FINAL REPORT NUMBER: SINCAP-TRC-20-005

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

FCA US LLC
2020 Ram 2500 Crew Cab
NHTSA NUMBER: M20200315

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

Report Date: November 20, 2020

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: 

John Shultz

Approval Date: November 20, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

Technical Report Documentation Page

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15. Supplemental Notes		

16. Abstract

This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2020 Ram 2500 Crew Cab , in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on October 1, 2020.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.14 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 20.8° C. The target vehicle post-test maximum crush was 188 mm at Level 1. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	17
Maximum Thoracic Rib Deflection	mm	44	27.2
Total Abdominal Force	N	2500	533.0
Pubic Symphysis Force	N	6000	-697.5
Lower Spine Acceleration	G	82*	26.7

Passenger ATD (SID-IIs)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	44
Lower Spine Resultant Acceleration	g's	82	24.2
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	822.4
Maximum Thoracic Rib Deflection	mm	38*	0.9
Maximum Abdominal Rib Deflection	mm	45*	0.4

* Proposed IARV

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

17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590

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TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2020 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 2020 Ram 2500 Crew Cab . The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A 2020 Ram 2500 Crew Cab was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.14 km/h (38.61 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 1, 2020. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

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

The dummies were instrumented in the following manner:

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

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

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	17
Maximum Thoracic Rib Deflection	mm	44	27.2
Combined Abdominal Force	N	2500	533.0
Pubic Symphysis Force	N	6000	-697.5
Lower Spine (T12) Resultant Acceleration	G	82*	26.7

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	44
Lower Spine (T12) Resultant Acceleration	G	82	24.2
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	822.4
Maximum Thoracic Rib Deflection	mm	38*	0.9
Maximum Abdominal Rib Deflection	mm	45*	0.4

* Proposed IARV

Supplemental Restraint Information is given below:

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

Photos Nos. 055, 064, 066, and 071 – These photos do not represent the actual foot placement position that the test was run with. These photographs should have been retaken after the foot placement was adjusted in the remote review session. Per the procedure, the feet should be parallel to/flat on the floor, not 90-degrees to the lower legs.

CG X: no good throughout

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20200315
Model Year	2020
Make	Ram
Model	2500 Crew Cab
Body Style	Truck
VIN	3C6UR4CJ5LG142242
Body Color	Bright White
Odometer Reading (km/mi)	96 mi
Engine Displacement (L)	6.4
Type/No. Cylinders	Gas/8
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear 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	FCA US LLC
Date of Manufacture	SEP/24/19
Vehicle Type	PASSENGER CAR

GVWR (kg)	4536
GAWR Front (kg)	2495
GAWR Rear (kg)	2722

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

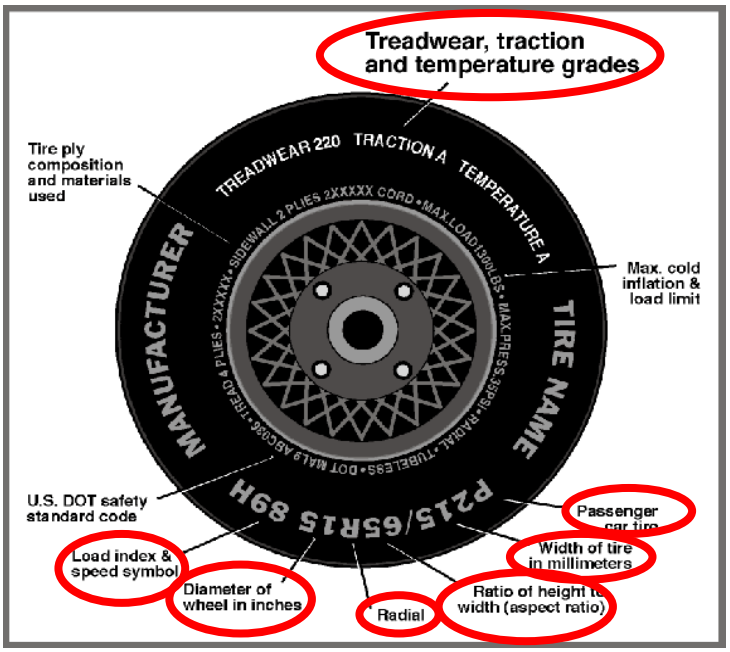
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity DSC)	3	3	N/A	6
Capacity Weight (VCW) (kg)				1645.0
DSC x 68.04 (kg)				408.2
Cargo Weight (RCLW) (kg)				1236.8

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Cold Pressure (kPa)	520	550
Recommended Tire Size	LT245/70R17	LT245/70R17
Tire Size on Vehicle	LT245/70R17	LT245/70R17
Tire Manufacturer	Firestone	Firestone
Tire Model	Transforce HT	Transforce HT
Treadwear	N/A	N/A
Traction	N/A	N/A
Temperature Grades	N/A	N/A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	119/116R	119/116r
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	VNP8 TF7 3319	VNP8 TF7 3319
DOT Safety Code Right	VNP8 TF7 3319	VNP8 TF7 3319

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

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	550	538	550	550
Tire Placard	kPa	520	520	550	550
Owner's Manual	kPa	520	520	550	550
As Tested	kPa	520	520	550	550

MDB TIRE SPECIFICATIONS

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	815.8	645.0		880.8	733.8		881.6	757.8	
Right	kg	798.2	622.8		811.2	709.0		806.0	697.4	
Ratio	%	56.0	44.0		54.0	46.0		53.7	46.3	
Totals	kg	1614.0	1267.8	2881.8	1692.0	1442.8	3134.8	1687.6	1455.2	3142.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2881.8	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)[1]	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	3142.8	(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	948	943	Yes
RF	mm	955	951	Yes
RR	mm	1017	1015	Yes
LR	mm	1008	1005	Yes
Vehicle CG (Aft of Front Axle)	mm	1757	1746	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+38	+26	

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

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plate mounted in truck bed	70.8
Removed: None	0.0

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

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

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	N/A	N/A	15.0
Front Passenger Seat	N/A	N/A	15.2
Front Center Seat*	N/A	N/A	4.9
Struck Side Rear Seat	N/A	N/A	7.5
Non-Struck Side Rear Seat	N/A	N/A	8.6
Rear Center Seat*	N/A	N/A	11.2

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	15.0	298	Max	N/A	N/A	N/A
			Mid	290	298	308
			Min	N/A	N/A	N/A
Front Passenger Seat	15.2	295	Max	N/A	N/A	N/A
			Mid	287	295	303
			Min	N/A	N/A	N/A
Front Center Seat*	4.9	202	Max	N/A	N/A	N/A
			Mid	N/A	202	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	7.5	363	Max	N/A	N/A	N/A
			Mid	N/A	363	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	8.6	353	Max	N/A	N/A	N/A
			Mid	N/A	353	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	11.2	221	Max	N/A	N/A	N/A
			Mid	N/A	221	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: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

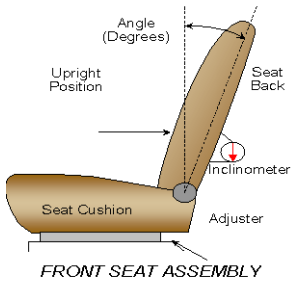
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	230	24	120	12
Front Passenger Seat	230	24	120	12
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	0	Fixed	0	Fixed
Non-Struck Side Rear Seat	0	Fixed	0	Fixed
Rear Center Seat*	0	Fixed	0	Fixed

* 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	55.8	29	5.1	8
Front Passenger Seat	56.3	29	4.8	8
Front Center Seat*	Fixed	N/A	19.3	N/A
Struck Side Rear Seat w/ Seated Dummy	Fixed	N/A	18.6	N/A
Non-Struck Side Rear Seat	Fixed	N/A	20.9	N/A
Rear Center Seat*	Fixed	N/A	17.7	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	5	5, Uppermost
Rear Seat	1	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.

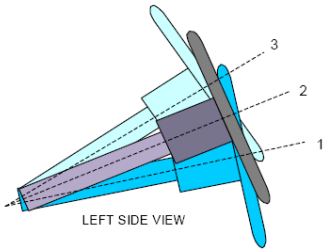
	Total # of Positions	Placed in Position #
Driver Seat	5 vertical, 7 horizontal	5,7 Full up, full forward
Rear Seat	2 vertical	1 Full down

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

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

STEERING COLUMN ADJUSTMENT

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



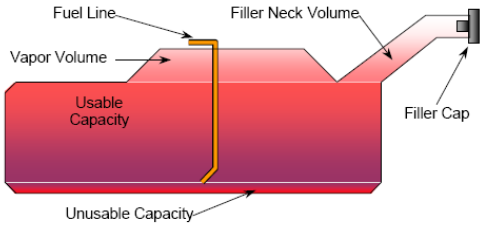
STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	13.8	N/A
Geometric Center, Position No. 2	23.6	N/A
Uppermost, Position No. 3	30.9	N/A
Telescoping Steering Wheel Travel		N/A
Test Position	23.6	N/A

FUEL PUMP

Describe the fuel pump type, details about how it operates, and the location of the fuel filler neck.

Ignition key in and turned to the run position



VEHICLE FUEL TANK ASSEMBLY

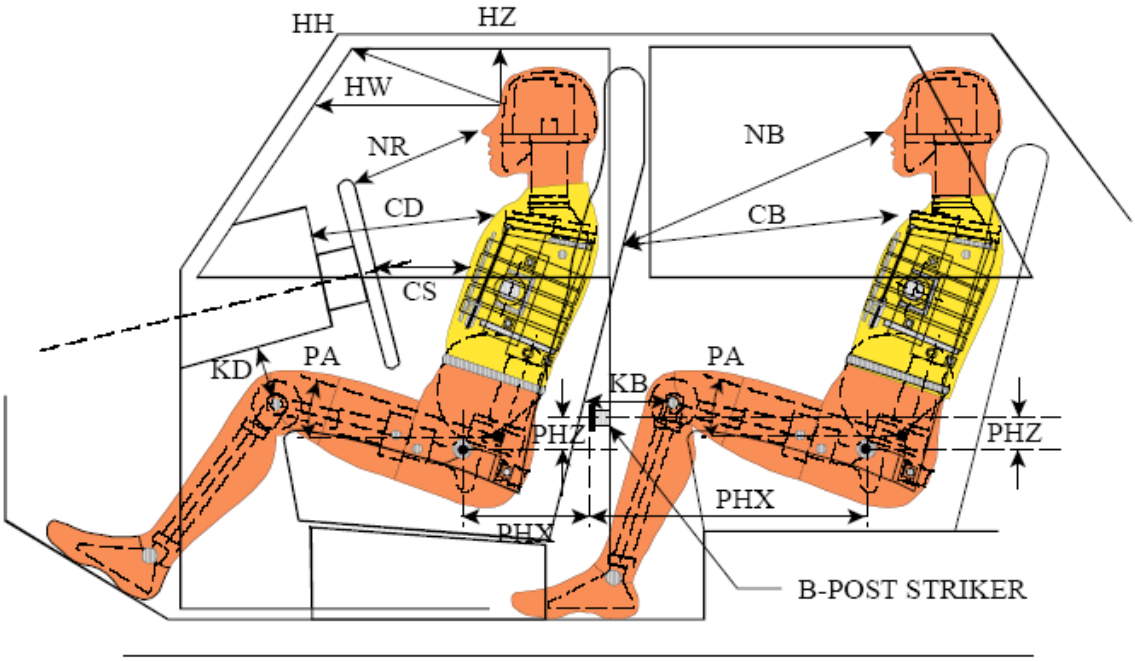
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	117
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	117
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	109
Actual Amount of Solvent Used in Test	109
1/3 of Usable Capacity	39

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



LEFT SIDE VIEW

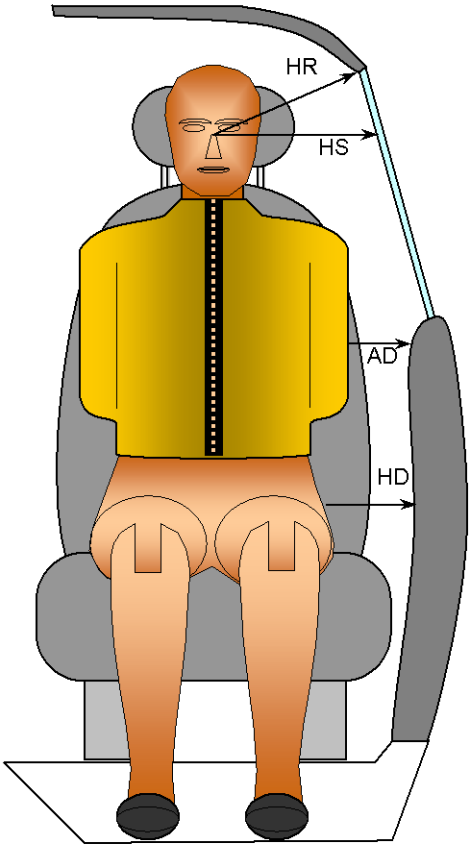
NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	457			
HW		Header to Windshield	674			
HZ	HZ	Head to Roof Liner	221		296	
NR	NB	Nose to Rim/Seat Back	448		644	
CD	CB	Chest to Dash/Seat Back	615		609	
CS		Chest to Steering Wheel	387			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	130	22.3	360	0.0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	98	24.1	358	0.0
PAX°	PAX°	Pelvic Tilt Angle X		0.2		0.4
	PAY°	Pelvic Tilt Angle Y				18.8
PHX	PHX	Hip Point to Striker (X-Axis)	183		229	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	19		18	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

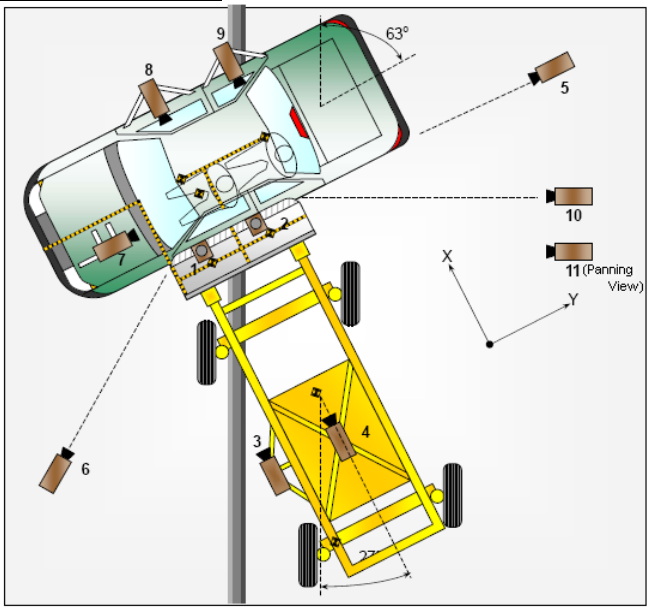


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	203	256
HS	Head to Side Window	mm	320	368
AD	Arm to Door	mm	104	165
HD	H-Point to Door	mm	160	171

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



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	12.5	1000
2	Overhead Close-up	0	770	-5692	28	1000
3	Left Impact Point (MDB)	-1811	890	-860	25	1000
4	Side Overall (MDB)	-2420	0	-1471	8.5	1000
5	Rear	1373	7605	-1635	20	1000
6	Left Front	-5153	-5734	-1585	20	1000
7	Driver Front (OB)				12.5	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

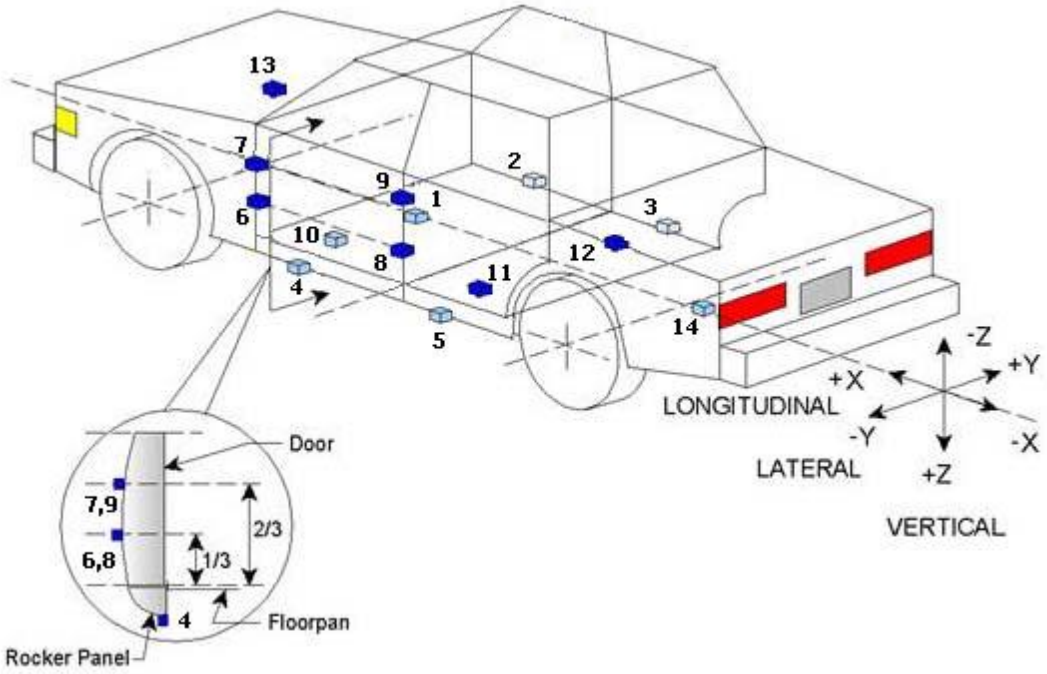
Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down
*All measurements accurate to ± 6 mm.
If applicable, explain why camera(s) did not operate as intended: N/A

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: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



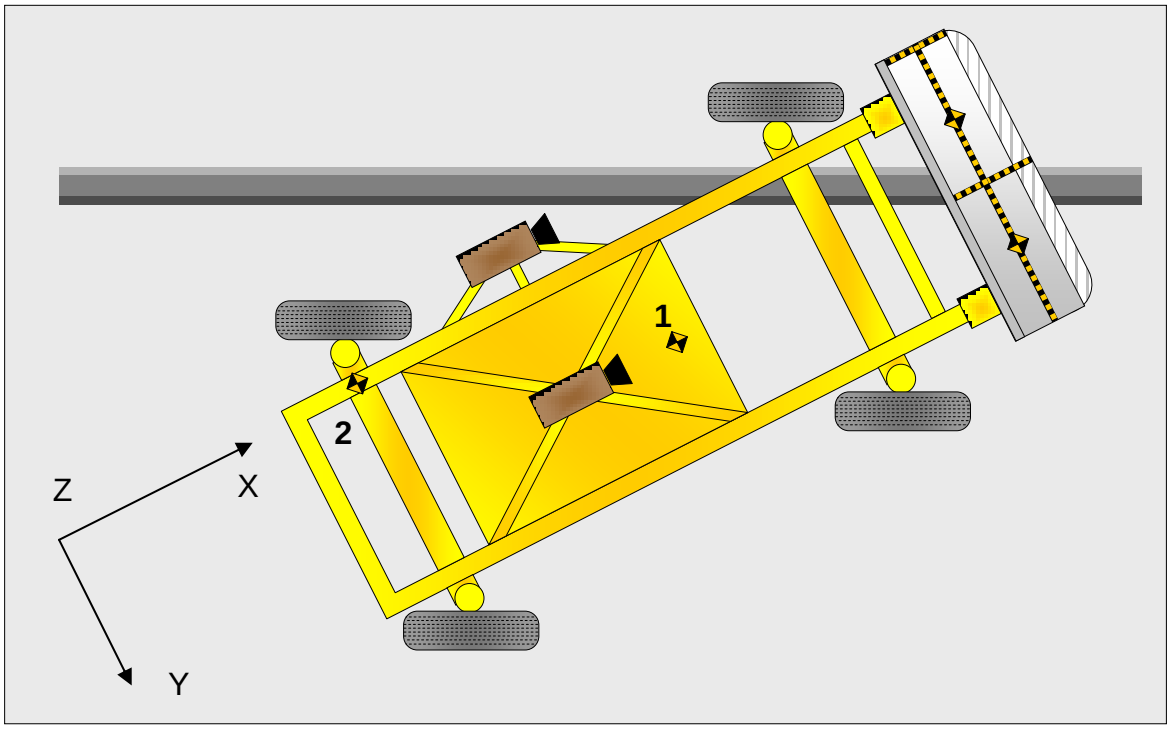
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3250	0	-748
2	Right Sill at Front Seat	4015	835	-554
3	Right Sill at Rear Seat	3045	835	-570
4	Left Sill at Front Door	4005	-835	-553
5	Left Sill at Rear Door	3055	-835	-561
6	A-Post Lower	4440	-900	-855
7	A-Post Middle	4435	-890	-1201
8	B-Post Lower	3320	-810	-858
9	B-Post Middle	3320	-800	-1223
10	Front Seat Track	3685	-555	-562
11	Rear Seat Structure	2750	-720	-802
12	Right Rear Occ. Compartment	2750	720	-812
13	Engine Block	4910	25	-1257
14	Rear Above Axle	1285	0	-936

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: 2020 Ram 2500 Crew Cab
Test Program: SINCAP Side Impact
NHTSA No.: M20200315
Test Date: 10/1/2020



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: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	None	SCAB
Top of Head	Head liner	SCAB
Left Side of Head	Head liner, SCAB	SCAB
Back of Head	Head liner	SCAB
Left Shoulder	SCAB	C-Pillar, Door panel
Upper Torso	Seatback bolster, SAB	None
Lower Torso	Seatback bolster	None
Left Hip	Seat cushion bolster, Door panel	Seat cushion bolster
Left Knee	Door panel	None

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	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	None
Side Window Damage	None
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3794
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		506
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+2
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-8

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

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	1104

MDB WEIGHTS

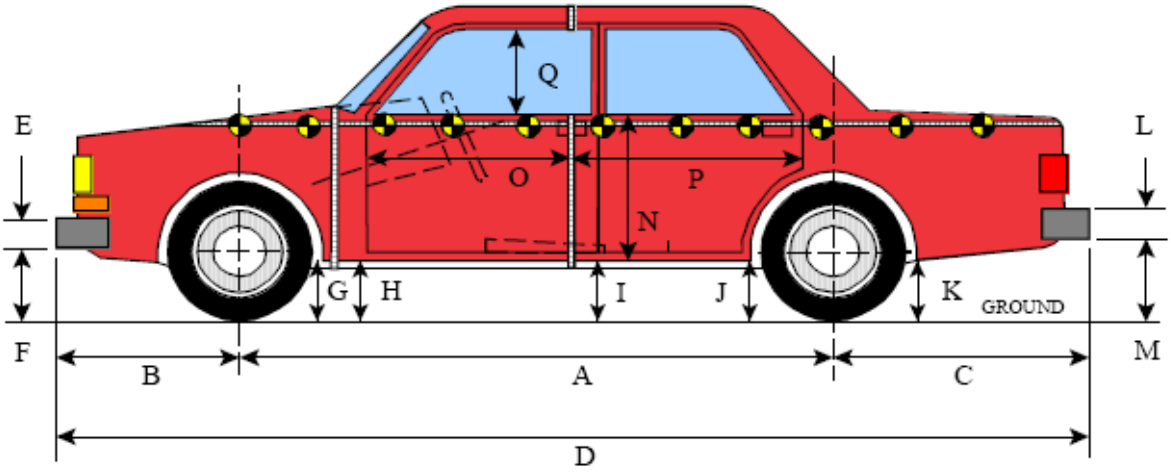
	Units	Front Axle	Rear Axle	Total
Left	kg	385.8	295.4	681.2
Right	kg	395.0	284.6	679.6
Ratio	%	57.4	42.6	100.0
Totals	kg	780.8	580.0	1360.8

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.14
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.15
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: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



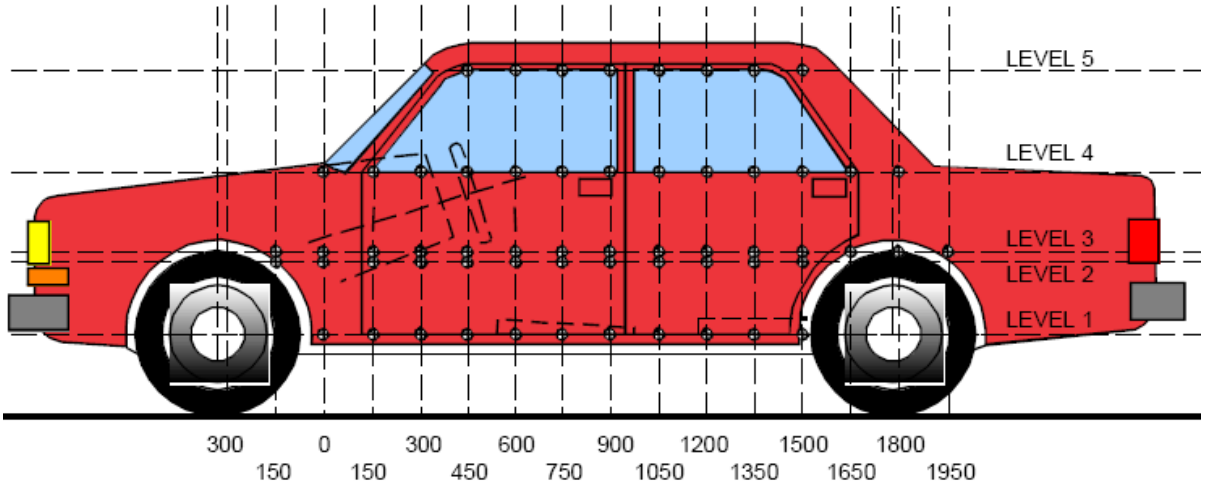
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3794	3760	34
B	Front Axle to Front Surface of Vehicle	993	993	0
C	Rear Axle to Rear Surface of Vehicle	1233	1233	0
D	Total Length at Centerline	6020	6050	-30
E	Front Bumper Thickness	260	260	0
F	Front Bumper Bottom to Ground	422	421	1
G	Sill Height at Front Wheel Well	470	463	7
H	Sill Height at Front Door Leading Edge	478	476	2
I	Sill Height at B-Pillar	488	530	-42
J1	Sill Height at Rear Wheel Well	515	561	-46
J2	Pinch Weld Height at Rear Wheel Well	408	450	-42
K	Sill Height Aft of Rear Wheel Well	562	578	-16
L	Rear Bumper Thickness	755	755	0
M	Rear Bumper Bottom to Ground	576	490	86
N	Sill Height to Window Bottom Sill	887	885	2
O	Front Door Leading Edge to Impact CL	800	790	10
P	Rear Door Trailing Edge to Impact CL	1345	1324	21
Q	Front Window Opening	492	492	0
R	Right Side Length	5960	5945	15
S	Left Side Length	5960	5910	50
T	Vehicle Width	2015	2025	-10

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	563	188	1800
2	Driver Hip Point	990	71	1500
3	Mid-Door	930	100	1350
4	Window Sill	1304	-10	2250
5	Window Top	1861	-18	2100

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: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

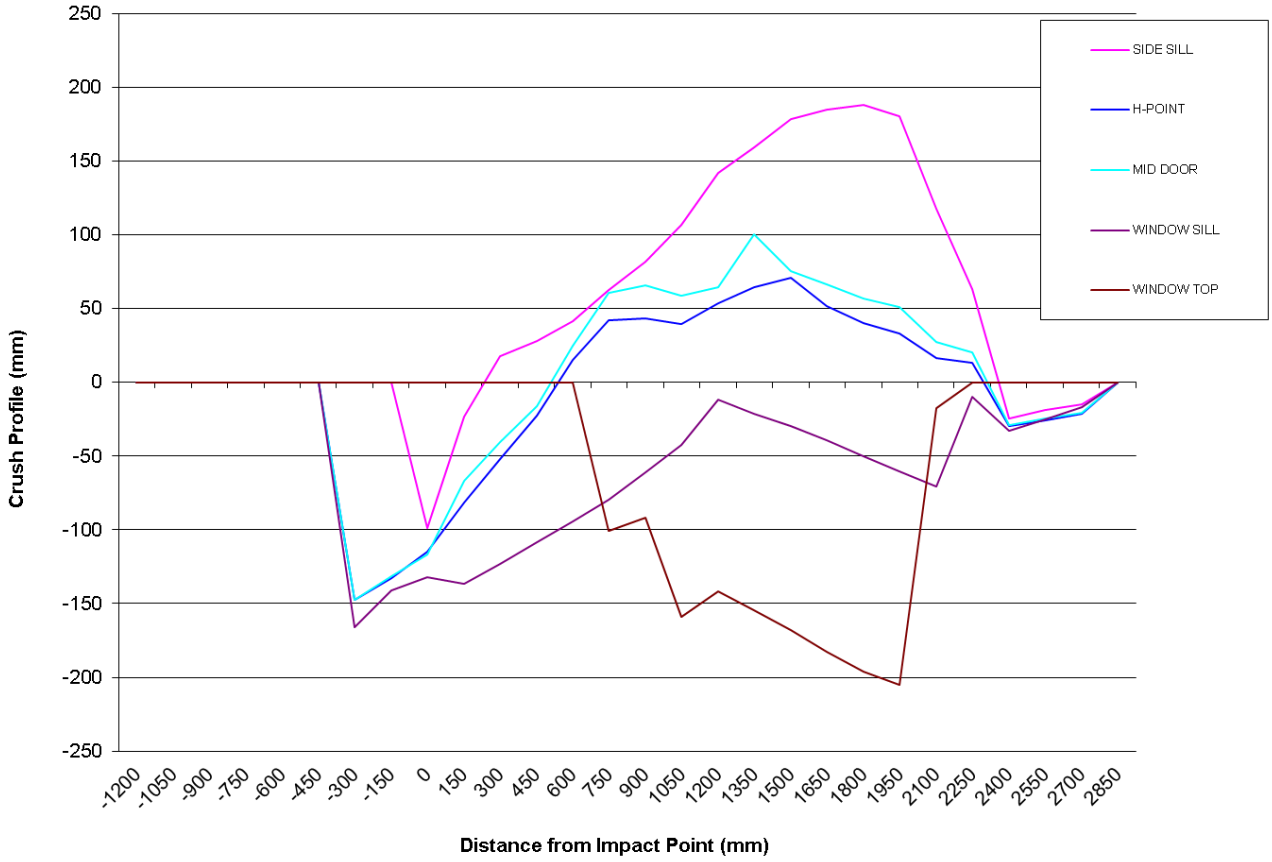
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
300	965	1013	1013	933	0	947	1065	1054	1056	0	18	-52	-41	-123	0
450	958	1012	1012	940	0	930	1034	1029	1049	0	28	-22	-17	-109	0
600	952	1011	1012	946	0	910	996	987	1041	0	42	15	25	-95	0
750	953	1011	1012	952	727	891	969	952	1031	828	62	42	60	-79	-101
900	955	1012	1014	957	732	873	969	948	1018	824	82	43	66	-61	-92
1050	957	1015	1016	962	739	850	976	957	1004	898	107	39	59	-42	-159
1200	959	1016	1017	965	746	817	962	952	977	888	142	54	65	-12	-142
1350	960	1018	1018	969	750	801	954	918	990	904	159	64	100	-21	-154
1500	961	1019	1019	972	752	783	948	944	1002	920	178	71	75	-30	-168
1650	963	1020	1019	975	754	778	968	953	1014	937	185	52	66	-39	-183
1800	964	1019	1019	977	756	776	979	962	1027	952	188	40	57	-50	-196
1950	966	1019	1018	979	759	785	985	967	1039	964	181	34	51	-60	-205
2100	967	1017	1016	979	758	849	1001	989	1050	776	118	16	27	-71	-18
2250	923	1002	999	963	0	860	989	979	973	0	63	13	20	-10	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.

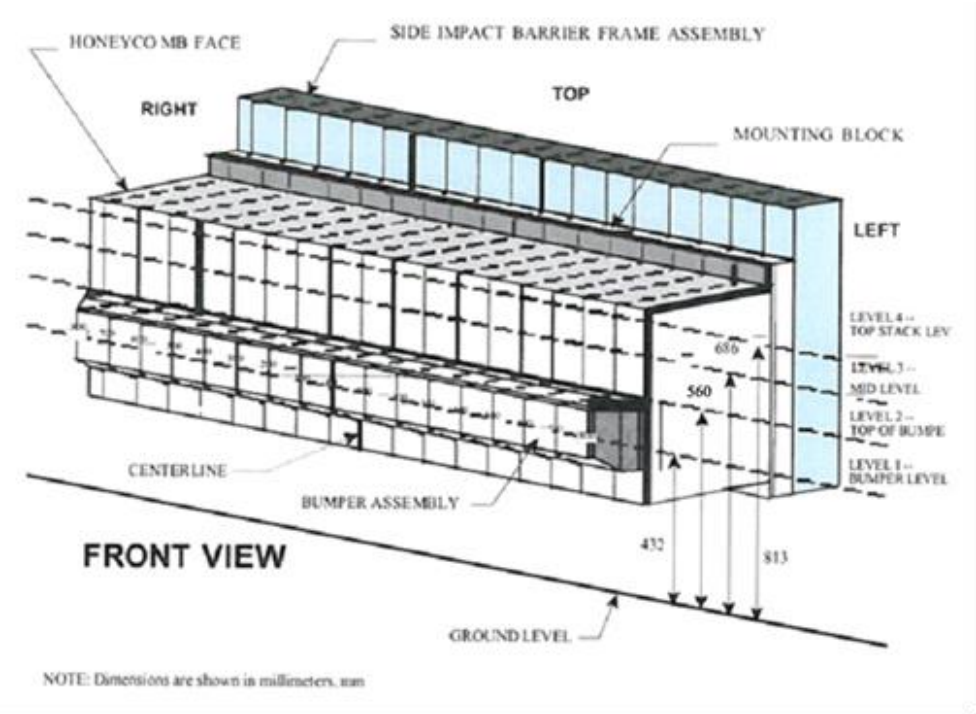
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

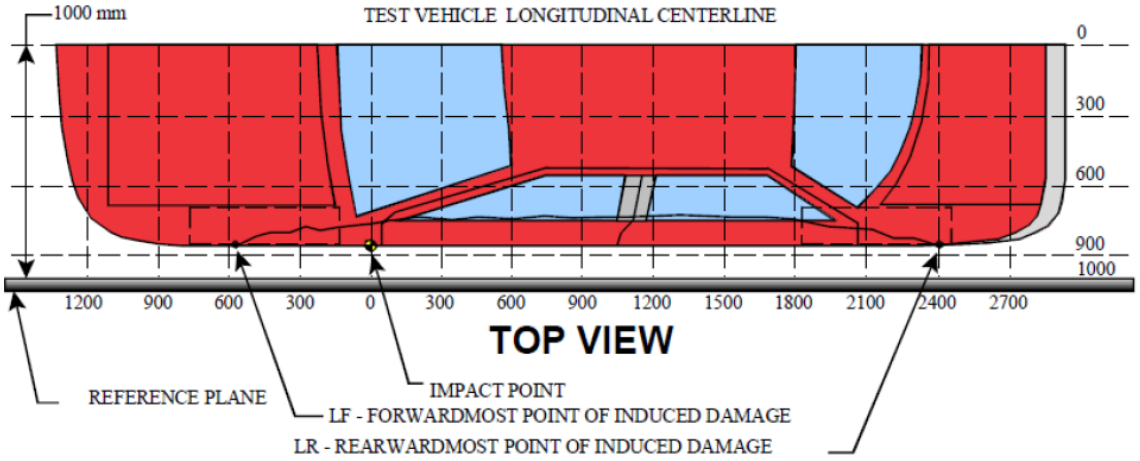
Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	71
B	Top of Bumper	560	800	Left	87
C	Mid-Level	686	800	Right	152
D	Top of Stack	813	800	Right	210

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	23	30	23	18	20	24	28	33	37	36	33	37	42	47	53	63	71
2	79	36	30	29	31	36	40	45	49	46	48	54	60	65	72	80	87
3	152	107	71	56	52	50	56	67	69	79	86	88	97	106	116	127	139
4	210	186	161	140	128	121	127	134	137	130	133	132	130	130	132	139	152

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



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

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1[1]	2250	1	860	923	0
2	1800	1	776	964	188
3	1350	1	801	960	159
4	1050	1	850	957	107
5	750	1	891	953	62
6[1]	300	1	947	965	0

1

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	4	230	382	152
2	500 mm Left of Center	4	253	383	130
3	200 mm Left of Center	4	251	384	133
4	200 mm Right of Center	4	257	384	127
5	500 mm Right of Center	4	244	384	140
6	800 mm Right of Center	4	174	384	210

[1] DPD 1 and 6 are 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: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020

Test Time: 16:44 **Temperature:** 21.2°C

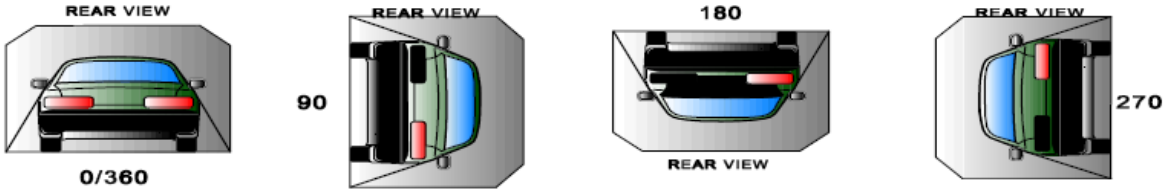
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

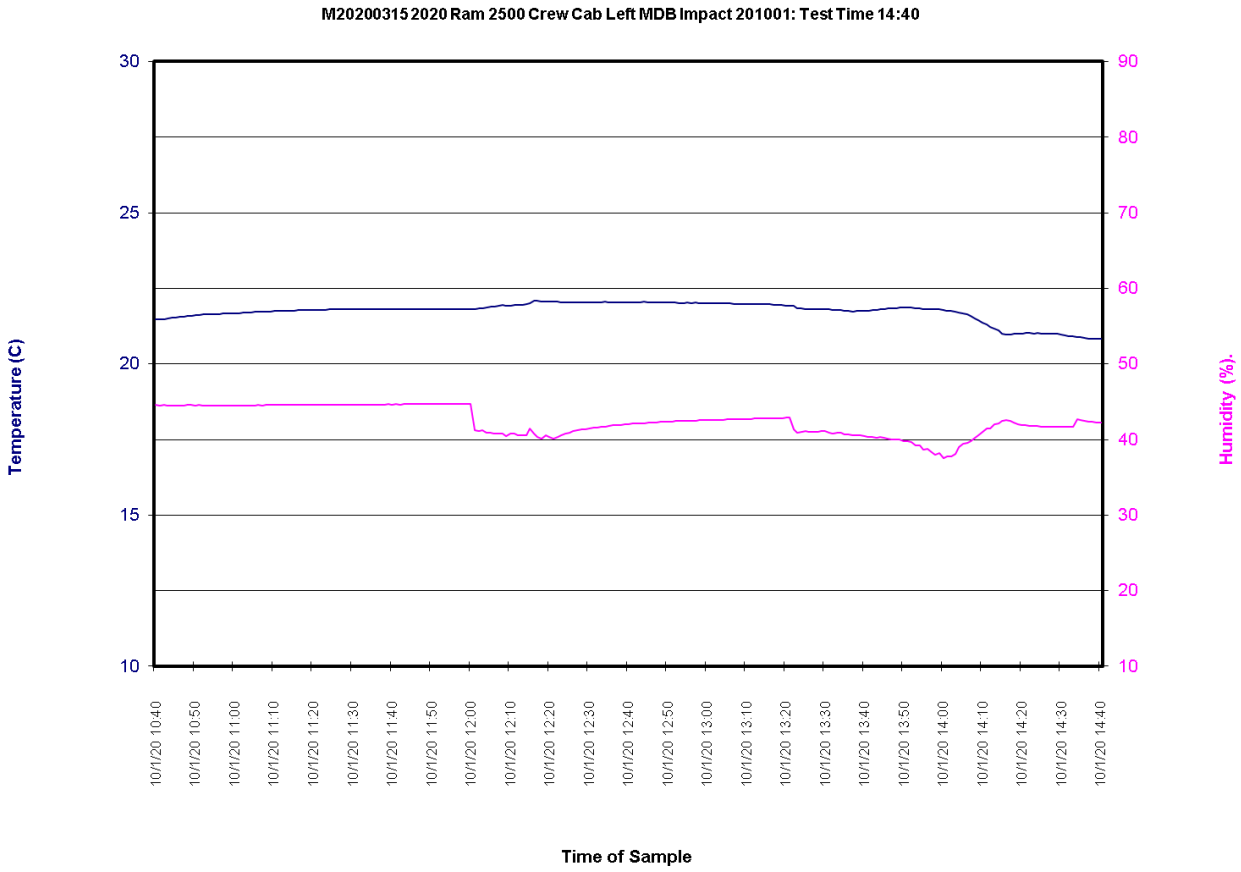
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

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: 2020 Ram 2500 Crew Cab NHTSA No.: M20200315
Test Program: SINCAP Side Impact Test Date: 10/1/2020



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

002 As-Delivered Left Rear ¾ View of Test Vehicle

003 Pre-Test Frontal View of Test Vehicle

004 Post-Test Frontal View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

006 Post-Test Left Front ¾ View of Test Vehicle

007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear ¾ View of Test Vehicle

