

FINAL REPORT NUMBER: SINCAP-TRC-17-002

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

**General Motors LLC
2017 Chevrolet Camaro 2DR Coupe
NHTSA NUMBER: M20170115**

**PREPARED BY:
Transportation Research Center Inc.
10820 State Route 347
P. O. Box B-67
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Report Date: December 5, 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 Prepared By: ILO Project Operations Group

Report Approved By: *Melinda Lackey*

Melinda Lackey

Approval Date: December 5, 2016

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2017 Chevrolet Camaro 2DR Coupe, 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 October 6, 2016. The impact velocity of the Moving Deformable Barrier (MDB) was 61.46 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 21.1° C. The target vehicle post-test maximum crush was 160 mm at Level 3. The test vehicle's performance was as follows: <table border="1"> <thead> <tr> <th colspan="4">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>N/A</td><td>1000</td><td>233</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>44</td><td>25.3</td></tr> <tr> <td>Total Abdominal Force</td><td>N</td><td>2500</td><td>687.6</td></tr> <tr> <td>Pubic Symphysis Force</td><td>N</td><td>6000</td><td>-886.7</td></tr> <tr> <td>Lower Spine Acceleration</td><td>G</td><td>82*</td><td>32.6</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="4">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>N/A</td><td>1000</td><td>285</td></tr> <tr> <td>Lower Spine Resultant Acceleration</td><td>g's</td><td>82</td><td>45.7</td></tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td><td>N</td><td>5525</td><td>2271.7</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>38*</td><td>28.4</td></tr> <tr> <td>Maximum Abdominal Rib Deflection</td><td>mm</td><td>45*</td><td>21.9</td></tr> </tbody> </table> * Proposed IARV The door on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door did not open during the side impact event.				Driver ATD (ES-2re)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	233	Maximum Thoracic Rib Deflection	mm	44	25.3	Total Abdominal Force	N	2500	687.6	Pubic Symphysis Force	N	6000	-886.7	Lower Spine Acceleration	G	82*	32.6	Passenger ATD (SID-IIs)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	285	Lower Spine Resultant Acceleration	g's	82	45.7	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2271.7	Maximum Thoracic Rib Deflection	mm	38*	28.4	Maximum Abdominal Rib Deflection	mm	45*	21.9
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SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2017 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 2017 Chevrolet Camaro 2DR Coupe. 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 2017 Chevrolet Camaro 2DR Coupe was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.46 km/h (38.19 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 October 6, 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 instrumentation 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	233
Maximum Thoracic Rib Deflection	mm	44	25.3
Combined Abdominal Force	N	2500	687.6
Pubic Symphysis Force	N	6000	-886.7
Lower Spine (T12) Resultant Acceleration	G	82*	32.6

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	285
Lower Spine (T12) Resultant Acceleration	G	82	45.7
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2271.7
Maximum Thoracic Rib Deflection	mm	38*	28.4
Maximum Abdominal Rib Deflection	mm	45*	21.9

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	Yes	No	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other	No	N/A	No	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 side curtain airbag did not fully deploy.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20170115
Model Year	2017
Make	Chevrolet
Model	Camaro
Body Style	Coupe
VIN	1G1FA1RX9H0113026
Body Color	Nightfall Gray Metallic
Odometer Reading (km/mi)	106 mi
Engine Displacement (L)	2.0T
Type/No. Cylinders	Inline/4
Engine Placement	Front/Longitudinal
Transmission Type	Manual
Transmission Speeds	6
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	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?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC
Date of Manufacture	07/16
Vehicle Type	Passenger Car

GVWR (kg)	1872
GAWR Front (kg)	868
GAWR Rear (kg)	1004

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

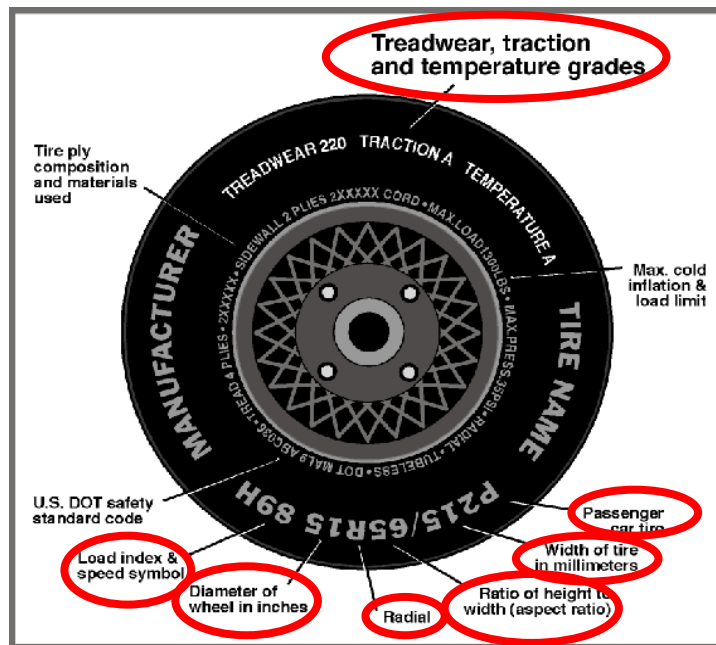
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	2	N/A	4
Capacity Weight (VCW) (kg)				328
DSC x 68.04 (kg)				272.16
Cargo Weight (RCLW) (kg)				55.84

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

GENERAL TEST AND VEHICLE PARAMETER DATA

NHTSA No.: M20170115
Test Date: 10/6/16



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	245/50R18	245/50R18
Tire Size on Vehicle	245/50R18	245/50R18
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle Sport	Eagle Sport
Treadwear	560	560
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	100V	100V
Tire Material	Polyester, Steel & Polyamide	Polyester, Steel & Polyamide
DOT Safety Code Left	M6JW JU1R 1916	M6JW JU1R 1916
DOT Safety Code Right	M6JW JU1R 1916	M6JW JU1R 1916

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

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	227	227	227	227
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	385.8	372.0		420.8	433.0		412.0	451.8	
Right	kg	394.0	356.0		415.6	413.6		397.6	425.4	
Ratio	%	51.7	48.3		49.7	50.3		48.0	52.0	
Totals	kg	779.8	728.0	1507.8	836.4	846.6	1683.0	809.6	877.2	1686.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1507.8	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	55.84	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1688.64	(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	720	715	Yes
RF	mm	726	719	Yes
RR	mm	723	723	Yes
LR	mm	713	714	Yes
Vehicle CG (Aft of Front Axle)	mm	1465	1417	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+19	+12	

***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: None	0.0
Removed: Rear tail lights, rear bumper fascia and rear bumper beam	16.2

DATA SHEET NO. 2

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

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

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	23.7	13.2	18.4
Front Passenger Seat	21.4	16.1	18.8
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	22.5
Non-Struck Side Rear Seat	Fixed	N/A	22.6
Rear Center Seat*	N/A	N/A	N/A

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	18.4	66	Max	123	128	133
			Mid	89	94	100
			Min	61	66	71
Front Passenger Seat	18.8	66	Max	N/A	N/A	N/A
			Mid	62	66	70
			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	22.5	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	22.6	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	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

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

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

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe

NHTSA No.: M20170115

Test Program: SINCAP Side Impact

Test Date: 10/6/16

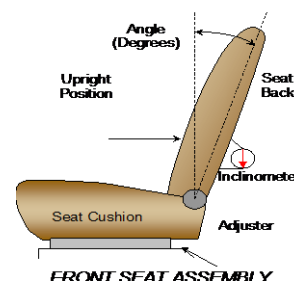
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	190	N/A	95	N/A
Front Passenger Seat	190	N/A	95	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Non-Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Rear Center Seat*	N/A	N/A	N/A	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	24.1	N/A	N/A	N/A
Front Passenger Seat	23.9	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	Fixed	N/A	Fixed	N/A
Non-Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Rear Center Seat*	N/A	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	1, Fixed	1, Fixed
Rear Seat	1, Fixed	1, Fixed

HEAD RESTRAINT ADJUSTMENT

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

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

DATA SHEET NO. 2 (CONTINUED)

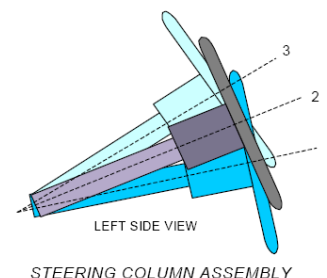
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

STEERING COLUMN ADJUSTMENT

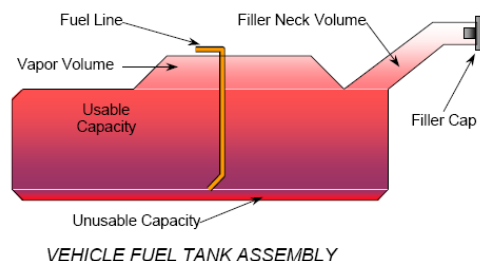
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	13.5	N/A
Geometric Center, Position No. 2	15.7	N/A
Uppermost, Position No. 3	18.0	N/A
Telescoping Steering Wheel Travel		40
Test Position	15.7	20

FUEL PUMP

The ECM supplies voltage to the fuel pump control module when the ECM detects that the ignition is ON. The voltage from the ECM to the fuel pump control module remains active for 2 seconds, unless the engine is in Crank or Run.



FUEL TANK CAPACITY

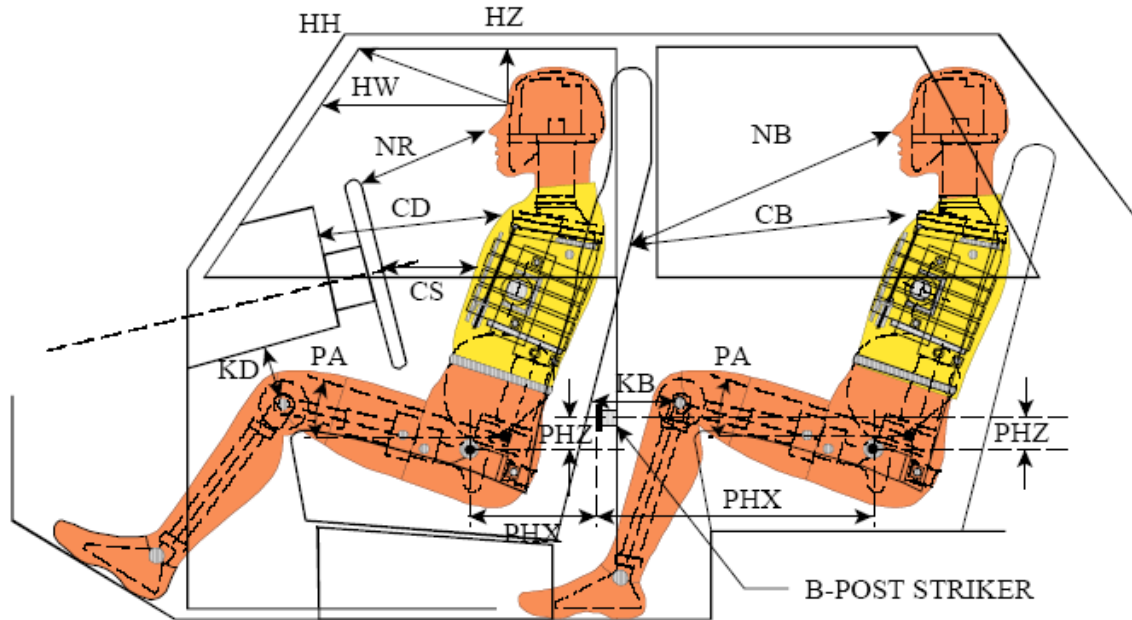
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	71.9
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	72.0
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	67.0
Actual Amount of Solvent Used in Test	67.0
1/3 of Usable Capacity	24.0

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16



LEFT SIDE VIEW

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

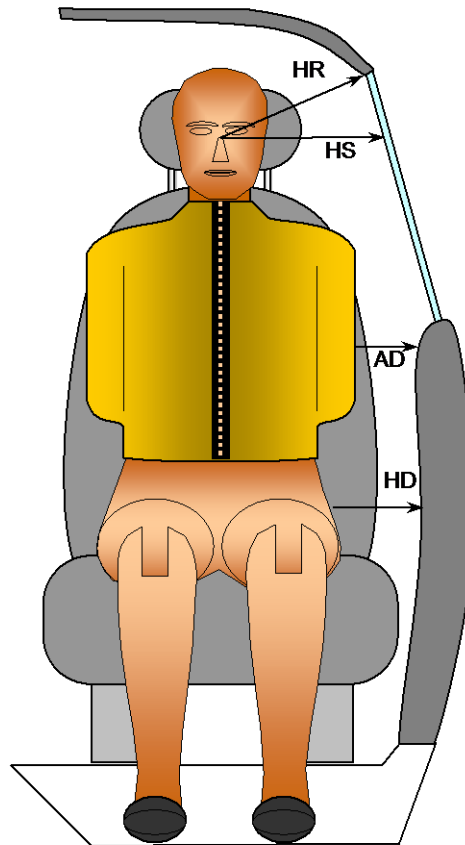
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	475			
HW		Header to Windshield	651			
HZ	HZ	Head to Roof Liner	168		167	
NR	NB	Nose to Rim/Seat Back	421		496	
CD	CB	Chest to Dash/Seat Back	584		400	
CS		Chest to Steering Wheel	371			
KD(L)/KDA(L) ⁰	KB(L)/KBA(L) ⁰	Left Knee to Dash/Seat Back	202	38	51	0.0
KD(R)/KDA(R) ⁰	KB(R)/KBA(R) ⁰	Right Knee to Dash/Seat Back	193	37.6	74	0.0
PAX ⁰	PAX ⁰	Pelvic Tilt Angle X		0.8		0.2
	PAY ⁰	Pelvic Tilt Angle Y				29.3
PHX	PHX	Hip Point to Striker (X-Axis)	435		282	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	240		151	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16



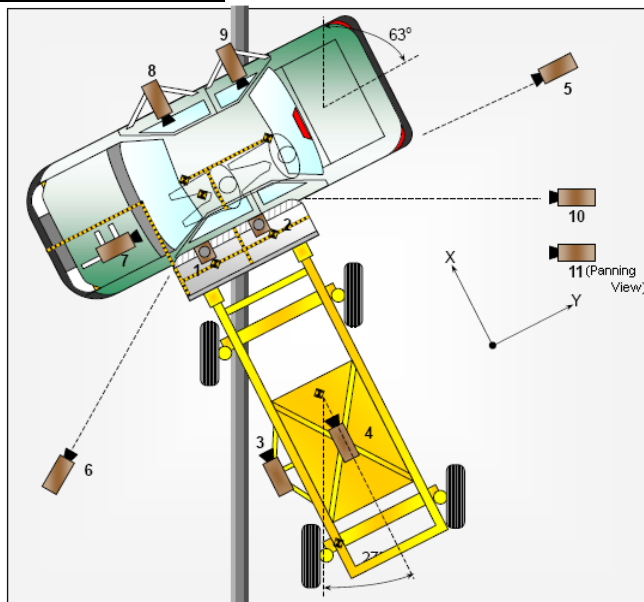
FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	185	245
HS	Head to Side Window	mm	321	314
AD	Arm to Door	mm	99	151
HD	H-Point to Door	mm	157	143

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-160	1150	5692	8.5	1000
2	Overhead Close-up	0	770	5692	16	1000
3	Left Impact Point (MDB)	1811	890	860	75	1000
4	Side Overall (MDB)	2625	0	1600	20	1000
5	Rear	0	7163	1180	20	1000
6	Left Front	1680	3537	1120	20	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				12.5	1000
9	Passenger Side (OB)				12.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

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

*All measurements accurate to ± 6 mm.

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

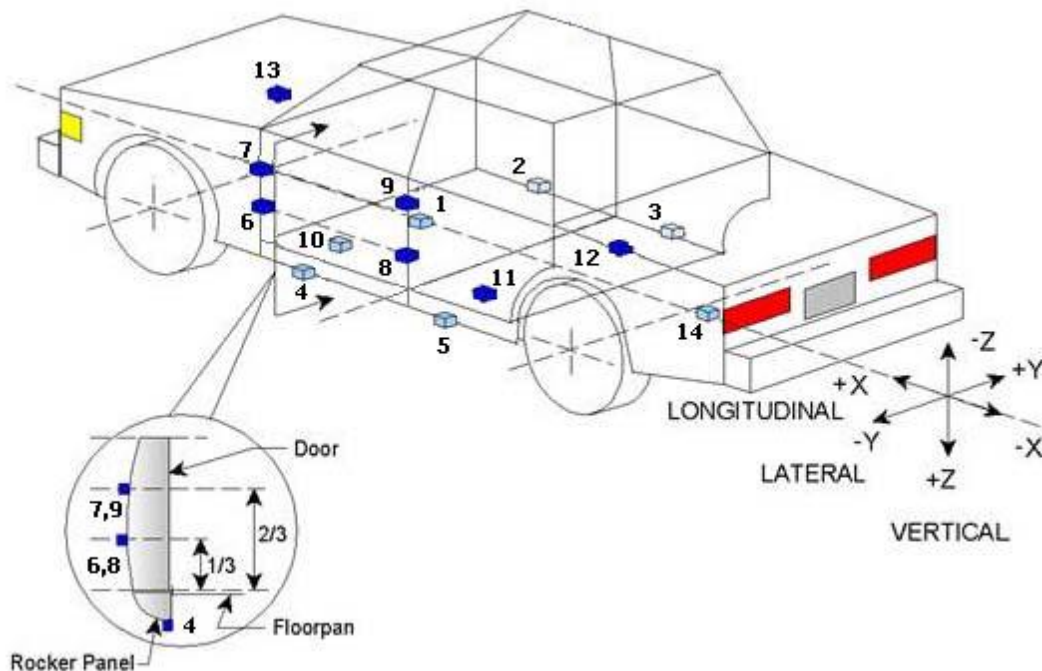
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	5
TOTAL	60

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16



TEST VEHICLE ACCELEROMETER LOCATIONS

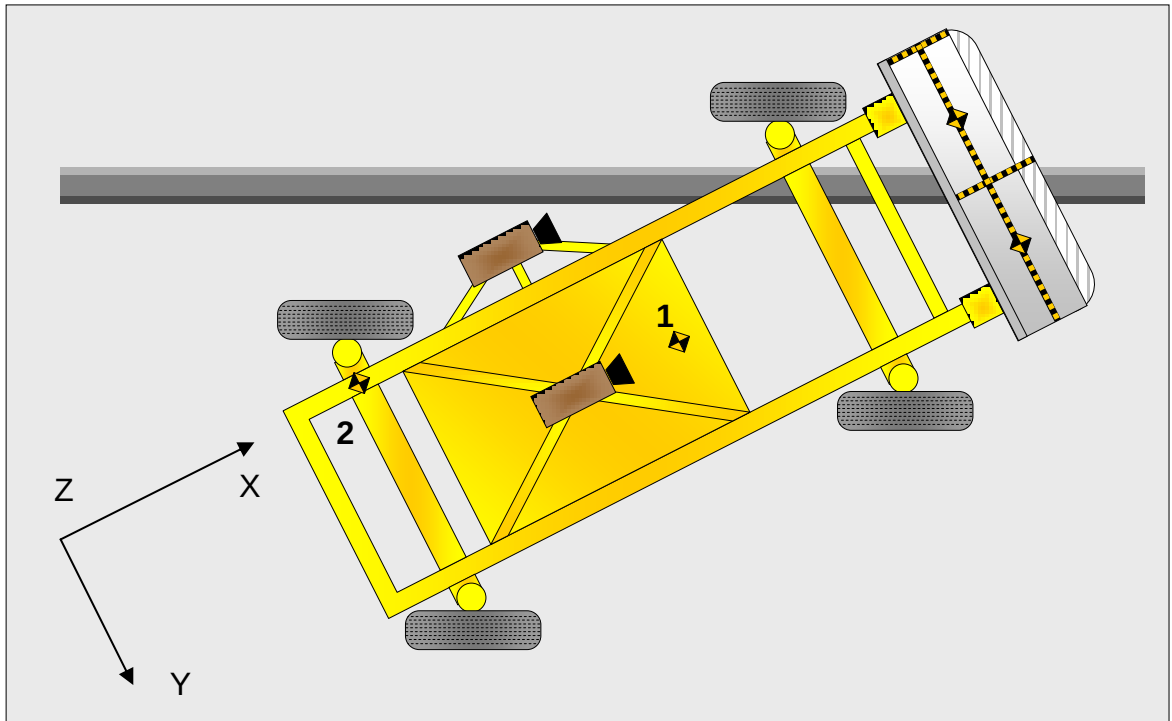
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2720	87	-452
2	Right Sill at Front Seat	2630	648	-332
3	Right Sill at Rear Seat	1970	665	-364
4	Left Sill at Front Door	2620	-648	-333
5	Left Sill at Rear Door	2000	-665	-313
6	A-Post Lower	3065	-768	-478
7	A-Post Middle	3080	-768	-840
8	B-Post Lower	1900	-858	-536
9	B-Post Middle	1825	-865	-813
10	Front Seat Track	2350	585	-235
11	Rear Seat Structure	1840	555	-501
12	Right Rear Occ. Compartment	1880	-540	-476
13	Engine Block	3680	43	-866
14	Rear Above Axle	708	0	-502

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: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16



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: 2017 Chevrolet Camaro 2DR Coupe
Test Program: SINCAP Side Impact

NHTSA No.: M20170115
Test Date: 10/6/16

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	Head liner, SCAB	Head liner
Top of Head	Head liner, SCAB	Head liner
Left Side of Head	Head liner, SCAB	Head liner
Back of Head	Head liner	Head liner
Left Shoulder	Torso/Pelvis Airbag	Door panel
Upper Torso	Seatback bolster, Torso/Pelvis Airbag	None
Lower Torso	Seatback bolster, Torso/Pelvis Airbag	Door panel
Left Hip	Torso/Pelvis Airbag, Door panel	Seat cushion bolster, door panel
Left Knee	Door panel	Front seat back, door panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Trunk Lid
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	N/A	Yes	N/A	Yes
Total Separation from Vehicle at Hinges or Latches	No	N/A	No	N/A	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	N/A	No	N/A	No
Disengaged from Latched Position	No	N/A	No	N/A	No
Latch Separated from Striker	No	N/A	No	N/A	No
Jammed Shut	Yes	N/A	No	N/A	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	N/A	No	N/A
Seat Disengagement from Floor pan	No	N/A	No	N/A
Seat Back Movement from Initial Position	No	N/A	No	N/A
Seat Back Collapse	No	N/A	No	N/A

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	None
Windshield Damage	Along A-Pillar
Side Window Damage	Driver's window broken out
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

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	N/A	No	N/A
Other	No	N/A	No	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2817
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		469
Actual Impact Point (Aft of Front Axle)	mm		459
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+10
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-6

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
Test Program: SINCAP Side Impact

NHTSA No.: M20170115
Test Date: 10/6/16

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	1110

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	422.0	257.2	679.2
Right	kg	357.2	327.0	684.2
Ratio	%	57.2	42.8	100.0
Totals	kg	779.2	584.2	1363.4

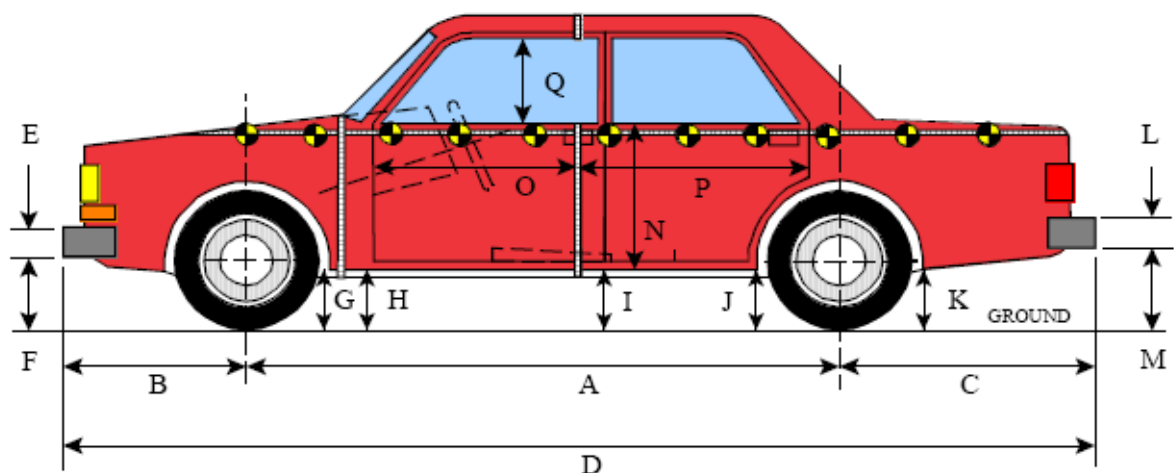
SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.46
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.48
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: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

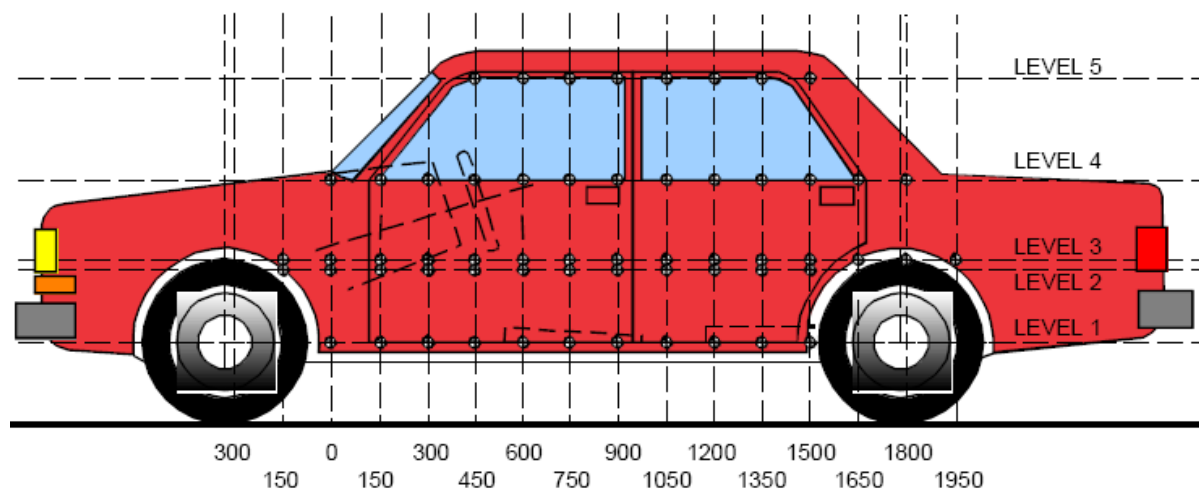


LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF $\pm 3\text{mm}$

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2817	2817	0
B	Front Axle to Front Surface of Vehicle	913	913	0
C	Rear Axle to Rear Surface of Vehicle	1030	1030	0
D	Total Length at Centerline	4760	4760	0
E	Front Bumper Thickness	116	116	0
F	Front Bumper Bottom to Ground	467	474	-7
G	Sill Height at Front Wheel Well	155	206	-51
H	Sill Height at Front Door Leading Edge	190	230	-40
I	Sill Height at B-Pillar	287	326	-39
J1	Sill Height at Rear Wheel Well	274	320	-46
J2	Pinch Weld Height at Rear Wheel Well	192	217	-25
K	Sill Height Aft of Rear Wheel Well	225	245	-20
L	Rear Bumper Thickness	210	210	0
M	Rear Bumper Bottom to Ground	500	525	-25
N	Sill Height to Window Bottom Sill	754	690	64
O	Front Door Leading Edge to Impact CL	560	560	0
P	Rear Door Trailing Edge to Impact CL	870	855	15
Q	Front Window Opening	327	307	20
R	Right Side Length	4375	4375	0
S	Left Side Length	4375	4375	0
T	Vehicle Width	1890	1890	0

DATA SHEET NO. 11**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**Test Vehicle: 2017 Chevrolet Camaro 2DR CoupeNHTSA No.: M20170115Test Program: SINCAP Side ImpactTest Date: 10/6/16**LEFT SIDE VIEW****MAXIMUM EXTERIOR CRUSH MEASUREMENTS**

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	370	135	150
2	Driver Hip Point	450	158	150
3	Mid-Door	625	160	1800
4	Window Sill	947	104	1350
5	Window Top	1283	4	1200-1350

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

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

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-150	0	0	942	0	0	0	0	856	0	0	0	0	86	0	0
0	925	928	922	0	0	831	837	816	0	0	94	91	106	0	0
150	903	909	912	797	0	768	751	763	780	0	135	158	149	17	0
300	892	893	908	807	0	780	753	802	783	0	112	140	106	24	0
450	896	888	907	811	0	777	743	802	779	0	119	145	105	32	0
600	899	884	907	817	0	776	741	803	790	0	123	143	104	27	0
750	903	883	906	820	0	778	738	800	779	0	125	145	106	41	0
900	905	882	904	823	610	779	739	799	766	609	126	143	105	57	1
1050	908	883	903	825	621	777	742	799	754	618	131	141	104	71	3
1200	909	883	901	827	621	777	749	801	739	617	132	134	100	88	4
1350	906	884	898	826	619	780	760	795	722	615	126	124	103	104	4
1500	901	886	897	823	615	785	778	788	754	612	116	108	109	69	3
1650	897	889	896	819	608	818	777	788	735	605	79	112	108	84	3
1800	905	905	907	821	594	865	844	747	796	591	40	61	160	25	3
1950	931	938	937	854	566	917	910	831	836	565	14	28	106	18	1
2100	0	0	952	866	0	0	0	891	851	0	0	0	61	15	0
2250	0	0	0	870	0	0	0	0	853	0	0	0	0	17	0
2400	0	0	0	865	0	0	0	0	857	0	0	0	0	8	0
2550	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

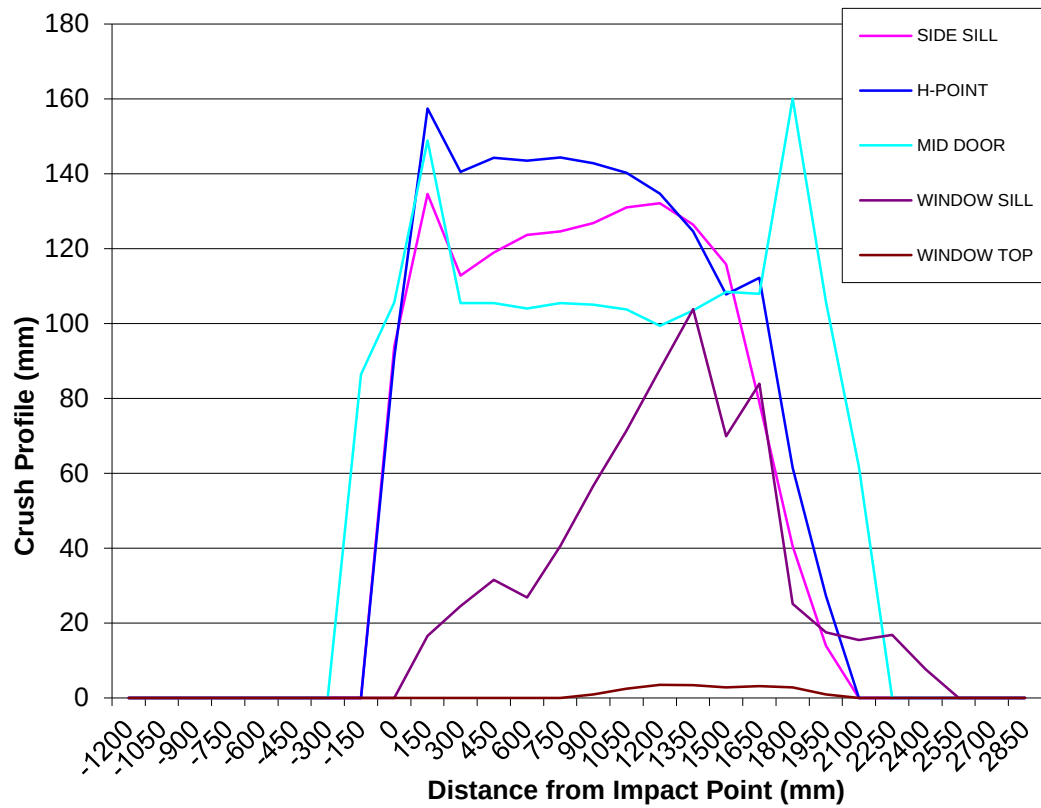
NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

DATA SHEET NO. 11 (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
Test Program: SINCAP Side Impact

NHTSA No.: M20170115
Test Date: 10/6/16

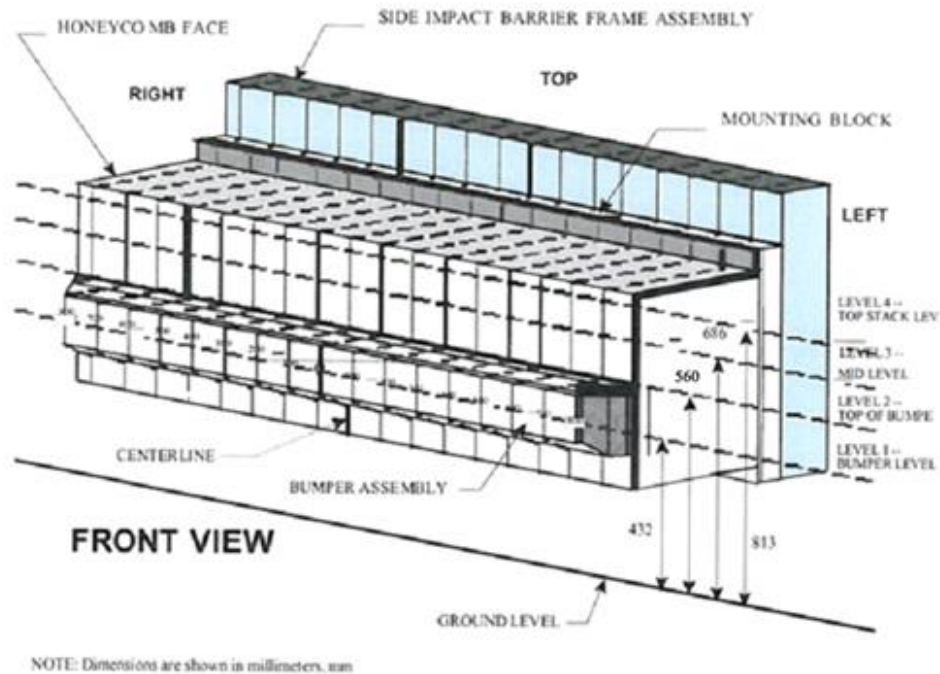


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	246
B	Top of Bumper	560	800	Right	166
C	Mid-Level	686	800	Left	118
D	Top of Stack	813	800	Left	142

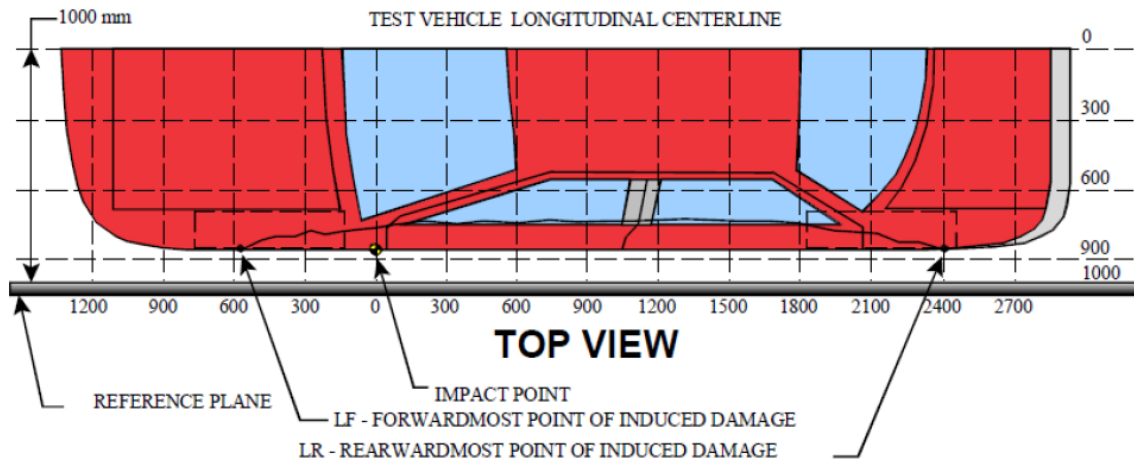
DEFORMABLE BARRIER STATIC CRUSH

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	246	243	241	241	221	210	201	196	191	186	182	177	174	177	179	168	162		
2	166	162	158	151	140	131	124	120	116	112	109	106	102	106	117	112	113		
3	99	108	109	78	59	52	48	47	50	58	66	75	88	98	117	115	118		
4	88	91	81	75	56	28	31	36	42	53	63	79	90	108	117	119	142		

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16



VEHICLE DAMAGE PROFILE DISTANCES¹

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	2400	4	857	865	0
2	1950	3	831	937	106
3	1350	1	780	906	126
4	900	2	739	882	143
5	300	2	753	893	140
6	-150	3	856	942	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	1	310	472	162
2	500 mm Left of Center	1	308	485	177
3	200 mm Left of Center	1	303	485	182
4	200 mm Right of Center	1	284	485	201
5	500 mm Right of Center	1	245	486	241
6	800 mm Right of Center	1	228	474	246

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

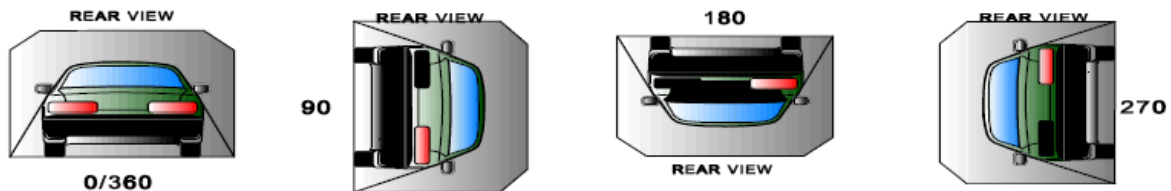
Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe
 Test Program: SINCAP Side Impact

