FINAL REPORT NUMBER: SINCAP-TRC-16-006

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

Toyota Motor Manufacturing, Texas, Inc.
2016 Toyota Tacoma Double Cab
NHTSA NUMBER: M20165114

PREPARED BY:
Transportation Research Center Inc.
10820 State Route 347
P. O. Box B-67
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Report Date: June 3, 2016

FINAL REPORT

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

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Report Approved By: Melinda Lackey

Melinda Lackey, Project Manager

Approval Date: June 3, 2016

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

Technical Report Documentation Page

1. Report No. SINCAP-TRC-16-006	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2016 Toyota Tacoma Double Cab, NHTSA No.: M20165114		5. Report Date June 3, 2016 6. Performing Organization Code TRC Inc.
7. Author(s) Melinda Lackey, Project Manager		8. Performing Organization Report Number 160414
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		10. Work Unit No. 11. Contract or Grant No. DTNH22-14-D-00354
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave, SE, Room W43-410 Washington, DC 20590		13. Type of Report and Period Covered Final Test Report April 14, 2016 – June 3, 2016 14. Sponsoring Agency Code NRM-110
15. Supplemental Notes		

16. Abstract

This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2016 Toyota Tacoma Double Cab, in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on April14, 2016.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.19 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22° C. The target vehicle post-test maximum crush was 339 mm at Level 1. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	62
Maximum Thoracic Rib Deflection	mm	44	32.8
Total Abdominal Force	N	2500	896.1
Pubic Symphysis Force	N	6000	-988.0
Lower Spine Acceleration	G	82*	47.0

Passenger ATD (SID-IIs)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	84
Lower Spine Resultant Acceleration	g's	82	30.4
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1778.3
Maximum Thoracic Rib Deflection	mm	38*	18.8
Maximum Abdominal Rib Deflection	mm	45*	11.7

* Proposed IARV

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

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

19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. Number of Pages 215	22. Price

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TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

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

SECTION 2

SUMMARY OF TEST RESULTS

A 2016 Toyota Tacoma Double Cab was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.19 km/h (38.64 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on April 14, 2016. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated October 2015. The side impact event was documented by 11 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

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

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

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	62
Maximum Thoracic Rib Deflection	mm	44	32.8
Combined Abdominal Force	N	2500	896.1
Pubic Symphysis Force	N	6000	-988.0
Lower Spine (T12) Resultant Acceleration	G	82*	47.0

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	84
Lower Spine (T12) Resultant Acceleration	G	82	30.4
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1778.3
Maximum Thoracic Rib Deflection	mm	38*	18.8
Maximum Abdominal Rib Deflection	mm	45*	11.7

* Proposed IARV

Supplemental Restraint Information is given below:

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

GENERAL COMMENTS

All doors remained closed throughout the test. No fuel spillage occurred during the impact or the static rollover test which followed. Injury values for both ATDs were within the established performance thresholds. The restraint system performed as expected.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20165114
Model Year	2016
Make	Toyota
Model	Tacoma
Body Style	Double Cab
VIN	5TFAX5GN1GX059512
Body Color	Magnetic Gray Metallic
Odometer Reading (km/mi)	140.0 mi
Engine Displacement (L)	2.7
Type/No. Cylinders	Straight/4
Engine Placement	Front/Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	RWD
Roof Rack	Rails
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufacturing, Texas, Inc.
Date of Manufacture	1/16
Vehicle Type	Truck

GVWR (kg)	2545
GAWR Front (kg)	1320
GAWR Rear (kg)	1490

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity DSC)	2	3	N/A	5
Capacity Weight (VCW) (kg)				631.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)[1]				290.8

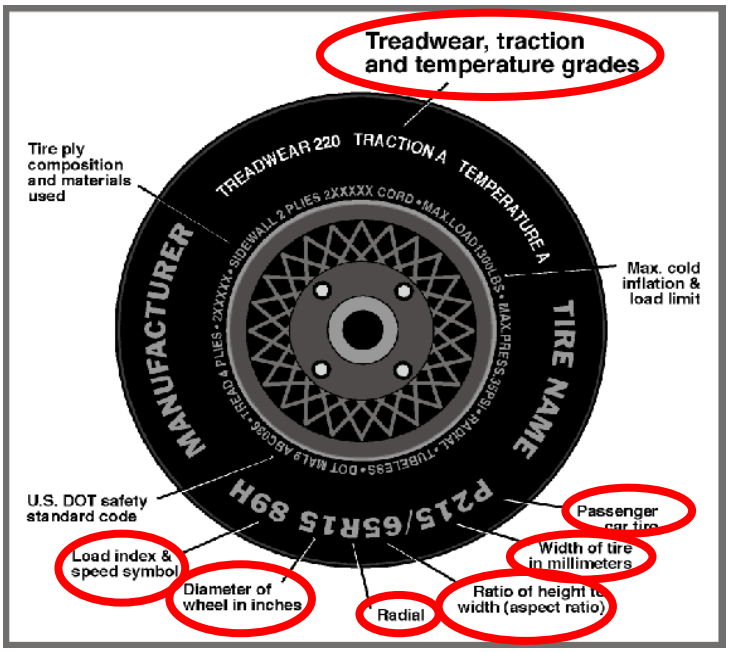
VEHICLE SEAT TYPE

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	Yes	Yes	N/A	N/A
Third Row Seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

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

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P245/75R16	P245/75R16
Tire Size on Vehicle	P245/75R16	P245/75R16
Tire Manufacturer	Firestone	Firestone
Tire Model	Destination LE[2]	Destination LE[2]
Treadwear	520	520
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	109S	109S
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	8X70 DE2 4115	8X70 DE2 4115
DOT Safety Code Right	8X70 DE2 4115	8X70 DE2 4115

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

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	227	227	220	220
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	N/A	N/A	N/A	N/A
As Tested	kPa	220	220	220	220

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21 kPa	207	207	207	207

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	503.6	425.2		505.6	511.0		545.0	542.4	
Right	kg	489.6	410.2		522.0	542.6		492.8	509.0	
Ratio	%	54.3	45.7		49.4	50.6		49.7	50.3	
Totals	kg	993.2	835.4	1828.6	1027.6	1053.6	2081.2	1037.8	1051.4	2089.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1828.6	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)[1]	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2089.6	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement
LF	mm	878	883	Yes
RF	mm	887	888	Yes
RR	mm	912	913	Yes
LR	mm	898	908	Yes
Vehicle CG (Aft of Front Axle)	mm	1636	1645	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+33	-18	

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

Test height adjustable suspension setting, if applicable: N/A

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plate mounted in cargo bed	48.1
Removed: None	0.0

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

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

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	21.9	16.9	18.8
Front Passenger Seat	21.3	16.6	18.6
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	18.3
Non-Struck Side Rear Seat	Fixed	N/A	18.4
Rear Center Seat*	Fixed	N/A	17.9

* 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	18.8	211	Max	N/A	N/A	N/A
			Mid	200	211	221
			Min	N/A	N/A	N/A
Front Passenger Seat	18.6	216	Max	N/A	N/A	N/A
			Mid	205	216	225
			Min	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	18.3	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	18.4	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*	17.9	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

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

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

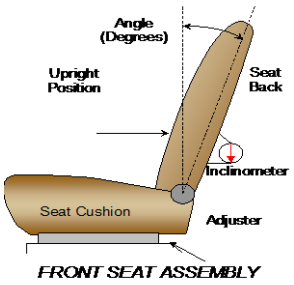
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	240	17	120	8
Front Passenger Seat	240	17	120	8
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Non-Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Rear Center Seat*	Fixed	N/A	Fixed	N/A

* If applicable

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	50.7	26	0.2 rear	4
Front Passenger Seat	50.4	26	0.7 rear	4
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	Fixed	N/A	N/A	N/A
Non-Struck Side Rear Seat	Fixed	N/A	N/A	N/A
Rear Center Seat*	Fixed	N/A	N/A	N/A

* If applicable

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4, Numbered from 0 to 3	0, Uppermost
Rear Seat	1, Fixed	1

HEAD RESTRAINT ADJUSTMENT

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

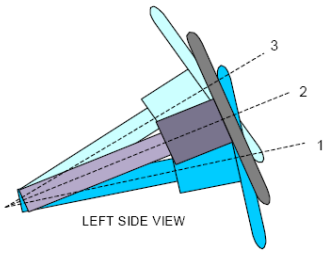
	Total # of Positions	Placed in Position #
Driver Seat	4, Numbered from 0 to 3	0, Uppermost
Rear Seat	1, Fixed	1

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

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

STEERING COLUMN ADJUSTMENT

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

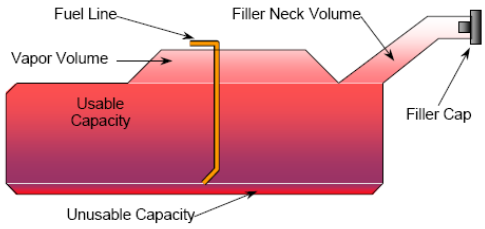


STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	24.0	N/A
Geometric Center, Position No. 2	25.6	N/A
Uppermost, Position No. 3	27.2	N/A
Telescoping Steering Wheel Travel		22
Test Position	25.6	11

FUEL PUMP

The electric fuel pump is activated when the ignition is Turned on.



VEHICLE FUEL TANK ASSEMBLY

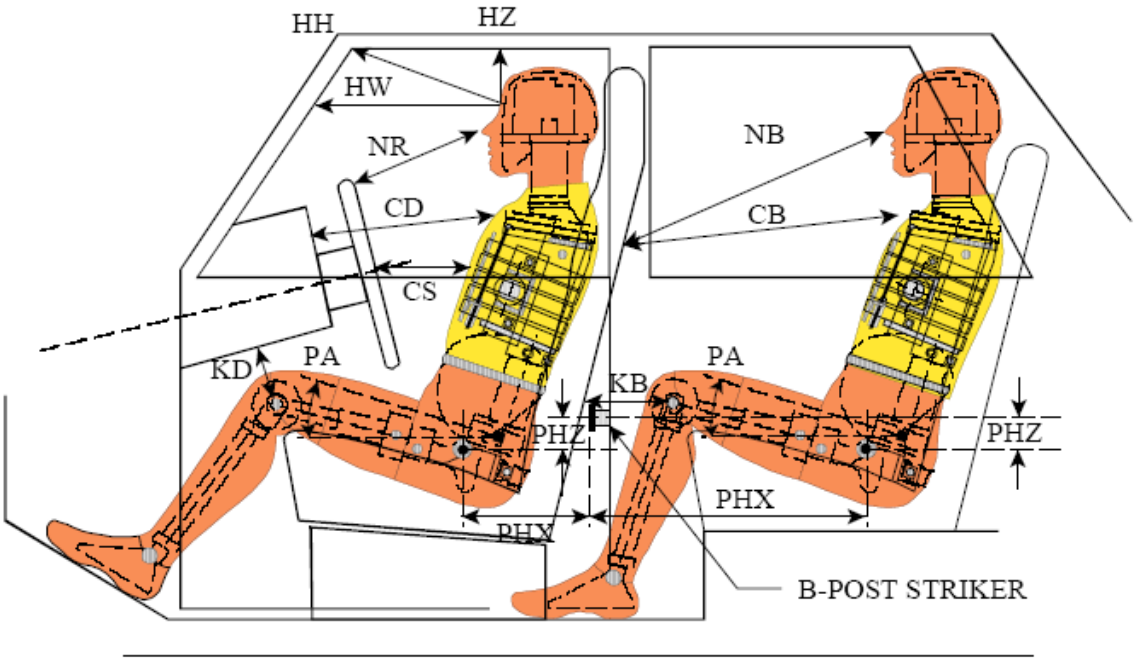
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	79.9
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	N/A
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	74.3
Actual Amount of Solvent Used in Test	74.3
1/3 of Usable Capacity	26.6

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



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

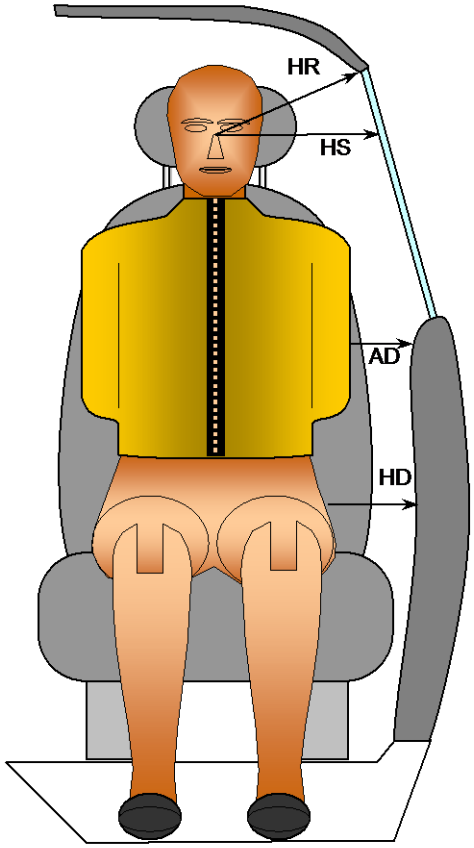
LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	443			
HW		Header to Windshield	607			
HZ	HZ	Head to Roof Liner	185		271	
NR	NB	Nose to Rim/Seat Back	468		533	
CD	CB	Chest to Dash/Seat Back	594		494	
CS		Chest to Steering Wheel	362			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	156	11.0	236	0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	158	16.0	234	0
PAX°	PAX°	Pelvic Tilt Angle X		N/A		21.6
	PAY°	Pelvic Tilt Angle Y				0.4
PHX	PHX	Hip Point to Striker (X-Axis)	193		267	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	154		207	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

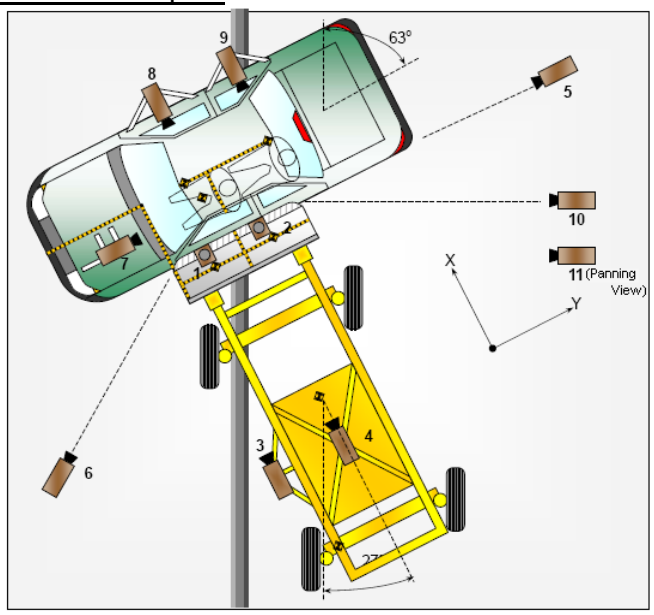


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	221	263
HS	Head to Side Window	mm	344	360
AD	Arm to Door	mm	115	149
HD	H-Point to Door	mm	170	180

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-338	1158	-5731	6	1000
2	Overhead Close-up	-167	894	-5712	16	1000
3	Left Impact Point (MDB)	-1170	-855	-834	25	1000
4	Side Overall (MDB)	-2410	0	-1421	6	1000
5	Rear	912	8271	1425	18	1000
6	Left Front	3601	5120	1400	20	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				25	1000
9	Passenger Side (OB)				25	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

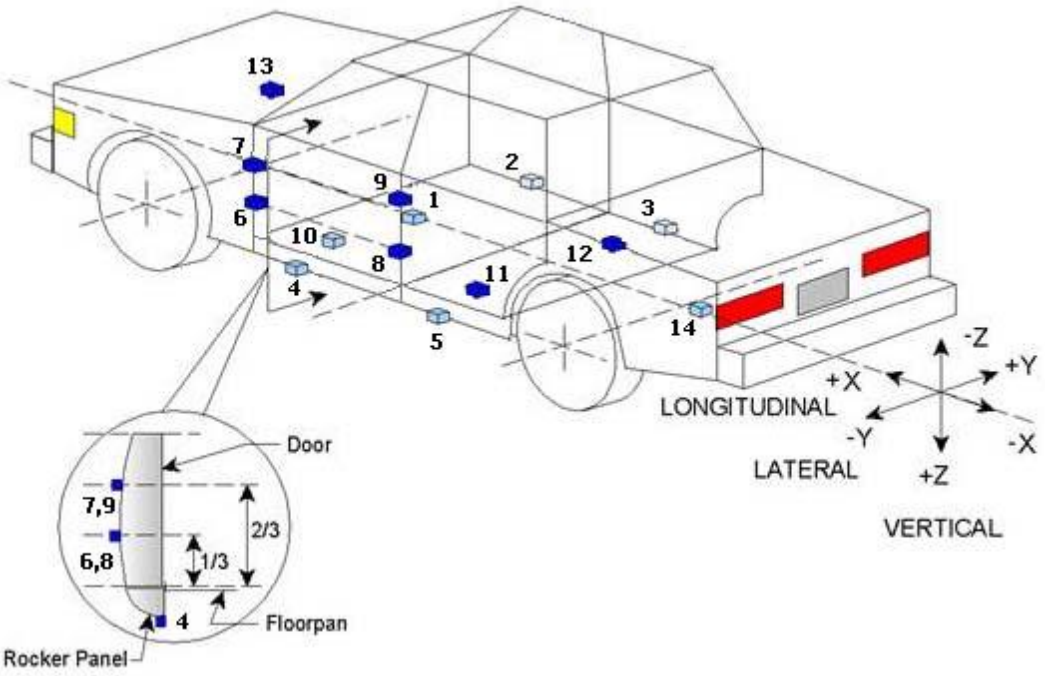
Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down
*All measurements accurate to ± 6 mm.
If applicable, explain why camera(s) did not operate as intended: N/A

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



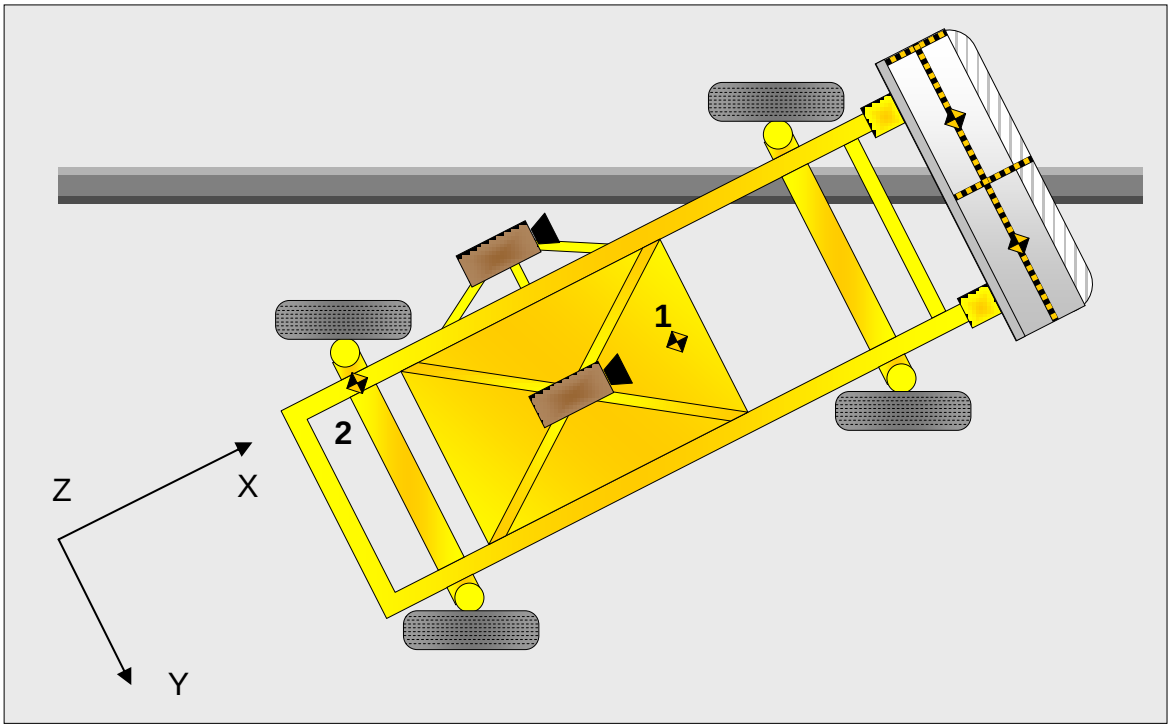
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3485	110	-527
2	Right Sill at Front Seat	3545	745	-525
3	Right Sill at Rear Seat	2355	715	-532
4	Left Sill at Front Door	3545	745	-520
5	Left Sill at Rear Door	2365	715	-525
6	A-Post Lower	3875	845	-658
7	A-Post Middle	3870	845	-1047
8	B-Post Lower	2843	820	-710
9	B-Post Middle	2820	820	-1145
10	Front Seat Track	3025	605	-543
11	Rear Seat Structure	2175	585	-510
12	Right Rear Occ. Compartment	2200	553	-533
13	Engine Block	4240	0	-910
14	Rear Above Axle	995	0	-792

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

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



MDB ACCELEROMETER LOCATIONS

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

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	None
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	Right rear tire rolled of rim

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3250
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		498
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+10
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-3

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2591
C.G. Location aft of Front Axle	1100

MDB WEIGHTS

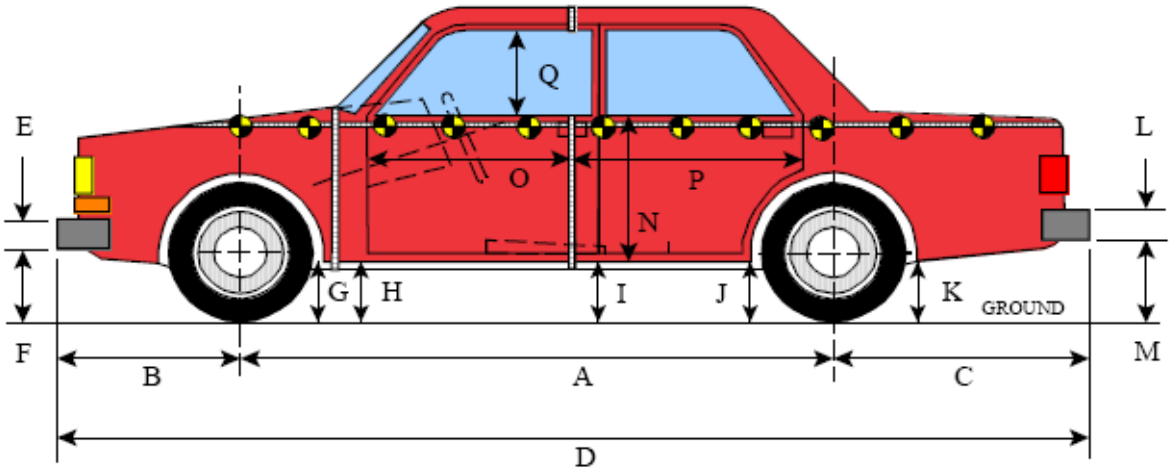
	Units	Front Axle	Rear Axle	Total
Left	kg	401.0	281.8	682.8
Right	kg	383.8	297.2	681.0
Ratio	%	57.5	42.5	100.0
Totals	kg	784.8	579.0	1363.8

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.19
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.23
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



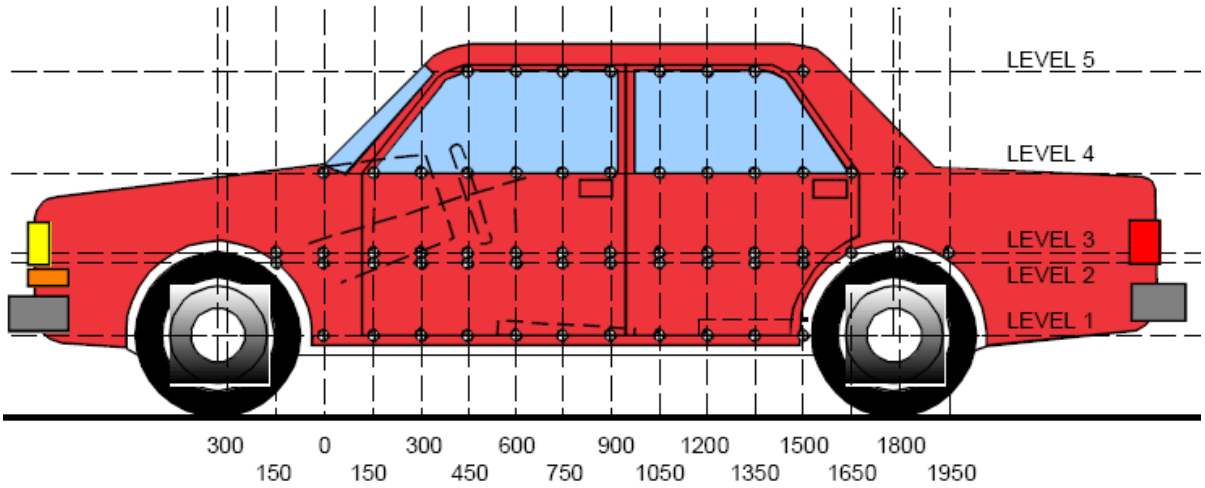
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3250	3247	3
B	Front Axle to Front Surface of Vehicle	962	962	0
C	Rear Axle to Rear Surface of Vehicle	1190	1190	0
D	Total Length at Centerline	5402	5404	-2
E	Front Bumper Thickness	110	110	0
F	Front Bumper Bottom to Ground	625	530	95
G	Sill Height at Front Wheel Well	515	520	-5
H	Sill Height at Front Door Leading Edge	530	550	-20
I	Sill Height at B-Pillar	524	560	-36
J1	Sill Height at Rear Wheel Well	475	500	-25
J2	Pinch Weld Height at Rear Wheel Well	423	445	-22
K	Sill Height Aft of Rear Wheel Well	550	620	-70
L	Rear Bumper Thickness	75	75	0
M	Rear Bumper Bottom to Ground	610	595	15
N	Sill Height to Window Bottom Sill	752	736	16
O	Front Door Leading Edge to Impact CL	792	779	13
P	Rear Door Trailing Edge to Impact CL	1217	1182	35
Q	Front Window Opening	425	424	1
R	Right Side Length	5250	5217	33
S	Left Side Length	5251	5215	36
T	Vehicle Width	1887	1920	-33

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	572	339	1350
2	Driver Hip Point	812	307	1500
3	Mid-Door	852	298	1500
4	Window Sill	1184	169	1350
5	Window Top	1708	57	1950

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

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

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

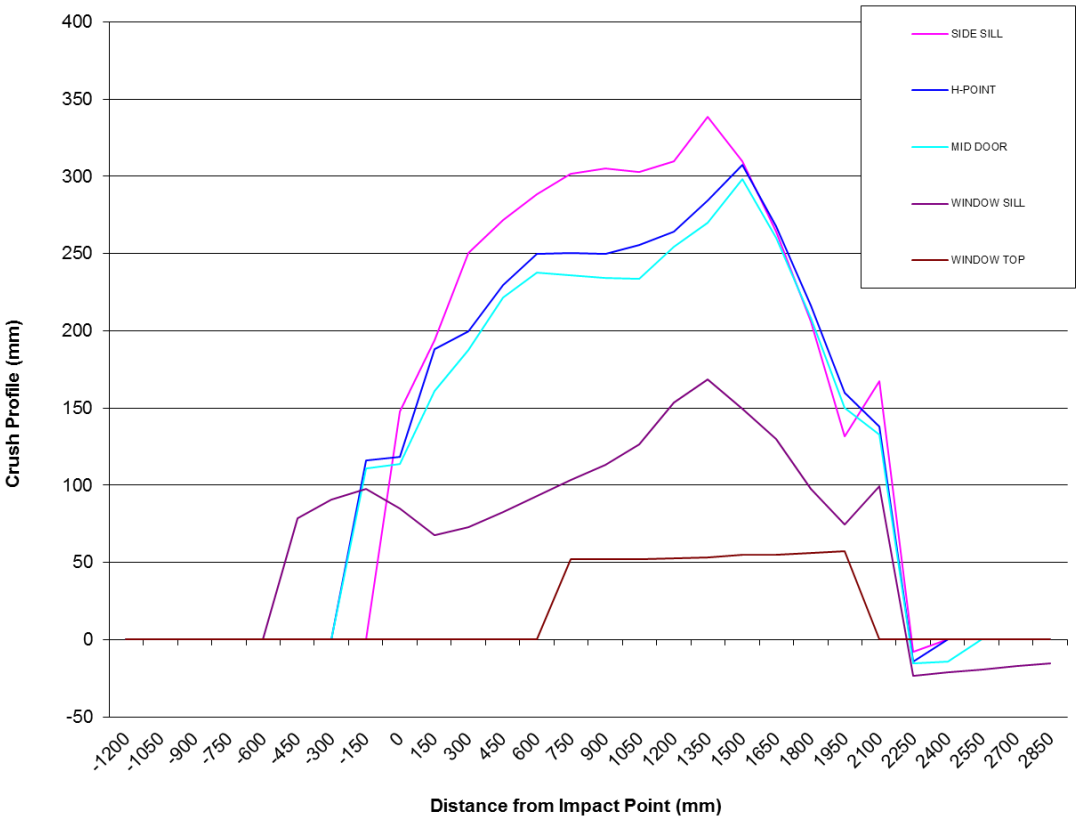
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	818	0	0	0	0	740	0	0	0	0	78	0
-300	0	0	0	826	0	0	0	0	735	0	0	0	0	91	0
-150	0	947	946	834	0	0	830	836	736	0	0	117	110	98	0
0	921	929	927	839	0	773	811	813	754	0	148	118	114	85	0
150	889	905	904	844	0	695	717	743	776	0	194	188	161	68	0
300	889	895	897	848	0	639	696	709	775	0	250	199	188	73	0
450	891	896	898	852	0	619	667	676	770	0	272	229	222	82	0
600	891	897	899	857	0	603	647	662	764	0	288	250	237	93	0
750	891	898	900	860	610	590	647	664	757	557	301	251	236	103	53
900	891	899	901	863	626	586	649	667	750	573	305	250	234	113	53
1050	891	900	902	865	634	588	644	669	738	581	303	256	233	127	53
1200	890	899	902	865	640	580	635	647	712	587	310	264	255	153	53
1350	888	898	901	866	641	549	614	631	697	588	339	284	270	169	53
1500	886	897	899	866	641	576	590	601	716	586	310	307	298	150	55
1650	884	895	898	865	638	619	628	638	735	583	265	267	260	130	55
1800	882	894	897	864	634	676	678	688	766	578	206	216	209	98	56
1950	879	892	895	862	623	747	733	744	788	566	132	159	151	74	57
2100	871	888	891	860	0	703	750	758	760	0	168	138	133	100	0
2250	899	912	909	845	0	906	926	924	869	0	-7	-14	-15	0	0
2400	0	0	939	845	0	0	0	953	866	0	0	0	-14	-21	0
2550	0	0	0	844	0	0	0	0	863	0	0	0	0	-19	0
2700	0	0	0	844	0	0	0	0	861	0	0	0	0	-17	0
2850	0	0	0	845	0	0	0	0	860	0	0	0	0	-15	0

NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

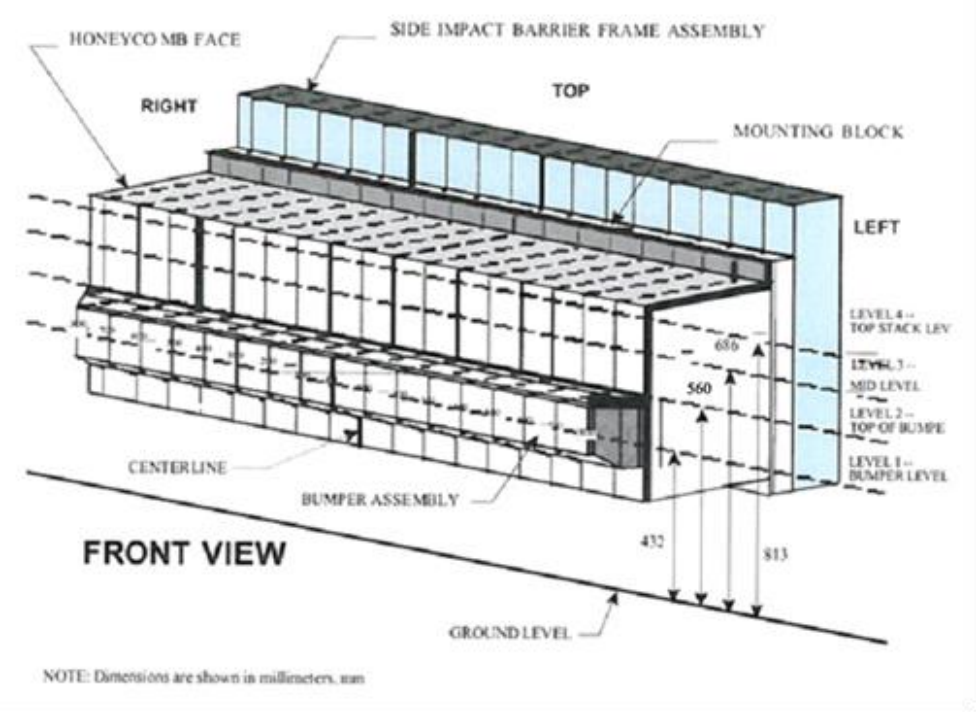
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	111
B	Top of Bumper	560	---[1]	Right	372
C	Mid-Level	686	800	Right	182
D	Top of Stack	813	800	Right	199

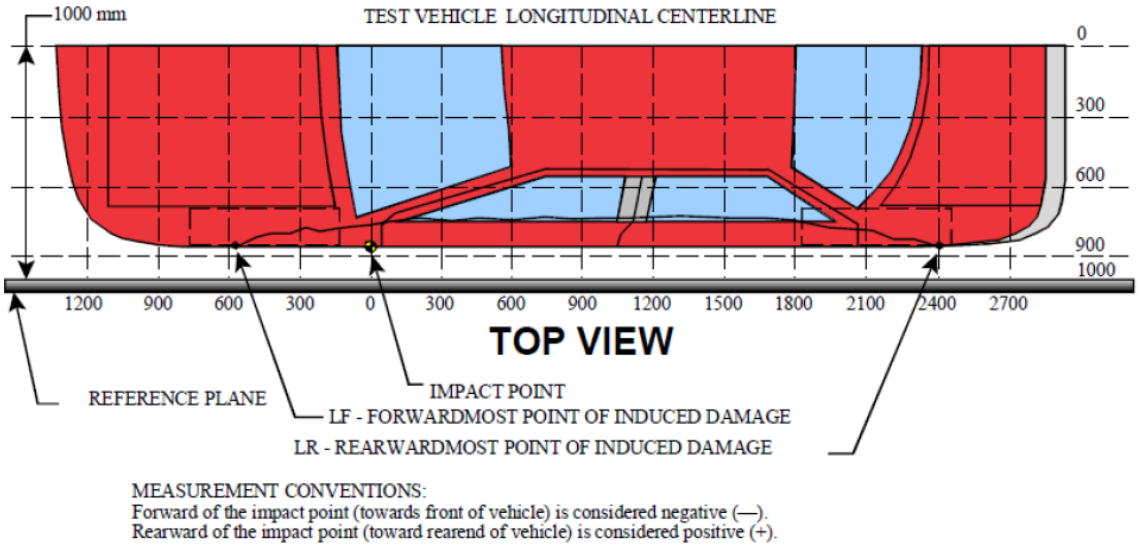
DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	91	78	69	65	62	64	66	69	72	76	79	84	89	95	101	107	111
2[1]	126	89	80	77	372	372	372	372	372	87	95	102	107	112	117	124	133
3	182	130	84	50	41	36	57	68	56	58	52	58	67	76	89	103	128
4	199	149	111	79	61	68	88	126	115	105	96	91	90	96	109	128	148

[1] At Row B, Top of Bumper, a maximum crush of 372 mm was achieved at multiple distances.

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



MEASUREMENT CONVENTIONS:
Forward of the impact point (towards front of vehicle) is considered negative (—).
Rearward of the impact point (toward rearend of vehicle) is considered positive (+).

VEHICLE DAMAGE PROFILE DISTANCES[1]

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	2100	1	703	871	0
2	1650	2	628	895	267
3	1050	1	588	891	303
4	600	1	603	891	288
5	0	1	773	921	148
6	-450	4	740	818	0

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	4	235	383	148
2	500 mm Left of Center	2	271	383	112
3	200 mm Left of Center	4	288	384	96
4	200 mm Right of Center	2	11	383	372
5	500 mm Right of Center	4	306	385	79
6	800 mm Right of Center	4	185	384	199

[1] DPD 1 and 6 defined as zero crush since the crush does not extend to the end of the vehicle.

