FINAL REPORT NUMBER: SINCAP-TRC-22-002

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

FORD MOTOR CO.
2022 Ford F-250 Super Cab
NHTSA NUMBER: M20220208

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

Report Date: May 22, 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

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement.

Report Prepared By: ILO Project Operations Group

Report Approved By: 

John Shultz

Approval Date: May 22, 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

1. Report No. SINCAP-TRC-22-002	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Draft Report of New Car Assessment Program Side Impact MDB Testing of a 2022 Ford F-250 Super Cab, NHTSA No.: M20220208		5. Report Date May 22, 2023 6. Performing Organization Code TRC Inc.
7. Author(s) John Shultz, Project Manager		8. Performing Organization Report Number 220628
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		10. Work Unit No. 11. Contract or Grant No. 693JJ920D000018
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave, SE Washington, DC 20590		13. Type of Report and Period Covered Draft Test Report June 28, 2022 – May 22, 2023 14. Sponsoring Agency Code NRM-110
15. Supplemental Notes		

16. Abstract

This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2022 Ford F-250 Super Cab, in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on June 28, 2022.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.36 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22.7° C. The target vehicle post-test maximum crush was 146 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	14
Maximum Thoracic Rib Deflection	mm	44	18.0
Total Abdominal Force	N	2500	636.8
Pubic Symphysis Force	N	6000	-670.6
Lower Spine Acceleration	G	82*	23.1

Passenger ATD (SID-IIs)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	61
Lower Spine Resultant Acceleration	g's	82	16.7
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	506.7
Maximum Thoracic Rib Deflection	mm	38*	0.5
Maximum Abdominal Rib Deflection	mm	45*	0.1

* 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

19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. Number of Pages 217	22. Price

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

TABLE OF CONTENTS

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 Ford F-250 Super Cab. 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 Ford F-250 Super Cab was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.36 km/h (38.75 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 June 28, 2022. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated 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 instrumenation calibration data.

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	14
Maximum Thoracic Rib Deflection	mm	44	18.0
Combined Abdominal Force	N	2500	636.8
Pubic Symphysis Force	N	6000	-670.6
Lower Spine (T12) Resultant Acceleration	G	82*	23.1

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	61
Lower Spine (T12) Resultant Acceleration	G	82	16.7
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	506.7
Maximum Thoracic Rib Deflection	mm	38*	0.5
Maximum Abdominal Rib Deflection	mm	45*	0.1

* Proposed IARV

Supplemental Restraint Information is given below:

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

GENERAL COMMENTS

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

Driver Head AX; Noise Spikes Present
Left Lower A-Post AY; Questionable Data
Left Lower B-Post AY; Failed at 24.0 MS
Left Mid B-Post AY; Failed at 29.0 MS
Left Front Sill AY; Questionable Data
Left Rear Sill AY; Questionable Data

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20220208
Model Year	2022
Make	Ford
Model	F-250 Super Cab
Body Style	Truck
VIN	1FT7X2A62NEE48856
Body Color	Iconic Silver
Odometer Reading (km/mi)	5 mi
Engine Displacement (L)	6.2
Type/No. Cylinders	V/8
Engine Placement	Inline
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	FORD MOTOR CO.
Date of Manufacture	05/22
Vehicle Type	Truck

GVWR (kg)	4536
GAWR Front (kg)	1792
GAWR Rear (kg)	2876

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

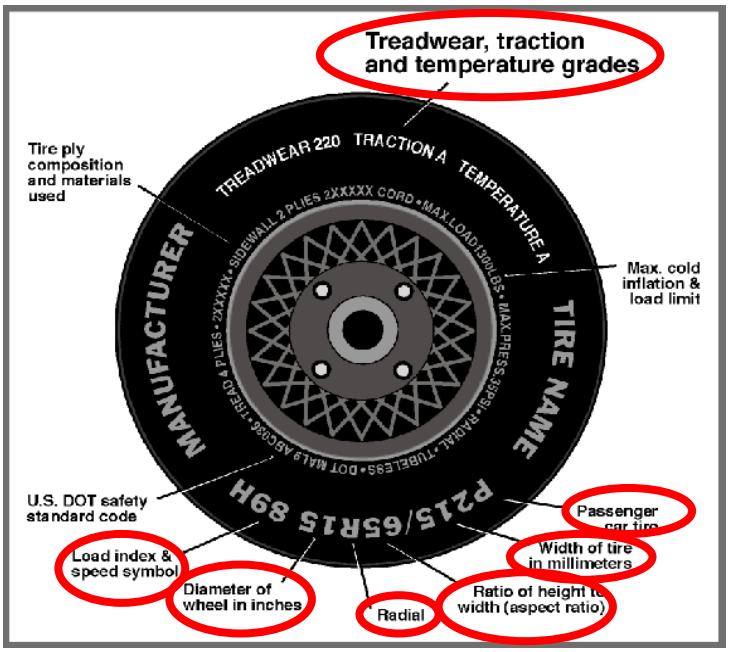
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity DSC)	3	3	N/A	6
Capacity Weight (VCW) (kg)				1803.0
DSC x 68.04 (kg)				408.24
Cargo Weight (RCLW) (kg)				1394.76

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Cold Pressure (kPa)	450	550
Recommended Tire Size	448	552
Tire Size on Vehicle	LT245/75R17	LT245/75R17
Tire Manufacturer	Michelin	Michelin
Tire Model	LTX M/S2	LTX M/S2
Treadwear	N/A	N/A
Traction	N/A	N/A
Temperature Grades	N/A	N/A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	121/118R	121/118R
Tire Material	Polyester, Polyamide, Steel	Polyester, Polyamide, Steel
DOT Safety Code Left	1M3 43 007X 1722	1M3 43 007X 1722
DOT Safety Code Right	1M3 43 007X 1722	1M3 43 007X 1722

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

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	379	414	400	400
Tire Placard	kPa	448	448	552	552
Owner's Manual	kPa	448	448	552	552
As Tested	kPa	448	448	552	552

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	760.2	575.0		834.4	664.6		826.6	691.6	
Right	kg	743.0	583.6		747.4	669.2		740.0	664.6	
Ratio	%	56.5	43.5		54.3	45.7		53.6	46.4	
Totals	kg	1503.2	1158.6	2661.8	1581.8	1333.8	2915.6	1566.6	1356.2	2922.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2661.8	(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	2922.8	(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	982	985	Yes
RF	mm	975	979	Yes
RR	mm	1064	1065	Yes
LR	mm	1063	1067	Yes
Vehicle CG (Aft of Front Axle)	mm	1747	1722	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+34	+24	

***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 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Plate weight	95.6
Removed: None	0.0

TEST SURFACE MARKINGS

	Distance from 63° Impact Angle Line (mm)
Fore 25 mm target	400
Aft 25 mm target	400
Pre-Impact Angle Line	400

Parallel Track Target	X Location (mm)	Y Location (mm)
A	0	0
B	1765	3445
C	3739	3445
D	3820	0

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

Test Vehicle:	2022 Ford F-250 Super Cab	NHTSA No.:	M20220208
Test Program:	SINCAP Side Impact	Test Date:	6/28/2022

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	N/A	N/A	15.6
Front Passenger Seat	N/A	N/A	16.8
Front Center Seat*	N/A	N/A	10.0
Struck Side Rear Seat	N/A	N/A	17.5
Non-Struck Side Rear Seat	N/A	N/A	17.9
Rear Center Seat*	N/A	N/A	19.1

* 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	15.6	339	Max	N/A	N/A	N/A
			Mid	341	339	338
			Min	N/A	N/A	N/A
Front Passenger Seat	16.8	347	Max	N/A	N/A	N/A
			Mid	349	347	345
			Min	N/A	N/A	N/A
Front Center Seat*	10.0	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	17.5	282	Max	N/A	N/A	N/A
			Mid	N/A	282	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	17.9	281	Max	N/A	N/A	N/A
			Mid	N/A	281	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	19.1	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 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

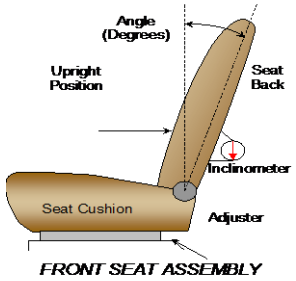
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	255	37	125	18
Front Passenger Seat	255	37	125	18
Front Center Seat*	0	Fixed	0	Fixed
Struck Side Rear Seat	0	Fixed	0	Fixed
Non-Struck Side Rear Seat	0	Fixed	0	Fixed
Rear Center Seat*	0	Fixed	0	Fixed

* If applicable

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	50.8	28	2.8	5
Front Passenger Seat	50.7	28	2.3	5
Front Center Seat*	0.0	Fixed	0.0	Fixed
Struck Side Rear Seat w/ Seated Dummy	0.0	Fixed	0.0	Fixed
Non-Struck Side Rear Seat	0.0	Fixed	0.0	Fixed
Rear Center Seat*	0.0	Fixed	0.0	Fixed

* 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	4, full up
Rear Seat	0	Fixed

HEAD RESTRAINT ADJUSTMENT

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

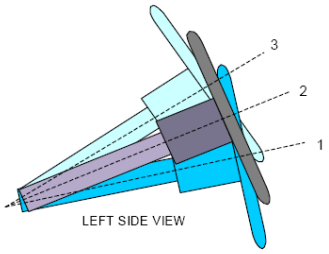
	Total # of Positions	Placed in Position #
Driver Seat	3	3, full up
Rear Seat	2	0, full down

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

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

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.



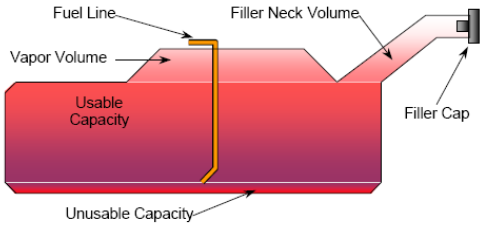
STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	20.0	
Geometric Center, Position No. 2	21.9	
Uppermost, Position No. 3	23.7	
Telescoping Steering Wheel Travel		40
Test Position	21.9	20

FUEL PUMP

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

The electric fuel pump operates for 3 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 3 seconds following ignition actuation the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls the fuel pump is deactivated. Also, the fuel pump is shut-off by the restraint control module to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



VEHICLE FUEL TANK ASSEMBLY

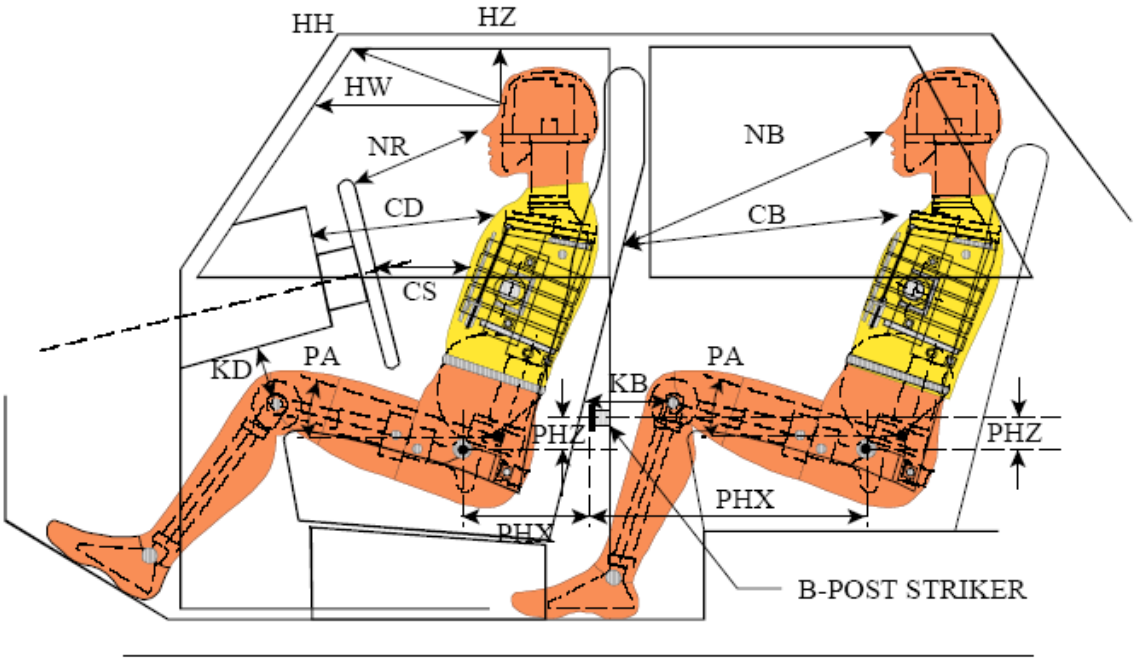
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	128.7
Usable Capacity of "Optional Tank" (see Form No. 1)	0.0
Usable Capacity of Standard Tank (see Owner's Manual)	128.7
Usable Capacity of Optional Tank (see Owner's Manual)	0.0
93% of Usable Capacity	119.7
Actual Amount of Solvent Used in Test	119.7
1/3 of Usable Capacity	42.9

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 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



LEFT SIDE VIEW

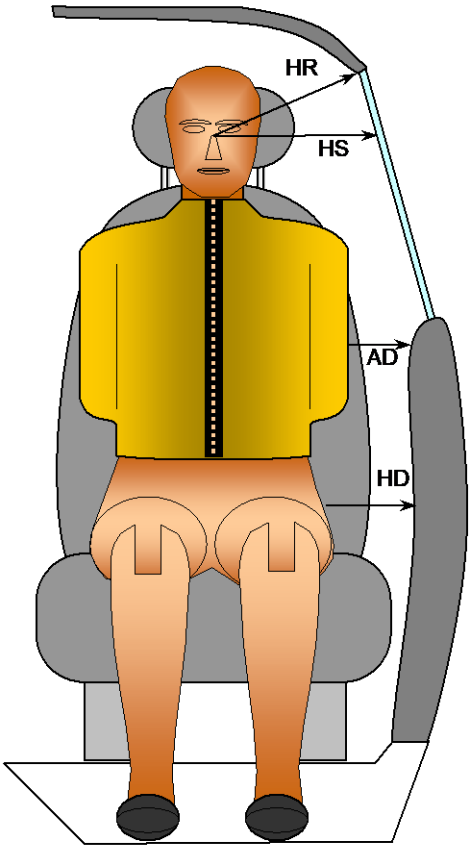
NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	454			
HW		Header to Windshield	725			
HZ	HZ	Head to Roof Liner	202		308	
NR	NB	Nose to Rim/Seat Back	446		480	
CD	CB	Chest to Dash/Seat Back	624		490	
CS		Chest to Steering Wheel	314			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	145	23.0	210	4.6
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	137	22.7	208	4.9
PAX°	PAX°	Pelvic Tilt Angle X		0.5		0.3
	PAY°	Pelvic Tilt Angle Y				17.6
PHX	PHX	Hip Point to Striker (X-Axis)	299		391	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	59		770	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Ford F-250 Super Cab
Test Program: SINCAP Side Impact
NHTSA No.: M20220208
Test Date: 6/28/2022

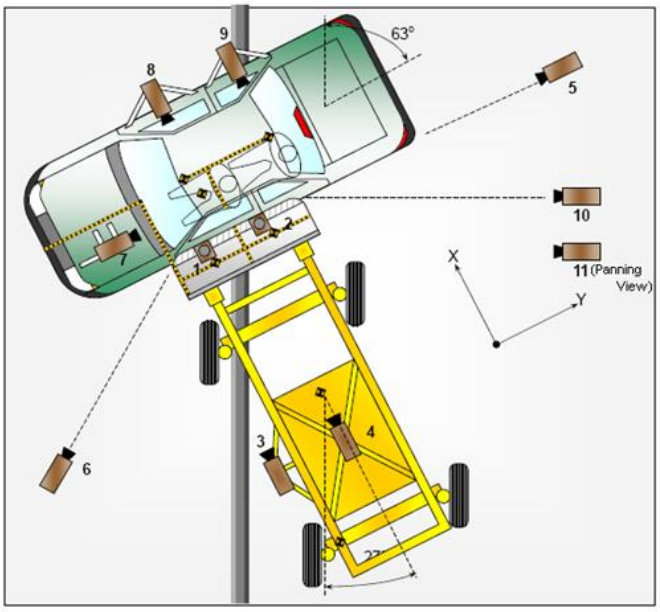


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	195	278
HS	Head to Side Window	mm	329	301
AD	Arm to Door	mm	114	169
HD	H-Point to Door	mm	167	203

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



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

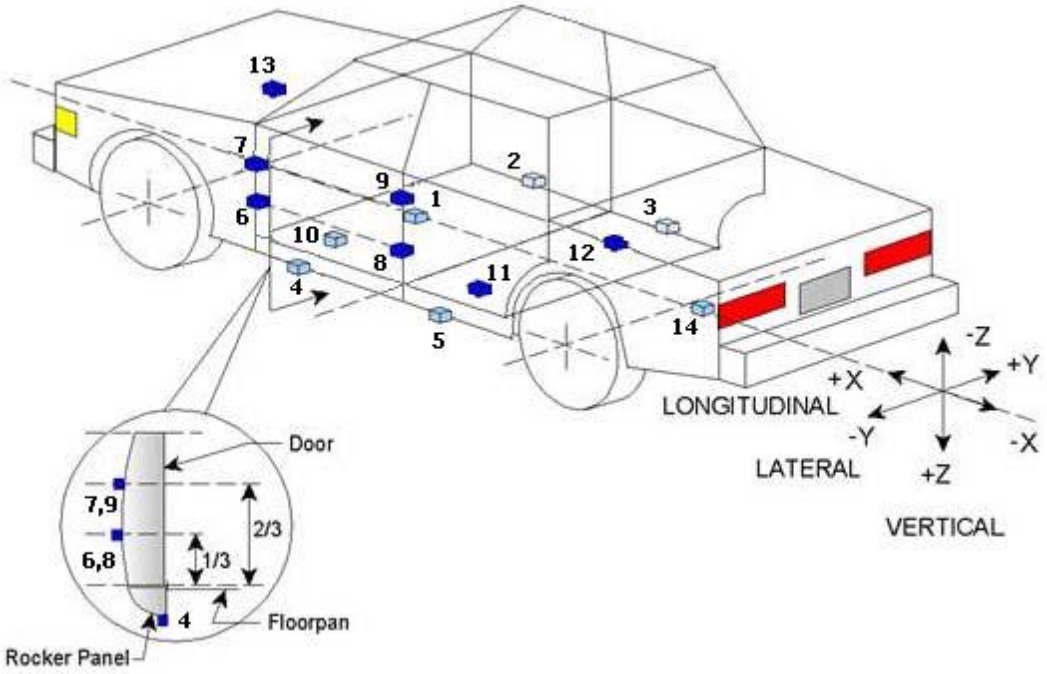
Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down
*All measurements accurate to ± 6 mm.
If applicable, explain why camera(s) did not operate as intended: Cameras 10 and 11 failed during recordingt

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 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



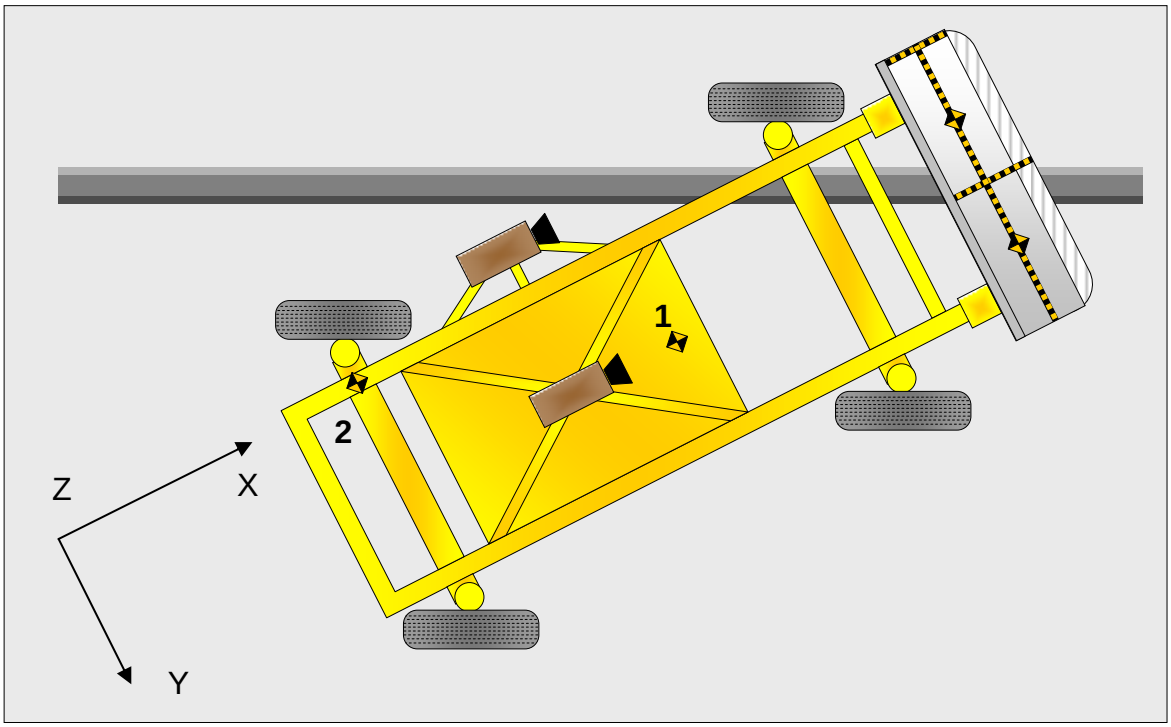
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3915	0	-808
2	Right Sill at Front Seat	3976	684	-627
3	Right Sill at Rear Seat	3255	690	-689
4	Left Sill at Front Door	3954	-686	-646
5	Left Sill at Rear Door	3258	-685	-700
6	A-Post Lower	4380	-908	-706
7	A-Post Middle	4395	-872	-1221
8	B-Post Lower	3325	-850	-70
9	B-Post Middle	3285	-855	-1175
10	Front Seat Track	3527	-638	-746
11	Rear Seat Structure	2730	-502	-763
12	Right Rear Occ. Compartment	2725	496	-763
13	Engine Block	4952	85	-1148
14	Rear Above Axle	1317	0	-870

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 Ford F-250 Super Cab
Test Program: SINCAP Side Impact
NHTSA No.: M20220208
Test Date: 6/28/2022



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 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	None	None
Top of Head	Side header	SCAB
Left Side of Head	Side header	SCAB
Back of Head	Side header, Head restraint	C pillar, Head restraint
Left Shoulder	SCAB	None
Upper Torso	SAB	None
Lower Torso	SAB	None
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	Cracked
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

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 Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	No
Seat Belt Load Limiter	Yes	No	Yes	No
Other	No	N/A	No	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3765
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		523
Actual Impact Point (Aft of Front Axle)	mm		502
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+21
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	+10

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

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

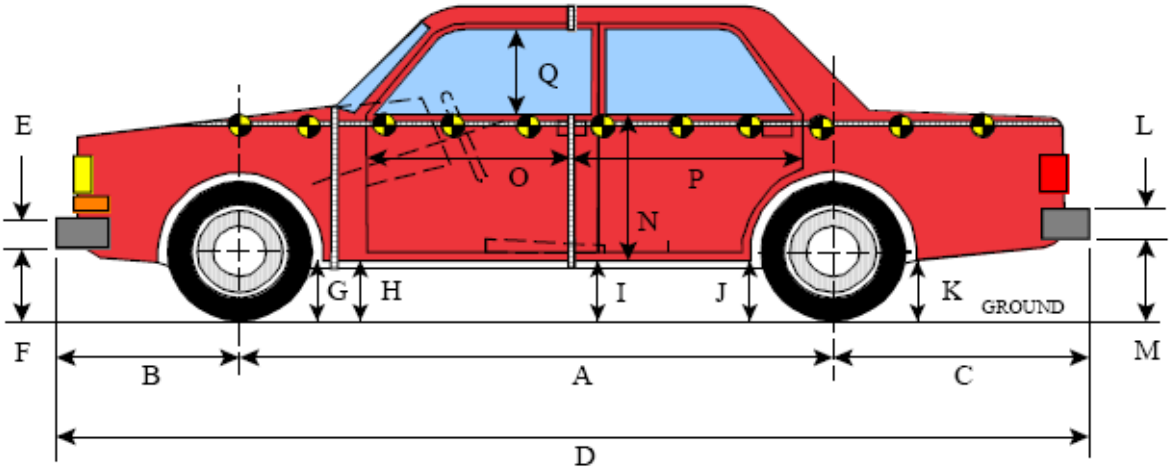
	Units	Front Axle	Rear Axle	Total
Left	kg	417.4	268.4	685.8
Right	kg	360.8	321.0	681.8
Ratio	%	56.9	43.1	100.0
Totals	kg	778.2	589.4	1367.6

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.36
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.35
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 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



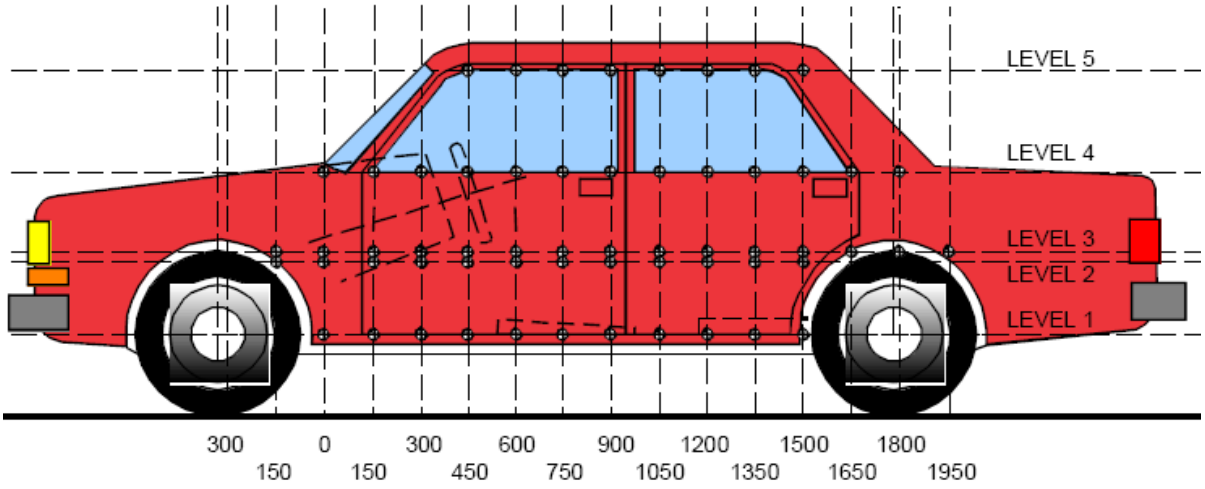
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3765	3768	-3
B	Front Axle to Front Surface of Vehicle	970	970	0
C	Rear Axle to Rear Surface of Vehicle	1330	1330	0
D	Total Length at Centerline	6065	6036	29
E	Front Bumper Thickness	260	260	0
F	Front Bumper Bottom to Ground	382	380	2
G	Sill Height at Front Wheel Well	515	514	1
H	Sill Height at Front Door Leading Edge	523	534	-11
I	Sill Height at B-Pillar	555	579	-24
J1	Sill Height at Rear Wheel Well	568	550	18
J2	Pinch Weld Height at Rear Wheel Well	477	501	-24
K	Sill Height Aft of Rear Wheel Well	602	618	-16
L	Rear Bumper Thickness	225	225	0
M	Rear Bumper Bottom to Ground	530	543	-13
N	Sill Height to Window Bottom Sill	955	930	25
O	Front Door Leading Edge to Impact CL	708	706	2
P	Rear Door Trailing Edge to Impact CL	1227	1195	32
Q	Front Window Opening	535	533	2
R	Right Side Length	5831	5831	0
S	Left Side Length	5835	5830	5
T	Vehicle Width	2030	2015	15
U	Front Wheel Track Width	2030	1993	37
V	Rear Wheel Track Width	1730	1730	0

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	645	131	450
				600
				750
2	Driver Hip Point	993	134	1650
3	Mid-Door	917	146	1650
4	Window Sill	1235	69	1500
				1650
5	Window Top	1891	3	2100

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

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

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-450	0	1008	0	936	0	0	1012	0	943	0	0	-4	0	-7	0
-300	0	1012	1012	947	0	0	1010	999	951	0	0	2	13	-4	0
-150	0	1003	1013	956	0	0	996	994	963	0	0	7	19	-7	0
0	1001	994	997	963	0	930	980	977	968	0	71	14	20	-5	0
150	989	997	994	969	0	893	968	953	981	0	96	29	41	-12	0
300	991	1000	998	971	0	880	973	961	975	0	111	27	37	-4	0
450	993	1002	1000	978	0	862	973	961	986	0	131	29	39	-8	0
600	995	1005	1003	984	0	864	973	956	994	0	131	32	47	-10	0
750	996	1007	1005	989	0	865	964	947	1000	0	131	43	58	-11	0
900	998	1010	1007	994	716	871	942	922	999	726	127	68	85	-5	-10
1050	999	1012	1009	997	727	883	942	913	995	734	116	70	96	2	-7
1200	999	1013	1010	1001	733	911	946	915	990	737	88	67	95	11	-4
1350	1000	1014	1012	1004	739	908	941	923	983	861	92	73	89	21	-122
1500	998	1013	1011	1004	741	874	908	889	935	765	124	105	122	69	-24
1650	998	1013	1011	1005	745	868	879	865	936	782	130	134	146	69	-37
1800	998	1013	1012	1006	748	887	900	891	947	799	111	113	121	59	-51
1950	998	1013	1011	1005	751	934	970	964	984	815	64	43	47	21	-64
2100	996	1012	1010	1005	726	918	994	990	992	720	78	18	20	13	6
2250	984	999	998	994	0	984	999	997	995	0	0	0	1	-1	0
2700	984	999	997	995	0	984	999	996	996	0	0	0	1	-1	0
2850	989	999	998	995	0	988	999	997	996	0	1	0	1	-1	0
3000	1011	1006	1012	994	0	1010	1006	1011	994	0	1	0	1	0	0

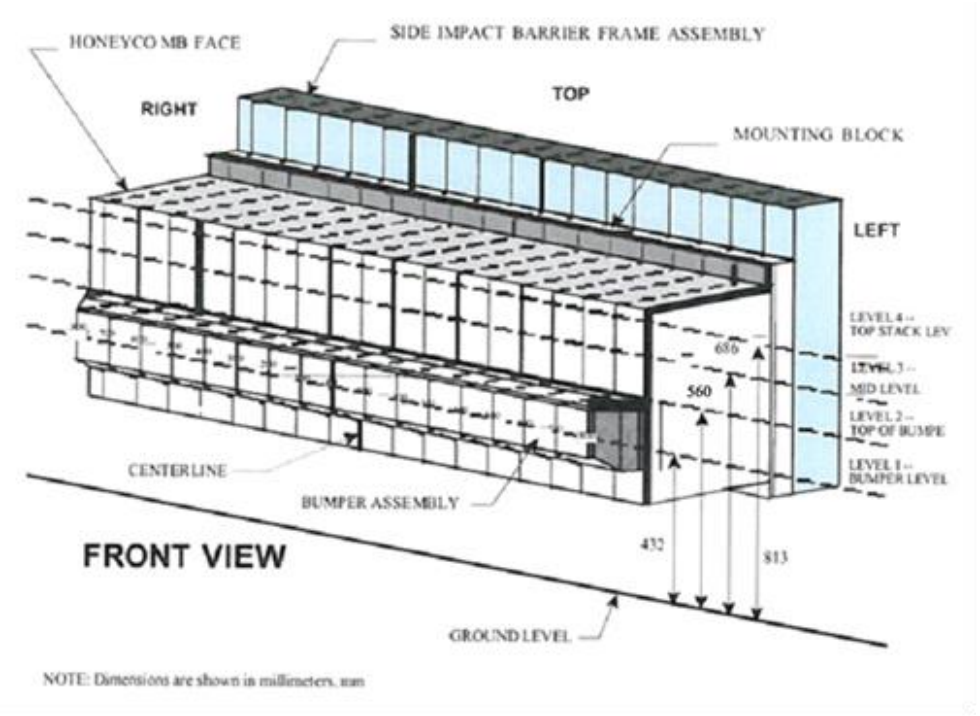
NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

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

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

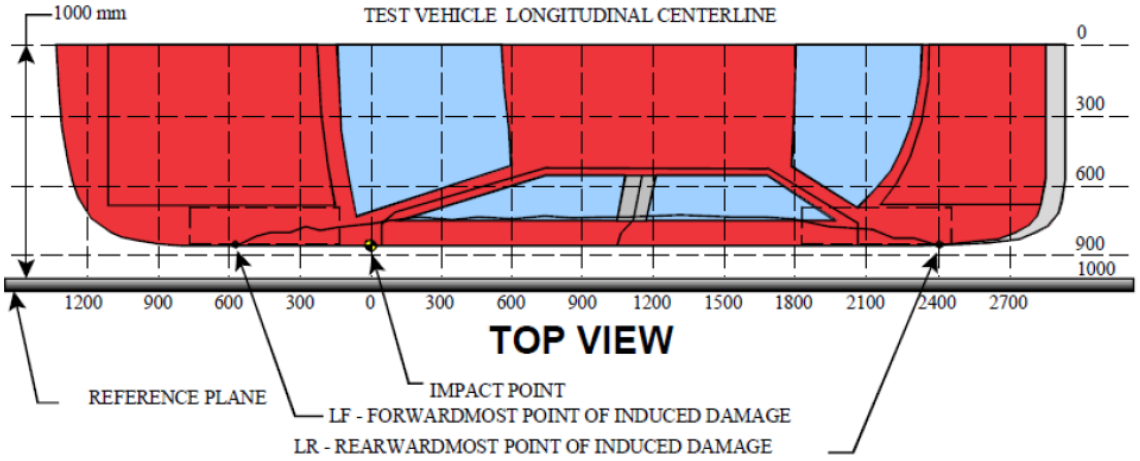
Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	700	Right	136
B	Top of Bumper	560	800	Right	188
C	Mid-Level	686	800	Right	219
D	Top of Stack	813	800	Left	238

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	134	136	132	129	127	126	125	124	122	121	122	117	114	113	112	112	109
2	188	164	156	155	152	152	152	151	146	146	143	140	138	138	139	139	139
3	219	183	178	184	182	176	176	155	142	134	129	130	133	128	135	164	171
4	237	191	163	158	168	163	172	161	151	148	147	149	163	174	181	209	238

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



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[1]	2850	3	1017	1019	0
2	2250	3	997	998	1
3	1650	3	865	1011	146
4	900	1	871	998	127
5	300	1	880	991	111
6[1]	-300	3	999	1012	0

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	4	145	383	238
2	500 mm Left of Center	4	209	383	174
3	200 mm Left of Center	4	236	383	147
4	200 mm Right of Center	3	207	383	176
5	500 mm Right of Center	3	145	383	184
6	800 mm Right of Center	4	146	383	237

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

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

Test Vehicle: 2022 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022

Test Time: 15:51 **Temperature:** 22.7°C

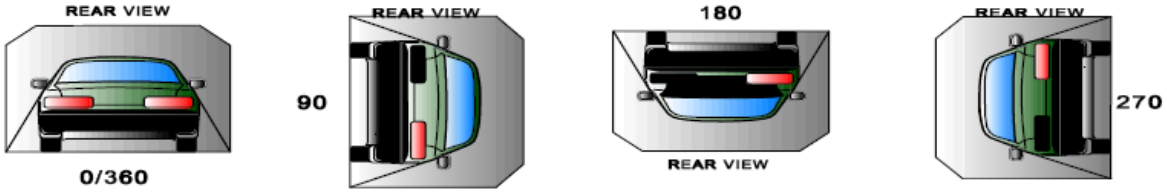
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

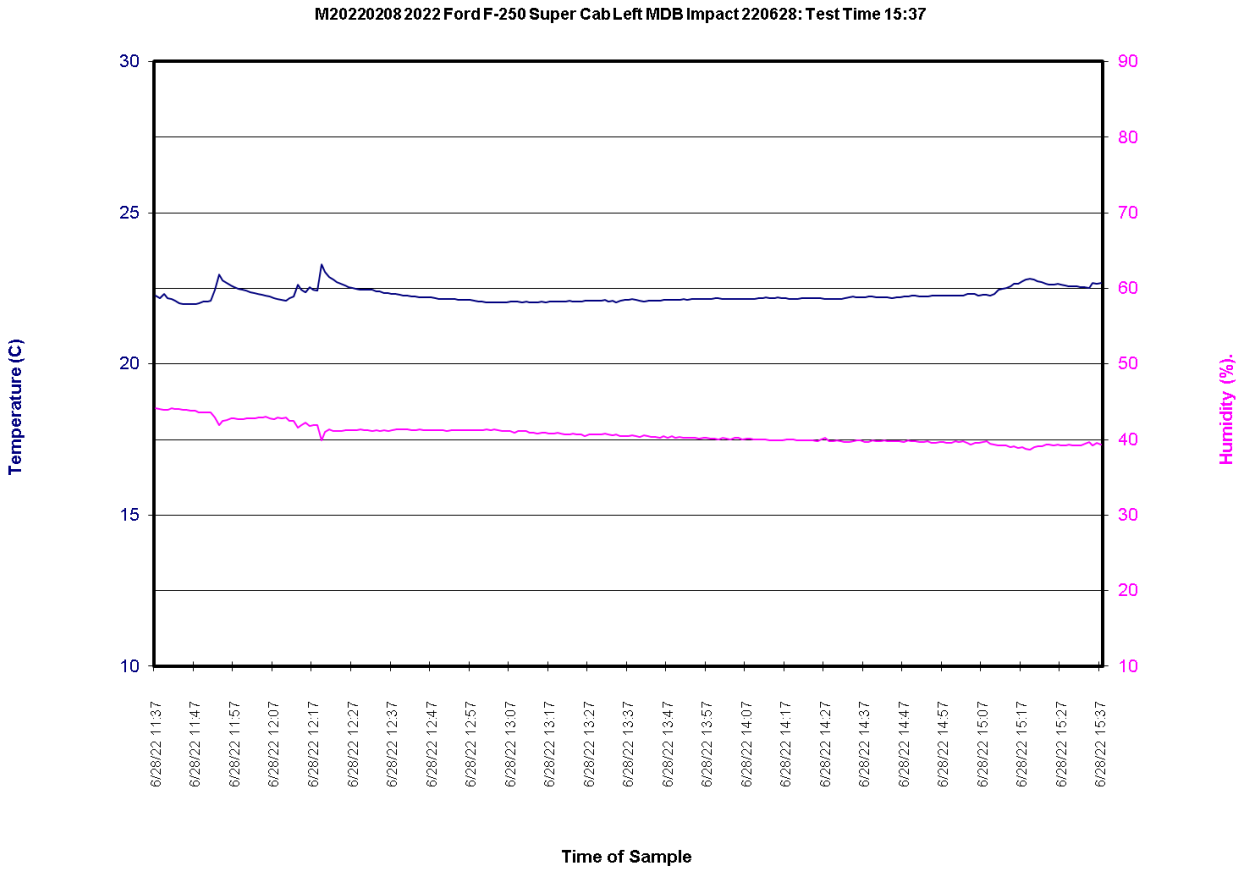
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