NHTSA No.: M20170115
 Test Date: 10/6/16

Test Time: 15:25 **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

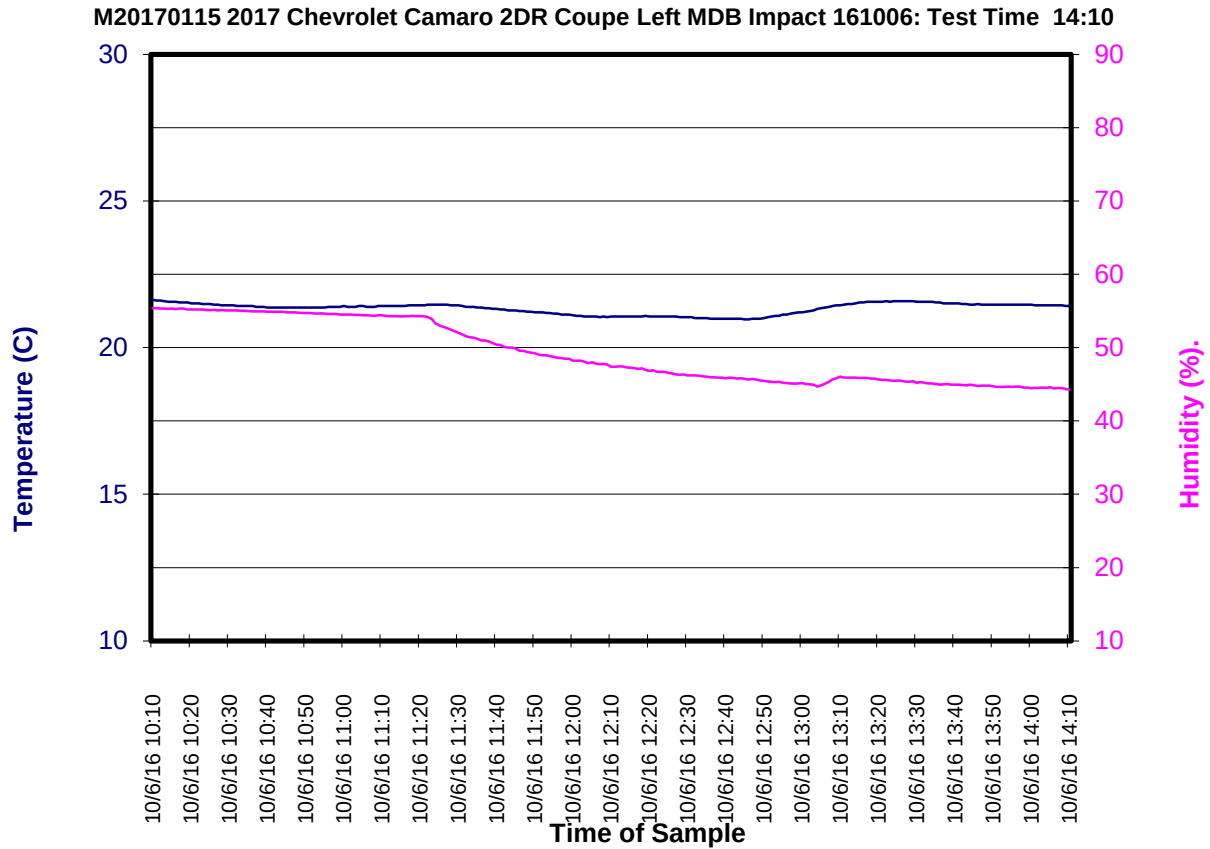
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2017 Chevrolet Camaro 2DR Coupe

NHTSA No.: M20170115

Test Program: SINCAP Side Impact

Test Date: 10/6/16



APPENDIX A
PHOTOGRAPHS

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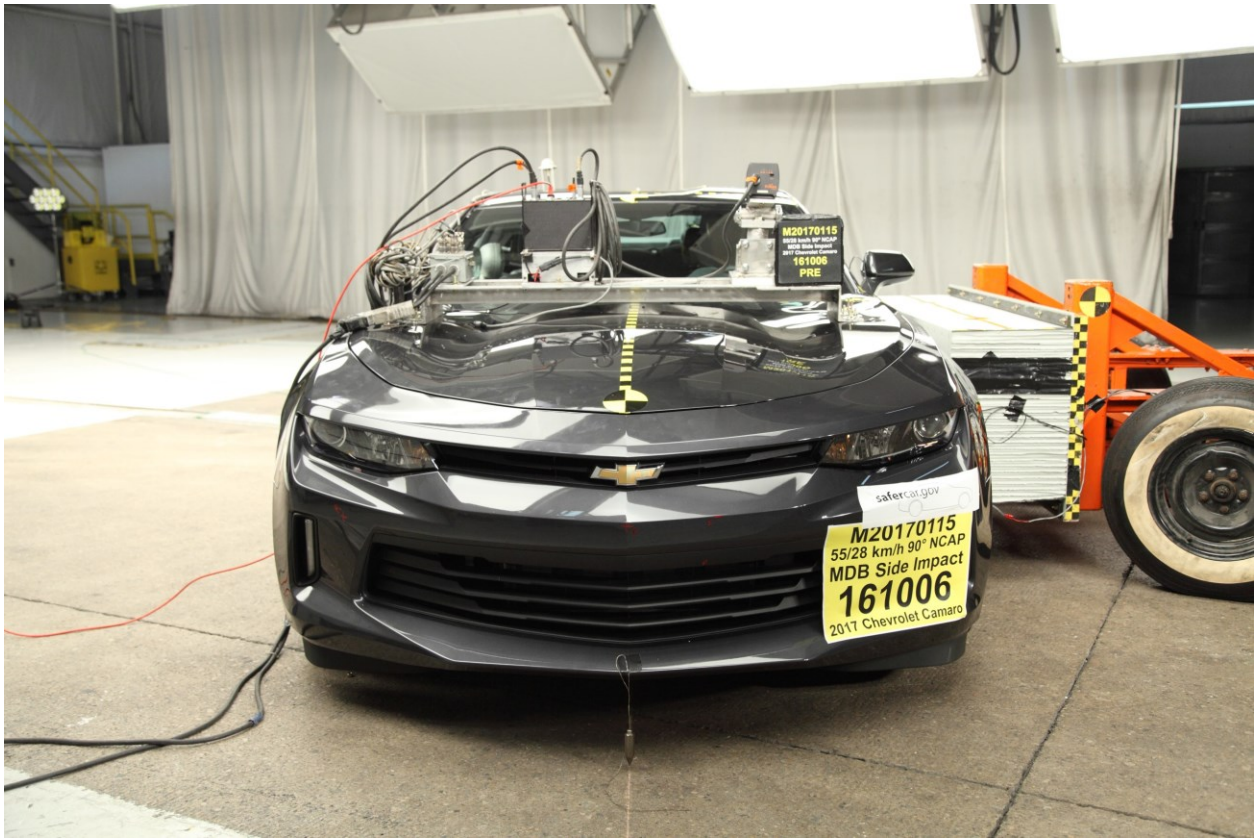
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093	Close-Up View of Vehicle's Tire Information Placard or Label	A-52
094	Pre-Test Ballast View	A-53
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102	Monroney Label	A-57
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-57
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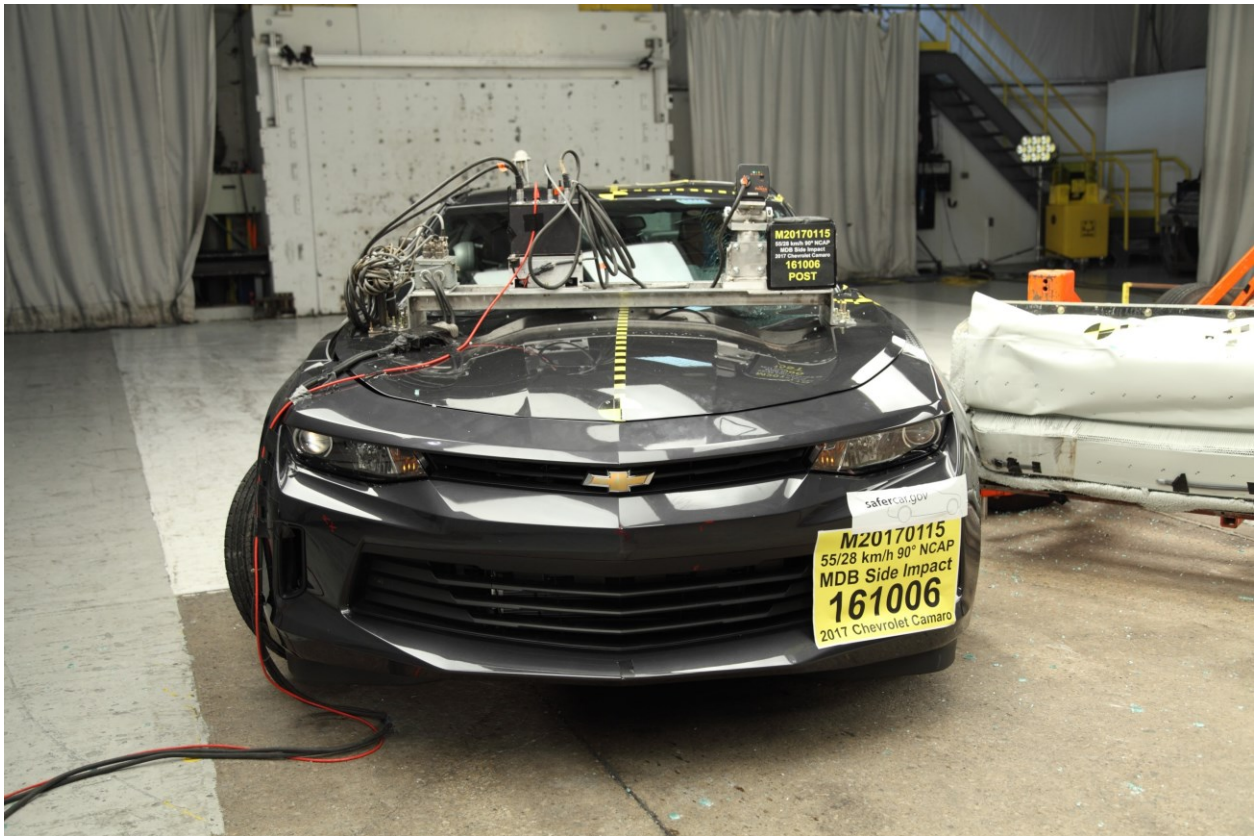
001 As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



002 As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



003 Pre-Test Frontal View of Test Vehicle



004 Post-Test Frontal View of Test Vehicle



005 Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



006 Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



007 Pre-Test Left Side View of Test Vehicle



008 Post-Test Left Side View of Test Vehicle



009 Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



010 Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



011 Pre-Test Rear View of Test Vehicle



012 Post-Test Rear View of Test Vehicle



013 Pre-Test Right Side View of Test Vehicle



014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area



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



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



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



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



021 Pre-Test Left Front Door Latch Close-Up



022 Post-Test Left Front Door Latch Close-Up

PHOTO NOT APPLICABLE

023 Pre-Test Left Rear Door Latch Close-Up

PHOTO NOT APPLICABLE

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

PHOTO NOT AVAILABLE

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



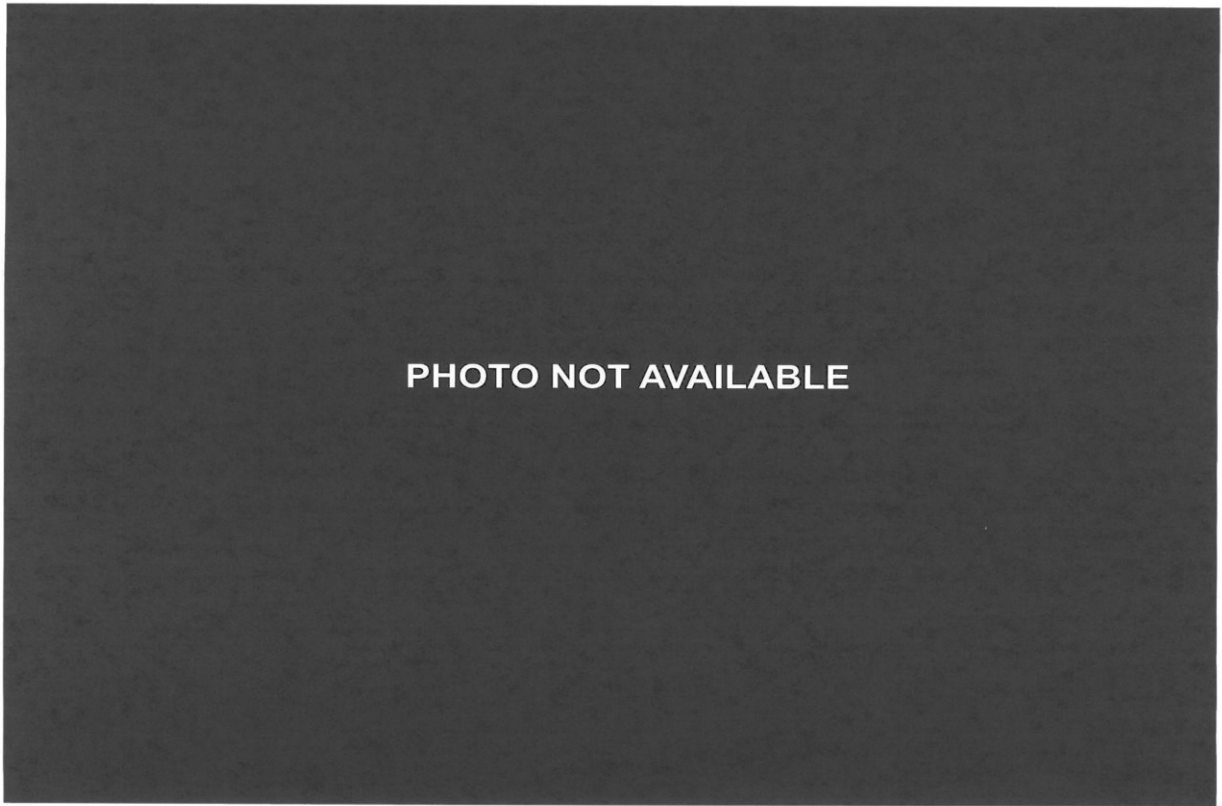
054 Post-Test Driver Dummy Close-Up Knee Contact View

PHOTO NOT APPLICABLE

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



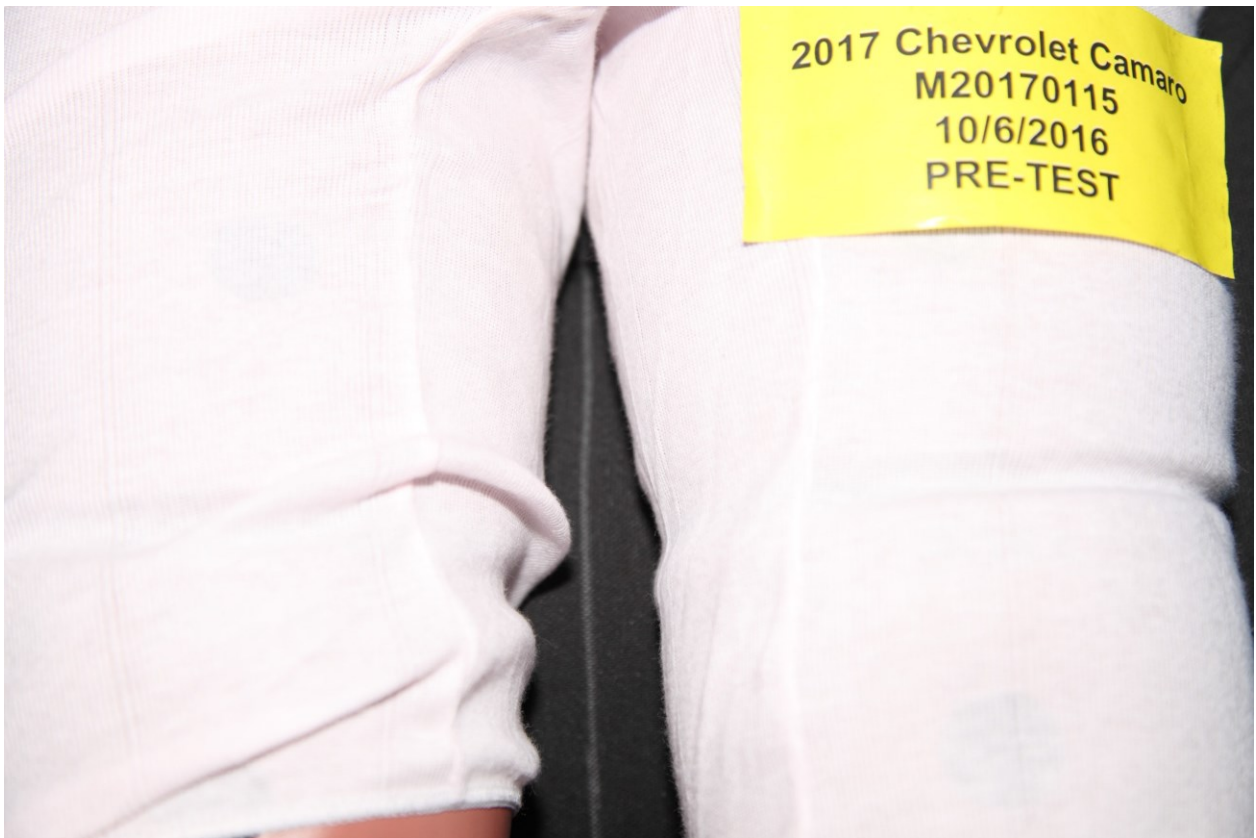
058 Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



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



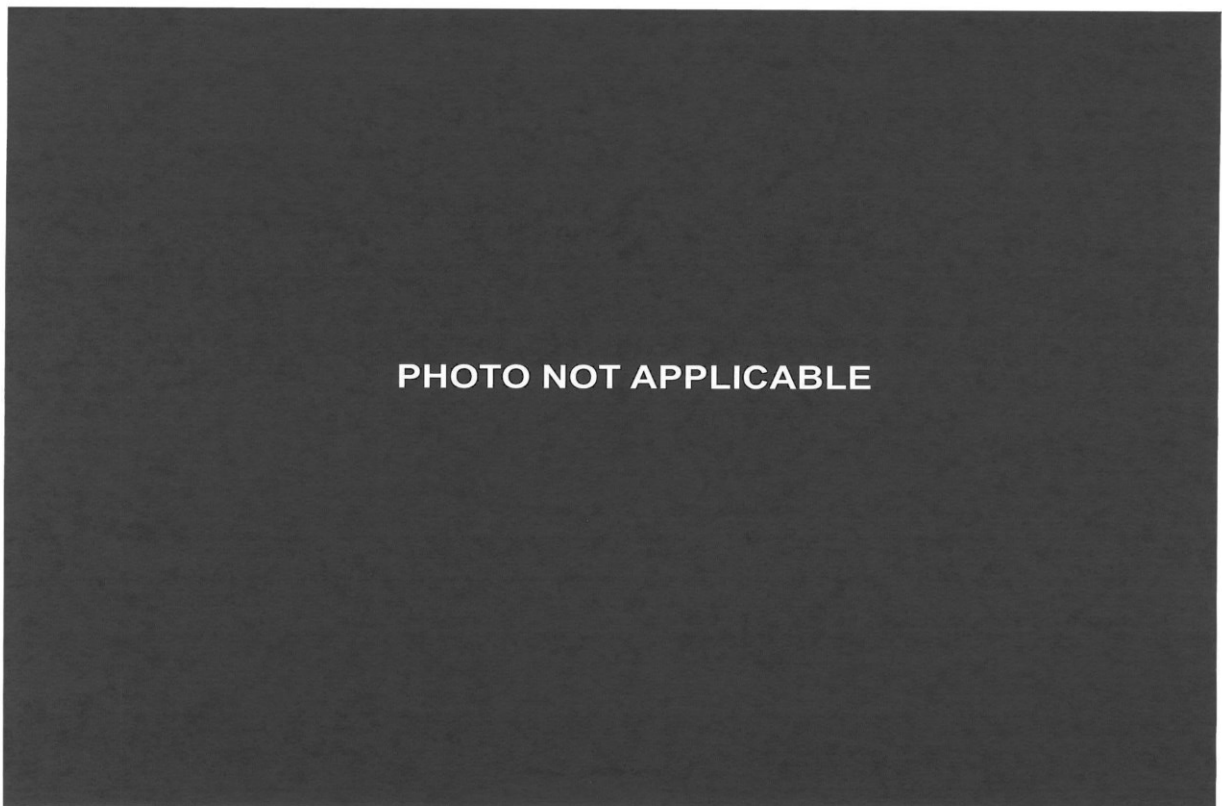
063 Pre-Test View of Rear Passenger Dummy Head Showing Dummy Head is Level



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

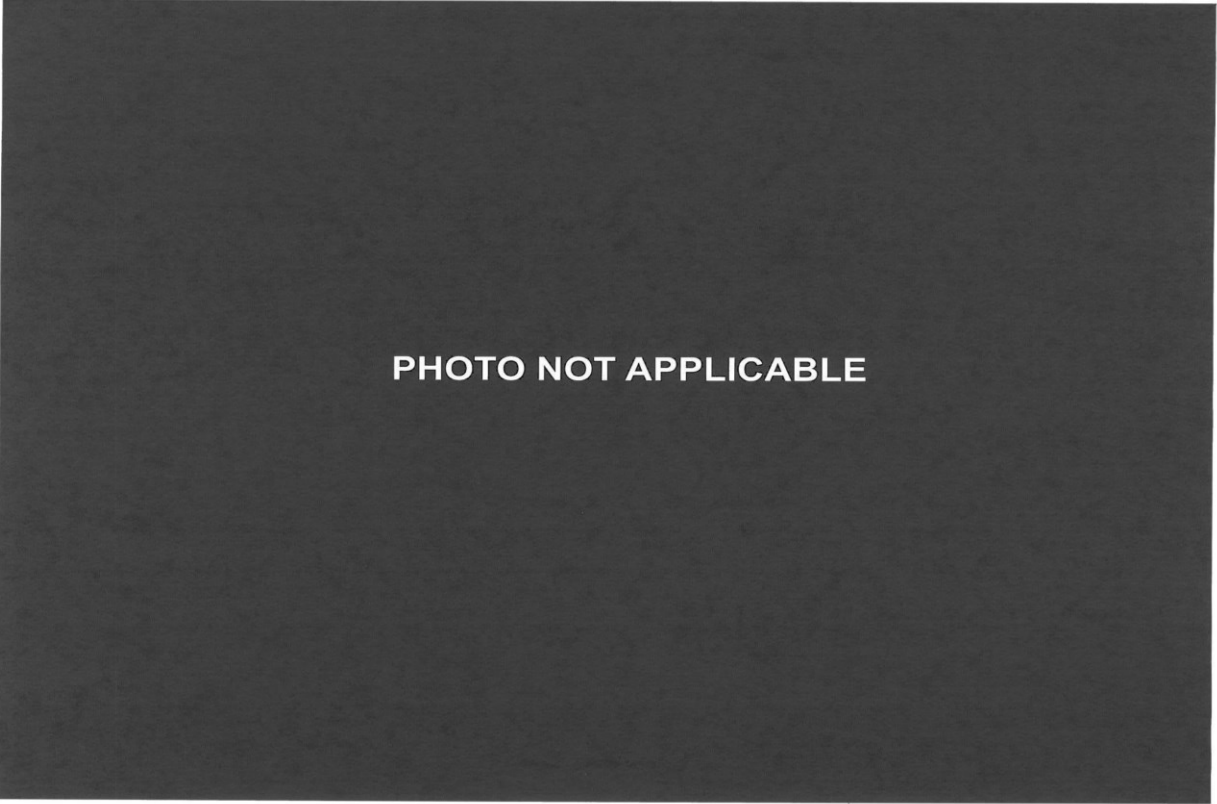


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067 Pre-test Close-Up Left Side View of Rear Passenger Seat Back

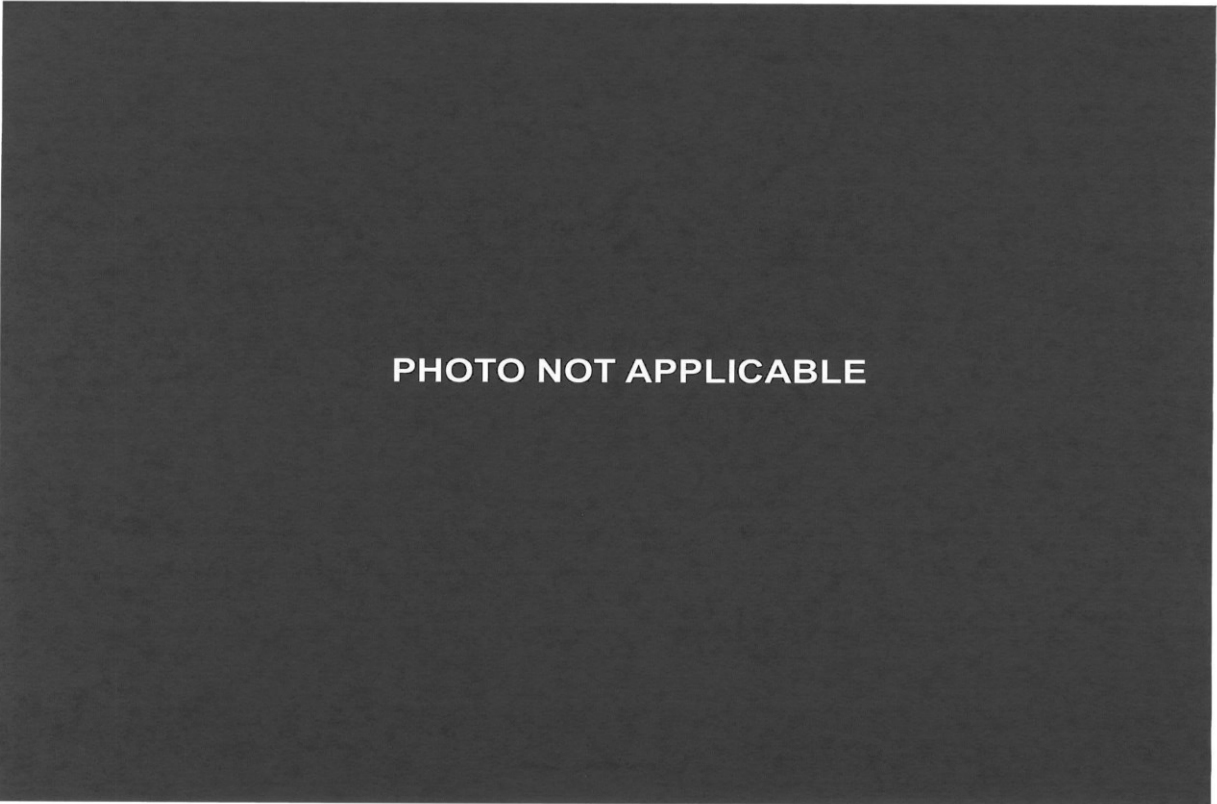


PHOTO NOT APPLICABLE

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



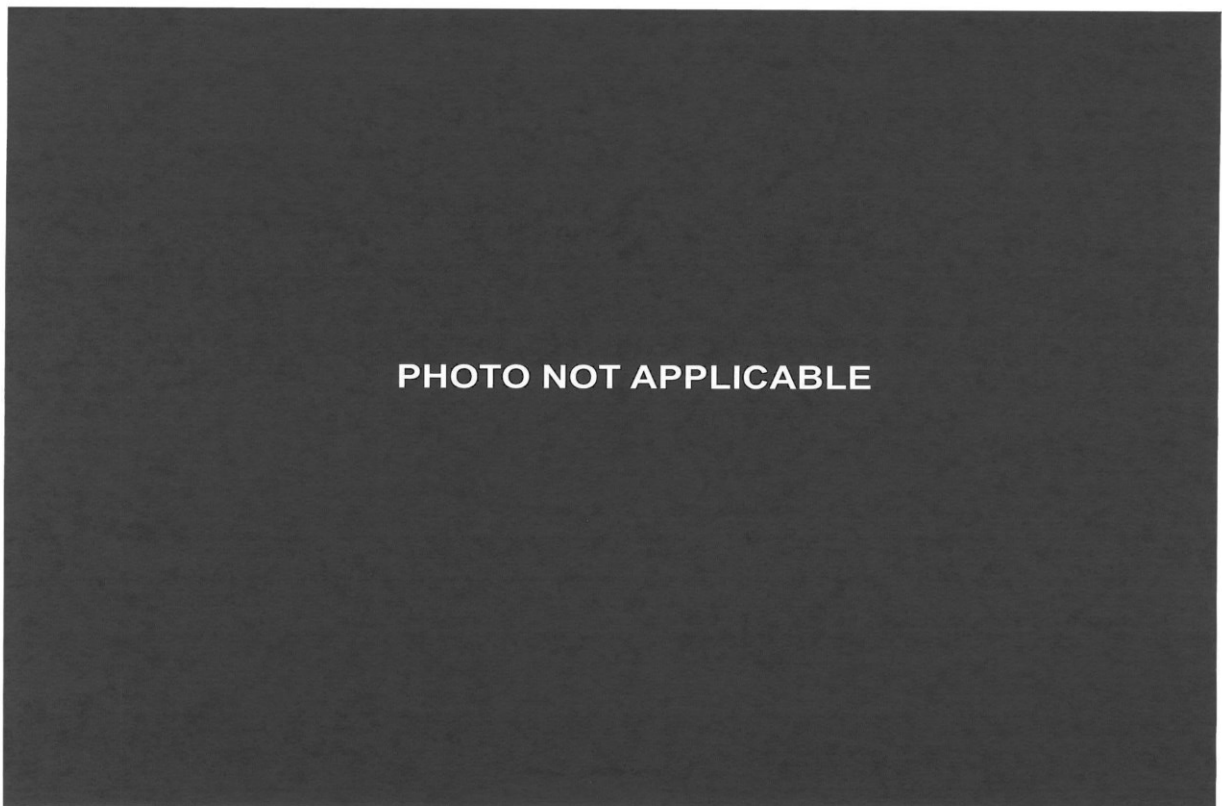
073 Pre-Test Passenger Inner Door Panel View



074 Post-Test Passenger Inner Door Panel View



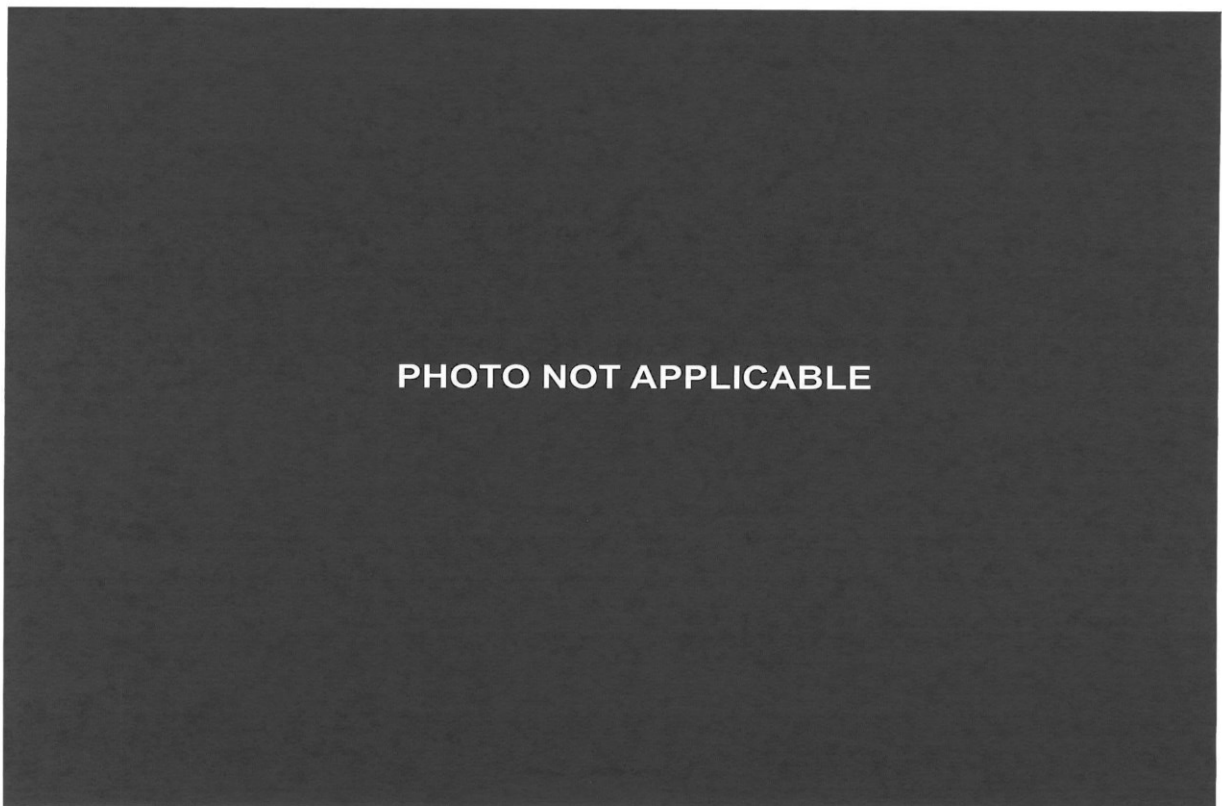
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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



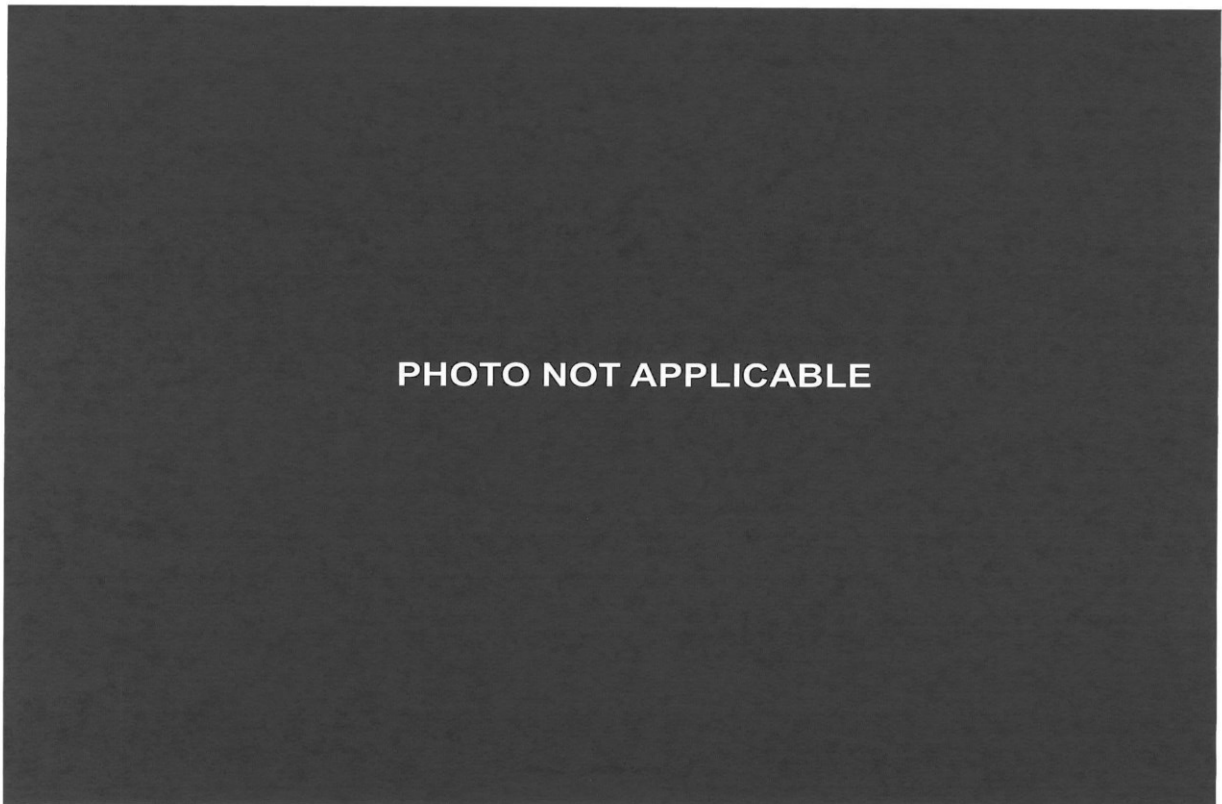
077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



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

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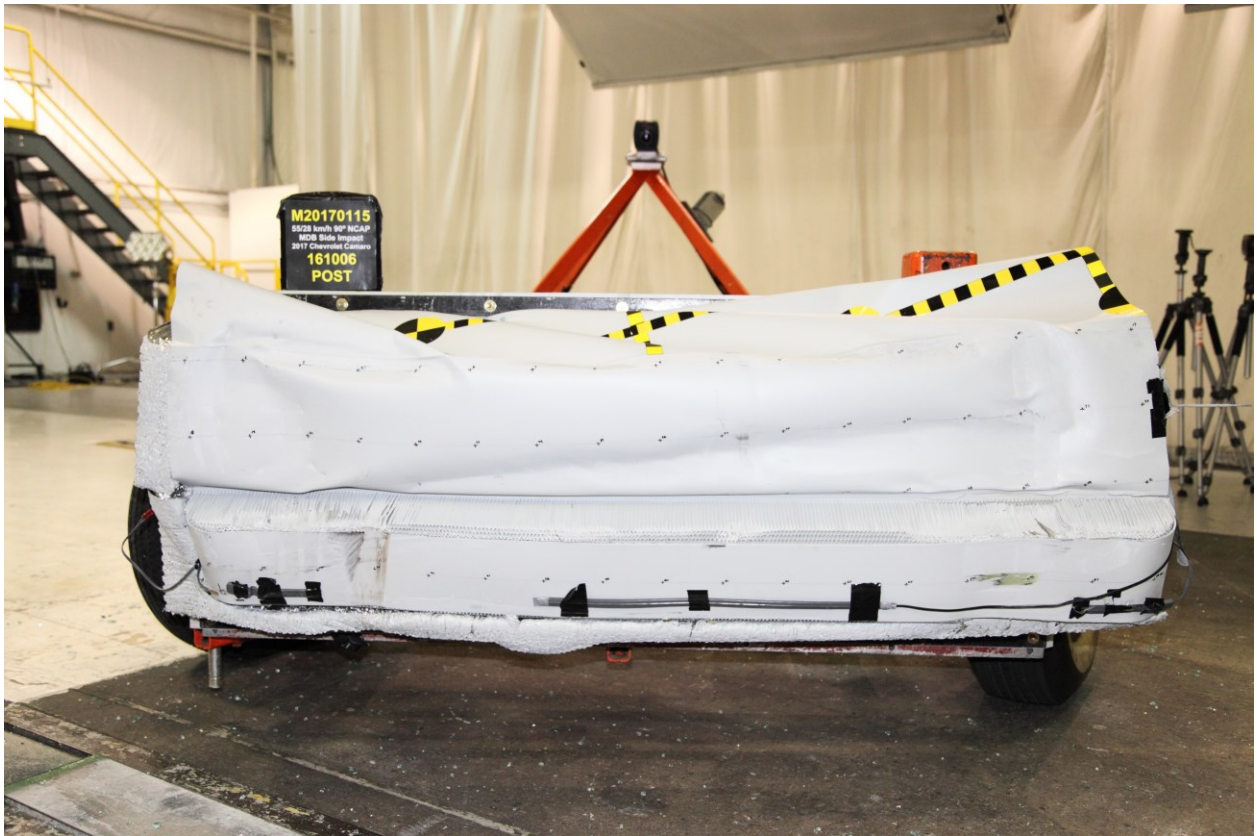
082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



