FINAL REPORT NUMBER: SINCAP-TRC-19-003

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

NISSAN MOTOR CO., LTD.
2019 Infiniti QX50 SUV
NHTSA NUMBER: M20195215

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

Report Date: June 13, 2019

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NRM-110
1200 New Jersey Ave, SE, Room W43-410
Washington, D.C. 20590

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Report Prepared By: ILO Project Operations Group

Report Approved By: 

John Shultz

Approval Date: June 13, 2019

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

Technical Report Documentation Page

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15. Supplemental Notes		

16. Abstract

This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2019 Infiniti QX50 SUV, in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on March 21, 2019.

The impact velocity of the Moving Deformable Barrier (MDB) was 61.99 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 21.2° C. The target vehicle post-test maximum crush was 255 mm at Level 3. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	74
Maximum Thoracic Rib Deflection	mm	44	23.8
Total Abdominal Force	N	2500	855.3
Pubic Symphysis Force	N	6000	-1347.2
Lower Spine Acceleration	G	82*	29.3

Passenger ATD (SID-IIs)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	162
Lower Spine Resultant Acceleration	g's	82	49.5
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2494.0
Maximum Thoracic Rib Deflection	mm	38*	15.4
Maximum Abdominal Rib Deflection	mm	45*	46.8

* Proposed IARV

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

17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

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TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2019 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00354. The purpose of this test is to generate comparative side impact performance in a 2019 Infiniti QX50 SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A 2019 Infiniti QX50 SUV 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 61.99 km/h (38.52 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on March 21, 2019. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

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

The dummies were instrumented in the following manner:

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

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

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	74
Maximum Thoracic Rib Deflection	mm	44	23.8
Combined Abdominal Force	N	2500	855.3
Pubic Symphysis Force	N	6000	-1347.2
Lower Spine (T12) Resultant Acceleration	G	82*	29.3

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	162
Lower Spine (T12) Resultant Acceleration	G	82	49.5
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2494.0
Maximum Thoracic Rib Deflection	mm	38*	15.4
Maximum Abdominal Rib Deflection	mm	45*	46.8

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	Yes	No	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Unknown	Yes	Unknown
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 the driver were within the established performance thresholds. Injury values for the Maximum Abdominal Rib Deflection of the Rear Passenger ATD exceeded the proposed IARV.

Driver Head Acceleration Y Resultant: Questionable spikes at 58MS, 74MS, and 212MS

Rear Passenger Upper Abdominal Rib Deflection Y: Questionable data from 56MS to 76MS

Left Middle A-Post Acceleration (Y); Channel failed at 58.0 ms

Left Lower B-Post Acceleration (Y); No data throughout

Rear Seat Structure Acceleration (Y); Channel failed at 16.0 ms

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20195215
Model Year	2019
Make	Infiniti
Model	QX50
Body Style	MPV
VIN	3PCAJ5M13KF128478
Body Color	Liquid Platinum
Odometer Reading (km/mi)	149 mi.
Engine Displacement (L)	2.0
Type/No. Cylinders	Gas/4
Engine Placement	Front/Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	NISSAN MOTOR CO., LTD.
Date of Manufacture	11/18
Vehicle Type	MPV

GVWR (lbs)	4916
GAWR Front (lbs)	2822
GAWR Rear (lbs)	2513

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

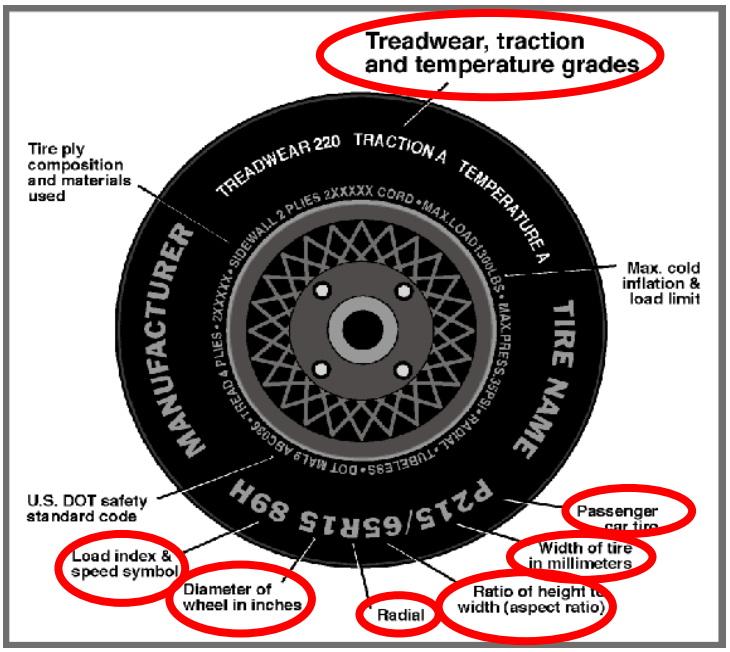
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity DSC)	2	3	N/A	5
Capacity Weight (VCW) (kg)				390.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				49.8

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	P235/55RF19	P235/55RF19
Tire Size on Vehicle	P235/55RF19	P235/55RF19
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Ecopia H/L 422 Plus	Ecopia H/L 422 Plus
Treadwear	600	600
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	4	4
Tire Plies Body	2	2
Load Index/Speed Symbol	101V	101V
Tire Material	Rayon, Steel, Nylon	Rayon, Steel, Nylon
DOT Safety Code Left	EJ FO CMH4217	EJ FO CMH2718
DOT Safety Code Right	EJ FO CMH4217	EJ FO CMH4217

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

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	345	345	345	345
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	230	230	230	230
As Tested	kPa	230	230	230	230

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	515.2	368.2		558.0	433.6		563.4	449.4	
Right	kg	55.6	350.2		526.0	398.8		520.8	390.4	
Ratio	%	58.9	41.1		56.6	43.4		56.4	43.6	
Totals	kg	1030.8	718.4	1749.2	1084.0	832.4	1916.4	1084.2	839.8	1924.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1749.2	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	49.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1924.0	(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	781	777	Yes
RF	mm	780	784	Yes
RR	mm	779	782	Yes
LR	mm	761	766	Yes
Vehicle CG (Aft of Front Axle)	mm	1220	1214	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+43	+28	

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

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plate mounted in cargo area	1.4
Removed: None	0.0

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

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

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	24.2	19.9	15.7
Front Passenger Seat	24.7	16.3	20.5
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	N/A	N/A	17.0
Non-Struck Side Rear Seat	N/A	N/A	14.7
Rear Center Seat*	N/A	N/A	13.8

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	15.7	178	Max	238	244	259
			Mid	204	211	225
			Min	171	178	190
Front Passenger Seat	20.5	178	Max	228	238	248
			Mid	198	208	218
			Min	168	178	188
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	17.0	225	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	225	225	225
Non-Struck Side Rear Seat	14.7	227	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	227	227	227
Rear Center Seat*	13.8	225	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	225	225	225

* If applicable.

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

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

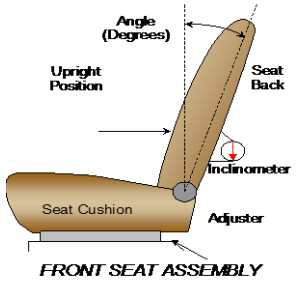
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	260	N/A	130	N/A
Front Passenger Seat	260	N/A	130	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	150	11	150	10
Non-Struck Side Rear Seat	150	11	150	10
Rear Center Seat*	150	11	150	10

* 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	83.2	N/A	0.6	N/A
Front Passenger Seat	78.3	N/A	0.6	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	10.2	10	10.2	8
Non-Struck Side Rear Seat	10.2	10	9.8	8
Rear Center Seat*	10.2	10	10.2	8

* 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, Uppermost
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

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

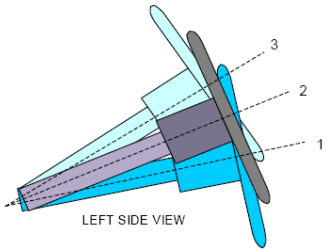
	Total # of Positions	Placed in Position #
Driver Seat	5	0, Uppermost
Rear Seat	2	2, Lowermost

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

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

STEERING COLUMN ADJUSTMENT

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



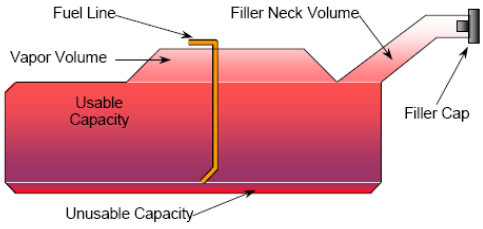
STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	23.0	0
Geometric Center, Position No. 2	25.8	26
Uppermost, Position No. 3	28.7	52
Telescoping Steering Wheel Travel		52
Test Position	25.8	26

FUEL PUMP

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

1) For 1.0 seconds after the ignition is switched to “ON”.
2) While the engine is running.
3) For 1.5 seconds after the engine stops running.



VEHICLE FUEL TANK ASSEMBLY

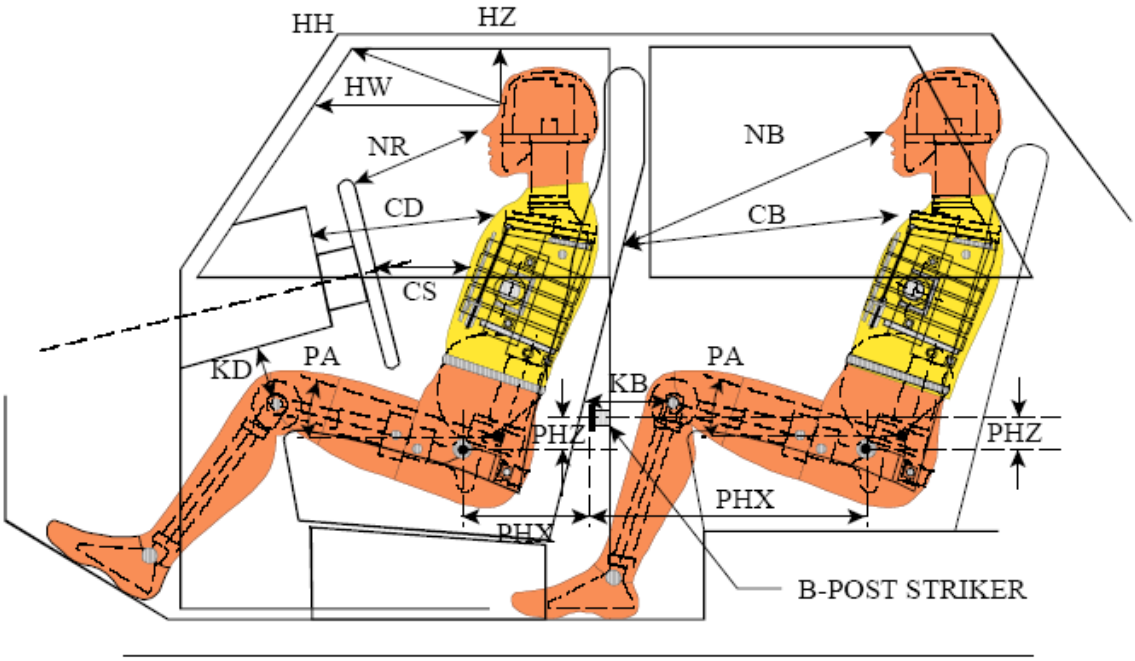
FUEL TANK CAPACITY

	Liters
Usable Capacity of “Standard Tank” (see Form No. 1)	60.2
Usable Capacity of “Optional Tank” (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner’s Manual)	60.0
Usable Capacity of Optional Tank (see Owner’s Manual)	N/A
93% of Usable Capacity	56.0
Actual Amount of Solvent Used in Test	56.0
1/3 of Usable Capacity	20.1

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



LEFT SIDE VIEW

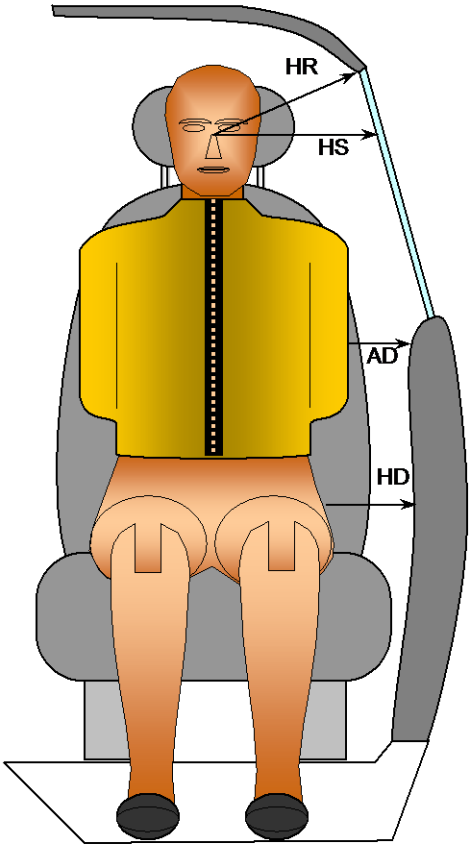
NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	414			
HW		Header to Windshield	655			
HZ	HZ	Head to Roof Liner	214		305	
NR	NB	Nose to Rim/Seat Back	437		532	
CD	CB	Chest to Dash/Seat Back	564		520	
CS		Chest to Steering Wheel	364			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	218	23.6	312	0.0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	213	27.3	310	0.0
PAX°	PAX°	Pelvic Tilt Angle X		0.2		0.3
	PAY°	Pelvic Tilt Angle Y				18.5
PHX	PHX	Hip Point to Striker (X-Axis)	202		298	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	182		274	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

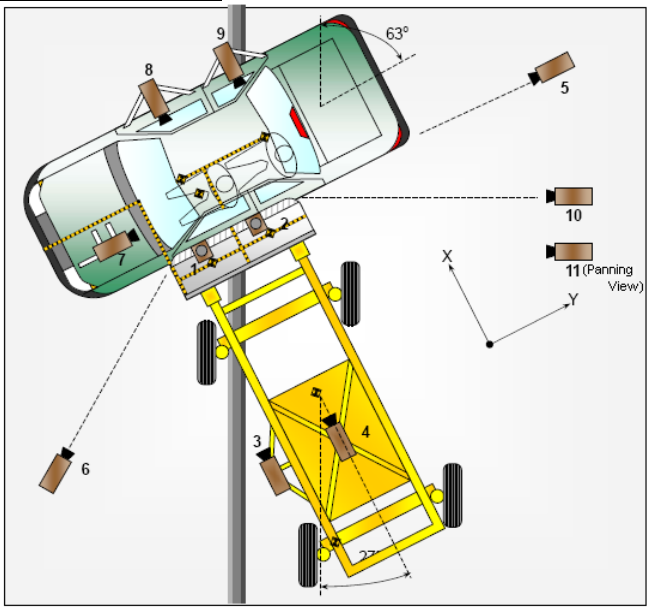


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	236	262
HS	Head to Side Window	mm	372	380
AD	Arm to Door	mm	110	173
HD	H-Point to Door	mm	170	179

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-160	-1150	-5692	8.5	1000
2	Overhead Close-up	0	770	-5692	28	1000
3	Left Impact Point (MDB)	1842	926	-860	12.5	1000
4	Side Overall (MDB)	2432	0	-1485	12.5	1000
5	Rear	0	-7402	-1492	20	1000
6	Left Front	2658	4456	-1478	20	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				12.5	1000
9	Passenger Side (OB)				12.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

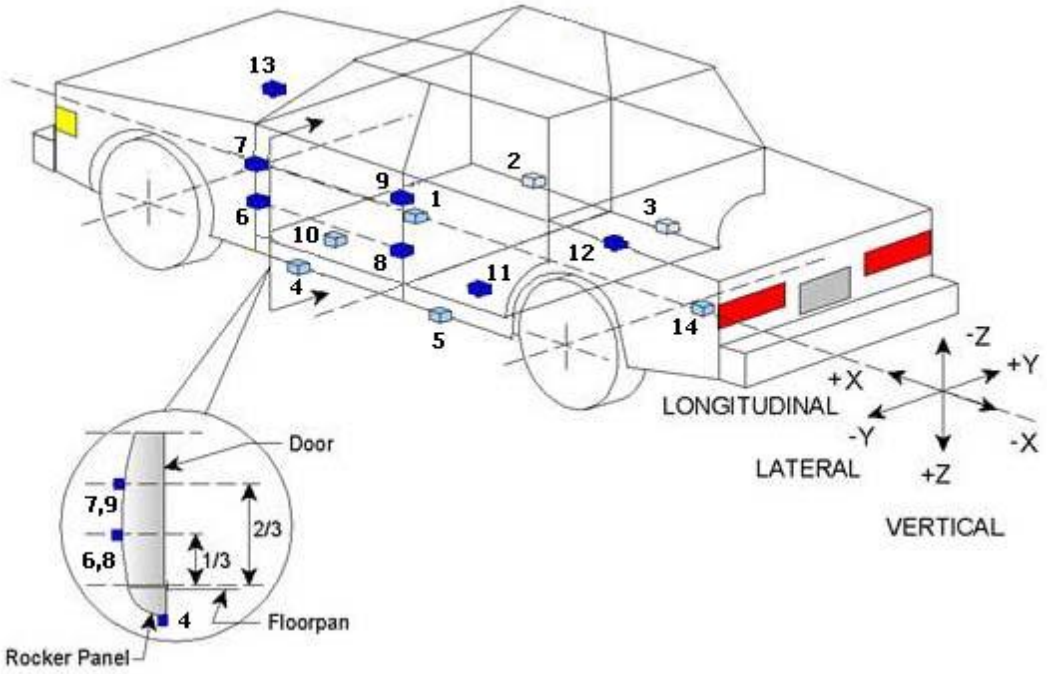
Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down
*All measurements accurate to ± 6 mm.
If applicable, explain why camera(s) did not operate as intended: N/A

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



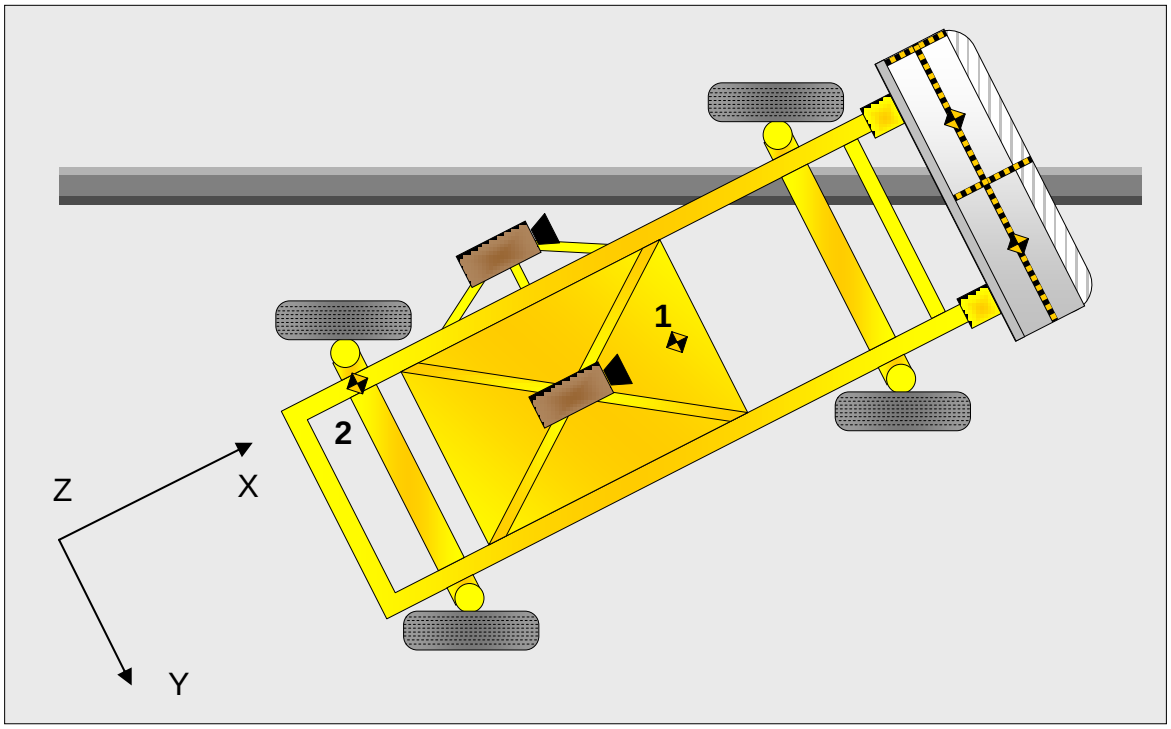
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2940	635	-400
2	Right Sill at Front Seat	2915	705	-386
3	Right Sill at Rear Seat	1930	710	-385
4	Left Sill at Front Door	2913	-710	-380
5	Left Sill at Rear Door	1930	-710	-380
6	A-Post Lower	3210	-857	-919
7	A-Post Middle	3210	-850	-955
8	B-Post Lower	2145	-850	-685
9	B-Post Middle	2100	-840	-1015
10	Front Seat Track	2425	-553	-420
11	Rear Seat Structure	1390	-340	-522
12	Right Rear Occ. Compartment	1795	437	-390
13	Engine Block	4040	85	-866
14	Rear Above Axle	740	0	-485

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: 2019 Infiniti QX50 SUV
Test Program: SINCAP Side Impact
NHTSA No.: M20195215
Test Date: 3/21/2019



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-2179	0	-505
2	MDB Rear	-3648	-650	-618

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

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SINCAP Side Impact
NHTSA No.: M20195215
Test Date: 3/21/2019

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2796
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		458
Actual Impact Point (Aft of Front Axle)	mm		460
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	-2
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	+6

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SINCAP Side Impact
NHTSA No.: M20195215
Test Date: 3/21/2019

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	1100

MDB WEIGHTS

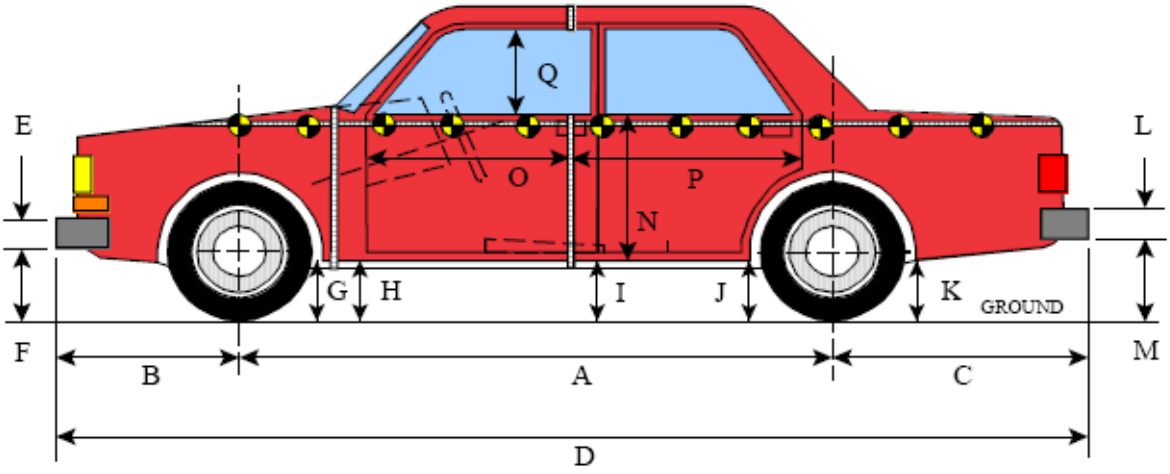
	Units	Front Axle	Rear Axle	Total
Left	kg	410.0	269.6	679.6
Right	kg	375.6	309.6	685.2
Ratio	%	57.6	42.4	100.0
Totals	kg	785.6	579.2	1364.8

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.99
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.97
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: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



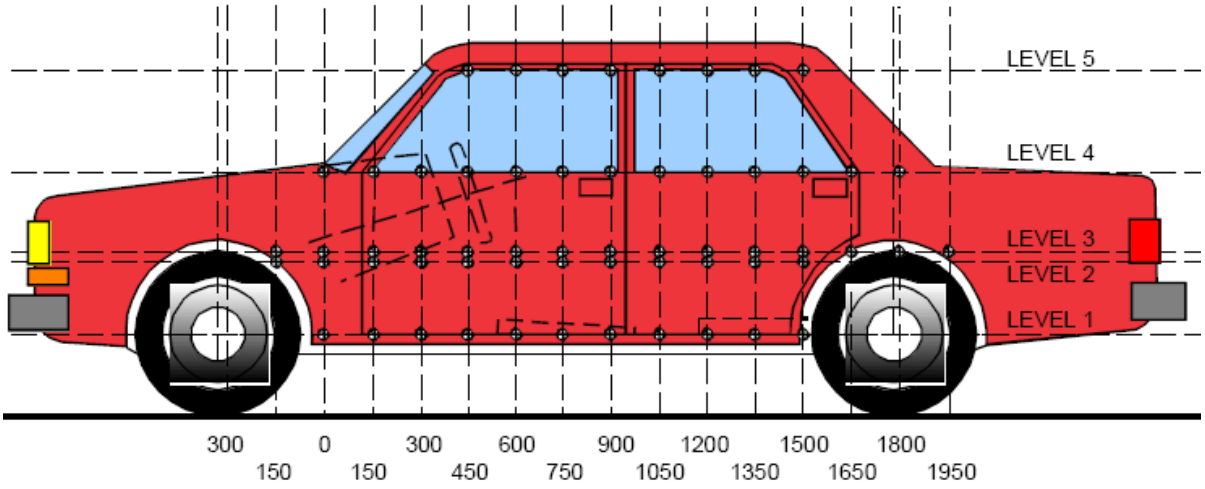
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2796	2785	11
B	Front Axle to Front Surface of Vehicle	930	930	0
C	Rear Axle to Rear Surface of Vehicle	970	970	0
D	Total Length at Centerline	4690	4696	-6
E	Front Bumper Thickness	77	77	0
F	Front Bumper Bottom to Ground	483	447	36
G	Sill Height at Front Wheel Well	278	261	17
H	Sill Height at Front Door Leading Edge	272	314	-42
I	Sill Height at B-Pillar	275	327	-52
J1	Sill Height at Rear Wheel Well	300	345	-45
J2	Pinch Weld Height at Rear Wheel Well	230	260	-30
K	Sill Height Aft of Rear Wheel Well	400	445	-45
L	Rear Bumper Thickness	75	75	0
M	Rear Bumper Bottom to Ground	485	540	-55
N	Sill Height to Window Bottom Sill	870	765	105
O	Front Door Leading Edge to Impact CL	910	730	180
P	Rear Door Trailing Edge to Impact CL	1390	1345	45
Q	Front Window Opening	440	435	5
R	Right Side Length	4419	4406	13
S	Left Side Length	4415	4421	-6
T	Vehicle Width	1900	1897	3

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	430	123	600
2	Driver Hip Point	652	237	1650
3	Mid-Door	783	255	1500
4	Window Sill	1074	80	1200
5	Window Top	1569	18	1650

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: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

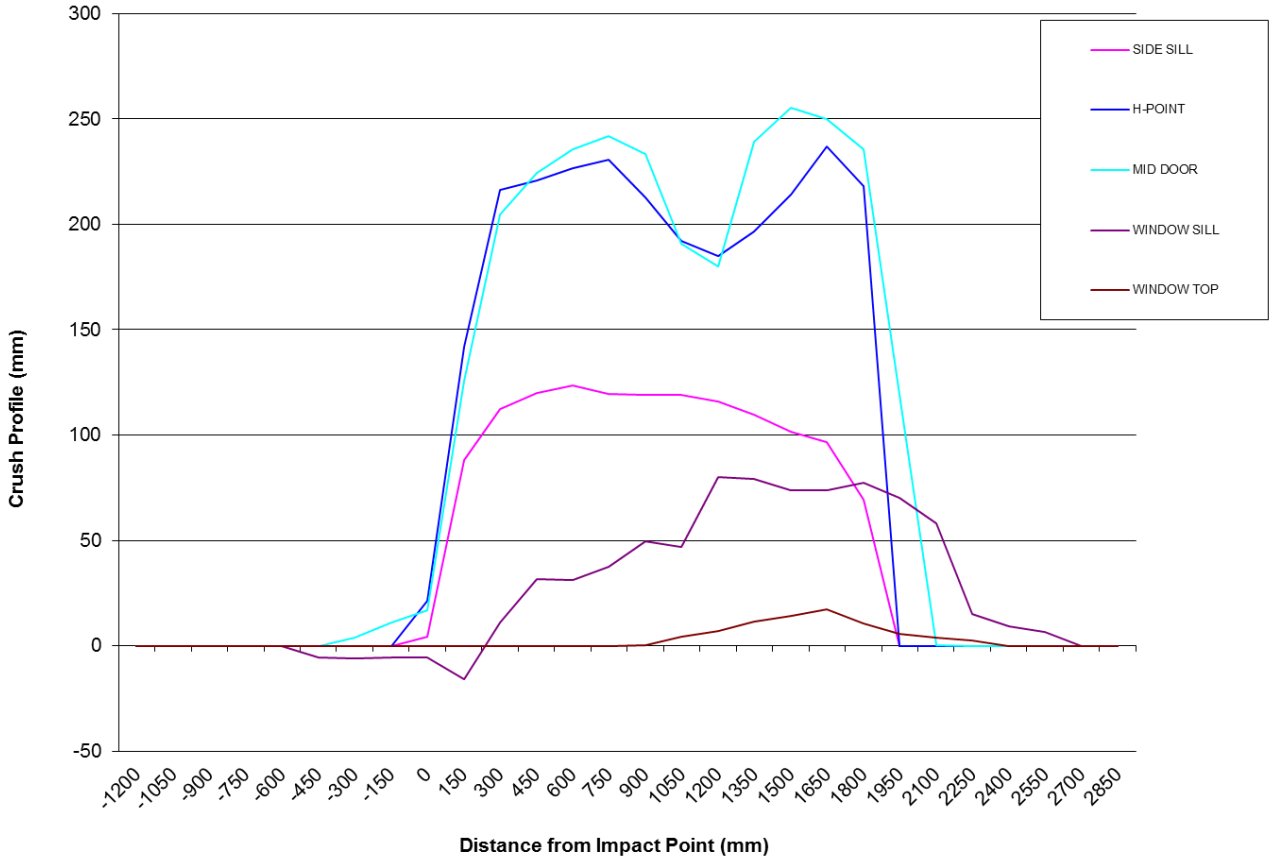
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-450	0	0	0	744	0	0	0	0	749	0	0	0	0	-5	0
-300	0	0	951	779	0	0	0	947	785	0	0	0	4	-6	0
-150	0	0	952	806	0	0	0	941	812	0	0	0	11	-6	0
0	938	951	950	828	0	933	929	933	834	0	5	22	17	-6	0
150	927	943	947	840	0	839	801	822	856	0	88	142	125	-16	0
300	927	939	947	843	0	815	723	743	832	0	112	216	204	11	0
450	929	937	948	852	0	809	716	723	820	0	120	221	225	32	0
600	928	935	947	865	0	805	708	712	834	0	123	227	235	31	0
750	927	933	946	879	0	808	702	704	842	0	119	231	242	37	0
900	926	931	945	890	619	807	718	711	840	619	119	213	234	50	0
1050	924	929	943	889	626	805	737	752	842	622	119	192	191	47	4
1200	920	926	941	909	628	805	741	761	829	621	115	185	180	80	7
1350	917	927	940	911	628	807	730	701	832	616	110	197	239	79	12
1500	916	931	941	905	627	814	717	686	831	613	102	214	255	74	14
1650	917	937	944	896	624	821	700	694	822	606	96	237	250	74	18
1800	923	945	948	886	616	854	727	712	808	606	69	218	236	78	10
1950	0	944	952	879	605	0	---[1]	833	809	599	0	---[1]	119	70	6
2100	0	0	950	900	589	0	0	---[1]	841	585	0	0	---[1]	59	4
2250	0	0	0	903	566	0	0	0	888	564	0	0	0	15	2
2400	0	0	0	898	0	0	0	0	889	0	0	0	0	9	0
2550	0	0	0	887	0	0	0	0	881	0	0	0	0	6	0

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

[1]Missing Driver Hip Point 1950 and Mid-Door point 2100 post-test

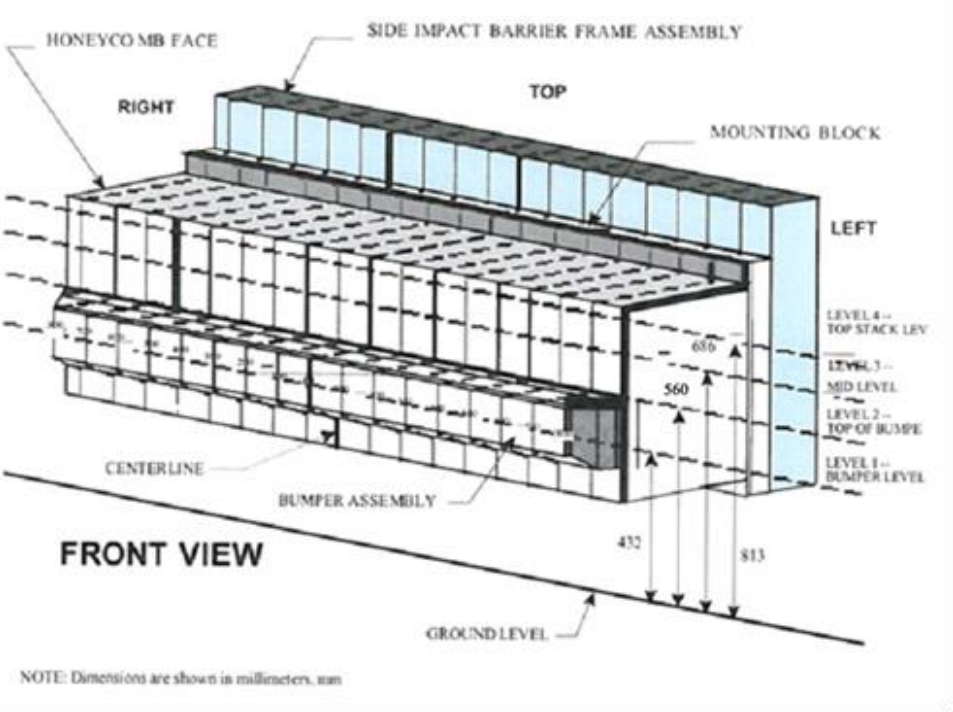
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	245
B	Top of Bumper	560	800	Right	117
C	Mid-Level	686	800	Left	116
D	Top of Stack	813	800	Left	156

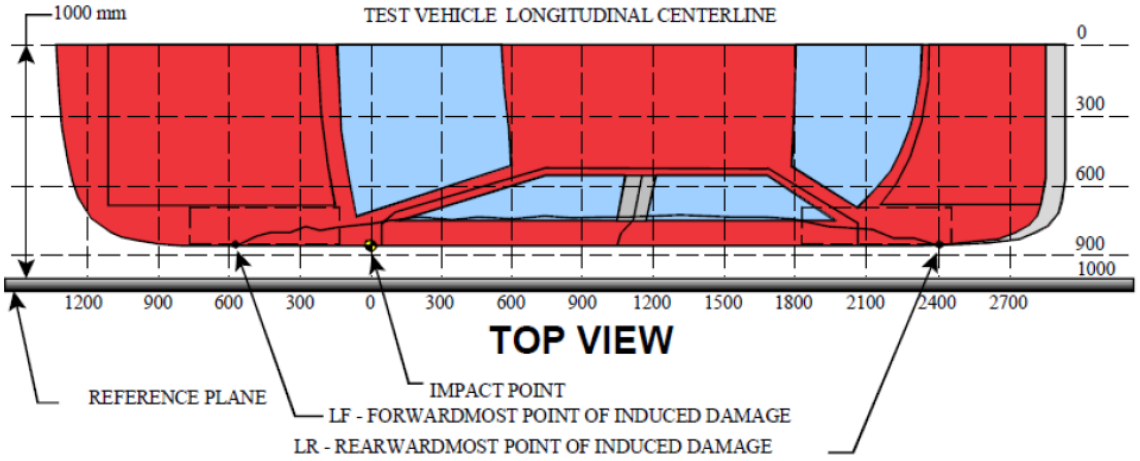
DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	245	237	226	219	217	216	216	215	213	212	211	210	209	208	207	211	205
2	117	112	109	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	100	97	98	96	97	98	112
3	68	51	51	44	50	68	90	91	71	47	38	38	44	54	60	71	116
4	70	58	49	43	62	92	113	115	79	63	59	62	67	76	89	110	156

[1]Missing points 38-44 post-test

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



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	2550	4	881	887	6
2	1950	3	833	952	119
3	1350	3	701	940	239
4	900	3	711	945	234
5	300	2	723	939	216
6[1]	-300	3	947	951	0

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	1	266	471	205
2	500 mm Left of Center	1	277	485	208
3	200 mm Left of Center	1	274	485	211
4	200 mm Right of Center	1	270	486	216
5	500 mm Right of Center	1	268	487	219
6	800 mm Right of Center	1	231	476	245

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

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

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019

Test Time: 17:23 **Temperature:** 22.3°C

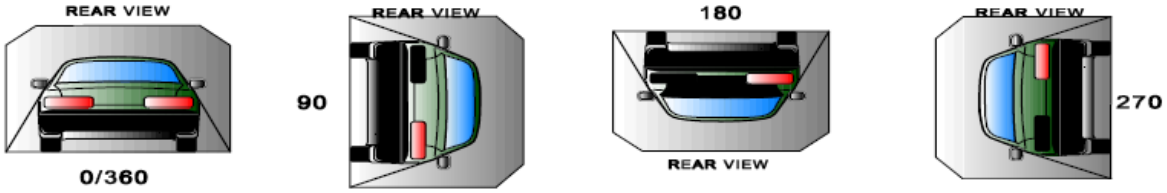
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable is 5 ounces)

C. For the following 25 minutes: 0 oz.
(Maximum allowable is 1 ounce/minute)

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	90	330	420
90 to 180	90	330	840
180 to 270	90	330	1260
270 to 360	90	330	1680

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

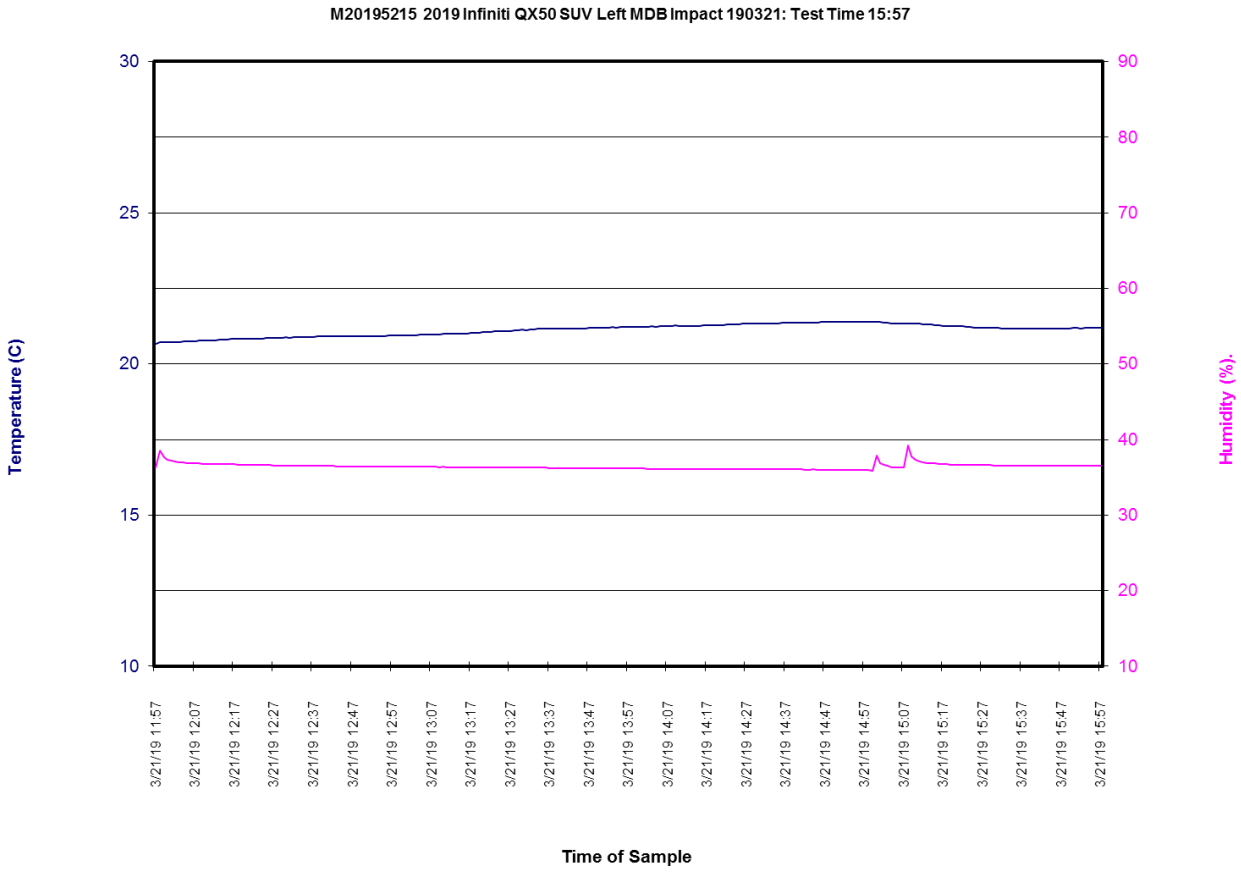
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