010 Post-Test Left Rear ¾ View of Test Vehicle

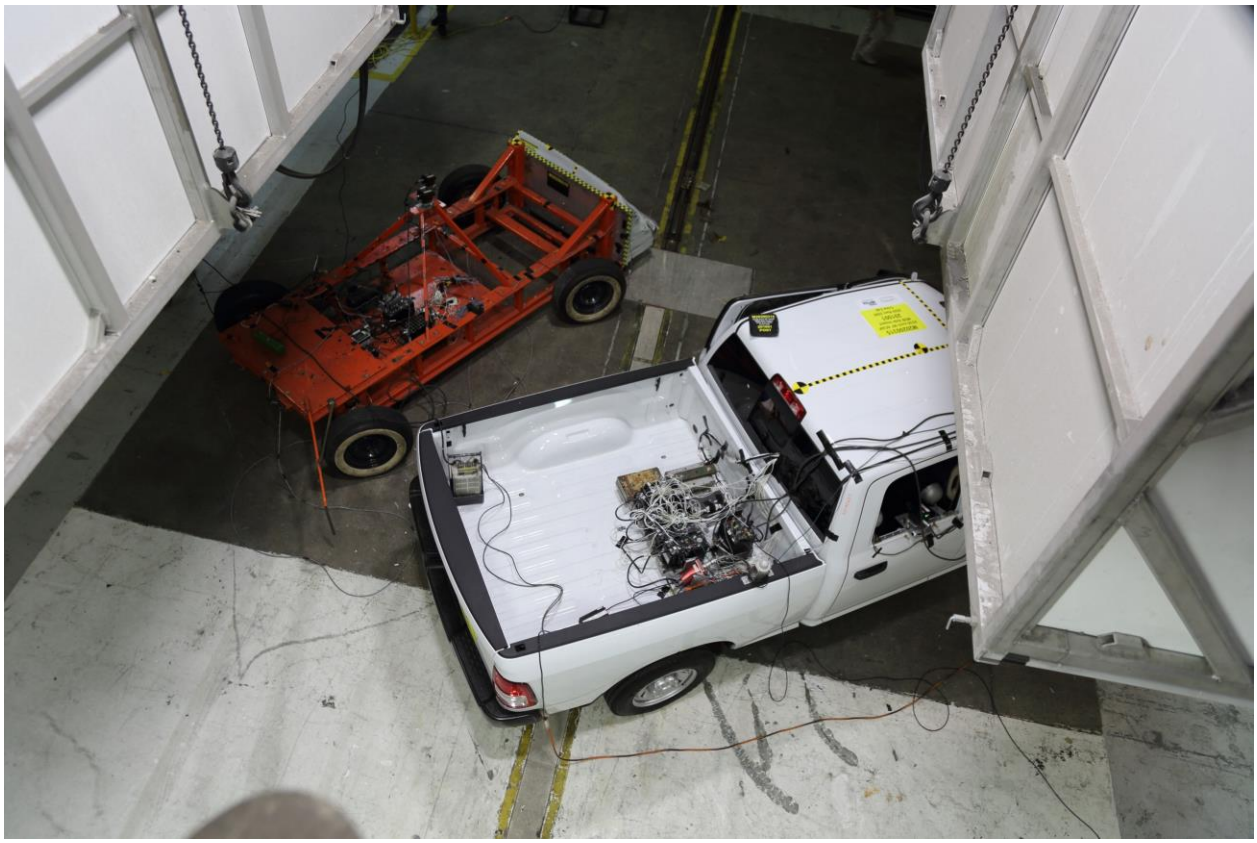
011 Pre-Test Rear View of Test Vehicle

012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle

015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

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

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

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

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

021 Pre-Test Left Front Door Latch Close-Up

022 Post-Test Left Front Door Latch Close-Up

023 Pre-Test Left Rear Door Latch Close-Up

024 Post-Test Left Rear Door Latch Close-Up

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

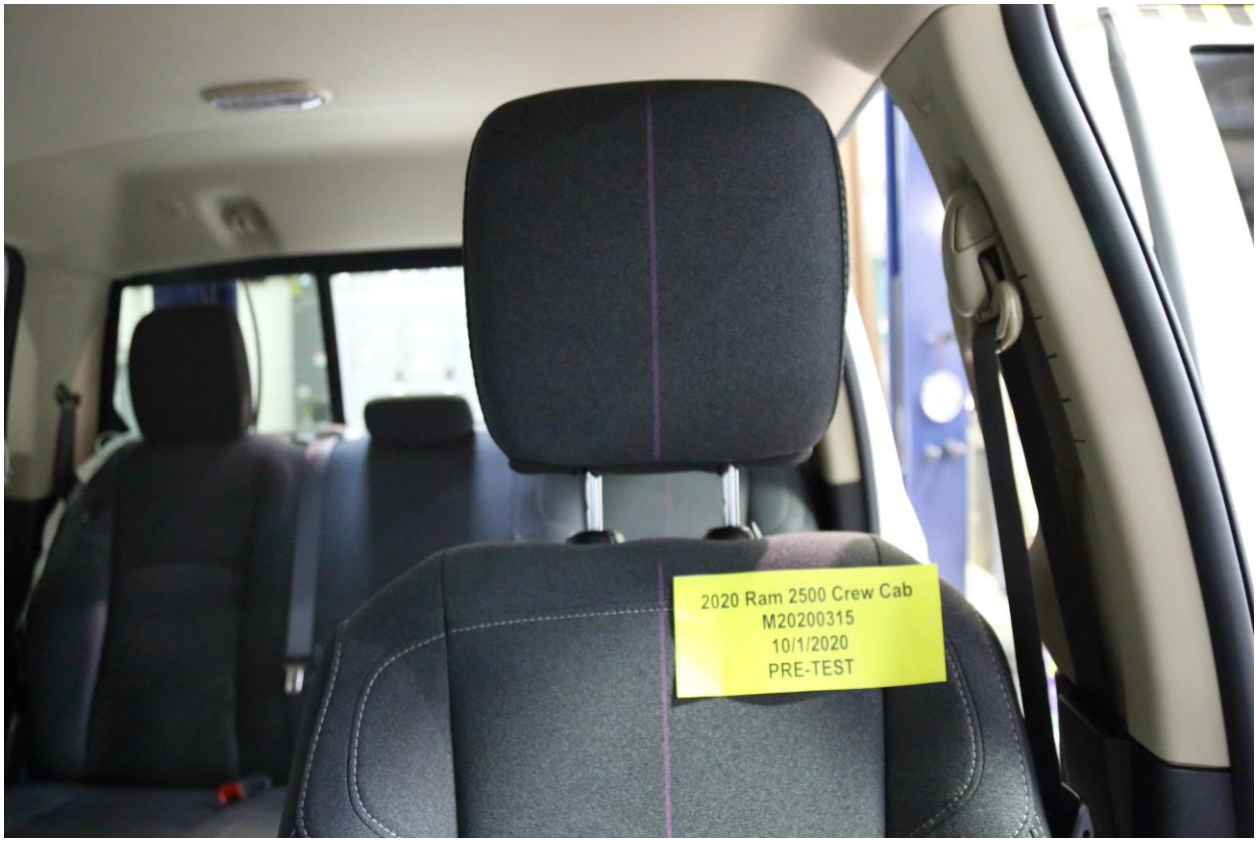
026 Post-Test Front Close-Up View of Driver Dummy

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

Intentionally Left Blank

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

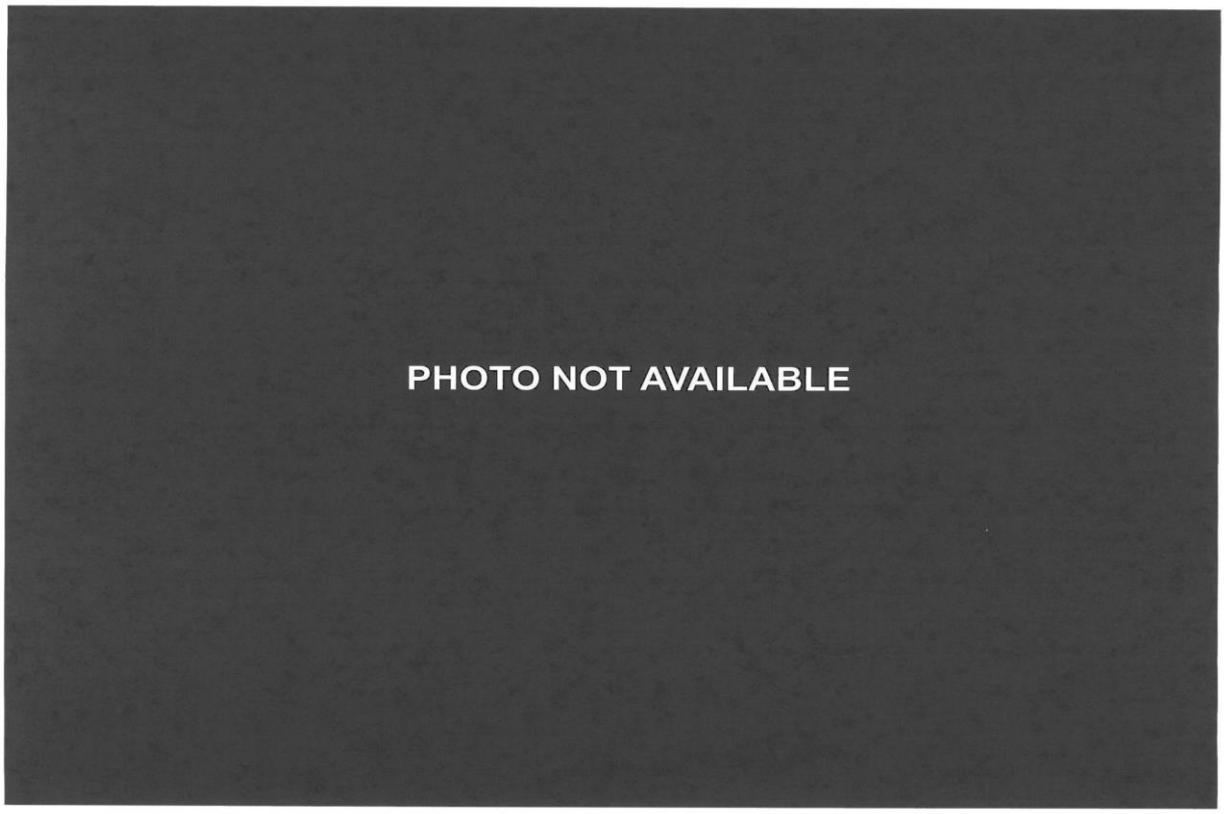
033 Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan

034 Pre-Test Placement of Driver's Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy

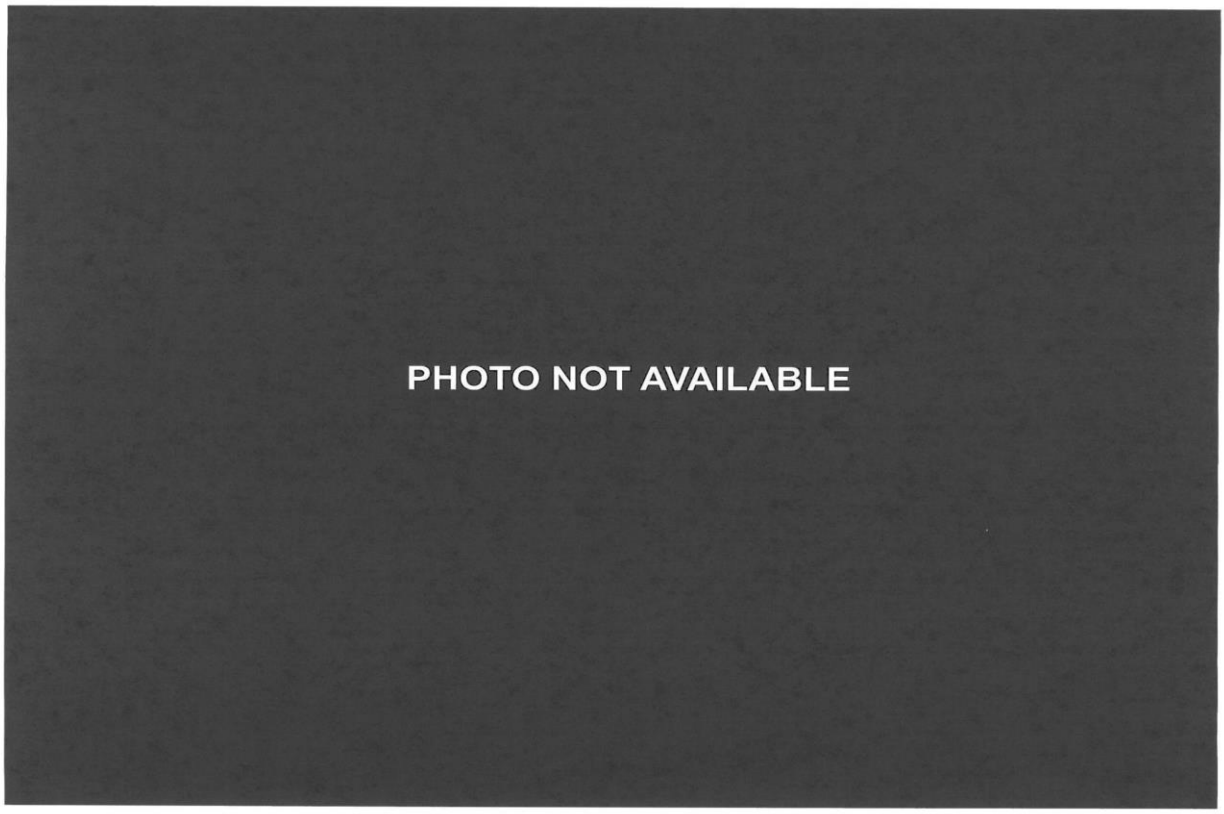
036 Pre-Test Left Side View of Steering Wheel

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



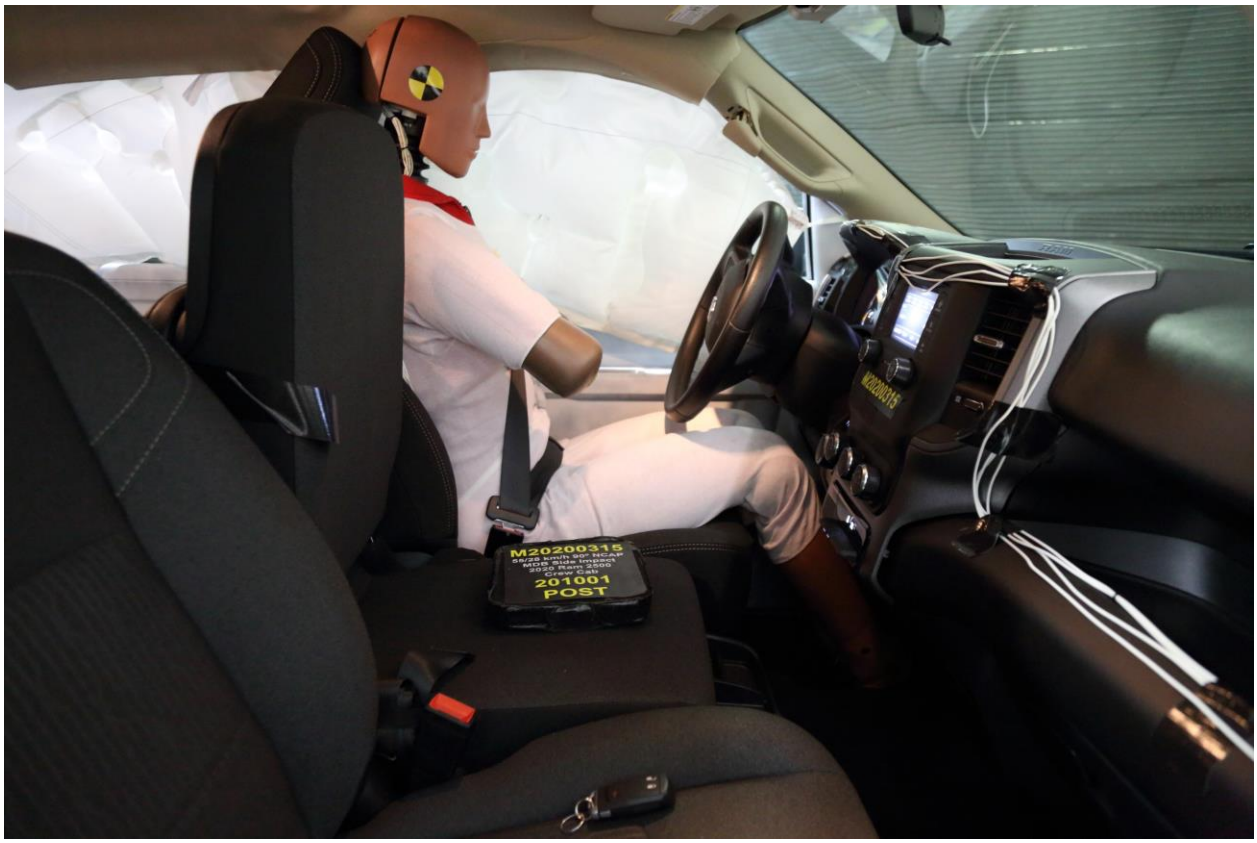
040 Pre-Test Close-Up Left Side View of Driver Seat Back

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

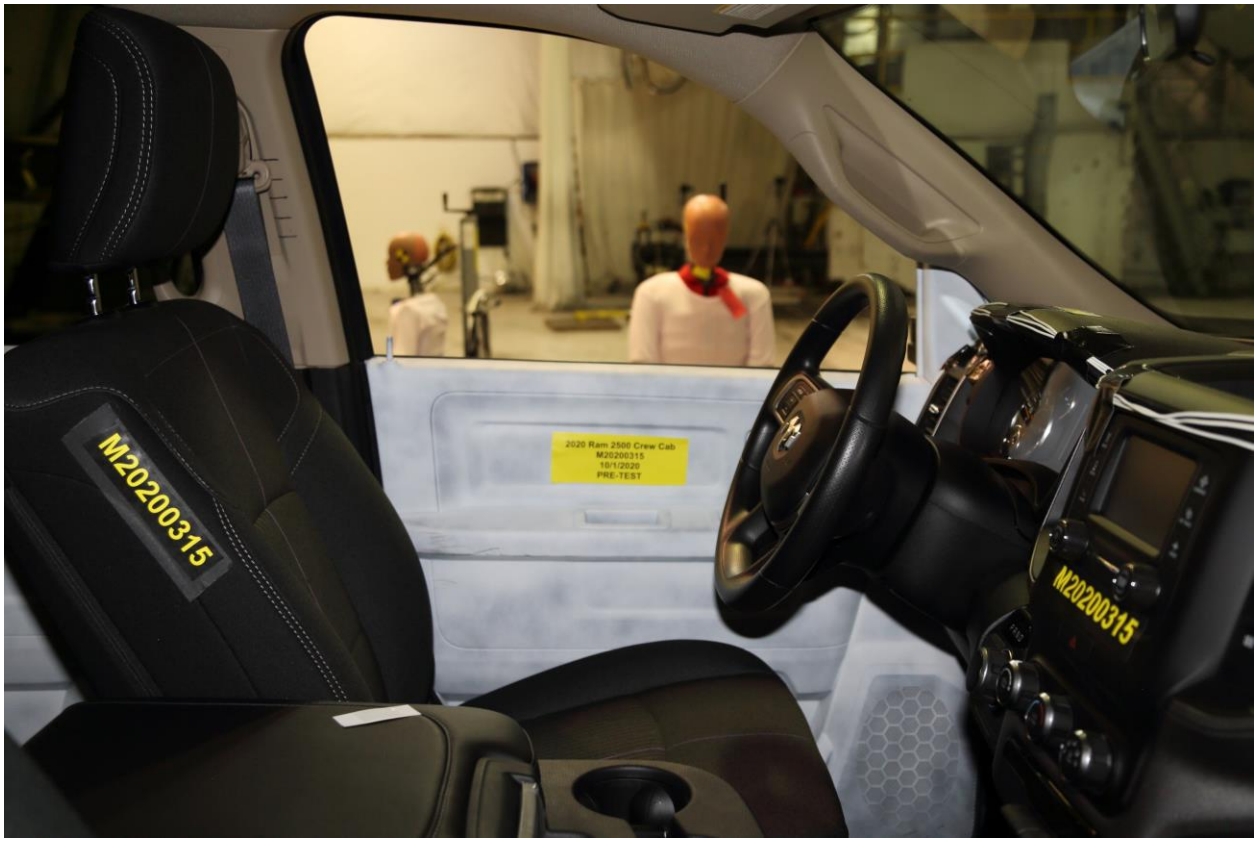
042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View

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

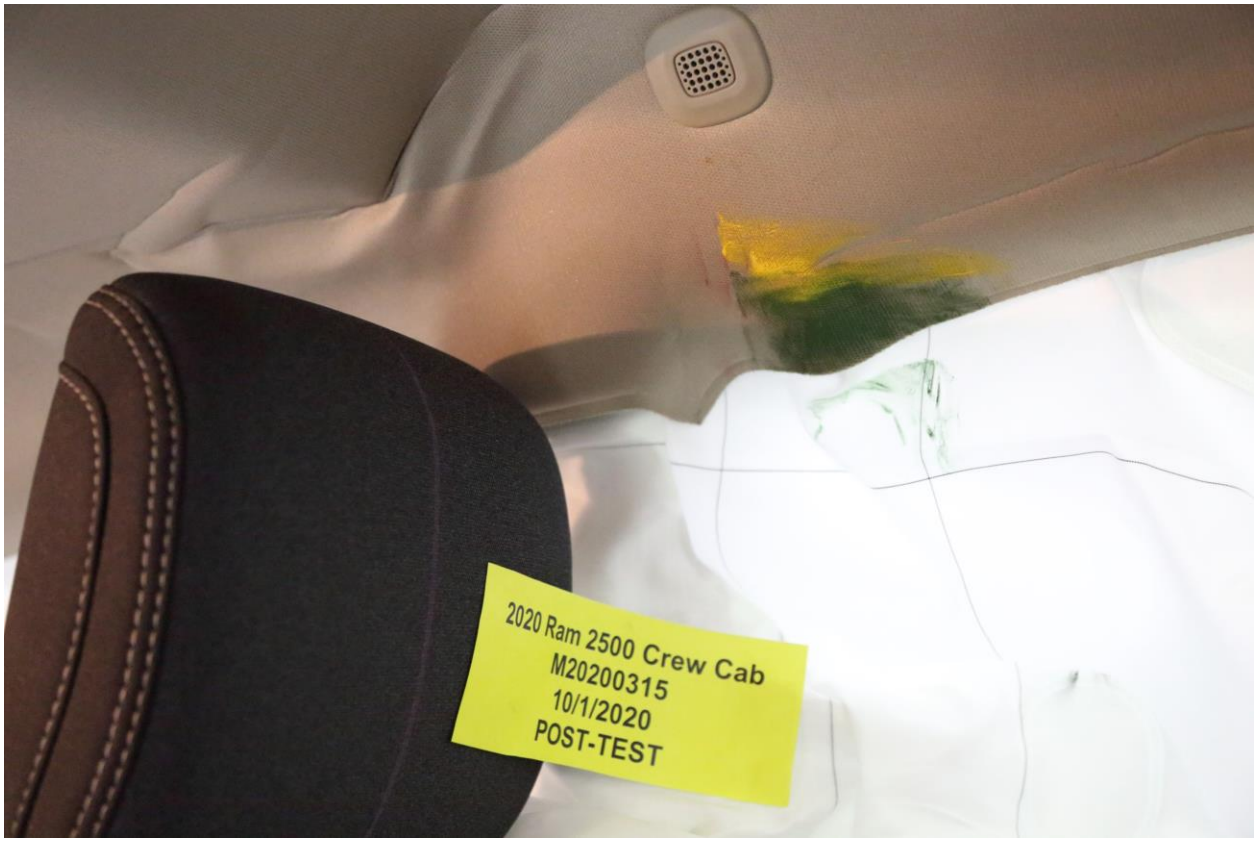


045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

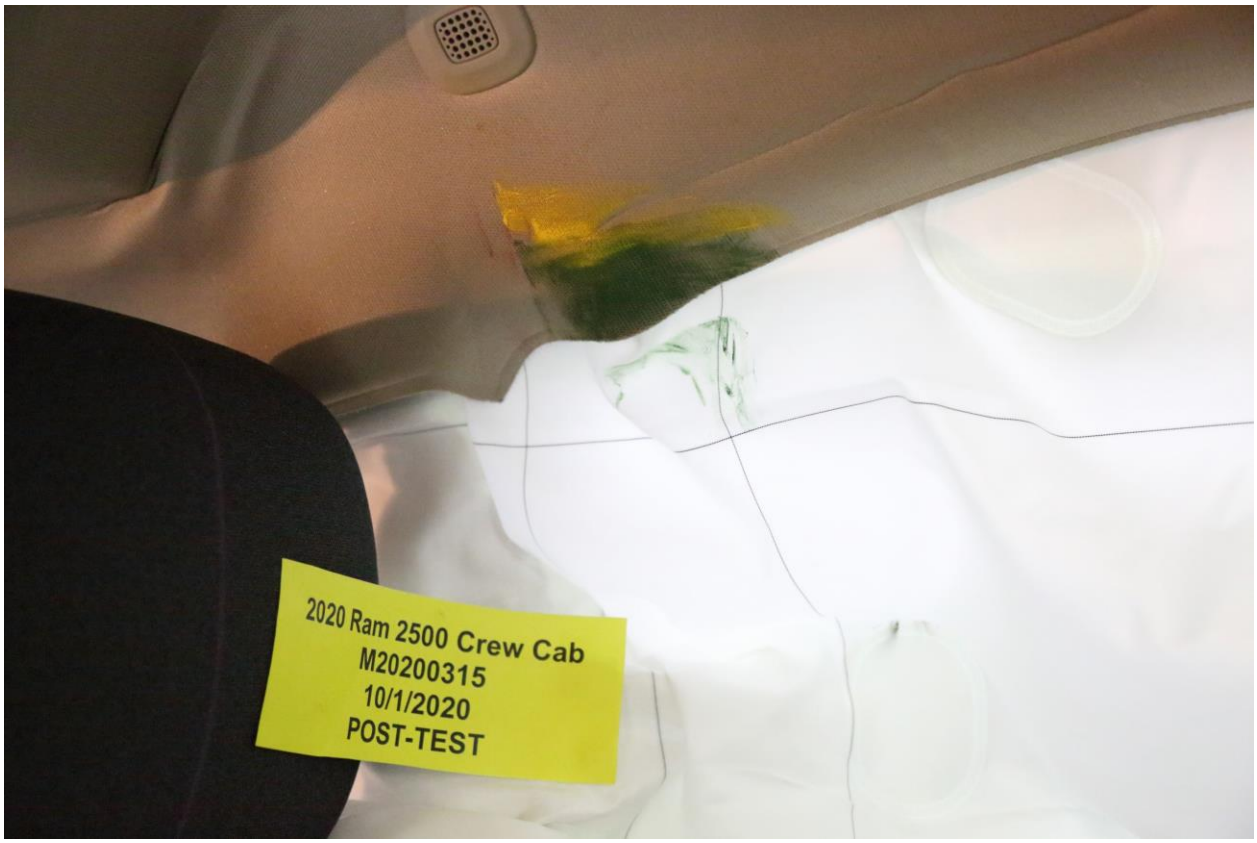


046 Pre-Test Driver Inner Door Panel View

047 Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations



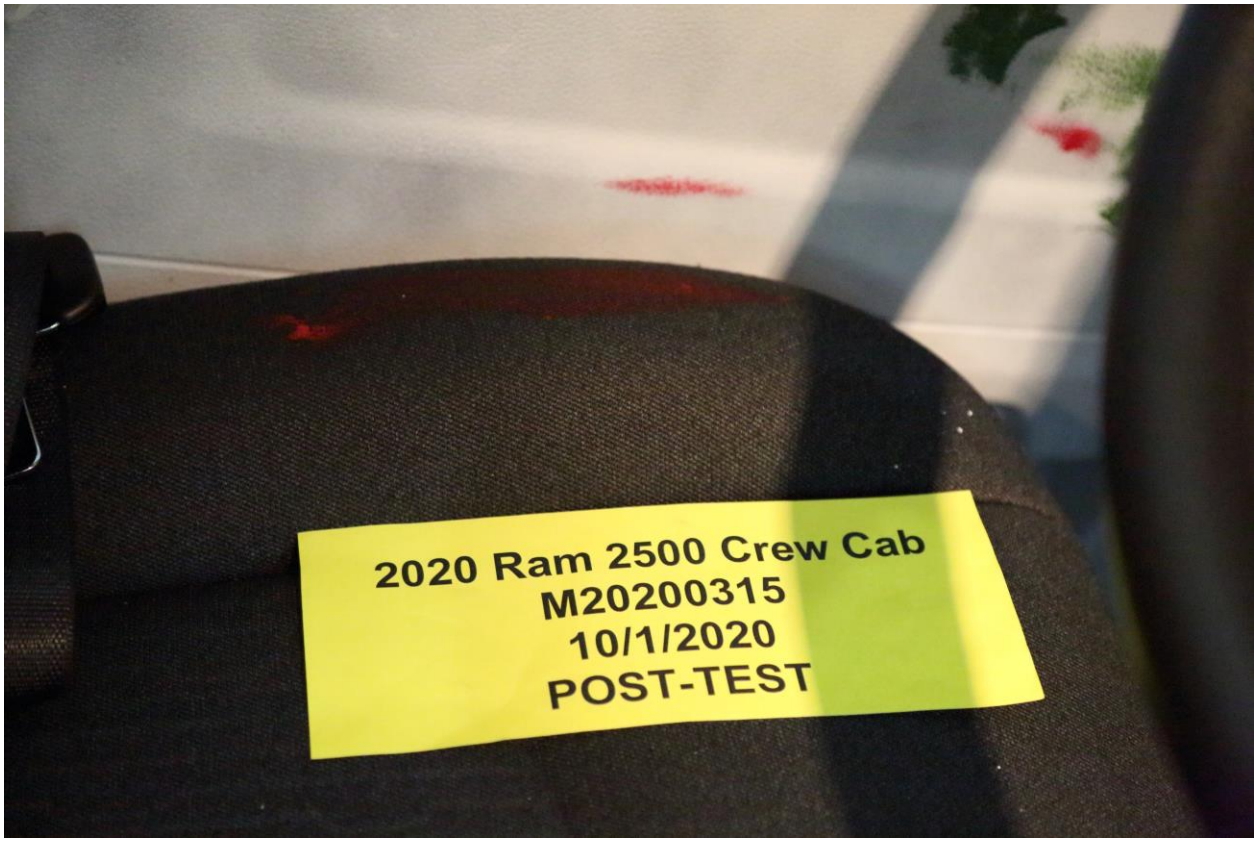
048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View



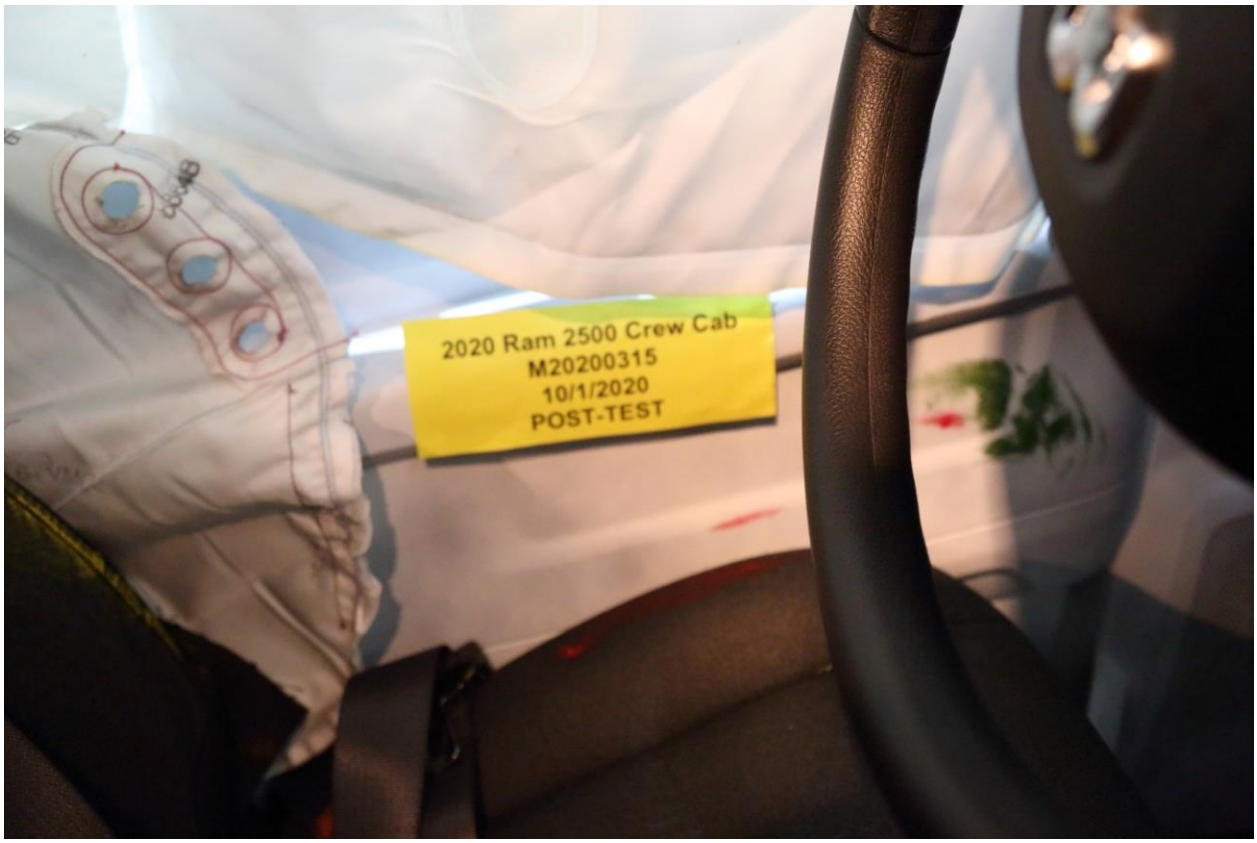
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

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

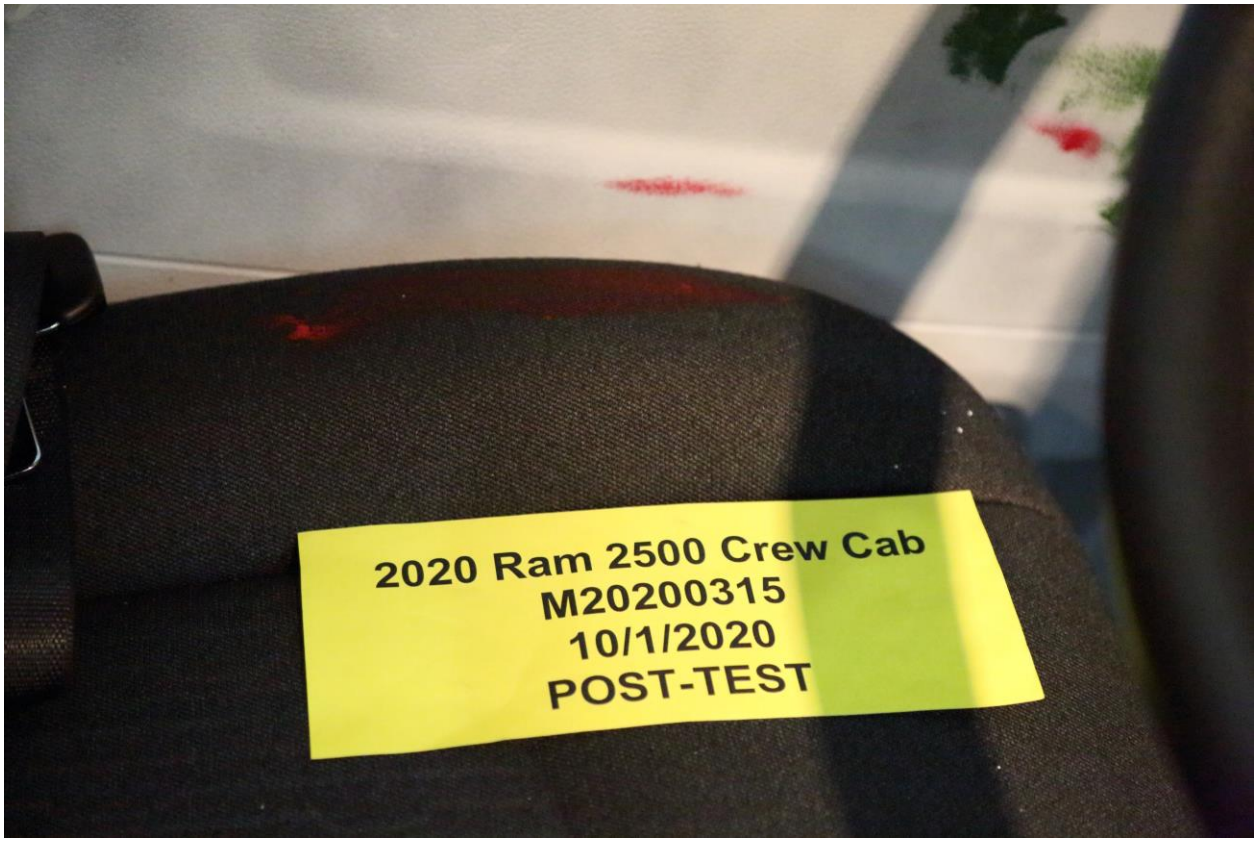
051 Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



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



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



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

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

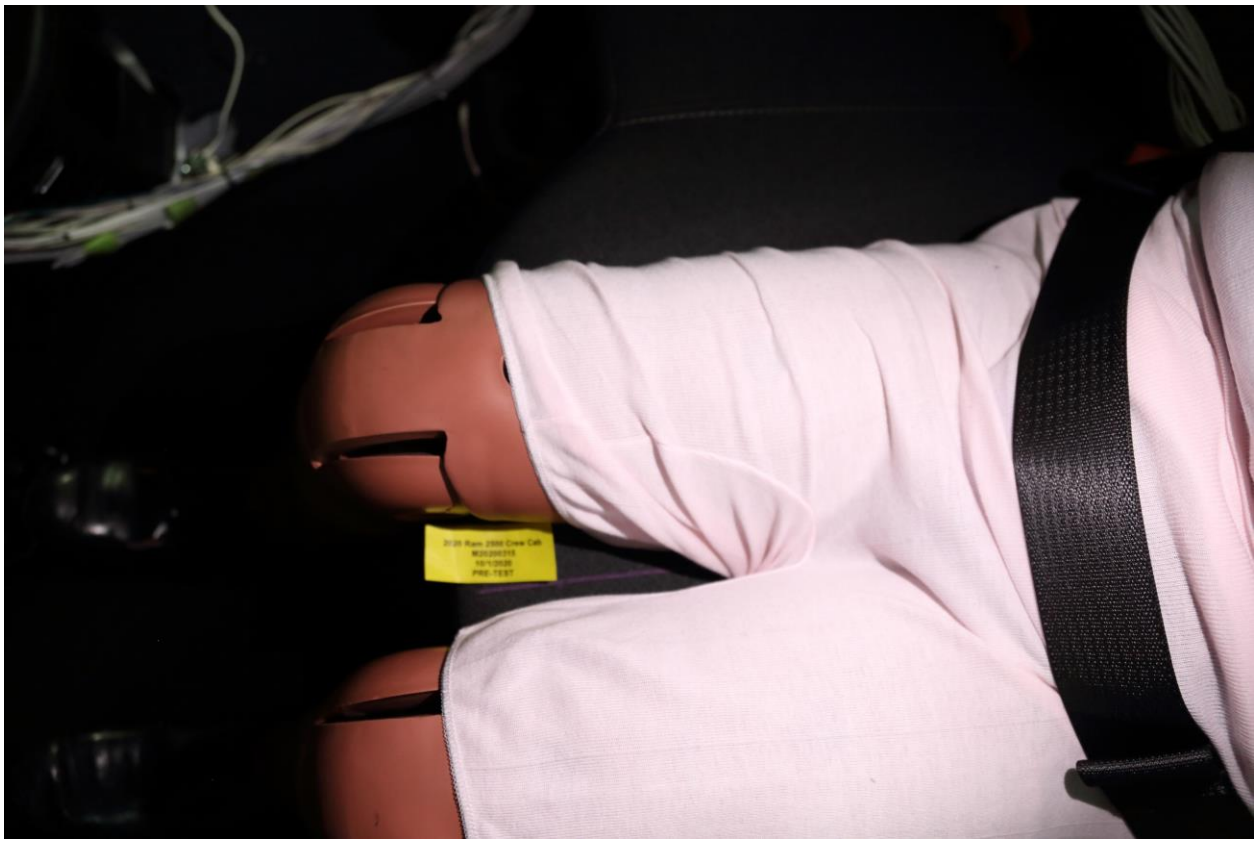
056 Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View

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

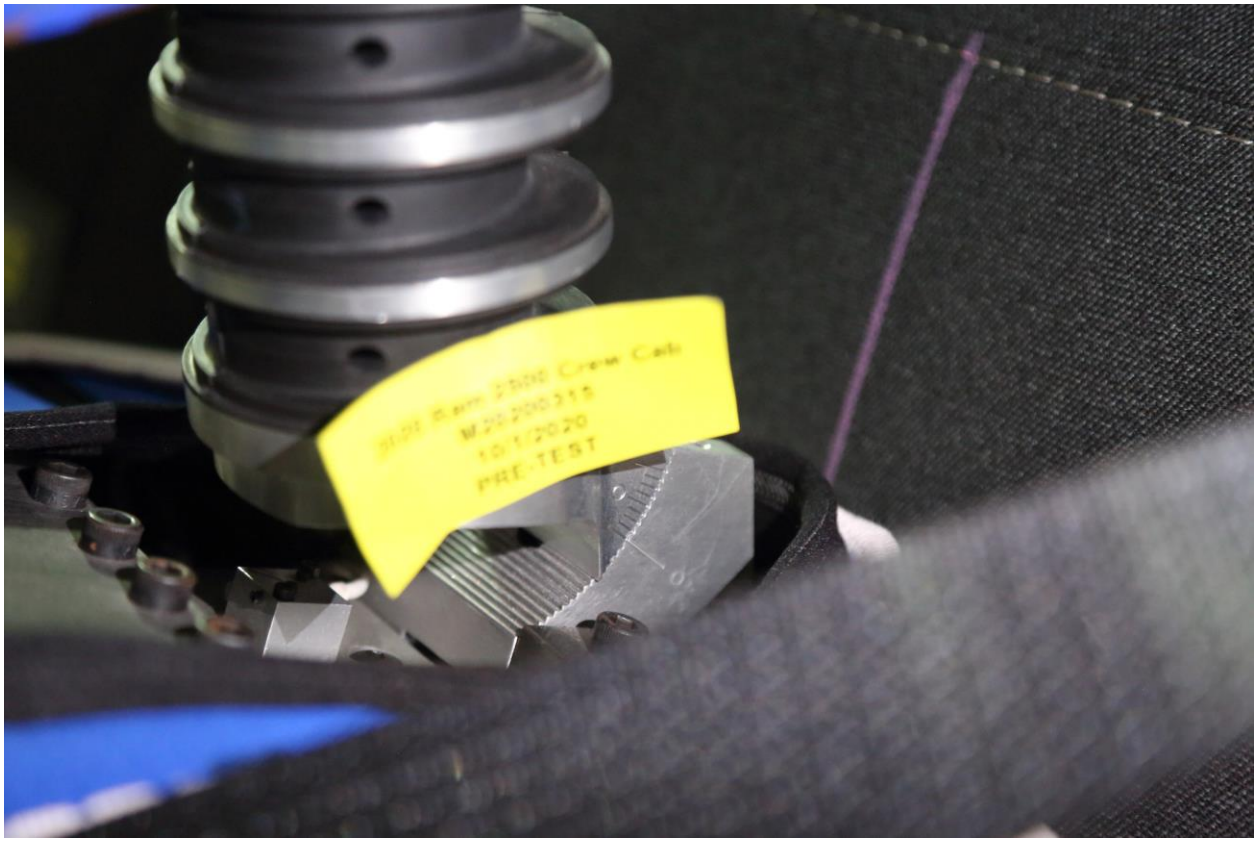
058 Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning

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

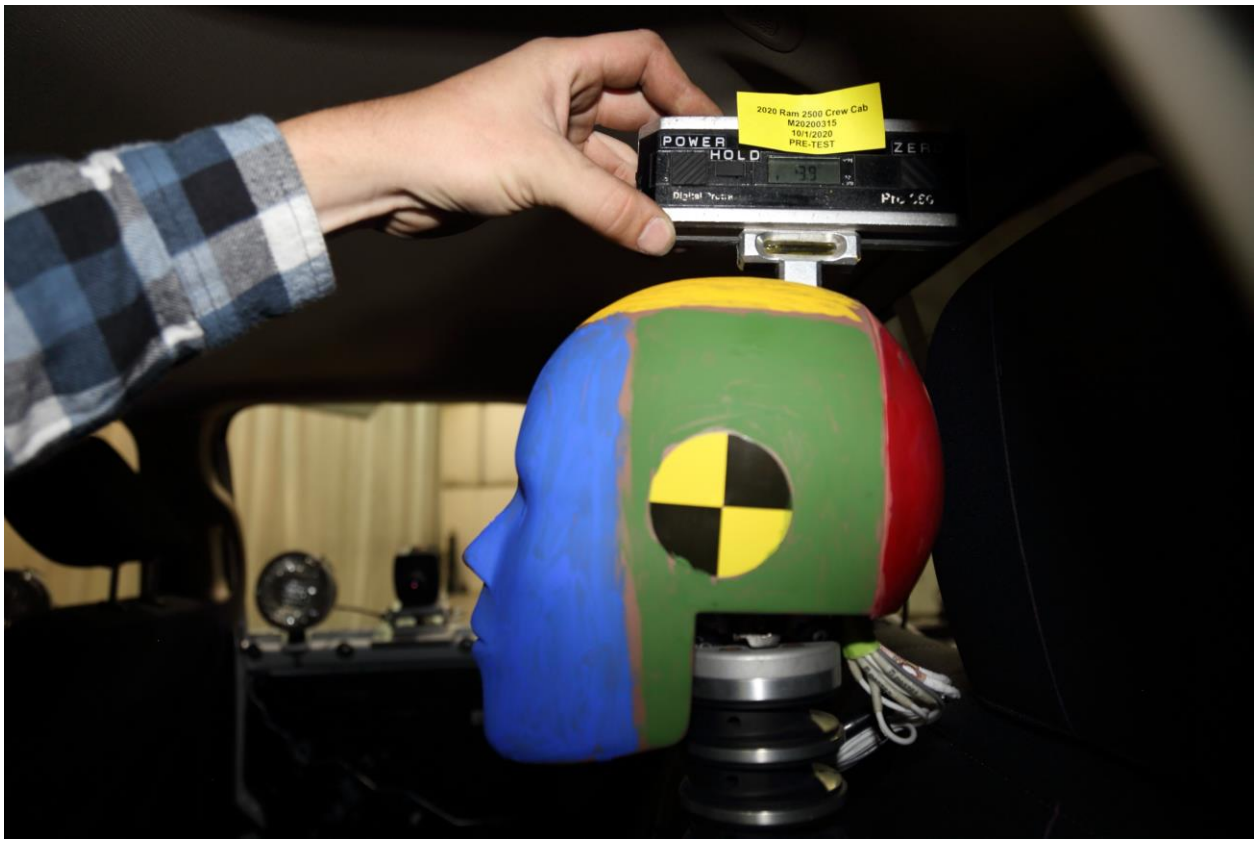
060 Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



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



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

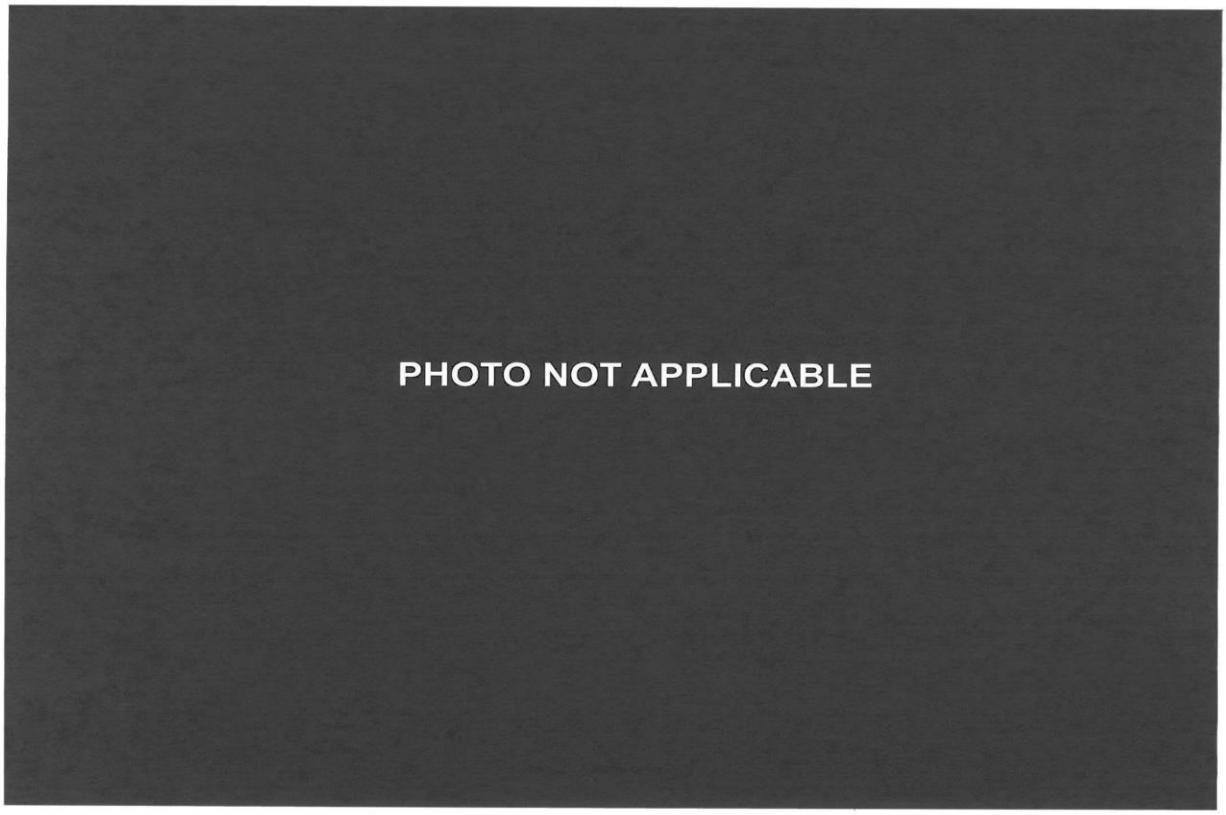


063 Pre-Test View of Rear Passenger Dummy's Head Showing Dummy Head is Level

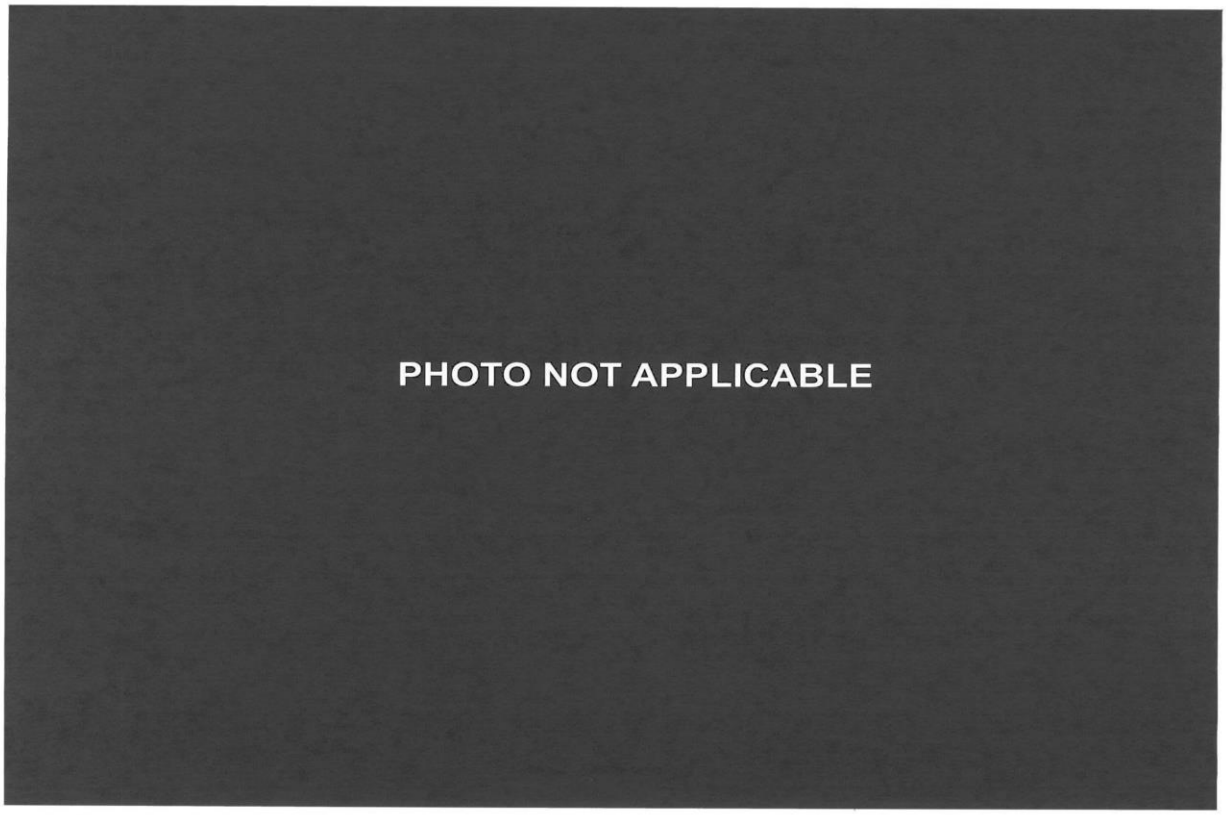
064 Pre-Test Placement of Rear Passenger Dummy's Feet

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

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



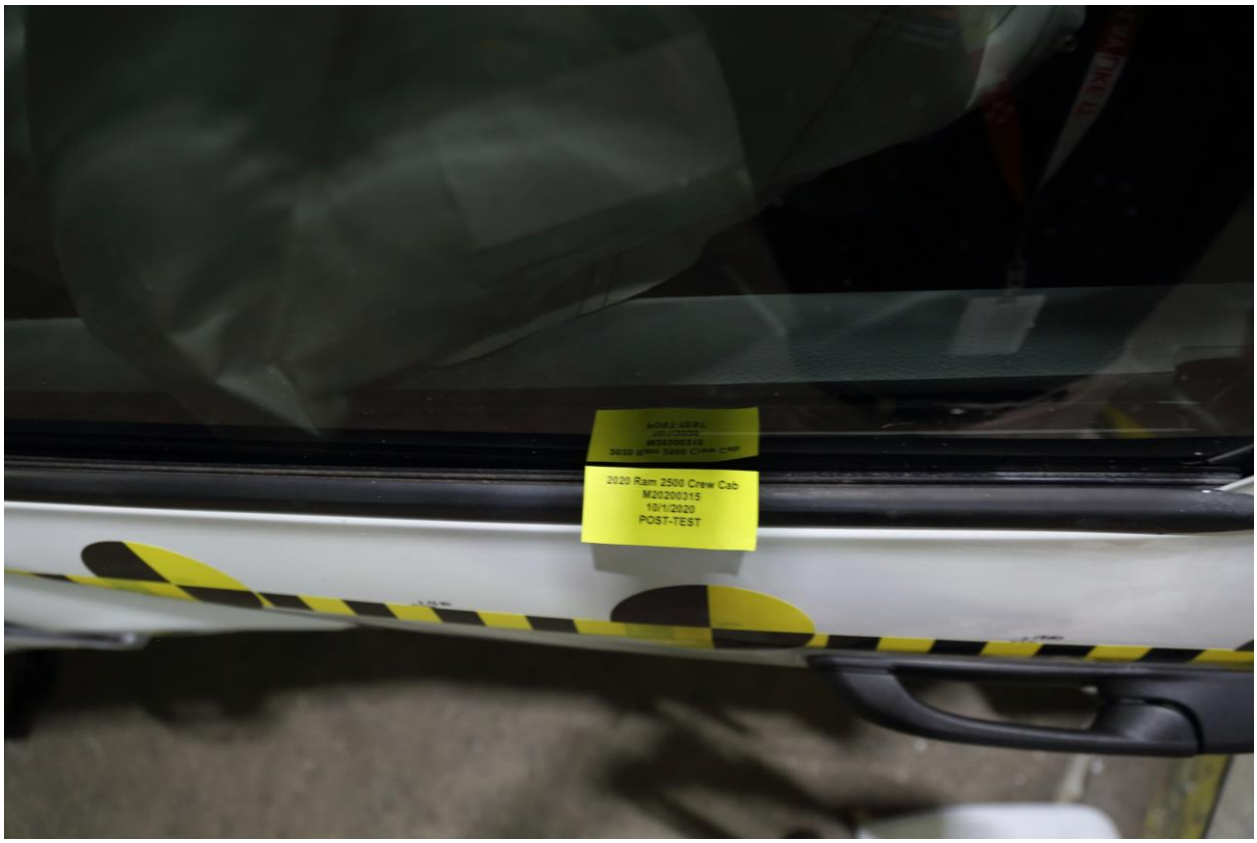
067 Pre-test Close-Up Left Side View of Rear Passenger Seat Back



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

Intentionally Left Blank

069 Pre-Test Rear Passenger Dummy and Door Clearance View



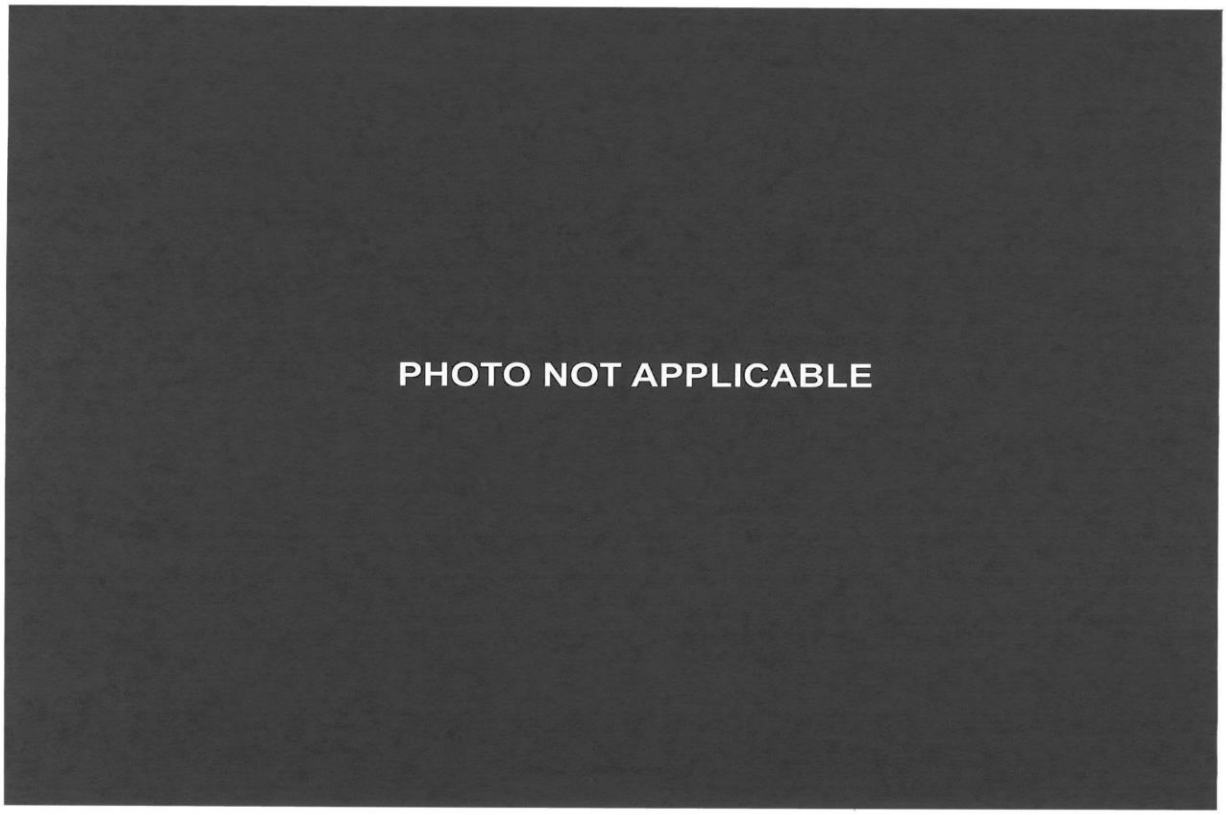
070 Post-Test Rear Passenger Dummy and Door Clearance View

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

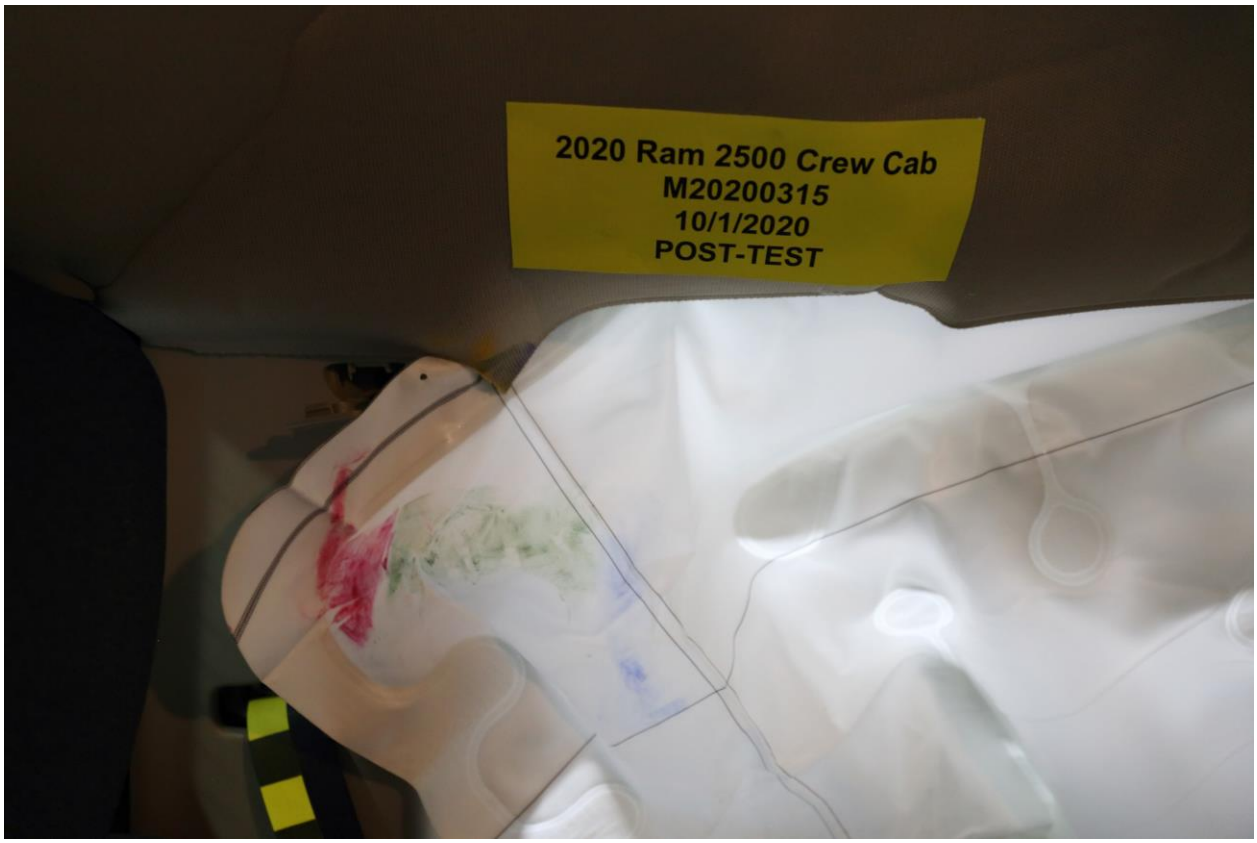
072 Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment

073 Pre-Test Rear Passenger Inner Door Panel View

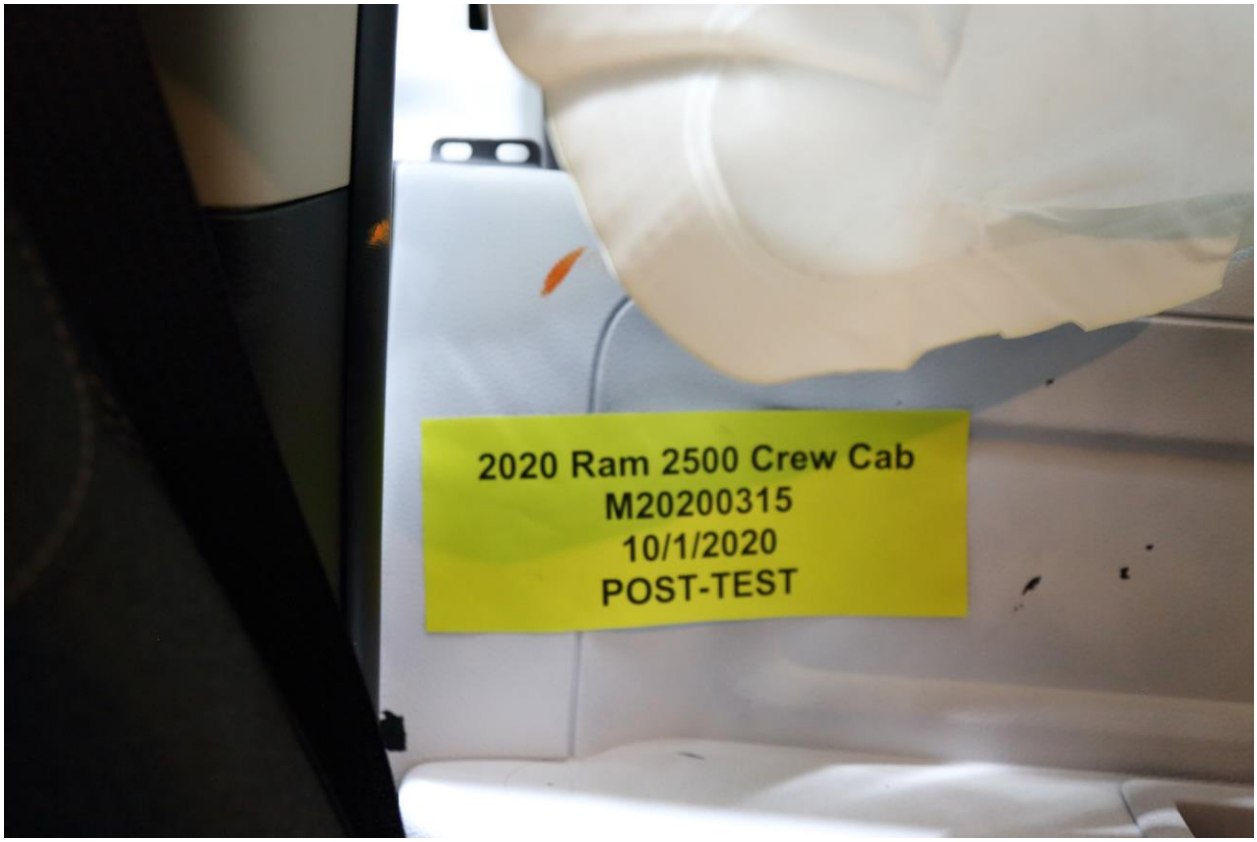
074 Post-Test Rear Passenger Inner Door Panel View



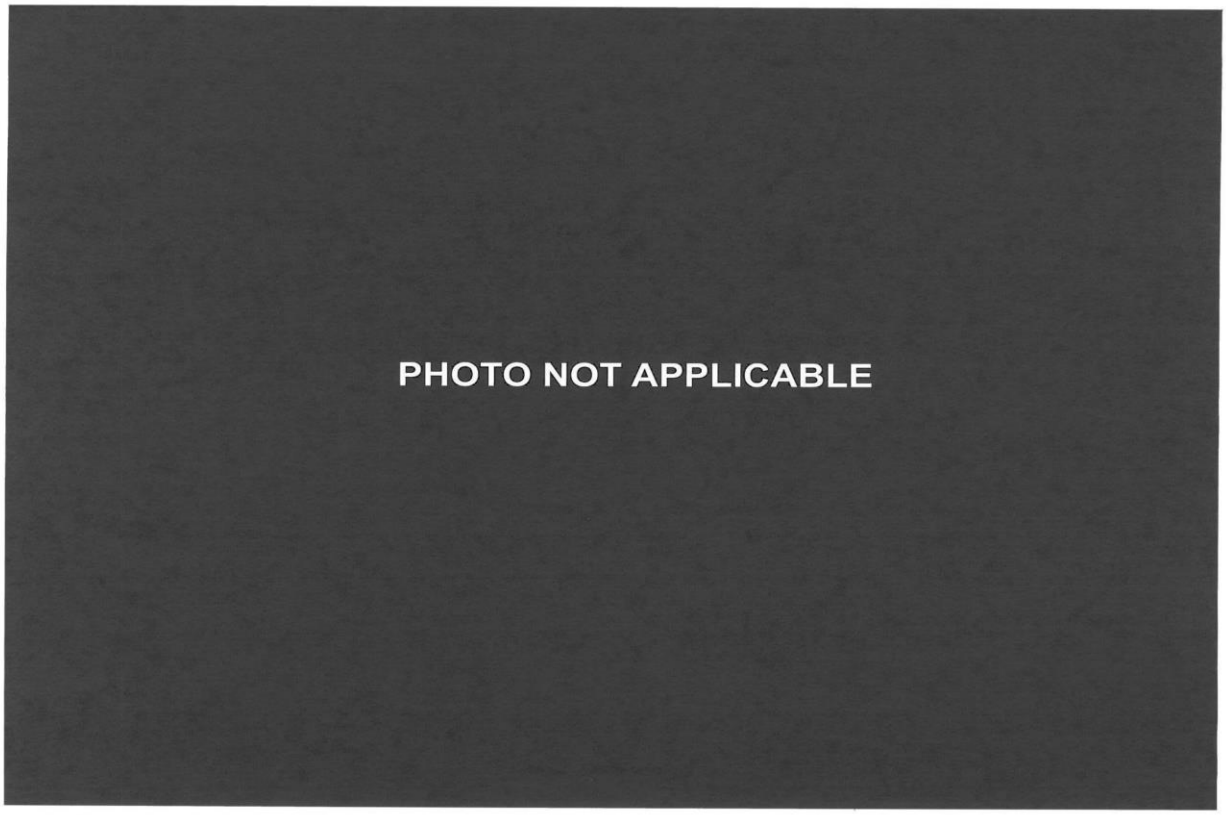
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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

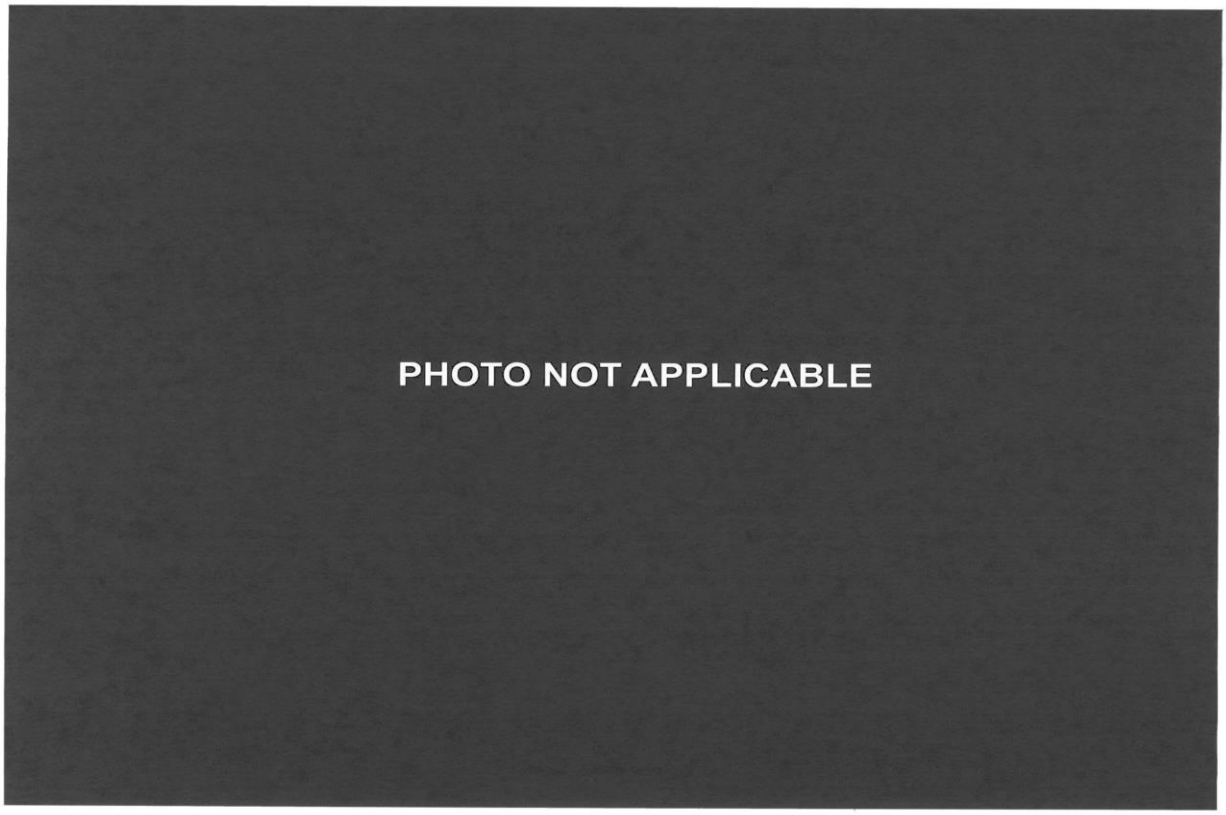


077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View

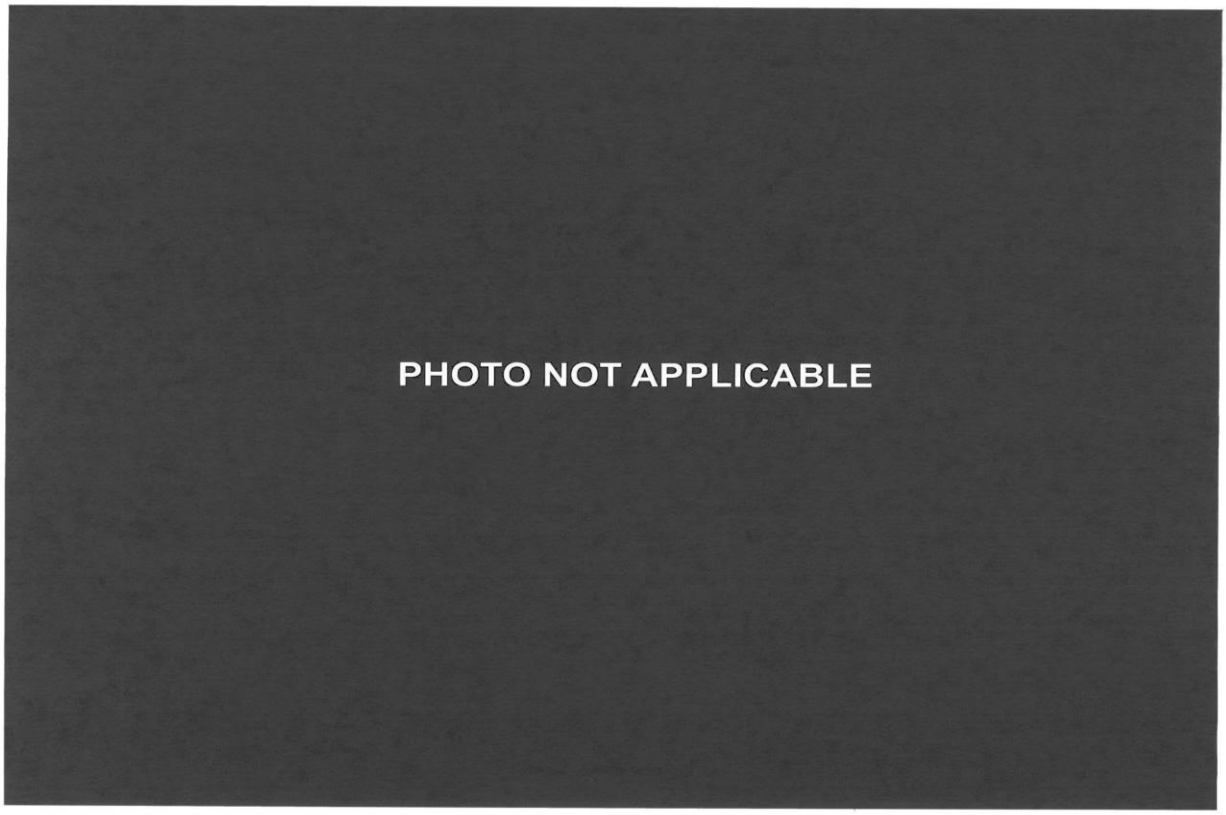


078 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View

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



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



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

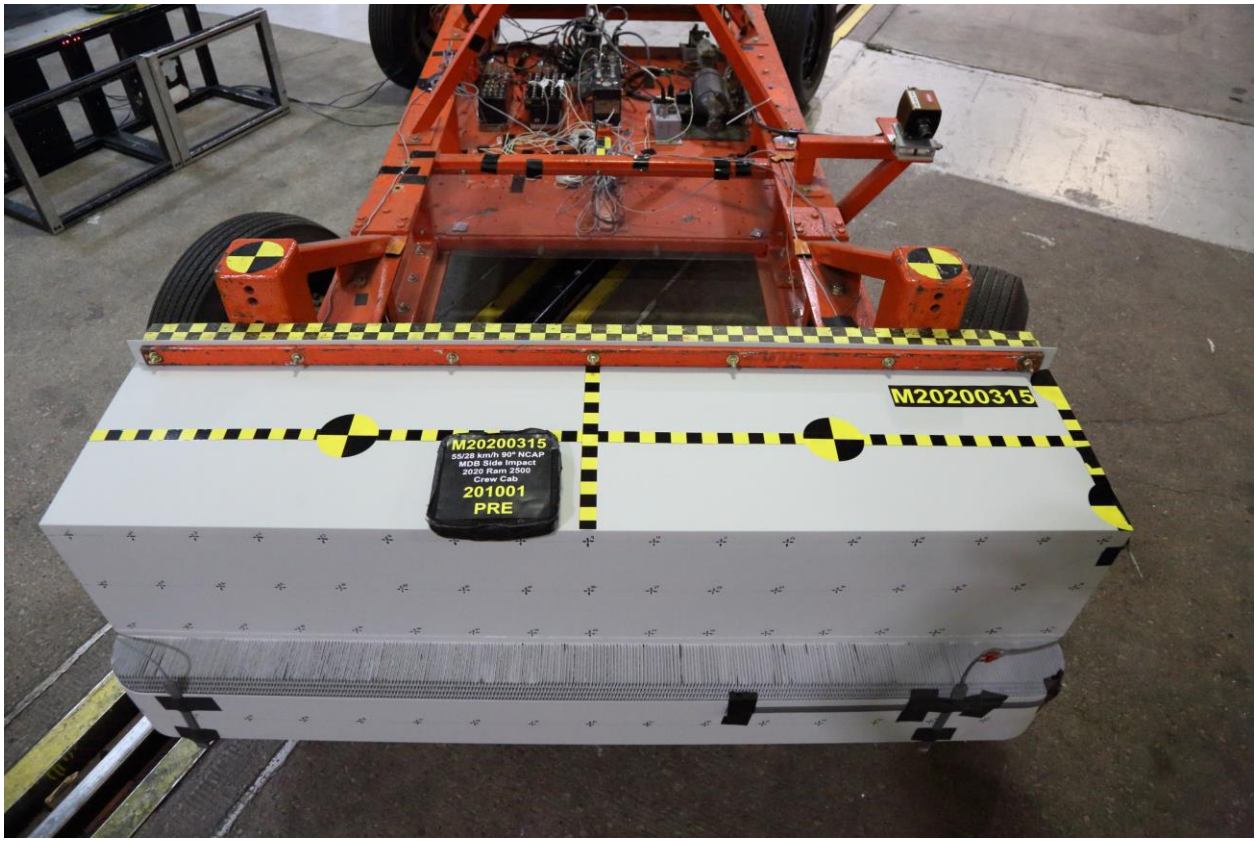
Intentionally Left Blank

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

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

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

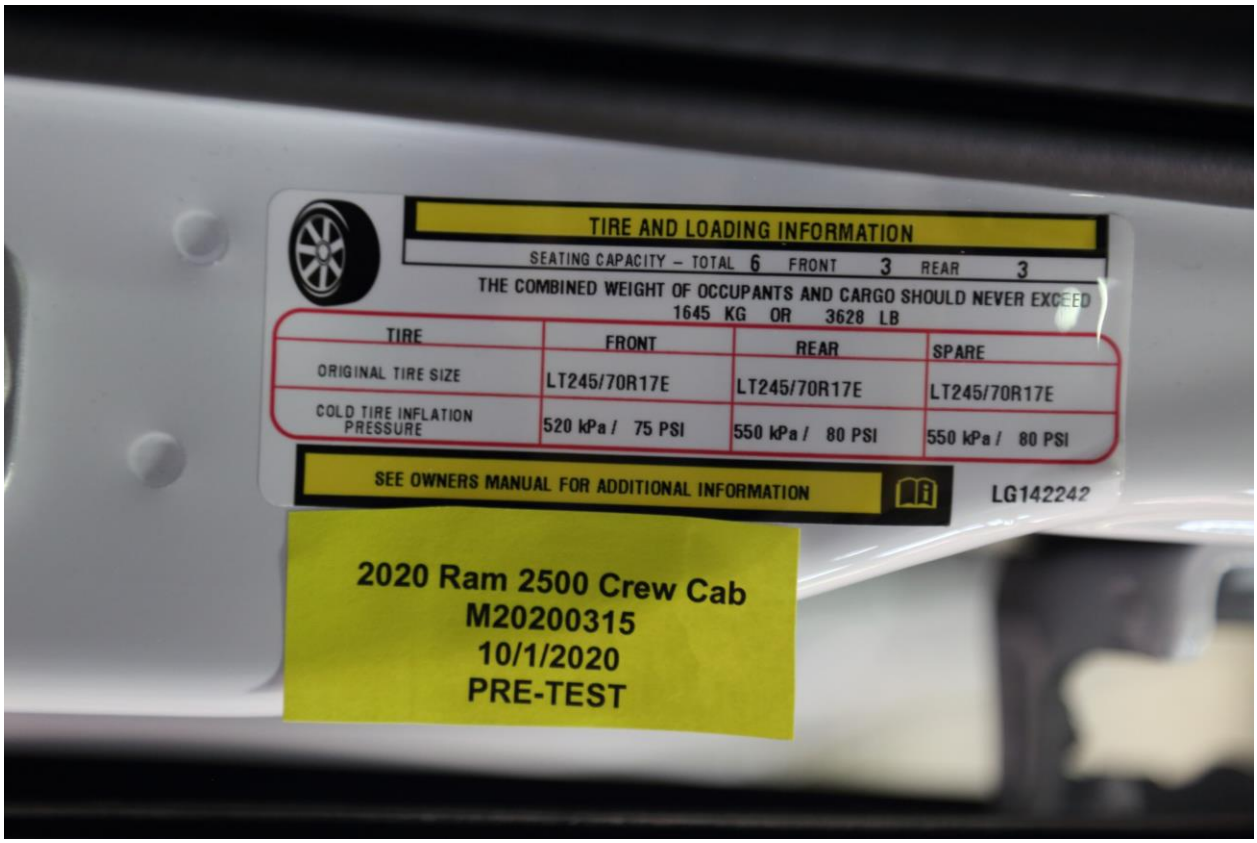
088 Pre-Test Left Side View of MDB Impactor Face

089 Post-Test Left Side View of MDB Impactor Face

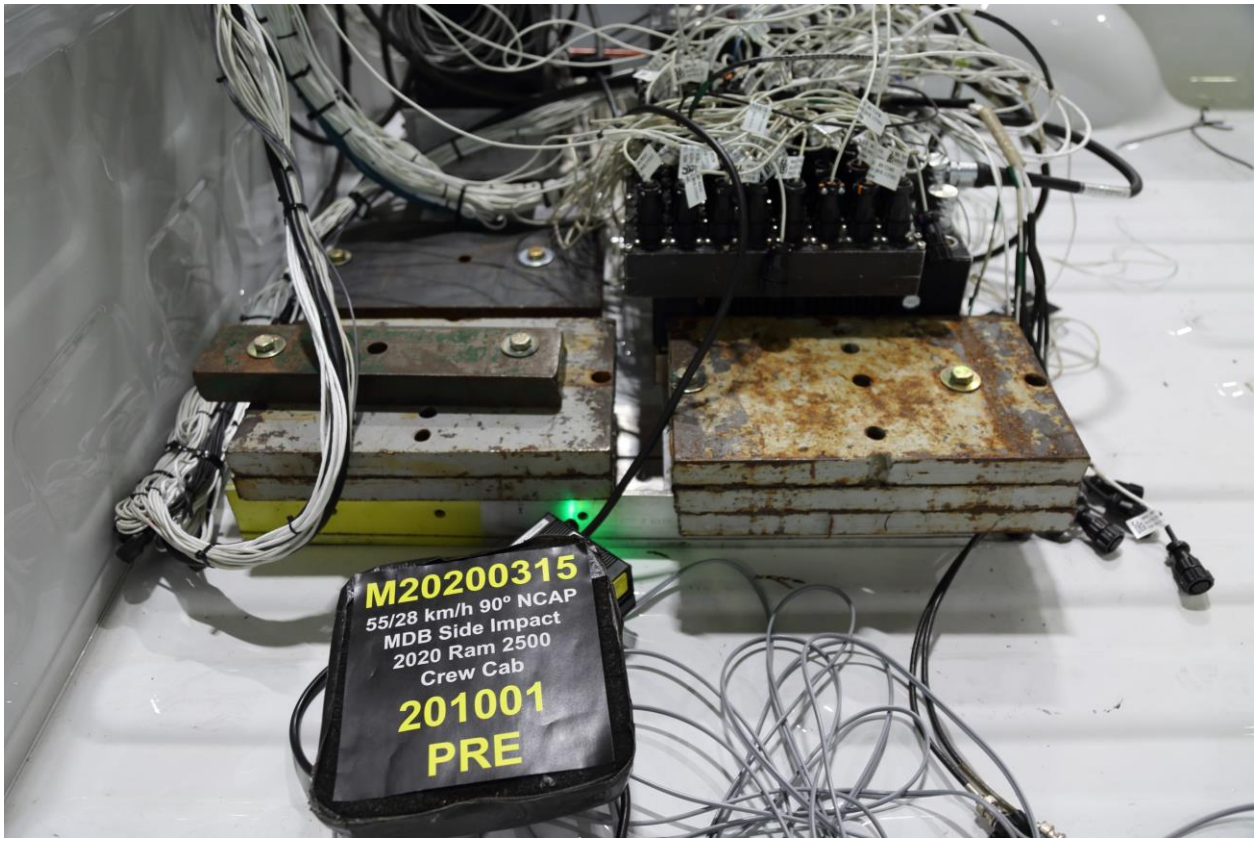
090 Pre-Test Right Side View of MDB Impactor Face

