FINAL REPORT NUMBER: SINCAP-TRC-23-002

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

MITSUBISHI MOTORS CORPORATION, JAPAN
2023 Mitsubishi Outlander
NHTSA NUMBER: M20235602

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

Report Date: August 24, 2023

FINAL REPORT

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

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Report Prepared By: ILO Project Operations Group

Report Approved By: 

John Shultz

Approval Date: August 24, 2023

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

Technical Report Documentation Page

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15. Supplemental Notes		

16. Abstract

This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2023 Mitsubishi Outlander, 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 March 2, 2023.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.05 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 20.9° C. The target vehicle post-test maximum crush was 191 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	140
Maximum Thoracic Rib Deflection	mm	44	21.1
Total Abdominal Force	N	2500	826.1
Pubic Symphysis Force	N	6000	-1678.4
Lower Spine Acceleration	G	82*	27.8

Passenger ATD (SID-IIs)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	176
Lower Spine Resultant Acceleration	g's	82	31.1
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2263.9
Maximum Thoracic Rib Deflection	mm	38*	15.8
Maximum Abdominal Rib Deflection	mm	45*	17.7

* Proposed IARV

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

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

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SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2023 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 2023 Mitsubishi Outlander. 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 2023 Mitsubishi Outlander 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 62.05 km/h (38.56 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 March 2, 2023. 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 instrumentation calibration data.

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	140
Maximum Thoracic Rib Deflection	mm	44	21.1
Combined Abdominal Force	N	2500	826.1
Pubic Symphysis Force	N	6000	-1678.4
Lower Spine (T12) Resultant Acceleration	G	82*	27.8

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	176
Lower Spine (T12) Resultant Acceleration	G	82	31.1
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2263.9
Maximum Thoracic Rib Deflection	mm	38*	15.8
Maximum Abdominal Rib Deflection	mm	45*	17.7

* Proposed IARV

Supplemental Restraint Information is given below:

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

GENERAL COMMENTS

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

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20235602
Model Year	2023
Make	Mitsubishi
Model	Outlander
Body Style	MPV
VIN	JA4J3UA82PZ022931
Body Color	Cosmic Blue
Odometer Reading (km/mi)	10 Miles
Engine Displacement (L)	2.5
Type/No. Cylinders	Inline/4
Engine Placement	Front
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	MITSUBISHI MOTORS CORPORATION, JAPAN
Date of Manufacture	NOV 2022
Vehicle Type	MPV

GVWR (kg)	2355
GAWR Front (kg)	1210
GAWR Rear (kg)	1365

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

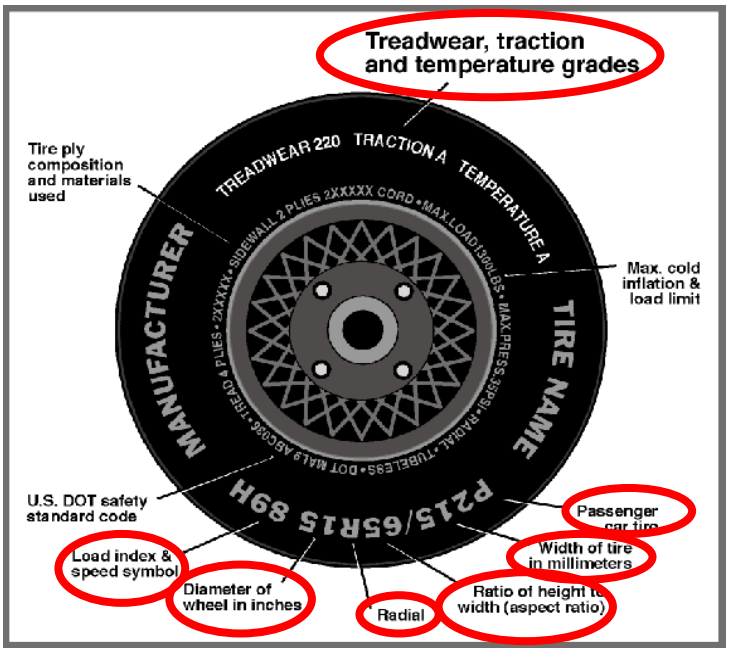
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	2	7
Capacity Weight (VCW) (kg)				525.0
DSC x 68.04 (kg)				476.28
Cargo Weight (RCLW) (kg)				48.72

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2023 Mitsubishi Outlander
Test Program: SINCAP Side Impact
NHTSA No.: M20235602
Test Date: 3/2/2023



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	P255/45R20	P255/45R20
Tire Size on Vehicle	P255/45R20	P255/45R20
Tire Manufacturer	Nexen	Nexen
Tire Model	Radial GTX	Radial GTX
Treadwear	600	600
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	101W	101W
Tire Material	Polyester Steel Nylon	Polyester Steel Nylon
DOT Safety Code Left	1UA FD FMCL 3722	1UA FD HABR 3622
DOT Safety Code Right	1UA FD FMCR 3522	1UA FD HABR 3622

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

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	262	262	262	262
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

MDB TIRE SPECIFICATIONS

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	481.0	363.4		517.4	441.4		528.4	446.0	
Right	kg	481.4	352.4		473.2	411.2		479.0	398.4	
Ratio	%	57.3	42.7		53.7	46.3		54.4	45.6	
Totals	kg	962.4	715.8	1678.2	958.8	884.4	1843.2	1007.4	844.4	1851.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1678.2	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	48.72	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1851.92	(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	830	833	Yes
RF	mm	838	838	Yes
RR	mm	828	825	Yes
LR	mm	817	809	Yes
Vehicle CG (Aft of Front Axle)	mm	1236	1254	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+42	+32	

***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

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

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plates	32.3
Removed: None	0.0

TEST SURFACE MARKINGS

	Distance from 63° Impact Angle Line (mm)
Fore 25 mm target	930
Aft 25 mm target	935
Pre-Impact Angle Line	265

Parallel Track Target	X Location (mm)	Y Location (mm)
A	0	0
B	3425	1745
C	3425	5289
D	0	5289

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

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	23.1	14.1	18.6
Front Passenger Seat	16.4	16.4	16.4
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	10.3	10.3	10.3
Non-Struck Side Rear Seat	11.5	11.5	11.5
Rear Center Seat*	N/A	N/A	N/A

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	18.6	204	Max	262	275	282
			Mid	234	239	248
			Min	207	204	214
Front Passenger Seat	16.4	204	Max	N/A	N/A	N/A
			Mid	195	204	213
			Min	N/A	N/A	N/A
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	10.3	270	Max	N/A	N/A	N/A
			Mid	270	271	271
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	11.5	276	Max	N/A	N/A	N/A
			Mid	276	277	277
			Min	N/A	N/A	N/A
Rear Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

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

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

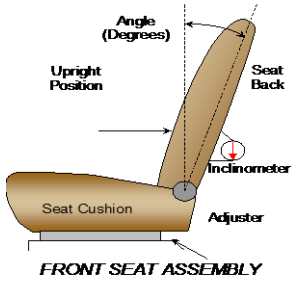
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	260	N/A	130	N/A
Front Passenger Seat	260	27	130	14
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	226	23	226	23
Non-Struck Side Rear Seat	225	23	225	23
Rear Center Seat*	N/A	N/A	N/A	N/A

* If applicable

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	84.5	N/A	6.2	N/A
Front Passenger Seat	71.5	38	5.4	10
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	22.1	12	17	0
Non-Struck Side Rear Seat	22.0	12	17	0
Rear Center Seat*	N/A	N/A	N/A	N/A

* If applicable

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4	0, Full Up
Rear Seat	0	N/A

HEAD RESTRAINT ADJUSTMENT

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

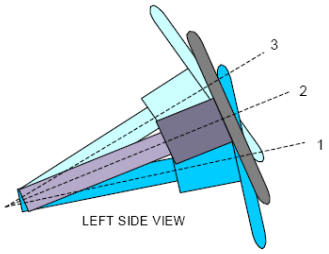
	Total # of Positions	Placed in Position #
Driver Seat	5	0, Full Up
Rear Seat	1	1, Full Down

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

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

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.



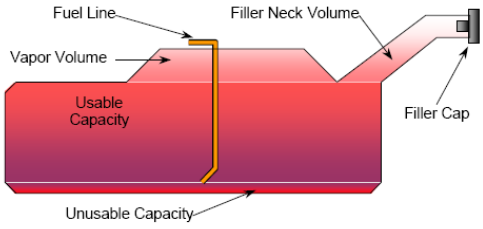
STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	23.2	0
Geometric Center, Position No. 2	25.6	27
Uppermost, Position No. 3	28.0	54
Telescoping Steering Wheel Travel		54
Test Position	25.6	27

FUEL PUMP

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

N/A



VEHICLE FUEL TANK ASSEMBLY

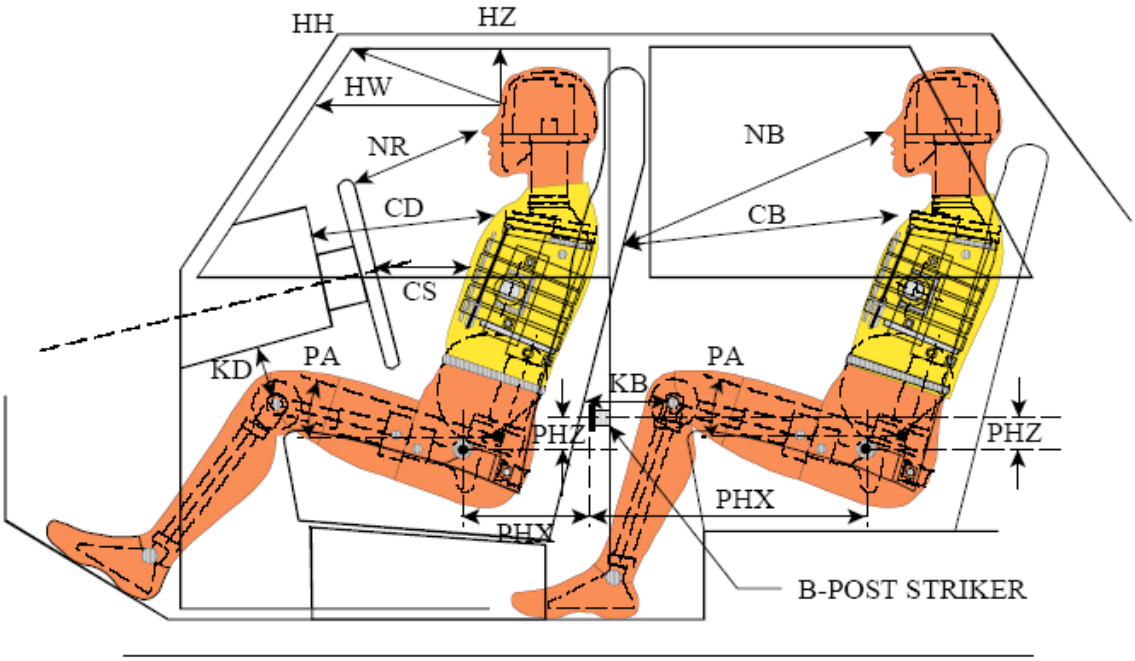
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	55
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	55
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	51
Actual Amount of Solvent Used in Test	51
1/3 of Usable Capacity	18.3

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: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



LEFT SIDE VIEW

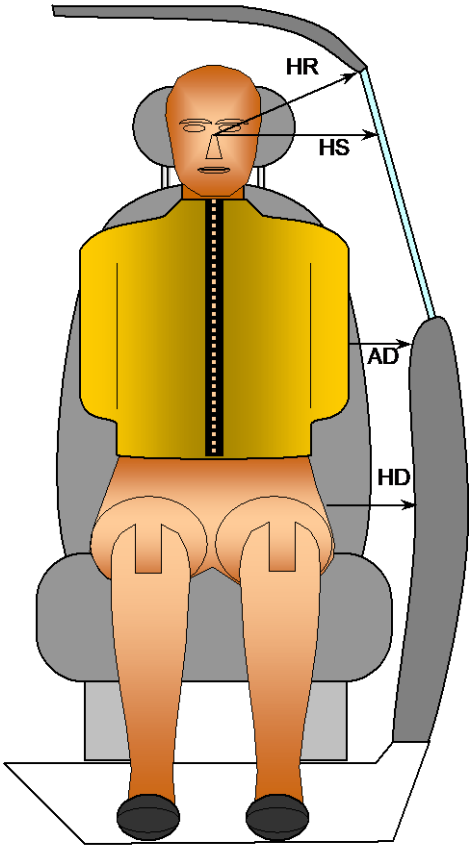
NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	405			
HW		Header to Windshield	731			
HZ	HZ	Head to Roof Liner	221		270	
NR	NB	Nose to Rim/Seat Back	482		531	
CD	CB	Chest to Dash/Seat Back	588		515	
CS		Chest to Steering Wheel	374			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	175	15.0	269	9.5
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	135	16.2	270	10.1
PAX°	PAX°	Pelvic Tilt Angle X		0.2		0.1
	PAY°	Pelvic Tilt Angle Y				18.5
PHX	PHX	Hip Point to Striker (X-Axis)	262		280	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	270		255	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

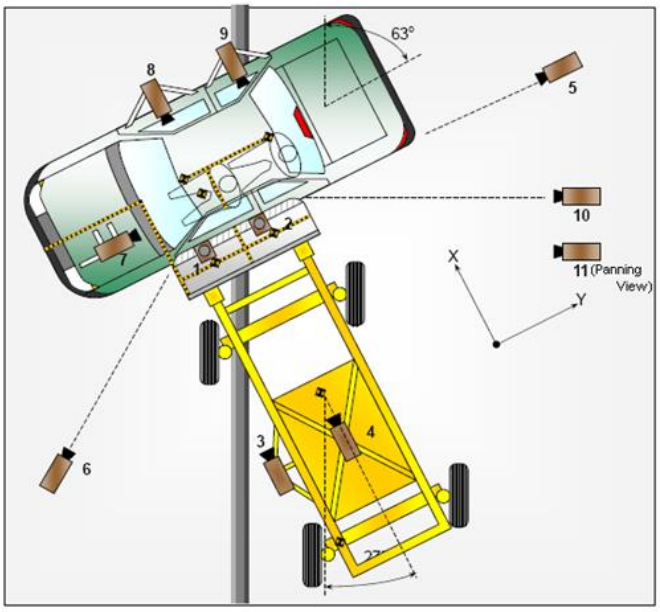


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	223	262
HS	Head to Side Window	mm	358	381
AD	Arm to Door	mm	95	138
HD	H-Point to Door	mm	141	153

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	1582	0	-5606	20	1000
2	Overhead Close-up	1399	0	-5922	20	1000
3	Left Impact Point (MDB)	1545	-940	-819	25	1000
4	Side Overall (MDB)	2281	0	-1410	8.5	1000
5	Rear	0	7440	-1628	20	1000
6	Left Front	0	-7398	-1584	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

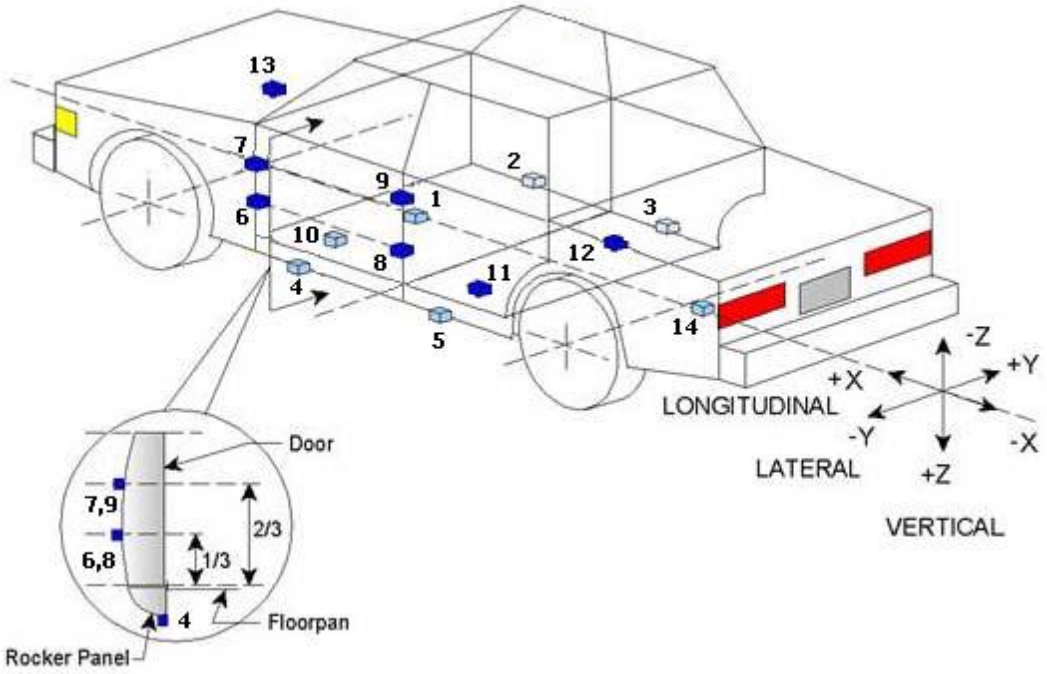
Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down
*All measurements accurate to ± 6 mm.
If applicable, explain why camera(s) did not operate as intended: N/A

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



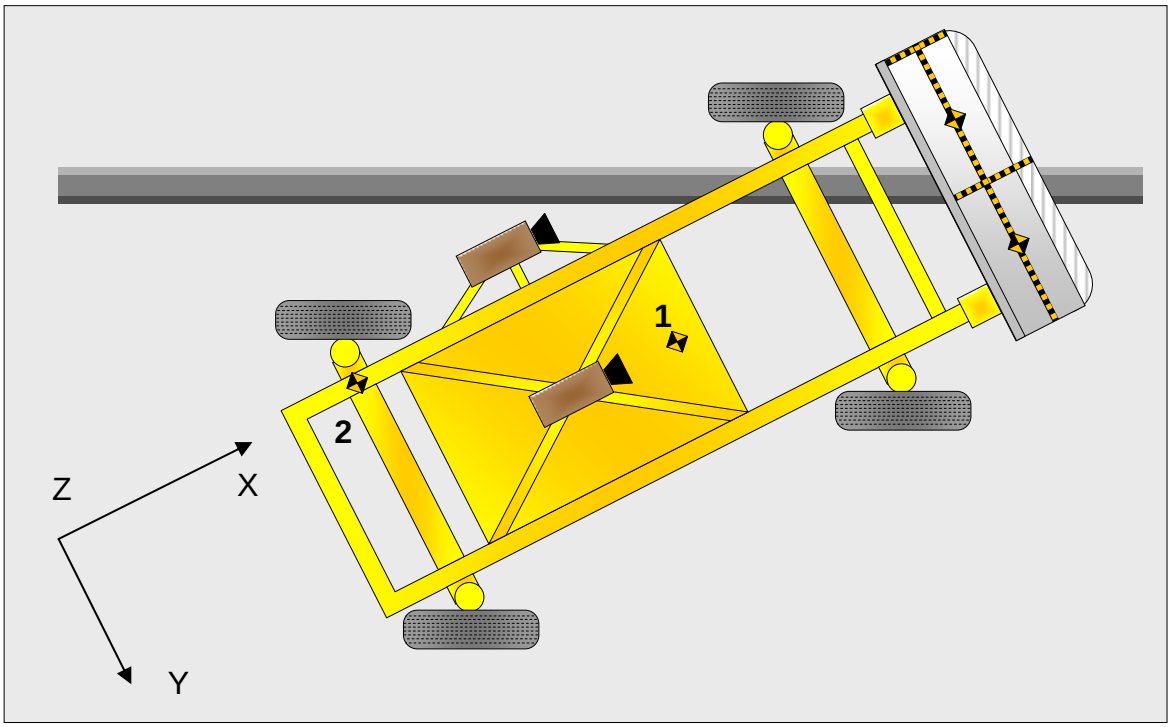
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2889	129	-459
2	Right Sill at Front Seat	2890	704	-452
3	Right Sill at Rear Seat	1778	665	-462
4	Left Sill at Front Door	2901	-701	-450
5	Left Sill at Rear Door	1776	-717	-458
6	A-Post Lower	3210	-823	-623
7	A-Post Middle	3245	-809	-1038
8	B-Post Lower	2143	-821	-610
9	B-Post Middle	2095	-795	-1074
10	Front Seat Track	2448	-558	-450
11	Rear Seat Structure	1577	-666	-447
12	Right Rear Occ. Compartment	1590	638	-459
13	Engine Block	3863	143	-886
14	Rear Above Axle	1125	0	-579

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: 2023 Mitsubishi Outlander
Test Program: SINCAP Side Impact
NHTSA No.: M20235602
Test Date: 3/2/2023



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-2196	0	-500
2	MDB Rear	-3585	-645	-620

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB	SCAB
Top of Head	SCAB	SCAB
Left Side of Head	SCAB	SCAB
Back of Head	Driver head restraint	SCAB; 2nd row head restraint
Left Shoulder	SCAB	SAB
Upper Torso	SAB	SAB
Lower Torso	SAB	SAB
Left Hip	SAB	SAB
Left Knee	None	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	Driver side window cracked
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2710
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		450
Actual Impact Point (Aft of Front Axle)	mm		445
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+5
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-5

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

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	1116

MDB WEIGHTS

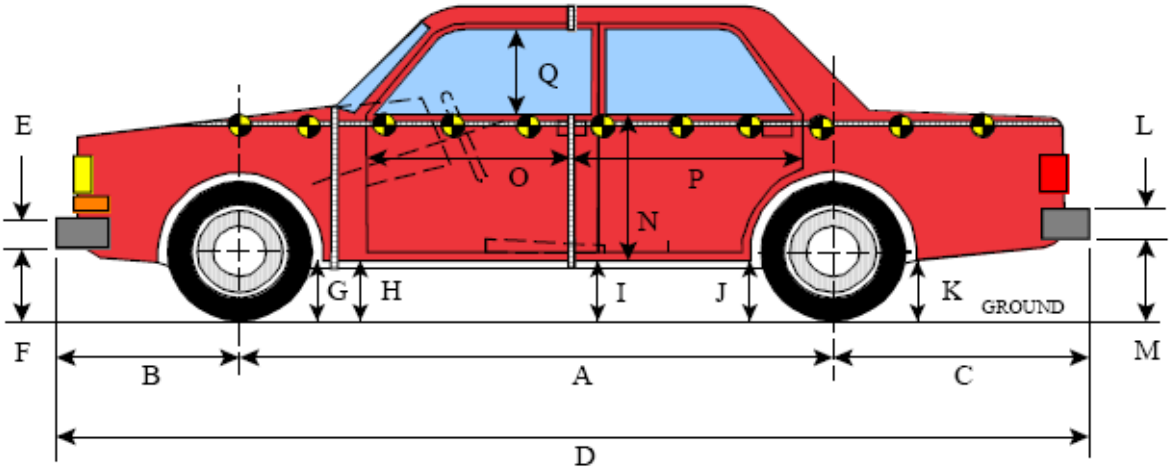
	Units	Front Axle	Rear Axle	Total
Left	kg	422.6	261.8	684.4
Right	kg	355.8	327.2	683.0
Ratio	%	56.9	43.1	100.0
Totals	kg	778.4	589.0	1367.4

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.05
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.02
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: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



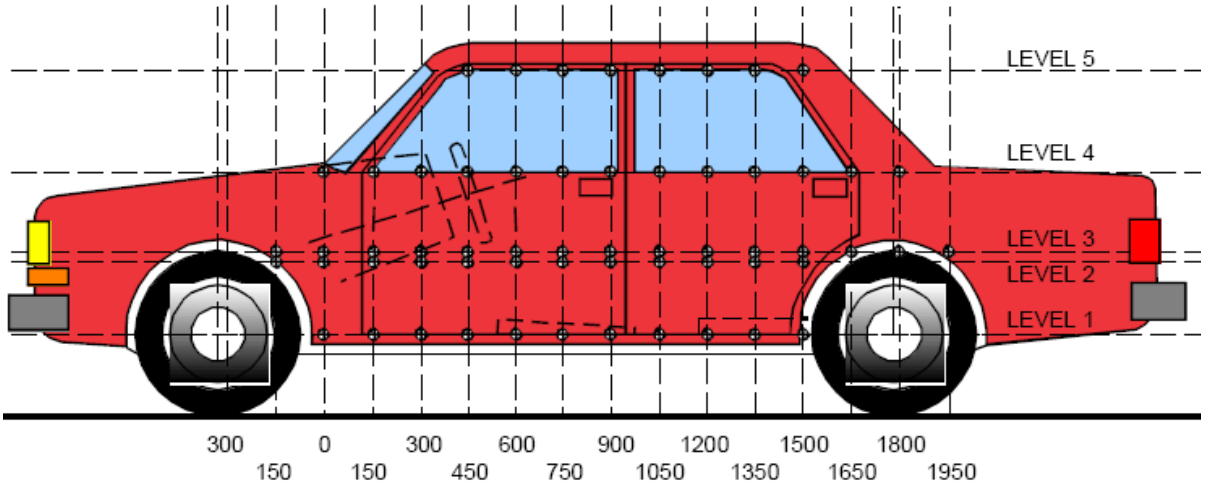
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2710	2702	-8
B	Front Axle to Front Surface of Vehicle	900	890	-10
C	Rear Axle to Rear Surface of Vehicle	1090	1090	0
D	Total Length at Centerline	4700	4682	-18
E	Front Bumper Thickness	75	75	0
F	Front Bumper Bottom to Ground	535	487	-48
G	Sill Height at Front Wheel Well	313	322	9
H	Sill Height at Front Door Leading Edge	355	387	32
I	Sill Height at B-Pillar	363	416	53
J1	Sill Height at Rear Wheel Well	285	310	25
J2	Pinch Weld Height at Rear Wheel Well	285	305	20
K	Sill Height Aft of Rear Wheel Well	422	468	46
L	Rear Bumper Thickness	170	170	0
M	Rear Bumper Bottom to Ground	527	582	55
N	Sill Height to Window Bottom Sill	887	830	-57
O	Front Door Leading Edge to Impact CL	815	802	-13
P	Rear Door Trailing Edge to Impact CL	1345	1348	3
Q	Front Window Opening	433	425	-8
R	Right Side Length	4478	4456	-22
S	Left Side Length	4478	4445	-33
T	Vehicle Width	1865	1863	-2
U	Front Wheel Track Width	1845	1790	-55
V	Rear Wheel Track Width	1590	1565	-25

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	449	143	300
				450
2	Driver Hip Point	681	166	750
3	Mid-Door	710	191	1350
				1500
4	Window Sill	1112	70	1800
5	Window Top	1614	5	5

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: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

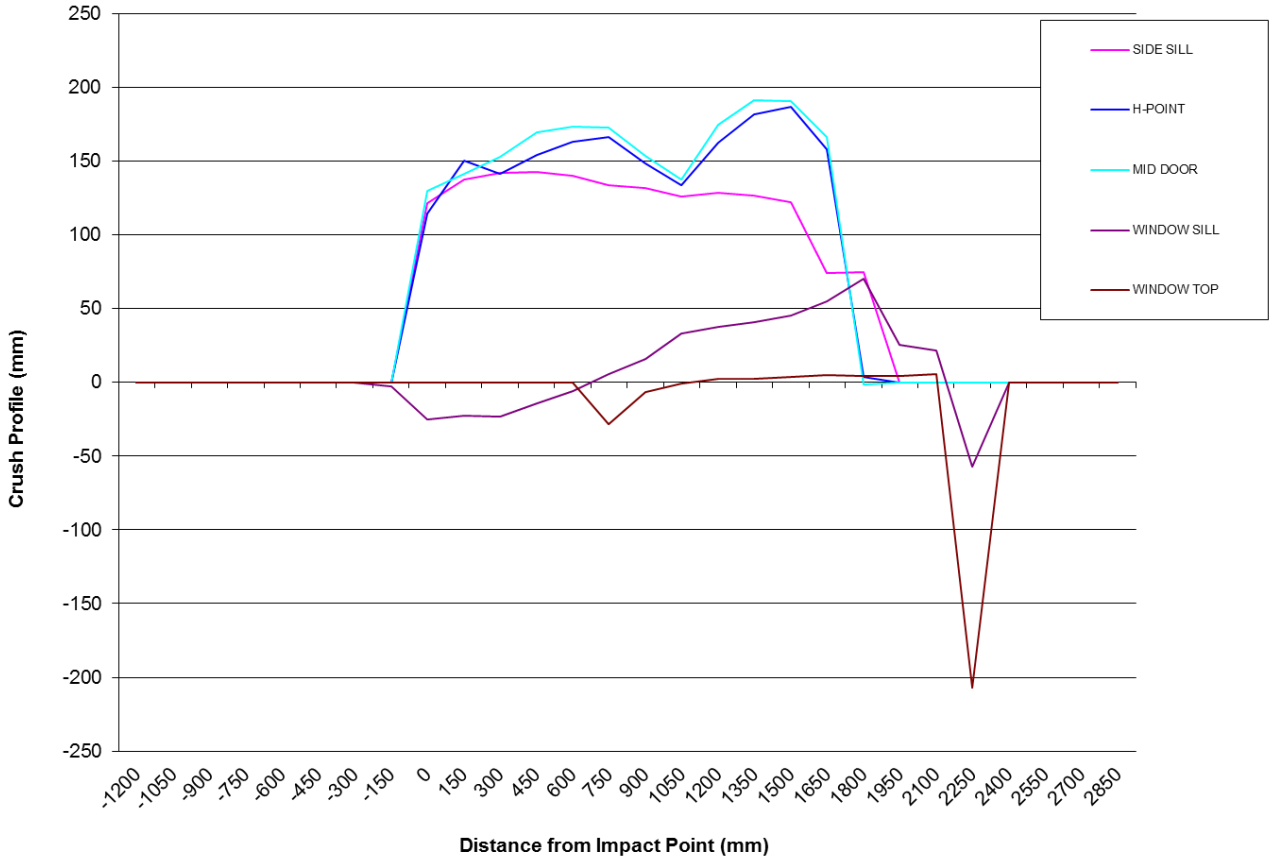
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Crush				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
-150	0	0	0	822	0	0	0	0	825	0	0	0	0	-3	0
0	925	933	934	826	0	804	819	805	851	0	121	114	129	-25	0
150	919	929	930	829	0	781	779	788	851	0	138	150	142	-22	0
300	919	920	922	837	0	776	778	769	860	0	143	142	153	-23	0
450	920	913	916	849	0	777	759	747	863	0	143	154	169	-14	0
600	920	911	914	858	0	780	748	741	863	0	140	163	173	-5	0
750	919	909	912	865	598	785	743	740	860	626	134	166	172	5	-28
900	918	908	911	872	625	786	760	758	856	631	132	148	153	16	-6
1050	917	908	910	876	631	791	774	773	843	632	126	134	137	33	-1
1200	915	906	909	880	633	786	744	734	842	630	129	162	175	38	3
1350	912	906	908	883	633	785	724	717	842	631	127	182	191	41	2
1500	909	908	911	886	633	787	721	720	841	630	122	187	191	45	3
1650	907	915	917	887	632	833	757	751	832	627	74	158	166	55	5
1800	908	924	926	885	629	833	921	928	815	625	75	3	-2	70	4
1950	0	0	0	881	626	0	0	0	855	622	0	0	0	26	4
2100	0	0	0	879	622	0	0	0	858	616	0	0	0	21	6
2250	0	0	0	872	617	0	0	0	929	824	0	0	0	-57	-207

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.

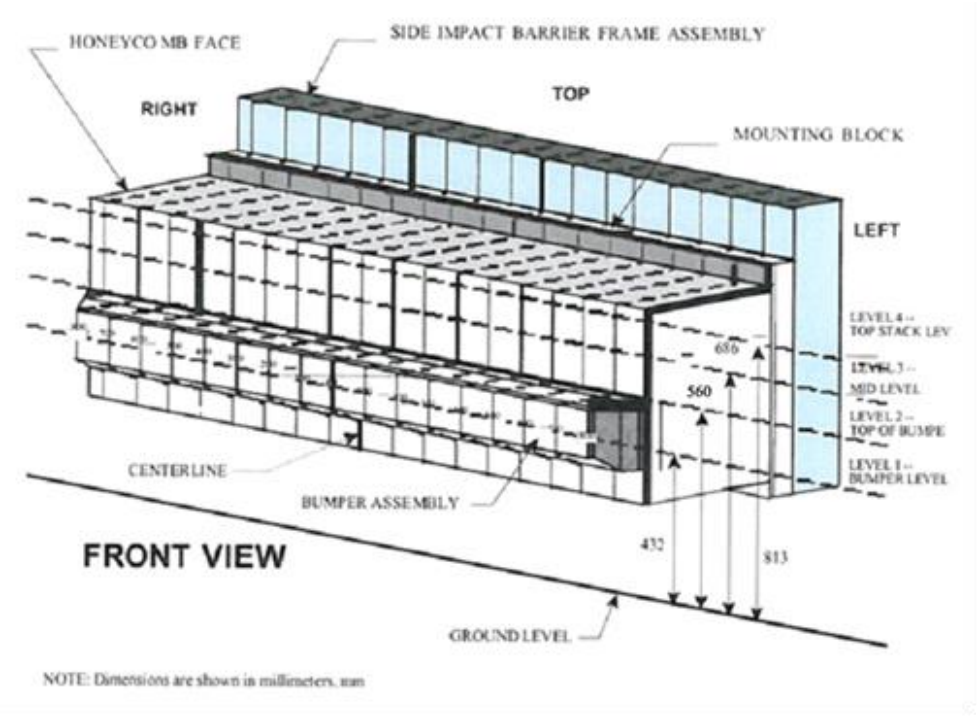
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2023 Mitsubishi Outlander
Test Program: SINCAP Side Impact
NHTSA No.: M20235602
Test Date: 3/2/2023



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

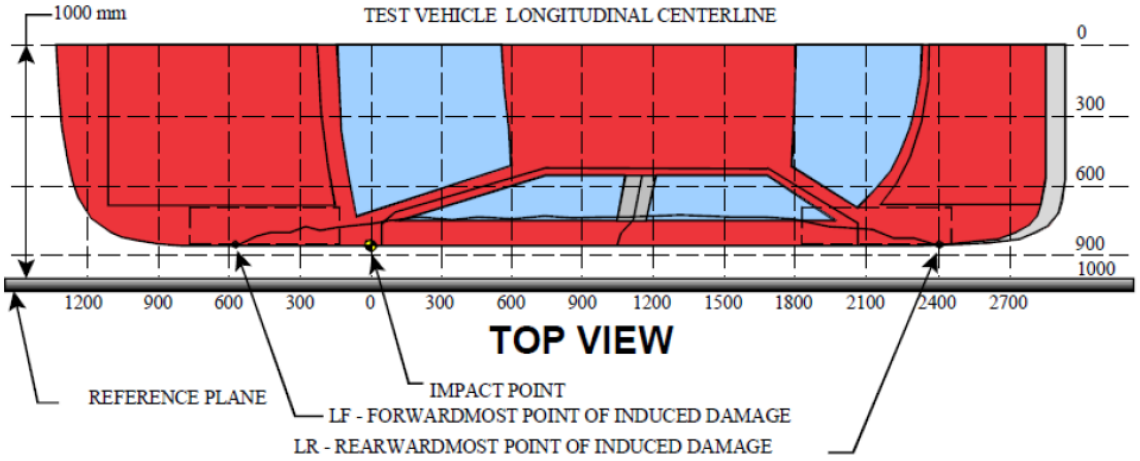
Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	225
B	Top of Bumper	560	800	Left	164
C	Mid-Level	686	800	Left	113
D	Top of Stack	813	800	Left	150

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	225	222	221	220	219	220	220	219	215	211	208	207	206	206	205	207	211
2	124	127	127	125	124	128	127	123	118	113	110	108	107	105	106	115	164
3	54	54	63	48	54	68	92	82	53	49	48	46	51	61	86	101	113
4	45	41	43	59	79	108	119	89	68	58	56	60	61	71	92	118	150

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



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]	2100	4	858	879	0
2	1650	3	751	917	166
3	1200	3	734	909	175
4	900	3	758	911	153
5	450	3	747	916	169
6[1]	0	3	805	934	0

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	1	265	476	211
2	500 mm Left of Center	1	282	488	206
3	200 mm Left of Center	1	278	486	208
4	200 mm Right of Center	1	266	486	220
5	500 mm Right of Center	1	266	486	220
6	800 mm Right of Center	1	251	476	225

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

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

Test Vehicle: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023

Test Time: 16:45 **Temperature:** 20.9°C

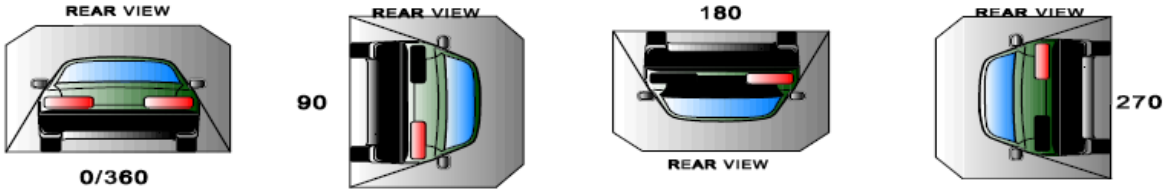
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

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

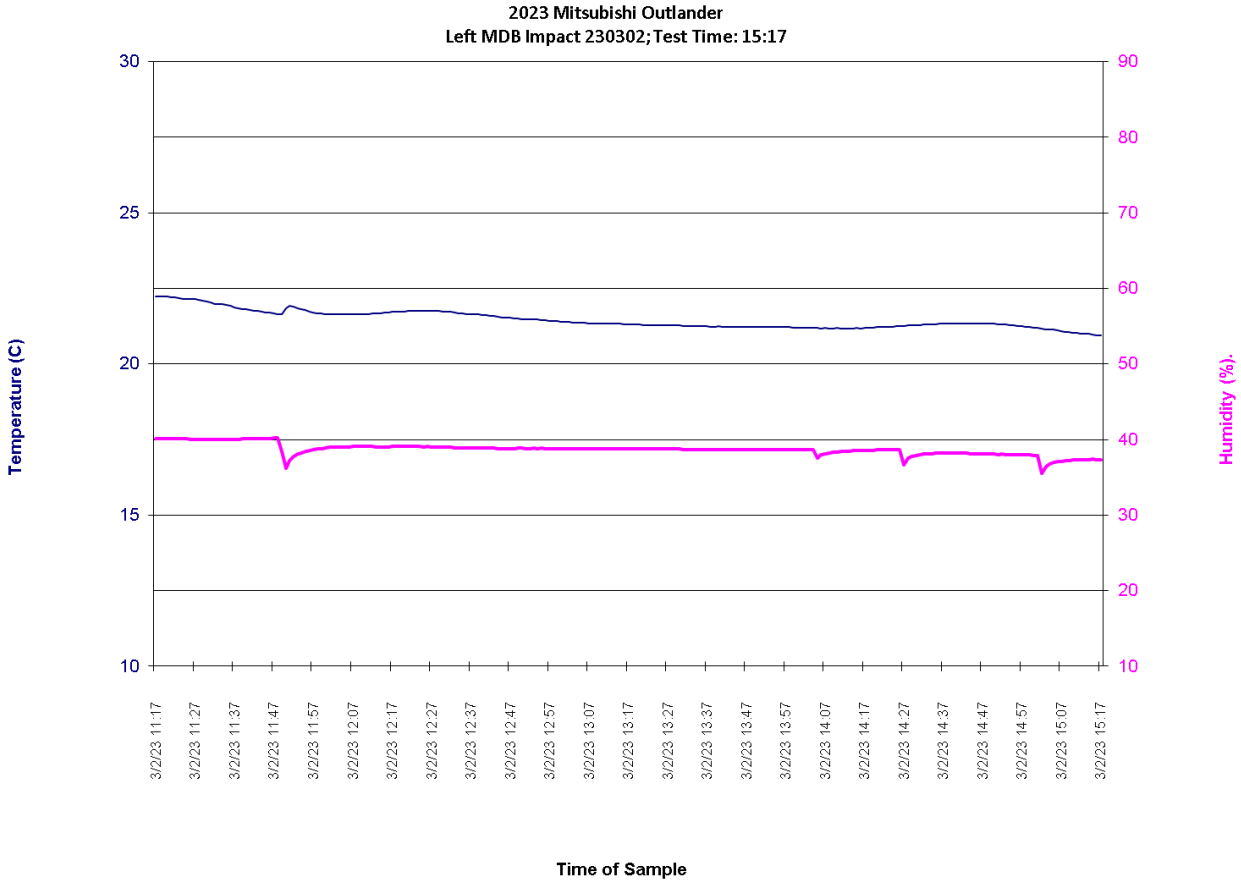
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

