

FINAL REPORT NUMBER: SINCAP-TRC-23-001

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

**NISSAN MOTOR CO., LTD.
2023 Nissan Armada
NHTSA NUMBER: M20235205**

**PREPARED BY:
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P. O. Box B-67
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Report Date: January 18, 2024

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: January 18, 2024

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2023 Nissan Armada, 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 February 16, 2023. The impact velocity of the Moving Deformable Barrier (MDB) was 61.80 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 20.5° C. The target vehicle post-test maximum crush was 195 mm at Level 1. The test vehicle's performance was as follows: Driver ATD (ES-2re) <table border="1"> <thead> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>N/A</td><td>1000</td><td>29.304</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>44</td><td>21.880</td></tr> <tr> <td>Total Abdominal Force</td><td>N</td><td>2500</td><td>277.940</td></tr> <tr> <td>Pubic Symphysis Force</td><td>N</td><td>6000</td><td>-682.510</td></tr> <tr> <td>Lower Spine Acceleration</td><td>G</td><td>82*</td><td>23.060</td></tr> </tbody> </table> Passenger ATD (SID-IIs) <table border="1"> <thead> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>N/A</td><td>1000</td><td>15.222</td></tr> <tr> <td>Lower Spine Resultant Acceleration</td><td>g's</td><td>82</td><td>14.440</td></tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td><td>N</td><td>5525</td><td>832.000</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>38*</td><td>0.080</td></tr> <tr> <td>Maximum Abdominal Rib Deflection</td><td>mm</td><td>45*</td><td>0.670</td></tr> </tbody> </table> * 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.				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	29.304	Maximum Thoracic Rib Deflection	mm	44	21.880	Total Abdominal Force	N	2500	277.940	Pubic Symphysis Force	N	6000	-682.510	Lower Spine Acceleration	G	82*	23.060	Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	15.222	Lower Spine Resultant Acceleration	g's	82	14.440	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	832.000	Maximum Thoracic Rib Deflection	mm	38*	0.080	Maximum Abdominal Rib Deflection	mm	45*	0.670
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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 Nissan Armada. 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 Nissan Armada was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.80 km/h (38.45 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on February 16, 2023. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated March 2020. The side impact event was documented by 11 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen forward, middle, and rear y-axis load cells

Lower spine (T12) tri-axial accelerometers

Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

Primary and redundant head CG triaxial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (T12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	29.304
Maximum Thoracic Rib Deflection	mm	44	21.880
Combined Abdominal Force	N	2500	277.940
Pubic Symphysis Force	N	6000	-682.510
Lower Spine (T12) Resultant Acceleration	G	82*	23.060

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	15.222
Lower Spine (T12) Resultant Acceleration	G	82	14.440
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	832.000
Maximum Thoracic Rib Deflection	mm	38*	0.080
Maximum Abdominal Rib Deflection	mm	45*	0.670

* 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	Yes		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	N/A	Yes	N/A
Other Safety Restraint	No	N/A	No	N/A

GENERAL COMMENTS

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

Left Side Sill at Rear Seat Acceleration (Y); FAILED AT 20.0 MS

Left Lower A-Post Acceleration (Y); Failed at 8.0 MS

Rear Seat Structure Acceleration (Y); Failed at 22.0 MS

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20235205	Traction Control System (TCS)	Yes
Model Year	2023	Auto-Leveling System	No
Make	Nissan	Automatic Door Locks (ADL)	Yes
Model	Armada	Power Window Auto-Reverse	Yes
Body Style	MPV	Other Optional Feature	No
VIN	JN8AY2BC8P9180709	Driver Front Airbag	Yes
Body Color	Brilliant Silver	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	5 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	5.6	Driver Torso Airbag	No
Type/No. Cylinders	V8	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Inline Front	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	7	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	2WD	Rear Pass. Torso Airbag	No
Roof Rack	Yes	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	Yes	Rear Passenger Pelvis Airbag	No
Running Boards	Yes	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Passenger Load Limiter	Yes
		Other	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	NISSAN MOTOR CO., LTD.	GVWR (LB)	7300
Date of Manufacture	10/22	GAWR Front (LB)	3616
Vehicle Type	MPV	GAWR Rear (LB)	4343

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	3	8
Capacity Weight (VCW) (kg)				660.0
DSC x 68.04 (kg)				544.32
Cargo Weight (RCLW) (kg)				115.68

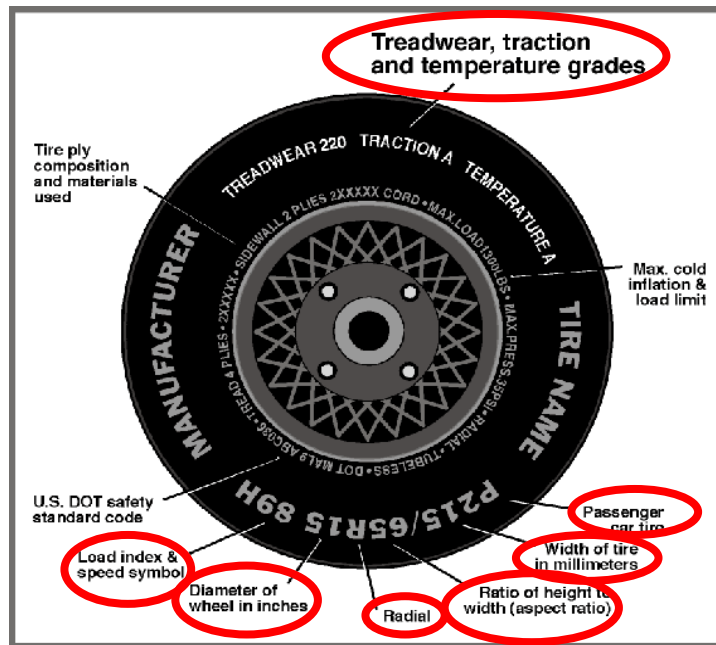
VEHICLE SEAT TYPE

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 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P275/60R20 114H	P275/60R20 114H
Tire Size on Vehicle	P275/60R20	P275/60R20
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler	Dueler
Treadwear	360	360
Traction	B	B
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	114H	114H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	DOT EJ NU DEM4022	DOT EJ NU DEM4022
DOT Safety Code Right	DOT EJ NU DEM4022	DOT EJ NU DEM4022

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

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	276	283	283	283
Tire Placard	kPa	241	241	241	241
Owner's Manual	kPa	241	241	241	241
As Tested	kPa	241	241	241	241

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	643.8	645.6		690.0	750.4		687.8	778.4	
Right	kg	650.0	625.6		636.0	722.6		628.4	711.0	
Ratio	%	50.4	49.6		47.4	52.6		46.9	53.1	
Totals	kg	1293.8	1271.2	2565.0	1326.0	1473.0	2799.0	1316.2	1489.4	2805.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2565	(A)
Sum of Actual Weight of 2 P572V ATDS Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	115.68	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2805.68	(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	907	907	Yes
RF	mm	903	912	Yes
RR	mm	882	882	Yes
LR	mm	866	866	Yes
Vehicle CG (Aft of Front Axle)	mm	1634	1620	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+39	+25	

***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 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plates	99.0
Removed: None	0.0

TEST SURFACE MARKINGS

	Distance from 63° Impact Angle Line (mm)
Fore 25 mm target	1020
Aft 25 mm target	1022
Pre-Impact Angle Line	205

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 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023

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	16.4	9	12.7
Front Passenger Seat	12.5	9.8	11.2
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	N/A	N/A	N/A
Non-Struck Side Rear Seat	N/A	N/A	N/A
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	12.7	303	Max	335	334	333
			Mid	318.5	319	317.5
			Min	302	304	302
Front Passenger Seat	11.2	304	Max	334	326	328
			Mid	318	315	315
			Min	302	304	302
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	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
Non-Struck Side Rear 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
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 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023

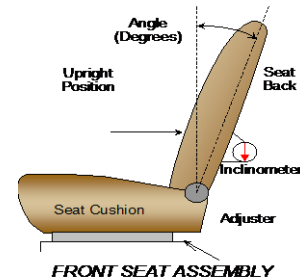
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	240	N/A	120	N/A
Front Passenger Seat	240	N/A	120	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	N/A	N/A	N/A	N/A
Non-Struck Side Rear Seat	N/A	N/A	N/A	N/A
Rear Center Seat*	N/A	N/A	N/A	N/A

* If applicable

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	55.3	N/A	10.4	N/A
Front Passenger Seat	55.3	N/A	10.4	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	20	10	0.9	10
Non-Struck Side Rear Seat	20	10	0.9	10
Rear Center Seat*	20	10	0.9	10

* 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	4	0, Full Up

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	5	4, Full Down

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

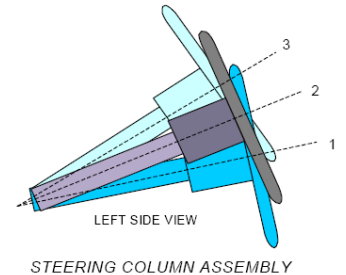
Test Vehicle: 2023 Nissan Armada
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STEERING COLUMN ADJUSTMENT

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

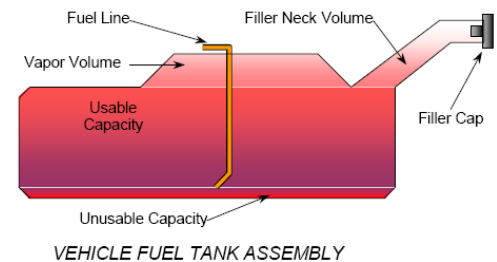
	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	17.1	0
Geometric Center, Position No. 2	24.1	16
Uppermost, Position No. 3	31.2	32
Telescoping Steering Wheel Travel		32
Test Position	24.1	16



FUEL PUMP

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

Approximately 1 second after the ignition is switched to "ON" While the engine is running. Approximately for 1.5 seconds after the engine stops running



FUEL TANK CAPACITY

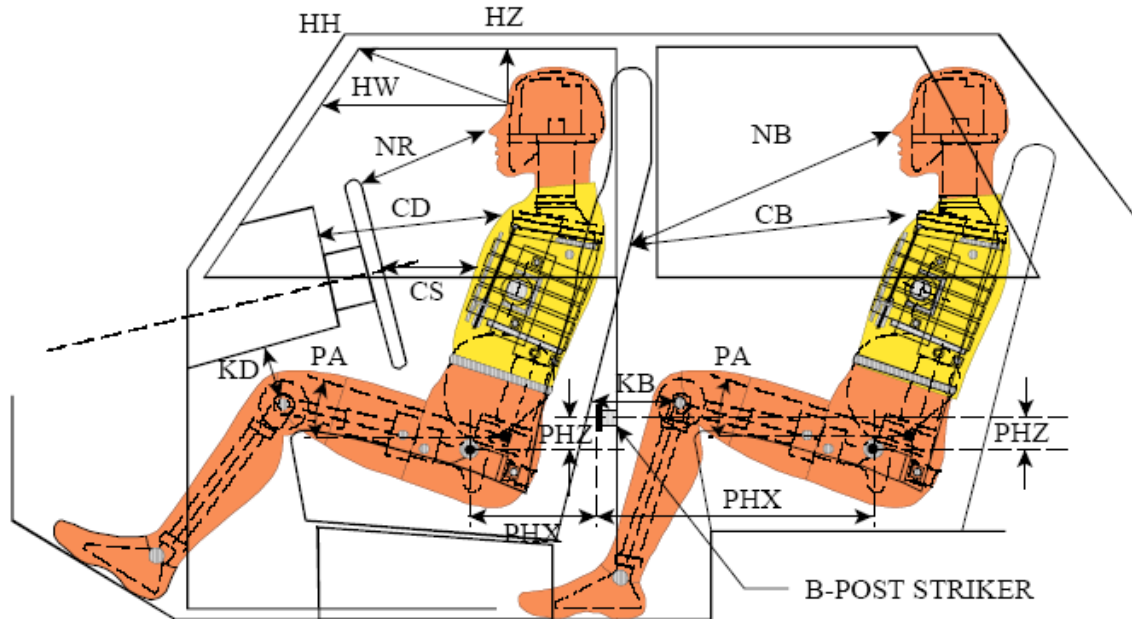
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	98.4
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	98.4
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	91.5
Actual Amount of Solvent Used in Test	91.5
1/3 of Usable Capacity	32.8

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



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

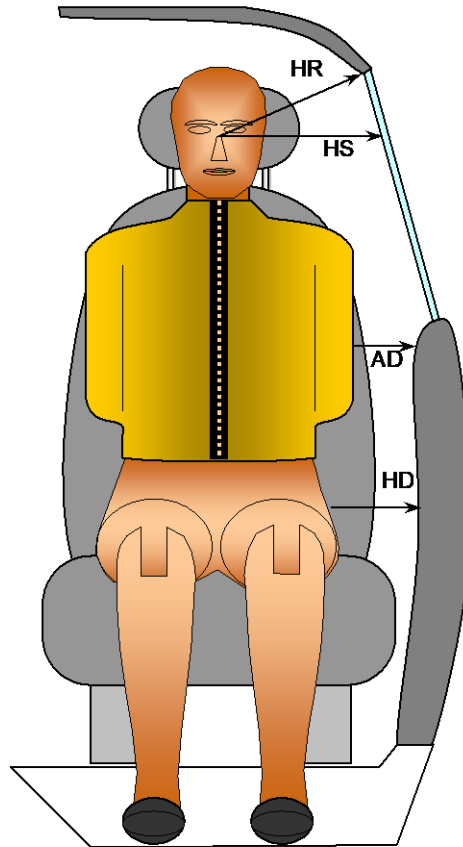
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	396			
HW		Header to Windshield	597			
HZ	HZ	Head to Roof Liner	182		310	
NR	NB	Nose to Rim/Seat Back	435		635	
CD	CB	Chest to Dash/Seat Back	539		637	
CS		Chest to Steering Wheel	332			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	135	56.0	378	9.2
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	125	23.0	382	8.5
PAX°	PAX°	Pelvic Tilt Angle X		0.2		0.4
	PAY°	Pelvic Tilt Angle Y				18.4
PHX	PHX	Hip Point to Striker (X-Axis)	271		280	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	40		107	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



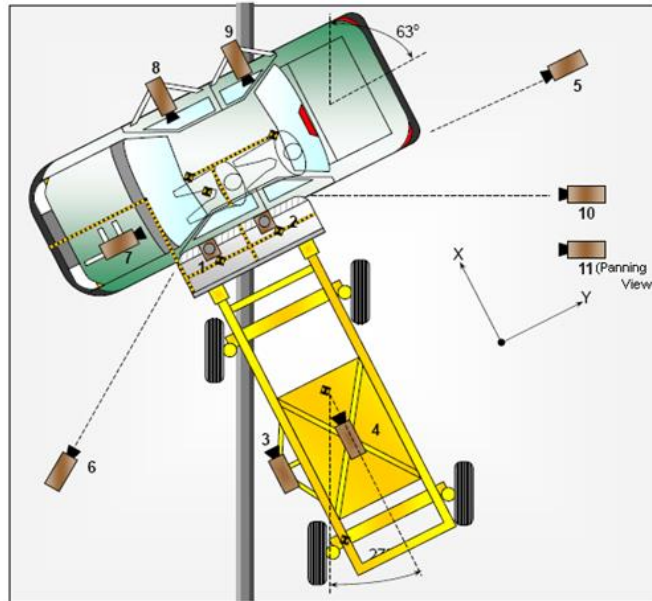
FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	239	304
HS	Head to Side Window	mm	345	380
AD	Arm to Door	mm	92	173
HD	H-Point to Door	mm	119	182

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



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	8921	-1501	20	1000
6	Left Front	1990	-3180	-1520	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

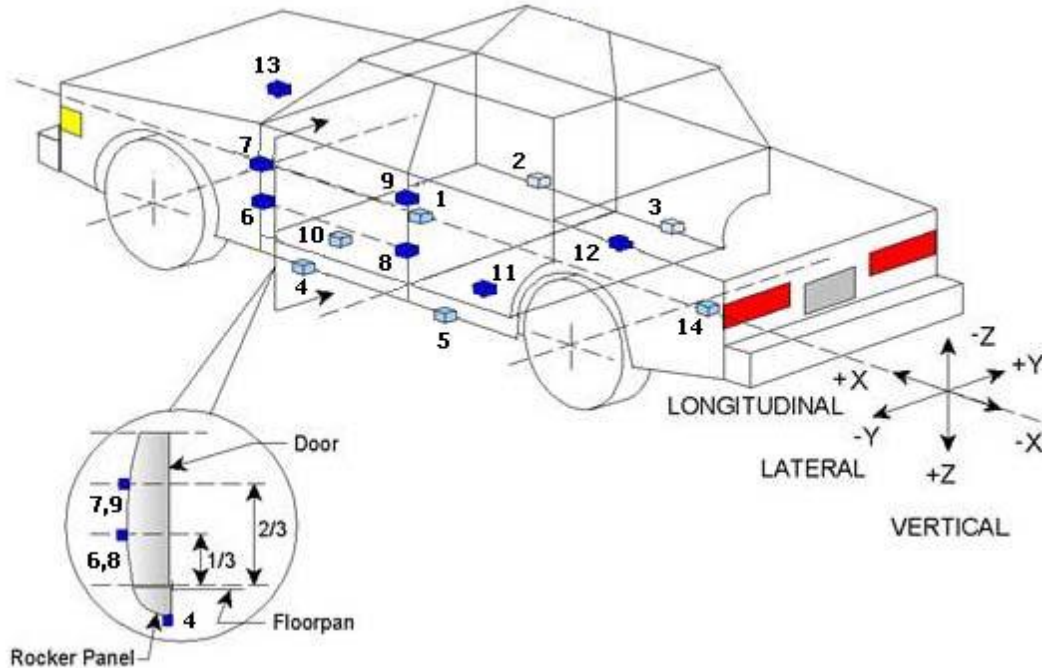
INSTRUMENTATION

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 Nissan Armada
Test Program: SINCAP Side Impact

NHTSA No.: M20235205
Test Date: 2/16/2023



TEST VEHICLE ACCELEROMETER LOCATIONS

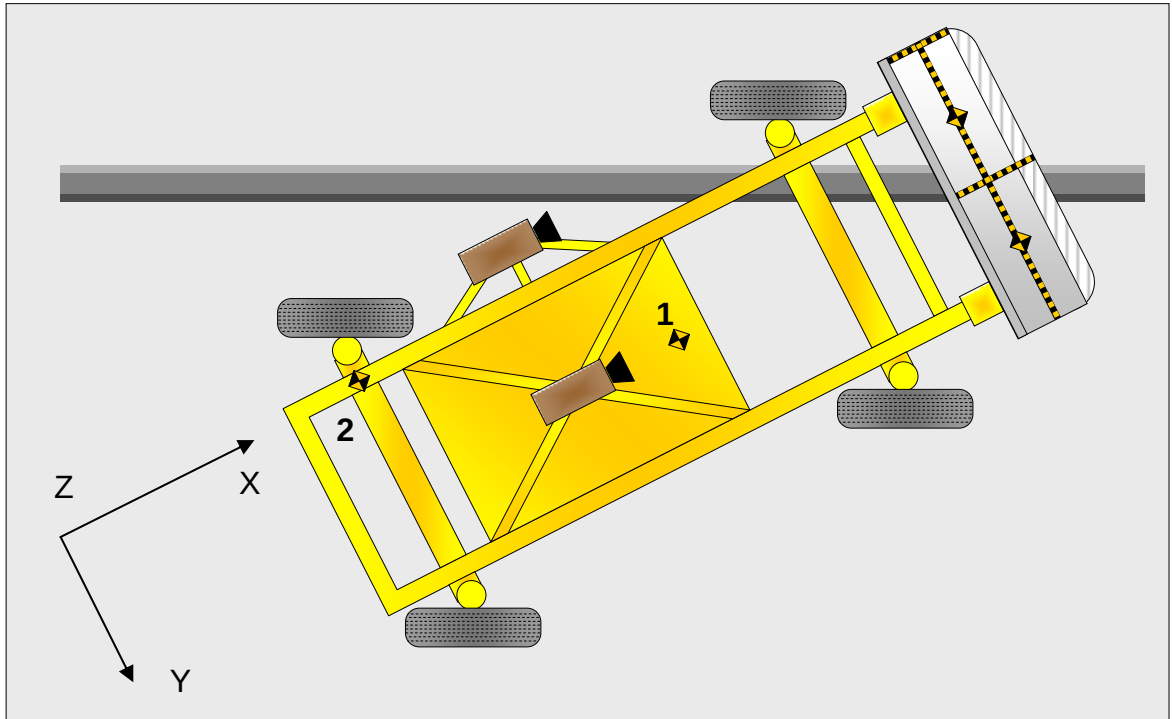
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3323	191	-635
2	Right Sill at Front Seat	3280	752	-535
3	Right Sill at Rear Seat	2246	767	-516
4	Left Sill at Front Door	3288	-754	-533
5	Left Sill at Rear Door	2225	-772	-508
6	A-Post Lower	3696	-915	-714
7	A-Post Middle	3692	-906	-1077
8	B-Post Lower	2582	-899	-747
9	B-Post Middle	2564	-904	-1195
10	Front Seat Track	2790	-685	-625
11	Rear Seat Structure	1860	-600	-719
12	Right Rear Occ. Compartment	1820	620	-724
13	Engine Block	4290	0	-1129
14	Rear Above Axle	1085	0	-739

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 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



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 Nissan Armada
Test Program: SINCAP Side Impact

NHTSA No.: M20235205
Test Date: 2/16/2023

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	None	None
Top of Head	SCAB; Side Header	SCAB
Left Side of Head	SCAB; Side Header	SCAB
Back of Head	Head Restraint, SCAB; Side Header	Head Restraint, SCAB
Left Shoulder	SCAB	SCAB, Door Panel
Upper Torso	SAB; Side Seat Bolster	None
Lower Torso	SAB; Side Seat Bolster	None
Left Hip	SAB, Seat pan, Door Panel	Door Panel
Left Knee	Door Panel	Door Panel

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2023 Nissan Armada
Test Program: SINCAP Side Impact

NHTSA No.: M20235205
Test Date: 2/16/2023

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3078
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		502
Actual Impact Point (Aft of Front Axle)	mm		488
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+14
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	+5

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2023 Nissan Armada
Test Program: SINCAP Side Impact

NHTSA No.: M20235205
Test Date: 2/16/2023

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	1112

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	408.0	274.2	682.2
Right	kg	372.8	312.4	685.2
Ratio	%	57.1	42.9	100.0
Totals	kg	780.8	586.6	1367.4

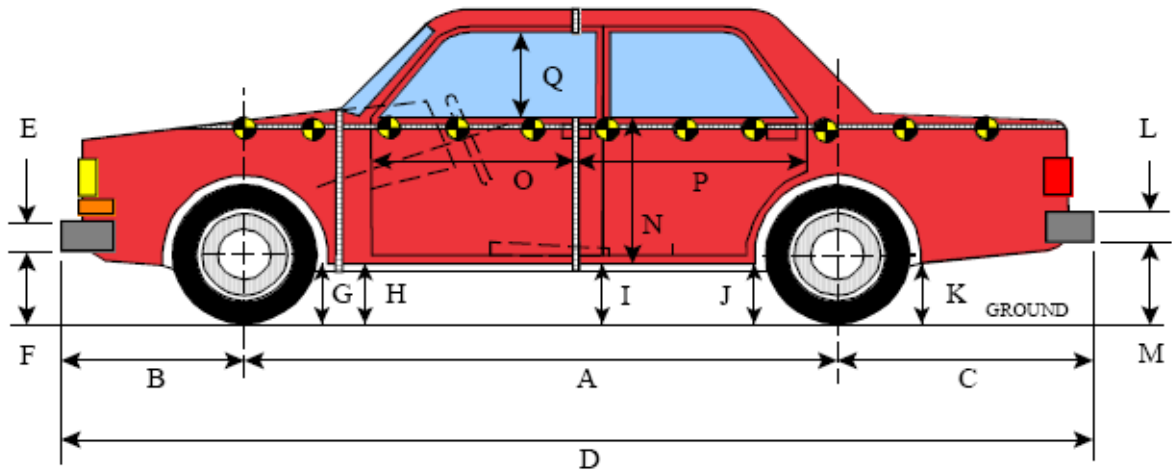
SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.80
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.84
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 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

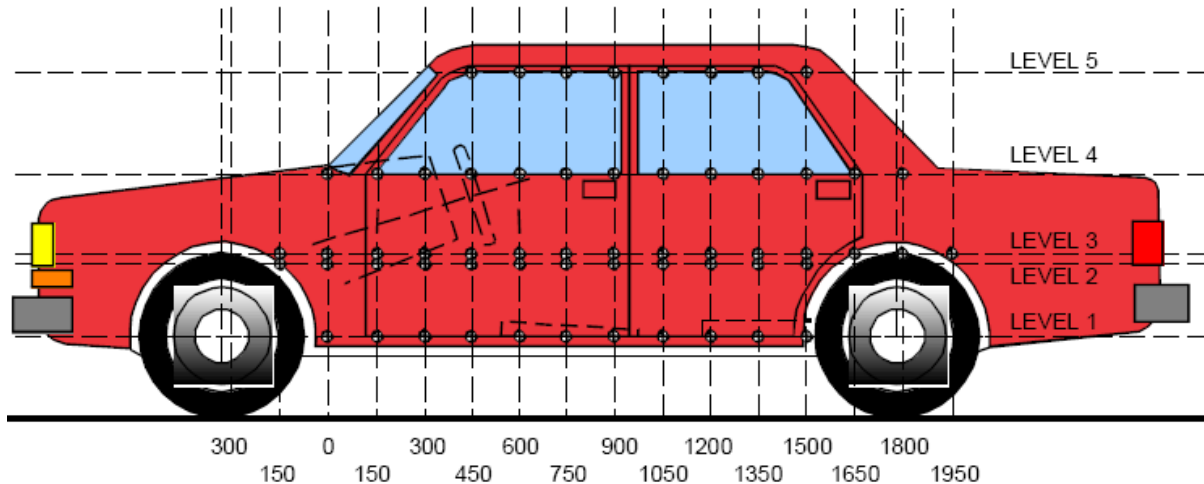
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	3078	3062	-16
B	Front Axle to Front Surface of Vehicle	991	991	0
C	Rear Axle to Rear Surface of Vehicle	1233	1224	-9
D	Total Length at Centerline	5302	5277	-25
E	Front Bumper Thickness	35	35	0
F	Front Bumper Bottom to Ground	728	728	0
G	Sill Height at Front Wheel Well	390	357	-33
H	Sill Height at Front Door Leading Edge	432	418	-14
I	Sill Height at B-Pillar	485	482	-3
J1	Sill Height at Rear Wheel Well	385	389	4
J2	Pinch Weld Height at Rear Wheel Well	327	356	29
K	Sill Height Aft of Rear Wheel Well	403	405	2
L	Rear Bumper Thickness	152	152	0
M	Rear Bumper Bottom to Ground	596	596	0
N	Sill Height to Window Bottom Sill	925	900	-25
O	Front Door Leading Edge to Impact CL	854	753	-101
P	Rear Door Trailing Edge to Impact CL	1374	1427	53
Q	Front Window Opening	458	456	-2
R	Right Side Length	5040	5057	17
S	Left Side Length	5040	5033	-7
T	Vehicle Width	2030	2029	-1
U	Front Wheel Track Width	1719	1708	-11
V	Rear Wheel Track Width	1735	1740	5

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	525	195	1200
2	Driver Hip Point	900	186	1650
3	Mid-Door	860	193	1650
4	Window Sill	1220	65	1500
5	Window Top	1788	-3	2550

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 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

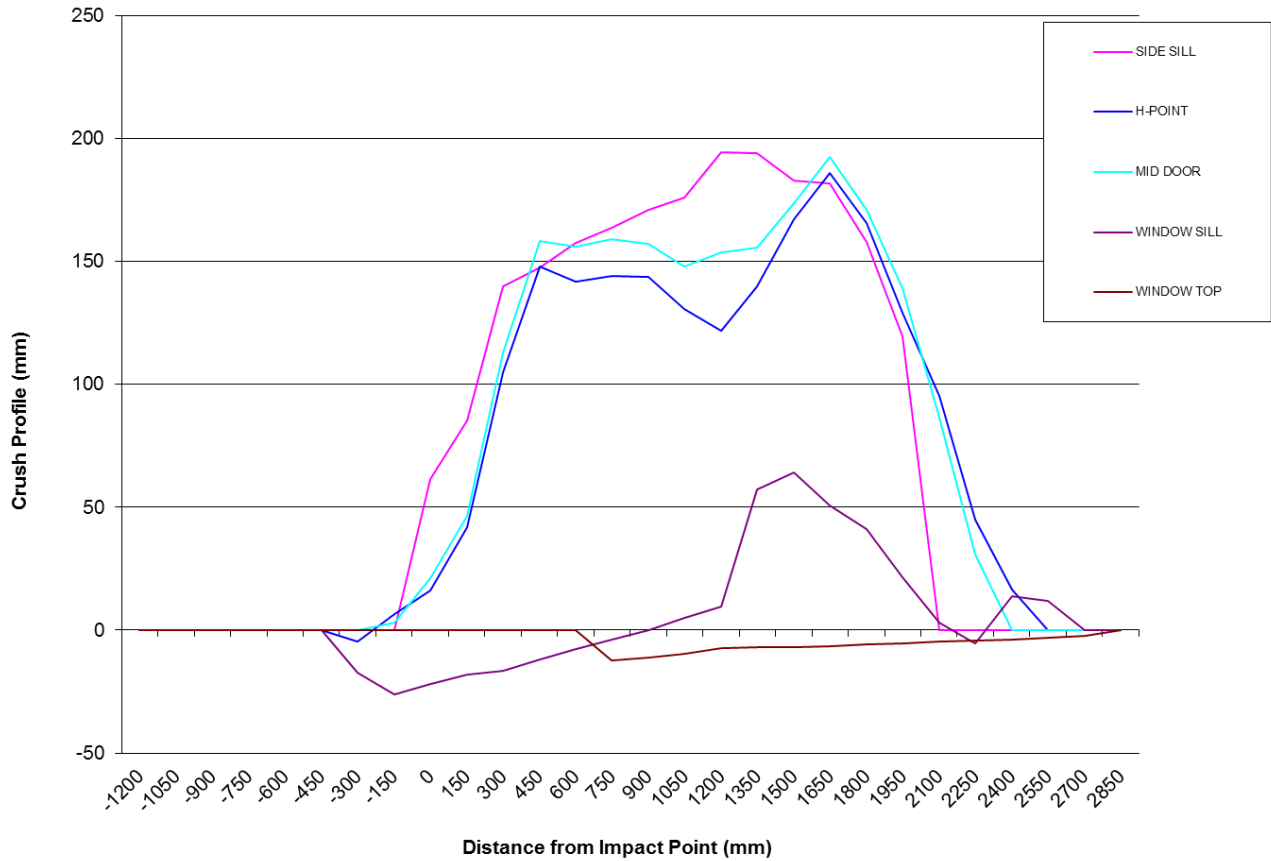
	Pre-Test					Post-Test					Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-300	0	1014	1016	893	0	0	1019	1016	910	0	0	-5	0	-17	0
-150	0	1000	1007	904	0	0	993	1004	930	0	0	7	3	-26	0
0	1004	999	1000	914	0	943	983	979	935	0	61	16	21	-21	0
150	979	997	997	922	0	894	955	951	940	0	85	42	46	-18	0
300	970	996	995	930	0	830	891	882	947	0	140	105	113	-17	0
450	966	996	995	937	0	818	848	837	949	0	148	148	158	-12	0
600	966	997	996	941	0	808	855	840	949	0	158	142	156	-8	0
750	967	998	997	944	700	803	853	838	948	712	164	145	159	-4	-12
900	967	998	996	946	730	796	854	839	945	741	171	144	157	1	-11
1050	967	997	996	948	737	791	866	848	943	747	176	131	148	5	-10
1200	966	996	994	948	740	771	874	841	938	748	195	122	153	10	-8
1350	965	995	993	948	743	771	855	837	891	749	194	140	156	57	-6
1500	964	993	991	948	744	781	826	818	883	751	183	167	173	65	-7
1650	965	992	991	946	743	783	806	798	896	750	182	186	193	50	-7
1800	972	993	993	945	741	814	827	822	904	747	158	166	171	41	-6
1950	980	996	997	944	739	860	867	858	923	744	120	129	139	21	-5
2100	0	999	1000	942	735	0	904	914	939	740	0	95	86	3	-5
2250	0	1001	1011	939	730	0	956	981	945	734	0	45	30	-6	-4
2400	0	1015	0	935	725	0	999	0	922	729	0	16	0	13	-4
2550	0	0	0	931	720	0	0	0	919	723	0	0	0	12	-3
2700	0	0	0	0	715	0	0	0	0	717	0	0	0	0	-2

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 Nissan Armada
Test Program: SINCAP Side Impact

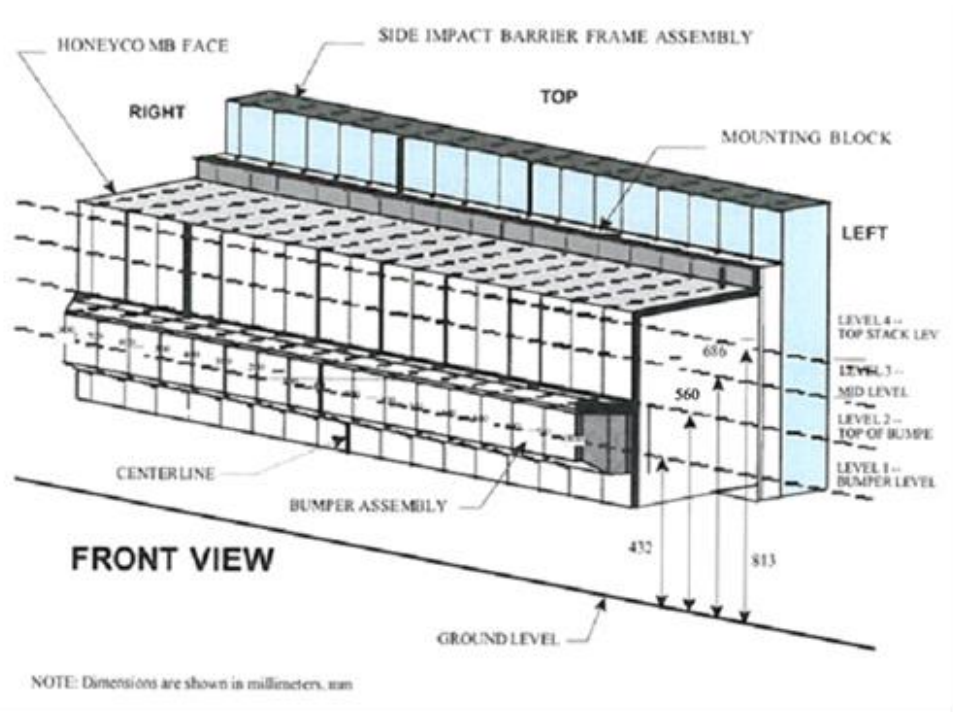
NHTSA No.: M20235205
Test Date: 2/16/2023



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	185	Right	800
B	Top of Bumper	560	182	Right	800
C	Mid-Level	686	208	Right	800
D	Top of Stack	813	181	Right	800

DEFORMABLE BARRIER STATIC CRUSH

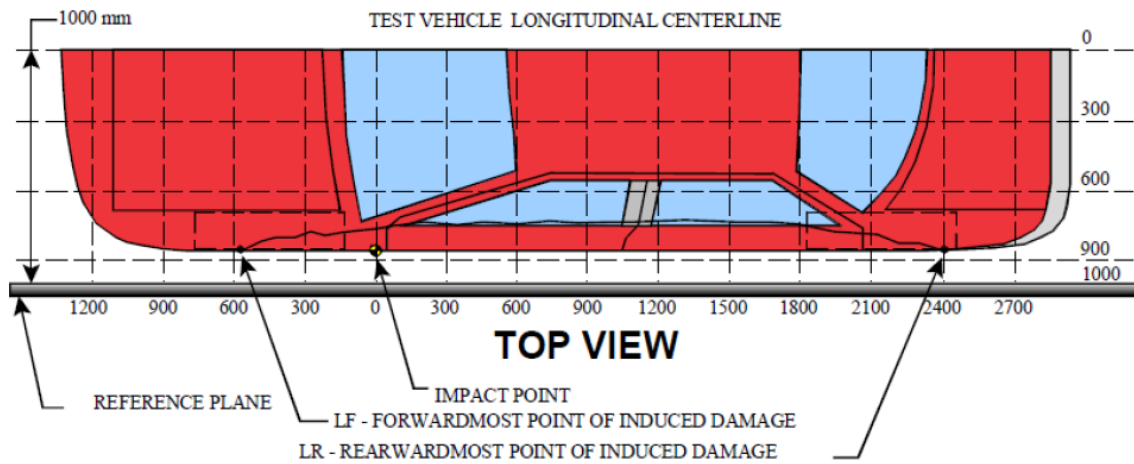
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	185	163	148	140	138	135	133	131	129	128	124	121	120	118	117	117	118
2	182	175	143	145	140	---	---	---	130	126	122	119	116	112	109	106	101
3	208	169	145	105	84	77	87	71	66	60	56	51	50	54	61	71	84
4	181	149	127	117	115	120	143	104	84	64	57	54	55	59	68	86	120

¹Missing points post-test

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023



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	2550	4	919	931	0
2	1950	3	858	997	139
3	1500	1	781	964	183
4	900	1	796	967	171
5	450	3	837	995	158
6 ¹	-150	2	993	1000	0

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	4	263	383	120
2	500 mm Left of Center	1	366	484	118
3	200 mm Left of Center	1	361	485	124
4	200 mm Right of Center	4	241	384	143
5	500 mm Right of Center	2	239	384	145
6	800 mm Right of Center	3	178	386	208

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

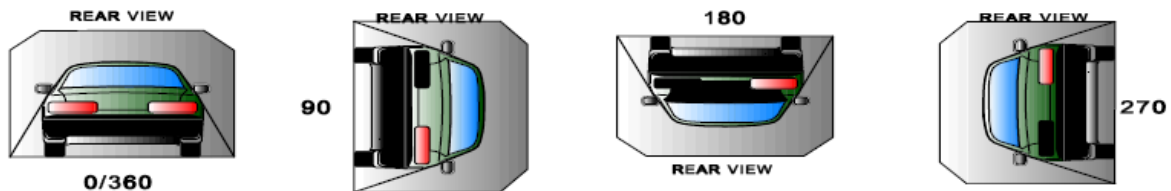
Test Vehicle: 2023 Nissan Armada
 Test Program: SINCAP Side Impact

NHTSA No.: M20235205
 Test Date: 2/16/2023

Test Time: 16:30 **Temperature:** 20.5°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

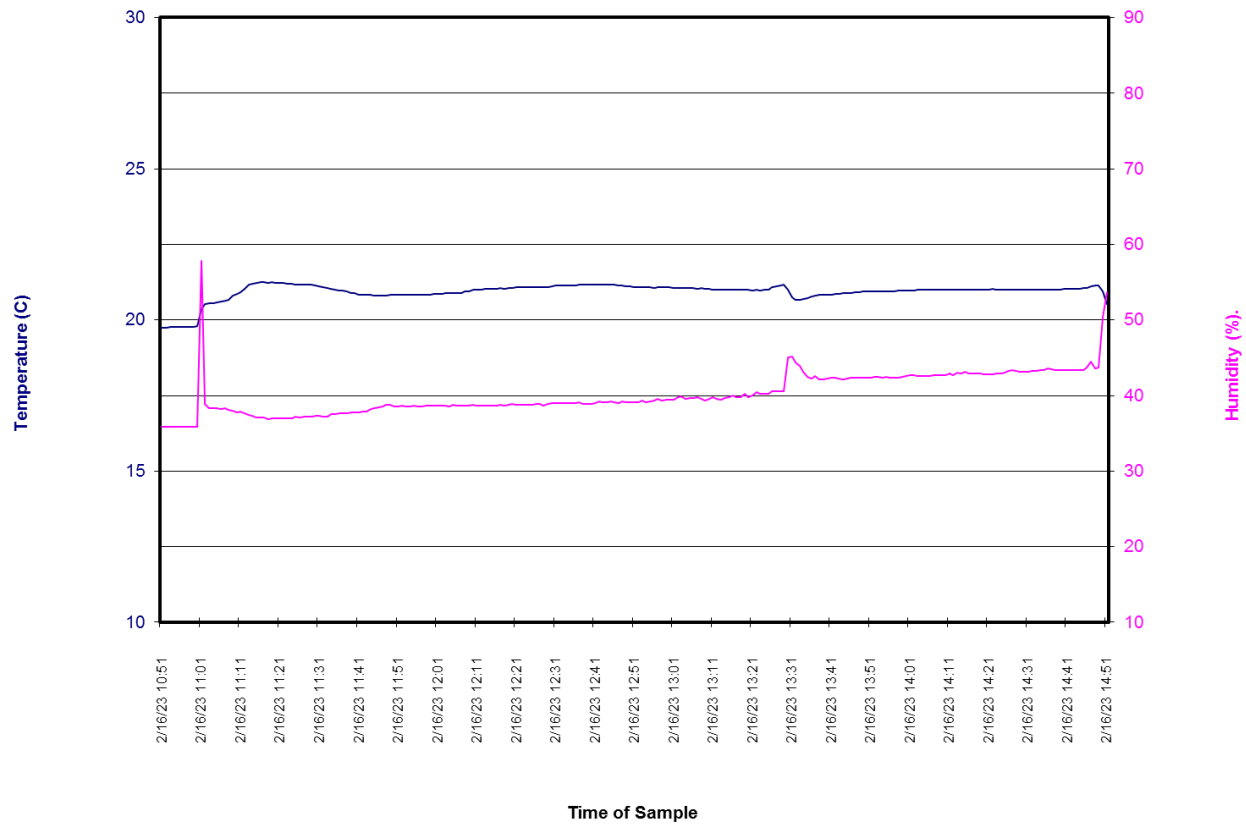
Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DATA SHEET NO. 15
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2023 Nissan Armada
Test Program: SINCAP Side Impact

