DRAFT REPORT NUMBER: SPNCAP-TRC-16-002

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

Ford Motor Company
2016 F250 SuperCab Pickup Truck
NHTSA NUMBER: M20160203

PREPARED BY:
Transportation Research Center Inc.
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East Liberty, OH 43319

Report Date: December 3, 2015

FINAL REPORT

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

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Report Approved By: Melinda Lackey

Melinda Lackey, Project Manager

Approval Date: December 3, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

FINAL REPORT ACCEPTANCE BY OCWS:

COTR, New Car Assessment Program
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Date: _____

Technical Report Documentation Page

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15. Supplemental Notes		

16. Abstract

A 32.2 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject vehicle, a 2016 Ford F-250 SuperCab Pickup Truck, in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on October 22, 2015.

The impact velocity was 32.28 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 21° C. The test vehicle's post-test maximum crush was 683 mm at Level 5.

The test or target vehicle's performance is given below:

	Unit	Threshold	Front SID-IIs
Head Injury Criteria (HIC_{36}):	NA	1000	726
Resultant Lower Spine Acceleration:	g's	82	61.6
Total Pelvic Force: (sum of acetabular and iliac forces)	N	5525	4136.9
Maximum Thoracic Rib Deflection	mm	38	35.3
Maximum Abdomen Rib Deflection	mm	45	35.9

The door struck by the pole 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 Pole Part 572V 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 Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

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SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY16 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 F-250 SuperCab Pickup Truck manufactured by Ford Motor Company. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated September 2013.

SECTION 2
SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a model year 2016 F-250 SuperCab Pickup Truck. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.28 km/h. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, OH, on October 22, 2015. Pre-test and post-test photographs of the test vehicle and the side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated September 2013. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

Head CG Triaxial Accelerometers
Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
Abdomen Upper and Lower Rib Displacement Potentiometers
Lower Spine (T12) Triaxial Accelerometers
Iliac Load Cell
Acetabulum Load Cell

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

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})	NA	1000	726
Lower Spine Acceleration Resultant	G	82	61.6
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4136.9
Maximum Thoracic Rib Deflection	mm	38*	35.3
Maximum Abdominal Rib Deflection	mm	45*	35.9

* 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		
Knee Airbag	No	N/A		
Curtain	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
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
Center Seat Airbag	No	N/A	No	N/A

GENERAL COMMENTS

None

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20160203
Model Year	2016
Make	Ford
Model	F-250
Body Style	Extended Cab Pickup Truck
VIN	1FT7X2A6XGEA62625
Body Color	Magnetic
Odometer Reading (km/mi)	10.7 mi
Engine Displacement (L)	6.2
Type/No. Cylinders	8
Engine Placement	Front/Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	Yes
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	No
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 Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. 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 Manufacturer	08/15
Vehicle Type	Truck

GVWR (kg)	4536
GAWR Front (kg)	1928
GAWR Rear (kg)	2812

VEHICLE SEATING AND WEIGHT CAPACITY DATA

	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	N/A	5
Vehicle Capacity Weight (VCW) (kg)				1561.0
DSC X 68.04 kg				340.2
Rated Cargo and Luggage Weight (RCLW) (kg)[1]				1220.8

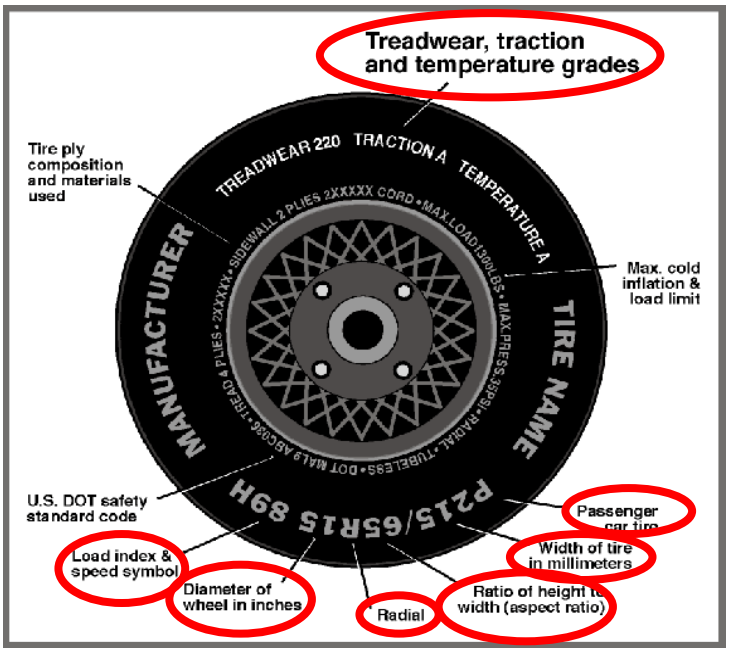
VEHICLE SEAT TYPE

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] RCLW is limited to 136.0 kg

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

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Cold Pressure (kPa)	420	480
Recommended Tire Size	LT275/65R18	LT275/65R18
Tire Size on Vehicle	LT275/65R18	LT275/65R18
Tire Manufacturer	Continental	Continental
Tire Model	Contitrac	Contitrac
Treadwear	N/A	N/A
Traction	N/A	N/A
Temperature Grades	N/A	N/A
Tire Plies Sidewall	2	2
Tire Plies Body	6	6
Load Index/Speed Symbol	123/120 S	123/120 S
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	A3B9 HOOR 3315	A3B9 HOOR 3315
DOT Safety Code Right	A3B9 HOOR 3315	A3B9 HOOR 3315

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

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	379	379	365	365
Tire Placard	kPa	420	420	520	520
Owner's Manual	kPa	N/A	N/A	N/A	N/A
As Tested	kPa	420	420	520	520

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	806.4	667.4		828.0	748.4		846.0	750.8	
Right	kg	818.4	621.2		808.8	707.2		816.2	685.4	
Ratio	%	55.8	44.2		52.9	47.1		53.6	46.4	
Totals	kg	1624.8	1288.6	2913.4	1636.8	1455.6	3092.4	1662.2	1436.2	3098.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2913.4	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	49.0	(B)
Rated Cargo/Luggage Weight (RCLW) [1]	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	3098.4	(A+B+C)

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plate mounted in bed.	80.3
Components removed: None	0.0

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	Deg.	-0.8	-0.8	-0.7	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg.	-0.4	-0.4	-0.2	Yes
Front Bumper-Line Angle (left-to-right)**	Deg.	0.0	-0.3	-0.4	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg.	-0.6	-0.6	-0.7	Yes
Vehicle CG (Aft of Front Axle)	mm	1601	1704	1678	
Vehicle CG (Left (+) / Right (-) from longitudinal Centerline)	mm	+10	+17	+26	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)
*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for "Meets Requirements".

[1] RCLW limited to 136.0 kg

DATA SHEET NO. 2

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

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

SEAT POSITIONING

The driver seat, front center seat (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, 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	20.2	9.4	14.8
Front Passenger Seat	20.2	9.2	14.7
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	N/A
Non-Struck Side Rear Seat	Fixed	N/A	N/A
Rear Center Seat*	Fixed	N/A	N/A

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	14.8	405	Max	429	432	435
			Mid	398	402	405
			Min	368	371	374
Front Passenger Seat	14.7	386	Max	409	412	416
			Mid	379	383	386
			Min	350	353	357
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	9.2	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	7.7	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*	8.0	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 SYSTEMS DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

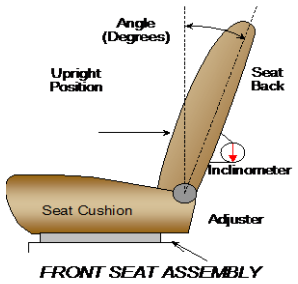
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	214	N/A	0	N/A
Front Passenger Seat	310	N/A	0	N/A
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 such that the dummy's head is level. 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 passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1. For the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match 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	61.5	N/A	14.4 rwd	N/A
Front Passenger Seat	61.7	N/A	14.4 rwd	N/A
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 BELT ANCHORAGE ADJUSTMENT

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

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

HEAD RESTRAINT ADJUSTMENT

Head restraints are 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, Lowermost

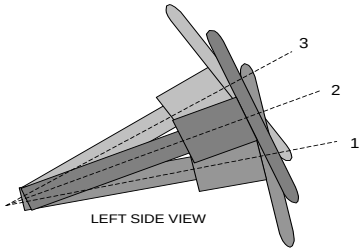
DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

STEERING COLUMN ADJUSTMENT

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

	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	67.0	324
Geometric Center, Position No. 2	65.05	324
Uppermost, Position No. 3	63.1	324
Telescoping Steering Wheel Travel		24
Test Position	65.0	312

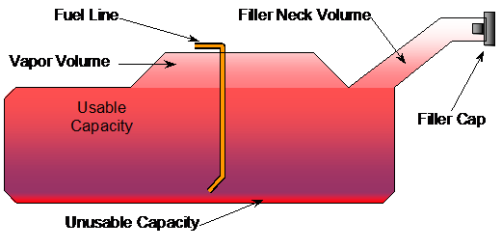


STEERING COLUMN ASSEMBLY

FUEL PUMP

Describe the fuel pump type, deta1LS about how it operates and the location of the fuel filler neck:

Fuel tank is located in front of the rear axle. Filler neck enters the right side of the tank. Cap is on right rear quarter panel. Fuel pump will run when engine is running. Also, it will run briefly when ignition key is turned to the "ON" position without starting the engine.



VEHICLE FUEL TANK ASSEMBLY

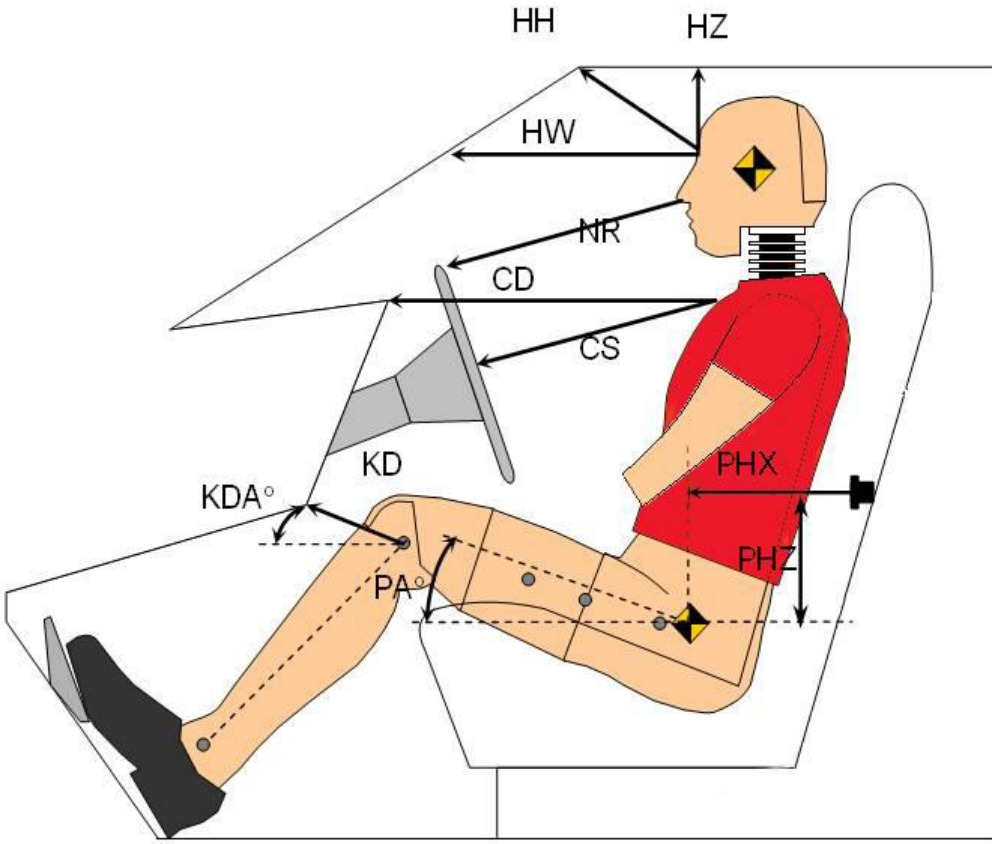
FUEL TANK CAPACITY

	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)	132.0
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	41.1

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

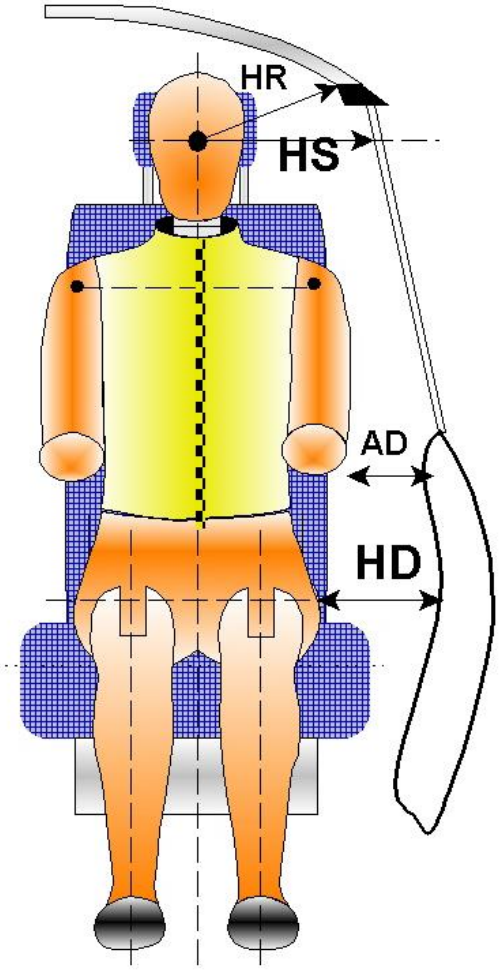
Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	390	
HW	Head to Windshield	599	
HZ	Head to Visor	238	
NR	Nose to Rim	299	
CD	Chest to Dashboard	482	
CS	Chest to Steering Wheel	244	
KDL/KDLA°	Left Knee to Dash	143	29
KDR/KDRA°	Right Knee to Dash	140	29
PAX°	Pelvic Tilt Angle (X-axis)		1.0
PAY°	Pelvic Tilt Angle (Y-axis)		25.3
PHX	Hip Point to Striker (X-Axis)	459 fwd	
PHZ	Hip Point to Striker (Z-Axis)	54 above	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

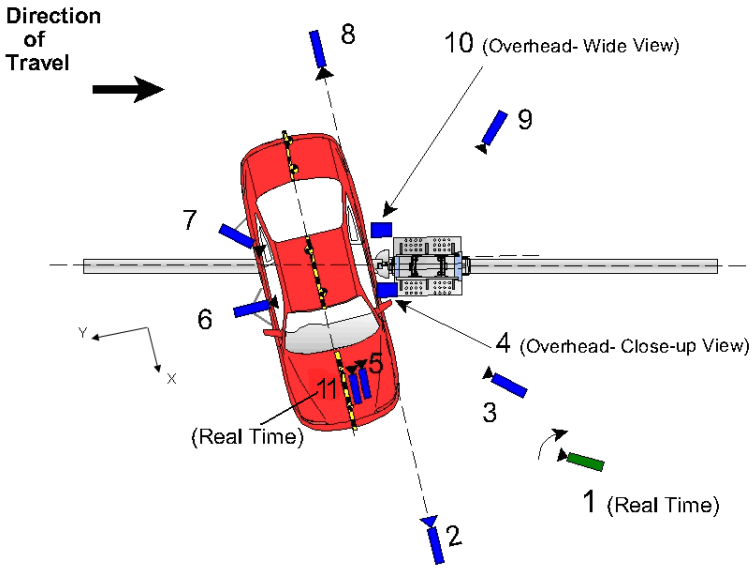
Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



Code	Measurement Description	Length (mm)
HR	Head to Side Header	271
HS	Head to Side Window	429
AD	Arm to Door	177
HD	Hip Point to Door	250

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



REFERENCE: (from point of impact for X and Y; from ground for Z)
+ X = Forward of vehicle, + Y = Right of vehicle, + Z = Down

Camera No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real time (24-30 fps) pan view of impact				Zoom	30
2	Front ground level – impact view	5454	300	-1631	20	1000
3	Impact side 45° – forward pole view	3423	-1124	-1473	20	1000
4	Overhead Close-up view of impact	-255	-120	-5706	Zoom	1000
5	Onboard – dummy front view				25	1000
6	Onboard – dummy side view				12.5	1000
7	Onboard – dummy rear oblique view				12.5	1000
8	Rear ground level – impact view	-6357	0	-1535	20	1000
9	Impact side 45° – rearward pole view	-4167	-2839	-1386	20	1000
10	Overhead wide view of impact	-350	150	-5706	8.5	1000
11	Real time dummy front view				Zoom	30

All measurements accurate to +/- 6 mm.

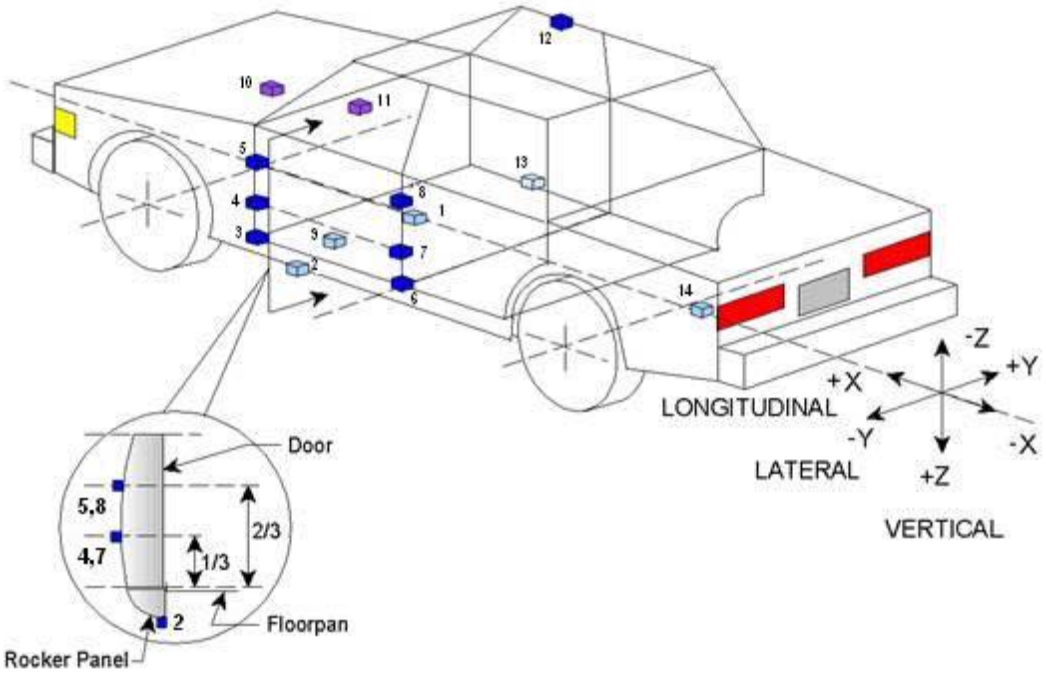
NOTE: Vehicle was at a 75° angle to the rigid pole.
If applicable, explain why camera(s) did not run: Not Applicable

INSTRUMENTATION

	Number of Channels
Driver Dummy	19
Vehicle Structure	18
Pole Load Cells	8
TOTAL	45

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



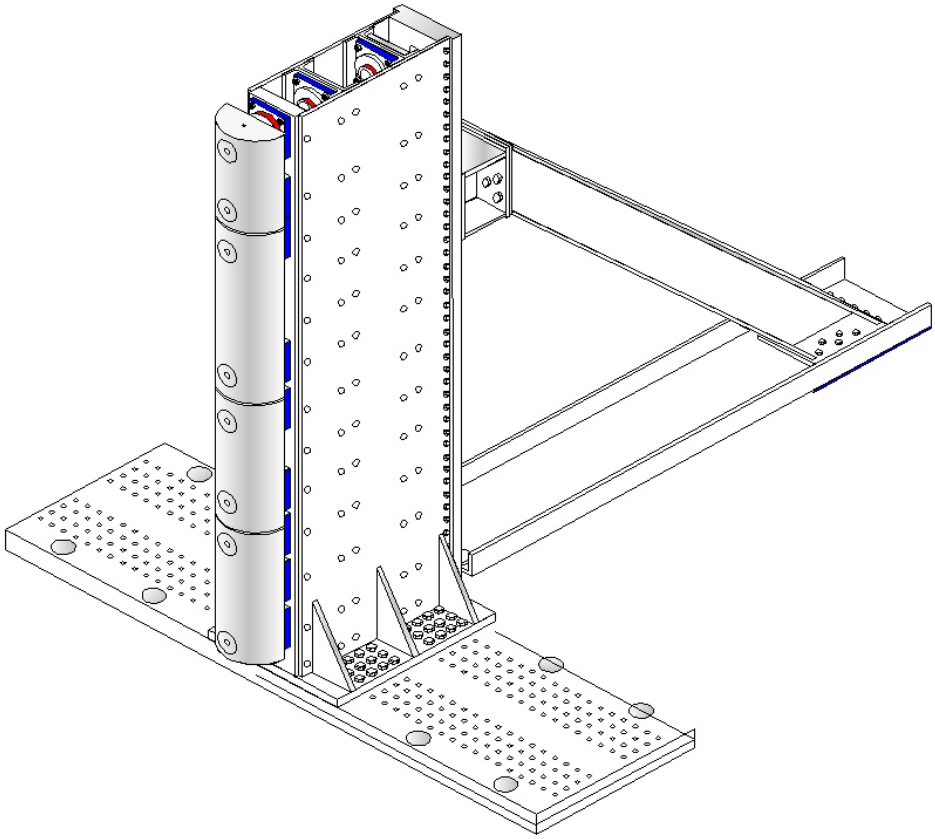
	Accelerometer/Sensor Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3893	198	-697
2	Left Floor Sill	3858	-704	-608
3	A-Pillar Sill	4028	-775	-543
4	A-Pillar Low	4223	-875	-762
5	A-Pillar Mid	4233	-875	-1130
6	B-Pillar Sill	3103	-735	-505
7	B-Pillar Low	3088	-865	-870
8	B-Pillar Mid	3088	-863	-1185
9	Driver Seat Track	3496	-690	-712
10	Engine Top	4903	290	-1089
11	Firewall	4703	0	-1275
12	Right Roof	3403	665	-1896
13	Right Floor Sill	3668	775	-560
14	Rear Floorpan	1205	0	-835

Reference: *X - Test Vehicle Rear Bumper (+ forward)*
Y - Test Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

FOIL 300K RIGID POLE



Load Cell Locations	
ID	**Height From Top of Carrier (mm)**
1	87
2	468
3	648
4	978
5	1168
6	1651
7	1816
8	2057

DATA SHEET NO. 8
POST TEST OBSERVATIONS

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	SCAB
Top of Head	SCAB
Left Side of Head	SCAB
Back of Head	None
Left Shoulder	Torso/Pelvis Airbag
Upper Torso	Torso/Pelvis Airbag
Lower Torso	Torso/Pelvis Airbag
Left Hip	Torso/Pelvis Airbag
Left Knee	Door Panel

POST TEST DOOR PERFORMANCE

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

* Indicate “Yes”, “No”, or “NA”.

