

**Final Report Number: NCAP-TRC-19-002**

**New Car Assessment Program (NCAP)  
Frontal Barrier Impact Test**

**NISSAN MOTOR CO., LTD.  
2019 Nissan Armada SUV  
NHTSA Number: M20195203**

**PREPARED BY:  
Transportation Research Center Inc.  
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East Liberty, OH 43319**



**Report Date: December 21, 2018**

**FINAL REPORT**

**Prepared For:  
U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Office of Crashworthiness Standards  
1200 New Jersey Ave, SE Room W43-410  
Washington, DC 20590**

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Prepared By: ILO Project Operations Group

Approved By: John Shultz

Approval Date: December 21, 2018

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date \_\_\_\_\_

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

Date \_\_\_\_\_

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16. Abstract																																																																											
<p>A 56.0 km/h NCAP Frontal Impact Test was conducted on a 2019 Nissan Armada SUV, in accordance with the specifications the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. This test was conducted to obtain data related to FMVSS Nos. 208, 212, 219 (partial), and 301 performance. The test was conducted at the Transportation Research Center Inc. in East Liberty, Ohio on November 1, 2018.</p> <p>The impact velocity was 56.61 km/h, and the ambient temperature at the barrier face at the time of impact was 20.9° C. The target vehicle post-test maximum crush was 485 millimeters at Crush zone 5 at right side. The test vehicle's performance is as follows:</p>																																																																											
<table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>15</sub>)</td> <td>NA</td> <td>700</td> <td>384</td> <td>NA</td> <td>700</td> <td>285</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-36.6</td> <td>mm</td> <td>52</td> <td>-29.4</td> </tr> <tr> <td>3ms Chest Clip</td> <td>Gs</td> <td>60</td> <td>43.7</td> <td>Gs</td> <td>60</td> <td>50.0</td> </tr> <tr> <td>Nij</td> <td>NA</td> <td>1</td> <td>0.36</td> <td>NA</td> <td>1</td> <td>0.37</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1953.6</td> <td>Newtons</td> <td>2620</td> <td>972.5</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-423.6</td> <td>Newtons</td> <td>2520</td> <td>-346.8</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-4373.2</td> <td>Newtons</td> <td>6800</td> <td>-2008.4</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-2895.5</td> <td>Newtons</td> <td>6800</td> <td>-2377.0</td> </tr> </tbody> </table>							Measurement Description	Driver ATD			Passenger ATD			Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC <sub>15</sub> )	NA	700	384	NA	700	285	Maximum Chest Compression	mm	63	-36.6	mm	52	-29.4	3ms Chest Clip	Gs	60	43.7	Gs	60	50.0	Nij	NA	1	0.36	NA	1	0.37	Neck Tension	Newtons	4170	1953.6	Newtons	2620	972.5	Neck Compression	Newtons	4000	-423.6	Newtons	2520	-346.8	Left Femur Force	Newtons	10000	-4373.2	Newtons	6800	-2008.4	Right Femur Force	Newtons	10000	-2895.5	Newtons	6800	-2377.0
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## **1: PURPOSE AND SUMMARY OF THE TEST**

### **PURPOSE**

This 56 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-12-D-00257. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

This 56 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Test Procedure or NCAP Full Frontal Rigid Barrier Impact Testing dated May 2018.

### **SUMMARY**

A load cell barrier consisting of 288 load cells was impacted by a 2019 Nissan Armada SUV at a velocity of 56.61 km/h. The test was performed at Transportation Research Center, Inc. on November 1, 2018. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

One Part 572E 50th percentile male anthropomorphic test device (ATD) was placed in the driver seating position and one Part 572O 5th percentile female ATD was placed in the right-front passenger position according to dummy placement instructions specified in the Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, femur load cells, and lower leg instrumentation.

The driver (position 1) ATD (Serial No. 037), and the right-front passenger (position 2) ATD (Serial No. 426) were qualified prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 102 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

There was 100.0 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage (or electrolyte spillage) after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 485 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: front airbag, headrest, side airbag and knee bolster. The passenger's visible contact points were as follows: front airbag, sun visor, headrest, side airbag and glove box.

The occupant data is summarized below:

<b>ATD Position</b>	<b>HIC<sub>15</sub></b>	<b>Nij</b>	<b>Neck Tension (N)</b>	<b>Neck Compression (N)</b>	<b>3 ms Chest Clip (Gs)</b>	<b>Chest Disp. (mm)</b>	<b>Left Femur (N)</b>	<b>Right Femur (N)</b>
Driver (50 <sup>th</sup> Male)	384	0.36	1953.6	-423.6	43.7	-36.6	-4373.2	-2895.5
Passenger (5 <sup>th</sup> Female)	285	0.37	972.5	-346.8	50.0	-29.4	-2008.4	-2377.0

## **2.2 REPORT AREA 2: DATA SHEETS**

**DATA SHEET NO. 1 - GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

**TEST VEHICLE INFORMATION**

NHTSA No.	M20195203
Model Year	2019
Make	Nissan
Model	Armada
Body Style	MPV
VIN	JN8AY2NCXK9580081
Body Color	Gun Metallic
Odometer Reading (km/mi)	14 mis
Engine Displacement (L)	5.6
Type/No. Cylinders	Gas/8
Engine Placement	Front/Longitudinal
Transmission Type	Automatic
Transmission Speeds	7 Speed
Overdrive	Yes
Final Drive	AWD
Roof Rack	No
Sunroof/T-Top	Yes
Running Boards	Yes
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

**TEST VEHICLE OPTIONS**

Traction Control System (TCS)	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other:	No

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

**DATA FROM CERTIFICATION LABEL**

Manufactured by	NISSAN MOTOR CO., LTD.	GVWR (lb)	7500
Date of Manufacture	7/18	GAWR Front (lb)	3616
		GAWR Rear (lb)	4343

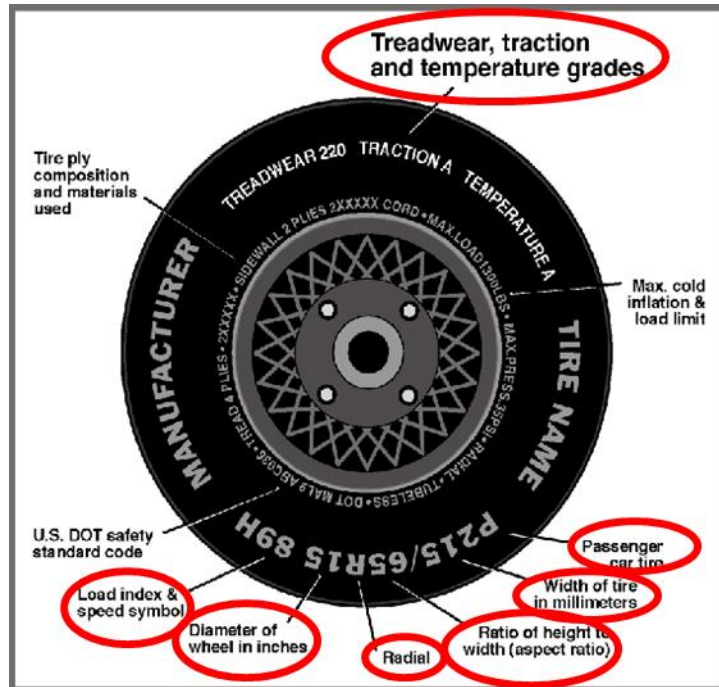
**VEHICLE SEATING AND WEIGHT CAPACITY**

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	Split Bench	
Number of Occupants	2	2	3	7
Capacity Wt. (VCW) (kg)				700
Cargo Wt. (RCLW) (kg)				224

## DATA SHEET NO. 1 - GENERAL TEST AND VEHICLE PARAMETER DATA (CONT'D)

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018



### DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	240	240
Recommended Tire Size	P275/60R20 114H	P275/60R20 114H
Tire Size on Vehicle	P275/60R20	P275/60 R20
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler H/T	Dueler H/T
Treadwear	360	360
Traction Grade	B	B
Temperature Grade	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	114H	114H
Tire Material	Polyester/Steel/Nylon	Polyester/Steel/Nylon
DOT Safety Code Right	EJNU JHB2518	EJNU JHB2518
DOT Safety Code Left	EJNU JHB2518	EJNU JHB2518

**DATA SHEET NO. 1 - GENERAL TEST AND VEHICLE PARAMETER DATA  
(CONT'D)**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	682.8	662.2		720.4	776.6	
Right	kg	691.0	629.8		684.6	751.4	
Ratio	%	51.5	48.5		47.9	52.1	
Totals	kg	1373.8	1292.0	2665.8	1405.0	1528.0	2933.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2665.8
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW) <sup>1</sup>	kg	136.0
Vehicle Target Weight (TVTW)	kg	2941.1

**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG (aft of front)
As Delivered	mm	942	944	914	925	1483
As Tested	mm	935	942	885	894	1594
Post Test	mm	881	870	891	887	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	3060
Total Vehicle Length at Left Side	mm	5153
Total Vehicle Length at Centerline	mm	5273
Total Vehicle Length at Right Side	mm	5151
Weight of Ballast in Cargo Area	kg	118.0
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	liters	91.6

**LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:** None

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<sup>1</sup> Rated cargo and luggage weight limited to 136.0 kg or 300.0 lbs.

**DATA SHEET NO. 1 - GENERAL TEST AND VEHICLE PARAMETER DATA  
(CONT'D)**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	<b>Elements</b>	<b>Pre-Test (mm)</b>
1	Total Length	5273
2	Total Width	2040
3	Bumper Top Height	480
4	Bumper Bottom Height	425
5	Longitudinal Member Top Height	550
6	Distance Between Longitudinal Members	805
7	Longitudinal Member Width	72
8	Engine Top Height	1230
9	Engine Bottom Height	286
10	Engine and Gearbox Width	1700
11	Front Bumper-Engine Distance	650
12	Front Shock Absorber Fixing Height	815
13	Bonnet Leading Edge Height	1100
14	Front Shock Absorber Fixing Width	1300
15	Front Bumper – Front Axle Distance	950
16	Front Axle – A-Pillar Distance	660
17	A-Pillar – B-Pillar Distance	1090
18	B-Pillar – Rear Axle Distance	1317
19	B-Pillar – C-Pillar Distance	1030
20	Roof Sill Bottom Height	1700
21	Roof Sill Top Height	1755
22	Floor Sill Bottom Height	520
23	Floor Sill Top Height	633

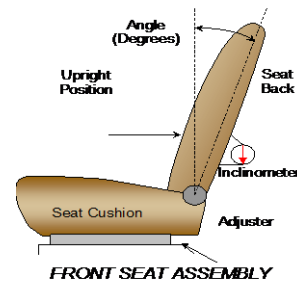
## DATA SHEET NO. 2 - SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

### NORMAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable



	Degree
Driver Seat back angle:	10.5
Passenger Seat back angle:	7.1

### SEAT FORE/AFT POSITIONS

Describe the method of determining seat fore/aft positions.

Driver: Mid position, Positioned according to Form 1

Passenger: Full forward, Positioned according to Form 1

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	252	126
Passenger Seat	240	0

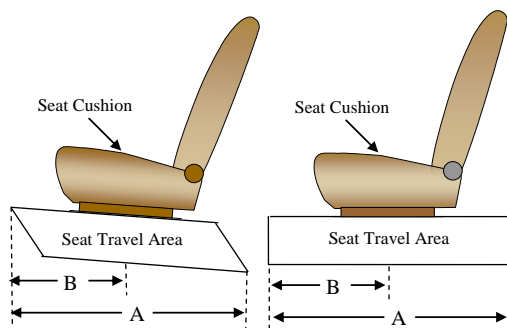
### SEAT BELT UPPER ANCHORAGE

Describe the method of positioning seat belt upper anchorages..

Driver: Uppermost, Positioned according to Form 1

Passenger: Uppermost, Positioned according to Form 1.

	Total No. of Positions	Placed in Position No.
Driver Seat	4	1 (Uppermost)
Passenger Seat	4	1 (Uppermost)



**DATA SHEET NO. 2 - SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING  
WHEEL DATA (CONT'D)**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

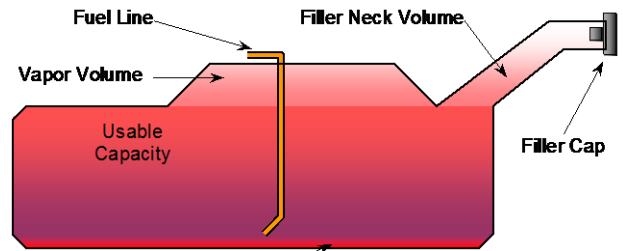
NHTSA No.: M20195203  
 Test Date: 11/1/2018

**FUEL TANK CAPACITY**

	<b>Liters</b>
Usable Capacity of "Standard Tank"	98.4
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	91.6
Actual Amount of Solvent Used	91.6
1/3 of Usable Capacity	32.8

Describe the fuel system - what type of fuel pump, details about how it operates, etc.

The fuel pump is activated for  
approximately 1 second when the  
ignition is turned on

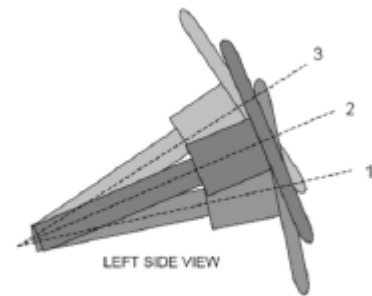


**VEHICLE FUEL TANK ASSEMBLY**

**STEERING COLUMN ADJUSTMENT**

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. Describe how this measurement was taken.

Steel square was placed across the rim of  
the steering wheel, an inclinometer was  
placed on plate and the angle was  
measured. Telescope travel was measured  
full in and full out and set at the midpoint.



**STEERING COLUMN ASSEMBLY**

**STEERING COLUMN POSITIONS**

	<b>Degrees</b>	<b>Fore/Aft Position (mm)</b>
Lowermost Position No. 1	11.4	0
Geometric Center Position No. 2	18.4	16
Uppermost Position No. 3	25.4	32
Telescoping Steering Wheel Travel	13.0	32
Test Position	18.4	16

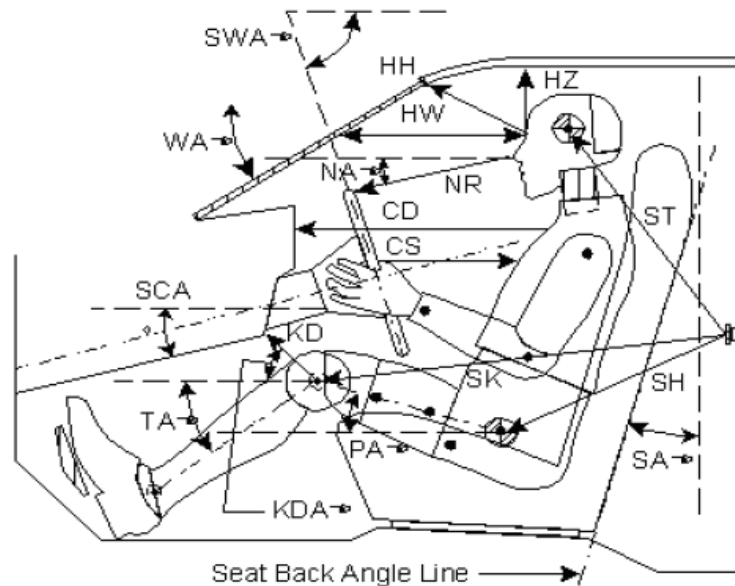
### DATA SHEET NO. 3 - DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Nissan Armada SUV

NHTSA No.: M20195203

Test Program: NCAP Frontal Impact

Test Date: 11/1/2018

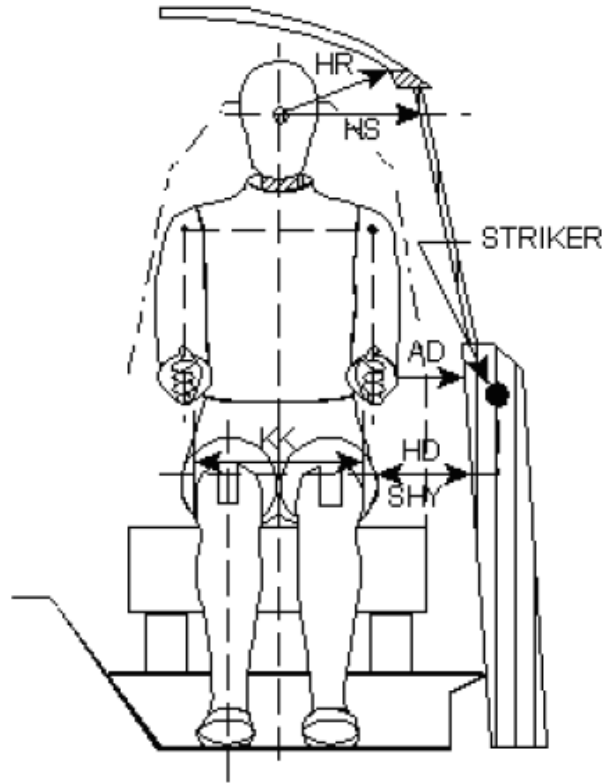


Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		35.2		
SWA°	Steering Wheel Angle		18.4		
SCA°	Steering Column Angle		71.6		
SA°	Seat Back Angle (on head rest post)		10.5		7.1
HZ	Head to Roof (Z)	236	0.0	232	0.0
HH	Head to Header	426	20.9	344	39.1
HW	Head to Windshield	658	0.0	588	0.0
NR	Nose to Rim	396	10.1		
CD	Chest to Dash	530		371	
CS	Chest to Steering Hub	306	6.8		
RA	Rim to Abdomen	180	0.0		
KDL	Left Knee to Dash	147	16.4	71	33.3
KDR	Right Knee to Dash	128	16.3	73	33.3
PA°	Pelvic Angle		24.5		20.1
TA°	Tibia Angle		48.4		63.7
SK	Striker to Knee	638	2.3	775	3.5
ST	Striker to Head	622	-79.2	590	-62.7
SH	Striker to H-Point	262	16.3	400	9.4

## DATA SHEET NO. 4 - DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

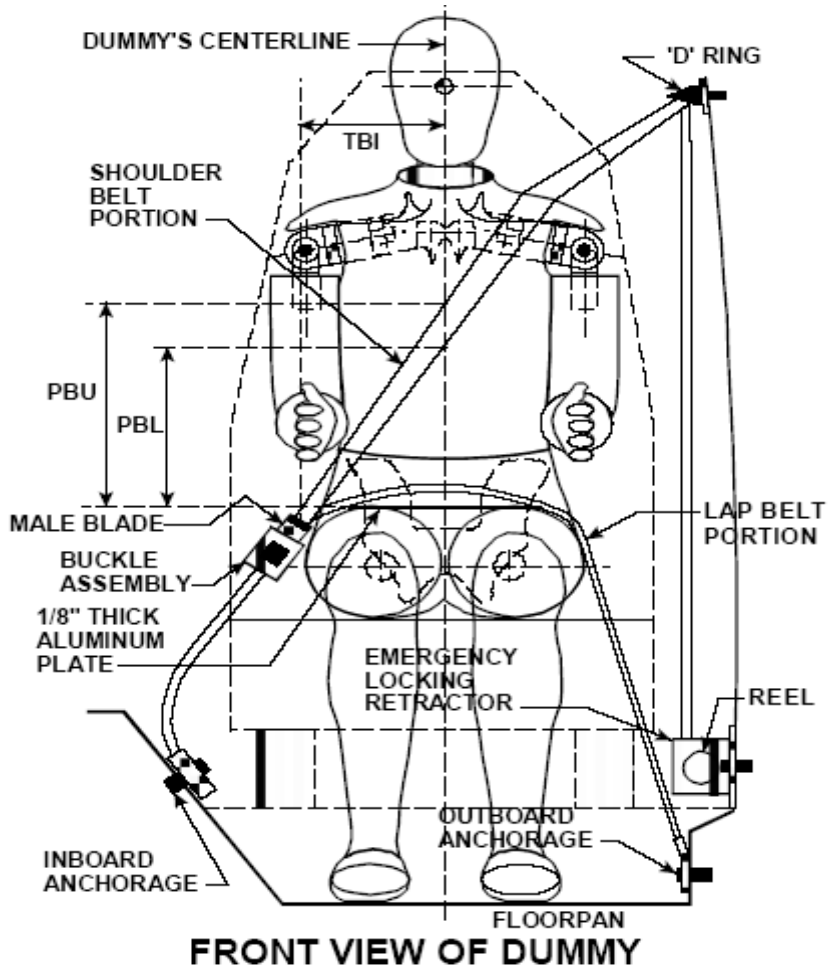


Code	Measurement Description	Driver	Passenger
AD	Arm to Door	132	90
HD	H-Point to Door	143	167
HR	Head to Side Header	267	282
HS	Head to Side Window	369	376
KK	Knee to Knee	376	170
SHY	Striker to H-Point (Y Direction)	248	284
AA	Ankle to Ankle	390	158

**DATA SHEET NO. 5 - SEAT BELT POSITIONING DATA**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018



**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	351	305
PBL – Top surface of reference to belt lower edge	mm	285	221