NHTSA No.: M20235205
Test Date: 2/16/2023

M20235205 2023 Nissan Armada Left MDB Impact 230216: Test Time 14:51



APPENDIX A
PHOTOGRAPHS

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056	Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-34
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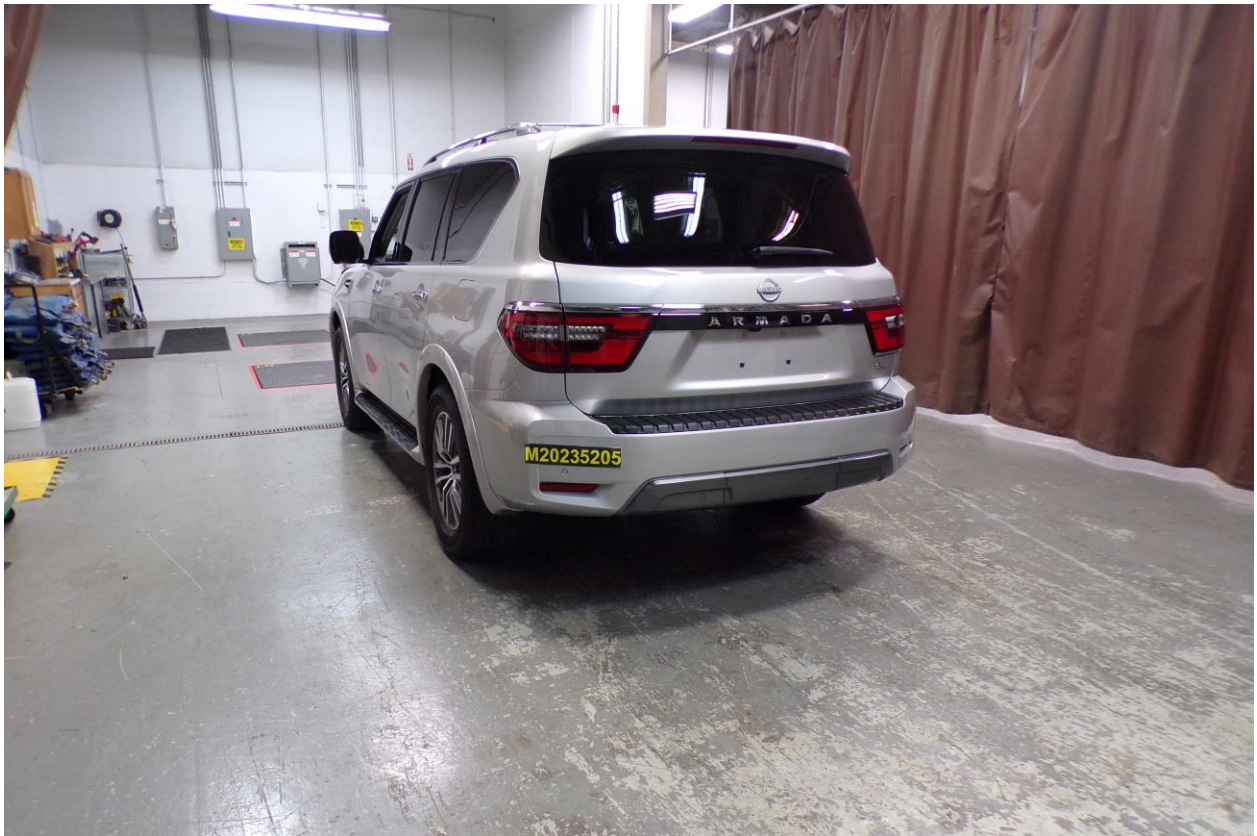
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097	FMVSS No. 301 Static Rollover 90 Degrees	A-55
098	FMVSS No. 301 Static Rollover 180 Degrees	A-56
099	FMVSS No. 301 Static Rollover 270 Degrees	A-56
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102	Monroney Label	A-58
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-58
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001 As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



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



003 Pre-Test Frontal View of Test Vehicle



004 Post-Test Frontal View of Test Vehicle



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



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



007 Pre-Test Left Side View of Test Vehicle



008 Post-Test Left Side View of Test Vehicle



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



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



011 Pre-Test Rear View of Test Vehicle



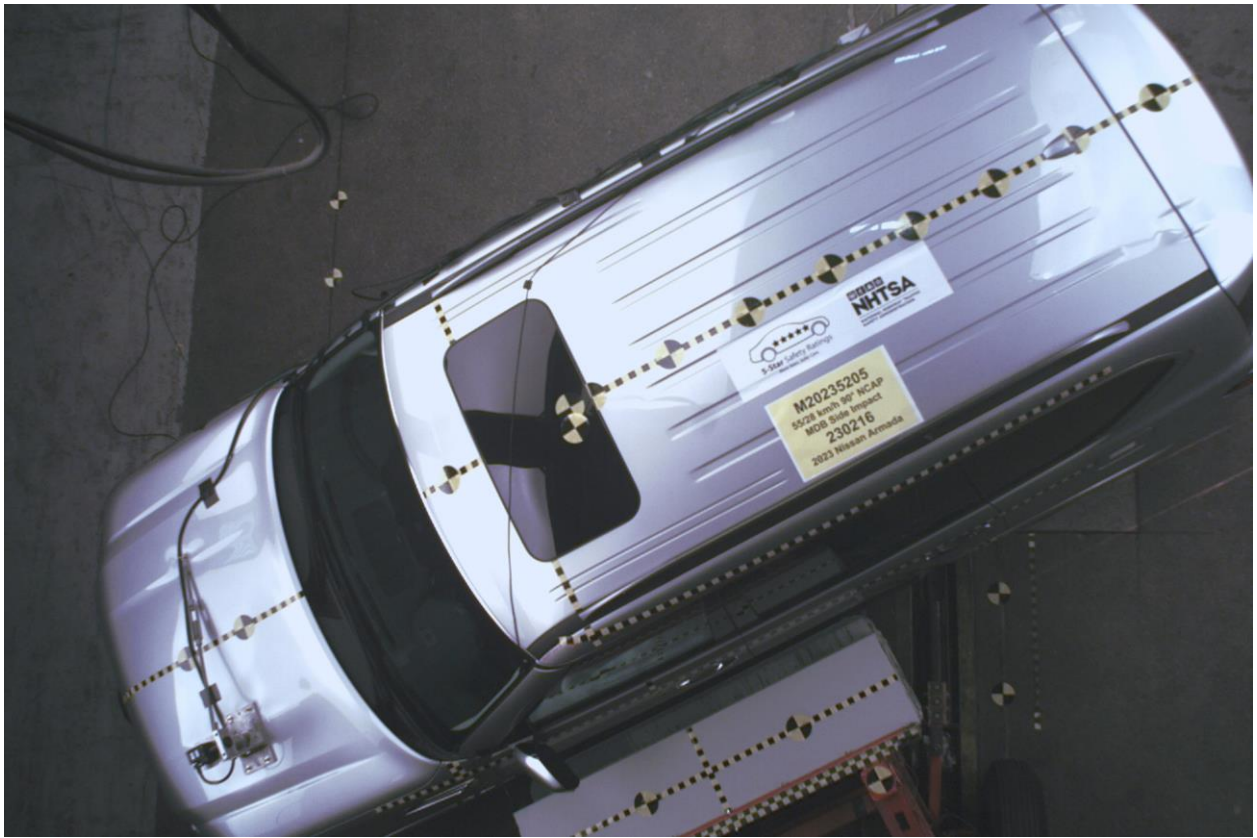
012 Post-Test Rear View of Test Vehicle



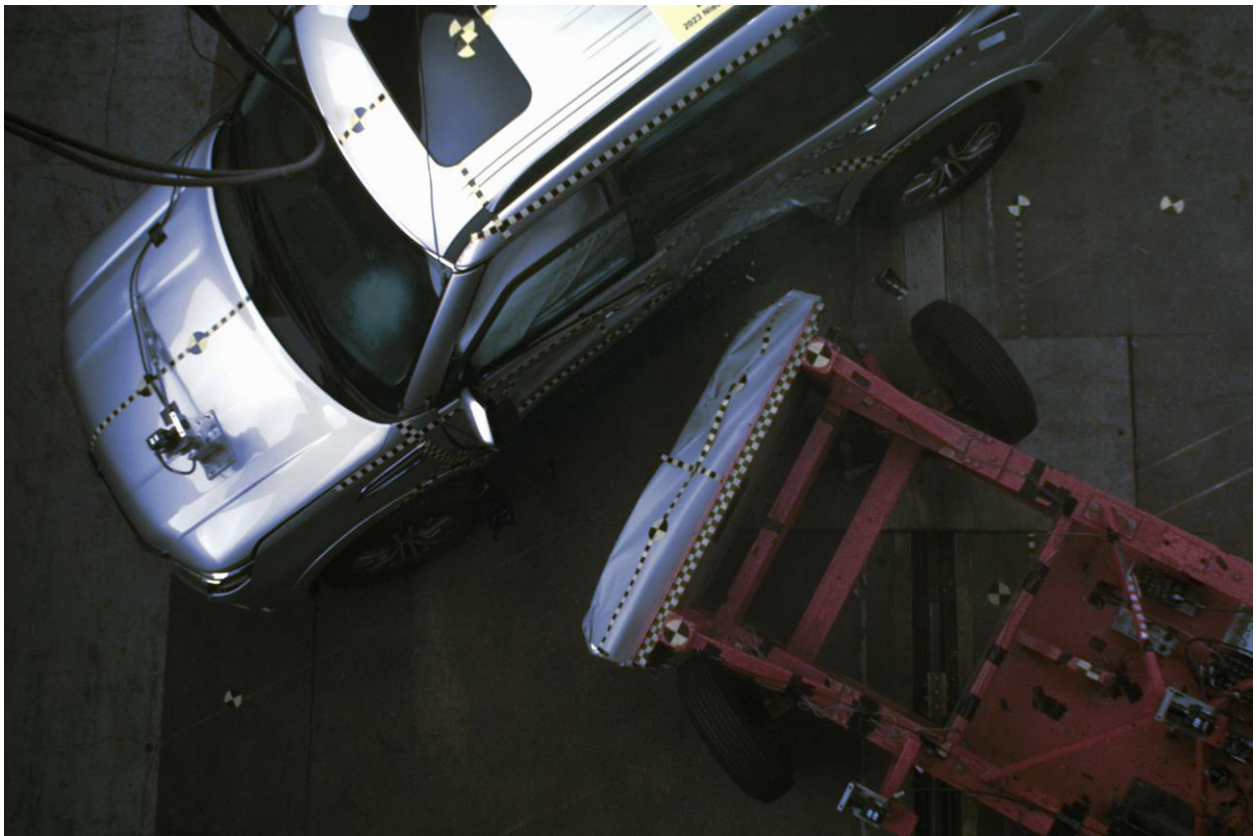
013 Pre-Test Right Side View of Test Vehicle



014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area



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



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



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



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



021 Pre-Test Left Front Door Latch Close-Up



022 Post-Test Left Front Door Latch Close-Up



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

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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



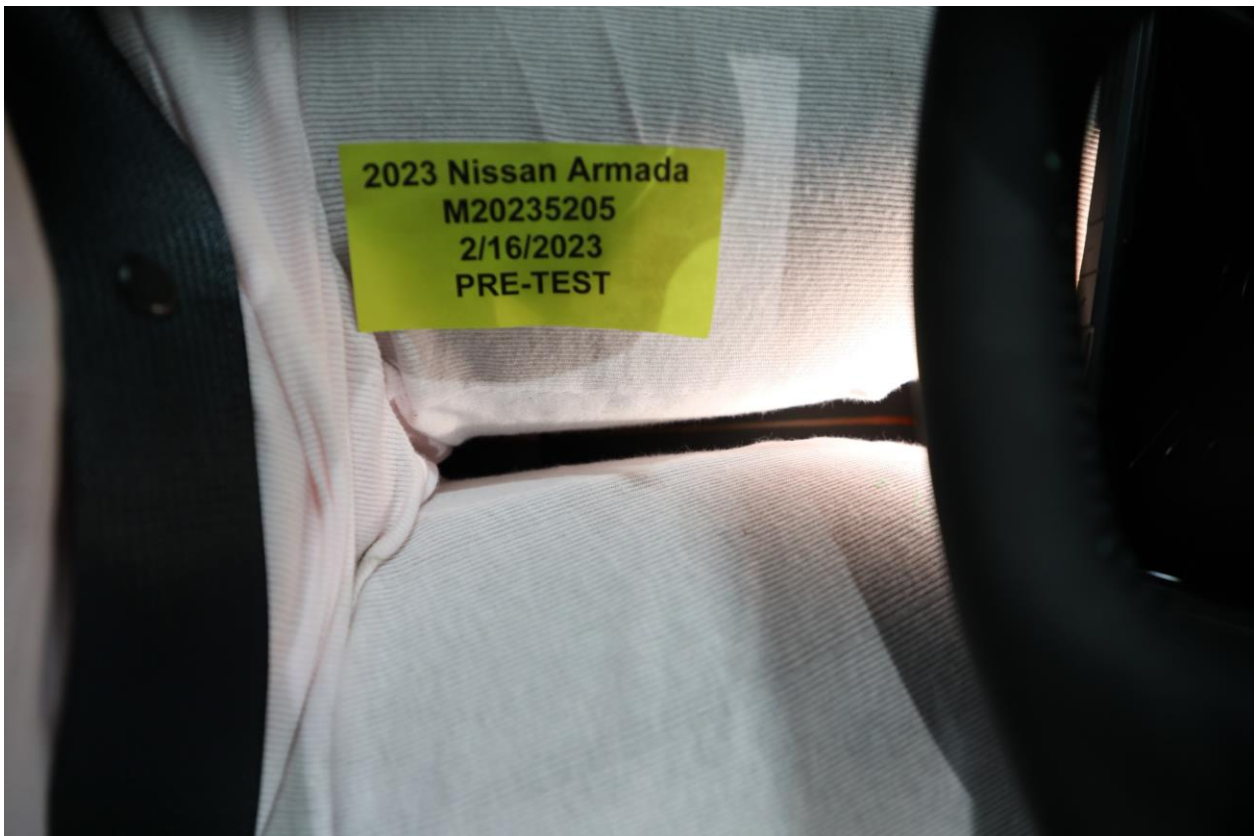
030 Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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



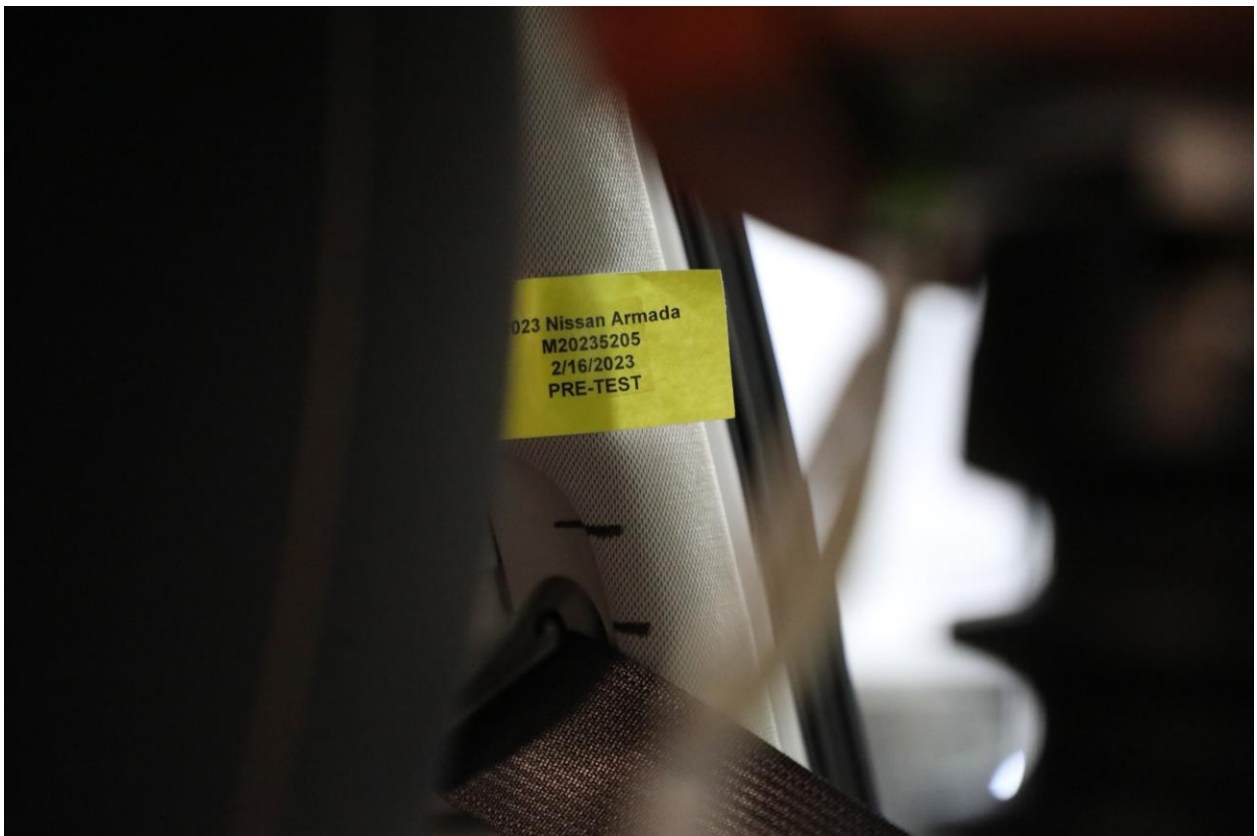
032 Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



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



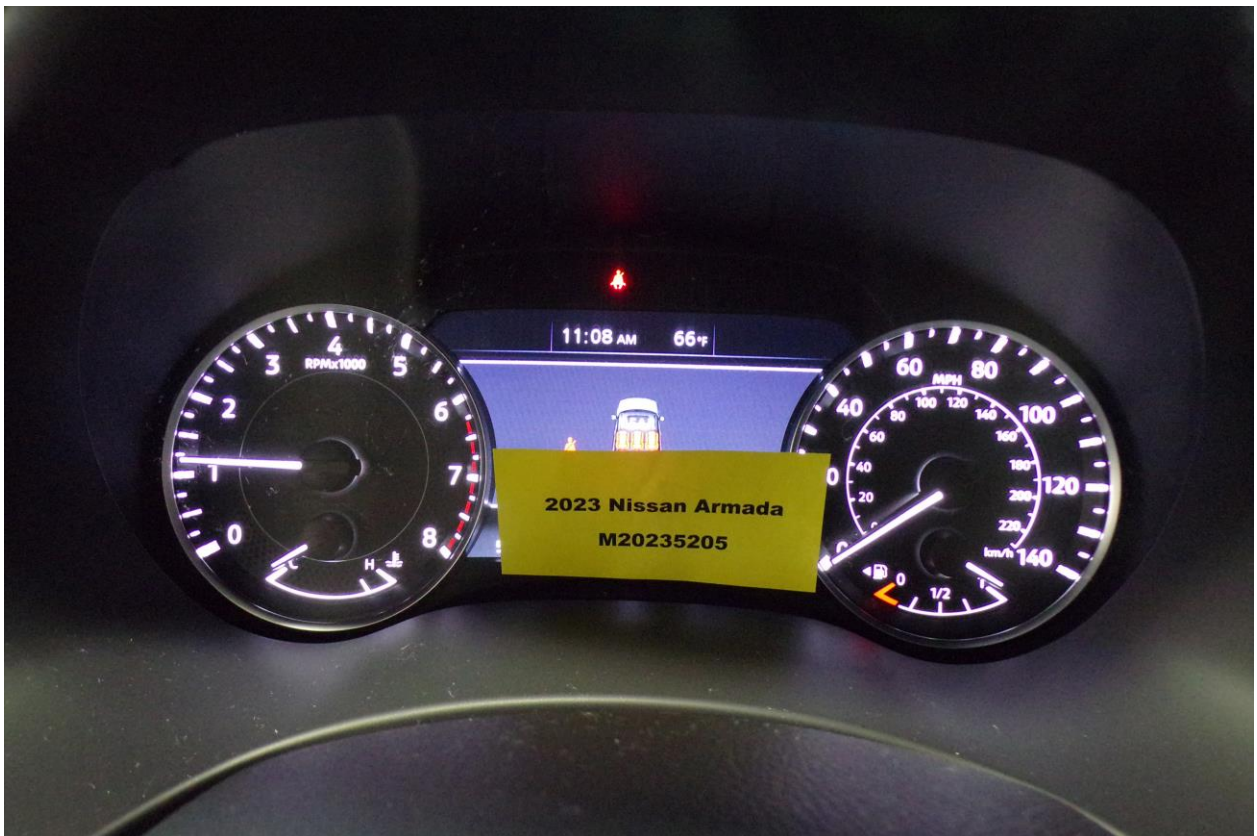
034 Pre-Test Placement of Driver's Dummy Feet



035 Pre-Test View of Belt Anchorage for Driver Dummy



036 Pre-Test Left Side View of Steering Wheel



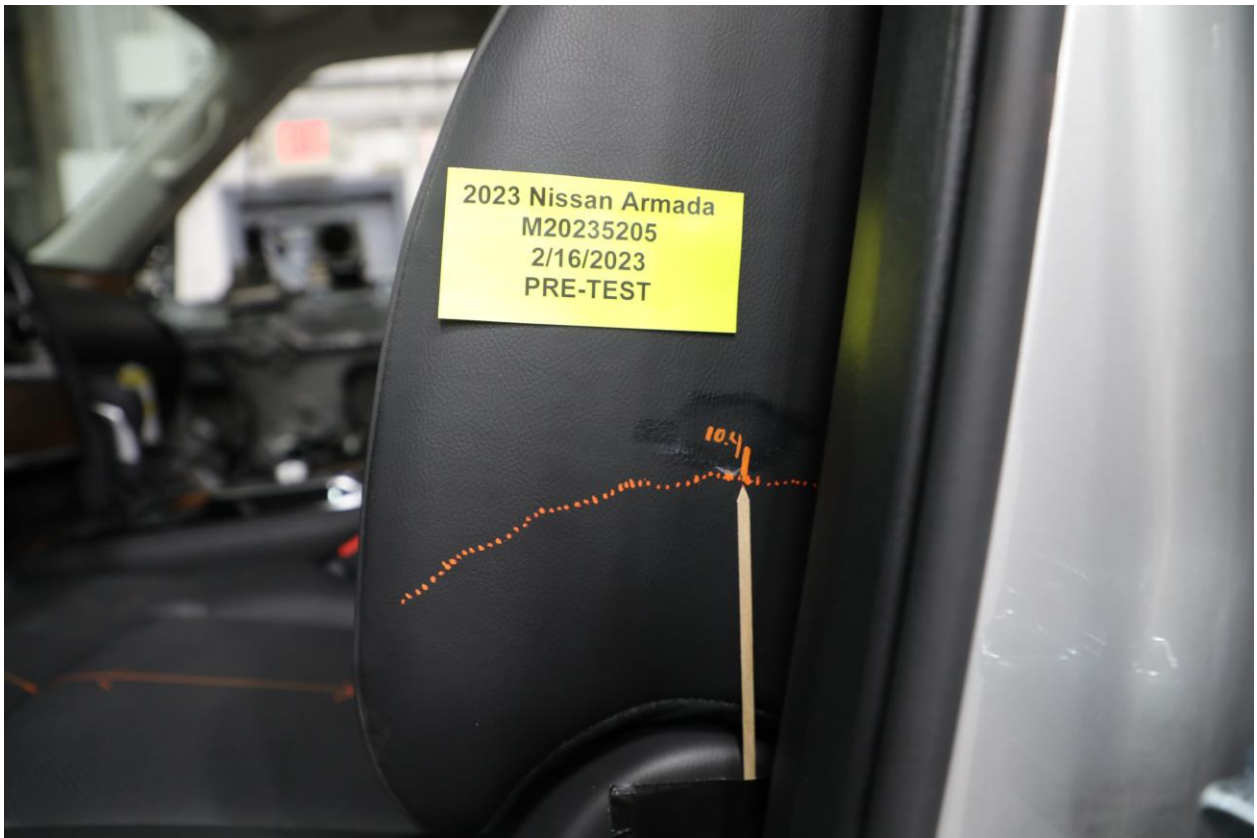
037 View of Disengaged Parking Brake



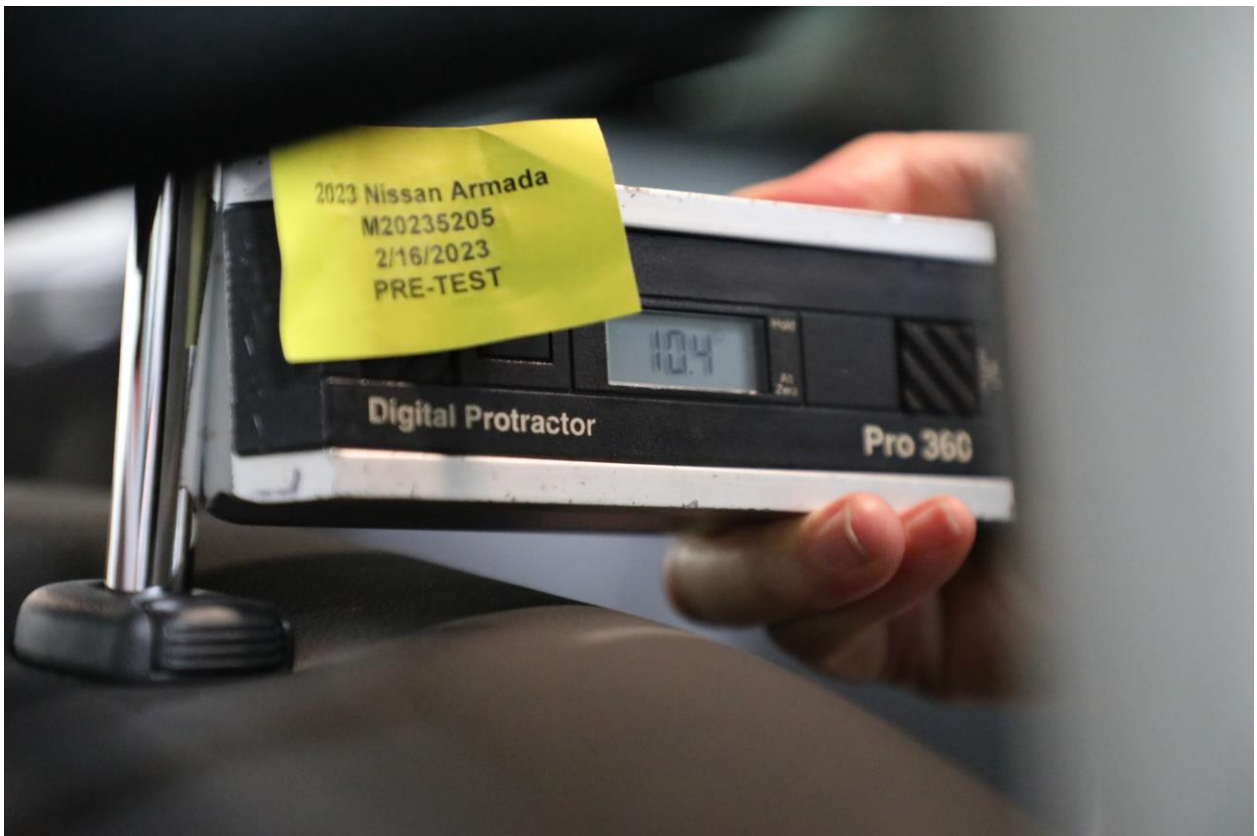
038 Pre-Test View of Parking Brake



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



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



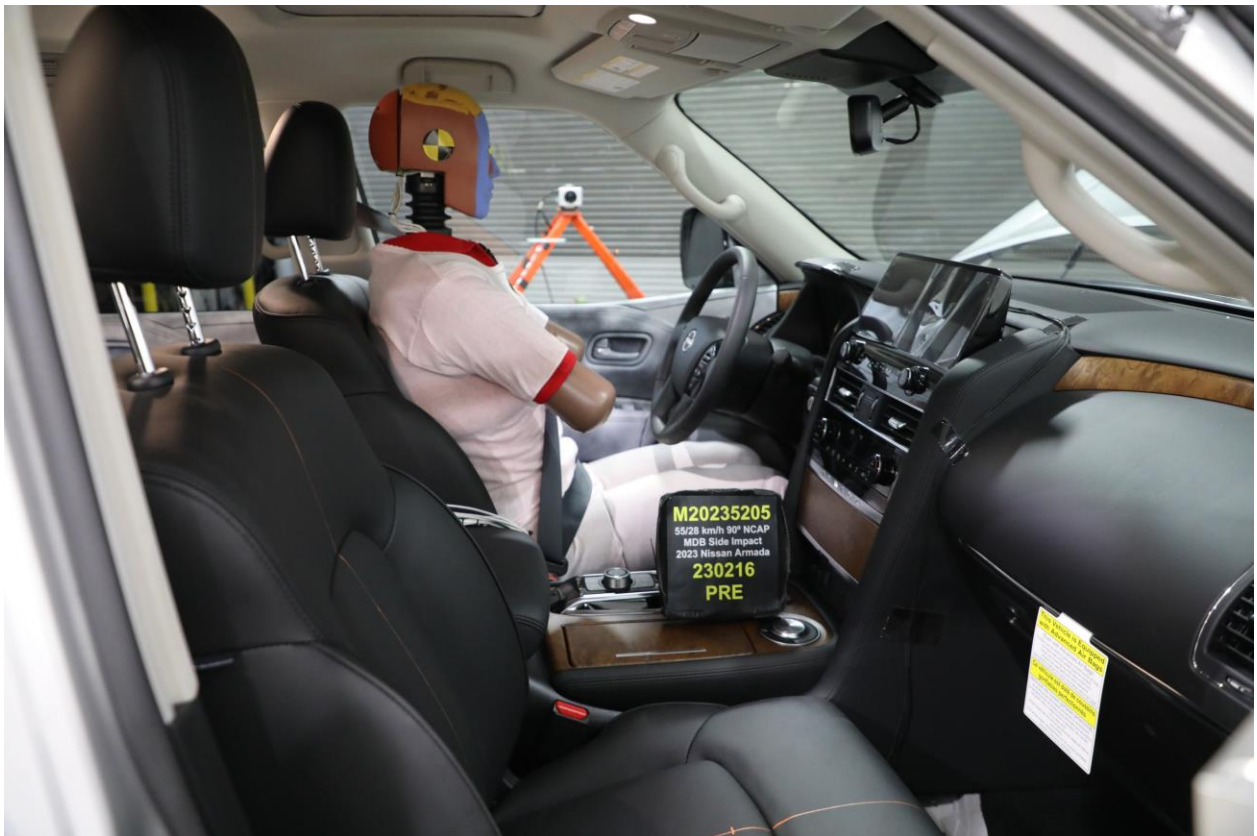
041 Pre-Test Close-Up View of Driver Seat Back or Head Restraint



042 Pre-Test Driver Dummy and Door Clearance View



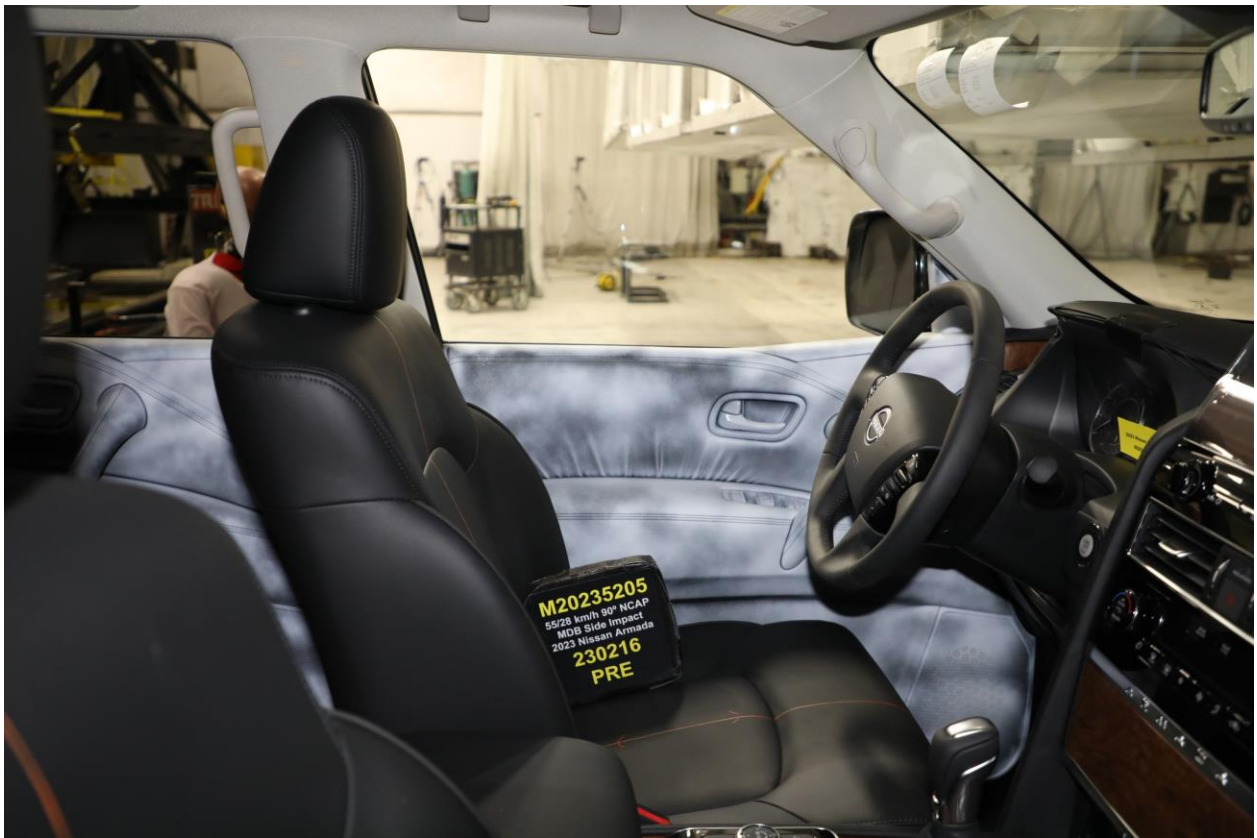
043 Post-Test Driver Dummy and Door Clearance View



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



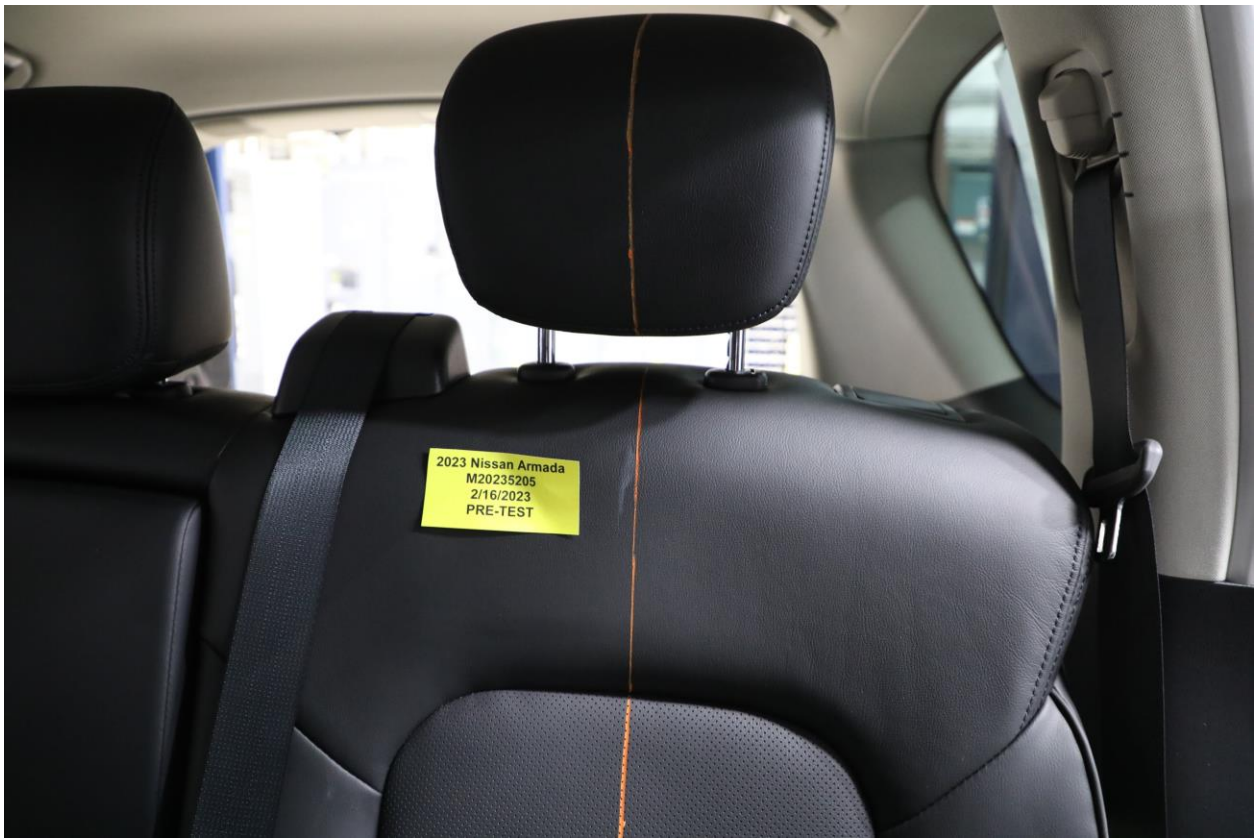
055 Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking



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



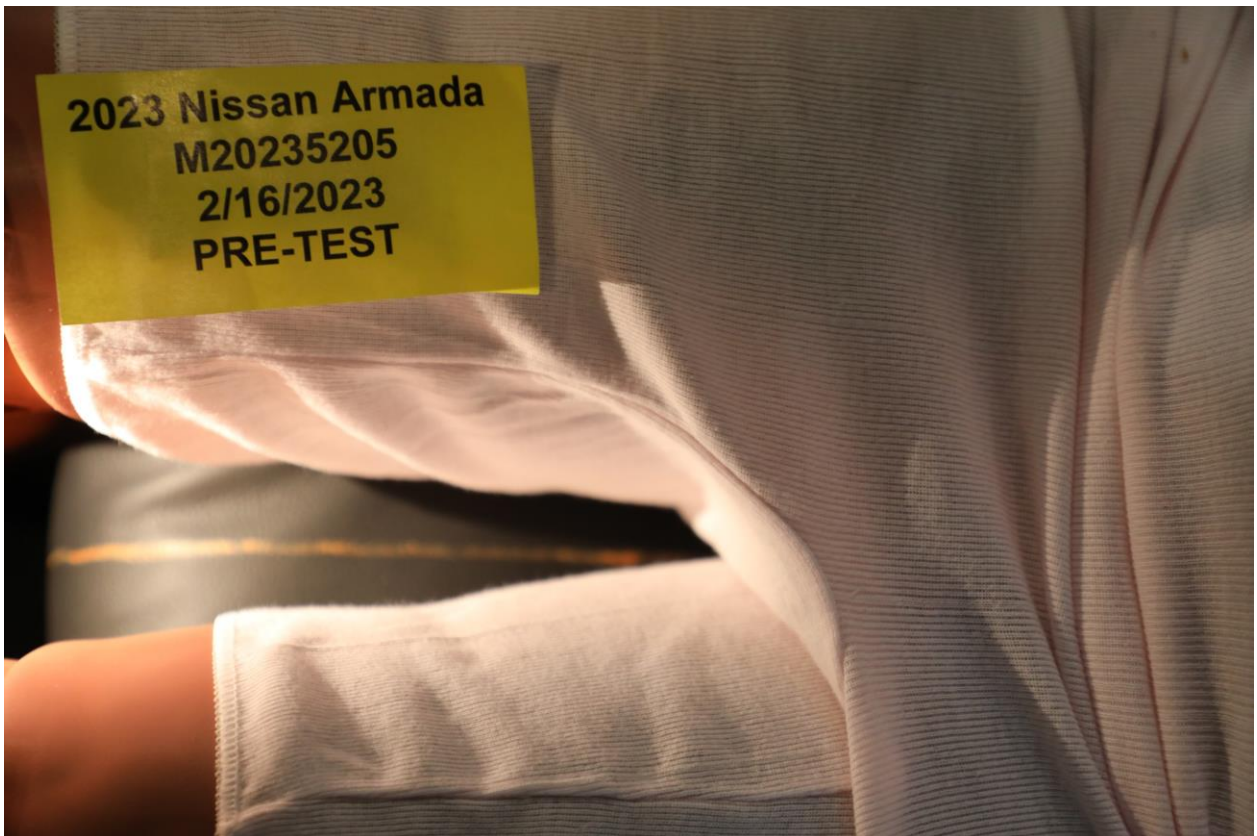
058 Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