091 Post-Test Right Side View of MDB Impactor Face

092 Close-Up View of Vehicle's Certification Label



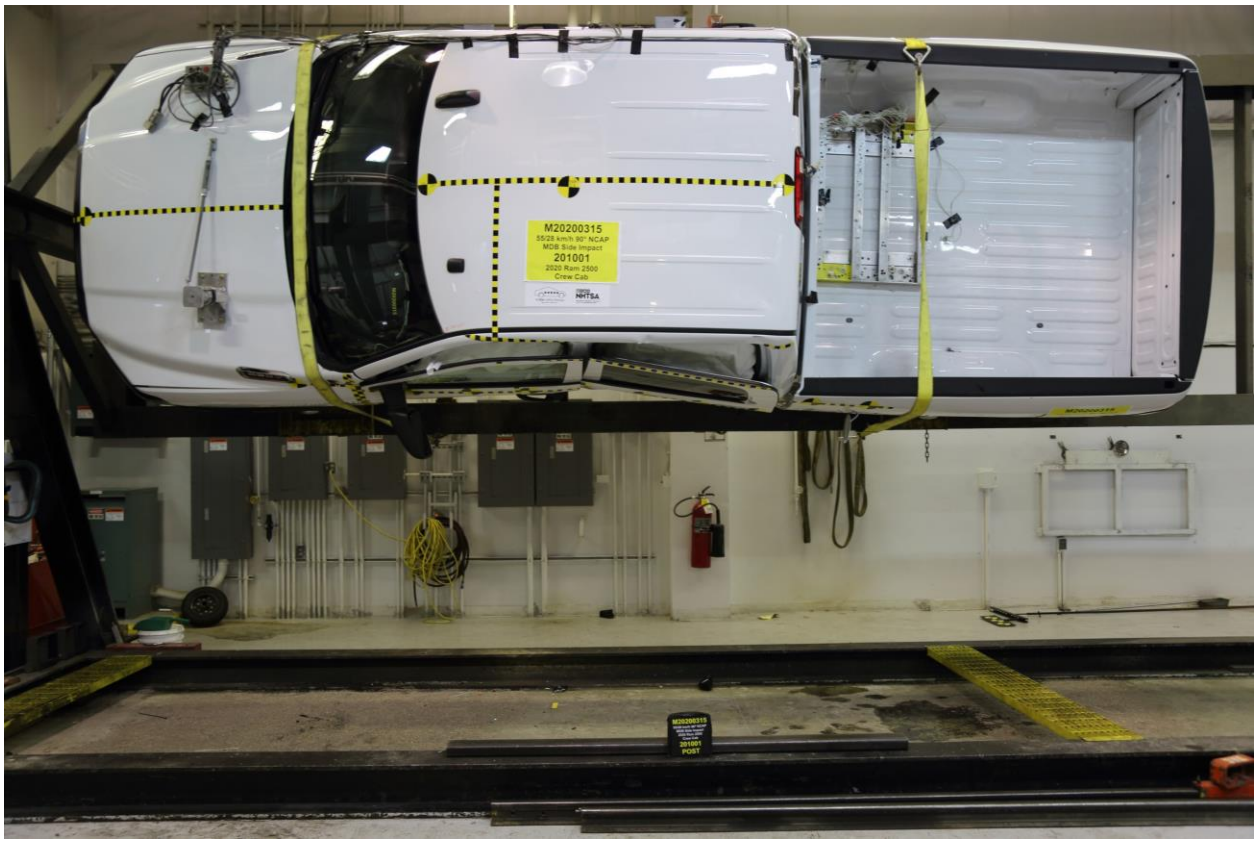
093 Close-Up View of Vehicle's Tire Information Placard or Label



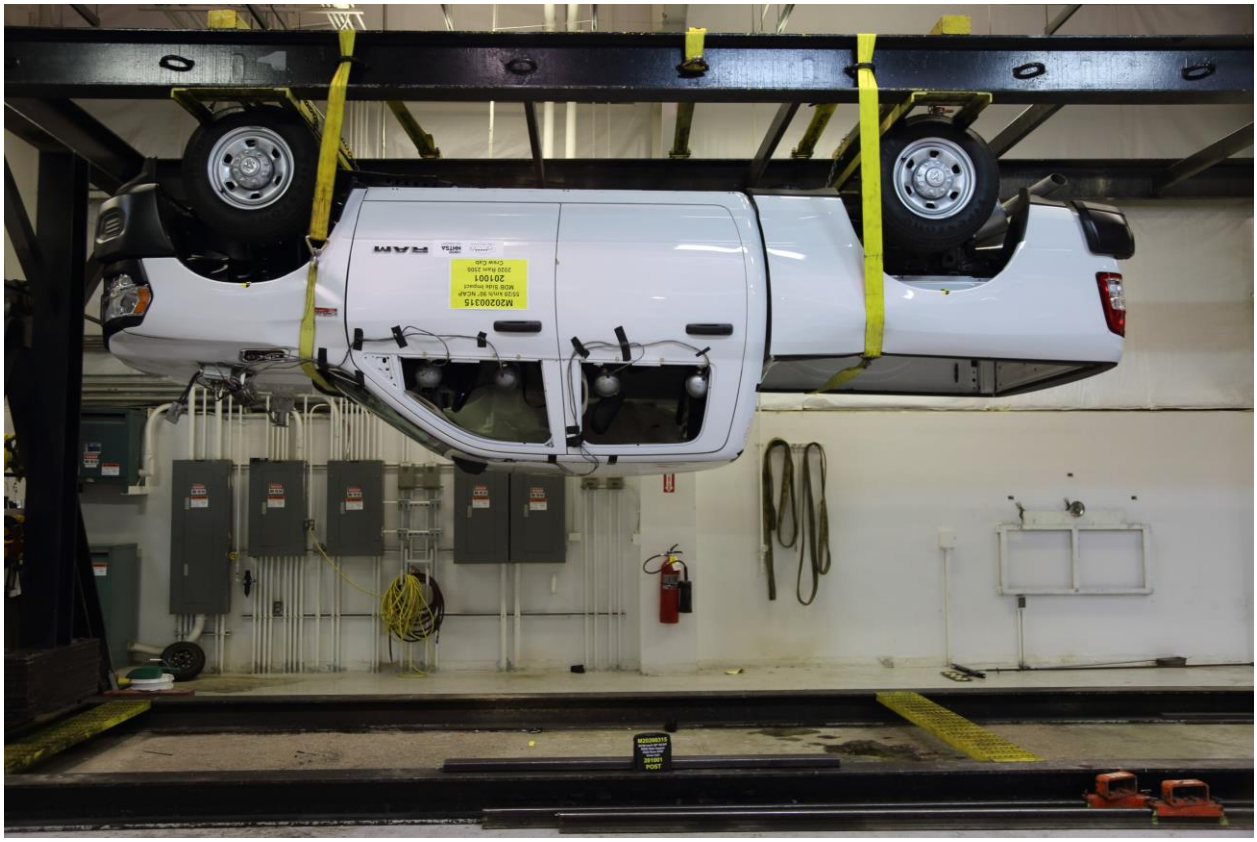
094 Pre-Test Ballast View

095 No. Post-Test Primary and Redundant Speed Trap Read-Out

096 FMVSS No. 301 Static Rollover 0 Degrees

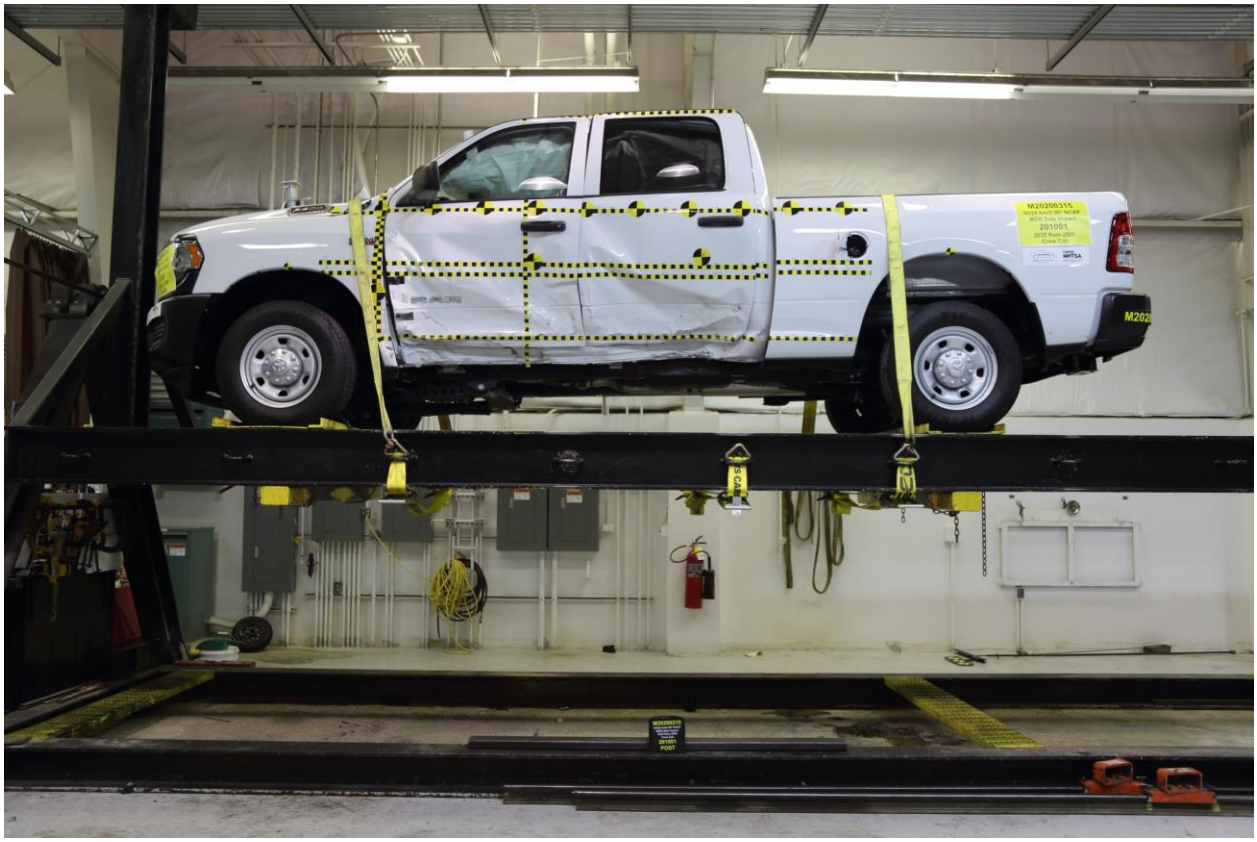


097 FMVSS No. 301 Static Rollover 90 Degrees



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

2020 MODEL YEAR

RAM 2500 TRADESMAN CREW CAB 4X2

For more information visit: www.ramtrucks.com or call 1-866-RAMINFO

FCA US LLC

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $37,300

RAM 2500 TRADESMAN CREW CAB 4X2
Exterior Color: Bright White Clear-Coat Exterior Paint
Interior Color: Black Interior Color
Interior: Cloth 40/20/40 Bench Seat
Engine: 6.4L Heavy Duty V8 HEMI® with MDS
Transmission: 8-Speed Automatic 8HP75-LCV Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Air Bags
Supplemental Side-Curtain Front and Rear Air Bags
Supplemental Front Seat Side Air Bags
ParkView® Rear Back-Up Camera
3.73 Axle Ratio
Push-Button Start
Electronic Stability Control
Electronic Roll Mitigation
Hill Start Assist
Traction Control
Trailer Sway Damping
4-Wheel Disc Anti-Lock Brakes
730-Amp Maintenance Free Battery
180-Amp Alternator
Sentry Key® Theft Deterrent System
Cruise Control
Power Front Windows with 1-Touch Up & Down Feature
Power Accessory Delay
Tire Pressure Monitoring Display
Tire-Fill Alert

INTERIOR FEATURES
Uconnect® 3 with 5-Inch Display
Integrated Voice Command with Bluetooth®
6-Speakers
Media Hub-2 USB, Full Function, Auxiliary Input
Remote USB Port - Charge Only
Air Conditioning
40 / 20 / 40 Split Bench Seat
Rear Folding Seat
Rear Underseat Compartment Storage
12-Volt Auxiliary Power Outlet
Temperature & Compass Gauge
Rear View Day / Night Mirror
Driver / Passenger Assist Handles

EXTERIOR FEATURES
17-Inch x 7.5-Inch Steel Styled Wheels
LT245/70R17E BSW All-Season Tires
31-Gallon Fuel Tank
Locking Tailgate
Class V Receiver-Hitch
7-Pin Trailer Connector
4-Pin Trailer Connector
Tinted Windshield Glass
Tinted Glass Windows
Automatic Headlamps
Halogen Quad Headlamps
Incandescent Tail Lamps
Cargo and Center High-Mounted Stop Lamp
Full-Size Spare Tire

OPTIONAL EQUIPMENT (May Replace Standard Equipment)
Customer Preferred Package 22A $995
Tradesman Level 2 Equipment Group
Cloth 40/20/40 Bench Seat
Floor Covering Carpet
Front and Rear Floor Mats
Rear Power Sliding Window
SiriusXM® with 1-Year Radio Sub Call 800-643-2112

DESTINATION CHARGE $1,695

TOTAL PRICE: * $39,990

WARRANTY COVERAGE
5-year or 60,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5YEAR/60,000MILE POWERTRAIN WARRANTY

Assembly Point/Port of Entry: SALTILLO, MEXICO
VIN: 3C6-UR4CJ5LG-142242 LAVON: 2213

SHIPTO 45462 44
NYLE MAXWELL CHRYSLER DODGE JEEP
14150 STATE HIGHWAY 79
TAYLOR TX 76574-4606

SOLDTO 63 45462
NYLE MAXWELL CHRYSLER DODGE JEEP
14150 STATE HIGHWAY 79
TAYLOR TX 76574-4606

THIS LABEL IS AFFIXED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.

* STATE AND/OR LOCAL TAXES, IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA DOT Fuel Economy and Environment

Fuel Economy
N/A
combined city/hwy city highway
N/A gallons per 100 miles

Heavy duty vehicle, no label required.

You save **N/A** in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost **N/A**

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 1 10 Best

Smog Rating (tailpipe only) 1 10 Best

fueleconomy.gov
Calculate personalized estimates and compare vehicles

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

MOPAR VEHICLE PROTECTION
A PRODUCT OF FCA US LLC
Ask for Mopar Vehicle Protection for your vehicle. We Built It. We Back It.

102 Monroney Label

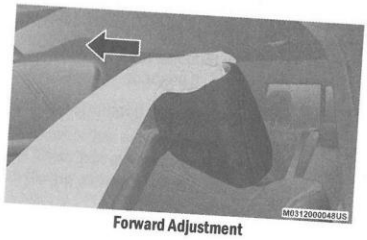
Front Head Restraints

Four-Way Head Restraints — If Equipped

Your vehicle may be equipped with front four-way driver and passenger head restraints.

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, push the adjustment button, located at the base of the head restraint, and push downward on the head restraint.

To adjust the head restraint forward, pull the top of the head restraint toward the front of the vehicle as desired and release. To adjust the head restraint rearward, pull the top of the head restraint to the forward most position and release. The head restraint will return to the rear most position.



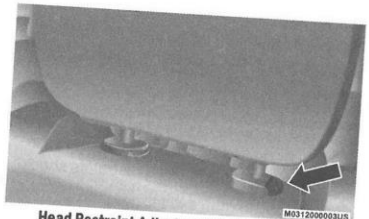
Forward Adjustment

NOTE:
If your vehicle is equipped with a front bench seat, the center head restraint is not adjustable or removable.

Two-Way Head Restraints — If Equipped

Your vehicle may be equipped with front two-way driver and passenger head restraints.

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, push the adjustment button, located at the base of head restraint, and push downward on the head restraint.



Head Restraint Adjustment Button Location

NOTE:
The head restraints should only be removed by qualified technicians, for service purposes only. If either of the head restraints require removal, see an authorized dealer.

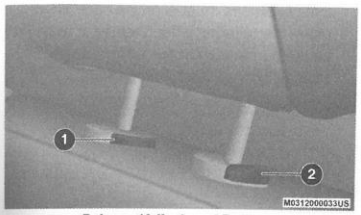
WARNING!

- All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a crash.
- Head restraints should never be adjusted while the vehicle is in motion. Driving a vehicle with the head restraints improperly adjusted or removed could cause serious injury or death in the event of a collision.

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

Rear Head Restraint Adjustment

The rear seats are equipped with adjustable and removable head restraints. To raise the head restraint, pull upward on the head restraint. To lower the head restraint, push the adjustment button located on the base of the head restraint and push downward on the head restraint.



Release/Adjustment Buttons

1 – Release Button
2 – Adjustment Button

NOTE:

- The rear center head restraint (Crew Cab) has only one adjustment position that is used to aid in the routing of a tether. Refer to "Occupant Restraint Systems" in "Safety" for further information.
- Do not reposition the head restraint 180 degrees to the incorrect position in an attempt to gain additional clearance to the back of the head.

Rear Head Restraint Removal

To remove the head restraint, push the adjustment button and the release button while pulling upward on the whole assembly. To reinstall the head restraint, put the head restraint posts into the holes and adjust it to the appropriate height.

NOTE:
To remove outboard restraints, the rear seat bottom must be folded up.

WARNING!

- A loose head restraint thrown forward in a collision or hard stop could cause serious injury or death to occupants of the vehicle. Always securely stow removed head restraints in a location outside the occupant compartment.
- ALL the head restraints MUST be reinstalled in the vehicle to properly protect the occupants. Follow the re-installation instructions above prior to operating the vehicle or occupying a seat.

STEERING WHEEL

Tilt Steering Column

This feature allows you to tilt the steering column upward or downward. The tilt lever is located on the steering column, below the multifunction lever.

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

The following additional data can be obtained from the Research and Development section of the NHTSA website (www.nhtsa.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)
Passenger Head Angular Velocity (X)
Passenger Head Angular Velocity (Y)
Passenger Head Angular Velocity (Z)

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

NHTSA

Test Date: 10/01/2020

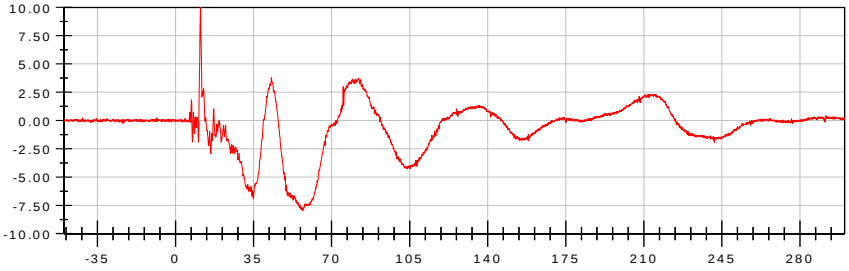
Test Lab: CTF

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

Test Number: 201001 (M20200315)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

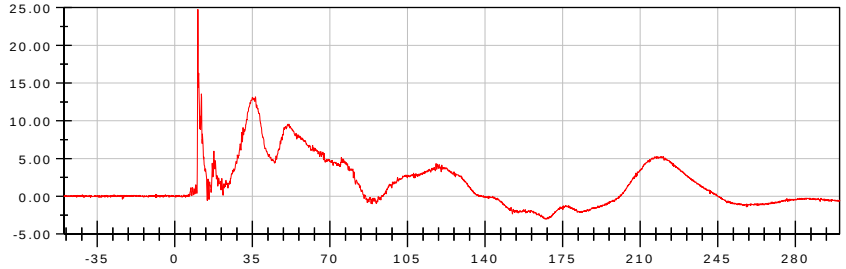
9.98 g at 11.20 ms

<Min>

-7.98 g at 57.12 ms

CFC_1000

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



<Max>

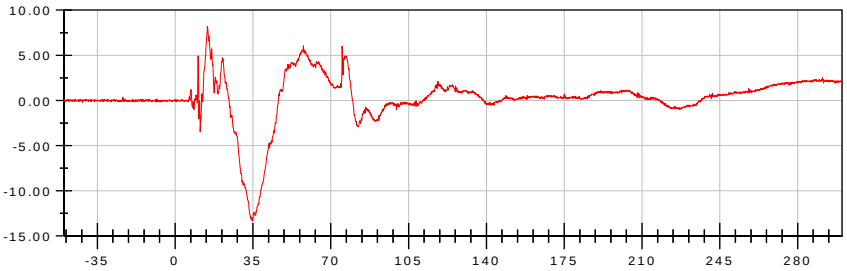
24.75 g at 10.40 ms

<Min>

-3.05 g at 167.60 ms

CFC_1000

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



<Max>

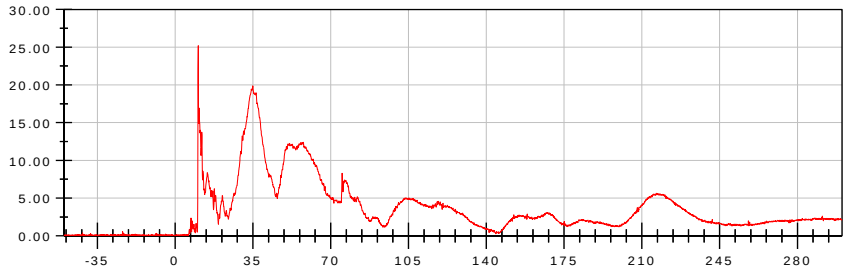
8.22 g at 14.48 ms

<Min>

-13.35 g at 34.72 ms

CFC_1000

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



<Max>

25.21 g at 10.40 ms

<Min>

0.03 g at -49.52 ms

CFC_1000

NHTSA

Test Date: 10/01/2020

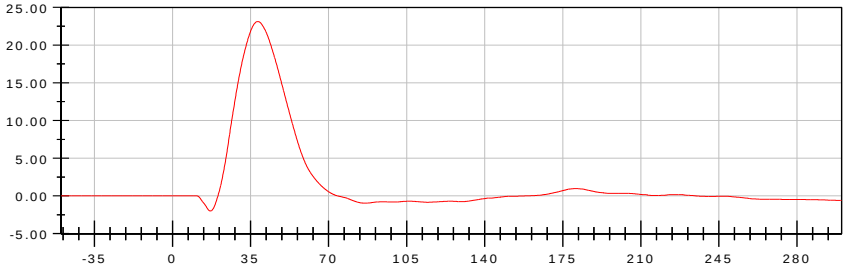
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 201001 (M20200315)

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



<Max>

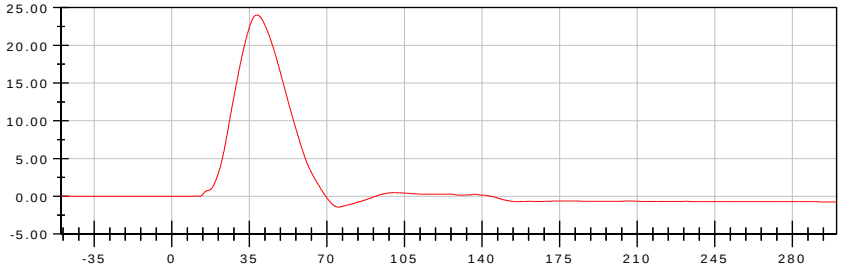
23.12 mm at 38.32 ms

<Min>

-2.00 mm at 16.96 ms

CFC_180

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



<Max>

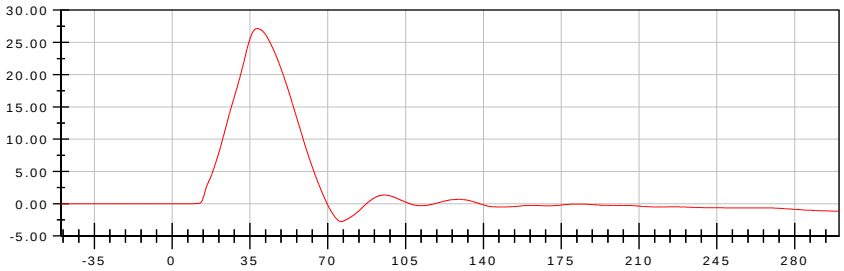
24.02 mm at 38.40 ms

<Min>

-1.44 mm at 75.28 ms

CFC_180

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



<Max>

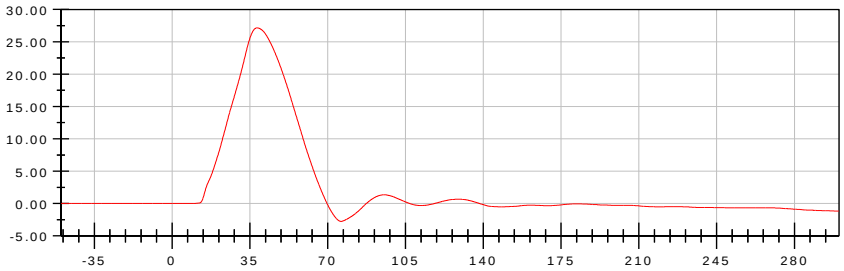
27.15 mm at 38.24 ms

<Min>

-2.76 mm at 76.00 ms

CFC_180

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



<Max>

27.15 mm at 38.24 ms

<Min>

-2.76 mm at 76.00 ms

CFC_180

NHTSA

Test Date: 10/01/2020

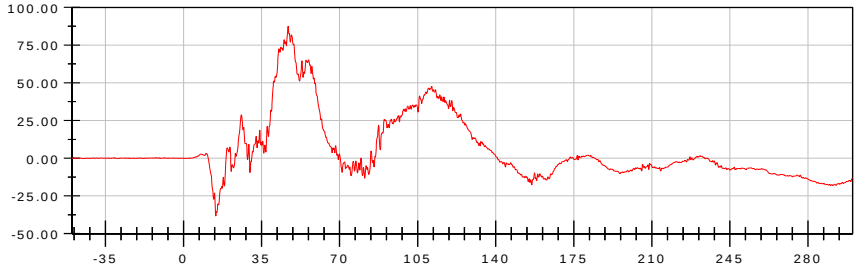
Test Lab: CTF

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

Test Number: 201001 (M20200315)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

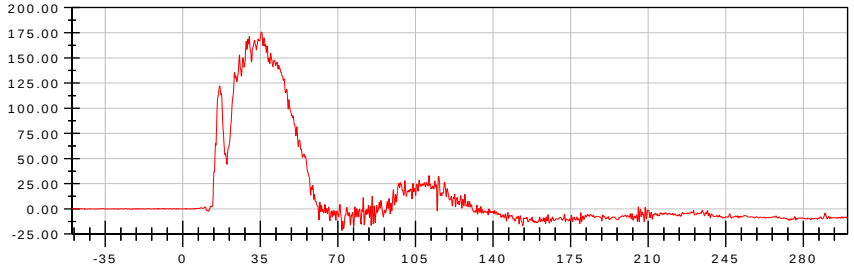
87.39 N at 46.88 ms

<Min>

-38.24 N at 14.48 ms

CFC_600

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



<Max>

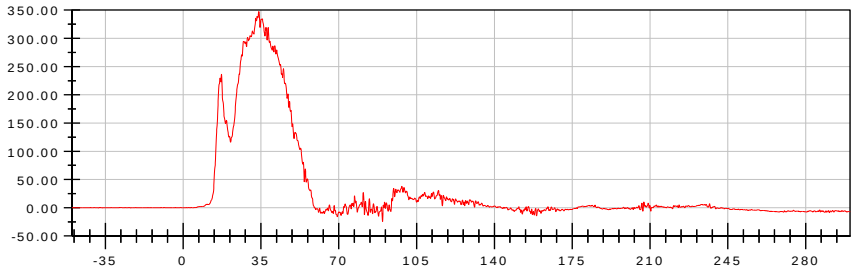
175.68 N at 35.52 ms

<Min>

-21.55 N at 71.84 ms

CFC_600

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



<Max>

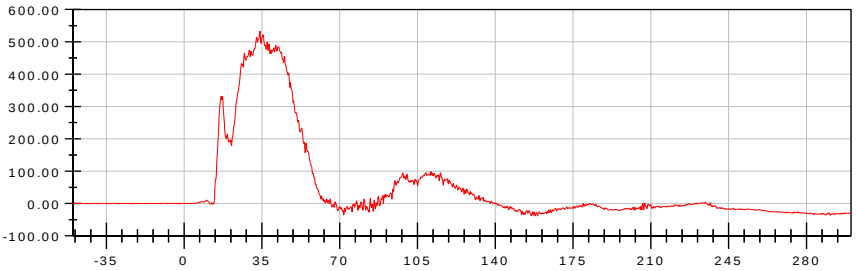
347.48 N at 34.08 ms

<Min>

-24.14 N at 89.68 ms

CFC_600

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



<Max>

532.96 N at 34.08 ms

<Min>

-38.43 N at 157.92 ms

CFC_600

NHTSA

Test Date: 10/01/2020

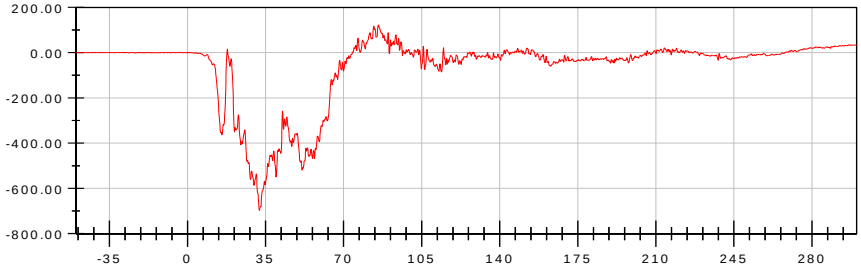
Test Lab: CTF

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

Test Number: 201001 (M20200315)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

122.10 N at 85.60 ms

<Min>

-697.53 N at 32.24 ms

CFC_600

NHTSA

Test Date: 10/01/2020

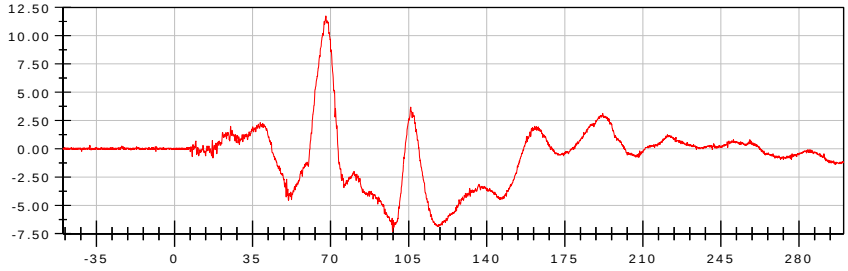
Test Lab: CTF

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

Test Number: 201001 (M20200315)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

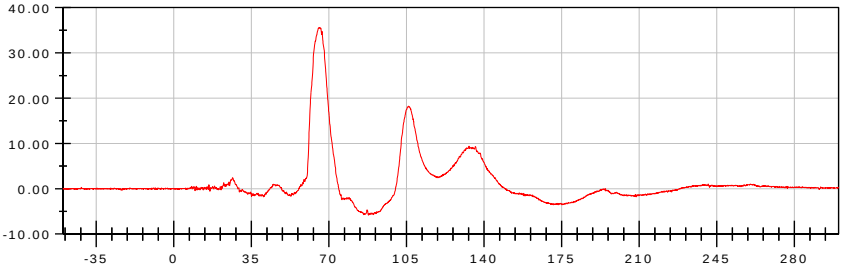
11.75 g at 67.84 ms

<Min>

-7.32 g at 97.84 ms

CFC_1000

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



<Max>

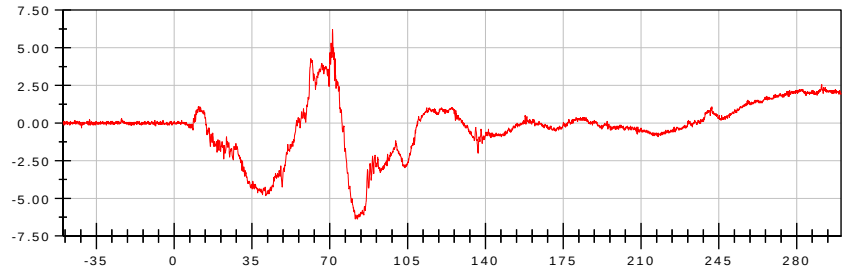
35.58 g at 65.36 ms

<Min>

-5.84 g at 87.84 ms

CFC_1000

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



<Max>

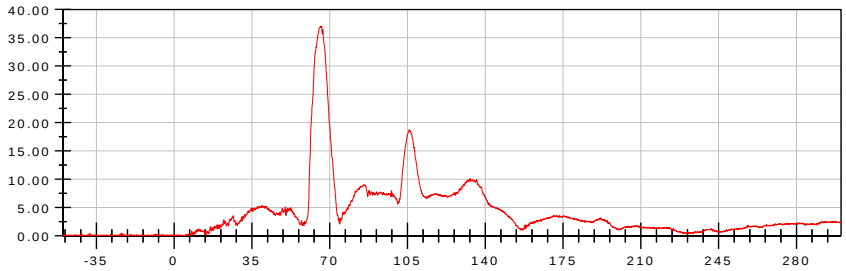
6.21 g at 71.28 ms

<Min>

-6.37 g at 81.44 ms

CFC_1000

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



<Max>

37.05 g at 66.32 ms

<Min>

0.02 g at -49.84 ms

CFC_1000

NHTSA

Test Date: 10/01/2020

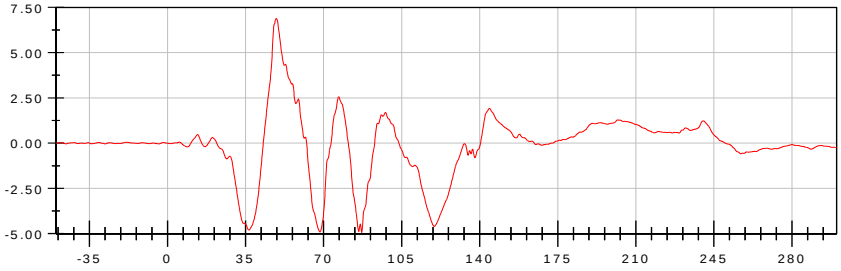
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 201001 (M20200315)

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



<Max>

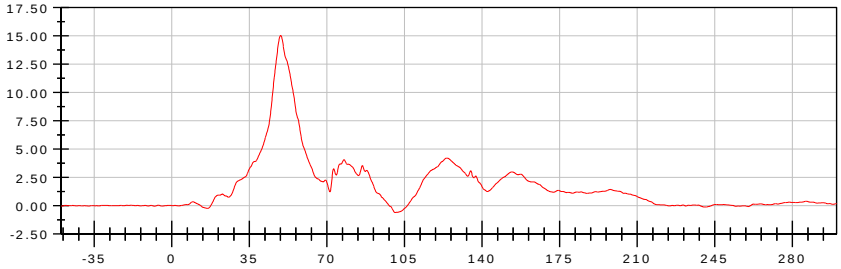
6.89 g at 48.80 ms

<Min>

-4.93 g at 87.12 ms

CFC_180

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



<Max>

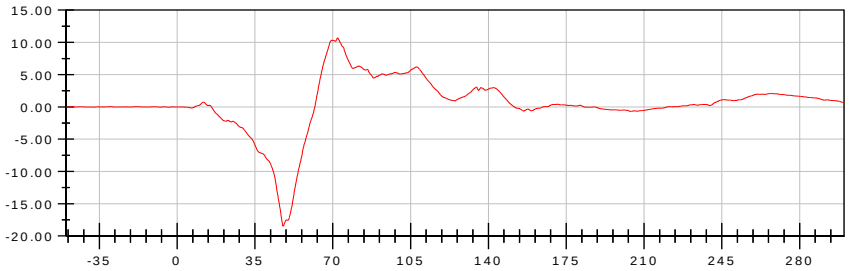
15.04 g at 49.12 ms

<Min>

-0.60 g at 100.80 ms

CFC_180

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



<Max>

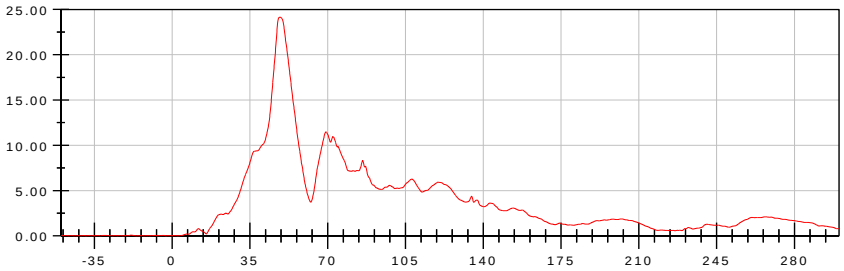
10.68 g at 72.16 ms

<Min>

-18.46 g at 47.68 ms

CFC_180

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



<Max>

24.15 g at 48.56 ms

<Min>

0.00 g at -34.96 ms

CFC_180

NHTSA

Test Date: 10/01/2020

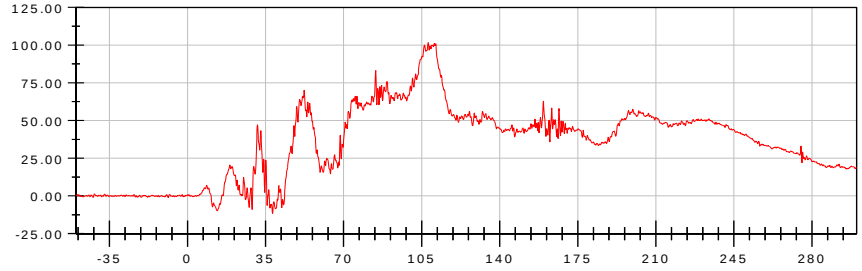
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 201001 (M20200315)

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



<Max>

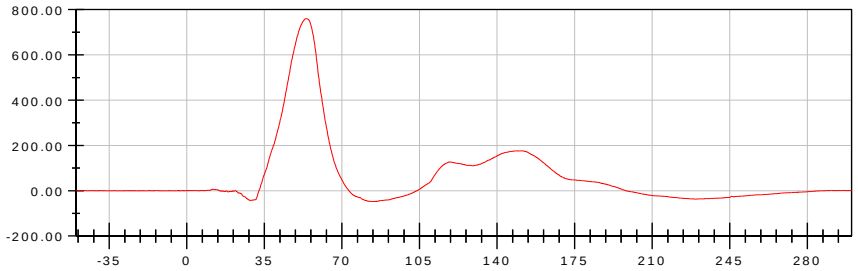
101.59 N at 107.92 ms

<Min>

-11.57 N at 38.08 ms

CFC_600

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



<Max>

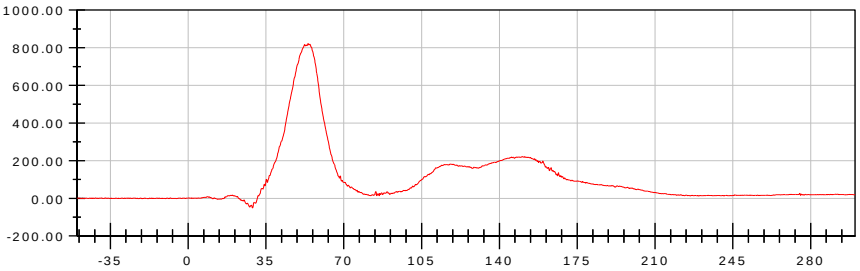
760.24 N at 53.92 ms

<Min>

-47.93 N at 84.16 ms

CFC_600

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



<Max>

822.40 N at 53.92 ms

<Min>

-51.38 N at 28.96 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 72

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	909	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	347	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	154	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	328	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	201	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	199	Yes
14	Pelvis Depth	235.0 - 245.0	242	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	156	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. 72-1
Test Date: 8/18/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Peak Resultant Acceleration	125 - 155 g	131.0 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	7.3 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	4.18 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

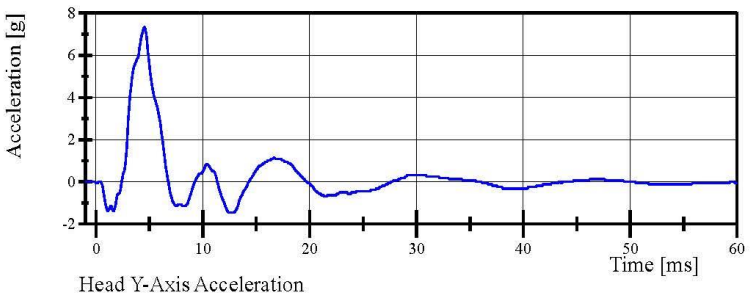
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

08.18.2020 11:17:03 321

Transportation Research Center Inc.

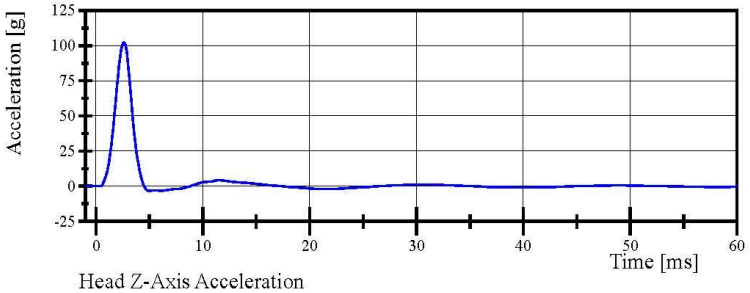
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/18/2020

Head X-Axis Acceleration



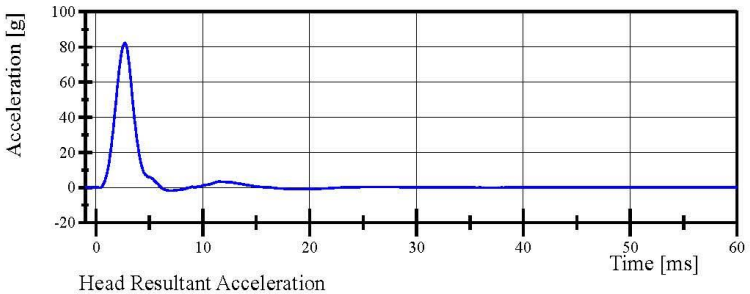
Filter Class: CFC_1000
Max: 7.3 g at 4.6 ms
Min: -1.5 g at 12.4 ms

Head Y-Axis Acceleration



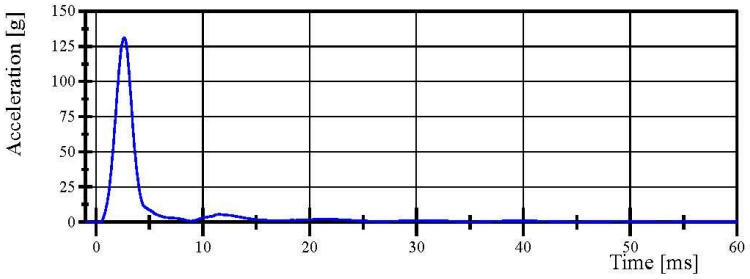
Filter Class: CFC_1000
Max: 102.2 g at 2.6 ms
Min: -3.2 g at 5.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 82.3 g at 2.7 ms
Min: -1.7 g at 6.8 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 131.0 g at 2.6 ms
Min: 0.0 g at -1.0 ms

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

08.18.2020 11:17:58 321

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/19/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	50 %	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	-51.6 deg	Yes
Time of Peak	54 - 66 ms	56.4 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	57.5 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 05053

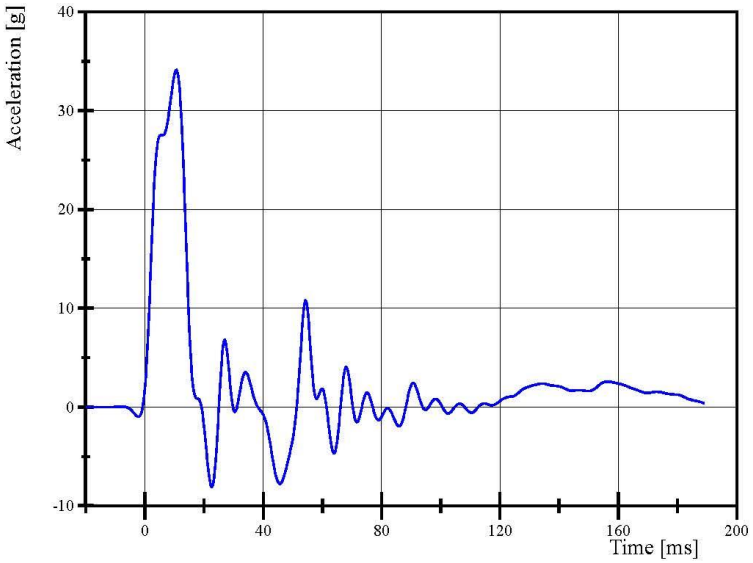
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

08.19.2020 08:57:42 1462

Transportation Research Center Inc.