**BELT LENGTH DATA**

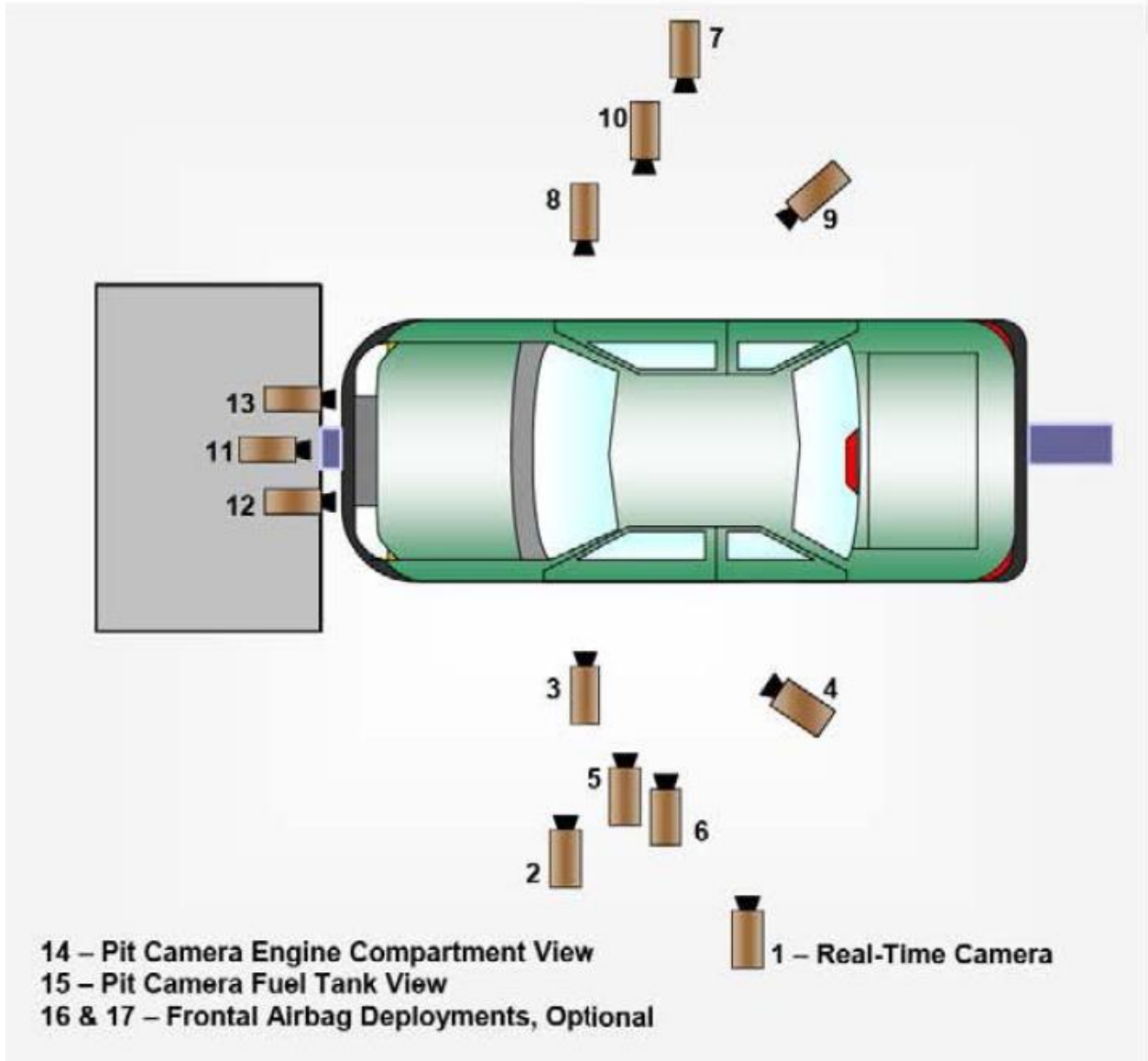
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	952	1096
Lap belt length as measured on ATD	mm	800	954
Remainder of belt on reel	mm	788	725
Total belt length for continuous webbing systems	mm	2540	2775

## DATA SHEET NO. 6 - HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2019 Nissan Armada SUV  
Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
Test Date: 11/1/2018

### CAMERA POSITIONS FOR FRONTAL IMPACTS



**DATA SHEET NO. 6 - HIGH SPEED CAMERA LOCATIONS AND DATA  
(CONT'D)**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

**CAMERA LOCATIONS**

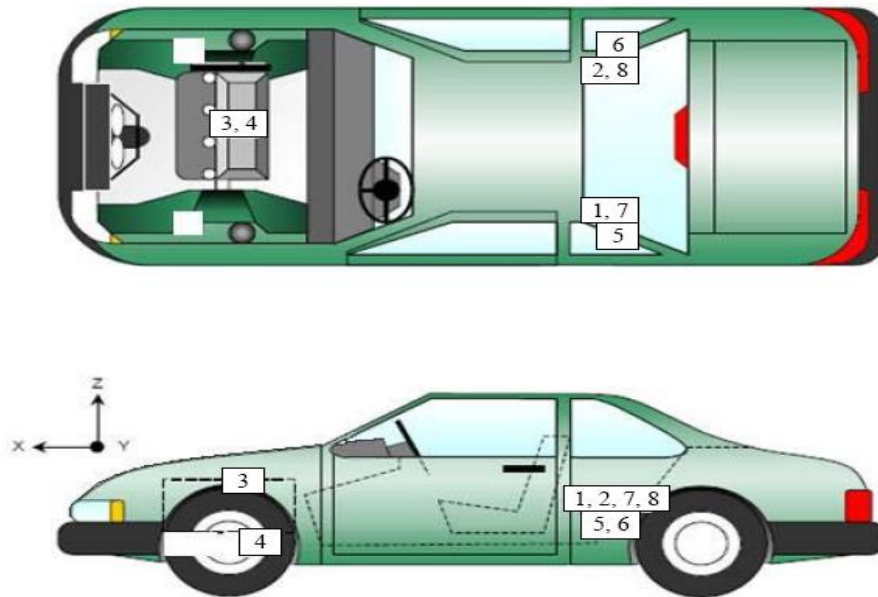
No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	REAL-TIME LEFT OVERALL	848	-4858	-1128	Zoom	30
2	LEFT OVERALL	2596	-6558	-1217	20	1000
3	DRIVER CLOSE-UP	1894	-5283	-1494	50	1000
4	LEFT FRONT HALF	1389	-4827	-1394	25	1000
5	LEFT ANGLE	3966	-2624	-2009	25	1000
6	STEERING COLUMN	2243	-5806	-2049	50	1000
7	RIGHT OVERALL	1970	6177	-1220	20	1000
8	PASSENGER CLOSE-UP	1381	5760	-1494	50	1000
9	RIGHT FRONT HALF	946	5418	-1361	25	1000
10	RIGHT ANGLE	4079	2819	-1975	25	1000
11	WINDSHIELD	0	0	-2541	12.5	1000
12	DRIVER WINDSHIELD	0	-568	-2541	25	1000
13	PASSENGER WINDSHIELD	0	529	-2541	25	1000
14	PIT FRONT	689	0	3163	25	1000
15	PIT REAR	2623	0	3163	12.5	1000
16	DRIVER ONBOARD				12.5	1000
17	PASSENGER ONBOARD				12.5	1000

Reference Points: +X – forward of impact plane  
 +Y – right of monorail center  
 +Z – into ground

## DATA SHEET NO. 7 - VEHICLE ACCELEROMETER DATA

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018



### VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2290	-430	-680
2	Right Rear Accelerometer – X Direction	2290	435	-680
3	Engine Top X	4950	-85	-1137
4	Engine Bottom X	4740	80	-289
5	Left Rear Accelerometer – Z Direction	2290	-430	-685
6	Right Rear Accelerometer – Z Direction	2290	435	-685
7	Left Rear Accelerometer – X Direction Redundant	2290	-400	-680
8	Right Rear Accelerometer- X Direction Redundant	2290	405	-680

Reference Points: X – Rear Surface of Vehicle (+ forward)  
 Y – Vehicle Centerline (+ to right)  
 Z – Ground Plane (+ down)

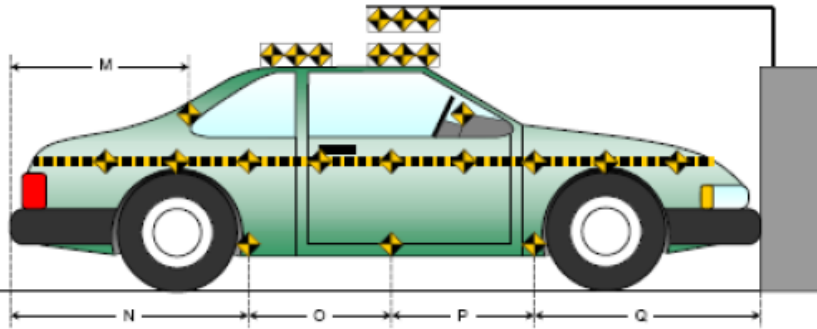
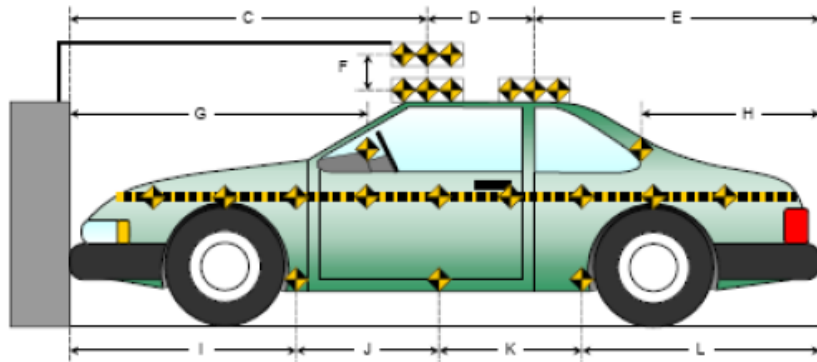
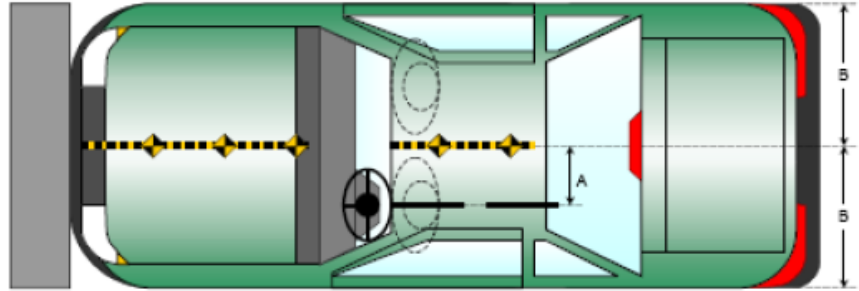
## DATA SHEET NO. 8 - PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

Item	Value
A	467
B	1020
C	2430
D	600
E	2857
F	255
G	5650
H	1628
I	1510
J	975
K	1004
L	1780
M	1635
N	1791
O	1002
P	970
Q	1495

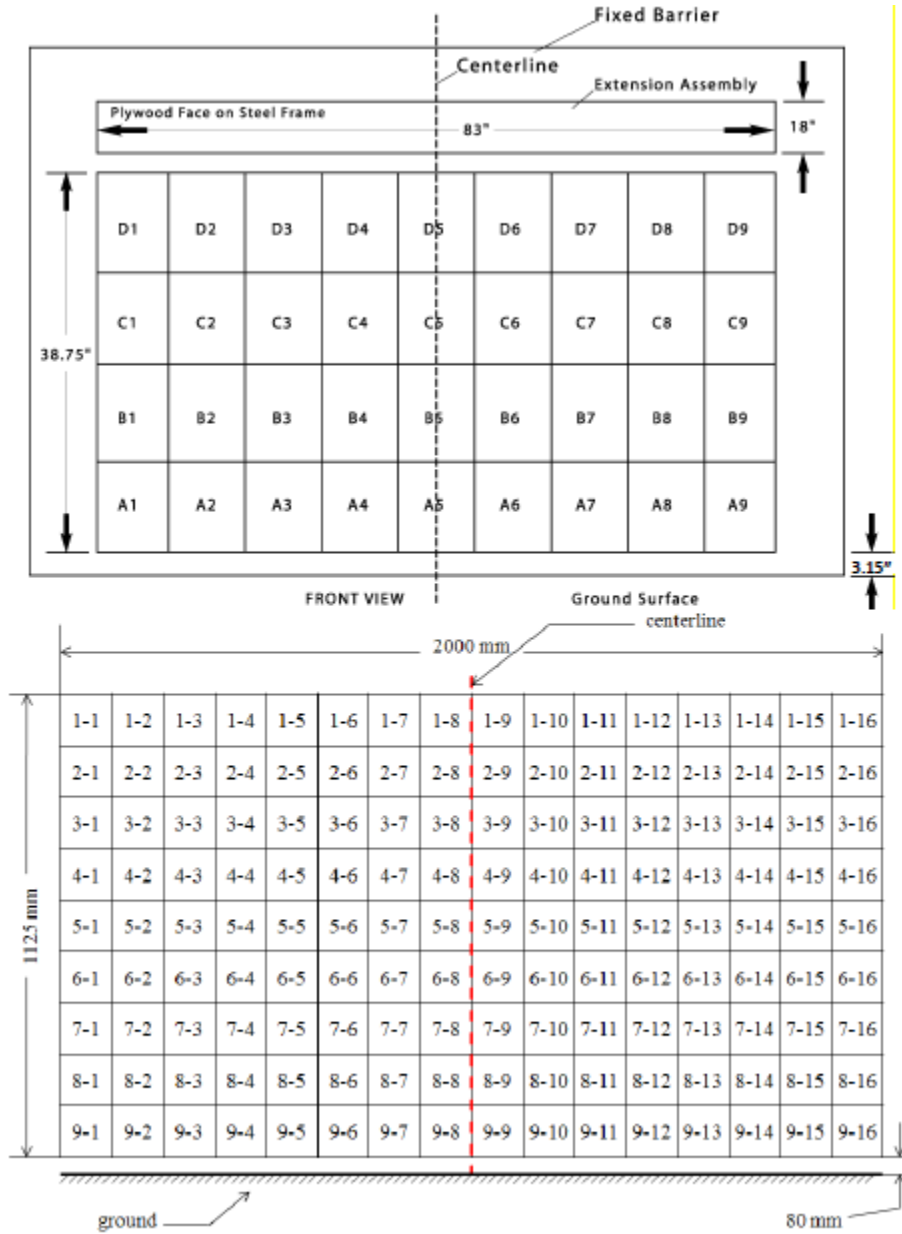
All units in millimeters



## DATA SHEET NO. 9 - LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018



## DATA SHEET NO. 10 - TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2019 Nissan Armada SUV

NHTSA No.: M20195203

Test Program: NCAP Frontal Impact

Test Date: 11/1/2018

### INSTRUMENTATION

<b>Instrumentation</b>	<b>Number of Channels Collected</b>
Driver Dummy Accelerometers	47
Passenger Dummy Accelerometers	47
Vehicle Structure Accelerometers	8
<b>Total</b>	<b>102</b>

### CAMERA COVERAGE

<b>Type of Camera</b>	<b>Number Used in this Test</b>
High-Speed Vehicle Onboard	2
High-Speed Offboard	14
Real-Time Panning	1
<b>Total</b>	<b>17</b>

**DATA SHEET NO. 11 - POST-TEST OBSERVATIONS**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50th / 037	Hybrid III 5th / 426
Head Contact	Frontal Airbag and Headrest	Frontal Airbag, Sun Visor Headrest and Seatback
Upper Torso Contact	Side Airbag	Side Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

**DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION**

Description	Driver	Passenger	Other
Locked/Unlocked Doors**	Locked	Locked	
Front Door Opening**	No	No	
Rear Door Opening**	No	No	
Trunk/Hatch/Tailgate Opening**			No
Seat Track Shift (mm) **	No	No	
Seat Back Movement from Initial Position**	No	No	

\*\*NOTE: Indicate “No”, “N/A”, or “Yes”, and if “Yes”, describe

**POST- OTHER VEHICLE POST-TEST OBSERVATIONS**

Critical Areas of Performance	Observations
Windshield Damage	None
Window Damage	None
Other Notable Effects	None

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	1501
Center	mm	1520
Right Side	mm	1451
Average	mm	1491

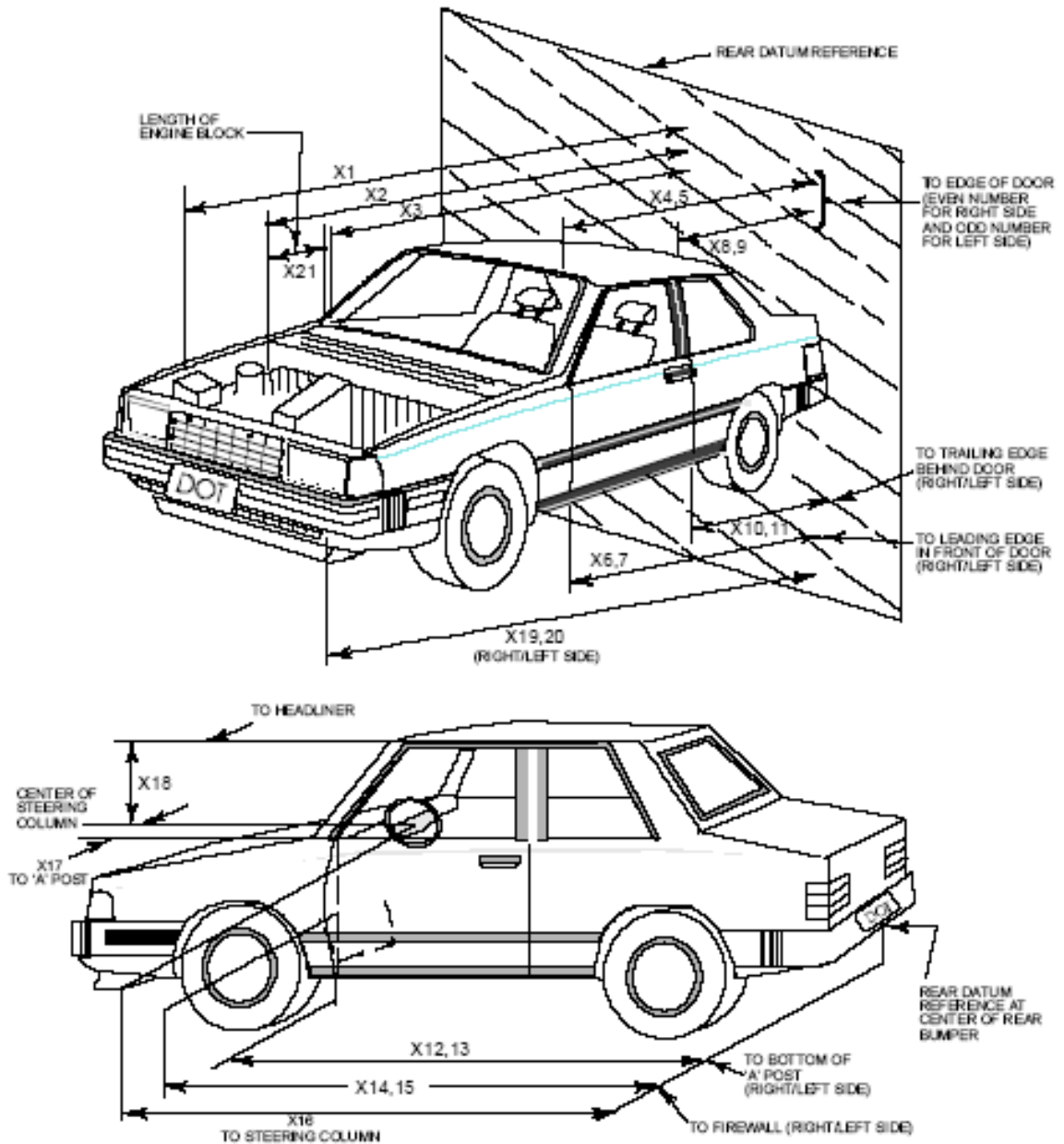
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Torso/Pelvis Side Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	Yes	Yes	Yes
Knee Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Seat Belt Buckle Pretensioner	No	N/A	No	N/A
Other	No	N/A	No	N/A

## DATA SHEET NO. 12 - VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018



**DATA SHEET NO. 12 - VEHICLE PROFILE MEASUREMENTS (CONT'D)**

Test Vehicle: 2019 Nissan Armada SUV

NHTSA No.: M20195203

Test Program: NCAP Frontal Impact

Test Date: 11/1/2018

<b>No.</b>	<b>Measurement Description</b>	<b>Pre-Test</b>	<b>Post-Test</b>	<b>Difference</b>
1	Total Length of Vehicle at Centerline	5273	4803	470
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4623	4373	250
3	RSOV to Firewall	4088	4105	-17
4	RSOV to Upper Leading Edge of Right Door	3663	3701	-38
5	RSOV to Upper Leading Edge of Left Door	3655	3698	-43
6	RSOV to Lower Leading Edge of Right Door	3671	3691	-20
7	RSOV to Lower Leading Edge of Left Door	3669	3683	-14
8	RSOV to Upper Trailing Edge of Right Door	2611	2657	-46
9	RSOV to Upper Trailing Edge of Left Door	2615	2655	-40
10	RSOV to Lower Trailing Edge of Right Door	2603	2619	-16
11	RSOV to Lower Trailing Edge of Left Door	2598	2608	-10
12	RSOV to Bottom of "A" Post-of Right Side	3658	3694	-36
13	RSOV to Bottom of "A" Post-of Left Side	3656	3706	-50
14	RSOV to Firewall, Right Side	4076	4065	11
15	RSOV to Firewall, Left Side	4068	4153	-85
16	RSOV to Steering Column	3223	3283	-60
17	Center of Steering Column to "A" Post	356	334	22
18	Center of Steering Column to Headliner	455	420	35
19	RSOV to Right Side of Front Bumper	5151	4803	348
20	RSOV to Left Side of Front Bumper	5153	4849	304
21	Length of Engine Block	700	700	0
RD	RSOV to Right Side of Dash Panel	3508	3563	-55
CD	RSOV to Center of Dash Panel	3518	4105	-587
LD	RSOV to Left Side of Dash Panel	3505	4100	-595

