FINAL REPORT NUMBER: SINCAP-TRC-16-004

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

FORD MOTOR COMPANY
2016 Ford F-250 SuperCrew Pickup Truck
NHTSA NUMBER: M20160208

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

Report Date: February 16, 2016

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NRM-110
1200 New Jersey Ave, SE, Room W43-410
Washington, D.C. 20590

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Report Approved By: Melinda Lackey

Melinda Lackey, Project Manager

Approval Date: February 16, 2016

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 2016 Ford F-250 SuperCrew Pickup Truck, 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 14, 2016.

The impact velocity of the Moving Deformable Barrier (MDB) was 61.89 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22° C. The target vehicle post-test maximum crush was 288 mm at Level 1. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	N/A	1000	29
Maximum Thoracic Rib Deflection	mm	44	14.9
Total Abdominal Force	N	2500	369.4
Pubic Symphysis Force	N	6000	-1021.5

Passenger ATD (SID-IIs)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	N/A	1000	21
Lower Spine Resultant Acceleration	g's	82	31.9
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	848.8
Maximum Thoracic Rib Deflection	mm	38*	8.7
Maximum Abdominal Rib Deflection	mm	45*	25.9

* 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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TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2016 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00354. The purpose of this test is to generate comparative side impact performance in a 2016 Ford F-250 SuperCrew Pickup Truck. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A 2016 Ford F-250 SuperCrew Pickup Truck 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 61.89 km/h (38.46 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 14, 2016. 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 October 2015. 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	29
Maximum Thoracic Rib Deflection	mm	44	14.9
Combined Abdominal Force	N	2500	369.4
Pubic Symphysis Force	N	6000	-1021.5

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	21
Lower Spine (T12) Resultant Acceleration	G	82	31.9
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	848.8
Maximum Thoracic Rib Deflection	mm	38*	8.7
Maximum Abdominal Rib Deflection	mm	45*	25.9

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
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	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	N/A	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.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20160208
Model Year	2016
Make	Ford
Model	F-250
Body Style	Super Duty Crew Cab
VIN	1FT7W2A64GEA19398
Body Color	Ingot Silver Metallic
Odometer Reading (km/mi)	9.9 mi
Engine Displacement (L)	6.2
Type/No. Cylinders	V/8
Engine Placement	Front/Longitudinal
Transmission Type	Automatic
Transmission Speeds	6 Speed
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	06/15
Vehicle Type	Truck

GVWR (kg)	4536
GAWR Front (kg)	1860
GAWR Rear (kg)	2767

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)				1580
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)[1]				1239.8

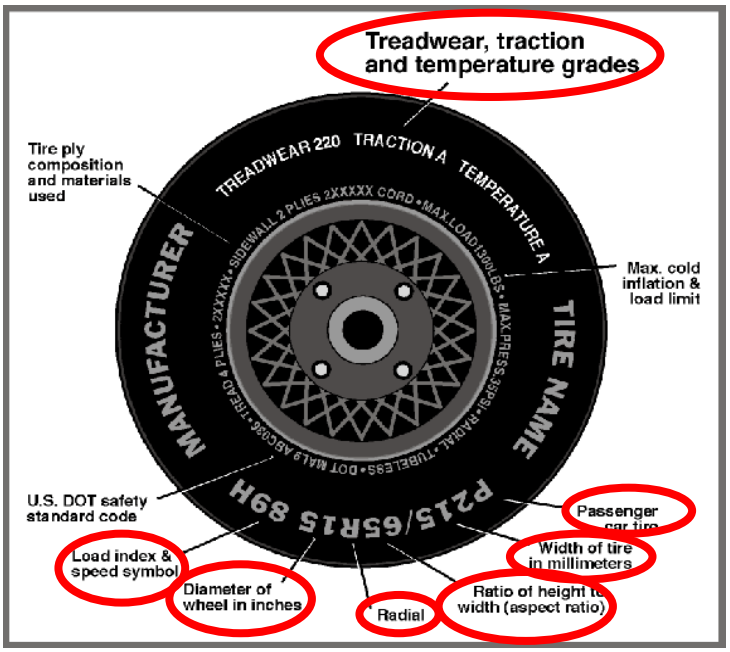
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes	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

[1]Rated cargo and luggage weight is limited to 136.0 kg or 300.0 lbs.

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

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Cold Pressure (kPa)	450	550
Recommended Tire Size	LT245/75R17	LT245/75R17
Tire Size on Vehicle	LT245/75R17	LT245/75R17
Tire Manufacturer	General	General
Tire Model	Grabber HTS	Grabber HTS
Treadwear	N/A	N/A
Traction	N/A	N/A
Temperature Grades	N/A	N/A
Tire Plies Sidewall	6	6
Tire Plies Body	2	2
Load Index/Speed Symbol	121/118 S	121/118 S
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	A343 HM64 2015	A343 HM64 2015
DOT Safety Code Right	A343 HM64 2015	A343 HM64 2015

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

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	410	405	505	500
Tire Placard	kPa	450	450	550	550
Owner's Manual	kPa	N/A	N/A	N/A	N/A
As Tested	kPa	450	450	550	550

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21 kPa	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	807.0	656.4		867.0	757.4		872.4	753.2	
Right	kg	811.6	625.2		807.4	721.4		828.4	707.6	
Ratio	%	55.8	44.2		53.1	46.9		53.8	46.2	
Totals	kg	1618.6	1281.6	2900.2	1674.4	1478.8	3153.2	1700.8	1460.8	3161.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2900.2	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW) [1]	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	3161.2	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement
LF	mm	927	927	Yes
RF	mm	939	943	Yes
RR	mm	998	997	Yes
LR	mm	984	983	Yes
Vehicle CG (Aft of Front Axle)	mm	1841	1869	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+25	+26	

***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: Steel plate mounted in cargo bed	72.6
Removed: None.	0.0

[1]Rated cargo and luggage weight is limited to 136.0 kg or 300.0 lbs.

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

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	N/A	N/A	13.2
Front Passenger Seat	N/A	N/A	13.3
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	10.0
Non-Struck Side Rear Seat	Fixed	N/A	9.9
Rear Center Seat*	Fixed	N/A	10.4

* 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	13.2	346	Max	344	346	349
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Front Passenger Seat	13.3	353	Max	349	353	360
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	10.0	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	9.9	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*	10.4	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: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

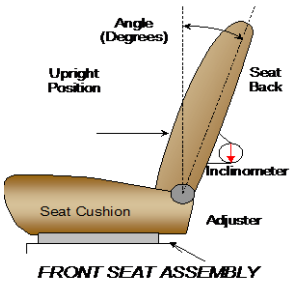
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	202	47	101	24
Front Passenger Seat	220	51	110	26
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

* If applicable

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	48.8	27	16.7	9
Front Passenger Seat	48.9	27	16.4	9
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	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

* If applicable

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	1, Fixed	1, Fixed

HEAD RESTRAINT ADJUSTMENT

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

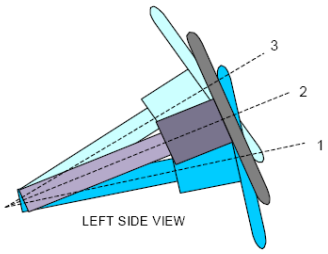
	Total # of Positions	Placed in Position #
Driver Seat	3, Numbered from 0 to 2	2, Uppermost
Rear Seat	1, Fixed	1, Fixed

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

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

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.

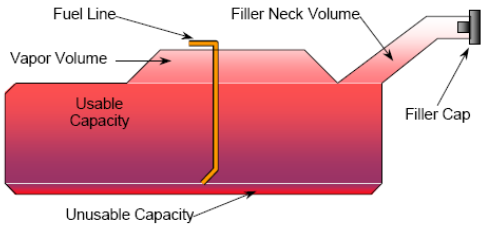


STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	68.3	200
Geometric Center, Position No. 2	66.3	212.5
Uppermost, Position No. 3	64.4	225
Telescoping Steering Wheel Travel		25
Test Position	66.3	212.5

FUEL PUMP

The electric fuel pump operates with ignition ON and stays on while the engine is running. A fuel pump shut-off switch stops fuel flow if the vehicle sustains an impact above a certain magnitude. The fuel filler neck is located on the left side of the vehicle between cab and the wheel well.



VEHICLE FUEL TANK ASSEMBLY

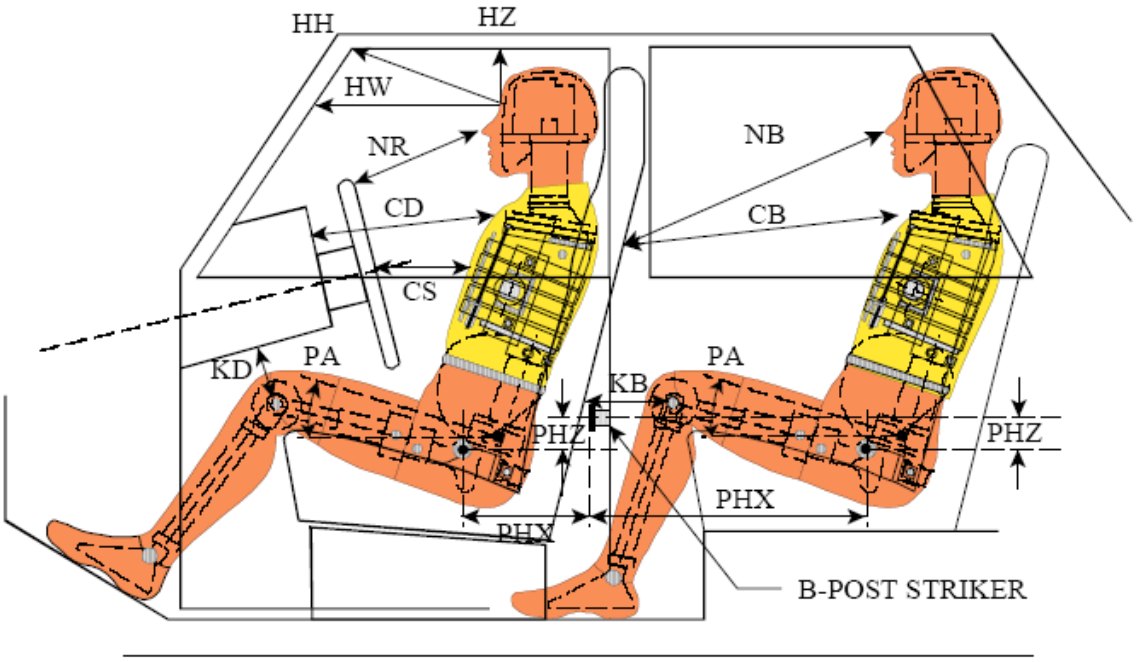
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	132.5
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	132
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	123.2
Actual Amount of Solvent Used in Test	123.2
1/3 of Usable Capacity	44.2

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: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



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

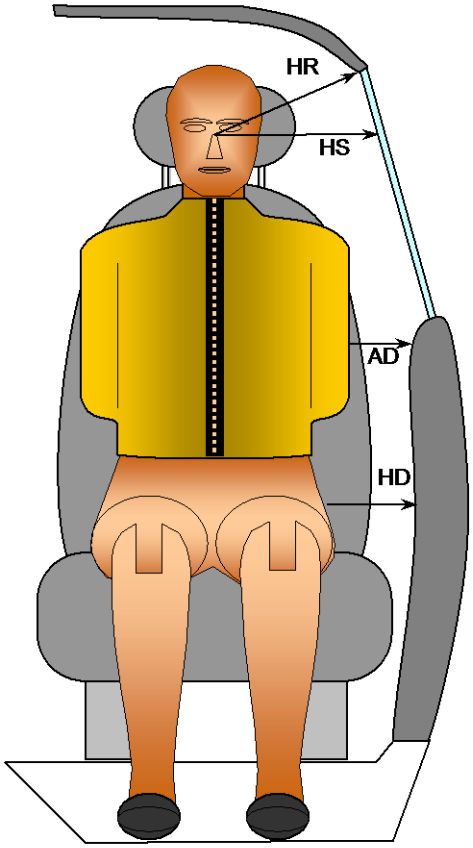
LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	474			
HW		Header to Windshield	610			
HZ	HZ	Head to Roof Liner	177		324	
NR	NB	Nose to Rim/Seat Back	457		655	
CD	CB	Chest to Dash/Seat Back	610		624	
CS		Chest to Steering Wheel	302			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	187	30.7	344	0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	187	30.7	344	0
PAX°	PAX°	Pelvic Tilt Angle X		1.8		0.2
	PAY°	Pelvic Tilt Angle Y				20.3
PHX	PHX	Hip Point to Striker (X-Axis)	330 forward		224 forward	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	26 above		25 above	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

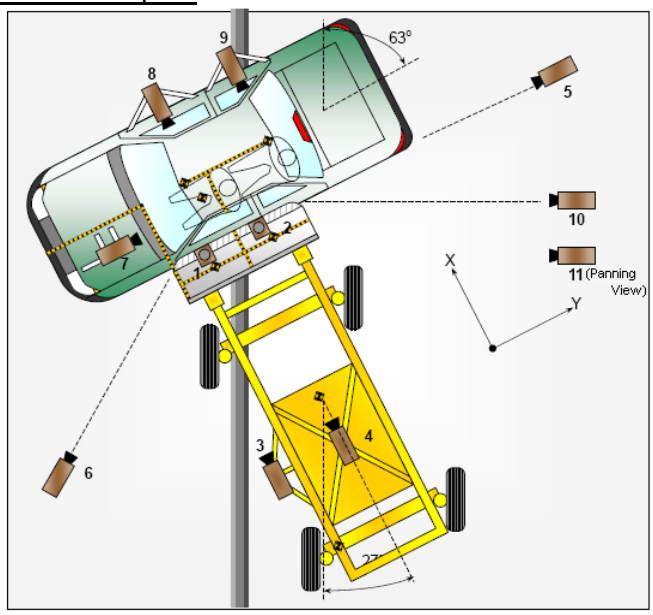


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	191	282
HS	Head to Side Window	mm	352	391
AD	Arm to Door	mm	142	184
HD	H-Point to Door	mm	235	235

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	457	-5738	6	1000
2	Overhead Close-up	0	0	-5738	16	1000
3	Left Impact Point (MDB)	-1823	-855	-830	12.5	1000
4	Side Overall (MDB)	-2465	0	-1437	8.5	1000
5	Rear	321	8034	-1220	20	1000
6	Left Front	-2321	-3999	-1410	20	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				16	1000
9	Passenger Side (OB)				12.5	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.

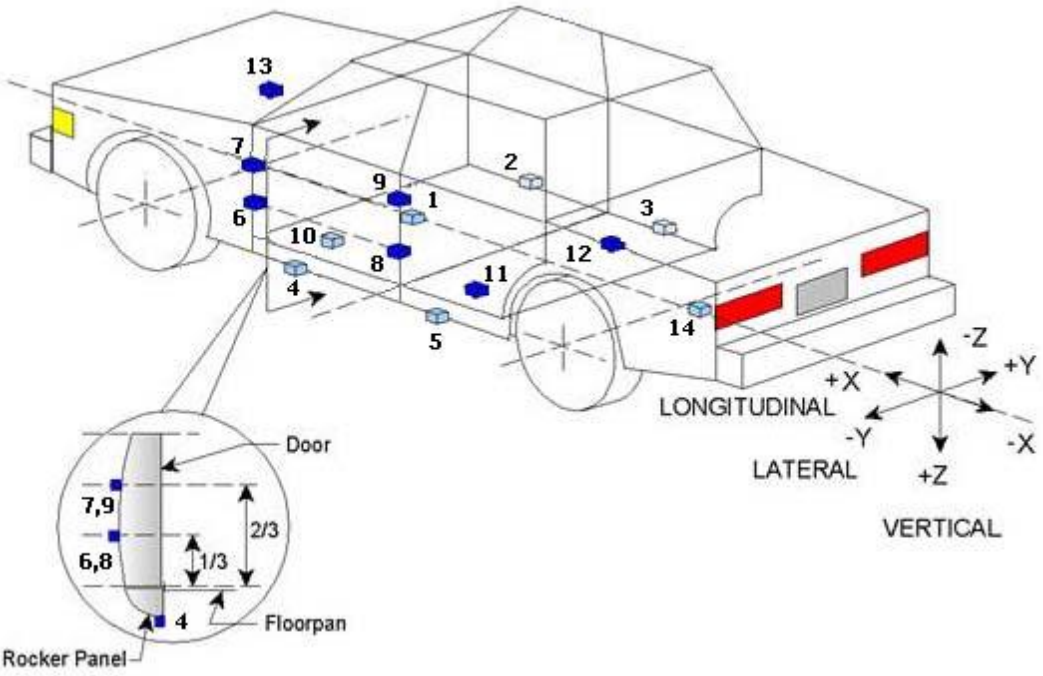
If applicable, explain why camera(s) did not operate as intended: N/A

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: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



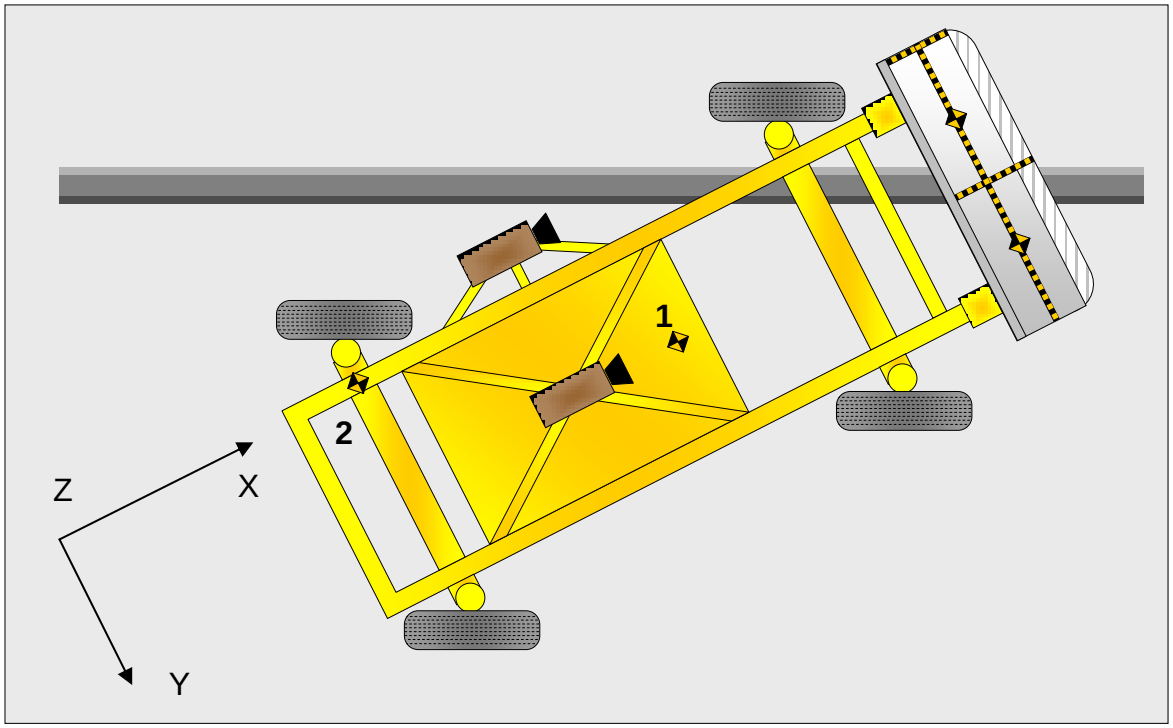
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	4205	70	-763
2	Right Sill at Front Seat	4230	735	-565
3	Right Sill at Rear Seat	3090	805	-555
4	Left Sill at Front Door	4225	-765	-547
5	Left Sill at Rear Door	3090	-805	-555
6	A-Post Lower	4585	-875	-738
7	A-Post Middle	4590	-875	-1106
8	B-Post Lower	3455	-865	-710
9	B-Post Middle	3475	-863	-1148
10	Front Seat Track	3805	-665	-735
11	Rear Seat Structure	2975	-715	-642
12	Right Rear Occ. Compartment	2990	715	-554
13	Engine Block	5185	225	-1053
14	Rear Above Axle	1270	0	-852

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: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



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: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB, Headliner	SCAB
Top of Head	SCAB, Headliner	SCAB
Left Side of Head	SCAB, Headliner	SCAB
Back of Head	SCAB	None
Left Shoulder	SCAB	Seatback, C-Pillar
Upper Torso	Seatback	Seatback, Door Panel
Lower Torso	Torso/Pelvis Airbag	Seatback
Left Hip	Torso/Pelvis Airbag	Seat Cushion
Left Knee	None	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	N/A
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	N/A
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	N/A
Disengaged from Latched Position	No	No	No	No	N/A
Latch Separated from Striker	No	No	No	No	N/A
Jammed Shut	Yes	Yes	No	No	N/A
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

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	Some Deformation
Sill Separation	None
Windshield Damage	None
Side Window Damage	Driver Side Window- Shattered
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	N/A		
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	N/A	No	N/A
Other	N/A	N/A	N/A	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3985
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		506
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+2
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-5

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

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	1107

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	415.0	268.0	683.0
Right	kg	368.4	316.2	684.6
Ratio	%	57.3	42.7	100.0
Totals	kg	783.4	584.2	1367.6

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.89
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.95
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

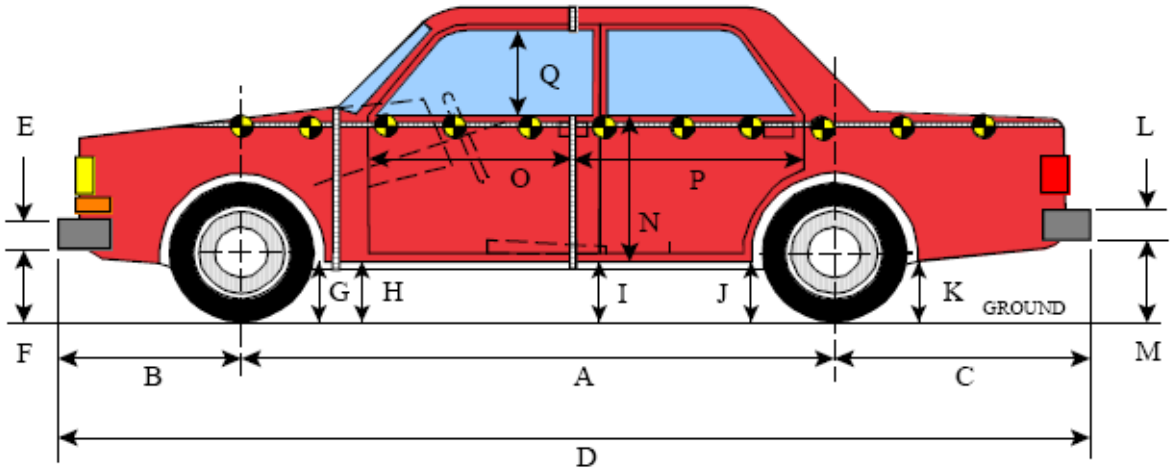
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	58
B[1]	Top of Bumper	560	800	Right	104
C	Mid-Level	686	800	Right	189
D	Top of Stack	813	800	Right	266

[1]Top of bumper measurements were collected at 560 mm to eliminate post-test measurement point obstruction by the bumper element.

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



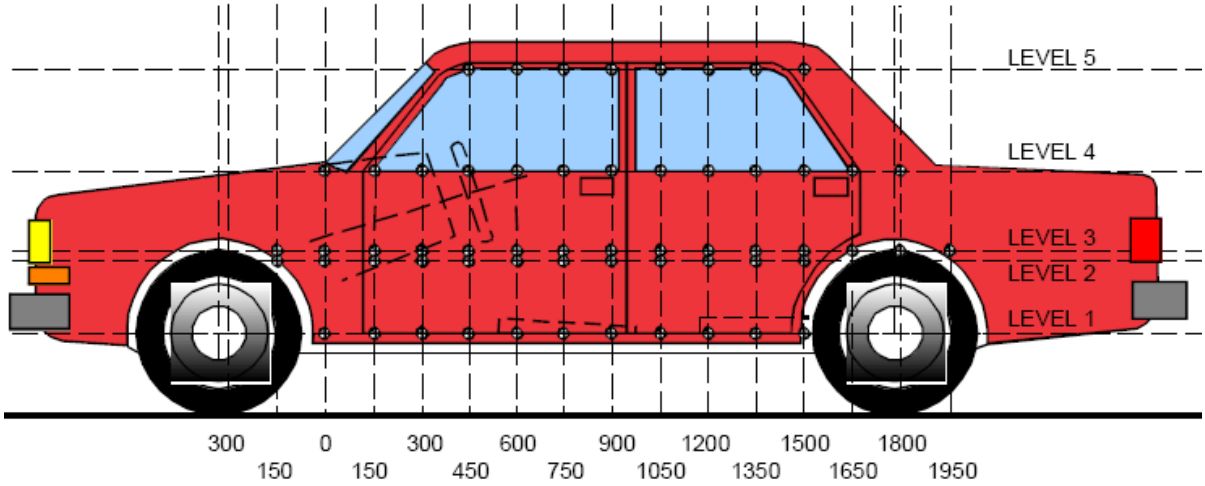
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3985	3990	-5
B	Front Axle to Front Surface of Vehicle	980	980	0
C	Rear Axle to Rear Surface of Vehicle	1324	1324	0
D	Total Length at Centerline	6280	6265	15
E	Front Bumper Thickness	225	225	0
F	Front Bumper Bottom to Ground	385	365	20
G	Sill Height at Front Wheel Well	421	462	-41
H	Sill Height at Front Door Leading Edge	414	479	-65
I	Sill Height at B-Pillar	430	472	-42
J1	Sill Height at Rear Wheel Well	470	501	-31
J2	Pinch Weld Height at Rear Wheel Well	424	457	-33
K	Sill Height Aft of Rear Wheel Well	504	526	-22
L	Rear Bumper Thickness	175	175	0
M	Rear Bumper Bottom to Ground	510	499	11
N	Sill Height to Window Bottom Sill	880	860	20
O	Front Door Leading Edge to Impact CL	725	716	9
P	Rear Door Trailing Edge to Impact CL	1456	1352	104
Q	Front Window Opening	520	515	5
R	Right Side Length	6207	6202	5
S	Left Side Length	6200	6186	14
T	Vehicle Width	2038	2022	16

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	546	288	1200
2	Driver Hip Point	963	204	1650
3	Mid-Door	831	251	1650
4	Window Sill	1177	118	1500
5	Window Top	1835	-83	1500

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: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

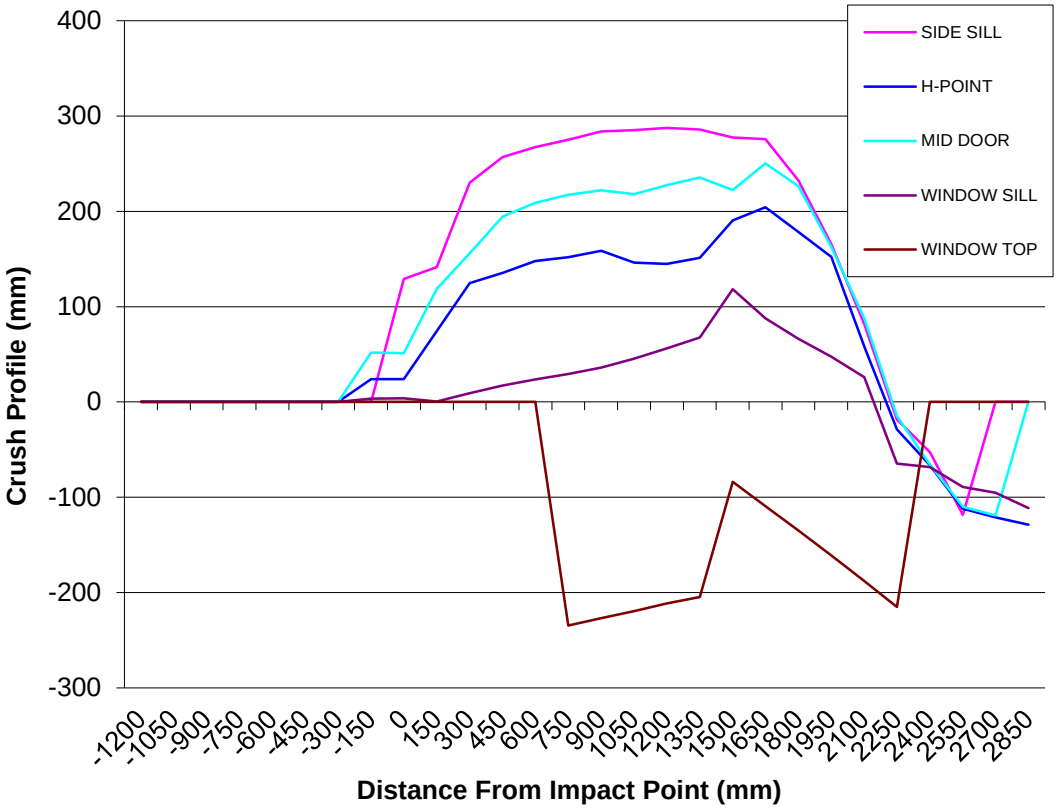
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	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	0	0	0	0	0	0	0	0	0	0	0	0
-150	0	1016	1024	977	0	0	992	972	974	0	0	24	52	3	0
0	995	1008	1013	979	0	866	984	962	975	0	129	24	51	4	0
150	984	1009	1003	977	0	843	935	884	977	0	141	74	119	0	0
300	986	1013	1005	980	0	756	888	849	970	0	230	125	156	10	0
450	987	1015	1006	986	0	730	879	812	968	0	257	136	194	18	0
600	988	1016	1008	991	0	720	868	799	967	0	268	148	209	24	0
750	988	1017	1009	996	747	712	865	791	966	981	276	152	218	30	-234
900	987	1018	1010	1000	758	703	859	788	964	985	284	159	222	36	-227
1050	986	1018	1010	1004	762	701	872	792	958	982	285	146	218	46	-220
1200	986	1018	1010	1006	766	698	873	783	950	977	288	145	227	56	-211
1350	985	1019	1011	1007	769	699	868	776	939	973	286	151	235	68	-204
1500	983	1018	1009	1007	771	706	827	786	889	854	277	191	223	118	-83
1650	982	1017	1009	1008	772	706	813	758	920	882	276	204	251	88	-110
1800	980	1017	1008	1008	773	748	838	782	941	908	232	179	226	67	-135
1950	979	1017	1008	1008	774	813	864	845	961	935	166	153	163	47	-161
2100	977	1016	1007	1007	775	895	958	919	981	963	82	58	88	26	-188
2250	974	1015	1007	1007	776	993	1044	1021	1071	992	-19	-29	-14	0	-216
2400	971	1011	1004	1002	0	1023	1078	1069	1071	0	-52	-67	-65	-69	0
2550	964	1003	996	994	0	1082	1116	1106	1083	0	-118	-113	-110	-89	0
2700	962	1003	995	994	0	1090	1124	1113	1090	0	-128	-121	-118	-96	0
2850	964	1004	996	994	0	1102	1132	1123	1105	0	-138	-128	-127	-111	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.

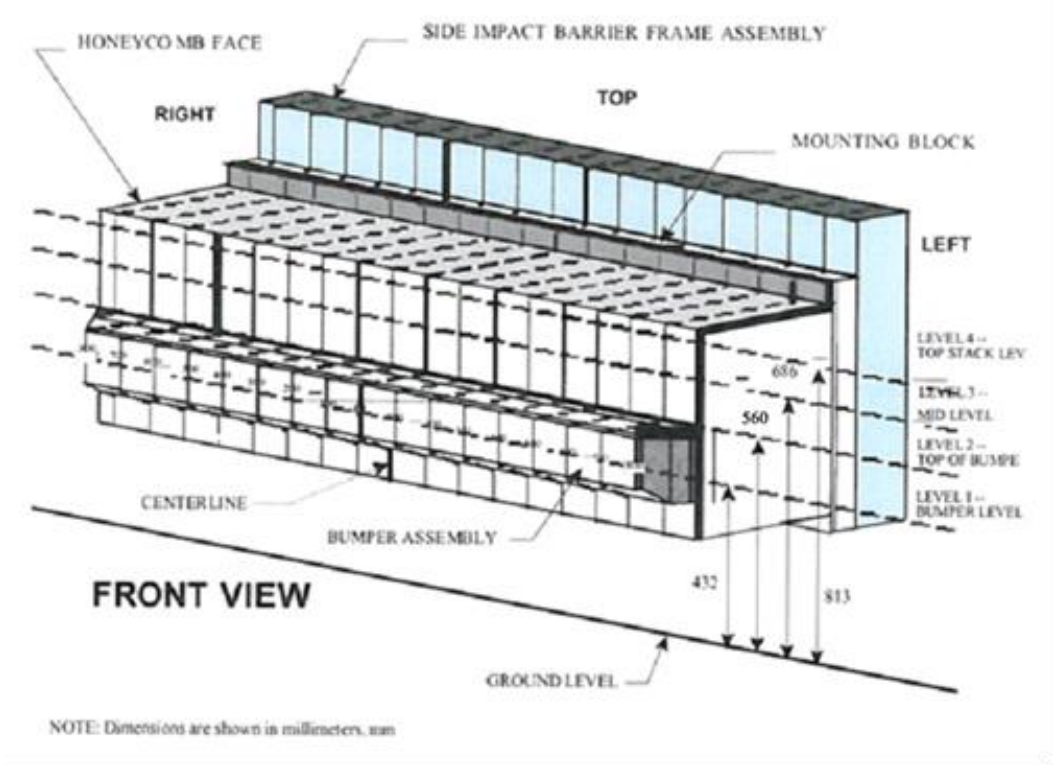
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



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	266	226	193	164	171	169	157	139	131	125	119	132	123	136	155	178	204
2	189	136	107	101	100	83	79	79	78	78	78	79	78	84	93	111	143
3	104	69	62	56	49	42	37	32	27	25	25	24	25	28	32	39	62
4	58	47	44	41	40	35	31	28	25	23	22	23	23	24	30	38	32

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

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16

Test Time: 15:28 **Temperature:** 21.1°C

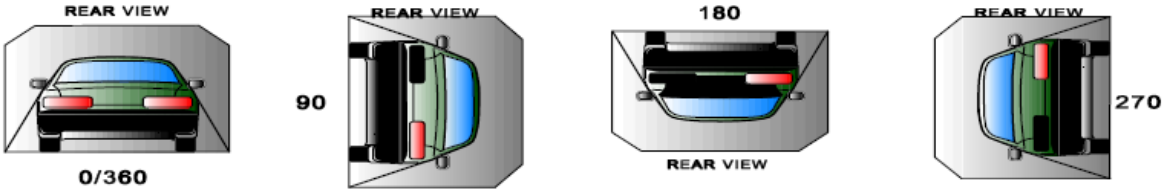
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

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

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

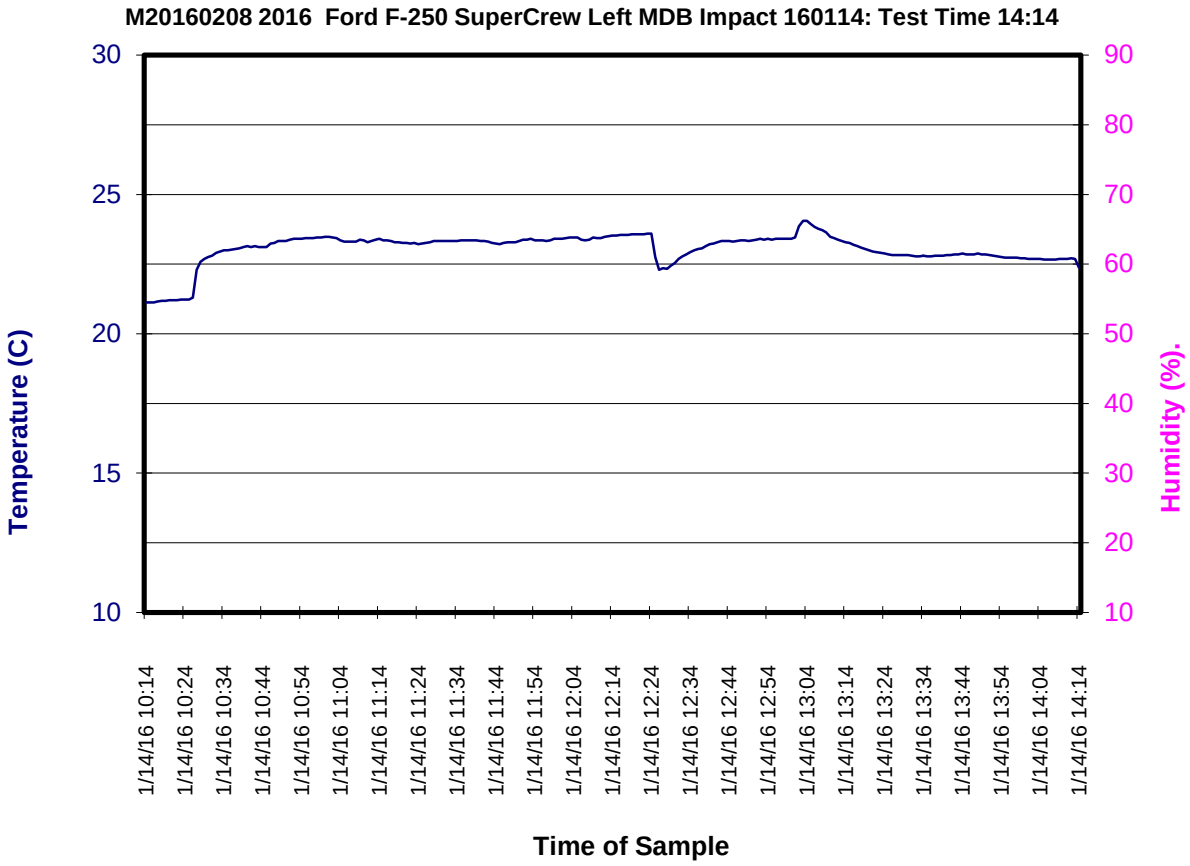
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 14[1]

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2016 Ford F-250 SuperCrew Pickup Truck NHTSA No.: M20160208
Test Program: NCAP Side Impact Test Date: 1/14/16



[1] The humidity was not recorded for this test.