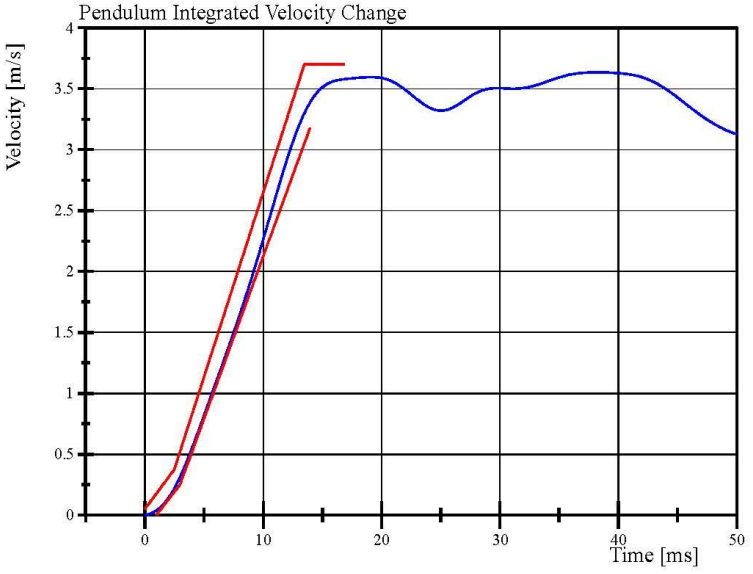
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/19/2020

Pendulum Acceleration



Filter Class: CFC_60
Max: 34.1 g at 10.6 ms
Min: -8.1 g at 22.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 38.2 ms
Min: 0.0 m/s at 0.0 ms

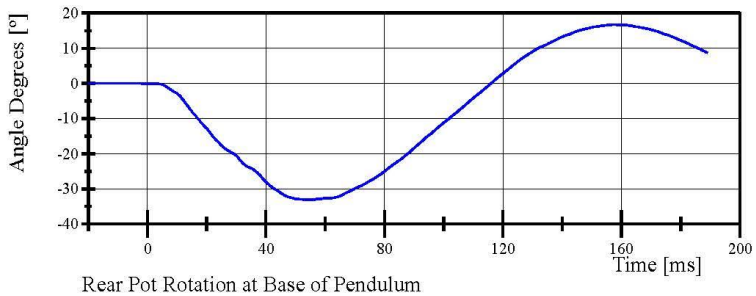
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

08.19.2020 08:58:10 1462

Transportation Research Center Inc.

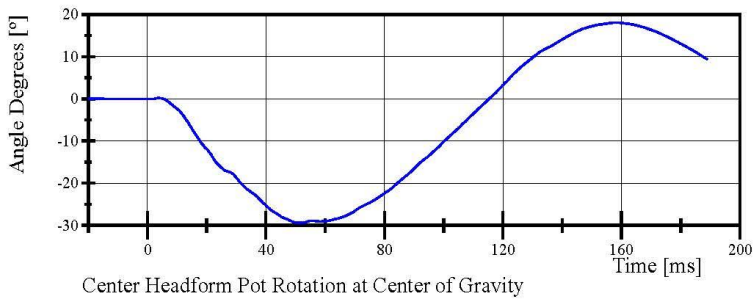
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/19/2020

Forward Pot Rotation at Base of Pendulum



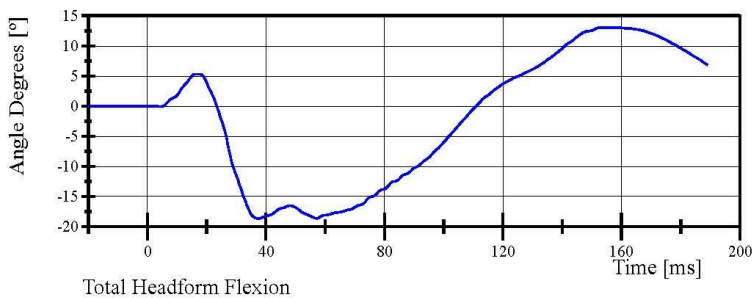
Filter Class: CFC_180
Max: 16.7 ° at 157.5 ms
Min: -33.1 ° at 55.5 ms

Rear Pot Rotation at Base of Pendulum



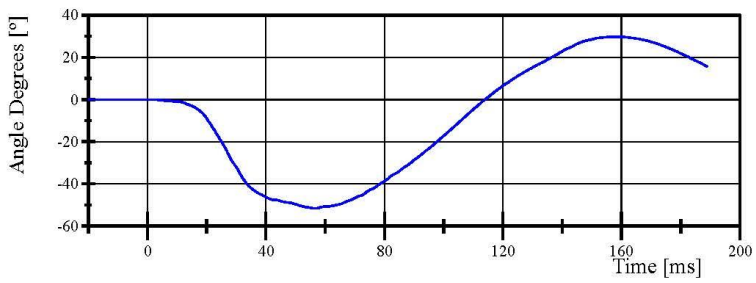
Filter Class: CFC_180
Max: 18.1 ° at 158.2 ms
Min: -29.4 ° at 51.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 13.0 ° at 152.8 ms
Min: -18.7 ° at 37.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 29.7 ° at 157.6 ms
Min: -51.6 ° at 56.4 ms

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

08.19.2020 08:58:10 1462

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-8.98 g	Yes

Test meets specifications.

Condition: Used

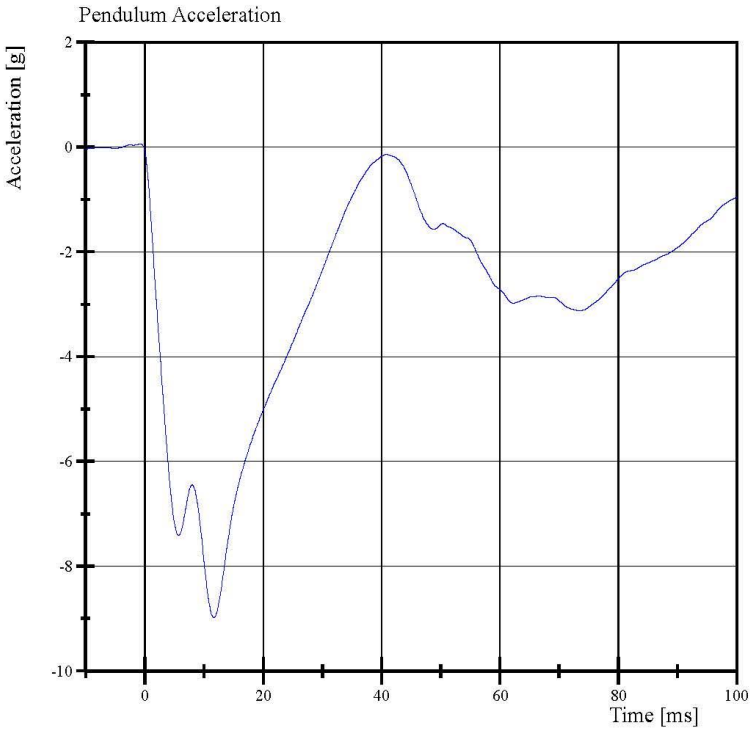
Comments:
Arm S/N: 175-3501-07014

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

08.21.2020 13:01:49 586

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -9.0 g at 11.7 ms

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

08.21.2020 13:02:18 586

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.2 mm	Yes

Test meets specifications.

Condition: Used

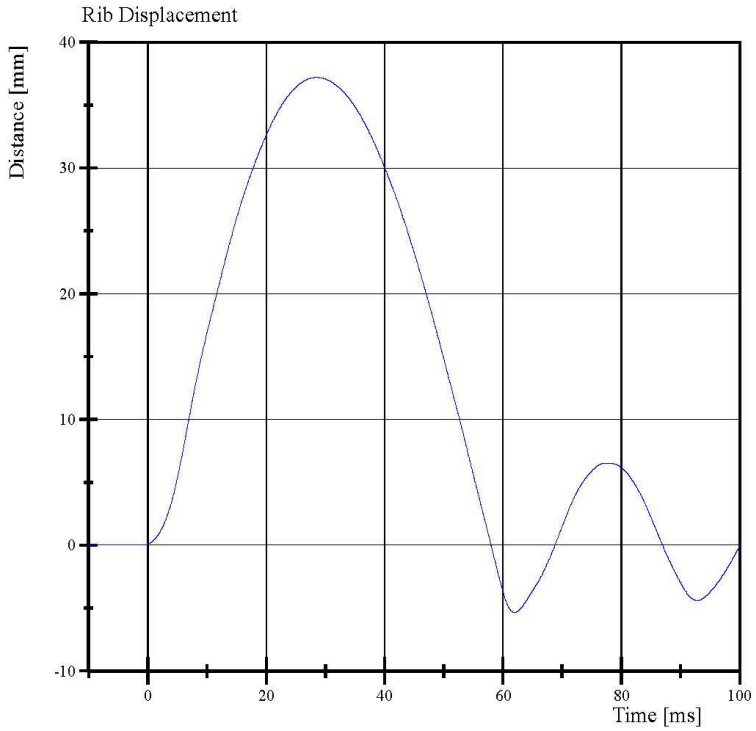
Comments:
Drop Height: 462mm
Rib Module: 175-4008-A

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

08.21.2020 10:57:43 528

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 37.2 mm at 28.6 ms
Min: -5.4 mm at 61.9 ms

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

08.21.2020 10:58:13 528

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.9 mm	Yes

Test meets specifications.

Condition: Used

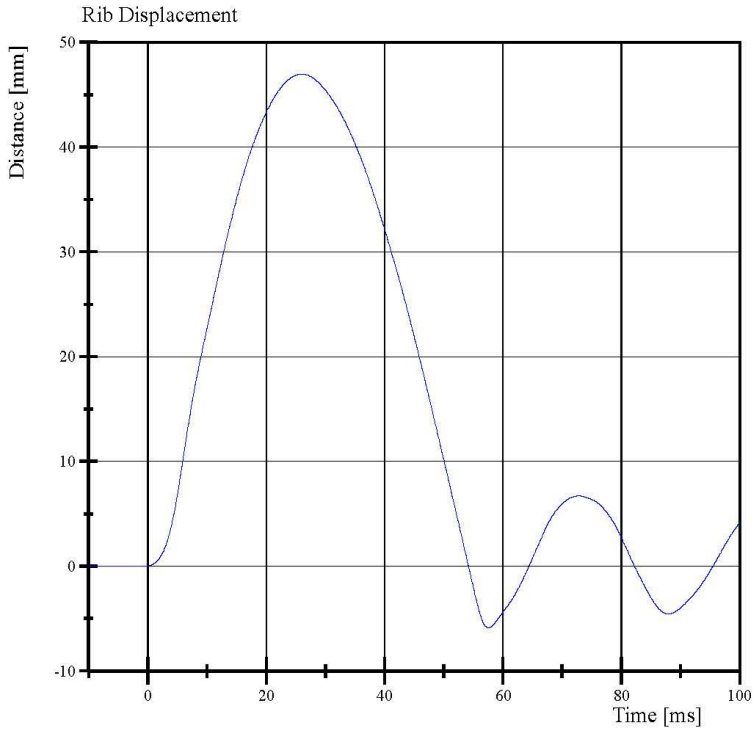
Comments:
Drop Height: 816mm
Rib Module: 175-4008-A

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

08.21.2020 10:41:10 471

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 46.9 mm at 26.0 ms
Min: -5.9 mm at 57.5 ms

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

08.21.2020 10:41:41 471

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	61 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.9 mm	Yes

Test meets specifications.

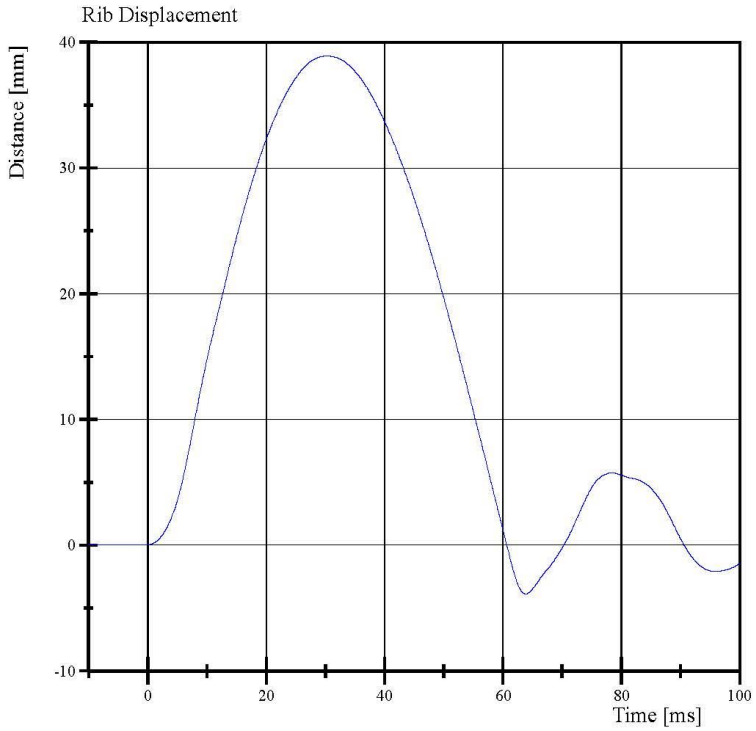
Condition: Used
Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A

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

08.21.2020 11:00:49 547

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 38.9 mm at 30.3 ms
Min: -3.9 mm at 63.8 ms

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

08.21.2020 11:01:19 547

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	50.2 mm	Yes

Test meets specifications.

Condition: Used

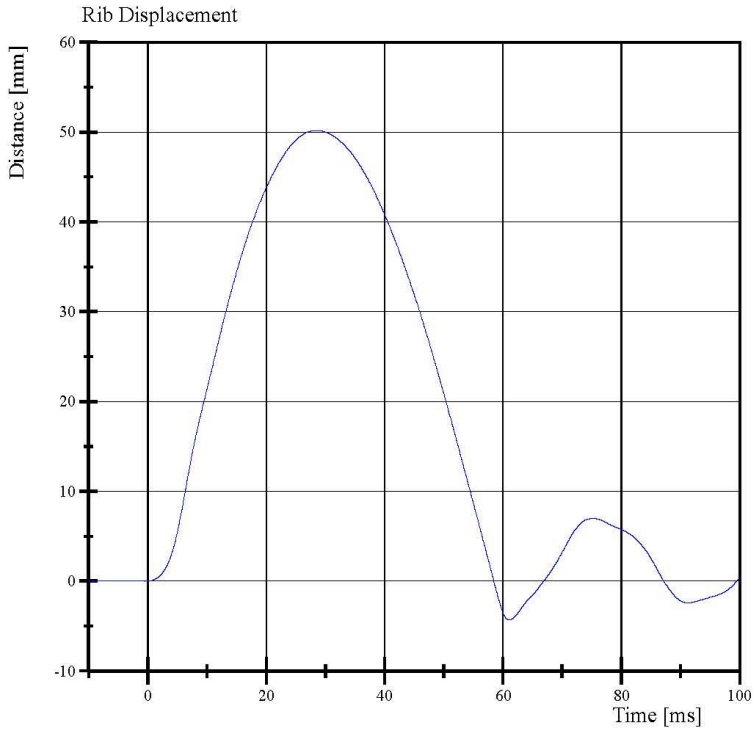
Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A

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

08.21.2020 10:55:41 466

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 50.2 mm at 28.5 ms
Min: -4.3 mm at 61.0 ms

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

08.21.2020 10:56:12 466

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.7 mm	Yes

Test meets specifications.

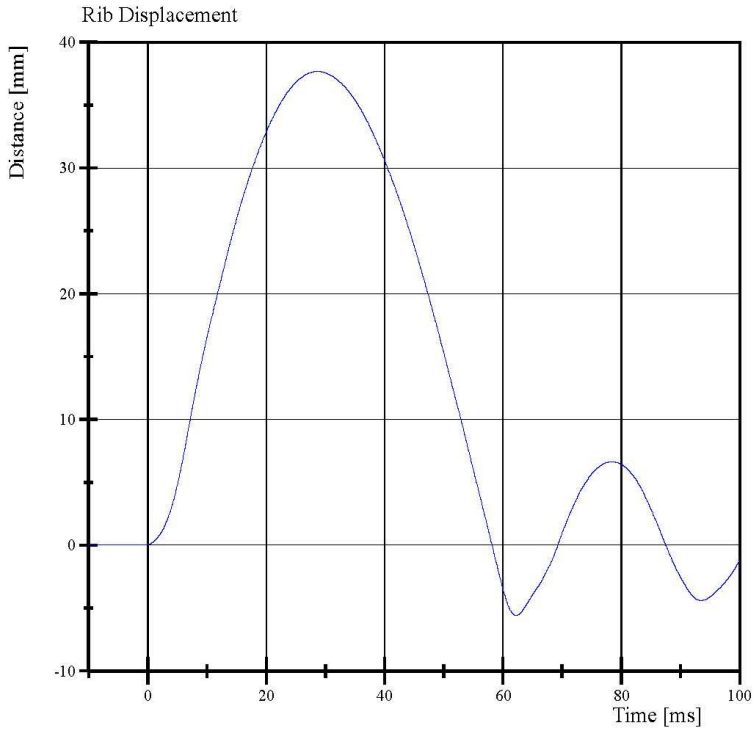
Condition: Used
Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A-06-017

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

08.21.2020 11:09:49 580

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 37.7 mm at 28.7 ms
Min: -5.6 mm at 62.2 ms

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

08.21.2020 11:10:18 580

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.6 mm	Yes

Test meets specifications.

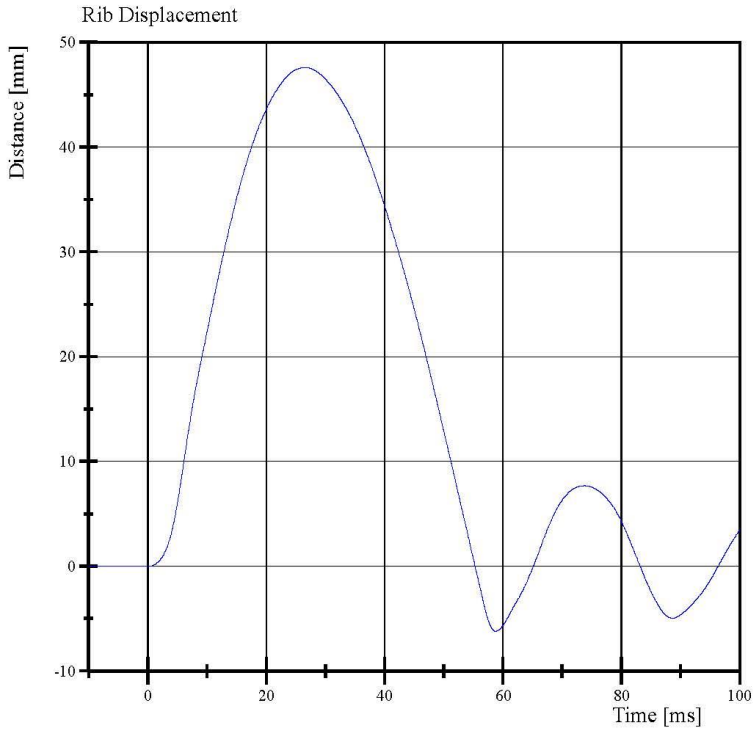
Condition: Used
Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A-06-017

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

08.21.2020 11:04:25 454

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 47.6 mm at 26.5 ms
Min: -6.2 mm at 58.8 ms

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

08.21.2020 11:04:56 454

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.460 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,592.2 N	Yes
Upper Rib Displacement	34 - 41 mm	39.1 mm	Yes
Center Rib Displacement	37 - 45 mm	41.3 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.3 mm	Yes

Test meets specifications.

Condition: Used

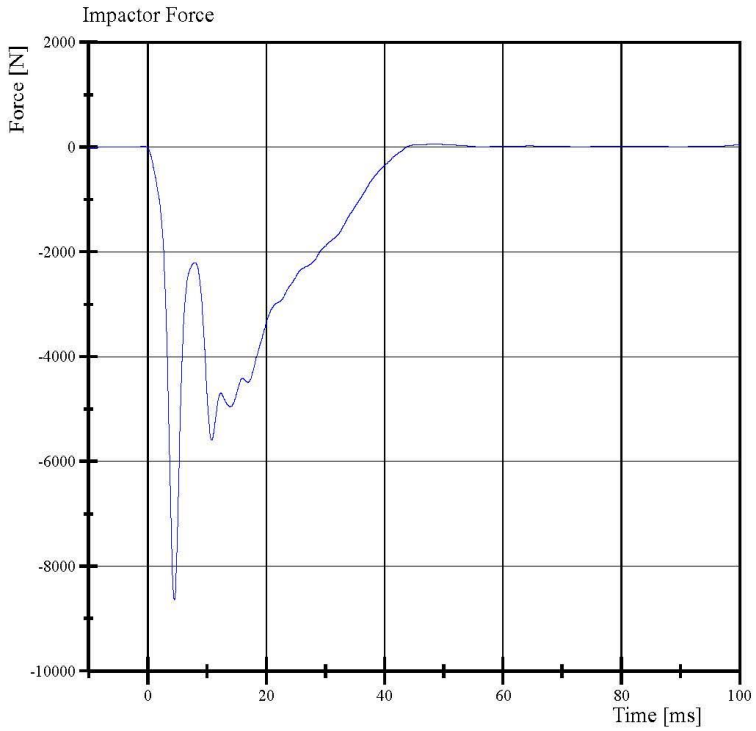
Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

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

08.21.2020 13:05:48 453

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020



Filter Class: CFC_180
Max: 55.4 N at 48.7 ms
Min: -8,646.7 N at 4.5 ms

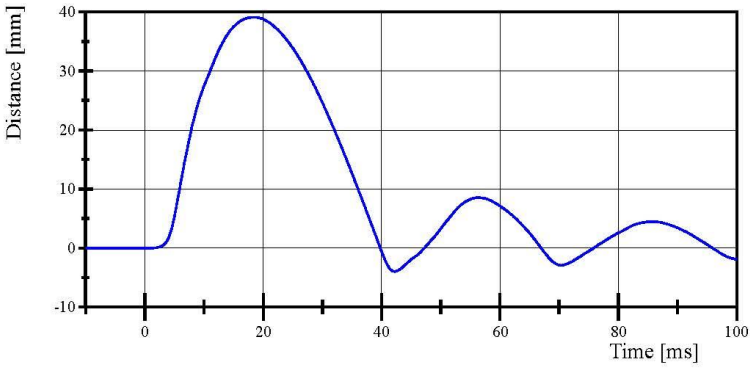
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

08.21.2020 13:06:40 453

Transportation Research Center Inc.

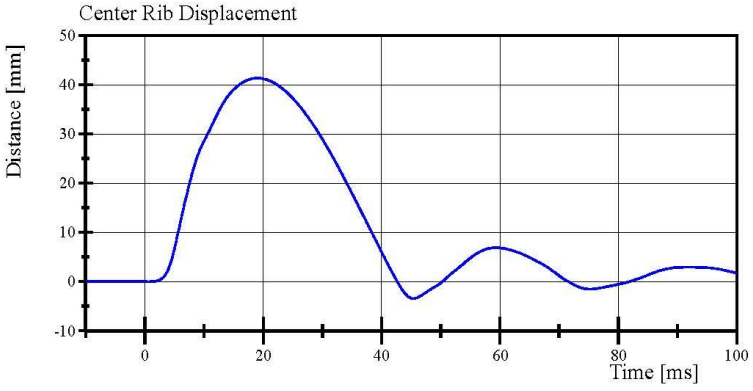
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Upper Rib Displacement



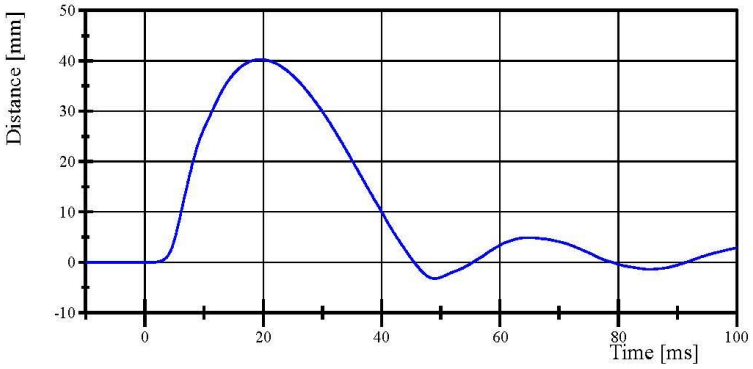
Filter Class: CFC_180
Max: 39.1 mm at 18.5 ms
Min: -4.0 mm at 42.2 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.3 mm at 19.0 ms
Min: -3.4 mm at 45.4 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.3 mm at 19.4 ms
Min: -3.2 mm at 49.0 ms

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

08.21.2020 13:06:40 453

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 72-6
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.116 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-48.4 deg	Yes
Time of Peak	39 - 53 ms	44.2 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.0 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Lumbar S/N: 150365

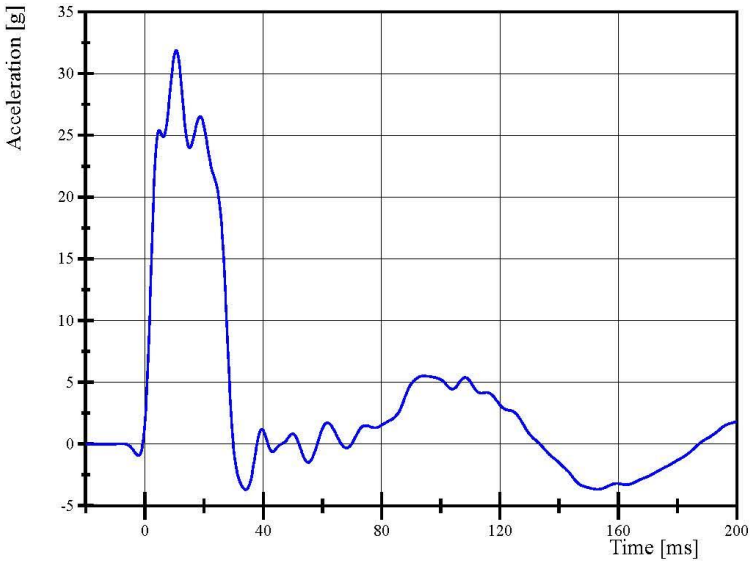
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

08.21.2020 08:09:12 637

Transportation Research Center Inc.

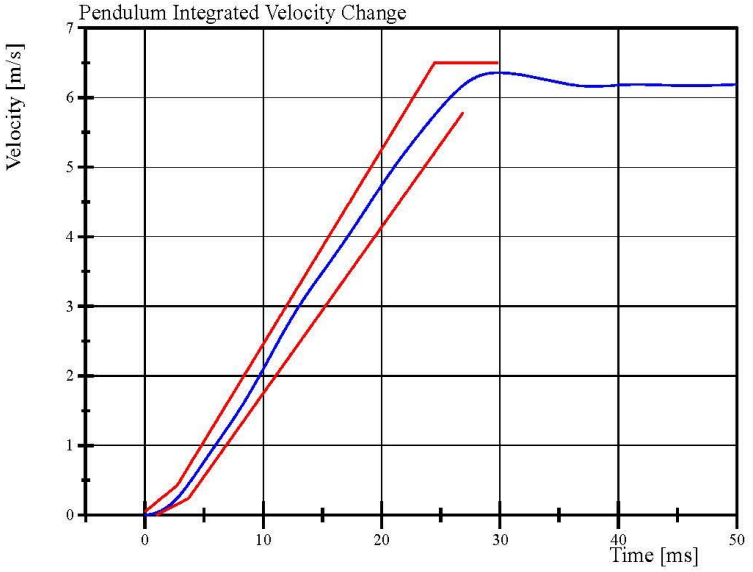
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 72-6
Test Date: 8/21/2020

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.9 g at 10.6 ms
Min: -3.7 g at 34.1 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.4 m/s at 29.8 ms
Min: 0.0 m/s at 0.0 ms

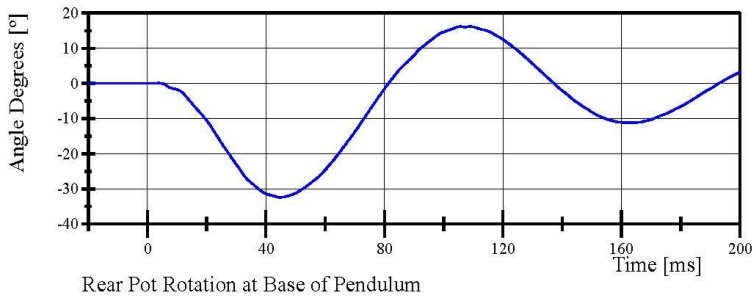
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

08.21.2020 08:10:41 637

Transportation Research Center Inc.

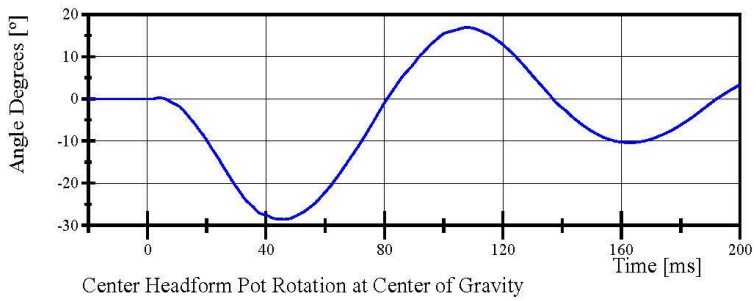
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 72-6
Test Date: 8/21/2020

Forward Pot Rotation at Base of Pendulum



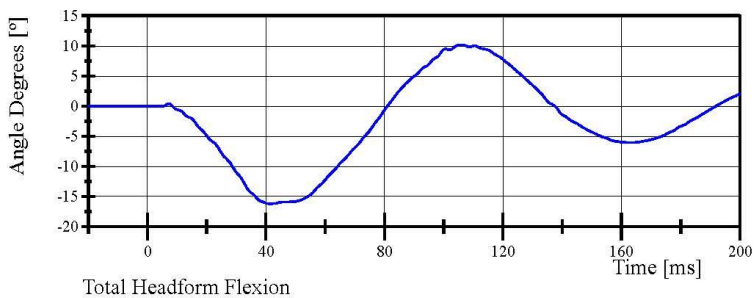
Filter Class: CFC_180
Max: 16.2 ° at 109.0 ms
Min: -32.4 ° at 44.8 ms

Rear Pot Rotation at Base of Pendulum



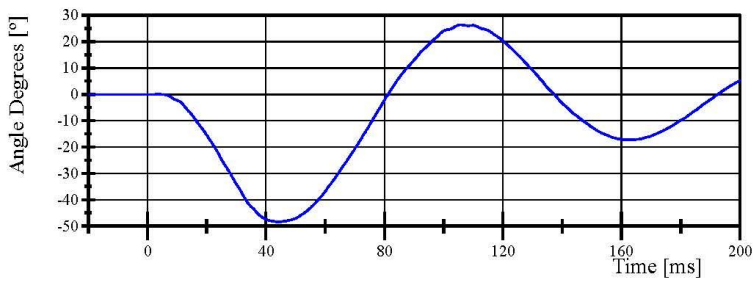
Filter Class: CFC_180
Max: 16.9 ° at 107.9 ms
Min: -28.5 ° at 46.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 10.2 ° at 105.8 ms
Min: -16.2 ° at 41.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 26.4 ° at 105.7 ms
Min: -48.4 ° at 44.2 ms

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

08.21.2020 08:10:41 637

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.06 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,146.0 N	Yes
Time of Peak	10.6 - 13.0 ms	12.08 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,399.1 N	Yes
Time of Peak	10.0 - 12.3 ms	11.28 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Abdomen S/N: 1066

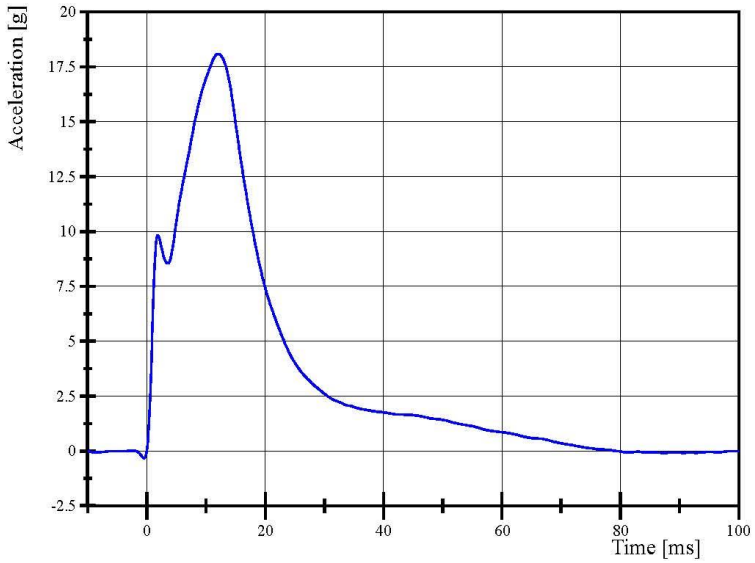
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

08.21.2020 13:10:24 594

Transportation Research Center Inc.

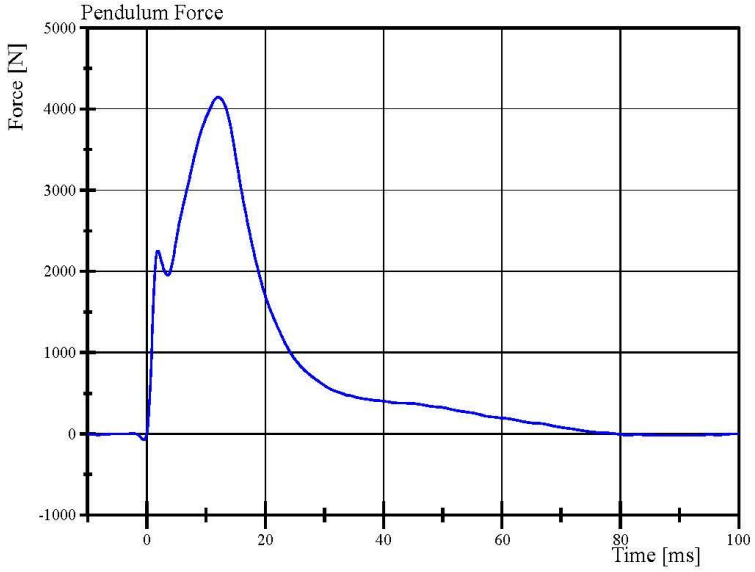
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.1 g at 12.1 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,146.0 N at 12.1 ms
Min: -75.3 N at -0.5 ms

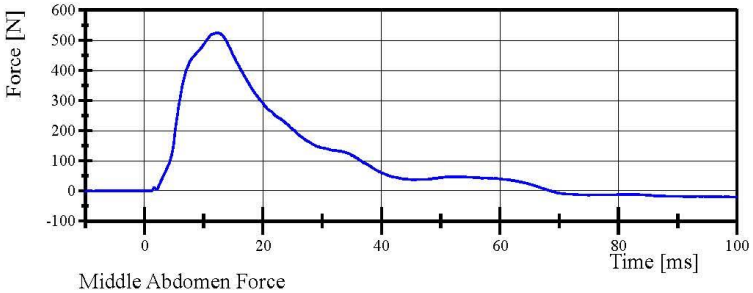
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

08.21.2020 13:10:52 594

Transportation Research Center Inc.

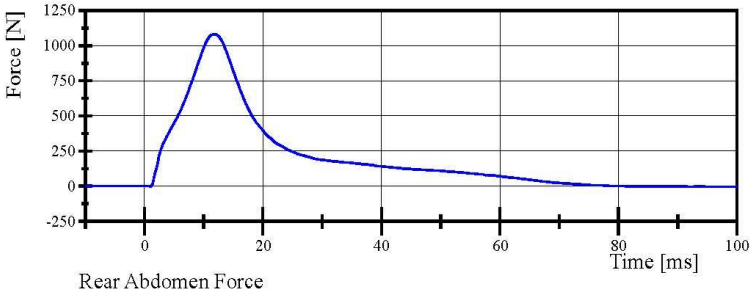
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Front Abdomen Force



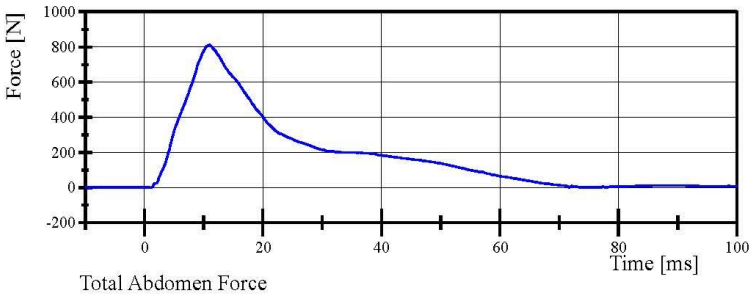
Filter Class: CFC_600
Max: 524.9 N at 12.2 ms
Min: -20.6 N at 100.0 ms

Middle Abdomen Force



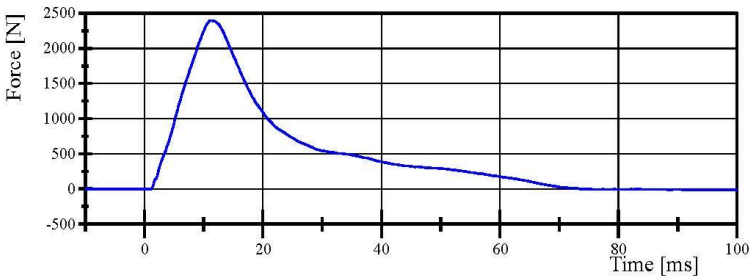
Filter Class: CFC_600
Max: 1,079.8 N at 11.9 ms
Min: -3.6 N at 97.8 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 811.1 N at 10.9 ms
Min: -0.8 N at 1.1 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,399.1 N at 11.3 ms
Min: -16.4 N at 97.6 ms

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

08.21.2020 13:10:52 594

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,199.3 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,286.2 N	Yes
Time of Peak	12.2 - 17.0 ms	13.36 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: N/A

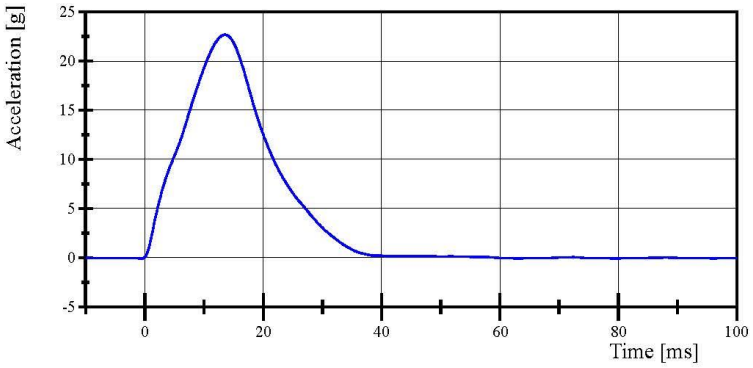
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

08.21.2020 13:14:22 547

Transportation Research Center Inc.

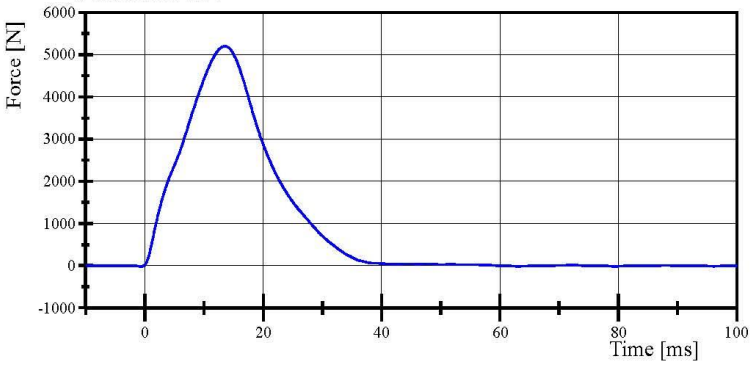
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 72-1
Test Date: 8/21/2020

Pendulum Acceleration



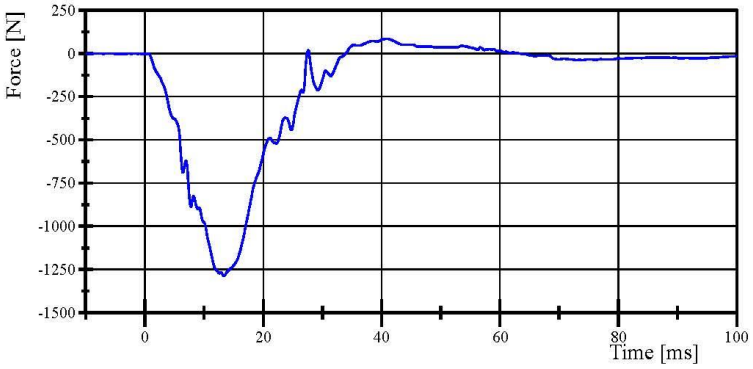
Filter Class: CFC_180
Max: 22.7 g at 13.5 ms
Min: -0.1 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,199.3 N at 13.5 ms
Min: -18.1 N at -0.6 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 85.5 N at 40.9 ms
Min: -1,286.2 N at 13.4 ms

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

08.21.2020 13:14:56 547

Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 73

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	909	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	347	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	154	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	328	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	201	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	199	Yes
14	Pelvis Depth	235.0 - 245.0	242	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	156	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. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Peak Resultant Acceleration	125 - 155 g	144.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	9.0 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	4.03 %	Yes

Test meets specifications.

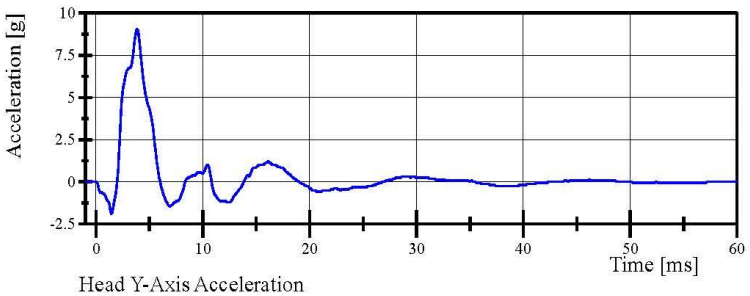
Condition: Used

Comments:
Head Skin S/N: DP6812

Transportation Research Center Inc.