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

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195215
Test Program: SINCAP Side Impact Test Date: 3/21/2019



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

002 As-Delivered Left Rear ¾ View of Test Vehicle

003 Pre-Test Frontal View of Test Vehicle

004 Post-Test Frontal View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

006 Post-Test Left Front ¾ View of Test Vehicle

007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear ¾ View of Test Vehicle

010 Post-Test Left Rear ¾ View of Test Vehicle

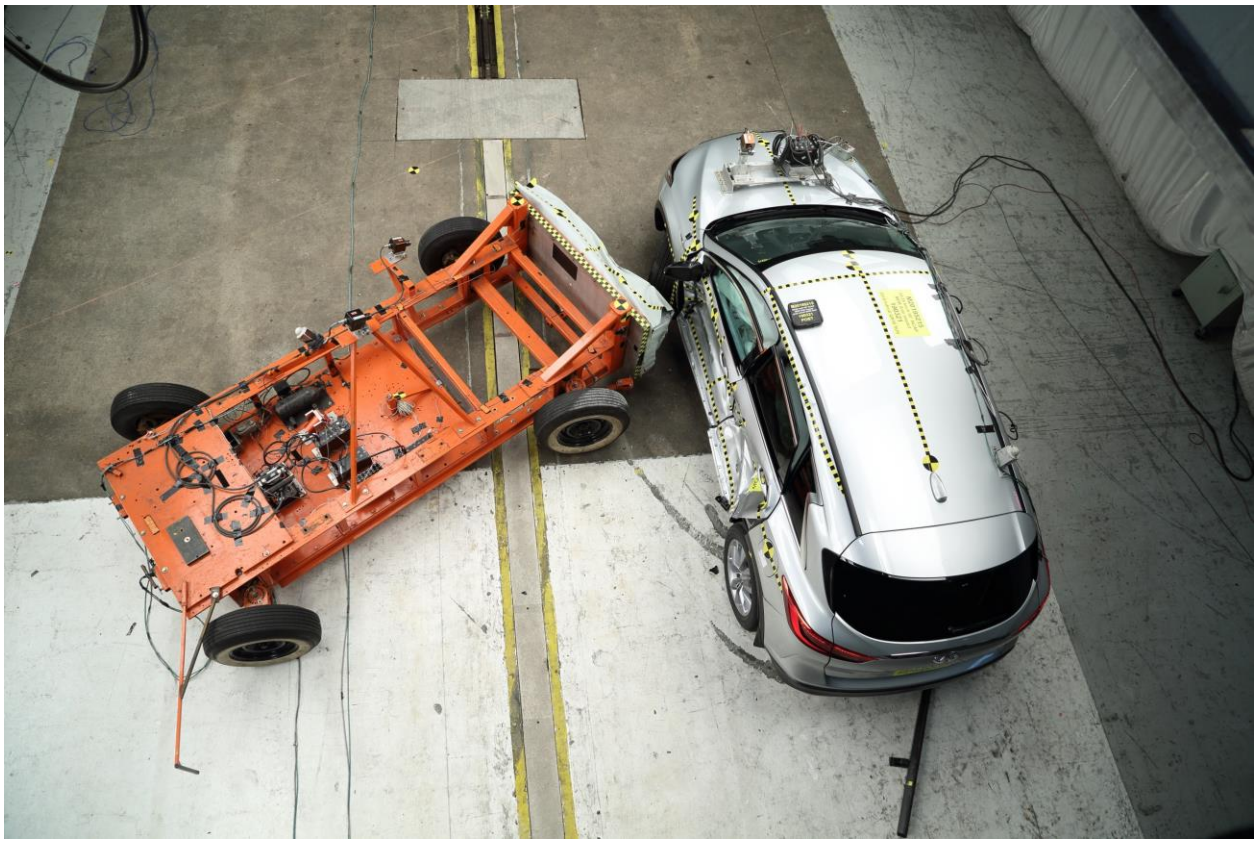
011 Pre-Test Rear View of Test Vehicle

012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle

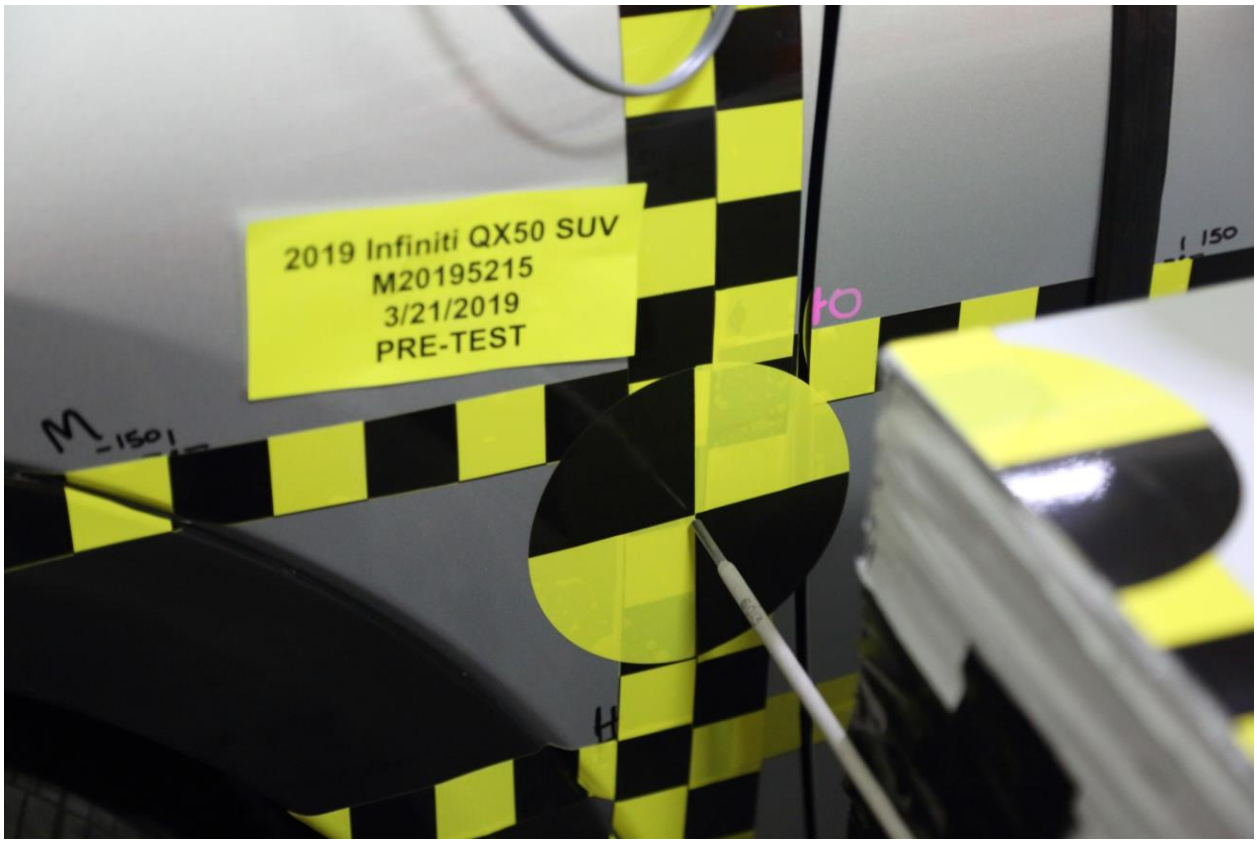
015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

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

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

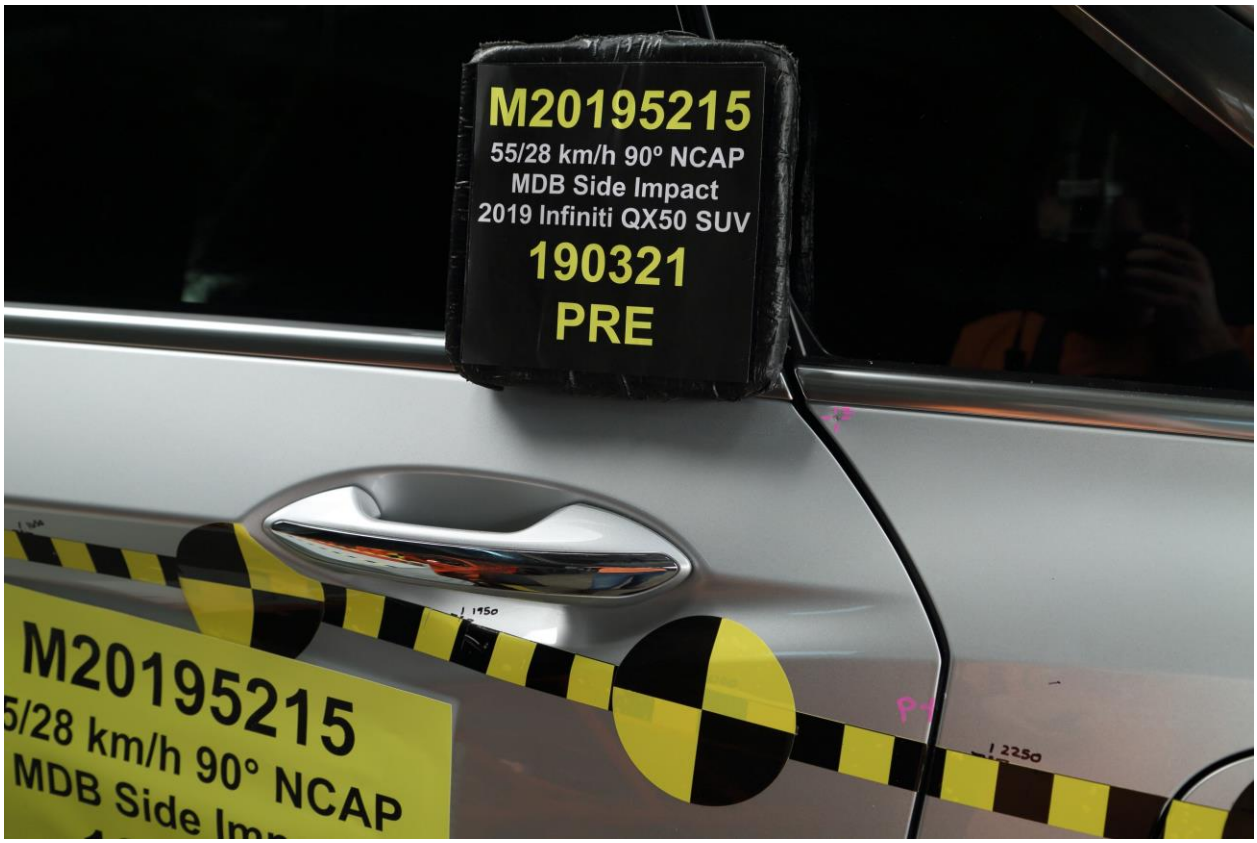


019 Pre-Test Close-Up View of Impact Point Target

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

021 Pre-Test Left Front Door Latch Close-Up

022 Post-Test Left Front Door Latch Close-Up



023 Pre-Test Left Rear Door Latch Close-Up

024 Post-Test Left Rear Door Latch Close-Up

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

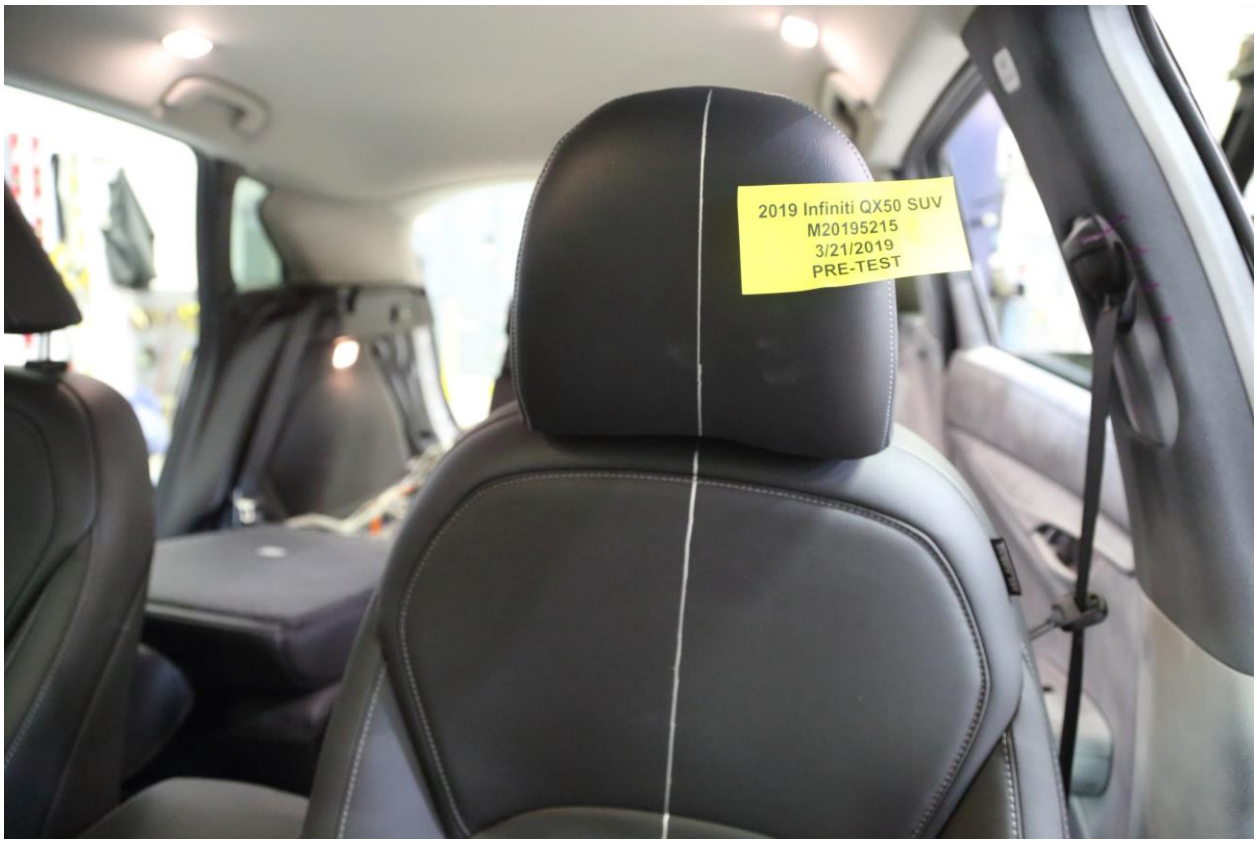
026 Post-Test Front Close-Up View of Driver Dummy

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

Intentionally Left Blank

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

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



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

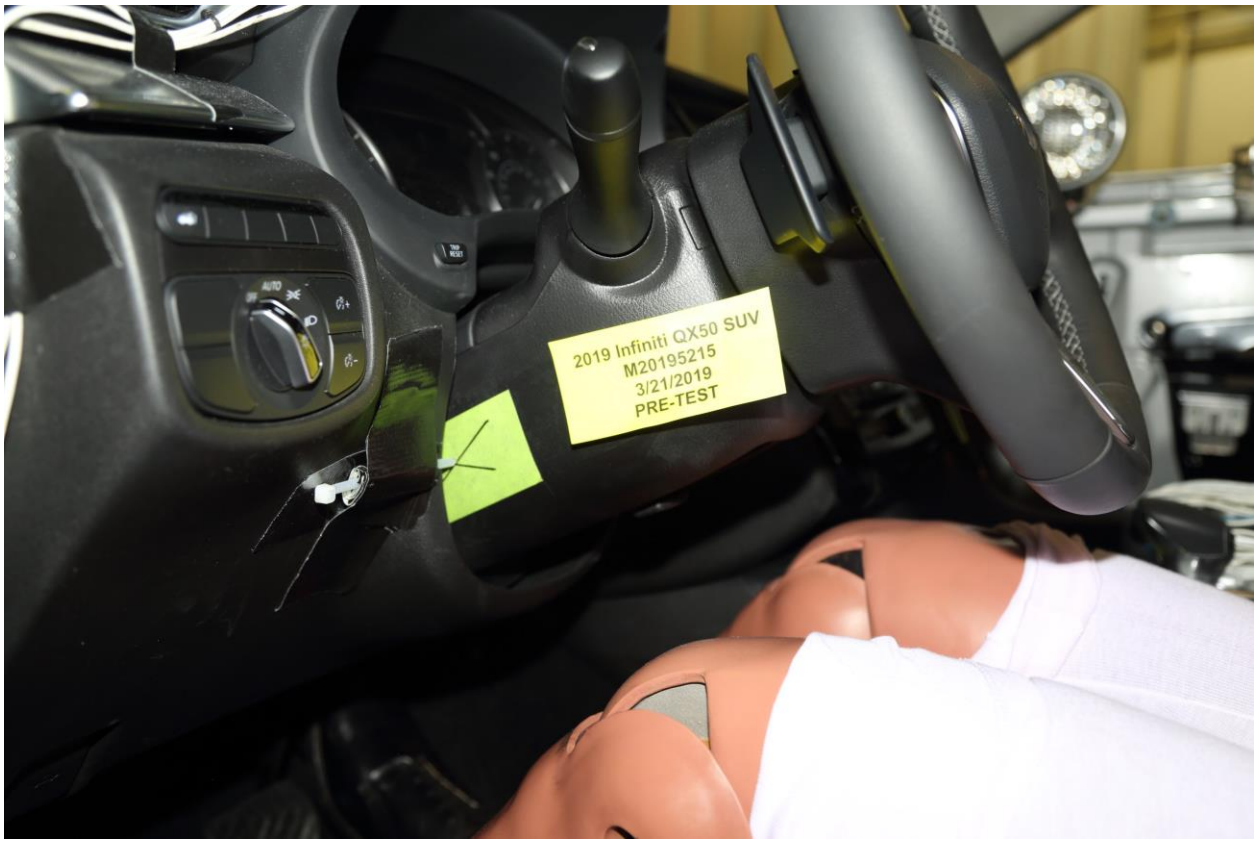
031 Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint

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

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

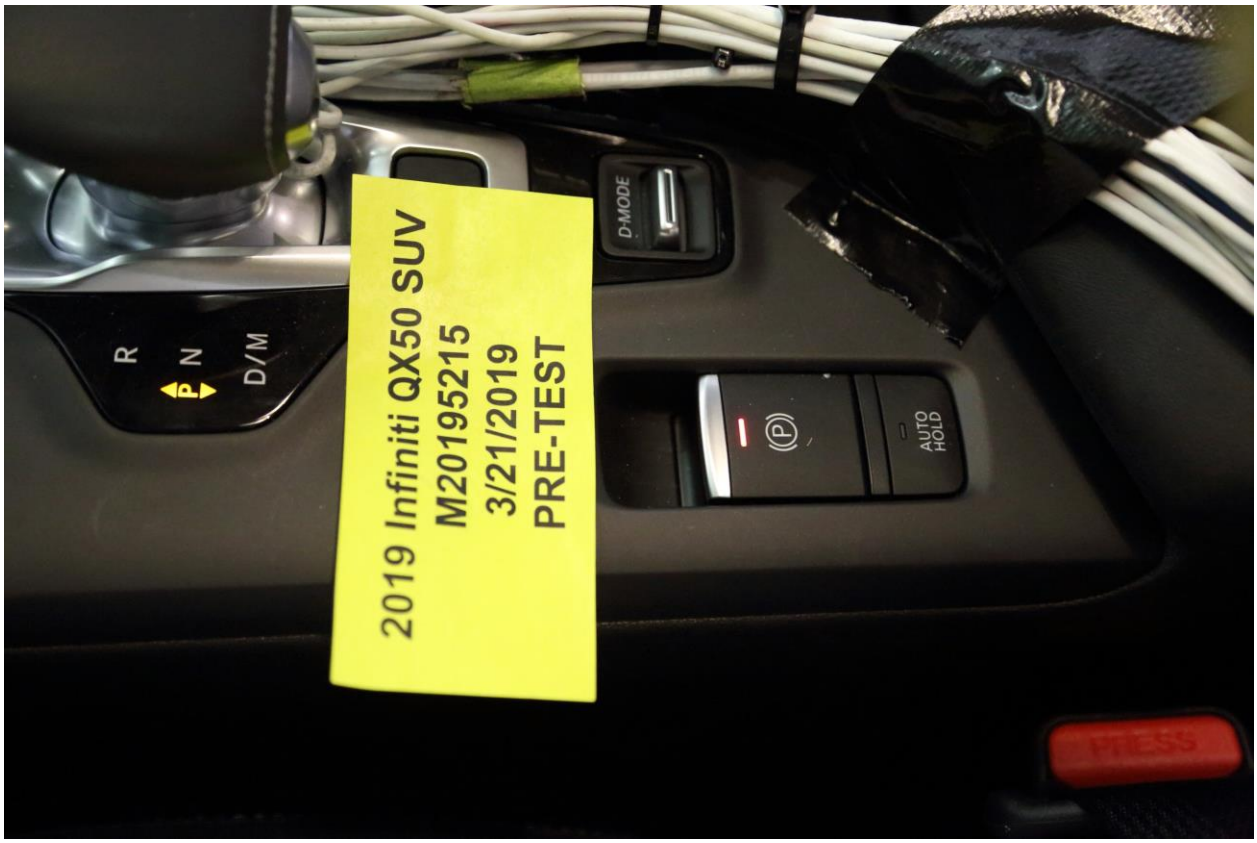
034 Pre-Test Placement of Driver's Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy



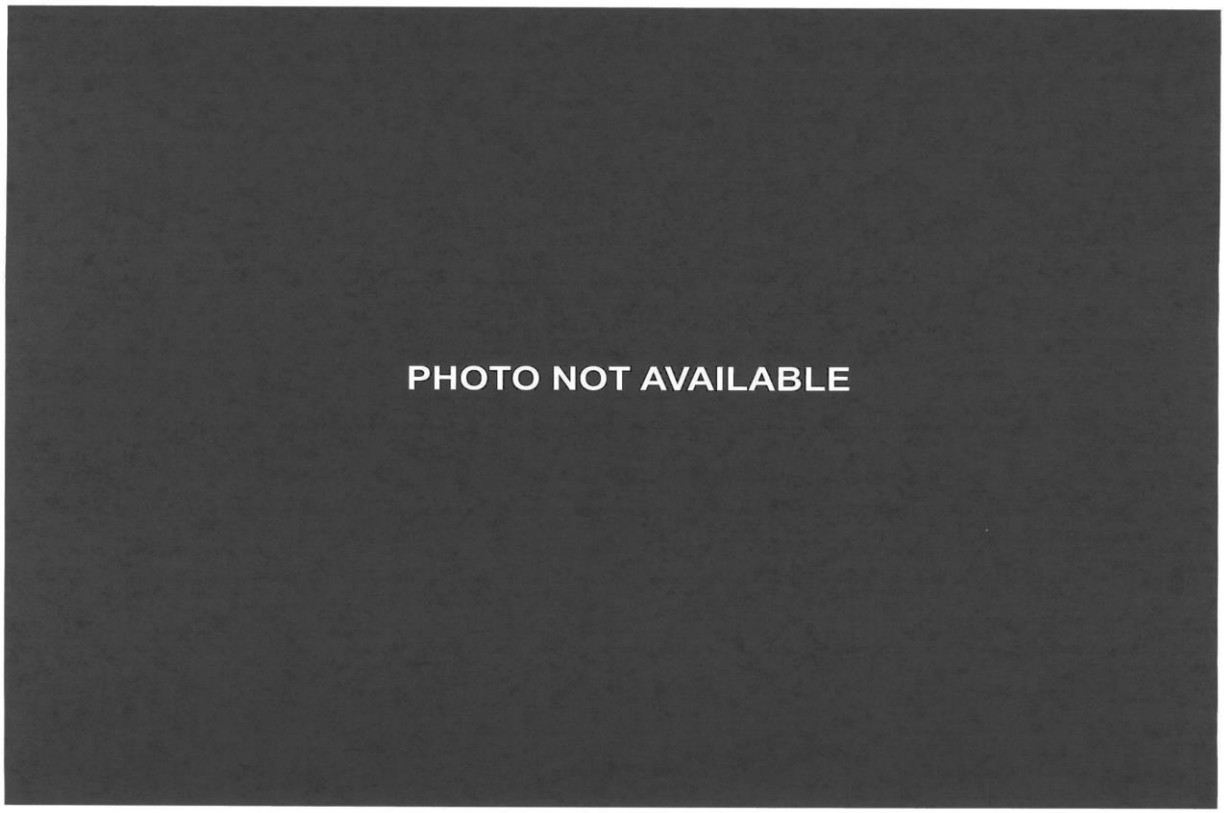
036 Pre-Test Left Side View of Steering Wheel

037 View of Disengaged Parking Brake



038 Pre-Test View of Parking Brake

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



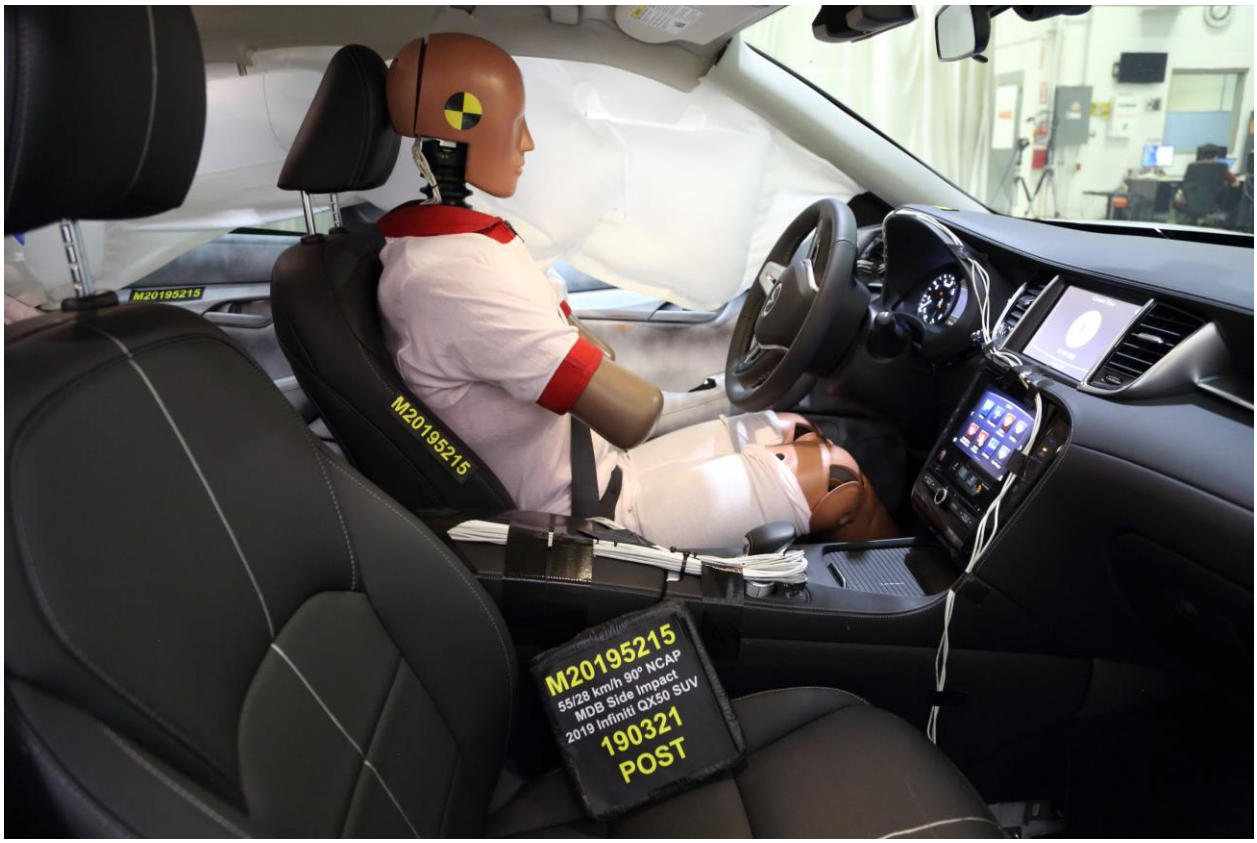
040 Pre-Test Close-Up Left Side View of Driver Seat Back

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

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View

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



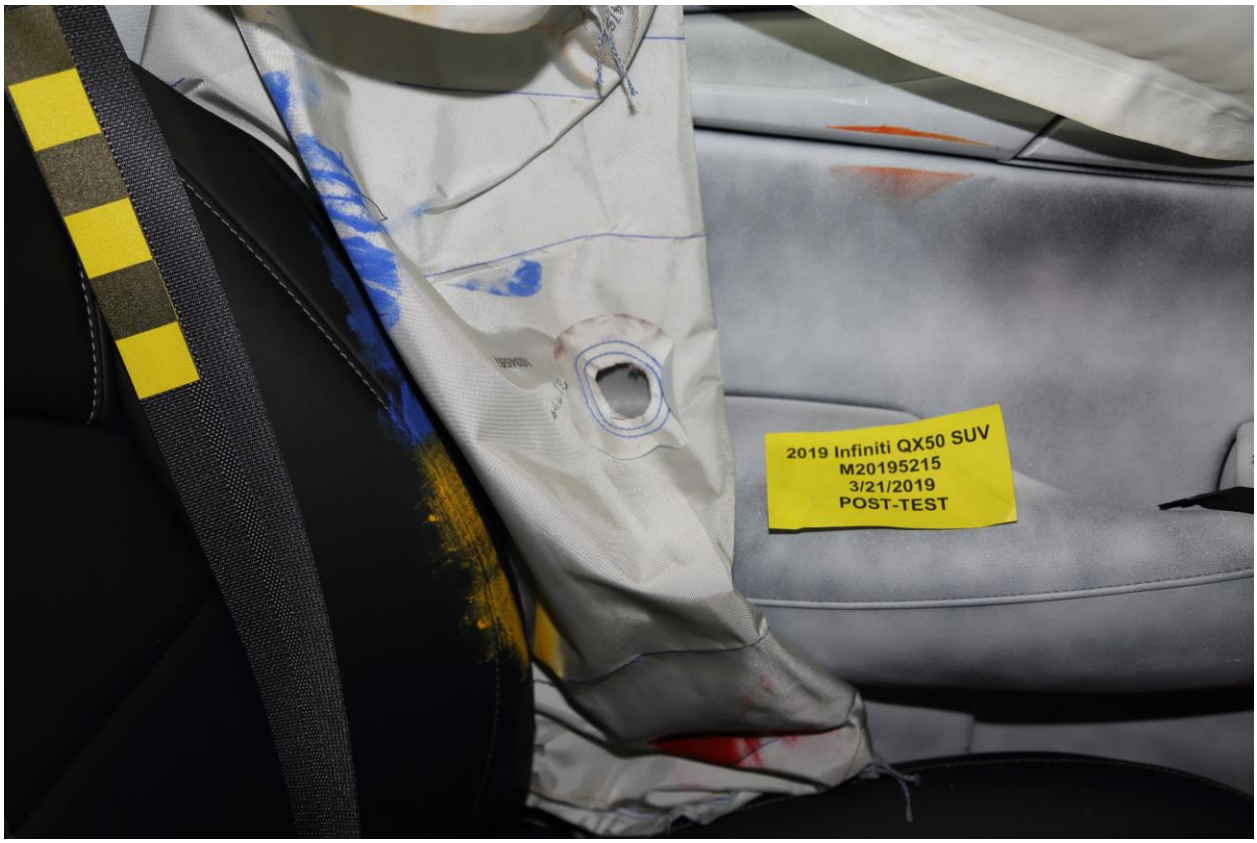
045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

046 Pre-Test Driver Inner Door Panel View

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

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

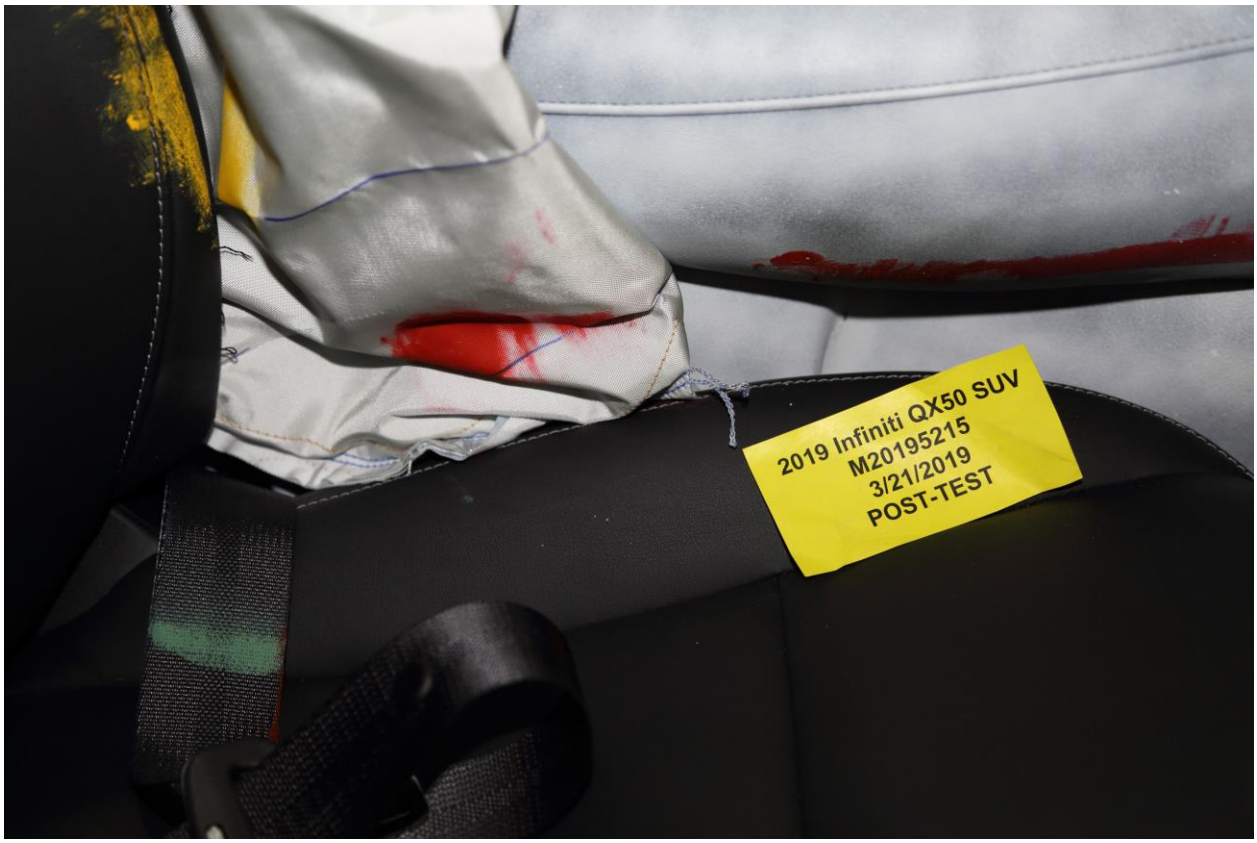
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



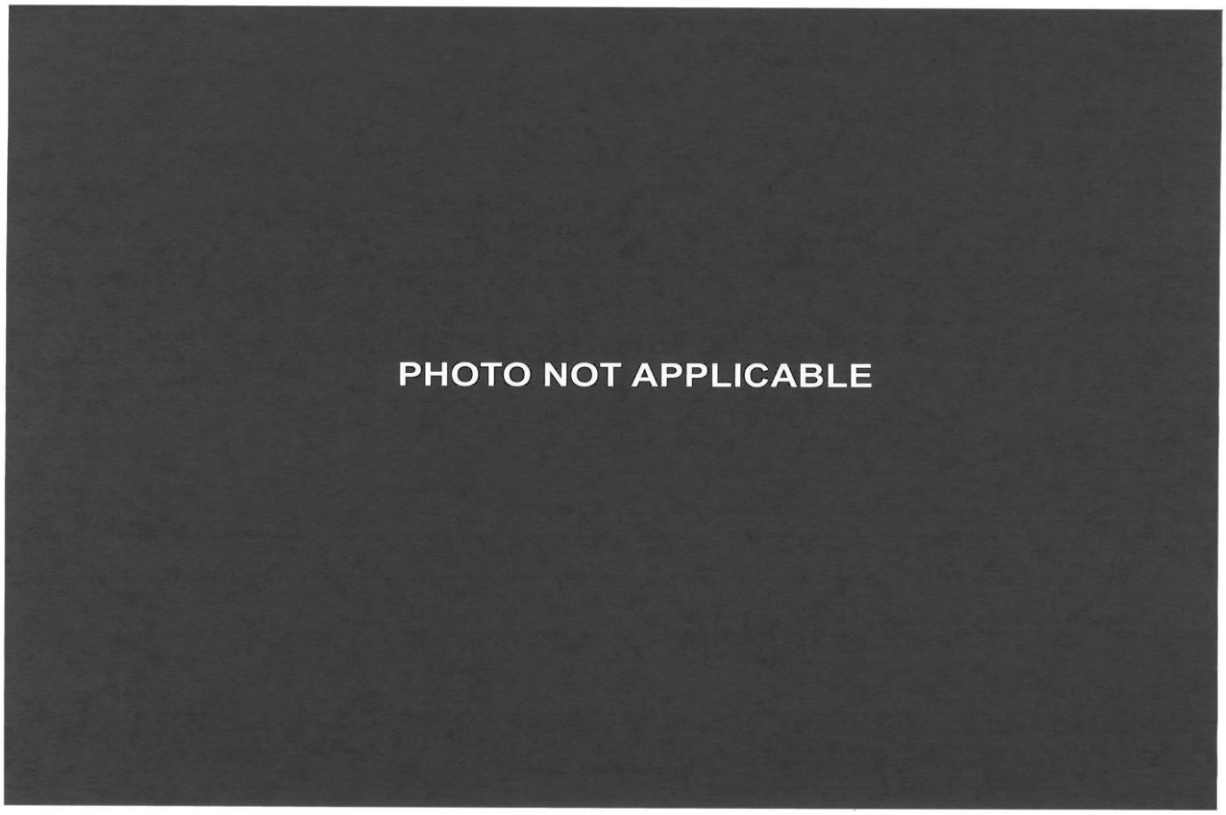
050 Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

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

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



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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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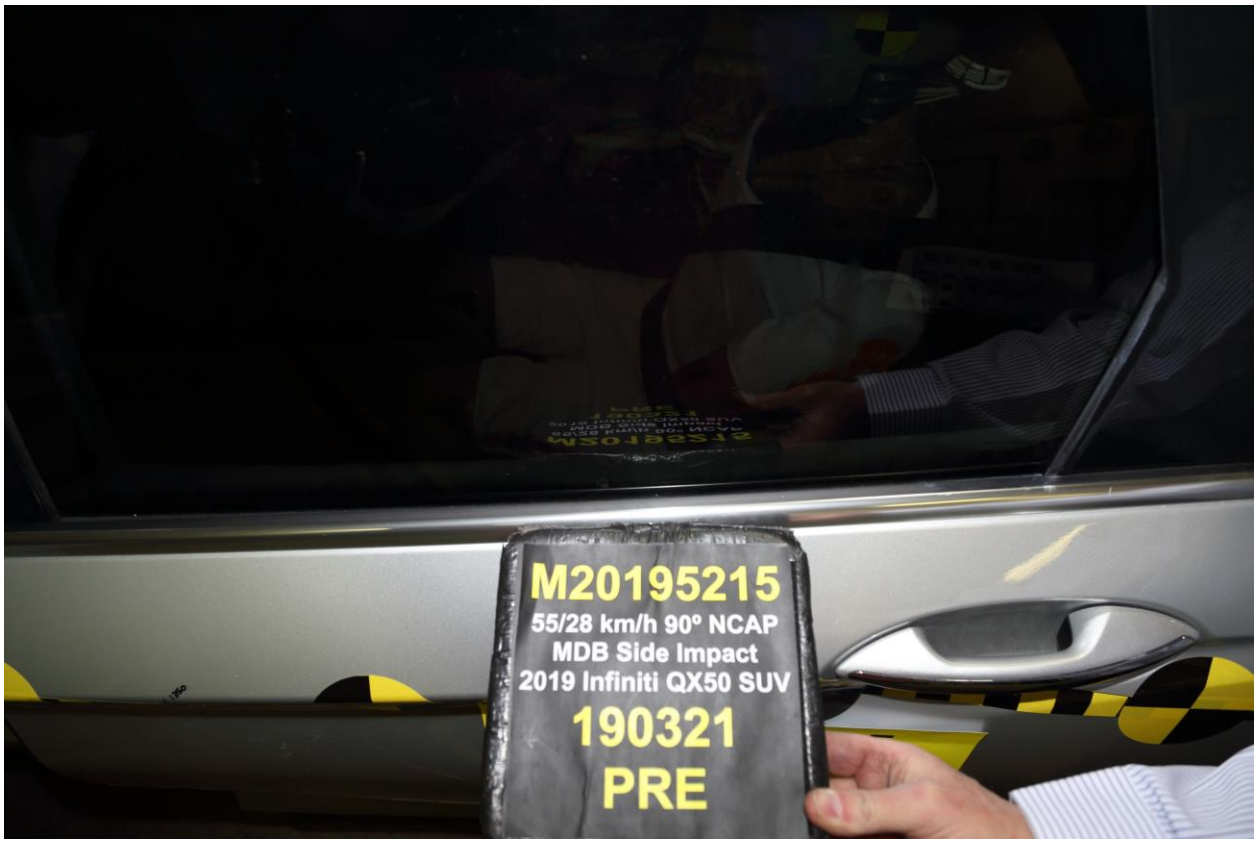