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 Ford F-250 Super Cab NHTSA No.: M20220208
Test Program: SINCAP Side Impact Test Date: 6/28/2022



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

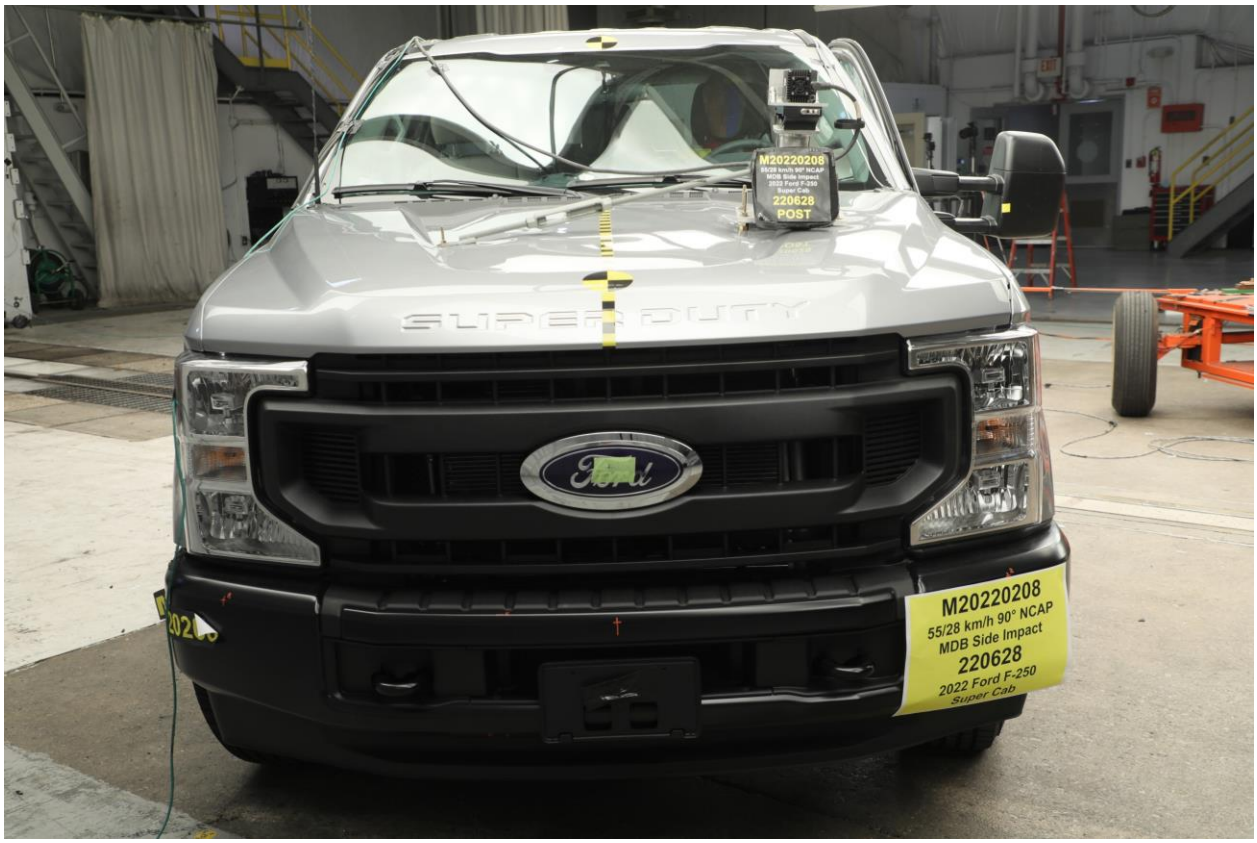
TABLE OF PHOTOGRAPHS (CONTINUED)

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

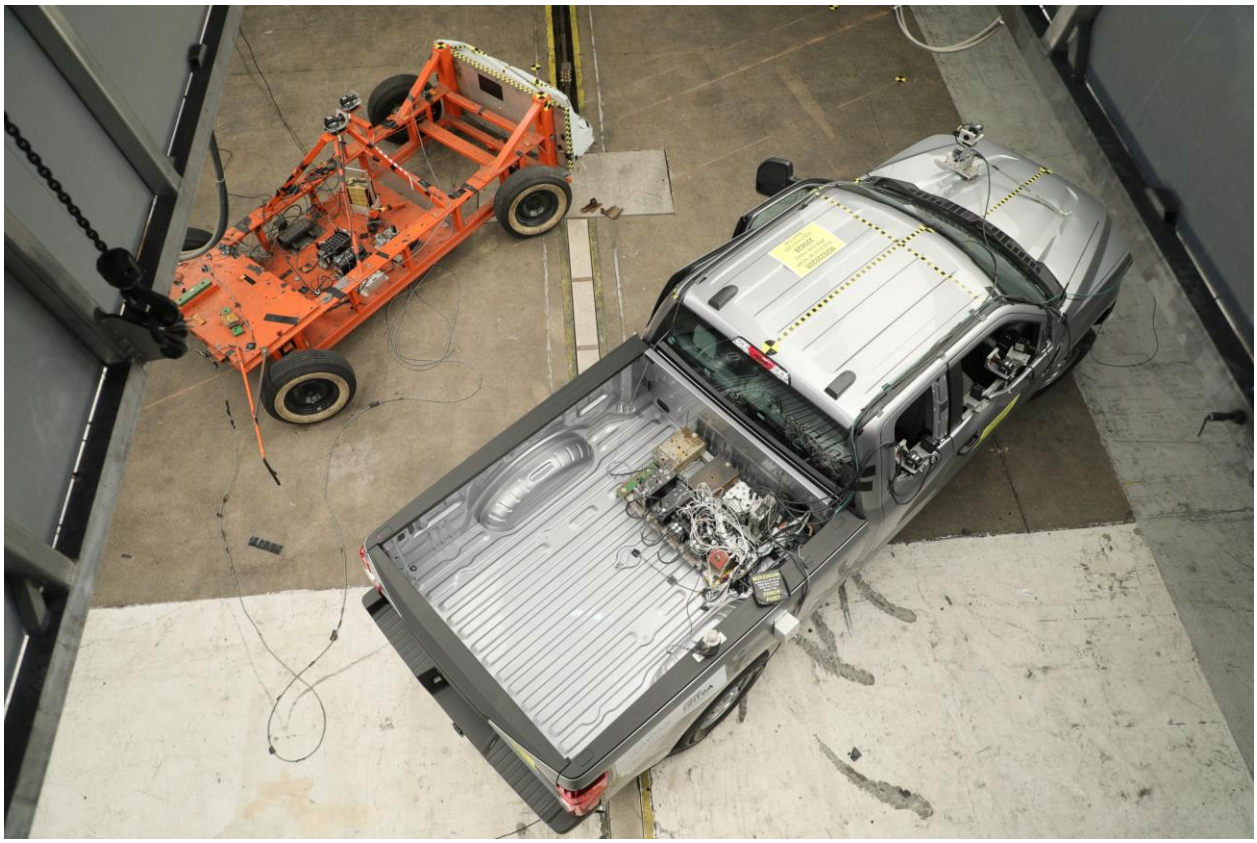
011 Pre-Test Rear View of Test Vehicle

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

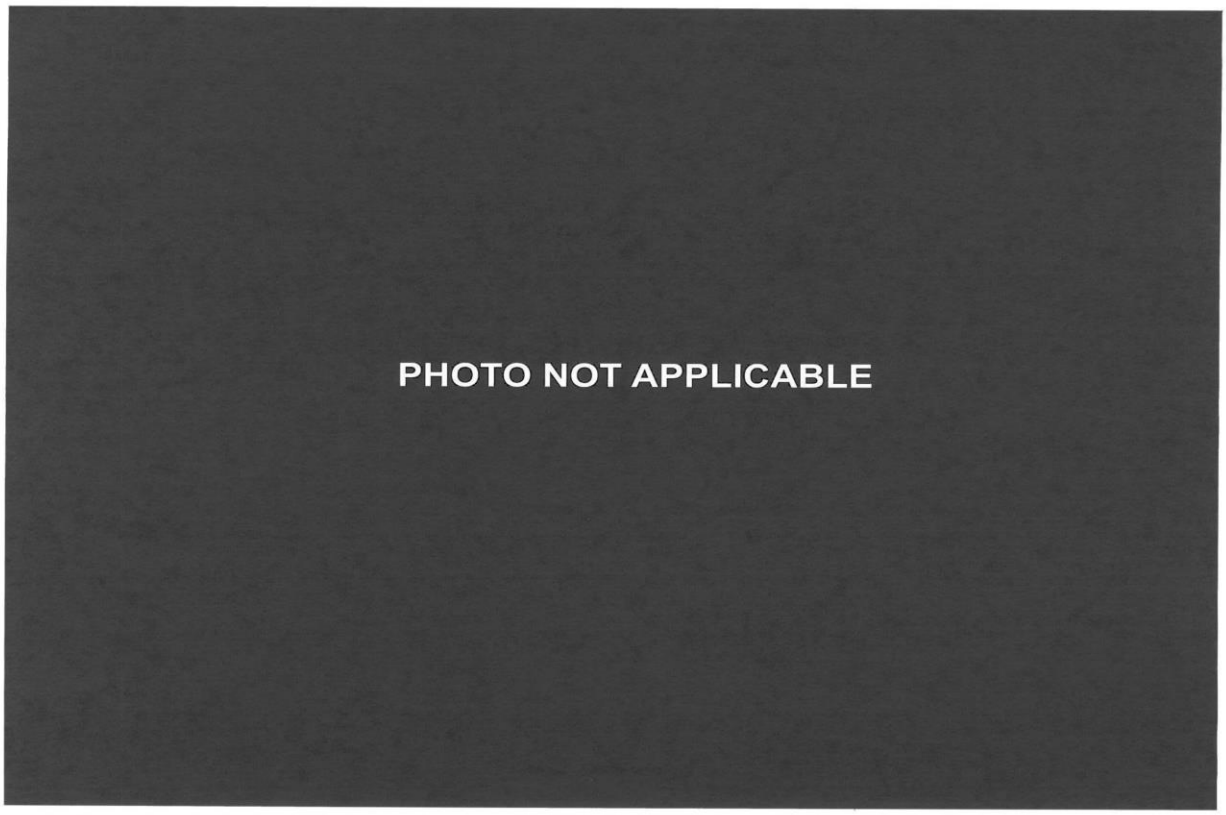
018 Pre-Test Right Side View MDB Positioned Against Side of Test Vehicle

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

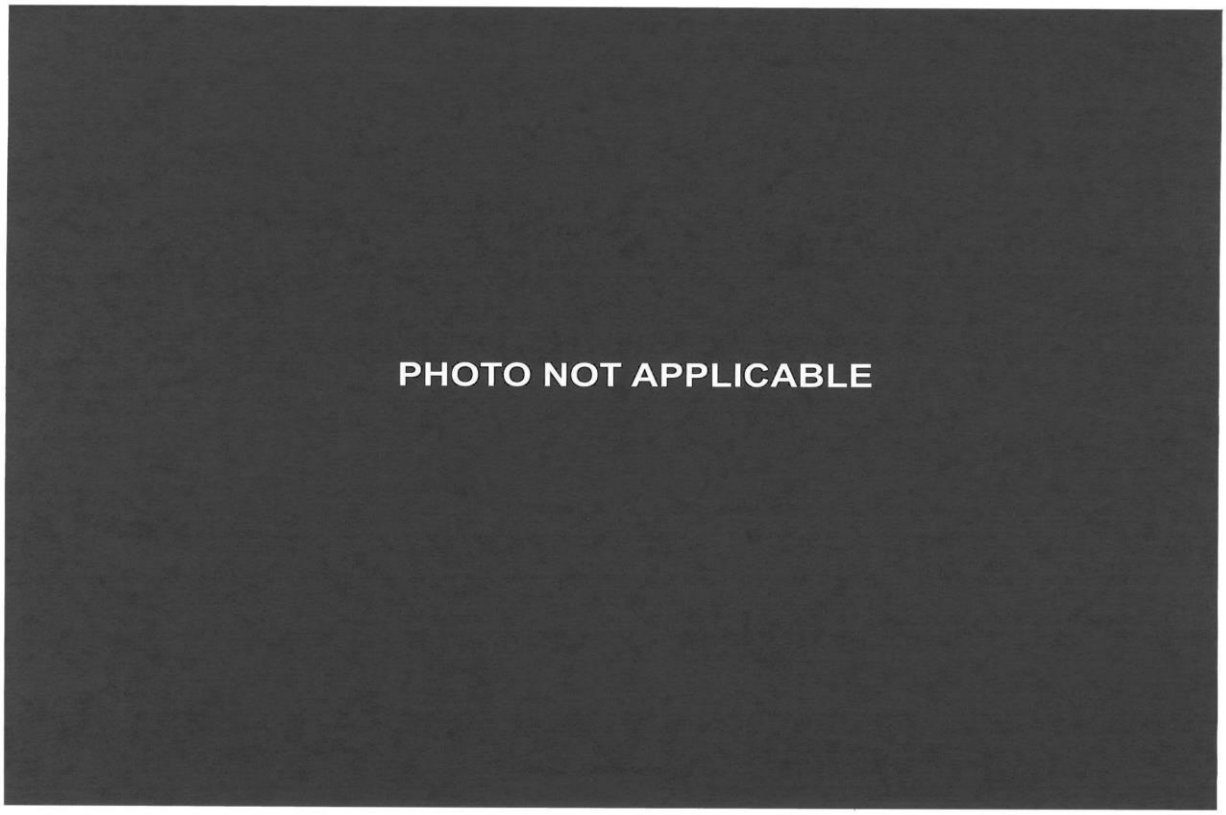
020 Post-Test Close-Up View of Impact Point Target

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

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

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

Intentionally Left Blank

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

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

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

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

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

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

034 Pre-Test Placement of Driver's Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy

036 Pre-Test Left Side View of Steering Wheel

037 View of Disengaged Parking Brake

038 Pre-Test View of Parking Brake

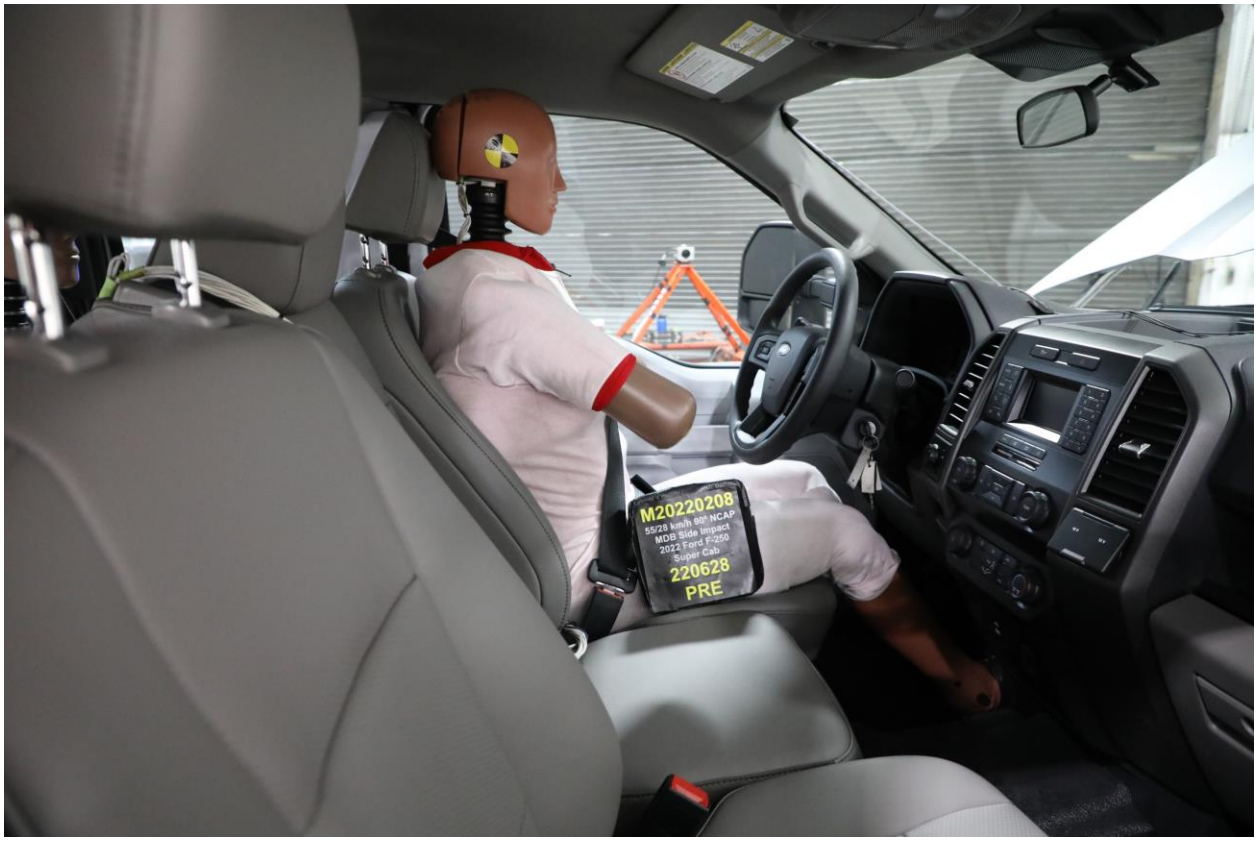
039 Pre-Test Close-Up Left Side View of Driver Seat Track

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

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

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View



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

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

046 Pre-Test Driver Inner Door Panel View

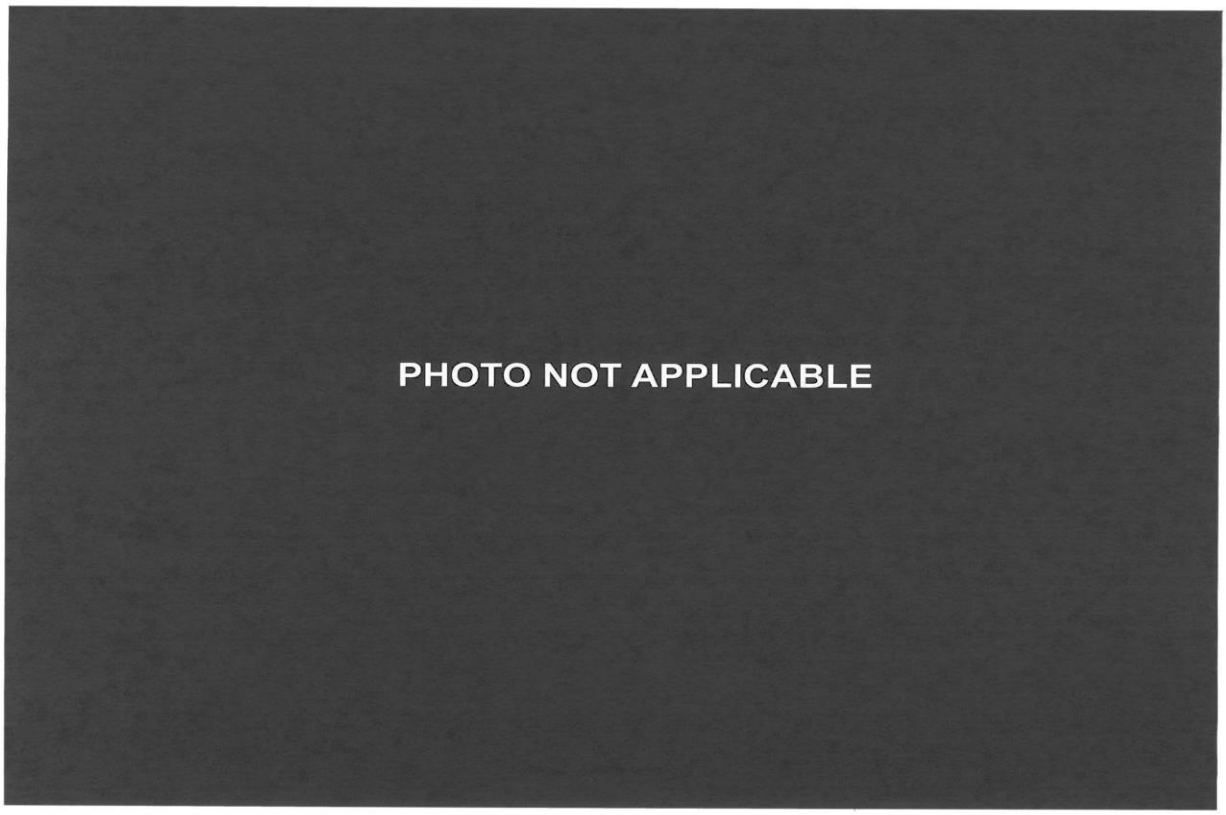
047 Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

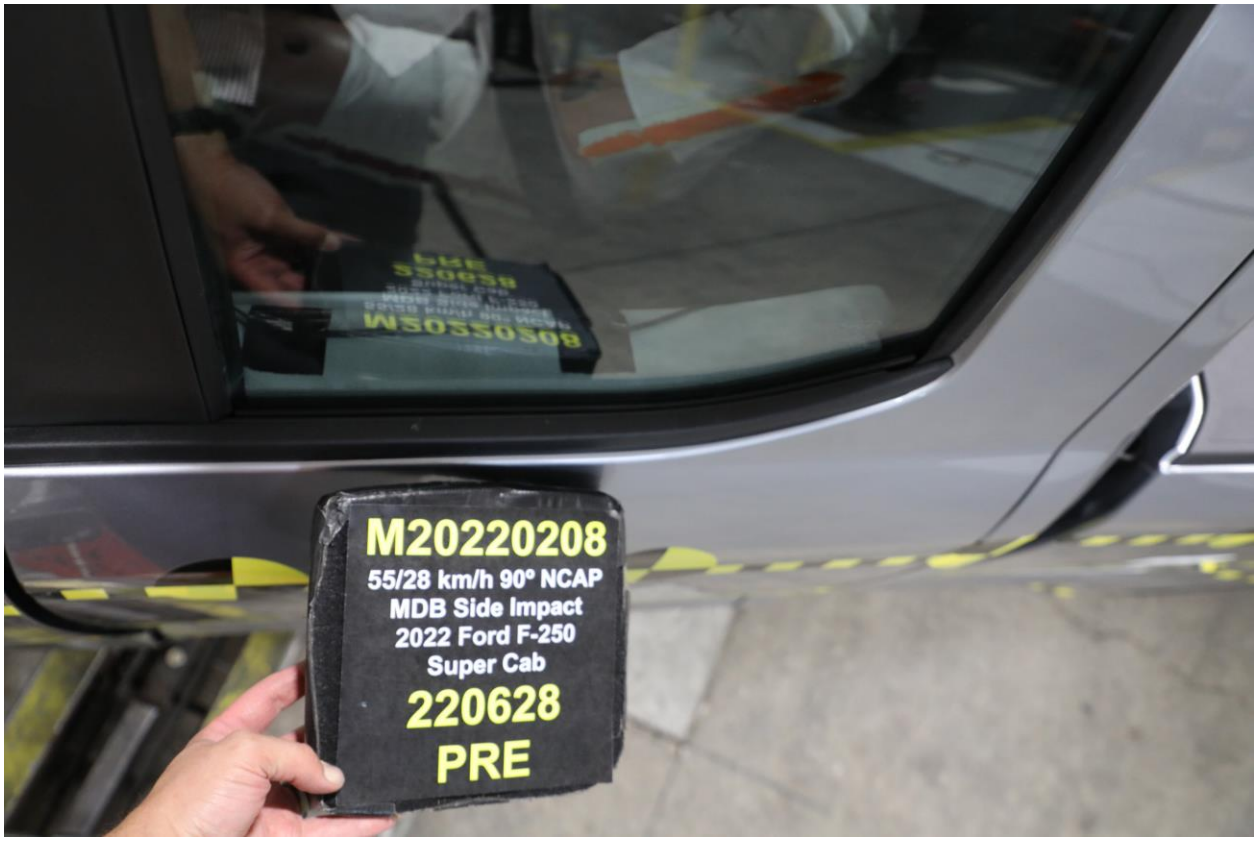
065 Pre-Test View of Belt Anchorage for Rear Passenger Dummy

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

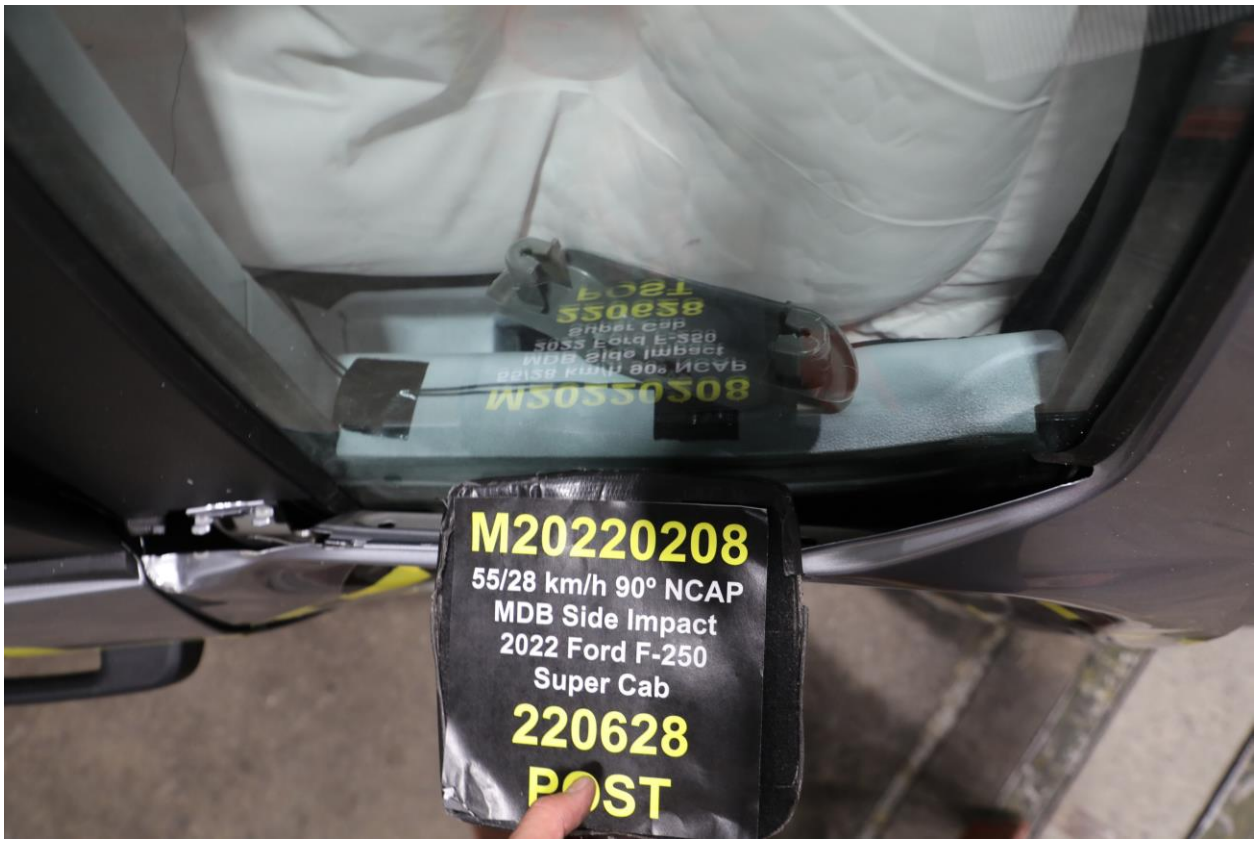
067 Pre-test Close-Up Left Side View of Rear Passenger Seat Back

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

Intentionally Left Blank



069 Pre-Test Rear Passenger Dummy and Door Clearance View



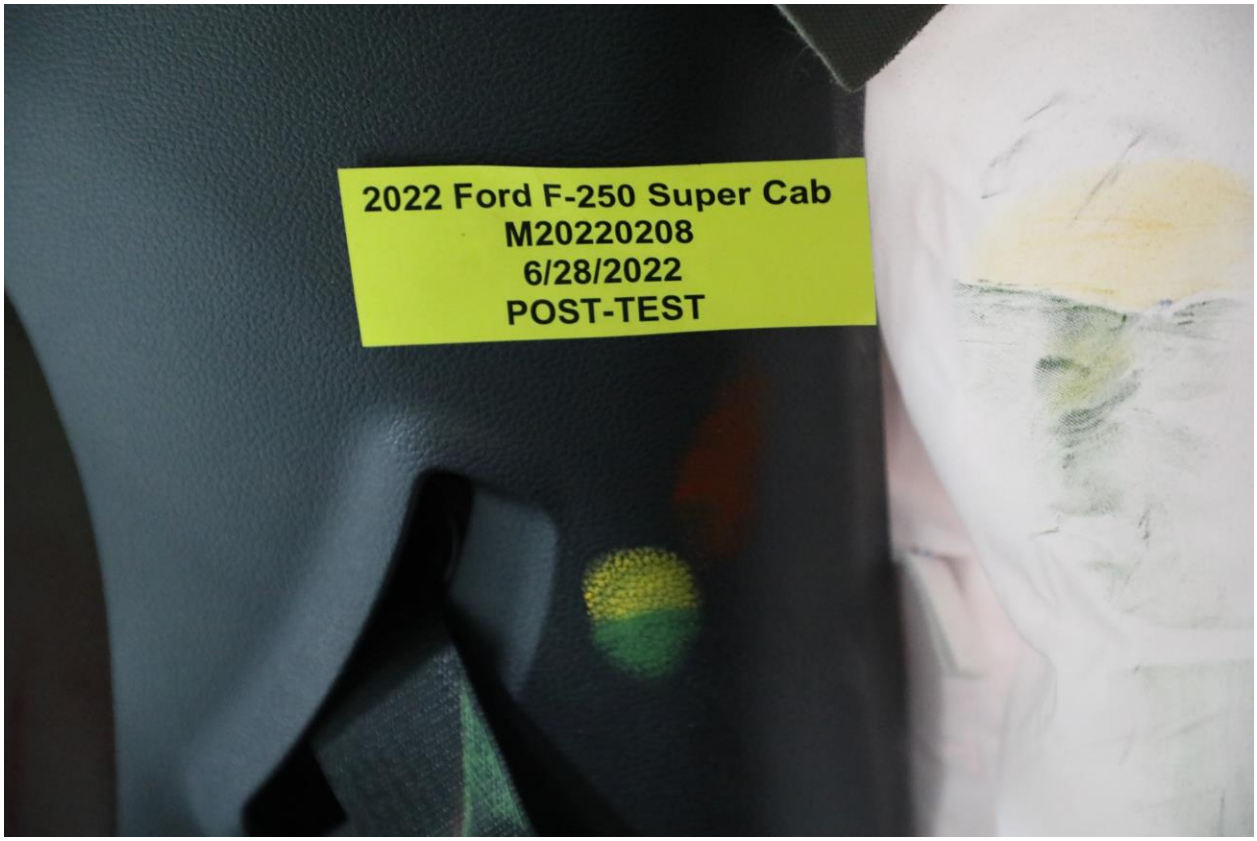
070 Post-Test Rear Passenger Dummy and Door Clearance View

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

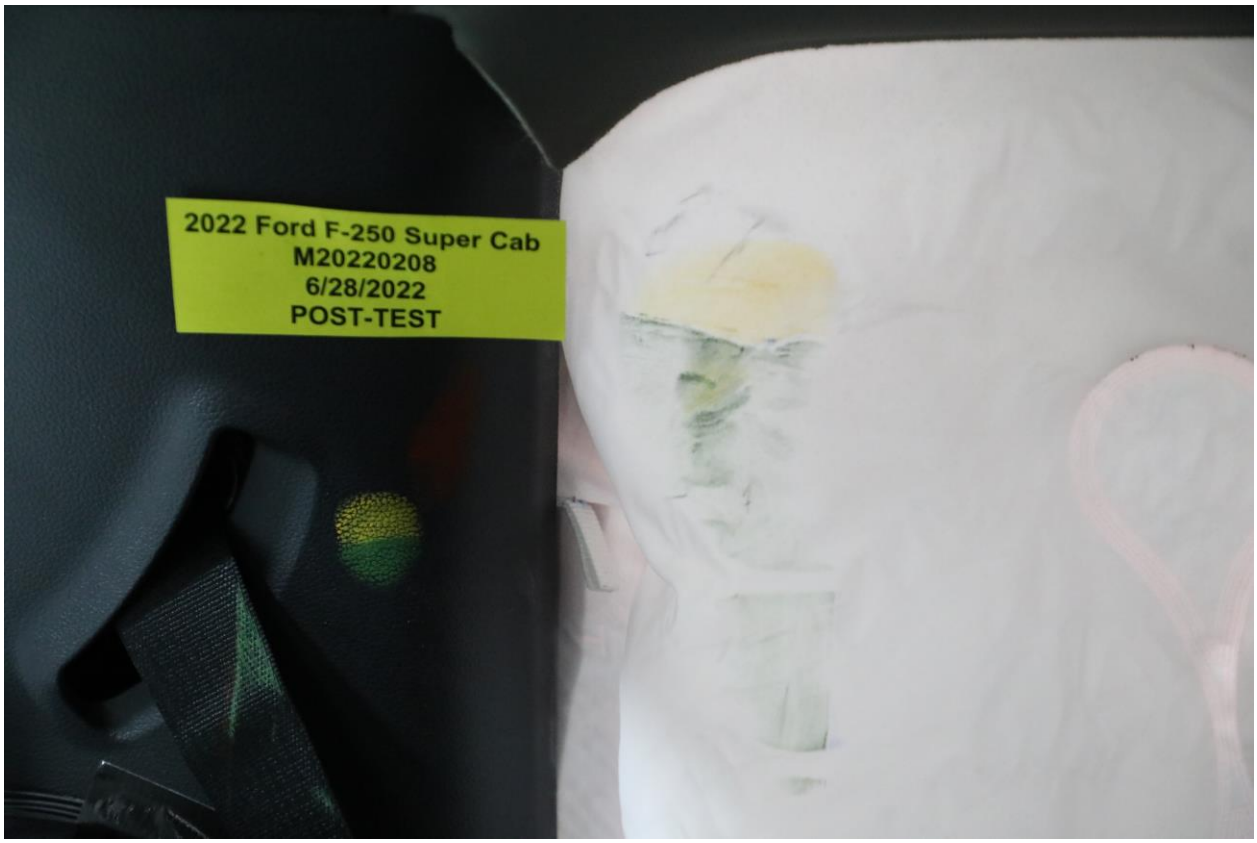
072 Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment

073 Pre-Test Rear Passenger Inner Door Panel View

074 Post-Test Rear Passenger Inner Door Panel View

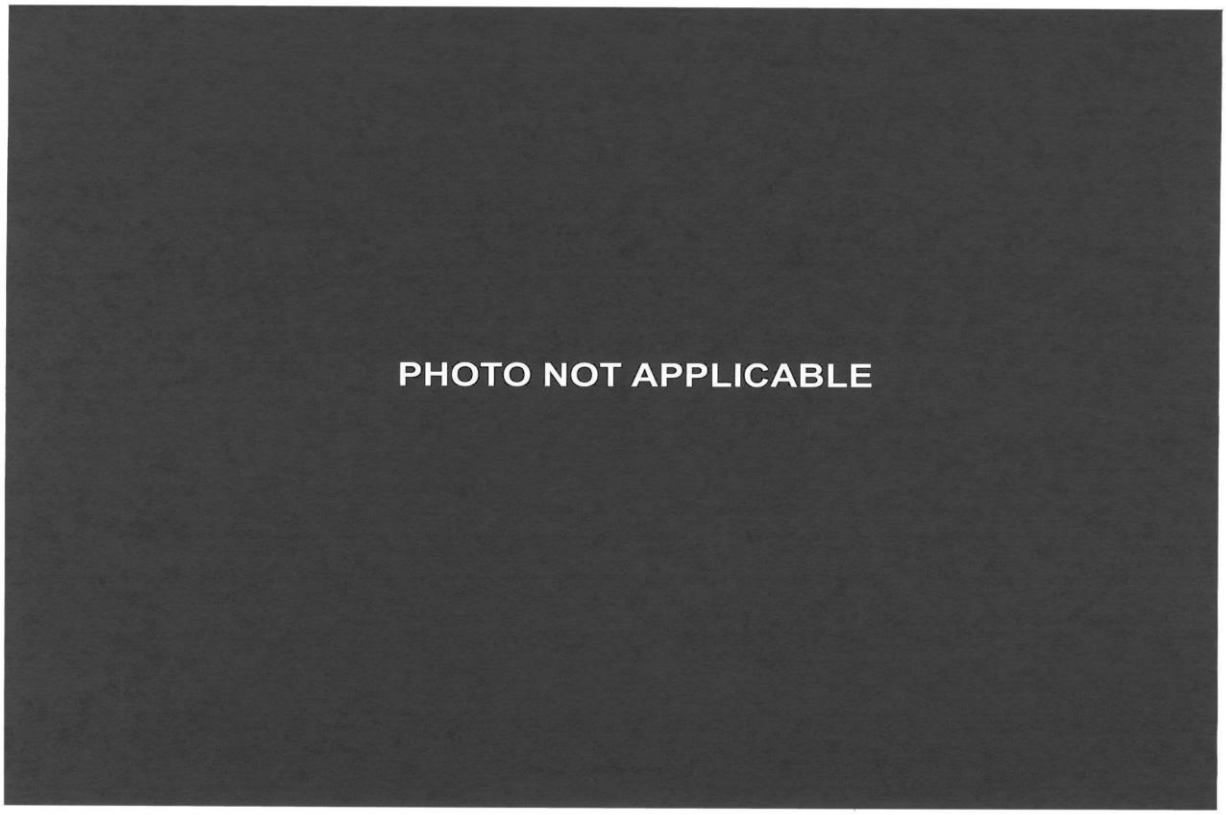


075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View

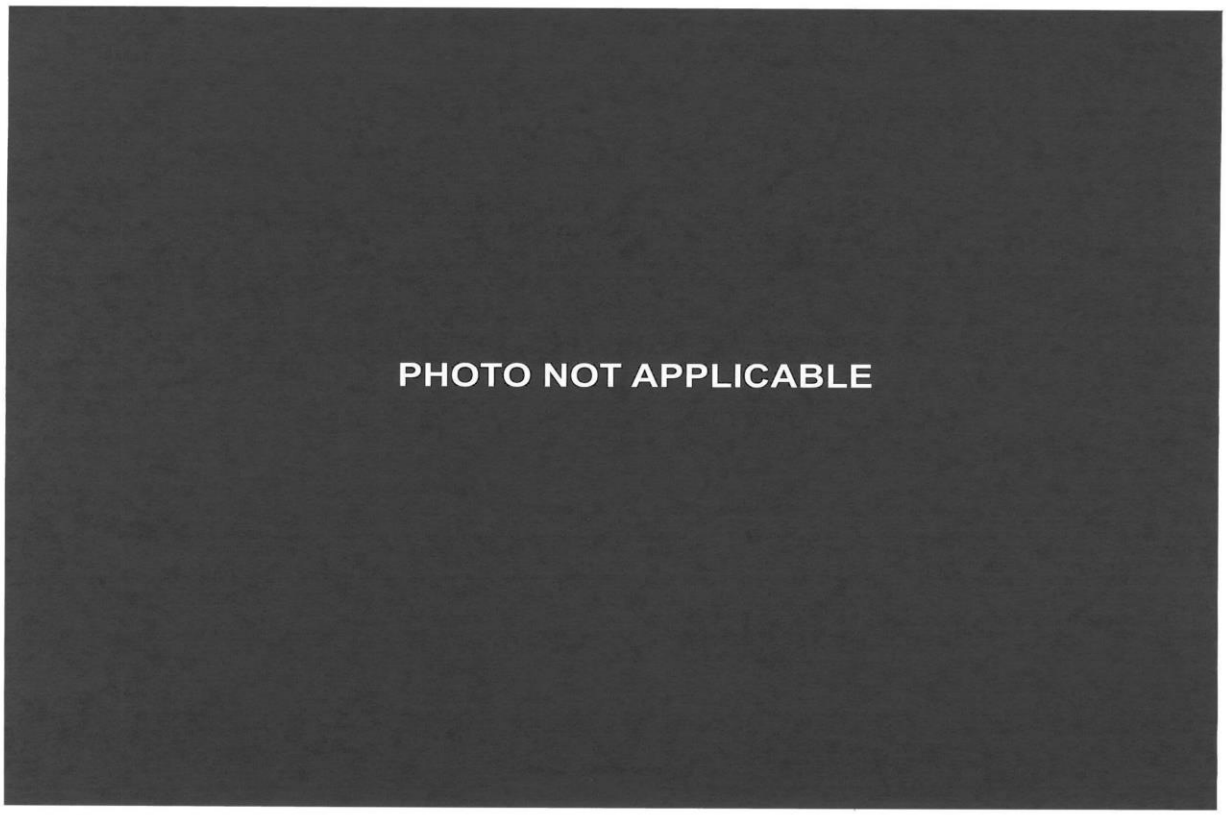


076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

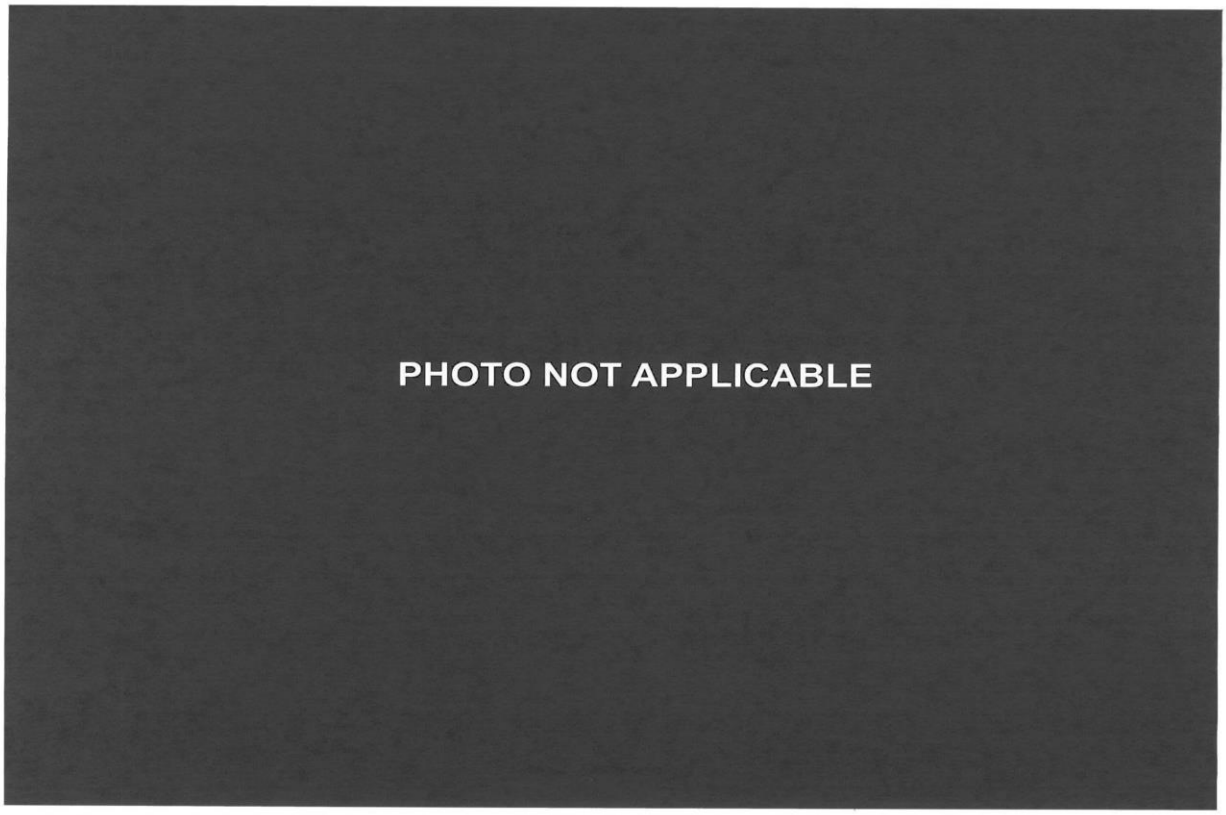
077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



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



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



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

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

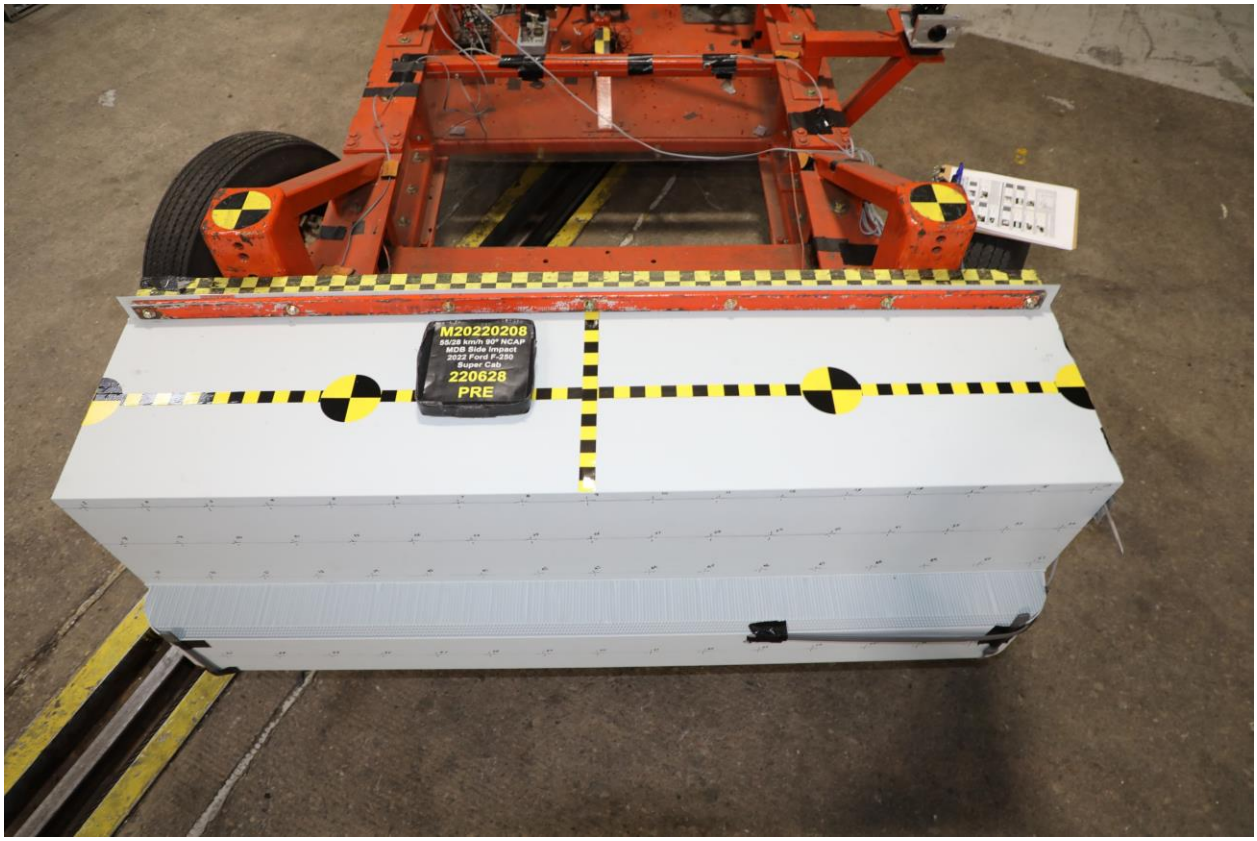
Intentionally Left Blank

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

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

084 Pre-Test Front View of MDB Impactor Face

085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face

087 Post-Test Top View of MDB Impactor Face

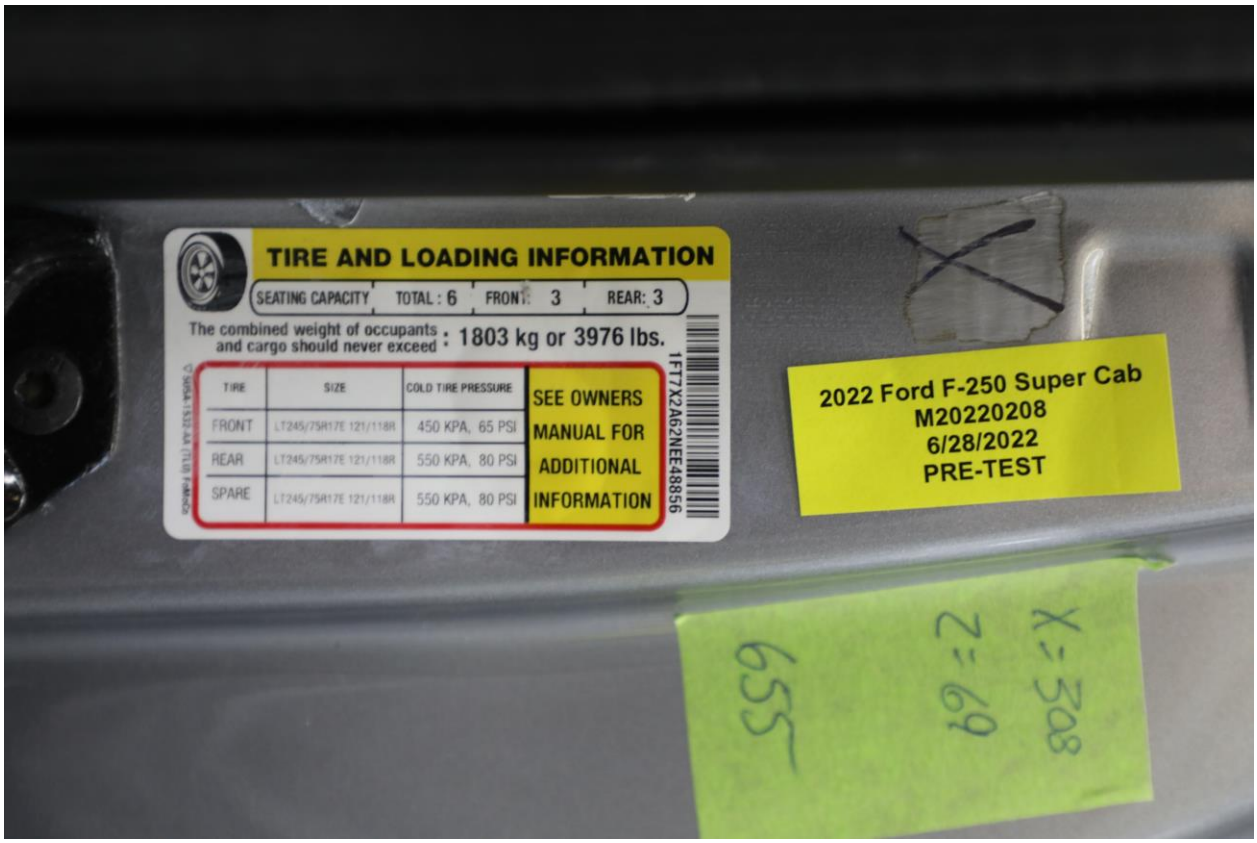
088 Pre-Test Left Side View of MDB Impactor Face

089 Post-Test Left Side View of MDB Impactor Face

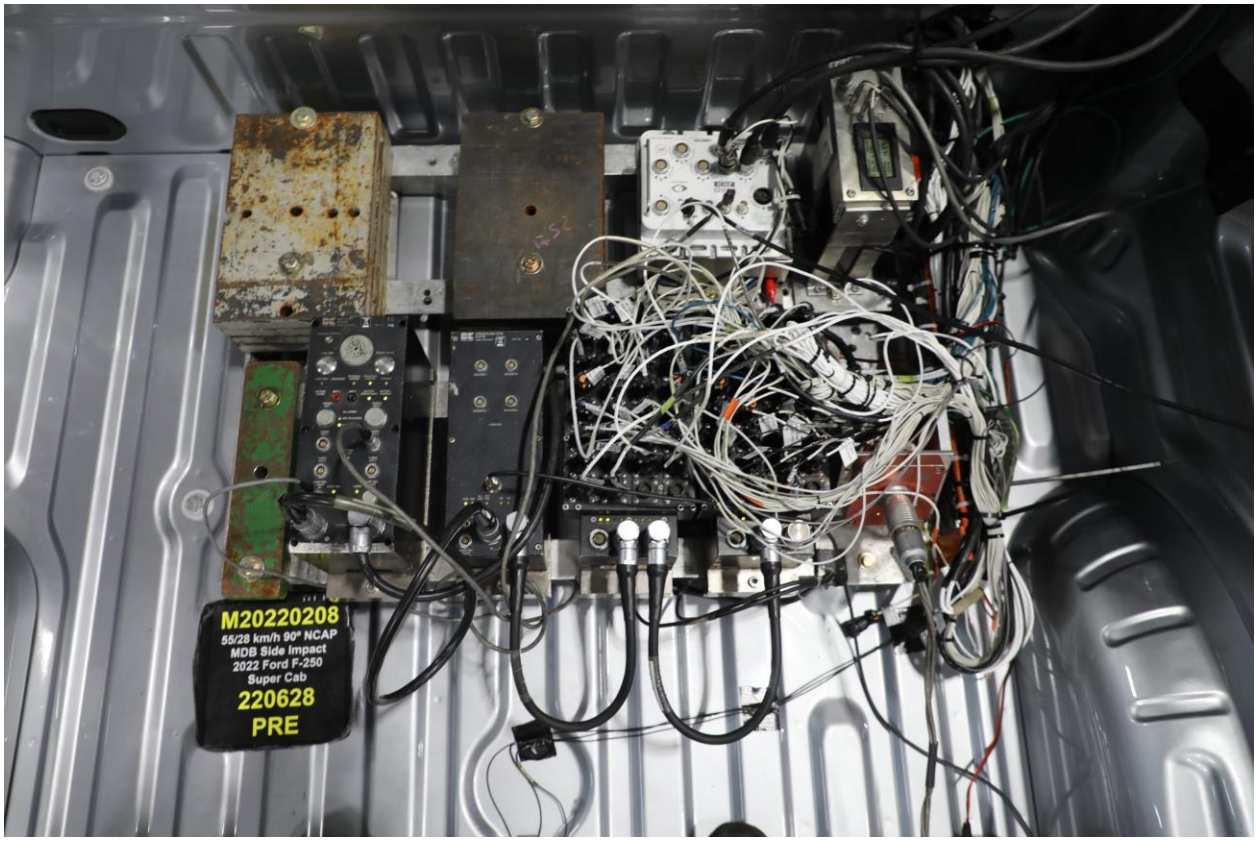
090 Pre-Test Right Side View of MDB Impactor Face

091 Post-Test Right Side View of MDB Impactor Face

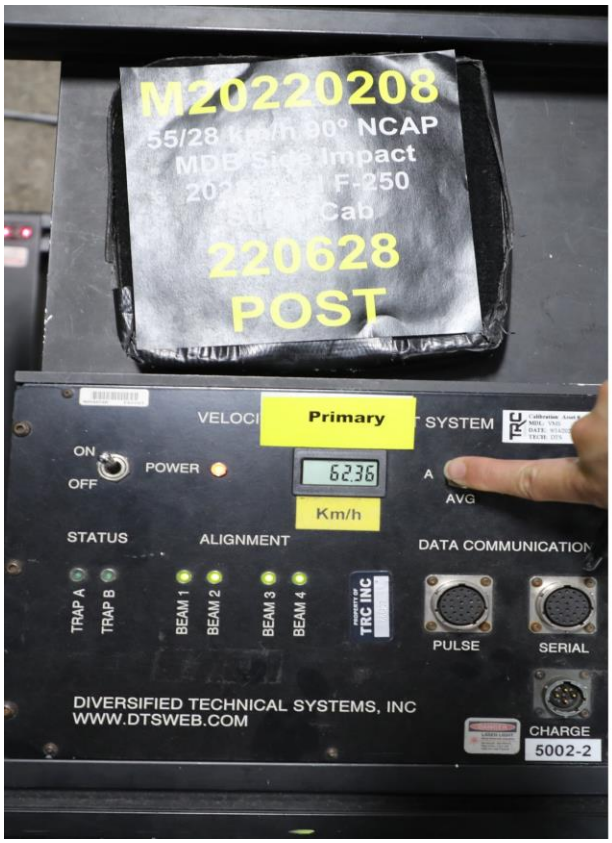
092 Close-Up View of Vehicle's Certification Label



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



094 Pre-Test Ballast View

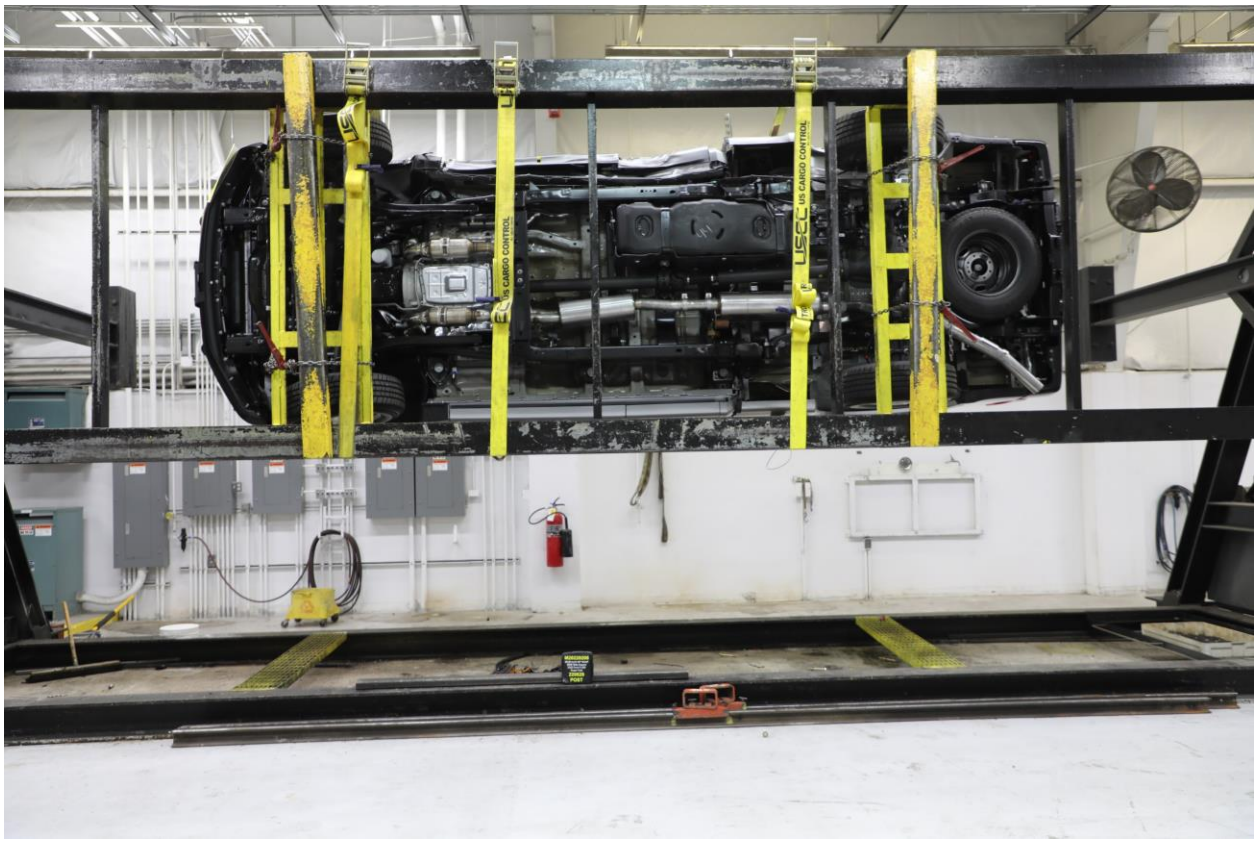


095 No. Post-Test Primary and Redundant Speed Trap Read-Out

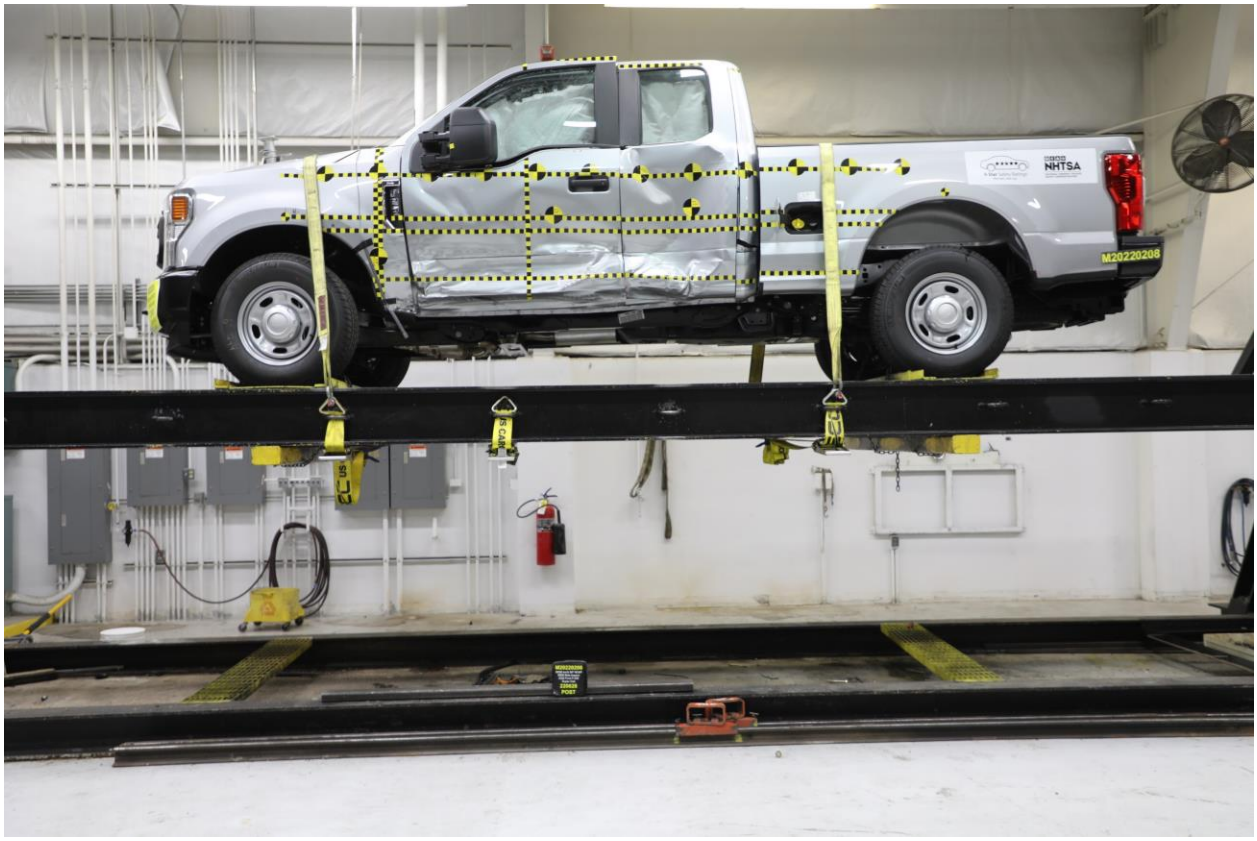
096 FMVSS No. 301 Static Rollover 0 Degrees

097 FMVSS No. 301 Static Rollover 90 Degrees

098 FMVSS No. 301 Static Rollover 180 Degrees

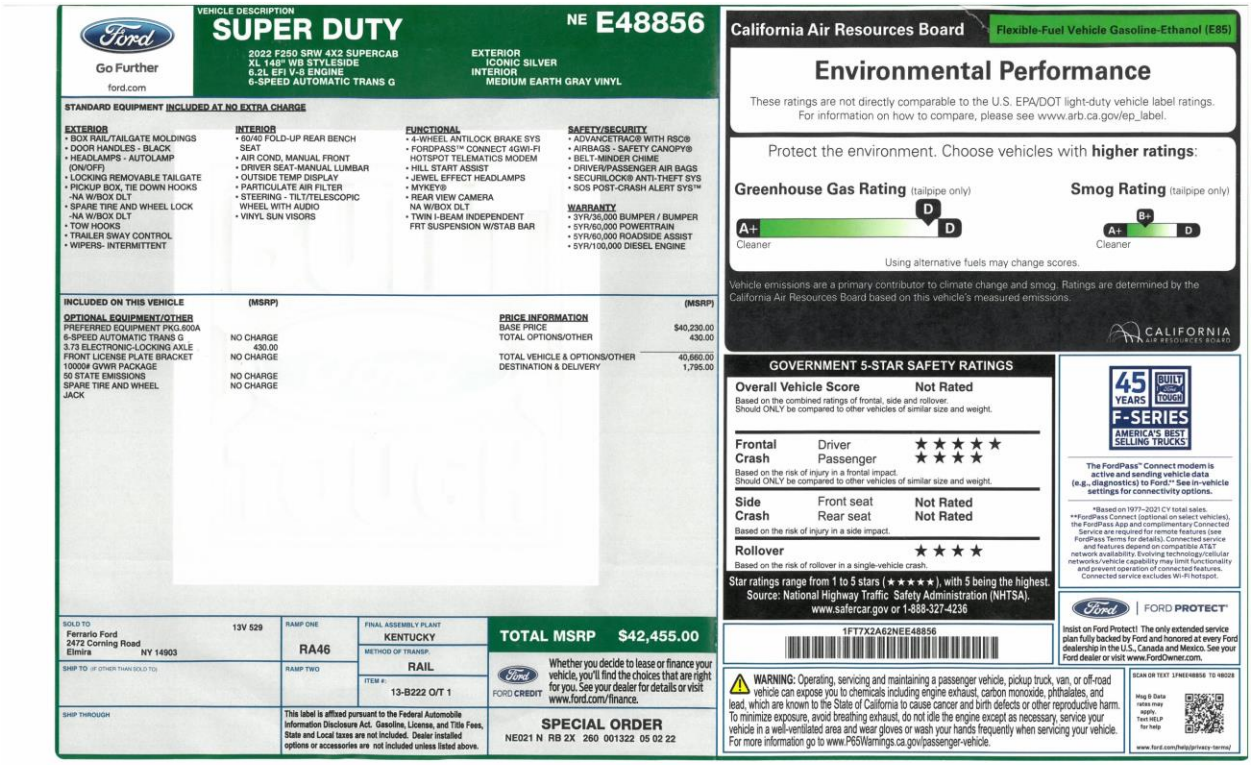


099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event



VEHICLE DESCRIPTION
SUPER DUTY NE **E48856**
2022 F250 SRW 4X2 SUPERCAB
XL 148" WB STYLESIDE
6.2L EFI V-8 ENGINE
6-SPEED AUTOMATIC TRANS G
EXTERIOR ICONIC SILVER
INTERIOR MEDIUM EARTH GRAY VINYL

STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE

EXTERIOR
- BOX RAIL/TAILGATE MOLDINGS
- DOOR HANDLES - BLACK
- HEADLAMPS - AUTOLAMP (ON/OFF)
- LOCKING REMOVABLE TAILGATE
- PICKUP BOX, TIE DOWN HOOKS -NA W/BOX DLT
- SPARE TIRE AND WHEEL LOCK -NA W/BOX DLT
- TOW HOOKS
- TRAILER SWAY CONTROL
- WIPERS- INTERMITTENT

INTERIOR
- 60/40 FOLD-UP REAR BENCH SEAT
- AIR COND, MANUAL FRONT
- DRIVER SEAT-MANUAL LUMBAR
- OUTSIDE TEMP DISPLAY
- PARTICULATE AIR FILTER
- STEERING - TILT/TELESCOPIC WHEEL WITH AUDIO
- VINYL SUN VISORS

FUNCTIONAL
- 4-WHEEL ANTILOCK BRAKE SYS
- FORDPASS™ CONNECT 4GWI-FI HOTSPOT TELEMATICS MODEM
- HILL START ASSIST
- JEWEL EFFECT HEADLAMPS
- MYKEY®
- REAR VIEW CAMERA NA W/BOX DLT
- TWIN I-BEAM INDEPENDENT FRT SUSPENSION W/STAB BAR

SAFETY/SECURITY
- ADVANCETRAC® WITH RSC®
- AIRBAGS - SAFETY CANOPY®
- BELT-MINDER CHIME
- DRIVER/PASSENGER AIR BAGS
- SECURILOCK® ANTI-THEFT SYS
- SOS POST-CRASH ALERT SYS™

WARRANTY
- 3YR/36,000 BUMPER / BUMPER
- 5YR/60,000 POWERTRAIN
- 5YR/60,000 ROADSIDE ASSIST
- 5YR/100,000 DIESEL ENGINE

INCLUDED ON THIS VEHICLE	(MSRP)
OPTIONAL EQUIPMENT/OTHER	
PREFERRED EQUIPMENT PKG.600A	
6-SPEED AUTOMATIC TRANS G	NO CHARGE
3.73 ELECTRONIC-LOCKING AXLE	430.00
FRONT LICENSE PLATE BRACKET	NO CHARGE
10000# GVWR PACKAGE	
50 STATE EMISSIONS	NO CHARGE
SPARE TIRE AND WHEEL JACK	NO CHARGE

PRICE INFORMATION	(MSRP)
BASE PRICE	$40,230.00
TOTAL OPTIONS/OTHER	430.00
TOTAL VEHICLE & OPTIONS/OTHER	40,660.00
DESTINATION & DELIVERY	1,795.00

SOLD TO: Ferraro Ford, 2472 Corning Road, Elmira NY 14903 — 13V 529
SHIP TO (IF OTHER THAN SOLD TO)
SHIP THROUGH
RAMP ONE: RA46
RAMP TWO
FINAL ASSEMBLY PLANT: KENTUCKY
METHOD OF TRANSP.: RAIL
ITEM #: 13-B222 O/T 1

This label is affixed pursuant to the Federal Automobile Information Disclosure Act. Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.

TOTAL MSRP $42,455.00

FORD CREDIT — Whether you decide to lease or finance your vehicle, you'll find the choices that are right for you. See your dealer for details or visit www.ford.com/finance.

SPECIAL ORDER
NE021 N RB 2X 260 001322 05 02 22

California Air Resources Board — Flexible-Fuel Vehicle Gasoline-Ethanol (E85)

Environmental Performance

These ratings are not directly comparable to the U.S. EPA/DOT light-duty vehicle label ratings. For information on how to compare, please see www.arb.ca.gov/ep_label.

Protect the environment. Choose vehicles with **higher ratings**:

Greenhouse Gas Rating (tailpipe only): D — A+ Cleaner — D
Smog Rating (tailpipe only): B+ — A+ Cleaner — D

Using alternative fuels may change scores.

Vehicle emissions are a primary contributor to climate change and smog. Ratings are determined by the California Air Resources Board based on this vehicle's measured emissions.

CALIFORNIA AIR RESOURCES BOARD

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	★★★★★
	Passenger	★★★★
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

1FT7X2A62NEE48856

45 YEARS BUILT FORD TOUGH — F-SERIES AMERICA'S BEST SELLING TRUCKS

The FordPass™ Connect modem is active and sending vehicle data (e.g., diagnostics) to Ford.** See in-vehicle settings for connectivity options.

*Based on 1977–2021 CY total sales. **FordPass Connect (optional on select vehicles), the FordPass App and complimentary Connected Service are required for remote features (see FordPass Terms for details). Connected service and features depend on compatible AT&T network availability. Evolving technology/cellular networks/vehicle capability may limit functionality and prevent operation of connected features. Connected service excludes Wi-Fi hotspot.

Ford | FORD PROTECT

Insist on Ford Protect! The only extended service plan fully backed by Ford and honored at every Ford dealership in the U.S., Canada and Mexico. See your Ford dealer or visit www.FordOwner.com.

WARNING: Operating, servicing and maintaining a passenger vehicle, pickup truck, van, or off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to www.P65Warnings.ca.gov/passenger-vehicle.

SCAN OR TEXT 1FNEE48856 TO 48028
Msg & Data rates may apply. Text HELP for help
www.ford.com/help/privacy-terms/

102 Monroney Label

Front Seats

INSTALLING THE HEAD RESTRAINT

Align the steel stems into the guide sleeves and push the head restraint down until it locks.

MOVING THE SEAT BACKWARD AND FORWARD

WARNING: Do not adjust the driver seat or seat backrest when your vehicle is moving. This may result in sudden seat movement, causing the loss of control of your vehicle.

WARNING: Make sure the seat fully locks into place by rocking it backward and forward. Not securing the seat into the locked position can be dangerous in a crash and could cause serious personal injury or death.

For vehicles with tilting head restraints:

1. Adjust the seat backrest to an upright driving or riding position.
2. Pivot the head restraint forward toward your head to the preferred position.

After the head restraint reaches the forward-most tilt position, pivot it forward again to release it to the rearward, untilted position.

Note: *Do not attempt to force the head restraint backward after it is tilted. Instead, continue tilting it forward until the head restraint releases to the upright position.*

REMOVING THE HEAD RESTRAINT

1. Pull up the head restraint until it reaches the highest adjustment position.
2. Press and hold the adjust and release button and the unlock and remove button.
3. Pull up the head restraint.

Note: *Your vehicle may have a front row center head restraint that you cannot adjust or remove.*

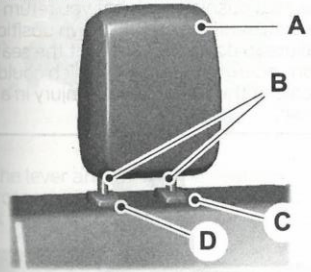
160

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

MANUAL SEATS

HEAD RESTRAINT COMPONENTS

Outermost Head Restraints



The head restraints consist of:

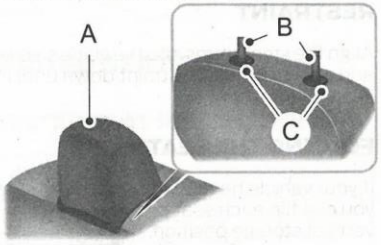
A An energy absorbing head restraint.

B Two steel stems.

C Guide sleeve adjust and release button.

D Guide sleeve unlock and remove button.

Center Head Restraint - Crew Cab



A An energy absorbing head restraint.

B Two steel stems.

C Guide sleeve unlock and remove button.

ADJUSTING THE HEAD RESTRAINT

Pull the head restraint up to raise it.

To lower the head restraint:

1. Press and hold the adjust and release button.
2. Push the head restraint down.

Your vehicle may have a rear seat center head restraint that you cannot adjust or remove.

REMOVING THE HEAD RESTRAINT

1. Pull up the head restraint until it reaches its highest position.
2. Press and hold the adjust and release button and the unlock and remove button.
3. Pull up the head restraint.