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: 2023 Mitsubishi Outlander NHTSA No.: M20235602
Test Program: SINCAP Side Impact Test Date: 3/2/2023



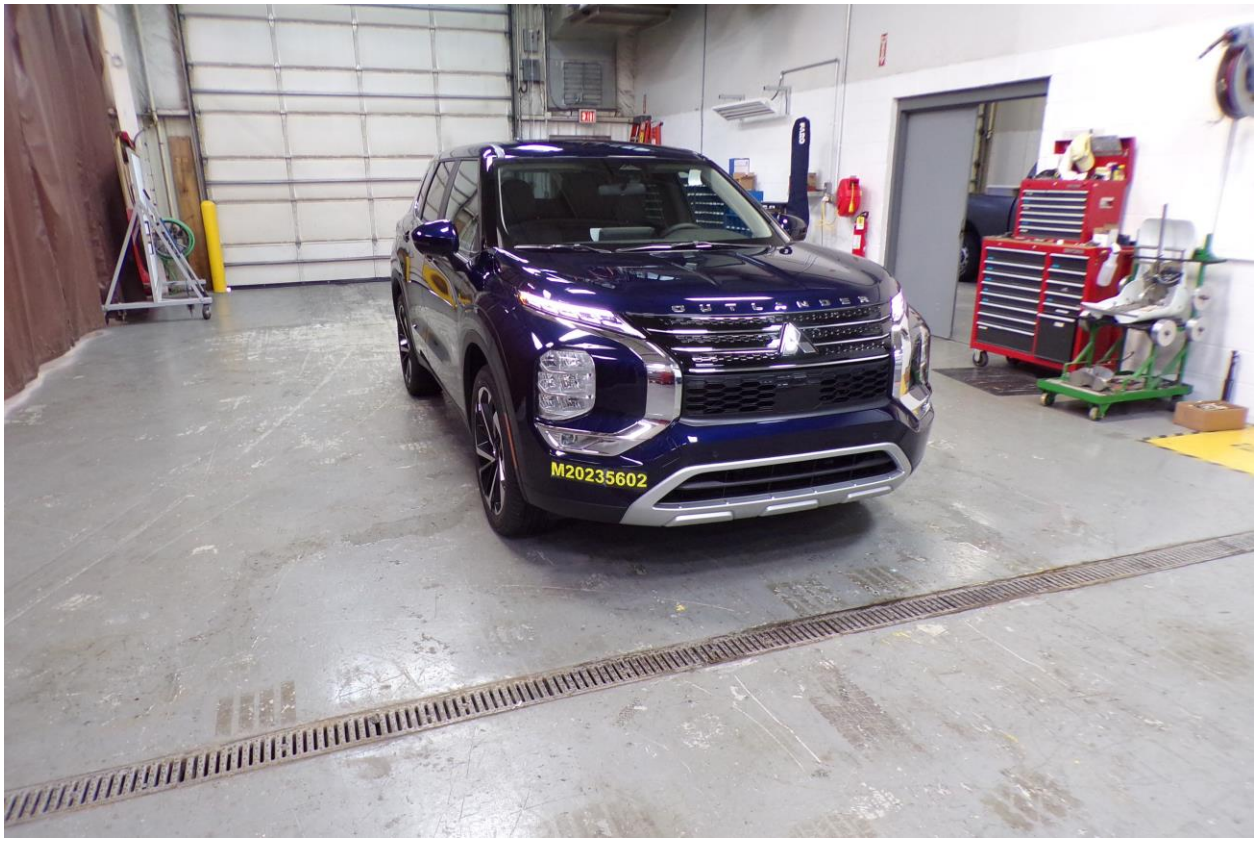
APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

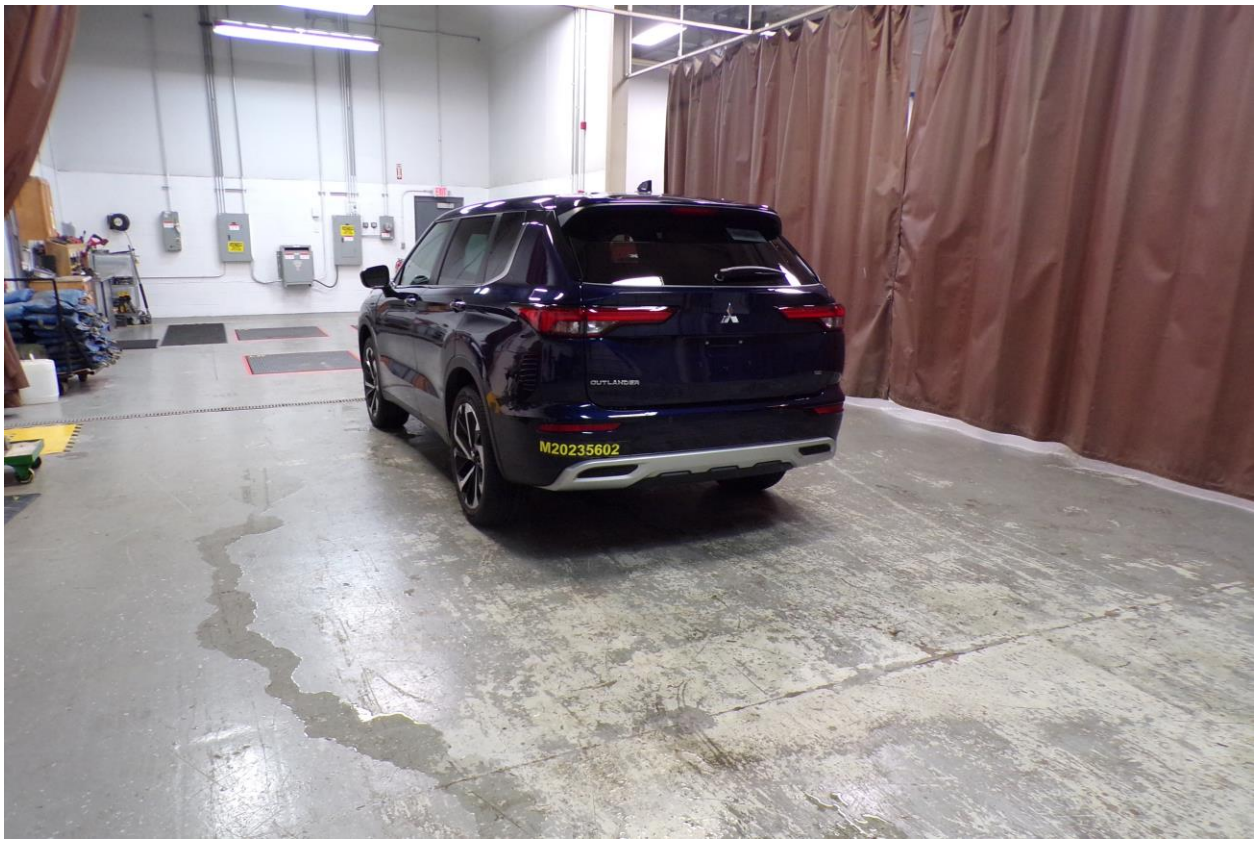
TABLE OF PHOTOGRAPHS (CONTINUED)

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

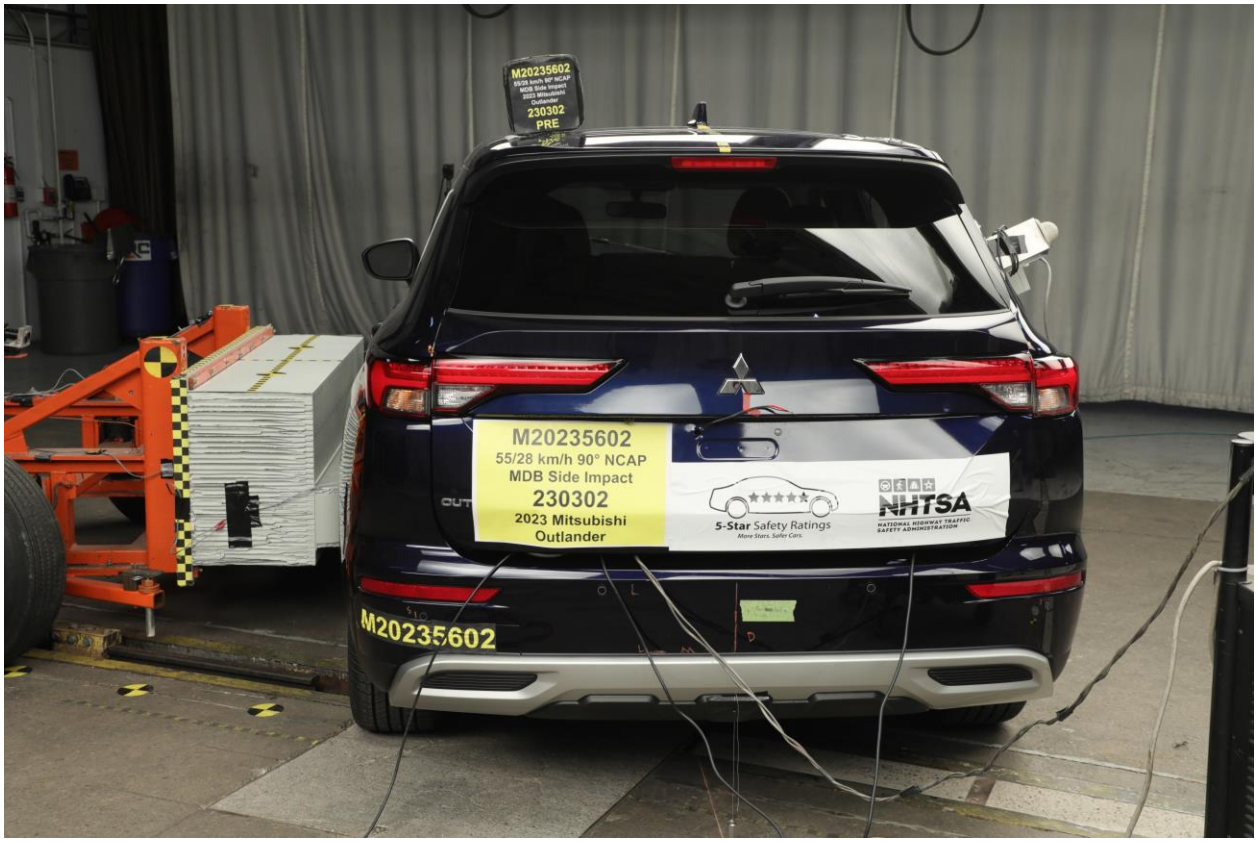
006 Post-Test Left Front ¾ View of Test Vehicle

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



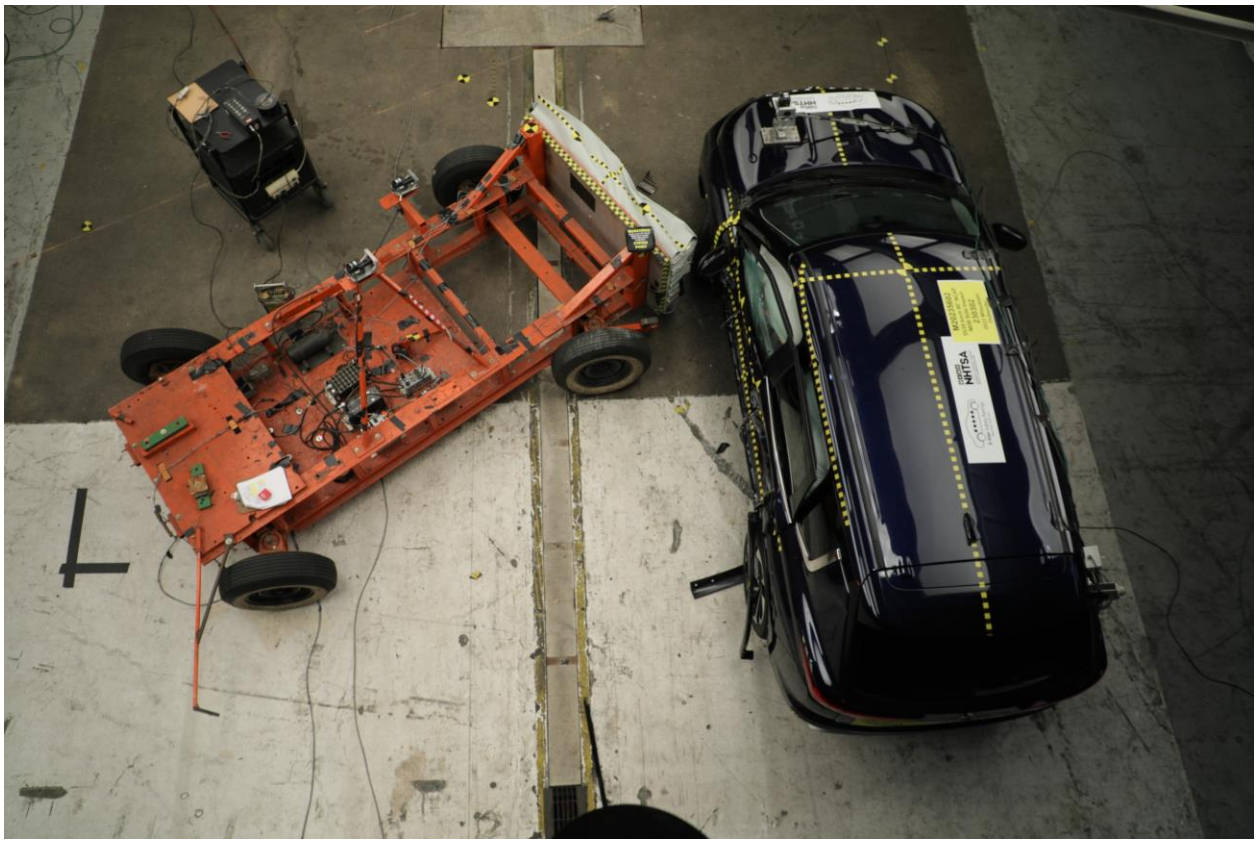
011 Pre-Test Rear View of Test Vehicle

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

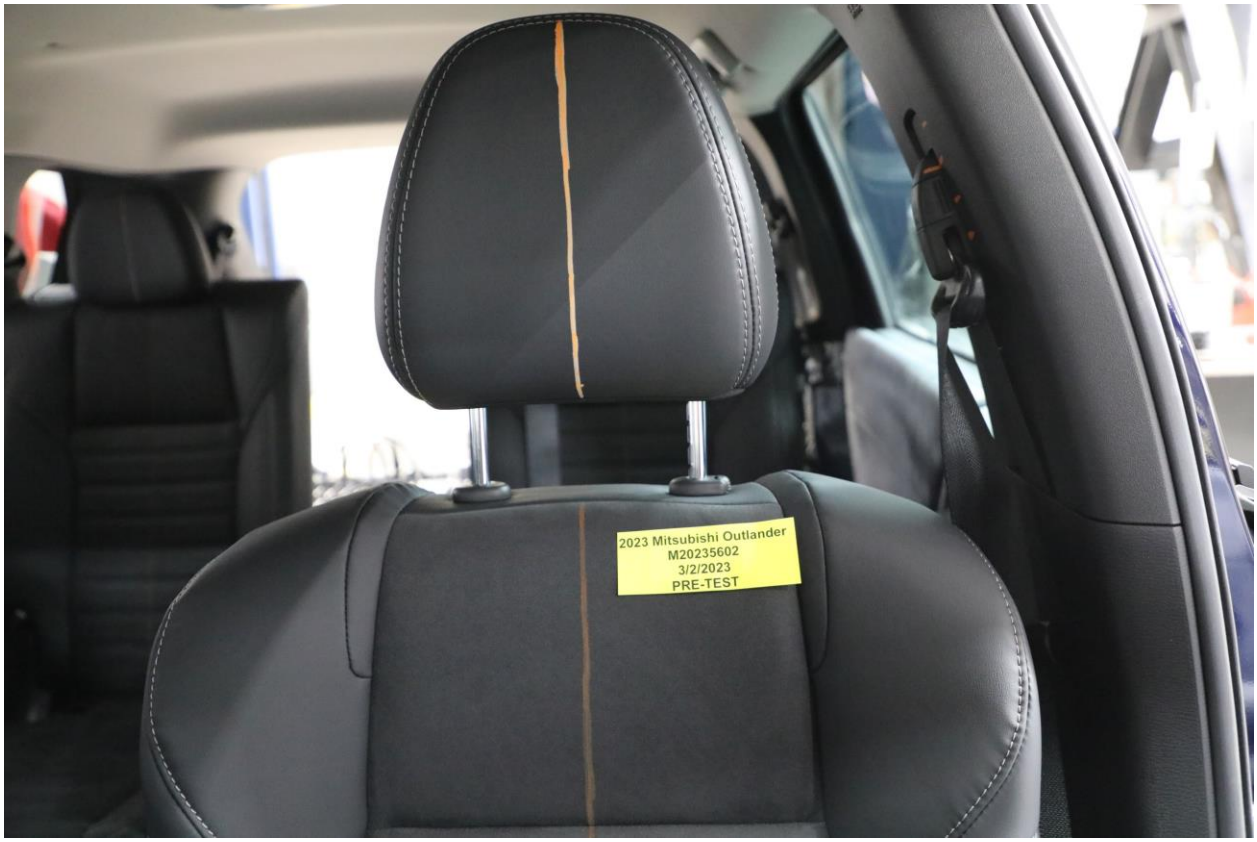
026 Post-Test Front Close-Up View of Driver Dummy

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

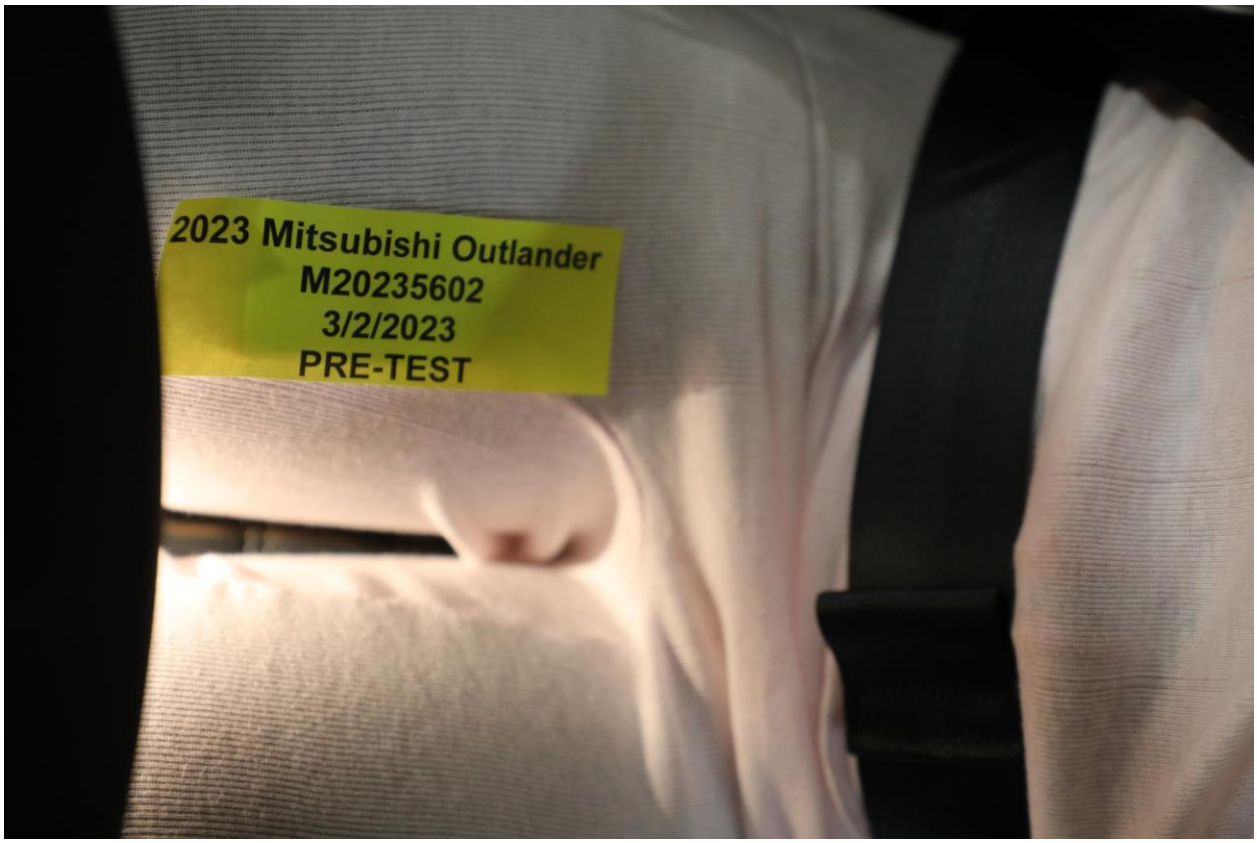
029 Post-Test Left Side View of Driver Dummy Shoulder and Door Top



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

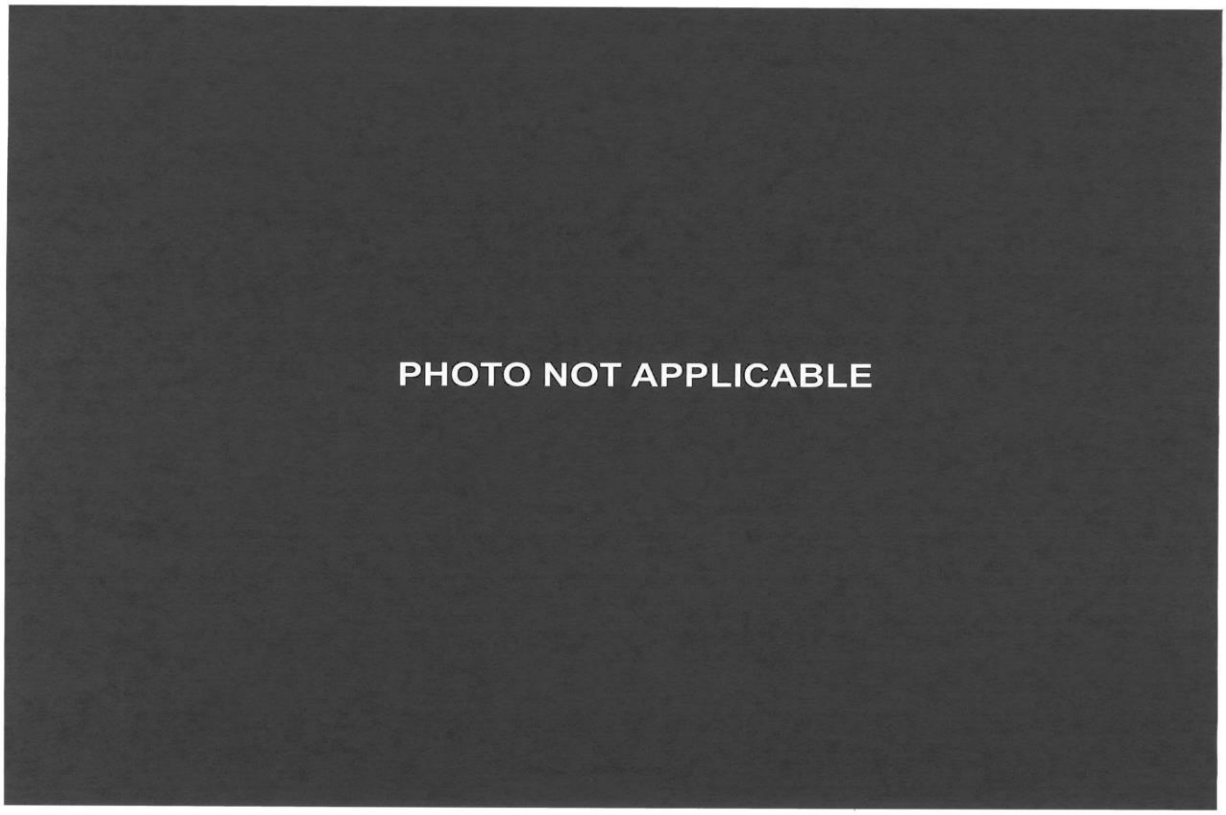
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

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

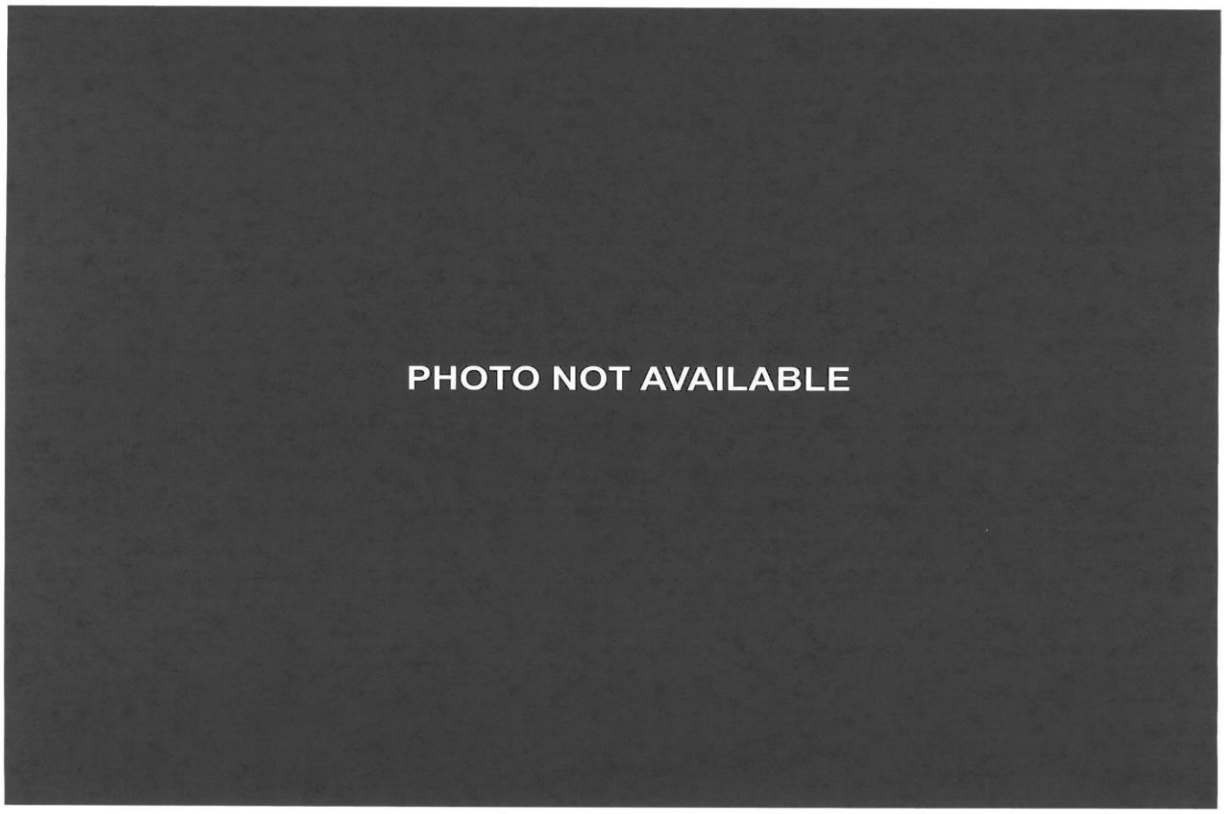


054 Post-Test Driver Dummy Close-Up Knee Contact View

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

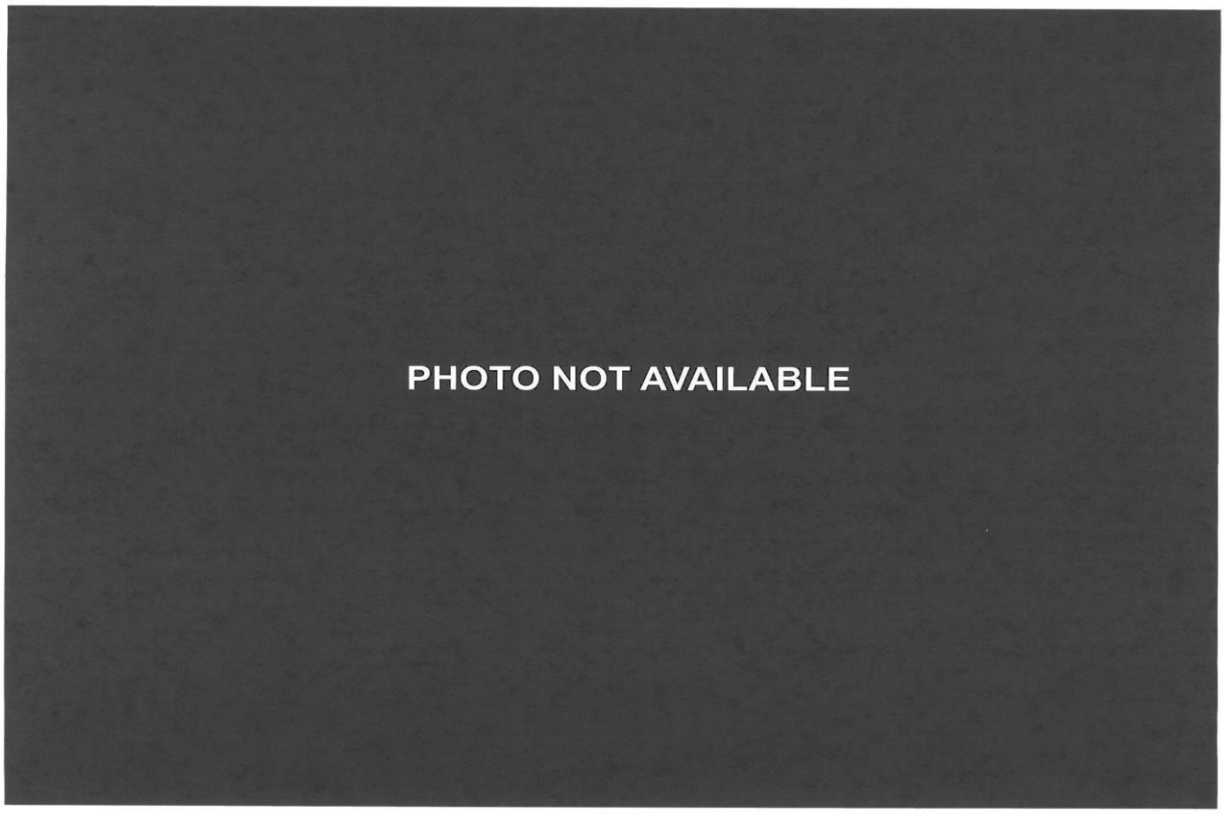
056 Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View

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

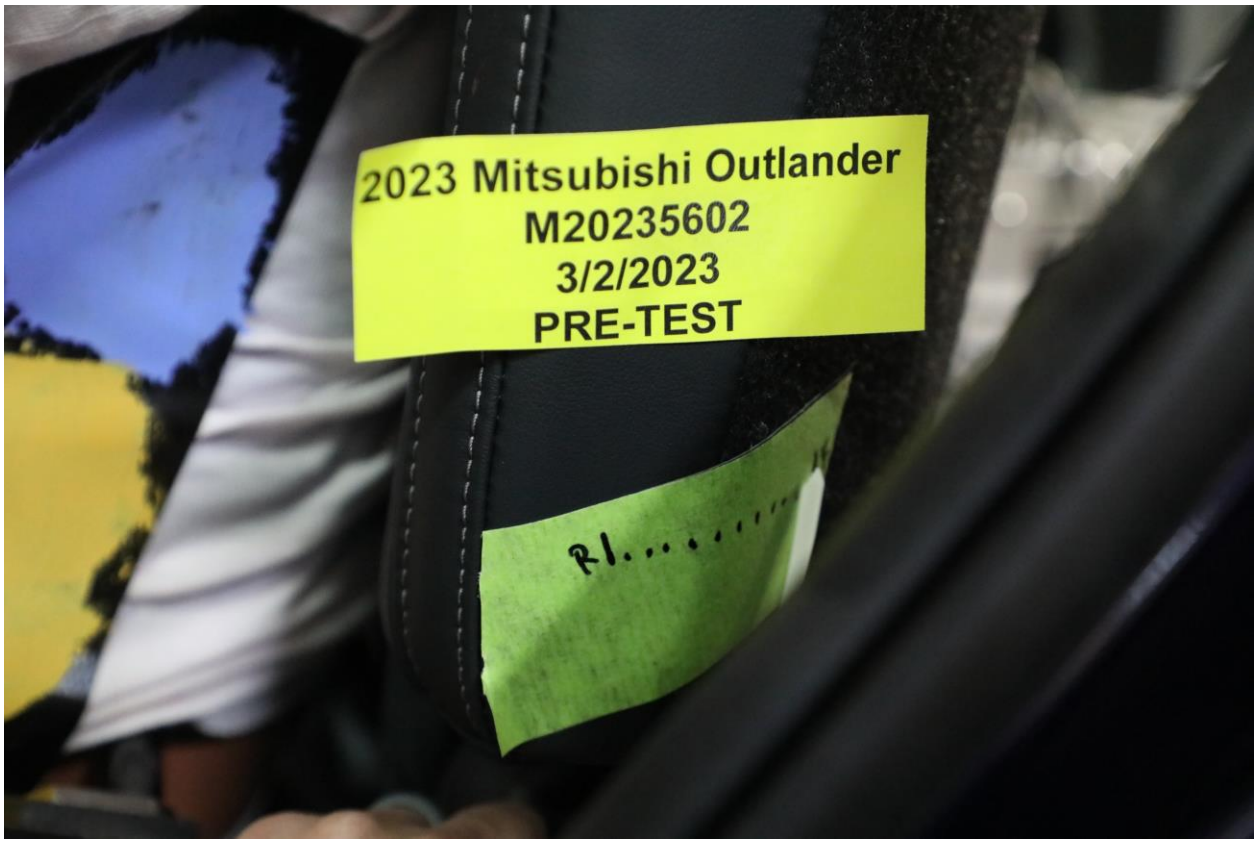
062 Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket

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

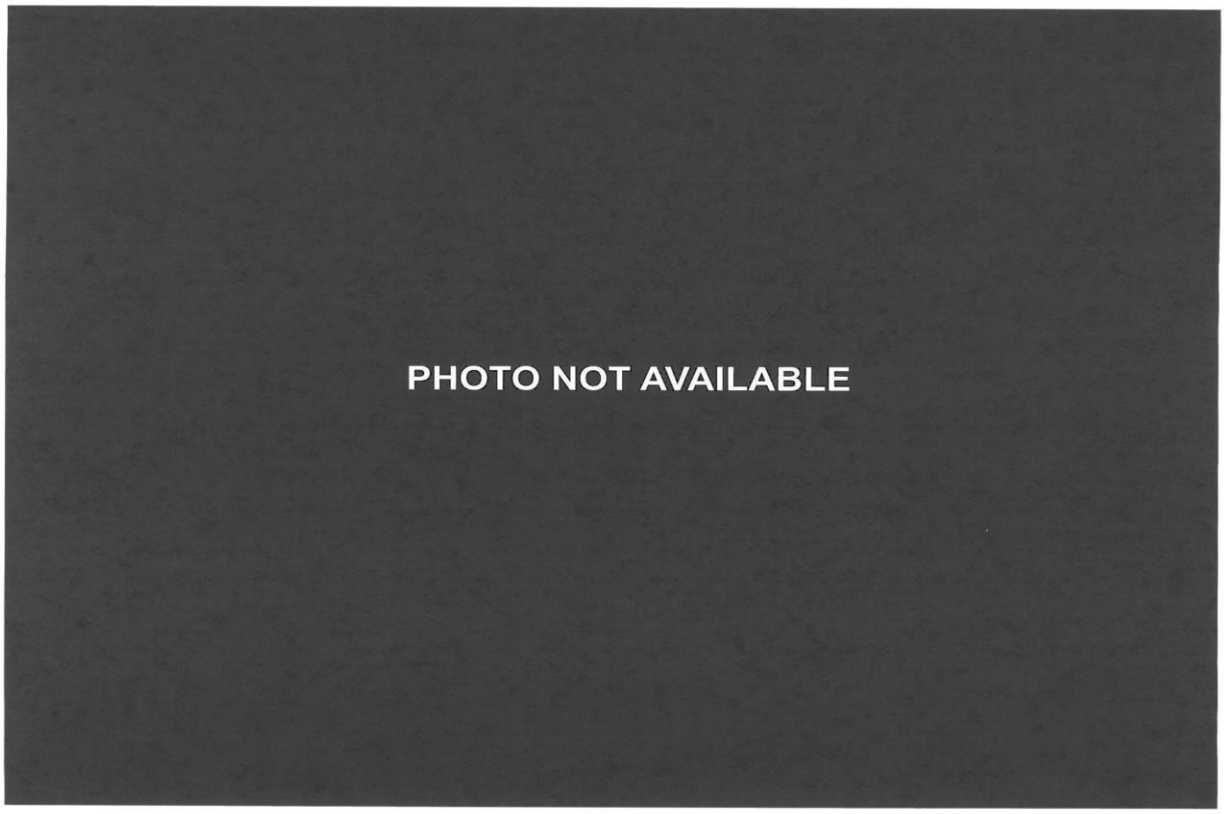
Intentionally Left Blank

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

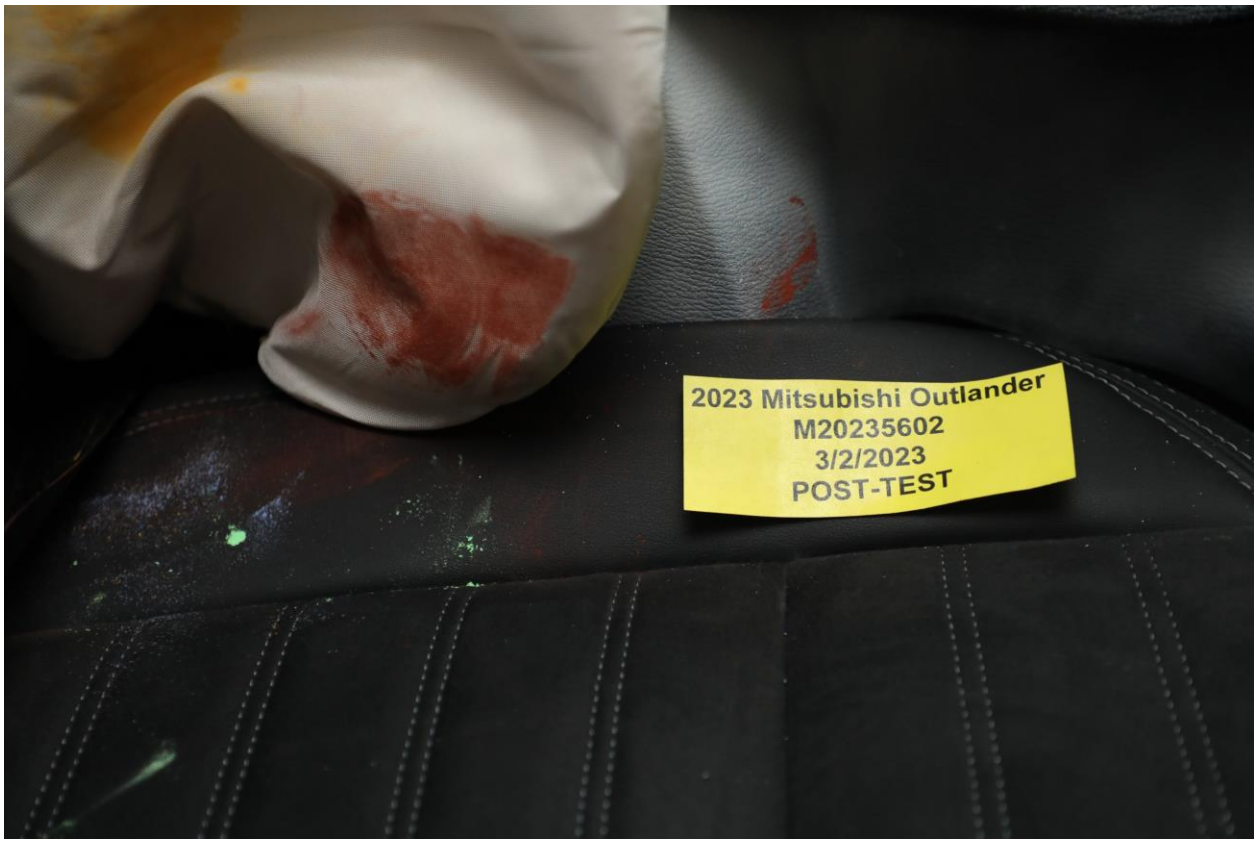
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View