DATA SHEET NO. 14
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16

Test Time: 17:14 **Temperature:** 21.1°C

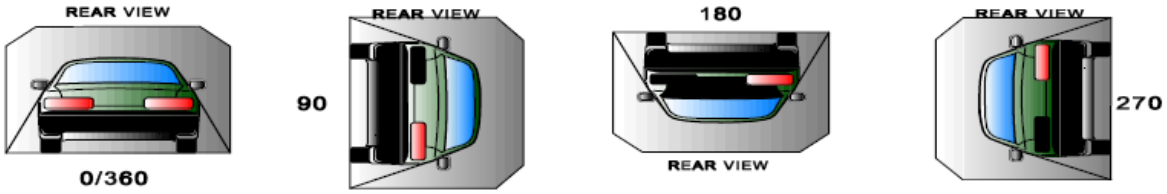
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

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

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

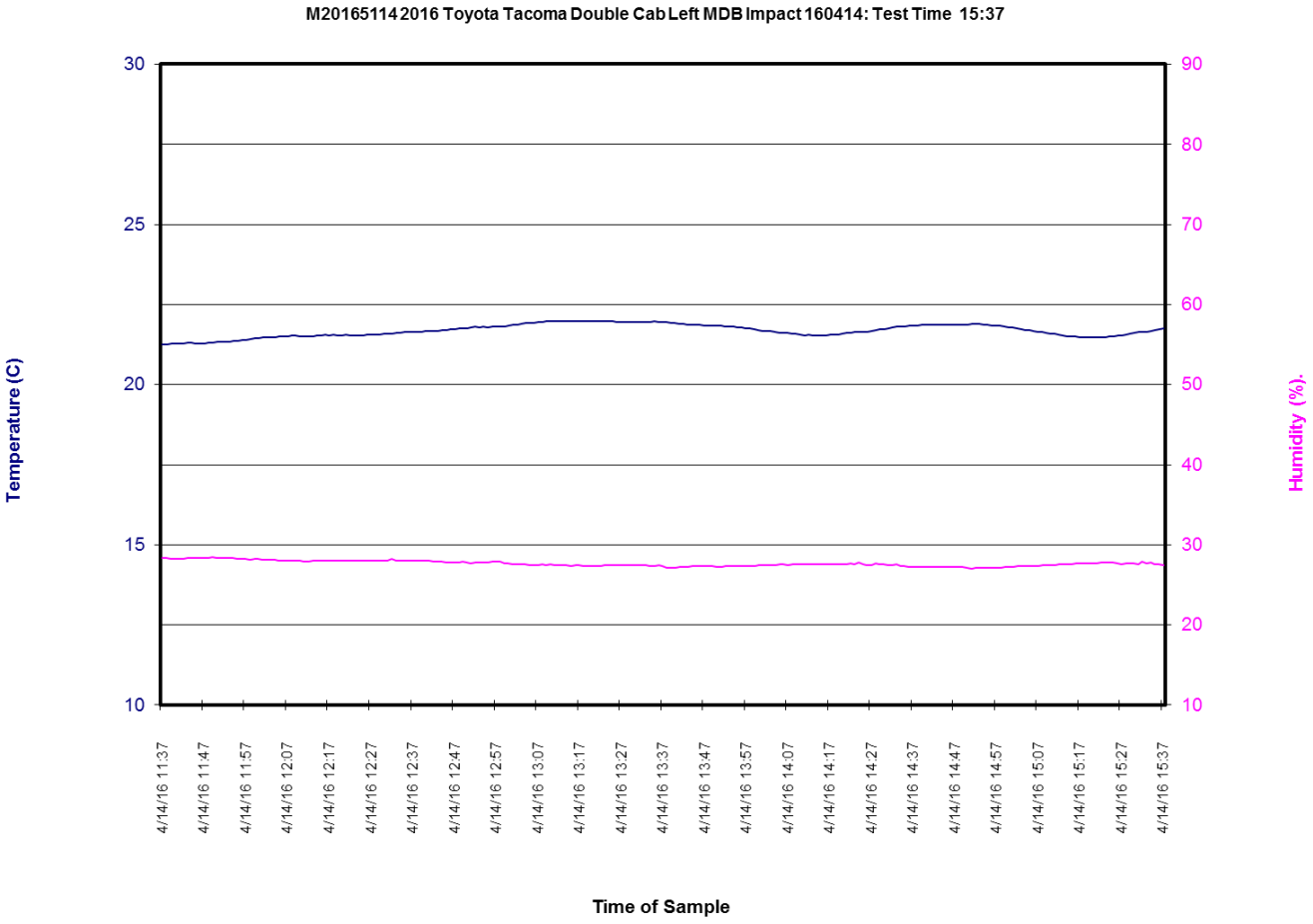
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 15
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2016 Toyota Tacoma Double Cab NHTSA No.: M20165114
Test Program: SINCAP Side Impact Test Date: 4/14/16



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

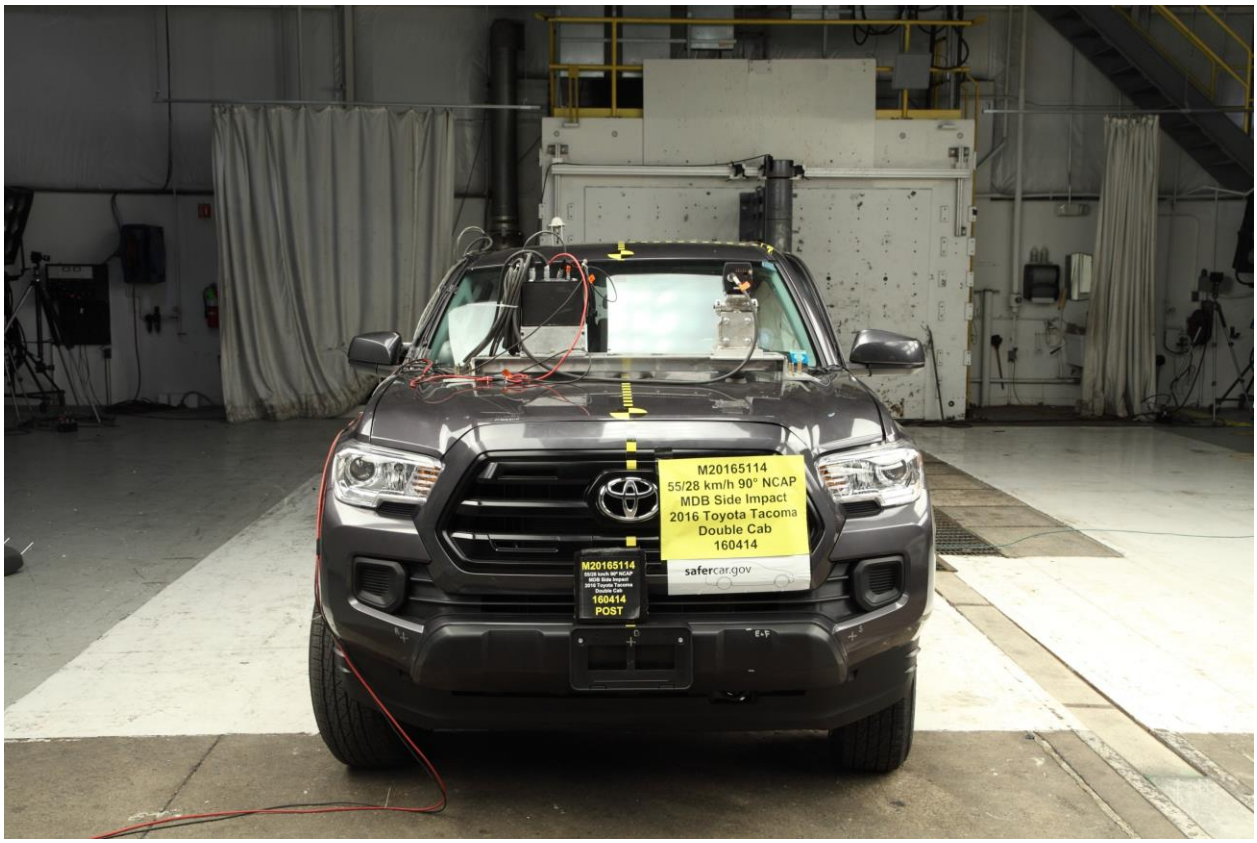
TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

002 As-Delivered Left Rear ¾ View of Test Vehicle

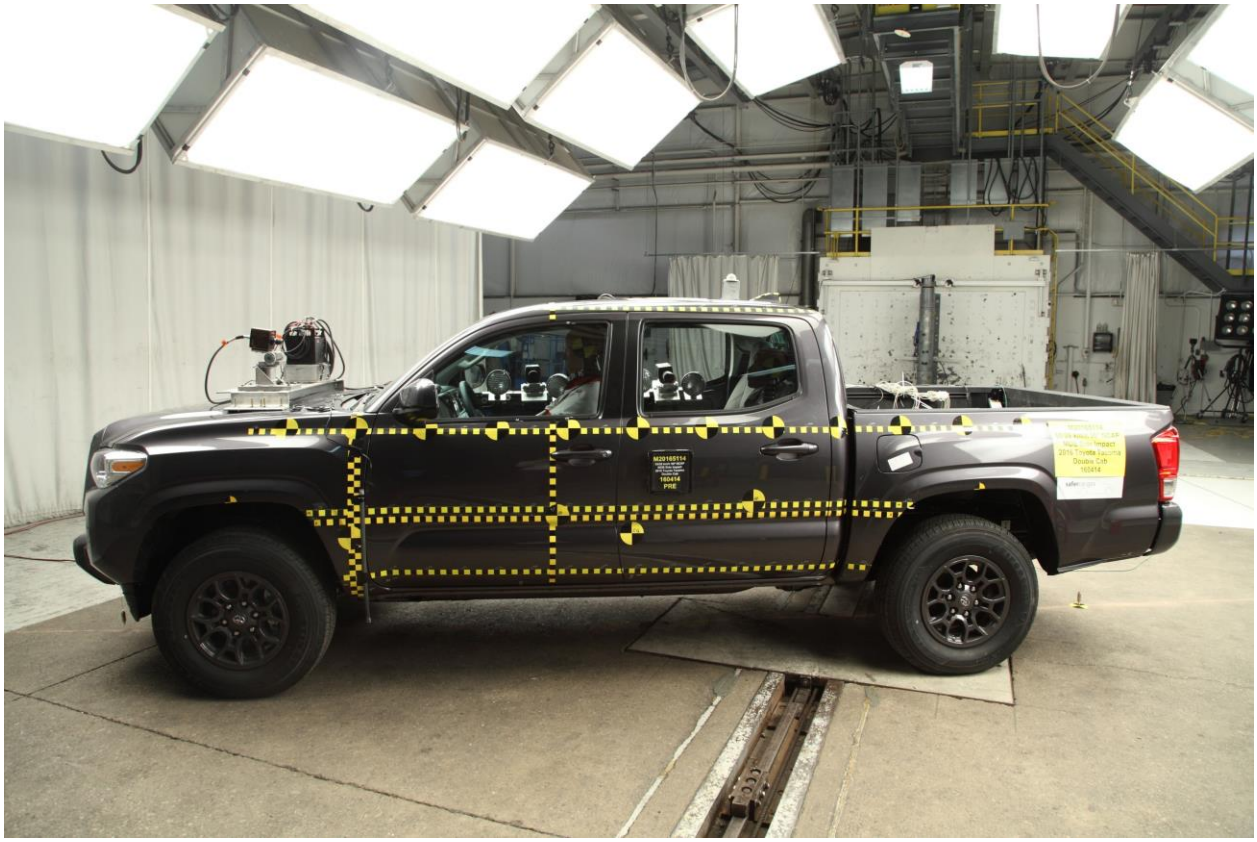
003 Pre-Test Frontal View of Test Vehicle



004 Post-Test Frontal View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

006 Post-Test Left Front ¾ View of Test Vehicle



007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear ¾ View of Test Vehicle

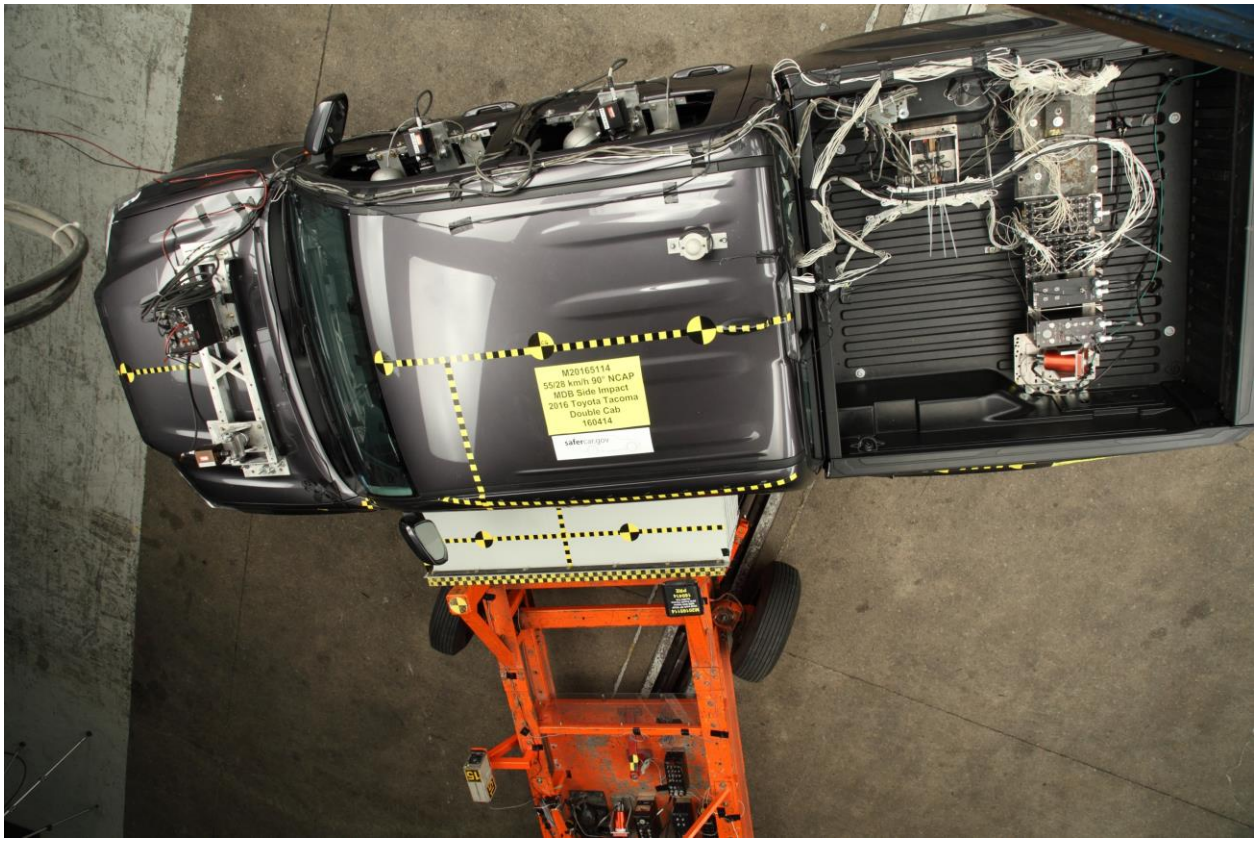
010 Post-Test Left Rear ¾ View of Test Vehicle

011 Pre-Test Rear View of Test Vehicle

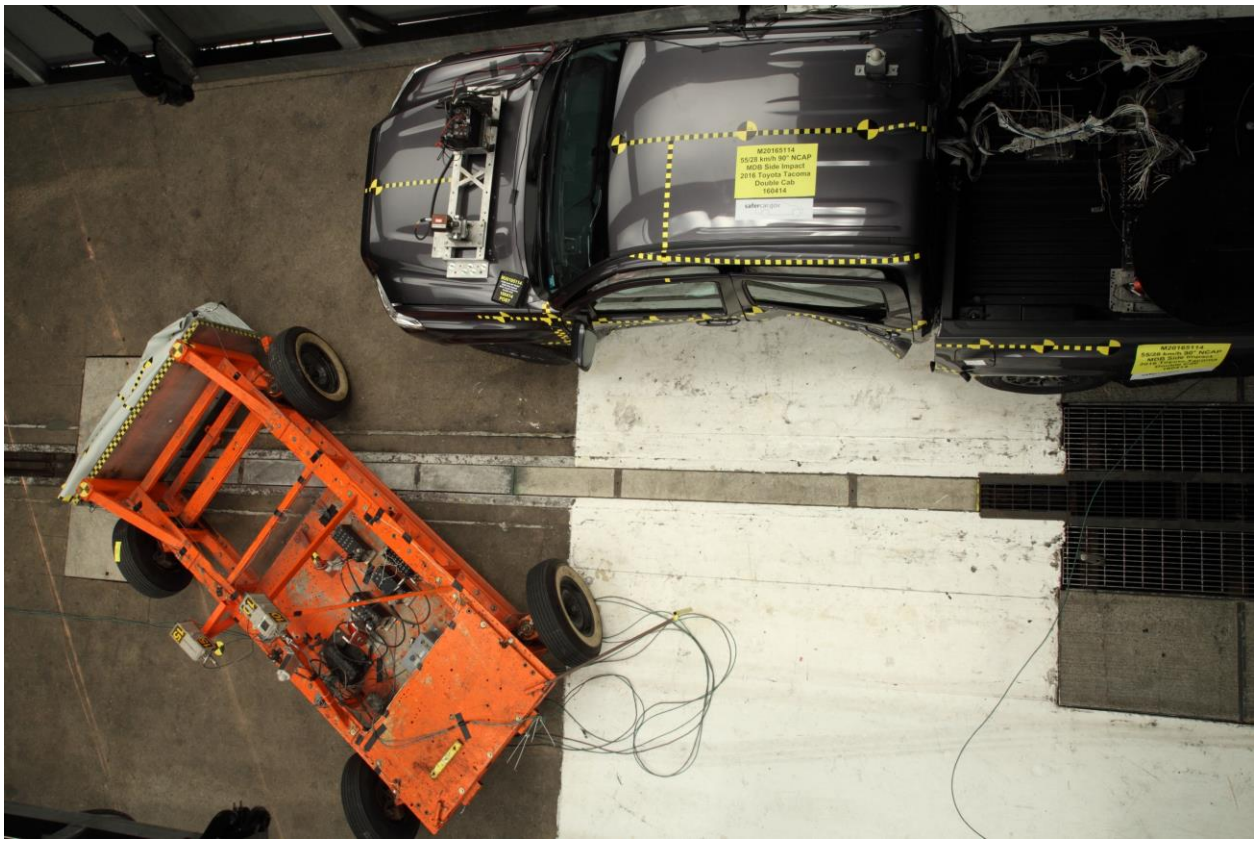
012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

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

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

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

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

021 Pre-Test Left Front Door Latch Close-Up

022 Post-Test Left Front Door Latch Close-Up

023 Pre-Test Left Rear Door Latch Close-Up

024 Post-Test Left Rear Door Latch Close-Up

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

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

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

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

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

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

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

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

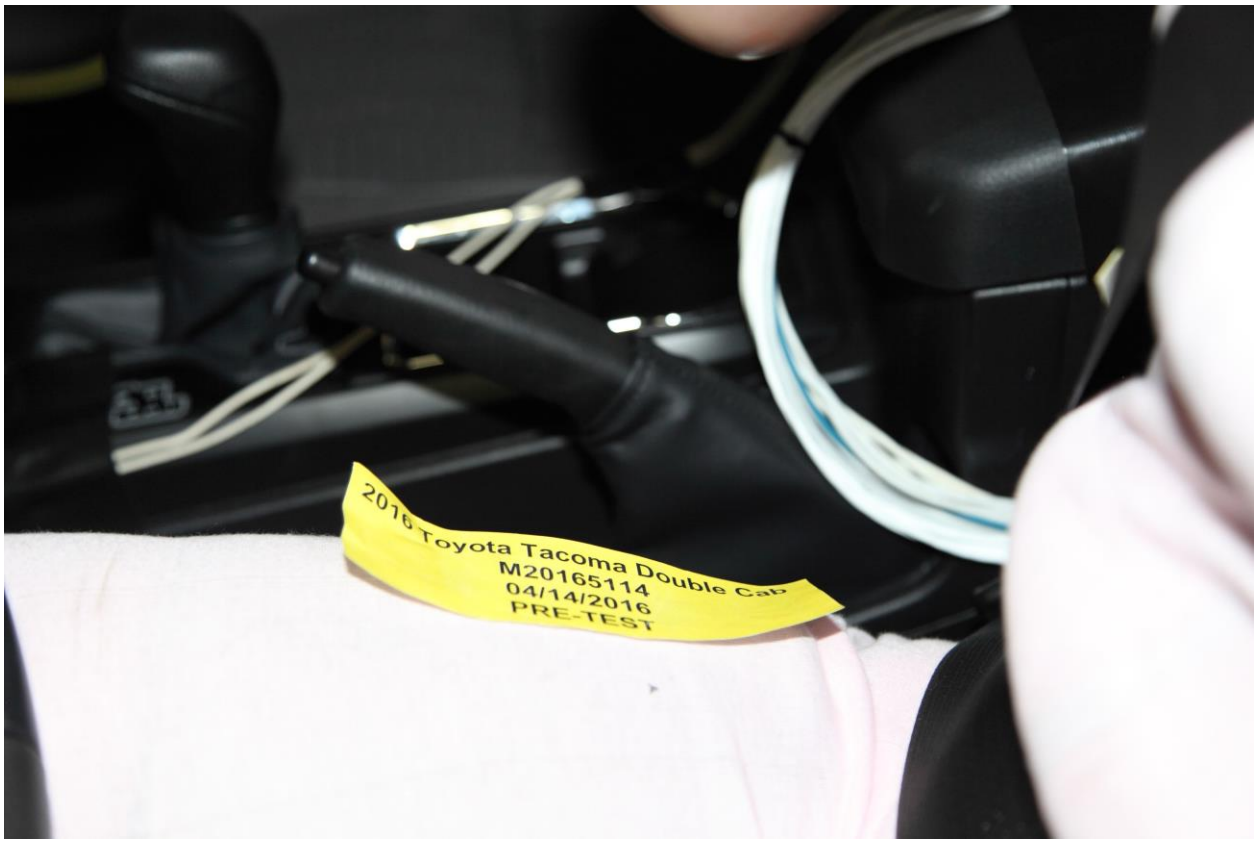
033 Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan

034 Pre-Test Placement of Driver Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy

036 Pre-Test Left Side View of Steering Wheel

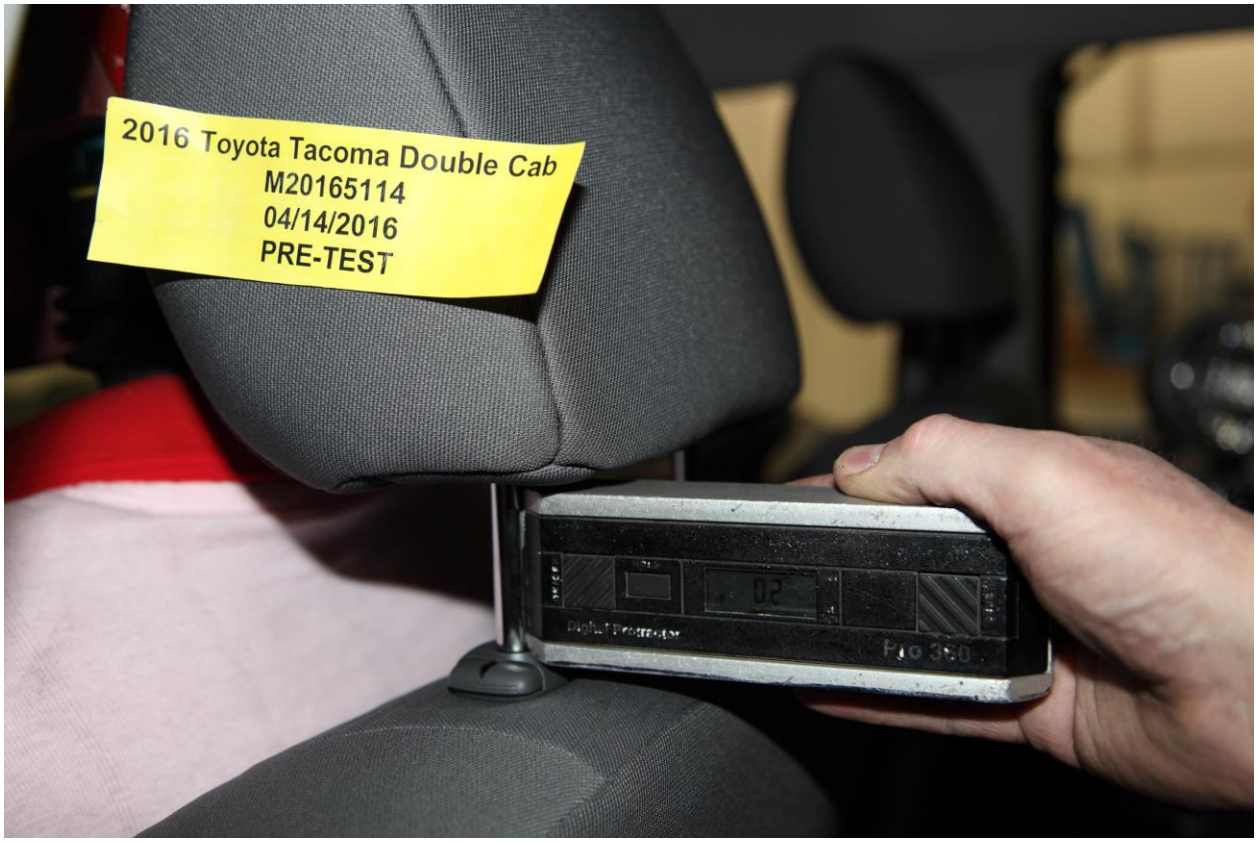
037 View of Disengaged Parking Brake



038 Pre-Test View of Parking Brake

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

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



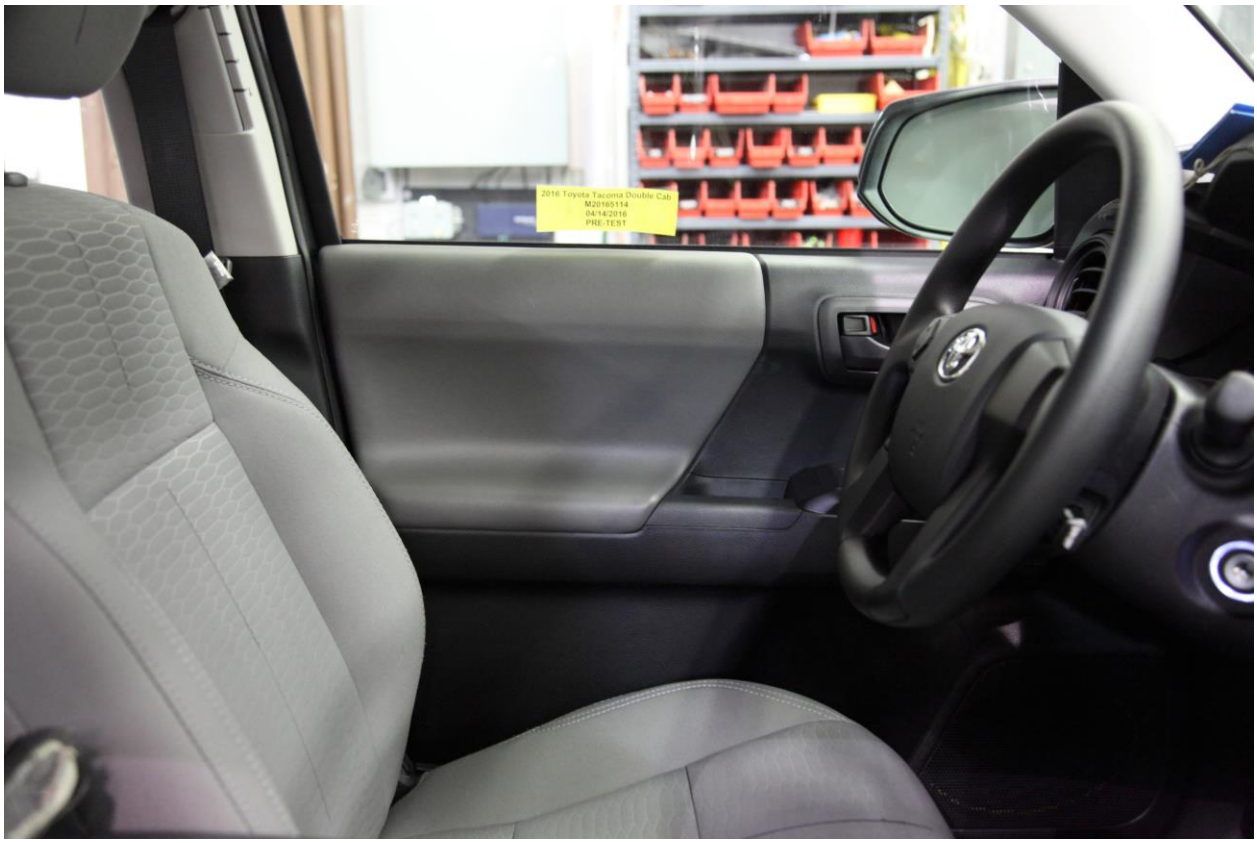
041 Pre-Test Close-Up View of Driver Seat Back or Head Restraint

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View

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

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



046 Pre-Test Driver Inner Door Panel View

047 Post-Test Driver Inner Door Panel View

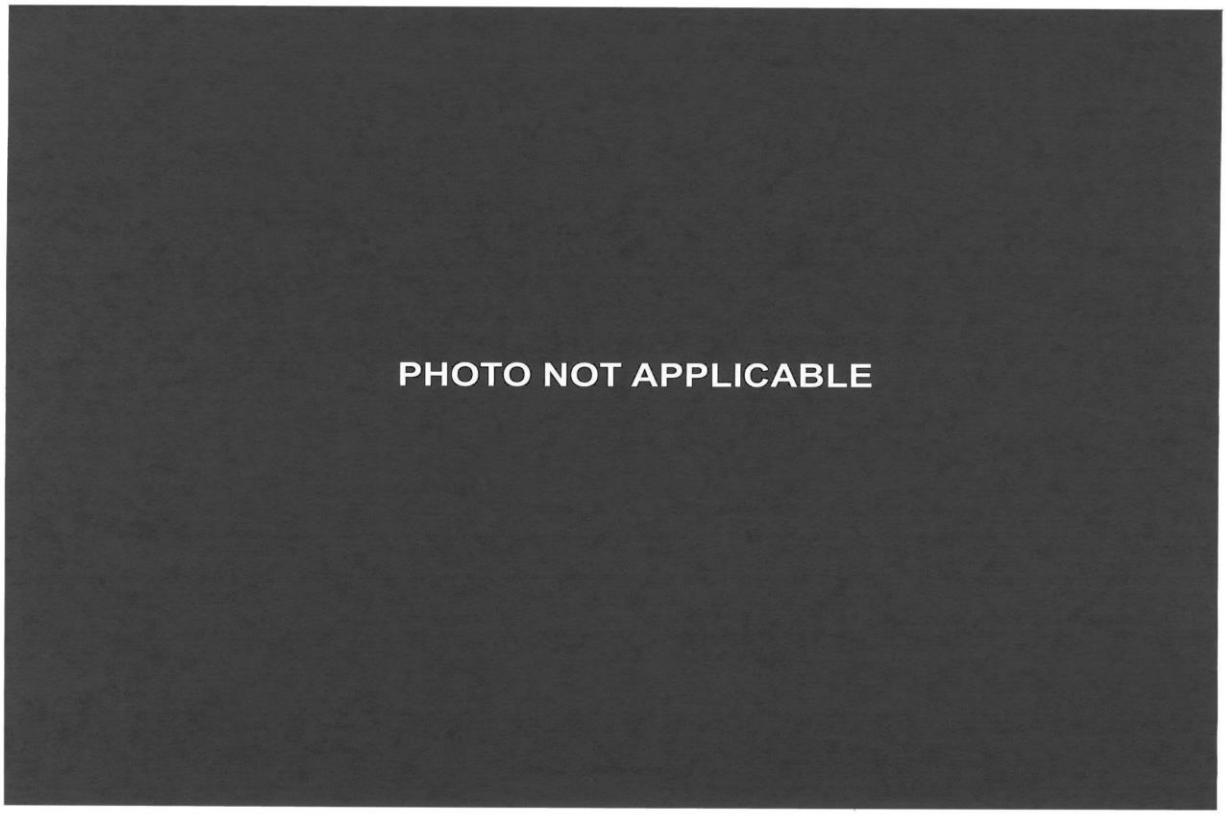
048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

064 Pre-Test Placement of Rear Passenger Dummy Feet

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

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

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

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

069 Pre-Test Passenger Dummy and Door Clearance View

070 Post-Test Passenger Dummy and Door Clearance View

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

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

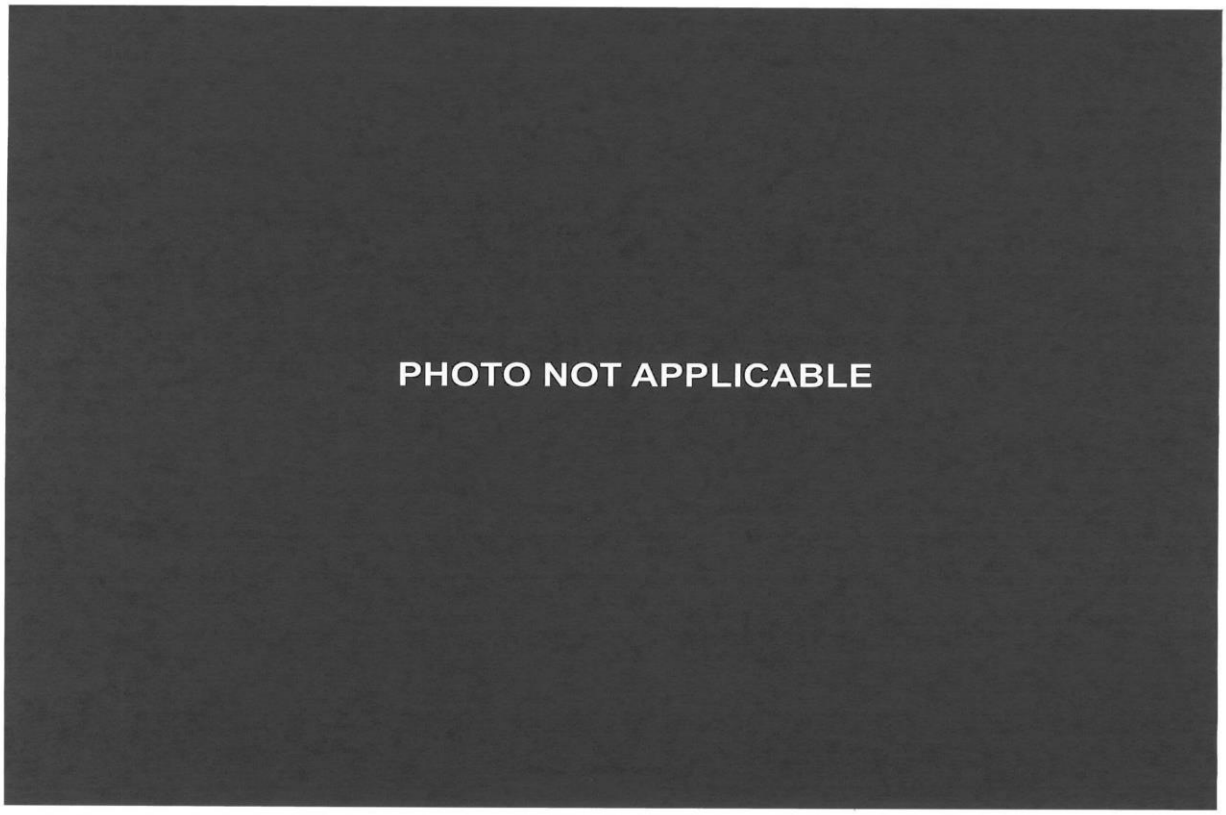
073 Pre-Test Passenger Inner Door Panel View