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: 06/28/2022

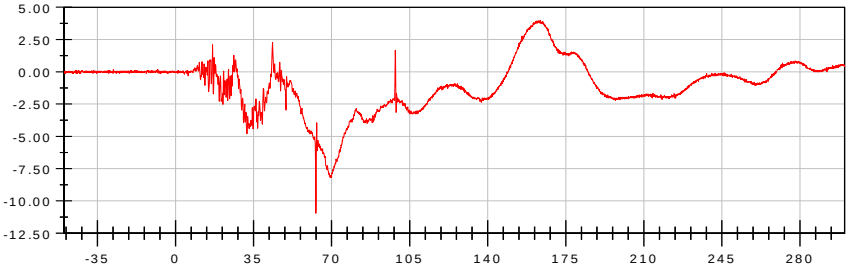
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 220628 (M20220208)

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



<Max>

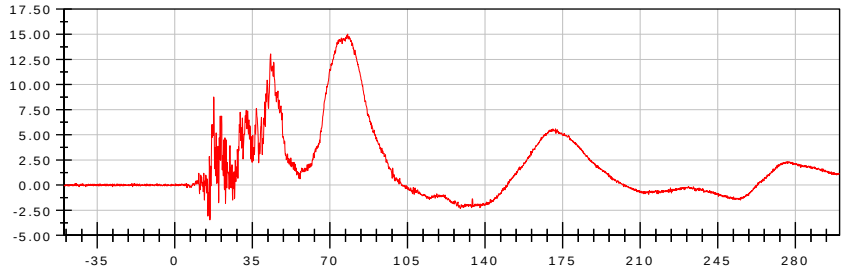
3.99 g at 163.68 ms

<Min>

-10.96 g at 62.96 ms

CFC_1000

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



<Max>

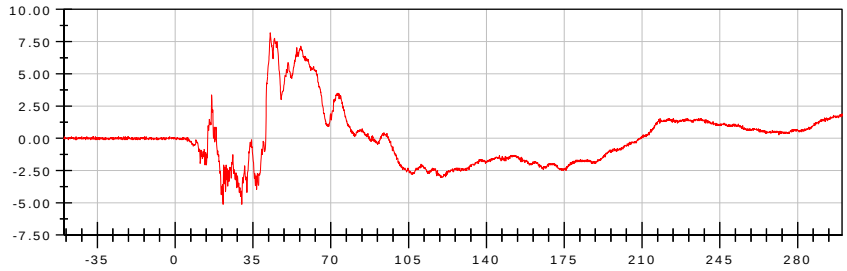
15.03 g at 78.00 ms

<Min>

-3.47 g at 15.84 ms

CFC_1000

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



<Max>

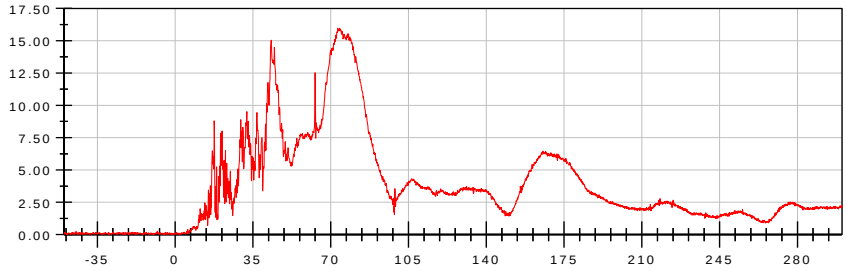
8.19 g at 42.72 ms

<Min>

-5.12 g at 21.52 ms

CFC_1000

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



<Max>

15.97 g at 74.00 ms

<Min>

0.03 g at -49.12 ms

CFC_1000

NHTSA

Test Date: 06/28/2022

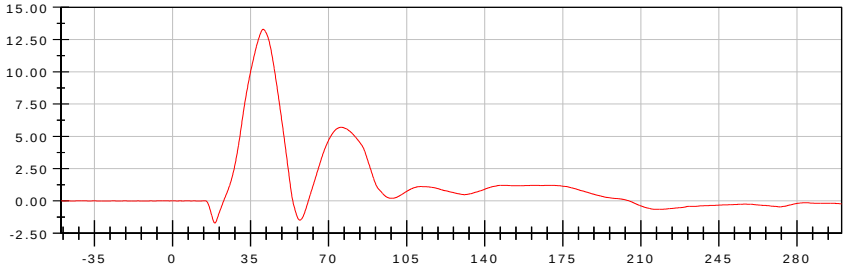
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 220628 (M20220208)

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



<Max>

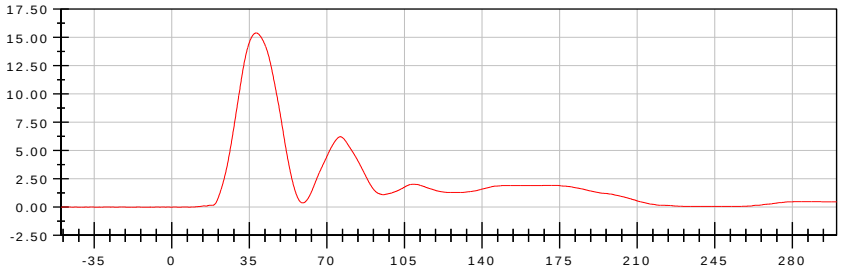
13.29 mm at 40.64 ms

<Min>

-1.71 mm at 18.96 ms

CFC_180

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



<Max>

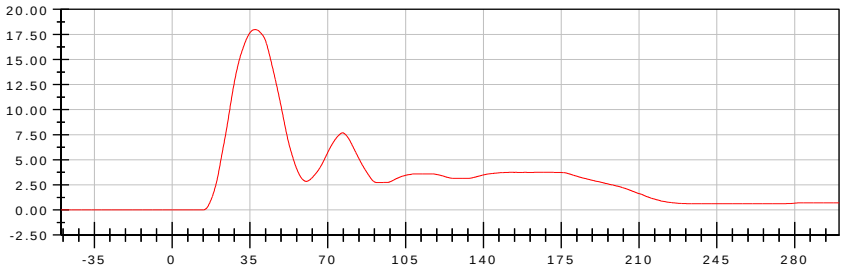
15.39 mm at 38.16 ms

<Min>

0.00 mm at -41.68 ms

CFC_180

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



<Max>

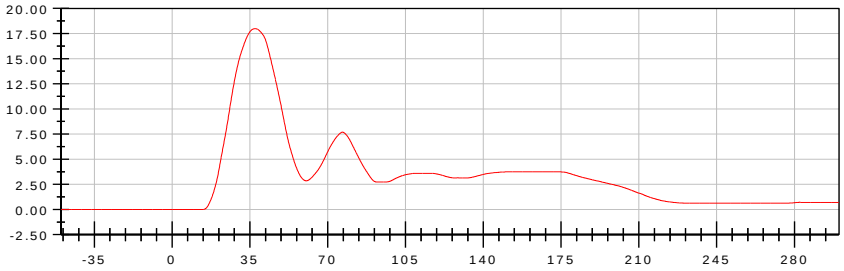
17.98 mm at 37.36 ms

<Min>

0.00 mm at 13.44 ms

CFC_180

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



<Max>

17.98 mm at 37.36 ms

<Min>

0.00 mm at 13.44 ms

CFC_180

NHTSA

Test Date: 06/28/2022

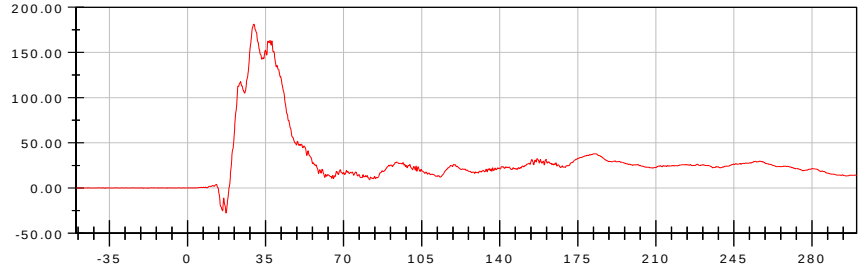
Test Lab: CTF

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

Test Number: 220628 (M20220208)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

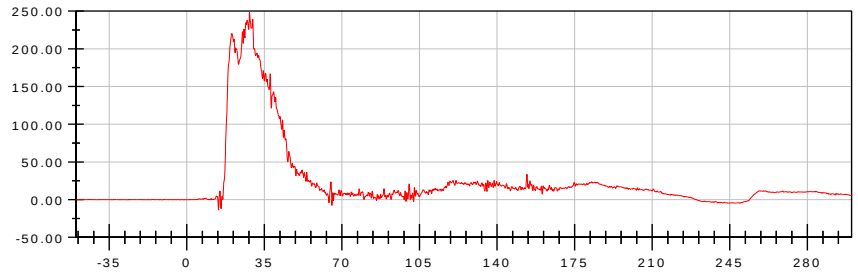
181.16 N at 29.84 ms

<Min>

-27.76 N at 17.28 ms

CFC_600

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



<Max>

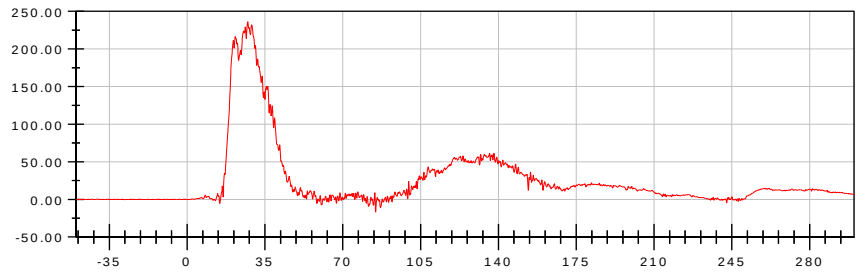
247.99 N at 28.32 ms

<Min>

-13.36 N at 14.32 ms

CFC_600

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



<Max>

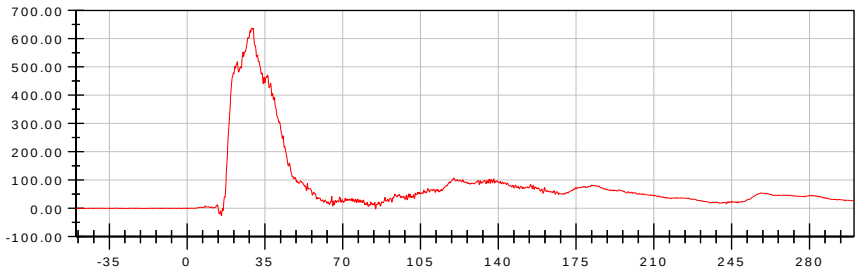
236.27 N at 27.28 ms

<Min>

-16.86 N at 84.80 ms

CFC_600

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



<Max>

636.80 N at 29.68 ms

<Min>

-26.00 N at 15.44 ms

CFC_600

NHTSA

Test Date: 06/28/2022

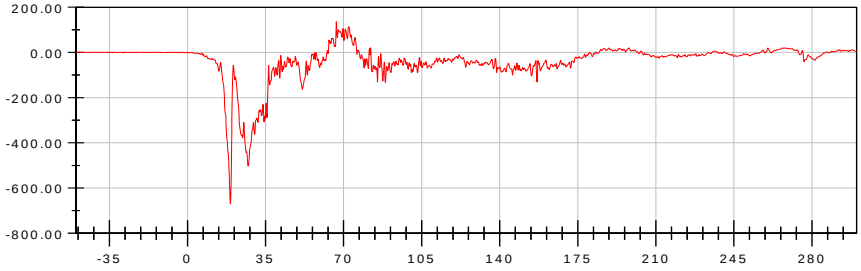
Test Lab: CTF

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

Test Number: 220628 (M20220208)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

135.03 N at 66.72 ms

<Min>

-670.55 N at 19.20 ms

CFC_600

NHTSA

Test Date: 06/28/2022

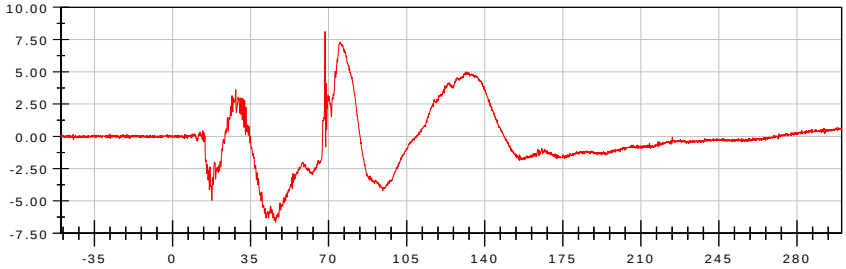
Test Lab: CTF

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

Test Number: 220628 (M20220208)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

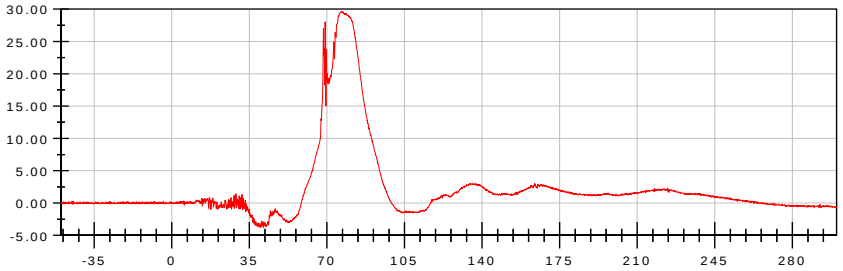
8.12 g at 68.40 ms

<Min>

-6.64 g at 46.24 ms

CFC_1000

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



<Max>

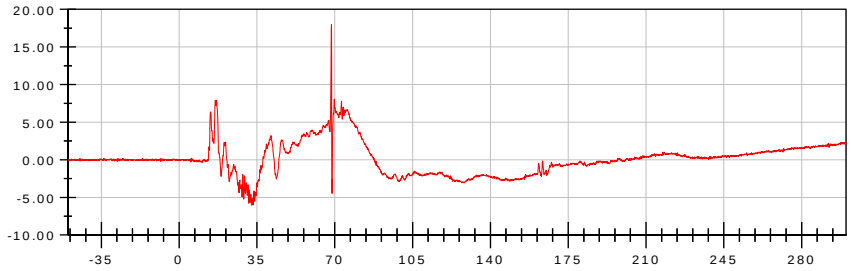
29.63 g at 76.80 ms

<Min>

-3.78 g at 39.84 ms

CFC_1000

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



<Max>

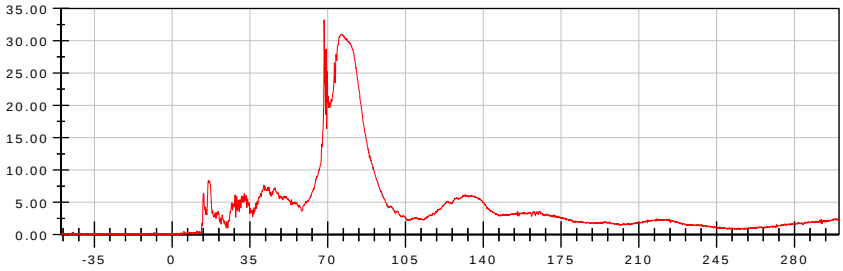
17.97 g at 68.48 ms

<Min>

-6.02 g at 32.56 ms

CFC_1000

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



<Max>

33.22 g at 68.40 ms

<Min>

0.03 g at -49.52 ms

CFC_1000

NHTSA

Test Date: 06/28/2022

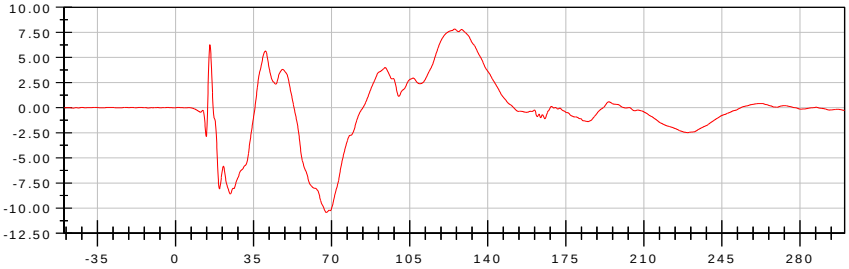
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 220628 (M20220208)

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



<Max>

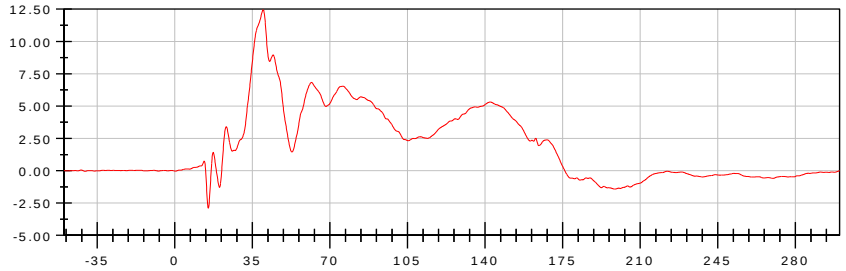
7.83 g at 125.20 ms

<Min>

-10.42 g at 67.60 ms

CFC_180

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



<Max>

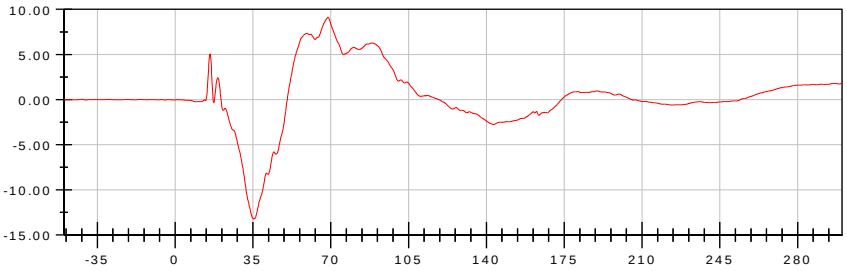
12.44 g at 39.84 ms

<Min>

-2.89 g at 15.12 ms

CFC_180

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



<Max>

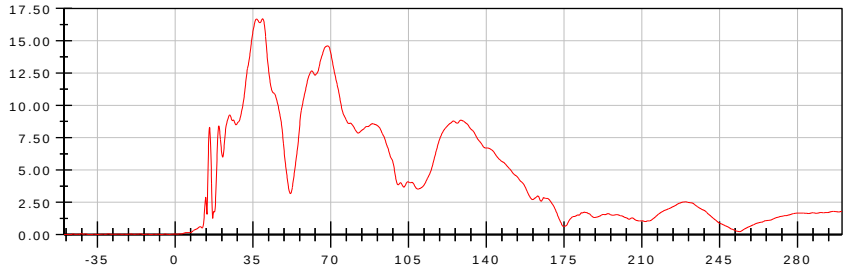
9.12 g at 68.80 ms

<Min>

-13.21 g at 35.28 ms

CFC_180

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



<Max>

16.69 g at 39.36 ms

<Min>

0.00 g at -47.28 ms

CFC_180

NHTSA

Test Date: 06/28/2022

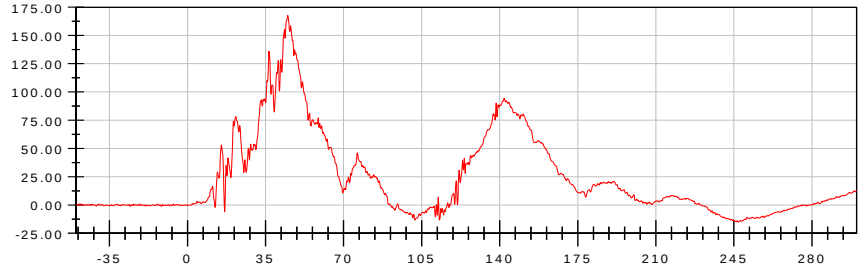
Test Lab: CTF

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

Test Number: 220628 (M20220208)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

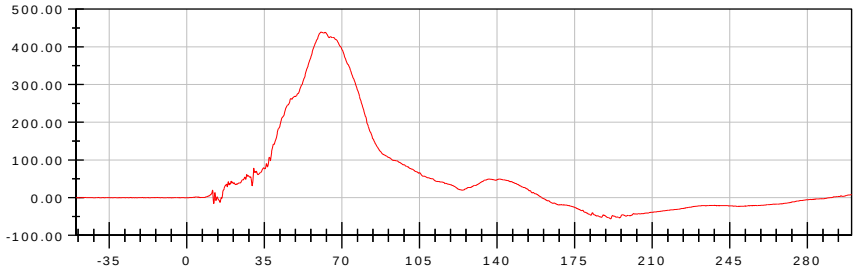
167.63 N at 44.96 ms

<Min>

-15.13 N at 247.04 ms

CFC_600

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



<Max>

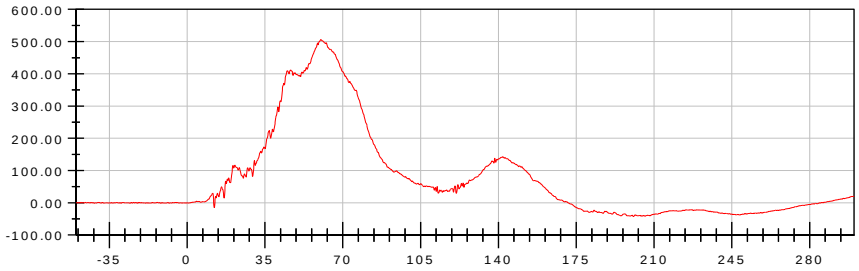
439.12 N at 60.56 ms

<Min>

-56.09 N at 191.20 ms

CFC_600

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



<Max>

506.73 N at 60.16 ms

<Min>

-42.68 N at 200.72 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. 79

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. 79-1
Test Date: 6/13/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	68 %	Yes
Peak Resultant Acceleration	125 - 155 g	132.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	7.9 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	4.15 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

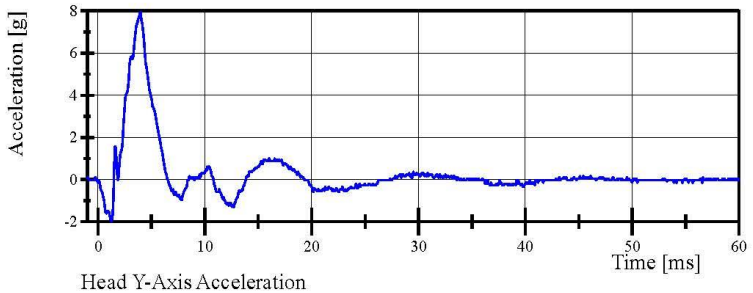
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.13.2022 10:27:17 362

Transportation Research Center Inc.

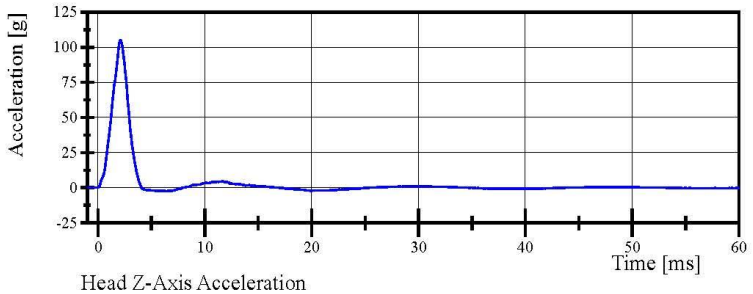
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/13/2022

Head X-Axis Acceleration



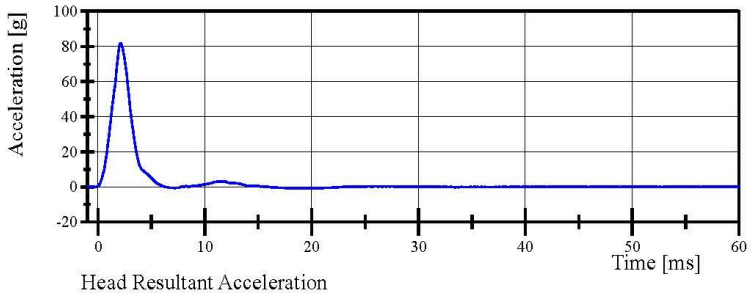
Filter Class: CFC_1000
Max: 7.9 g at 4.0 ms
Min: -2.0 g at 1.3 ms

Head Y-Axis Acceleration



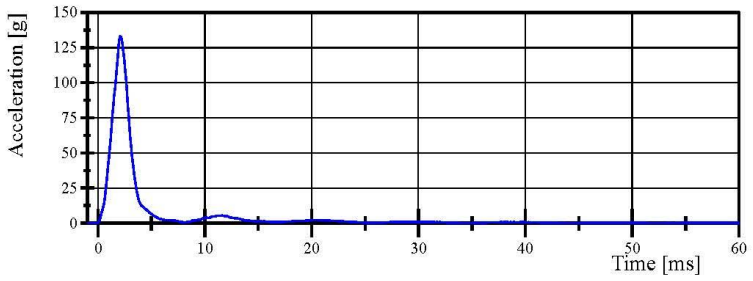
Filter Class: CFC_1000
Max: 105.1 g at 2.1 ms
Min: -2.4 g at 6.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 81.8 g at 2.2 ms
Min: -0.9 g at 18.5 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 132.9 g at 2.1 ms
Min: 0.0 g at -0.8 ms

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

06.13.2022 10:28:11 362

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/15/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	61 %	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	54.4 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	57.9 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 05053

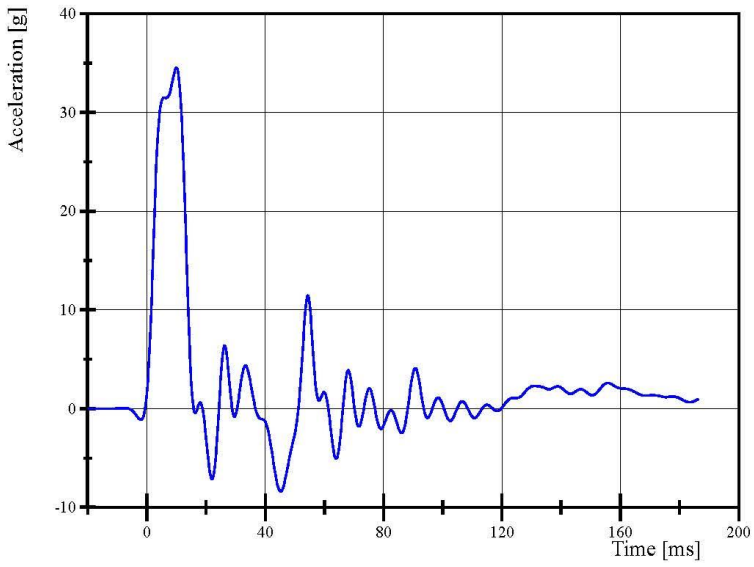
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

06.15.2022 14:53:57 1495

Transportation Research Center Inc.

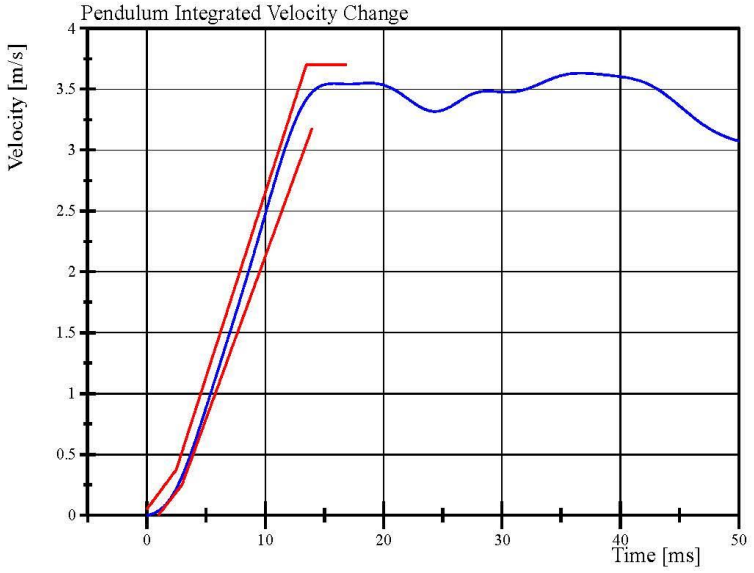
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/15/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 34.5 g at 9.9 ms
Min: -8.4 g at 45.2 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 36.7 ms
Min: 0.0 m/s at 0.0 ms

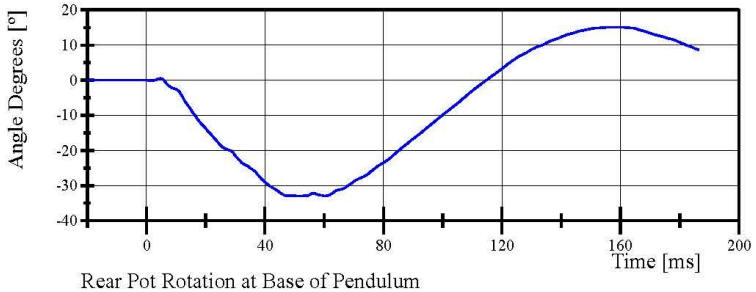
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.15.2022 15:03:58 1495

Transportation Research Center Inc.

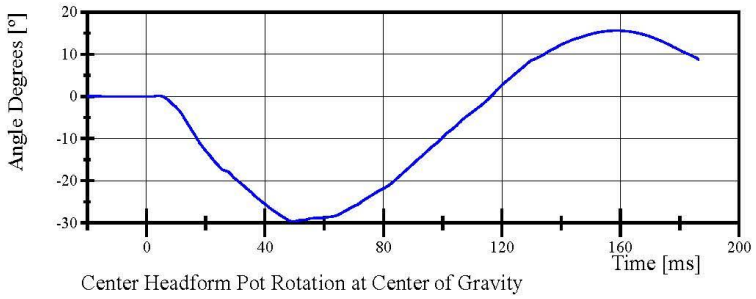
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/15/2022

Forward Pot Rotation at Base of Pendulum



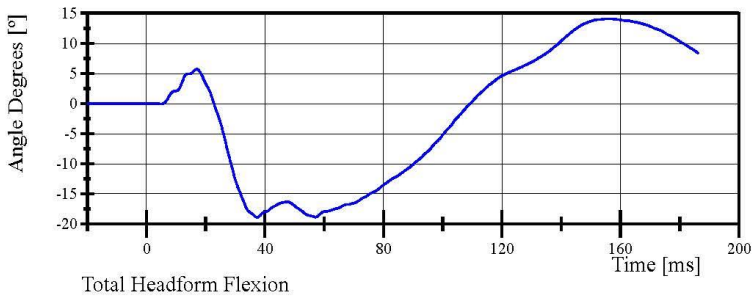
Filter Class: CFC_180
Max: 15.0 ° at 159.5 ms
Min: -33.0 ° at 51.4 ms

Rear Pot Rotation at Base of Pendulum



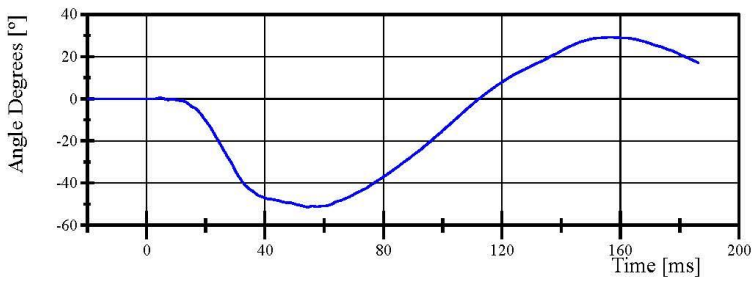
Filter Class: CFC_180
Max: 15.6 ° at 158.9 ms
Min: -29.6 ° at 49.4 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 14.1 ° at 155.4 ms
Min: -18.9 ° at 37.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 29.1 ° at 156.6 ms
Min: -51.4 ° at 54.4 ms

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

06.15.2022 15:03:58 1495

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 79-2
Test Date: 6/16/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.24 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.35 g	Yes

Test meets specifications.

Condition: Used

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

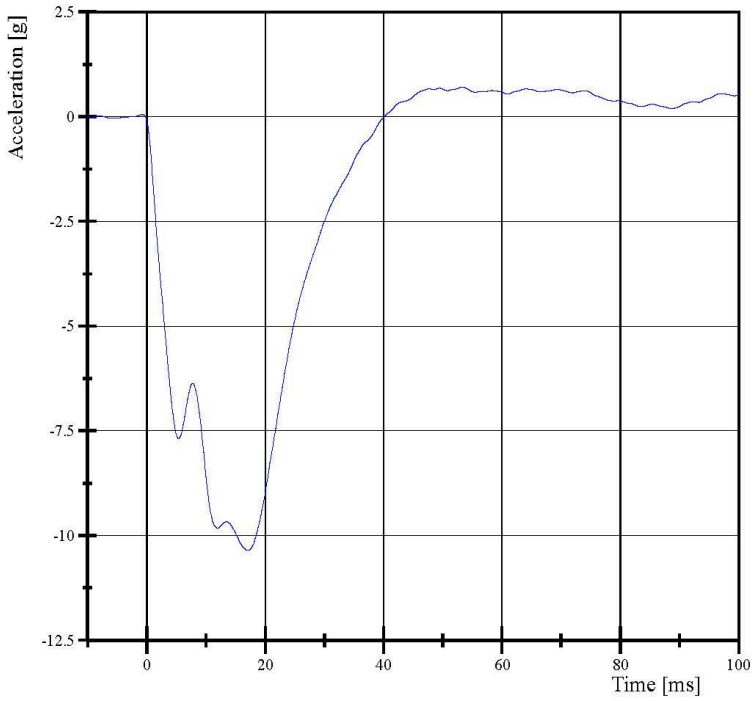
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.16.2022 11:37:51 592

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 79-2
Test Date: 6/16/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 0.7 g at 53.3 ms
Min: -10.3 g at 17.1 ms

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

06.16.2022 11:39:30 592

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.0 mm	Yes

Test meets specifications.

Condition: Used

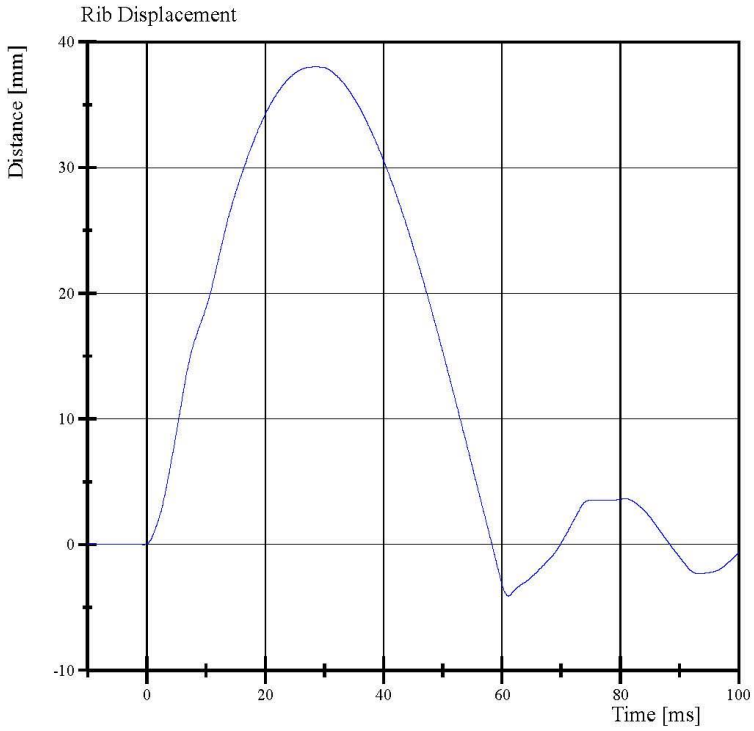
Comments:
Drop Height: 462mm
Rib Module: 175-4008-A

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

06.10.2022 14:15:52 621

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022



Filter Class: CFC_180
Max: 38.0 mm at 28.6 ms
Min: -4.1 mm at 61.0 ms

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

06.10.2022 14:16:52 621

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.8 mm	Yes

Test meets specifications.

Condition: Used

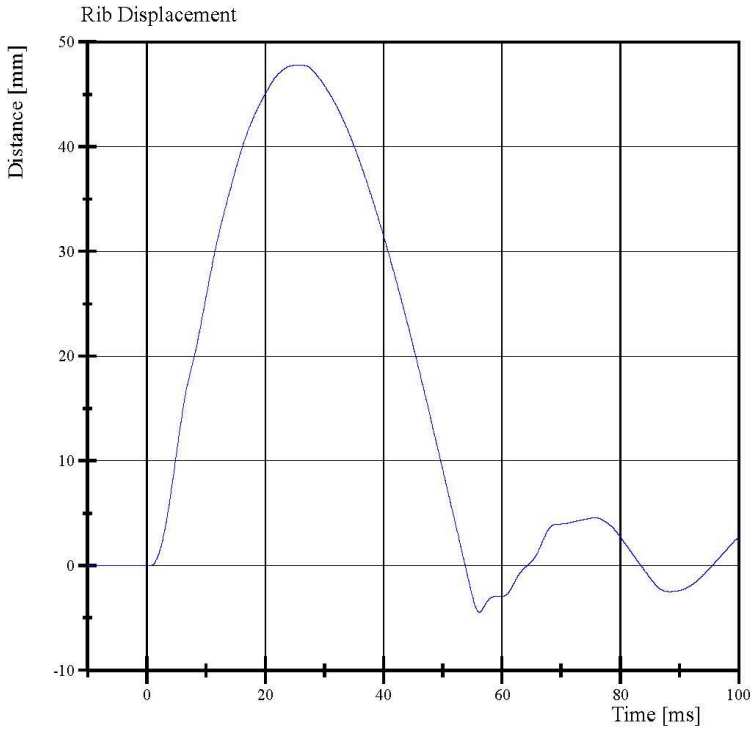
Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A-06-017

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

06.10.2022 14:01:45 508

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022



Filter Class: CFC_180
Max: 47.8 mm at 26.1 ms
Min: -4.5 mm at 56.2 ms

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

06.10.2022 14:02:22 508

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	50 %	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

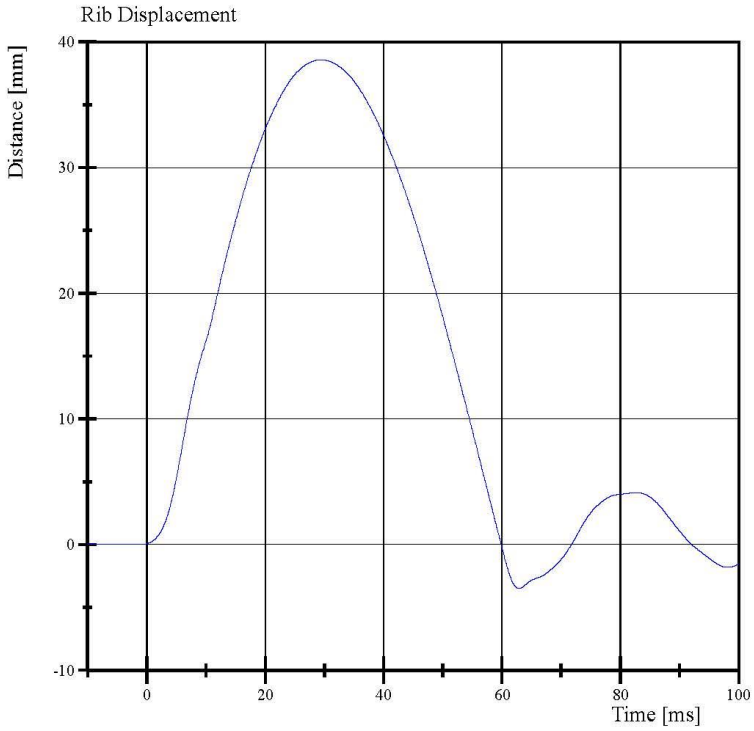
Comments:
Drop Height: 462mm
Rib Module: 175-4008-A

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

06.10.2022 14:29:41 611

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022



Filter Class: CFC_180
Max: 38.6 mm at 29.5 ms
Min: -3.5 mm at 62.9 ms

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

06.10.2022 14:30:33 611

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	50.0 mm	Yes

Test meets specifications.

Condition: Used

Comments:

Drop Height: 816mm

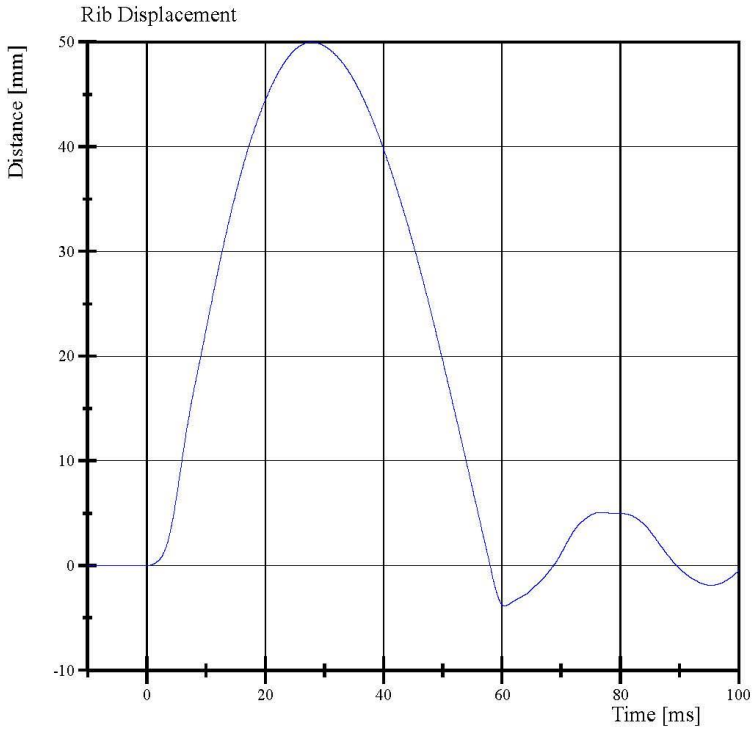
Rib Module: 175-4008-A

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

06.10.2022 14:22:59 502

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022



Filter Class: CFC_180
Max: 50.0 mm at 27.9 ms
Min: -3.9 mm at 60.5 ms

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

06.10.2022 14:23:42 502

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.0 mm	Yes

Test meets specifications.