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

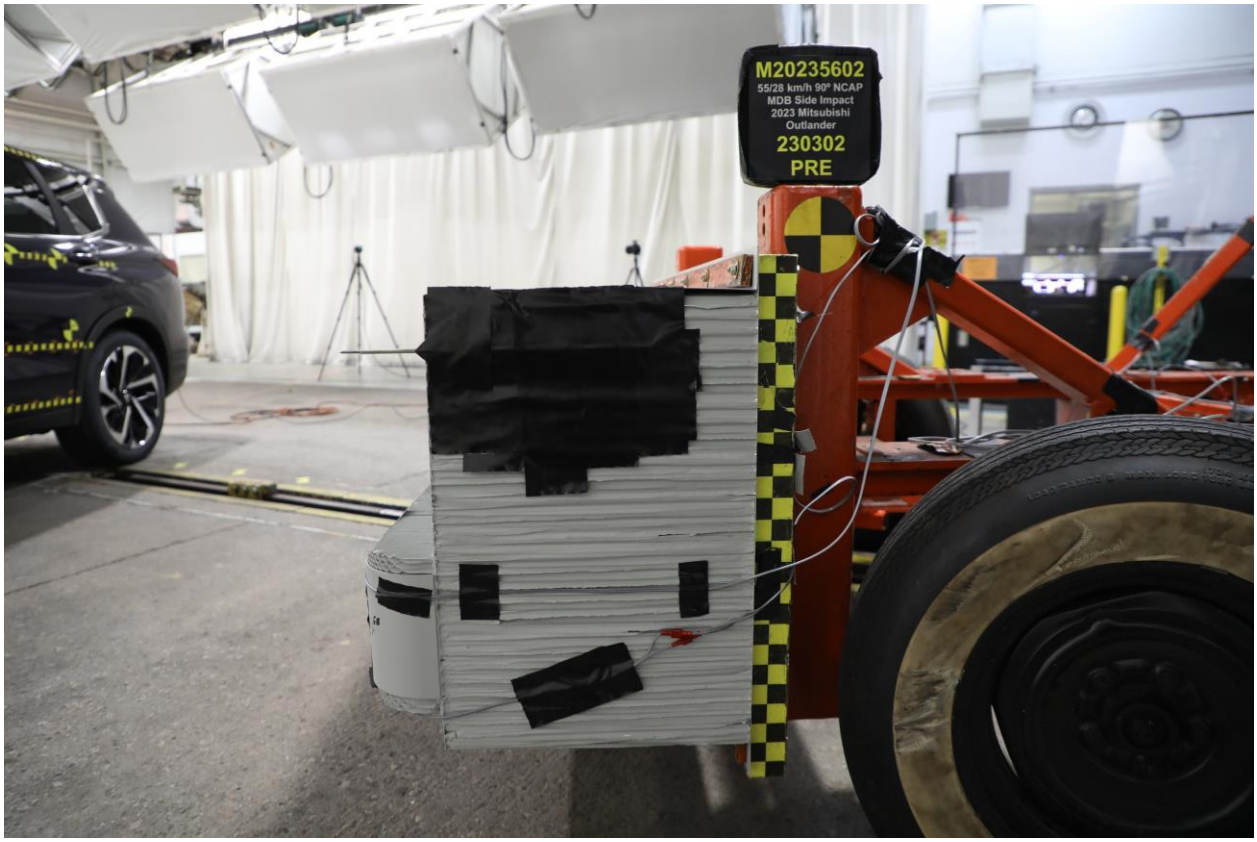
083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck

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

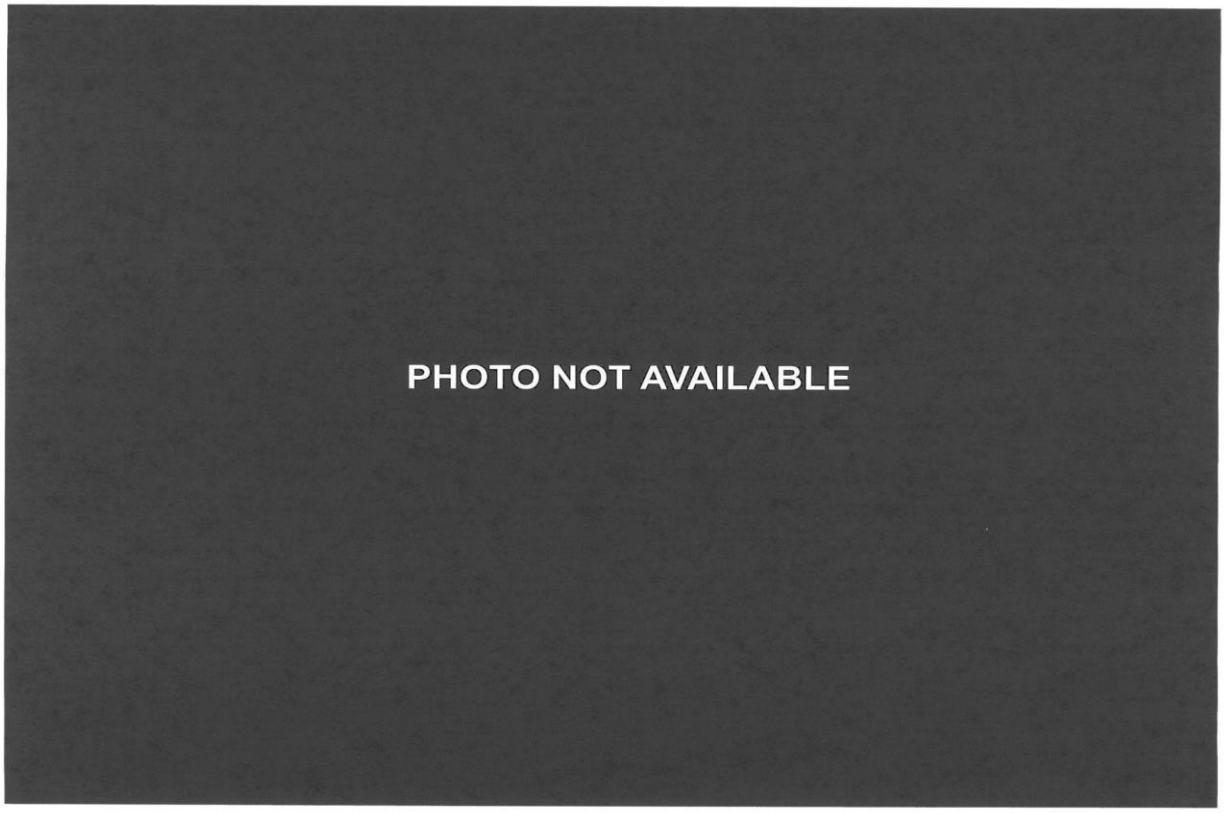
087 Post-Test Top View of MDB Impactor Face



088 Pre-Test Left Side View of MDB Impactor Face

089 Post-Test Left Side View of MDB Impactor Face

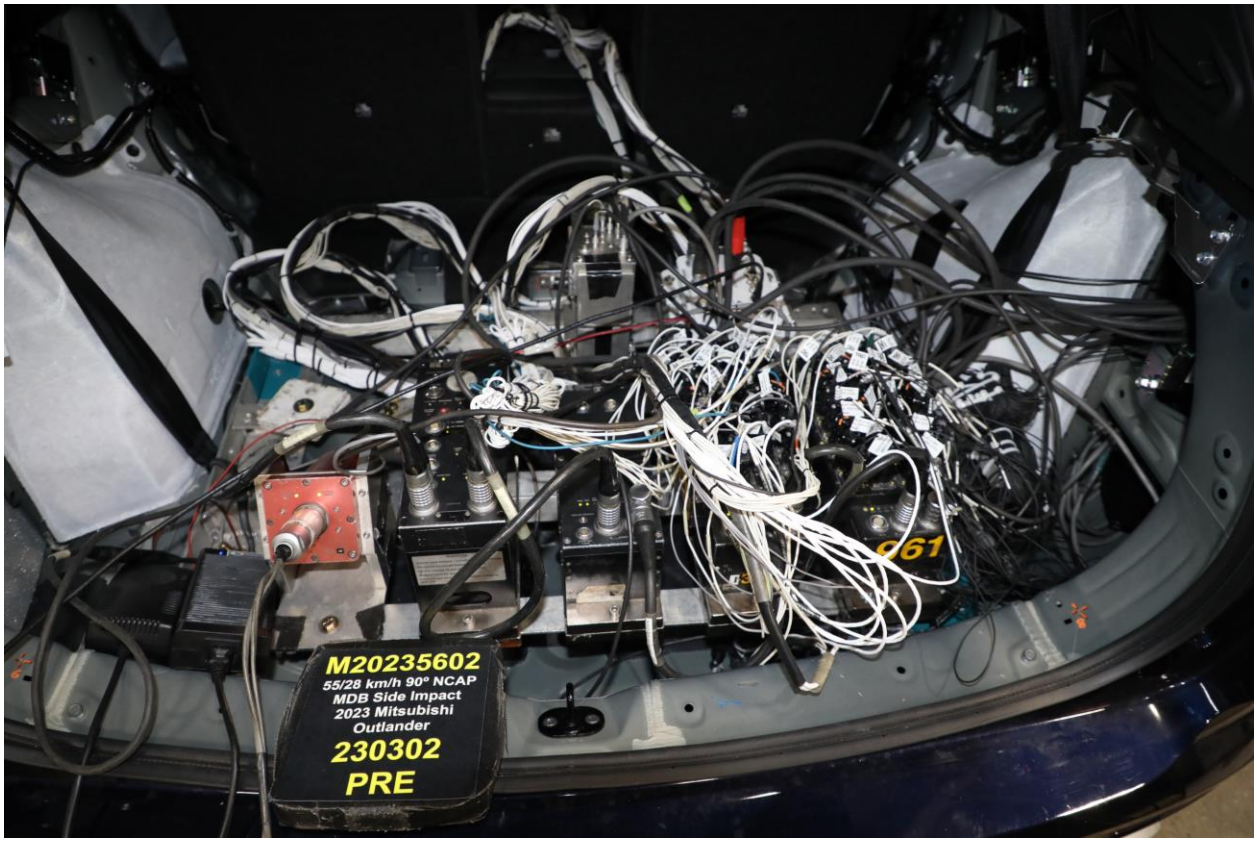
090 Pre-Test Right Side View of MDB Impactor Face



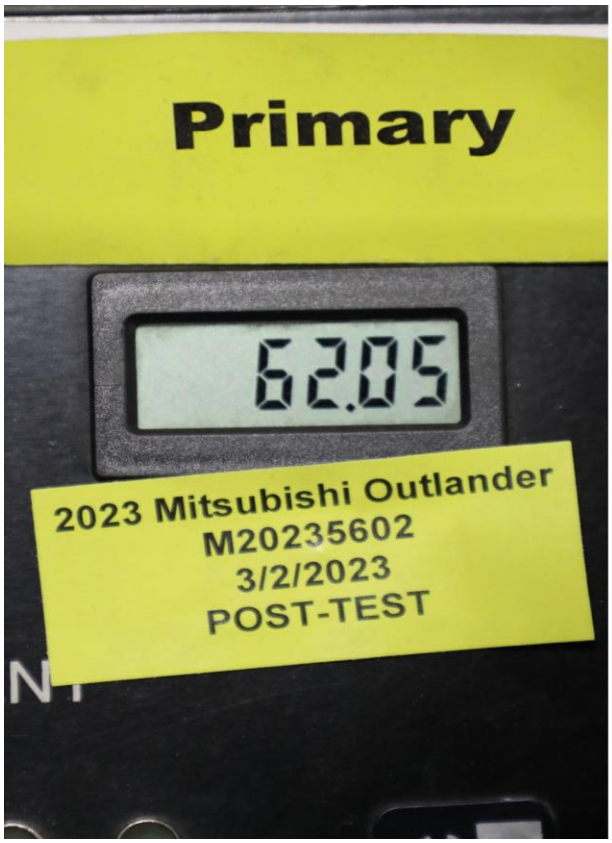
091 Post-Test Right Side View of MDB Impactor Face

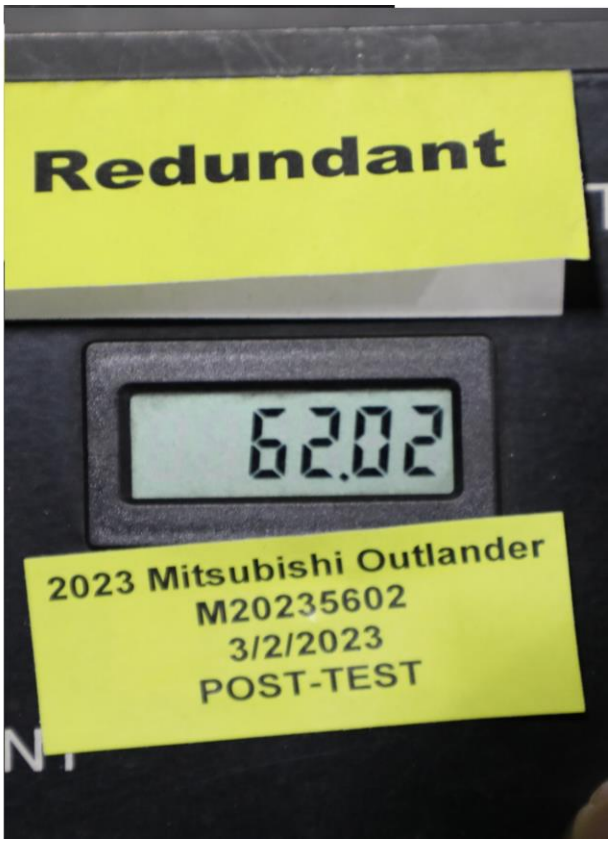
092 Close-Up View of Vehicle's Certification Label

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

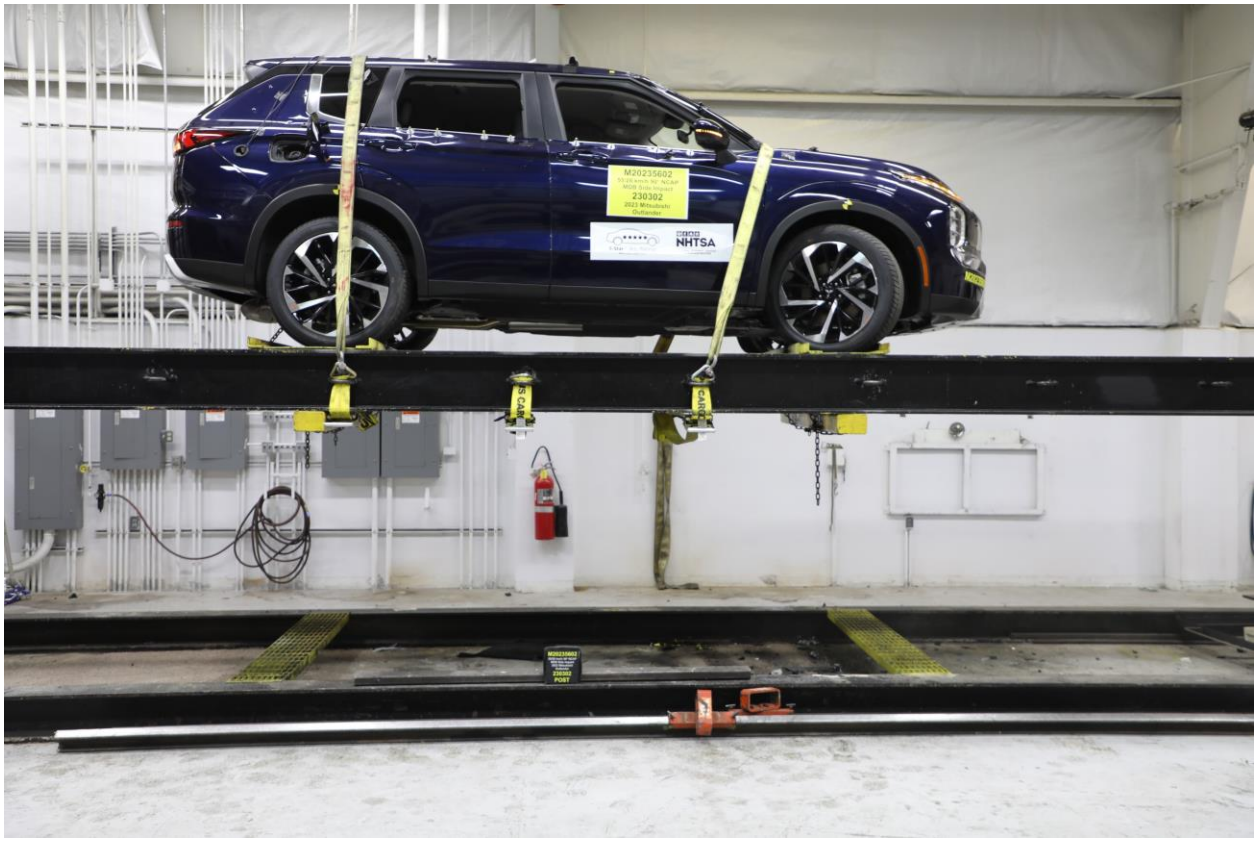


094 Pre-Test Ballast View



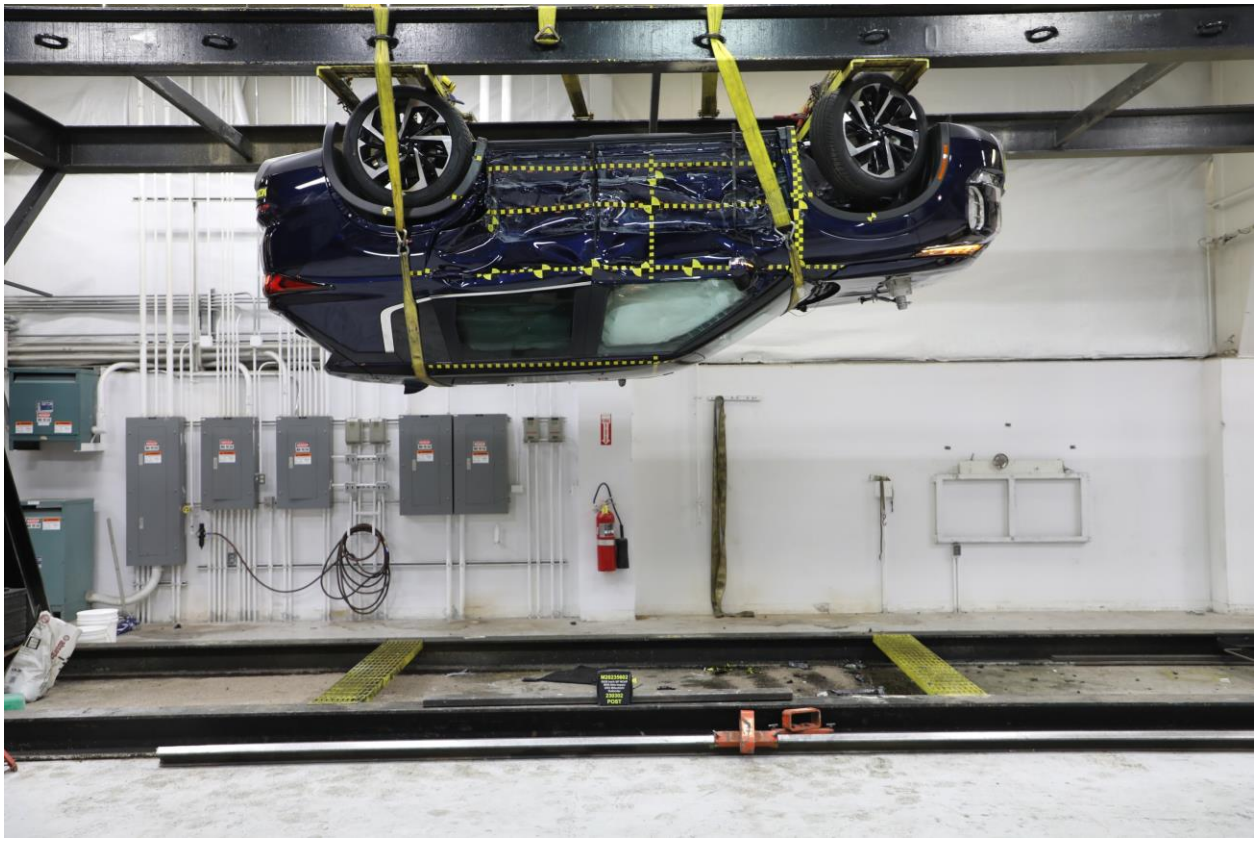


095 No. Post-Test Primary and Redundant Speed Trap Read-Out

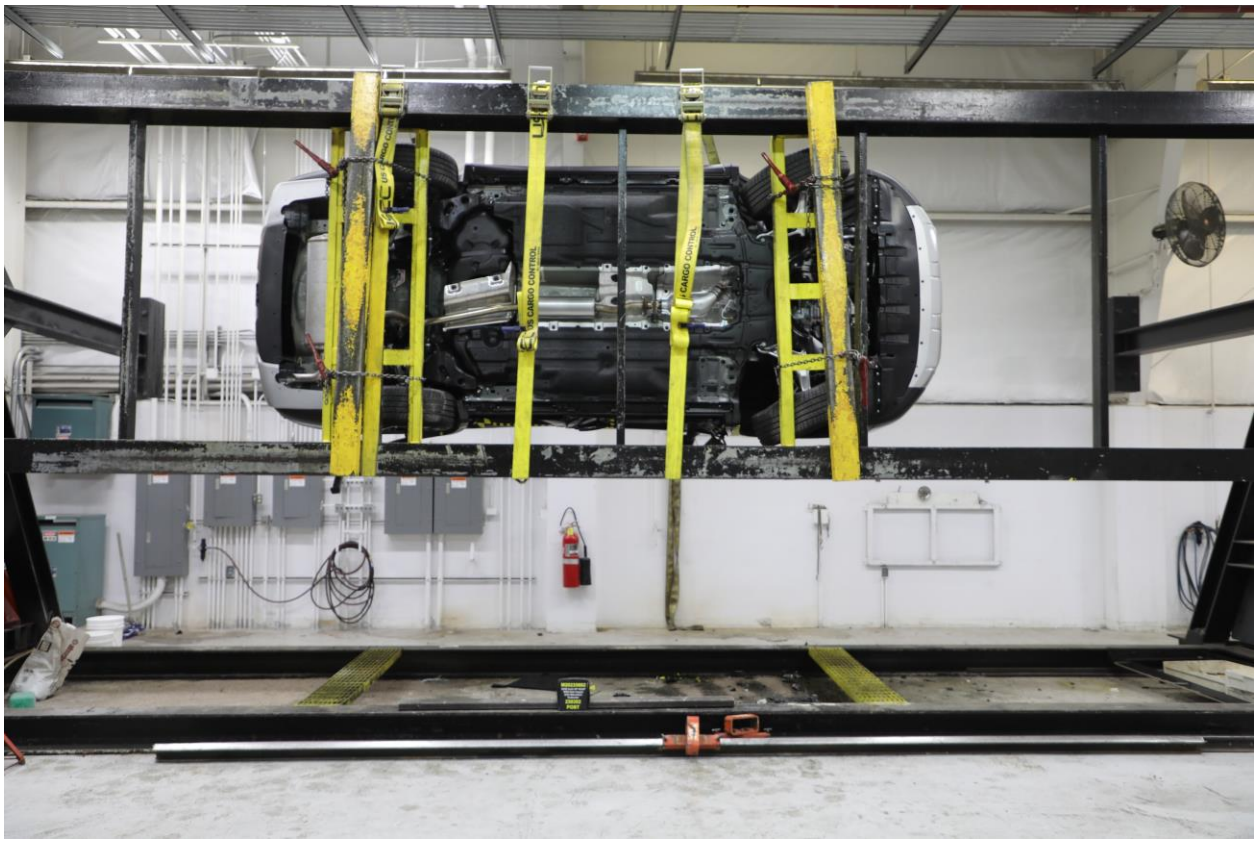


096 FMVSS No. 301 Static Rollover 0 Degrees

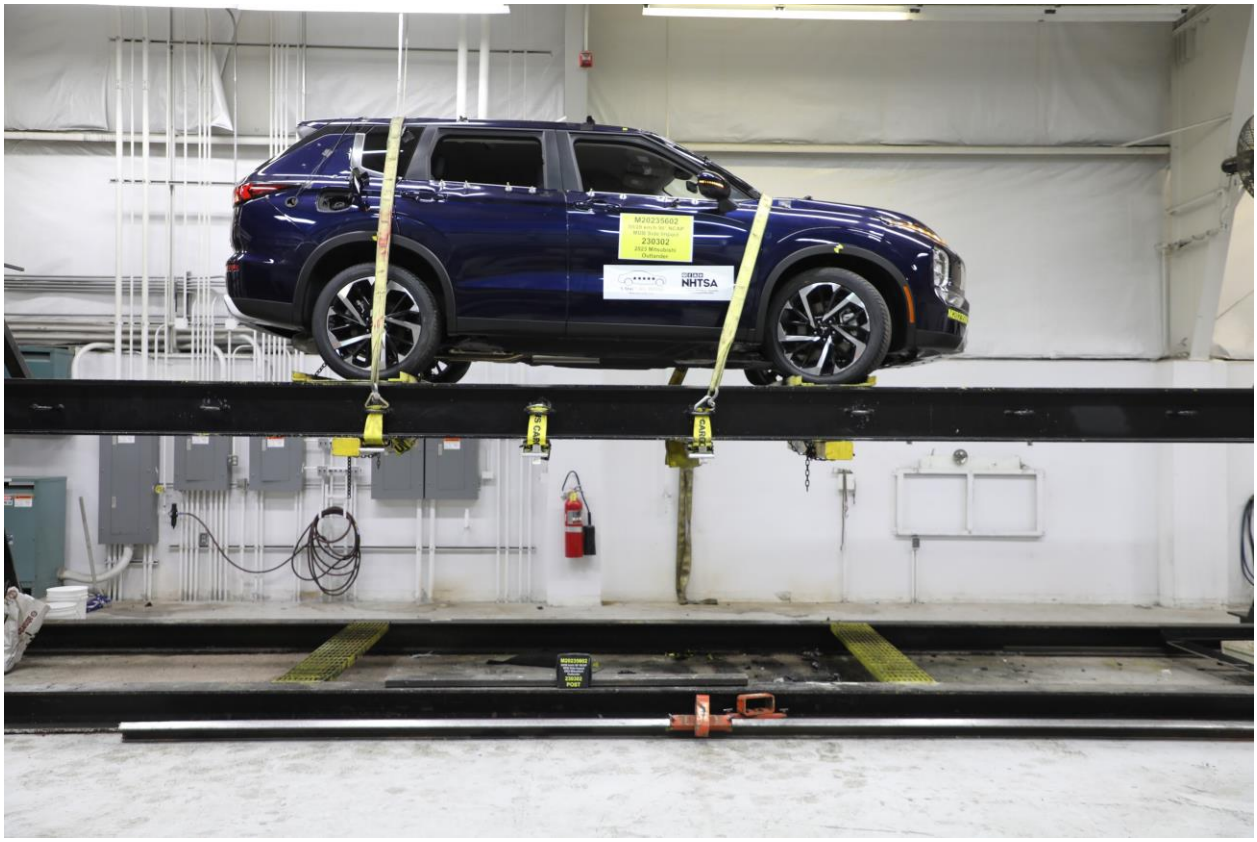
097 FMVSS No. 301 Static Rollover 90 Degrees



098 FMVSS No. 301 Static Rollover 180 Degrees

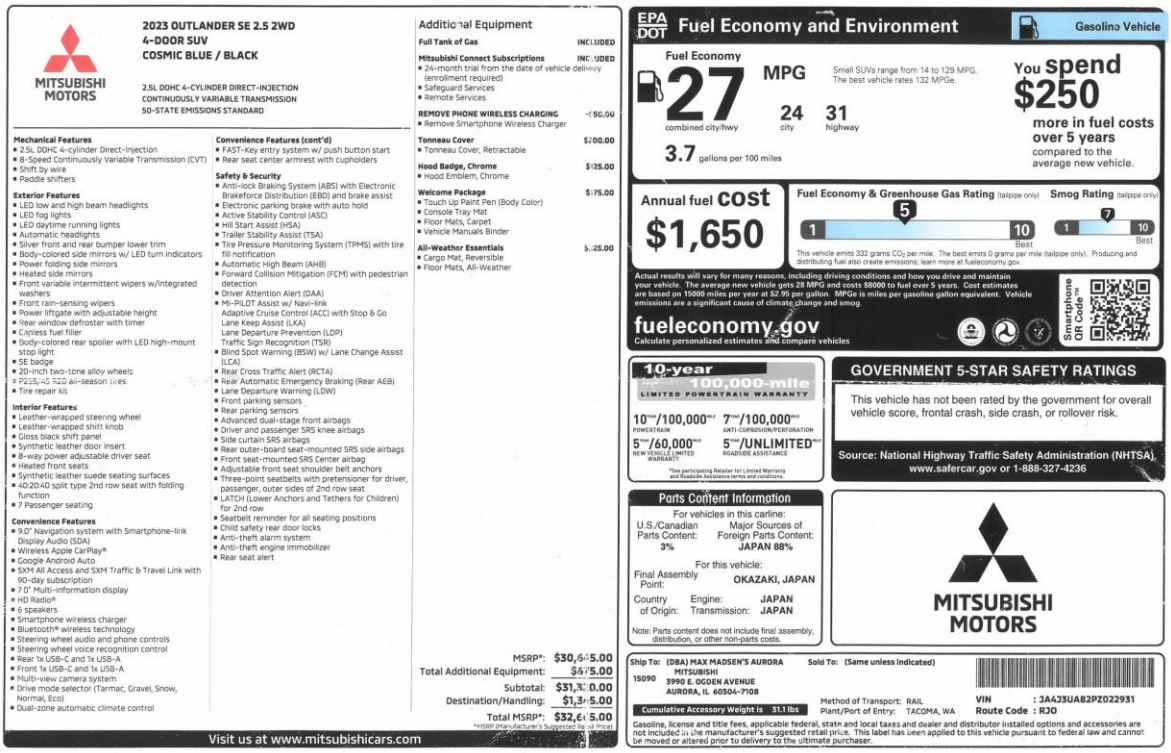


099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event



MITSUBISHI MOTORS

2023 OUTLANDER SE 2.5 2WD
4-DOOR SUV
COSMIC BLUE / BLACK

2.5L DOHC 4-CYLINDER DIRECT-INJECTION
CONTINUOUSLY VARIABLE TRANSMISSION
50-STATE EMISSIONS STANDARD

Mechanical Features
- 2.5L DOHC 4-cylinder Direct-Injection
- 8-Speed Continuously Variable Transmission (CVT)
- Shift by wire
- Paddle shifters

Exterior Features
- LED low and high beam headlights
- LED fog lights
- LED daytime running lights
- Automatic headlights
- Silver front and rear bumper lower trim
- Body-colored side mirrors w/ LED turn indicators
- Power folding side mirrors
- Heated side mirrors
- Front variable intermittent wipers w/integrated washers
- Front rain-sensing wipers
- Power liftgate with adjustable height
- Rear window defroster with timer
- Capless fuel filler
- Body-colored rear spoiler with LED high-mount stop light
- SE badge
- 20-inch two-tone alloy wheels
- P235/45 R20 all-season tires
- Tire repair kit

Interior Features
- Leather-wrapped steering wheel
- Leather-wrapped shift knob
- Gloss black shift panel
- Synthetic leather door insert
- 8-way power adjustable driver seat
- Heated front seats
- Synthetic leather suede seating surfaces
- 40:20:40 split type 2nd row seat with folding function
- 7 Passenger seating

Convenience Features
- 9.0" Navigation system with Smartphone-link Display Audio (SDA)
- Wireless Apple CarPlay®
- Google Android Auto
- SXM All Access and SXM Traffic & Travel Link with 90-day subscription
- 7.0" Multi-information display
- HD Radio®
- 6 speakers
- Smartphone wireless charger
- Bluetooth® wireless technology
- Steering wheel audio and phone controls
- Steering wheel voice recognition control
- Rear 1x USB-C and 1x USB-A
- Front 1x USB-C and 1x USB-A
- Multi-view camera system
- Drive mode selector (Tarmac, Gravel, Snow, Normal, Eco)
- Dual-zone automatic climate control

Convenience Features (cont'd)
- FAST-Key entry system w/ push button start
- Rear seat center armrest with cupholders

Safety & Security
- Anti-lock Braking System (ABS) with Electronic Brakeforce Distribution (EBD) and brake assist
- Electronic parking brake with auto hold
- Active Stability Control (ASC)
- Hill Start Assist (HSA)
- Trailer Stability Assist (TSA)
- Tire Pressure Monitoring System (TPMS) with tire fill notification
- Automatic High Beam (AHB)
- Forward Collision Mitigation (FCM) with pedestrian detection
- Driver Attention Alert (DAA)
- Mi-PILOT Assist w/ Navi-link
  Adaptive Cruise Control (ACC) with Stop & Go
  Lane Keep Assist (LKA)
  Lane Departure Prevention (LDP)
  Traffic Sign Recognition (TSR)
- Blind Spot Warning (BSW) w/ Lane Change Assist (LCA)
- Rear Cross Traffic Alert (RCTA)
- Rear Automatic Emergency Braking (Rear AEB)
- Lane Departure Warning (LDW)
- Front parking sensors
- Rear parking sensors
- Advanced dual-stage front airbags
- Driver and passenger SRS knee airbags
- Side curtain SRS airbags
- Rear outer-board seat-mounted SRS side airbags
- Front seat-mounted SRS Center airbag
- Adjustable front seat shoulder belt anchors
- Three-point seatbelts with pretensioner for driver, passenger, outer sides of 2nd row seat
- LATCH (Lower Anchors and Tethers for Children) for 2nd row
- Seatbelt reminder for all seating positions
- Child safety rear door locks
- Anti-theft alarm system
- Anti-theft engine immobilizer
- Rear seat alert

Additional Equipment

Full Tank of Gas	INCLUDED
Mitsubishi Connect Subscriptions ▪ 24-month trial from the date of vehicle delivery (enrollment required) ▪ Safeguard Services ▪ Remote Services	INCLUDED
REMOVE PHONE WIRELESS CHARGING ▪ Remove Smartphone Wireless Charger	-$0.00
Tonneau Cover ▪ Tonneau Cover, Retractable	$700.00
Hood Badge, Chrome ▪ Hood Emblem, Chrome	$125.00
Welcome Package ▪ Touch Up Paint Pen (Body Color) ▪ Console Tray Mat ▪ Floor Mats, Carpet ▪ Vehicle Manuals Binder	$175.00
All-Weather Essentials ▪ Cargo Mat, Reversible ▪ Floor Mats, All-Weather	$325.00
MSRP*:	$30,645.00
Total Additional Equipment:	$675.00
Subtotal:	$31,320.00
Destination/Handling:	$1,325.00
Total MSRP*:	$32,645.00

*MSRP (Manufacturer's Suggested Retail Price)

Visit us at www.mitsubishicars.com

EPA DOT **Fuel Economy and Environment** — Gasoline Vehicle

Fuel Economy: **27** MPG combined city/hwy — 24 city — 31 highway
3.7 gallons per 100 miles

Small SUVs range from 14 to 129 MPG. The best vehicle rates 132 MPGe.

You spend **$250** more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost **$1,650**

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 5 (1–10, Best)
Smog Rating (tailpipe only): 7 (1–10, Best)

This vehicle emits 332 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs $8000 to fuel over 5 years. Cost estimates are based on 15000 miles per year at $2.95 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code™

10-year/100,000-mile LIMITED POWERTRAIN WARRANTY

10yr/100,000mi POWERTRAIN
7yr/100,000mi ANTI-CORROSION/PERFORATION
5yr/60,000mi NEW VEHICLE LIMITED WARRANTY
5yr/UNLIMITED mi ROADSIDE ASSISTANCE
*See participating Retailer for Limited Warranty and Roadside Assistance terms and conditions.

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

Parts Content Information

For vehicles in this carline:
U.S./Canadian Parts Content: 3%
Major Sources of Foreign Parts Content: JAPAN 88%

For this vehicle:
Final Assembly Point: OKAZAKI, JAPAN
Country of Origin: Engine: JAPAN; Transmission: JAPAN

Note: Parts content does not include final assembly, distribution, or other non-parts costs.

MITSUBISHI MOTORS

Ship To: (DBA) MAX MADSEN'S AURORA MITSUBISHI
15090 3990 E. OGDEN AVENUE
AURORA, IL 60504-7108

Sold To: (Same unless indicated)

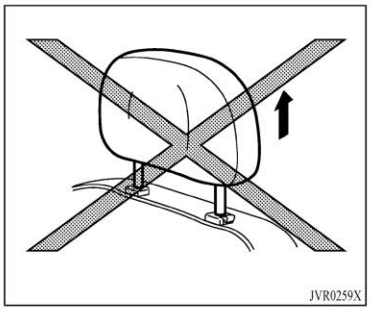
Cumulative Accessory Weight is 31.1 lbs

Method of Transport: RAIL
Plant/Port of Entry: TACOMA, WA

VIN : JA4J3UA82PZ022931
Route Code : RJO

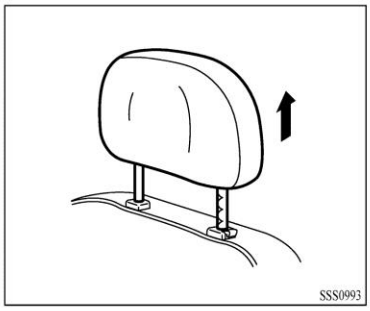
Gasoline, license and title fees, applicable federal, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price. This label has been applied to this vehicle pursuant to federal law and cannot be moved or altered prior to delivery to the ultimate purchaser.

102 Monroney Label



For non-adjustable head restraint

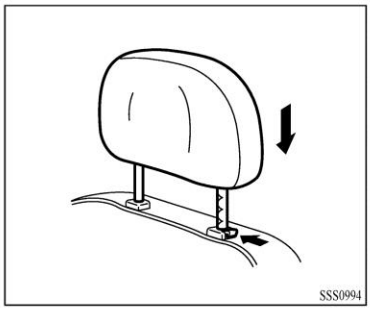
Make sure the head restraint is positioned so the lock knob is engaged in the notch before riding in that designated seating position.



Raise

To raise the head restraint, pull it up.

Make sure the head restraint is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

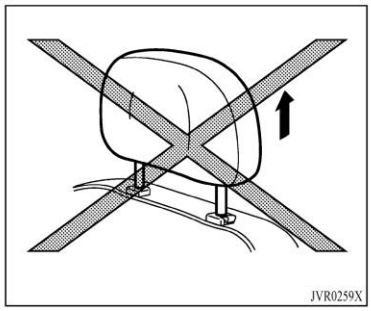


Lower

To lower, push and hold the lock knob and push the head restraint down.

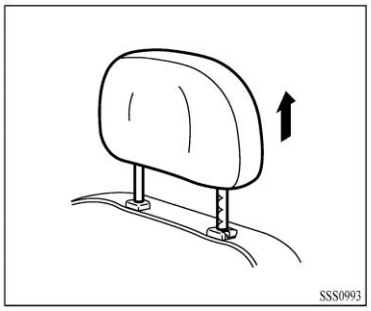
Make sure the head restraint is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

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



For non-adjustable head restraint

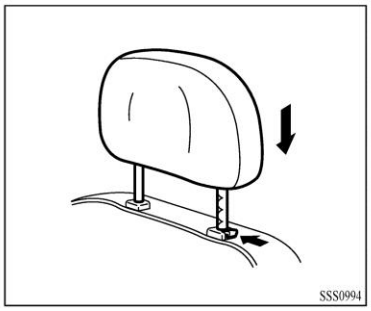
Make sure the head restraint is positioned so the lock knob is engaged in the notch before riding in that designated seating position.



