FINAL REPORT NUMBER: SINCAP-TRC-22-004

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

GENERAL MOTORS LLC
2022 Chevrolet Traverse
NHTSA NUMBER: M20220109

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

Report Date: July 26, 2023

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
Washington, D.C. 20590

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Report Prepared By: ILO Project Operations Group

Report Approved By: 

John Shultz

Approval Date: July 26, 2023

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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7. Author(s) John Shultz, Project Manager		8. Performing Organization Report Number 220927
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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 2022 Chevrolet Traverse, 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 September 27, 2022.

The impact velocity of the Moving Deformable Barrier (MDB) was 61.88, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22.3° C. The target vehicle post-test maximum crush was 324 mm at Level 3. 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	135
Maximum Thoracic Rib Deflection	mm	44	23.9
Total Abdominal Force	N	2500	802.2
Pubic Symphysis Force	N	6000	-1006.2
Lower Spine Acceleration	G	82*	25.2

Passenger ATD (SID-IIs)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	229
Lower Spine Resultant Acceleration	g's	82	52.6
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4346.0
Maximum Thoracic Rib Deflection	mm	38*	10.4
Maximum Abdominal Rib Deflection	mm	45*	28.8

* 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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SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2022 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. 693JJ920D000018. The purpose of this test is to generate comparative side impact performance in a 2022 Chevrolet Traverse. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated March 2020.

SECTION 2

SUMMARY OF TEST RESULTS

A 2022 Chevrolet Traverse was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.88 (38.45 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 September 27, 2022. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2re 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 March 2020. The side impact event was documented by 11 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

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

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

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	135
Maximum Thoracic Rib Deflection	mm	44	23.9
Combined Abdominal Force	N	2500	802.2
Pubic Symphysis Force	N	6000	-1006.2
Lower Spine (T12) Resultant Acceleration	G	82*	25.2

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	229
Lower Spine (T12) Resultant Acceleration	G	82	52.6
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4346.0
Maximum Thoracic Rib Deflection	mm	38*	10.4
Maximum Abdominal Rib Deflection	mm	45*	28.8

* 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/Abdomen 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: Front Center Seat Airbag	Yes	Yes	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.

LEFT FRONT SILL AY; Failed at 10.0 MS

LEFT REAR SILL AY; Failed at 10.0 MS

Wrong year for test date on small yellow pretest placard

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20220109
Model Year	2022
Make	Chevrolet
Model	Traverse
Body Style	MPV
VIN	1GNERGKW4NJ133052
Body Color	Northsky Blue Metallic
Odometer Reading (km/mi)	148 mi
Engine Displacement (L)	3.6
Type/No. Cylinders	V/6
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	9
Overdrive	Yes
Final Drive	FWD
Roof Rack	Yes
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes, Driver Only
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/Abdomen 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: Front Center Seat Airbag	Yes

Does owner's manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured By	GENERAL MOTORS LLC
Date of Manufacture	01/22
Vehicle Type	MPV

GVWR (kg)	2800
GAWR Front (kg)	1450
GAWR Rear (kg)	1600

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

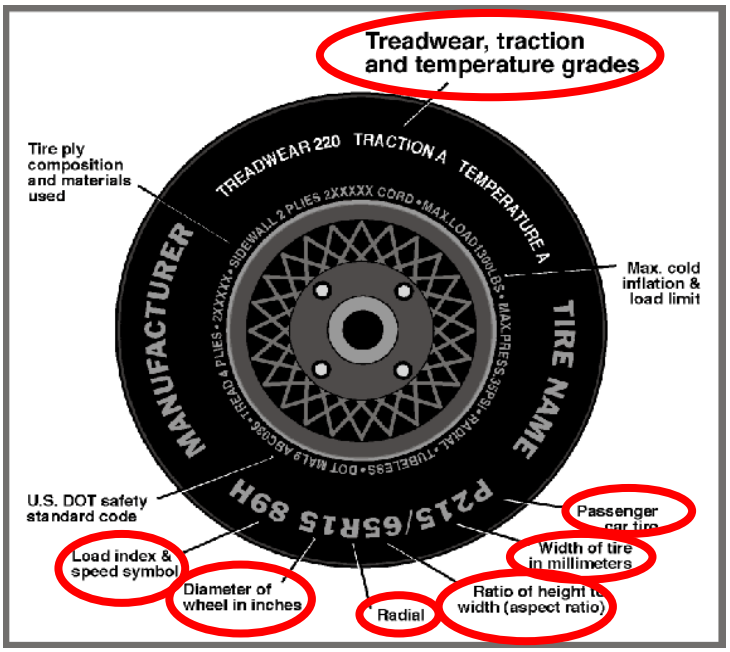
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	2	3	7
Capacity Weight (VCW) (kg)				799.0
DSC x 68.04 (kg)				476.28
Cargo Weight (RCLW) (kg)				322.72

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2022 Chevrolet Traverse
Test Program: SINCAP Side Impact
NHTSA No.: M20220109
Test Date: 9/27/2022



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	255/55R20	255/55R20
Tire Size on Vehicle	255/55R20	255/55R20
Tire Manufacturer	Continental	Continental
Tire Model	CrossContact LX20	CrossContact LX20
Treadwear	680	680
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	107H	107H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	DOT 17X AXAA02 2122	DOT 17X AXAA02 2122
DOT Safety Code Right	DOT 17X AXAA02 2122	DOT 17X AXAA02 2122

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

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	214	220	220	220
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

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	585.0	424.6		619.8	550.6		633.2	552.2	
Right	kg	563.8	412.4		544.6	524.0		561.6	499.8	
Ratio	%	57.9	42.1		52.0	48.0		53.2	46.8	
Totals	kg	1148.8	837.0	1985.8	1164.4	1074.6	2239.0	1194.8	1052.0	2246.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1985.8	(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	2246.8	(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	876	876	Yes
RF	mm	882	882	Yes
RR	mm	906	897	Yes
LR	mm	895	885	Yes
Vehicle CG (Aft of Front Axle)	mm	1442	1478	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+47	+39	

***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

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

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

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plates	129.4
Removed: None	0.0

TEST SURFACE MARKINGS

	Distance from 63° Impact Angle Line (mm)
Fore 25 mm target	998
Aft 25 mm target	1000
Pre-Impact Angle Line	120

Parallel Track Target	X Location (mm)	Y Location (mm)
A	0	0
B	3412	1767
C	3412	2750
D	0	1135

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

Test Vehicle:	2022 Chevrolet Traverse	NHTSA No.:	M20220109
Test Program:	SINCAP Side Impact	Test Date:	9/27/2022

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	20.0	10.5	15.2
Front Passenger Seat	N/A	N/A	14.7
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	12.6	11.8	12.2
Non-Struck Side Rear Seat	12.8	12.3	12.5
Rear Center Seat*	N/A	N/A	N/A

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	15.2	271	Max	330	334	338
			Mid	298	302	306
			Min	267	271	275
Front Passenger Seat	14.7	302	Max	N/A	N/A	N/A
			Mid	300	302	305
			Min	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	12.2	294	Max	N/A	N/A	N/A
			Mid	294	296	295
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	12.5	333	Max	N/A	N/A	N/A
			Mid	333	326	328
			Min	N/A	N/A	N/A
Rear Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

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

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

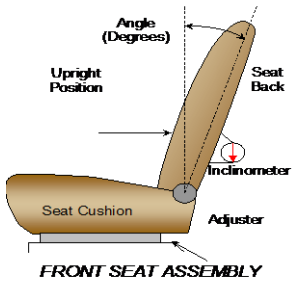
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	243	N/A	122	N/A
Front Passenger Seat	241	25	121	12
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	140	15	140	14
Non-Struck Side Rear Seat	140	15	140	14
Rear Center Seat*	N/A	N/A	N/A	N/A

* If applicable

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	65.5	N/A	19.5	N/A
Front Passenger Seat	64.4	34	19.6	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	12.2	7	11.6	0
Non-Struck Side Rear Seat	12.2	7	11.6	0
Rear Center Seat*	N/A	N/A	N/A	N/A

* If applicable

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4	0, Full Up
Rear Seat	1	0

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.

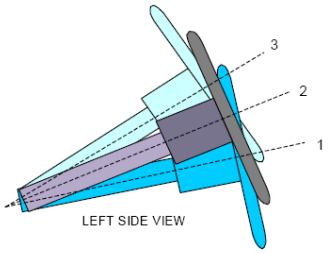
	Total # of Positions	Placed in Position #
Driver Seat	9	Full up
Rear Seat	4	Full Down

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

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

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.



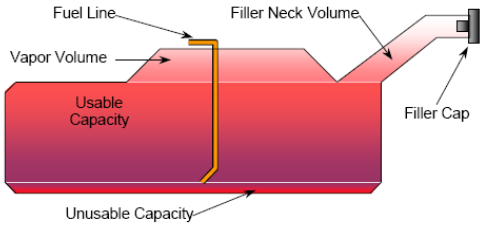
STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	19.1	0
Geometric Center, Position No. 2	21.8	30
Uppermost, Position No. 3	24.4	60
Telescoping Steering Wheel Travel		30
Test Position	21.8	60

FUEL PUMP

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

Pump will run for ~ 3 seconds when the key is turned on and then will not run unless the engine is cranking or running. ECM supplies voltage to the fuel pump control module when ECM detects that the ignition is ON.



VEHICLE FUEL TANK ASSEMBLY

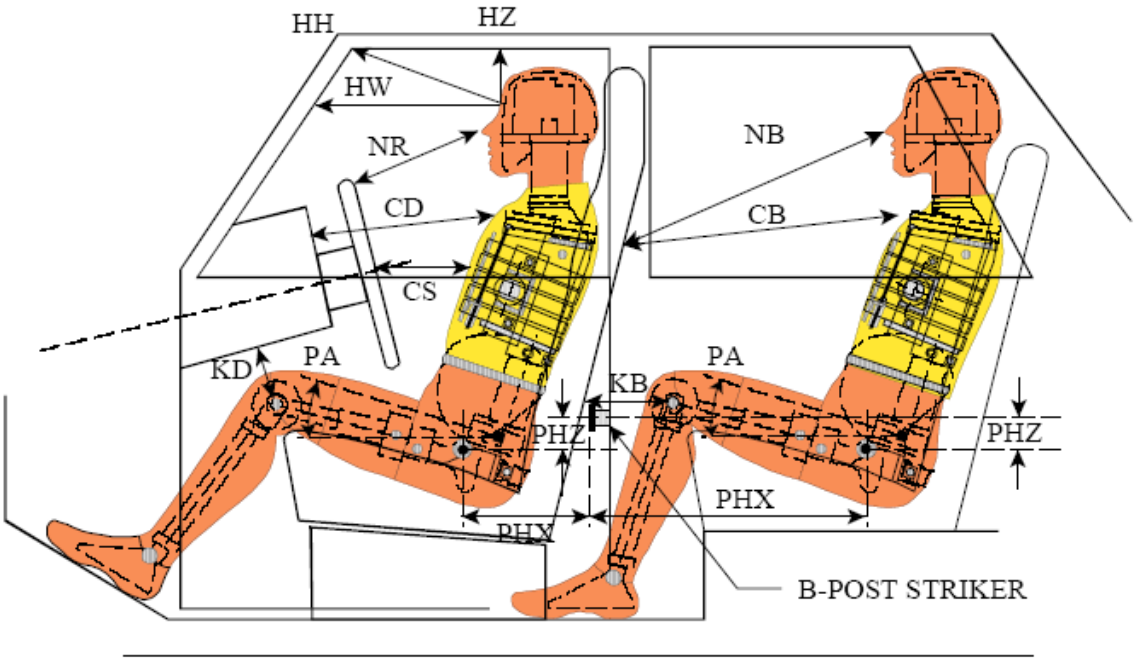
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	82.1
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	82.1
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	76.4
Actual Amount of Solvent Used in Test	76.4
1/3 of Usable Capacity	27.4

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: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



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

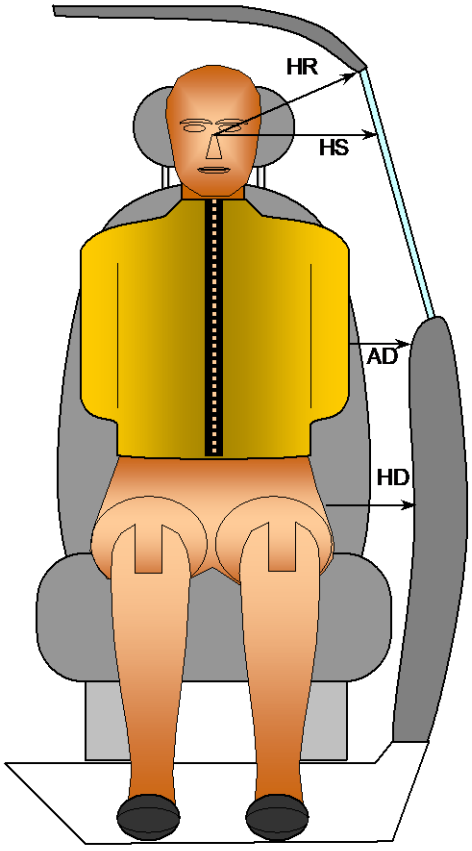
LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	411			
HW		Header to Windshield	760			
HZ	HZ	Head to Roof Liner	229		316	
NR	NB	Nose to Rim/Seat Back	432		645	
CD	CB	Chest to Dash/Seat Back	552		628	
CS		Chest to Steering Wheel	392			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	218	8.5	346	10.2
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	212	6.2	345	10.0
PAX°	PAX°	Pelvic Tilt Angle X		1.2		0.3
	PAY°	Pelvic Tilt Angle Y				18.0
PHX	PHX	Hip Point to Striker (X-Axis)	155		283	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	73		146	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

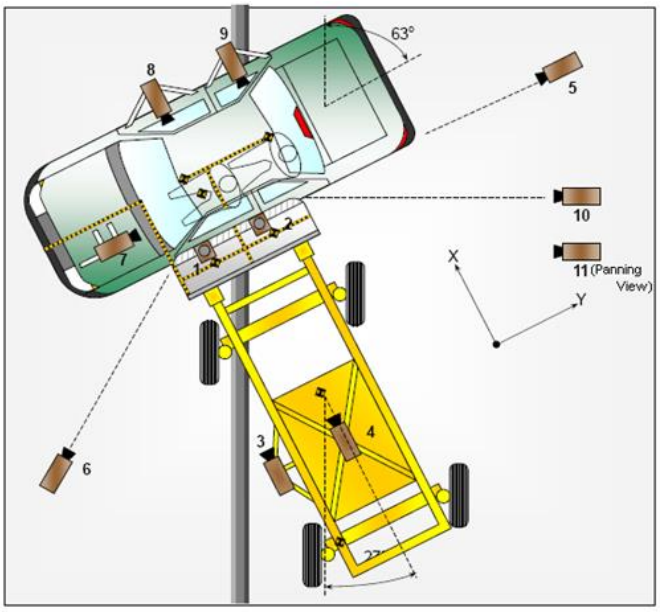


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	261	296
HS	Head to Side Window	mm	390	363
AD	Arm to Door	mm	114	167
HD	H-Point to Door	mm	160	166

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	1585	0	5676	20	1000
2	Overhead Close-up	1390	0	5977	20	1000
3	Left Impact Point (MDB)	1525	912	867	25	1000
4	Side Overall (MDB)	2262	0	1421	8.5	1000
5	Rear	0	8957	1437	20	1000
6	Left Front	1960	-3130	1417	20	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				8.5	1000
9	Passenger Side (OB)				8.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

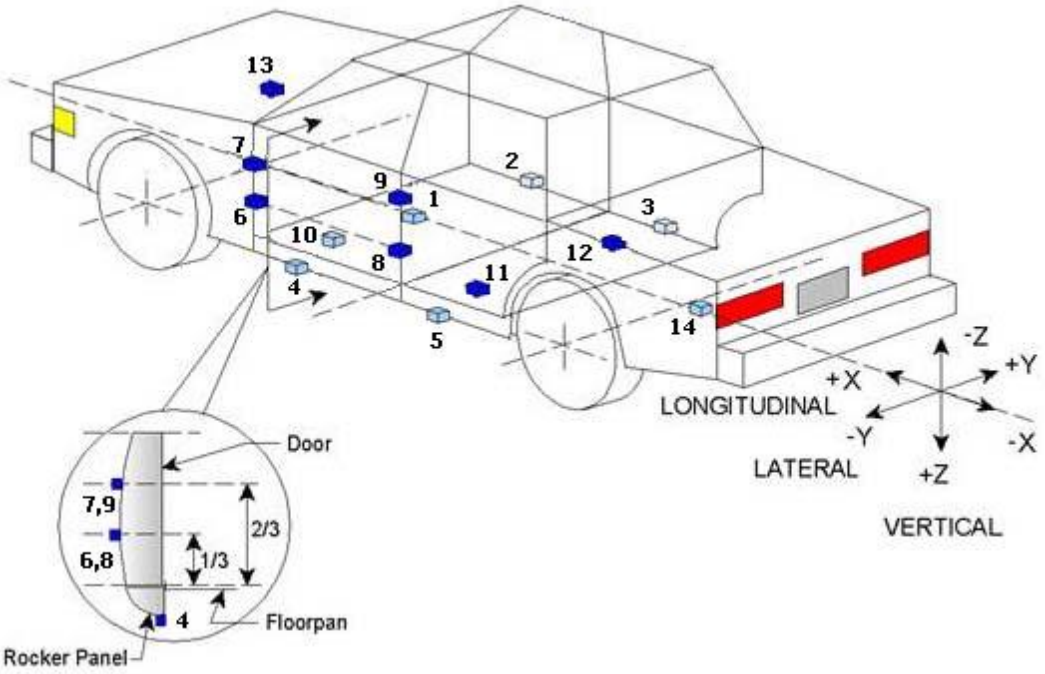
Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down
*All measurements accurate to ± 6 mm.
If applicable, explain why camera(s) did not operate as intended: Camera number 11 failed

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: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



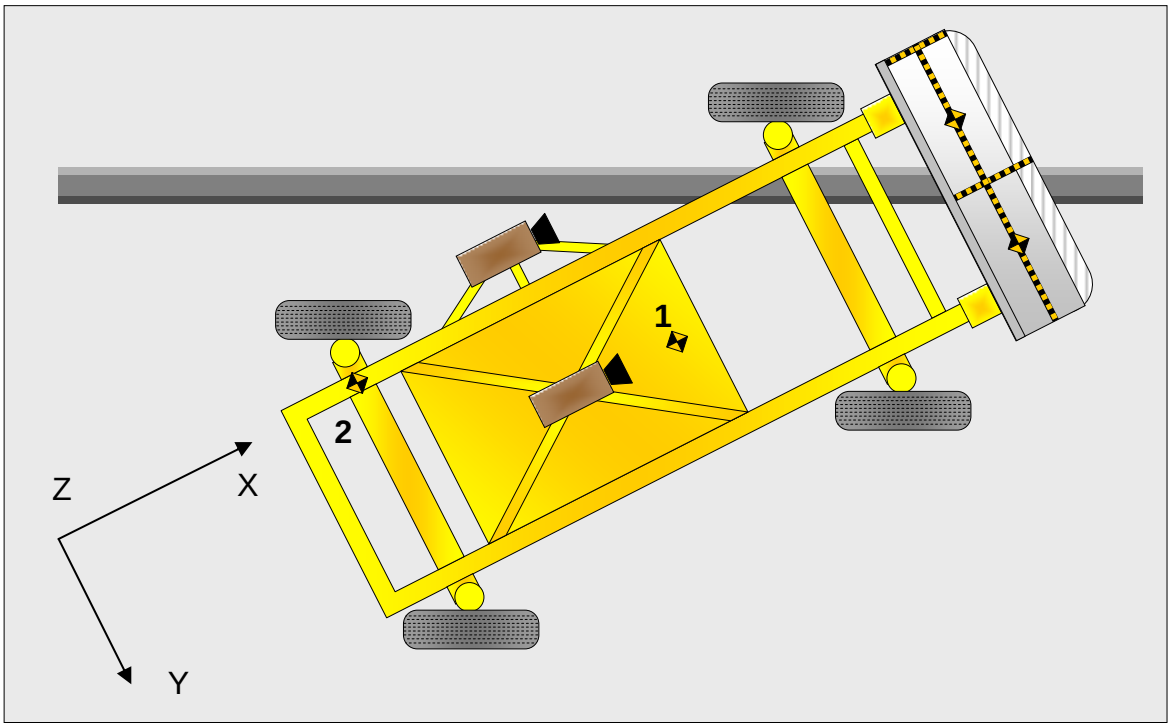
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3292	133	-409
2	Right Sill at Front Seat	3054	785	-420
3	Right Sill at Rear Seat	1997	765	-456
4	Left Sill at Front Door	3065	-786	-420
5	Left Sill at Rear Door	1946	-765	-449
6	A-Post Lower	3660	-902	-660
7	A-Post Middle	3685	-880	-1007
8	B-Post Lower	2565	-882	-607
9	B-Post Middle	2554	-863	-1085
10	Front Seat Track	2780	-629	-498
11	Rear Seat Structure	2076	-765	-439
12	Right Rear Occ. Compartment	2094	765	-456
13	Engine Block	4260	150	-932
14	Rear Above Axle	1338	-35	-584

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: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-2120	0	-530
2	MDB Rear	-2655	-650	-610

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB	SCAB
Top of Head	SCAB	SCAB
Left Side of Head	SCAB	SCAB
Back of Head	SCAB; Head restraint	SCAB; Head restraint
Left Shoulder	SAB; Door panel	Door panel
Upper Torso	SAB	Door panel
Lower Torso	SAB	Door panel
Left Hip	SAB	Door panel
Left Knee	Door Panel	Door panel

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	None
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST-TEST OBSERVATIONS

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

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/Abdomen 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: Front Center Seat Airbag	Yes	Yes	No	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3100
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		505
Actual Impact Point (Aft of Front Axle)	mm		500
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+5
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-7

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

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	1117

MDB WEIGHTS

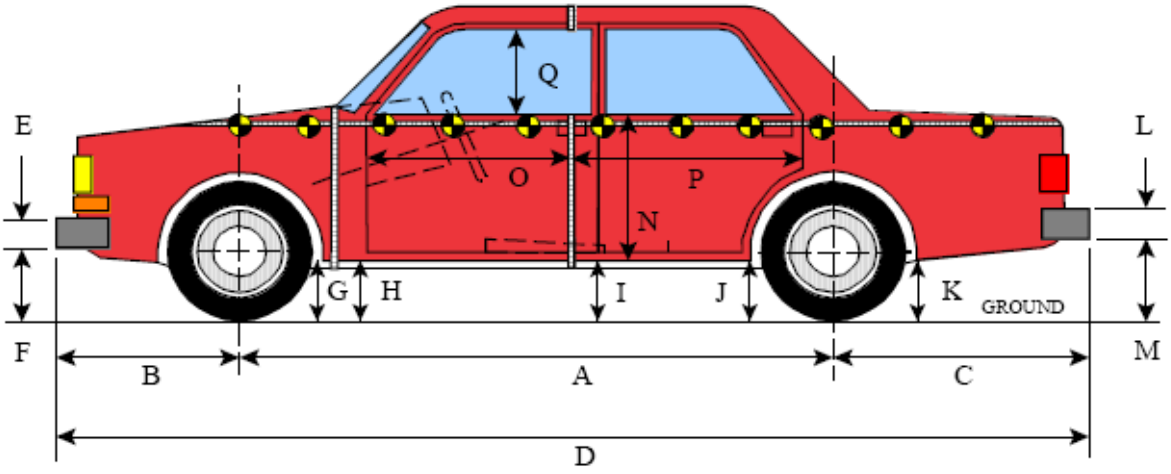
	Units	Front Axle	Rear Axle	Total
Left	kg	409.6	274.0	683.6
Right	kg	369.4	316.6	686.0
Ratio	%	56.9	43.1	100
Totals	kg	779.0	590.6	1369.6

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.88
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.90
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: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



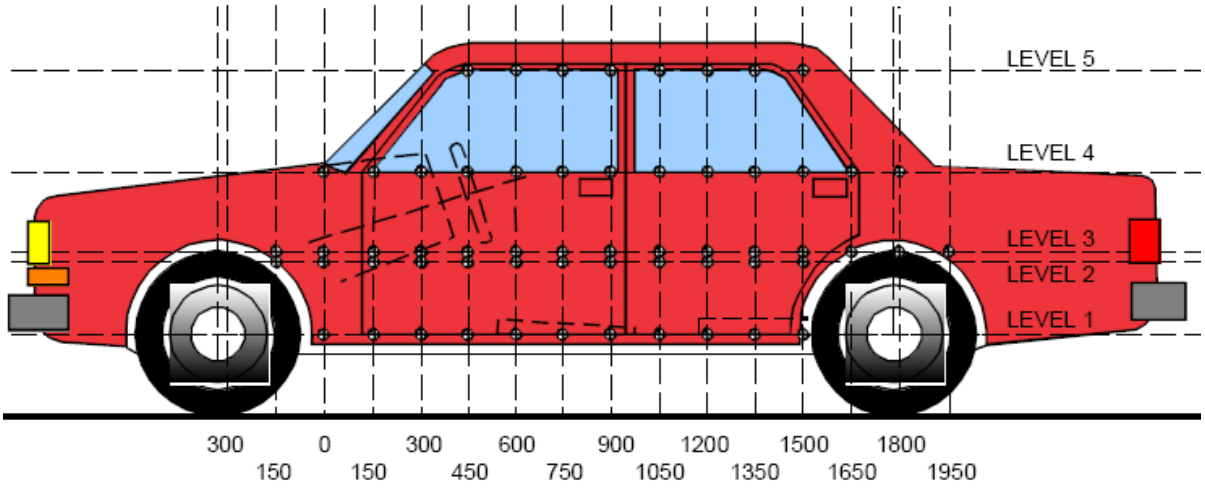
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3080	3065	-15
B	Front Axle to Front Surface of Vehicle	1070	1070	0
C	Rear Axle to Rear Surface of Vehicle	1090	1090	0
D	Total Length at Centerline	5240	5244	4
E	Front Bumper Thickness	92	92	0
F	Front Bumper Bottom to Ground	510	525	15
G	Sill Height at Front Wheel Well	442	455	13
H	Sill Height at Front Door Leading Edge	440	460	20
I	Sill Height at B-Pillar	475	505	30
J1	Sill Height at Rear Wheel Well	495	515	20
J2	Pinch Weld Height at Rear Wheel Well	277	315	38
K	Sill Height Aft of Rear Wheel Well	320	340	20
L	Rear Bumper Thickness	165	165	0
M	Rear Bumper Bottom to Ground	490	510	20
N	Sill Height to Window Bottom Sill	914	800	-114
O	Front Door Leading Edge to Impact CL	847	800	-47
P	Rear Door Trailing Edge to Impact CL	1410	1361	-49
Q	Front Window Opening	460	463	3
R	Right Side Length	5008	5010	2
S	Left Side Length	5008	4996	-12
T	Vehicle Width	2000	1985	-15
U	Front Wheel Track Width	1720	1716	-4
V	Rear Wheel Track Width	1716	1716	0

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Chevrolet Traverse
Test Program: SINCAP Side Impact
NHTSA No.: M20220109
Test Date: 9/27/2022



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	500	133	1650
2	Driver Hip Point	803	320	1650
3	Mid-Door	776	324	1800
4	Window Sill	1181	97	1050
5	Window Top	1696	2	1500

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

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

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

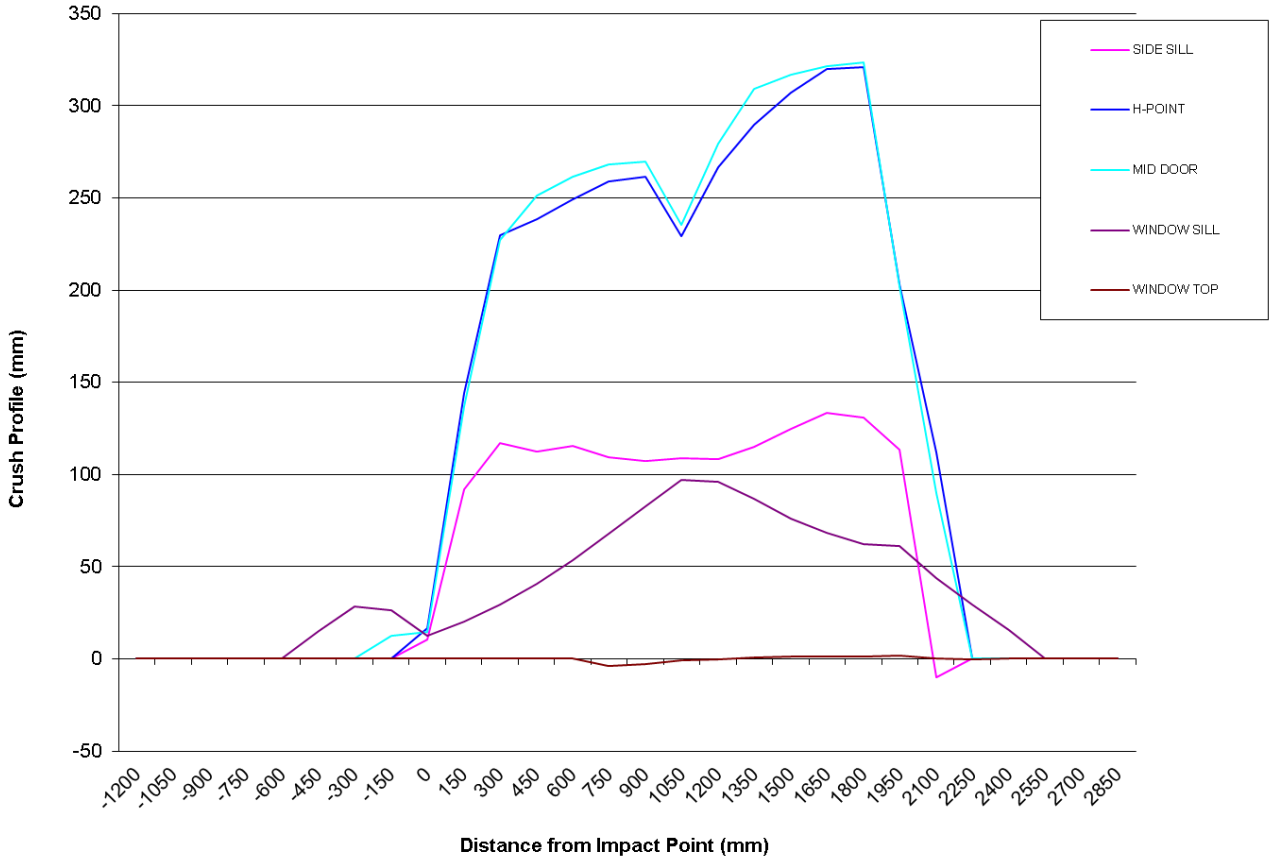
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-450	0	0	0	843	0	0	0	0	828	0	0	0	0	15	0
-300	0	0	0	858	0	0	0	0	830	0	0	0	0	28	0
-150	0	0	983	870	0	0	0	970	844	0	0	0	13	26	0
0	958	973	972	879	0	948	956	958	866	0	10	17	14	13	0
150	947	969	968	886	0	855	825	831	866	0	92	144	137	20	0
300	941	968	967	899	0	824	738	739	870	0	117	230	228	29	0
450	936	968	967	910	0	824	730	716	870	0	112	238	251	40	0
600	934	969	968	921	0	818	720	707	867	0	116	249	261	54	0
750	931	970	970	930	655	822	711	701	862	658	109	259	269	68	-3
900	930	971	971	938	672	823	710	701	855	675	107	261	270	83	-3
1050	930	971	971	942	678	821	742	736	845	679	109	229	235	97	-1
1200	928	970	970	940	681	820	704	691	845	681	108	266	279	95	0
1350	926	970	970	939	682	811	680	661	852	682	115	290	309	87	0
1500	925	969	969	938	684	801	662	652	862	682	124	307	317	76	2
1650	927	967	967	936	684	794	647	646	868	683	133	320	321	68	1
1800	933	968	969	934	685	802	647	645	872	684	131	321	324	62	1
1950	943	976	977	931	687	829	773	775	870	686	114	203	202	61	1
2100	952	987	988	928	687	962	875	898	884	686	-10	112	90	44	1
2250	0	0	0	924	682	0	0	0	895	683	0	0	0	29	-1
2400	0	0	0	921	677	0	0	0	906	677	0	0	0	15	0

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

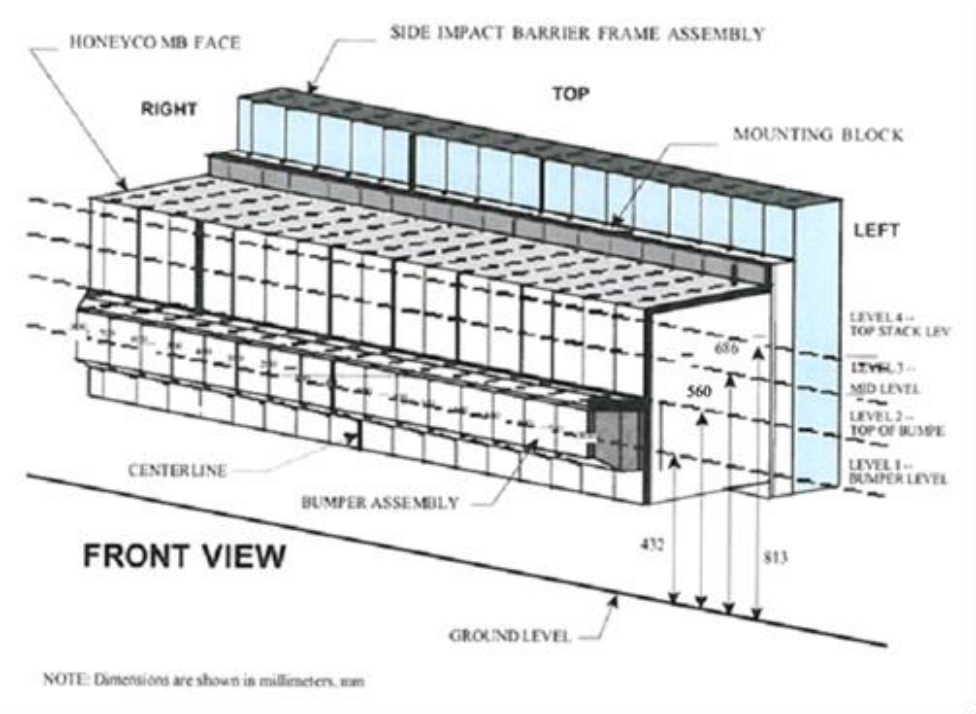
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	700	Right	230
B	Top of Bumper	560	200	Right	91
C	Mid-Level	686	800	Left	77
D	Top of Stack	813	800	Left	87

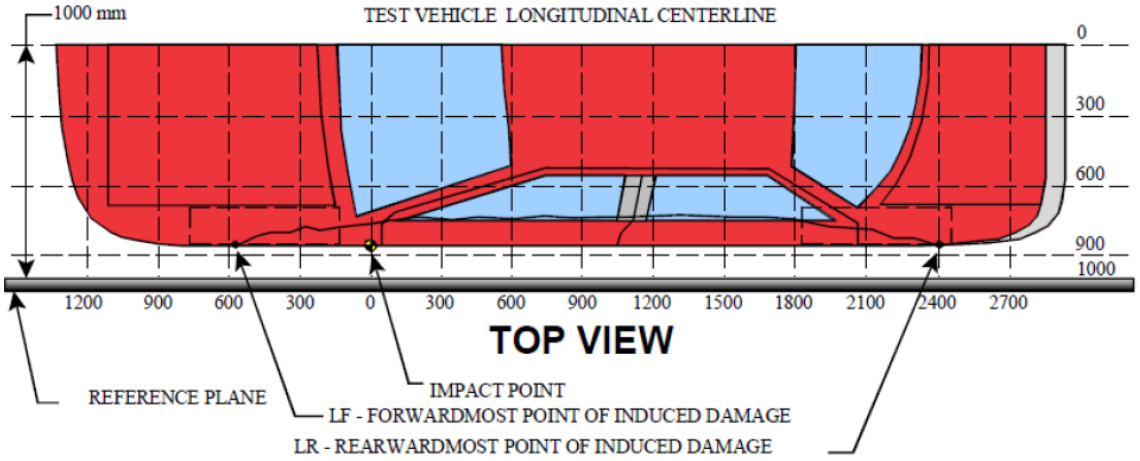
DEFORMABLE BARRIER STATIC CRUSH

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	230	230	226	225	224	223	223	222	224	223	219	218	216	214	213	214	213
2	90	89	87	86	86	86	91	---[1]	90	83	81	79	77	76	74	72	84
3	35	21	19	21	24	24	36	34	52	40	20	19	22	27	34	40	77
4	38	28	20	18	22	30	50	58	52	20	25	28	36	44	56	64	87

[1]Missing point-post-test

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



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	2400	4	906	921	15
2	1800	3	645	969	324
3	1200	3	691	970	279
4	750	3	701	970	269
5	150	2	825	969	144
6[1]	-450	4	828	843	15

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	1		474	
2	500 mm Left of Center	1	271	485	214
3	200 mm Left of Center	1	266	485	219
4	200 mm Right of Center	1	263	486	223
5	500 mm Right of Center	1	261	486	225
6	800 mm Right of Center	1	243	473	230

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

Test Vehicle: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022

Test Time: 14:20 **Temperature:** 22.3°C

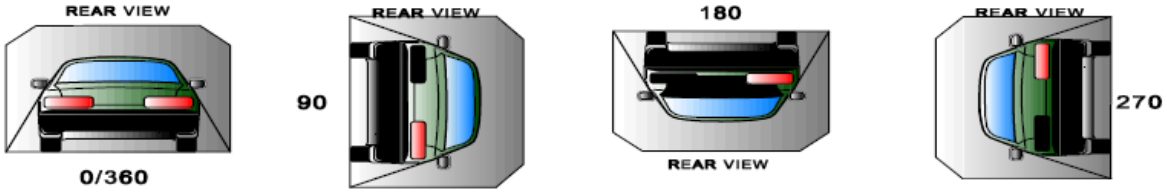
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

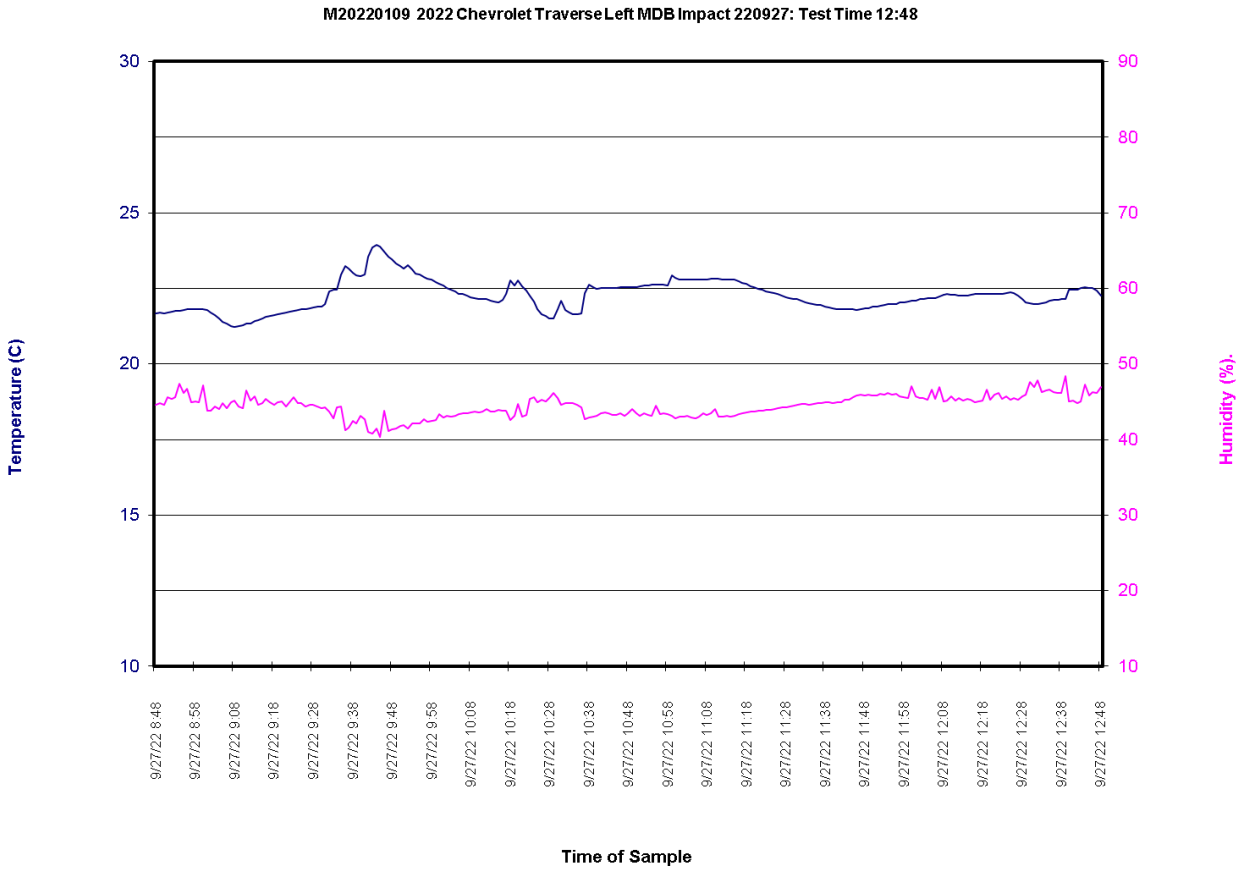
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