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



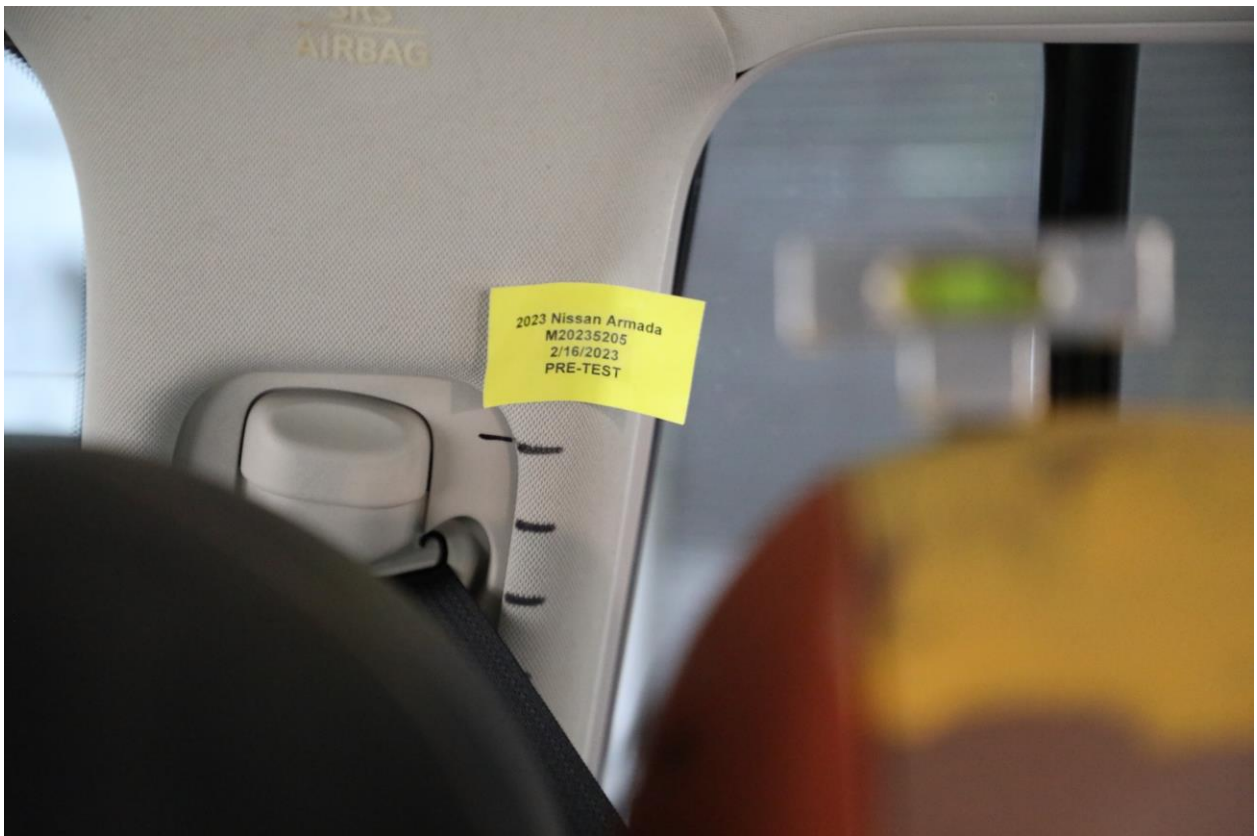
062 Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



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



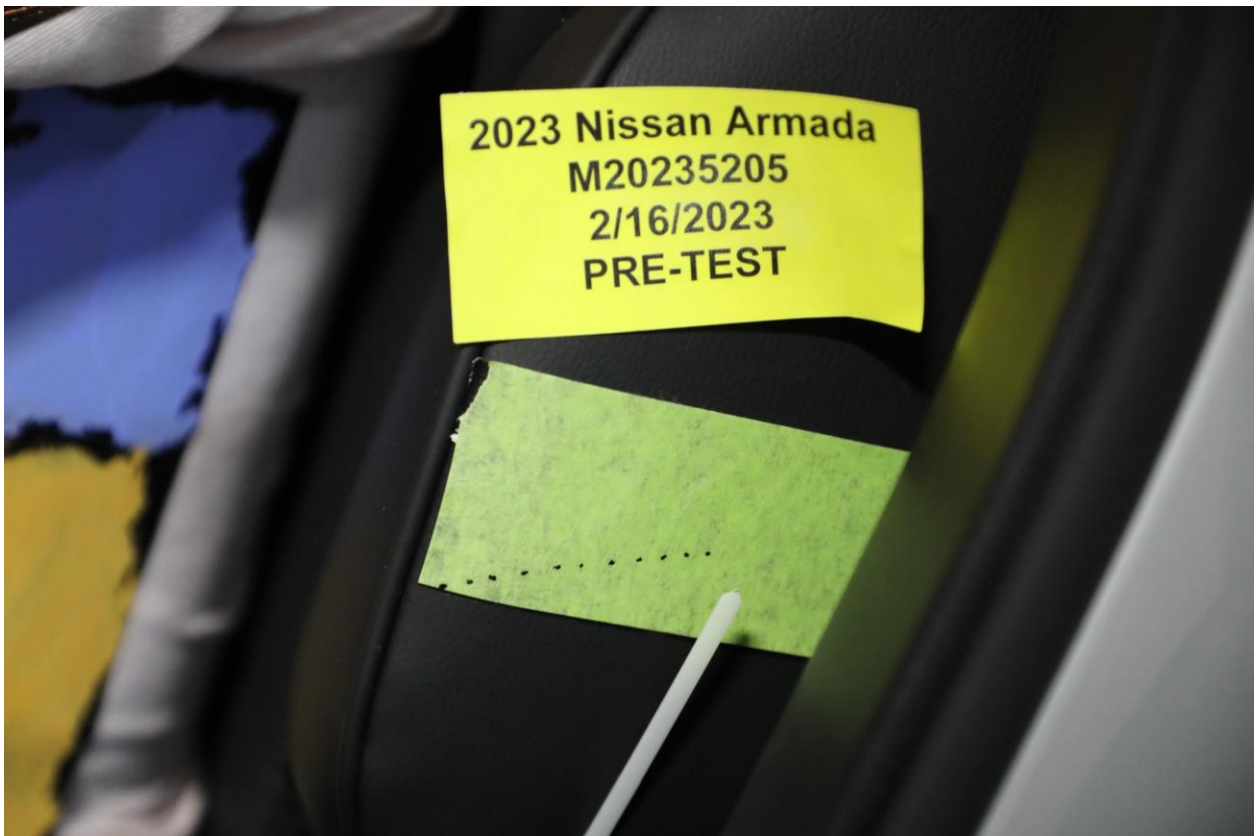
064 Pre-Test Placement of Rear Passenger Dummy's Feet



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

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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



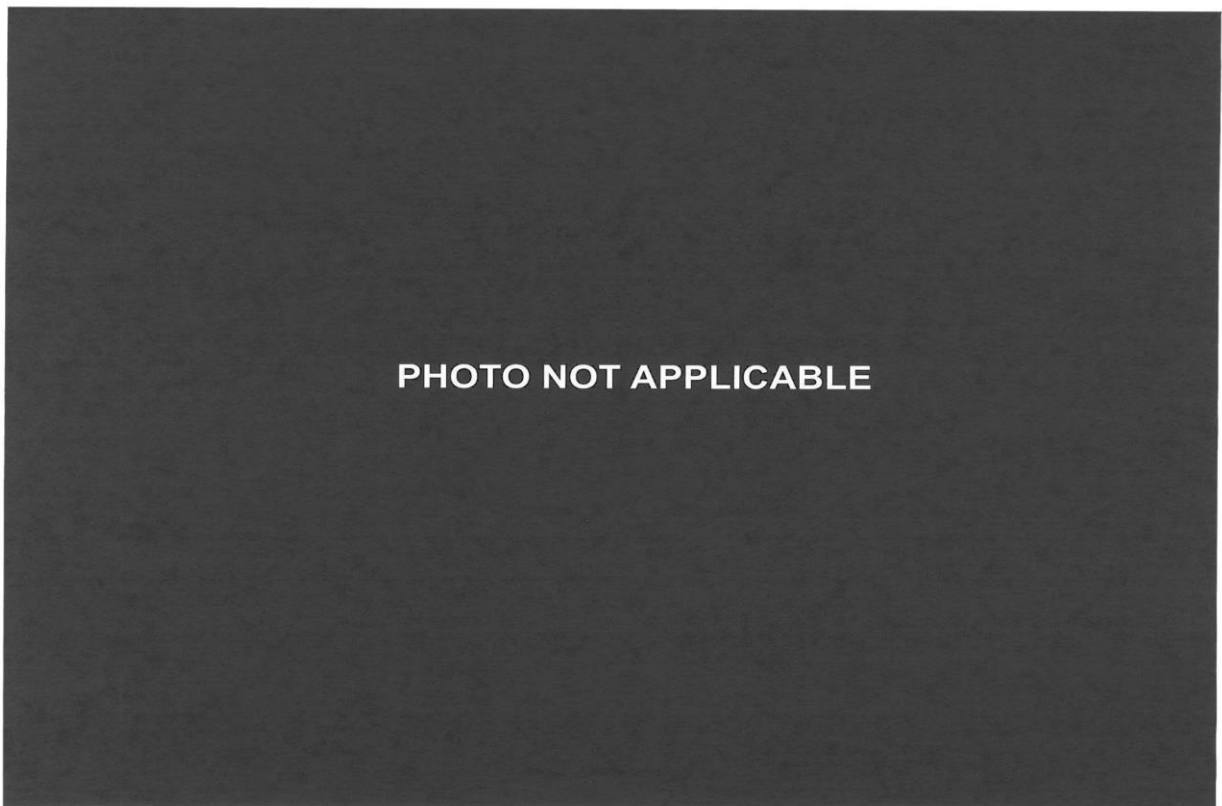
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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



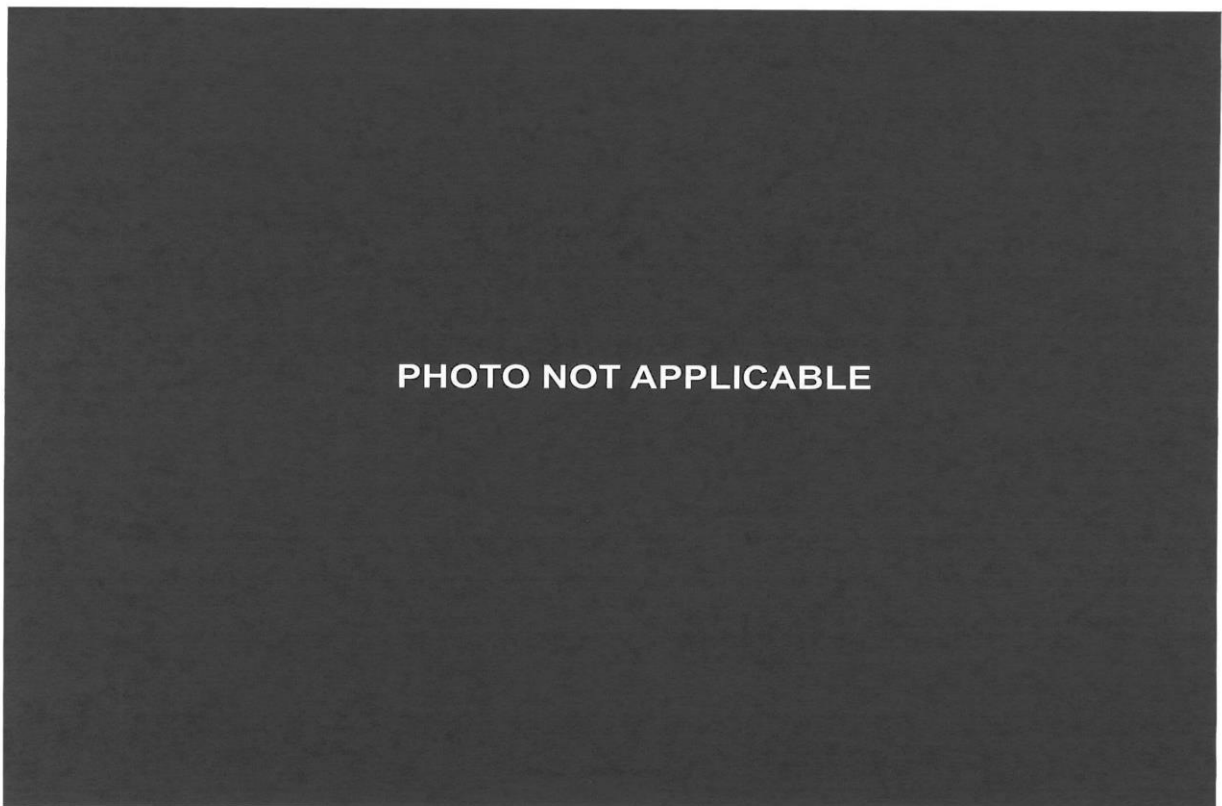
077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



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

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



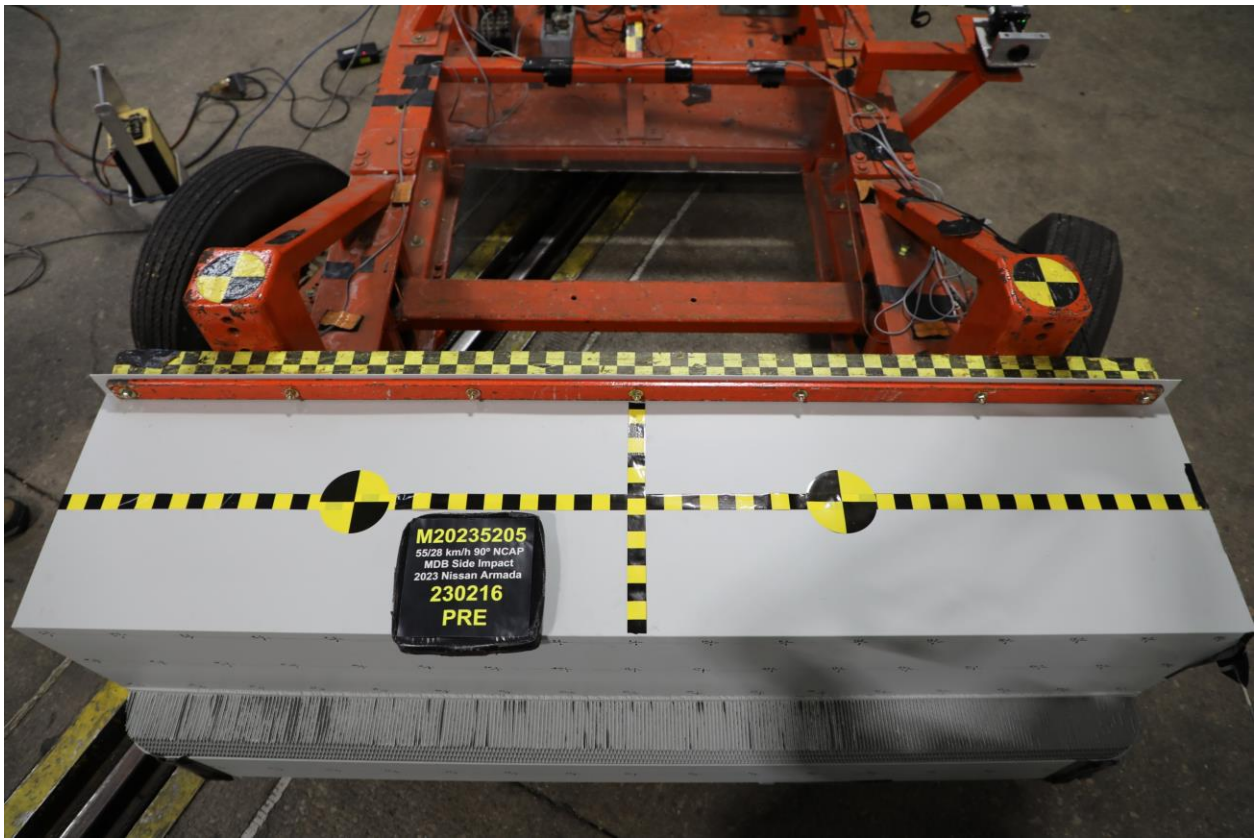
083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



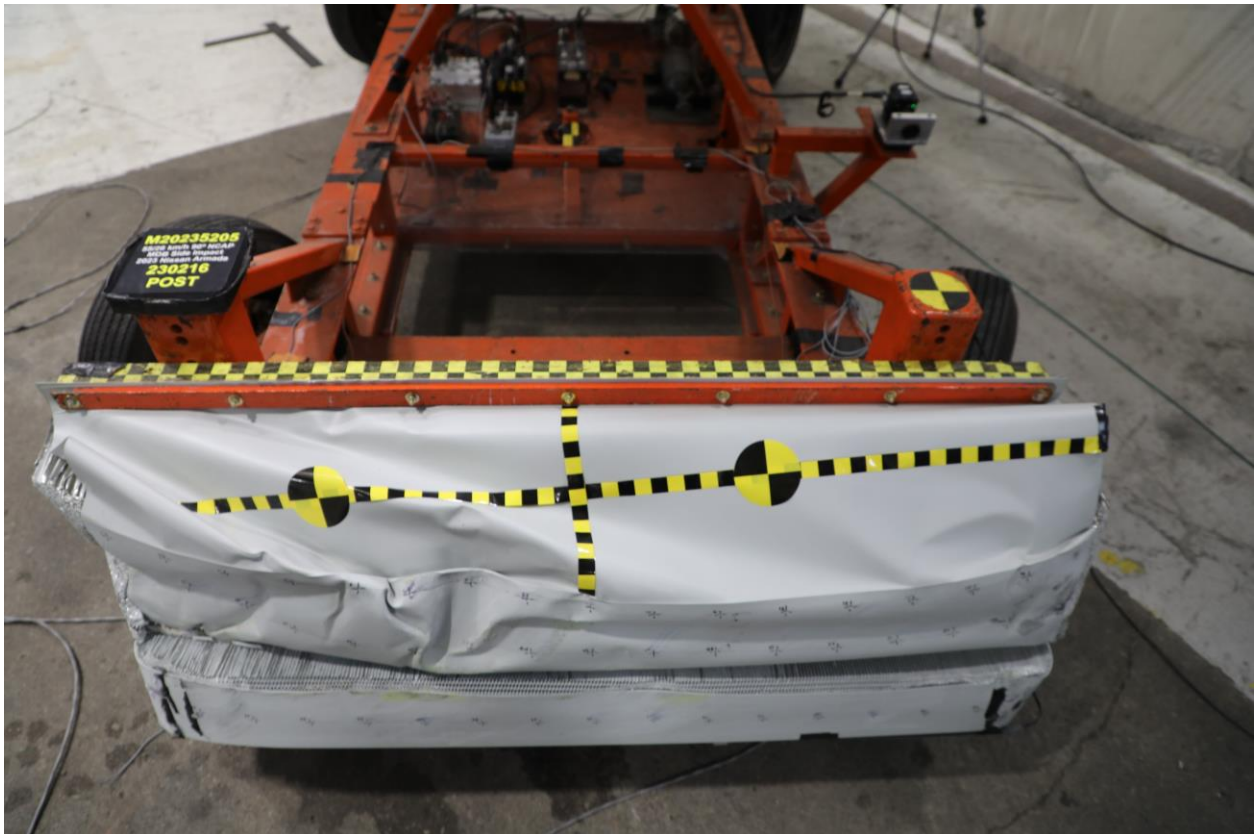
084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face



087 Post-Test Top View of MDB Impactor Face



088 Pre-Test Left Side View of MDB Impactor Face



089 Post-Test Left Side View of MDB Impactor Face



090 Pre-Test Right Side View of MDB Impactor Face



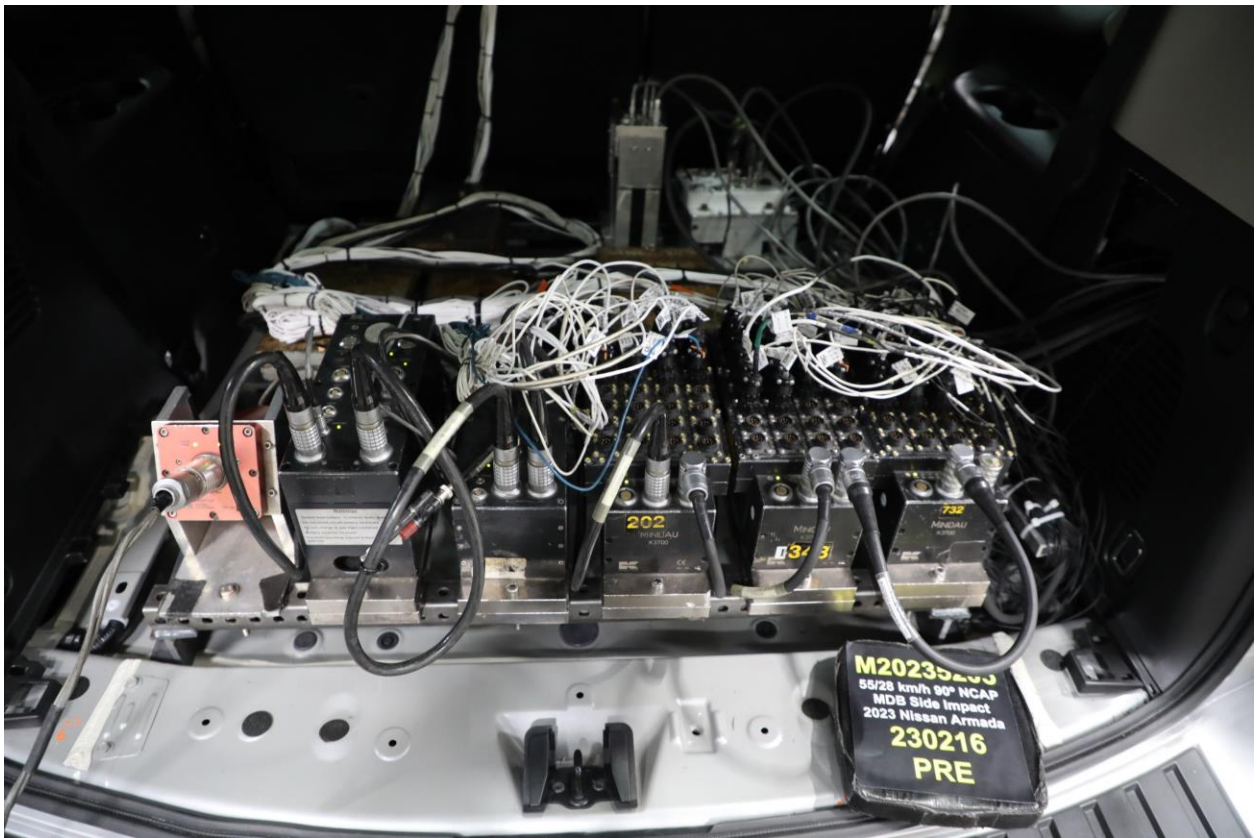
091 Post-Test Right Side View of MDB Impactor Face



092 Close-Up View of Vehicle's Certification Label



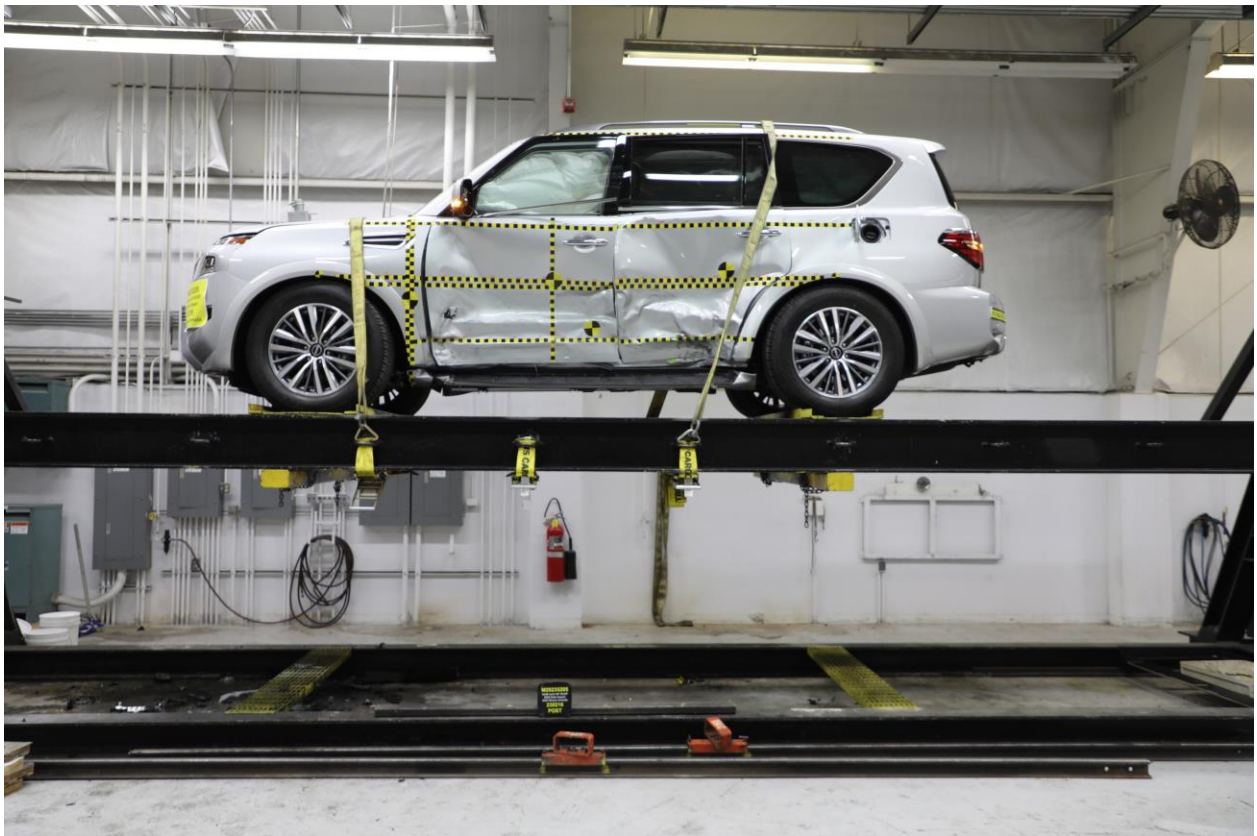
093 Close-Up View of Vehicle's Tire Information Placard or Label



094 Pre-Test Ballast View



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



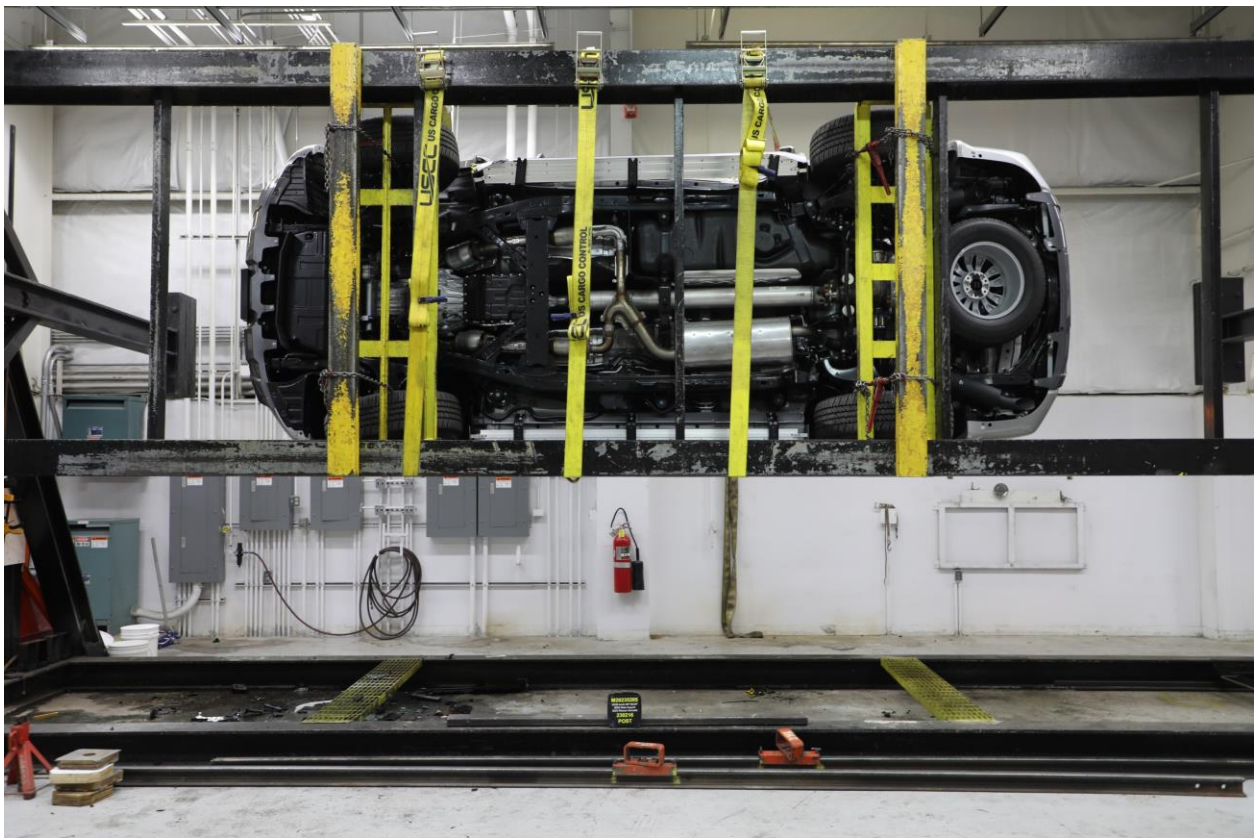
096 FMVSS No. 301 Static Rollover 0 Degrees



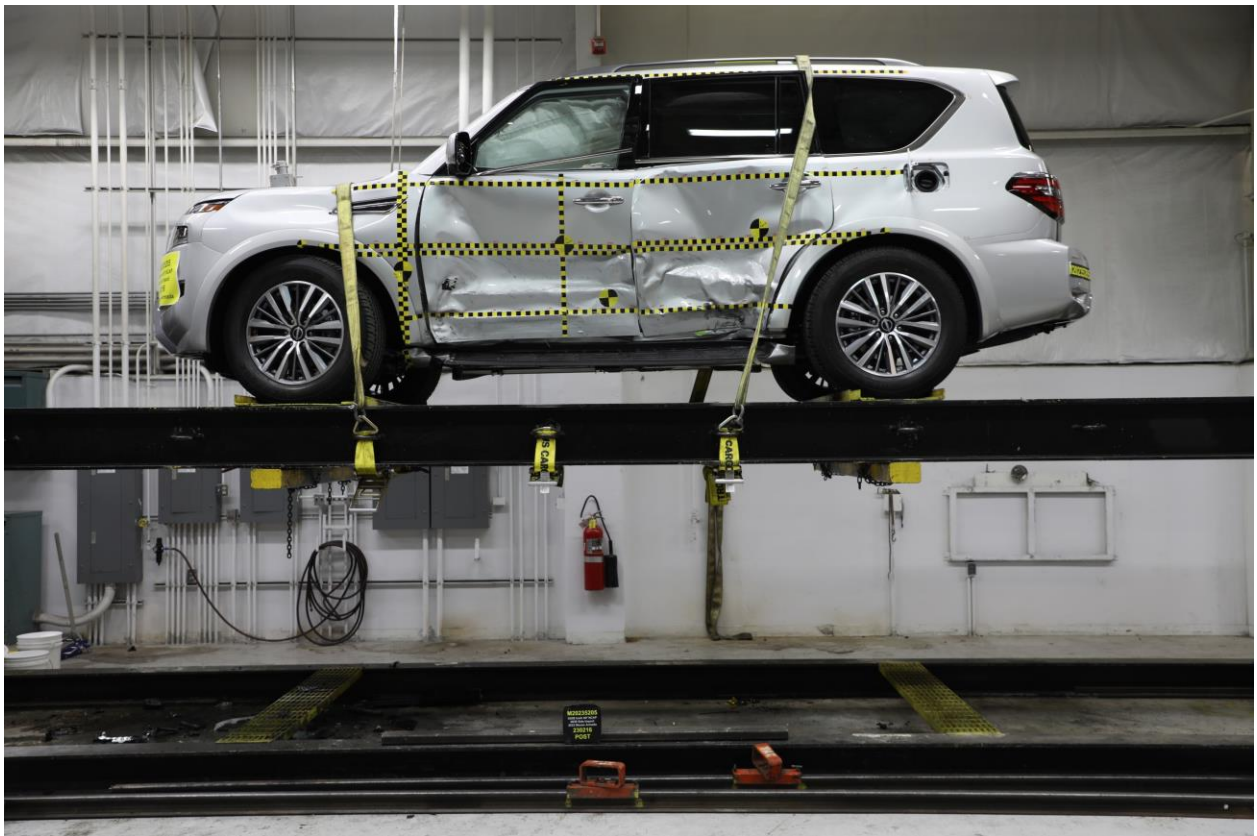
097 FMVSS No. 301 Static Rollover 90 Degrees



098 FMVSS No. 301 Static Rollover 180 Degrees



099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees



101 Impact Event



2023 NISSAN ARMADA SL 2WD AUTO



Scan QR code for general model information & options

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
1.6-Liter Endurance® V6 Engine
100 Horsepower & 413 lb-ft Torque
6-Speed Automatic Transmission
Class IV Integrated Receiver Hitch**

SAFETY & SECURITY
Nissan Safety Shield 360
High Beam Assist
Automatic Emergency Braking
with Pedestrian Detection
Lane Departure Warning
Blind Spot Warning
Rear Automatic Braking
Rear Cross Traffic Alert
Intelligent Forward Collision Warning
Intelligent Lane Intervention
Intelligent Blind Spot Intervention
Intelligent Around View Monitor

COMFORT & CONVENIENCE
Power Driver Seat
Power Passenger Seats
Driver Memory Functions
Leather Driver and Front Passenger Seats
Leather Wrapped Steering Wheel w/ Memory
Leather Wrapped Shift Knobs
Leather-upholstered 1st & 2nd Row Seats
1 USB Ports (2) Type-A & (2) Type-C
Three (3) 12-Volt Power Outlets
120-volt AC power outlet
Wireless Charging
All-Flow Auto Dual Zone A/C &
Rear Indirect Auto A/C w/ Micro Filter
Driver Attention Alert
Intelligent Cruise Control (ICC)
All Start Assist
Taller Brakes Controller**
Taller Spray Control**
Auto-dimming Inside Mirror with
Homelink® Universal Transceiver
Remote Engine Start
Memory Intelligent Key

AUDIO & INFOTAINMENT

NissanConnect®
12.3" Color Touch-Screen Display
Wireless Apple CarPlay®
Android Auto™ +
Nissan Door-to-Door Navigation+
Bluetooth® Hands-free Phone System+
Wi-Fi Hotspot+
SiriusXM® Radio, Traffic, & Travel Link
with Trial Subscription Included+
NissanConnect® Services powered by
SiriusXM® w/ Trial
Subscription Included+
7" Color Meter Display
Voice Recognition+
13 Speaker BOSE® Audio System
Alexa Built-In

EXTERIOR
20" Painted Alloy Wheels
LED Headlamps & Fog Lamps
Power Sliding Moonroof
Power Liftgate
Power Folding Heated Outside Mirrors
with LED Turn Signal Indicators

+For more information, see dealer, owner's manual or www.NissanUSA.com/connect/legal

**Towing capability varies by configuration. See Nissan towing guide and owner's manual for additional information.

Manufacturer's Suggested Retail Base Price:	\$58,370.00
Options Included by Manufacturer	
CARPETED FLOOR MATS	380.00
CARGO PACKAGE	230.00
Cargo Area Protector	
Cargo Net	
First Aid Kit	
ILLUMINATED KICK PLATES	380.00
CROSS BARS	380.00
DESTINATION CHARGES	1,695.00
Total**	\$61,445.00

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

EPA DOT Fuel Economy and Environment

Fuel Economy

16 MPG
combined city/hwy

14 city 19 highway

6.2 gallons per 100 miles

STANDARD SUV range from 14 to 102 MPG. The best vehicle rates 132 MPG.

You spend \$9,000
more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$3,400

Fuel Economy & Greenhouse Gas Rating

Smog Rating

1 2 10 10 Best

This vehicle emits 558 grams CO₂ per mile. The best emits 8 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fuelconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs \$8,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.65 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

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

Frontal Crash	Driver Passenger	Not Rated
Side Crash	Front seat Rear seat	Not Rated
Rollover		★★★

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

This Vehicle qualifies for Nissan's **Security+Plus Extended Protection Plan**
The only service agreement backed by Nissan Extended Services North America. Ask your dealer for details, or call 1-800-NISSAN-1 for more information.

DELIVERY

VEHICLE COLORS:
EXT: BRILLIANT SILVER
INT: CHARCOAL

FINAL ASSEMBLY POINT:
LOS ANGELES

TRANSPORT METHOD:
TRUCK

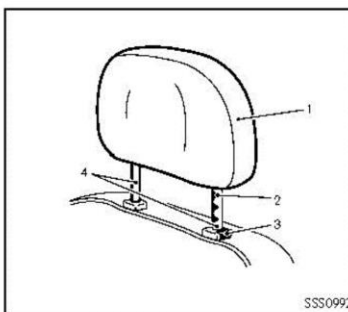
DEALER:
EMPIRE NISSAN
1377 KETTERING LOOP
ONTARIO CA 91761

VIN: JN8AY2C8P9180709
EMS: 50 STATE EMISSIONS
MDL: 20515180709 423-G
OPT: E-182M2N52892C03

20221114224321A5102C

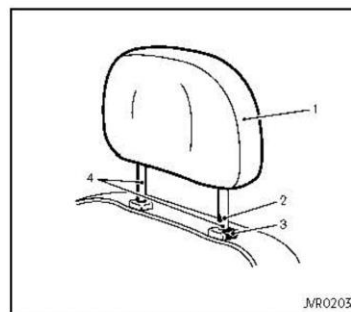
102 Monroney Label

riding in that designated seating position.



ADJUSTABLE HEAD RESTRAINT/ HEADREST COMPONENTS

1. Removable head restraint/headrest
2. Multiple notches
3. Lock knob
4. Stalks



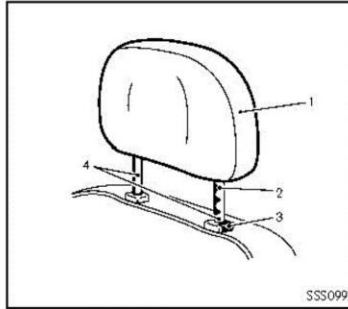
NON-ADJUSTABLE HEAD RE- STRAINT/HEADREST COMPONENTS

1. Removable head restraint/headrest
2. Single notch
3. Lock knob
4. Stalks

1-16 Safety — seats, seat belts and supplemental restraint system

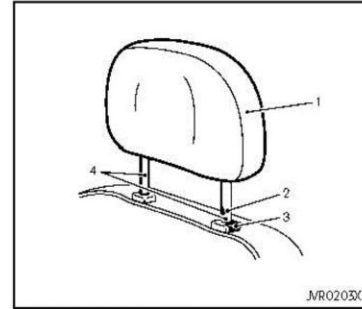
103 Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

riding in that designated seating position.