Raise

To raise the head restraint, pull it up.

Make sure the head restraint is positioned so the lock knob is engaged in the notch before riding in that designated seating position.



Lower

To lower, push and hold the lock knob and push the head restraint down.

Make sure the head restraint is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

NHTSA

Test Date: 03/02/2023

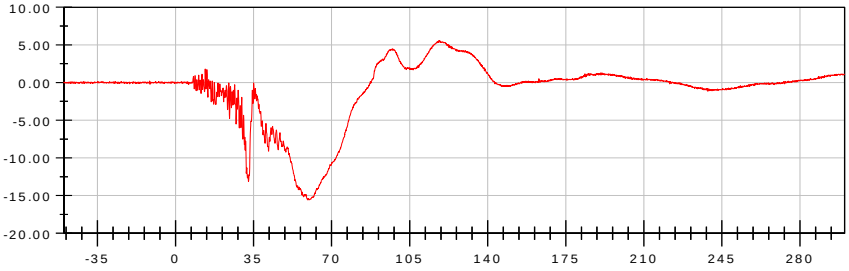
Test Lab: CTF

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

Test Number: 230302 (M20235602)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

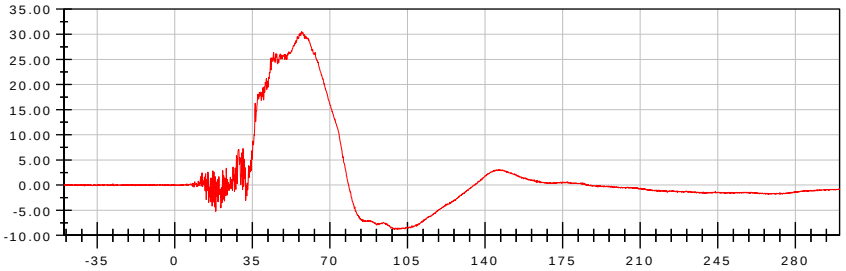
5.58 g at 118.16 ms

<Min>

-15.59 g at 59.20 ms

CFC_1000

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



<Max>

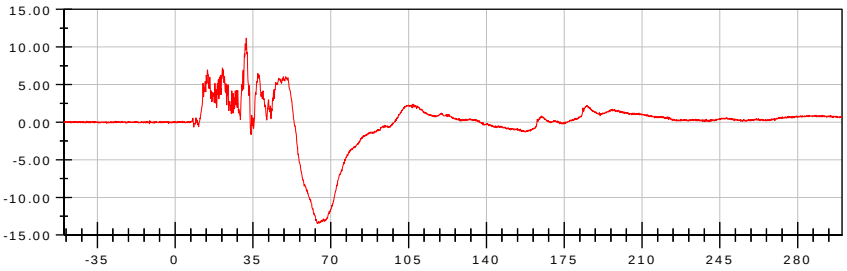
30.51 g at 57.28 ms

<Min>

-8.85 g at 99.12 ms

CFC_1000

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



<Max>

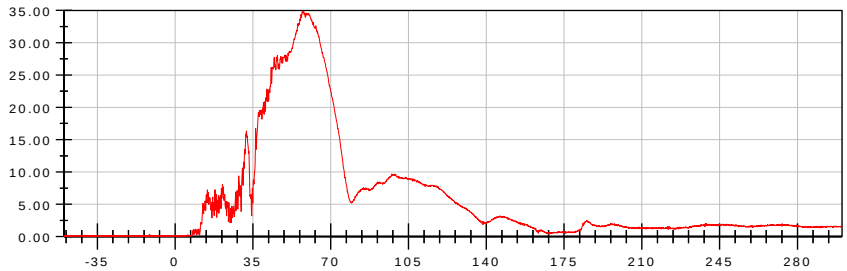
11.17 g at 32.00 ms

<Min>

-13.43 g at 63.84 ms

CFC_1000

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



<Max>

34.85 g at 57.84 ms

<Min>

0.04 g at -49.68 ms

CFC_1000

NHTSA

Test Date: 03/02/2023

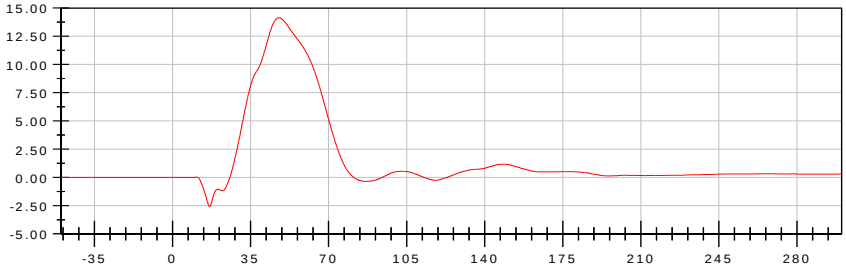
Test Lab: CTF

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

Position #4 SID IIs Dummy (DQ0570)

Test Number: 230302 (M20235602)

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



<Max>

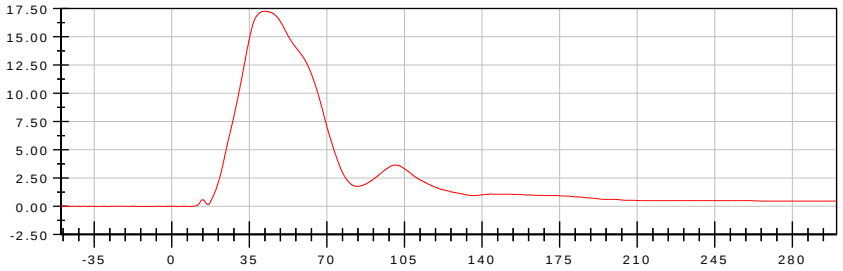
14.14 mm at 47.68 ms

<Min>

-2.59 mm at 16.64 ms

CFC_180

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



<Max>

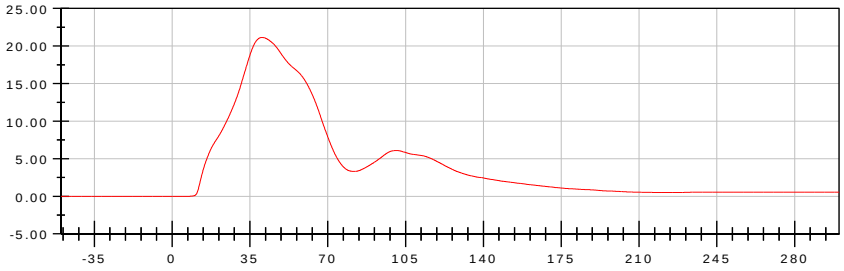
17.26 mm at 42.08 ms

<Min>

0.00 mm at 8.56 ms

CFC_180

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



<Max>

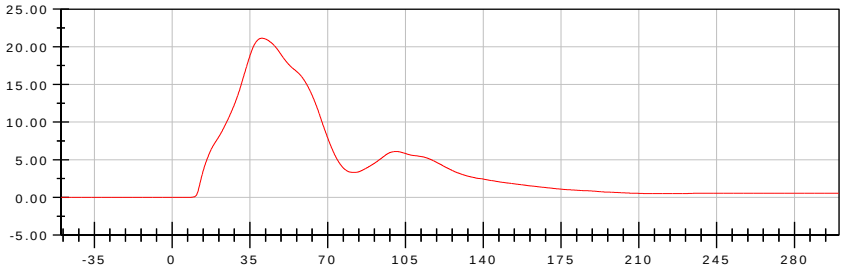
21.13 mm at 40.40 ms

<Min>

0.00 mm at 7.12 ms

CFC_180

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



<Max>

21.13 mm at 40.40 ms

<Min>

0.00 mm at 7.12 ms

CFC_180

NHTSA

Test Date: 03/02/2023

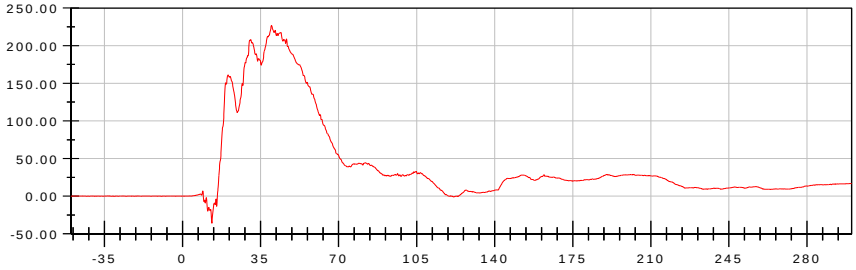
Test Lab: CTF

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

Test Number: 230302 (M20235602)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

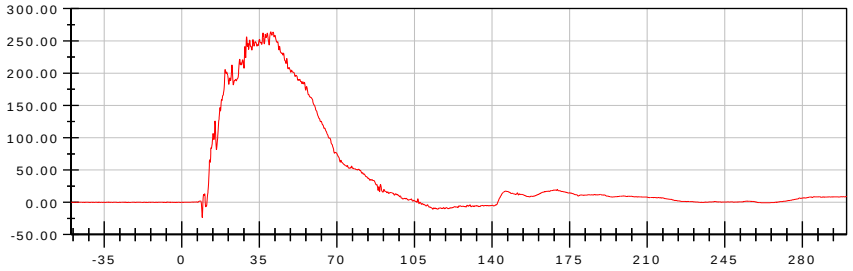
226.83 N at 39.92 ms

<Min>

-35.85 N at 13.12 ms

CFC_600

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



<Max>

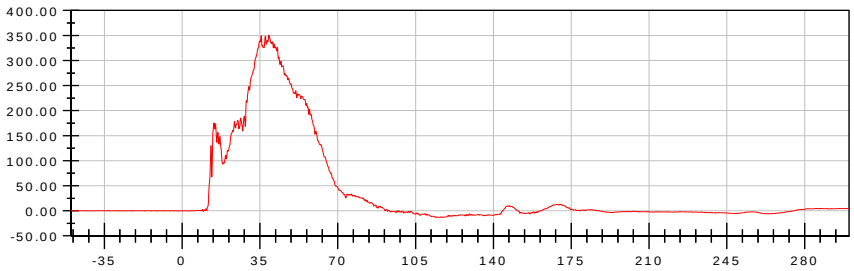
263.97 N at 40.16 ms

<Min>

-23.47 N at 9.20 ms

CFC_600

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



<Max>

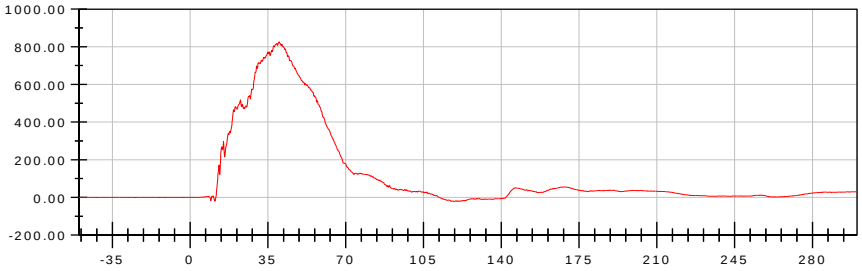
350.81 N at 39.04 ms

<Min>

-13.32 N at 117.44 ms

CFC_600

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



<Max>

826.13 N at 40.08 ms

<Min>

-20.87 N at 120.00 ms

CFC_600

NHTSA

Test Date: 03/02/2023

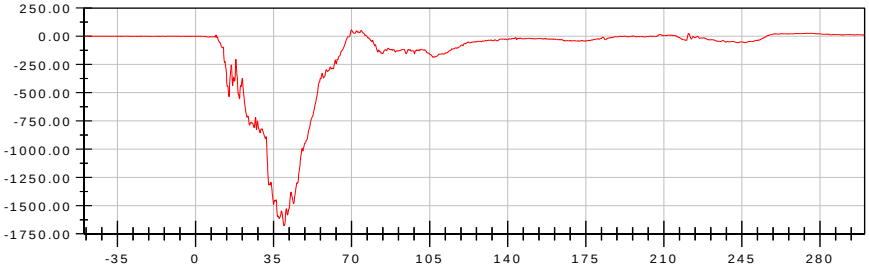
Test Lab: CTF

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

Test Number: 230302 (M20235602)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

56.95 N at 69.92 ms

<Min>

-1,678.42 N at 39.68 ms

CFC_600

NHTSA

Test Date: 03/02/2023

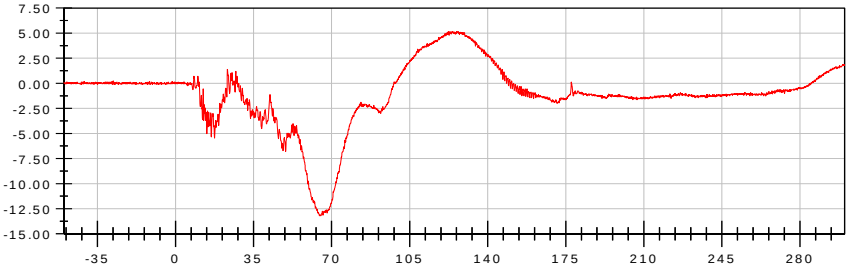
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 230302 (M20235602)

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



<Max>

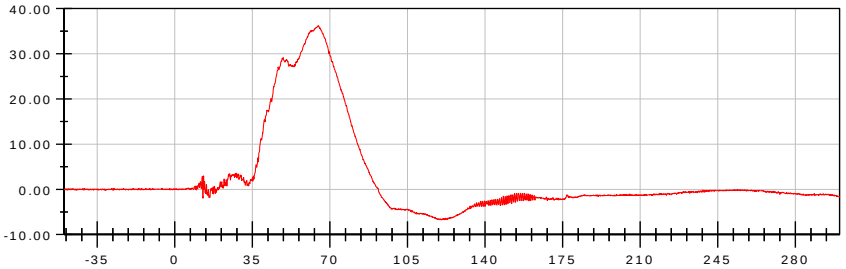
5.15 g at 122.32 ms

<Min>

-13.19 g at 64.48 ms

CFC_1000

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



<Max>

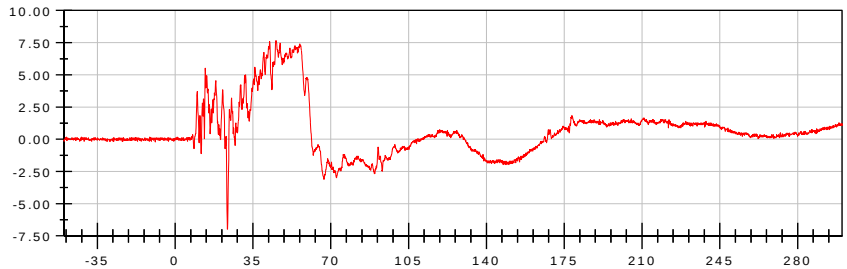
36.21 g at 64.80 ms

<Min>

-6.73 g at 119.76 ms

CFC_1000

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



<Max>

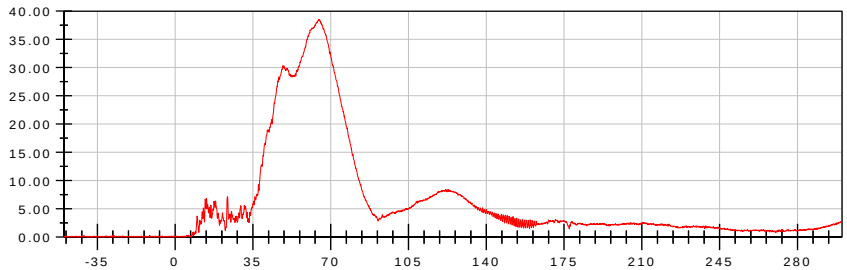
7.65 g at 45.20 ms

<Min>

-6.99 g at 23.52 ms

CFC_1000

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



<Max>

38.52 g at 64.80 ms

<Min>

0.03 g at -49.76 ms

CFC_1000

NHTSA

Test Date: 03/02/2023

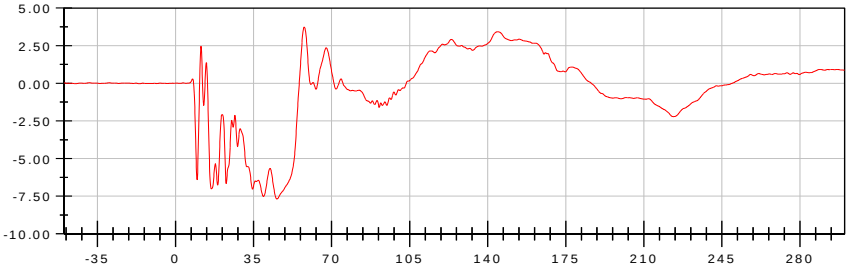
Test Lab: CTF

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

Test Number: 230302 (M20235602)

Position #4 SID IIs Dummy (DQ0570)

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



<Max>

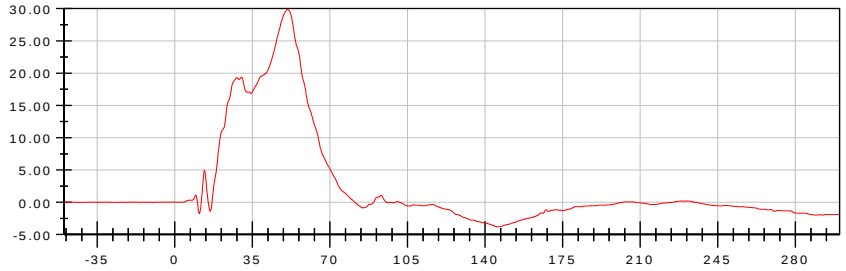
3.73 g at 57.68 ms

<Min>

-7.68 g at 45.44 ms

CFC_180

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



<Max>

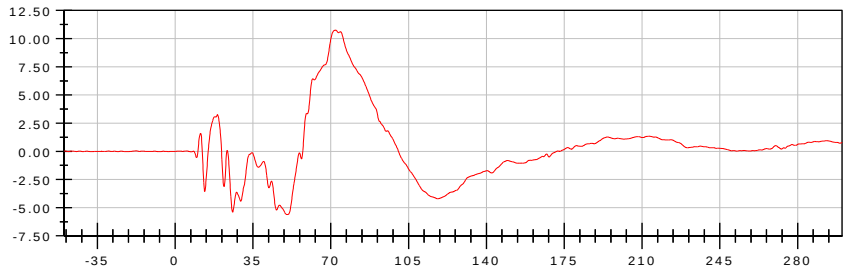
29.86 g at 50.96 ms

<Min>

-3.81 g at 146.32 ms

CFC_180

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



<Max>

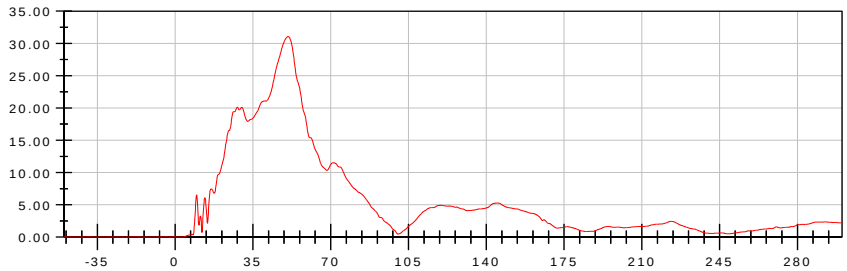
10.75 g at 72.16 ms

<Min>

-5.62 g at 50.40 ms

CFC_180

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



<Max>

31.07 g at 50.80 ms

<Min>

0.00 g at -47.28 ms

CFC_180

NHTSA

Test Date: 03/02/2023

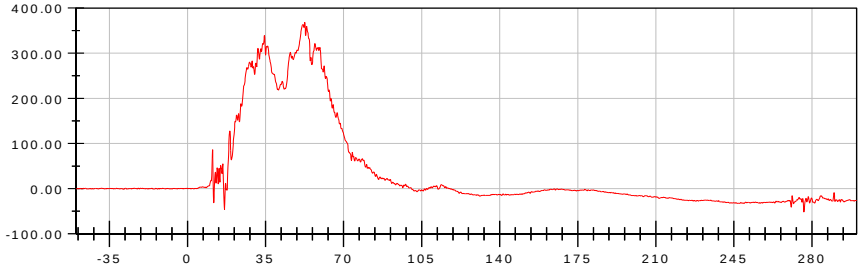
Position #1 ES-2 Dummy with Rib Extension (F030)

Position #4 SID IIs Dummy (DQ0570)

Test Lab: CTF

Test Number: 230302 (M20235602)

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



<Max>

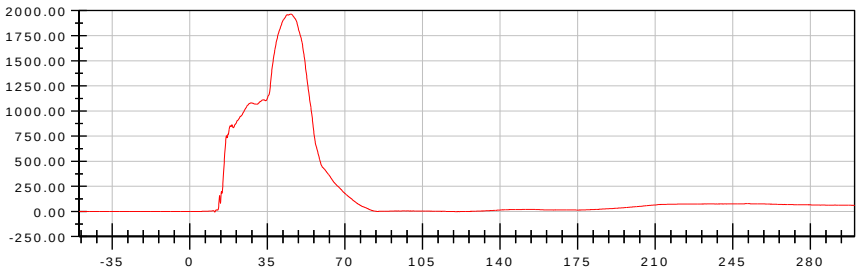
368.07 N at 52.56 ms

<Min>

-51.67 N at 276.40 ms

CFC_600

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



<Max>

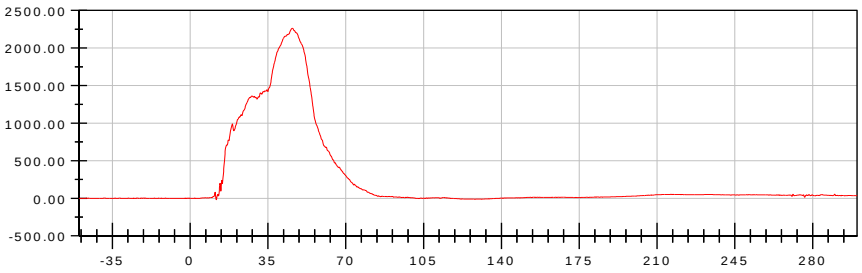
1,965.19 N at 45.68 ms

<Min>

-6.18 N at 11.28 ms

CFC_600

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



<Max>

2,263.86 N at 46.00 ms

<Min>

-17.64 N at 11.76 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. 86

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. 86-2
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Resultant Acceleration	125 - 155 g	129.7 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.4 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	3.76 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

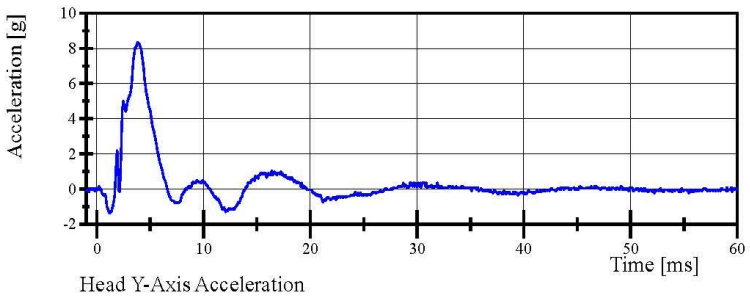
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

02.20.2023 13:30:26 362

Transportation Research Center Inc.

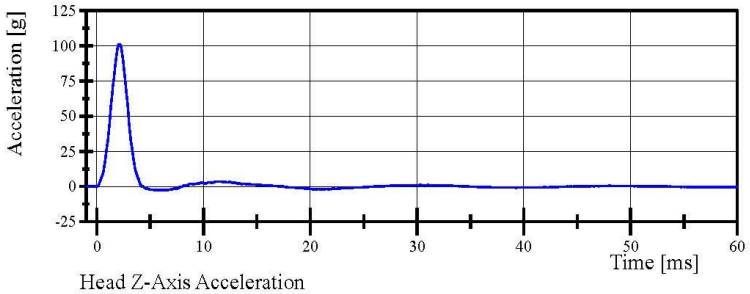
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 86-2
Test Date: 2/20/2023

Head X-Axis Acceleration



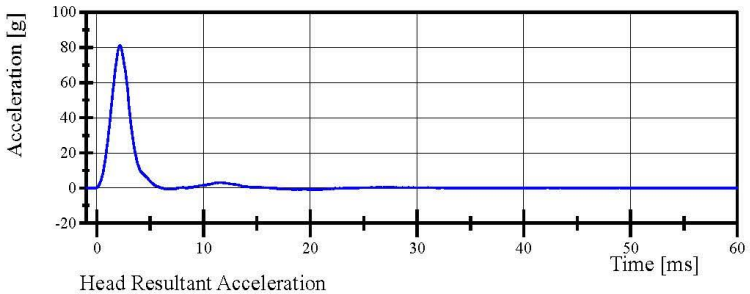
Filter Class: CFC_1000
Max: 8.4 g at 3.8 ms
Min: -1.4 g at 1.2 ms

Head Y-Axis Acceleration



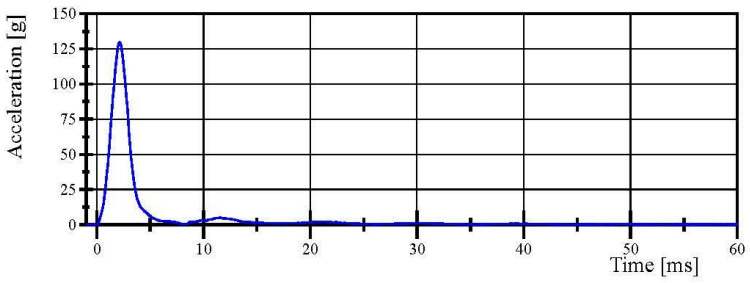
Filter Class: CFC_1000
Max: 101.4 g at 2.2 ms
Min: -2.6 g at 6.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 81.0 g at 2.2 ms
Min: -1.0 g at 20.3 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 129.7 g at 2.2 ms
Min: 0.0 g at 34.8 ms

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

02.20.2023 13:30:50 362

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.35 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-51.0 deg	Yes
Time of Peak	54 - 66 ms	57.2 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	55.2 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 05053

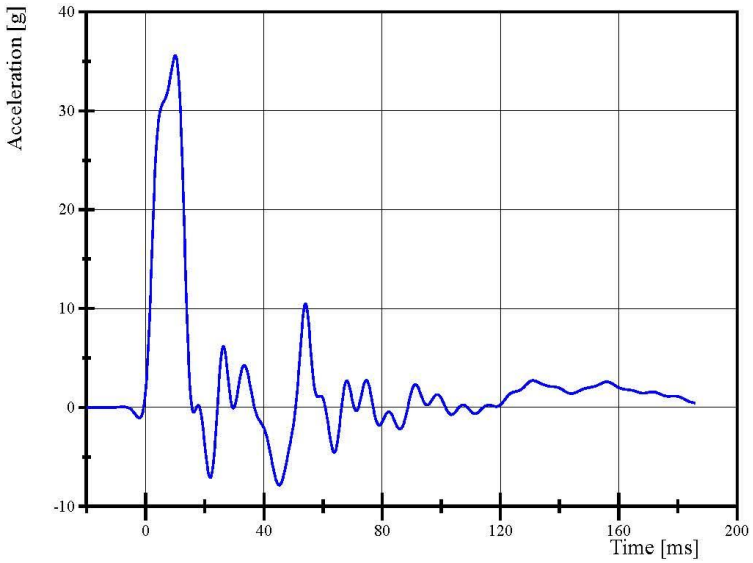
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

02.20.2023 13:23:56 1502

Transportation Research Center Inc.

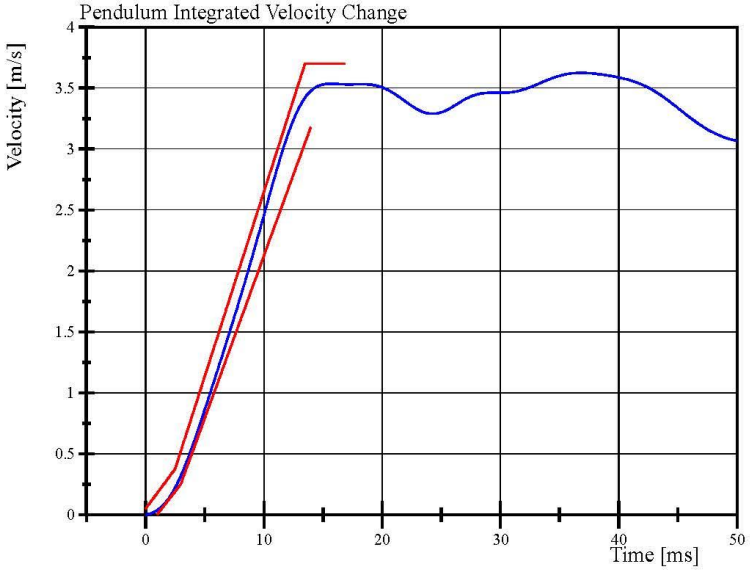
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Pendulum Acceleration



Filter Class: CFC_60
Max: 35.6 g at 10.1 ms
Min: -7.9 g at 45.2 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 36.8 ms
Min: 0.0 m/s at 0.0 ms

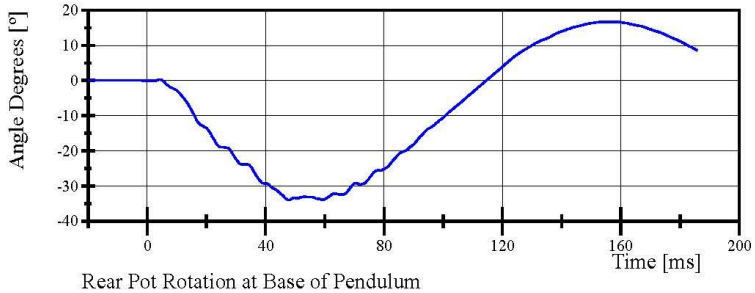
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 13:24:23 1502

Transportation Research Center Inc.

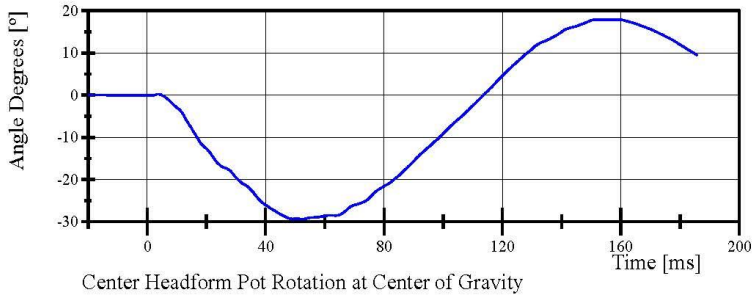
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Forward Pot Rotation at Base of Pendulum



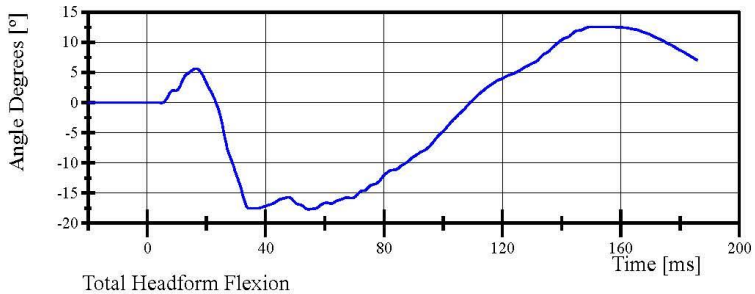
Filter Class: CFC_180
Max: 16.7 ° at 156.6 ms
Min: -34.0 ° at 47.8 ms

Rear Pot Rotation at Base of Pendulum



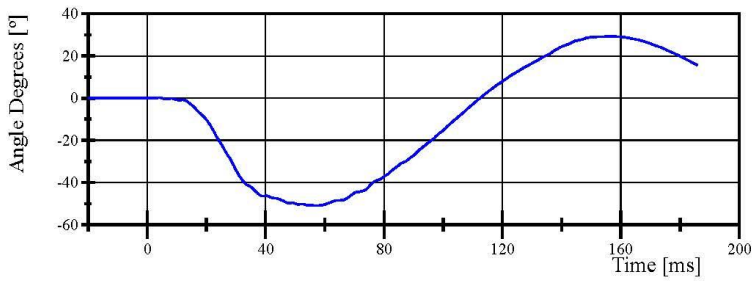
Filter Class: CFC_180
Max: 17.9 ° at 158.5 ms
Min: -29.4 ° at 52.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 12.6 ° at 149.6 ms
Min: -17.7 ° at 54.5 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 29.3 ° at 156.3 ms
Min: -51.0 ° at 57.2 ms

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

02.20.2023 13:24:23 1502

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.14 g	Yes

Test meets specifications.

Condition: Used

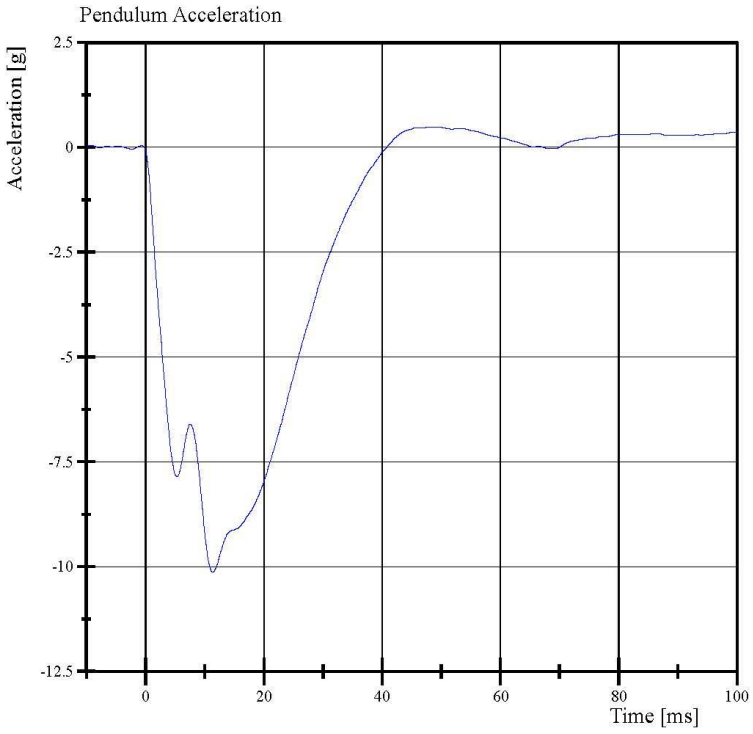
Comments:
Arm S/N: 175-3501-07014

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

02.20.2023 14:12:58 584

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 0.5 g at 48.6 ms
Min: -10.1 g at 11.4 ms

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

02.20.2023 14:13:30 584

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.5 mm	Yes

Test meets specifications.

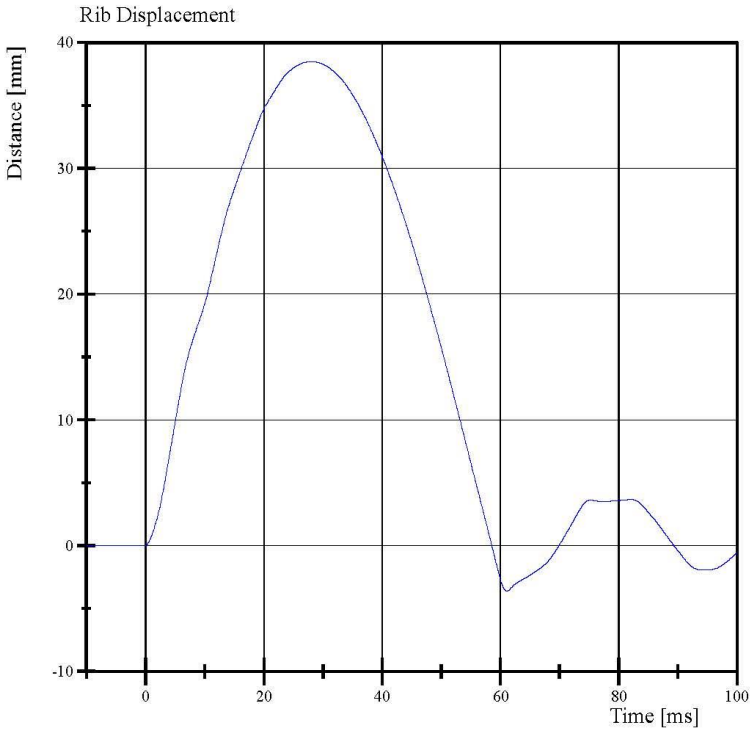
Condition: Used
Comments:
Drop Height: 462 mm
Rib Foam S/N: EK6973

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

02.20.2023 10:34:34 626

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 38.5 mm at 28.0 ms
Min: -3.6 mm at 61.0 ms

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

02.20.2023 10:35:06 626

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.5 mm	Yes

Test meets specifications.

Condition: Used

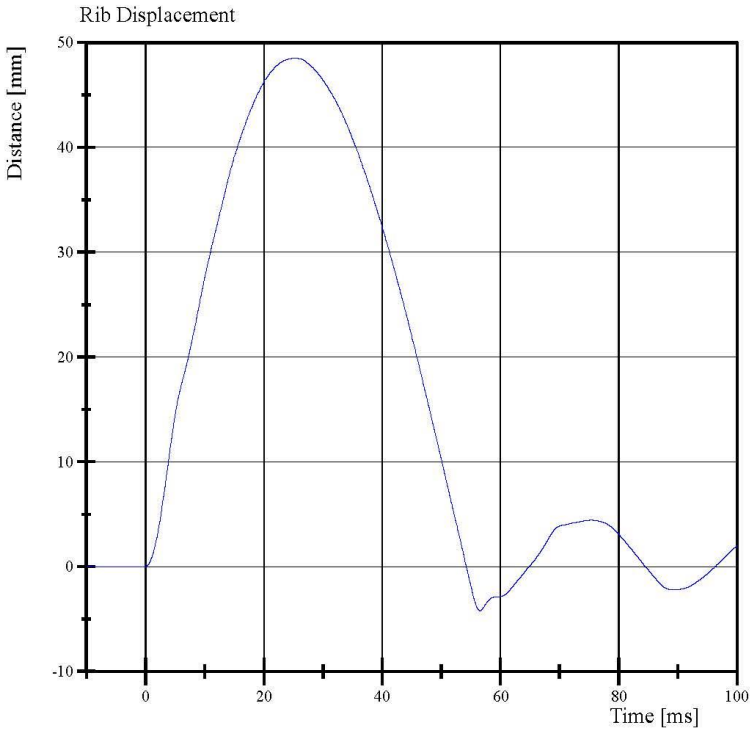
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6973

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

02.20.2023 10:28:16 519

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 48.5 mm at 25.4 ms
Min: -4.2 mm at 56.6 ms

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

02.20.2023 10:28:57 519

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.5 mm	Yes

Test meets specifications.

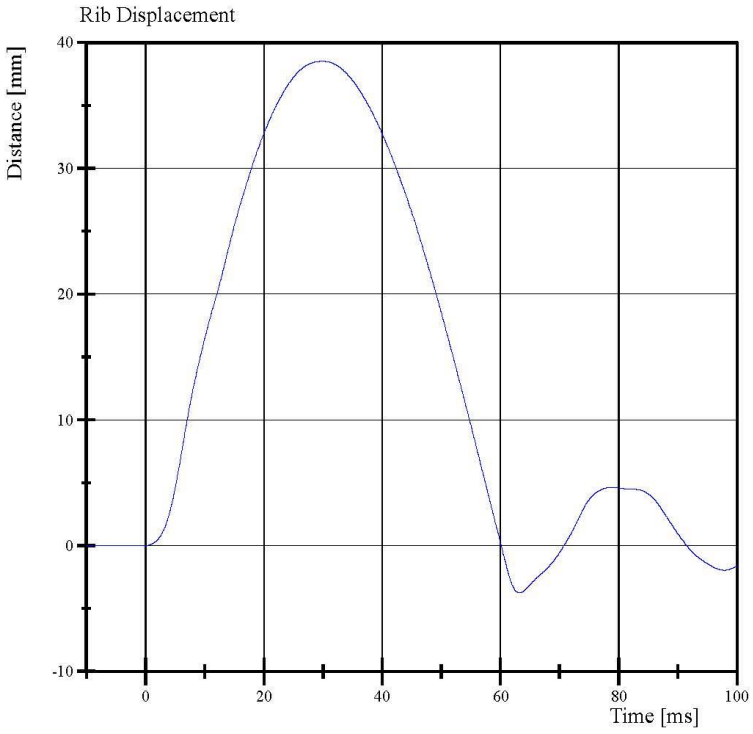
Condition: Used
Comments:
Drop Height: 462mm
Rib Foam S/N: EK6970

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

02.20.2023 10:49:32 607

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 38.5 mm at 29.8 ms
Min: -3.8 mm at 63.2 ms

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

02.20.2023 10:50:19 607

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	50.0 mm	Yes

Test meets specifications.