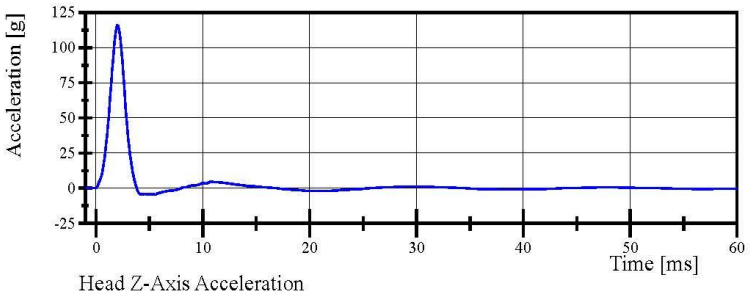
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Head X-Axis Acceleration



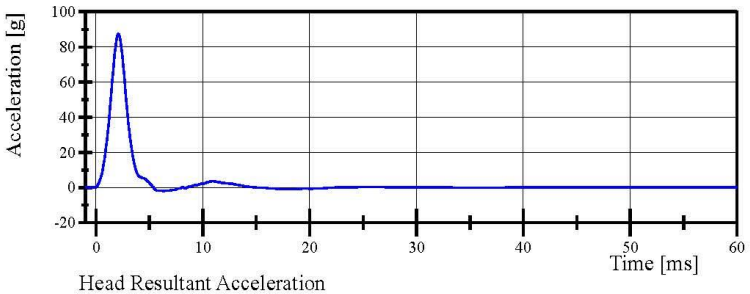
Filter Class: CFC_1000
Max: 9.0 g at 3.8 ms
Min: -1.9 g at 1.4 ms

Head Y-Axis Acceleration



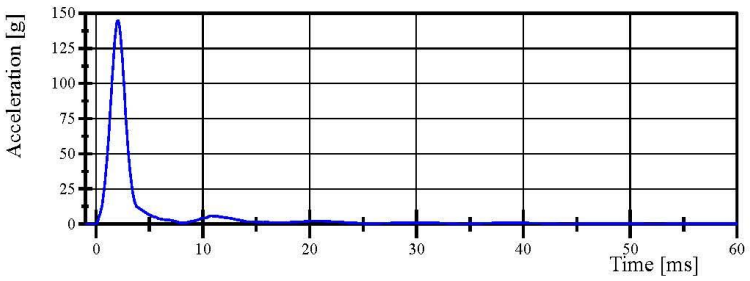
Filter Class: CFC_1000
Max: 115.9 g at 2.0 ms
Min: -4.4 g at 5.5 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 87.5 g at 2.1 ms
Min: -1.9 g at 6.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 144.9 g at 2.1 ms
Min: 0.0 g at -1.0 ms

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

10.02.2020 09:29:34 327

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-51.7 deg	Yes
Time of Peak	54 - 66 ms	57.8 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	57.6 ms	Yes

Test meets specifications.

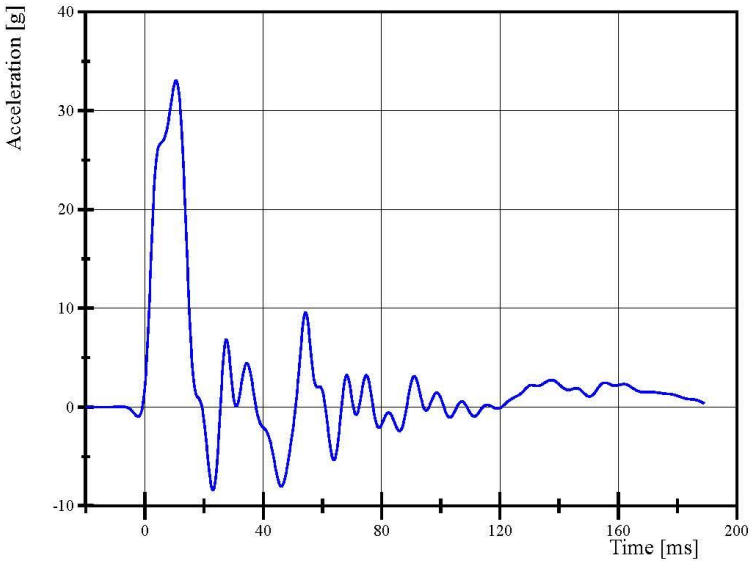
Condition: Used

Comments:
Neck S/N: 05053

Transportation Research Center Inc.

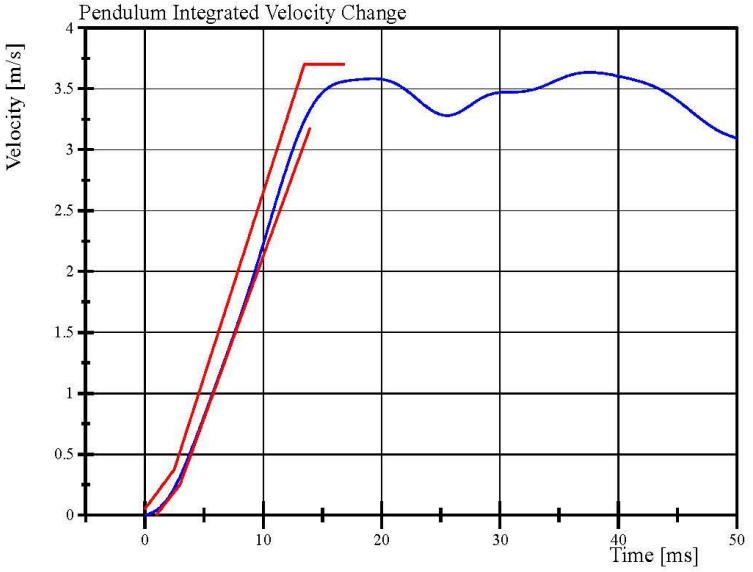
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Pendulum Acceleration



Filter Class: CFC_60
Max: 33.1 g at 10.6 ms
Min: -8.4 g at 23.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 37.5 ms
Min: 0.0 m/s at 0.0 ms

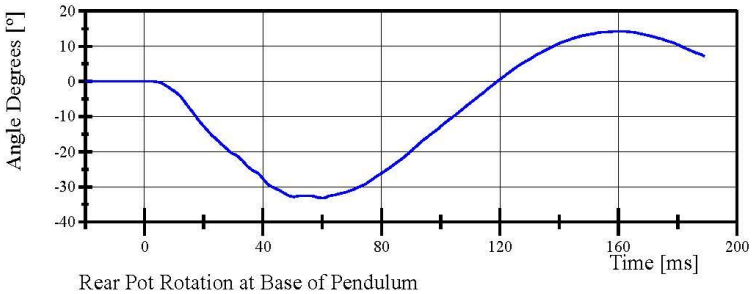
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.02.2020 09:55:44 1463

Transportation Research Center Inc.

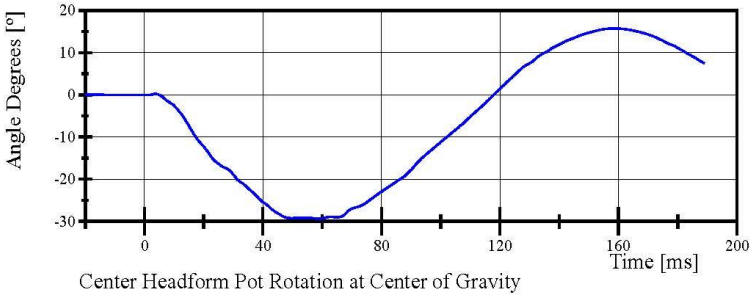
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Forward Pot Rotation at Base of Pendulum



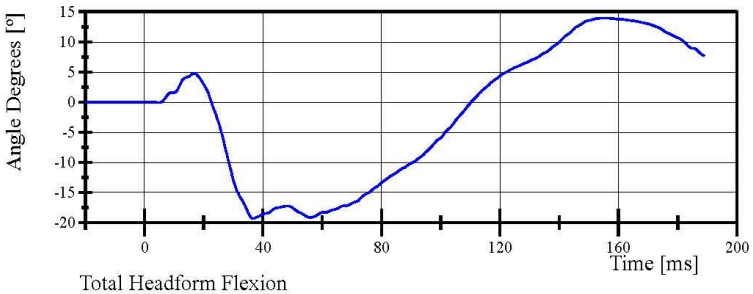
Filter Class: CFC_180
Max: 14.2 ° at 162.1 ms
Min: -33.2 ° at 60.2 ms

Rear Pot Rotation at Base of Pendulum



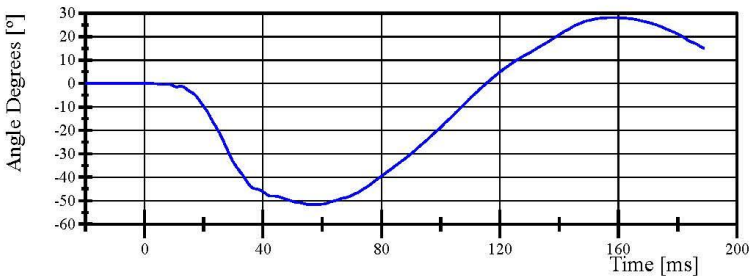
Filter Class: CFC_180
Max: 15.7 ° at 158.7 ms
Min: -29.4 ° at 59.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 13.9 ° at 153.9 ms
Min: -19.3 ° at 36.6 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 28.1 ° at 157.8 ms
Min: -51.7 ° at 57.8 ms

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

10.02.2020 09:55:44 1463

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.92 g	Yes

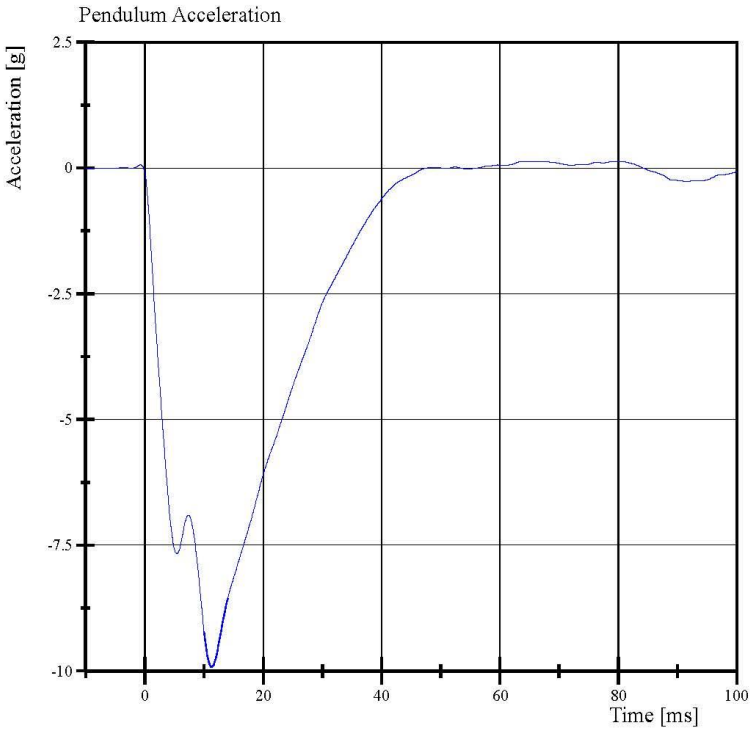
Test meets specifications.

Condition: Used

Comments:
Arm S/N: 175-3501-07014

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 0.1 g at 64.4 ms
Min: -9.9 g at 11.3 ms

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

10.02.2020 11:27:43 591

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.2 mm	Yes

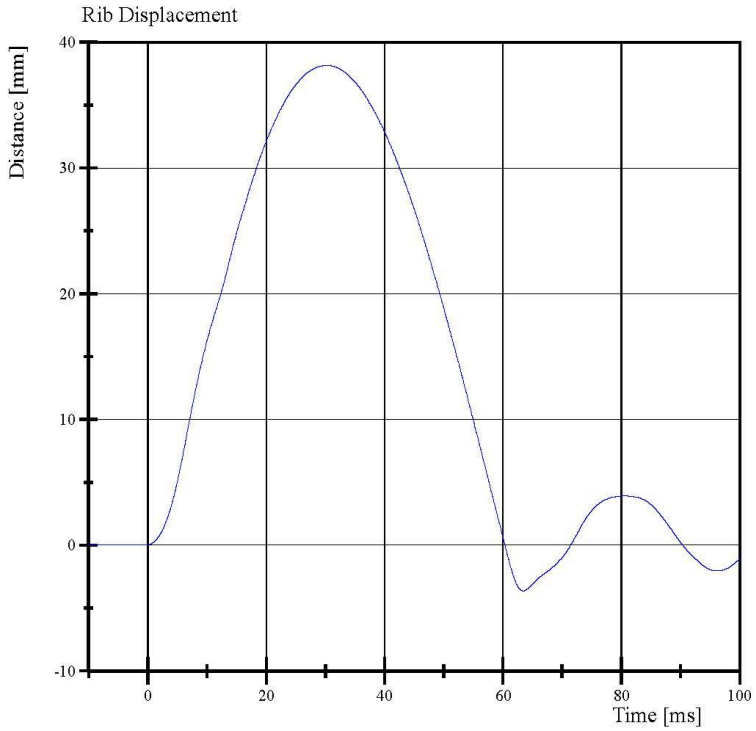
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 38.2 mm at 30.3 ms
Min: -3.6 mm at 63.4 ms

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

10.02.2020 08:49:30 539

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.7 mm	Yes

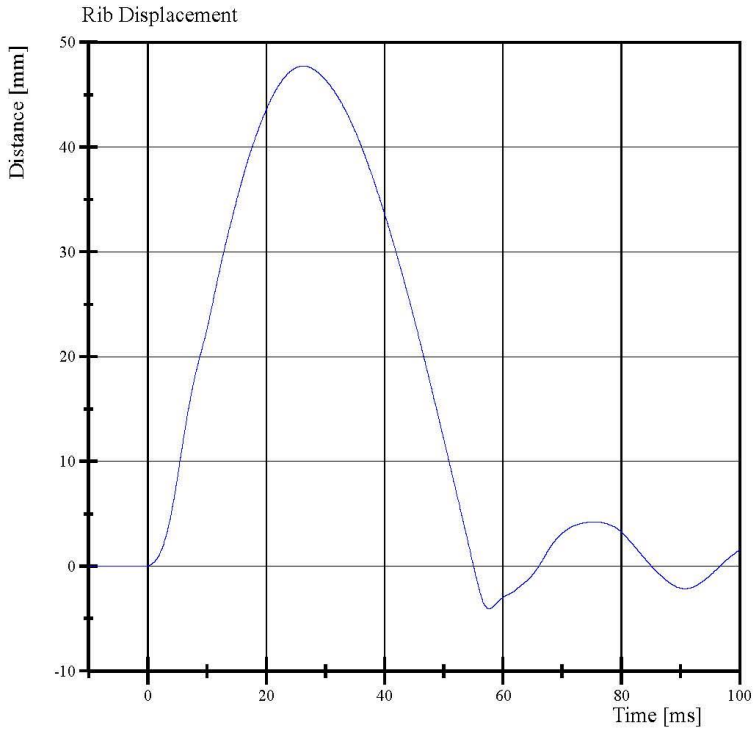
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 47.7 mm at 26.2 ms
Min: -4.1 mm at 57.7 ms

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

10.02.2020 08:45:14 465

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.4 mm	Yes

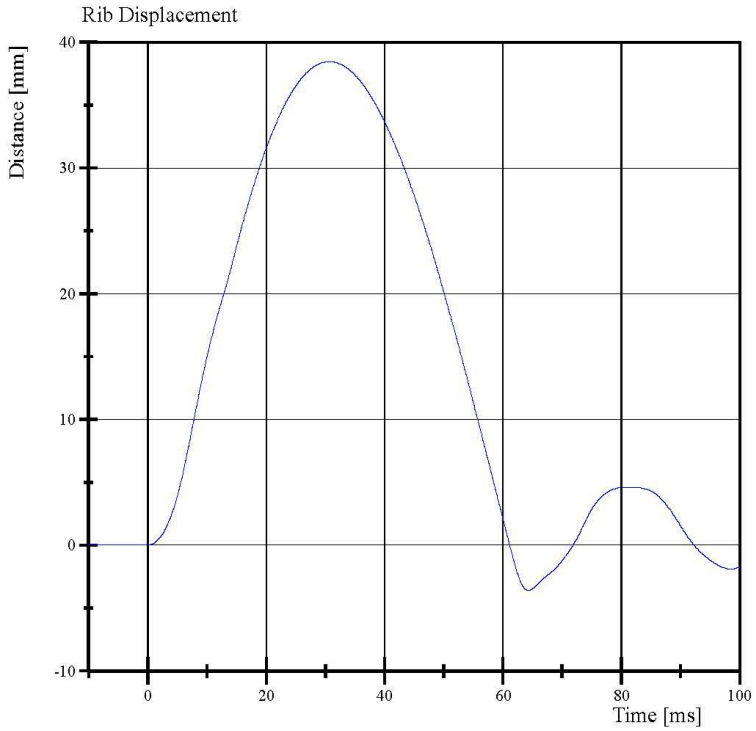
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 38.4 mm at 30.6 ms
Min: -3.6 mm at 64.3 ms

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

10.02.2020 08:59:23 565

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	50.0 mm	Yes

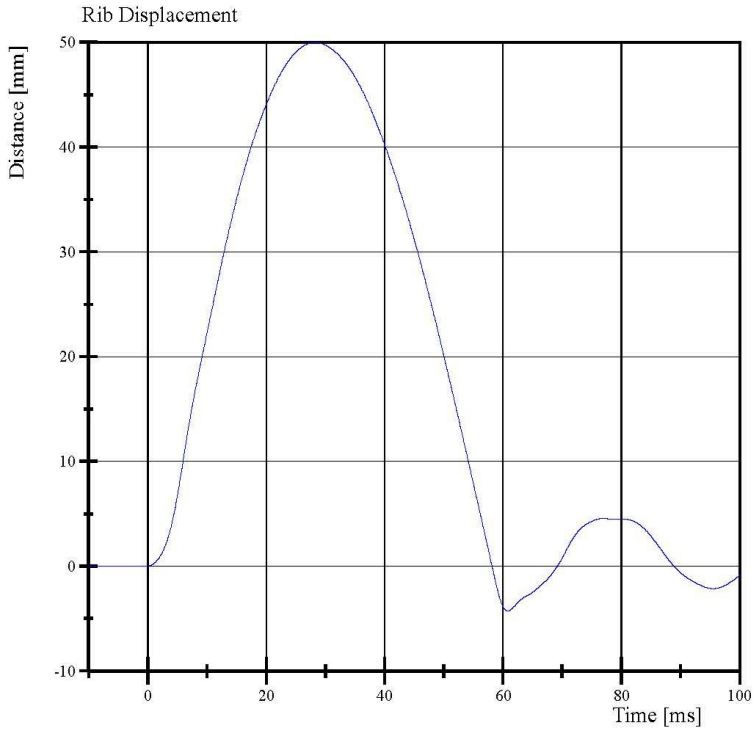
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 50.0 mm at 28.2 ms
Min: -4.3 mm at 60.8 ms

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

10.02.2020 08:53:24 458

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.9 mm	Yes

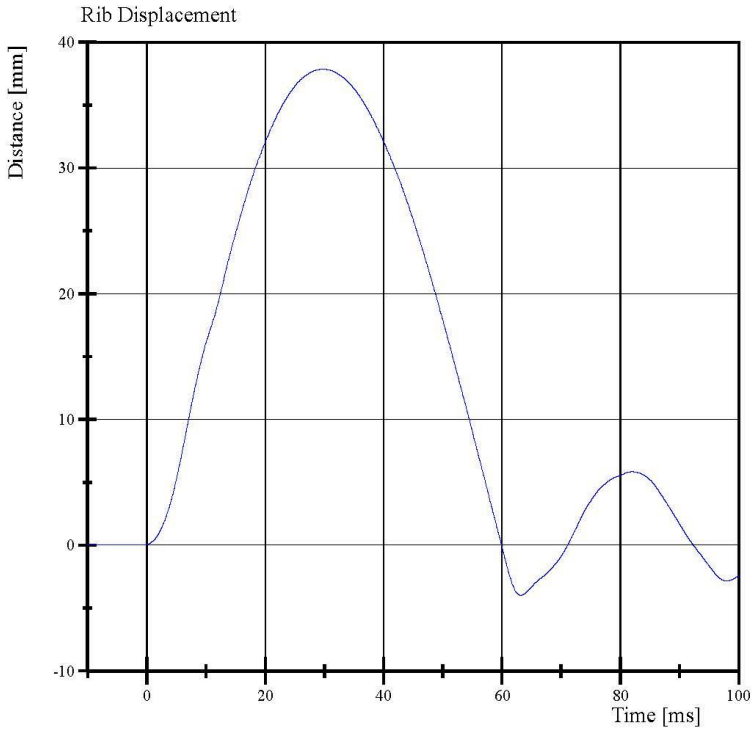
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A-06-017

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 37.9 mm at 29.8 ms
Min: -4.0 mm at 63.2 ms

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

10.02.2020 09:10:01 548

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.8 mm	Yes

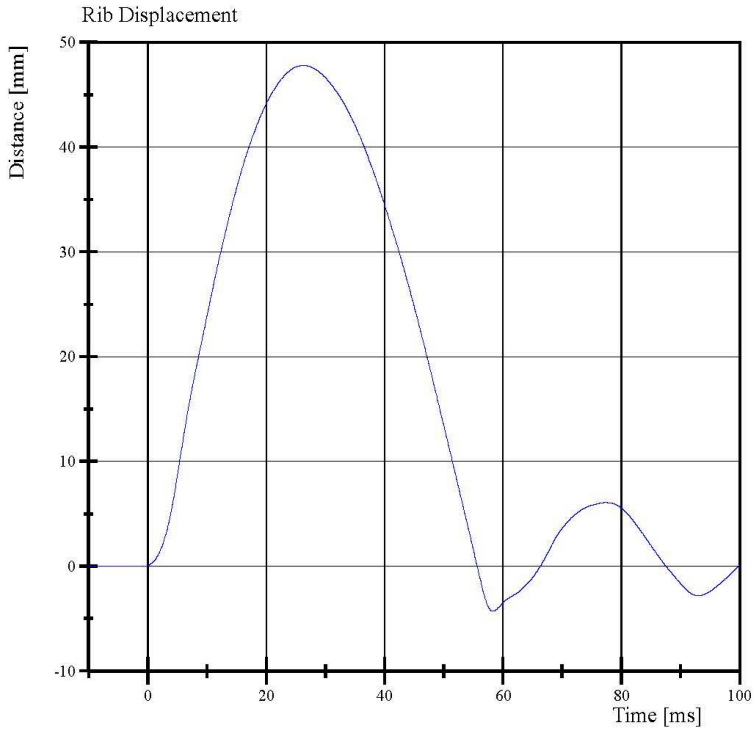
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A-06-017

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 47.8 mm at 26.2 ms
Min: -4.3 mm at 58.3 ms

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

10.02.2020 09:03:50 472

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.490 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,825.9 N	Yes
Upper Rib Displacement	34 - 41 mm	38.0 mm	Yes
Center Rib Displacement	37 - 45 mm	40.1 mm	Yes
Lower Rib Displacement	37 - 44 mm	39.8 mm	Yes

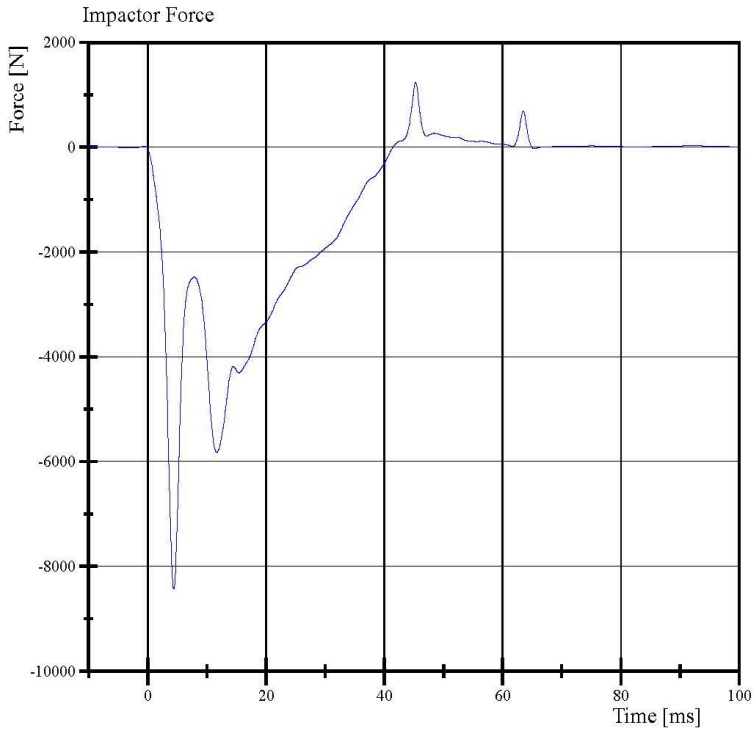
Test meets specifications.

Condition: Used

Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020



Filter Class: CFC_180
Max: 1,233.4 N at 45.3 ms
Min: -8,435.1 N at 4.4 ms

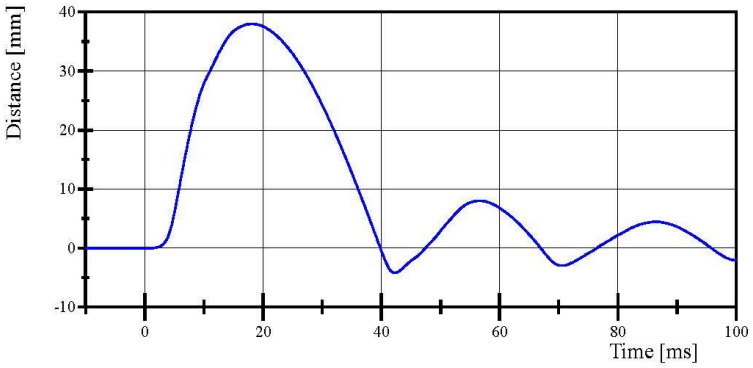
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.02.2020 11:31:01 458

Transportation Research Center Inc.

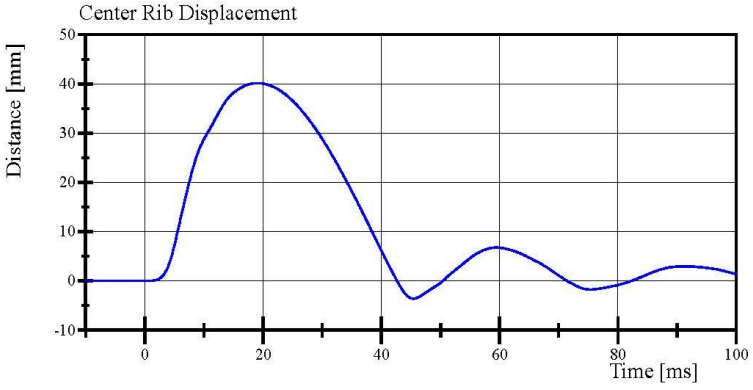
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Upper Rib Displacement



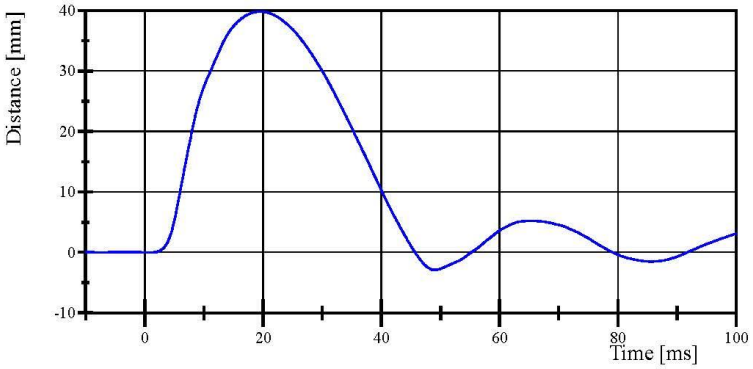
Filter Class: CFC_180
Max: 38.0 mm at 18.2 ms
Min: -4.2 mm at 42.2 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 40.1 mm at 19.0 ms
Min: -3.6 mm at 45.4 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 39.8 mm at 19.4 ms
Min: -2.9 mm at 49.0 ms

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

10.02.2020 11:31:02 458

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.121 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-48.4 deg	Yes
Time of Peak	39 - 53 ms	44.2 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.7 ms	Yes

Test meets specifications.

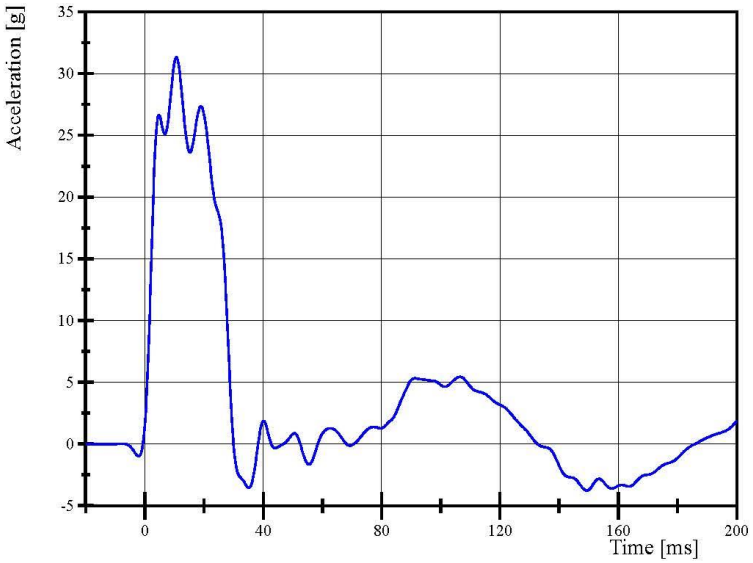
Condition: Used

Comments:
Lumbar S/N: 150365

Transportation Research Center Inc.

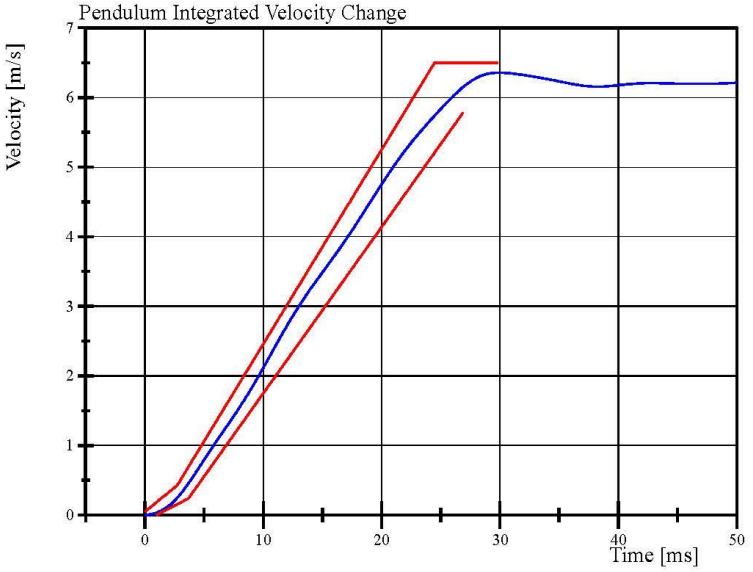
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.3 g at 10.6 ms
Min: -3.8 g at 149.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.4 m/s at 30.0 ms
Min: 0.0 m/s at 0.0 ms

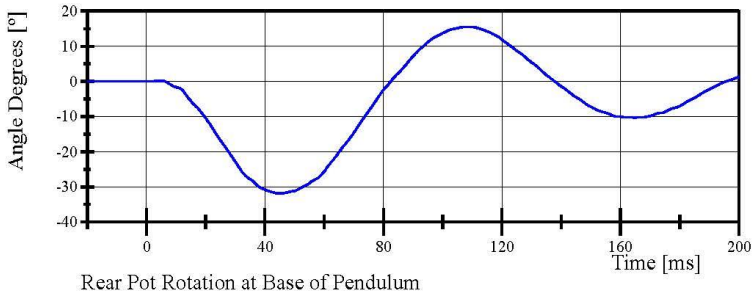
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.02.2020 10:38:47 637

Transportation Research Center Inc.

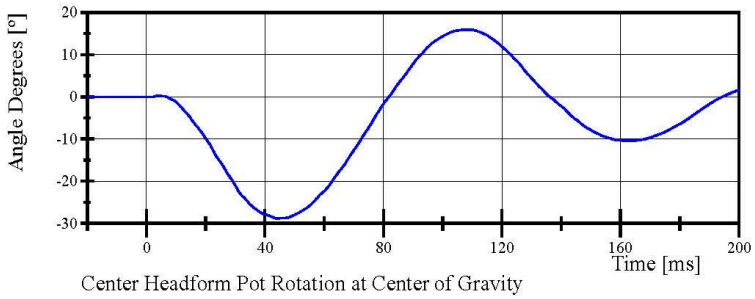
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Forward Pot Rotation at Base of Pendulum



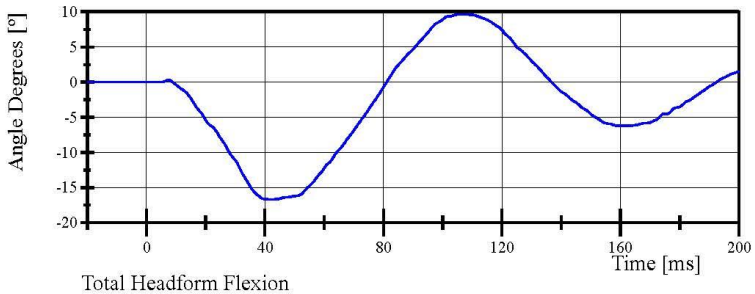
Filter Class: CFC_180
Max: 15.5 ° at 109.4 ms
Min: -31.8 ° at 44.4 ms

Rear Pot Rotation at Base of Pendulum



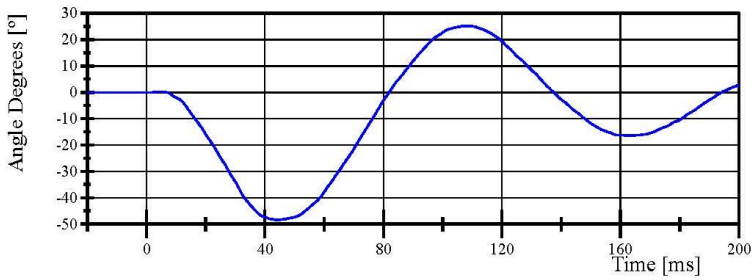
Filter Class: CFC_180
Max: 16.0 ° at 108.2 ms
Min: -28.8 ° at 44.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.6 ° at 105.4 ms
Min: -16.7 ° at 42.1 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.1 ° at 107.7 ms
Min: -48.4 ° at 44.2 ms

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

10.02.2020 10:38:47 637

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.06 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,168.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.12 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,454.4 N	Yes
Time of Peak	10.0 - 12.3 ms	11.12 ms	Yes

Test meets specifications.

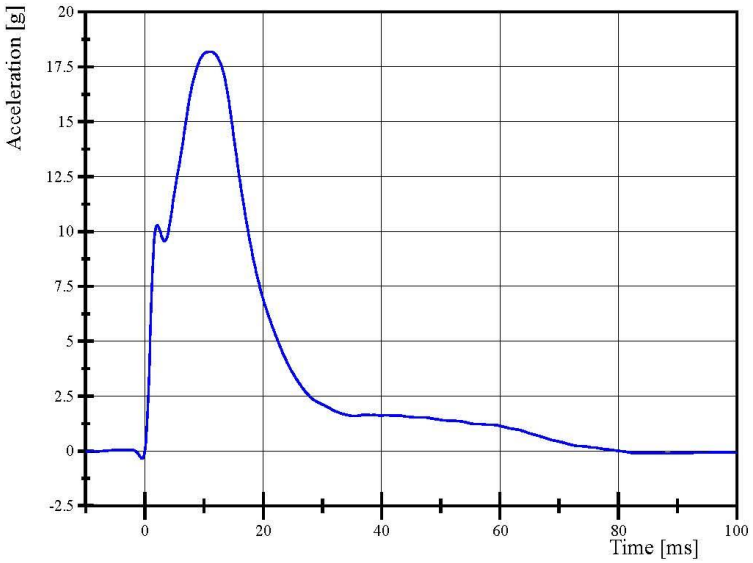
Condition: Used

Comments:
Abdomen S/N: 1066

Transportation Research Center Inc.

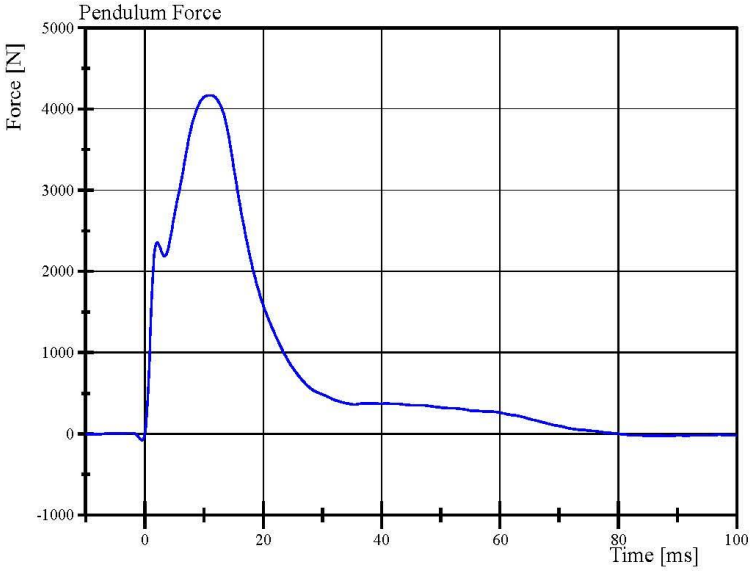
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.2 g at 11.1 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,168.3 N at 11.1 ms
Min: -77.9 N at -0.5 ms

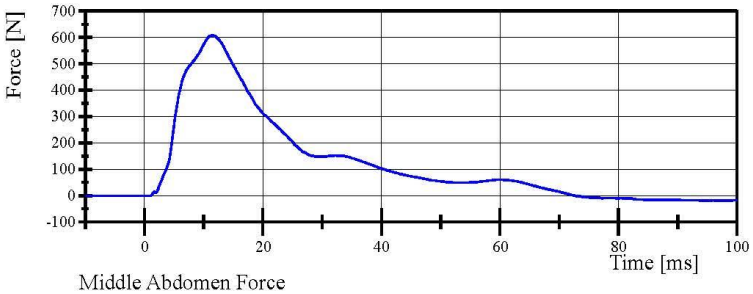
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

10.02.2020 11:37:05 597

Transportation Research Center Inc.

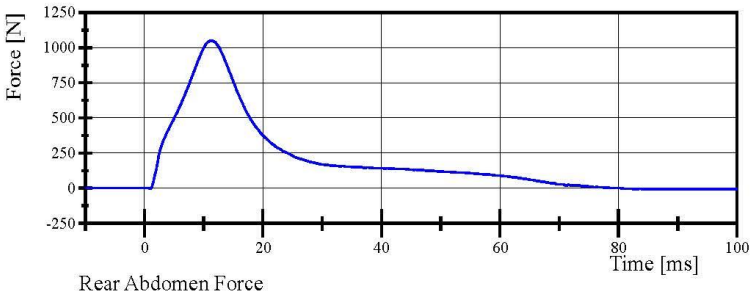
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Front Abdomen Force



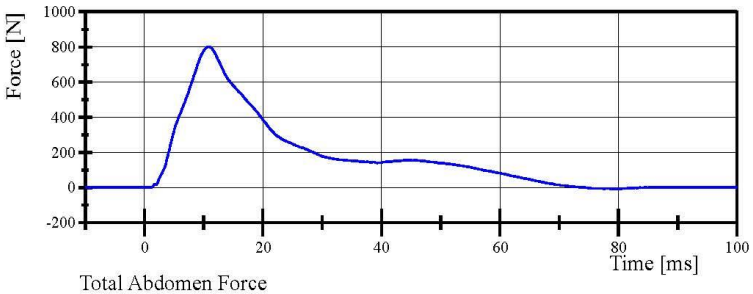
Filter Class: CFC_600
Max: 607.8 N at 11.5 ms
Min: -18.5 N at 98.4 ms

Middle Abdomen Force



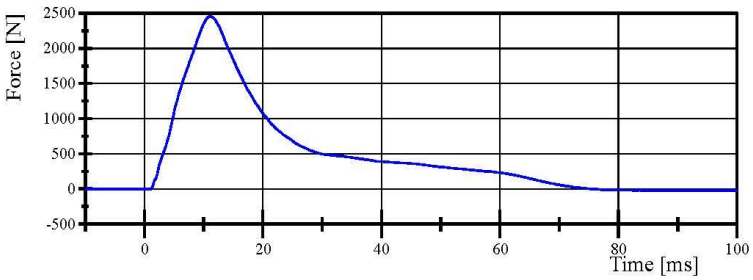
Filter Class: CFC_600
Max: 1,048.9 N at 11.2 ms
Min: -7.3 N at 96.2 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 801.2 N at 10.9 ms
Min: -8.0 N at 80.3 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,454.4 N at 11.1 ms
Min: -26.0 N at 98.5 ms

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

10.02.2020 11:37:06 597

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,306.9 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,351.2 N	Yes
Time of Peak	12.2 - 17.0 ms	13.12 ms	Yes

Test meets specifications.

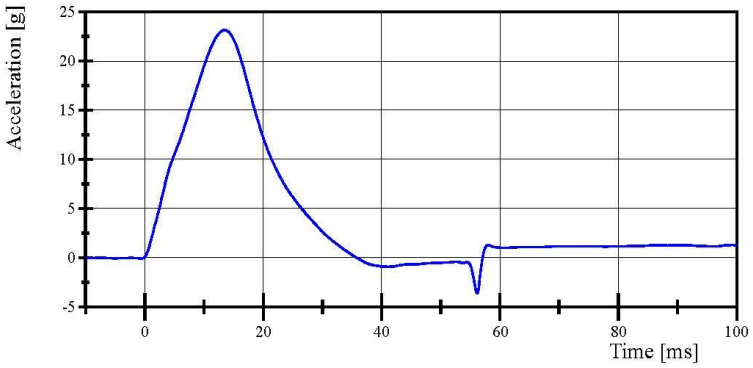
Condition: Used

Comments:
Pelvis Skin S/N: N/A

Transportation Research Center Inc.