069 Pre-Test Rear Passenger Dummy and Door Clearance View

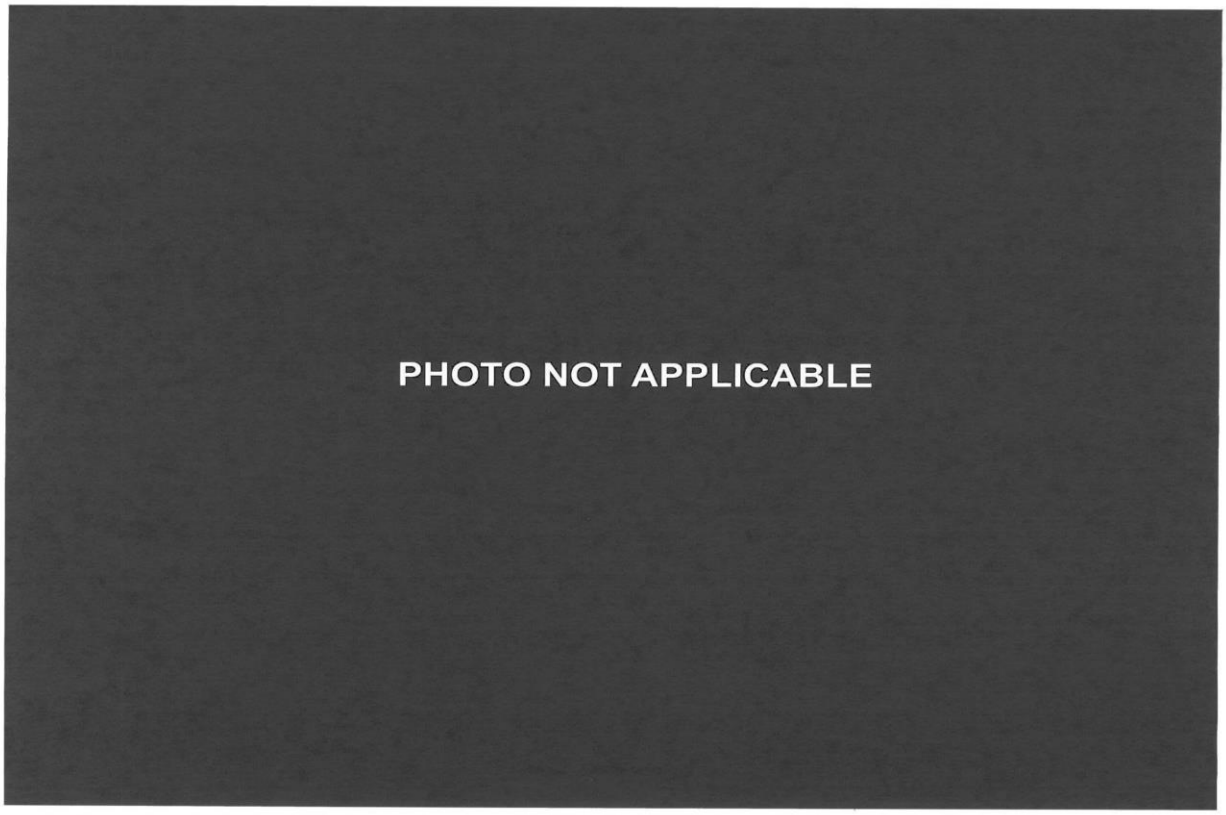
070 Post-Test Rear Passenger Dummy and Door Clearance View

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

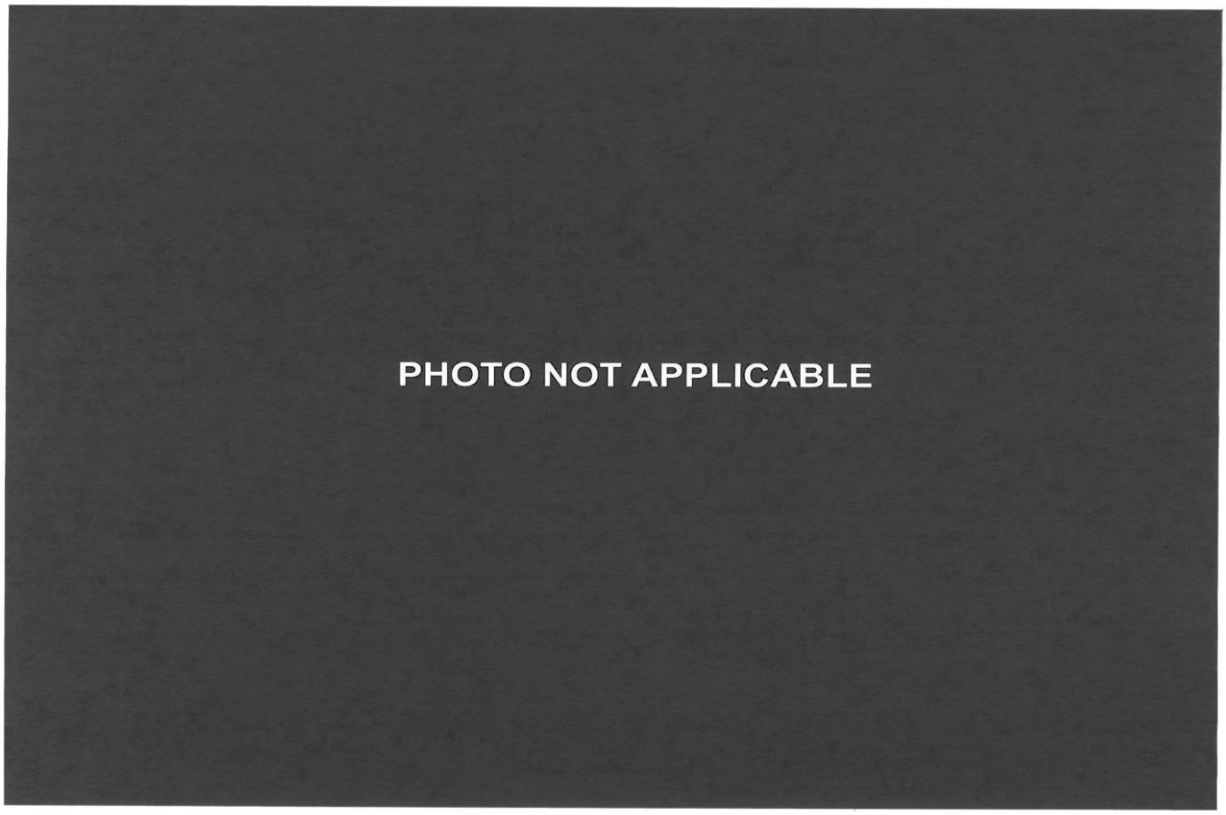
074 Post-Test Rear Passenger Inner Door Panel View



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

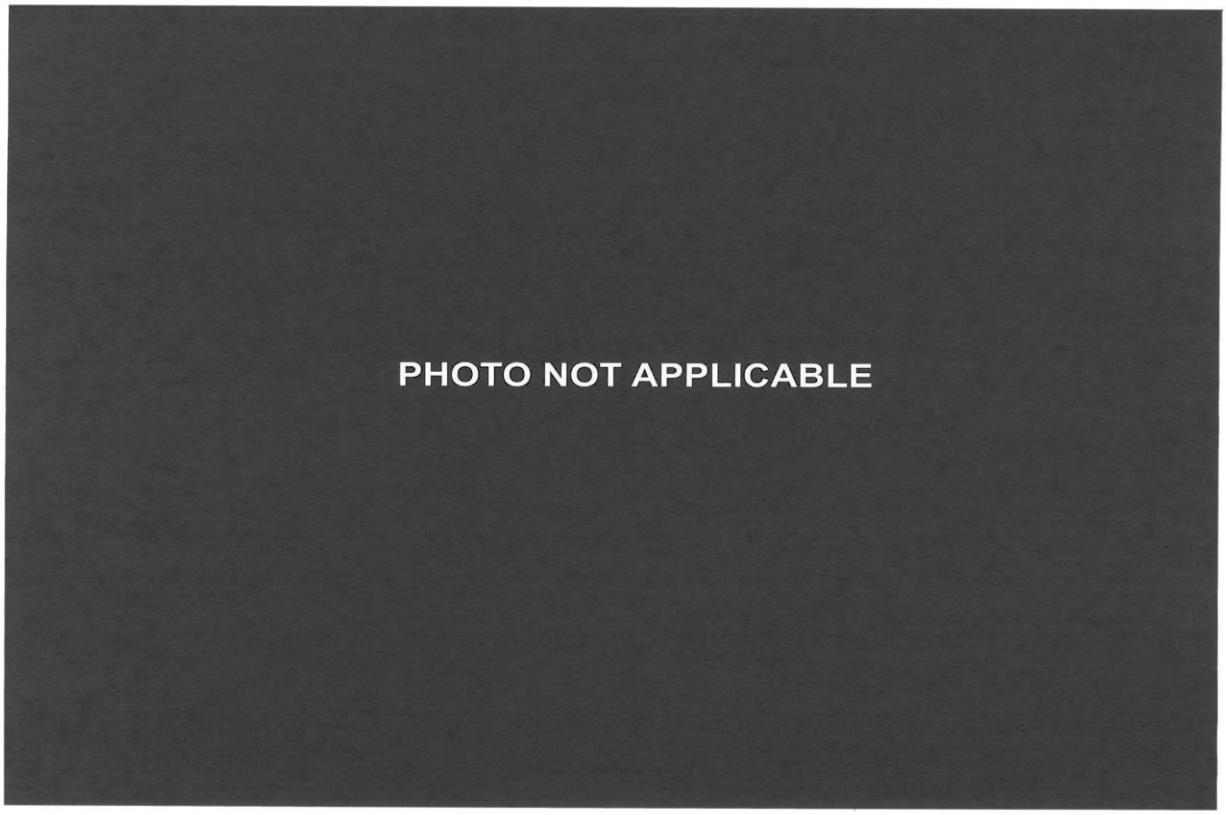
076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

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

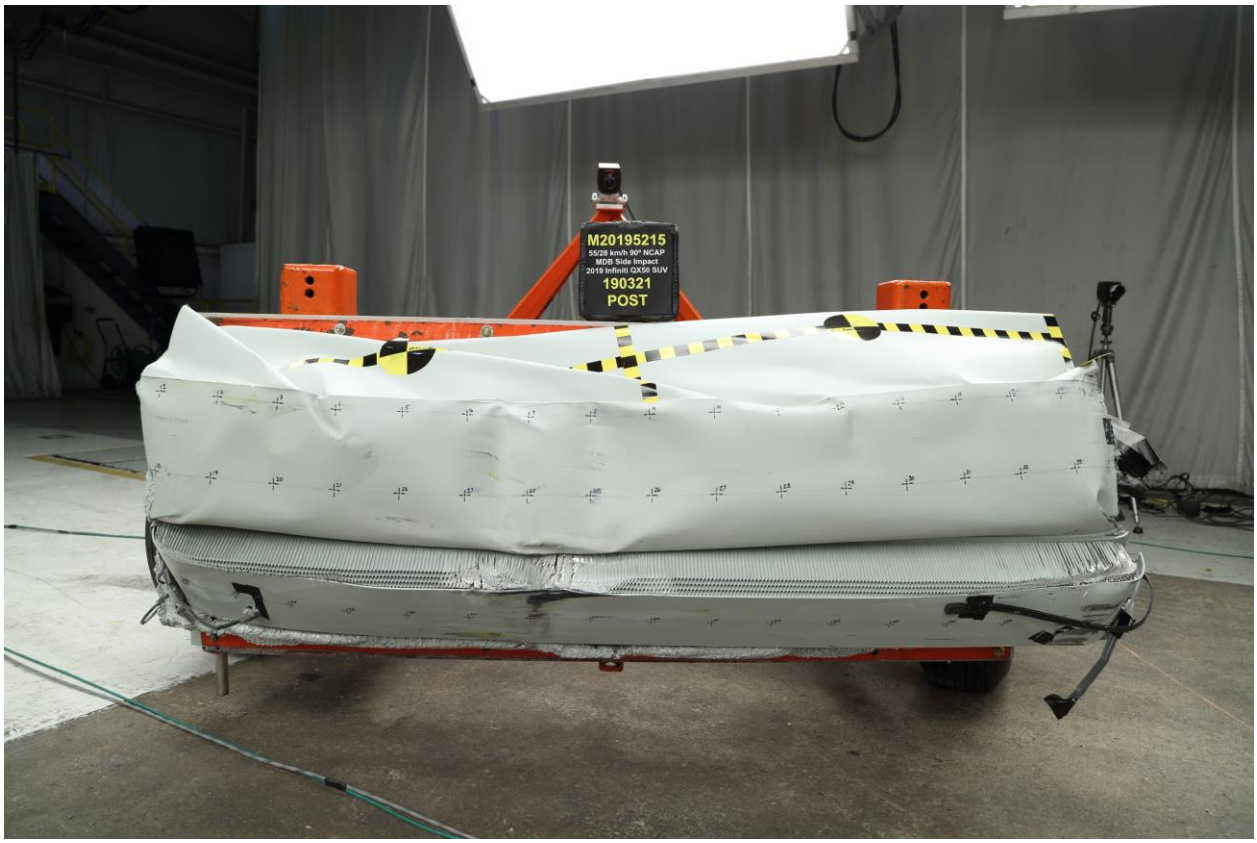
081 Post-Test Rear Passenger Dummy Close-Up Knee Contact View

Intentionally Left Blank

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

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

084 Pre-Test Front View of MDB Impactor Face

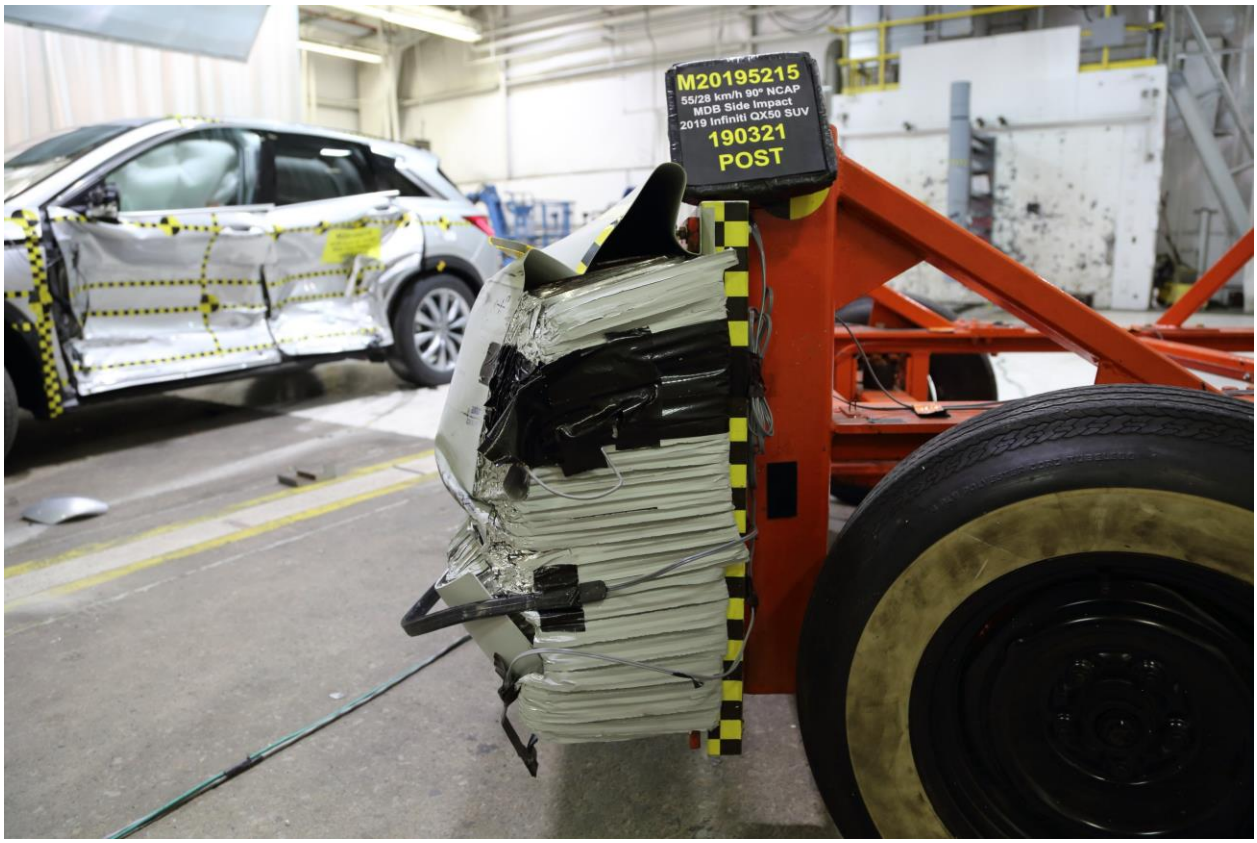


085 Post-Test Front View of MDB Impactor Face

086 Pre-Test Top View of MDB Impactor Face

087 Post-Test Top View of MDB Impactor Face

088 Pre-Test Left Side View of MDB Impactor Face



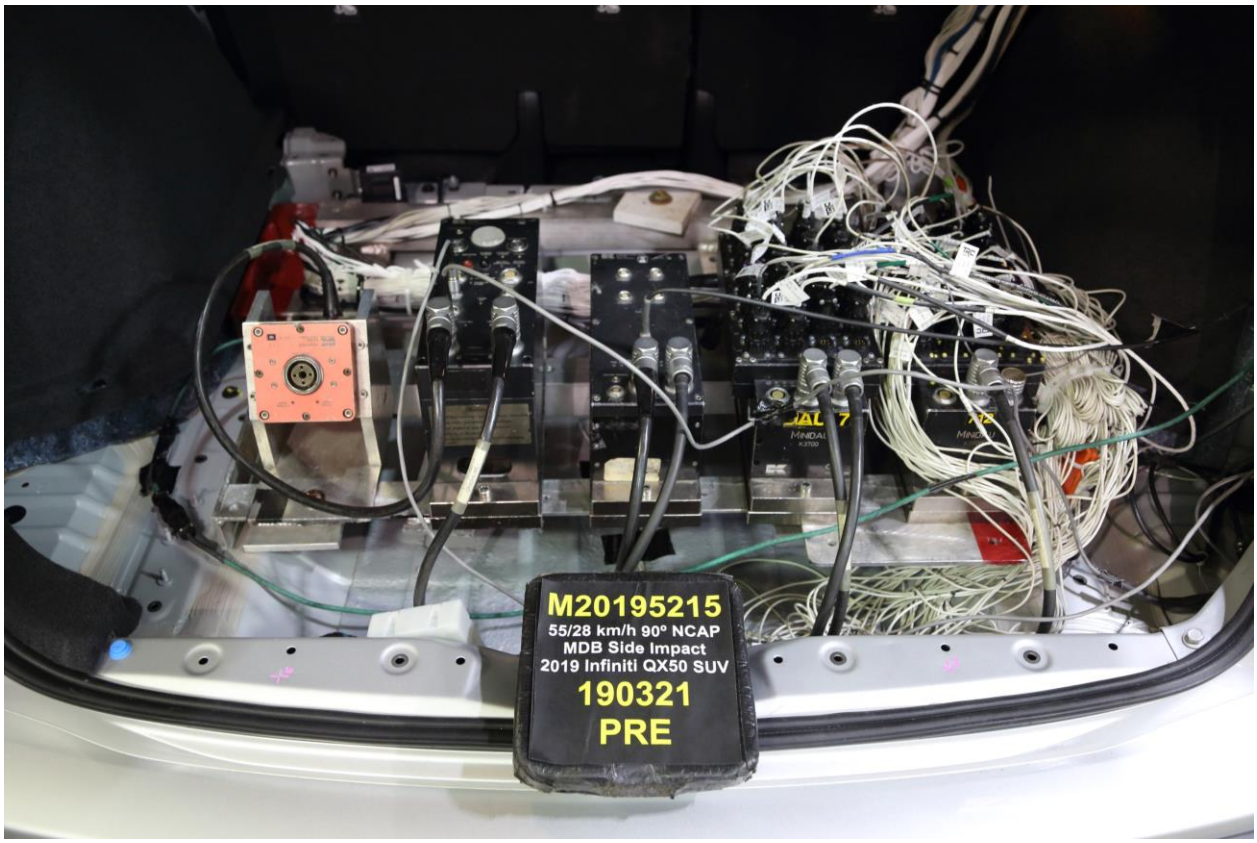
089 Post-Test Left Side View of MDB Impactor Face

090 Pre-Test Right Side View of MDB Impactor Face

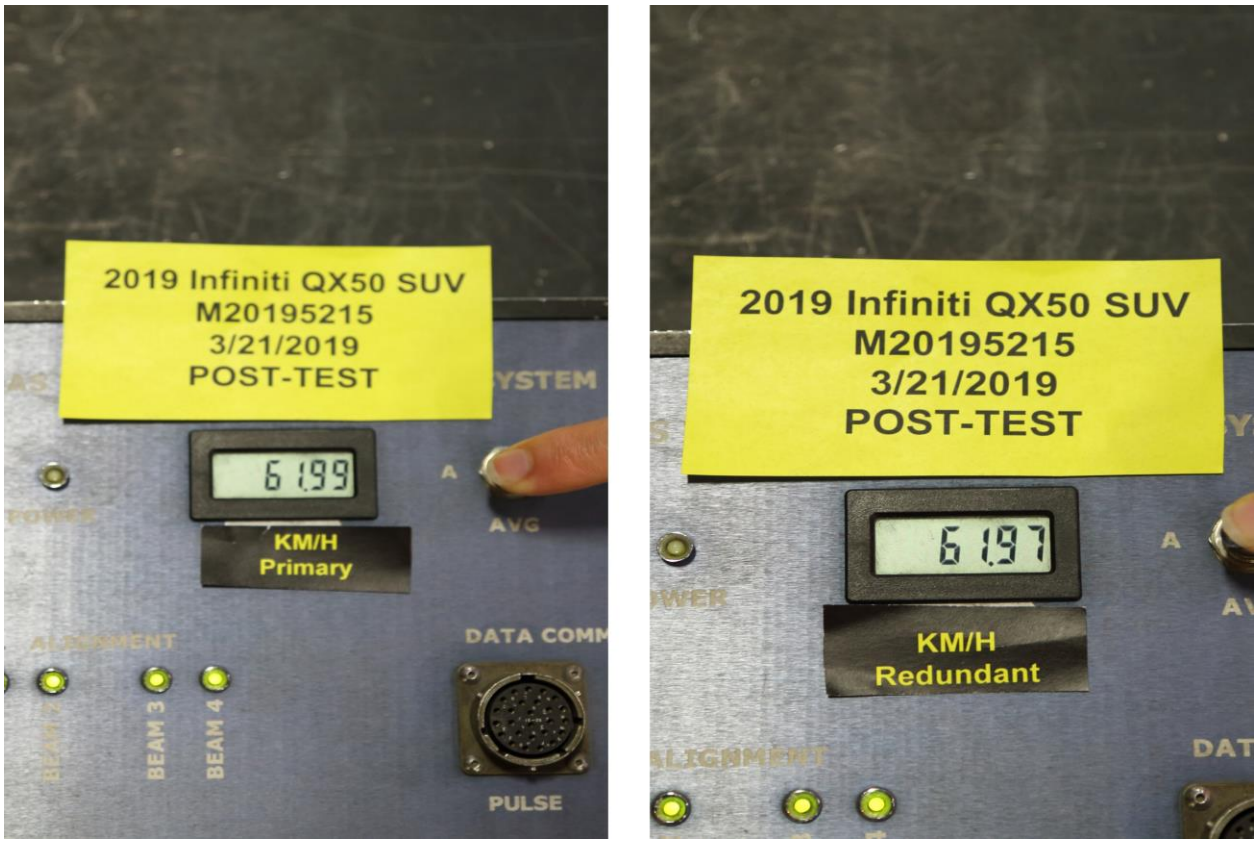
091 Post-Test Right Side View of MDB Impactor Face

092 Close-Up View of Vehicle's Certification Label

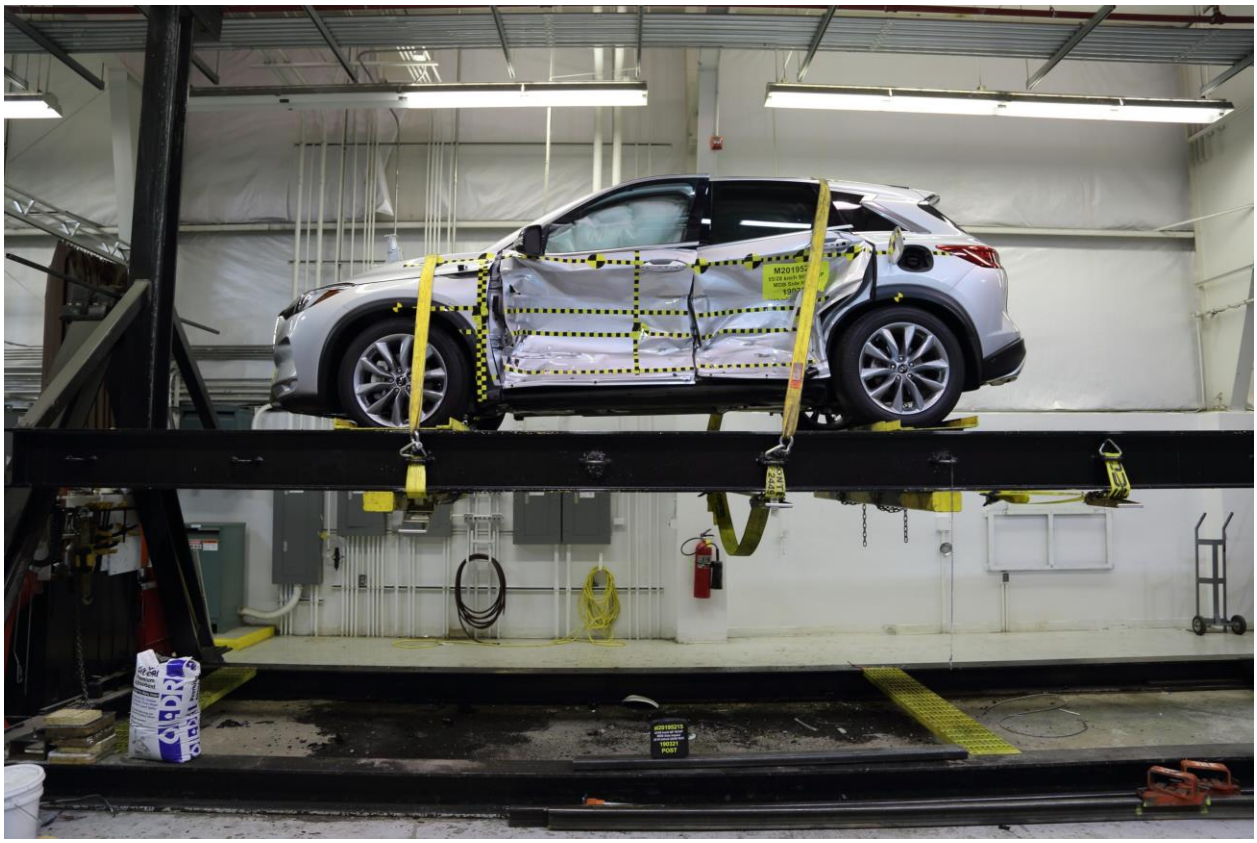
093 Close-Up View of Vehicle's Tire Information Placard or Label



094 Pre-Test Ballast View

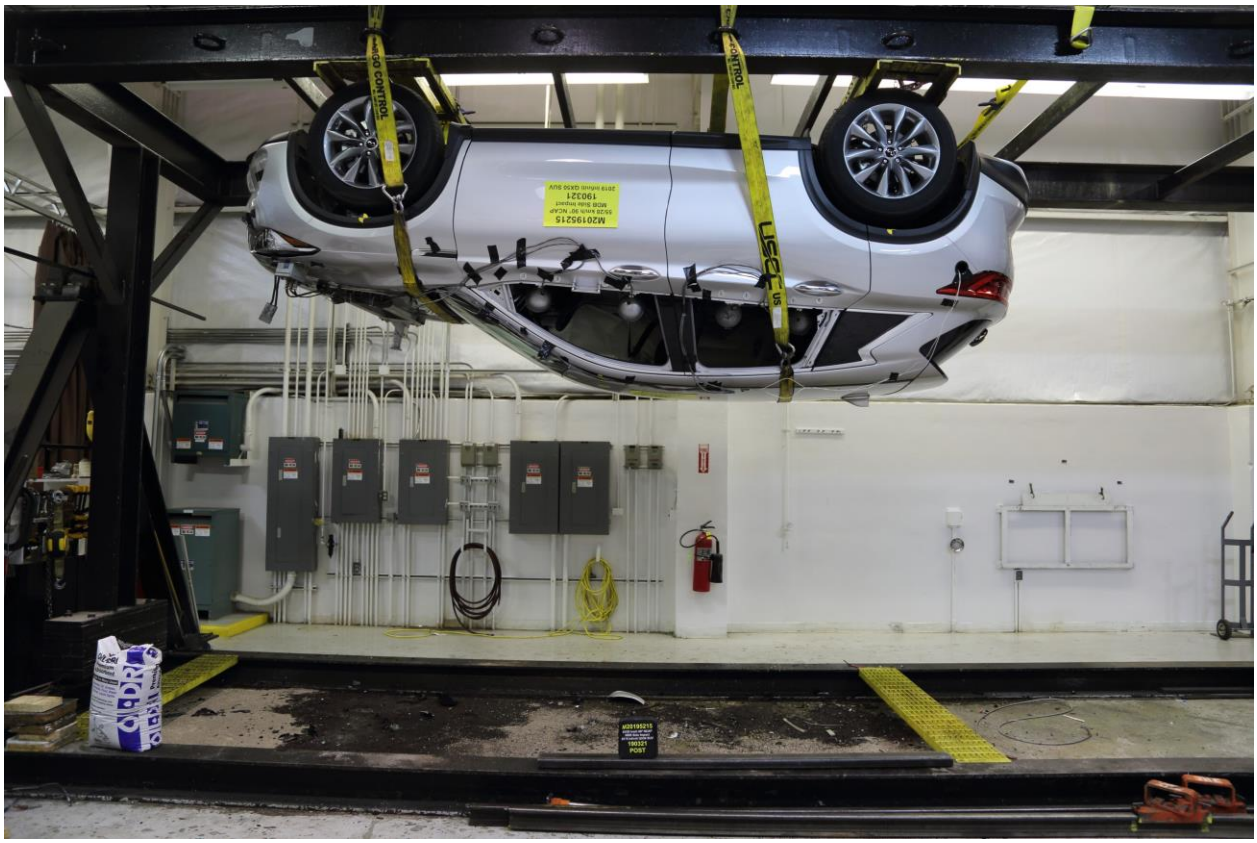


095 No. Post-Test Primary and Redundant Speed Trap Read-Out

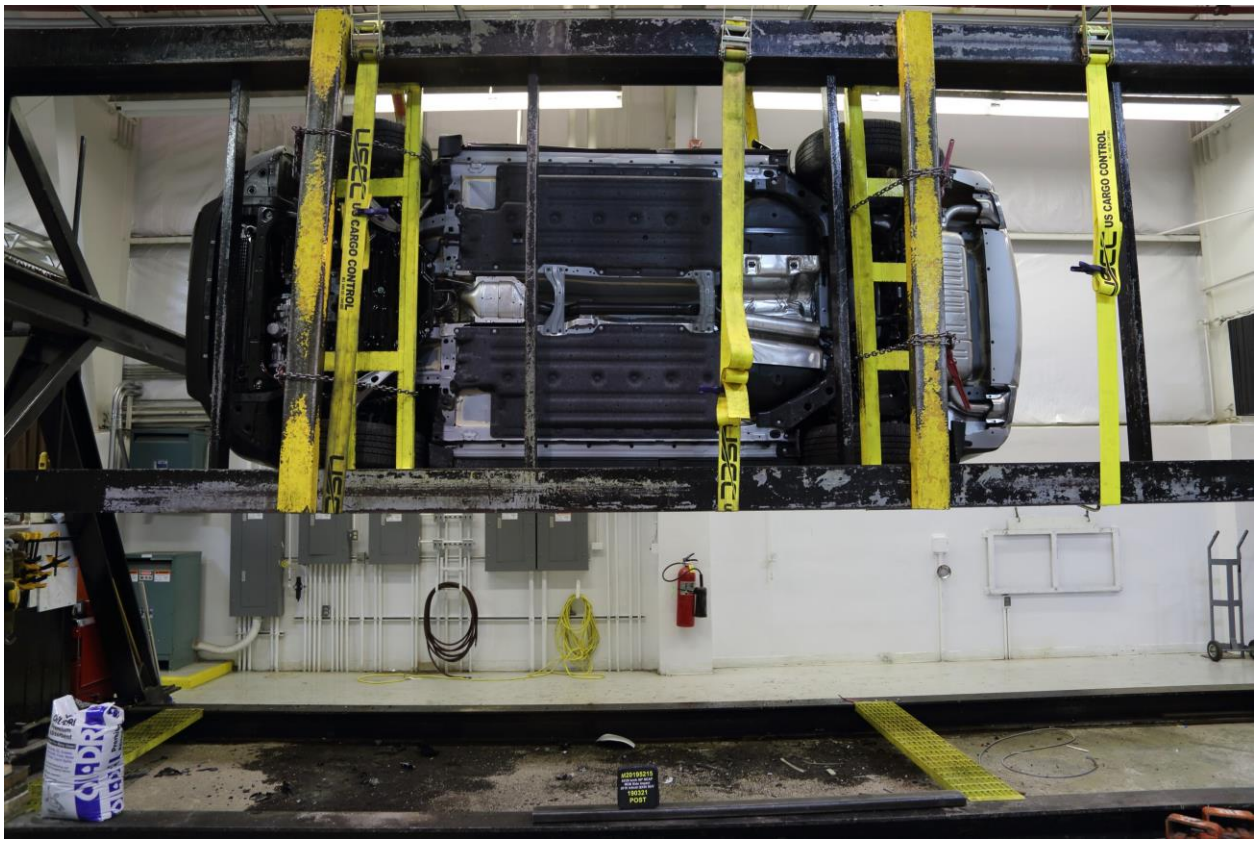


096 FMVSS No. 301 Static Rollover 0 Degrees

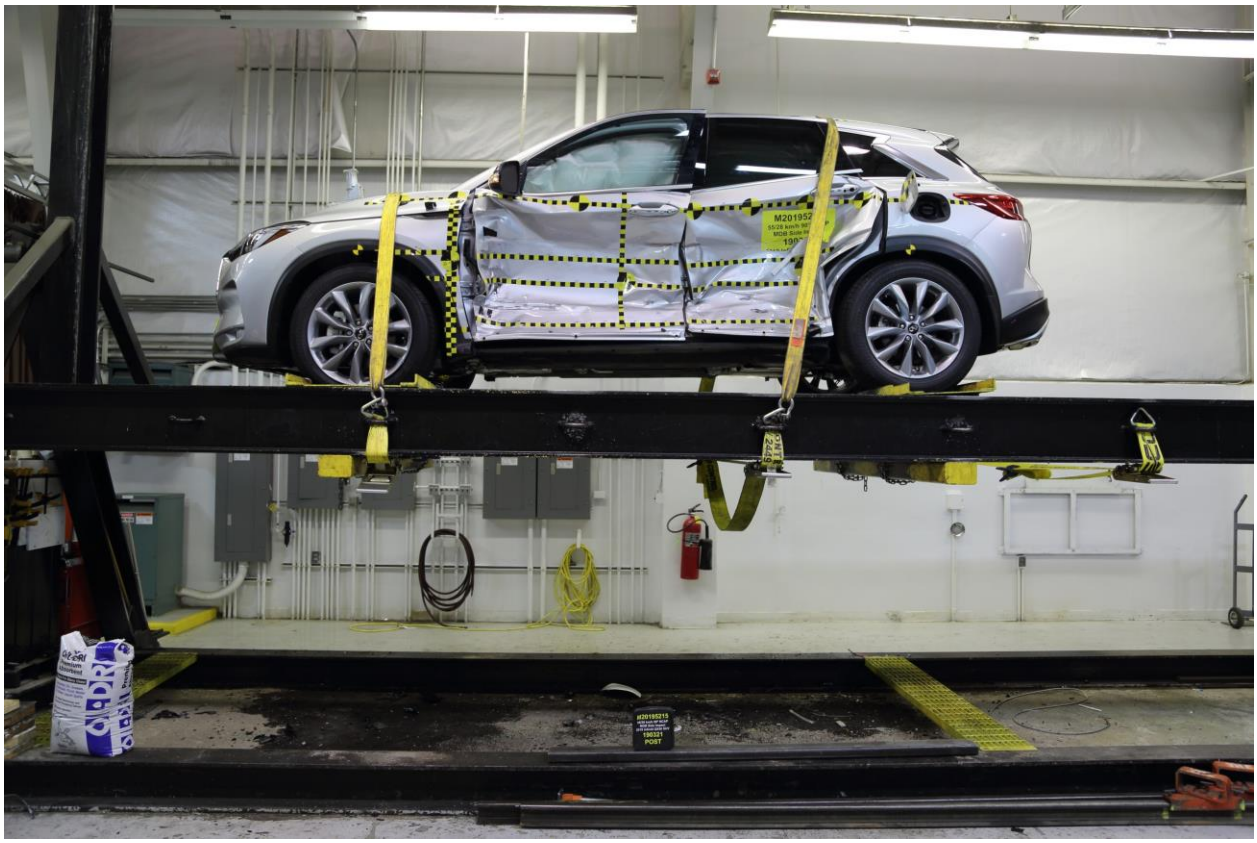
097 FMVSS No. 301 Static Rollover 90 Degrees



098 FMVSS No. 301 Static Rollover 180 Degrees



099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event

INFINITI

2019 INFINITI QX50
PURE FWD

EMPOWER THE DRIVE™

Standard Equipment Included at No Extra Charge

PERFORMANCE:
2.0L Variable Compression-Turbo 4-cylinder engine
268 horsepower
280 lb-ft torque
Front wheel drive (FWD)
INFINITI Drive Mode Selector
Continuously Variable Transmission (CVT)
19-inch aluminum alloy wheels
P235/55R19 all-season, run-flat tires
Dual exhaust finishers

COMFORT AND CONVENIENCE:
Leatheraette seating
8-way power adjustable front seats with 2-way driver power lumbar
Rear seat slide, recline, and fold flat function (60/40 split)
Leather wrapped steering wheel and shift knob
Manual tilt and telescopic steering column
Paddle shifters
Rear privacy glass
Rear window defroster and wiper
Auto on/off LED headlights
LED signature daytime running lights
Dual-zone automatic climate control with rear seat vents
Illuminated vanity mirrors
Electronic parking brake
Power adjustable, manual folding outside mirrors
Body colored door handles with chrome accent and front LED welcome lights
Speed sensitive windshield wipers with mist function

TECHNOLOGY:
Forward Emergency Braking (FEB) with Pedestrian Detection
Predictive Forward Collision Warning (PFCW)
INFINITI InTouch™ dual display system *
Rear view monitor
Bluetooth® hands-free phone and audio streaming *
Voice recognition *
SiriusXM® Satellite Radio *
SiriusXM® Travel Link *
AM/FM radio with CD player
4 USB ports
Power rear lift gate
Intelligent Key with Push Button Ignition
Active Noise Cancellation (ANC)
Cruise Control
i-M Start Assist
Easy fill tire alert

SAFETY AND SECURITY:
INFINITI Advanced Air Bag System (AABS)
Supplemental front air bags (SRS)
Front seat mounted side impact supplemental air bags
Roof mounted curtain side impact supplemental air bags with rollover sensor
Front driver and passenger knee supplemental air bags
Lower Anchors and Tethers for CHildren (LATCH)
Anti-lock Braking System (ABS) with brake assist
Traction Control System (TCS)
Vehicle Dynamic Control (VDC)
Electronic Brake force Distribution (EBD)
Independent Tire Pressure Monitoring System (TPMS)
7 point front seatbelts with pretensioners and load limiters

*For more information, see dealer, owner's manual, or www.infinitiusa.com/intouch/important-information
**Replaces standard equipment

Manufacturer's Suggested Retail Base Price:	$36,550.00
Options Included by Manufacturer: SPLASH GUARDS	185.00
DESTINATION CHARGES	995.00
Total*	$37,730.00

*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.