074 Post-Test Passenger Inner Door Panel View

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

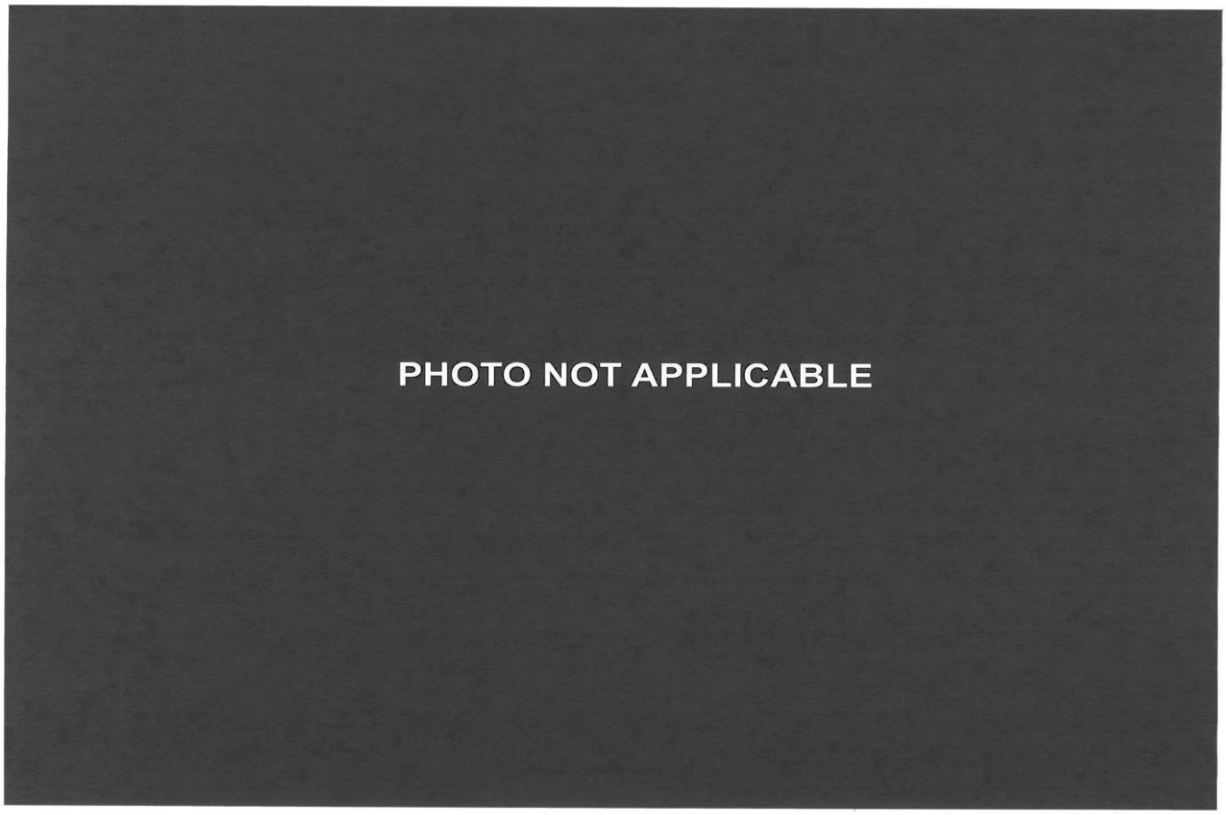
076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

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



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

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



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

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

Intentionally Left Blank

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

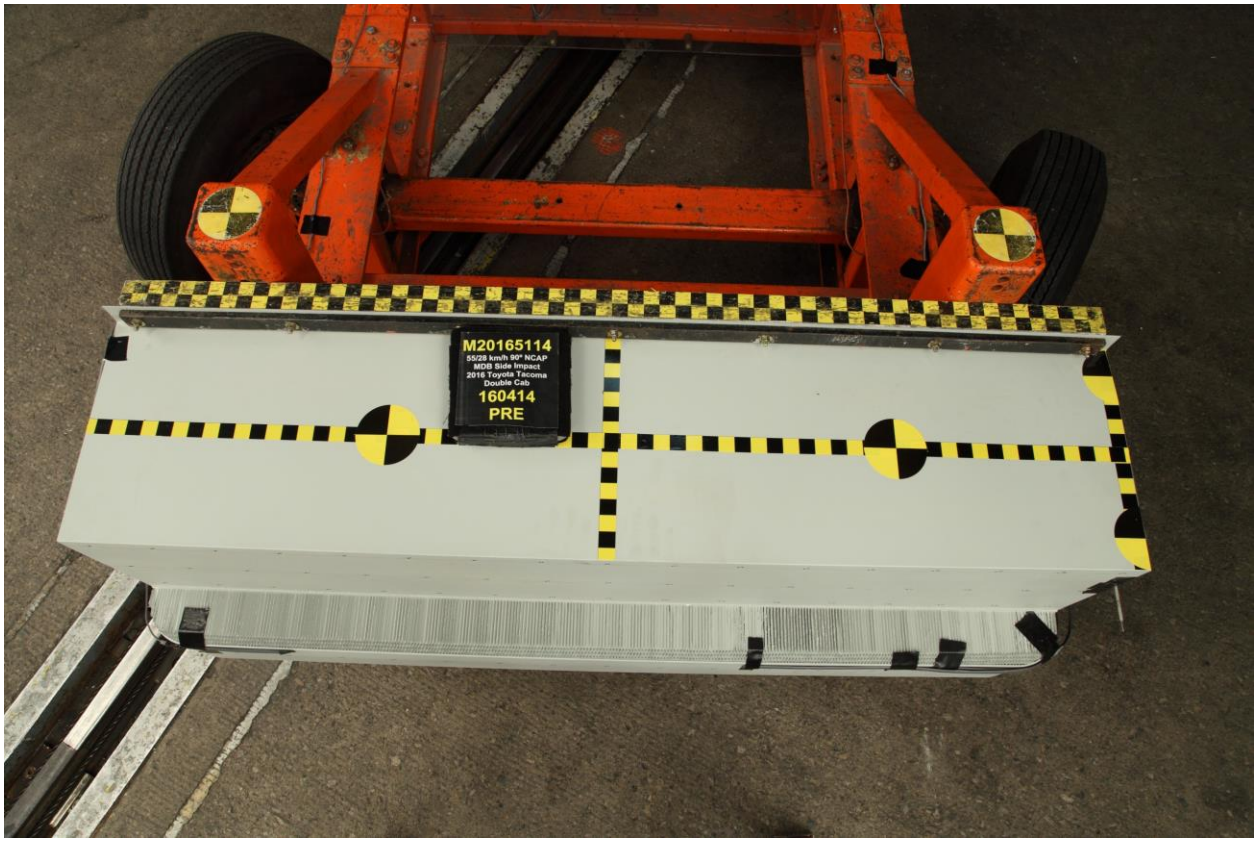
083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck

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

Intentionally Left Blank

084 Pre-Test Front View of MDB Impactor Face

085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face

087 Post-Test Top View of MDB Impactor Face

088 Pre-Test Left Side View of MDB Impactor Face

089 Post-Test Left Side View of MDB Impactor Face

090 Pre-Test Right Side View of MDB Impactor Face

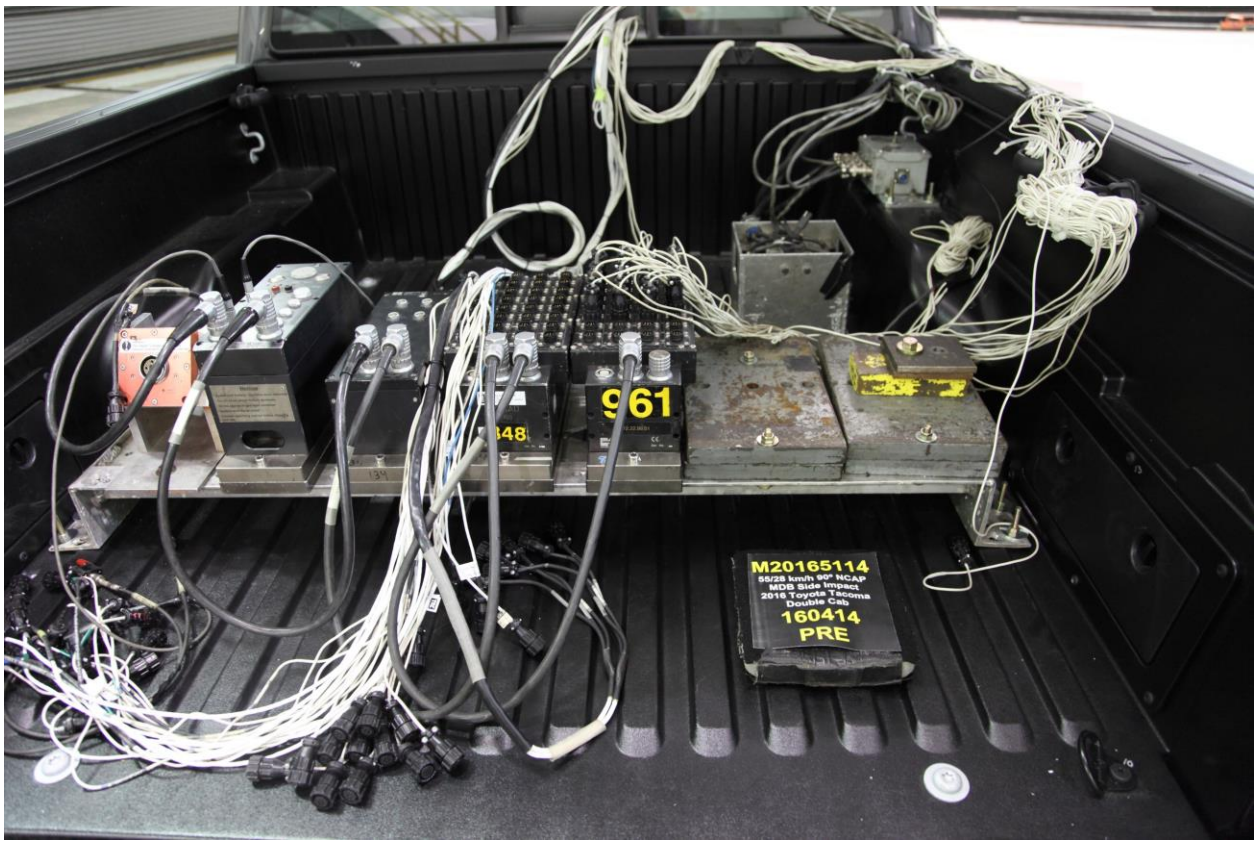
091 Post-Test Right Side View of MDB Impactor Face

092 Close-Up View of Vehicle Certification Label

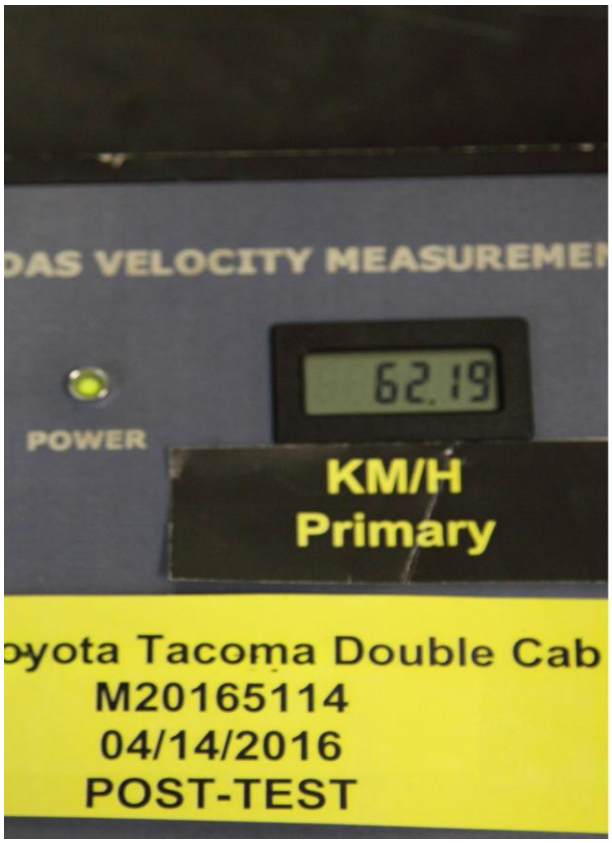
093 Close-Up View of Vehicle Tire Information Placard or Label

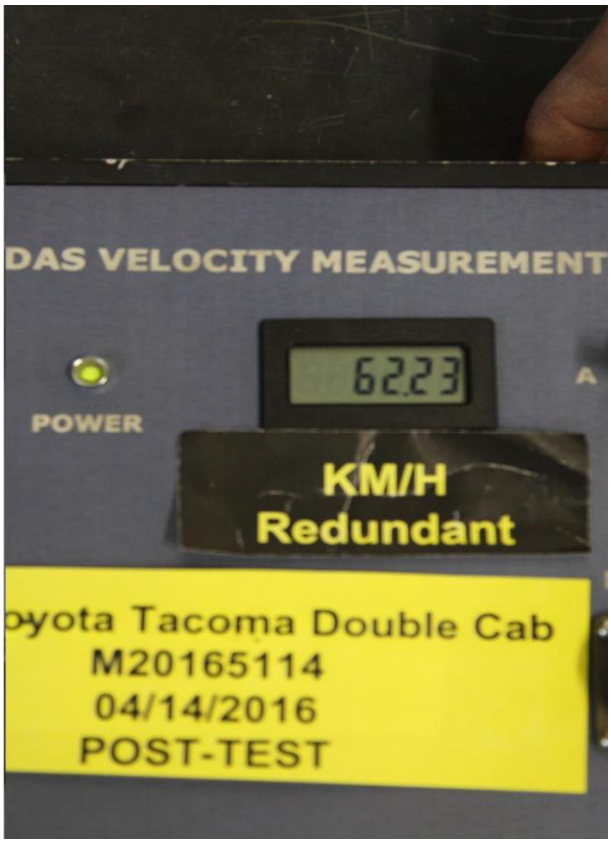
093a Reduced Load Carrying Capacity Label

Intentionally Left Blank



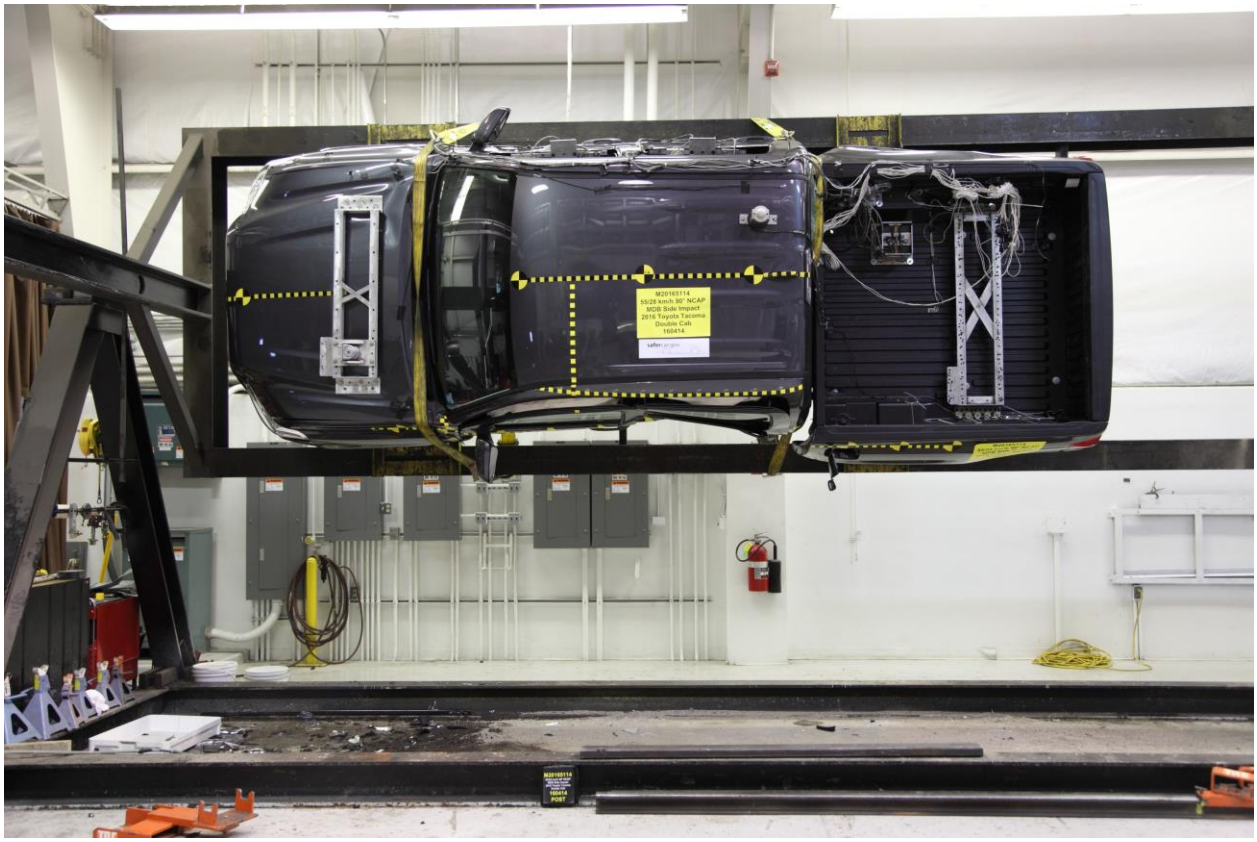
094 Pre-Test Ballast View





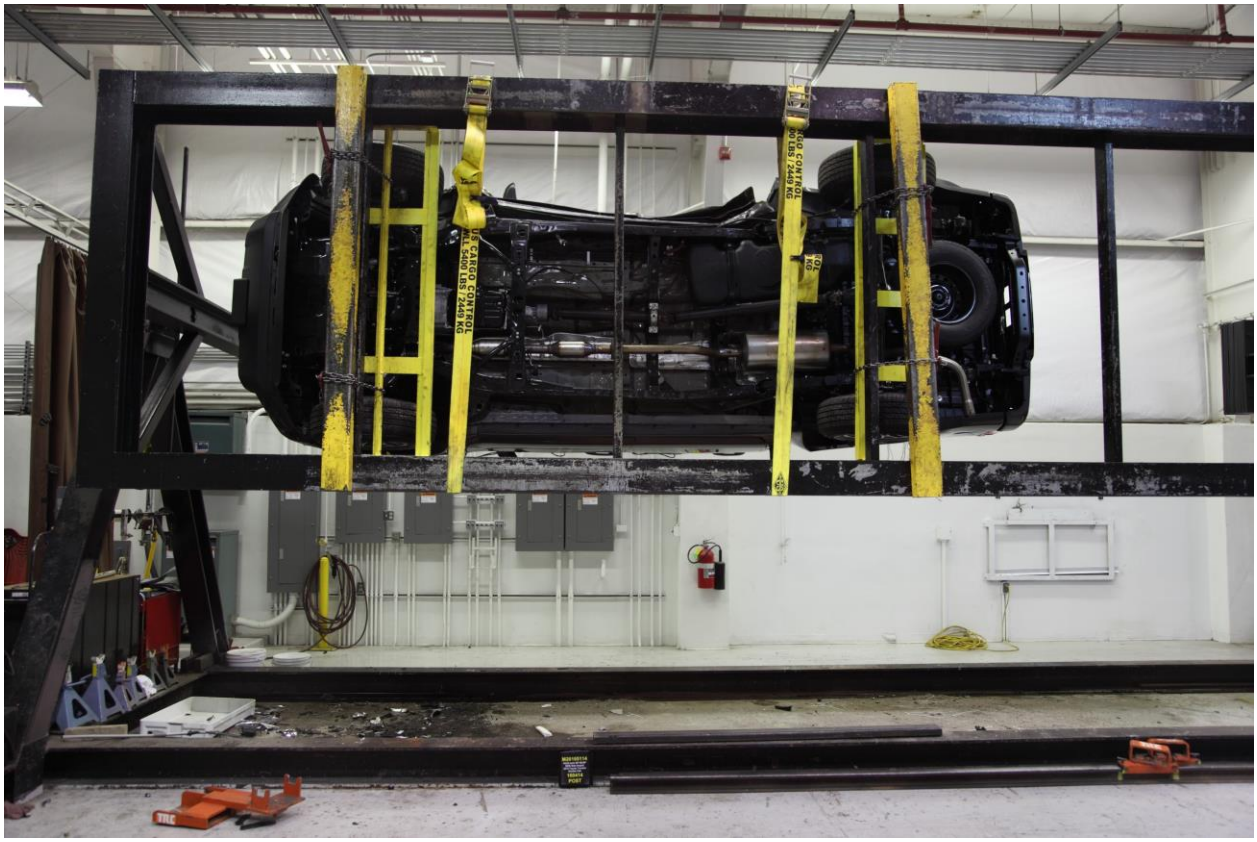
095 Post-Test Primary Speed Trap Read-Out

096 FMVSS No. 301 Static Rollover 0 Degrees



097 FMVSS No. 301 Static Rollover 90 Degrees

098 FMVSS No. 301 Static Rollover 180 Degrees

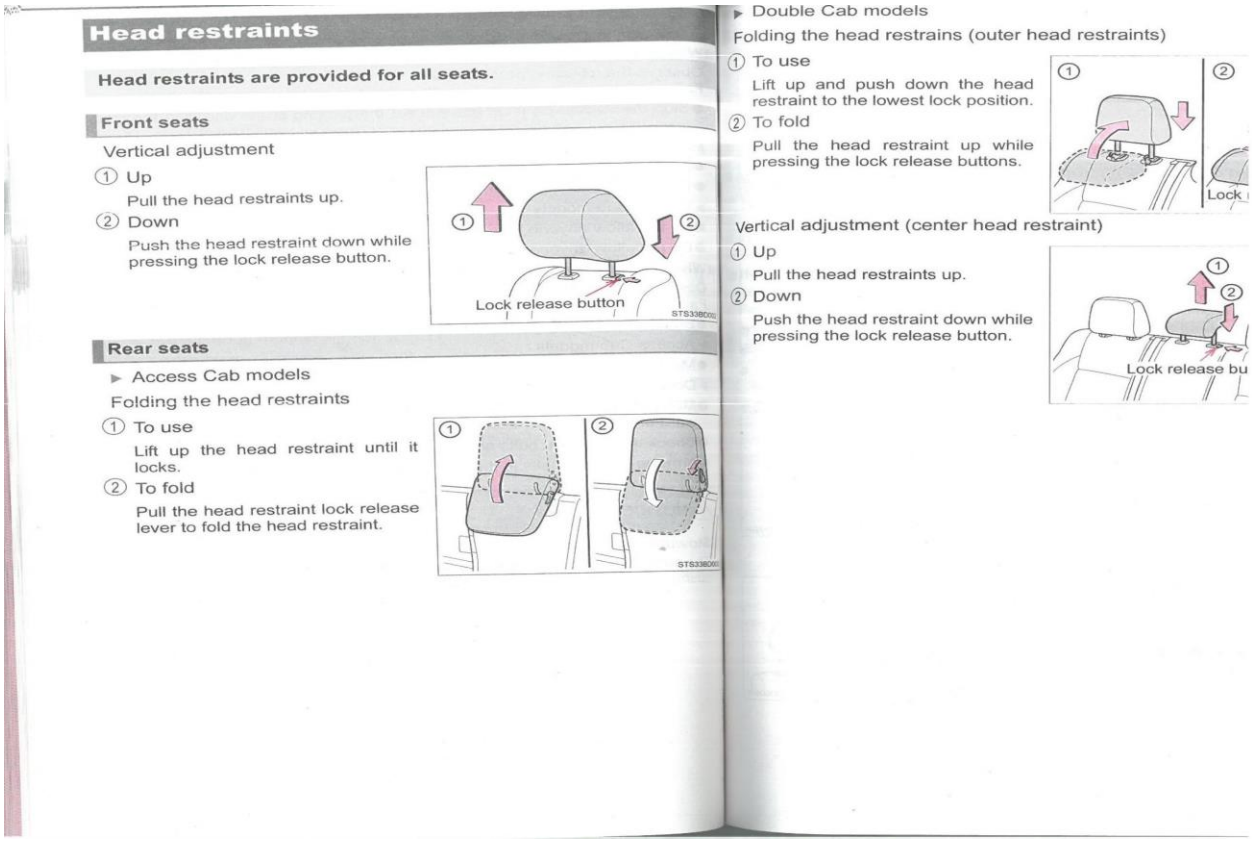


099 FMVSS No. 301 Static Rollover 270 Degrees

100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event

102 Monroney Label



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

Head restraints

Head restraints are provided for all seats.

Front seats

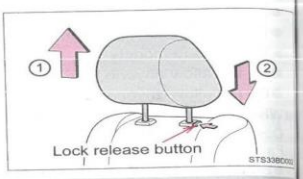
Vertical adjustment

① Up

Pull the head restraints up.

② Down

Push the head restraint down while pressing the lock release button.



Rear seats

▶ Access Cab models

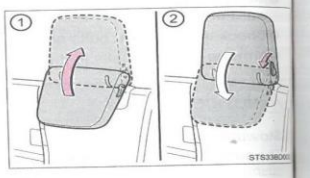
Folding the head restraints

① To use

Lift up the head restraint until it locks.

② To fold

Pull the head restraint lock release lever to fold the head restraint.



▶ Double Cab models

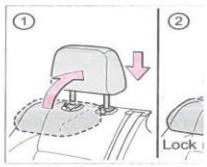
Folding the head restrains (outer head restraints)

① To use

Lift up and push down the head restraint to the lowest lock position.

② To fold

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



Vertical adjustment (center head restraint)

① Up

Pull the head restraints up.

② Down

Push the head restraint down while pressing the lock release button.

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

NHTSA

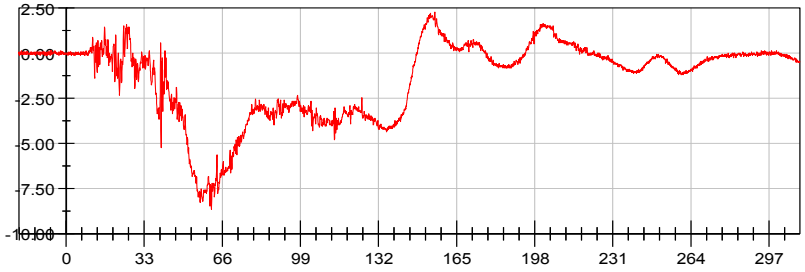
Test Date: 04/14/2016

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

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)

Test Number: 160414 (M20165114)

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



<Max>

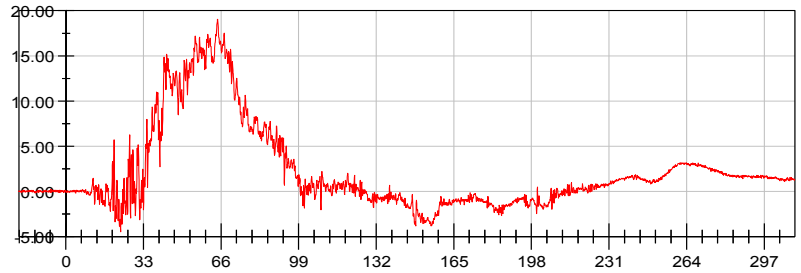
2.28 g at 155.76 ms

<Min>

-8.65 g at 61.36 ms

CFC_1000

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



<Max>

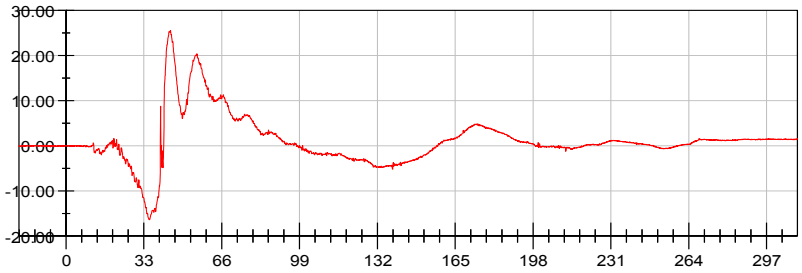
19.05 g at 64.48 ms

<Min>

-4.51 g at 23.28 ms

CFC_1000

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



<Max>

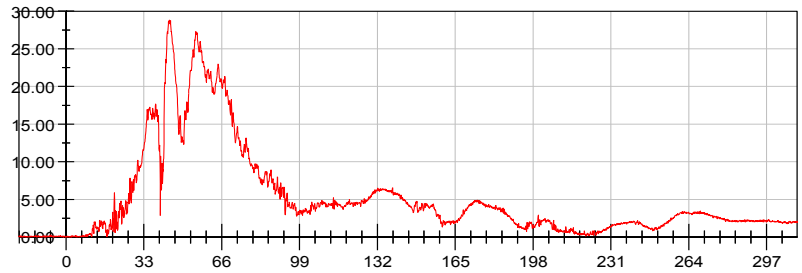
25.57 g at 44.32 ms

<Min>

-16.37 g at 35.28 ms

CFC_1000

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



<Max>

28.80 g at 43.84 ms

<Min>

0.03 g at -19.60 ms

CFC_1000

NHTSA

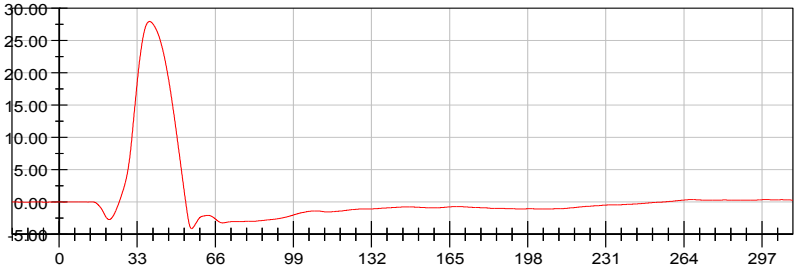
Test Date: 04/14/2016

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

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)

Test Number: 160414 (M20165114)

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



<Max>

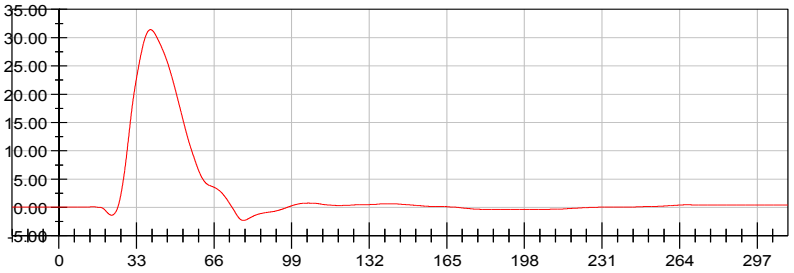
27.96 mm at 38.16 ms

<Min>

-4.12 mm at 56.00 ms

CFC_180

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



<Max>

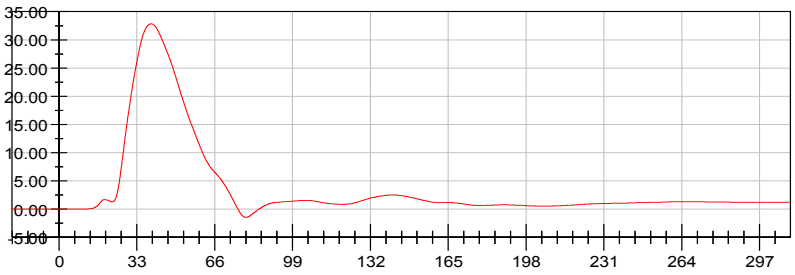
31.42 mm at 39.04 ms

<Min>

-2.35 mm at 78.48 ms

CFC_180

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



<Max>

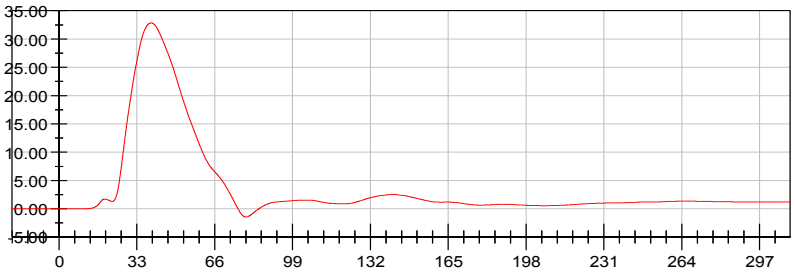
32.84 mm at 39.04 ms

<Min>

-1.45 mm at 79.20 ms

CFC_180

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



<Max>

32.84 mm at 39.04 ms

<Min>

-1.45 mm at 79.20 ms

CFC_180

NHTSA

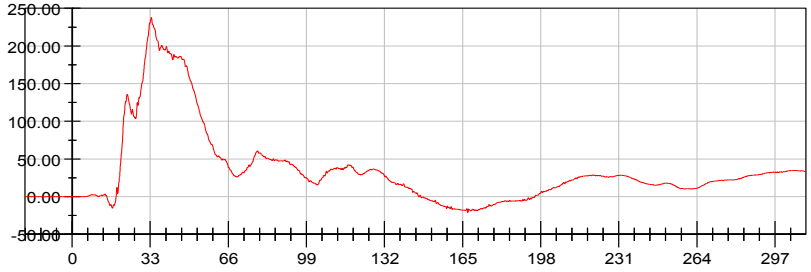
Test Date: 04/14/2016

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

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)

Test Number: 160414 (M20165114)

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



<Max>

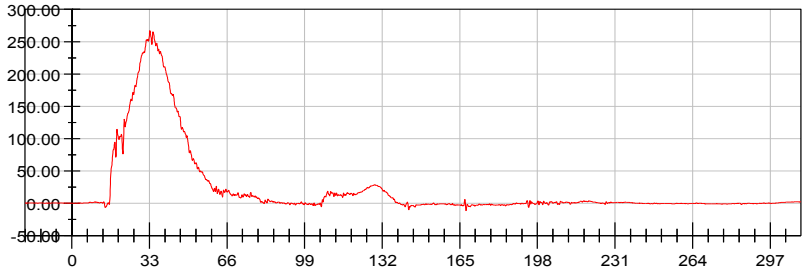
237.72 N at 33.44 ms

<Min>

-20.94 N at 167.20 ms

CFC_600

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



<Max>

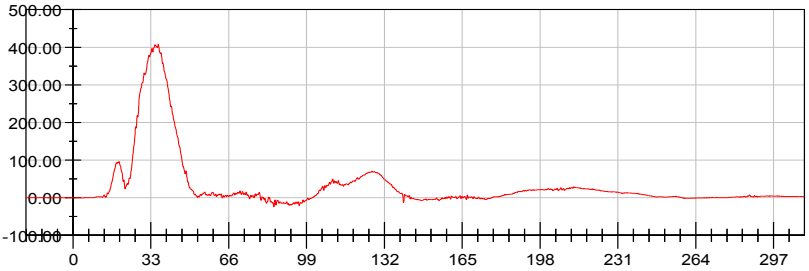
267.07 N at 33.20 ms

<Min>

-11.43 N at 167.60 ms

CFC_600

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



<Max>

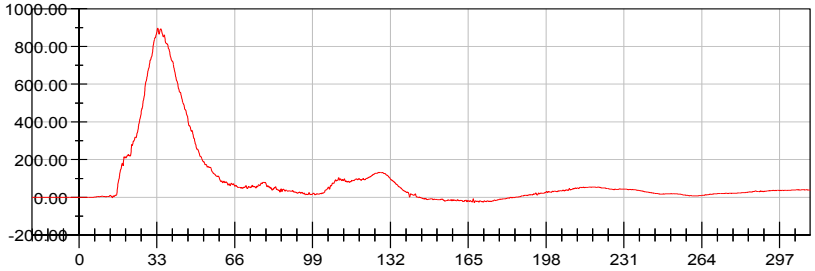
407.34 N at 36.16 ms

<Min>

-24.27 N at 85.20 ms

CFC_600

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



<Max>

896.09 N at 33.36 ms

<Min>

-28.21 N at 167.60 ms

CFC_600

NHTSA

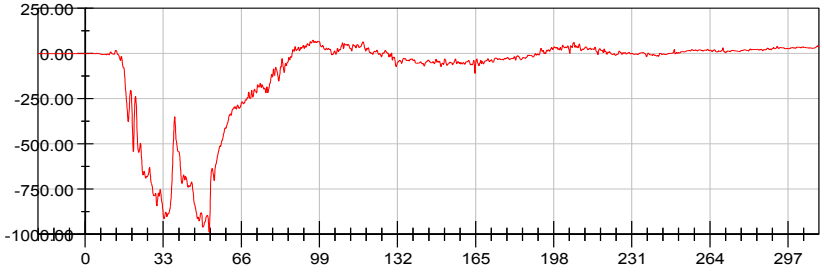
Test Date: 04/14/2016

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

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)

Test Number: 160414 (M20165114)