POST-TEST SEAT PERFORMANCE

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

* Indicate “Yes”, “No”, or “NA”.

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	N/A no B-Pillar
Sill Separation	None Visible
Windshield Damage	Broken
Side Window Damage	Driver window shattered
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

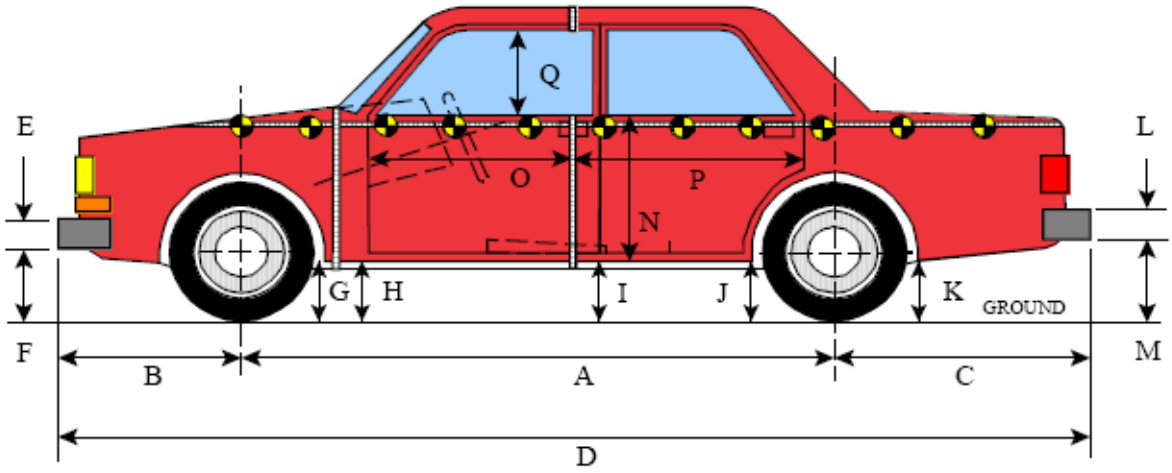
Restraint Type	Struck Side (Driver)		Struck Side (Rear Passenger)	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Knee Airbag	No	N/A		
Curtain	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	N/A	No	N/A
Center Seat Airbag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

VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1435
Actual Impact Point (Aft of Front Axle)	mm		1436
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 of Intended Impact point	-1
Angle Between Vehicle's Longitudinal Centerline and Line of Motion	degrees	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.28
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.24

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



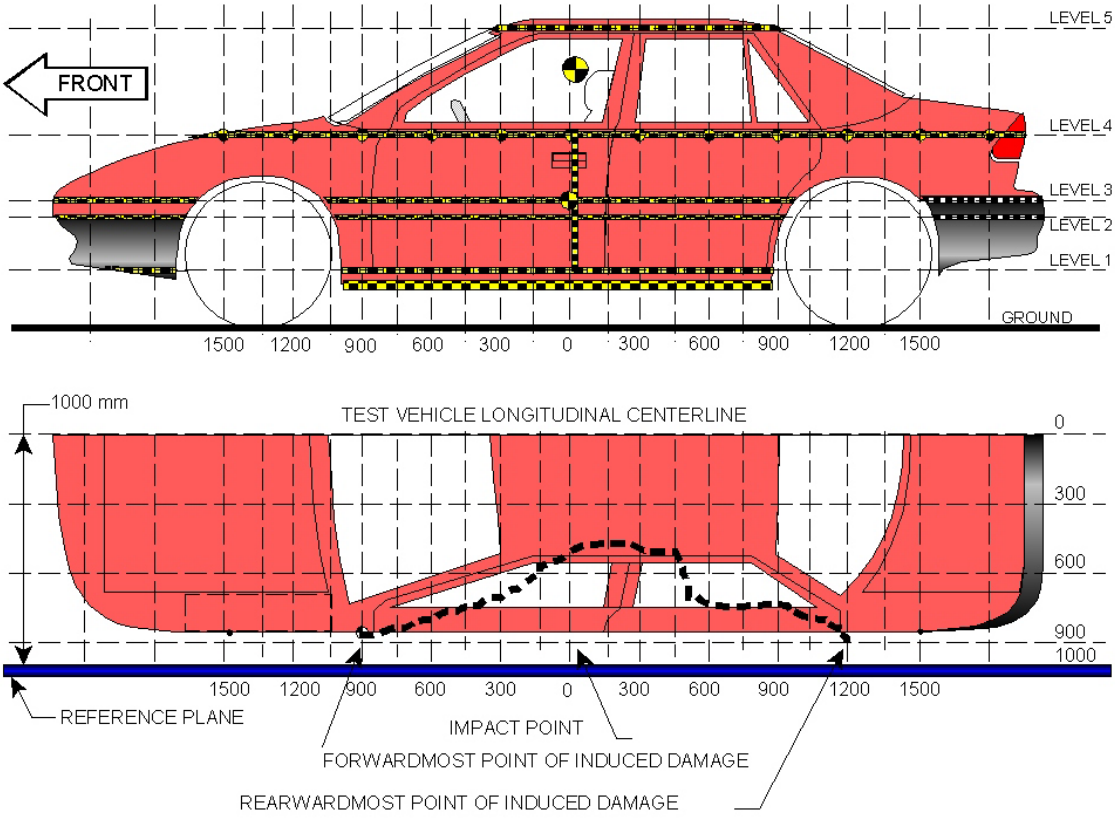
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3620	3429	191
B	Front Axle to Front Surface of Vehicle	993	961	32
C	Rear Axle to Rear Surface of Vehicle	1325	1310	15
D	Total Length at Centerline	5938	5820	118
E	Front Bumper Thickness	230	230	0
F	Front Bumper Bottom to Ground	396	456	-60
G	Sill Height at Front Wheel Well	448	481	-33
H	Sill Height at Front Door Leading Edge	453	498	-45
I	Sill Height at B-Pillar	469	488	-19
J1	Sill Height at Rear Wheel Well	508	421	87
J2	Pinch Weld Height at Rear Wheel Well	405	530	-125
K	Sill Height Aft of Rear Wheel Well	545	603	-58
L	Rear Bumper Thickness	200	200	0
M	Rear Bumper Bottom to Ground	510	561	-51
N	Sill Height to Bottom of Front Window Sill	890	1322	-432
O	Front Door Leading Edge to Impact CL	718	610	108
P	Rear Door Trailing Edge to Impact CL	1124	750	374
Q	Front Window Opening	540	524	16
R	Right Side Length	5820	5833	-13
S	Left Side Length	5820	5642	178
T	Vehicle Width at "B" Pillars	2032	1844	188

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



NOTE: All measurements are in millimeters (mm)

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	581	513	150
2	Occupant H-Point	993	466	150
3	Mid-Door	855	481	150
4	Window Sill	1186	469	150
5	Window Top	1855	683	0

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

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

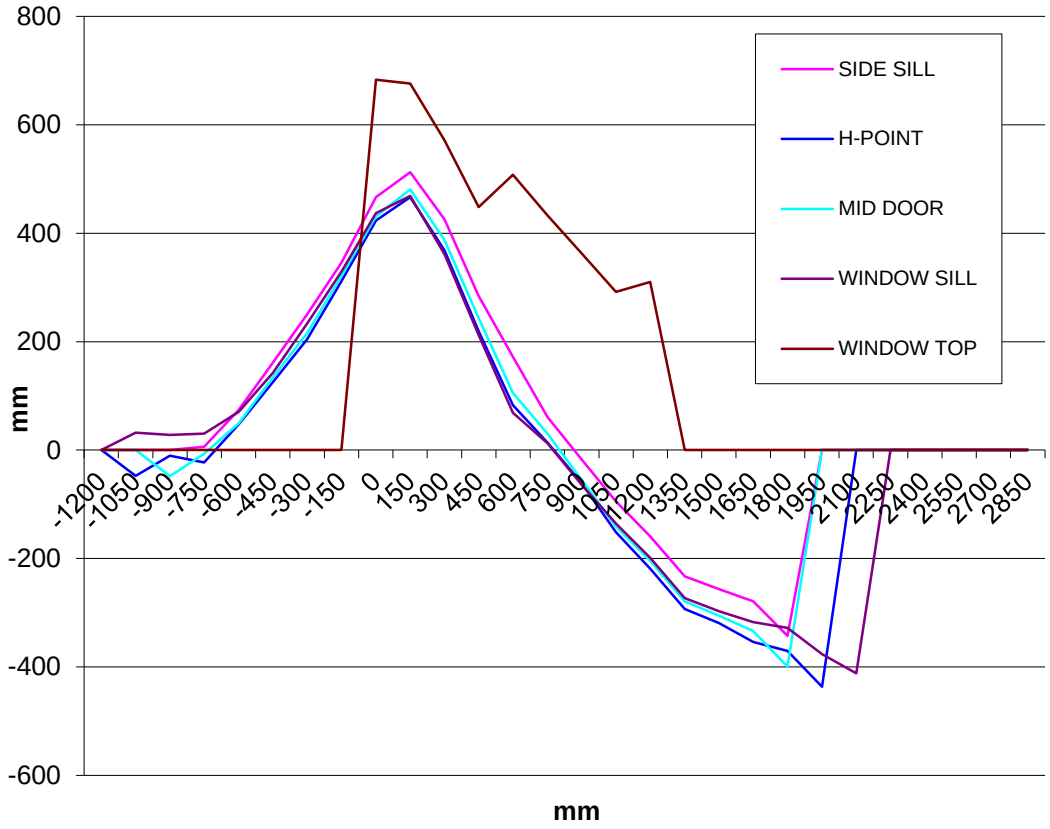
Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	-5	-28	17	0	0	5	20	-10	0	0	-10	-48	27	0
-750	-5	-12	-7	16	0	-11	11	0	-15	0	6	-23	-7	31	0
-600	2	-15	-10	18	0	-72	-62	-59	-52	0	74	47	49	70	0
-450	1	-18	-11	13	0	-160	-143	-145	-129	0	161	125	134	142	0
-300	0	-20	-13	7	0	-251	-224	-228	-226	0	251	204	215	233	0
-150	0	-21	-14	2	0	-346	-332	-335	-328	0	346	311	321	330	0
0	0	-22	-15	-3	246	-466	-446	-446	-440	-437	466	424	431	437	683
150	1	-23	-15	-8	236	-512	-489	-496	-477	-440	513	466	481	469	676
300	2	-23	-16	-11	231	-424	-391	-403	-373	-340	426	368	387	362	571
450	3	-24	-16	-13	227	-281	-243	-259	-226	-222	284	219	243	213	449
600	4	-25	-17	-14	223	-168	-108	-122	-83	-285	172	83	105	69	508
750	5	-27	-18	-16	220	-56	-40	-48	-29	-213	61	13	30	13	433
900	6	-28	-18	-17	218	23	34	38	47	-145	-17	-62	-56	-64	363
1050	7	-27	-17	-18	216	102	125	124	118	-76	-95	-152	-141	-136	292
1200	11	-24	-15	-16	242	170	195	189	183	-68	-159	-219	-204	-199	310
1350	19	-16	-8	-8	0	252	277	271	265	0	-233	-293	-279	-273	0
1500	22	-15	-7	-9	0	279	304	298	288	0	-257	-319	-305	-297	0
1650	26	-15	-6	-9	0	306	339	328	308	0	-280	-354	-334	-317	0
1800	10	-16	-25	-8	0	352	355	374	320	0	-342	-371	-399	-328	0
1950	0	-34	0	-8	0	0	403	0	369	0	0	-437	0	-377	0
2100	0	-34	0	-8	0	0	436	0	404	0	0	-470	0	-412	0
2250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy’s head.

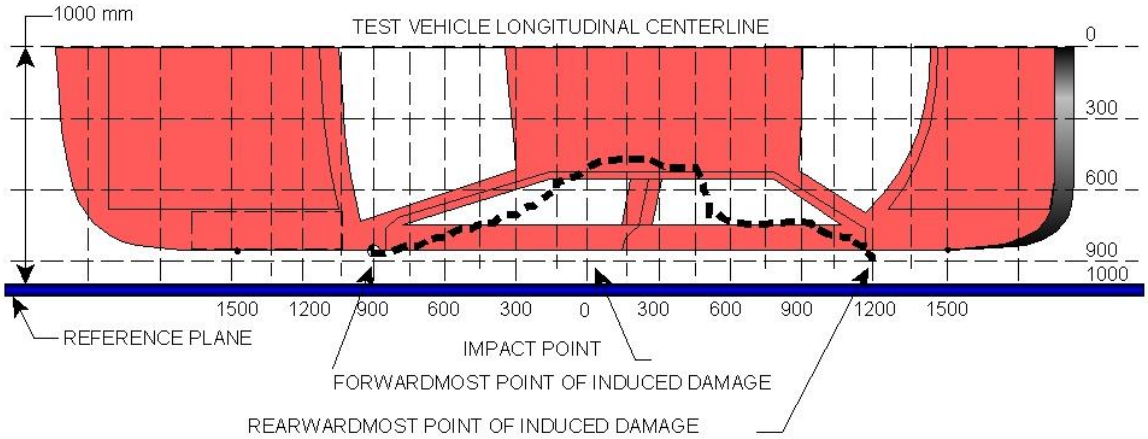
DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15



VEHICLE DAMAGE PROFILE DISTANCES[1]

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	1200	5	-68	242	0
2	750	5	-213	220	433
3	300	5	-340	231	571
4	-150	1	-346	0	346
5	-600	1	-72	2	74
6	-1050	4	-12	20	0

[1] DPD 1 and 6 defined as zero crush since the crush doesn't extend to the end of the vehicle.

DATA SHEET NO. 12

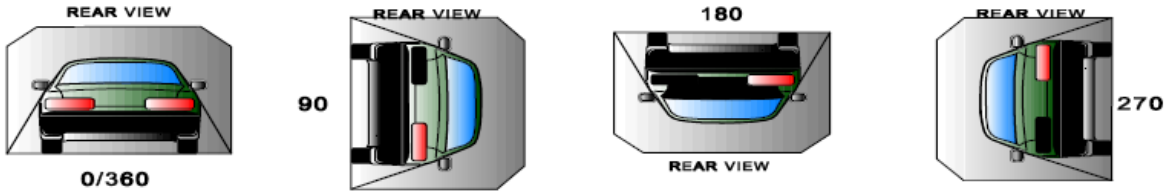
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203
Test Program: SPNCAP Side Impact Test Date: 10/22/15

Test Time: 16:25 **Temperature:** 21.1ºC

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)
B. For the 5 minute period after motion ceases: 0
(Maximum allowable is 5 ounces)
C. For the following 25 minutes: 0
(Maximum allowable is 1 ounce/minute)
D. Spillage Deta1LS: 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

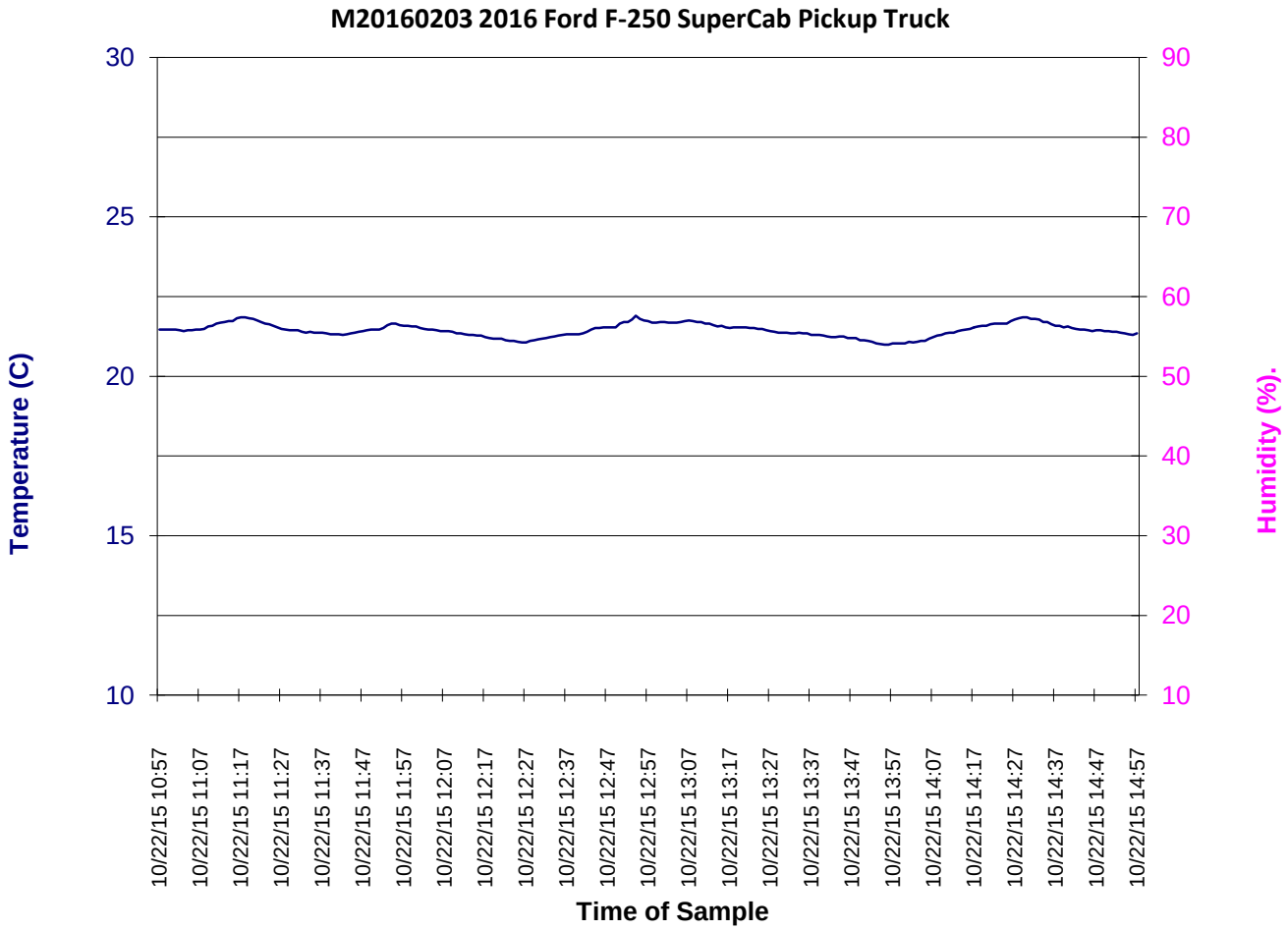
Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DATA SHEET NO. 13[1]

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2016 F-250 SuperCab Pickup Truck NHTSA No.: M20160203

Test Program: SPNCAP Side Impact Test Date: 10/22/15



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

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As Delivered Right Front 3-4 View of Test Vehicle

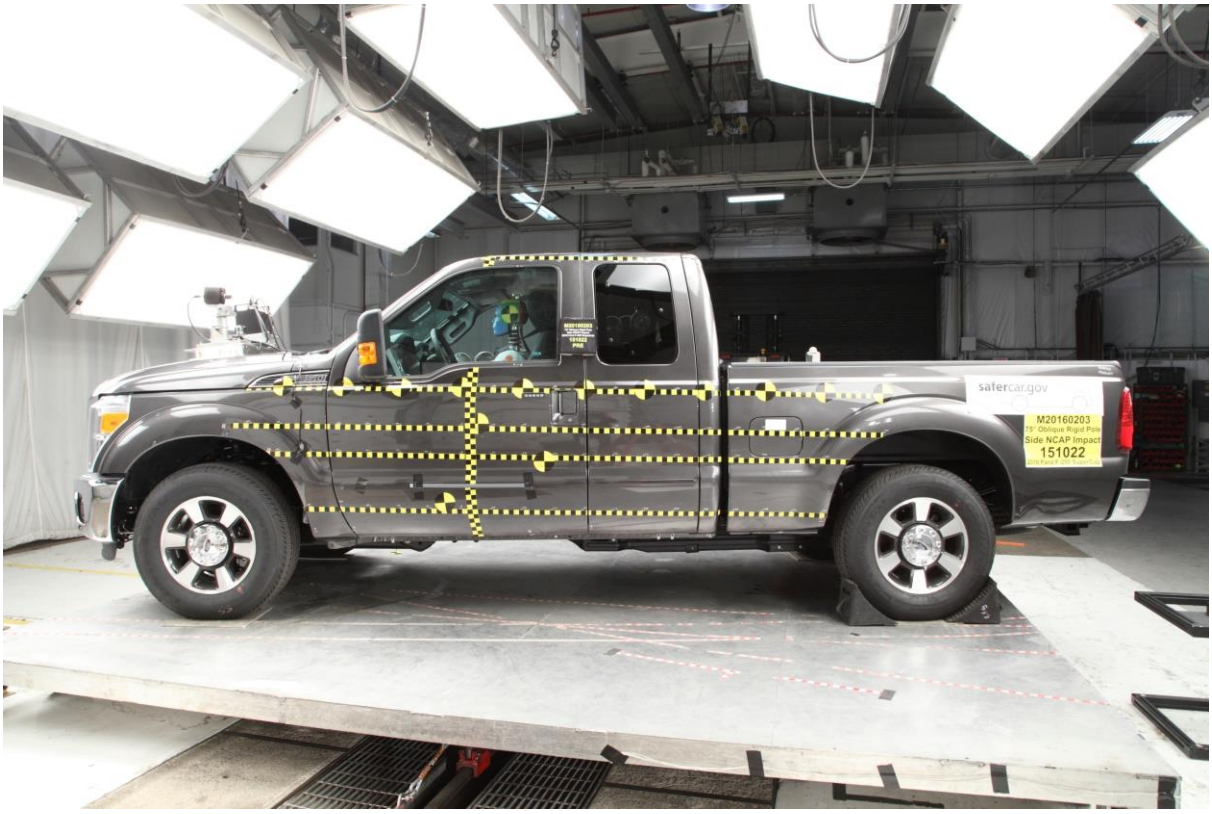
002 As Delivered Left Rear 3-4 View of Test Vehicle