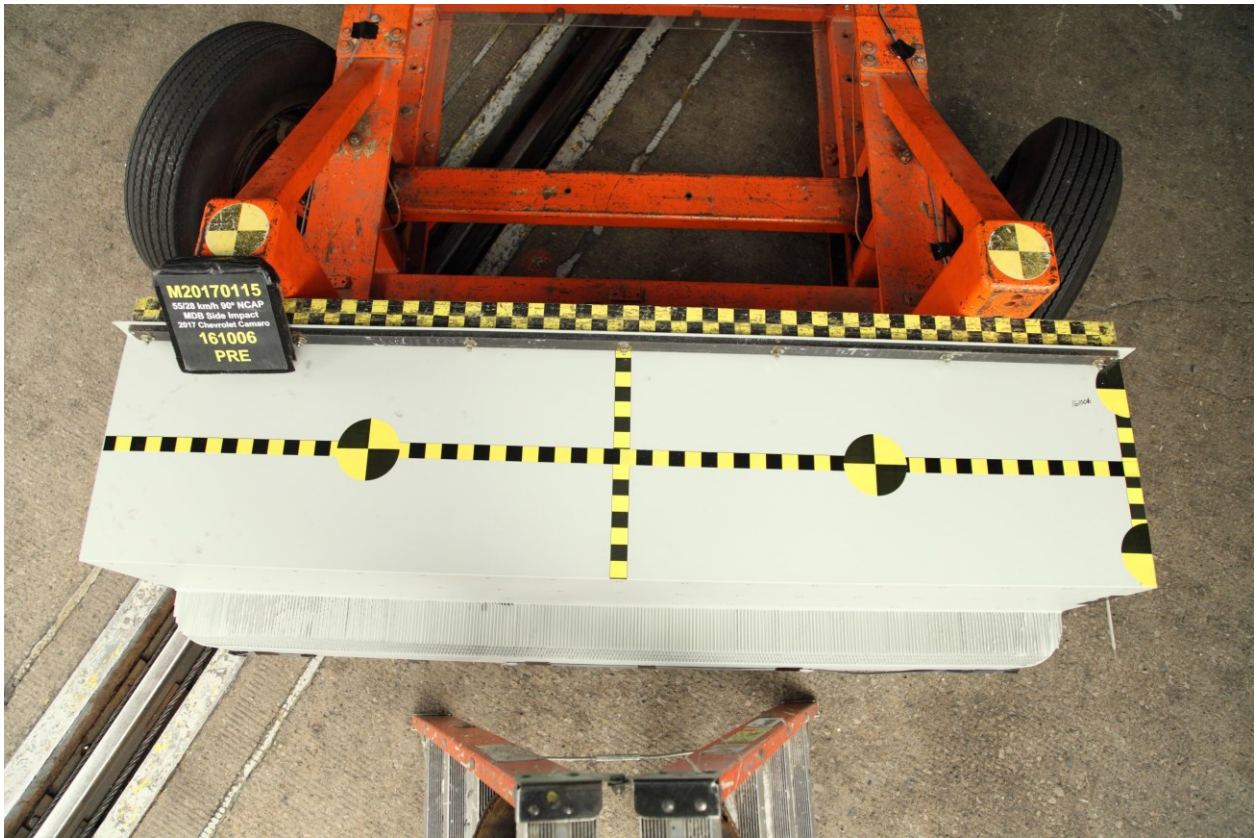
083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face



087 Post-Test Top View of MDB Impactor Face



088 Pre-Test Left Side View of MDB Impactor Face



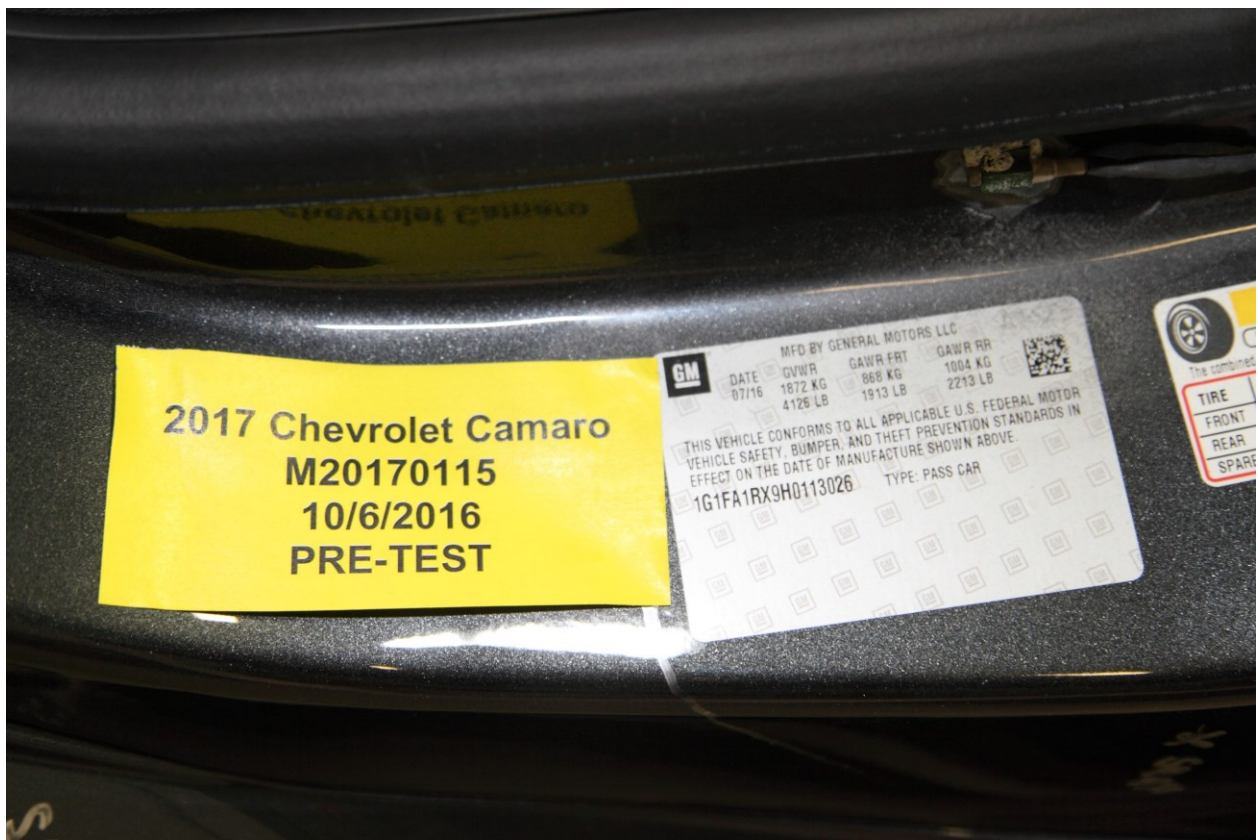
089 Post-Test Left Side View of MDB Impactor Face



090 Pre-Test Right Side View of MDB Impactor Face



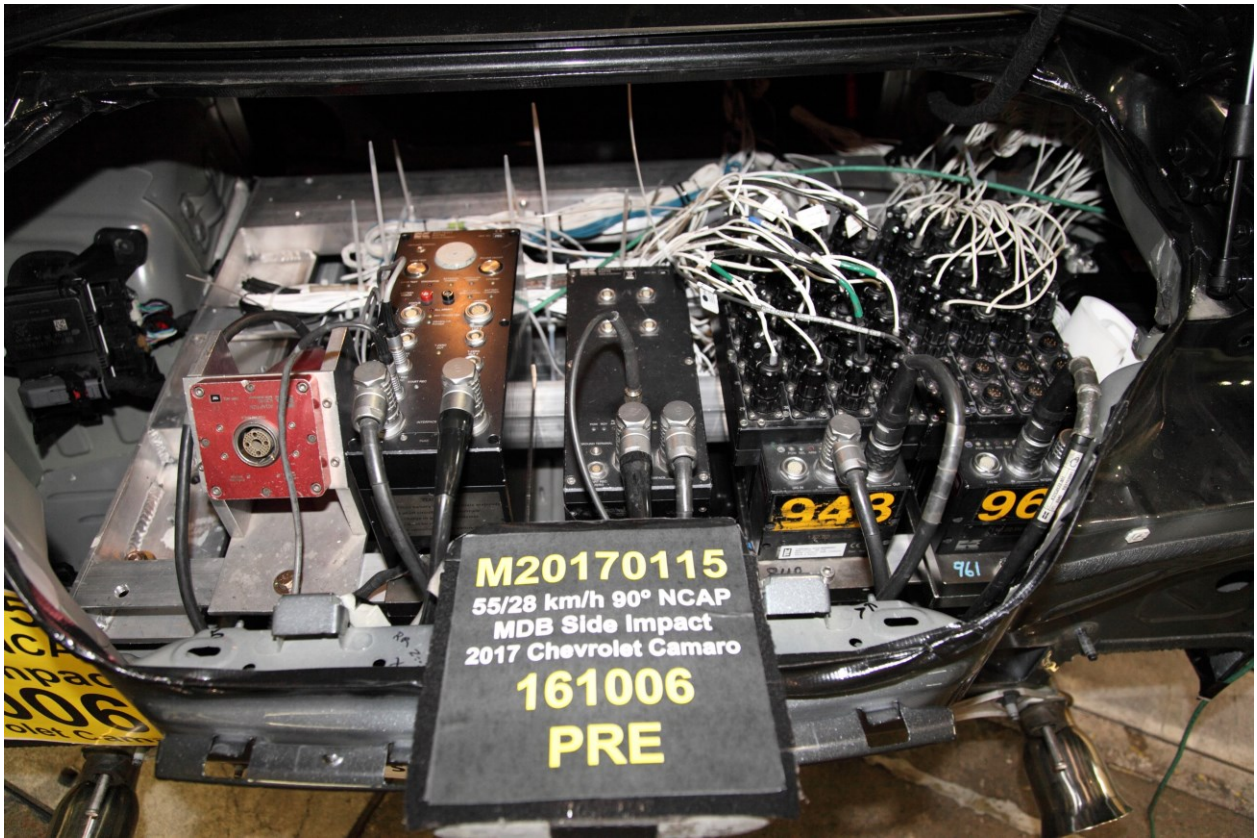
091 Post-Test Right Side View of MDB Impactor Face



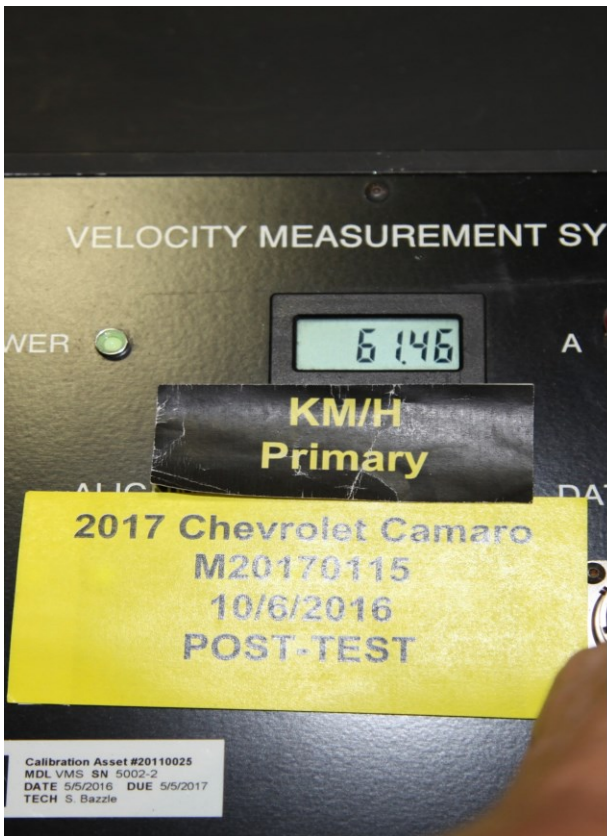
092 Close-Up View of Vehicle Certification Label



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



094 Pre-Test Ballast View



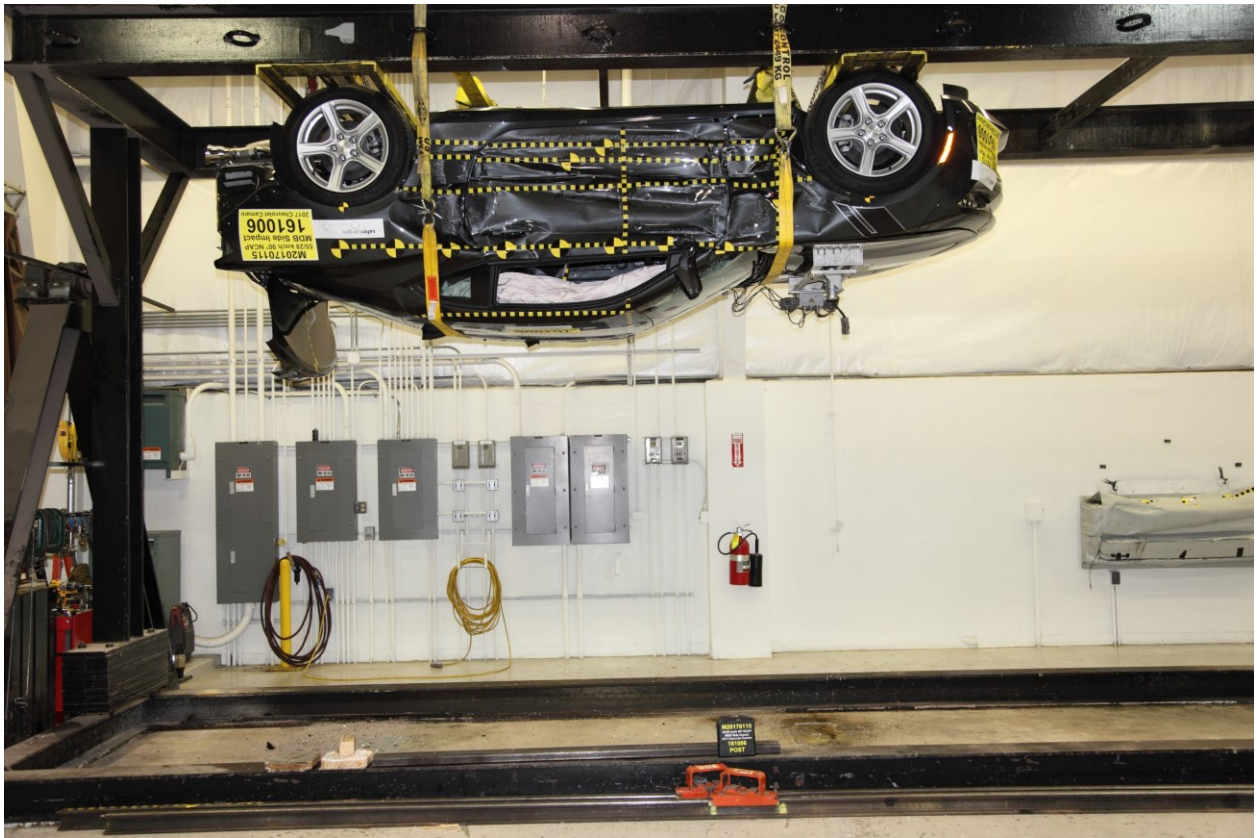
095 Post-Test Primary Speed Trap Read-Out



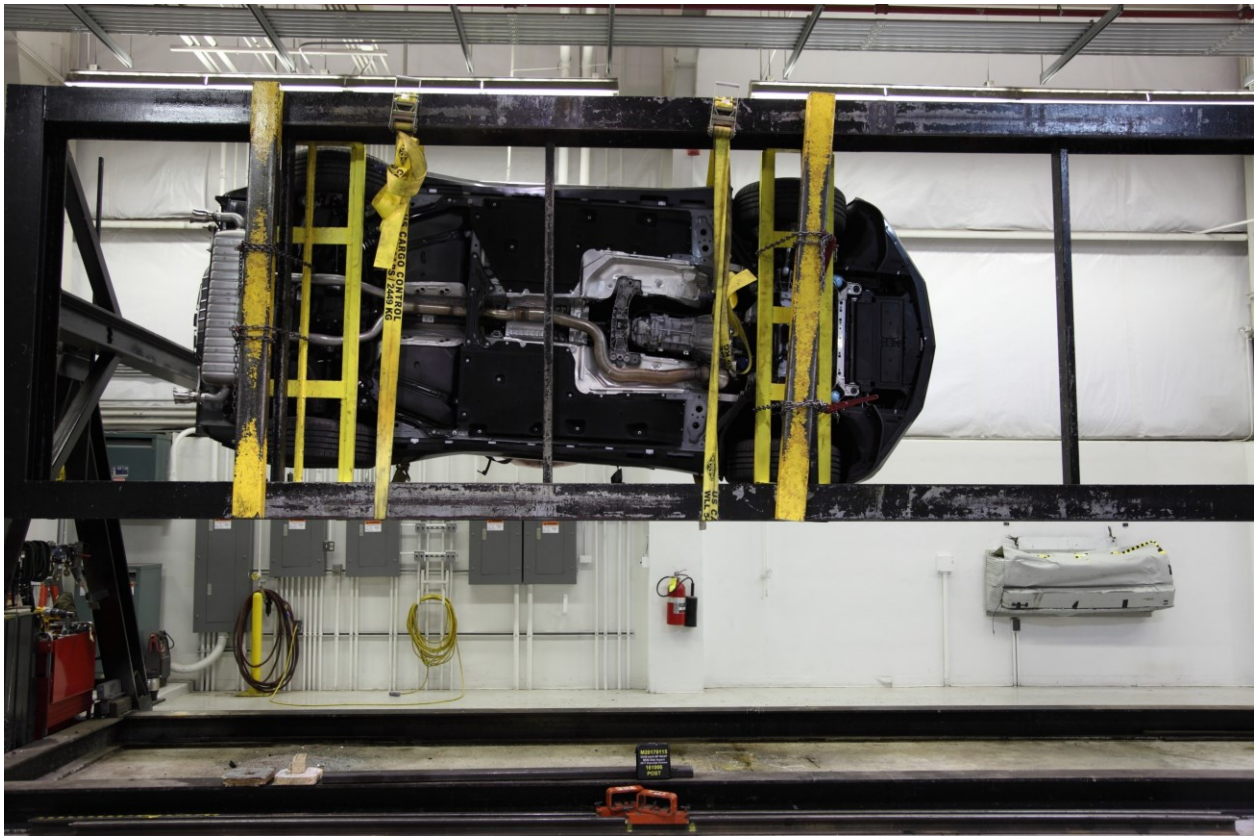
096 FMVSS No. 301 Static Rollover 0 Degrees



097 FMVSS No. 301 Static Rollover 90 Degrees



098 FMVSS No. 301 Static Rollover 180 Degrees



099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees



101 Impact Event



INTERIOR: JET BLACK

U.S. EPA FUEL ECONOMY INFORMATION

STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN.

- CHEVROLET COMPLETE CARE
- SEE WWW.CHEVY.COM OR DEALER FOR TERMS, DETAILS & LIMITS
- TWO MAINTENANCE VISITS
- OIL & FILTER CHANGE
- 4-WHEEL TIRE ROTATION
- 27 POINT INSPECTION
- 3 YEAR/50,000 MILES BUMPER-TO-BUMPER WARRANTY
- 5 YEAR/100,000 MILES POWERTRAIN LIMITED WARRANTY
- ROADSIDE ASSISTANCE
- COURTESY TRANSPORTATION

MECHANICAL

- ENGINE, 2.0L TURBO, 4-CYL. SIDI, VVT
- 6 SPEED MANUAL TRANSMISSION
- SPORT SUSPENSION
- TIRE SEALANT AND INFLATOR KIT
- PWR STEERING, ELECTRIC

- DRIVER MODE SELECTOR
- CAPLESS FUELING

SAFETY & SECURITY

- STABILITRAK-STABILITY CONTROL INCLUDES TRACTION CONTROL
- AIR BAGS, DRIVER AND FRONT PASSENGER DUAL-STAGE FRONTAL, THORAX SIDE-IMPACT, KNEE, AND HEAD CURTAIN SIDE-IMPACT
- ANTI LOCK BRAKE SYSTEM, 4-WHEEL DISC
- REAR CHILD SEAT LATCH ANCHORS
- BATTERY RUNDOWN PROTECTION
- THEFT DETERRENT SYSTEM
- REAR VISION CAMERA

EXTERIOR

- HEADLAMPS, HALOGEN PROJECTOR
- DAYTIME RUNNING LAMPS, LED
- WHEELS, 18" SILVER PAINTED ALUMINUM
- POWER OUTSIDE ADJUSTABLE MIRRORS

- EXHAUST, DUAL TIPS

INTERIOR

- KEYLESS OPEN AND START
- 8-WAY POWER DRIVER SEAT
- 6-WAY POWER PASSENGER SEAT
- AIR CONDITIONING, SINGLE ZONE AUTOMATIC
- WINDOWS, POWER WITH EXPRESS UP/DOWN
- LEATHER WRAP STEERING WHEEL
- LEATHER TRIMMED SHIFT KNOB
- COLOR DRIVER INFORMATION CTR
- TRUNK RELEASE, POWER
- COMPASS DISPLAY
- STEERING COLUMN, MANUAL RAISE AND TELESCOPING
- REAR SEAT, FOLDING
- GLOVEBOX, LOCKABLE
- FLOOR MATS, FRONT

CONNECTIVITY FEATURES

- CHEVROLET MYLINK AUDIO SYSTEM
- 7" DIAGONAL COLOR TOUCHSCREEN

- SELECT BLUETOOTH STREAMING, APPLE CARPLAY CAPABILITY AND ANDROID AUTO CAPABILITY PROVIDED BY APPLE AND GOOGLE AVAILABLE WITH COMPATIBLE SMARTPHONES
- XM RADIO + SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUSXM AFTER 12 MTHS
- ONSTAR(R) INCLUDES 5 YR BASIC PLAN PLUS 6 MTH SERVICE W/ AUTOMATIC CRASH RESPONSE, NAVIGATION & MORE (SUBJECT TO TERMS SEE ONSTAR.COM)
- 4G LTE WI-FI(R) HOTSPOT WITH LIMITED DATA TRIAL AND MORE (SUBJECT TO TERMS SEE ONSTAR.COM)
- BLUETOOTH FOR PHONE

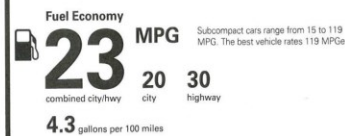
OPTIONS & PRICING

Visit us at www.chevy.com

MANUFACTURER'S SUGGESTED RETAIL PRICE	
STANDARD VEHICLE PRICE	\$26,305.00
OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)	
BLACK METALLIC HASH MARK DECALS (DLR INSTALLED)	195.00
TOTAL OPTIONS	\$195.00
TOTAL VEHICLE & OPTIONS	\$26,500.00
DESTINATION CHARGE	995.00
TOTAL VEHICLE PRICE*	\$27,495.00

EPA DOT Fuel Economy and Environment

These estimates reflect new EPA methods beginning with 2017 models.



You spend \$1,000
more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,600

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

Smog Rating (tailpipe only)

Best

This vehicle emits 380 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fuelconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 26 MPG and costs \$7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.45 per gallon. MPG is miles per gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov

Calculate personalized estimates and compare vehicles

Gasoline Vehicle

GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236



Equipped with the safety and connectivity of OnStar®
Visit onstar.com for details.

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 60%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 17%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
LANSING, MI U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law. Do not remove prior to delivery to the ultimate purchaser. Includes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above. Total taxes or license fees.

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ORDER NO. 140404K SALES CODE E
SALES MODEL CODE 14047
DEALER NO. 1029
FINAL ASSEMBLY:
LANSING, MI U.S.A.

VIN 1G1FA1RX8H0113026

DEALER TO WHOM DELIVERED
FAIRFIELD CHEVROLET-CADILLAC
400 N. DERR DRIVE, PO BOX 388
LEWISBURG, PA 17837-0388

LY
1GA1229899

102 Monroney Label

Seats and Restraints 57

Head Restraints

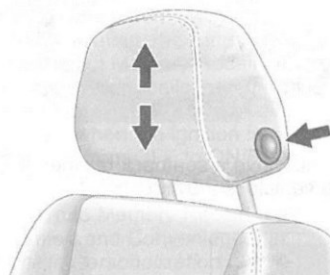
The vehicle's front seats have adjustable head restraints in the outboard seating positions.

Warning

With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.



Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chance of a neck injury in a crash.



To raise or lower the head restraint, press the button located on the side of the head restraint, and pull up or push the head restraint down, and release the button. Pull and push on the head restraint after the button is released to make sure that it is locked in place.

The front outboard head restraints are not removable.

Front Seats

Power Seat Adjustment



To adjust a power seat:

- Move the seat forward or rearward by sliding the horizontal control forward or rearward.
- Raise or lower the front part of the seat cushion by moving the front of the horizontal control up or down.
- Raise or lower the entire seat by moving the entire horizontal control up or down.

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

Head Restraints

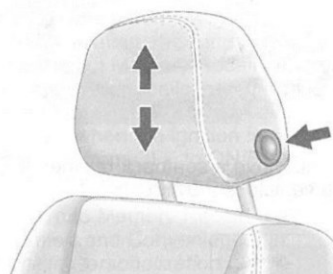
The vehicle's front seats have adjustable head restraints in the outboard seating positions.

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Power Seat Adjustment



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- Raise or lower the entire seat by moving the entire horizontal control up or down.

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

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1	Driver Head Acceleration (X) Primary vs. Time	B-5
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration (Z) Primary vs. Time	B-5
4	Driver Head Resultant Acceleration Primary vs. Time	B-5
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-6
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-6
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-6
8	Driver Thorax Rib Deflection Maximum vs. Time	B-6
9	Driver Anterior Abdominal Force (Y) vs. Time	B-7
10	Driver Middle Abdominal Force (Y) vs. Time	B-7
11	Driver Posterior Abdominal Force (Y) vs. Time	B-7
12	Driver Total Abdominal Force (Y) vs. Time	B-7
13	Driver Pubic Symphysis Force (Y) vs. Time	B-8
14	Passenger Head Acceleration (X) Primary vs. Time	B-8
15	Passenger Head Acceleration (Y) Primary vs. Time	B-8
16	Passenger Head Acceleration (Z) Primary vs. Time	B-8
17	Passenger Head Resultant Acceleration Primary vs. Time	B-9
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-9
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-9
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-9
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-10
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-10
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-10
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-10

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

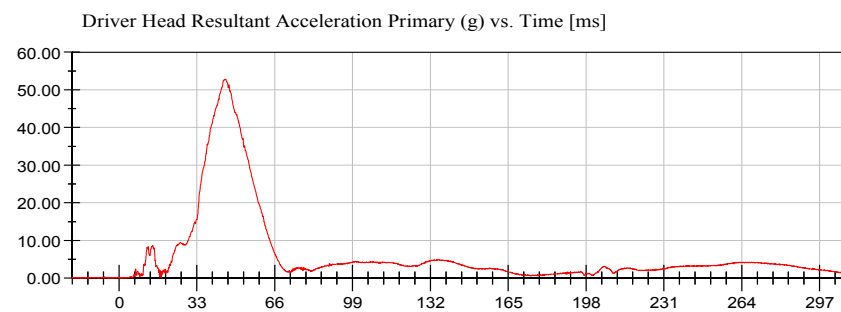
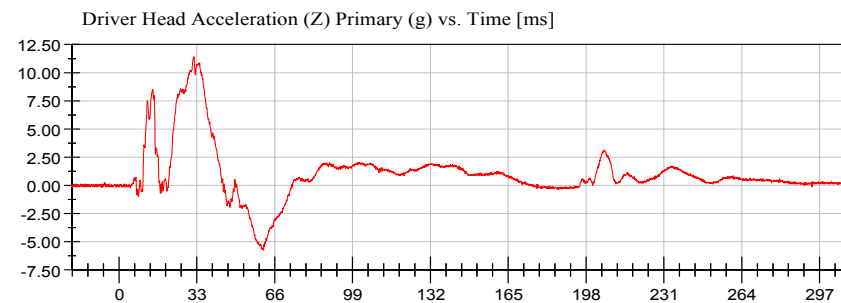
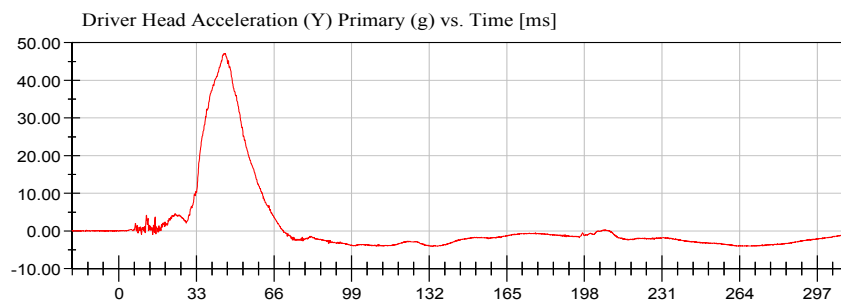
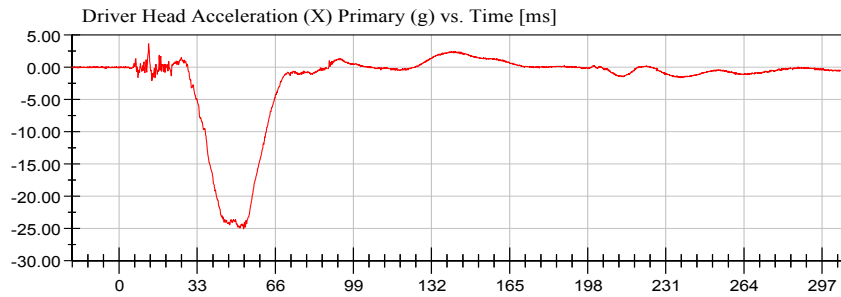
NHTSA

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

Test Date: 10/06/2016

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

Test Number: 161006 (M20170115)



NHTSA

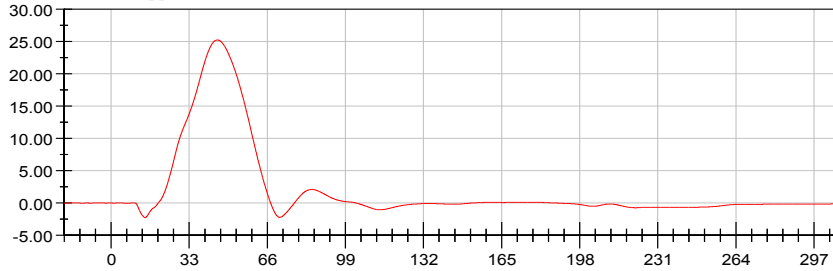
Position #1 ES-2 Dummy with Rib Extension (F030)

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

Test Number: 161006 (M20170115)

Test Date: 10/06/2016

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



<Max>

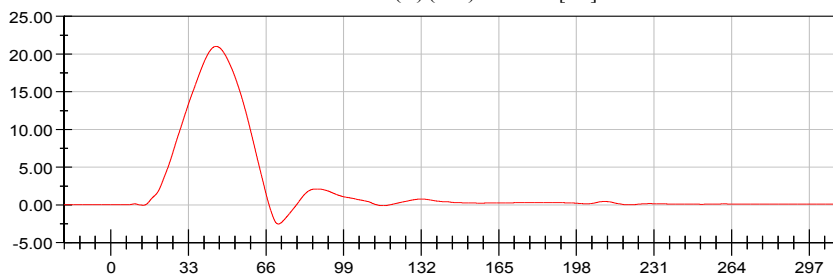
25.25 mm at 44.96 ms

<Min>

-2.24 mm at 14.32 ms

CFC_180

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



<Max>

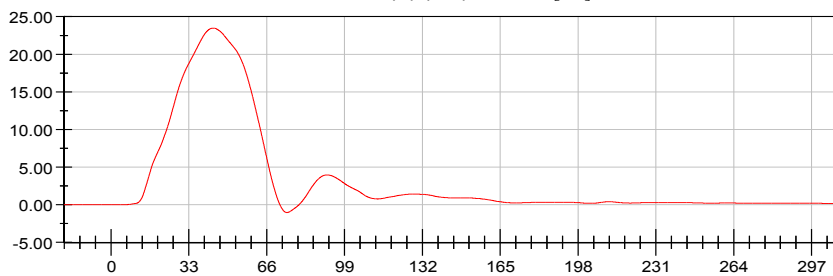
21.02 mm at 44.72 ms

<Min>

-2.56 mm at 71.28 ms

CFC_180

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



<Max>

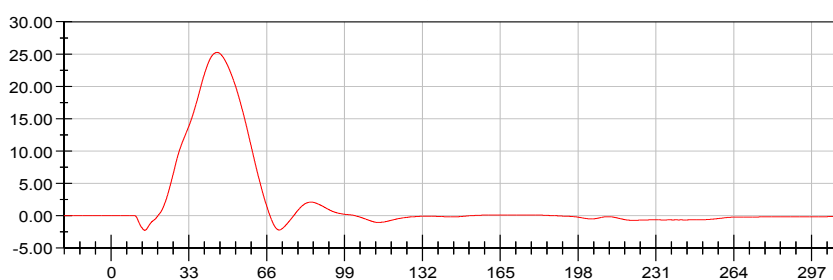
23.46 mm at 43.36 ms

<Min>

-1.03 mm at 74.56 ms

CFC_180

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



<Max>

25.25 mm at 44.96 ms

<Min>

-2.24 mm at 14.32 ms

CFC_180



NHTSA

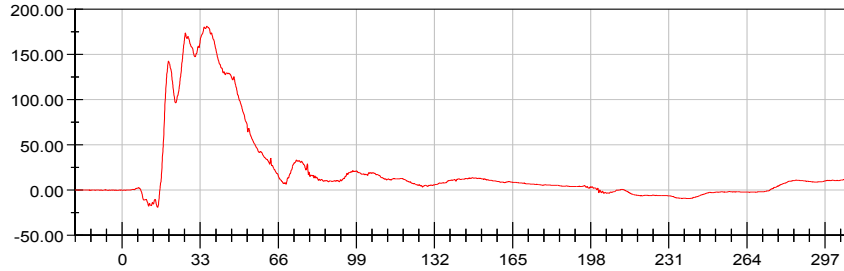
Position #1 ES-2 Dummy with Rib Extension (F030)

Test Date: 10/06/2016

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

Test Number: 161006 (M20170115)

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



<Max>

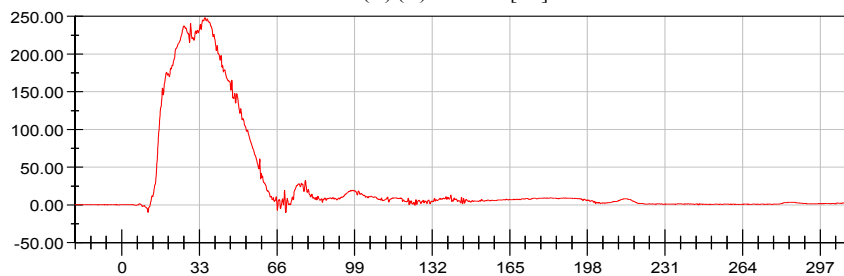
181.25 N at 35.84 ms

<Min>

-18.94 N at 15.04 ms

CFC_600

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



<Max>

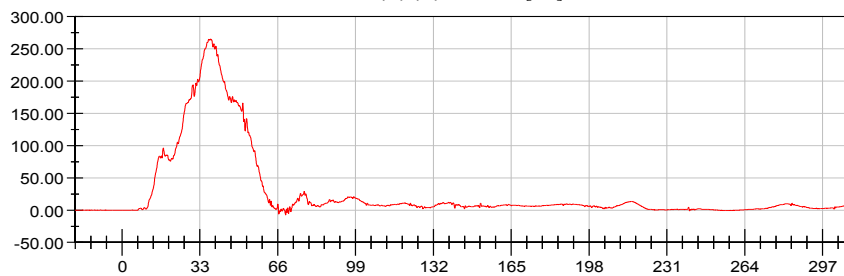
248.41 N at 35.28 ms

<Min>

-10.35 N at 69.68 ms

CFC_600

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



<Max>

265.11 N at 37.60 ms

<Min>

-7.63 N at 69.36 ms

CFC_600

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



<Max>

687.63 N at 36.64 ms

<Min>

-19.37 N at 11.12 ms

CFC_600

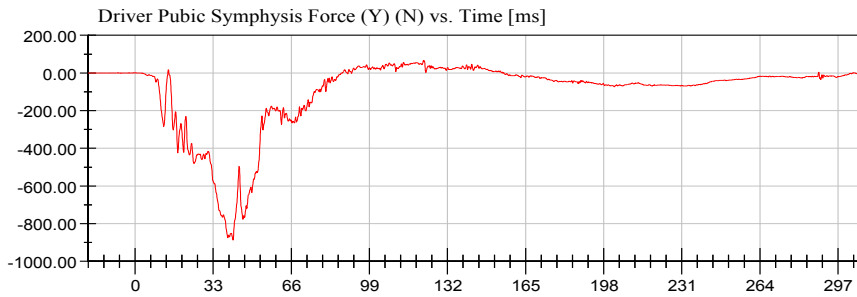


NHTSA

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)
Test Number: 161006 (M20170115)

Test Date: 10/06/2016

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



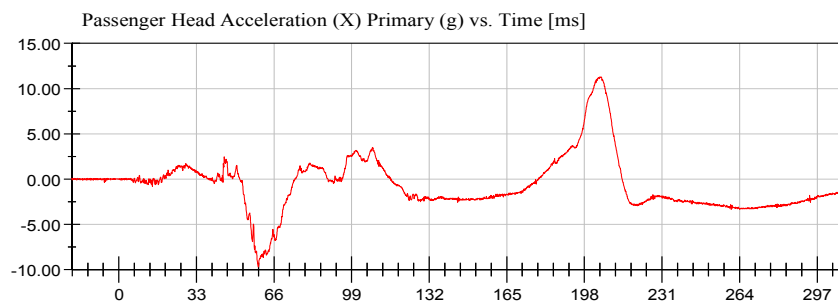
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67.02 N at 121.84 ms