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



<Max>

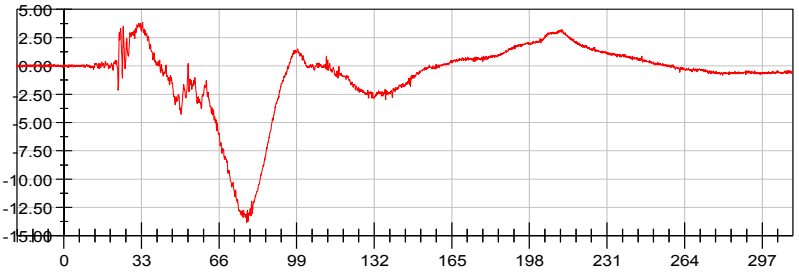
74.19 N at 96.24 ms

<Min>

-988.00 N at 52.40 ms

CFC_600

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



<Max>

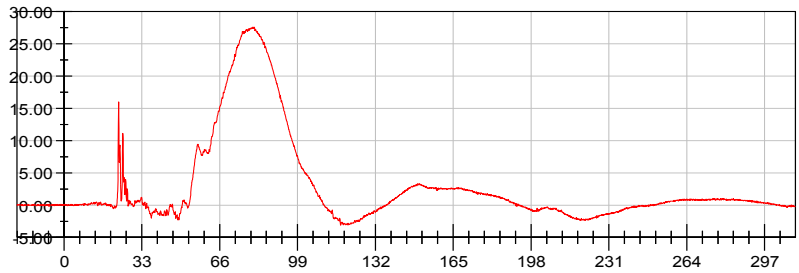
3.84 g at 33.44 ms

<Min>

-13.86 g at 77.76 ms

CFC_1000

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



<Max>

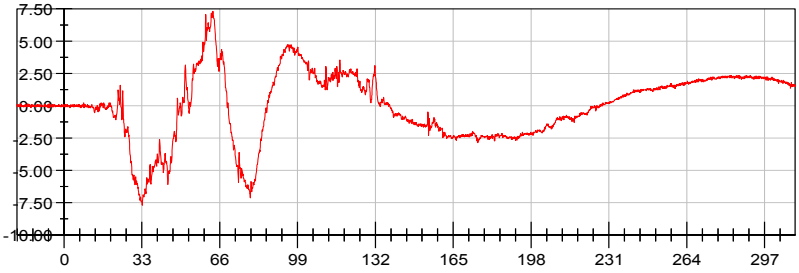
27.60 g at 80.08 ms

<Min>

-3.12 g at 117.28 ms

CFC_1000

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



<Max>

7.30 g at 63.12 ms

<Min>

-7.68 g at 33.20 ms

CFC_1000

NHTSA

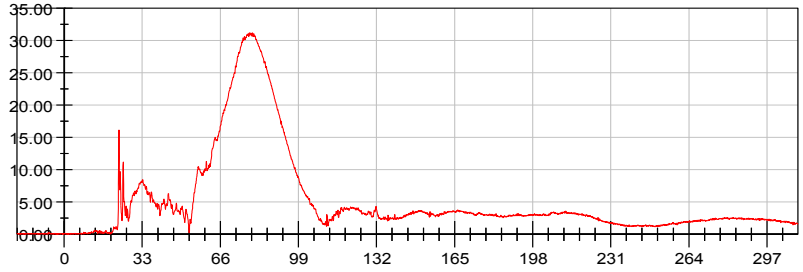
Test Date: 04/14/2016

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

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)

Test Number: 160414 (M20165114)

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



<Max>

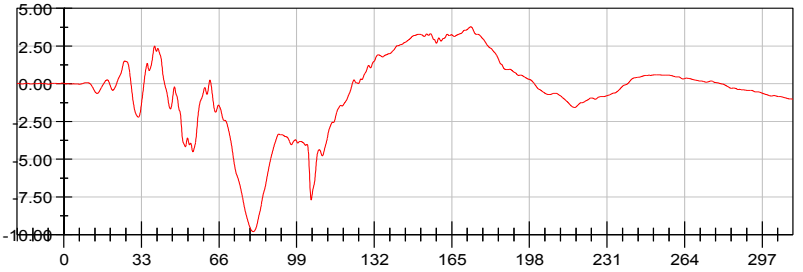
31.19 g at 79.60 ms

<Min>

0.04 g at -18.48 ms

CFC_1000

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



<Max>

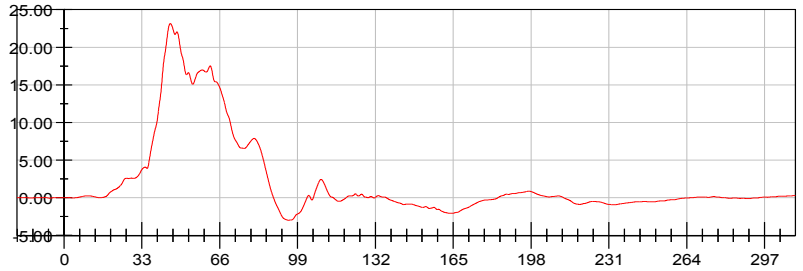
3.77 g at 173.12 ms

<Min>

-9.81 g at 80.56 ms

CFC_180

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



<Max>

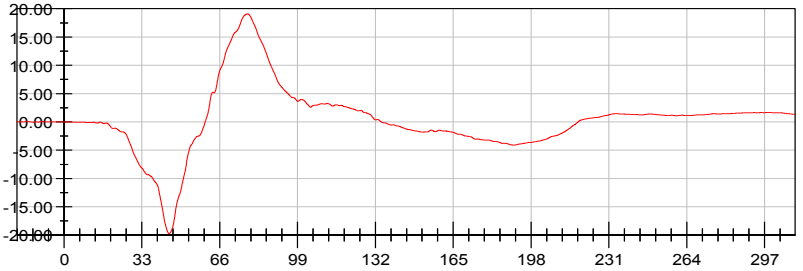
23.15 g at 45.04 ms

<Min>

-2.99 g at 95.20 ms

CFC_180

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



<Max>

19.08 g at 77.92 ms

<Min>

-19.76 g at 44.56 ms

CFC_180

NHTSA

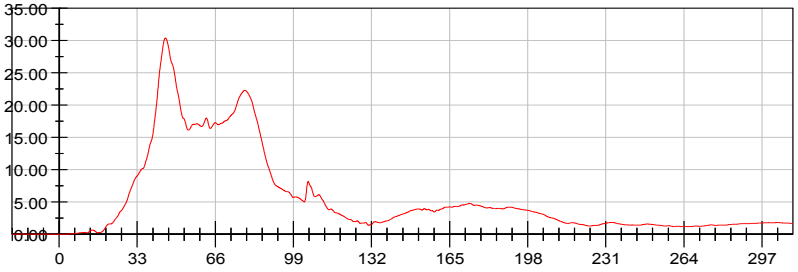
Test Date: 04/14/2016

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

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)

Test Number: 160414 (M20165114)

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



<Max>

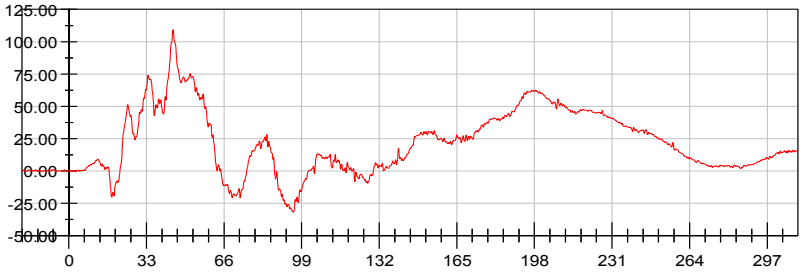
30.40 g at 44.88 ms

<Min>

0.01 g at -11.84 ms

CFC_180

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



<Max>

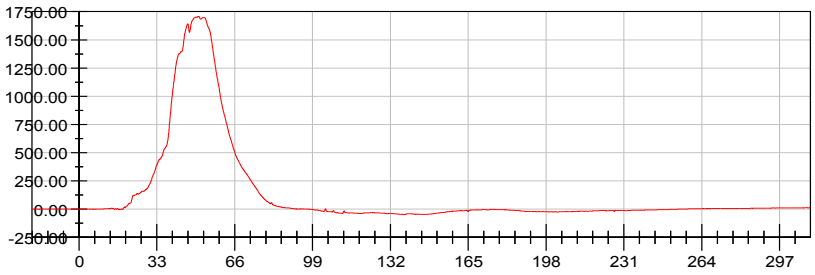
109.11 N at 44.32 ms

<Min>

-31.88 N at 95.52 ms

CFC_600

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



<Max>

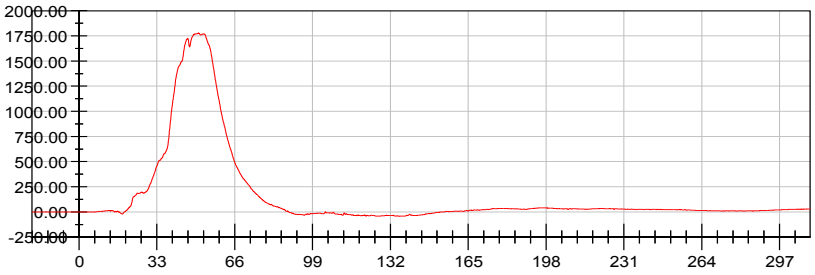
1,707.34 N at 50.64 ms

<Min>

-48.18 N at 138.08 ms

CFC_600

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



<Max>

1,778.34 N at 50.64 ms

<Min>

-42.83 N at 136.00 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

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

Table 3. Lateral Neck Pendulum Test
- Pendulum Velocity (m/s) vs. Time (ms)
- Flexion Angle (°) vs. Time (ms)
- Moment About Occipital Condyle (Nm) vs. Time (ms)

Table 4. Shoulder Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Shoulder Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)

Table 5. Thorax (With Arm) Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Shoulder Displacement (mm) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 6. Thorax (Without Arm) Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 7. Abdomen Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Upper Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 8. Pelvis Plug Quasi-Static Test (Optional*)
Table 9. Pelvis Acetabulum Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Pelvis (Y) Acceleration (G's) vs. Time (ms)
- Acetabulum Force (N) vs. Time (ms)

Table 10. Pelvis Iliac Impact Test
- Impactor Acceleration (G's) vs. Time (ms)
- Pelvis (Y) Acceleration (G's) vs. Time (ms)
- Iliac Force (N) vs. Time (ms)

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 34
03/18/16

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	559	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	156	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	205	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	158	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Technician

Approved

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 34-3
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	17 %	Yes
Peak Resultant Acceleration	125 - 155 g	139.8 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	5.9 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

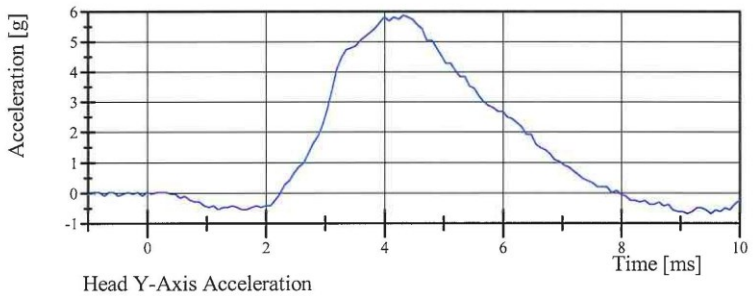
Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 07:40:05 355

Transportation Research Center Inc.

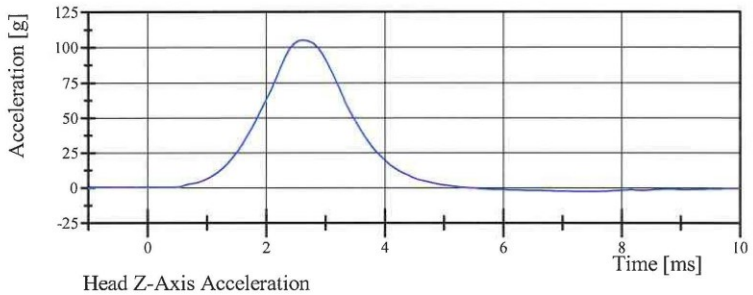
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 34-3
Test Date: 3/21/2016

Head X-Axis Acceleration



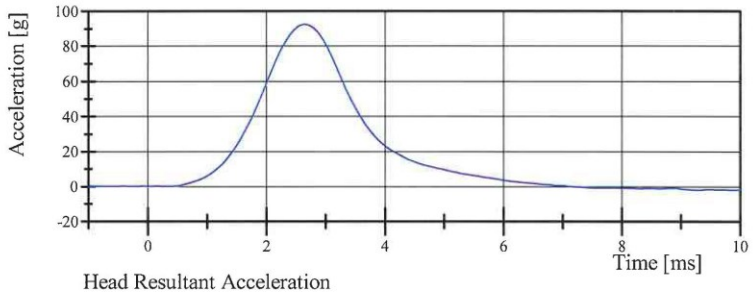
Filter Class: CFC_1000
Max: 5.9 g at 4.3 ms
Min: -0.7 g at 9.1 ms

Head Y-Axis Acceleration



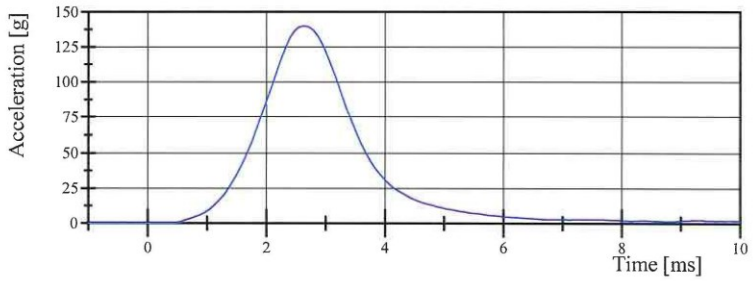
Filter Class: CFC_1000
Max: 105.0 g at 2.6 ms
Min: -2.7 g at 7.3 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 92.4 g at 2.6 ms
Min: -1.9 g at 9.4 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 139.8 g at 2.6 ms
Min: 0.0 g at -1.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 07:40:10 355

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	23 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.7 deg	Yes
Time of Peak	54 - 66 ms	61.7 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	61.4 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

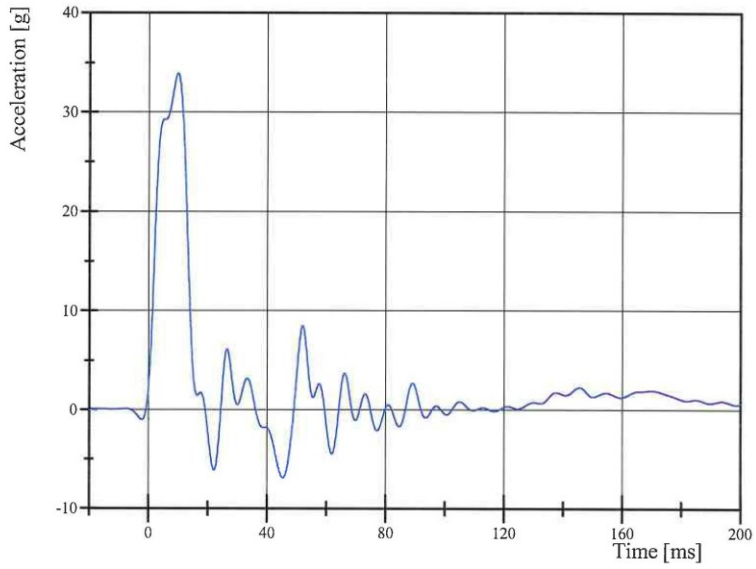
Specification Source: NHTSA Final Rule 8/15/2008

03.18.2016 15:21:26 1308

Transportation Research Center Inc.

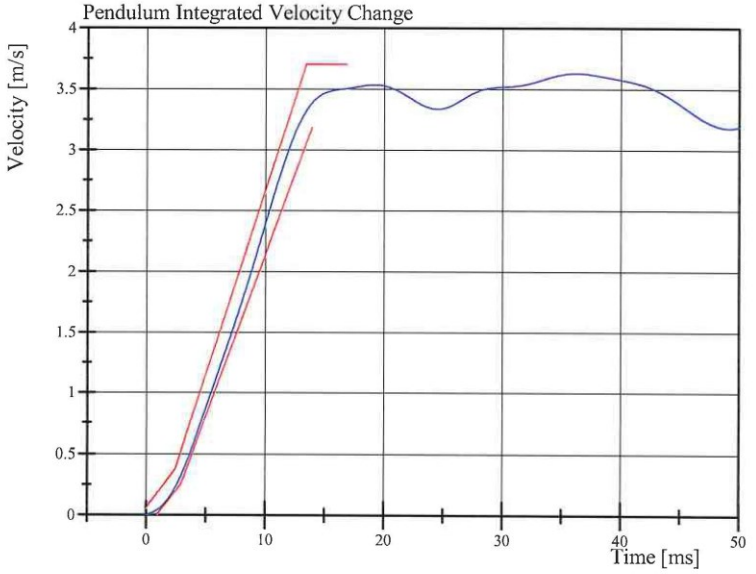
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/18/2016

Pendulum Acceleration



Filter Class: CFC_60
Max: 33.9 g at 10.0 ms
Min: -6.9 g at 45.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 36.2 ms
Min: 0.0 m/s at 0.0 ms

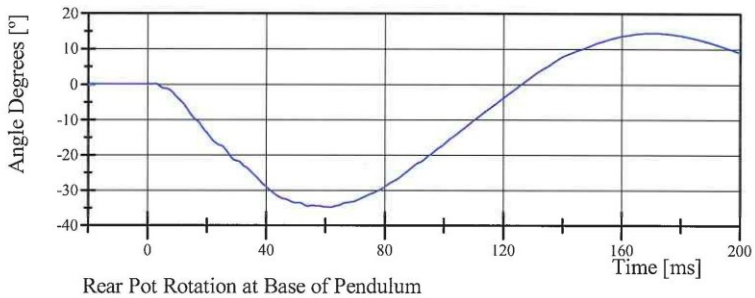
Specification Source: NHTSA Final Rule 8/15/2008

03.18.2016 15:21:36 1308

Transportation Research Center Inc.

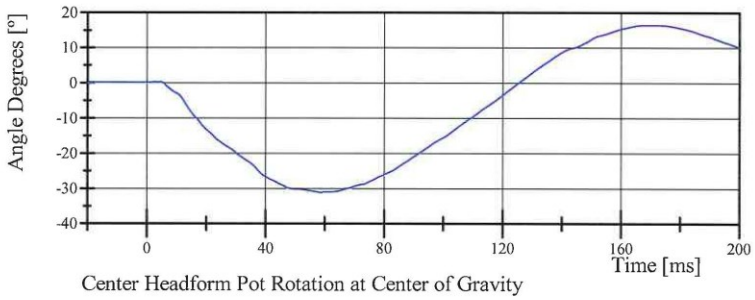
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/18/2016

Forward Pot Rotation at Base of Pendulum



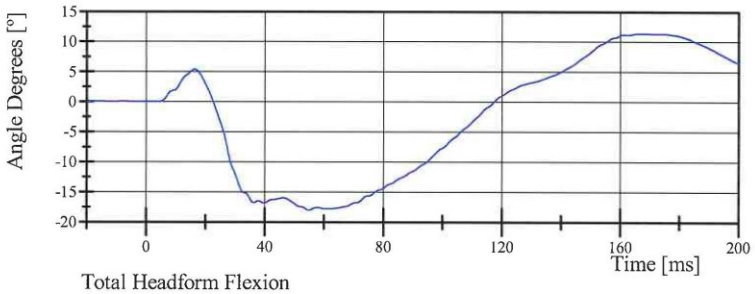
Filter Class: CFC_180
Max: 14.5 ° at 169.4 ms
Min: -34.8 ° at 61.7 ms

Rear Pot Rotation at Base of Pendulum



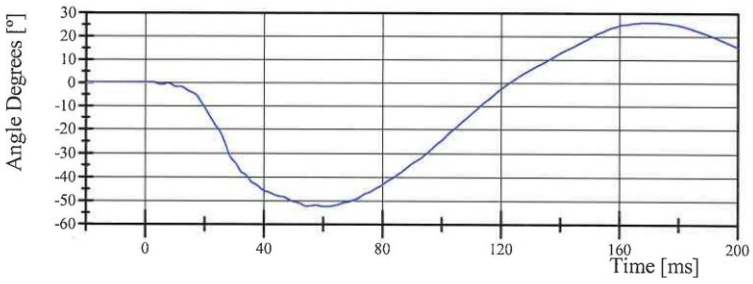
Filter Class: CFC_180
Max: 16.5 ° at 168.5 ms
Min: -31.3 ° at 58.7 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.4 ° at 167.8 ms
Min: -18.1 ° at 54.9 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.9 ° at 169.1 ms
Min: -52.7 ° at 61.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.18.2016 15:21:37 1308

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.43 g	Yes

Test meets specifications.

Comments:

Technician

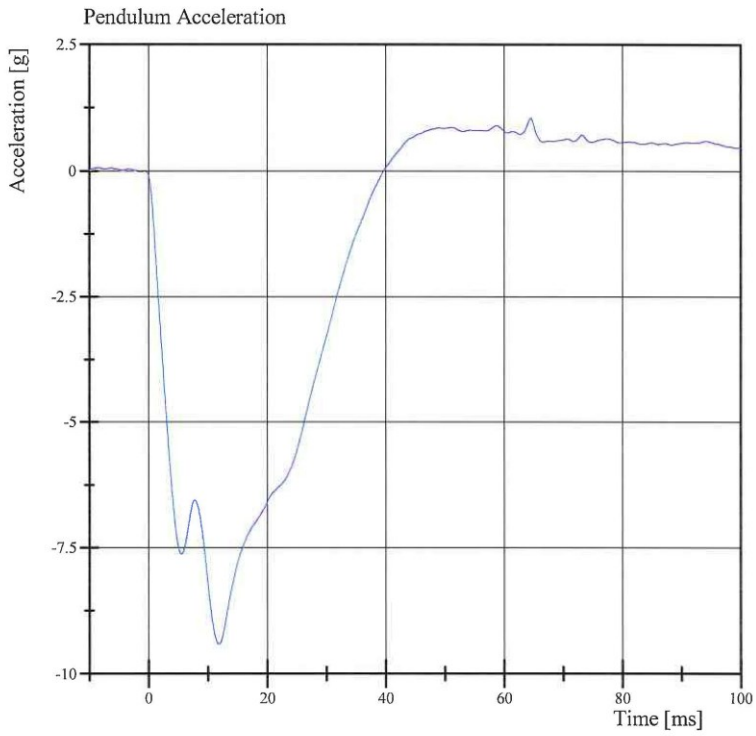
Approved

Specification Source: NHTSA final rule 8/15/2008

03.21.2016 10:37:40 548

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 1.0 g at 64.6 ms
Min: -9.4 g at 11.9 ms

Specification Source: NHTSA final rule 8/15/2008

03.21.2016 10:37:55 548

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

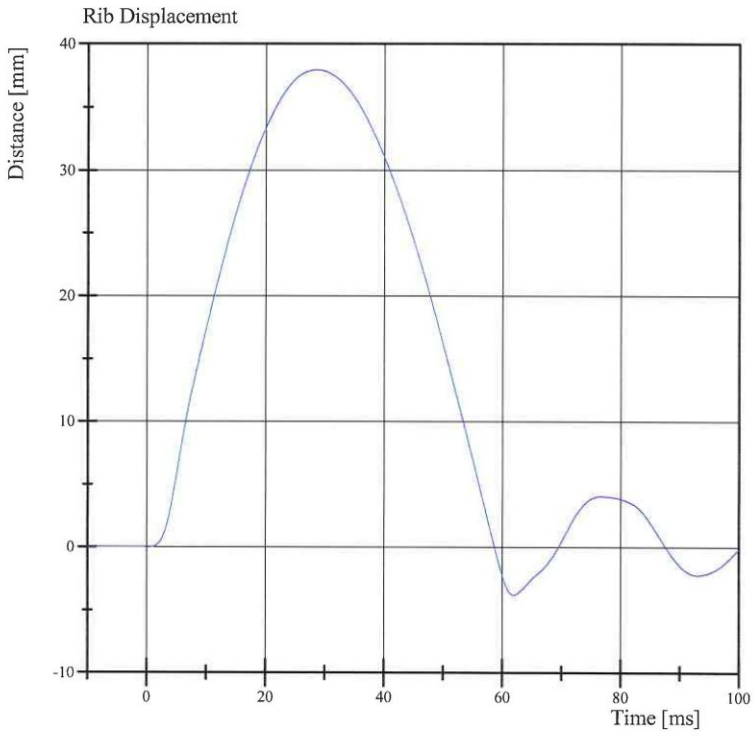
Approved

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:00:06 845

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 37.9 mm at 28.6 ms
Min: -3.8 mm at 62.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:00:20 845

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.8 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

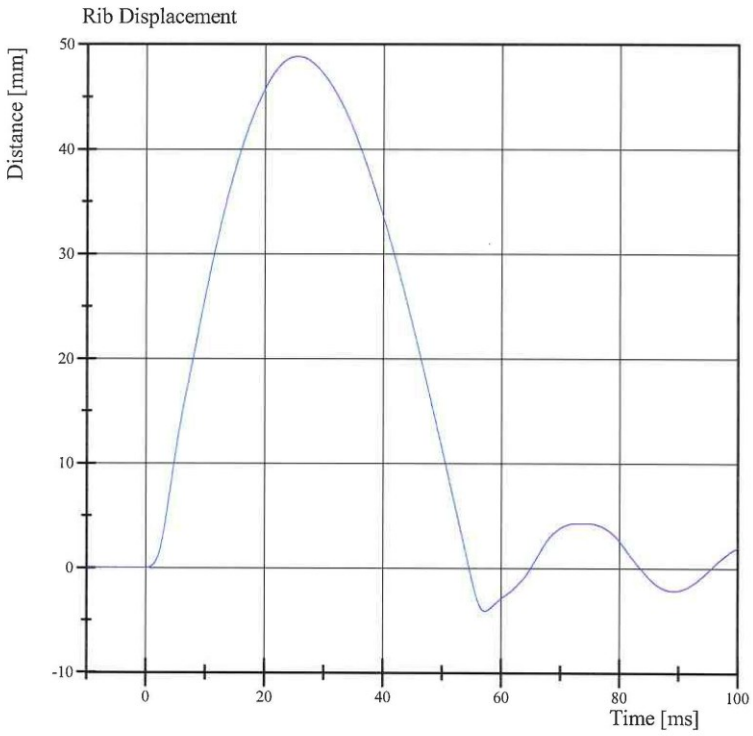
Approved

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 08:53:08 674

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 48.8 mm at 25.6 ms
Min: -4.1 mm at 57.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 08:53:39 674

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.5 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

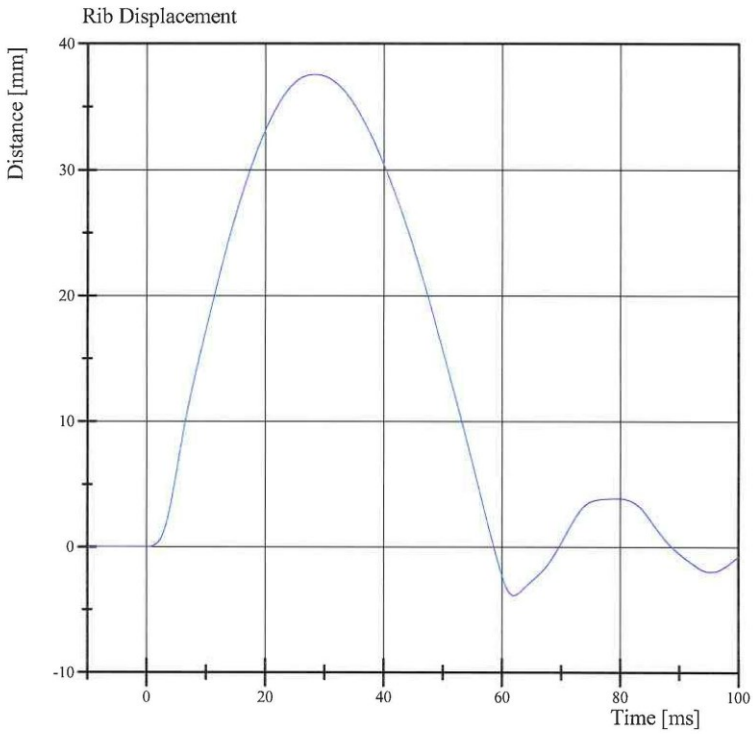
Approved

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:24:43 828

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 37.5 mm at 28.3 ms
Min: -3.8 mm at 62.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:24:58 828

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

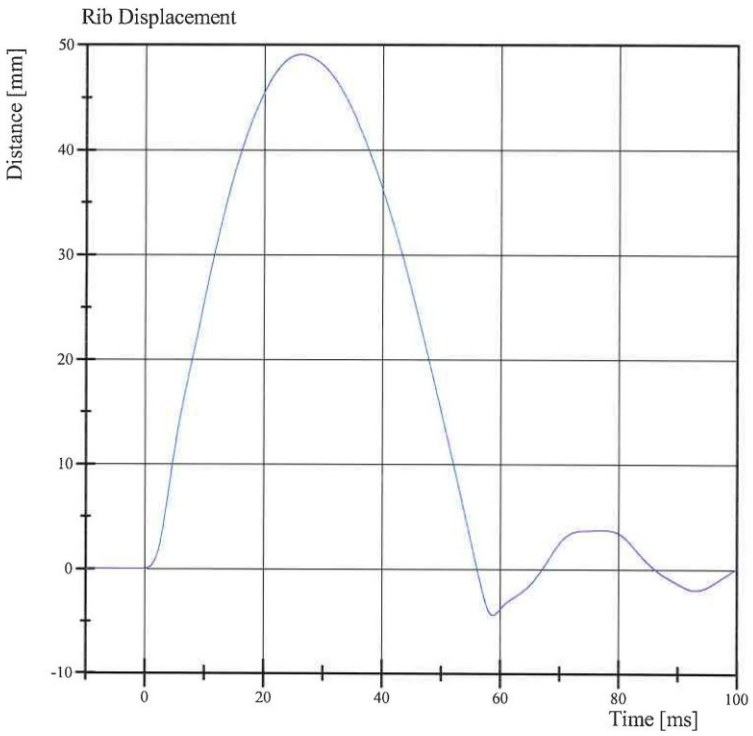
Approved

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:18:24 673

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 49.1 mm at 26.2 ms
Min: -4.4 mm at 58.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:18:42 673

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

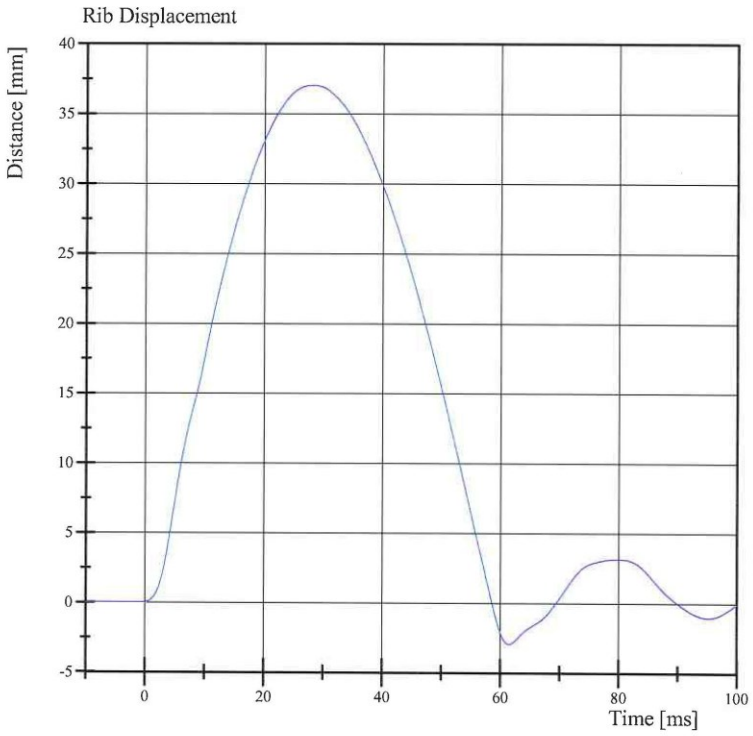
Approved

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:41:50 837

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 37.0 mm at 28.2 ms
Min: -3.0 mm at 61.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:42:12 837

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

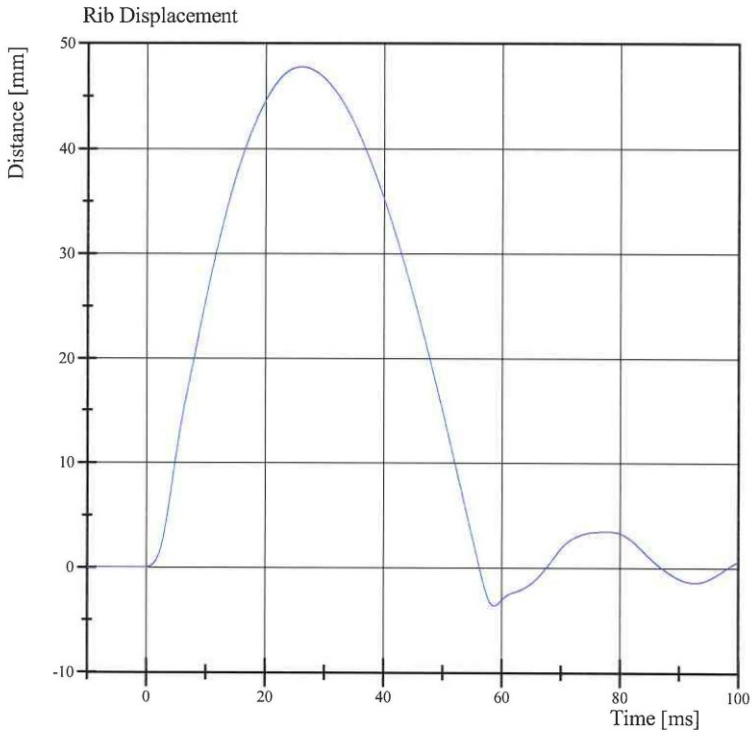
Approved

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:32:26 669

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 47.7 mm at 26.2 ms
Min: -3.6 mm at 58.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 09:32:47 669

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.538 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,610.1 N	Yes
Upper Rib Displacement	34 - 41 mm	38.8 mm	Yes
Center Rib Displacement	37 - 45 mm	41.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.0 mm	Yes

Test meets specifications.

Comments:

Technician

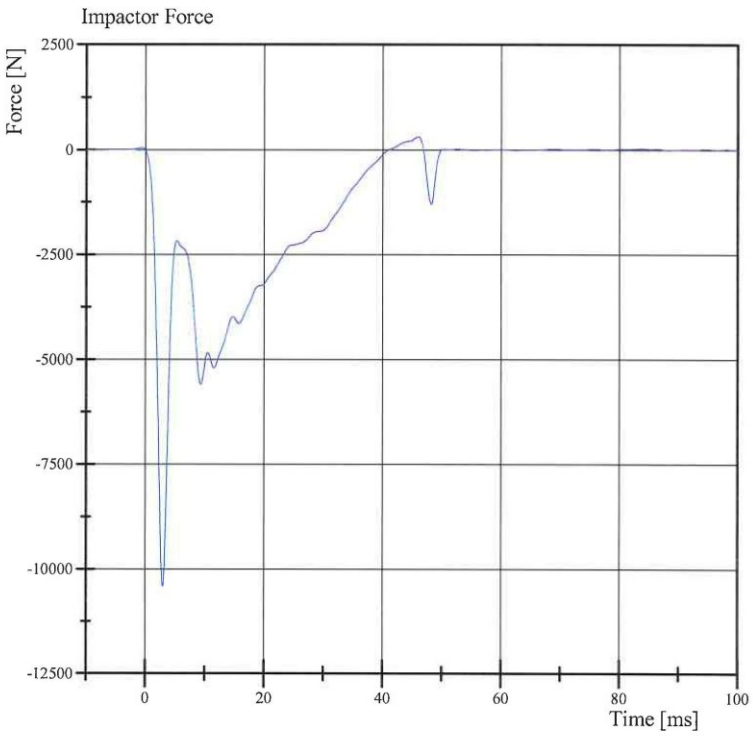
Approved

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

03.21.2016 10:44:12 448

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016



Filter Class: CFC_180
Max: 304.2 N at 46.0 ms
Min: -10,433.1 N at 3.0 ms

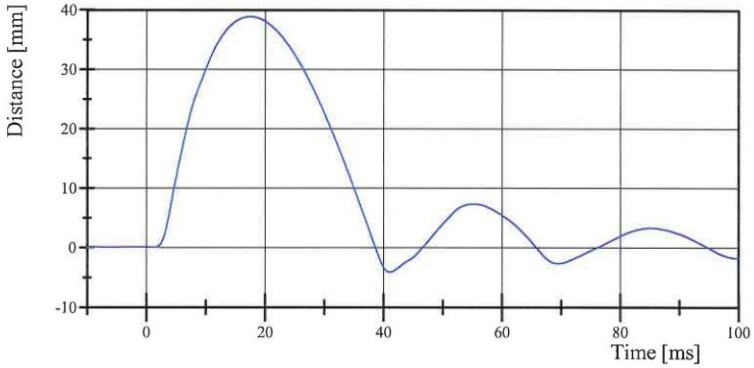
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

03.21.2016 10:44:29 448

Transportation Research Center Inc.

