

FINAL REPORT NUMBER: SPNCAP-TRC-19-003

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**NISSAN MOTOR CO., LTD.
2019 Infiniti QX50 SUV
NHTSA NUMBER: M20195214**

**PREPARED BY:
Transportation Research Center Inc.
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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: _____

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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16. Abstract A 32.2 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject vehicle, a 2019 Infiniti QX50 SUV, in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on March 20, 2019. The impact velocity was 32.72 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 21.3° C. The test vehicle's post-test maximum crush was 384 mm at Level 3. The test or target vehicle's performance is given below: <table border="1"> <thead> <tr> <th></th><th>Unit</th><th>Threshold</th><th>Front SID-IIs</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆):</td><td>NA</td><td>1000</td><td>183</td></tr> <tr> <td>Resultant Lower Spine Acceleration:</td><td>g's</td><td>82</td><td>37.8</td></tr> <tr> <td>Total Pelvic Force: (sum of acetabular and iliac forces)</td><td>N</td><td>5525</td><td>2368.1</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>38*</td><td>20.8</td></tr> <tr> <td>Maximum Abdomen Rib Deflection</td><td>mm</td><td>45*</td><td>22.2</td></tr> </tbody> </table> * Proposed IARV The doors on the struck side did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					Unit	Threshold	Front SID-IIs	Head Injury Criteria (HIC ₃₆):	NA	1000	183	Resultant Lower Spine Acceleration:	g's	82	37.8	Total Pelvic Force: (sum of acetabular and iliac forces)	N	5525	2368.1	Maximum Thoracic Rib Deflection	mm	38*	20.8	Maximum Abdomen Rib Deflection	mm	45*	22.2
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V 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 Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																									
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TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
1 Test Purpose and Procedure	1
2 Summary of Test Results	2
3 Occupant and Vehicle Information	4
 <u>Data Sheet No.</u>	 <u>Page No.</u>
1 General Test and Vehicle Parameter Data	5
2 Seat, Seat Belt, Steering Wheel Adjustment and Fuel Systems Data	8
3 Dummy Longitudinal Clearance Dimensions	11
4 Dummy Lateral Clearance Dimensions	12
5 Camera and Instrumentation Data	13
6 Vehicle Accelerometer Data	14
7 Rigid Pole Load Cell Data	15
8 Post-Test Observations	16
9 Vehicle Profile Measurements	18
10 Vehicle Exterior Crush Measurements	19
11 Vehicle Damage Profile Distances	22
12 FMVSS No. 301 Fuel Integrity Post-Impact Data	23
13 Dummy/Vehicle Temperature and Humidity Stabilization Data	24
 <u>Appendix</u>	 <u>Page No.</u>
A Photographs	A-1
B Vehicle and Dummy Response Data Plots	B-1
C Dummy Configuration and Performance Verification Data	C-1
D Test Equipment And Instrumentation Calibration Data	D-1

SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY 19 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 manufactured by NISSAN MOTOR CO., LTD. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a model year 2019 Infiniti QX50 SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.72 km/h. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, OH, on March 20, 2019. Pre-test and post-test photographs of the test vehicle and the side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated October 2015. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

- Primary and Redundant Head CG Triaxial Accelerometers
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper and Lower Rib Displacement Potentiometers
- Lower Spine (T12) Triaxial Accelerometers
- Iliac Load Cell
- Acetabulum Load Cell

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 contains the test equipment and instrumentation calibration data.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)	NA	1000	183
Lower Spine Acceleration Resultant	G	82	37.8
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2368.1
Maximum Thoracic Rib Deflection	mm	38*	20.8
Maximum Abdominal Rib Deflection	mm	45*	22.2

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

GENERAL COMMENTS

Driver Head Angular X: Channel Failed

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20195214
Model Year	2019
Make	Infiniti
Model	QX50
Body Style	MPV
VIN	3PCAJ5M17KF131464
Body Color	Liquid Platinum
Odometer Reading (km/mi)	11 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 Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Rear Pass. 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 Manufacturer	12/18
Vehicle Type	MPV

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

VEHICLE SEATING AND WEIGHT CAPACITY DATA

	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	N/A	5
Vehicle Capacity Weight (VCW) (kg)				390.0
DSC X 68.04 kg				340.2
Rated Cargo and Luggage Weight (RCLW) (kg)				49.8

VEHICLE SEAT TYPE

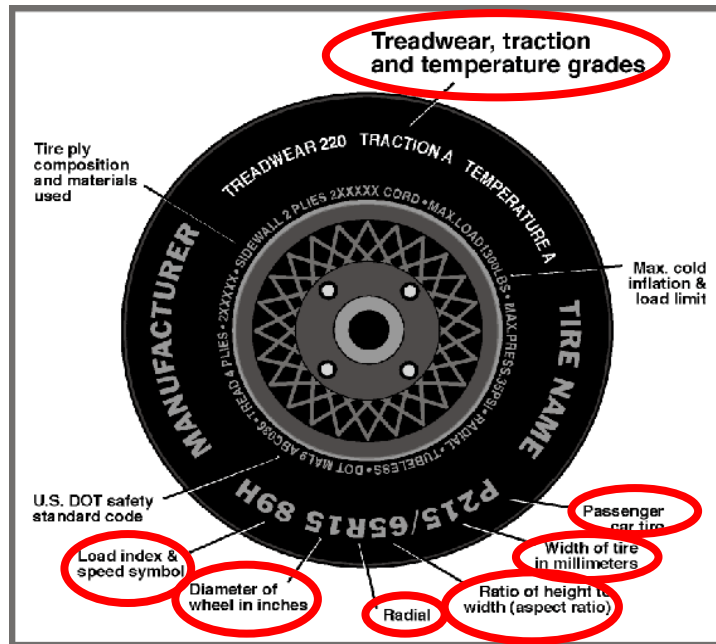
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	Yes	N/A	N/A		N/A	Yes	N/A
Rear or Second Row Seat	N/A	N/A	Yes	Yes	N/A	Yes	N/A
Third row seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
Test Date: 3/20/2019



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 CMH2218	EJ FO CMH2318
DOT Safety Code Right	EJ FO CMH2318	EJ FO CMH2018

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

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	331	345	331	331
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	230	230	230	230
As Tested	kPa	230	230	230	230

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	515.0	365.4		538.0	395.2		542.6	406.2	
Right	kg	515.4	347.8		523.6	378.8		519.6	374.0	
Ratio	%	59.1	40.9		57.8	42.2		57.7	42.3	
Totals	kg	1030.4	713.2	1743.6	1061.6	774.0	1835.6	1062.2	780.2	1842.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total As Delivered Weight (UVW)	kg	1743.6
Actual Weight of 1 P572V ATD (SID-ILs) Dummy Used	kg	49.0
Rated Cargo/Luggage Weight (RCLW)	kg	49.8
Calculated Vehicle Target Weight (TVTW)	kg	1842.4

(A)
 (B)
 (C)
 (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

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	Deg.	-0.2	-0.2	0.0	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg.	-0.2	-0.2	0.0	Yes
Front Bumper-Line Angle (left-to-right)**	Deg.	0.0	0.0	-0.1	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg.	+0.2	0.0	0.0	Yes
Vehicle CG (Aft of Front Axle)	mm	1141	1176	1181	
Vehicle CG (Left (+) / Right (-) from longitudinal Centerline)	mm	-8	+14	+24	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for "Meets Requirements".

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: None	0.0
Components Removed: Rear fascia and bumper beam, tail lights, right side door panels and speakers	18.2

Test height adjustable suspension setting, if applicable:

N/A

DATA SHEET NO. 2

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2019 Infiniti QX50 SUV

NHTSA No.: M20195214

Test Program: SPNCAP Side Impact

Test Date: 3/20/2019

SEAT POSITIONING

The driver seat, front center seat (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, 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	24.5	16.0	20.2
Front Passenger Seat	23.8	15.6	19.7
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	Fixed	18.0
Non-Struck Side Rear Seat	Fixed	Fixed	19.9
Rear Center Seat*	Fixed	Fixed	18.0

* 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	20.2	221	Max	231	241	252
			Mid	200	213	221
			Min	168	181	190
Front Passenger Seat	19.7	216	Max	223	234	252
			Mid	197	204	216
			Min	163	174	185
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	18.0	218	Max	N/A	N/A	N/A
			Mid	218	215	213
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	19.9	201	Max	N/A	N/A	N/A
			Mid	201	200	198
			Min	N/A	N/A	N/A
Rear Center Seat*	18.0	218	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019

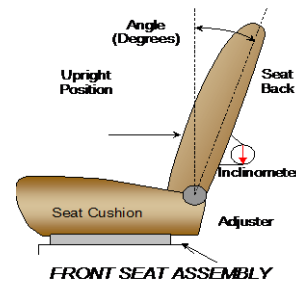
SEAT FORE/AFT POSITION

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

* If applicable.

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. 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 passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1. For the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match 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	79.5	N/A	-4.0	N/A
Front Passenger Seat	79.2	N/A	-4.0	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	18.0	10	-10.4	0
Non-Struck Side Rear Seat	17.5	10	-10.7	0
Rear Center Seat*	18.0	10	-10.4	0

* If applicable.

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4	0, Uppermost

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	5, Lowermost

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

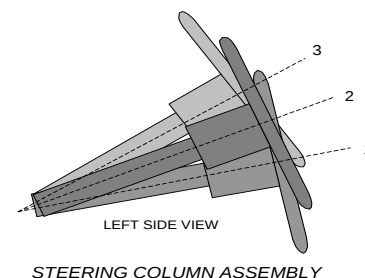
Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel geometric locus it describes when moved through its full range of motion.

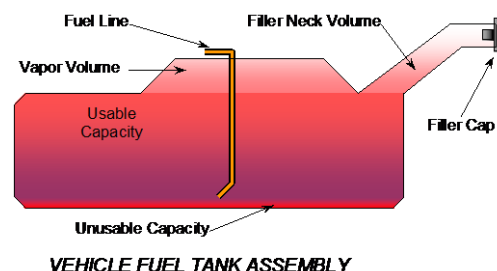
	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	23.0	0
Geometric Center, Position No. 2	25.8	26
Uppermost, Position No. 3	28.5	52
Telescoping Steering Wheel Travel		52
Test Position	25.8	26



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.



FUEL TANK CAPACITY

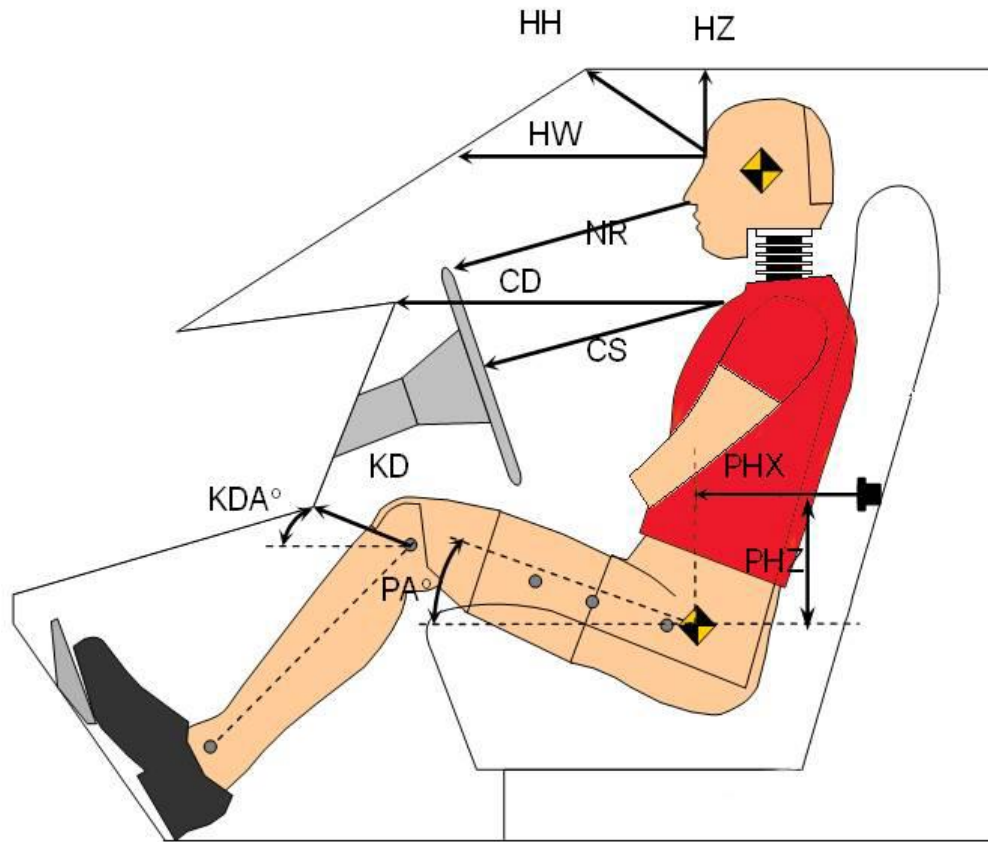
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	60.2
Usable Capacity of "Optional" Tank (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	60.0
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	56.0
Actual Amount of Solvent Used in Test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

Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 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
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019

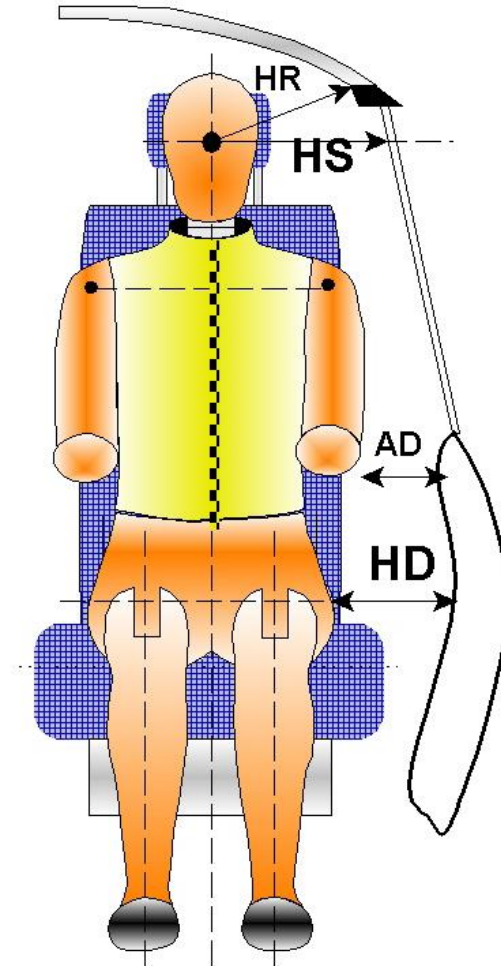


Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	325	
HW	Head to Windshield	642	
HZ	Head to Visor	207	
NR	Nose to Rim	258	
CD	Chest to Dashboard	411	
CS	Chest to Steering Wheel	177	
KDL/KDLA°	Left Knee to Dash	142	40.1
KDR/KDRA°	Right Knee to Dash	128	39.6
PAX°	Pelvic Tilt Angle (X-axis)		0.3
PAY°	Pelvic Tilt Angle (Y-axis)		18.9
PHX	Hip Point to Striker (X-Axis)	366	
PHZ	Hip Point to Striker (Z-Axis)	147	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019

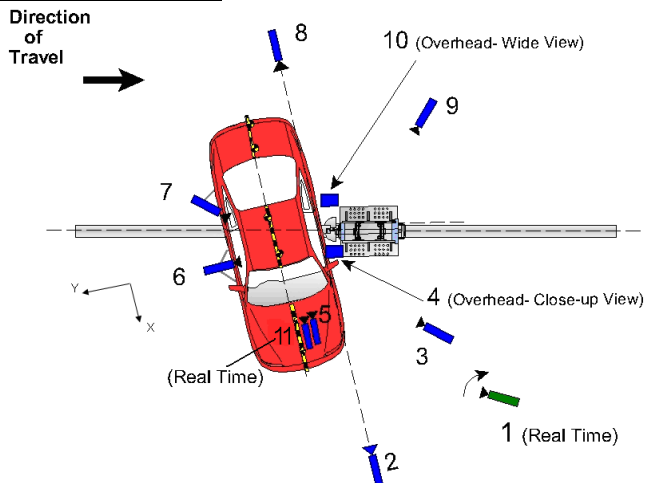


Code	Measurement Description	Length (mm)
HR	Head to Side Header	304
HS	Head to Side Window	398
AD	Arm to Door	166
HD	Hip Point to Door	157

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019



REFERENCE: (from point of impact for X and Y; from ground for Z)
 + X = Forward of vehicle, + Y = Right of vehicle, + Z = Down

Camera No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real time (24-30 fps) pan view of impact				Zoom	30
2	Front ground level – impact view	0	5149	-1531	20	1000
3	Impact side 45° – forward pole view	1163	4153	-1479	20	1000
4	Overhead Close-up view of impact	0	0	-5650	28	1000
5	Onboard – dummy front view				25	1000
6	Onboard – dummy side view				12.5	1000
7	Onboard – dummy rear oblique view				12.5	1000
8	Rear ground level – impact view	0	-5960	-1486	20	1000
9	Impact side 45° – rearward pole view	3754	-5088	-1400	20	1000
10	Overhead wide view of impact	221	0	-5650	18	1000
11	Real time dummy front view				Zoom	30

All measurements accurate to +/- 6 mm.

NOTE: Vehicle was at a 75° angle to the rigid pole.

If applicable, explain why camera(s) did not run: N/A

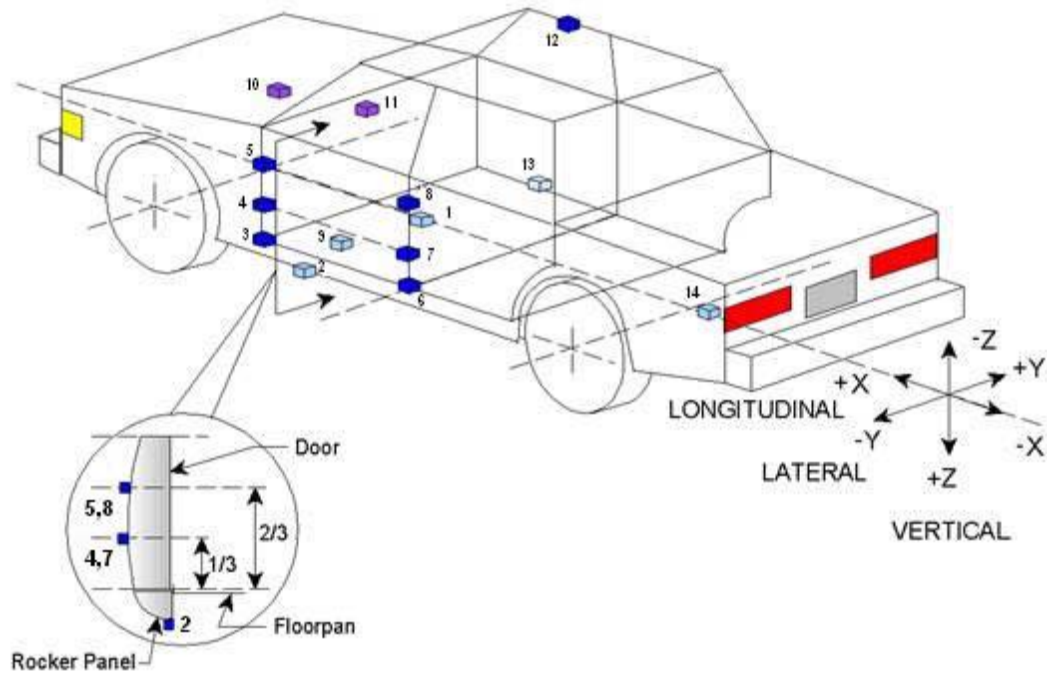
INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Vehicle Structure	18
Pole Load Cells	8
TOTAL	42

**DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
Test Date: 3/20/2019



Accelerometer/Sensor Location				
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2885	105	-252
2	Left Floor Sill	2912	-675	-351
3	A-Pillar Sill	3180	-685	-500
4	A-Pillar Low	3220	-850	-615
5	A-Pillar Mid	3222	-825	-952
6	B-Pillar Sill	2115	-748	-490
7	B-Pillar Low	2135	-847	-690
8	B-Pillar Mid	2115	-825	-1015
9	Driver Seat Track	2430	-550	-330
10	Engine Top	4098	85	-838
11	Firewall	3665	0	-878
12	Right Roof	2342	635	-1565
13	Right Floor Sill	2897	675	-337
14	Rear Floorpan	760	0	-500

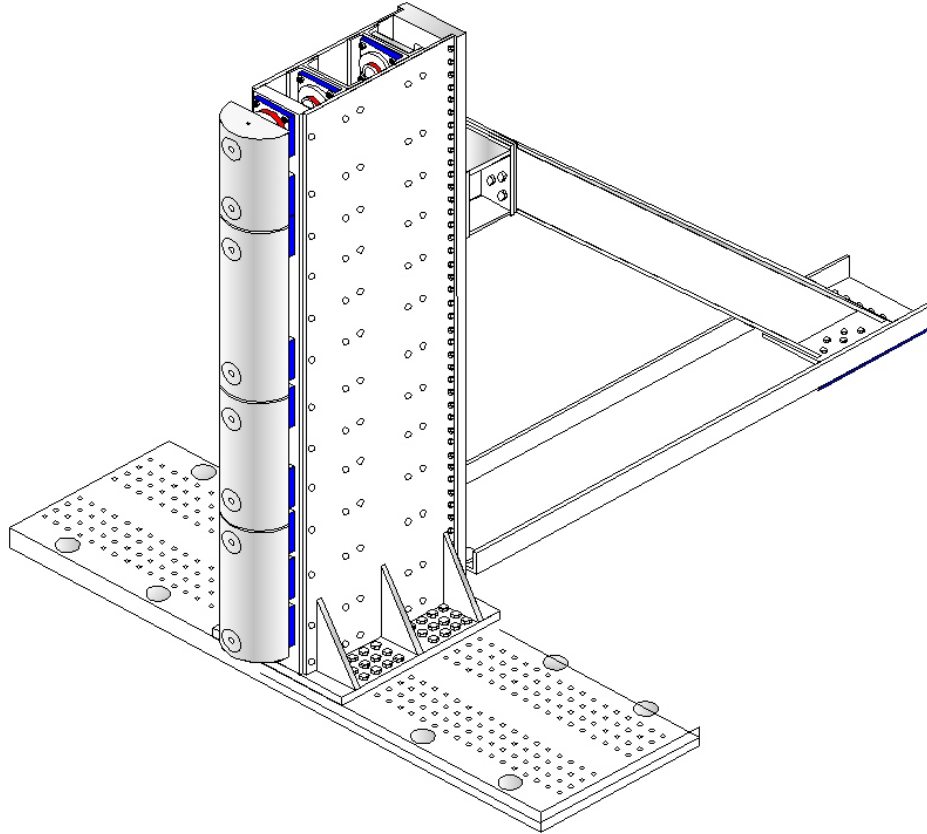
Reference: X - Test Vehicle Rear Bumper (+ forward)
Y - Test Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
Test Date: 3/20/2019

FOIL 300K RIGID POLE



Load Cell Locations	
ID	Height From Top of Carrier (mm)
1	87
2	468
3	648
4	978
5	1168
6	1651
7	1816
8	2057

**DATA SHEET NO. 8
POST-TEST OBSERVATIONS**

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
Test Date: 3/20/2019

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	SCAB
Top of Head	SCAB
Left Side of Head	SCAB
Back of Head	SCAB
Left Shoulder	Seatback bolster, SCAB, SAB
Upper Torso	Seatback bolster
Lower Torso	Seatback bolster, SAB
Left Hip	SAB, Door panel
Left Knee	None

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	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

* Indicate "Yes", "No", or "NA".