<Min>

-886.67 N at 41.36 ms

CFC_600



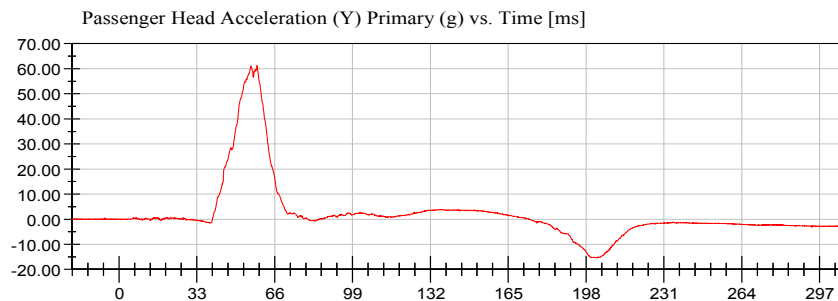
<Max>

11.29 g at 204.48 ms

<Min>

-9.74 g at 59.28 ms

CFC_1000



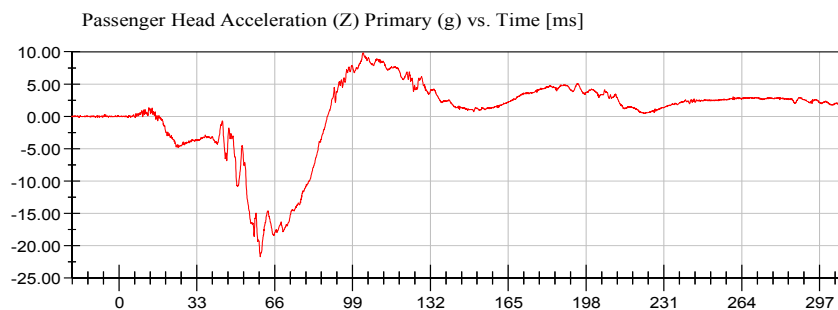
<Max>

61.32 g at 58.56 ms

<Min>

-15.43 g at 202.08 ms

CFC_1000



<Max>

9.84 g at 103.52 ms

<Min>

-21.71 g at 59.92 ms

CFC_1000



NHTSA

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

Test Date: 10/06/2016

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

Test Number: 161006 (M20170115)

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



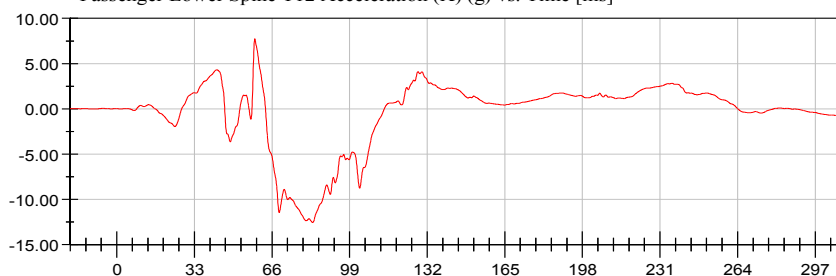
<Max>

64.38 g at 58.64 ms

<Min>

0.04 g at -19.68 ms

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



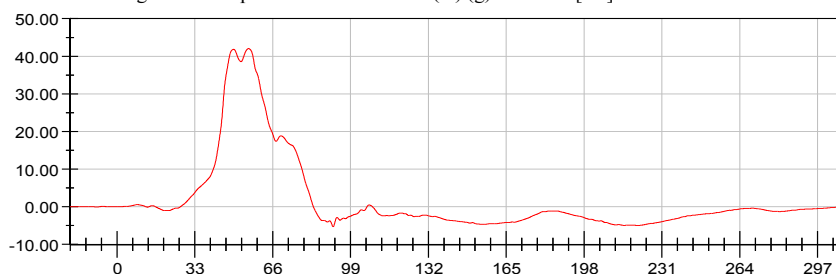
<Max>

7.73 g at 58.64 ms

<Min>

-12.57 g at 83.28 ms

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



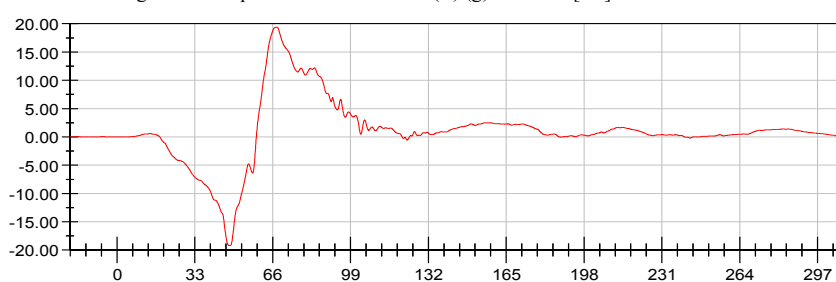
<Max>

42.05 g at 55.76 ms

<Min>

-5.32 g at 91.60 ms

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



<Max>

19.39 g at 67.76 ms

<Min>

-19.20 g at 48.08 ms



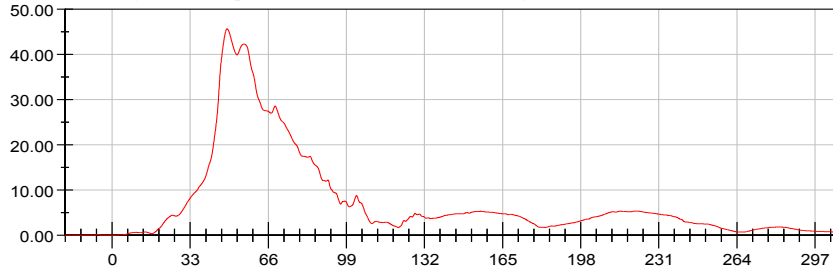
NHTSA

Test Lab: Transportation Research Center, Inc. Position #4 SID IIs Dummy (305)
Test Number: 161006 (M20170115)

Test Date: 10/06/2016

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

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



<Max>

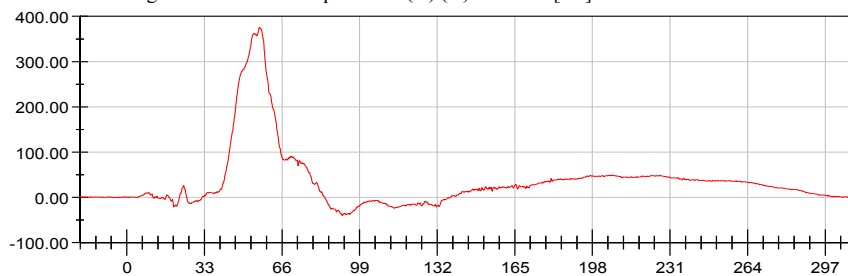
45.71 g at 48.56 ms

<Min>

0.01 g at -7.44 ms

CFC_180

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



<Max>

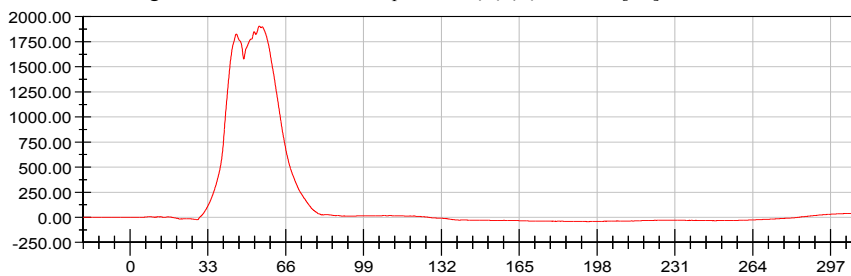
375.64 N at 56.40 ms

<Min>

-40.61 N at 91.60 ms

CFC_600

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



<Max>

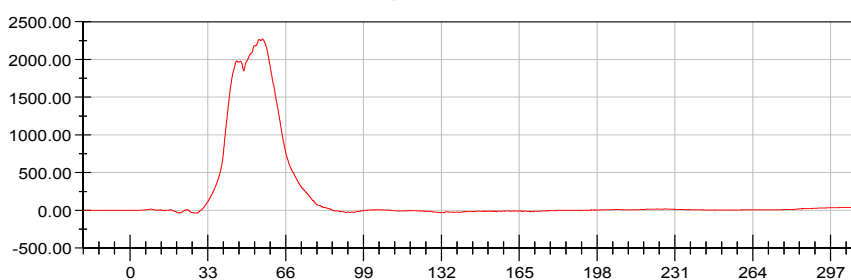
1,906.25 N at 54.80 ms

<Min>

-42.80 N at 193.92 ms

CFC_600

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



<Max>

2,271.70 N at 56.16 ms

<Min>

-36.09 N at 21.04 ms

CFC_600



APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

Table 1. External Measurements

Table 2. Head Drop Test

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 Neck Pendulum Test

Pendulum Velocity (m/s) vs. Time (ms)
Flexion Angle (°) vs. Time (ms)
Potentiometer A (°) vs. Time (ms)
Potentiometer B (°) vs. Time (ms)
Potentiometer C (°) vs. Time (ms)

Table 4. Shoulder Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Table 5. Thorax – Upper Rib Drop Test

Upper Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Upper Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 6. Thorax – Middle Rib Drop Test

Middle Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Middle Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 7. Thorax – Lower Rib Drop Test

Lower Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
Lower Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

Table 8. Thorax – Full Body Impact Test

Pendulum Acceleration (G's) vs. Time (ms)
Impactor Force (kN) vs. Time (ms)
Upper Rib Displacement (mm) vs. Time (ms)
Middle Rib Displacement (mm) vs. Time (ms)
Lower Rib Displacement (mm) vs. Time (ms)

Table 9. Abdomen Impact Test

Impactor Force (kN) vs. Time (ms)
Front Abdomen Force (kN) vs. Time (ms)
Middle Abdomen Force (kN) vs. Time (ms)
Rear Abdomen Force (kN) vs. Time (ms)
Total Abdomen Force (kN) vs. Time (ms)

Table 10. Lumbar Spine Flexion Test

Pendulum Velocity (m/s) vs. Time (ms)
Spine Flexion Angle (°) vs. Time (ms)
Potentiometer A (°) vs. Time (ms)
Potentiometer B (°) vs. Time (ms)
Potentiometer C (°) vs. Time (ms)

Table 11. Pelvis Impact Test

Pendulum Acceleration (G's) vs. Time (ms)
Impactor Force (kN) vs. Time (ms)
Pubic Symphysis (Y) Force (kN) vs. Time (ms)

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Table 1. External Measurements

Table 2. Head Drop Test

- 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. 40

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	912	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	445	Yes
6	Head Width	152.0 - 158.0	155	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	365	Yes
11	Head Depth	196.0 - 206.0	204	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

Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 40-2

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Peak Resultant Acceleration	125 - 155 g	150.8 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	-12.2 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.06.2016 09:28:24 361

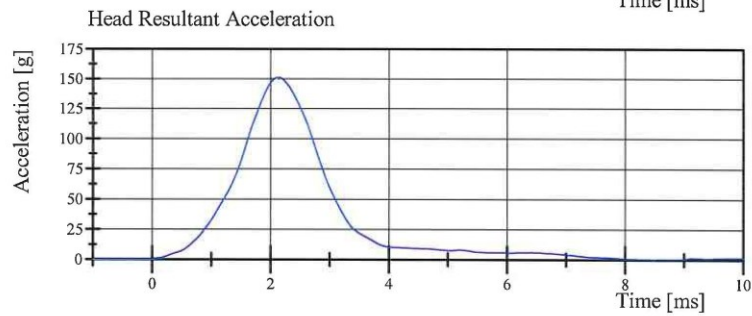
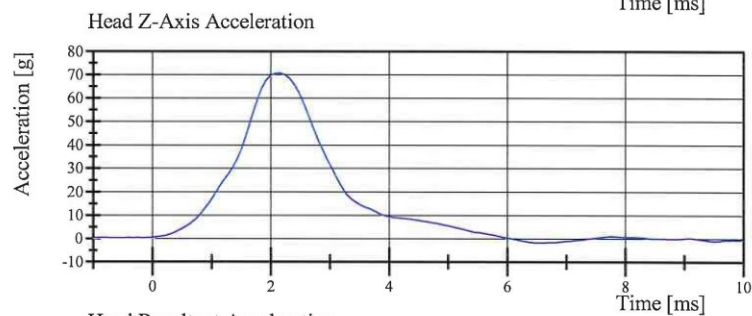
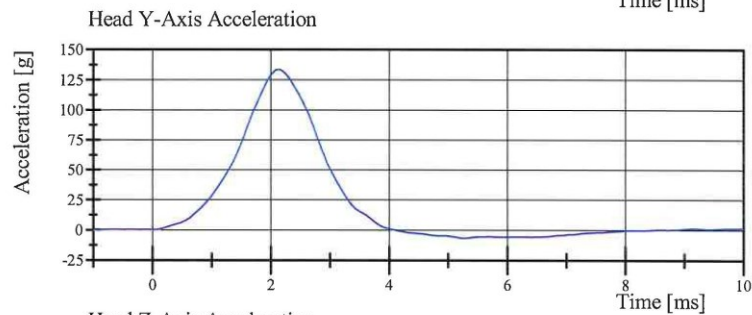
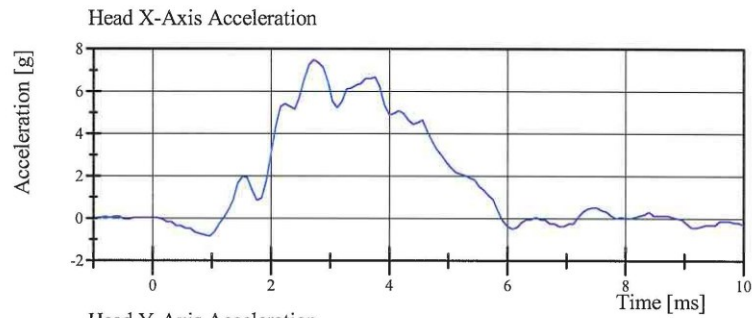


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 40-2

Test Date: 9/1/2016



Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.06.2016 09:28:32 361



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	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	-55.5 deg	Yes
Time of Peak	54 - 66 ms	55.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	67.4 ms	Yes

Test meets specifications.

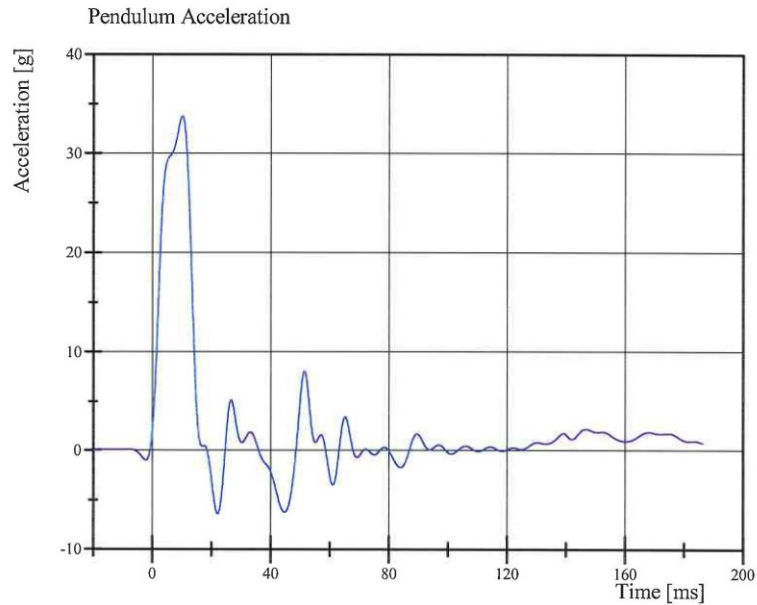
Comments:

Transportation Research Center Inc.

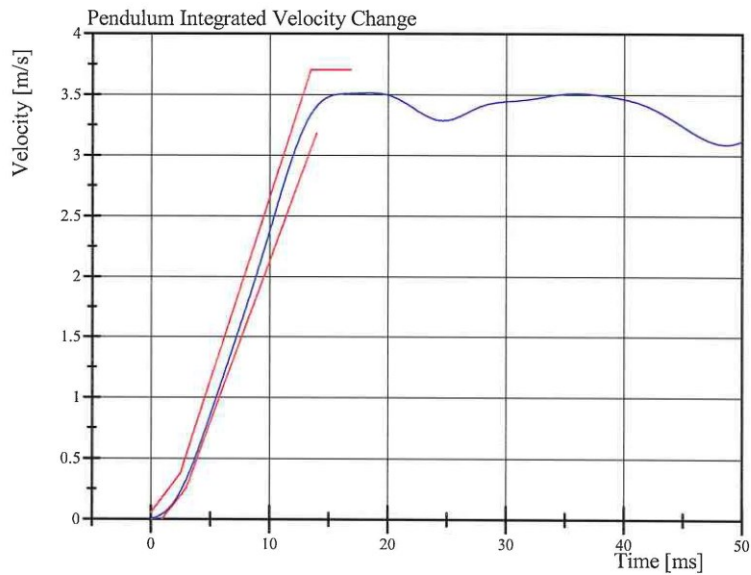
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016



Filter Class: CFC_60
Max: 33.7 g at 10.2 ms
Min: -6.5 g at 22.2 ms



Filter Class: CFC_60
Max: 3.5 m/s at 18.5 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:08:57 1495

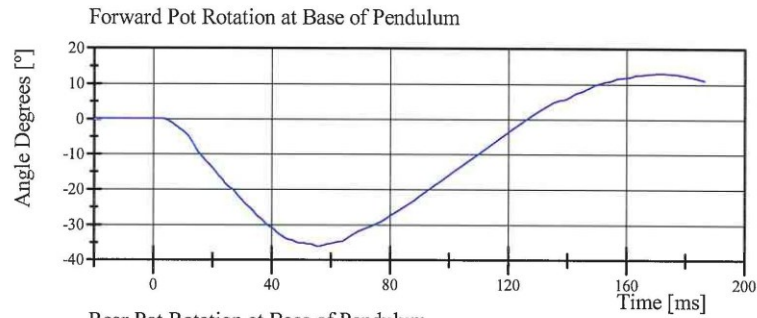


Transportation Research Center Inc.

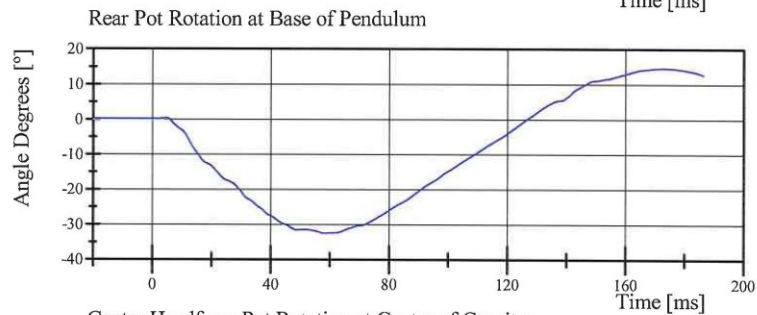
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 40-1

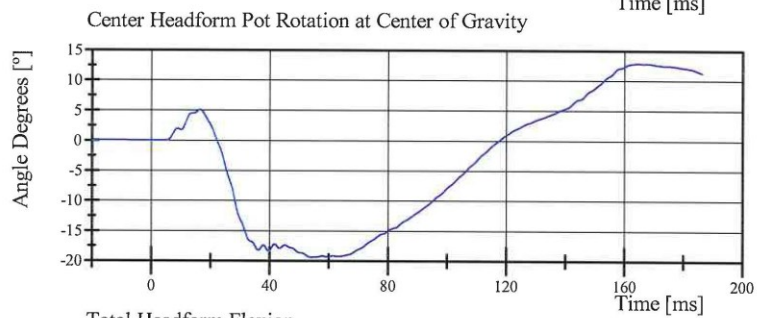
Test Date: 9/1/2016



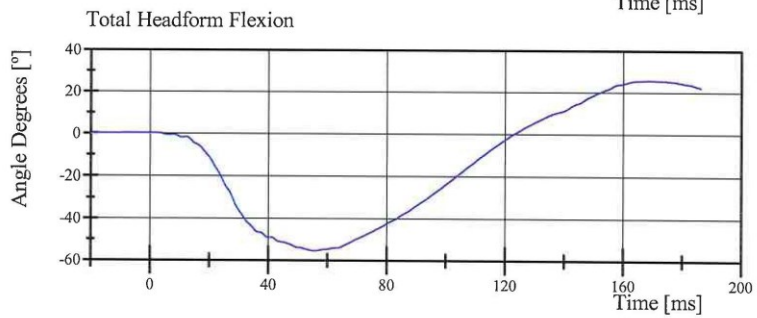
Filter Class: CFC_180
Max: 13.0 ° at 171.9 ms
Min: -36.1 ° at 55.8 ms



Filter Class: CFC_180
Max: 14.6 ° at 172.7 ms
Min: -32.6 ° at 58.6 ms



Filter Class: CFC_180
Max: 12.9 ° at 164.5 ms
Min: -19.5 ° at 54.2 ms



Filter Class: CFC_180
Max: 25.7 ° at 169.4 ms
Min: -55.5 ° at 55.7 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:08:58 1495



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.05 g	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 11:14:54 585

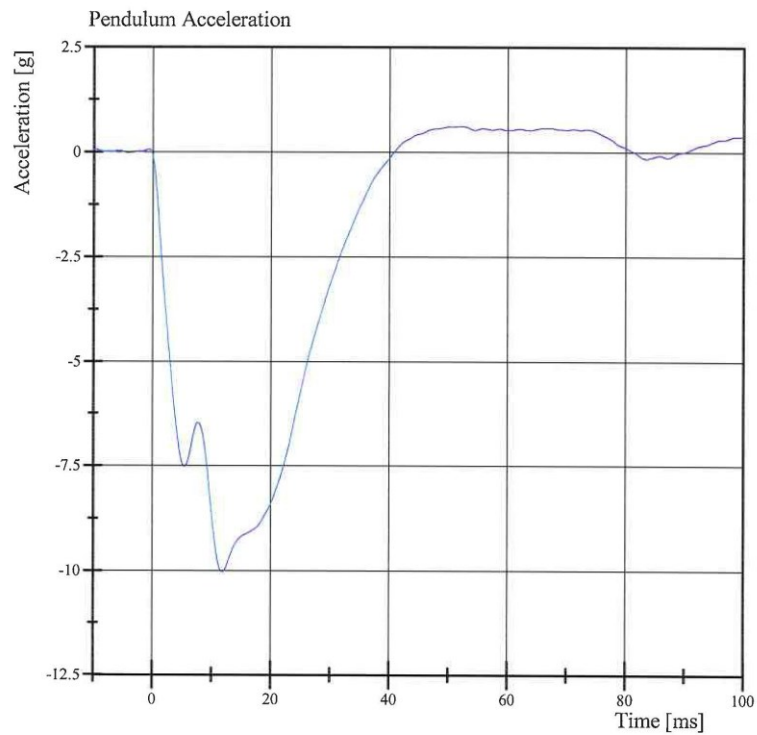


Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016



Filter Class: CFC_180
Max: 0.6 g at 52.1 ms
Min: -10.0 g at 11.8 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 11:15:04 585



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.5 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

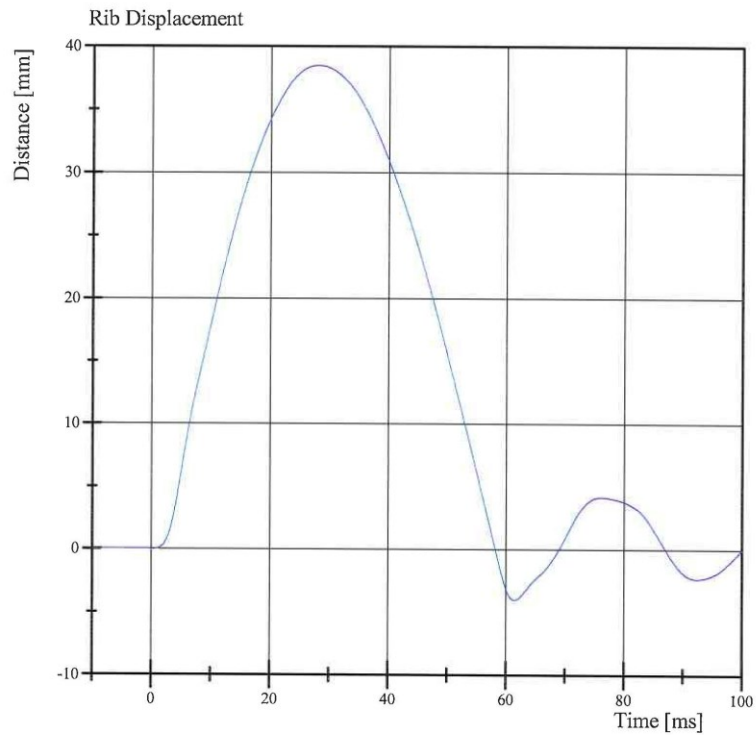
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:27:48 902



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 38.5 mm at 28.0 ms
Min: -4.0 mm at 61.4 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:27:58 902



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

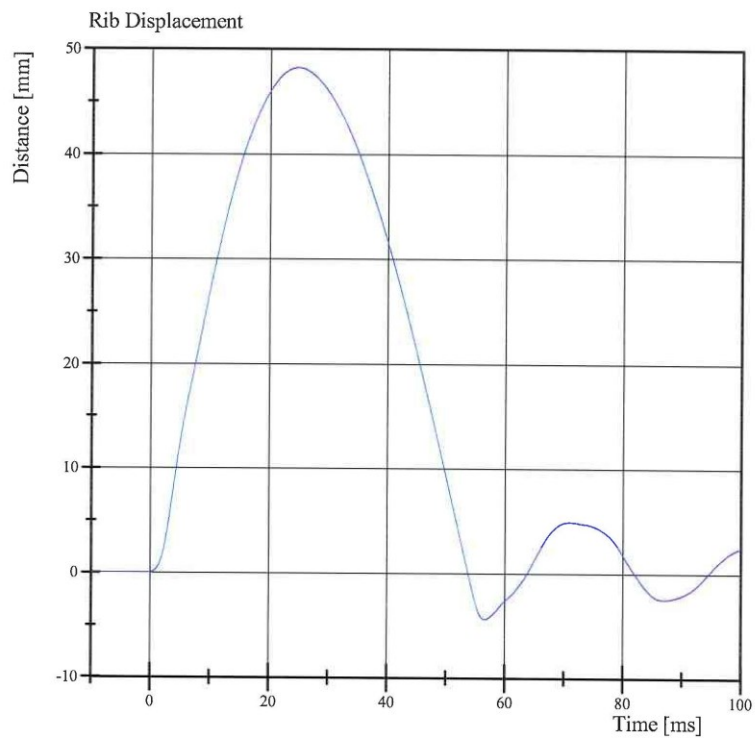
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:21:18 716



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 48.2 mm at 24.7 ms
Min: -4.4 mm at 56.6 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:21:29 716



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

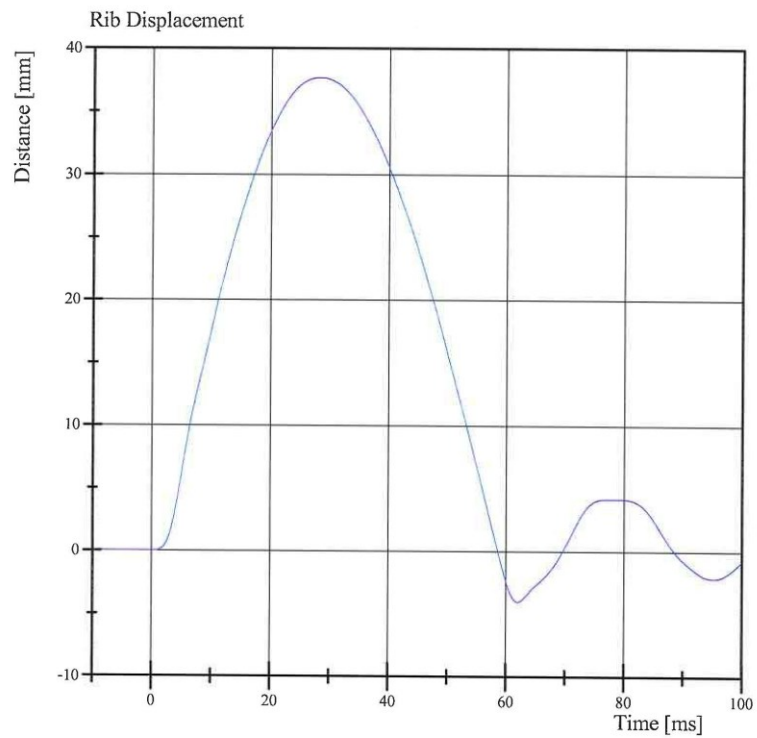
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:37:32 905



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 37.7 mm at 28.2 ms
Min: -4.0 mm at 62.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:37:44 905



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

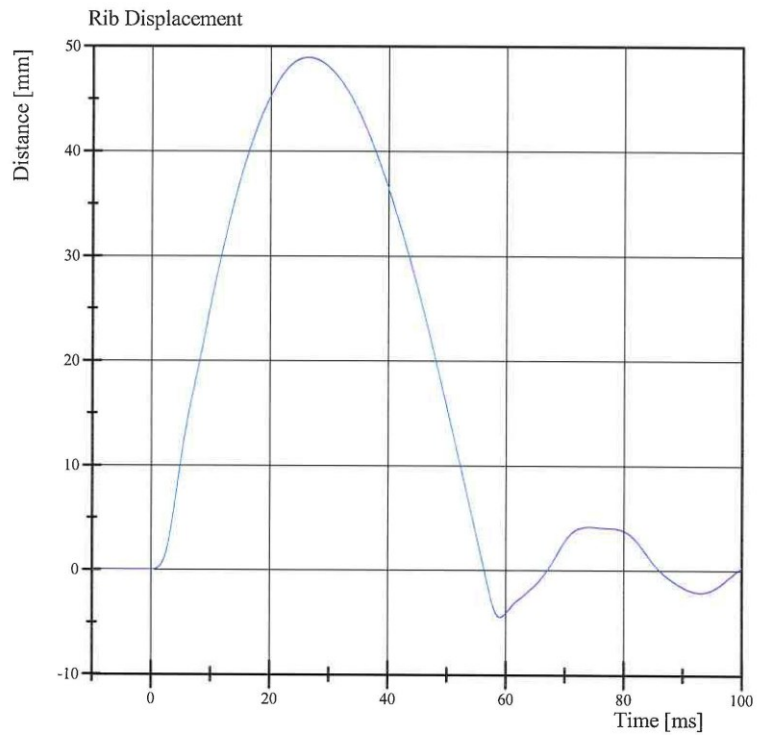
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:32:01 702



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 48.9 mm at 26.4 ms
Min: -4.5 mm at 59.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:32:12 702



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

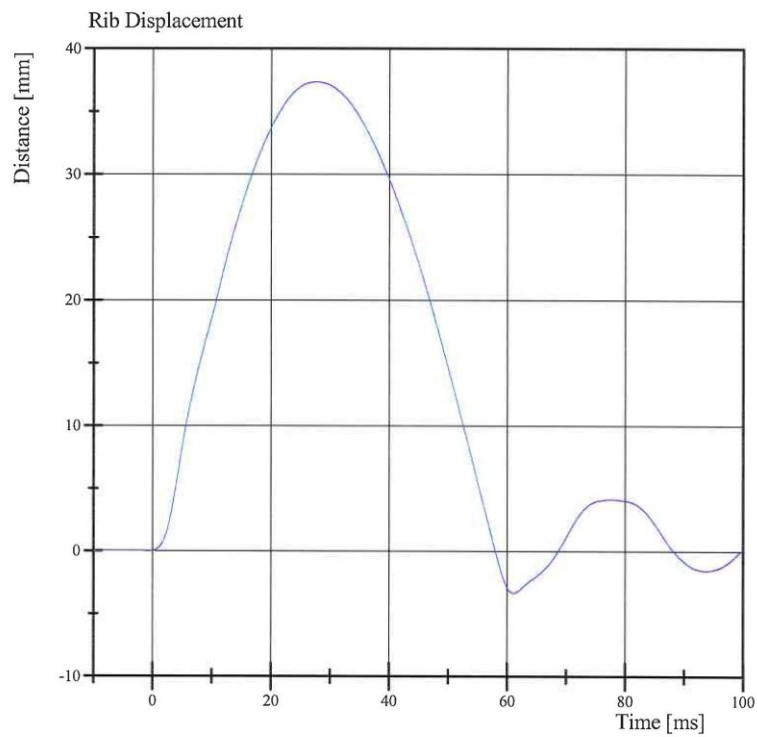
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:50:56 901



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 37.3 mm at 27.7 ms
Min: -3.3 mm at 61.1 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:51:06 901



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

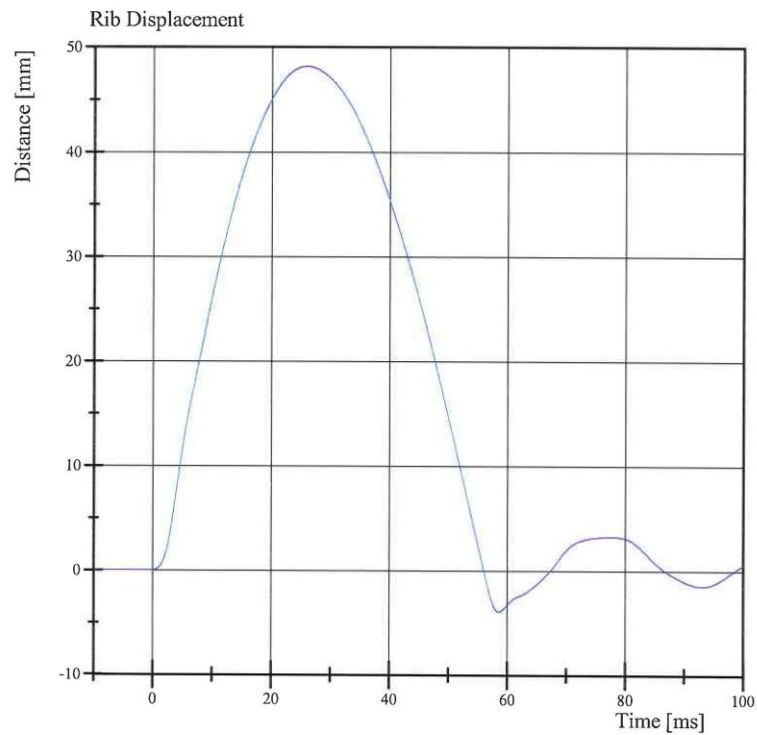
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:45:32 703



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 48.2 mm at 25.9 ms
Min: -3.9 mm at 58.6 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 09:45:42 703



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.557 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,313.1 N	Yes
Upper Rib Displacement	34 - 41 mm	38.3 mm	Yes
Center Rib Displacement	37 - 45 mm	41.1 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.9 mm	Yes

Test meets specifications.