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

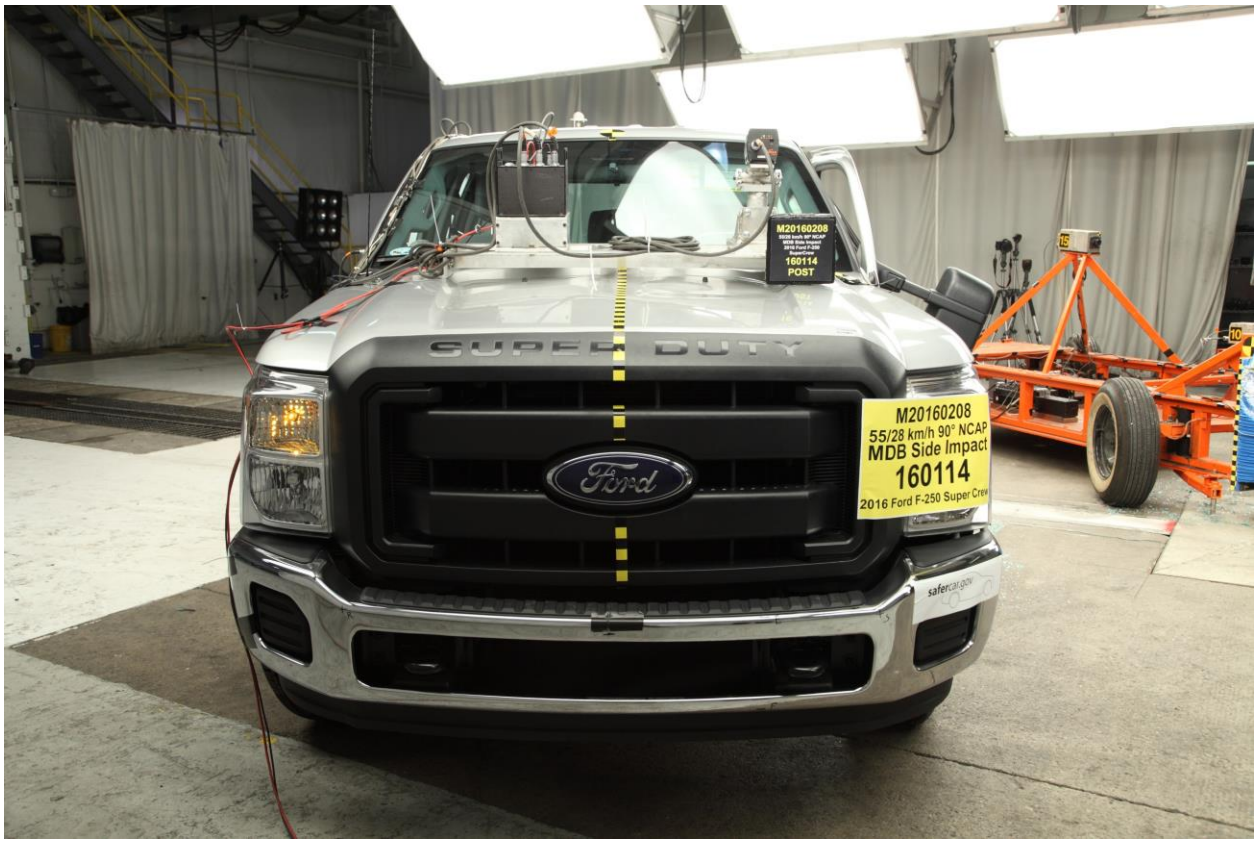
TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

002 As-Delivered Left Rear ¾ View of Test Vehicle

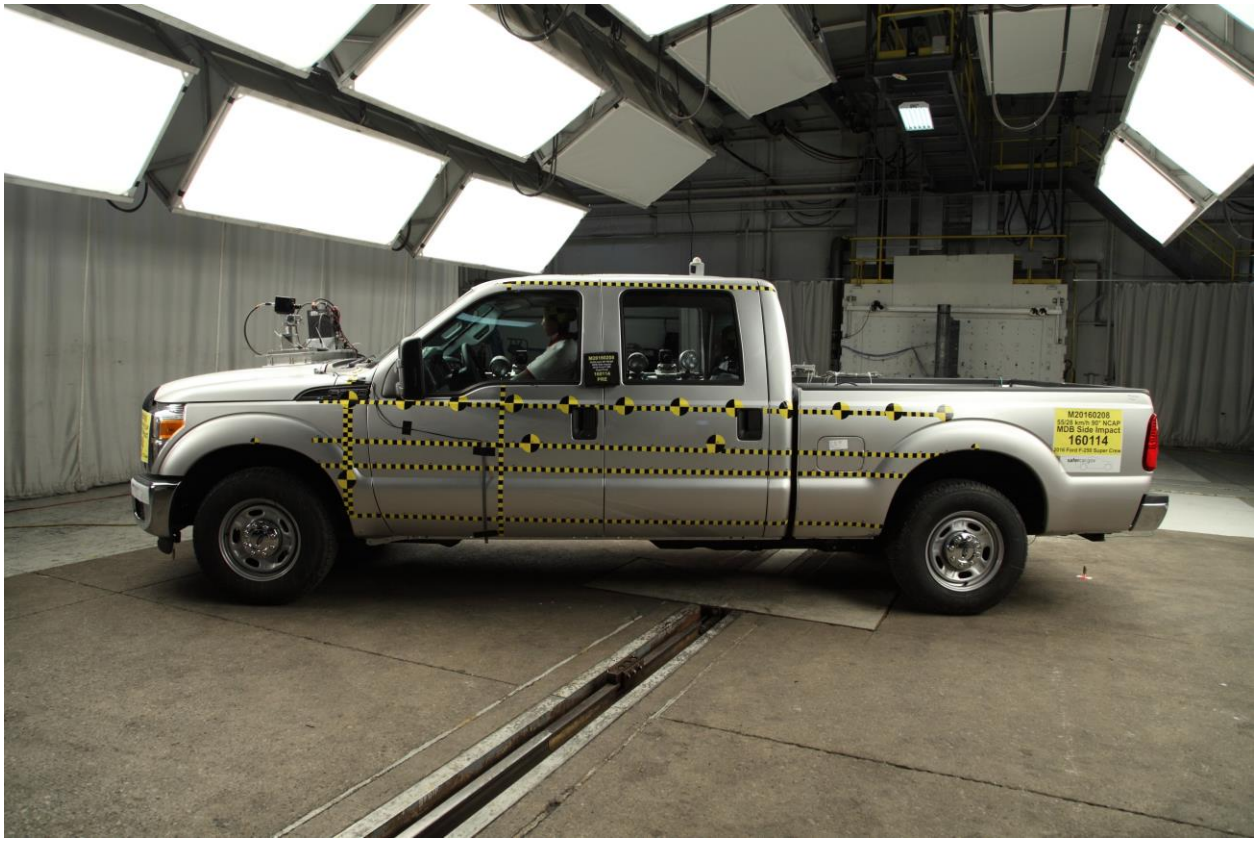
003 Pre-Test Front View of Test Vehicle



004 Post-Test Front View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

006 Post-Test Left Front ¾ View of Test Vehicle



007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear ¾ View of Test Vehicle

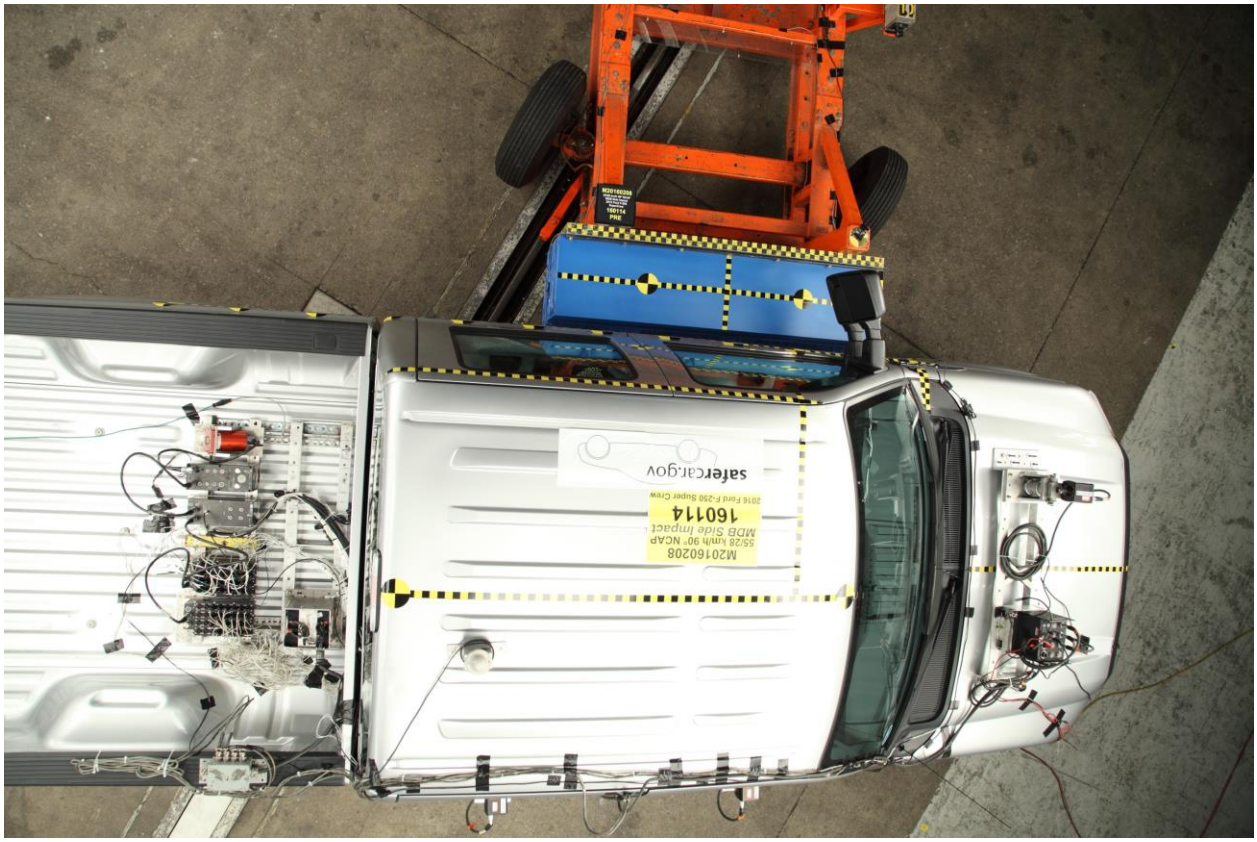
010 Post-Test Left Rear ¾ View of Test Vehicle

011 Pre-Test Rear View of Test Vehicle

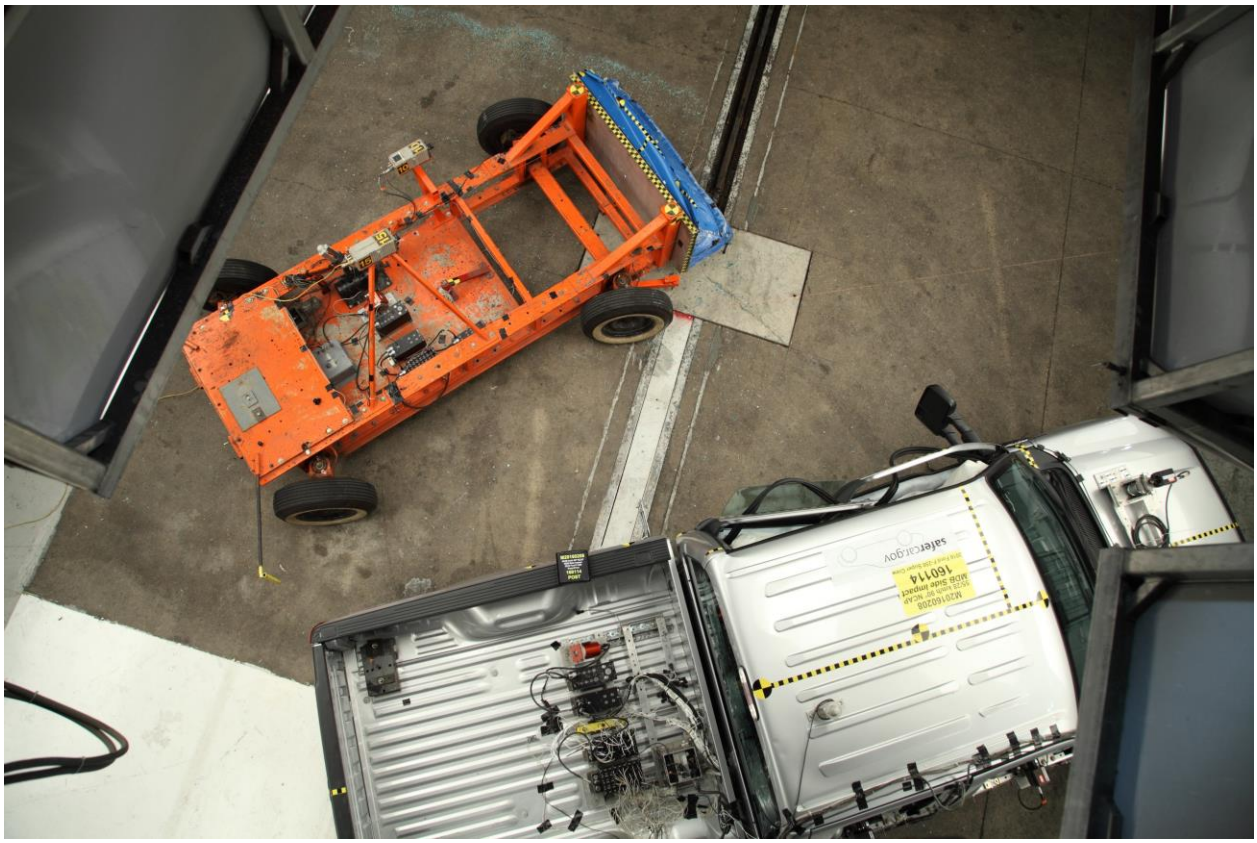
012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

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

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

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

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

021 Pre-Test Left Front Door Latch Close-up

022 Post-Test Left Front Door Latch Close-up

023 Pre-Test Left Rear Door Latch Close-up

024 Post-Test Left Rear Door Latch Close-up

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

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

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

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

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

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

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

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

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

034 Pre-Test Placement of Driver Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy

036 Pre-Test Left Side View of Steering Wheel

037 View of Disengaged Parking Brake

038 Pre-Test View of Parking Brake

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

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

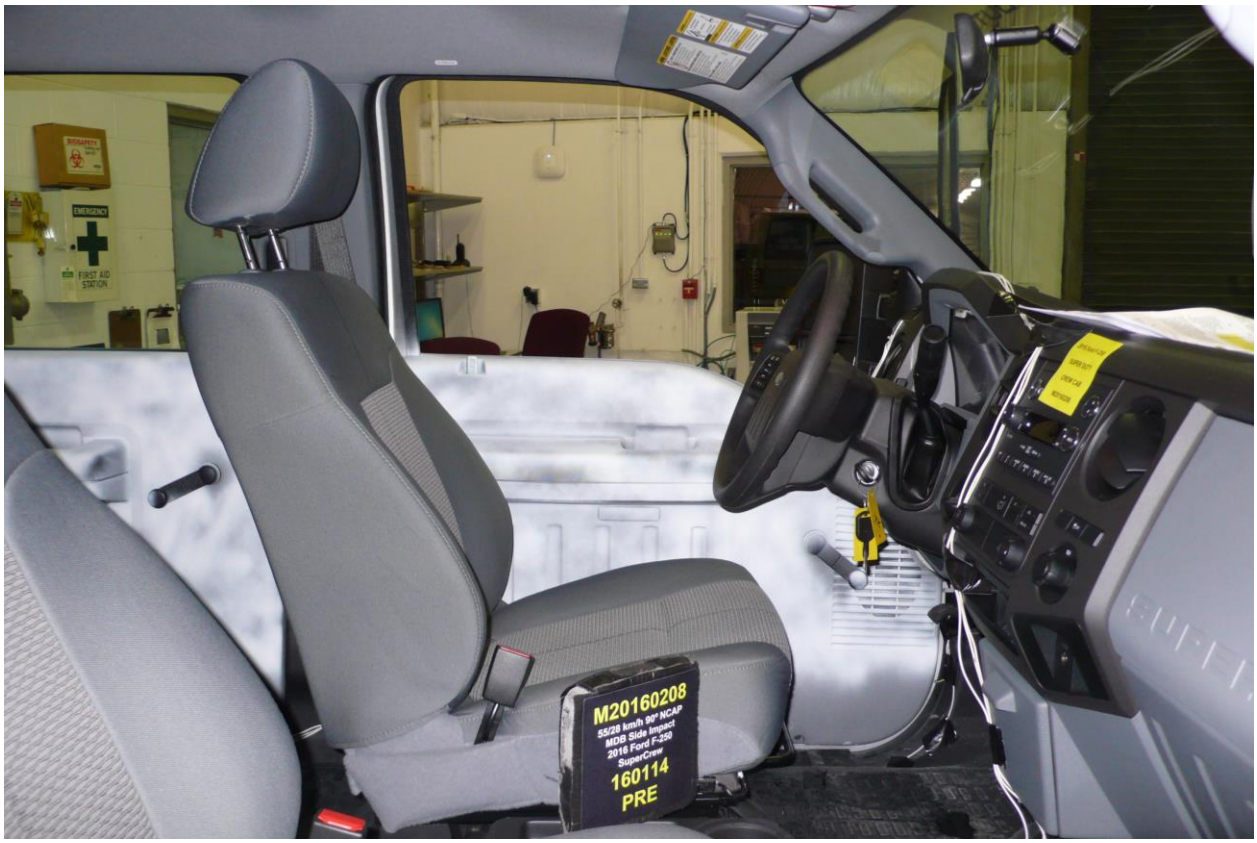
041 Pre-Test Close-Up View of Driver Seat Back or Head Restraint

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View

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

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



046 Pre-Test Driver Inner Door Panel View

047 Post-Test Driver Inner Door Panel View

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

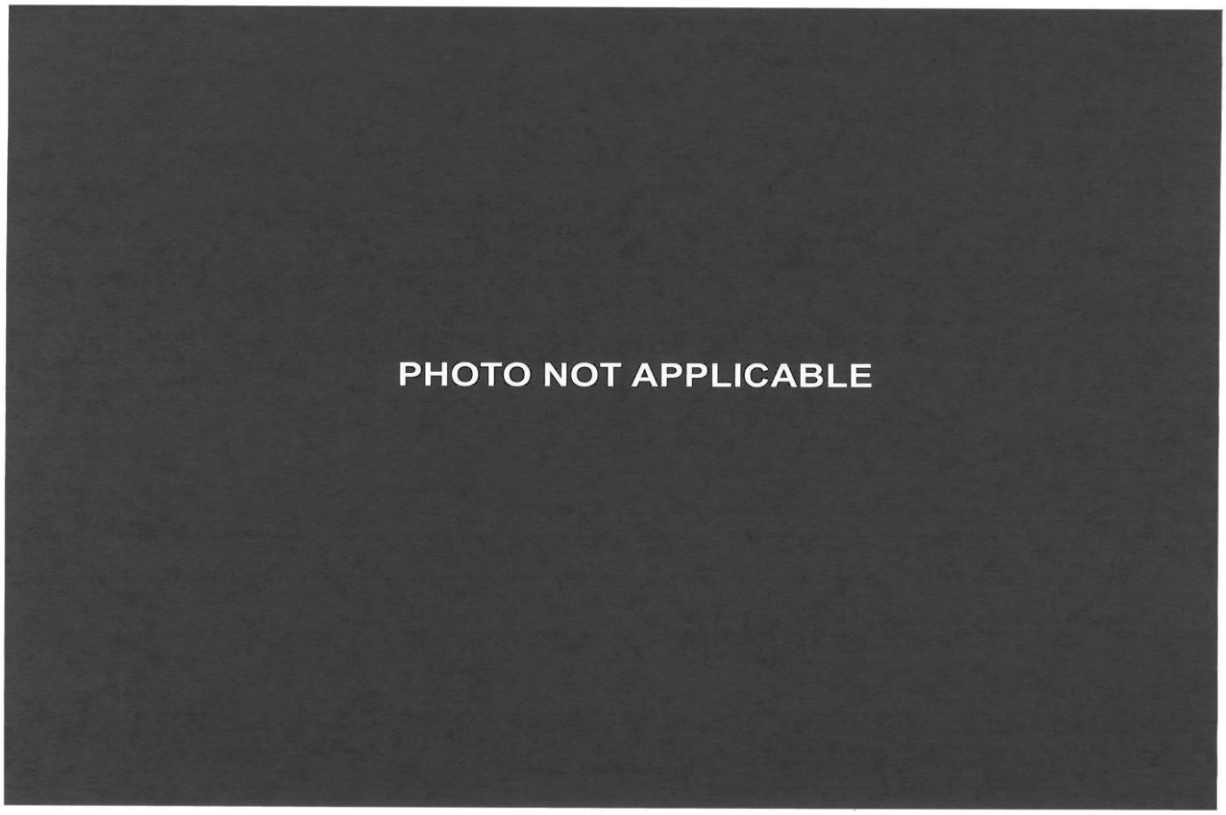
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

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

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

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

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



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

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

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

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

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

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

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

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

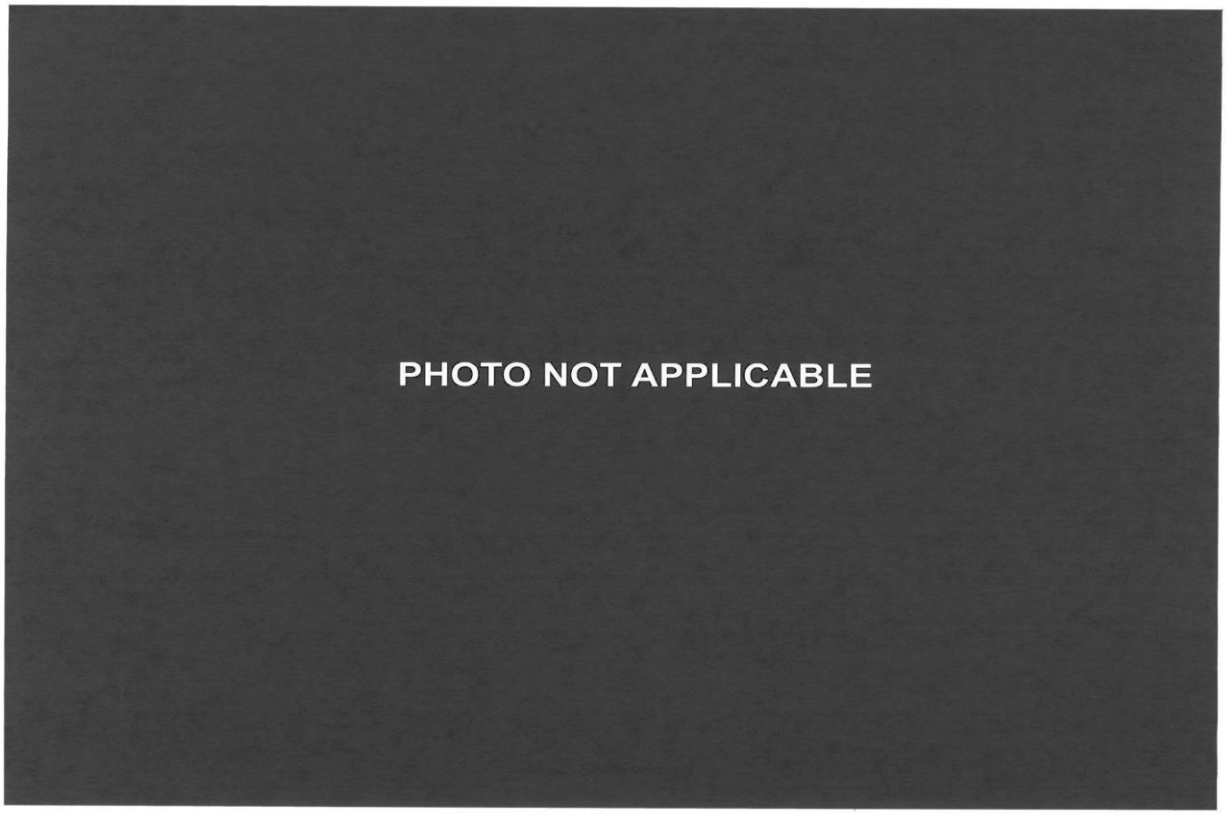
062 Pre-Test View of Rear Passenger Dummy Neck Showing Position of Adjustable Neck Bracket

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

064 Pre-Test Placement of Rear Passenger Dummy Feet

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

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



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

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

069 Pre-Test Passenger Dummy and Door Clearance View

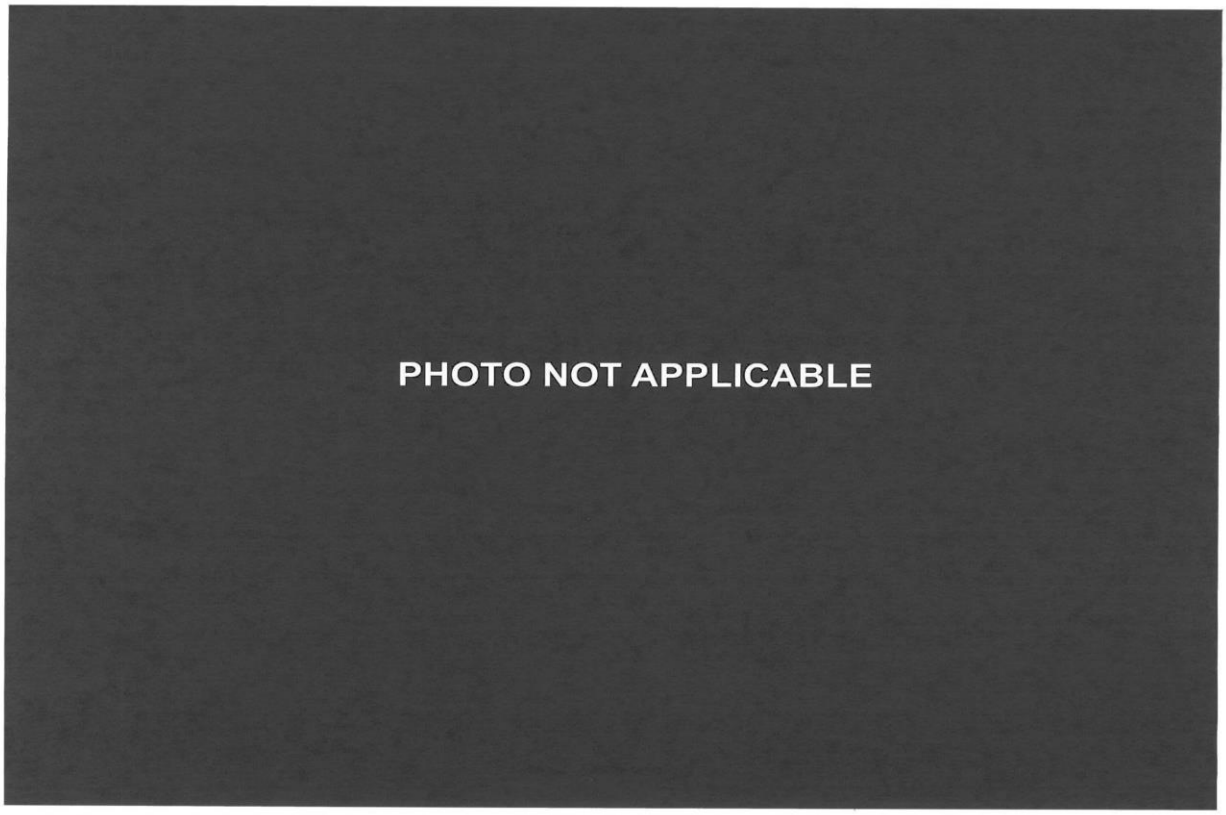
070 Post-Test Passenger Dummy and Door Clearance View

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

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

073 Pre-Test Passenger Inner Door Panel View

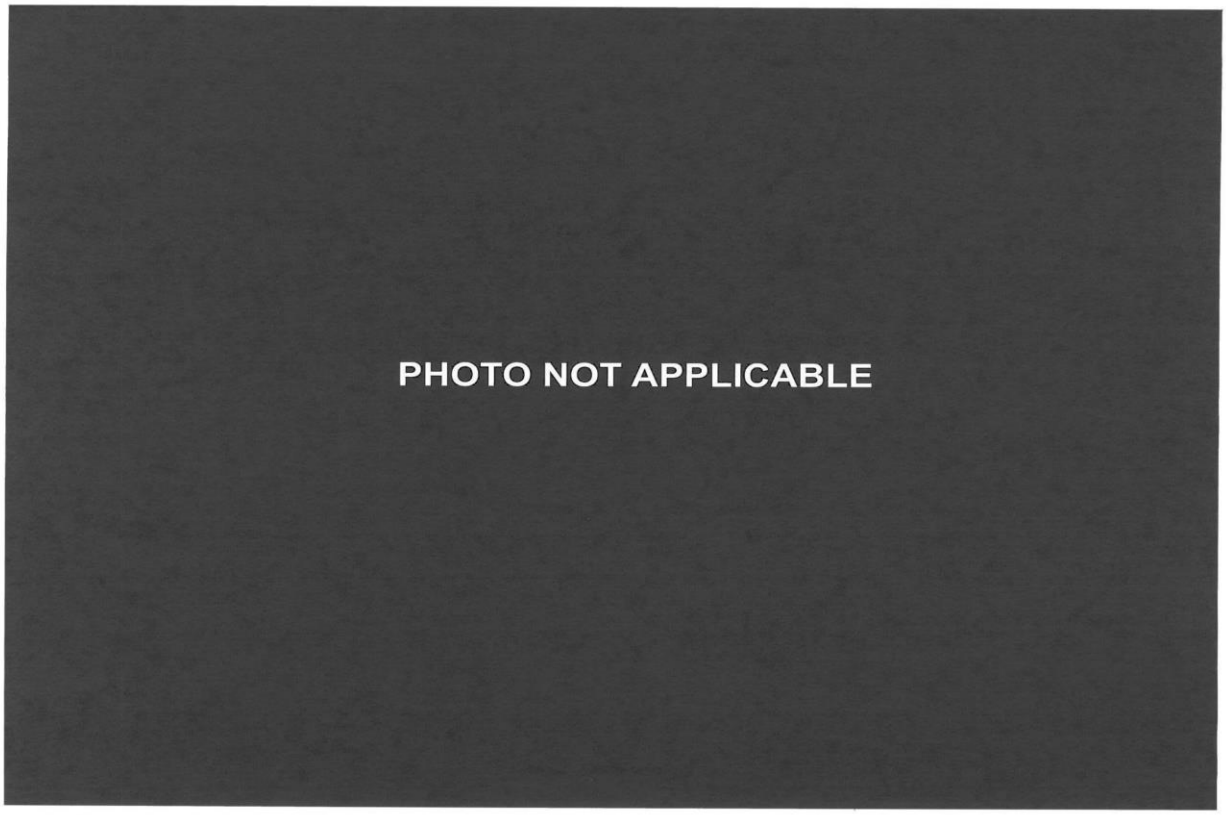
074 Post-Test Passenger Inner Door Panel View



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

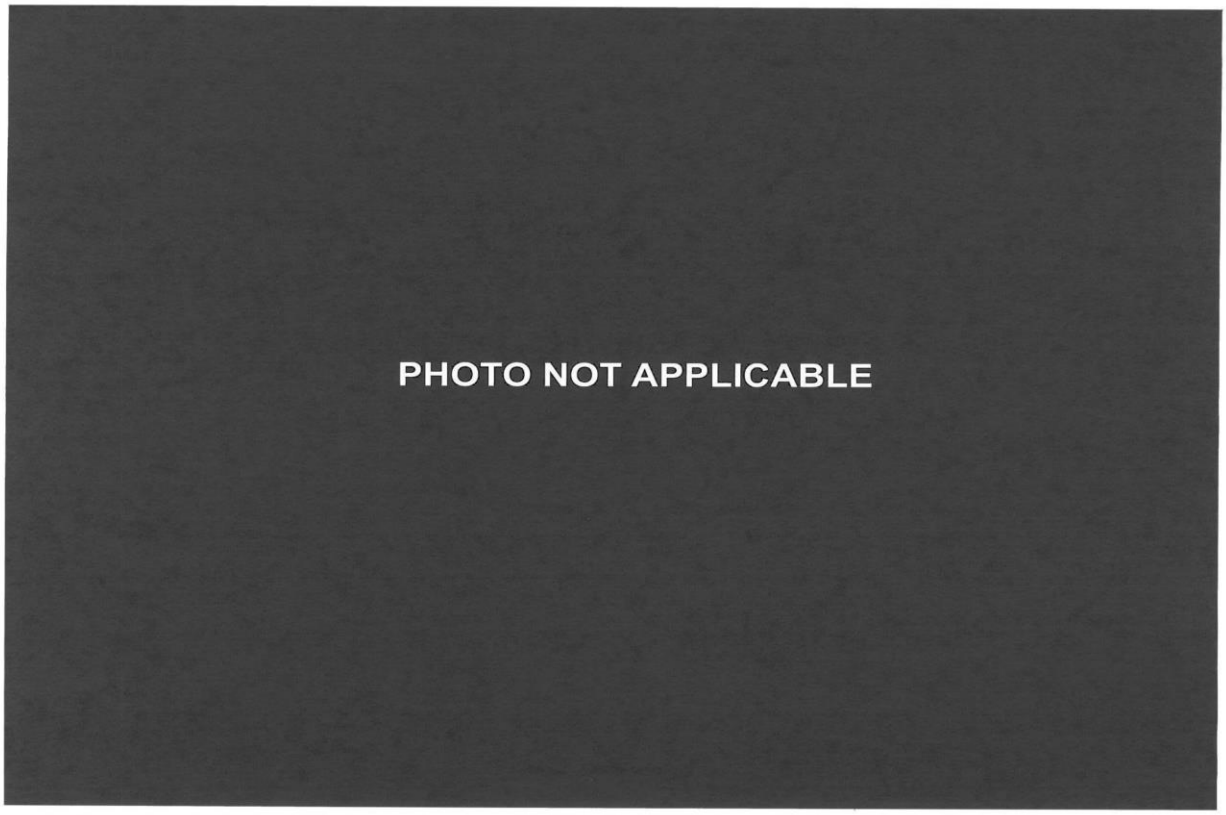
076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

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



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

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



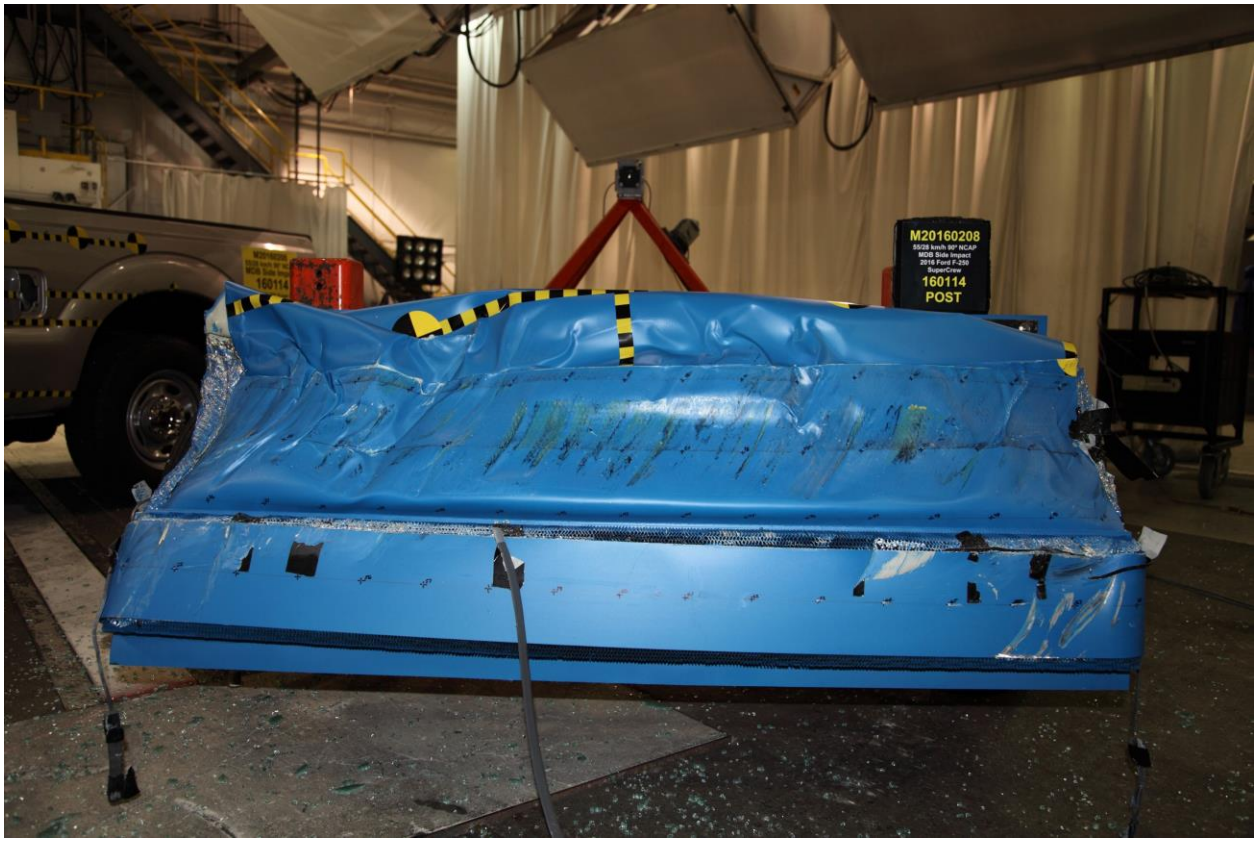
080 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View