Condition: Used

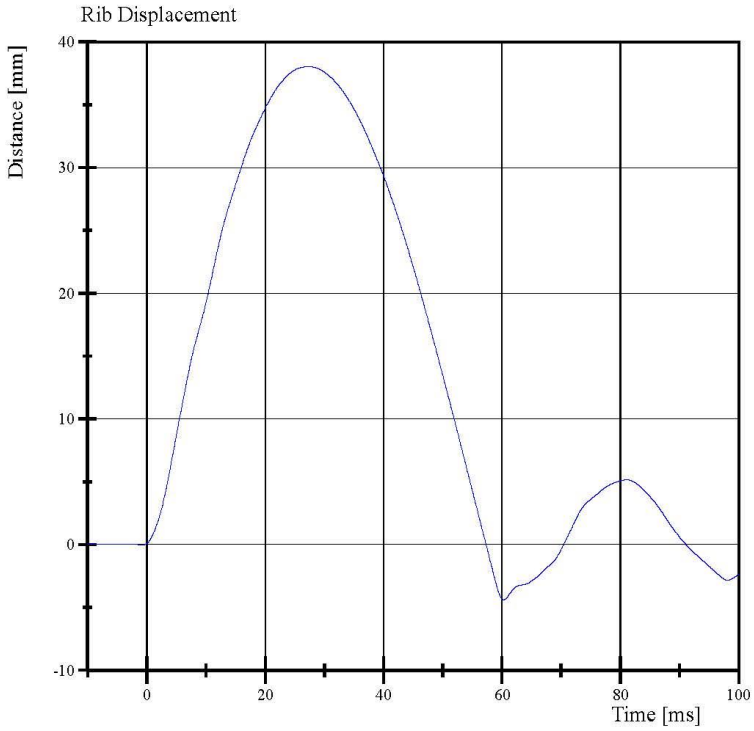
Comments:
Drop Height: 462mm
Rib Module: 175-4008-A-06-017

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

06.10.2022 14:46:28 632

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022



Filter Class: CFC_180
Max: 38.0 mm at 27.3 ms
Min: -4.4 mm at 60.3 ms

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

06.10.2022 14:47:35 632

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.0 mm	Yes

Test meets specifications.

Condition: Used

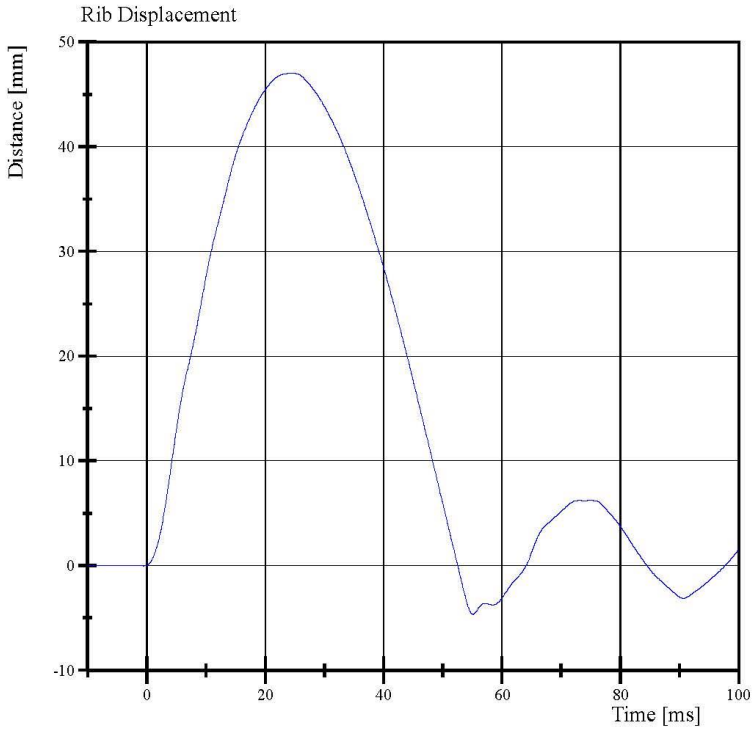
Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A-06-017

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

06.10.2022 14:38:37 521

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/10/2022



Filter Class: CFC_180
Max: 47.0 mm at 24.6 ms
Min: -4.7 mm at 55.1 ms

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

06.10.2022 14:39:20 521

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.484 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-6,066.3 N	Yes
Upper Rib Displacement	34 - 41 mm	37.8 mm	Yes
Center Rib Displacement	37 - 45 mm	39.4 mm	Yes
Lower Rib Displacement	37 - 44 mm	39.6 mm	Yes

Test meets specifications.

Condition: Used

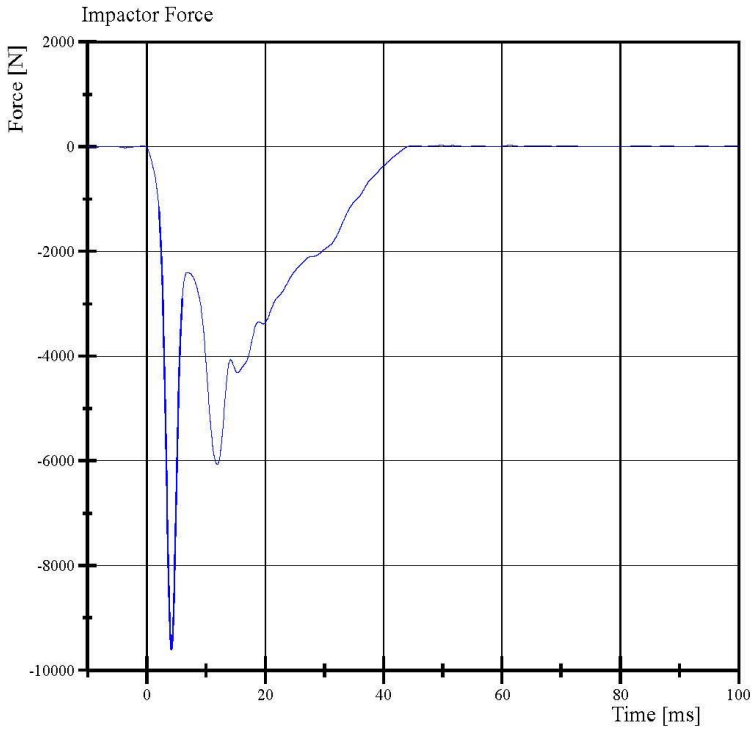
Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

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

06.16.2022 10:51:02 480

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022



Filter Class: CFC_180
Max: 24.8 N at 61.4 ms
Min: -9,604.2 N at 4.2 ms

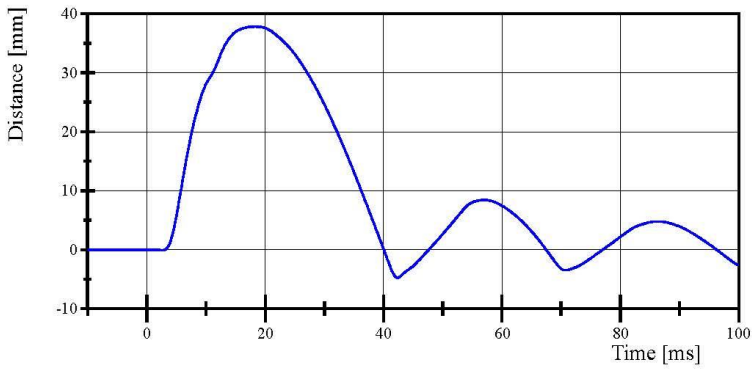
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.16.2022 10:52:34 480

Transportation Research Center Inc.

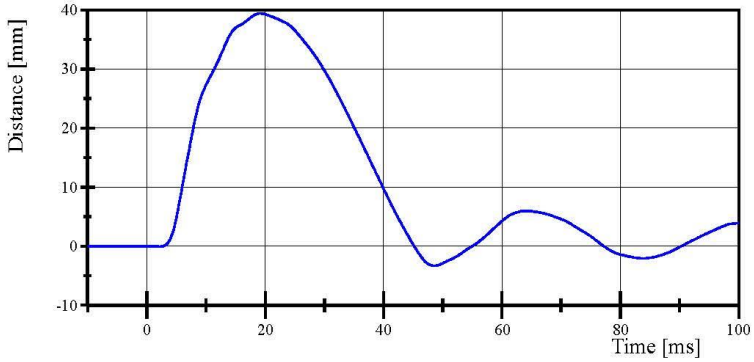
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022

Upper Rib Displacement



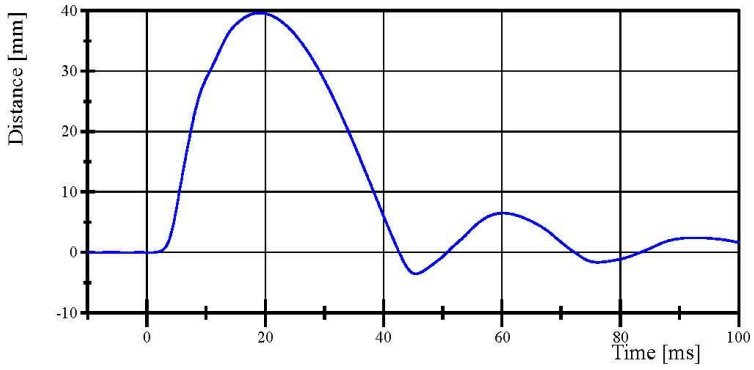
Filter Class: CFC_180
Max: 37.8 mm at 18.2 ms
Min: -4.8 mm at 42.3 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 39.4 mm at 19.1 ms
Min: -3.3 mm at 48.6 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 39.6 mm at 19.0 ms
Min: -3.6 mm at 45.4 ms

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

06.16.2022 10:52:35 480

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 79-2
Test Date: 6/15/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.120 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.7 deg	Yes
Time of Peak	39 - 53 ms	43.3 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.5 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Lumbar S/N: 150365

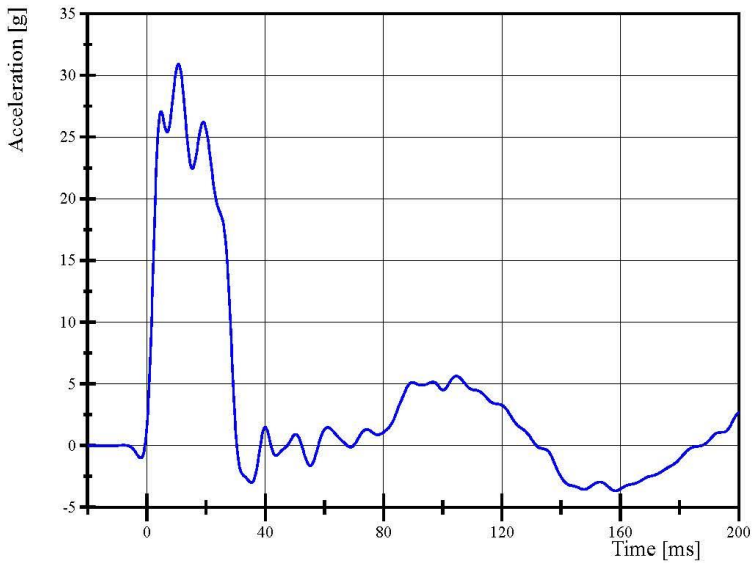
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

06.15.2022 14:24:25 673

Transportation Research Center Inc.

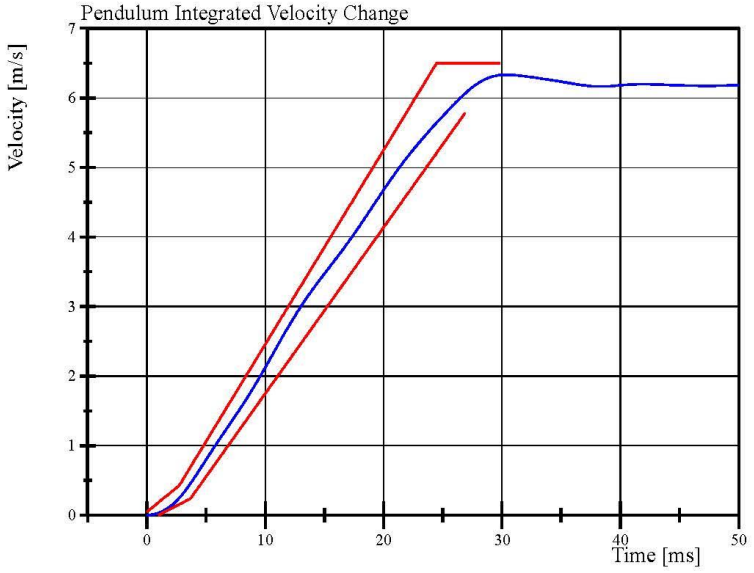
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 79-2
Test Date: 6/15/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 30.9 g at 10.6 ms
Min: -3.7 g at 158.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.3 m/s at 30.4 ms
Min: 0.0 m/s at 0.0 ms

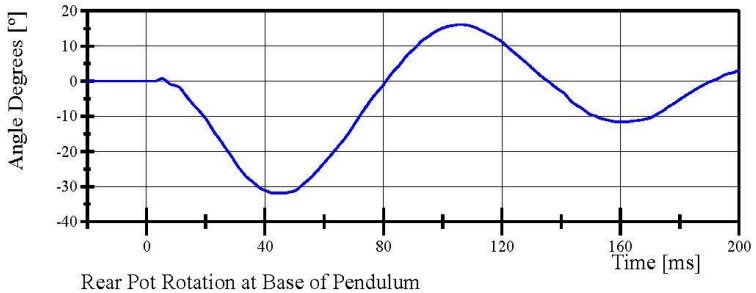
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.15.2022 14:31:20 673

Transportation Research Center Inc.

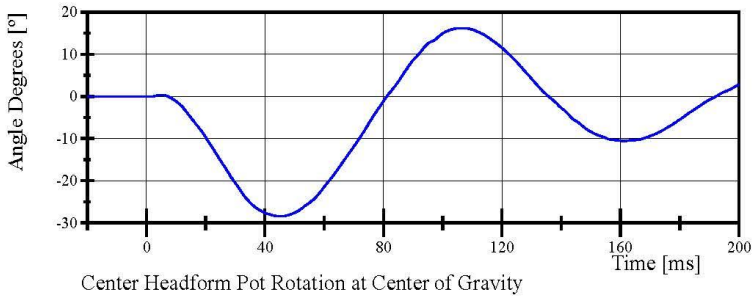
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 79-2
Test Date: 6/15/2022

Forward Pot Rotation at Base of Pendulum



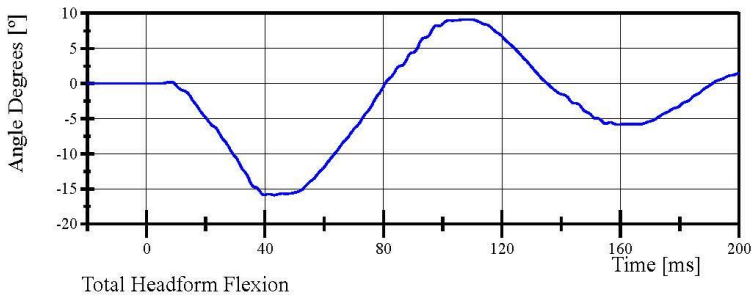
Filter Class: CFC_180
Max: 16.2 ° at 105.8 ms
Min: -31.9 ° at 45.6 ms

Rear Pot Rotation at Base of Pendulum



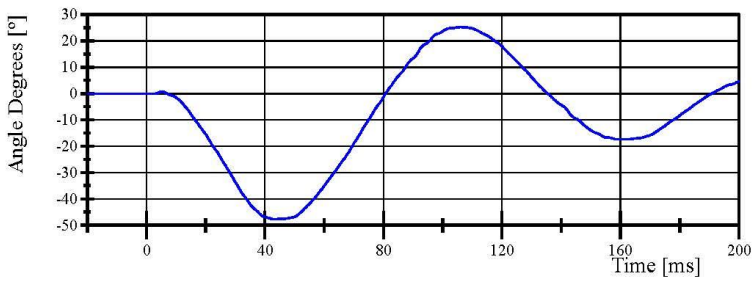
Filter Class: CFC_180
Max: 16.2 ° at 106.5 ms
Min: -28.4 ° at 45.1 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.1 ° at 108.6 ms
Min: -15.9 ° at 43.1 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.2 ° at 106.2 ms
Min: -47.7 ° at 43.3 ms

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

06.15.2022 14:31:21 673

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.05 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,295.0 N	Yes
Time of Peak	10.6 - 13.0 ms	11.60 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,439.7 N	Yes
Time of Peak	10.0 - 12.3 ms	11.36 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Abdomen S/N: 1066

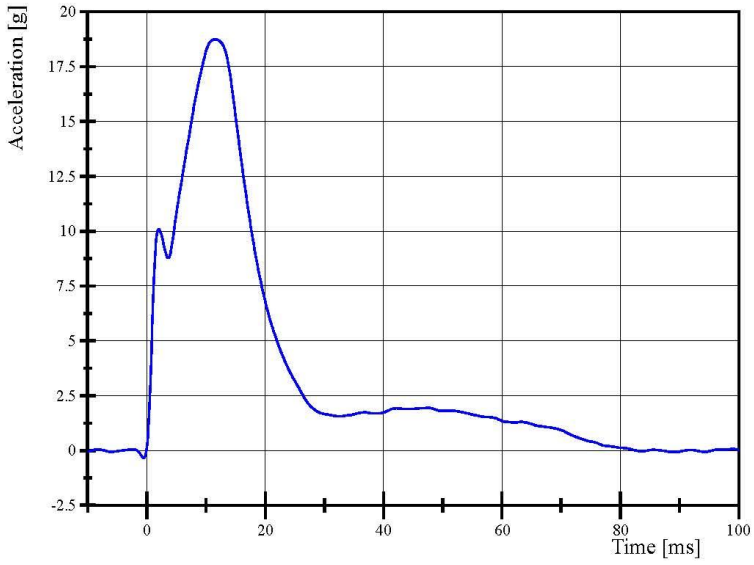
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.16.2022 11:12:28 619

Transportation Research Center Inc.

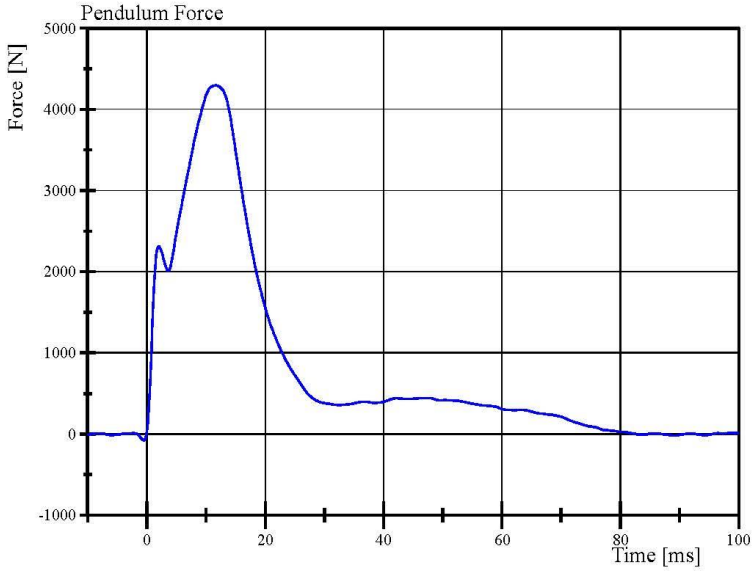
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.7 g at 11.6 ms
Min: -0.3 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,295.0 N at 11.6 ms
Min: -77.3 N at -0.6 ms

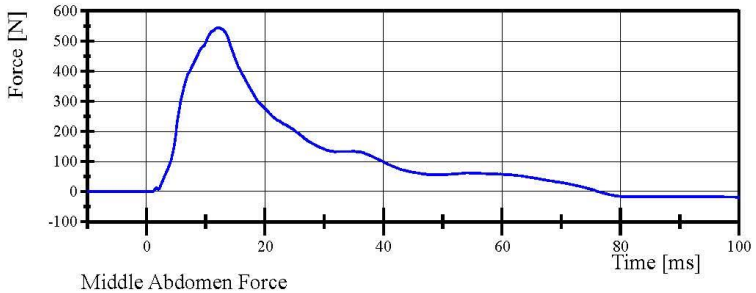
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.16.2022 11:13:16 619

Transportation Research Center Inc.

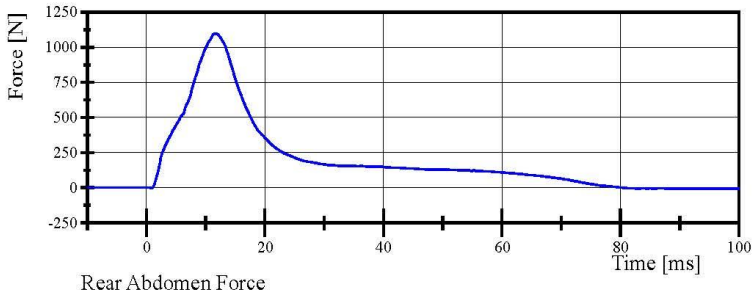
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022

Front Abdomen Force



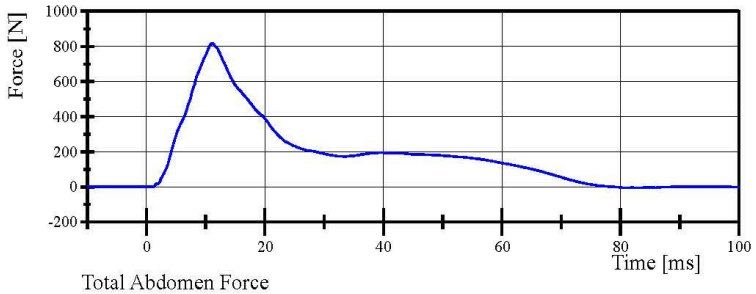
Filter Class: CFC_600
Max: 543.9 N at 12.0 ms
Min: -18.6 N at 99.8 ms

Middle Abdomen Force



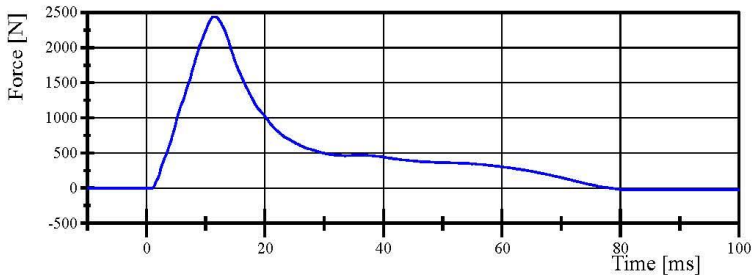
Filter Class: CFC_600
Max: 1,097.3 N at 11.7 ms
Min: -7.5 N at 100.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 818.3 N at 11.0 ms
Min: -5.3 N at 80.7 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,439.7 N at 11.4 ms
Min: -27.3 N at 100.0 ms

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

06.16.2022 11:13:16 619

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	64 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,108.6 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,343.0 N	Yes
Time of Peak	12.2 - 17.0 ms	14.08 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: N/A

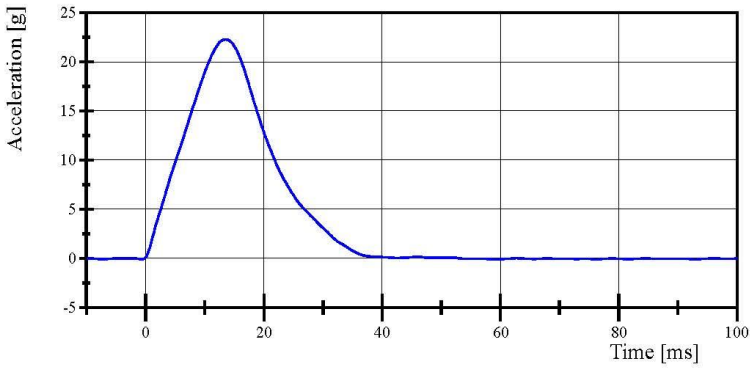
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.16.2022 11:32:09 591

Transportation Research Center Inc.

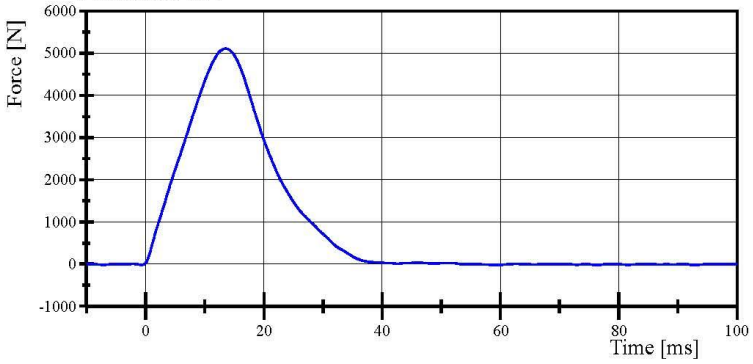
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 79-1
Test Date: 6/16/2022

Pendulum Acceleration



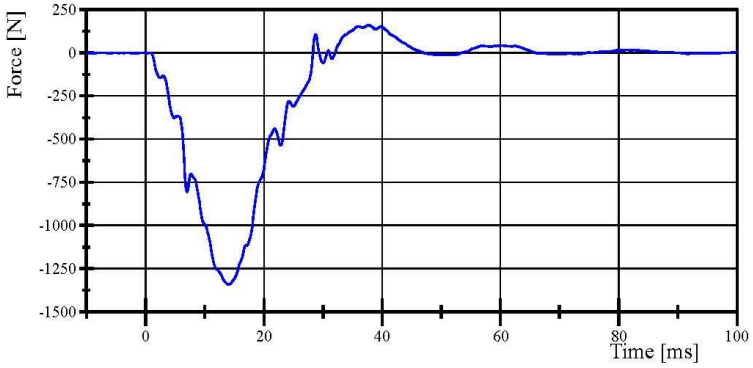
Filter Class: CFC_180
Max: 22.3 g at 13.5 ms
Min: -0.1 g at 76.3 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,108.6 N at 13.5 ms
Min: -22.6 N at 76.3 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 160.1 N at 37.8 ms
Min: -1,343.0 N at 14.1 ms

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

06.16.2022 11:33:13 591

Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 80

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. 80-1
Test Date: 6/30/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Peak Resultant Acceleration	125 - 155 g	142.8 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.0 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	3.75 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

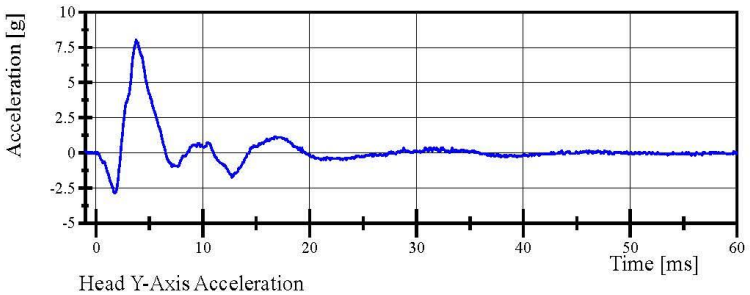
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

06.30.2022 09:08:26 361

Transportation Research Center Inc.

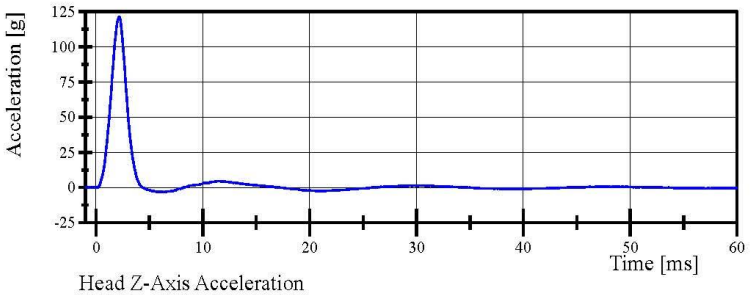
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Head X-Axis Acceleration



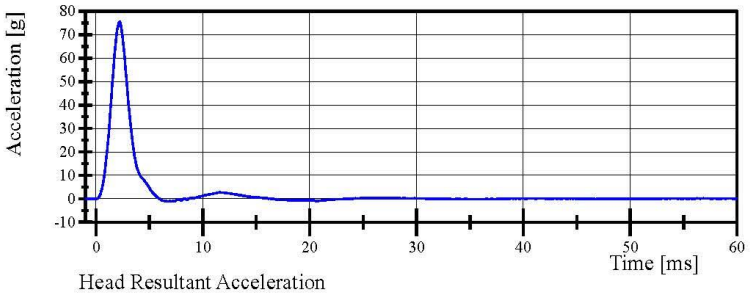
Filter Class: CFC_1000
Max: 8.0 g at 3.8 ms
Min: -2.8 g at 1.7 ms

Head Y-Axis Acceleration



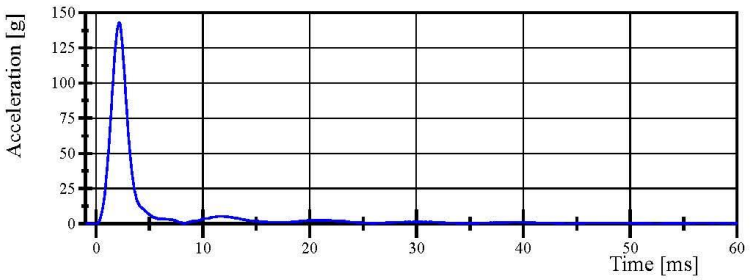
Filter Class: CFC_1000
Max: 121.4 g at 2.2 ms
Min: -3.2 g at 6.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 75.6 g at 2.2 ms
Min: -1.1 g at 6.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 142.8 g at 2.2 ms
Min: 0.0 g at -1.0 ms

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

06.30.2022 09:09:21 361

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 80-2
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-51.0 deg	Yes
Time of Peak	54 - 66 ms	55.9 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	57.8 ms	Yes

Test meets specifications.

Condition: Used
Comments:
Neck S/N: 05053

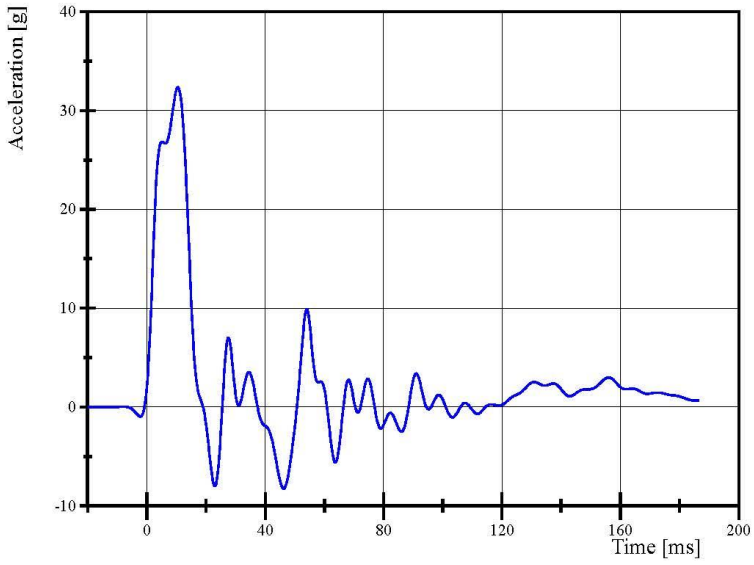
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

06.29.2022 16:46:11 1494

Transportation Research Center Inc.

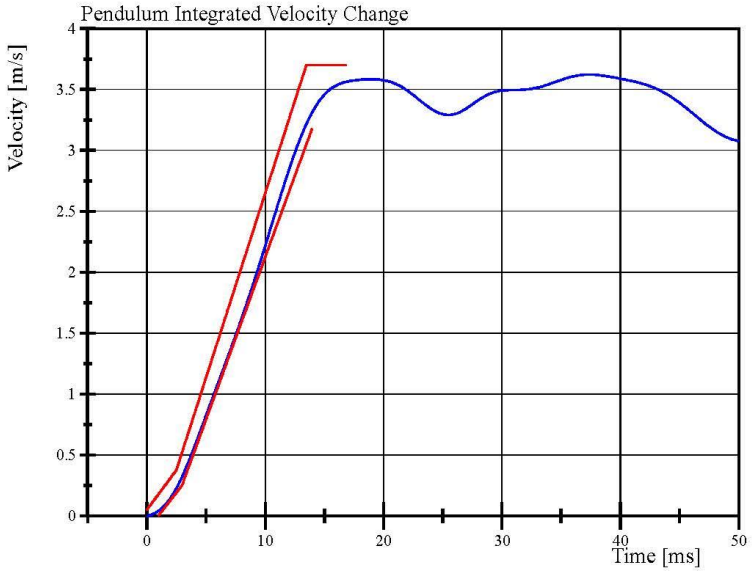
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 80-2
Test Date: 6/29/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 32.4 g at 10.5 ms
Min: -8.3 g at 46.2 ms

Pendulum Integrated Velocity Change



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

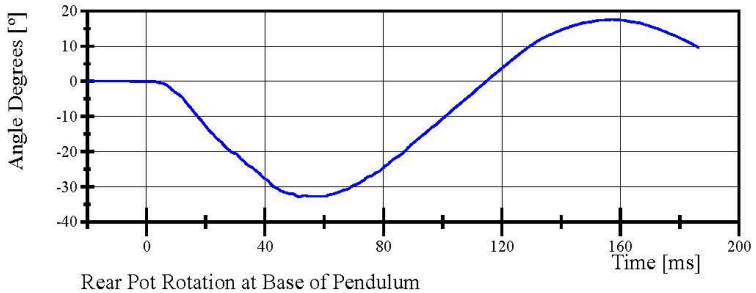
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.29.2022 16:47:00 1494

Transportation Research Center Inc.

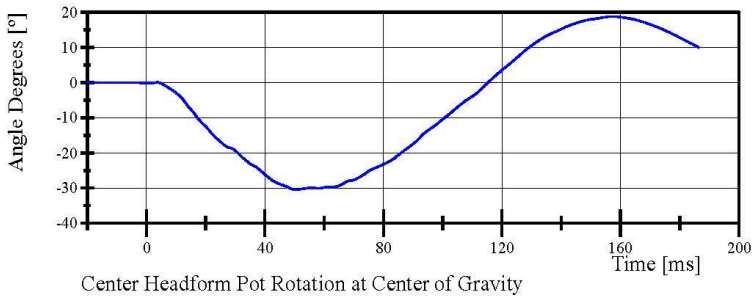
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 80-2
Test Date: 6/29/2022

Forward Pot Rotation at Base of Pendulum



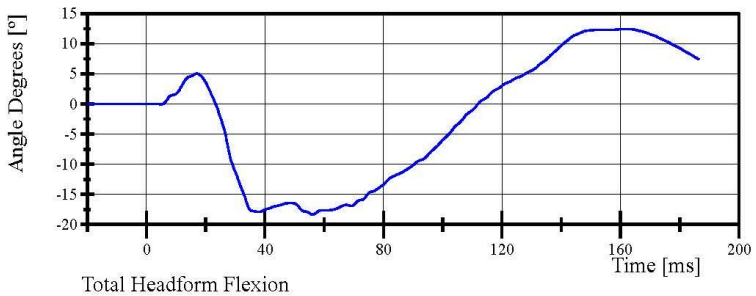
Filter Class: CFC_180
Max: 17.5 ° at 157.2 ms
Min: -32.9 ° at 51.5 ms

Rear Pot Rotation at Base of Pendulum



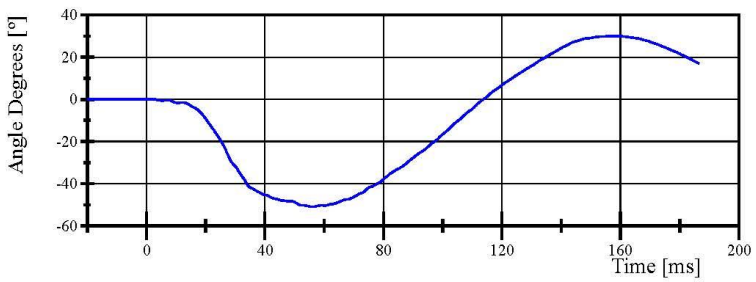
Filter Class: CFC_180
Max: 18.8 ° at 157.3 ms
Min: -30.5 ° at 50.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 12.4 ° at 161.0 ms
Min: -18.3 ° at 56.1 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 29.9 ° at 157.0 ms
Min: -51.0 ° at 55.9 ms

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

06.29.2022 16:47:00 1494

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 80-2
Test Date: 7/1/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-8.84 g	Yes

Test meets specifications.

Condition: Used

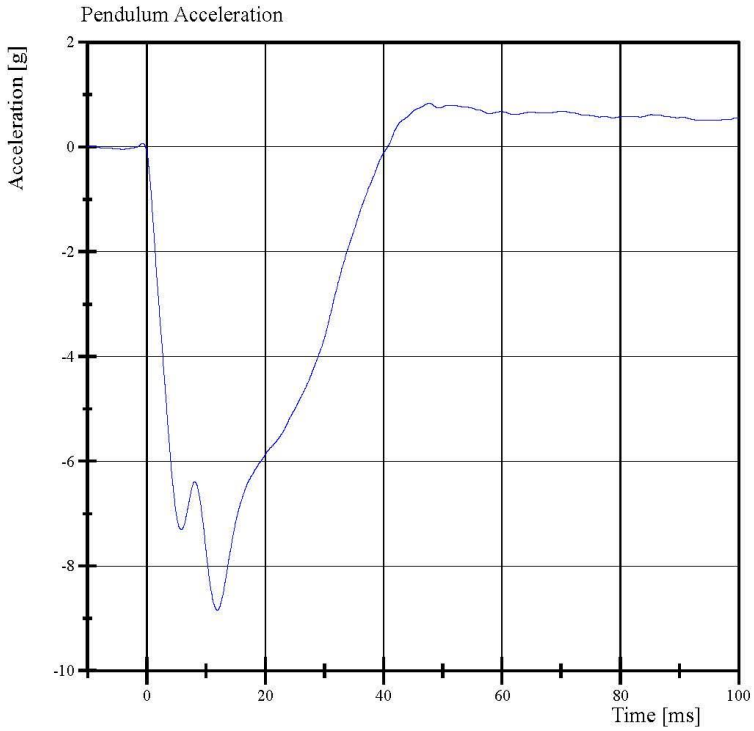
Comments:
Arm S/N: 175-3501-07014

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

07.01.2022 08:12:25 649

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 80-2
Test Date: 7/1/2022



Filter Class: CFC_180
Max: 0.8 g at 47.7 ms
Min: -8.8 g at 11.9 ms

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

07.01.2022 08:13:44 649

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.6 mm	Yes

Test meets specifications.