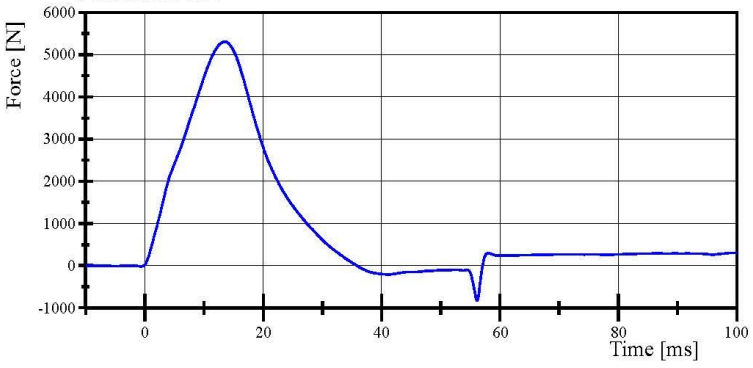
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 73-1
Test Date: 10/2/2020

Pendulum Acceleration



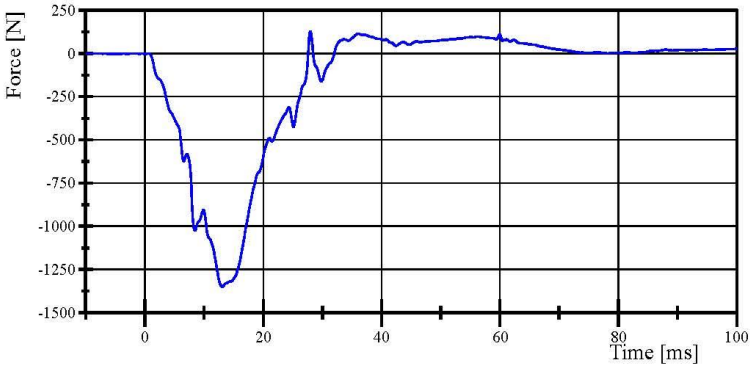
Filter Class: CFC_180
Max: 23.2 g at 13.5 ms
Min: -3.6 g at 56.2 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,306.9 N at 13.5 ms
Min: -825.6 N at 56.2 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 128.6 N at 28.0 ms
Min: -1,351.2 N at 13.1 ms

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

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Pre-Test Calibration Sheets
Passenger S/N DQ0570

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 05

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	785	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	83	Yes
D	H-Point from Seat Back	141.0 - 151.0	147	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	184	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	533	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	427	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	316	Yes
R	Arm Length	249.0 - 259.0	254	Yes
S	Knee Joint to seat Back	478.0 - 493.0	486	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	349	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	781	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/18/2020

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	132.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-6.2 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.29 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

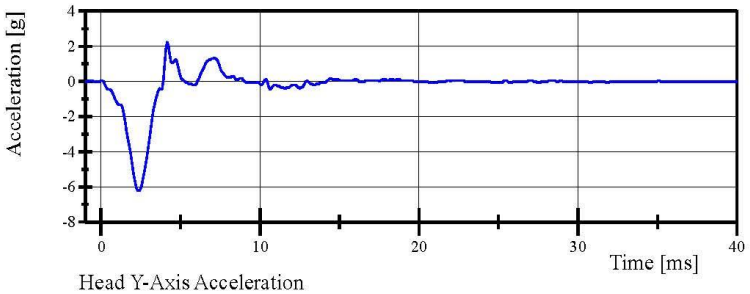
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

08.18.2020 11:29:21 199

Transportation Research Center Inc.

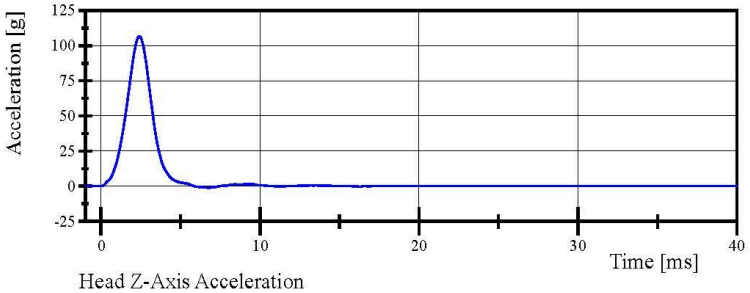
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/18/2020

Head X-Axis Acceleration



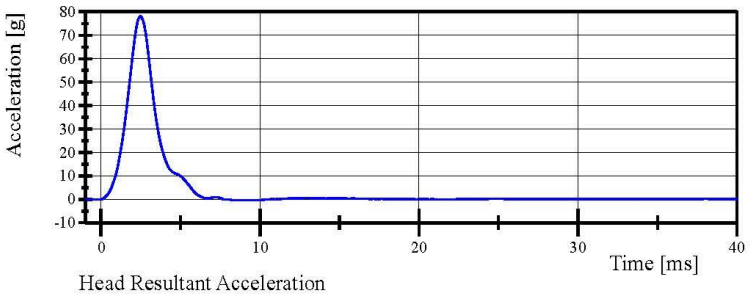
Filter Class: CFC_1000
Max: 2.2 g at 4.2 ms
Min: -6.2 g at 2.3 ms

Head Y-Axis Acceleration



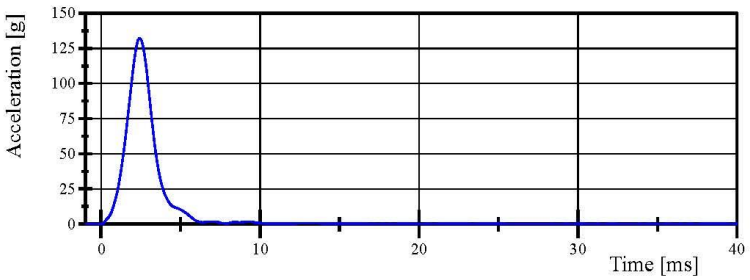
Filter Class: CFC_1000
Max: 106.8 g at 2.4 ms
Min: -1.0 g at 6.7 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 78.1 g at 2.5 ms
Min: -0.5 g at 8.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 132.3 g at 2.4 ms
Min: 0.0 g at -0.2 ms

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

08.18.2020 11:29:56 199

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 5-5
Test Date: 8/25/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.612 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.557 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.706 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.990 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.859 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.886 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.0 deg	Yes
Time of Peak	50 - 70 ms	60.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	42.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	109.9 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N; DP3365

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

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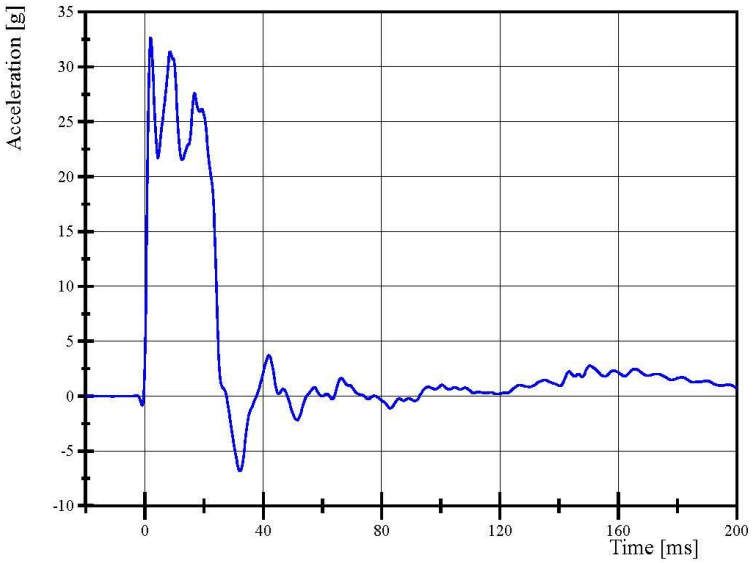
Transportation Research Center Inc.

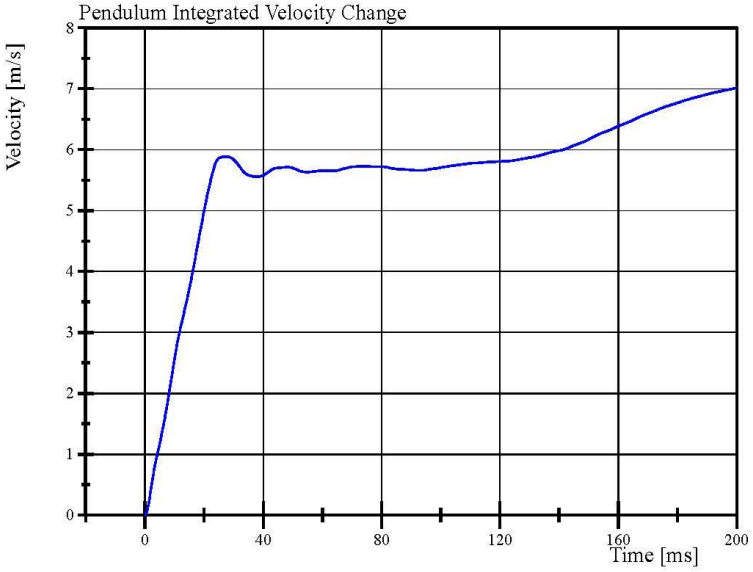
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 5-5
Test Date: 8/25/2020

Pendulum Acceleration



Filter Class: CFC_180
Max: 32.6 g at 1.9 ms
Min: -6.8 g at 32.1 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.0 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

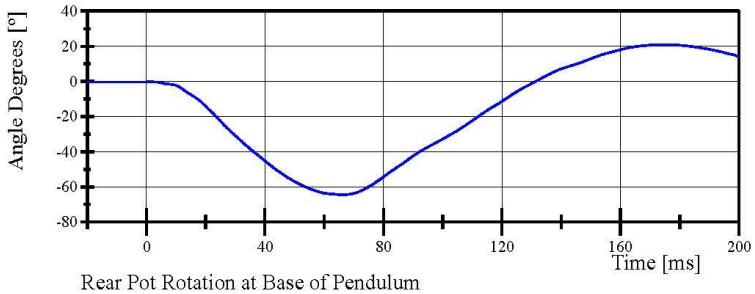
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 13:33:03 717

Transportation Research Center Inc.

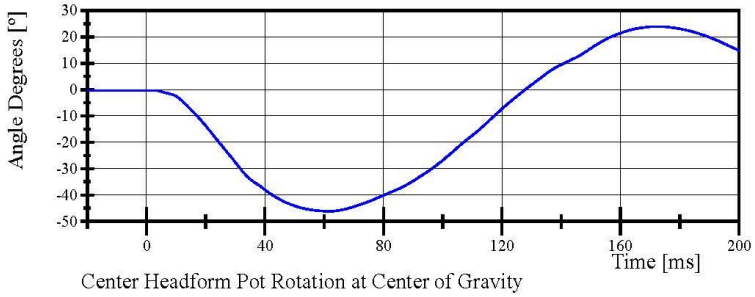
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 5-5
Test Date: 8/25/2020

Forward Pot Rotation at Base of Pendulum



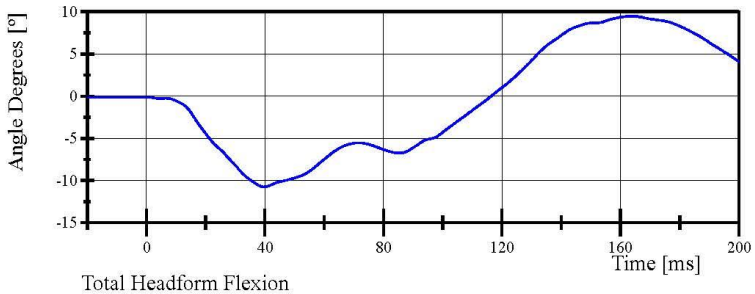
Filter Class: CFC_60
Max: 21.0 ° at 174.9 ms
Min: -64.5 ° at 66.2 ms

Rear Pot Rotation at Base of Pendulum



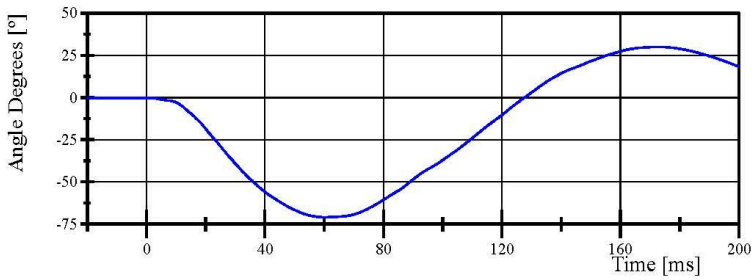
Filter Class: CFC_60
Max: 23.9 ° at 172.5 ms
Min: -46.2 ° at 61.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 9.5 ° at 163.8 ms
Min: -10.8 ° at 39.7 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 29.9 ° at 173.1 ms
Min: -71.0 ° at 60.2 ms

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

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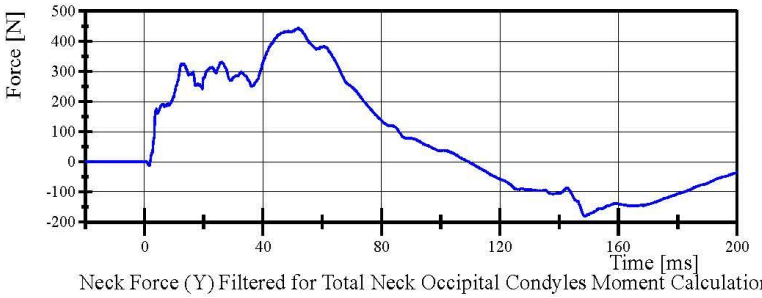
Transportation Research Center Inc.

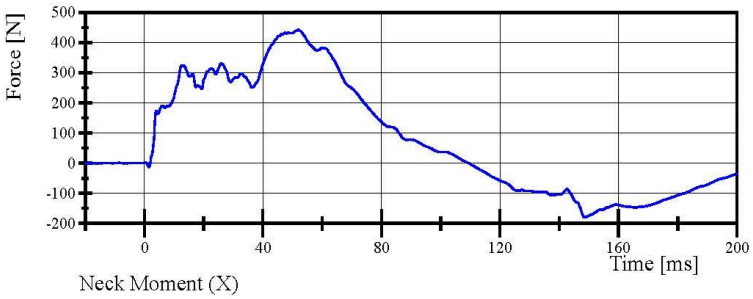
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 5-5
Test Date: 8/25/2020

Neck Force (Y)



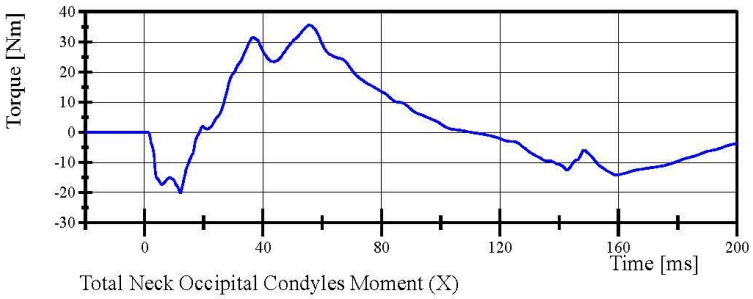
Filter Class: CFC_1000
Max: 443.4 N at 52.0 ms
Min: -179.7 N at 148.5 ms

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



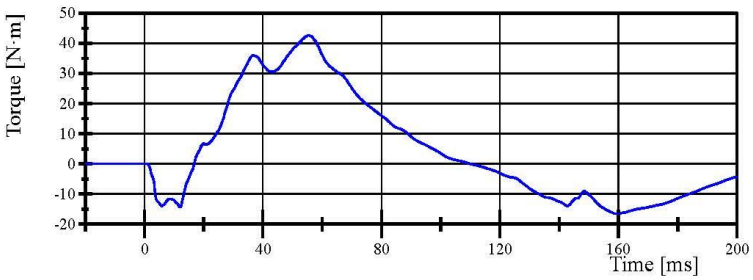
Filter Class: CFC_600
Max: 443.0 N at 51.9 ms
Min: -179.7 N at 148.6 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 35.6 Nm at 55.5 ms
Min: -20.0 Nm at 12.1 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 42.7 N·m at 55.4 ms
Min: -16.6 N·m at 159.5 ms

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

08.25.2020 13:33:04 717

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.0 g	Yes
Shoulder Displacement	28 - 37 mm	31.2 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	17.2 g	Yes

Test meets specifications.

Condition: Used

Comments:
Left Arm S/N: DP8451

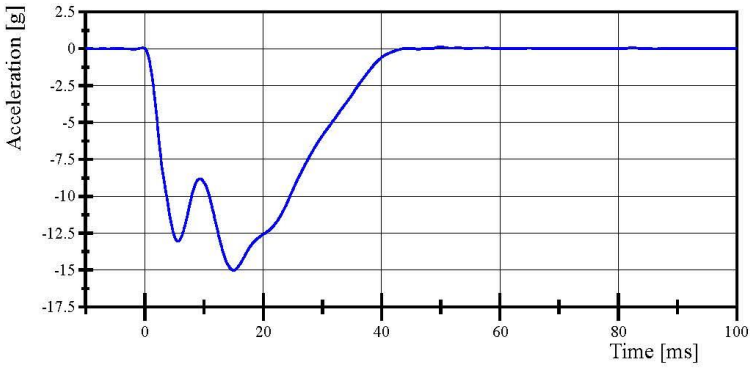
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 09:47:06 845

Transportation Research Center Inc.

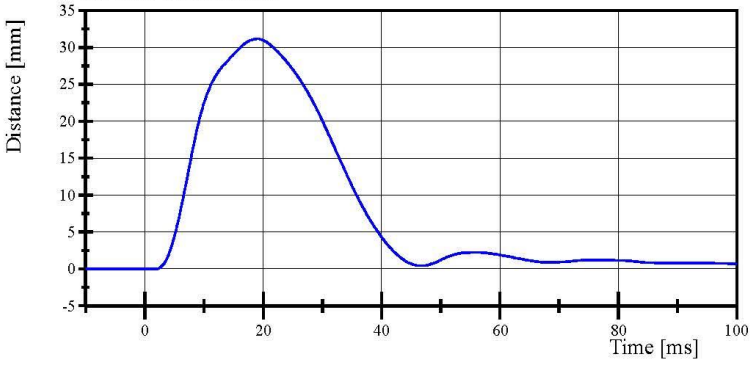
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Probe Acceleration



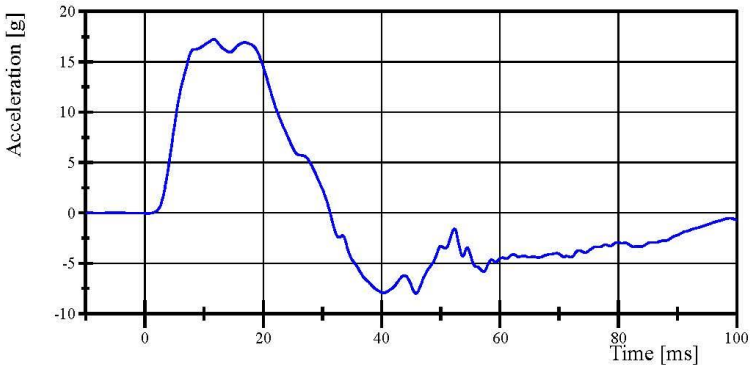
Filter Class: CFC_180
Max: 0.1 g at 49.9 ms
Min: -15.0 g at 15.0 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.2 mm at 19.0 ms
Min: -0.0 mm at 2.0 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 17.2 g at 11.6 ms
Min: -8.0 g at 45.8 ms

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

08.25.2020 09:47:33 845

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.670 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.9 g	Yes
Shoulder Displacement	31 - 40 mm	37.4 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.8 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.9 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.9 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	36.5 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.0 g	Yes

Test meets specifications.

Condition: Used

Comments:
Left Arm S/N: DP8451
Shoulder Rib S/N: 180-3355 DO9814
Upper Thorax Rib S/N: 180-3362 DP6492
Middle Thorax Rib S/N: 180-3362 DP6493
Lower Thorax Rib S/N: 180-3362 DP7664

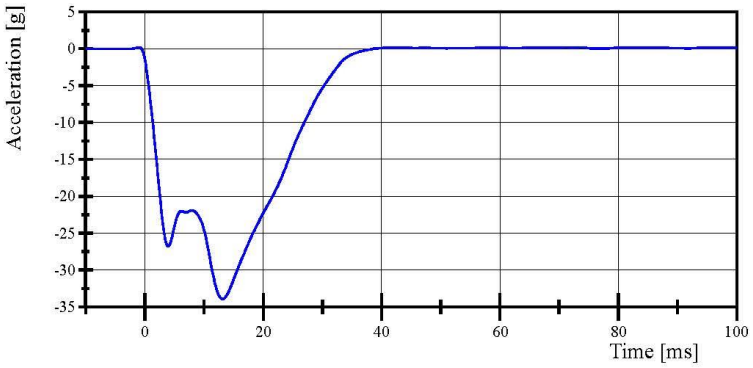
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 11:08:09 605

Transportation Research Center Inc.

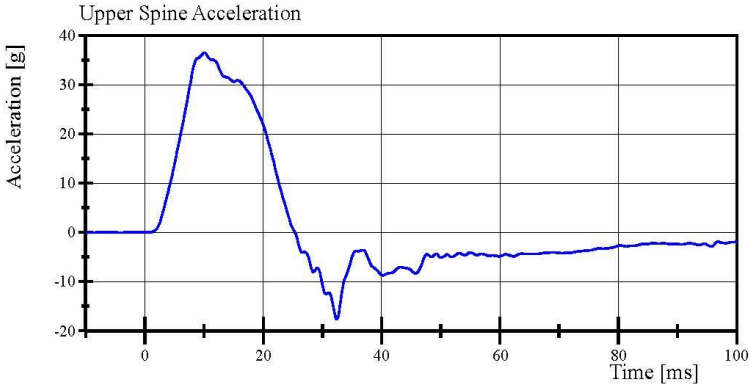
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Probe Acceleration



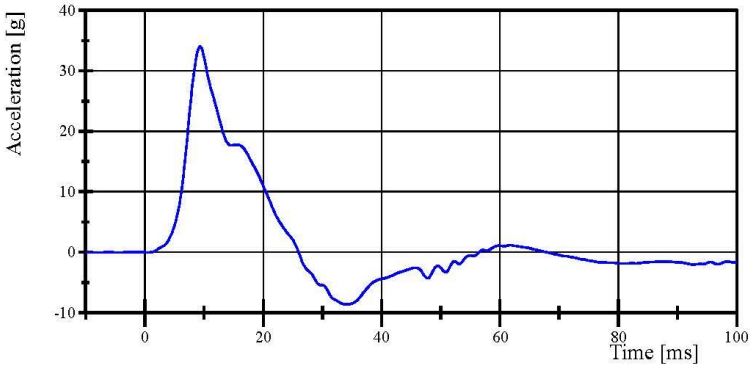
Filter Class: CFC_180
Max: 0.2 g at -1.0 ms
Min: -33.9 g at 13.1 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 36.5 g at 10.1 ms
Min: -17.7 g at 32.4 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.0 g at 9.4 ms
Min: -8.6 g at 34.1 ms

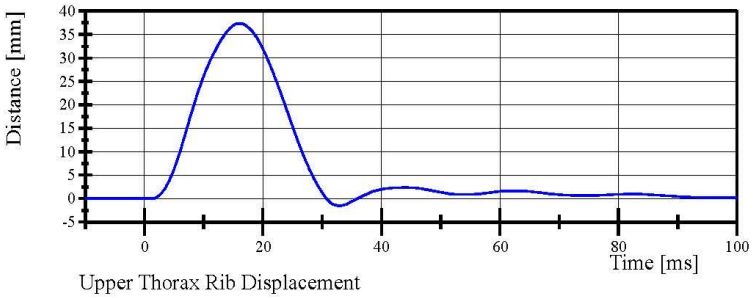
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 11:09:02 605

Transportation Research Center Inc.

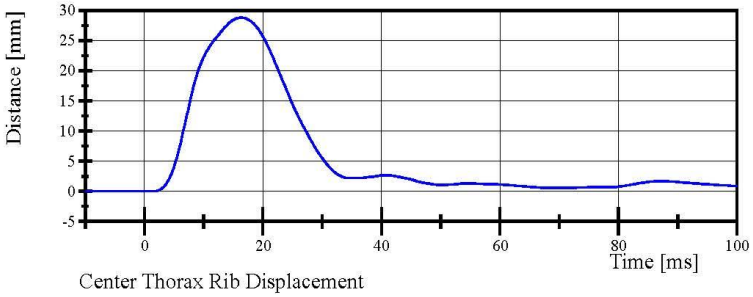
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Shoulder Rib Displacement



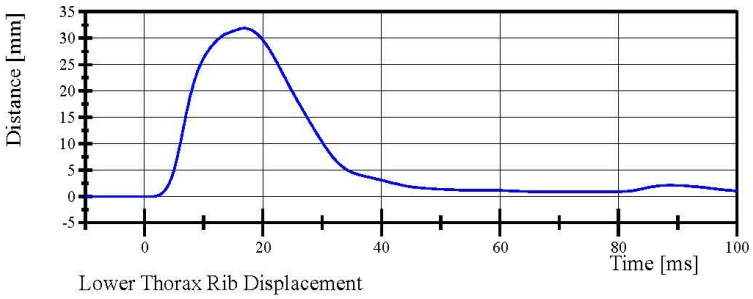
Filter Class: CFC_600
Max: 37.4 mm at 16.1 ms
Min: -1.5 mm at 32.9 ms

Upper Thorax Rib Displacement



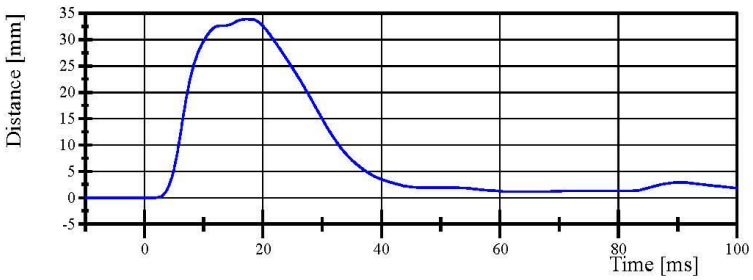
Filter Class: CFC_600
Max: 28.8 mm at 16.3 ms
Min: -0.0 mm at 1.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.9 mm at 16.8 ms
Min: -0.0 mm at 1.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.9 mm at 17.2 ms
Min: -0.0 mm at 1.4 ms

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

08.25.2020 11:09:02 605

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.327 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.8 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.9 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	42.7 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	40.1 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.7 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.5 g	Yes

Test meets specifications.

Condition: Used

Comments:
Upper Thorax Rib S/N: 180-3362 DP6492
Middle Thorax Rib S/N: 180-3362 DP6493
Lower Thorax Rib S/N: 180-3362 DP7664

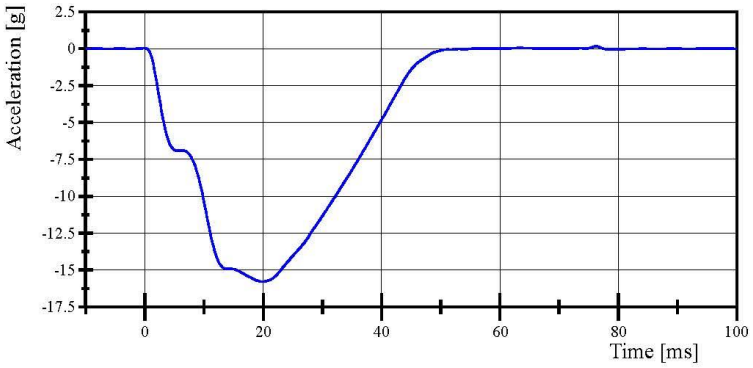
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 10:11:32 806

Transportation Research Center Inc.

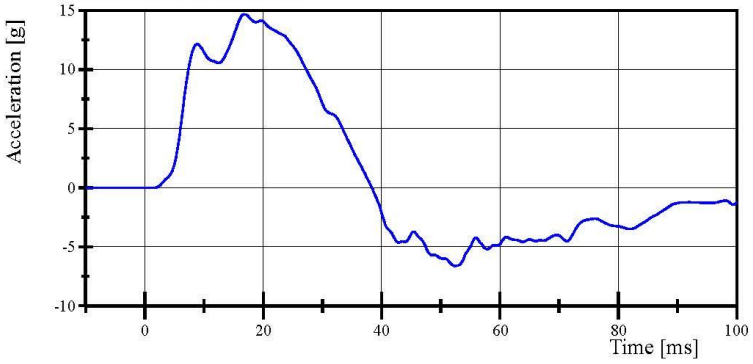
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Probe Acceleration



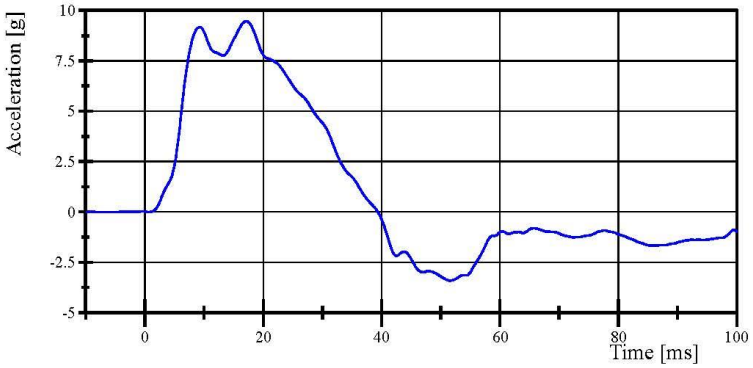
Filter Class: CFC_180
Max: 0.2 g at 76.2 ms
Min: -15.8 g at 19.9 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.7 g at 16.8 ms
Min: -6.6 g at 52.4 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.5 g at 17.1 ms
Min: -3.4 g at 51.5 ms

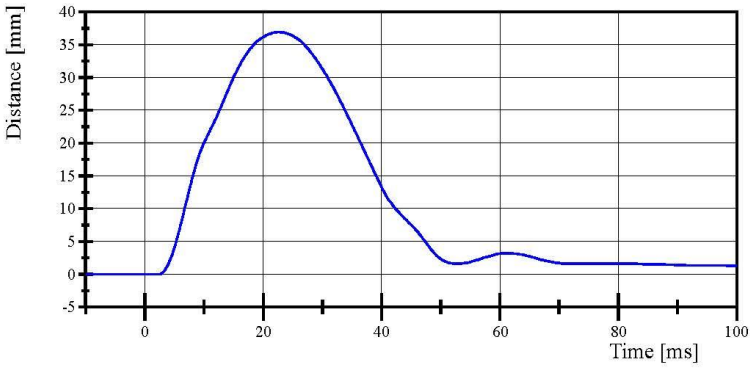
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 10:12:11 806

Transportation Research Center Inc.

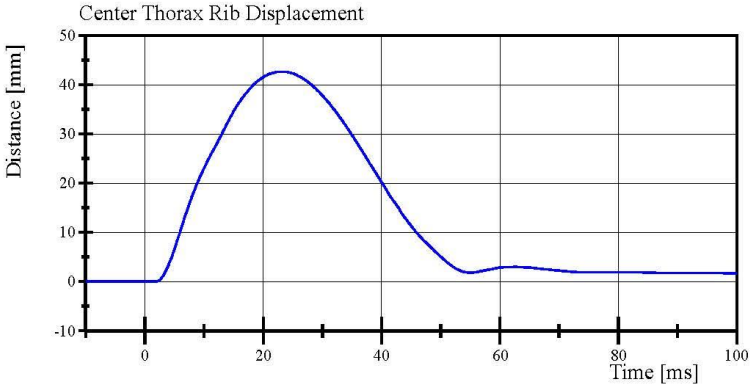
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Upper Thorax Rib Displacement



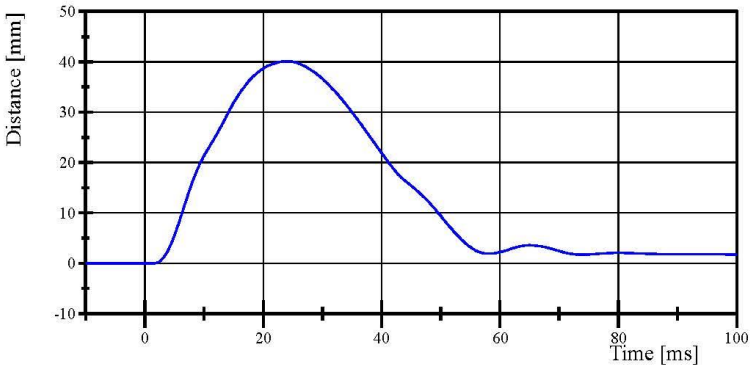
Filter Class: CFC_600
Max: 36.9 mm at 22.6 ms
Min: -0.0 mm at 2.3 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 42.7 mm at 23.1 ms
Min: -0.0 mm at 1.7 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.1 mm at 24.0 ms
Min: -0.0 mm at 1.4 ms

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

08.25.2020 10:12:11 806

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.4 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	41.4 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	37.2 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.05 g	Yes

Test meets specifications.

Condition: Used

Comments:
Upper Abdominal Rib S/N: 180-3368 DP5142
Lower Abdominal Rib S/N: 180-3368 DP5143

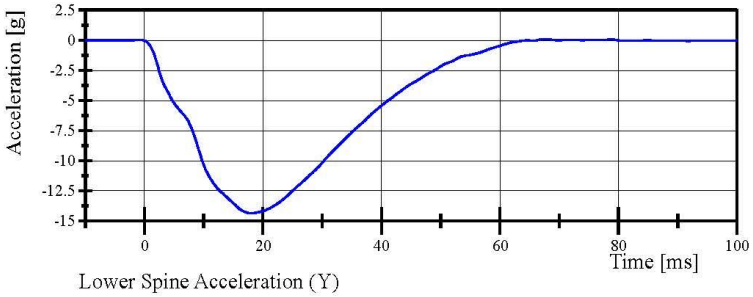
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 11:03:12 665

Transportation Research Center Inc.

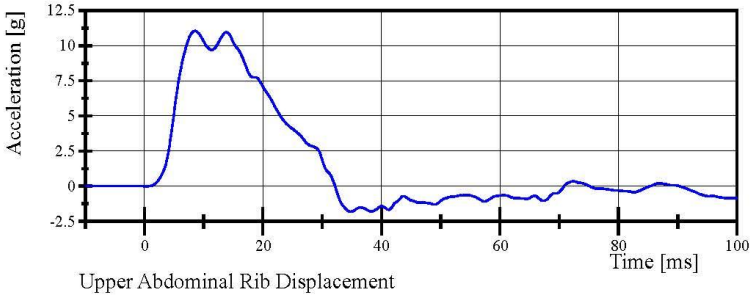
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Probe Acceleration



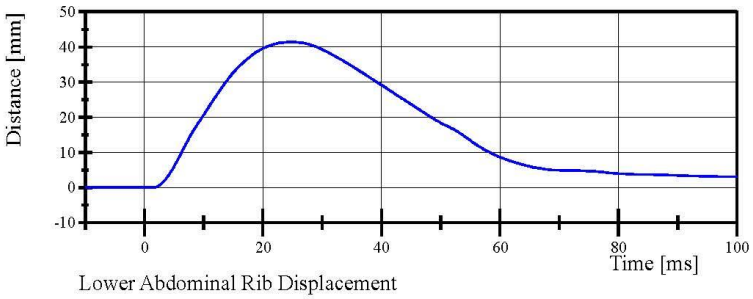
Filter Class: CFC_180
Max: 0.1 g at 78.8 ms
Min: -14.4 g at 18.0 ms

Lower Spine Acceleration (Y)



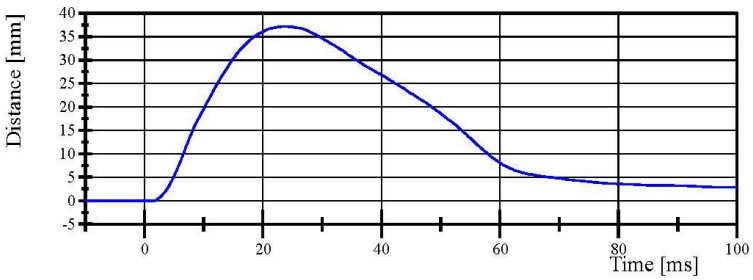
Filter Class: CFC_180
Max: 11.0 g at 8.6 ms
Min: -1.8 g at 34.8 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.4 mm at 24.8 ms
Min: -0.0 mm at 1.4 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 37.2 mm at 23.6 ms
Min: -0.0 mm at 1.5 ms

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

08.25.2020 11:04:05 665

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.8 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	30.7 g	Yes
Iliac Force	4,100 - 5,100 N	4,495.6 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: EN1613

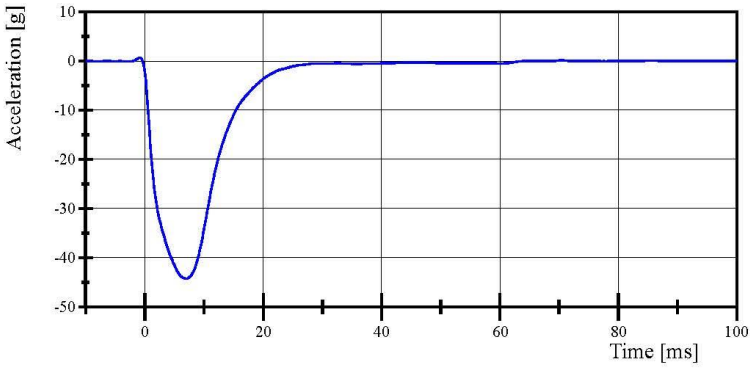
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 09:26:56 675

Transportation Research Center Inc.

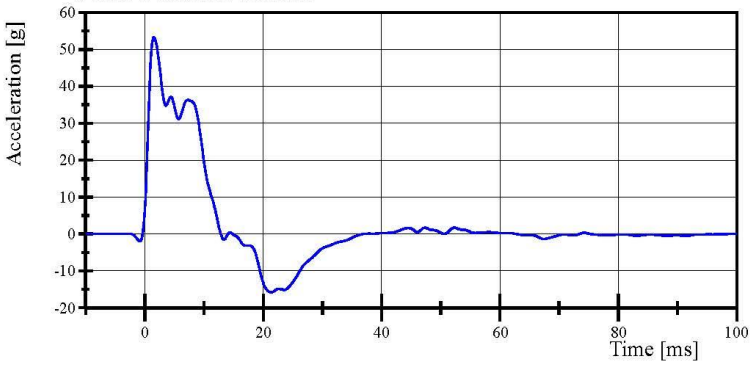
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Probe Acceleration



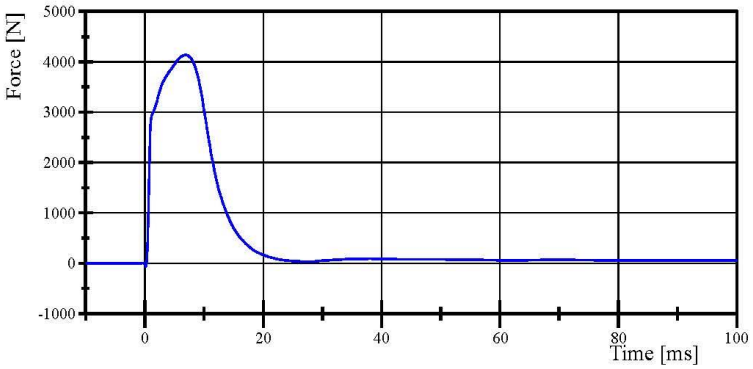
Filter Class: CFC_180
Max: 0.7 g at -0.9 ms
Min: -44.2 g at 7.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 53.3 g at 1.5 ms
Min: -15.8 g at 21.3 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,134.5 N at 6.9 ms
Min: -68.2 N at 0.2 ms

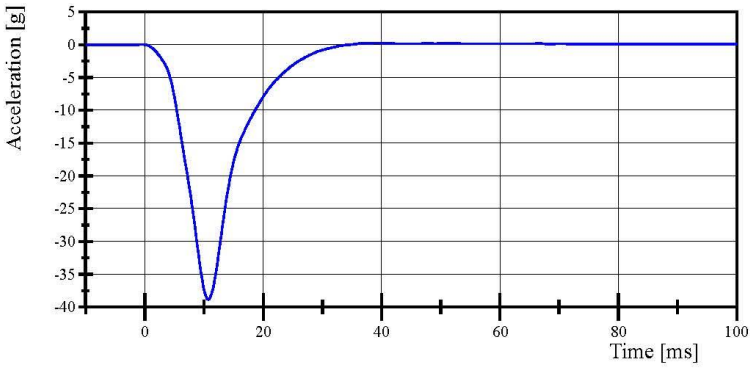
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

08.25.2020 12:01:12 434

Transportation Research Center Inc.

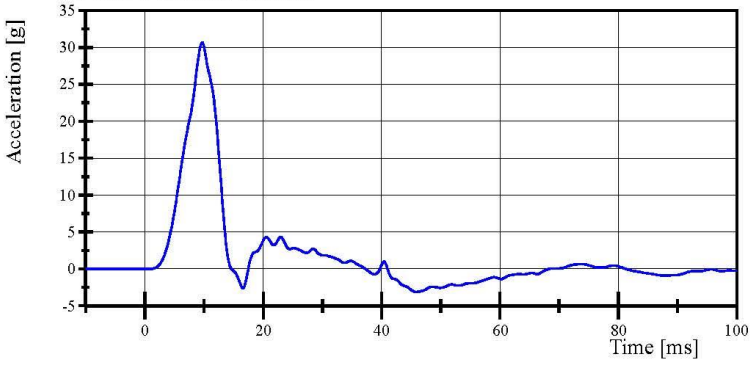
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Probe Acceleration



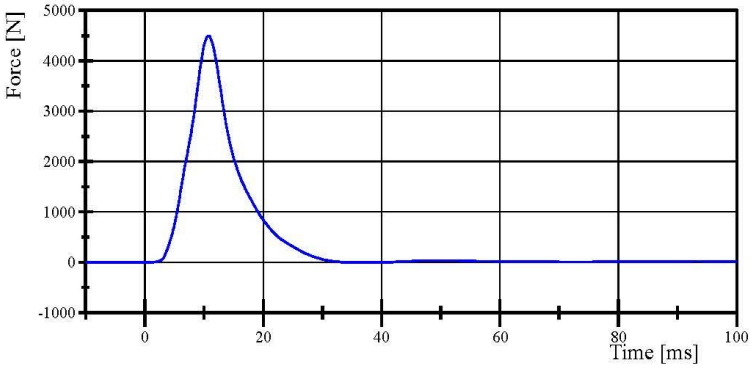
Filter Class: CFC_180
Max: 0.2 g at 39.3 ms
Min: -38.8 g at 10.7 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 30.7 g at 9.7 ms
Min: -3.1 g at 45.8 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,495.6 N at 10.7 ms
Min: -5.6 N at 41.3 ms

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

08.25.2020 09:27:21 675

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 5-1
Test Date: 8/25/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.64 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.23 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	36.3 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,134.5 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: EN1613
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13187
Cal Date: 20190808

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

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Post-Test Calibration Sheets
Passenger S/N DQ0570

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 06

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	785	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	83	Yes
D	H-Point from Seat Back	141.0 - 151.0	147	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	184	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	533	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	427	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	316	Yes
R	Arm Length	249.0 - 259.0	254	Yes
S	Knee Joint to seat Back	478.0 - 493.0	486	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	349	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	781	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	129.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-5.9 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.18 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

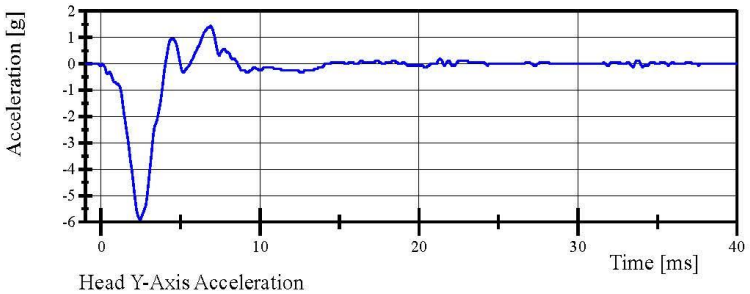
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

10.02.2020 08:01:48 199

Transportation Research Center Inc.