003 Pre-Test Frontal View of Test Vehicle

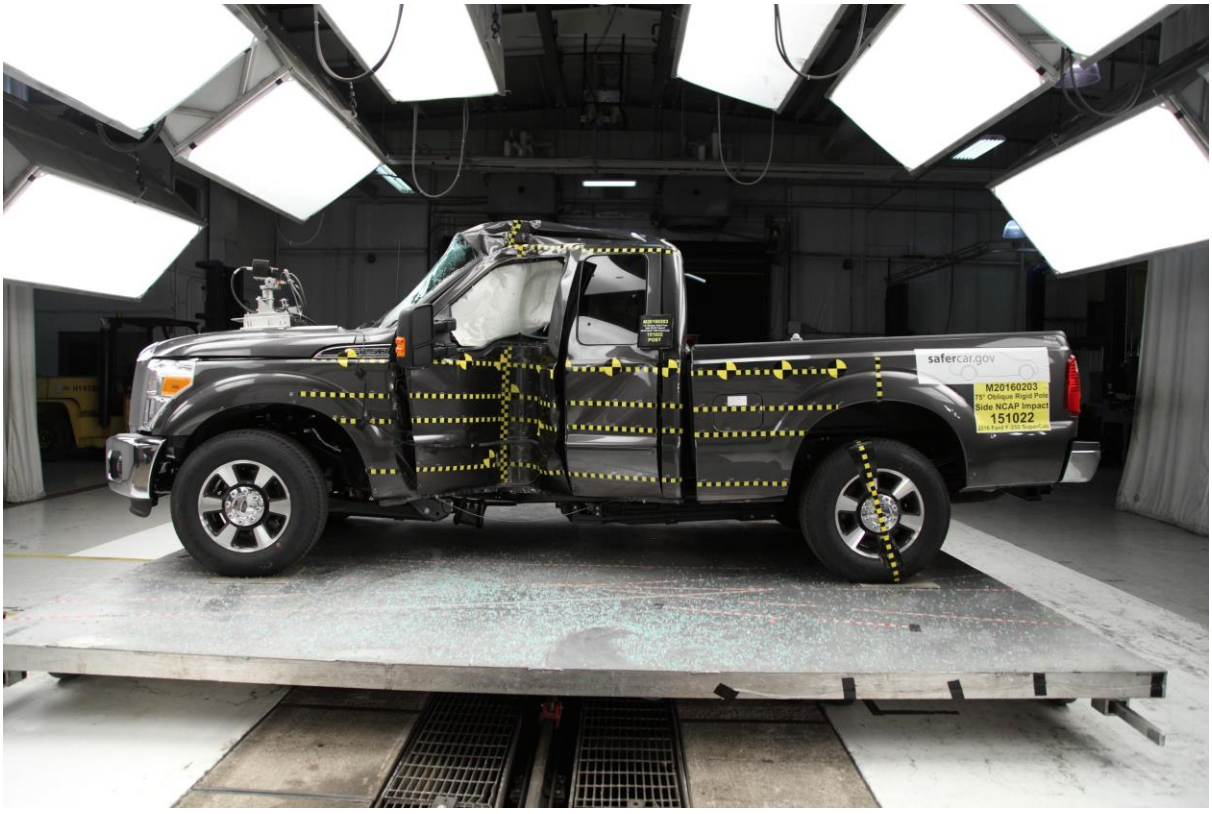
004 Post-Test Frontal View of Test Vehicle

005 Pre-Test Left Front 3-4 View of Test Vehicle

006 Post-Test Left Front 3-4 View of Test Vehicle



007 Pre-Test Left Side View of Test Vehicle



008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear 3-4 View of Test Vehicle

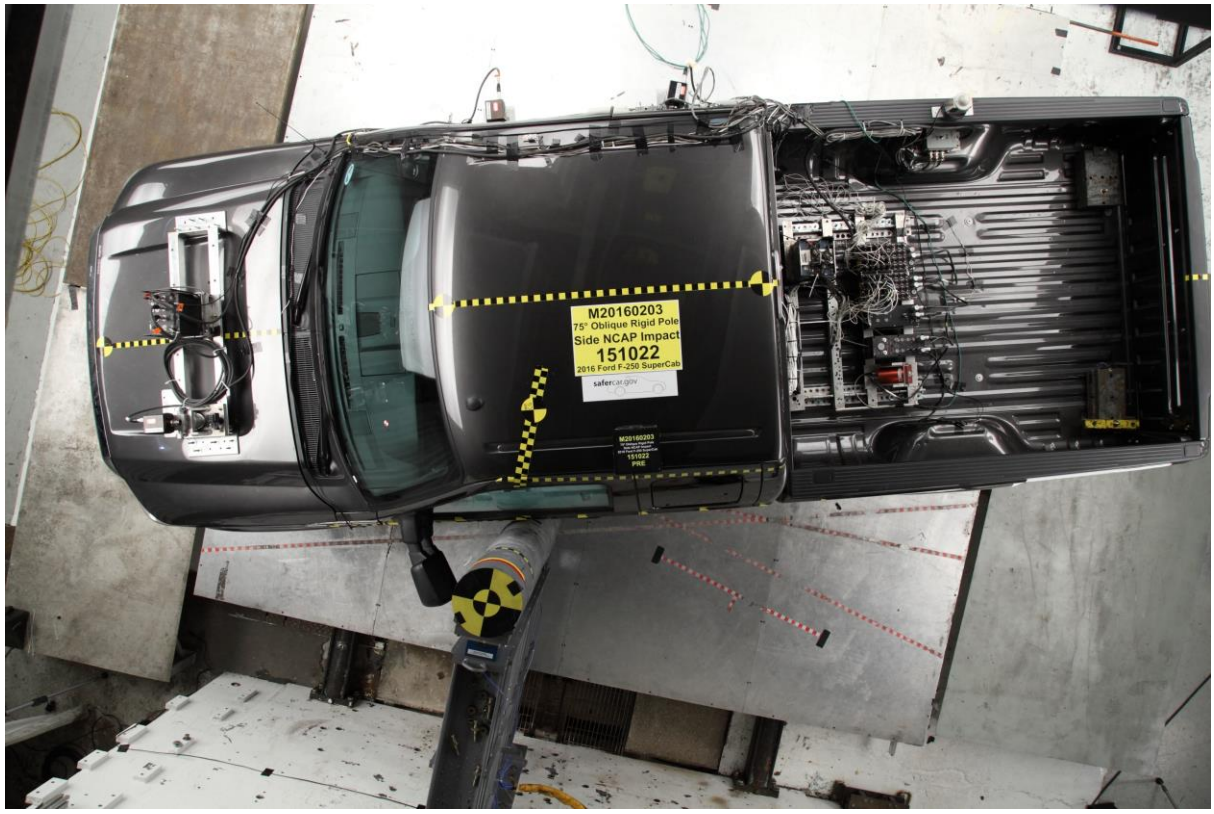
010 Post-Test Left Rear 3-4 View of Test Vehicle

011 Pre-Test Rear View of Test Vehicle

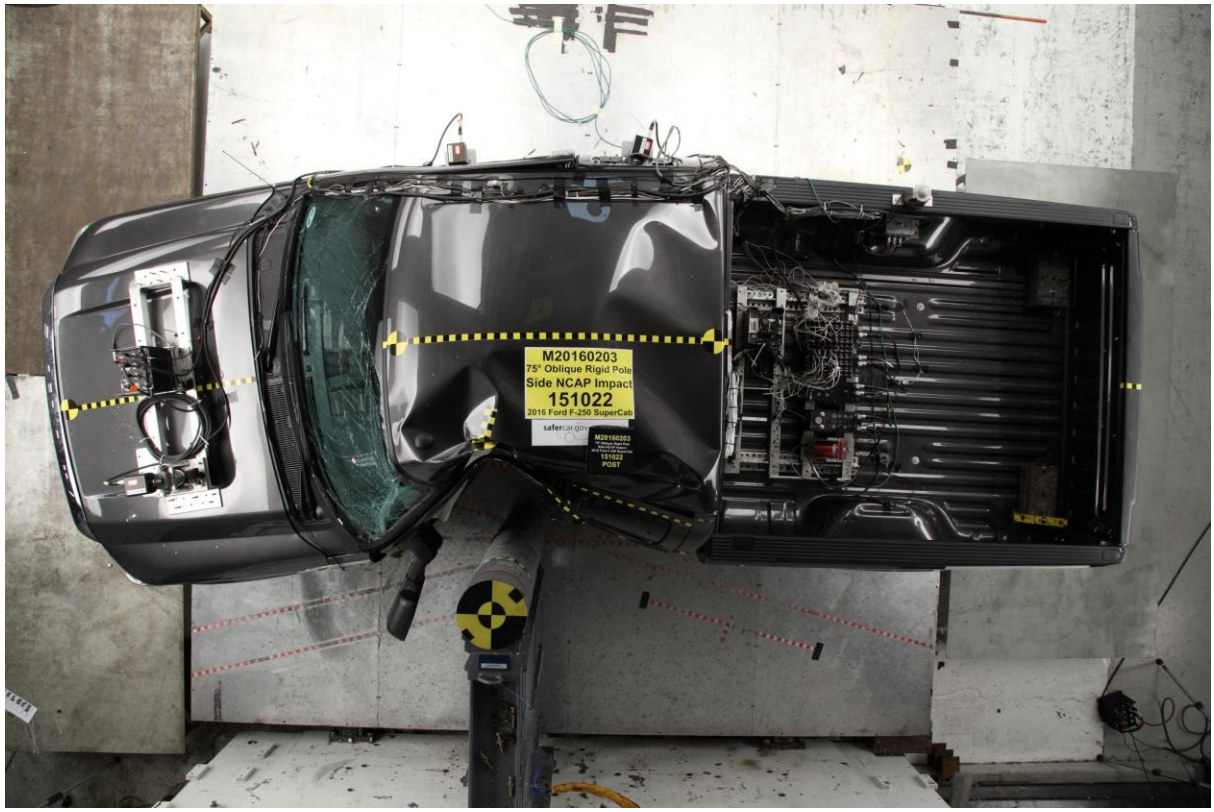
012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle

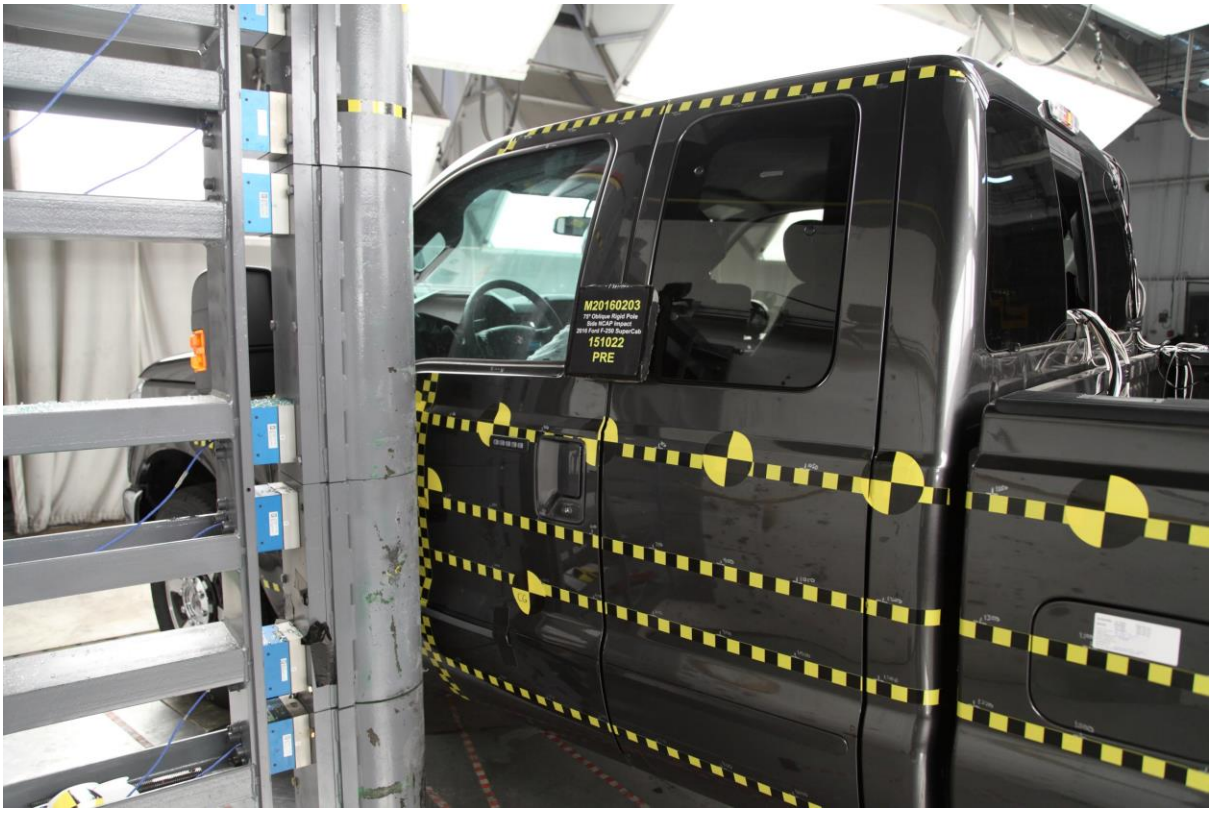


015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

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



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

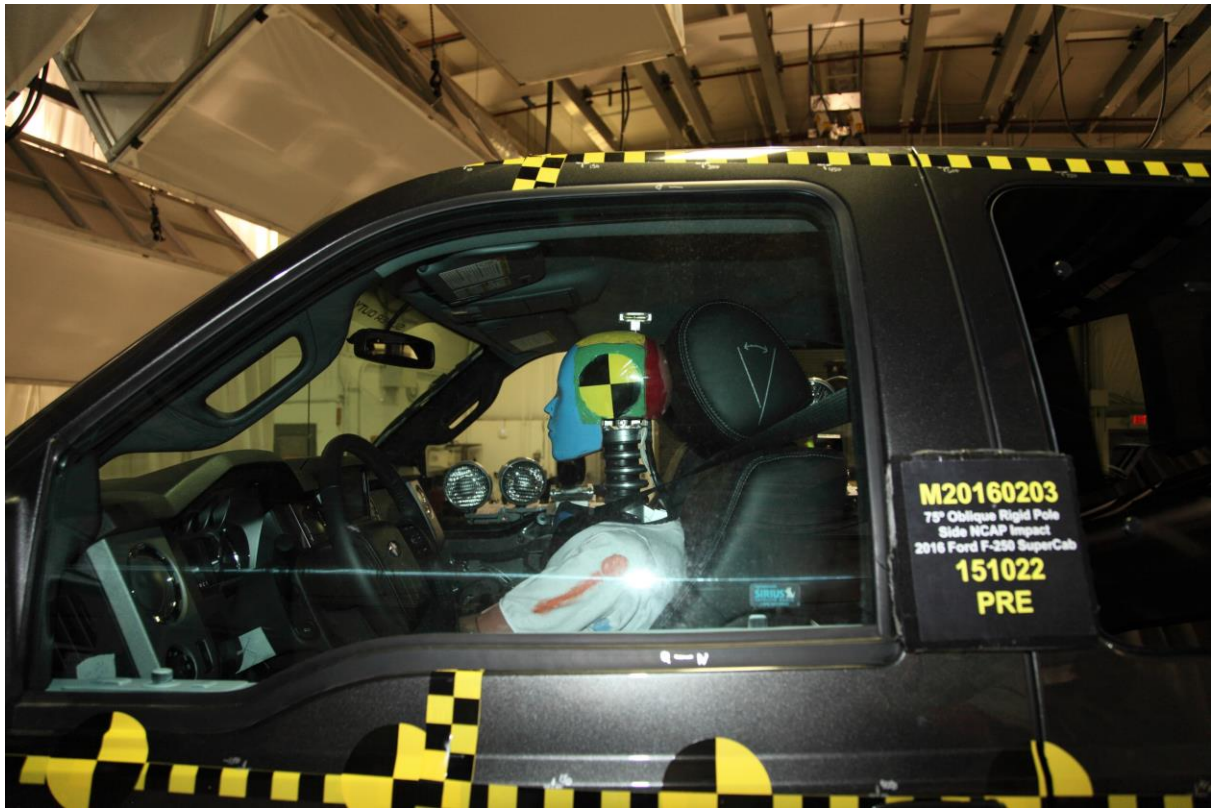
019 Pre-Test Close-Up View of Impact Point Target

020 Post-Test Close-Up View of Impact Point Target Showing Impact Location

021 Pre-Test Front Close-Up View of Dummy Head and Chest

022 Post-Test Front Close-Up View of Dummy

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



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

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

026 Pre-Test Front View of Seat Back Prior to Dummy Positioning

027 Pre-Test Front View of Dummy Head and Shoulders in Relation to Head Restraint

028 Pre-Test Front View of Seat Pan Prior to Dummy Positioning

029 Pre-Test Overhead View of Dummy Thighs on Seat Pan

030 Pre-Test Left Side View of Dummy Neck Showing Position of Adjustable Neck Bracket

031 Pre-Test Left Side View of Dummy Head Showing Dummy Head is Level

032 Pre-Test Placement of Dummy Feet

033 Pre-Test View of Belt Anchorage for Dummy

034 Pre-Test Left Side View of Steering Wheel

035 Pre-Test View of Disengaged Parking Brake

036 Pre-Test View of Parking Brake

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

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

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

040 Pre-Test Dummy and Door Clearance View

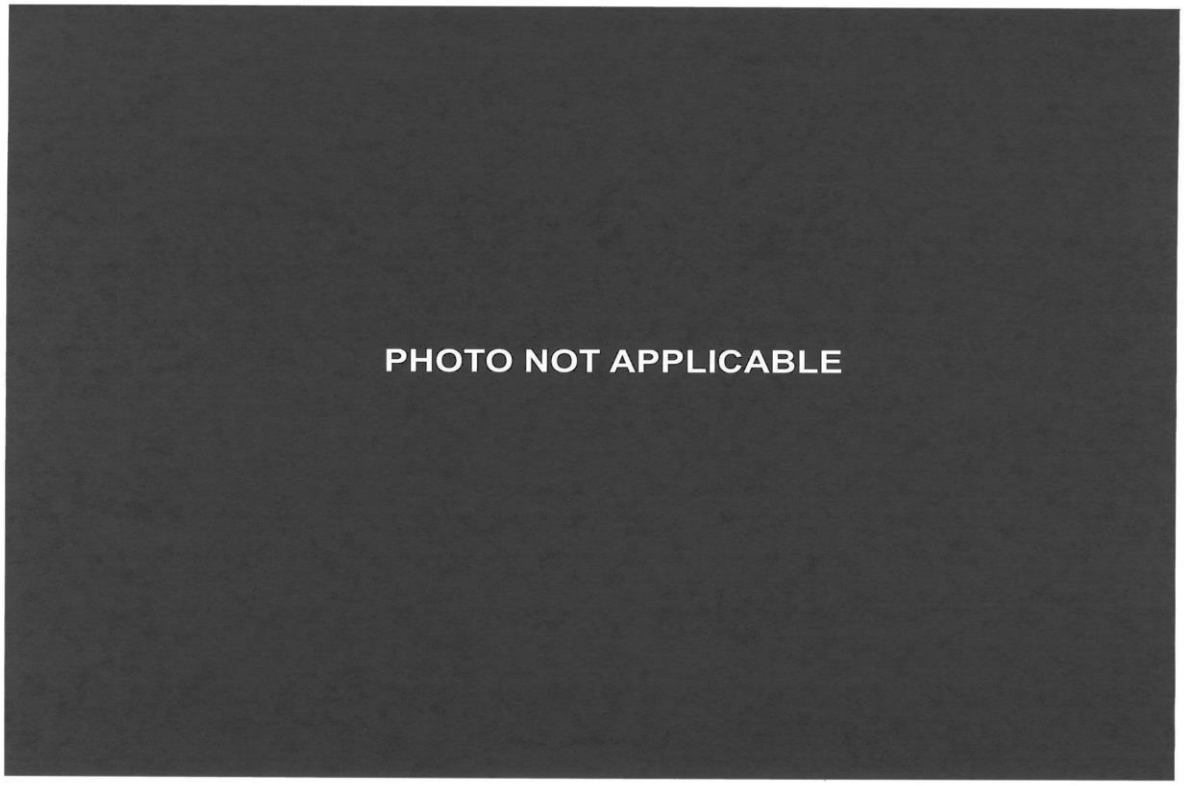
041 Post-Test Dummy and Door Clearance View

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

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

044 Pre-Test Inner Driver Door Panel View

045 Post-Test Inner Driver Door Panel View Showing Dummy Contact Location



046 Post-Test Dummy Close-Up Head Contact with Vehicle View

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

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

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

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

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

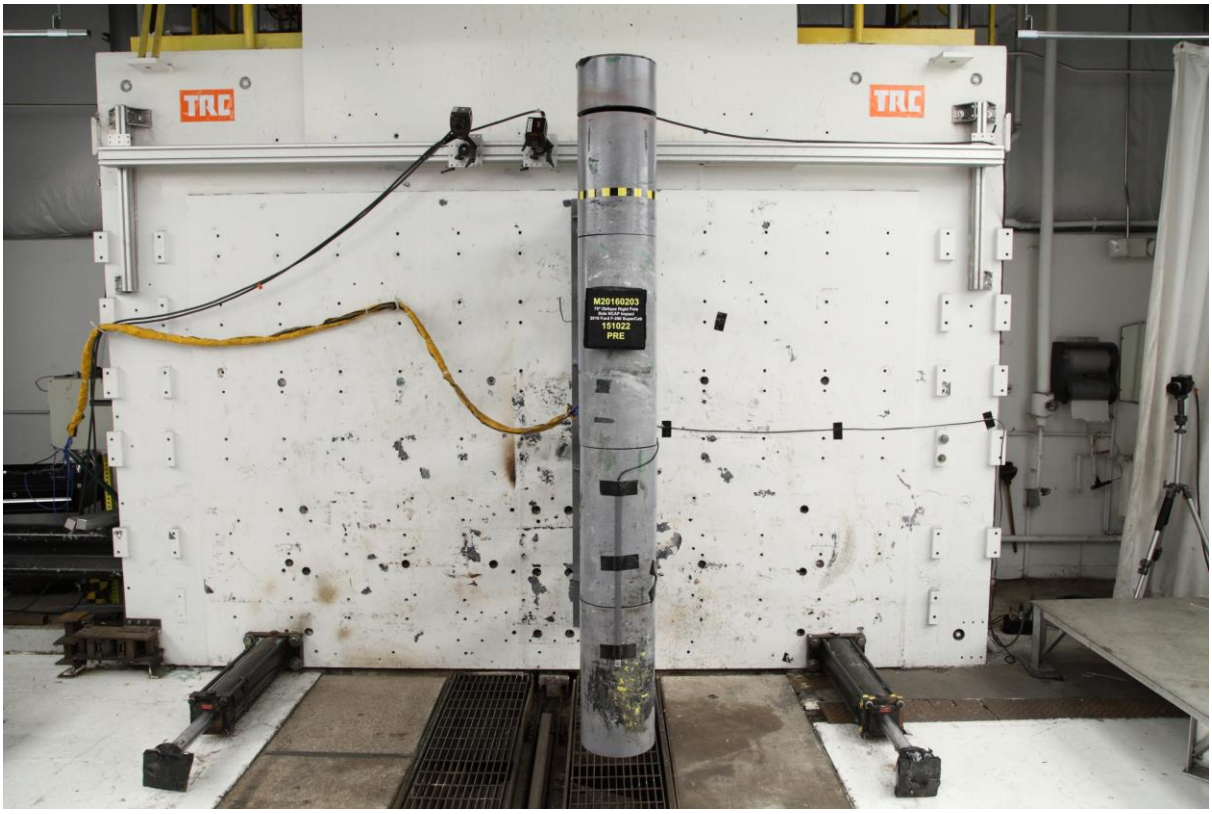
052 Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View