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: 2022 Chevrolet Traverse NHTSA No.: M20220109
Test Program: SINCAP Side Impact Test Date: 9/27/2022



APPENDIX A
PHOTOGRAPHS

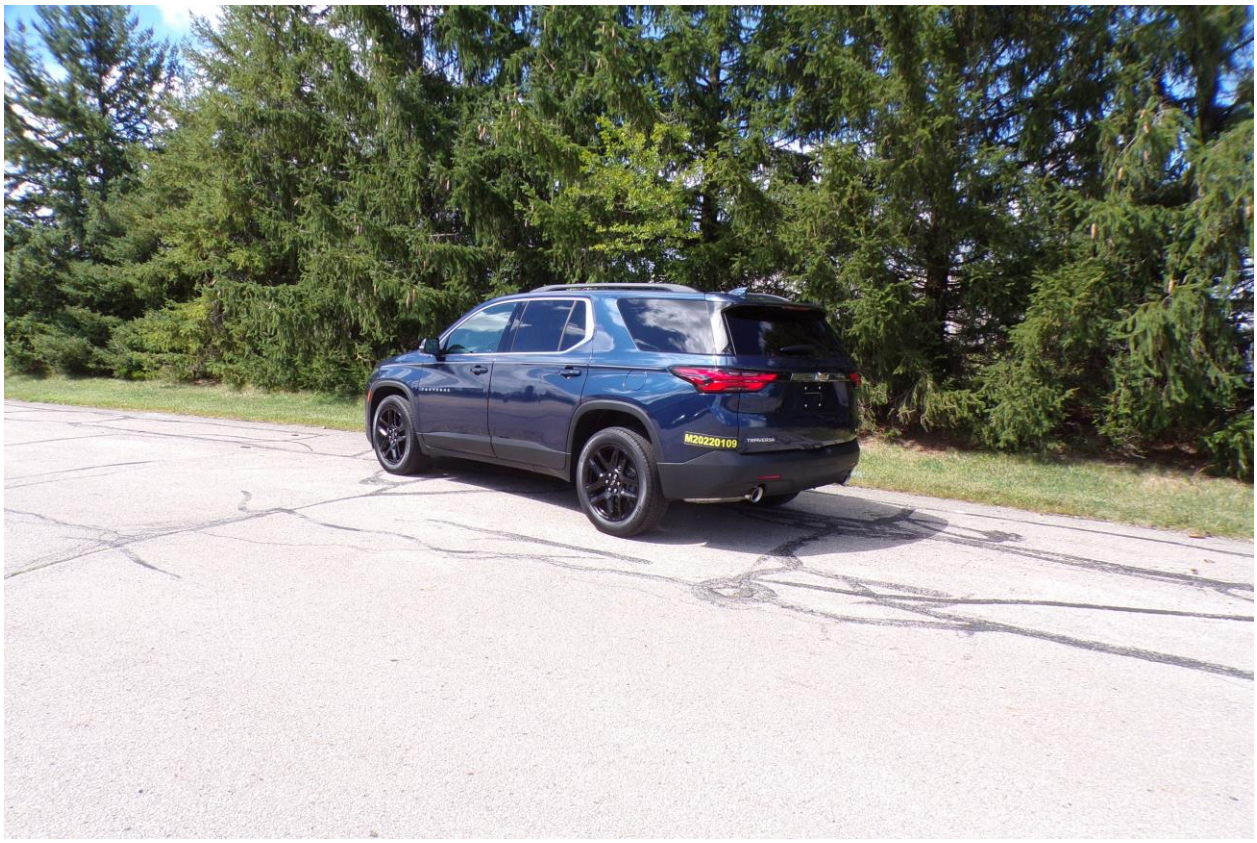
TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

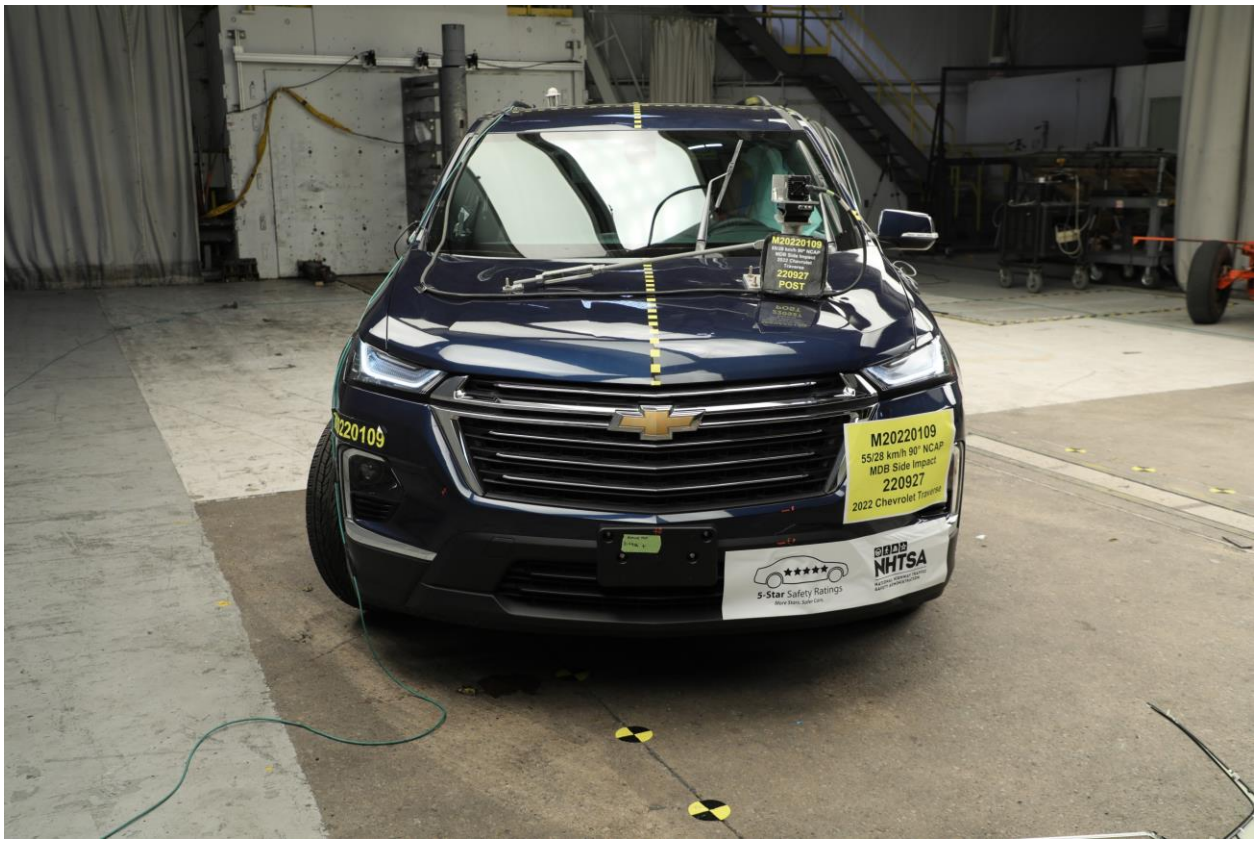
TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

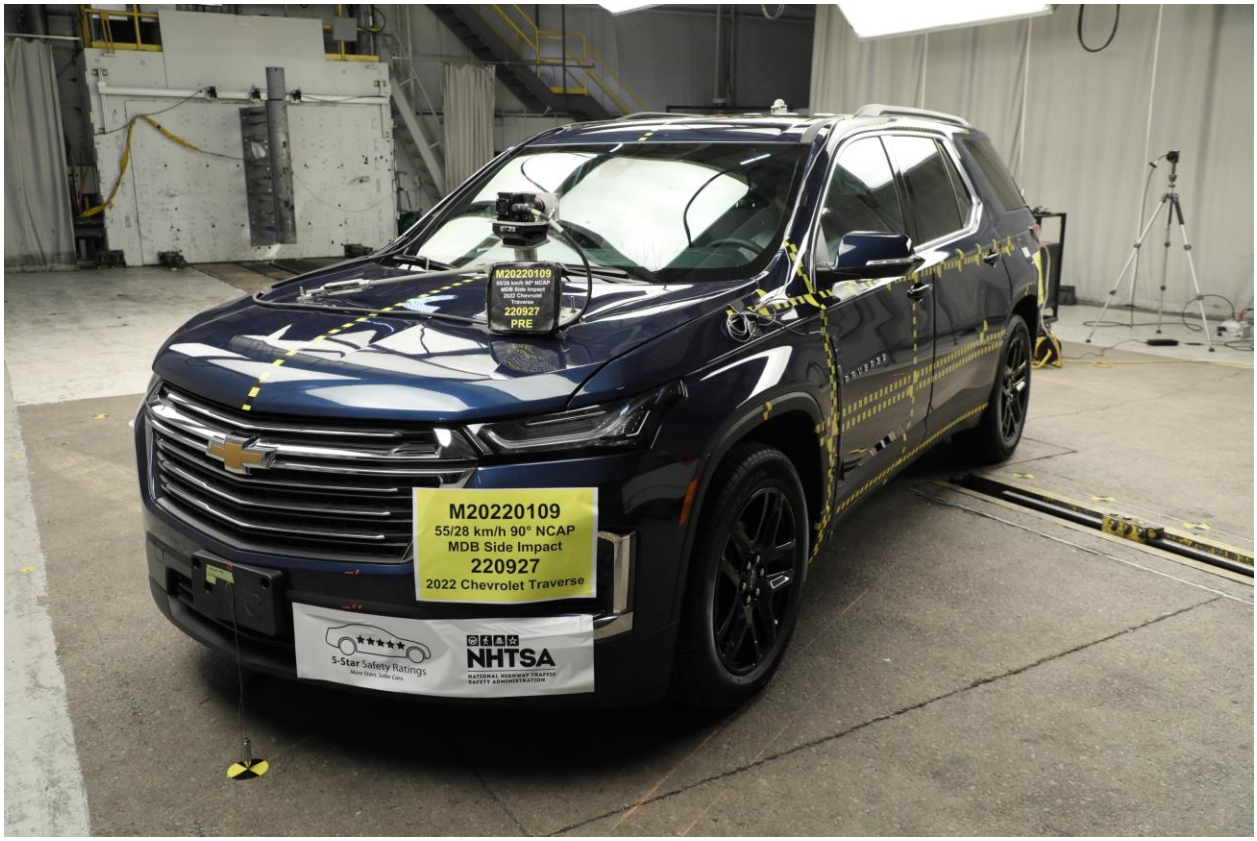


002 As-Delivered Left Rear ¾ View of Test Vehicle

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

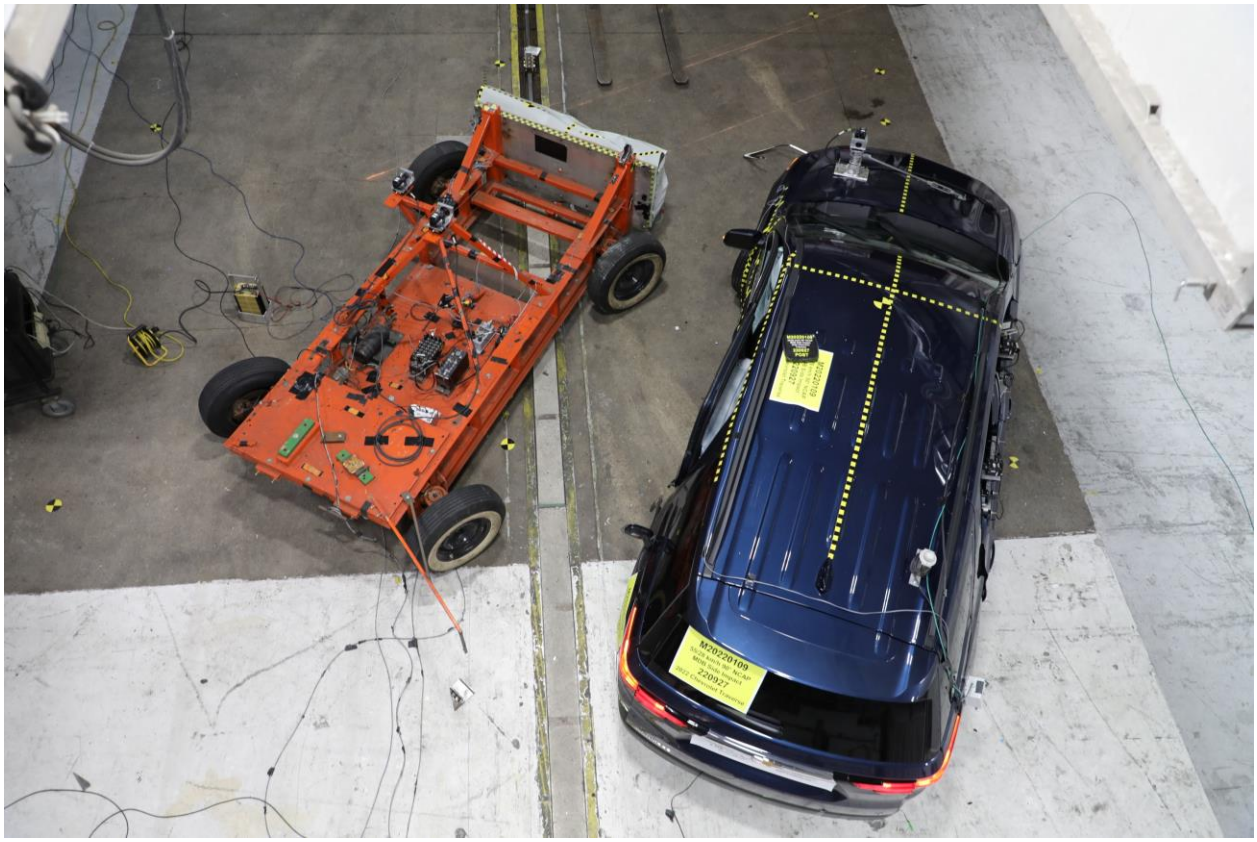
011 Pre-Test Rear View of Test Vehicle

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

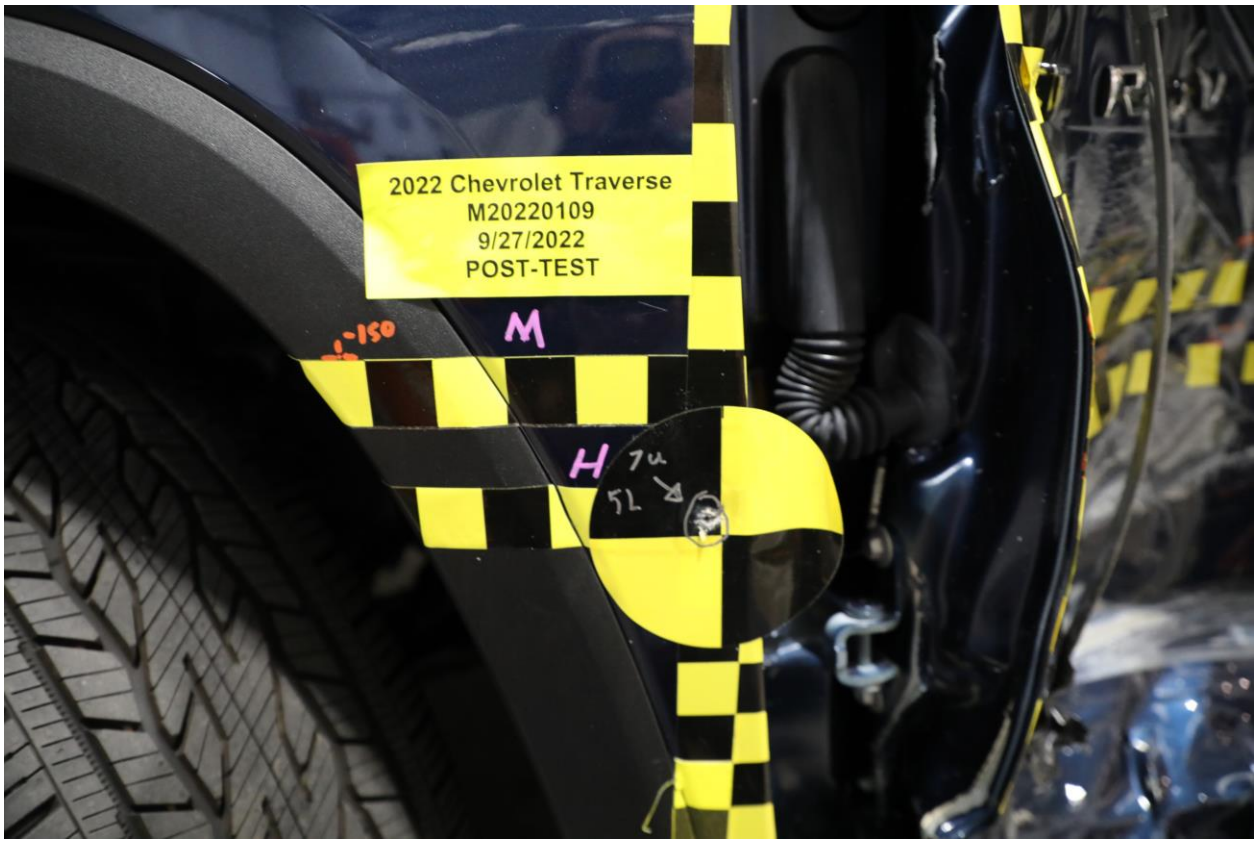


016 Post-Test Overhead View of Test Area

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[1]

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

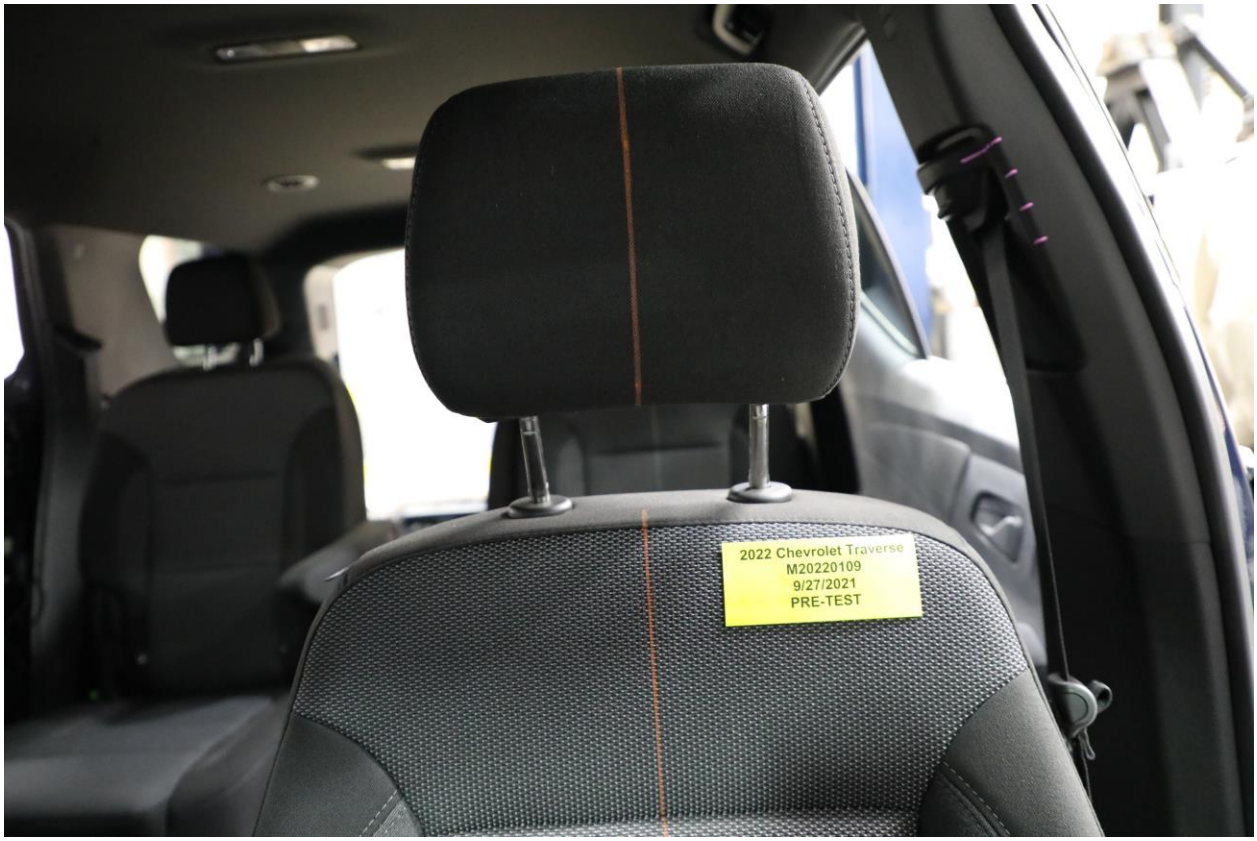
[1] Label has wrong year for testing date. Should be 9/27/22

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

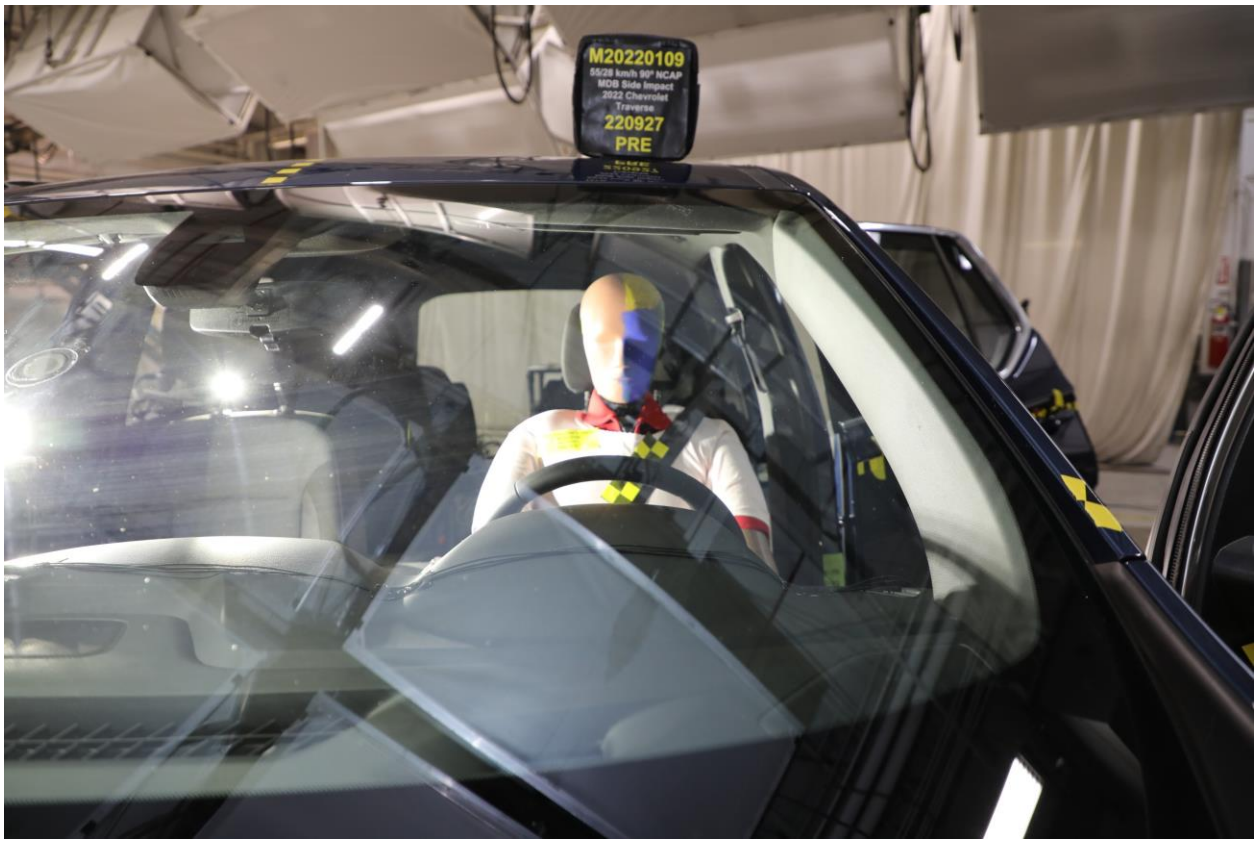
Intentionally Left Blank

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

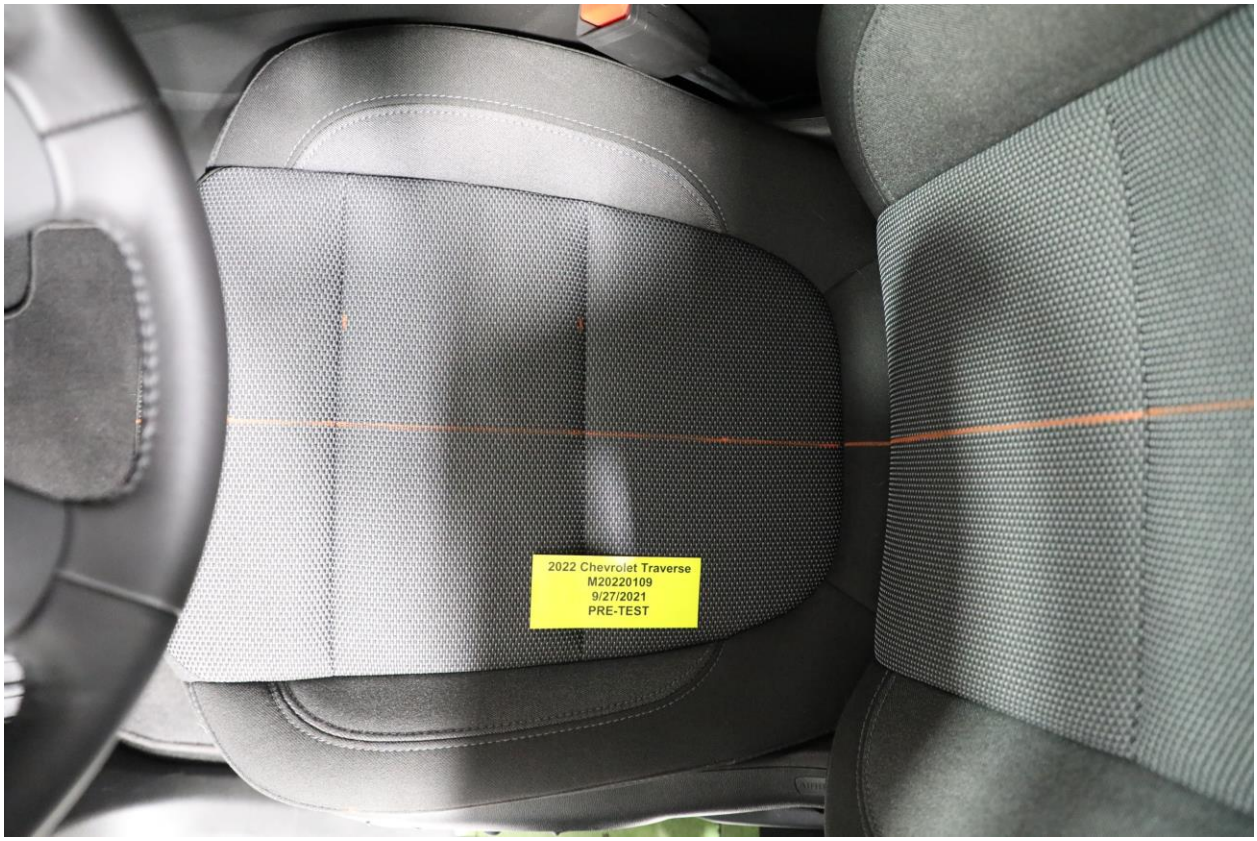


030 Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning[1]



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

[1] Label has wrong year for testing date. Should be 9/27/22



032 Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning[1]

033 Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan[1]

[1] Label has wrong year for testing date. Should be 9/27/22

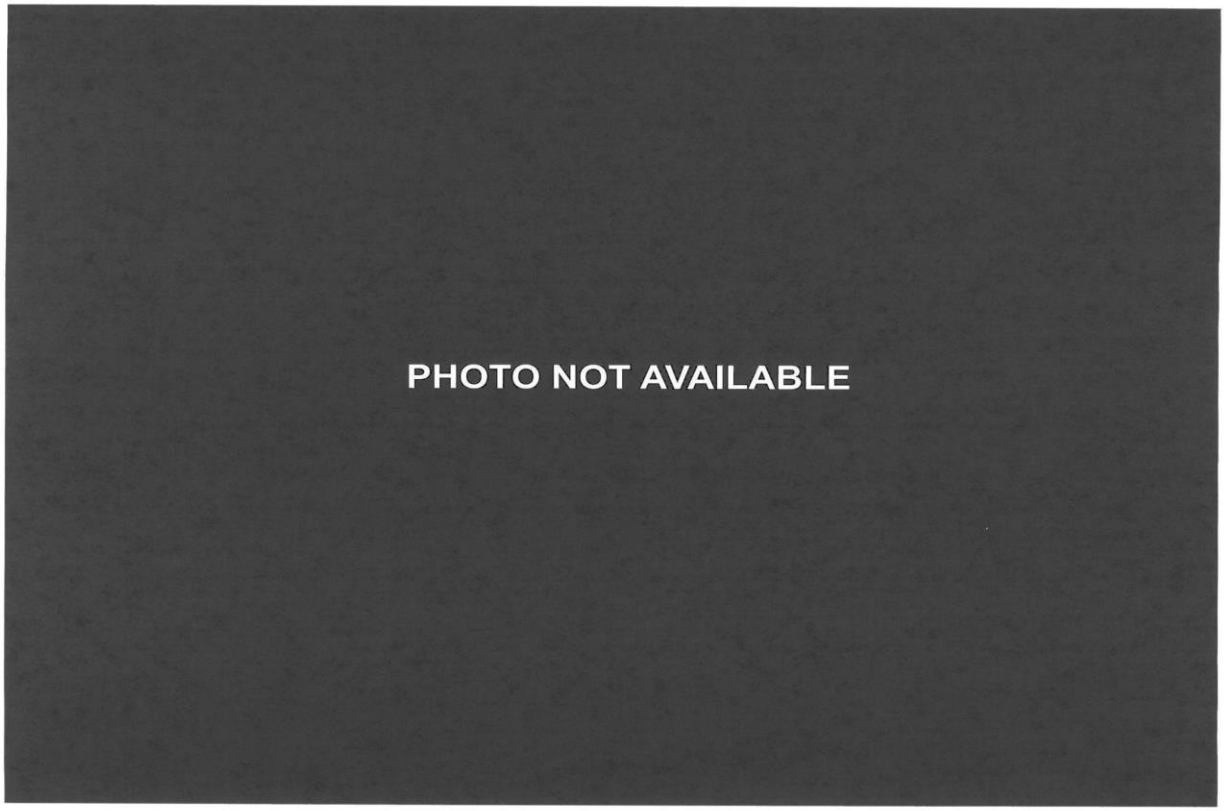
034 Pre-Test Placement of Driver's Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy[1]

[1] Label has wrong year for testing date. Should be 9/27/22

036 Pre-Test Left Side View of Steering Wheel[1]

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[1]

041 Pre-Test Close-Up View of Driver Seat Back or Head Restraint[1]

[1] Label has wrong year for testing date. Should be 9/27/22

042 Pre-Test Driver Dummy and Door Clearance View[1]

043 Post-Test Driver Dummy and Door Clearance View

[1] Label has wrong year for testing date. Should be 9/27/22

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

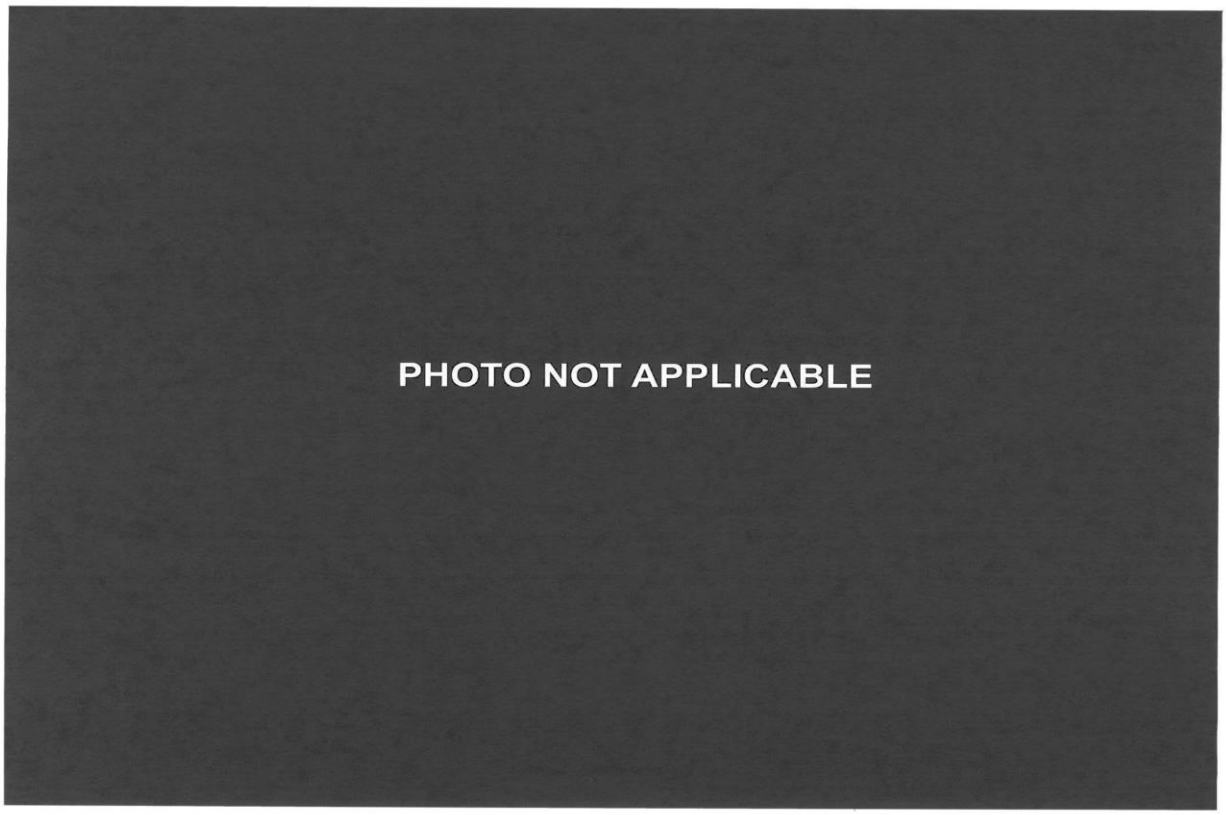
045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

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

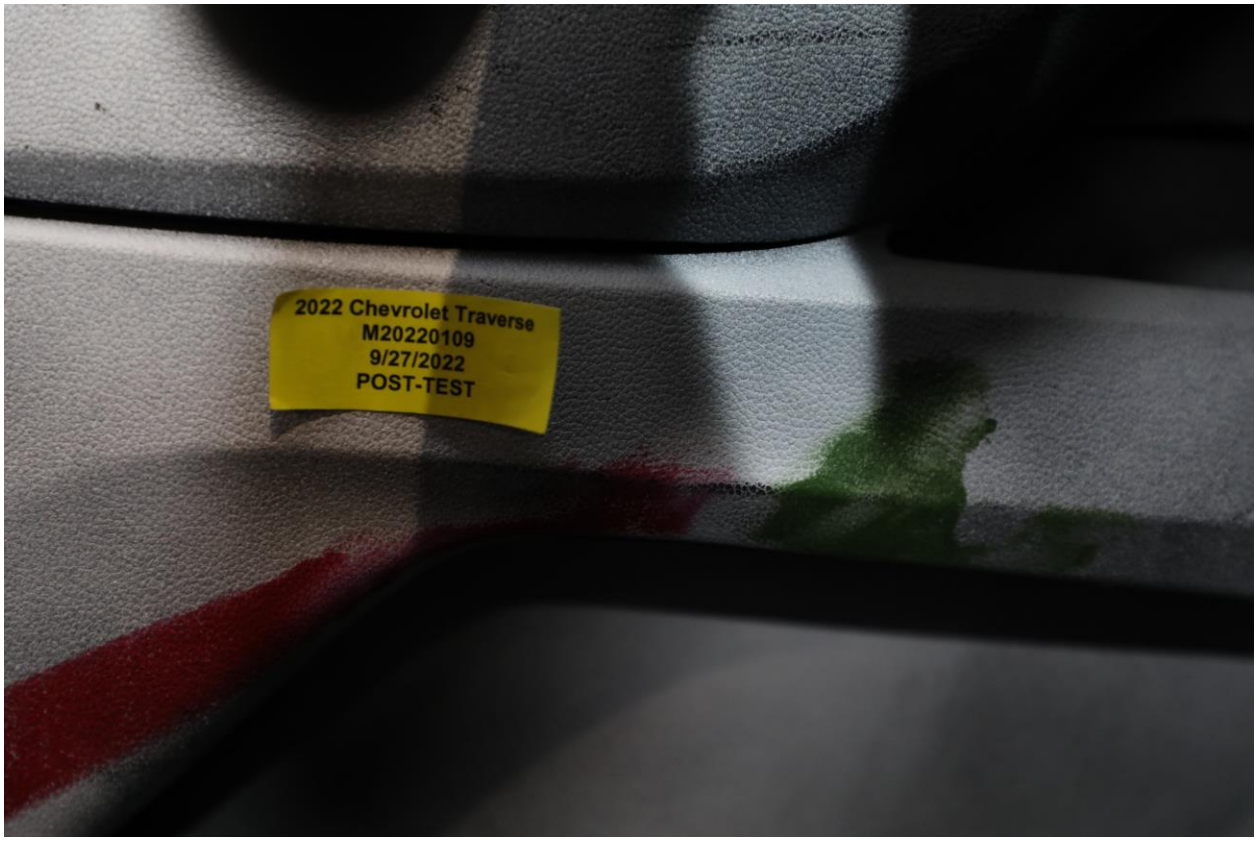


050 Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

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

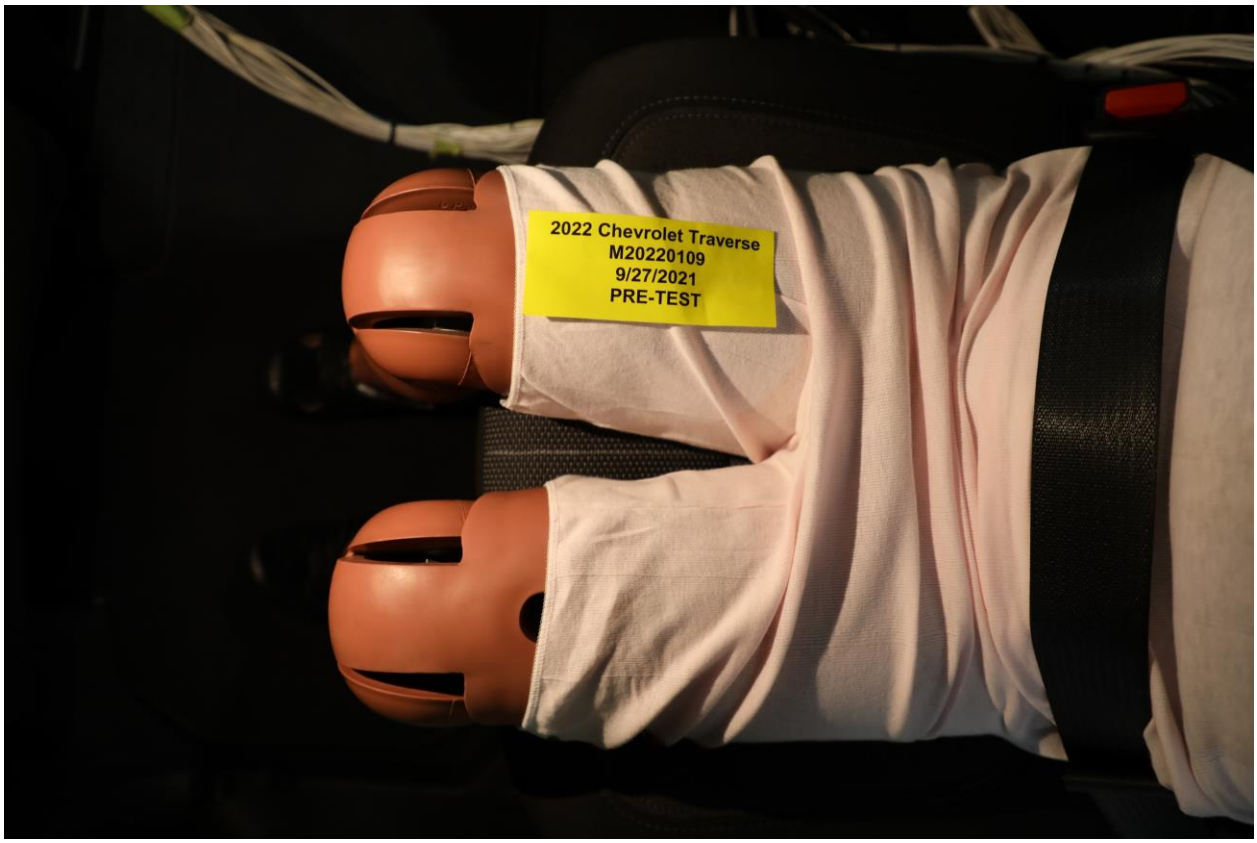
057 Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View