**Not actual Monroney Label. Provided for informational purposes only. Vehicle features, pricing and other information subject to change, may vary from actual vehicle content and/or Monroney label description. While Nissan makes reasonable efforts to ensure accuracy of information, Nissan is not responsible for changes, errors or omissions. See actual vehicle and/or verify information in question with your Nissan dealer.

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy: 27 MPG (combined city/hwy) — 24 city — 31 highway — 3.7 gallons per 100 miles
SMALL SUVS range from 18 to 37 MPG. The best vehicle rated 136 MPGe

You spend $1,250 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $1,650

Fuel Economy & Greenhouse Gas Rating (1 Worst, 6 Best) — Smog Rating (1 Worst, 5 Best)

This vehicle emits 376 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $7,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.00 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score		Not Rated
Frontal Crash	Driver	Not Rated
	Passenger	Not Rated
Side Crash	Front seat	Not Rated
	Rear seat	Not Rated
Rollover		Not Rated

Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.
Based on the risk of injury in a side impact.
Based on the risk of rollover in a single-vehicle crash.

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

TOTAL OWNERSHIP EXPERIENCE
Every Infiniti Vehicle Includes Infiniti's:
- 4-Year/60,000 Mile Basic Limited Warranty Coverage **
- 6-Year/70,000 Mile Powertrain Limited Warranty Coverage **
- 7-Year Unlimited Mileage Corrosion Limited Warranty Coverage **
- 24-hour Roadside Assistance **
- Complimentary Service Loan Car ***

** Please see the Infiniti Warranty Information booklet for details.
*** Please ask your Infiniti retailer for details.

DELIVERY

VEHICLE COLORS:
EXT: LIQUID PLATINUM
INT: GRAPHITE

FINAL ASSEMBLY POINT:
AGUAS(ABV.)MEX

TRANSPORT METHOD:
TRUCK

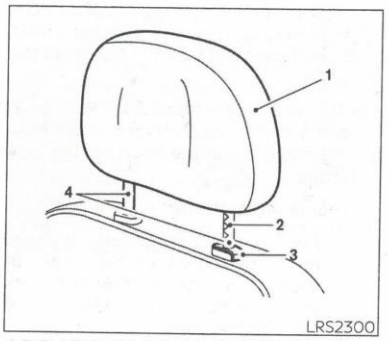
DEALER:
NALLEY INFINITI / ATLANTA
2550 THE NALLEY WAY
ATLANTA GA
30360

VIN: 3PCAJ5M13KF128478
EMS: 50 STATE EMISSIONS
MDL: 81119-128478 K23-G
OPT: D-B92C03L11S5Z86

20181012234102AS71045

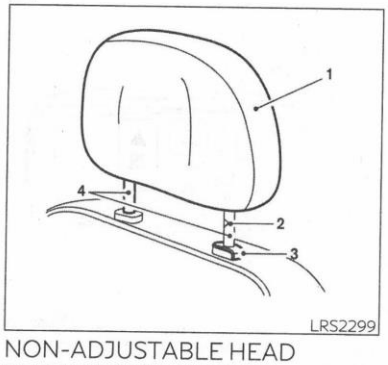
Unofficial Copy**

102 Monroney Label



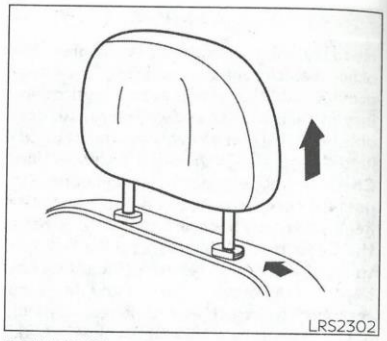
ADJUSTABLE HEAD RESTRAINT/ HEADREST COMPONENTS

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



NON-ADJUSTABLE HEAD RESTRAINT/HEADREST COMPONENTS

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



REMOVE

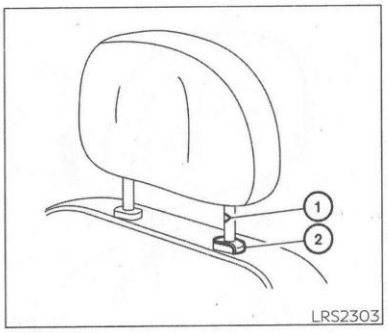
Use the following procedure to remove the head restraint/headrest:

1. Pull the head restraint/headrest up to the highest position.
2. Push and hold the lock knob.
3. Remove the head restraint/headrest from the seat.
4. Store the head restraint/headrest properly in a secure place so it is not loose in the vehicle.

1-8 **Safety—Seats, seat belts and supplemental restraint system**

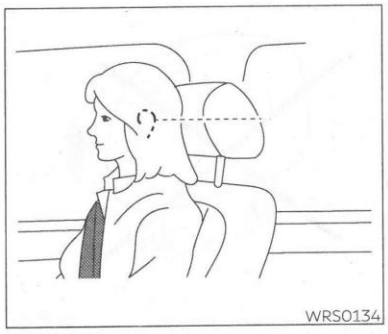
103 Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

5. Reinstall and properly adjust the head restraint/headrest before an occupant uses the seating position.



INSTALL

1. Align the head restraint/headrest stalks with the holes in the seat. Make sure that the head restraint/headrest is facing the correct direction. The stalk with the notch (notches) ① must be installed in the hole with the lock knob ②.
2. Push and hold the lock knob and push the head restraint/headrest down.
3. Properly adjust the head restraint/headrest before an occupant uses the seating position.



ADJUST

For adjustable head restraint/headrest

Adjust the head restraint/headrest so the center is level with the center of your ears. If your ear position is still higher than the recommended alignment, place the head restraint/headrest at the highest position.

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

Additional Driver & Passenger Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

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

NHTSA

Test Date: 03/21/2019

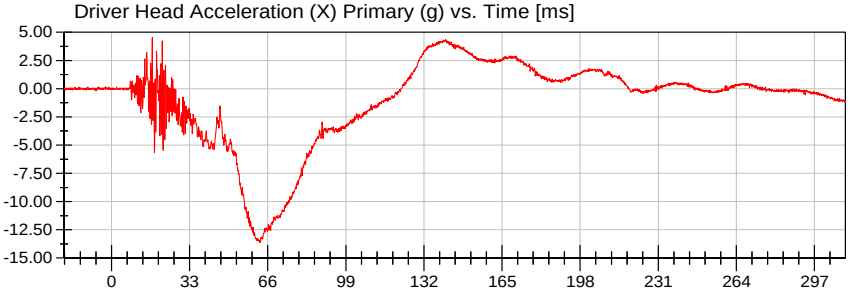
Test Lab: CTF

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

Test Number: 190321 (M20195215)

Position #4 SID IIs Dummy (305)

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



<Max>

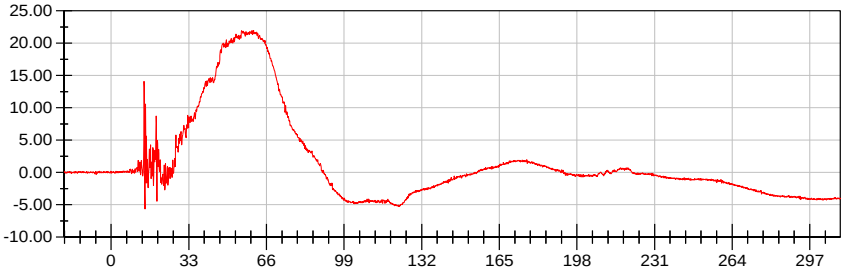
4.55 g at 17.20 ms

<Min>

-13.62 g at 62.80 ms

CFC_1000

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



<Max>

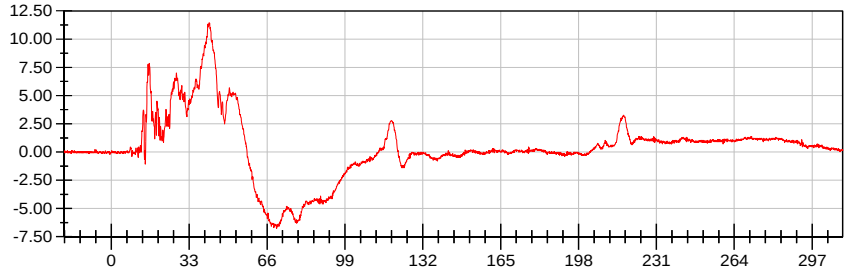
21.98 g at 60.48 ms

<Min>

-5.66 g at 14.32 ms

CFC_1000

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



<Max>

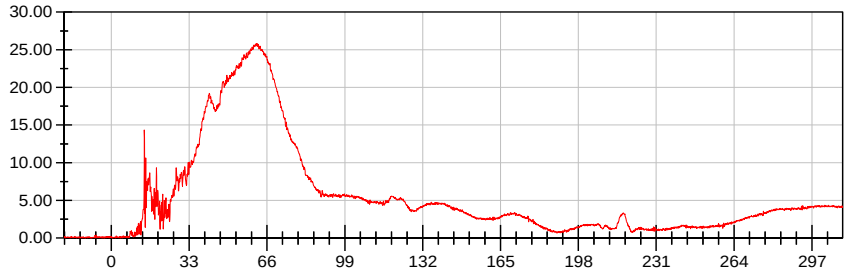
11.46 g at 41.44 ms

<Min>

-6.77 g at 70.08 ms

CFC_1000

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



<Max>

25.85 g at 61.84 ms

<Min>

0.02 g at -19.60 ms

CFC_1000

NHTSA

Test Date: 03/21/2019

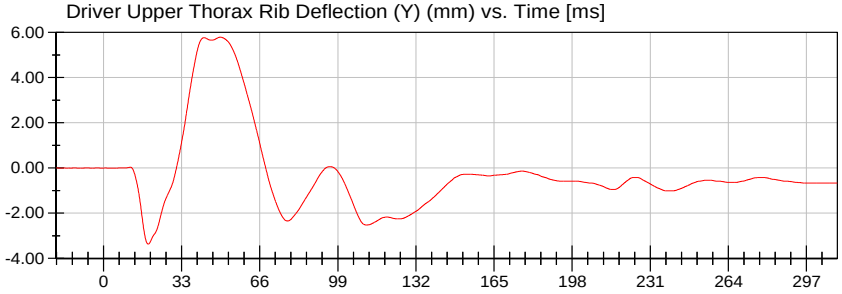
Test Lab: CTF

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

Test Number: 190321 (M20195215)

Position #4 SID IIs Dummy (305)

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



<Max>

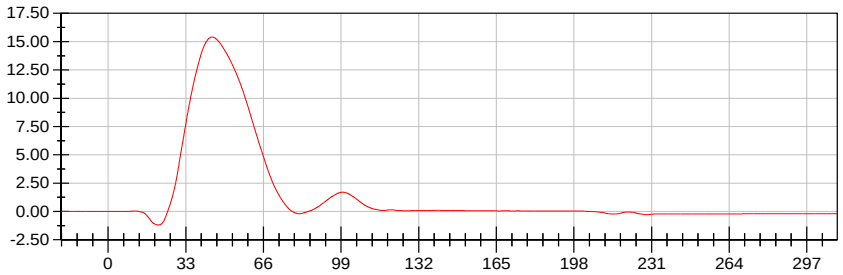
5.79 mm at 49.36 ms

<Min>

-3.37 mm at 18.88 ms

CFC_180

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



<Max>

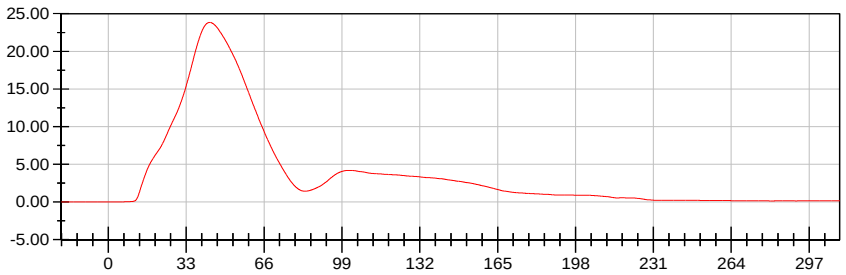
15.40 mm at 44.24 ms

<Min>

-1.19 mm at 21.36 ms

CFC_180

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



<Max>

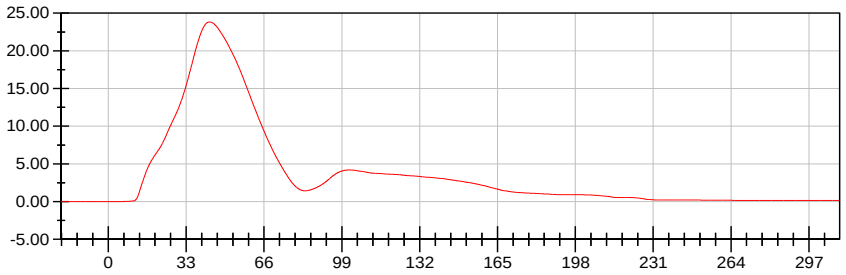
23.83 mm at 42.96 ms

<Min>

0.00 mm at -10.64 ms

CFC_180

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



<Max>

23.83 mm at 42.96 ms

<Min>

0.00 mm at -10.64 ms

CFC_180

NHTSA

Test Date: 03/21/2019

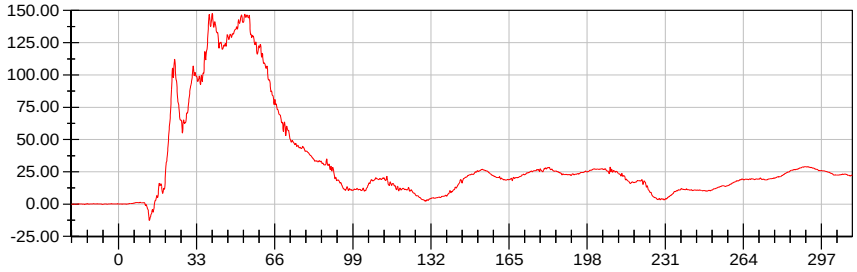
Test Lab: CTF

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

Test Number: 190321 (M20195215)

Position #4 SID IIs Dummy (305)

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



<Max>

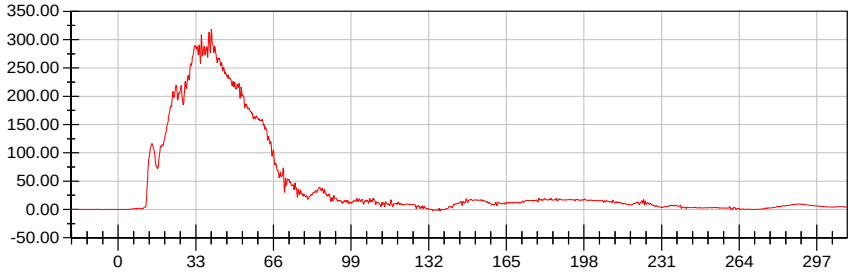
147.61 N at 39.60 ms

<Min>

-12.73 N at 13.04 ms

CFC_600

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



<Max>

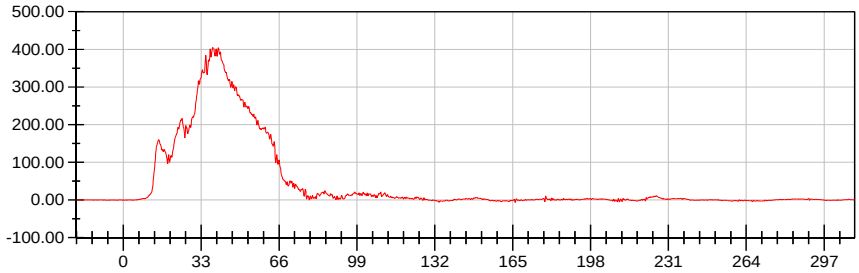
318.31 N at 39.60 ms

<Min>

-2.79 N at 136.80 ms

CFC_600

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



<Max>

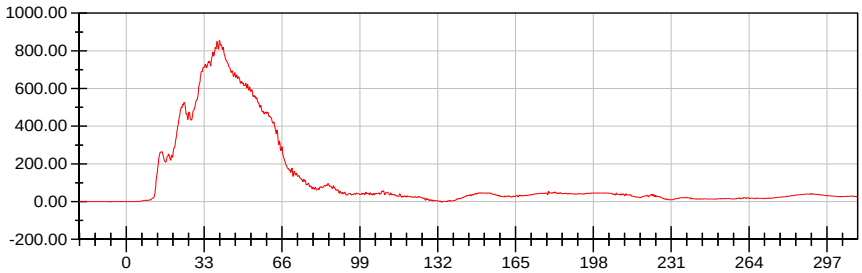
404.78 N at 37.92 ms

<Min>

-6.52 N at 166.08 ms

CFC_600

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



<Max>

855.26 N at 39.52 ms

<Min>

-3.21 N at 133.84 ms

CFC_600

NHTSA

Test Date: 03/21/2019

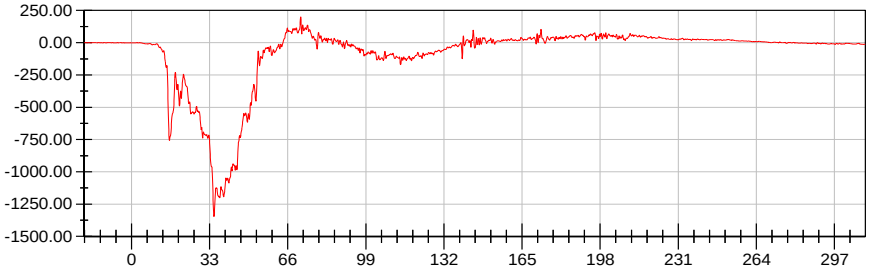
Test Lab: CTF

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

Test Number: 190321 (M20195215)

Position #4 SID IIs Dummy (305)

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



<Max>

198.76 N at 71.52 ms

<Min>

-1,347.18 N at 34.88 ms

CFC_600

NHTSA

Test Date: 03/21/2019

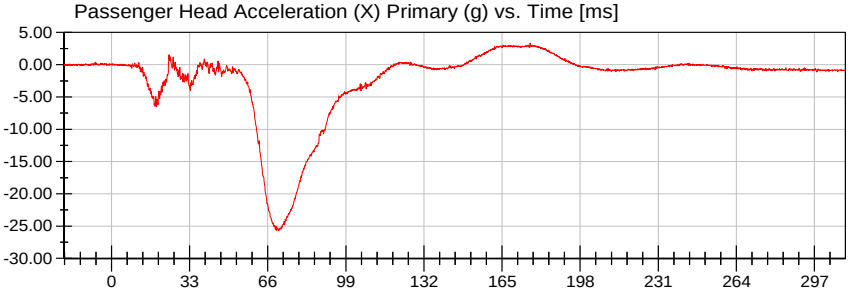
Test Lab: CTF

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

Test Number: 190321 (M20195215)

Position #4 SID IIs Dummy (305)

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



<Max>

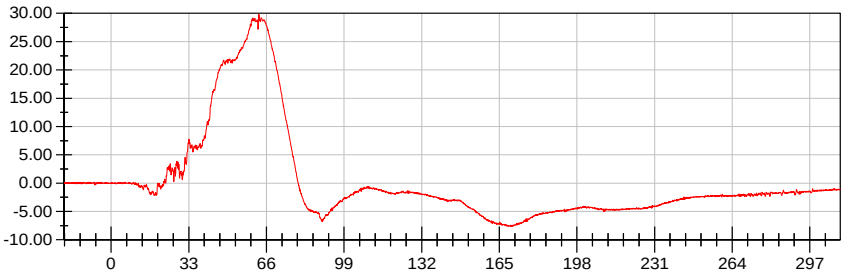
3.34 g at 176.88 ms

<Min>

-25.71 g at 70.48 ms

CFC_1000

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



<Max>

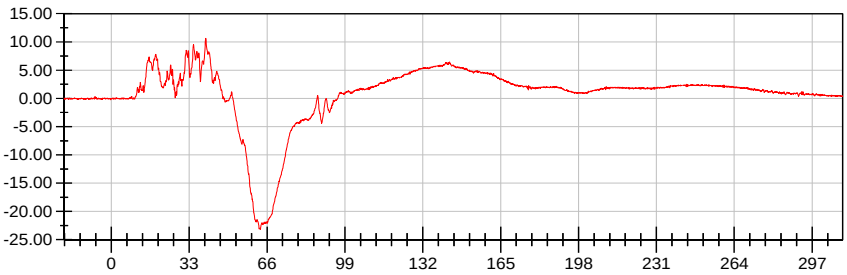
29.82 g at 62.80 ms

<Min>

-7.64 g at 169.52 ms

CFC_1000

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



<Max>

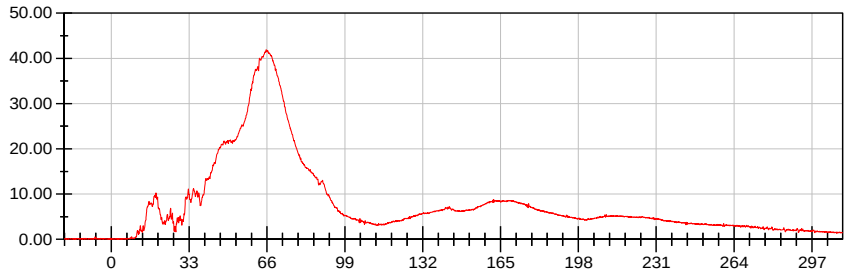
10.63 g at 40.00 ms

<Min>

-23.17 g at 63.12 ms

CFC_1000

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



<Max>

41.89 g at 65.68 ms

<Min>

0.02 g at -15.76 ms

CFC_1000

NHTSA

Test Date: 03/21/2019

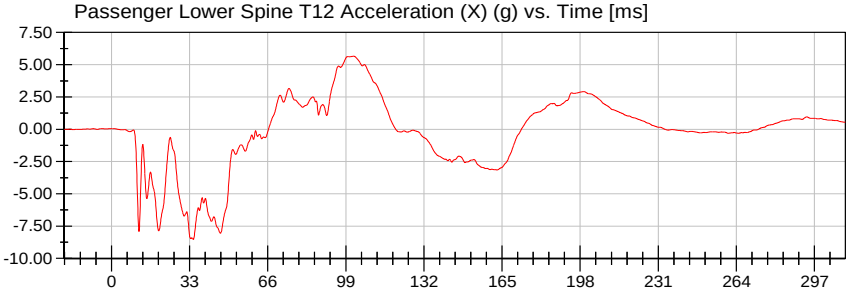
Test Lab: CTF

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

Test Number: 190321 (M20195215)

Position #4 SID IIs Dummy (305)

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



<Max>

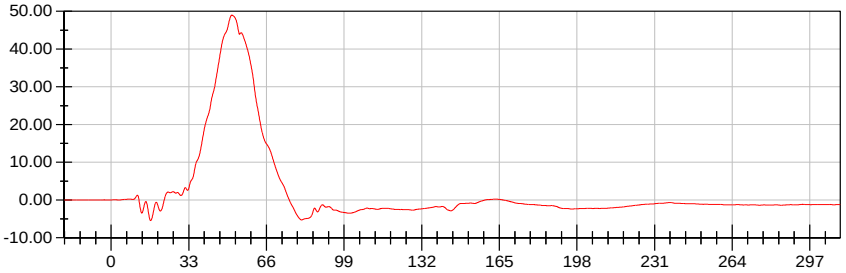
5.66 g at 102.32 ms

<Min>

-8.53 g at 34.56 ms

CFC_180

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



<Max>

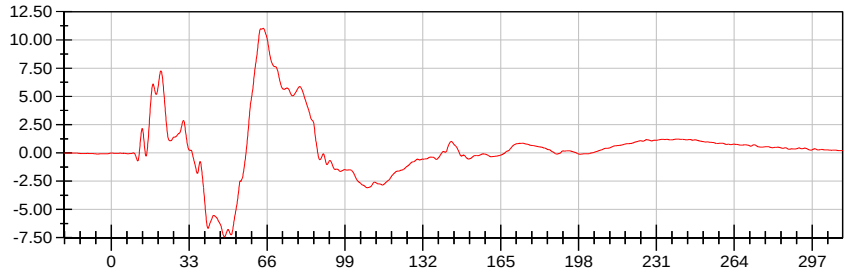
48.99 g at 51.36 ms

<Min>

-5.46 g at 16.80 ms

CFC_180

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



<Max>

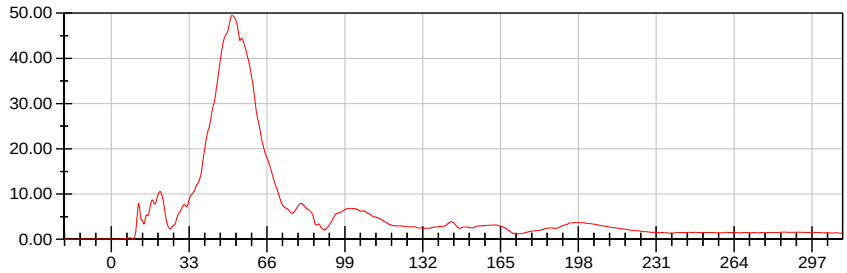
11.02 g at 64.48 ms

<Min>

-7.43 g at 47.92 ms

CFC_180

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



<Max>

49.50 g at 51.28 ms

<Min>

0.01 g at -17.12 ms

CFC_180

NHTSA

Test Date: 03/21/2019

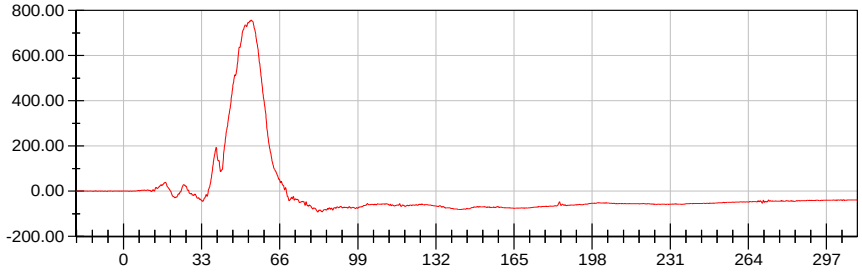
Test Lab: CTF

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

Test Number: 190321 (M20195215)

Position #4 SID IIs Dummy (305)

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



<Max>

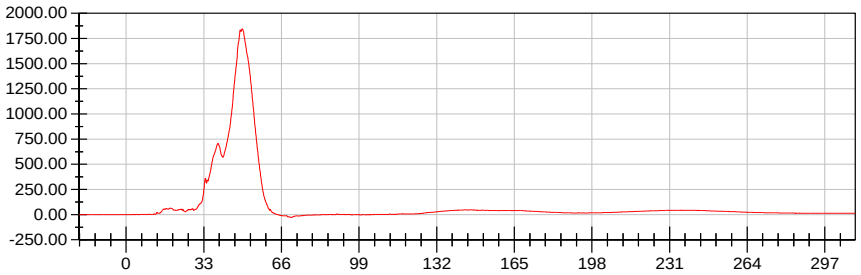
756.85 N at 53.92 ms

<Min>

-92.26 N at 82.08 ms

CFC_600

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



<Max>

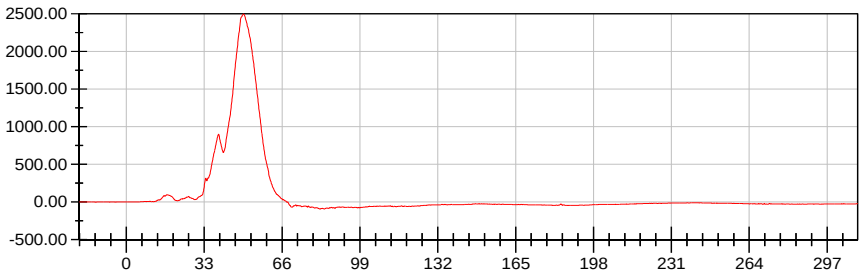
1,845.17 N at 49.36 ms

<Min>

-28.66 N at 70.24 ms

CFC_600

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



<Max>

2,493.95 N at 49.68 ms

<Min>

-94.67 N at 82.16 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

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

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

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

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

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

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

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

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

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 61

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	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	97	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	328	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	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. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Peak Resultant Acceleration	125 - 155 g	135.3 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.5 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	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

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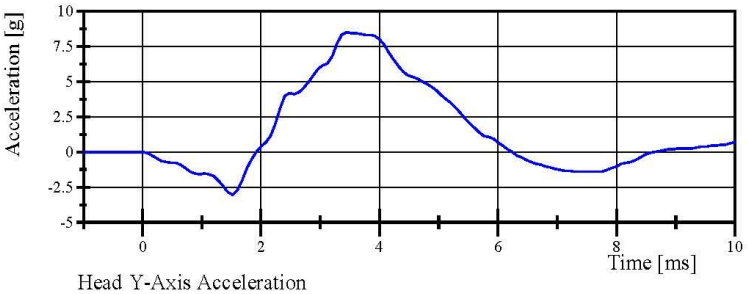
Transportation Research Center Inc.

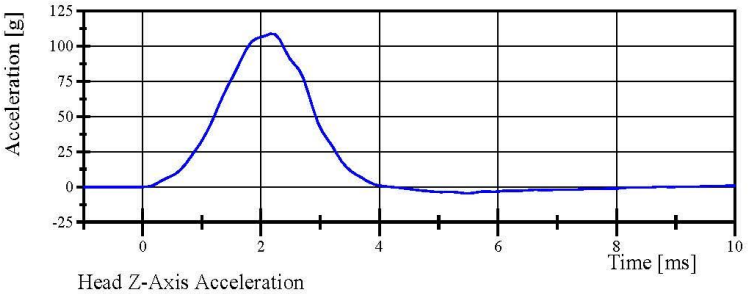
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Head X-Axis Acceleration



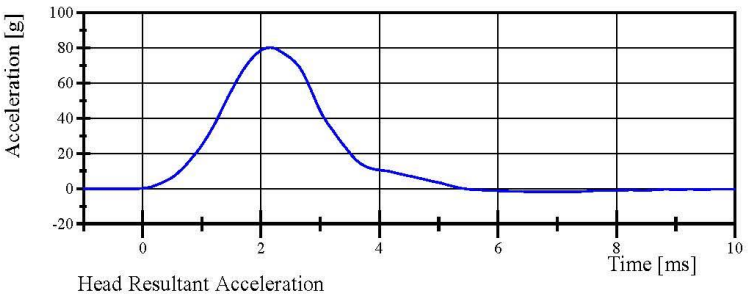
Filter Class: CFC_1000
Max: 8.5 g at 3.4 ms
Min: -3.0 g at 1.5 ms

Head Y-Axis Acceleration



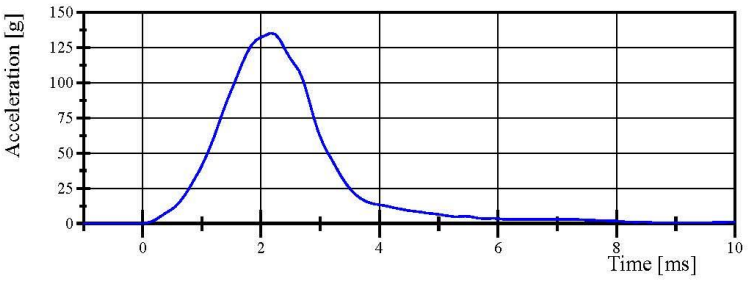
Filter Class: CFC_1000
Max: 108.9 g at 2.2 ms
Min: -4.6 g at 5.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 80.3 g at 2.2 ms
Min: -1.8 g at 6.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 135.3 g at 2.2 ms
Min: 0.0 g at -1.0 ms

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

02.22.2019 08:58:43 327

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 61-3
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.33 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-50.6 deg	Yes
Time of Peak	54 - 66 ms	54.2 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	62.5 ms	Yes

Test meets specifications.

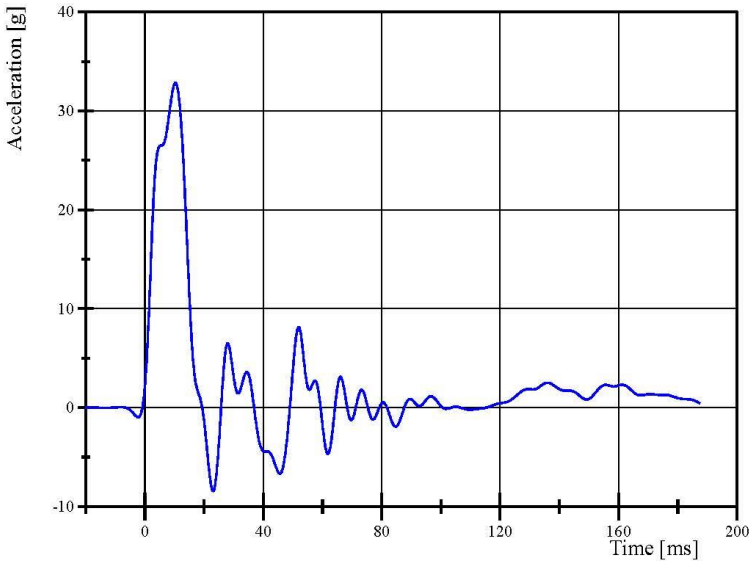
Condition: Used

Comments:
Neck S/N: DS5463

Transportation Research Center Inc.

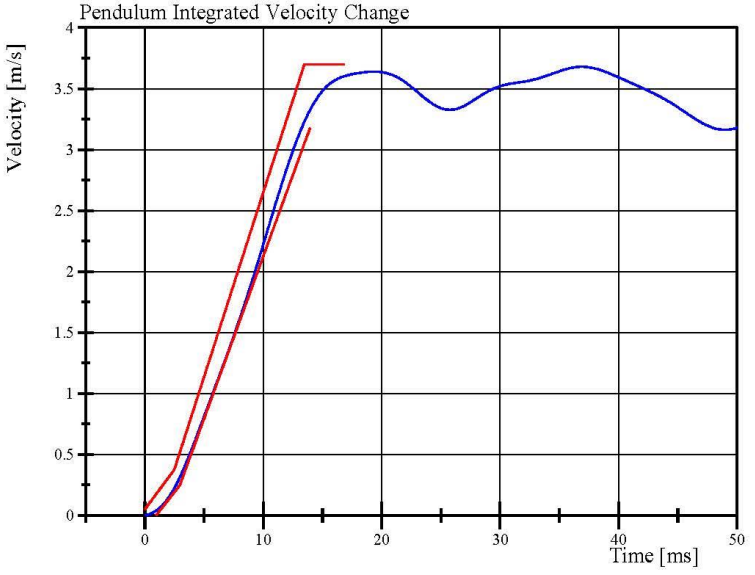
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 61-3
Test Date: 2/22/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 32.8 g at 10.3 ms
Min: -8.4 g at 23.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.7 m/s at 36.9 ms
Min: 0.0 m/s at 0.0 ms

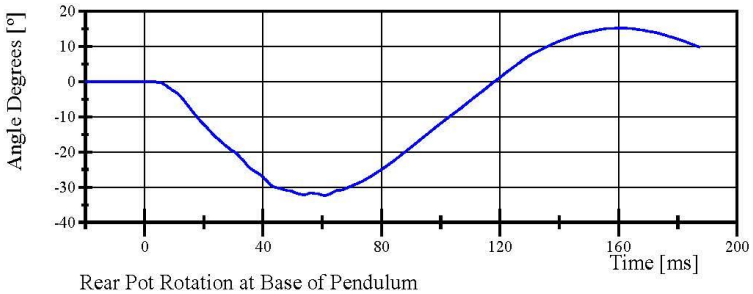
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.22.2019 14:44:26 1481

Transportation Research Center Inc.