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

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

055 Close-Up View of Vehicle Certification Label

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

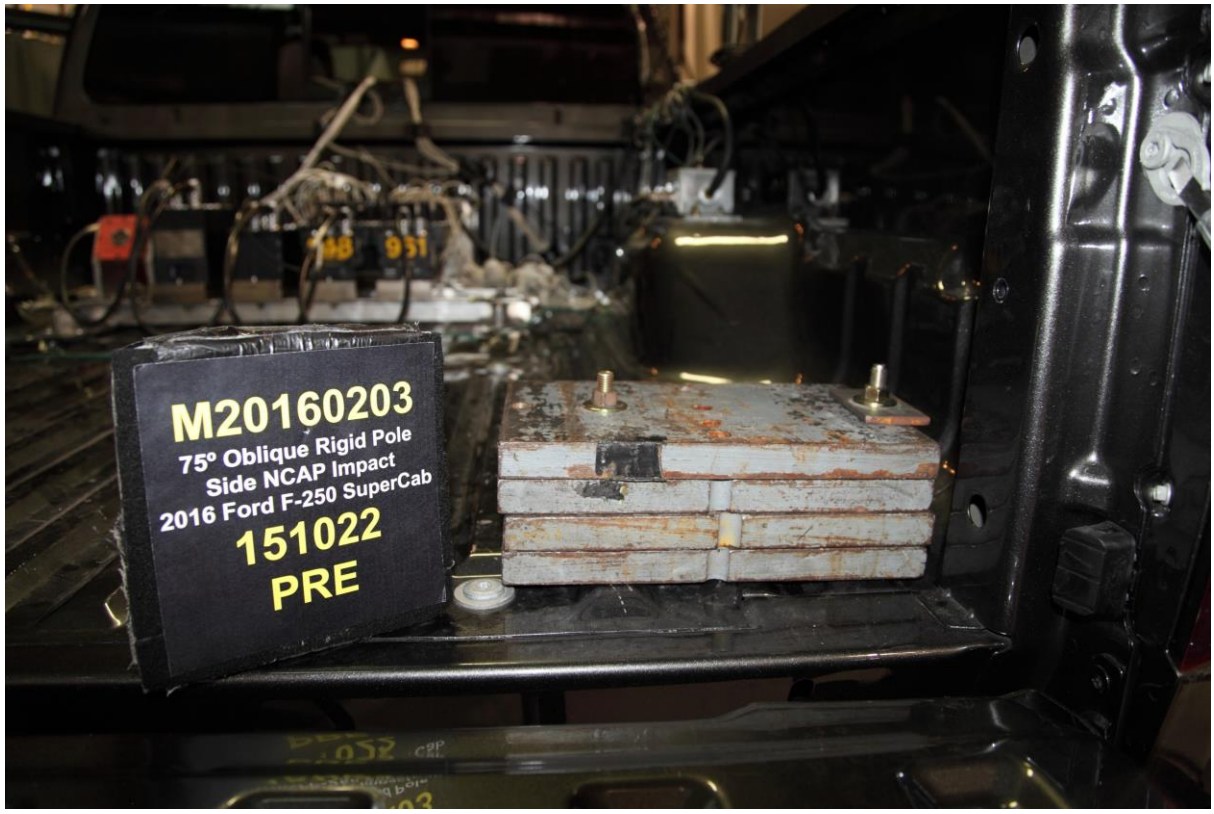


057 Pre-Test Pole Barrier Front View

058 Post-Test Pole Barrier Front View

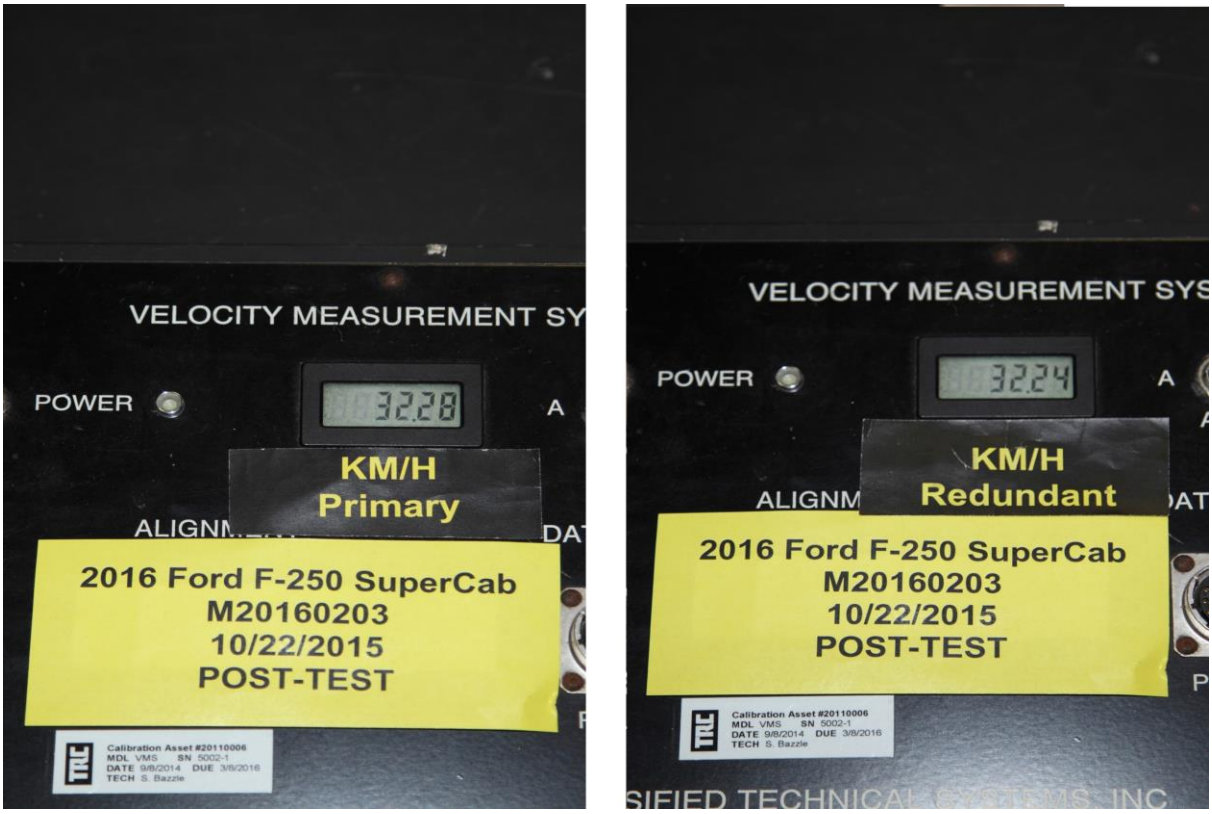
059 Pre-Test Pole Barrier Side View

060 Post-Test Pole Barrier Side View



061 Pre-Test Ballast View

061a Pre Test Ballast View

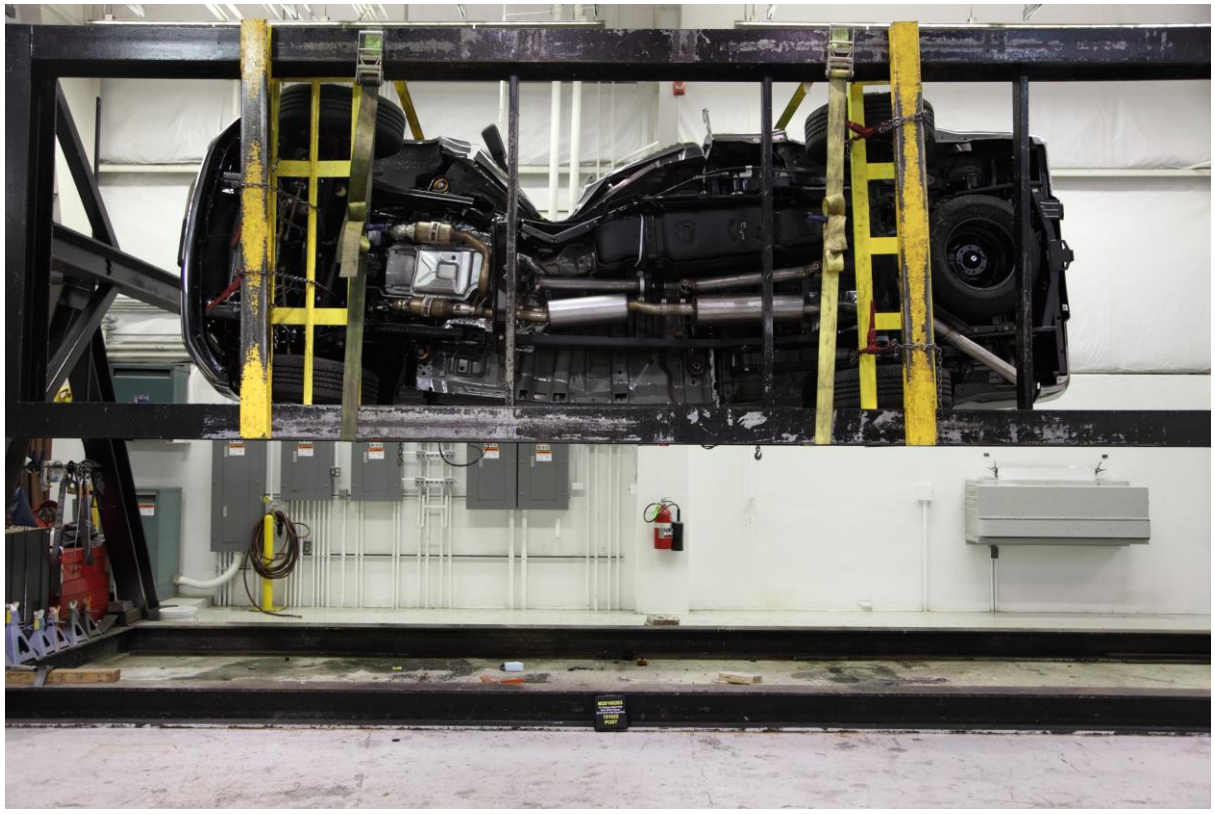


062 Post-Test Primary and Redundant Speed Trap Read-Out

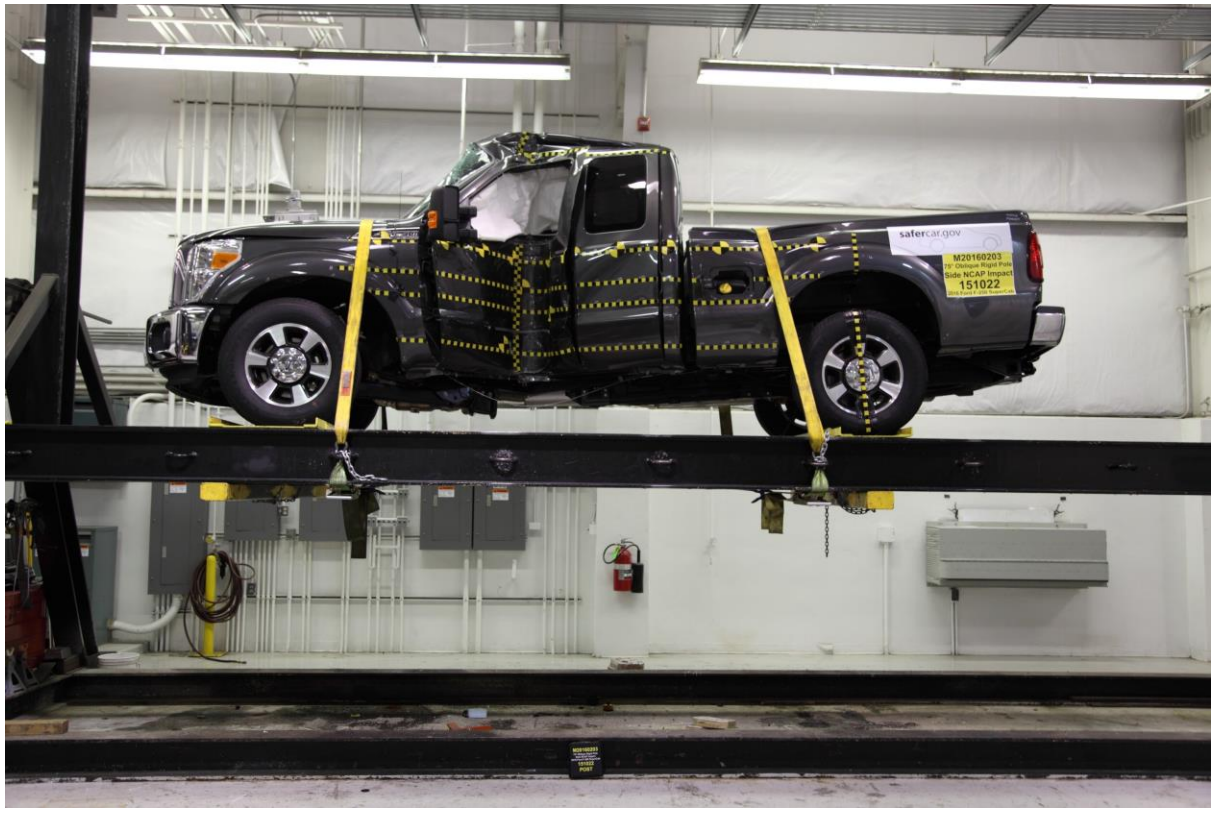
063 FMVSS No. 301 Static Rollover 0 Degrees

064 FMVSS No. 301 Static Rollover 90 Degrees

065 FMVSS No. 301 Static Rollover 180 Degrees

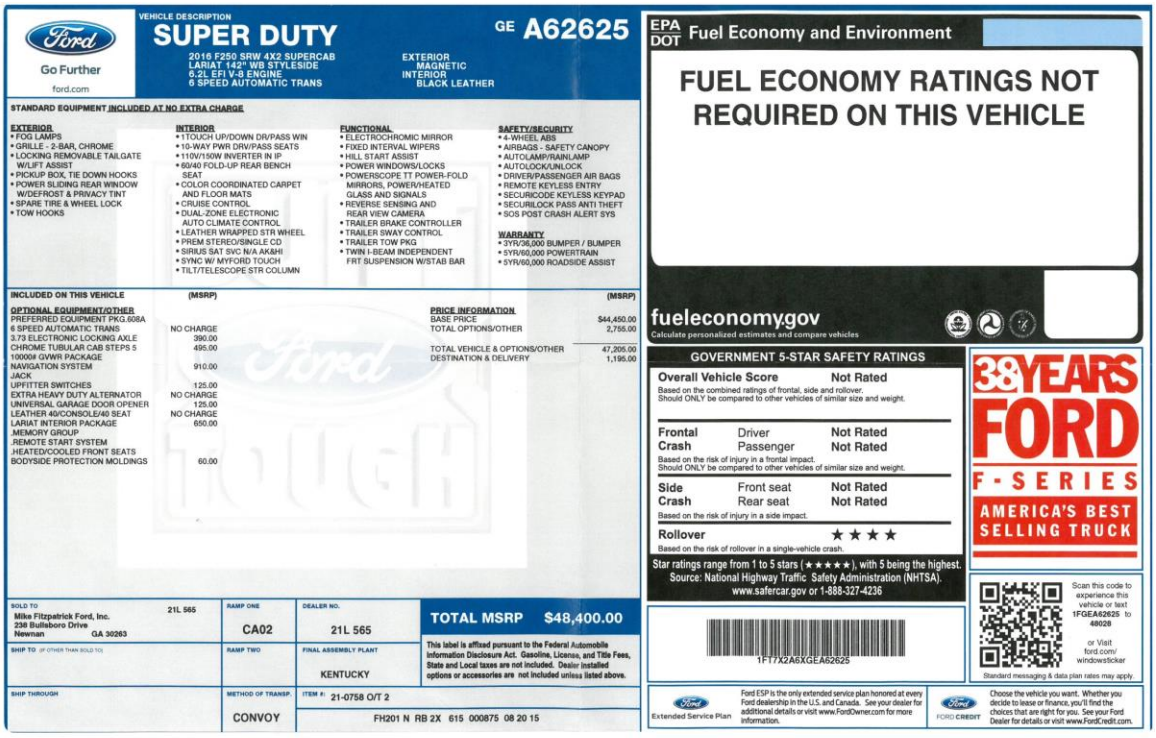


066 FMVSS No. 301 Static Rollover 270 Degrees



067 FMVSS No. 301 Static Rollover 360 Degrees

068 Impact Event



069 Monroney Label

Supplementary Restraints System

The side airbags are located on the outboard side of the seatbacks of the front seats. In certain sideways crashes, the airbag on the side affected by the crash will be inflated. The airbag was designed to inflate between the door panel and occupant to further enhance the protection provided occupants in side impact crashes.

E152533

The system consists of the following:

- A label or embossed side panel indicating that side airbags are found on your vehicle.
- Side airbags located inside the seatback of the driver and front passenger seats.
- Crash sensors and monitoring system with readiness indicator. See **Crash Sensors and Airbag Indicator** (page 45).

The design and development of the side airbag system included recommended testing procedures that were developed by a group of automotive safety experts known as the Side Airbag Technical Working Group. These recommended testing procedures help reduce the risk of injuries related to the deployment of side airbags.

SAFETY CANOPY™

WARNINGS

Do not place objects or mount equipment on or near the headliner at the siderail that may come into contact with a deploying curtain airbag. Failure to follow these instructions may increase the risk of personal injury in the event of a crash.

Do not lean your head on the door. The curtain airbag could injure you as it deploys from the headliner.

Do not attempt to service, repair, or modify the curtain airbags, its fuses, the A, B, or C pillar trim, or the headliner on a vehicle containing curtain airbags as you could be seriously injured or killed. Contact your authorized dealer as soon as possible.

All occupants of your vehicle including the driver should always wear their safety belts even when an airbag supplemental restraint system and curtain airbag is provided. Failure to properly wear your safety belt could seriously increase the risk of injury or death.

To reduce risk of injury, do not obstruct or place objects in the deployment path of the curtain airbag.

If the curtain airbags have deployed, the curtain airbags will not function again. The curtain airbags (including the A, B and C pillar trim and headliner) must be inspected and serviced by an authorized dealer. If the curtain airbag is not replaced, the unrepaired area will increase the risk of injury in a crash.

070 Head Restraint Use and Adjustment Information from Vehicle Owner Manual

071 Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at: www.nhtsa.dot.gov.

Additional Driver Dummy Instrumentation Data

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

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

NHTSA

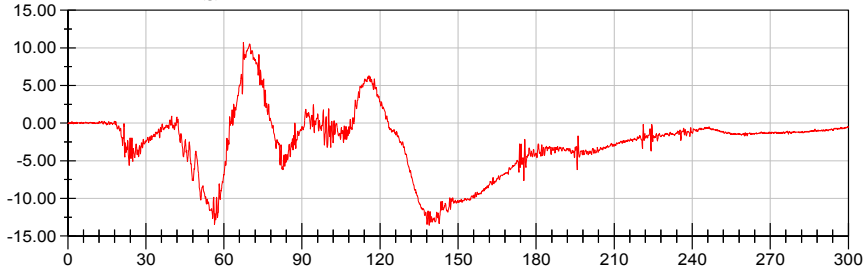
Test Date: 10/22/2015

Position #1 SID IIs Dummy (DI8818)

Test Lab: CTF

Test Number: 151022 (M20160203)

Head Accel X (g) vs. Time [ms]



<Max>

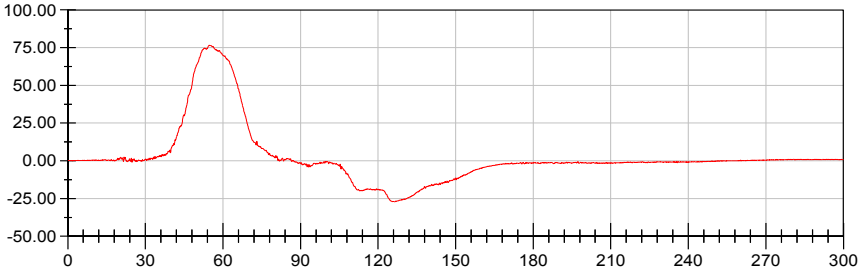
10.72 g at 67.52 ms

<Min>

-13.58 g at 138.88 ms

CFC_1000

Head Accel Y (g) vs. Time [ms]



<Max>

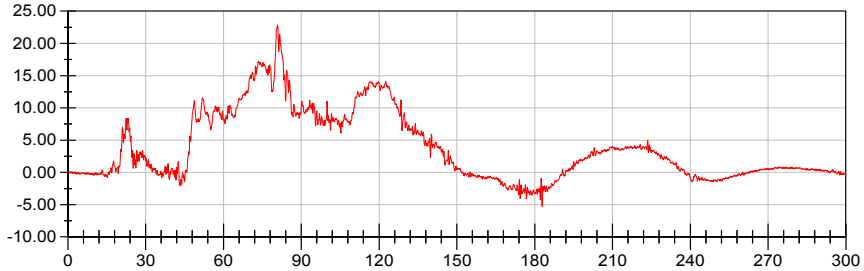
76.64 g at 54.72 ms

<Min>

-27.20 g at 126.32 ms

CFC_1000

Head Accel Z (g) vs. Time [ms]



<Max>

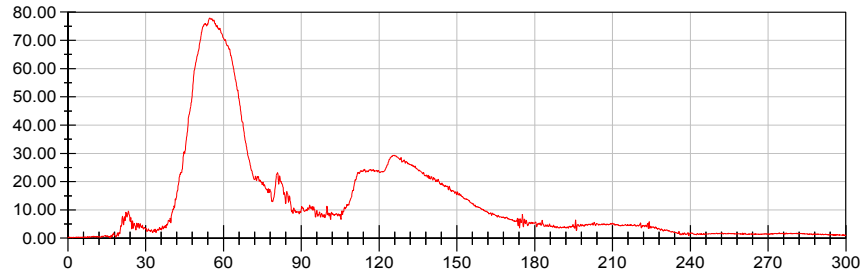
22.83 g at 80.80 ms

<Min>

-5.28 g at 182.88 ms

CFC_1000

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



<Max>

77.90 g at 54.72 ms

<Min>

0.09 g at 16.40 ms

CFC_1000

NHTSA

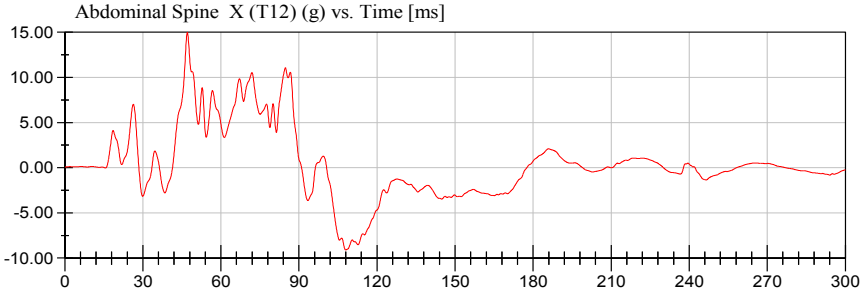
Test Date: 10/22/2015

Position #1 SID IIs Dummy (DI8818)