**ADJUSTABLE HEAD RESTRAINT/
HEADREST COMPONENTS**

1. Removable head restraint/headrest
2. Multiple notches
3. Lock knob
4. Stalks



**NON-ADJUSTABLE HEAD RE-
STRAINT/HEADREST COMPONENTS**

1. Removable head restraint/headrest
2. Single notch
3. Lock knob
4. Stalks

1-16 Safety — seats, seat belts and supplemental restraint system

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

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

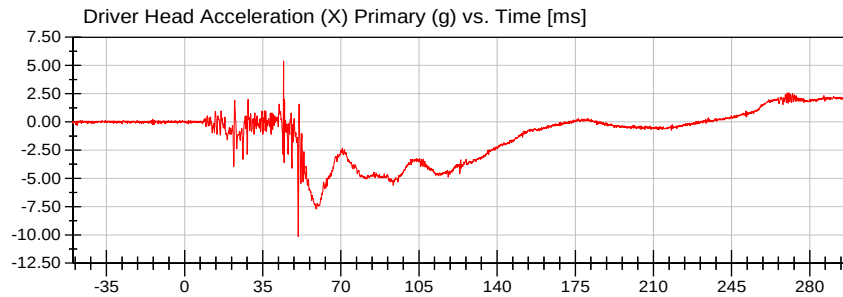
Test Lab: CTF

Test Number: 230216 (M20235205)

Test Date: 02/16/2023

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

Position #4 SID IIs Dummy (DQ0570)

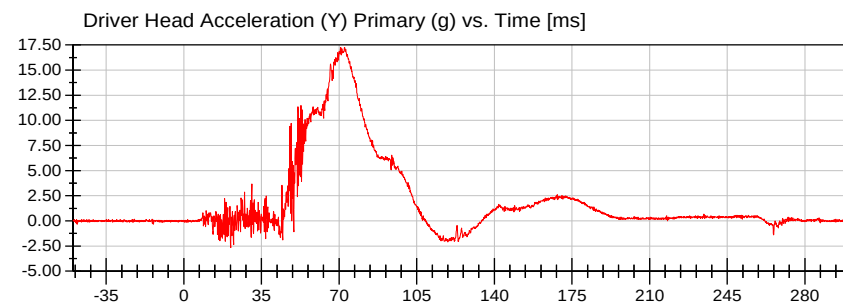


<Max>

5.38 g at 44.32 ms

<Min>

-10.15 g at 50.96 ms

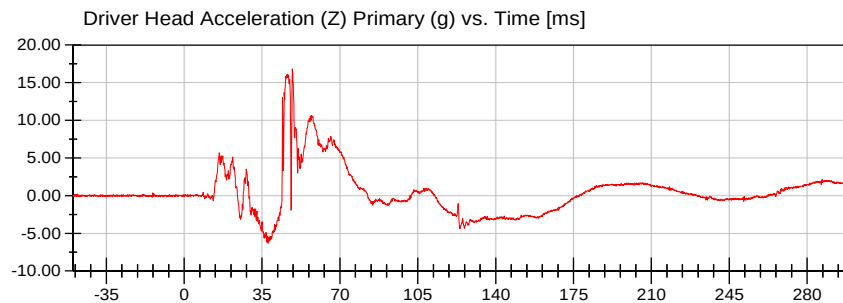


<Max>

17.27 g at 70.72 ms

<Min>

-2.67 g at 21.12 ms

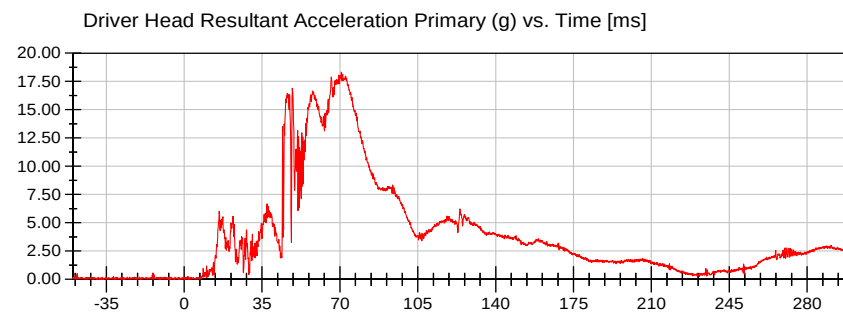


<Max>

16.83 g at 48.64 ms

<Min>

-6.33 g at 37.76 ms



<Max>

18.32 g at 70.64 ms

<Min>

0.01 g at -48.32 ms



NHTSA

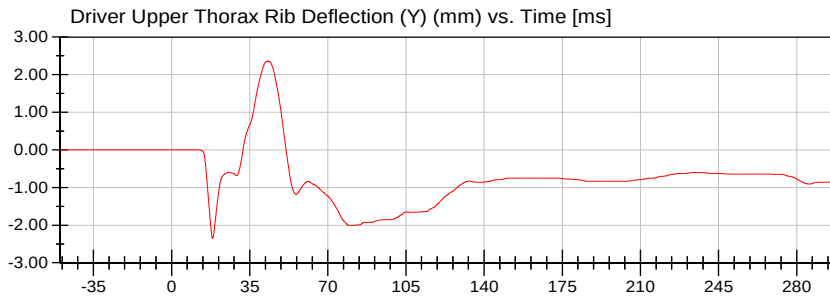
Test Lab: CTF

Test Number: 230216 (M20235205)

Test Date: 02/16/2023

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

Position #4 SID IIs Dummy (DQ0570)



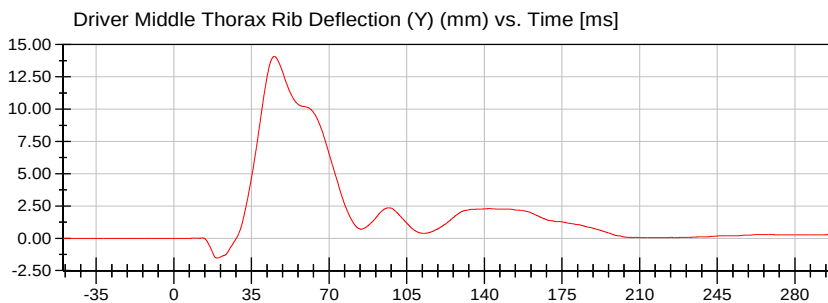
<Max>

2.36 mm at 42.96 ms

<Min>

-2.35 mm at 18.40 ms

CFC_180



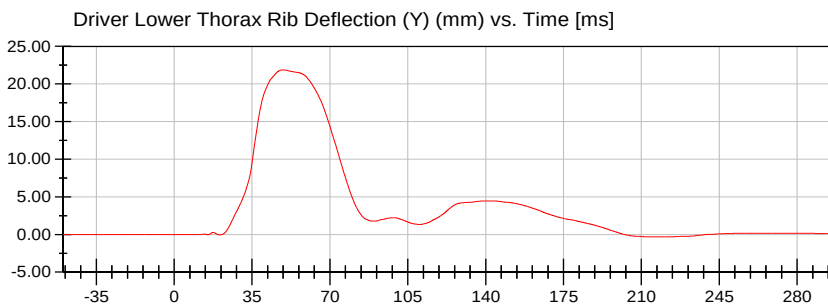
<Max>

14.08 mm at 45.28 ms

<Min>

-1.53 mm at 19.44 ms

CFC_180



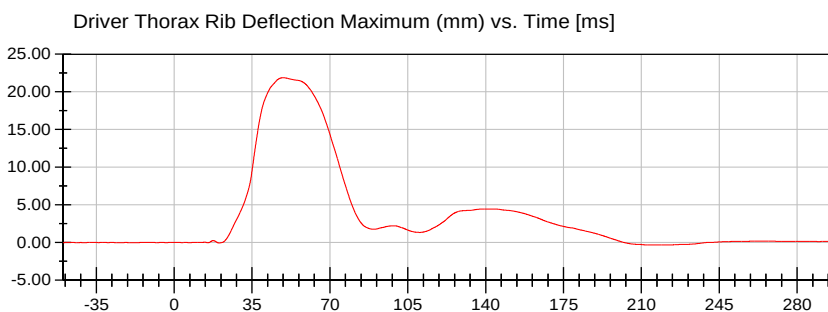
<Max>

21.88 mm at 49.04 ms

<Min>

-0.31 mm at 219.84 ms

CFC_180



<Max>

21.88 mm at 49.04 ms

<Min>

-0.31 mm at 219.84 ms

CFC_180



NHTSA

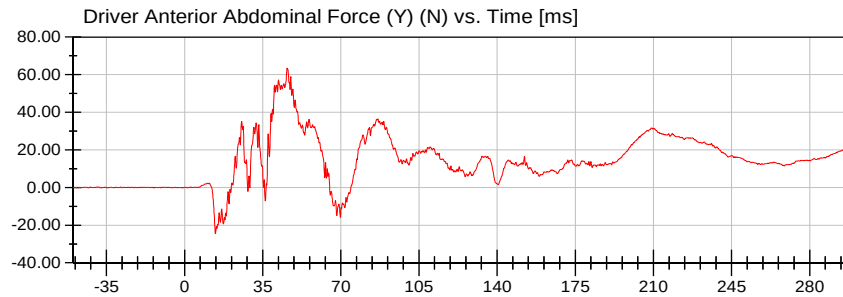
Test Lab: CTF

Test Number: 230216 (M20235205)

Test Date: 02/16/2023

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

Position #4 SID IIs Dummy (DQ0570)



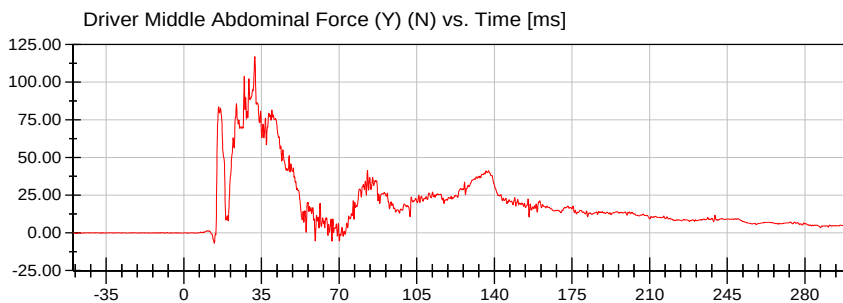
<Max>

63.43 N at 45.92 ms

<Min>

-24.56 N at 13.84 ms

CFC_600



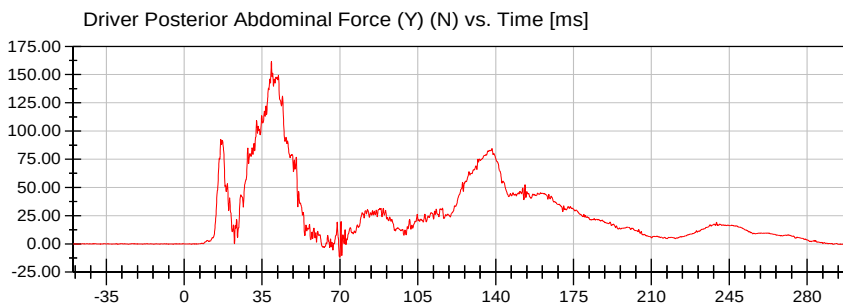
<Max>

116.93 N at 32.00 ms

<Min>

-6.83 N at 13.76 ms

CFC_600



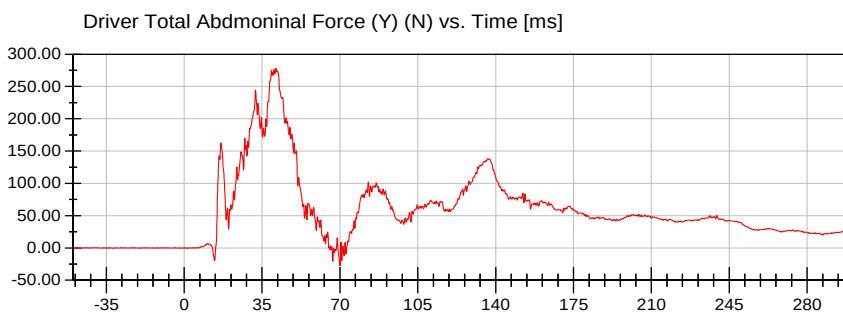
<Max>

161.55 N at 39.20 ms

<Min>

-11.90 N at 69.92 ms

CFC_600



<Max>

277.94 N at 41.20 ms

<Min>

-27.45 N at 70.00 ms

CFC_600



NHTSA

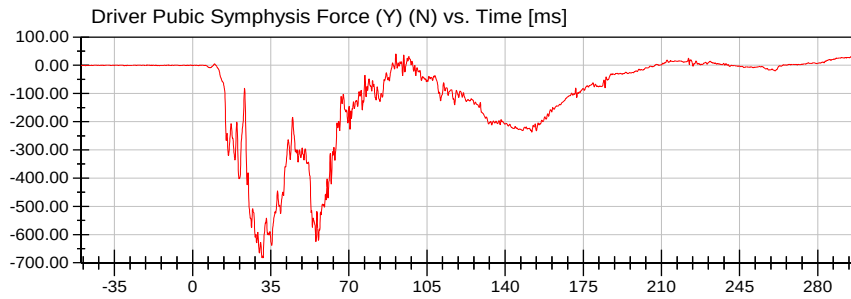
Test Lab: CTF

Test Number: 230216 (M20235205)

Test Date: 02/16/2023

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

Position #4 SID IIs Dummy (DQ0570)



<Max>

40.24 N at 91.12 ms

<Min>

-682.51 N at 31.52 ms

CFC_600



NHTSA

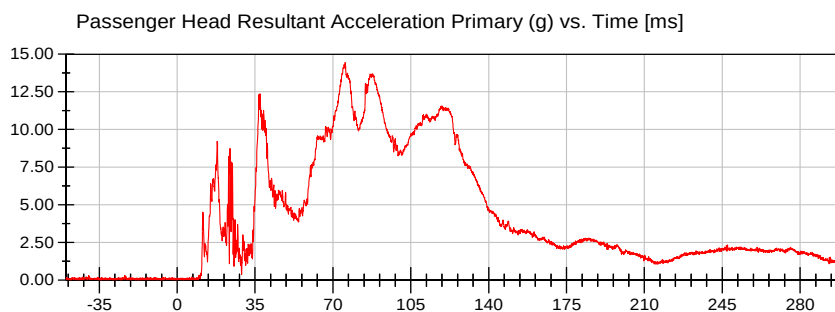
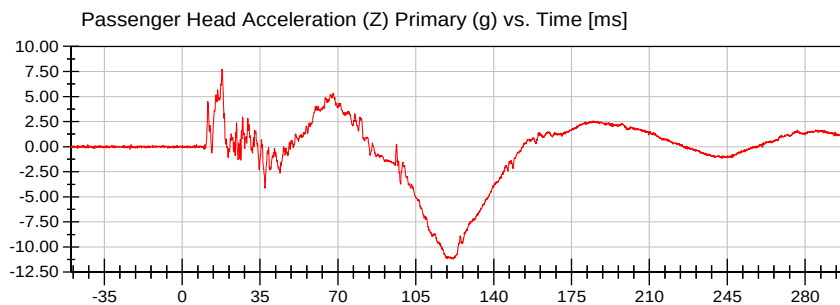
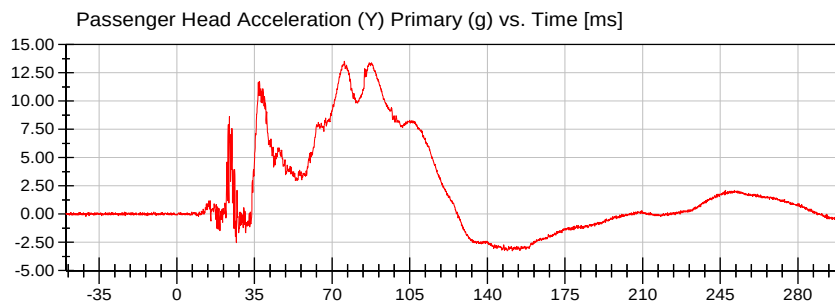
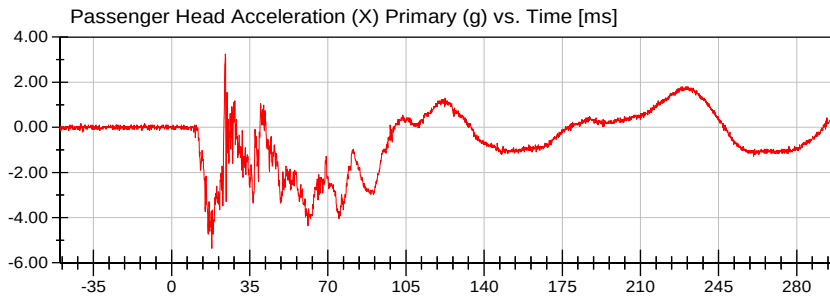
Test Lab: CTF

Test Number: 230216 (M20235205)

Test Date: 02/16/2023

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

Position #4 SID IIs Dummy (DQ0570)



NHTSA

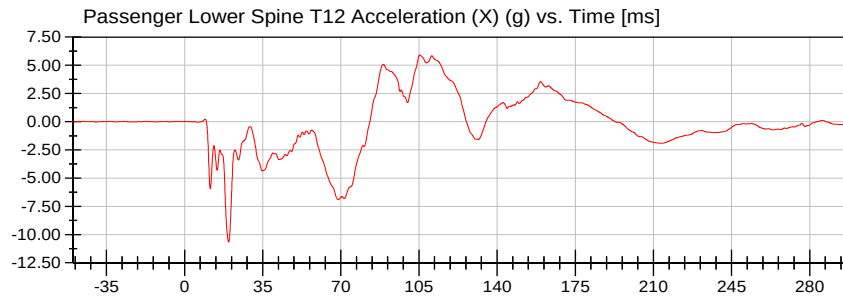
Test Lab: CTF

Test Number: 230216 (M20235205)

Test Date: 02/16/2023

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

Position #4 SID IIs Dummy (DQ0570)



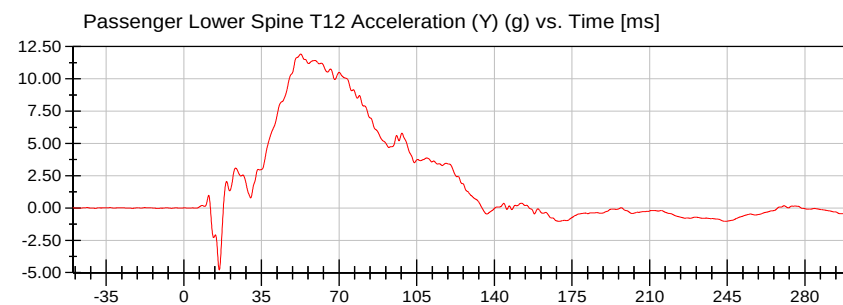
<Max>

5.91 g at 105.36 ms

<Min>

-10.66 g at 19.76 ms

CFC_180



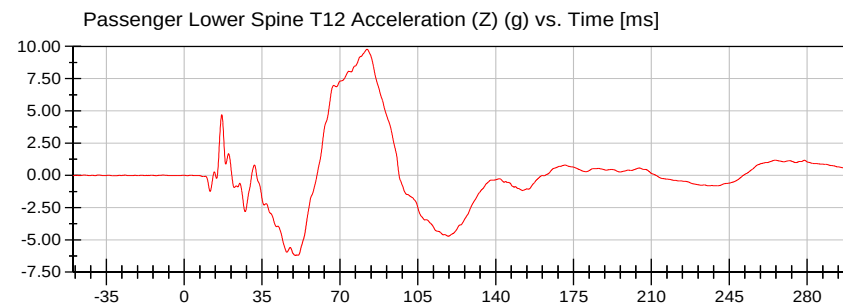
<Max>

11.91 g at 52.64 ms

<Min>

-4.80 g at 16.00 ms

CFC_180



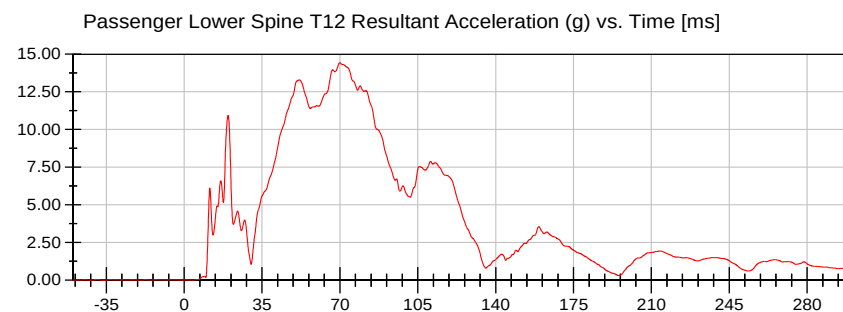
<Max>

9.78 g at 82.24 ms

<Min>

-6.20 g at 50.16 ms

CFC_180



<Max>

14.44 g at 69.92 ms

<Min>

0.00 g at -48.88 ms

CFC_180



NHTSA

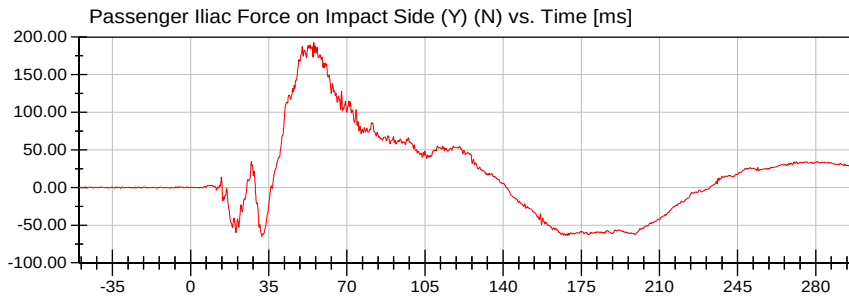
Test Lab: CTF

Test Number: 230216 (M20235205)

Test Date: 02/16/2023

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

Position #4 SID IIs Dummy (DQ0570)



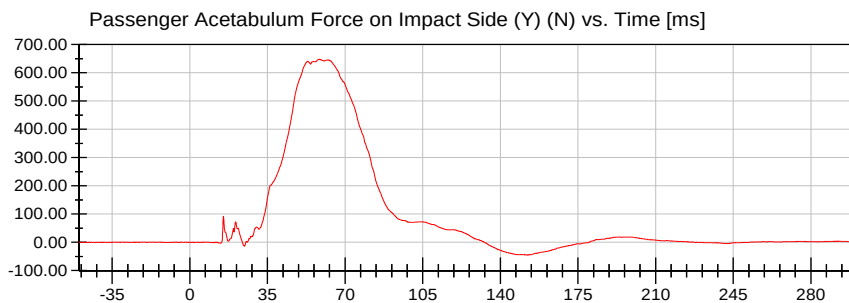
<Max>

192.65 N at 55.20 ms

<Min>

-64.83 N at 31.92 ms

CFC_600



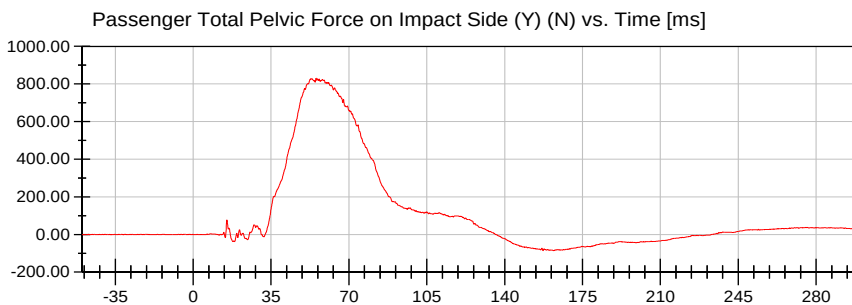
<Max>

648.15 N at 58.40 ms

<Min>

-45.20 N at 152.08 ms

CFC_600



<Max>

832.00 N at 55.20 ms

<Min>

-85.86 N at 157.20 ms

CFC_600



APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

Table 1. External Measurements

Table 2. Head Drop Test

- Head (X) Acceleration (G's) vs. Time (ms)
- Head (Y) Acceleration (G's) vs. Time (ms)
- Head (Z) Acceleration (G's) vs. Time (ms)
- Resultant Head Acceleration (G's) vs. Time (ms)

Table 3 Neck Pendulum Test

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

Table 4. Shoulder Impact Test

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

Table 5. Thorax – Upper Rib Drop Test

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

Table 6. Thorax – Middle Rib Drop Test

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

Table 7. Thorax – Lower Rib Drop Test

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

Table 8. Thorax – Full Body Impact Test

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

Table 9. Abdomen Impact Test

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

Table 10. Lumbar Spine Flexion Test

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

Table 11. Pelvis Impact Test

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

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Table 1. External Measurements

Table 2. Head Drop Test

- Head (X) Acceleration (G's) vs. Time (ms)
- Head (Y) Acceleration (G's) vs. Time (ms)
- Head (Z) Acceleration (G's) vs. Time (ms)
- Resultant Head Acceleration (G's) vs. Time (ms)

Table 3. Lateral Neck Pendulum Test

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

Table 4. Shoulder Impact Test

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

Table 5. Thorax (With Arm) Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Shoulder Displacement (mm) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 6. Thorax (Without Arm) Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 7. Abdomen Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Upper Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

Table 8. Pelvis Plug Quasi-Static Test (Optional*)

Table 9. Pelvis Acetabulum Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Pelvis (Y) Acceleration (G's) vs. Time (ms)
- Acetabulum Force (N) vs. Time (ms)

Table 10. Pelvis Iliac Impact Test

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

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 85

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. 85-2

Test Date: 1/31/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Peak Resultant Acceleration	125 - 155 g	136.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	9.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	< 15 %	3.48 %	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

01.31.2023 07:55:54 362

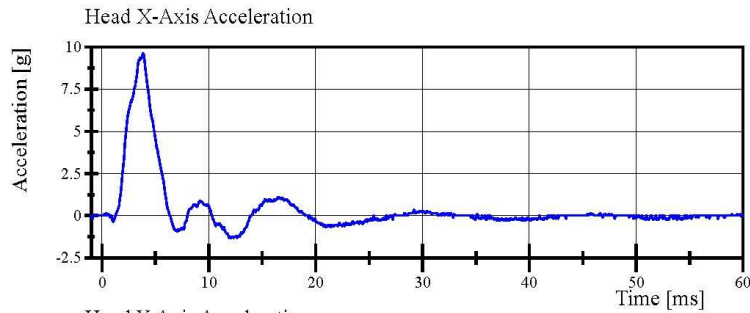


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 85-2

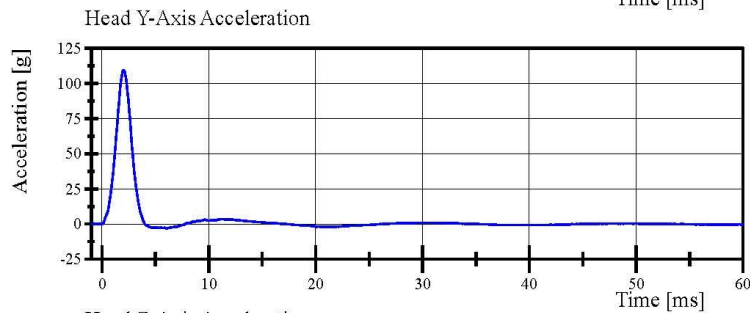
Test Date: 1/31/2023



Filter Class: CFC_1000

Max: 9.6 g at 3.8 ms

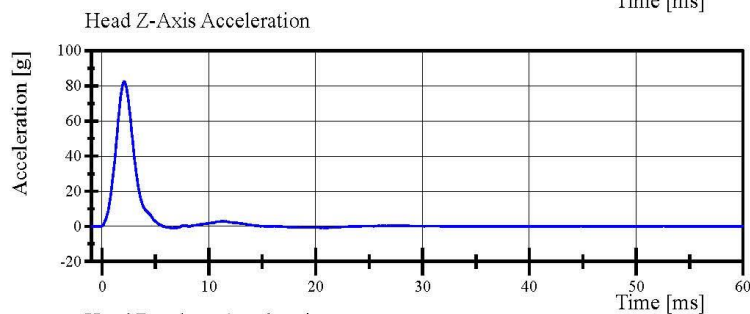
Min: -1.3 g at 11.9 ms



Filter Class: CFC_1000

Max: 109.4 g at 2.0 ms

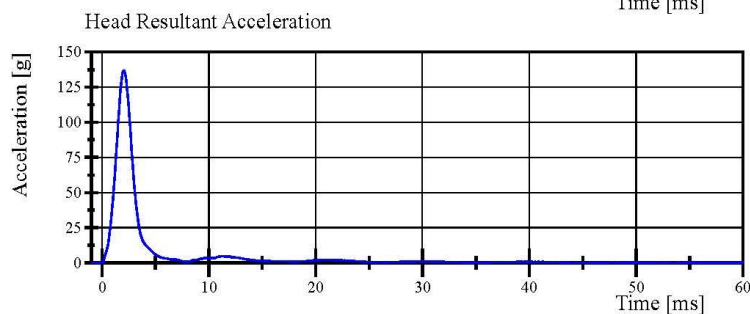
Min: -2.9 g at 6.0 ms



Filter Class: CFC_1000

Max: 82.5 g at 2.1 ms

Min: -1.0 g at 6.6 ms



Filter Class: CFC_1000

Max: 136.9 g at 2.1 ms

Min: 0.0 g at -0.6 ms

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

01.31.2023 07:57:07 362



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 85-3

Test Date: 1/31/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-51.1 deg	Yes
Time of Peak	54 - 66 ms	56.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	54.8 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 05053

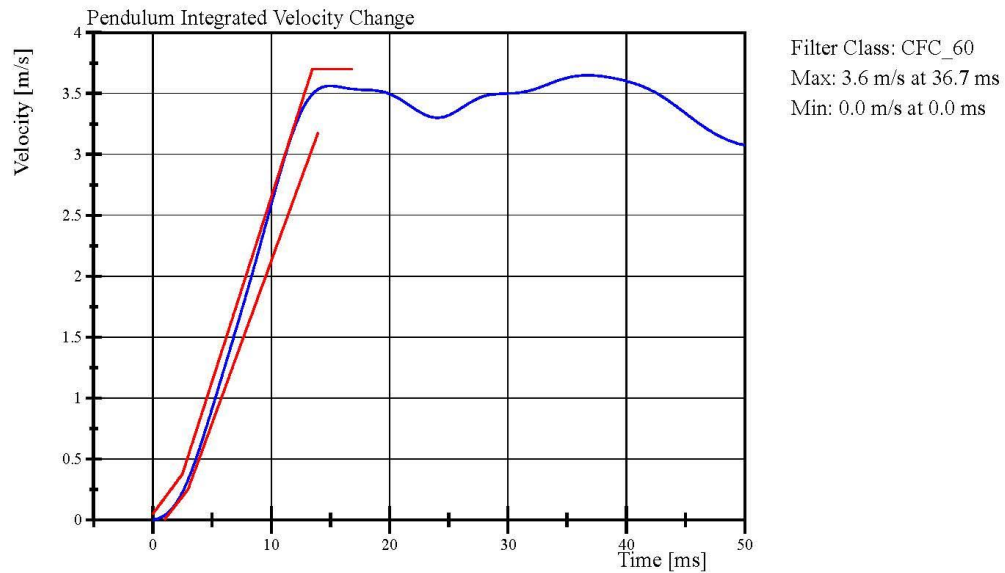
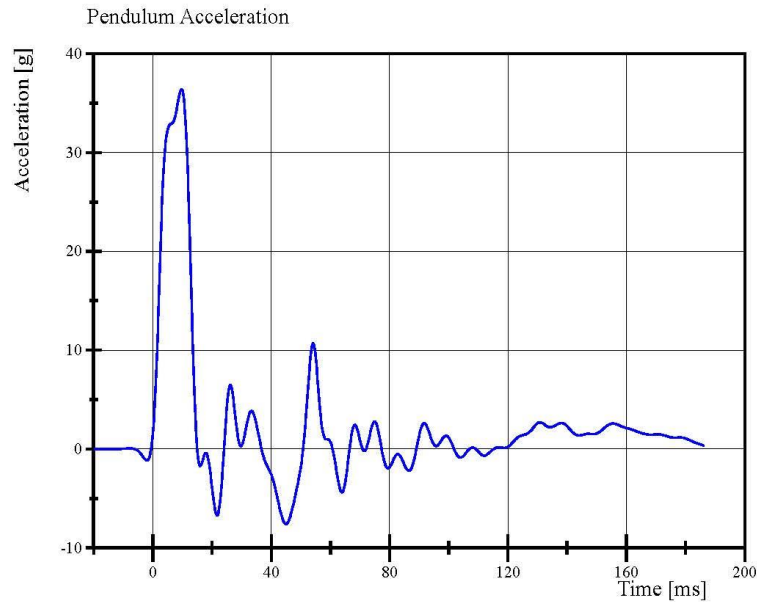
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

01.31.2023 09:34:27 1496



Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 85-3
Test Date: 1/31/2023



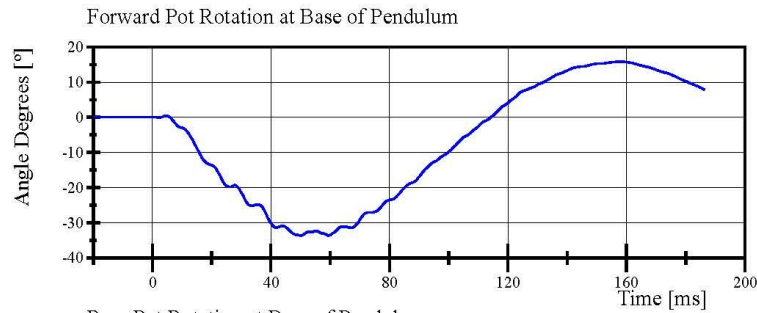
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

01.31.2023 09:34:59 1496

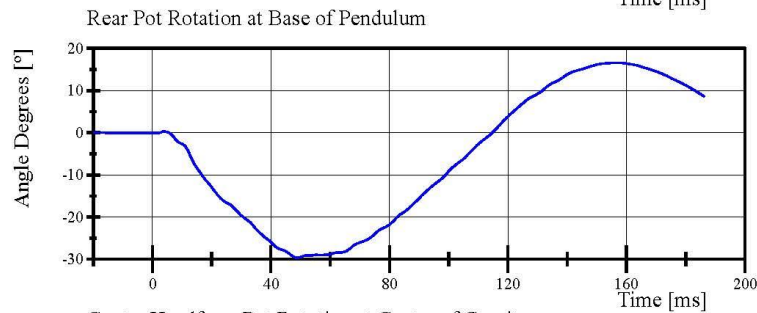


Transportation Research Center Inc.

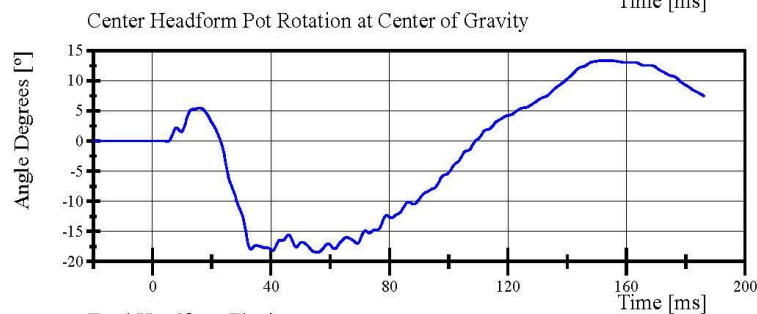
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 85-3
Test Date: 1/31/2023



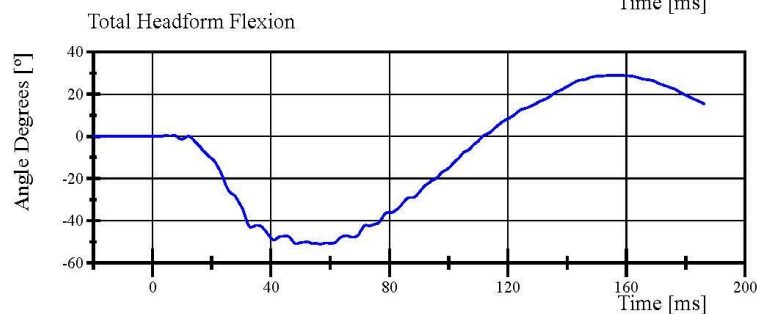
Filter Class: CFC_180
Max: 15.8 ° at 157.6 ms
Min: -33.6 ° at 50.1 ms



Filter Class: CFC_180
Max: 16.6 ° at 157.2 ms
Min: -29.6 ° at 48.9 ms



Filter Class: CFC_180
Max: 13.3 ° at 151.8 ms
Min: -18.5 ° at 55.8 ms



Filter Class: CFC_180
Max: 29.0 ° at 156.2 ms
Min: -51.1 ° at 56.7 ms

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

01.31.2023 09:34:59 1496



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 2/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.85 g	Yes

Test meets specifications.

Condition: Used

Comments:

Arm S/N: 175-3501-07014

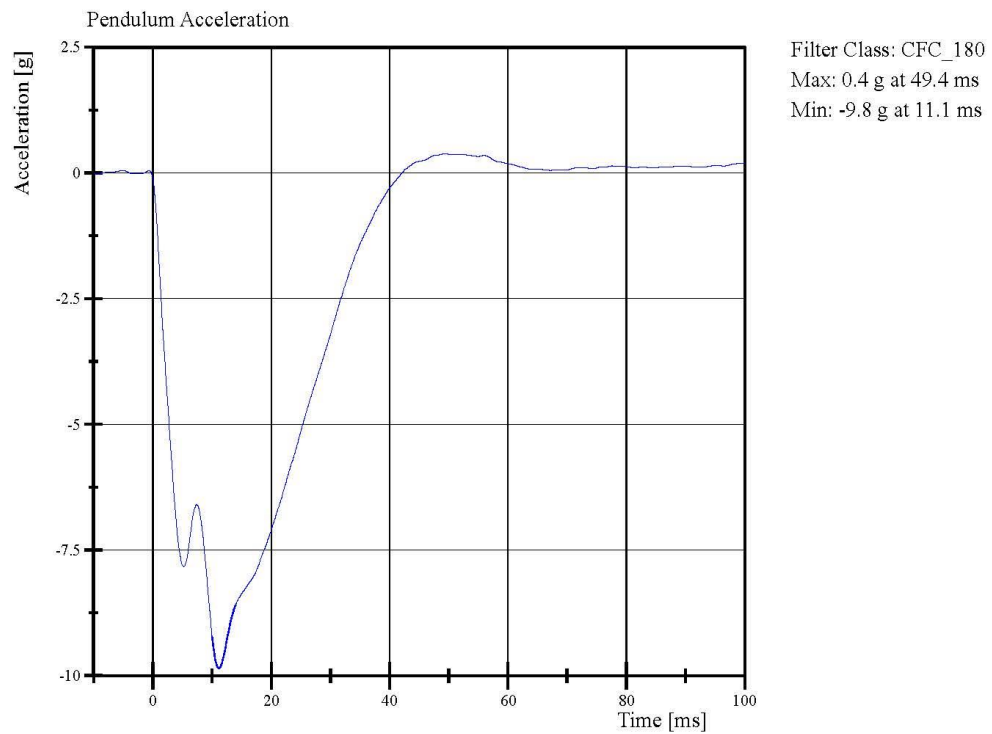
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.06.2023 11:48:03 619



Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 2/6/2023



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

02.06.2023 11:49:03 619



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 1/30/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.8 mm	Yes

Test meets specifications.

Condition: Used

Comments:

Drop Height: 462 mm

Rib Foam S/N: EK6973

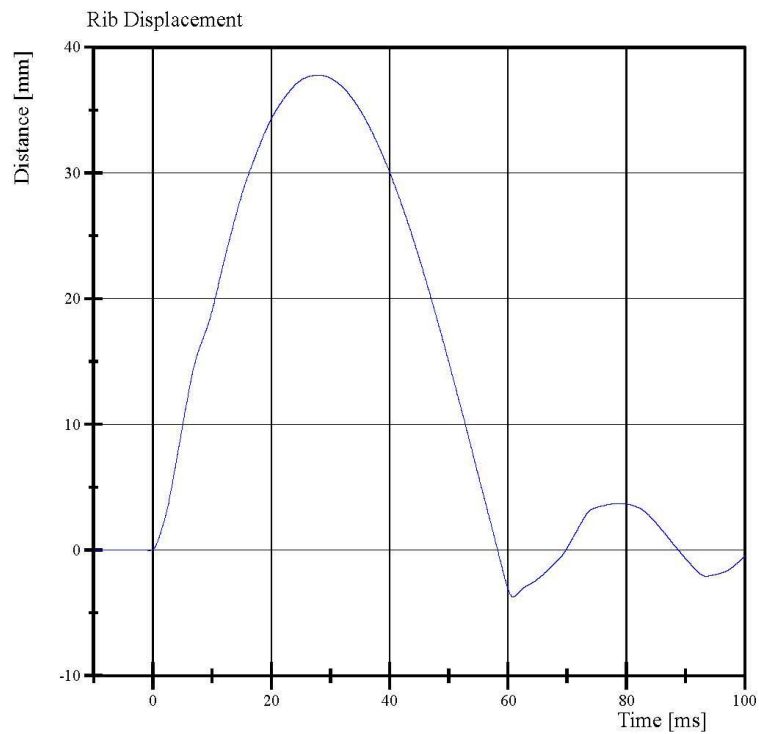
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

01.30.2023 11:37:27 626



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 1/30/2023



Filter Class: CFC_180
Max: 37.8 mm at 28.0 ms
Min: -3.7 mm at 60.9 ms

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

01.30.2023 11:37:53 626



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 1/30/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.0 mm	Yes

Test meets specifications.