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

* Indicate "Yes", "No", or "NA".

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	None
Windshield Damage	Along A pillar and across top edge
Side Window Damage	Driver window broken out
Other Notable Effects	None

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

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
Test Date: 3/20/2019

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

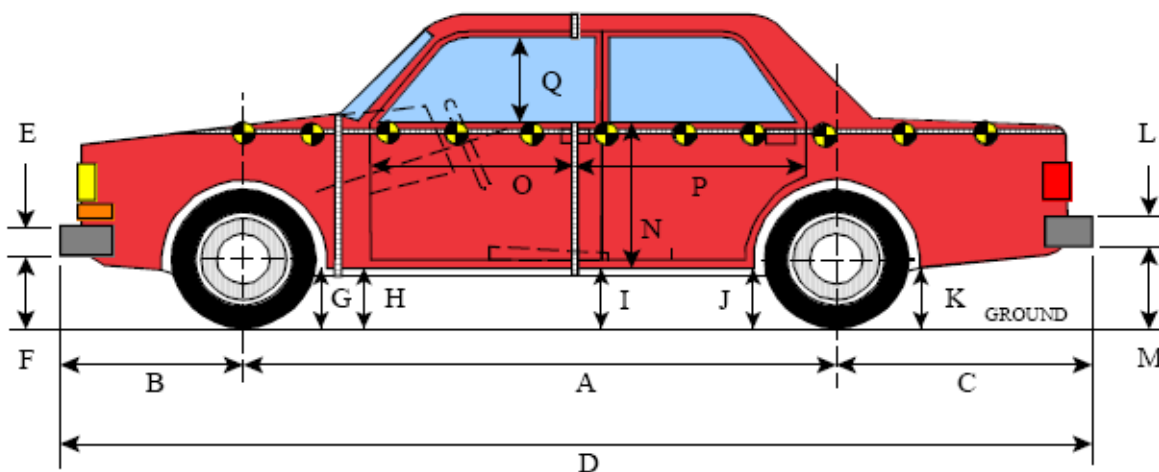
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1115
Actual Impact Point (Aft of Front Axle)	mm		1119
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 of Intended Impact point	-4
Angle Between Vehicle's Longitudinal Centerline and Line of Motion	degrees	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.72
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.71

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019



LEFT SIDE VIEW

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

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

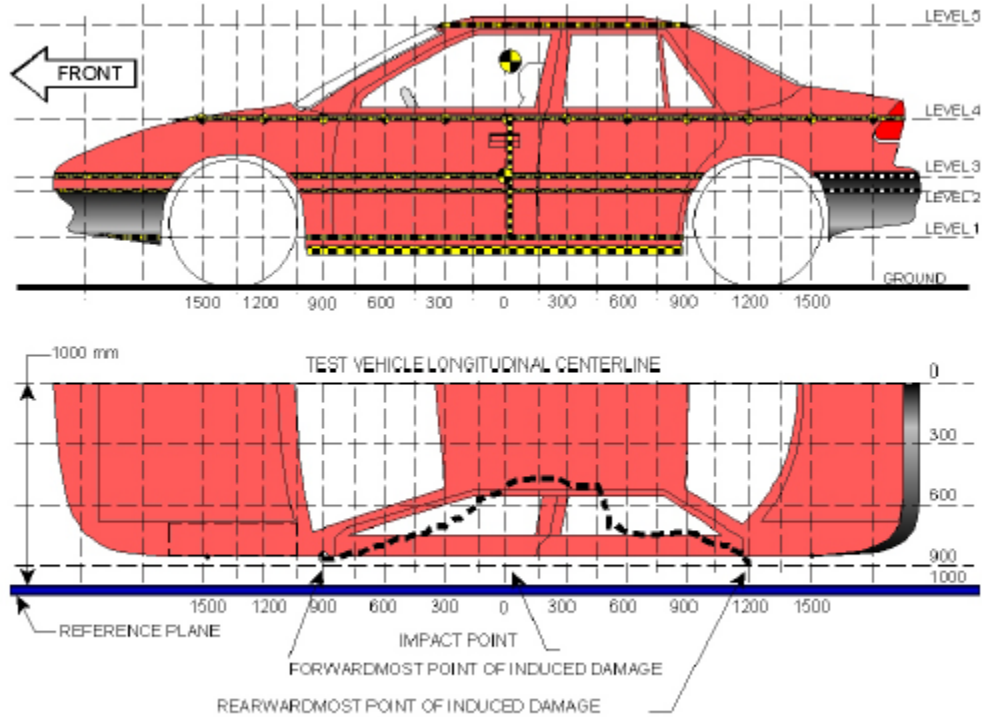
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2790	2730	60
B	Front Axle to Front Surface of Vehicle	930	930	0
C	Rear Axle to Rear Surface of Vehicle	970	970	0
D	Total Length at Centerline	4690	4670	20
E	Front Bumper Thickness	77	77	0
F	Front Bumper Bottom to Ground	483	510	-27
G	Sill Height at Front Wheel Well	285	290	-5
H	Sill Height at Front Door Leading Edge	285	285	0
I	Sill Height at B-Pillar	302	320	-18
J1	Sill Height at Rear Wheel Well	310	343	-33
J2	Pinch Weld Height at Rear Wheel Well	243	265	-22
K	Sill Height Aft of Rear Wheel Well	402	440	-38
L	Rear Bumper Thickness	75	75	0
M	Rear Bumper Bottom to Ground	499	550	-51
N	Sill Height to Bottom of Front Window Sill	900	900	0
O	Front Door Leading Edge to Impact CL	634	457	177
P	Rear Door Trailing Edge to Impact CL	1555	1475	80
Q	Front Window Opening	427	410	17
R	Right Side Length	4410	4445	-35
S	Left Side Length	4410	4360	50
T ¹	Vehicle Width at B-Pillars	1885	1800	85

¹ Max width = 1900

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019



NOTE: All measurements are in millimeters (mm)

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	396	324	0
2	Occupant H-Point	646	357	0
3	Mid-Door	764	384	0
4	Window Sill	1083	346	0
5	Window Top	1580	176	150

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

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019

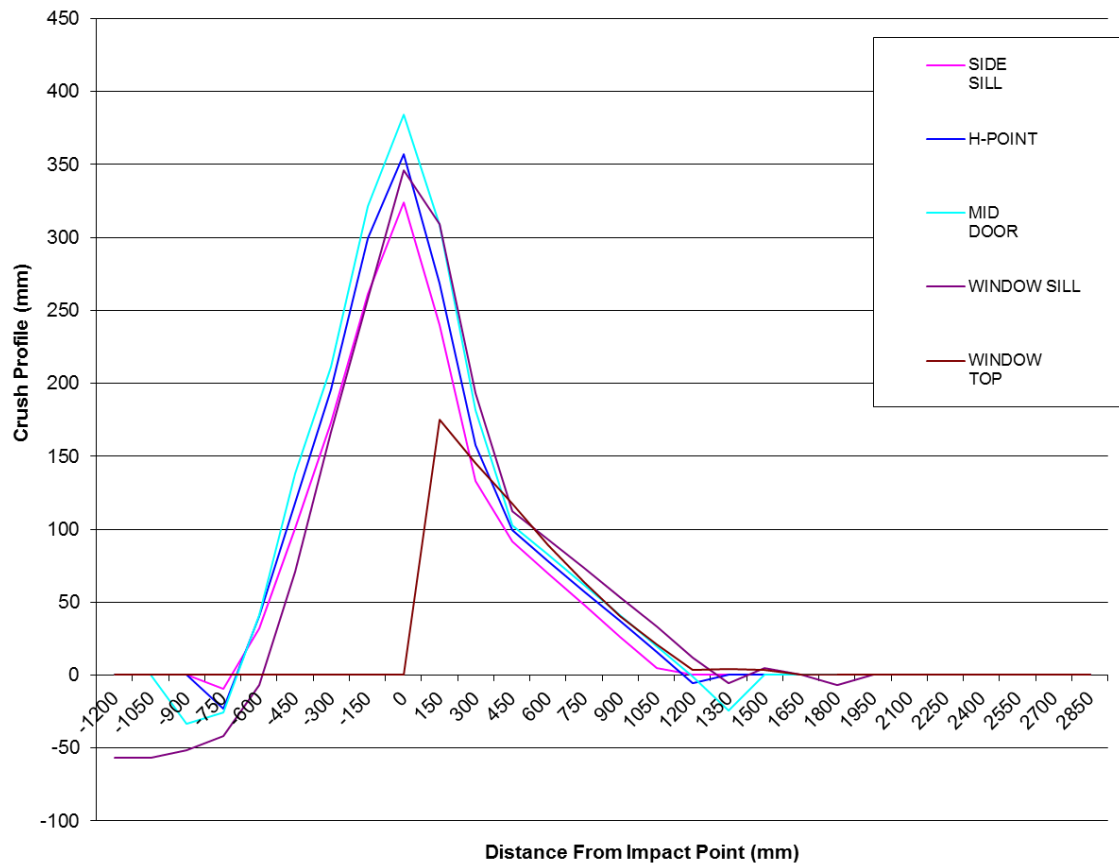
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200	0	0	0	748	0	0	0	0	805	0	0	0	0	-57	0
-1050	0	0	0	782	0	0	0	0	839	0	0	0	0	-57	0
-900	0	0	955	810	0	0	0	988	862	0	0	0	-33	-52	0
-750	945	957	958	832	0	954	980	983	874	0	-9	-23	-25	-42	0
-600	930	950	955	845	0	898	910	914	852	0	32	40	41	-7	0
-450	932	946	954	849	0	831	828	816	778	0	101	118	138	71	0
-300	933	944	954	854	0	760	748	743	687	0	173	196	211	167	0
-150	933	941	953	866	0	672	642	632	608	0	261	299	321	258	0
0	932	939	952	880	0	608	582	568	534	0	324	357	384	346	0
150	931	936	950	892	616	691	668	641	582	440	240	268	309	310	176
300	928	934	948	893	624	795	776	767	700	479	133	158	181	193	145
450	925	932	947	914	628	833	832	844	802	511	92	100	103	112	117
600	922	932	947	918	629	852	854	864	825	540	70	78	83	93	89
750	921	937	948	913	626	872	879	887	840	563	49	58	61	73	63
900	923	944	952	905	623	896	906	910	852	582	27	38	42	53	41
1050	930	952	956	895	615	925	936	936	862	594	5	16	20	33	21
1200	0	951	959	882	604	0	957	961	870	601	0	-6	-2	12	3
1350	0	0	959	904	589	0	0	983	910	585	0	0	-24	-6	4
1500	0	0	0	907	566	0	0	0	902	562	0	0	0	5	4
1650	0	0	0	903	0	0	0	0	903	0	0	0	0	0	0
1800	0	0	0	892	0	0	0	0	899	0	0	0	0	-7	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. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Infiniti QX50 SUV
Test Program: SPNCAP Side Impact

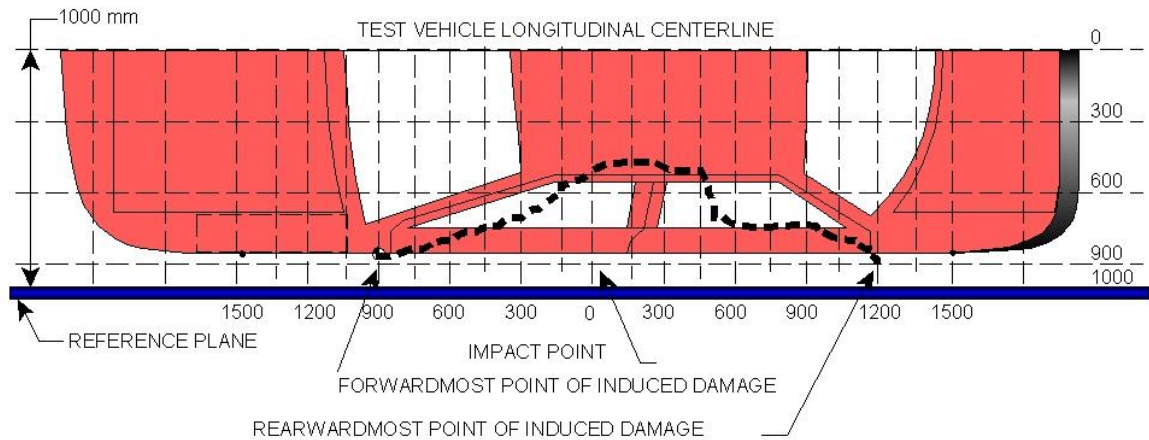
NHTSA No.: M20195214
Test Date: 3/20/2019



DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2019 Infiniti QX50 SUV
 Test Program: SPNCAP Side Impact

NHTSA No.: M20195214
 Test Date: 3/20/2019



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1 ¹	1500	4	902	907	0
2	1050	4	862	895	33
3	600	4	825	918	93
4	300	4	700	893	193
5	-150	3	632	953	321
6 ¹	-600	3	914	955	0

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

DATA SHEET NO. 12

FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2019 Infiniti QX50 SUV

NHTSA No.: M20195214

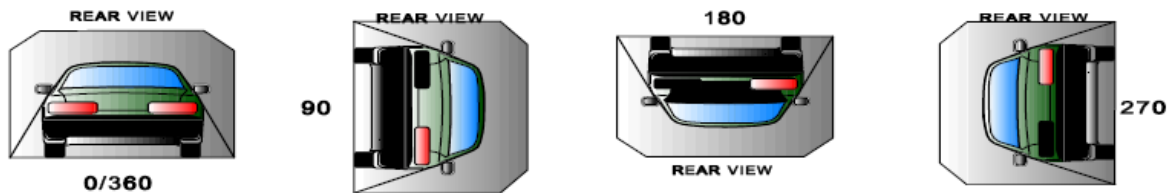
Test Program: SPNCAP Side Impact

Test Date: 3/20/2019

Test Time: 18:14 Temperature: 21.6°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

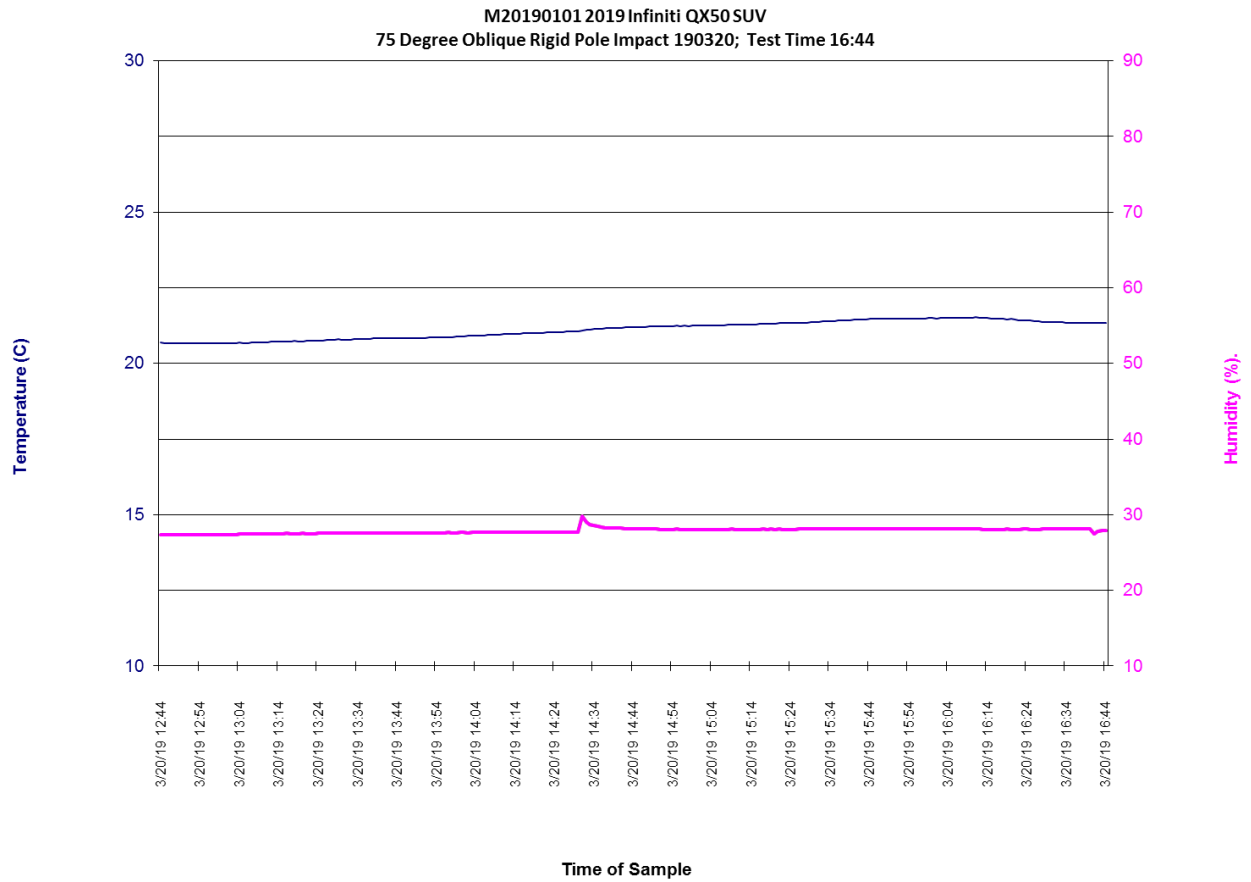
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	0
90 to 180	0	0	0	0
180 to 270	0	0	0	0
270 to 360	0	0	0	0

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. 13
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2019 Infiniti QX50 SUV NHTSA No.: M20195214
Test Program: SPNCAP Side Impact Test Date: 3/20/2019



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

No.	Description	Page
1	As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle	A-4
2	As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	A-4
3	Pre-Test Frontal View of Test Vehicle	A-5
4	Post-Test Frontal View of Test Vehicle	A-5
5	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-6
6	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-6
7	Pre-Test Left Side View of Test Vehicle	A-7
8	Post-Test Left Side View of Test Vehicle	A-7
9	Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-8
10	Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-8
11	Pre-Test Rear View of Test Vehicle	A-9
12	Post-Test Rear View of Test Vehicle	A-9
13	Pre-Test Right Side View of Test Vehicle	A-10
14	Post-Test Right Side View of Test Vehicle	A-10
15	Pre-Test Overhead View of Test Area	A-11
16	Post-Test Overhead View of Test Area	A-11
17	Pre-Test Left Side View of Pole Positioned Against Side of Vehicle	A-12
18	Pre-Test Right Side View of Pole Positioned Against Side of Vehicle	A-12
19	Pre-Test Close-Up View of Impact Point Target	A-13
20	Post-Test Close-Up View of Impact Point Target Showing Impact Location	A-13
21	Pre-Test Front Close-Up View of Dummy Head and Chest	A-14
22	Post-Test Front Close-Up View of Dummy	A-14
23	Pre-Test Left Side View of Dummy Showing Belt and Chalking	A-15
24	Pre-Test Left Side View of Dummy Shoulder and Door Top View	A-16
25	Post-Test Left Side View of Dummy Shoulder and Door Top View	A-16
26	Pre-Test Front View of Seat Back Prior to Dummy Positioning	A-17
27	Pre-Test Front View of Dummy Head and Shoulders in Relation to Head Restraint	A-17
28	Pre-Test Front View of Seat Pan Prior to Dummy Positioning	A-18
29	Pre-Test Overhead View of Dummy Thighs on Seat Pan	A-18
30	Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket	A-19
31	Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level	A-19
32	Pre-Test Placement of Dummy's Feet	A-20
33	Pre-Test View of Belt Anchorage for Dummy	A-20
34	Pre-Test Left Side View of Steering Wheel	A-21
35	Pre-Test View of Disengaged Parking Brake	A-21

TABLE OF PHOTOGRAPHS (CONTINUED)

No.	Description	Page
36	Pre-Test View of Parking Brake	A-22
37	Pre-Test Close-Up Left Side View of Driver Seat Track	A-22
38	Pre-Test Close-Up Left Side View of Driver Seat Back	A-23
39	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-23
40	Pre-Test Dummy and Door Clearance View	A-24
41	Post-Test Dummy and Door Clearance View	A-24
42	Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment	A-25
43	Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment	A-25
44	Pre-Test Inner Driver Door Panel View	A-26
45	Post-Test Inner Driver Door Panel View Showing Dummy Contact Location	A-26
46	Post-Test Dummy Close-Up Head Contact with Vehicle Interior View	A-27
47	Post-Test Dummy Close-Up Head Contact with Side Airbag View	A-27
48	Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View	A-28
49	Post-Test Dummy Close-Up Torso Contact with Side Airbag View	A-28
50	Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-29
51	Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View	A-29
52	Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View	A-30
53	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-31
54	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-31
55	Close-Up View of Vehicle's Certification Label	A-32
56	Close-Up View of Vehicle's Tire Information Placard or Label	A-32
57	Pre-Test Pole Barrier Front View	A-33
58	Post-Test Pole Barrier Front View	A-33
59	Pre-Test Pole Barrier Side View	A-34
60	Post-Test Pole Barrier Side View	A-34
61	Pre-Test Ballast View	A-35
62	Post-Test Primary and Redundant Speed Trap Read-Out	A-35
63	FMVSS No. 301 Static Rollover 0 Degrees	A-36
64	FMVSS No. 301 Static Rollover 90 Degrees	A-36
65	FMVSS No. 301 Static Rollover 180 Degrees	A-37
66	FMVSS No. 301 Static Rollover 270 Degrees	A-37
67	FMVSS No. 301 Static Rollover 360 Degrees	A-38
68	Impact Event	A-38
69	Monroney Label	A-39
70	Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-39
70a	Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-40
71	Post-Test View of Shattered Vehicle Inner Door Panel	A-40