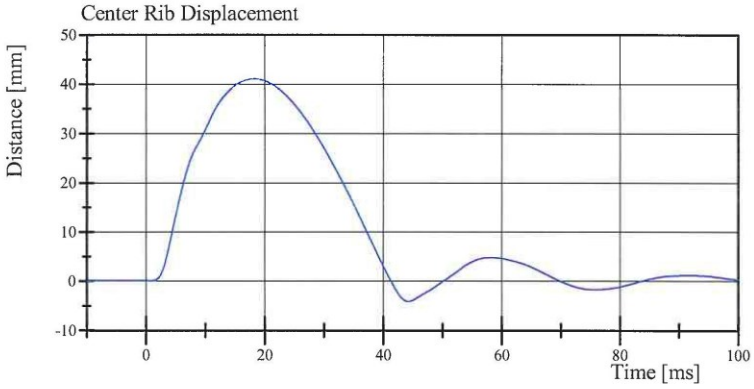
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 34-1
Test Date: 3/21/2016

Upper Rib Displacement



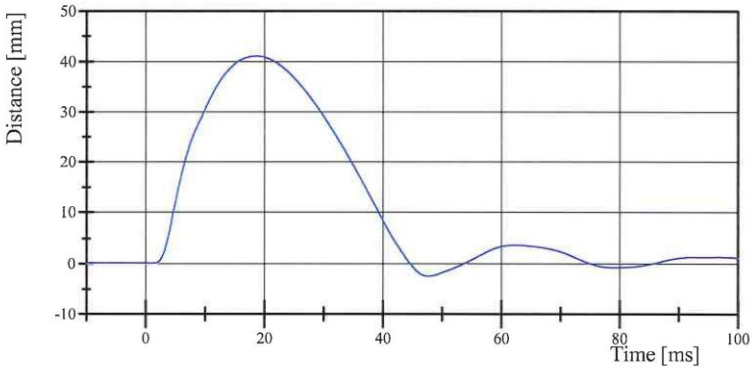
Filter Class: CFC_180
Max: 38.8 mm at 17.5 ms
Min: -4.1 mm at 41.1 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.0 mm at 18.2 ms
Min: -4.2 mm at 44.2 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 41.0 mm at 18.6 ms
Min: -2.6 mm at 47.7 ms

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

03.21.2016 10:44:29 448

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 34-13
Test Date: 3/23/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.04 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,039.0 N	Yes
Time of Peak	10.6 - 13.0 ms	10.96 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,446.3 N	Yes
Time of Peak	10.0 - 12.3 ms	10.72 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

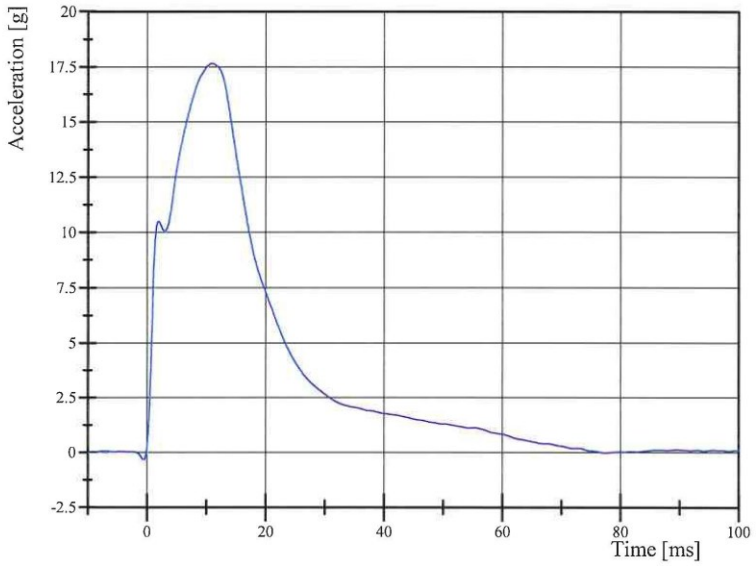
Specification Source: NHTSA Final Rule 8/15/2008

03.23.2016 13:32:36 612

Transportation Research Center Inc.

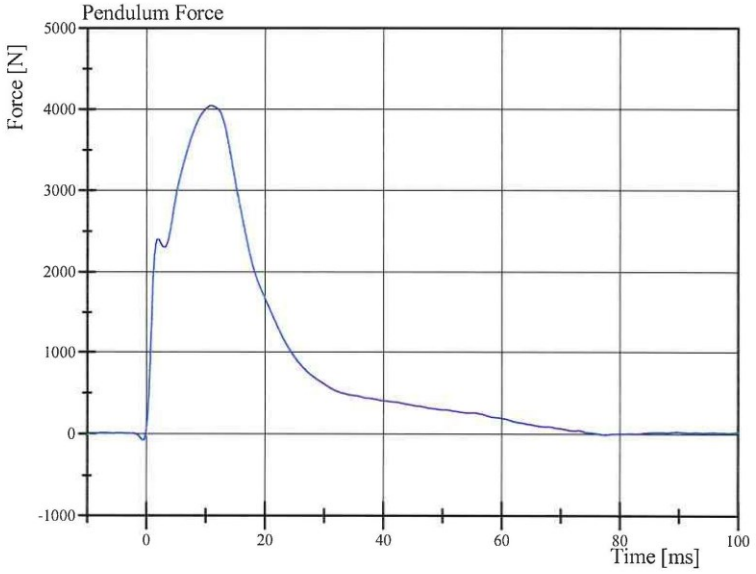
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 34-13
Test Date: 3/23/2016

Pendulum Acceleration



Filter Class: CFC_180
Max: 17.6 g at 11.0 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,039.0 N at 11.0 ms
Min: -79.8 N at -0.5 ms

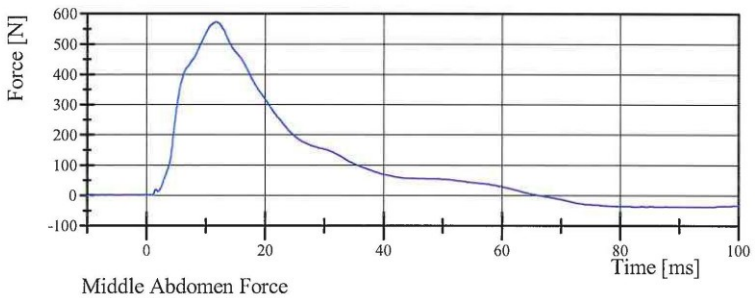
Specification Source: NHTSA Final Rule 8/15/2008

03.23.2016 13:32:52 612

Transportation Research Center Inc.

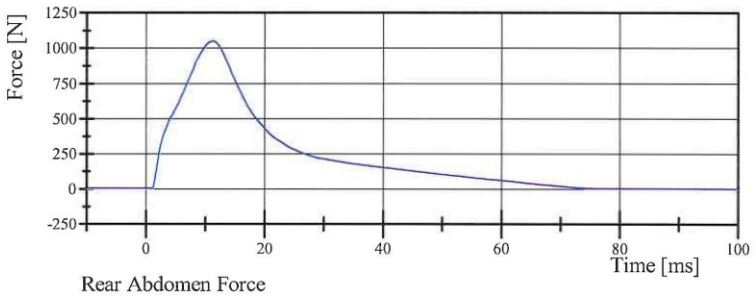
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 34-13
Test Date: 3/23/2016

Front Abdomen Force



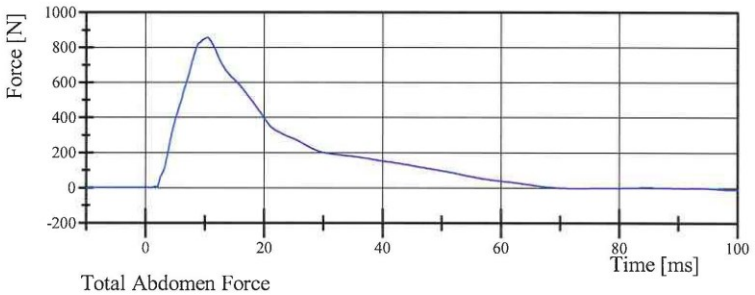
Filter Class: CFC_600
Max: 570.5 N at 11.8 ms
Min: -36.9 N at 94.6 ms

Middle Abdomen Force



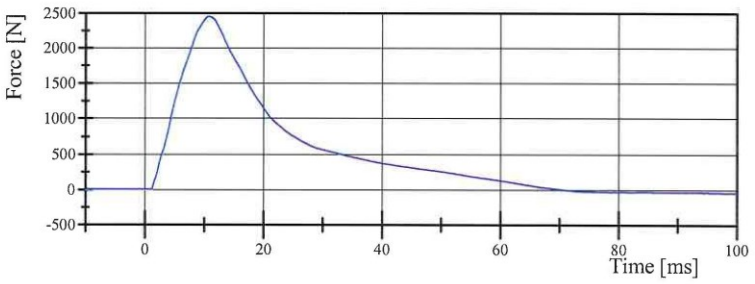
Filter Class: CFC_600
Max: 1,045.1 N at 11.3 ms
Min: -2.4 N at 1.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 855.5 N at 10.6 ms
Min: -9.4 N at 99.6 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,446.3 N at 10.7 ms
Min: -43.6 N at 98.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.23.2016 13:32:53 612

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 34-3
Test Date: 3/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.069 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-48.0 deg	Yes
Time of Peak	39 - 53 ms	44.6 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.9 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

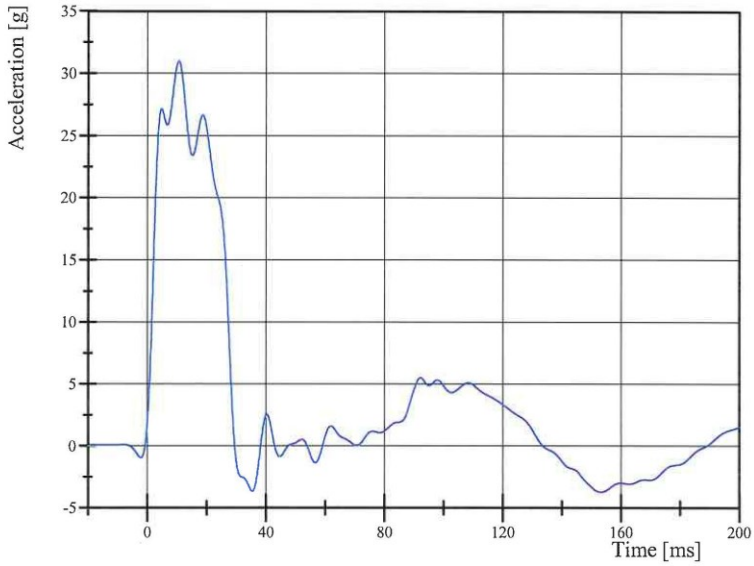
Specification Source: NHTSA Final Rule 8/15/2008

03.18.2016 14:53:19 575

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 34-3
Test Date: 3/18/2016

Pendulum Acceleration



Filter Class: CFC_60
Max: 30.9 g at 10.7 ms
Min: -3.7 g at 153.2 ms

Pendulum Integrated Velocity Change

Filter Class: CFC_60
Max: 6.3 m/s at 29.6 ms
Min: 0.0 m/s at 0.0 ms

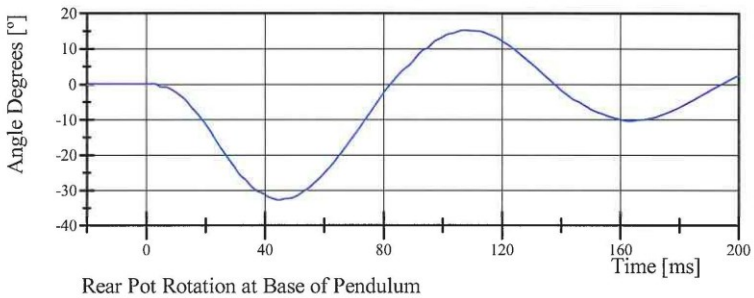
Specification Source: NHTSA Final Rule 8/15/2008

03.18.2016 14:53:36 575

Transportation Research Center Inc.

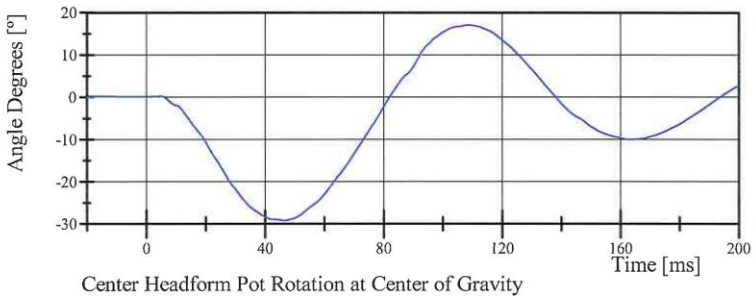
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 34-3
Test Date: 3/18/2016

Forward Pot Rotation at Base of Pendulum



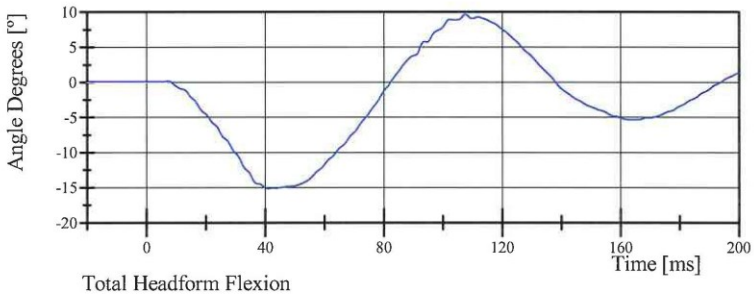
Filter Class: CFC_180
Max: 15.1 ° at 107.5 ms
Min: -32.9 ° at 44.7 ms

Rear Pot Rotation at Base of Pendulum



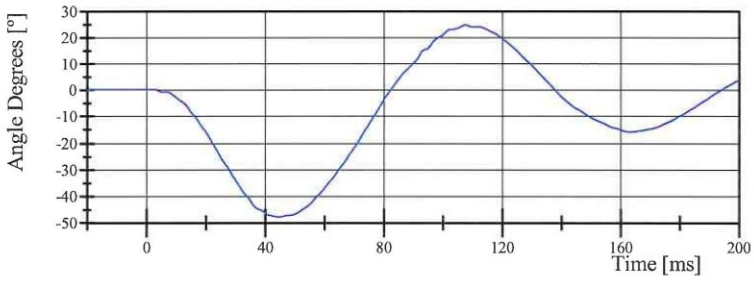
Filter Class: CFC_180
Max: 17.0 ° at 108.6 ms
Min: -29.3 ° at 46.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.6 ° at 107.7 ms
Min: -15.2 ° at 41.0 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 24.8 ° at 107.7 ms
Min: -48.0 ° at 44.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.18.2016 14:53:37 575

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 34-2
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,271.7 N	Yes
Time of Peak	11.8 - 16.1 ms	12.80 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,287.7 N	Yes
Time of Peak	12.2 - 17.0 ms	12.56 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

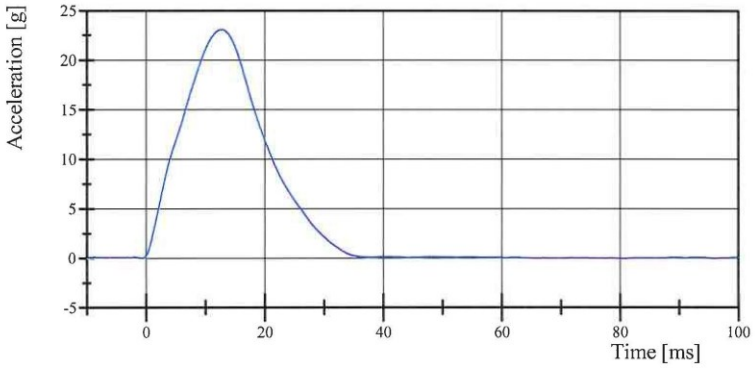
Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 11:38:49 569

Transportation Research Center Inc.

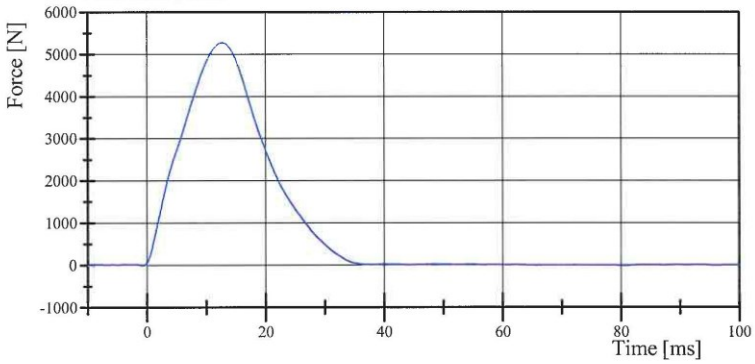
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 34-2
Test Date: 3/21/2016

Pendulum Acceleration



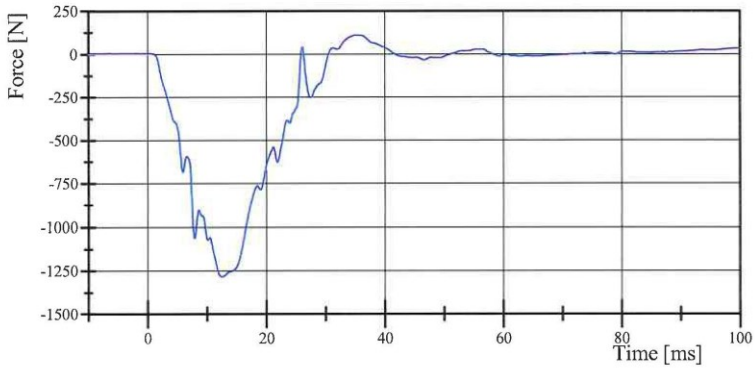
Filter Class: CFC_180
Max: 23.0 g at 12.8 ms
Min: -0.1 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,271.7 N at 12.8 ms
Min: -15.4 N at -0.6 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 107.4 N at 35.1 ms
Min: -1,287.7 N at 12.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

03.21.2016 11:39:02 569

Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 35
03/18/16

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	558	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	444	Yes
6	Head Width	152.0 - 158.0	156	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	205	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	158	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Technician

Approved

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	152.4 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	7.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

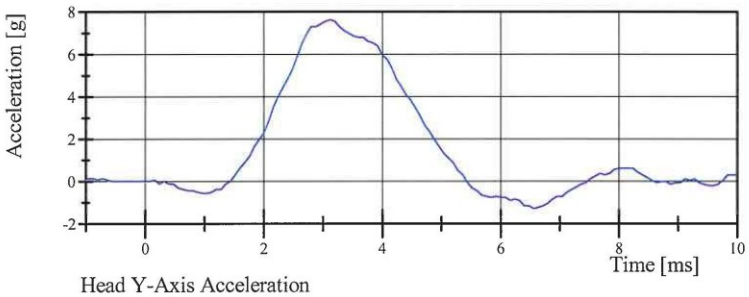
Specification Source: NHTSA Final Rule 8/15/2008

04.15.2016 13:49:20 358

Transportation Research Center Inc.

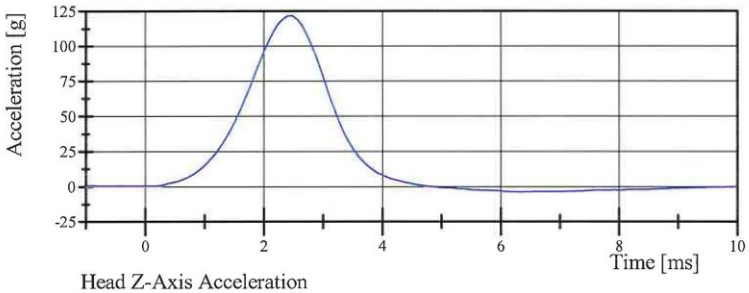
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/15/2016

Head X-Axis Acceleration



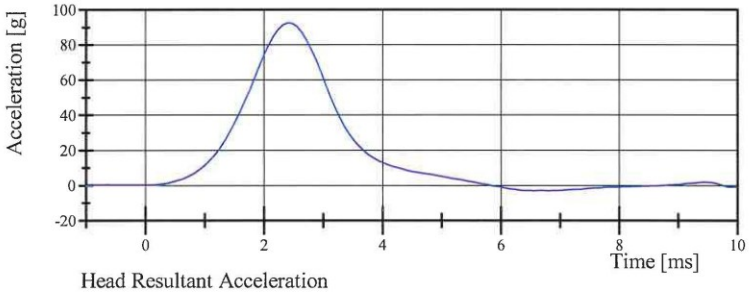
Filter Class: CFC_1000
Max: 7.6 g at 3.1 ms
Min: -1.3 g at 6.6 ms

Head Y-Axis Acceleration



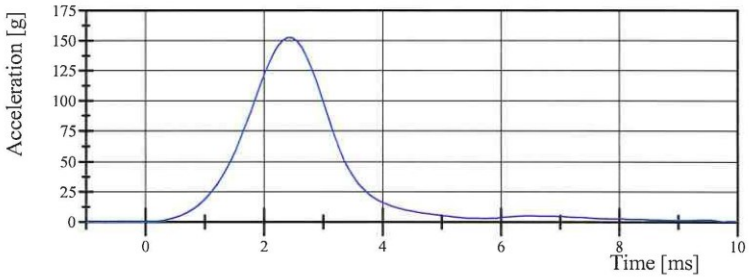
Filter Class: CFC_1000
Max: 121.2 g at 2.5 ms
Min: -4.0 g at 6.3 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 92.3 g at 2.4 ms
Min: -3.1 g at 6.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 152.4 g at 2.4 ms
Min: 0.0 g at -0.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.15.2016 13:49:26 358

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.38 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.8 deg	Yes
Time of Peak	54 - 66 ms	55.7 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	68.1 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

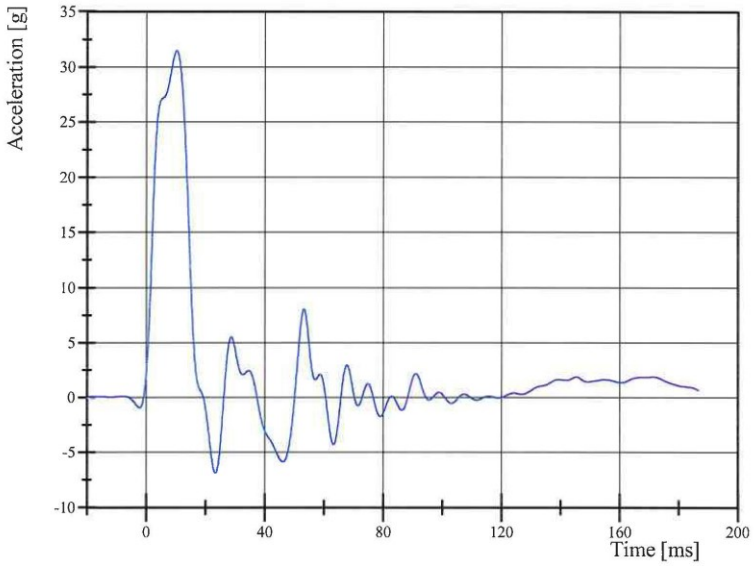
Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:11:30 1492

Transportation Research Center Inc.

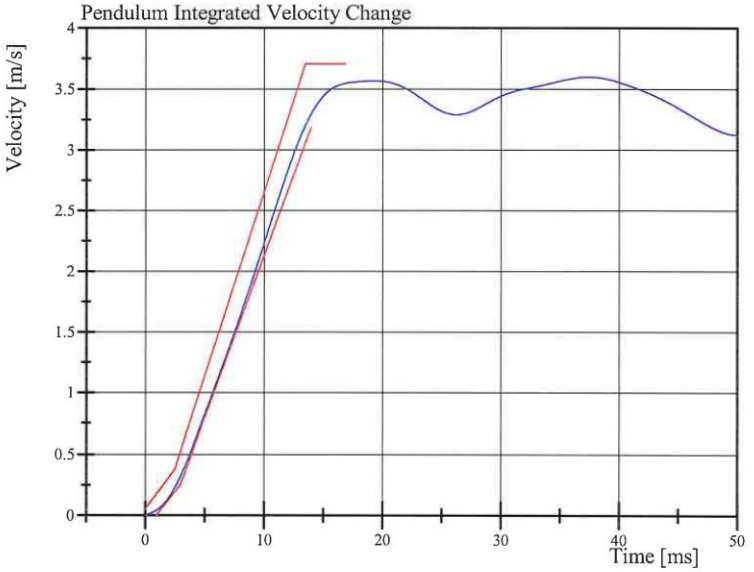
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.4 g at 10.2 ms
Min: -7.0 g at 23.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 37.4 ms
Min: 0.0 m/s at 0.0 ms

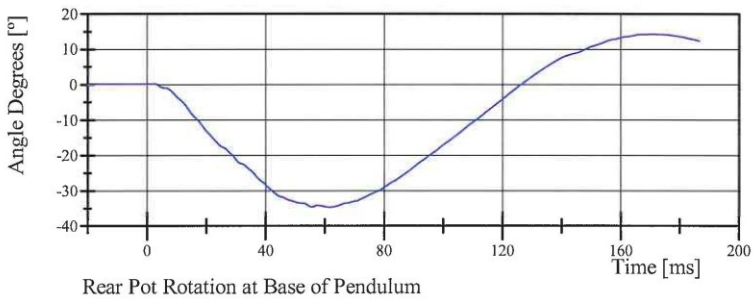
Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:11:38 1492

Transportation Research Center Inc.

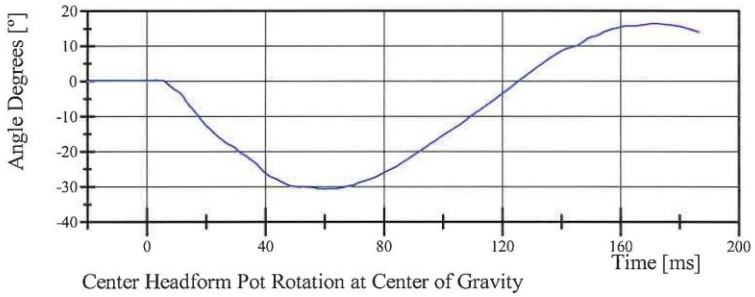
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Forward Pot Rotation at Base of Pendulum



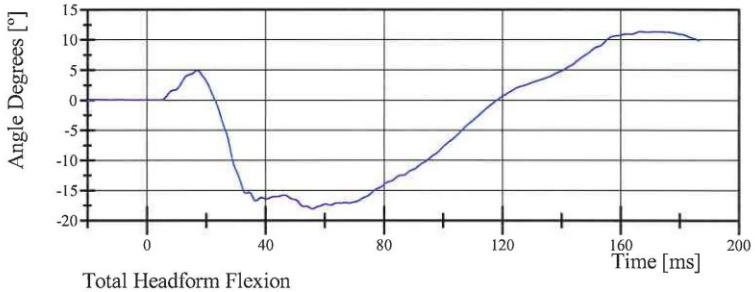
Filter Class: CFC_180
Max: 14.3 ° at 170.5 ms
Min: -34.9 ° at 61.7 ms

Rear Pot Rotation at Base of Pendulum



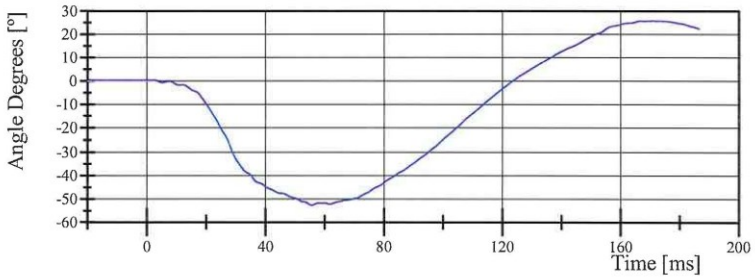
Filter Class: CFC_180
Max: 16.4 ° at 171.0 ms
Min: -30.8 ° at 59.8 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.4 ° at 166.7 ms
Min: -18.1 ° at 55.8 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.6 ° at 171.0 ms
Min: -52.8 ° at 55.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:11:39 1492

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.84 g	Yes

Test meets specifications.

Comments:

Technician

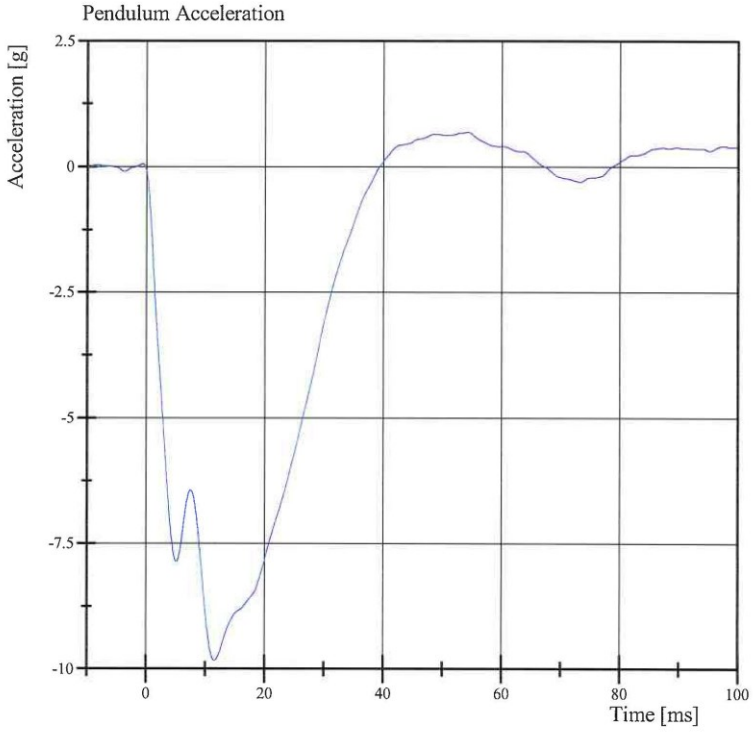
Approved

Specification Source: NHTSA final rule 8/15/2008

04.18.2016 14:38:14 562

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 0.7 g at 54.2 ms
Min: -9.8 g at 11.5 ms

Specification Source: NHTSA final rule 8/15/2008

04.18.2016 14:38:20 562

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

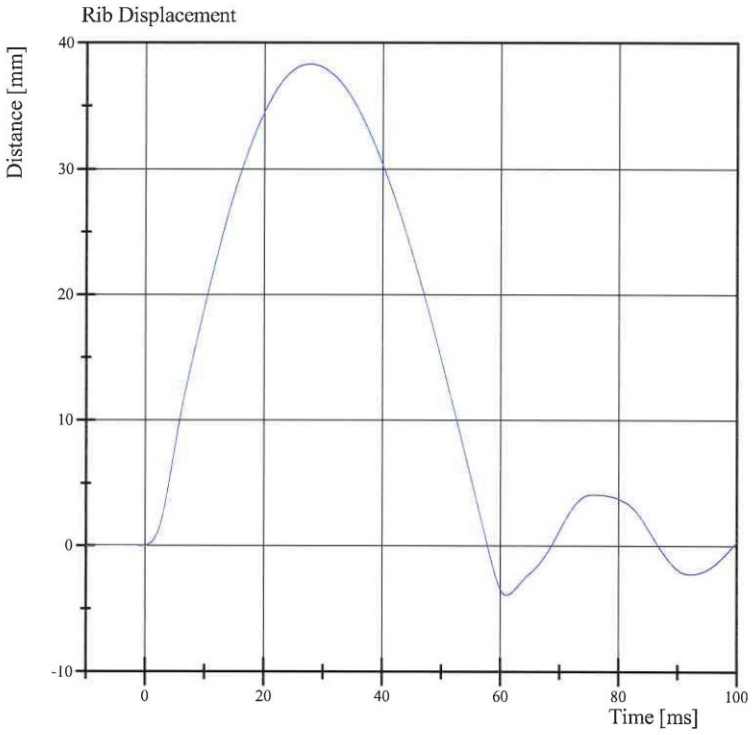
Approved

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:44:21 888

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 38.3 mm at 27.7 ms
Min: -3.9 mm at 61.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:44:34 888

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.6 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

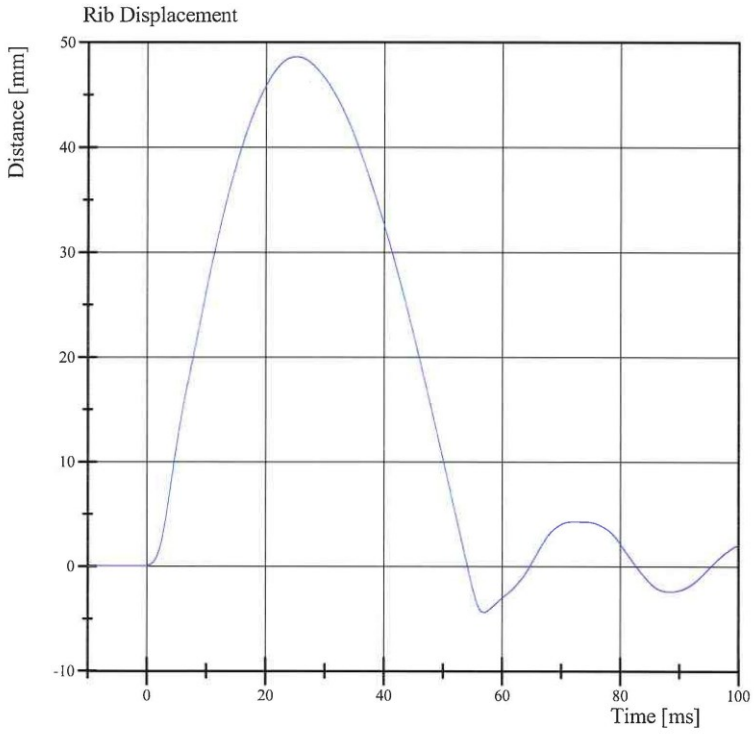
Approved

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:39:02 708

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 48.6 mm at 25.1 ms
Min: -4.4 mm at 56.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:39:14 708

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

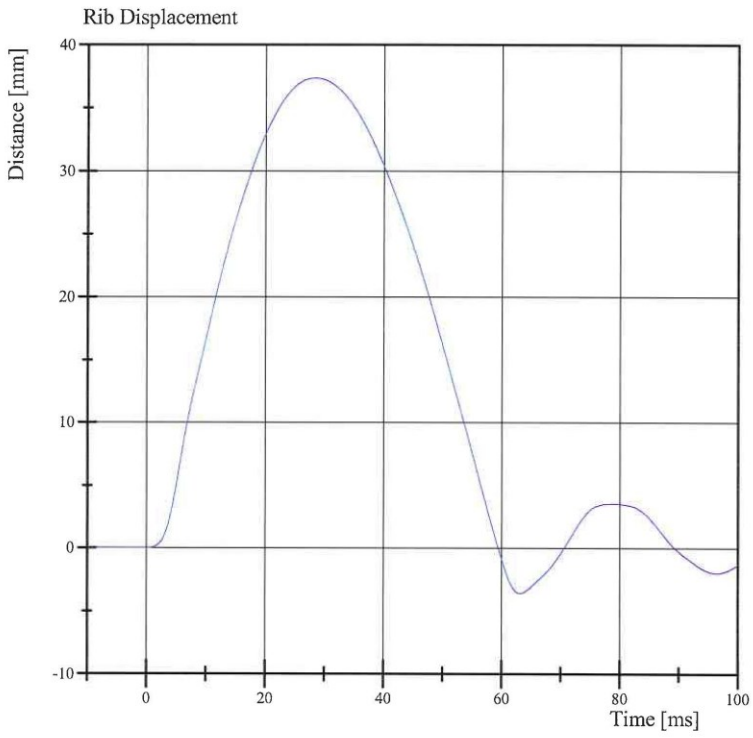
Approved

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:54:51 861

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 37.4 mm at 28.3 ms
Min: -3.6 mm at 63.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:54:57 861

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

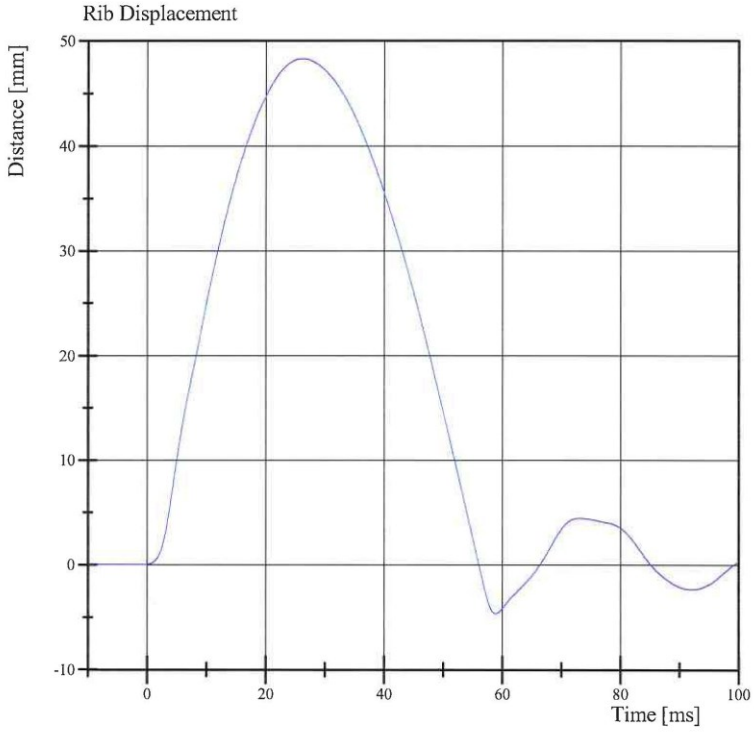
Approved

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:50:12 695

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 48.3 mm at 26.2 ms
Min: -4.7 mm at 58.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 11:50:23 695

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

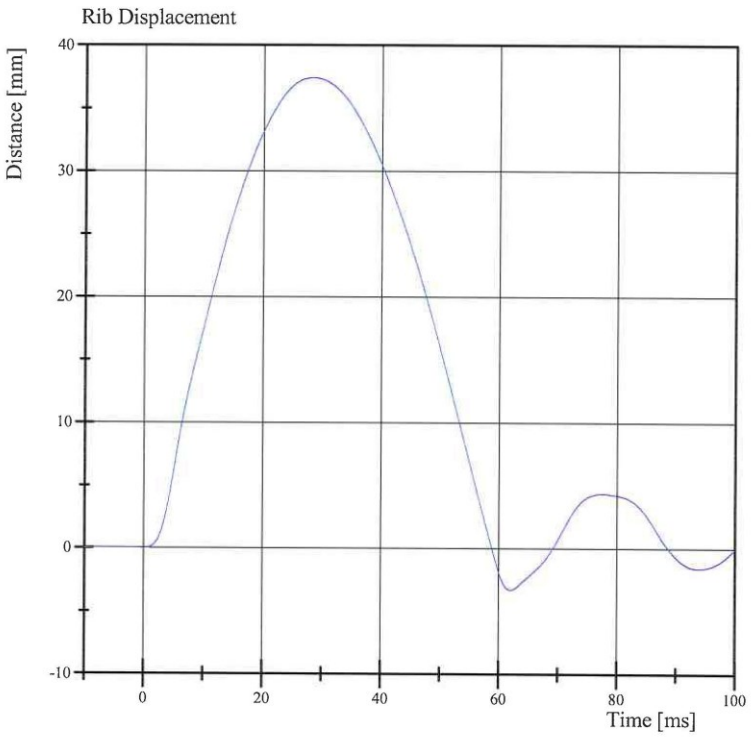
Approved

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 12:08:43 890

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 37.4 mm at 28.3 ms
Min: -3.3 mm at 62.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 12:08:54 890

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

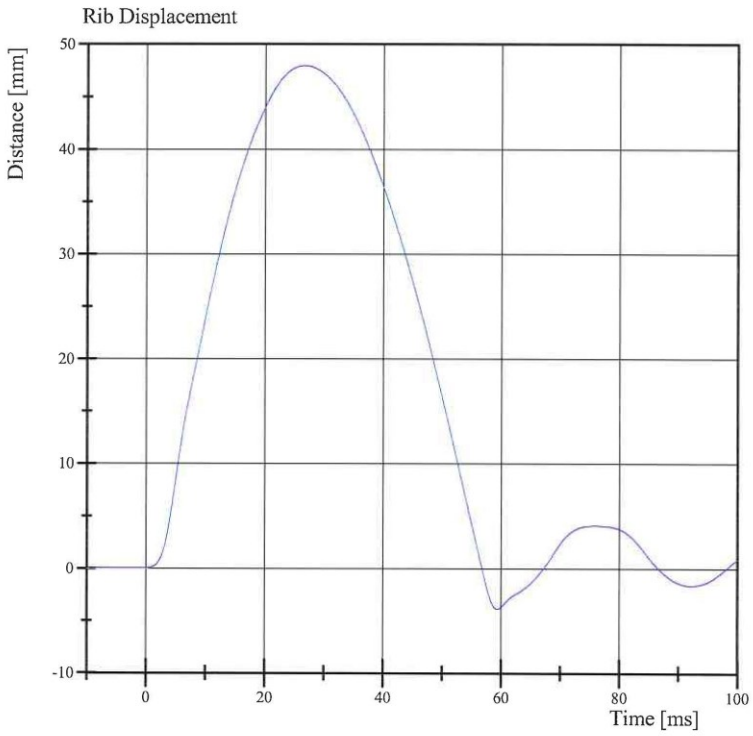
Approved

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 12:00:51 696

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 47.9 mm at 26.6 ms
Min: -3.9 mm at 59.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 12:01:03 696

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.544 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,556.8 N	Yes
Upper Rib Displacement	34 - 41 mm	38.5 mm	Yes
Center Rib Displacement	37 - 45 mm	41.2 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.6 mm	Yes

Test meets specifications.