Condition: Used

Comments:
Rib Module: 175-4008-A

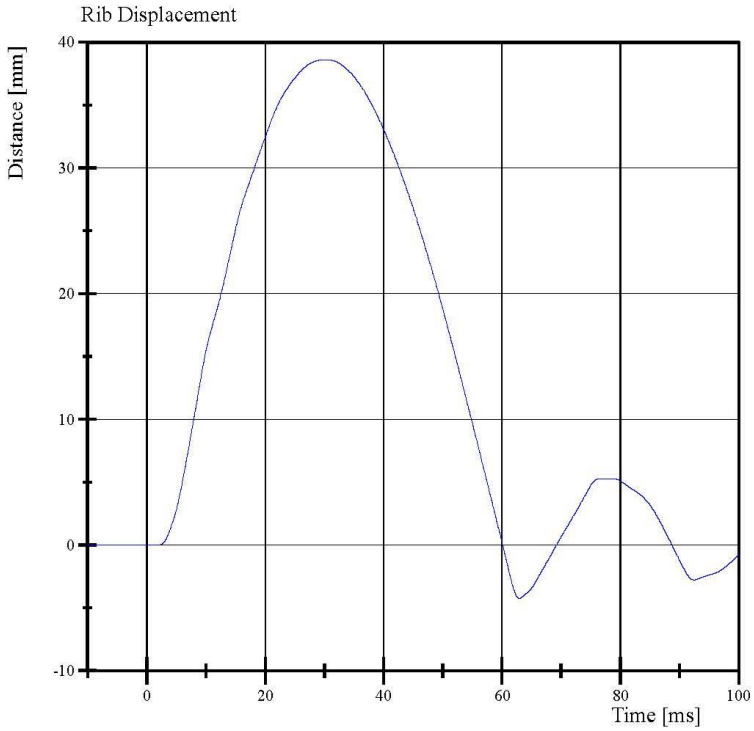
Drop Height: 459

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

06.29.2022 14:48:13 609

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022



Filter Class: CFC_180
Max: 38.6 mm at 30.2 ms
Min: -4.2 mm at 62.9 ms

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

06.29.2022 14:51:11 609

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.4 mm	Yes

Test meets specifications.

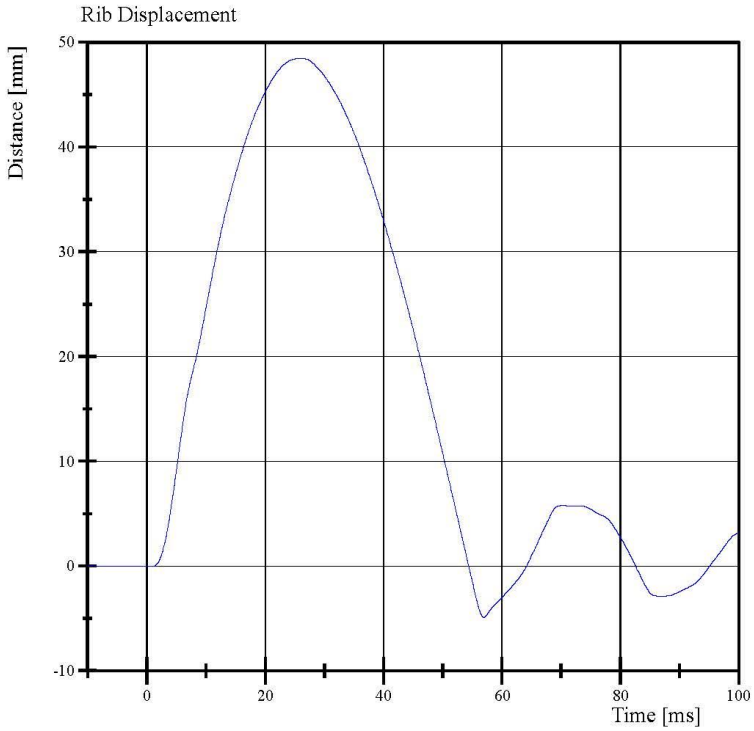
Condition: Used
Comments:
Rib Module: 175-4008-A
Drop Height: 813

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

06.29.2022 15:13:54 513

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022



Filter Class: CFC_180
Max: 48.4 mm at 26.1 ms
Min: -4.9 mm at 57.0 ms

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

06.29.2022 15:16:19 513

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	20.6 ºC	Yes
Relative Humidity	10 - 70 %	54 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.6 mm	Yes

Test meets specifications.

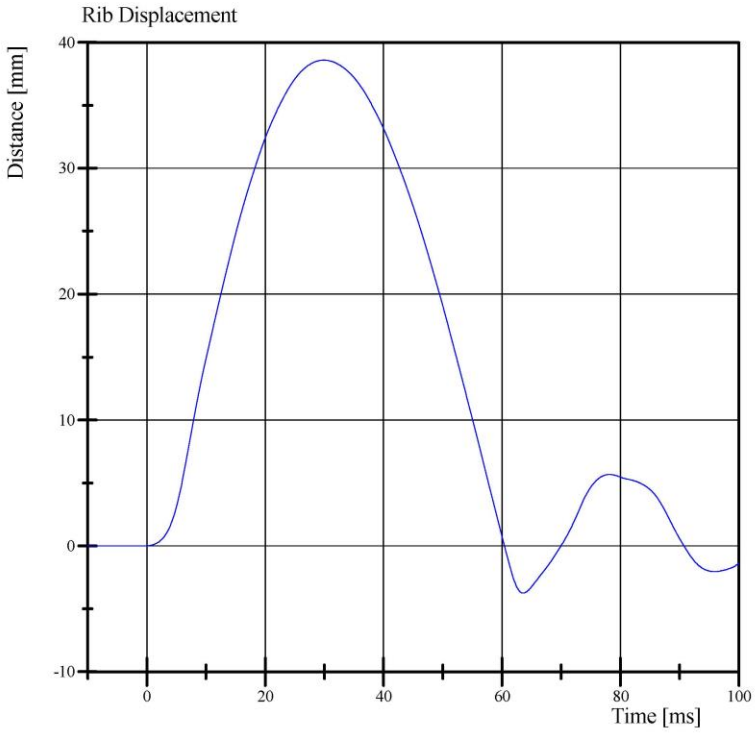
Condition: Used
Comments:
Rib Module: 175-4008-A
Drop Height: 459

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

06.29.2022 16:02:50 599

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022



Filter Class: CFC_180
Max: 38.6 mm at 29.9 ms
Min: -3.8 mm at 63.6 ms

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

06.29.2022 16:07:25 599

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	21.4 ºC	Yes
Relative Humidity	10 - 70 %	53 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	50.1 mm	Yes

Test meets specifications.

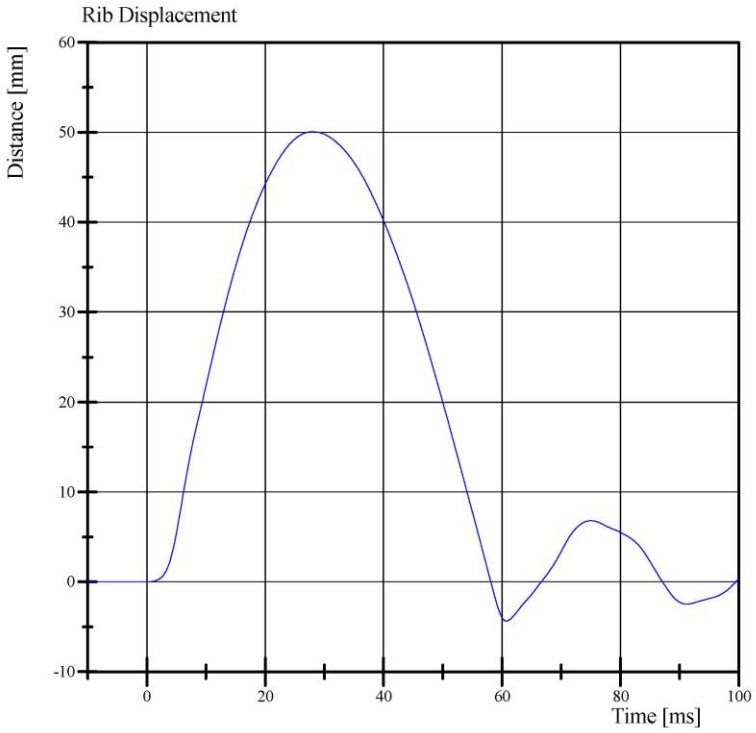
Condition: Used
Comments:
Rib Module: 175-4008-A
Drop Height: 813

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

06.29.2022 16:15:53 494

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022



Filter Class: CFC_180
Max: 50.1 mm at 28.1 ms
Min: -4.4 mm at 60.7 ms

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

06.29.2022 16:16:18 494

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.8 mm	Yes

Test meets specifications.

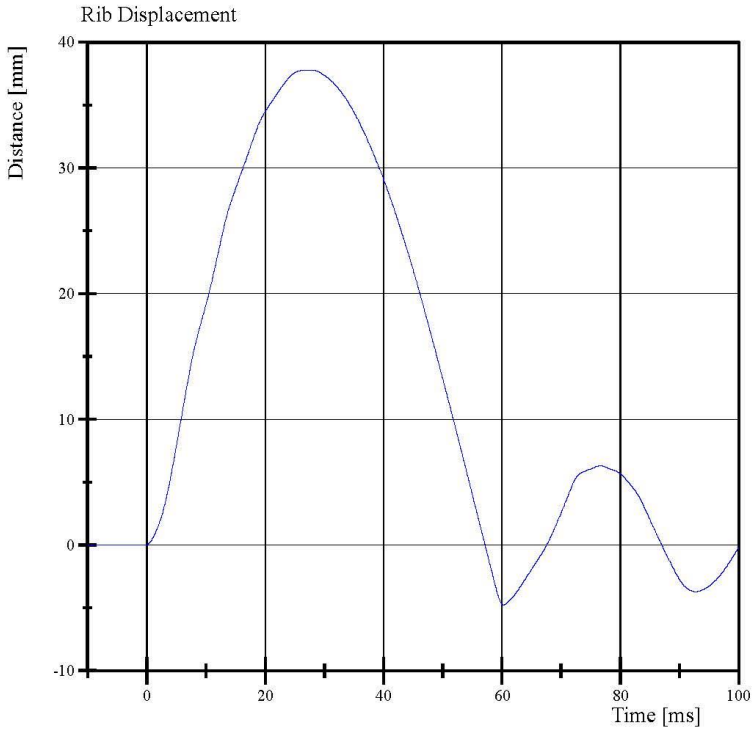
Condition: Used
Comments:
Rib Module: 175-4008-A-06-017
Drop Height: 459

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

06.29.2022 16:28:51 624

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022



Filter Class: CFC_180
Max: 37.8 mm at 27.4 ms
Min: -4.8 mm at 60.3 ms

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

06.29.2022 16:30:35 624

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.7 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	45.8 mm	No

Test does not meet specifications.

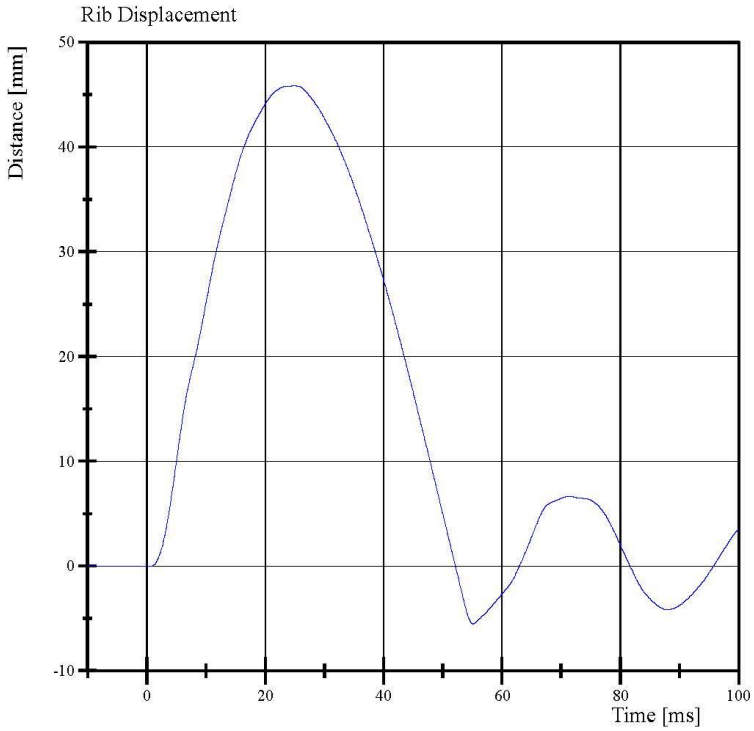
Condition: Used
Comments:
Rib Module: 175-4008-A-06-017
Drop Height: 813

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

06.29.2022 16:35:13 516

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/29/2022



Filter Class: CFC_180
Max: 45.8 mm at 25.0 ms
Min: -5.5 mm at 55.1 ms

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

06.29.2022 16:35:45 516

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	55 %	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	-5,390.8 N	Yes
Upper Rib Displacement	34 - 41 mm	38.9 mm	Yes
Center Rib Displacement	37 - 45 mm	40.7 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.6 mm	Yes

Test meets specifications.

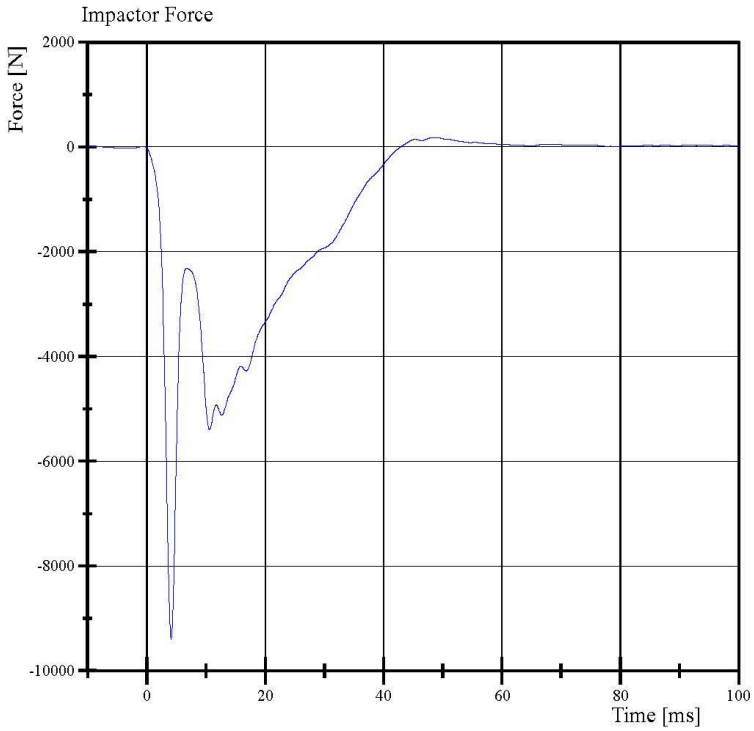
Condition: Used
Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

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

06.30.2022 13:48:44 442

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022



Filter Class: CFC_180
Max: 176.0 N at 48.4 ms
Min: -9,402.6 N at 4.1 ms

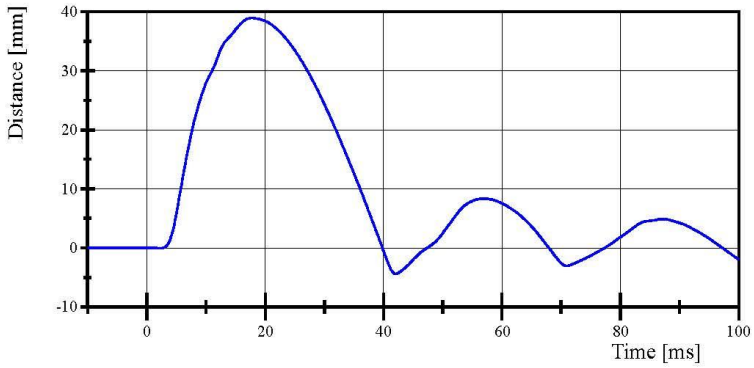
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.30.2022 13:55:00 442

Transportation Research Center Inc.

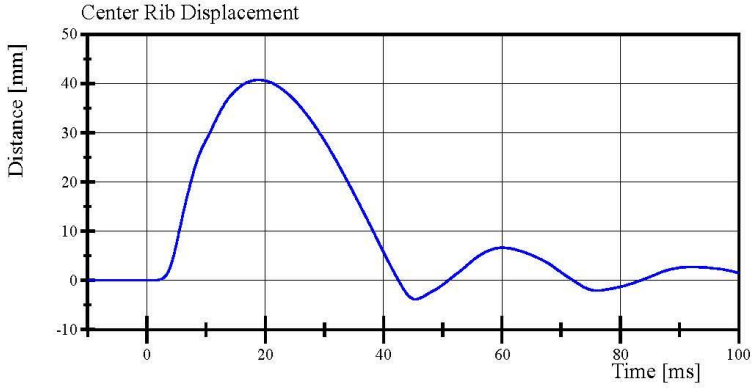
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Upper Rib Displacement



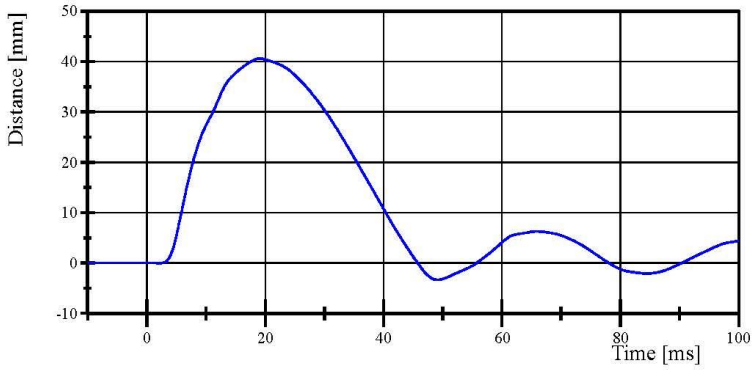
Filter Class: CFC_180
Max: 38.9 mm at 17.8 ms
Min: -4.4 mm at 42.1 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 40.7 mm at 18.8 ms
Min: -3.8 mm at 45.4 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.6 mm at 19.1 ms
Min: -3.3 mm at 49.1 ms

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

06.30.2022 13:55:00 442

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 80-3
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.112 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-46.5 deg	Yes
Time of Peak	39 - 53 ms	44.2 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	36.0 ms	No

Test does not meet specifications.

Condition: Used

Comments:

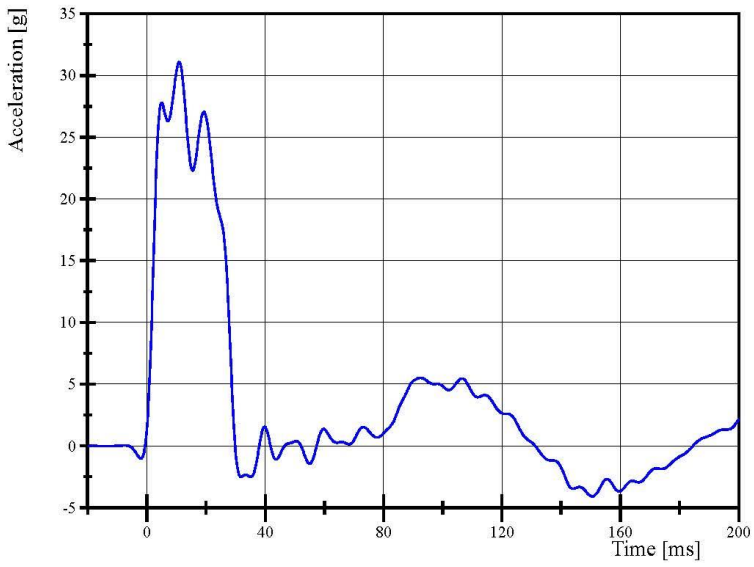
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

06.29.2022 14:15:09 672

Transportation Research Center Inc.

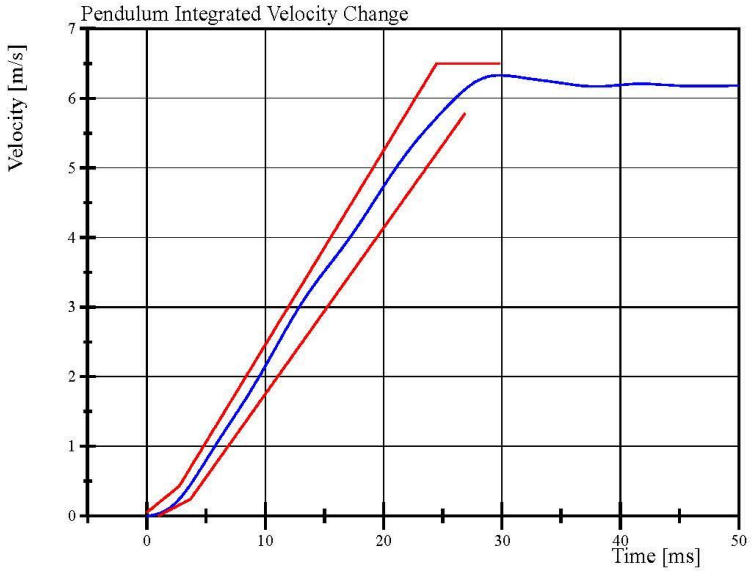
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 80-3
Test Date: 6/29/2022

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.1 g at 10.9 ms
Min: -4.1 g at 150.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.3 m/s at 29.8 ms
Min: 0.0 m/s at 0.0 ms

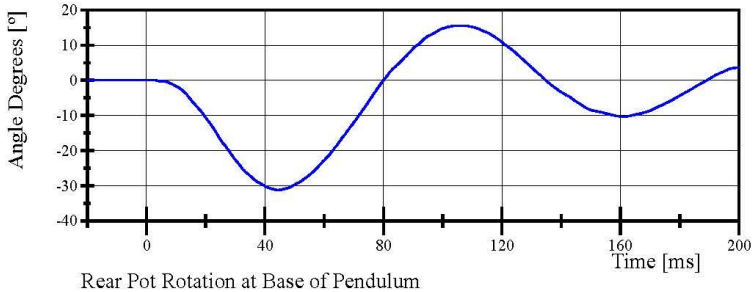
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.29.2022 14:16:36 672

Transportation Research Center Inc.

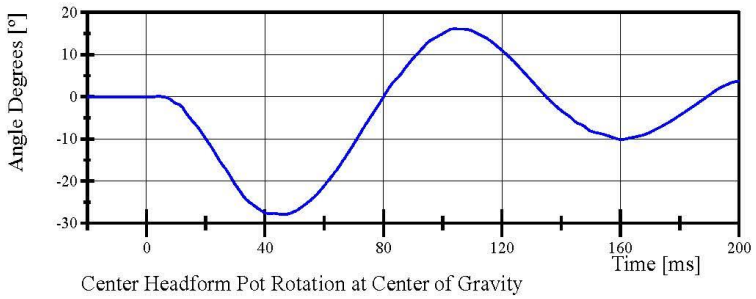
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 80-3
Test Date: 6/29/2022

Forward Pot Rotation at Base of Pendulum



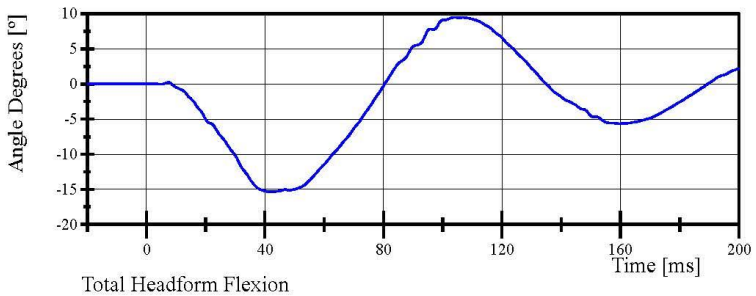
Filter Class: CFC_180
Max: 15.6 ° at 105.9 ms
Min: -31.2 ° at 44.3 ms

Rear Pot Rotation at Base of Pendulum



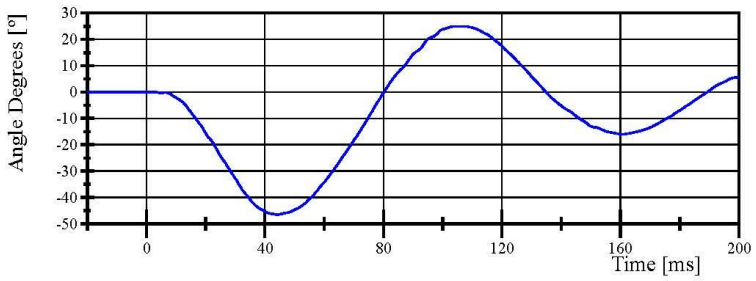
Filter Class: CFC_180
Max: 16.1 ° at 104.0 ms
Min: -27.9 ° at 46.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.5 ° at 103.9 ms
Min: -15.3 ° at 41.8 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 25.0 ° at 106.3 ms
Min: -46.5 ° at 44.2 ms

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

06.29.2022 14:16:36 672

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.04 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,281.5 N	Yes
Time of Peak	10.6 - 13.0 ms	12.24 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,409.3 N	Yes
Time of Peak	10.0 - 12.3 ms	11.60 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Abdomen S/N: 1066

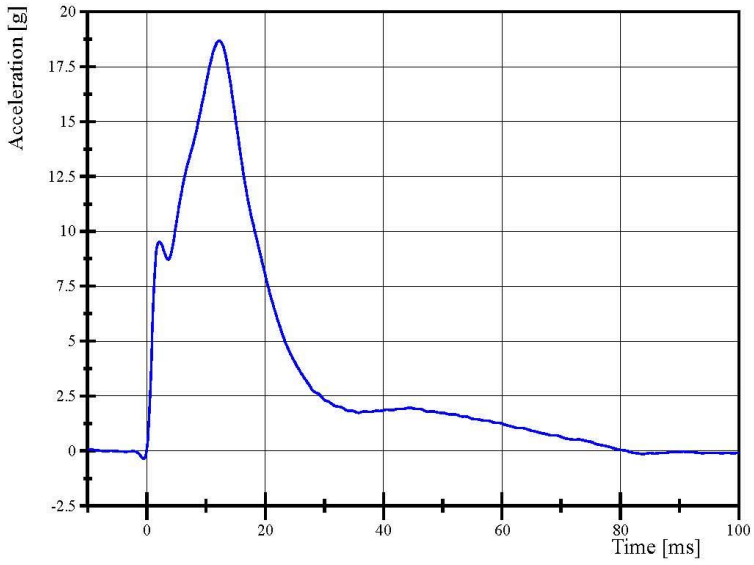
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.30.2022 15:07:02 594

Transportation Research Center Inc.

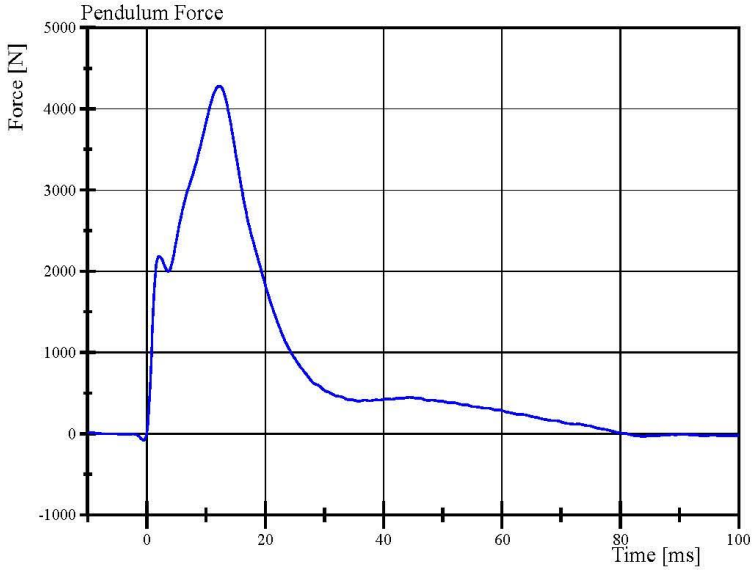
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.7 g at 12.2 ms
Min: -0.4 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,281.5 N at 12.2 ms
Min: -82.3 N at -0.6 ms

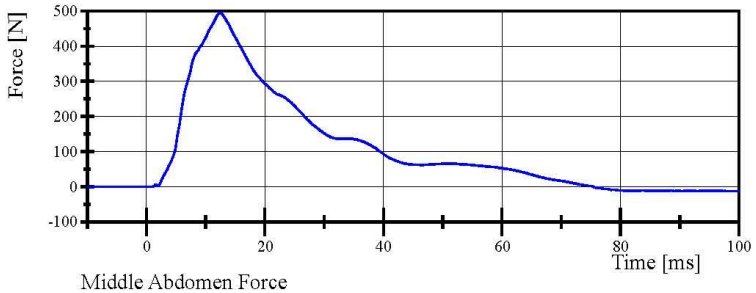
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

06.30.2022 15:07:54 594

Transportation Research Center Inc.

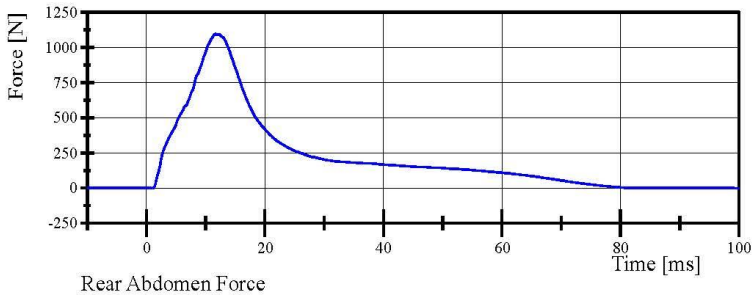
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Front Abdomen Force



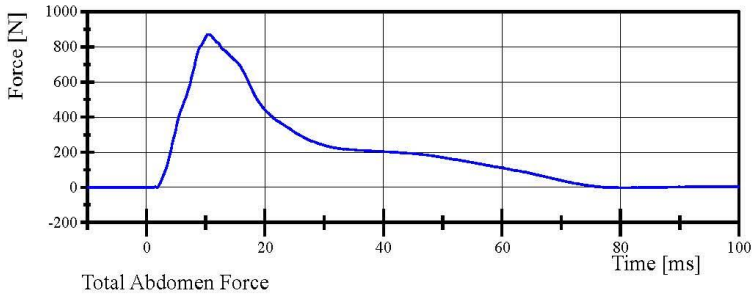
Filter Class: CFC_600
Max: 494.7 N at 12.6 ms
Min: -12.7 N at 99.4 ms

Middle Abdomen Force



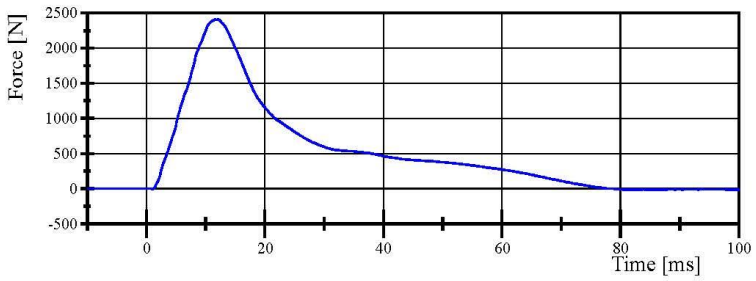
Filter Class: CFC_600
Max: 1,096.4 N at 11.6 ms
Min: -1.4 N at 1.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 871.8 N at 10.5 ms
Min: -2.6 N at 79.8 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,409.3 N at 11.6 ms
Min: -11.4 N at 81.8 ms

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

06.30.2022 15:07:54 594

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,080.9 N	Yes
Time of Peak	11.8 - 16.1 ms	12.48 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,350.1 N	Yes
Time of Peak	12.2 - 17.0 ms	11.36 ms	No

Test does not meet specifications.

Condition: Used

Comments:

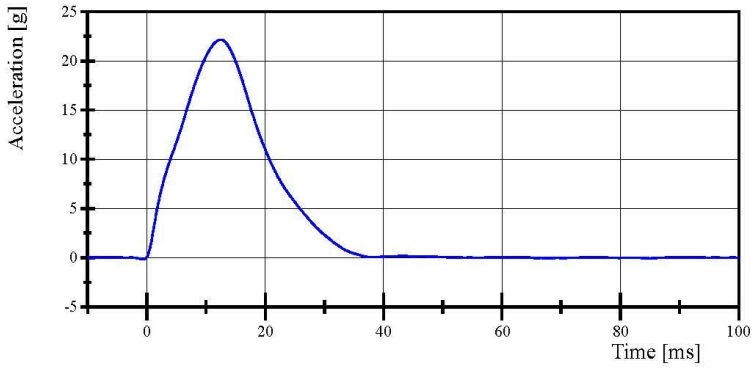
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

06.30.2022 15:36:20 575

Transportation Research Center Inc.

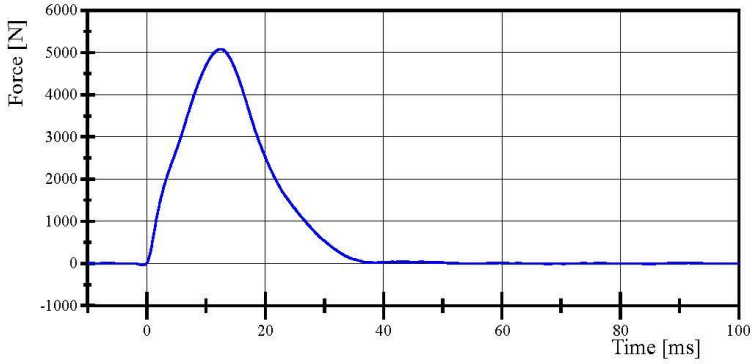
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 80-1
Test Date: 6/30/2022

Pendulum Acceleration



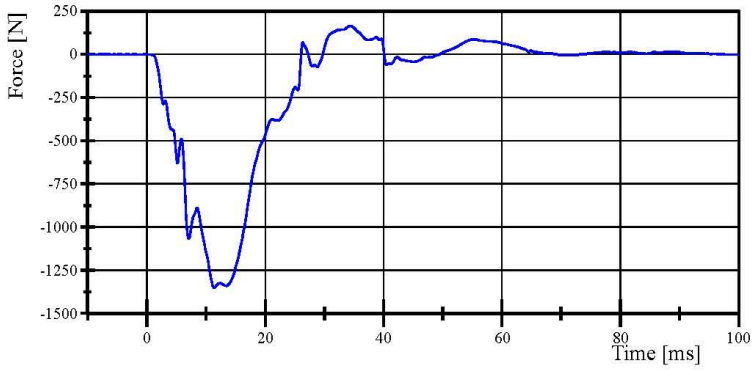
Filter Class: CFC_180
Max: 22.2 g at 12.5 ms
Min: -0.2 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,080.9 N at 12.5 ms
Min: -36.7 N at -0.6 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 164.8 N at 34.3 ms
Min: -1,350.1 N at 11.4 ms

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

06.30.2022 15:37:13 575

Pre-Test Calibration Sheets
Driver S/N DQ5070

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 12

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. 12-2
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	133.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.7 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.37 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP8345

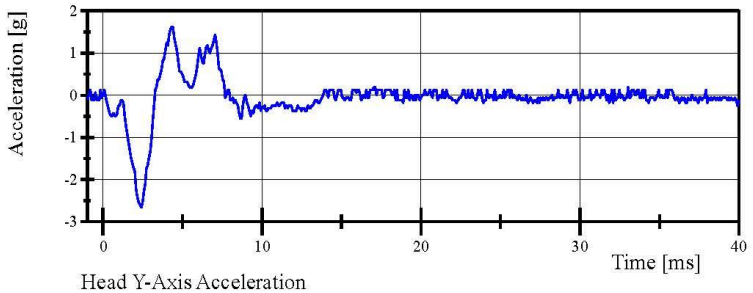
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.10.2022 08:36:13 235

Transportation Research Center Inc.

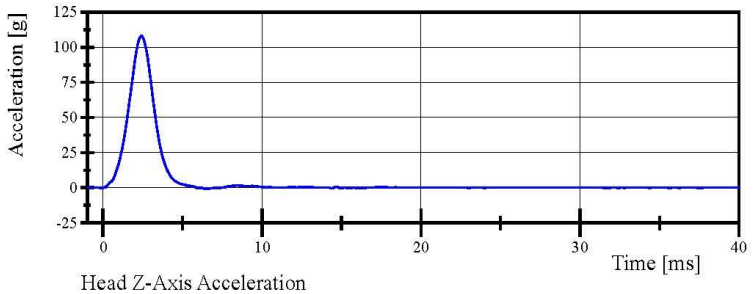
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 12-2
Test Date: 6/10/2022

Head X-Axis Acceleration



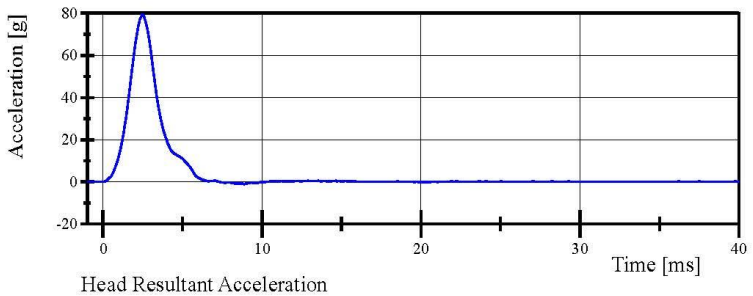
Filter Class: CFC_1000
Max: 1.6 g at 4.3 ms
Min: -2.7 g at 2.4 ms

Head Y-Axis Acceleration



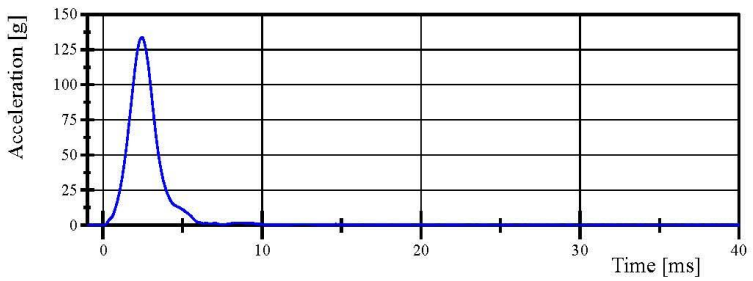
Filter Class: CFC_1000
Max: 108.1 g at 2.4 ms
Min: -0.6 g at 6.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 79.3 g at 2.5 ms
Min: -1.0 g at 8.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 133.8 g at 2.4 ms
Min: 0.1 g at -1.0 ms

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

06.10.2022 08:36:44 235

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 12-2
Test Date: 6/9/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	64 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.614 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.668 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.857 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.145 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.857 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.858 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-73.0 deg	Yes
Time of Peak	50 - 70 ms	62.9 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	113.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 717

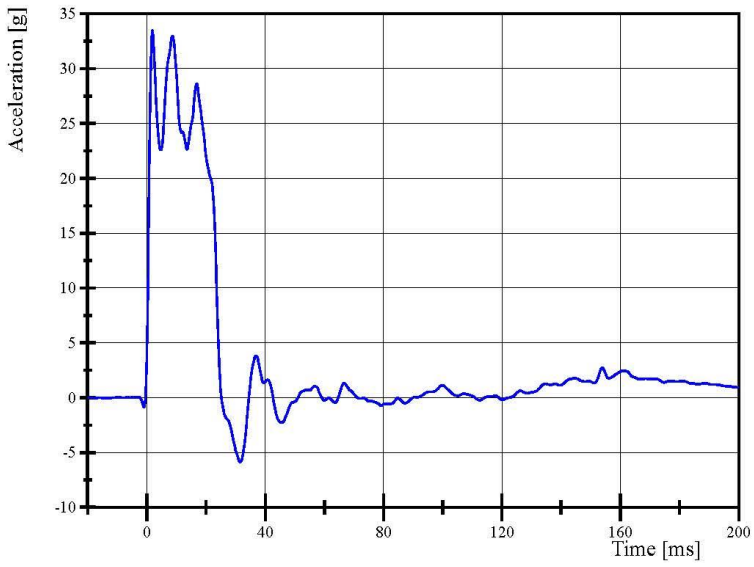
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

06.09.2022 14:57:01 752

Transportation Research Center Inc.