Comments:

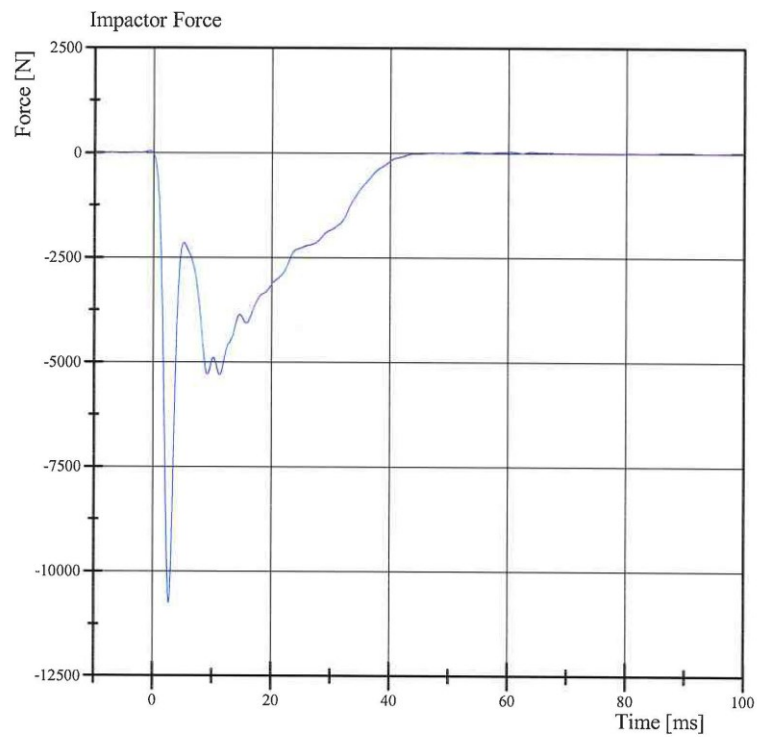
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 11:22:43 470



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 35.2 N at 60.4 ms
Min: -10,771.5 N at 2.7 ms

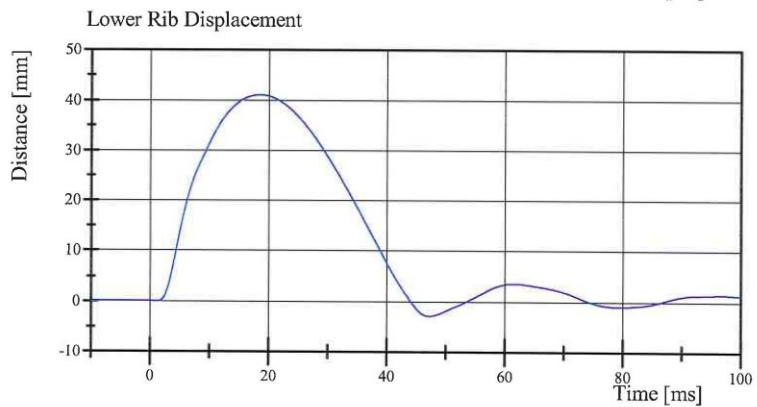
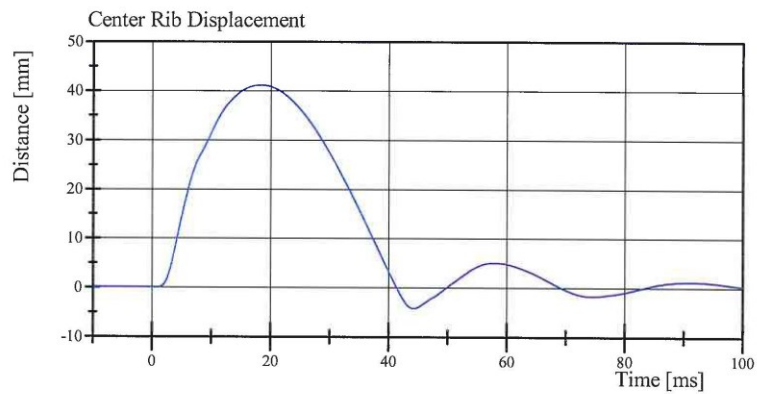
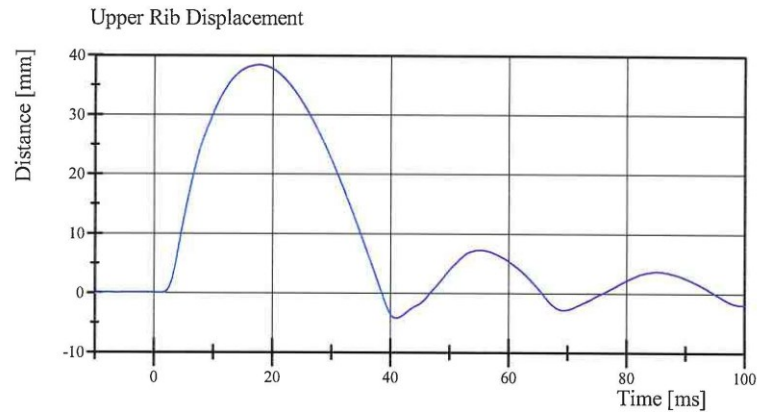
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 11:23:09 470



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 40-1
Test Date: 9/1/2016



Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 11:23:10 470



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.05 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,076.9 N	Yes
Time of Peak	10.6 - 13.0 ms	12.48 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,463.6 N	Yes
Time of Peak	10.0 - 12.3 ms	11.36 ms	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.06.2016 10:32:53 608

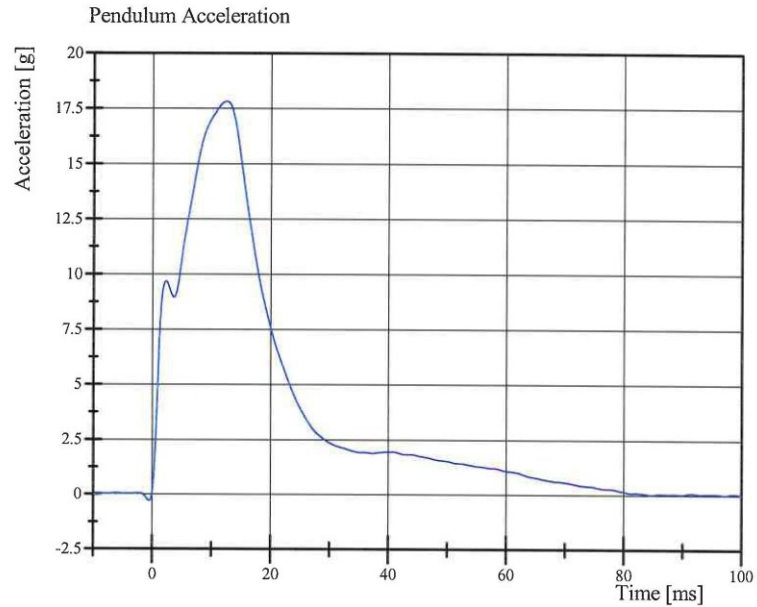


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 40-1

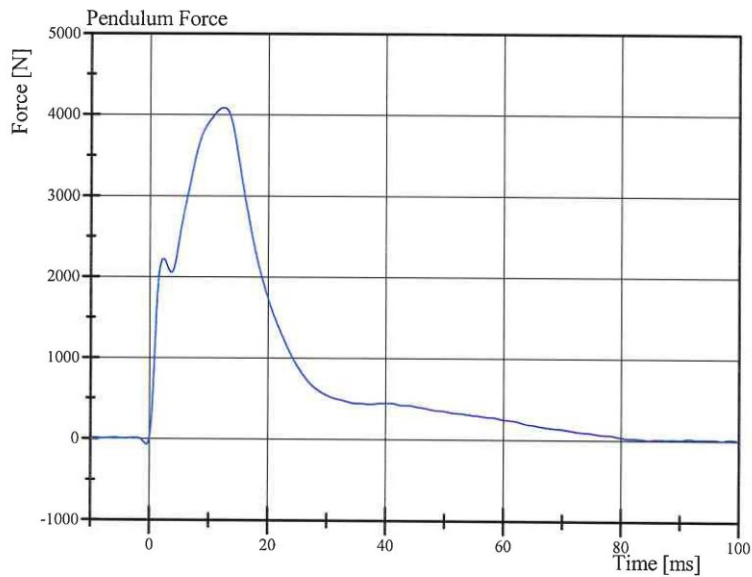
Test Date: 9/1/2016



Filter Class: CFC_180

Max: 17.8 g at 12.5 ms

Min: -0.3 g at -0.6 ms



Filter Class: CFC_180

Max: 4,076.9 N at 12.5 ms

Min: -75.4 N at -0.6 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.06.2016 10:33:10 608

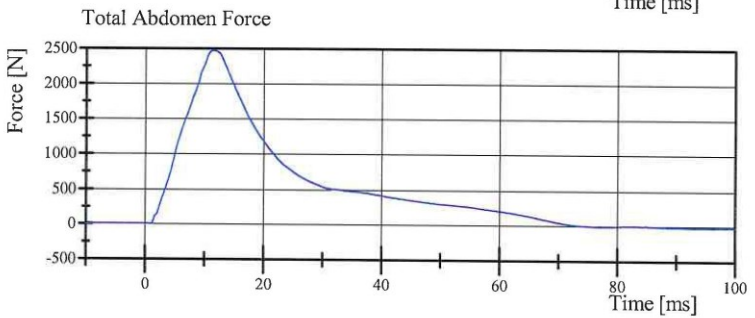
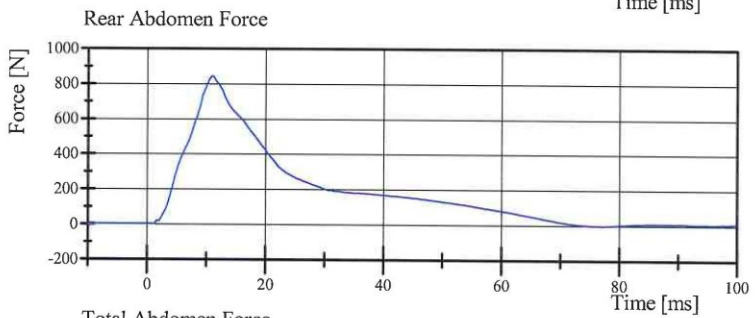
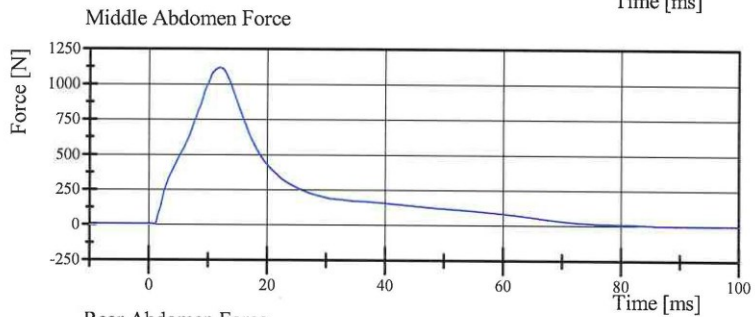
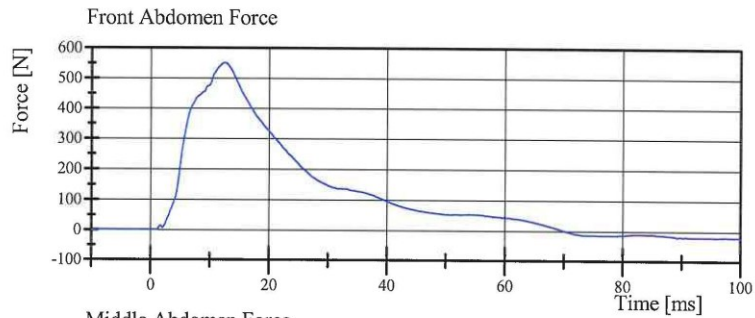


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016



Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.06.2016 10:33:10 608



Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.074 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-52.7 deg	Yes
Time of Peak	39 - 53 ms	44.6 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	38.8 ms	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 08:54:33 675

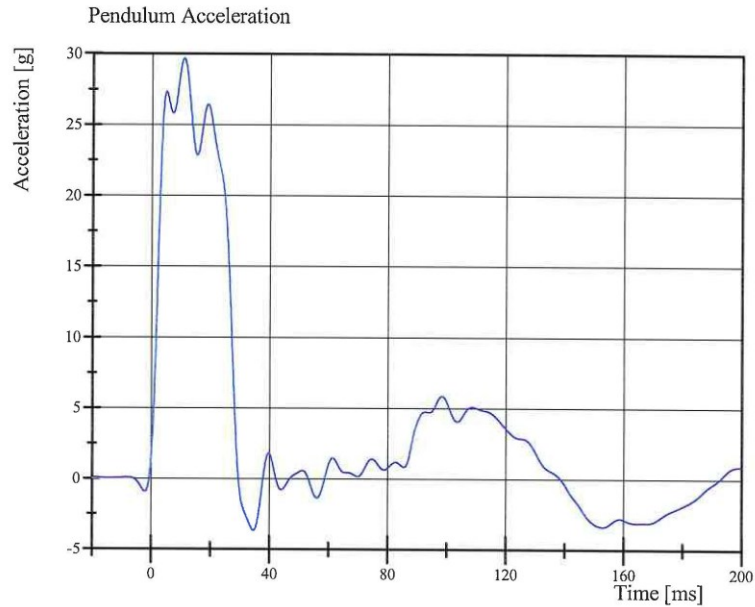


Transportation Research Center Inc.

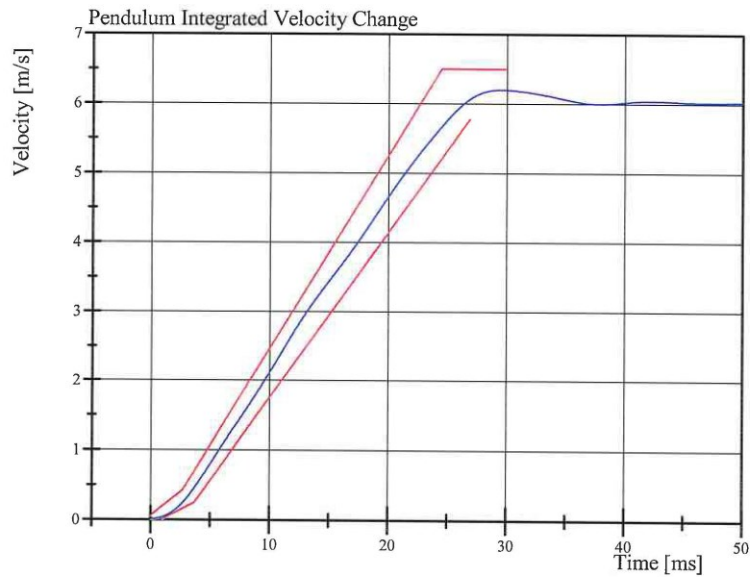
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 40-1

Test Date: 9/1/2016



Filter Class: CFC_60
Max: 29.6 g at 10.9 ms
Min: -3.7 g at 34.6 ms



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

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 08:54:39 675

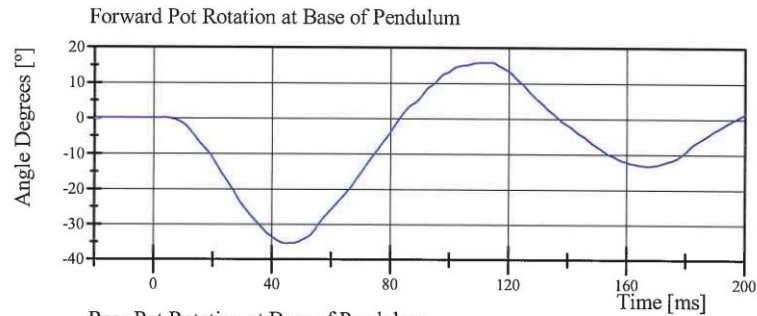


Transportation Research Center Inc.

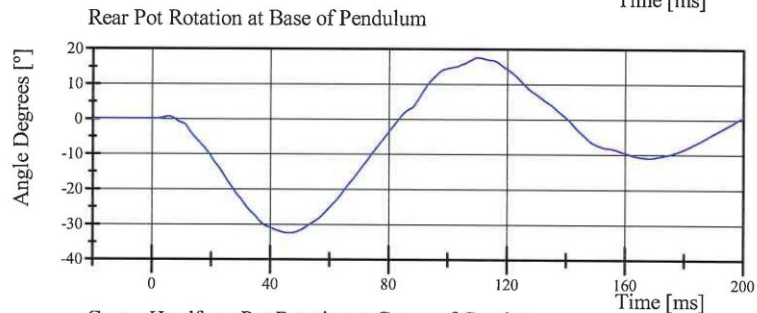
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 40-1

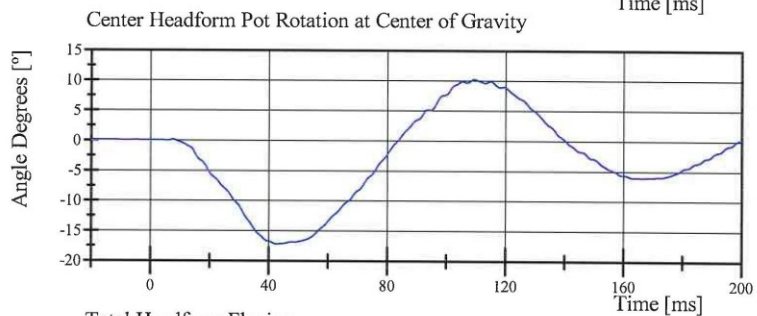
Test Date: 9/1/2016



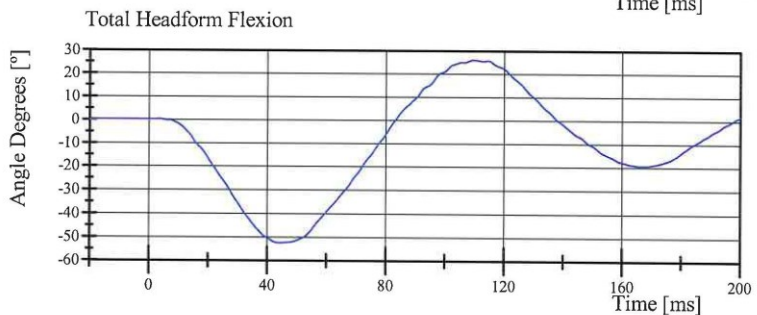
Filter Class: CFC_180
Max: 15.9 ° at 111.8 ms
Min: -35.5 ° at 44.7 ms



Filter Class: CFC_180
Max: 17.6 ° at 110.0 ms
Min: -32.5 ° at 46.6 ms



Filter Class: CFC_180
Max: 10.3 ° at 109.4 ms
Min: -17.3 ° at 42.6 ms



Filter Class: CFC_180
Max: 26.0 ° at 109.6 ms
Min: -52.7 ° at 44.6 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 08:54:39 675



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 40-2

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,228.9 N	Yes
Time of Peak	11.8 - 16.1 ms	14.40 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,297.8 N	Yes
Time of Peak	12.2 - 17.0 ms	13.84 ms	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 12:27:24 579

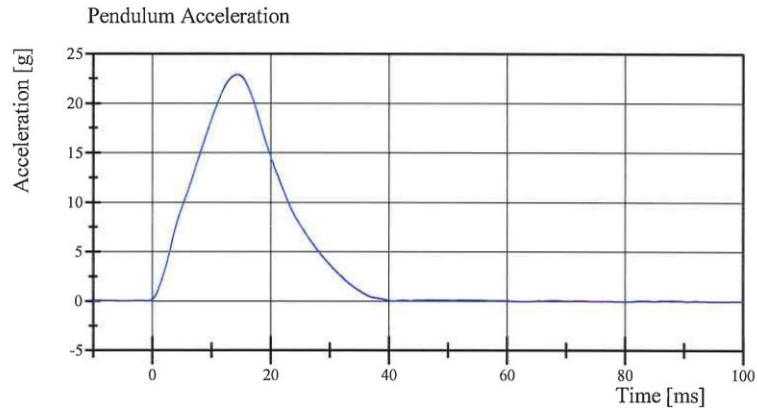


Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 40-2

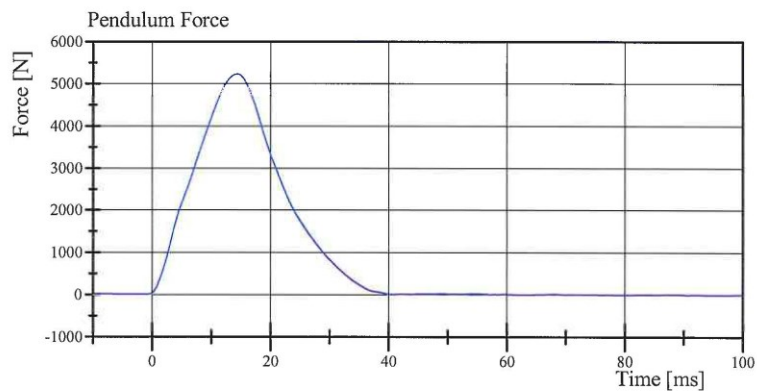
Test Date: 9/1/2016



Filter Class: CFC_180

Max: 22.8 g at 14.4 ms

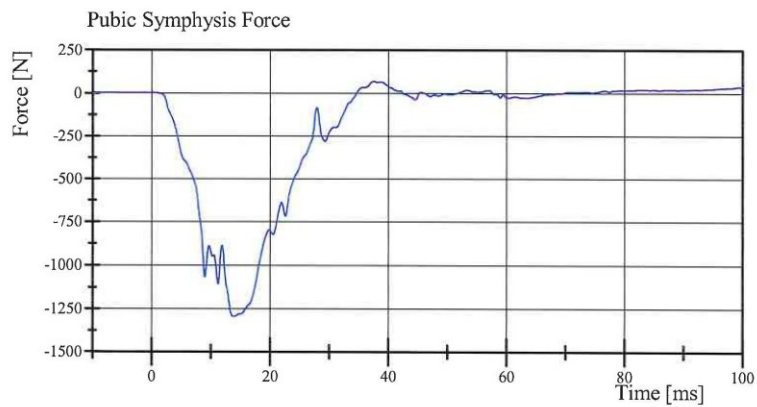
Min: -0.0 g at 62.1 ms



Filter Class: CFC_180

Max: 5,228.9 N at 14.4 ms

Min: -6.7 N at 62.1 ms



Filter Class: CFC_600

Max: 67.9 N at 37.5 ms

Min: -1,297.8 N at 13.8 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.01.2016 12:27:33 579



Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 41

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	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	155	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	365	Yes
11	Head Depth	196.0 - 206.0	204	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

Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Resultant Acceleration	125 - 155 g	139.8 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	9.3 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

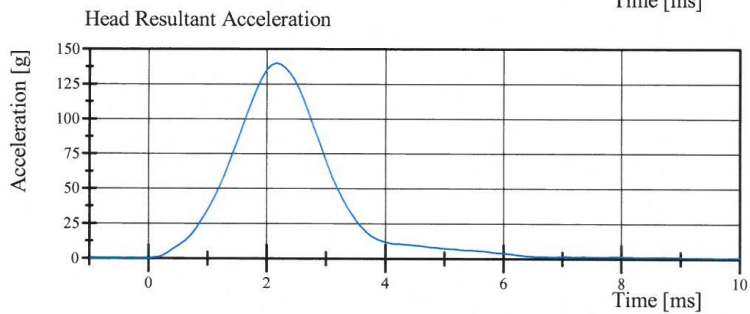
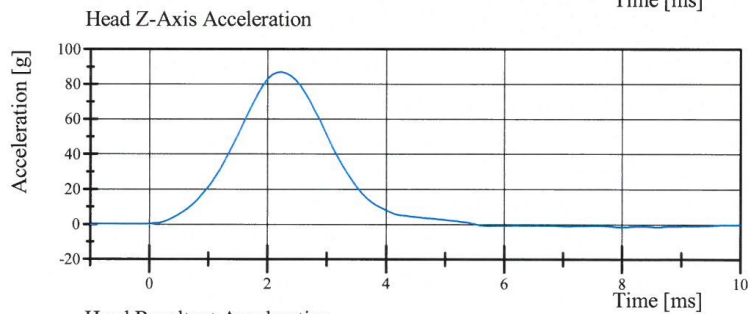
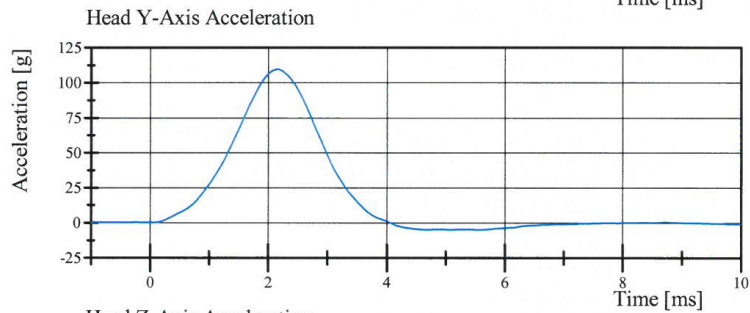
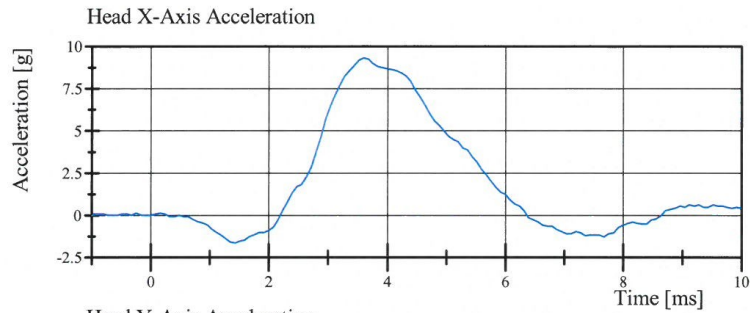
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 11:23:19 361



Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 11:23:29 361



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	52 %	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	-56.1 deg	Yes
Time of Peak	54 - 66 ms	55.1 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	66.6 ms	Yes

Test meets specifications.

Comments:

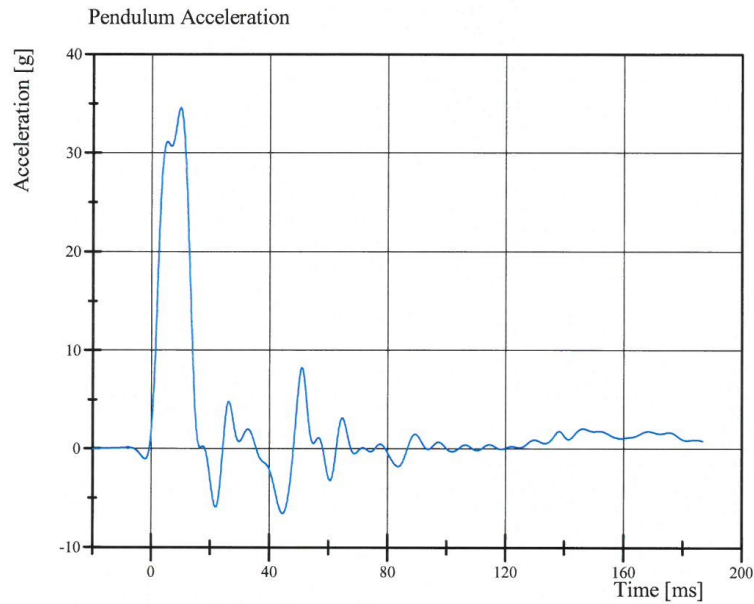
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 09:20:17 1489

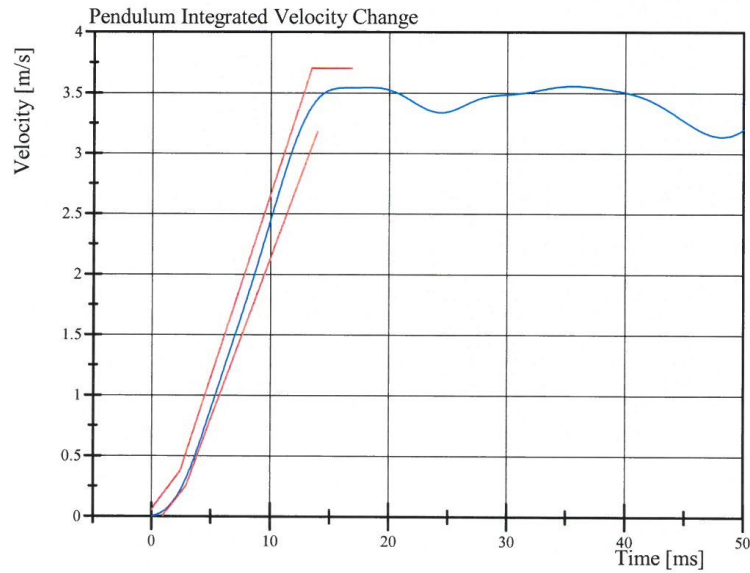


Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Filter Class: CFC_60
Max: 34.5 g at 9.9 ms
Min: -6.6 g at 44.6 ms



Filter Class: CFC_60
Max: 3.6 m/s at 35.6 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 09:20:27 1489

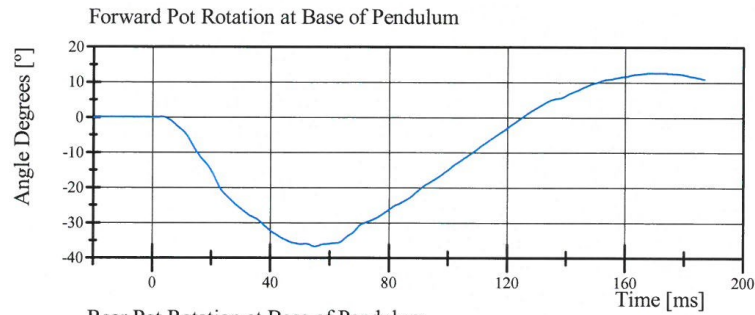


Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 41-1

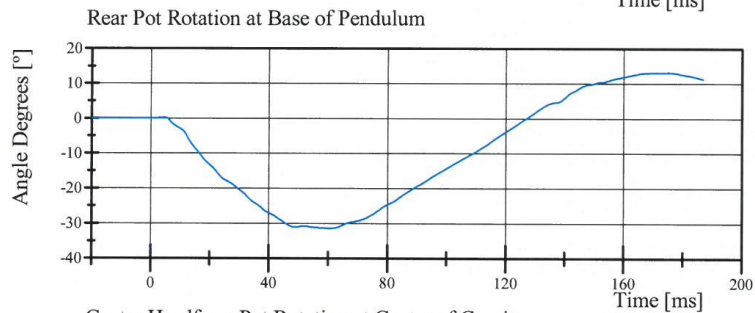
Test Date: 10/7/2016



Filter Class: CFC_180

Max: 12.7 ° at 168.6 ms

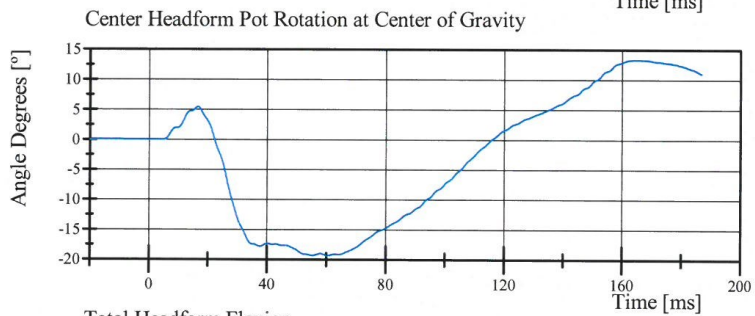
Min: -36.8 ° at 55.0 ms



Filter Class: CFC_180

Max: 13.2 ° at 175.2 ms

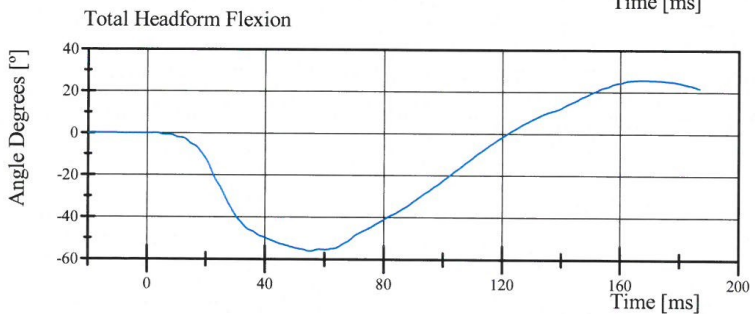
Min: -31.5 ° at 60.6 ms



Filter Class: CFC_180

Max: 13.4 ° at 164.6 ms

Min: -19.3 ° at 60.6 ms



Filter Class: CFC_180

Max: 26.0 ° at 168.0 ms

Min: -56.1 ° at 55.1 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 09:20:28 1489



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.66 g	Yes

Test meets specifications.

Comments:

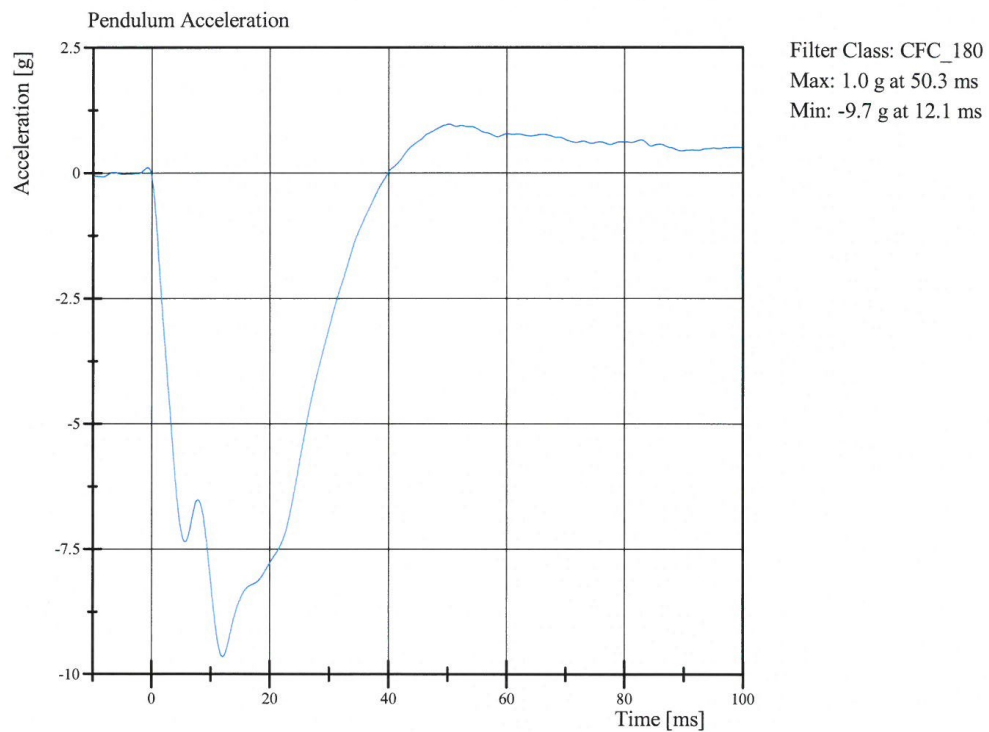
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:44:53 610



Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:45:06 610



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

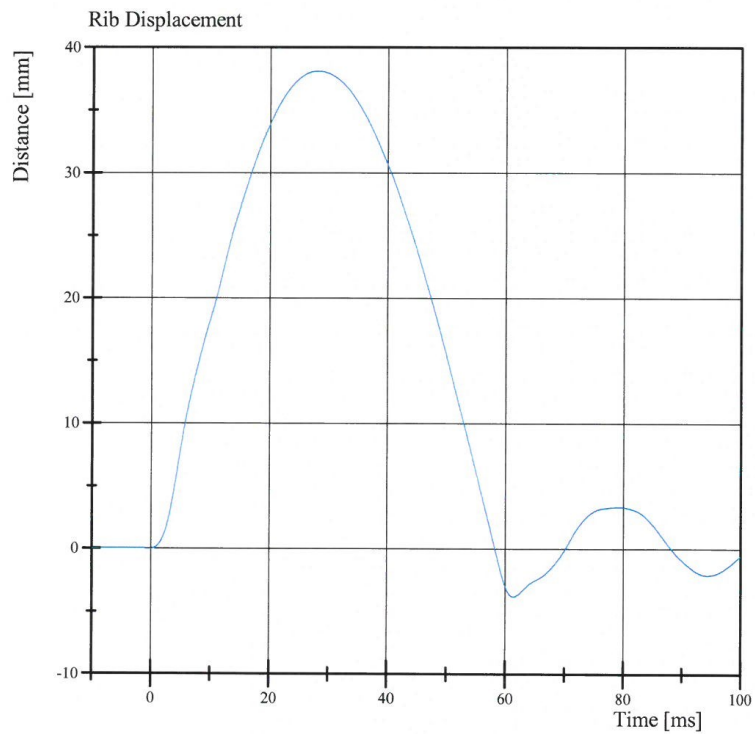
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:38:08 898



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 38.1 mm at 28.2 ms
Min: -3.8 mm at 61.4 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:38:19.898



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

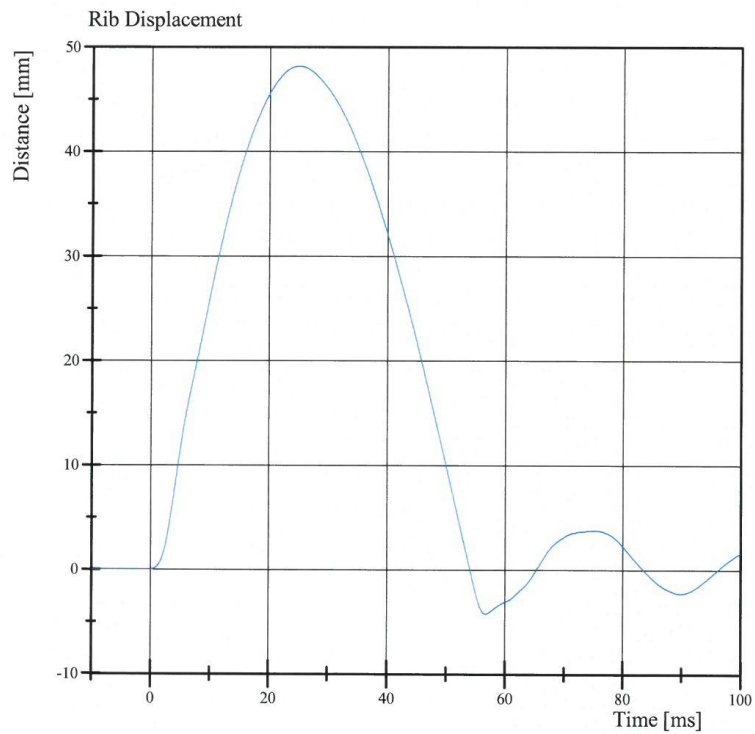
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:31:44 705



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 48.2 mm at 25.0 ms
Min: -4.2 mm at 56.7 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:31:53 705



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	53 %	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

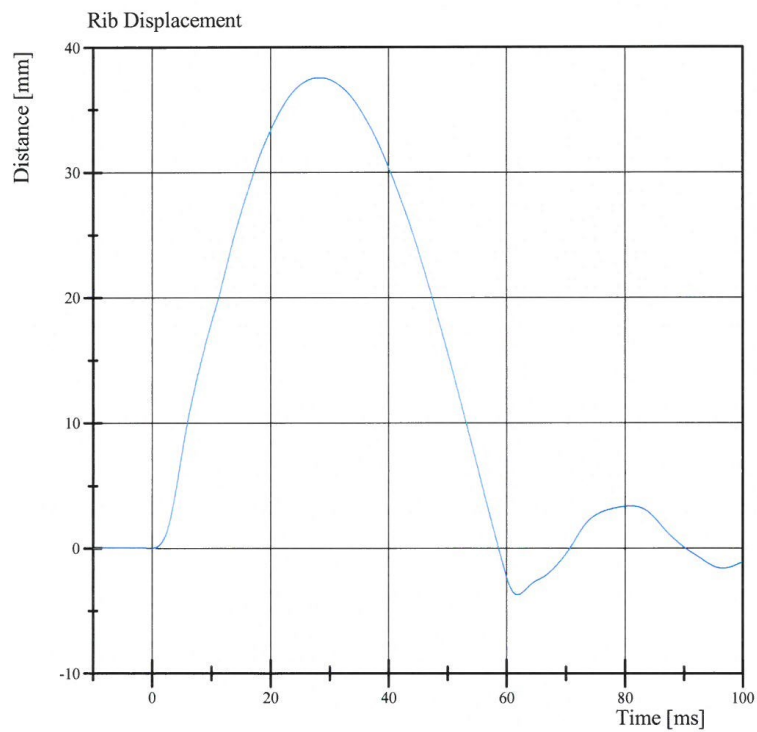
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:48:34 894



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 37.5 mm at 28.3 ms
Min: -3.7 mm at 61.8 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:48:46 894



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

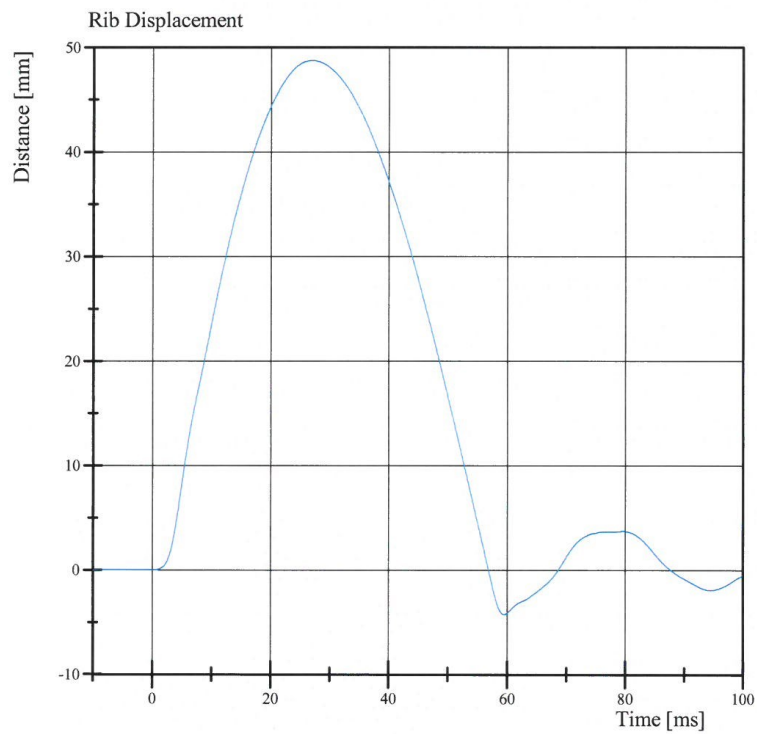
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:42:18 705