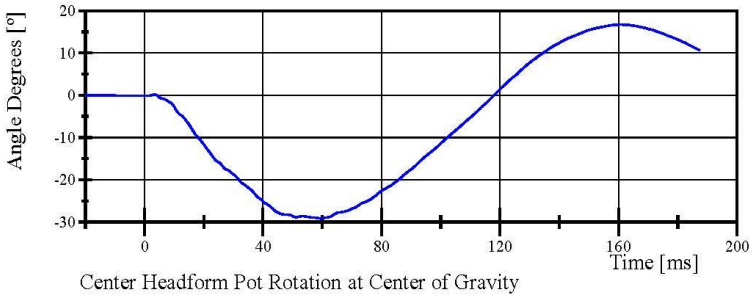
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 61-3
Test Date: 2/22/2019

Forward Pot Rotation at Base of Pendulum



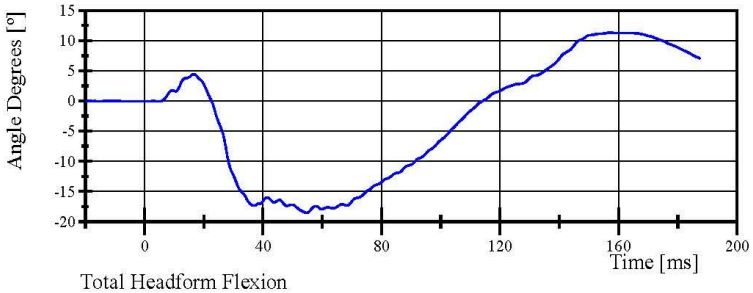
Filter Class: CFC_180
Max: 15.3 ° at 160.5 ms
Min: -32.3 ° at 60.8 ms

Rear Pot Rotation at Base of Pendulum



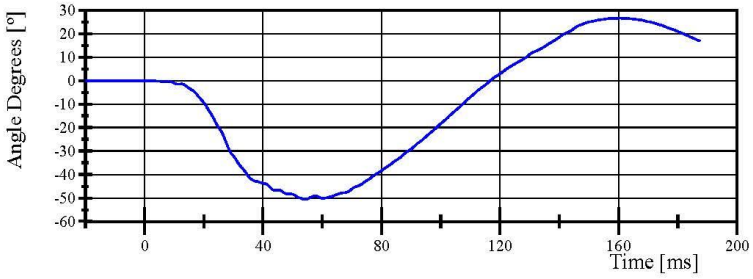
Filter Class: CFC_180
Max: 16.7 ° at 160.7 ms
Min: -29.1 ° at 59.4 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.3 ° at 157.0 ms
Min: -18.5 ° at 54.6 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 26.5 ° at 160.5 ms
Min: -50.6 ° at 54.2 ms

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

02.22.2019 14:44:27 1481

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.32 g	Yes

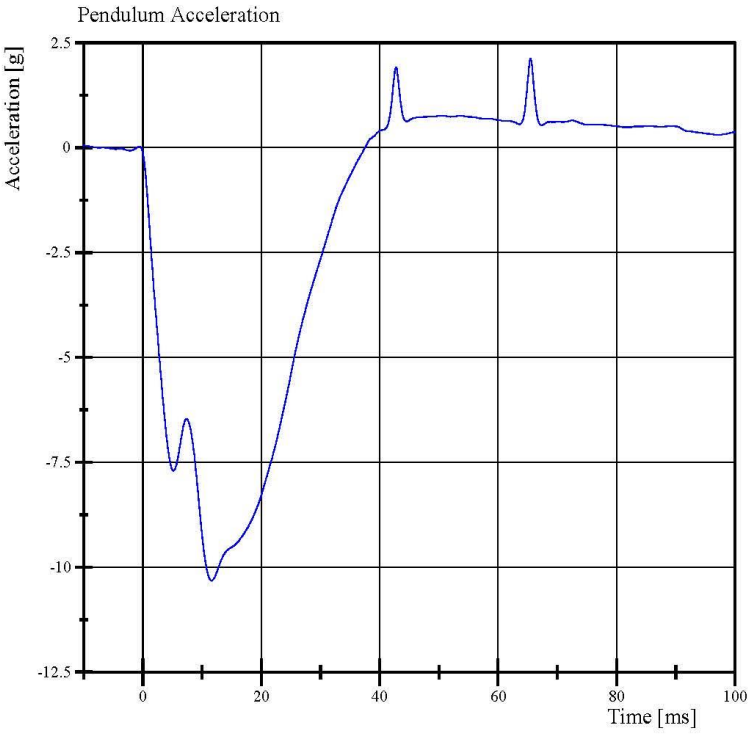
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 2.1 g at 65.5 ms
Min: -10.3 g at 11.6 ms

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

02.22.2019 15:50:42 523

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.3 mm	Yes

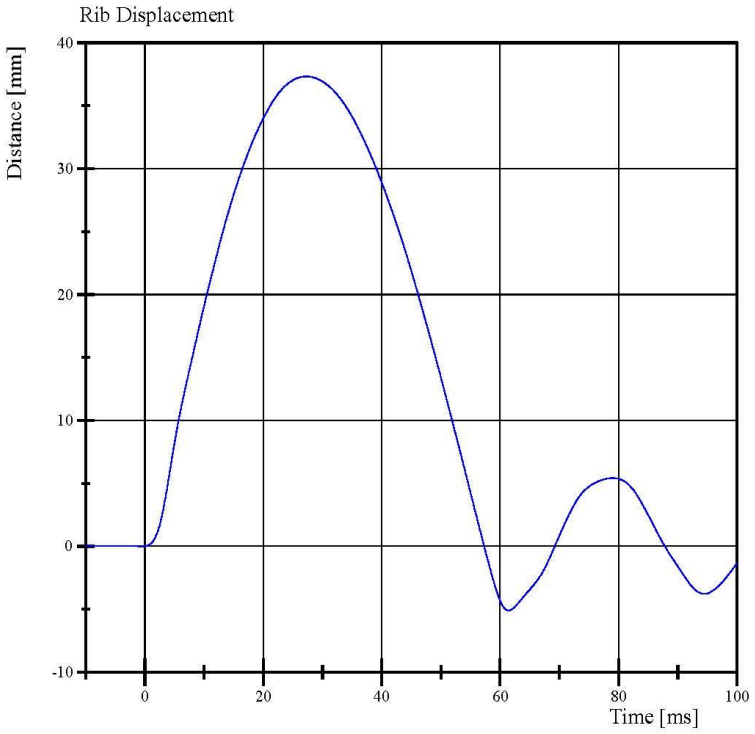
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 37.3 mm at 27.3 ms
Min: -5.1 mm at 61.4 ms

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

02.22.2019 09:29:11 498

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.8 mm	Yes

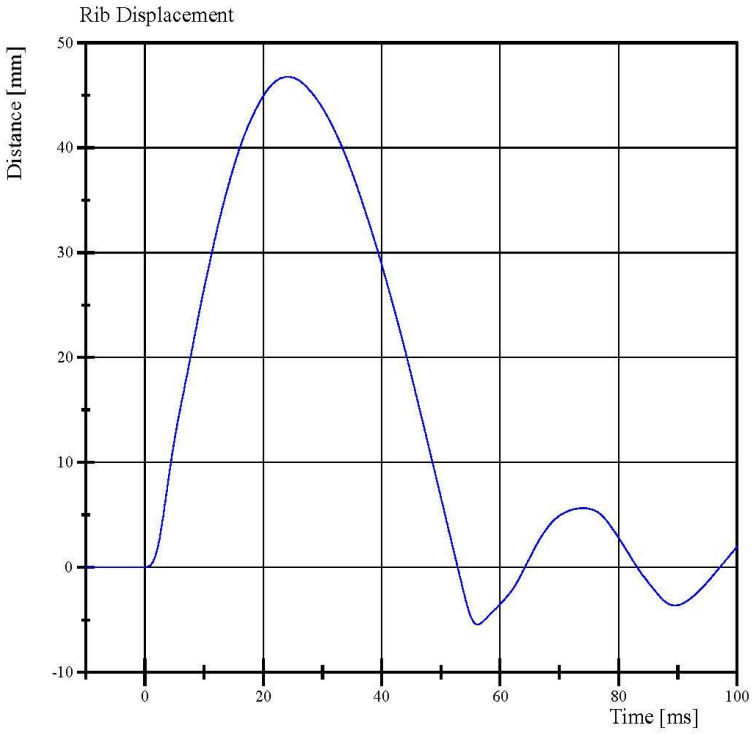
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 46.8 mm at 24.2 ms
Min: -5.5 mm at 56.2 ms

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

02.22.2019 09:20:24 408

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ℃	21.4 ℃	Yes
Relative Humidity	10 - 70 %	38 %	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

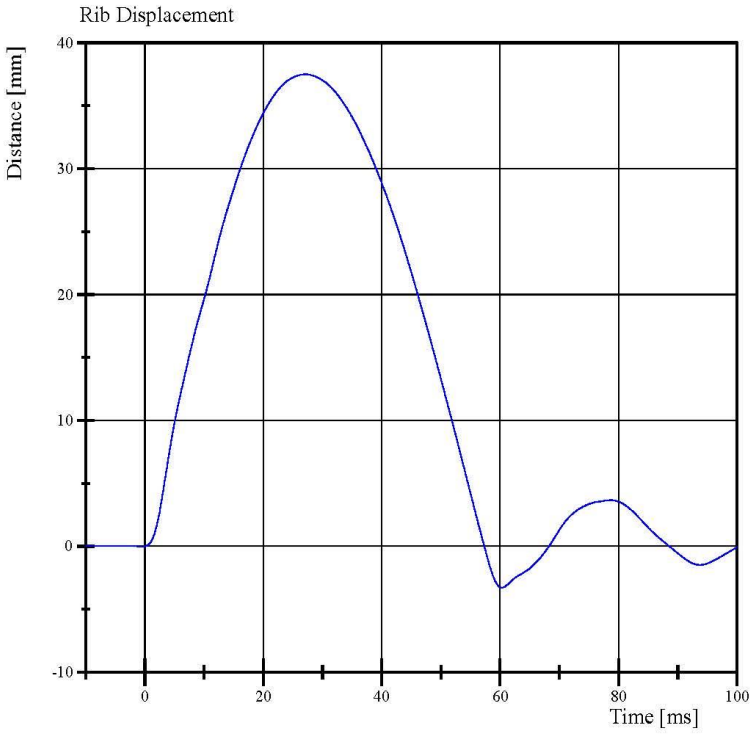
Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A

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

02.22.2019 09:49:53 500

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 37.5 mm at 27.1 ms
Min: -3.3 mm at 60.3 ms

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

02.22.2019 09:50:26 500

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ℃	21.4 ℃	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.5 mm	Yes

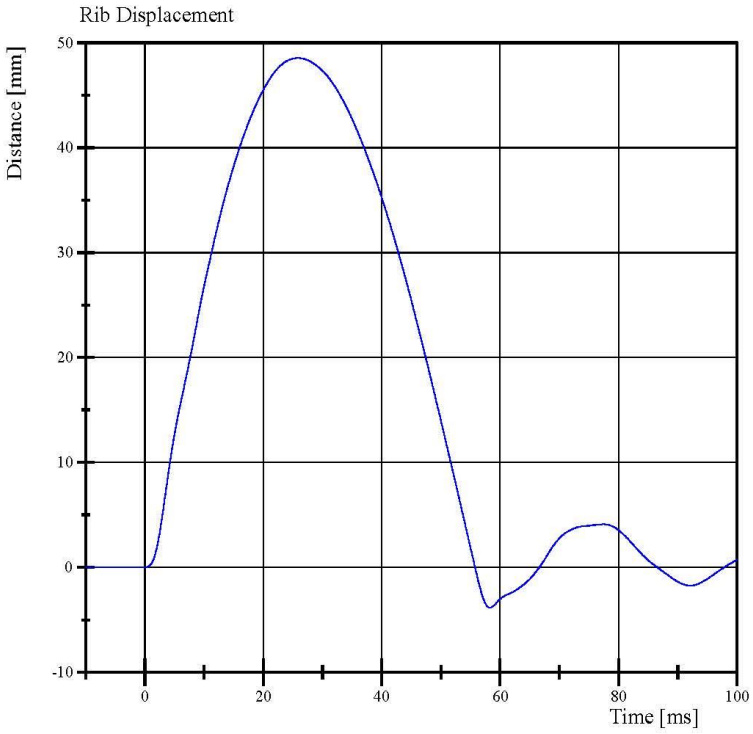
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 48.5 mm at 25.8 ms
Min: -3.8 mm at 58.2 ms

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

02.22.2019 09:38:05 420

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ℃	21.4 ℃	Yes
Relative Humidity	10 - 70 %	41 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.4 mm	Yes

Test meets specifications.

Condition: Used

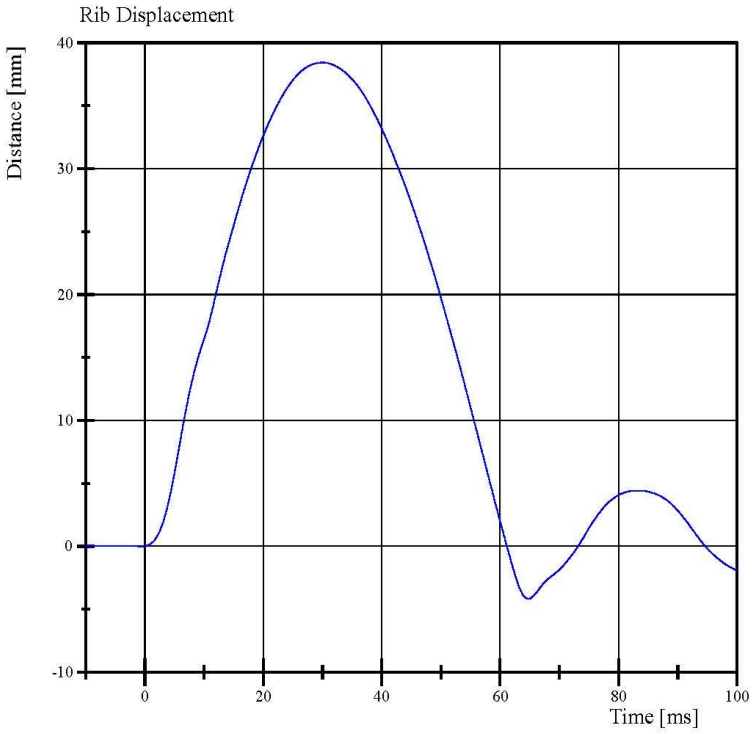
Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A-06-017

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

02.22.2019 10:01:58 456

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 38.4 mm at 30.0 ms
Min: -4.2 mm at 64.7 ms

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

02.22.2019 10:02:31 456

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.5 mm	Yes

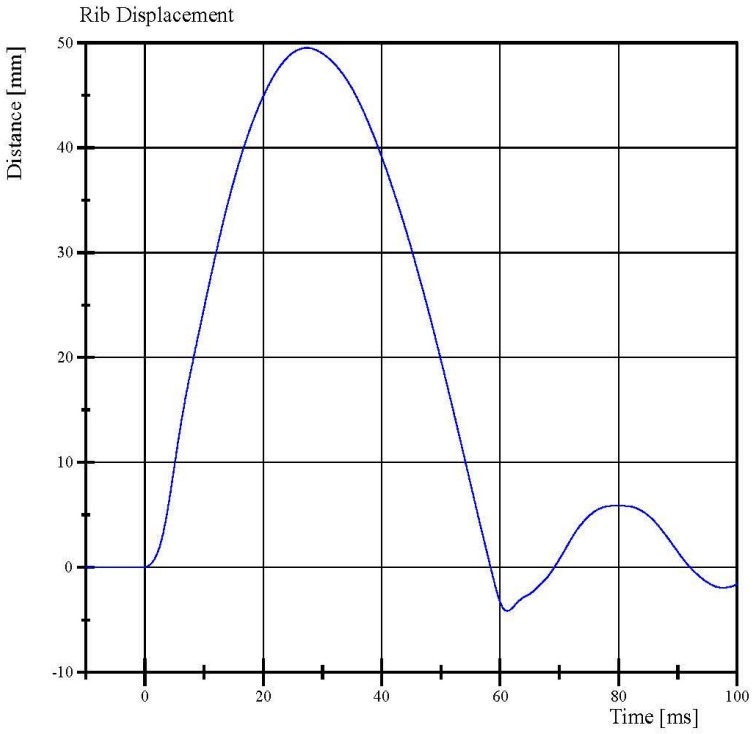
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 49.5 mm at 27.4 ms
Min: -4.2 mm at 61.2 ms

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

02.22.2019 09:56:30 412

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.547 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,507.4 N	Yes
Upper Rib Displacement	34 - 41 mm	38.4 mm	Yes
Center Rib Displacement	37 - 45 mm	42.9 mm	Yes
Lower Rib Displacement	37 - 44 mm	42.0 mm	Yes

Test meets specifications.

Condition: Used

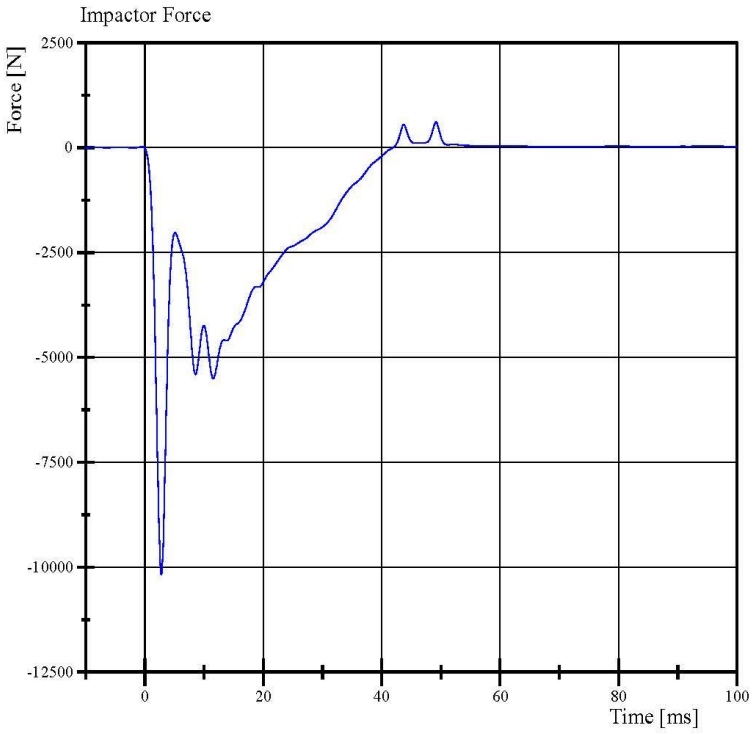
Comments:
Upper Rib Module S/N: 175-4008-A
Middle Rib Module S/N: 175-4008-A
Lower Rib Module S/N: 175-4008-A-06-017

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

02.22.2019 15:54:00 445

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019



Filter Class: CFC_180
Max: 613.3 N at 49.2 ms
Min: -10,174.7 N at 2.8 ms

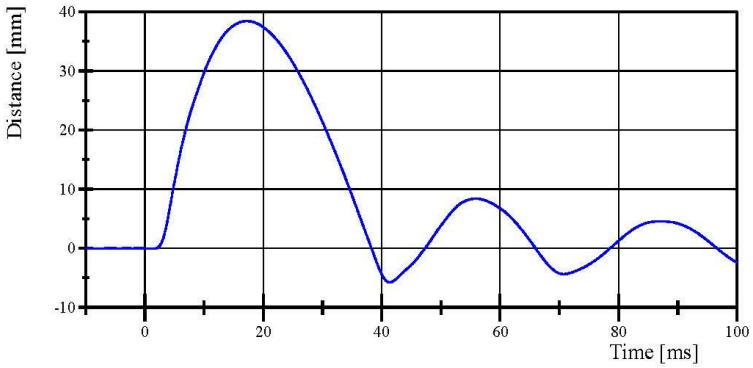
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.22.2019 15:54:33 445

Transportation Research Center Inc.

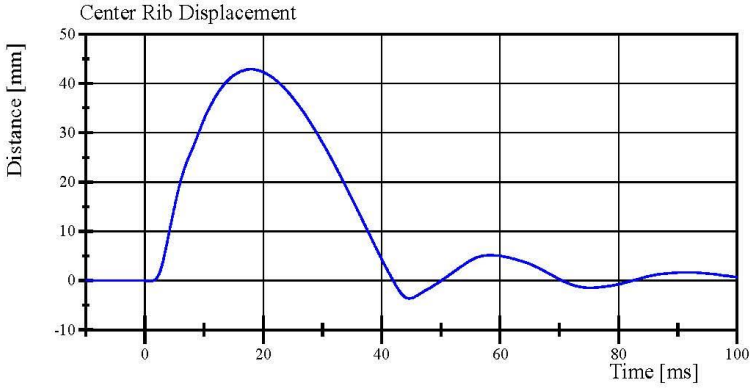
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 61-1
Test Date: 2/22/2019

Upper Rib Displacement



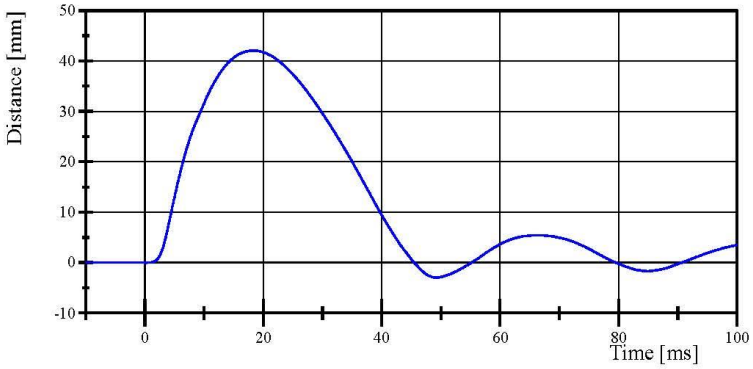
Filter Class: CFC_180
Max: 38.4 mm at 17.2 ms
Min: -5.7 mm at 41.4 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 42.9 mm at 18.0 ms
Min: -3.6 mm at 44.6 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 42.0 mm at 18.3 ms
Min: -3.0 mm at 49.2 ms

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

02.22.2019 15:54:34 445

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 61-3
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.097 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-48.1 deg	Yes
Time of Peak	39 - 53 ms	44.1 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.4 ms	Yes

Test meets specifications.

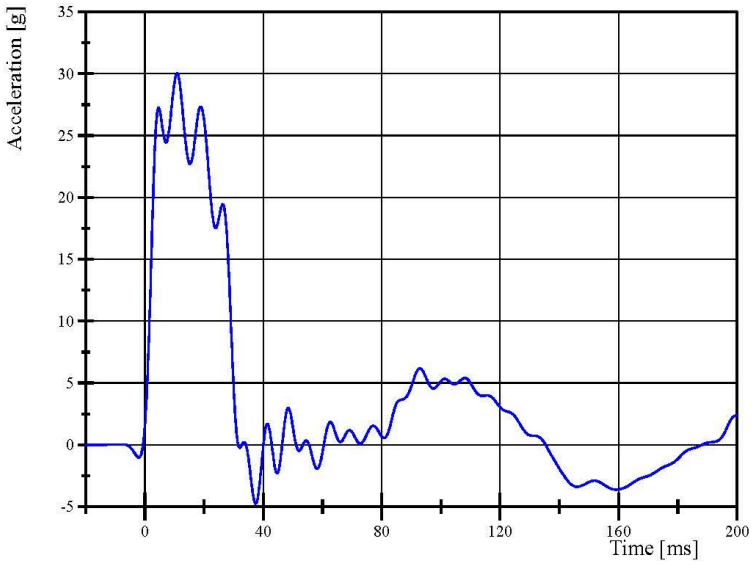
Condition: Used

Comments:
Lumbar S/N: DM3011

Transportation Research Center Inc.

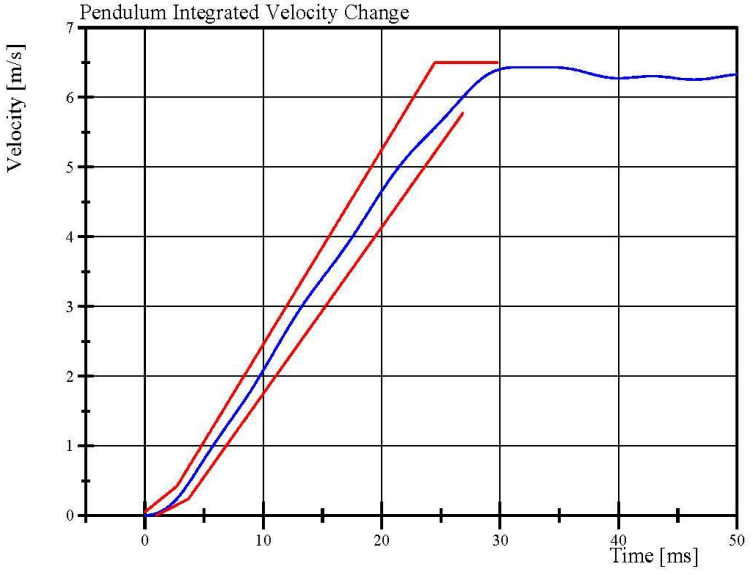
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 61-3
Test Date: 2/22/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 30.0 g at 10.9 ms
Min: -4.7 g at 37.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.4 m/s at 31.5 ms
Min: 0.0 m/s at 0.0 ms

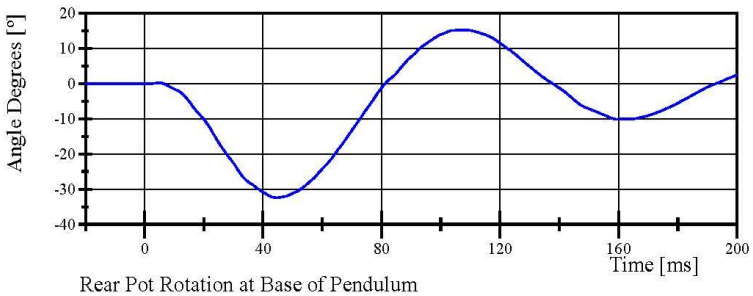
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.22.2019 12:47:50 639

Transportation Research Center Inc.

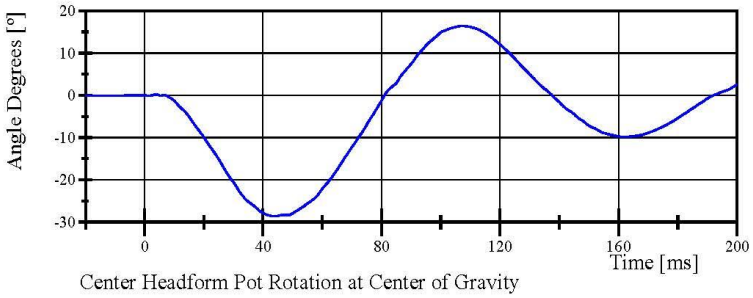
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 61-3
Test Date: 2/22/2019

Forward Pot Rotation at Base of Pendulum



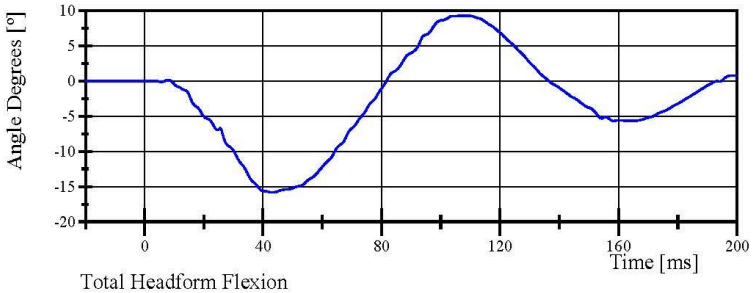
Filter Class: CFC_180
Max: 15.3 ° at 108.2 ms
Min: -32.4 ° at 44.6 ms

Rear Pot Rotation at Base of Pendulum



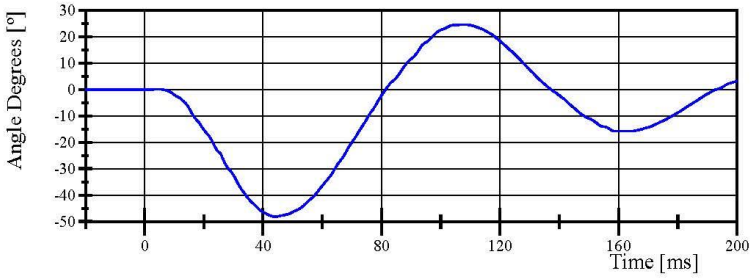
Filter Class: CFC_180
Max: 16.5 ° at 107.2 ms
Min: -28.6 ° at 43.8 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 9.3 ° at 109.0 ms
Min: -15.8 ° at 43.3 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 24.6 ° at 108.3 ms
Min: -48.1 ° at 44.1 ms

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

02.22.2019 12:47:51 639

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 61-2
Test Date: 2/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.10 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,318.8 N	Yes
Time of Peak	10.6 - 13.0 ms	10.88 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,553.6 N	Yes
Time of Peak	10.0 - 12.3 ms	10.96 ms	Yes

Test meets specifications.

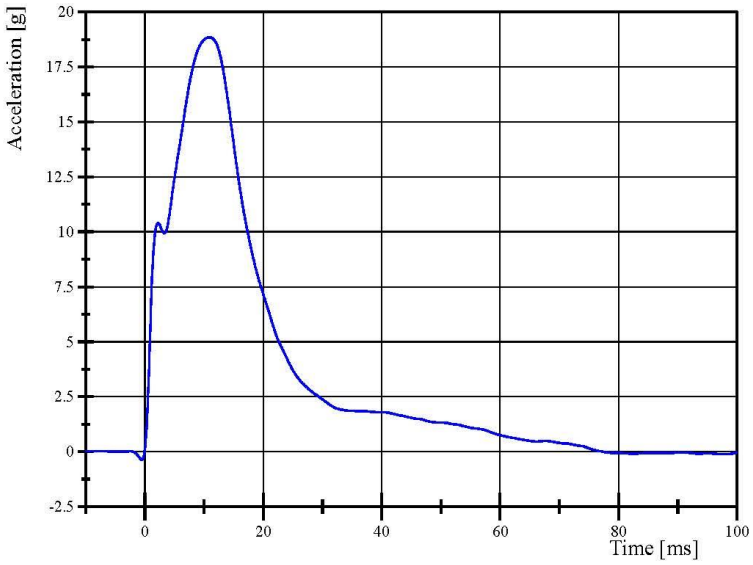
Condition: Used

Comments:
Abdomen S/N: 1066

Transportation Research Center Inc.

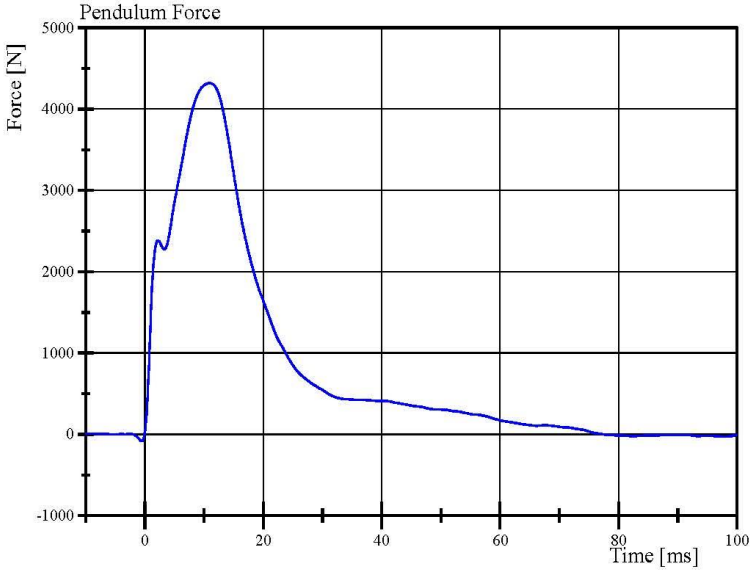
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 61-2
Test Date: 2/25/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.8 g at 10.9 ms
Min: -0.4 g at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,318.8 N at 10.9 ms
Min: -83.0 N at -0.6 ms

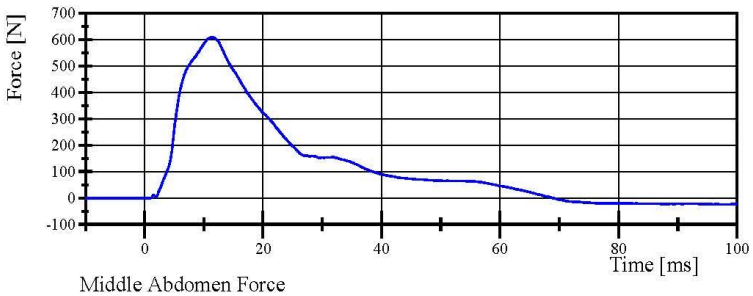
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

02.25.2019 07:44:40 578

Transportation Research Center Inc.

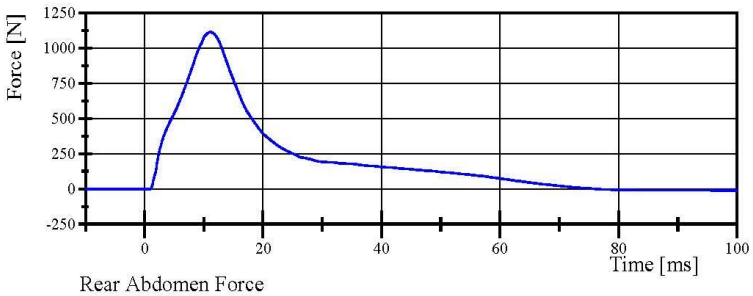
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 61-2
Test Date: 2/25/2019

Front Abdomen Force



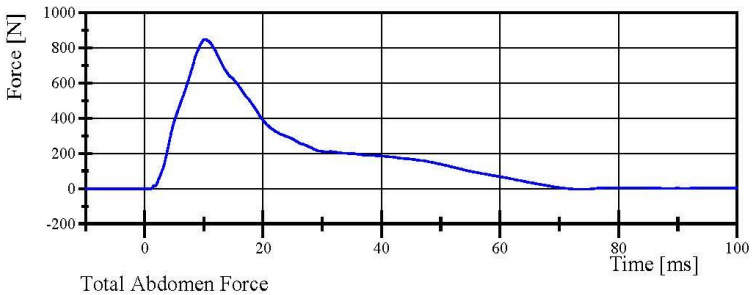
Filter Class: CFC_600
Max: 609.0 N at 11.4 ms
Min: -23.9 N at 98.3 ms

Middle Abdomen Force



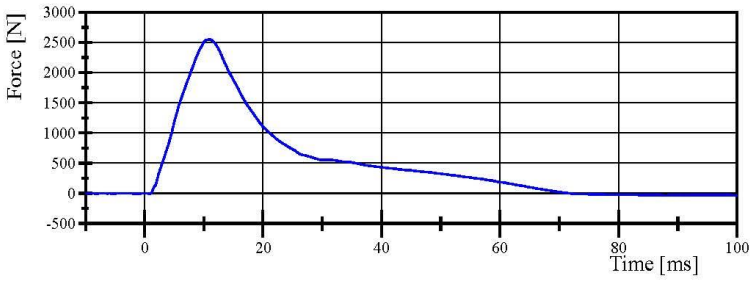
Filter Class: CFC_600
Max: 1,114.7 N at 11.1 ms
Min: -10.6 N at 98.2 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 848.8 N at 10.2 ms
Min: -4.2 N at 73.9 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,553.6 N at 11.0 ms
Min: -31.0 N at 99.8 ms

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

02.25.2019 07:44:41 578

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 61-2
Test Date: 2/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.38 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,305.1 N	Yes
Time of Peak	11.8 - 16.1 ms	12.48 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,269.1 N	Yes
Time of Peak	12.2 - 17.0 ms	12.88 ms	Yes

Test meets specifications.

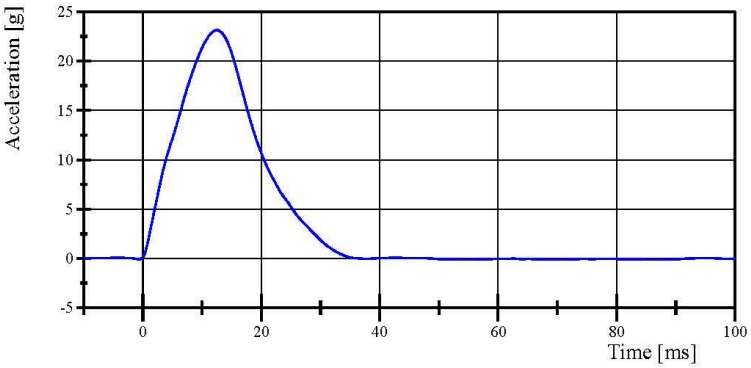
Condition: Used

Comments:
Pelvis Skin S/N: N/A

Transportation Research Center Inc.

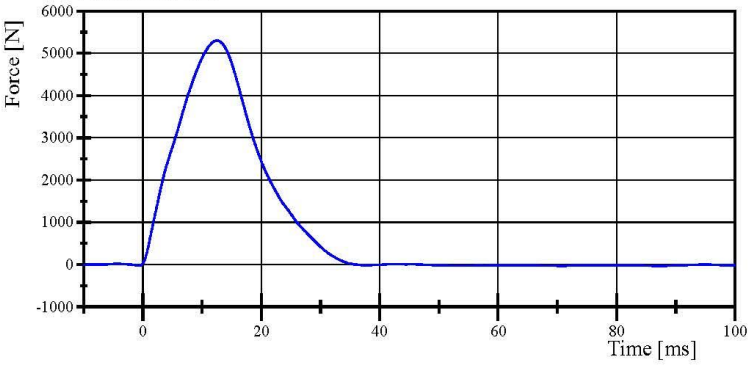
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 61-2
Test Date: 2/25/2019

Pendulum Acceleration



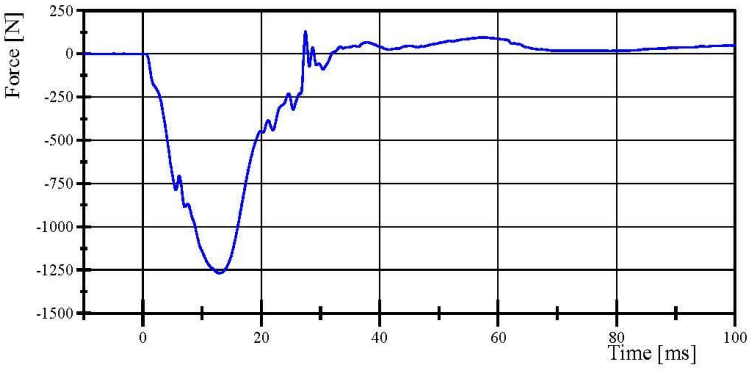
Filter Class: CFC_180
Max: 23.1 g at 12.5 ms
Min: -0.2 g at 70.9 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,305.1 N at 12.5 ms
Min: -35.2 N at 70.9 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 128.8 N at 27.4 ms
Min: -1,269.1 N at 12.9 ms

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. 62

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	561	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	97	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	328	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	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. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	143.2 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	9.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

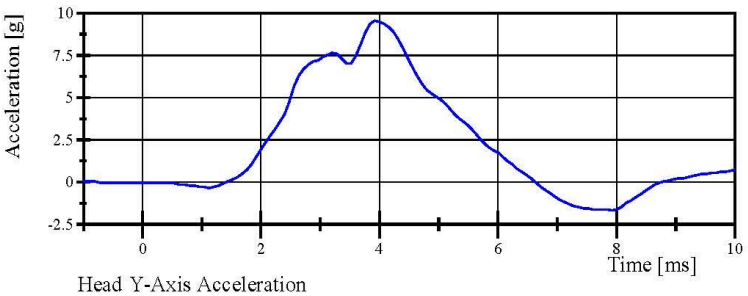
Condition: Used

Comments:
Head Skin S/N: DP6812

Transportation Research Center Inc.

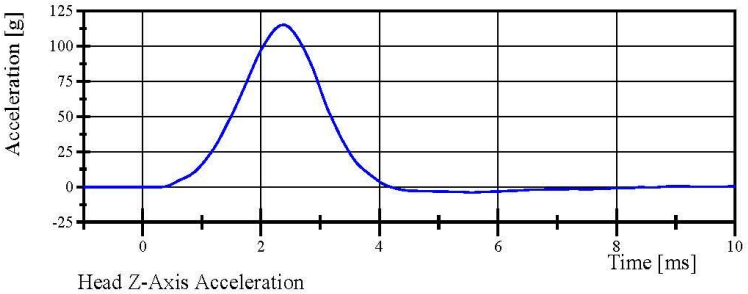
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Head X-Axis Acceleration



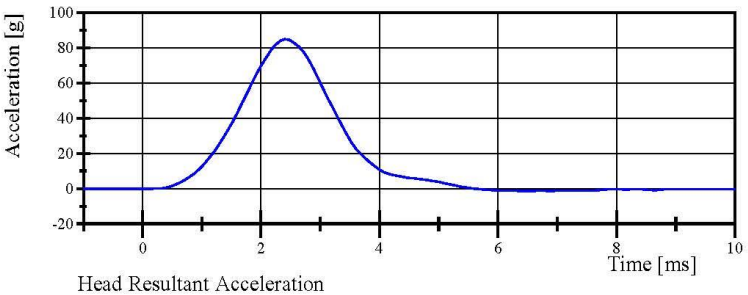
Filter Class: CFC_1000
Max: 9.6 g at 3.9 ms
Min: -1.7 g at 7.9 ms

Head Y-Axis Acceleration



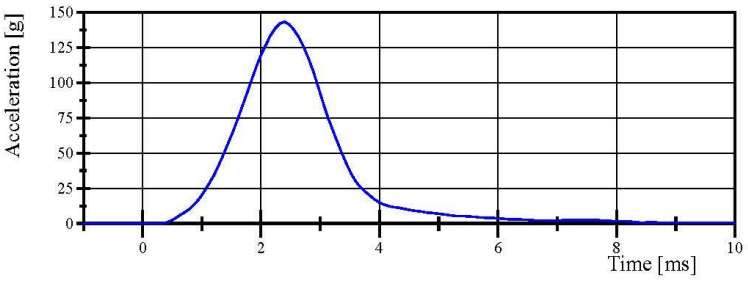
Filter Class: CFC_1000
Max: 115.2 g at 2.4 ms
Min: -3.9 g at 5.5 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 85.0 g at 2.4 ms
Min: -1.3 g at 6.4 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 143.2 g at 2.4 ms
Min: 0.0 g at -0.7 ms

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

03.22.2019 08:58:29 324

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 62-4
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.44 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-53.3 deg	Yes
Time of Peak	54 - 66 ms	54.4 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	63.9 ms	Yes

Test meets specifications.

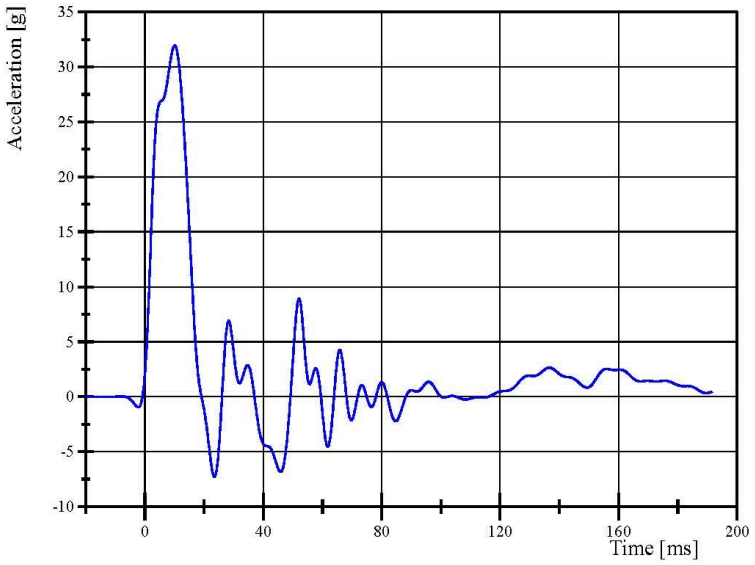
Condition: Used

Comments:
Neck S/N: DS5463

Transportation Research Center Inc.

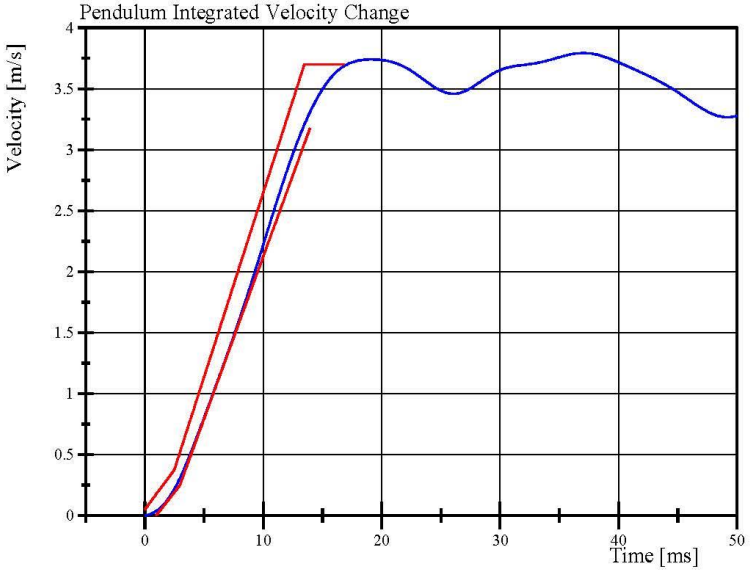
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 62-4
Test Date: 3/25/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.9 g at 10.1 ms
Min: -7.3 g at 23.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.8 m/s at 37.0 ms
Min: 0.0 m/s at 0.0 ms

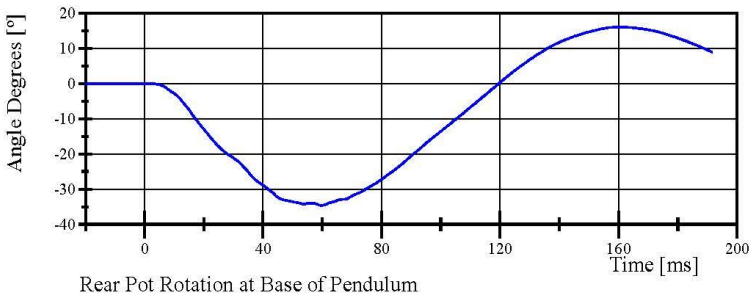
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 07:24:13 1430

Transportation Research Center Inc.