Comments:

Technician

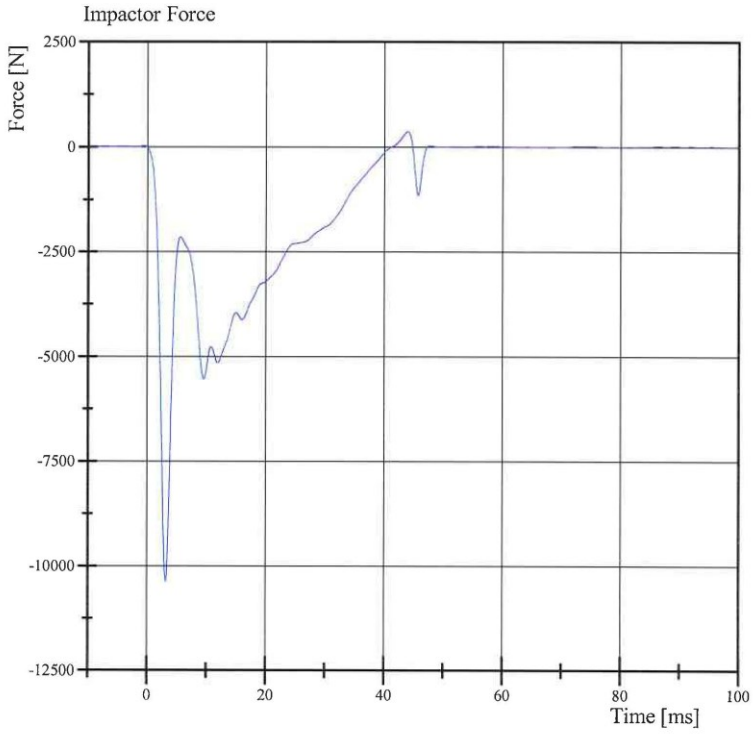
Approved

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

04.18.2016 14:44:37 467

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016



Filter Class: CFC_180
Max: 364.6 N at 43.9 ms
Min: -10,384.1 N at 3.2 ms

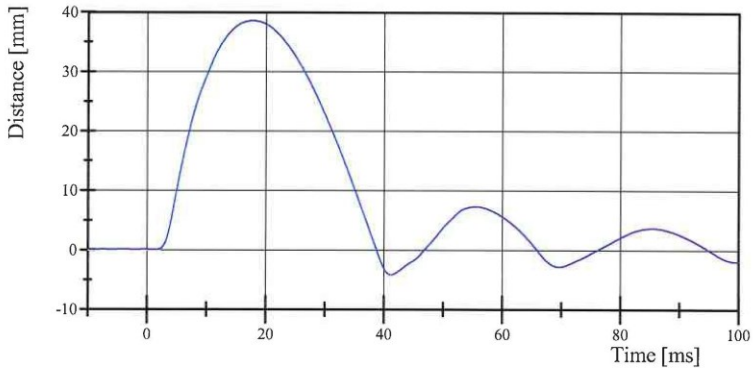
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

04.18.2016 14:44:44 467

Transportation Research Center Inc.

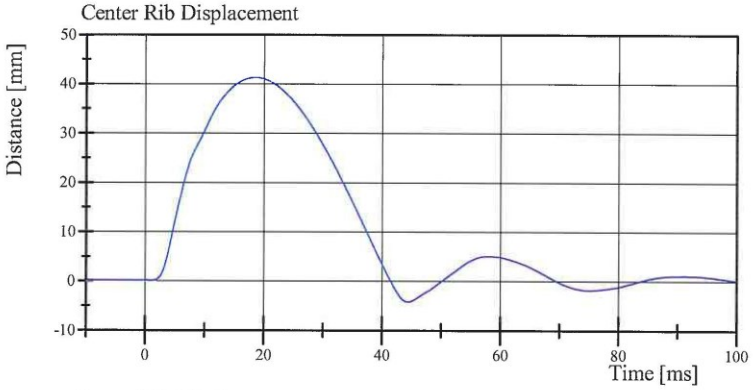
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Upper Rib Displacement



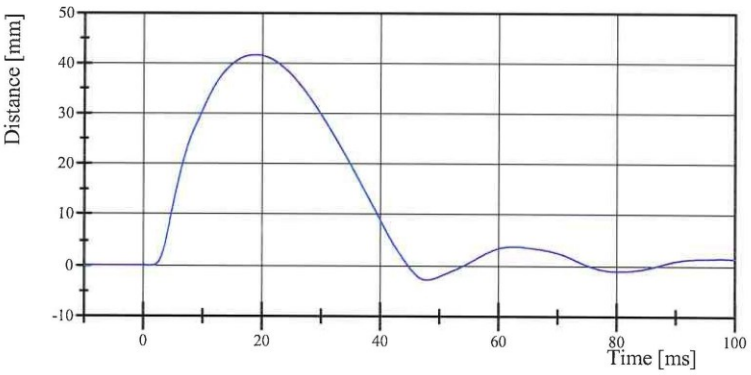
Filter Class: CFC_180
Max: 38.5 mm at 17.8 ms
Min: -4.2 mm at 41.2 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.2 mm at 18.6 ms
Min: -4.3 mm at 44.3 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 41.6 mm at 18.8 ms
Min: -2.8 mm at 47.8 ms

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

04.18.2016 14:44:44 467

Transportation Research Center Inc.

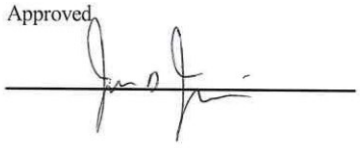
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 35-2
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.06 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,234.7 N	Yes
Time of Peak	10.6 - 13.0 ms	11.28 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,531.8 N	Yes
Time of Peak	10.0 - 12.3 ms	10.96 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

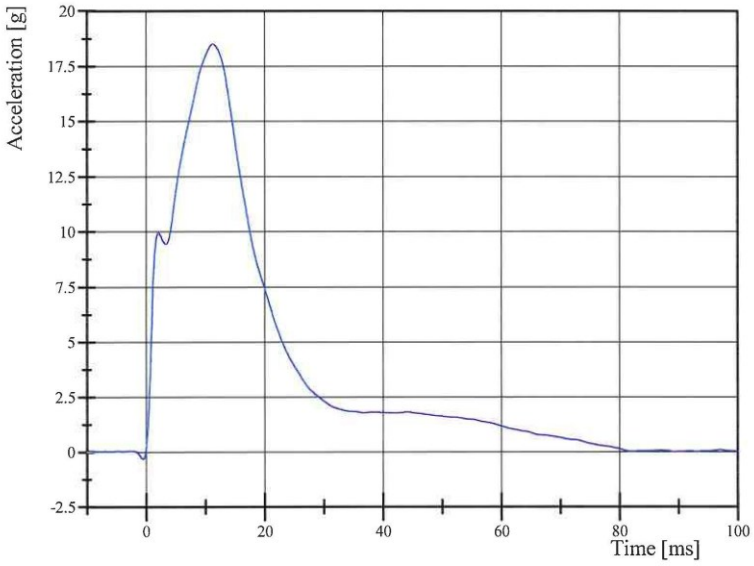
Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 15:35:34 593

Transportation Research Center Inc.

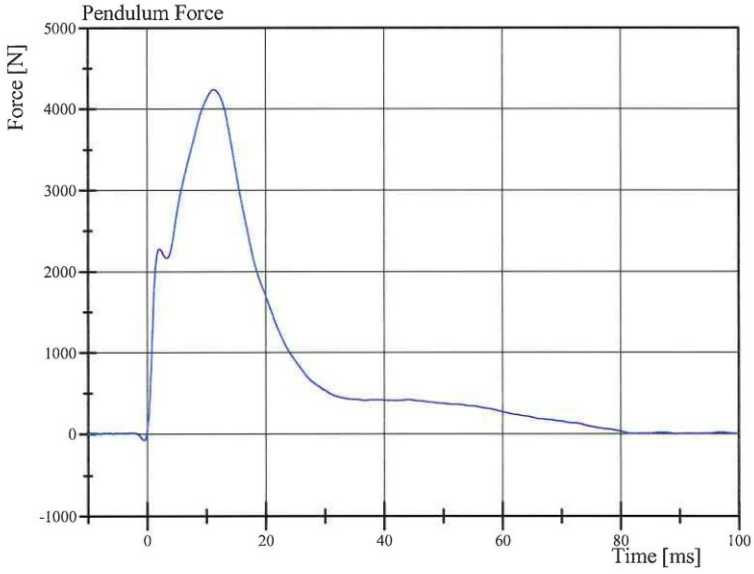
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 35-2
Test Date: 4/18/2016

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.5 g at 11.3 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,234.7 N at 11.3 ms
Min: -78.5 N at -0.5 ms

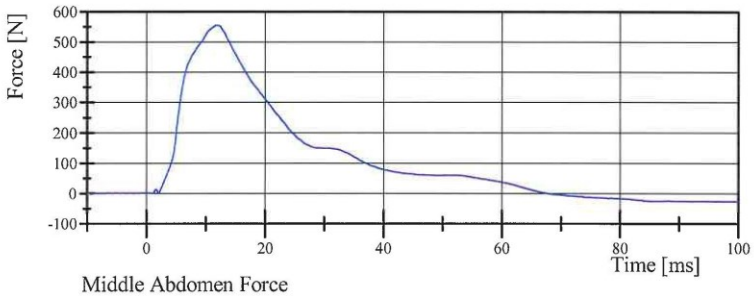
Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 15:35:41 593

Transportation Research Center Inc.

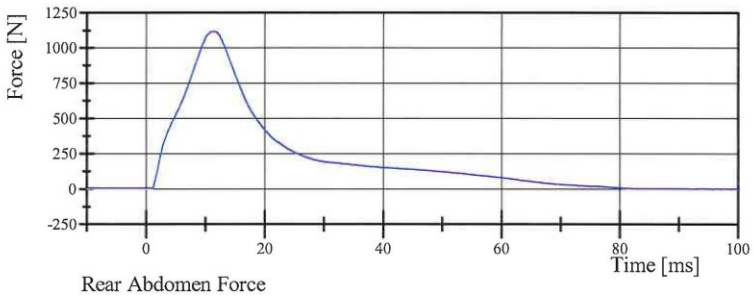
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 35-2
Test Date: 4/18/2016

Front Abdomen Force



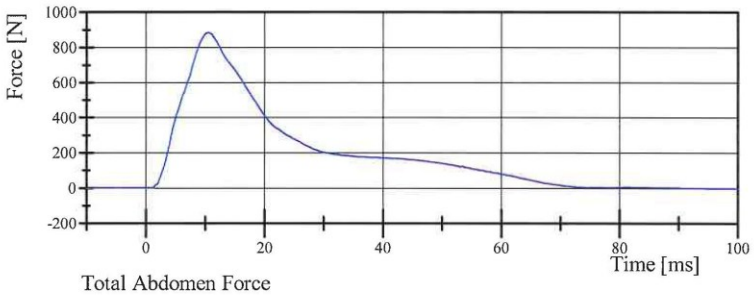
Filter Class: CFC_600
Max: 553.1 N at 11.8 ms
Min: -25.7 N at 98.6 ms

Middle Abdomen Force



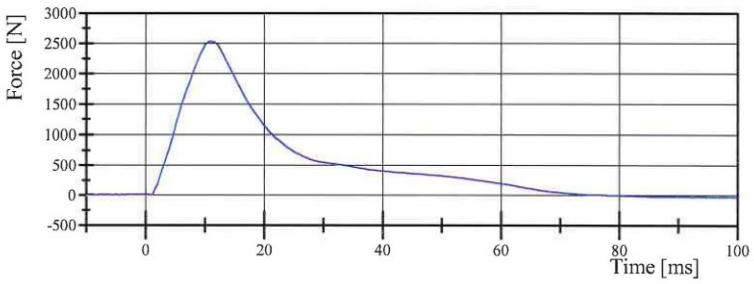
Filter Class: CFC_600
Max: 1,114.5 N at 11.5 ms
Min: -2.1 N at 1.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 880.5 N at 10.6 ms
Min: -1.5 N at 100.0 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,531.8 N at 11.0 ms
Min: -28.7 N at 99.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 15:35:41 593

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.067 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-46.3 deg	Yes
Time of Peak	39 - 53 ms	44.4 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.8 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

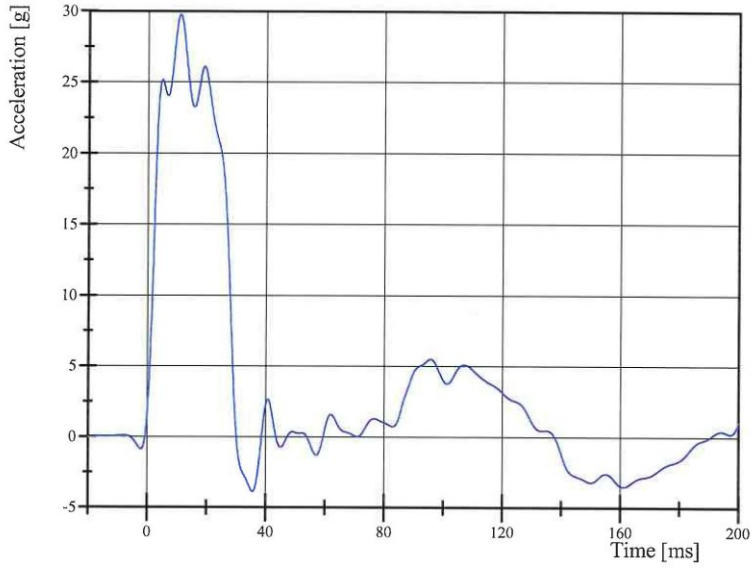
Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 10:45:16 677

Transportation Research Center Inc.

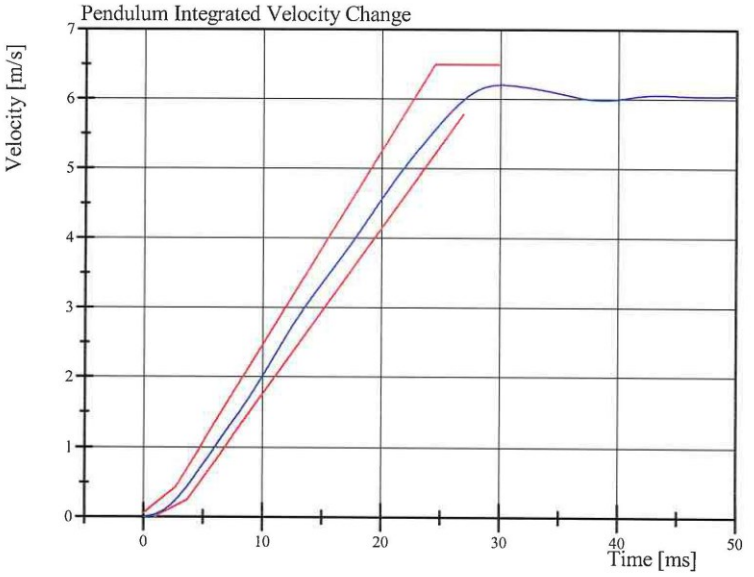
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Pendulum Acceleration



Filter Class: CFC_60
Max: 29.7 g at 10.9 ms
Min: -3.9 g at 35.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.2 m/s at 30.1 ms
Min: 0.0 m/s at 0.0 ms

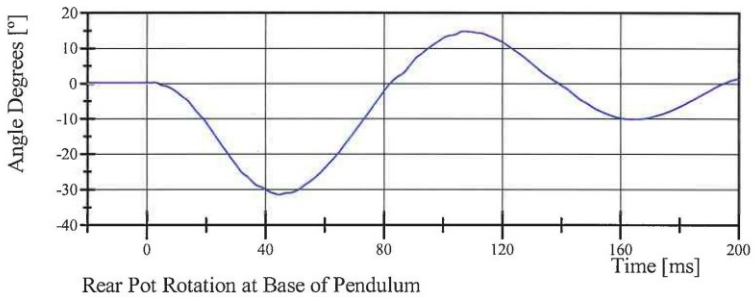
Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 10:45:23 677

Transportation Research Center Inc.

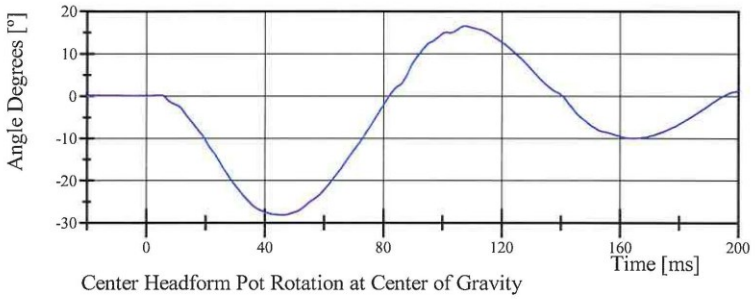
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Forward Pot Rotation at Base of Pendulum



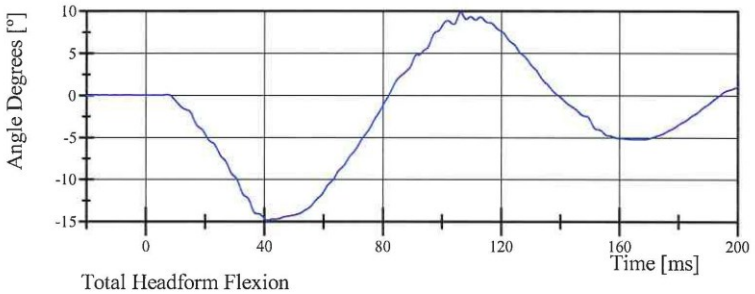
Filter Class: CFC_180
Max: 14.7 ° at 106.8 ms
Min: -31.6 ° at 44.6 ms

Rear Pot Rotation at Base of Pendulum



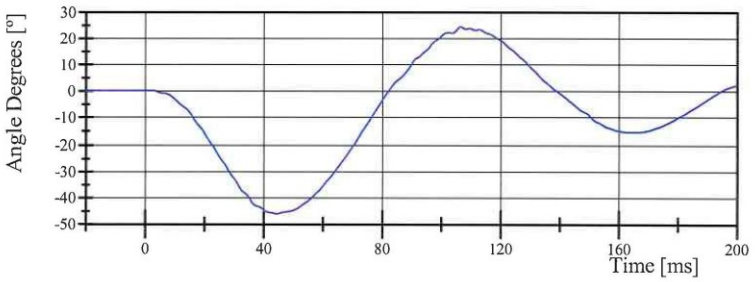
Filter Class: CFC_180
Max: 16.5 ° at 107.5 ms
Min: -28.3 ° at 45.7 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.8 ° at 106.2 ms
Min: -14.9 ° at 41.0 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 24.5 ° at 106.3 ms
Min: -46.3 ° at 44.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 10:45:23 677

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,147.8 N	Yes
Time of Peak	11.8 - 16.1 ms	13.04 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,264.5 N	Yes
Time of Peak	12.2 - 17.0 ms	12.96 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

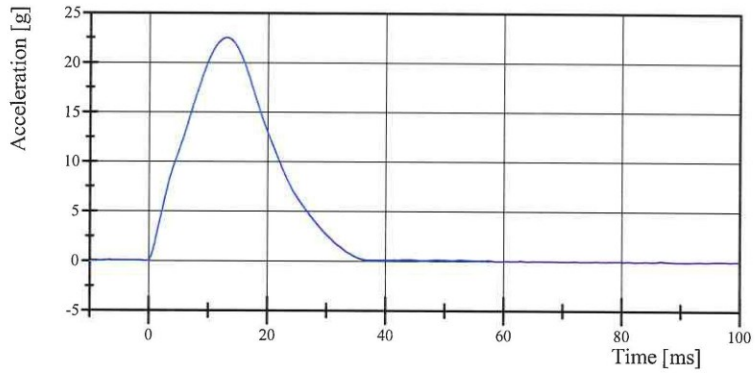
Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 15:06:13 555

Transportation Research Center Inc.

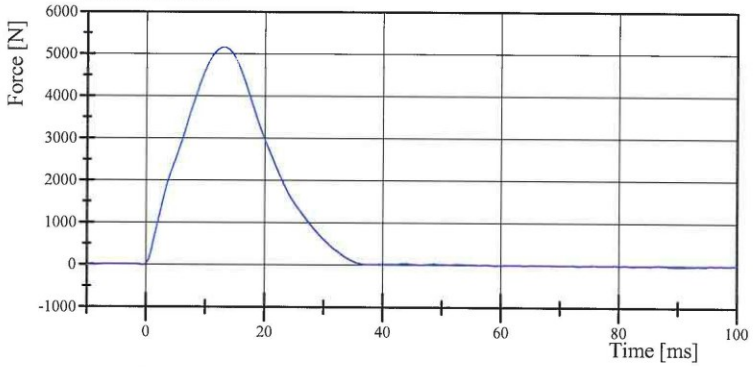
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 35-1
Test Date: 4/18/2016

Pendulum Acceleration



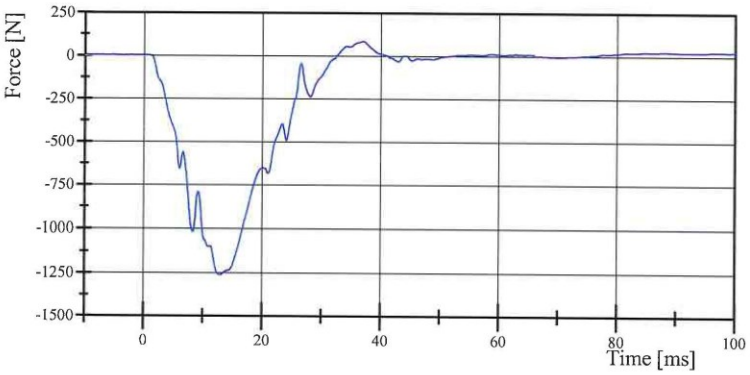
Filter Class: CFC_180
Max: 22.5 g at 13.0 ms
Min: -0.1 g at 90.8 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,147.8 N at 13.0 ms
Min: -16.8 N at 90.8 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 82.6 N at 37.0 ms
Min: -1,264.5 N at 13.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

04.18.2016 15:06:19 555

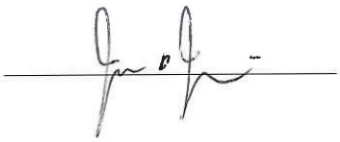
Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.40

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	783	Yes
B	Shoulder Pivot Height	437.0 - 453.0	446	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	130	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	525	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician

Approved



Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 40-2
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	121.5 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-1.7 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

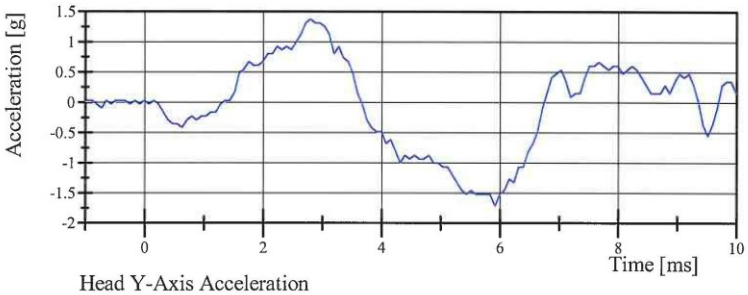
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.21.2016 13:32:04 232

Transportation Research Center Inc.

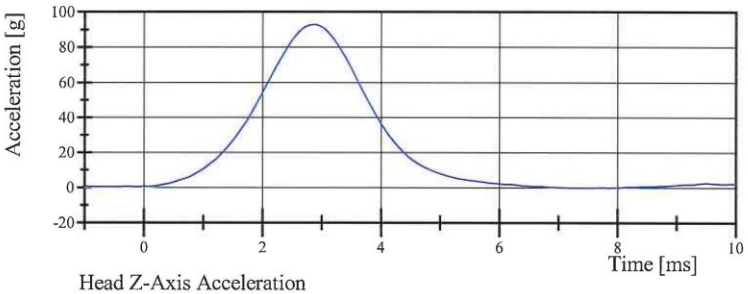
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 40-2
Test Date: 3/21/2016

Head X-Axis Acceleration



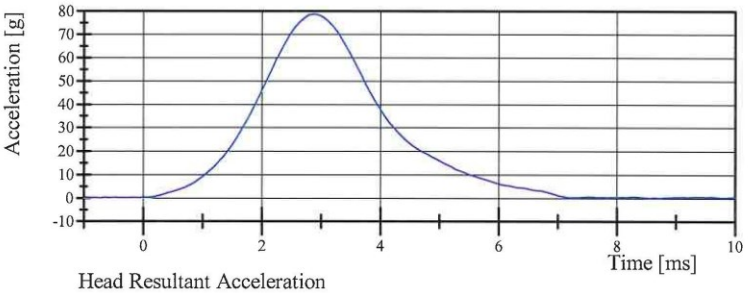
Filter Class: CFC_1000
Max: 1.4 g at 2.8 ms
Min: -1.7 g at 5.9 ms

Head Y-Axis Acceleration



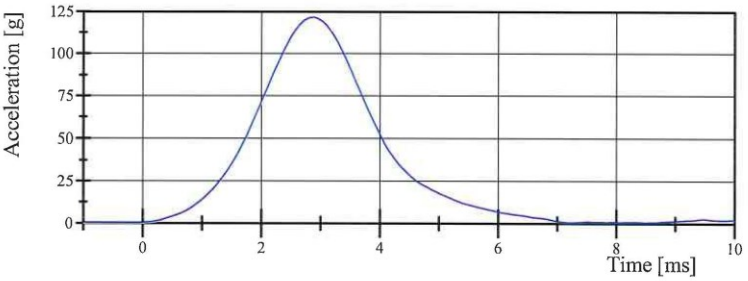
Filter Class: CFC_1000
Max: 92.6 g at 2.9 ms
Min: -0.4 g at 7.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 78.5 g at 2.9 ms
Min: -0.1 g at -0.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 121.5 g at 2.9 ms
Min: 0.1 g at -0.8 ms

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

03.21.2016 13:32:11 232

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/21/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.616 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.584 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.772 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.058 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.840 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.840 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-74.4 deg	Yes
Time of Peak	50 - 70 ms	60.8 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	42.0 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	111.5 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

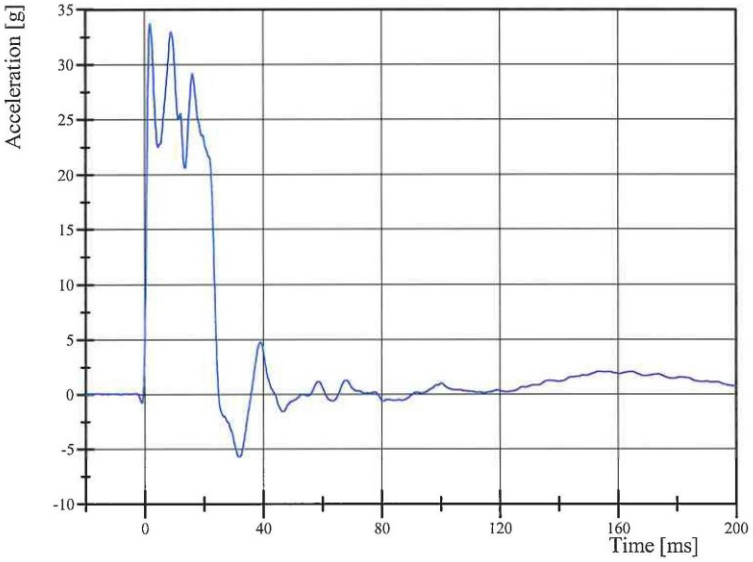
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.21.2016 10:15:45 637

Transportation Research Center Inc.

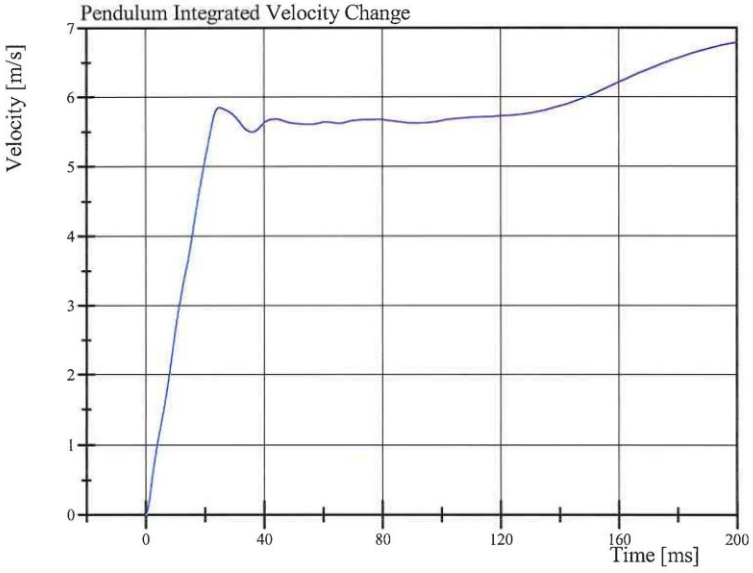
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/21/2016

Pendulum Acceleration



Filter Class: CFC_180
Max: 33.6 g at 2.0 ms
Min: -5.8 g at 31.8 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

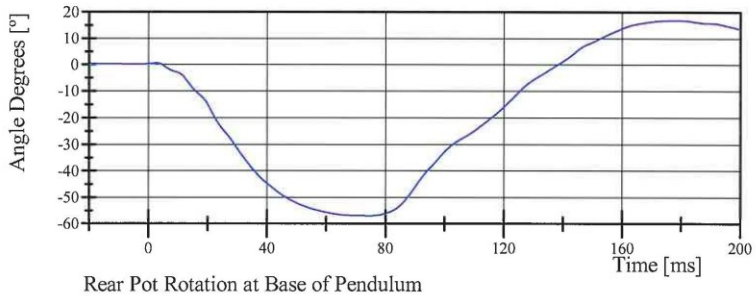
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.21.2016 10:15:53 637

Transportation Research Center Inc.

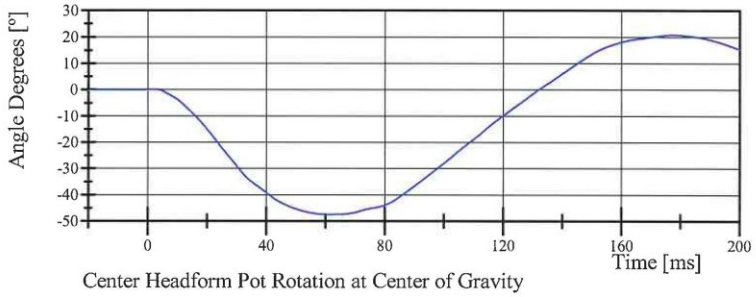
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/21/2016

Forward Pot Rotation at Base of Pendulum



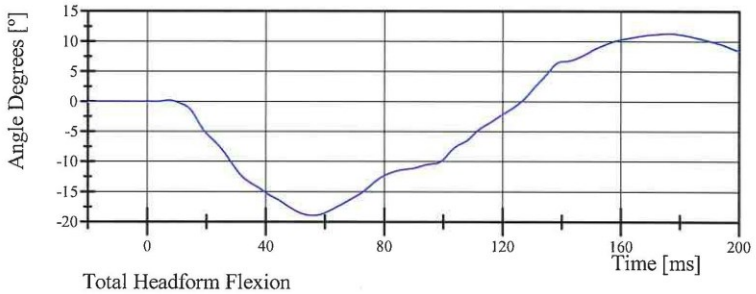
Filter Class: CFC_60
Max: 16.8 ° at 178.6 ms
Min: -57.2 ° at 74.5 ms

Rear Pot Rotation at Base of Pendulum



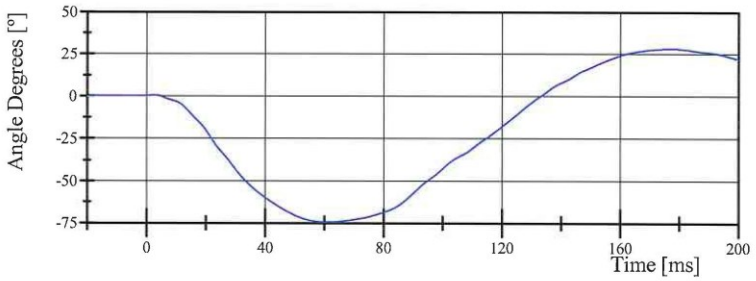
Filter Class: CFC_60
Max: 20.7 ° at 177.5 ms
Min: -47.6 ° at 61.7 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 11.3 ° at 176.6 ms
Min: -19.0 ° at 55.9 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 28.2 ° at 177.3 ms
Min: -74.4 ° at 60.8 ms

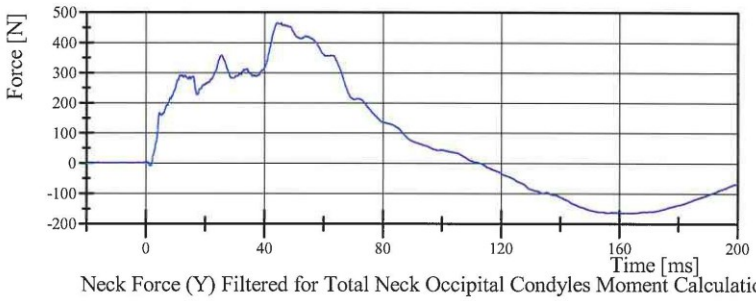
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.21.2016 10:15:53 637

Transportation Research Center Inc.