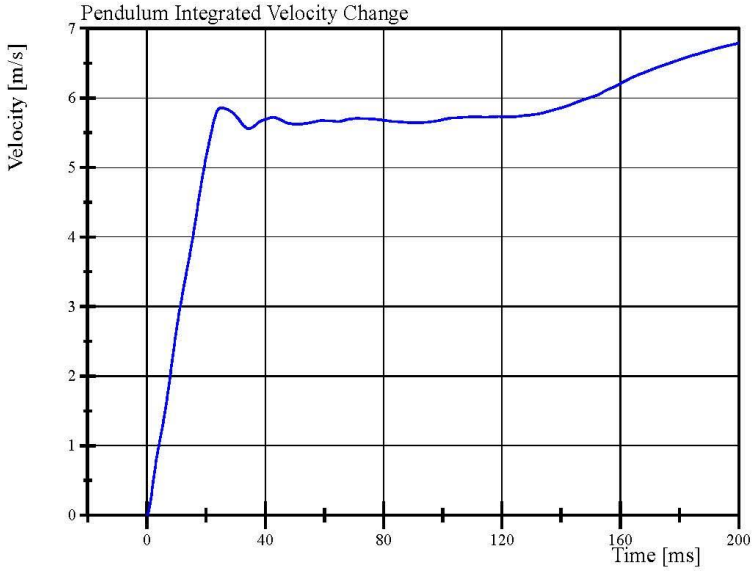
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 12-2
Test Date: 6/9/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 33.5 g at 1.8 ms
Min: -5.8 g at 31.5 ms

Pendulum Integrated Velocity Change



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

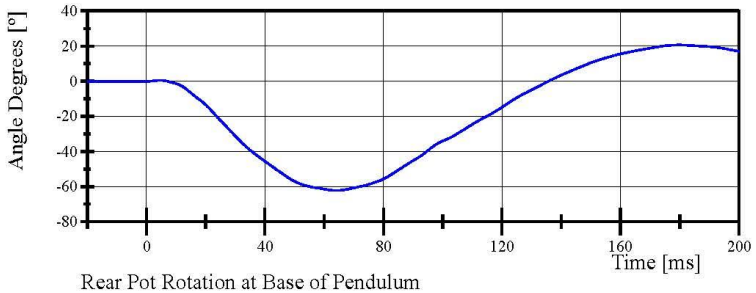
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 14:57:23 752

Transportation Research Center Inc.

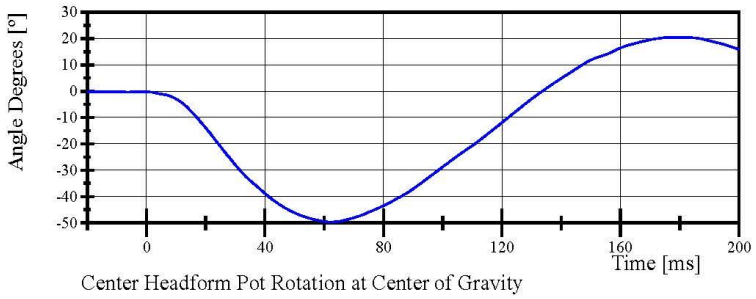
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 12-2
Test Date: 6/9/2022

Forward Pot Rotation at Base of Pendulum



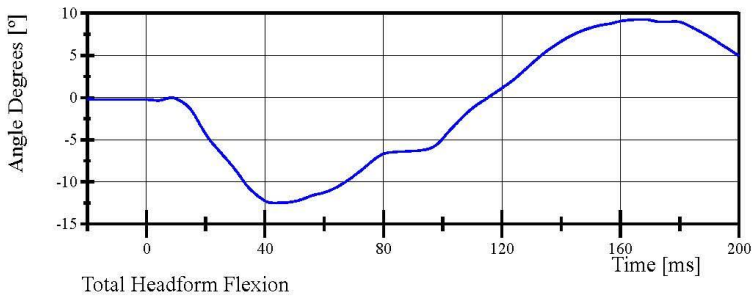
Filter Class: CFC_60
Max: 20.7 ° at 179.7 ms
Min: -62.3 ° at 64.1 ms

Rear Pot Rotation at Base of Pendulum



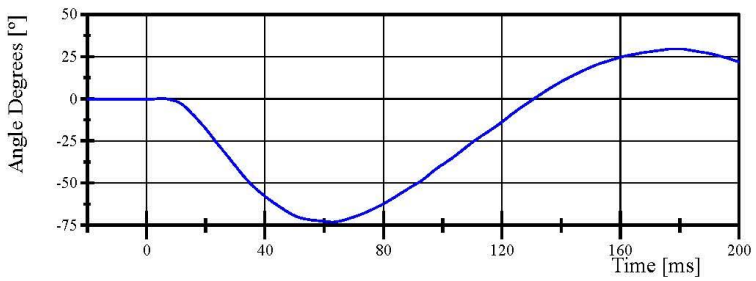
Filter Class: CFC_60
Max: 20.4 ° at 179.3 ms
Min: -49.7 ° at 62.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 9.3 ° at 167.4 ms
Min: -12.5 ° at 43.1 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 29.7 ° at 179.0 ms
Min: -73.0 ° at 62.9 ms

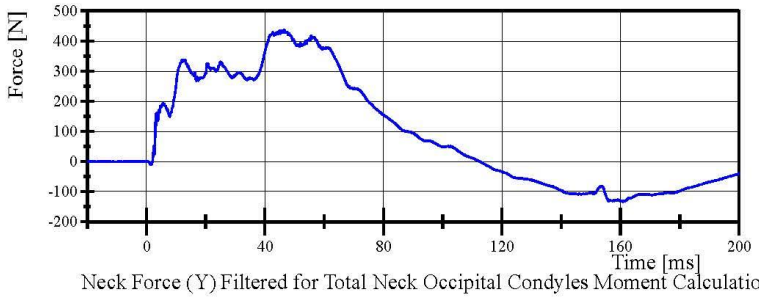
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 14:57:23 752

Transportation Research Center Inc.

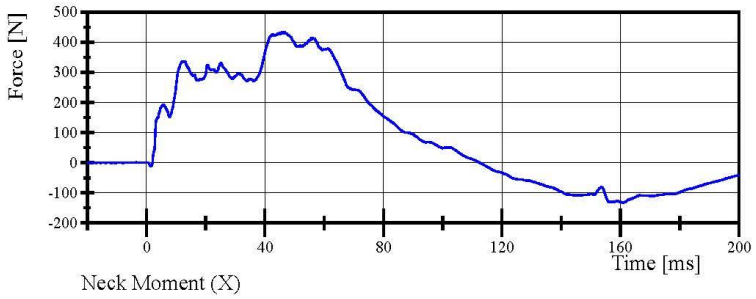
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 12-2
Test Date: 6/9/2022

Neck Force (Y)



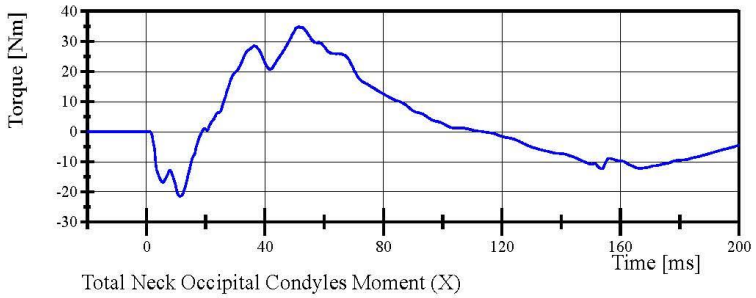
Filter Class: CFC_1000
Max: 437.5 N at 46.6 ms
Min: -134.1 N at 160.9 ms

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



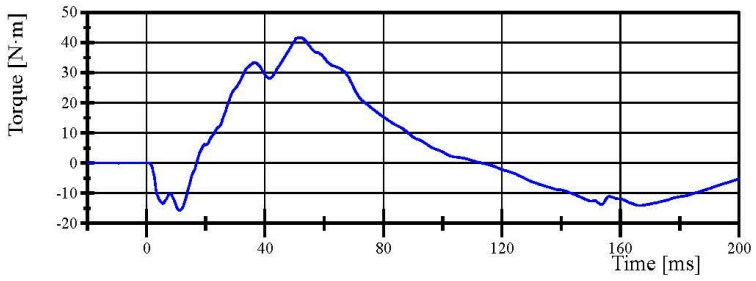
Filter Class: CFC_600
Max: 433.8 N at 46.6 ms
Min: -133.3 N at 160.9 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.9 Nm at 51.5 ms
Min: -21.4 Nm at 11.3 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 41.7 N·m at 51.5 ms
Min: -15.7 N·m at 11.1 ms

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

06.09.2022 14:57:23 752

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.1 g	Yes
Shoulder Displacement	28 - 37 mm	32.0 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.7 g	Yes

Test meets specifications.

Condition: Used

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

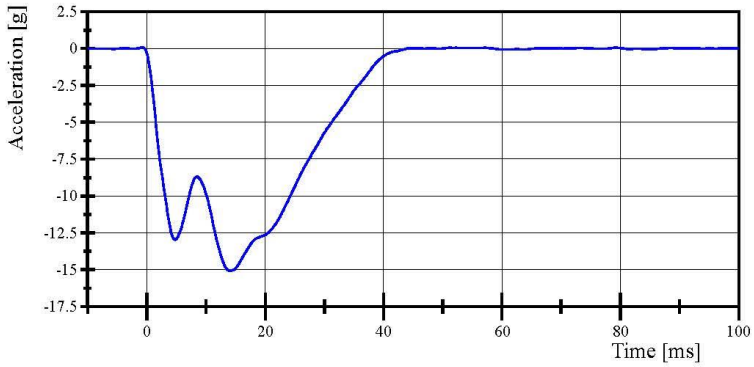
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 11:39:28 863

Transportation Research Center Inc.

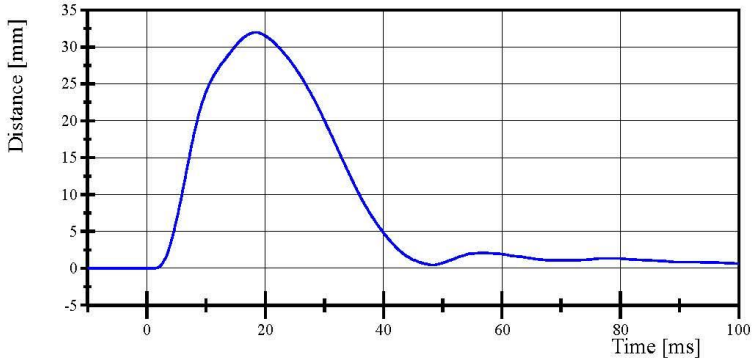
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Probe Acceleration



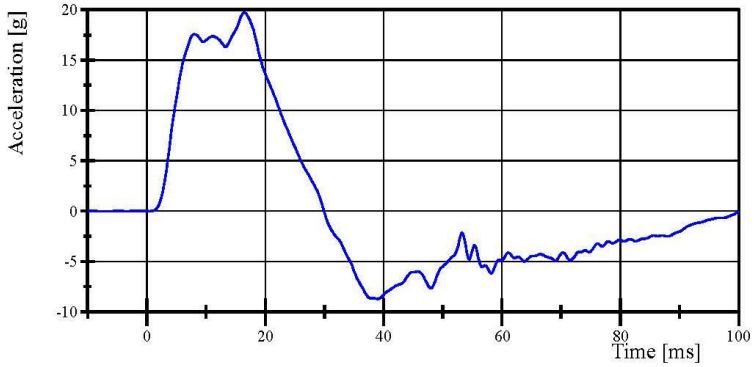
Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -15.1 g at 14.1 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 32.0 mm at 18.4 ms
Min: -0.0 mm at -8.0 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.7 g at 16.5 ms
Min: -8.7 g at 39.0 ms

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

06.09.2022 11:41:18 863

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.687 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.2 g	Yes
Shoulder Displacement	31 - 40 mm	34.0 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.0 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.2 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	35.1 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	35.8 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.2 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

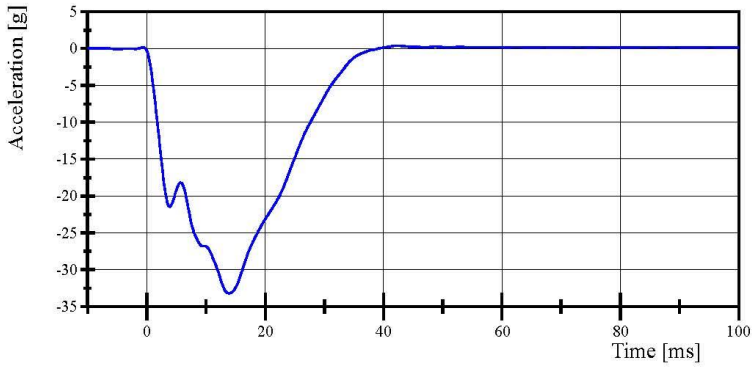
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 13:26:24 641

Transportation Research Center Inc.

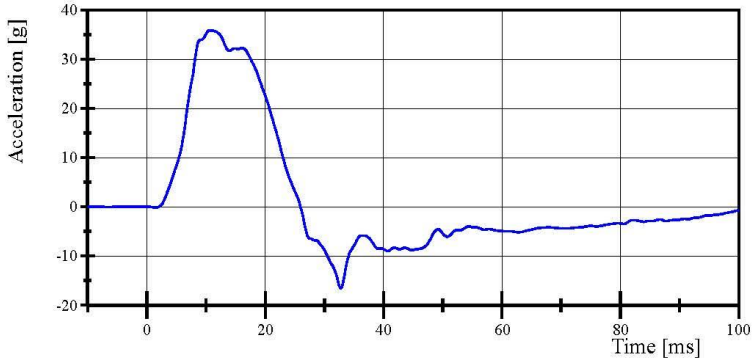
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Probe Acceleration



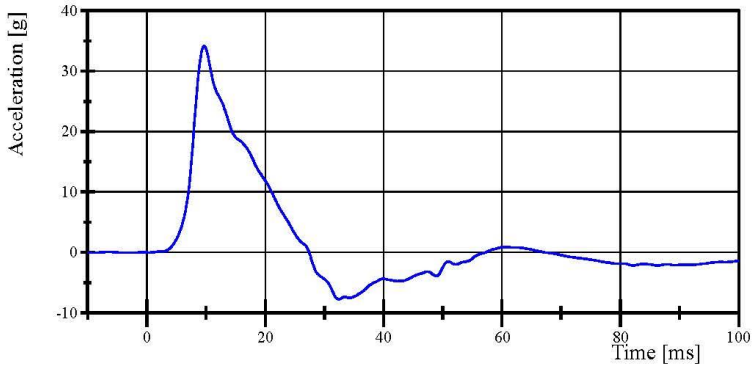
Filter Class: CFC_180
Max: 0.4 g at 42.2 ms
Min: -33.2 g at 13.8 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 35.8 g at 10.6 ms
Min: -16.6 g at 32.7 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.2 g at 9.7 ms
Min: -7.8 g at 32.4 ms

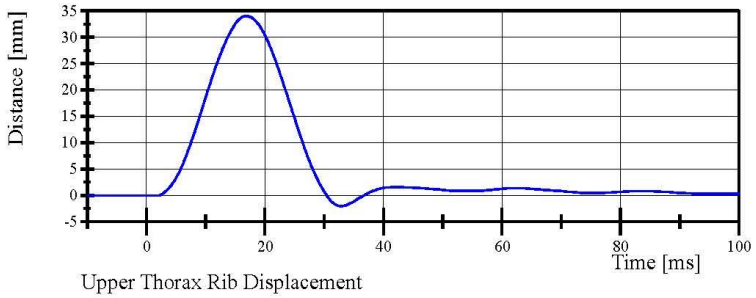
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 13:28:20 641

Transportation Research Center Inc.

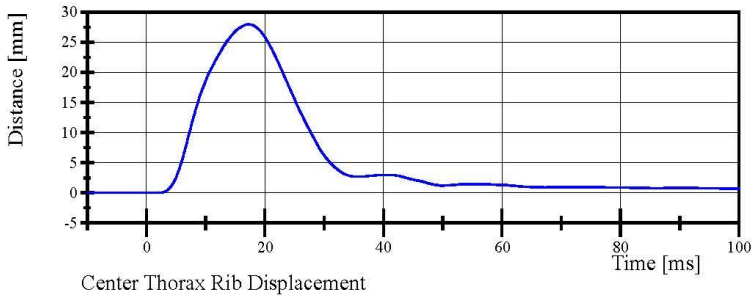
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Shoulder Rib Displacement



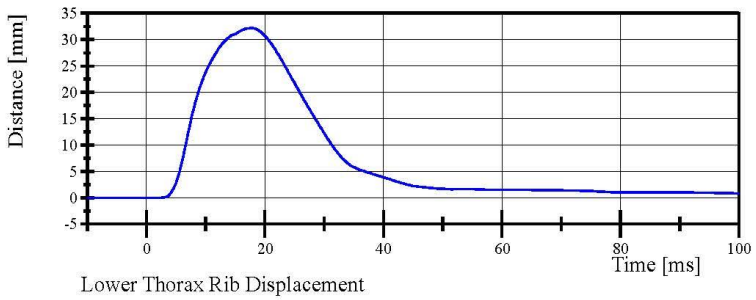
Filter Class: CFC_600
Max: 34.0 mm at 16.8 ms
Min: -2.0 mm at 32.9 ms

Upper Thorax Rib Displacement



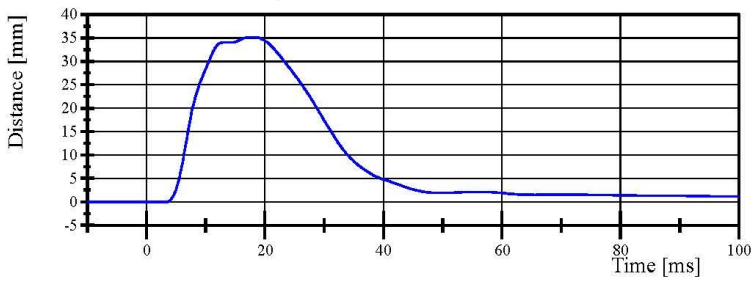
Filter Class: CFC_600
Max: 28.0 mm at 17.1 ms
Min: -0.0 mm at 0.3 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.2 mm at 17.9 ms
Min: -0.0 mm at -4.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 35.1 mm at 17.4 ms
Min: -0.0 mm at 3.4 ms

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

06.09.2022 13:28:20 641

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	64 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.330 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.0 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.6 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.9 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	40.3 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.2 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.8 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

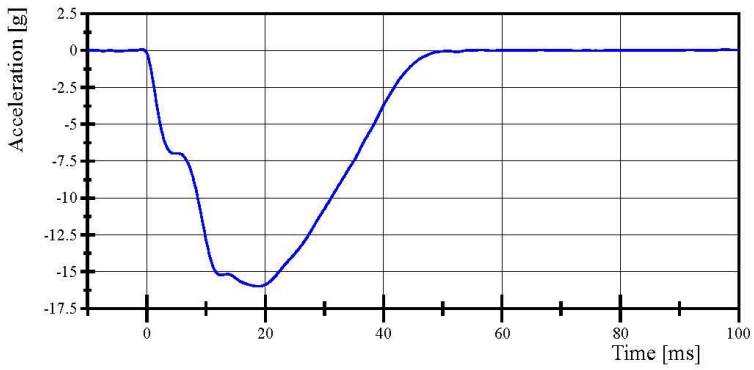
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 12:05:25 854

Transportation Research Center Inc.

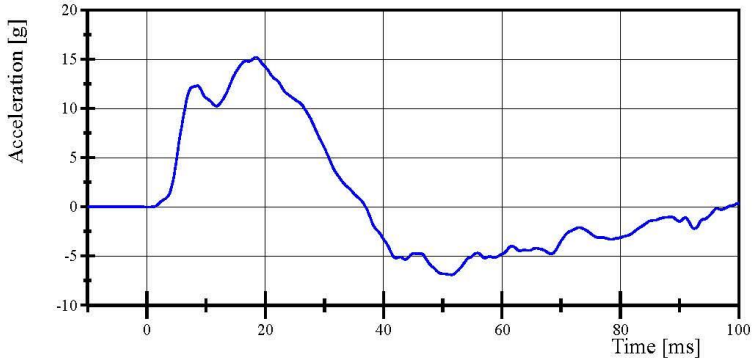
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Probe Acceleration



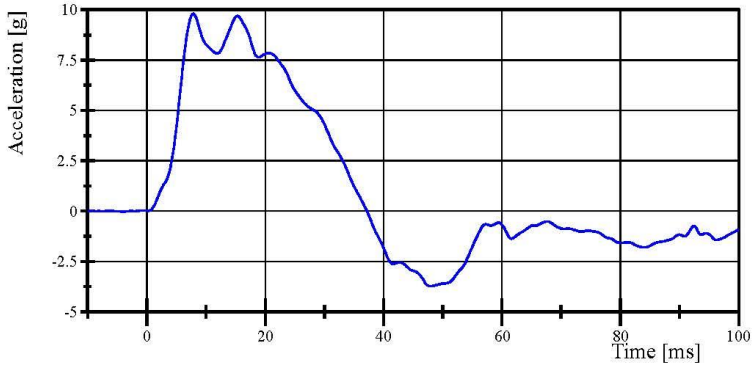
Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -16.0 g at 18.9 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.2 g at 18.4 ms
Min: -6.9 g at 51.4 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.8 g at 7.8 ms
Min: -3.7 g at 47.8 ms

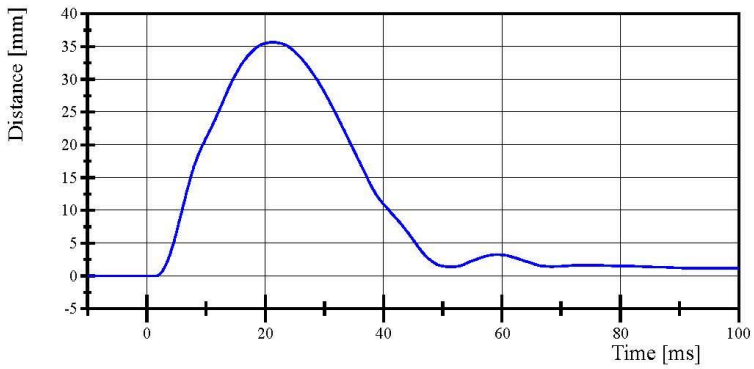
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 12:06:06 854

Transportation Research Center Inc.

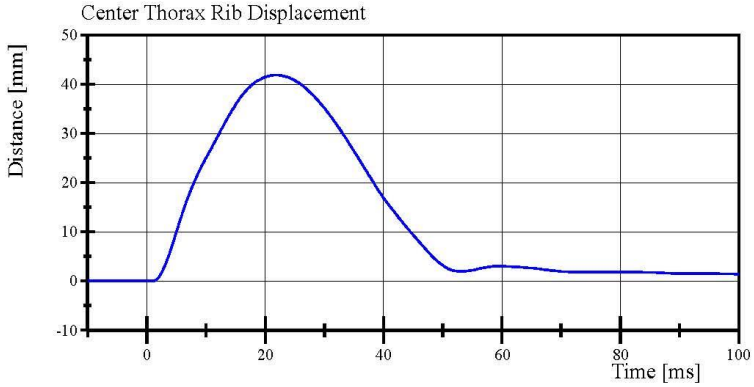
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Upper Thorax Rib Displacement



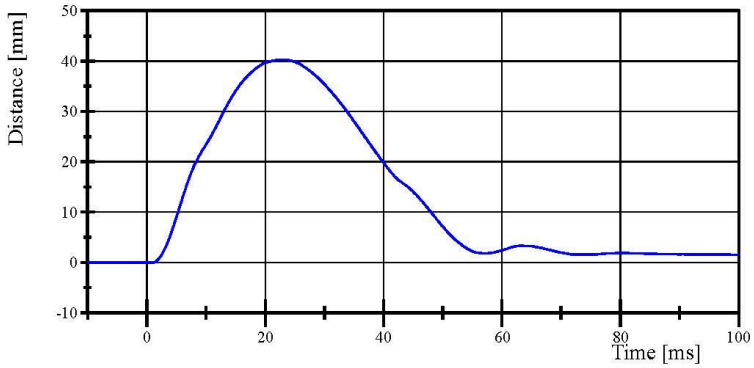
Filter Class: CFC_600
Max: 35.6 mm at 21.3 ms
Min: -0.0 mm at 1.4 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.9 mm at 21.8 ms
Min: -0.0 mm at -9.8 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.3 mm at 22.8 ms
Min: -0.0 mm at 1.0 ms

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

06.09.2022 12:06:06 854

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	66 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.4 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	38.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.71 g	Yes

Test meets specifications.

Condition: Used

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

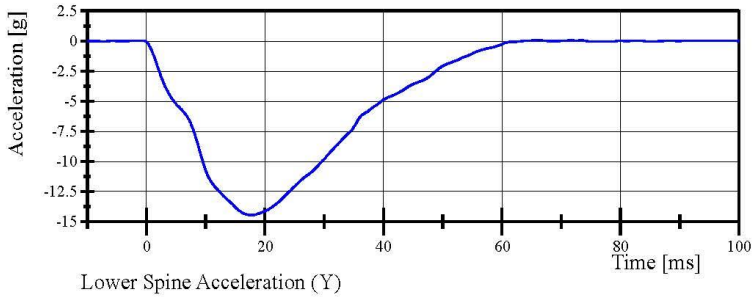
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 11:47:24 690

Transportation Research Center Inc.

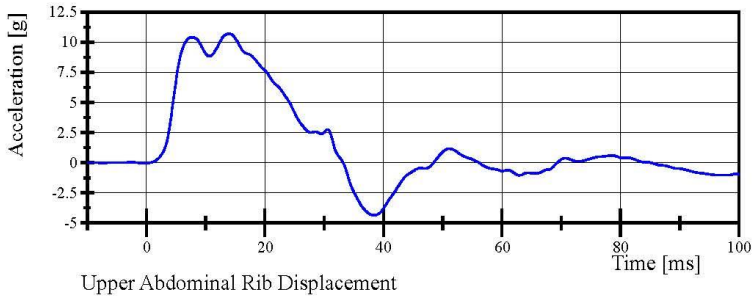
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Probe Acceleration



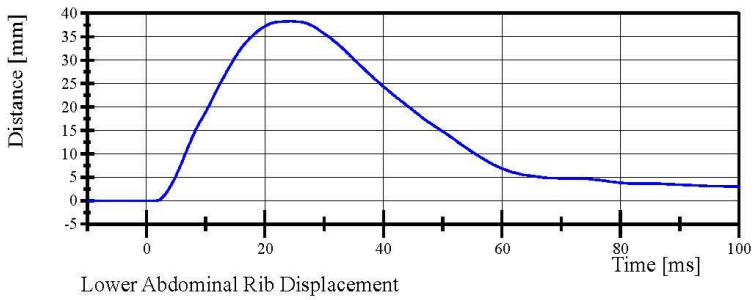
Filter Class: CFC_180
Max: 0.1 g at 66.2 ms
Min: -14.4 g at 17.8 ms

Lower Spine Acceleration (Y)



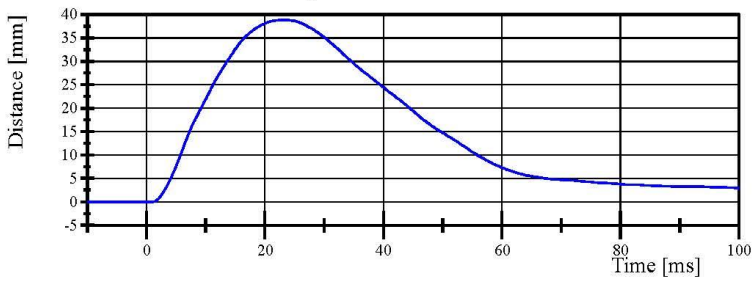
Filter Class: CFC_180
Max: 10.7 g at 13.9 ms
Min: -4.4 g at 38.3 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 38.3 mm at 24.4 ms
Min: -0.0 mm at 1.5 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 38.8 mm at 23.4 ms
Min: -0.0 mm at 1.0 ms

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

06.09.2022 11:48:23 690

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	65 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.61 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-46.68 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	42.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,081.0 N	Yes

Test meets specifications.

Condition: Used
Comments:
Pelvis Skin S/N: EN1613
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13752
Cal Date: 20200325

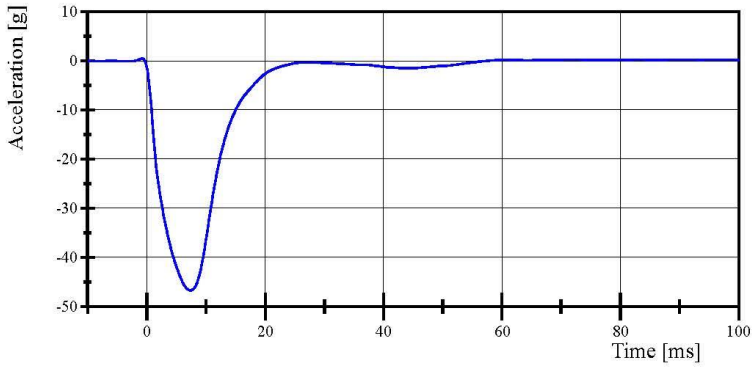
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.09.2022 13:39:00 451

Transportation Research Center Inc.

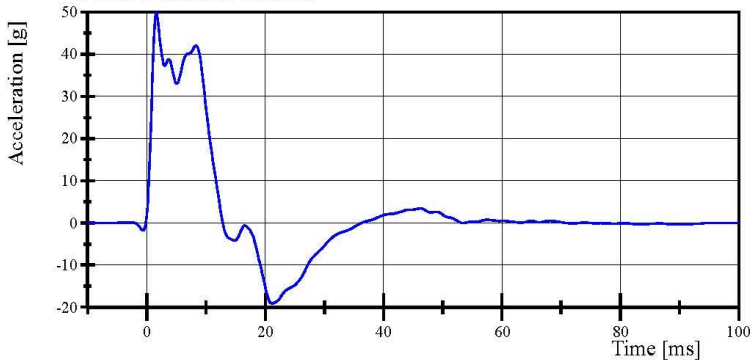
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 12-1
Test Date: 6/9/2022

Probe Acceleration



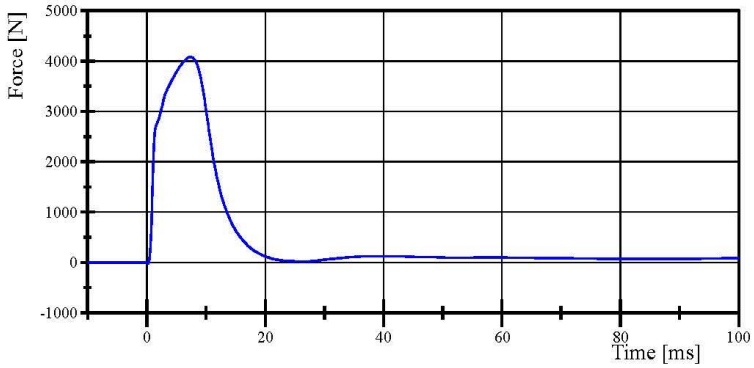
Filter Class: CFC_180
Max: 0.5 g at -0.8 ms
Min: -46.7 g at 7.4 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 49.9 g at 1.6 ms
Min: -19.1 g at 21.2 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,081.0 N at 7.4 ms
Min: -20.4 N at 0.2 ms

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

06.09.2022 13:41:30 451

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 12-2
Test Date: 6/10/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.39 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.5 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	31.2 g	Yes
Iliac Force	4,100 - 5,100 N	4,504.0 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: EN1613

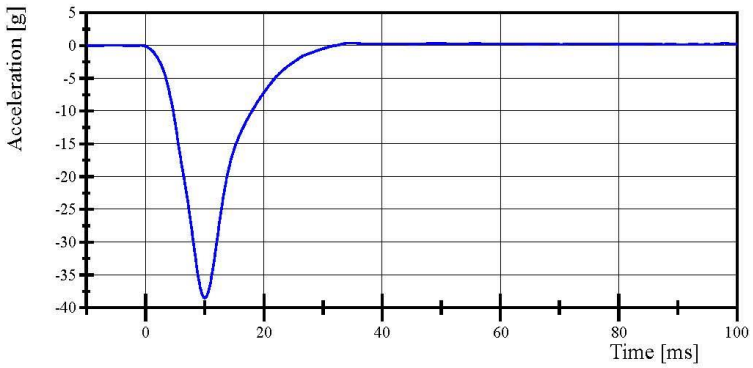
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.10.2022 08:55:36 651

Transportation Research Center Inc.

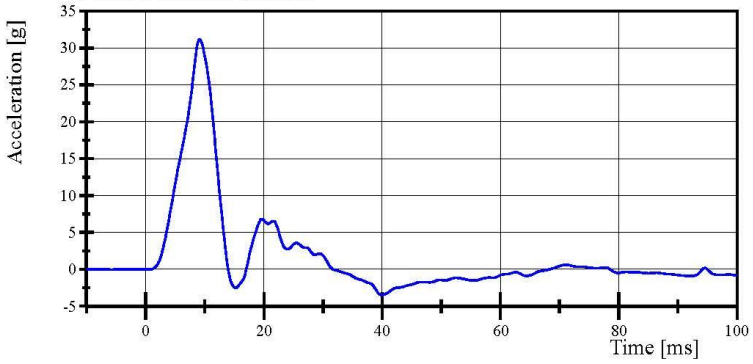
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 12-2
Test Date: 6/10/2022

Probe Acceleration



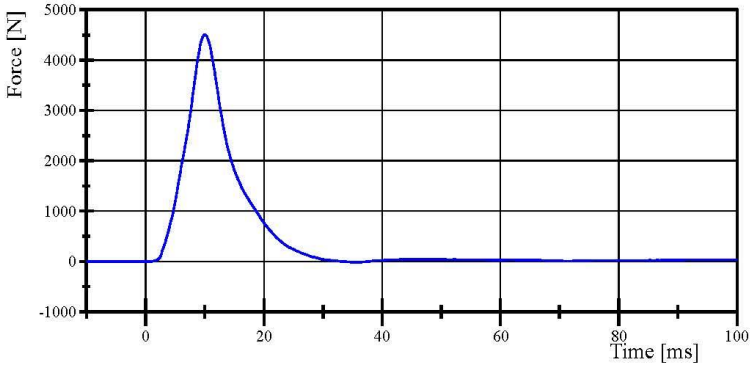
Filter Class: CFC_180
Max: 0.4 g at 34.7 ms
Min: -38.5 g at 10.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 31.2 g at 9.1 ms
Min: -3.5 g at 39.9 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,504.0 N at 10.0 ms
Min: -17.1 N at 35.6 ms

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

06.10.2022 08:56:15 651

Post-Test Calibration Sheets
Driver S/N DQ5070

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 13

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. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	129.1 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-4.4 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.58 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP8345

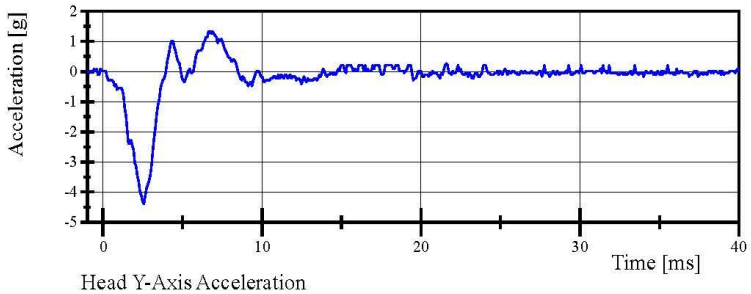
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

06.29.2022 09:08:21 234

Transportation Research Center Inc.

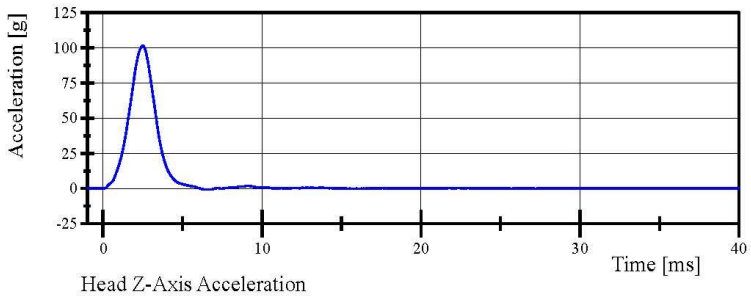
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Head X-Axis Acceleration



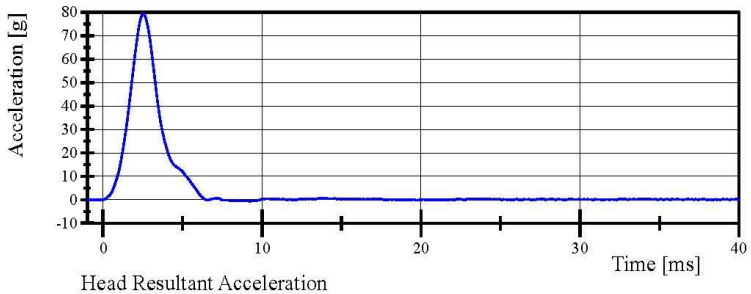
Filter Class: CFC_1000
Max: 1.3 g at 6.6 ms
Min: -4.4 g at 2.6 ms

Head Y-Axis Acceleration



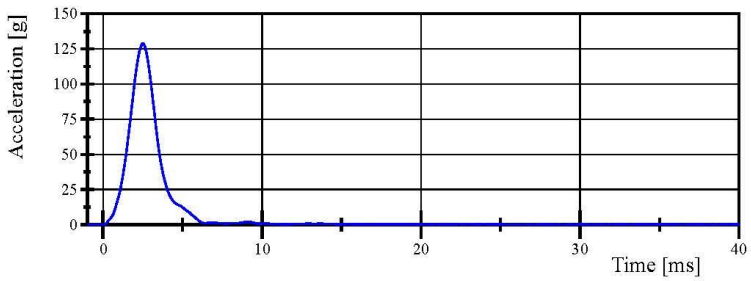
Filter Class: CFC_1000
Max: 101.7 g at 2.5 ms
Min: -0.6 g at 6.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 79.3 g at 2.5 ms
Min: -0.6 g at 9.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 129.1 g at 2.5 ms
Min: 0.0 g at -0.7 ms

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

06.29.2022 09:08:54 234

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.612 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.564 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.800 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.063 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.847 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.849 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.0 deg	Yes
Time of Peak	50 - 70 ms	57.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.9 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	110.8 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 717

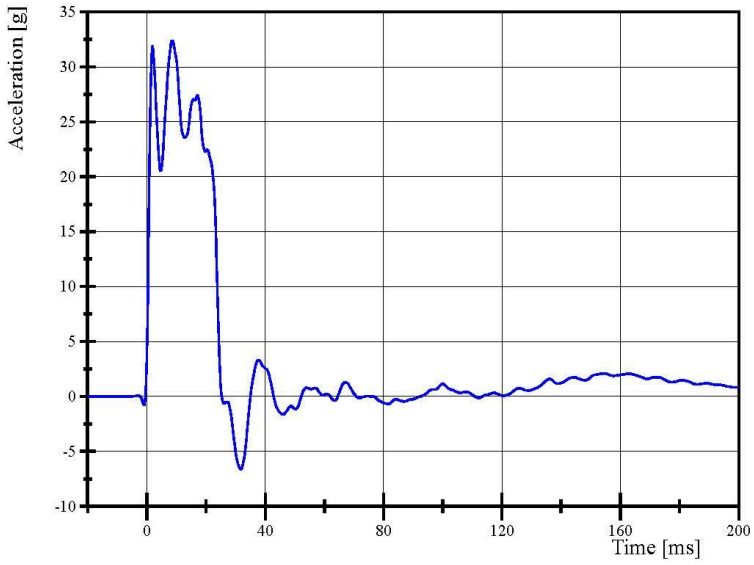
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

06.29.2022 09:51:49 753

Transportation Research Center Inc.

