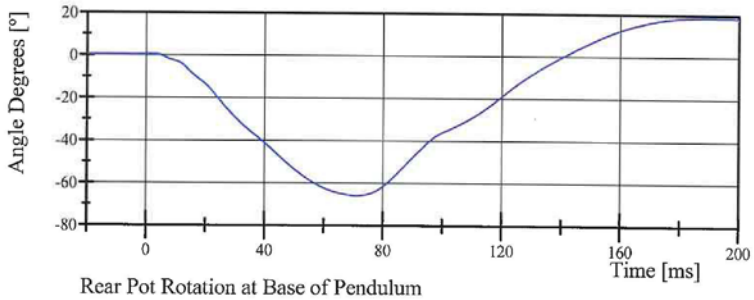
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 12:06:55 641

Transportation Research Center Inc.

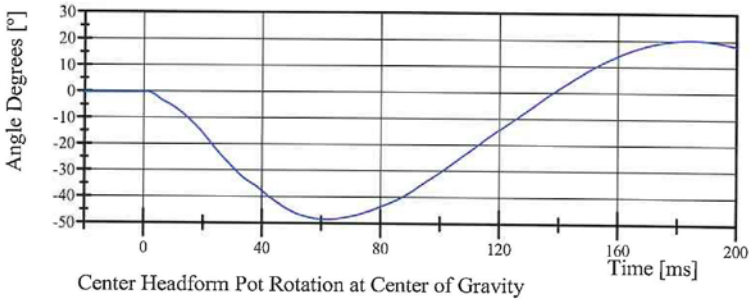
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Forward Pot Rotation at Base of Pendulum



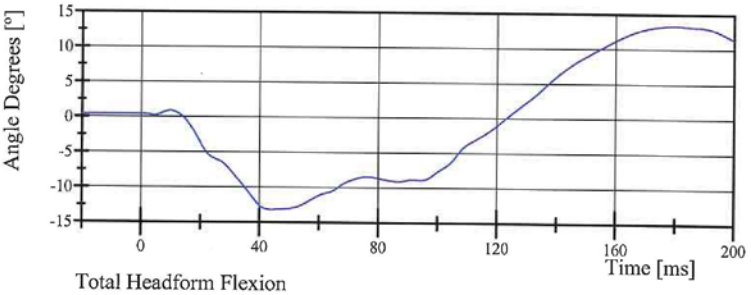
Filter Class: CFC_60
Max: 18.5 ° at 189.8 ms
Min: -65.9 ° at 70.9 ms

Rear Pot Rotation at Base of Pendulum



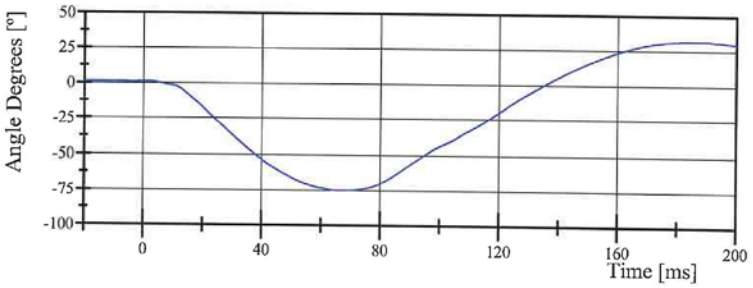
Filter Class: CFC_60
Max: 20.1 ° at 184.4 ms
Min: -48.6 ° at 61.8 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.3 ° at 179.4 ms
Min: -13.2 ° at 44.0 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 31.5 ° at 188.1 ms
Min: -75.0 ° at 66.1 ms

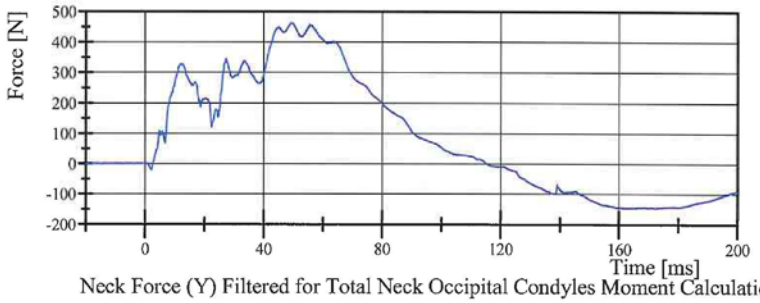
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 12:06:56 641

Transportation Research Center Inc.