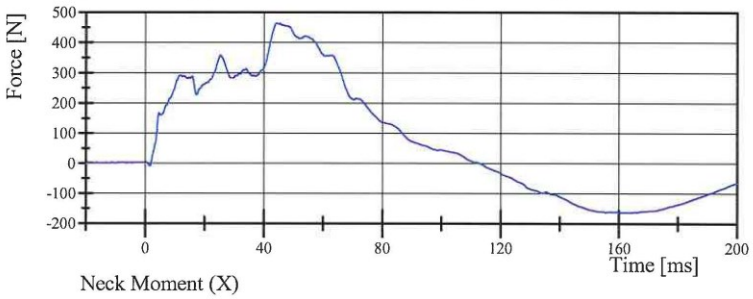
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/21/2016

Neck Force (Y)



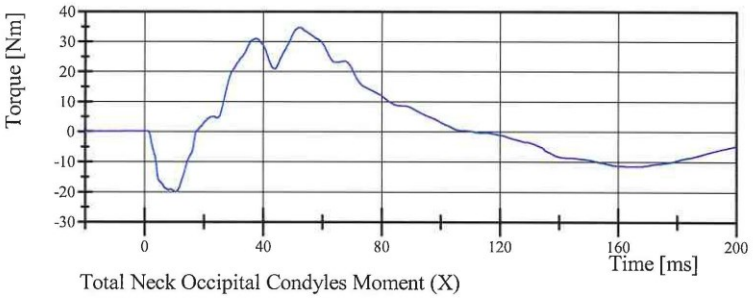
Filter Class: CFC_1000
Max: 463.9 N at 45.8 ms
Min: -164.3 N at 161.1 ms

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



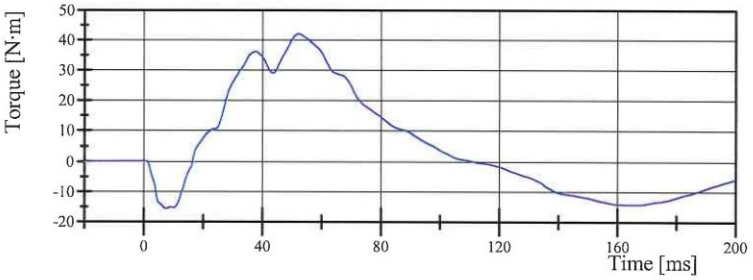
Filter Class: CFC_600
Max: 463.2 N at 44.4 ms
Min: -164.0 N at 164.1 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.7 Nm at 52.2 ms
Min: -20.2 Nm at 10.6 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 42.0 N·m at 52.2 ms
Min: -15.7 N·m at 8.1 ms

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

03.21.2016 10:15:54 637

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.7 g	Yes
Shoulder Displacement	28 - 37 mm	28.6 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	21.4 g	Yes

Test meets specifications.

Comments:

Technician

Approved

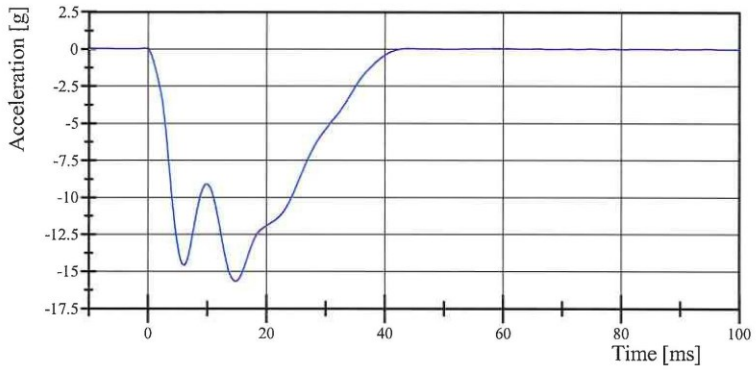
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.25.2016 09:34:36 851

Transportation Research Center Inc.

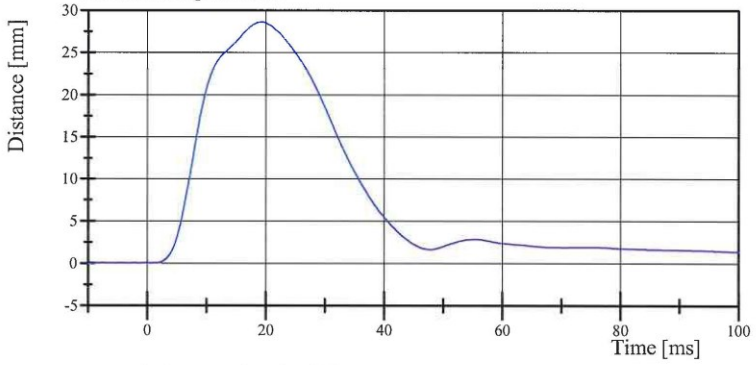
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Probe Acceleration



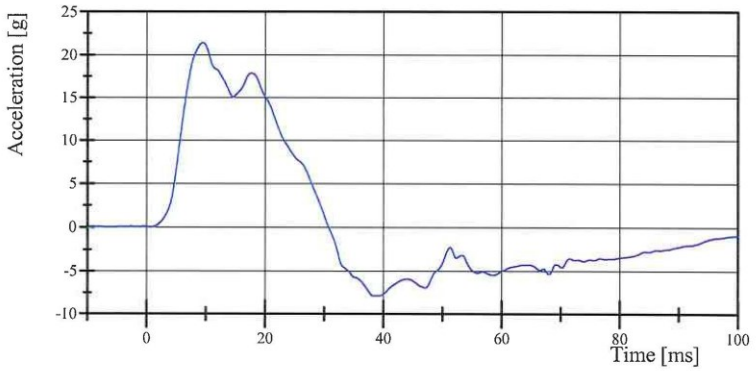
Filter Class: CFC_180
Max: 0.0 g at 58.9 ms
Min: -15.7 g at 14.9 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 28.6 mm at 19.3 ms
Min: -0.0 mm at -6.7 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 21.4 g at 9.5 ms
Min: -7.9 g at 38.6 ms

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

03.25.2016 09:35:00 851

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 40-2
Test Date: 3/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.747 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.0 g	Yes
Shoulder Displacement	31 - 40 mm	35.1 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.0 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	30.0 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	32.4 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	40.5 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	35.1 g	Yes

Test meets specifications.

Comments:

Technician

Approved

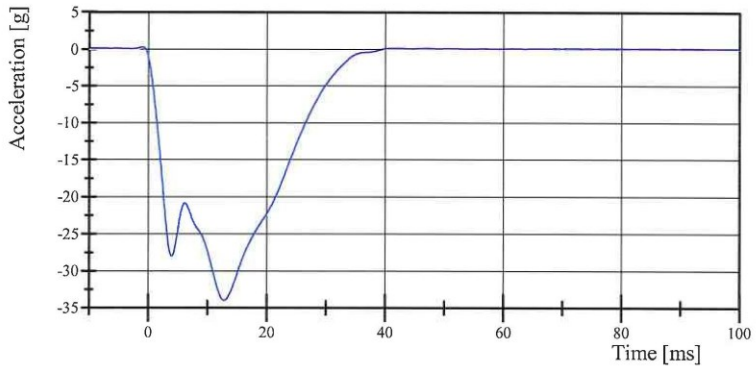
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.25.2016 09:37:58 621

Transportation Research Center Inc.

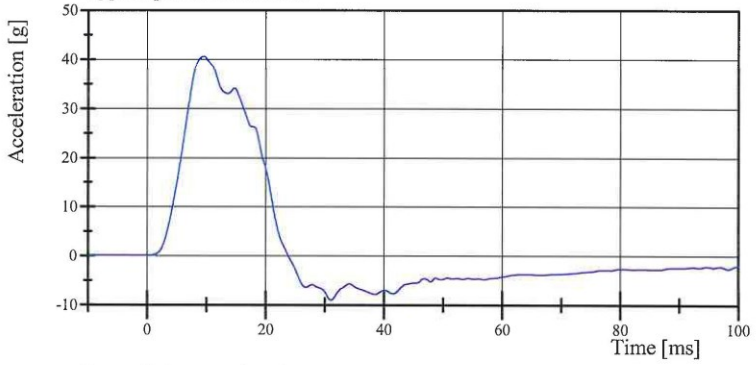
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 40-2
Test Date: 3/24/2016

Probe Acceleration



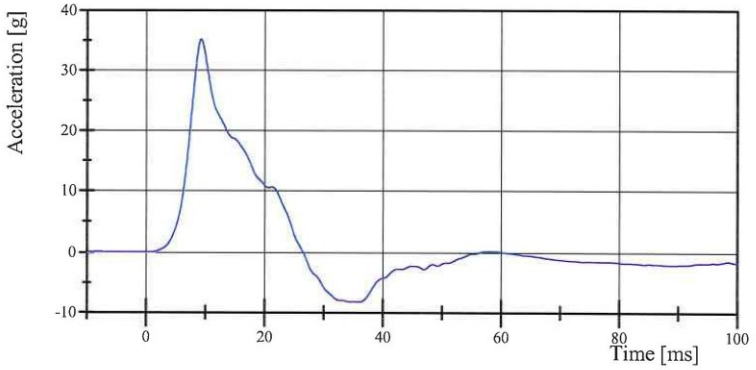
Filter Class: CFC_180
Max: 0.2 g at -0.9 ms
Min: -34.0 g at 12.9 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 40.5 g at 9.6 ms
Min: -9.1 g at 31.1 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 35.1 g at 9.3 ms
Min: -8.3 g at 36.0 ms

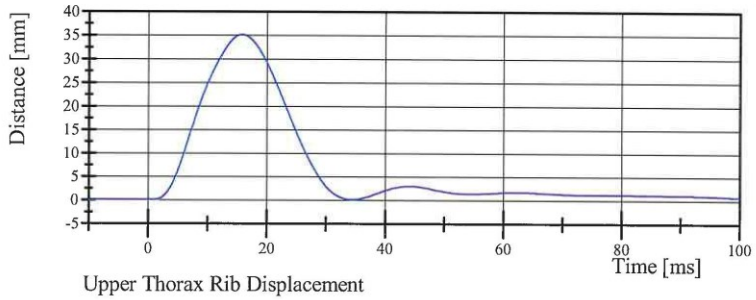
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.25.2016 09:38:13 621

Transportation Research Center Inc.

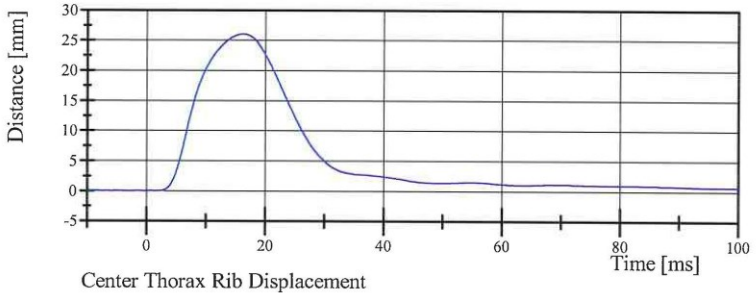
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 40-2
Test Date: 3/24/2016

Shoulder Rib Displacement



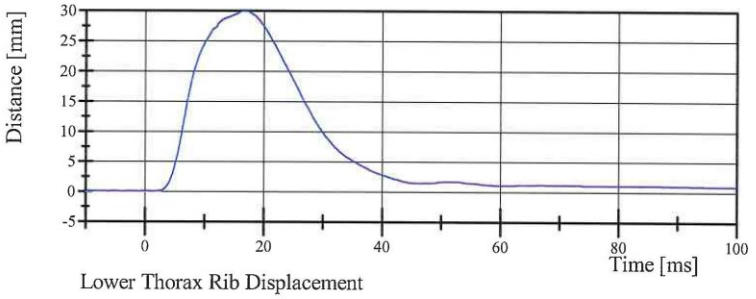
Filter Class: CFC_600
Max: 35.1 mm at 15.8 ms
Min: -0.0 mm at 1.0 ms

Upper Thorax Rib Displacement



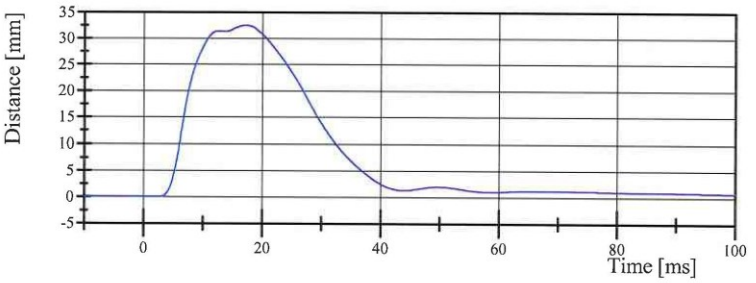
Filter Class: CFC_600
Max: 26.0 mm at 16.2 ms
Min: -0.0 mm at -0.2 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 30.0 mm at 16.8 ms
Min: -0.0 mm at -4.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.4 mm at 17.2 ms
Min: -0.0 mm at -6.4 ms

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

03.25.2016 09:38:15 621

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.339 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.6 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	39.9 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.3 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.4 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.6 g	Yes

Test meets specifications.

Comments:

Technician

Approved

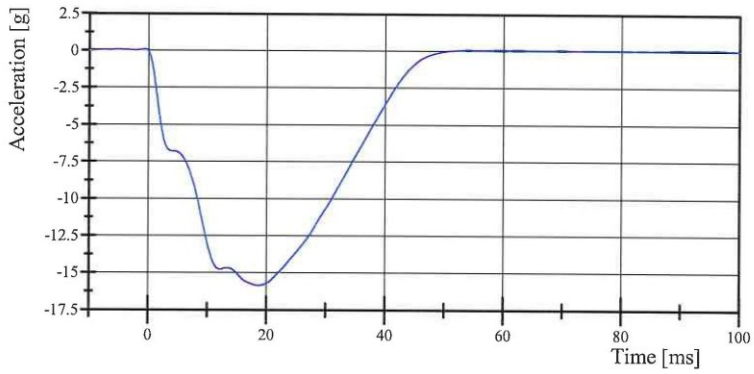
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.25.2016 09:56:51 857

Transportation Research Center Inc.

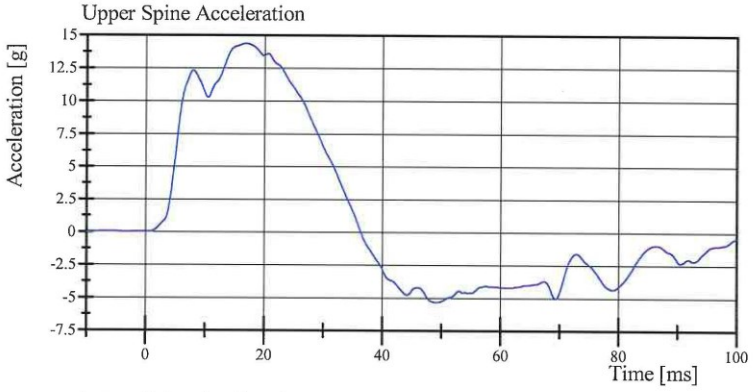
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Probe Acceleration



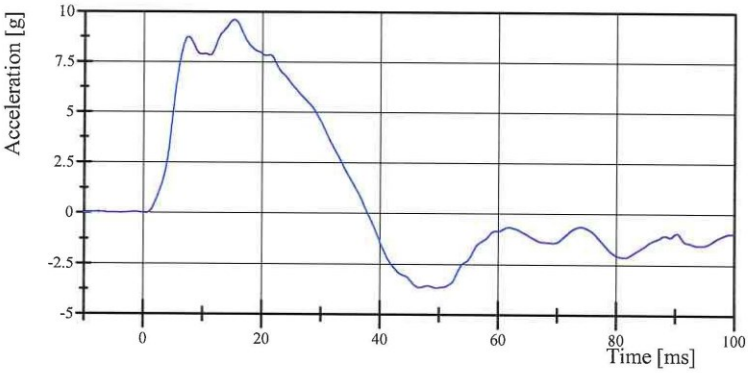
Filter Class: CFC_180
Max: 0.1 g at 89.8 ms
Min: -15.9 g at 18.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.4 g at 16.8 ms
Min: -5.4 g at 49.3 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.6 g at 15.3 ms
Min: -3.7 g at 49.6 ms

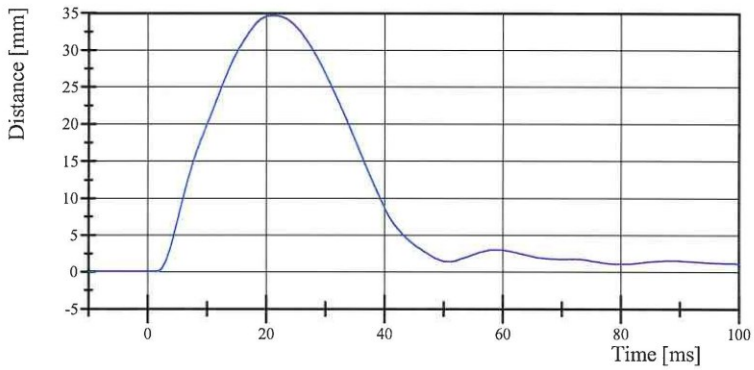
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.25.2016 09:56:59 857

Transportation Research Center Inc.

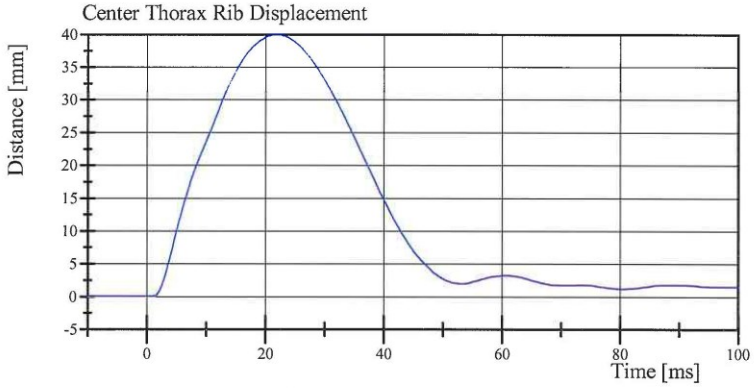
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Upper Thorax Rib Displacement



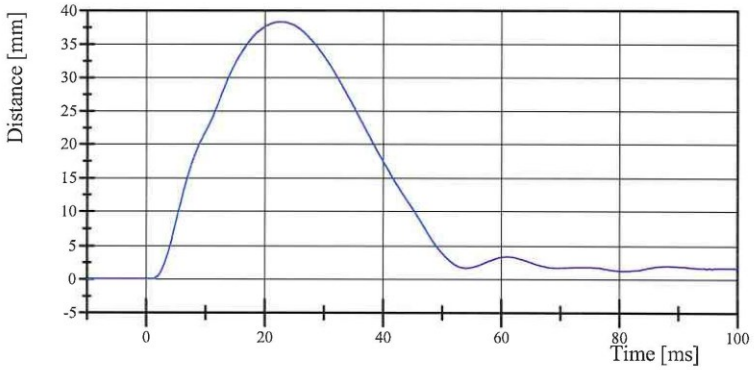
Filter Class: CFC_600
Max: 34.6 mm at 21.2 ms
Min: -0.0 mm at -8.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.9 mm at 22.0 ms
Min: -0.0 mm at 1.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 38.3 mm at 22.7 ms
Min: -0.0 mm at -4.2 ms

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

03.25.2016 09:57:00 857

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.6 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	44.8 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	39.1 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.39 g	Yes

Test meets specifications.

Comments:

Technician

Approved

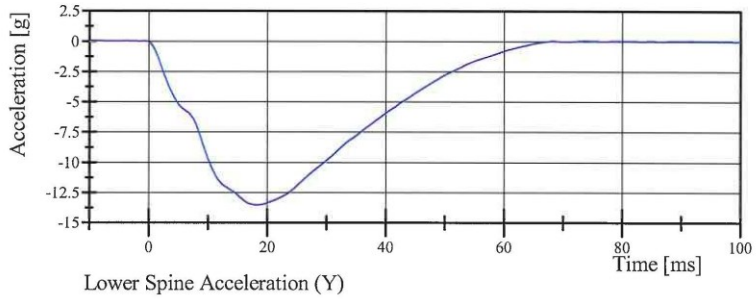
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.25.2016 09:46:14 688

Transportation Research Center Inc.

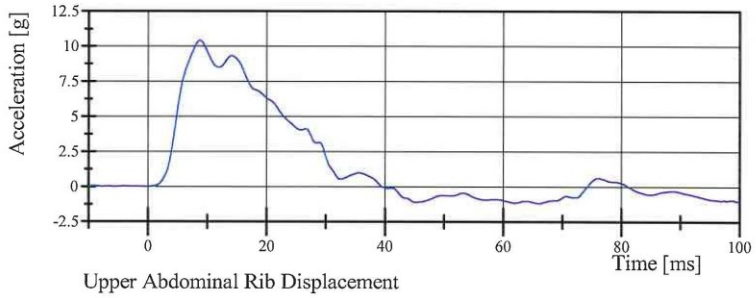
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Probe Acceleration



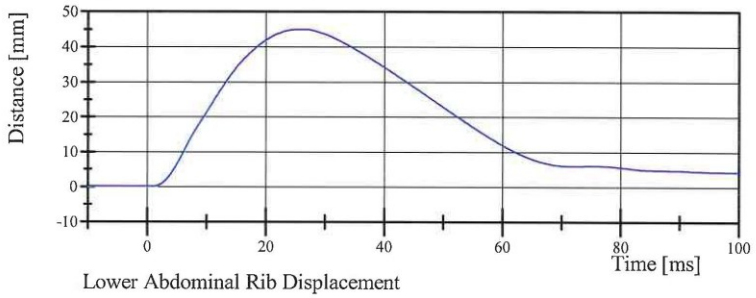
Filter Class: CFC_180
Max: 0.1 g at 73.8 ms
Min: -13.6 g at 18.3 ms

Lower Spine Acceleration (Y)



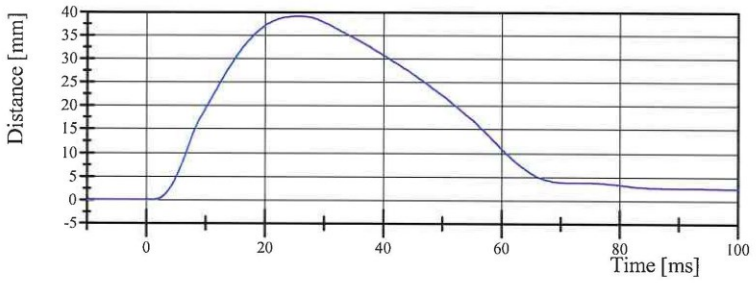
Filter Class: CFC_180
Max: 10.4 g at 8.8 ms
Min: -1.2 g at 66.1 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 44.8 mm at 26.0 ms
Min: -0.0 mm at -2.2 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 39.1 mm at 25.9 ms
Min: -0.0 mm at 0.2 ms

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

03.25.2016 09:46:22 688

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.63 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-43.65 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.7 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,247.9 N	Yes

Test meets specifications.

Comments:

Technician

Approved

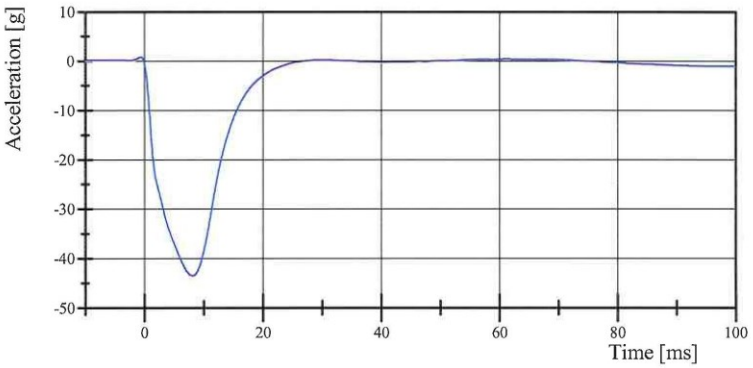
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.24.2016 15:17:07 452

Transportation Research Center Inc.

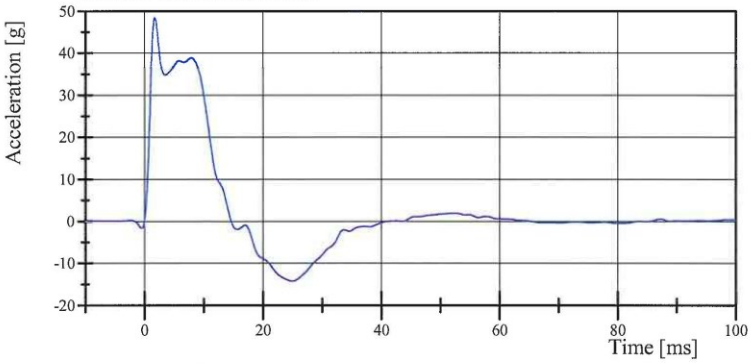
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 40-1
Test Date: 3/24/2016

Probe Acceleration



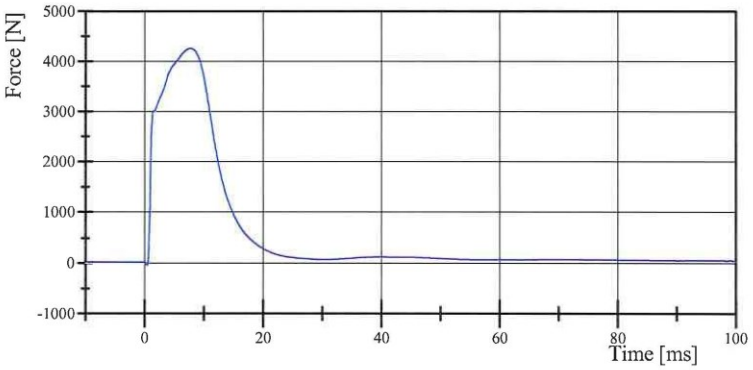
Filter Class: CFC_180
Max: 0.6 g at -0.6 ms
Min: -43.7 g at 8.2 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 48.4 g at 1.8 ms
Min: -14.3 g at 25.0 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,247.9 N at 7.8 ms
Min: -57.0 N at 0.5 ms

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

03.24.2016 15:17:28 452

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 40-2
Test Date: 3/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.0 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	31.9 g	Yes
Iliac Force	4,100 - 5,100 N	4,941.3 N	Yes

Test meets specifications.

Comments:

Technician

Approved

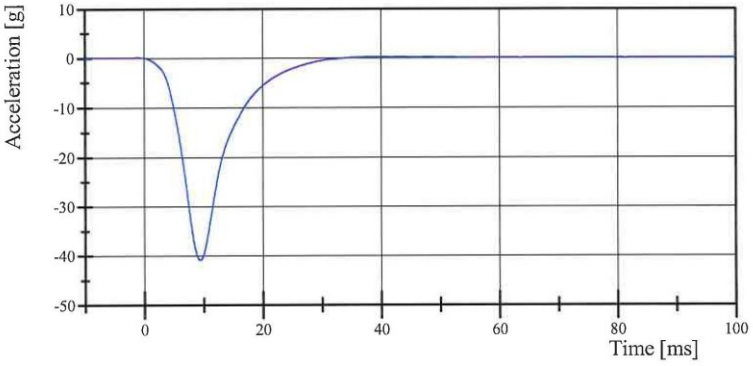
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

03.24.2016 12:28:26 701

Transportation Research Center Inc.

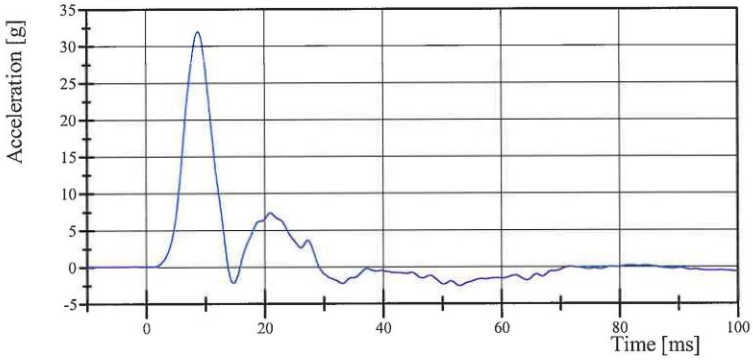
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 40-2
Test Date: 3/24/2016

Probe Acceleration



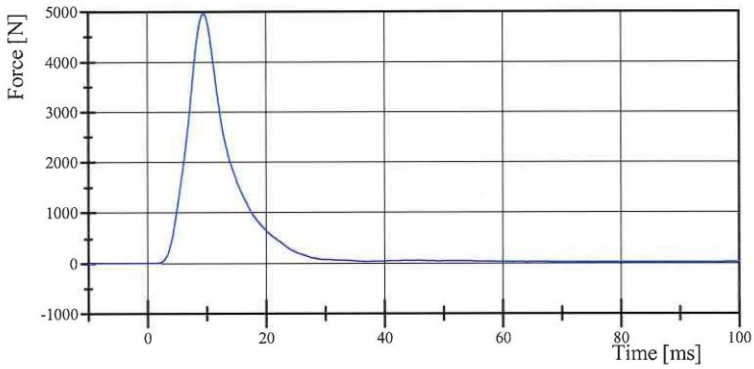
Filter Class: CFC_180
Max: 0.2 g at 38.0 ms
Min: -41.0 g at 9.4 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 31.9 g at 8.9 ms
Min: -2.6 g at 53.0 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,941.3 N at 9.6 ms
Min: -0.7 N at -6.9 ms

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

03.24.2016 12:28:38 701

Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.41

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	783	Yes
B	Shoulder Pivot Height	437.0 - 453.0	446	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	130	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	525	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	120.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.1 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

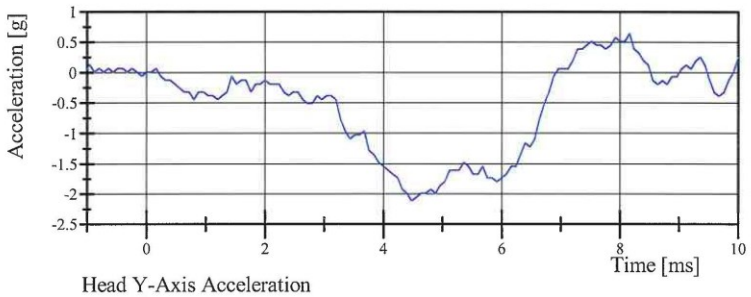
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 09:35:07 230

Transportation Research Center Inc.

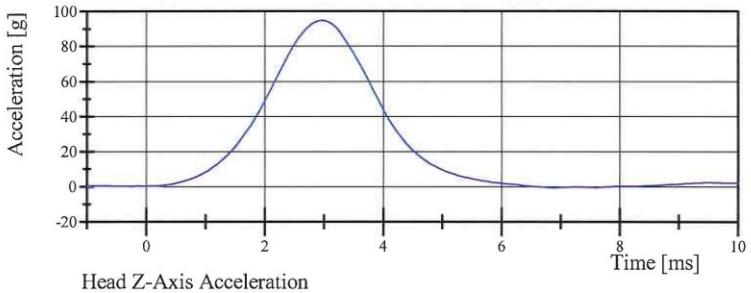
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Head X-Axis Acceleration



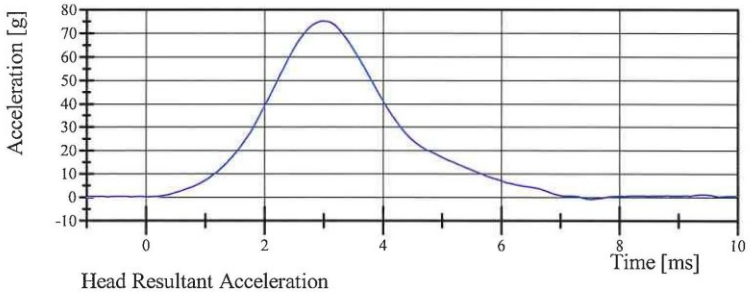
Filter Class: CFC_1000
Max: 0.6 g at 8.2 ms
Min: -2.1 g at 4.5 ms

Head Y-Axis Acceleration



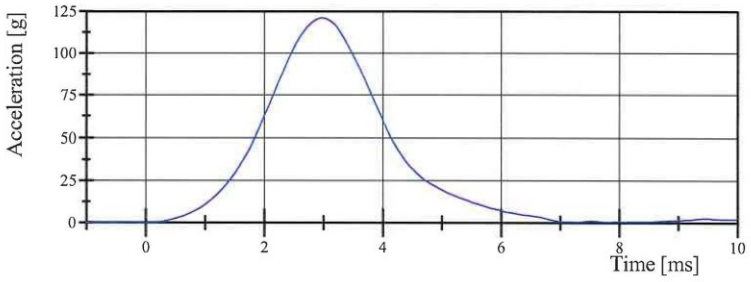
Filter Class: CFC_1000
Max: 94.6 g at 3.0 ms
Min: -0.6 g at 6.9 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 75.1 g at 3.0 ms
Min: -0.9 g at 7.5 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 120.8 g at 3.0 ms
Min: 0.0 g at -0.6 ms

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

04.15.2016 09:35:14 230

Transportation Research Center Inc.

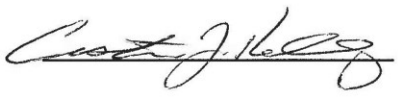
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 41-2
Test Date: 4/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.615 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.688 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.925 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.227 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.826 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.828 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-76.3 deg	Yes
Time of Peak	50 - 70 ms	60.4 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	42.5 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	110.8 ms	Yes

Test meets specifications.

Comments:

Technician



Approved

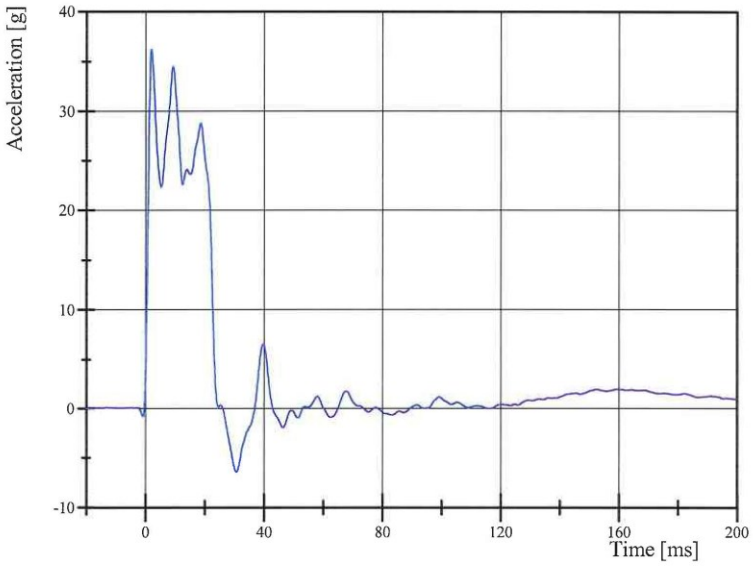
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 11:43:32 749

Transportation Research Center Inc.

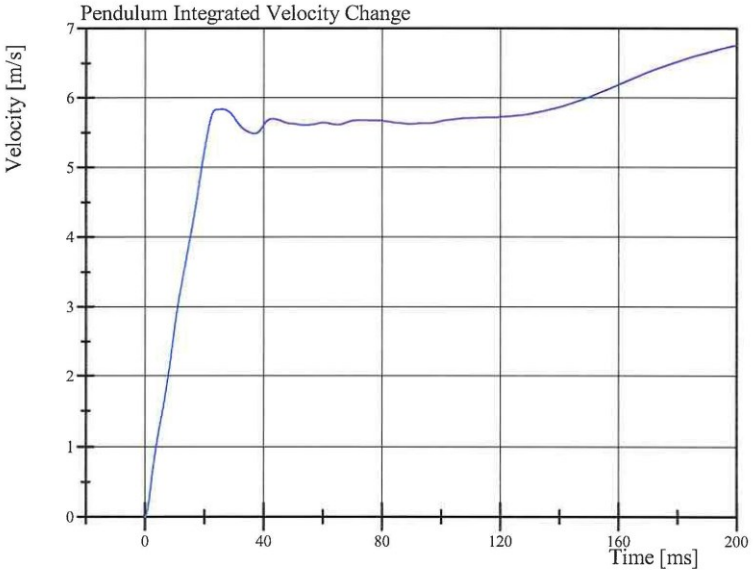
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 41-2
Test Date: 4/15/2016

Pendulum Acceleration



Filter Class: CFC_180
Max: 36.1 g at 2.0 ms
Min: -6.4 g at 30.7 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

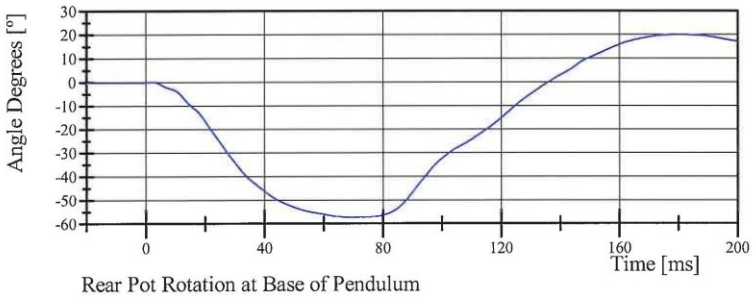
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 11:43:40 749

Transportation Research Center Inc.