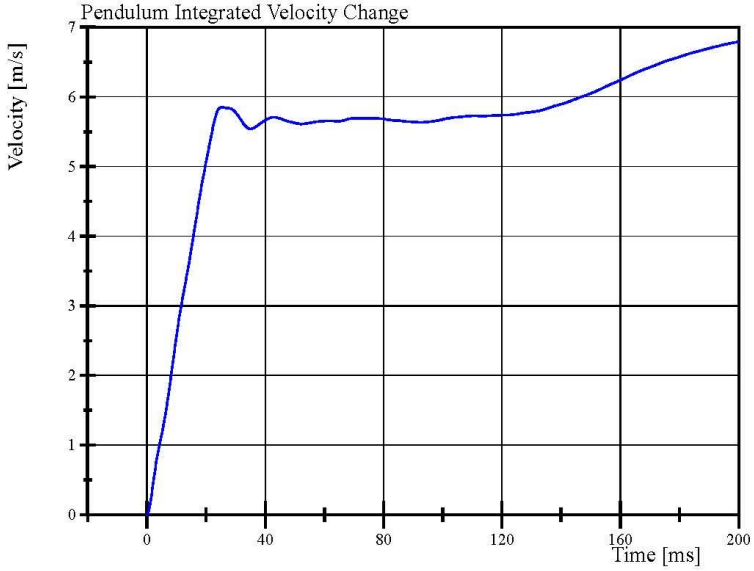
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Pendulum Acceleration



Filter Class: CFC_180
Max: 32.4 g at 8.6 ms
Min: -6.6 g at 31.8 ms

Pendulum Integrated Velocity Change



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

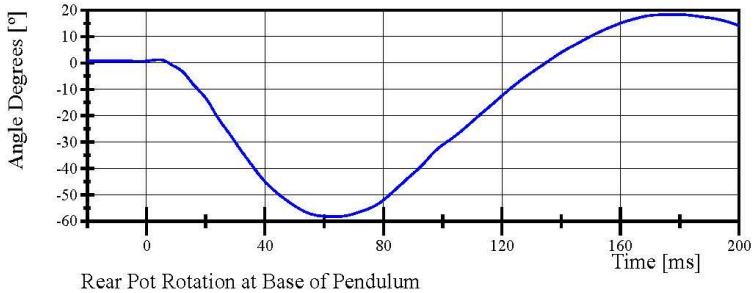
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 09:52:25 753

Transportation Research Center Inc.

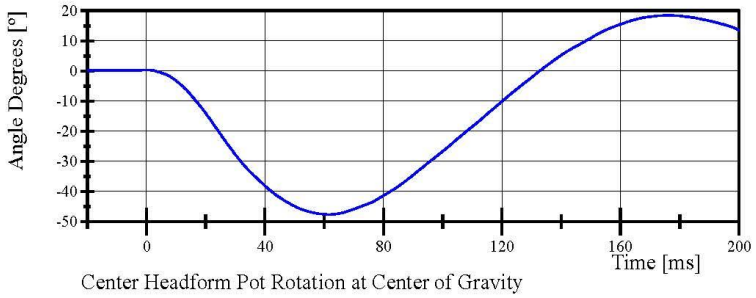
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Forward Pot Rotation at Base of Pendulum



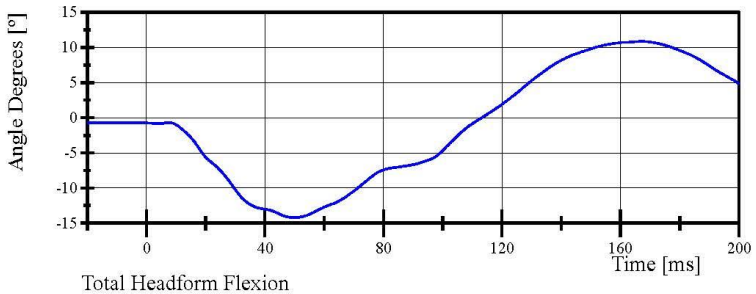
Filter Class: CFC_60
Max: 18.3 ° at 178.7 ms
Min: -58.2 ° at 62.0 ms

Rear Pot Rotation at Base of Pendulum



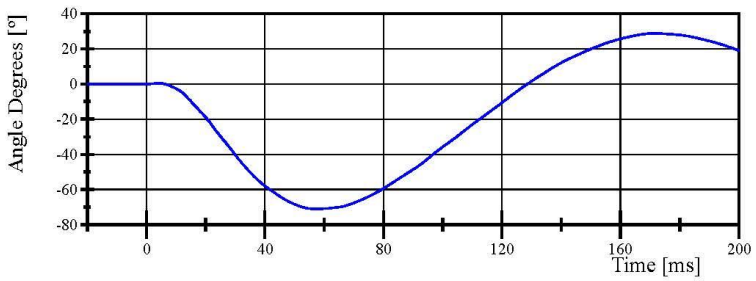
Filter Class: CFC_60
Max: 18.5 ° at 176.2 ms
Min: -47.6 ° at 61.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 10.8 ° at 167.2 ms
Min: -14.2 ° at 49.8 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 28.8 ° at 171.2 ms
Min: -71.0 ° at 57.2 ms

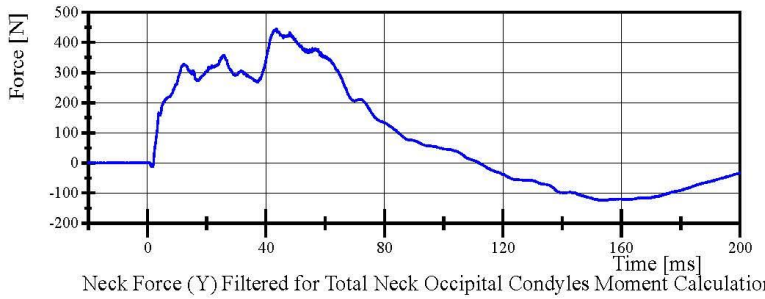
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 09:52:25 753

Transportation Research Center Inc.

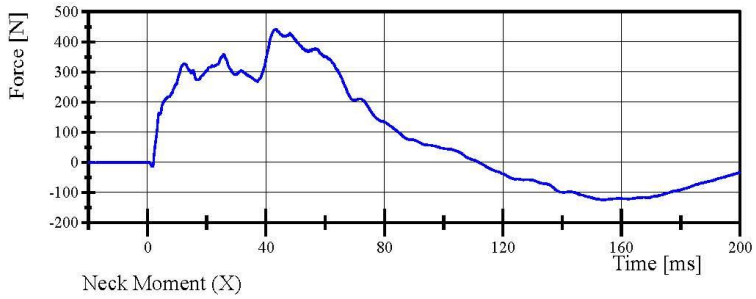
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Neck Force (Y)



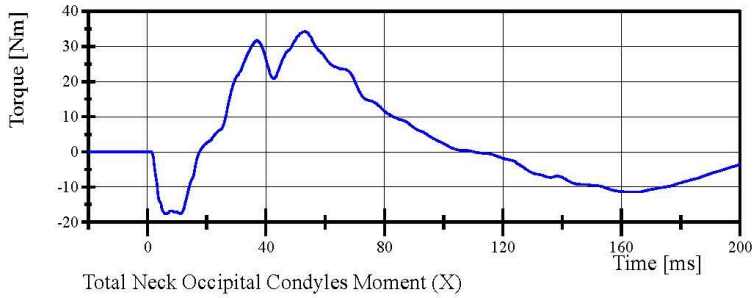
Filter Class: CFC_1000
Max: 445.5 N at 43.5 ms
Min: -124.2 N at 153.3 ms

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



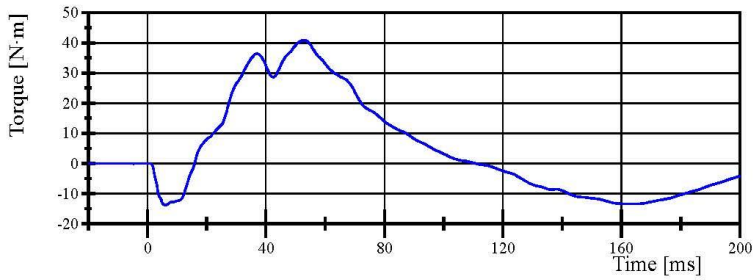
Filter Class: CFC_600
Max: 442.7 N at 43.5 ms
Min: -124.1 N at 153.4 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.3 Nm at 53.2 ms
Min: -17.7 Nm at 6.2 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 40.9 N·m at 53.1 ms
Min: -13.9 N·m at 6.1 ms

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

06.29.2022 09:52:25 753

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.1 g	Yes
Shoulder Displacement	28 - 37 mm	32.1 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.3 g	Yes

Test meets specifications.

Condition: Used

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

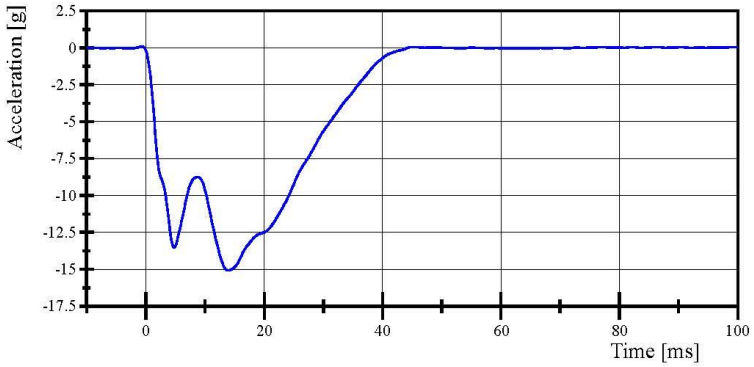
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 11:24:59 864

Transportation Research Center Inc.

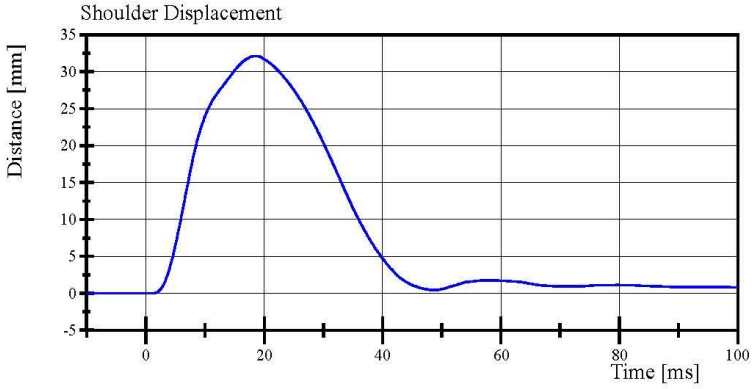
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Probe Acceleration



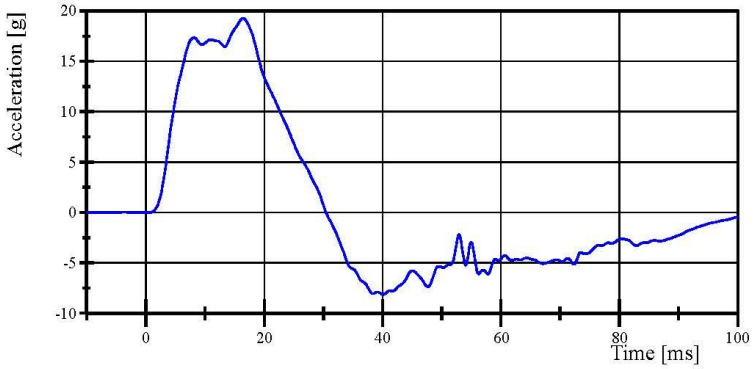
Filter Class: CFC_180
Max: 0.1 g at -0.7 ms
Min: -15.1 g at 13.9 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 32.1 mm at 18.3 ms
Min: -0.0 mm at -0.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.3 g at 16.4 ms
Min: -8.1 g at 40.1 ms

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

06.29.2022 11:25:32 864

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.694 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.6 g	Yes
Shoulder Displacement	31 - 40 mm	35.4 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.7 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.9 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	35.3 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.6 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

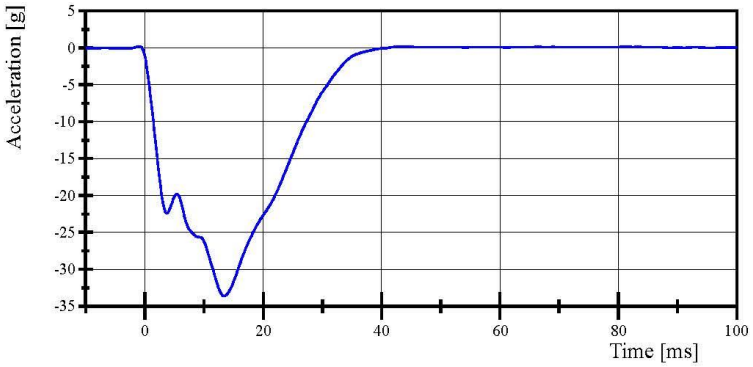
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 14:32:27 620

Transportation Research Center Inc.

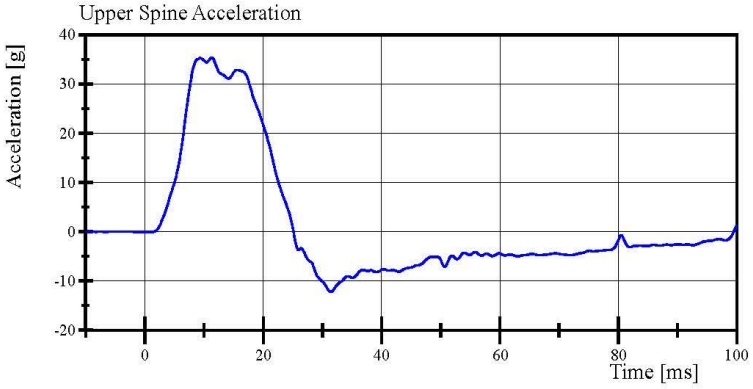
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Probe Acceleration



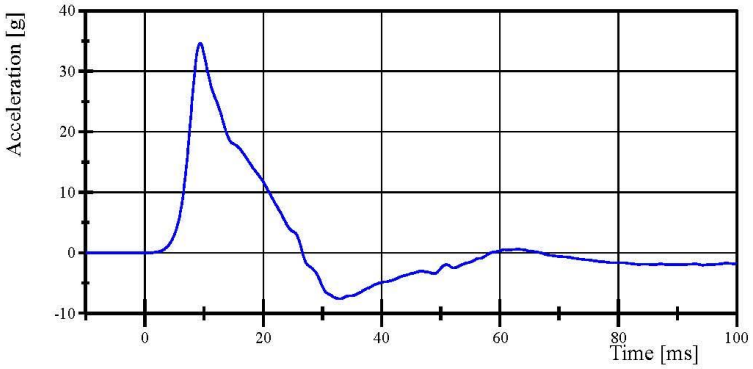
Filter Class: CFC_180
Max: 0.2 g at -1.0 ms
Min: -33.6 g at 13.4 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 35.3 g at 11.3 ms
Min: -12.2 g at 31.4 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 34.6 g at 9.4 ms
Min: -7.6 g at 32.9 ms

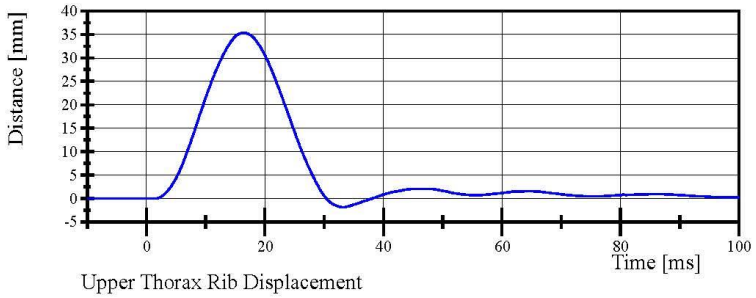
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 14:34:43 620

Transportation Research Center Inc.

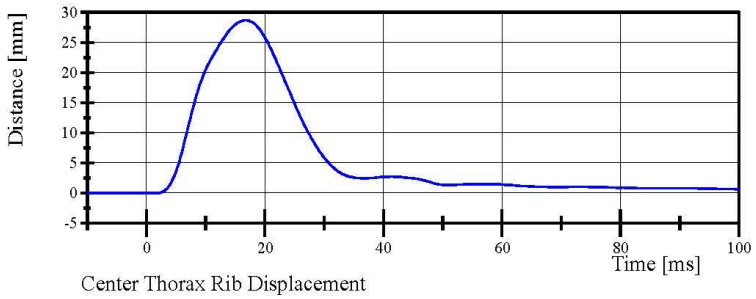
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Shoulder Rib Displacement



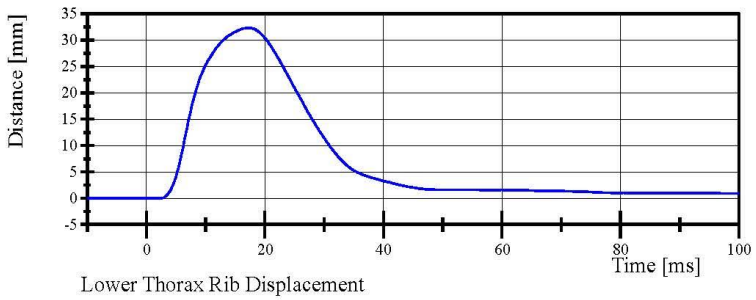
Filter Class: CFC_600
Max: 35.4 mm at 16.3 ms
Min: -1.8 mm at 33.2 ms

Upper Thorax Rib Displacement



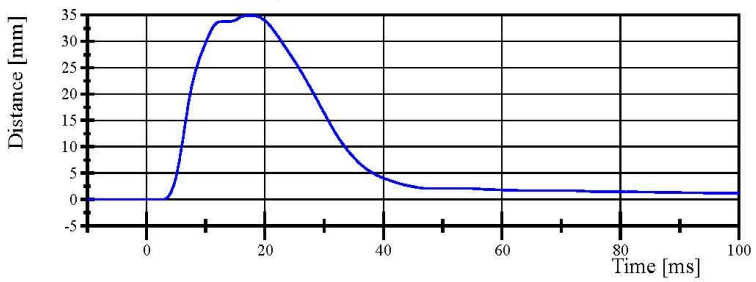
Filter Class: CFC_600
Max: 28.7 mm at 16.7 ms
Min: -0.0 mm at 1.3 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.3 mm at 17.0 ms
Min: -0.0 mm at 2.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.9 mm at 17.2 ms
Min: -0.0 mm at -9.9 ms

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

06.29.2022 14:34:43 620

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.346 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.3 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.1 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.6 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	41.0 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.5 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.6 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

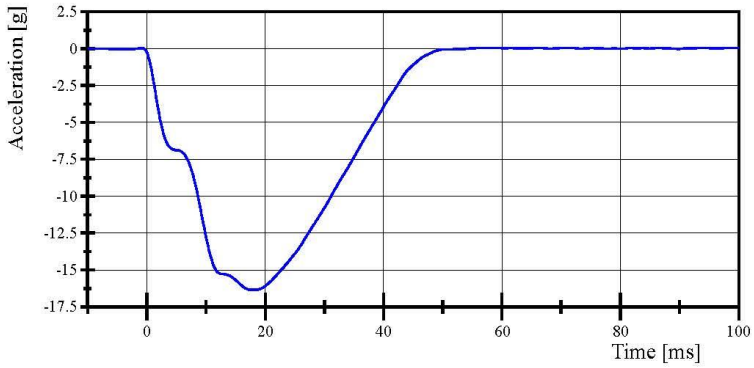
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 11:46:52 833

Transportation Research Center Inc.

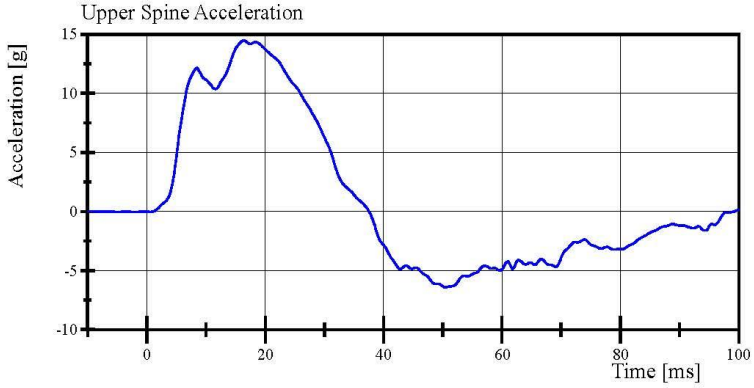
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Probe Acceleration



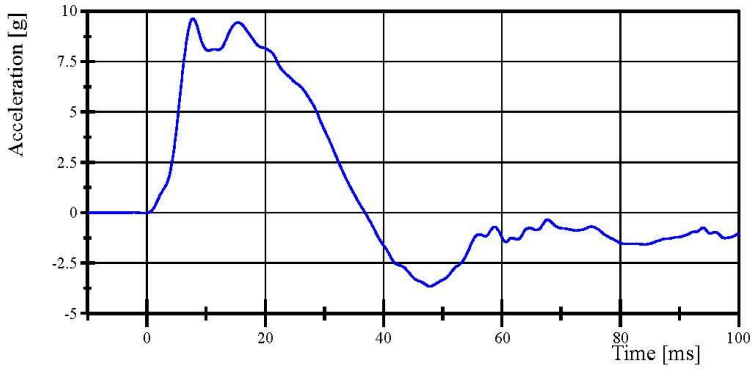
Filter Class: CFC_180
Max: 0.1 g at 70.9 ms
Min: -16.3 g at 18.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.5 g at 16.4 ms
Min: -6.4 g at 50.5 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.6 g at 7.8 ms
Min: -3.7 g at 47.8 ms

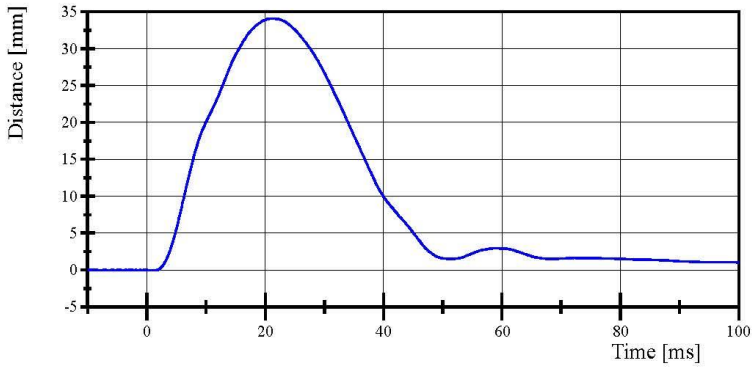
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 11:47:44 833

Transportation Research Center Inc.

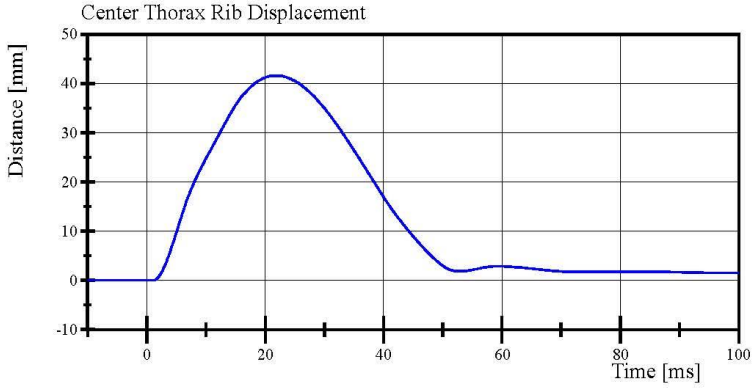
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Upper Thorax Rib Displacement



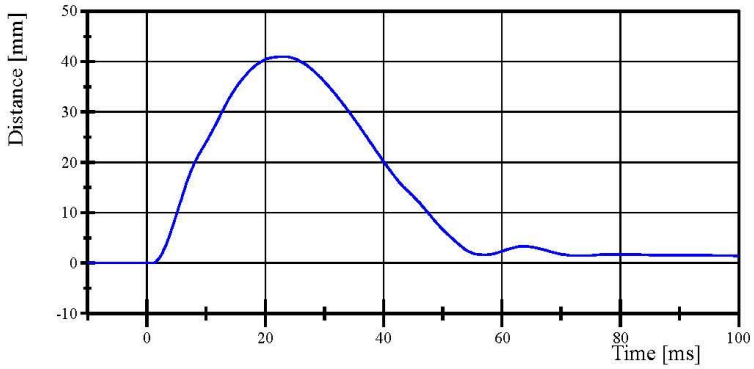
Filter Class: CFC_600
Max: 34.1 mm at 21.1 ms
Min: -0.0 mm at 1.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.6 mm at 21.8 ms
Min: -0.0 mm at 0.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.0 mm at 23.4 ms
Min: -0.0 mm at 1.0 ms

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

06.29.2022 11:47:44 833

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	48 %	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	40.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	36.5 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.05 g	Yes

Test meets specifications.

Condition: Used

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

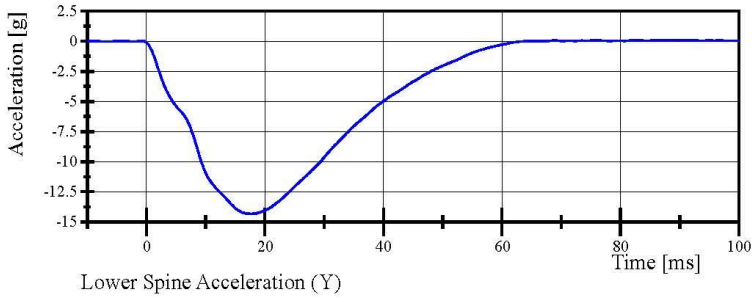
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 11:36:04 670

Transportation Research Center Inc.

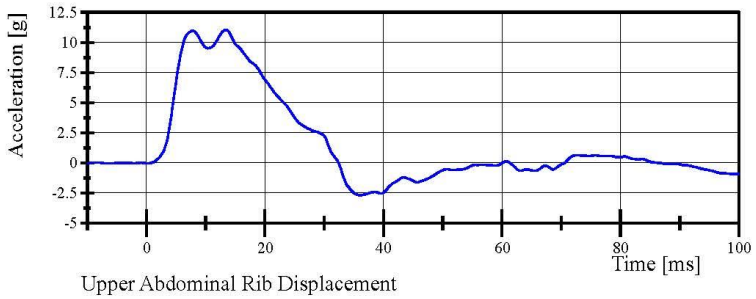
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Probe Acceleration



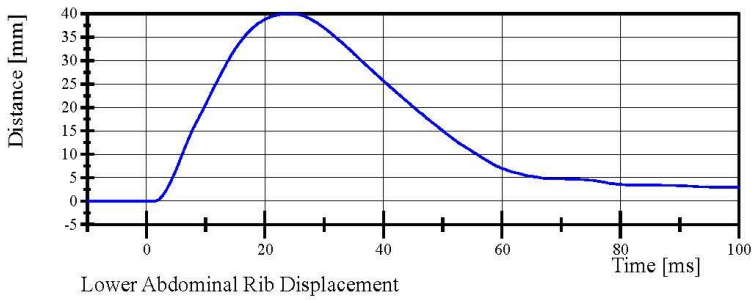
Filter Class: CFC_180
Max: 0.1 g at 89.6 ms
Min: -14.3 g at 17.7 ms

Lower Spine Acceleration (Y)



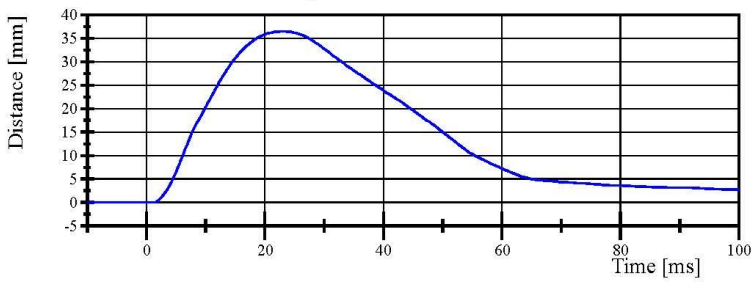
Filter Class: CFC_180
Max: 11.0 g at 13.4 ms
Min: -2.7 g at 36.0 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 40.0 mm at 23.7 ms
Min: -0.0 mm at 1.3 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 36.5 mm at 23.1 ms
Min: -0.0 mm at 1.1 ms

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

06.29.2022 11:36:40 670

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-46.66 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	41.7 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,135.3 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: EN1613
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13759
Cal Date: 20200325

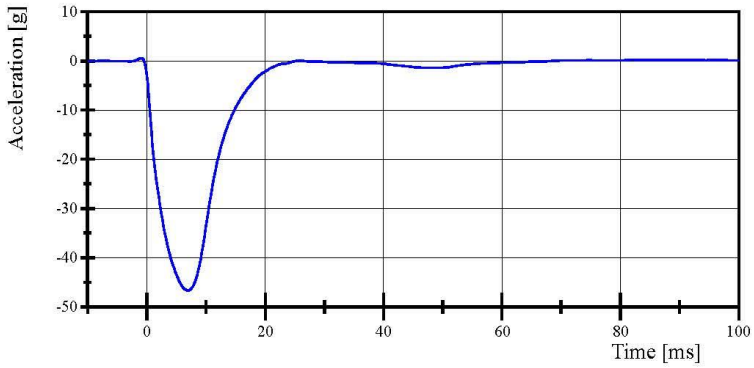
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

06.29.2022 11:03:10 464

Transportation Research Center Inc.

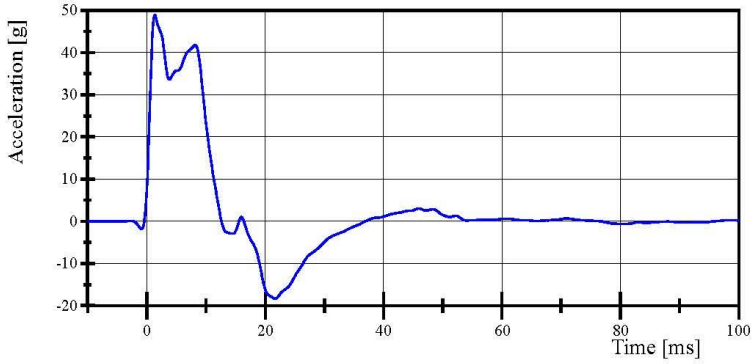
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Probe Acceleration



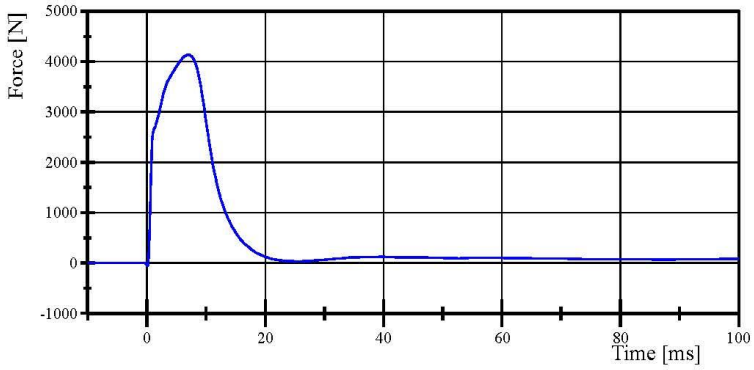
Filter Class: CFC_180
Max: 0.6 g at -1.0 ms
Min: -46.7 g at 7.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 48.9 g at 1.4 ms
Min: -18.3 g at 21.7 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,135.3 N at 7.0 ms
Min: -56.7 N at 0.1 ms

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

06.29.2022 11:04:13 464

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	21.5 ºC	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	-36.7 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	27.4 g	No
Iliac Force	4,100 - 5,100 N	4,174.7 N	Yes

Test does not meet specifications.

Condition: Used
Comments:
Pelvis Skin S/N: EN1613

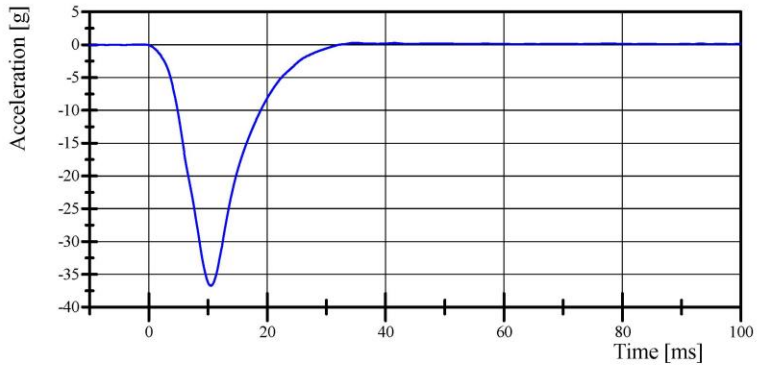
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

06.30.2022 11:56:42 651

Transportation Research Center Inc.

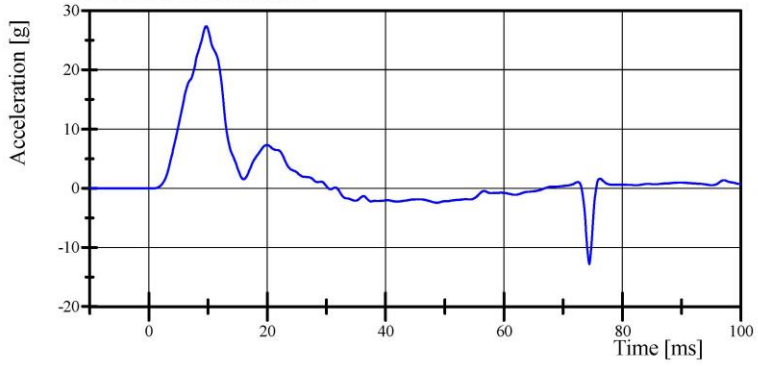
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 13-1
Test Date: 6/29/2022

Probe Acceleration



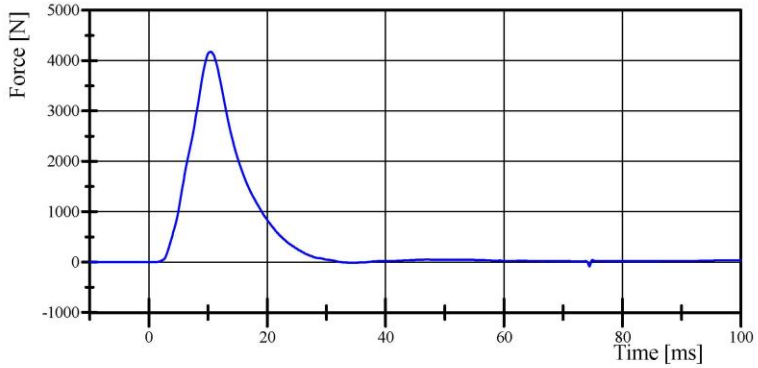
Filter Class: CFC_180
Max: 0.3 g at 34.8 ms
Min: -36.7 g at 10.5 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 27.4 g at 9.7 ms
Min: -12.8 g at 74.4 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,174.7 N at 10.4 ms
Min: -84.9 N at 74.4 ms

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

06.30.2022 11:57:15 651

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	1-Mar-2022
		Y	T10352	Endevco	2-Mar-2022
		Z	P91950	Endevco	1-Mar-2022
Redundant Head Accelerometers		X	T16771	Endevco	1-Mar-2022
		Y	P83368	Endevco	2-Mar-2022
		Z	P91904	Endevco	1-Mar-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	1-Mar-2022
		Y	P91615	Endevco	1-Mar-2022
		Z	P64884	Endevco	1-Mar-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	3-Mar-2022
			Y	P93774	Endevco	3-Mar-2022
			Z	P91566	Endevco	3-Mar-2022
Redundant Head Accelerometers			X	P93766	Endevco	9-May-2022
			Y	P93762	Endevco	3-Mar-2022
			Z	P93761	Endevco	3-Mar-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	4-Mar-2022
			Y	P94647	Endevco	3-Mar-2022
			Z	P94530	Endevco	3-Mar-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)				13753	SACO	25-Mar-2020
Pelvis Plug (non-struck side)				13754	SACO	25-Mar-2020

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A377448	Measurement Specialties	19-Apr-2022
	Vehicle Center of Gravity	Y	A298374	Measurement Specialties	19-Apr-2022
	Vehicle Center of Gravity	Z	A349794	Measurement Specialties	19-Apr-2022
2	Right Sill at Front Seat	X	A378330	Measurement Specialties	4-Apr-2022
	Right Sill at Front Seat	Y	A378323	Measurement Specialties	4-Apr-2022
	Right Sill at Front Seat	Z	A378332	Measurement Specialties	4-Apr-2022
3	Right Sill at Rear Seat	X	A318460	Measurement Specialties	19-Apr-2022
	Right Sill at Rear Seat	Y	A318488	Measurement Specialties	19-Apr-2022
	Right Sill at Rear Seat	Z	A377536	Measurement Specialties	19-Apr-2022
4	Left Sill at Front Door	Y	A400122	Measurement Specialties	19-Apr-2022
5	Left Sill at Rear Door	Y	A318447	Measurement Specialties	19-Apr-2022
6	Left A-Post Lower	Y	A378308	Measurement Specialties	19-Apr-2022
7	Left A-Post Middle	Y	A318453	Measurement Specialties	19-Apr-2022
8	Left B-Post Lower	Y	A224476	Measurement Specialties	23-May-2022
9	B-Post Middle	Y	A400088	Measurement Specialties	19-Apr-2022
10	Front Seat Track	Y	A381841	Measurement Specialties	4-Apr-2022
11	Rear Seat Track or Structure	Y	A300448	Measurement Specialties	19-Apr-2022
12	Right Rear Occupant Compartment	Y	A241155	Measurement Specialties	19-Apr-2022
13	Engine Block	X	A378379	Measurement Specialties	19-Apr-2022
	Engine Block	Y	A300456	Measurement Specialties	19-Apr-2022
14	Rear Floorpan Above Axle	X	A300441	Measurement Specialties	19-Apr-2022
	Rear Floorpan Above Axle	Y	A318467	Measurement Specialties	19-Apr-2022
	Rear Floorpan Above Axle	Z	A400118	Measurement Specialties	19-Apr-2022

TABLE 4 – MDB Instrumentation

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