Condition: Used

Comments:

Drop Height: 816 mm

Rib Foam S/N: EK6973

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

01.30.2023 11:31:54 524

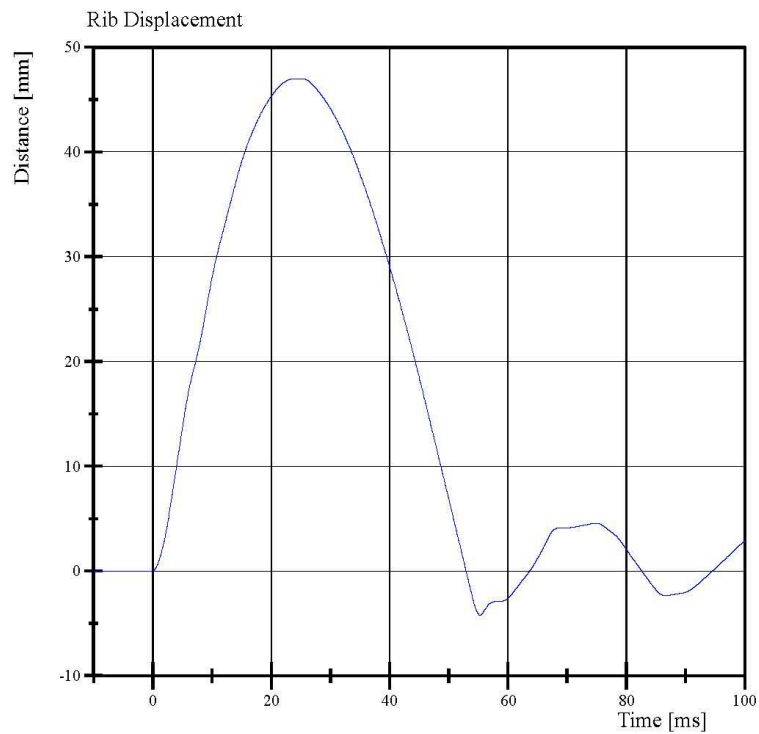


Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 1/30/2023



Filter Class: CFC_180
Max: 47.0 mm at 24.9 ms
Min: -4.2 mm at 55.3 ms

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

01.30.2023 11:32:44 524



Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 1/30/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.2 mm	Yes

Test meets specifications.

Condition: Used

Comments:

Drop Height: 816 mm

Rib Foam S/N: EK6970

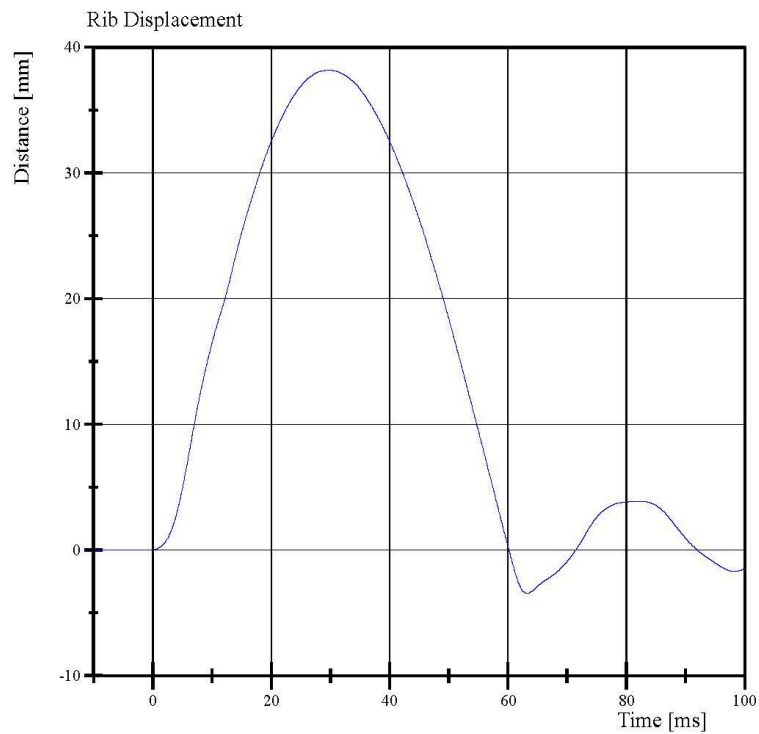
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

01.30.2023 11:46:44 618



Transportation Research Center Inc.

3.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 1/30/2023



Filter Class: CFC_180
Max: 38.2 mm at 29.7 ms
Min: -3.5 mm at 63.2 ms

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

01.30.2023 11:47:23 618



Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 1/30/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.8 mm	Yes

Test meets specifications.

Condition: Used

Comments:

Drop Height: 816 mm

Rib Foam S/N: EK6970

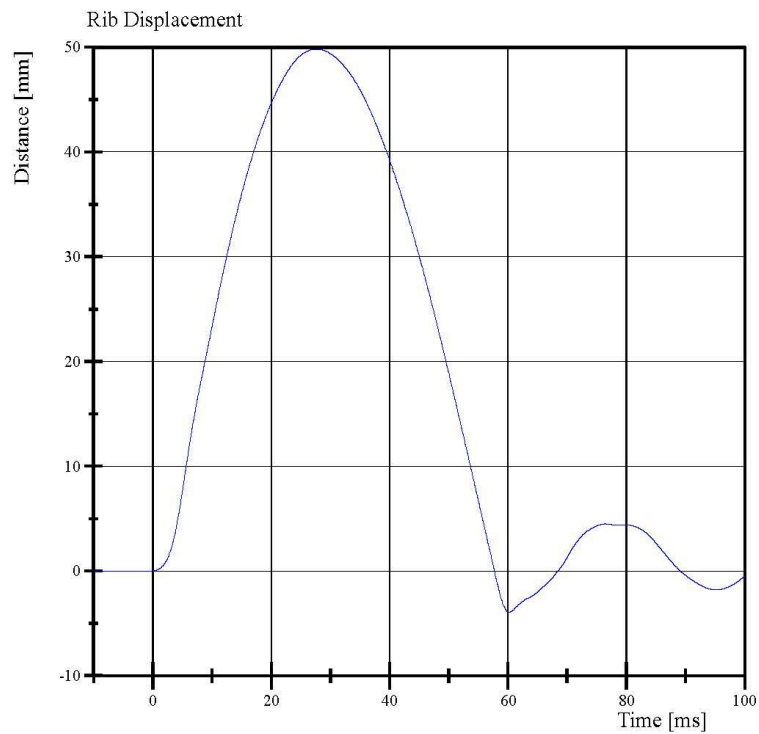
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

01.30.2023 11:41:48 507



Transportation Research Center Inc.

4.0 m/s Middle Full Rib Module
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 1/30/2023



Filter Class: CFC_180
Max: 49.8 mm at 27.7 ms
Min: -3.9 mm at 60.2 ms

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

01.30.2023 11:42:20 507



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 1/30/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	25 %	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

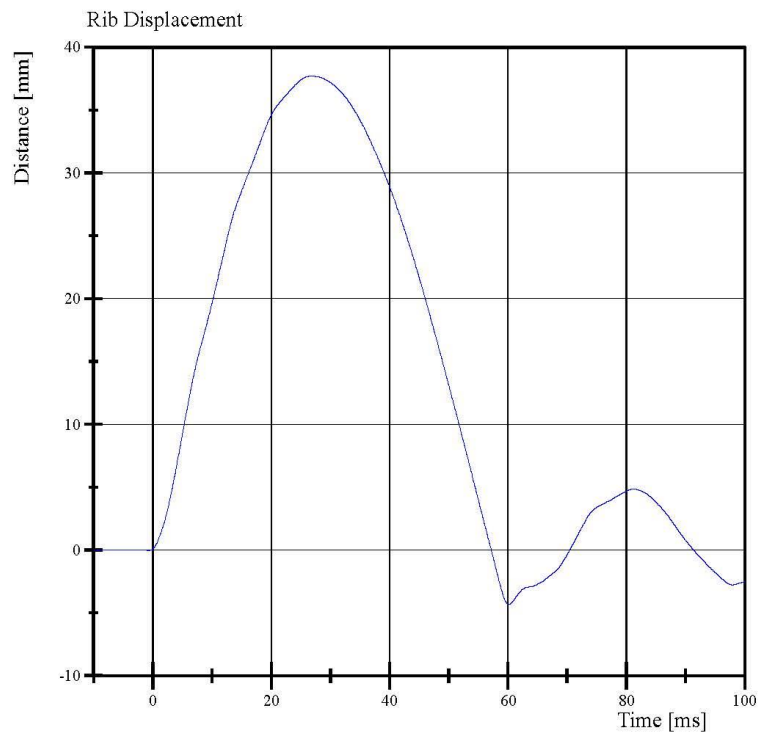
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

01.30.2023 11:57:50 631



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 1/30/2023



Filter Class: CFC_180
Max: 37.7 mm at 26.7 ms
Min: -4.3 mm at 60.2 ms

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

01.30.2023 11:59:03 631



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 1/30/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.7 mm	Yes

Test meets specifications.

Condition: Used

Comments:

Drop Height: 816 mm

Rib Foam S/N: EK6971

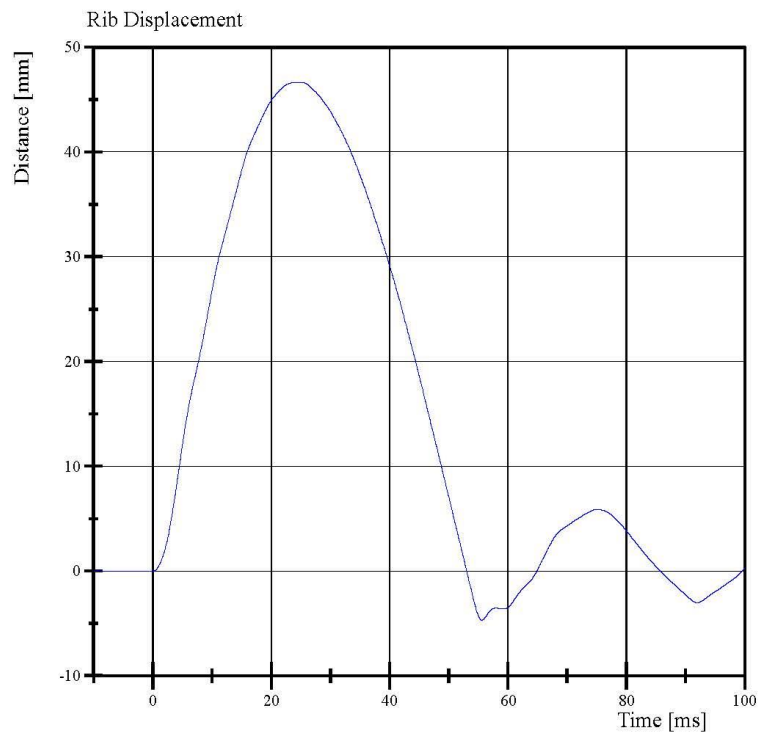
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

01.30.2023 11:51:45 526



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 1/30/2023



Filter Class: CFC_180
Max: 46.7 mm at 24.7 ms
Min: -4.7 mm at 55.6 ms

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

01.30.2023 11:52:21 526



Transportation Research Center Inc.

Left Lower Thorax

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 2/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.456 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,641.7 N	Yes
Upper Rib Displacement	34 - 41 mm	36.9 mm	Yes
Center Rib Displacement	37 - 45 mm	40.2 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

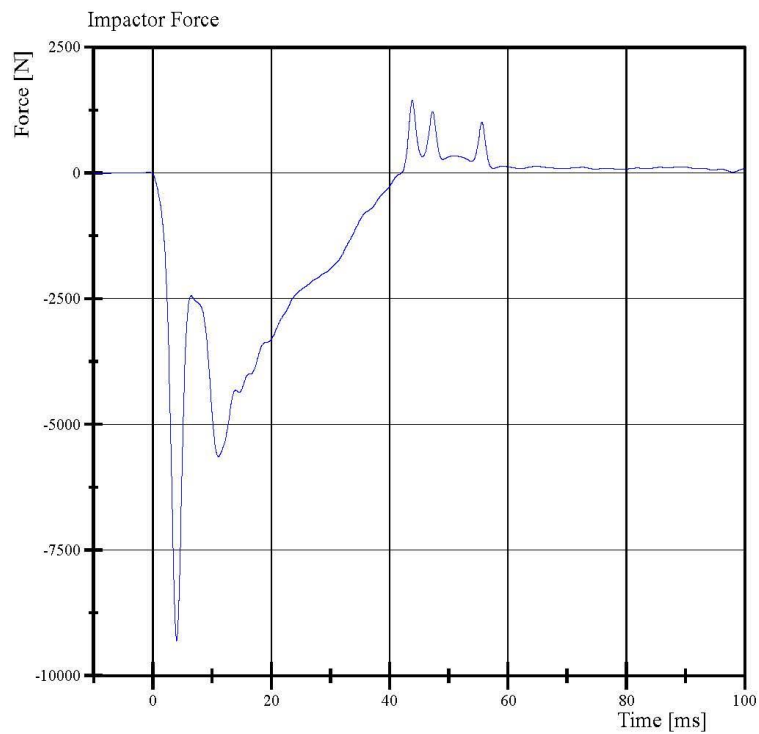
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.06.2023 12:42:59 474



Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 2/6/2023



Filter Class: CFC_180
Max: 1,446.9 N at 43.8 ms
Min: -9,305.7 N at 4.0 ms

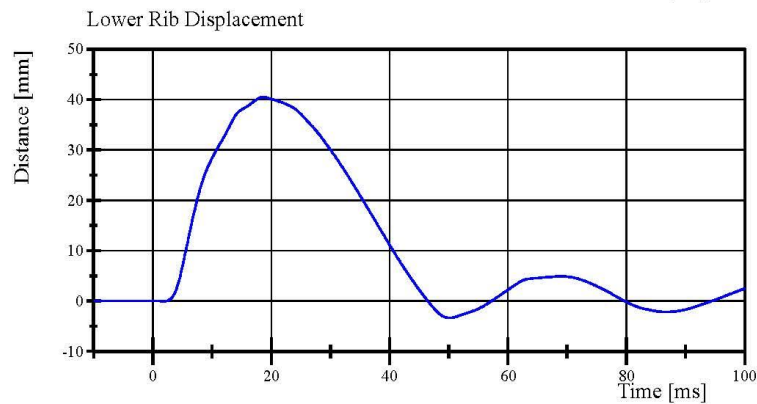
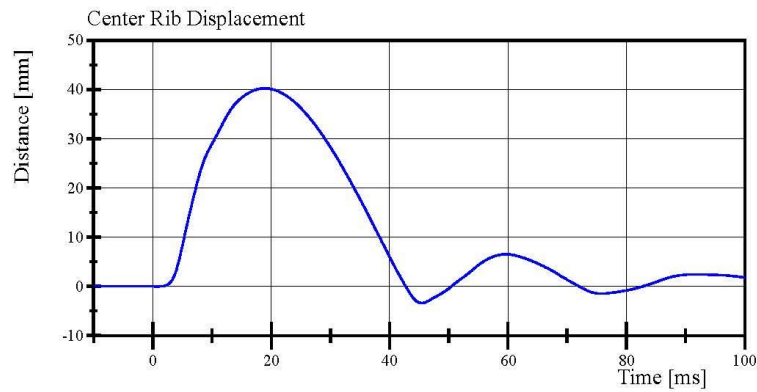
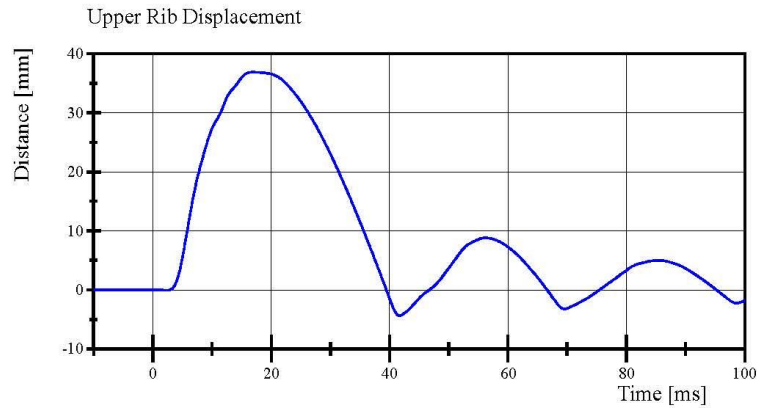
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.06.2023 12:43:57 474



Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 2/6/2023



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

02.06.2023 12:43:57 474



Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 85-23

Test Date: 2/2/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.137 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-46.3 deg	Yes
Time of Peak	39 - 53 ms	42.6 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	37.7 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Lumbar S/N: DS3472

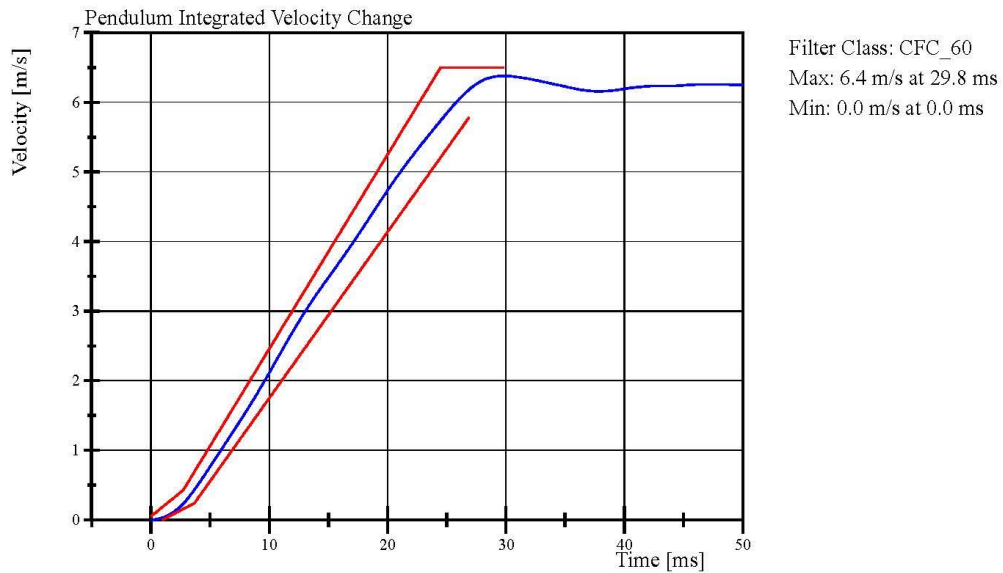
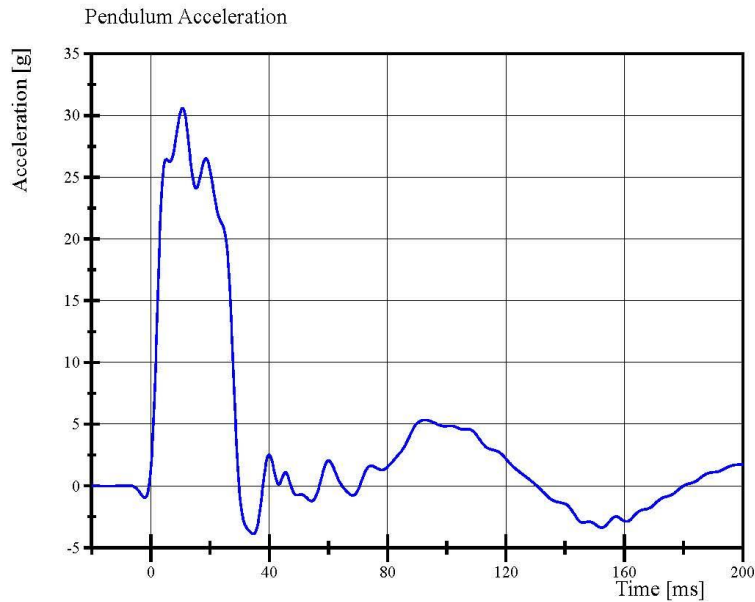
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.02.2023 11:27:18 668



Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 85-23
Test Date: 2/2/2023



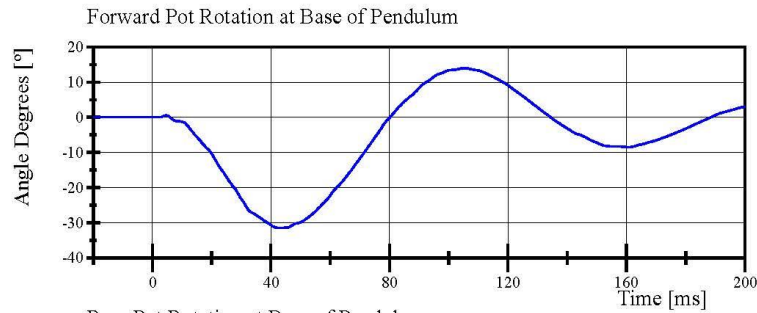
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.02.2023 11:27:42 668

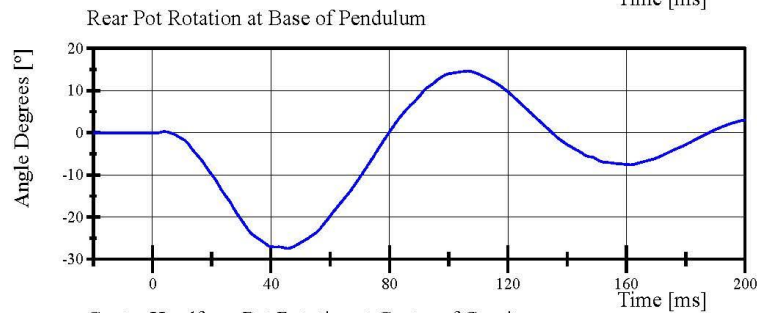


Transportation Research Center Inc.

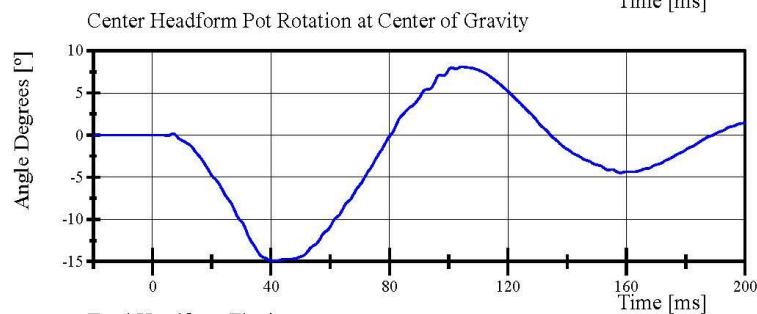
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 85-23
Test Date: 2/2/2023



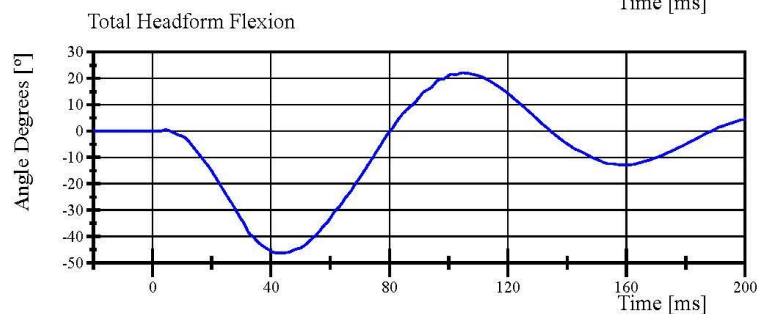
Filter Class: CFC_180
Max: 14.0 ° at 105.3 ms
Min: -31.5 ° at 42.9 ms



Filter Class: CFC_180
Max: 14.6 ° at 106.4 ms
Min: -27.4 ° at 45.6 ms



Filter Class: CFC_180
Max: 8.1 ° at 104.6 ms
Min: -14.9 ° at 40.4 ms



Filter Class: CFC_180
Max: 22.1 ° at 104.8 ms
Min: -46.3 ° at 42.6 ms

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

02.02.2023 11:27:42 668



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 85-1

Test Date: 2/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.05 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,348.1 N	Yes
Time of Peak	10.6 - 13.0 ms	11.52 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,426.5 N	Yes
Time of Peak	10.0 - 12.3 ms	10.88 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Abdomen S/N: 1066

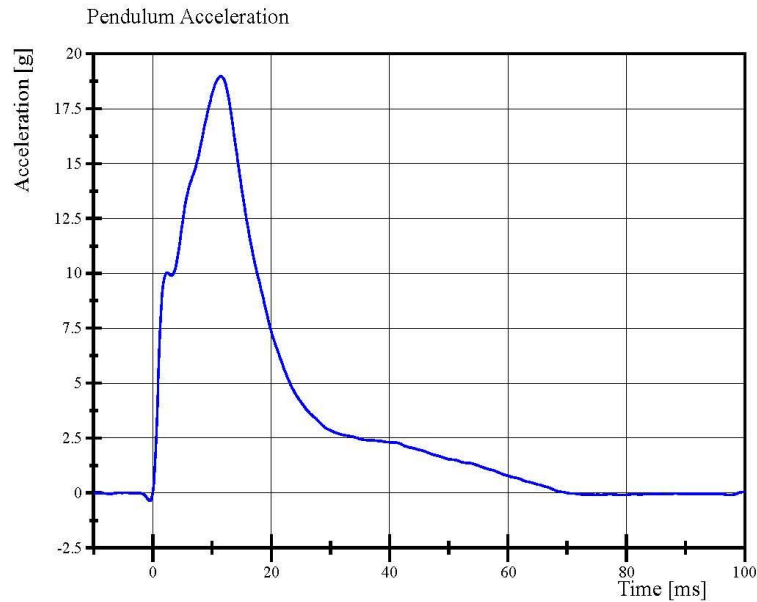
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.06.2023 12:52:23 623

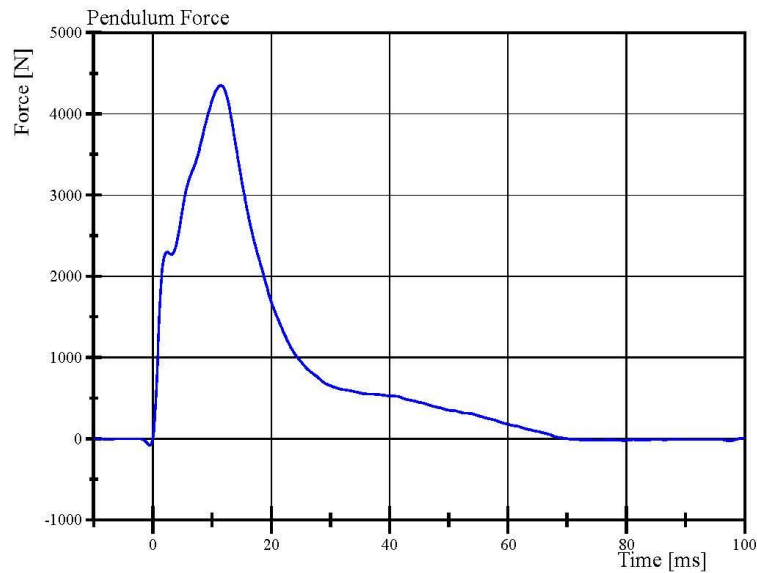


Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 85-1
Test Date: 2/6/2023



Filter Class: CFC_180
Max: 19.0 g at 11.5 ms
Min: -0.4 g at -0.5 ms



Filter Class: CFC_180
Max: 4,348.1 N at 11.5 ms
Min: -81.7 N at -0.5 ms

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

02.06.2023 12:52:57 623

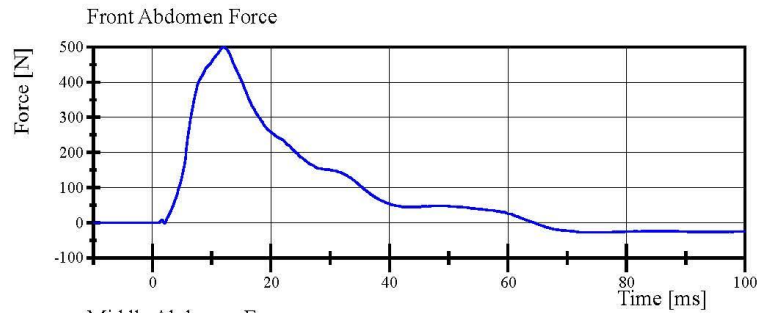


Transportation Research Center Inc.

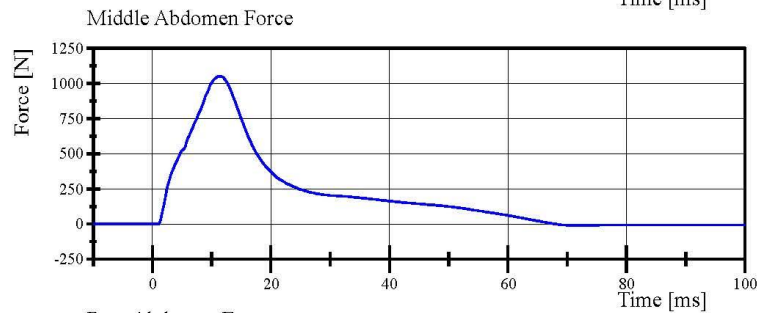
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 85-1

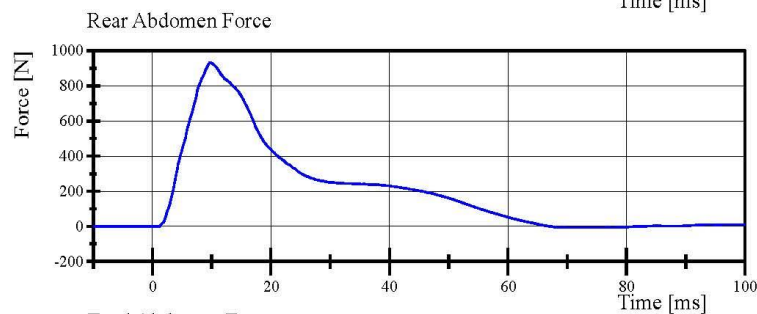
Test Date: 2/6/2023



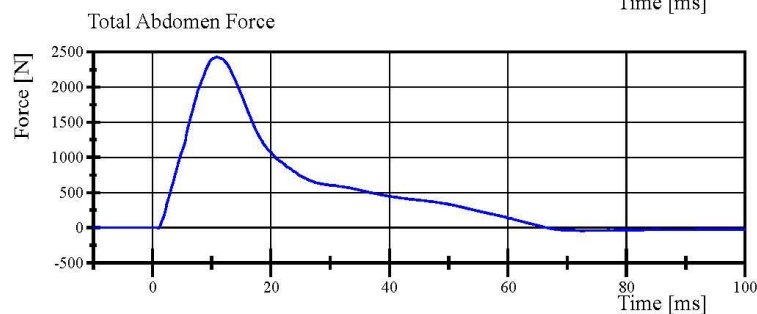
Filter Class: CFC_600
Max: 499.4 N at 12.0 ms
Min: -27.7 N at 73.4 ms



Filter Class: CFC_600
Max: 1,051.1 N at 11.2 ms
Min: -9.3 N at 72.3 ms



Filter Class: CFC_600
Max: 932.4 N at 9.8 ms
Min: -6.1 N at 72.3 ms



Filter Class: CFC_600
Max: 2,426.5 N at 10.9 ms
Min: -42.6 N at 72.4 ms

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

02.06.2023 12:52:57 623



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 85-4

Test Date: 2/6/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.38 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,295.2 N	Yes
Time of Peak	11.8 - 16.1 ms	12.56 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,379.5 N	Yes
Time of Peak	12.2 - 17.0 ms	12.80 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Pelvis Skin S/N: N/A

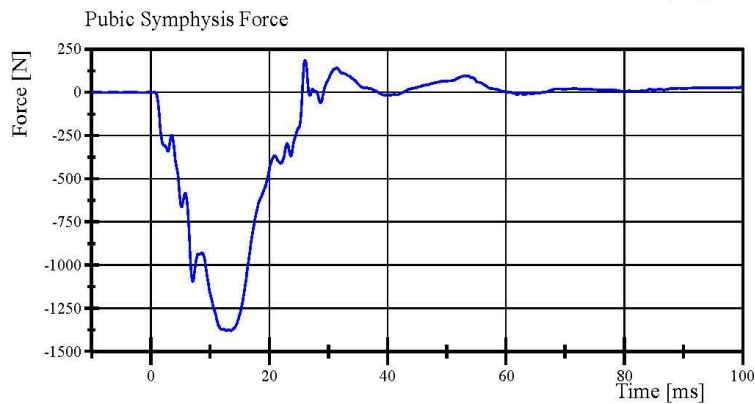
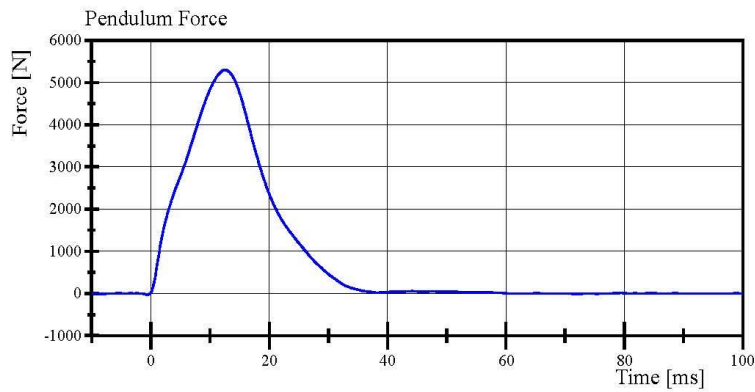
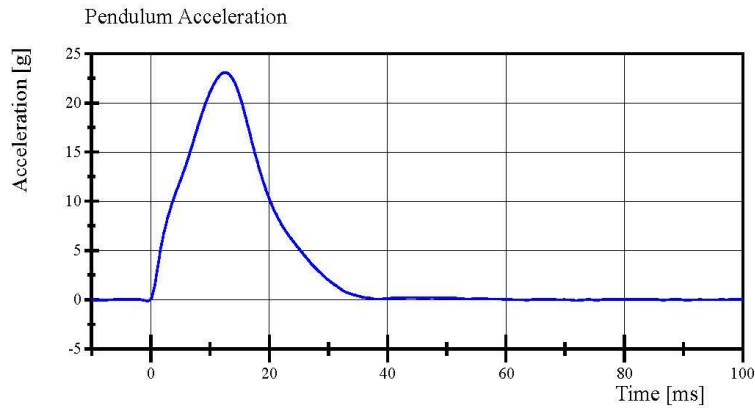
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.06.2023 14:53:29 600



Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 85-4
Test Date: 2/6/2023



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

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Post-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

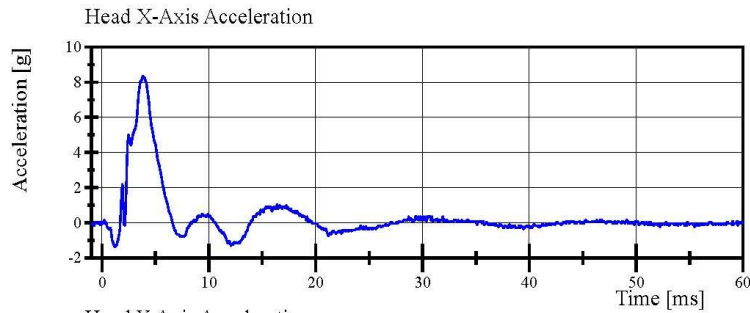


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 86-2

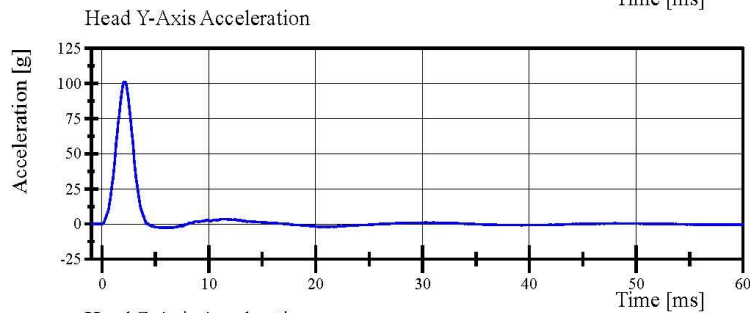
Test Date: 2/20/2023



Filter Class: CFC_1000

Max: 8.4 g at 3.8 ms

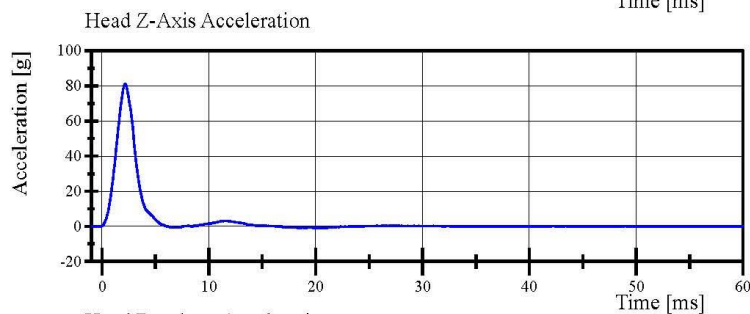
Min: -1.4 g at 1.2 ms



Filter Class: CFC_1000

Max: 101.4 g at 2.2 ms

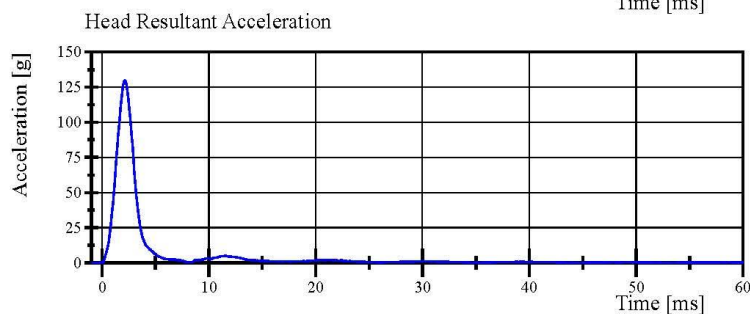
Min: -2.6 g at 6.2 ms



Filter Class: CFC_1000

Max: 81.0 g at 2.2 ms

Min: -1.0 g at 20.3 ms



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

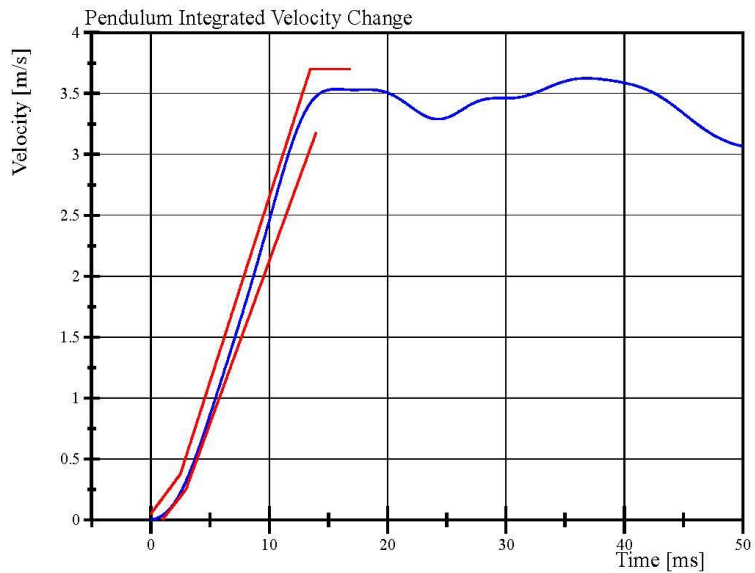
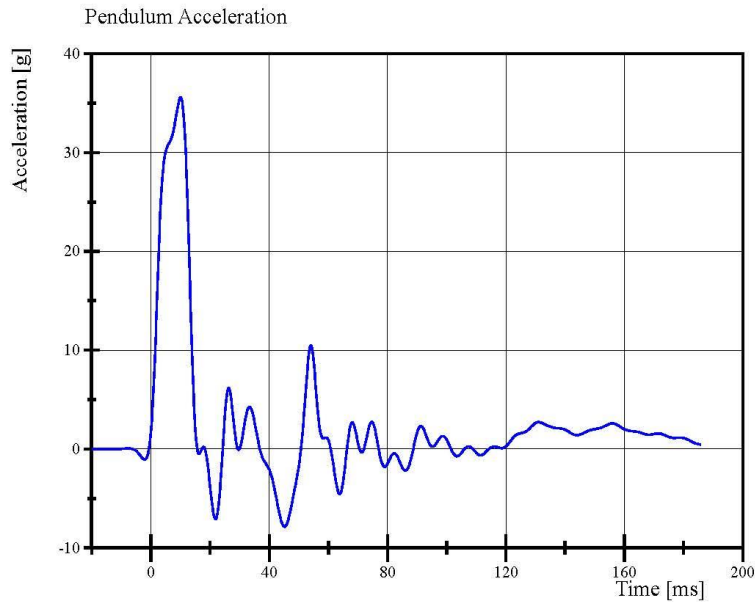
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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



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

02.20.2023 13:24:23 1502

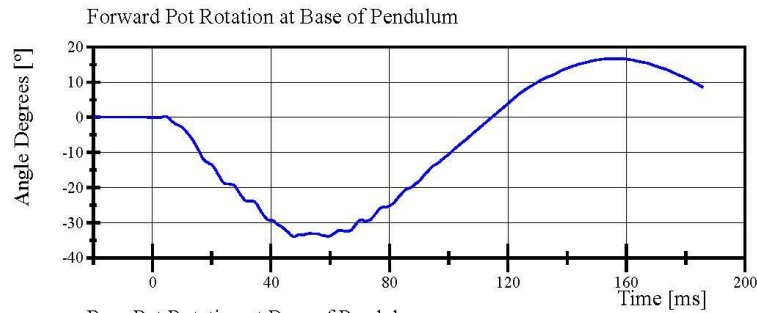


Transportation Research Center Inc.