All Dimensions in mm

## DATA SHEET NO. 13 - ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

### VEHICLE INFORMATION

VIN: JN8AY2NCXK9580081  
 Vehicle Size Category: MPV

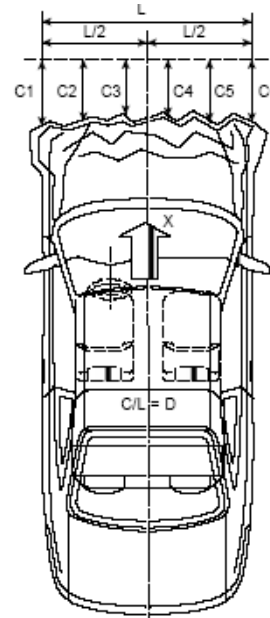
Wheelbase: 3060  
 Test Weight (kg): 2933.0

### ACCELEROMETER DATA

Accelerometer Locations: As listed on Page 15 of this report.  
 Cal. Procedure/Interval: TRC procedure / 6 month interval  
 Integration Algorithm: Trapezoidal  
 Linearity: > 99%  
 Impact Velocity (km/h): 56.61  
 Velocity Change (km/h): 63.06  
 Time of Separation (ms): 208

### CRUSH PROFILE

Collision Deformation Classification: 12FDEW2  
 Midpoint of Damage: Centerline  
 Damage Region Length (mm): 1219  
 Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5153	4803	350
C2	Crush zone 2 at left side	mm	5263	4793	470
C3	Crush zone 3 at left side	mm	5273	4793	480
C4	Crush zone 4 at right side	mm	5273	4798	475
C5	Crush zone 5 at right side	mm	5263	4778	485
C6	Crush zone 6 at right side	mm	5151	4849	302
L	C1 to C6	mm	1524	1524	0

**DATA SHEET NO. 14 - VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

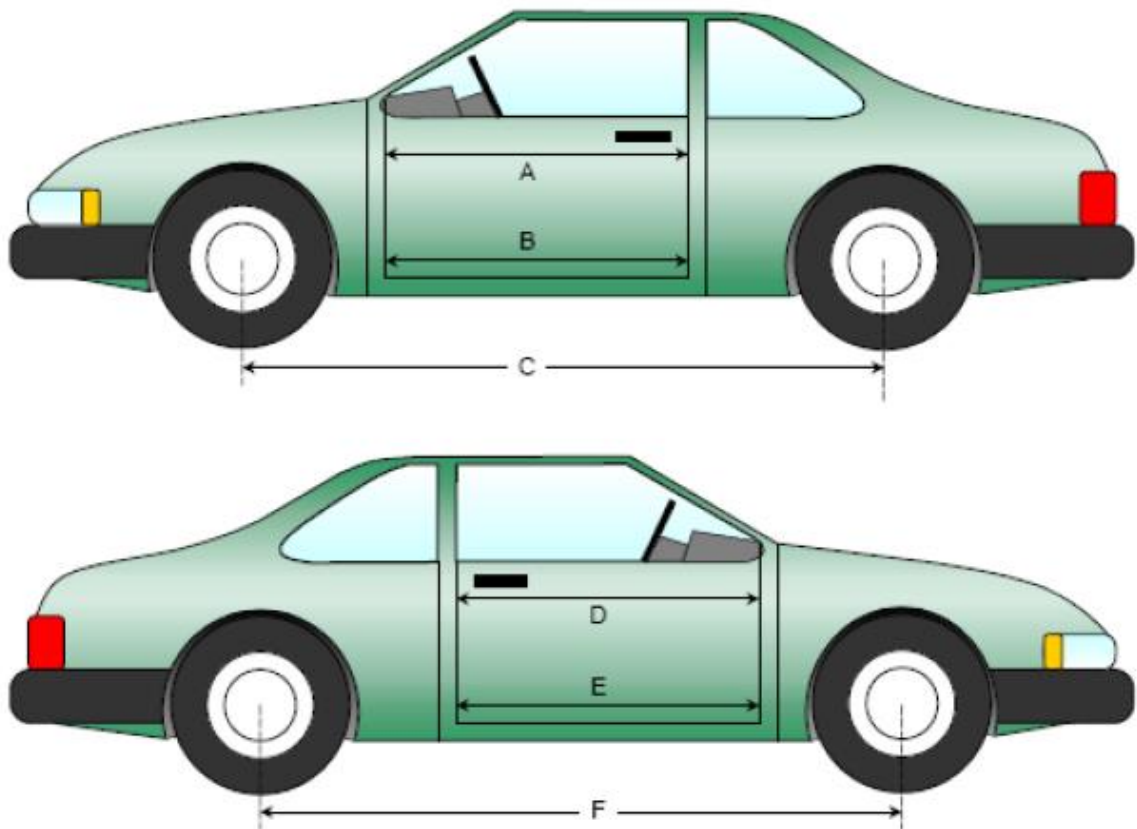
NHTSA No.: M20195203  
 Test Date: 11/1/2018

**DOOR OPENING WIDTH**

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1007	1010	-3
B	Left Side Lower	mm	895	898	-3
C	Right Side Upper	mm	1008	1010	-2
D	Right Side Lower	mm	880	880	0

**WHEELBASE MEASUREMENTS**

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3060	3025	35
F	Right Side Wheelbase	mm	3060	3050	10



**DATA SHEET NO. 14 - VEHICLE INTRUSION MEASUREMENTS (CONT'D)**

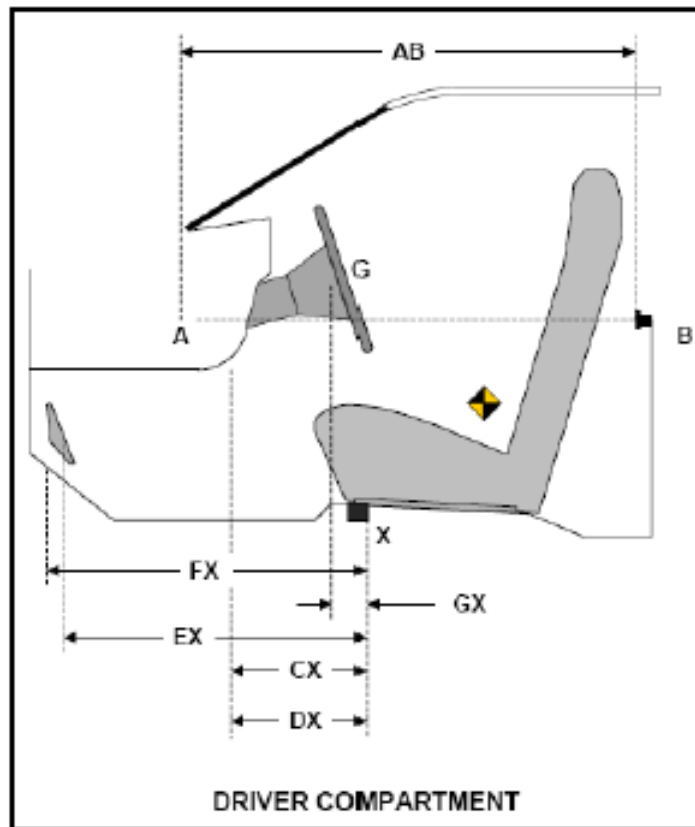
Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	996	1000	-4
CX	Left Knee Bolster to X	mm	265	281	-16
DX	Right Knee Bolster to X	mm	280	293	-13
EX	Brake Pedal to X	mm	550	600	-50
FX	Foot Rest to X	mm	550	560	-10
GX	Center of Steering Column Wheel Hub to X	mm	53	90	-37

X = Front of Seat Track (Stationary)



**DATA SHEET NO. 15 - SUMMARY OF INDICANT FMVSS 212 AND FMVSS 219  
(PARTIAL) DATA**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

Please provide windshield mounting details.

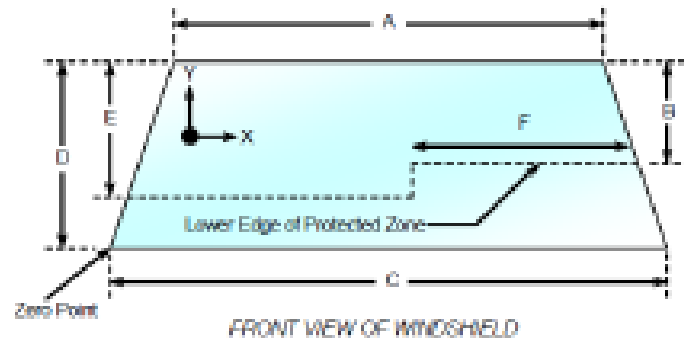
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 20.9° C

**WINDSHIELD PERIPHERY MEASUREMENTS**

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2323	2323	100.0
Right Side	2323	2323	100.0
Total	4646	4646	100.0

Item	Units	Value
A	mm	1430
B	mm	445
C	mm	1695
D	mm	760
E	mm	470
F	mm	515



**AREAS OF PROTECTED ZONE FAILURES**

A. Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.

X	Y
NA	NA
NA	NA
NA	NA
NA	NA

B. The inner surface of the windshield was penetrated by the hood support beneath the protected zone.

X	Y
NA	NA
NA	NA
NA	NA
NA	NA

**DATA SHEET NO. 16 - FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS**

Test Vehicle: 2019 Nissan Armada SUV  
Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
Test Date: 11/1/2018

**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA**

Temperature at Time of Impact: 20.9°C

Test Time: 15:35

**Stoddard Solvent Spillage Measurements**

- A From impact until vehicle motion ceases: 0 oz.  
(maximum allowable – 1 oz.)
- B For the 5-minute period after motion ceases: 0 oz.  
(maximum allowable – 5 oz.)
- C For the following 25 minutes: 0 oz.  
(maximum allowable – 1 oz./minutes)
- D Spillage: None

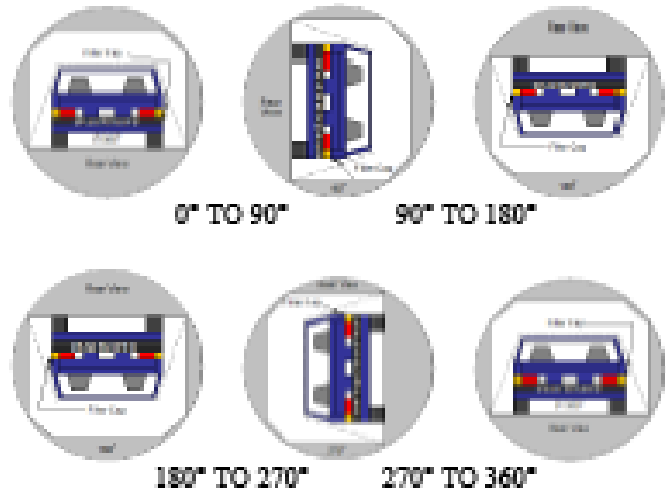
**DATA SHEET NO. 16 - FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS (CONT'D)**

Test Vehicle: 2019 Nissan Armada SUV  
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
 Test Date: 11/1/2018

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage:

None  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**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	1480

**FMVSS 301 SPILLAGE TABLE**

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

**SOLVENT SPILLAGE LOCATION TABLE**

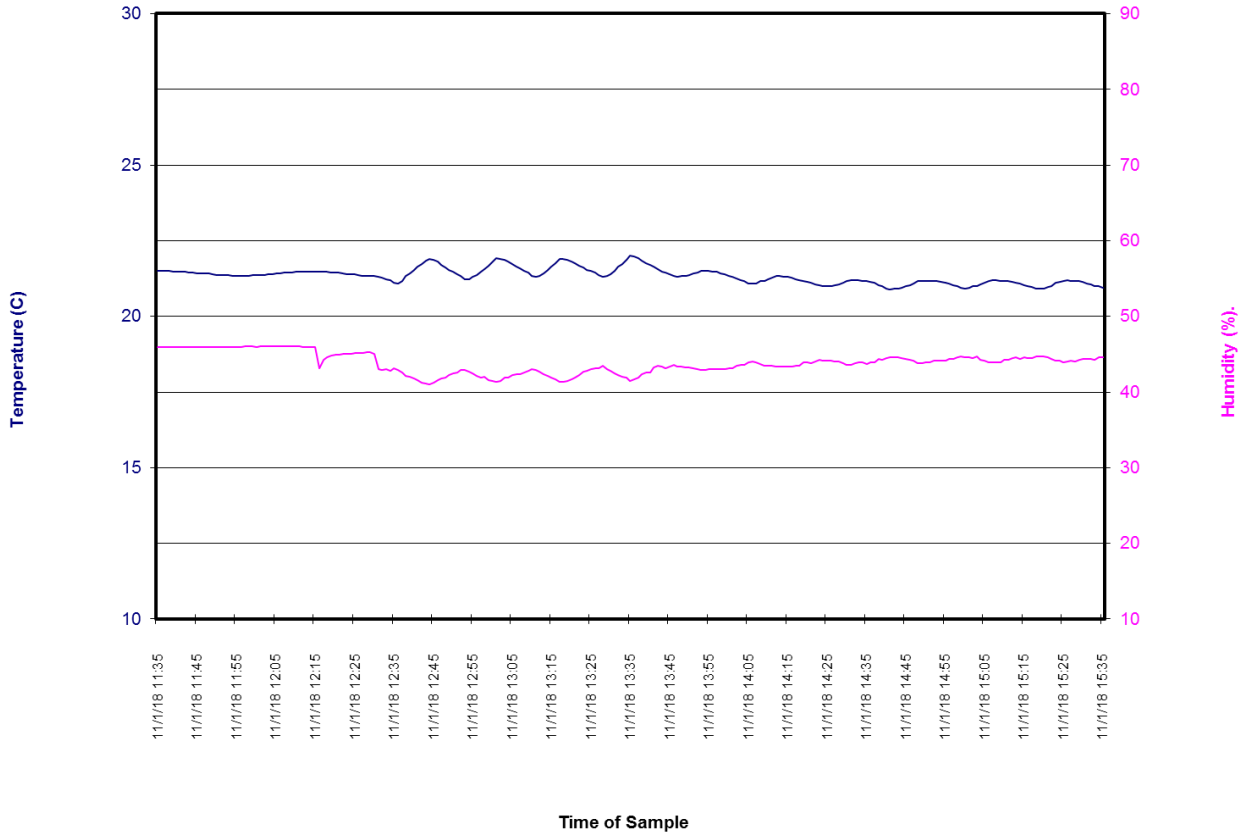
Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

# DATA SHEET NO. 17 - DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2019 Nissan Armada SUV  
Test Program: NCAP Frontal Impact

NHTSA No.: M20195203  
Test Date: 11/1/2018

Frontal NCAP 181101 Test Time 15:35



**APPENDIX A**  
**PHOTOGRAPHS**

## TABLE OF PHOTOGRAPHS

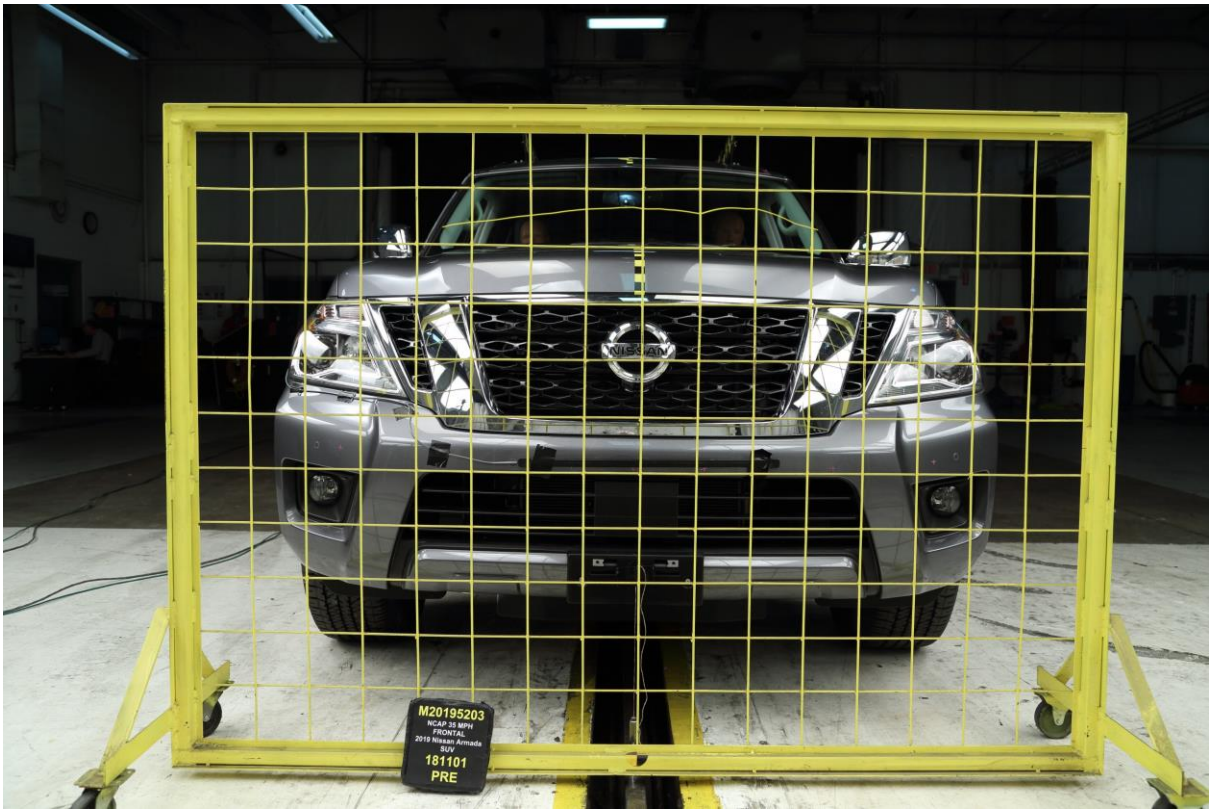
No.	Description	Page
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4	Manufacturer's Label	A-6
5	Tire Placard	A-7
6	2019 Nissan Armada SUV Frontal As Delivered	A-8
7	Right Rear 3-4 View, as Received	A-8
8	Pre-Test Front View of Test Vehicle	A-9
9	Post-Test Front View of Test Vehicle	A-9
10	Pre-Test Left View of Test Vehicle	A-10
11	Post-Test Left View of Test Vehicle	A-10
12	Pre-Test Right View of Test Vehicle	A-11
13	Post-Test Right View of Test Vehicle	A-11
14	Pre-Test Right Front 3-4 View	A-12
15	Post-Test Right Front 3-4 View	A-12
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23	Post-Test Fuel Filler Cap View	A-16
24	Pre-Test Front Underbody View	A-17
25	Post-Test Front Underbody View	A-17
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25b	Post-Test Mid Underbody View	A-18
26	Pre-Test Rear Underbody View	A-19
27	Post-Test Rear Underbody View	A-19
28	Pre-Test Dummy Cable Routing	A-20
29	Post-Test Dummy Cable Routing	A-20
30	Pre-Test Driver Dummy Front View	A-21
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34	Pre-Test Driver Dummy and Vehicle Interior View	A-23
35	Post-Test Driver Dummy and Vehicle Interior View	A-23

## TABLE OF PHOTOGRAPHS (CONTINUED)

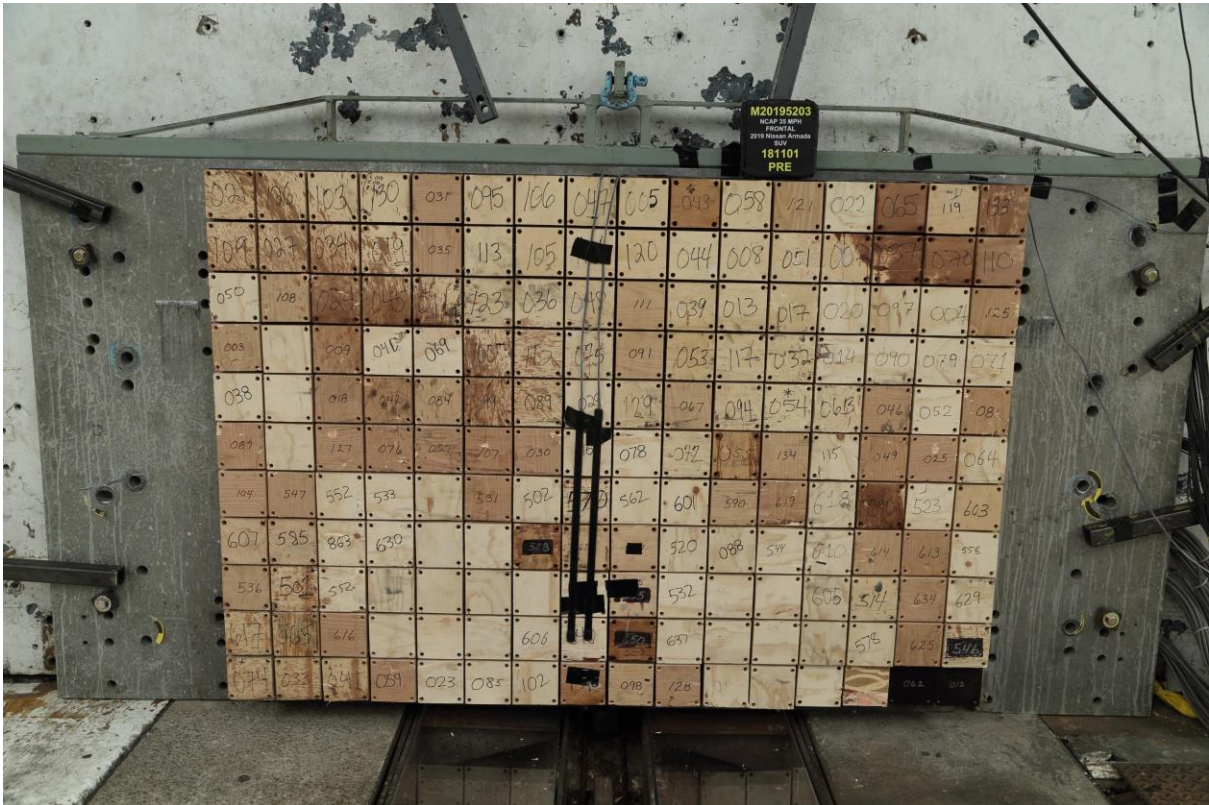
<b>No.</b>	<b>Description</b>	<b>Page</b>
36	Pre-Test Driver's Seat Fore-Aft Markings	A-24
37	Post-Test Driver's Seat Fore-Aft Markings	A-24
38	Pre-Test View of Belt Anchorage for Driver Dummy	A-25
39	Post-Test View of Belt Anchorage for Driver Dummy	A-25
40	Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy	A-26
41	Post-Test View of Belt Buckle and Latch Plate for Driver Dummy	A-26
42	Pre-Test Driver Dummy Feet	A-27
43	Post-Test Driver Dummy Feet	A-27
44	Pre-Test Driver's Side Knee Bolster	A-28
45	Post-Test Driver's Side Knee Bolster	A-28
46	Pre-Test Driver's Side Floorpan	A-29
47	Post-Test Driver's Side Floorpan	A-29
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49	Post-Test Driver Dummy Contact with Airbag	A-30
50	Post-Test Driver Dummy Contact with Headrest	A-31
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52	Post-Test View of the Steering Wheel	A-32
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54	Post-Test Passenger Dummy Front View	A-33
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67	Pre-Test Passenger Side Knee Bolster	A-40
68	Post-Test Passenger Side Knee Bolster	A-40