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 48.7 mm at 27.0 ms
Min: -4.2 mm at 59.5 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:42:36 705



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

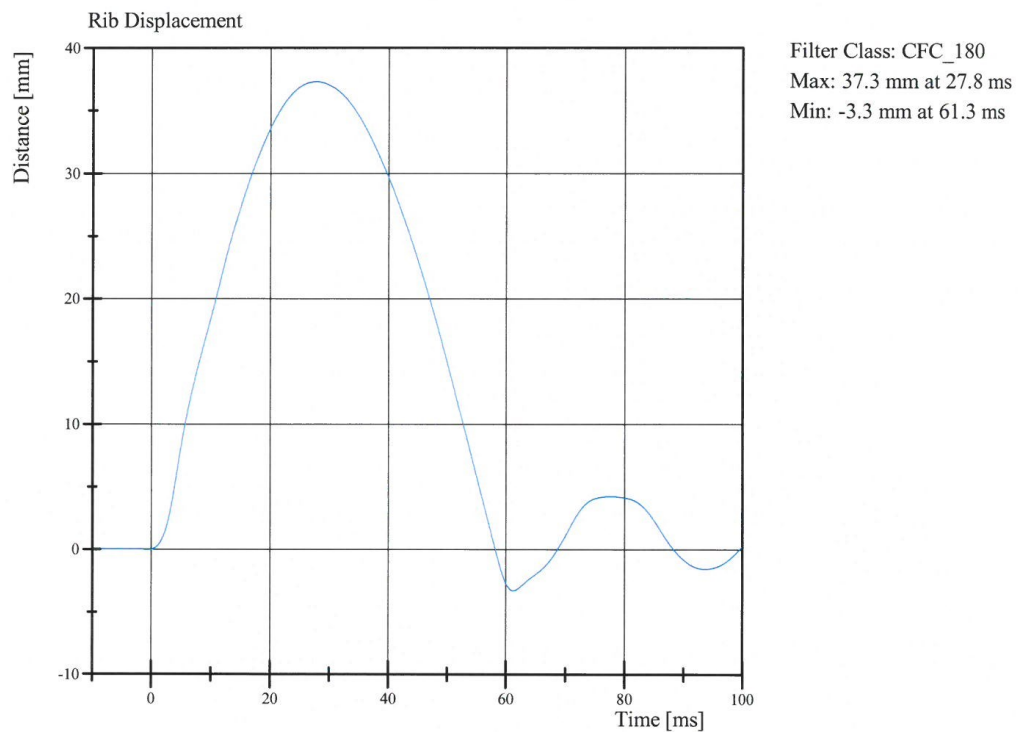
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:59:53 896



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 11:00:03 896



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

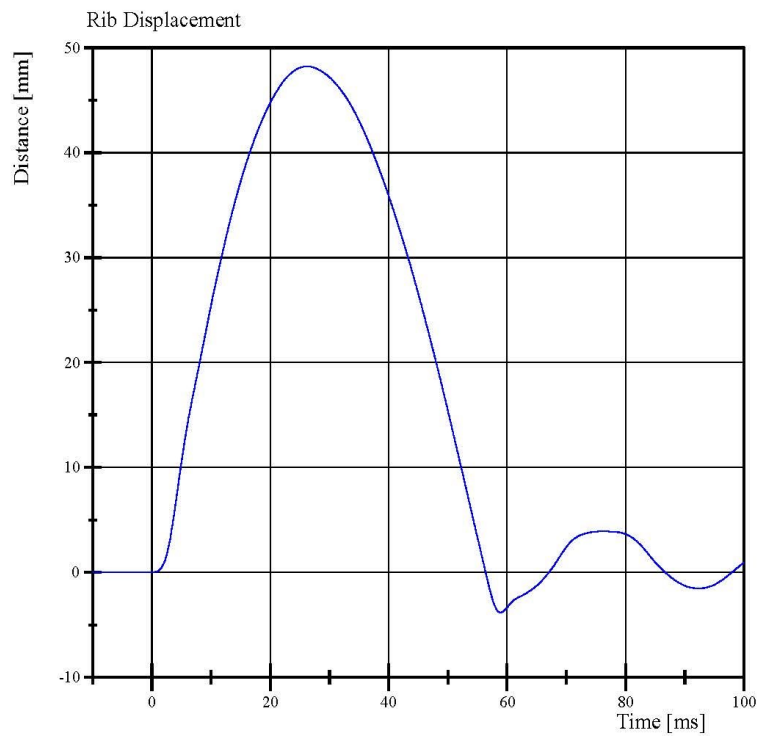
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:54:07 704



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 48.2 mm at 26.2 ms
Min: -3.8 mm at 58.9 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 10:54:19 704



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.507 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-6,061.6 N	Yes
Upper Rib Displacement	34 - 41 mm	36.8 mm	Yes
Center Rib Displacement	37 - 45 mm	39.7 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.3 mm	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:52:19 495

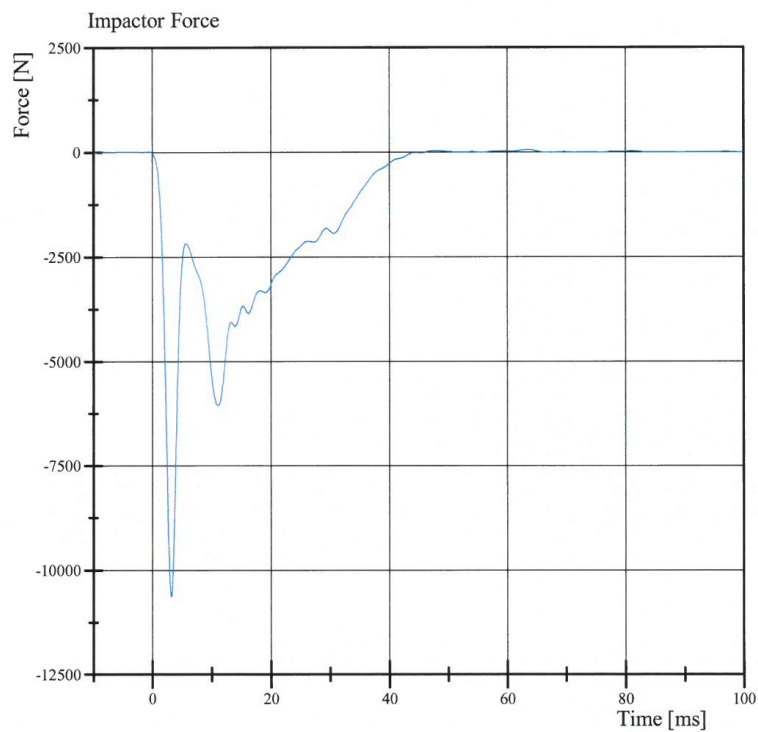


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016



Filter Class: CFC_180

Max: 58.2 N at 63.5 ms

Min: -10,652.4 N at 3.2 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:52:34 495

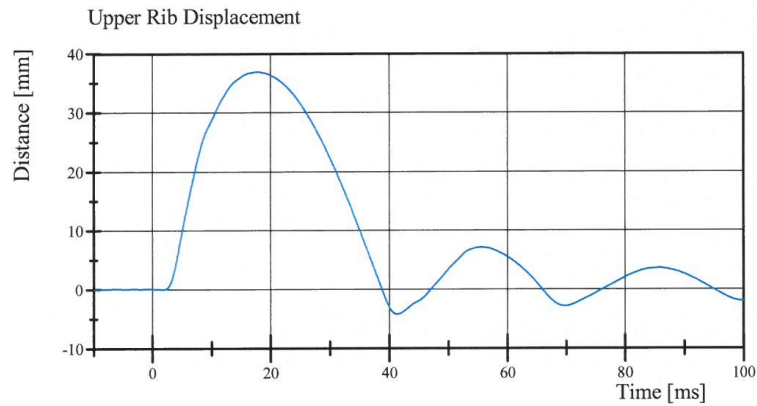


Transportation Research Center Inc.

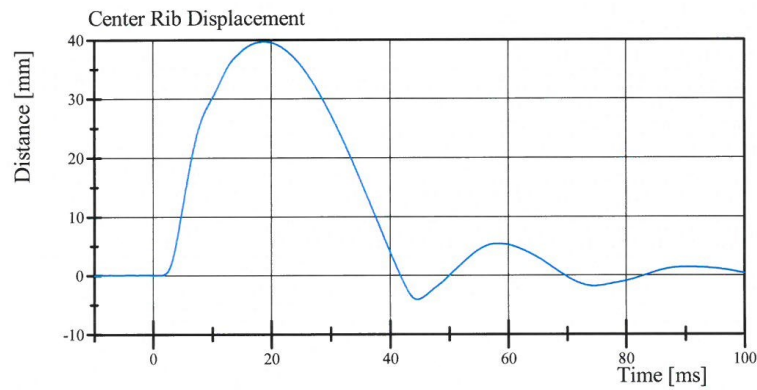
Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 41-1

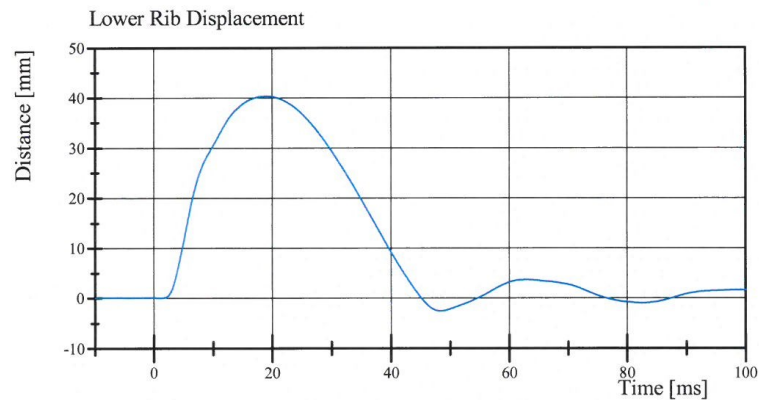
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 36.8 mm at 17.8 ms
Min: -4.3 mm at 41.3 ms



Filter Class: CFC_180
Max: 39.7 mm at 18.8 ms
Min: -4.1 mm at 44.6 ms



Filter Class: CFC_180
Max: 40.3 mm at 19.0 ms
Min: -2.6 mm at 48.3 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:52:35 495



Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.04 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,044.9 N	Yes
Time of Peak	10.6 - 13.0 ms	12.48 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,435.1 N	Yes
Time of Peak	10.0 - 12.3 ms	11.44 ms	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:59:26 639

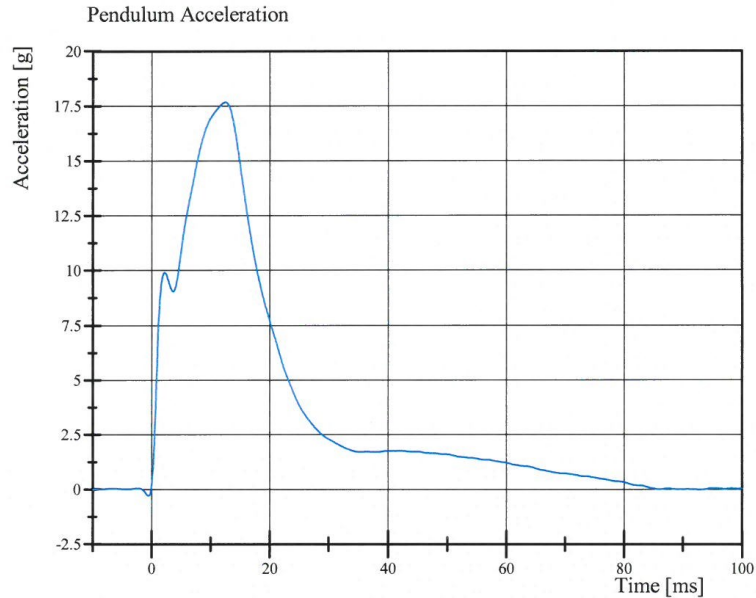


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 41-1

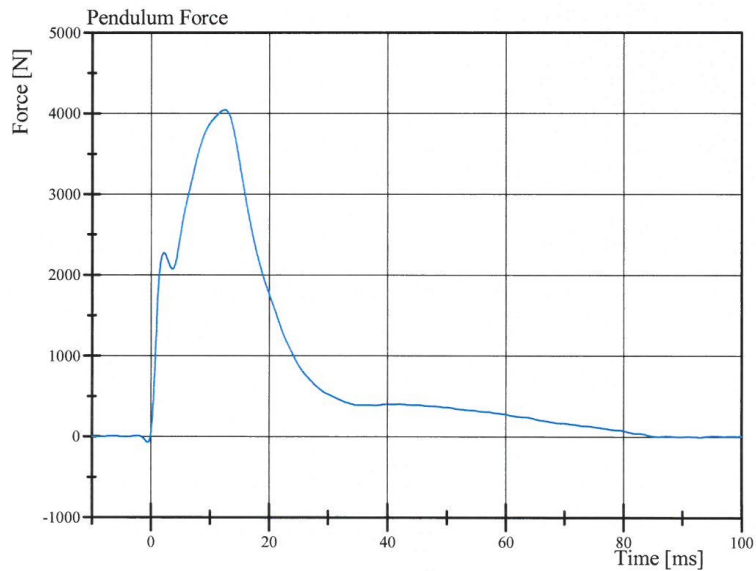
Test Date: 10/7/2016



Filter Class: CFC_180

Max: 17.7 g at 12.5 ms

Min: -0.3 g at -0.6 ms



Filter Class: CFC_180

Max: 4,044.9 N at 12.5 ms

Min: -75.3 N at -0.6 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:59:36 639

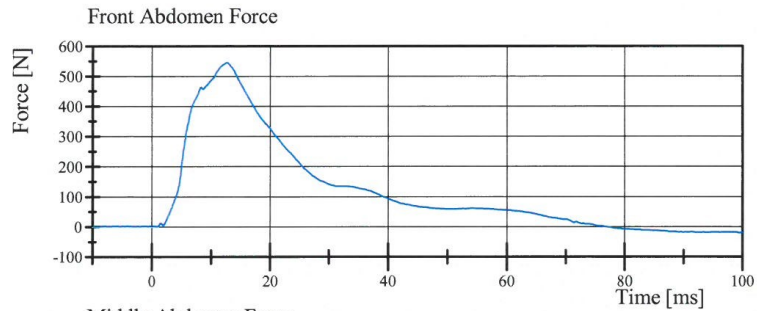


Transportation Research Center Inc.

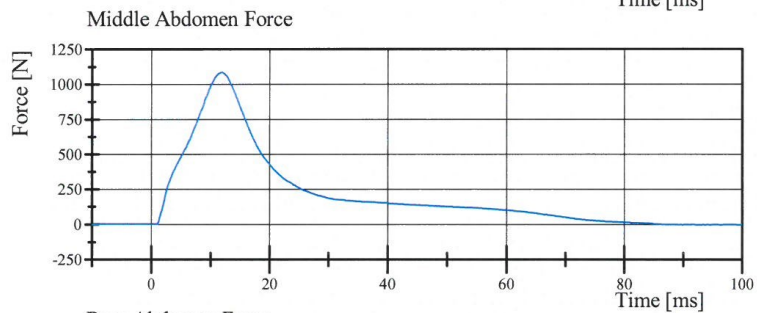
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 41-1

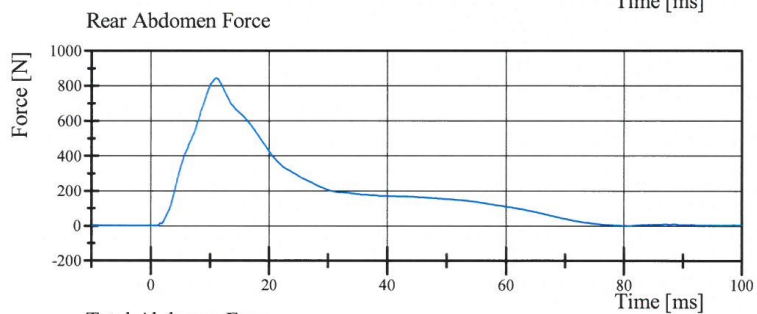
Test Date: 10/7/2016



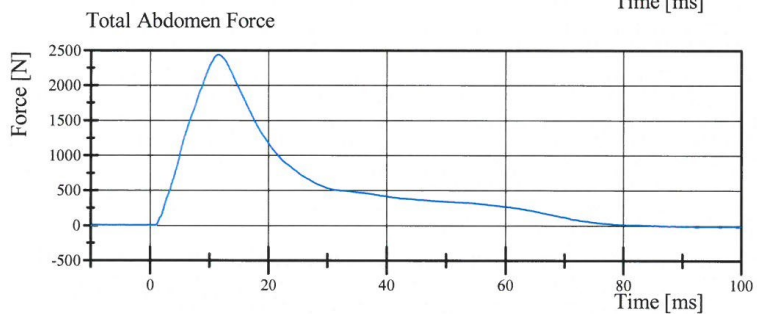
Filter Class: CFC_600
Max: 543.3 N at 12.7 ms
Min: -19.5 N at 99.5 ms



Filter Class: CFC_600
Max: 1,083.1 N at 11.8 ms
Min: -3.4 N at 92.2 ms



Filter Class: CFC_600
Max: 841.5 N at 11.0 ms
Min: -0.4 N at 1.0 ms



Filter Class: CFC_600
Max: 2,435.1 N at 11.4 ms
Min: -17.5 N at 92.6 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 12:59:37 639



Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 41-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.066 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-53.0 deg	Yes
Time of Peak	39 - 53 ms	45.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	37.4 ms	Yes

Test meets specifications.

Comments:

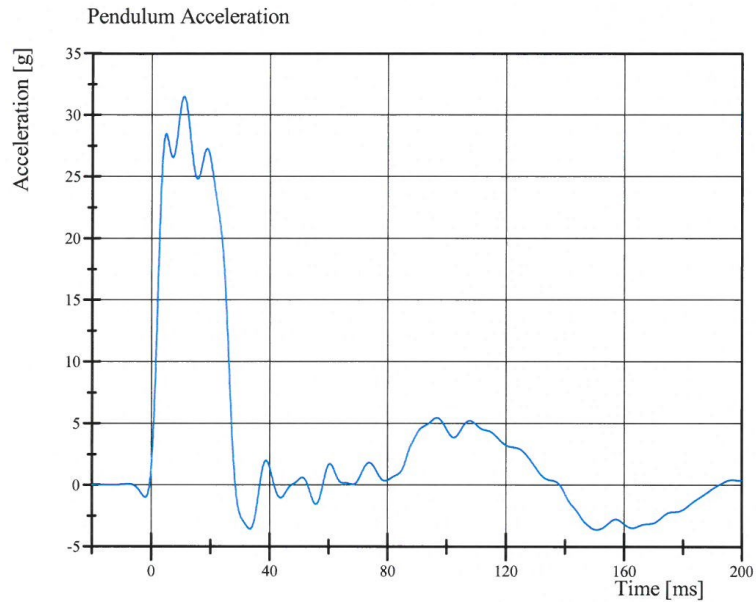
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 09:01:35 674

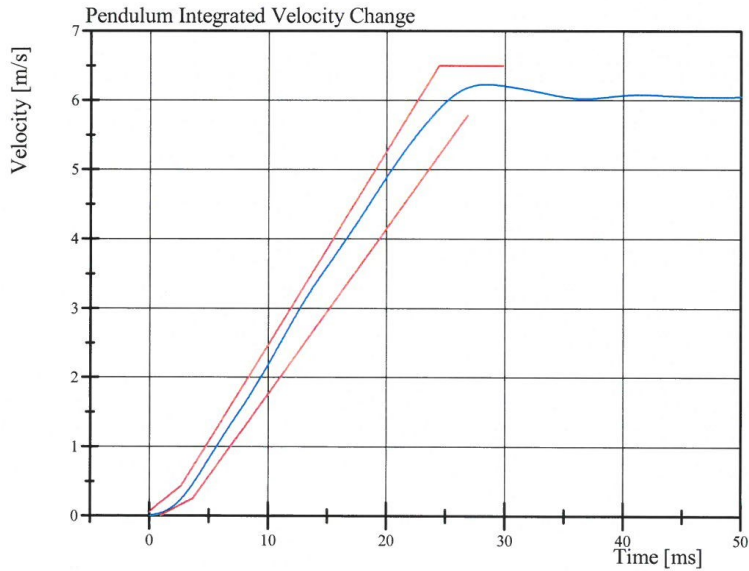


Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 41-1
Test Date: 10/7/2016



Filter Class: CFC_60
Max: 31.4 g at 11.0 ms
Min: -3.6 g at 150.6 ms



Filter Class: CFC_60
Max: 6.2 m/s at 28.5 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 09:01:48 674

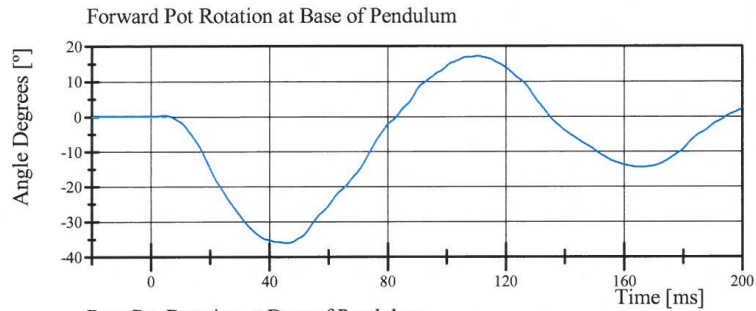


Transportation Research Center Inc.

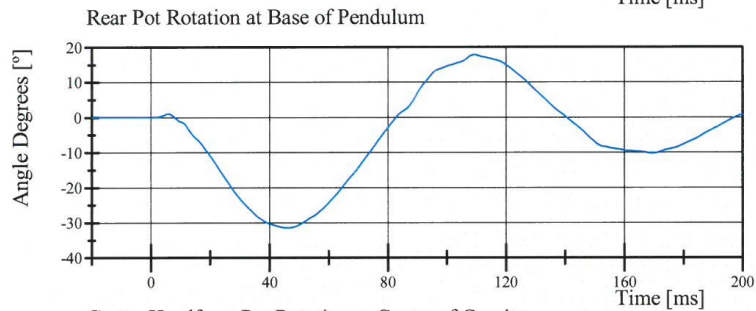
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 41-1

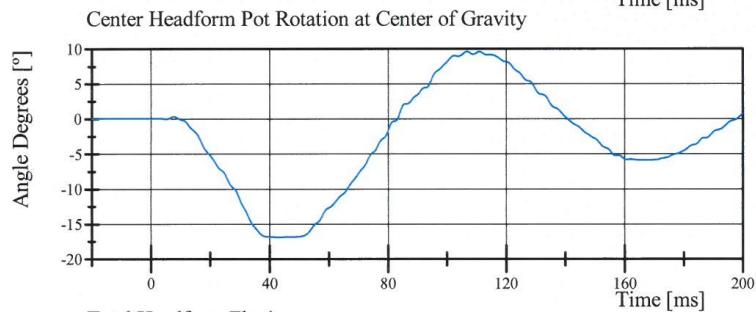
Test Date: 10/7/2016



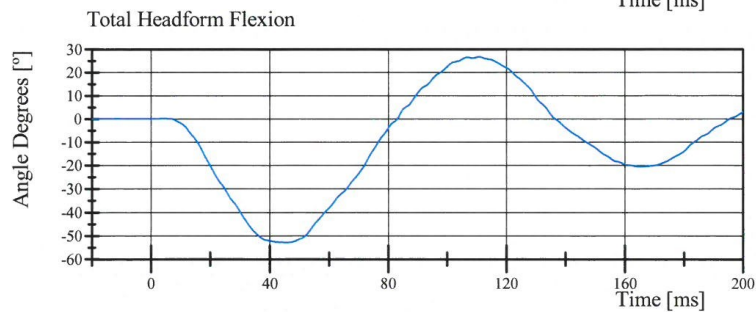
Filter Class: CFC_180
Max: 17.1 ° at 110.6 ms
Min: -36.1 ° at 45.8 ms



Filter Class: CFC_180
Max: 17.8 ° at 109.4 ms
Min: -31.5 ° at 45.9 ms



Filter Class: CFC_180
Max: 9.6 ° at 106.8 ms
Min: -16.9 ° at 43.4 ms



Filter Class: CFC_180
Max: 26.7 ° at 110.9 ms
Min: -53.0 ° at 45.7 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 09:01:50 674



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 41-2

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,178.5 N	Yes
Time of Peak	11.8 - 16.1 ms	14.08 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,279.4 N	Yes
Time of Peak	12.2 - 17.0 ms	14.16 ms	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 13:51:17 552

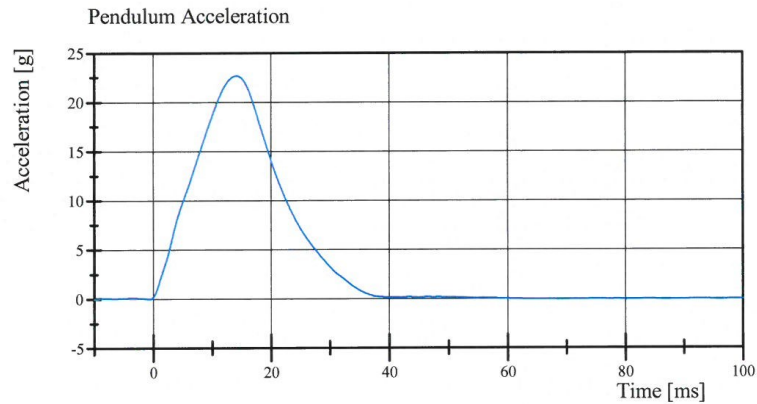


Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 41-2

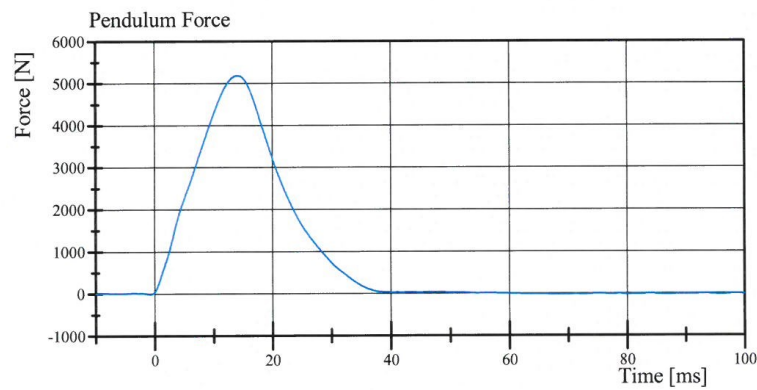
Test Date: 10/7/2016



Filter Class: CFC_180

Max: 22.6 g at 14.1 ms

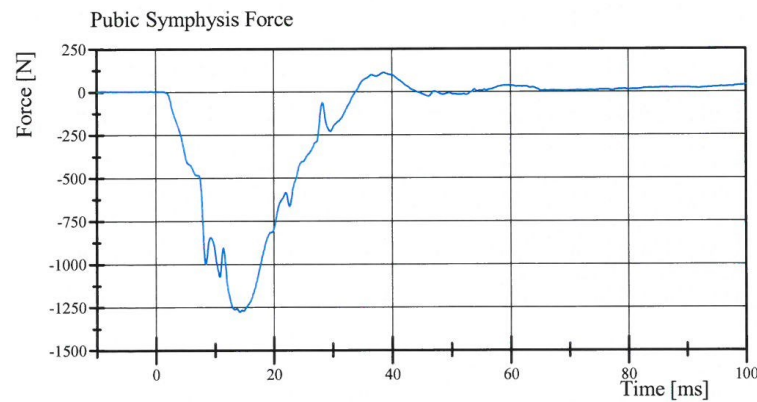
Min: -0.1 g at 86.7 ms



Filter Class: CFC_180

Max: 5,178.5 N at 14.1 ms

Min: -20.4 N at 86.7 ms



Filter Class: CFC_600

Max: 110.8 N at 38.7 ms

Min: -1,279.4 N at 14.2 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.07.2016 13:51:23 552



Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.46

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	447	Yes
C	H-Point Height	79.0 - 89.0	88	Yes
D	H-Point from Seat Back	141.0 - 151.0	143	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	535	Yes
L	Popliteal Height	343.0 - 369.0	345	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	395	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	202	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	222	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	480	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	349	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	873	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 46-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	117.6 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	5.2 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 09:14:28 231

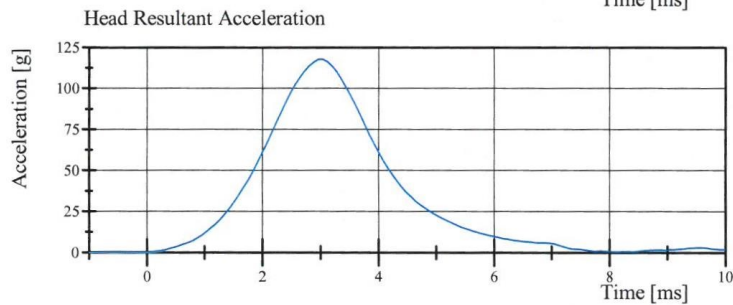
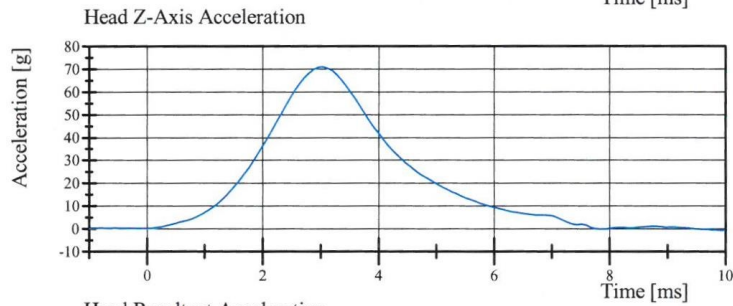
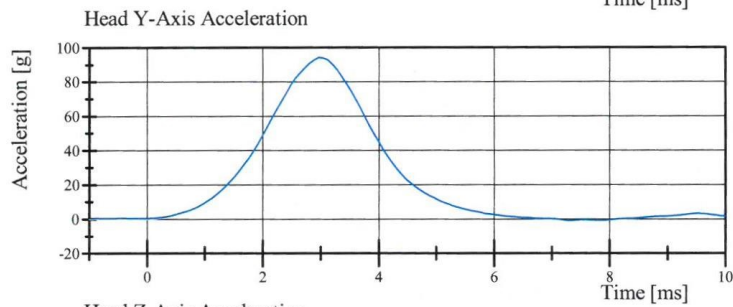
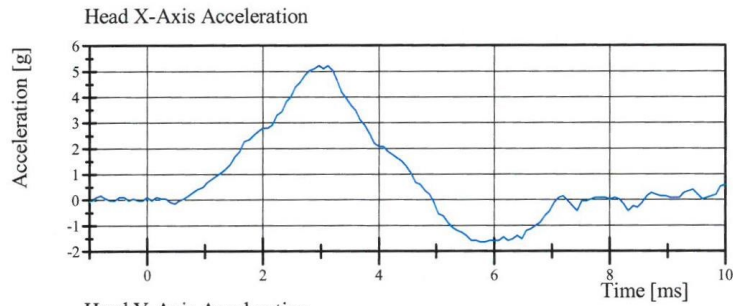


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 46-1

Test Date: 9/1/2016



Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 09:14:40 231



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 46-2

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.604 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.658 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.906 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.259 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.782 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.785 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-74.8 deg	Yes
Time of Peak	50 - 70 ms	57.9 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.6 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	112.2 ms	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 10:56:21 749

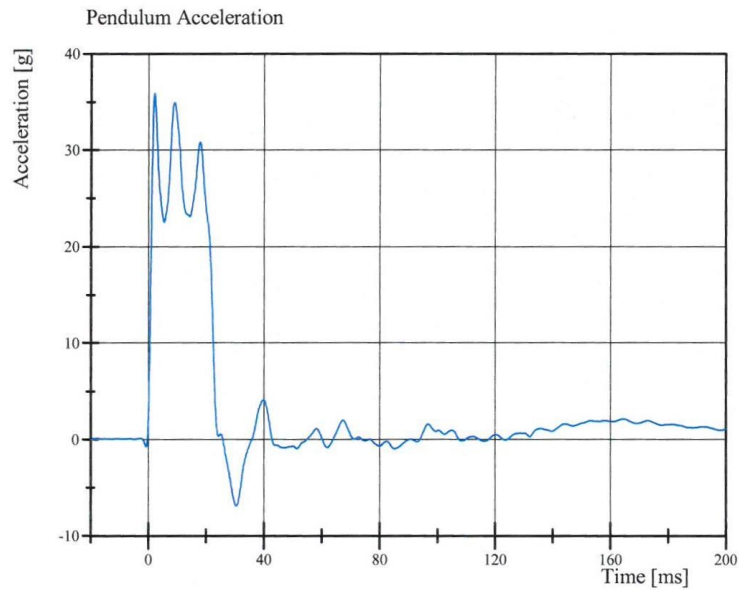


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 46-2

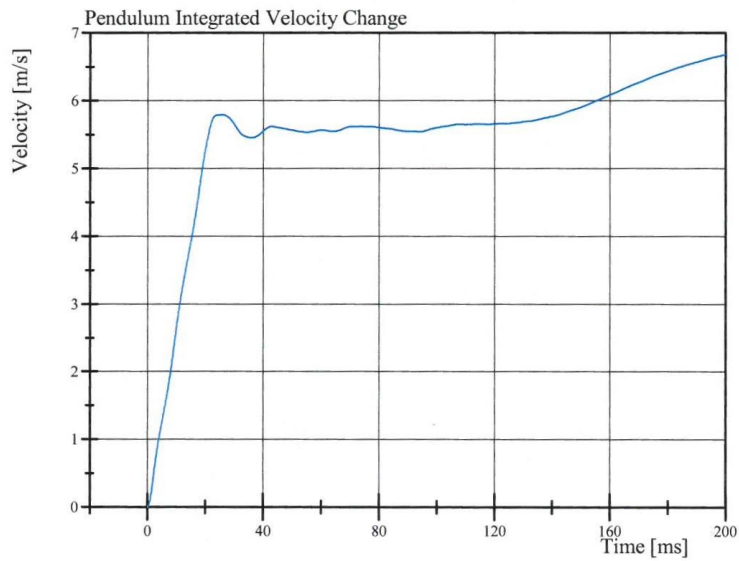
Test Date: 9/1/2016



Filter Class: CFC_180

Max: 35.8 g at 2.0 ms

Min: -6.9 g at 30.5 ms



Filter Class: CFC_180

Max: 6.7 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 10:56:30 749



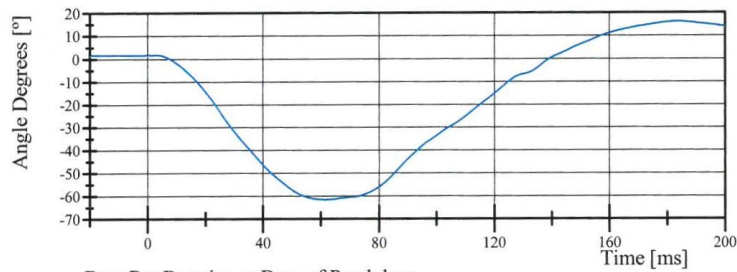
Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 46-2

Test Date: 9/1/2016

Forward Pot Rotation at Base of Pendulum

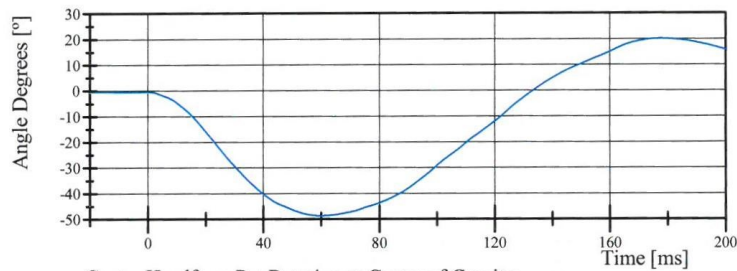


Filter Class: CFC_60

Max: 16.1 ° at 183.6 ms

Min: -61.8 ° at 61.5 ms

Rear Pot Rotation at Base of Pendulum

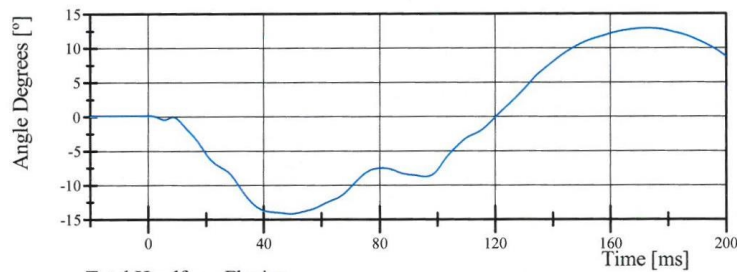


Filter Class: CFC_60

Max: 20.1 ° at 177.5 ms

Min: -48.8 ° at 59.7 ms

Center Headform Pot Rotation at Center of Gravity

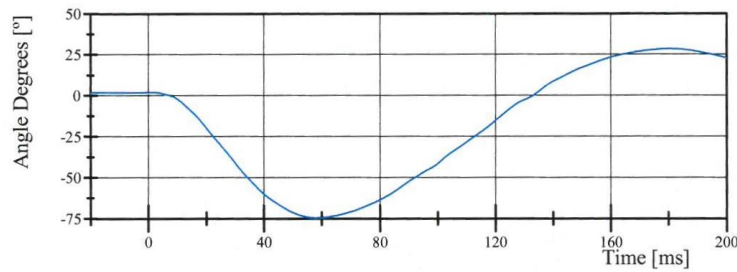


Filter Class: CFC_60

Max: 12.9 ° at 172.3 ms

Min: -14.2 ° at 49.3 ms

Total Headform Flexion



Filter Class: CFC_60

Max: 28.4 ° at 180.2 ms

Min: -74.8 ° at 57.9 ms

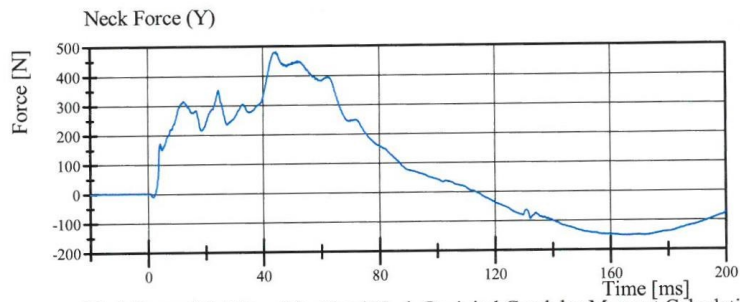
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 10:56:31 749

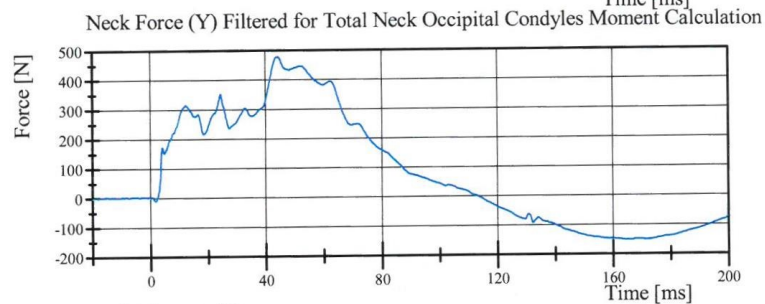


Transportation Research Center Inc.