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

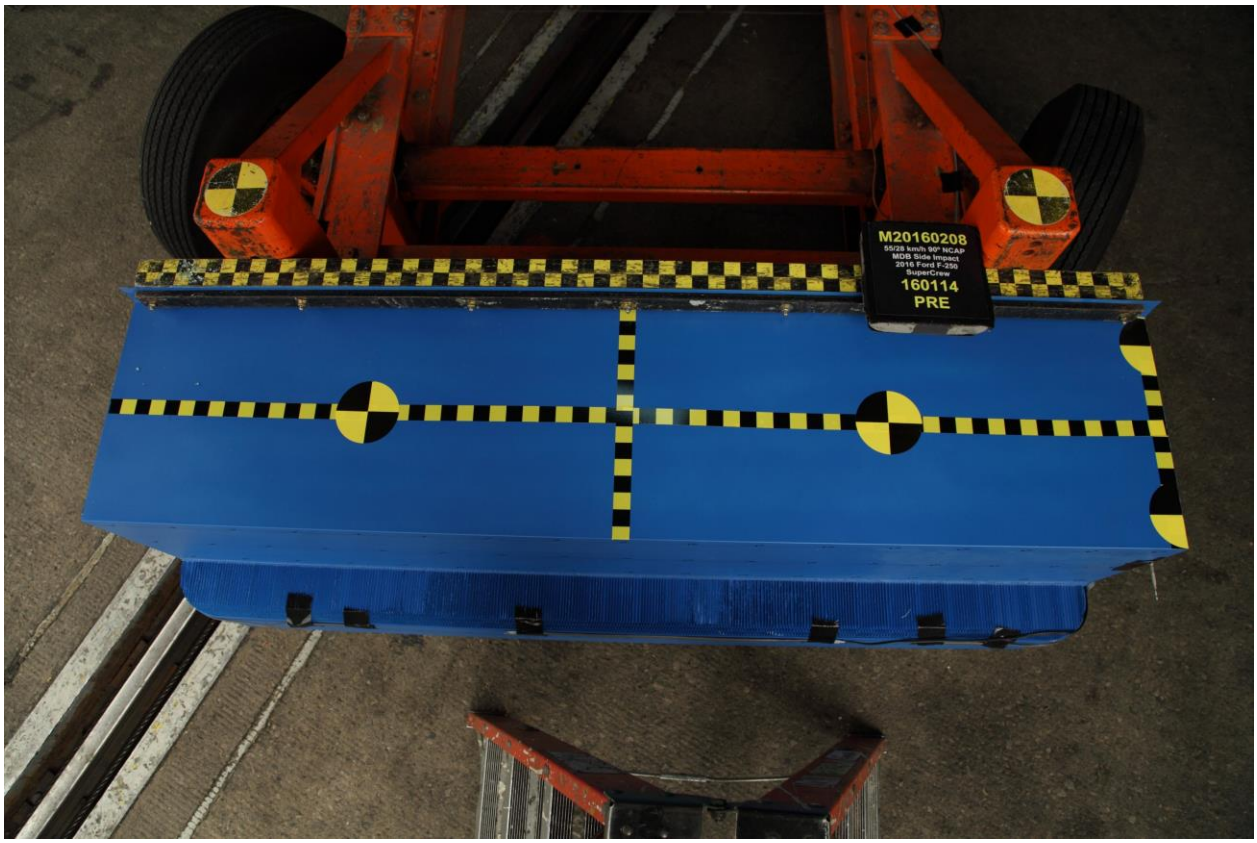
082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

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

084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face

087 Post-Test Top View of MDB Impactor Face

088 Pre-Test Left Side View of MDB Impactor Face

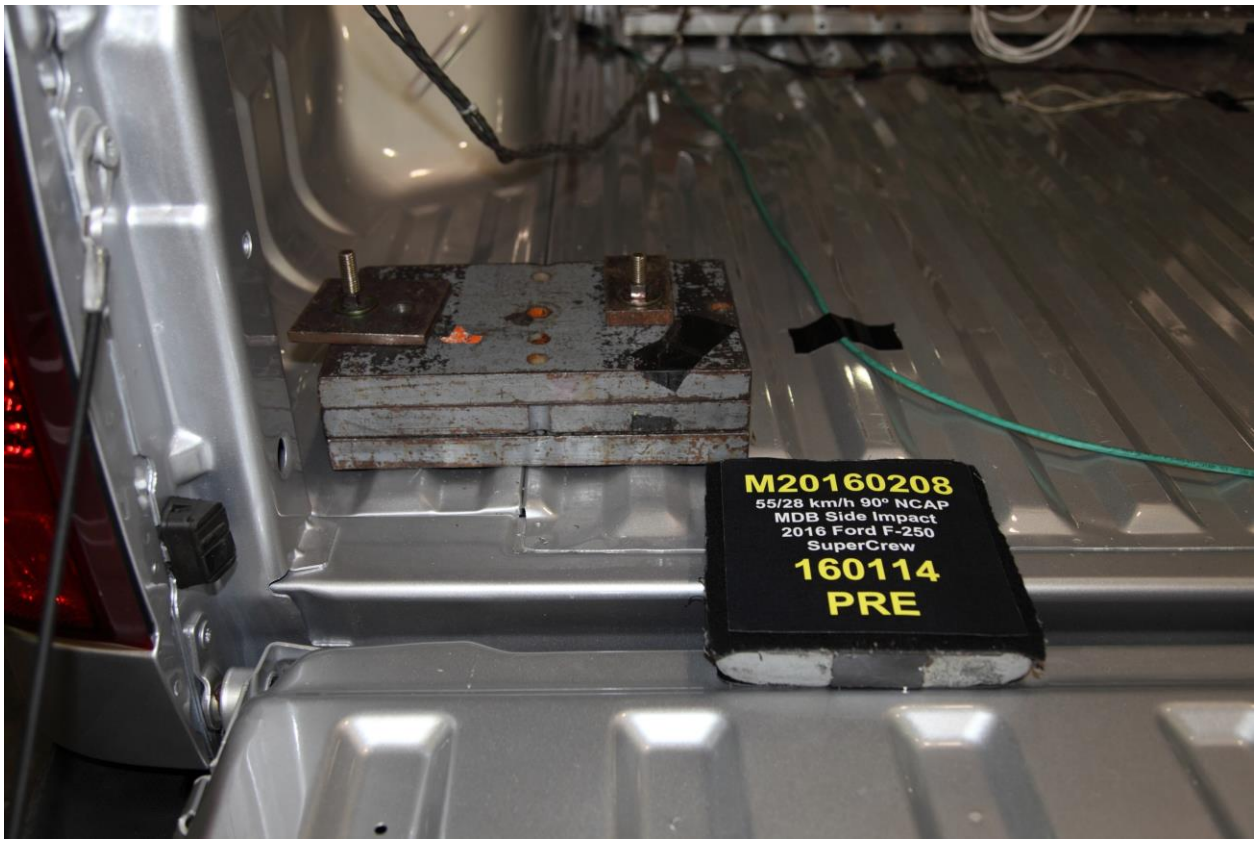
089 Post-Test Left Side View of MDB Impactor Face

090 Pre-Test Right Side View of MDB Impactor Face

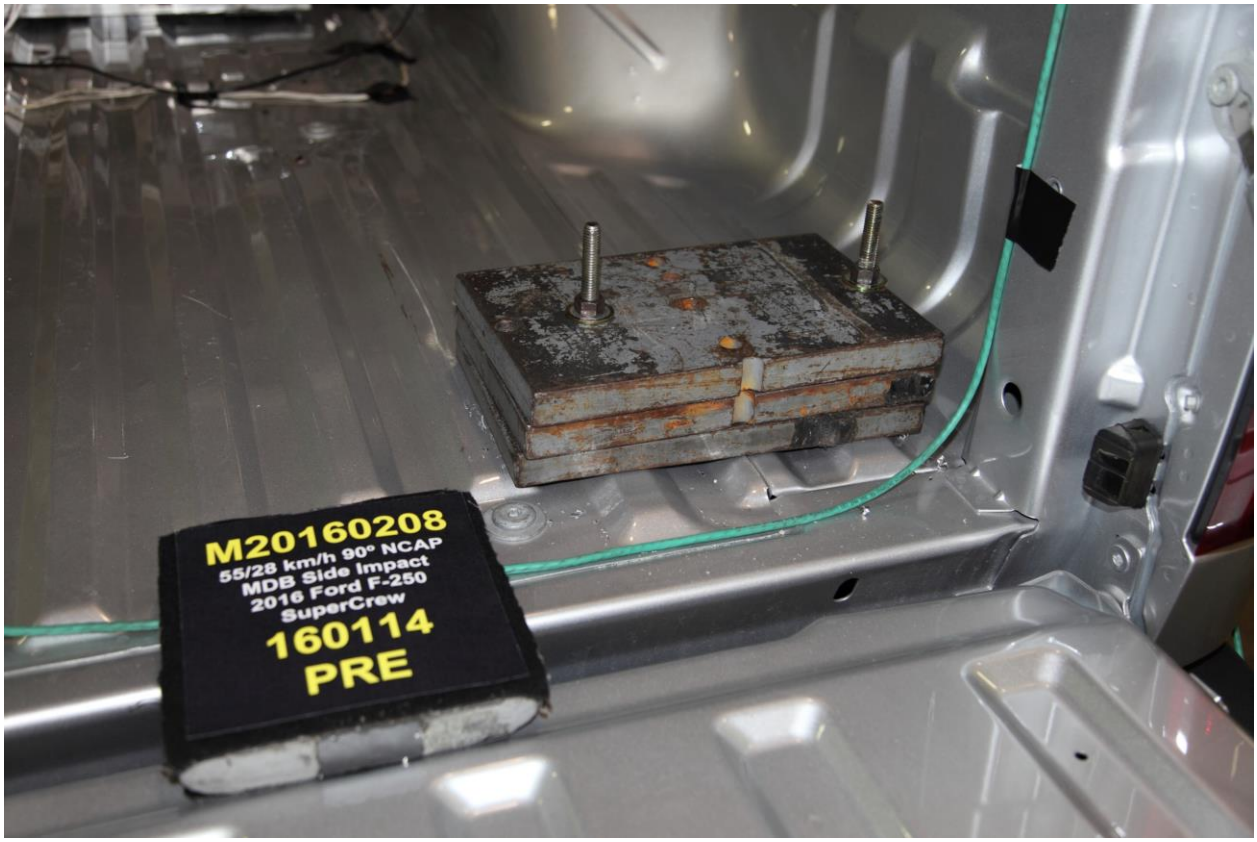
091 Post-Test Right Side View of MDB Impactor Face

092 Close-Up View of Vehicle Certification Label

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

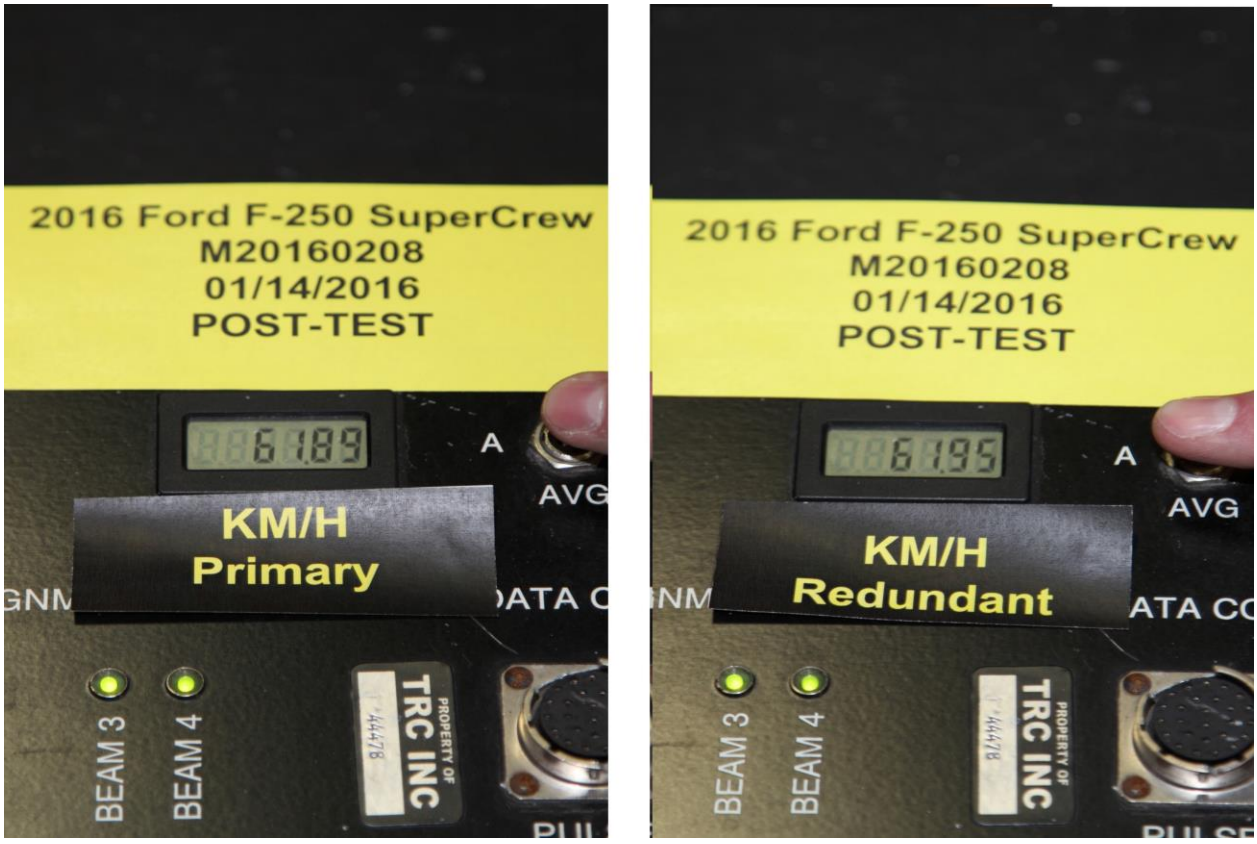


094 Pre-Test Ballast View

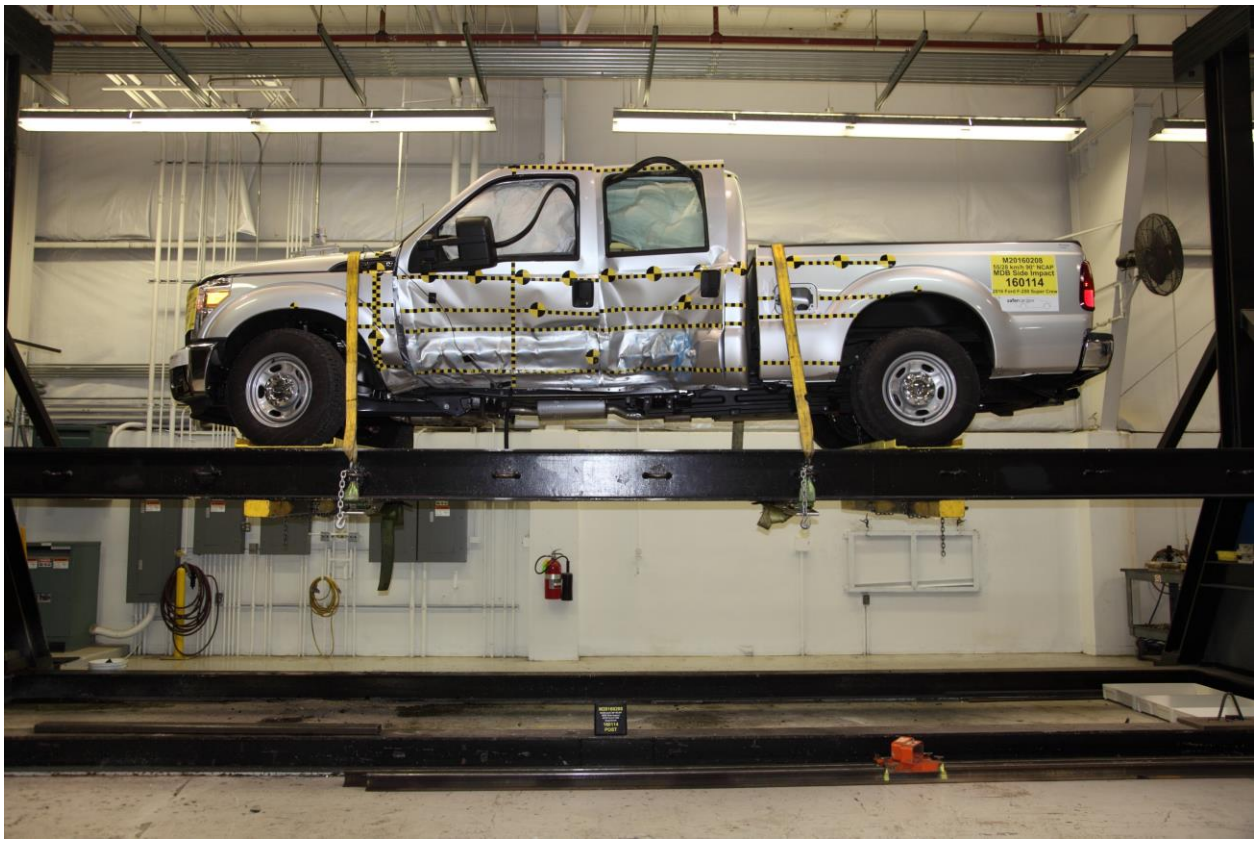


094a Pre-Test Ballast View

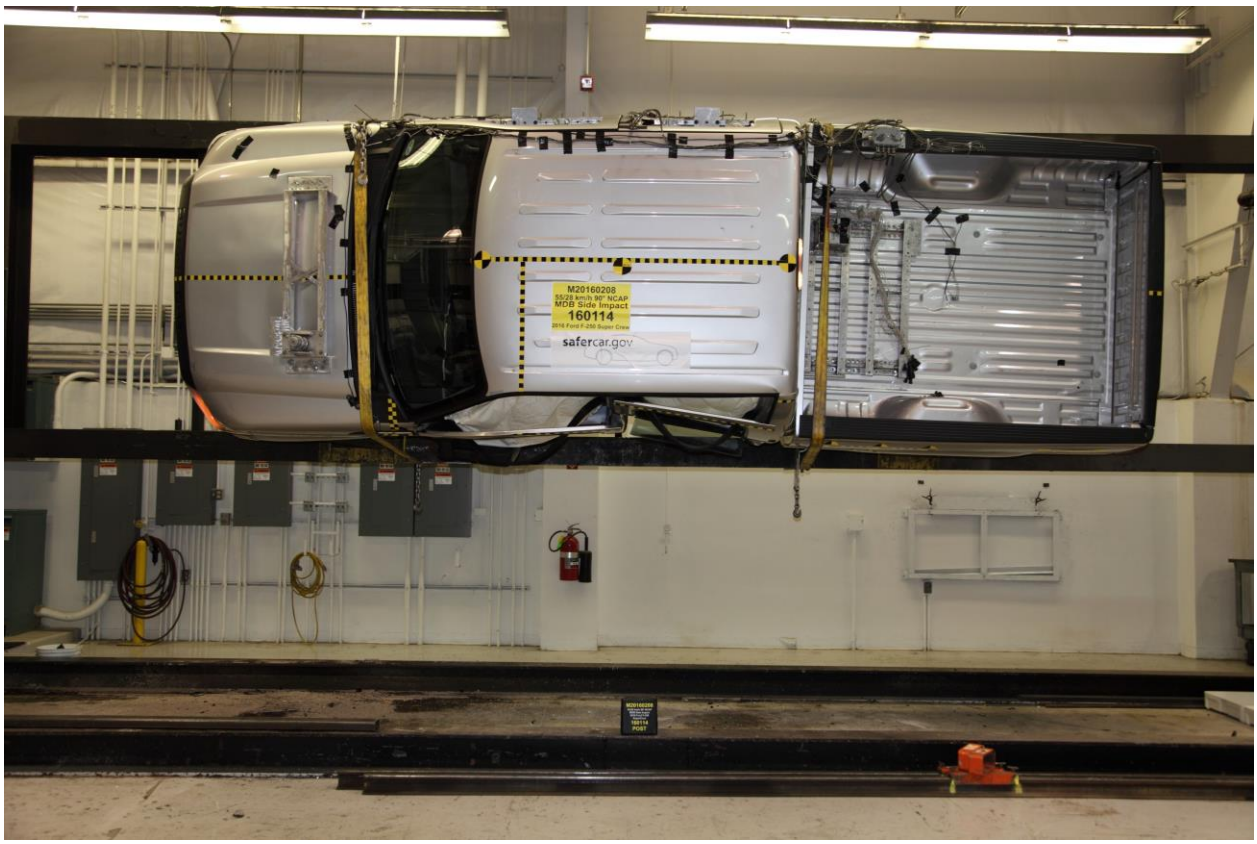
094b Pre-Test Ballast View



095 Post-Test Primary Speed Trap Read-Out

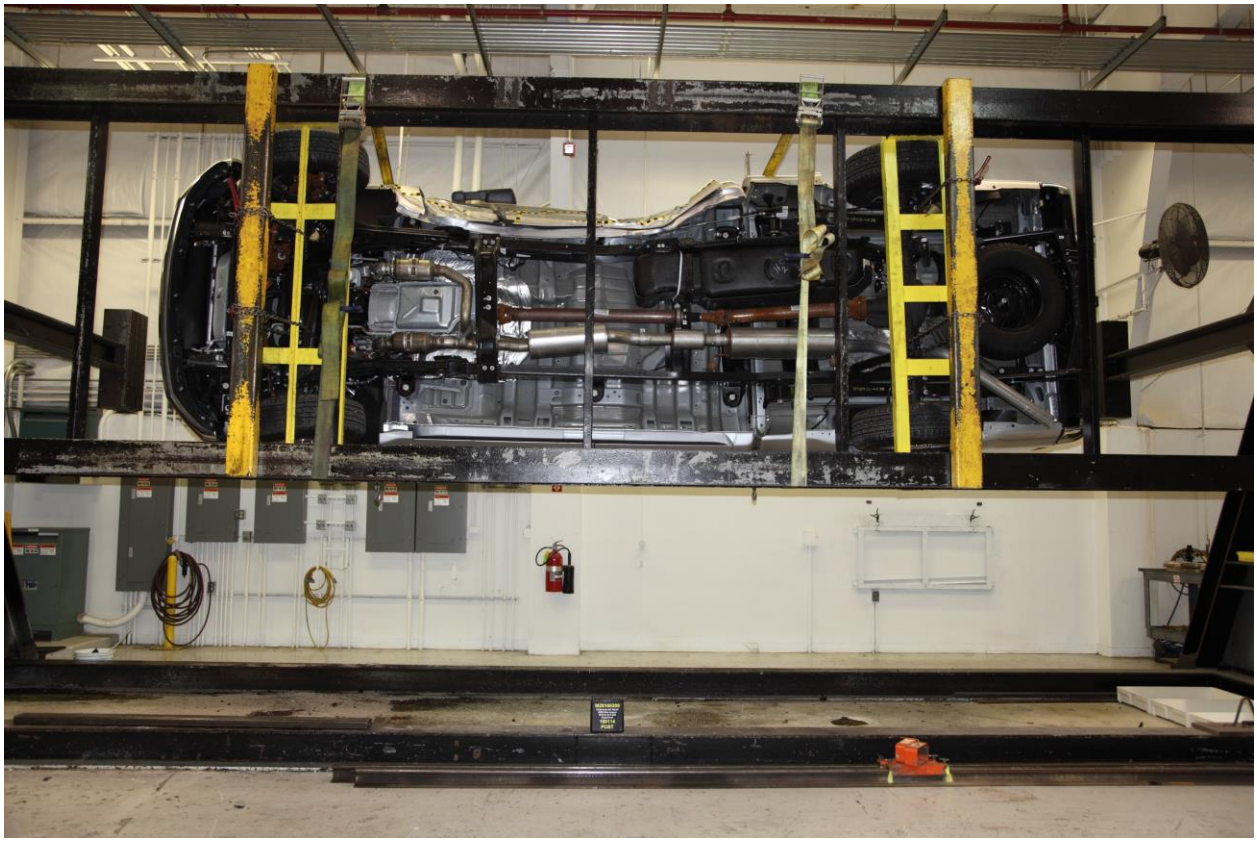


096 FMVSS No. 301 Static Rollover 0 Degrees

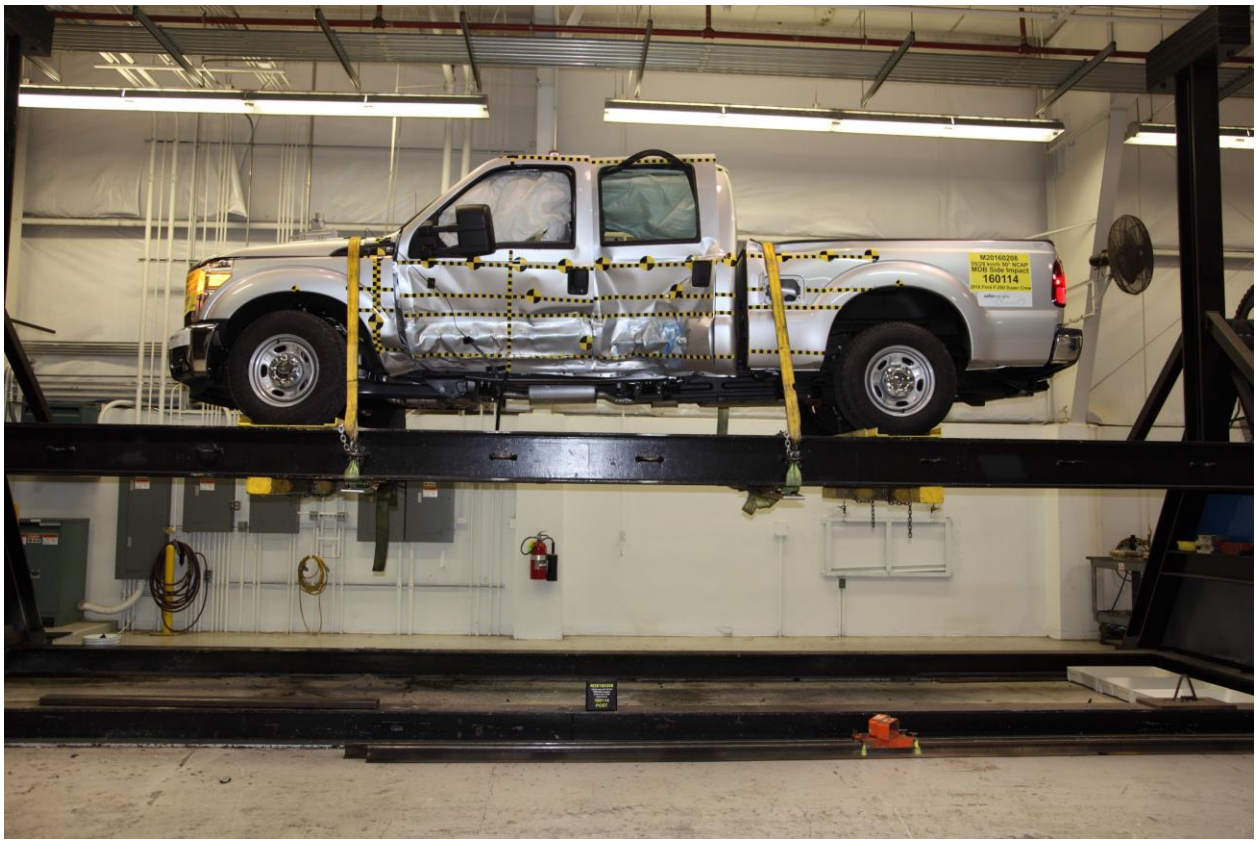


097 FMVSS No. 301 Static Rollover 90 Degrees

098 FMVSS No. 301 Static Rollover 180 Degrees

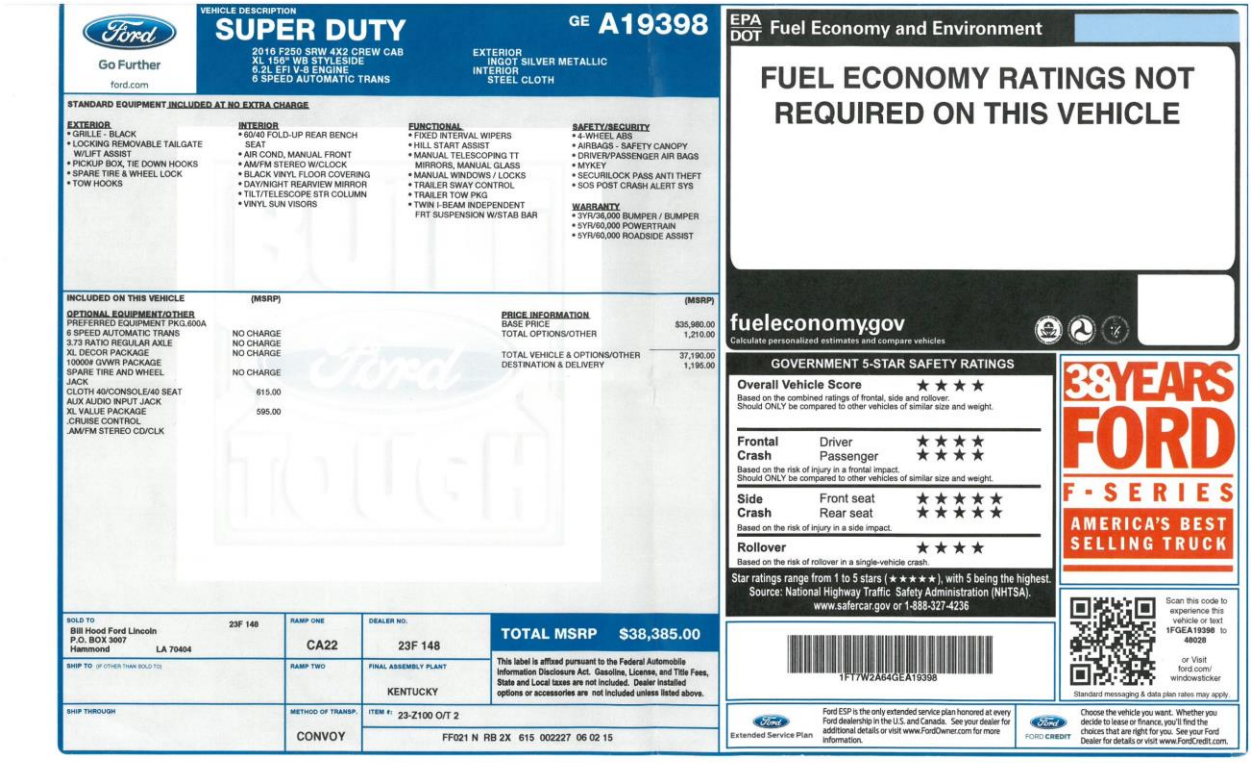


099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event



102 Monroney Label

Seats

WARNINGS

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

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

The head restraints consist of:

A An energy absorbing head restraint.
B Two steel stems.
C Guide sleeve adjust and release button.
D Guide sleeve unlock and remove 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. Press and hold buttons C and D.
2. Pull the head restraint up.

Installing the Head Restraint

Align the steel stems into the guide sleeves and push the head restraint down until it locks.

Front Row Center, Outboard (Crew Cab), and Rear Seat Center (Crew Cab) Head Restraints

Note: *The SuperCab has rear outboard head restraints that are not removable and are bolted to the back wall.*

Your vehicle may be equipped with head restraints that are non-adjustable. The non-adjustable head restraints consist of:

E162872

A An energy absorbing head restraint.
B Two steel stems.
C Guide sleeve unlock and remove button.

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

Seats

MANUAL SEATS

WARNING

Do not adjust the driver's seat or seat back when your vehicle is moving.

Moving the Seat Backward and Forward

E162727

Recline Adjustment

E162728

Removing the Head Restraint

1. Press and hold buttons C.
2. Pull up the head restraint.

Installing the Head Restraint

Align the steel stems into the guide sleeves and push the head restraint down until it locks.

Tilting Head Restraints (If Equipped)

The front head restraints tilt for extra comfort. To tilt the head restraint, do the following:

E144727

1. Adjust the seat back to an upright driving or riding position.
2. Pivot the head restraint forward toward your head to the desired position.

After the head restraint reaches the forward-most tilt position, pivot it forward again to release it to the rearward, un-tilted position.

Note: *Do not attempt to force the head restraint backward after it is tilted. Instead, continue tilting it forward until the head restraint releases to the upright position.*

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

NHTSA

Test Date: 01/14/2016

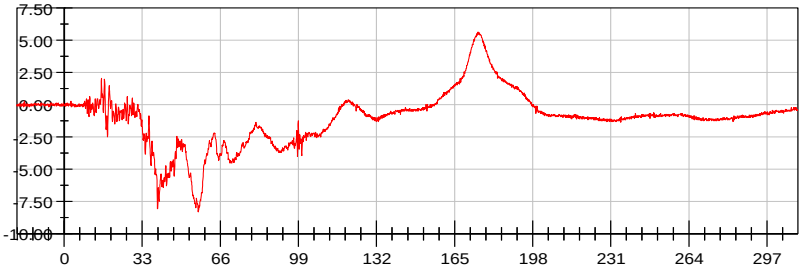
Test Lab: CTF

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

Test Number: 160114 (M20160208)

Position #4 SID IIs Dummy (305)

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



<Max>

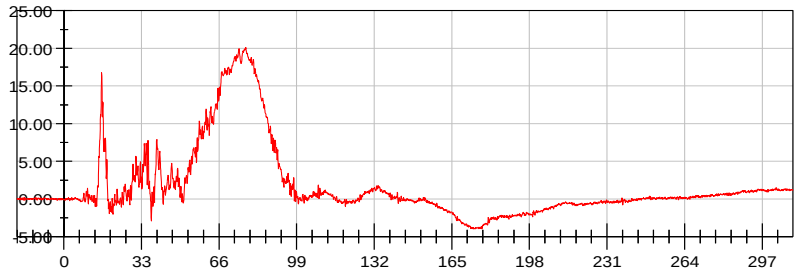
5.65 g at 174.88 ms

<Min>

-8.31 g at 56.64 ms

CFC_1000

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



<Max>

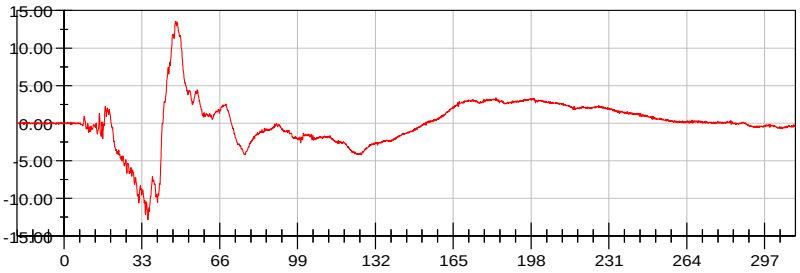
20.07 g at 77.28 ms

<Min>

-4.01 g at 174.16 ms

CFC_1000

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



<Max>

13.52 g at 47.20 ms

<Min>

-12.85 g at 35.60 ms

CFC_1000

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

<Max>

20.63 g at 77.28 ms

<Min>

0.03 g at -19.84 ms

CFC_1000

NHTSA

Test Date: 01/14/2016

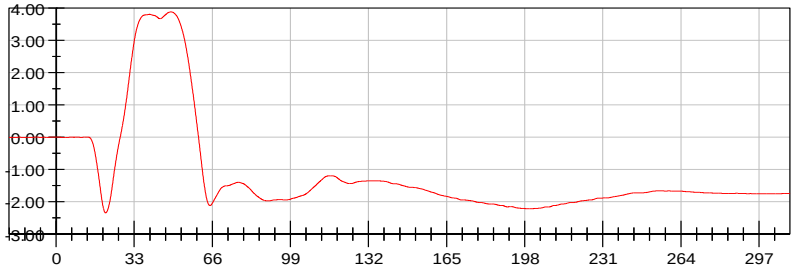
Test Lab: CTF

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

Test Number: 160114 (M20160208)

Position #4 SID IIs Dummy (305)

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



<Max>

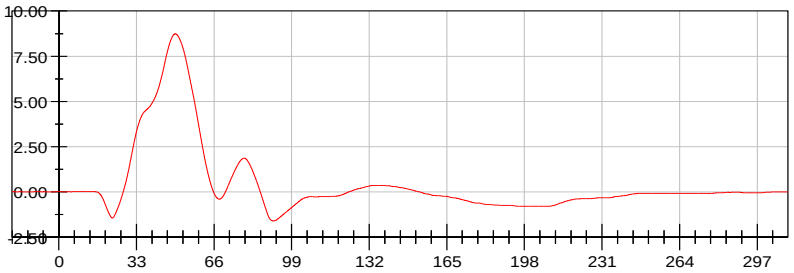
3.88 mm at 48.48 ms

<Min>

-2.34 mm at 20.88 ms

CFC_180

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



<Max>

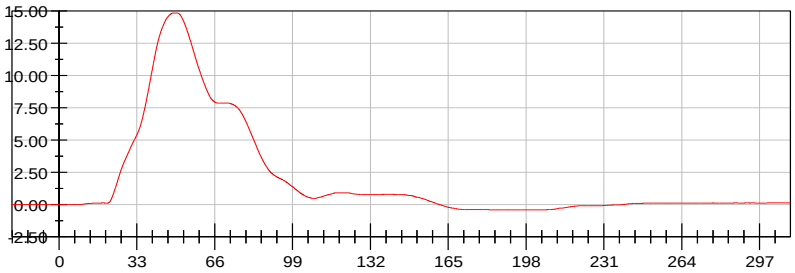
8.74 mm at 49.52 ms

<Min>

-1.61 mm at 91.20 ms

CFC_180

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



<Max>

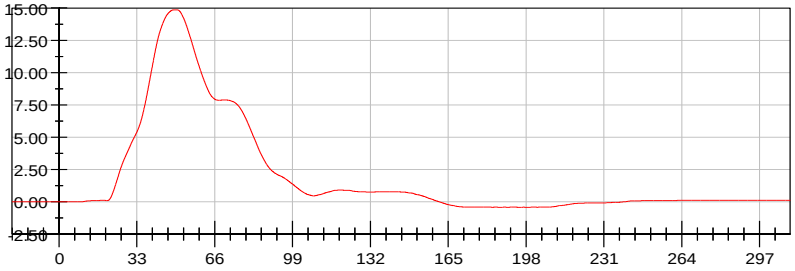
14.86 mm at 49.76 ms

<Min>

-0.41 mm at 187.04 ms

CFC_180

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



<Max>

14.86 mm at 49.76 ms

<Min>

-0.41 mm at 187.04 ms

CFC_180

NHTSA

Test Date: 01/14/2016

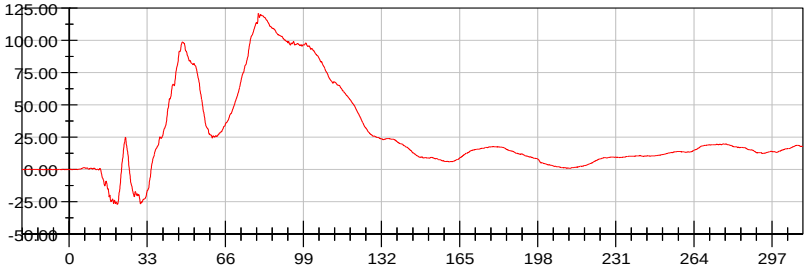
Test Lab: CTF

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

Test Number: 160114 (M20160208)