No. 001 As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



No. 002 As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



No. 003 Pre-Test Frontal View of Test Vehicle



No. 004 Post-Test Frontal View of Test Vehicle



No. 005 Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



No. 006 Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



No. 007 Pre-Test Left Side View of Test Vehicle



No. 008 Post-Test Left Side View of Test Vehicle



No. 009 Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



No. 010 Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



No. 011 Pre-Test Rear View of Test Vehicle



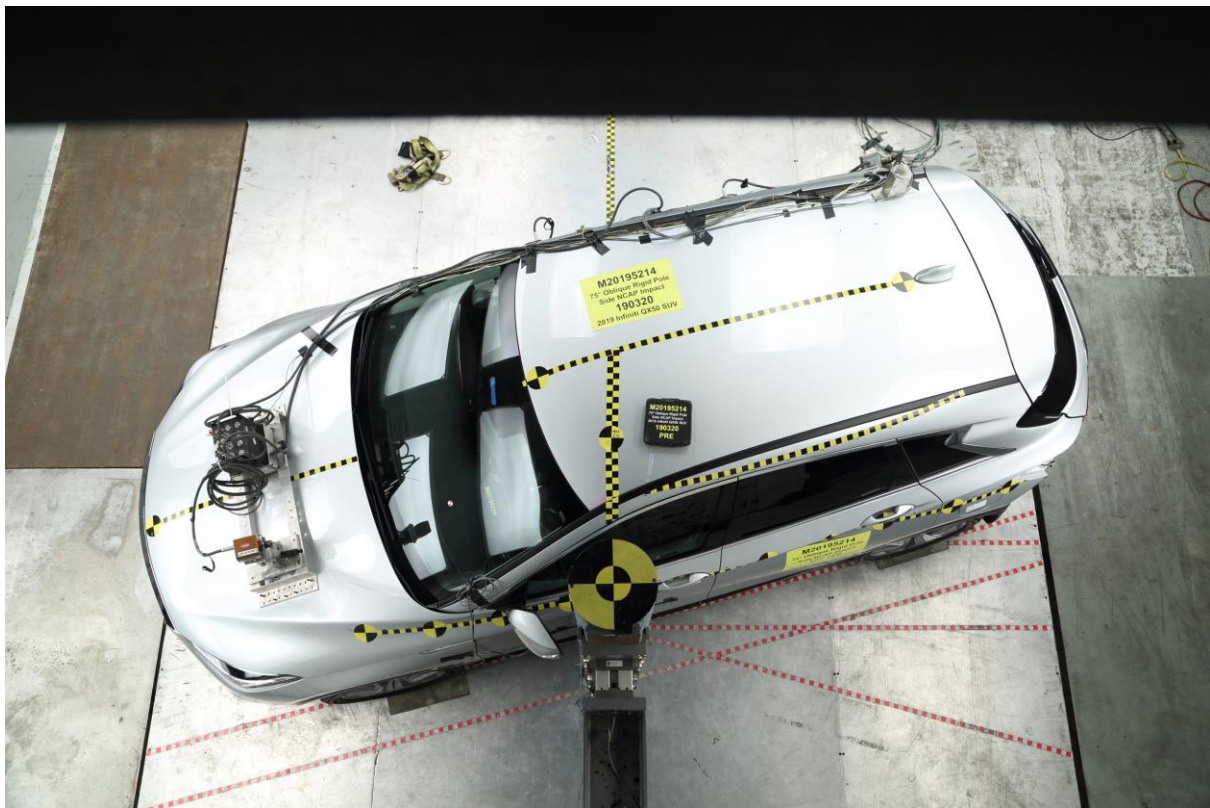
No. 012 Post-Test Rear View of Test Vehicle



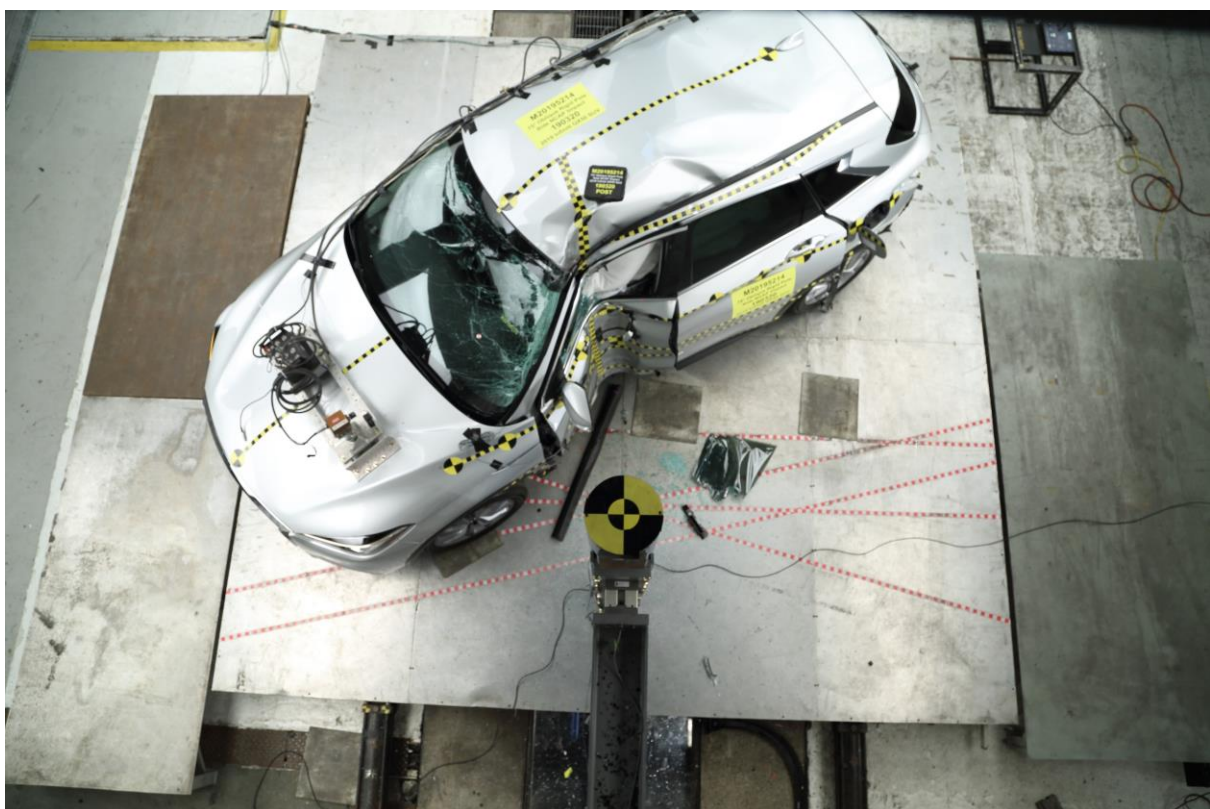
No. 013 Pre-Test Right Side View of Test Vehicle



No. 014 Post-Test Right Side View of Test Vehicle



No. 015 Pre-Test Overhead View of Test Area



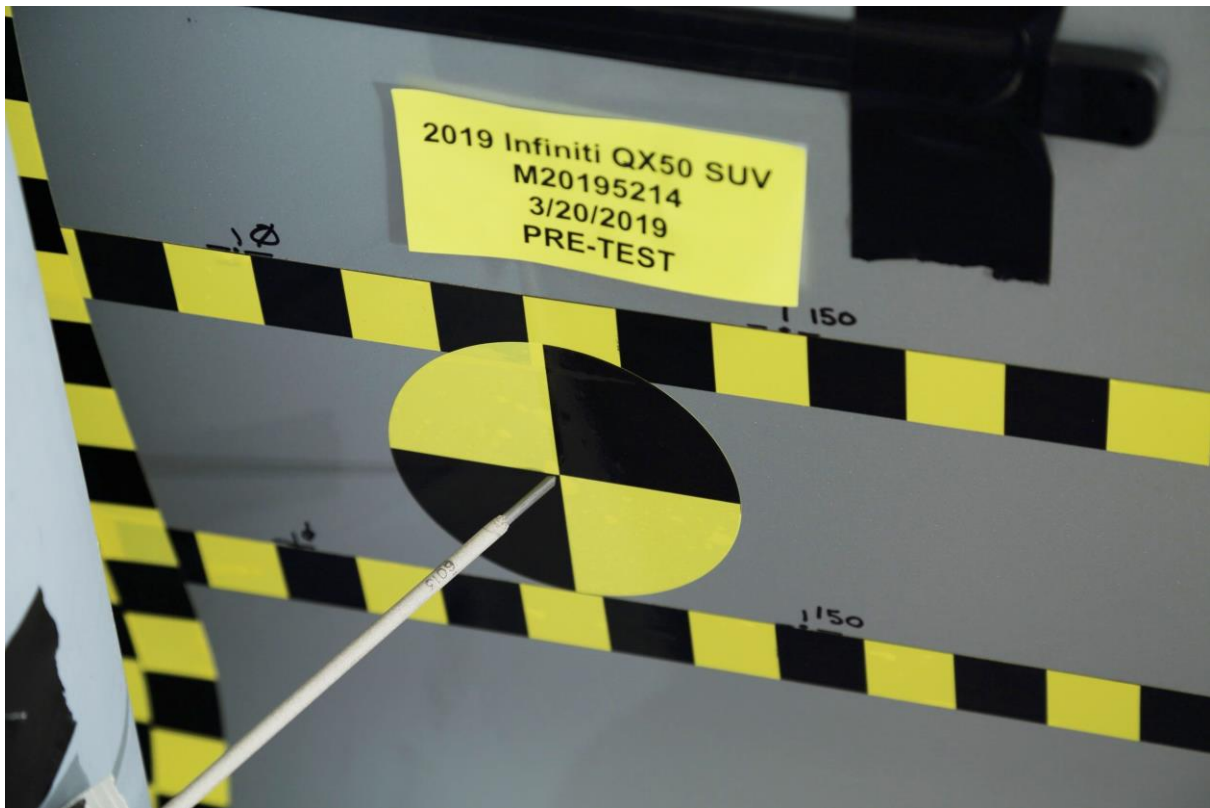
No. 016 Post-Test Overhead View of Test Area



No. 017 Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



No. 018 Pre-Test Right Side View of Pole Positioned Against Side of Vehicle



No. 019 Pre-Test Close-Up View of Impact Point Target



No. 020 Post-Test Close-Up View of Impact Point Target Showing Impact Location



No. 021 Pre-Test Front Close-Up View of Dummy Head and Chest

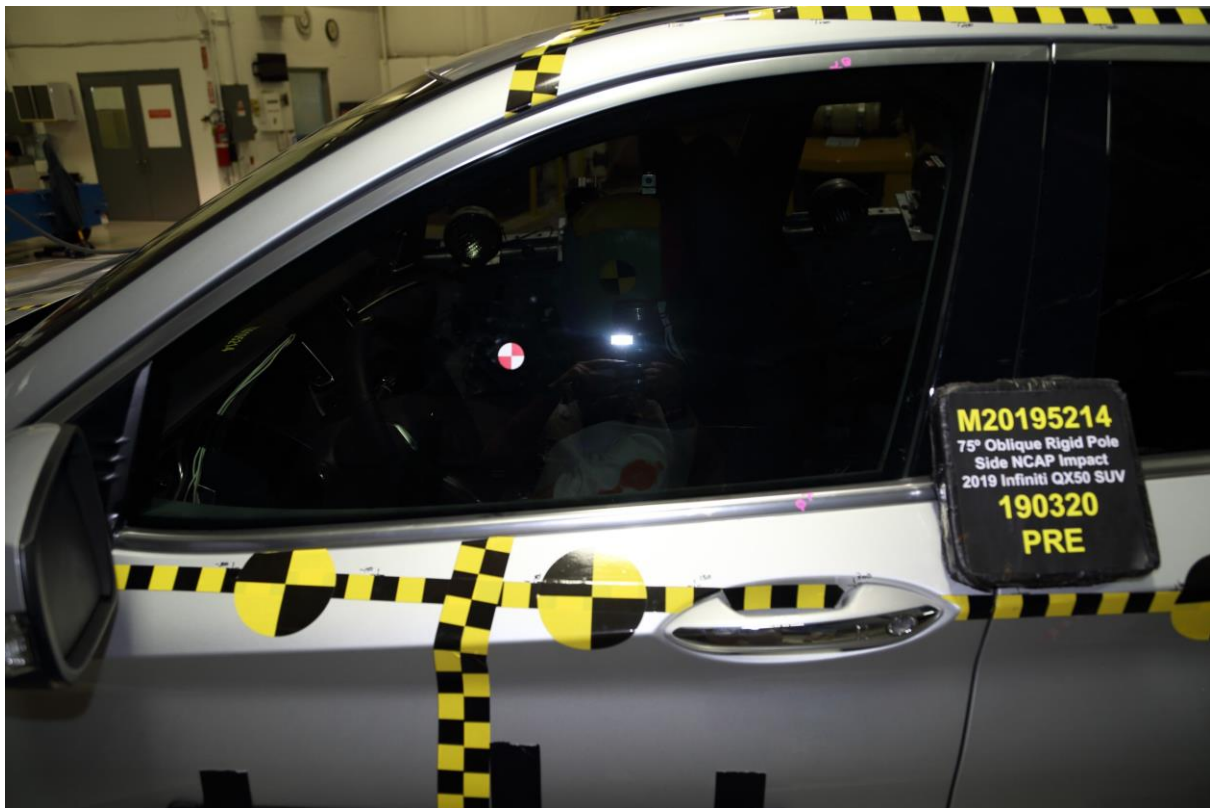


No. 022 Post-Test Front Close-Up View of Dummy



No. 023 Pre-Test Left Side View of Dummy Showing Belt and Chalking

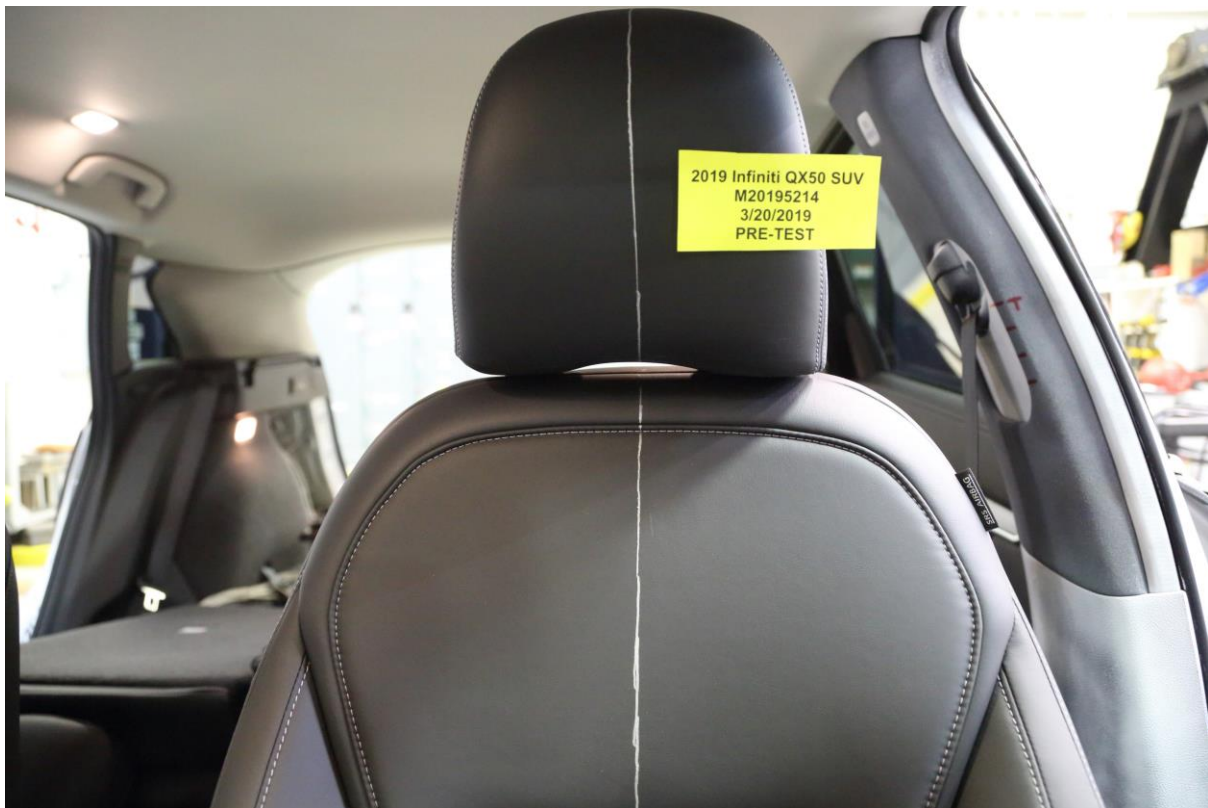
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No. 024 Pre-Test Left Side View of Dummy Shoulder and Door Top View



No. 025 Post-Test Left Side View of Dummy Shoulder and Door Top View



No. 026 Pre-Test Front View of Seat Back Prior to Dummy Positioning



No. 027 Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



No. 028 Pre-Test Front View of Seat Pan Prior to Dummy Positioning



No. 029 Pre-Test Overhead View of Dummy Thighs on Seat Pan



No. 030 Pre-Test Left Side View of Dummy Neck Showing Position of Adjustable Neck Bracket



No. 031 Pre-Test Left Side View of Dummy Head Showing Dummy Head is Level



No. 032 Pre-Test Placement of Dummy Feet



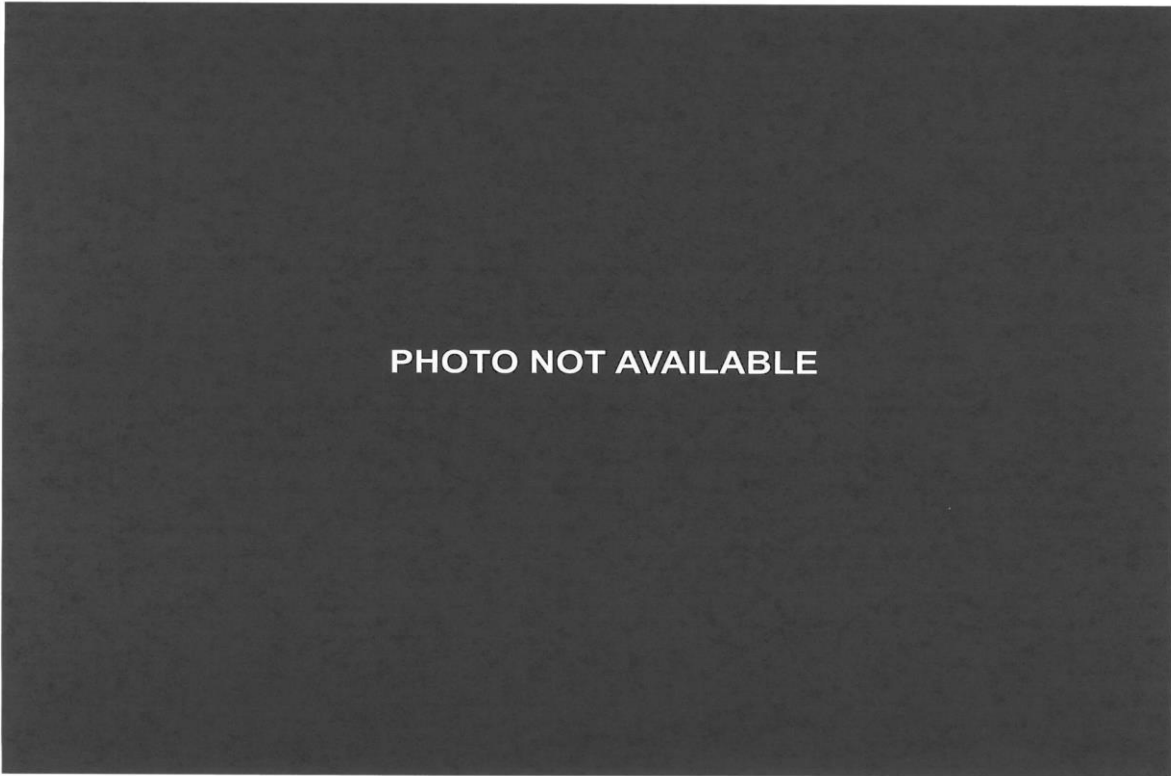
No. 033 Pre-Test View of Belt Anchorage for Dummy



No. 034 Pre-Test Left Side View of Steering Wheel



No. 035 Pre-Test View of Disengaged Parking Brake



No. 036 Pre-Test View of Parking Brake



No. 037 Pre-Test Close-Up Left Side View of Driver Seat Track



No. 038 Pre-Test Close-Up Left Side View of Driver Seat Back



No. 039 Pre-Test Close-Up View of Driver Seat Back or Head Restraint



No. 040 Pre-Test Dummy and Door Clearance View



No. 041 Post-Test Dummy and Door Clearance View



No. 042 Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



No. 043 Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



No. 044 Pre-Test Inner Door Panel View



No. 045 Post-Test Inner Door Panel View Showing Dummy Contact Location

PHOTO NOT APPLICABLE

No. 046 Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



No. 047 Post-Test Dummy Close-Up Head Contact with Side Airbag View



No. 048 Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



No. 049 Post-Test Dummy Close-Up Torso Contact with Side Airbag View



No. 050 Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



No. 051 Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View

PHOTO NOT APPLICABLE

No. 052 Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View

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No. 053 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



No. 054 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



No. 055 Close-Up View of Vehicle Certification Label



No. 056 Close-Up View of Vehicle Tire Information Placard or Label



No. 057 Pre-Test Pole Barrier Front View



No. 058 Post-Test Pole Barrier Front View



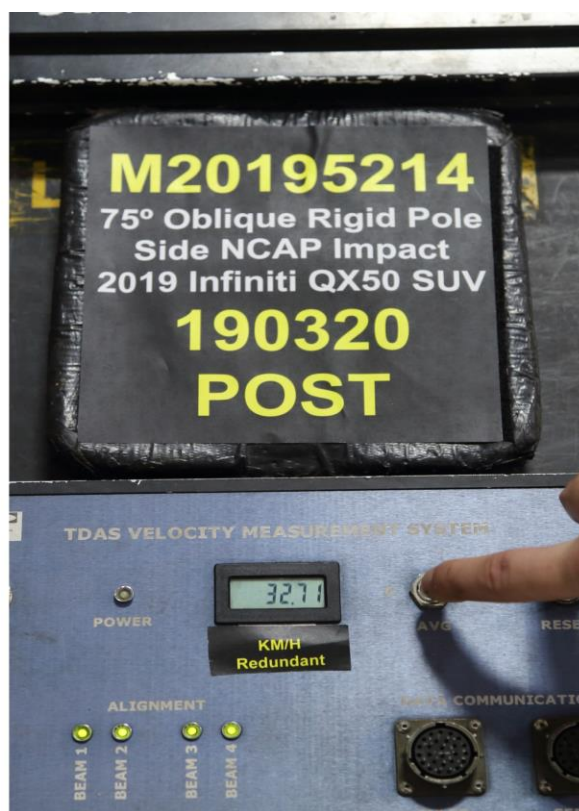
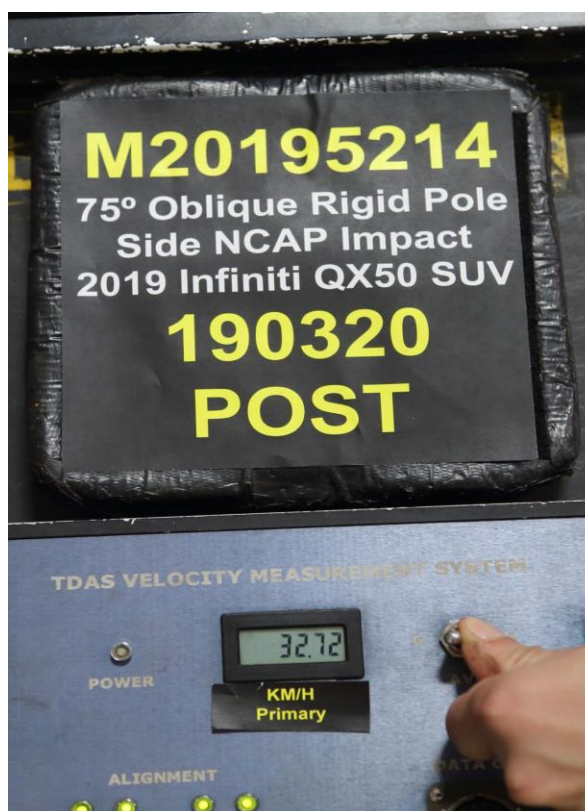
No. 059 Pre-Test Pole Barrier Side View