**TABLE OF PHOTOGRAPHS (CONTINUED)**

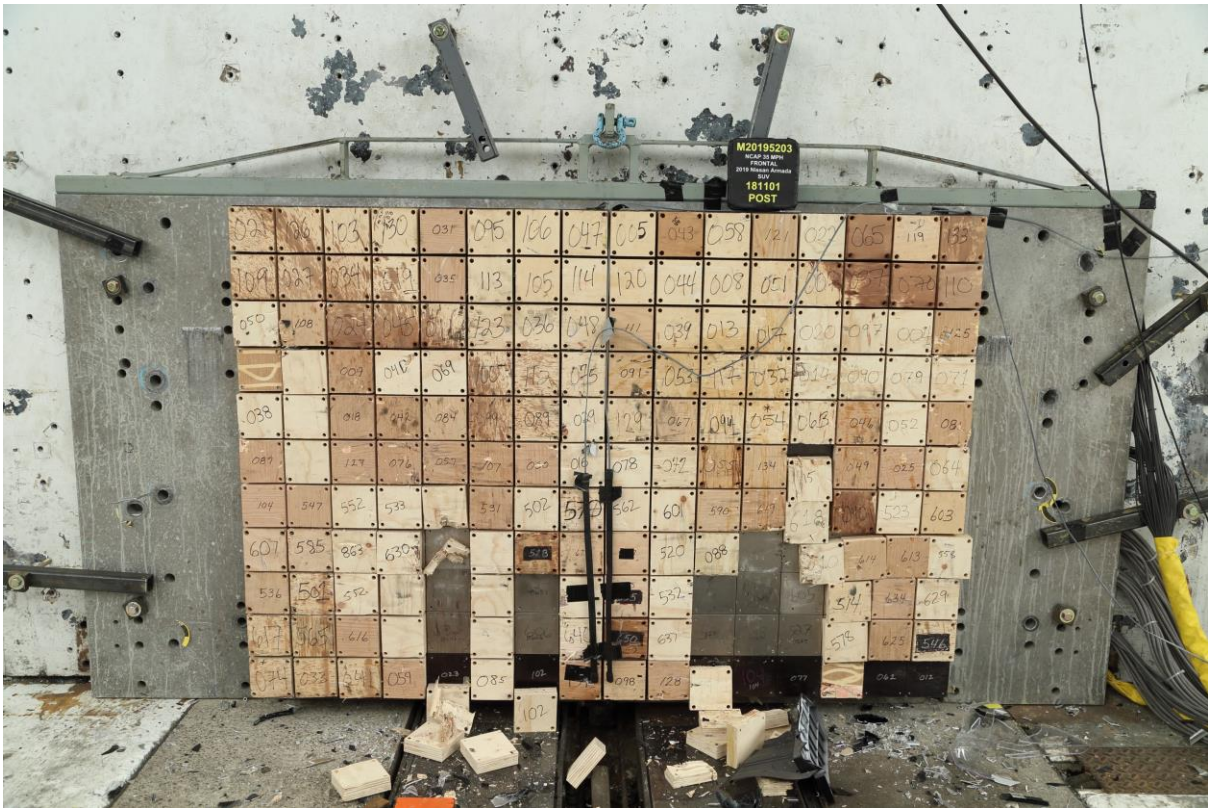
<b>No.</b>	<b>Description</b>	<b>Page</b>
<b>69</b>	Pre-Test Passenger Side Floorpan	<b>A-41</b>
<b>70</b>	Post-Test Passenger Side Floorpan	<b>A-41</b>
<b>71</b>	Post-Test Passenger Dummy Face	<b>A-42</b>
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<b>76</b>	Post-Test Speed Trap Read-out	<b>A-44</b>
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<b>83</b>	Monroney Label Photograph	<b>A-48</b>



**001 Load Cell Location**



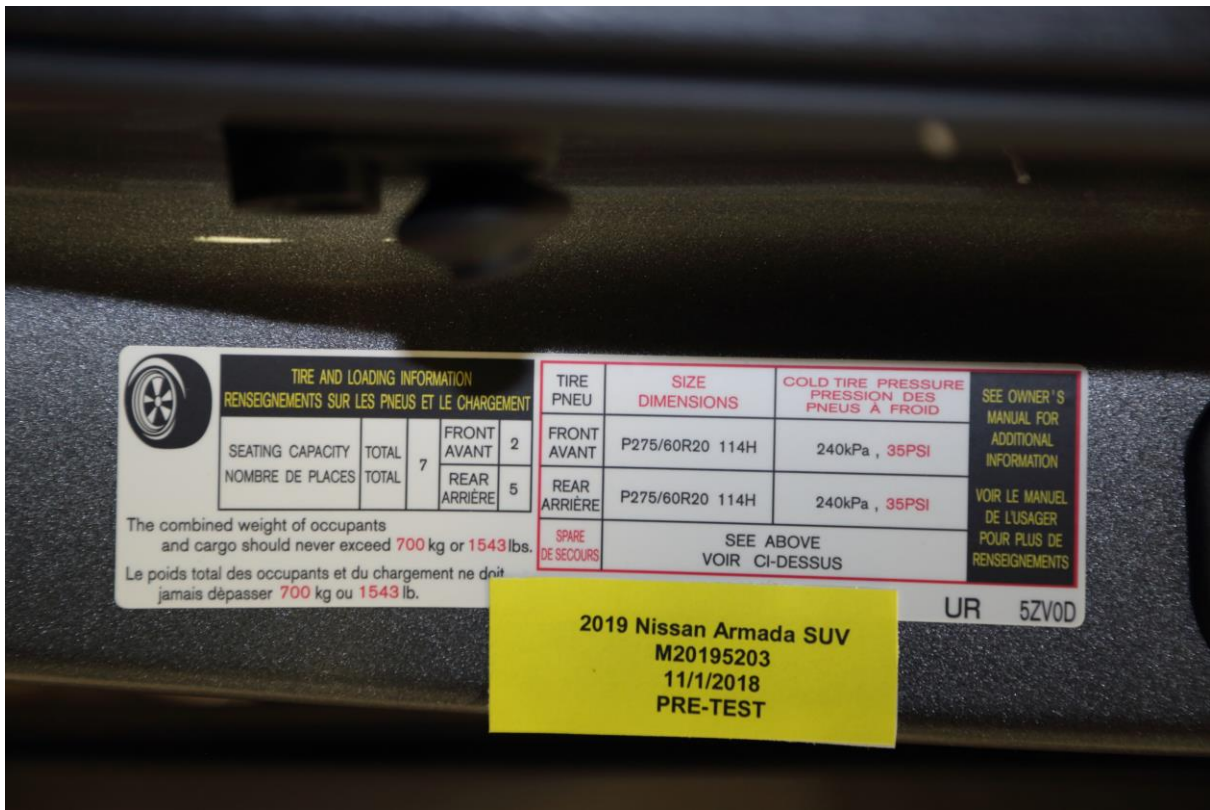
**002 Pre-Test Load Cell Wall**



**003 Post-Test Load Cell Wall**



**004 Manufacturer's Label**



005 Tire Placard



**006 2019 Nissan Armada SUV Frontal As Delivered**



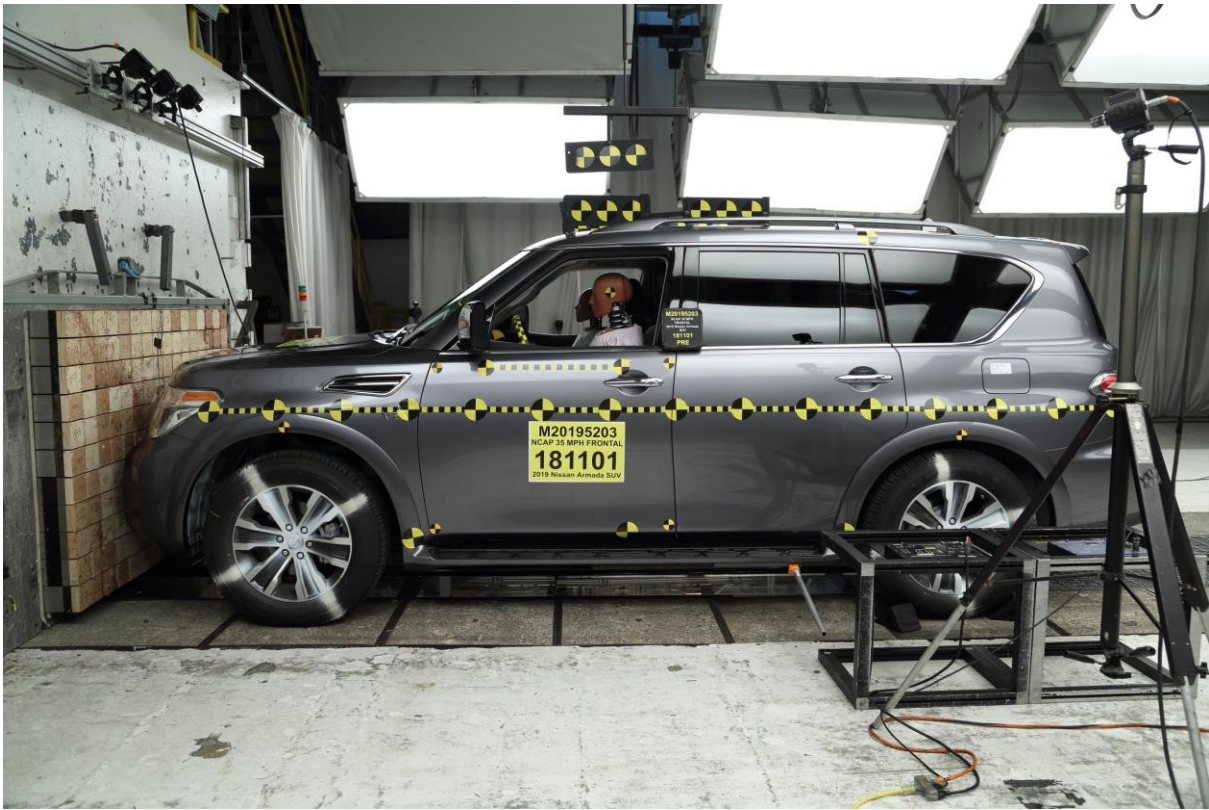
**007 Left Rear 3-4 View, as Received**



**008 Pre-Test Front View of Test Vehicle**



**009 Post-Test Front View of Test Vehicle**



**010 Pre-Test Left View of Test Vehicle**



**011 Post-Test Left View of Test Vehicle**



**012 Pre-Test Right View of Test Vehicle**



**013 Post-Test Right View of Test Vehicle**



**014 Pre-Test Right Front 3-4 View**



**015 Post-Test Right Front 3-4 View**



**016 Pre-Test Left Rear 3-4 View**



**017 Post-Test Left Rear 3-4 View**



018 Pre-Test Windshield View



019 Post-Test Windshield View



**020 Pre-Test Engine Compartment View**



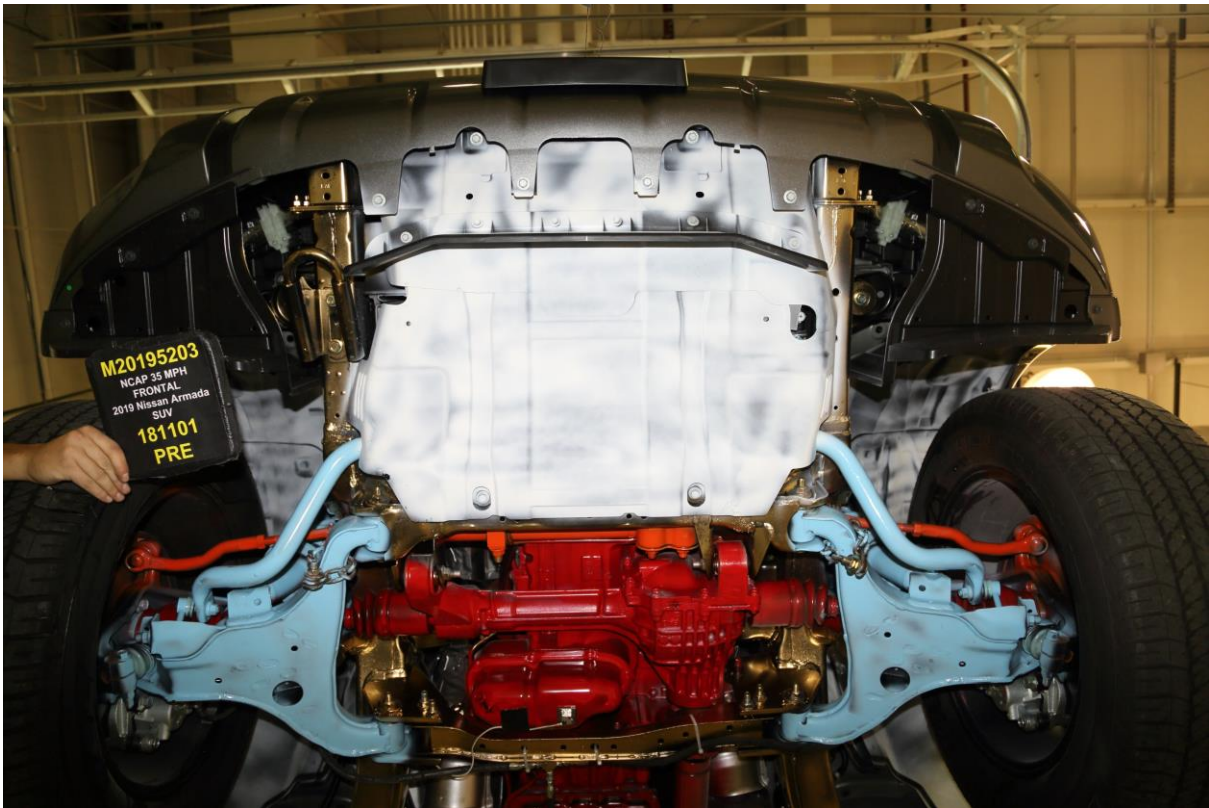
**021 Post-Test Engine Compartment View**