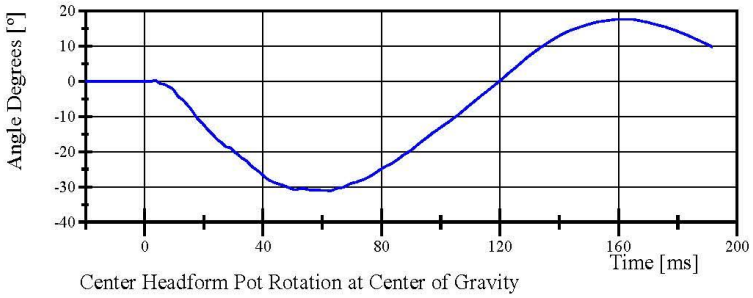
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 62-4
Test Date: 3/25/2019

Forward Pot Rotation at Base of Pendulum



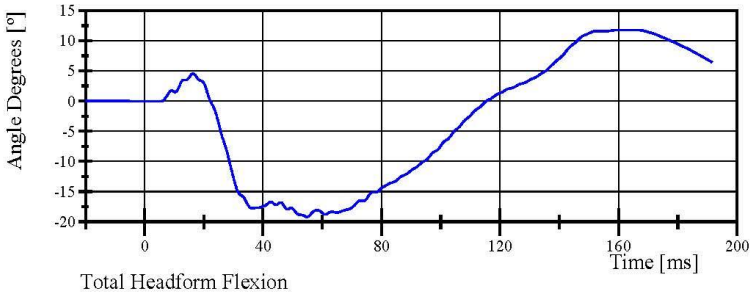
Filter Class: CFC_180
Max: 16.0 ° at 161.7 ms
Min: -34.6 ° at 59.7 ms

Rear Pot Rotation at Base of Pendulum



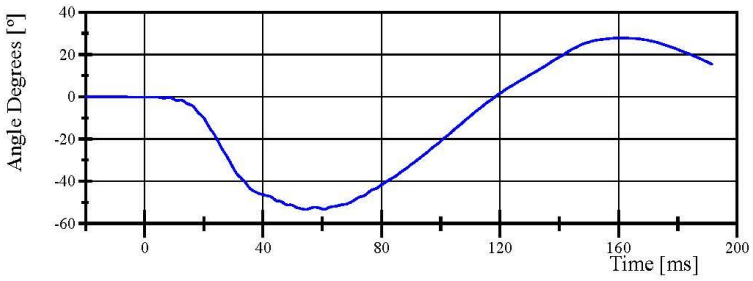
Filter Class: CFC_180
Max: 17.7 ° at 162.6 ms
Min: -31.0 ° at 62.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.8 ° at 166.5 ms
Min: -19.2 ° at 54.8 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 27.8 ° at 161.7 ms
Min: -53.3 ° at 54.4 ms

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

03.25.2019 07:24:14 1430

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.22 g	Yes

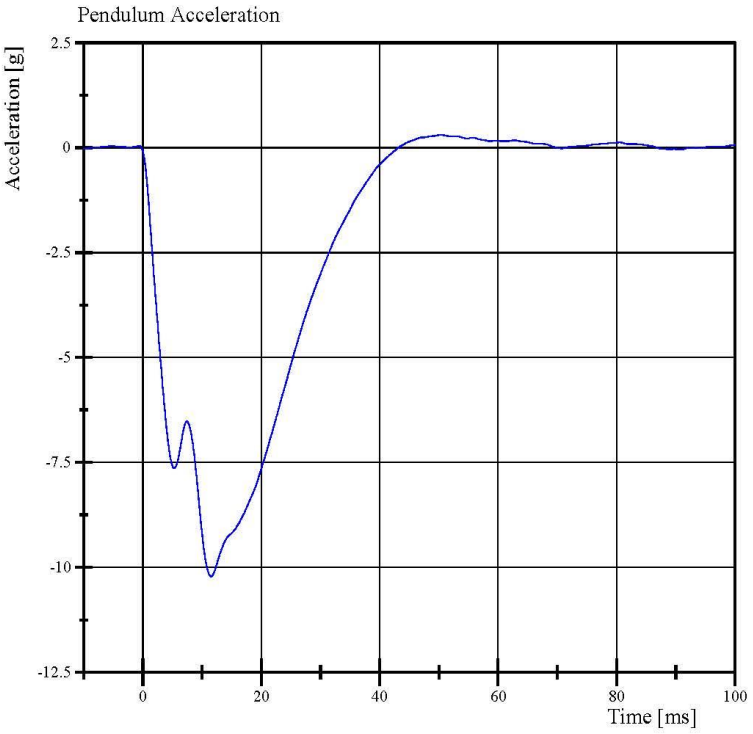
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019



Filter Class: CFC_180
Max: 0.3 g at 50.4 ms
Min: -10.2 g at 11.5 ms

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

03.25.2019 08:16:51 554

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.4 mm	Yes

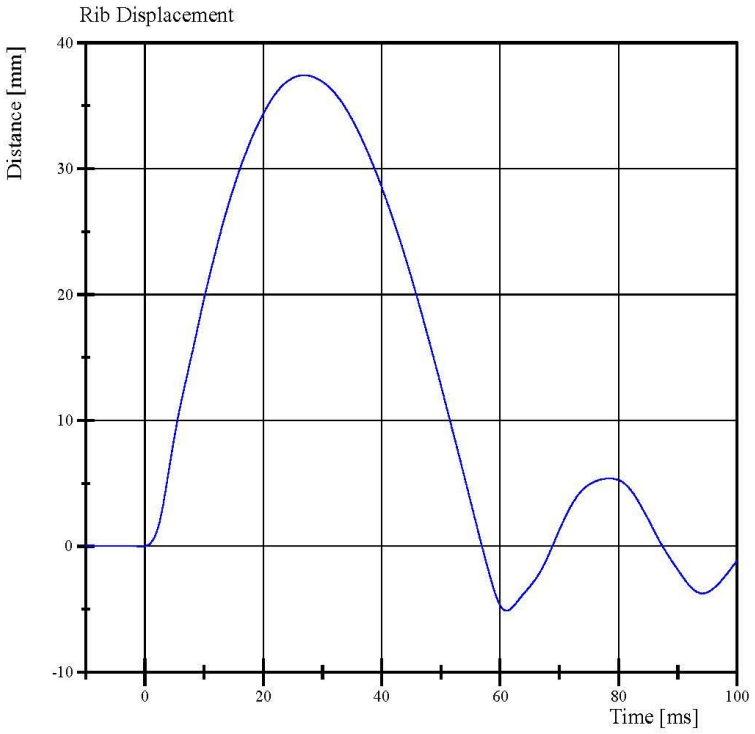
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 37.4 mm at 27.0 ms
Min: -5.1 mm at 61.0 ms

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

03.22.2019 09:14:43 481

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.7 mm	Yes

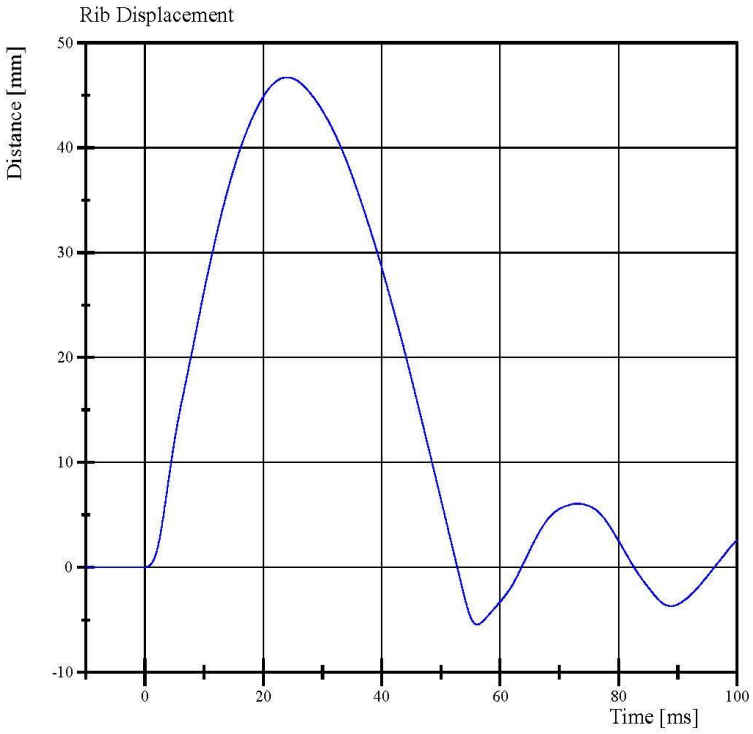
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 46.7 mm at 24.0 ms
Min: -5.5 mm at 56.1 ms

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

03.22.2019 09:05:00 409

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.6 mm	Yes

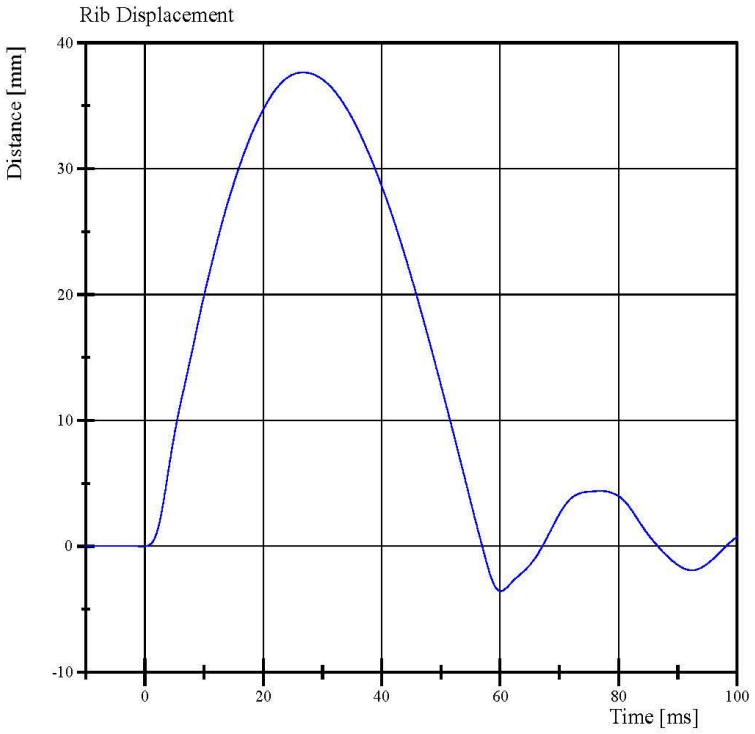
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 37.6 mm at 26.8 ms
Min: -3.6 mm at 60.1 ms

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

03.22.2019 09:54:50 501

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.8 mm	Yes

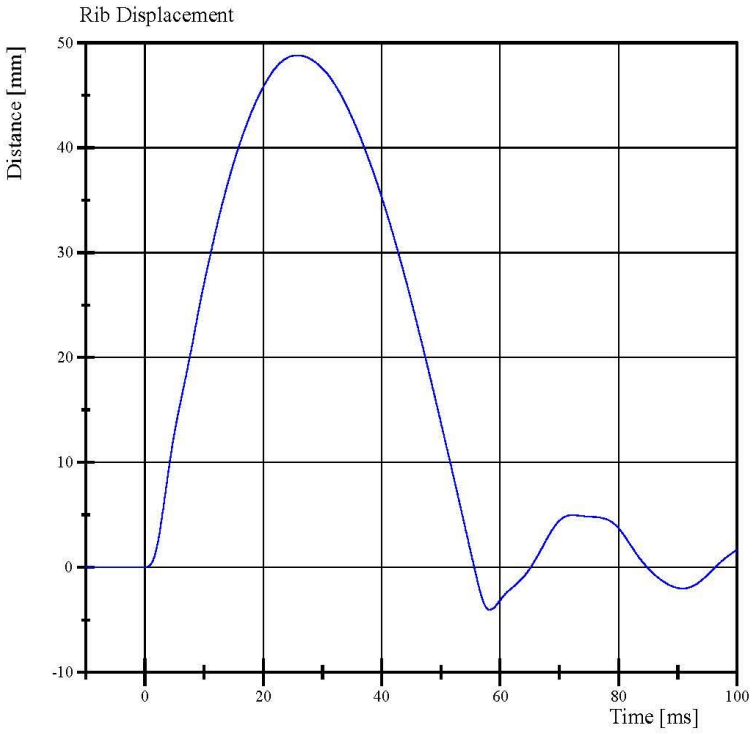
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 48.8 mm at 25.8 ms
Min: -4.1 mm at 58.2 ms

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

03.22.2019 09:48:57 417

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ℃	21.6 ℃	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.5 mm	Yes

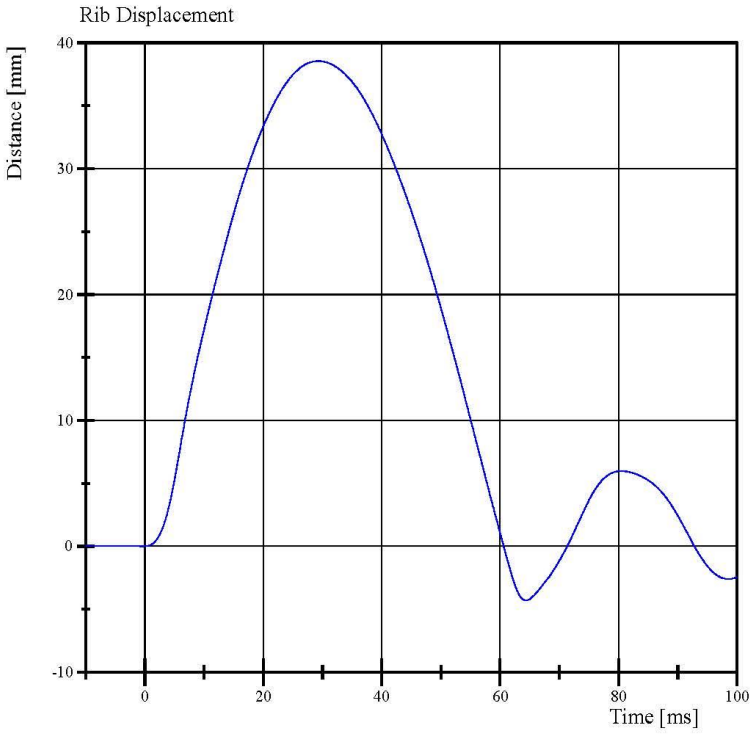
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 38.5 mm at 29.4 ms
Min: -4.3 mm at 64.3 ms

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

03.22.2019 10:16:08 476

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.5 mm	Yes

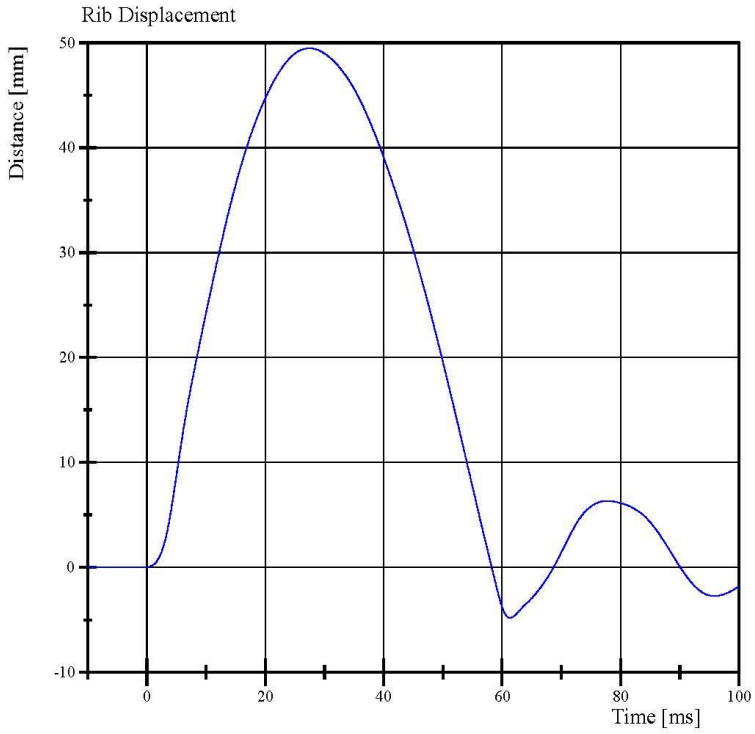
Test meets specifications.

Condition: Used

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

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 49.5 mm at 27.4 ms
Min: -4.8 mm at 61.3 ms

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

03.22.2019 10:10:09 393

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.546 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,376.4 N	Yes
Upper Rib Displacement	34 - 41 mm	37.8 mm	Yes
Center Rib Displacement	37 - 45 mm	42.2 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.1 mm	Yes

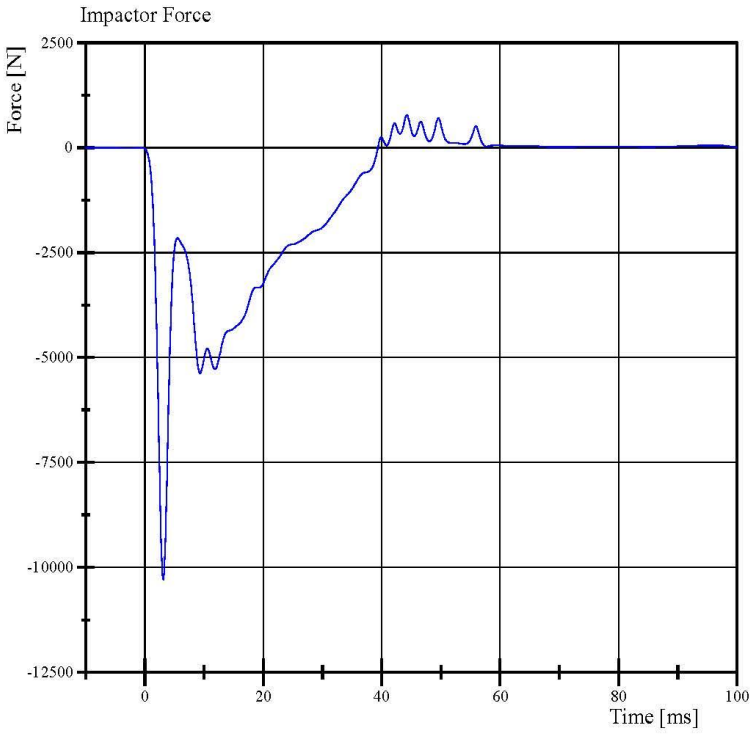
Test meets specifications.

Condition: Used

Comments:
Upper Rib Module S/N: 175-4008-A
Middle Rib Module S/N: 175-4008-A
Lower Rib Module S/N: 175-4008-A-06-017

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019



Filter Class: CFC_180
Max: 785.8 N at 44.2 ms
Min: -10,296.6 N at 3.1 ms

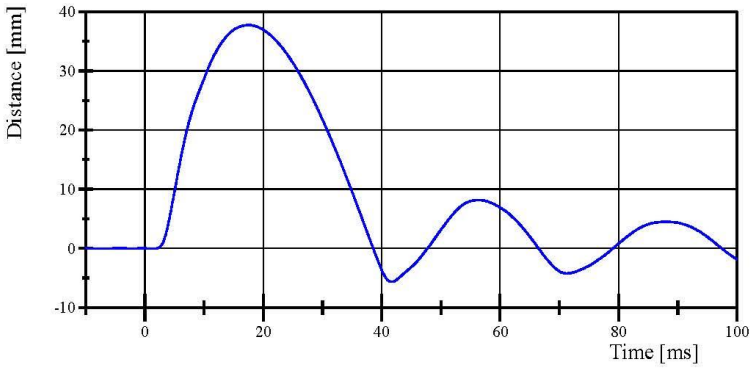
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:33:59 446

Transportation Research Center Inc.

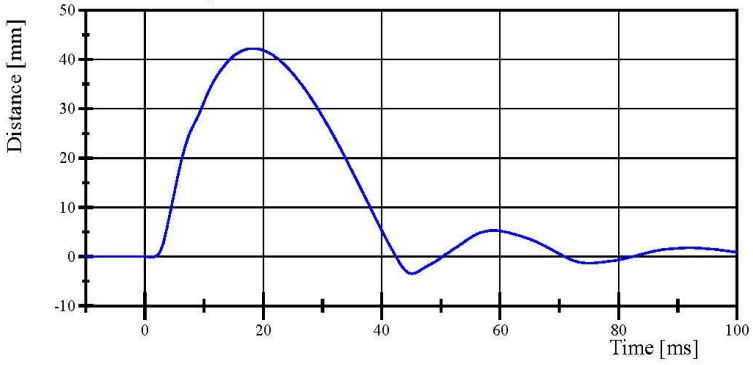
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Upper Rib Displacement



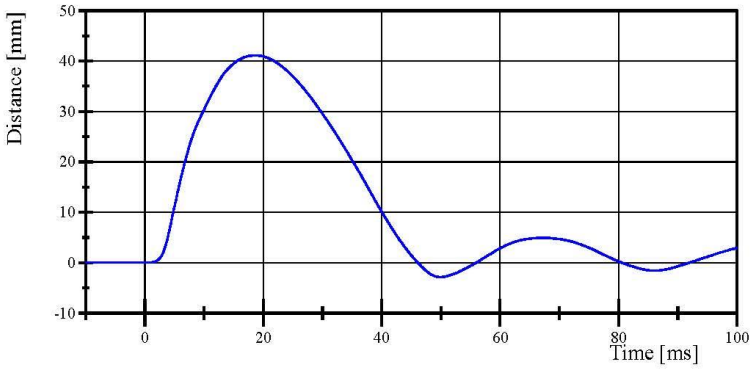
Filter Class: CFC_180
Max: 37.8 mm at 17.5 ms
Min: -5.7 mm at 41.7 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 42.2 mm at 18.3 ms
Min: -3.5 mm at 45.1 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 41.1 mm at 18.6 ms
Min: -2.8 mm at 49.9 ms

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

03.25.2019 08:34:00 446

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 62-2
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.095 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.8 deg	Yes
Time of Peak	39 - 53 ms	43.0 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	38.0 ms	Yes

Test meets specifications.

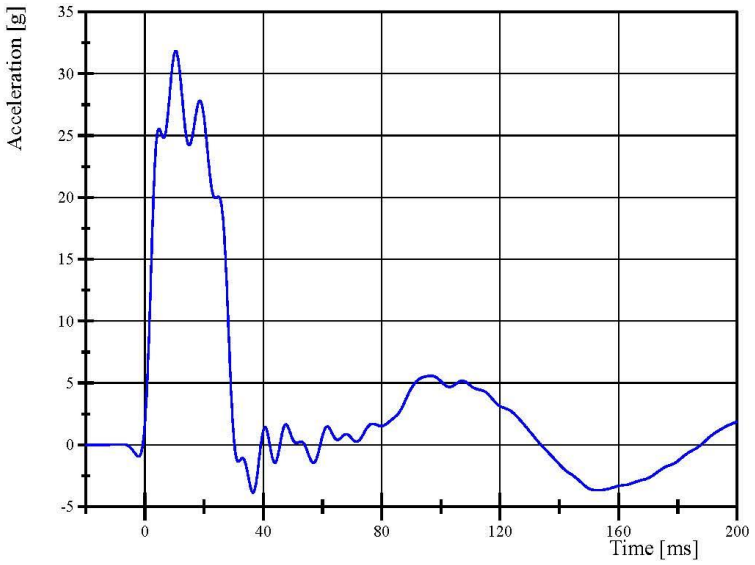
Condition: Used

Comments:
Lumbar S/N: DM3011

Transportation Research Center Inc.

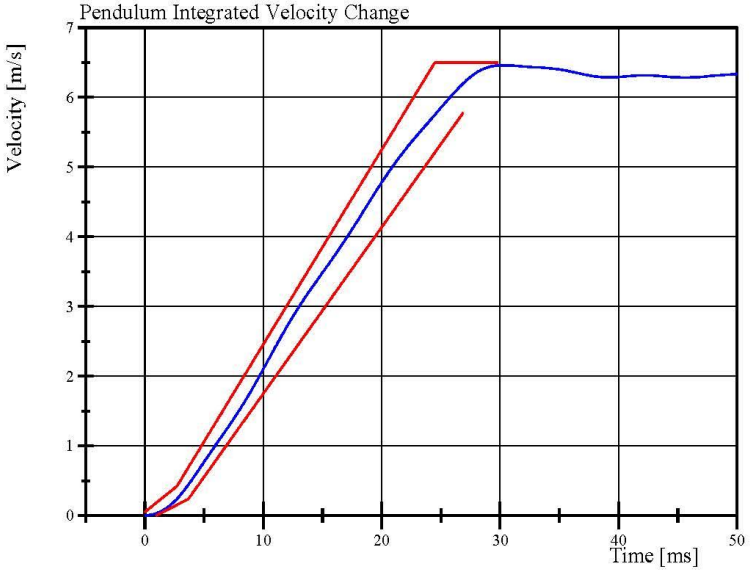
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 62-2
Test Date: 3/22/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.8 g at 10.4 ms
Min: -3.9 g at 36.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.5 m/s at 30.2 ms
Min: 0.0 m/s at 0.0 ms

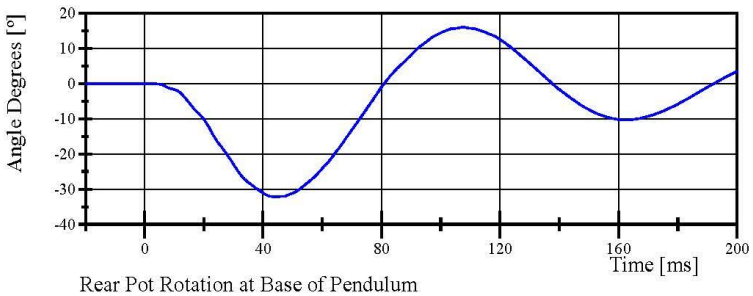
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 10:36:42 638

Transportation Research Center Inc.

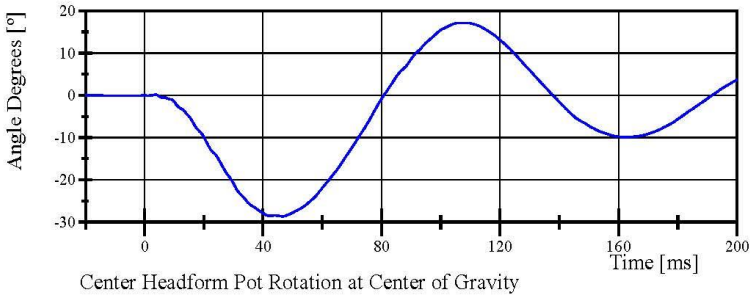
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 62-2
Test Date: 3/22/2019

Forward Pot Rotation at Base of Pendulum



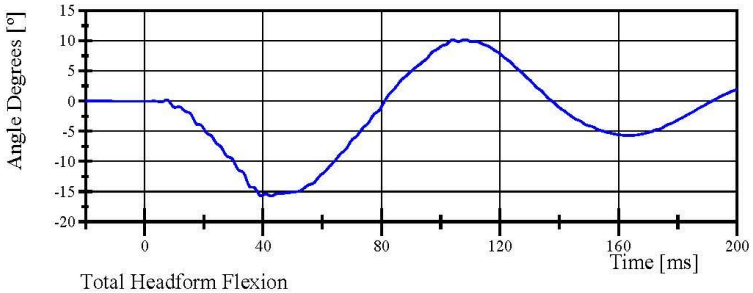
Filter Class: CFC_180
Max: 16.0 ° at 107.4 ms
Min: -32.2 ° at 44.4 ms

Rear Pot Rotation at Base of Pendulum



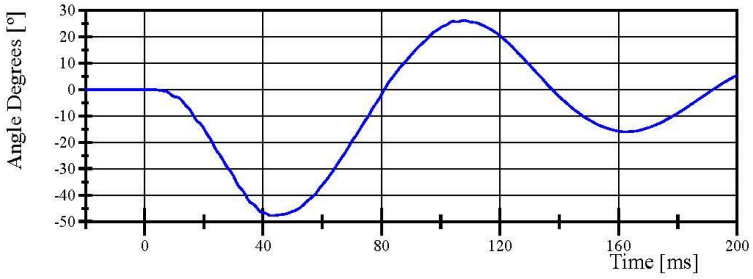
Filter Class: CFC_180
Max: 17.2 ° at 107.0 ms
Min: -28.6 ° at 46.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 10.2 ° at 108.1 ms
Min: -15.7 ° at 42.7 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 26.2 ° at 107.8 ms
Min: -47.8 ° at 43.0 ms

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

03.22.2019 10:36:42 638

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.08 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,219.7 N	Yes
Time of Peak	10.6 - 13.0 ms	11.20 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,472.7 N	Yes
Time of Peak	10.0 - 12.3 ms	10.80 ms	Yes

Test meets specifications.

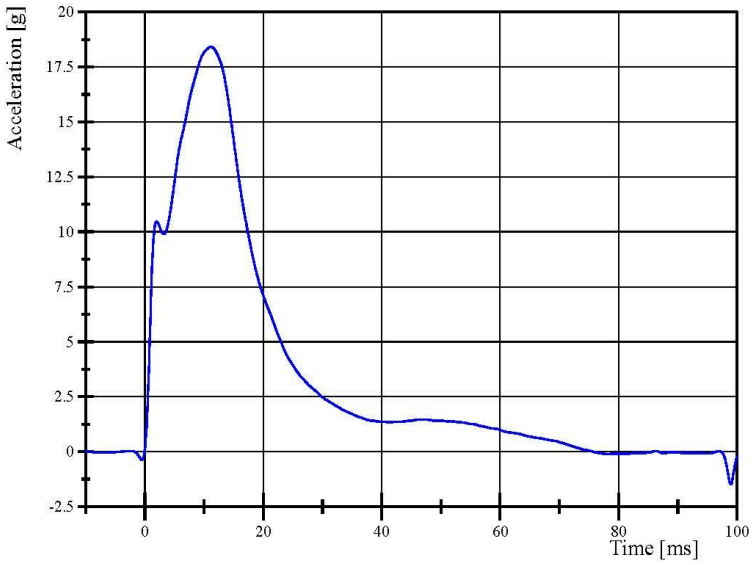
Condition: Used

Comments:
Abdomen S/N: 1066

Transportation Research Center Inc.

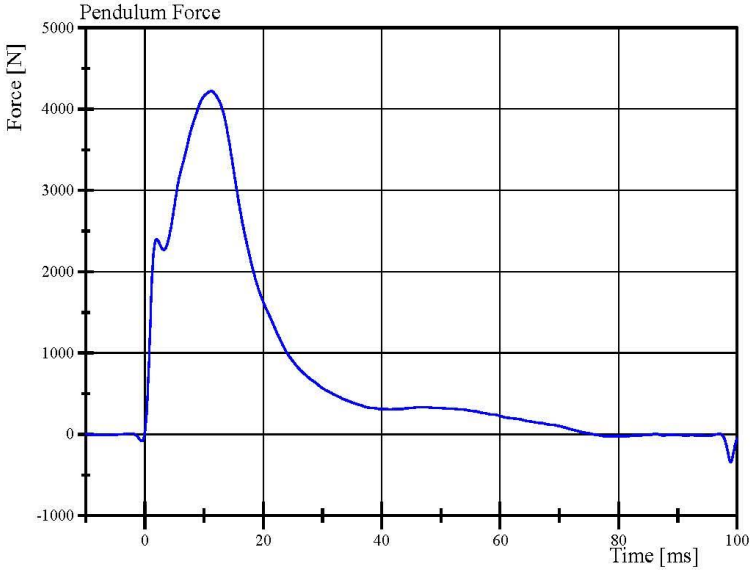
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.4 g at 11.2 ms
Min: -1.5 g at 99.0 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,219.7 N at 11.2 ms
Min: -341.7 N at 99.0 ms

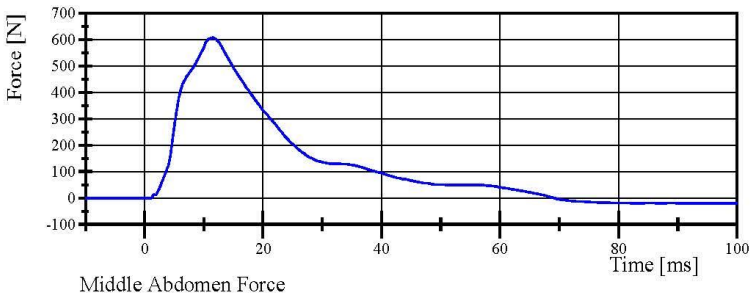
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:51:00 595

Transportation Research Center Inc.

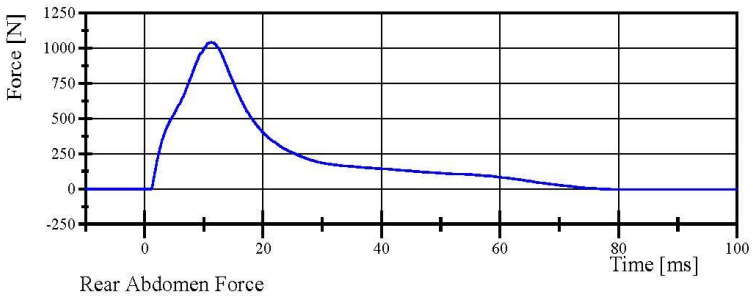
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Front Abdomen Force



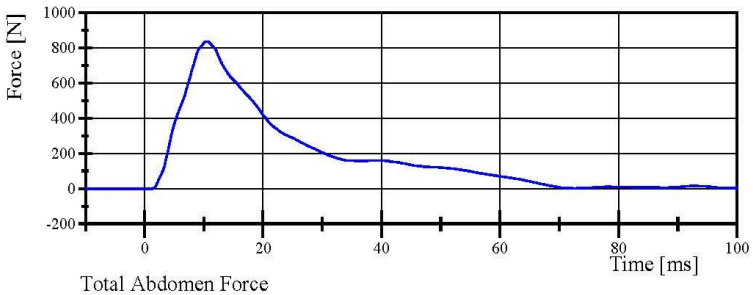
Filter Class: CFC_600
Max: 607.7 N at 11.4 ms
Min: -20.7 N at 97.4 ms

Middle Abdomen Force



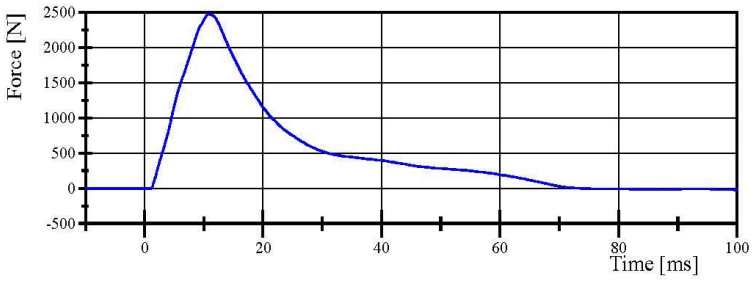
Filter Class: CFC_600
Max: 1,040.4 N at 11.4 ms
Min: -4.4 N at 97.3 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 837.0 N at 10.5 ms
Min: -0.2 N at -4.1 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,472.7 N at 10.8 ms
Min: -21.3 N at 100.0 ms

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

03.25.2019 08:51:01 595

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.36 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,344.6 N	Yes
Time of Peak	11.8 - 16.1 ms	13.12 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,324.8 N	Yes
Time of Peak	12.2 - 17.0 ms	13.12 ms	Yes

Test meets specifications.

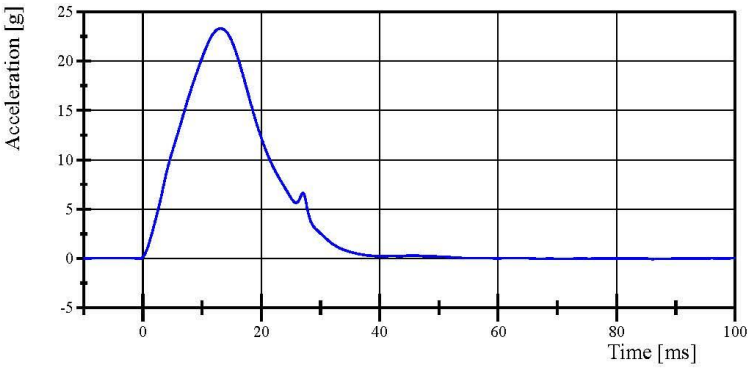
Condition: Used

Comments:
Pelvis Skin S/N: N/A

Transportation Research Center Inc.

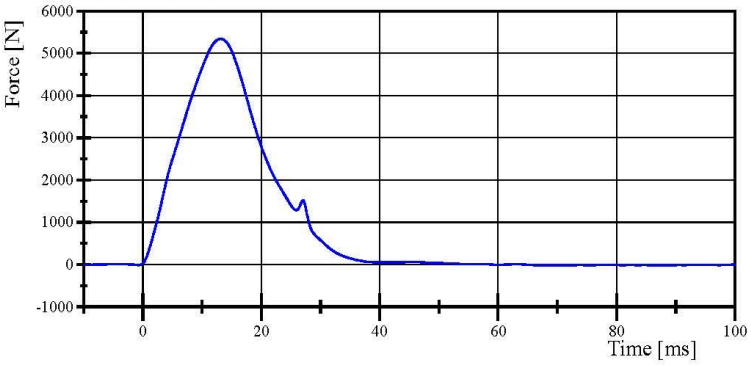
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Pendulum Acceleration



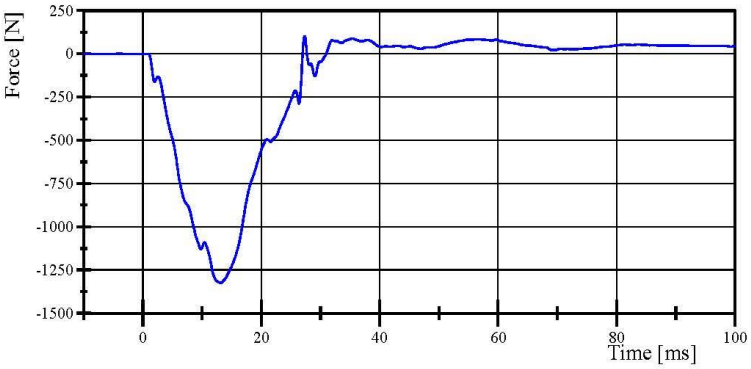
Filter Class: CFC_180
Max: 23.3 g at 13.1 ms
Min: -0.1 g at 86.1 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,344.6 N at 13.1 ms
Min: -16.8 N at 86.1 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 101.6 N at 27.3 ms
Min: -1,324.8 N at 13.1 ms

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

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Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No. 69

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	448	Yes
C	H-Point Height	79.0 - 89.0	86	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	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	143	Yes
H	Head Back from Backline	40.0 - 46.0	44	Yes
I	Head Depth	178.0 - 188.0	185	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	348	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	396	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	197	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to seat Back	478.0 - 493.0	482	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	351	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	877	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 ℃	21.4 ℃	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	117.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	1.6 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

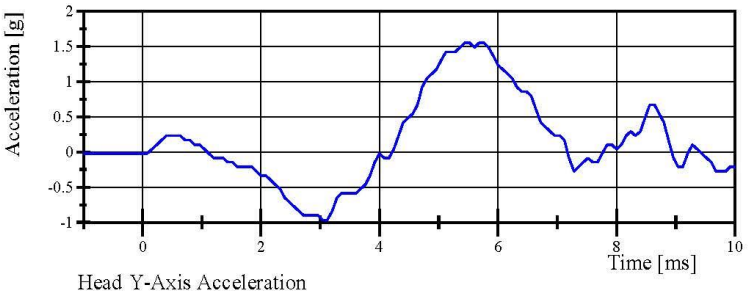
Condition: Used

Comments:
Head Skin S/N: 1253

Transportation Research Center Inc.