No. 060 Post-Test Pole Barrier Side View

PHOTO NOT AVAILABLE

No. 061 Pre-Test Ballast View



No. 062 Post-Test Primary and Redundant Speed Trap Read Out



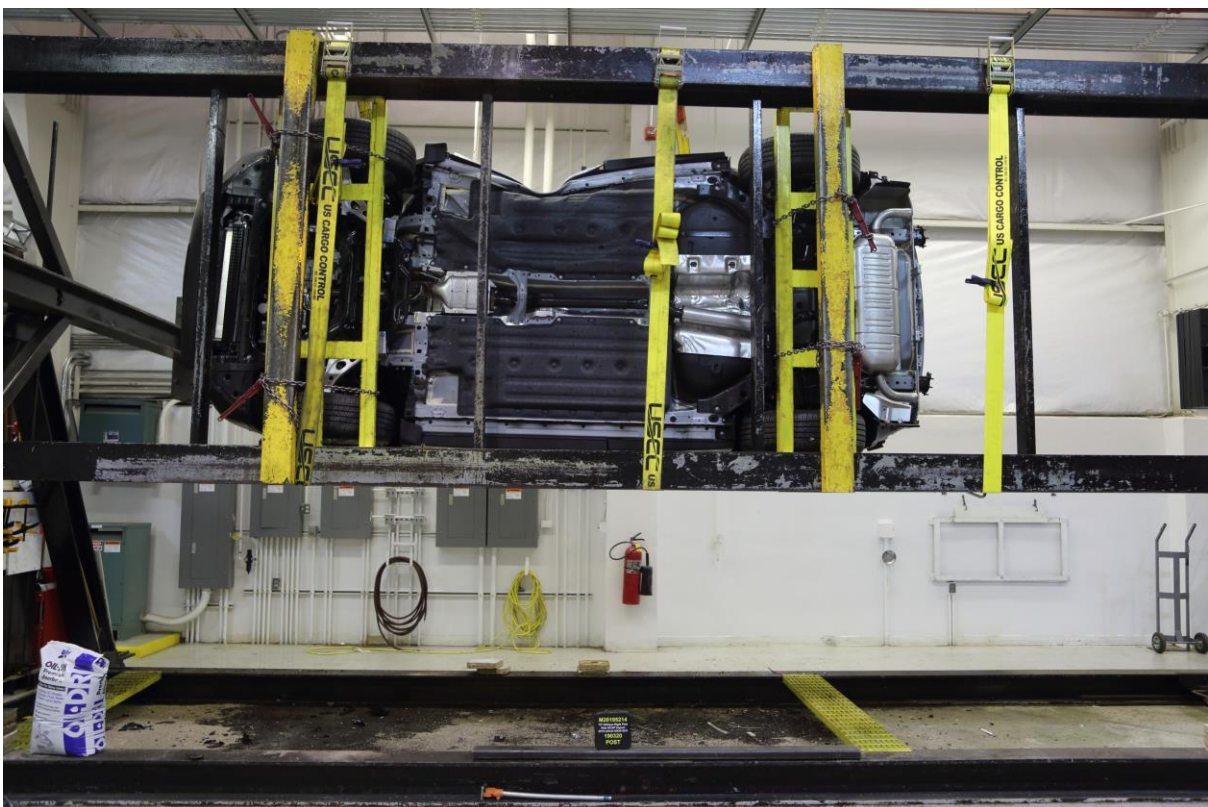
No. 063 FMVSS No. 301 Static Rollover 0 Degrees



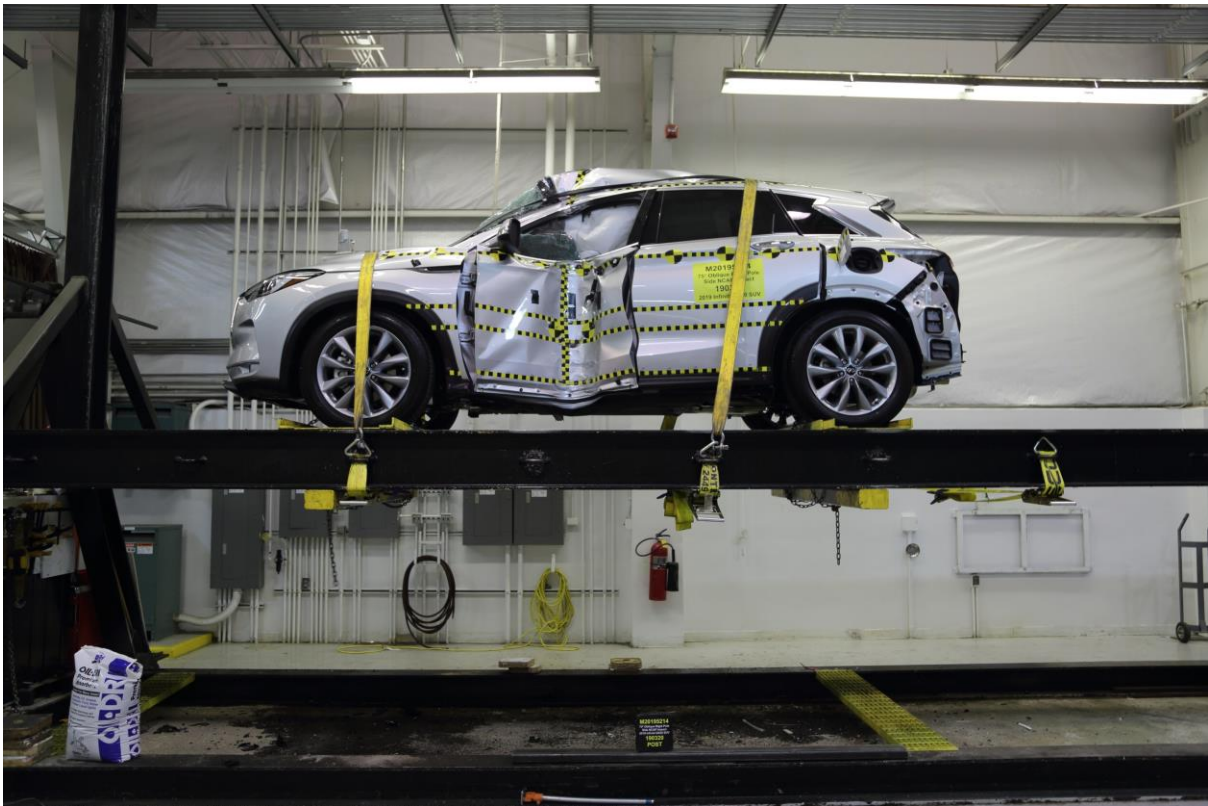
No. 064 FMVSS No. 301 Static Rollover 90 Degrees



No. 065 FMVSS No. 301 Static Rollover 180 Degrees



No. 066 FMVSS No. 301 Static Rollover 270 Degrees



No. 067 FMVSS No. 301 Static Rollover 360 Degrees



No. 068 Impact Event



2019 INFINITI QX50 PURE FWD

EMPOWER THE DRIVE™

Standard Equipment Included at No Extra Charge

PERFORMANCE:
2.5L 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:
Leatherette seating
8-way power adjustable front seats
with 2-way thigh 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 iTouch™ 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
Hill 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)
3-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

***not include dealer installed options and accessories, local taxes or license fees. This label has

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

Fuel Economy and Environment

Fuel Economy

27 MPG
combined city/hwy
3.7 gallons per 100 miles

SMALL SUVs range from 18 to 37 MPG.
The best vehicle rates 136 MPG/gal.

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

Fuel Economy & Greenhouse Gas Rating

**Annual fuel cost
\$1,650**

6 (Best) 10 (Worst)

This vehicle emits 336 grams CO₂ per mile. The best emits 2 grams per mile (tailpipe only). Producing and distributing fuel also causes emissions, based on the fuel economy rate.

Smog Rating (tailpipe only)
5 (Best) 10 (Worst)

This vehicle emits 336 grams CO₂ per mile. The best emits 2 grams per mile (tailpipe only). Producing and distributing fuel also causes emissions, based on the fuel economy rate.

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 \$7,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. MPGe is miles per gallon gasoline equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

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

Frontal Crash	Driver Passenger	Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
Side Crash	Front seat Rear seat	Not Rated
Based on the risk of injury in a side impact.		
Rollover		Not Rated
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

DELIVERY

VEHICLE COLORS:
EXT: LIQUID PLATINUM
INT: GRAPHITE

FINAL ASSEMBLY POINT:
AGUAS/ABV JMEIX

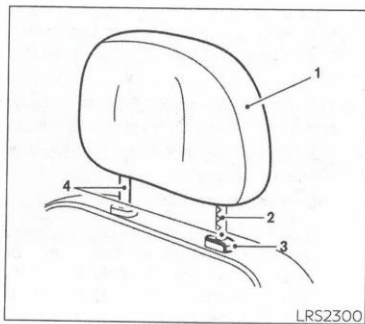
TRANSPORT METHOD:
TRUCK

DEALER:
INFINITI OF TAMPA
4600 N DALE MABRY HWY
TAMPA FL
33614

VIN: 3PCA5M17N7F131464
EMS: 50 STATE EMISSIONS
MDL: 81119-131464 K23-G
OPT: F-892C03L11555296

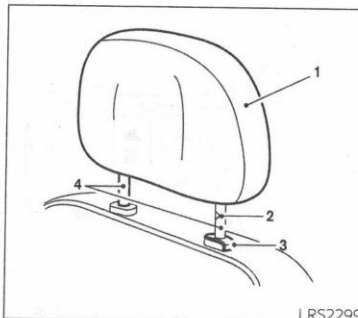
2018122224118AS7048

No. 069 Monroney Label



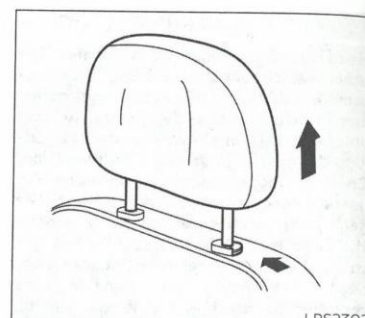
ADJUSTABLE HEAD RESTRAINT/ HEADREST COMPONENTS

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

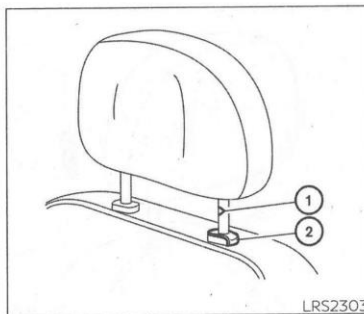
Use the following procedure to remove the head restraint/headrest:

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

No. 070 Head Restraint Use and Adjustment Information from Vehicle Owner 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.

Safety—Seats, seat belts and supplemental restraint system 1-9

No. 070a Head Restraint Use and Adjustment Information from Vehicle Owner Manual

PHOTO NOT APPLICABLE

No. 071 Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

No.	Description	Page
1	Driver Head Acceleration (X) vs. Time	B-4
2	Driver Head Acceleration (Y) vs. Time	B-4
3	Driver Head Acceleration (Z) vs. Time	B-4
4	Driver Head Acceleration Resultant vs. Time	B-4
5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-5
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-5
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-5
8	Driver Lower Spine T12 Acceleration Resultant vs. Time	B-5
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-6
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-6
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-6

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at: www.nhtsa.gov.

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration (X) Redundant
 Driver Head Acceleration (Y) Redundant
 Driver Head Acceleration (Z) Redundant
 Driver Upper Thorax Rib Deflection (Y)
 Driver Middle Thorax Rib Deflection (Y)
 Driver Lower Thorax Rib Deflection (Y)
 Driver Upper Abdomen Rib Deflection (Y)
 Driver Lower Abdomen Rib Deflection (Y)
 Driver Head Angular Velocity (X)
 Driver Head Angular Velocity (Y)
 Driver 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)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (X)
Load Cell Pole Barrier #2 Force (X)
Load Cell Pole Barrier #3 Force (X)
Load Cell Pole Barrier #4 Force (X)
Load Cell Pole Barrier #5 Force (X)
Load Cell Pole Barrier #6 Force (X)
Load Cell Pole Barrier #7 Force (X)
Load Cell Pole Barrier #8 Force (X)

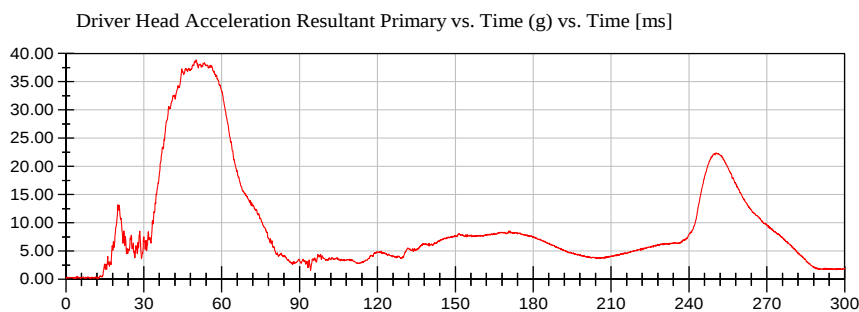
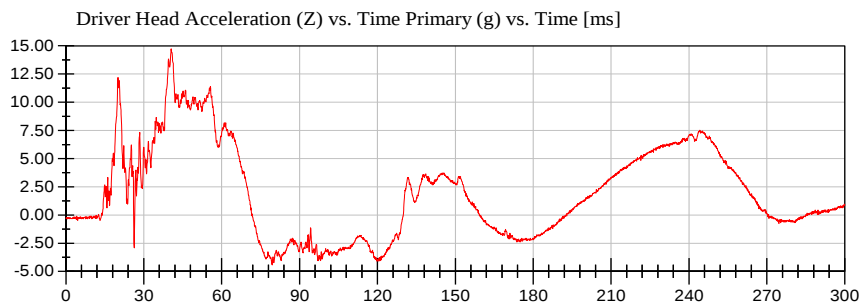
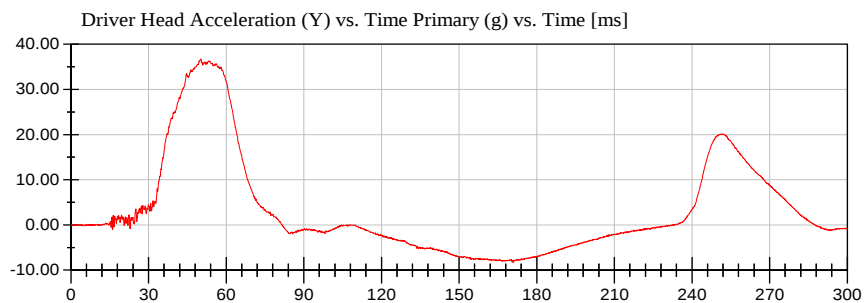
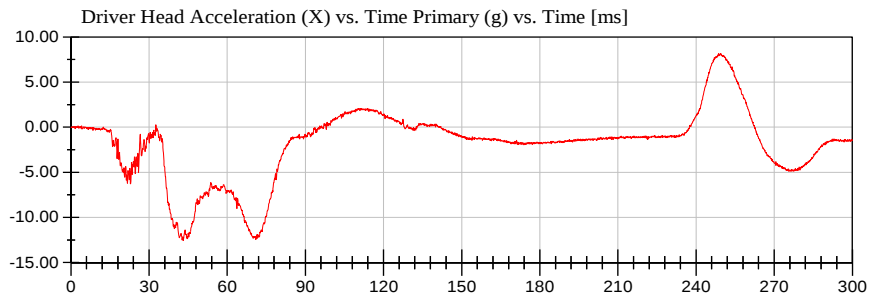
NHTSA

Test Lab: CTF

Test Number: 190320 (M20195214)

Position #1 SID IIs Dummy (297)

Test Date: 03/20/2019



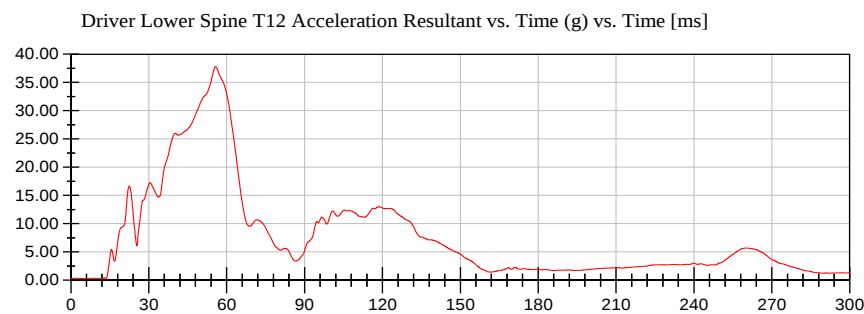
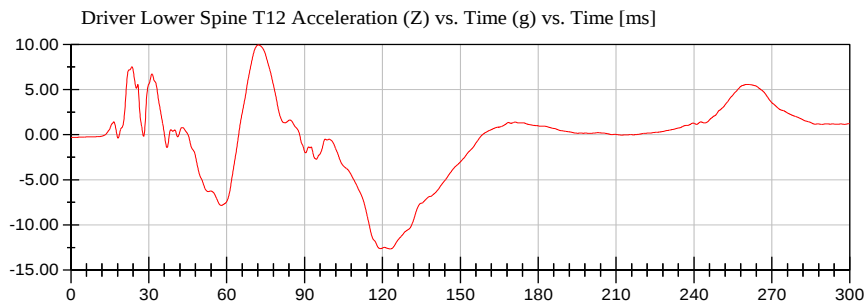
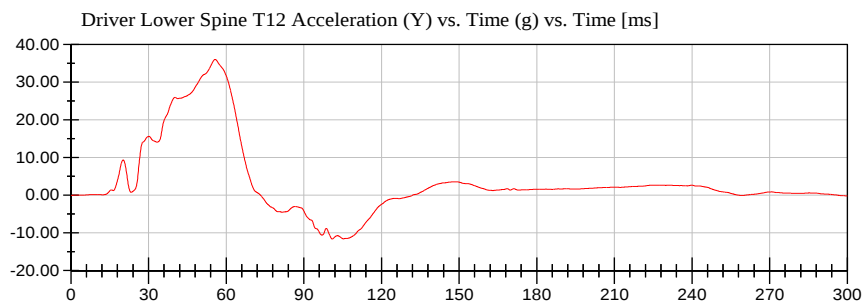
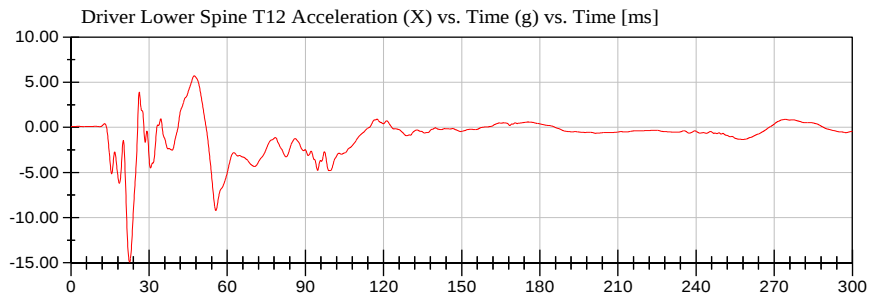
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Test Lab: CTF

Test Number: 190320 (M20195214)

Position #1 SID IIs Dummy (297)

Test Date: 03/20/2019



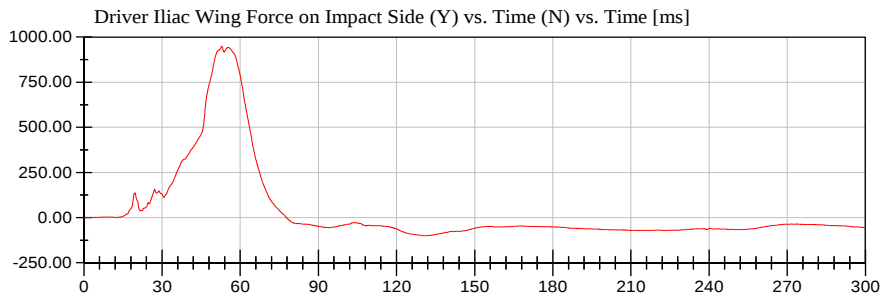
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Test Lab: CTF

Test Number: 190320 (M20195214)

Position #1 SID IIs Dummy (297)

Test Date: 03/20/2019

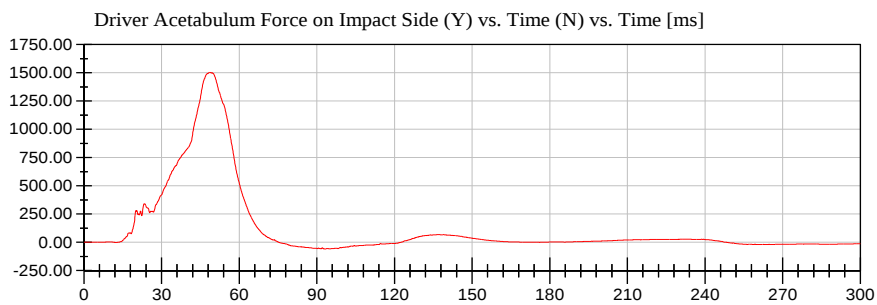


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948.22 N at 52.96 ms

<Min>

-100.20 N at 130.56 ms

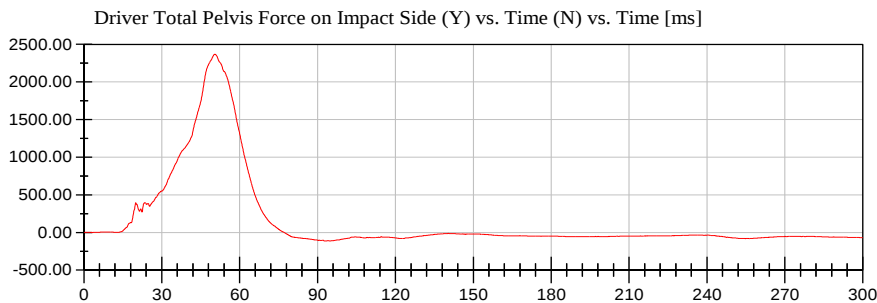


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1,503.58 N at 48.80 ms

<Min>

-59.19 N at 93.28 ms



<Max>

2,368.14 N at 50.48 ms

<Min>

-113.74 N at 93.36 ms



APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS
SID-IIs (Driver) Dummy
Description

Table 1. External Measurements

Table 2. Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)
Head (X) Acceleration (G's) vs. Time (ms)
Head (Y) Acceleration (G's) vs. Time (ms)
Head (Z) 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 297

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 297 Calibration No. 33

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	781	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	147	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	103	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	147	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	528	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	223	Yes
P	Foot Length (left)	216.0 - 232.0	221	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	254	Yes
S	Knee Joint to seat Back	478.0 - 493.0	485	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	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	879	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 297 Certification No. 33-1

Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	117.1 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 S/N: 1330

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

Page 9 of 31

02.21.2019 13:13:45 197

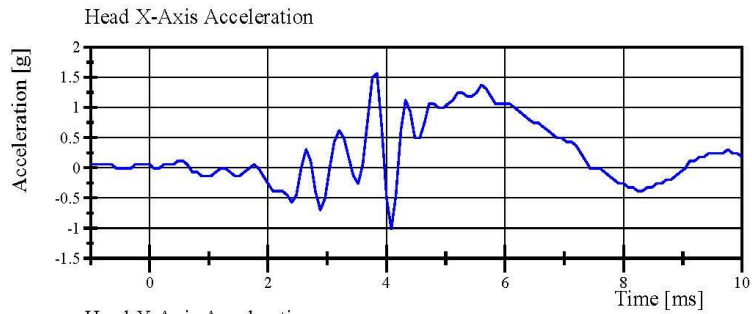


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 297 Certification No. 33-1

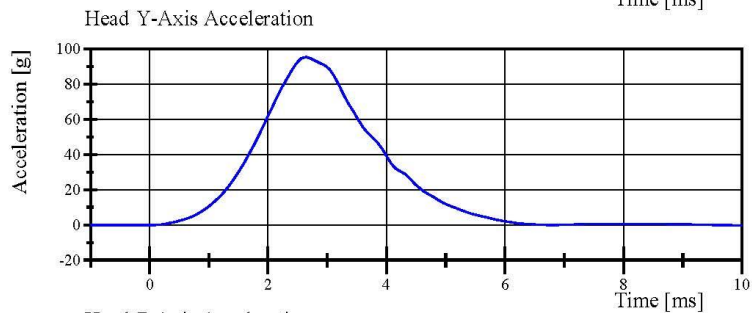
Test Date: 2/21/2019



Filter Class: CFC_1000

Max: 1.6 g at 3.8 ms

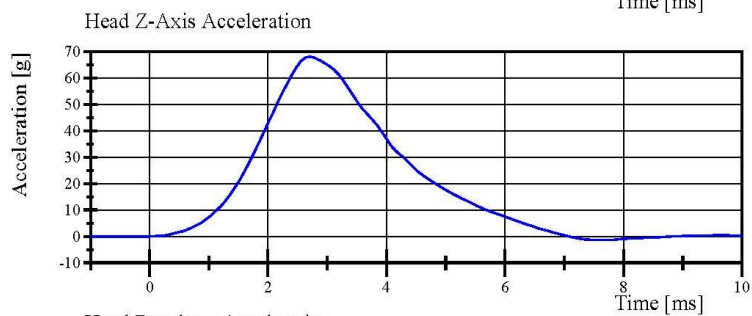
Min: -1.0 g at 4.1 ms



Filter Class: CFC_1000

Max: 95.5 g at 2.6 ms

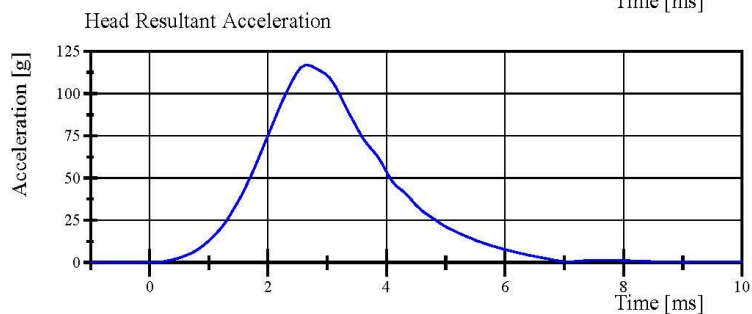
Min: -0.2 g at 9.8 ms



Filter Class: CFC_1000

Max: 68.1 g at 2.7 ms

Min: -1.3 g at 7.5 ms



Filter Class: CFC_1000

Max: 117.1 g at 2.6 ms

Min: 0.0 g at -0.6 ms

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

02.21.2019 13:14:22 197



Transportation Research Center Inc.