058 Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning[1]

059 Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint[1]

[1] Label has wrong year for testing date. Should be 9/27/22

060 Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning[1]



061 Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan[1]

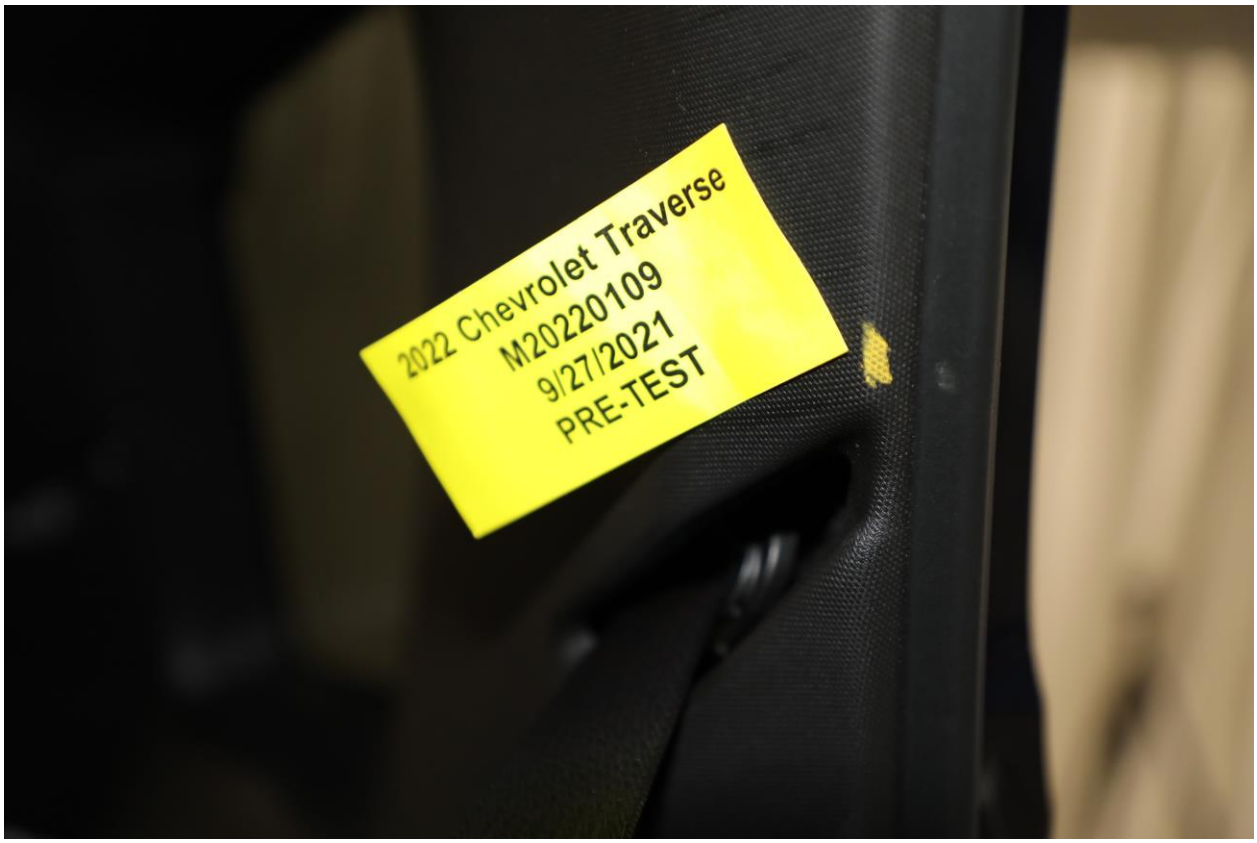
[1] Label has wrong year for testing date. Should be 9/27/22

062 Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket[1]

063 Pre-Test View of Rear Passenger Dummy's Head Showing Dummy Head is Level[1]

[1] Label has wrong year for testing date. Should be 9/27/22

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



065 Pre-Test View of Belt Anchorage for Rear Passenger Dummy[1]

[1] Label has wrong year for testing date. Should be 9/27/22

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[1]

Intentionally Left Blank

[1] Label has wrong year for testing date. Should be 9/27/22

069 Pre-Test Rear Passenger Dummy and Door Clearance View[1]

070 Post-Test Rear Passenger Dummy and Door Clearance View

[1] Label has wrong year for testing date. Should be 9/27/22

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

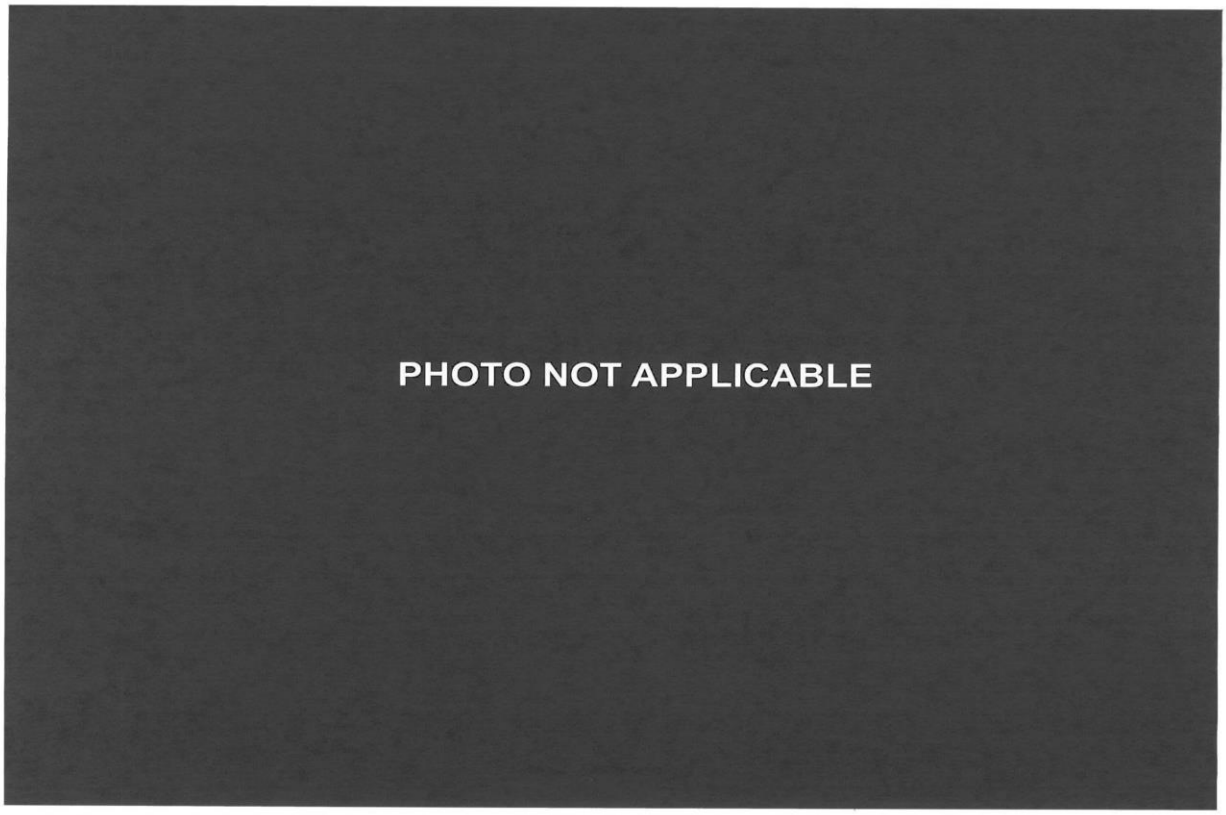
073 Pre-Test Rear Passenger Inner Door Panel View

074 Post-Test Rear Passenger Inner Door Panel View

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

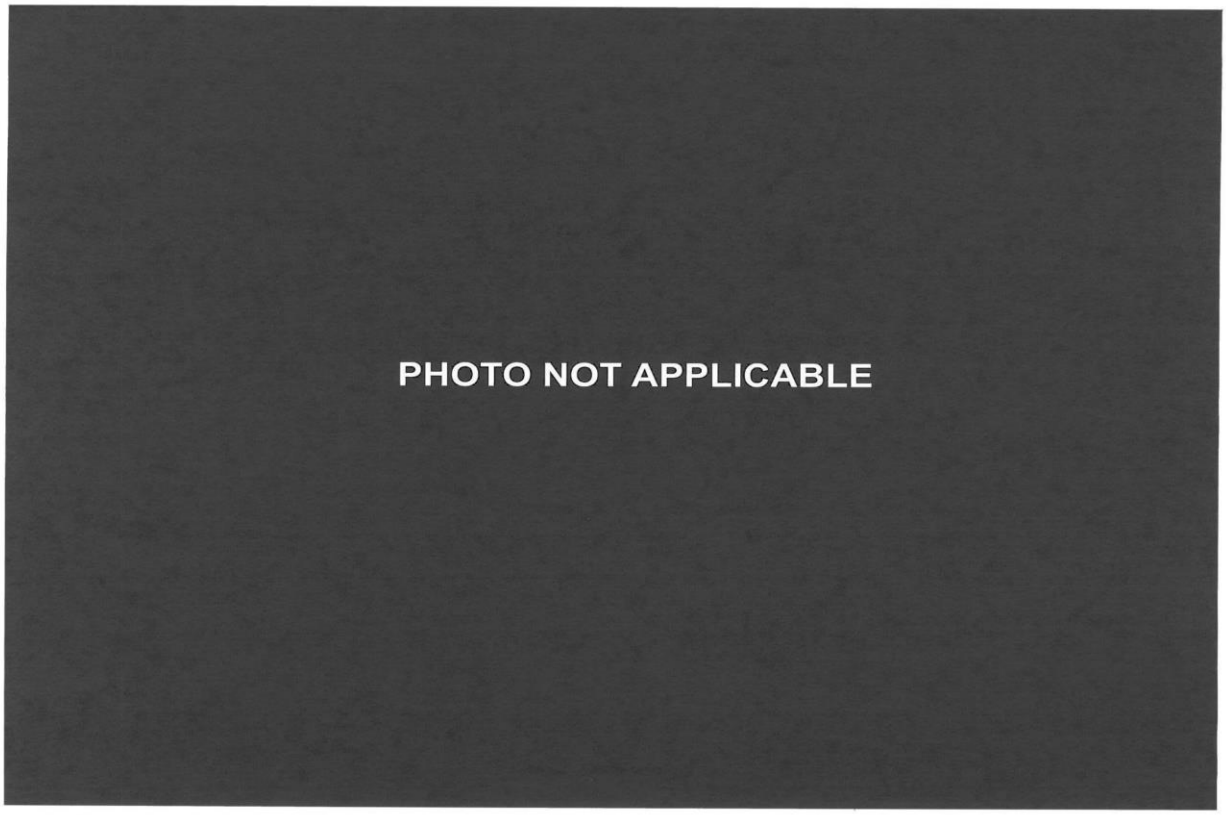
076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

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

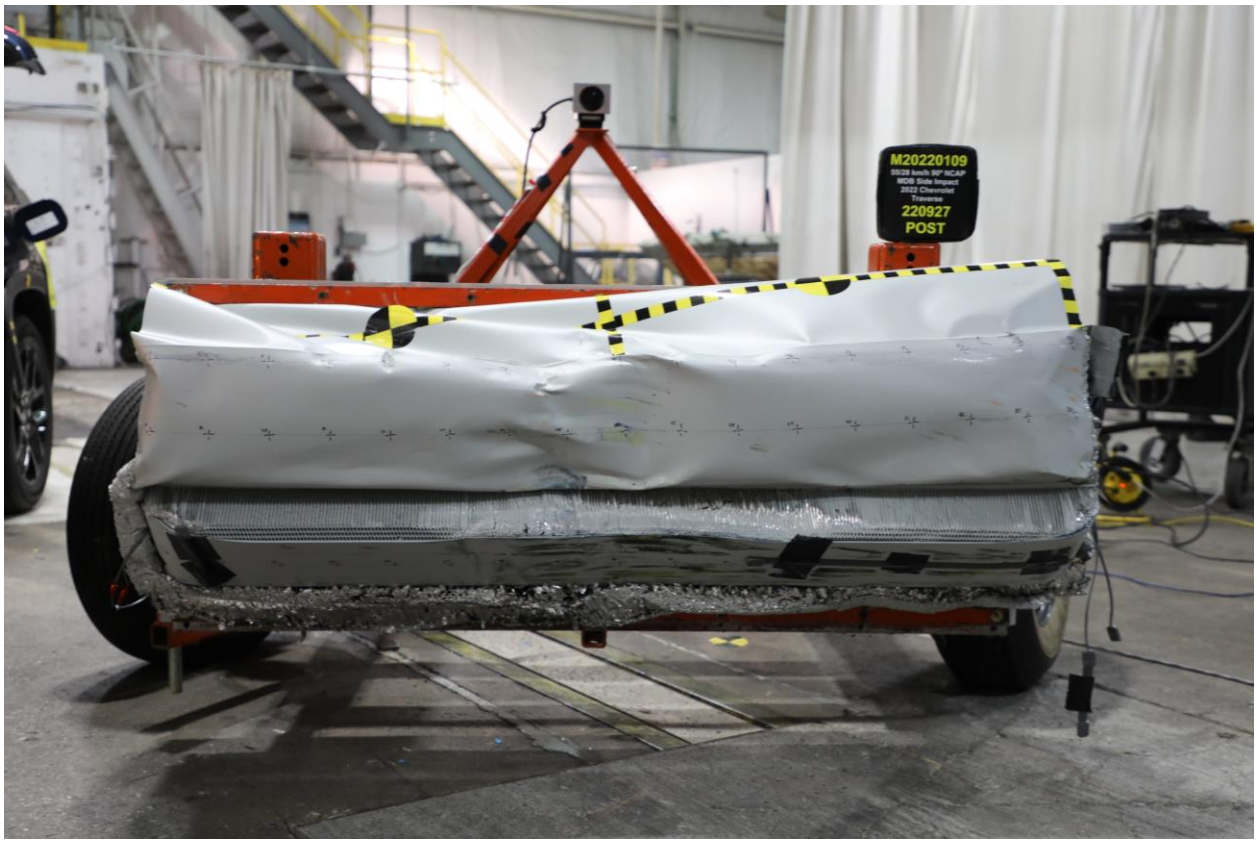
081 Post-Test Rear Passenger Dummy Close-Up Knee Contact View

Intentionally Left Blank

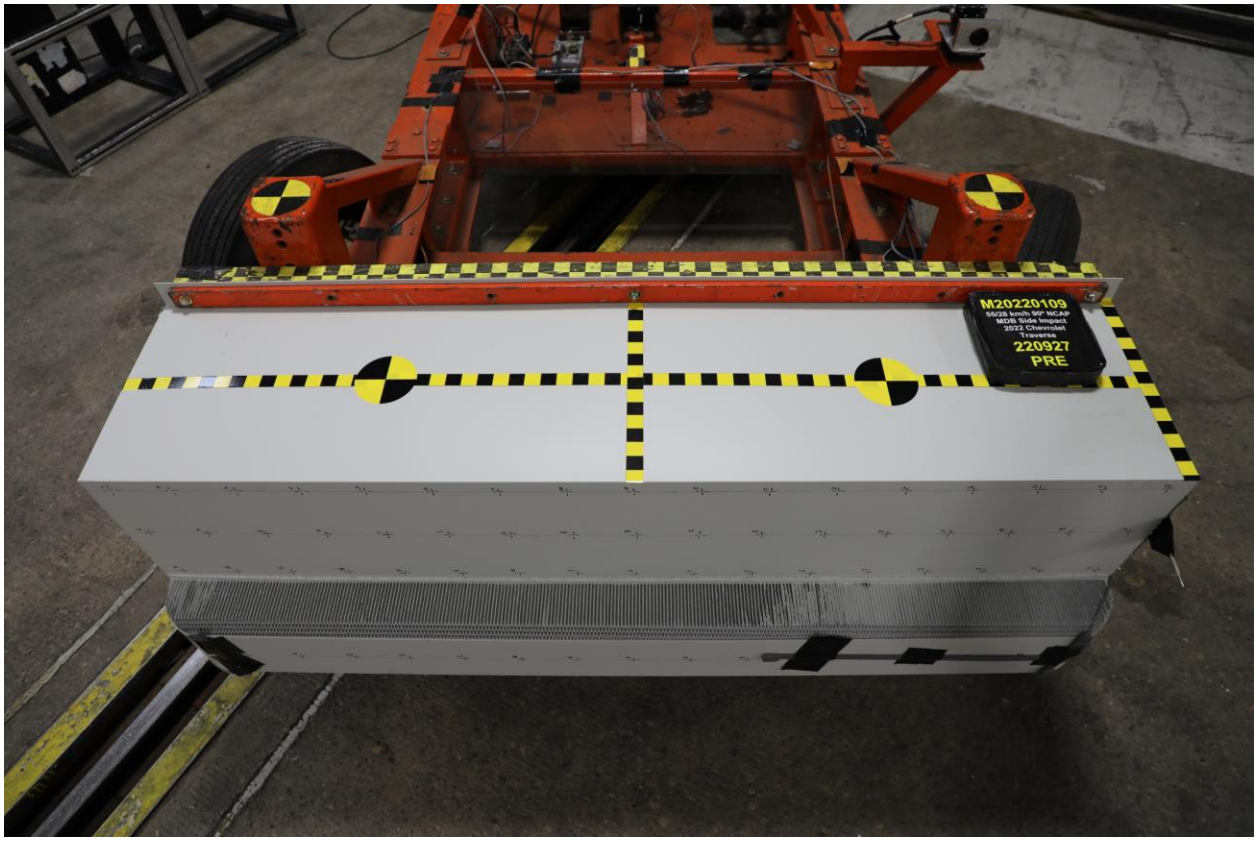
082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

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

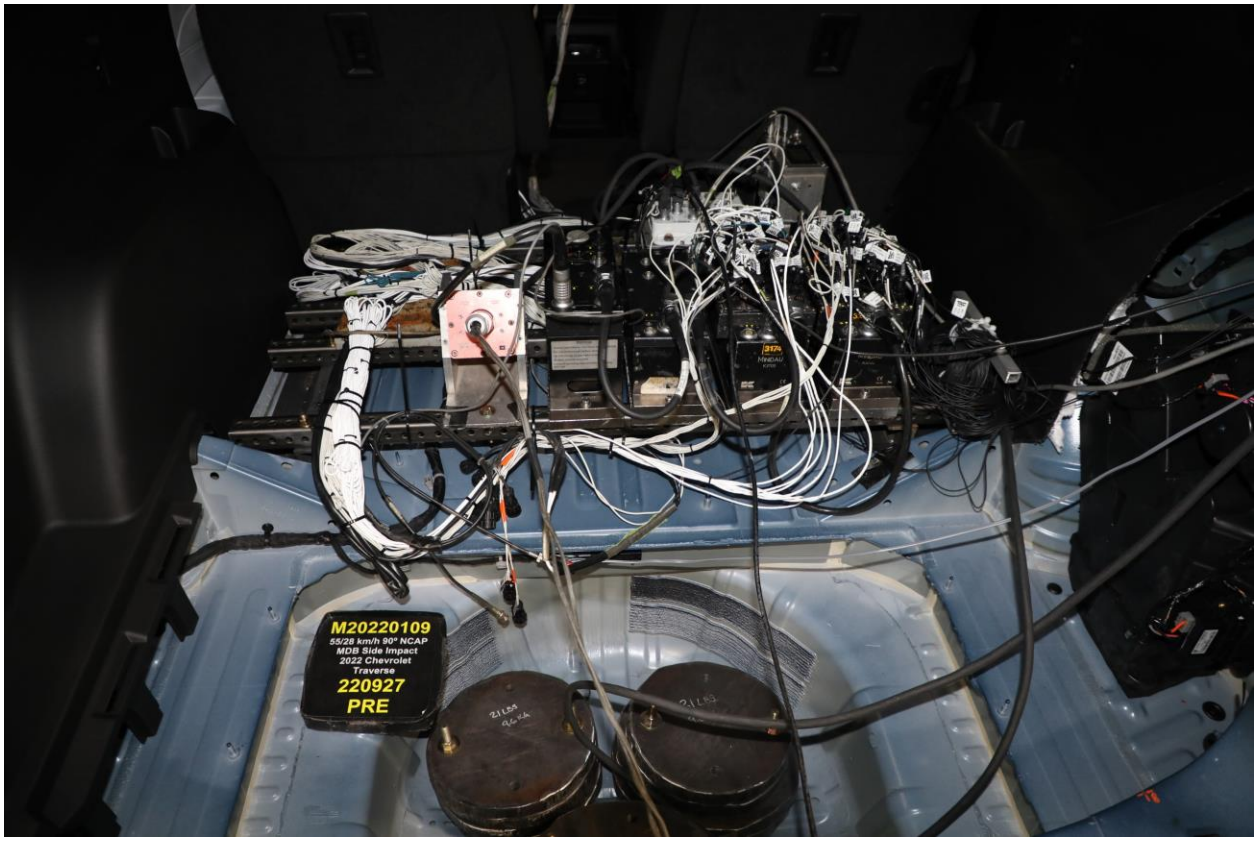
090 Pre-Test Right Side View of MDB Impactor Face

091 Post-Test Right Side View of MDB Impactor Face

092 Close-Up View of Vehicle's Certification Label[1]

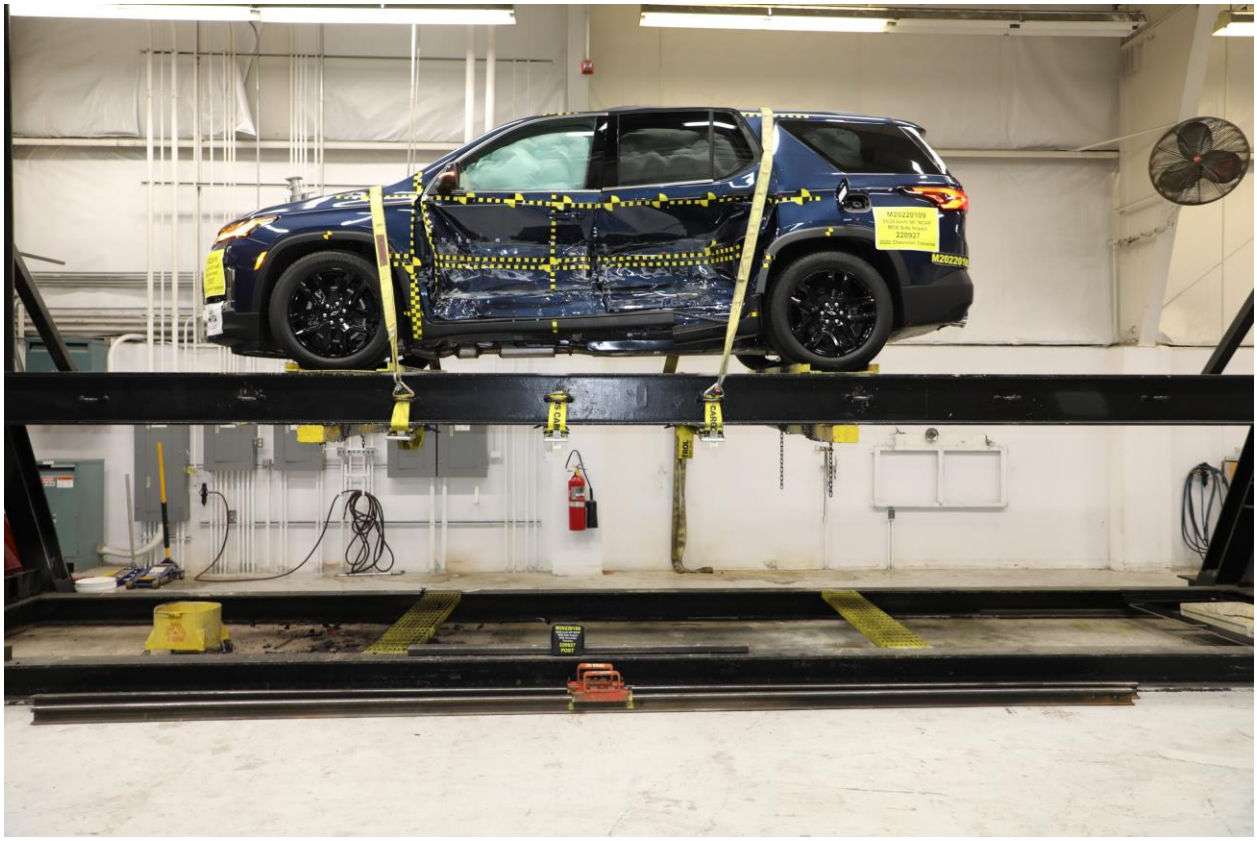
093 Close-Up View of Vehicle's Tire Information Placard or Label[1]

[1] Label has wrong year for testing date. Should be 9/27/22

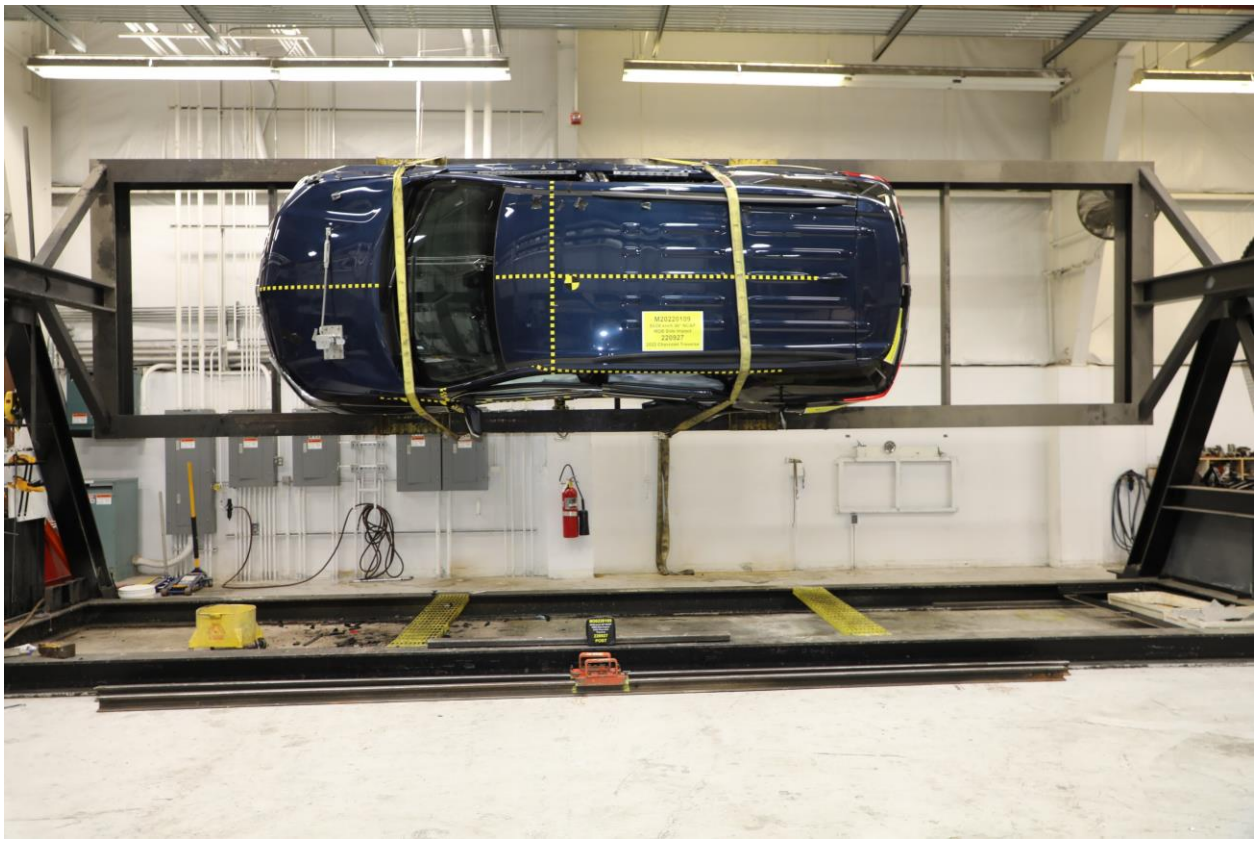


094 Pre-Test Ballast View

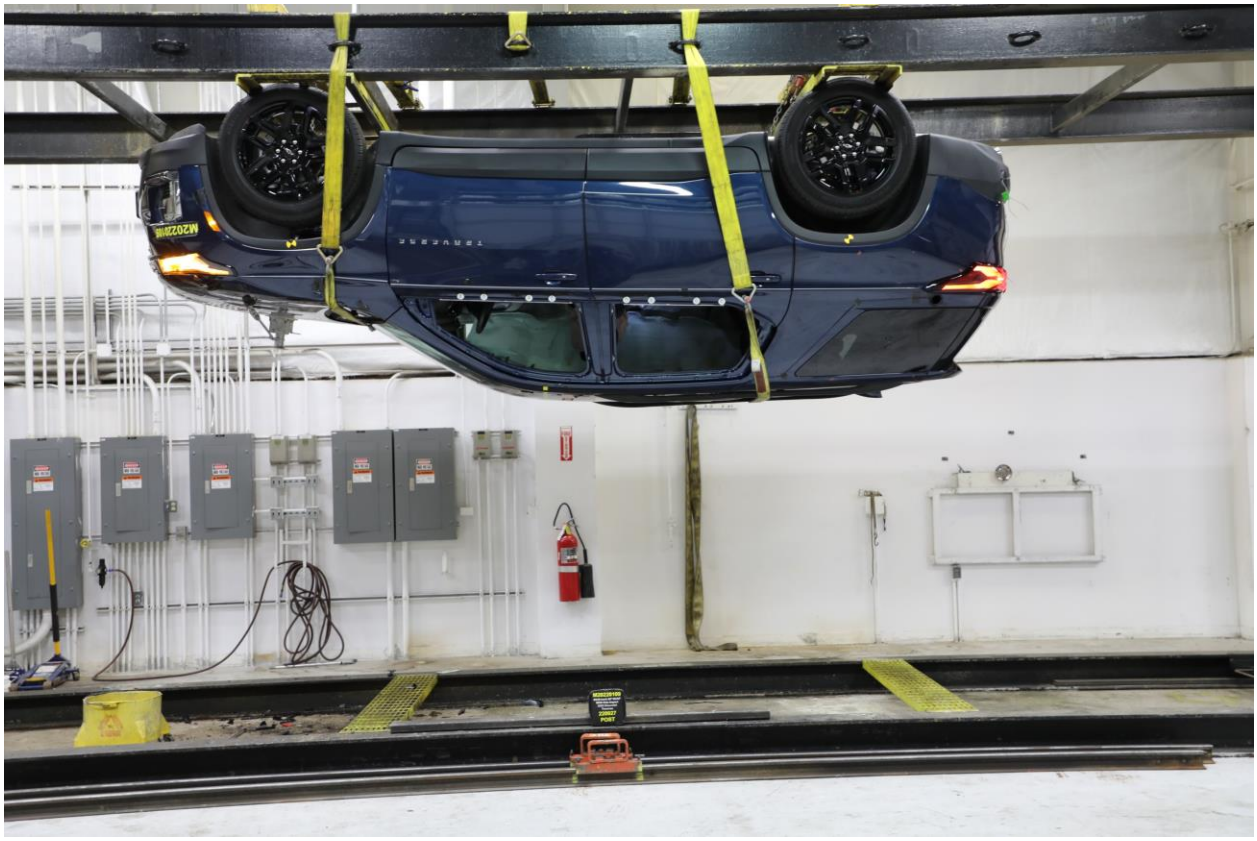
095 Post-Test Primary and Redundant Speed Trap Read-Out



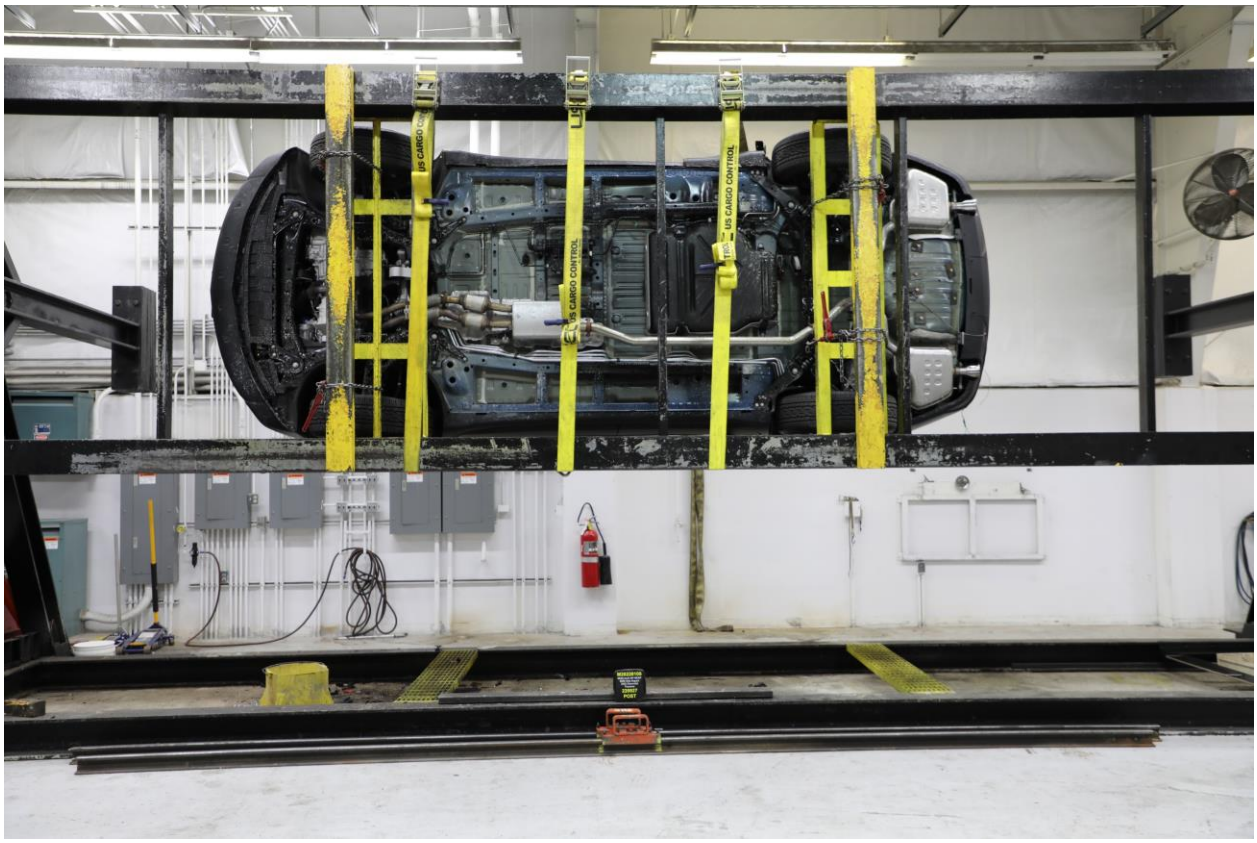
096 FMVSS No. 301 Static Rollover 0 Degrees



097 FMVSS No. 301 Static Rollover 90 Degrees



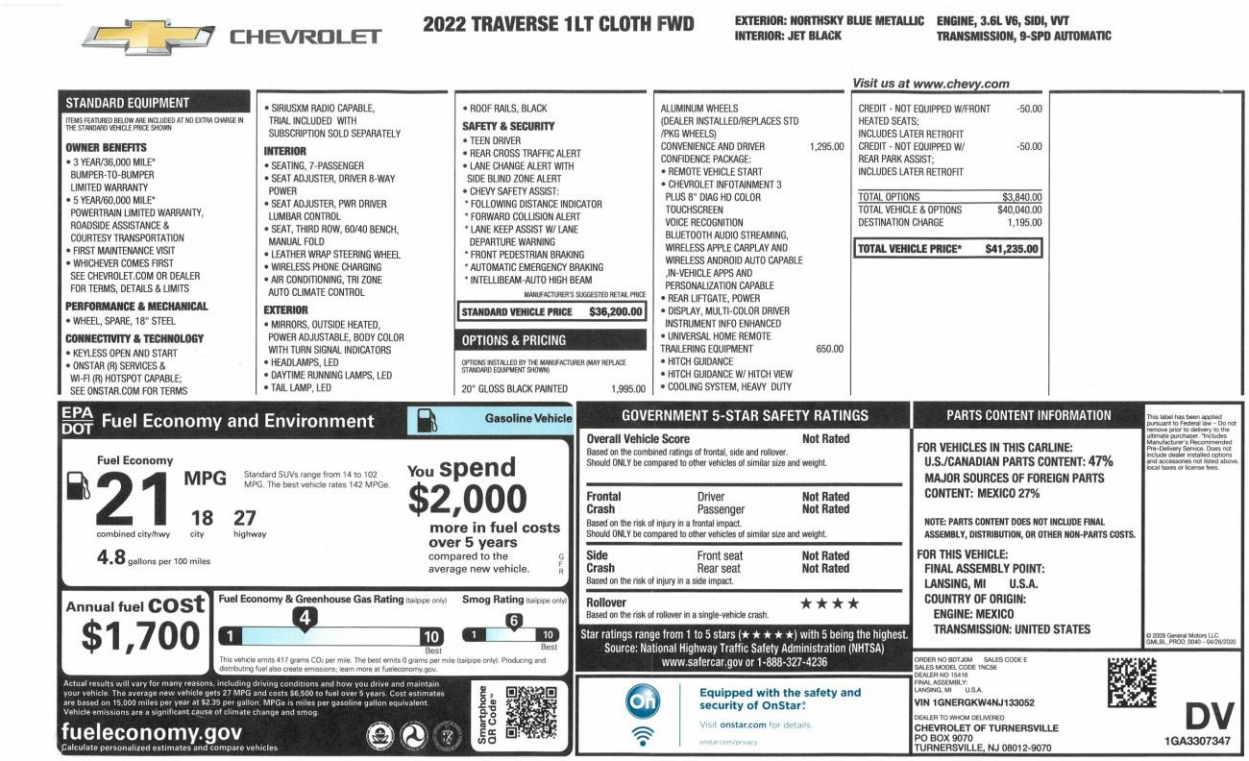
098 FMVSS No. 301 Static Rollover 180 Degrees



099 FMVSS No. 301 Static Rollover 270 Degrees

100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event



CHEVROLET

2022 TRAVERSE 1LT CLOTH FWD

EXTERIOR: NORTHSKY BLUE METALLIC
INTERIOR: JET BLACK

ENGINE, 3.6L V6, SIDI, VVT
TRANSMISSION, 9-SPD AUTOMATIC

Visit us at www.chevy.com

STANDARD EQUIPMENT

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

OWNER BENEFITS
- 3 YEAR/36,000 MILE* BUMPER-TO-BUMPER LIMITED WARRANTY
- 5 YEAR/60,000 MILE* POWERTRAIN LIMITED WARRANTY, ROADSIDE ASSISTANCE & COURTESY TRANSPORTATION
- FIRST MAINTENANCE VISIT
- WHICHEVER COMES FIRST SEE CHEVROLET.COM OR DEALER FOR TERMS, DETAILS & LIMITS

PERFORMANCE & MECHANICAL
- WHEEL, SPARE, 18" STEEL

CONNECTIVITY & TECHNOLOGY
- KEYLESS OPEN AND START
- ONSTAR (R) SERVICES & WI-FI (R) HOTSPOT CAPABLE; SEE ONSTAR.COM FOR TERMS
- SIRIUSXM RADIO CAPABLE, TRIAL INCLUDED WITH SUBSCRIPTION SOLD SEPARATELY

INTERIOR
- SEATING, 7-PASSENGER
- SEAT ADJUSTER, DRIVER 8-WAY POWER
- SEAT ADJUSTER, PWR DRIVER LUMBAR CONTROL
- SEAT, THIRD ROW, 60/40 BENCH, MANUAL FOLD
- LEATHER WRAP STEERING WHEEL
- WIRELESS PHONE CHARGING
- AIR CONDITIONING, TRI ZONE AUTO CLIMATE CONTROL

EXTERIOR
- MIRRORS, OUTSIDE HEATED, POWER ADJUSTABLE, BODY COLOR WITH TURN SIGNAL INDICATORS
- HEADLAMPS, LED
- DAYTIME RUNNING LAMPS, LED
- TAIL LAMP, LED
- ROOF RAILS, BLACK

SAFETY & SECURITY
- TEEN DRIVER
- REAR CROSS TRAFFIC ALERT
- LANE CHANGE ALERT WITH SIDE BLIND ZONE ALERT
- CHEVY SAFETY ASSIST:
  - FOLLOWING DISTANCE INDICATOR
  - FORWARD COLLISION ALERT
  - LANE KEEP ASSIST W/ LANE DEPARTURE WARNING
  - FRONT PEDESTRIAN BRAKING
  - AUTOMATIC EMERGENCY BRAKING
  - INTELLIBEAM-AUTO HIGH BEAM

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE	**$36,200.00**

OPTIONS & PRICING

OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

20" GLOSS BLACK PAINTED	1,995.00
ALUMINUM WHEELS (DEALER INSTALLED/REPLACES STD /PKG WHEELS)	
CONVENIENCE AND DRIVER CONFIDENCE PACKAGE:	1,295.00
• REMOTE VEHICLE START	
• CHEVROLET INFOTAINMENT 3 PLUS 8" DIAG HD COLOR TOUCHSCREEN VOICE RECOGNITION BLUETOOTH AUDIO STREAMING, WIRELESS APPLE CARPLAY AND WIRELESS ANDROID AUTO CAPABLE /IN-VEHICLE APPS AND PERSONALIZATION CAPABLE	
• REAR LIFTGATE, POWER	
• DISPLAY, MULTI-COLOR DRIVER INSTRUMENT INFO ENHANCED	
• UNIVERSAL HOME REMOTE	
TRAILERING EQUIPMENT	650.00
• HITCH GUIDANCE	
• HITCH GUIDANCE W/ HITCH VIEW	
• COOLING SYSTEM, HEAVY DUTY	
CREDIT - NOT EQUIPPED W/FRONT HEATED SEATS; INCLUDES LATER RETROFIT	-50.00
CREDIT - NOT EQUIPPED W/ REAR PARK ASSIST; INCLUDES LATER RETROFIT	-50.00
TOTAL OPTIONS	$3,840.00
TOTAL VEHICLE & OPTIONS	$40,040.00
DESTINATION CHARGE	1,195.00
TOTAL VEHICLE PRICE*	**$41,235.00**

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy: **21 MPG** combined city/hwy (18 city, 27 highway). Standard SUVs range from 14 to 102 MPG. The best vehicle rates 142 MPGe.