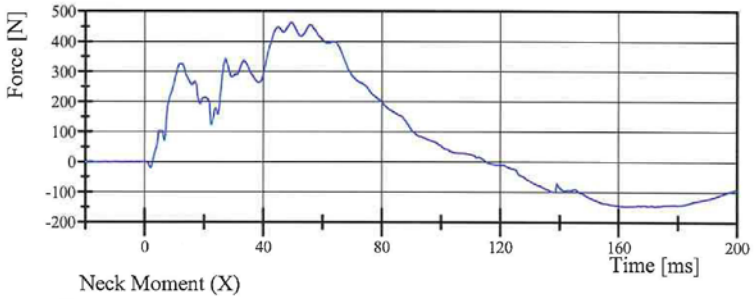
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Neck Force (Y)



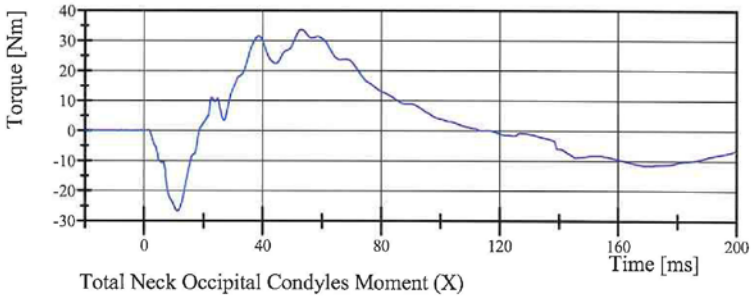
Filter Class: CFC_1000
Max: 463.7 N at 49.3 ms
Min: -148.2 N at 172.2 ms

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



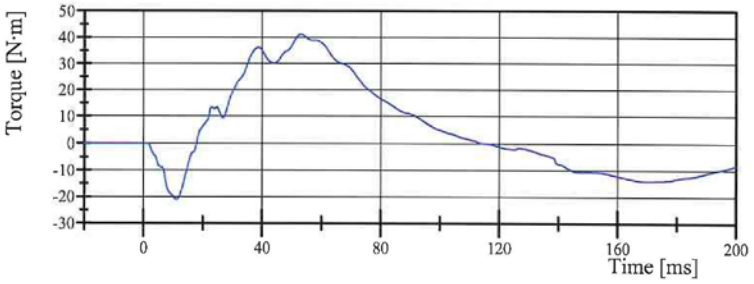
Filter Class: CFC_600
Max: 463.4 N at 49.4 ms
Min: -148.1 N at 172.2 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.7 Nm at 52.8 ms
Min: -26.7 Nm at 11.3 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Consta
Max: 41.1 N·m at 53.0 ms
Min: -21.1 N·m at 11.1 ms

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

01.10.2014 12:06:56 641

Transportation Research Center Inc.

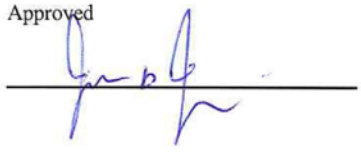
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.8 g	Yes
Shoulder Displacement	28 - 37 mm	31.0 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	20.2 g	Yes

Test meets specifications.

Comments:

Technician 

Approved 

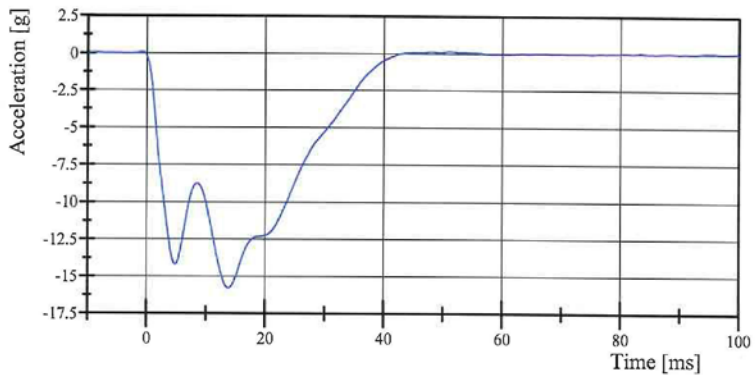
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 16:21:29 828

Transportation Research Center Inc.

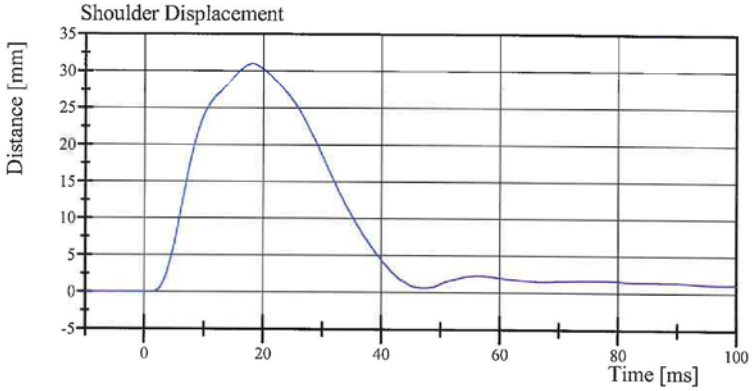
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Probe Acceleration