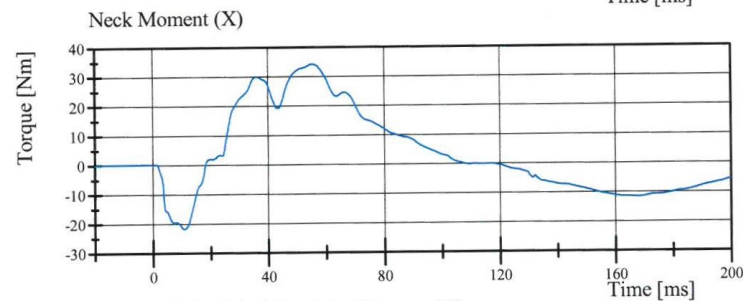
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 46-2
Test Date: 9/1/2016



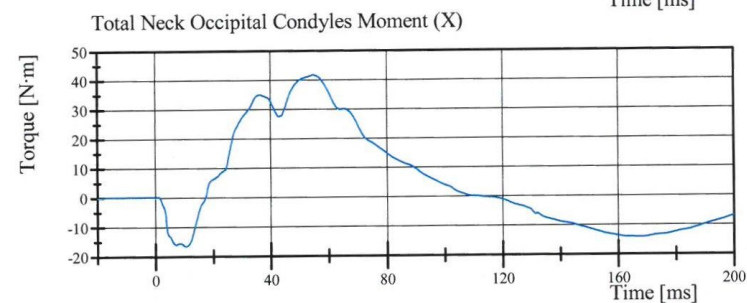
Filter Class: CFC_1000
Max: 479.3 N at 44.6 ms
Min: -152.0 N at 164.2 ms



Filter Class: CFC_600
Max: 477.1 N at 44.5 ms
Min: -151.8 N at 164.4 ms



Filter Class: CFC_600
Max: 34.2 Nm at 54.9 ms
Min: -21.9 Nm at 10.6 ms



Filter Class: Without_(Consta
Max: 41.6 N·m at 54.8 ms
Min: -16.8 N·m at 10.5 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 10:56:32 749



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 46-1

Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.8 g	Yes
Shoulder Displacement	28 - 37 mm	28.8 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	21.2 g	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 08:28:34 870

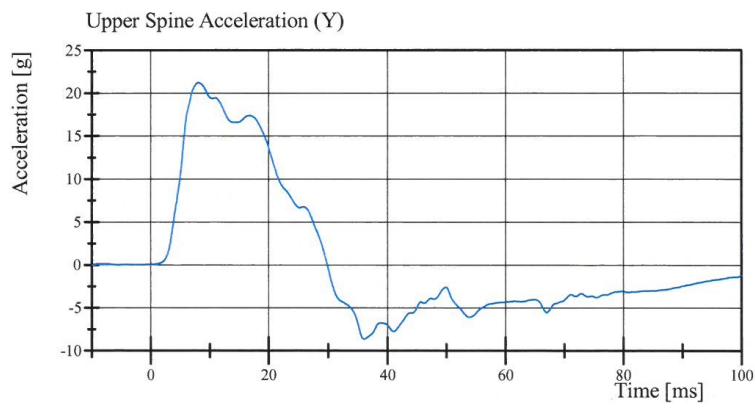
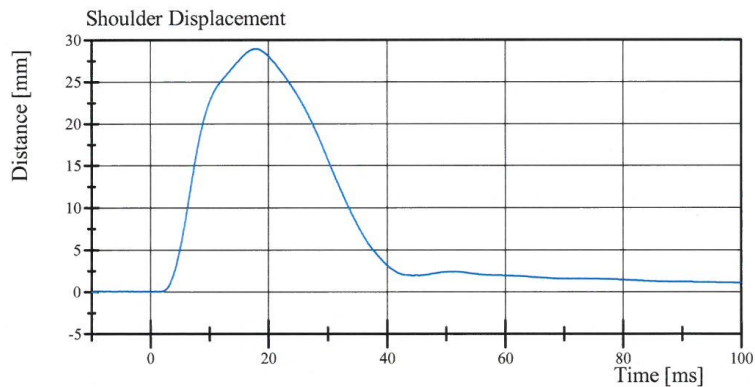
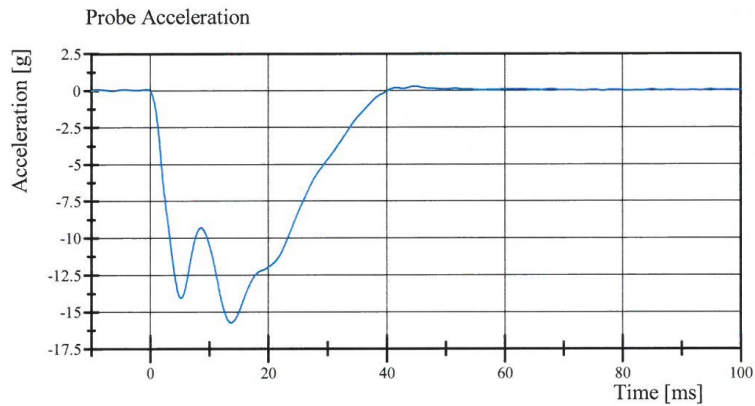


Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 46-1

Test Date: 9/1/2016



Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 08:28:46 870



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 46-1
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.771 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.6 g	Yes
Shoulder Displacement	31 - 40 mm	33.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	25.9 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	40.6 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.3 g	Yes

Test meets specifications.

Comments:

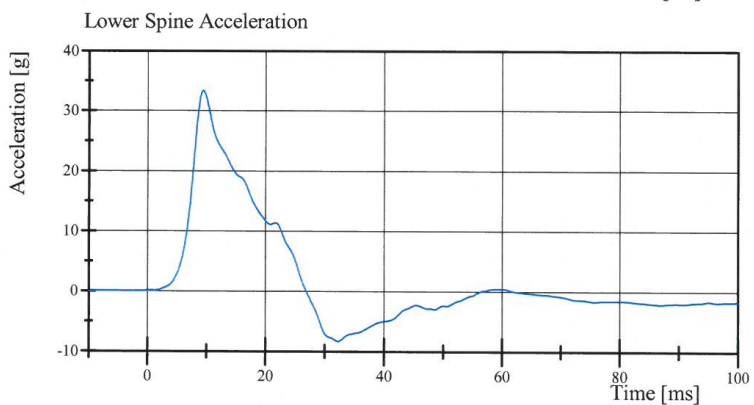
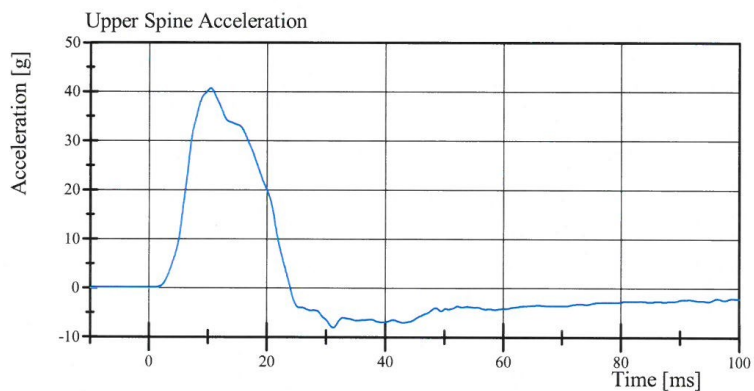
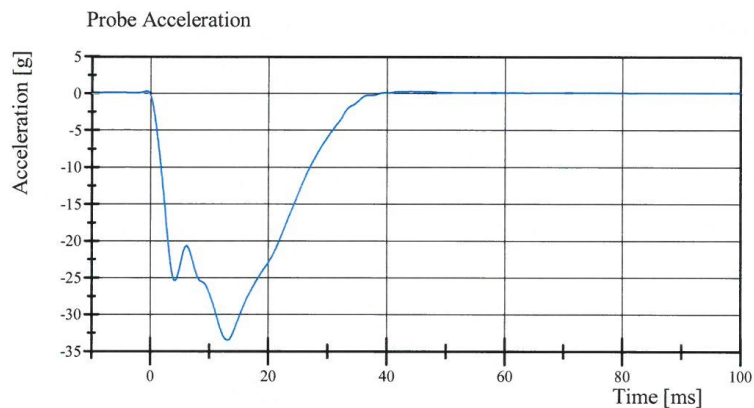
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 10:15:04 627



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 46-1
Test Date: 9/1/2016



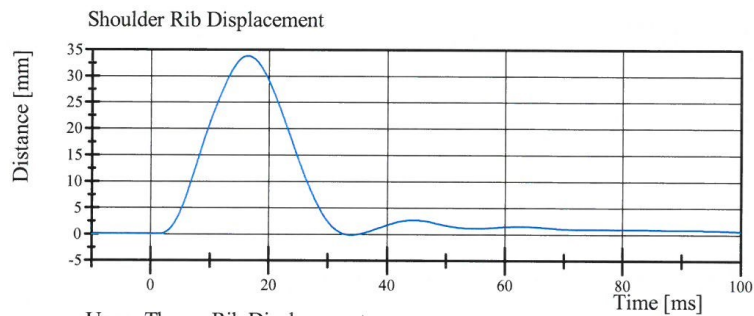
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 10:15:15 627

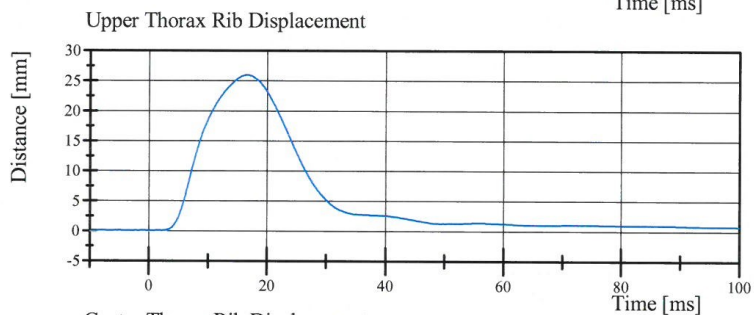


Transportation Research Center Inc.

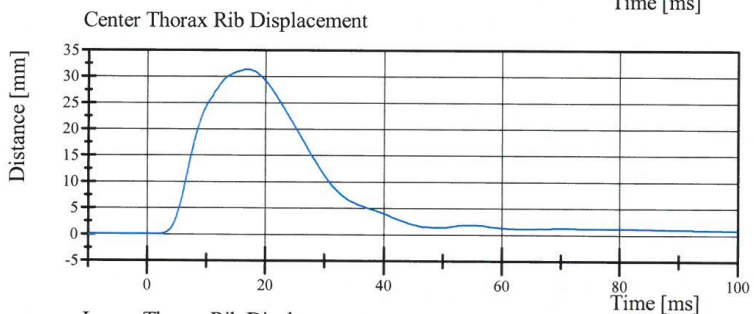
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 46-1
Test Date: 9/1/2016



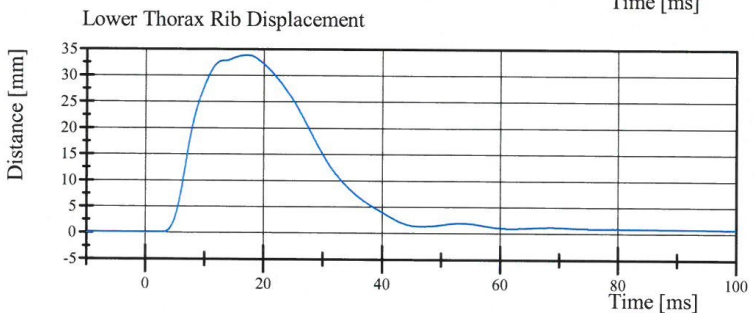
Filter Class: CFC_600
Max: 33.7 mm at 16.4 ms
Min: -0.2 mm at 33.9 ms



Filter Class: CFC_600
Max: 25.9 mm at 16.6 ms
Min: -0.0 mm at -9.8 ms



Filter Class: CFC_600
Max: 31.3 mm at 17.0 ms
Min: -0.0 mm at -4.1 ms



Filter Class: CFC_600
Max: 33.8 mm at 17.0 ms
Min: -0.0 mm at -1.8 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 10:15:16 627



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 46-2
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.7 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.390 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.0 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.7 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.8 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.7 g	Yes

Test meets specifications.

Comments:

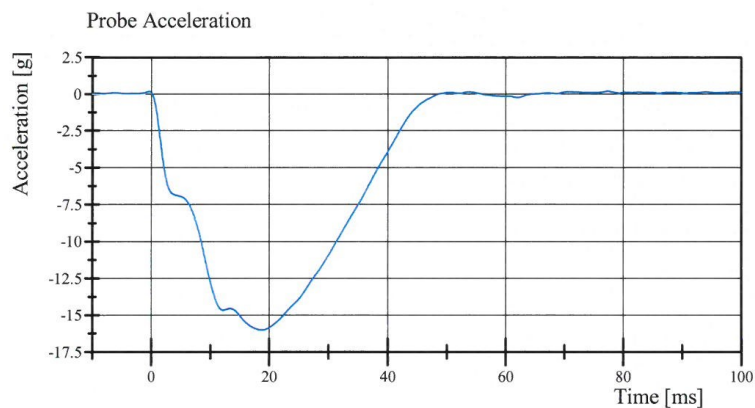
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 09:42:09 865

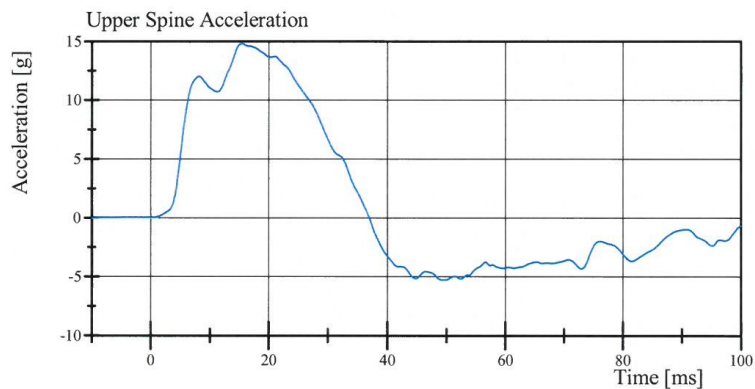


Transportation Research Center Inc.

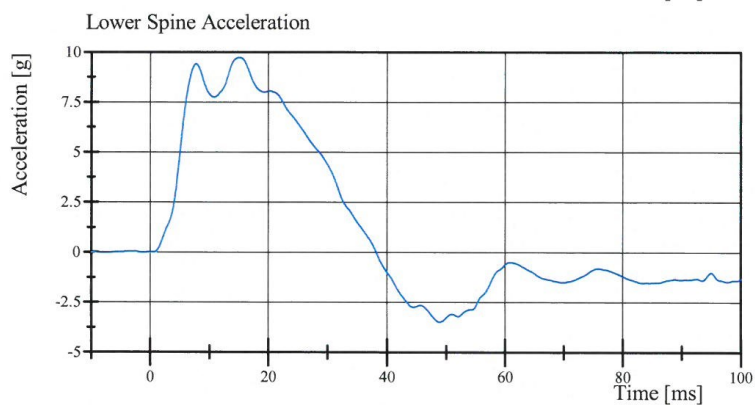
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 46-2
Test Date: 9/1/2016



Filter Class: CFC_180
Max: 0.2 g at 77.3 ms
Min: -16.0 g at 18.8 ms



Filter Class: CFC_180
Max: 14.8 g at 15.4 ms
Min: -5.3 g at 49.3 ms



Filter Class: CFC_180
Max: 9.7 g at 15.0 ms
Min: -3.5 g at 48.9 ms

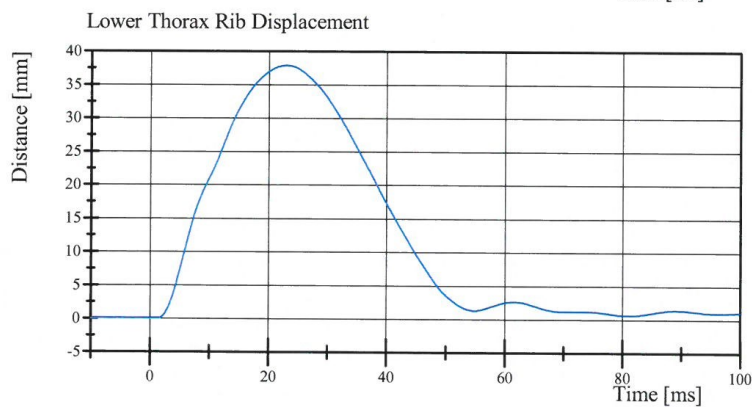
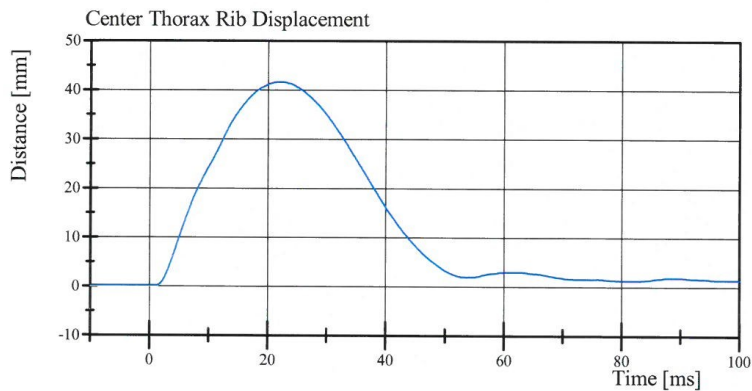
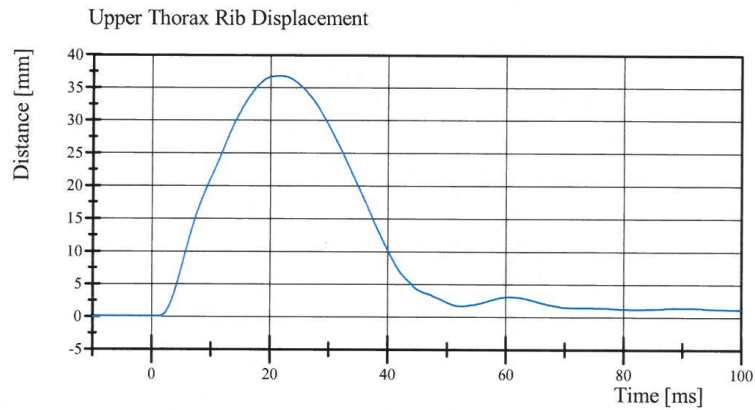
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 09:42:23 865



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 46-2
Test Date: 9/1/2016



Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 09:42:24 865



Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 46-1
Test Date: 9/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-12.9 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	46.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	39.5 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	9.89 g	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 08:45:35 698

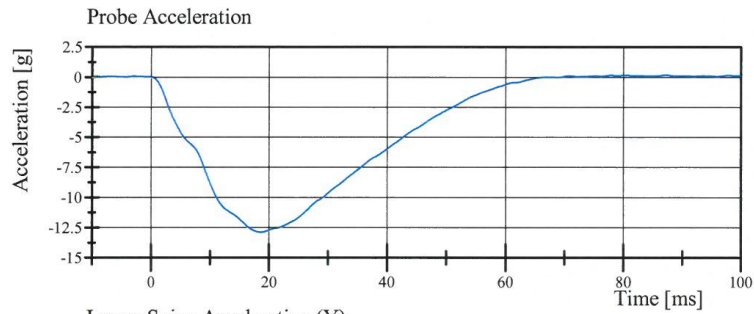


Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 46-1

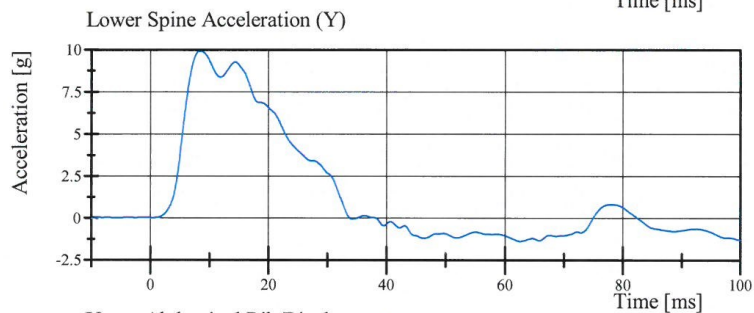
Test Date: 9/1/2016



Filter Class: CFC_180

Max: 0.2 g at 87.2 ms

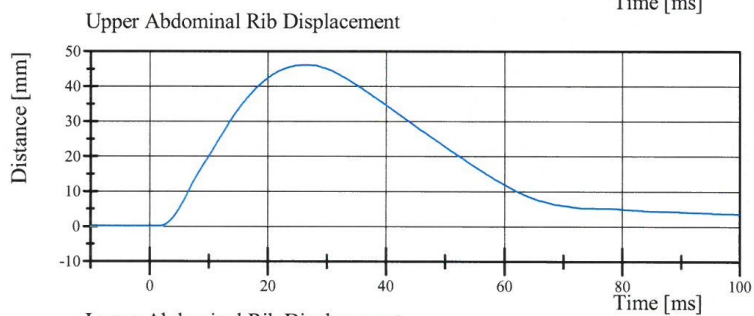
Min: -12.9 g at 18.6 ms



Filter Class: CFC_180

Max: 9.9 g at 8.4 ms

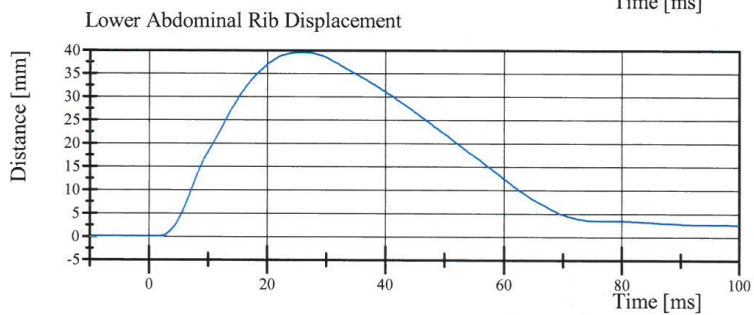
Min: -1.4 g at 62.6 ms



Filter Class: CFC_600

Max: 46.0 mm at 26.6 ms

Min: -0.0 mm at 1.5 ms



Filter Class: CFC_600

Max: 39.5 mm at 26.1 ms

Min: -0.0 mm at -5.4 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.01.2016 08:45:47 698



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 46-7

Test Date: 9/13/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-45.51 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	40.6 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,198.4 N	Yes

Test meets specifications.

Comments: Pelvis Plug #63506

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.13.2016 13:33:06 480

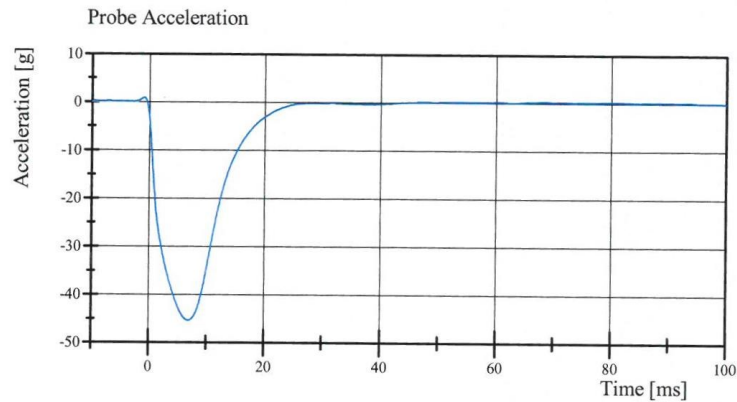


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIa Serial No. 305 Certification No. 46-7

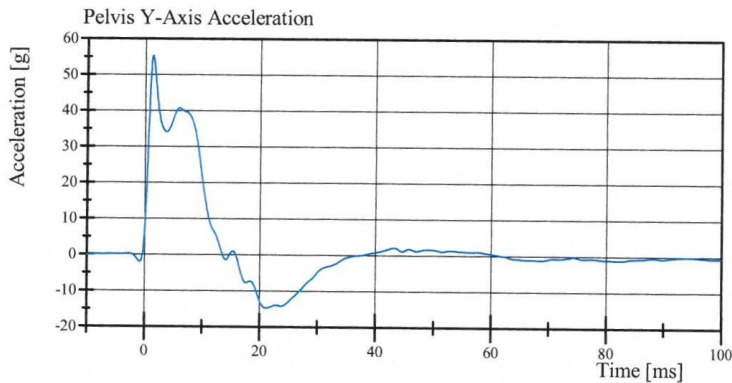
Test Date: 9/13/2016



Filter Class: CFC_180

Max: 0.7 g at -1.0 ms

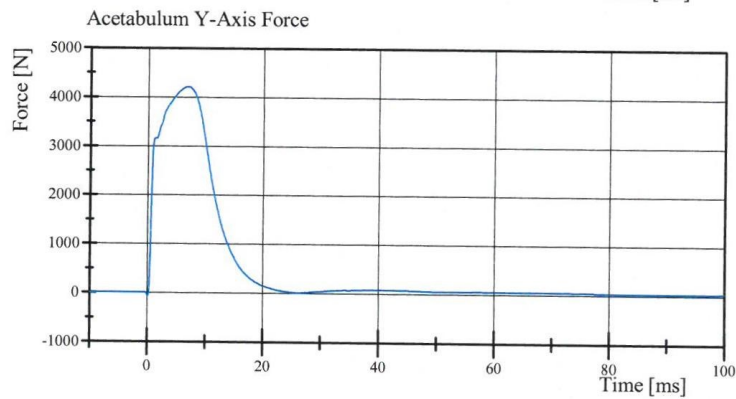
Min: -45.5 g at 6.9 ms



Filter Class: CFC_180

Max: 55.2 g at 1.3 ms

Min: -14.8 g at 21.1 ms



Filter Class: CFC_600

Max: 4,198.4 N at 6.8 ms

Min: -71.6 N at 0.1 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.13.2016 13:33:13 480



Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 46-2
Test Date: 9/13/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.39 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-40.6 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	32.2 g	Yes
Iliac Force	4,100 - 5,100 N	4,442.7 N	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.13.2016 16:17:48 649

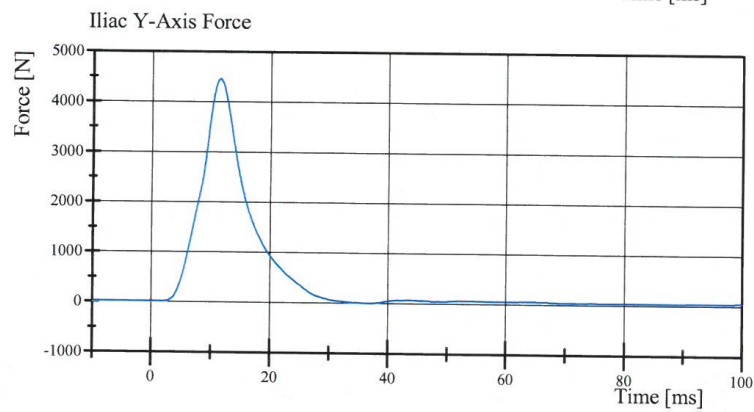
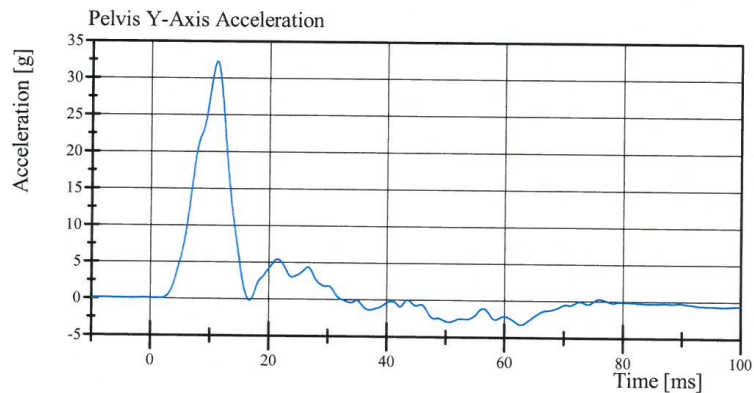
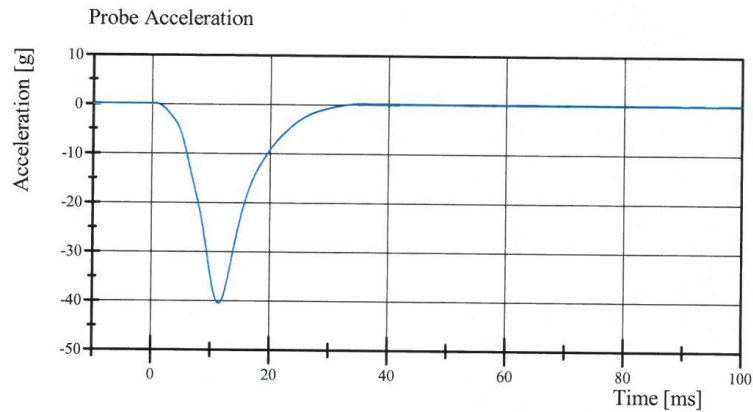


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 46-2

Test Date: 9/13/2016



Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.13.2016 16:18:06 649



Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.47

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	447	Yes
C	H-Point Height	79.0 - 89.0	88	Yes
D	H-Point from Seat Back	141.0 - 151.0	143	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	535	Yes
L	Popliteal Height	343.0 - 369.0	345	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	395	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	202	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	222	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	480	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	349	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	873	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 47-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	124.0 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.4 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:12:10 232

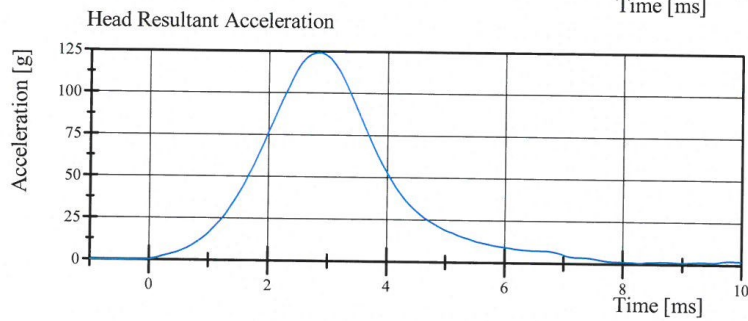
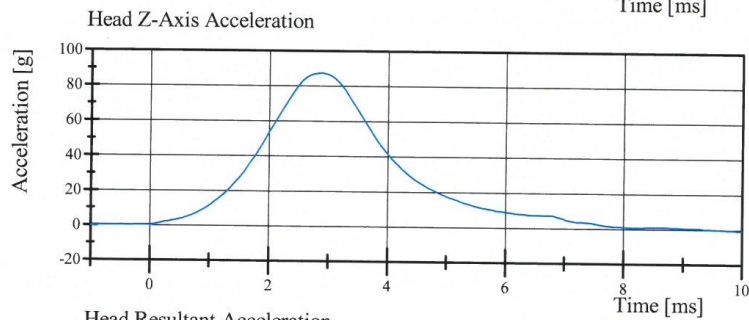
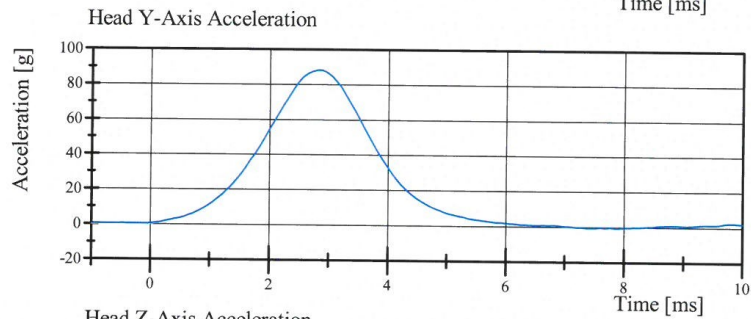
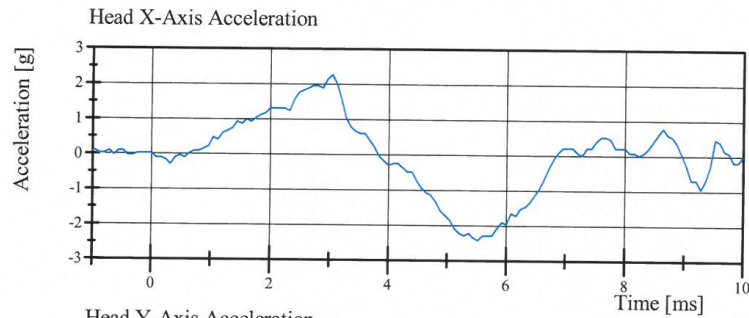


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 47-1

Test Date: 10/7/2016



Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:12:20 232



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 47-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.622 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.481 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.748 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.054 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	5.826 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-79.6 deg	Yes
Time of Peak	50 - 70 ms	60.9 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	39.9 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	114.5 ms	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:51:41 743

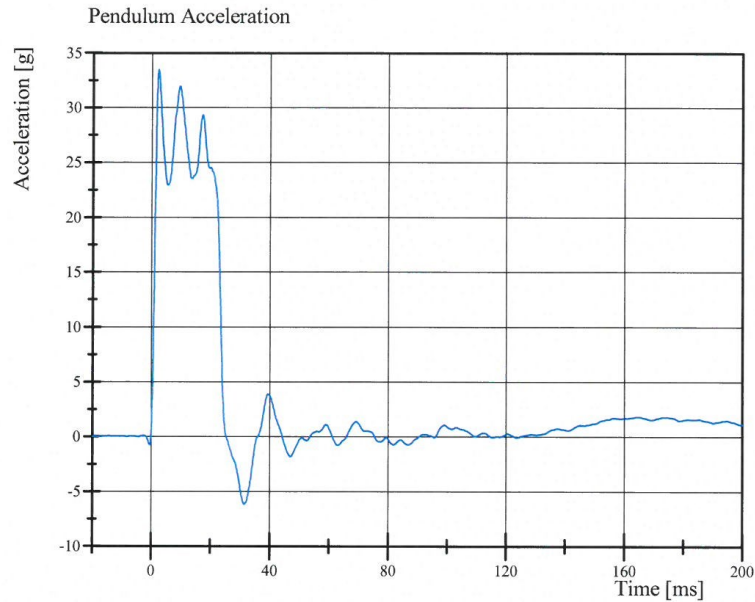


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 47-1

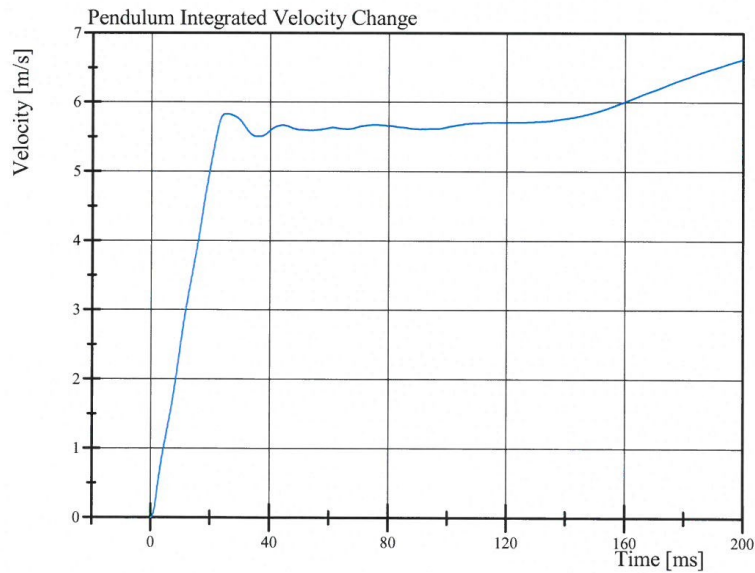
Test Date: 10/7/2016



Filter Class: CFC_180

Max: 33.4 g at 2.3 ms

Min: -6.2 g at 31.4 ms



Filter Class: CFC_180

Max: 6.6 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:51:52 743

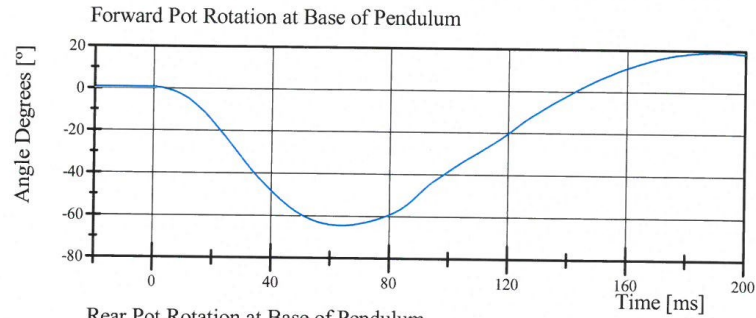


Transportation Research Center Inc.