Left Lateral Neck

SID IIS Serial No. 297 Certification No. 33-2

Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	38 %	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	2.559 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.719 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.023 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.958 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	6.015 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-72.8 deg	Yes
Time of Peak	50 - 70 ms	67.5 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	42.1 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	124.4 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 779

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

Page 11 of 31

02.21.2019 16:09:46 717

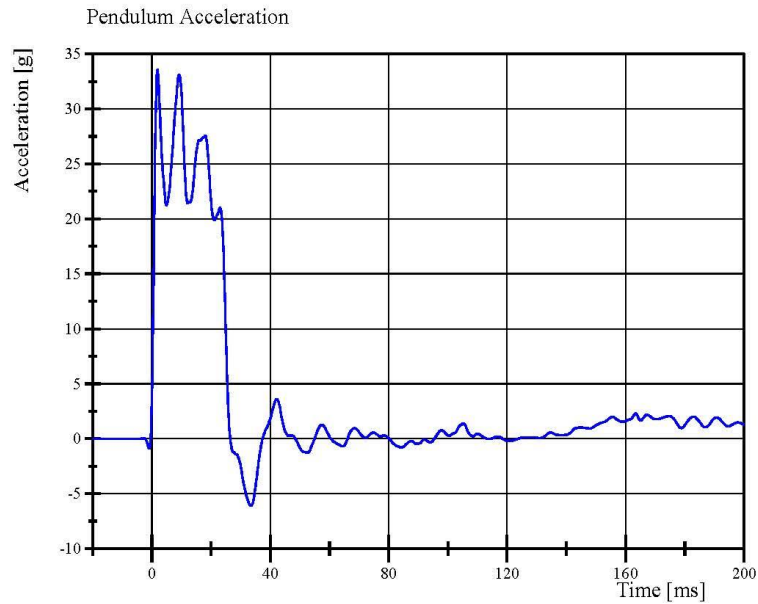


Transportation Research Center Inc.

Left Lateral Neck

SID IIS Serial No. 297 Certification No. 33-2

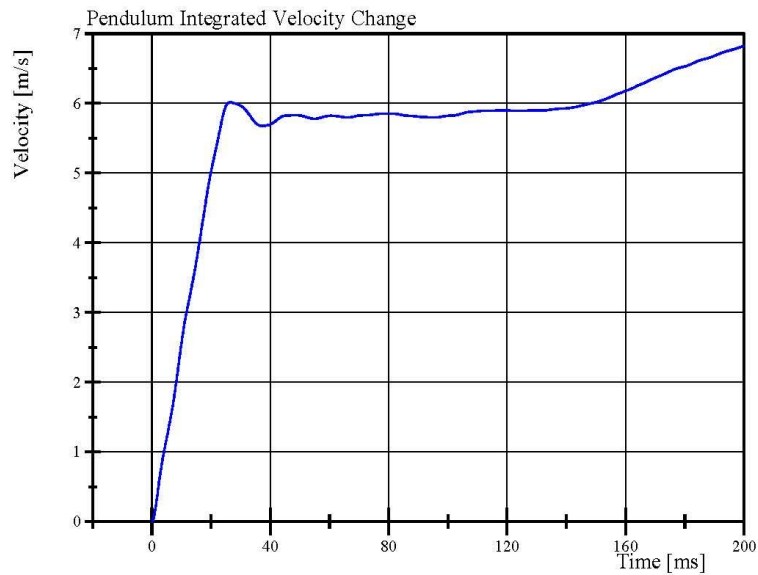
Test Date: 2/21/2019



Filter Class: CFC_180

Max: 33.6 g at 1.9 ms

Min: -6.1 g at 33.4 ms



Filter Class: CFC_180

Max: 6.8 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

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

02.21.2019 16:11:04 717

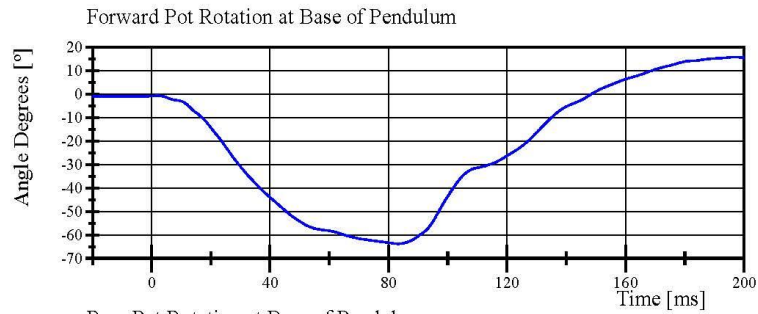


Transportation Research Center Inc.

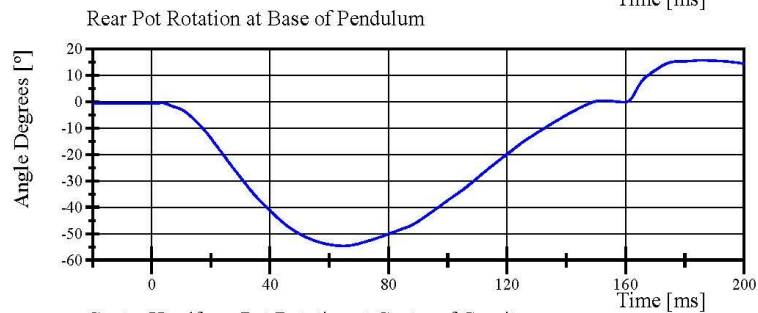
Left Lateral Neck

SID IIS Serial No. 297 Certification No. 33-2

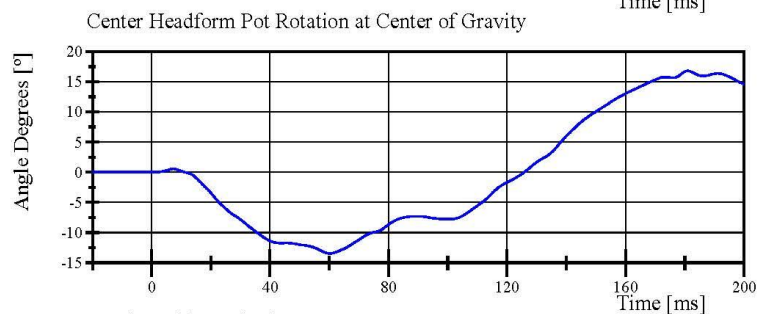
Test Date: 2/21/2019



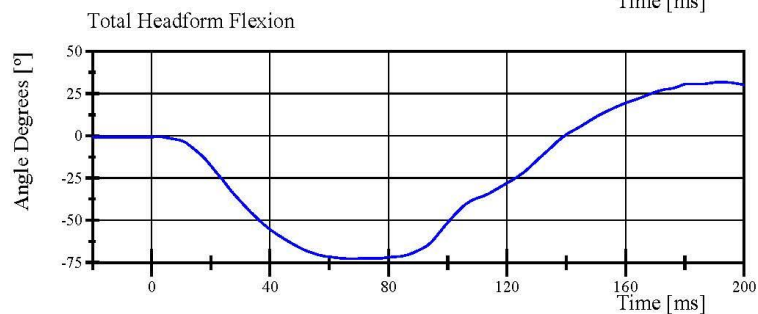
Filter Class: CFC_60
Max: 15.8 ° at 196.7 ms
Min: -63.7 ° at 83.3 ms



Filter Class: CFC_60
Max: 15.7 ° at 185.4 ms
Min: -54.5 ° at 64.8 ms



Filter Class: CFC_60
Max: 16.8 ° at 181.0 ms
Min: -13.4 ° at 60.1 ms



Filter Class: CFC_60
Max: 31.7 ° at 191.8 ms
Min: -72.8 ° at 67.5 ms

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

02.21.2019 16:11:05 717

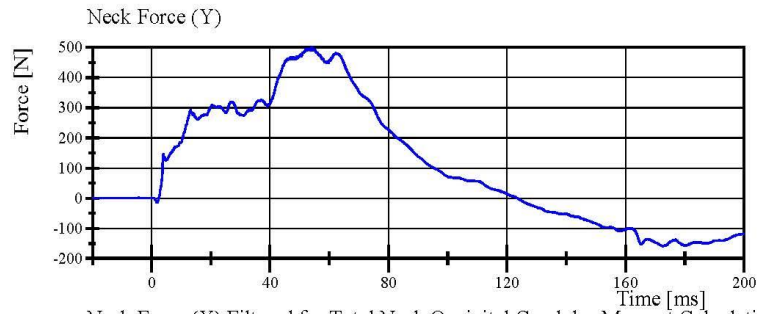


Transportation Research Center Inc.

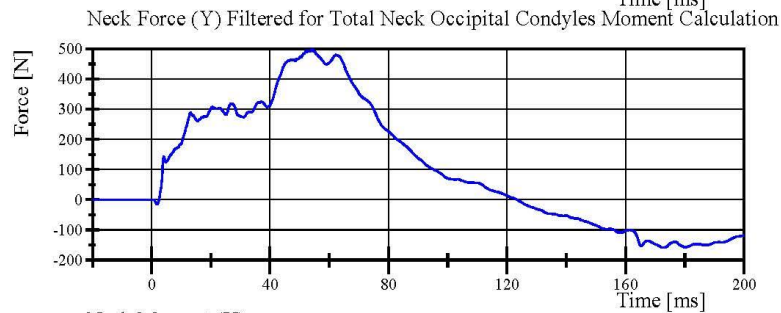
Left Lateral Neck

SID IIS Serial No. 297 Certification No. 33-2

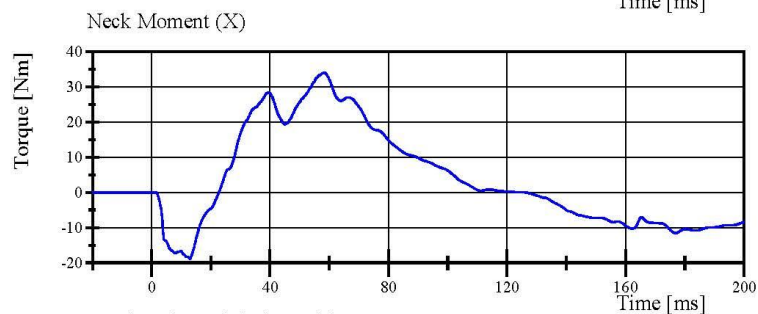
Test Date: 2/21/2019



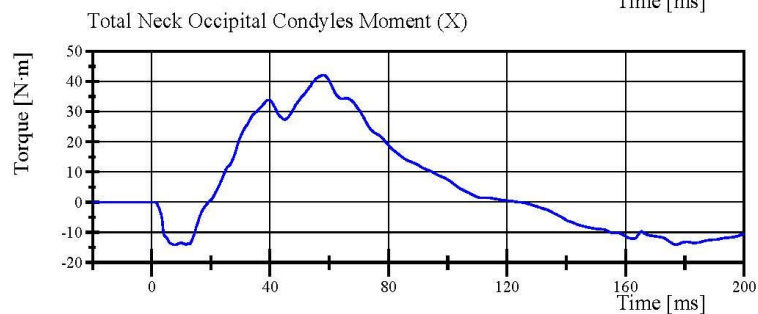
Filter Class: CFC_1000
Max: 500.1 N at 54.2 ms
Min: -159.4 N at 172.6 ms



Filter Class: CFC_600
Max: 498.5 N at 54.1 ms
Min: -158.9 N at 172.6 ms



Filter Class: CFC_600
Max: 34.1 Nm at 58.3 ms
Min: -18.8 Nm at 13.0 ms



Filter Class: Without_(Consta
Max: 42.1 N·m at 58.2 ms
Min: -14.2 N·m at 8.1 ms

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

02.21.2019 16:11:06 717



Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.0 g	Yes
Shoulder Displacement	28 - 37 mm	29.9 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.7 g	Yes

Test meets specifications.

Condition: Used

Comments:

Left Arm S/N: 940L

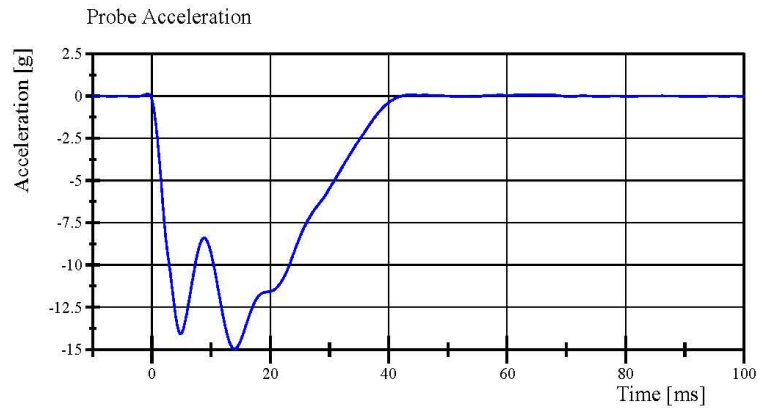
Shoulder Rib S/N: 180-3355 259

Transportation Research Center Inc.

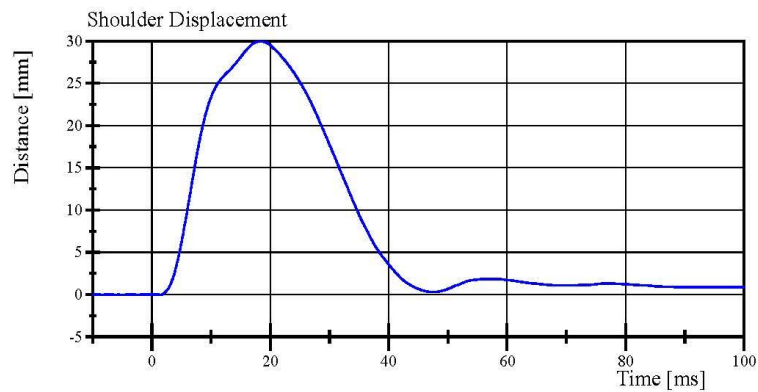
Left Lateral Shoulder

SID IIs Serial No. 297 Certification No. 33-1

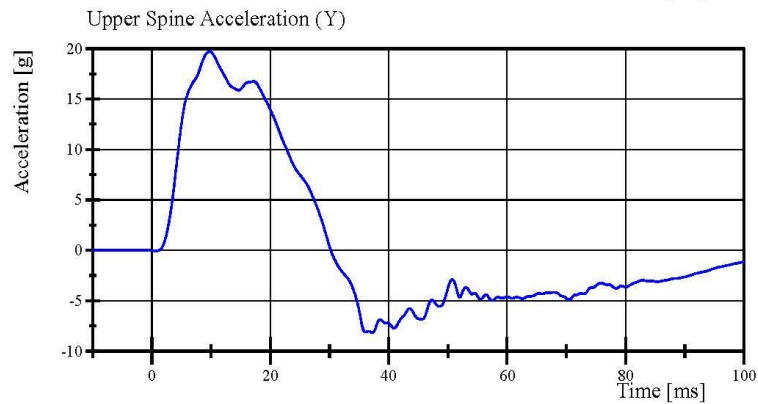
Test Date: 2/21/2019



Filter Class: CFC_180
Max: 0.1 g at -0.7 ms
Min: -15.0 g at 13.9 ms



Filter Class: CFC_600
Max: 29.9 mm at 18.3 ms
Min: -0.0 mm at 1.5 ms



Filter Class: CFC_180
Max: 19.7 g at 9.8 ms
Min: -8.2 g at 37.2 ms

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

02.21.2019 09:35:01 815



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.737 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.4 g	Yes
Shoulder Displacement	31 - 40 mm	35.1 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.4 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.0 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.1 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.9 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	35.0 g	Yes

Test meets specifications.

Condition: Used

Comments:

Left Arm S/N: 940L

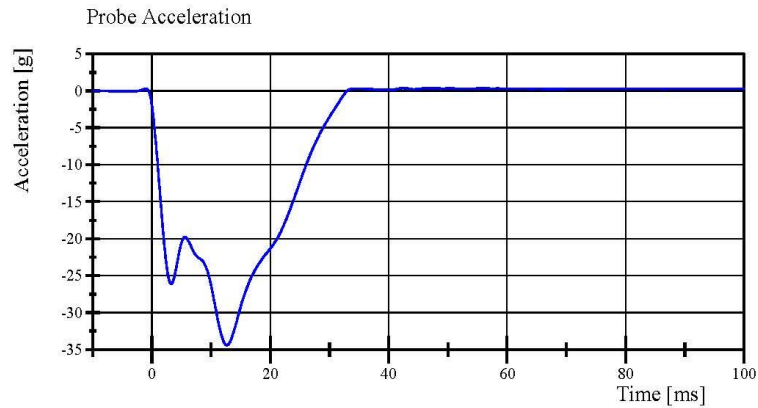
Upper Thorax Rib #1 S/N: 2009

MiddleThorax Rib #2 S/N: 2010

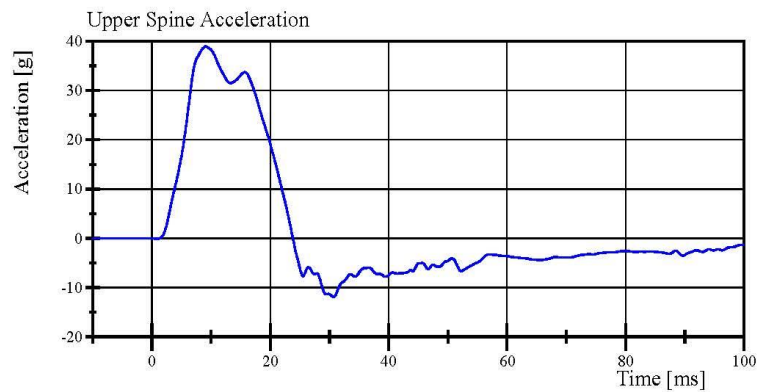
LowerThorax Rib #3 S/N: 2029

Transportation Research Center Inc.

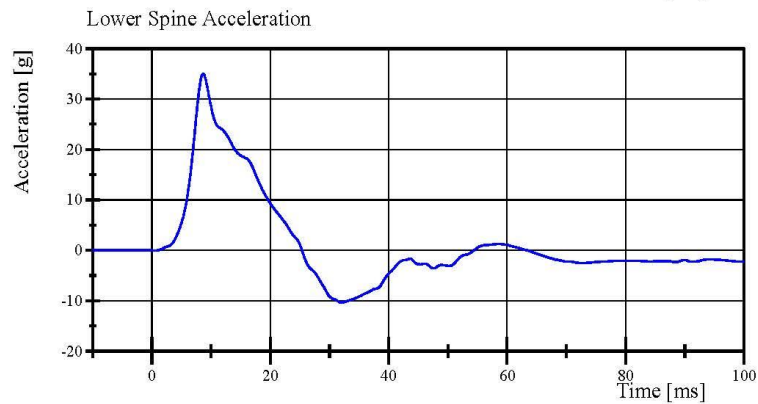
Left Lateral Thorax with Arm
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019



Filter Class: CFC_180
Max: 0.4 g at 42.4 ms
Min: -34.4 g at 12.6 ms



Filter Class: CFC_180
Max: 38.9 g at 9.1 ms
Min: -11.9 g at 30.7 ms



Filter Class: CFC_180
Max: 35.0 g at 8.6 ms
Min: -10.4 g at 32.0 ms

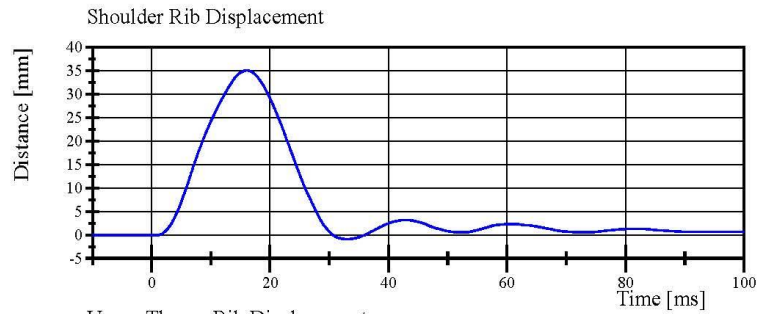
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.21.2019 10:47:21 631

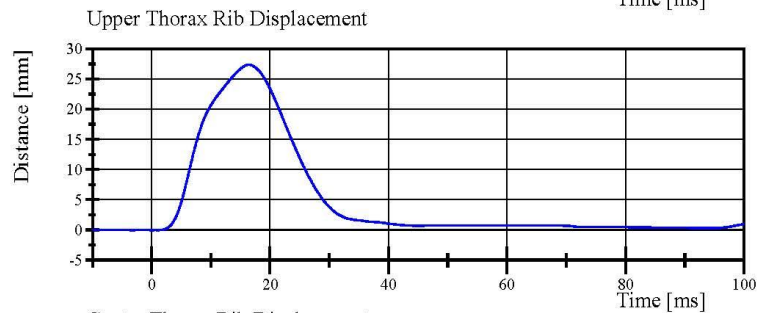


Transportation Research Center Inc.