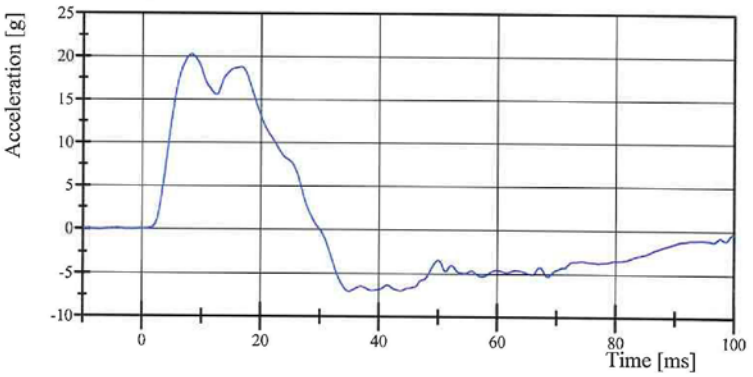
Filter Class: CFC_180
Max: 0.1 g at 51.0 ms
Min: -15.8 g at 13.8 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.0 mm at 18.2 ms
Min: -0.0 mm at 1.0 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 20.2 g at 8.2 ms
Min: -7.0 g at 34.9 ms

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

01.10.2014 16:21:40 828

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.707 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.5 g	Yes
Shoulder Displacement	31 - 40 mm	34.3 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.5 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.4 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.2 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.2 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.8 g	Yes

Test meets specifications.

Comments:

Technician

Approved

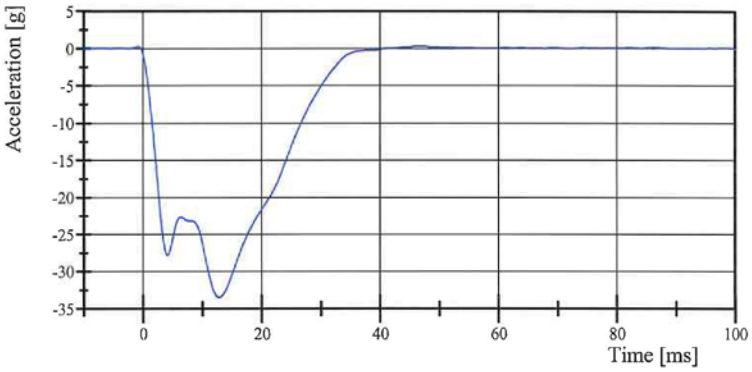
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 18:09:42 609

Transportation Research Center Inc.

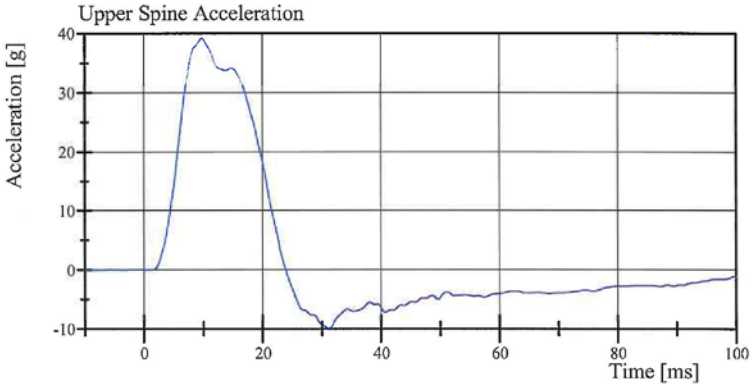
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Probe Acceleration



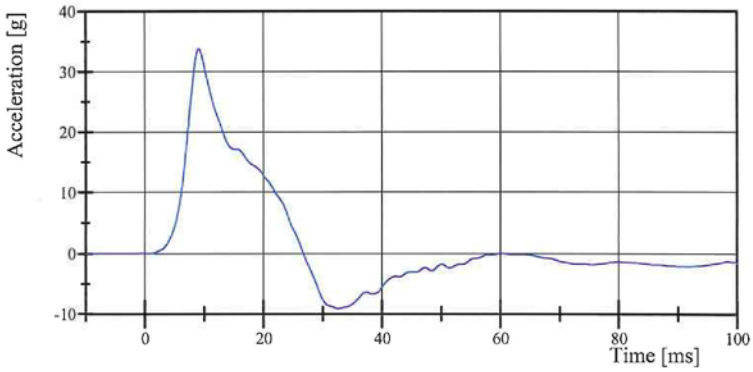
Filter Class: CFC_180
Max: 0.3 g at 46.7 ms
Min: -33.5 g at 12.8 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 39.2 g at 9.8 ms
Min: -9.9 g at 31.1 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 33.8 g at 9.1 ms
Min: -9.2 g at 32.6 ms

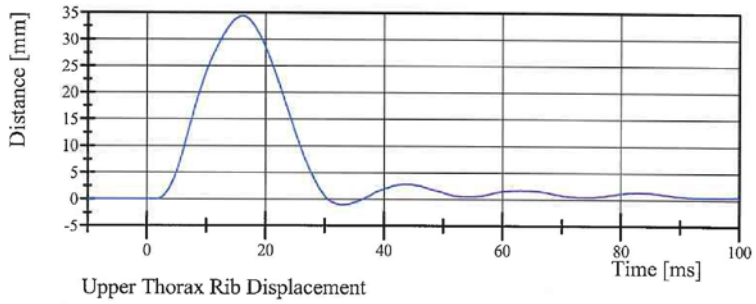
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 18:09:54 609

Transportation Research Center Inc.