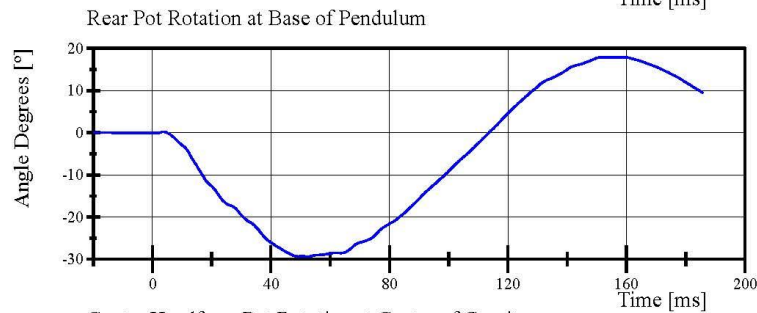
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 86-1

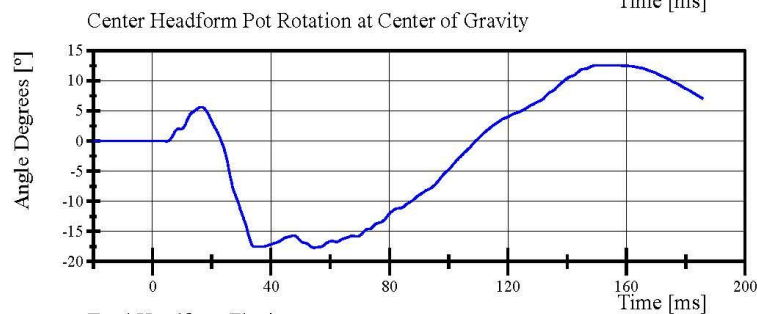
Test Date: 2/20/2023



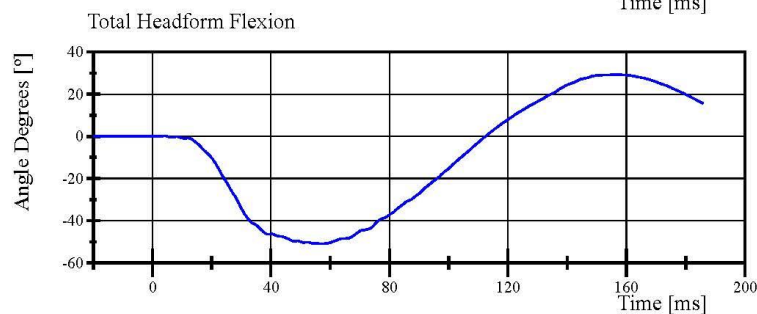
Filter Class: CFC_180
Max: 16.7 ° at 156.6 ms
Min: -34.0 ° at 47.8 ms



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



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



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

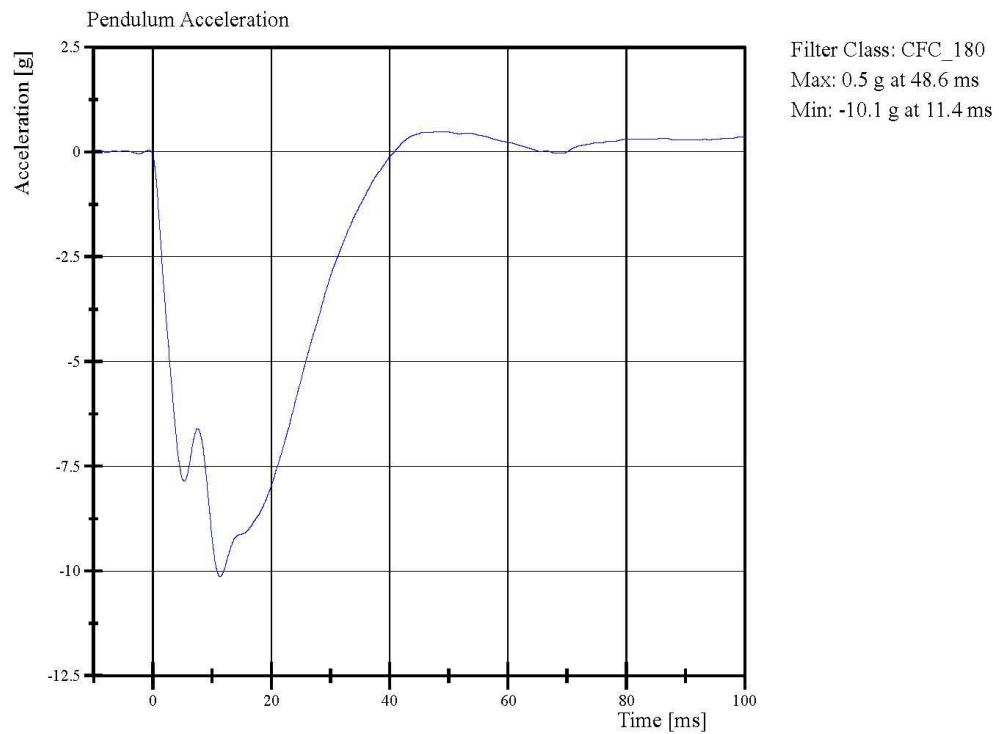
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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



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

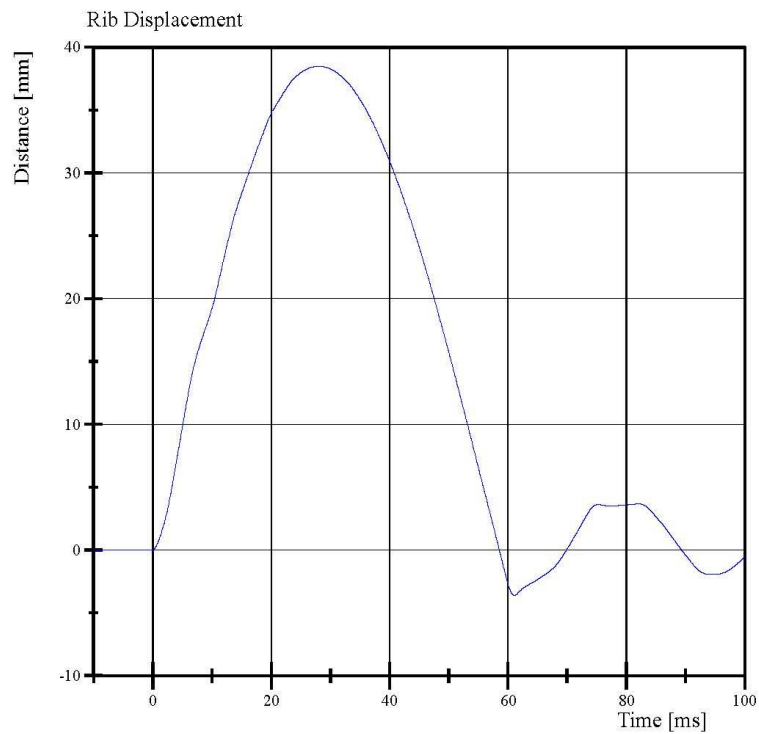
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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

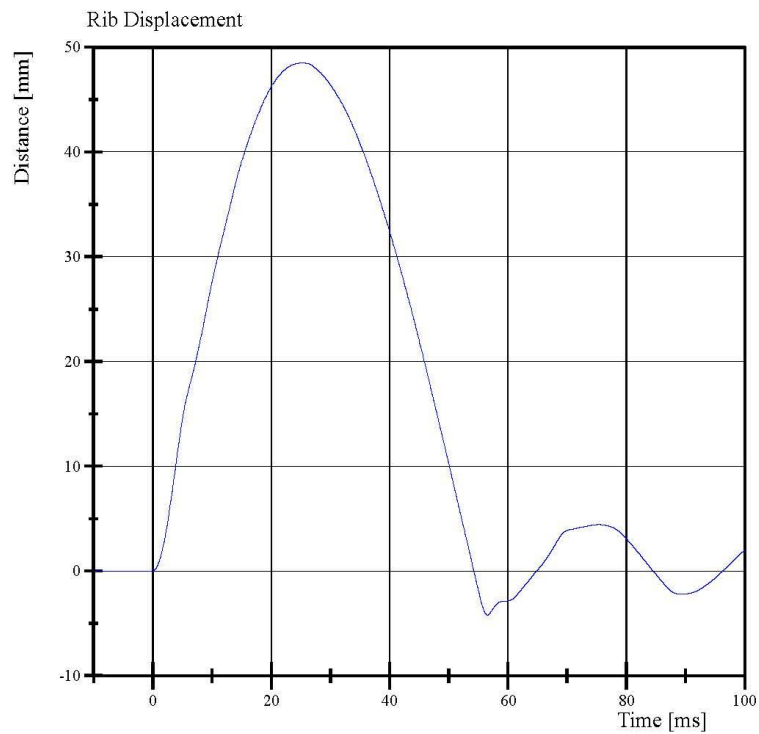
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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

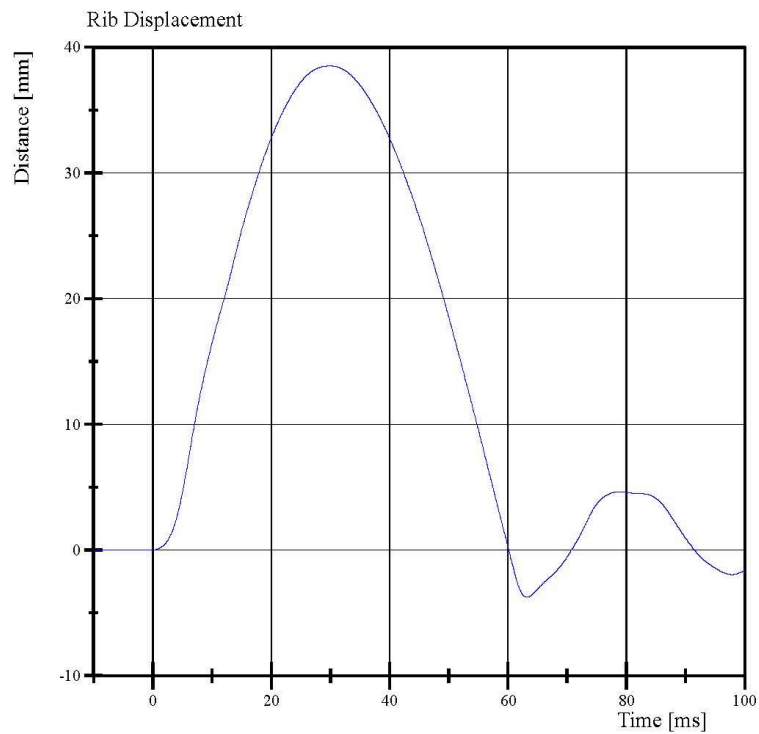
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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

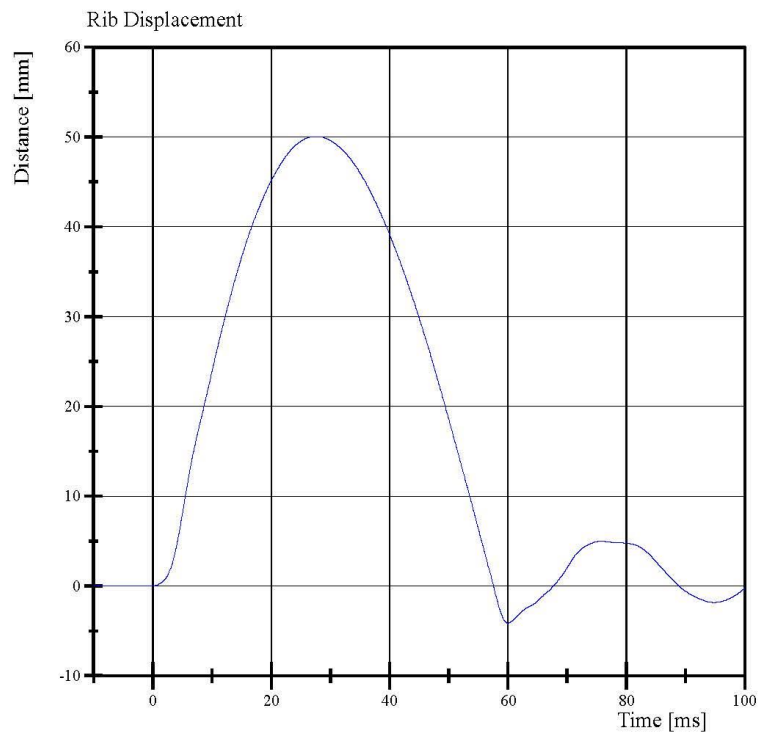
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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

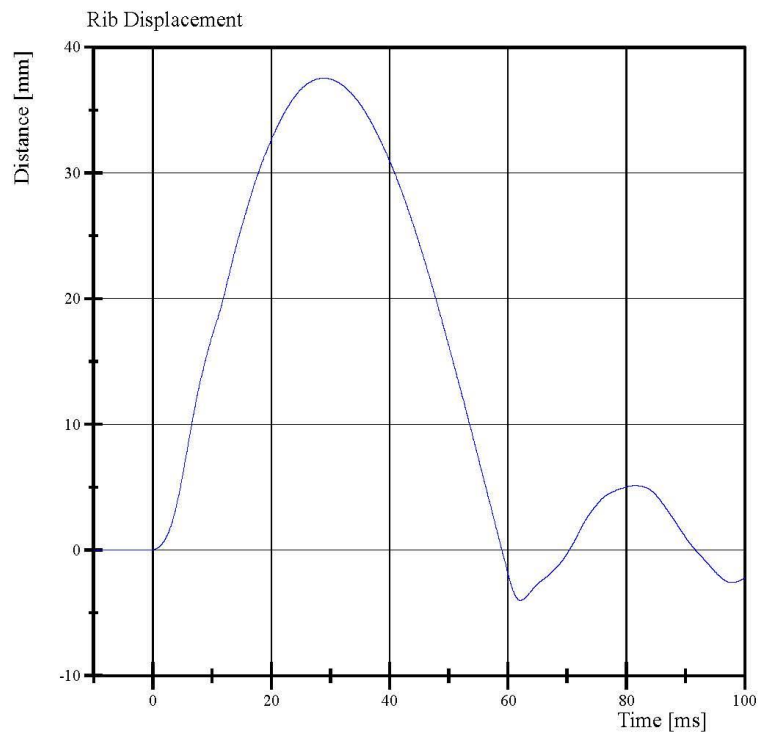
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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

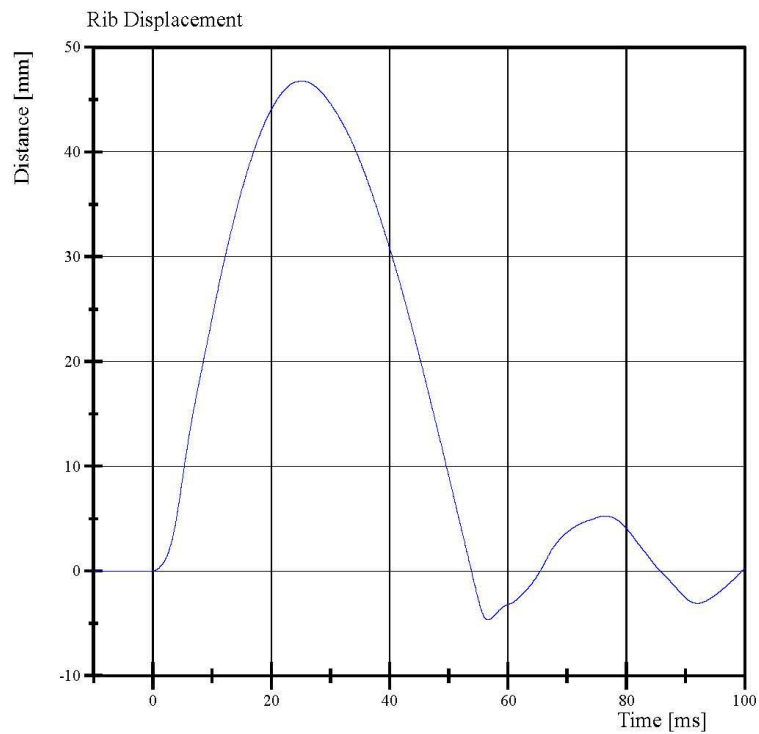


Transportation Research Center Inc.

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

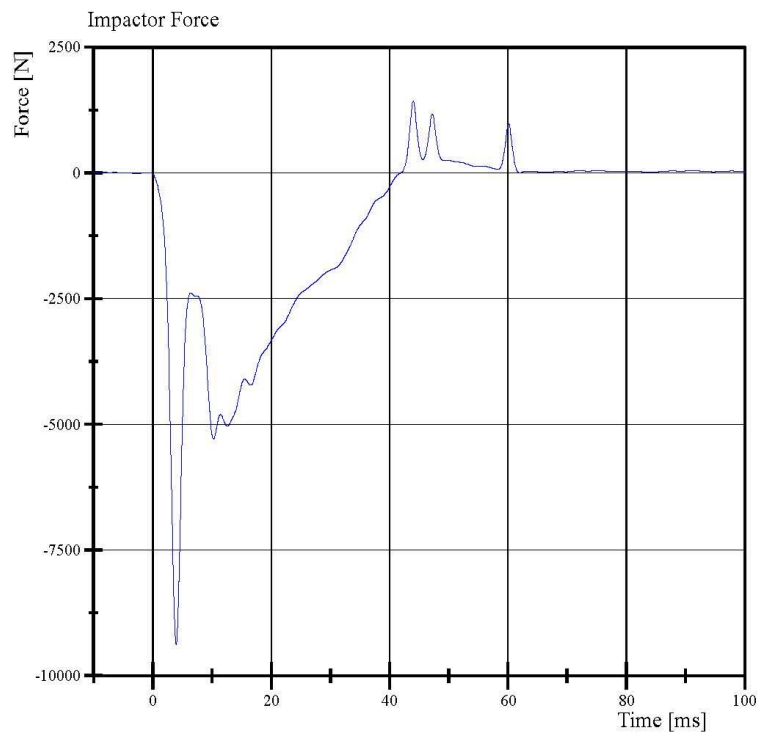
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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

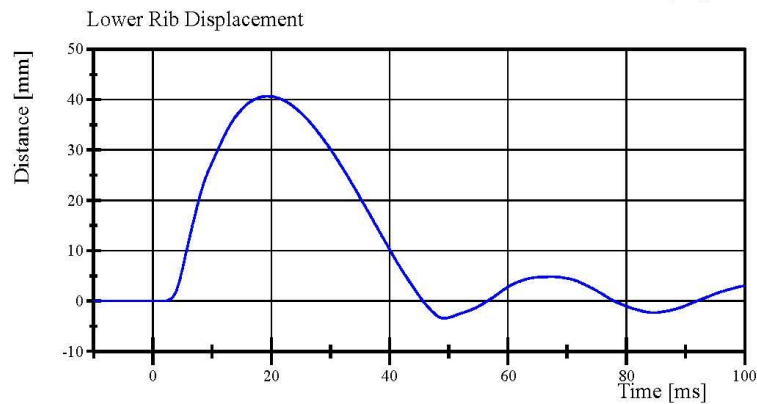
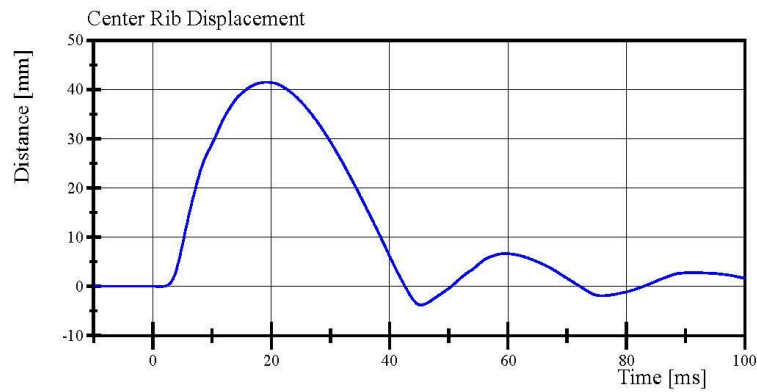
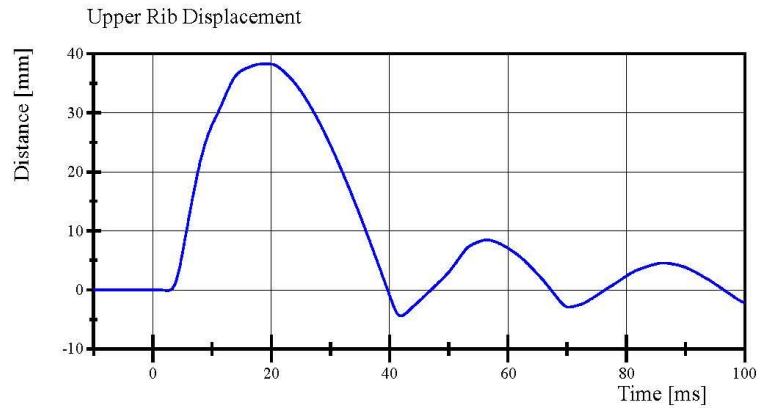
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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Transportation Research Center Inc.

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



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

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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

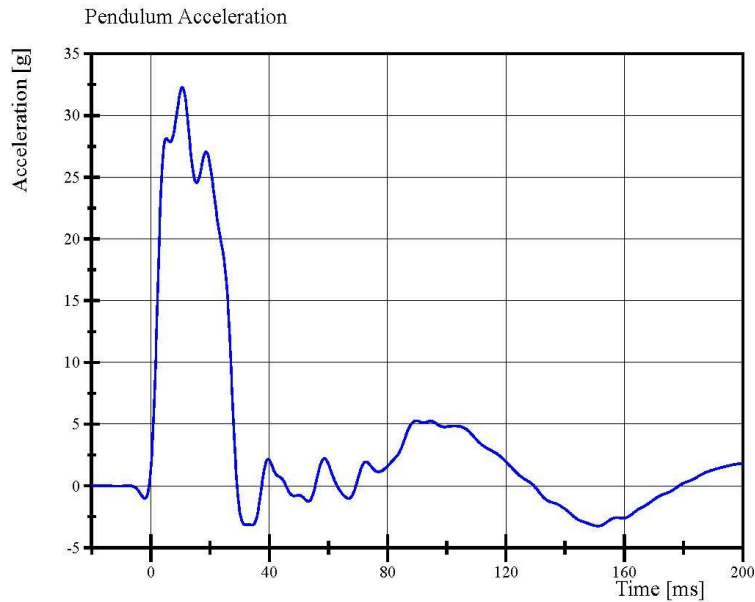
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 13:07:09 668

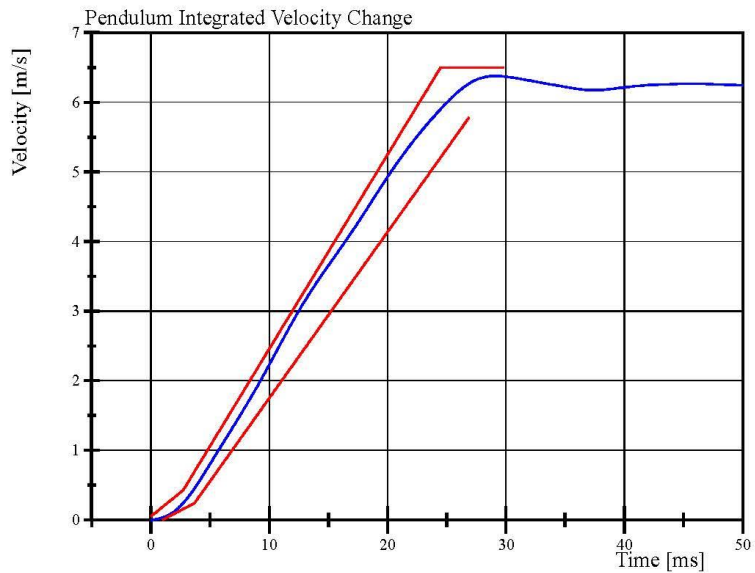


Transportation Research Center Inc.

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



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



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

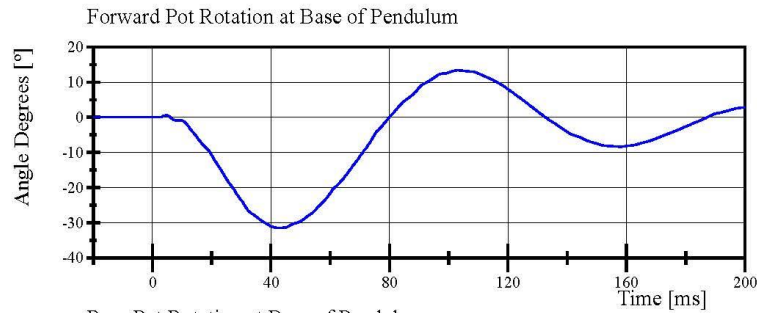
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 13:07:44 668

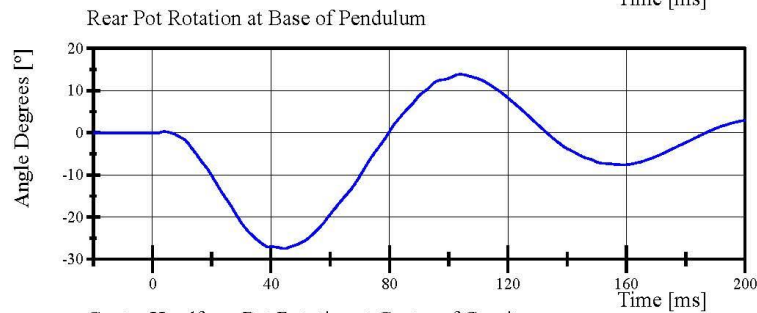


Transportation Research Center Inc.

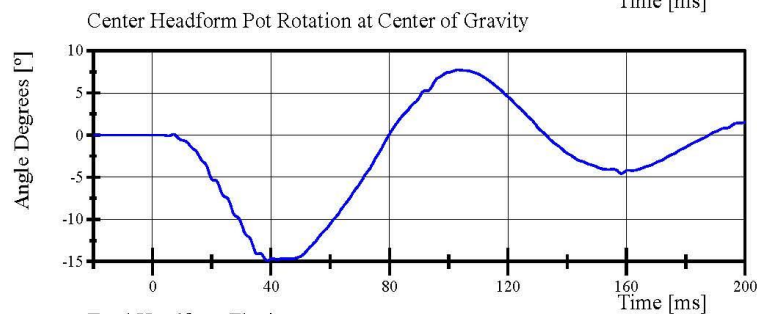
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 86-3
Test Date: 2/20/2023



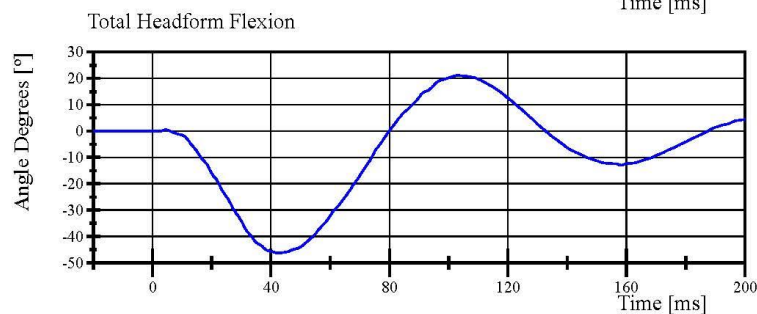
Filter Class: CFC_180
Max: 13.4 ° at 103.2 ms
Min: -31.5 ° at 42.9 ms



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



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



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

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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

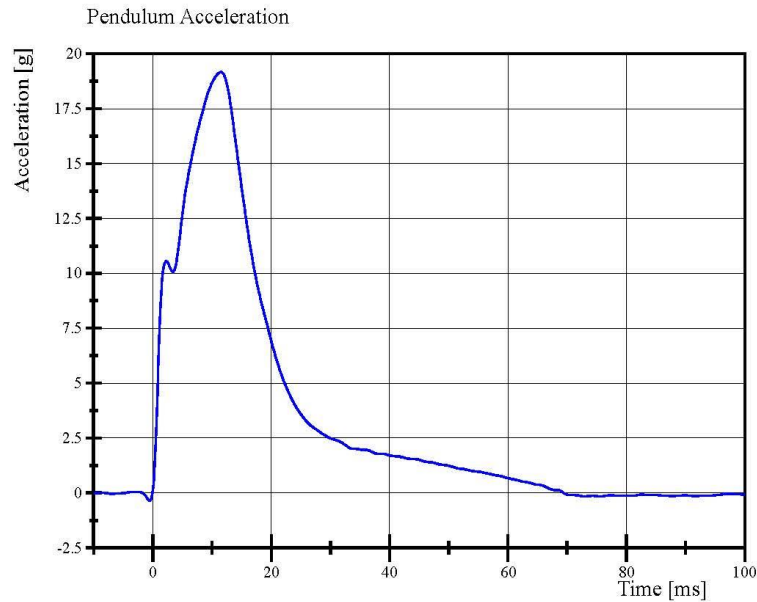
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.20.2023 14:28:42 638

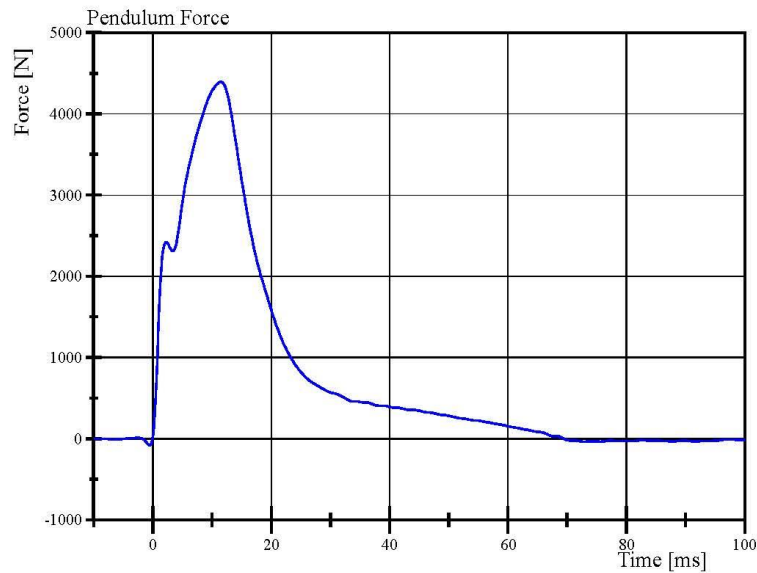


Transportation Research Center Inc.

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



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



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

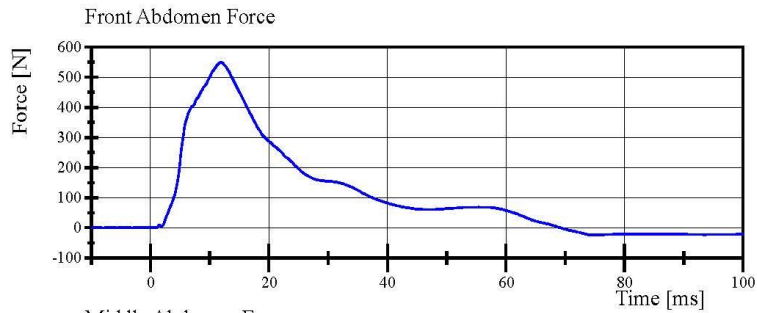


Transportation Research Center Inc.

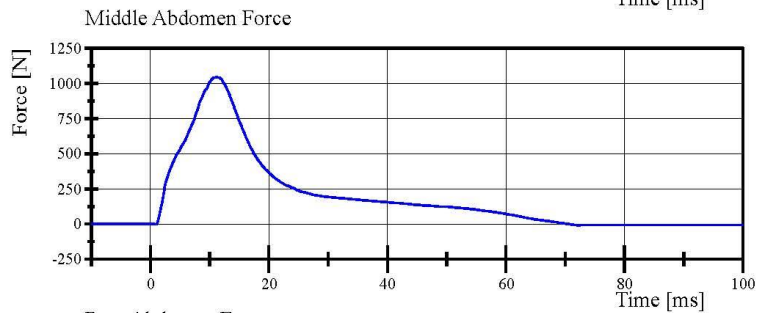
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 86-1

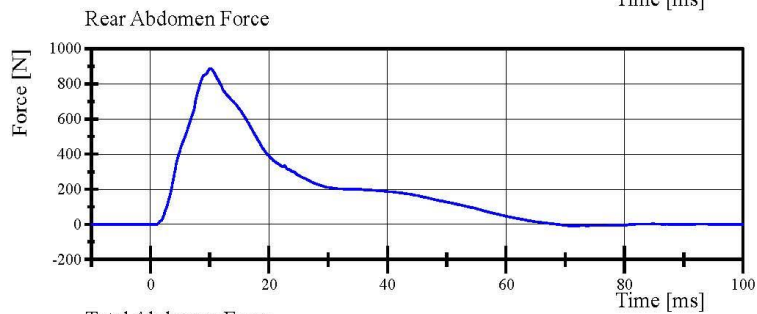
Test Date: 2/20/2023



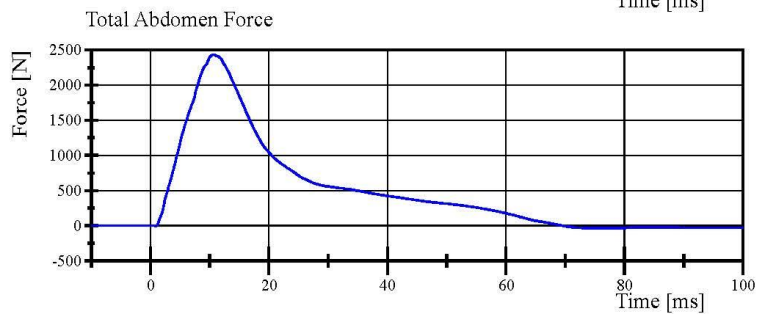
Filter Class: CFC_600
Max: 549.8 N at 11.9 ms
Min: -24.1 N at 74.3 ms



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



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



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

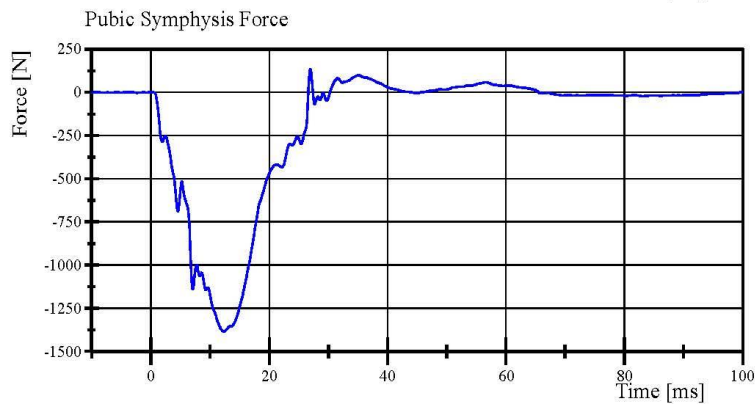
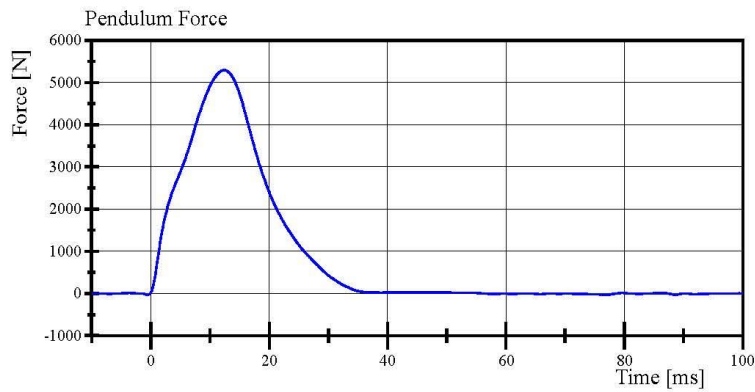
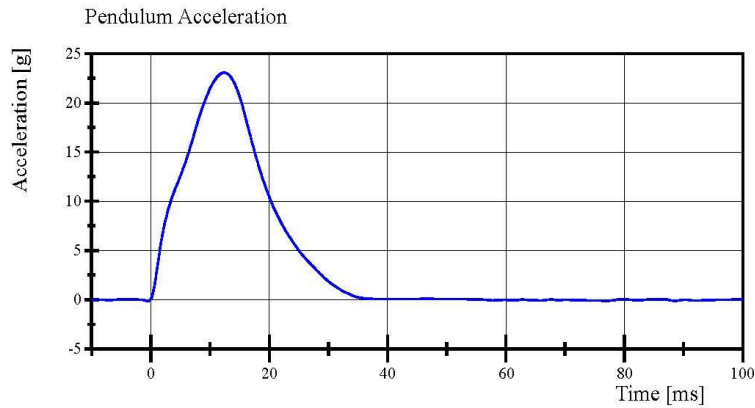


Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 86-2

Test Date: 2/20/2023



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

02.20.2023 15:06:25 597



Pre-Test Calibration Sheets
Driver S/N DQ5070

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. DQ0570 Calibration No. 18

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

Revised 9/29/2005



Report Number: DQ0570_S2H18

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Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. DQ0570 Certification No. 18-1

Test Date: 1/26/2023

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	123.6 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-4.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	< 15 %	1.27 %	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

01.26.2023 11:14:03 235

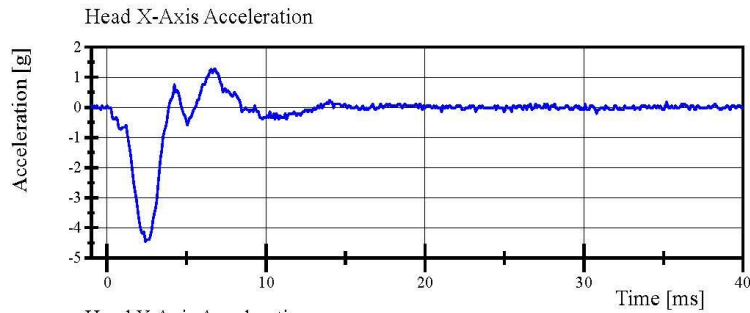


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. DQ0570 Certification No. 18-1

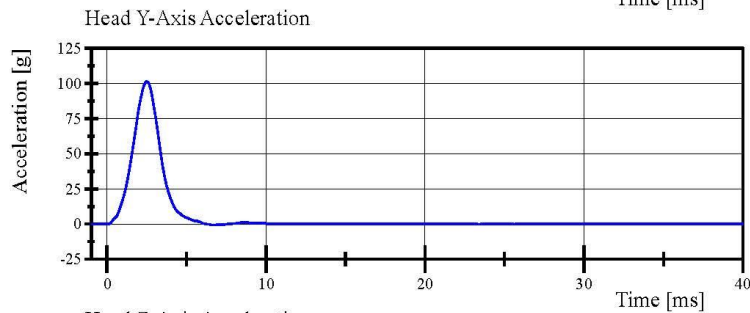
Test Date: 1/26/2023



Filter Class: CFC_1000

Max: 1.3 g at 6.6 ms

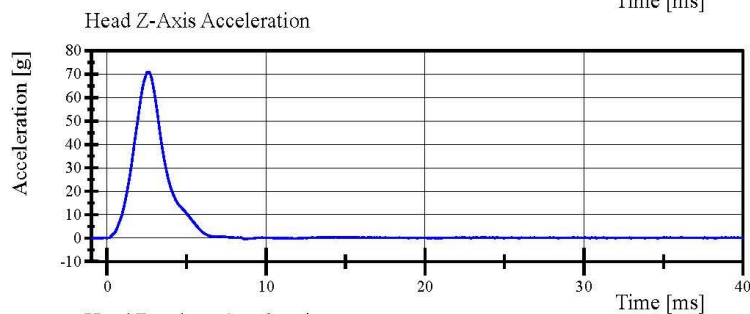
Min: -4.5 g at 2.4 ms



Filter Class: CFC_1000

Max: 101.4 g at 2.5 ms

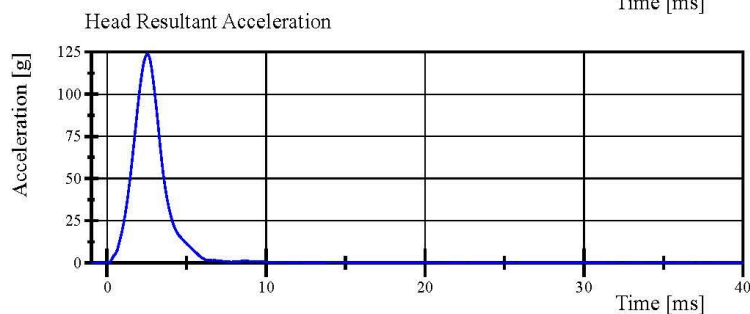
Min: -0.5 g at 6.7 ms



Filter Class: CFC_1000

Max: 71.0 g at 2.6 ms

Min: -0.4 g at 8.7 ms



Filter Class: CFC_1000

Max: 123.6 g at 2.6 ms

Min: 0.0 g at -0.6 ms

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

01.26.2023 11:14:29 235



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. DQ0570 Certification No. 18-2

Test Date: 1/26/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.609 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.690 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.901 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.220 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.814 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.839 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-74.0 deg	Yes
Time of Peak	50 - 70 ms	59.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.0 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	111.5 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

01.26.2023 13:27:22 749

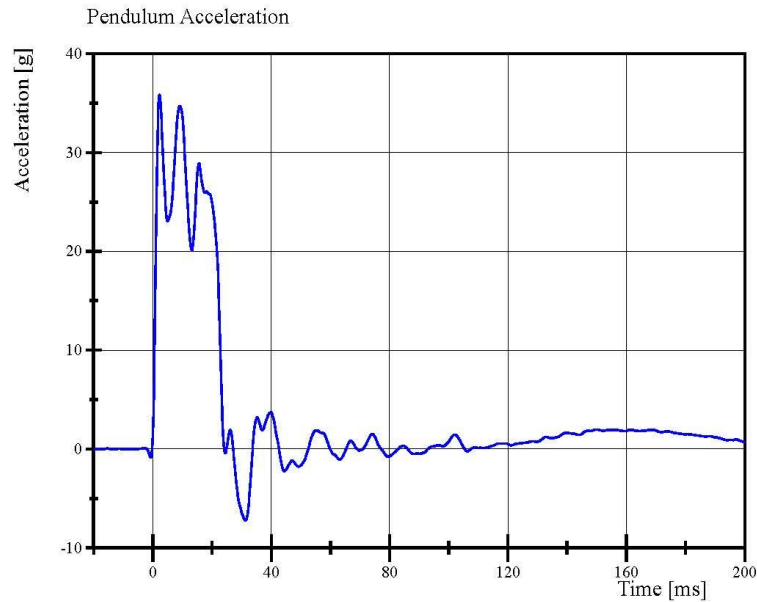


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. DQ0570 Certification No. 18-2

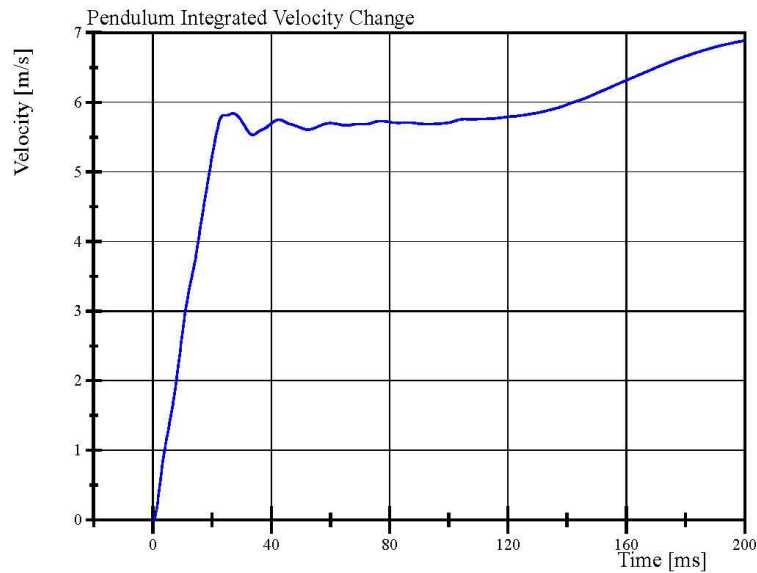
Test Date: 1/26/2023



Filter Class: CFC_180

Max: 35.8 g at 2.2 ms

Min: -7.2 g at 31.3 ms



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

01.26.2023 13:27:56 749

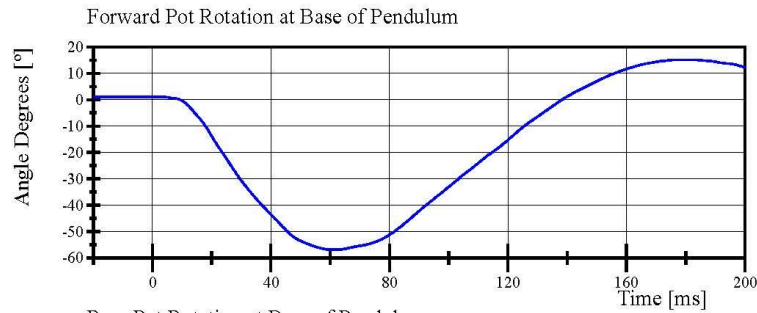


Transportation Research Center Inc.