Test Lab: CTF

Test Number: 151022 (M20160203)

Abdominal Spine X (T12) (g) vs. Time [ms]



<Max>

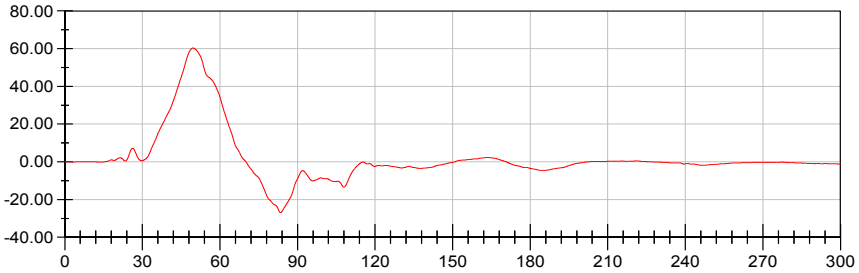
14.99 g at 47.12 ms

<Min>

-9.10 g at 108.00 ms

CFC_180

Abdominal Spine Y (T12) (g) vs. Time [ms]



<Max>

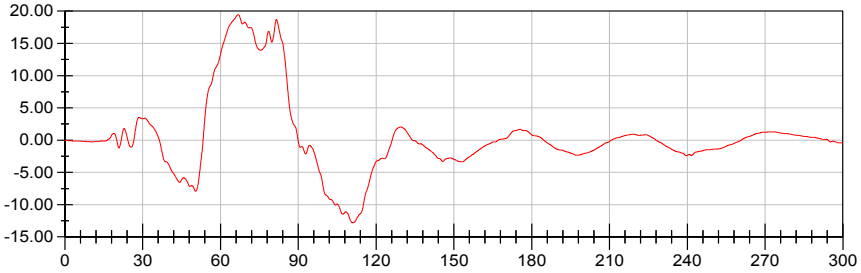
60.33 g at 49.52 ms

<Min>

-26.90 g at 83.44 ms

CFC_180

Abdominal Spine Z (T12) (g) vs. Time [ms]



<Max>

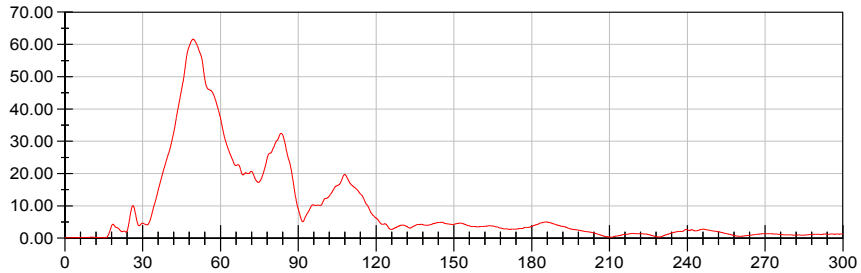
19.46 g at 66.80 ms

<Min>

-12.80 g at 111.04 ms

CFC_180

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



<Max>

61.61 g at 49.44 ms

<Min>

0.10 g at 0.00 ms

CFC_180

NHTSA

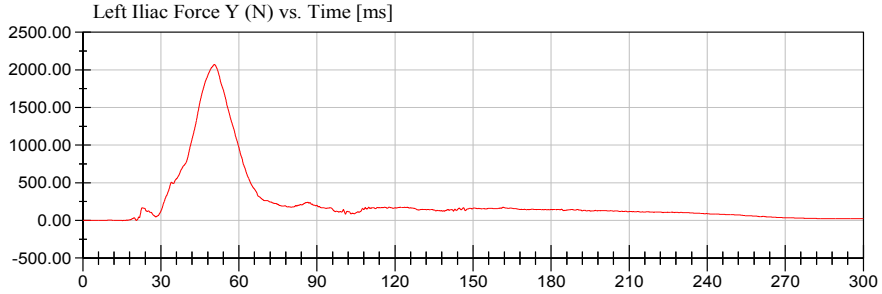
Test Date: 10/22/2015

Position #1 SID IIs Dummy (DI8818)

Test Lab: CTF

Test Number: 151022 (M20160203)

Left Iliac Force Y (N) vs. Time [ms]



<Max>

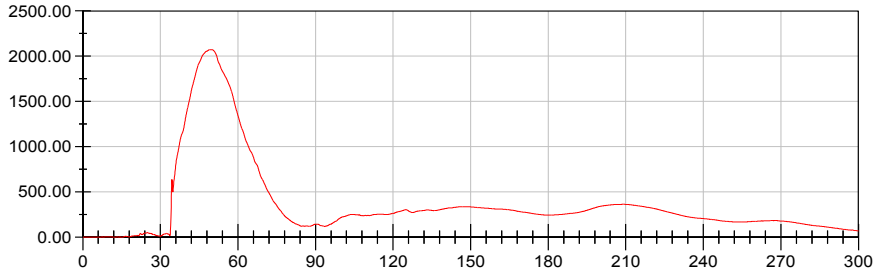
2,071.10 N at 50.56 ms

<Min>

-1.46 N at 15.20 ms

CFC_600

Left Acetabulum Force Y (N) vs. Time [ms]



<Max>

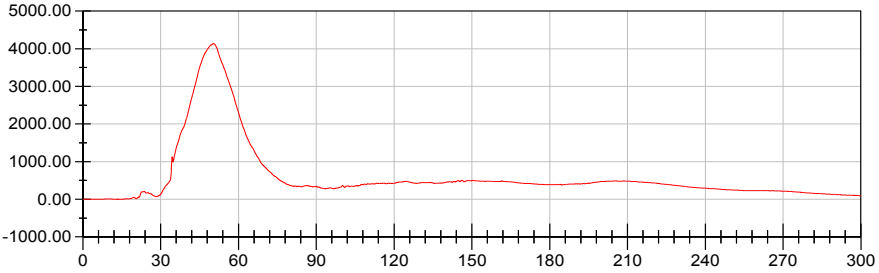
2,072.07 N at 49.92 ms

<Min>

0.54 N at 15.12 ms

CFC_600

Driver Total Pelvis Force on Impact Side (Y) (N) vs. Time [ms]



<Max>

4,136.88 N at 50.40 ms

<Min>

-0.86 N at 15.20 ms

CFC_600

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS
SID-IIs (Driver) Dummy
Description

Pre-Test Calibration Sheets
Driver S/N DI8818

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DI8818 Calibration No.17

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	441	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	131	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	182	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	352	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	427	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	313	Yes
R	Arm Length	249.0 - 259.0	255	Yes
S	Knee Joint to seat Back	478.0 - 493.0	485	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	867	Yes
Z	Waist Circumference	761.0 - 791.0	775	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. DI8818 Certification No. 17-2
Test Date: 10/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	128.5 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

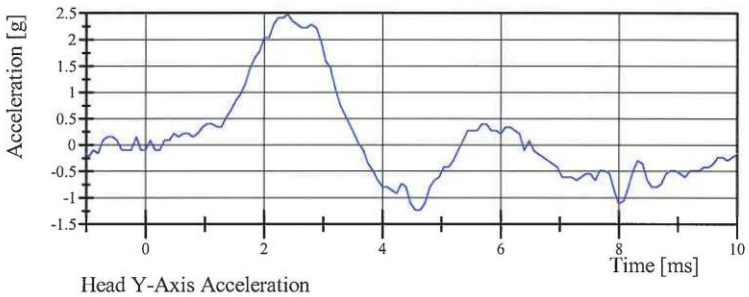
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 15:12:09 233

Transportation Research Center Inc.

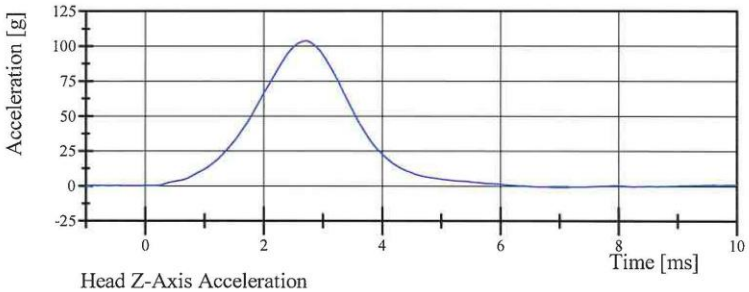
Left Lateral Head Drop
SID IIs Serial No. DI8818 Certification No. 17-2
Test Date: 10/16/2015

Head X-Axis Acceleration



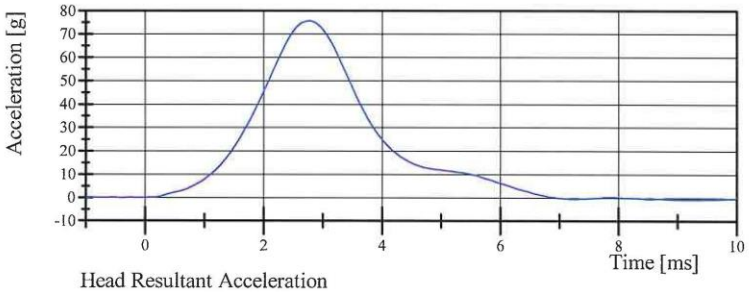
Filter Class: CFC_1000
Max: 2.5 g at 2.4 ms
Min: -1.2 g at 4.6 ms

Head Y-Axis Acceleration



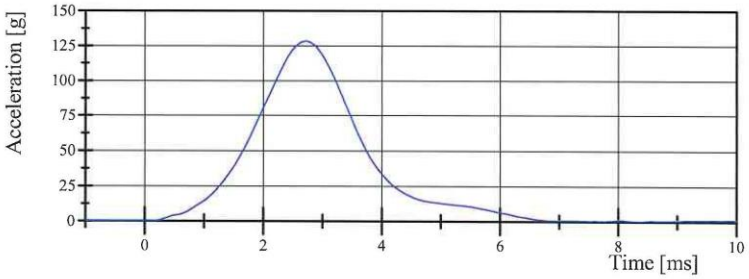
Filter Class: CFC_1000
Max: 103.8 g at 2.7 ms
Min: -0.7 g at 6.9 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 75.8 g at 2.8 ms
Min: -0.7 g at 9.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 128.5 g at 2.7 ms
Min: 0.1 g at -0.3 ms

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

10.16.2015 15:12:17 233

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.589 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.497 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.676 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.904 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.773 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.851 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-76.1 deg	Yes
Time of Peak	50 - 70 ms	67.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.6 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	114.5 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

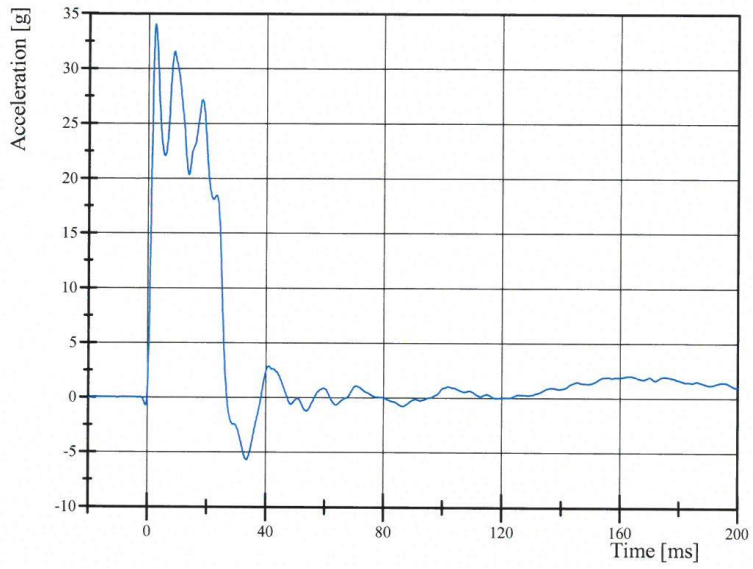
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 09:03:34 639

Transportation Research Center Inc.

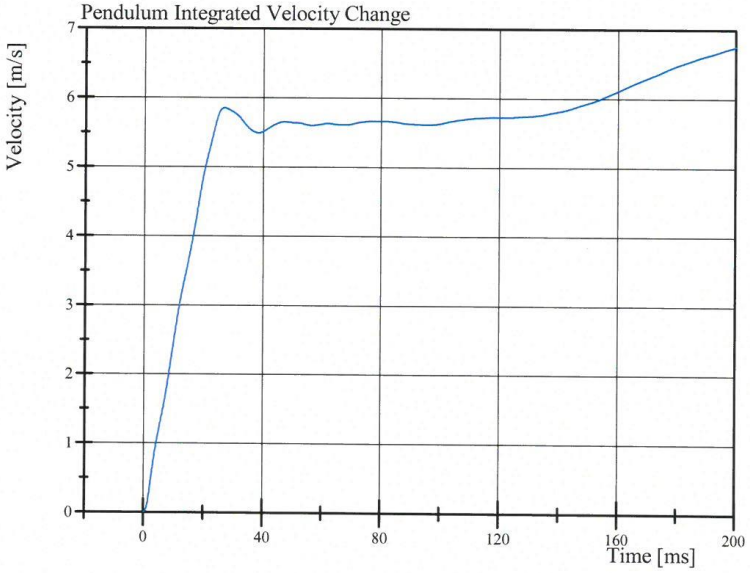
Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Pendulum Acceleration



Filter Class: CFC_180
Max: 34.0 g at 2.4 ms
Min: -5.7 g at 33.5 ms

Pendulum Integrated Velocity Change



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

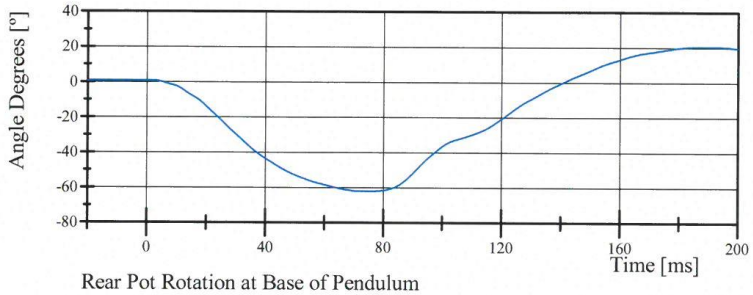
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 09:03:42 639

Transportation Research Center Inc.

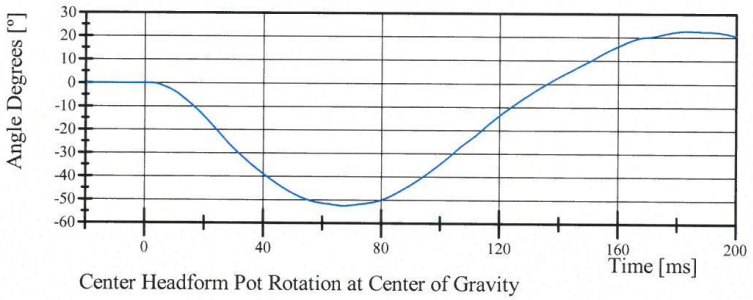
Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Forward Pot Rotation at Base of Pendulum



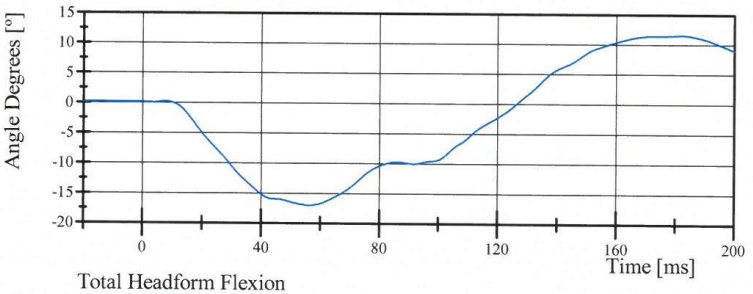
Filter Class: CFC_60
Max: 20.5 ° at 187.4 ms
Min: -62.0 ° at 72.3 ms

Rear Pot Rotation at Base of Pendulum



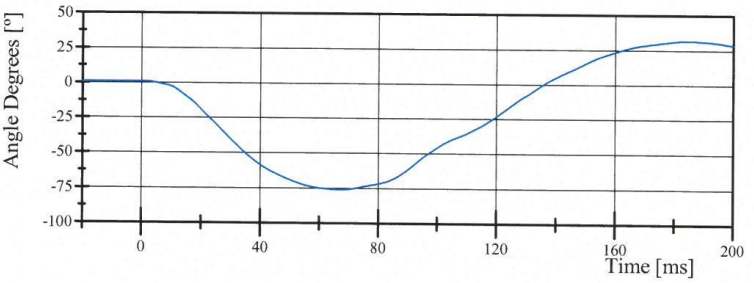
Filter Class: CFC_60
Max: 22.8 ° at 183.5 ms
Min: -52.5 ° at 67.1 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 11.6 ° at 182.2 ms
Min: -17.0 ° at 56.3 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 32.0 ° at 184.3 ms
Min: -76.1 ° at 67.0 ms

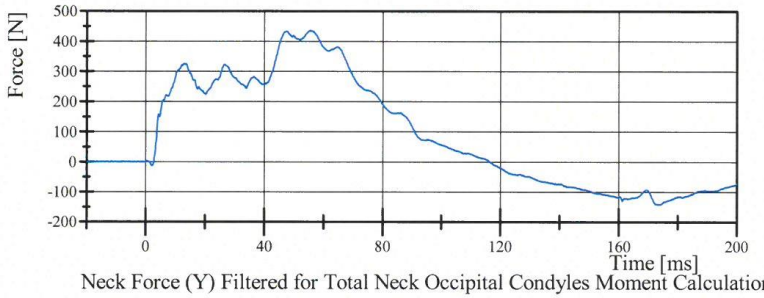
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 09:03:43 639

Transportation Research Center Inc.

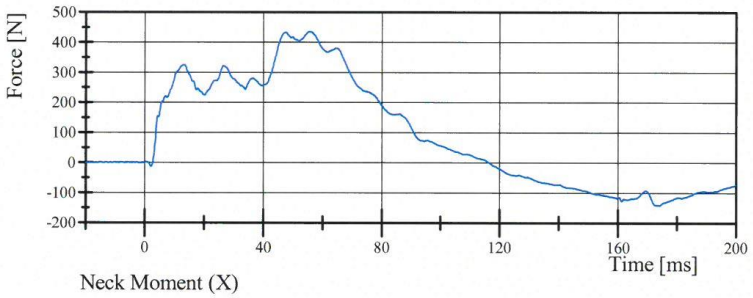
Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Neck Force (Y)



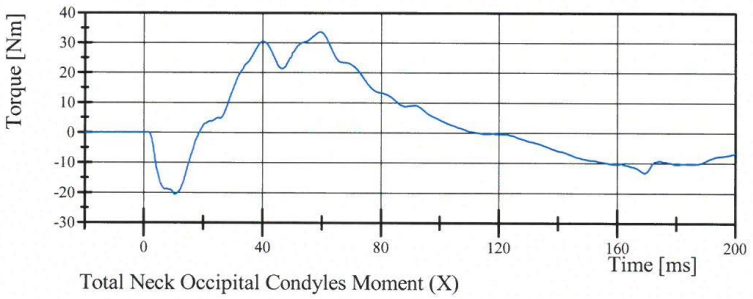
Filter Class: CFC_1000
Max: 435.4 N at 55.4 ms
Min: -140.7 N at 174.1 ms

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



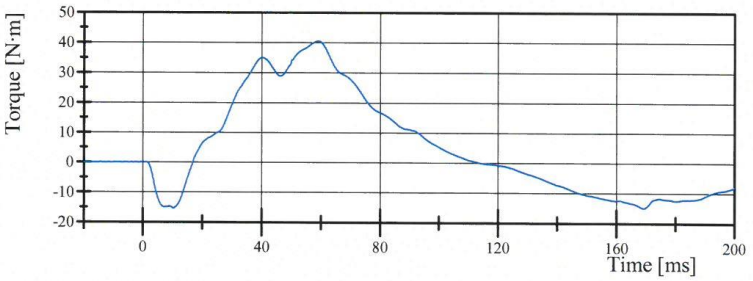
Filter Class: CFC_600
Max: 435.2 N at 55.3 ms
Min: -140.5 N at 174.1 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.7 Nm at 59.4 ms
Min: -20.6 Nm at 10.5 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 40.6 N·m at 59.0 ms
Min: -15.4 N·m at 10.3 ms

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

10.16.2015 09:03:44 639

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-14.3 g	Yes
Shoulder Displacement	28 - 37 mm	32.3 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	18.9 g	Yes

Test meets specifications.

Comments:

Technician

Approved

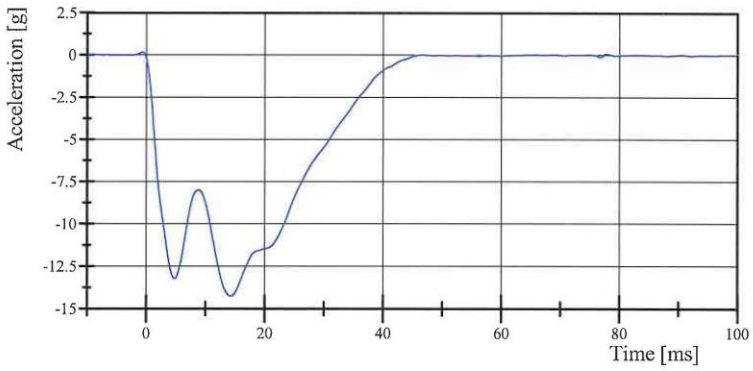
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 12:31:51 877

Transportation Research Center Inc.

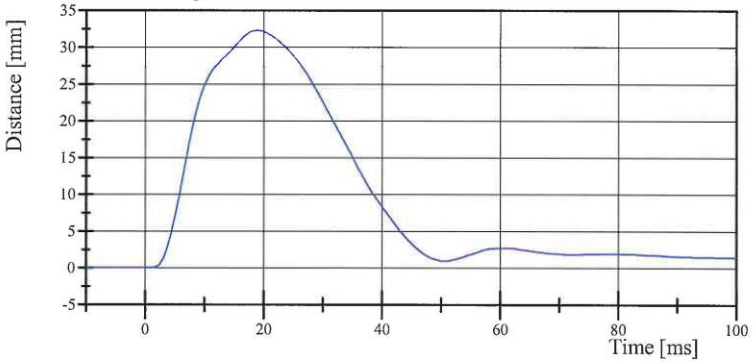
Left Lateral Shoulder
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Probe Acceleration



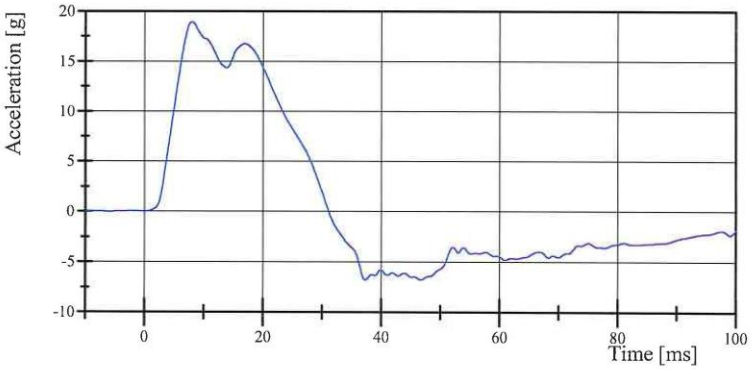
Filter Class: CFC_180
Max: 0.1 g at -0.6 ms
Min: -14.3 g at 14.3 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 32.3 mm at 19.0 ms
Min: -0.0 mm at -5.3 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 18.9 g at 8.0 ms
Min: -6.8 g at 37.3 ms

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

10.16.2015 12:31:59 877

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.731 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.1 g	Yes
Shoulder Displacement	31 - 40 mm	37.4 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	29.3 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.0 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	37.1 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.0 g	Yes

Test meets specifications.