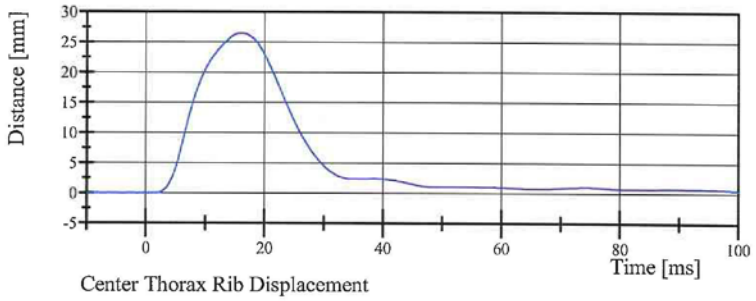
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Shoulder Rib Displacement



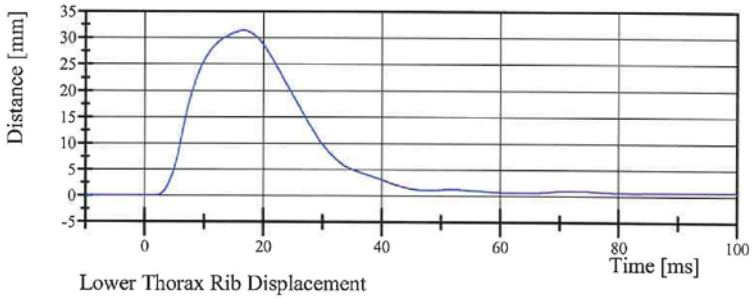
Filter Class: CFC_600
Max: 34.3 mm at 16.1 ms
Min: -1.0 mm at 33.0 ms

Upper Thorax Rib Displacement



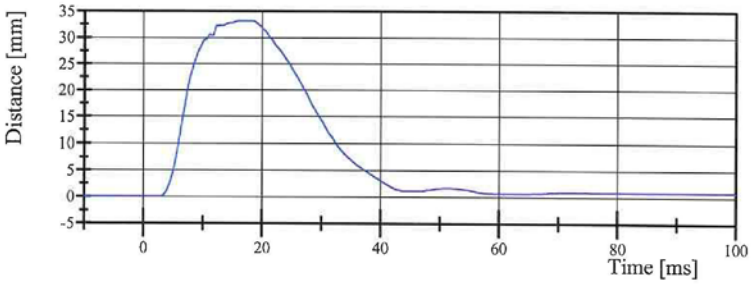
Filter Class: CFC_600
Max: 26.5 mm at 16.1 ms
Min: -0.0 mm at -7.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.4 mm at 16.6 ms
Min: -0.0 mm at -7.3 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.2 mm at 17.3 ms
Min: -0.0 mm at 2.6 ms

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

01.10.2014 18:09:55 609

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.391 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.0 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.6 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.0 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.4 g	Yes

Test meets specifications.

Comments:

Technician

Approved

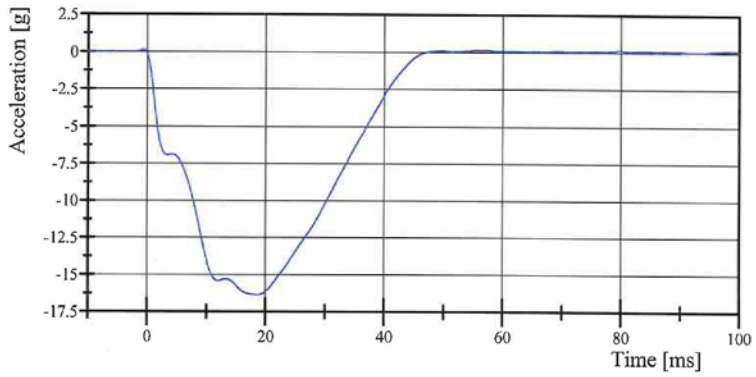
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 17:21:34 829

Transportation Research Center Inc.