4.8 gallons per 100 miles

You spend **$2,000** more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost **$1,700**

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 4 (1–10, Best)

Smog Rating (tailpipe only): 6 (1–10, Best)

This vehicle emits 417 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $6,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.39 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code™

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score — Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver	Not Rated
	Passenger	Not Rated

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat	Not Rated
	Rear seat	Not Rated

Based on the risk of injury in a side impact.

Rollover — ★★★★
Based on the risk of rollover in a single-vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

Equipped with the safety and security of OnStar:
Visit onstar.com for details.
onstar.com/privacy

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 47%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 27%

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

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

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

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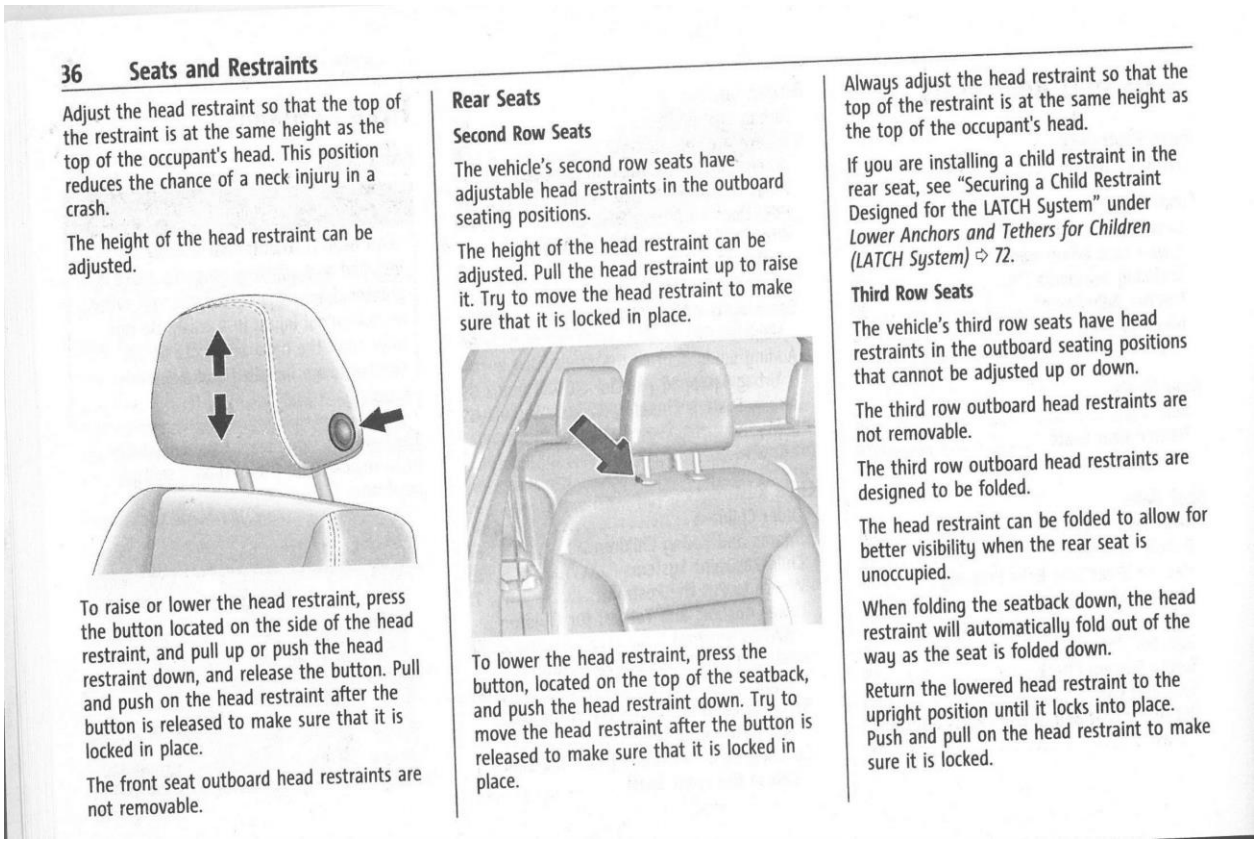
ORDER NO BDTJDM SALES CODE E
SALES MODEL CODE 1NC56
DEALER NO 19416
FINAL ASSEMBLY: LANSING, MI U.S.A.

VIN 1GNERGKW4NJ133052

DEALER TO WHOM DELIVERED
CHEVROLET OF TURNERSVILLE
PO BOX 9070
TURNERSVILLE, NJ 08012-9070

DV
1GA3307347

102 Monroney Label



36 Seats and Restraints

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

The height of the head restraint can be adjusted.

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

The front seat outboard head restraints are not removable.

Rear Seats

Second Row Seats

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

The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure that it is locked in place.

To lower the head restraint, press the button, located on the top of the seatback, and push the head restraint down. Try to move the head restraint after the button is released to make sure that it is locked in place.

Always adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head.

If you are installing a child restraint in the rear seat, see "Securing a Child Restraint Designed for the LATCH System" under *Lower Anchors and Tethers for Children (LATCH System)* ⇨ 72.

Third Row Seats

The vehicle's third row seats have head restraints in the outboard seating positions that cannot be adjusted up or down.

The third row outboard head restraints are not removable.

The third row outboard head restraints are designed to be folded.

The head restraint can be folded to allow for better visibility when the rear seat is unoccupied.

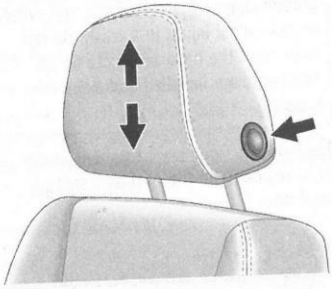
When folding the seatback down, the head restraint will automatically fold out of the way as the seat is folded down.

Return the lowered head restraint to the upright position until it locks into place. Push and pull on the head restraint to make sure it is locked.

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

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

The height of the head restraint can be adjusted.



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

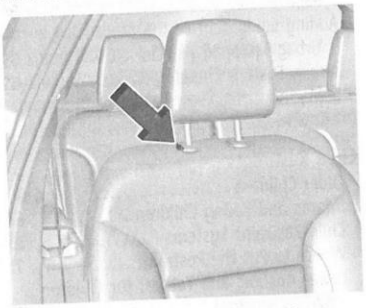
The front seat outboard head restraints are not removable.

Rear Seats

Second Row Seats

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

The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure that it is locked in place.



To lower the head restraint, press the button, located on the top of the seatback, and push the head restraint down. Try to move the head restraint after the button is released to make sure that it is locked in place.

Always adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head.

If you are installing a child restraint in the rear seat, see "Securing a Child Restraint Designed for the LATCH System" under *Lower Anchors and Tethers for Children (LATCH System)* ⇨ 72.

Third Row Seats

The vehicle's third row seats have head restraints in the outboard seating positions that cannot be adjusted up or down.

The third row outboard head restraints are not removable.

The third row outboard head restraints are designed to be folded.

The head restraint can be folded to allow for better visibility when the rear seat is unoccupied.

When folding the seatback down, the head restraint will automatically fold out of the way as the seat is folded down.

Return the lowered head restraint to the upright position until it locks into place. Push and pull on the head restraint to make sure it is locked.

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

[1] Label has wrong year for testing date. Should be 9/27/22

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: 09/27/2022

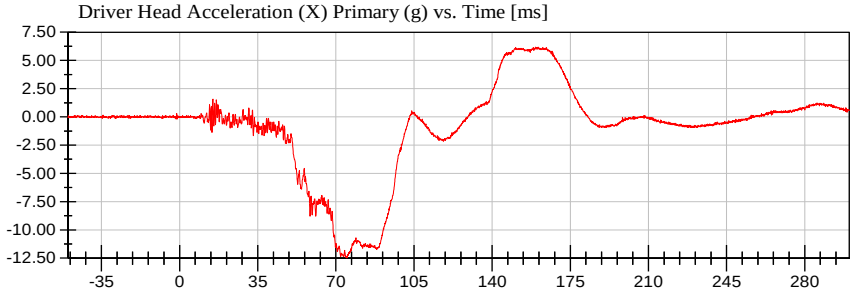
Test Lab: CTF

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

Test Number: 220927 (M20220109)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

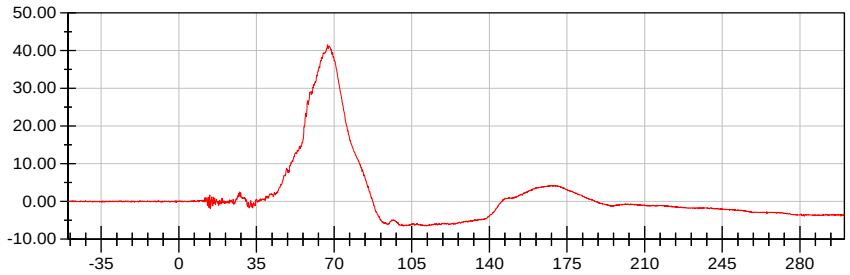
6.19 g at 159.36 ms

<Min>

-12.48 g at 74.96 ms

CFC_1000

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



<Max>

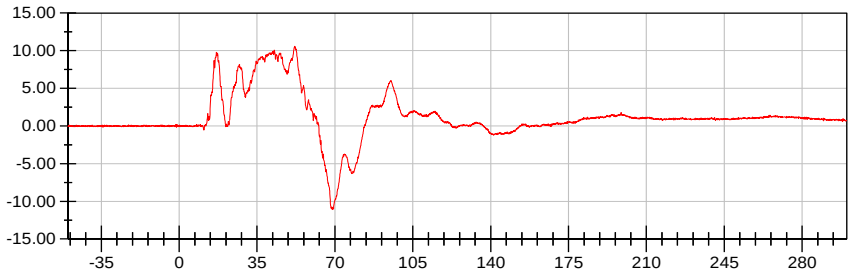
41.57 g at 67.04 ms

<Min>

-6.54 g at 101.28 ms

CFC_1000

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



<Max>

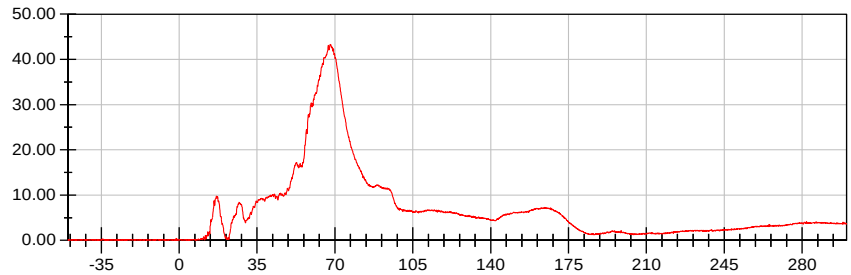
10.58 g at 51.84 ms

<Min>

-11.10 g at 68.80 ms

CFC_1000

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



<Max>

43.32 g at 67.92 ms

<Min>

0.04 g at -49.84 ms

CFC_1000

NHTSA

Test Date: 09/27/2022

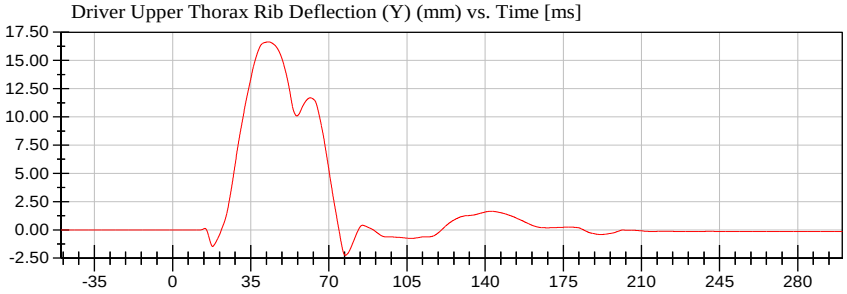
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 220927 (M20220109)

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



<Max>

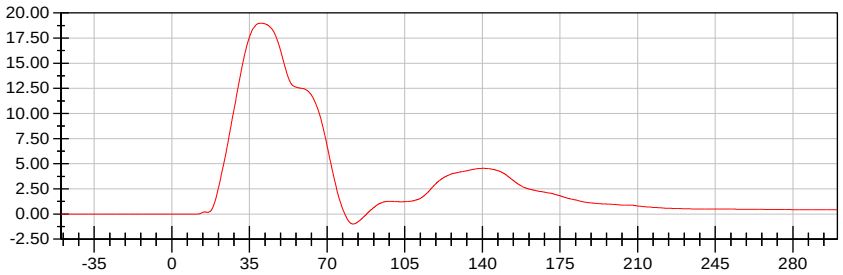
16.64 mm at 42.88 ms

<Min>

-2.25 mm at 77.36 ms

CFC_180

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



<Max>

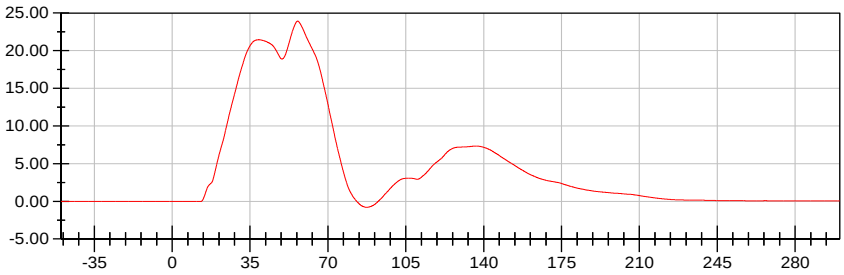
18.98 mm at 40.24 ms

<Min>

-0.99 mm at 81.68 ms

CFC_180

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



<Max>

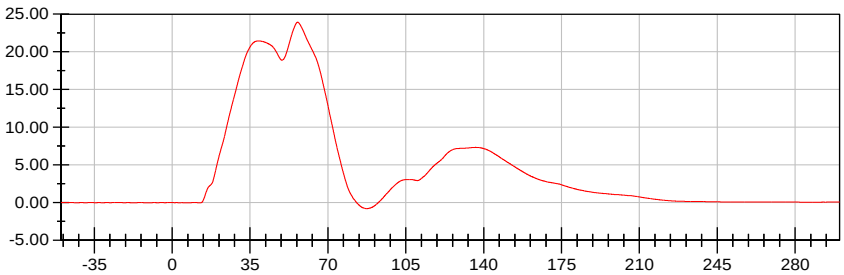
23.94 mm at 56.40 ms

<Min>

-0.79 mm at 87.52 ms

CFC_180

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



<Max>

23.94 mm at 56.40 ms

<Min>

-0.79 mm at 87.52 ms

CFC_180

NHTSA

Test Date: 09/27/2022

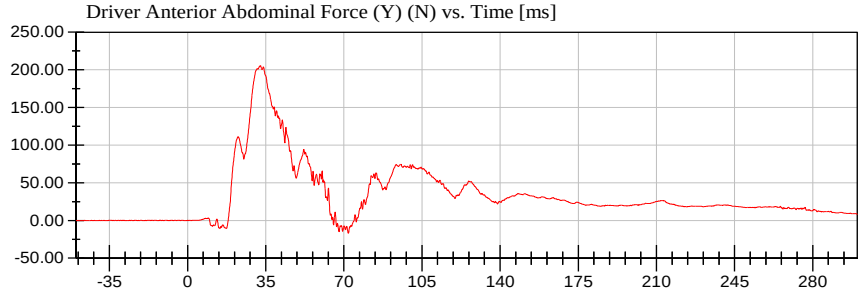
Test Lab: CTF

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

Test Number: 220927 (M20220109)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

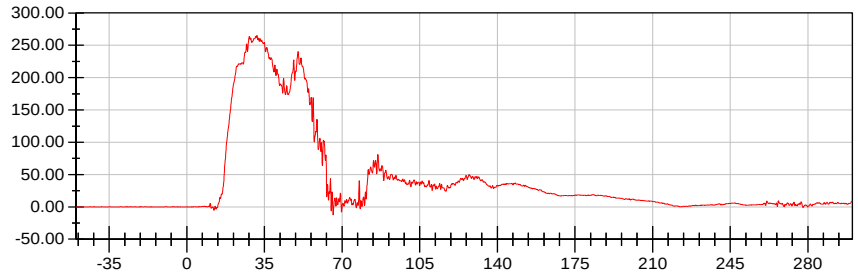
205.52 N at 32.64 ms

<Min>

-17.13 N at 72.00 ms

CFC_600

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



<Max>

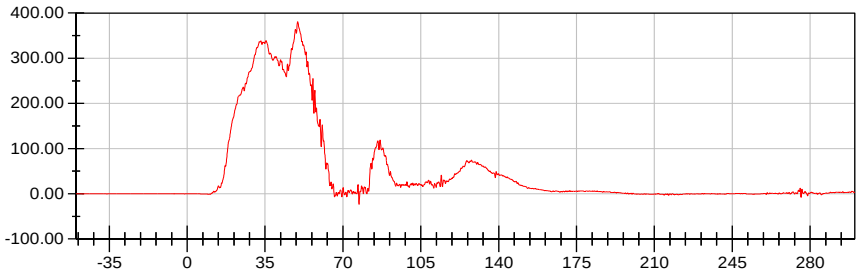
265.16 N at 31.60 ms

<Min>

-12.44 N at 66.00 ms

CFC_600

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



<Max>

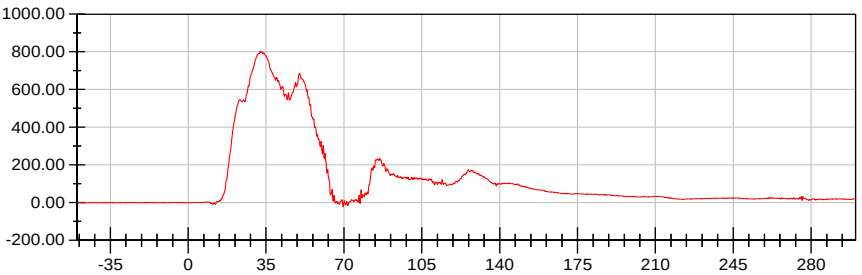
380.54 N at 49.60 ms

<Min>

-23.90 N at 77.20 ms

CFC_600

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



<Max>

802.22 N at 32.40 ms

<Min>

-22.22 N at 69.68 ms

CFC_600

NHTSA

Test Date: 09/27/2022

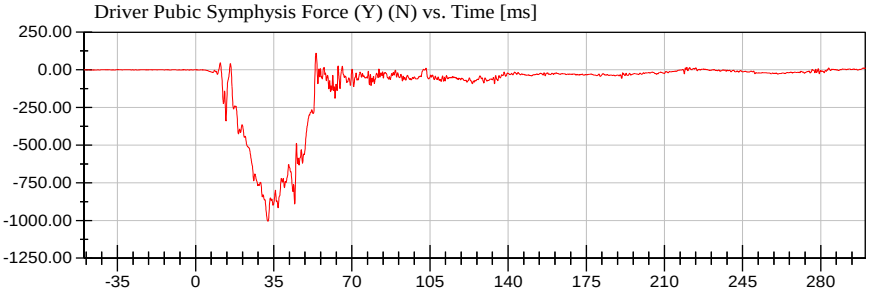
Test Lab: CTF

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

Test Number: 220927 (M20220109)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

110.88 N at 54.00 ms

<Min>

-1,006.18 N at 32.48 ms

CFC_600

NHTSA

Test Date: 09/27/2022

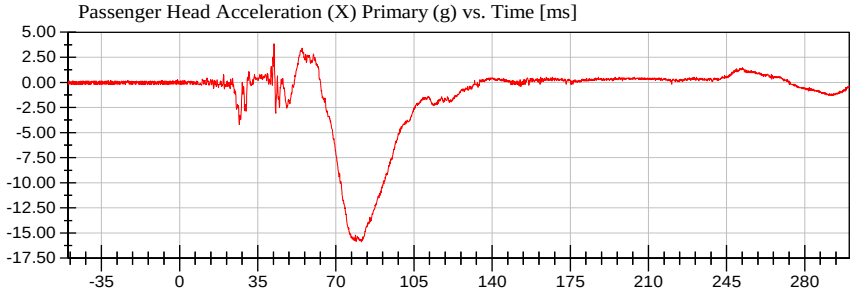
Test Lab: CTF

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

Test Number: 220927 (M20220109)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

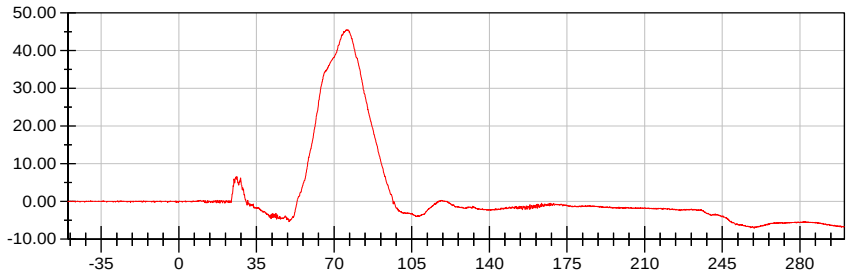
3.85 g at 42.32 ms

<Min>

-15.89 g at 81.44 ms

CFC_1000

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



<Max>

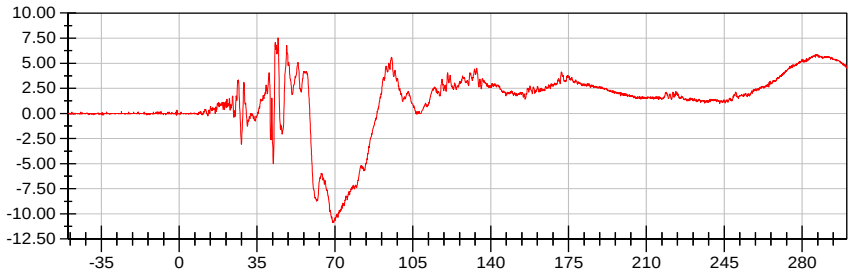
45.57 g at 75.60 ms

<Min>

-7.13 g at 259.44 ms

CFC_1000

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



<Max>

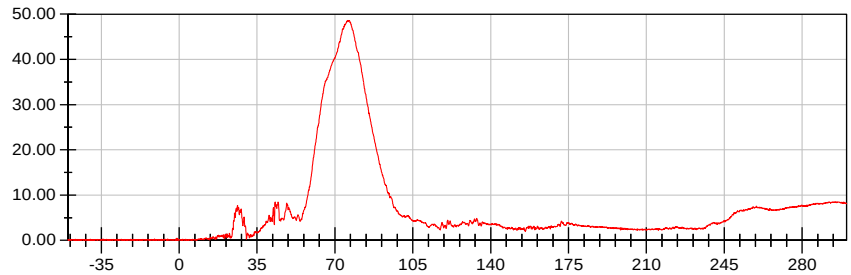
7.53 g at 44.48 ms

<Min>

-10.86 g at 68.96 ms

CFC_1000

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



<Max>

48.62 g at 76.40 ms

<Min>

0.01 g at -49.84 ms

CFC_1000

NHTSA

Test Date: 09/27/2022

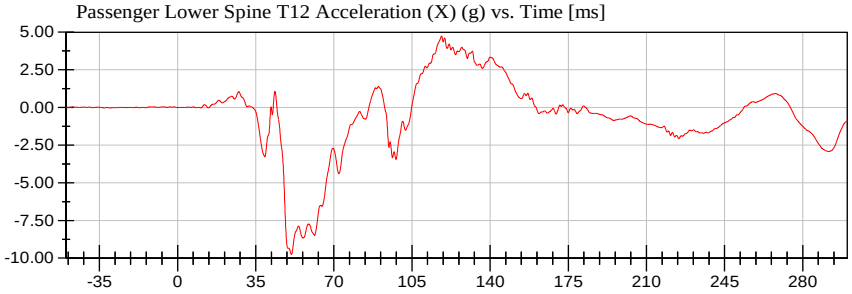
Test Lab: CTF

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

Test Number: 220927 (M20220109)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

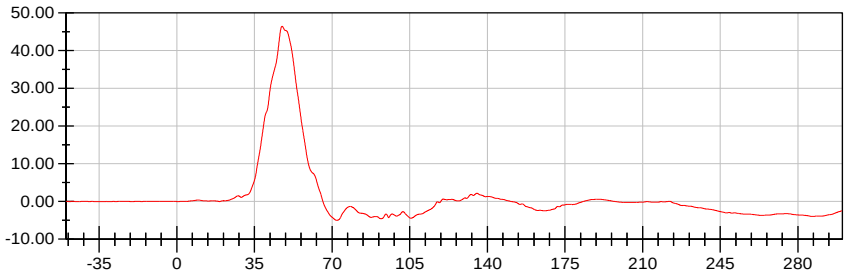
4.74 g at 118.24 ms

<Min>

-9.75 g at 51.04 ms

CFC_180

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



<Max>

46.47 g at 47.52 ms

<Min>

-4.98 g at 71.92 ms

CFC_180

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

<Max>

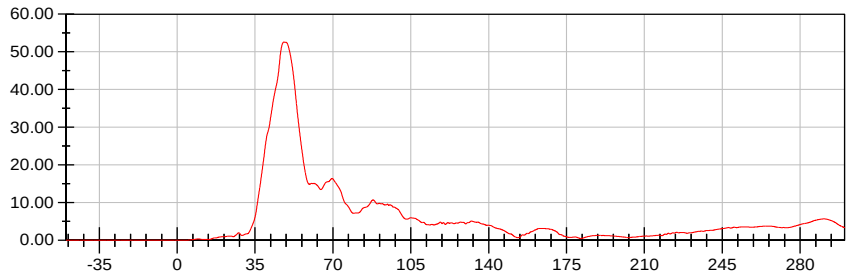
15.65 g at 69.52 ms

<Min>

-24.95 g at 48.72 ms

CFC_180

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



<Max>

52.58 g at 48.00 ms

<Min>

0.00 g at 1.36 ms

CFC_180

NHTSA

Test Date: 09/27/2022

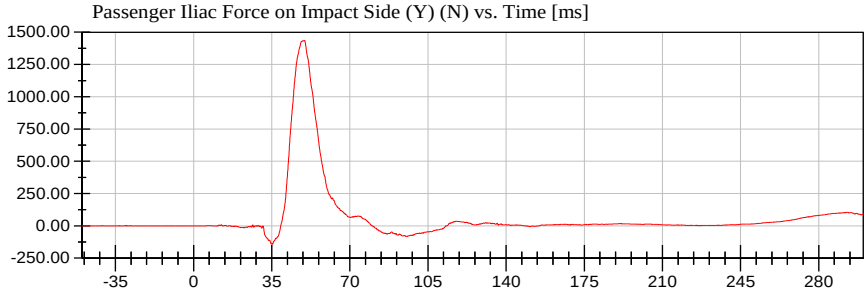
Test Lab: CTF

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

Test Number: 220927 (M20220109)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

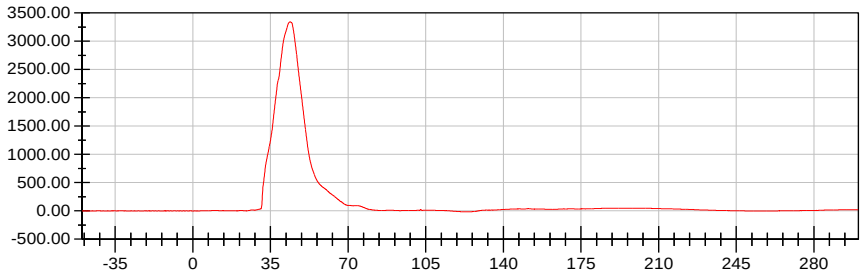
1,435.97 N at 49.68 ms

<Min>

-143.07 N at 35.36 ms

CFC_600

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



<Max>

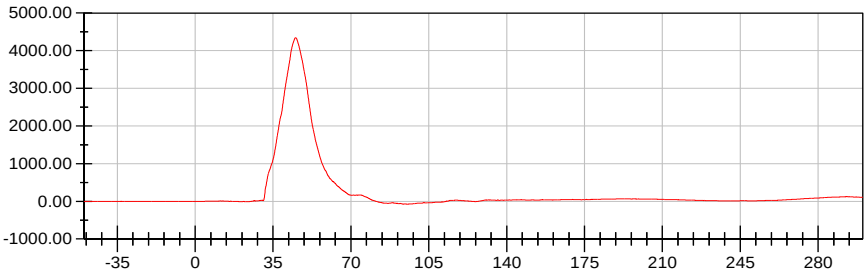
3,343.31 N at 43.92 ms

<Min>

-16.86 N at 122.72 ms

CFC_600

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



<Max>

4,346.04 N at 45.04 ms

<Min>

-75.85 N at 95.52 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

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

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

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

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

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

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

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

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

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 83

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	443	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	279	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. 82-2
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Peak Resultant Acceleration	125 - 155 g	146.6 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	9.4 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	3.97 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

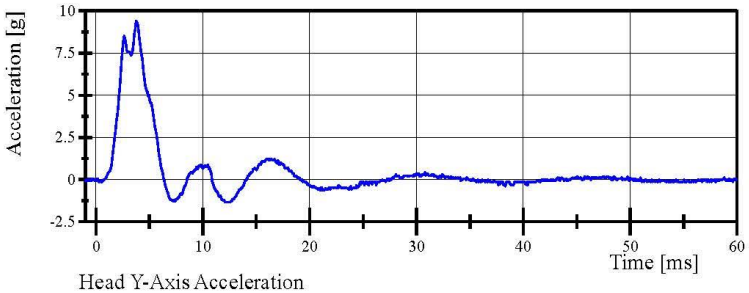
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

09.22.2022 12:41:12 361

Transportation Research Center Inc.

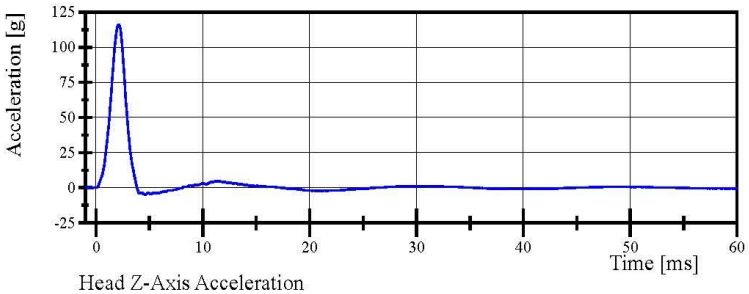
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 82-2
Test Date: 9/22/2022

Head X-Axis Acceleration



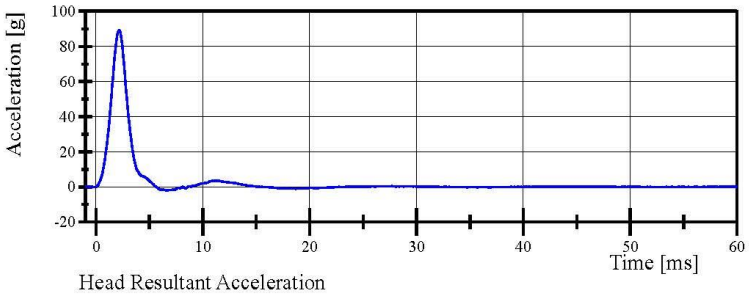
Filter Class: CFC_1000
Max: 9.4 g at 3.8 ms
Min: -1.4 g at 12.1 ms

Head Y-Axis Acceleration



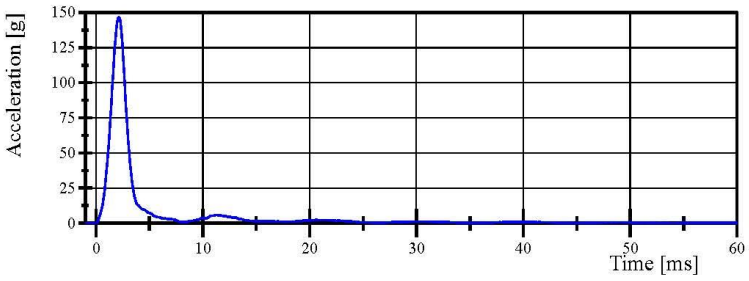
Filter Class: CFC_1000
Max: 116.2 g at 2.2 ms
Min: -4.9 g at 4.6 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 89.2 g at 2.2 ms
Min: -1.9 g at 6.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 146.6 g at 2.2 ms
Min: 0.0 g at -0.8 ms

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

09.22.2022 12:41:51 361

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/23/2022

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	-3.33 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-51.1 deg	Yes
Time of Peak	54 - 66 ms	55.2 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	56.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 05053

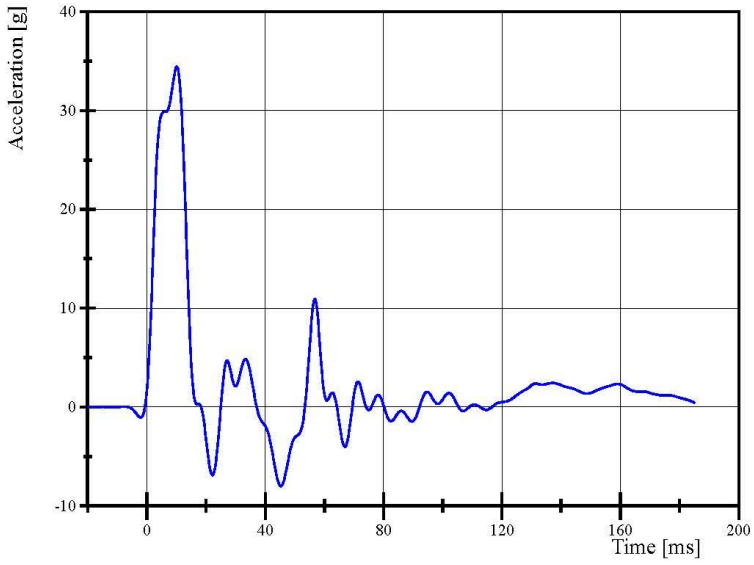
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

09.23.2022 10:08:31 1510

Transportation Research Center Inc.

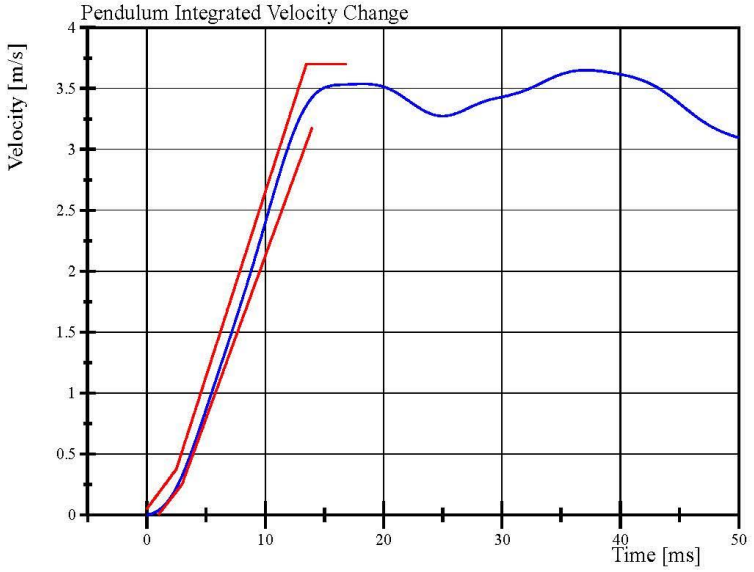
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/23/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 34.4 g at 10.1 ms
Min: -8.0 g at 45.3 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.7 m/s at 37.0 ms
Min: 0.0 m/s at 0.0 ms

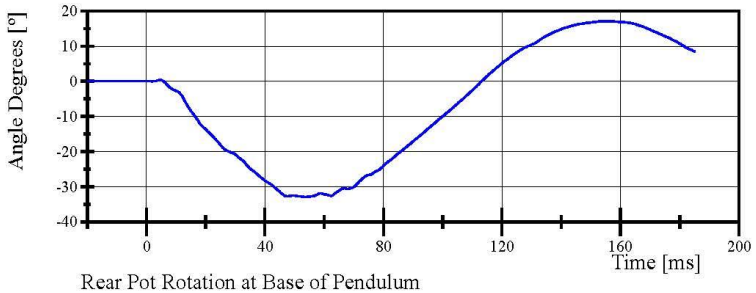
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.23.2022 10:19:26 1510

Transportation Research Center Inc.

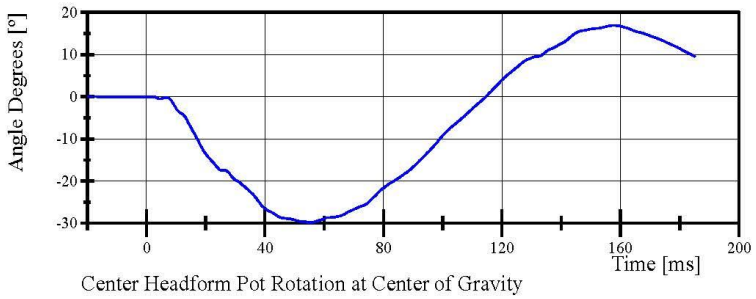
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/23/2022

Forward Pot Rotation at Base of Pendulum



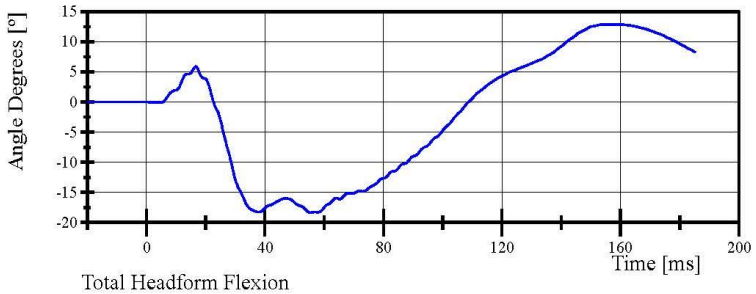
Filter Class: CFC_180
Max: 17.1 ° at 154.7 ms
Min: -32.9 ° at 53.7 ms

Rear Pot Rotation at Base of Pendulum



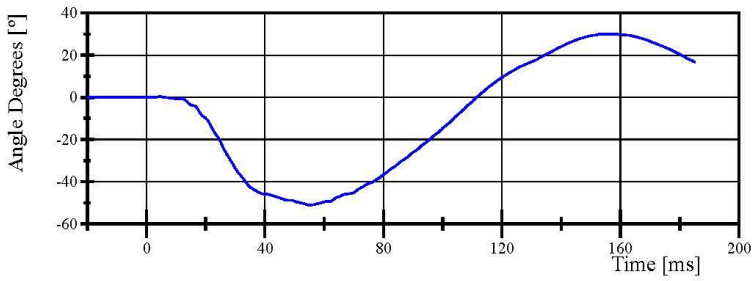
Filter Class: CFC_180
Max: 16.9 ° at 157.8 ms
Min: -29.8 ° at 55.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 12.9 ° at 154.2 ms
Min: -18.4 ° at 55.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 30.0 ° at 154.6 ms
Min: -51.1 ° at 55.2 ms

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

09.23.2022 10:19:26 1510

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/23/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.71 g	Yes

Test meets specifications.