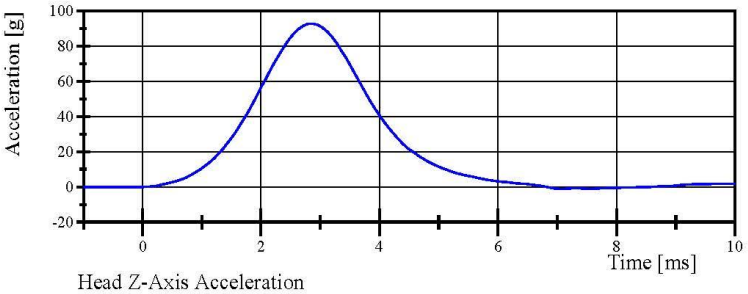
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Head X-Axis Acceleration



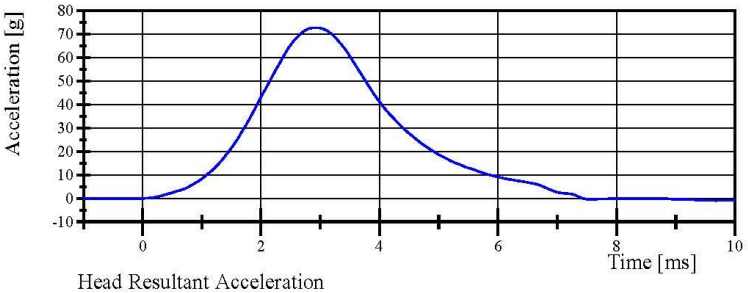
Filter Class: CFC_1000
Max: 1.6 g at 5.4 ms
Min: -1.0 g at 3.0 ms

Head Y-Axis Acceleration



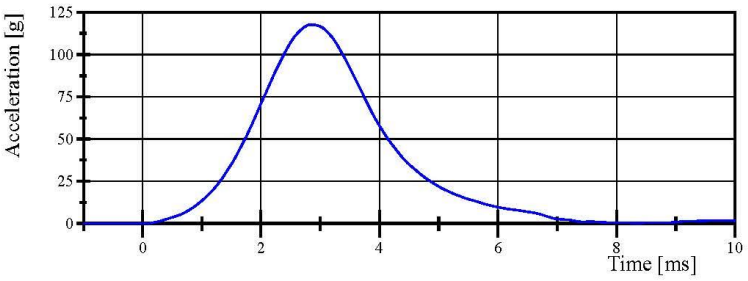
Filter Class: CFC_1000
Max: 92.7 g at 2.8 ms
Min: -1.1 g at 7.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 72.8 g at 2.9 ms
Min: -0.9 g at 9.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 117.8 g at 2.9 ms
Min: 0.0 g at -1.0 ms

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

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Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 69-2
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.604 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.758 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.967 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.283 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	6.007 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	6.021 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.2 deg	Yes
Time of Peak	50 - 70 ms	65.6 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.1 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	120.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 180-2001-606

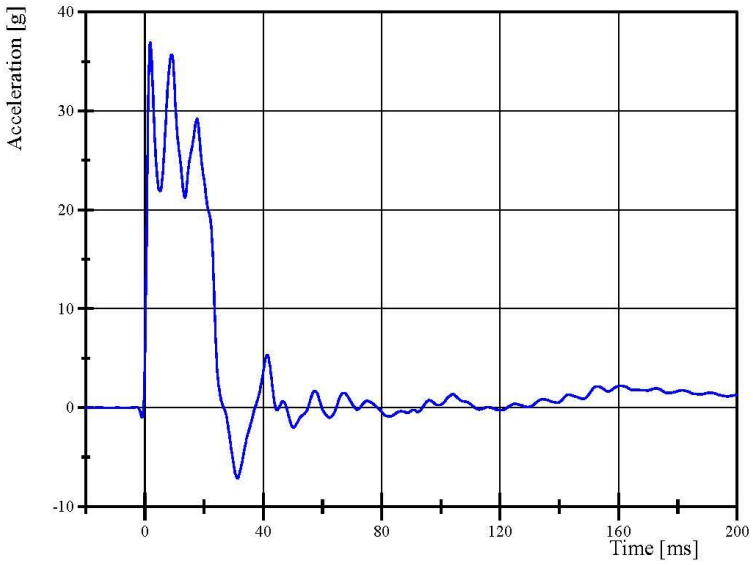
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

02.22.2019 09:42:41 720

Transportation Research Center Inc.

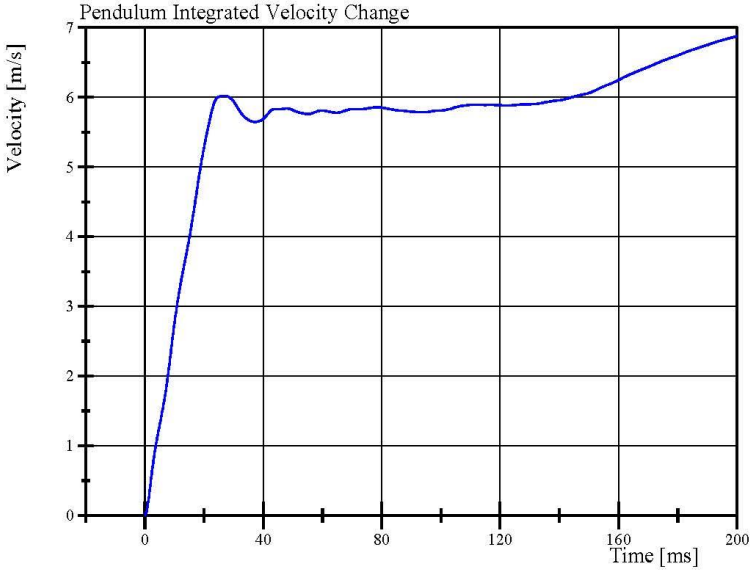
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 69-2
Test Date: 2/22/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 36.9 g at 1.8 ms
Min: -7.1 g at 31.3 ms

Pendulum Integrated Velocity Change



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

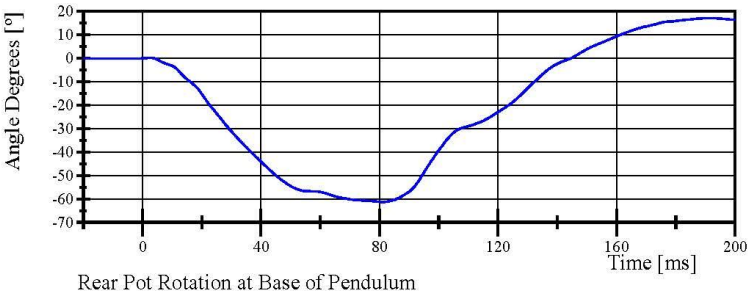
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.22.2019 09:43:13 720

Transportation Research Center Inc.

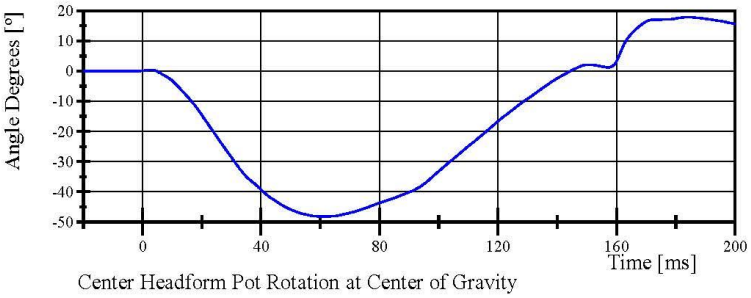
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 69-2
Test Date: 2/22/2019

Forward Pot Rotation at Base of Pendulum



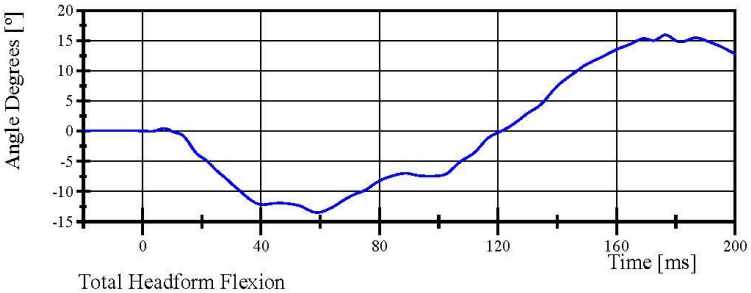
Filter Class: CFC_60
Max: 17.0 ° at 191.4 ms
Min: -61.3 ° at 81.0 ms

Rear Pot Rotation at Base of Pendulum



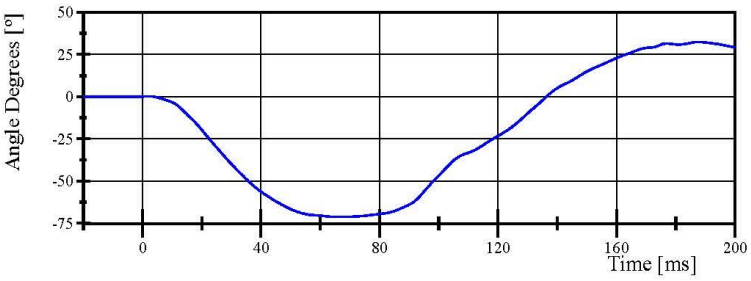
Filter Class: CFC_60
Max: 18.0 ° at 184.2 ms
Min: -48.2 ° at 61.3 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 16.0 ° at 176.5 ms
Min: -13.5 ° at 59.0 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 32.3 ° at 187.5 ms
Min: -71.2 ° at 65.6 ms

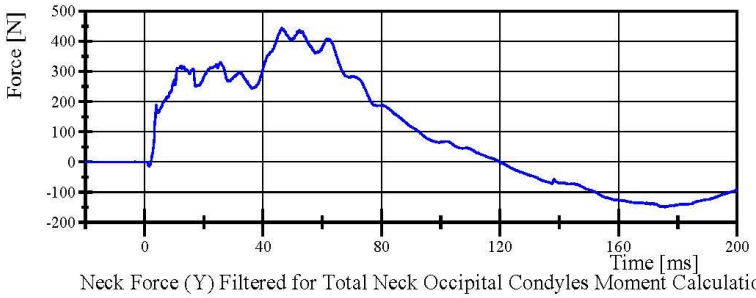
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.22.2019 09:43:14 720

Transportation Research Center Inc.

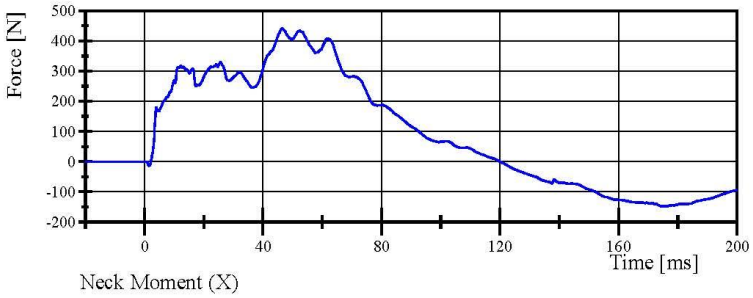
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 69-2
Test Date: 2/22/2019

Neck Force (Y)



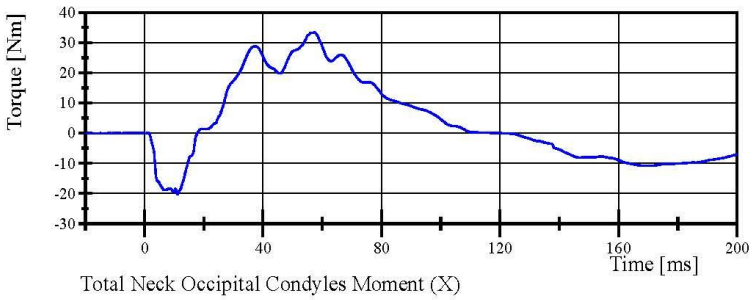
Filter Class: CFC_1000
Max: 444.2 N at 46.3 ms
Min: -149.9 N at 175.7 ms

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



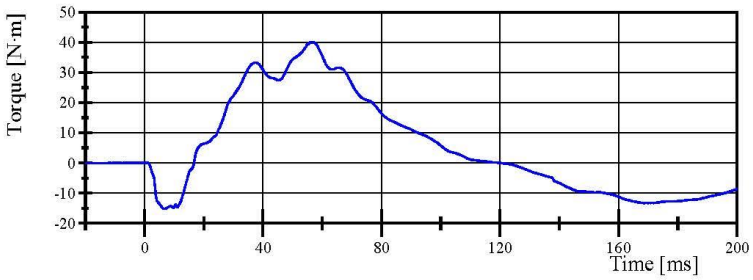
Filter Class: CFC_600
Max: 442.2 N at 46.4 ms
Min: -148.8 N at 175.7 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.4 Nm at 57.4 ms
Min: -20.2 Nm at 11.0 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 40.1 N·m at 56.1 ms
Min: -15.2 N·m at 6.7 ms

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

02.22.2019 09:43:15 720

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.9 g	Yes
Shoulder Displacement	28 - 37 mm	28.8 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.1 g	Yes

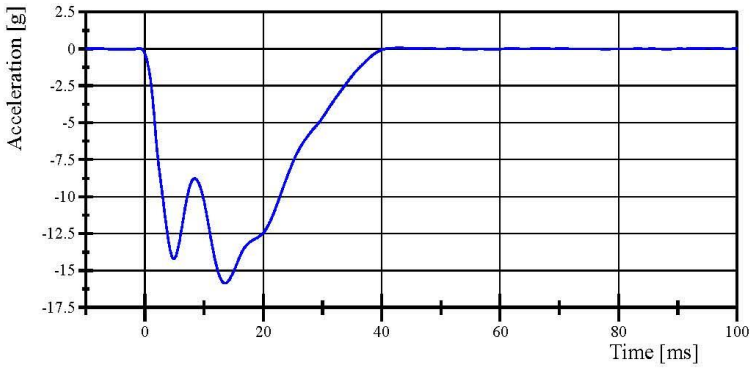
Test meets specifications.

Condition: Used
Comments:
Left Arm S/N: 952
Shoulder Rib S/N: 180-3355 169

Transportation Research Center Inc.

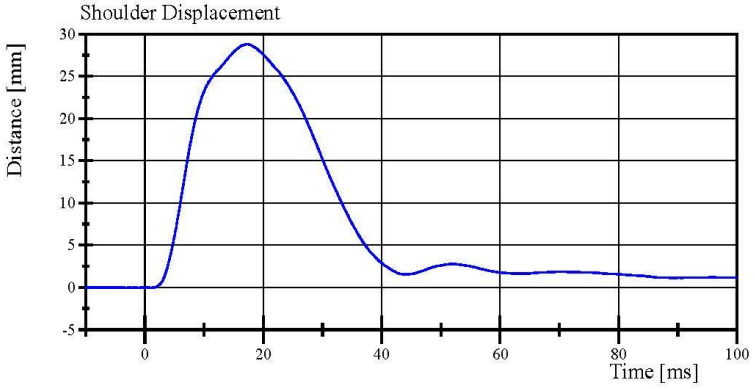
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Probe Acceleration



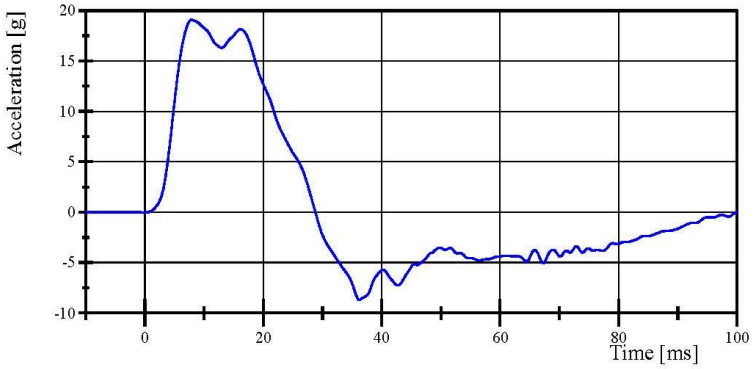
Filter Class: CFC_180
Max: 0.1 g at 43.0 ms
Min: -15.9 g at 13.5 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 28.8 mm at 17.3 ms
Min: -0.0 mm at 1.2 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.1 g at 7.8 ms
Min: -8.7 g at 36.2 ms

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

02.22.2019 10:53:26 843

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 69-3
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.747 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-32.3 g	Yes
Shoulder Displacement	31 - 40 mm	36.9 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.5 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.0 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	32.6 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.9 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.0 g	Yes

Test meets specifications.

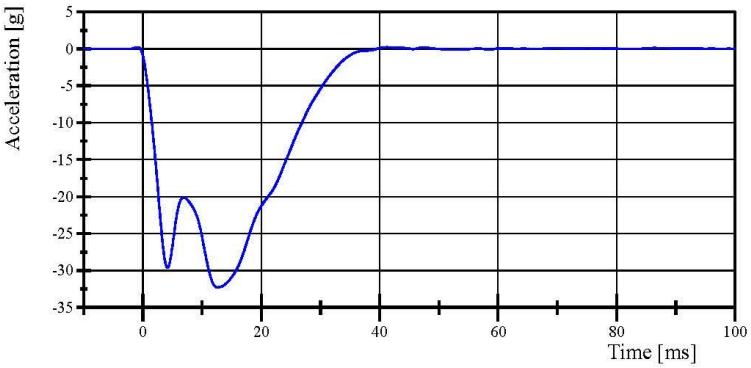
Condition: Used

Comments:
Left Arm S/N: 952
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

Transportation Research Center Inc.

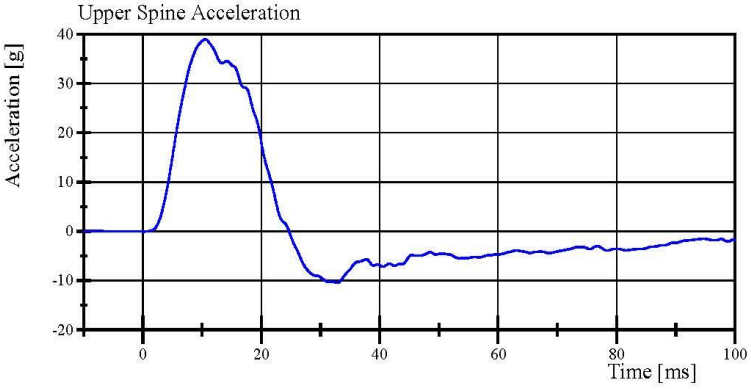
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 69-3
Test Date: 2/22/2019

Probe Acceleration



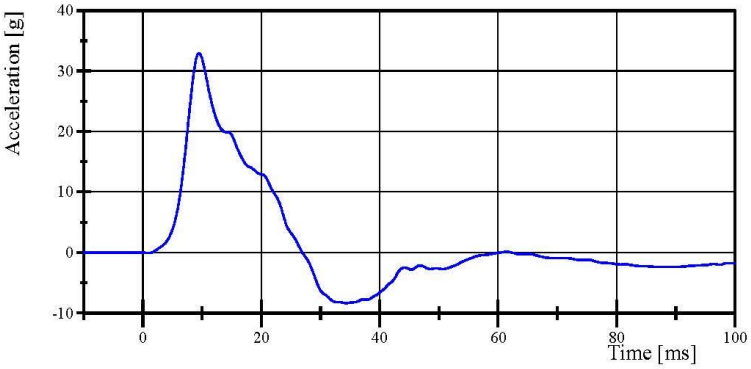
Filter Class: CFC_180
Max: 0.2 g at 41.2 ms
Min: -32.3 g at 12.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 38.9 g at 10.6 ms
Min: -10.5 g at 32.9 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 33.0 g at 9.4 ms
Min: -8.4 g at 34.3 ms

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

02.22.2019 15:09:47 601

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.275 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.0 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.3 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.2 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.7 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.0 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.8 g	Yes

Test meets specifications.

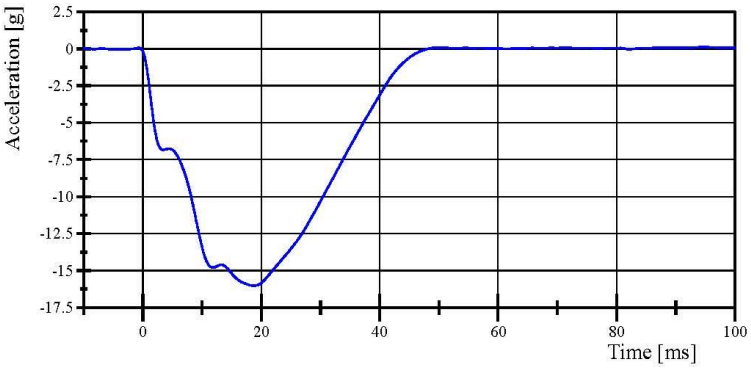
Condition: Used

Comments:
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

Transportation Research Center Inc.

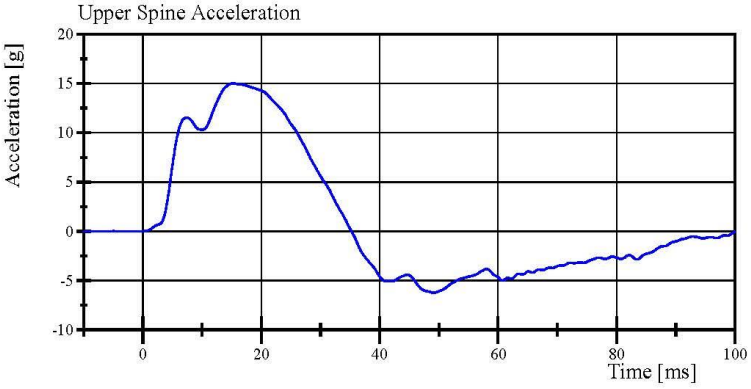
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Probe Acceleration



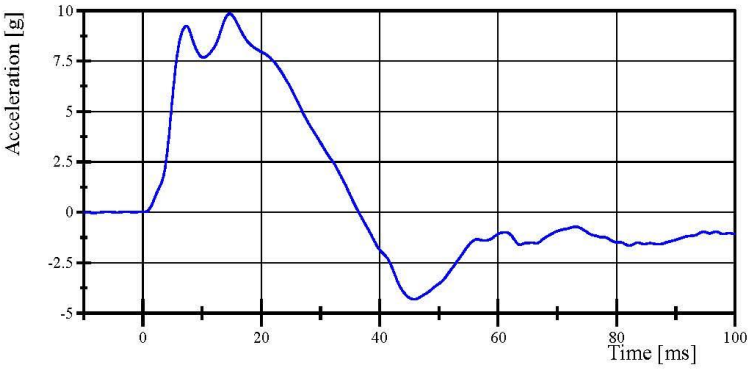
Filter Class: CFC_180
Max: 0.1 g at 94.7 ms
Min: -16.0 g at 18.7 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 15.0 g at 15.2 ms
Min: -6.2 g at 49.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.8 g at 14.6 ms
Min: -4.3 g at 45.8 ms

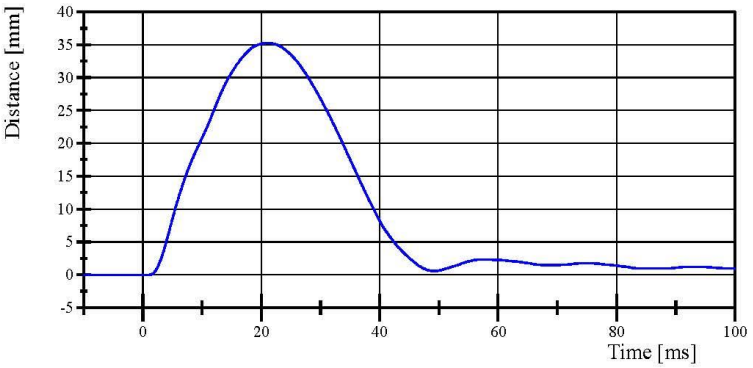
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.22.2019 11:40:45 856

Transportation Research Center Inc.

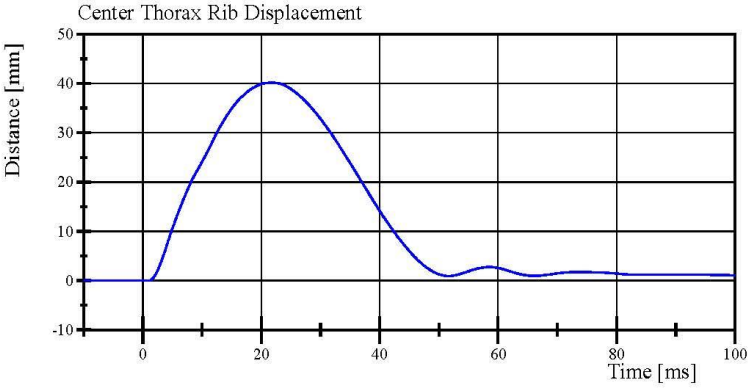
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Upper Thorax Rib Displacement



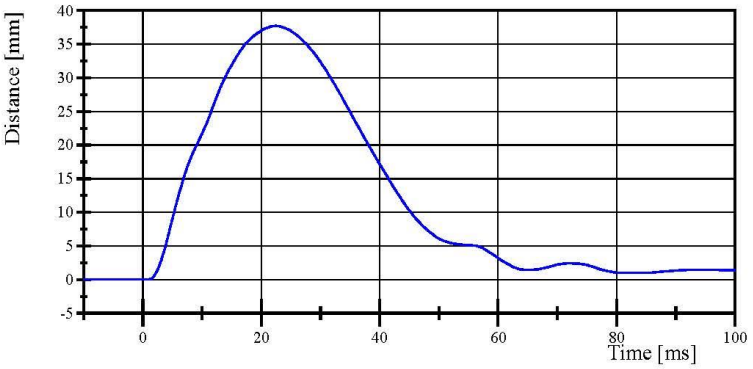
Filter Class: CFC_600
Max: 35.3 mm at 21.2 ms
Min: -0.0 mm at -4.8 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.2 mm at 21.8 ms
Min: -0.0 mm at 1.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.7 mm at 22.5 ms
Min: -0.0 mm at 0.7 ms

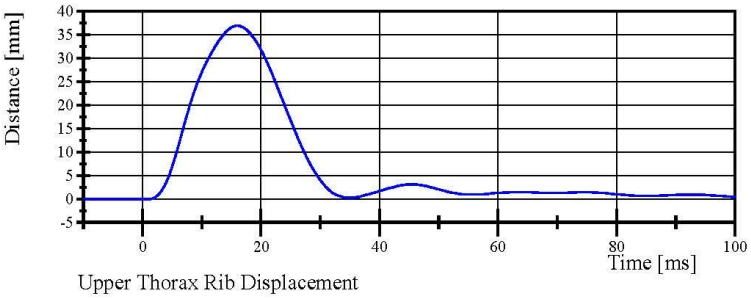
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.22.2019 11:40:45 856

Transportation Research Center Inc.

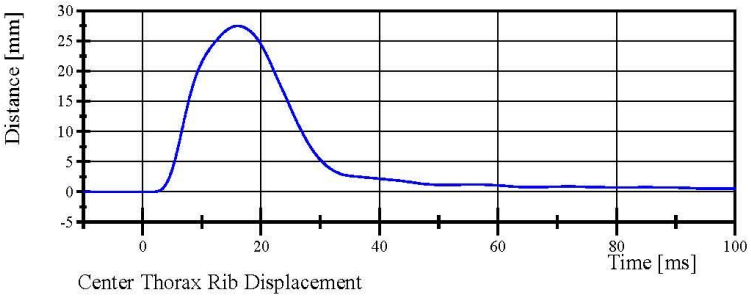
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 69-3
Test Date: 2/22/2019

Shoulder Rib Displacement



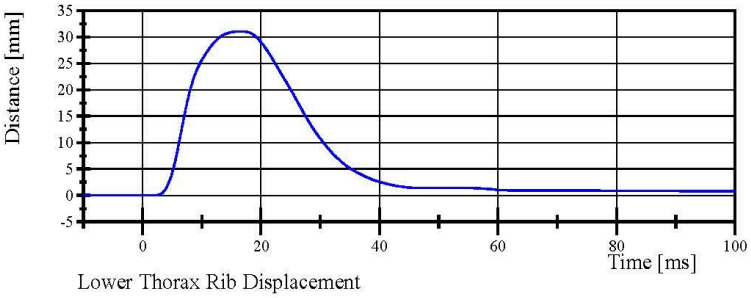
Filter Class: CFC_600
Max: 36.9 mm at 15.9 ms
Min: -0.0 mm at 1.1 ms

Upper Thorax Rib Displacement



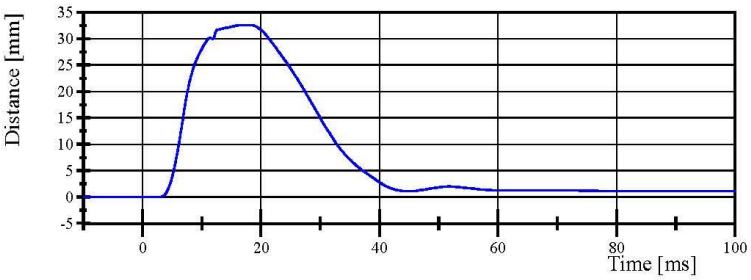
Filter Class: CFC_600
Max: 27.5 mm at 16.1 ms
Min: -0.0 mm at -2.5 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.0 mm at 16.2 ms
Min: -0.0 mm at 1.7 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.6 mm at 17.8 ms
Min: -0.0 mm at 2.2 ms

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

02.22.2019 15:09:48 601

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	40.0 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.30 g	Yes

Test meets specifications.

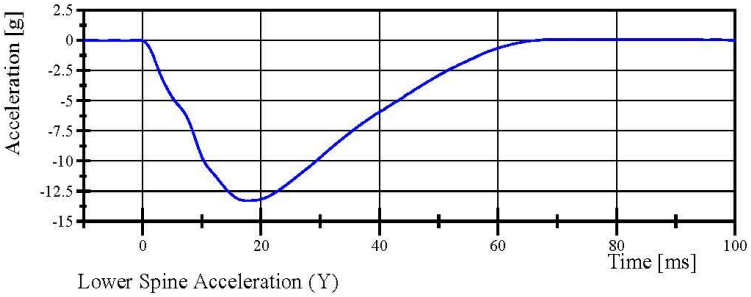
Condition: Used

Comments:
Upper Abdominal Rib S/N: 1997
Lower Abdominal Rib S/N: DS1234

Transportation Research Center Inc.

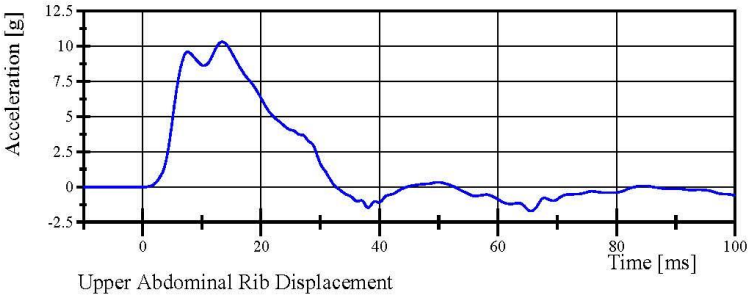
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Probe Acceleration



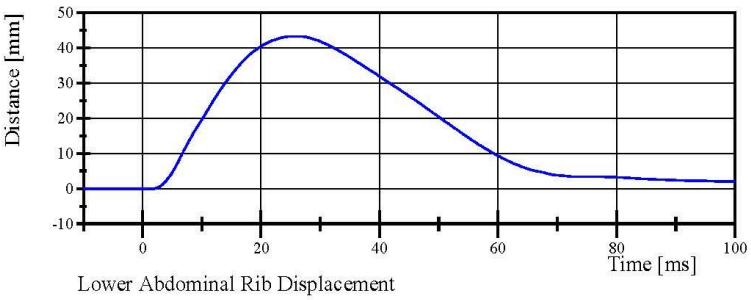
Filter Class: CFC_180
Max: 0.1 g at 71.5 ms
Min: -13.3 g at 17.8 ms

Lower Spine Acceleration (Y)



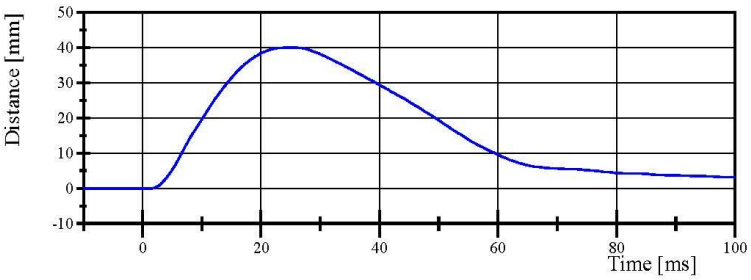
Filter Class: CFC_180
Max: 10.3 g at 13.4 ms
Min: -1.7 g at 65.5 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 43.3 mm at 25.7 ms
Min: -0.0 mm at 1.7 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 40.0 mm at 25.0 ms
Min: -0.0 mm at 1.3 ms

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

02.22.2019 15:27:42 666

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 69-2
Test Date: 2/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.60 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.16 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.1 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,993.4 N	Yes

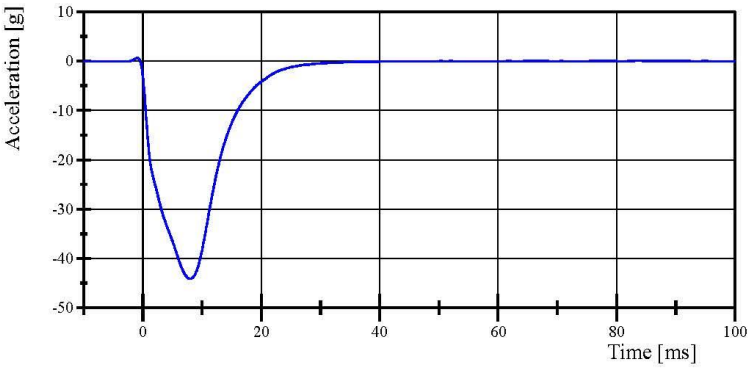
Test meets specifications.

Condition: Used
Comments:
Pelvis Skin S/N: 884
Pelvis Plug Info:
Manufacturer: SACO
S/N: 11637
Cal Date: 20170327

Transportation Research Center Inc.

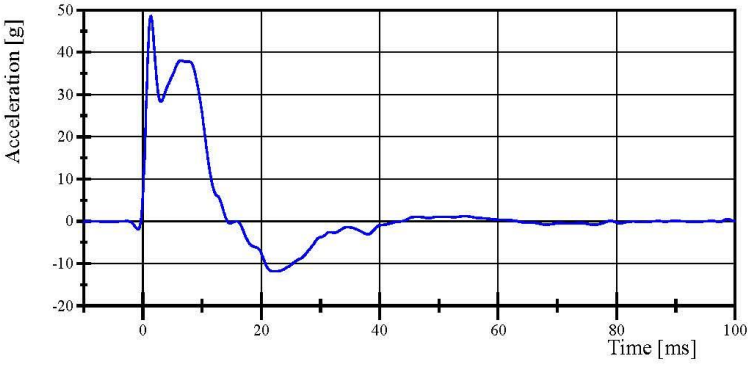
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 69-2
Test Date: 2/25/2019

Probe Acceleration



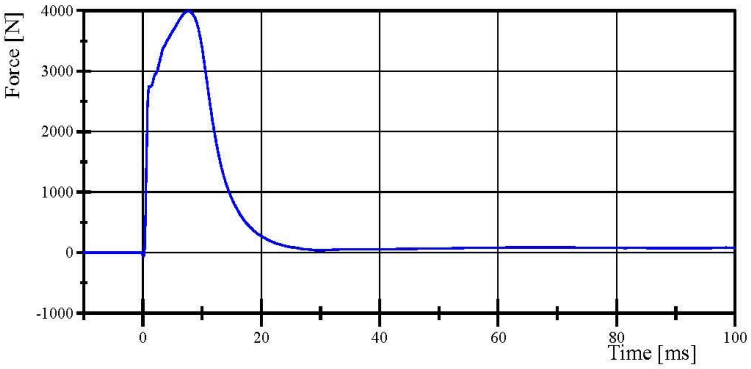
Filter Class: CFC_180
Max: 0.6 g at -1.0 ms
Min: -44.2 g at 8.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 48.6 g at 1.4 ms
Min: -11.8 g at 22.0 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,993.4 N at 7.7 ms
Min: -63.3 N at 0.1 ms

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

02.25.2019 06:57:32 414

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.6 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.5 g	Yes
Iliac Force	4,100 - 5,100 N	4,425.5 N	Yes

Test meets specifications.

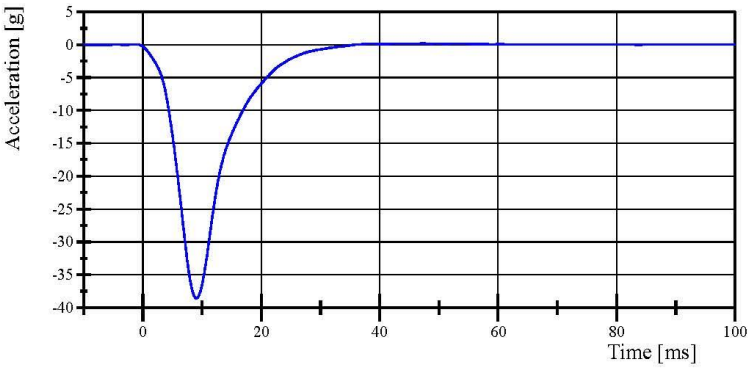
Condition: Used

Comments:
Pelvis Skin S/N: 884

Transportation Research Center Inc.

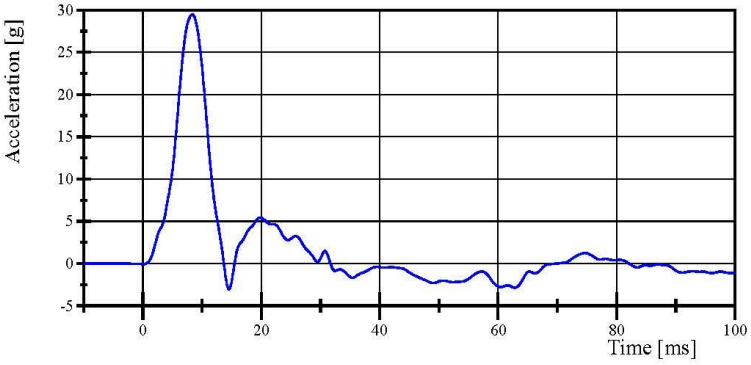
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 69-1
Test Date: 2/22/2019

Probe Acceleration



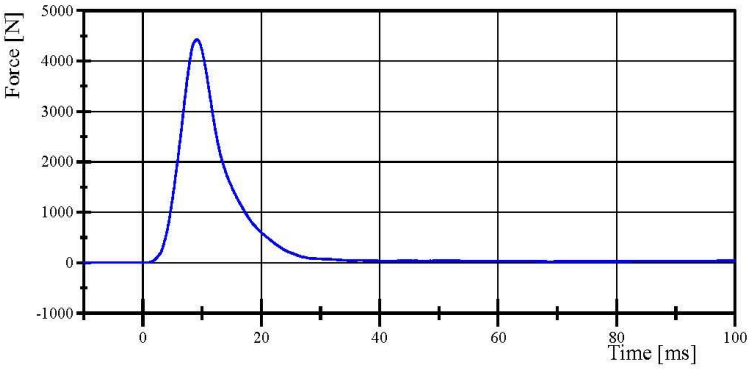
Filter Class: CFC_180
Max: 0.2 g at 47.3 ms
Min: -38.6 g at 9.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 29.5 g at 8.3 ms
Min: -3.0 g at 14.6 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,425.5 N at 9.2 ms
Min: -0.9 N at -8.4 ms

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

02.22.2019 10:21:34 662

Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No. 70

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	448	Yes
C	H-Point Height	79.0 - 89.0	86	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	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	143	Yes
H	Head Back from Backline	40.0 - 46.0	44	Yes
I	Head Depth	178.0 - 188.0	185	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	348	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	396	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	197	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to seat Back	478.0 - 493.0	482	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	351	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	877	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	120.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	3.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

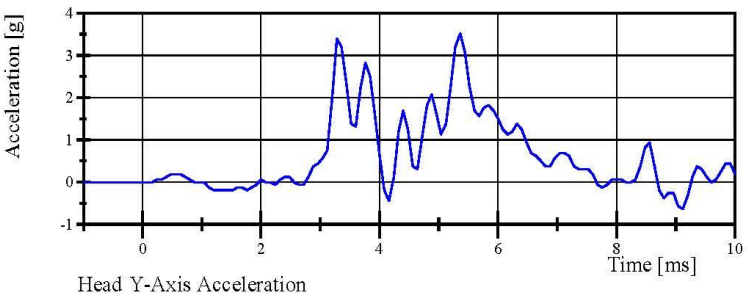
Condition: Used

Comments:
Head Skin S/N: 1253

Transportation Research Center Inc.

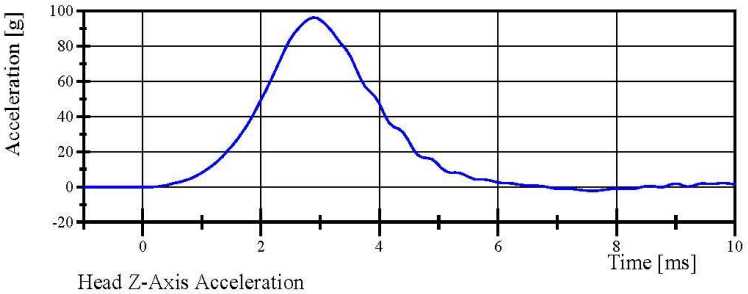
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Head X-Axis Acceleration



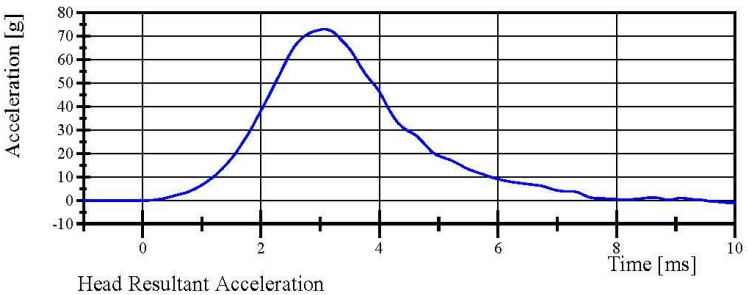
Filter Class: CFC_1000
Max: 3.5 g at 5.4 ms
Min: -0.6 g at 9.1 ms

Head Y-Axis Acceleration



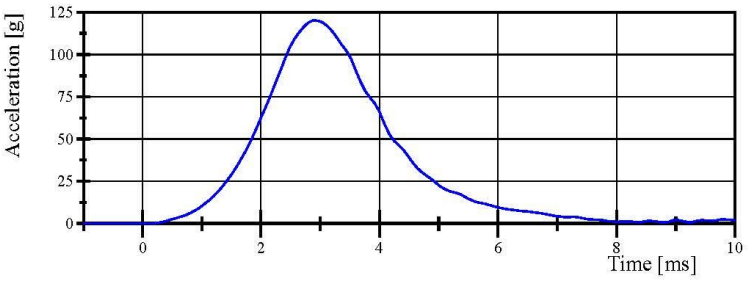
Filter Class: CFC_1000
Max: 96.3 g at 2.9 ms
Min: -2.2 g at 7.5 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 72.9 g at 3.0 ms
Min: -1.1 g at 9.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 120.2 g at 2.9 ms
Min: 0.0 g at -0.9 ms

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

03.22.2019 11:58:38 195

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	41 %	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	2.418 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.545 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.762 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.770 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	6.014 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.0 deg	Yes
Time of Peak	50 - 70 ms	69.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.1 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	119.2 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 180-2001-606

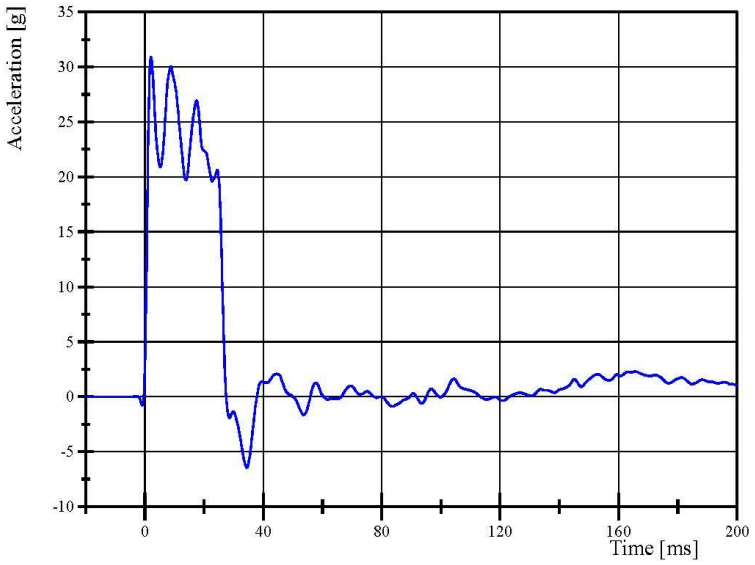
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

03.25.2019 08:26:45 717

Transportation Research Center Inc.