Position #4 SID IIs Dummy (305)

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



<Max>

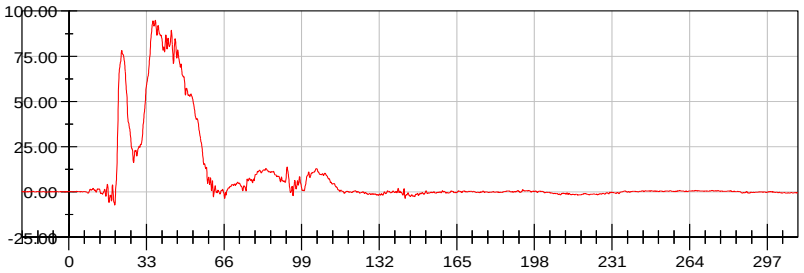
120.96 N at 80.00 ms

<Min>

-26.94 N at 20.32 ms

CFC_600

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



<Max>

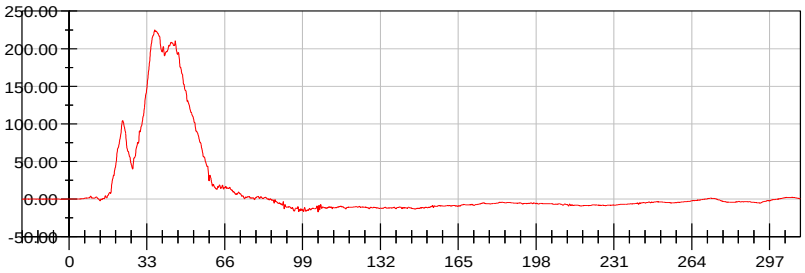
94.85 N at 36.80 ms

<Min>

-7.37 N at 19.52 ms

CFC_600

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



<Max>

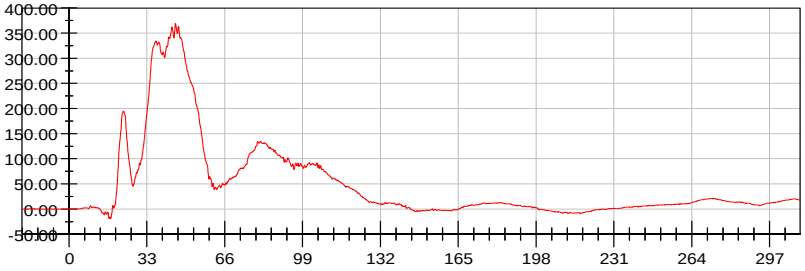
224.76 N at 36.40 ms

<Min>

-16.90 N at 105.60 ms

CFC_600

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



<Max>

369.44 N at 45.12 ms

<Min>

-19.05 N at 17.68 ms

CFC_600

NHTSA

Test Date: 01/14/2016

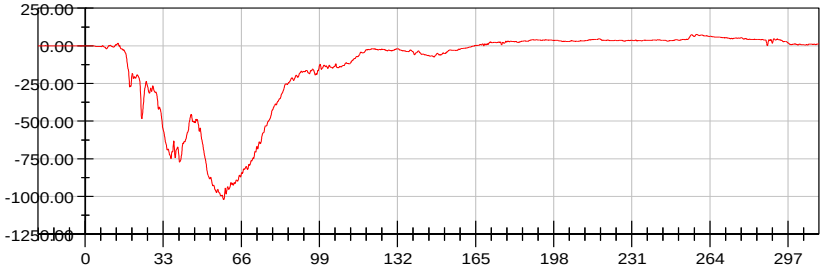
Test Lab: CTF

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

Test Number: 160114 (M20160208)

Position #4 SID IIs Dummy (305)

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



<Max>

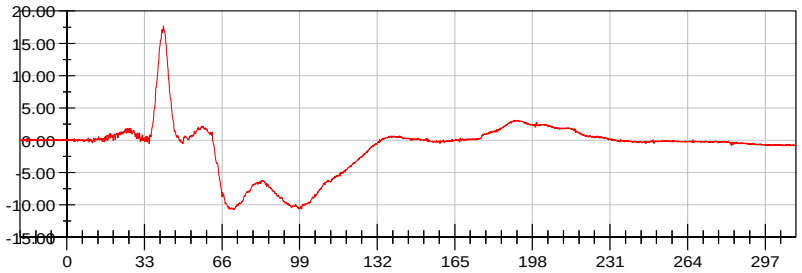
75.96 N at 258.32 ms

<Min>

-1,021.52 N at 58.48 ms

CFC_600

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



<Max>

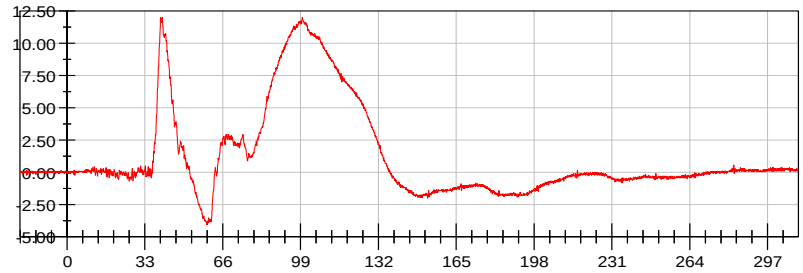
17.72 g at 41.04 ms

<Min>

-10.79 g at 70.96 ms

CFC_1000

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



<Max>

12.01 g at 39.68 ms

<Min>

-4.05 g at 59.28 ms

CFC_1000

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

<Max>

5.04 g at 99.76 ms

<Min>

-8.63 g at 54.08 ms

CFC_1000

NHTSA

Test Date: 01/14/2016

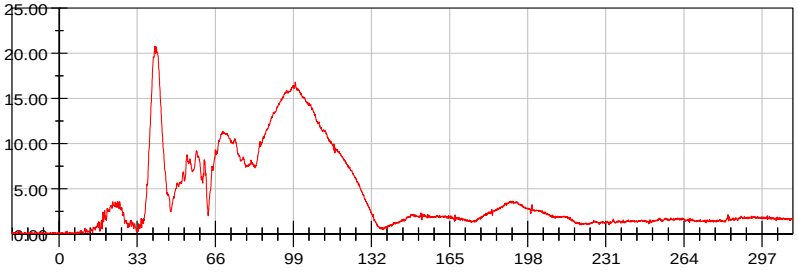
Test Lab: CTF

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

Test Number: 160114 (M20160208)

Position #4 SID IIs Dummy (305)

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



<Max>

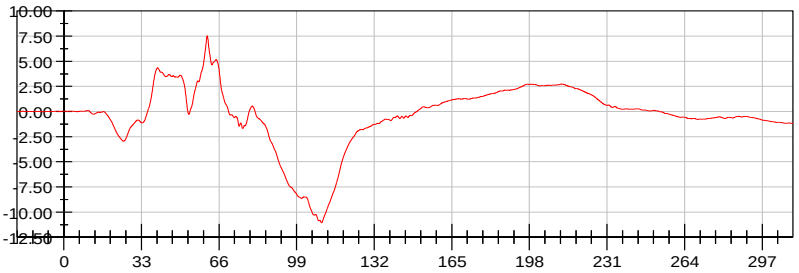
20.79 g at 40.48 ms

<Min>

0.04 g at -19.84 ms

CFC_1000

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



<Max>

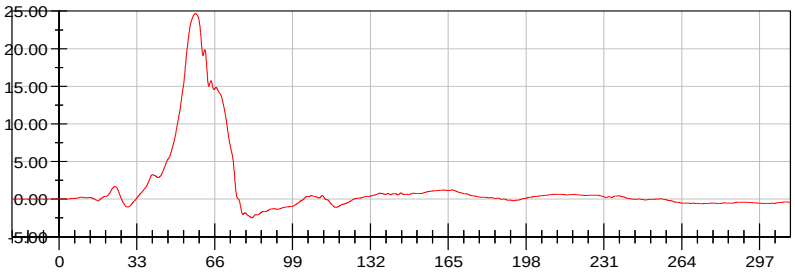
7.54 g at 60.96 ms

<Min>

-11.09 g at 109.60 ms

CFC_180

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



<Max>

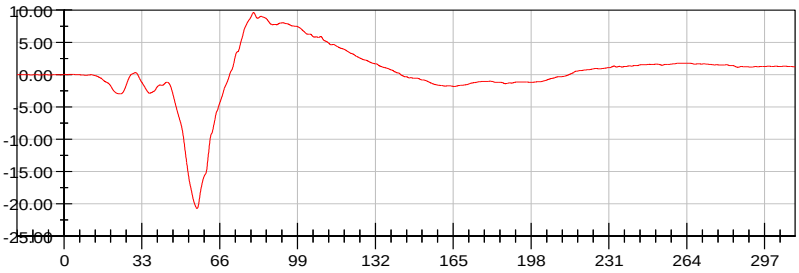
24.65 g at 57.76 ms

<Min>

-2.48 g at 81.84 ms

CFC_180

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



<Max>

9.61 g at 80.32 ms

<Min>

-20.70 g at 56.40 ms

CFC_180

NHTSA

Test Date: 01/14/2016

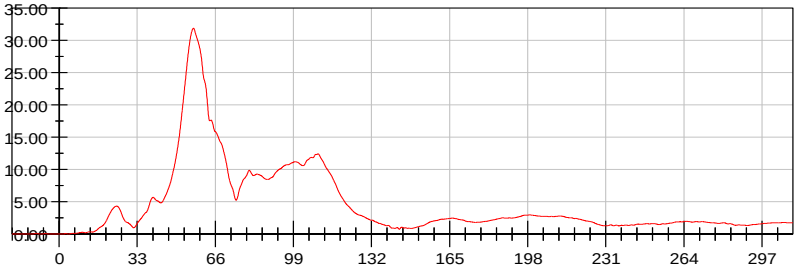
Test Lab: CTF

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

Test Number: 160114 (M20160208)

Position #4 SID IIs Dummy (305)

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



<Max>

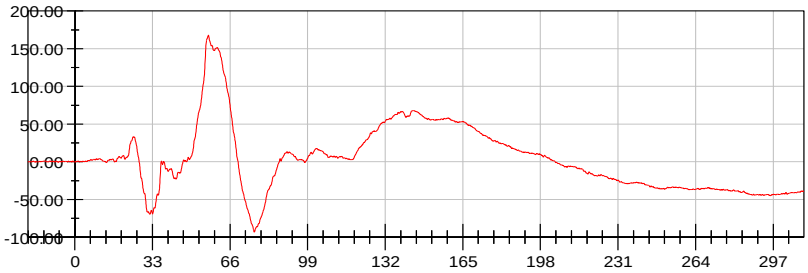
31.90 g at 56.80 ms

<Min>

0.00 g at -16.88 ms

CFC_180

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



<Max>

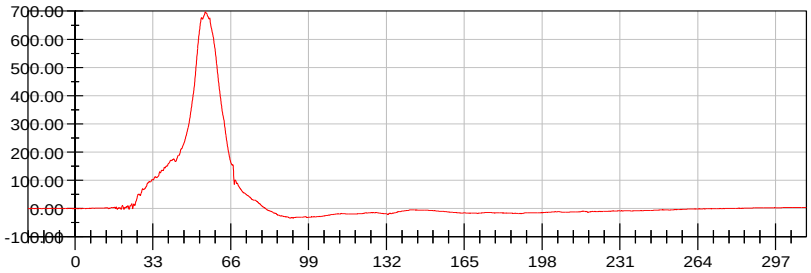
167.95 N at 56.80 ms

<Min>

-93.60 N at 76.32 ms

CFC_600

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



<Max>

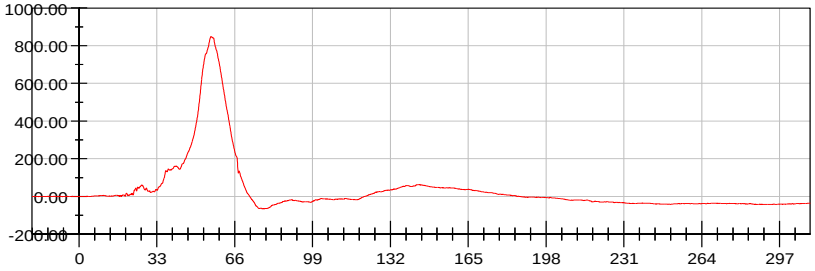
697.28 N at 55.28 ms

<Min>

-33.90 N at 91.36 ms

CFC_600

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



<Max>

848.82 N at 55.92 ms

<Min>

-66.10 N at 77.76 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Table 1. External Measurements
Table 2. Head Drop Test
- Head (X) Acceleration (G's) vs. Time (ms)
- Head (Y) Acceleration (G's) vs. Time (ms)
- Head (Z) Acceleration (G's) vs. Time (ms)
- Resultant Head 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. 30
12/03/15

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	443	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	474	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	279	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	205	Yes
12	Thorax Depth	262.0 - 272.0	262	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	158	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	606	Yes

Technician

Melissa Schinker

Approved

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Resultant Acceleration	125 - 155 g	129.0 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

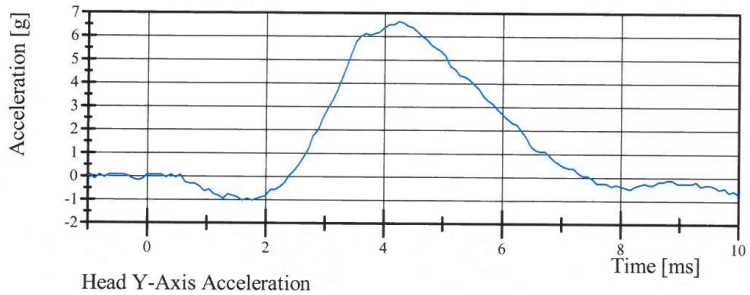
Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 10:33:42 355

Transportation Research Center Inc.

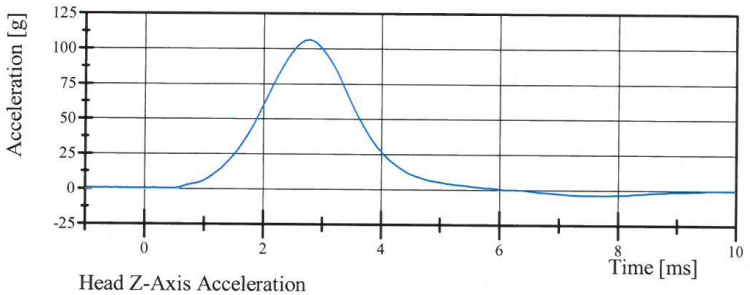
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Head X-Axis Acceleration



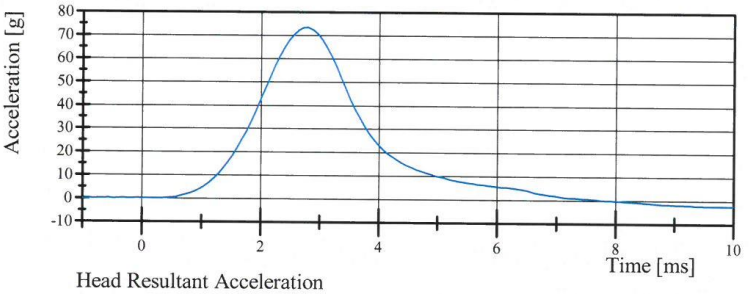
Filter Class: CFC_1000
Max: 6.6 g at 4.2 ms
Min: -1.0 g at 1.6 ms

Head Y-Axis Acceleration



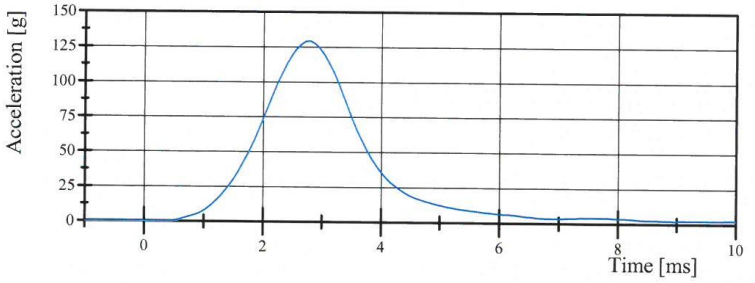
Filter Class: CFC_1000
Max: 106.2 g at 2.8 ms
Min: -4.0 g at 7.6 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 73.2 g at 2.8 ms
Min: -2.3 g at 9.8 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 129.0 g at 2.8 ms
Min: 0.1 g at -0.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 10:33:49 355

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	41 %	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	-53.4 deg	Yes
Time of Peak	54 - 66 ms	57.3 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	66.7 ms	Yes

Test meets specifications.

Comments:

Technician Melissa Schinker

Approved

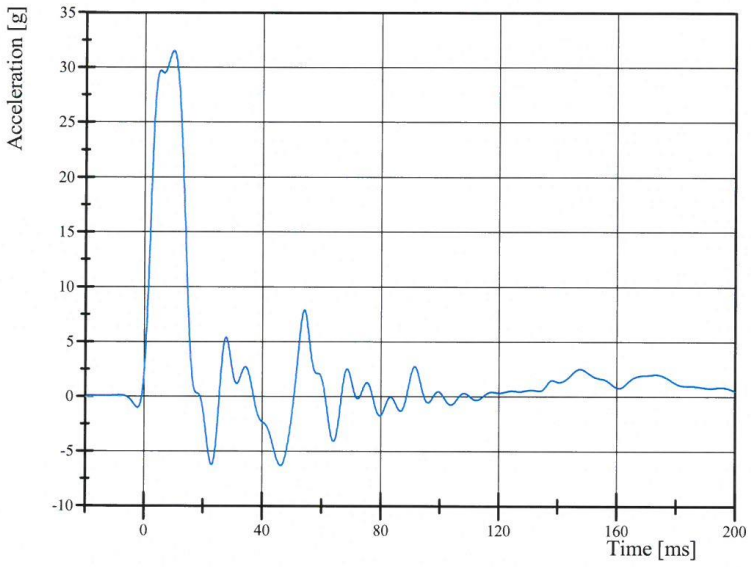
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 08:38:31 1312

Transportation Research Center Inc.

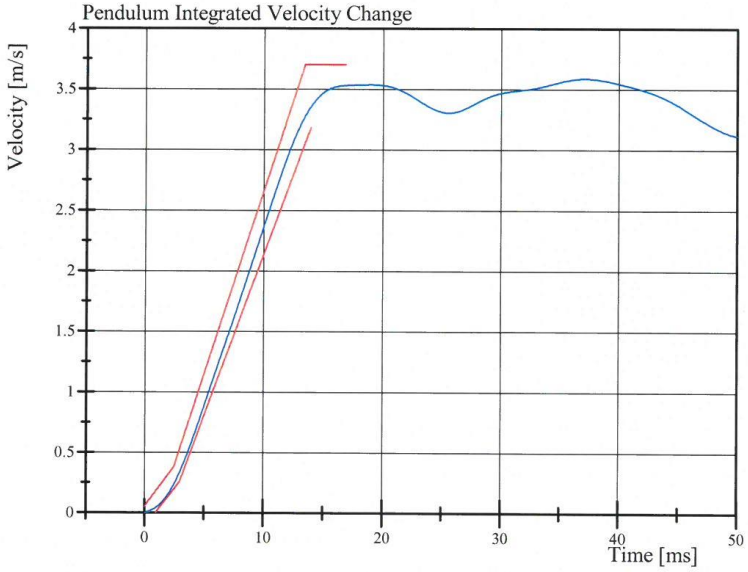
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 12/1/2015

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.5 g at 9.8 ms
Min: -6.3 g at 46.3 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 37.1 ms
Min: 0.0 m/s at 0.0 ms

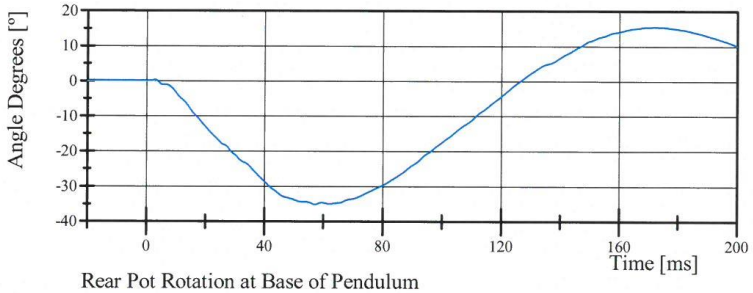
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 08:38:39 1312

Transportation Research Center Inc.

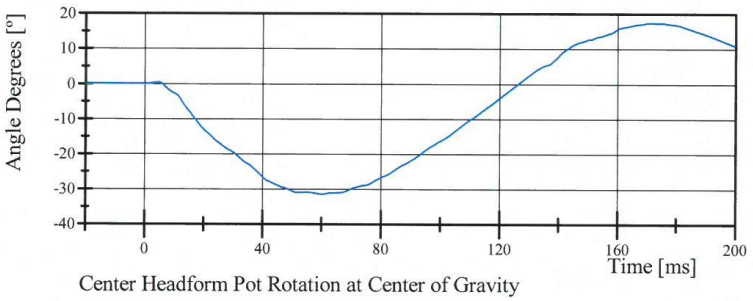
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 12/1/2015

Forward Pot Rotation at Base of Pendulum



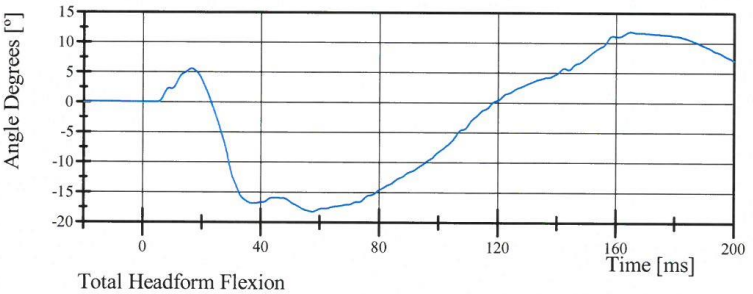
Filter Class: CFC_180
Max: 15.4 ° at 171.9 ms
Min: -35.2 ° at 57.1 ms

Rear Pot Rotation at Base of Pendulum



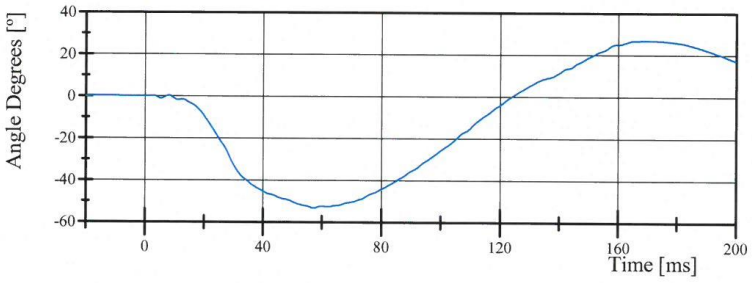
Filter Class: CFC_180
Max: 17.5 ° at 171.2 ms
Min: -31.6 ° at 60.1 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.9 ° at 165.0 ms
Min: -18.2 ° at 57.5 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 27.0 ° at 169.2 ms
Min: -53.4 ° at 57.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 08:38:40 1312

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.93 g	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinkel

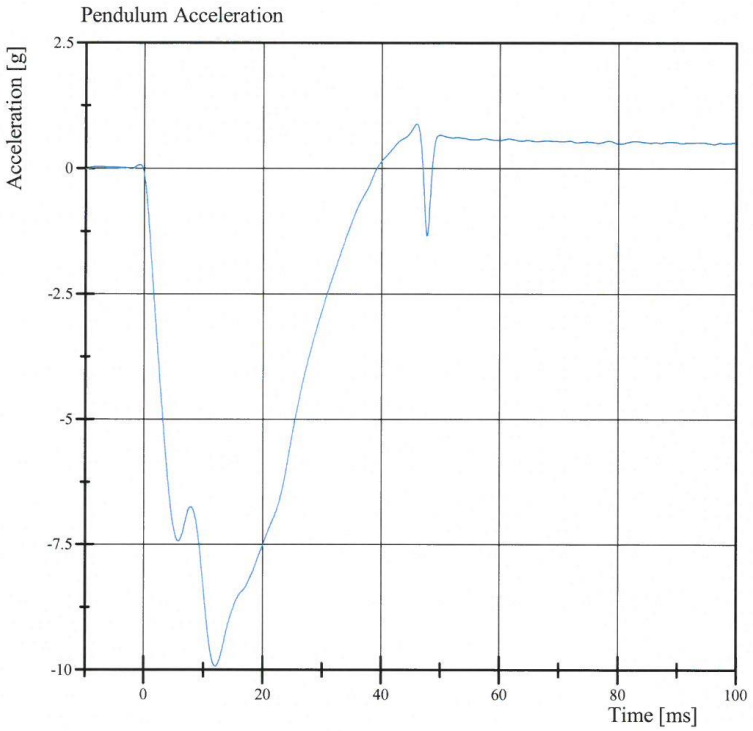
Approved

Specification Source: NHTSA final rule 8/15/2008

12.01.2015 13:12:21 552

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 12/1/2015



Filter Class: CFC_180
Max: 0.9 g at 46.0 ms
Min: -9.9 g at 12.1 ms

Specification Source: NHTSA final rule 8/15/2008

12.01.2015 13:12:28 552

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

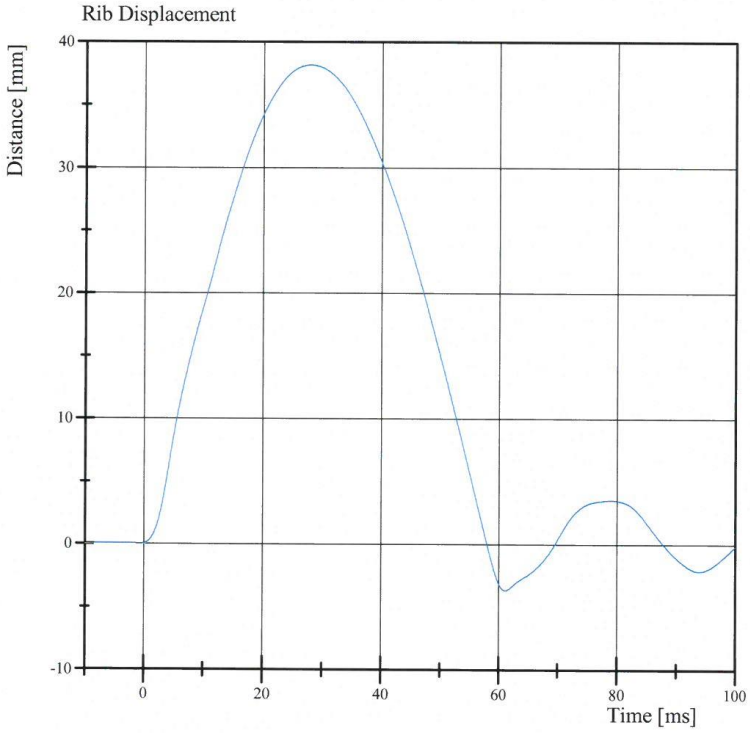
Approved

Specification Source: NHTSA Final Rule 8/15/2008

12.02.2015 15:09:35 946

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015



Filter Class: CFC_180
Max: 38.1 mm at 27.9 ms
Min: -3.7 mm at 61.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.02.2015 15:09:48 946

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	39 %	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

Melissa Schenker

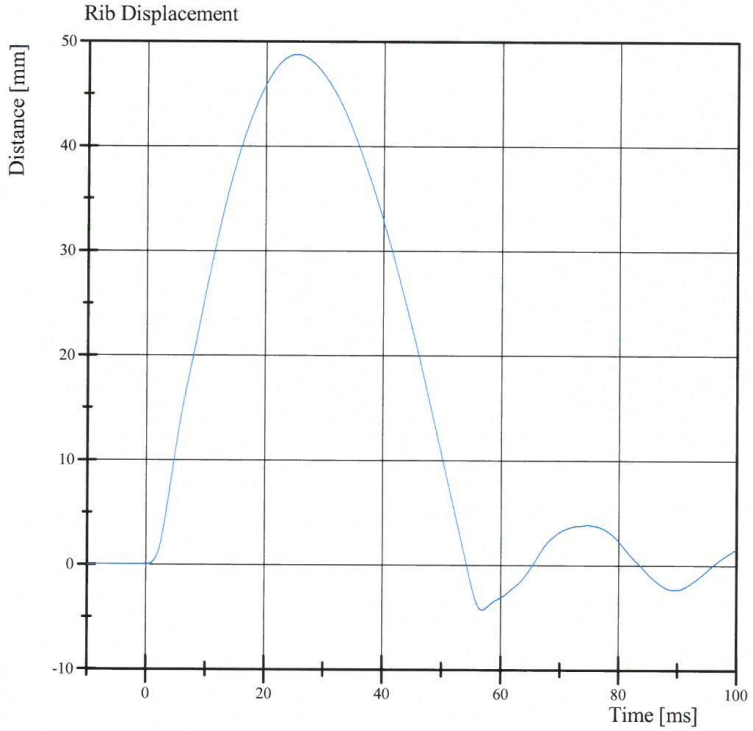
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 10:41:53 742

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015



Filter Class: CFC_180
Max: 48.7 mm at 25.3 ms
Min: -4.3 mm at 56.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 10:42:00 742

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.6 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

Melissa Schenk

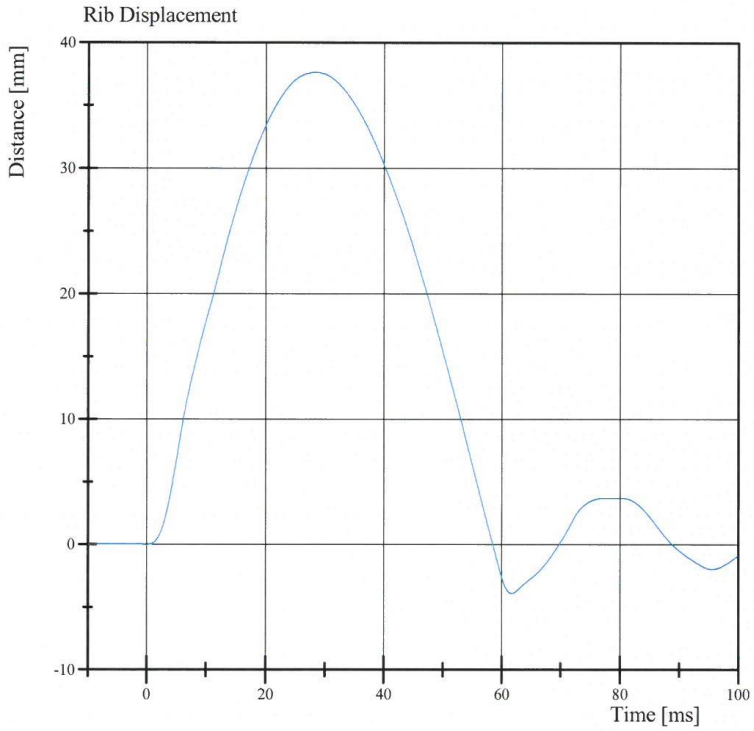
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:26:02 929

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015



Filter Class: CFC_180
Max: 37.6 mm at 28.3 ms
Min: -3.9 mm at 61.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:26:12 929

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician Melissa Schinker

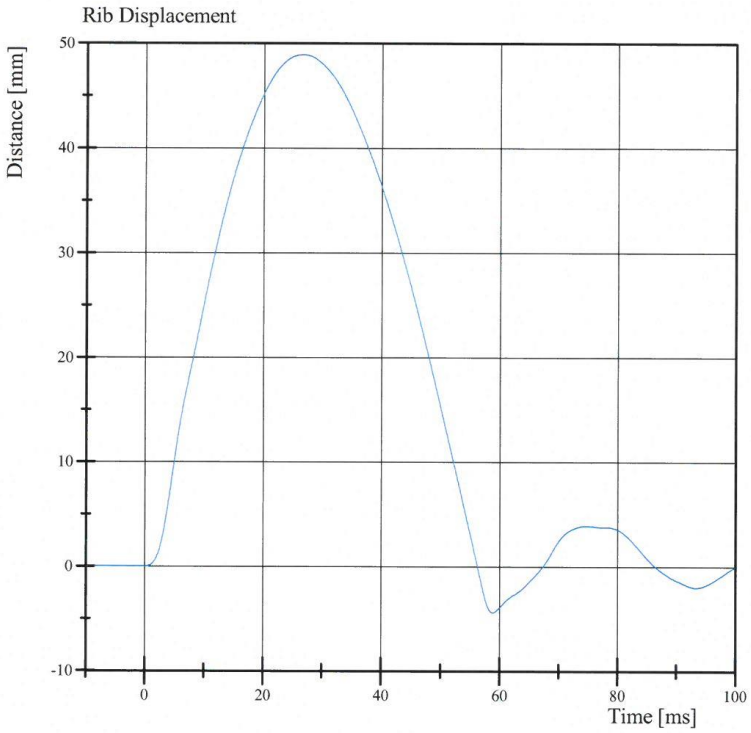
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:11:21 740

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015



Filter Class: CFC_180
Max: 48.9 mm at 26.6 ms
Min: -4.4 mm at 58.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:11:30 740

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	40 %	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 Melissa Schinker

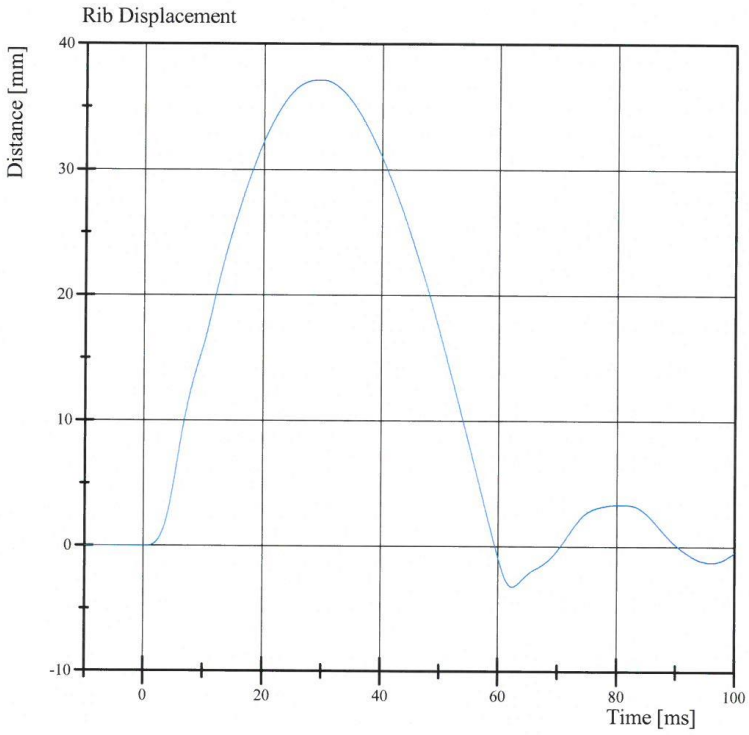
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:37:25 925

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015



Filter Class: CFC_180
Max: 37.1 mm at 29.6 ms
Min: -3.2 mm at 62.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:37:37 925

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

Melissa Schinker

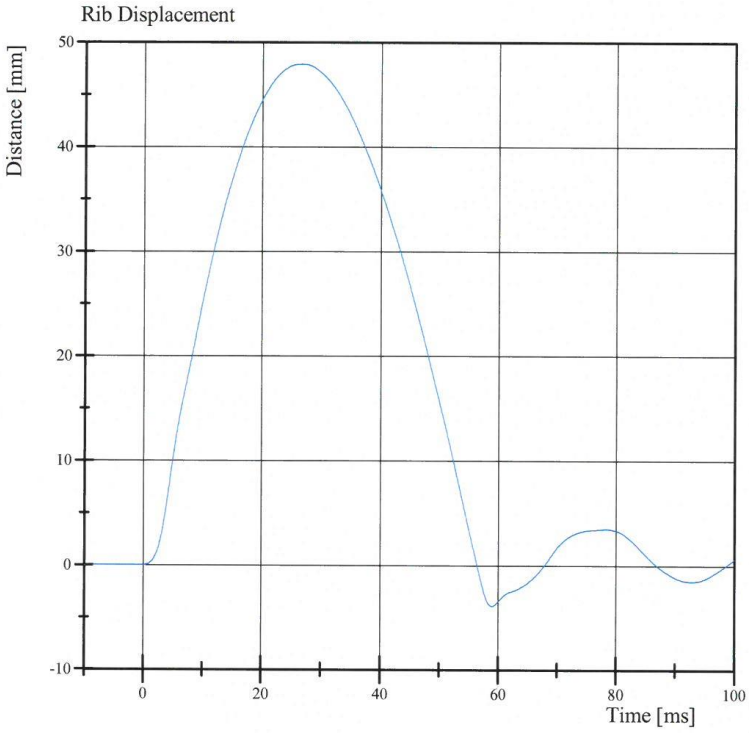
Approved

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:29:06 744

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 11/30/2015



Filter Class: CFC_180
Max: 47.9 mm at 26.7 ms
Min: -3.9 mm at 59.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

11.30.2015 11:29:16 744

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 30-2
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.580 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-6,051.9 N	Yes
Upper Rib Displacement	34 - 41 mm	38.3 mm	Yes
Center Rib Displacement	37 - 45 mm	41.3 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.9 mm	Yes

Test meets specifications.