Condition: Used

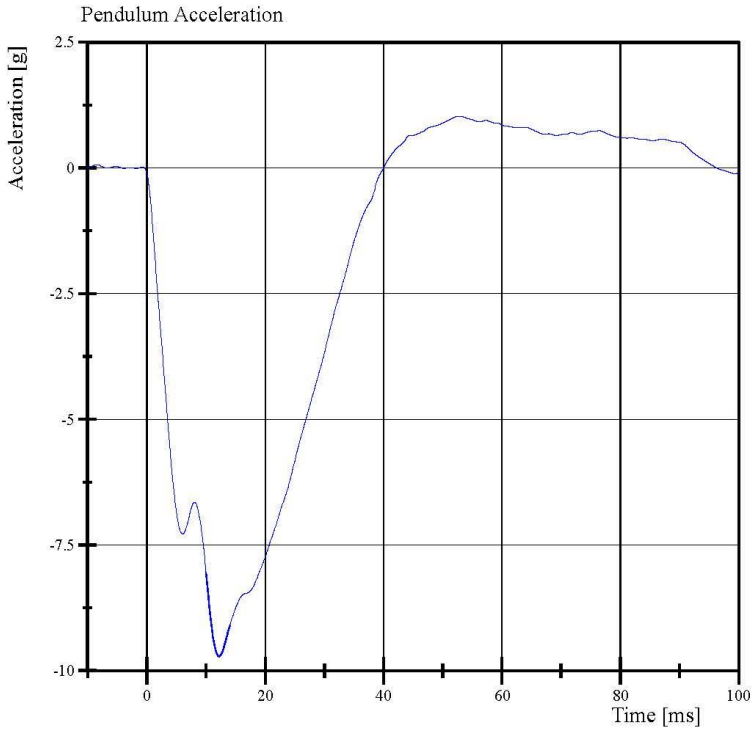
Comments:
Arm S/N: 175-3501-07014

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

09.23.2022 13:30:16 711

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/23/2022



Filter Class: CFC_180
Max: 1.0 g at 52.7 ms
Min: -9.7 g at 12.2 ms

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

09.23.2022 13:30:50 711

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	61 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

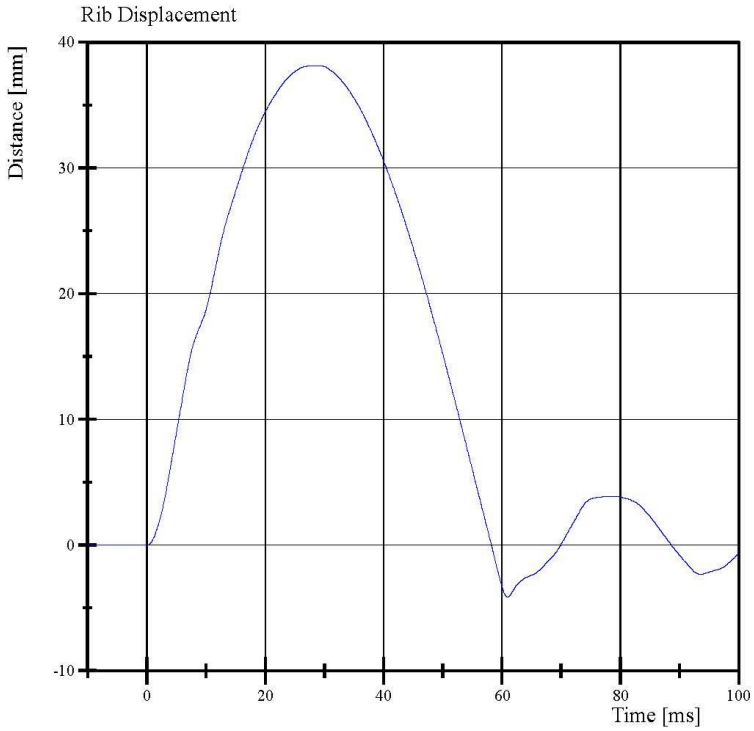
Condition: Used
Comments:
Drop Height: 462 mm
Rib Foam S/N: EK6973

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

09.22.2022 09:15:26 627

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022



Filter Class: CFC_180
Max: 38.1 mm at 29.0 ms
Min: -4.1 mm at 61.0 ms

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

09.22.2022 09:16:03 627

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	60 %	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

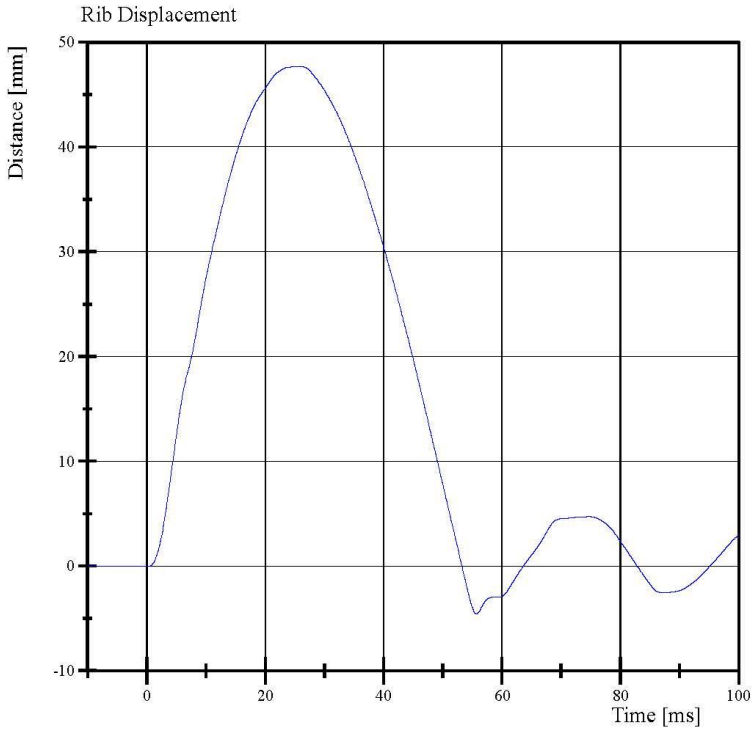
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6973

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

09.22.2022 09:09:37 526

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022



Filter Class: CFC_180
Max: 47.7 mm at 26.1 ms
Min: -4.6 mm at 55.7 ms

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

09.22.2022 09:10:19 526

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.6 mm	Yes

Test meets specifications.

Condition: Used

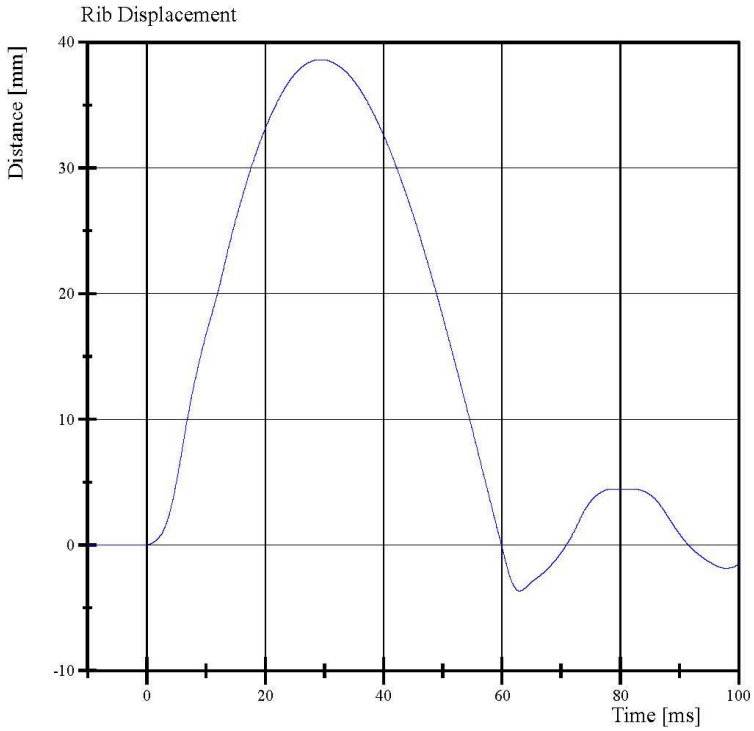
Comments:
Drop Height: 462mm
Rib Foam S/N: EK6970

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

09.22.2022 09:28:06 611

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022



Filter Class: CFC_180
Max: 38.6 mm at 29.4 ms
Min: -3.7 mm at 63.0 ms

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

09.22.2022 09:28:38 611

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	50.1 mm	Yes

Test meets specifications.

Condition: Used

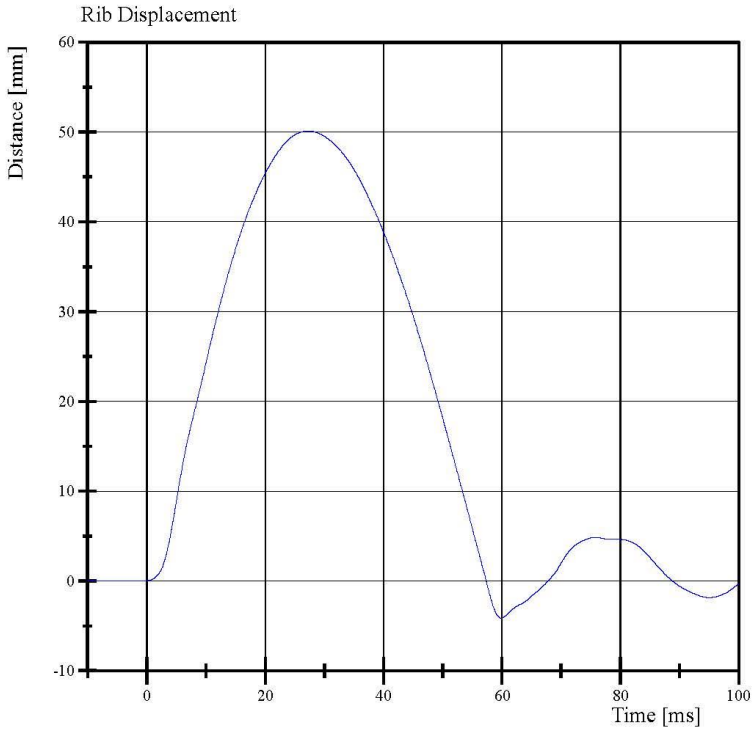
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6970

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

09.22.2022 09:22:48 519

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022



Filter Class: CFC_180
Max: 50.1 mm at 27.3 ms
Min: -4.1 mm at 59.8 ms

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

09.22.2022 09:23:25 519

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.9 mm	Yes

Test meets specifications.

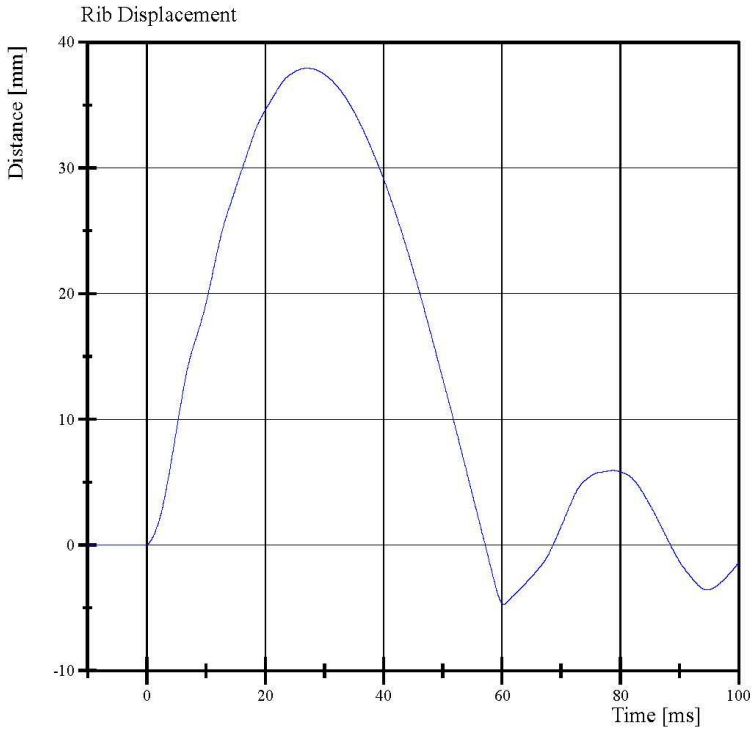
Condition: Used
Comments:
Drop Height: 462 mm
Rib Foam S/N: EK6971

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

09.22.2022 09:47:17 638

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022



Filter Class: CFC_180
Max: 37.9 mm at 27.0 ms
Min: -4.7 mm at 60.3 ms

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

09.22.2022 09:47:56 638

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.8 mm	Yes

Test meets specifications.

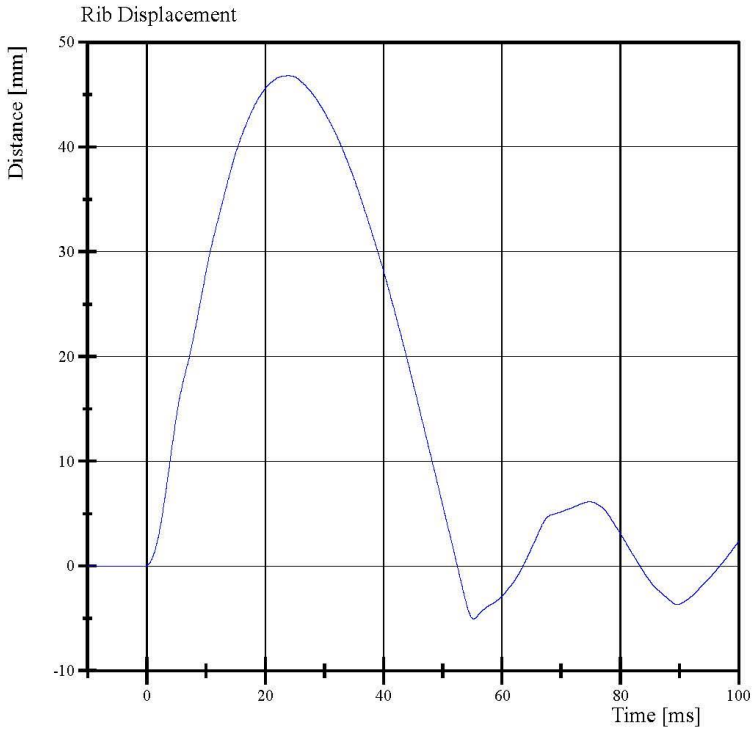
Condition: Used
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6971

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

09.22.2022 09:42:03 543

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/22/2022



Filter Class: CFC_180
Max: 46.8 mm at 23.9 ms
Min: -5.1 mm at 55.2 ms

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

09.22.2022 09:42:51 543

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 82-3
Test Date: 9/26/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.464 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,352.3 N	Yes
Upper Rib Displacement	34 - 41 mm	38.5 mm	Yes
Center Rib Displacement	37 - 45 mm	41.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.5 mm	Yes

Test meets specifications.

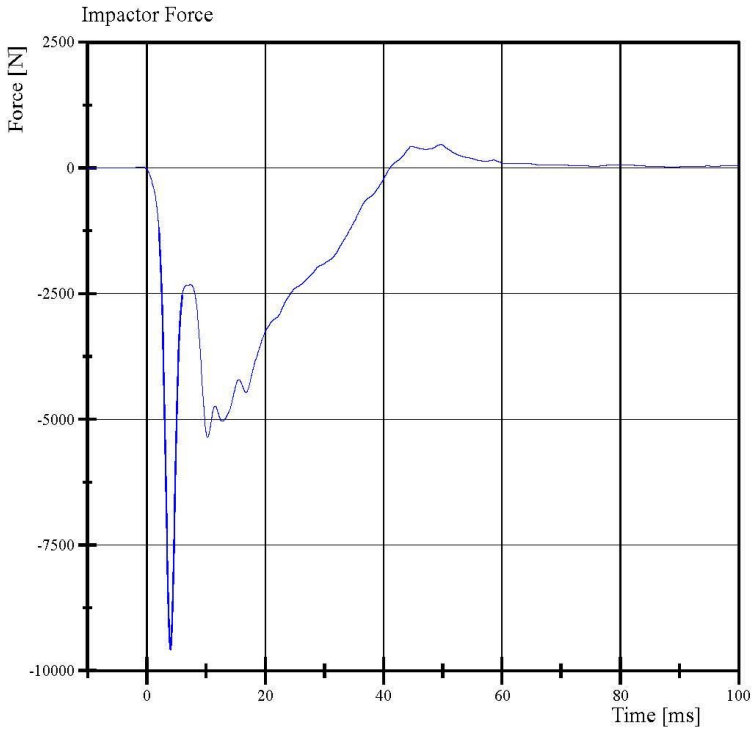
Condition: Used
Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

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

09.26.2022 07:49:19 578

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 82-3
Test Date: 9/26/2022



Filter Class: CFC_180
Max: 465.5 N at 49.7 ms
Min: -9,576.8 N at 4.0 ms

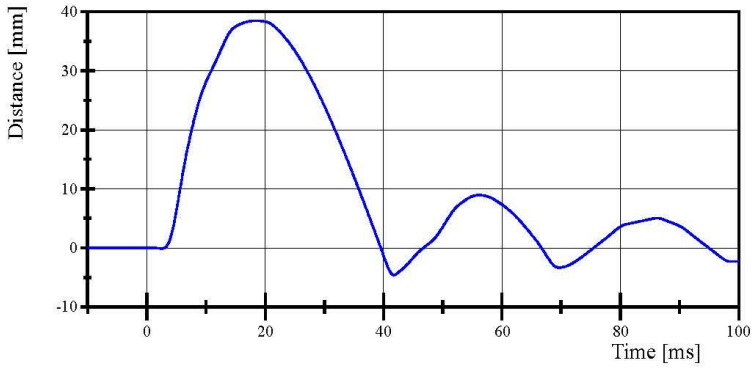
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.26.2022 07:50:30 578

Transportation Research Center Inc.

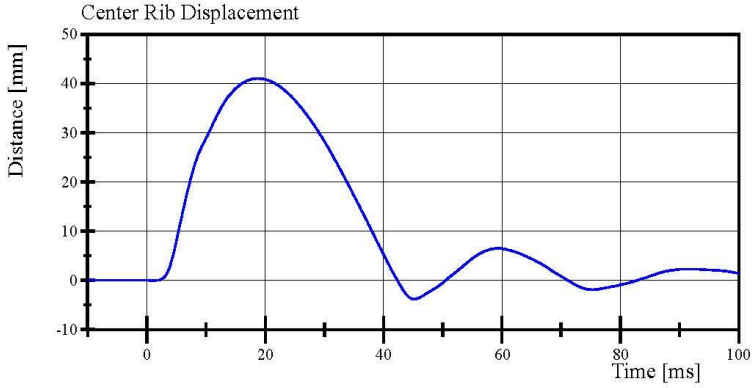
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 82-3
Test Date: 9/26/2022

Upper Rib Displacement



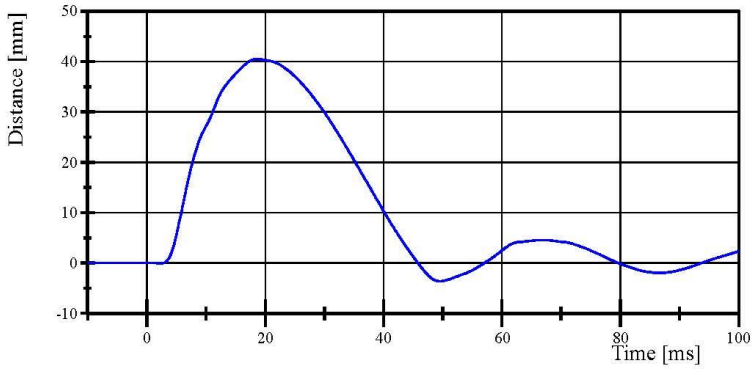
Filter Class: CFC_180
Max: 38.5 mm at 18.5 ms
Min: -4.6 mm at 41.8 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.0 mm at 18.7 ms
Min: -3.8 mm at 45.1 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.5 mm at 18.6 ms
Min: -3.6 mm at 49.5 ms

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

09.26.2022 07:50:30 578

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 83-4
Test Date: 9/26/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.147 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-45.5 deg	Yes
Time of Peak	39 - 53 ms	40.1 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	39.9 ms	Yes

Test meets specifications.

Condition: New

Comments:
Lumbar S/N: DS3472

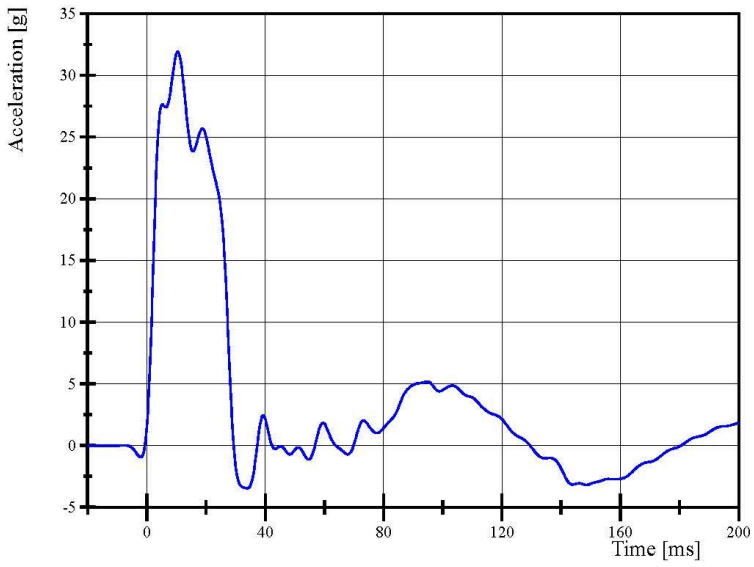
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

09.26.2022 21:07:07 667

Transportation Research Center Inc.

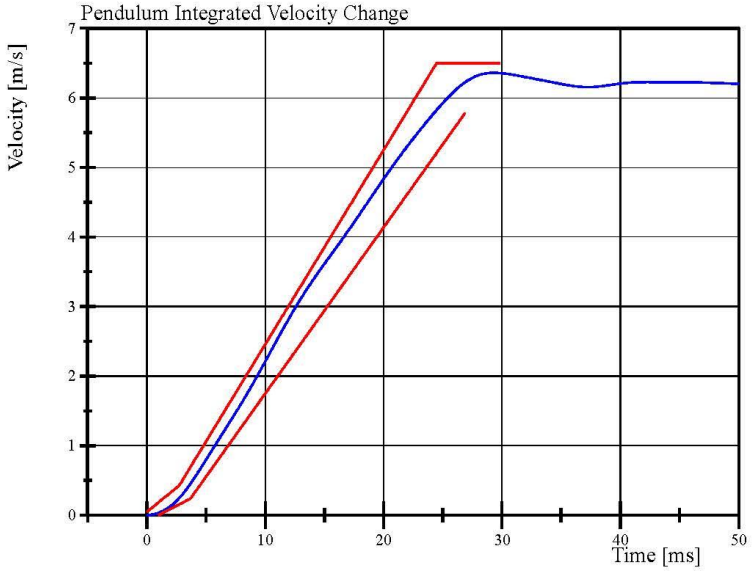
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 83-4
Test Date: 9/26/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.9 g at 10.4 ms
Min: -3.5 g at 33.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.4 m/s at 29.4 ms
Min: 0.0 m/s at 0.0 ms

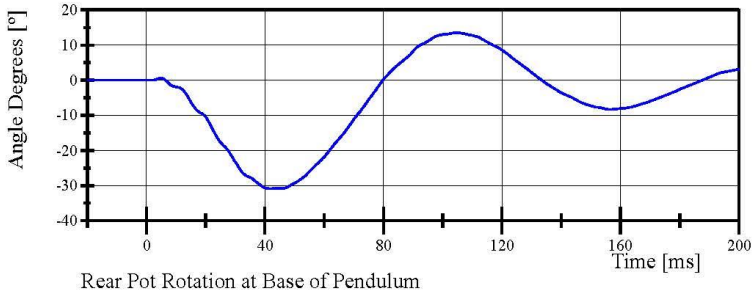
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.26.2022 21:11:33 667

Transportation Research Center Inc.

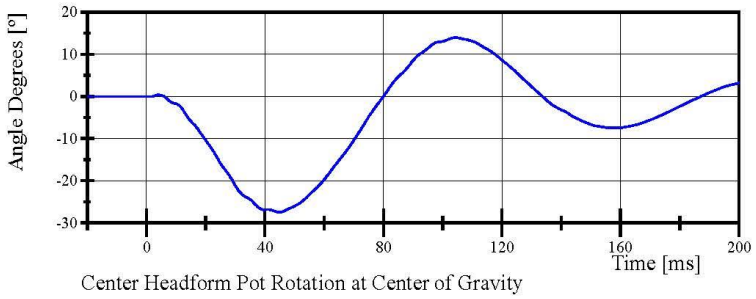
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 83-4
Test Date: 9/26/2022

Forward Pot Rotation at Base of Pendulum



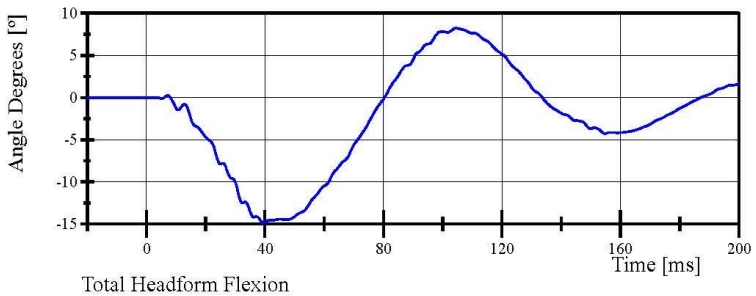
Filter Class: CFC_180
Max: 13.6 ° at 104.7 ms
Min: -30.9 ° at 41.8 ms

Rear Pot Rotation at Base of Pendulum



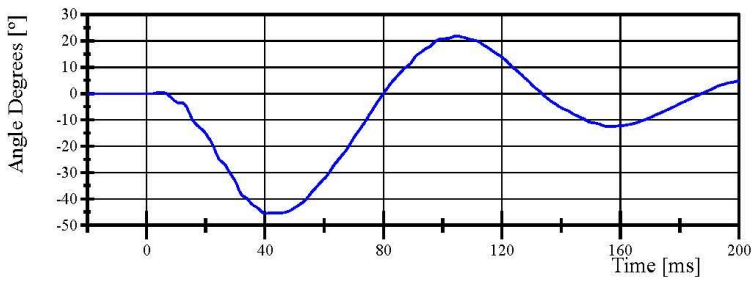
Filter Class: CFC_180
Max: 13.9 ° at 104.4 ms
Min: -27.5 ° at 45.0 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 8.2 ° at 104.5 ms
Min: -14.9 ° at 39.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 21.8 ° at 104.6 ms
Min: -45.5 ° at 40.1 ms

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

09.26.2022 21:11:33 667

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/26/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.06 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,393.4 N	Yes
Time of Peak	10.6 - 13.0 ms	12.32 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,340.3 N	Yes
Time of Peak	10.0 - 12.3 ms	11.92 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Abdomen S/N: 1066

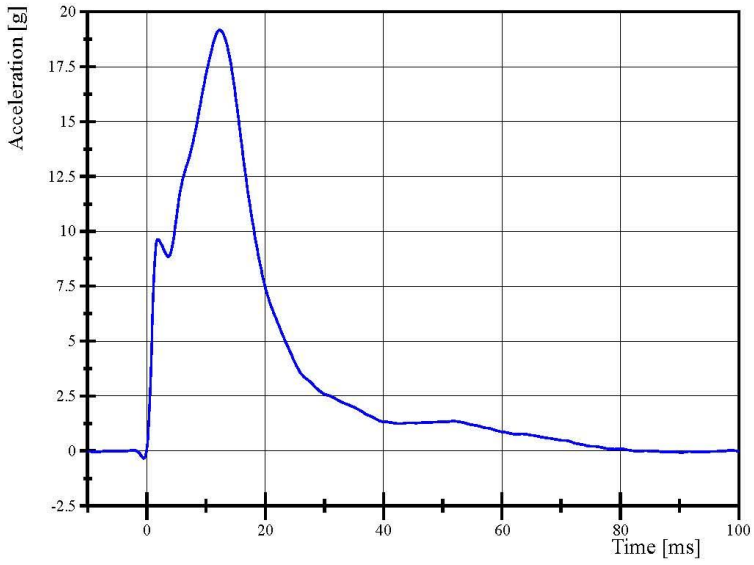
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.26.2022 08:27:24 690

Transportation Research Center Inc.

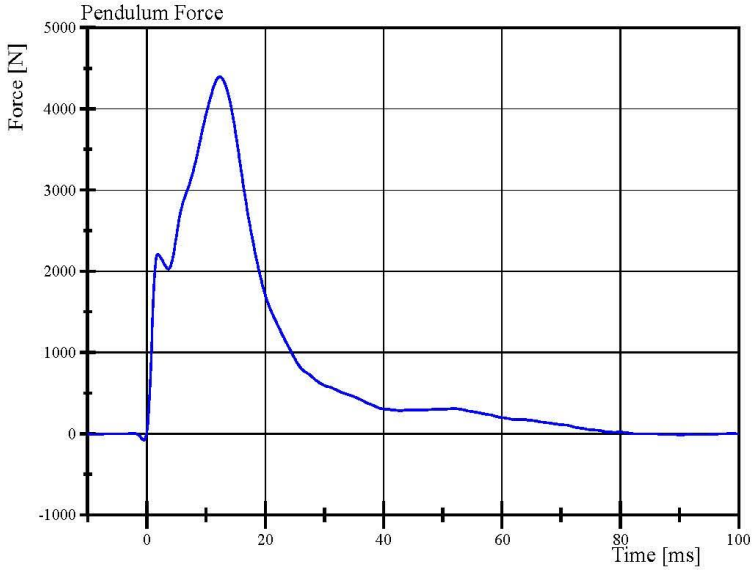
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/26/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 19.2 g at 12.3 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,393.4 N at 12.3 ms
Min: -77.1 N at -0.5 ms

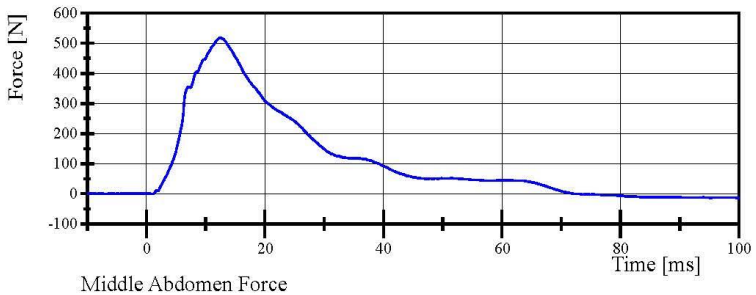
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.26.2022 08:28:49 690

Transportation Research Center Inc.

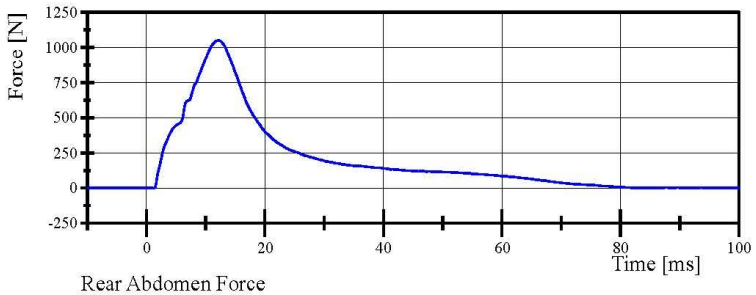
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 82-1
Test Date: 9/26/2022

Front Abdomen Force



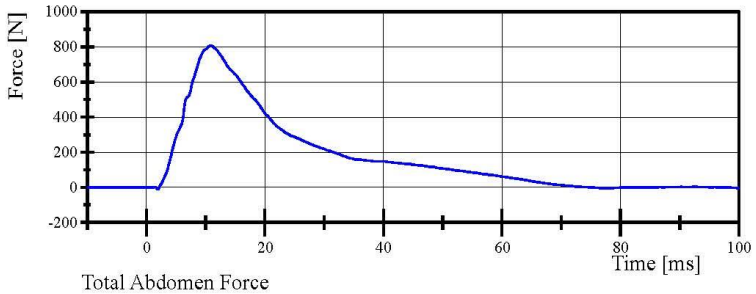
Filter Class: CFC_600
Max: 517.5 N at 12.4 ms
Min: -13.5 N at 99.8 ms

Middle Abdomen Force



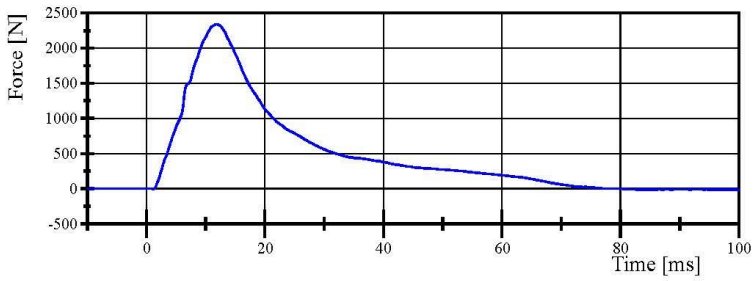
Filter Class: CFC_600
Max: 1,050.8 N at 12.2 ms
Min: -2.1 N at 1.2 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 808.0 N at 10.9 ms
Min: -11.3 N at 1.9 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,340.3 N at 11.9 ms
Min: -16.8 N at 99.9 ms

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

09.26.2022 08:28:50 690

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 82-2
Test Date: 9/26/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,081.3 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,287.1 N	Yes
Time of Peak	12.2 - 17.0 ms	13.68 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: N/A

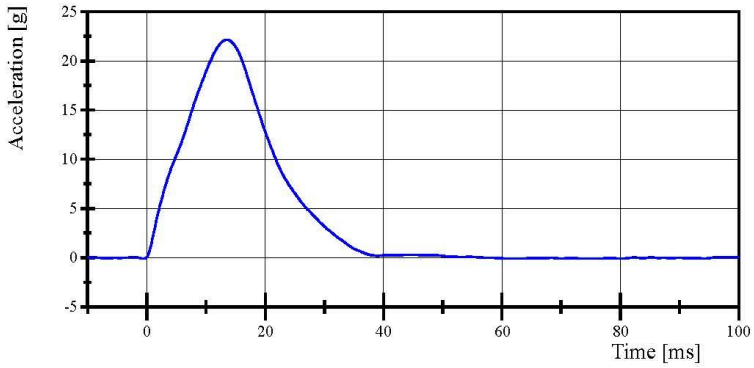
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.26.2022 09:10:43 596

Transportation Research Center Inc.

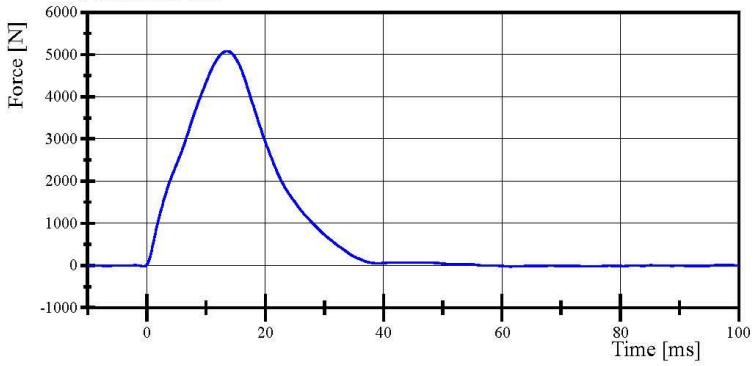
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 82-2
Test Date: 9/26/2022

Pendulum Acceleration



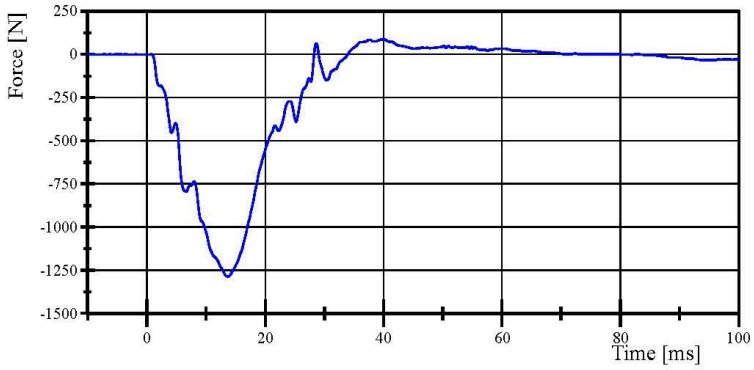
Filter Class: CFC_180
Max: 22.2 g at 13.5 ms
Min: -0.1 g at 61.4 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,081.3 N at 13.5 ms
Min: -20.7 N at 61.4 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 87.8 N at 39.9 ms
Min: -1,287.1 N at 13.7 ms

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

09.26.2022 09:11:31 596

Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 84

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	443	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	279	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. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Peak Resultant Acceleration	125 - 155 g	144.4 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.7 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	4.46 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

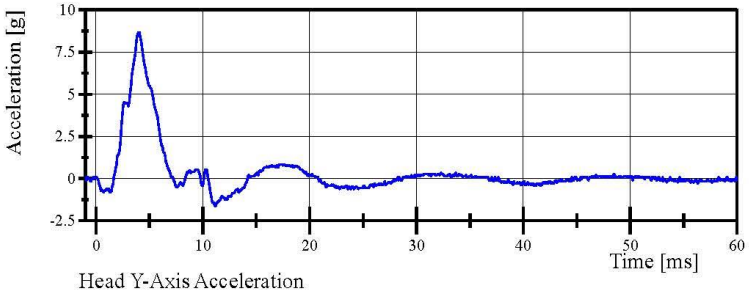
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

09.28.2022 12:11:10 361

Transportation Research Center Inc.

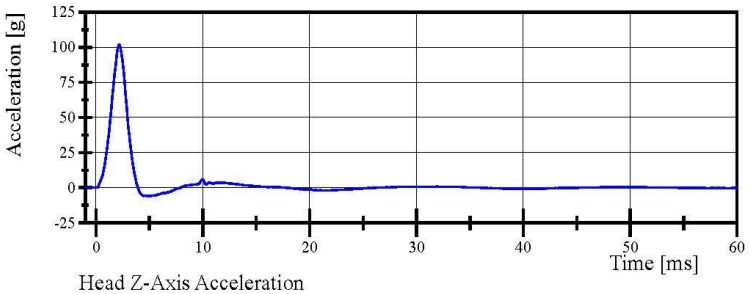
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Head X-Axis Acceleration



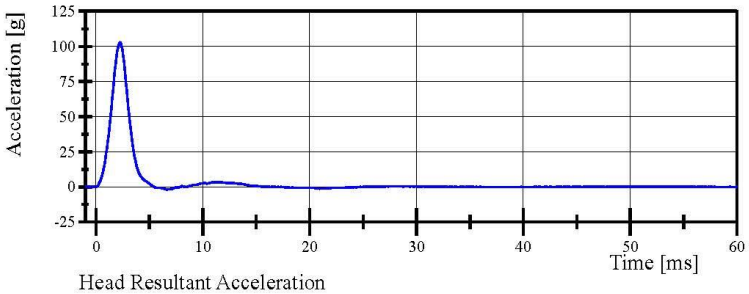
Filter Class: CFC_1000
Max: 8.7 g at 4.0 ms
Min: -1.6 g at 11.2 ms

Head Y-Axis Acceleration



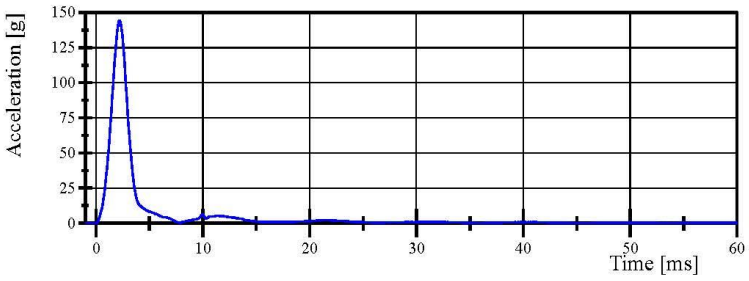
Filter Class: CFC_1000
Max: 101.8 g at 2.2 ms
Min: -5.7 g at 4.5 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 103.0 g at 2.2 ms
Min: -1.8 g at 6.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 144.4 g at 2.2 ms
Min: 0.0 g at -0.2 ms

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

09.28.2022 12:11:53 361

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	45 %	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	-51.4 deg	Yes
Time of Peak	54 - 66 ms	56.6 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	57.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 05053

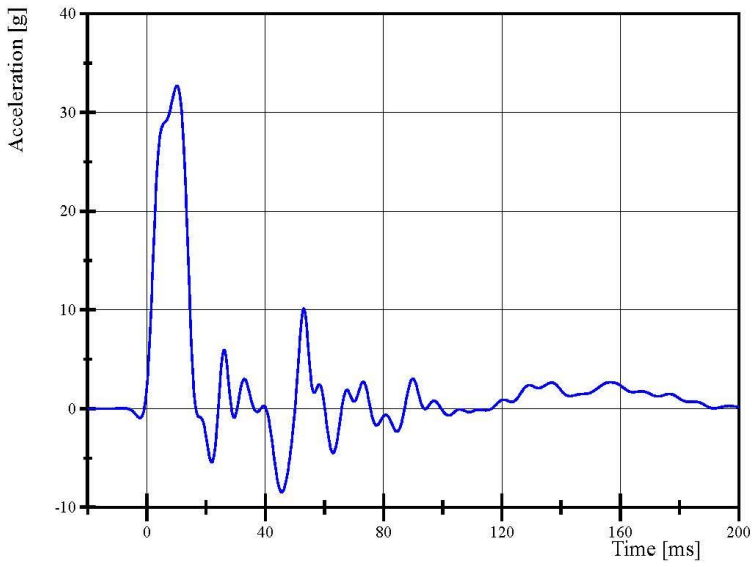
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

09.28.2022 11:24:24 1217

Transportation Research Center Inc.