Comments:

Technician

Approved

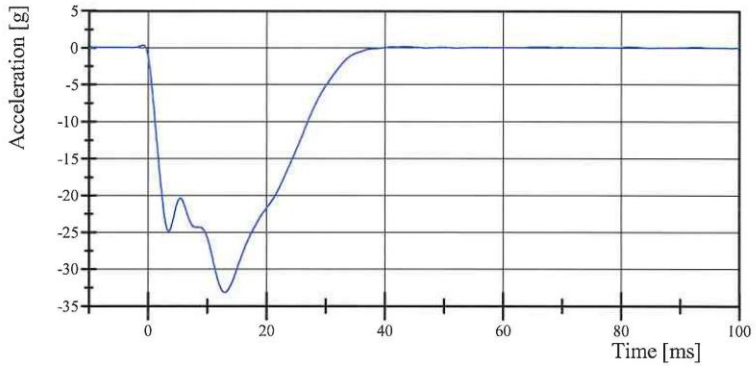
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 13:46:34 638

Transportation Research Center Inc.

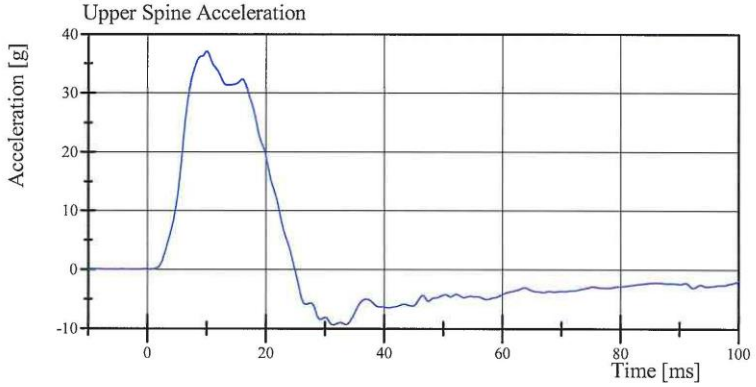
Left Lateral Thorax with Arm
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Probe Acceleration



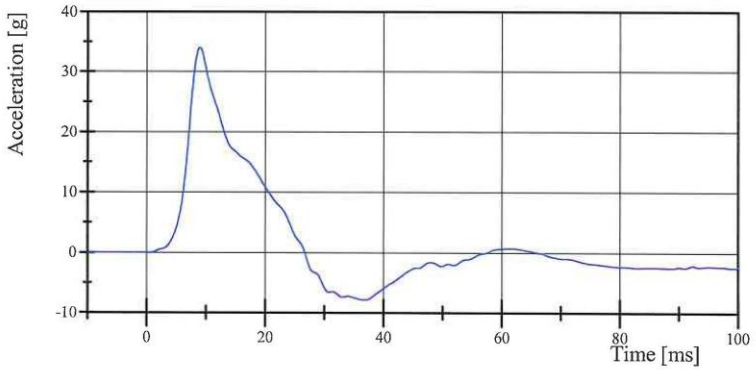
Filter Class: CFC_180
Max: 0.3 g at -0.9 ms
Min: -33.1 g at 13.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 37.1 g at 10.0 ms
Min: -9.4 g at 31.4 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.0 g at 9.0 ms
Min: -7.9 g at 36.8 ms

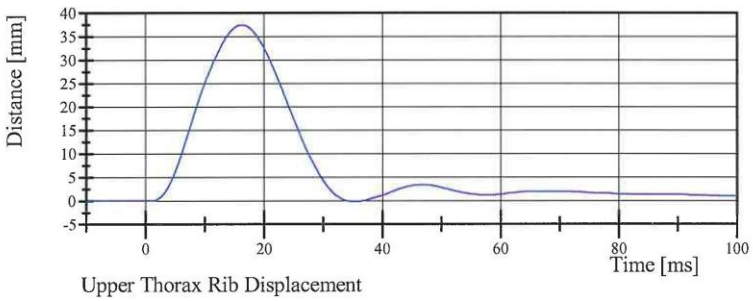
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 13:46:42 638

Transportation Research Center Inc.

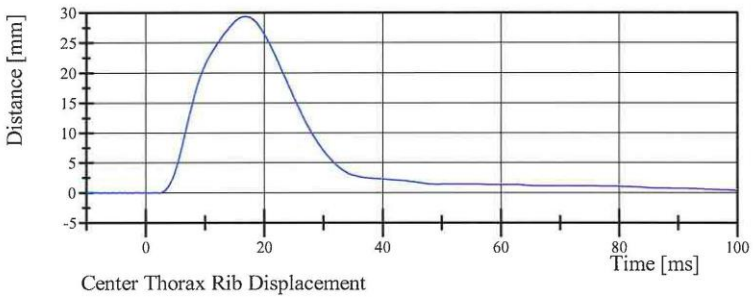
Left Lateral Thorax with Arm
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Shoulder Rib Displacement



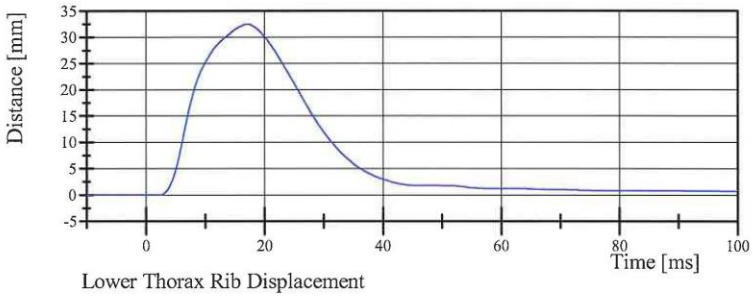
Filter Class: CFC_600
Max: 37.4 mm at 16.2 ms
Min: -0.2 mm at 35.1 ms

Upper Thorax Rib Displacement



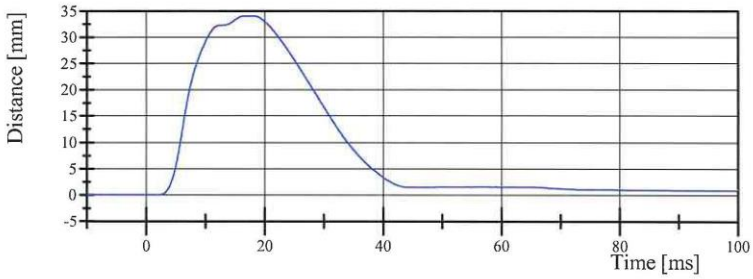
Filter Class: CFC_600
Max: 29.3 mm at 16.8 ms
Min: -0.0 mm at 2.3 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.5 mm at 17.3 ms
Min: -0.0 mm at 2.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.0 mm at 16.8 ms
Min: -0.0 mm at -7.4 ms

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

10.16.2015 13:46:43 638

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.286 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.9 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	39.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.3 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.6 g	Yes

Test meets specifications.

Comments:

Technician

Approved

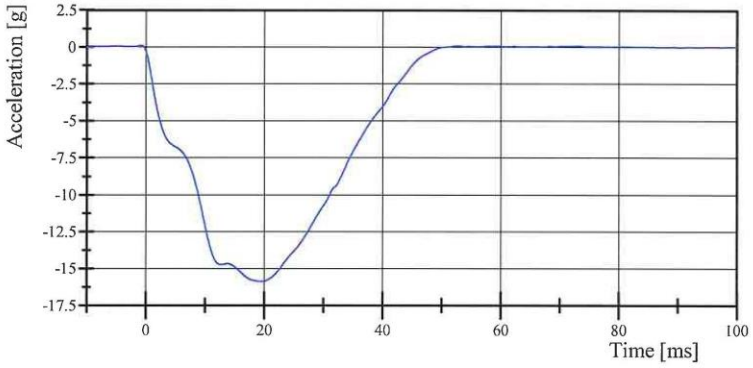
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 12:56:47 875

Transportation Research Center Inc.

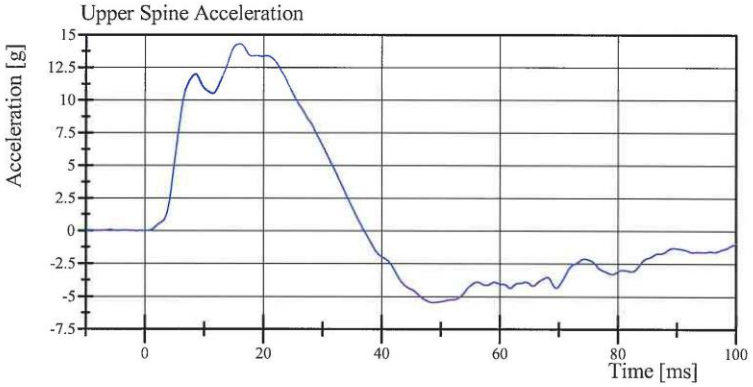
Left Lateral Thorax without Arm
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Probe Acceleration



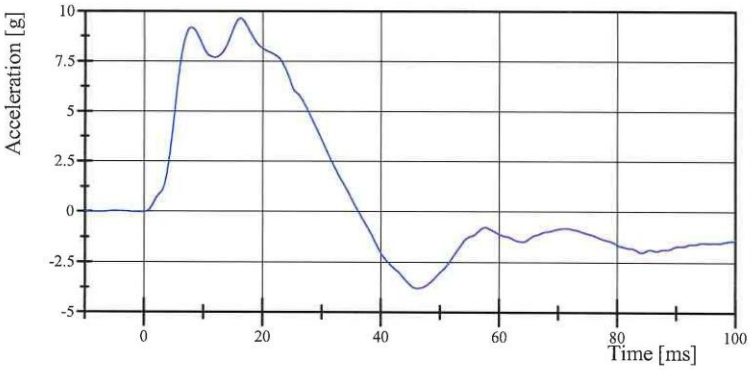
Filter Class: CFC_180
Max: 0.1 g at 73.0 ms
Min: -15.9 g at 19.5 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.3 g at 16.0 ms
Min: -5.5 g at 48.6 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.6 g at 16.2 ms
Min: -3.8 g at 46.2 ms

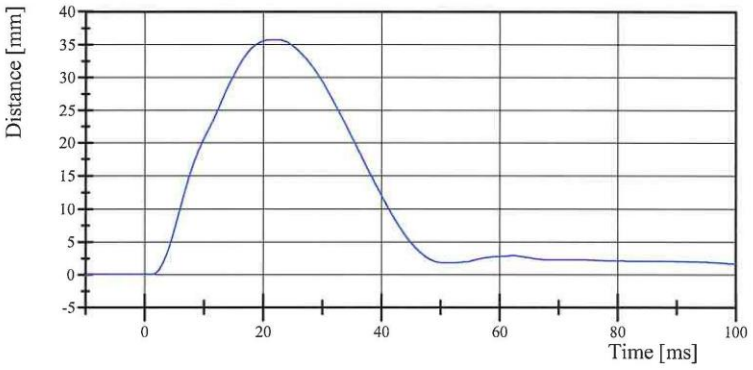
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 12:56:54 875

Transportation Research Center Inc.

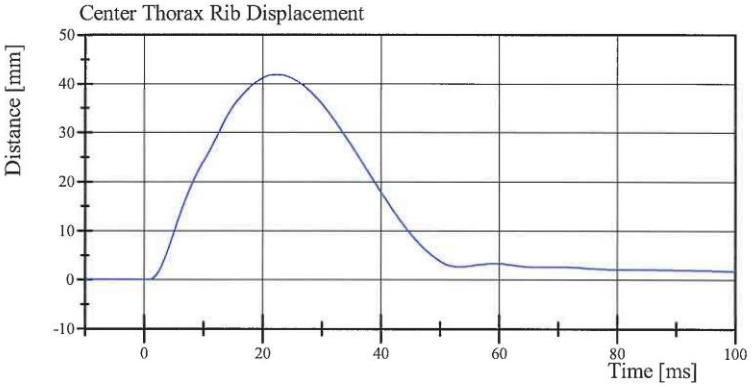
Left Lateral Thorax without Arm
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Upper Thorax Rib Displacement



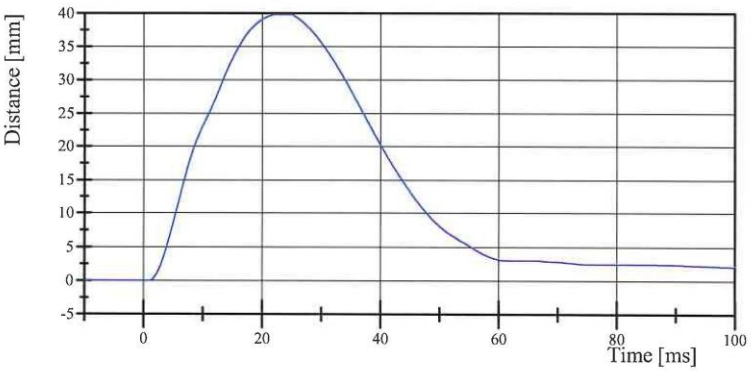
Filter Class: CFC_600
Max: 35.8 mm at 21.9 ms
Min: -0.0 mm at 1.2 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.9 mm at 22.3 ms
Min: -0.0 mm at 0.8 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.8 mm at 24.8 ms
Min: -0.0 mm at 0.9 ms

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

10.16.2015 12:56:55 875

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.0 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.1 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.03 g	Yes

Test meets specifications.

Comments:

Technician

Approved

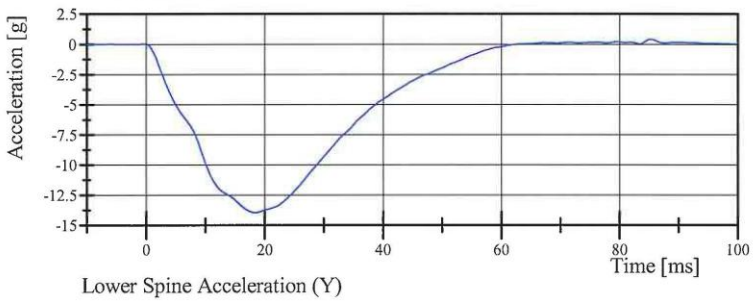
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 12:45:14 693

Transportation Research Center Inc.

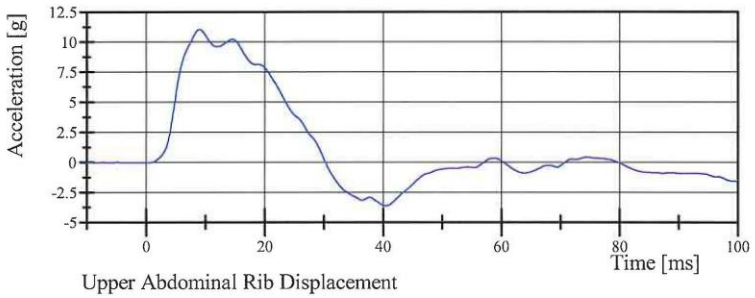
Left Lateral Abdomen
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Probe Acceleration



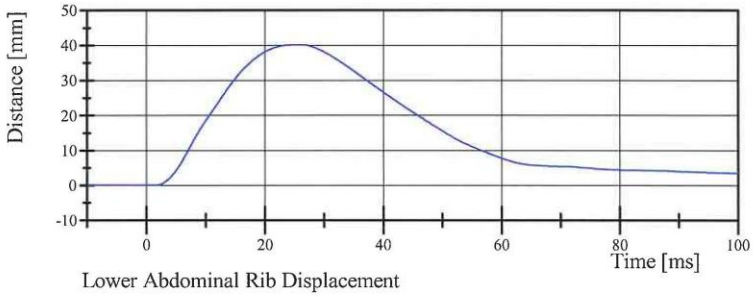
Filter Class: CFC_180
Max: 0.4 g at 85.2 ms
Min: -14.0 g at 18.4 ms

Lower Spine Acceleration (Y)



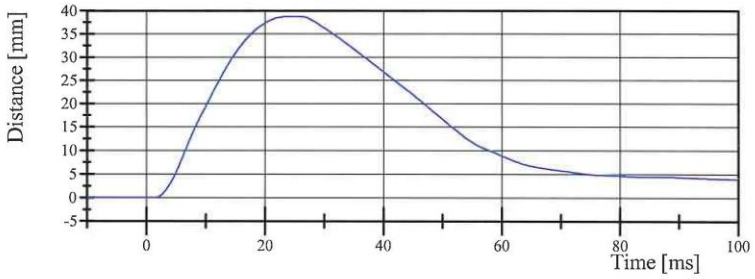
Filter Class: CFC_180
Max: 11.0 g at 9.0 ms
Min: -3.6 g at 40.4 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 40.1 mm at 25.2 ms
Min: -0.0 mm at 1.7 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 38.8 mm at 24.1 ms
Min: -0.0 mm at 1.5 ms

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

10.16.2015 12:45:23 693

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DI8818 Certification No. 17-2
Test Date: 10/19/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.67 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.39 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	41.9 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,129.1 N	Yes

Test meets specifications.

Comments:

Technician

Approved

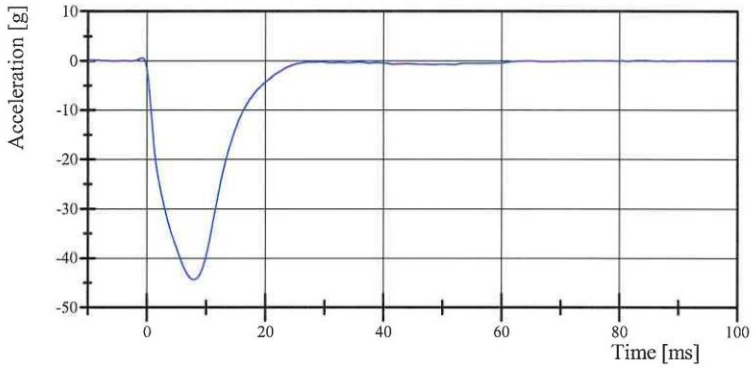
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2015 08:12:32 461

Transportation Research Center Inc.

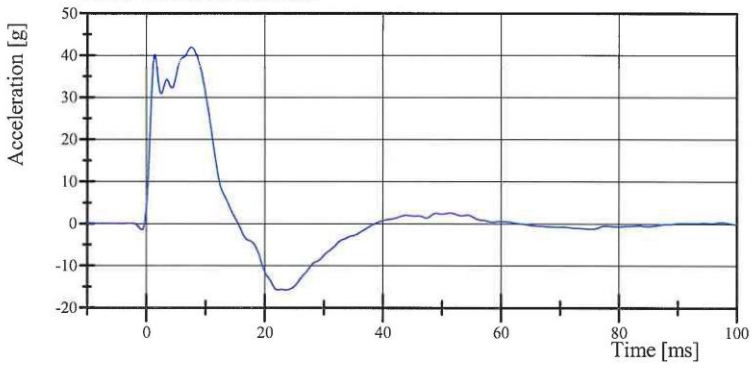
Left Lateral Pelvis
SID IIs Serial No. DI8818 Certification No. 17-2
Test Date: 10/19/2015

Probe Acceleration



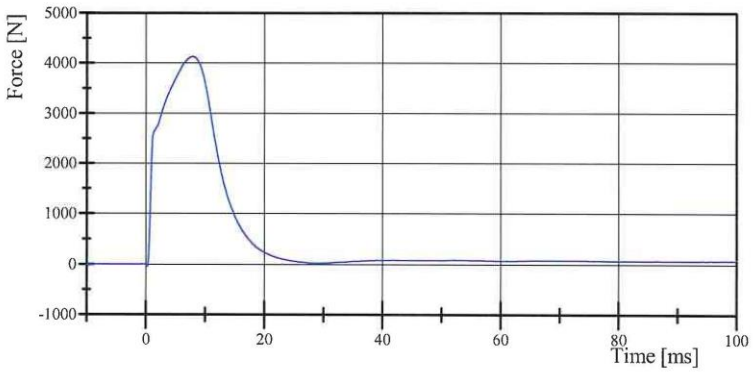
Filter Class: CFC_180
Max: 0.5 g at -0.8 ms
Min: -44.4 g at 7.9 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 41.9 g at 7.5 ms
Min: -15.8 g at 23.6 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,129.1 N at 7.8 ms
Min: -43.9 N at 0.2 ms

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

10.19.2015 08:12:39 461

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-39.7 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	28.3 g	Yes
Iliac Force	4,100 - 5,100 N	4,330.7 N	Yes

Test meets specifications.

Comments:

Technician

Approved

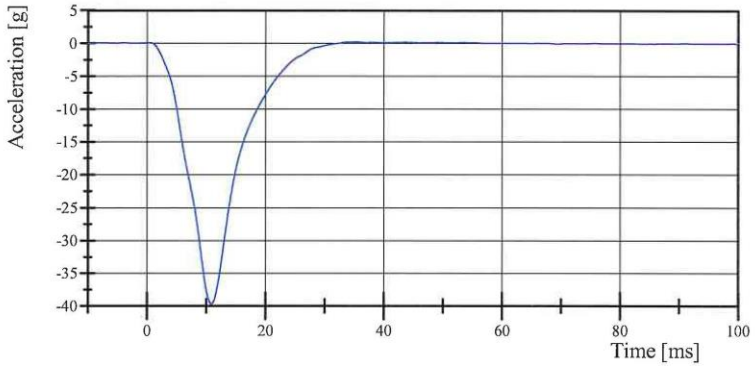
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.16.2015 11:41:11 671

Transportation Research Center Inc.