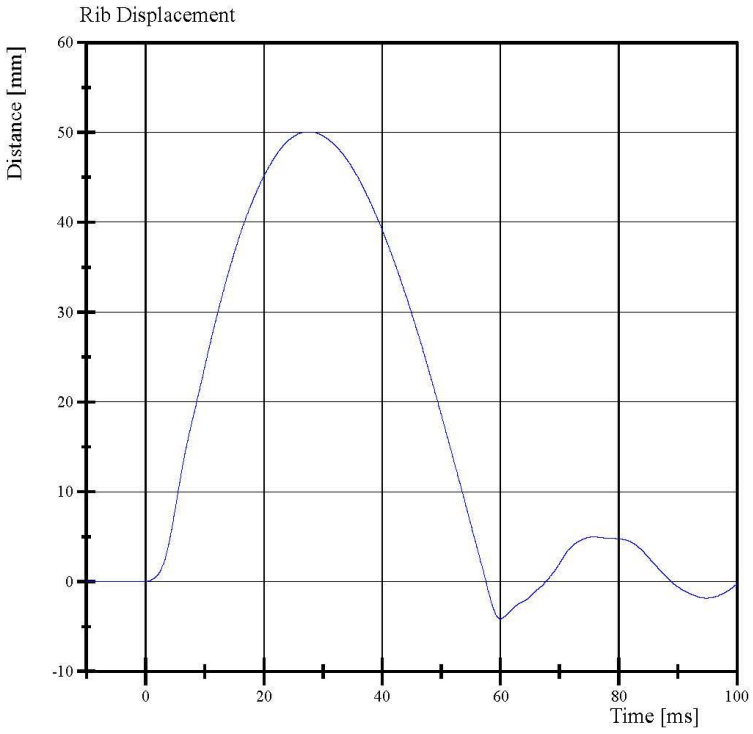
Condition: Used
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6970

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

02.20.2023 10:42:58 502

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 50.0 mm at 27.7 ms
Min: -4.1 mm at 60.0 ms

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

02.20.2023 10:43:29 502

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.5 mm	Yes

Test meets specifications.

Condition: Used

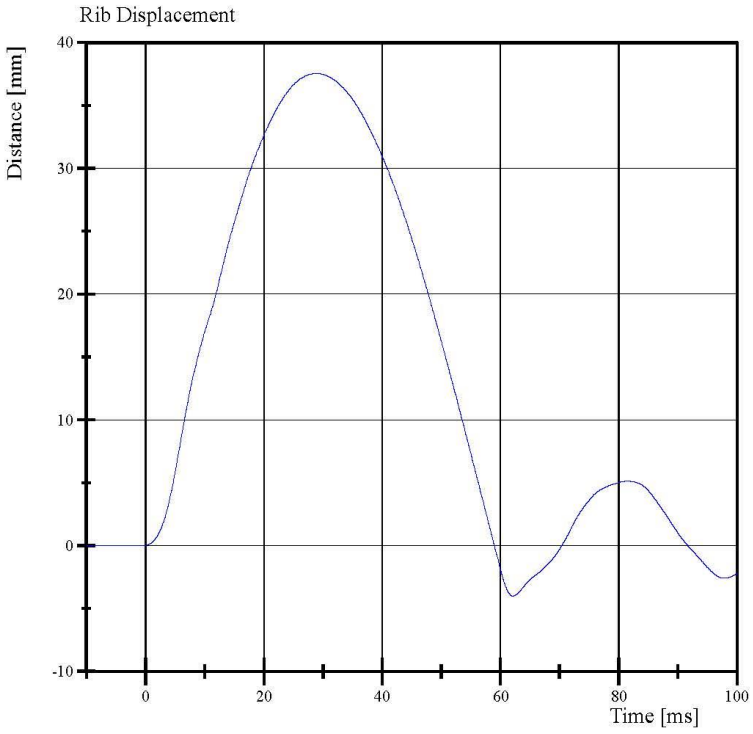
Comments:
Drop Height: 462 mm
Rib Foam S/N: EK6971

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

02.20.2023 11:00:41 606

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 37.5 mm at 28.9 ms
Min: -4.0 mm at 62.1 ms

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

02.20.2023 11:01:13 606

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.8 mm	Yes

Test meets specifications.

Condition: Used

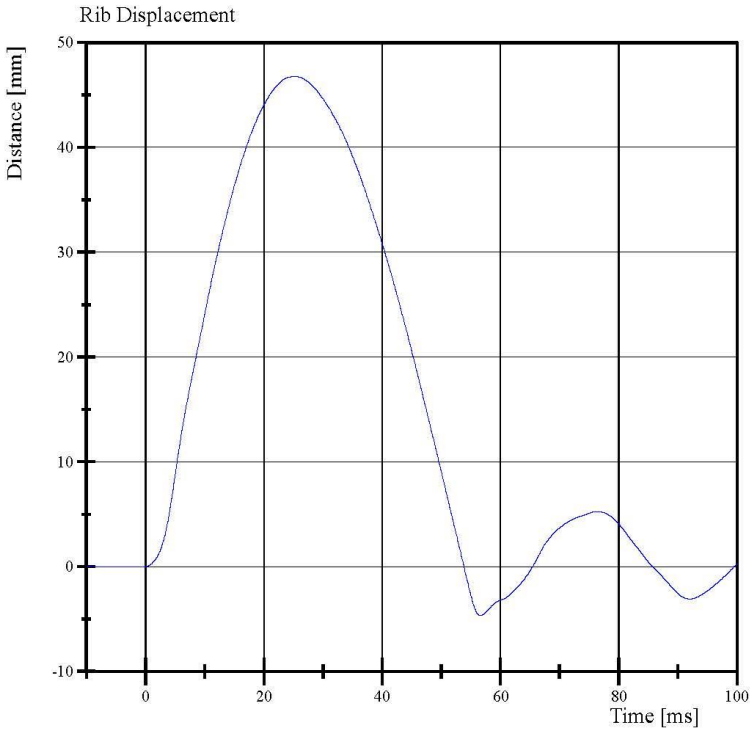
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6971

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

02.20.2023 10:55:55 511

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 46.8 mm at 25.2 ms
Min: -4.7 mm at 56.6 ms

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

02.20.2023 10:56:33 511

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.439 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,289.9 N	Yes
Upper Rib Displacement	34 - 41 mm	38.3 mm	Yes
Center Rib Displacement	37 - 45 mm	41.5 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.7 mm	Yes

Test meets specifications.

Condition: Used

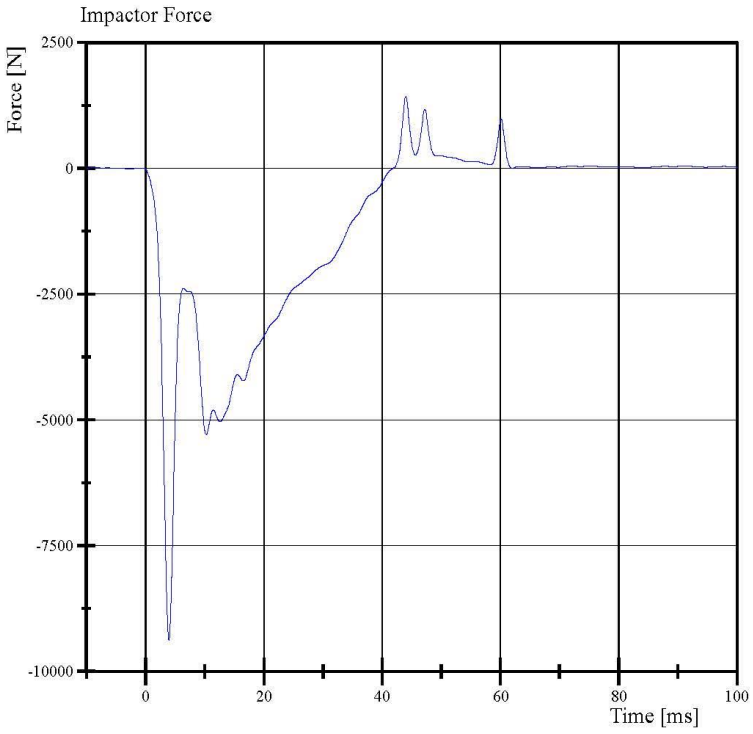
Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

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

02.20.2023 14:19:23 495

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023



Filter Class: CFC_180
Max: 1,427.1 N at 44.0 ms
Min: -9,385.0 N at 3.9 ms

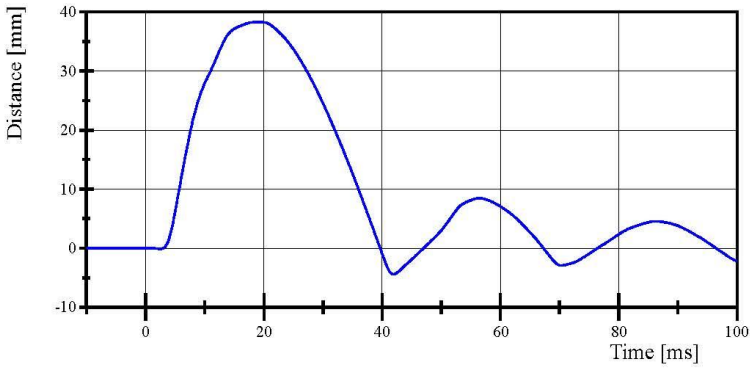
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 14:20:19 495

Transportation Research Center Inc.

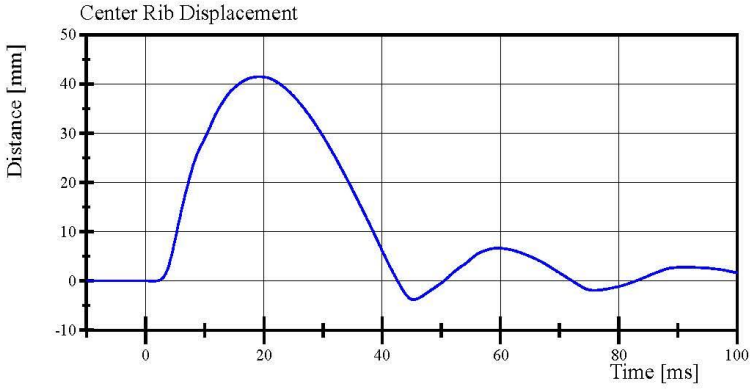
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Upper Rib Displacement



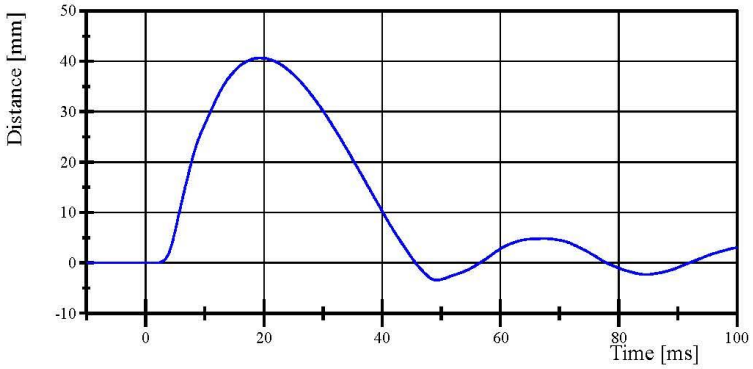
Filter Class: CFC_180
Max: 38.3 mm at 19.0 ms
Min: -4.4 mm at 41.9 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.5 mm at 19.2 ms
Min: -3.8 mm at 45.4 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.7 mm at 19.4 ms
Min: -3.4 mm at 49.3 ms

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

02.20.2023 14:20:19 495

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 86-3
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.143 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-46.2 deg	Yes
Time of Peak	39 - 53 ms	42.4 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.5 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Lumbar S/N: DS3472

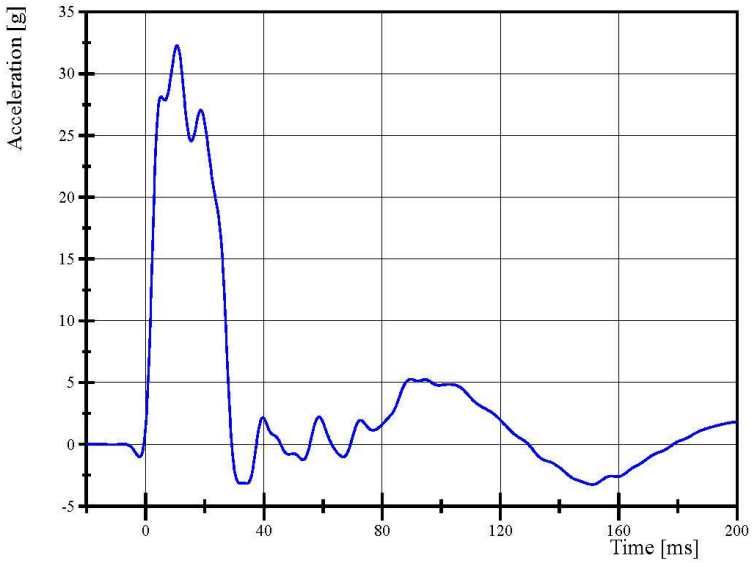
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

02.20.2023 13:07:09 668

Transportation Research Center Inc.

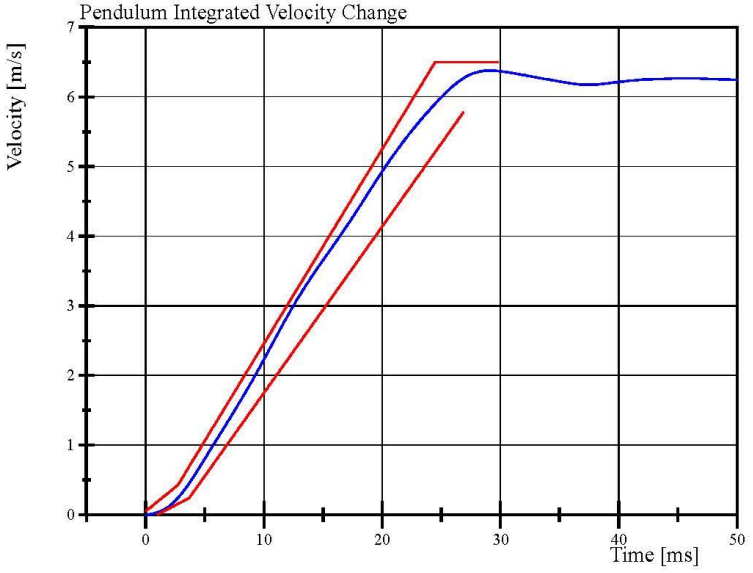
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 86-3
Test Date: 2/20/2023

Pendulum Acceleration



Filter Class: CFC_60
Max: 32.3 g at 10.6 ms
Min: -3.2 g at 151.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.4 m/s at 29.1 ms
Min: 0.0 m/s at 0.0 ms

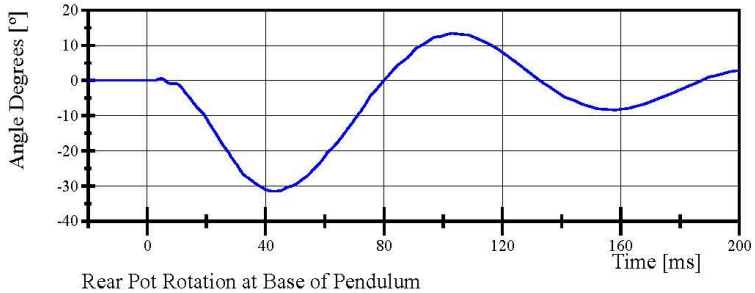
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 13:07:44 668

Transportation Research Center Inc.

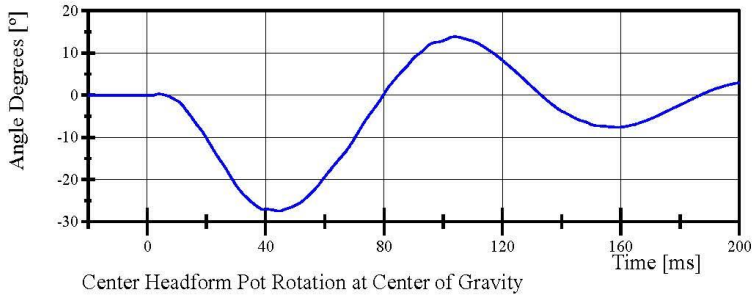
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 86-3
Test Date: 2/20/2023

Forward Pot Rotation at Base of Pendulum



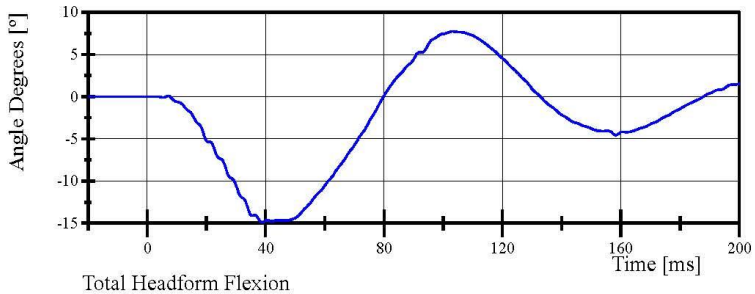
Filter Class: CFC_180
Max: 13.4 ° at 103.2 ms
Min: -31.5 ° at 42.9 ms

Rear Pot Rotation at Base of Pendulum



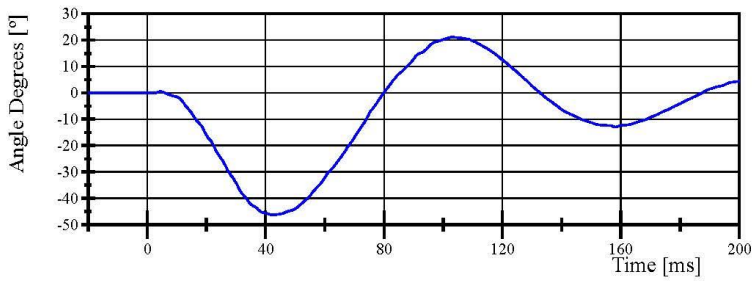
Filter Class: CFC_180
Max: 13.9 ° at 103.9 ms
Min: -27.5 ° at 44.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 7.7 ° at 103.2 ms
Min: -14.9 ° at 38.8 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 21.1 ° at 103.2 ms
Min: -46.2 ° at 42.4 ms

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

02.20.2023 13:07:44 668

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.04 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,392.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.52 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,434.1 N	Yes
Time of Peak	10.0 - 12.3 ms	10.64 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Abdomen S/N: 1066

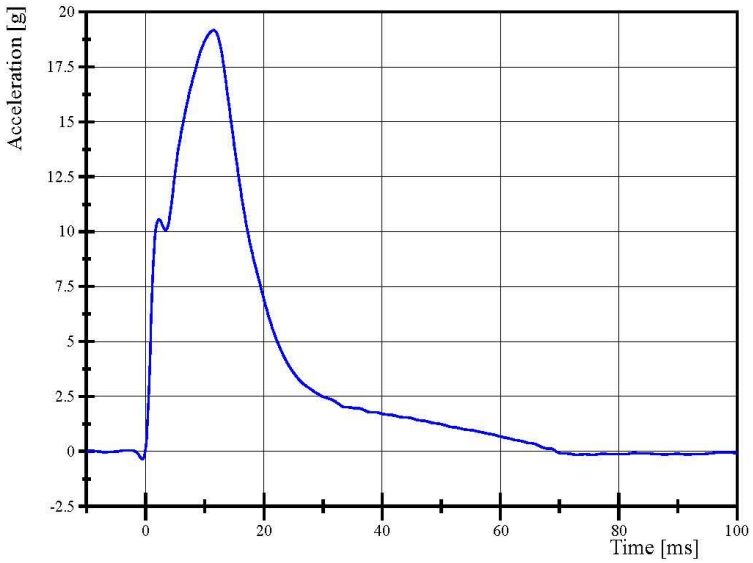
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 14:28:42 638

Transportation Research Center Inc.

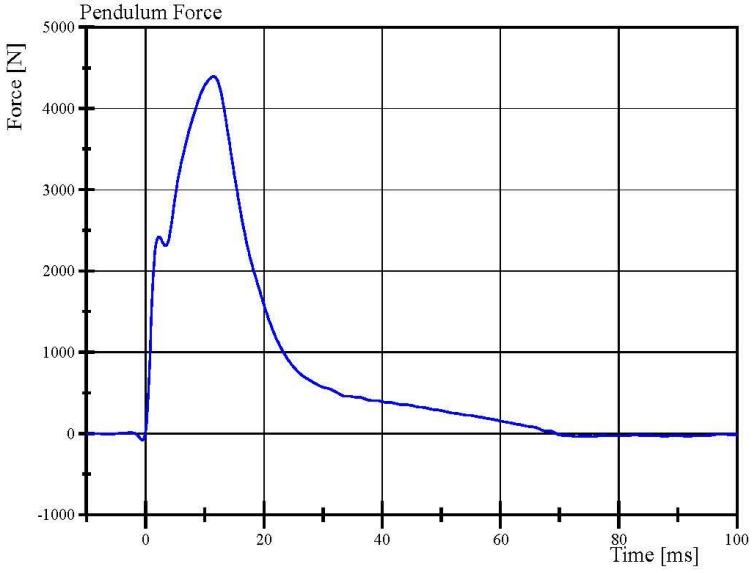
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Pendulum Acceleration



Filter Class: CFC_180
Max: 19.2 g at 11.5 ms
Min: -0.4 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,392.3 N at 11.5 ms
Min: -82.5 N at -0.6 ms

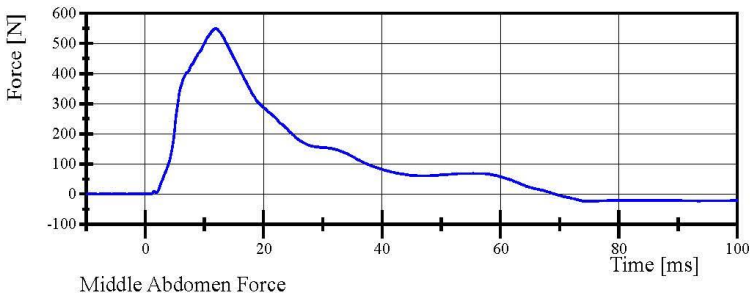
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 14:29:09 638

Transportation Research Center Inc.

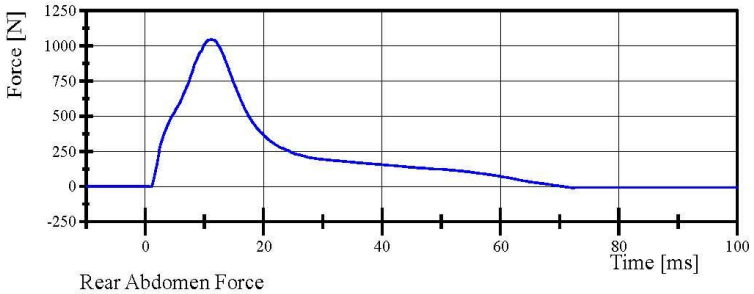
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 86-1
Test Date: 2/20/2023

Front Abdomen Force



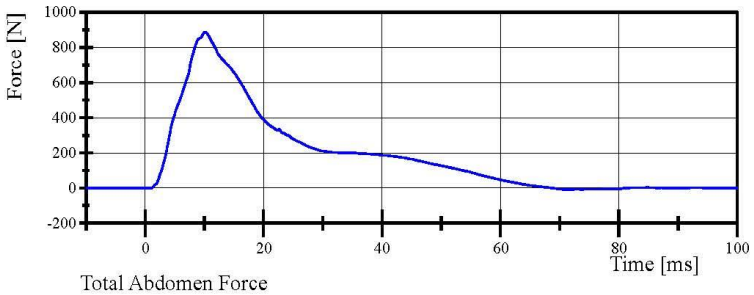
Filter Class: CFC_600
Max: 549.8 N at 11.9 ms
Min: -24.1 N at 74.3 ms

Middle Abdomen Force



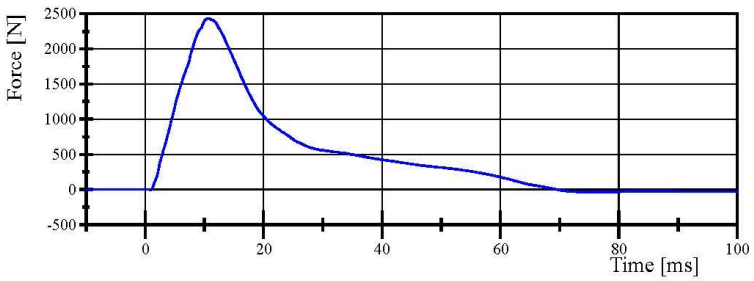
Filter Class: CFC_600
Max: 1,044.0 N at 11.3 ms
Min: -8.3 N at 72.2 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 887.6 N at 10.1 ms
Min: -7.4 N at 71.8 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,434.1 N at 10.6 ms
Min: -38.1 N at 74.2 ms

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

02.20.2023 14:29:09 638

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 86-2
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.37 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,291.9 N	Yes
Time of Peak	11.8 - 16.1 ms	12.32 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,384.4 N	Yes
Time of Peak	12.2 - 17.0 ms	12.32 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: N/A

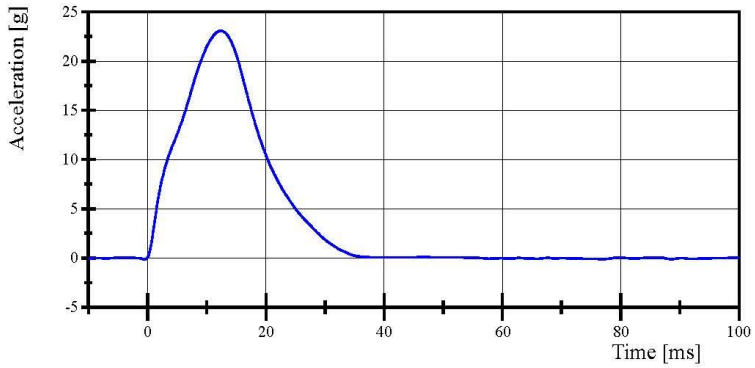
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 15:05:58 597

Transportation Research Center Inc.

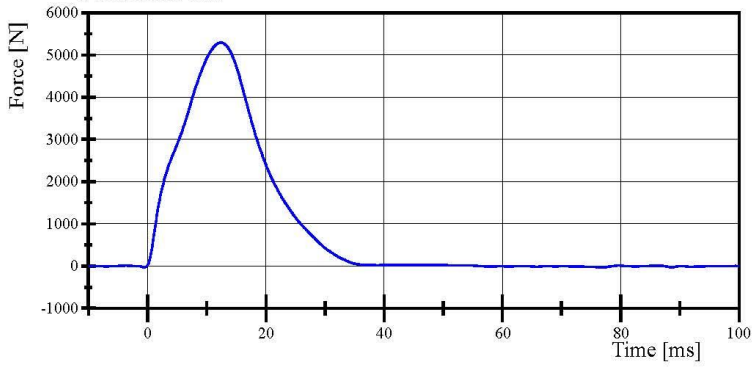
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 86-2
Test Date: 2/20/2023

Pendulum Acceleration



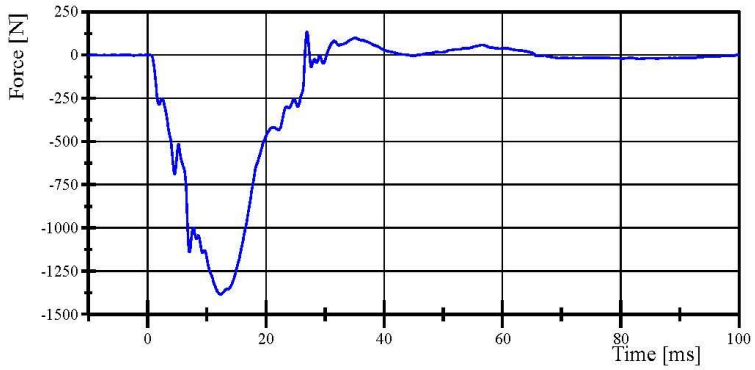
Filter Class: CFC_180
Max: 23.1 g at 12.3 ms
Min: -0.1 g at 76.8 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,291.9 N at 12.3 ms
Min: -31.5 N at 76.8 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 134.9 N at 27.0 ms
Min: -1,384.4 N at 12.3 ms

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

02.20.2023 15:06:25 597

Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 87

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. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Resultant Acceleration	125 - 155 g	137.8 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	7.0 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	3.87 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP6812

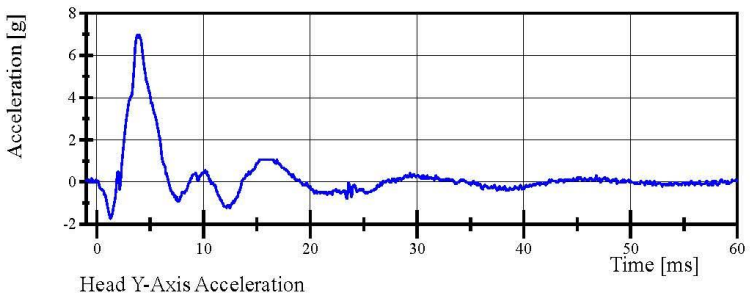
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

03.06.2023 09:39:29 362

Transportation Research Center Inc.

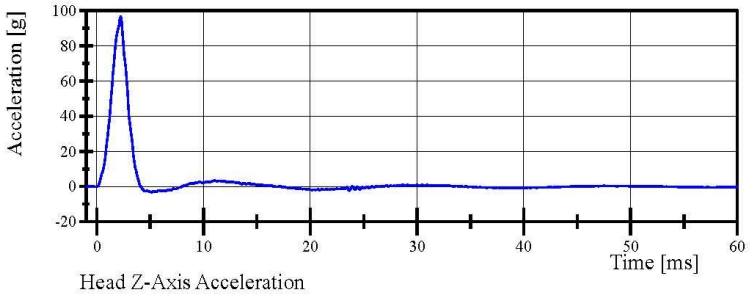
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Head X-Axis Acceleration



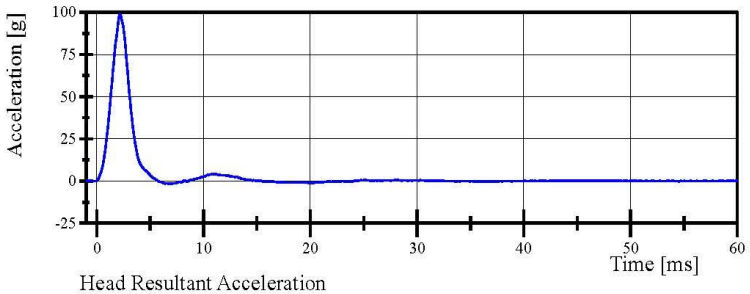
Filter Class: CFC_1000
Max: 7.0 g at 3.8 ms
Min: -1.7 g at 1.3 ms

Head Y-Axis Acceleration



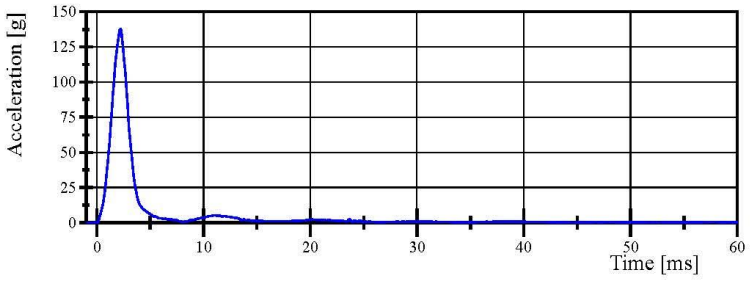
Filter Class: CFC_1000
Max: 96.7 g at 2.2 ms
Min: -3.2 g at 5.1 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 99.0 g at 2.2 ms
Min: -1.7 g at 6.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 137.8 g at 2.2 ms
Min: 0.0 g at -0.2 ms

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

03.06.2023 09:39:55 362

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/7/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ºC	21.0 ºC	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.35 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-51.4 deg	Yes
Time of Peak	54 - 66 ms	57.8 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	54.6 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 05053

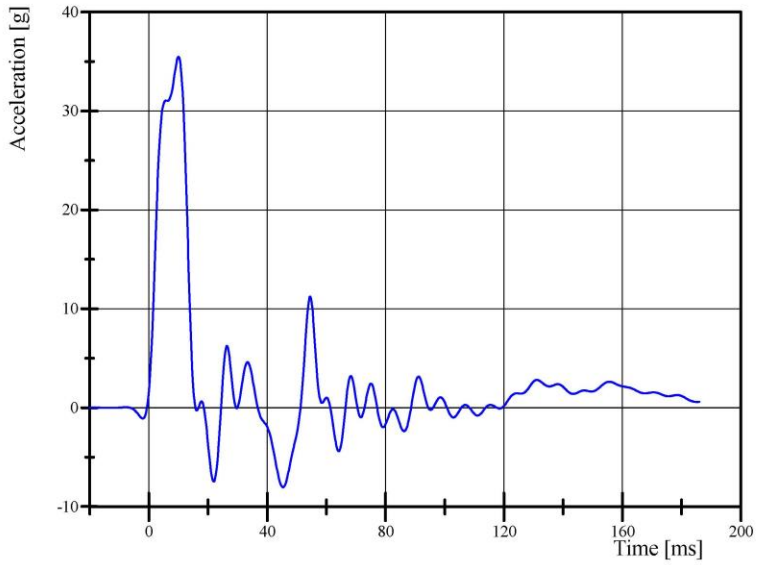
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

03.07.2023 08:11:29 1500

Transportation Research Center Inc.

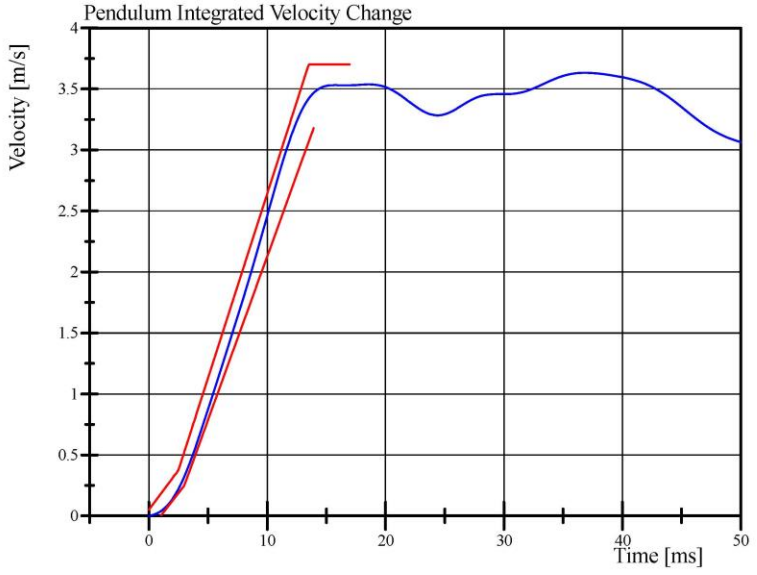
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/7/2023

Pendulum Acceleration



Filter Class: CFC_60
Max: 35.5 g at 10.0 ms
Min: -8.0 g at 45.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.6 m/s at 36.8 ms
Min: 0.0 m/s at 0.0 ms

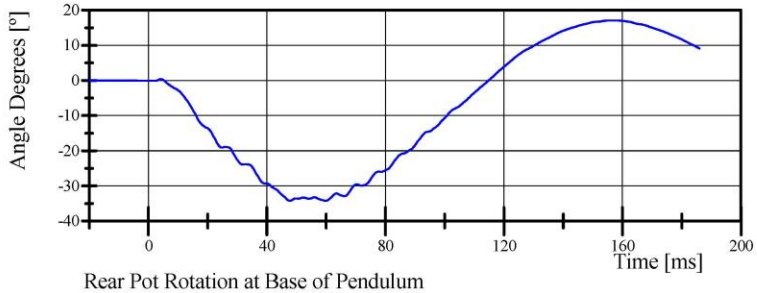
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.07.2023 08:12:23 1500

Transportation Research Center Inc.

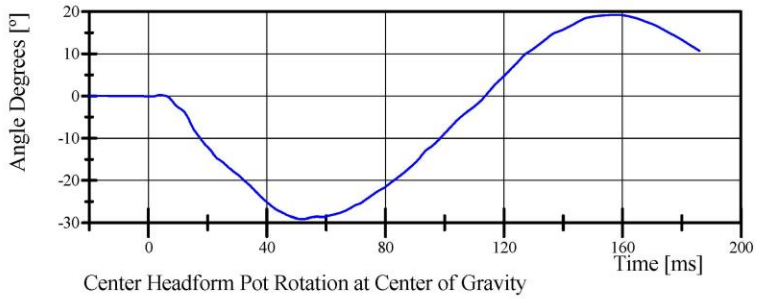
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/7/2023

Forward Pot Rotation at Base of Pendulum



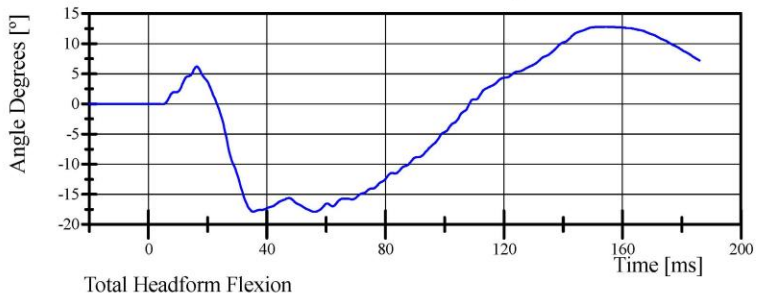
Filter Class: CFC_180
Max: 17.1 ° at 156.1 ms
Min: -34.2 ° at 59.8 ms

Rear Pot Rotation at Base of Pendulum



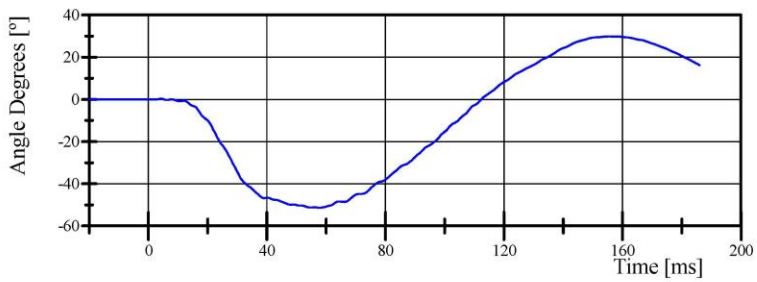
Filter Class: CFC_180
Max: 19.2 ° at 158.2 ms
Min: -29.1 ° at 51.9 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 12.8 ° at 154.5 ms
Min: -17.9 ° at 56.0 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 29.8 ° at 155.6 ms
Min: -51.4 ° at 57.8 ms

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

03.07.2023 08:12:24 1500

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.56 g	Yes

Test meets specifications.

Condition: Used

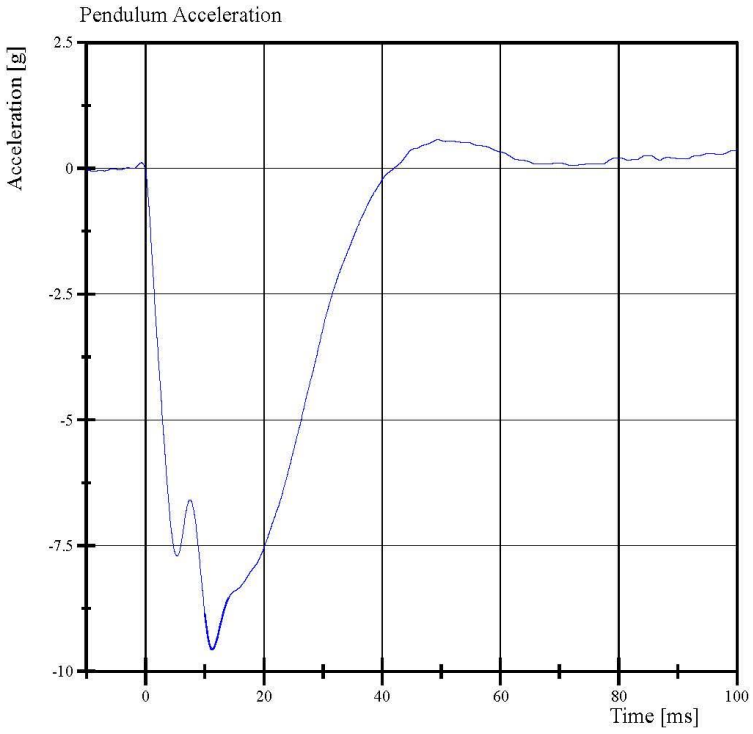
Comments:
Arm S/N: 175-3501-07014

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

03.06.2023 14:00:54 608

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/6/2023



Filter Class: CFC_180
Max: 0.6 g at 49.4 ms
Min: -9.6 g at 11.3 ms

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

03.06.2023 14:01:21 608

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.6 mm	Yes

Test meets specifications.