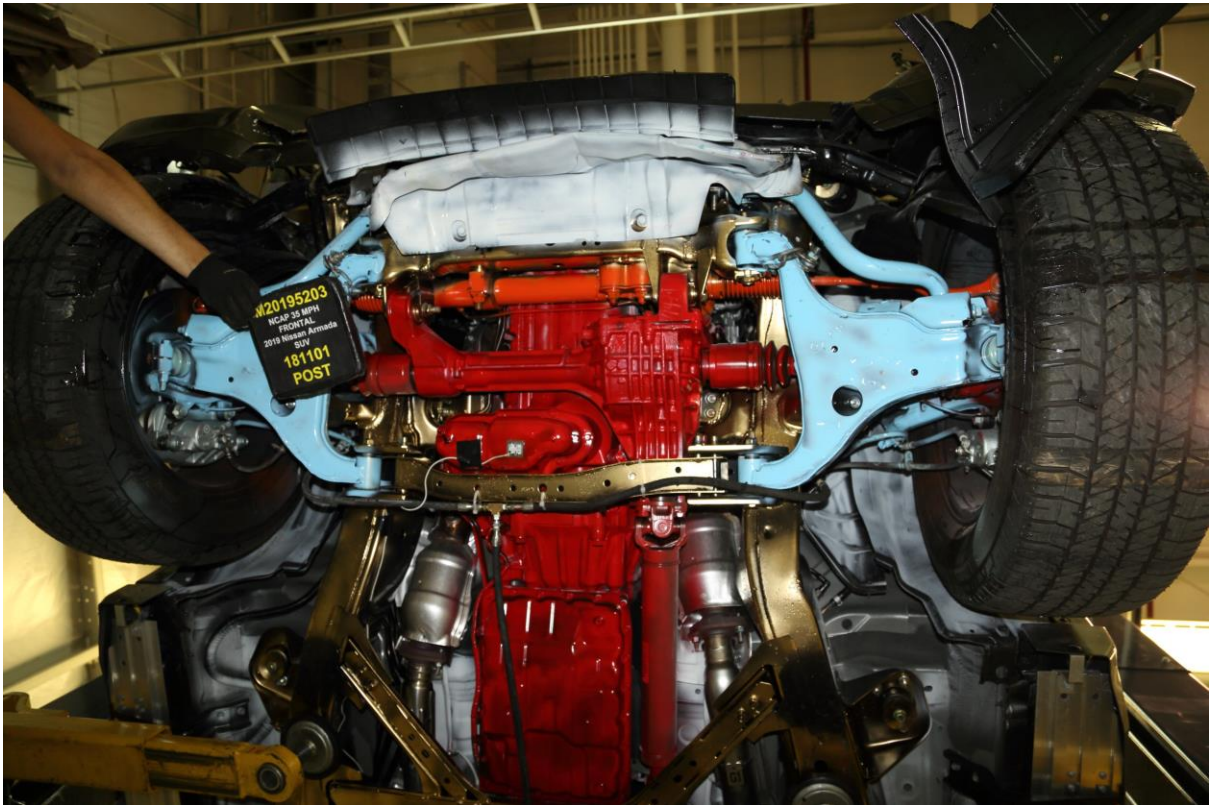
**022 Pre-Test Fuel Filler Cap View**



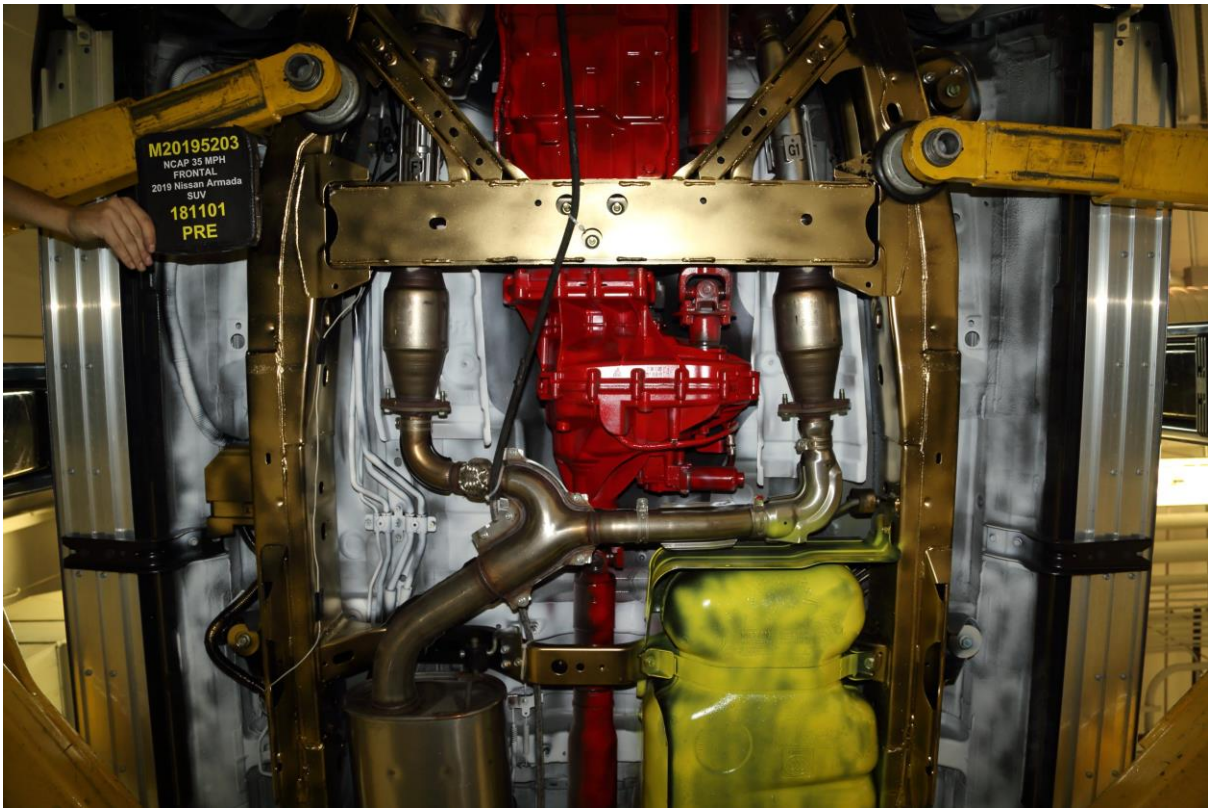
**023 Post-Test Fuel Filler Cap View**



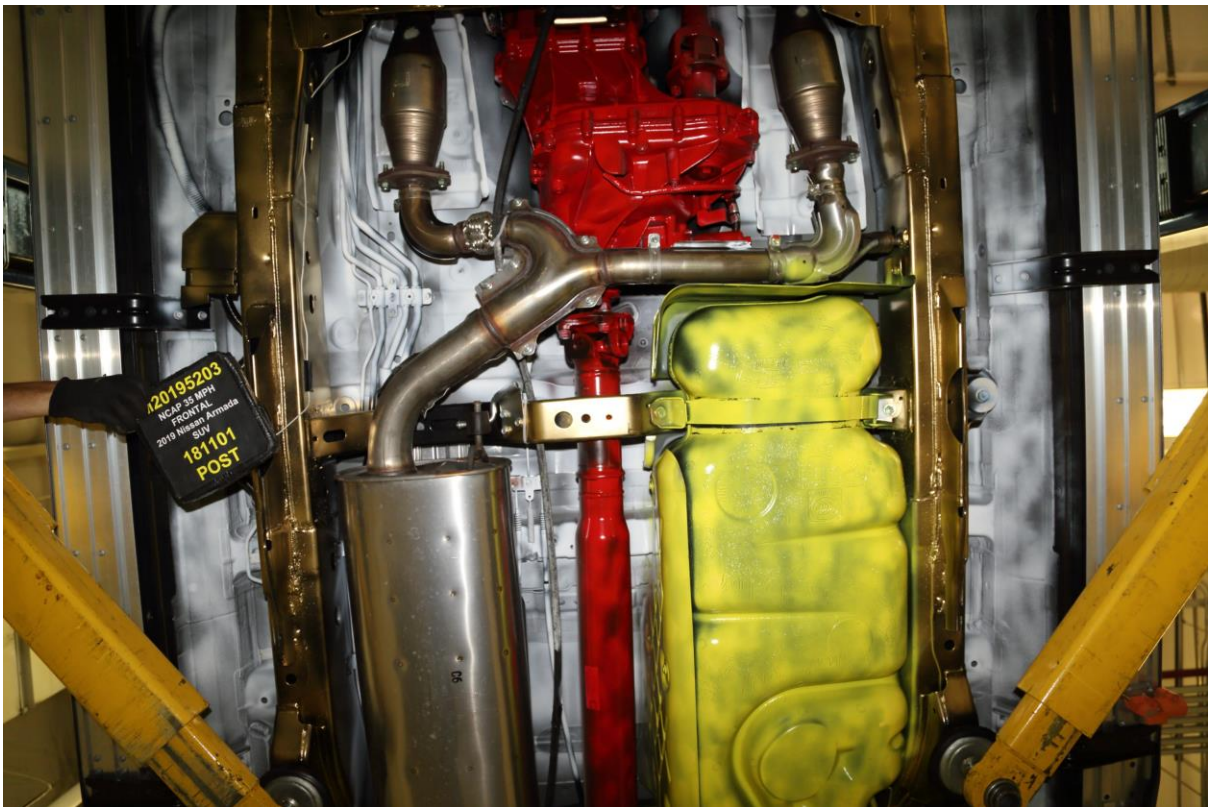
**024 Pre-Test Front Underbody View**



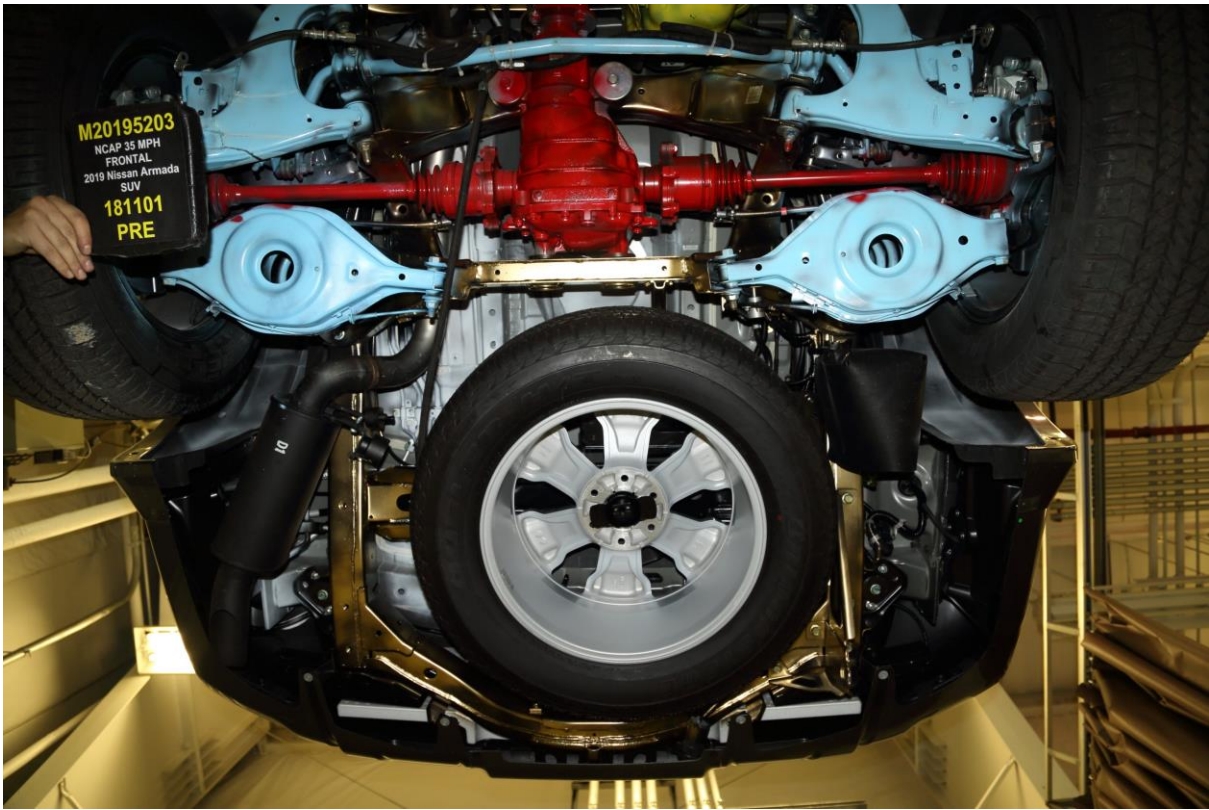
**025 Post-Test Front Underbody View**



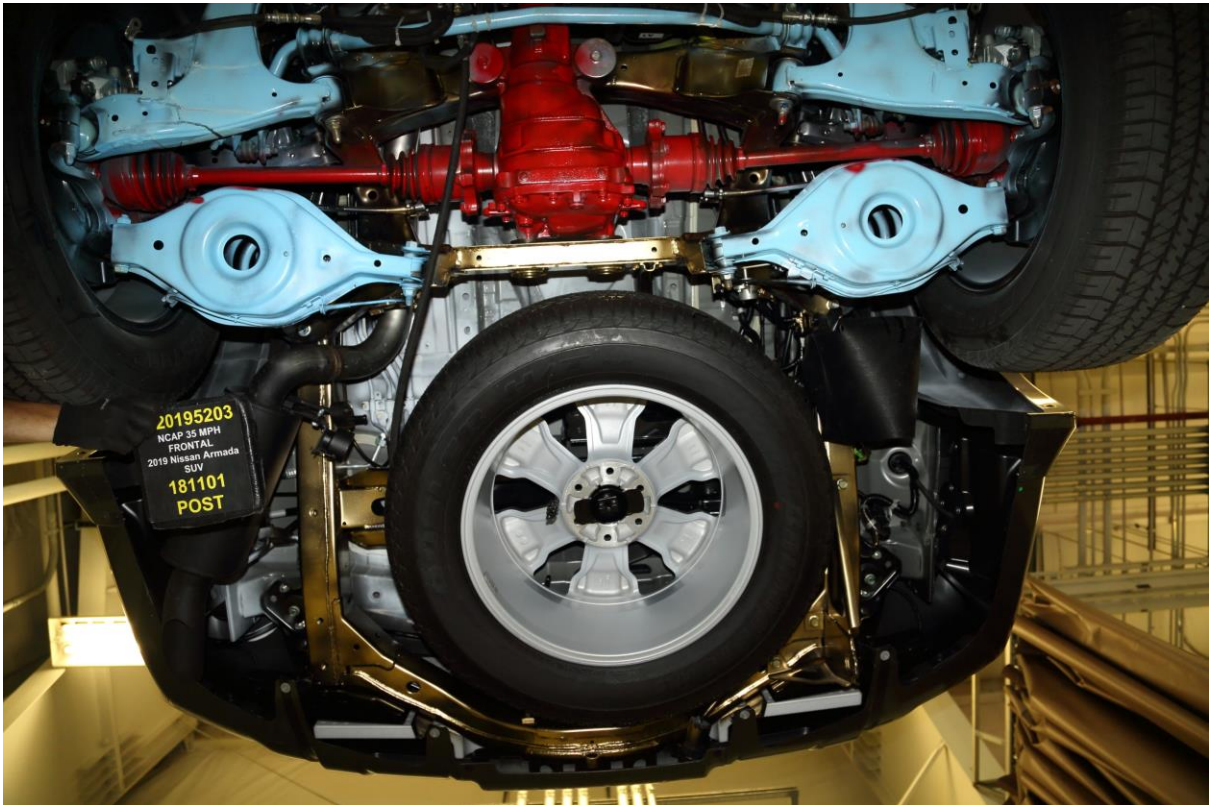
**025a Pre-Test Mid Underbody View**



**025b Post-Test Mid Underbody View**



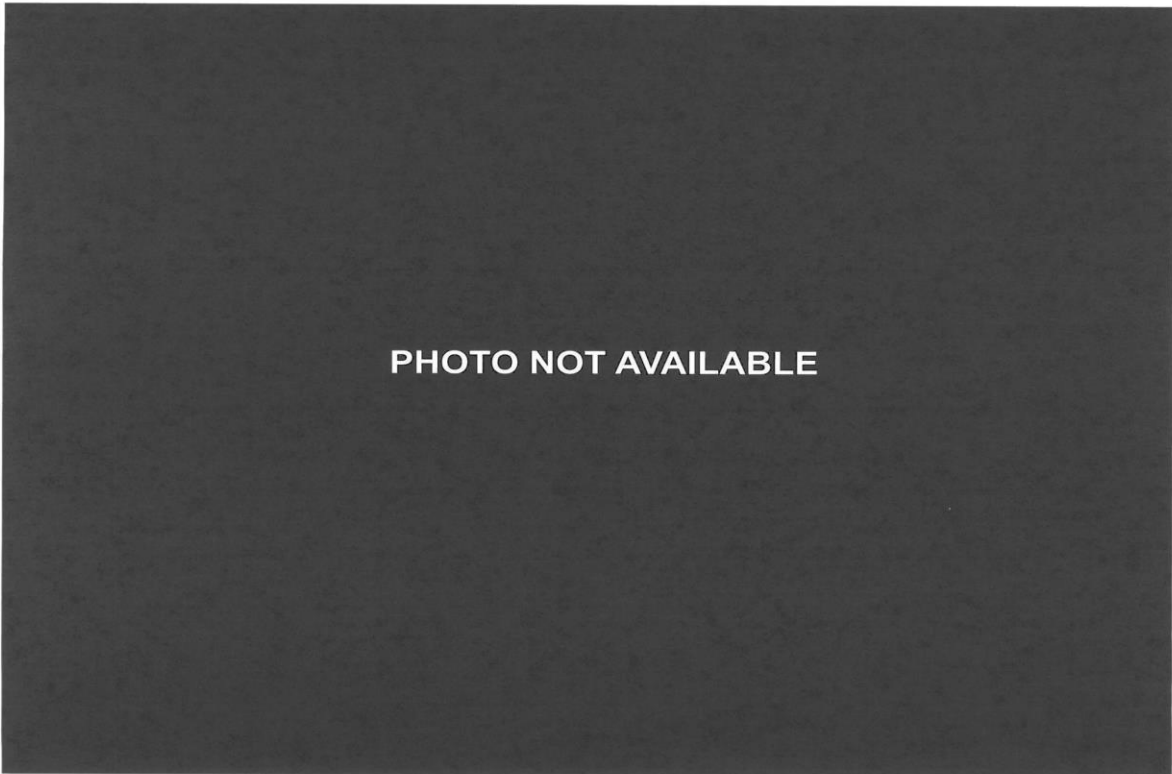
**026 Pre-Test Rear Underbody View**



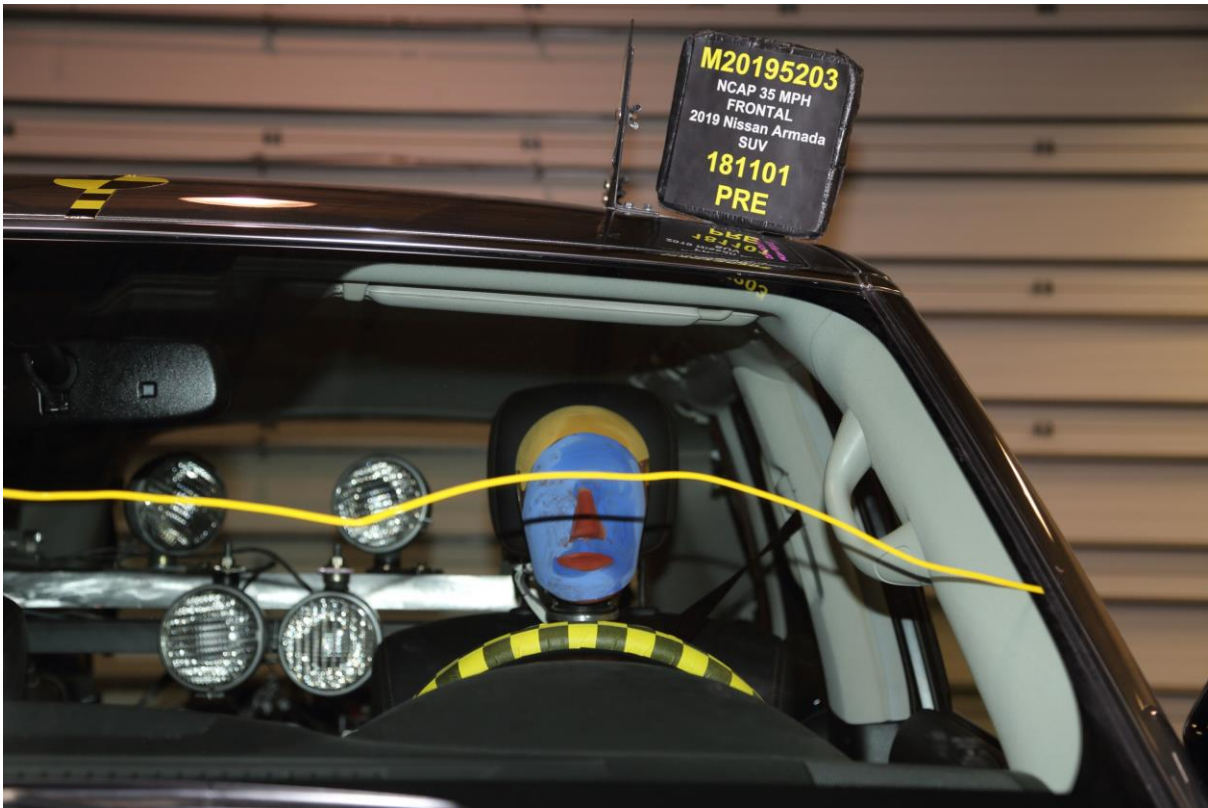
**027 Post-Test Rear Underbody View**



**028 Pre-Test Dummy Cable Routing**



**029 Post-Test Dummy Cable Routing**



**030 Pre-Test Driver Dummy Front View**



**031 Post-Test Driver Dummy Front View**



**032 Pre-Test Driver Dummy Window View**



**033 Post-Test Driver Dummy Window View**



**034 Pre-Test Driver Dummy and Vehicle Interior View**



**035 Post-Test Driver Dummy and Vehicle Interior View**



**036 Pre-Test Driver's Seat Fore-Aft Markings**



**037 Post-Test Driver's Seat Fore-Aft Markings**



**038 Pre-Test View of Belt Anchorage for Driver Dummy**



**039 Post-Test View of Belt Anchorage for Driver Dummy**



**040 Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy**



**041 Post-Test View of Belt Buckle and Latch Plate for Driver Dummy**



**042 Pre-Test Driver Dummy Feet**



**043 Post-Test Driver Dummy Feet**



**044 Pre-Test Driver's Side Knee Bolster**



**045 Post-Test Driver's Side Knee Bolster**



**046 Pre-Test Driver's Side Floorpan**



**047 Post-Test Driver's Side Floorpan**



**048 Post-Test Driver Dummy Face**



**049 Post-Test Driver Dummy Contact with Airbag**



**050 Post-Test Driver Dummy Contact with Headrest**

**Intentionally Left Blank**



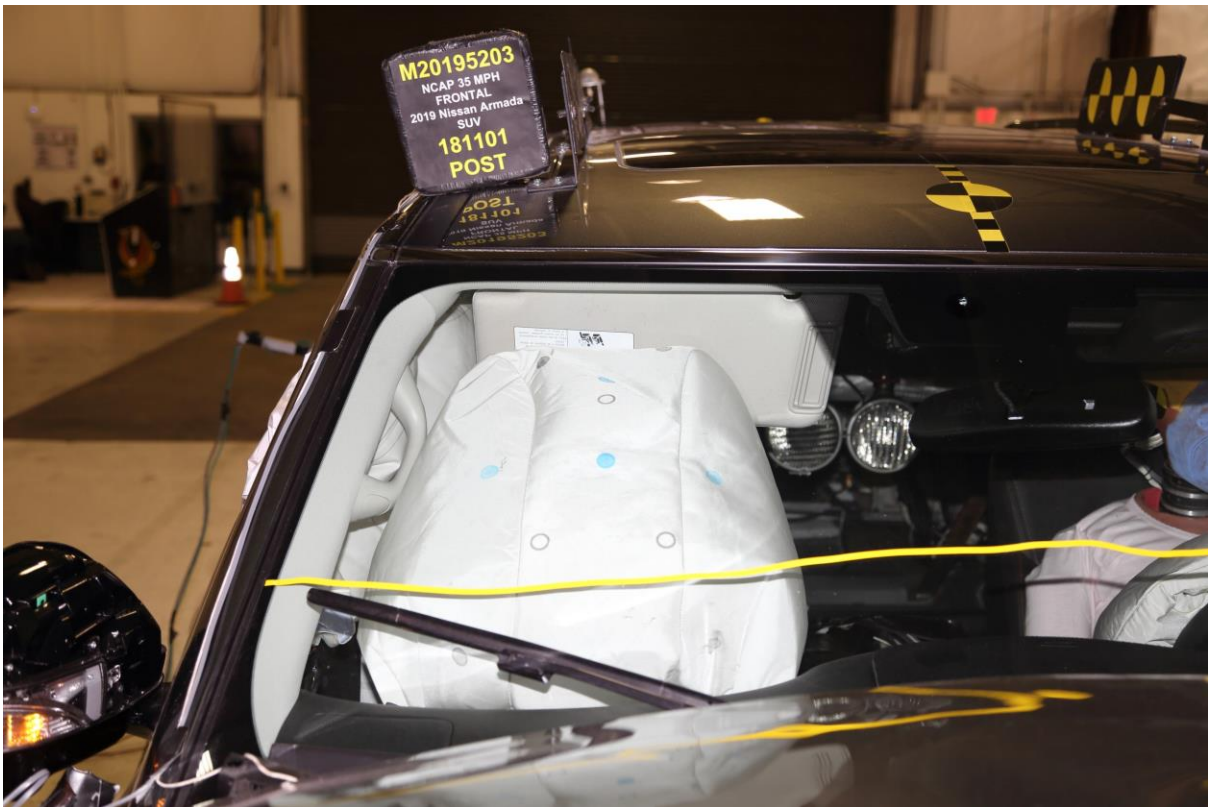
**051 Pre-Test View of the Steering Wheel**