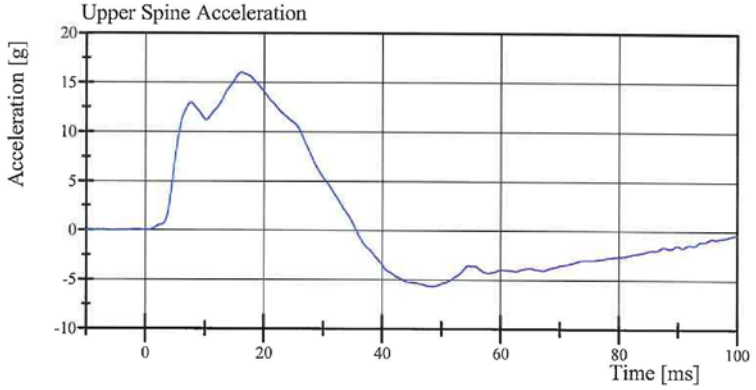
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Probe Acceleration



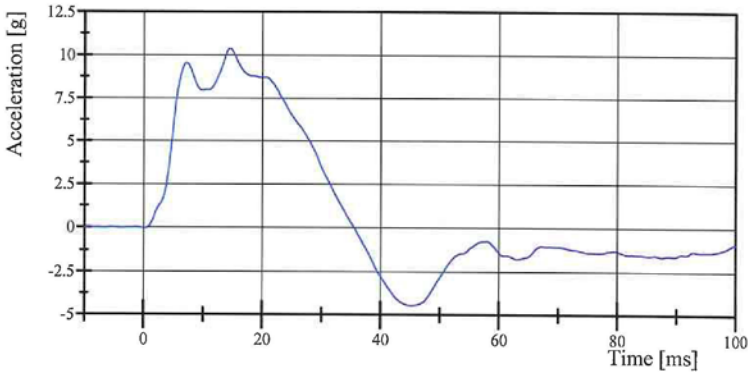
Filter Class: CFC_180
Max: 0.1 g at 57.0 ms
Min: -16.4 g at 18.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 16.0 g at 16.2 ms
Min: -5.7 g at 48.1 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.4 g at 14.5 ms
Min: -4.5 g at 45.2 ms

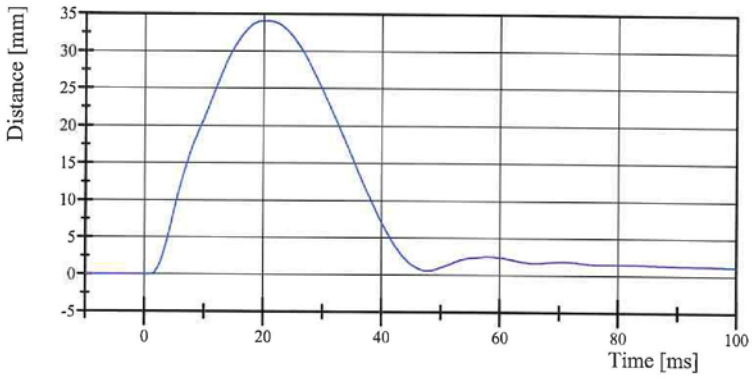
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 17:21:46 829

Transportation Research Center Inc.

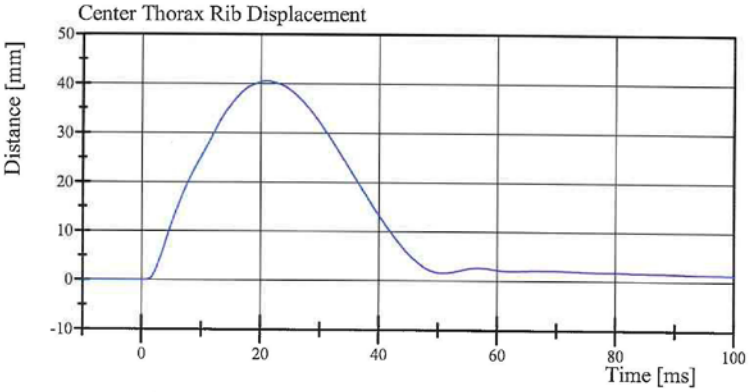
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Upper Thorax Rib Displacement



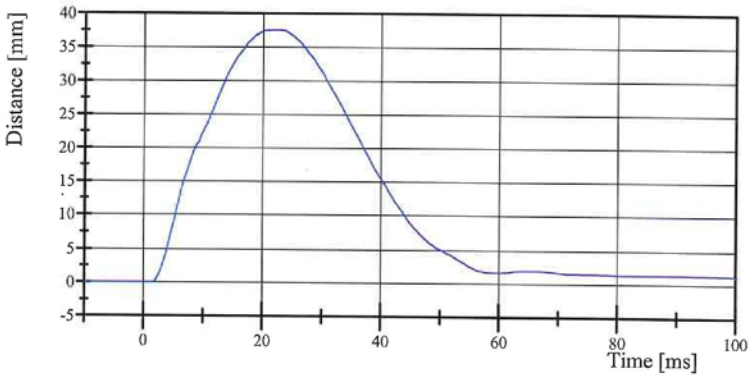
Filter Class: CFC_600
Max: 34.0 mm at 20.3 ms
Min: -0.0 mm at -6.4 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.5 mm at 20.8 ms
Min: -0.0 mm at -5.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.6 mm at 22.5 ms
Min: -0.0 mm at 1.4 ms

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

01.10.2014 17:21:47 829

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.5 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.1 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	37.5 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.58 g	Yes

Test meets specifications.