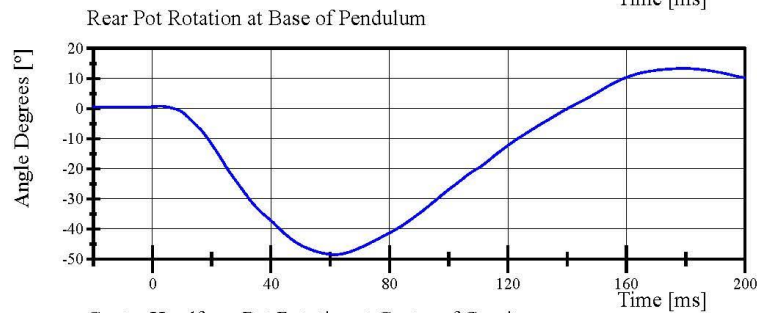
Left Lateral Neck

SID IIs Serial No. DQ0570 Certification No. 18-2

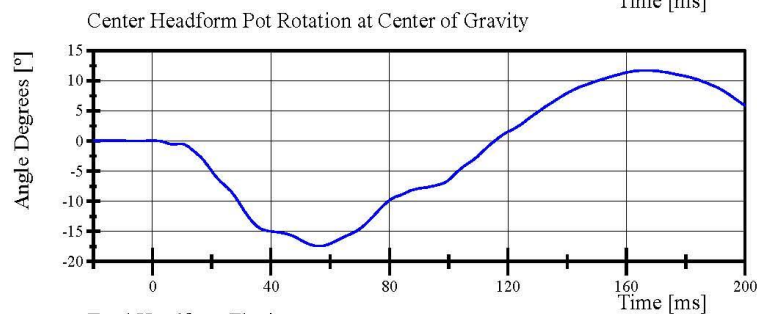
Test Date: 1/26/2023



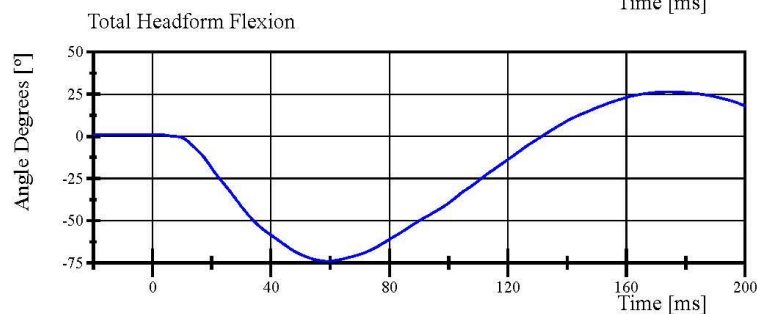
Filter Class: CFC_60
Max: 15.2 ° at 178.4 ms
Min: -56.9 ° at 61.3 ms



Filter Class: CFC_60
Max: 13.4 ° at 179.4 ms
Min: -48.5 ° at 61.4 ms



Filter Class: CFC_60
Max: 11.7 ° at 166.5 ms
Min: -17.4 ° at 56.2 ms



Filter Class: CFC_60
Max: 26.3 ° at 174.2 ms
Min: -74.0 ° at 59.0 ms

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

01.26.2023 13:27:56 749

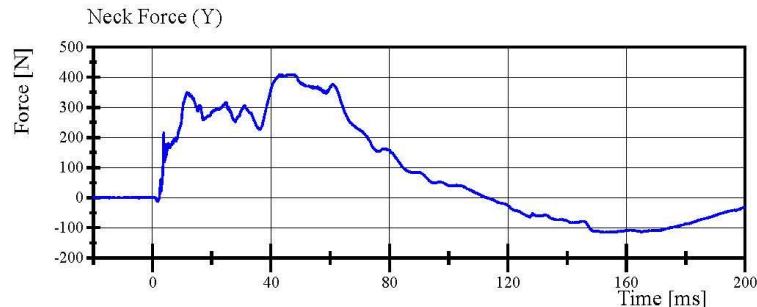


Transportation Research Center Inc.

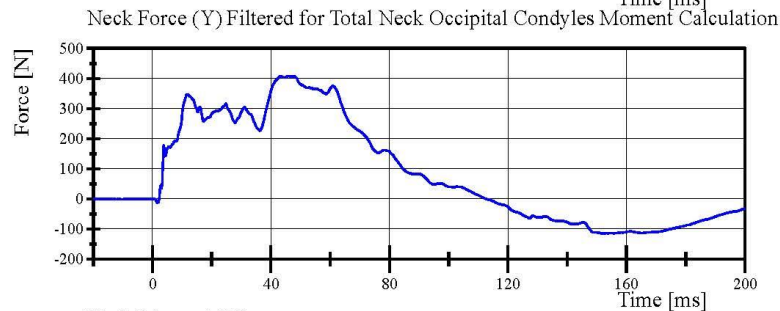
Left Lateral Neck

SID IIs Serial No. DQ0570 Certification No. 18-2

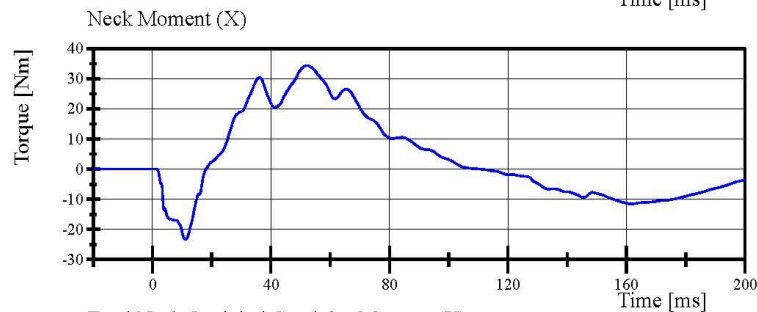
Test Date: 1/26/2023



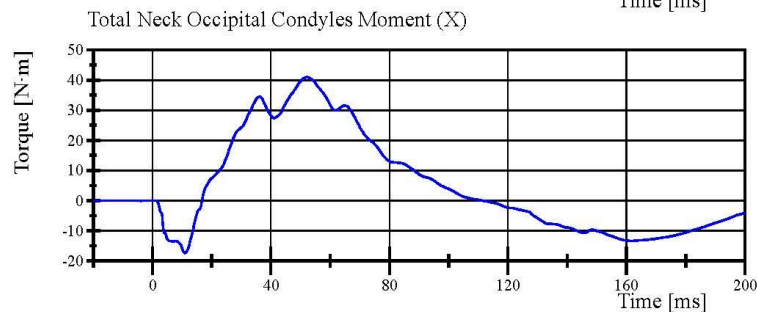
Filter Class: CFC_1000
Max: 410.2 N at 43.4 ms
Min: -115.4 N at 152.3 ms



Filter Class: CFC_600
Max: 408.7 N at 46.1 ms
Min: -114.8 N at 152.4 ms



Filter Class: CFC_600
Max: 34.4 Nm at 52.1 ms
Min: -23.3 Nm at 11.2 ms



Filter Class: Without_(Constar
Max: 41.0 N·m at 52.1 ms
Min: -17.3 N·m at 11.0 ms

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

01.26.2023 13:27:56 749



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. DQ0570 Certification No. 18-1

Test Date: 1/26/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.1 g	Yes
Shoulder Displacement	28 - 37 mm	30.8 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	18.9 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

01.26.2023 09:04:01 883

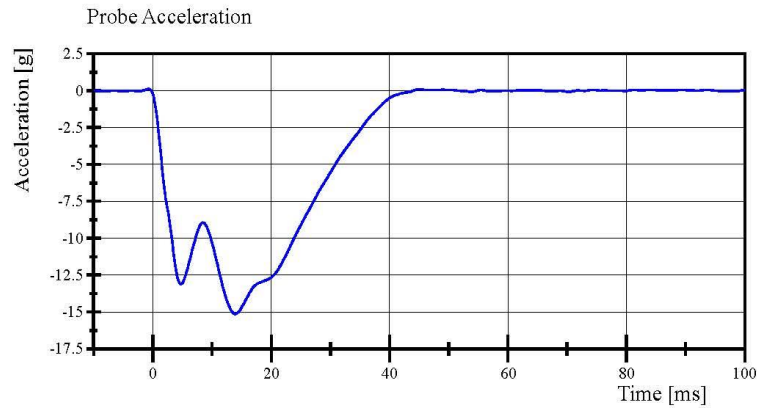


Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. DQ0570 Certification No. 18-1

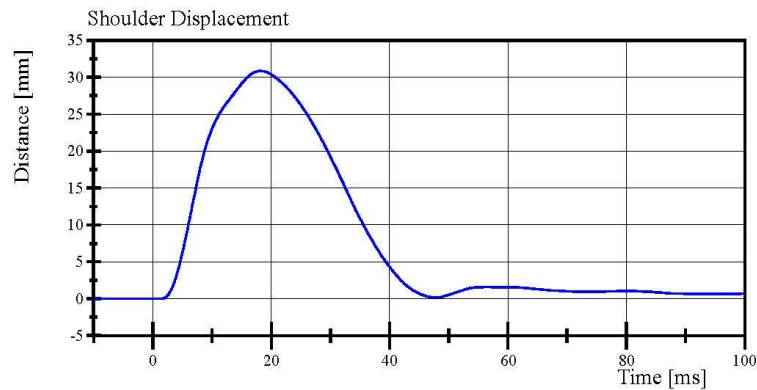
Test Date: 1/26/2023



Filter Class: CFC_180

Max: 0.1 g at -0.7 ms

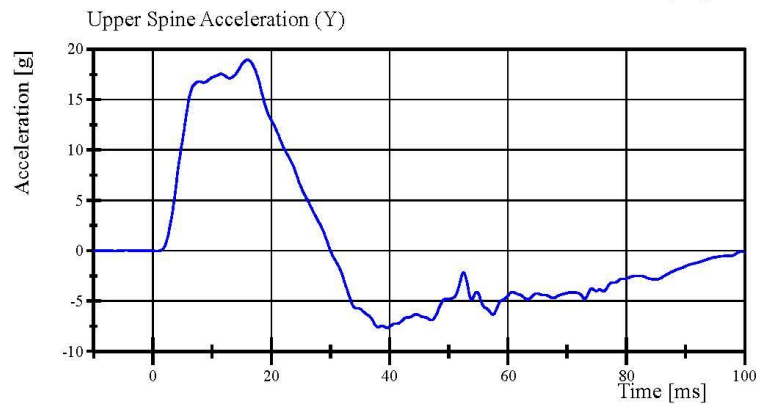
Min: -15.1 g at 13.9 ms



Filter Class: CFC_600

Max: 30.8 mm at 18.1 ms

Min: -0.0 mm at 1.1 ms



Filter Class: CFC_180

Max: 18.9 g at 16.0 ms

Min: -7.7 g at 39.6 ms

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

01.26.2023 09:04:42 883



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 18-1
Test Date: 1/26/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.705 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.3 g	Yes
Shoulder Displacement	31 - 40 mm	35.8 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	28.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	30.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	32.5 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	36.9 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	35.6 g	Yes

Test meets specifications.

Condition: Used

Comments:

Left Arm S/N: DP8451

Shoulder Rib S/N: 180-3355 DO9814

Upper Thorax Rib S/N: 180-3362 DP6492

Middle Thorax Rib S/N: 180-3362 DP6493

Lower Thorax Rib S/N: 180-3362 DP7664

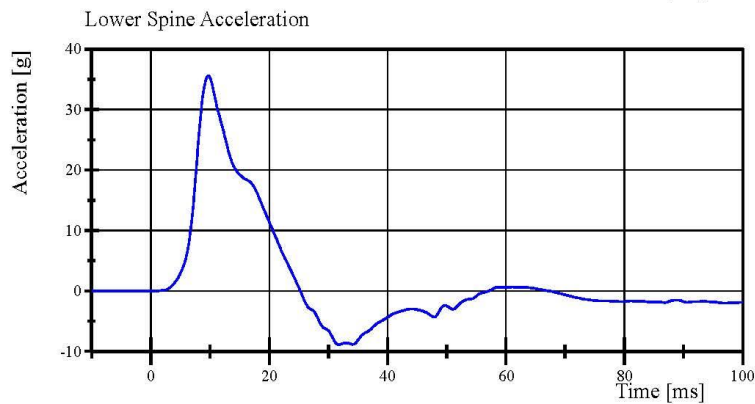
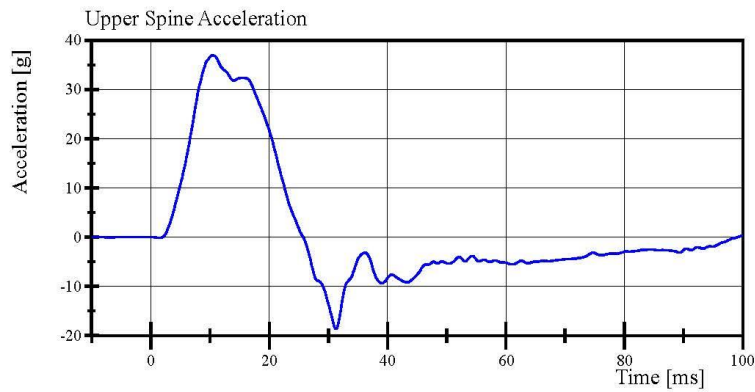
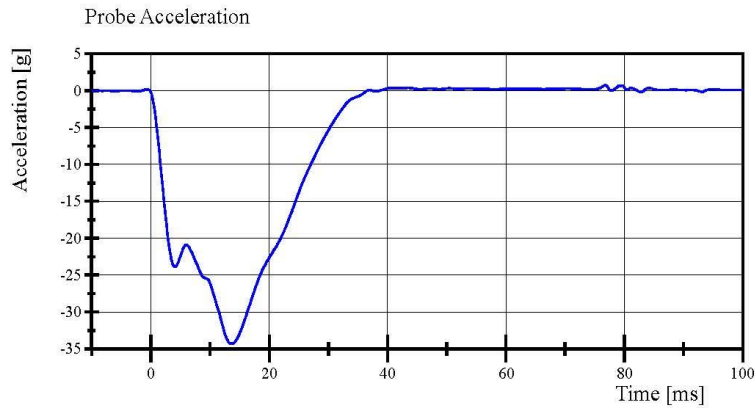
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

01.26.2023 10:01:44 630



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 18-1
Test Date: 1/26/2023



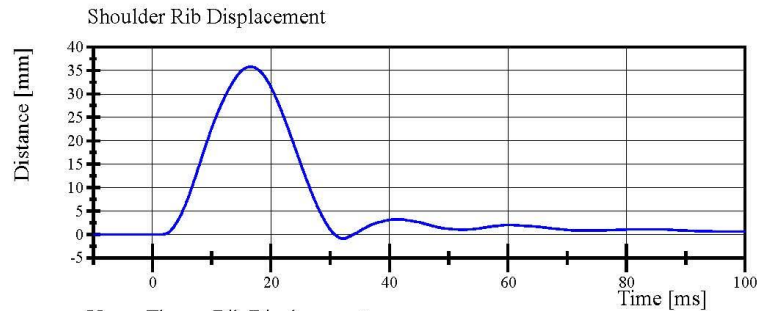
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

01.26.2023 10:02:32 630

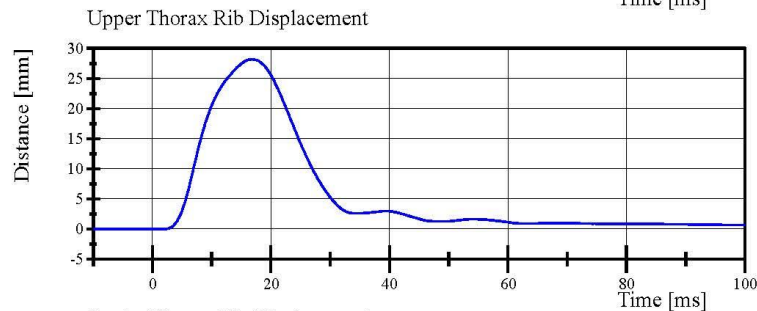


Transportation Research Center Inc.

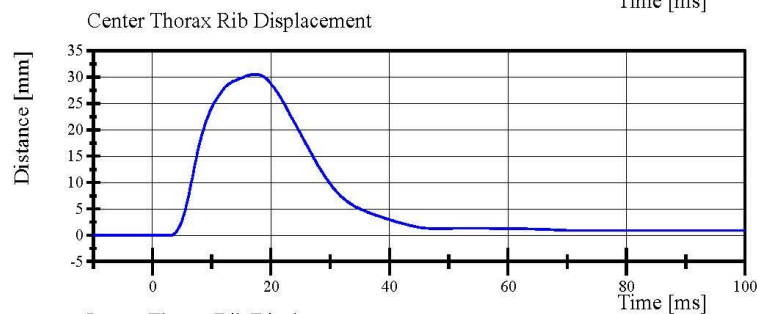
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 18-1
Test Date: 1/26/2023



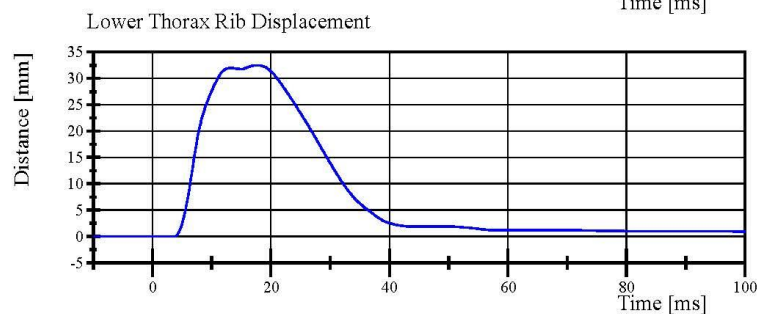
Filter Class: CFC_600
Max: 35.8 mm at 16.6 ms
Min: -0.9 mm at 32.2 ms



Filter Class: CFC_600
Max: 28.2 mm at 16.8 ms
Min: -0.0 mm at -1.3 ms



Filter Class: CFC_600
Max: 30.5 mm at 17.2 ms
Min: -0.0 mm at 3.1 ms



Filter Class: CFC_600
Max: 32.5 mm at 17.8 ms
Min: -0.0 mm at 3.6 ms

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

01.26.2023 10:02:32 630



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 18-1
Test Date: 1/26/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.332 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.2 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	39.5 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.0 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.7 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

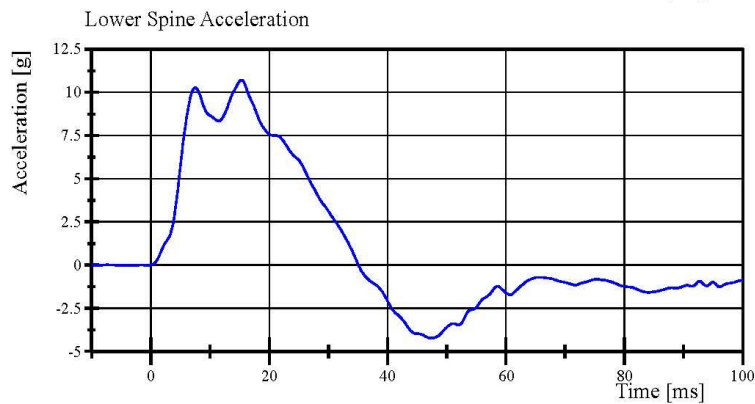
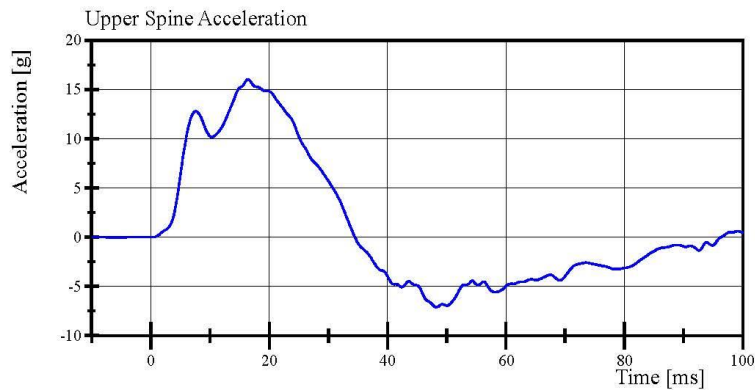
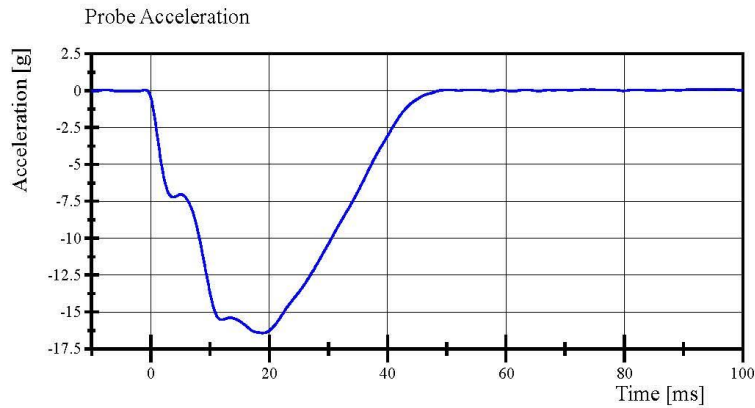
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

01.26.2023 09:25:30 878



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 18-1
Test Date: 1/26/2023



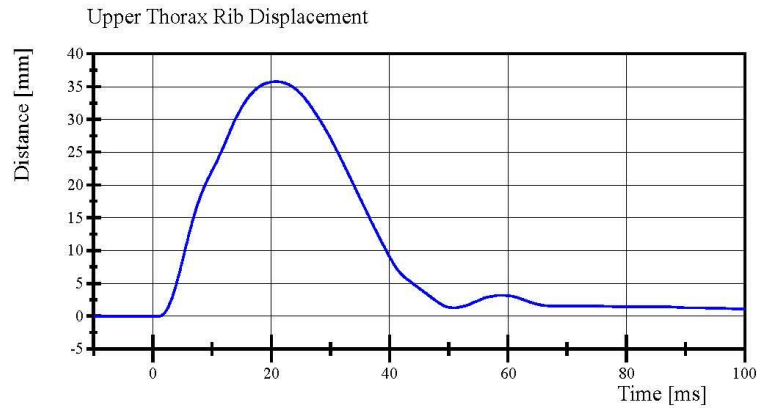
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

01.26.2023 09:26:33 878

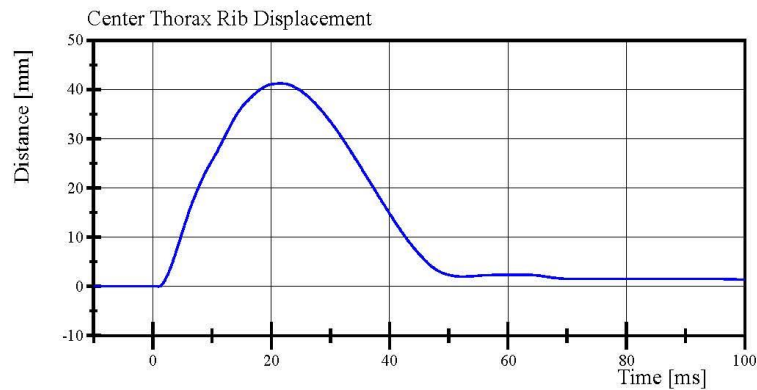


Transportation Research Center Inc.

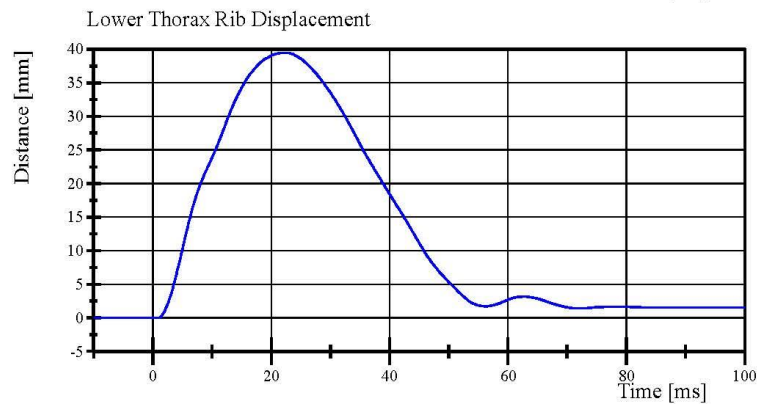
Left Lateral Thorax without Arm
SID IIs Serial No. DQ0570 Certification No. 18-1
Test Date: 1/26/2023



Filter Class: CFC_600
Max: 35.8 mm at 20.9 ms
Min: -0.0 mm at 1.0 ms



Filter Class: CFC_600
Max: 41.2 mm at 21.6 ms
Min: -0.0 mm at 1.0 ms



Filter Class: CFC_600
Max: 39.5 mm at 22.1 ms
Min: -0.0 mm at 0.9 ms

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

01.26.2023 09:26:34 878



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. DQ0570 Certification No. 18-1

Test Date: 1/26/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.9 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	39.2 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	35.7 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.38 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

01.26.2023 09:15:20 695

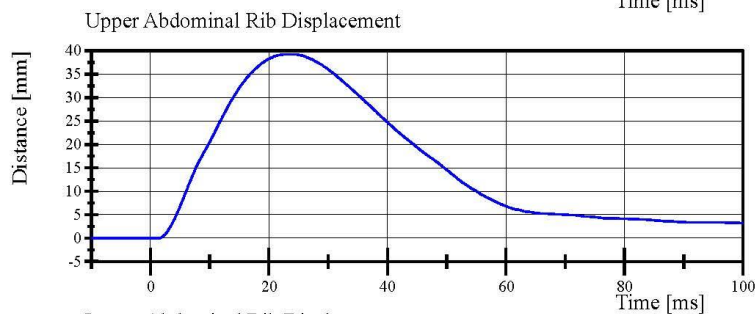
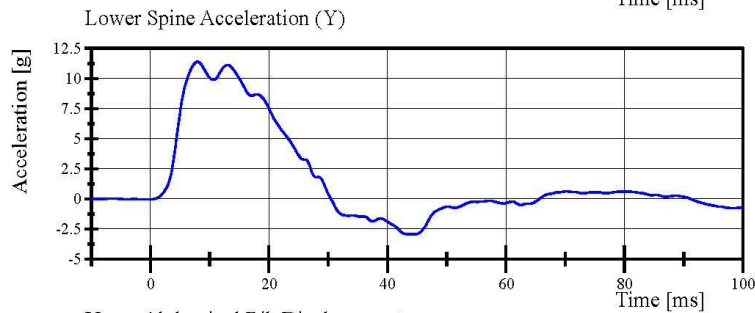
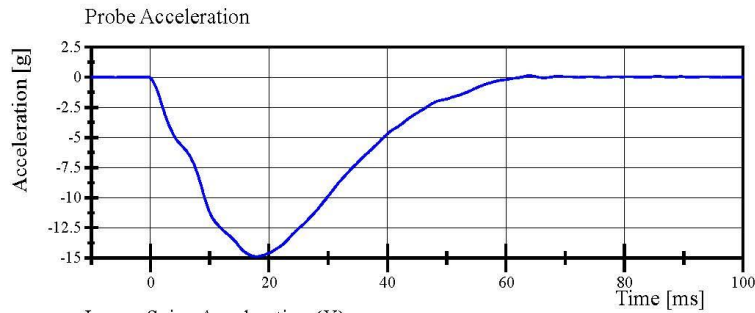


Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. DQ0570 Certification No. 18-1

Test Date: 1/26/2023



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

01.26.2023 09:15:51 695



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. DQ0570 Certification No. 18-2

Test Date: 2/1/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.63 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-45.56 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.7 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,827.9 N	Yes

Test meets specifications.

Condition: Used

Comments:

Pelvis Skin S/N: 1173

Pelvis Plug Info:

Manufacturer: SACO

S/N: 13780

Cal Date: 20200407

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

02.01.2023 08:12:54 473

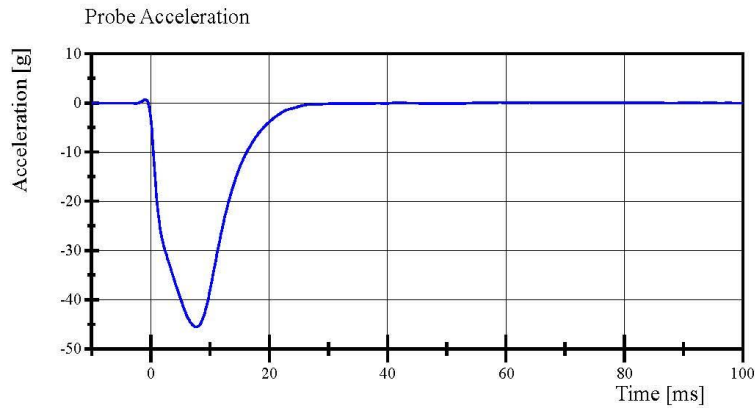


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. DQ0570 Certification No. 18-2

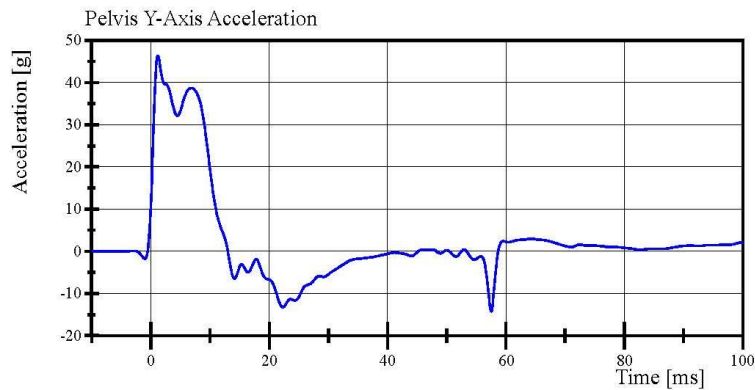
Test Date: 2/1/2023



Filter Class: CFC_180

Max: 0.7 g at -1.0 ms

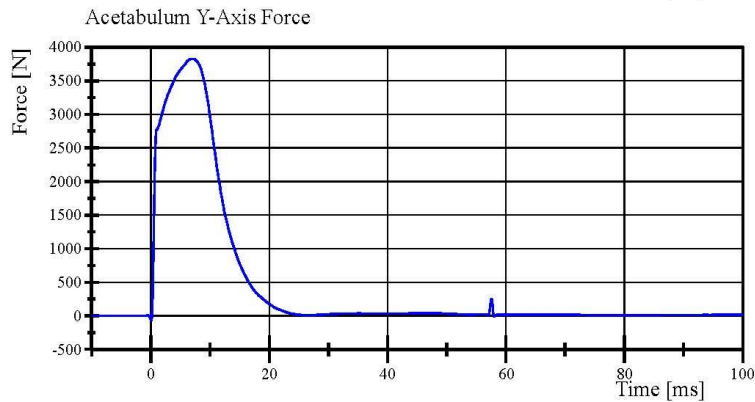
Min: -45.6 g at 7.7 ms



Filter Class: CFC_180

Max: 46.3 g at 1.2 ms

Min: -14.3 g at 57.5 ms



Filter Class: CFC_600

Max: 3,827.9 N at 7.0 ms

Min: -65.2 N at 0.0 ms

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

02.01.2023 08:14:53 473



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. DQ0570 Certification No. 18-8

Test Date: 1/31/2023

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-42.8 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	38.8 g	Yes
Iliac Force	4,100 - 5,100 N	4,967.1 N	Yes

Test meets specifications.