**052 Post-Test View of the Steering Wheel**



**053 Pre-Test Passenger Dummy Front View**



**054 Post-Test Passenger Dummy Front View**



**055 Pre-Test Passenger Dummy Window View**



**056 Post-Test Passenger Dummy Window View**



**057 Pre-Test Passenger Dummy and Vehicle Interior View**



**058 Post-Test Passenger Dummy and Vehicle Interior View**



059 Pre-Test Passenger's Seat Fore-Aft Markings



060 Post-Test Passenger's Seat Fore-Aft Markings



**061 Pre-Test View of Belt Anchorage for Passenger Dummy**



**062 Post-Test View of Belt Anchorage for Passenger Dummy**



**063 Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy**



**064 Post-Test View of Belt Buckle and Latch Plate for Passenger Dummy**



**065 Pre-Test Passenger Dummy Feet**



**066 Post-Test Passenger Dummy Feet**



**067 Pre-Test Passenger's Side Knee Bolster**



**068 Post-Test Passenger's Side Knee Bolster**



**069 Pre-Test Passenger's Side Floorpan**



**070 Post-Test Passenger's Side Floorpan**



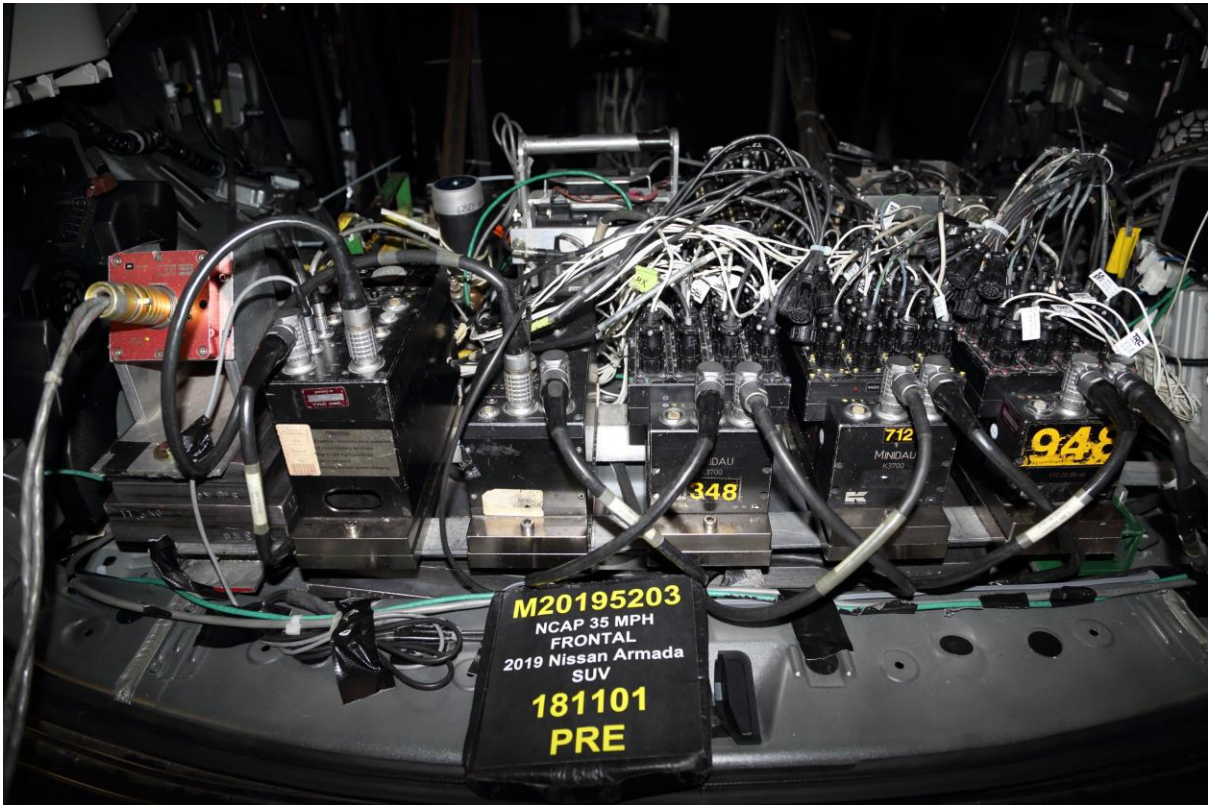
**071 Post-Test Passenger Dummy Face**



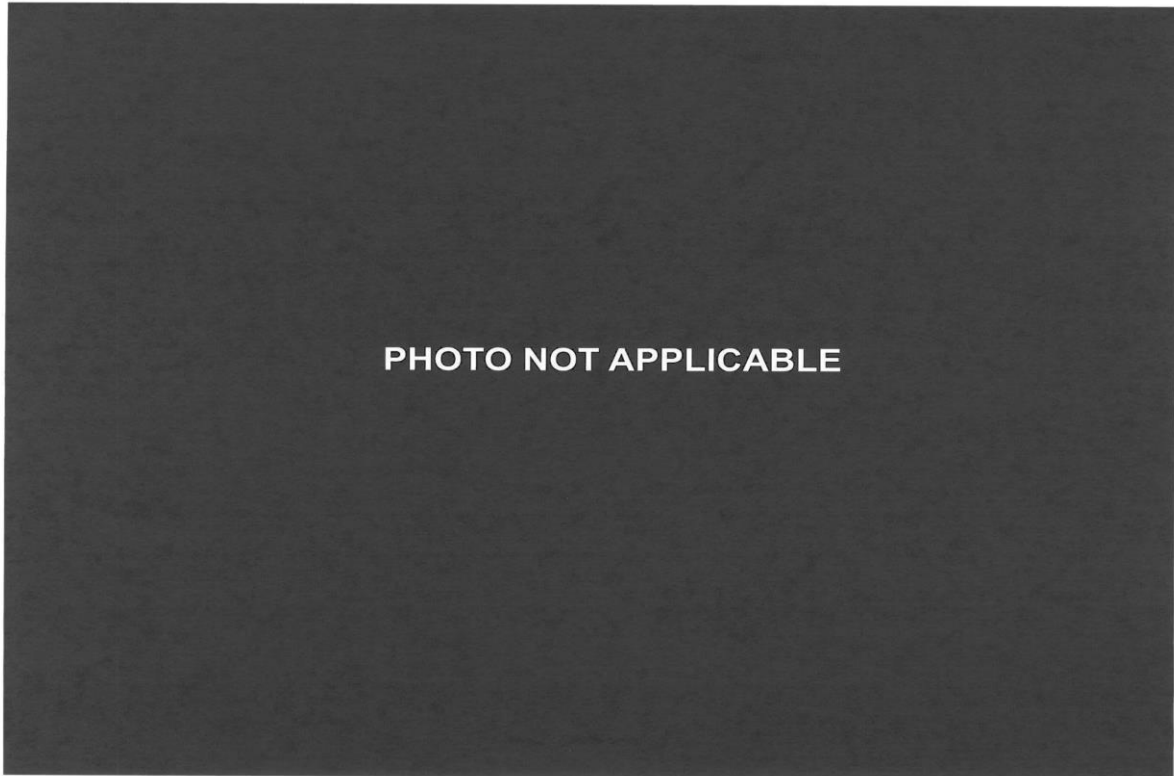
**072 Post-Test Passenger Dummy Contact with Airbag**



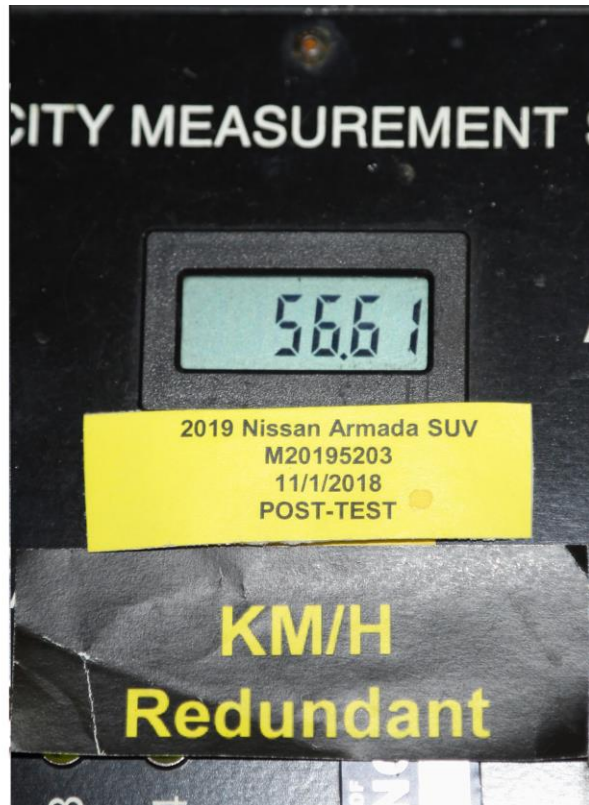
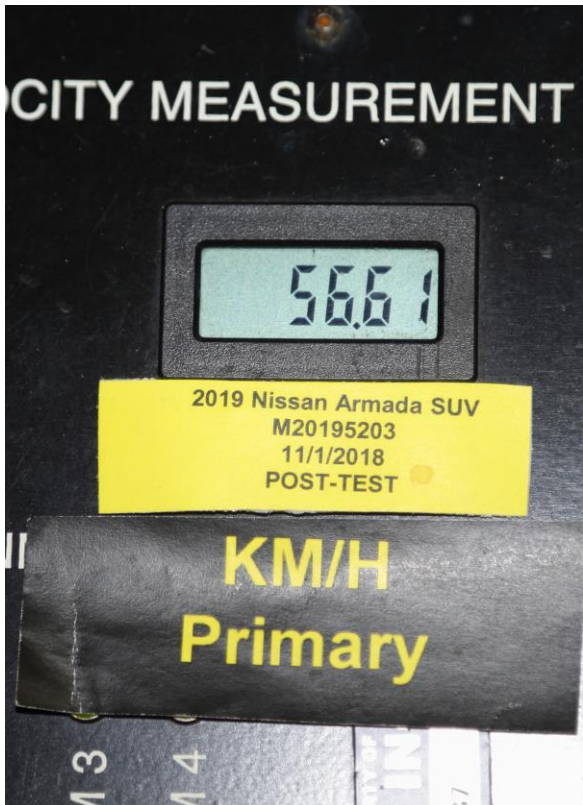
**073 Post-Test Passenger Dummy Contact with Headrest**



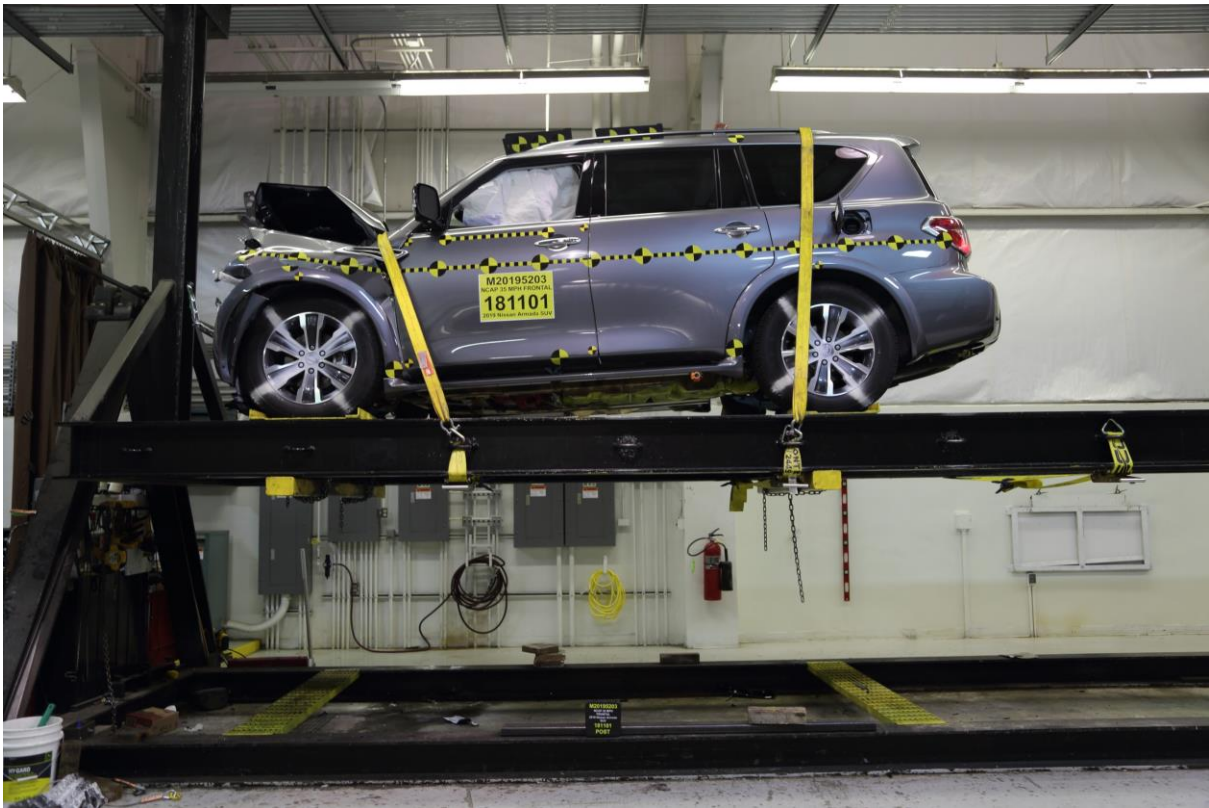
**074 Photograph of Ballast Installed in Vehicle**



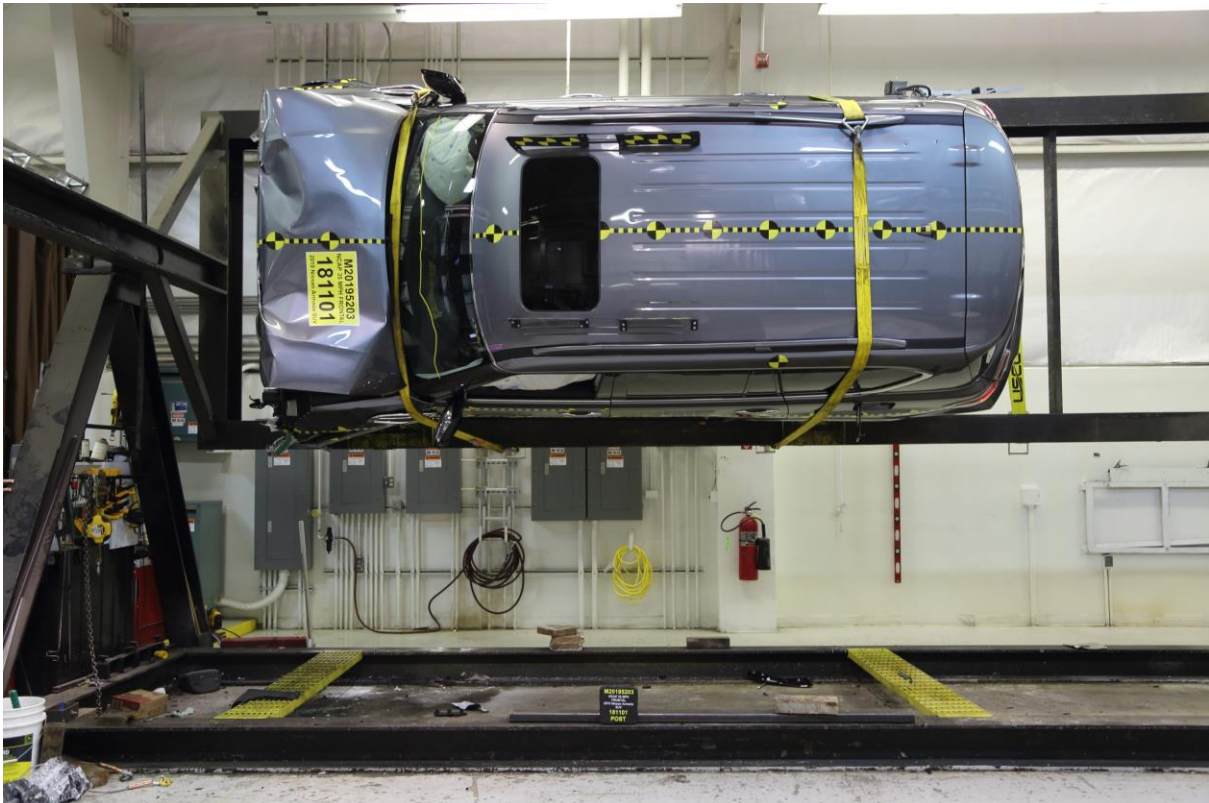
**075 Post-Test Stoddard Spillage Location View**



**076 Post-Test Speed Trap Read out**



**077 Vehicle at 0° on Static Rollover Device**



**078 Vehicle at 90° on Static Rollover Device**



**079 Vehicle at 180° on Static Rollover Device**



**080 Vehicle at 270° on Static Rollover Device**



**081 Vehicle at 360° on Static Rollover Device**



**082 2019 Nissan Armada SUV Frontal Impact Event**



# 2019 NISSAN ARMADA SL 4WD



Scan QR code for general model information & options

### Standard Equipment Included at No Extra Charge

**MECHANICAL & PERFORMANCE**  
5.6-Liter Endurance V8 Engine  
300 Horsepower & 304 lb-ft Torque  
7-speed Automatic Transmission  
Independent Double-Wishbone Suspension  
Front and Rear Ventilated Disc Brakes  
Hill Start Assist  
4WD Selector Switch  
20" Machine Finished Alloy Wheels

**SAFETY & SECURITY**  
Driver & Front Passenger, Side-Impact & Curtain Airbags  
Lower Anchor & Tethers for Children (LATCH)  
Vehicle Dynamic Control (VDC) with Traction Control System (TCS)  
4-Wheel Anti-Lock Braking System (ABS)  
Electronic Brake Force Distribution (EBD)  
Tire Pressure Monitoring System (TPMS)  
Vehicle Security System (VSS)  
Nissan Anti-Theft System (NATS)  
Intelligent Around View Monitor (i-AVM)  
Rear Door Alert  
Intelligent Cruise Control (ICC)  
Automatic Emergency Braking (AEB)  
Intelligent Forward Collision Warning (IFCW)

**COMFORT & CONVENIENCE**  
Leather Appointed Seats  
10-Way Power Driver Seat with Memory including 2-Way Power Lumbar Support  
8-Way Power Front Passenger Seat including 2-Way Power Lumbar Support  
Heated Driver and Front Passenger Seats  
Power Folding 60/40 3rd Row Seat  
Intelligent Key with Memory  
Remote Engine Start  
13-Speaker Bose® Premium Audio System with AM/FM/SXM/CD/MP3 Aux  
4 USB Ports  
(2) Charge Only  
(2) Charge with iPod® Connectivity

**COMFORT & CONVENIENCE (cont'd)**  
Nissan Navigation System+  
8" Color Display with Multi-Touch Control  
Bluetooth® Hands-free Phone System+  
Hands-free Text Messaging Assistant+  
HD Radio® Technology  
SiriusXM® Radio+  
SiriusXM Traffic and Travel Link+ (with 3 year complimentary access)  
NissanConnect® Services  
Powered by SiriusXM®  
(3 year complimentary trial access to NissanConnect Services Select package)  
(8 month complimentary trial access to NissanConnect Services Premium Plus package)  
Dual Zone Automatic A/C with Microfilter  
Rear A/C with Rear Controls  
(3) 12-Volt Power Outlets and 120V AC  
Power Windows w/ One Touch Up/Down  
Front and Rear Sunroof System  
Front Rain Sensing Wipers  
Auto-Dimming Rearview Mirror with HomeLink® Universal Transceiver  
Leather Wrapped Steering Wheel  
Leather Wrapped Shift Knob

**EXTERIOR**  
Automatic On/Off Headlights  
Side, Back and Rear Window Privacy Glass  
Chrome Plated Electric Heated Outside Mirrors with Memory & Puddle Lamps  
Dark Painted Roof Rails, Side Step Rails, and Overfenders  
Front Fog Lights  
Power Luggage  
Trailer Brake Controller Proxiw  
Receiver Hitch w/ 7-Pin Wiring Harness

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

**Manufacturer's Suggested Retail Base Price:** \$54,500.00

**Options Included by Manufacturer**

**PREMIUM PACKAGE** 1,480.00  
Power Sliding Moonroof w/ Front Tilt and Rear Slide  
Intelligent Distance Control  
Blind Spot Warning  
Intelligent Back-up Intervention  
**CAPTAIN'S CHAIRS PACKAGE** 450.00  
2nd-Row Captain's Chairs  
2nd-Row Center Console w/ Padded Armrest (Seating Revised From 8 TO 7 Passengers)  
**CARPETED FLOOR MATS (3-ROW)** 315.00  
**CARPETED CARGO MAT - CAPTAIN'S SEAT**

**DESTINATION CHARGES** 1,395.00

**Total\*** \$58,230.00

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

**Fuel Economy**  
15 MPG combined city/hwy  
13 MPG city  
18 MPG highway  
6.7 gallons per 100 miles

STANDARD SUVs range from 11 to 90 MPG. The best vehicle rates 130 MPG.

**You spend \$5,750 more in fuel costs over 5 years compared to the average new vehicle.**

**Annual fuel COST \$2,550**

**Fuel Economy & Greenhouse Gas Rating** (EPA only) Smog Rating (EPA only)

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$7,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.25 per gallon. MPGe is miles per gasoline gallon 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.

<b>Frontal Crash</b>	<b>Driver Passenger</b>	<b>Not Rated</b>
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
<b>Side Crash</b>	<b>Front seat</b>	★★★★★
	<b>Rear seat</b>	★★★★★
Based on the risk of injury in a side impact.		
<b>Rollover</b>		★★★
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 1-888-327-4235

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

**DELIVERY**  
VEHICLE COLORS:  
EXT: GUN METALLIC  
INT: CHARCOAL  
FINAL ASSEMBLY POINT:  
LOS ANGELES  
TRANSPORT METHOD:  
TRUCK  
DEALER:  
BOMMARTO NIS HAZELWOOD  
675 DUNN ROAD  
HAZELWOOD MO  
63042

VIN: JN8AY2NCKX560081  
EMS: 50 STATE EMISSIONS  
MDL: 26419-560081 KAD-G  
OPT: C-P01X0L93C03

201809020445R1954

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

## 083 Monroney Label Photograph

**APPENDIX B**  
**VEHICLE AND DUMMY RESPONSE DATA PLOTS**

## TABLE OF DATA PLOTS

<b>No.</b>	<b>List of Data Plots Provided in the Test Report</b>	<b>Page</b>
1	Driver Head X Acceleration vs. Time Primary	B-5
2	Driver Head Y Acceleration vs. Time Primary	B-5
3	Driver Head Z Acceleration vs. Time Primary	B-5
4	Driver Head Resultant Acceleration vs. Time Primary	B-5
5	Driver Chest X Deflection vs. Time	B-6
6	Driver Chest X Acceleration vs. Time Primary	B-7
7	Driver Chest Y Acceleration vs. Time Primary	B-7
8	Driver Chest Z Acceleration vs. Time Primary	B-7
9	Driver Chest Resultant Acceleration vs. Time Primary	B-7
10	Driver Upper Neck Force X vs. Time	B-8
11	Driver Upper Neck Force Z vs. Time	B-8
12	Driver Upper Neck Moment Y vs. Time	B-8
13	Driver Nij vs. Time	B-9
14	Driver Left Femur Force vs. Time	B-10
15	Driver Right Femur Force vs. Time	B-10
16	Passenger Head X Acceleration vs. Time Primary	B-11
17	Passenger Head Y Acceleration vs. Time Primary	B-11
18	Passenger Head Z Acceleration vs. Time Primary	B-11
19	Passenger Head Resultant Acceleration vs. Time Primary	B-11
20	Passenger Chest X Deflection vs. Time	B-12
21	Passenger Chest X Acceleration vs. Time Primary	B-13
22	Passenger Chest Y Acceleration vs. Time Primary	B-13
23	Passenger Chest Z Acceleration vs. Time Primary	B-13
24	Passenger Chest Resultant Acceleration vs. Time Primary	B-13
25	Passenger Upper Neck Force X vs. Time	B-14
26	Passenger Upper Neck Force Z vs. Time	B-14
27	Passenger Upper Neck Moment Y vs. Time	B-14
28	Passenger Nij vs. Time	B-15
29	Passenger Left Femur Force vs. Time	B-16
30	Passenger Right Femur Force vs. Time	B-16

The following additional dummy and vehicle response data can be found in the R & D section of the NHTSA website at: [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov).