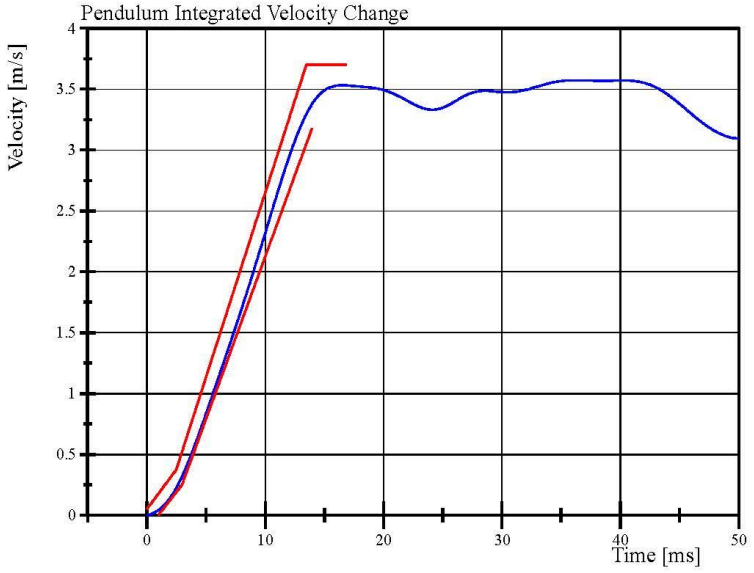
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 32.7 g at 10.2 ms
Min: -8.5 g at 45.6 ms

Pendulum Integrated Velocity Change



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

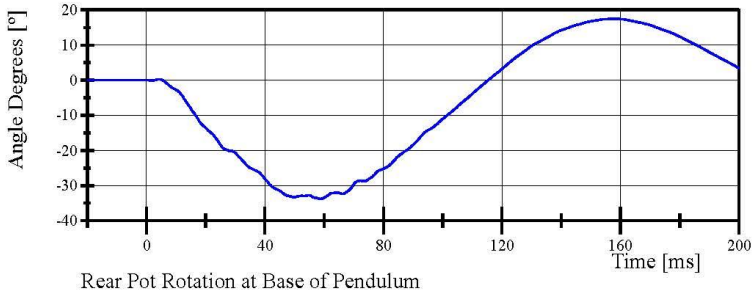
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.28.2022 11:25:17 1217

Transportation Research Center Inc.

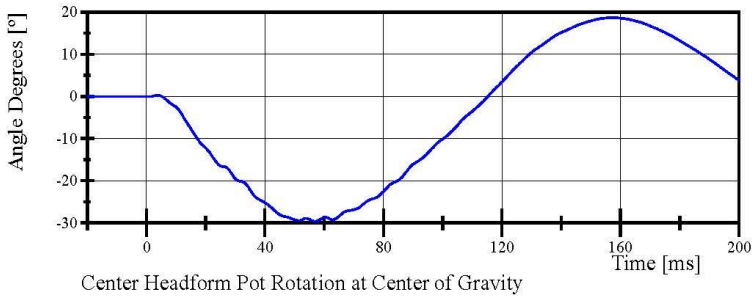
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Forward Pot Rotation at Base of Pendulum



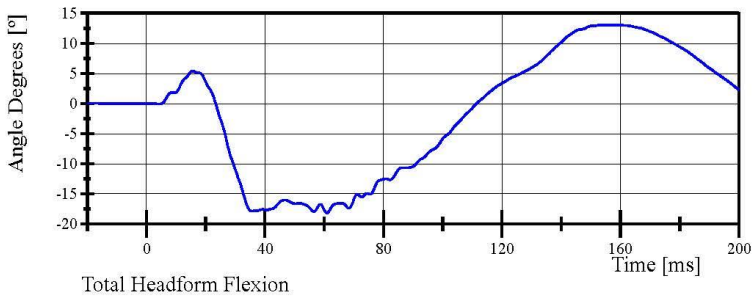
Filter Class: CFC_180
Max: 17.4 ° at 157.7 ms
Min: -33.8 ° at 58.6 ms

Rear Pot Rotation at Base of Pendulum



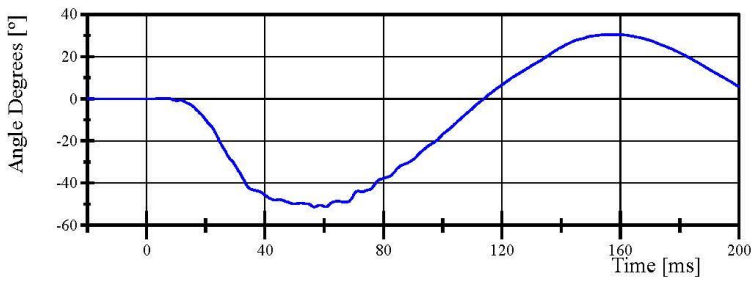
Filter Class: CFC_180
Max: 18.7 ° at 157.4 ms
Min: -29.6 ° at 57.0 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 13.1 ° at 156.9 ms
Min: -18.2 ° at 60.9 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 30.5 ° at 157.4 ms
Min: -51.4 ° at 56.6 ms

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

09.28.2022 11:25:17 1217

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.71 g	Yes

Test meets specifications.

Condition: Used

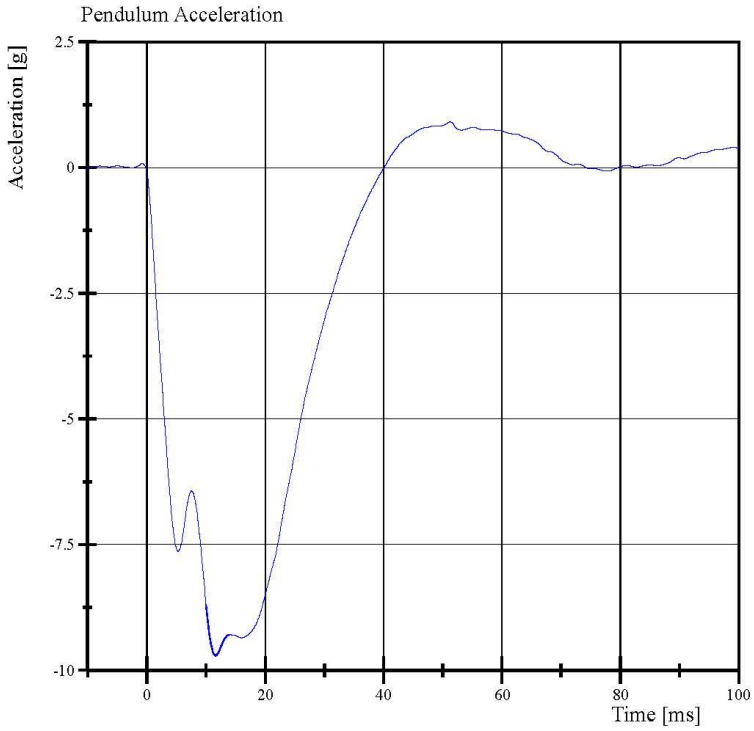
Comments:
Arm S/N: 175-3501-07014

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

09.28.2022 15:17:43 547

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 0.9 g at 51.3 ms
Min: -9.7 g at 11.6 ms

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

09.28.2022 15:18:13 547

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

Condition: Used

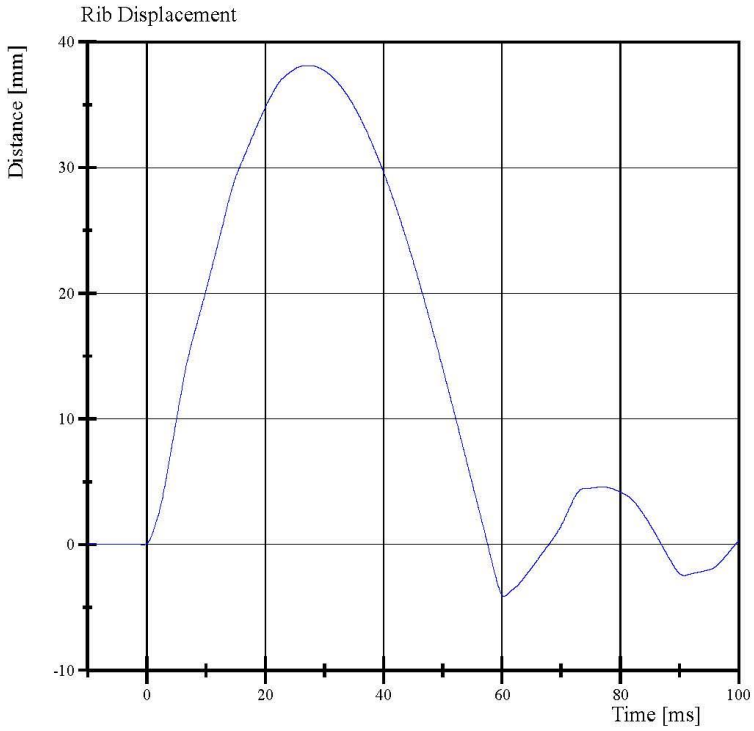
Comments:
Drop Height: 462 mm
Rib Foam S/N: EK6973

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

09.28.2022 13:26:54 648

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 38.1 mm at 27.2 ms
Min: -4.1 mm at 60.3 ms

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

09.28.2022 13:27:51 648

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.6 mm	Yes

Test meets specifications.

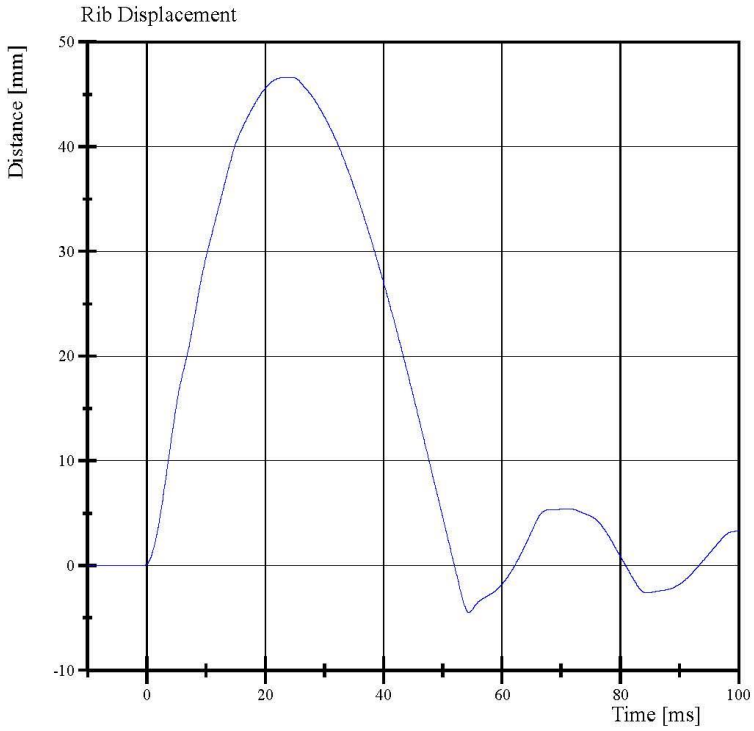
Condition: Used
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6973

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

09.28.2022 13:09:54 552

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 46.6 mm at 24.2 ms
Min: -4.5 mm at 54.4 ms

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

09.28.2022 13:11:01 552

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	43 %	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

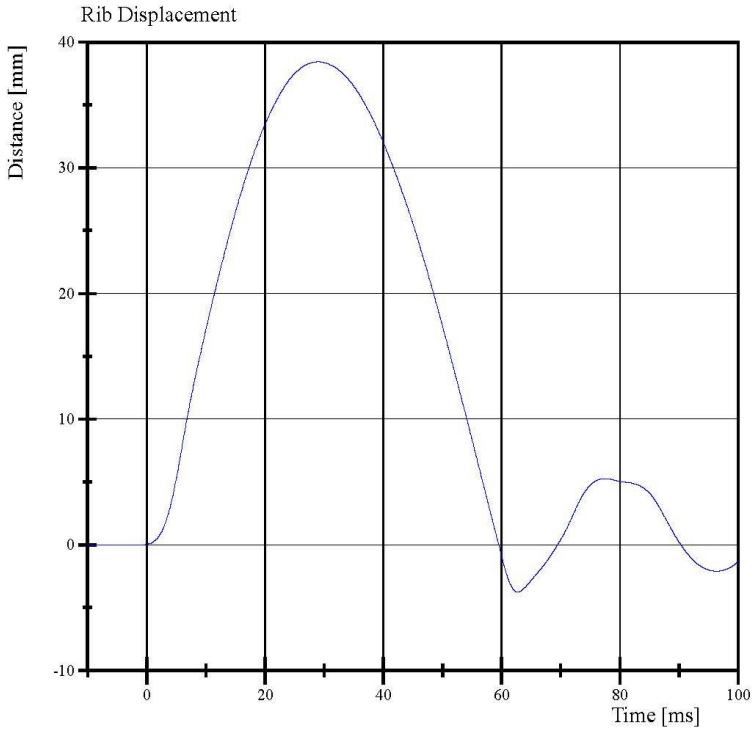
Comments:
Drop Height: 462mm
Rib Foam S/N: EK6970

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

09.28.2022 13:38:15 633

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 38.4 mm at 29.0 ms
Min: -3.8 mm at 62.7 ms

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

09.28.2022 13:38:54 633

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.8 mm	Yes

Test meets specifications.

Condition: Used

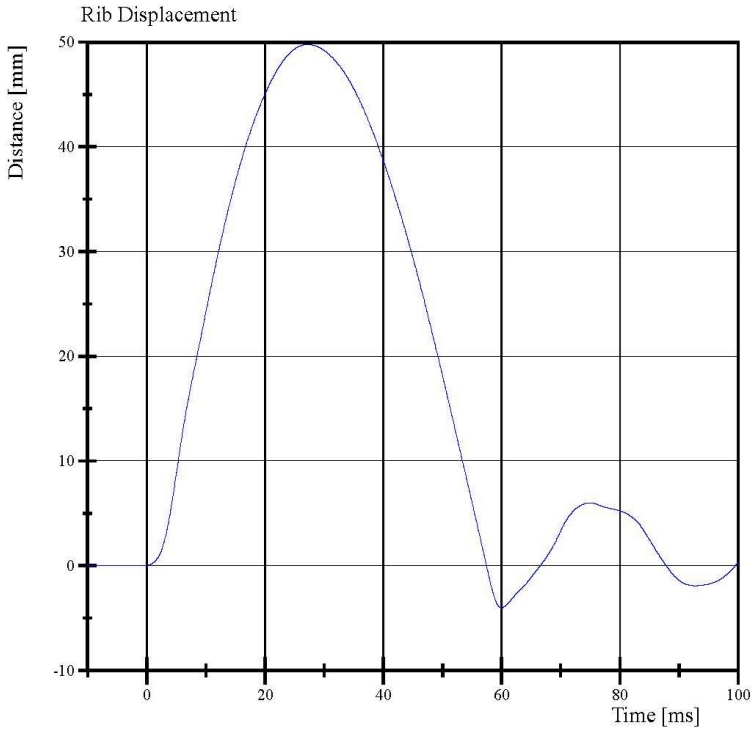
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6970

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

09.28.2022 13:31:20 519

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 49.8 mm at 27.3 ms
Min: -4.0 mm at 60.0 ms

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

09.28.2022 13:32:00 519

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	44 %	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

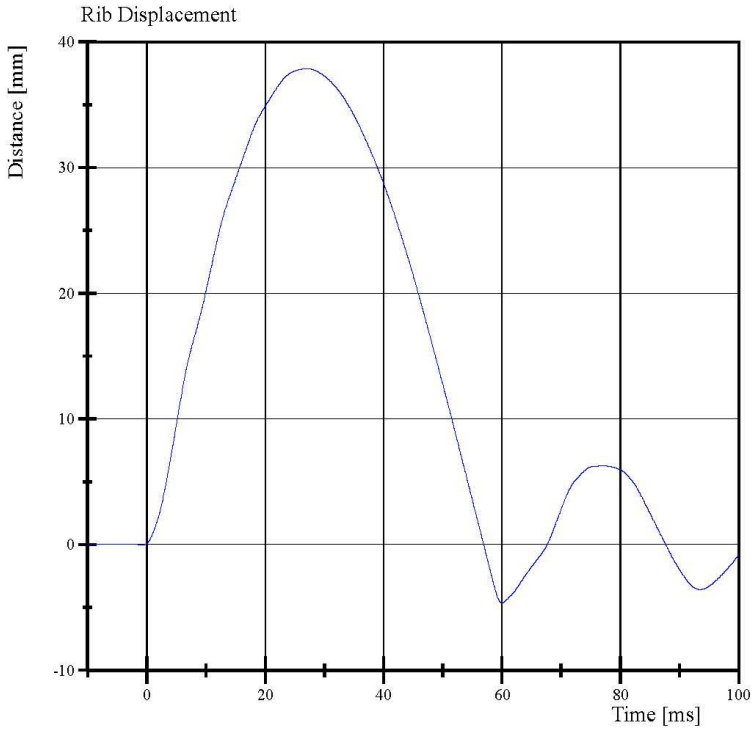
Comments:
Drop Height: 462 mm
Rib Foam S/N: EK6971

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

09.28.2022 13:53:43 627

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 37.9 mm at 27.0 ms
Min: -4.7 mm at 60.0 ms

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

09.28.2022 13:54:18 627

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.5 mm	Yes

Test meets specifications.

Condition: Used

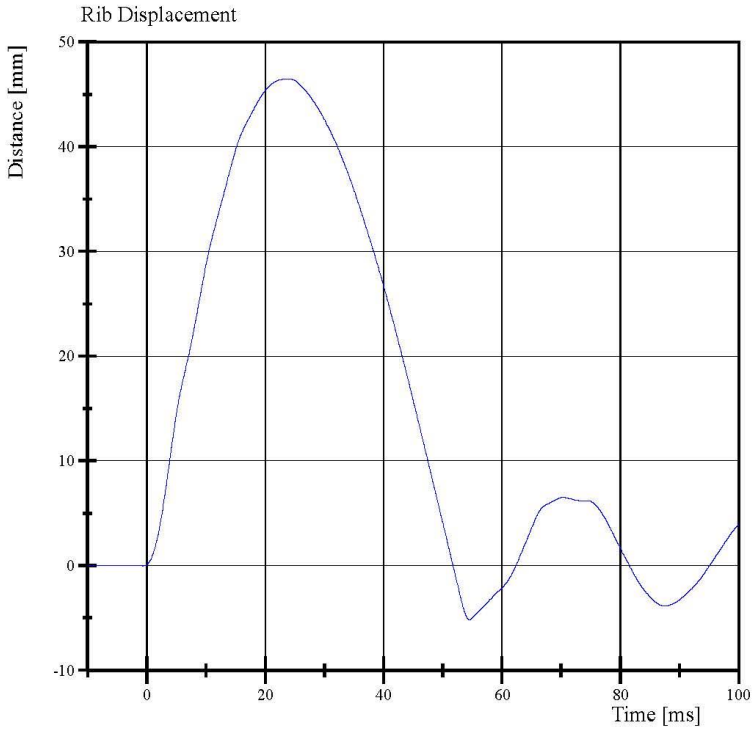
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6971

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

09.28.2022 13:46:35 535

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 46.5 mm at 23.9 ms
Min: -5.2 mm at 54.5 ms

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

09.28.2022 13:47:23 535

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.454 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,396.6 N	Yes
Upper Rib Displacement	34 - 41 mm	39.0 mm	Yes
Center Rib Displacement	37 - 45 mm	41.2 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.8 mm	Yes

Test meets specifications.

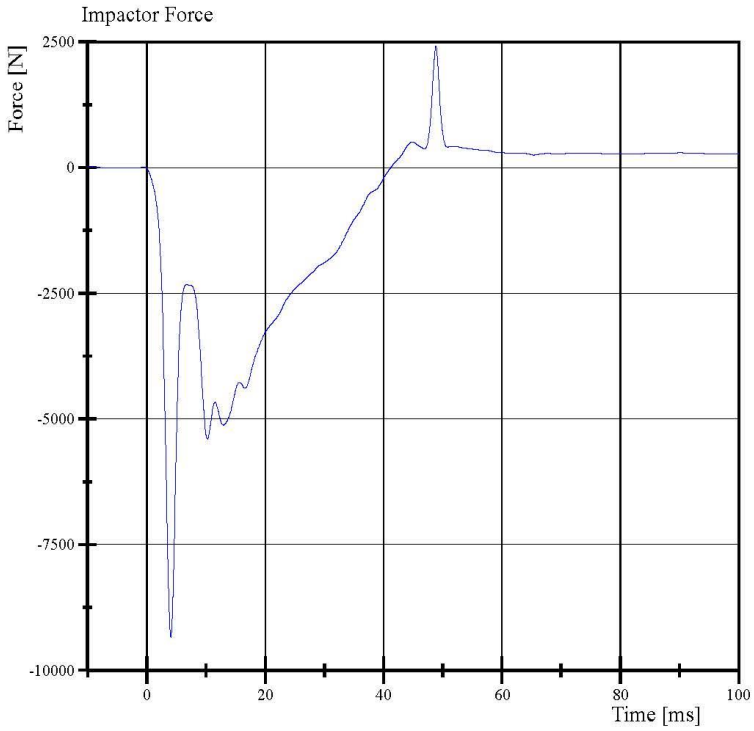
Condition: Used
Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

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

09.28.2022 15:29:16 457

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022



Filter Class: CFC_180
Max: 2,418.9 N at 48.8 ms
Min: -9,342.4 N at 4.1 ms

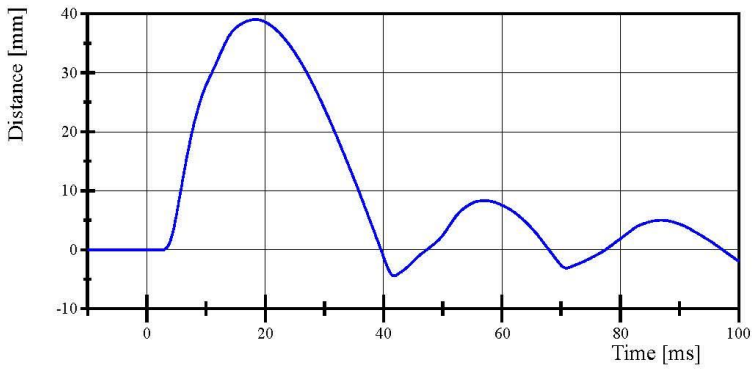
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.28.2022 15:30:40 457

Transportation Research Center Inc.

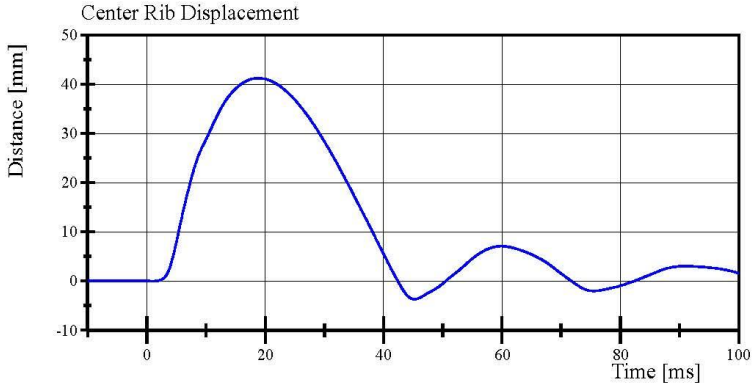
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Upper Rib Displacement



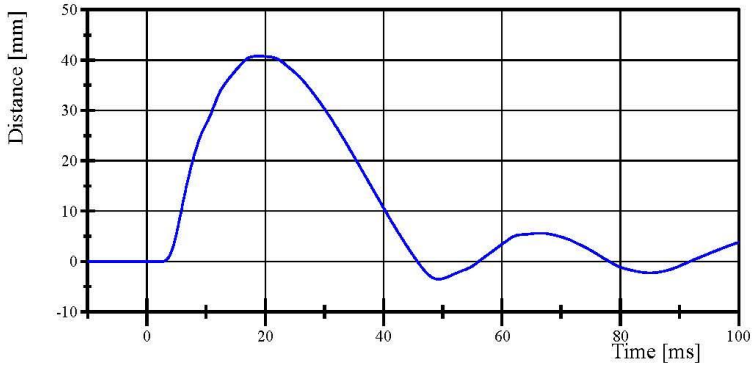
Filter Class: CFC_180
Max: 39.0 mm at 18.4 ms
Min: -4.4 mm at 41.8 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.2 mm at 18.8 ms
Min: -3.7 mm at 45.2 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.8 mm at 19.0 ms
Min: -3.5 mm at 49.4 ms

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

09.28.2022 15:30:41 457

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.147 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-45.8 deg	Yes
Time of Peak	39 - 53 ms	40.0 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	39.6 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Lumbar S/N: DS3472

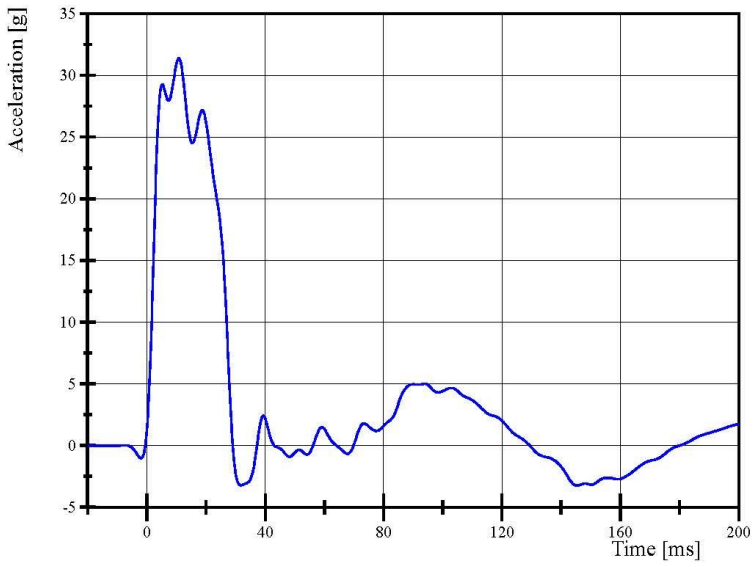
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

09.28.2022 10:38:25 667

Transportation Research Center Inc.

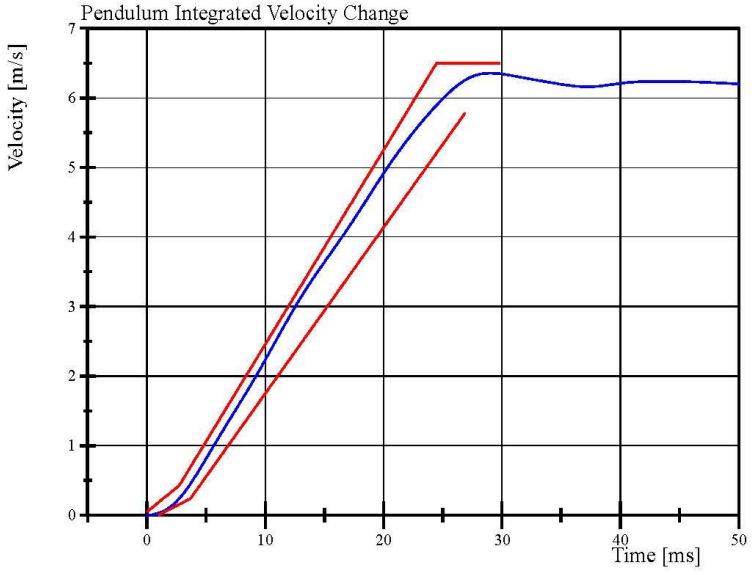
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.4 g at 10.8 ms
Min: -3.2 g at 145.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.4 m/s at 29.0 ms
Min: 0.0 m/s at 0.0 ms

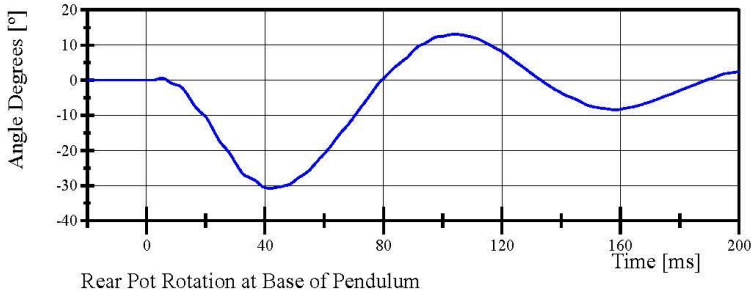
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.28.2022 10:39:57 667

Transportation Research Center Inc.

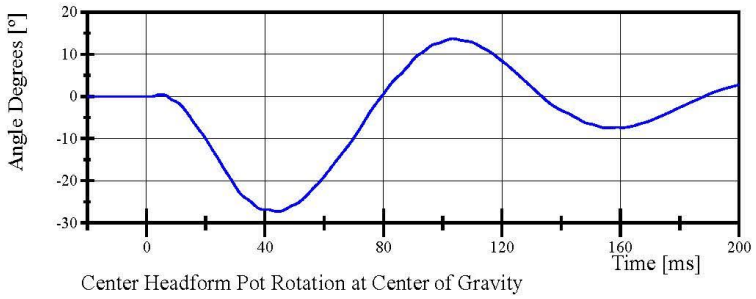
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/28/2022

Forward Pot Rotation at Base of Pendulum



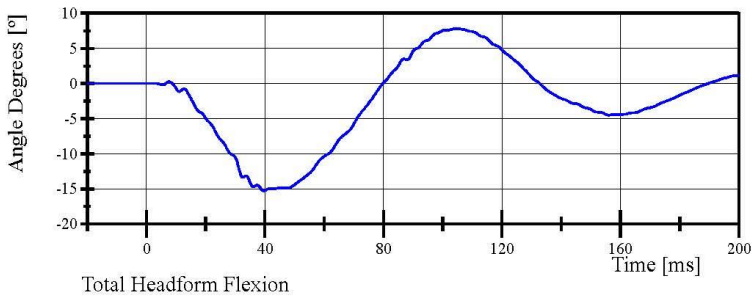
Filter Class: CFC_180
Max: 13.1 ° at 104.2 ms
Min: -30.8 ° at 41.7 ms

Rear Pot Rotation at Base of Pendulum



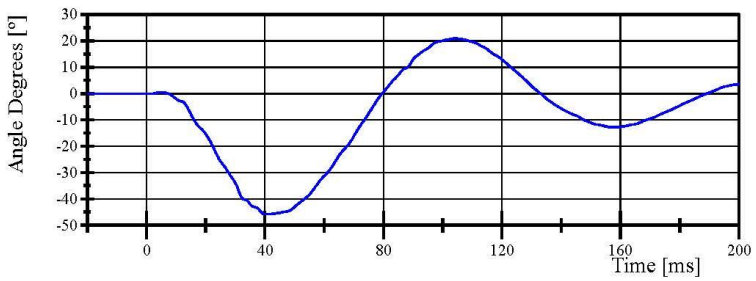
Filter Class: CFC_180
Max: 13.7 ° at 103.4 ms
Min: -27.3 ° at 44.4 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 7.8 ° at 104.3 ms
Min: -15.3 ° at 39.6 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 20.9 ° at 104.2 ms
Min: -45.8 ° at 40.0 ms

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

09.28.2022 10:39:57 667

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.07 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,353.7 N	Yes
Time of Peak	10.6 - 13.0 ms	11.68 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,395.1 N	Yes
Time of Peak	10.0 - 12.3 ms	11.60 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

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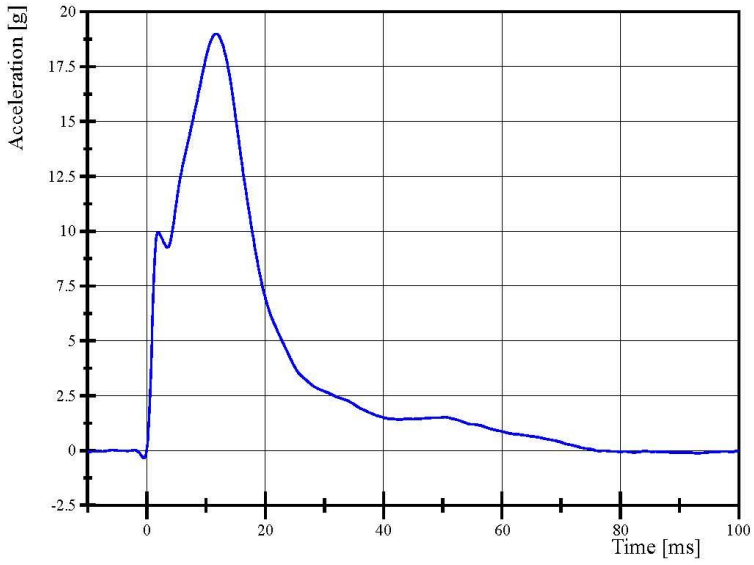
Transportation Research Center Inc.

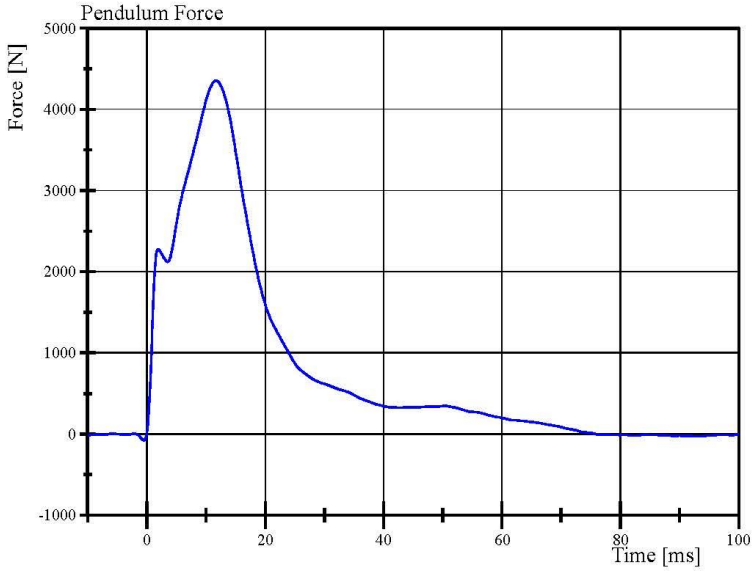
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/29/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 19.0 g at 11.7 ms
Min: -0.3 g at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,353.7 N at 11.7 ms
Min: -78.8 N at -0.5 ms

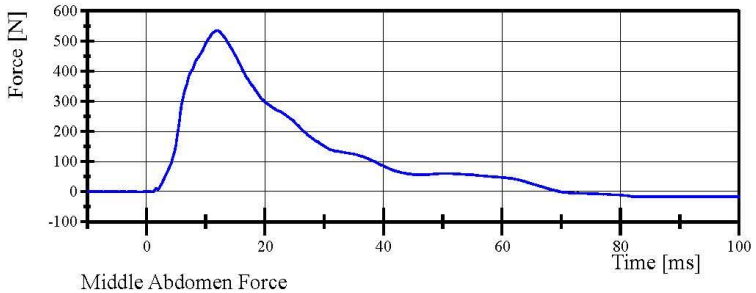
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

09.29.2022 08:28:48 596

Transportation Research Center Inc.

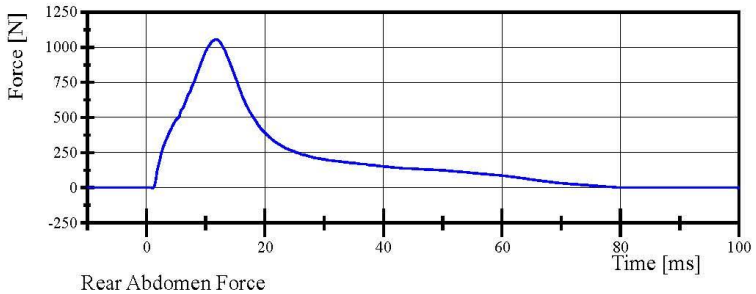
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/29/2022

Front Abdomen Force



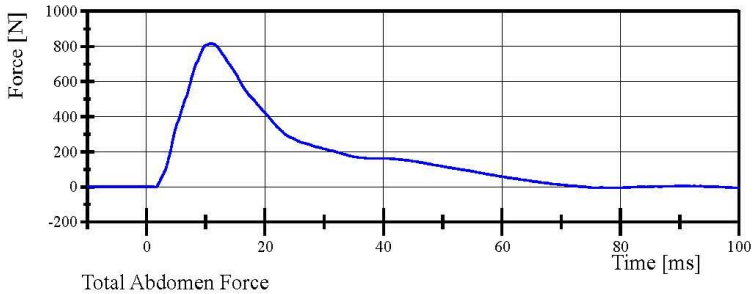
Filter Class: CFC_600
Max: 535.2 N at 11.9 ms
Min: -17.2 N at 84.2 ms

Middle Abdomen Force



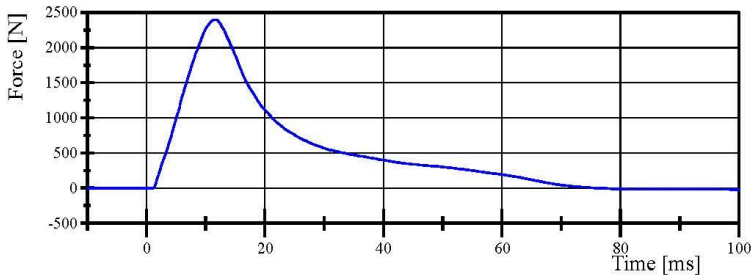
Filter Class: CFC_600
Max: 1,056.0 N at 11.8 ms
Min: -2.4 N at 1.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 817.1 N at 10.8 ms
Min: -5.2 N at 79.5 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,395.1 N at 11.6 ms
Min: -21.6 N at 99.9 ms

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

09.29.2022 08:28:48 596

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,013.0 N	Yes
Time of Peak	11.8 - 16.1 ms	12.64 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,320.7 N	Yes
Time of Peak	12.2 - 17.0 ms	12.88 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

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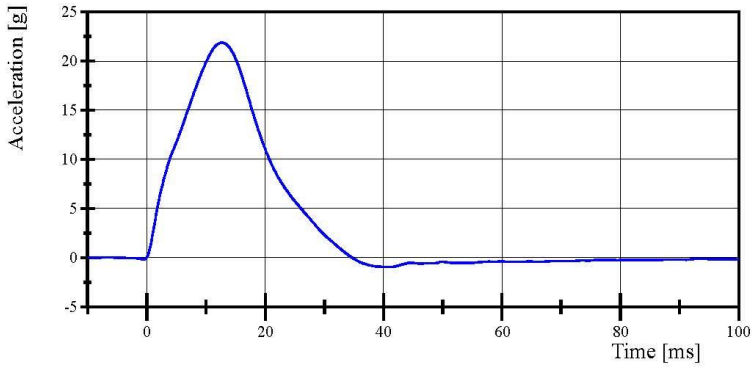
Transportation Research Center Inc.

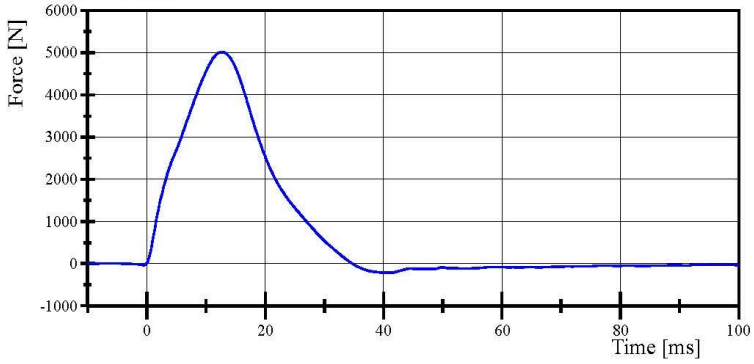
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 84-1
Test Date: 9/29/2022

Pendulum Acceleration



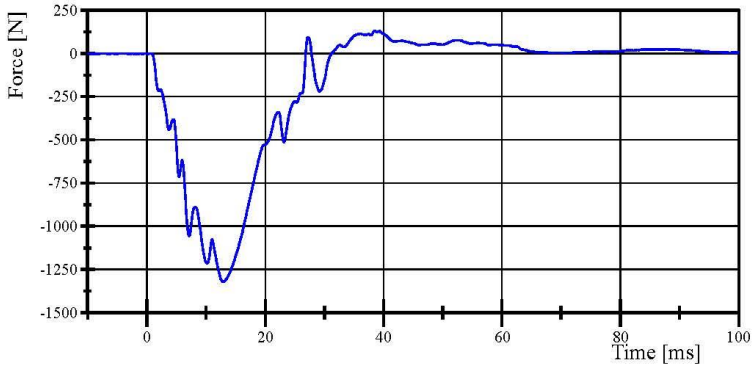
Filter Class: CFC_180
Max: 21.9 g at 12.6 ms
Min: -0.9 g at 41.2 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,013.0 N at 12.6 ms
Min: -211.0 N at 41.2 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 130.8 N at 38.5 ms
Min: -1,320.7 N at 12.9 ms

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

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Pre-Test Calibration Sheets
Driver S/N DQ5070

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 16

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	130	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	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	200	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	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	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 15-2
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	135.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-4.8 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.08 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP8345

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

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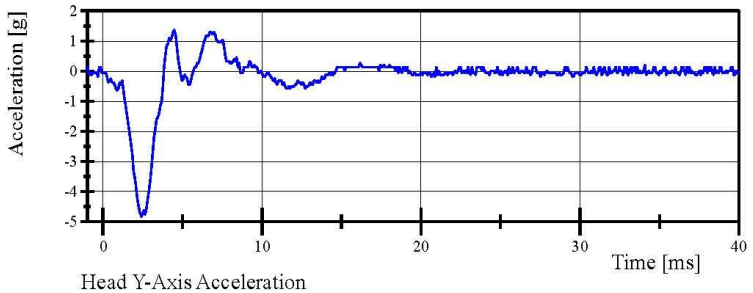
Transportation Research Center Inc.