Condition: Used

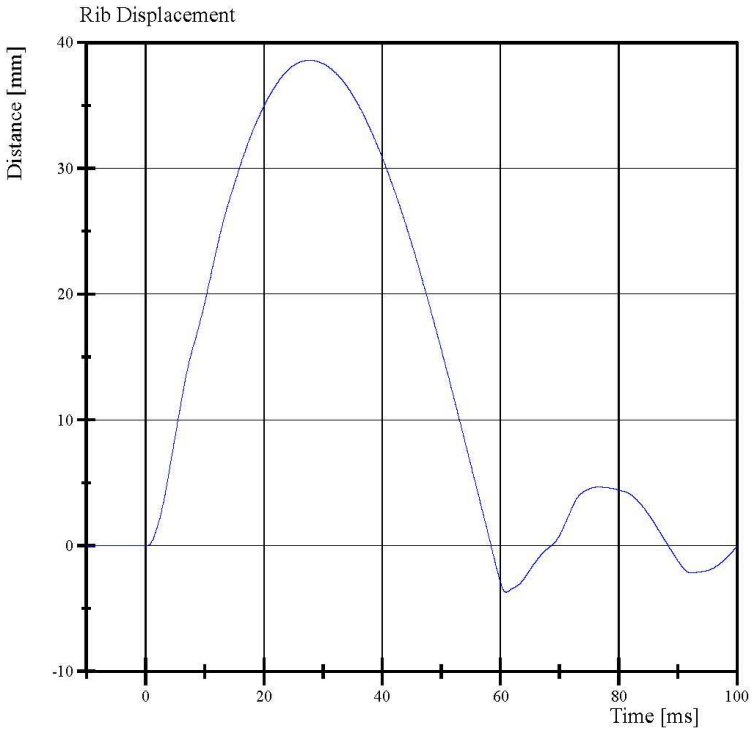
Comments:
Drop Height: 462mm
Rib Foam S/N: EK6973

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

03.06.2023 11:22:05 636

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023



Filter Class: CFC_180
Max: 38.6 mm at 27.8 ms
Min: -3.7 mm at 61.0 ms

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

03.06.2023 11:22:25 636

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

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

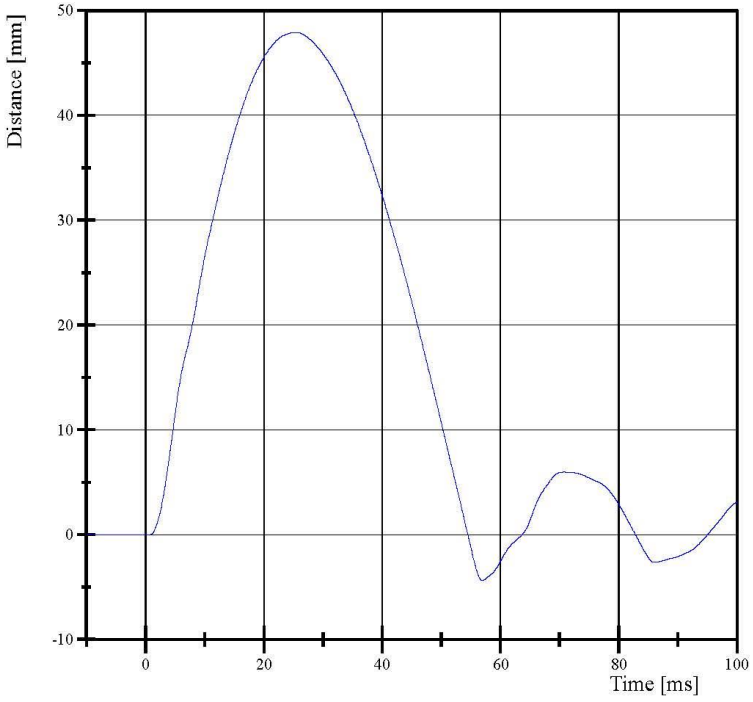
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

03.06.2023 11:21:05 514

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Rib Displacement



Filter Class: CFC_180
Max: 47.9 mm at 25.4 ms
Min: -4.4 mm at 57.0 ms

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

03.06.2023 11:21:37 514

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.3 mm	Yes

Test meets specifications.

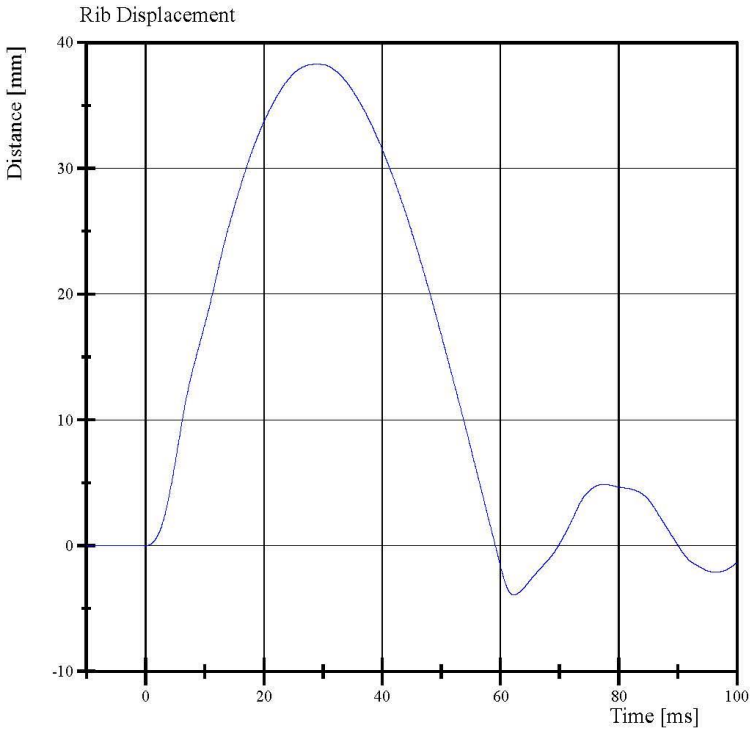
Condition: Used
Comments:
Drop Height: 462mm
Rib Foam S/N: EK6970

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

03.06.2023 11:35:05 608

Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023



Filter Class: CFC_180
Max: 38.3 mm at 28.7 ms
Min: -3.9 mm at 62.2 ms

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

03.06.2023 11:35:37 608

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.5 mm	Yes

Test meets specifications.

Condition: Used

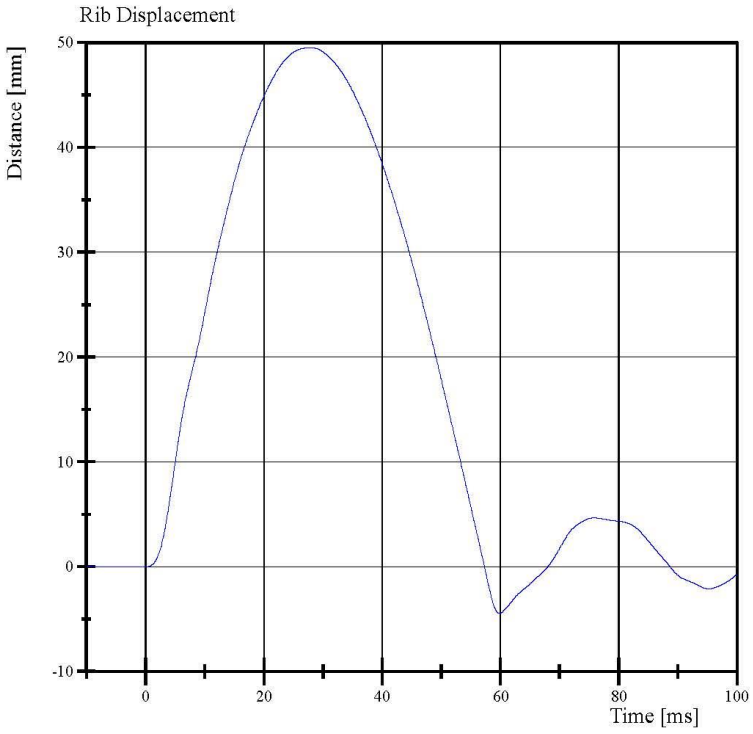
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6970

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

03.06.2023 11:29:27 524

Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/6/2023



Filter Class: CFC_180
Max: 49.5 mm at 27.8 ms
Min: -4.5 mm at 59.8 ms

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

03.06.2023 11:30:09 524

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.7 mm	Yes

Test meets specifications.

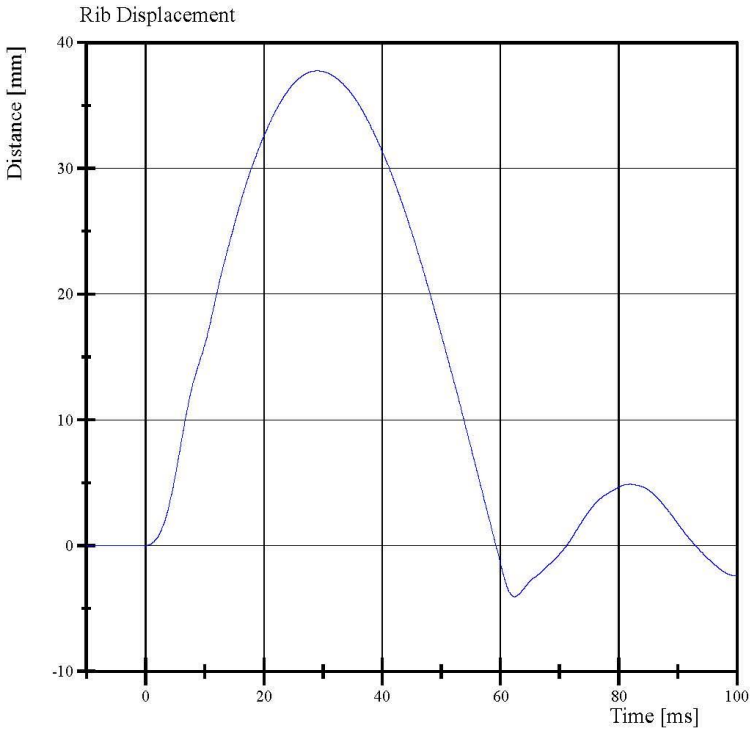
Condition: Used
Comments:
Drop Height: 462 mm
Rib Foam S/N: EK6971

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

03.06.2023 14:45:24 610

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023



Filter Class: CFC_180
Max: 37.7 mm at 29.0 ms
Min: -4.1 mm at 62.3 ms

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

03.06.2023 14:45:40 610

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.1 mm	Yes

Test meets specifications.

Condition: Used

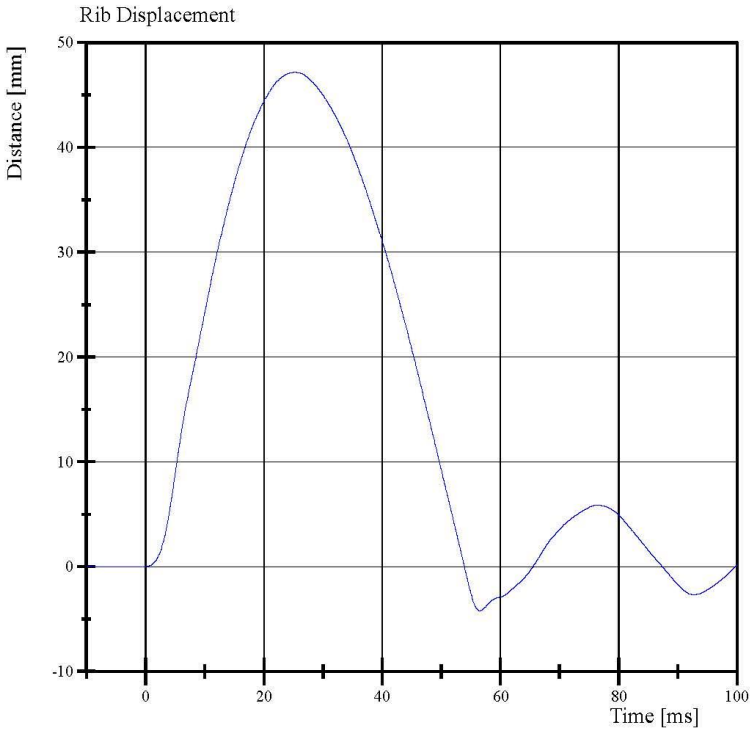
Comments:
Drop Height: 816 mm
Rib Foam S/N: EK6971

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

03.06.2023 11:38:49 501

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023



Filter Class: CFC_180
Max: 47.1 mm at 25.3 ms
Min: -4.2 mm at 56.5 ms

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

03.06.2023 11:39:18 501

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.430 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,282.1 N	Yes
Upper Rib Displacement	34 - 41 mm	39.8 mm	Yes
Center Rib Displacement	37 - 45 mm	41.3 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.5 mm	Yes

Test meets specifications.

Condition: Used

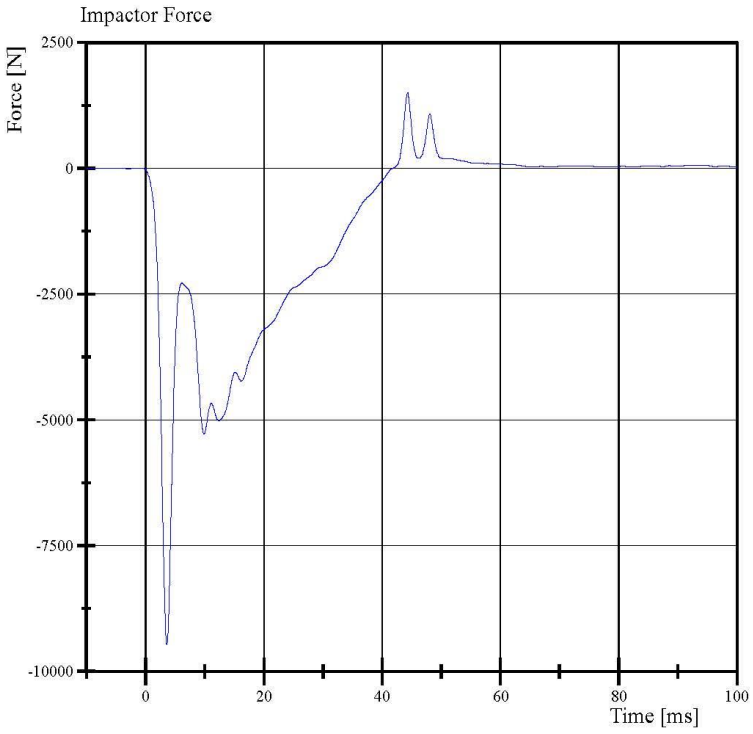
Comments:
Upper Rib Module S/N: 175-4008-A
Upper Rib Foam S/N: 175-4003-EK6973
Middle Rib Module S/N: 175-4008-A
Middle Rib Foam S/N: 175-4003-EK6970
Lower Rib Module S/N: 175-4008-A-06-017
Lower Rib Foam S/N: 175-4008-EK6971

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

03.06.2023 14:06:26 513

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/6/2023



Filter Class: CFC_180
Max: 1,499.3 N at 44.3 ms
Min: -9,470.2 N at 3.6 ms

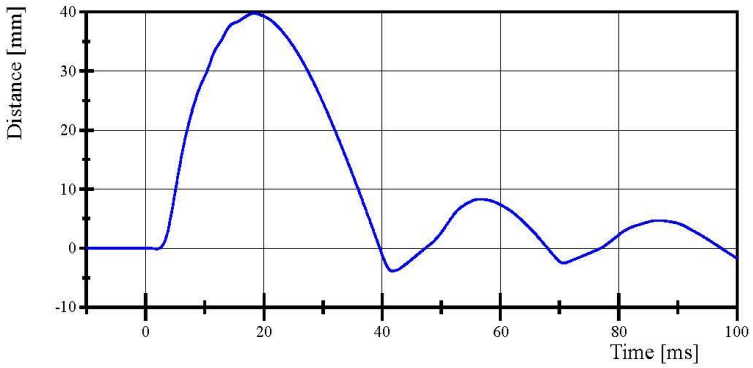
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.06.2023 14:07:23 513

Transportation Research Center Inc.

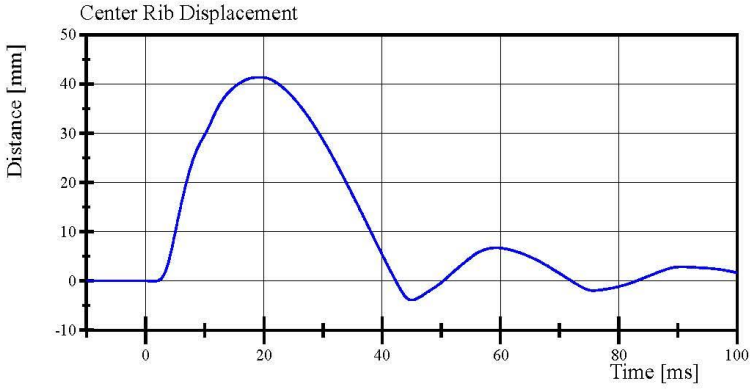
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 87-2
Test Date: 3/6/2023

Upper Rib Displacement



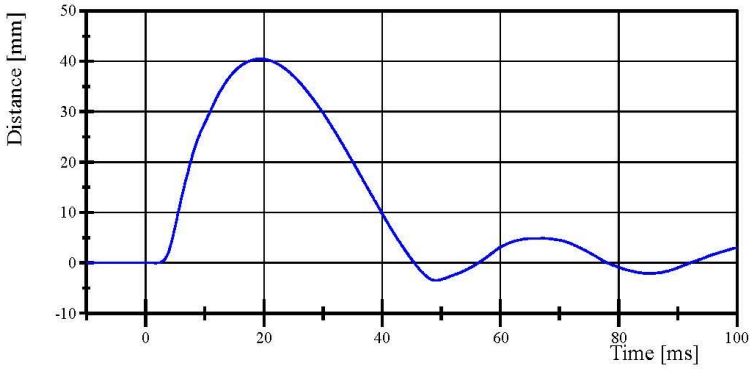
Filter Class: CFC_180
Max: 39.8 mm at 18.4 ms
Min: -3.9 mm at 41.8 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 41.3 mm at 19.2 ms
Min: -3.9 mm at 45.0 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.5 mm at 19.4 ms
Min: -3.5 mm at 49.1 ms

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

03.06.2023 14:07:23 513

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 87-3
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.134 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-45.7 deg	Yes
Time of Peak	39 - 53 ms	41.9 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	38.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Lumbar S/N: DS3472

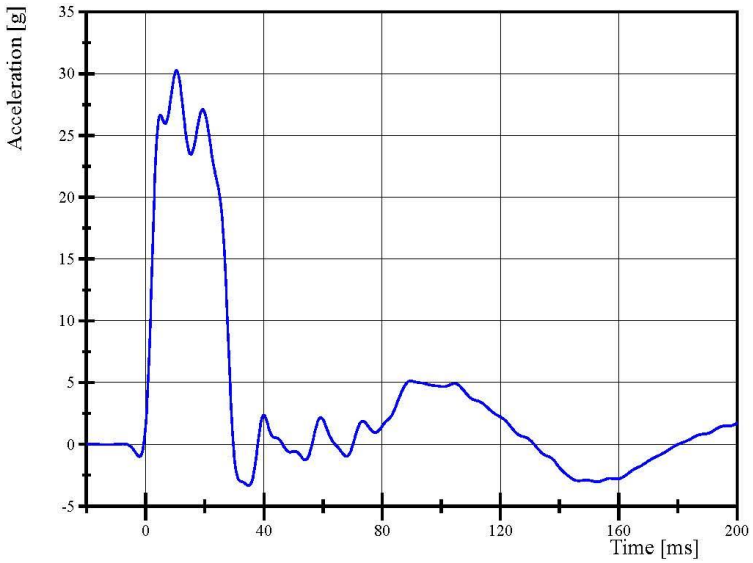
Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

03.06.2023 12:30:00 669

Transportation Research Center Inc.

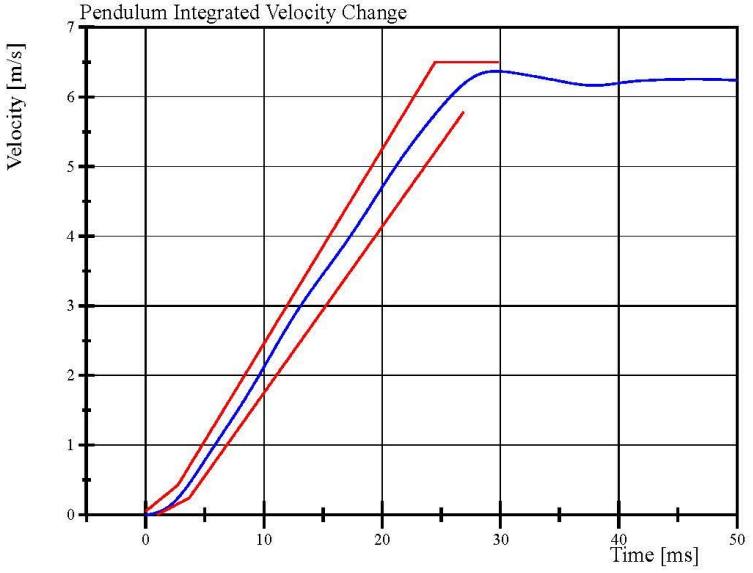
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 87-3
Test Date: 3/6/2023

Pendulum Acceleration



Filter Class: CFC_60
Max: 30.3 g at 10.5 ms
Min: -3.3 g at 34.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.4 m/s at 29.7 ms
Min: 0.0 m/s at 0.0 ms

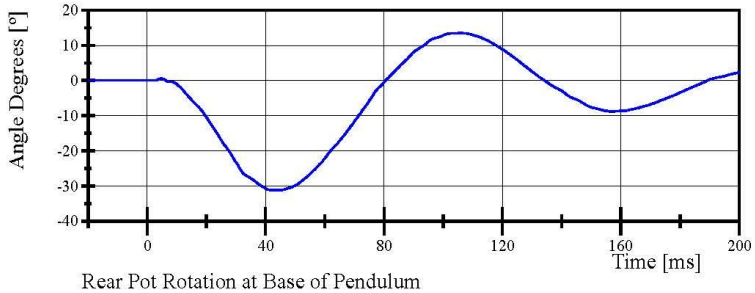
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.06.2023 12:30:31 669

Transportation Research Center Inc.

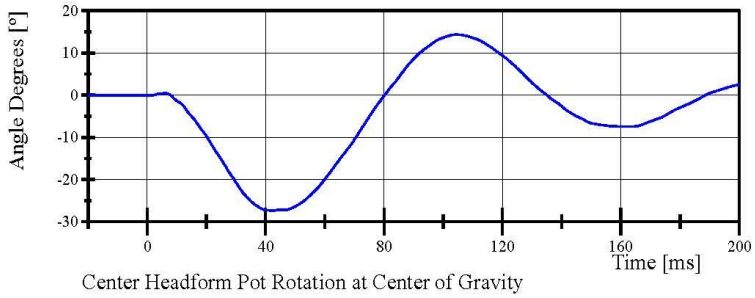
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 87-3
Test Date: 3/6/2023

Forward Pot Rotation at Base of Pendulum



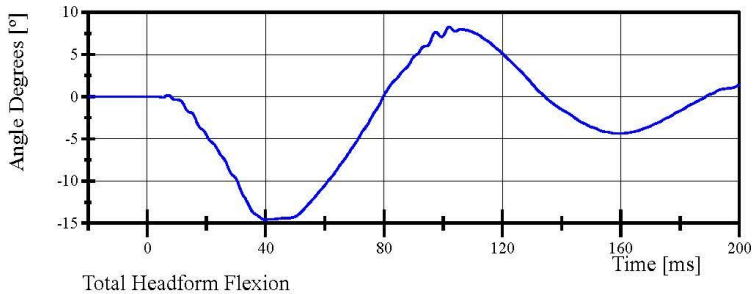
Filter Class: CFC_180
Max: 13.5 ° at 105.8 ms
Min: -31.2 ° at 44.4 ms

Rear Pot Rotation at Base of Pendulum



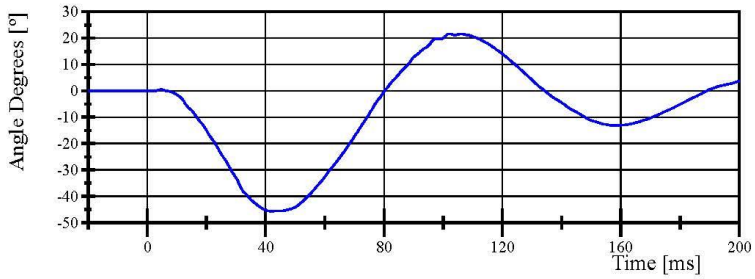
Filter Class: CFC_180
Max: 14.4 ° at 104.5 ms
Min: -27.4 ° at 42.3 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 8.3 ° at 102.1 ms
Min: -14.6 ° at 39.8 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 21.6 ° at 102.2 ms
Min: -45.7 ° at 41.9 ms

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

03.06.2023 12:30:31 669

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.04 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,315.7 N	Yes
Time of Peak	10.6 - 13.0 ms	11.52 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,414.3 N	Yes
Time of Peak	10.0 - 12.3 ms	11.36 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Abdomen S/N: 1066

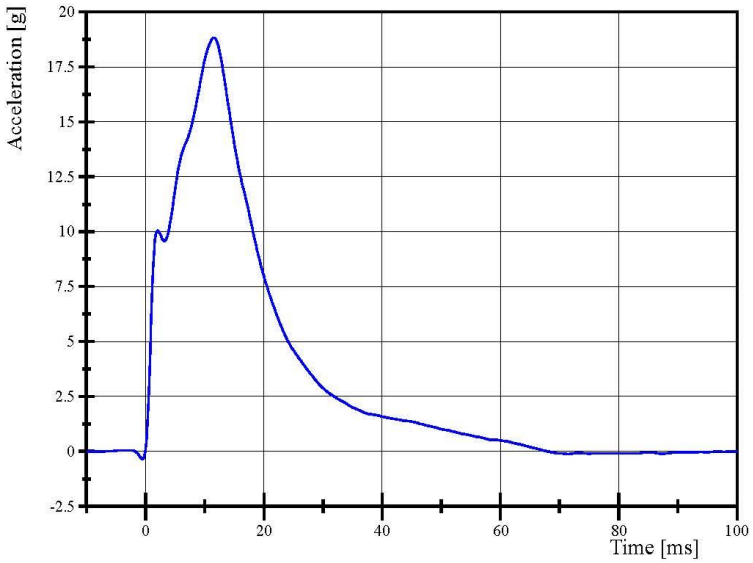
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.06.2023 13:44:38 504

Transportation Research Center Inc.

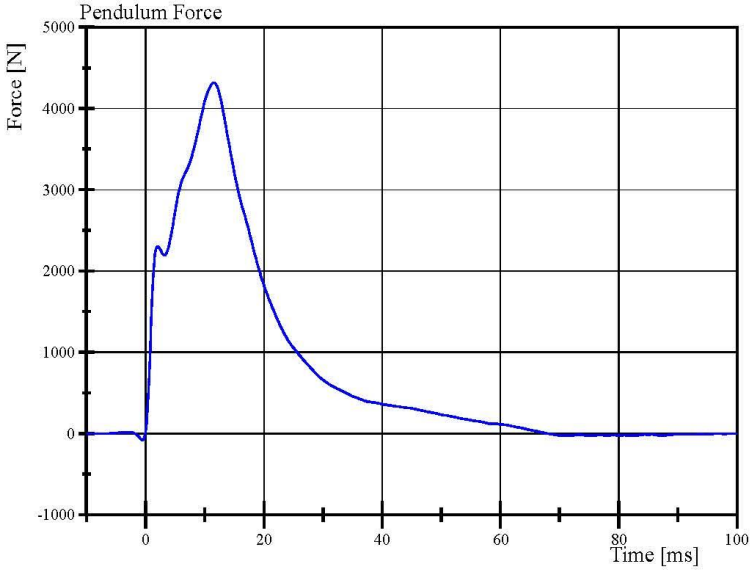
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.8 g at 11.5 ms
Min: -0.4 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,315.7 N at 11.5 ms
Min: -82.0 N at -0.6 ms

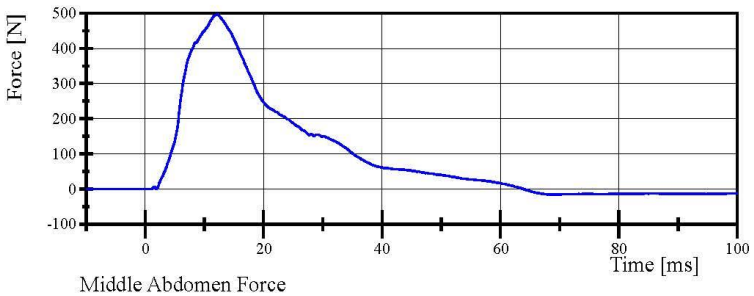
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.06.2023 13:45:05 504

Transportation Research Center Inc.

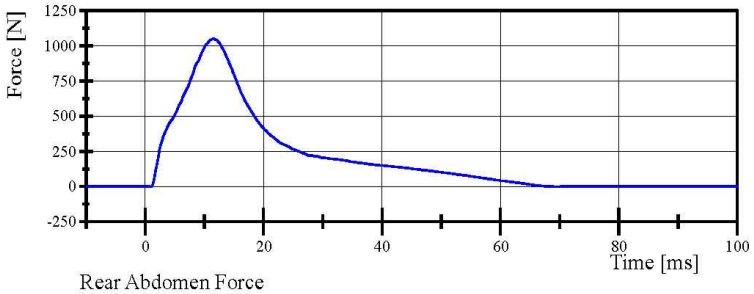
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Front Abdomen Force



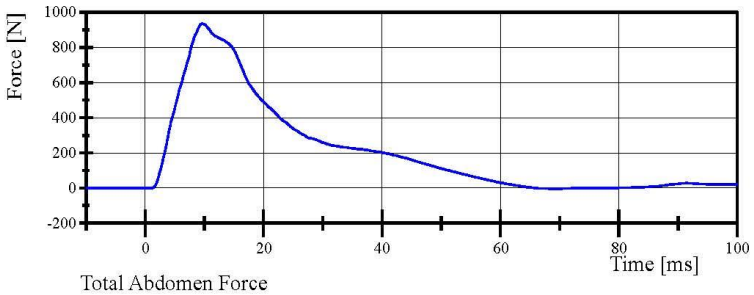
Filter Class: CFC_600
Max: 495.9 N at 12.2 ms
Min: -16.1 N at 69.2 ms

Middle Abdomen Force



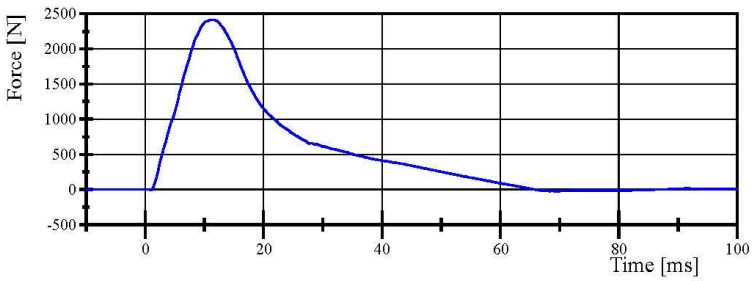
Filter Class: CFC_600
Max: 1,050.6 N at 11.5 ms
Min: -2.0 N at 1.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 935.2 N at 9.6 ms
Min: -4.0 N at 69.8 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,414.3 N at 11.4 ms
Min: -20.9 N at 69.2 ms

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

03.06.2023 13:45:05 504

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.37 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,304.1 N	Yes
Time of Peak	11.8 - 16.1 ms	12.72 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,382.8 N	Yes
Time of Peak	12.2 - 17.0 ms	13.52 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: N/A

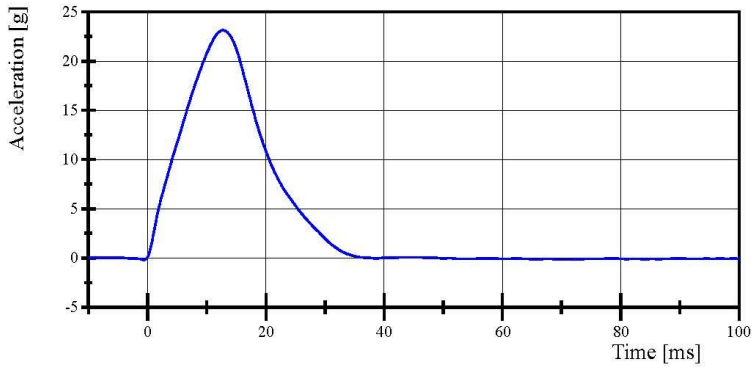
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.06.2023 13:52:11 633

Transportation Research Center Inc.

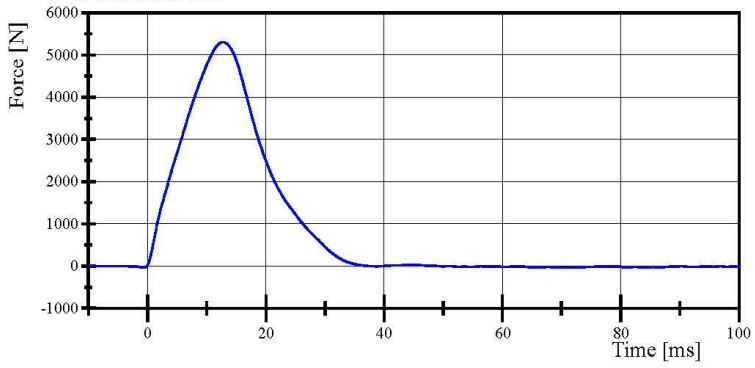
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 87-1
Test Date: 3/6/2023

Pendulum Acceleration



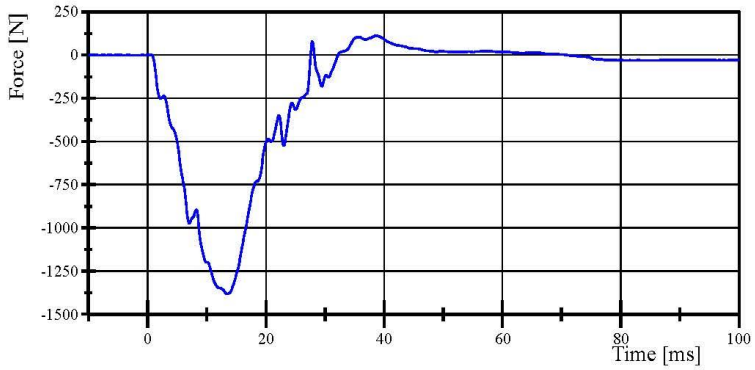
Filter Class: CFC_180
Max: 23.1 g at 12.7 ms
Min: -0.2 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,304.1 N at 12.7 ms
Min: -38.5 N at -0.6 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 111.9 N at 38.7 ms
Min: -1,382.8 N at 13.5 ms

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

03.06.2023 13:52:54 633

Pre-Test Calibration Sheets
Driver S/N DQ5070

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 19

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. 19-2
Test Date: 2/20/2023

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	131.5 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	3.1 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.22 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP8345

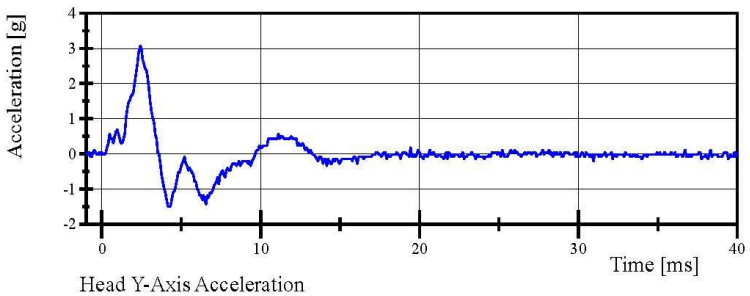
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

02.20.2023 07:55:34 234

Transportation Research Center Inc.

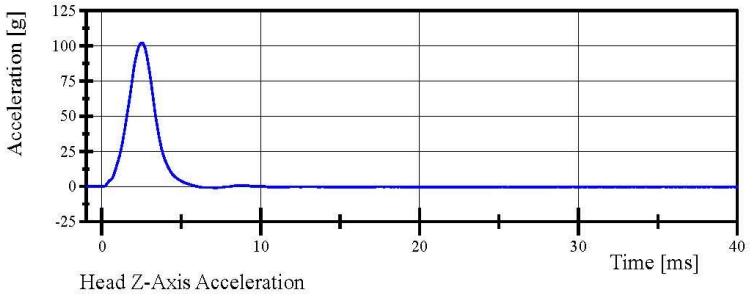
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 19-2
Test Date: 2/20/2023

Head X-Axis Acceleration



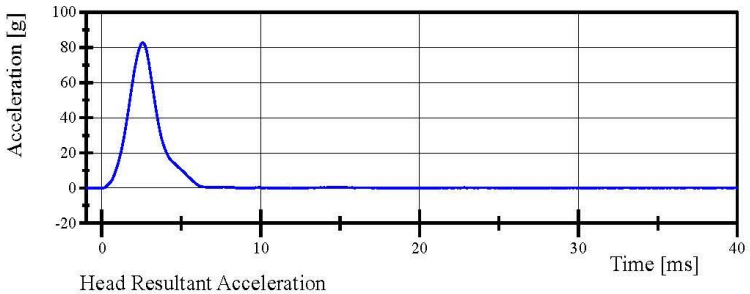
Filter Class: CFC_1000
Max: 3.1 g at 2.4 ms
Min: -1.5 g at 4.2 ms

Head Y-Axis Acceleration



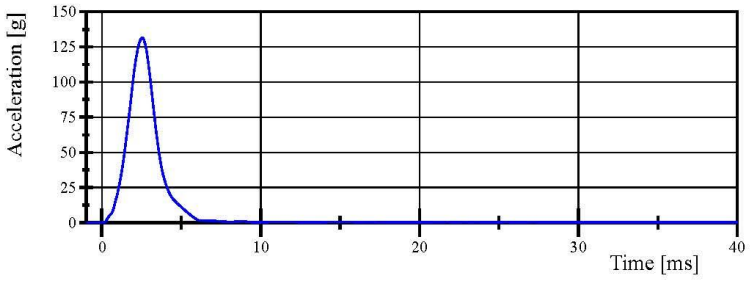
Filter Class: CFC_1000
Max: 102.3 g at 2.5 ms
Min: -0.9 g at 7.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 82.9 g at 2.6 ms
Min: -0.2 g at 11.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 131.5 g at 2.6 ms
Min: 0.1 g at -0.6 ms

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

02.20.2023 07:56:02 234

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 19-3
Test Date: 2/21/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.607 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.718 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.950 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.280 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.823 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.848 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-73.5 deg	Yes
Time of Peak	50 - 70 ms	60.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.2 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	111.9 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 717

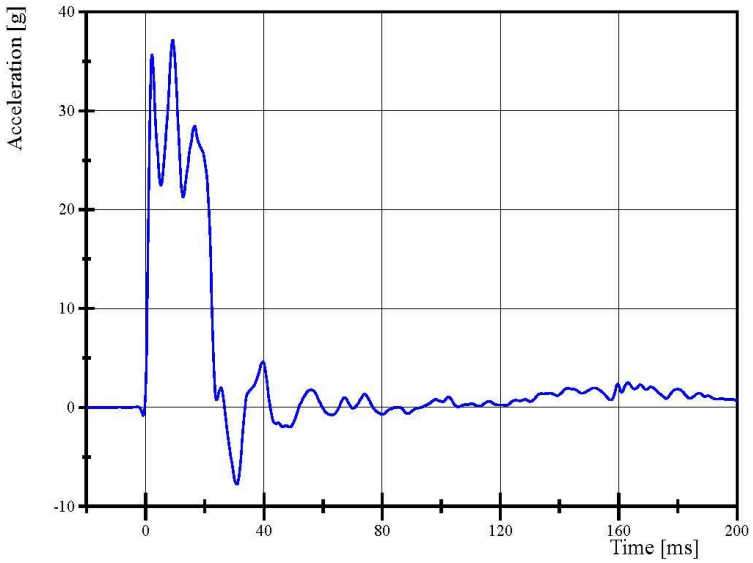
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

02.21.2023 09:12:56 750

Transportation Research Center Inc.