Comments:

Technician

Approved

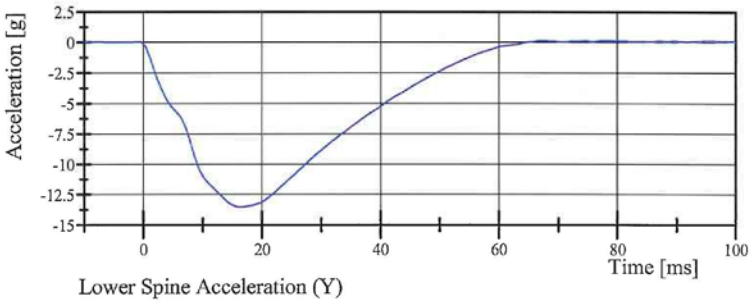
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 16:38:47 644

Transportation Research Center Inc.

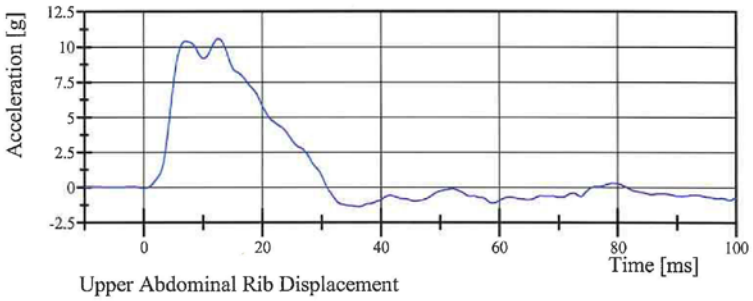
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Probe Acceleration



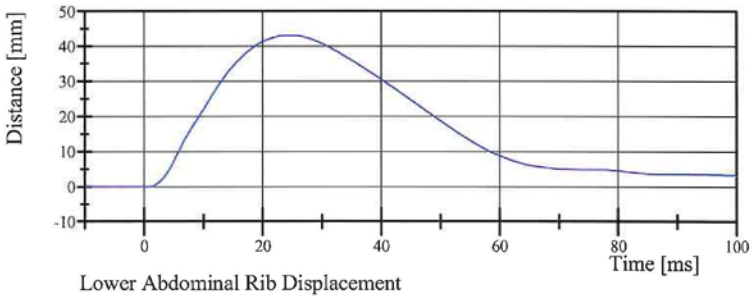
Filter Class: CFC_180
Max: 0.1 g at 78.2 ms
Min: -13.5 g at 16.4 ms

Lower Spine Acceleration (Y)



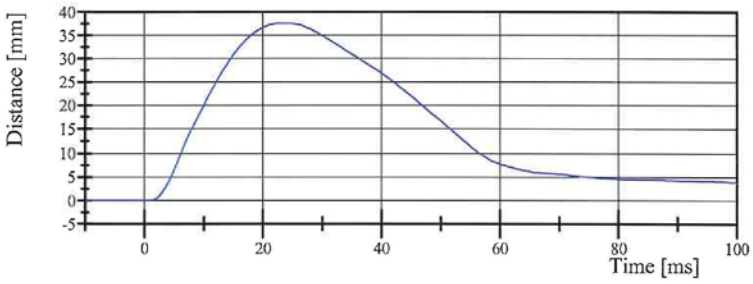
Filter Class: CFC_180
Max: 10.6 g at 12.6 ms
Min: -1.4 g at 36.2 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 43.1 mm at 24.4 ms
Min: -0.0 mm at -1.0 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 37.5 mm at 23.2 ms
Min: -0.0 mm at 0.8 ms

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

01.10.2014 16:38:57 644

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 24-7
Test Date: 1/13/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.63 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.95 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.3 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,274.5 N	Yes

Test meets specifications.

Comments:

Technician

Approved

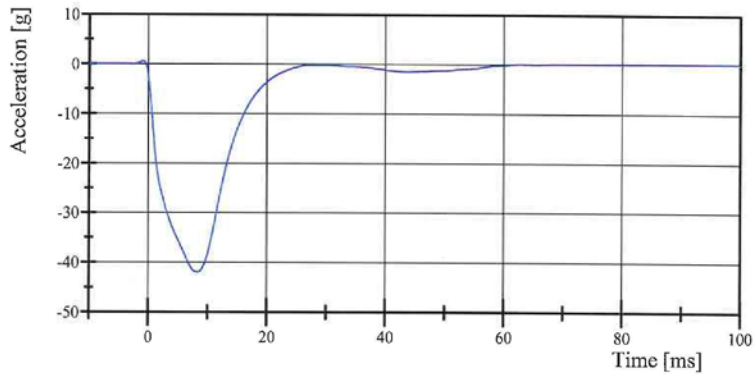
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.13.2014 18:16:38 449

Transportation Research Center Inc.