Comments:

Technician

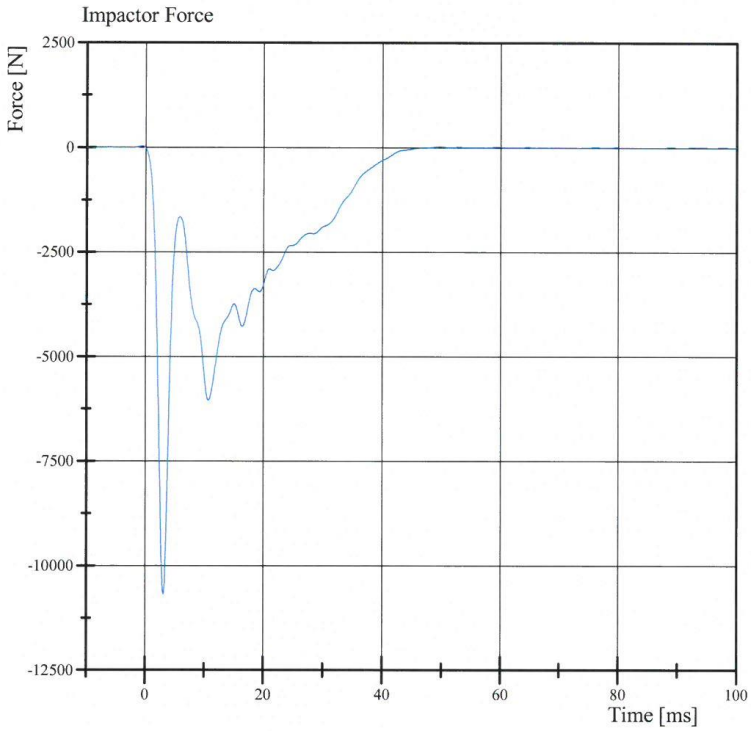
Approved

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

12.01.2015 13:50:35 368

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 30-2
Test Date: 12/1/2015



Filter Class: CFC_180
Max: 22.6 N at -0.6 ms
Min: -10,689.5 N at 3.1 ms

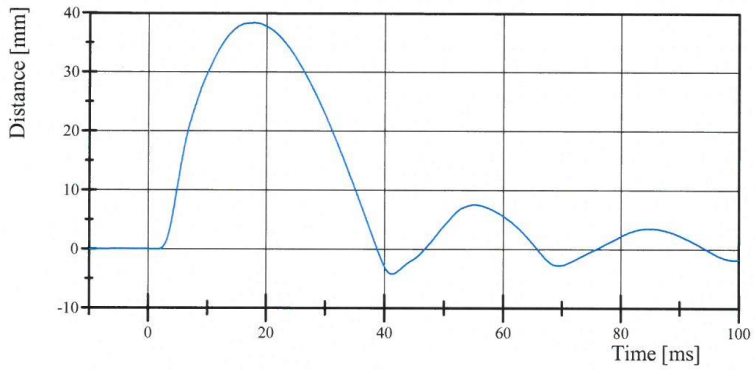
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

12.01.2015 13:50:45 368

Transportation Research Center Inc.

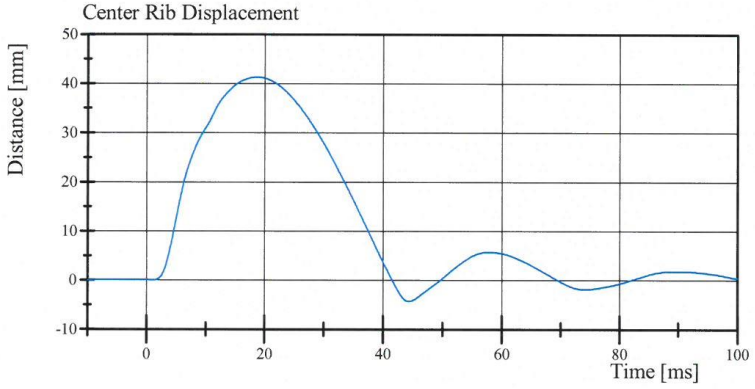
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 30-2
Test Date: 12/1/2015

Upper Rib Displacement



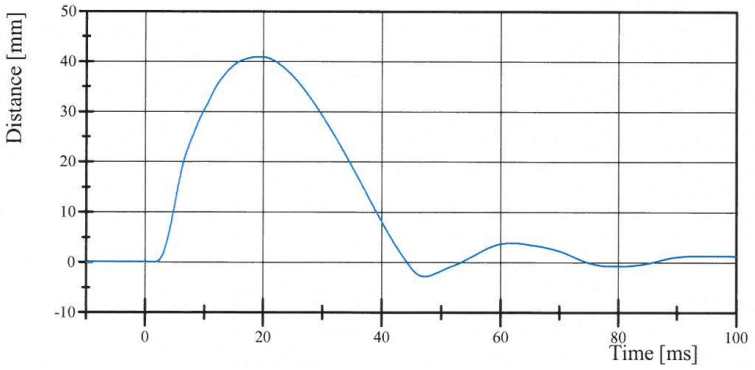
Filter Class: CFC_180
Max: 38.3 mm at 17.8 ms
Min: -4.2 mm at 41.3 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.3 mm at 18.6 ms
Min: -4.3 mm at 44.3 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.9 mm at 19.3 ms
Min: -2.8 mm at 47.2 ms

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

12.01.2015 13:50:46 368

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 30-3
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.06 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,206.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.20 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,614.0 N	Yes
Time of Peak	10.0 - 12.3 ms	11.36 ms	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

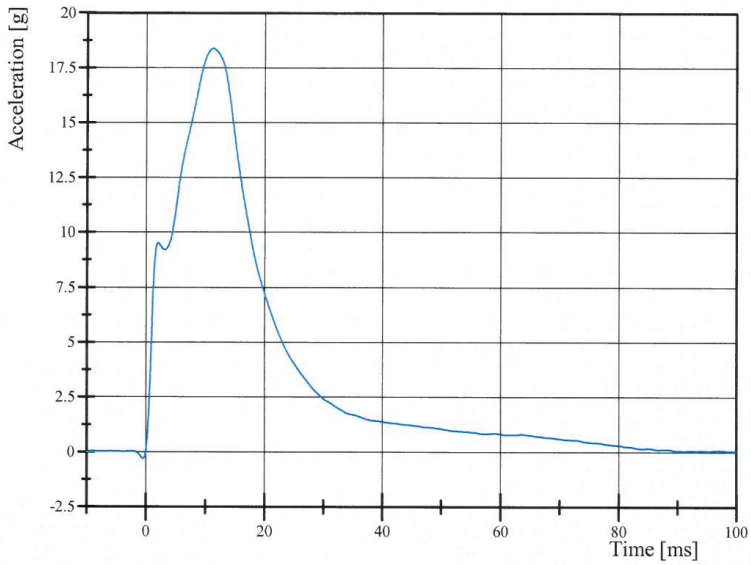
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 15:42:55 571

Transportation Research Center Inc.

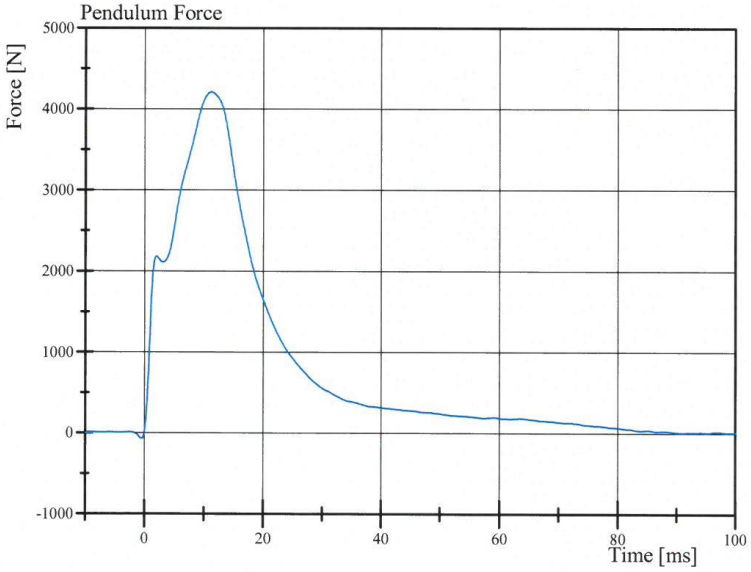
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 30-3
Test Date: 12/1/2015

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.4 g at 11.2 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,206.3 N at 11.2 ms
Min: -75.5 N at -0.5 ms

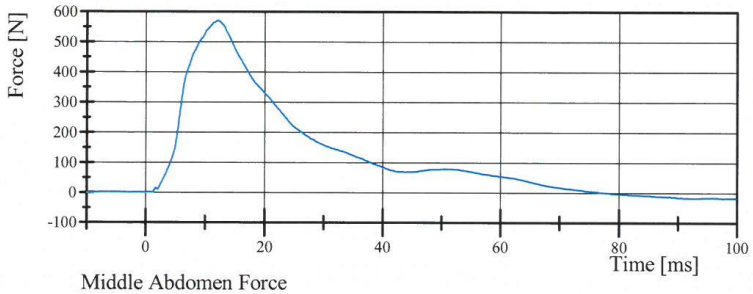
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 15:43:03 571

Transportation Research Center Inc.

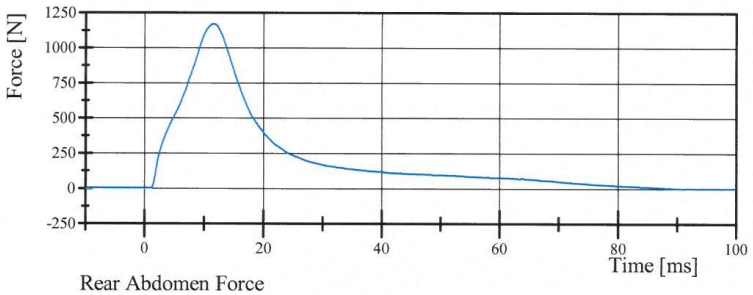
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 30-3
Test Date: 12/1/2015

Front Abdomen Force



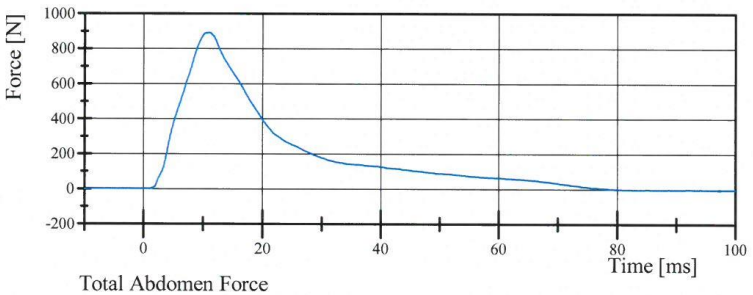
Filter Class: CFC_600
Max: 568.5 N at 12.1 ms
Min: -18.2 N at 97.6 ms

Middle Abdomen Force



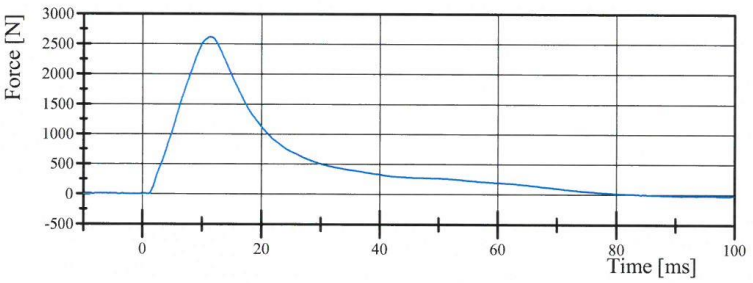
Filter Class: CFC_600
Max: 1,168.4 N at 11.5 ms
Min: -1.3 N at 1.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 889.8 N at 11.0 ms
Min: -5.2 N at 97.3 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,614.0 N at 11.4 ms
Min: -22.5 N at 97.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 15:43:04 571

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 30-16
Test Date: 12/2/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °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	-6.081 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-48.2 deg	Yes
Time of Peak	39 - 53 ms	42.2 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.9 ms	Yes

Test meets specifications.

Comments:

Technician

Melissa Schenker

Approved

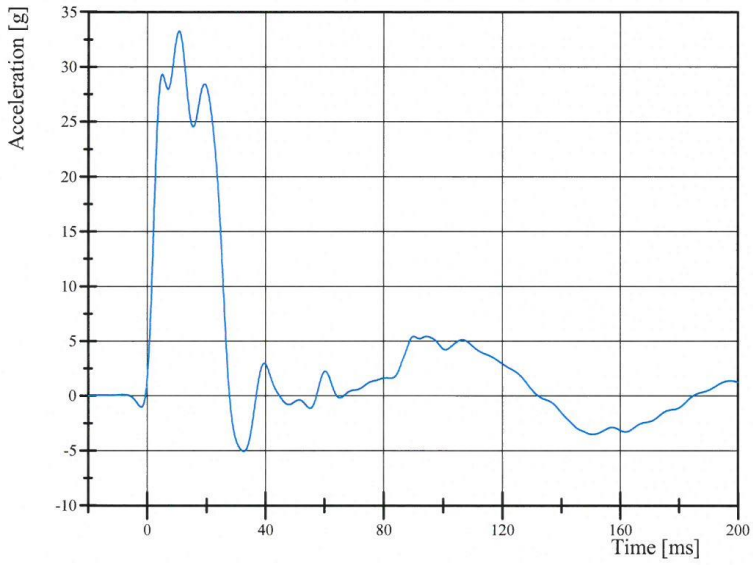
Specification Source: NHTSA Final Rule 8/15/2008

12.02.2015 14:02:39 573

Transportation Research Center Inc.

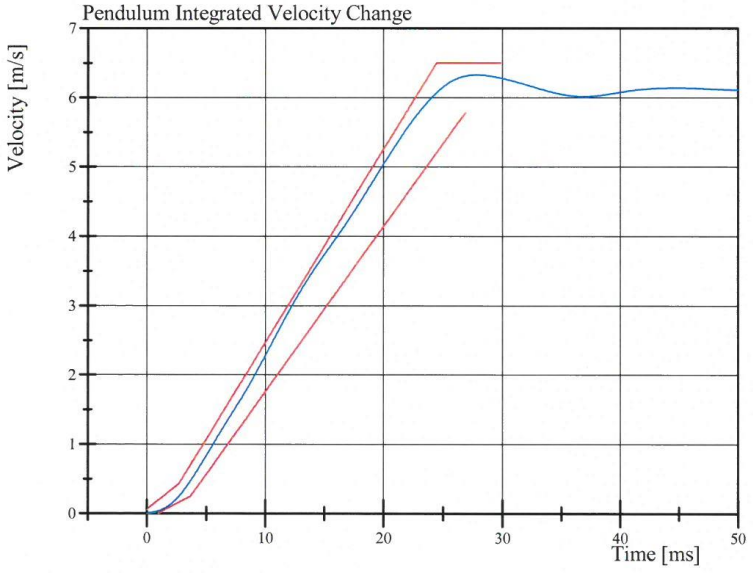
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 30-16
Test Date: 12/2/2015

Pendulum Acceleration



Filter Class: CFC_60
Max: 33.2 g at 10.7 ms
Min: -5.1 g at 32.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.3 m/s at 27.8 ms
Min: 0.0 m/s at 0.0 ms

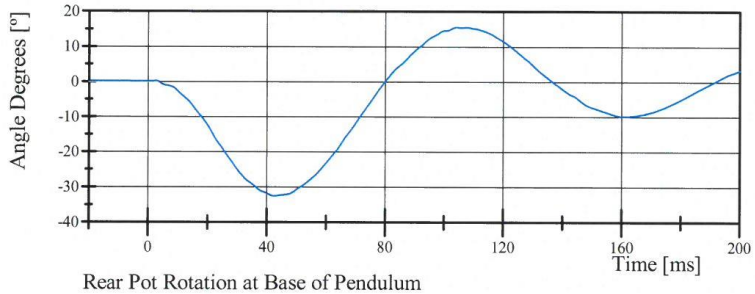
Specification Source: NHTSA Final Rule 8/15/2008

12.02.2015 14:02:47 573

Transportation Research Center Inc.

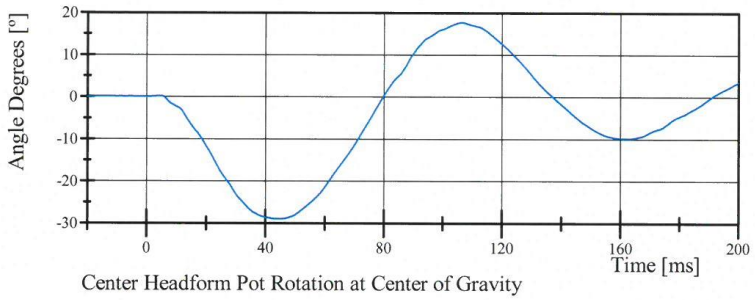
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 30-16
Test Date: 12/2/2015

Forward Pot Rotation at Base of Pendulum



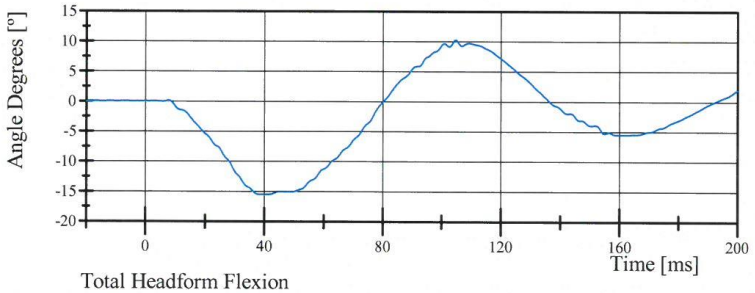
Filter Class: CFC_180
Max: 15.5 ° at 104.2 ms
Min: -32.7 ° at 42.6 ms

Rear Pot Rotation at Base of Pendulum



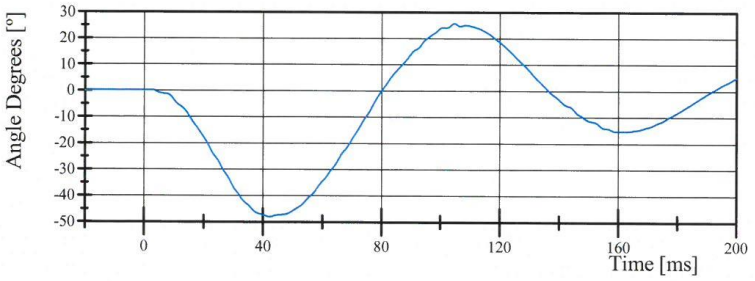
Filter Class: CFC_180
Max: 17.7 ° at 106.4 ms
Min: -29.0 ° at 44.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 10.3 ° at 104.7 ms
Min: -15.6 ° at 38.5 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.7 ° at 104.6 ms
Min: -48.2 ° at 42.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.02.2015 14:02:48 573

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 12/1/2015

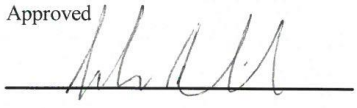
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,079.4 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,289.5 N	Yes
Time of Peak	12.2 - 17.0 ms	14.96 ms	Yes

Test meets specifications.

Comments:

Technician

Approved



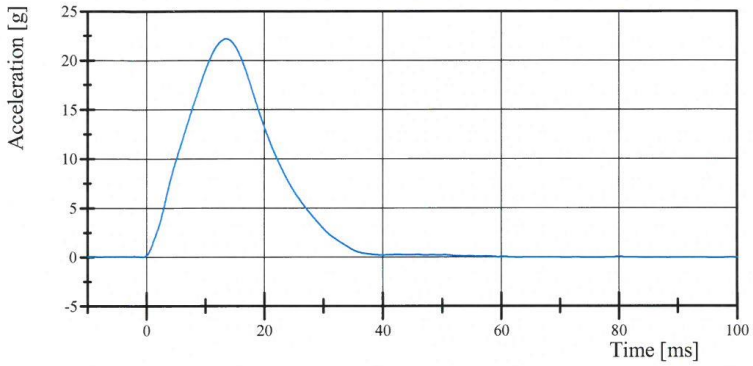
Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 13:41:32 470

Transportation Research Center Inc.

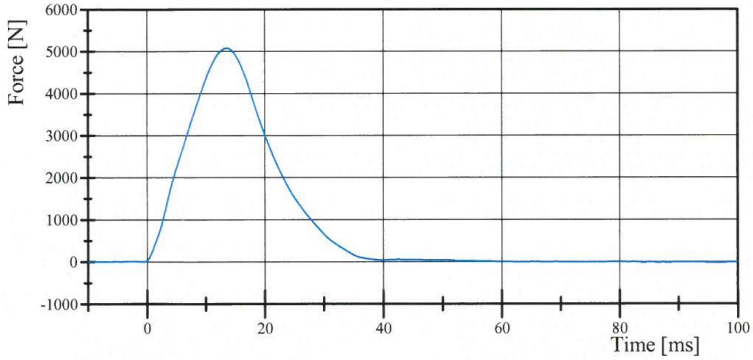
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 30-1
Test Date: 12/1/2015

Pendulum Acceleration



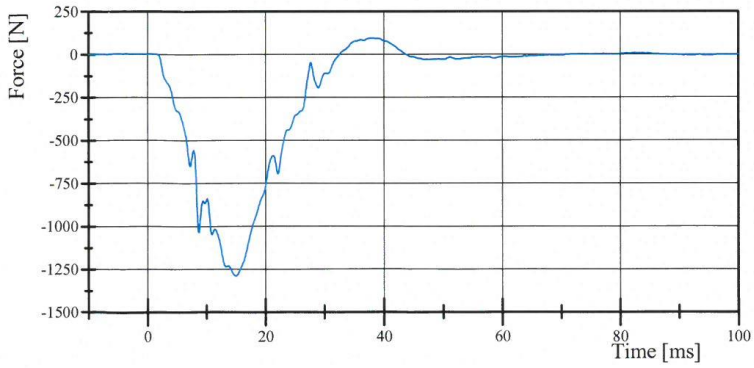
Filter Class: CFC_180
Max: 22.2 g at 13.5 ms
Min: -0.1 g at 97.0 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,079.4 N at 13.5 ms
Min: -14.4 N at 97.0 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 93.7 N at 37.8 ms
Min: -1,289.5 N at 15.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

12.01.2015 13:41:48 470

Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 31
01/16/16

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	559	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	443	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	474	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	205	Yes
12	Thorax Depth	262.0 - 272.0	262	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	158	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. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	154.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	7.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

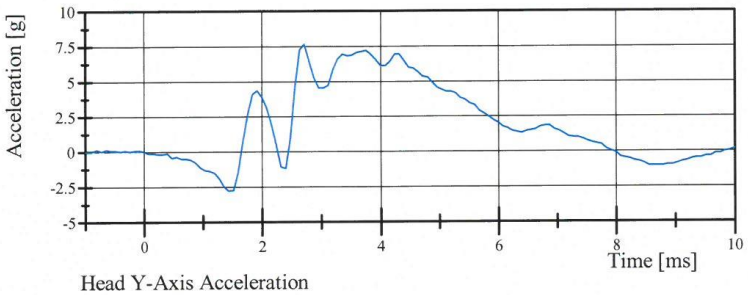
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 11:23:02 361

Transportation Research Center Inc.

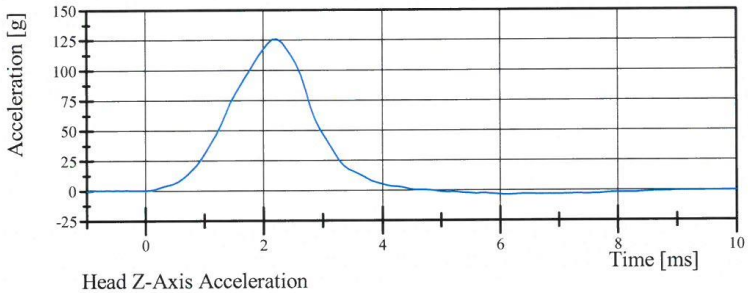
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Head X-Axis Acceleration



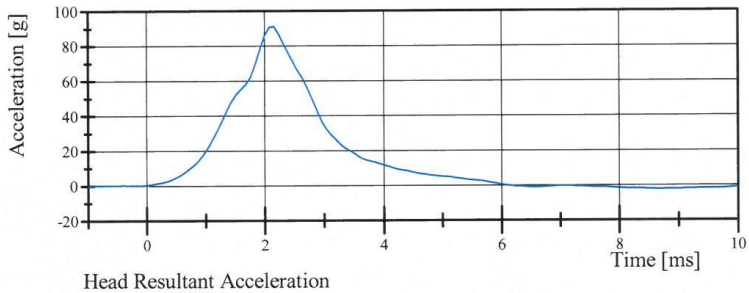
Filter Class: CFC_1000
Max: 7.6 g at 2.7 ms
Min: -2.8 g at 1.4 ms

Head Y-Axis Acceleration



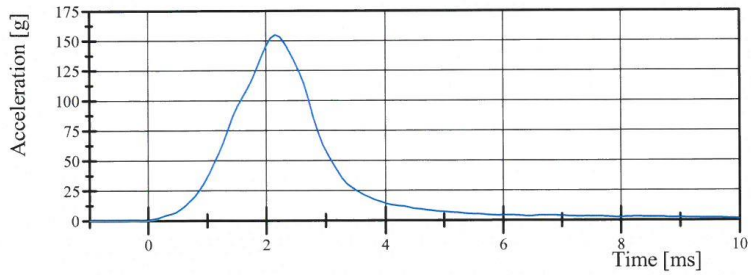
Filter Class: CFC_1000
Max: 125.9 g at 2.2 ms
Min: -3.9 g at 6.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 90.8 g at 2.2 ms
Min: -2.2 g at 8.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 154.9 g at 2.2 ms
Min: 0.0 g at -0.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 11:23:16 361

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-53.1 deg	Yes
Time of Peak	54 - 66 ms	54.4 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	69.0 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

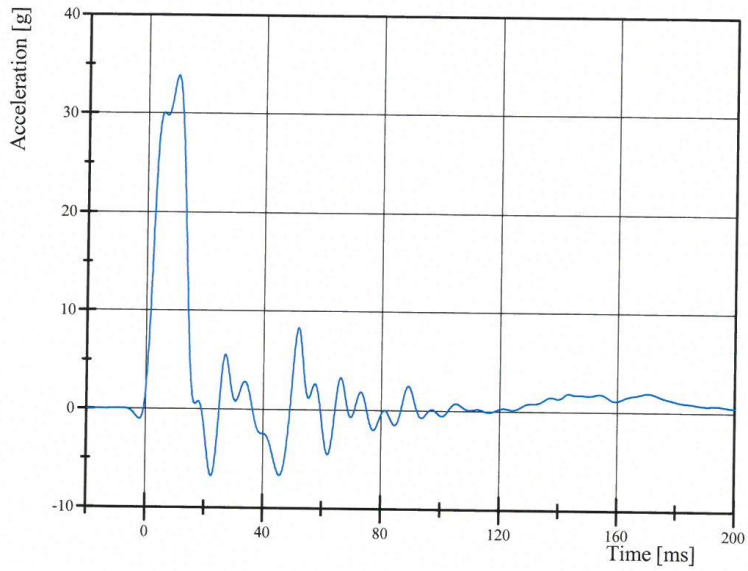
Specification Source: NHTSA Final Rule 8/15/2008

01.18.2016 16:13:02 1314

Transportation Research Center Inc.

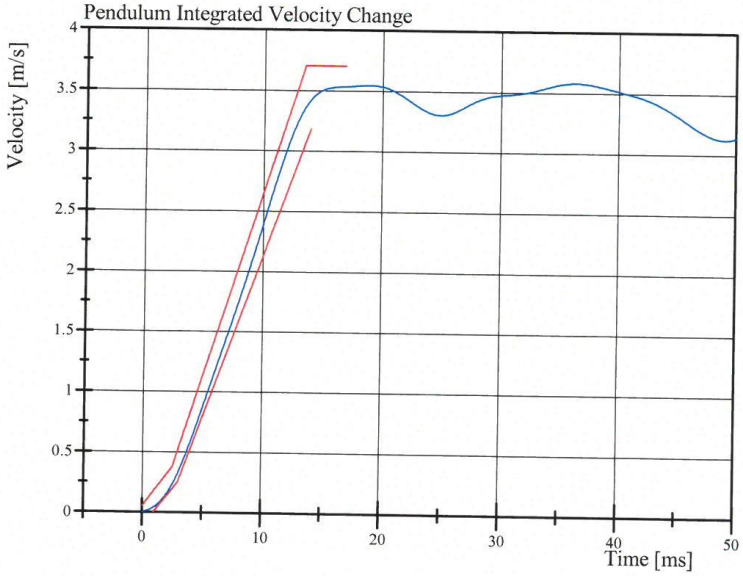
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Pendulum Acceleration



Filter Class: CFC_60
Max: 33.8 g at 10.2 ms
Min: -6.8 g at 22.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 36.3 ms
Min: 0.0 m/s at 0.0 ms

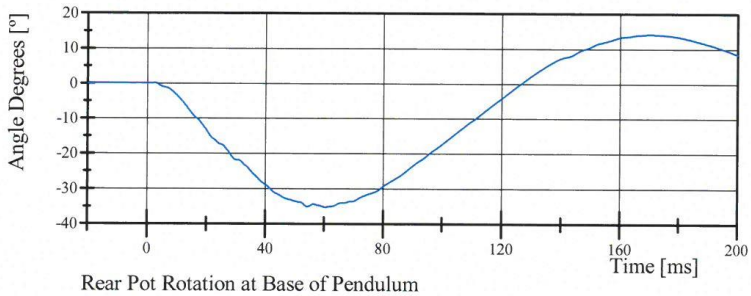
Specification Source: NHTSA Final Rule 8/15/2008

01.18.2016 16:13:10 1314

Transportation Research Center Inc.

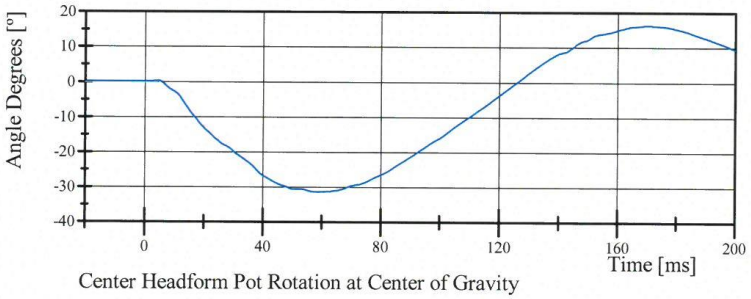
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Forward Pot Rotation at Base of Pendulum



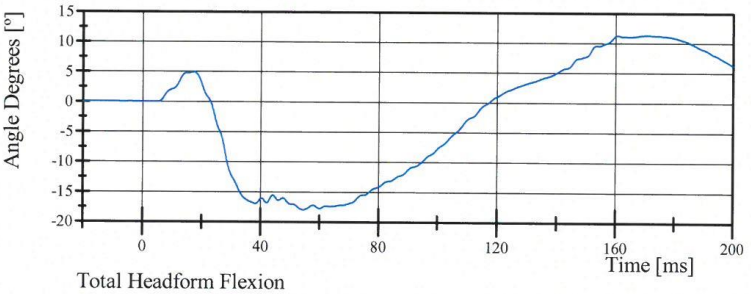
Filter Class: CFC_180
Max: 14.1 ° at 170.1 ms
Min: -35.3 ° at 60.4 ms

Rear Pot Rotation at Base of Pendulum



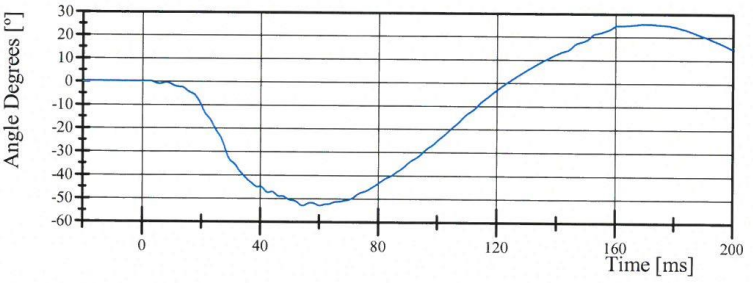
Filter Class: CFC_180
Max: 16.3 ° at 170.0 ms
Min: -31.4 ° at 58.7 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.4 ° at 171.4 ms
Min: -18.0 ° at 54.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.5 ° at 170.1 ms
Min: -53.1 ° at 54.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.18.2016 16:13:10 1314

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.15 g	Yes

Test meets specifications.

Comments:

Technician

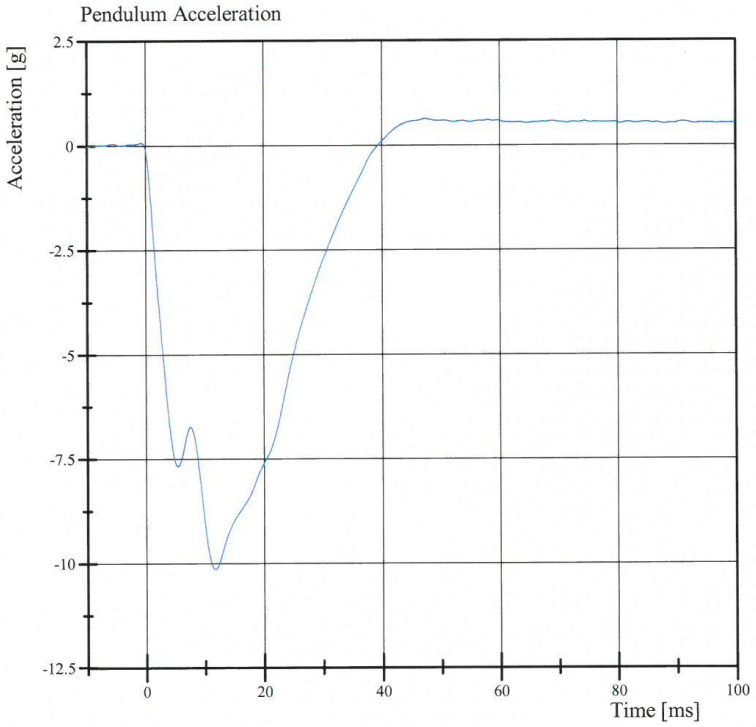
Approved

Specification Source: NHTSA final rule 8/15/2008

01.15.2016 13:56:09 566

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 0.6 g at 47.4 ms
Min: -10.1 g at 11.8 ms

Specification Source: NHTSA final rule 8/15/2008

01.15.2016 13:56:21 566

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

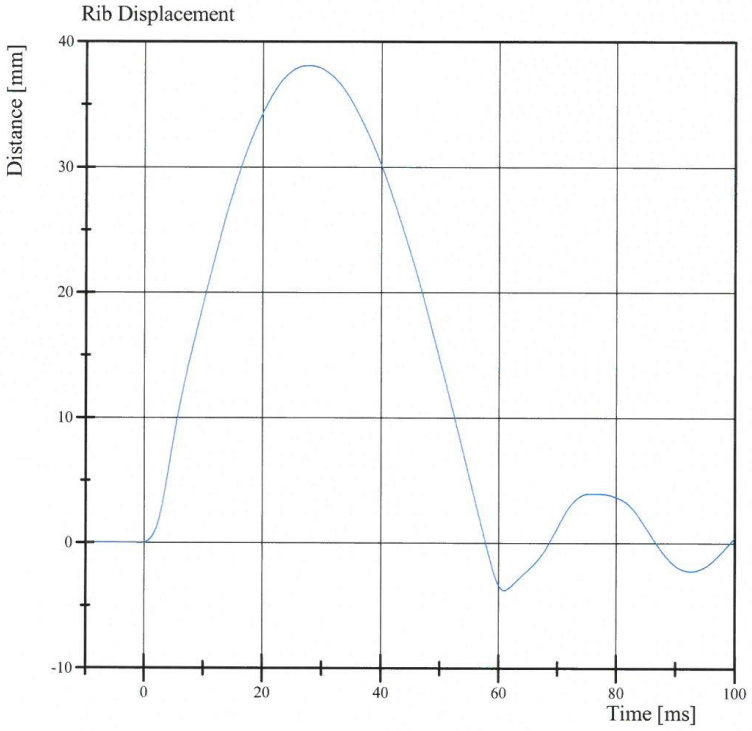
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:39:49 862

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 38.1 mm at 27.8 ms
Min: -3.8 mm at 61.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:40:04 862

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

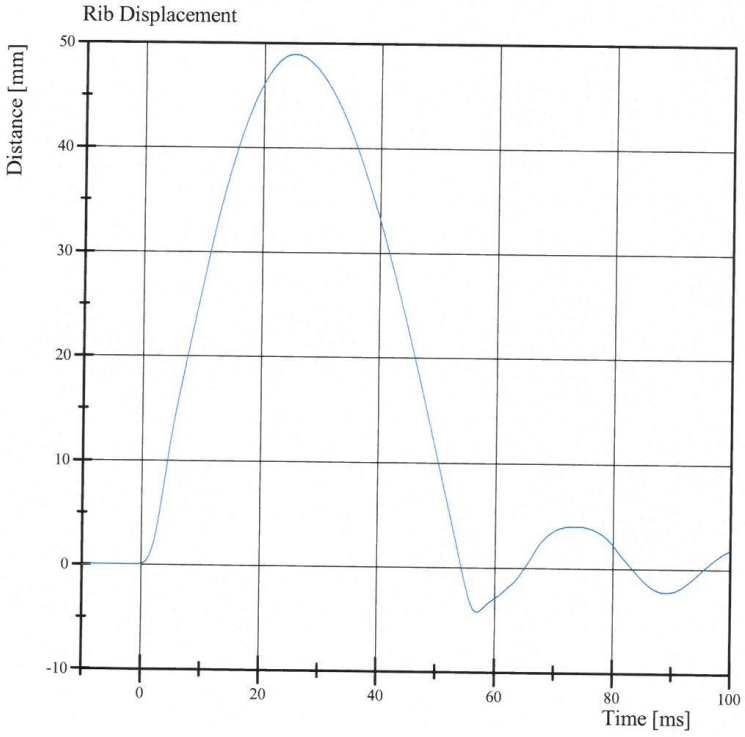
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:34:16 693

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 48.9 mm at 25.3 ms
Min: -4.3 mm at 57.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:34:31 693