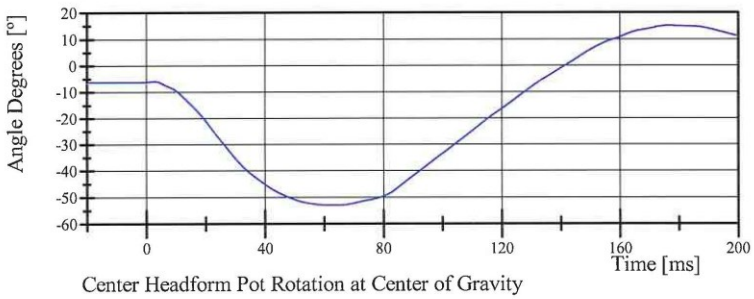
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 41-2
Test Date: 4/15/2016

Forward Pot Rotation at Base of Pendulum



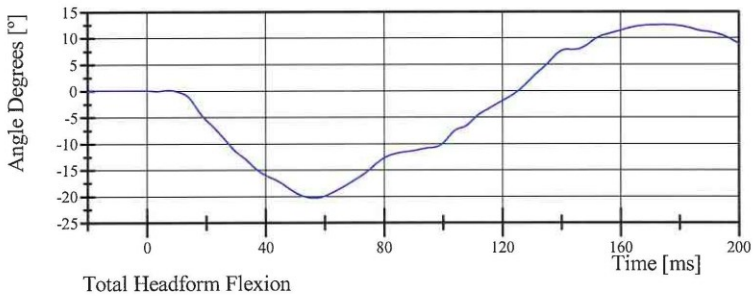
Filter Class: CFC_60
Max: 20.1 ° at 180.1 ms
Min: -57.5 ° at 70.2 ms

Rear Pot Rotation at Base of Pendulum



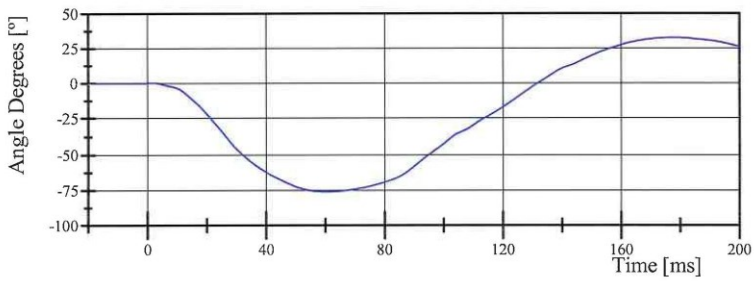
Filter Class: CFC_60
Max: 15.0 ° at 176.3 ms
Min: -53.1 ° at 63.0 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.5 ° at 174.7 ms
Min: -20.4 ° at 56.5 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 32.5 ° at 177.8 ms
Min: -76.3 ° at 60.4 ms

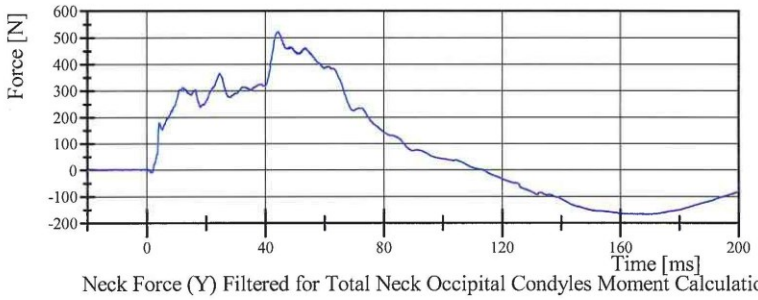
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 11:43:40 749

Transportation Research Center Inc.

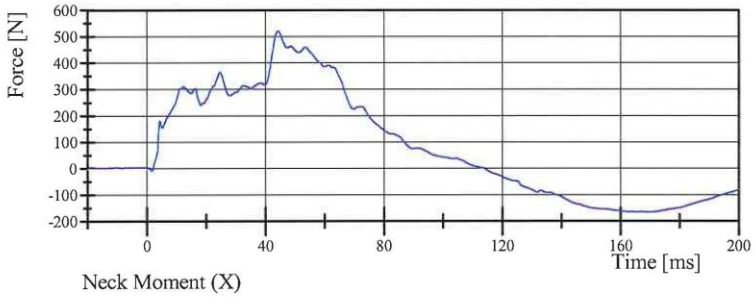
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 41-2
Test Date: 4/15/2016

Neck Force (Y)



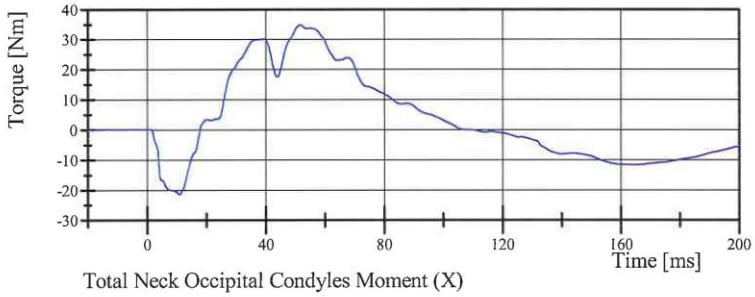
Filter Class: CFC_1000
Max: 520.5 N at 44.3 ms
Min: -167.5 N at 169.4 ms

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



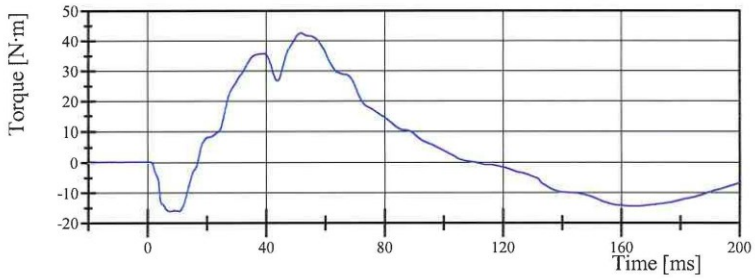
Filter Class: CFC_600
Max: 519.8 N at 44.3 ms
Min: -166.8 N at 169.5 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.7 Nm at 51.7 ms
Min: -21.5 Nm at 10.9 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constai
Max: 42.5 N·m at 51.8 ms
Min: -16.4 N·m at 10.6 ms

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

04.15.2016 11:43:41 749

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.0 g	Yes
Shoulder Displacement	28 - 37 mm	30.2 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	22.0 g	Yes

Test meets specifications.

Comments:

Technician

Approved

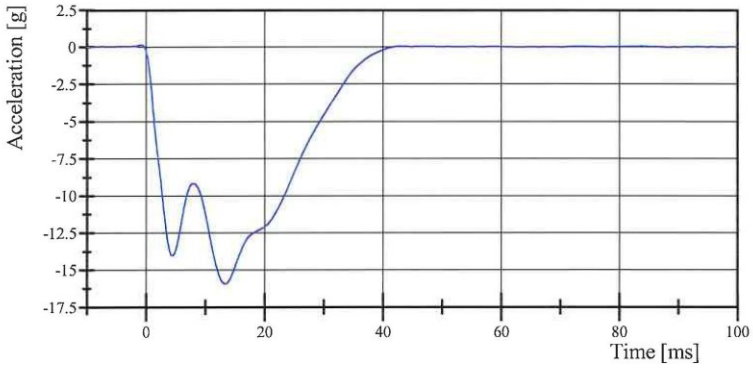
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 15:19:03 863

Transportation Research Center Inc.

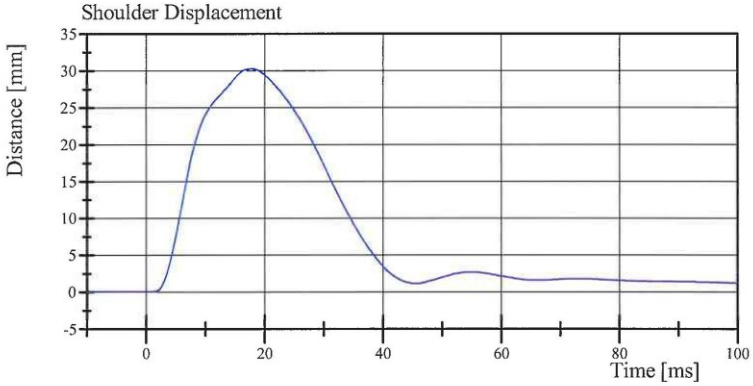
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Probe Acceleration



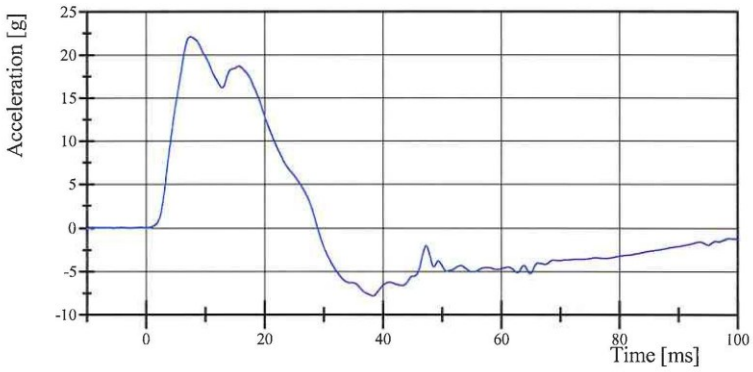
Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -16.0 g at 13.4 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 30.2 mm at 17.8 ms
Min: -0.0 mm at -9.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 22.0 g at 7.4 ms
Min: -7.8 g at 38.3 ms

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

04.15.2016 15:19:10 863

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 41-4
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.781 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.1 g	Yes
Shoulder Displacement	31 - 40 mm	34.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.5 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.1 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.0 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.9 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.5 g	Yes

Test meets specifications.

Comments:

Technician

Approved

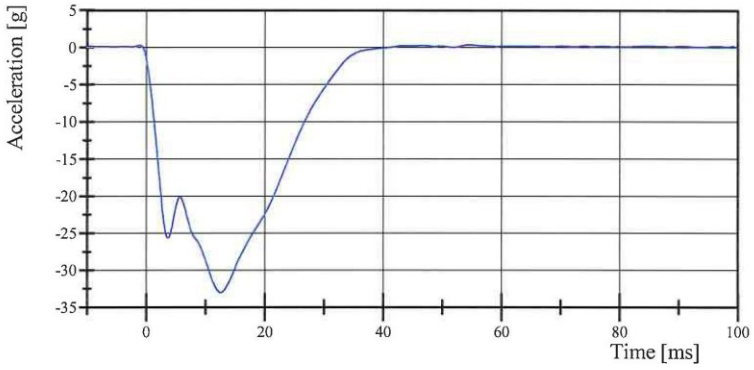
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.18.2016 12:54:27 598

Transportation Research Center Inc.

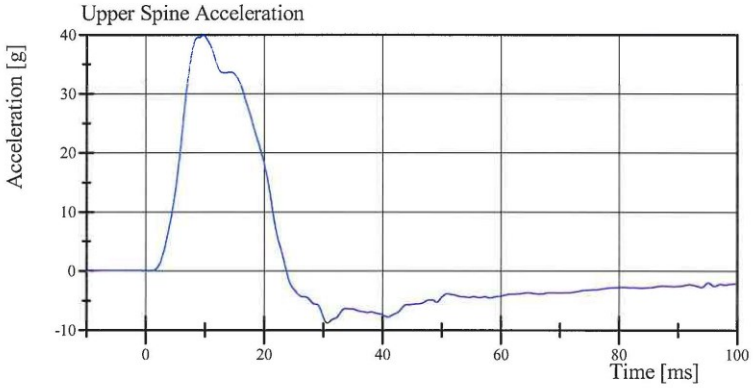
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 41-4
Test Date: 4/18/2016

Probe Acceleration



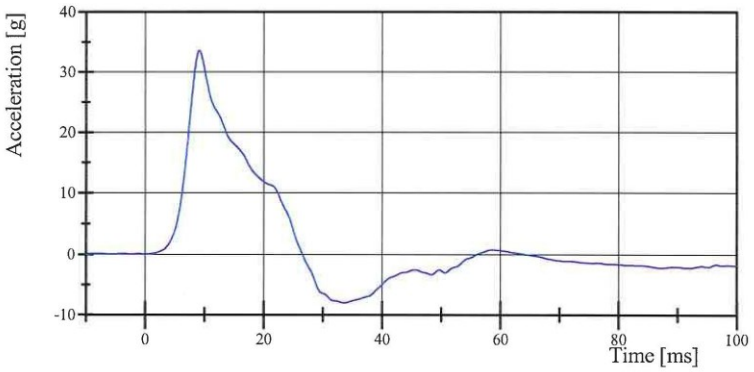
Filter Class: CFC_180
Max: 0.3 g at 54.5 ms
Min: -33.1 g at 12.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 39.9 g at 9.7 ms
Min: -8.9 g at 30.6 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 33.5 g at 9.1 ms
Min: -8.1 g at 33.6 ms

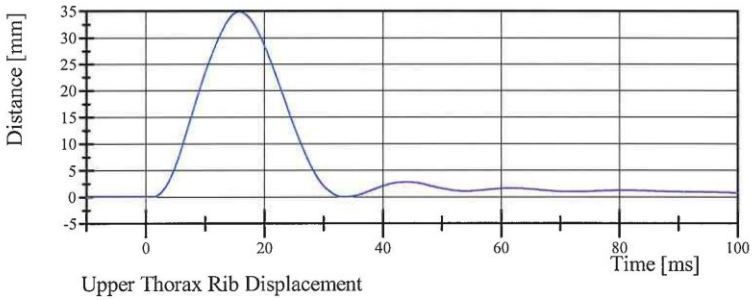
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.18.2016 12:54:37 598

Transportation Research Center Inc.

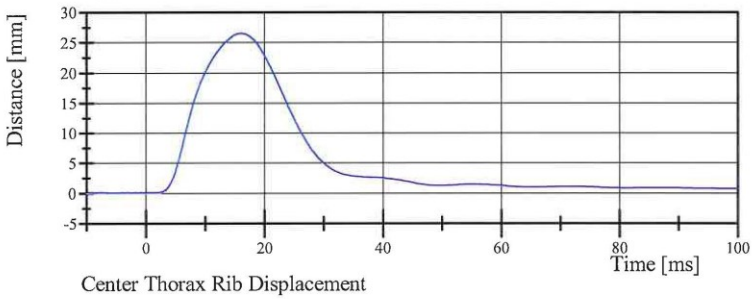
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 41-4
Test Date: 4/18/2016

Shoulder Rib Displacement



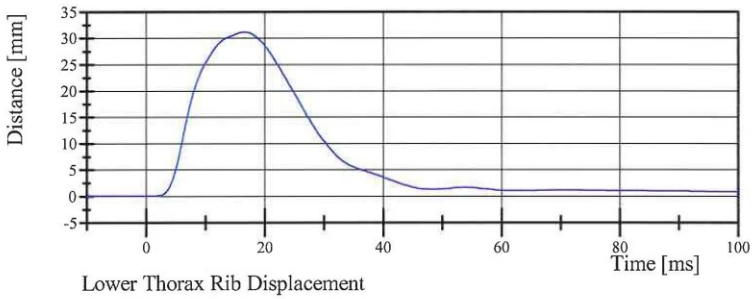
Filter Class: CFC_600
Max: 34.7 mm at 15.8 ms
Min: -0.0 mm at 33.5 ms

Upper Thorax Rib Displacement



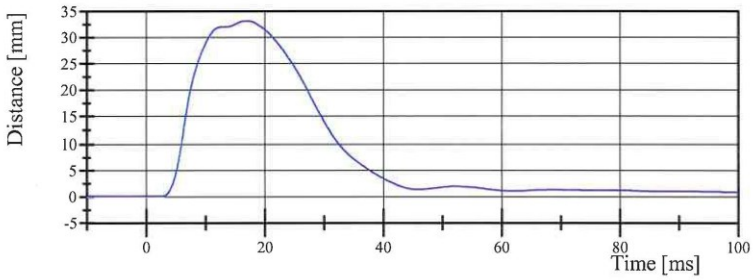
Filter Class: CFC_600
Max: 26.5 mm at 16.0 ms
Min: -0.0 mm at -2.4 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.1 mm at 16.6 ms
Min: -0.0 mm at -6.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.0 mm at 16.8 ms
Min: -0.0 mm at -0.2 ms

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

04.18.2016 12:54:38 598

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.347 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	37.0 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.0 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	36.7 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.6 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.5 g	Yes

Test meets specifications.

Comments:

Technician

Approved

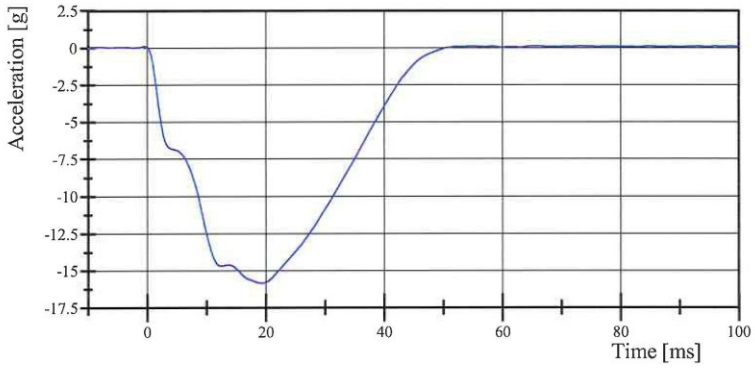
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.18.2016 10:26:30 856

Transportation Research Center Inc.

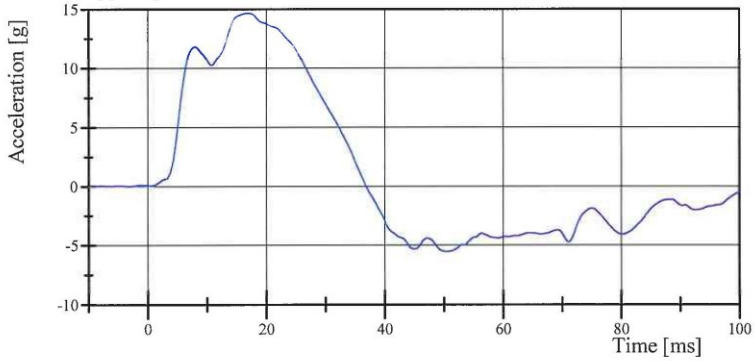
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/18/2016

Probe Acceleration



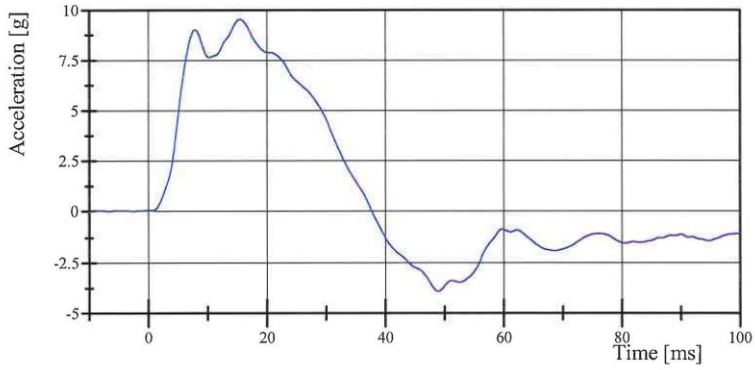
Filter Class: CFC_180
Max: 0.1 g at 65.8 ms
Min: -15.9 g at 19.3 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.6 g at 16.9 ms
Min: -5.5 g at 50.4 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.5 g at 15.4 ms
Min: -3.9 g at 48.9 ms

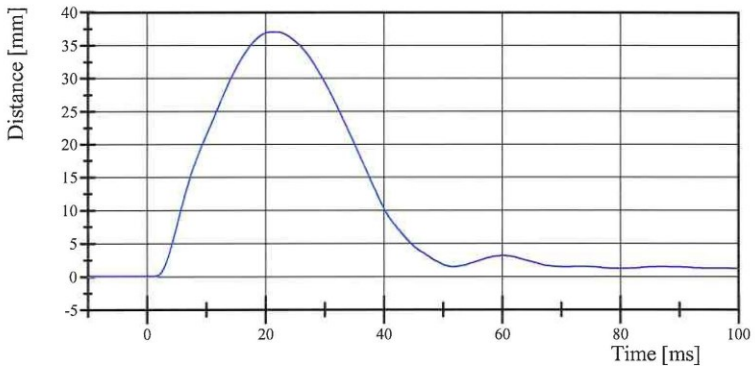
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.18.2016 10:26:57 856

Transportation Research Center Inc.

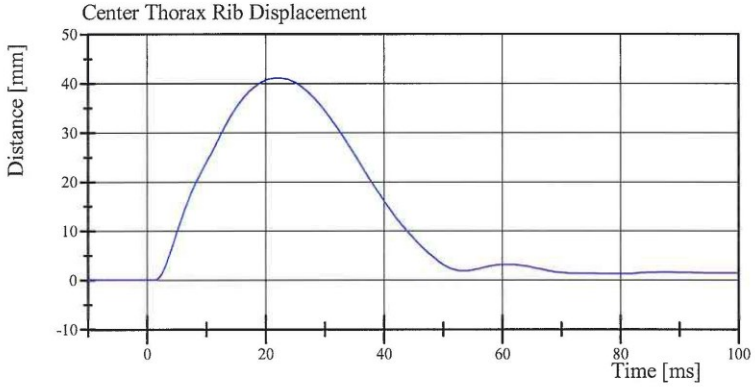
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/18/2016

Upper Thorax Rib Displacement



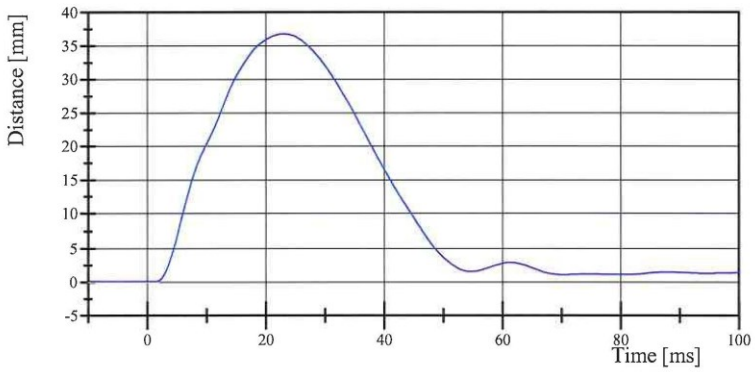
Filter Class: CFC_600
Max: 37.0 mm at 21.4 ms
Min: -0.0 mm at -2.9 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.0 mm at 22.1 ms
Min: -0.0 mm at -3.1 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 36.7 mm at 22.9 ms
Min: -0.0 mm at -9.5 ms

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

04.18.2016 10:26:58 856

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.4 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.7 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	42.2 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.10 g	Yes

Test meets specifications.

Comments:

Technician

Approved

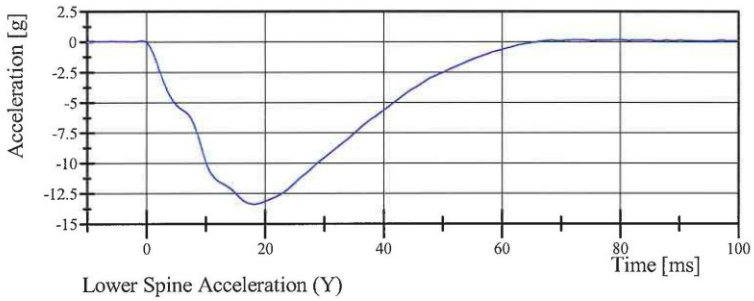
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 15:32:24 670

Transportation Research Center Inc.

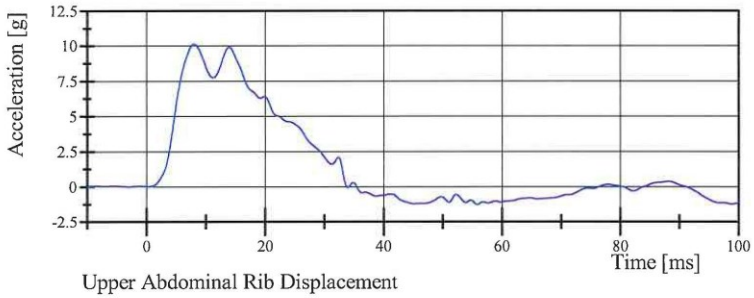
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Probe Acceleration



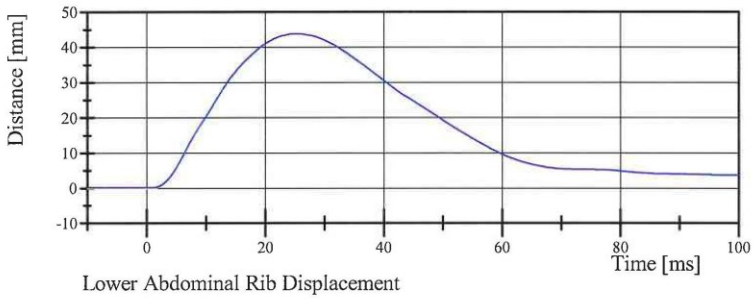
Filter Class: CFC_180
Max: 0.2 g at 72.9 ms
Min: -13.4 g at 18.1 ms

Lower Spine Acceleration (Y)



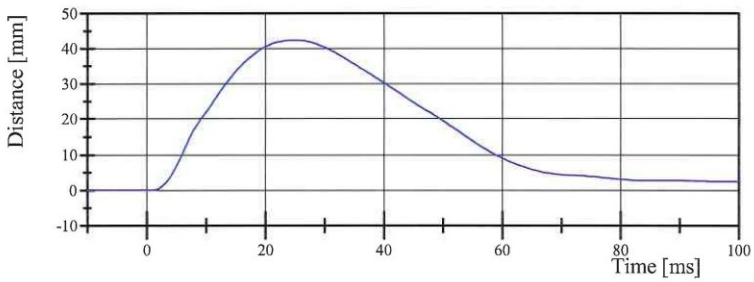
Filter Class: CFC_180
Max: 10.1 g at 8.0 ms
Min: -1.3 g at 55.8 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 43.7 mm at 25.0 ms
Min: -0.0 mm at -6.8 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 42.2 mm at 24.9 ms
Min: -0.0 mm at -2.9 ms

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

04.15.2016 15:32:31 670

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.63 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-42.64 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.4 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,101.5 N	Yes

Test meets specifications.

Comments:

Technician

Approved

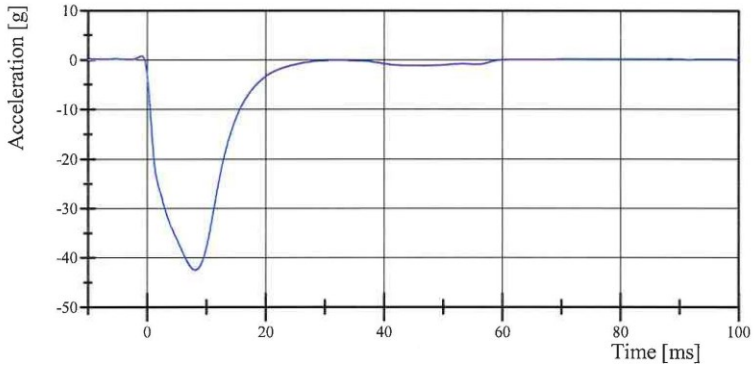
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 14:53:26 456

Transportation Research Center Inc.

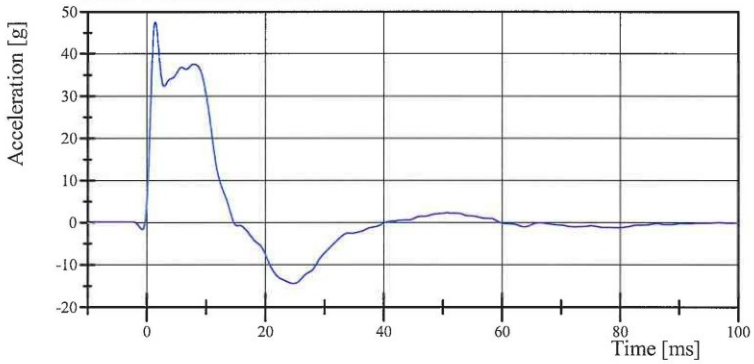
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Probe Acceleration



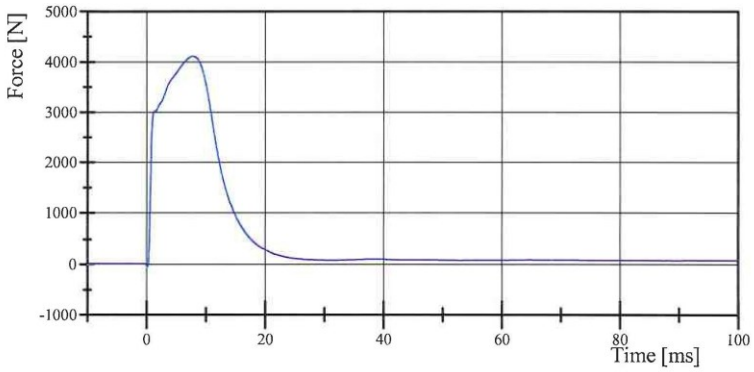
Filter Class: CFC_180
Max: 0.6 g at -1.0 ms
Min: -42.6 g at 8.1 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 47.6 g at 1.4 ms
Min: -14.5 g at 24.7 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,101.5 N at 7.8 ms
Min: -61.3 N at 0.2 ms

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

04.15.2016 14:53:37 456

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.8 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	31.1 g	Yes
Iliac Force	4,100 - 5,100 N	4,605.1 N	Yes

Test meets specifications.

Comments:

Technician

Approved

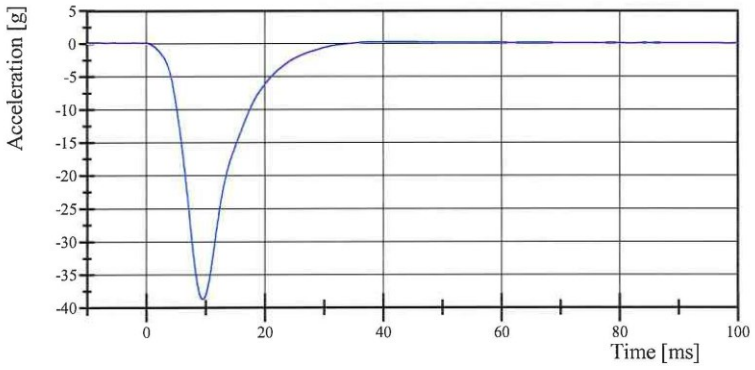
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

04.15.2016 08:43:38 691

Transportation Research Center Inc.

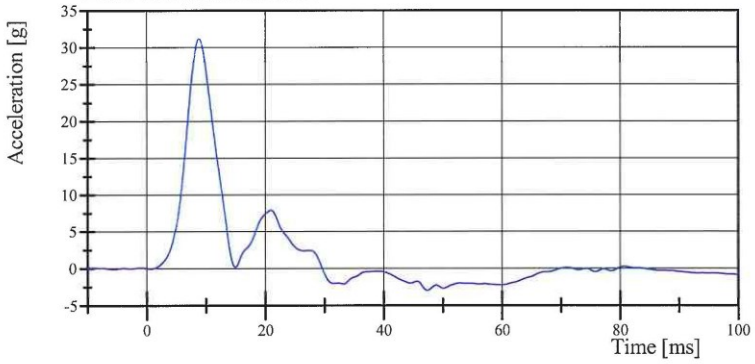
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 41-1
Test Date: 4/15/2016

Probe Acceleration



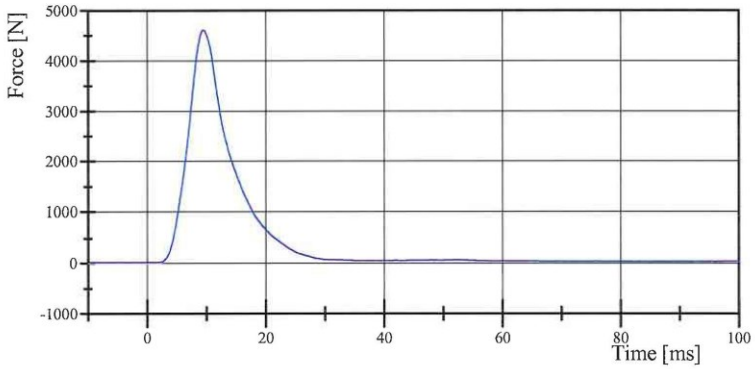
Filter Class: CFC_180
Max: 0.2 g at 41.3 ms
Min: -38.8 g at 9.5 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 31.1 g at 8.8 ms
Min: -3.0 g at 47.4 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,605.1 N at 9.4 ms
Min: -0.5 N at -2.6 ms

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

04.15.2016 08:43:45 691

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F030		
			Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers		X	P58890	Endevco	18-Mar-16
		Y	P51702	Endevco	18-Mar-16
		Z	P52083	Endevco	18-Mar-16
Redundant Head Accelerometers		X	P49190	Endevco	18-Mar-16
		Y	P52044	Endevco	18-Mar-16
		Z	P51717	Endevco	18-Mar-16
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	18-Mar-16
	Middle	Y	174	FTSS	18-Mar-16
	Lower	Y	173	FTSS	18-Mar-16
Abdomen Load Cells	Front	Y	1441	Denton	18-Mar-16
	Middle	Y	1436	Denton	18-Mar-16
	Rear	Y	1437	Denton	18-Mar-16
Lower Spine Accelerometers (T12)		X	P90854	Endevco	18-Mar-16
		Y	P90297	Endevco	18-Mar-16
		Z	P88531	Endevco	18-Mar-16
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	18-Mar-16

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers			X	P51719	Endevco	22-Mar-16
			Y	P51272	Endevco	22-Mar-16
			Z	P58862	Endevco	22-Mar-16
Redundant Head Accelerometers			X	P80926	Endevco	22-Mar-16
			Y	P50073	Endevco	22-Mar-16
			Z	P52098	Endevco	22-Mar-16
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	22-Mar-16
		Middle	Y	1161	Servo	22-Mar-16
		Lower	Y	037	Servo	22-Mar-16
	Abdominal Rib	Upper	Y	1295	Servo	22-Mar-16
		Lower	Y	1136	Servo	22-Mar-16
Lower Spine Accelerometers (T12)			X	P50068	Endevco	22-Mar-16
			Y	P52051	Endevco	22-Mar-16
			Z	P51710	Endevco	22-Mar-16
Acetabulum Load Cell			Y	D14283-FY	FTSS	1-Oct-15
Iliac Wing Load Cell			Y	287-FY	Denton	1-Oct-15
Pelvis Plug (struck side)				71102	Humanetics	18-Dec-13
Pelvis Plug (non-struck side)				36473	FTSS	23-Sep-10

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P91966	Endevco	30-Mar-16
	Vehicle Center of Gravity	Y	P91185	Endevco	30-Mar-16
	Vehicle Center of Gravity	Z	P91184	Endevco	30-Mar-16
2	Right Sill at Front Seat	X	P91999	Endevco	29-Feb-16
	Right Sill at Front Seat	Y	P79651	Endevco	25-Mar-16
	Right Sill at Front Seat	Z	P91870	Endevco	29-Feb-16
3	Right Sill at Rear Seat	X	P88568	Endevco	14-Jan-16
	Right Sill at Rear Seat	Y	P87156	Endevco	29-Jan-16
	Right Sill at Rear Seat	Z	P45591	Endevco	14-Jan-16
4	Left Sill at Front Door	Y	P91111	Endevco	14-Mar-16
5	Left Sill at Rear Door	Y	P22733	Endevco	12-Apr-16
6	Left A-Post Lower	Y	P76405	Endevco	17-Dec-15
7	Left A-Post Middle	Y	P54286	Endevco	30-Mar-16
8	Left B-Post Lower	Y	P91186	Endevco	29-Feb-16
9	B-Post Middle	Y	P81616	Endevco	1-Feb-16
10	Front Seat Track	Y	P41252	Endevco	6-Apr-16
11	Rear Seat Track or Structure	Y	P88004	Endevco	14-Jan-16
12	Right Rear Occupant Compartment	Y	P25061	Endevco	29-Jan-16
13	Engine Block	X	P74101	Endevco	31-Mar-16
	Engine Block	Y	P90288	Endevco	31-Mar-16
14	Rear Floorpan Above Axle	X	P61285	Endevco	25-Mar-16
	Rear Floorpan Above Axle	Y	P50463	Endevco	24-Nov-15
	Rear Floorpan Above Axle	Z	P82047	Endevco	25-Mar-16

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P87095	Endevco	2-Nov-2015
MDB Center of Gravity	Y	P88466	Endevco	6-Jan-2016
MDB Center of Gravity	Z	P49020	Endevco	6-Jan-2016
Left Frame Rail at Rear Axle Centerline	X	P61718	Endevco	1-Mar-2016
Left Frame Rail at Rear Axle Centerline	Y	P58759	Endevco	6-Jan-2016