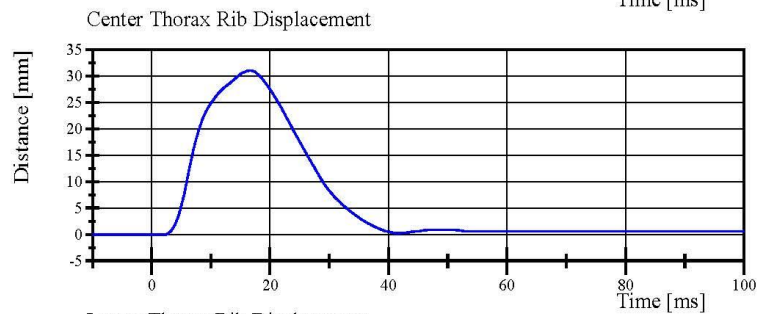
Left Lateral Thorax with Arm
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019



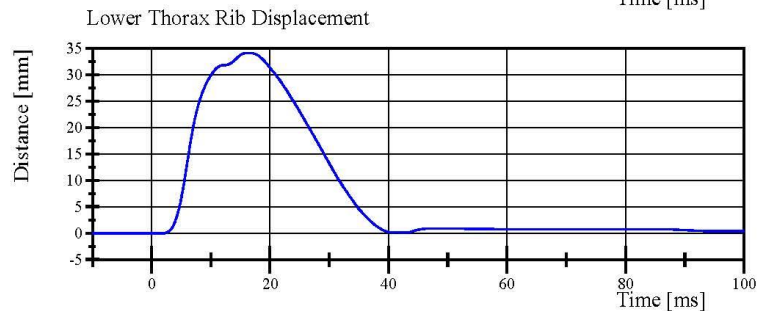
Filter Class: CFC_600
Max: 35.1 mm at 16.1 ms
Min: -0.8 mm at 32.9 ms



Filter Class: CFC_600
Max: 27.4 mm at 16.4 ms
Min: -0.0 mm at -3.3 ms



Filter Class: CFC_600
Max: 31.0 mm at 16.6 ms
Min: -0.0 mm at 2.2 ms



Filter Class: CFC_600
Max: 34.1 mm at 16.6 ms
Min: -0.0 mm at 2.1 ms

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

02.21.2019 10:47:22 631



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.335 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.8 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.4 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.9 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.6 g	Yes

Test meets specifications.

Condition: Used

Comments:

Upper Thorax Rib #1 S/N: 2009

Middle Thorax Rib #2 S/N: 2010

Lower Thorax Rib #3 S/N: 2029

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

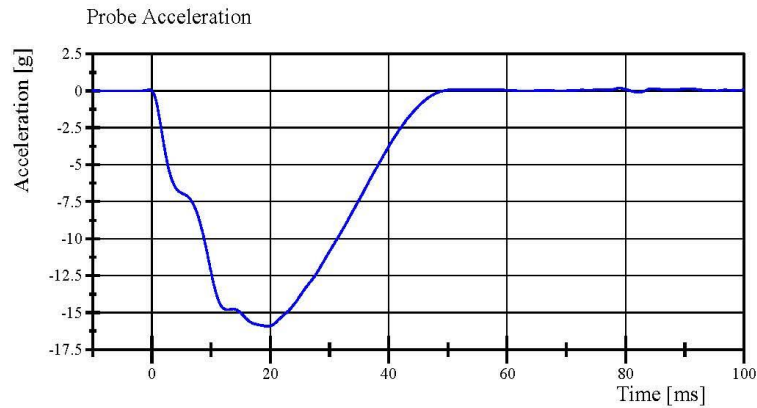
Page 20 of 31

02.21.2019 09:59:51 824

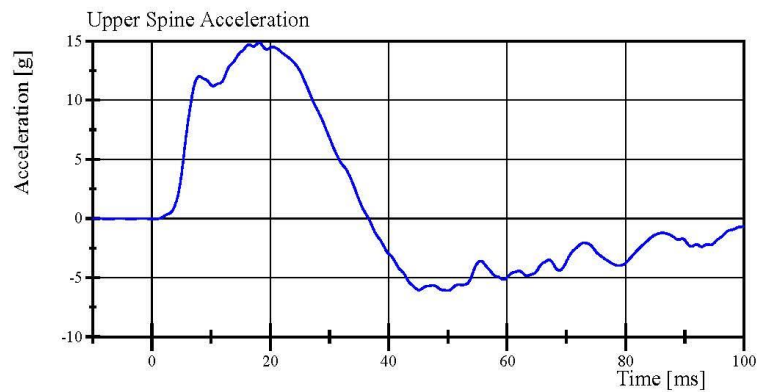


Transportation Research Center Inc.

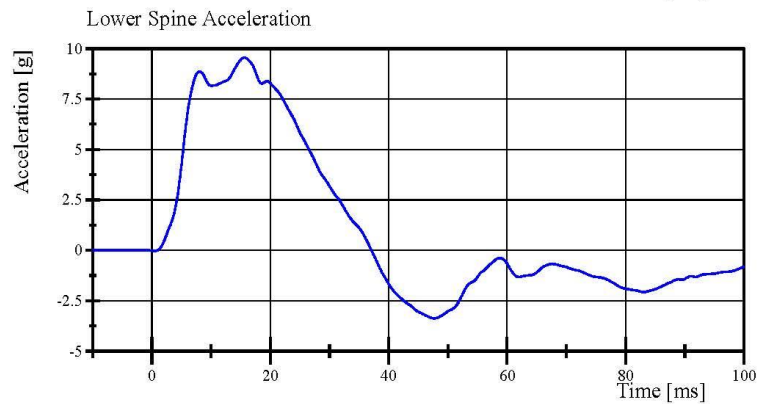
Left Lateral Thorax without Arm
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019



Filter Class: CFC_180
Max: 0.2 g at 79.0 ms
Min: -15.9 g at 19.5 ms



Filter Class: CFC_180
Max: 14.9 g at 18.1 ms
Min: -6.1 g at 50.1 ms



Filter Class: CFC_180
Max: 9.6 g at 15.6 ms
Min: -3.4 g at 47.7 ms

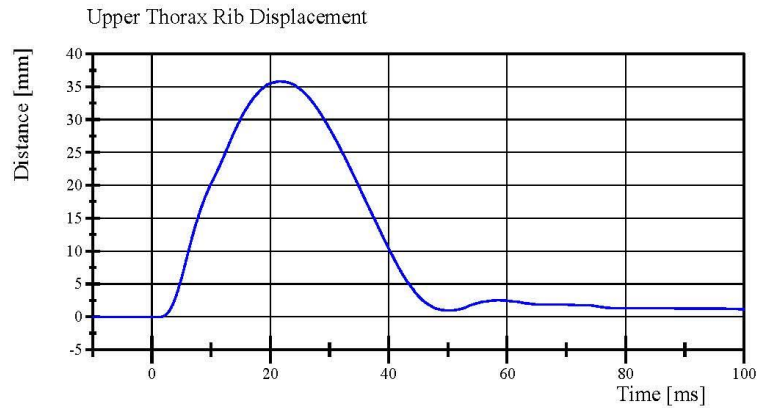
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

02.21.2019 10:00:36 824

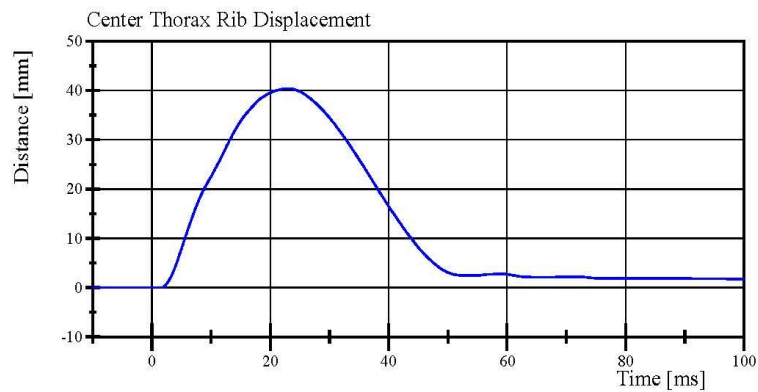


Transportation Research Center Inc.

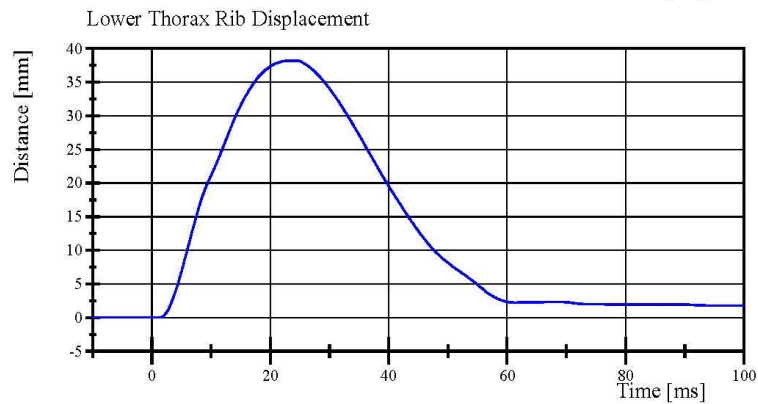
Left Lateral Thorax without Arm
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019



Filter Class: CFC_600
Max: 35.8 mm at 21.7 ms
Min: -0.0 mm at 1.4 ms



Filter Class: CFC_600
Max: 40.4 mm at 22.7 ms
Min: -0.0 mm at 1.6 ms



Filter Class: CFC_600
Max: 38.2 mm at 23.5 ms
Min: -0.0 mm at 1.3 ms

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

02.21.2019 10:00:37 824



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 297 Certification No. 33-1

Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.4 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	39.2 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	37.7 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.26 g	Yes

Test meets specifications.

Condition: Used

Comments:

Upper Abdominal Rib S/N: 1747

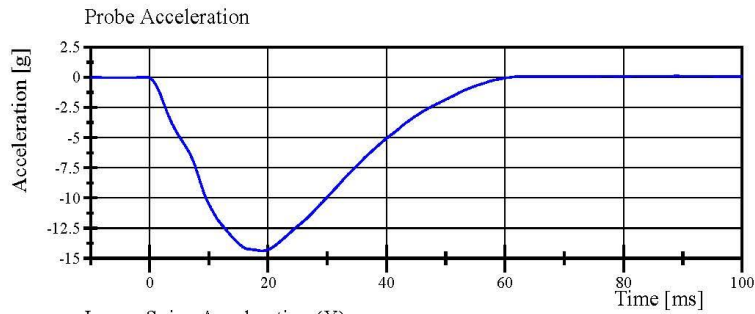
Lower Abdominal Rib S/N: 1748

Transportation Research Center Inc.

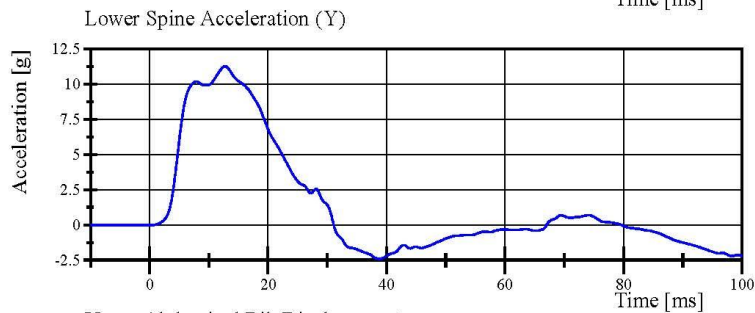
Left Lateral Abdomen

SID IIs Serial No. 297 Certification No. 33-1

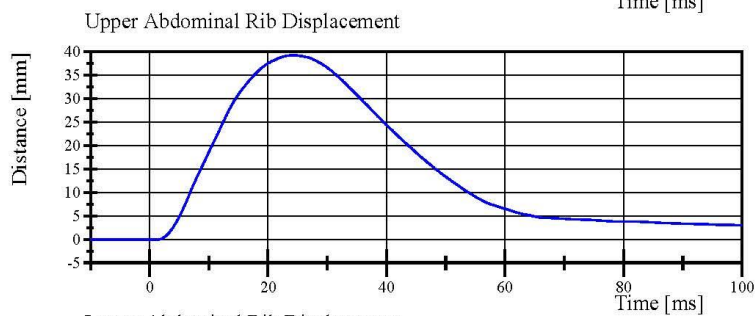
Test Date: 2/21/2019



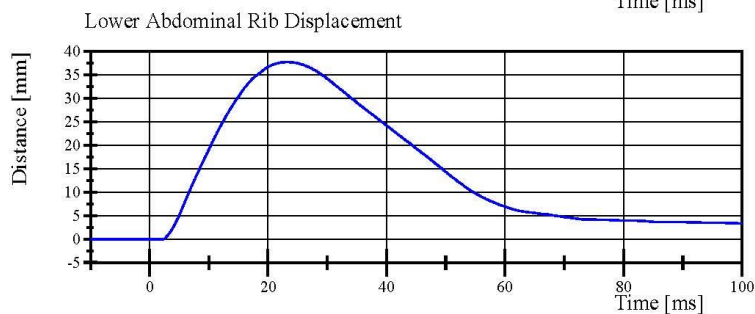
Filter Class: CFC_180
Max: 0.1 g at 88.9 ms
Min: -14.4 g at 19.0 ms



Filter Class: CFC_180
Max: 11.3 g at 12.7 ms
Min: -2.4 g at 38.7 ms



Filter Class: CFC_600
Max: 39.2 mm at 24.2 ms
Min: -0.0 mm at 1.4 ms



Filter Class: CFC_600
Max: 37.7 mm at 23.1 ms
Min: -0.0 mm at 2.2 ms

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

02.21.2019 09:47:47 603



Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 297 Certification No. 33-1
Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.63 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-44.89 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	39.6 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,251.3 N	Yes

Test meets specifications.

Condition: Used

Comments:

Pelvis Skin S/N: 1141

Pelvis Plug Info:

Manufacturer: Saco

S/N: 12324

Cal Date: 20180321

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

Page 27 of 31

02.21.2019 09:06:23 419

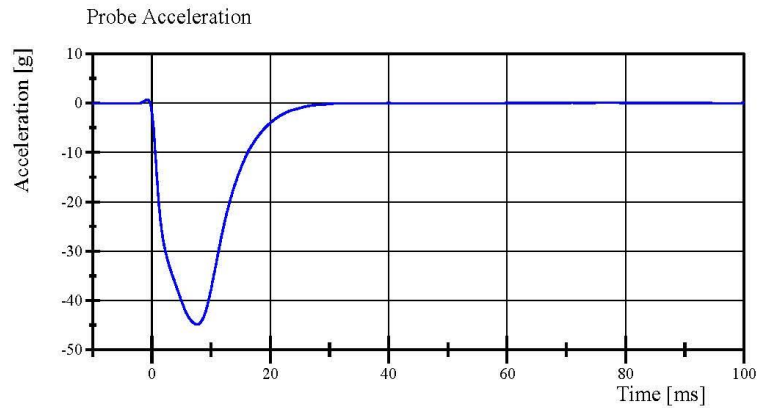


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 297 Certification No. 33-1

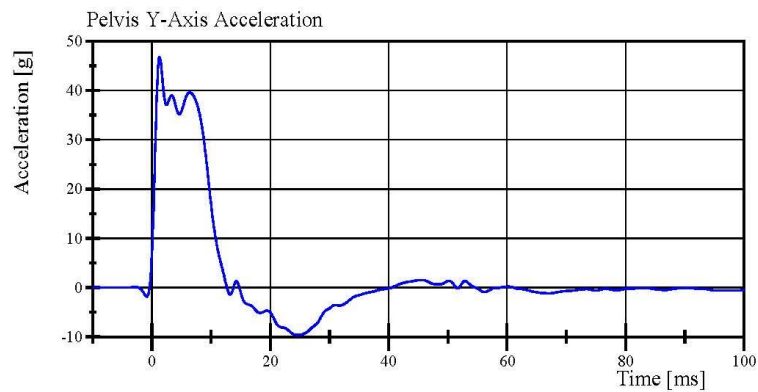
Test Date: 2/21/2019



Filter Class: CFC_180

Max: 0.7 g at -0.8 ms

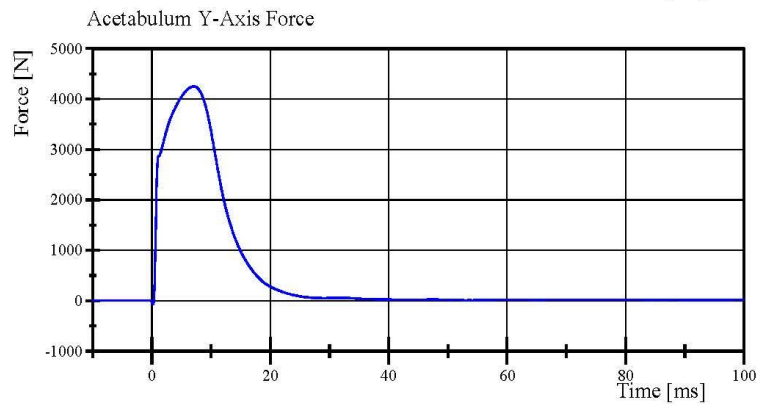
Min: -44.9 g at 7.6 ms



Filter Class: CFC_180

Max: 46.8 g at 1.3 ms

Min: -9.6 g at 24.6 ms



Filter Class: CFC_600

Max: 4,251.3 N at 7.1 ms

Min: -69.5 N at 0.2 ms

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

02.21.2019 09:10:16 419



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 297 Certification No. 33-2

Test Date: 2/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.24 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-43.8 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	36.5 g	Yes
Iliac Force	4,100 - 5,100 N	5,042.2 N	Yes

Test meets specifications.

Condition: Used

Comments:

Pelvis Skin S/N: 1141

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

Page 25 of 31

02.21.2019 14:22:45 664

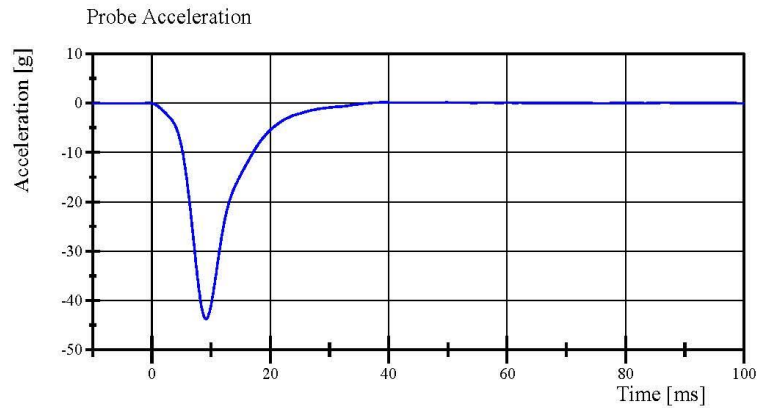


Transportation Research Center Inc.

Left Lateral Iliac

SID IIS Serial No. 297 Certification No. 33-2

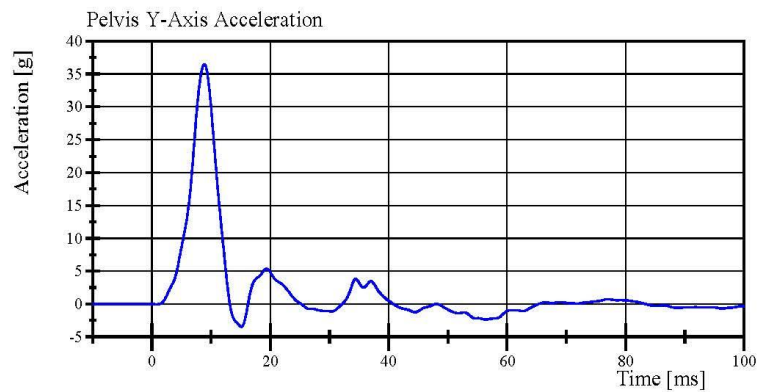
Test Date: 2/21/2019



Filter Class: CFC_180

Max: 0.2 g at 39.4 ms

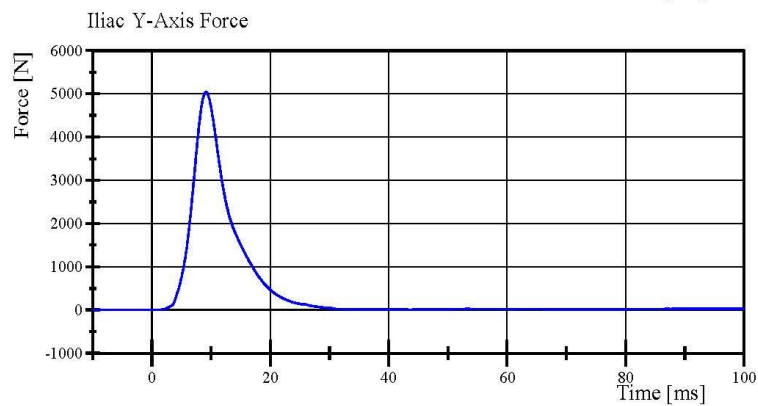
Min: -43.8 g at 9.1 ms



Filter Class: CFC_180

Max: 36.5 g at 8.9 ms

Min: -3.5 g at 15.1 ms



Filter Class: CFC_600

Max: 5,042.2 N at 9.1 ms

Min: -1.1 N at -9.4 ms

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

02.21.2019 14:24:00 664



Page 26 of 31

Post-Test Calibration Sheets
Driver S/N 297

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 297 Calibration No. 34

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	781	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	147	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	103	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	147	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	528	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	400	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	223	Yes
P	Foot Length (left)	216.0 - 232.0	221	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	254	Yes
S	Knee Joint to seat Back	478.0 - 493.0	485	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	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	878	Yes
Z	Waist Circumference	761.0 - 791.0	781	Yes

Transportation Research Center Inc.