Driver Head Acceleration X Redundant  
Driver Head Acceleration Y Redundant  
Driver Head Acceleration Z Redundant  
Driver Upper Neck Force Y  
Driver Upper Neck Moment X  
Driver Upper Neck Moment Z  
Driver Chest X Acceleration Redundant  
Driver Chest Y Acceleration Redundant  
Driver Chest Z Acceleration Redundant  
Driver Pelvis X  
Driver Pelvis Y  
Driver Pelvis Z  
Driver Pelvis Resultant  
Driver Left Femur Redundant  
Driver Right Femur Redundant  
Driver Left Upper Tibia Moment X  
Driver Left Upper Tibia Moment Y  
Driver Left Upper Tibia Force Z  
Driver Left Lower Tibia Moment X  
Driver Left Lower Tibia Moment Y  
Driver Left Lower Tibia Force Z  
Driver Right Upper Tibia Moment X  
Driver Right Upper Tibia Moment Y  
Driver Right Upper Tibia Force Z  
Driver Right Lower Tibia Moment X  
Driver Right Lower Tibia Moment Y  
Driver Right Lower Tibia Force Z  
Driver Left Foot Fore Z  
Driver Left Foot Aft X  
Driver Left Foot Aft Z  
Driver Right Foot Fore Z  
Driver Right Foot Aft X  
Driver Right Foot Aft Z  
Driver Shoulder Belt Force  
Driver Lap Belt Force

Driver Head Angular Velocity X  
Driver Head Angular Velocity Y  
Driver Head Angular Velocity Z  
Passenger Head Acceleration X Redundant  
Passenger Head Acceleration Y Redundant  
Passenger Head Acceleration Z Redundant  
Passenger Upper Neck Force Y  
Passenger Upper Neck Moment X  
Passenger Upper Neck Moment Z  
Passenger Chest X Acceleration Redundant  
Passenger Chest Y Acceleration Redundant  
Passenger Chest Z Acceleration Redundant  
Passenger Pelvis X  
Passenger Pelvis Y  
Passenger Pelvis Z  
Passenger Pelvis Resultant  
Passenger Left Femur Redundant  
Passenger Right Femur Redundant  
Passenger Left Upper Tibia Moment X  
Passenger Left Upper Tibia Moment Y  
Passenger Left Upper Tibia Force Z  
Passenger Left Lower Tibia Moment X  
Passenger Left Lower Tibia Moment Y  
Passenger Left Lower Tibia Force Z  
Passenger Right Upper Tibia Moment X  
Passenger Right Upper Tibia Moment Y  
Passenger Right Upper Tibia Force Z  
Passenger Right Lower Tibia Moment X  
Passenger Right Lower Tibia Moment Y  
Passenger Right Lower Tibia Force Z  
Passenger Left Foot Fore Z  
Passenger Left Foot Aft X  
Passenger Left Foot Aft Z  
Passenger Right Foot Fore Z  
Passenger Right Foot Aft X  
Passenger Right Foot Aft Z  
Passenger Shoulder Belt Force  
Passenger Lap Belt Force

Passenger Head Angular Velocity X  
Passenger Head Angular Velocity Y  
Passenger Head Angular Velocity Z  
Left Rear Seat Crossmember X  
Left Rear Seat Crossmember Z  
Right Rear Seat Crossmember X  
Right Rear Seat Crossmember Z  
Left Rear Seat Crossmember X Redundant  
Right Rear Seat Crossmember X Redundant  
Vehicle Engine Top X  
Vehicle Engine Bottom X  
Load Cell Barrier Forces and Moments

# NHTSA

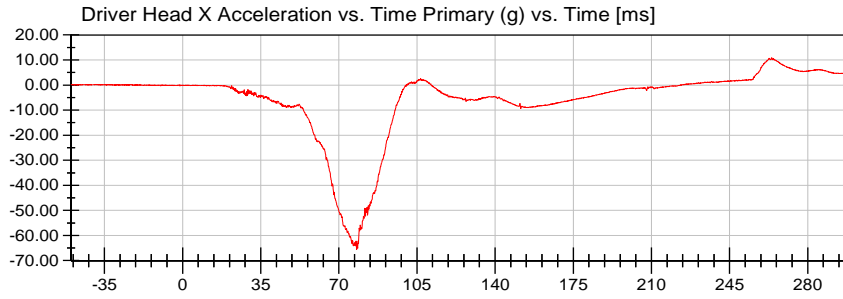
Test Lab: CTF

Test Number: 181101 (M20195203)

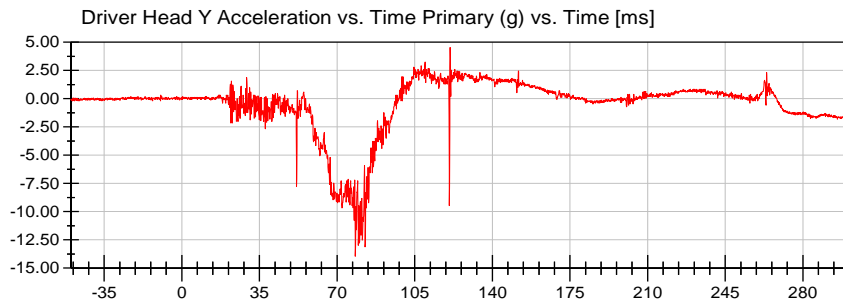
Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

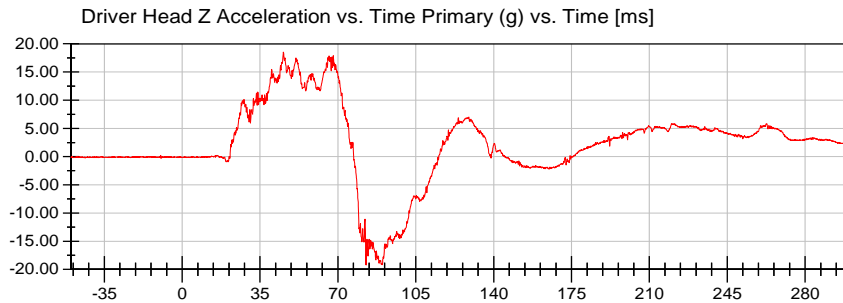
Position #2 Hybrid III Small Adult Female (426)



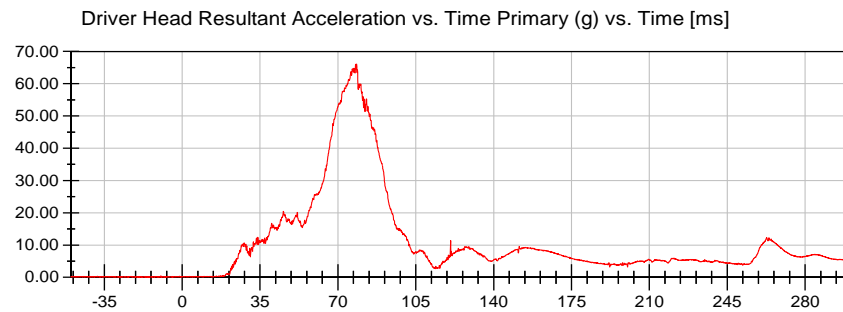
<Max>  
10.94 g at 263.84 ms  
<Min>  
-65.59 g at 77.92 ms  
CFC\_1000



<Max>  
4.55 g at 120.96 ms  
<Min>  
-13.96 g at 78.24 ms  
CFC\_1000



<Max>  
18.56 g at 45.44 ms  
<Min>  
-19.21 g at 82.64 ms  
CFC\_1000



<Max>  
66.11 g at 78.40 ms  
<Min>  
0.01 g at -28.32 ms  
CFC\_1000



# NHTSA

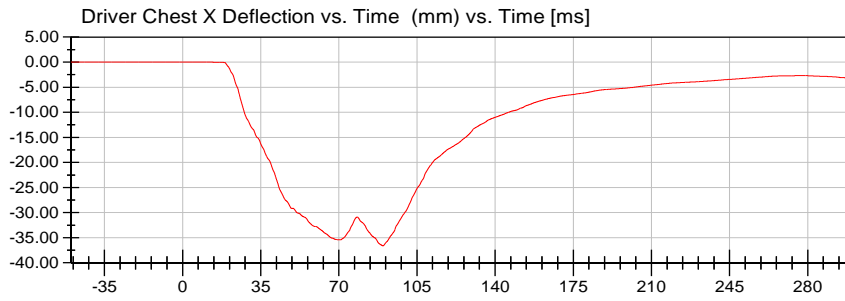
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



**<Max>**

0.01 mm at -13.76 ms

**<Min>**

-36.61 mm at 89.76 ms

CFC\_600



# NHTSA

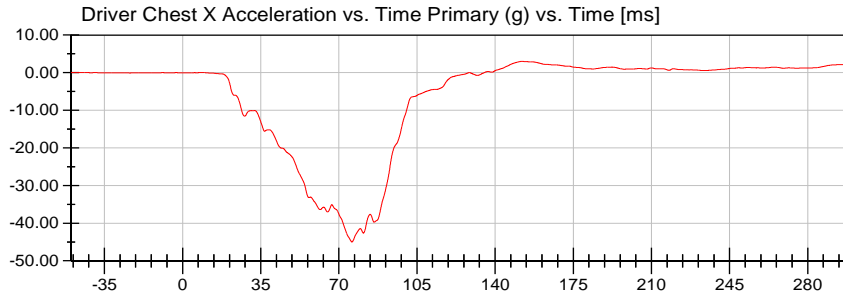
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



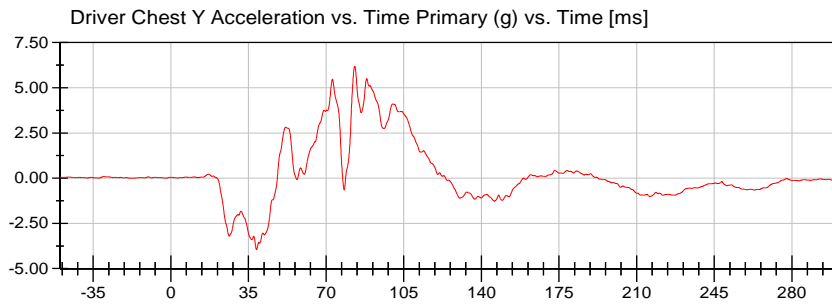
**<Max>**

2.99 g at 151.76 ms

**<Min>**

-45.01 g at 75.92 ms

CFC\_180



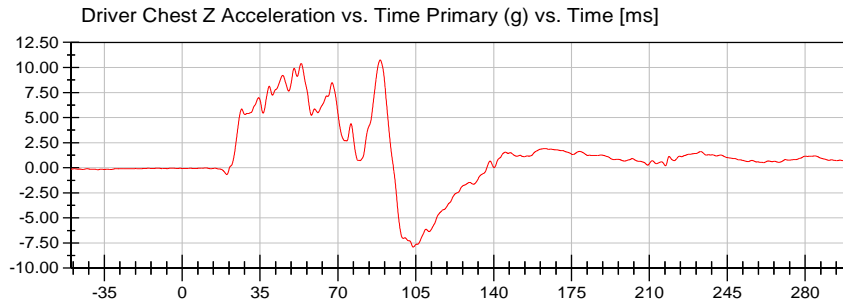
**<Max>**

6.19 g at 82.96 ms

**<Min>**

-3.96 g at 38.64 ms

CFC\_180



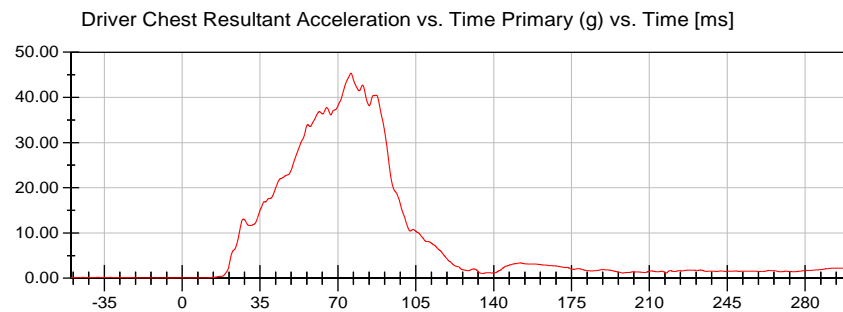
**<Max>**

10.74 g at 88.96 ms

**<Min>**

-7.90 g at 103.84 ms

CFC\_180



**<Max>**

45.35 g at 75.84 ms

**<Min>**

0.05 g at -11.44 ms

CFC\_180



# NHTSA

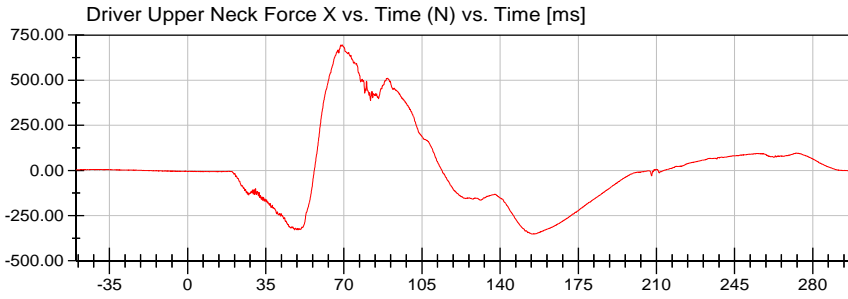
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



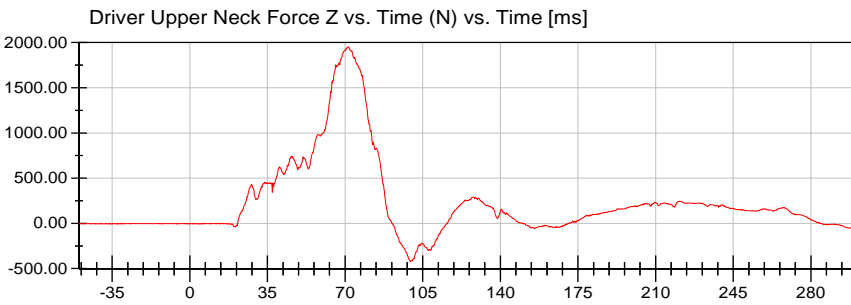
**<Max>**

695.38 N at 69.28 ms

**<Min>**

-352.02 N at 154.32 ms

CFC\_1000



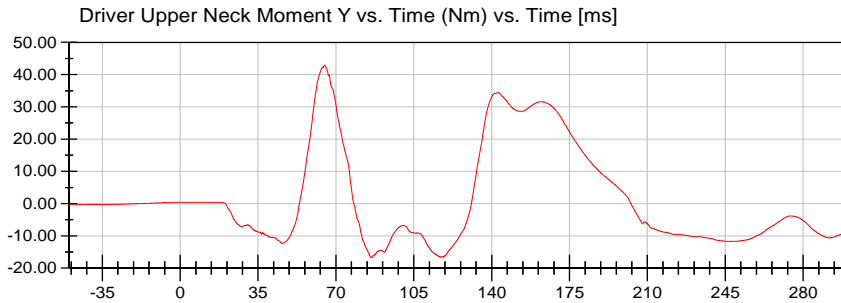
**<Max>**

1,953.56 N at 71.52 ms

**<Min>**

-423.63 N at 99.44 ms

CFC\_1000



**<Max>**

42.95 Nm at 64.80 ms

**<Min>**

-16.75 Nm at 85.84 ms

CFC\_600





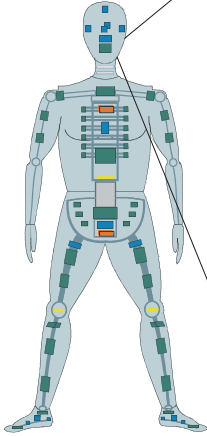
# 2019 Nissan Armada SUV NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 11/01/2018  
Time: 15:35

**Customer: NHTSA**  
**Test Number: M20195203**

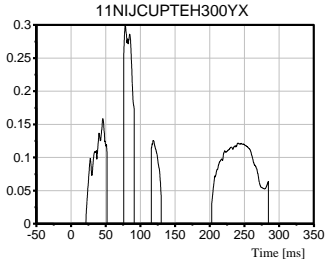
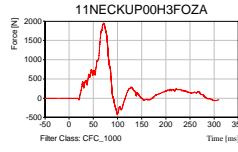
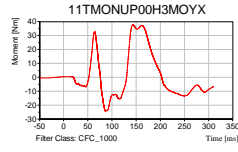
Test Orientation = Frontal  
Fzc(Tension) = 6806  
Fzc(Compression) = 6160  
Myc(Extension) = 135  
Myc(Flexion) = 310

**TRC Inc. Test Lab: CTF**  
**Test Number: 181101**

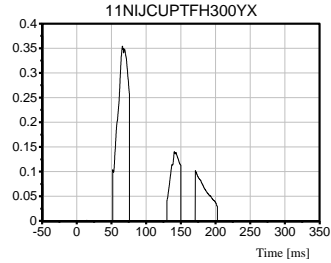


Dummy: HIII 50th Male  
Seating Position:  
Driver

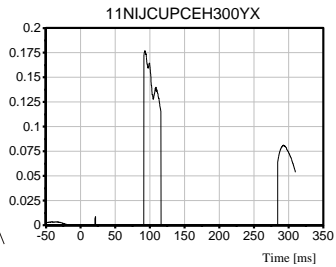
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



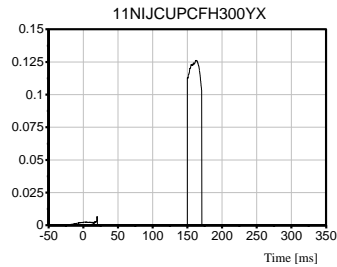
**Max [NTE] 0.3000 at 78.00 ms**



**Max [NTF] 0.3546 at 65.76 ms**



**Max [NCE] 0.1771 at 92.72 ms**



**Max [NCF] 0.1262 at 162.56 ms**

# NHTSA

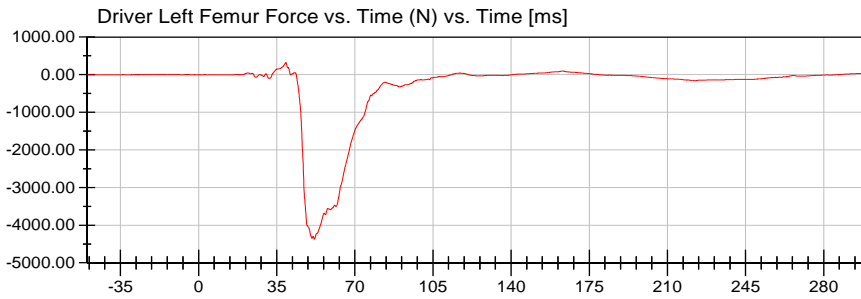
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



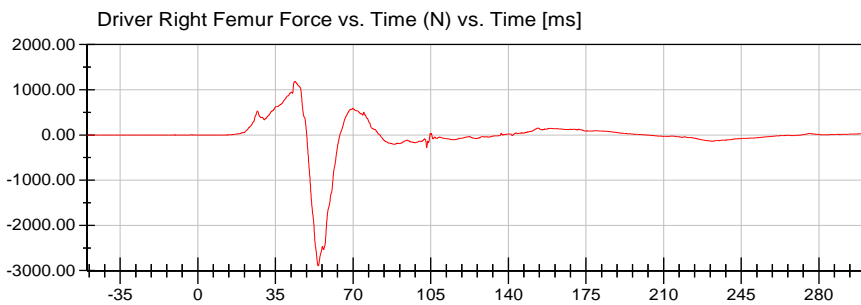
**<Max>**

322.44 N at 39.12 ms

**<Min>**

-4,373.23 N at 51.92 ms

CFC\_600



**<Max>**

1,184.39 N at 43.92 ms

**<Min>**

-2,895.46 N at 54.32 ms

CFC\_600



# NHTSA

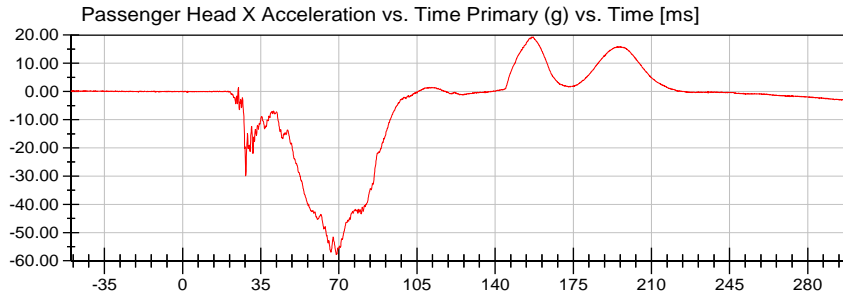
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

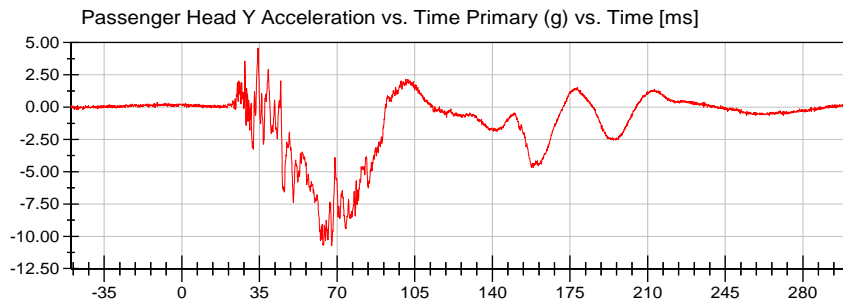
Position #2 Hybrid III Small Adult Female (426)