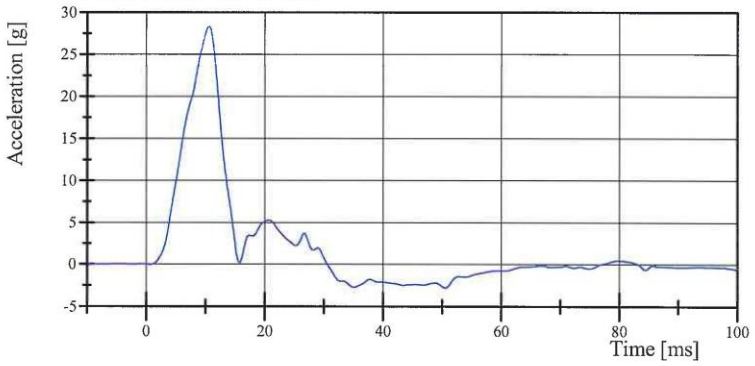
Left Lateral Iliac
SID IIs Serial No. DI8818 Certification No. 17-1
Test Date: 10/16/2015

Probe Acceleration



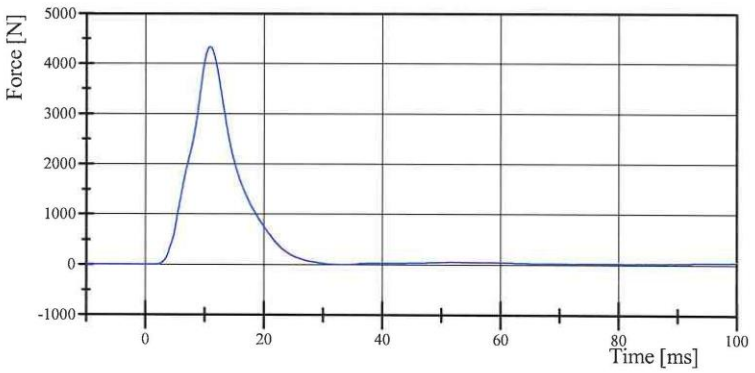
Filter Class: CFC_180
Max: 0.2 g at 35.4 ms
Min: -39.7 g at 10.9 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 28.3 g at 10.6 ms
Min: -2.8 g at 50.5 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,330.7 N at 10.9 ms
Min: -0.4 N at -0.6 ms

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

10.16.2015 11:41:38 671

Driver S/N DI8818
Post-Test Calibration Sheets

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DI8818 Calibration No.18

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	780	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	130	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	182	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	352	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	427	Yes
O	Chest Depth without Jacket	195.0 - 211.0	202	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	313	Yes
R	Arm Length	249.0 - 259.0	255	Yes
S	Knee Joint to seat Back	478.0 - 493.0	485	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	867	Yes
Z	Waist Circumference	761.0 - 791.0	775	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. DI8818 Certification No. 18-2
Test Date: 10/26/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	131.5 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	3.4 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

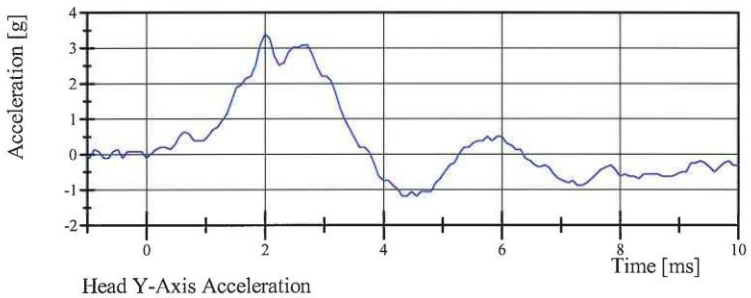
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.26.2015 09:20:51 234

Transportation Research Center Inc.

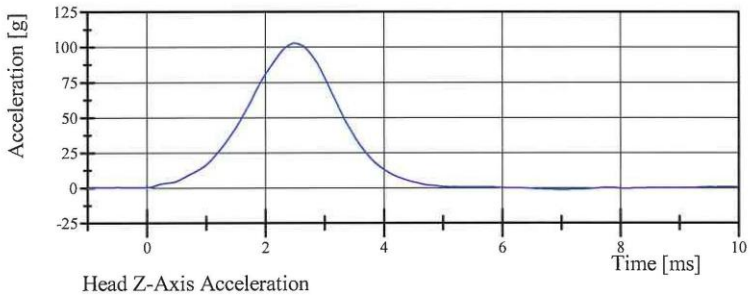
Left Lateral Head Drop
SID IIs Serial No. DI8818 Certification No. 18-2
Test Date: 10/26/2015

Head X-Axis Acceleration



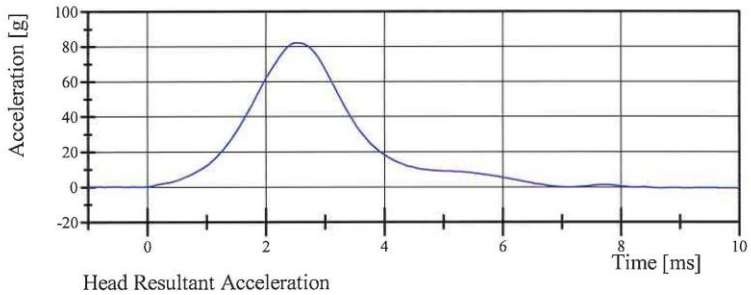
Filter Class: CFC_1000
Max: 3.4 g at 2.0 ms
Min: -1.2 g at 4.3 ms

Head Y-Axis Acceleration



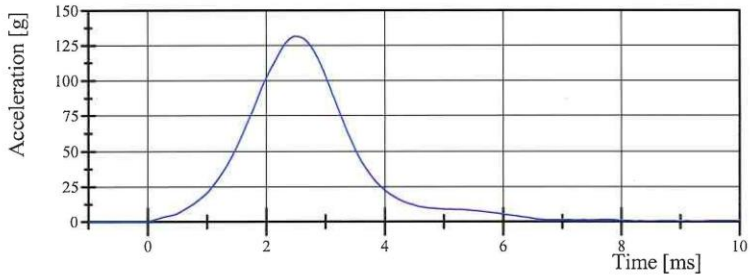
Filter Class: CFC_1000
Max: 102.8 g at 2.5 ms
Min: -1.2 g at 7.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 82.1 g at 2.6 ms
Min: -0.4 g at 9.1 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 131.5 g at 2.5 ms
Min: 0.1 g at -1.0 ms

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

10.26.2015 09:20:58 234

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.591 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.615 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.814 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.116 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.851 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.857 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-76.1 deg	Yes
Time of Peak	50 - 70 ms	64.8 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	117.2 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

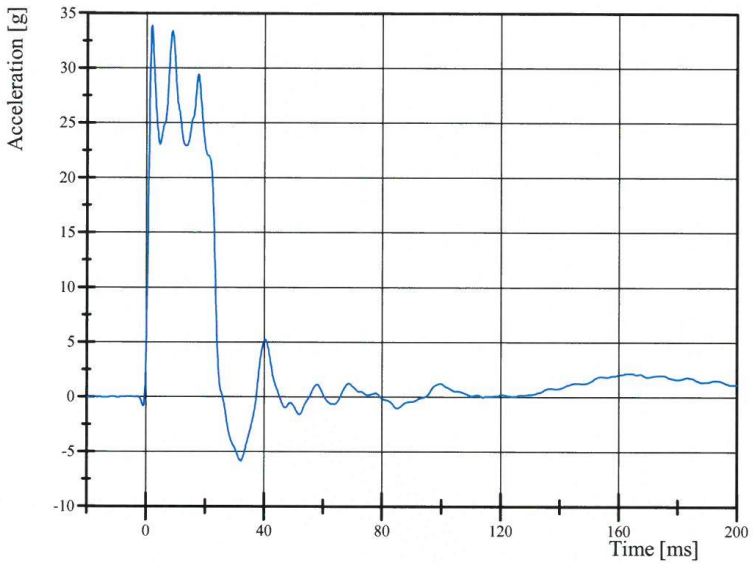
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 10:50:16 642

Transportation Research Center Inc.

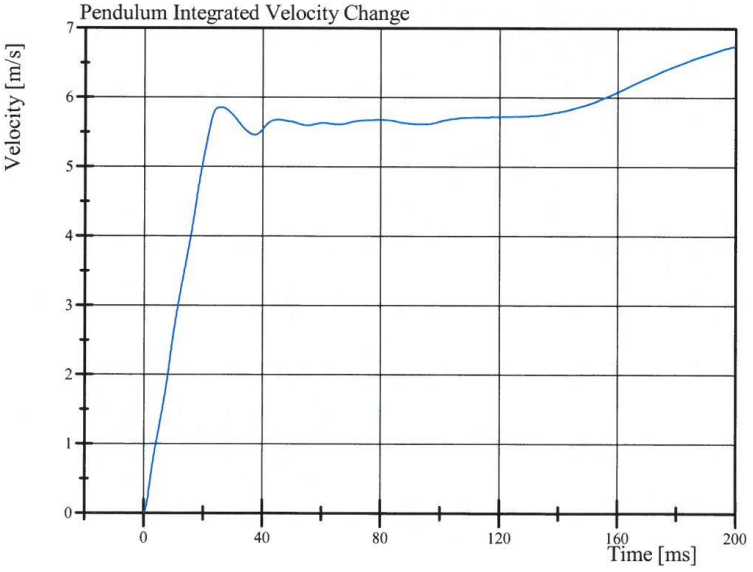
Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Pendulum Acceleration



Filter Class: CFC_180
Max: 33.9 g at 1.8 ms
Min: -5.8 g at 32.2 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

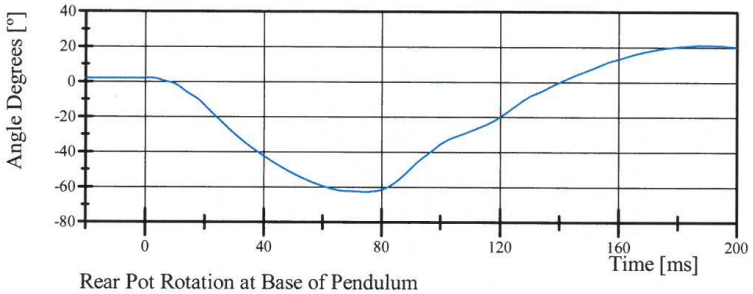
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 10:50:24 642

Transportation Research Center Inc.

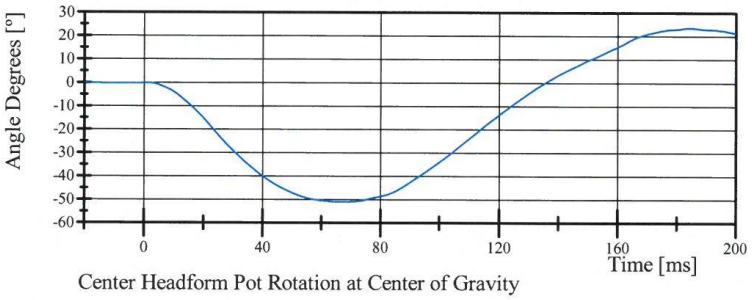
Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Forward Pot Rotation at Base of Pendulum



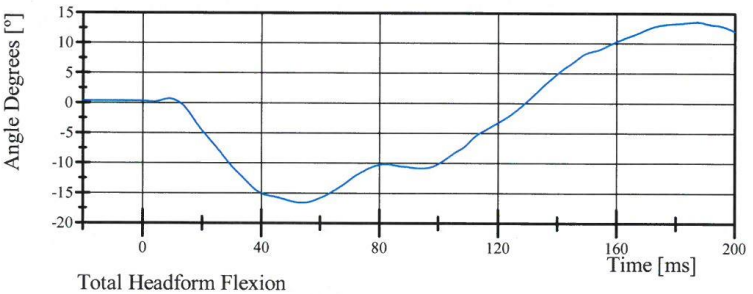
Filter Class: CFC_60
Max: 21.1 ° at 189.1 ms
Min: -62.6 ° at 74.6 ms

Rear Pot Rotation at Base of Pendulum



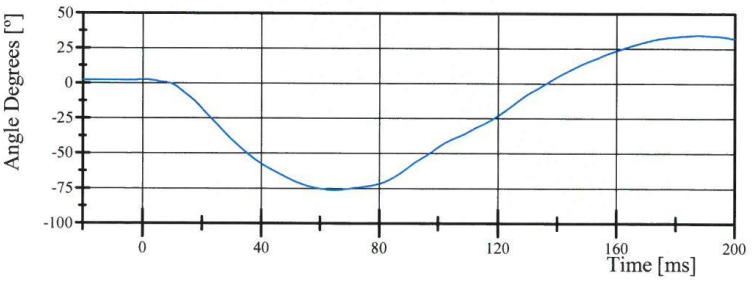
Filter Class: CFC_60
Max: 23.5 ° at 184.5 ms
Min: -51.0 ° at 66.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.6 ° at 187.4 ms
Min: -16.6 ° at 53.9 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 34.6 ° at 187.8 ms
Min: -76.1 ° at 64.8 ms

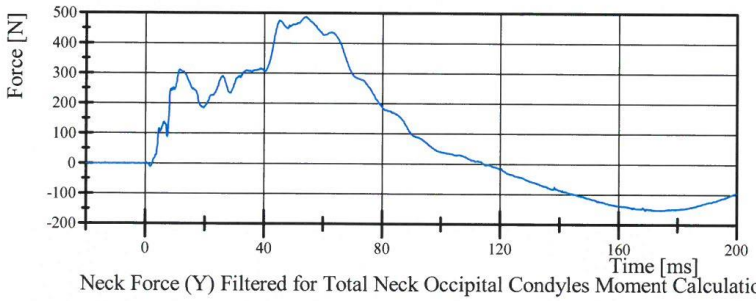
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 10:50:25 642

Transportation Research Center Inc.

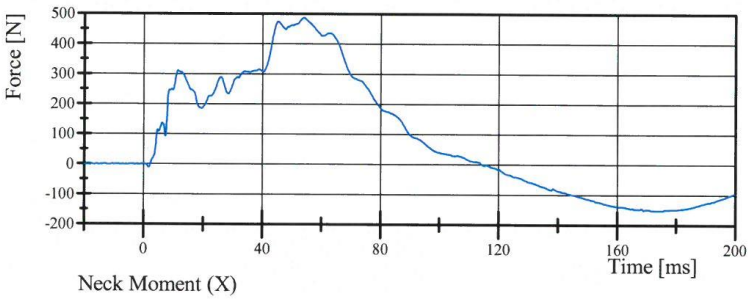
Left Lateral Neck
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Neck Force (Y)



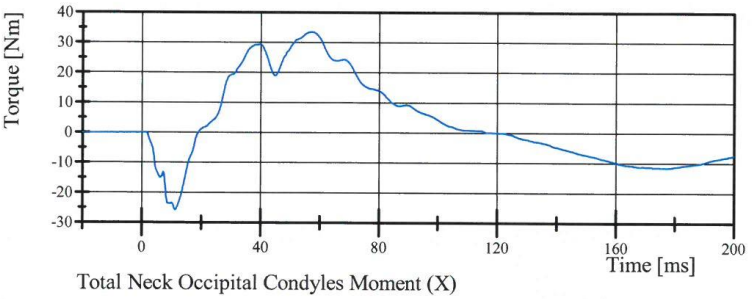
Filter Class: CFC_1000
Max: 487.9 N at 54.1 ms
Min: -152.1 N at 168.9 ms

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



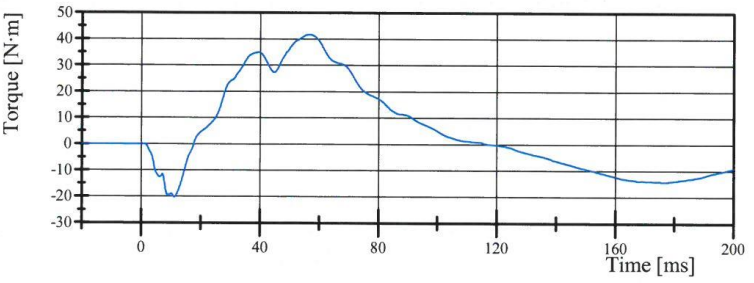
Filter Class: CFC_600
Max: 487.3 N at 54.1 ms
Min: -151.6 N at 174.5 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.5 Nm at 57.1 ms
Min: -25.7 Nm at 11.2 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constai
Max: 41.7 N·m at 56.9 ms
Min: -20.3 N·m at 11.1 ms

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

10.23.2015 10:50:25 642

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-14.7 g	Yes
Shoulder Displacement	28 - 37 mm	32.8 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.5 g	Yes

Test meets specifications.

Comments:

Technician

Approved

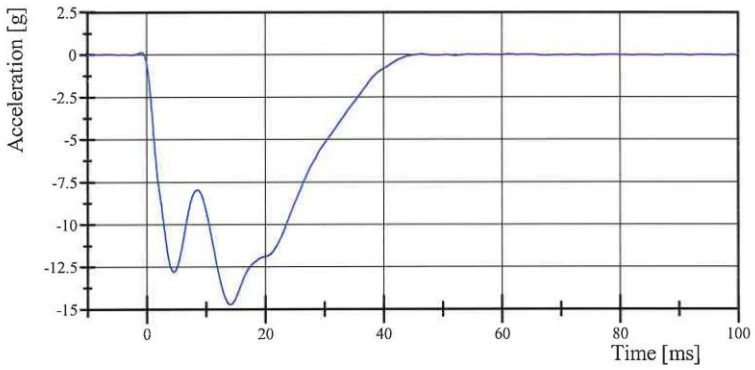
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 13:24:20 827

Transportation Research Center Inc.

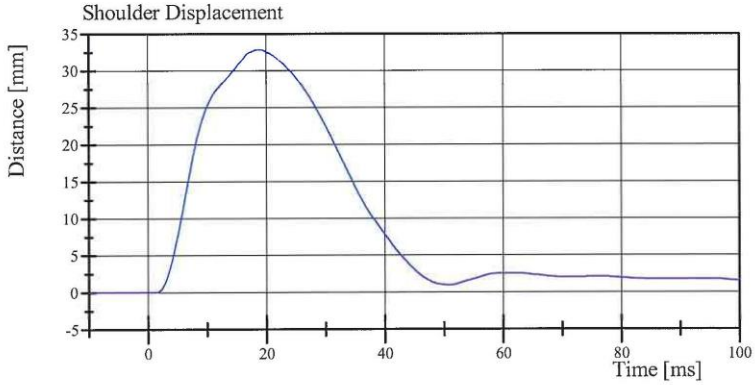
Left Lateral Shoulder
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Probe Acceleration



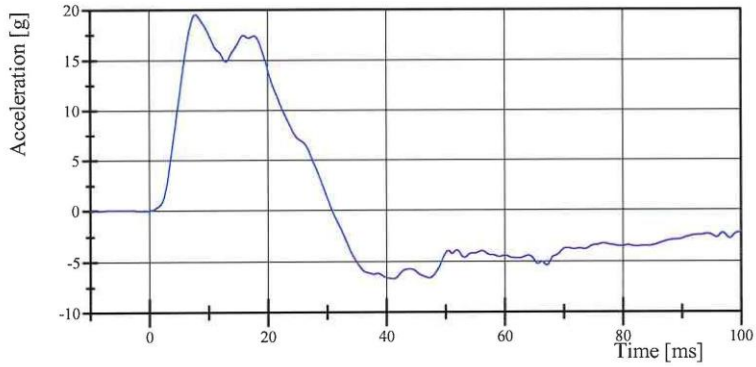
Filter Class: CFC_180
Max: 0.1 g at -0.9 ms
Min: -14.7 g at 14.2 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 32.8 mm at 18.8 ms
Min: -0.0 mm at 1.1 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.5 g at 7.8 ms
Min: -6.7 g at 41.1 ms

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

10.23.2015 13:24:28 827

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.736 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-32.3 g	Yes
Shoulder Displacement	31 - 40 mm	37.3 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	29.5 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.4 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	36.5 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.2 g	Yes

Test meets specifications.

Comments:

Technician

Approved

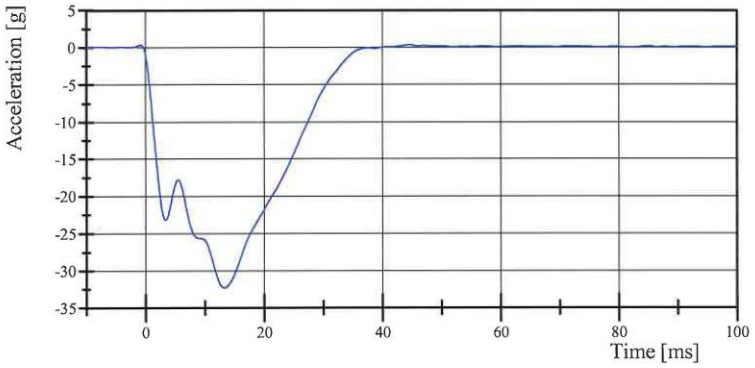
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 15:03:27 602

Transportation Research Center Inc.

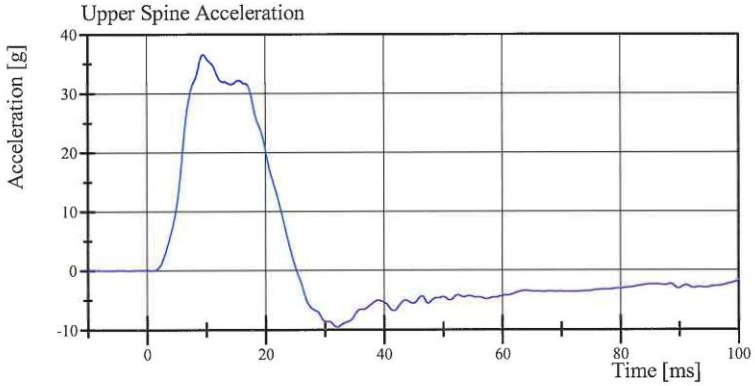
Left Lateral Thorax with Arm
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Probe Acceleration



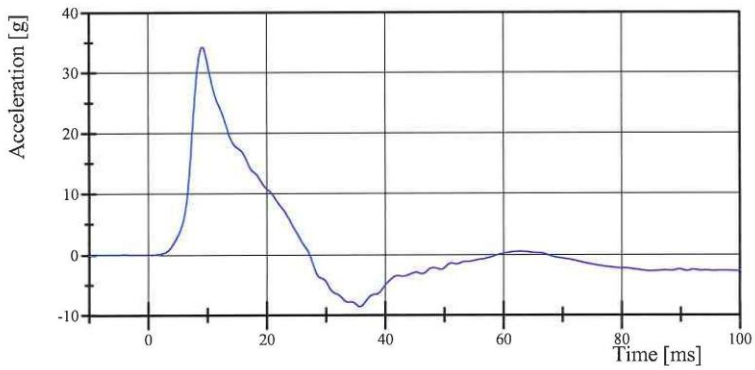
Filter Class: CFC_180
Max: 0.3 g at 44.6 ms
Min: -32.3 g at 13.3 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 36.5 g at 9.5 ms
Min: -9.6 g at 32.1 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.2 g at 9.2 ms
Min: -8.6 g at 35.8 ms

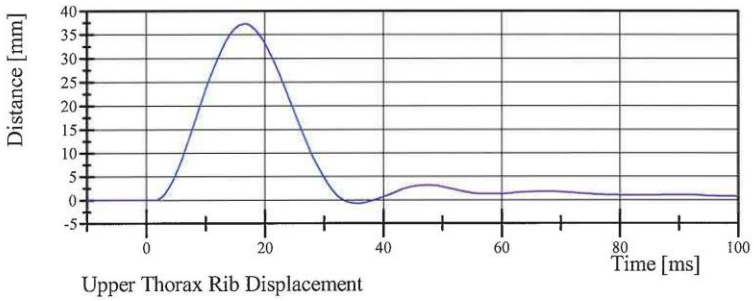
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 15:03:36 602

Transportation Research Center Inc.