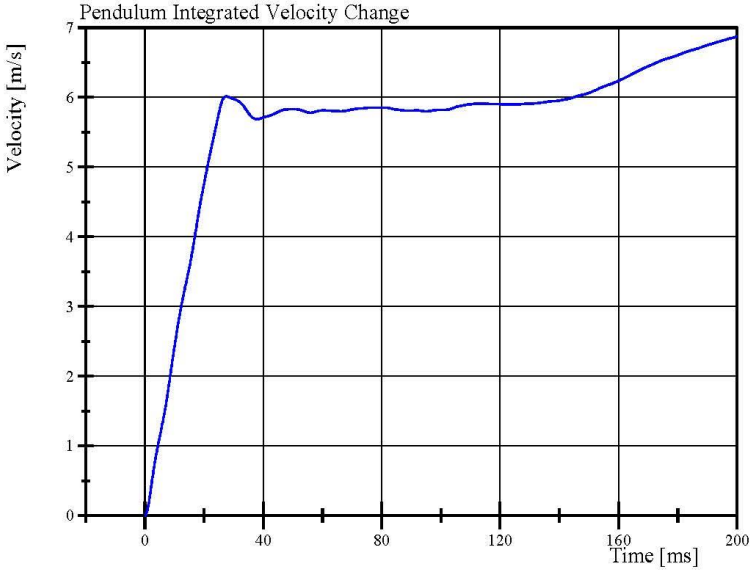
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 30.9 g at 2.1 ms
Min: -6.4 g at 34.5 ms

Pendulum Integrated Velocity Change



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

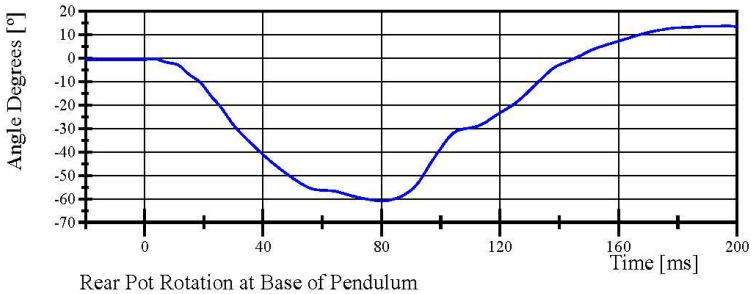
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.25.2019 08:27:16 717

Transportation Research Center Inc.

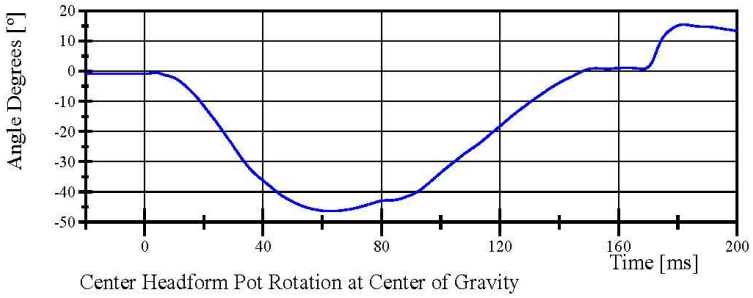
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Forward Pot Rotation at Base of Pendulum



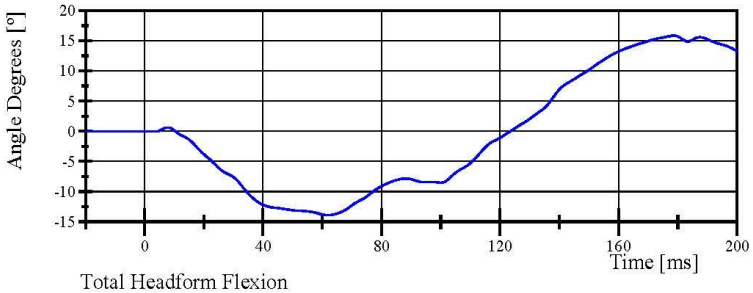
Filter Class: CFC_60
Max: 13.7 ° at 196.8 ms
Min: -60.8 ° at 80.0 ms

Rear Pot Rotation at Base of Pendulum



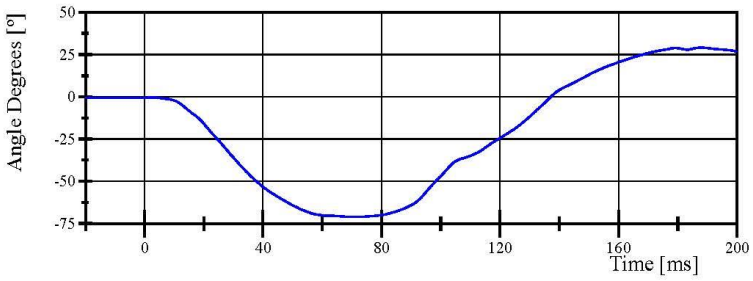
Filter Class: CFC_60
Max: 15.5 ° at 182.0 ms
Min: -46.4 ° at 62.9 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 15.9 ° at 178.6 ms
Min: -13.9 ° at 61.9 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 29.2 ° at 187.9 ms
Min: -71.0 ° at 69.0 ms

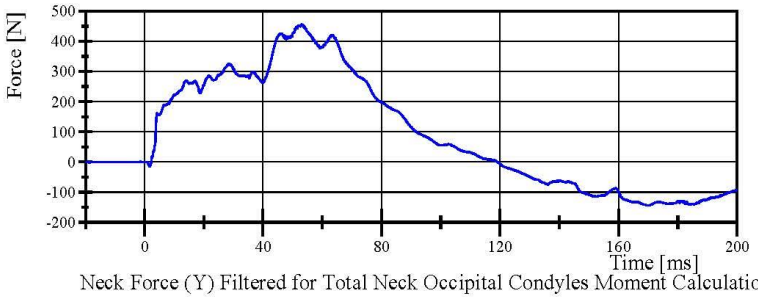
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.25.2019 08:27:17 717

Transportation Research Center Inc.

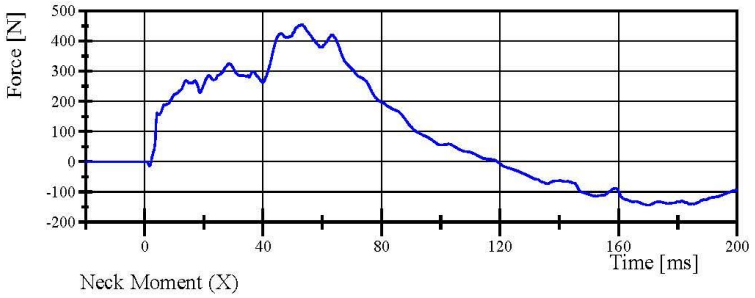
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Neck Force (Y)



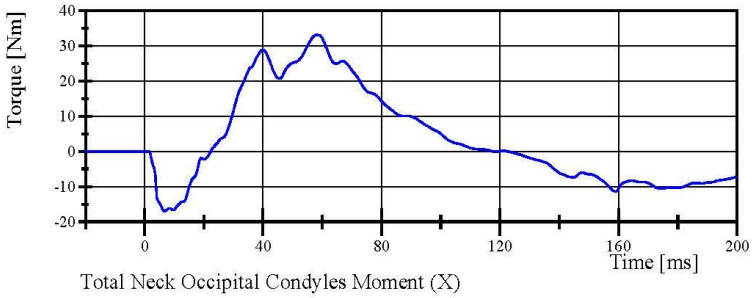
Filter Class: CFC_1000
Max: 456.7 N at 53.0 ms
Min: -143.6 N at 169.8 ms

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



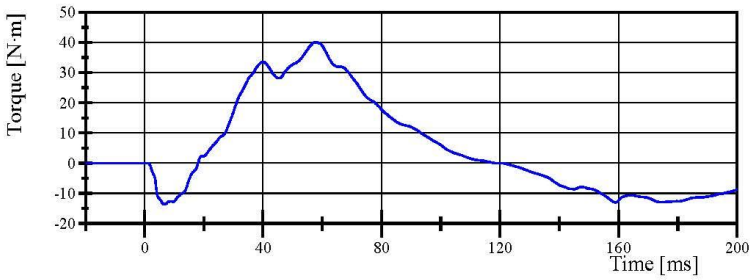
Filter Class: CFC_600
Max: 454.9 N at 53.0 ms
Min: -143.4 N at 169.8 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.1 Nm at 58.4 ms
Min: -17.0 Nm at 6.6 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 40.1 N·m at 57.7 ms
Min: -13.6 N·m at 6.6 ms

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

03.25.2019 08:27:18 717

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.0 g	Yes
Shoulder Displacement	28 - 37 mm	30.1 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	18.8 g	Yes

Test meets specifications.

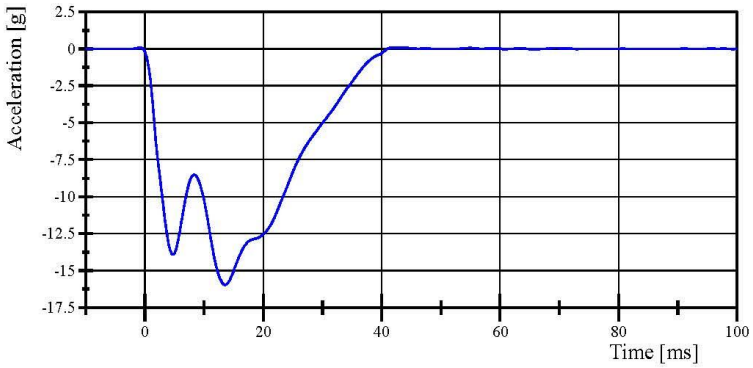
Condition: Used

Comments:
Left Arm S/N: 952
Shoulder Rib S/N: 180-3355 169

Transportation Research Center Inc.

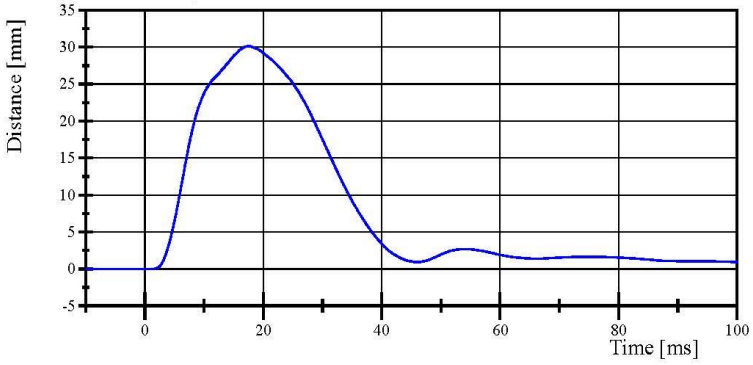
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



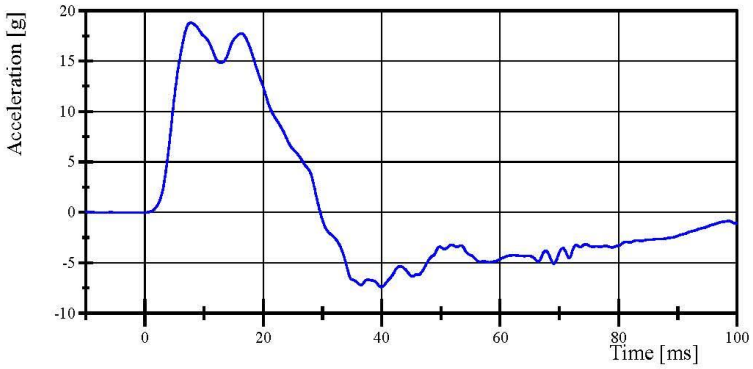
Filter Class: CFC_180
Max: 0.1 g at 41.9 ms
Min: -16.0 g at 13.5 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 30.1 mm at 17.5 ms
Min: -0.0 mm at 1.2 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 18.8 g at 7.8 ms
Min: -7.4 g at 39.9 ms

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

03.22.2019 08:56:14 835

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.724 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.9 g	Yes
Shoulder Displacement	31 - 40 mm	33.5 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.0 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.7 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	36.0 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.3 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	31.6 g	Yes

Test meets specifications.

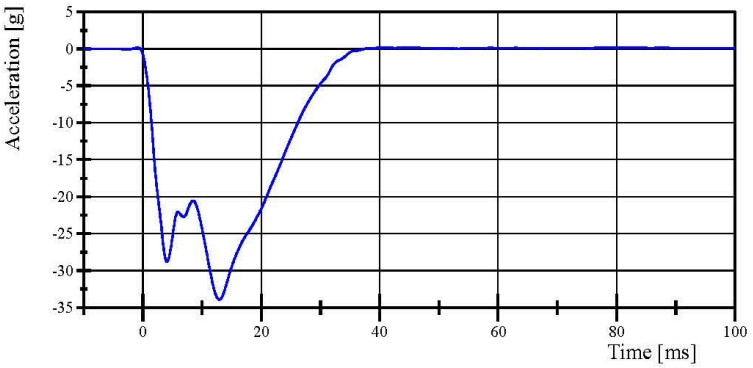
Condition: Used

Comments:
Left Arm S/N: 952
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

Transportation Research Center Inc.

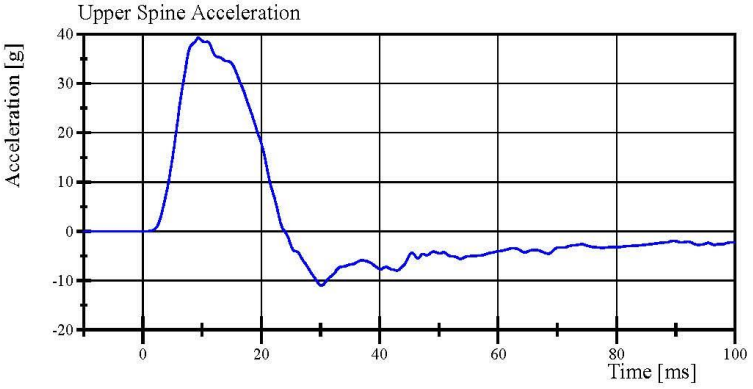
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



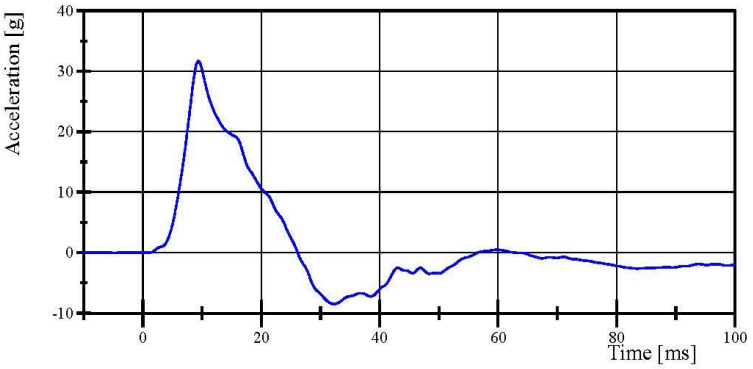
Filter Class: CFC_180
Max: 0.2 g at 45.6 ms
Min: -33.9 g at 13.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 39.3 g at 9.4 ms
Min: -11.0 g at 30.2 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 31.6 g at 9.4 ms
Min: -8.5 g at 32.2 ms

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

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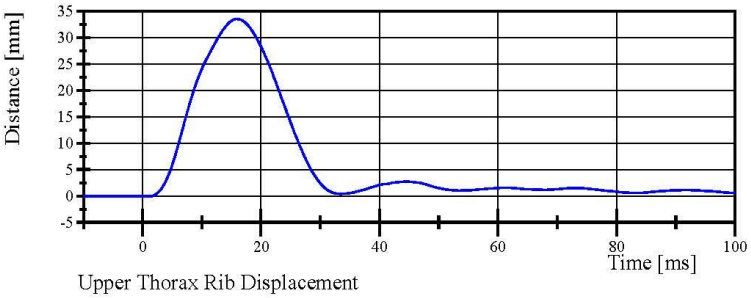
Transportation Research Center Inc.

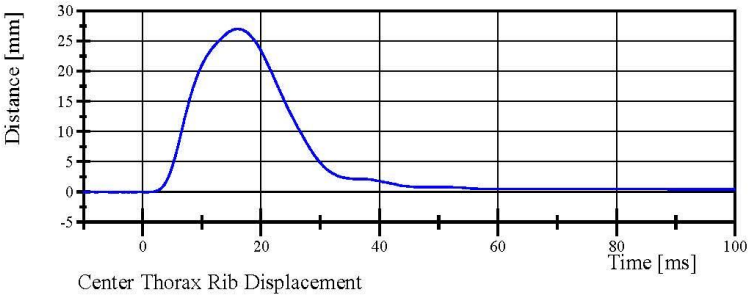
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Shoulder Rib Displacement



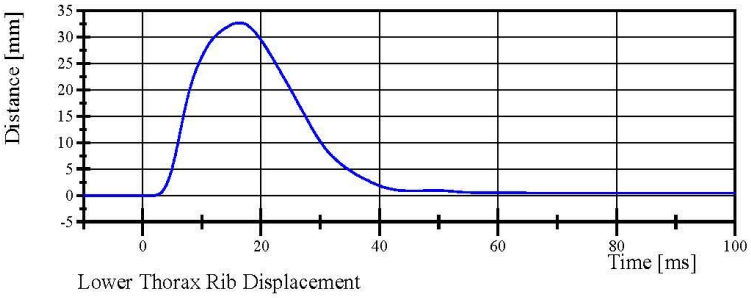
Filter Class: CFC_600
Max: 33.5 mm at 15.9 ms
Min: -0.0 mm at 1.4 ms

Upper Thorax Rib Displacement



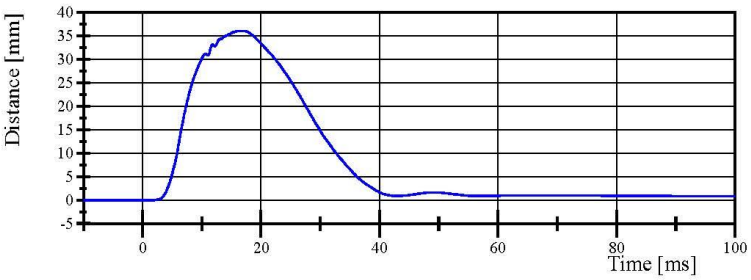
Filter Class: CFC_600
Max: 27.0 mm at 16.0 ms
Min: -0.0 mm at 0.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.7 mm at 16.3 ms
Min: -0.0 mm at 1.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 36.0 mm at 16.6 ms
Min: -0.0 mm at 0.7 ms

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

03.22.2019 10:02:50 612

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.274 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.8 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.4 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	39.9 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.5 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.0 g	Yes

Test meets specifications.

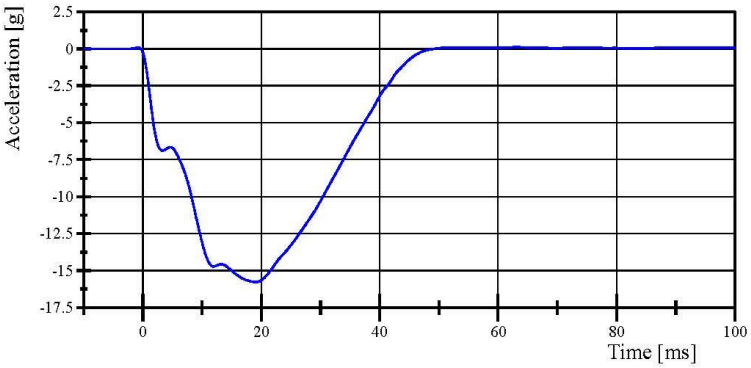
Condition: Used

Comments:
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

Transportation Research Center Inc.

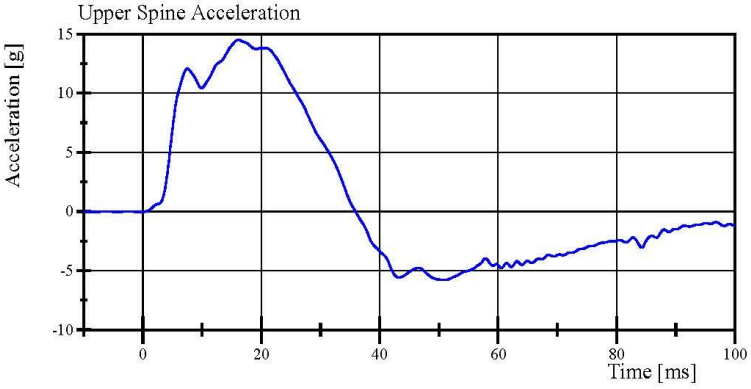
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



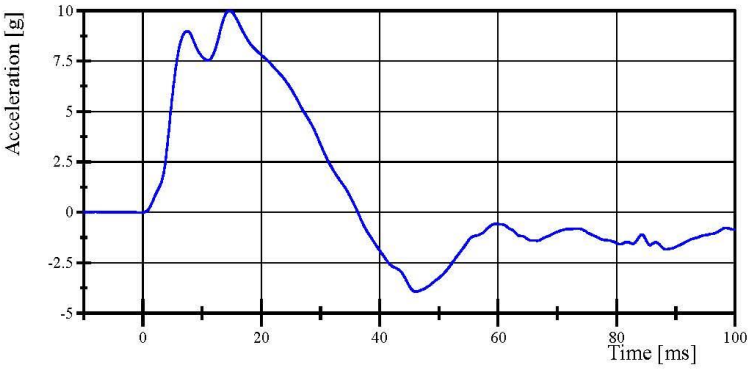
Filter Class: CFC_180
Max: 0.1 g at 63.1 ms
Min: -15.8 g at 19.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.5 g at 16.2 ms
Min: -5.8 g at 50.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.0 g at 14.6 ms
Min: -3.9 g at 46.1 ms

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

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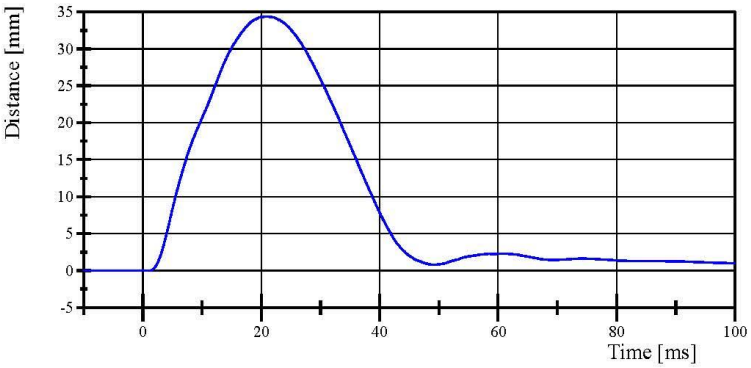
Transportation Research Center Inc.

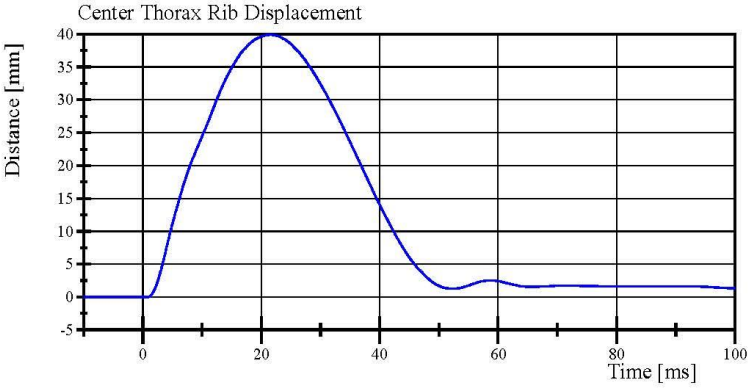
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Upper Thorax Rib Displacement



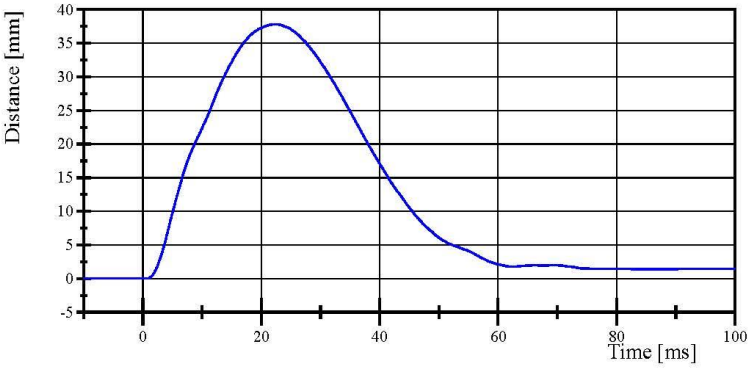
Filter Class: CFC_600
Max: 34.4 mm at 20.9 ms
Min: -0.0 mm at 1.0 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.9 mm at 21.5 ms
Min: -0.0 mm at 0.7 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.8 mm at 22.3 ms
Min: -0.0 mm at 0.6 ms

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

03.22.2019 09:27:00 841

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.1 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	45.7 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.4 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.14 g	Yes

Test meets specifications.

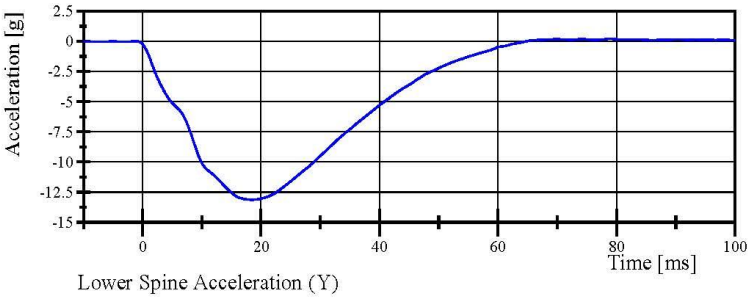
Condition: Used

Comments:
Upper Abdominal Rib S/N: 1997
Lower Abdominal Rib S/N: DS1234

Transportation Research Center Inc.

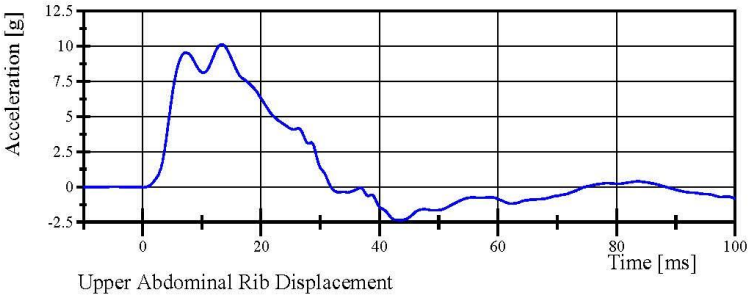
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



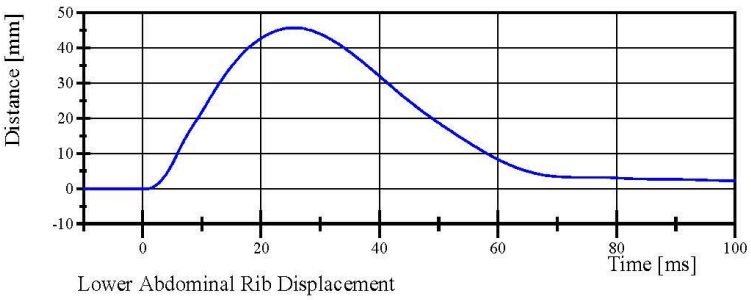
Filter Class: CFC_180
Max: 0.2 g at 79.0 ms
Min: -13.1 g at 18.4 ms

Lower Spine Acceleration (Y)



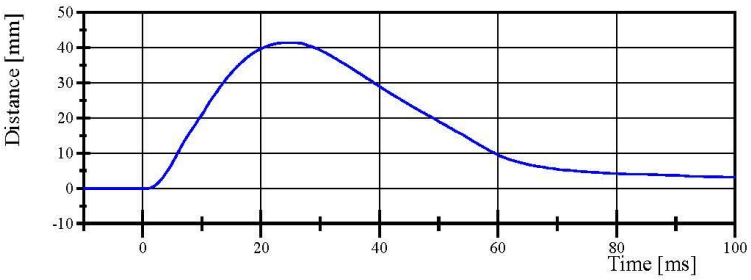
Filter Class: CFC_180
Max: 10.1 g at 13.4 ms
Min: -2.4 g at 43.4 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 45.7 mm at 25.5 ms
Min: -0.0 mm at 0.4 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.4 mm at 24.8 ms
Min: -0.0 mm at 0.6 ms

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

03.22.2019 09:09:42 646

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.61 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-42.47 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.1 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,877.5 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: 884
Pelvis Plug Info:
Manufacturer: SACO
S/N: 11764
Cal Date: 20180116

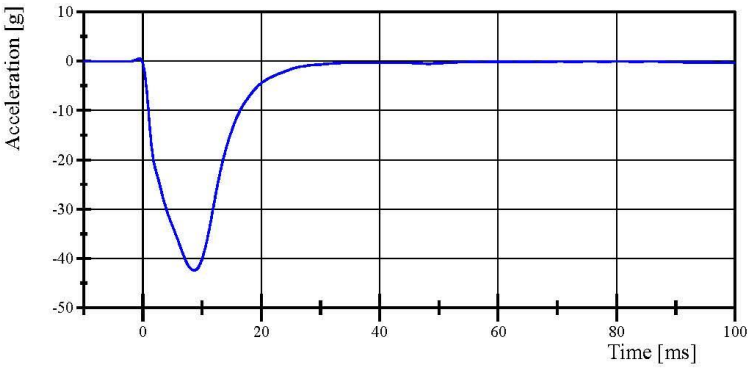
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 08:31:48 423

Transportation Research Center Inc.

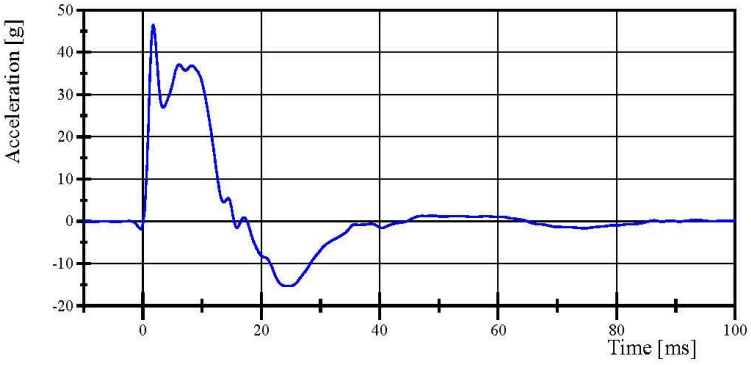
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



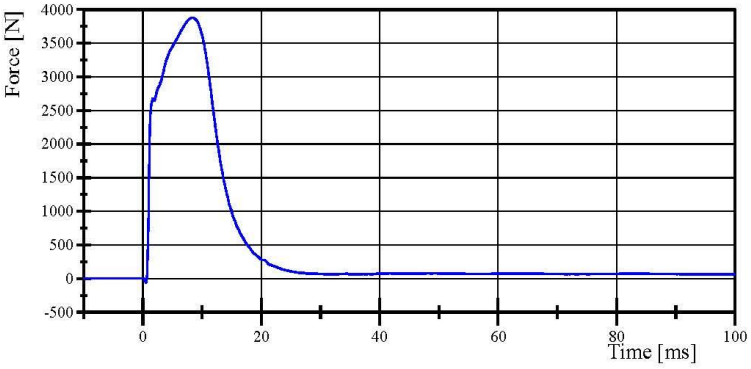
Filter Class: CFC_180
Max: 0.5 g at -0.6 ms
Min: -42.5 g at 8.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 46.6 g at 1.8 ms
Min: -15.3 g at 24.8 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,877.5 N at 8.3 ms
Min: -58.1 N at 0.6 ms

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

03.22.2019 08:34:11 423

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.7 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	30.4 g	Yes
Iliac Force	4,100 - 5,100 N	4,534.0 N	Yes

Test meets specifications.

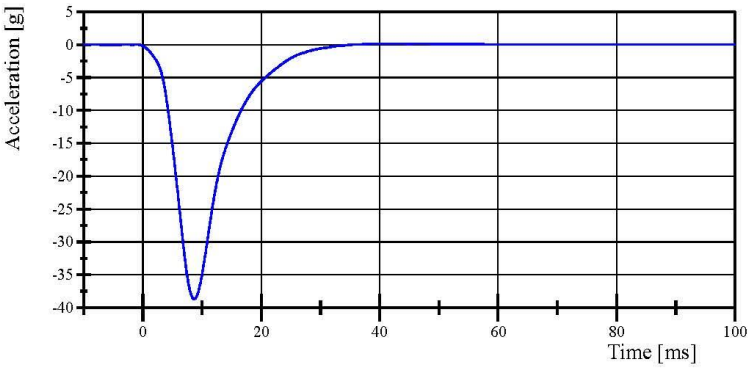
Condition: Used

Comments:
Pelvis Skin S/N: 884

Transportation Research Center Inc.

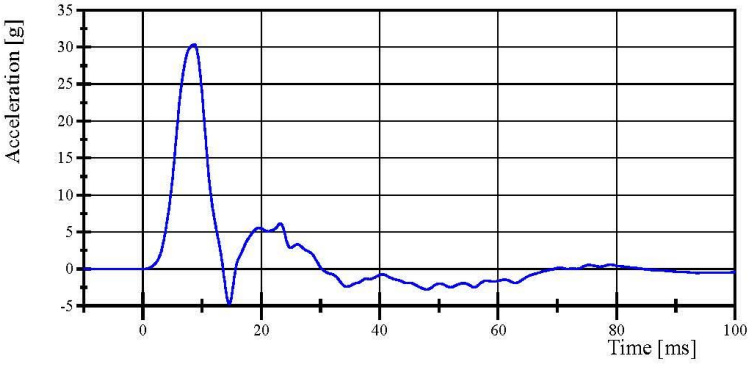
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



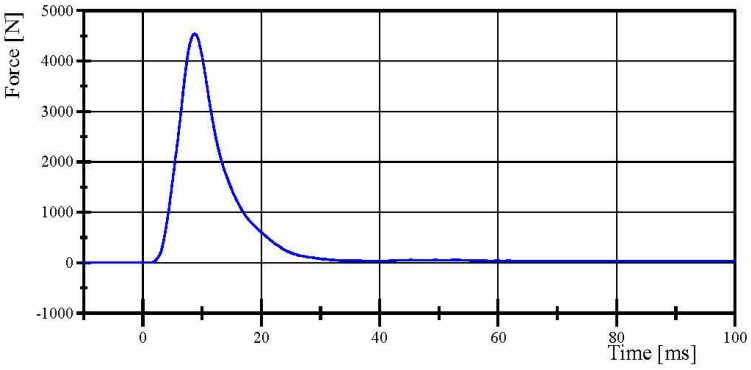
Filter Class: CFC_180
Max: 0.2 g at 43.3 ms
Min: -38.7 g at 8.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 30.4 g at 8.6 ms
Min: -4.7 g at 14.6 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,534.0 N at 8.7 ms
Min: -0.9 N at -0.2 ms

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

03.22.2019 10:52:28 626

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	28-Nov-2018
		Y	T10352	Endevco	28-Nov-2018
		Z	P91950	Endevco	28-Nov-2018
Redundant Head Accelerometers		X	P94566	Endevco	28-Nov-2018
		Y	P83368	Endevco	28-Nov-2018
		Z	P94483	Endevco	28-Nov-2018
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	11-Apr-2018
	Middle	Y	174	FTSS	11-Apr-2018
	Lower	Y	173	FTSS	11-Apr-2018
Abdomen Load Cells	Front	Y	1441	Denton	11-Apr-2018
	Middle	Y	1436	Denton	11-Apr-2018
	Rear	Y	1437	Denton	11-Apr-2018
Lower Spine Accelerometers (T12)		X	P89126	Endevco	28-Nov-2018
		Y	P87139	Endevco	28-Nov-2018
		Z	P64884	Endevco	28-Nov-2018
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	11-Apr-2018

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	T11432	Endevco	30-Nov-2018
			Y	P93774	Endevco	30-Nov-2018
			Z	P91566	Endevco	30-Nov-2018
Redundant Head Accelerometers			X	P91615	Endevco	30-Nov-2018
			Y	P93762	Endevco	30-Nov-2018
			Z	P93761	Endevco	30-Nov-2018
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	17-Apr-2018
		Middle	Y	037	Servo	17-Apr-2018
		Lower	Y	1161	Servo	17-Apr-2018
	Abdominal Rib	Upper	Y	1295	Servo	17-Apr-2018
		Lower	Y	1136	Servo	17-Apr-2018
Lower Spine Accelerometers (T12)			X	P94545	Endevco	30-Nov-2018
			Y	P94647	Endevco	30-Nov-2018
			Z	P94530	Endevco	30-Nov-2018
Acetabulum Load Cell			Y	DK7483S-FY	FTSS	16-Apr-2018
Iliac Wing Load Cell			Y	287-FY	Denton	16-Apr-2018
Pelvis Plug (struck side)				12279	SACO	15-Mar-2018
Pelvis Plug (non-struck side)				36473	FTSS	29-Sep-2010

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P87822	Endevco	21-Dec-2018
	Vehicle Center of Gravity	Y	P94524	Endevco	21-Dec-2018
	Vehicle Center of Gravity	Z	P88460	Endevco	21-Dec-2018
2	Right Sill at Front Seat	X	T11825	Endevco	8-Jan-2019
	Right Sill at Front Seat	Y	T11837	Endevco	8-Jan-2019
	Right Sill at Front Seat	Z	T11833	Endevco	8-Jan-2019
3	Right Sill at Rear Seat	X	T11821	Endevco	7-Jan-2019
	Right Sill at Rear Seat	Y	T11823	Endevco	7-Jan-2019
	Right Sill at Rear Seat	Z	T11834	Endevco	7-Jan-2019
4	Left Sill at Front Door	Y	P94485	Endevco	21-Dec-2018
5	Left Sill at Rear Door	Y	P66730	Endevco	19-Mar-2019
6	Left A-Post Lower	Y	T11448	Endevco	3-Jan-2019
7	Left A-Post Middle	Y	T11388	Endevco	3-Jan-2019
8	Left B-Post Lower	Y	T11822	Endevco	19-Mar-2019
9	B-Post Middle	Y	T11449	Endevco	19-Mar-2019
10	Front Seat Track	Y	T11398	Endevco	19-Mar-2019
11	Rear Seat Track or Structure	Y	T11397	Endevco	19-Mar-2019
12	Right Rear Occupant Compartment	Y	T11396	Endevco	19-Mar-2019
13	Engine Block	X	P56615	Endevco	21-Dec-2018
	Engine Block	Y	T11840	Endevco	8-Jan-2019
14	Rear Floorpan Above Axle	X	P76171	Endevco	19-Mar-2019
	Rear Floorpan Above Axle	Y	P75713	Endevco	19-Mar-2019
	Rear Floorpan Above Axle	Z	P76114	Endevco	19-Mar-2019

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P76454	Endevco	24-Oct-18
MDB Center of Gravity	Y	P58611	Endevco	24-Oct-18
MDB Center of Gravity	Z	P61295	Endevco	24-Oct-18
Left Frame Rail at Rear Axle Centerline	X	P75115	Endevco	24-Oct-18
Left Frame Rail at Rear Axle Centerline	Y	P94567	Endevco	24-Oct-18