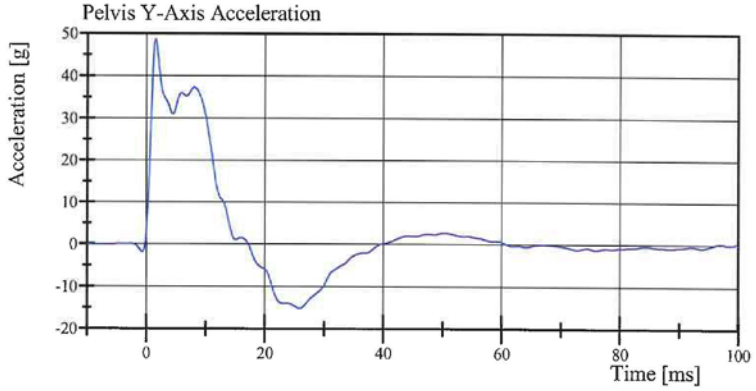
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 24-7
Test Date: 1/13/2014

Probe Acceleration



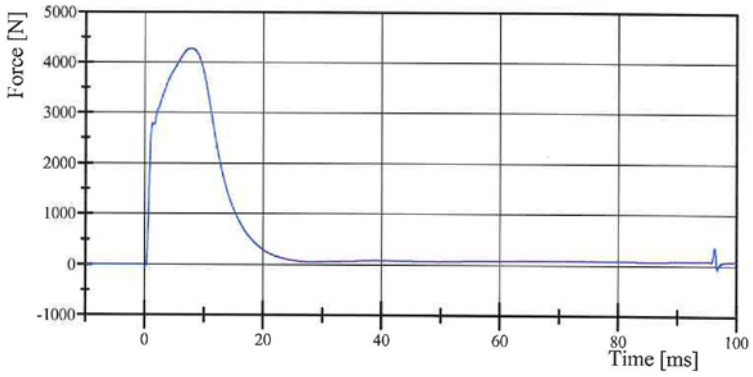
Filter Class: CFC_180
Max: 0.5 g at -0.9 ms
Min: -42.0 g at 8.2 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 48.7 g at 1.5 ms
Min: -15.1 g at 25.8 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,274.5 N at 7.8 ms
Min: -78.0 N at 96.7 ms

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

01.13.2014 18:16:57 449

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-40.6 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.8 g	Yes
Iliac Force	4,100 - 5,100 N	4,922.7 N	Yes

Test meets specifications.

Comments:

Technician

Approved

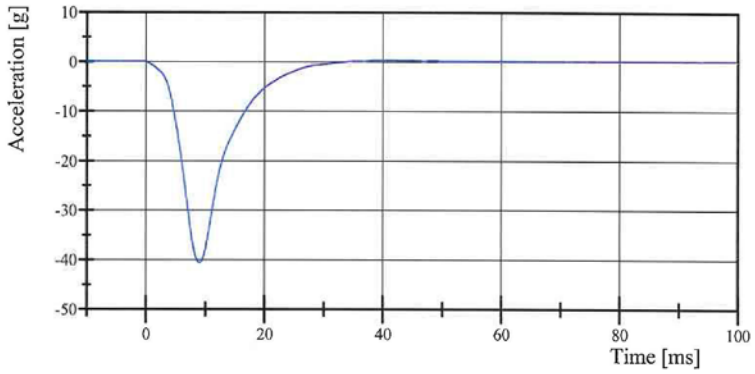
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.10.2014 15:14:14 676

Transportation Research Center Inc.

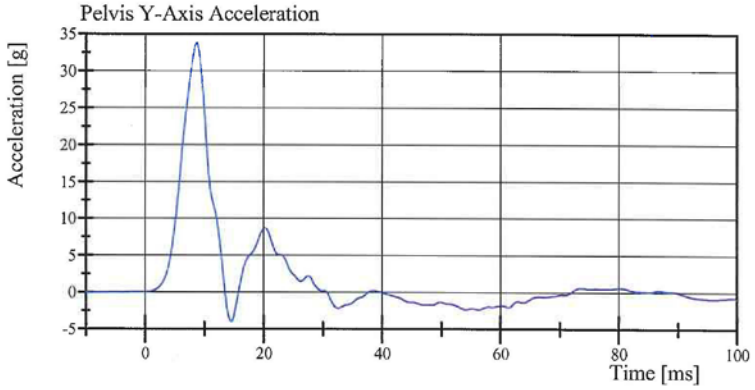
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 24-1
Test Date: 1/10/2014