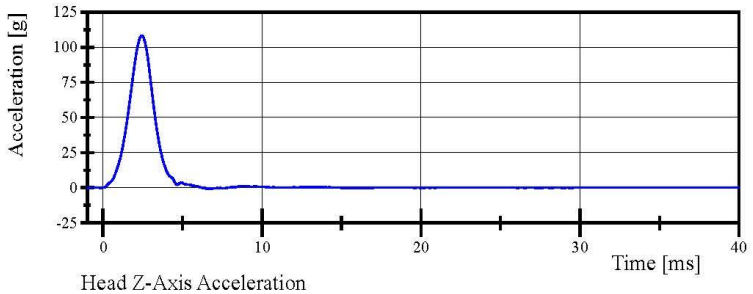
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 15-2
Test Date: 9/22/2022

Head X-Axis Acceleration



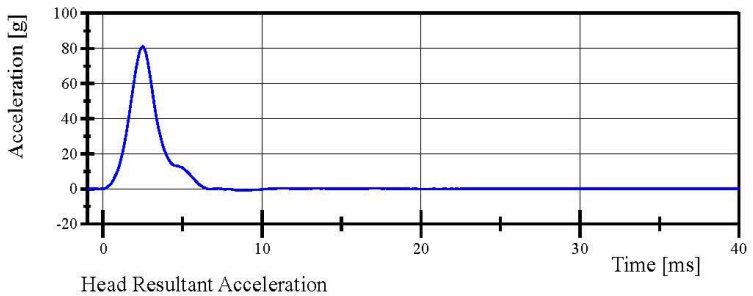
Filter Class: CFC_1000
Max: 1.4 g at 4.5 ms
Min: -4.8 g at 2.4 ms

Head Y-Axis Acceleration



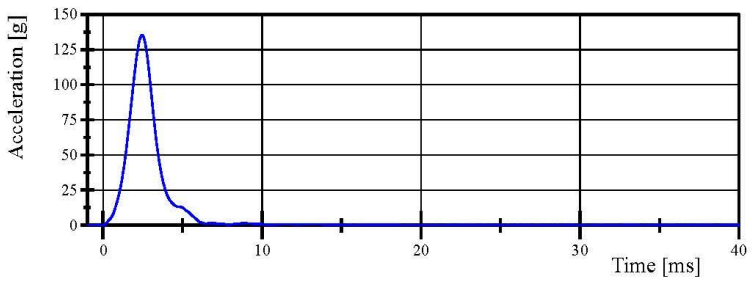
Filter Class: CFC_1000
Max: 108.3 g at 2.4 ms
Min: -0.6 g at 6.6 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 81.1 g at 2.5 ms
Min: -0.9 g at 9.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 135.3 g at 2.5 ms
Min: 0.1 g at 19.3 ms

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

09.22.2022 13:27:55 235

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.622 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.670 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.922 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.283 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.822 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.831 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-74.0 deg	Yes
Time of Peak	50 - 70 ms	60.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	111.1 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 717

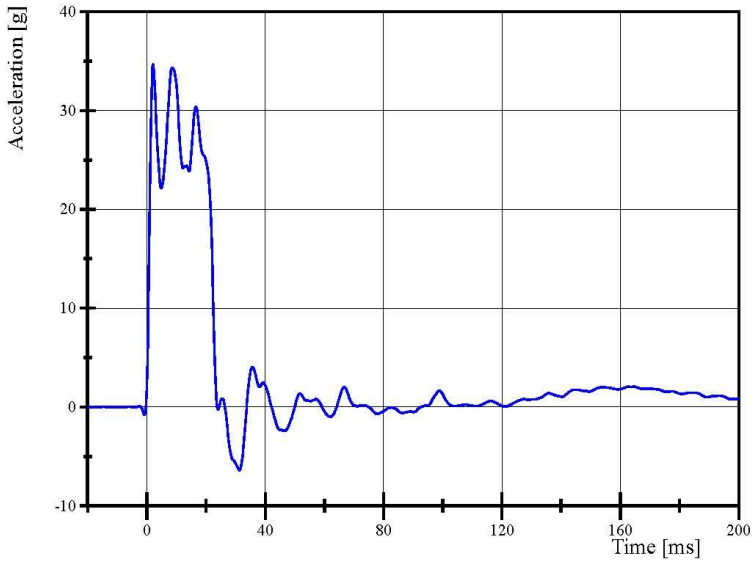
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

09.22.2022 14:14:25 748

Transportation Research Center Inc.

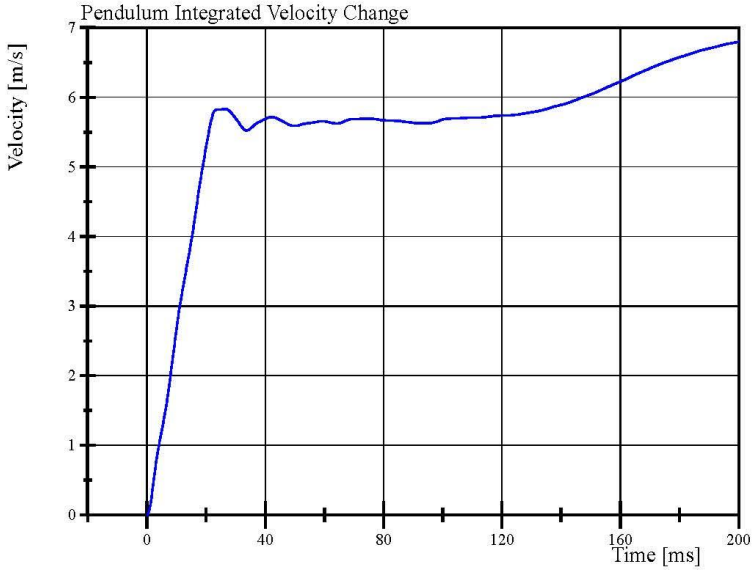
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 34.7 g at 2.1 ms
Min: -6.4 g at 31.3 ms

Pendulum Integrated Velocity Change



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

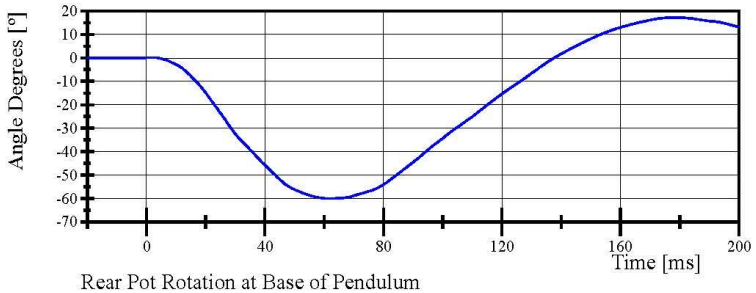
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 14:15:06 748

Transportation Research Center Inc.

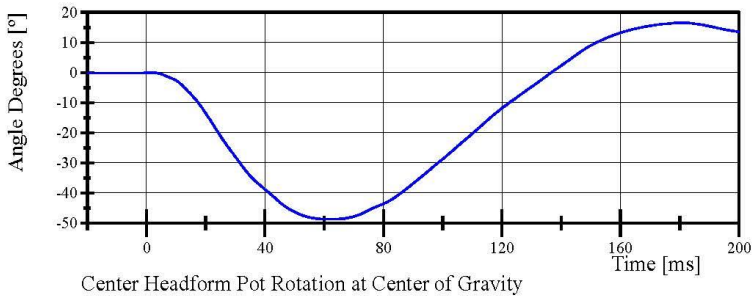
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Forward Pot Rotation at Base of Pendulum



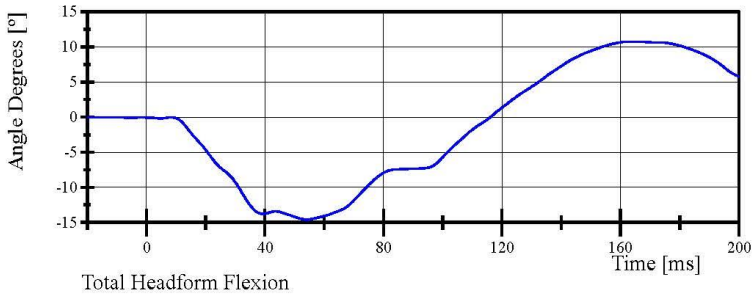
Filter Class: CFC_60
Max: 17.3 ° at 178.5 ms
Min: -60.0 ° at 61.8 ms

Rear Pot Rotation at Base of Pendulum



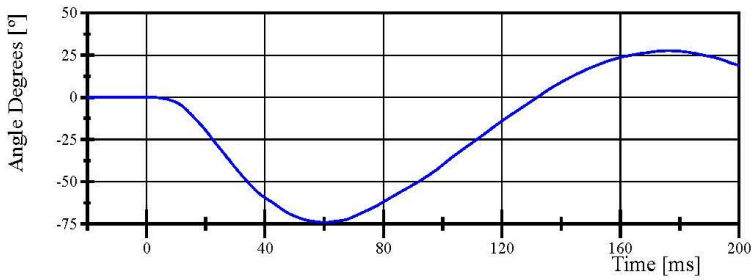
Filter Class: CFC_60
Max: 16.6 ° at 181.0 ms
Min: -48.7 ° at 60.7 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 10.7 ° at 164.0 ms
Min: -14.6 ° at 54.1 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 27.7 ° at 176.2 ms
Min: -74.0 ° at 60.2 ms

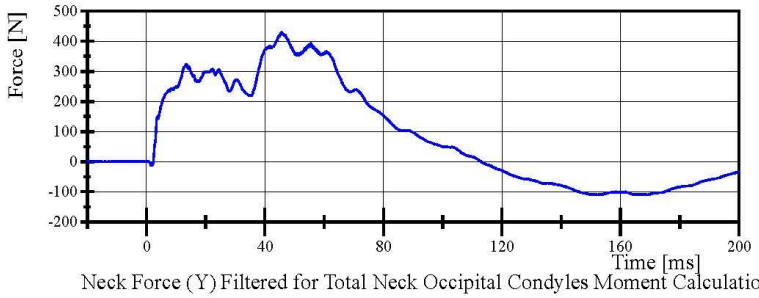
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 14:15:07 748

Transportation Research Center Inc.

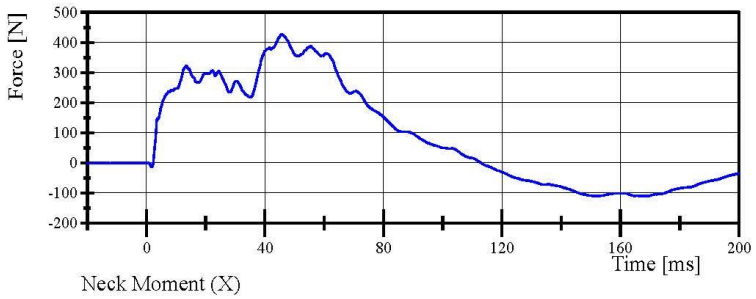
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Neck Force (Y)



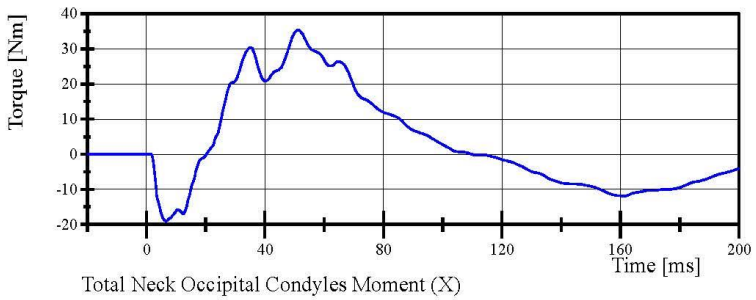
Filter Class: CFC_1000
Max: 428.9 N at 45.6 ms
Min: -110.3 N at 169.0 ms

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



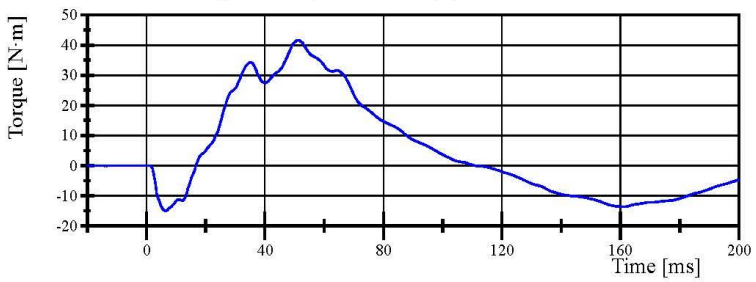
Filter Class: CFC_600
Max: 427.7 N at 45.6 ms
Min: -110.2 N at 169.0 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 35.4 Nm at 51.4 ms
Min: -19.0 Nm at 6.6 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 41.7 N·m at 51.3 ms
Min: -15.0 N·m at 6.4 ms

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

09.22.2022 14:15:07 748

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.1 g	Yes
Shoulder Displacement	28 - 37 mm	31.2 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	18.2 g	Yes

Test meets specifications.

Condition: Used
Comments:
Left Arm S/N: DP8451
Shoulder Rib S/N: DO9814

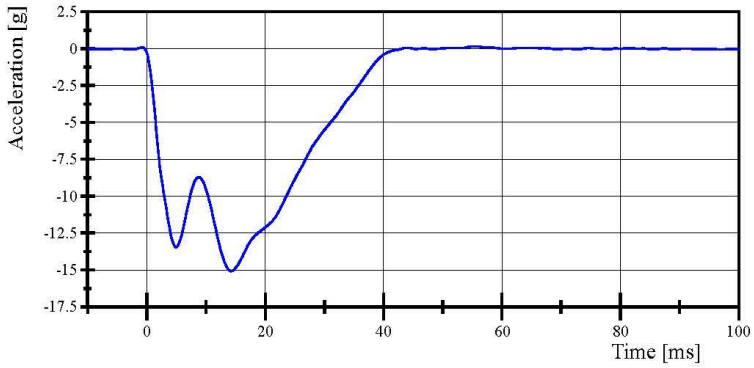
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 08:23:44 831

Transportation Research Center Inc.

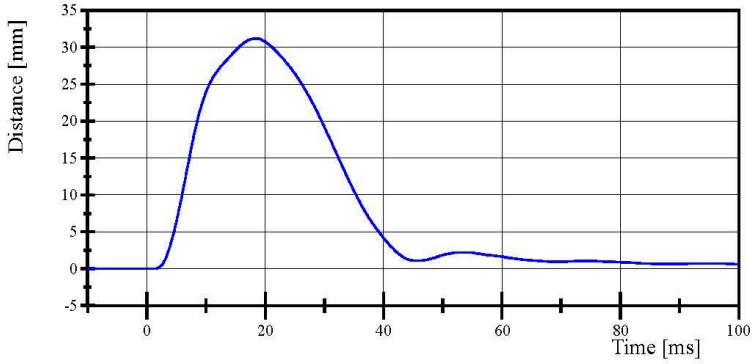
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Probe Acceleration



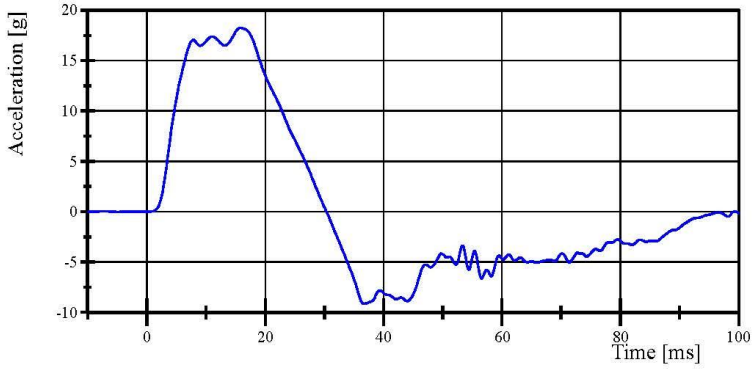
Filter Class: CFC_180
Max: 0.2 g at 55.4 ms
Min: -15.1 g at 14.2 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.2 mm at 18.3 ms
Min: -0.0 mm at 1.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 18.2 g at 15.8 ms
Min: -9.1 g at 36.7 ms

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

09.22.2022 08:24:14 831

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.695 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.2 g	Yes
Shoulder Displacement	31 - 40 mm	34.4 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.4 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.8 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	36.0 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	34.9 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.9 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

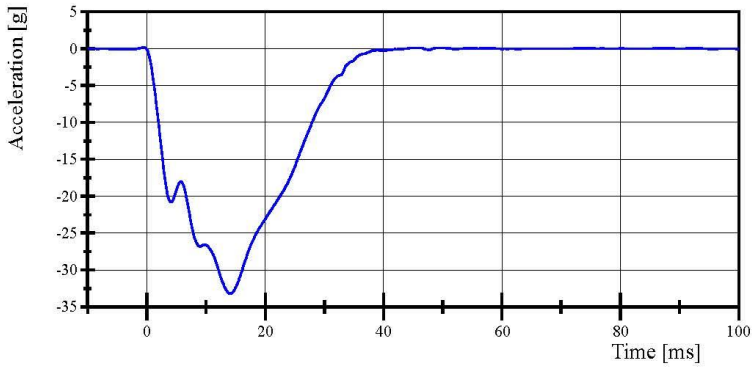
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 10:10:44 623

Transportation Research Center Inc.

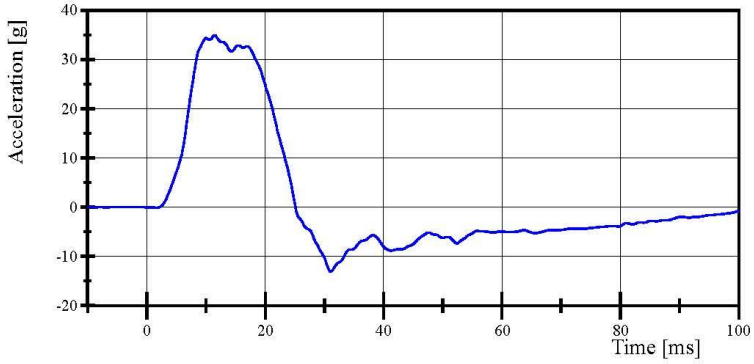
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Probe Acceleration



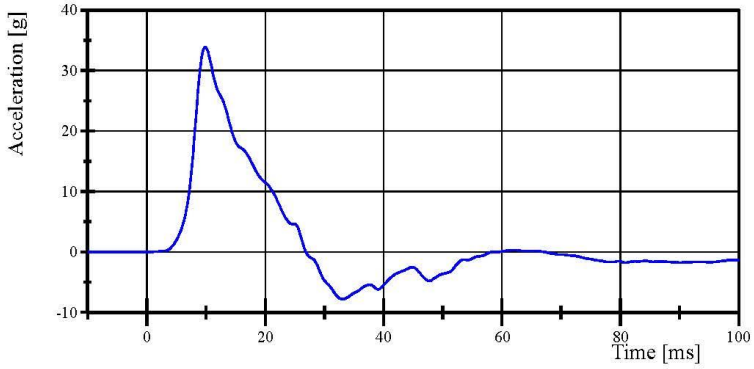
Filter Class: CFC_180
Max: 0.2 g at -0.6 ms
Min: -33.2 g at 14.1 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 34.9 g at 11.4 ms
Min: -13.1 g at 31.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 33.9 g at 9.8 ms
Min: -7.8 g at 33.0 ms

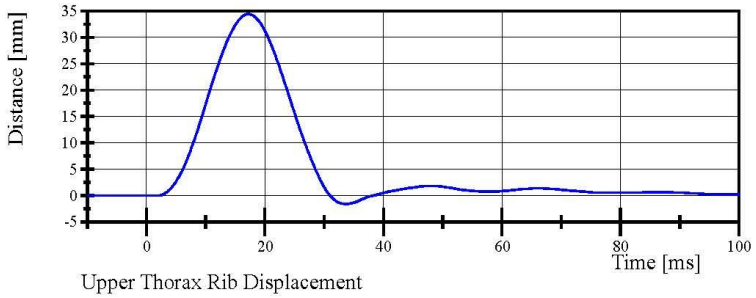
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 10:12:05 623

Transportation Research Center Inc.

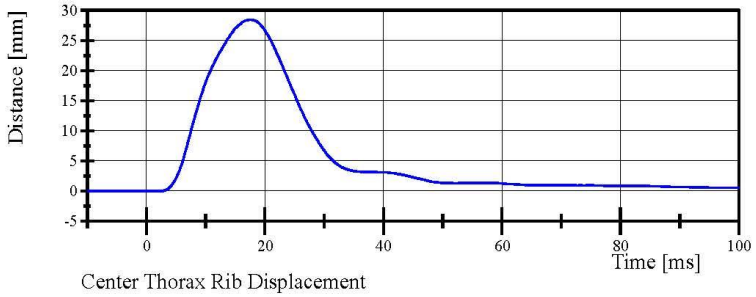
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Shoulder Rib Displacement



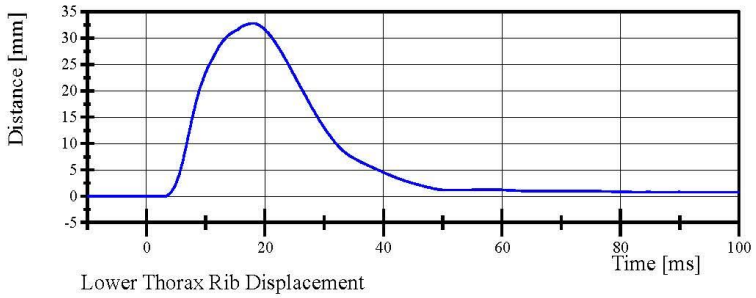
Filter Class: CFC_600
Max: 34.4 mm at 17.2 ms
Min: -1.6 mm at 33.7 ms

Upper Thorax Rib Displacement



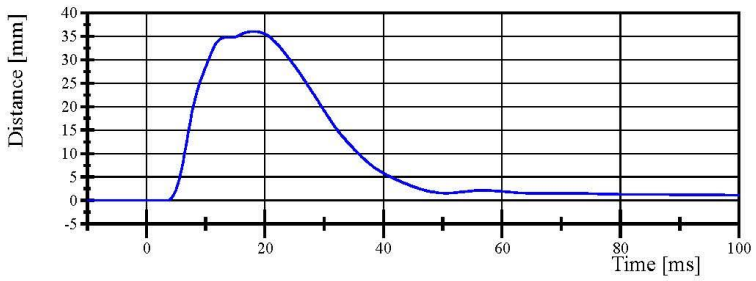
Filter Class: CFC_600
Max: 28.4 mm at 17.4 ms
Min: -0.0 mm at -6.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.8 mm at 18.2 ms
Min: -0.0 mm at 3.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 36.0 mm at 17.7 ms
Min: -0.0 mm at 3.5 ms

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

09.22.2022 10:12:05 623

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	61 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.333 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.3 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.4 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	42.0 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	41.5 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.3 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.9 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

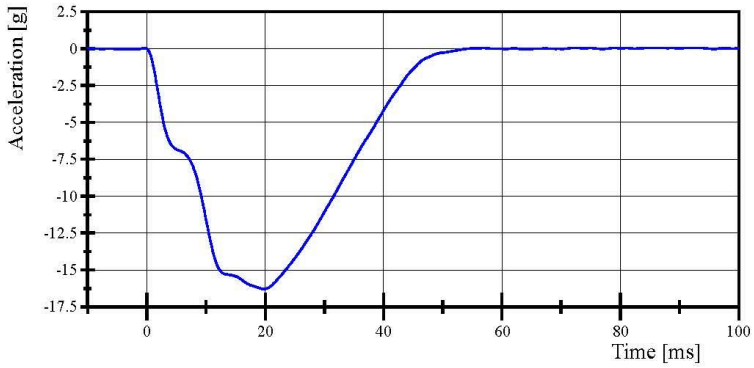
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 08:45:42 813

Transportation Research Center Inc.

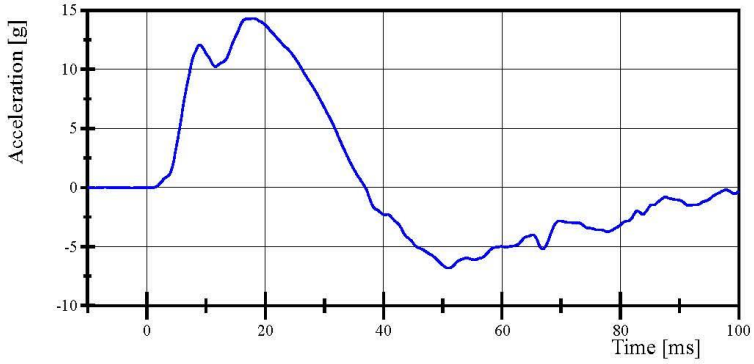
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Probe Acceleration



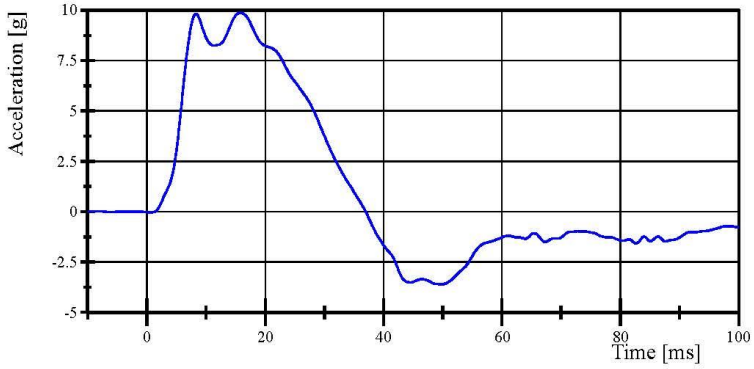
Filter Class: CFC_180
Max: 0.1 g at 92.0 ms
Min: -16.3 g at 19.7 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.3 g at 18.0 ms
Min: -6.8 g at 51.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.9 g at 15.8 ms
Min: -3.6 g at 49.8 ms

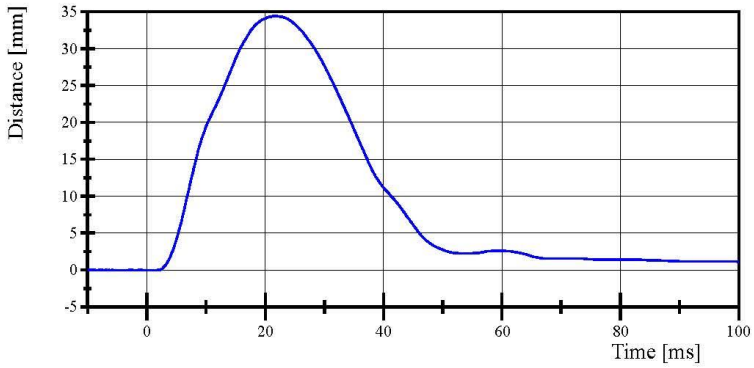
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 08:46:21 813

Transportation Research Center Inc.

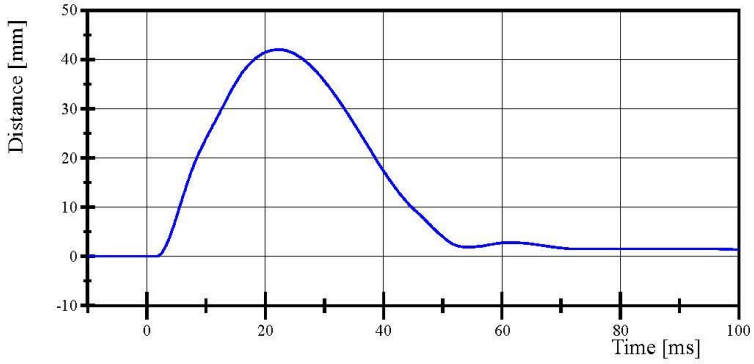
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Upper Thorax Rib Displacement



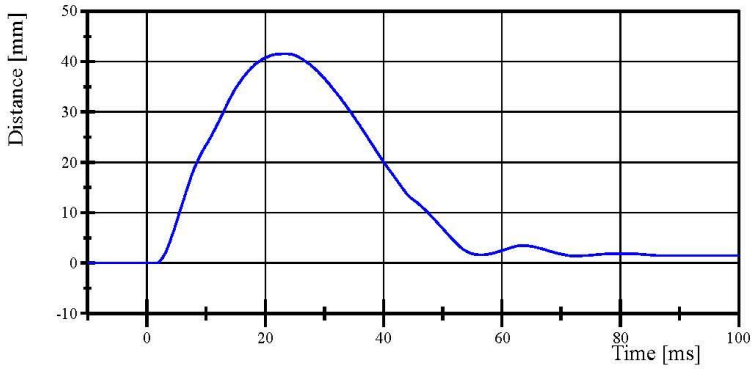
Filter Class: CFC_600
Max: 34.4 mm at 21.7 ms
Min: -0.0 mm at -3.9 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 42.0 mm at 22.2 ms
Min: -0.0 mm at 1.5 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.5 mm at 23.4 ms
Min: -0.0 mm at 1.6 ms

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

09.22.2022 08:46:22 813

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.1 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.89 g	Yes

Test meets specifications.

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

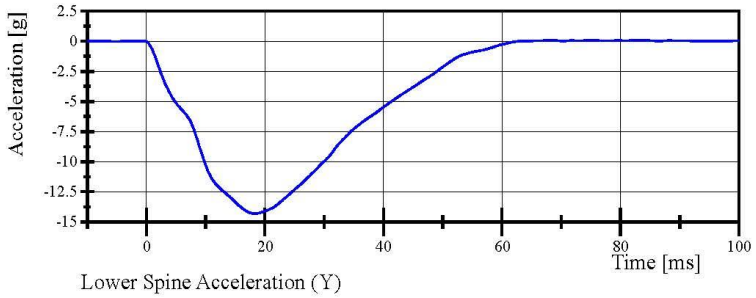
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.22.2022 08:32:38 651

Transportation Research Center Inc.

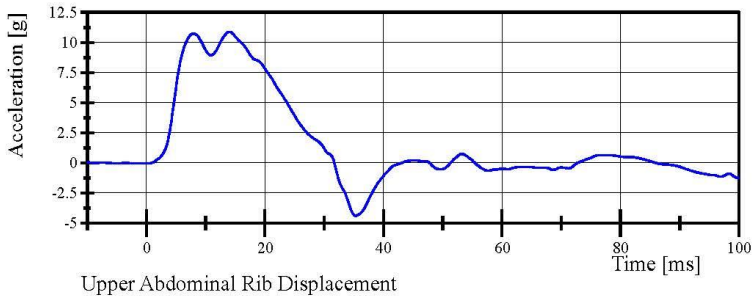
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 15-1
Test Date: 9/22/2022

Probe Acceleration



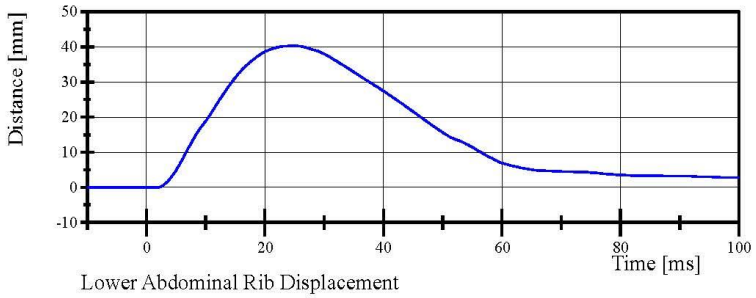
Filter Class: CFC_180
Max: 0.1 g at 75.2 ms
Min: -14.3 g at 18.2 ms

Lower Spine Acceleration (Y)



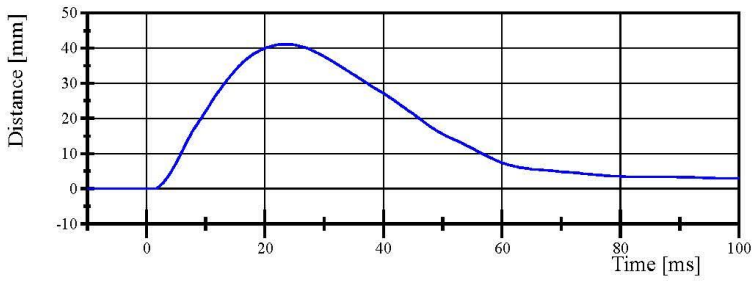
Filter Class: CFC_180
Max: 10.9 g at 13.9 ms
Min: -4.4 g at 35.4 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 40.3 mm at 24.9 ms
Min: -0.0 mm at 1.8 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.1 mm at 23.4 ms
Min: -0.0 mm at 1.3 ms

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

09.22.2022 08:33:10 651

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 16-1
Test Date: 9/26/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	21.0 ºC	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.34 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,039.5 N	Yes

Test meets specifications.

Condition: Used
Comments:
Pelvis Skin S/N: 1186
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13772
Cal Date: 20200325

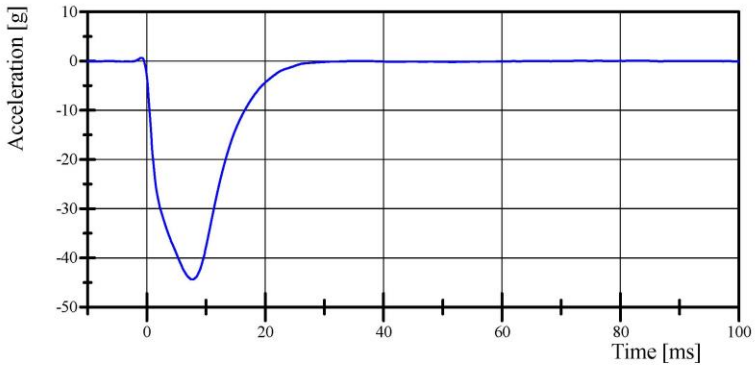
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

09.26.2022 13:01:37 456

Transportation Research Center Inc.

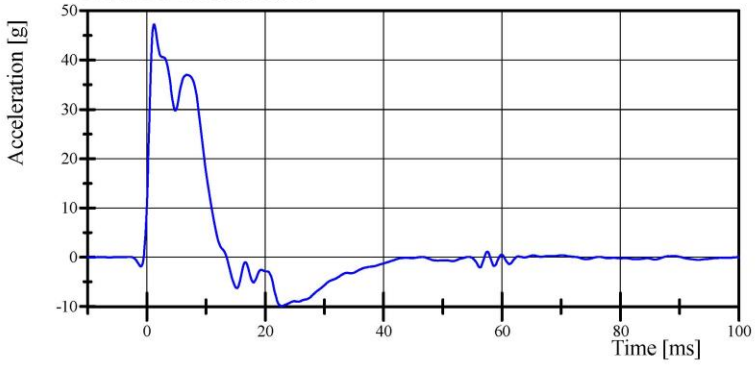
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 16-1
Test Date: 9/26/2022

Probe Acceleration



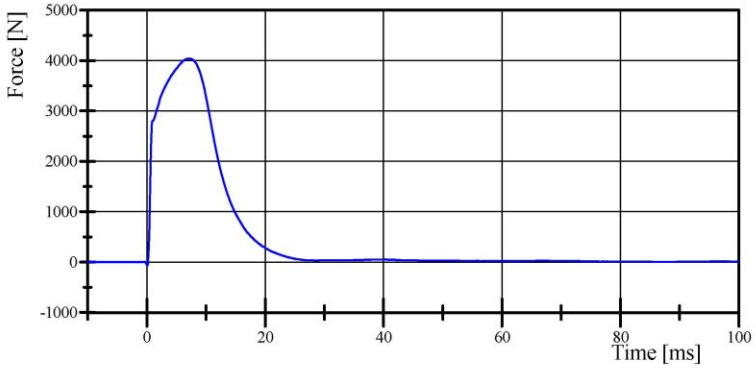
Filter Class: CFC_180
Max: 0.7 g at -0.9 ms
Min: -44.3 g at 7.7 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 47.2 g at 1.2 ms
Min: -9.9 g at 22.7 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,039.5 N at 7.1 ms
Min: -69.4 N at 0.1 ms

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

09.26.2022 13:04:43 456

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 16-1
Test Date: 9/26/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.39 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.4 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.6 g	Yes
Iliac Force	4,100 - 5,100 N	4,629.9 N	Yes

Test meets specifications.

Condition: New

Comments:
Pelvis Skin S/N: 0001186

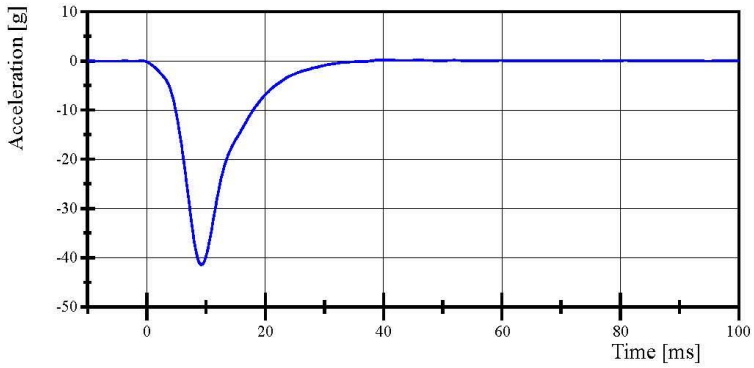
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.26.2022 11:30:29 645

Transportation Research Center Inc.

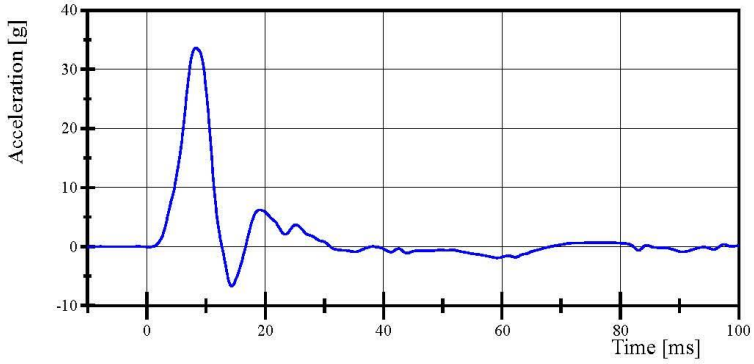
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 16-1
Test Date: 9/26/2022

Probe Acceleration



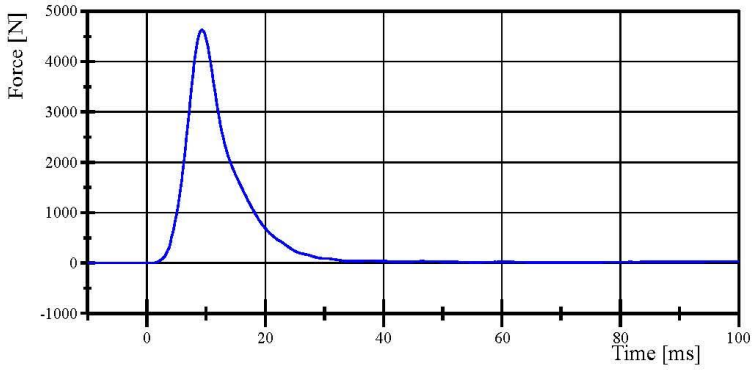
Filter Class: CFC_180
Max: 0.2 g at 39.4 ms
Min: -41.4 g at 9.2 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 33.6 g at 8.2 ms
Min: -6.7 g at 14.3 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,629.9 N at 9.3 ms
Min: -1.0 N at -4.6 ms

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

09.26.2022 11:30:55 645

Post-Test Calibration Sheets
Driver S/N DQ5070

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 17

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	130	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	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	200	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	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	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 17-2
Test Date: 9/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	122.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-3.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.55 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP8345

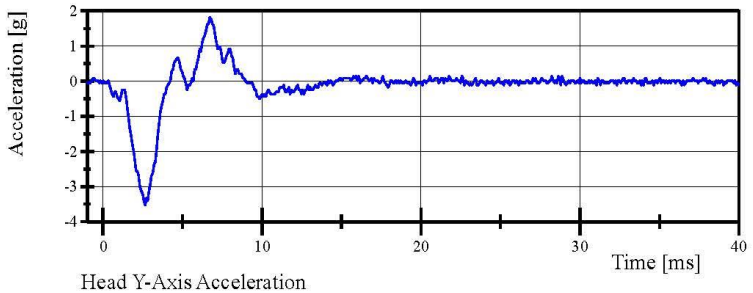
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

09.29.2022 10:13:24 232

Transportation Research Center Inc.