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

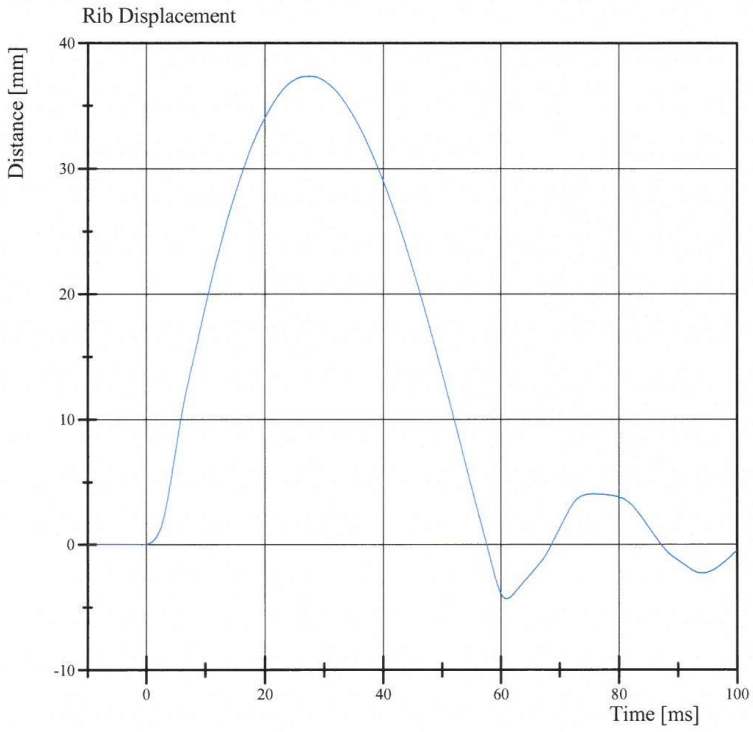
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:52:00 881

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 37.4 mm at 27.4 ms
Min: -4.3 mm at 61.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:52:08 881

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

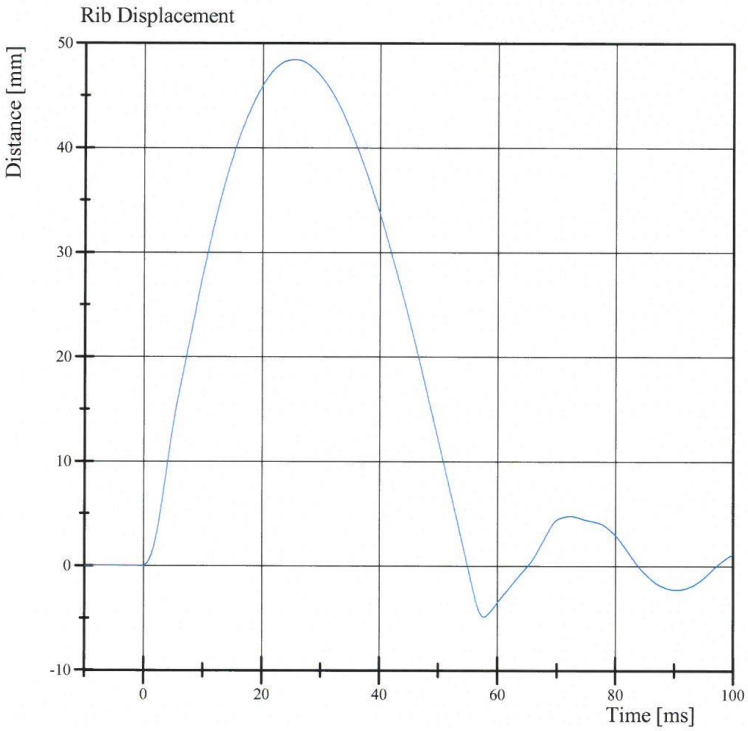
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:43:41 706

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 48.4 mm at 25.4 ms
Min: -4.9 mm at 57.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:43:50 706

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

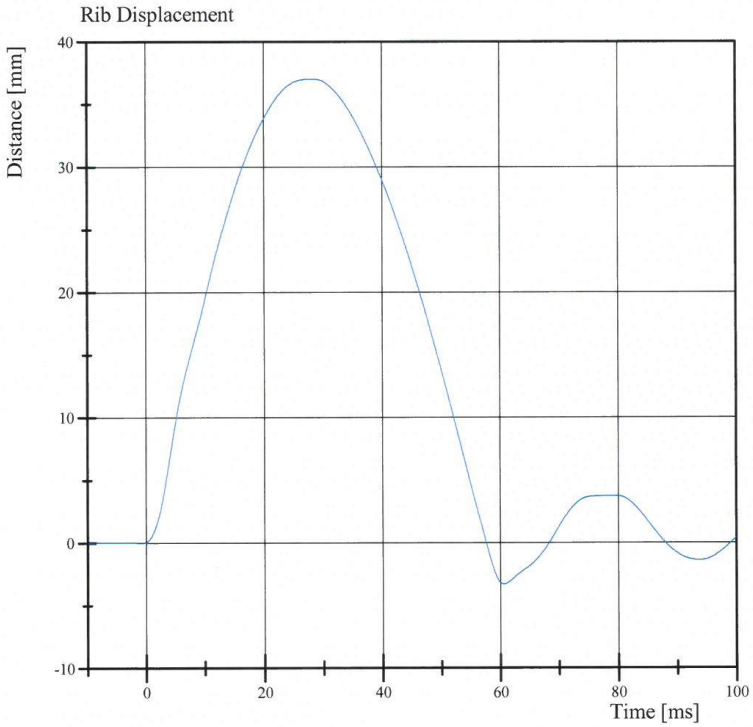
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 10:01:34 862

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 37.0 mm at 28.3 ms
Min: -3.3 mm at 60.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 10:01:42 862

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	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

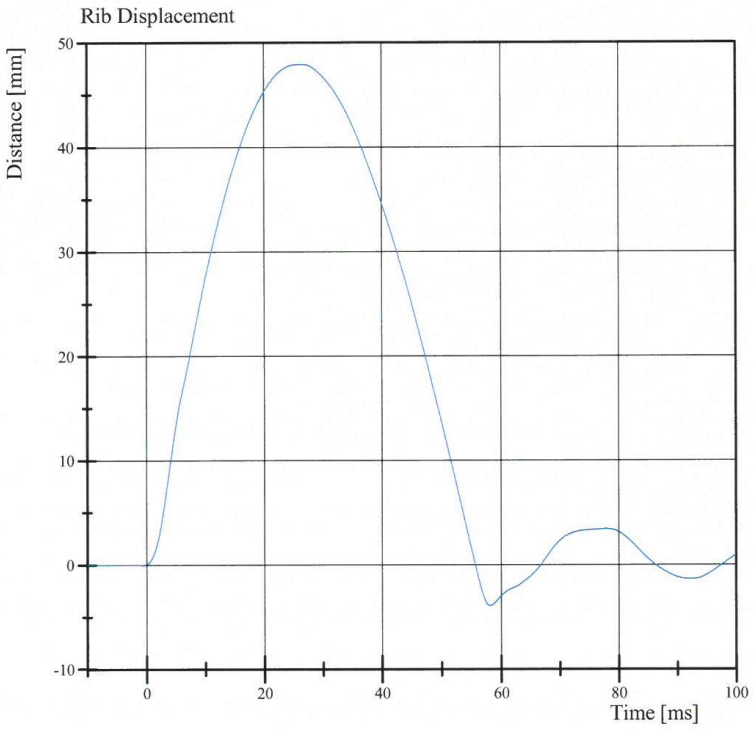
Approved

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:55:38 696

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 47.9 mm at 26.5 ms
Min: -3.9 mm at 58.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:55:53 696

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.539 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,512.2 N	Yes
Upper Rib Displacement	34 - 41 mm	38.8 mm	Yes
Center Rib Displacement	37 - 45 mm	41.8 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.7 mm	Yes

Test meets specifications.

Comments:

Technician

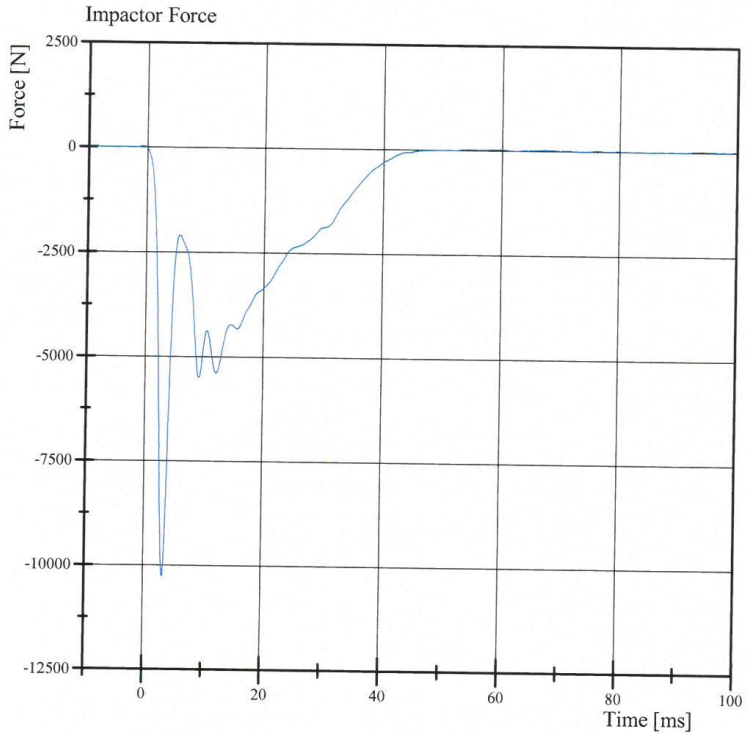
Approved

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

01.15.2016 14:00:32 414

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 29.0 N at 67.2 ms
Min: -10,288.4 N at 3.2 ms

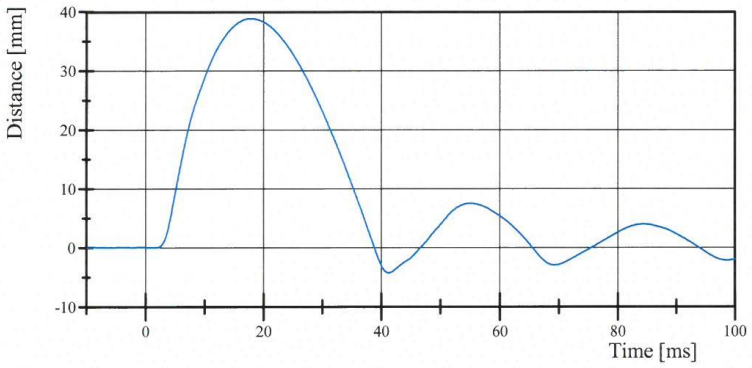
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

01.15.2016 14:00:58 414

Transportation Research Center Inc.

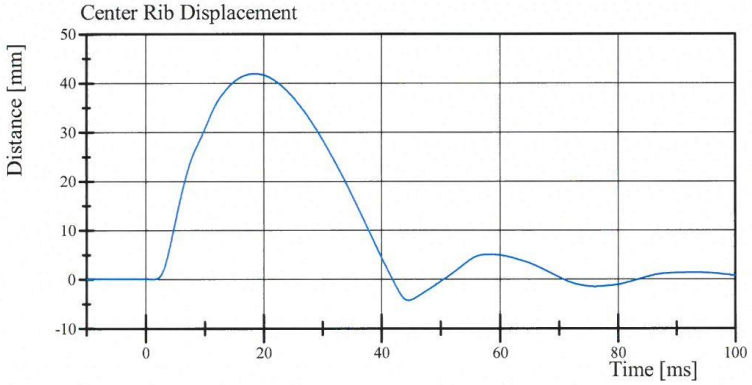
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Upper Rib Displacement



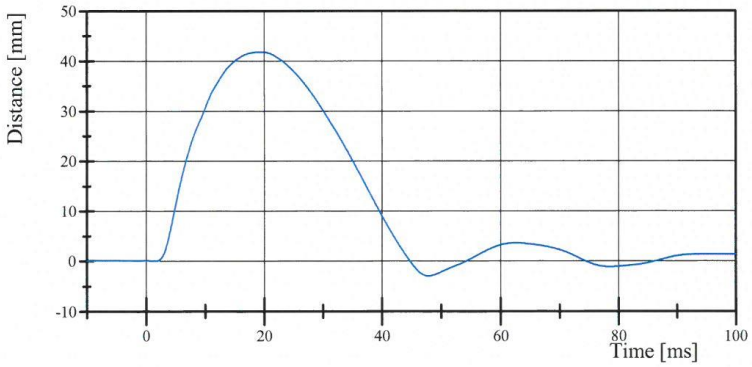
Filter Class: CFC_180
Max: 38.8 mm at 17.8 ms
Min: -4.3 mm at 41.2 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.8 mm at 18.5 ms
Min: -4.3 mm at 44.6 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 41.7 mm at 19.5 ms
Min: -3.0 mm at 47.8 ms

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

01.15.2016 14:00:59 414

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 31-6
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.08 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,268.7 N	Yes
Time of Peak	10.6 - 13.0 ms	10.64 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,646.4 N	Yes
Time of Peak	10.0 - 12.3 ms	10.48 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

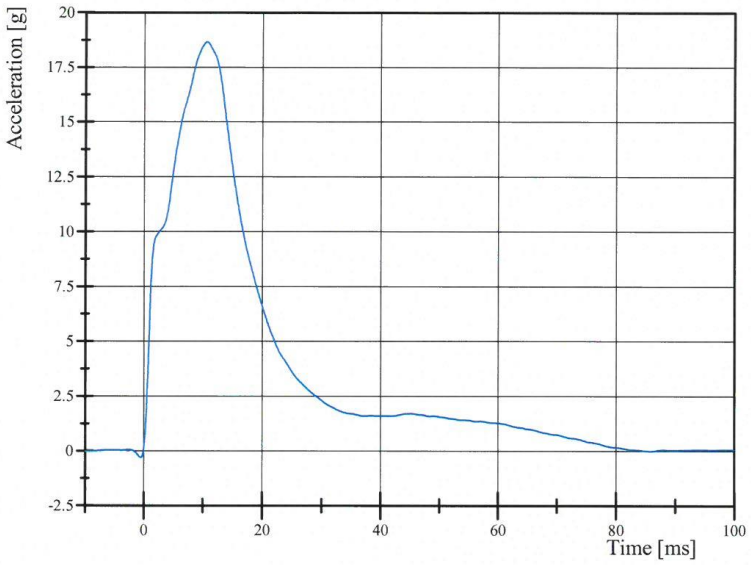
Specification Source: NHTSA Final Rule 8/15/2008

01.16.2016 07:26:21 557

Transportation Research Center Inc.

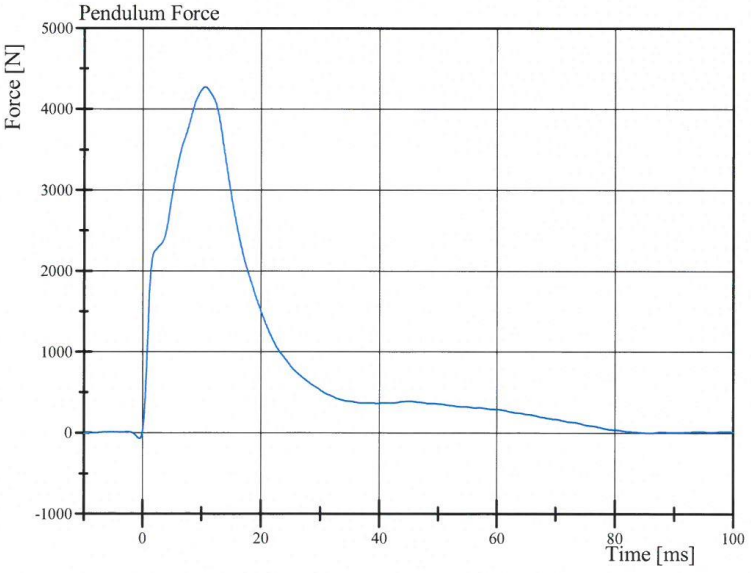
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 31-6
Test Date: 1/16/2016

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.6 g at 10.6 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,268.7 N at 10.6 ms
Min: -75.4 N at -0.5 ms

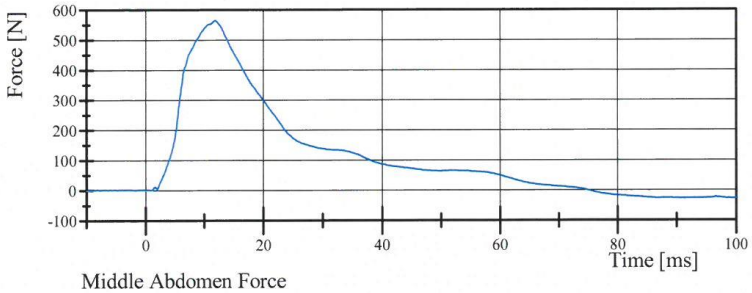
Specification Source: NHTSA Final Rule 8/15/2008

01.16.2016 07:26:45 557

Transportation Research Center Inc.

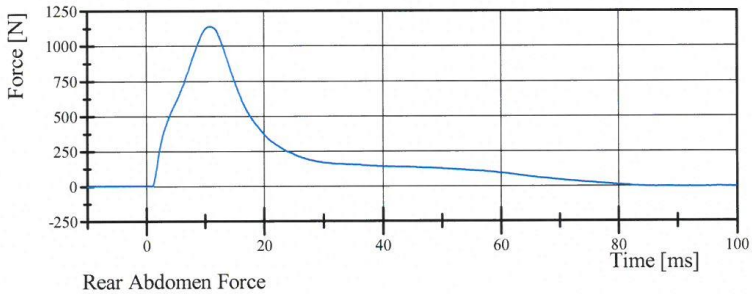
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 31-6
Test Date: 1/16/2016

Front Abdomen Force



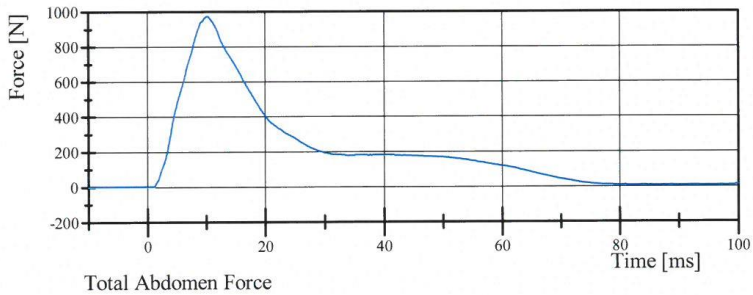
Filter Class: CFC_600
Max: 563.8 N at 11.8 ms
Min: -28.0 N at 99.6 ms

Middle Abdomen Force



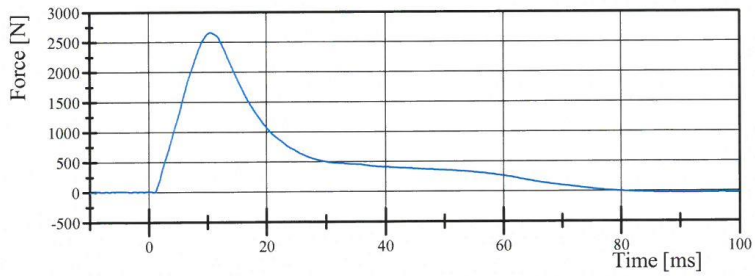
Filter Class: CFC_600
Max: 1,135.1 N at 10.9 ms
Min: -4.6 N at 91.1 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 971.6 N at 10.3 ms
Min: -0.7 N at 1.0 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,646.4 N at 10.5 ms
Min: -25.2 N at 90.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.16.2016 07:26:46 557

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 31-4
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.085 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-49.7 deg	Yes
Time of Peak	39 - 53 ms	43.4 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	39.5 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

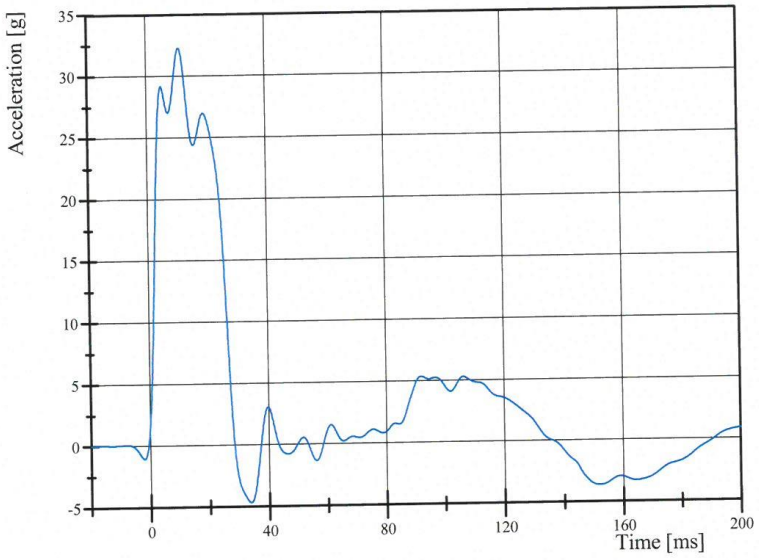
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 13:13:15 574

Transportation Research Center Inc.

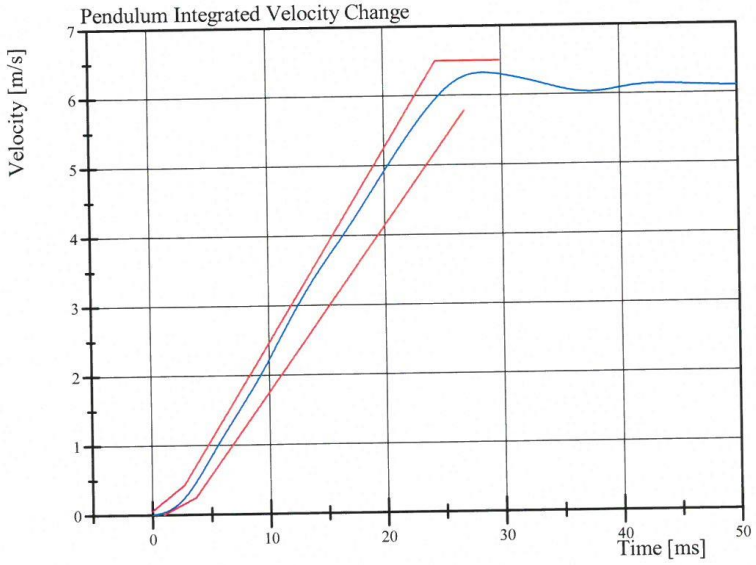
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 31-4
Test Date: 1/15/2016

Pendulum Acceleration



Filter Class: CFC_60
Max: 32.2 g at 11.0 ms
Min: -4.7 g at 33.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.3 m/s at 28.5 ms
Min: 0.0 m/s at 0.0 ms

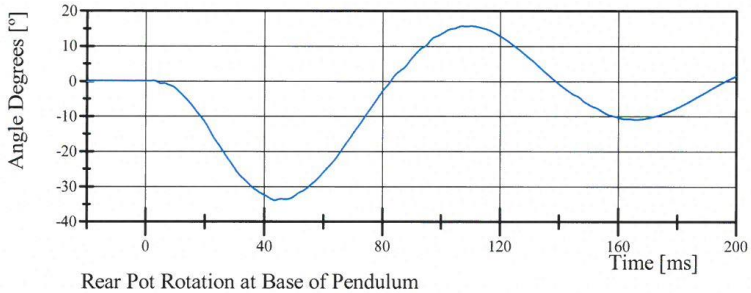
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 13:13:38 574

Transportation Research Center Inc.

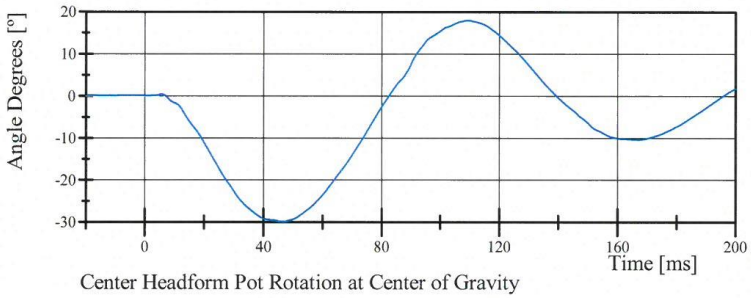
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 31-4
Test Date: 1/15/2016

Forward Pot Rotation at Base of Pendulum



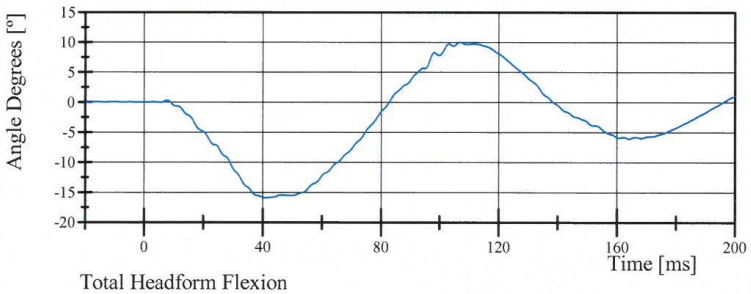
Filter Class: CFC_180
Max: 15.6 ° at 110.3 ms
Min: -33.9 ° at 43.5 ms

Rear Pot Rotation at Base of Pendulum



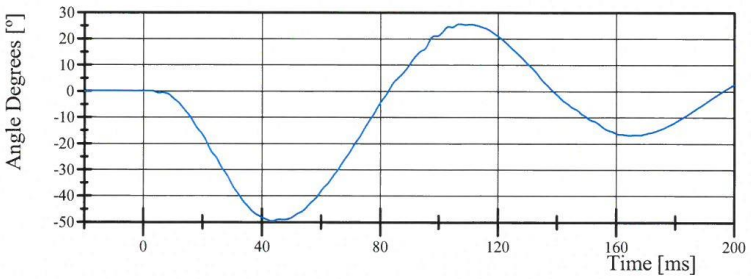
Filter Class: CFC_180
Max: 17.9 ° at 109.4 ms
Min: -29.9 ° at 46.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 10.0 ° at 107.0 ms
Min: -15.9 ° at 41.0 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.7 ° at 107.0 ms
Min: -49.7 ° at 43.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 13:13:39 574

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 31-3
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,130.3 N	Yes
Time of Peak	11.8 - 16.1 ms	13.44 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,253.8 N	Yes
Time of Peak	12.2 - 17.0 ms	13.36 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

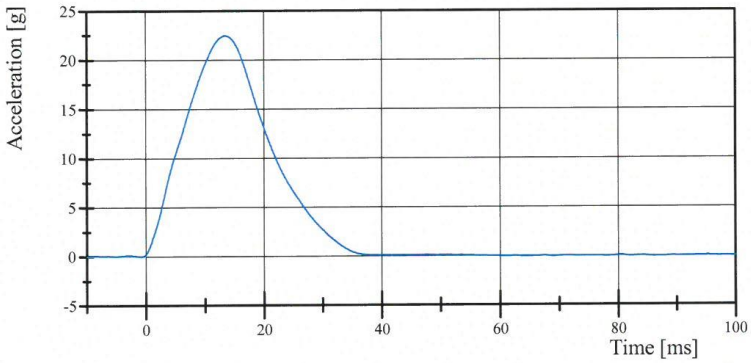
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 15:29:23 564

Transportation Research Center Inc.

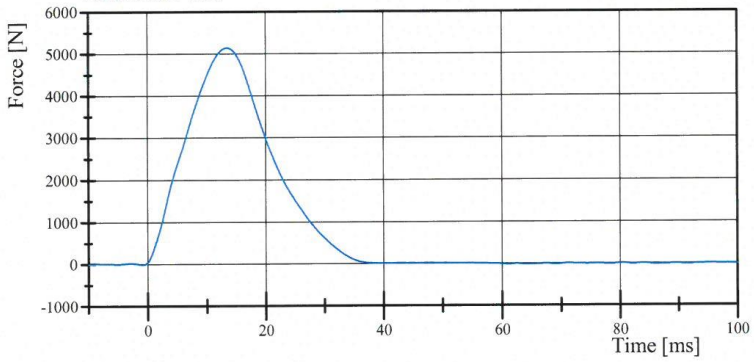
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 31-3
Test Date: 1/15/2016

Pendulum Acceleration



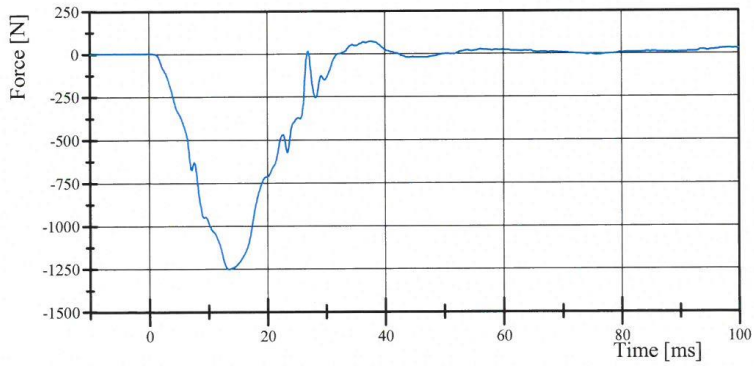
Filter Class: CFC_180
Max: 22.4 g at 13.4 ms
Min: -0.1 g at 64.0 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,130.3 N at 13.4 ms
Min: -19.6 N at 64.0 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 70.9 N at 37.6 ms
Min: -1,253.8 N at 13.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 15:29:43 564

Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.35

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	781	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	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	127	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	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	525	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	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	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician

Melissa Schinker

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	122.6 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.7 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

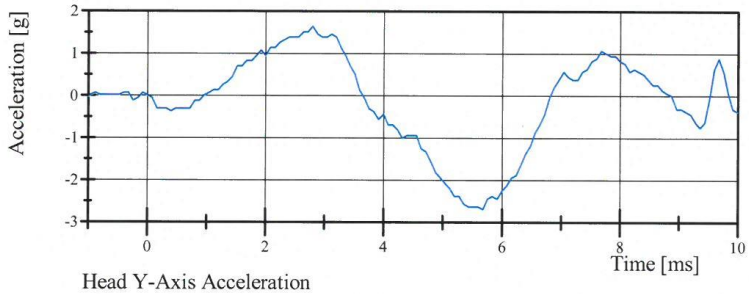
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.30.2015 13:54:41 232

Transportation Research Center Inc.

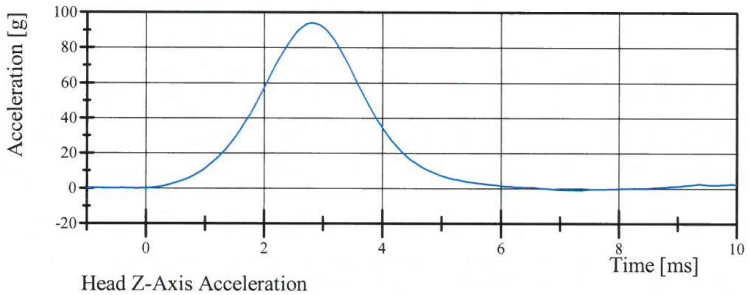
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 11/30/2015

Head X-Axis Acceleration



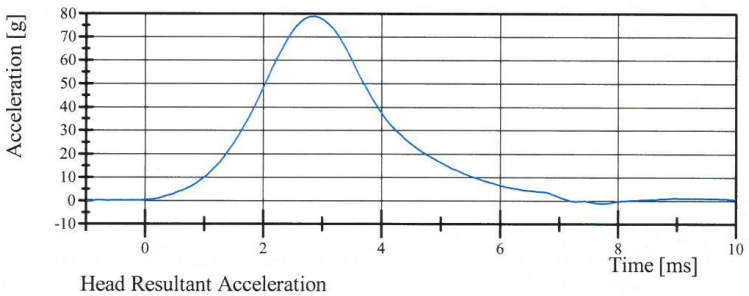
Filter Class: CFC_1000
Max: 1.6 g at 2.8 ms
Min: -2.7 g at 5.7 ms

Head Y-Axis Acceleration



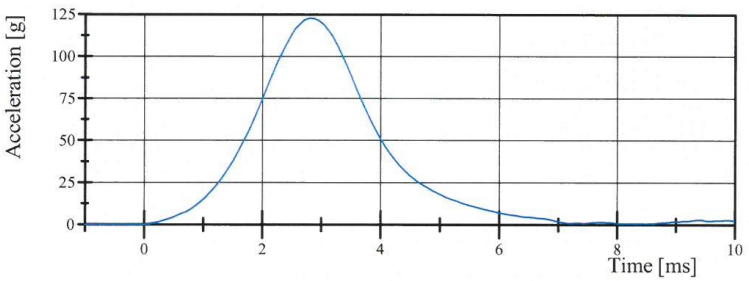
Filter Class: CFC_1000
Max: 94.1 g at 2.8 ms
Min: -0.8 g at 7.3 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 78.7 g at 2.9 ms
Min: -1.1 g at 7.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 122.6 g at 2.8 ms
Min: 0.0 g at -0.6 ms

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

11.30.2015 13:54:48 232

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 35-2
Test Date: 11/30/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.607 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.686 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.965 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.374 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.853 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.856 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-76.9 deg	Yes
Time of Peak	50 - 70 ms	69.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	42.5 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	114.2 ms	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

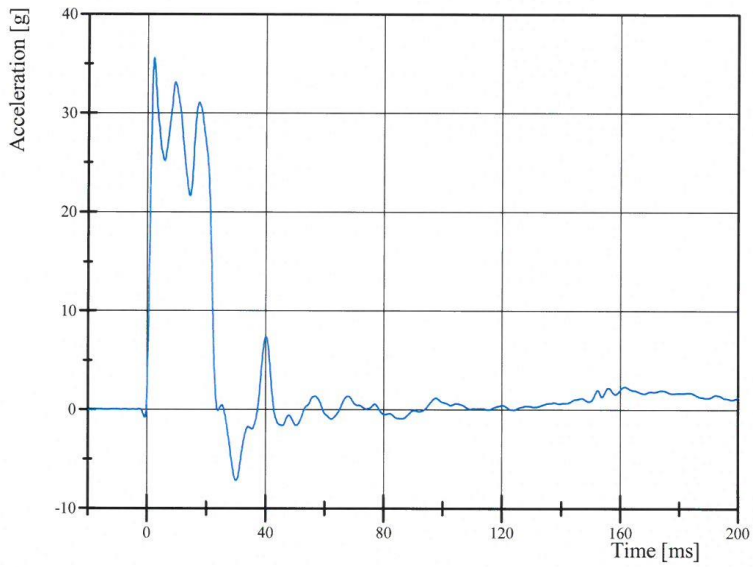
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.30.2015 14:24:25 638

Transportation Research Center Inc.

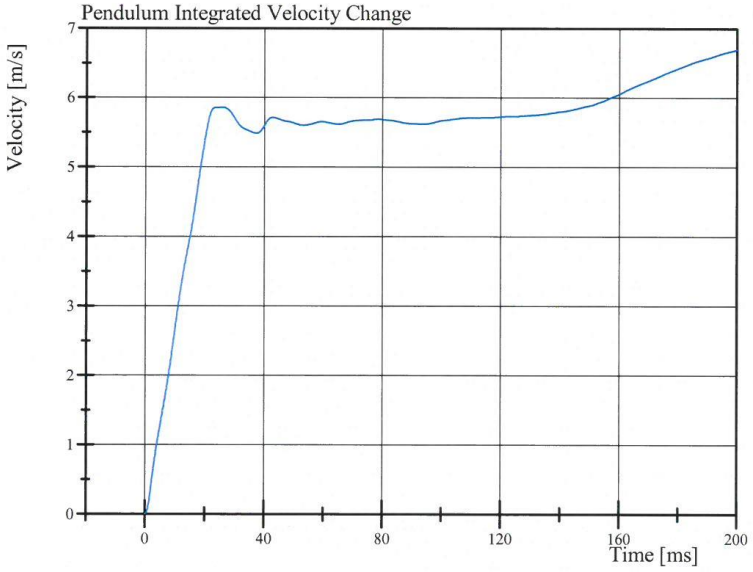
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 35-2
Test Date: 11/30/2015

Pendulum Acceleration



Filter Class: CFC_180
Max: 35.5 g at 2.2 ms
Min: -7.2 g at 30.0 ms

Pendulum Integrated Velocity Change



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

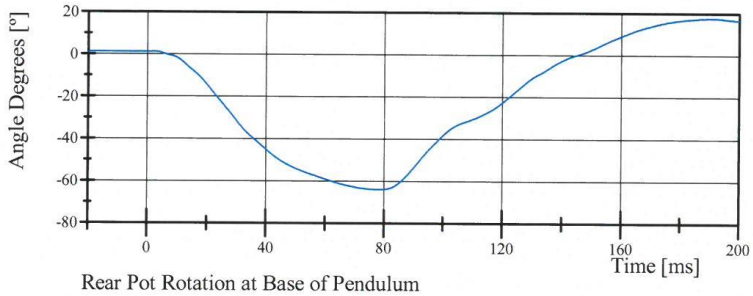
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.30.2015 14:24:33 638

Transportation Research Center Inc.