Left Lateral Head Drop

SID IIS Serial No. 297 Certification No. 34-2

Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	115.7 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-3.1 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head S/N: 1330

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

Page 9 of 31

03.21.2019 12:40:12 193

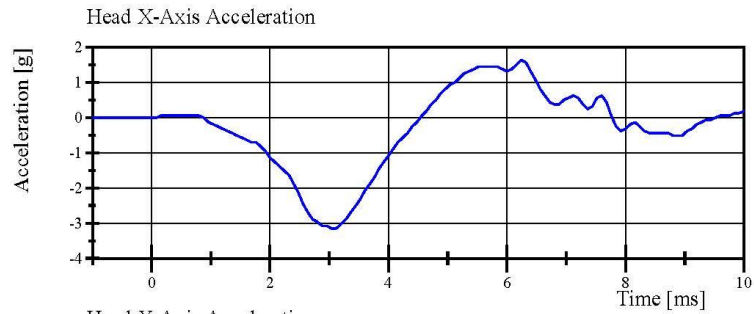


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 297 Certification No. 34-2

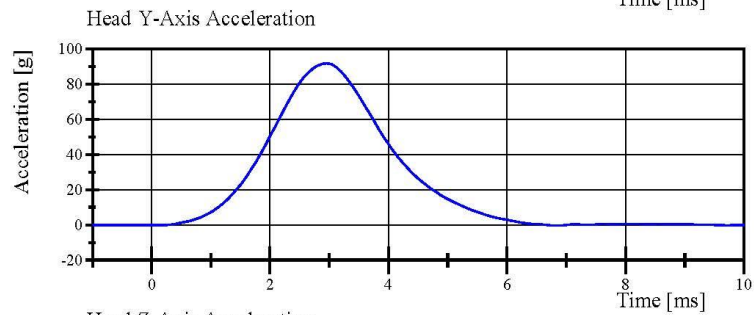
Test Date: 3/21/2019



Filter Class: CFC_1000

Max: 1.6 g at 6.2 ms

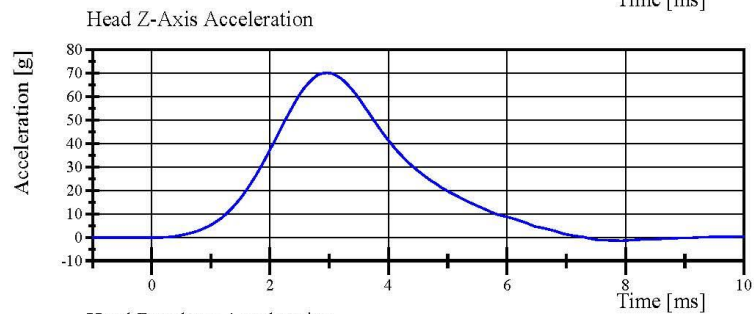
Min: -3.1 g at 3.0 ms



Filter Class: CFC_1000

Max: 91.9 g at 3.0 ms

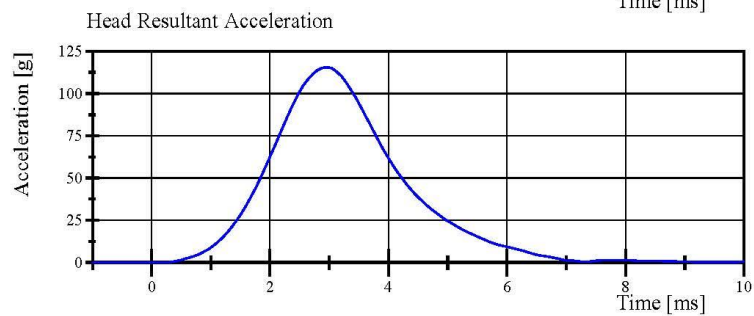
Min: -0.4 g at 6.8 ms



Filter Class: CFC_1000

Max: 70.2 g at 3.0 ms

Min: -1.4 g at 7.9 ms



Filter Class: CFC_1000

Max: 115.7 g at 3.0 ms

Min: 0.0 g at -1.0 ms

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

03.21.2019 12:40:47 193



Transportation Research Center Inc.

Left Lateral Neck

SID IIS Serial No. 297 Certification No. 34-2

Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.605 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.404 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.532 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.749 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.731 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.991 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.3 deg	Yes
Time of Peak	50 - 70 ms	67.1 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.6 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	123.9 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 779

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

Page 11 of 31

03.21.2019 11:24:43 716

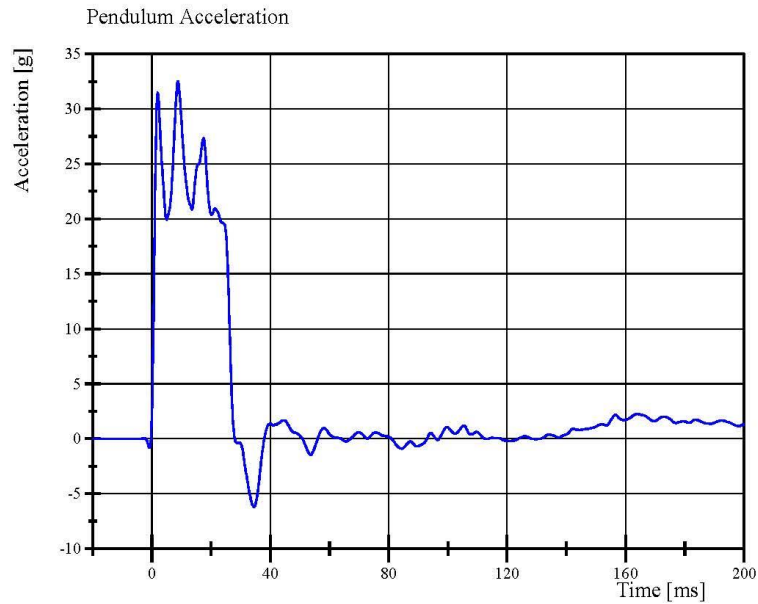


Transportation Research Center Inc.

Left Lateral Neck

SID IIS Serial No. 297 Certification No. 34-2

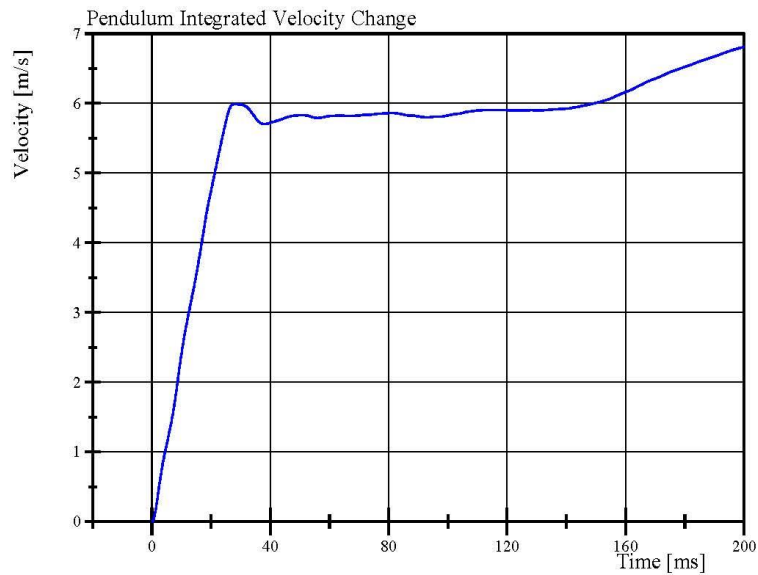
Test Date: 3/21/2019



Filter Class: CFC_180

Max: 32.5 g at 8.8 ms

Min: -6.2 g at 34.5 ms



Filter Class: CFC_180

Max: 6.8 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

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

03.21.2019 11:25:11 716

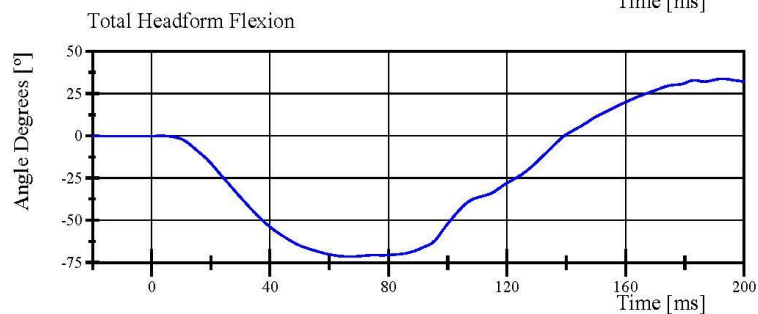
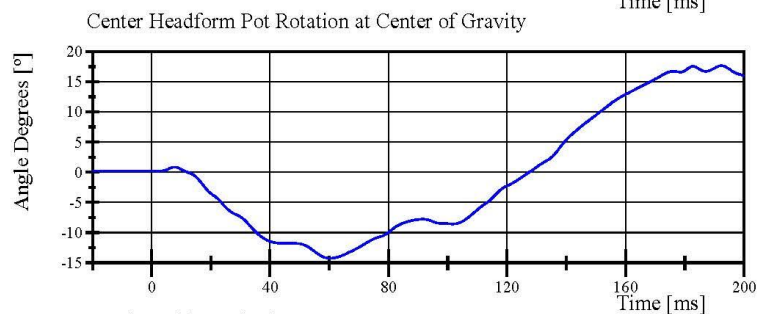
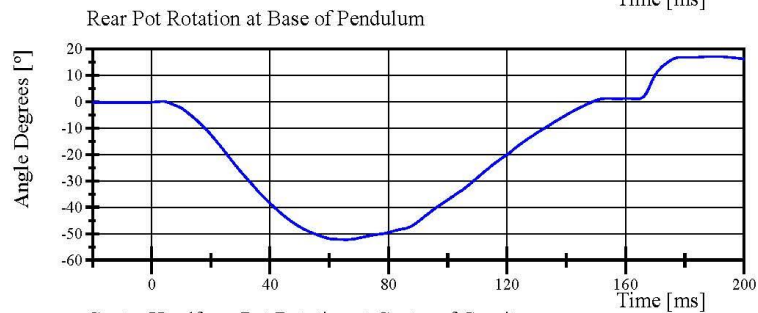
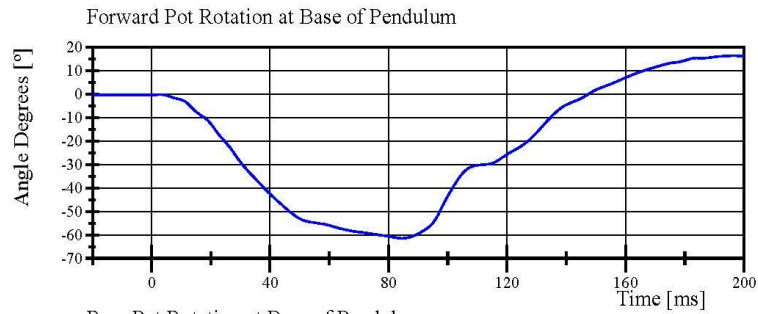


Transportation Research Center Inc.

Left Lateral Neck

SID IIS Serial No. 297 Certification No. 34-2

Test Date: 3/21/2019



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

03.21.2019 11:25:12 716

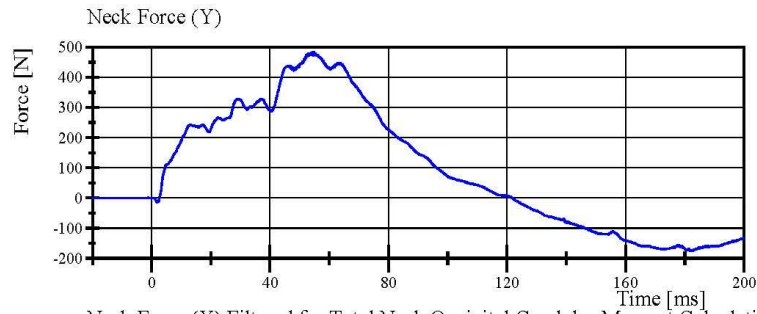


Transportation Research Center Inc.

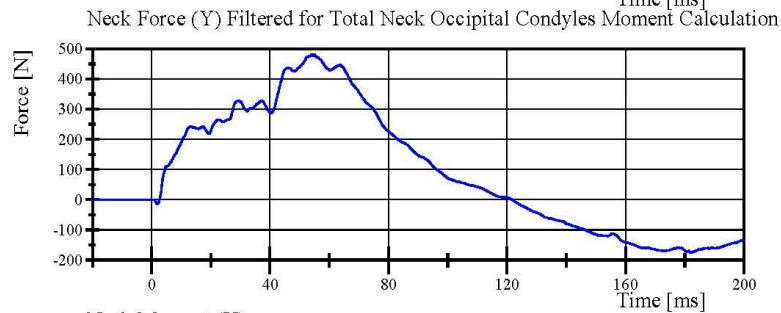
Left Lateral Neck

SID IIS Serial No. 297 Certification No. 34-2

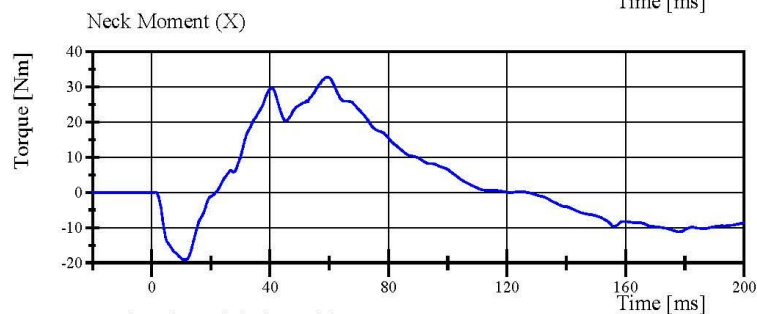
Test Date: 3/21/2019



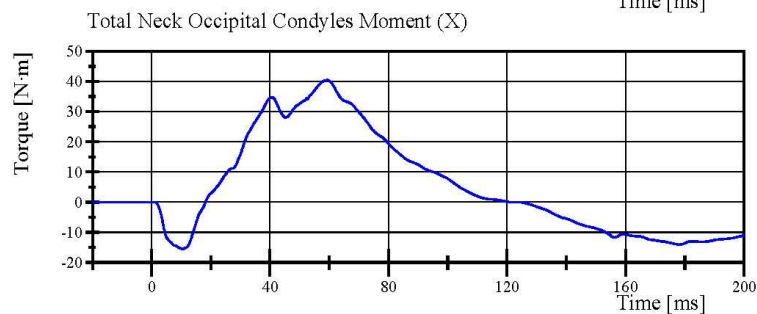
Filter Class: CFC_1000
Max: 484.0 N at 54.8 ms
Min: -174.9 N at 182.2 ms



Filter Class: CFC_600
Max: 481.8 N at 54.1 ms
Min: -174.0 N at 182.2 ms



Filter Class: CFC_600
Max: 32.9 Nm at 59.4 ms
Min: -19.1 Nm at 10.6 ms



Filter Class: Without_(Consta
Max: 40.6 N·m at 59.4 ms
Min: -15.5 N·m at 10.5 ms

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

03.21.2019 11:25:13 716



Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-14.9 g	Yes
Shoulder Displacement	28 - 37 mm	30.6 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.2 g	Yes

Test meets specifications.

Condition: Used

Comments:

Left Arm S/N: 940L

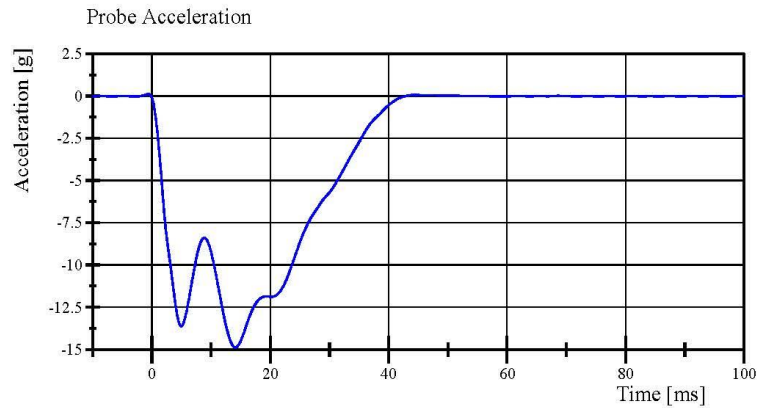
Shoulder Rib S/N: 180-3355 259

Transportation Research Center Inc.

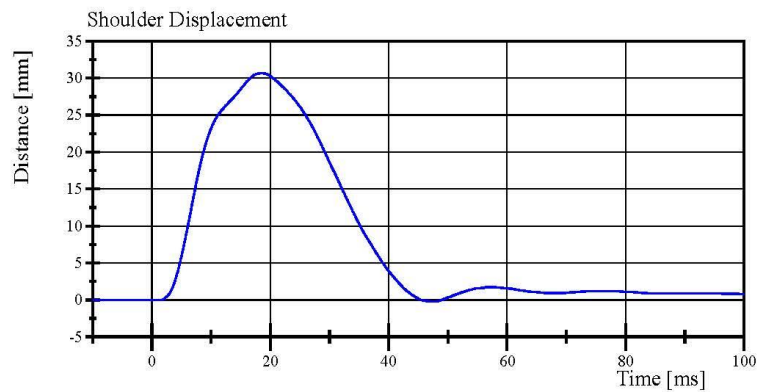
Left Lateral Shoulder

SID IIs Serial No. 297 Certification No. 34-1

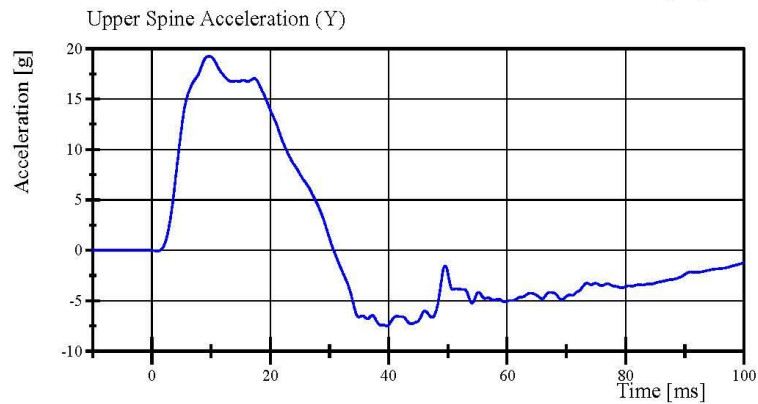
Test Date: 3/21/2019



Filter Class: CFC_180
Max: 0.1 g at -0.6 ms
Min: -14.9 g at 14.1 ms



Filter Class: CFC_600
Max: 30.6 mm at 18.5 ms
Min: -0.2 mm at 48.0 ms



Filter Class: CFC_180
Max: 19.2 g at 9.7 ms
Min: -7.5 g at 39.7 ms

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

03.21.2019 08:01:09 859



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.736 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.2 g	Yes
Shoulder Displacement	31 - 40 mm	34.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.0 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.3 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.5 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	34.7 g	Yes

Test meets specifications.

Condition: Used

Comments:

Left Arm S/N: 940L

Upper Thorax Rib #1 S/N: 2009

MiddleThorax Rib #2 S/N: 2010

LowerThorax Rib #3 S/N: 2029

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

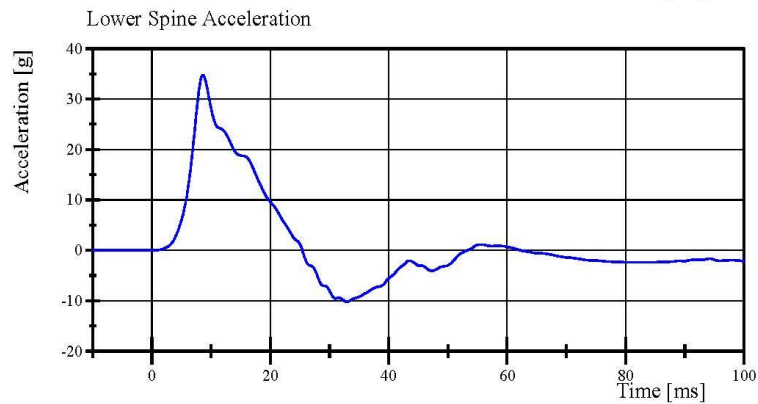
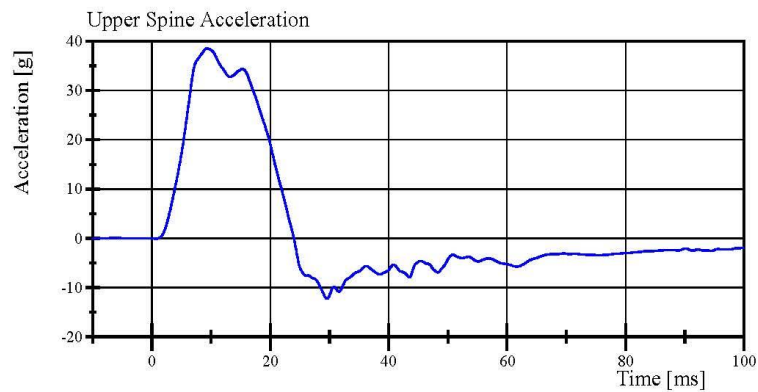
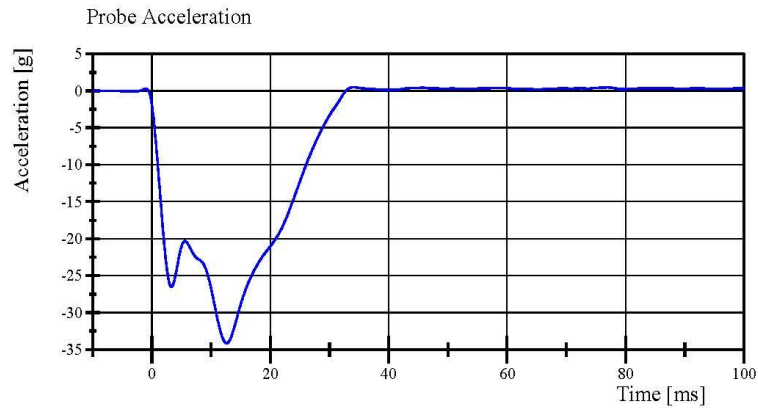
Page 17 of 31

03.21.2019 09:28:22 593



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019



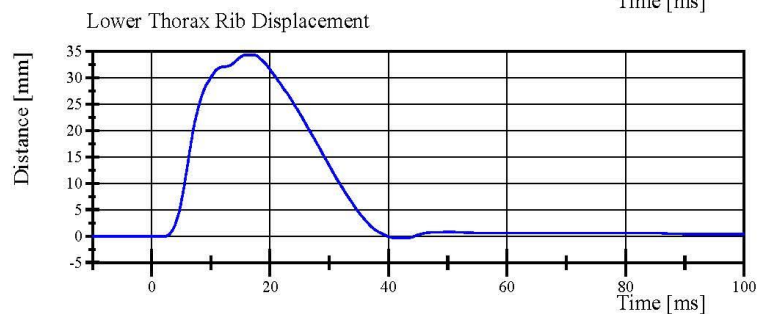
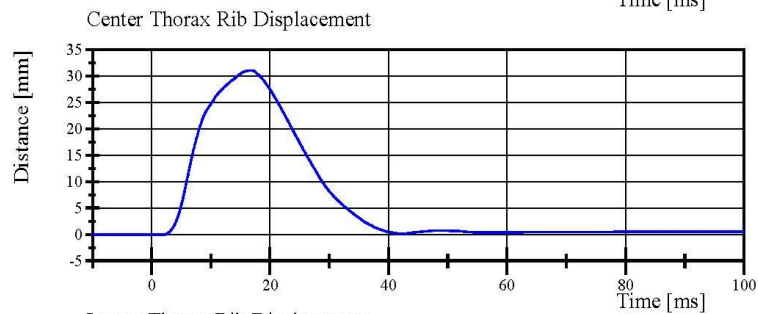
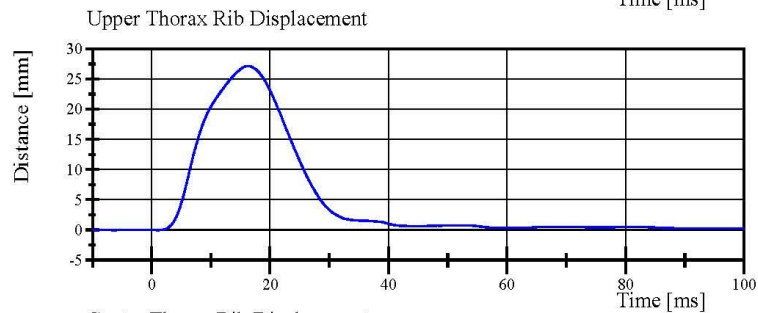
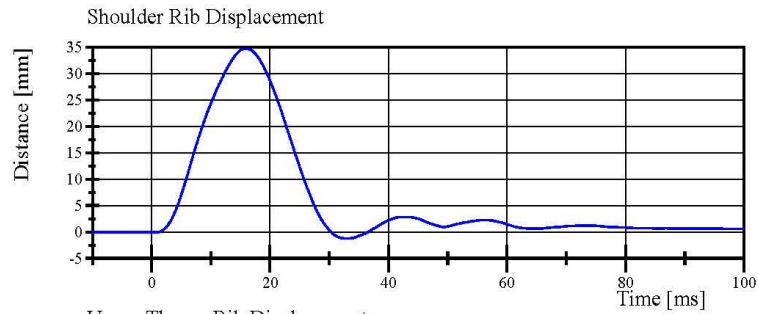
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.21.2019 09:29:19 593



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIS Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019



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

03.21.2019 09:29:20 593



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.330 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.9 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.1 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.0 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.4 g	Yes

Test meets specifications.