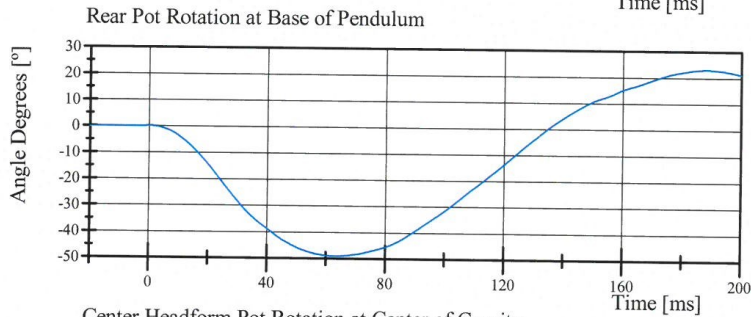
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 47-1

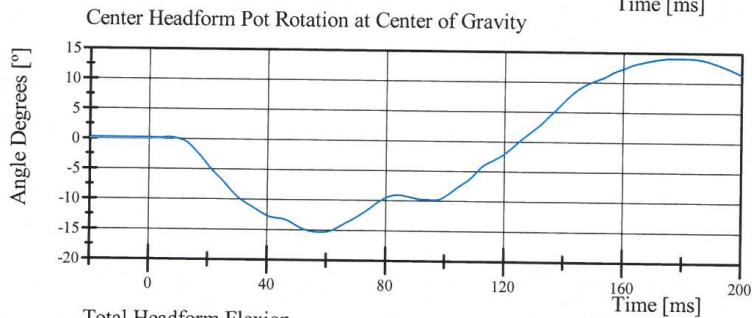
Test Date: 10/7/2016



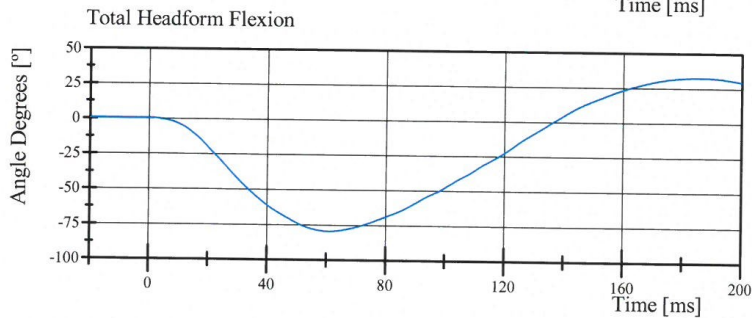
Filter Class: CFC_60
Max: 19.1 ° at 191.0 ms
Min: -64.6 ° at 63.8 ms



Filter Class: CFC_60
Max: 23.1 ° at 188.2 ms
Min: -49.2 ° at 63.1 ms



Filter Class: CFC_60
Max: 14.1 ° at 177.8 ms
Min: -15.4 ° at 58.0 ms



Filter Class: CFC_60
Max: 32.8 ° at 186.1 ms
Min: -79.6 ° at 60.9 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:51:54 743

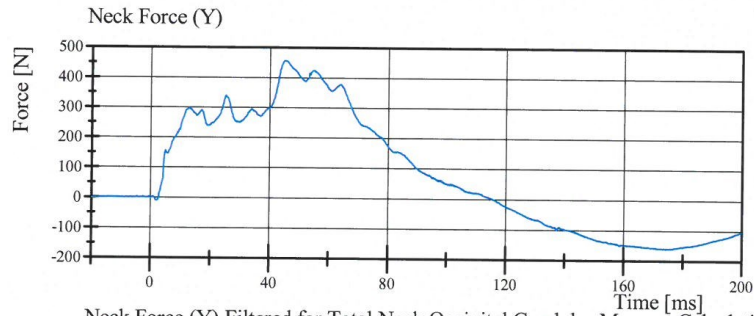


Transportation Research Center Inc.

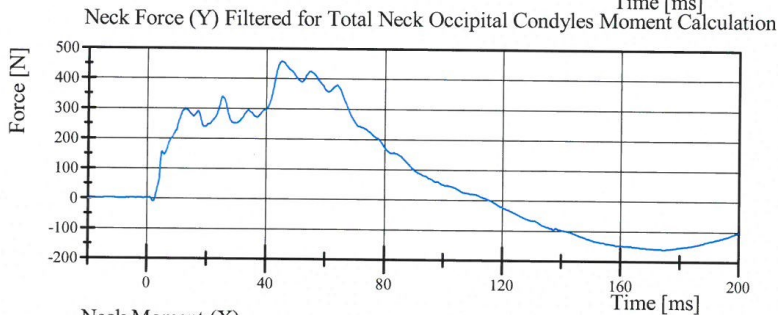
Left Lateral Neck

SID II_s Serial No. 305 Certification No. 47-1

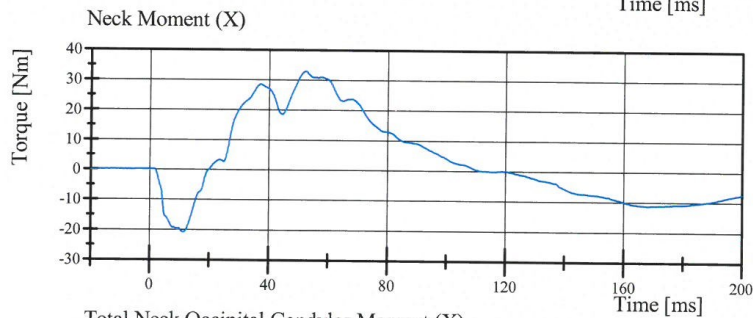
Test Date: 10/7/2016



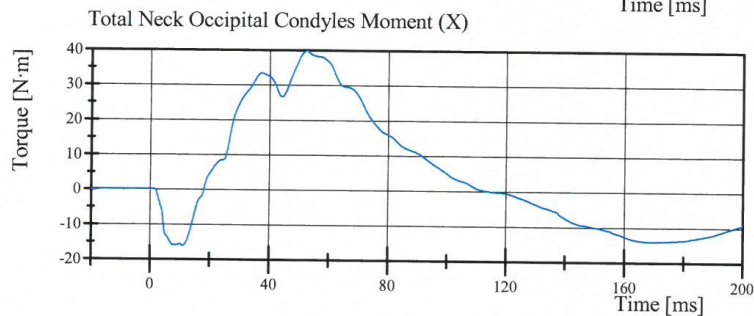
Filter Class: CFC_1000
Max: 456.1 N at 44.9 ms
Min: -160.5 N at 174.1 ms



Filter Class: CFC_600
Max: 456.2 N at 45.0 ms
Min: -159.5 N at 174.7 ms



Filter Class: CFC_600
Max: 32.9 Nm at 52.6 ms
Min: -21.0 Nm at 11.4 ms



Filter Class: Without (Consta
Max: 39.9 N·m at 52.6 ms
Min: -16.2 N·m at 11.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:51:55 743



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 47-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.9 g	Yes
Shoulder Displacement	28 - 37 mm	30.3 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	20.4 g	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:42:00 888

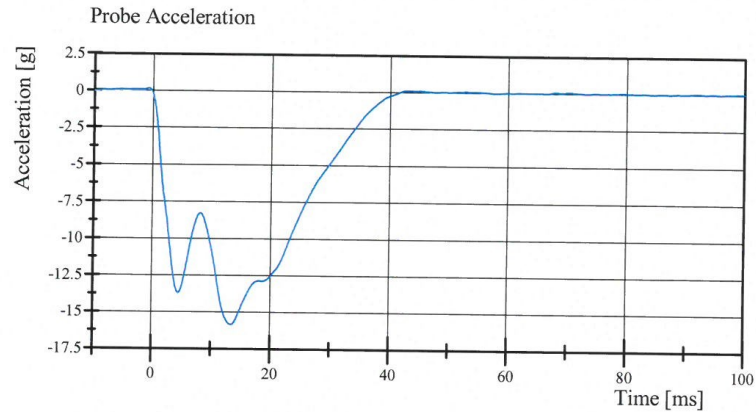


Transportation Research Center Inc.

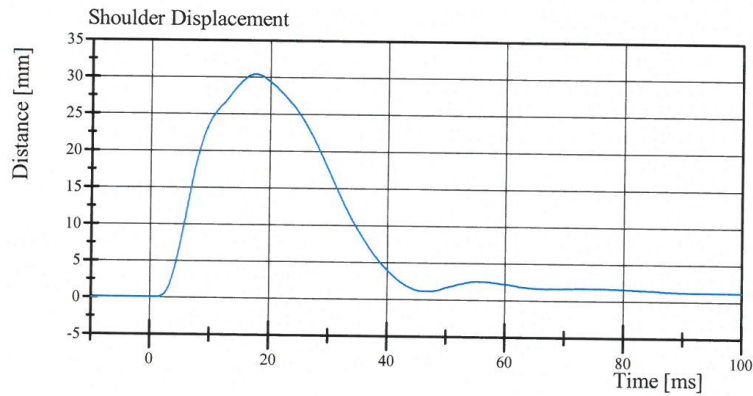
Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 47-1

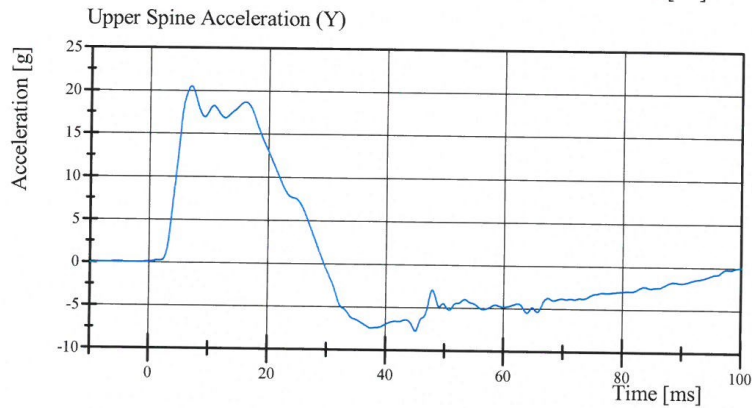
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 0.1 g at -0.7 ms
Min: -15.9 g at 13.4 ms



Filter Class: CFC_600
Max: 30.3 mm at 17.6 ms
Min: -0.0 mm at 1.1 ms



Filter Class: CFC_180
Max: 20.4 g at 7.0 ms
Min: -7.8 g at 45.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 09:42:40 888



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 47-1
Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.779 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-32.2 g	Yes
Shoulder Displacement	31 - 40 mm	33.1 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	35.9 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.4 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	31.5 g	Yes

Test meets specifications.

Comments:

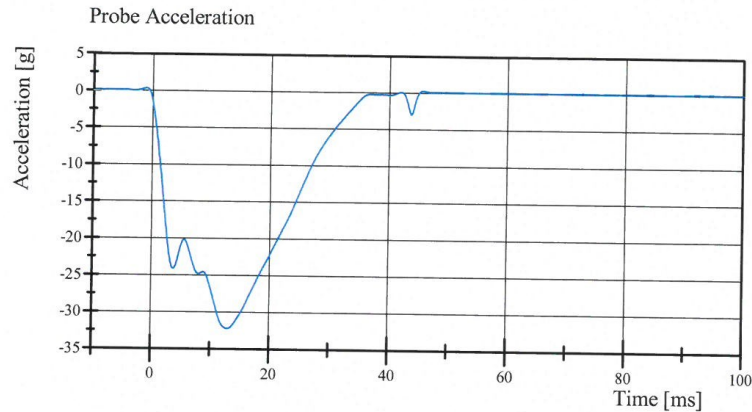
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 14:04:07 613

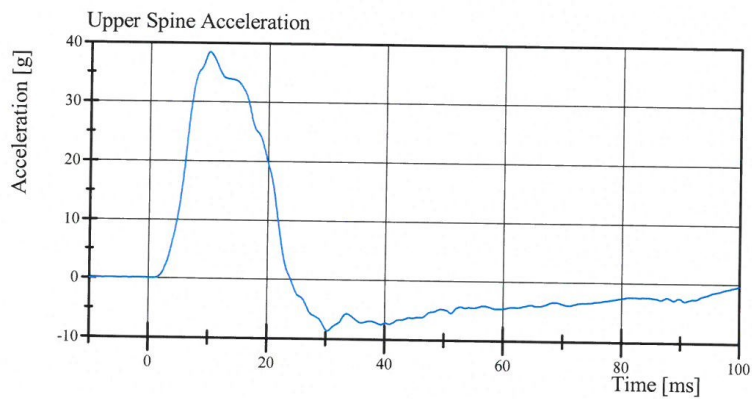


Transportation Research Center Inc.

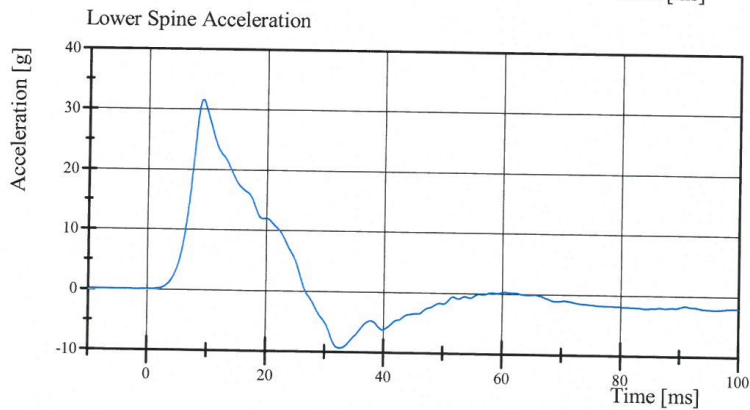
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 47-1
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 0.2 g at -1.1 ms
Min: -32.2 g at 13.0 ms



Filter Class: CFC_180
Max: 38.4 g at 10.0 ms
Min: -8.7 g at 30.3 ms



Filter Class: CFC_180
Max: 31.5 g at 9.1 ms
Min: -9.4 g at 32.6 ms

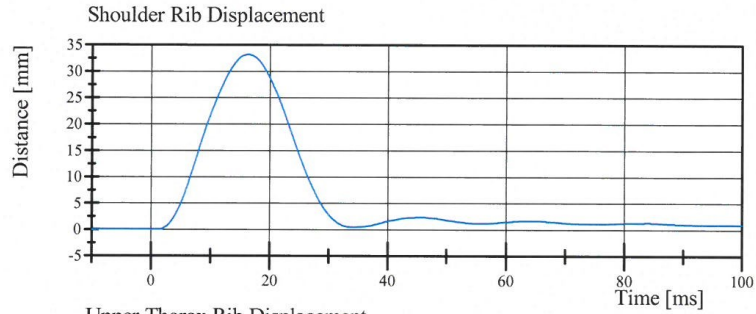
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 14:04:35 613

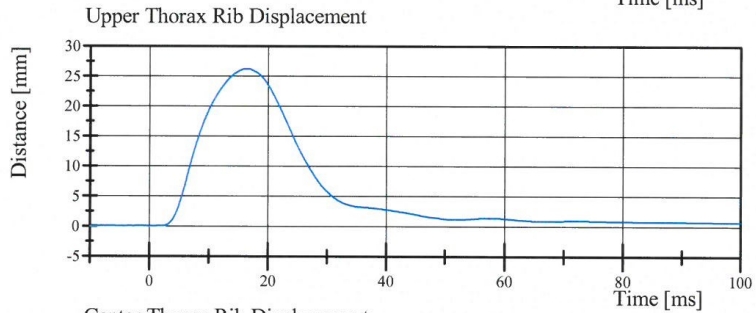


Transportation Research Center Inc.

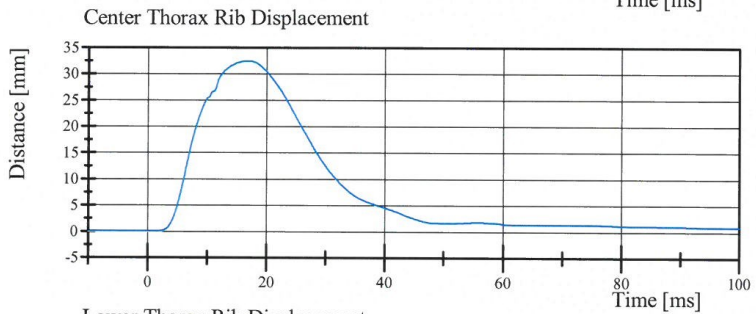
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 47-1
Test Date: 10/7/2016



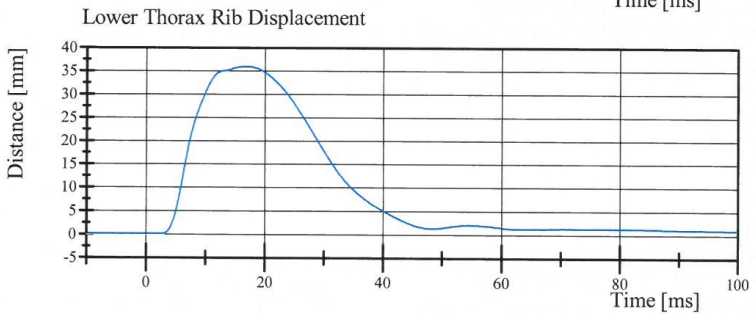
Filter Class: CFC_600
Max: 33.1 mm at 16.2 ms
Min: -0.0 mm at 1.4 ms



Filter Class: CFC_600
Max: 26.2 mm at 16.4 ms
Min: -0.0 mm at -4.3 ms



Filter Class: CFC_600
Max: 32.3 mm at 17.0 ms
Min: -0.0 mm at -9.2 ms



Filter Class: CFC_600
Max: 35.9 mm at 16.5 ms
Min: -0.0 mm at 1.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 14:04:36 613



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 47-1
Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.390 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.2 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.7 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.8 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.8 g	Yes

Test meets specifications.

Comments:

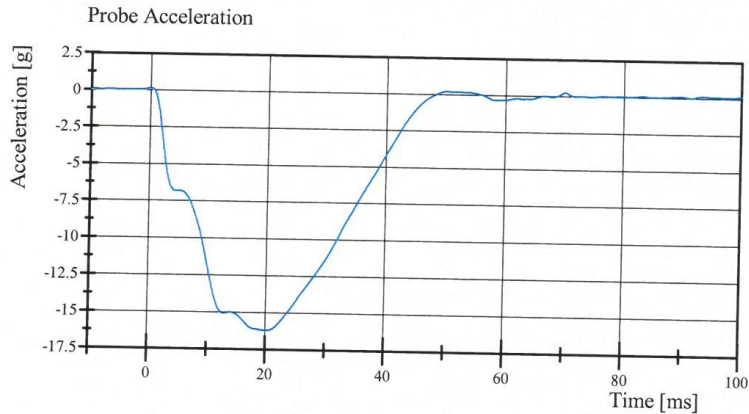
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 13:11:19 821

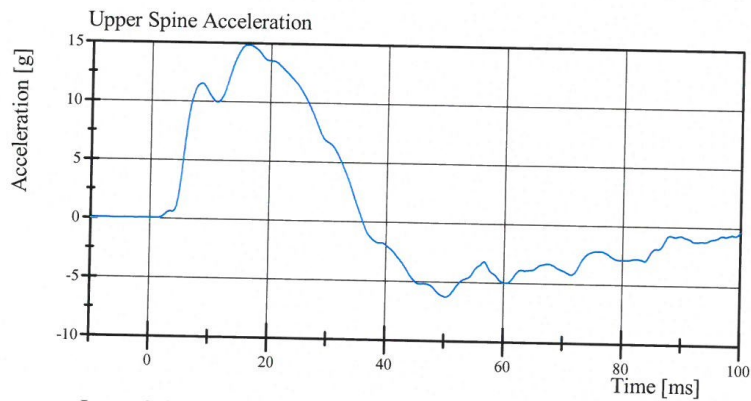


Transportation Research Center Inc.

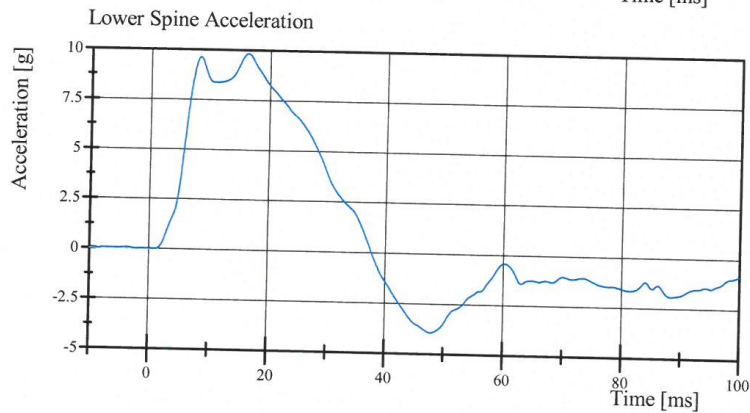
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 47-1
Test Date: 10/7/2016



Filter Class: CFC_180
Max: 0.2 g at 70.0 ms
Min: -16.2 g at 20.1 ms



Filter Class: CFC_180
Max: 14.8 g at 16.1 ms
Min: -6.3 g at 50.2 ms



Filter Class: CFC_180
Max: 9.8 g at 16.2 ms
Min: -3.9 g at 47.8 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

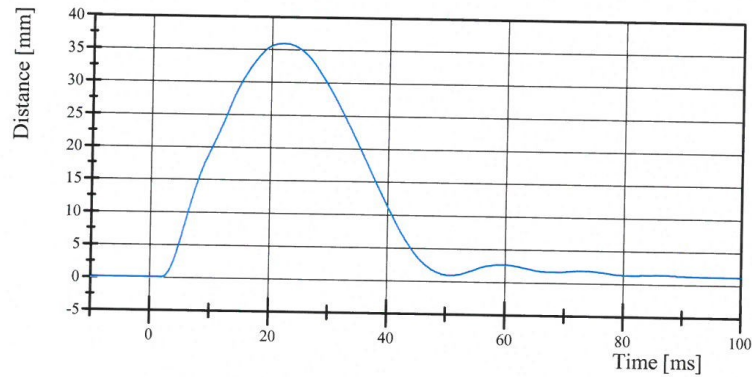
10.07.2016 13:11:32 821



Transportation Research Center Inc.

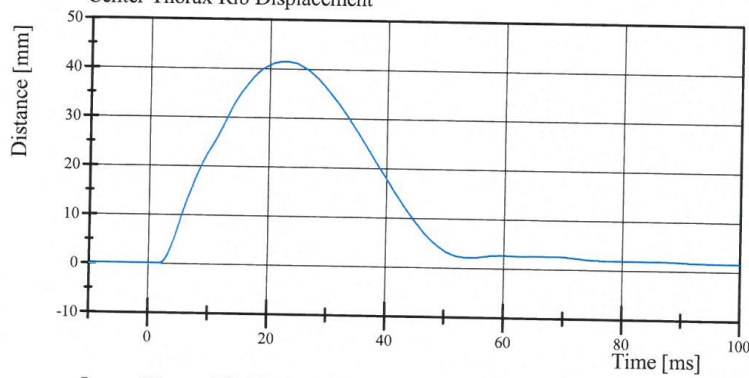
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 47-1
Test Date: 10/7/2016

Upper Thorax Rib Displacement



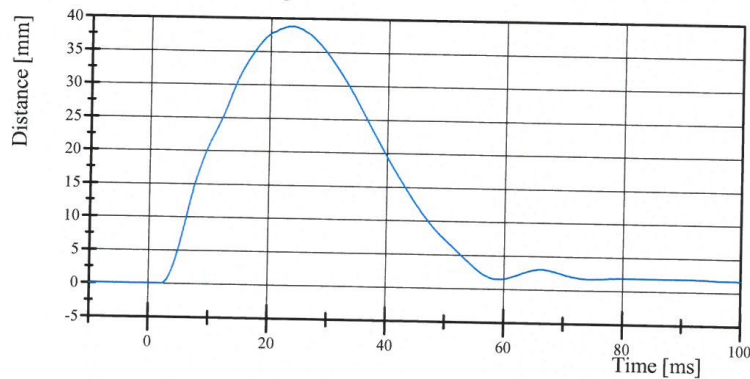
Filter Class: CFC_600
Max: 35.8 mm at 22.0 ms
Min: -0.0 mm at 1.8 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.5 mm at 22.6 ms
Min: -0.0 mm at 1.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 38.7 mm at 23.6 ms
Min: -0.0 mm at -5.7 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 13:11:33 821



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 47-3

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-12.8 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	46.4 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.7 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	9.71 g	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 12:24:59 730

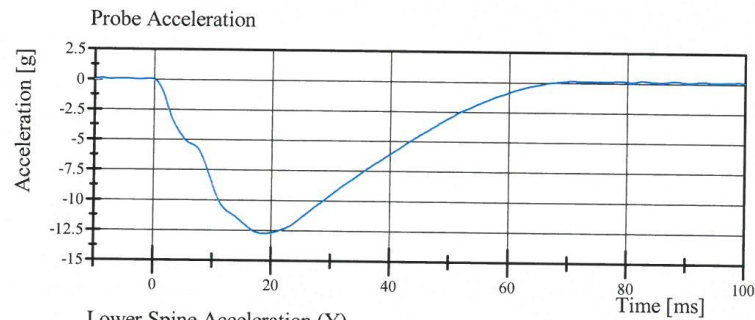


Transportation Research Center Inc.

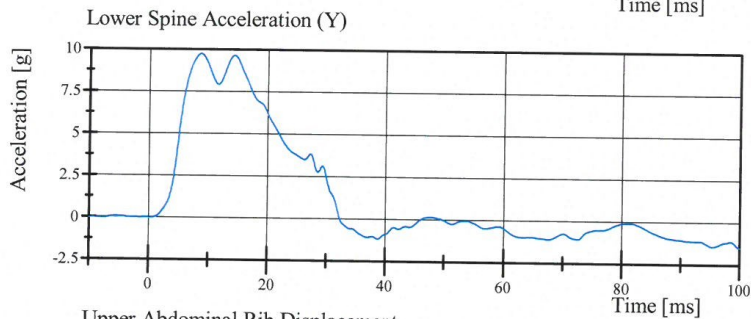
Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 47-3

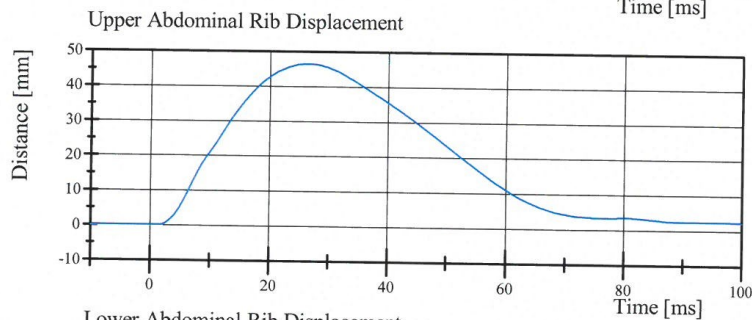
Test Date: 10/7/2016



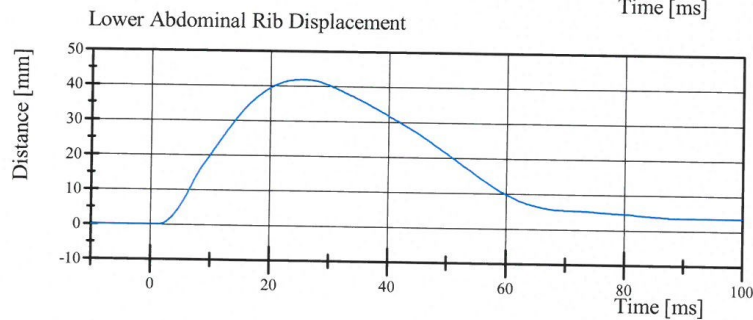
Filter Class: CFC_180
Max: 0.2 g at 82.5 ms
Min: -12.8 g at 18.7 ms



Filter Class: CFC_180
Max: 9.7 g at 8.6 ms
Min: -1.5 g at 100.0 ms



Filter Class: CFC_600
Max: 46.4 mm at 26.3 ms
Min: -0.0 mm at 1.6 ms



Filter Class: CFC_600
Max: 41.7 mm at 25.5 ms
Min: -0.0 mm at -7.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 12:25:14 730



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 47-1

Test Date: 10/7/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.64 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-45.22 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.1 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,232.7 N	Yes

Test meets specifications.

Comments: Pelvis plug #81013

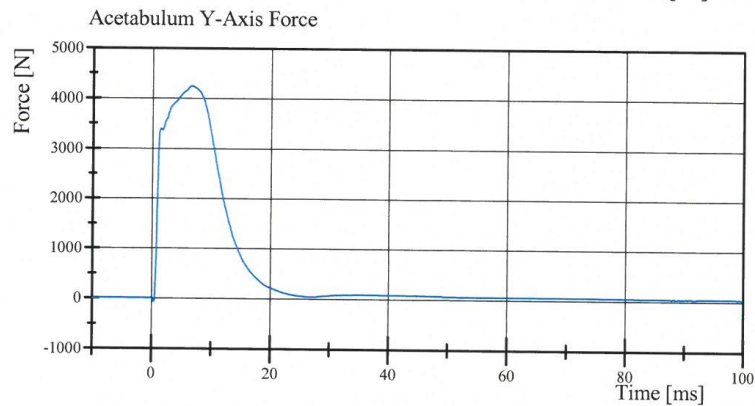
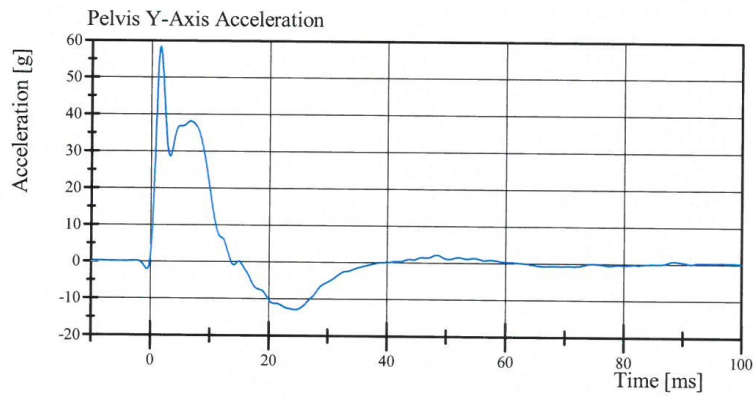
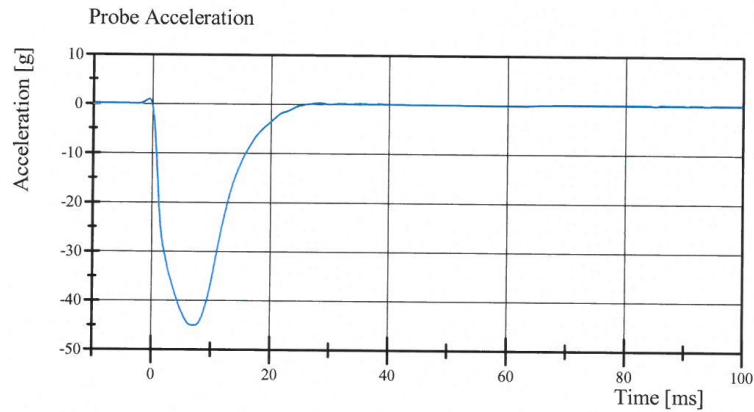
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 14:25:45 443



Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 47-1
Test Date: 10/7/2016



Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.07.2016 14:26:23 443



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 47-2

Test Date: 10/10/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.35 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.1 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.8 g	Yes
Iliac Force	4,100 - 5,100 N	4,578.4 N	Yes

Test meets specifications.

Comments:

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.10.2016 08:18:17 664

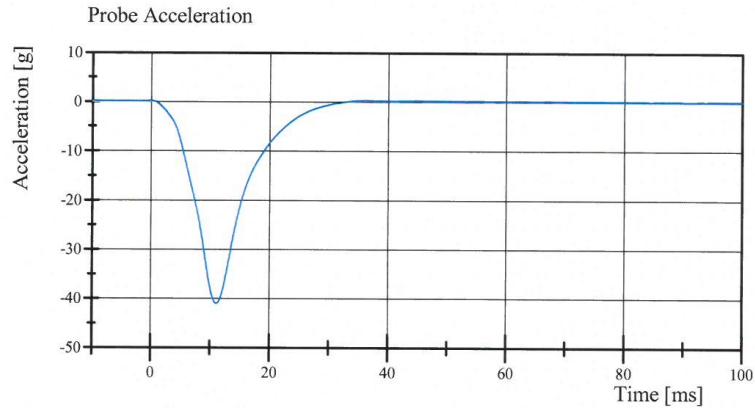


Transportation Research Center Inc.

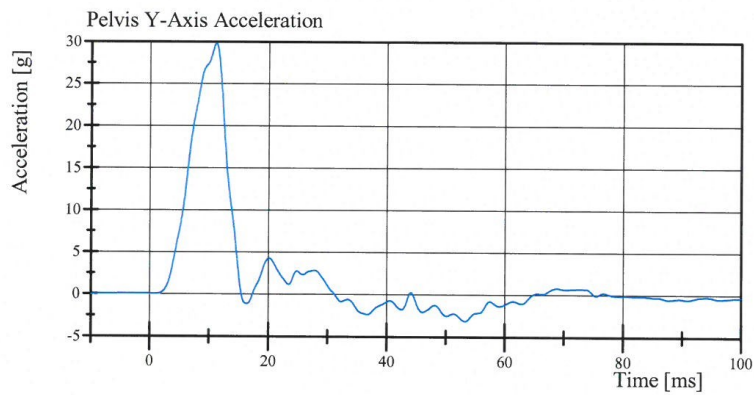
Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 47-2

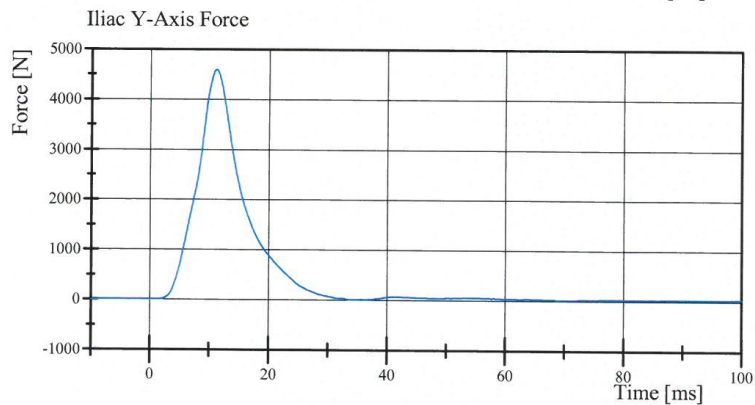
Test Date: 10/10/2016



Filter Class: CFC_180
Max: 0.2 g at 36.5 ms
Min: -41.1 g at 11.0 ms



Filter Class: CFC_180
Max: 29.8 g at 11.0 ms
Min: -3.1 g at 53.3 ms



Filter Class: CFC_600
Max: 4,578.4 N at 11.0 ms
Min: -0.7 N at -5.1 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.10.2016 08:18:34 664



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		P87680	Endevco	21-Sep-16
	Y		P87978	Endevco	21-Sep-16
	Z		P91950	Endevco	01-Apr-16
Redundant Head Accelerometers	X		P91617	Endevco	21-Sep-16
	Y		P94429	Endevco	01-Sep-16
	Z		P94483	Endevco	01-Sep-16
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	29-Sep-16
	Middle	Y	174	FTSS	29-Sep-16
	Lower	Y	173	FTSS	29-Sep-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		P89126	Endevco	21-Sep-16
	Y		P87139	Endevco	21-Sep-16
	Z		P64884	Endevco	21-Sep-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	P90267	Endevco	29-Sep-16
			Y	P93774	Endevco	01-Sep-16
			Z	P91566	Endevco	21-Sep-16
Redundant Head Accelerometers			X	P91615	Endevco	21-Sep-16
			Y	P93762	Endevco	01-Sep-16
			Z	P93761	Endevco	01-Sep-16
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	29-Sep-16
		Middle	Y	1161	Servo	29-Sep-16
		Lower	Y	037	Servo	29-Sep-16
	Abdominal Rib	Upper	Y	1295	Servo	29-Sep-16
		Lower	Y	1136	Servo	29-Sep-16
Lower Spine Accelerometers (T12)			X	P94545	Endevco	15-Sep-16
			Y	P94647	Endevco	21-Sep-16
			Z	P94530	Endevco	1-Sep-16
Acetabulum Load Cell			Y	103-FY	FTSS	13-Jun-16
Iliac Wing Load Cell			Y	287-FY	Denton	22-Mar-16
Pelvis Plug (struck side)				87123	Humanetics	29-Jun-15
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	P81667	Endevco	16-May-16
	Vehicle Center of Gravity	Y	P61351	Endevco	25-Jul-16
	Vehicle Center of Gravity	Z	P88468	Endevco	25-Jul-16
2	Right Sill at Front Seat	X	P93451	Endevco	25-Jul-16
	Right Sill at Front Seat	Y	P94544	Endevco	26-Jul-16
	Right Sill at Front Seat	Z	P58553	Endevco	22-Sep-16
3	Right Sill at Rear Seat	X	P91176	Endevco	22-Sep-16
	Right Sill at Rear Seat	Y	P91895	Endevco	25-Jul-16
	Right Sill at Rear Seat	Z	P45023	Endevco	28-Sep-16
4	Left Sill at Front Door	Y	P91173	Endevco	16-May-16
5	Left Sill at Rear Door	Y	P94659	Endevco	4-Oct-16
6	Left A-Post Lower	Y	P94549	Endevco	27-Jul-16
7	Left A-Post Middle	Y	P93519	Endevco	25-Jul-16
8	Left B-Post Lower	Y	P92000	Endevco	22-Sep-16
9	B-Post Middle	Y	P87164	Endevco	22-Sep-16
10	Front Seat Track	Y	P91963	Endevco	10-May-16
11	Rear Seat Track or Structure	Y	P94622	Endevco	4-Oct-16
12	Right Rear Occupant Compartment	Y	P45008	Endevco	22-Sep-16
13	Engine Block	X	P91183	Endevco	15-Sep-16
	Engine Block	Y	P25061	Endevco	20-Jul-16
14	Rear Floorpan Above Axle	X	P61285	Endevco	28-Sep-16
	Rear Floorpan Above Axle	Y	P50463	Endevco	25-Mar-16
	Rear Floorpan Above Axle	Z	P82047	Endevco	28-Sep-16

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P94552	Endevco	26-Jul-16
MDB Center of Gravity	Y	P94553	Endevco	26-Jul-16
MDB Center of Gravity	Z	P94546	Endevco	26-Jul-16
Left Frame Rail at Rear Axle Centerline	X	P93518	Endevco	25-Jul-16
Left Frame Rail at Rear Axle Centerline	Y	P93537	Endevco	25-Jul-16