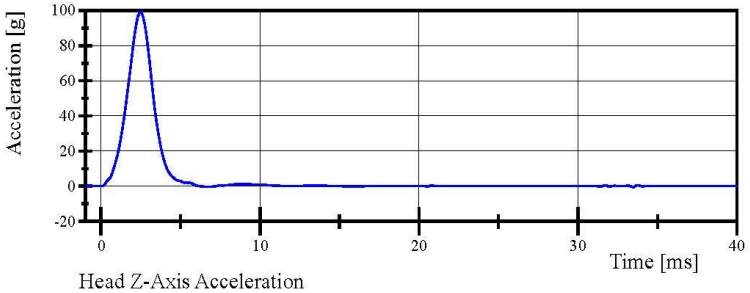
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Head X-Axis Acceleration



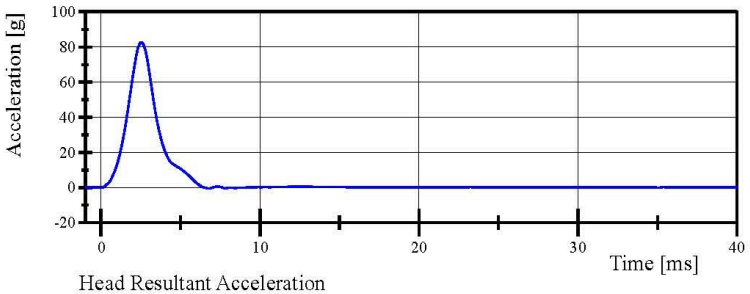
Filter Class: CFC_1000
Max: 1.4 g at 6.9 ms
Min: -5.9 g at 2.4 ms

Head Y-Axis Acceleration



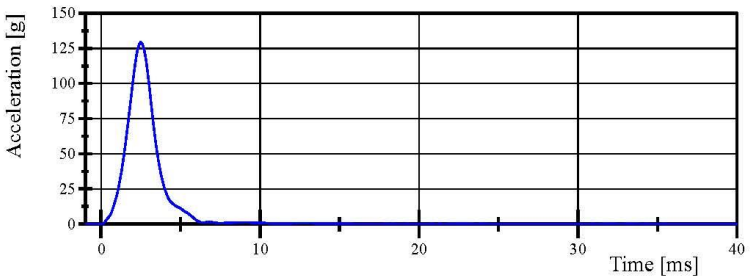
Filter Class: CFC_1000
Max: 99.3 g at 2.5 ms
Min: -0.5 g at 33.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 82.7 g at 2.6 ms
Min: -0.4 g at 6.8 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 129.4 g at 2.5 ms
Min: 0.0 g at -1.0 ms

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

10.02.2020 08:02:18 199

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.615 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.624 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.885 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.242 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.882 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.909 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-72.0 deg	Yes
Time of Peak	50 - 70 ms	60.9 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	43.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	111.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: DP3365

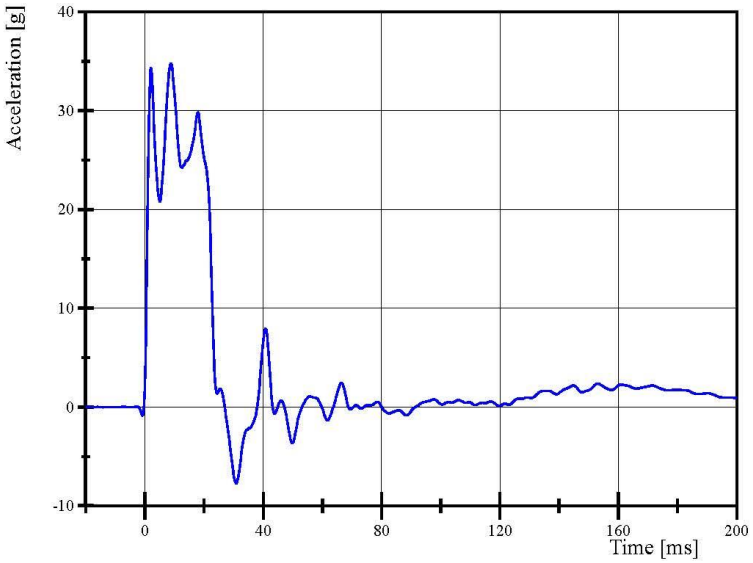
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

10.02.2020 08:35:09 716

Transportation Research Center Inc.

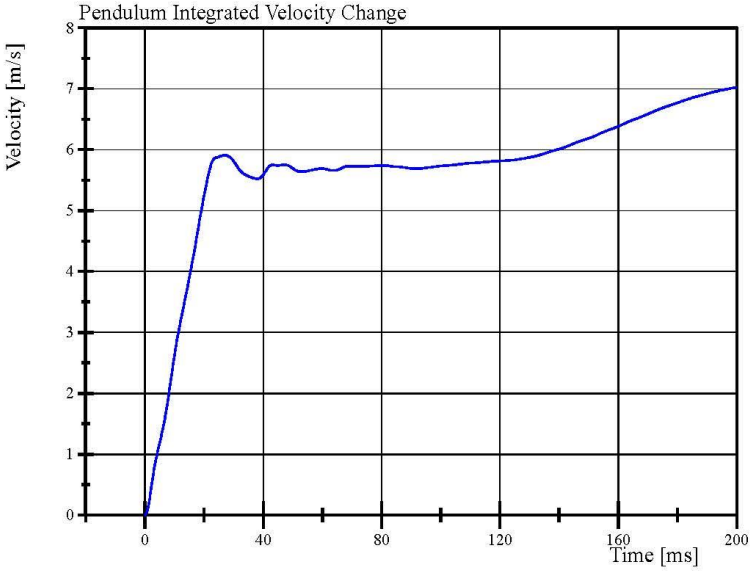
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Pendulum Acceleration



Filter Class: CFC_180
Max: 34.8 g at 8.8 ms
Min: -7.7 g at 30.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.0 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

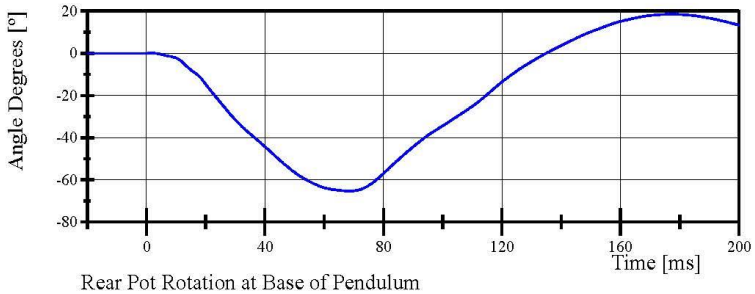
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 08:35:53 716

Transportation Research Center Inc.

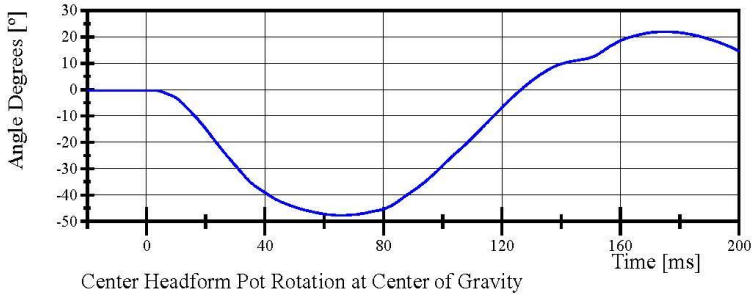
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Forward Pot Rotation at Base of Pendulum



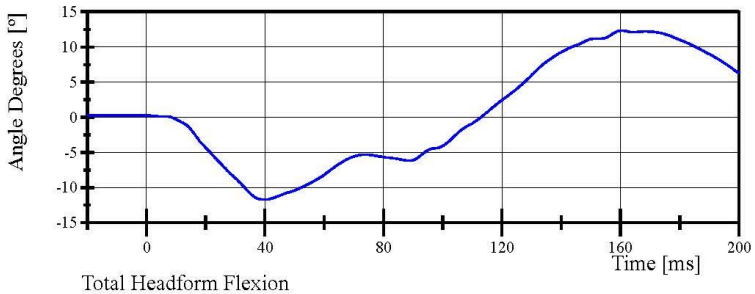
Filter Class: CFC_60
Max: 18.6 ° at 177.3 ms
Min: -65.3 ° at 68.5 ms

Rear Pot Rotation at Base of Pendulum



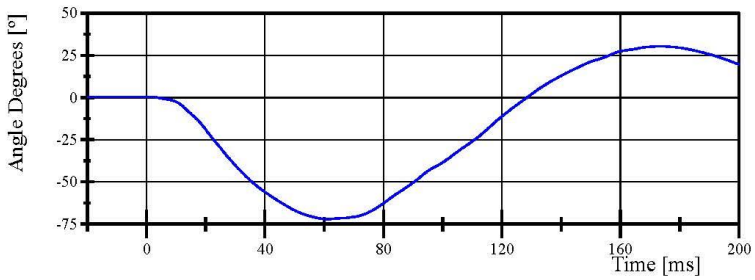
Filter Class: CFC_60
Max: 22.0 ° at 175.0 ms
Min: -47.7 ° at 65.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.3 ° at 160.5 ms
Min: -11.7 ° at 39.7 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 30.4 ° at 173.5 ms
Min: -72.0 ° at 60.9 ms

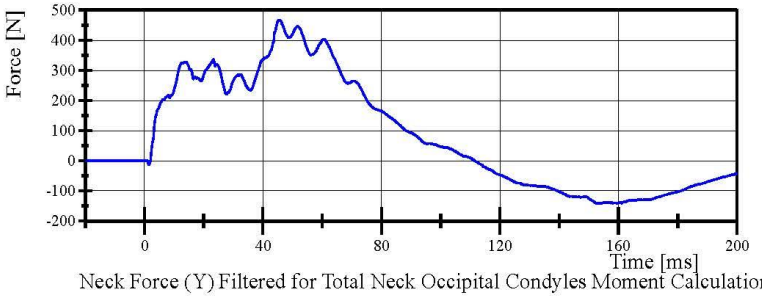
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 08:35:54 716

Transportation Research Center Inc.

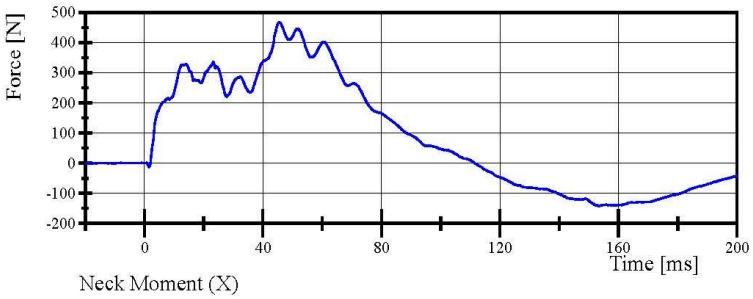
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Neck Force (Y)



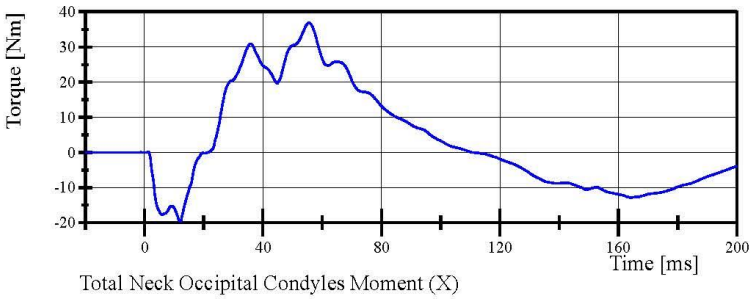
Filter Class: CFC_1000
Max: 466.6 N at 45.7 ms
Min: -142.7 N at 153.2 ms

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



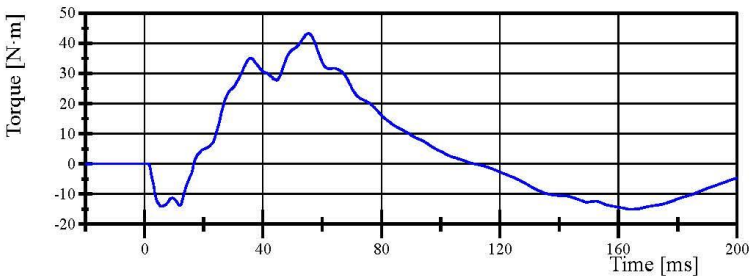
Filter Class: CFC_600
Max: 466.5 N at 45.6 ms
Min: -142.6 N at 153.4 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 36.9 Nm at 55.6 ms
Min: -19.5 Nm at 12.0 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 43.3 N·m at 55.4 ms
Min: -15.1 N·m at 163.9 ms

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

10.02.2020 08:35:54 716

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-14.8 g	Yes
Shoulder Displacement	28 - 37 mm	31.1 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	17.7 g	Yes

Test meets specifications.

Condition: Used

Comments:
Left Arm S/N: DP8451

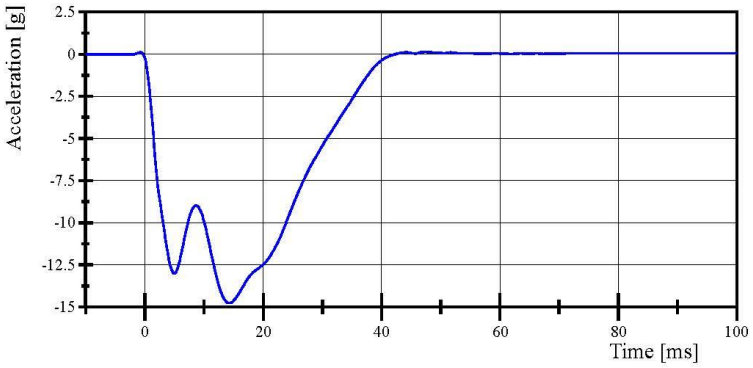
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 09:32:06 819

Transportation Research Center Inc.

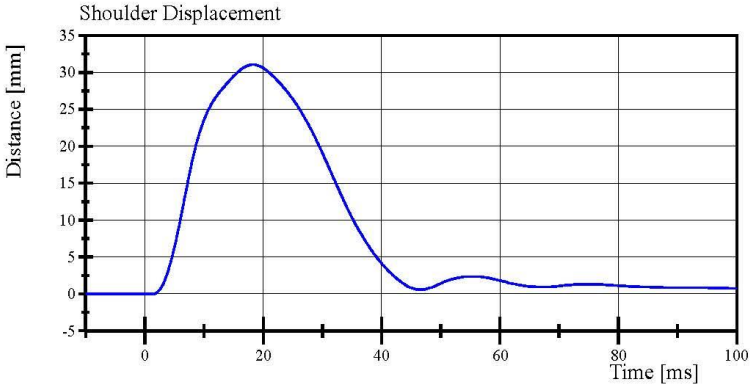
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Probe Acceleration



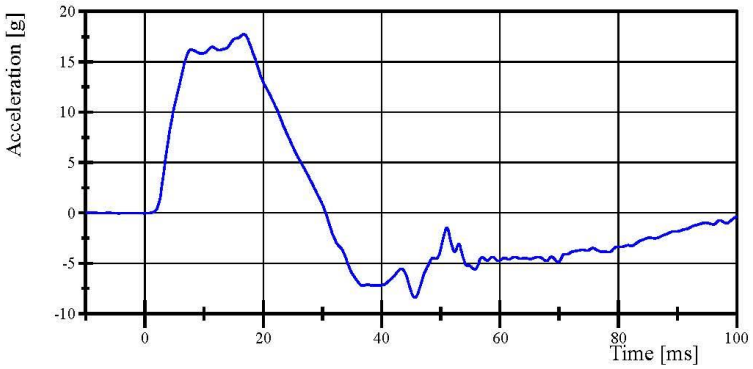
Filter Class: CFC_180
Max: 0.1 g at 47.4 ms
Min: -14.8 g at 14.2 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.1 mm at 18.2 ms
Min: -0.0 mm at 1.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 17.7 g at 16.7 ms
Min: -8.4 g at 45.6 ms

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

10.02.2020 09:32:36 819

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.677 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.6 g	Yes
Shoulder Displacement	31 - 40 mm	35.0 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.1 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.0 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.5 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	35.8 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.5 g	Yes

Test meets specifications.

Condition: Used

Comments:
Left Arm S/N: DP8451
Shoulder Rib S/N: 180-3355 DO9814
Upper Thorax Rib S/N: 180-3362 DP6492
Middle Thorax Rib S/N: 180-3362 DP6493
Lower Thorax Rib S/N: 180-3362 DP7664

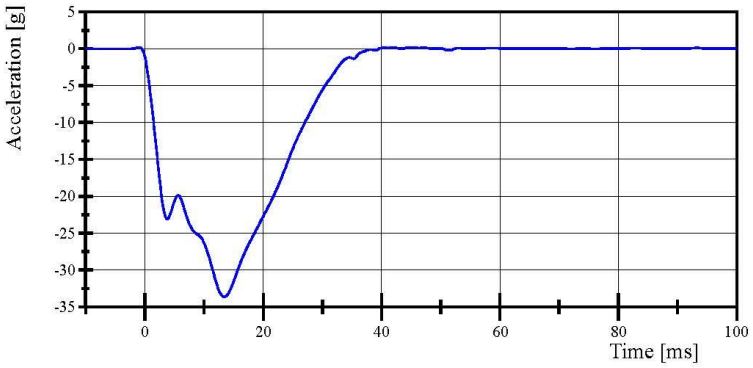
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 10:24:22 600

Transportation Research Center Inc.

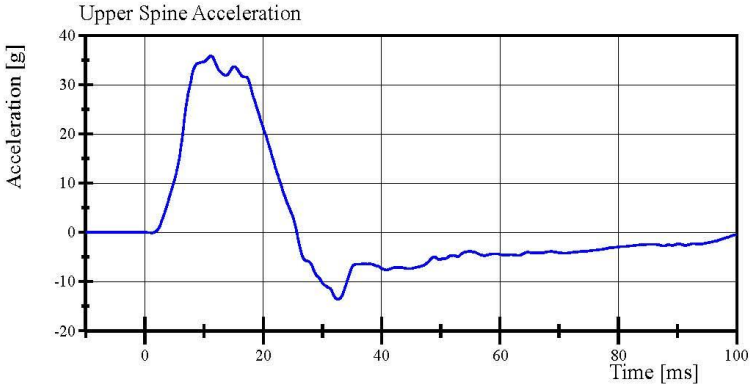
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Probe Acceleration



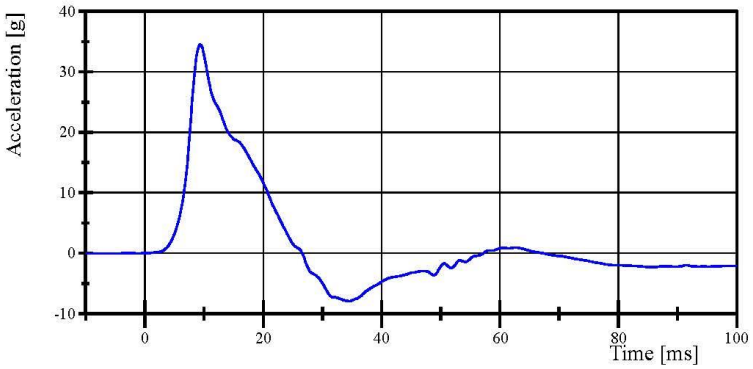
Filter Class: CFC_180
Max: 0.2 g at -1.0 ms
Min: -33.6 g at 13.4 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 35.8 g at 11.1 ms
Min: -13.5 g at 32.6 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.5 g at 9.4 ms
Min: -7.9 g at 34.6 ms

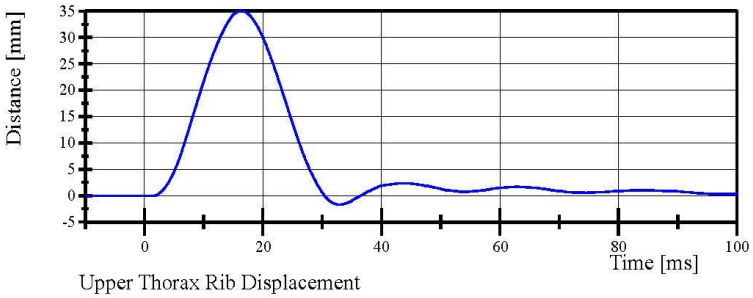
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 10:25:20 600

Transportation Research Center Inc.

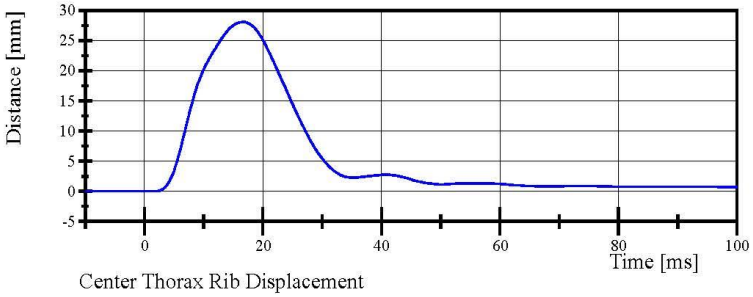
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Shoulder Rib Displacement



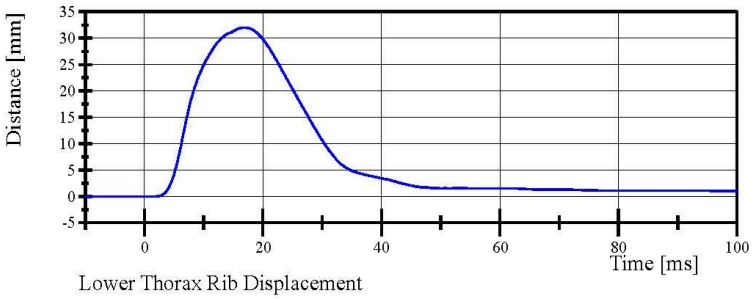
Filter Class: CFC_600
Max: 35.0 mm at 16.3 ms
Min: -1.7 mm at 33.0 ms

Upper Thorax Rib Displacement



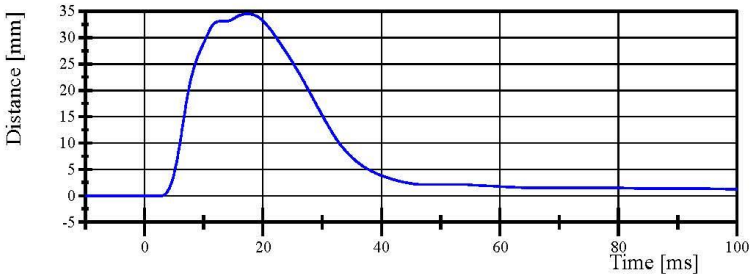
Filter Class: CFC_600
Max: 28.1 mm at 16.7 ms
Min: -0.0 mm at 1.8 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.0 mm at 16.9 ms
Min: -0.0 mm at 1.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.5 mm at 17.1 ms
Min: -0.0 mm at 2.7 ms

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

10.02.2020 10:25:20 600

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.322 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.7 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	42.2 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.7 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.2 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.3 g	Yes

Test meets specifications.

Condition: Used

Comments:
Upper Thorax Rib S/N: 180-3362 DP6492
Middle Thorax Rib S/N: 180-3362 DP6493
Lower Thorax Rib S/N: 180-3362 DP7664

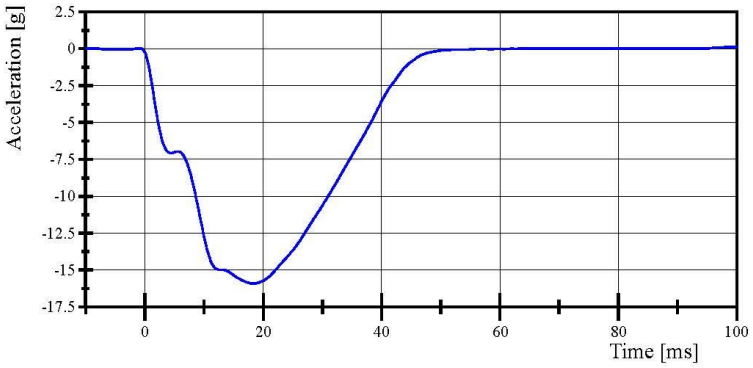
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 09:48:49 822

Transportation Research Center Inc.

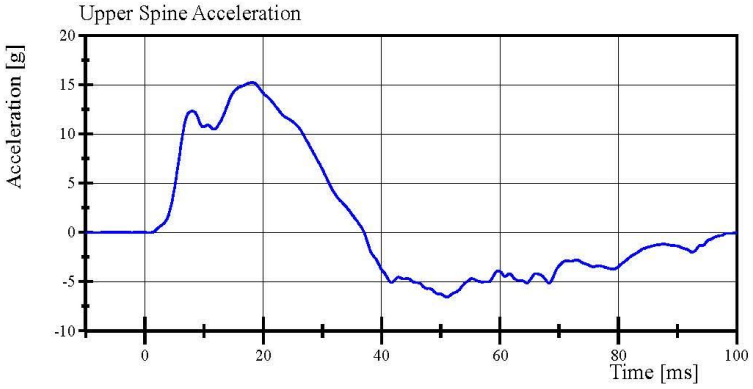
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Probe Acceleration



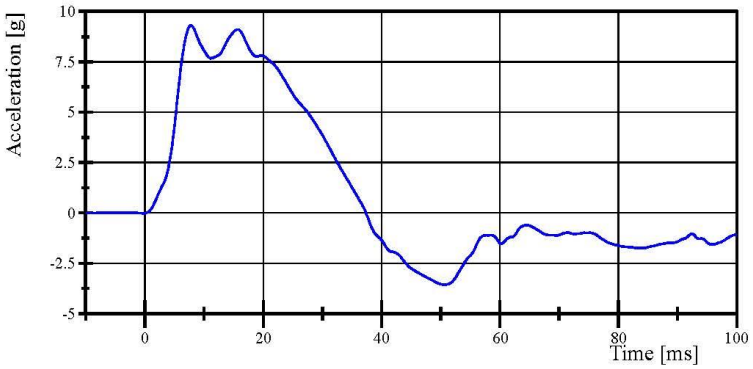
Filter Class: CFC_180
Max: 0.1 g at 99.1 ms
Min: -15.9 g at 18.3 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.2 g at 18.1 ms
Min: -6.6 g at 51.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.3 g at 7.8 ms
Min: -3.6 g at 50.6 ms

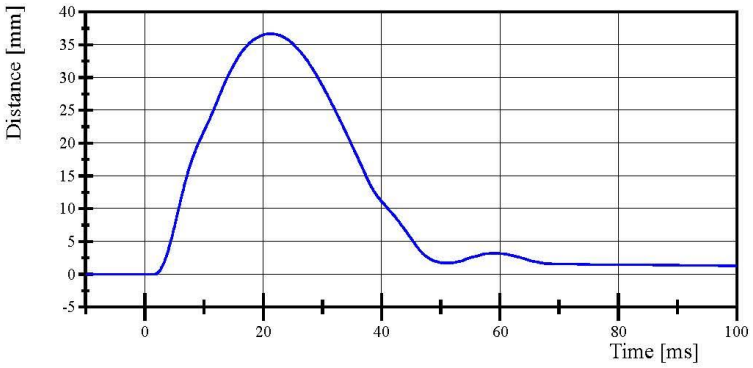
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 09:49:24 822

Transportation Research Center Inc.

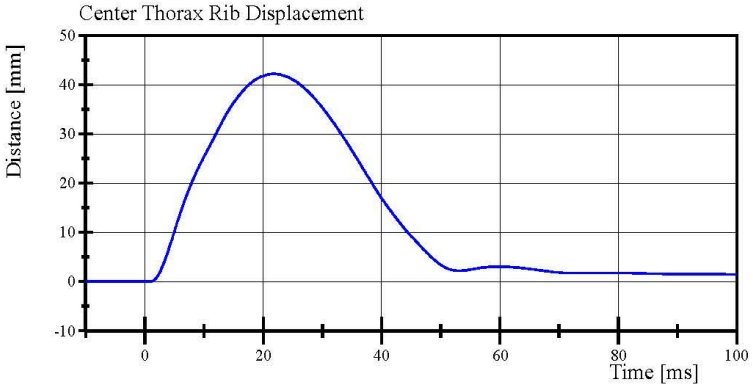
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Upper Thorax Rib Displacement



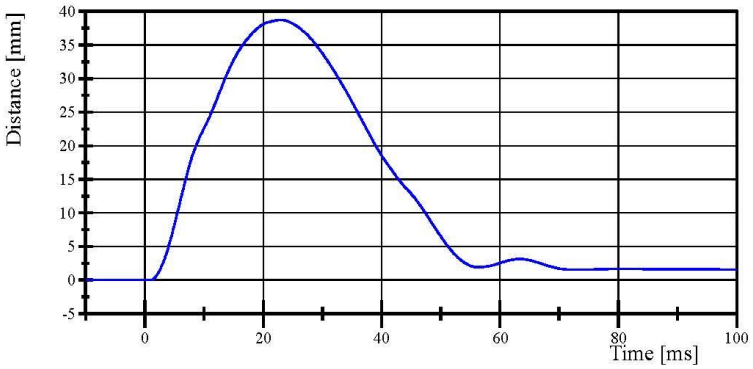
Filter Class: CFC_600
Max: 36.7 mm at 21.3 ms
Min: -0.0 mm at 1.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 42.2 mm at 21.8 ms
Min: -0.0 mm at 0.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 38.7 mm at 22.7 ms
Min: -0.0 mm at 1.0 ms

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

10.02.2020 09:49:24 822

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.8 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	41.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	39.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.16 g	Yes

Test meets specifications.

Condition: Used

Comments:
Upper Abdominal Rib S/N: 180-3368 DP5142
Lower Abdominal Rib S/N: 180-3368 DP5143

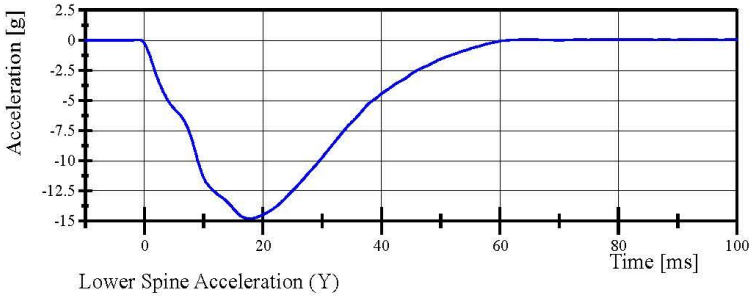
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 09:38:27 646

Transportation Research Center Inc.

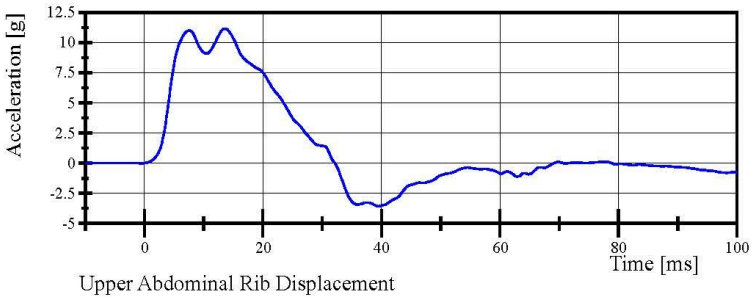
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Probe Acceleration



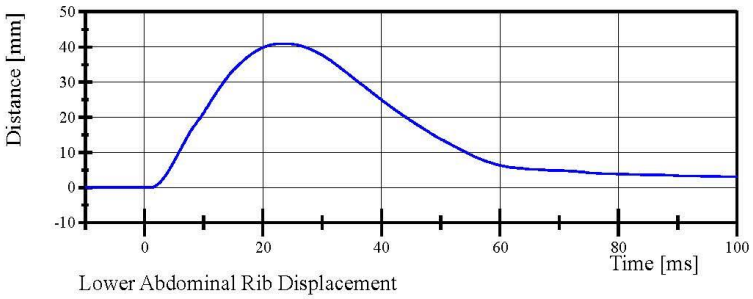
Filter Class: CFC_180
Max: 0.1 g at 91.0 ms
Min: -14.8 g at 17.8 ms

Lower Spine Acceleration (Y)



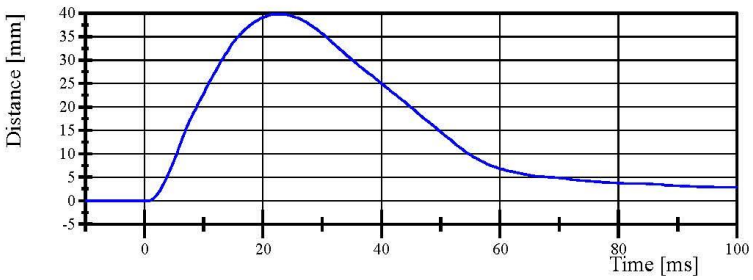
Filter Class: CFC_180
Max: 11.2 g at 13.5 ms
Min: -3.6 g at 39.4 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.0 mm at 23.3 ms
Min: -0.0 mm at 1.0 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 39.8 mm at 22.6 ms
Min: -0.0 mm at 0.6 ms

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

10.02.2020 09:39:03 646

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.64 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-43.80 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	40.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,979.1 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: EN1613
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13012
Cal Date: 20190723

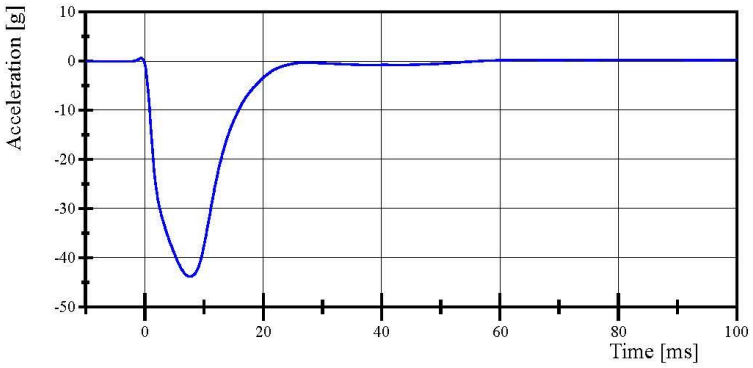
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

10.02.2020 11:15:35 401

Transportation Research Center Inc.

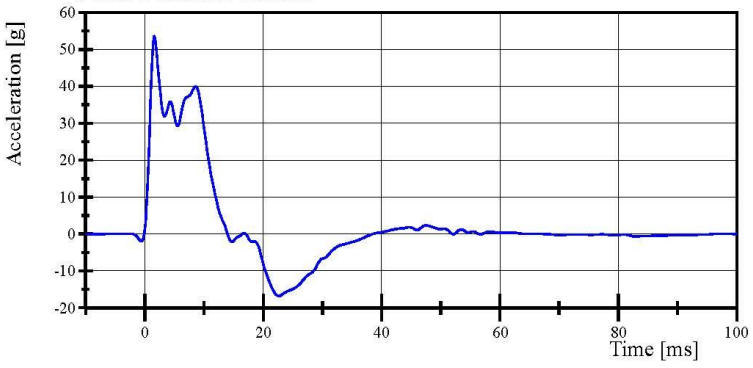
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Probe Acceleration



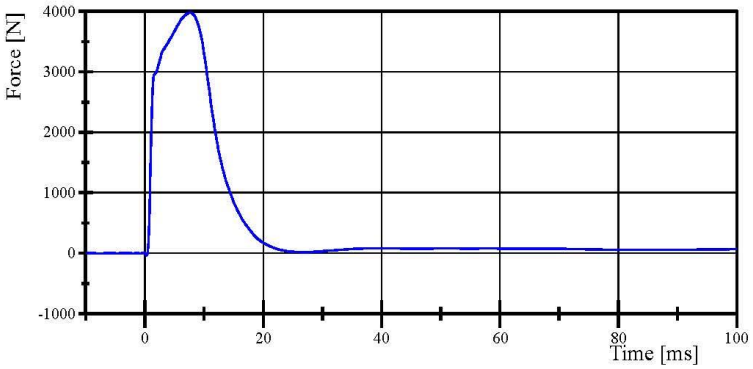
Filter Class: CFC_180
Max: 0.6 g at -0.6 ms
Min: -43.8 g at 7.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 53.6 g at 1.6 ms
Min: -16.8 g at 22.6 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,979.1 N at 7.7 ms
Min: -37.3 N at 0.3 ms

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

10.02.2020 11:16:59 401

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-39.0 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	32.9 g	Yes
Iliac Force	4,100 - 5,100 N	4,488.9 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: EN1613

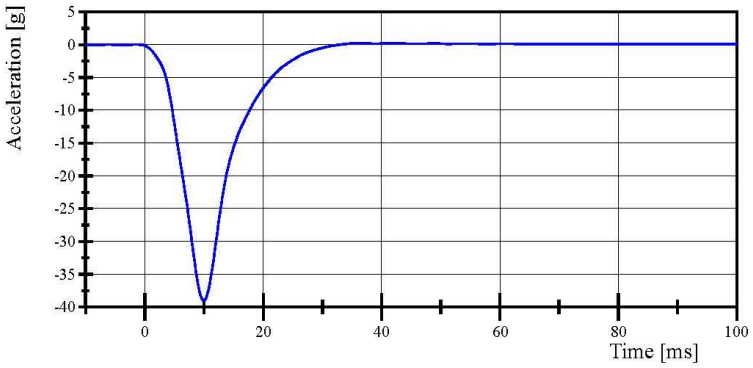
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

10.02.2020 09:13:57 682

Transportation Research Center Inc.

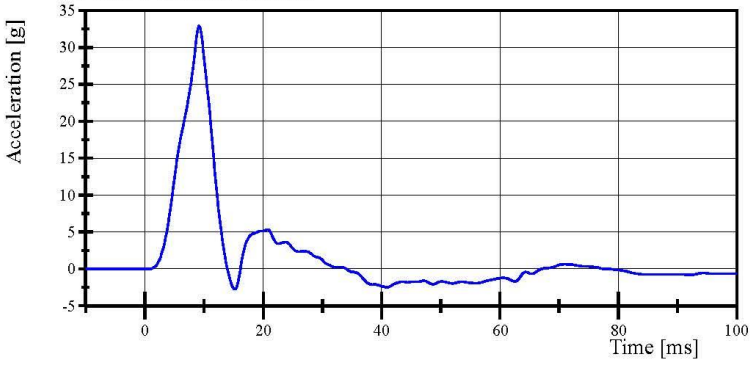
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 6-1
Test Date: 10/2/2020

Probe Acceleration



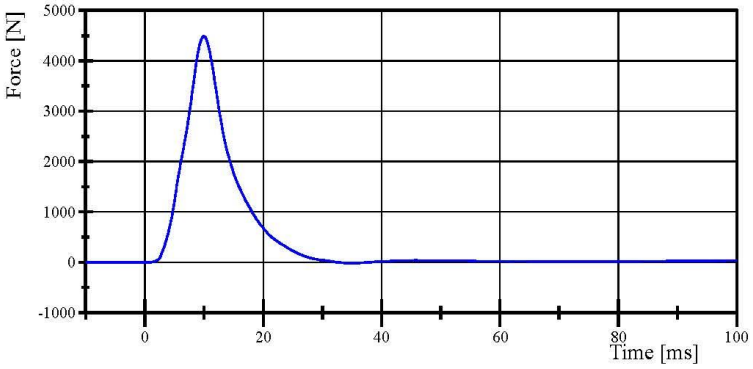
Filter Class: CFC_180
Max: 0.2 g at 35.3 ms
Min: -39.0 g at 9.9 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 32.9 g at 9.2 ms
Min: -2.7 g at 15.2 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,488.9 N at 10.0 ms
Min: -18.1 N at 35.3 ms

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

10.02.2020 09:14:28 682

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	19-Aug-2020
		Y	T10352	Endevco	19-Aug-2020
		Z	P91950	Endevco	19-Aug-2020
Redundant Head Accelerometers		X	T11817	Endevco	19-Aug-2020
		Y	P83368	Endevco	19-Aug-2020
		Z	P94483	Endevco	19-Aug-2020
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	21-Aug-2020
	Middle	Y	174	FTSS	21-Aug-2020
	Lower	Y	0913	Honeywell	21-Aug-2020
Abdomen Load Cells	Front	Y	1441	Denton	20-Aug-2020
	Middle	Y	1436	Denton	20-Aug-2020
	Rear	Y	1437	Denton	20-Aug-2020
Lower Spine Accelerometers (T12)		X	T11866	Endevco	19-Aug-2020
		Y	P87139	Endevco	19-Aug-2020
		Z	P64884	Endevco	19-Aug-2020
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	8-May-2020

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N DQ0570		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers			X	T11432	Endevco	19-Aug-2020
			Y	P93774	Endevco	19-Aug-2020
			Z	P91566	Endevco	19-Aug-2020
Redundant Head Accelerometers			X	P91615	Endevco	19-Aug-2020
			Y	P93762	Endevco	19-Aug-2020
			Z	P93761	Endevco	19-Aug-2020
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	24-Aug-2020
		Middle	Y	037	Servo	24-Aug-2020
		Lower	Y	048	Servo	18-Dec-2019
	Abdominal Rib	Upper	Y	1295	Servo	24-Aug-2020
		Lower	Y	1136	Servo	24-Aug-2020
Lower Spine Accelerometers (T12)			X	P94545	Endevco	19-Aug-2020
			Y	P94647	Endevco	19-Aug-2020
			Z	P94530	Endevco	19-Aug-2020
Acetabulum Load Cell			Y	DK7483S-FY	FTSS	20-Aug-2020
Iliac Wing Load Cell			Y	287-FY	Denton	20-Aug-2020
Pelvis Plug (struck side)				13258	SACO	12-Aug-2019
Pelvis Plug (non-struck side)				12581	SACO	3-Oct-2018

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P83356	Endevco	23-Jun-2020
	Vehicle Center of Gravity	Y	P58530	Endevco	23-Jun-2020
	Vehicle Center of Gravity	Z	T11805	Endevco	27-Aug-2020
2	Right Sill at Front Seat	X	P50393	Endevco	3-Jun-2020
	Right Sill at Front Seat	Y	P34046	Endevco	3-Jun-2020
	Right Sill at Front Seat	Z	P57803	Endevco	3-Jun-2020
3	Right Sill at Rear Seat	X	P58494	Endevco	3-Jun-2020
	Right Sill at Rear Seat	Y	P74456	Endevco	3-Jun-2020
	Right Sill at Rear Seat	Z	P58537	Endevco	3-Jun-2020
4	Left Sill at Front Door	Y	T11875	Endevco	27-Aug-2020
5	Left Sill at Rear Door	Y	T11871	Endevco	27-Aug-2020
6	Left A-Post Lower	Y	T23824	Endevco	2-Jun-2020
7	Left A-Post Middle	Y	T16786	Endevco	27-Aug-2020
8	Left B-Post Lower	Y	P57946	Endevco	3-Jun-2020
9	B-Post Middle	Y	P88038	Endevco	2-Jun-2020
10	Front Seat Track	Y	P58472	Endevco	27-Jul-2020
11	Rear Seat Track or Structure	Y	T23885	Endevco	27-Aug-2020
12	Right Rear Occupant Compartment	Y	T16770	Endevco	27-Aug-2020
13	Engine Block	X	P44288	Endevco	23-Jun-2020
	Engine Block	Y	T11449	Endevco	23-Jun-2020
14	Rear Floorpan Above Axle	X	P58551	Endevco	27-Aug-2020
	Rear Floorpan Above Axle	Y	P77747	Endevco	27-Aug-2020
	Rear Floorpan Above Axle	Z	P58549	Endevco	27-Aug-2020

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	T11835	Endevco	23-Jun-20
MDB Center of Gravity	Y	T11867	Endevco	27-Aug-20
MDB Center of Gravity	Z	T11804	Endevco	27-Aug-20
Left Frame Rail at Rear Axle Centerline	X	P61501	Endevco	23-Jun-20
Left Frame Rail at Rear Axle Centerline	Y	P87822	Endevco	23-Jun-20