Probe Acceleration



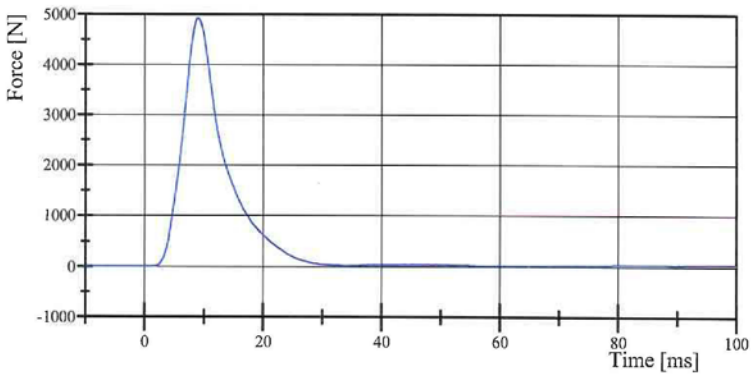
Filter Class: CFC_180
Max: 0.3 g at 41.7 ms
Min: -40.6 g at 9.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 33.8 g at 8.6 ms
Min: -4.0 g at 14.5 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,922.7 N at 9.0 ms
Min: -0.8 N at -1.8 ms

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

01.10.2014 15:14:25 676

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F030		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers		X	P58890	Endevco	9-Dec-13
		Y	P51702	Endevco	9-Dec-13
		Z	P52083	Endevco	9-Dec-13
Thoracic Rib Displacement Potentiometers	Upper	Y	175	FTSS	10-Dec-13
	Middle	Y	174	FTSS	10-Dec-13
	Lower	Y	173	FTSS	10-Dec-13
Abdomen Load Cells	Front	Y	1441	Denton	21-Oct-13
	Mid	Y	1436	Denton	21-Oct-13
	Rear	Y	1437	Denton	21-Oct-13
Lower Spine Accelerometers (T12)		X	P15954	Endevco	9-Dec-13
		Y	P68599	Endevco	9-Dec-13
		Z	P59005	Endevco	9-Dec-13
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	21-Oct-13

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	P51719	Endevco	11-Dec-13
			Y	P51272	Endevco	11-Dec-13
			Z	P58862	Endevco	11-Dec-13
Displacement Potentiometers	Shoulder		Y	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	12-Dec-13
		Middle	Y	1161	Servo	12-Dec-13
		Lower	Y	1279	Servo	12-Dec-13
	Abdominal Rib	Upper	Y	1295	Servo	12-Dec-13
		Lower	Y	1136	Servo	12-Dec-13
Lower Spine Accelerometers (T12)			X	P50068	Endevco	12-Dec-13
			Y	P52051	Endevco	12-Dec-13
			Z	P51710	Endevco	12-Dec-13
Acetabulum Load Cell			Y	103-FY	FTSS	24-Oct-13
Iliac Wing Load Cell			Y	287-FY	FTSS	28-Oct-13
Pelvis Plug (struck side)				63021	FTSS	11-Jan-13
Pelvis Plug (non-struck side)				36473	FTSS	23-Sep-10

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P73596	Endevco	4-Dec-13
	Vehicle Center of Gravity	Y	P80741	Endevco	16-Sep-13
	Vehicle Center of Gravity	Z	P81023	Endevco	10-Sep-13
2	Right Sill at Front Seat	X	P81641	Endevco	5-Nov-13
	Right Sill at Front Seat	Y	P81598	Endevco	13-Nov-13
	Right Sill at Front Seat	Z	P81087	Endevco	5-Nov-13
3	Right Sill at Rear Seat	X	P75236	Endevco	15-Oct-13
	Right Sill at Rear Seat	Y	P81092	Endevco	5-Nov-13
	Right Sill at Rear Seat	Z	P81607	Endevco	12-Nov-13
4	Left Sill at Front Seat	Y	P81640	Endevco	15-Nov-13
5	Left Sill at Rear Seat	Y	P81531	Endevco	5-Nov-13
6	Left A-Post Lower	Y	P81029	Endevco	5-Nov-13
7	Left A-Post Middle	Y	P81995	Endevco	5-Nov-13
8	Left B-Post Lower	Y	P57169	Endevco	23-Oct-13
9	B-Post Middle	Y	P80142	Endevco	5-Aug-13
10	Front Seat Track	Y	P82275	Endevco	12-Nov-13
11	Rear Seat Track or Structure	Y	P81637	Endevco	14-Nov-13
12	Right Rear Occupant Compartment	Y	P81016	Endevco	17-Sep-13
13	Engine Block	X	P80489	Endevco	6-Aug-13
	Engine Block	Y	P80488	Endevco	6-Aug-13
14	Rear Floorpan Above Axle	X	P76187	Endevco	17-Jul-13
	Rear Floorpan Above Axle	Y	P78202	Endevco	15-Sep-13
	Rear Floorpan Above Axle	Z	P80140	Endevco	21-Aug-13

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P80602	Endevco	17-Sep-13
MDB Center of Gravity	Y	P81025	Endevco	17-Sep-13
MDB Center of Gravity	Z	P81041	Endevco	17-Sep-13
Left Frame Rail at Rear Axle Centerline	X	P78221	Endevco	14-Aug-13
Left Frame Rail at Rear Axle Centerline	Y	P80765	Endevco	17-Sep-13