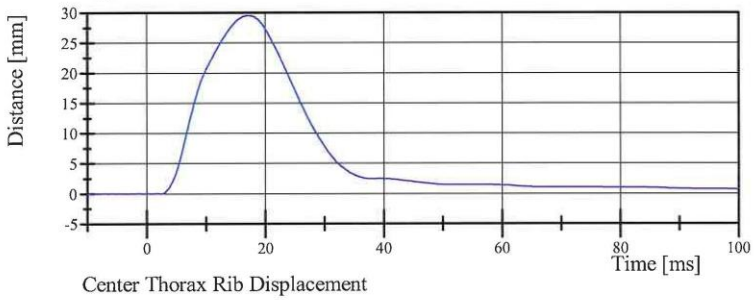
Left Lateral Thorax with Arm
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Shoulder Rib Displacement



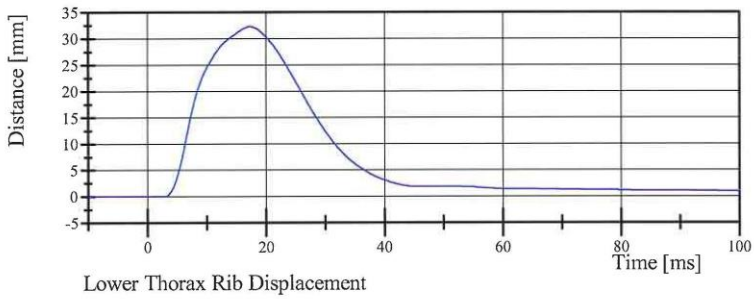
Filter Class: CFC_600
Max: 37.3 mm at 16.8 ms
Min: -0.7 mm at 35.9 ms

Upper Thorax Rib Displacement



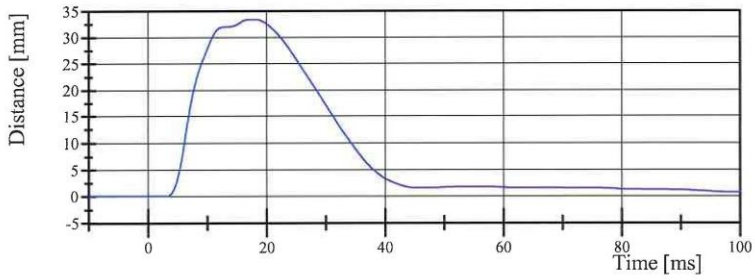
Filter Class: CFC_600
Max: 29.5 mm at 17.2 ms
Min: -0.0 mm at 2.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.3 mm at 17.3 ms
Min: -0.0 mm at 2.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.4 mm at 17.1 ms
Min: -0.0 mm at 3.1 ms

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

10.23.2015 15:03:37 602

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DI8818 Certification No. 18-2
Test Date: 10/23/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.356 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.6 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	39.5 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	42.8 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.7 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.7 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.2 g	Yes

Test meets specifications.

Comments:

Technician

Approved

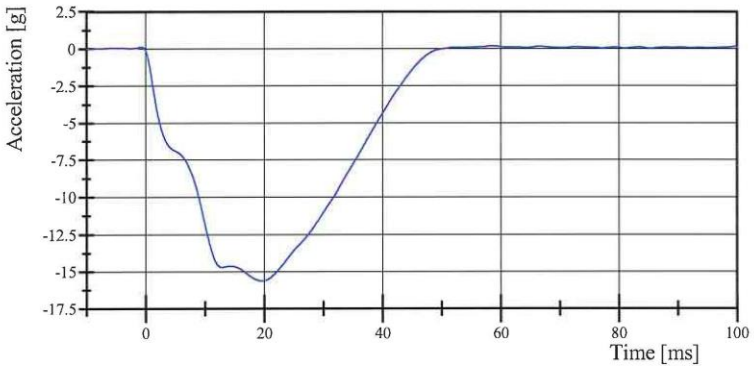
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 14:30:21 823

Transportation Research Center Inc.

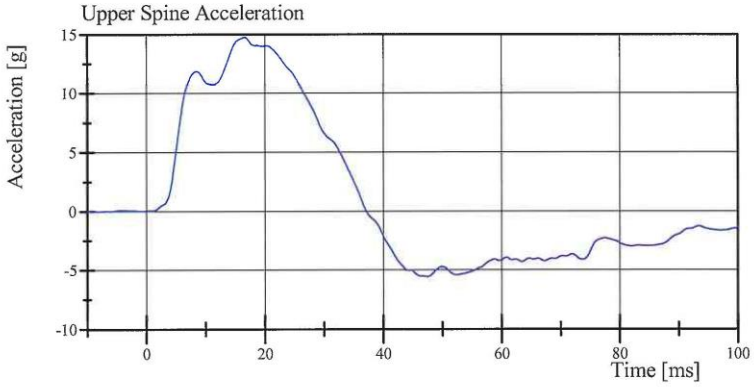
Left Lateral Thorax without Arm
SID IIs Serial No. DI8818 Certification No. 18-2
Test Date: 10/23/2015

Probe Acceleration



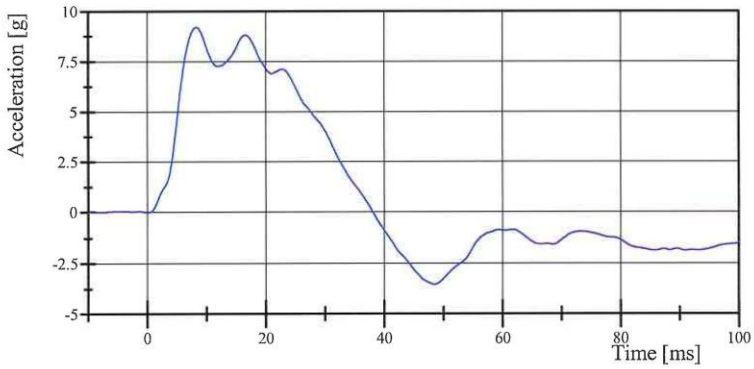
Filter Class: CFC_180
Max: 0.2 g at 58.5 ms
Min: -15.6 g at 19.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.7 g at 16.6 ms
Min: -5.5 g at 47.5 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.2 g at 8.3 ms
Min: -3.5 g at 48.5 ms

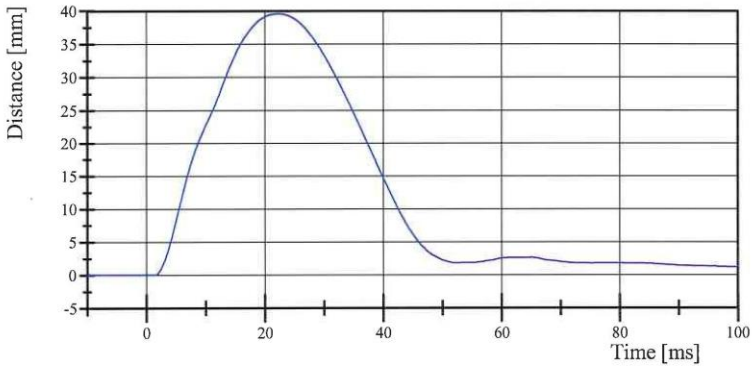
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 14:30:29 823

Transportation Research Center Inc.

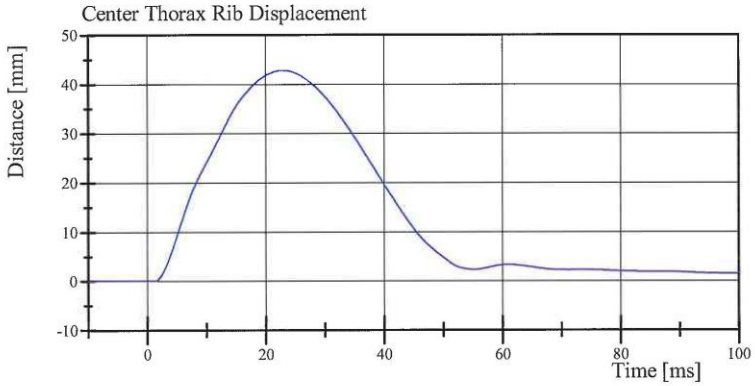
Left Lateral Thorax without Arm
SID IIs Serial No. DI8818 Certification No. 18-2
Test Date: 10/23/2015

Upper Thorax Rib Displacement



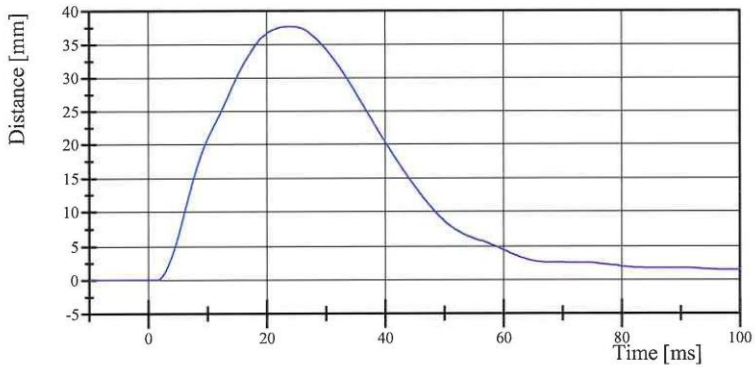
Filter Class: CFC_600
Max: 39.5 mm at 22.2 ms
Min: -0.0 mm at 1.4 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 42.8 mm at 23.0 ms
Min: -0.0 mm at 1.2 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.7 mm at 23.9 ms
Min: -0.0 mm at 1.4 ms

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

10.23.2015 14:30:30 823

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.4 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.9 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	36.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.05 g	Yes

Test meets specifications.

Comments:

Technician

Approved

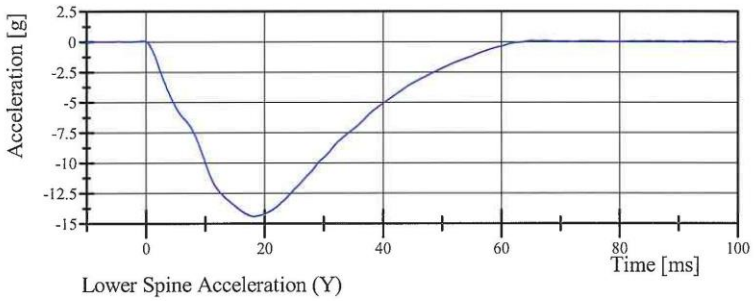
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 13:38:15 648

Transportation Research Center Inc.

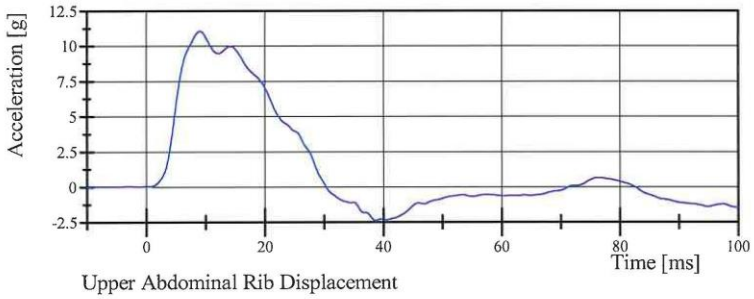
Left Lateral Abdomen
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Probe Acceleration



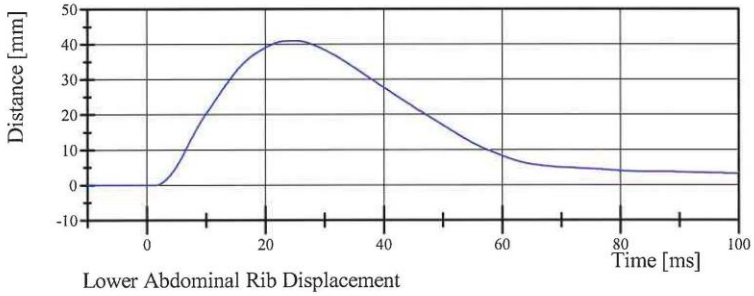
Filter Class: CFC_180
Max: 0.1 g at 65.1 ms
Min: -14.4 g at 18.2 ms

Lower Spine Acceleration (Y)



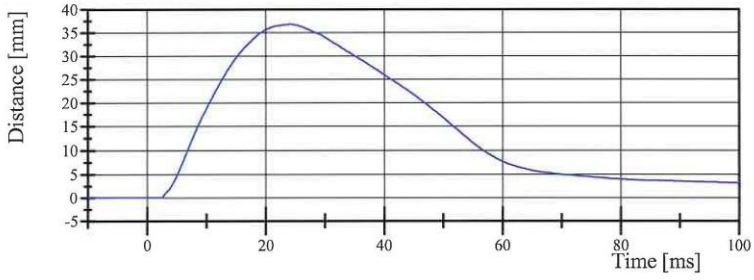
Filter Class: CFC_180
Max: 11.0 g at 9.1 ms
Min: -2.4 g at 38.7 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 40.9 mm at 25.0 ms
Min: -0.0 mm at 1.6 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 36.8 mm at 24.2 ms
Min: -0.0 mm at 2.3 ms

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

10.23.2015 13:38:25 648

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/26/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.67 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-43.49 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	40.5 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,166.2 N	Yes

Test meets specifications.

Comments:

Technician

Approved

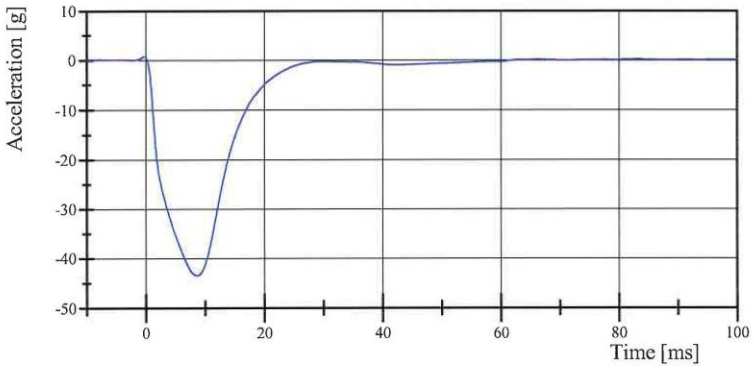
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.26.2015 08:19:52 439

Transportation Research Center Inc.

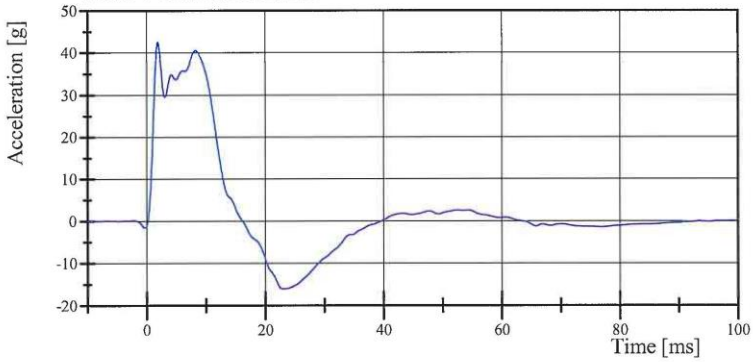
Left Lateral Pelvis
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/26/2015

Probe Acceleration



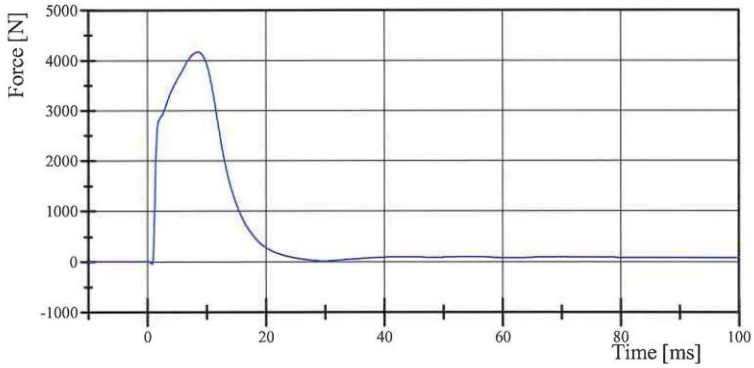
Filter Class: CFC_180
Max: 0.6 g at -0.2 ms
Min: -43.5 g at 8.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 42.6 g at 1.9 ms
Min: -16.1 g at 23.0 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,166.2 N at 8.6 ms
Min: -54.5 N at 0.8 ms

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

10.26.2015 08:20:01 439

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.35 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-42.0 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.8 g	Yes
Iliac Force	4,100 - 5,100 N	4,973.5 N	Yes

Test meets specifications.

Comments:

Technician

Approved

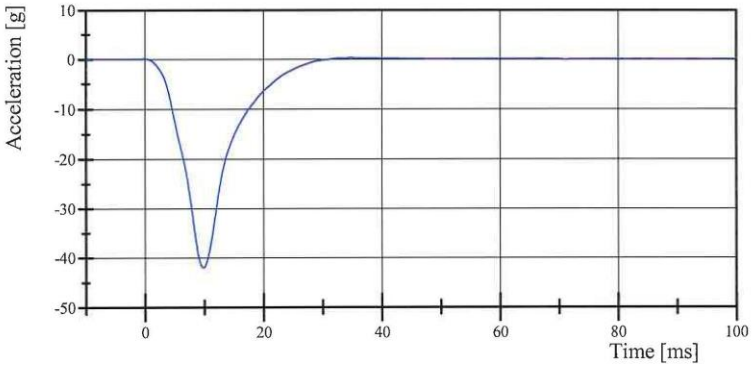
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.23.2015 12:40:37 647

Transportation Research Center Inc.

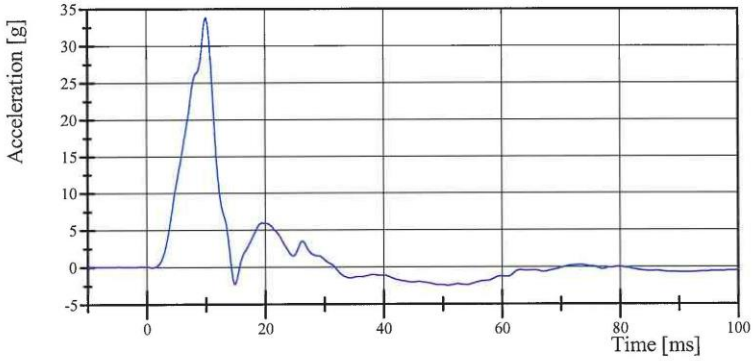
Left Lateral Iliac
SID IIs Serial No. DI8818 Certification No. 18-1
Test Date: 10/23/2015

Probe Acceleration



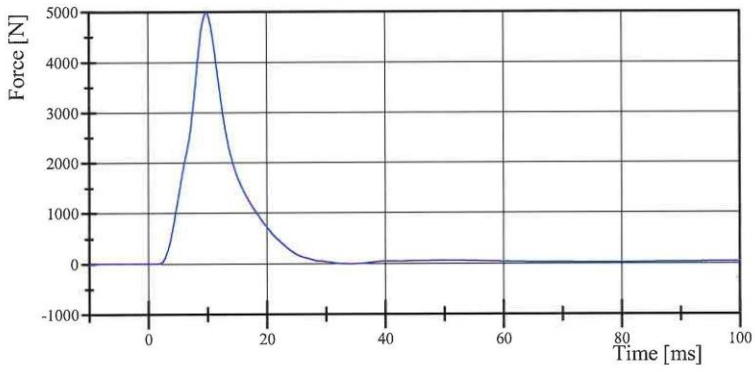
Filter Class: CFC_180
Max: 0.3 g at 34.8 ms
Min: -42.0 g at 9.8 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 33.8 g at 10.1 ms
Min: -2.5 g at 50.9 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,973.5 N at 9.9 ms
Min: -1.9 N at 34.0 ms

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

10.23.2015 12:40:49 647

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N DI8818		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	J32214	Endevco	29-Apr-2015
			Y	J27040	Endevco	29-Apr-2015
			Z	AGAC4	Endevco	29-Apr-2015
Displacement Potentiometers	Shoulder		Y	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	3787-047	Servo	29-Apr-2015
		Middle	Y	3745-01815	Servo	29-Apr-2015
		Lower	Y	3787-043	Servo	7-Oct-2015
	Abdominal Rib	Upper	Y	3745-01811	Servo	29-Apr-2015
		Lower	Y	3787-051	Servo	29-Apr-2015
Lower Spine Accelerometers (T12)			X	P64150	Endevco	29-Apr-2015
			Y	P64142	Endevco	29-Apr-2015
			Z	P64100	Endevco	29-Apr-2015
Acetabulum Load Cell			Y	235-FY	FTSS	29-Apr-2015
Iliac Wing Load Cell			Y	113-FY	FTSS	29-Apr-2015
Pelvis Plug (struck side)				63562	Humanetics	5-Apr-2013
Pelvis Plug (non-struck side)				63609	Humanetics	2-Apr-2013

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P87162	Endevco	18-Jun-2015
Vehicle Center of Gravity	Y	P85580	Endevco	3-Sep-2015
Vehicle Center of Gravity	Z	P81659	Endevco	20-Jul-2015
Left Floor Sill	Y	P90295	Endevco	12-Oct-2015
A-Pillar Sill	Y	P29868	Endevco	2-Sep-2015
A-Pillar Low	Y	P87582	Endevco	28-May-2015
A-Pillar Mid	Y	P75523	Endevco	21-Jul-2015
B-Pillar Sill	Y	P33867	Endevco	5-Oct-2015
B-Pillar Low	Y	P87172	Endevco	26-Jun-2015
B-Pillar Mid	Y	P87464	Endevco	21-May-2015
Driver Seat	Y	P61943	Endevco	20-Oct-2015
Engine Top	X	P45023	Endevco	6-May-2015
Engine Top	Y	P46078	Endevco	20-Jul-2015
Firewall	Y	P85357	Endevco	16-Oct-2015
Right Roof	Y	P33945	Endevco	5-Oct-2015
Right Floor Sill	Y	P91084	Endevco	12-Oct-2015
Rear Floor Pan	X	P29069	Endevco	15-May-2015
Rear Floor Pan	Y	P81064	Endevco	17-Jun-2015

TABLE 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	5763-88-FX	Denton	11-May-2015
Load Cell 2	5763-77-FX	Denton	9-Dec-2014
Load Cell 3	5764-103-FX	Denton	11-May-2015
Load Cell 4	5764-95-FX	Denton	9-Dec-2014
Load Cell 5	5763-92-FX	Denton	9-Dec-2014
Load Cell 6	5763-84-FX	Denton	9-Dec-2014
Load Cell 7	5764-97-FX	Denton	9-Dec-2014
Load Cell 8	5763-87-FX	Denton	9-Dec-2014