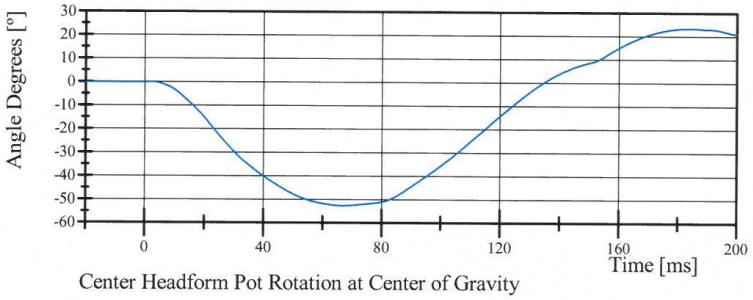
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 35-2
Test Date: 11/30/2015

Forward Pot Rotation at Base of Pendulum



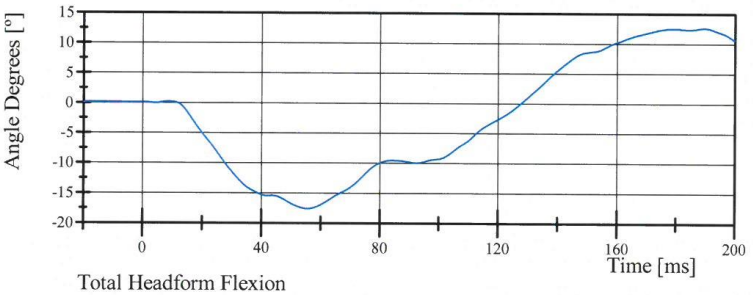
Filter Class: CFC_60
Max: 17.6 ° at 191.0 ms
Min: -64.0 ° at 78.6 ms

Rear Pot Rotation at Base of Pendulum



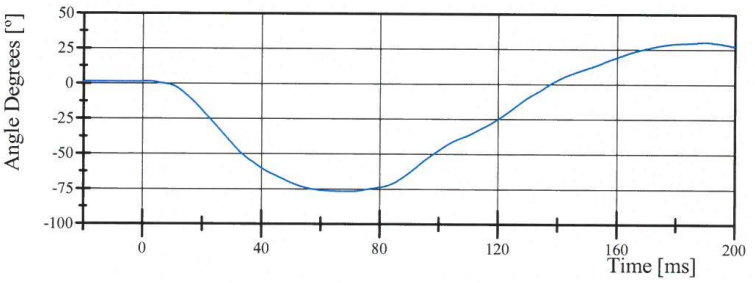
Filter Class: CFC_60
Max: 23.4 ° at 183.8 ms
Min: -52.8 ° at 67.0 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.7 ° at 189.7 ms
Min: -17.6 ° at 55.6 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 30.3 ° at 189.9 ms
Min: -76.9 ° at 69.0 ms

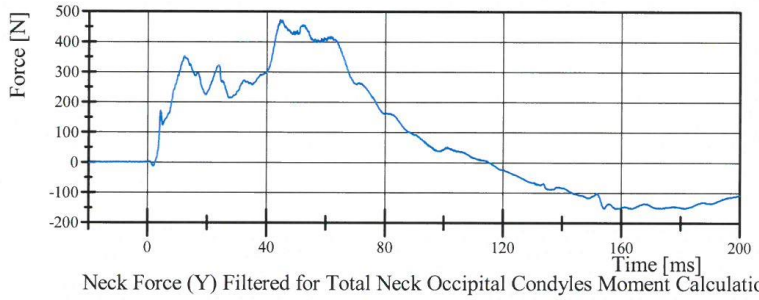
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

11.30.2015 14:24:34 638

Transportation Research Center Inc.

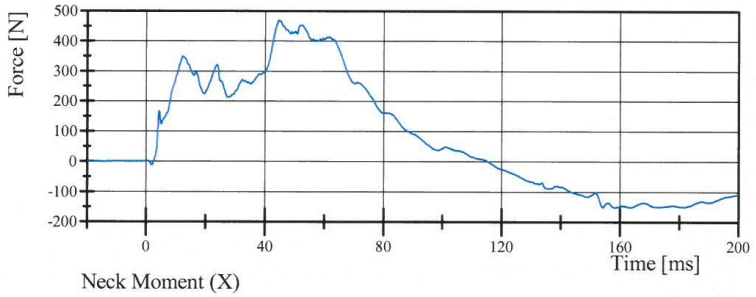
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 35-2
Test Date: 11/30/2015

Neck Force (Y)



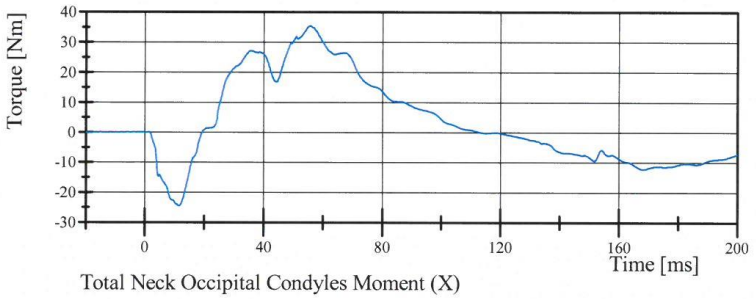
Filter Class: CFC_1000
Max: 471.8 N at 44.5 ms
Min: -151.6 N at 158.2 ms

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



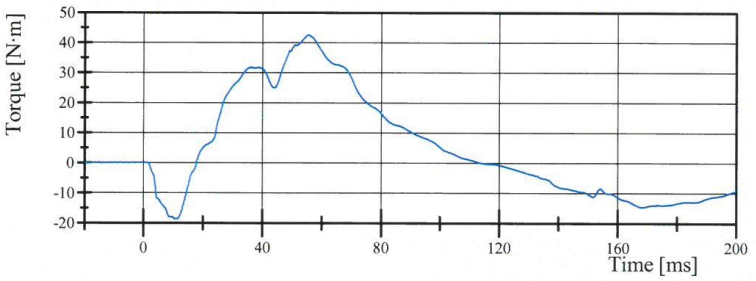
Filter Class: CFC_600
Max: 469.7 N at 44.5 ms
Min: -150.9 N at 158.2 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 35.3 Nm at 55.7 ms
Min: -24.5 Nm at 11.6 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 42.5 N·m at 55.6 ms
Min: -18.7 N·m at 10.6 ms

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

11.30.2015 14:24:35 638

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-17.1 g	Yes
Shoulder Displacement	28 - 37 mm	30.9 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	20.9 g	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

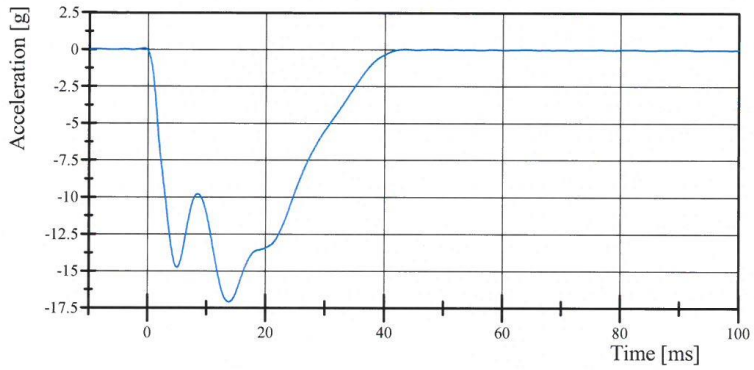
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 08:31:51 865

Transportation Research Center Inc.

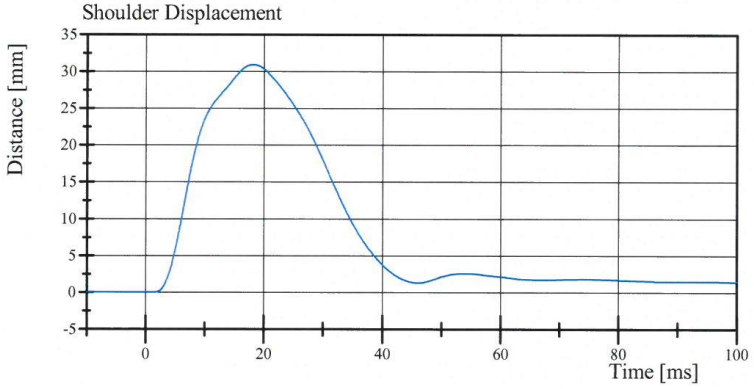
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Probe Acceleration



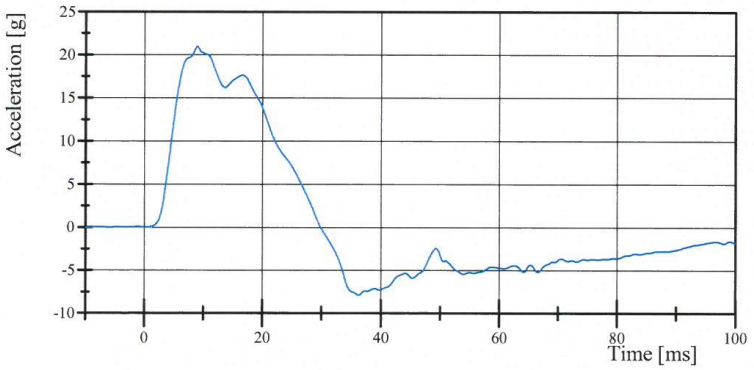
Filter Class: CFC_180
Max: 0.1 g at -0.6 ms
Min: -17.1 g at 13.8 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 30.9 mm at 18.2 ms
Min: -0.0 mm at -5.8 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 20.9 g at 9.0 ms
Min: -7.9 g at 36.2 ms

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

12.01.2015 08:31:59 865

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.767 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-35.5 g	Yes
Shoulder Displacement	31 - 40 mm	33.0 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	25.4 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.1 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.7 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	40.6 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	32.6 g	Yes

Test meets specifications.

Comments:

Technician

Melissa Schenker

Approved

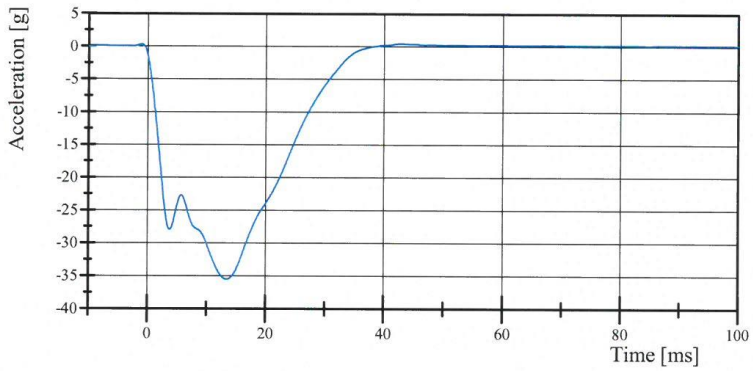
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 10:25:36 627

Transportation Research Center Inc.

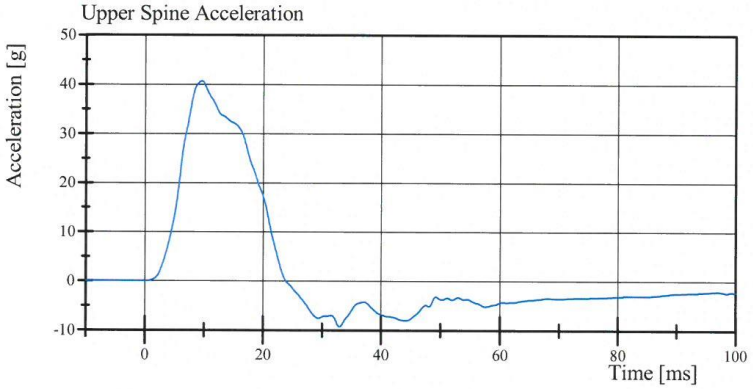
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Probe Acceleration



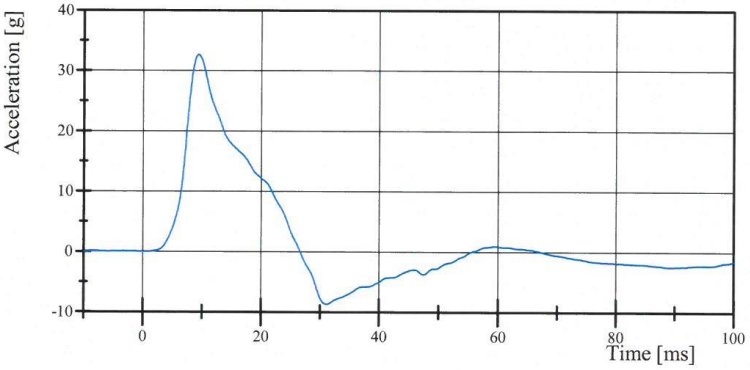
Filter Class: CFC_180
Max: 0.4 g at 42.8 ms
Min: -35.5 g at 13.4 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 40.6 g at 9.5 ms
Min: -9.3 g at 33.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 32.6 g at 9.4 ms
Min: -8.7 g at 31.1 ms

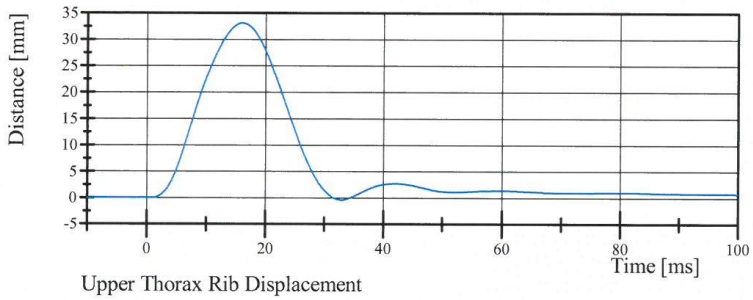
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 10:25:47 627

Transportation Research Center Inc.

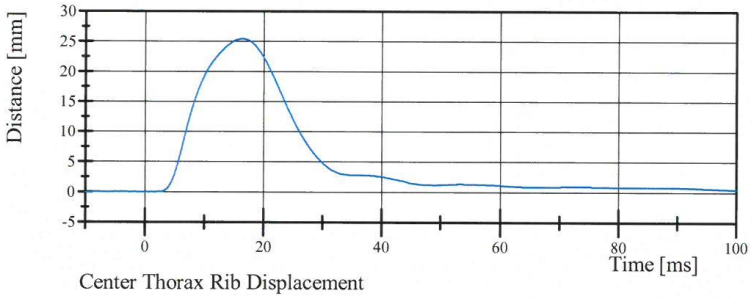
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Shoulder Rib Displacement



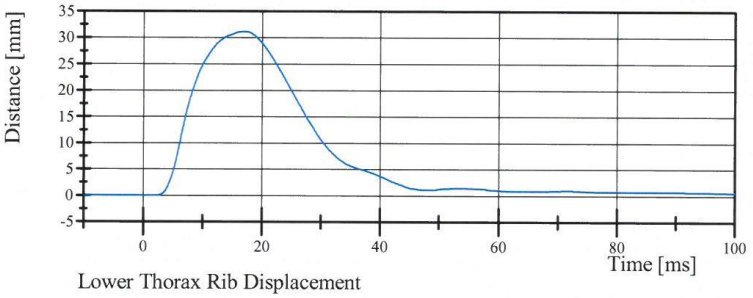
Filter Class: CFC_600
Max: 33.0 mm at 16.0 ms
Min: -0.4 mm at 33.0 ms

Upper Thorax Rib Displacement



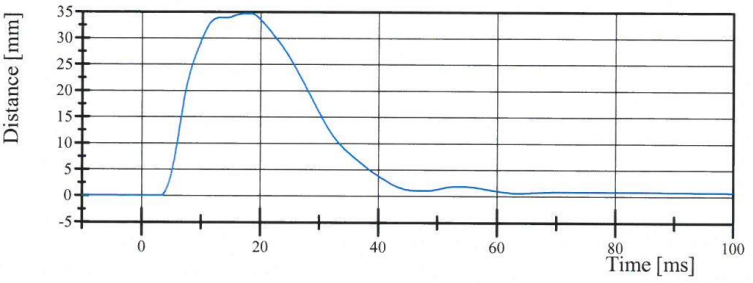
Filter Class: CFC_600
Max: 25.4 mm at 16.4 ms
Min: -0.0 mm at 1.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.1 mm at 17.0 ms
Min: -0.0 mm at -0.8 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.7 mm at 18.4 ms
Min: -0.0 mm at 3.2 ms

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

12.01.2015 10:25:48 627

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.310 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.6 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	39.4 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	35.3 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.1 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	8.9 g	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinkel

Approved

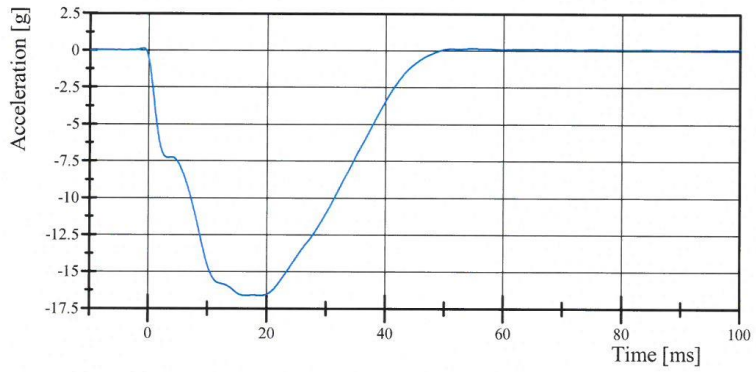
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 09:30:41 834

Transportation Research Center Inc.

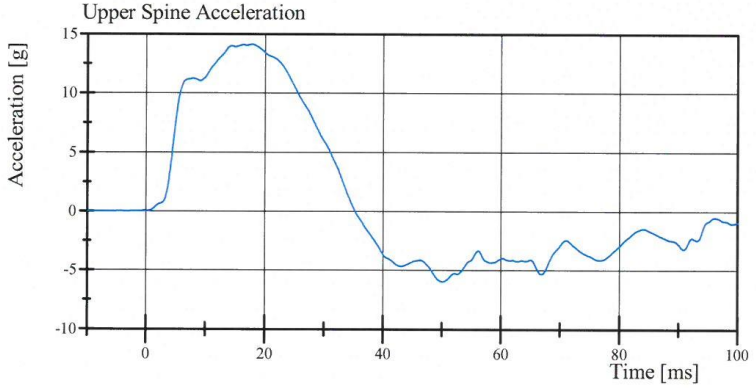
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Probe Acceleration



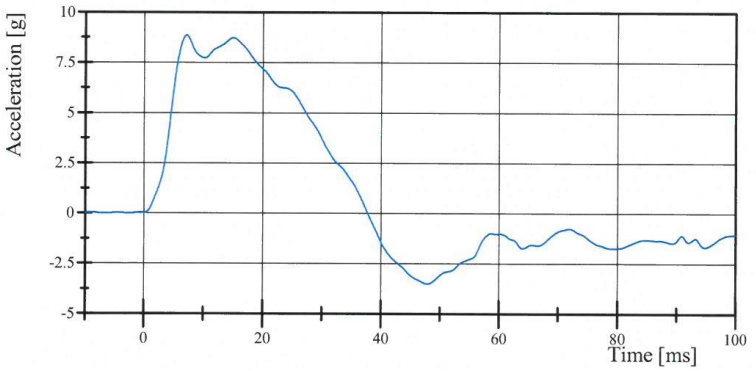
Filter Class: CFC_180
Max: 0.2 g at 54.8 ms
Min: -16.6 g at 19.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.1 g at 17.8 ms
Min: -5.9 g at 50.1 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 8.9 g at 7.1 ms
Min: -3.5 g at 47.9 ms

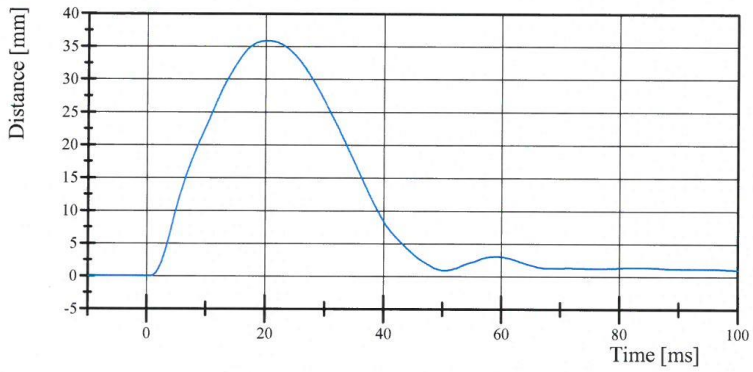
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 09:30:51 834

Transportation Research Center Inc.

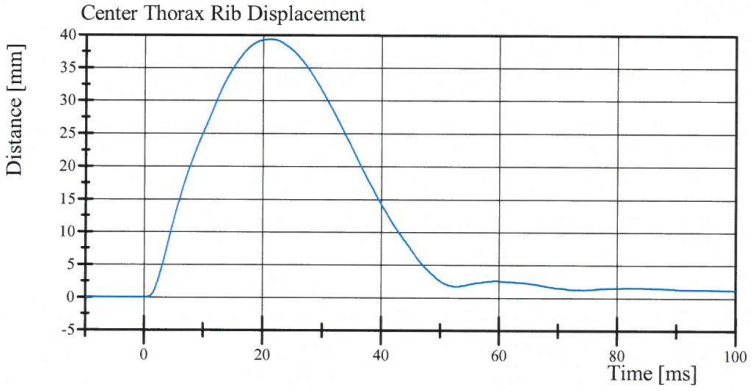
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Upper Thorax Rib Displacement



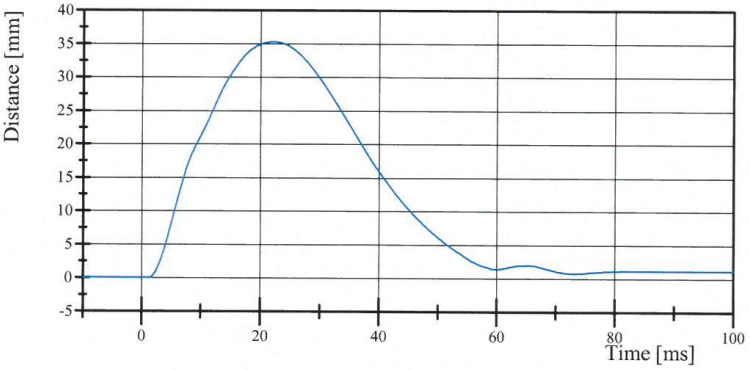
Filter Class: CFC_600
Max: 35.8 mm at 20.2 ms
Min: -0.0 mm at 0.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.4 mm at 21.0 ms
Min: -0.0 mm at -5.7 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 35.3 mm at 22.2 ms
Min: -0.0 mm at 1.2 ms

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

12.01.2015 09:30:52 834

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	45.5 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.4 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.22 g	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

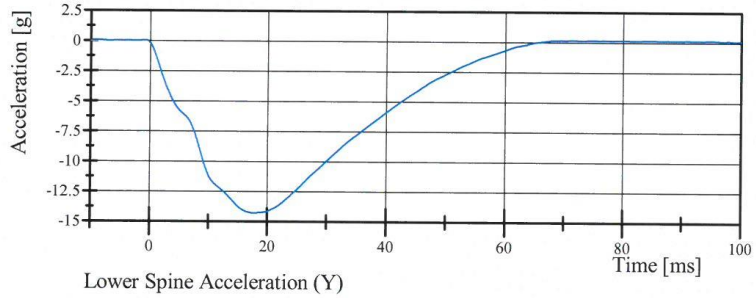
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 09:47:57 681

Transportation Research Center Inc.

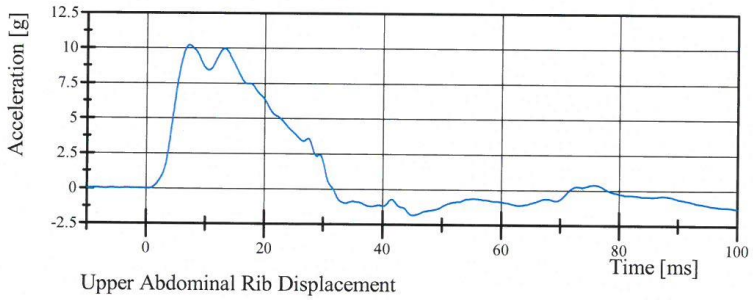
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Probe Acceleration



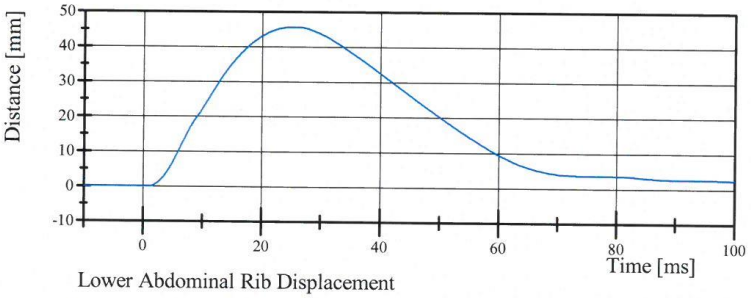
Filter Class: CFC_180
Max: 0.2 g at 79.8 ms
Min: -14.3 g at 17.8 ms

Lower Spine Acceleration (Y)



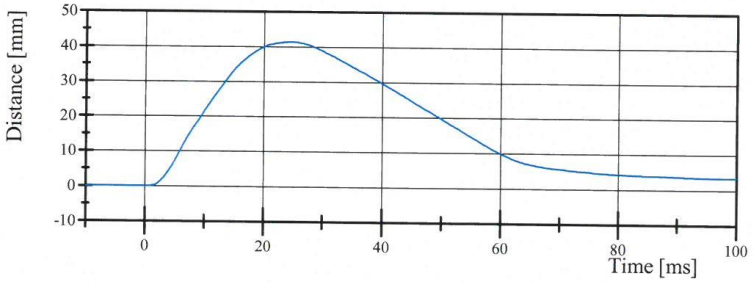
Filter Class: CFC_180
Max: 10.2 g at 7.1 ms
Min: -1.8 g at 45.0 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 45.5 mm at 25.0 ms
Min: -0.0 mm at 1.0 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.4 mm at 24.5 ms
Min: -0.0 mm at 0.6 ms

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

12.01.2015 09:48:05 681

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.64 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-46.32 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.6 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,289.7 N	Yes

Test meets specifications.

Comments:

Technician

Melissa Schenker

Approved

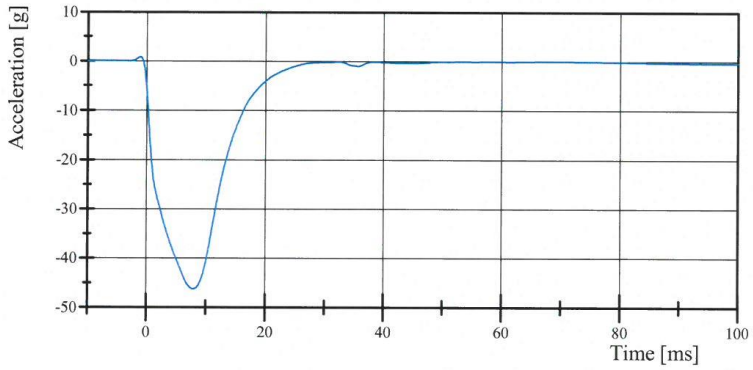
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 08:17:43 456

Transportation Research Center Inc.

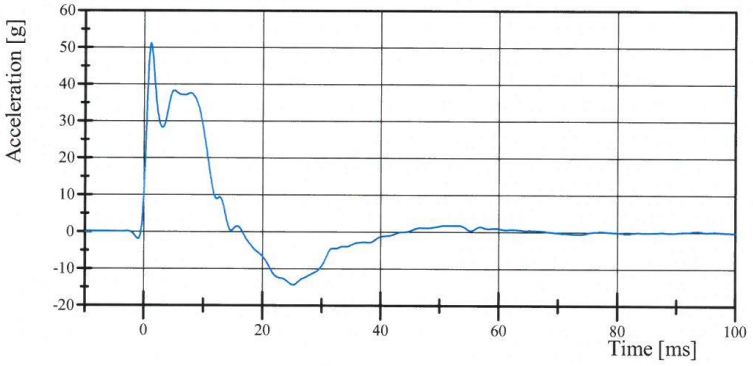
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Probe Acceleration



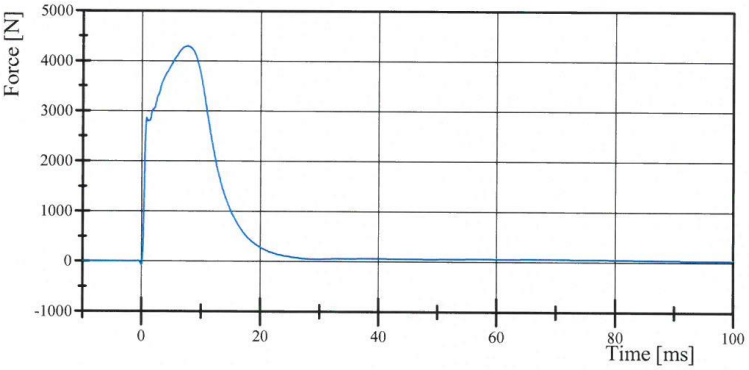
Filter Class: CFC_180
Max: 0.7 g at -1.0 ms
Min: -46.3 g at 7.9 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 51.2 g at 1.2 ms
Min: -14.4 g at 25.2 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,289.7 N at 7.6 ms
Min: -69.4 N at 0.0 ms

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

12.01.2015 08:17:51 456

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-40.9 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	30.6 g	Yes
Iliac Force	4,100 - 5,100 N	4,481.5 N	Yes

Test meets specifications.

Comments:

Technician

Melissa Schenker

Approved

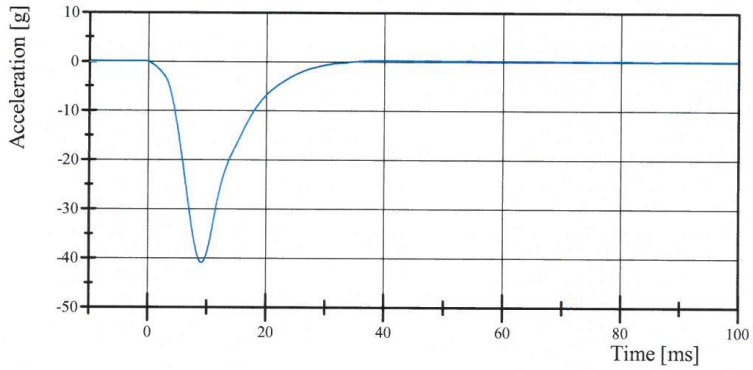
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

12.01.2015 10:55:43 648

Transportation Research Center Inc.

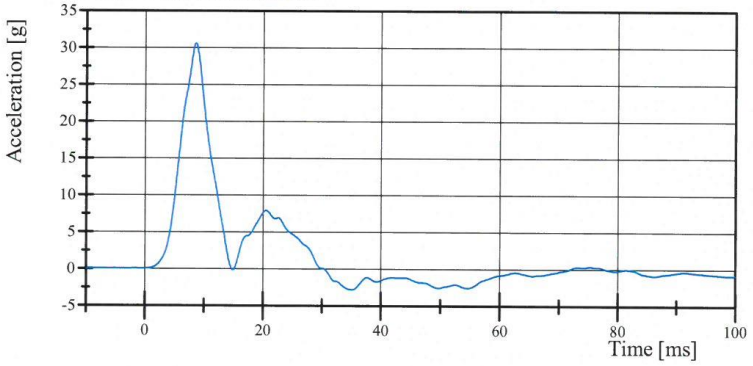
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 35-1
Test Date: 12/1/2015

Probe Acceleration



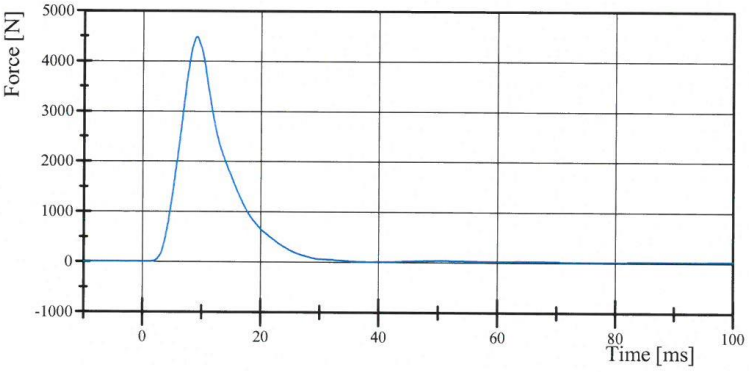
Filter Class: CFC_180
Max: 0.2 g at 43.3 ms
Min: -40.9 g at 9.1 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 30.6 g at 8.6 ms
Min: -2.8 g at 35.0 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,481.5 N at 9.1 ms
Min: -1.1 N at -8.8 ms

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

12.01.2015 10:55:52 648

Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.36

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	525	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	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. 36-1
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	120.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	7.3 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

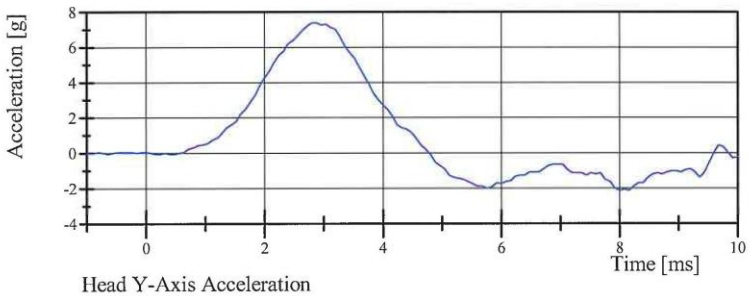
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 08:28:25 231

Transportation Research Center Inc.

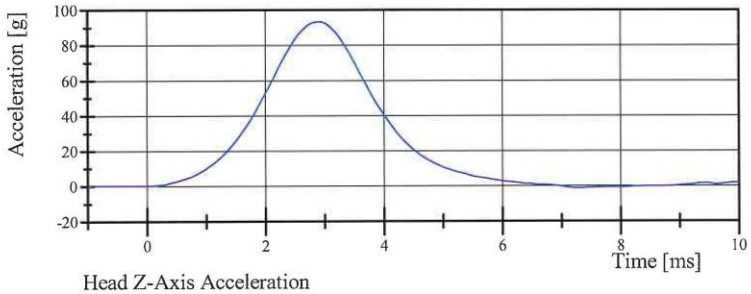
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Head X-Axis Acceleration



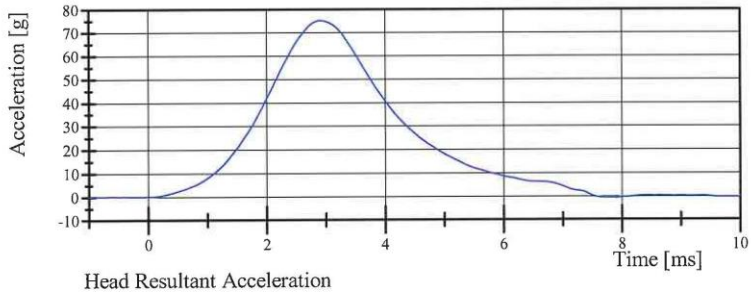
Filter Class: CFC_1000
Max: 7.3 g at 2.8 ms
Min: -2.1 g at 8.0 ms

Head Y-Axis Acceleration



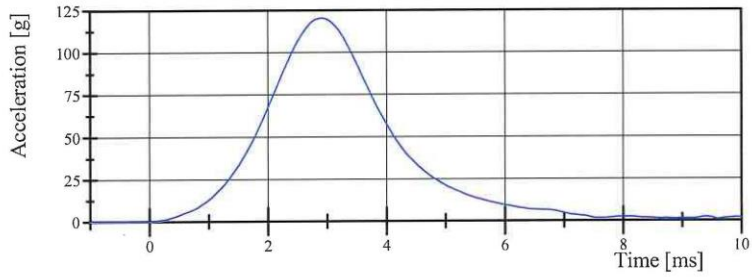
Filter Class: CFC_1000
Max: 93.5 g at 2.9 ms
Min: -1.2 g at 7.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 75.2 g at 2.9 ms
Min: -0.5 g at 7.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 120.2 g at 2.9 ms
Min: 0.0 g at -0.2 ms

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

01.16.2016 08:28:37 231

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 36-2
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.609 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.757 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.952 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.221 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.869 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.871 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-73.6 deg	Yes
Time of Peak	50 - 70 ms	63.8 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	119.5 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

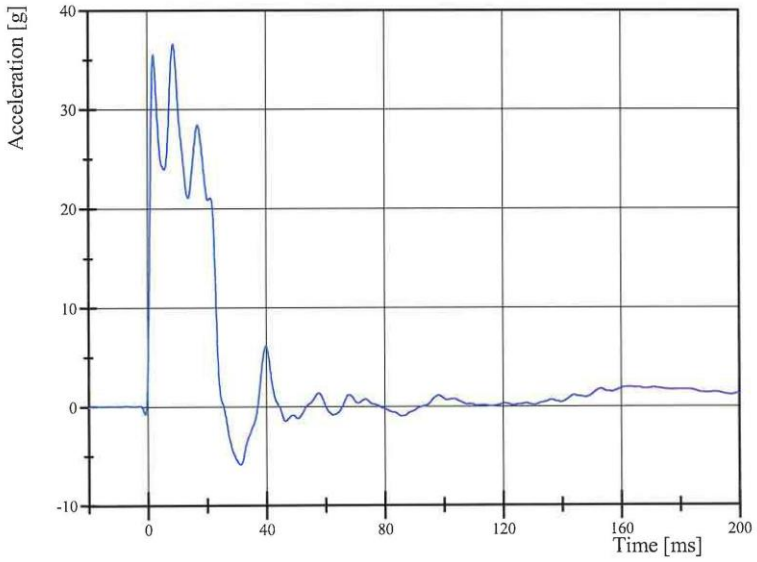
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:05:05 642

Transportation Research Center Inc.

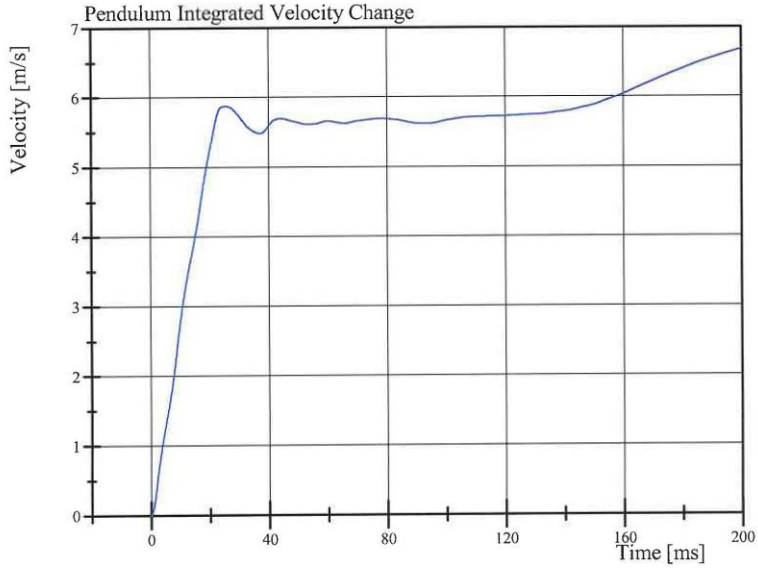
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 36-2
Test Date: 1/16/2016

Pendulum Acceleration



Filter Class: CFC_180
Max: 36.5 g at 8.7 ms
Min: -5.9 g at 31.2 ms

Pendulum Integrated Velocity Change



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

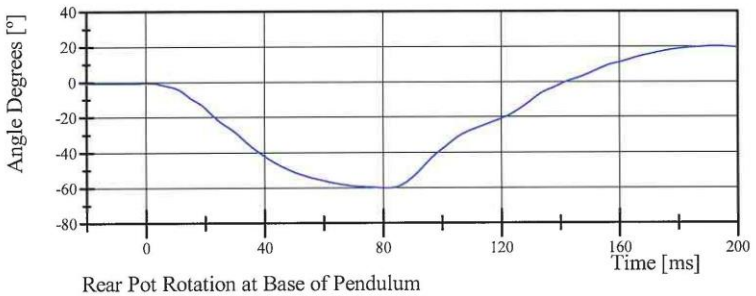
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:05:19 642

Transportation Research Center Inc.