Condition: Used

Comments:

Pelvis Skin S/N: 000173

Pelvis Plug Info:

Manufacturer: SACO

S/N: 13783-1

Cal Date: 20200508

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

01.31.2023 15:17:34 714

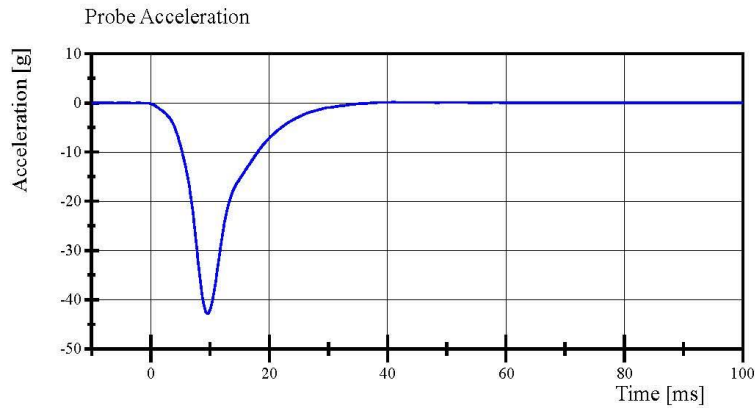


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. DQ0570 Certification No. 18-8

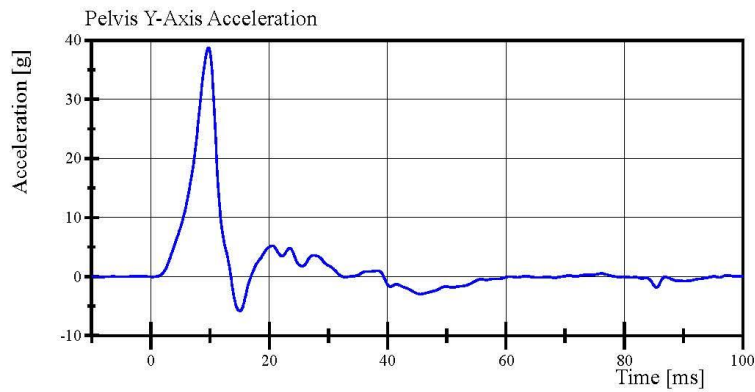
Test Date: 1/31/2023



Filter Class: CFC_180

Max: 0.2 g at 41.0 ms

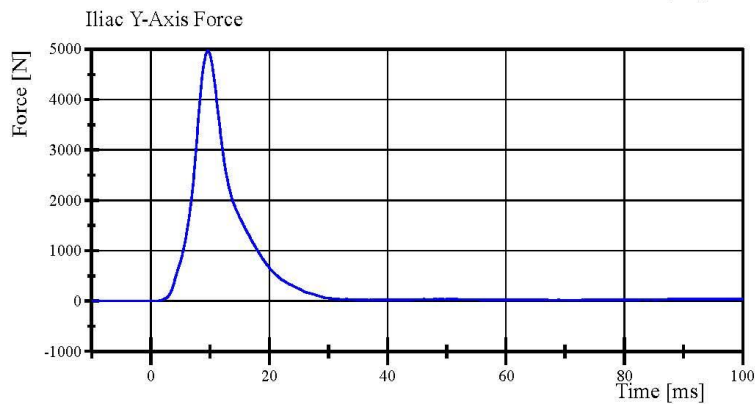
Min: -42.8 g at 9.6 ms



Filter Class: CFC_180

Max: 38.8 g at 9.8 ms

Min: -5.8 g at 15.0 ms



Filter Class: CFC_600

Max: 4,967.1 N at 9.7 ms

Min: -0.5 N at -9.0 ms

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

01.31.2023 15:19:49 714



Post-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

Revised 9/29/2005



Report Number: DQ0570_S2H19

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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

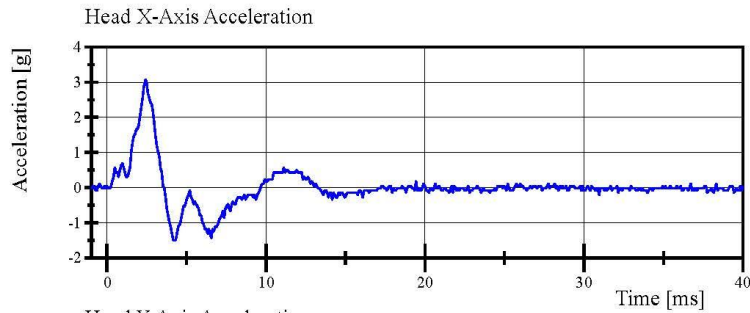


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. DQ0570 Certification No. 19-2

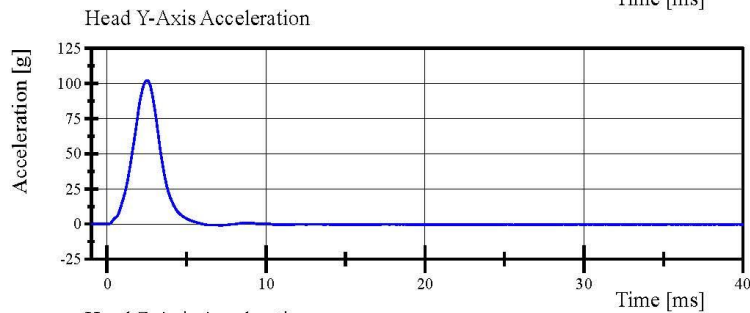
Test Date: 2/20/2023



Filter Class: CFC_1000

Max: 3.1 g at 2.4 ms

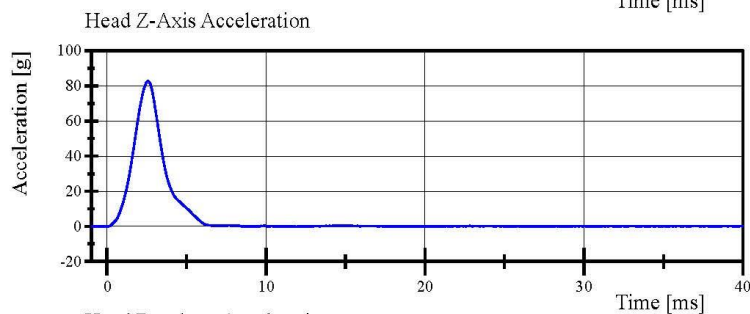
Min: -1.5 g at 4.2 ms



Filter Class: CFC_1000

Max: 102.3 g at 2.5 ms

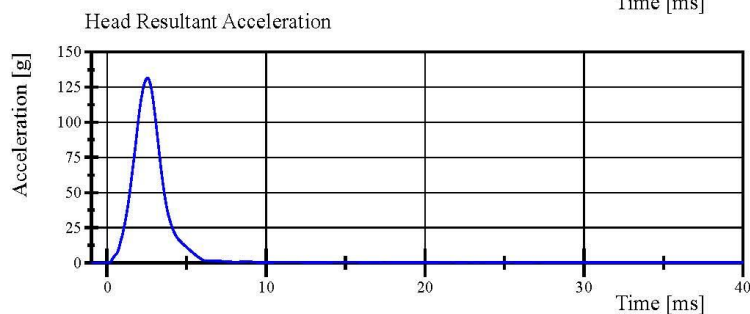
Min: -0.9 g at 7.0 ms



Filter Class: CFC_1000

Max: 82.9 g at 2.6 ms

Min: -0.2 g at 11.9 ms



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

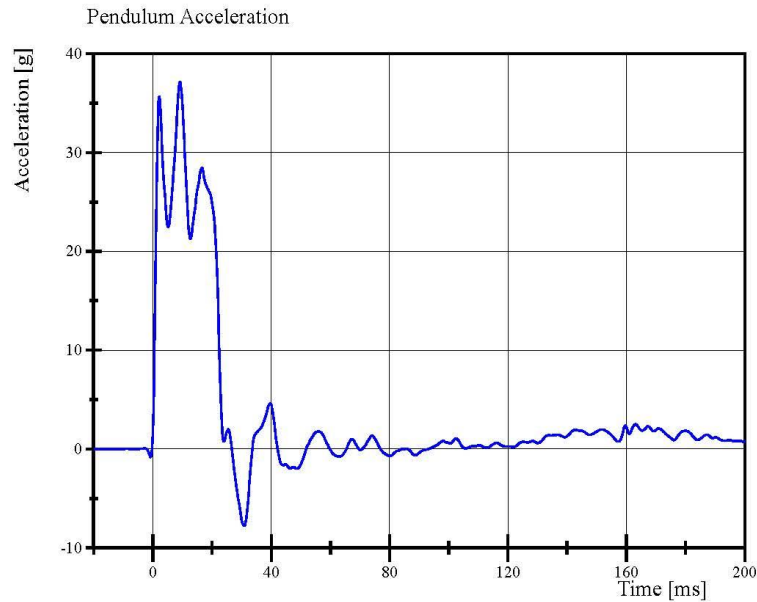


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. DQ0570 Certification No. 19-3

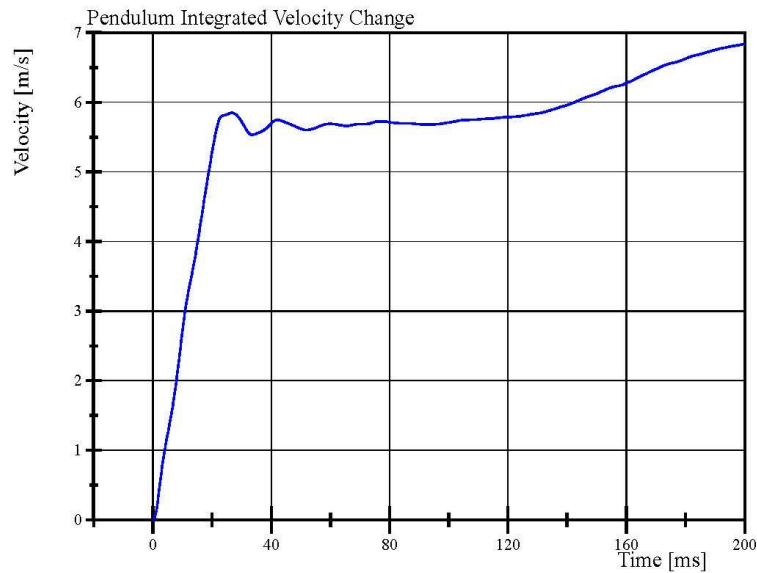
Test Date: 2/21/2023



Filter Class: CFC_180

Max: 37.2 g at 9.1 ms

Min: -7.8 g at 30.9 ms



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

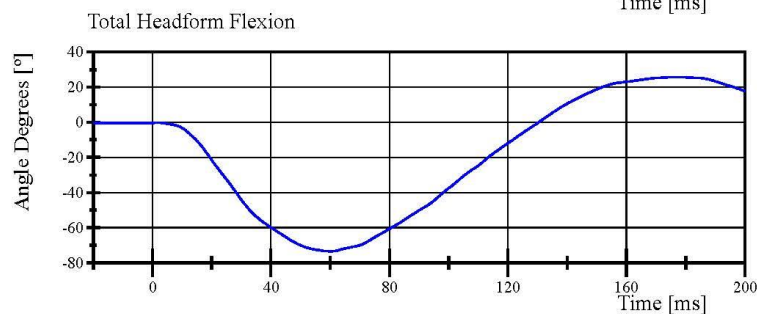
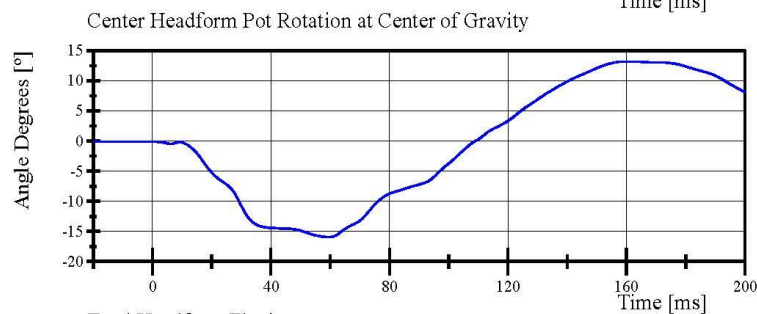
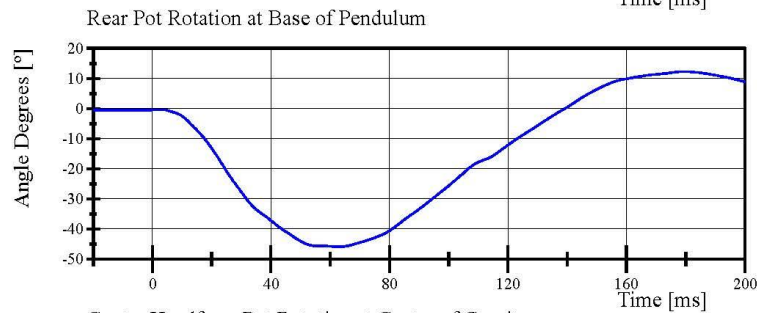
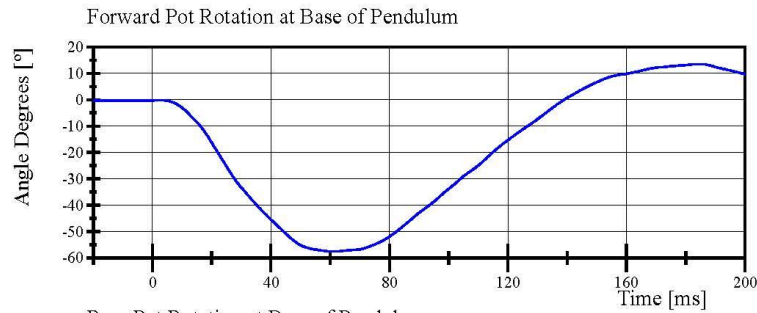


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. DQ0570 Certification No. 19-3

Test Date: 2/21/2023



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

02.21.2023 09:13:17 750



Transportation Research Center Inc.

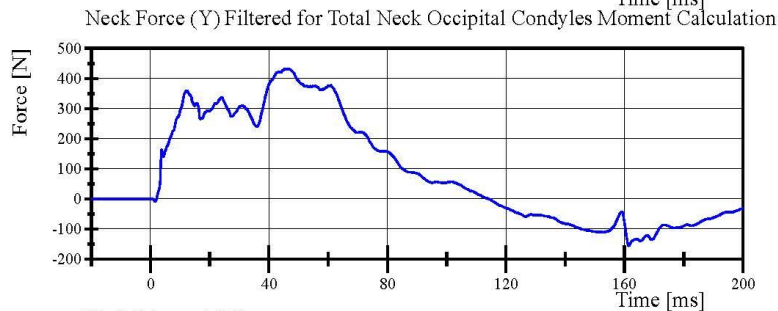
Left Lateral Neck

SID IIs Serial No. DQ0570 Certification No. 19-3

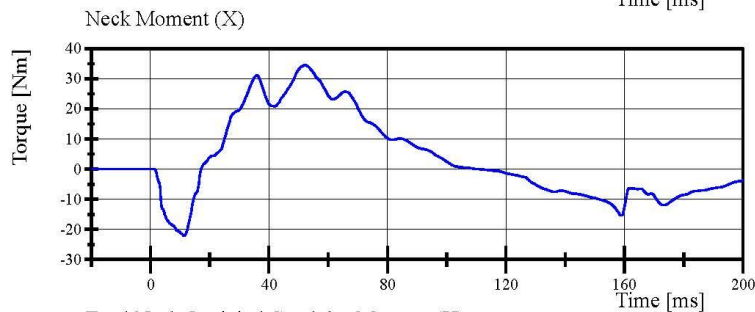
Test Date: 2/21/2023



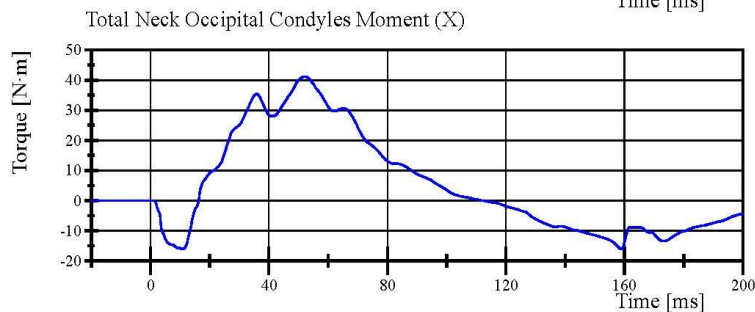
Filter Class: CFC_1000
Max: 433.9 N at 46.1 ms
Min: -155.6 N at 161.4 ms



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



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



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

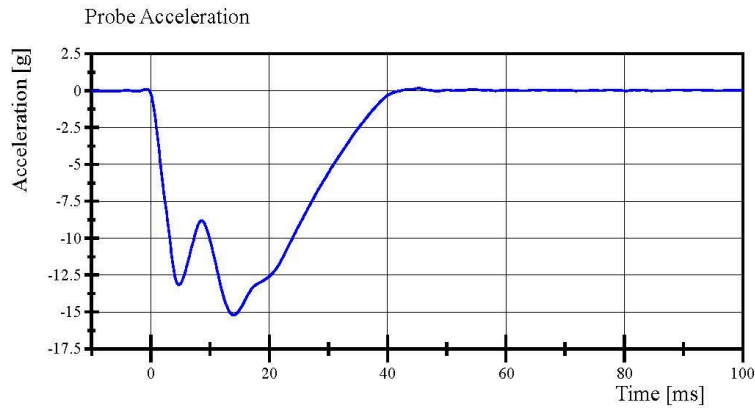


Transportation Research Center Inc.

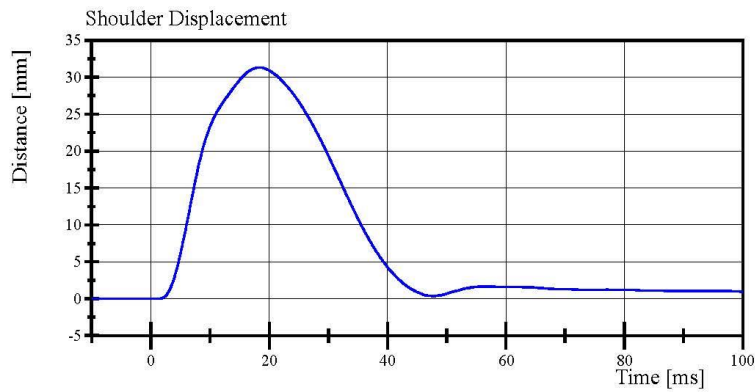
Left Lateral Shoulder

SID IIs Serial No. DQ0570 Certification No. 19-1

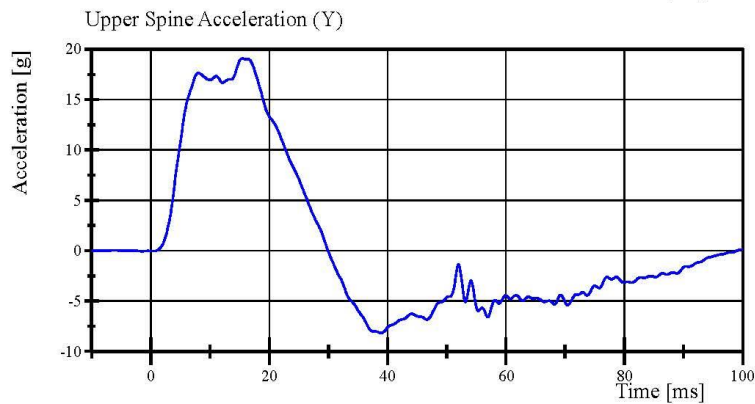
Test Date: 2/17/2023



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



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



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

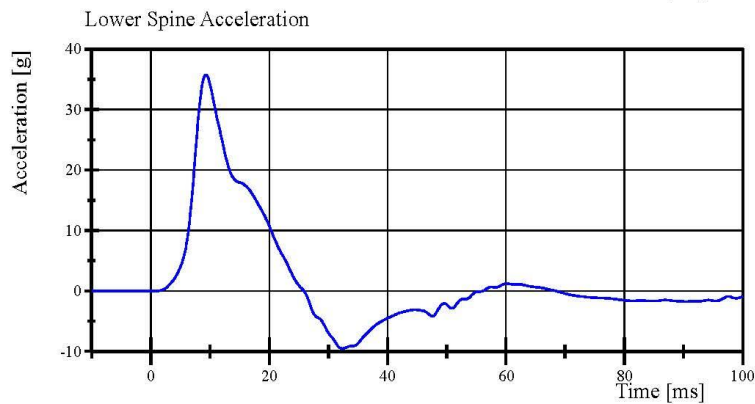
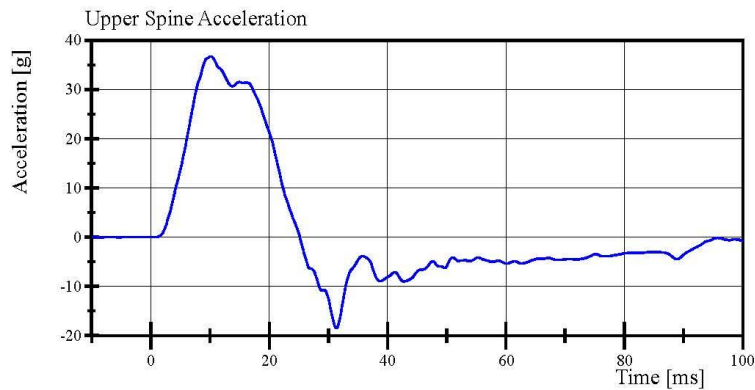
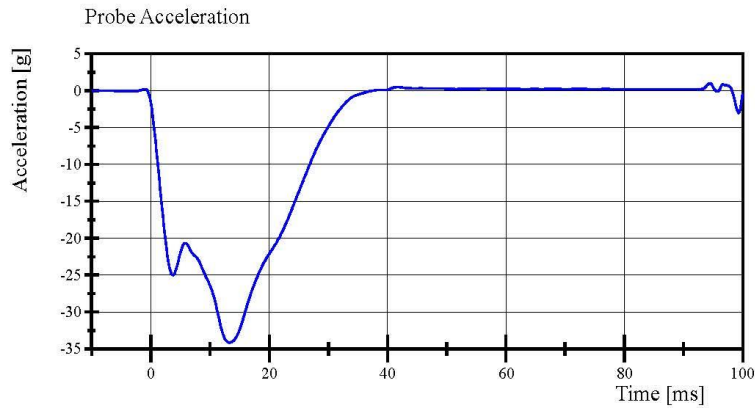
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

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



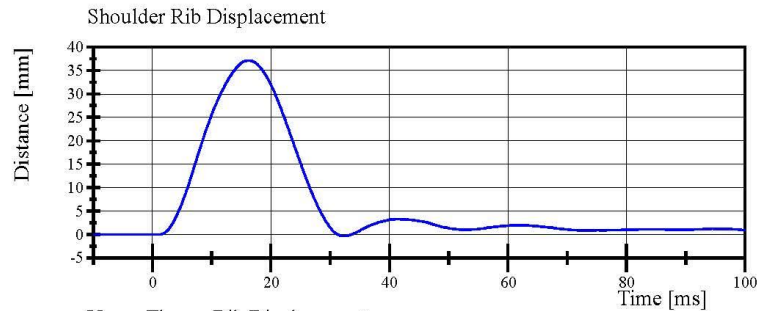
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.17.2023 13:20:11 648

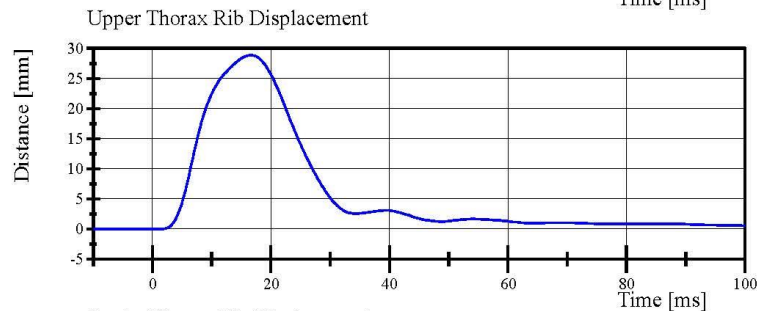


Transportation Research Center Inc.

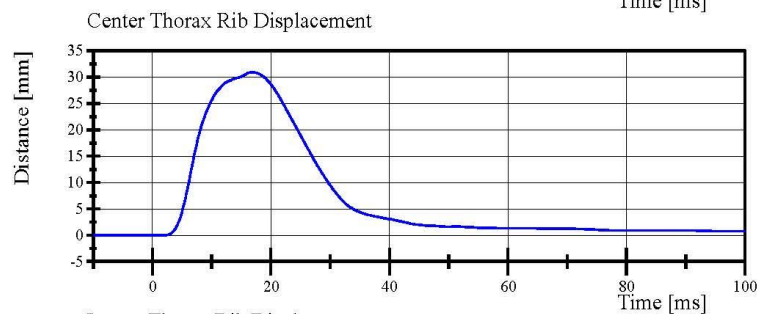
Left Lateral Thorax with Arm
SID IIs Serial No. DQ0570 Certification No. 19-1
Test Date: 2/17/2023



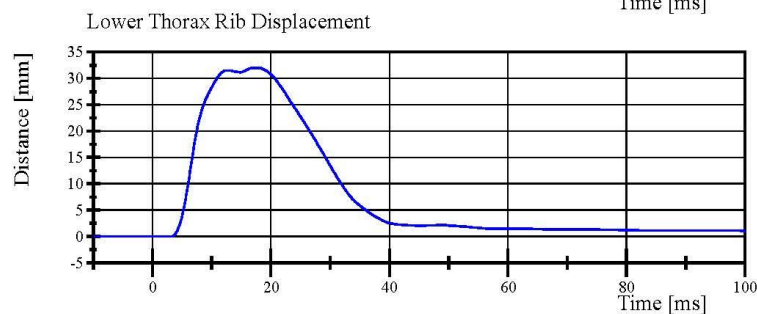
Filter Class: CFC_600
Max: 37.1 mm at 16.2 ms
Min: -0.3 mm at 32.3 ms



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



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



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

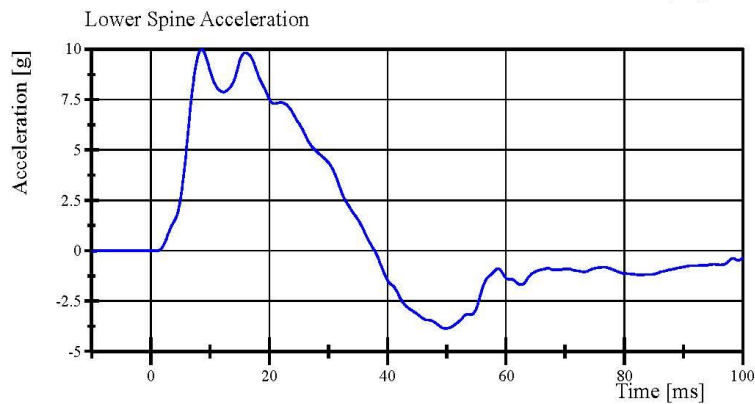
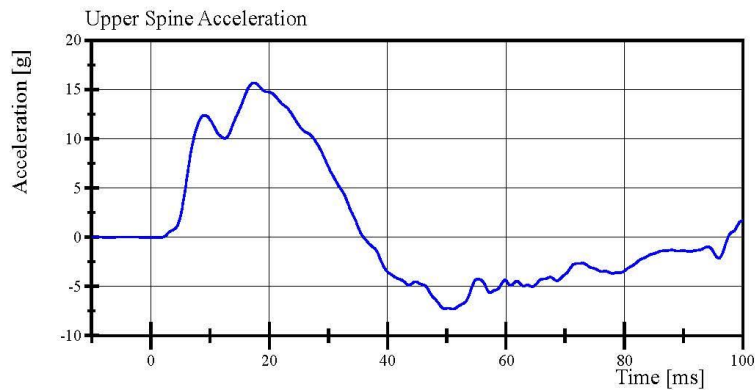
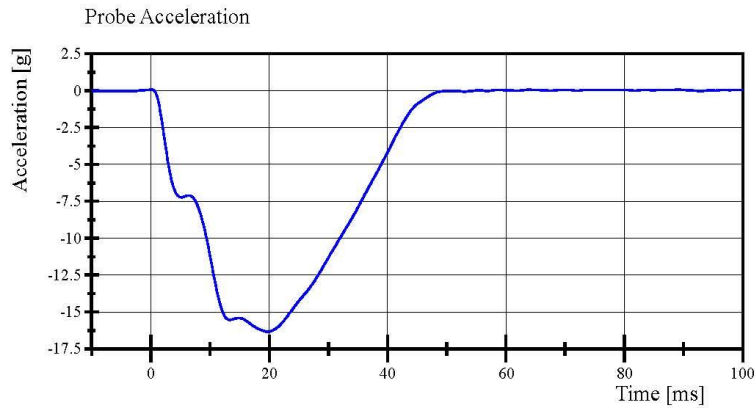
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

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



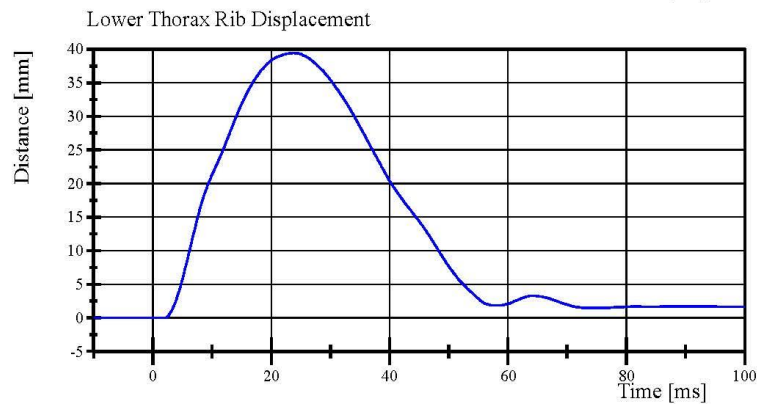
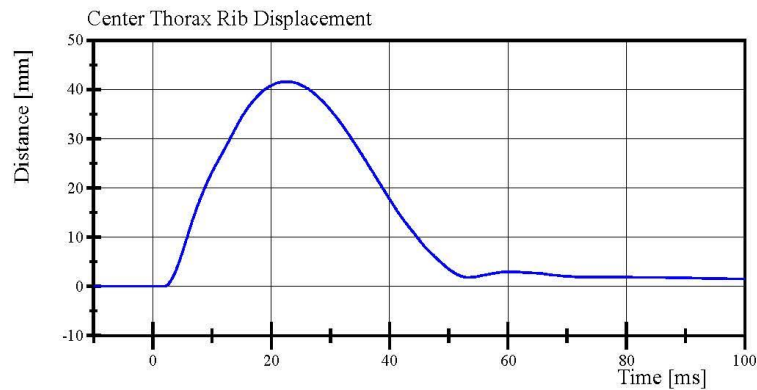
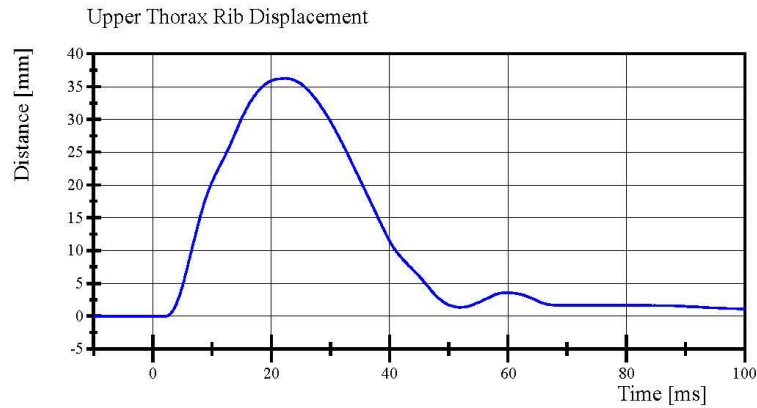
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

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



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

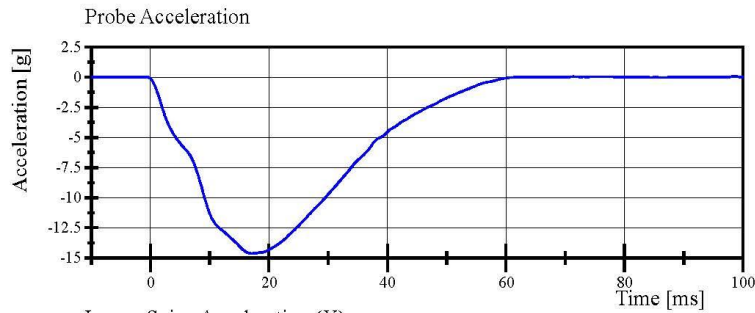


Transportation Research Center Inc.

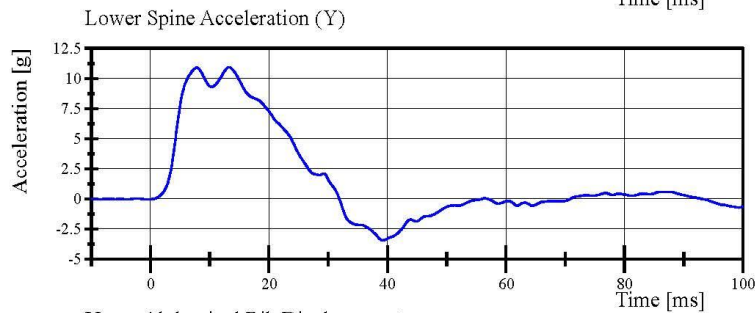
Left Lateral Abdomen

SID IIs Serial No. DQ0570 Certification No. 19-1

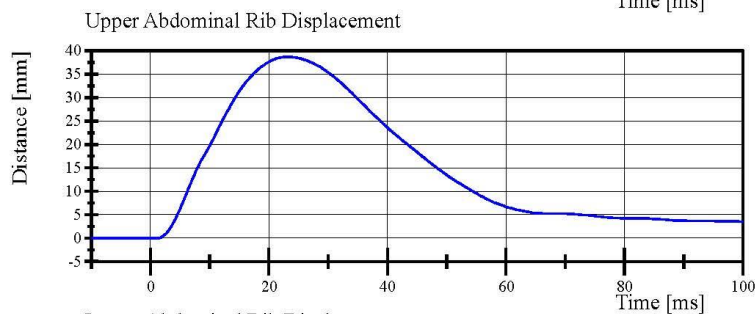
Test Date: 2/17/2023



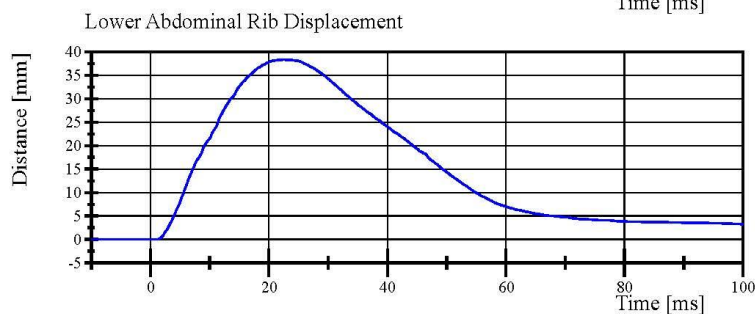
Filter Class: CFC_180
Max: 0.1 g at 98.5 ms
Min: -14.6 g at 17.1 ms



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



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



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

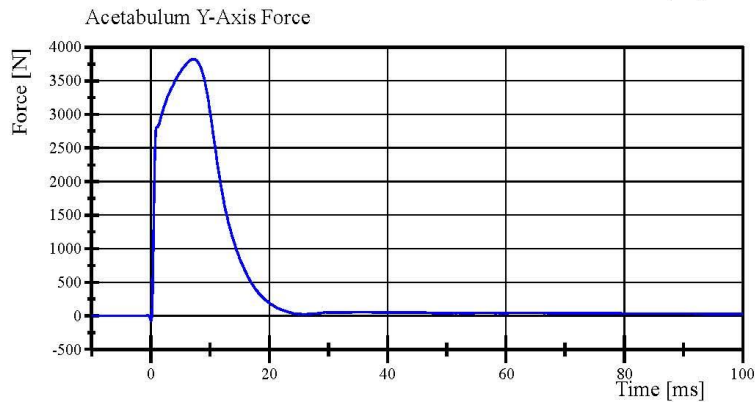
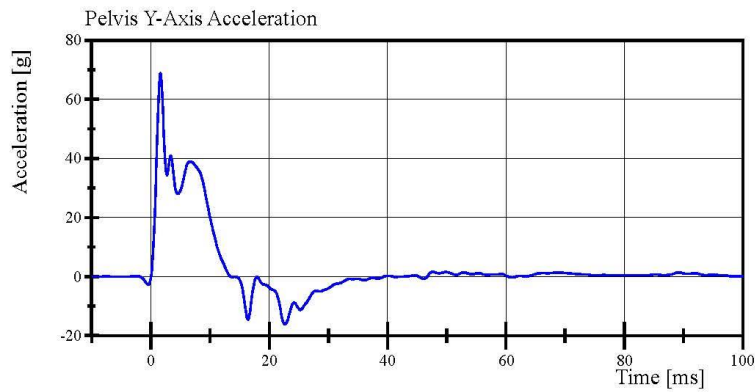
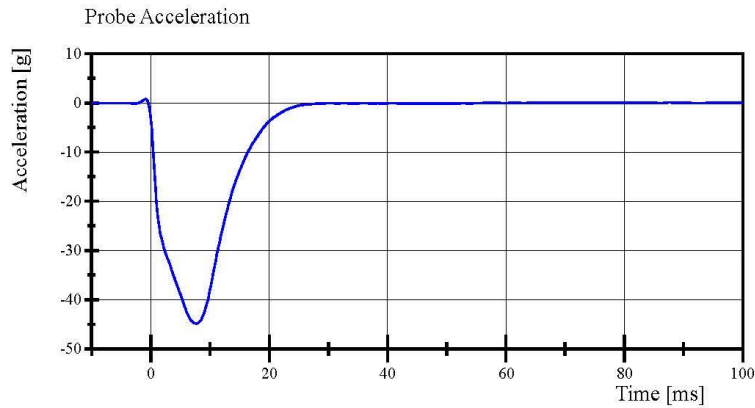


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. DQ0570 Certification No. 19-1

Test Date: 2/17/2023



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

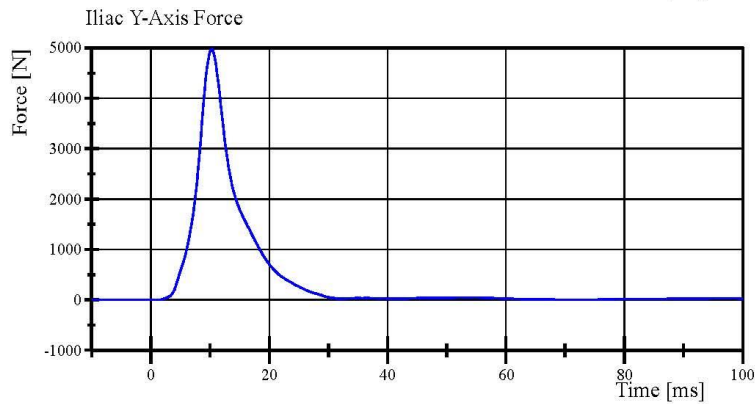
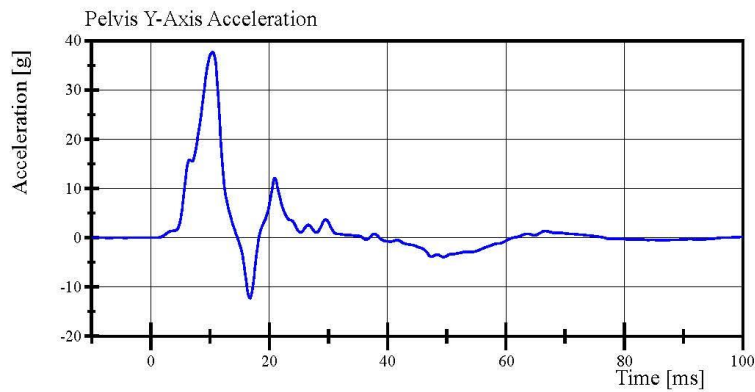
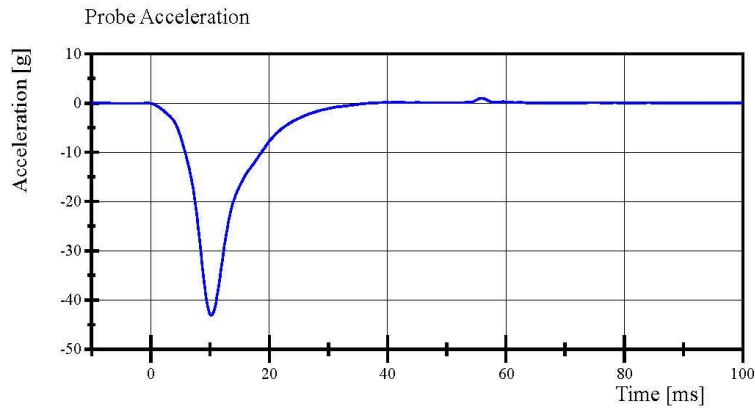


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. DQ0570 Certification No. 19-1

Test Date: 2/17/2023



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

02.17.2023 11:16:33 702



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	1-Mar-2022
	Middle	Y	174	FTSS	1-Mar-2022
	Lower	Y	0913	Honeywell	1-Mar-2022
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	4-Mar-2022	
		Middle	Y	037	Servo	4-Mar-2022	
		Lower	Y	048	Servo	4-Mar-2022	
	Abdominal Rib	Upper	Y	1295	Servo	4-Mar-2022	
		Lower	Y	1136	Servo	4-Mar-2022	
Lower Spine Accelerometers (T12)				X	P94545	Endevco	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)					13784	SACO	8-May-2020
Pelvis Plug (non-struck side)					13784-1	SACO	7-Apr-2020

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A377508	Measurement Specialties	10-Nov-2022
	Vehicle Center of Gravity	Y	A400088	Measurement Specialties	7-Oct-2022
	Vehicle Center of Gravity	Z	A349877	Measurement Specialties	10-Nov-2022
2	Right Sill at Front Seat	X	A251672	Measurement Specialties	10-Nov-2022
	Right Sill at Front Seat	Y	A298374	Measurement Specialties	7-Oct-2022
	Right Sill at Front Seat	Z	A254929	Measurement Specialties	10-Nov-2022
3	Right Sill at Rear Seat	X	A349872	Measurement Specialties	10-Nov-2022
	Right Sill at Rear Seat	Y	A349892	Measurement Specialties	10-Nov-2022
	Right Sill at Rear Seat	Z	A349899	Measurement Specialties	10-Nov-2022
4	Left Sill at Front Door	Y	A377538	Measurement Specialties	7-Oct-2022
5	Left Sill at Rear Door	Y	A373334	Measurement Specialties	3-Feb-2023
6	Left A-Post Lower	Y	A377493	Measurement Specialties	10-Nov-2022
7	Left A-Post Middle	Y	A298376	Measurement Specialties	10-Nov-2022
8	Left B-Post Lower	Y	A349898	Measurement Specialties	10-Nov-2022
9	B-Post Middle	Y	A298543	Measurement Specialties	10-Nov-2022
10	Front Seat Track	Y	A386360	Measurement Specialties	10-Nov-2022
11	Rear Seat Track or Structure	Y	A251671	Measurement Specialties	10-Nov-2022
12	Right Rear Occupant Compartment	Y	A318460	Measurement Specialties	7-Oct-2022
13	Engine Block	X	A349889	Measurement Specialties	10-Nov-2022
	Engine Block	Y	A378375	Measurement Specialties	10-Nov-2022
14	Rear Floorpan Above Axle	X	A298539	Measurement Specialties	10-Nov-2022
	Rear Floorpan Above Axle	Y	A349883	Measurement Specialties	10-Nov-2022
	Rear Floorpan Above Axle	Z	A300458	Measurement Specialties	10-Nov-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	A298329	Measurement Specialties	19-Aug-2022
Left Frame Rail at Rear Axle Centerline	Y	A298553	Measurement Specialties	19-Aug-2022