Condition: Used

Comments:

Upper Thorax Rib #1 S/N: 2009

Middle Thorax Rib #2 S/N: 2010

Lower Thorax Rib #3 S/N: 2029

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

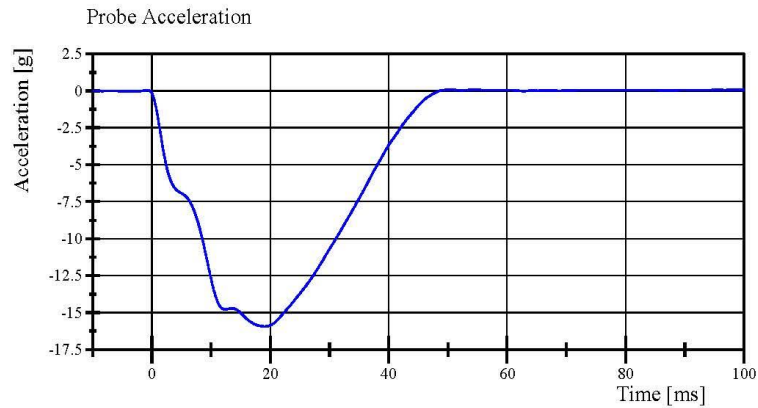
Page 20 of 31

03.21.2019 08:50:28 798

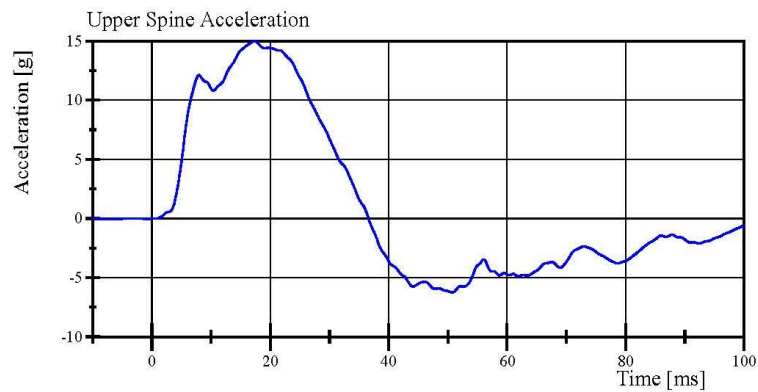


Transportation Research Center Inc.

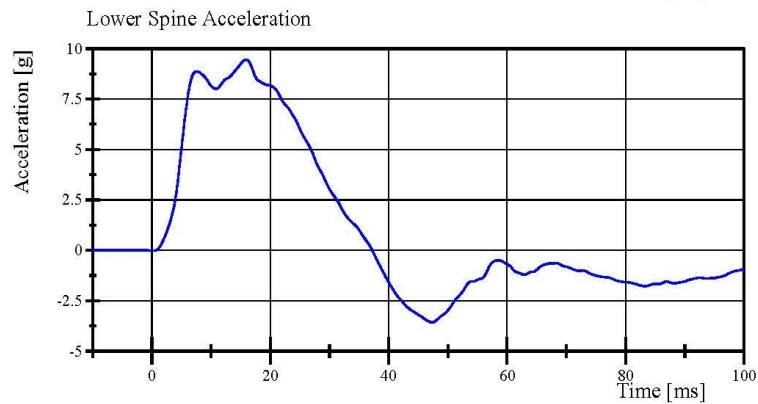
Left Lateral Thorax without Arm
SID IIs Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019



Filter Class: CFC_180
Max: 0.1 g at 50.6 ms
Min: -15.9 g at 19.1 ms



Filter Class: CFC_180
Max: 15.0 g at 17.4 ms
Min: -6.2 g at 50.7 ms



Filter Class: CFC_180
Max: 9.4 g at 15.9 ms
Min: -3.6 g at 47.4 ms

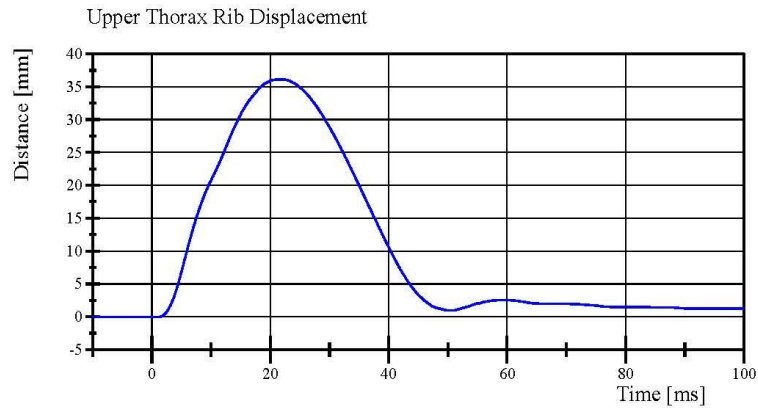
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.21.2019 08:51:12 798

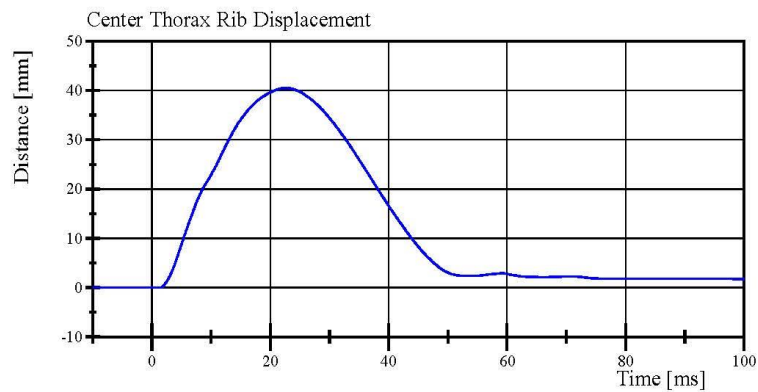


Transportation Research Center Inc.

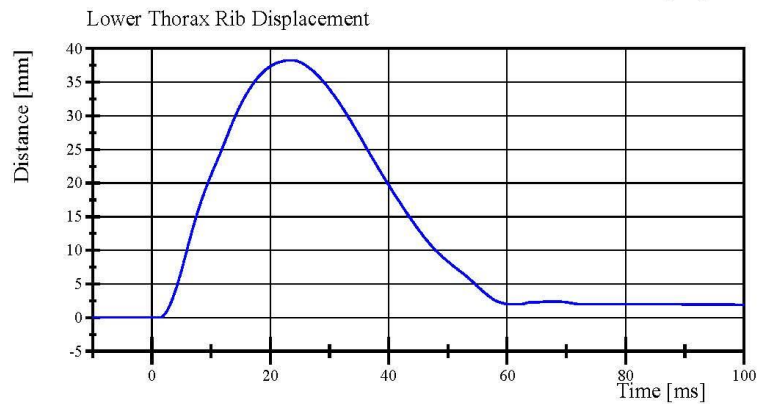
Left Lateral Thorax without Arm
SID IIs Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019



Filter Class: CFC_600
Max: 36.1 mm at 21.7 ms
Min: -0.0 mm at 1.2 ms



Filter Class: CFC_600
Max: 40.5 mm at 22.3 ms
Min: -0.0 mm at 1.4 ms



Filter Class: CFC_600
Max: 38.2 mm at 23.0 ms
Min: -0.0 mm at 1.3 ms

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

03.21.2019 08:51:13 798



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 297 Certification No. 34-1

Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	41.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	37.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.06 g	Yes

Test meets specifications.

Condition: Used

Comments:

Upper Abdominal Rib S/N: 1747

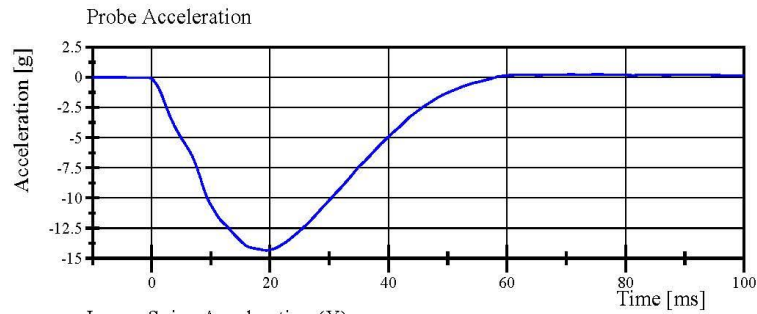
Lower Abdominal Rib S/N: 1748

Transportation Research Center Inc.

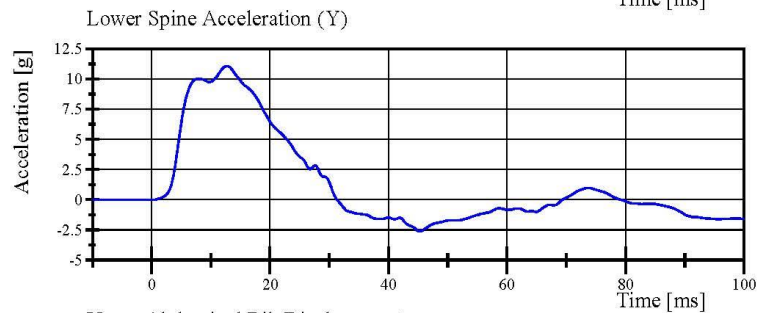
Left Lateral Abdomen

SID IIs Serial No. 297 Certification No. 34-1

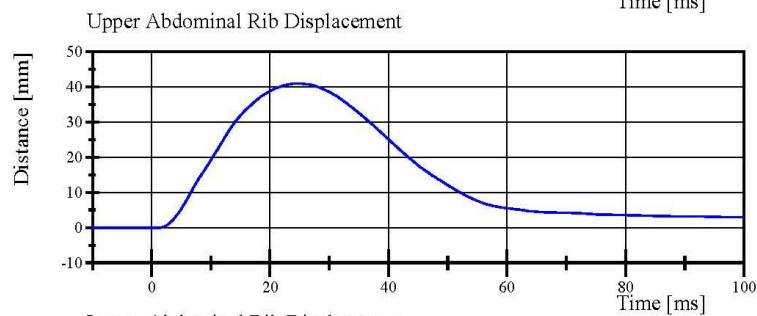
Test Date: 3/21/2019



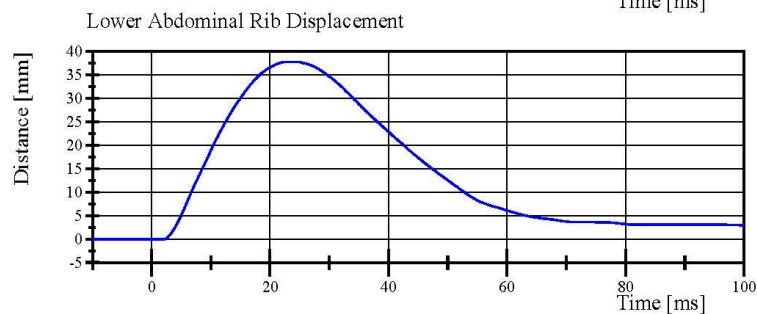
Filter Class: CFC_180
Max: 0.3 g at 75.3 ms
Min: -14.3 g at 19.4 ms



Filter Class: CFC_180
Max: 11.1 g at 12.7 ms
Min: -2.6 g at 45.3 ms



Filter Class: CFC_600
Max: 41.0 mm at 24.6 ms
Min: -0.0 mm at 0.5 ms



Filter Class: CFC_600
Max: 37.8 mm at 23.1 ms
Min: -0.0 mm at 2.1 ms

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

03.21.2019 08:25:26 624



Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 297 Certification No. 34-1
Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.63 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-45.63 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.3 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,220.5 N	Yes

Test meets specifications.

Condition: Used

Comments:

Pelvis Skin S/N: 1141

Pelvis Plug Info:

Manufacturer: Saco

S/N: 12277

Cal Date: 20180315

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

Page 27 of 31

03.21.2019 07:42:44 444

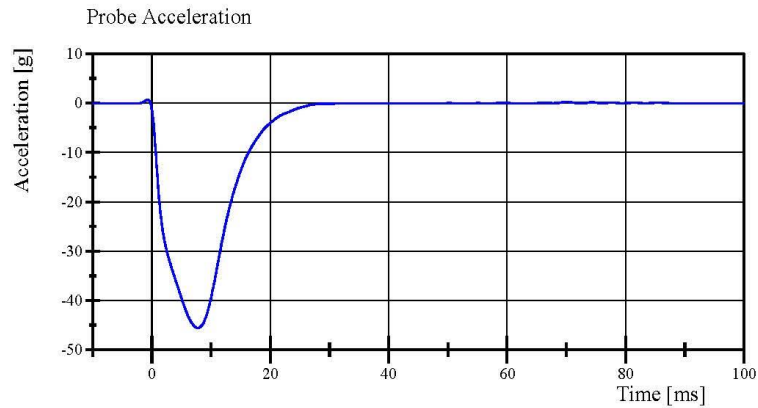


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 297 Certification No. 34-1

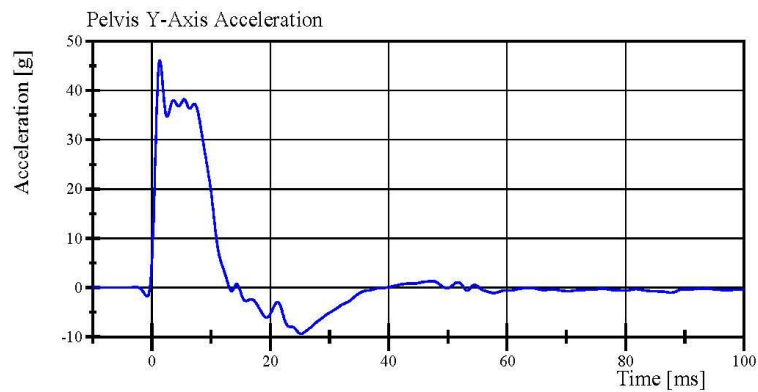
Test Date: 3/21/2019



Filter Class: CFC_180

Max: 0.7 g at -0.7 ms

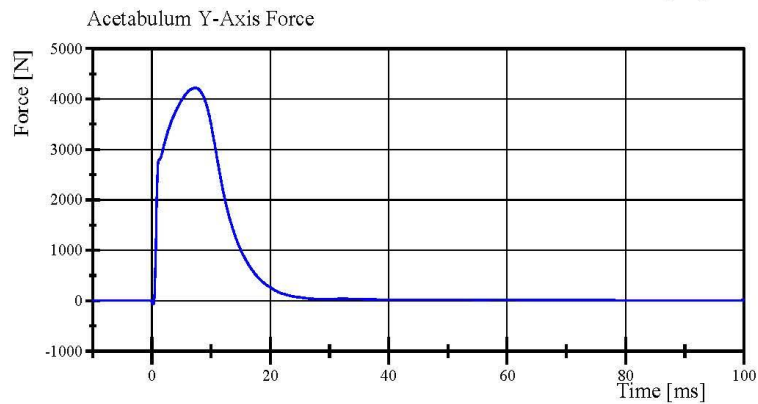
Min: -45.6 g at 7.8 ms



Filter Class: CFC_180

Max: 46.1 g at 1.4 ms

Min: -9.4 g at 25.2 ms



Filter Class: CFC_600

Max: 4,220.5 N at 7.4 ms

Min: -72.3 N at 0.2 ms

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

03.21.2019 07:43:49 444



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 297 Certification No. 34-1

Test Date: 3/21/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.24 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.6 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.3 g	Yes
Iliac Force	4,100 - 5,100 N	4,761.5 N	Yes

Test meets specifications.

Condition: Used

Comments:

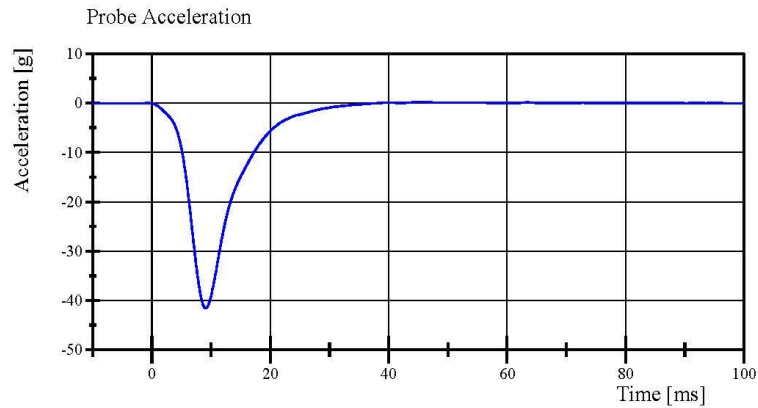
Pelvis Skin S/N: 1141

Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 297 Certification No. 34-1

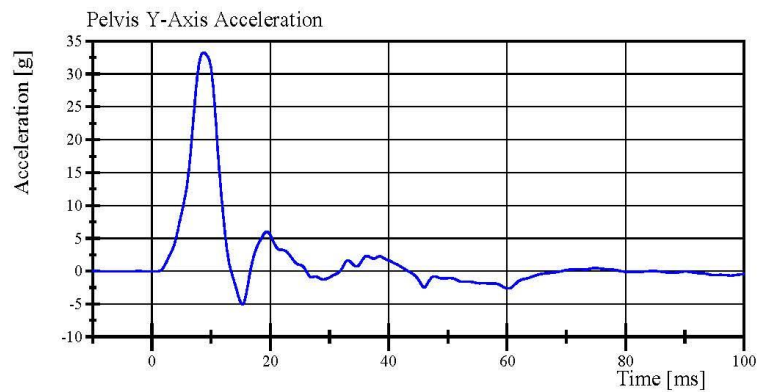
Test Date: 3/21/2019



Filter Class: CFC_180

Max: 0.3 g at 45.4 ms

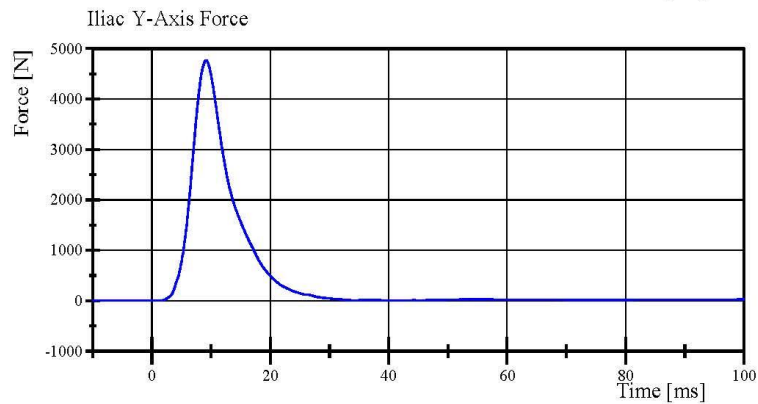
Min: -41.6 g at 9.1 ms



Filter Class: CFC_180

Max: 33.3 g at 8.7 ms

Min: -5.1 g at 15.3 ms



Filter Class: CFC_600

Max: 4,761.5 N at 9.2 ms

Min: -0.7 N at -9.4 ms

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

03.21.2019 09:43:00 653



APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 297			
				Serial Number	Manufacturer	Calibration Date	
Head Accelerometers				X	P93539	Endevco	3-Dec-2018
				Y	P93549	Endevco	3-Dec-2018
				Z	P93776	Endevco	3-Dec-2018
Displacement Potentiometers	Shoulder			Y	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	047	Servo	9-Apr-2018	
		Middle	Y	01815	Servo	9-Apr-2018	
		Lower	Y	043	Servo	9-Apr-2018	
	Abdominal Rib	Upper	Y	01811	Servo	9-Apr-2018	
		Lower	Y	051	Servo	9-Apr-2018	
Lower Spine Accelerometers (T12)				X	P94425	Endevco	3-Dec-2018
				Y	P91522	Endevco	3-Dec-2018
				Z	P91511	Endevco	3-Dec-2018
Acetabulum Load Cell				Y	235-FY	FTSS	9-Apr-2018
Iliac Wing Load Cell				Y	320-FY	FTSS	9-Apr-2018
Pelvis Plug (struck side)					11398	SACO	29-Aug-2016
Pelvis Plug (non-struck side)					36505	FTSS	24-Sep-2010

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P88038	Endevco	24-Oct-2018
Vehicle Center of Gravity	Y	P73220	Endevco	24-Oct-2018
Vehicle Center of Gravity	Z	P94561	Endevco	24-Oct-2018
Left Floor Sill	Y	T11819	Endevco	21-Jan-2019
A-Pillar Sill	Y	T11847	Endevco	8-Jan-2019
A-Pillar Low	Y	T11831	Endevco	8-Jan-2019
A-Pillar Mid	Y	P88453	Endevco	21-Dec-2018
B-Pillar Sill	Y	T11842	Endevco	20-Mar-2019
B-Pillar Low	Y	P88043	Endevco	24-Oct-2018
B-Pillar Mid	Y	P97719	Endevco	24-Oct-2018
Driver Seat	Y	P97716	Endevco	21-Dec-2018
Engine Top	X	P97876	Endevco	3-Jan-2019
Engine Top	Y	P97729	Endevco	3-Jan-2019
Firewall	Y	P73570	Endevco	24-Oct-2018
Right Roof	Y	P73587	Endevco	24-Oct-2018
Right Floor Sill	Y	T10349	Endevco	3-Jan-2019
Rear Floor Pan	X	P81065	Endevco	3-Jan-2019
Rear Floor Pan	Y	P57192	Endevco	3-Jan-2019

TABLE 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	DK7091S	Humanetics	14-Nov-2018
Load Cell 2	DK7120S	Humanetics	14-Nov-2018
Load Cell 3	DK7118S	Humanetics	14-Nov-2018
Load Cell 4	DK7124S	Humanetics	14-Nov-2018
Load Cell 5	DK7111S	Humanetics	14-Nov-2018
Load Cell 6	DK7126S	Humanetics	14-Nov-2018
Load Cell 7	DK7112S	Humanetics	14-Nov-2018
Load Cell 8	DK7074S	Humanetics	14-Nov-2018