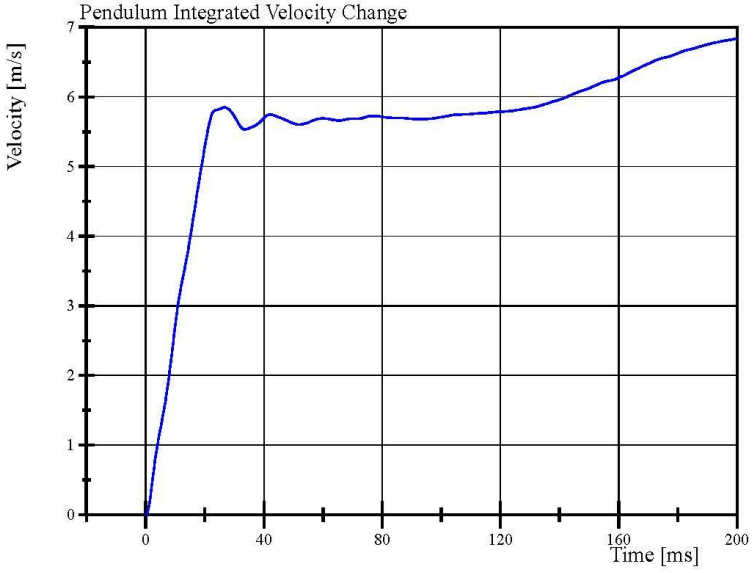
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 19-3
Test Date: 2/21/2023

Pendulum Acceleration



Filter Class: CFC_180
Max: 37.2 g at 9.1 ms
Min: -7.8 g at 30.9 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

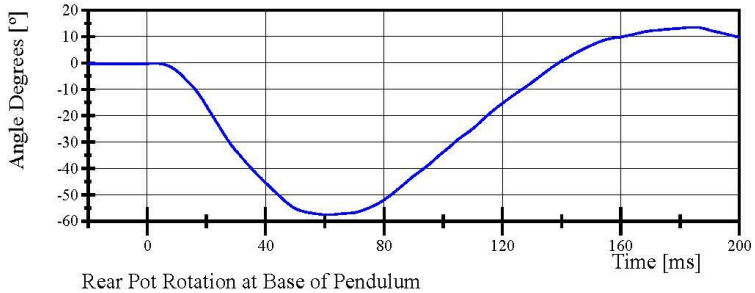
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.21.2023 09:13:17 750

Transportation Research Center Inc.

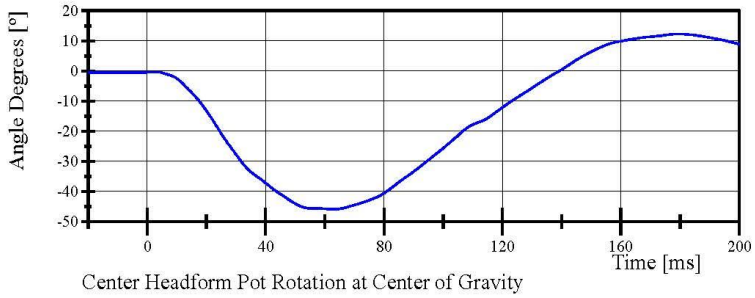
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 19-3
Test Date: 2/21/2023

Forward Pot Rotation at Base of Pendulum



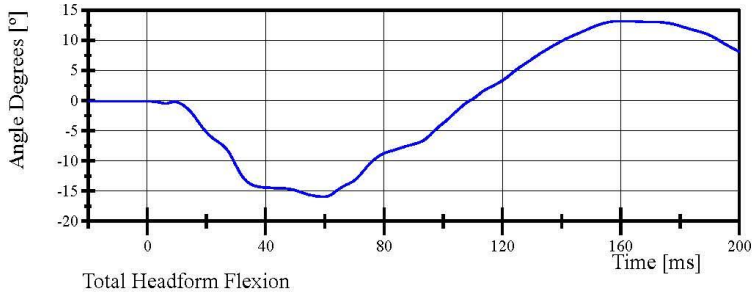
Filter Class: CFC_60
Max: 13.5 ° at 184.7 ms
Min: -57.6 ° at 61.1 ms

Rear Pot Rotation at Base of Pendulum



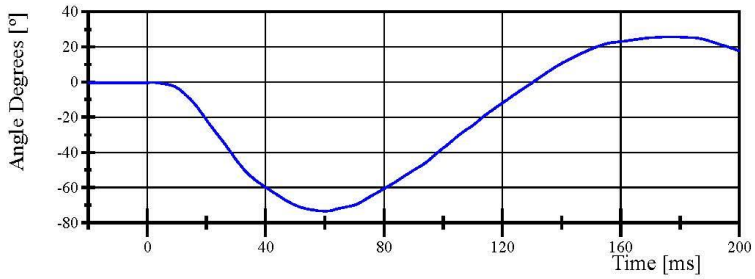
Filter Class: CFC_60
Max: 12.2 ° at 179.5 ms
Min: -45.8 ° at 62.8 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.2 ° at 159.4 ms
Min: -15.9 ° at 59.4 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 25.7 ° at 177.1 ms
Min: -73.5 ° at 60.2 ms

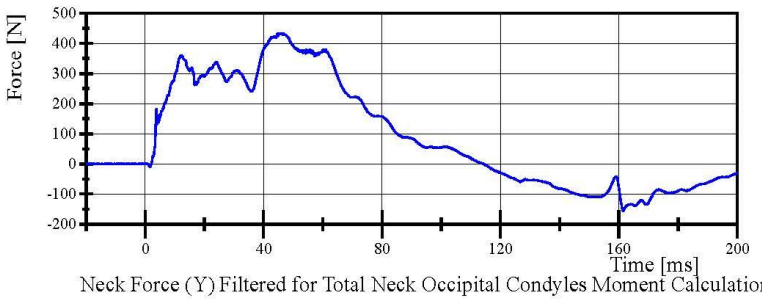
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.21.2023 09:13:17 750

Transportation Research Center Inc.

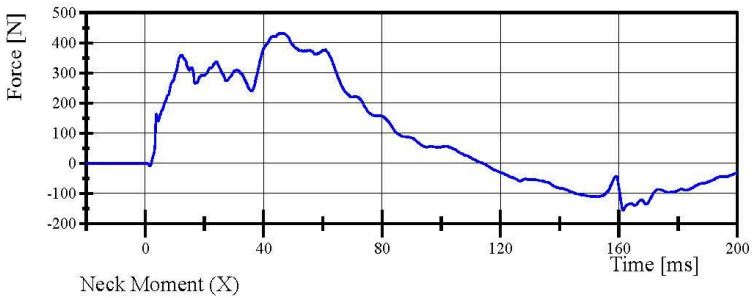
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 19-3
Test Date: 2/21/2023

Neck Force (Y)



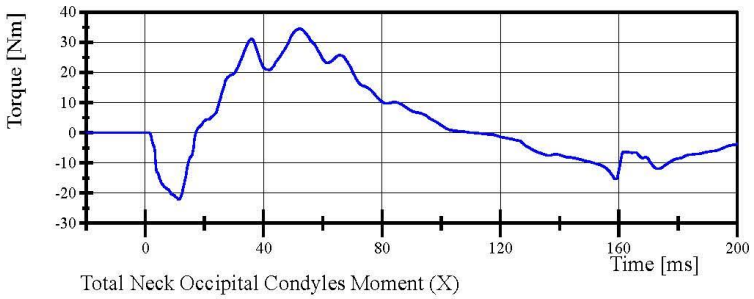
Filter Class: CFC_1000
Max: 433.9 N at 46.1 ms
Min: -155.6 N at 161.4 ms

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



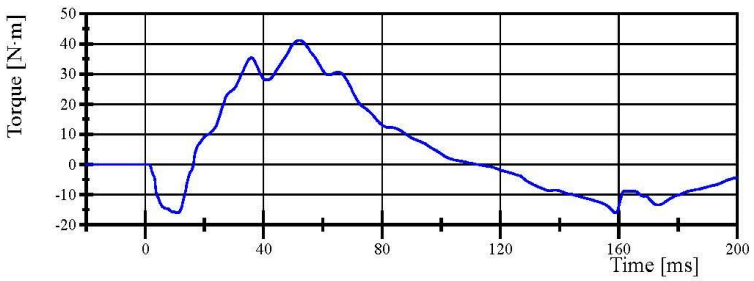
Filter Class: CFC_600
Max: 432.8 N at 45.4 ms
Min: -155.3 N at 161.4 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.5 Nm at 52.2 ms
Min: -22.1 Nm at 11.3 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 41.2 N·m at 52.1 ms
Min: -16.1 N·m at 159.0 ms

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

02.21.2023 09:13:17 750

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.2 g	Yes
Shoulder Displacement	28 - 37 mm	31.3 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.1 g	Yes

Test meets specifications.

Condition: Used

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

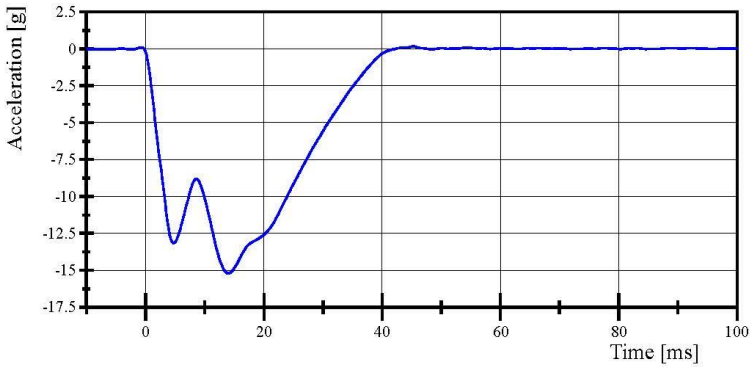
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 11:40:58 872

Transportation Research Center Inc.

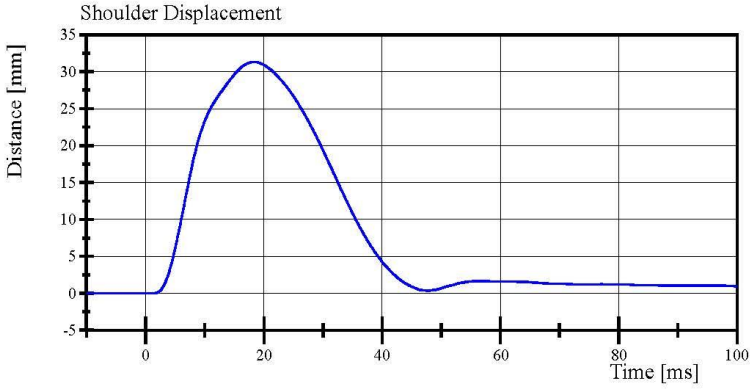
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Probe Acceleration



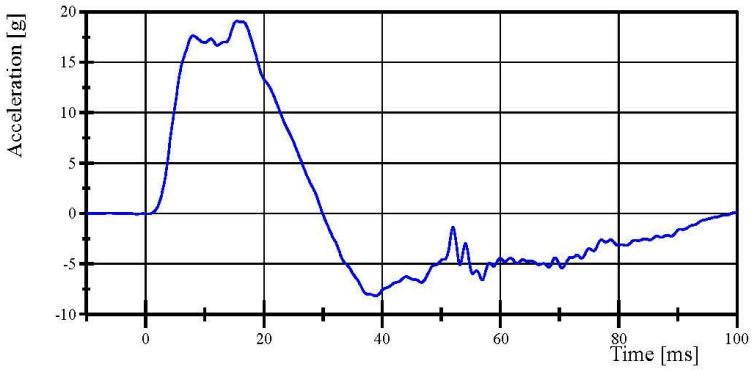
Filter Class: CFC_180
Max: 0.2 g at 45.3 ms
Min: -15.2 g at 14.0 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.3 mm at 18.3 ms
Min: -0.0 mm at 1.3 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.1 g at 15.4 ms
Min: -8.2 g at 38.9 ms

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

02.17.2023 11:41:26 872

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.692 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.1 g	Yes
Shoulder Displacement	31 - 40 mm	37.1 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.9 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	30.9 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	32.0 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	36.7 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	35.8 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

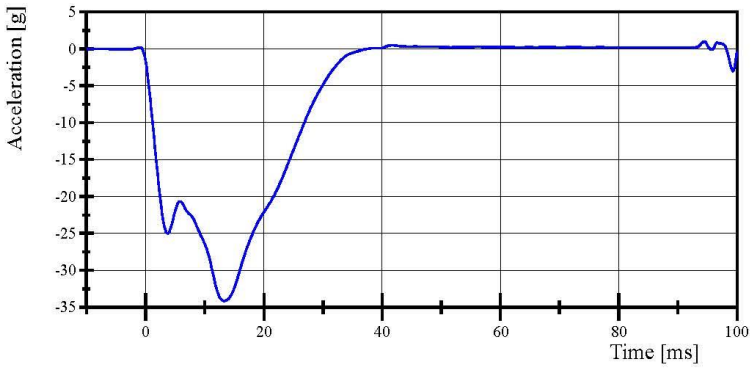
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 13:19:18 648

Transportation Research Center Inc.

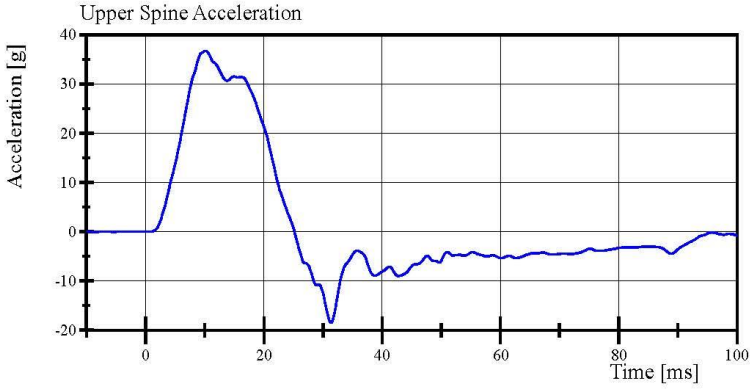
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Probe Acceleration



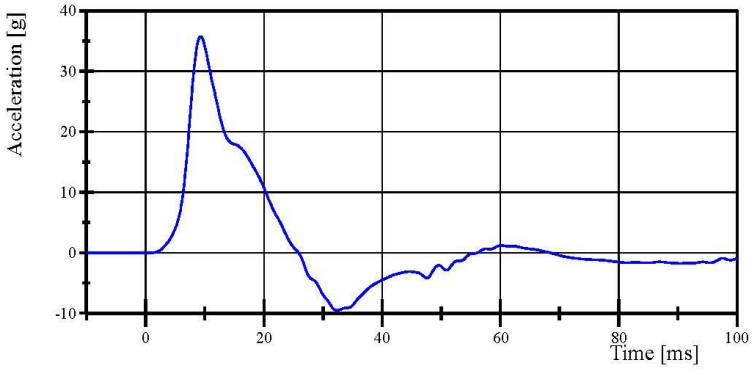
Filter Class: CFC_180
Max: 1.0 g at 94.5 ms
Min: -34.1 g at 13.3 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 36.7 g at 10.2 ms
Min: -18.5 g at 31.4 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 35.8 g at 9.3 ms
Min: -9.5 g at 32.3 ms

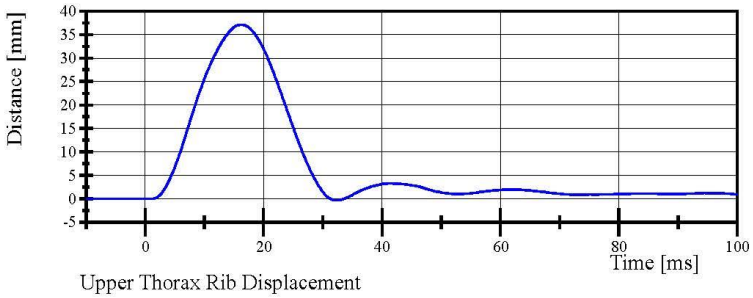
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 13:20:11 648

Transportation Research Center Inc.

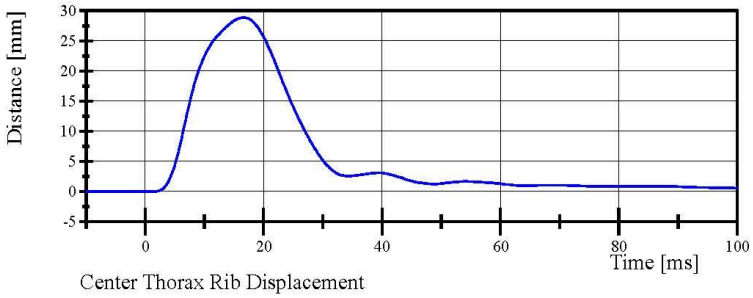
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Shoulder Rib Displacement



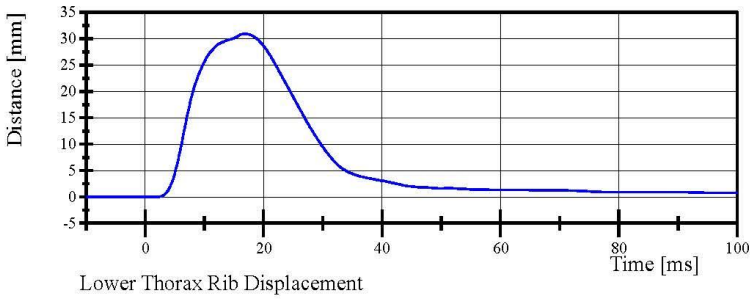
Filter Class: CFC_600
Max: 37.1 mm at 16.2 ms
Min: -0.3 mm at 32.3 ms

Upper Thorax Rib Displacement



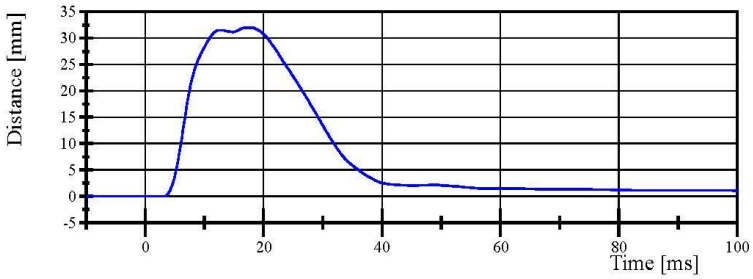
Filter Class: CFC_600
Max: 28.9 mm at 16.6 ms
Min: -0.0 mm at -4.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 30.9 mm at 16.8 ms
Min: -0.0 mm at -3.5 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.0 mm at 17.4 ms
Min: -0.0 mm at 3.1 ms

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

02.17.2023 13:20:12 648

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.329 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.3 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.3 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.6 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	39.4 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.7 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.0 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

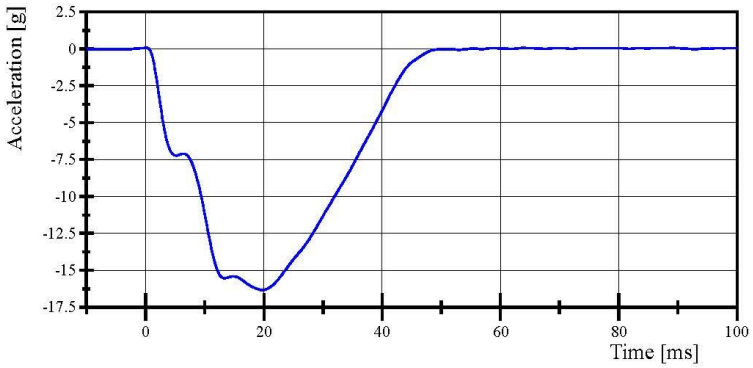
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 12:48:17 859

Transportation Research Center Inc.

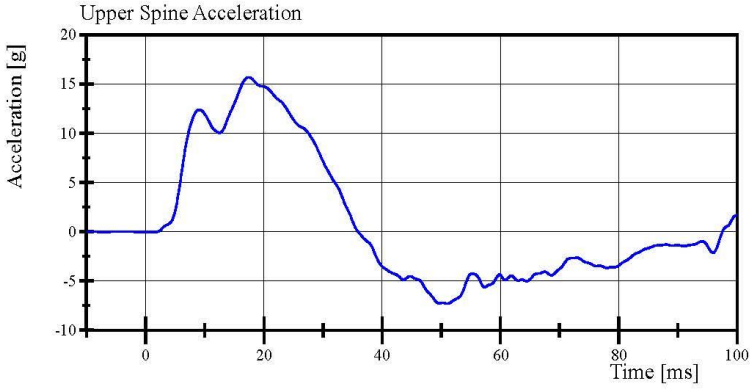
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Probe Acceleration



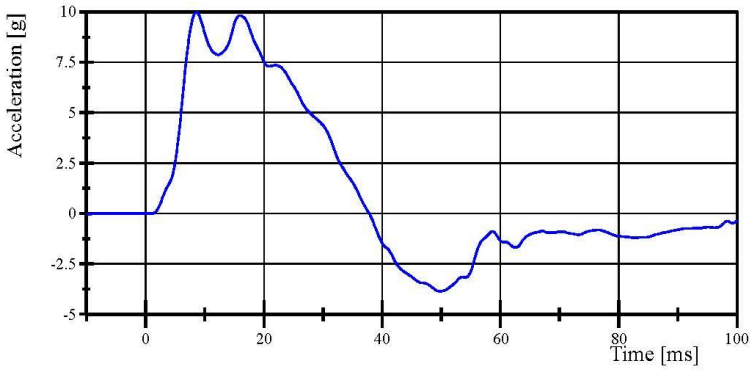
Filter Class: CFC_180
Max: 0.1 g at 0.1 ms
Min: -16.3 g at 19.8 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.7 g at 17.4 ms
Min: -7.3 g at 51.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.0 g at 8.6 ms
Min: -3.9 g at 49.8 ms

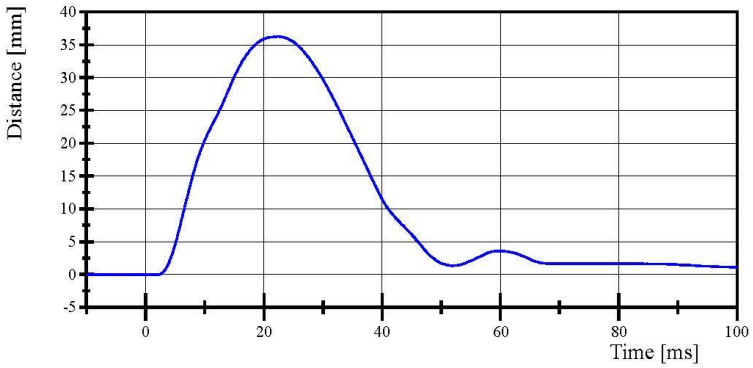
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 12:48:55 859

Transportation Research Center Inc.

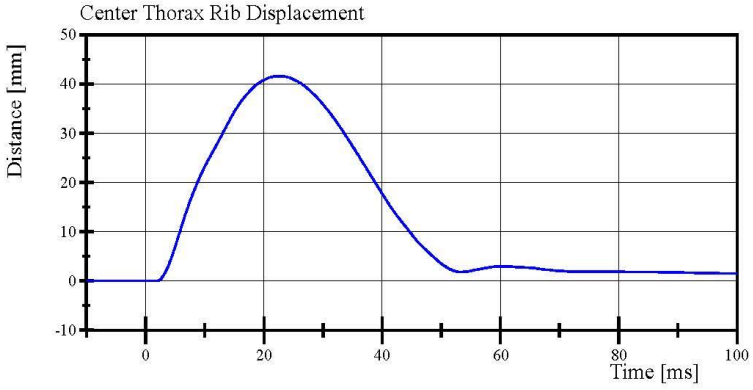
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Upper Thorax Rib Displacement



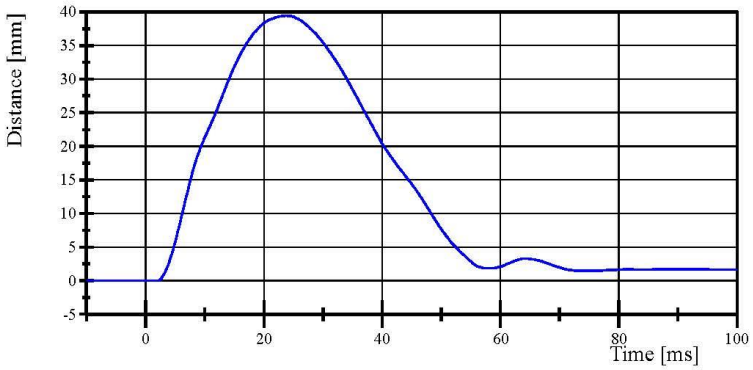
Filter Class: CFC_600
Max: 36.3 mm at 22.5 ms
Min: -0.0 mm at 2.0 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.6 mm at 22.6 ms
Min: -0.0 mm at -2.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.4 mm at 23.8 ms
Min: -0.0 mm at 2.0 ms

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

02.17.2023 12:48:55 859

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.6 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	38.7 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.3 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.93 g	Yes

Test meets specifications.

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

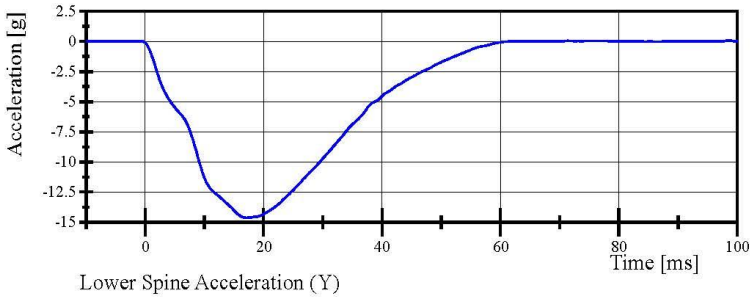
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 11:51:14 695

Transportation Research Center Inc.

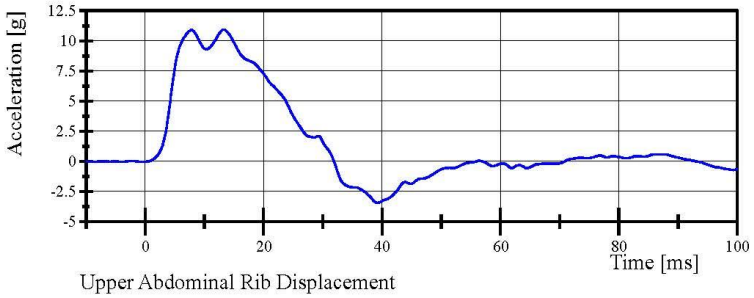
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Probe Acceleration



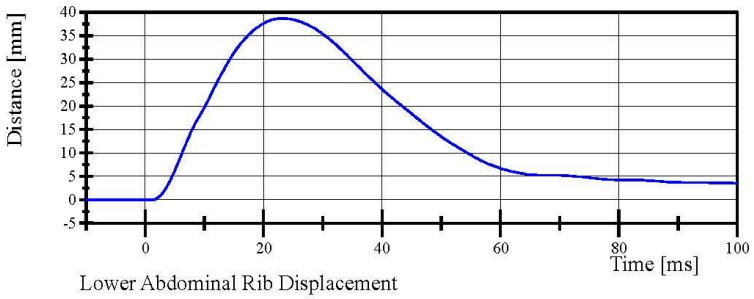
Filter Class: CFC_180
Max: 0.1 g at 98.5 ms
Min: -14.6 g at 17.1 ms

Lower Spine Acceleration (Y)



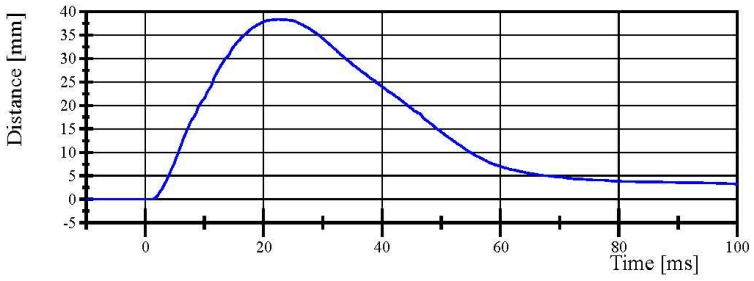
Filter Class: CFC_180
Max: 10.9 g at 13.3 ms
Min: -3.4 g at 39.3 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 38.7 mm at 23.2 ms
Min: -0.0 mm at 1.3 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 38.3 mm at 22.4 ms
Min: -0.0 mm at 0.9 ms

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

02.17.2023 11:51:30 695

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.83 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	39.0 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,824.2 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: 1173
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13789
Cal Date: 20200508

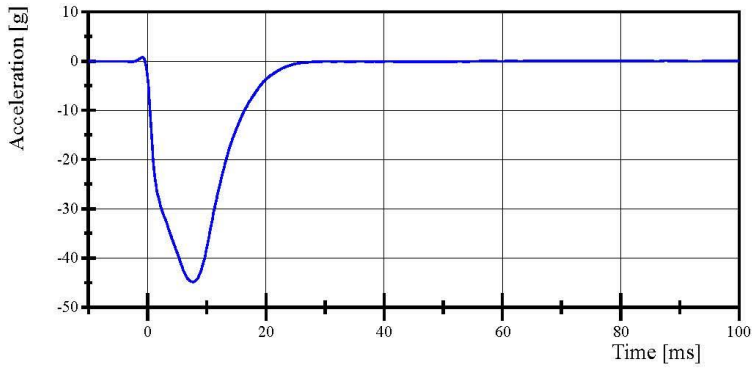
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 13:38:13 446

Transportation Research Center Inc.

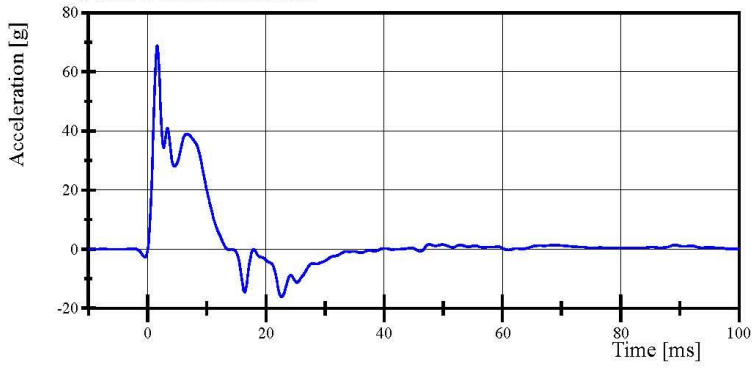
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Probe Acceleration



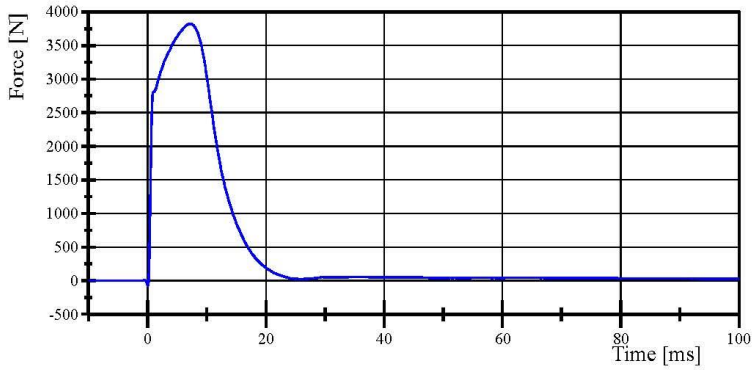
Filter Class: CFC_180
Max: 0.8 g at -0.9 ms
Min: -44.8 g at 7.7 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 68.9 g at 1.6 ms
Min: -16.1 g at 22.6 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,824.2 N at 7.1 ms
Min: -72.7 N at 0.0 ms

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

02.17.2023 13:39:51 446

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-43.1 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	37.7 g	Yes
Iliac Force	4,100 - 5,100 N	4,975.5 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: 000173

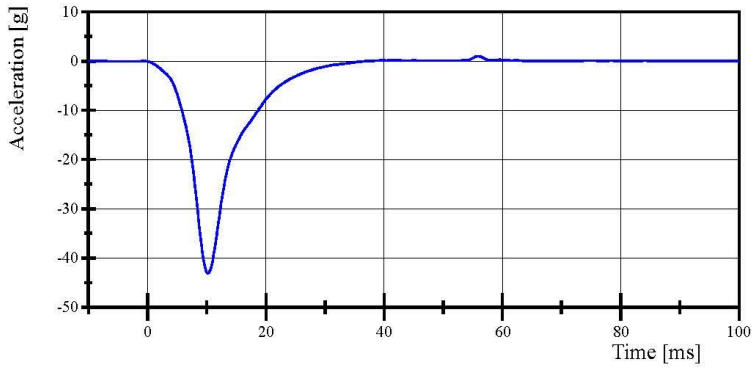
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 11:15:33 702

Transportation Research Center Inc.

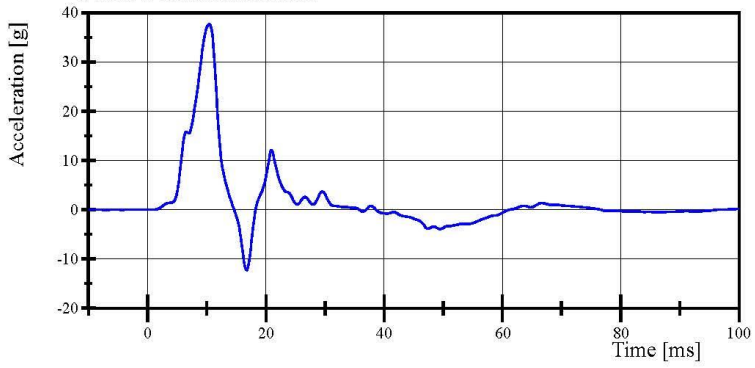
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023

Probe Acceleration



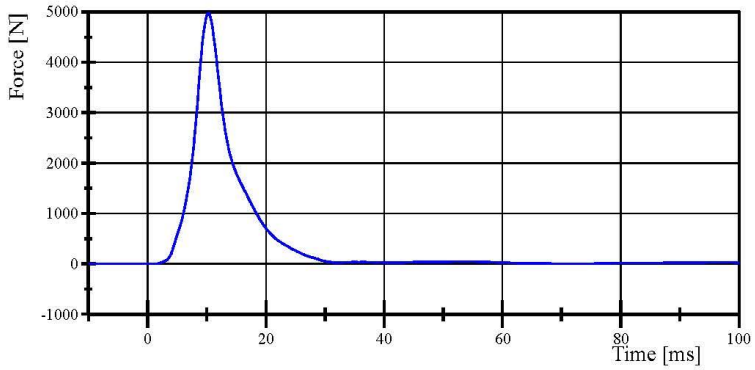
Filter Class: CFC_180
Max: 1.0 g at 55.9 ms
Min: -43.1 g at 10.2 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 37.7 g at 10.4 ms
Min: -12.2 g at 16.7 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,975.5 N at 10.2 ms
Min: -0.8 N at -8.3 ms

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

02.17.2023 11:16:33 702

Post-Test Calibration Sheets
Driver S/N DQ5070

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 20

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. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	128.7 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	1.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.18 %	Yes

Test meets specifications.

Condition: Used

Comments:
Head Skin S/N: DP8345

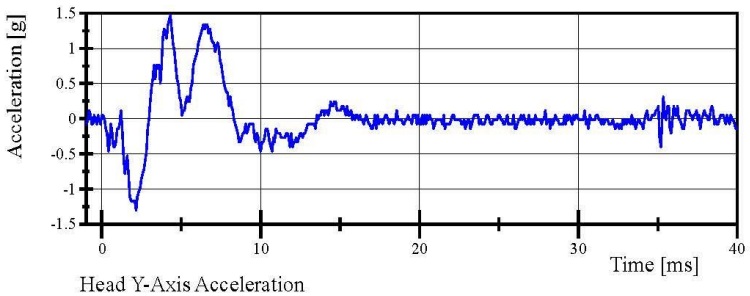
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

03.03.2023 12:48:34 235

Transportation Research Center Inc.

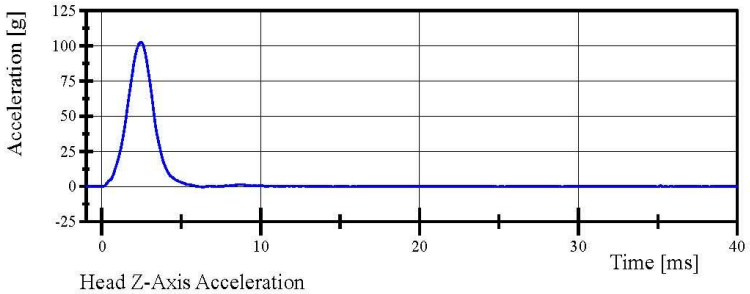
Left Lateral Head Drop
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Head X-Axis Acceleration



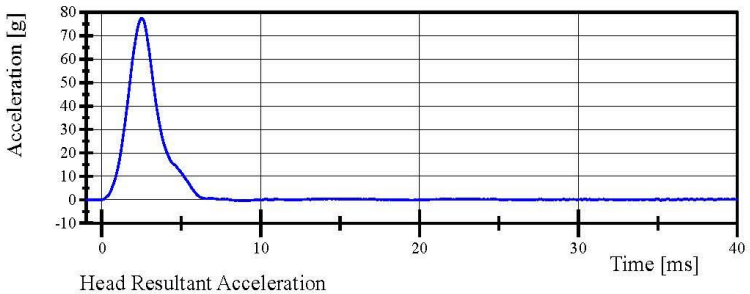
Filter Class: CFC_1000
Max: 1.5 g at 4.3 ms
Min: -1.3 g at 2.2 ms

Head Y-Axis Acceleration



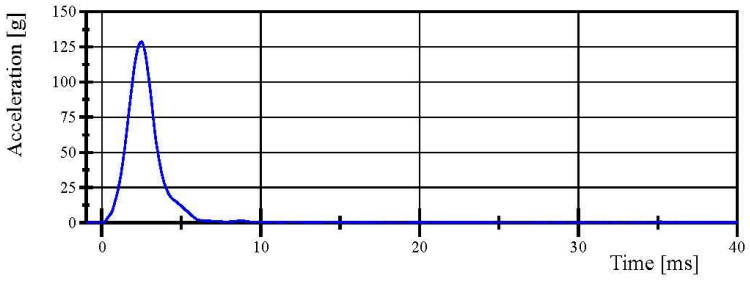
Filter Class: CFC_1000
Max: 102.8 g at 2.5 ms
Min: -0.3 g at 6.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 77.5 g at 2.5 ms
Min: -0.5 g at 8.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 128.7 g at 2.5 ms
Min: 0.0 g at 18.6 ms

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

03.03.2023 12:48:58 235

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.599 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.641 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.877 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.206 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.826 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.834 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.8 deg	Yes
Time of Peak	50 - 70 ms	58.6 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.6 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	110.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 717

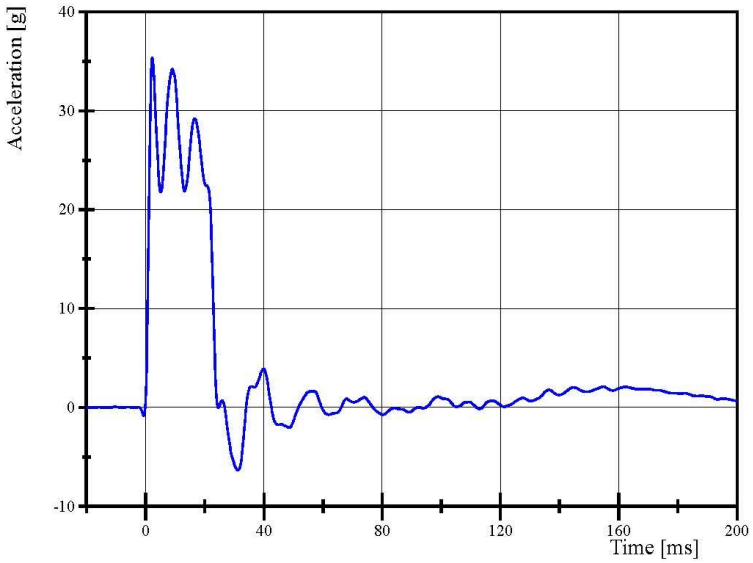
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

03.03.2023 13:10:20 749

Transportation Research Center Inc.