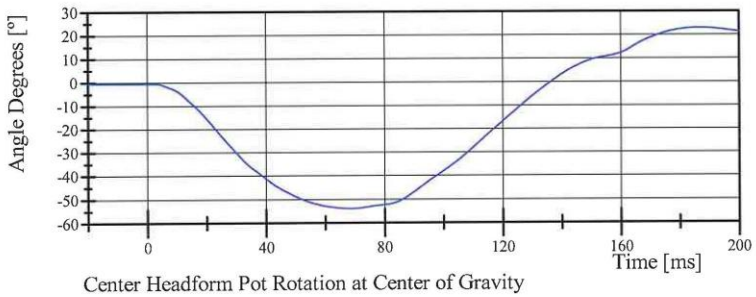
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 36-2
Test Date: 1/16/2016

Forward Pot Rotation at Base of Pendulum



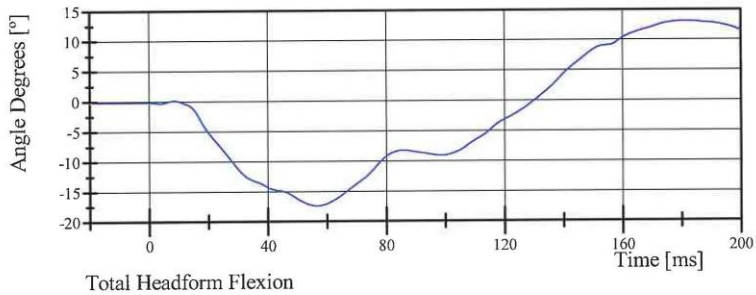
Filter Class: CFC_60
Max: 20.3 ° at 192.3 ms
Min: -60.3 ° at 81.2 ms

Rear Pot Rotation at Base of Pendulum



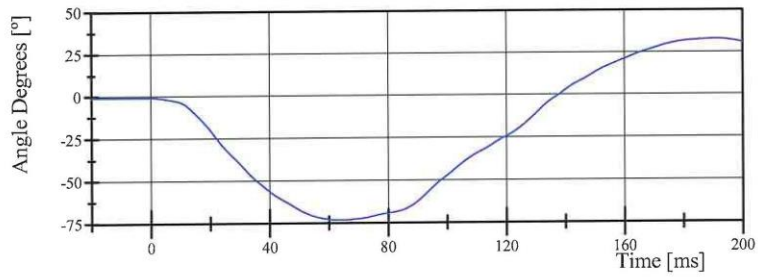
Filter Class: CFC_60
Max: 23.1 ° at 186.6 ms
Min: -54.0 ° at 68.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.1 ° at 180.7 ms
Min: -17.4 ° at 56.6 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 33.0 ° at 190.9 ms
Min: -73.6 ° at 63.8 ms

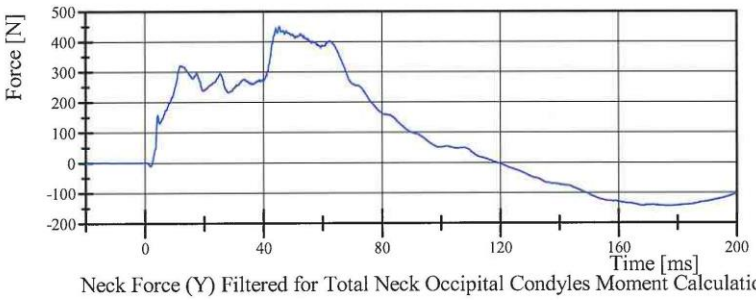
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:05:20 642

Transportation Research Center Inc.

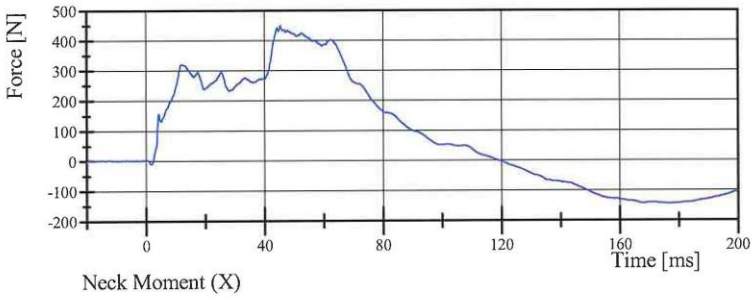
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 36-2
Test Date: 1/16/2016

Neck Force (Y)



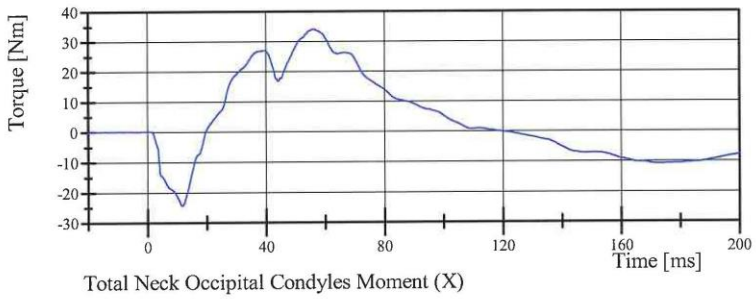
Filter Class: CFC_1000
Max: 449.7 N at 45.5 ms
Min: -144.3 N at 176.2 ms

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



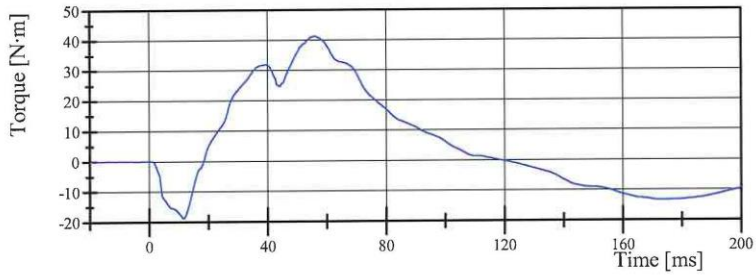
Filter Class: CFC_600
Max: 449.3 N at 45.4 ms
Min: -143.7 N at 176.2 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.2 Nm at 56.2 ms
Min: -24.6 Nm at 11.8 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constai
Max: 41.3 N·m at 56.1 ms
Min: -19.0 N·m at 11.7 ms

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

01.16.2016 10:05:21 642

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-17.9 g	Yes
Shoulder Displacement	28 - 37 mm	30.1 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	21.0 g	Yes

Test meets specifications.

Comments:

Technician

Approved

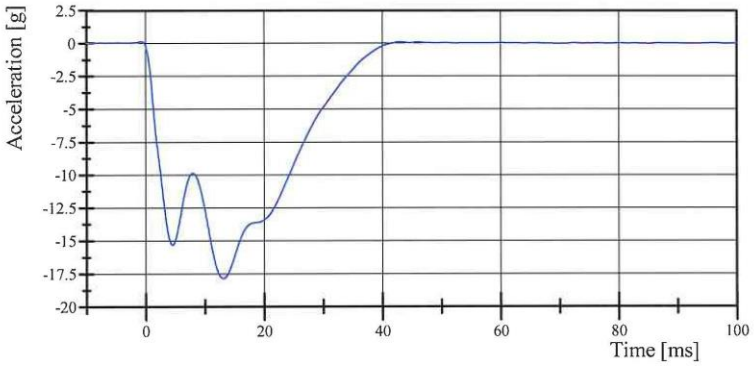
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:34:27 854

Transportation Research Center Inc.

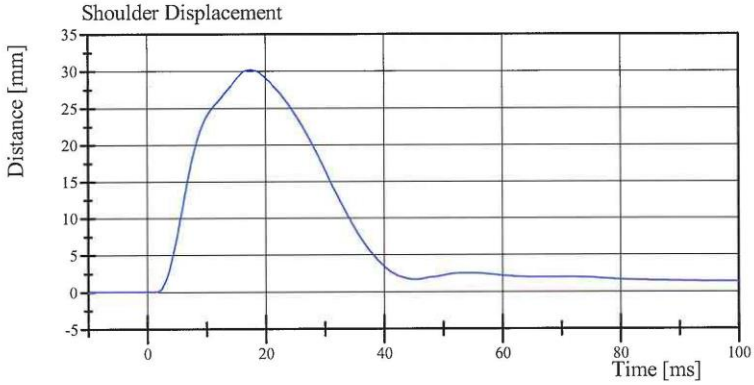
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Probe Acceleration



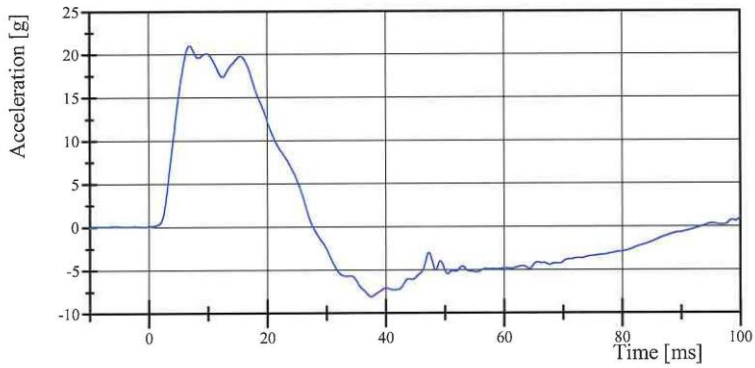
Filter Class: CFC_180
Max: 0.1 g at -0.7 ms
Min: -17.9 g at 13.1 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 30.1 mm at 17.5 ms
Min: -0.0 mm at -1.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 21.0 g at 7.0 ms
Min: -8.1 g at 37.5 ms

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

01.16.2016 10:34:42 854

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 36-5
Test Date: 1/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	11 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.741 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.3 g	Yes
Shoulder Displacement	31 - 40 mm	31.9 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	25.6 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.4 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	35.2 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	40.1 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.0 g	Yes

Test meets specifications.

Comments:

Technician

Approved

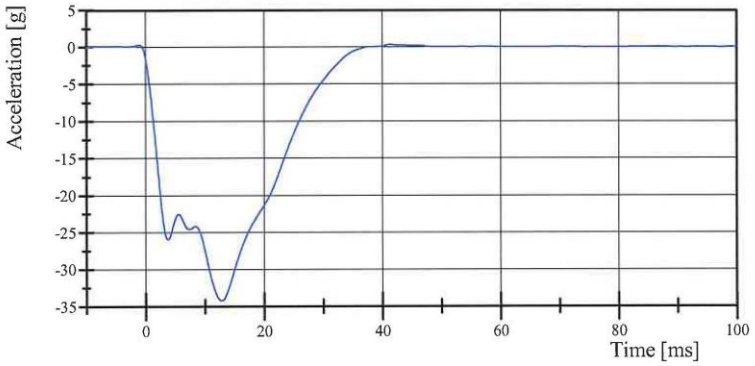
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.18.2016 08:19:49 618

Transportation Research Center Inc.

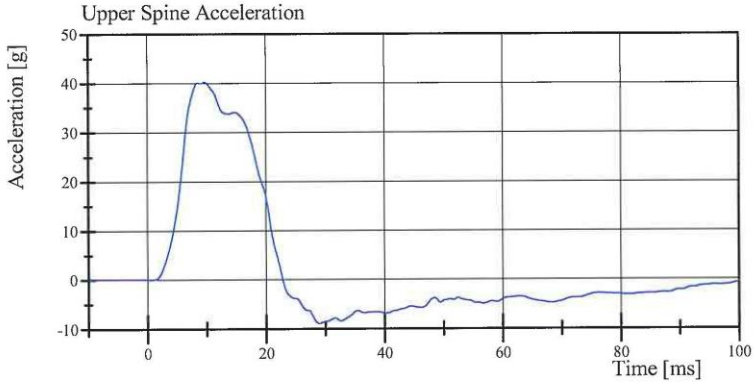
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 36-5
Test Date: 1/18/2016

Probe Acceleration



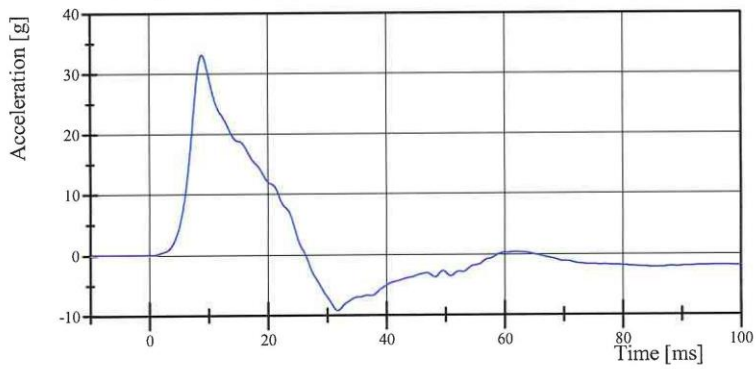
Filter Class: CFC_180
Max: 0.3 g at 41.4 ms
Min: -34.3 g at 12.8 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 40.1 g at 9.7 ms
Min: -9.0 g at 29.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 33.0 g at 8.9 ms
Min: -9.3 g at 31.8 ms

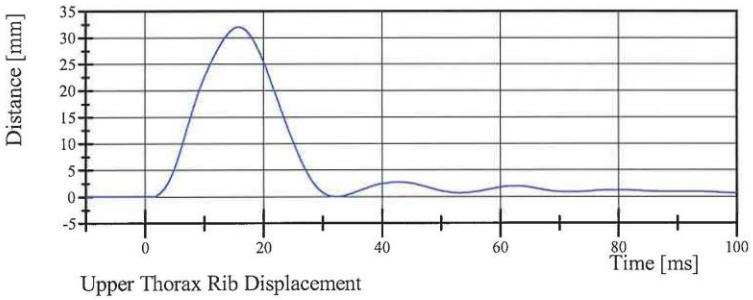
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.18.2016 08:20:03 618

Transportation Research Center Inc.

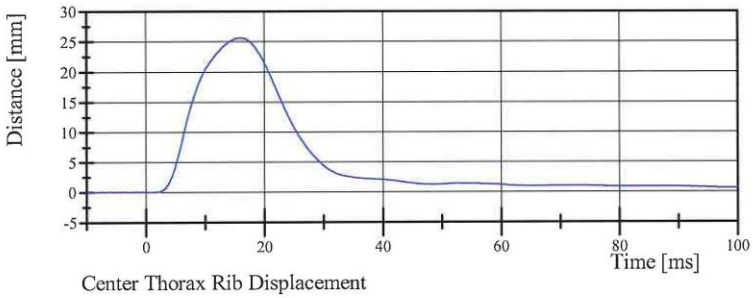
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 36-5
Test Date: 1/18/2016

Shoulder Rib Displacement



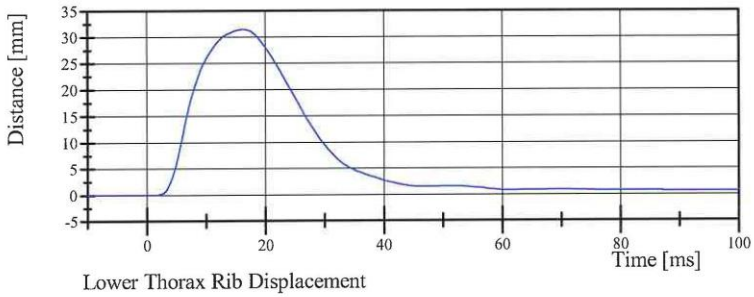
Filter Class: CFC_600
Max: 31.9 mm at 15.8 ms
Min: -0.0 mm at 1.1 ms

Upper Thorax Rib Displacement



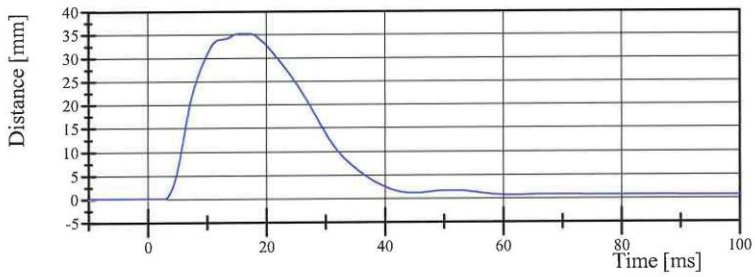
Filter Class: CFC_600
Max: 25.6 mm at 16.0 ms
Min: -0.0 mm at -8.3 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.4 mm at 16.2 ms
Min: -0.0 mm at -9.1 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 35.2 mm at 16.6 ms
Min: -0.0 mm at 2.7 ms

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

01.18.2016 08:20:04 618

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.337 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-17.5 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.4 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.3 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.8 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.9 g	Yes

Test meets specifications.

Comments:

Technician

Approved

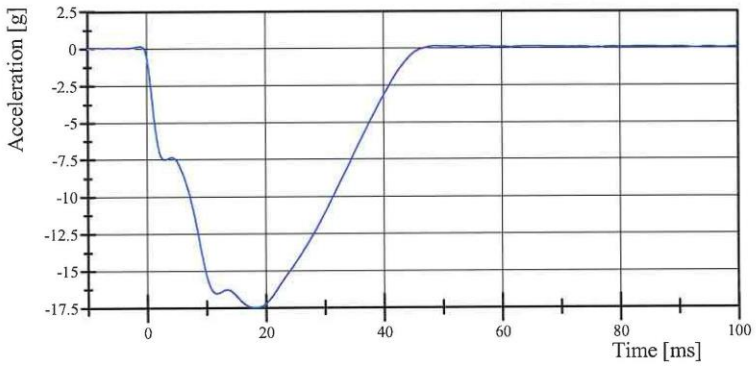
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 11:27:57 837

Transportation Research Center Inc.

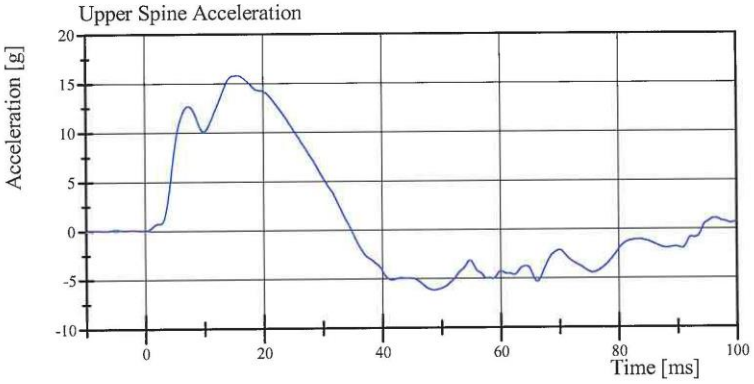
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Probe Acceleration



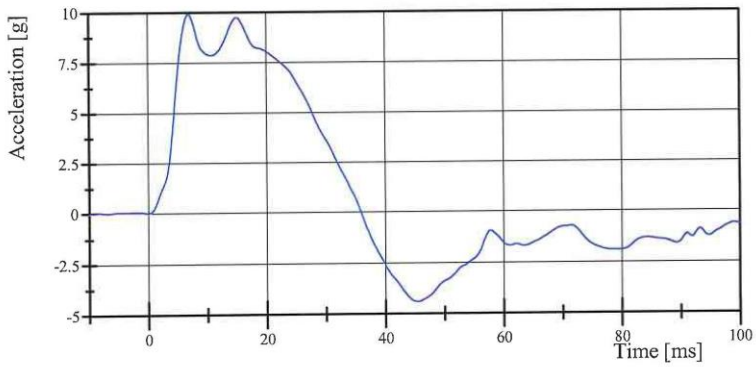
Filter Class: CFC_180
Max: 0.1 g at 57.2 ms
Min: -17.5 g at 18.2 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.8 g at 15.8 ms
Min: -6.2 g at 48.6 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.9 g at 6.9 ms
Min: -4.4 g at 45.4 ms

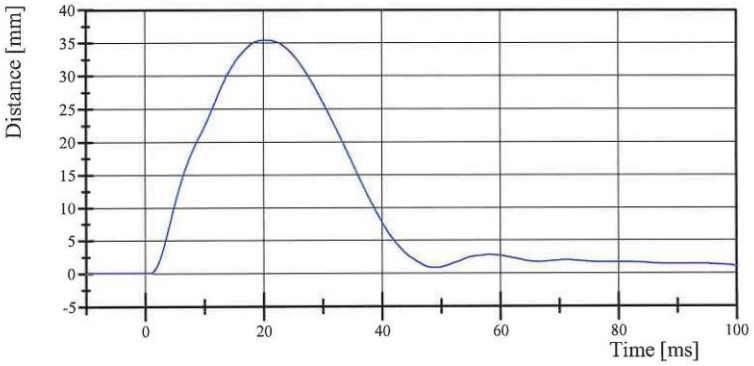
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 11:28:10 837

Transportation Research Center Inc.

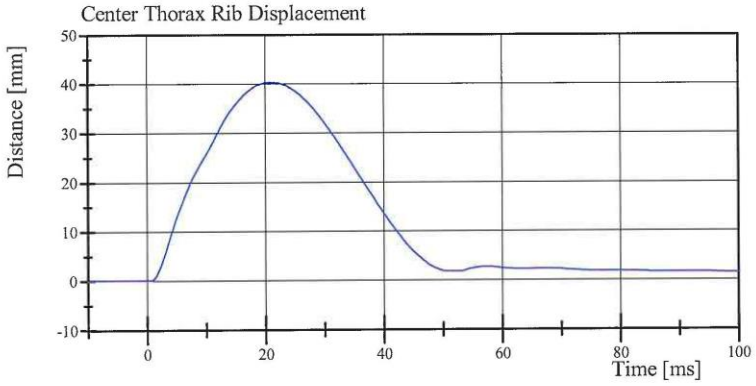
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Upper Thorax Rib Displacement



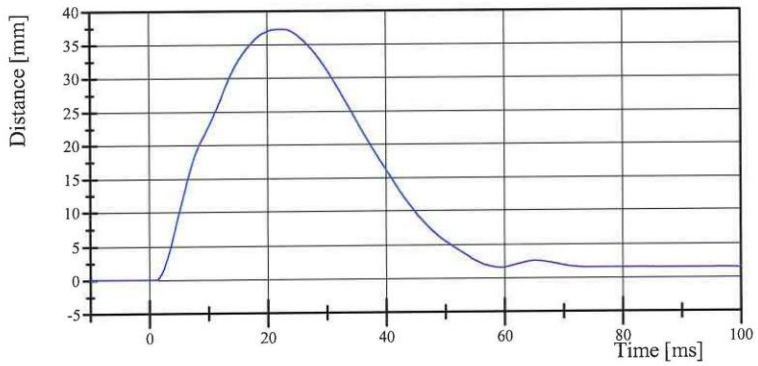
Filter Class: CFC_600
Max: 35.4 mm at 20.4 ms
Min: -0.0 mm at -5.4 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.3 mm at 21.0 ms
Min: -0.0 mm at 0.5 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.2 mm at 22.2 ms
Min: -0.0 mm at 1.0 ms

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

01.16.2016 11:28:11 837

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-15.0 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.0 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.36 g	Yes

Test meets specifications.

Comments:

Technician

Approved

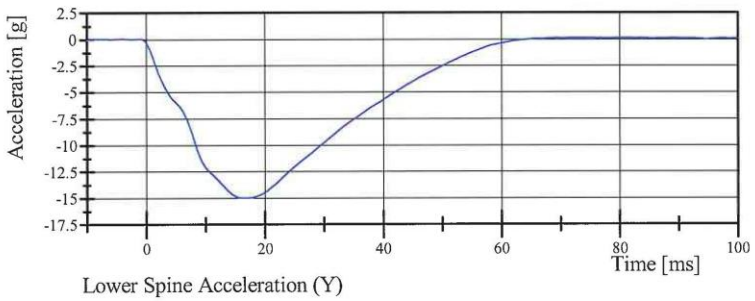
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:49:50 678

Transportation Research Center Inc.

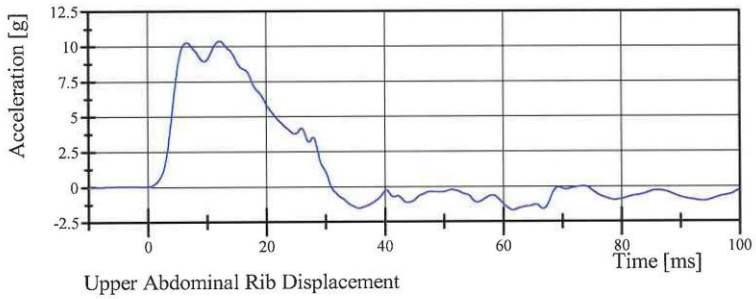
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Probe Acceleration



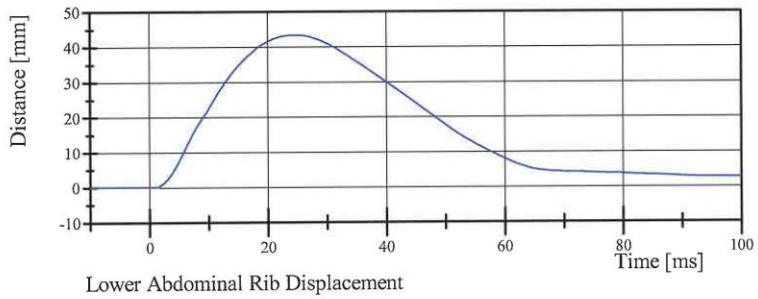
Filter Class: CFC_180
Max: 0.1 g at 72.0 ms
Min: -15.0 g at 16.3 ms

Lower Spine Acceleration (Y)



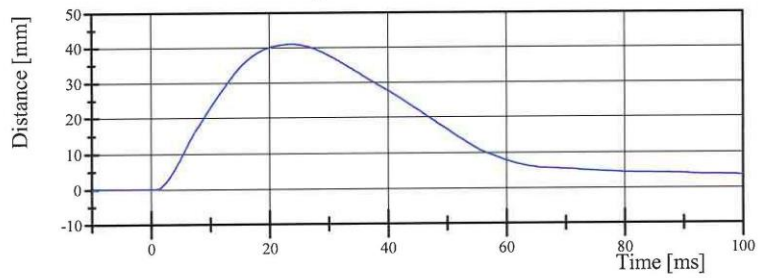
Filter Class: CFC_180
Max: 10.4 g at 12.2 ms
Min: -1.7 g at 61.6 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 43.3 mm at 24.3 ms
Min: -0.0 mm at 1.1 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.0 mm at 23.6 ms
Min: -0.0 mm at 0.6 ms

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

01.16.2016 10:50:04 678

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 36-4
Test Date: 1/19/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	21 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-43.29 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	39.5 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,222.8 N	Yes

Test meets specifications.

Comments:

Technician

Approved

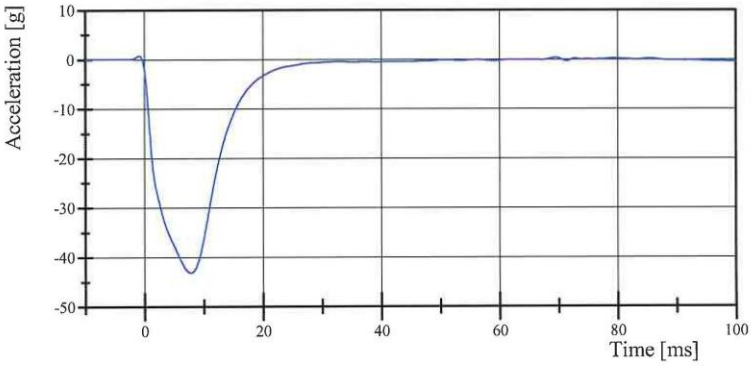
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.19.2016 16:24:29 469

Transportation Research Center Inc.

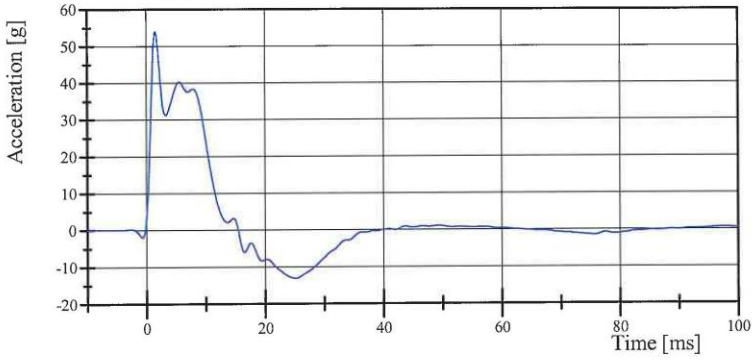
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 36-4
Test Date: 1/19/2016

Probe Acceleration



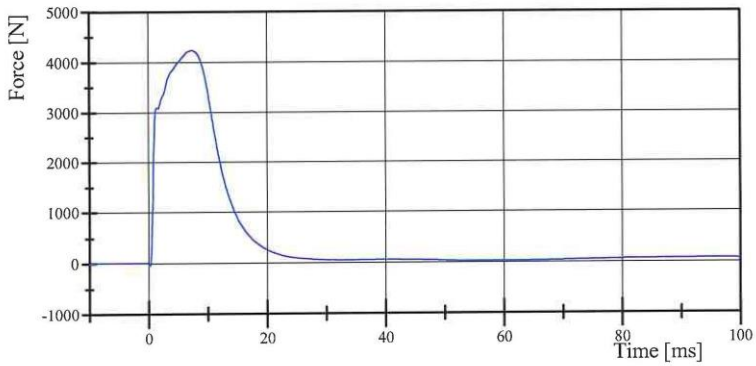
Filter Class: CFC_180
Max: 0.6 g at -0.9 ms
Min: -43.3 g at 7.8 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 54.1 g at 1.5 ms
Min: -13.2 g at 25.1 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,222.8 N at 7.4 ms
Min: -50.5 N at 0.2 ms

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

01.19.2016 16:24:48 469

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-43.4 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	32.2 g	Yes
Iliac Force	4,100 - 5,100 N	4,794.8 N	Yes

Test meets specifications.

Comments:

Technician

Approved

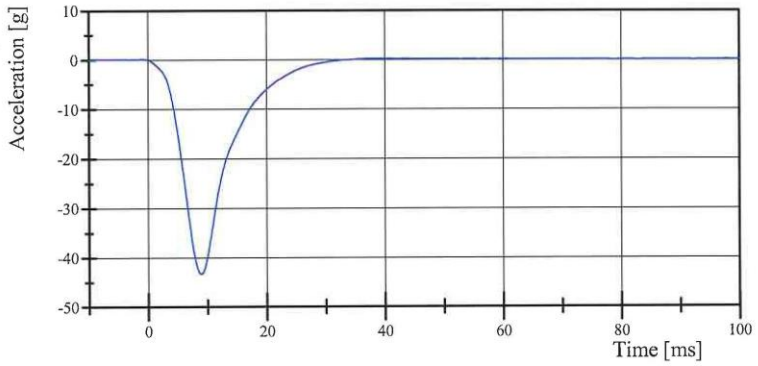
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:11:10 690

Transportation Research Center Inc.

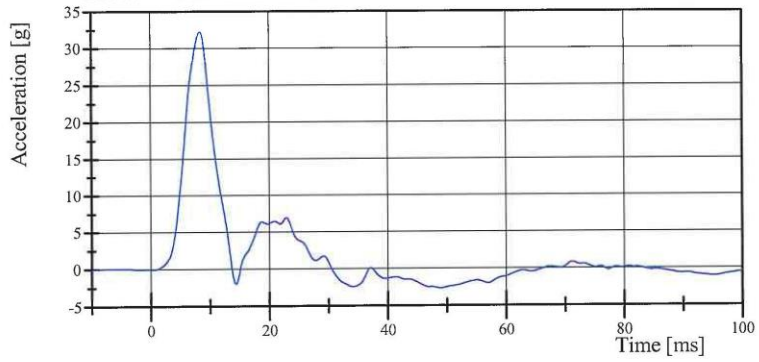
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Probe Acceleration



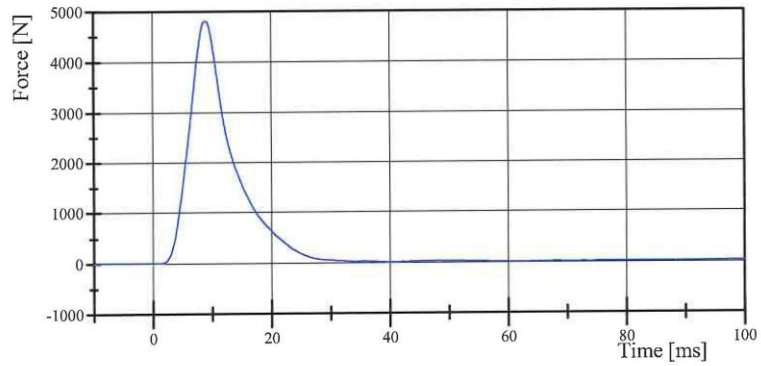
Filter Class: CFC_180
Max: 0.2 g at 38.1 ms
Min: -43.4 g at 9.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 32.2 g at 8.4 ms
Min: -2.7 g at 49.0 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,794.8 N at 9.0 ms
Min: -0.7 N at -9.4 ms

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

01.16.2016 10:11:37 690

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	29-Sep-15
		Y	P51702	Endevco	29-Sep-15
		Z	P52083	Endevco	29-Sep-15
Redundant Head Accelerometers		X	P49190	Endevco	29-Sep-15
		Y	P52044	Endevco	29-Sep-15
		Z	P51717	Endevco	29-Sep-15
Thoracic Rib Displacement Potentiometers	Upper	Y	111	FTSS	29-Sep-15
	Middle	Y	174	FTSS	29-Sep-15
	Lower	Y	173	FTSS	29-Sep-15
Abdomen Load Cells	Front	Y	1441	Denton	7-Apr-15
	Middle	Y	1436	Denton	7-Apr-15
	Rear	Y	1437	Denton	7-Apr-15
Lower Spine Accelerometers (T12)		X	P90853	Endevco	5-Jan-16
		Y	P90296	Endevco	5-Jan-16
		Z	P88531	Endevco	7-Aug -15
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	7-Apr-15

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers			X	P51719	Endevco	1-Oct-15
			Y	P51272	Endevco	1-Oct-15
			Z	P58862	Endevco	1-Oct-15
Redundant Head Accelerometers			X	P80926	Endevco	1-Oct-15
			Y	P50073	Endevco	1-Oct-15
			Z	P52098	Endevco	1-Oct-15
Displacement Potentiometers	Shoulder		Y	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	1-Oct-15
		Middle	Y	1161	Servo	1-Oct-15
		Lower	Y	037	Servo	1-Oct-15
	Abdominal Rib	Upper	Y	1295	Servo	1-Oct-15
		Lower	Y	1136	Servo	1-Oct-15
Lower Spine Accelerometers (T12)			X	P50068	Endevco	1-Oct-15
			Y	P52051	Endevco	1-Oct-15
			Z	P51710	Endevco	1-Oct-15
Acetabulum Load Cell			Y	D14283-FY	FTSS	1-Oct-15
Iliac Wing Load Cell			Y	287-FY	Denton	1-Oct-15
Pelvis Plug (struck side)				71036	Humanetics	13-Dec-13
Pelvis Plug (non-struck side)				36473	Humanetics	23-Sep-10

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P81659	Endevco	6-Jan-16
	Vehicle Center of Gravity	Y	P85580	Endevco	6-Jan-16
	Vehicle Center of Gravity	Z	P87162	Endevco	6-Jan-16
2	Right Sill at Front Seat	X	P47512	Endevco	21-Oct-15
	Right Sill at Front Seat	Y	P49313	Endevco	21-Oct-15
	Right Sill at Front Seat	Z	P41252	Endevco	21-Oct-15
3	Right Sill at Rear Seat	X	P81542	Endevco	7-Dec-15
	Right Sill at Rear Seat	Y	P34103	Endevco	7-Dec-15
	Right Sill at Rear Seat	Z	P81543	Endevco	13-Mar-15
4	Left Sill at Front Door	Y	P91089	Endevco	12-Oct-15
5	Left Sill at Rear Door	Y	P88032	Endevco	10-Jul-15
6	Left A-Post Lower	Y	P75519	Endevco	21-Oct-15
7	Left A-Post Middle	Y	P88424	Endevco	21-Oct-15
8	Left B-Post Lower	Y	P61350	Endevco	15-Oct-15
9	B-Post Middle	Y	P88543	Endevco	7-Aug-15
10	Front Seat Track	Y	P46069	Endevco	2-Nov-15
11	Rear Seat Track or Structure	Y	P81064	Endevco	17-Dec-15
12	Right Rear Occupant Compartment	Y	P25261	Endevco	17-Dec-15
13	Engine Block	X	P70050	Endevco	14-Oct-15
	Engine Block	Y	P88541	Endevco	7-Aug-15
14	Rear Floorpan Above Axle	X	P87155	Endevco	30-Nov-15
	Rear Floorpan Above Axle	Y	P25069	Endevco	30-Nov-15
	Rear Floorpan Above Axle	Z	P87173	Endevco	30-Nov-15

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P88466	Endevco	6-Jan-16
MDB Center of Gravity	Y	P58759	Endevco	6-Jan-16
MDB Center of Gravity	Z	P49020	Endevco	6-Jan-16
Left Frame Rail at Rear Axle Centerline	X	P87095	Endevco	2-Nov-15
Left Frame Rail at Rear Axle Centerline	Y	P50473	Endevco	21-Oct-15