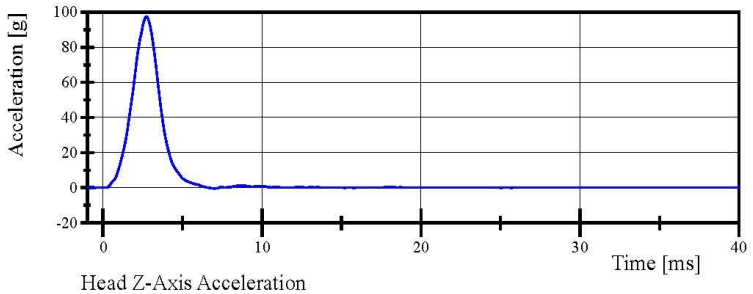
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 17-2
Test Date: 9/29/2022

Head X-Axis Acceleration



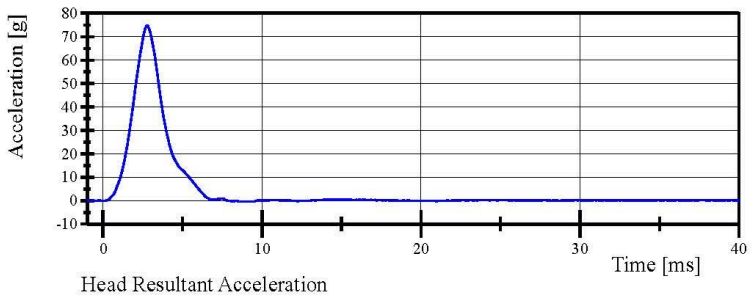
Filter Class: CFC_1000
Max: 1.8 g at 6.7 ms
Min: -3.5 g at 2.6 ms

Head Y-Axis Acceleration



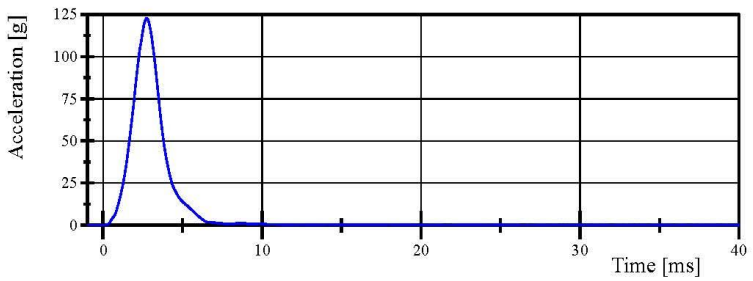
Filter Class: CFC_1000
Max: 97.4 g at 2.7 ms
Min: -0.4 g at 7.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 74.7 g at 2.8 ms
Min: -0.4 g at 8.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 122.8 g at 2.7 ms
Min: 0.0 g at -0.2 ms

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

09.29.2022 10:14:13 232

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.630 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.655 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.896 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.184 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.834 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.837 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	58.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.4 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	111.0 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 717

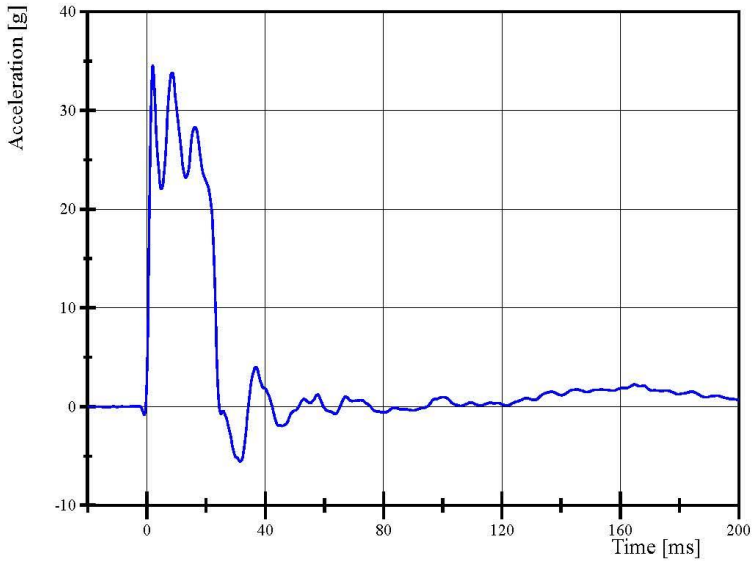
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

09.29.2022 08:37:11 747

Transportation Research Center Inc.

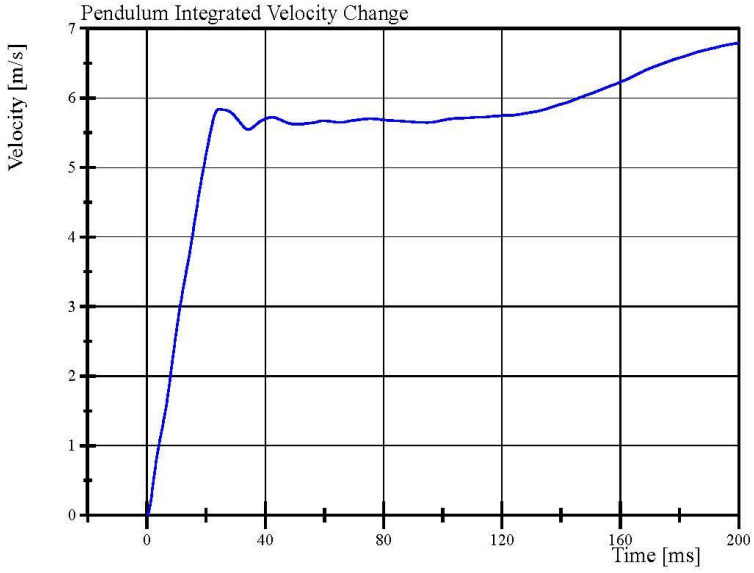
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/29/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 34.5 g at 2.0 ms
Min: -5.6 g at 31.4 ms

Pendulum Integrated Velocity Change



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

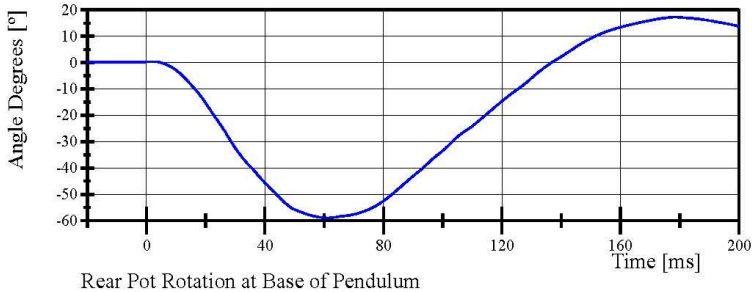
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.29.2022 08:38:41 747

Transportation Research Center Inc.

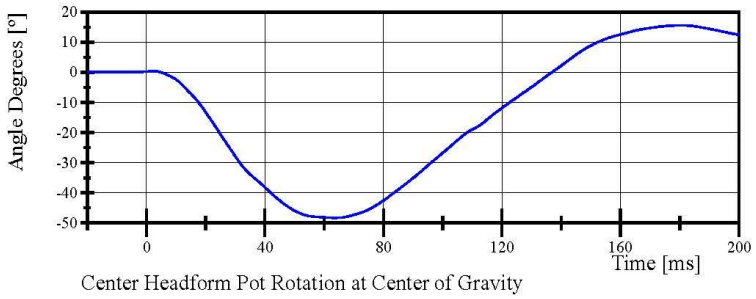
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/29/2022

Forward Pot Rotation at Base of Pendulum



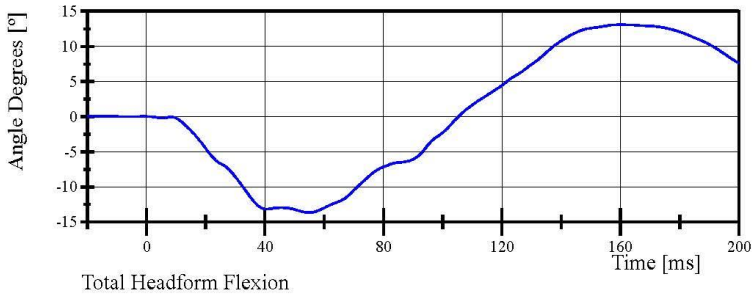
Filter Class: CFC_60
Max: 17.2 ° at 178.5 ms
Min: -58.9 ° at 61.1 ms

Rear Pot Rotation at Base of Pendulum



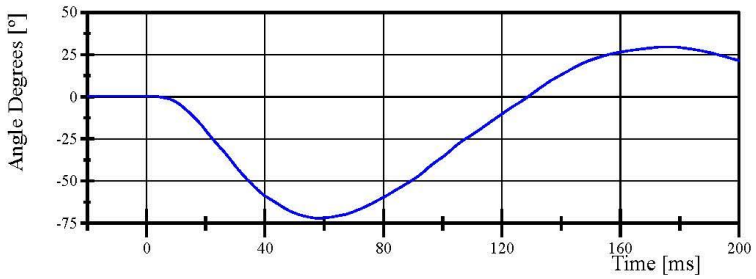
Filter Class: CFC_60
Max: 15.6 ° at 180.6 ms
Min: -48.4 ° at 63.4 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.1 ° at 160.2 ms
Min: -13.6 ° at 54.9 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 29.7 ° at 176.2 ms
Min: -72.0 ° at 58.2 ms

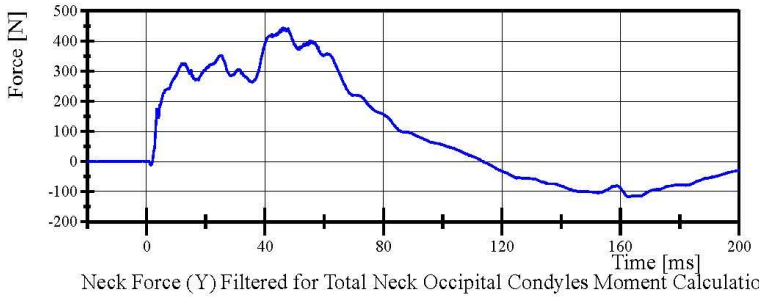
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.29.2022 08:38:41 747

Transportation Research Center Inc.

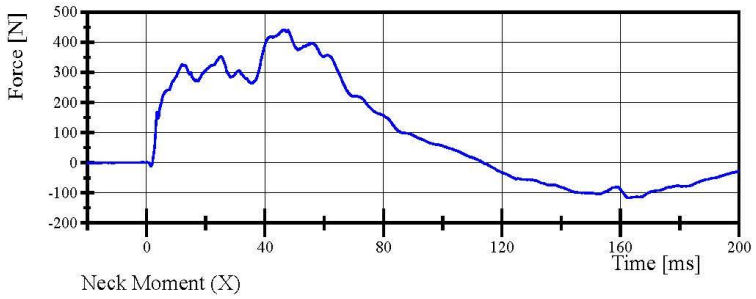
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/29/2022

Neck Force (Y)



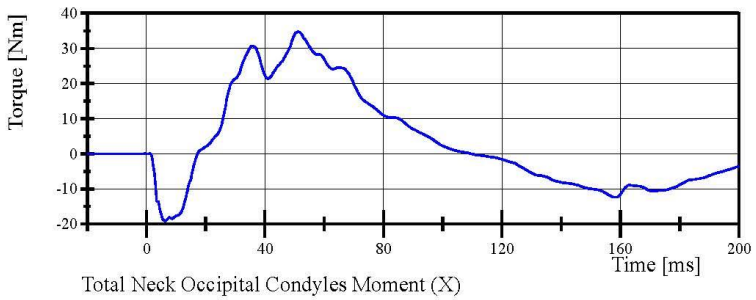
Filter Class: CFC_1000
Max: 443.6 N at 46.2 ms
Min: -117.6 N at 162.7 ms

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



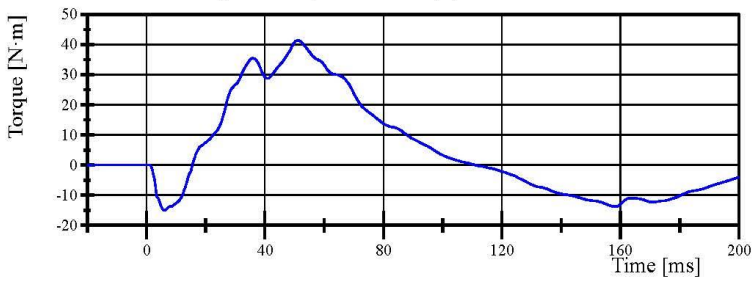
Filter Class: CFC_600
Max: 441.6 N at 46.1 ms
Min: -117.2 N at 162.6 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.7 Nm at 51.1 ms
Min: -19.2 Nm at 6.4 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 41.4 N·m at 51.1 ms
Min: -15.0 N·m at 6.3 ms

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

09.29.2022 08:38:41 747

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	44 %	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	30.6 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	18.7 g	Yes

Test meets specifications.

Condition: Used

Comments:
Left Arm S/N: DP8451
Shoulder Rib S/N: DO9814

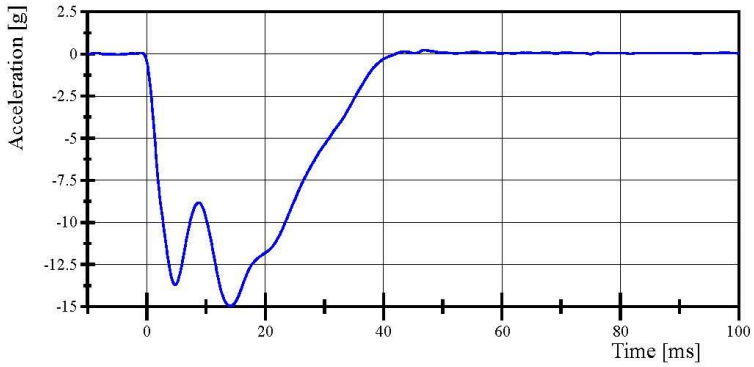
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 10:43:40 833

Transportation Research Center Inc.

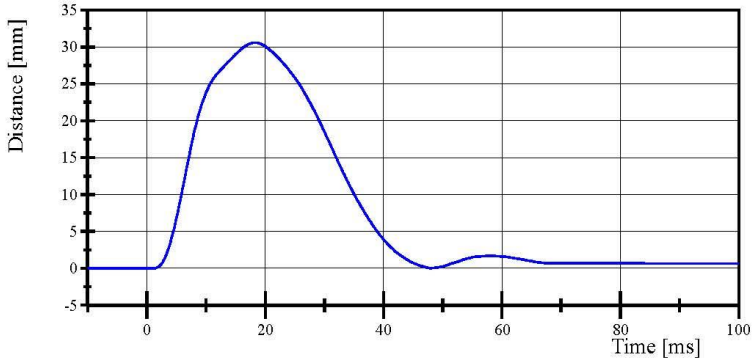
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Probe Acceleration



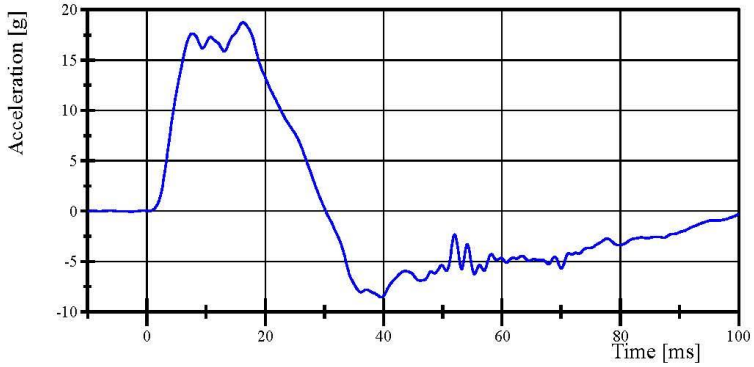
Filter Class: CFC_180
Max: 0.2 g at 46.9 ms
Min: -15.0 g at 14.1 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 30.6 mm at 18.3 ms
Min: -0.0 mm at -0.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 18.7 g at 16.2 ms
Min: -8.6 g at 39.6 ms

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

09.28.2022 10:44:09 833

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.679 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.5 g	Yes
Shoulder Displacement	31 - 40 mm	35.3 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.6 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.2 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.6 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	35.8 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	35.0 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

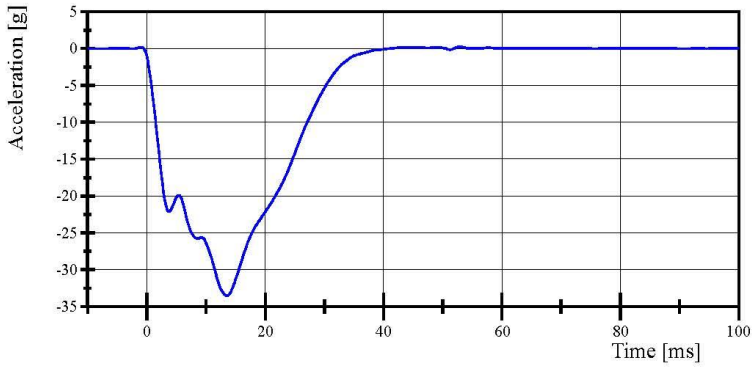
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 11:34:18 634

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Probe Acceleration

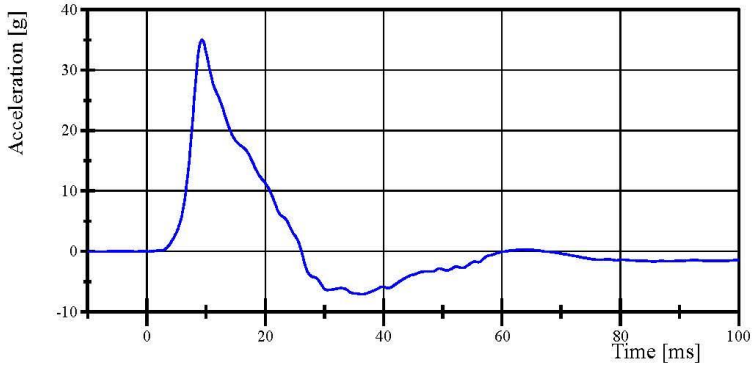


Filter Class: CFC_180
Max: 0.3 g at 53.0 ms
Min: -33.5 g at 13.5 ms

Upper Spine Acceleration

Filter Class: CFC_180
Max: 35.8 g at 11.4 ms
Min: -12.2 g at 31.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 35.0 g at 9.3 ms
Min: -7.1 g at 36.3 ms

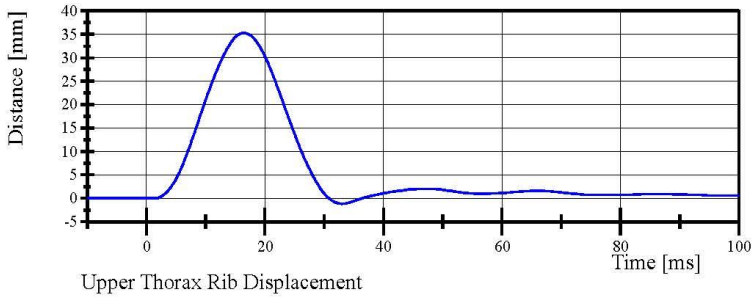
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 11:35:17 634

Transportation Research Center Inc.

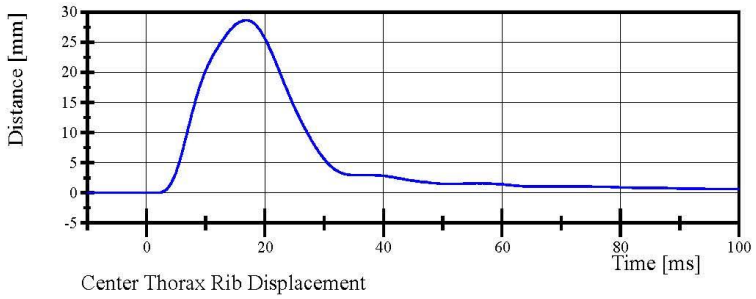
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Shoulder Rib Displacement



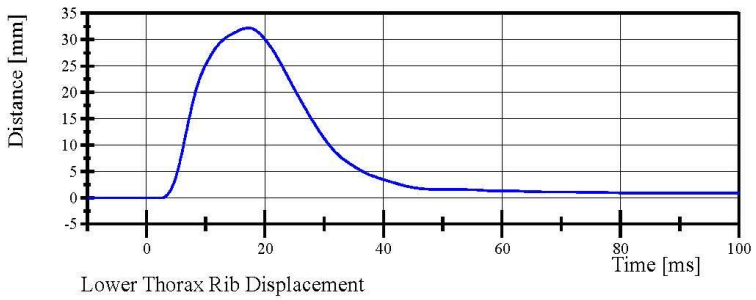
Filter Class: CFC_600
Max: 35.3 mm at 16.4 ms
Min: -1.1 mm at 33.0 ms

Upper Thorax Rib Displacement



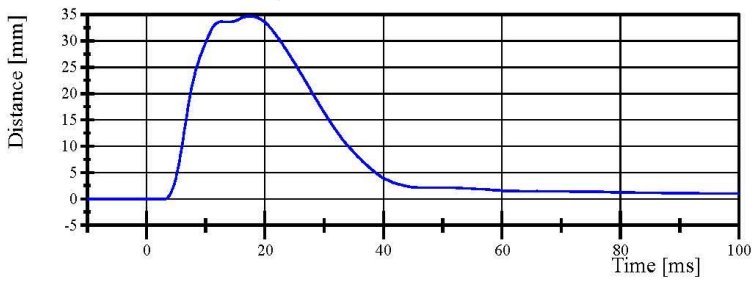
Filter Class: CFC_600
Max: 28.6 mm at 16.8 ms
Min: -0.0 mm at 1.9 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.2 mm at 17.3 ms
Min: -0.0 mm at 2.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.6 mm at 17.4 ms
Min: -0.0 mm at 3.1 ms

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

09.28.2022 11:35:17 634

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.334 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	37.1 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	42.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	40.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.1 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.2 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

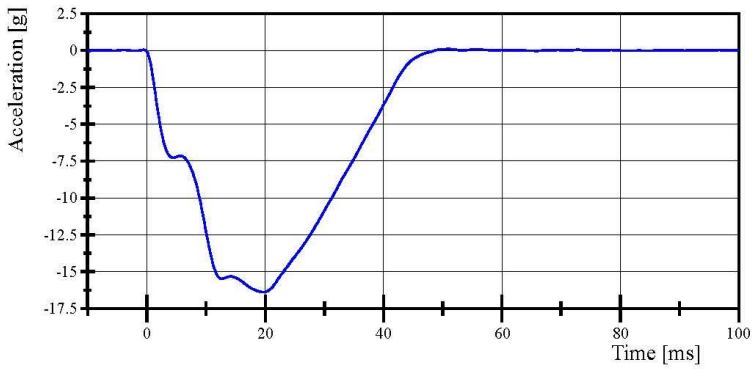
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 11:04:03 851

Transportation Research Center Inc.

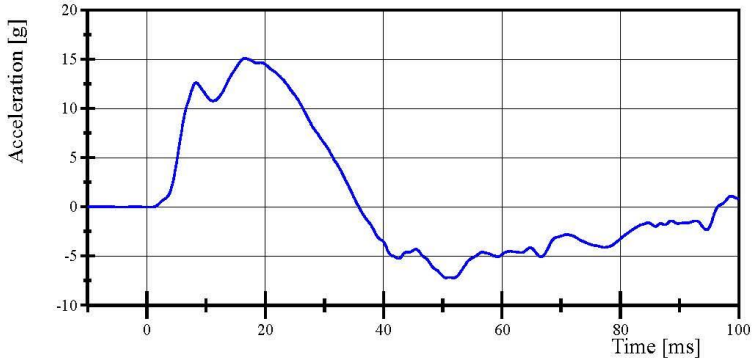
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Probe Acceleration



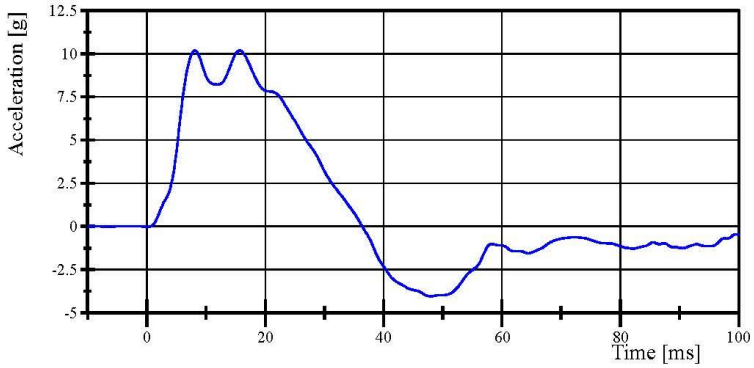
Filter Class: CFC_180
Max: 0.1 g at 50.9 ms
Min: -16.4 g at 19.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.1 g at 16.6 ms
Min: -7.2 g at 51.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.2 g at 15.7 ms
Min: -4.0 g at 48.0 ms

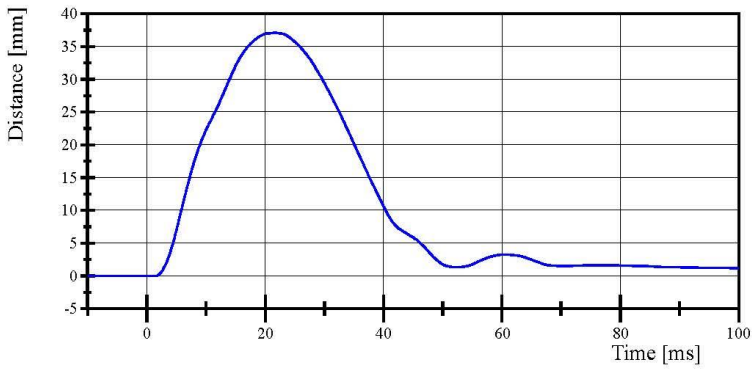
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 11:04:58 851

Transportation Research Center Inc.

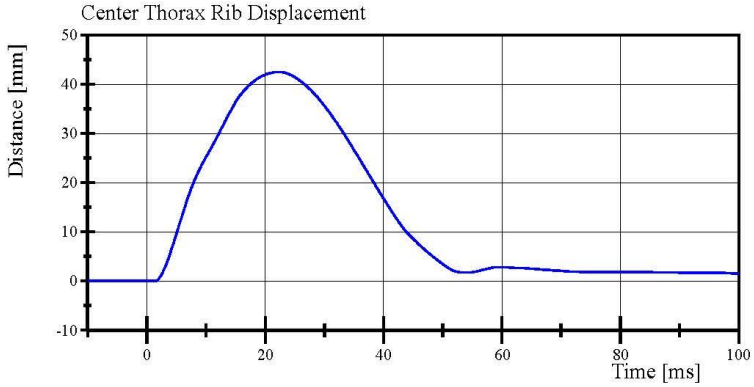
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Upper Thorax Rib Displacement



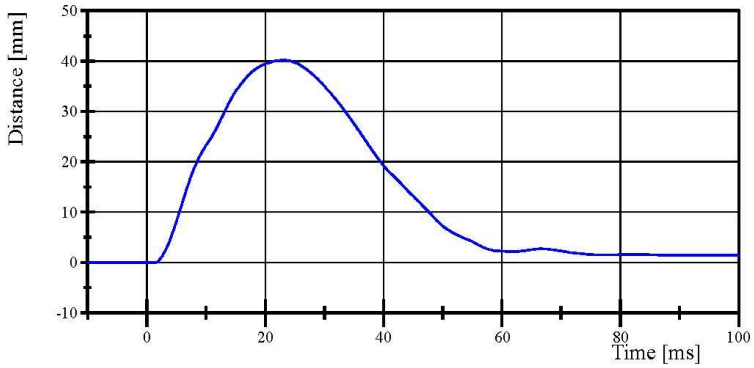
Filter Class: CFC_600
Max: 37.1 mm at 21.7 ms
Min: -0.0 mm at 1.4 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 42.5 mm at 22.2 ms
Min: -0.0 mm at 1.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.2 mm at 23.3 ms
Min: -0.0 mm at 1.4 ms

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

09.28.2022 11:04:58 851

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	39.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	37.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.39 g	Yes

Test meets specifications.

Condition: Used

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

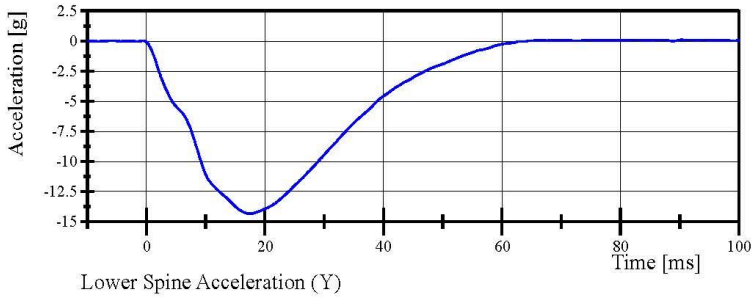
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 10:54:46 686

Transportation Research Center Inc.

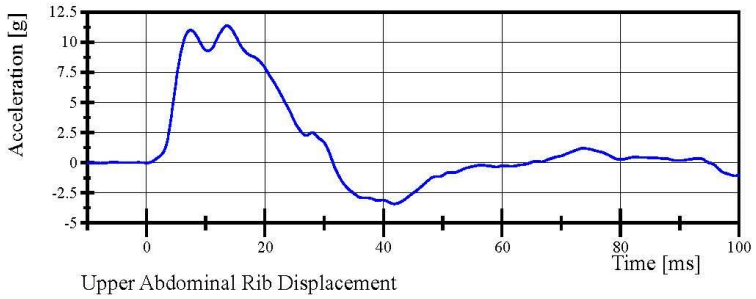
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Probe Acceleration



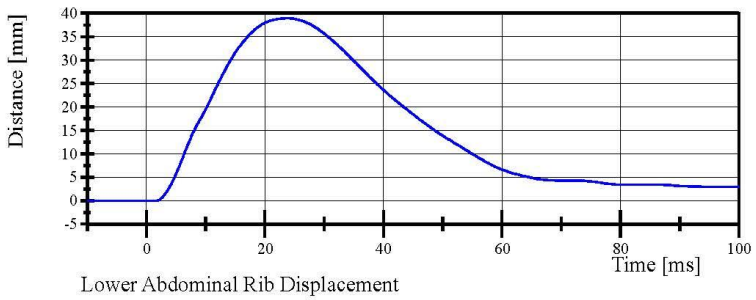
Filter Class: CFC_180
Max: 0.1 g at 90.4 ms
Min: -14.3 g at 17.4 ms

Lower Spine Acceleration (Y)



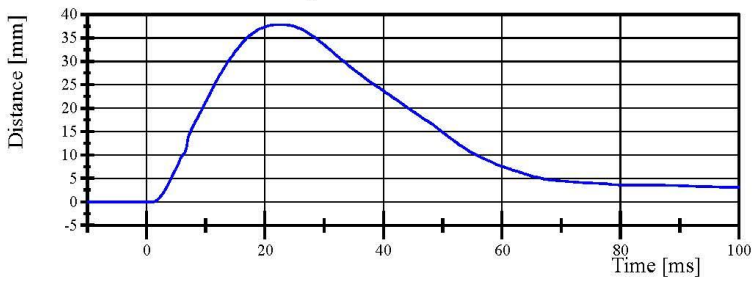
Filter Class: CFC_180
Max: 11.4 g at 13.6 ms
Min: -3.4 g at 41.8 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 39.0 mm at 23.8 ms
Min: -0.0 mm at 1.6 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 37.8 mm at 22.6 ms
Min: -0.0 mm at 1.0 ms

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

09.28.2022 10:55:13 686

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.61 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.70 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	36.9 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,965.2 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: 0001186
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13777
Cal Date: 20200325

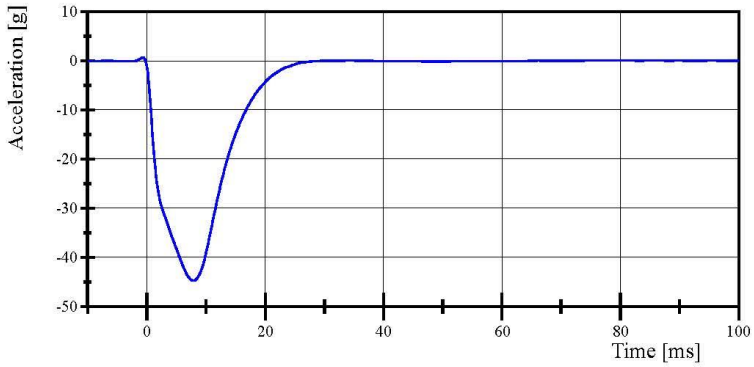
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 10:26:44 460

Transportation Research Center Inc.

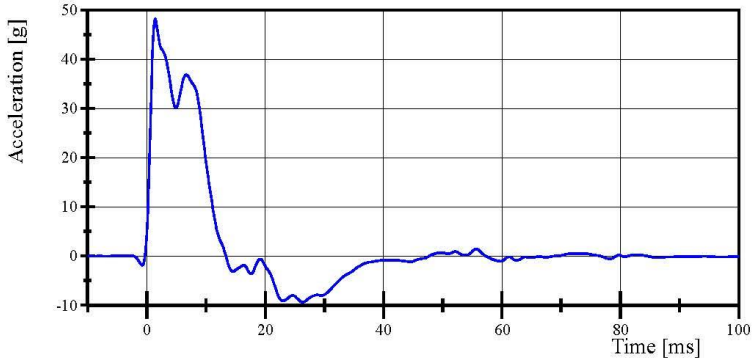
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Probe Acceleration



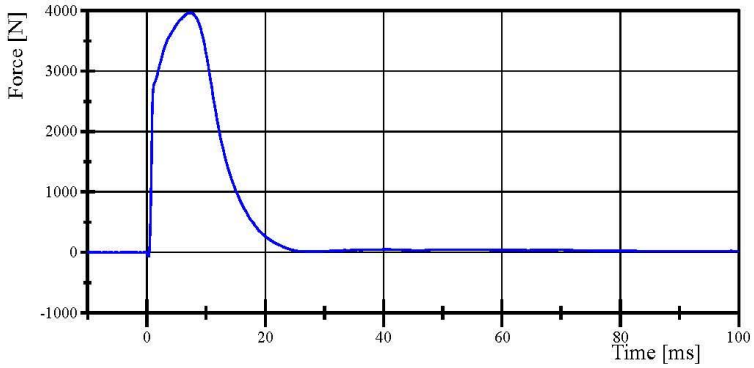
Filter Class: CFC_180
Max: 0.7 g at -0.7 ms
Min: -44.7 g at 7.8 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 48.2 g at 1.4 ms
Min: -9.4 g at 26.3 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,965.2 N at 7.4 ms
Min: -67.9 N at 0.2 ms

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

09.28.2022 10:28:07 460

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-43.3 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.2 g	Yes
Iliac Force	4,100 - 5,100 N	5,031.3 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis S/N: 0001186

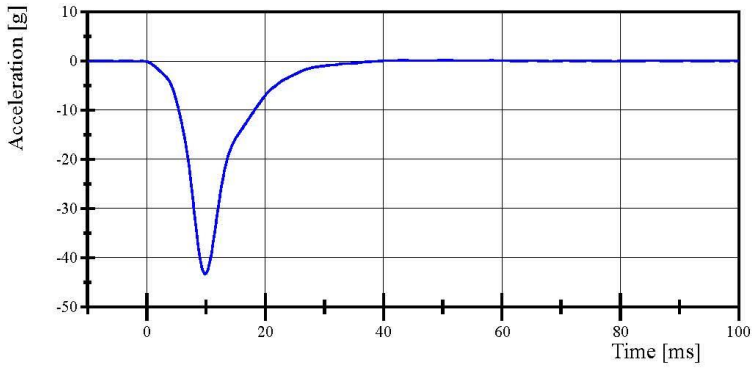
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

09.28.2022 12:38:25 688

Transportation Research Center Inc.

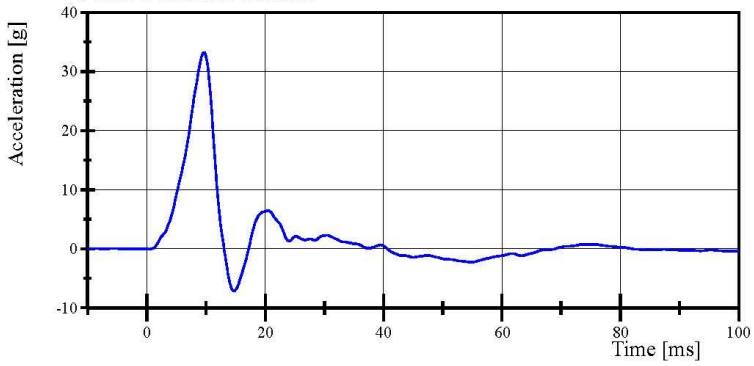
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 17-1
Test Date: 9/28/2022

Probe Acceleration



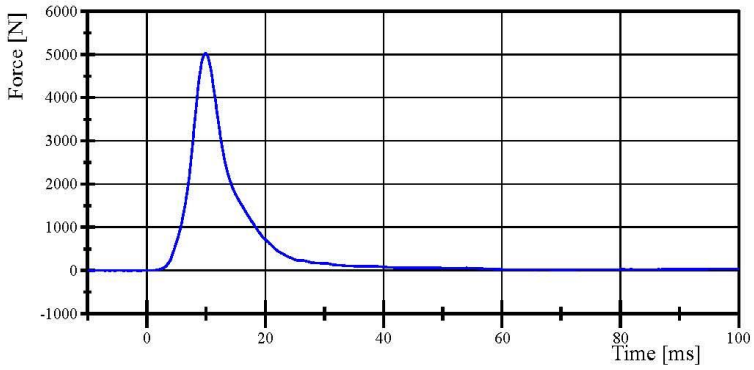
Filter Class: CFC_180
Max: 0.2 g at 43.2 ms
Min: -43.3 g at 9.8 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 33.2 g at 9.7 ms
Min: -7.2 g at 14.7 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 5,031.3 N at 9.9 ms
Min: -0.7 N at -9.1 ms

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

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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	29-Aug-2022
		Y	T10352	Endevco	29-Aug-2022
		Z	P91950	Endevco	29-Aug-2022
Redundant Head Accelerometers		X	T16771	Endevco	29-Aug-2022
		Y	P83368	Endevco	29-Aug-2022
		Z	P91904	Endevco	29-Aug-2022
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	1-Mar-2022
	Middle	Y	174	FTSS	1-Mar-2022
	Lower	Y	0913	Honeywell	1-Mar-2022
Abdomen Load Cells	Front	Y	1441	Denton	1-Mar-2022
	Middle	Y	1436	Denton	1-Mar-2022
	Rear	Y	1437	Denton	1-Mar-2022
Lower Spine Accelerometers (T12)		X	T11866	Endevco	29-Aug-2022
		Y	P91615	Endevco	29-Aug-2022
		Z	P64884	Endevco	29-Aug-2022
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	465-FY	Denton	1-Mar-2022

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N DQ0570		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers			X	T11432	Endevco	31-Aug-2022
			Y	P93774	Endevco	31-Aug-2022
			Z	P91566	Endevco	31-Aug-2022
Redundant Head Accelerometers			X	P93766	Endevco	31-Aug-2022
			Y	P93762	Endevco	31-Aug-2022
			Z	P93761	Endevco	31-Aug-2022
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	4-Mar-2022
		Middle	Y	037	Servo	4-Mar-2022
		Lower	Y	048	Servo	4-Mar-2022
	Abdominal Rib	Upper	Y	1295	Servo	4-Mar-2022
		Lower	Y	1136	Servo	4-Mar-2022
Lower Spine Accelerometers (T12)			X	P94545	Endevco	31-Aug-2022
			Y	P94647	Endevco	31-Aug-2022
			Z	P94530	Endevco	31-Aug-2022
Acetabulum Load Cell			Y	DK7483S-FY	FTSS	3-Mar-2022
Iliac Wing Load Cell			Y	287-FY	Denton	3-Mar-2022
Pelvis Plug (struck side)				13770	SACO	25-Mar-2022
Pelvis Plug (non-struck side)				13775	SACO	25-Mar-2022

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A318478	Measurement Specialties	19-Apr-2022
	Vehicle Center of Gravity	Y	A300416	Measurement Specialties	19-Apr-2022
	Vehicle Center of Gravity	Z	A318461	Measurement Specialties	19-Apr-2022
2	Right Sill at Front Seat	X	A386360	Measurement Specialties	26-May-2022
	Right Sill at Front Seat	Y	A298376	Measurement Specialties	23-May-2022
	Right Sill at Front Seat	Z	A349788	Measurement Specialties	19-Apr-2022
3	Right Sill at Rear Seat	X	A349898	Measurement Specialties	26-May-2022
	Right Sill at Rear Seat	Y	A300432	Measurement Specialties	19-Apr-2022
	Right Sill at Rear Seat	Z	A377538	Measurement Specialties	19-Apr-2022
4	Left Sill at Front Door	Y	A349899	Measurement Specialties	26-May-2022
5	Left Sill at Rear Door	Y	A254866	Measurement Specialties	26-May-2022
6	Left A-Post Lower	Y	A237895	Measurement Specialties	12-Apr-2022
7	Left A-Post Middle	Y	A298339	Measurement Specialties	19-Apr-2022
8	Left B-Post Lower	Y	A377508	Measurement Specialties	26-May-2022
9	B-Post Middle	Y	A349892	Measurement Specialties	26-May-2022
10	Front Seat Track	Y	A377197	Measurement Specialties	19-Apr-2022
11	Rear Seat Track or Structure	Y	A377541	Measurement Specialties	19-Apr-2022
12	Right Rear Occupant Compartment	Y	A227157	Measurement Specialties	23-May-2022
13	Engine Block	X	A241156	Measurement Specialties	26-May-2022
	Engine Block	Y	A254929	Measurement Specialties	26-May-2022
14	Rear Floorpan Above Axle	X	A251671	Measurement Specialties	26-May-2022
	Rear Floorpan Above Axle	Y	A298563	Measurement Specialties	12-Apr-2022
	Rear Floorpan Above Axle	Z	A318451	Measurement Specialties	26-May-2022

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A300443	Measurement Specialties	23-Mar-2022
MDB Center of Gravity	Y	A297062	Measurement Specialties	23-Mar-2022
MDB Center of Gravity	Z	A254898	Measurement Specialties	23-Mar-2022
Left Frame Rail at Rear Axle Centerline	X	A297045	Measurement Specialties	22-Mar-2022
Left Frame Rail at Rear Axle Centerline	Y	A297050	Measurement Specialties	22-Mar-2022