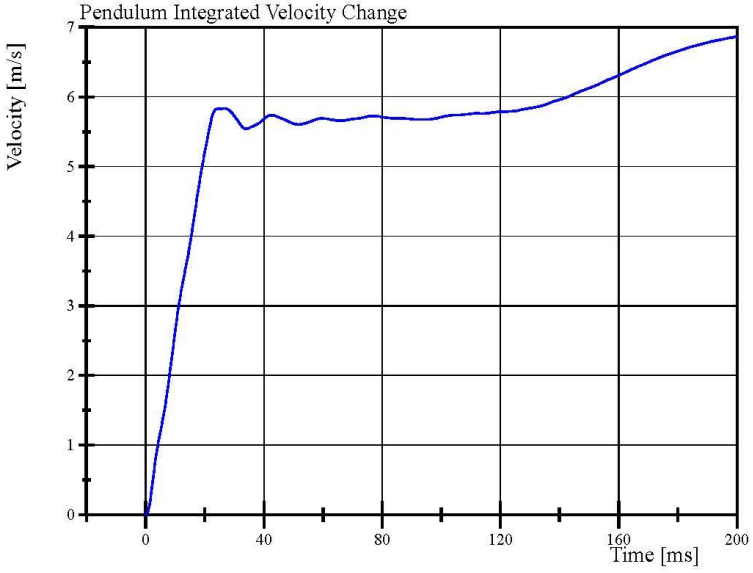
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Pendulum Acceleration



Filter Class: CFC_180
Max: 35.4 g at 2.2 ms
Min: -6.4 g at 31.1 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.9 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

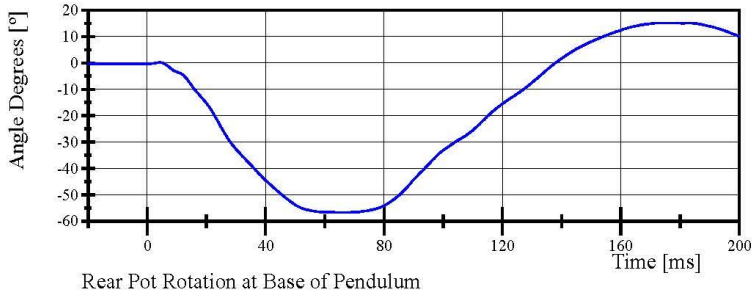
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 13:10:47 749

Transportation Research Center Inc.

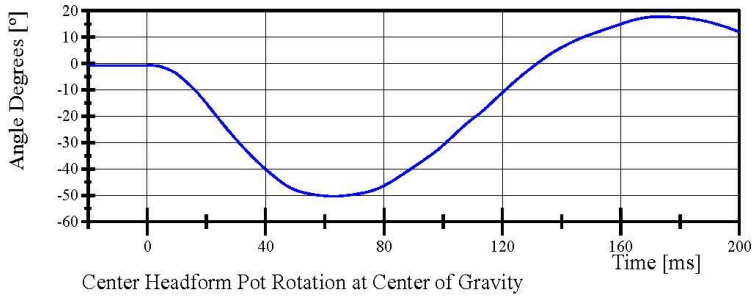
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Forward Pot Rotation at Base of Pendulum



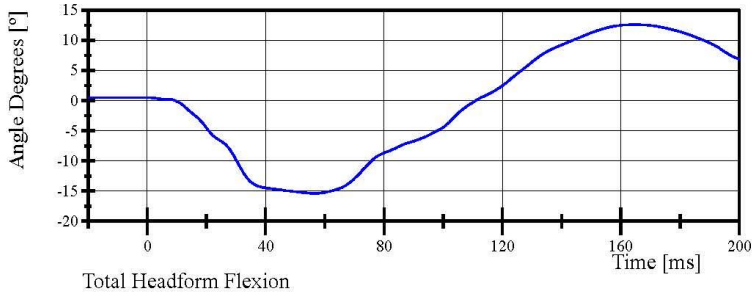
Filter Class: CFC_60
Max: 15.1 ° at 174.7 ms
Min: -56.6 ° at 66.3 ms

Rear Pot Rotation at Base of Pendulum



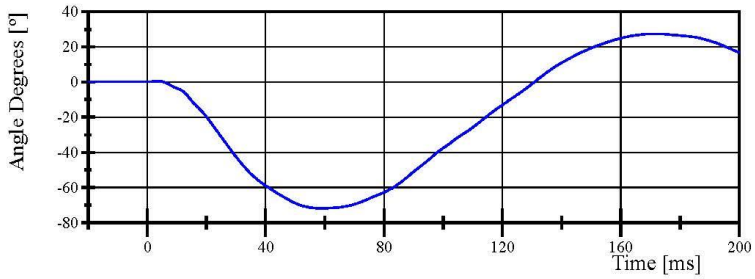
Filter Class: CFC_60
Max: 17.7 ° at 172.6 ms
Min: -50.3 ° at 63.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.6 ° at 164.6 ms
Min: -15.4 ° at 56.5 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 27.4 ° at 171.3 ms
Min: -71.8 ° at 58.6 ms

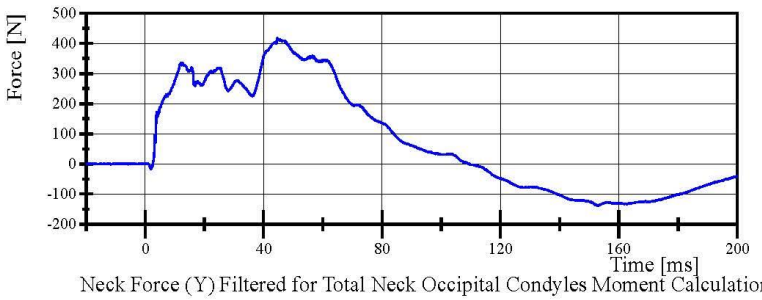
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 13:10:47 749

Transportation Research Center Inc.

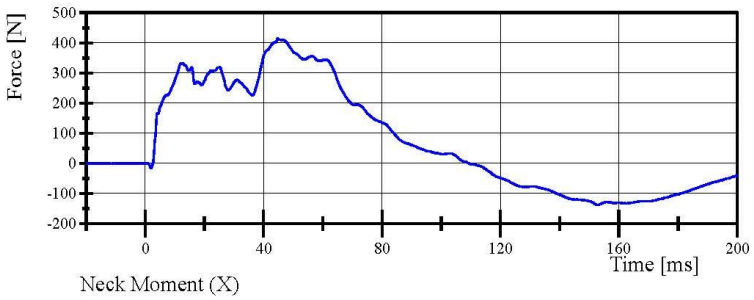
Left Lateral Neck
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Neck Force (Y)



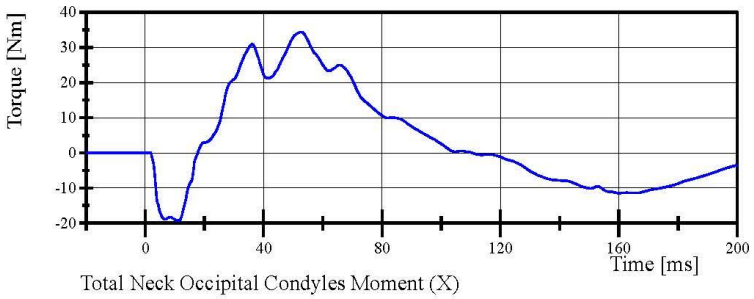
Filter Class: CFC_1000
Max: 416.8 N at 44.6 ms
Min: -138.2 N at 153.1 ms

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



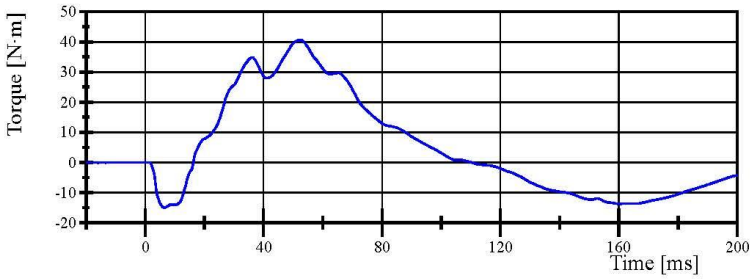
Filter Class: CFC_600
Max: 414.6 N at 44.7 ms
Min: -138.0 N at 152.9 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 34.4 Nm at 52.4 ms
Min: -19.2 Nm at 10.8 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 40.6 N·m at 52.3 ms
Min: -14.9 N·m at 6.2 ms

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

03.03.2023 13:10:47 749

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.0 g	Yes
Shoulder Displacement	28 - 37 mm	31.0 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	18.5 g	Yes

Test meets specifications.

Condition: Used

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

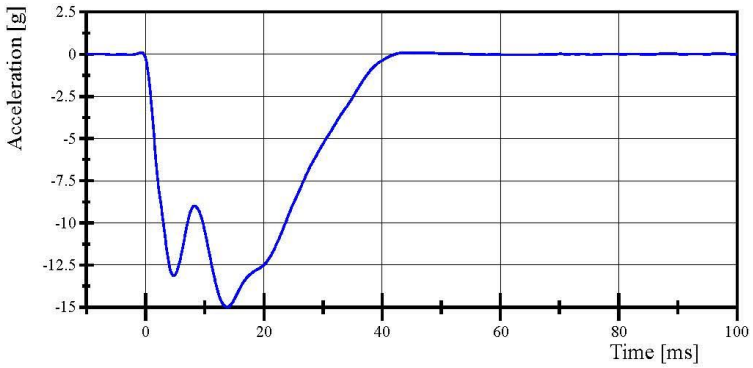
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 09:39:43 866

Transportation Research Center Inc.

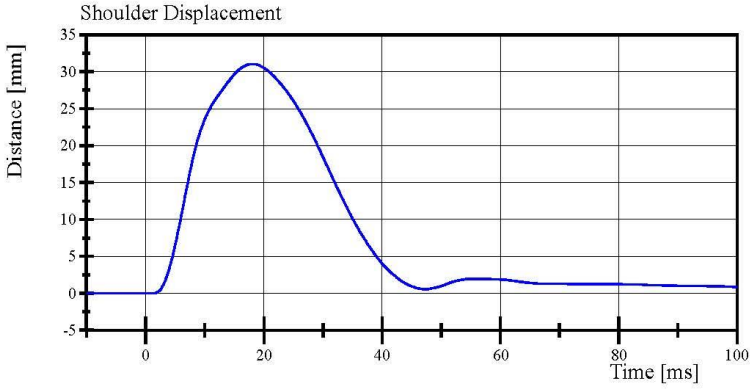
Left Lateral Shoulder
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Probe Acceleration



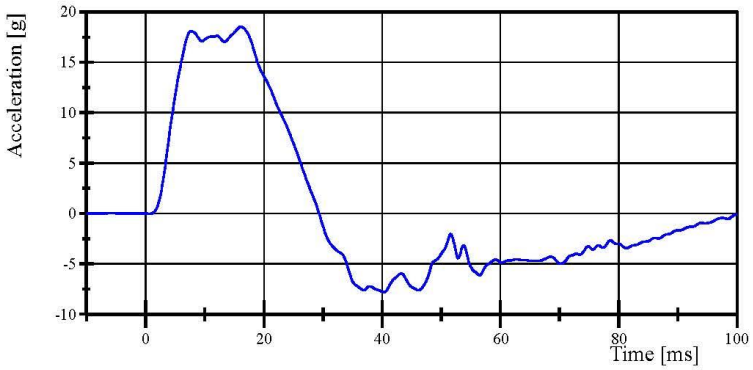
Filter Class: CFC_180
Max: 0.1 g at 45.4 ms
Min: -15.0 g at 13.8 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.0 mm at 18.1 ms
Min: -0.0 mm at -5.0 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 18.5 g at 16.2 ms
Min: -7.8 g at 40.3 ms

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

03.03.2023 09:40:11 866

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.687 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.8 g	Yes
Shoulder Displacement	31 - 40 mm	35.2 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.1 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.8 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	36.8 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	36.0 g	Yes

Test meets specifications.

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

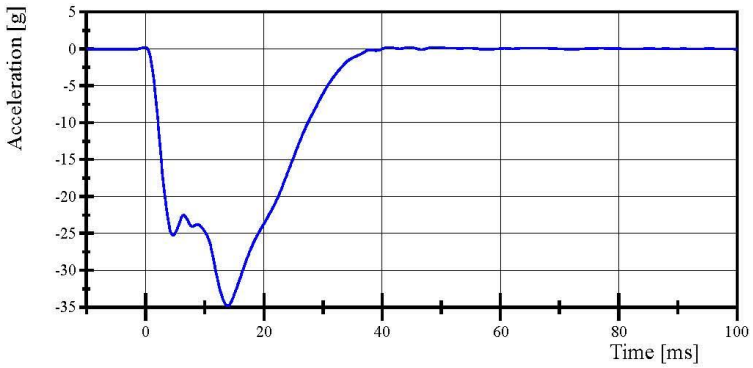
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 10:44:04 641

Transportation Research Center Inc.

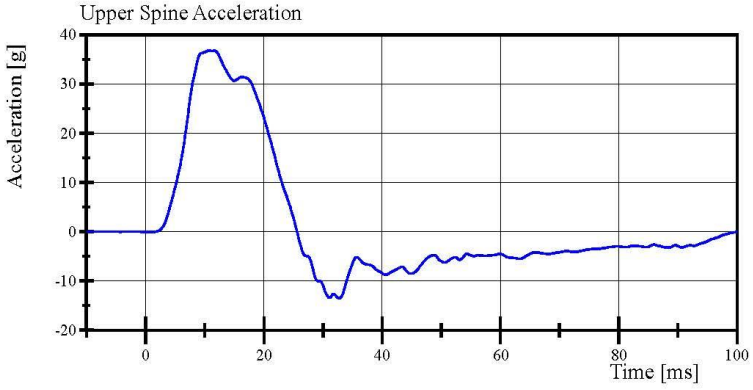
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Probe Acceleration



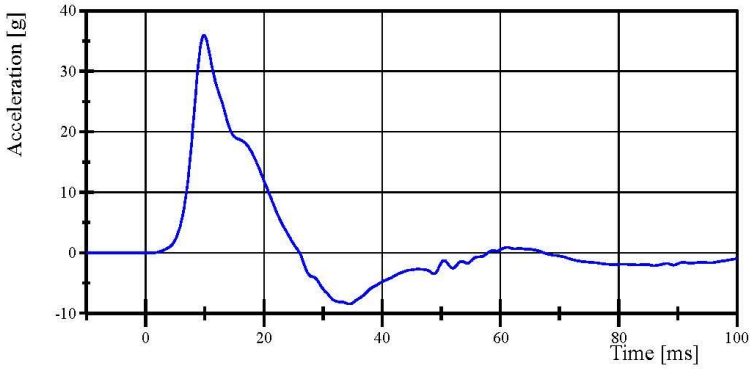
Filter Class: CFC_180
Max: 0.2 g at 41.1 ms
Min: -34.8 g at 13.8 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 36.8 g at 10.7 ms
Min: -13.5 g at 32.7 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 36.0 g at 9.8 ms
Min: -8.5 g at 34.5 ms

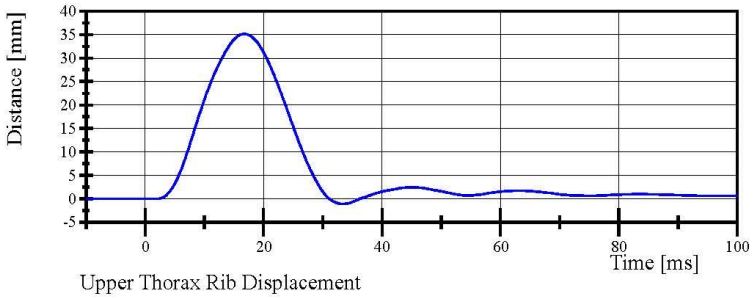
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 10:52:26 641

Transportation Research Center Inc.

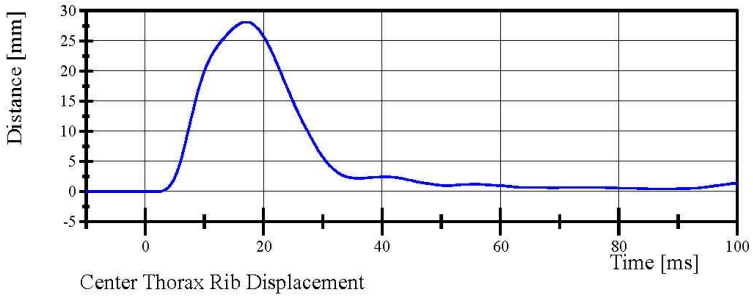
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Shoulder Rib Displacement



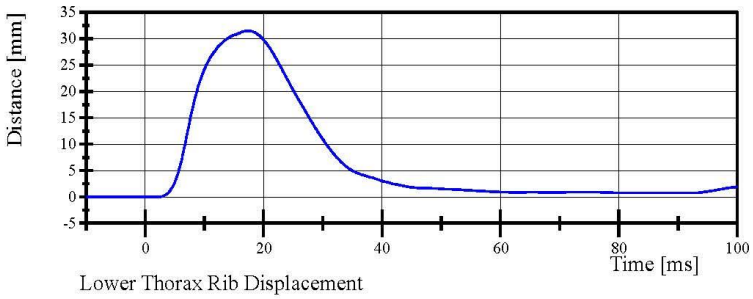
Filter Class: CFC_600
Max: 35.2 mm at 16.7 ms
Min: -1.1 mm at 33.3 ms

Upper Thorax Rib Displacement



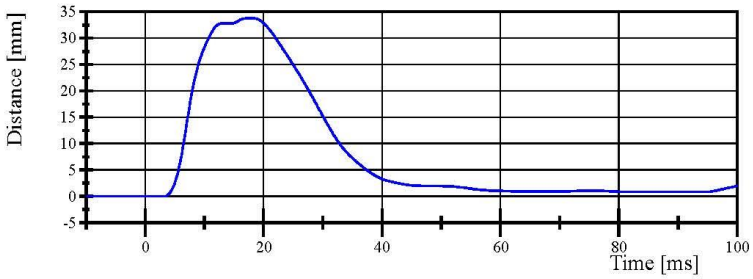
Filter Class: CFC_600
Max: 28.1 mm at 17.0 ms
Min: -0.0 mm at -6.8 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.5 mm at 17.4 ms
Min: -0.0 mm at -1.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.8 mm at 17.5 ms
Min: -0.0 mm at 3.1 ms

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

03.03.2023 10:52:26 641

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.325 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.6 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.4 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	39.0 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.3 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.3 g	Yes

Test meets specifications.

Condition: Used

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

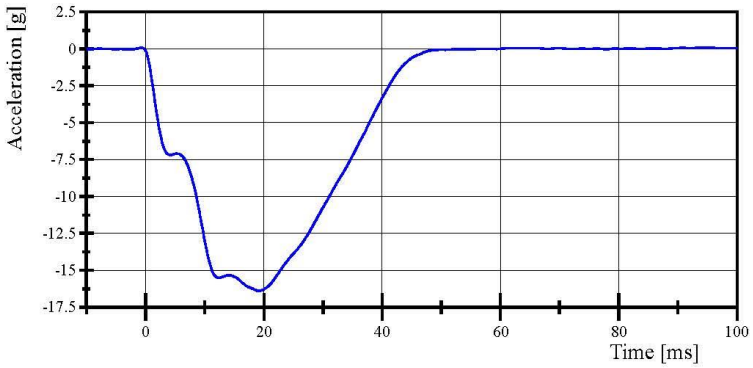
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 09:57:26 878

Transportation Research Center Inc.

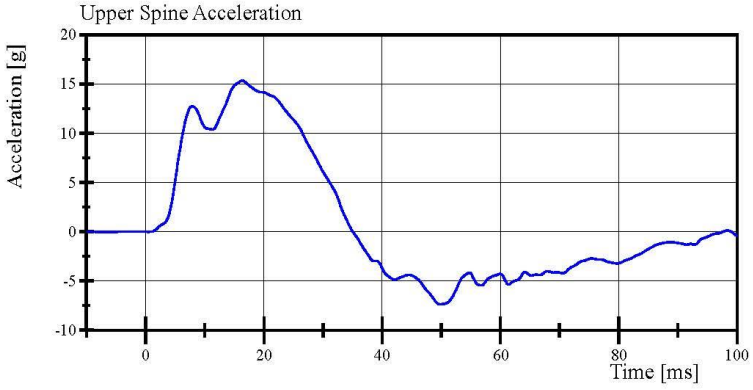
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Probe Acceleration



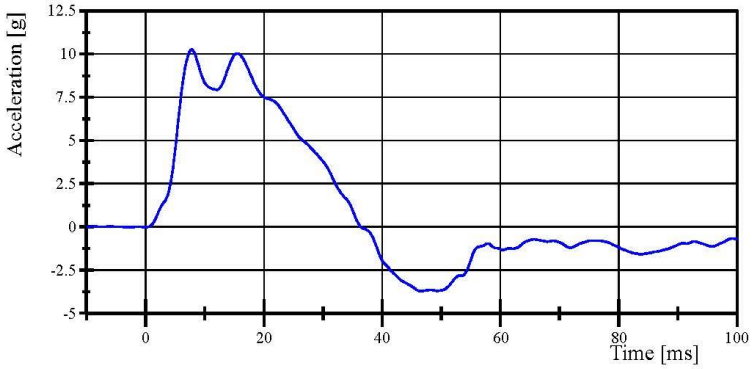
Filter Class: CFC_180
Max: 0.1 g at 93.7 ms
Min: -16.4 g at 19.1 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.3 g at 16.3 ms
Min: -7.4 g at 49.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.3 g at 7.8 ms
Min: -3.7 g at 46.5 ms

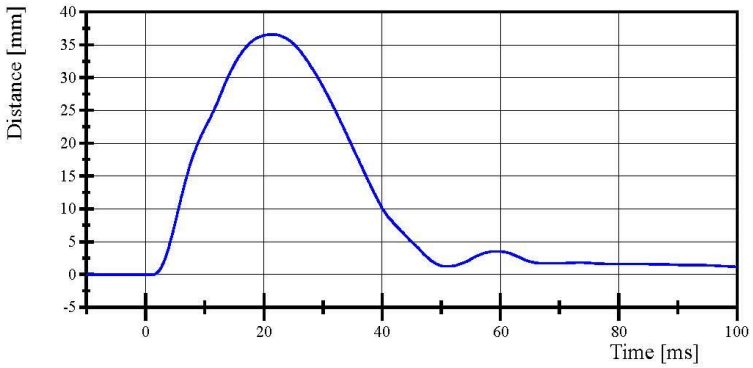
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 09:58:06 878

Transportation Research Center Inc.

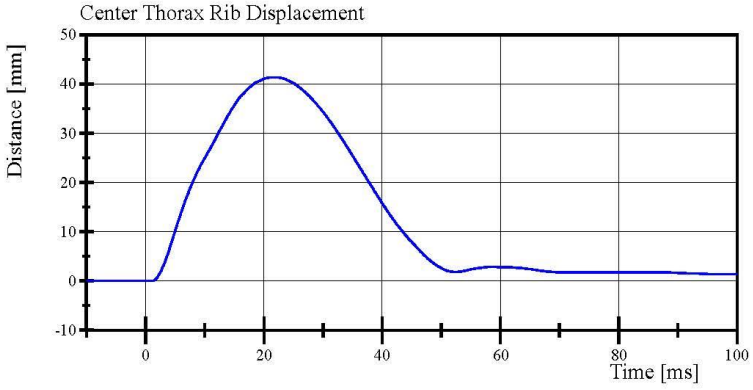
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Upper Thorax Rib Displacement



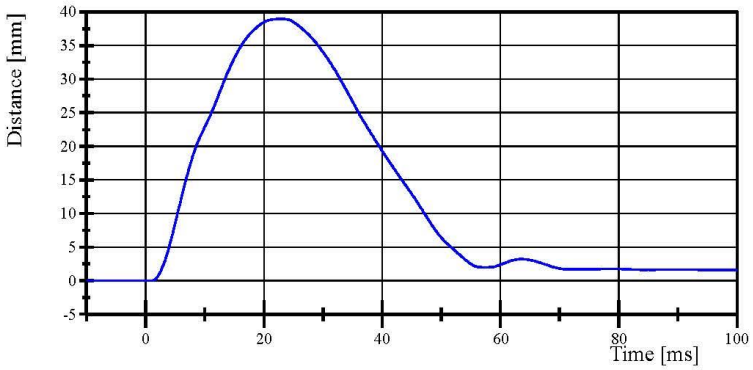
Filter Class: CFC_600
Max: 36.6 mm at 21.5 ms
Min: -0.0 mm at -9.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.4 mm at 21.7 ms
Min: -0.0 mm at -2.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.0 mm at 22.9 ms
Min: -0.0 mm at 1.0 ms

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

03.03.2023 09:58:07 878

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.8 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	38.4 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	39.3 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.28 g	Yes

Test meets specifications.

Condition: Used

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

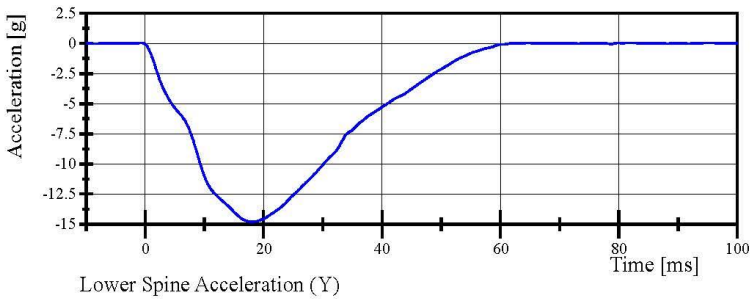
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 09:49:18 711

Transportation Research Center Inc.

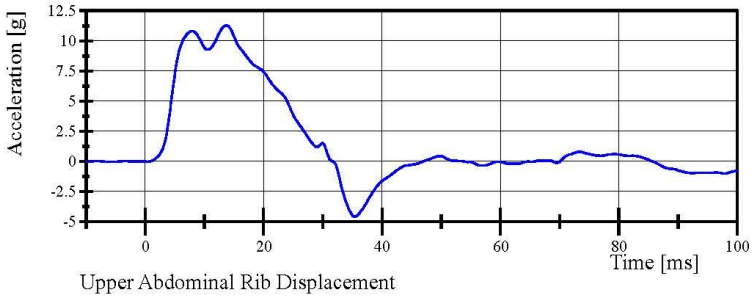
Left Lateral Abdomen
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Probe Acceleration



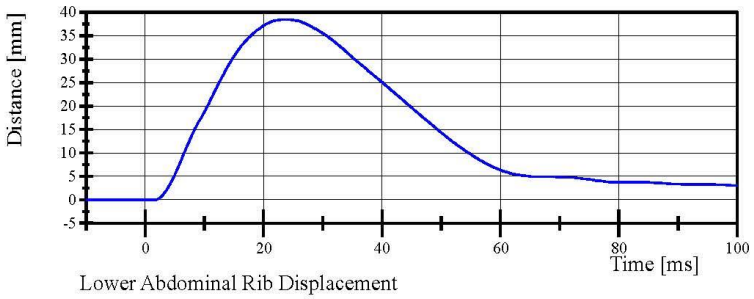
Filter Class: CFC_180
Max: 0.0 g at 82.2 ms
Min: -14.8 g at 18.0 ms

Lower Spine Acceleration (Y)



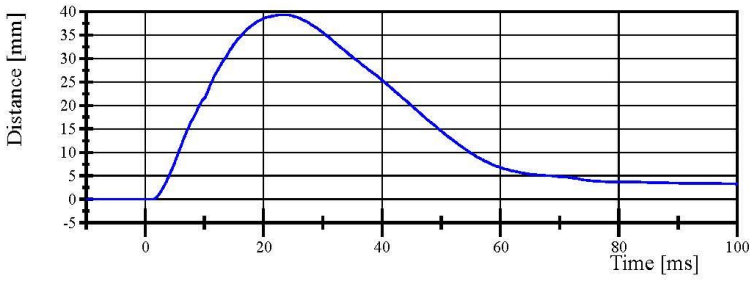
Filter Class: CFC_180
Max: 11.3 g at 13.7 ms
Min: -4.6 g at 35.4 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 38.4 mm at 23.8 ms
Min: -0.0 mm at 1.6 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 39.3 mm at 23.0 ms
Min: -0.0 mm at 1.0 ms

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

03.03.2023 09:49:46 711

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.90 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.8 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,967.5 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: 1173
Pelvis Plug Info:
Manufacturer: SACO
S/N: 13797
Cal Date: 20200508

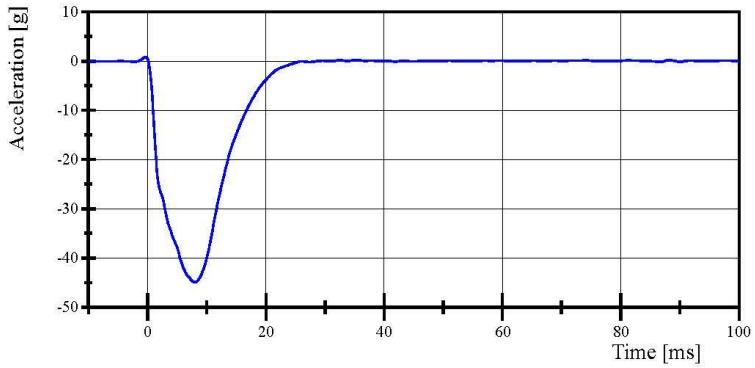
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.03.2023 11:31:14 471

Transportation Research Center Inc.

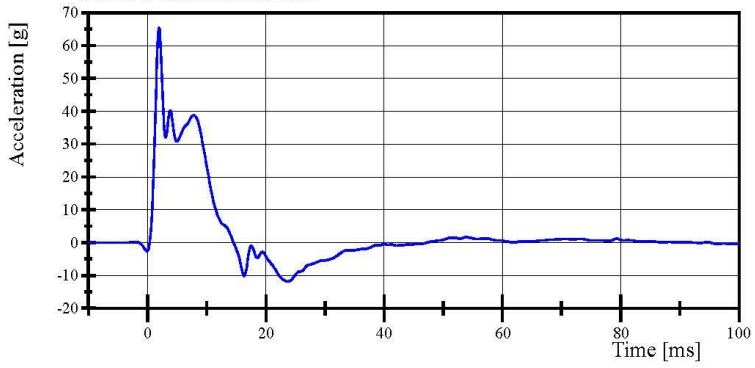
Left Lateral Pelvis
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Probe Acceleration



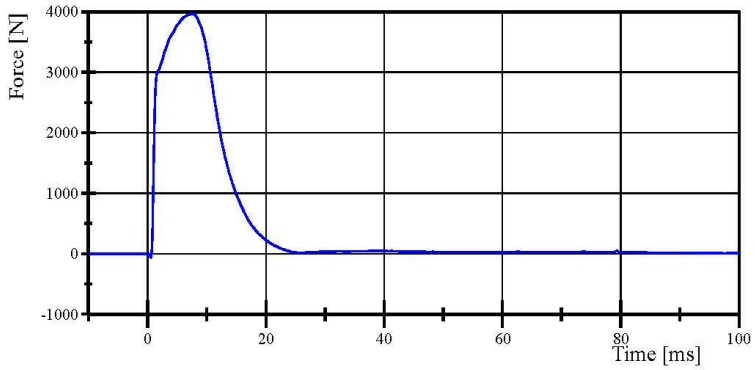
Filter Class: CFC_180
Max: 0.8 g at -0.4 ms
Min: -44.9 g at 7.9 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 65.4 g at 1.9 ms
Min: -11.8 g at 23.7 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,967.5 N at 7.6 ms
Min: -60.3 N at 0.5 ms

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

03.03.2023 11:32:31 471

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-42.5 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	36.7 g	Yes
Iliac Force	4,100 - 5,100 N	4,890.9 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: 000173

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

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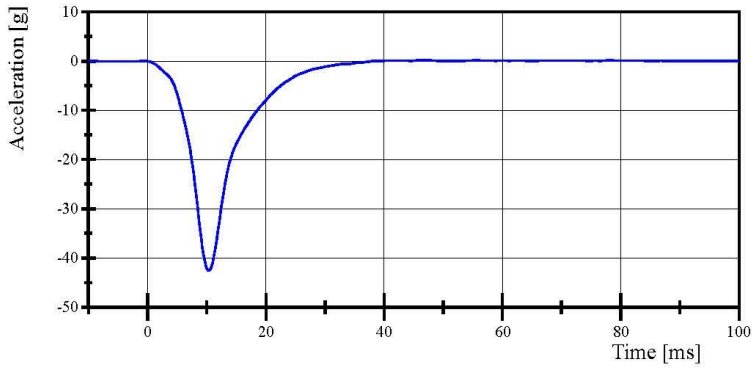
Transportation Research Center Inc.

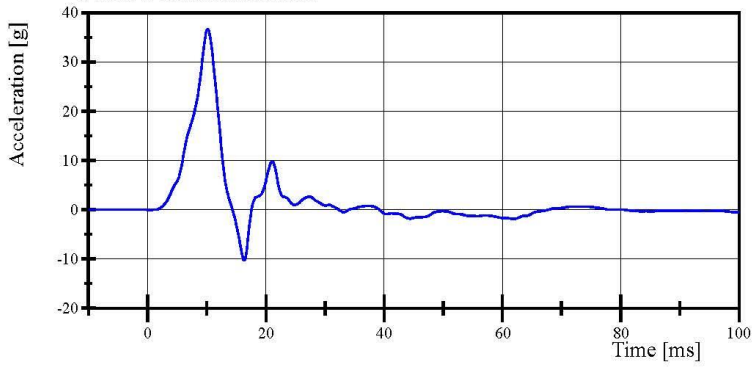
Left Lateral Iliac
SID IIs Serial No. DQ0570 Certification No. 20-1
Test Date: 3/3/2023

Probe Acceleration



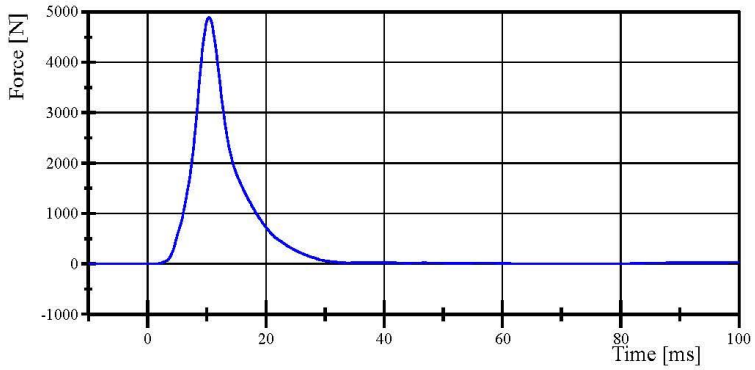
Filter Class: CFC_180
Max: 0.2 g at 46.4 ms
Min: -42.5 g at 10.3 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 36.7 g at 10.2 ms
Min: -10.3 g at 16.3 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,890.9 N at 10.4 ms
Min: -0.7 N at -5.8 ms

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

03.03.2023 09:29:42 635

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	13-Feb-2023
		Y	T10352	Endevco	13-Feb-2023
		Z	P87064	Endevco	14-Feb-2023
Redundant Head Accelerometers		X	T16771	Endevco	13-Feb-2023
		Y	P83368	Endevco	13-Feb-2023
		Z	P91904	Endevco	13-Feb-2023
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	14-Feb-2023
	Middle	Y	174	FTSS	14-Feb-2023
	Lower	Y	0913	Honeywell	14-Feb-2023
Abdomen Load Cells	Front	Y	1441	Denton	14-Feb-2023
	Middle	Y	1436	Denton	14-Feb-2023
	Rear	Y	1437	Denton	14-Feb-2023
Lower Spine Accelerometers (T12)		X	T11866	Endevco	13-Feb-2023
		Y	P91615	Endevco	13-Feb-2023
		Z	P64884	Endevco	13-Feb-2023
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	465-FY	Denton	14-Feb-2023

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N DQ0570		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers			X	T11432	Endevco	10-Feb-2023
			Y	P93774	Endevco	10-Feb-2023
			Z	P91566	Endevco	10-Feb-2023
Redundant Head Accelerometers			X	P93766	Endevco	10-Feb-2023
			Y	P93762	Endevco	10-Feb-2023
			Z	P93761	Endevco	10-Feb-2023
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	13-Feb-2023
		Middle	Y	037	Servo	13-Feb-2023
		Lower	Y	048	Servo	13-Feb-2023
	Abdominal Rib	Upper	Y	1295	Servo	13-Feb-2023
		Lower	Y	1136	Servo	13-Feb-2023
Lower Spine Accelerometers (T12)			X	P94545	Endevco	10-Feb-2023
			Y	P94647	Endevco	10-Feb-2023
			Z	P94530	Endevco	10-Feb-2023
Acetabulum Load Cell			Y	DK7483S-FY	FTSS	13-Feb-2023
Iliac Wing Load Cell			Y	287-FY	Denton	13-Feb-2023
Pelvis Plug (struck side)				13793	SACO	8-May-2020
Pelvis Plug (non-struck side)				13794	SACO	8-May-2020

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A378311	Measurement Specialties	7-Oct-2022
	Vehicle Center of Gravity	Y	A230699	Measurement Specialties	6-Oct-2022
	Vehicle Center of Gravity	Z	A297045	Measurement Specialties	7-Oct-2022
2	Right Sill at Front Seat	X	A349794	Measurement Specialties	7-Oct-2022
	Right Sill at Front Seat	Y	A349879	Measurement Specialties	10-Nov-2022
	Right Sill at Front Seat	Z	A298341	Measurement Specialties	6-Oct-2022
3	Right Sill at Rear Seat	X	A377508	Measurement Specialties	10-Nov-2022
	Right Sill at Rear Seat	Y	A400088	Measurement Specialties	7-Oct-2022
	Right Sill at Rear Seat	Z	A318460	Measurement Specialties	7-Oct-2022
4	Left Sill at Front Door	Y	A377538	Measurement Specialties	7-Oct-2022
5	Left Sill at Rear Door	Y	A254898	Measurement Specialties	7-Oct-2022
6	Left A-Post Lower	Y	A318447	Measurement Specialties	7-Oct-2022
7	Left A-Post Middle	Y	A400122	Measurement Specialties	7-Oct-2022
8	Left B-Post Lower	Y	A254916	Measurement Specialties	3-Feb-2023
9	B-Post Middle	Y	A377493	Measurement Specialties	10-Nov-2022
10	Front Seat Track	Y	A298543	Measurement Specialties	10-Nov-2022
11	Rear Seat Track or Structure	Y	A318453	Measurement Specialties	7-Oct-2022
12	Right Rear Occupant Compartment	Y	A297062	Measurement Specialties	7-Oct-2022
13	Engine Block	X	A251664	Measurement Specialties	19-Sep-2022
	Engine Block	Y	A377536	Measurement Specialties	7-Oct-2022
14	Rear Floorpan Above Axle	X	A318488	Measurement Specialties	7-Oct-2022
	Rear Floorpan Above Axle	Y	A377448	Measurement Specialties	7-Oct-2022
	Rear Floorpan Above Axle	Z	A318461	Measurement Specialties	7-Oct-2022

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A378352	Measurement Specialties	7-Oct-2022
MDB Center of Gravity	Y	A300428	Measurement Specialties	7-Oct-2022
MDB Center of Gravity	Z	A227171	Measurement Specialties	6-Oct-2022
Left Frame Rail at Rear Axle Centerline	X	A349899	Measurement Specialties	10-Nov-2022
Left Frame Rail at Rear Axle Centerline	Y	A349898	Measurement Specialties	10-Nov-2022