<Max>  
19.28 g at 157.04 ms

<Min>  
-57.82 g at 68.88 ms

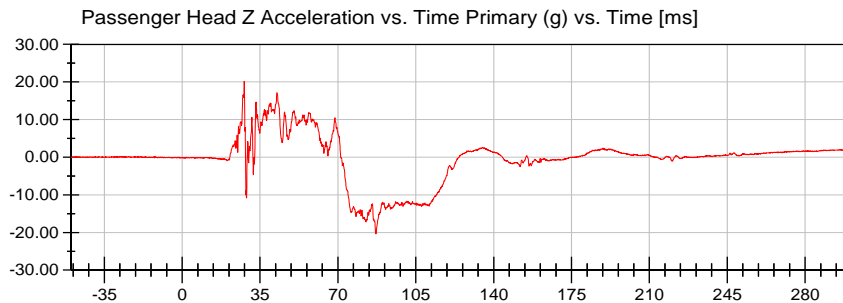
CFC\_1000



<Max>  
4.59 g at 34.32 ms

<Min>  
-10.73 g at 67.60 ms

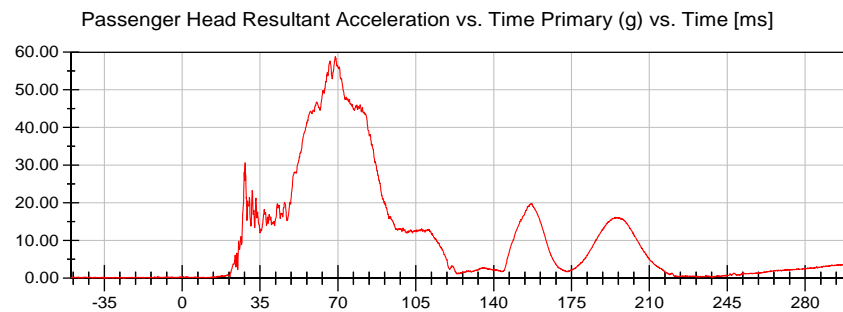
CFC\_1000



<Max>  
20.16 g at 27.92 ms

<Min>  
-20.35 g at 87.12 ms

CFC\_1000



<Max>  
58.82 g at 68.88 ms

<Min>  
0.03 g at -49.04 ms

CFC\_1000



**NHTSA**

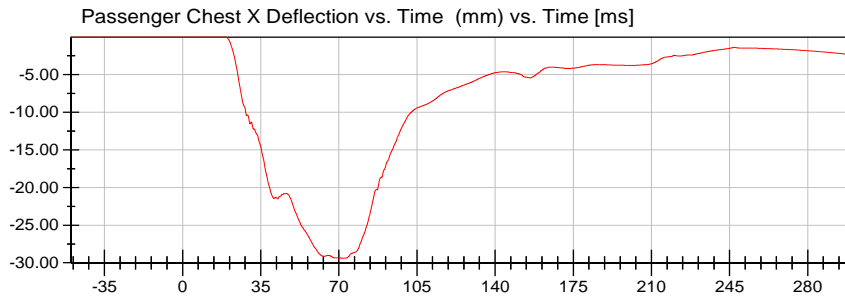
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



**<Max>**

0.00 mm at 9.84 ms

**<Min>**

-29.41 mm at 71.52 ms

CFC\_600



# NHTSA

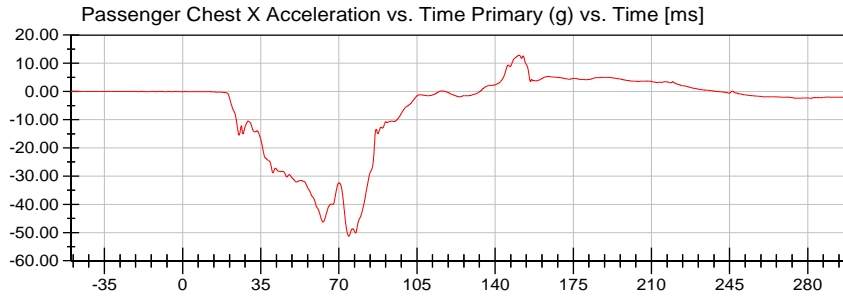
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



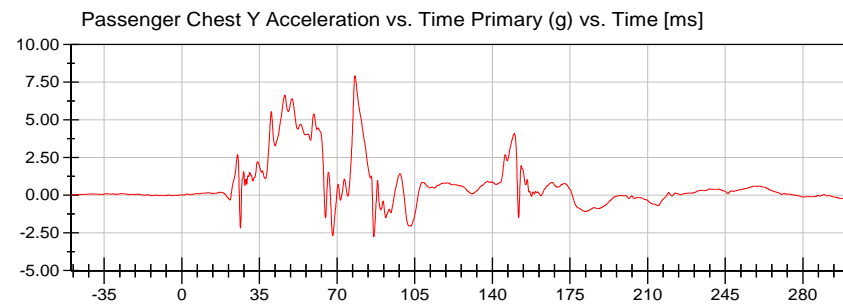
**<Max>**

12.83 g at 150.72 ms

**<Min>**

-51.25 g at 74.40 ms

CFC\_180



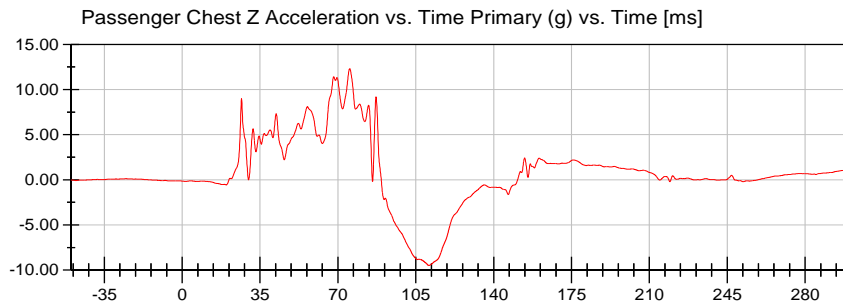
**<Max>**

7.94 g at 78.00 ms

**<Min>**

-2.76 g at 86.56 ms

CFC\_180



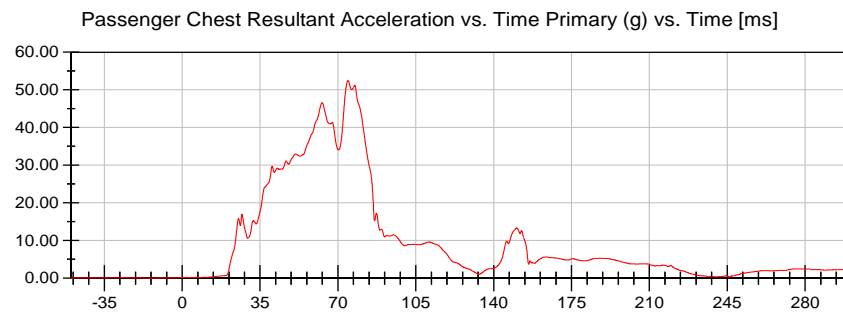
**<Max>**

12.31 g at 75.28 ms

**<Min>**

-9.49 g at 110.88 ms

CFC\_180



**<Max>**

52.46 g at 74.56 ms

**<Min>**

0.02 g at -14.24 ms

CFC\_180



# NHTSA

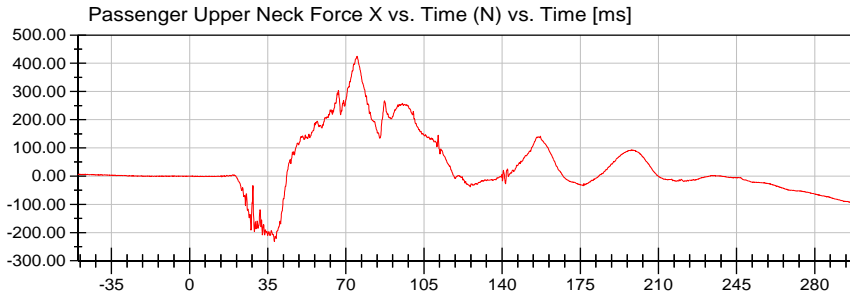
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



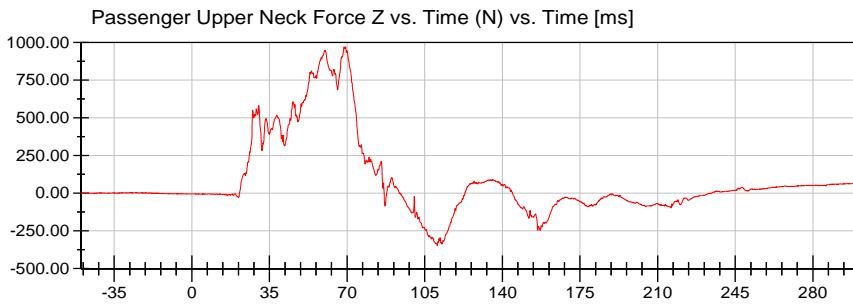
**<Max>**

425.04 N at 75.04 ms

**<Min>**

-231.46 N at 38.00 ms

CFC\_1000



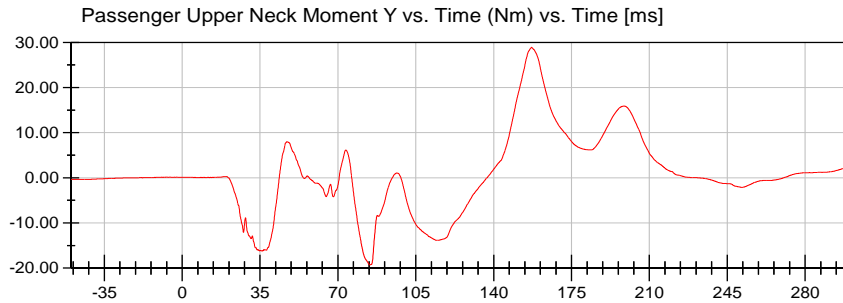
**<Max>**

972.48 N at 69.28 ms

**<Min>**

-346.80 N at 110.64 ms

CFC\_1000



**<Max>**

28.90 Nm at 157.04 ms

**<Min>**

-19.28 Nm at 84.32 ms

CFC\_600





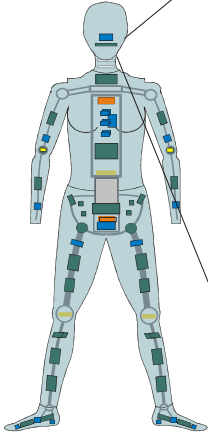
2019 Nissan Armada SUV NCAP 35 mph Frontal Impact  
Neck Injury Predictor (NIJ)

Date: 11/01/2018  
Time: 15:35

Customer: NHTSA  
Test Number: M20195203

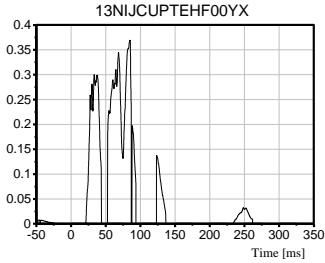
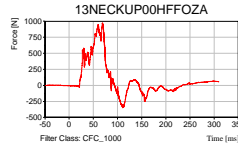
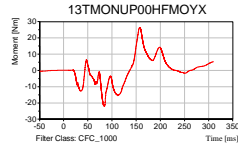
Test Orientation = Frontal  
Fzc(Tension) = 4287  
Fzc(Compression) = 3880  
Myc(Extension) = 67  
Myc(Flexion) = 155

TRC Inc. Test Lab: CTF  
Test Number: 181101

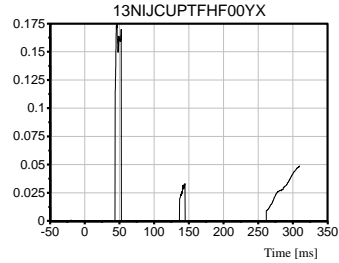


Dummy: HIII 5th Female  
Seating Position:  
Right Front Passenger

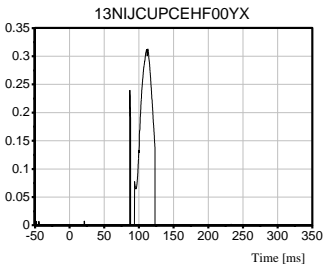
NIJ Source Code: (Fz/Fzc)+(My/Myc)



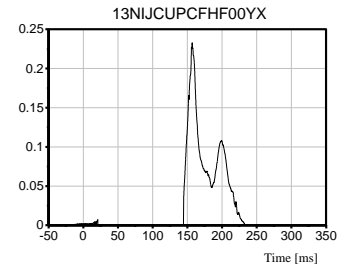
Max [NTE] 0.3692 at 84.64 ms



Max [NTF] 0.1743 at 46.40 ms



Max [NCE] 0.3128 at 112.80 ms



Max [NCF] 0.2328 at 156.96 ms

**NHTSA**

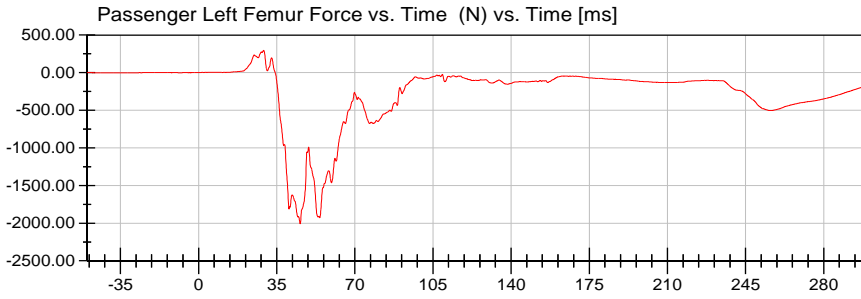
Test Lab: CTF

Test Number: 181101 (M20195203)

Test Date: 11/01/2018

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



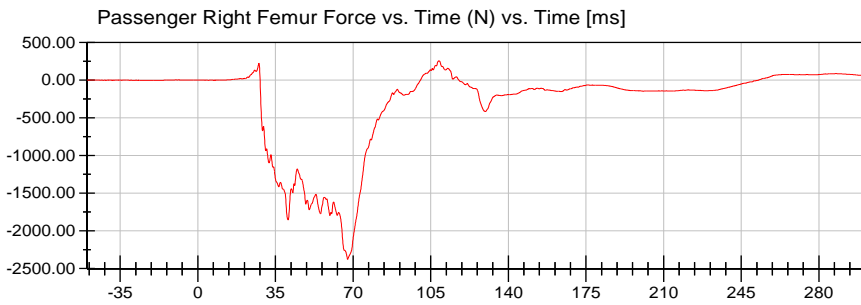
**<Max>**

295.61 N at 29.20 ms

**<Min>**

-2,008.40 N at 45.52 ms

CFC\_600



**<Max>**

257.46 N at 108.72 ms

**<Min>**

-2,376.97 N at 67.60 ms

CFC\_600



**APPENDIX C**  
**DUMMY CALIBRATION AND PERFORMANCE VERIFICATION**

**Pre-Test Calibration Sheets**

**Driver S/N 037**

**Transportation Research Center Inc.**  
**572E HIII 50th Male Dummy**  
**External Dimensions**  
**Serial No. 037**  
**Calibration No. 51**

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	512	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	91	Yes
F	Thigh Clearance	139.7 - 154.9	146	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	199	Yes
K	Buttock Knee Length	579.1 - 604.5	601	Yes
L	Popliteal Height	429.3 - 454.7	440	Yes
M	Knee Pivot Height	485.1 - 500.4	494	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	425	Yes
W	Foot Breadth	91.4 - 106.7	96	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	865	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Revised 8/10/12



## Transportation Research Center Inc.

Front Head Drop  
HIII 50th Serial No. 037 Certification No. 51-1  
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	258.9 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-2.2 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

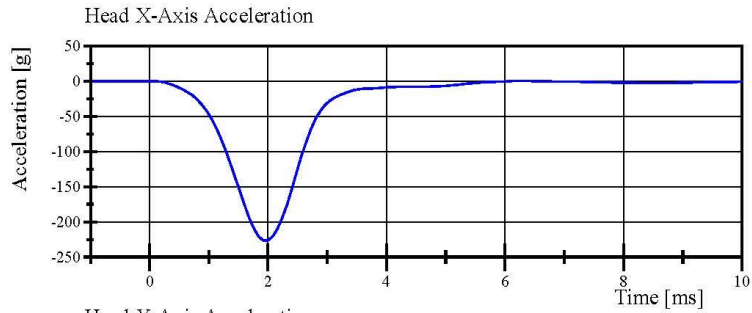
**Head Skin S/N: N/A**

# Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 51-1

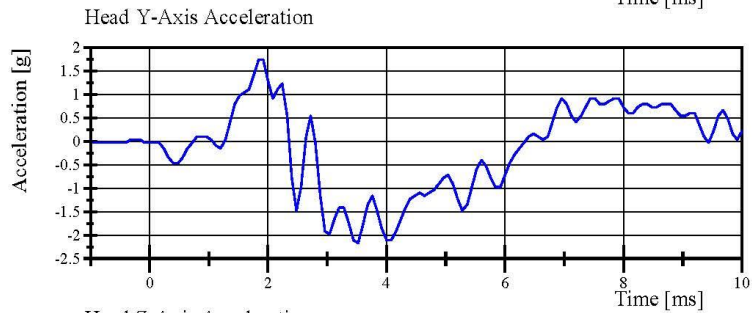
Test Date: 10/11/2018



Filter Class: CFC\_1000

Max: 0.6 g at 6.2 ms

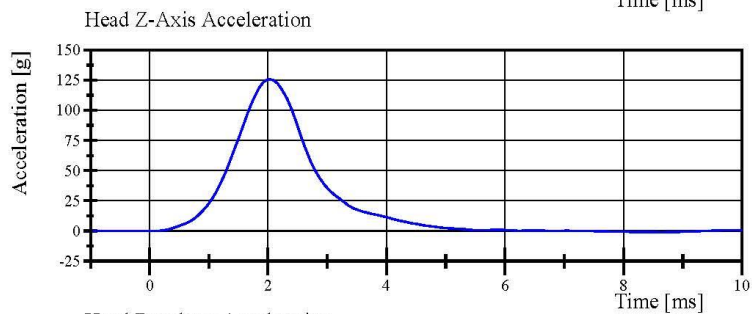
Min: -226.4 g at 1.9 ms



Filter Class: CFC\_1000

Max: 1.7 g at 1.8 ms

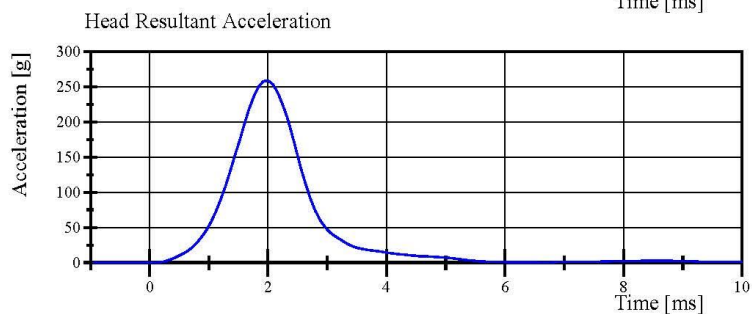
Min: -2.2 g at 3.5 ms



Filter Class: CFC\_1000

Max: 125.8 g at 2.0 ms

Min: -1.1 g at 8.6 ms



Filter Class: CFC\_1000

Max: 258.9 g at 2.0 ms

Min: 0.0 g at -1.0 ms

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

10.11.2018 10:42:07 579



## Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.936 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	34.7 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-27.26 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-21.40 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-17.99 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-17.99 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-73.6 °	Yes
Time of Peak	57 - 64 ms	58.5 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	115.8 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	95.9 N·m	Yes
Time of Peak	47 - 58 ms	48.3 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.6 ms	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Neck S/N: 4728**

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

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10.11.2018 13:30:50 1830

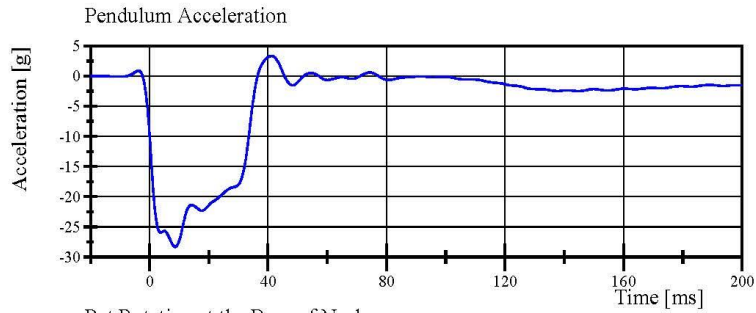


# Transportation Research Center Inc.

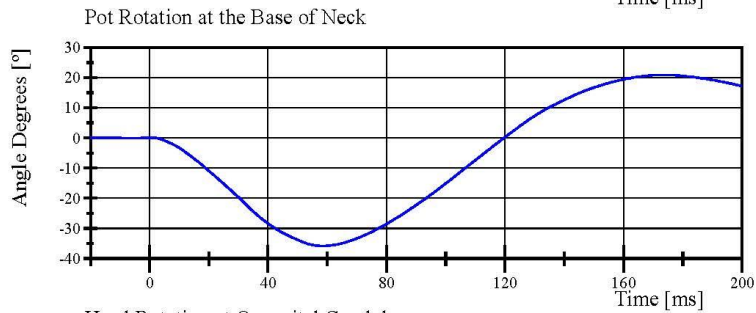
Neck Flexion

HIII 50th Serial No. 037 Certification No. 51-1

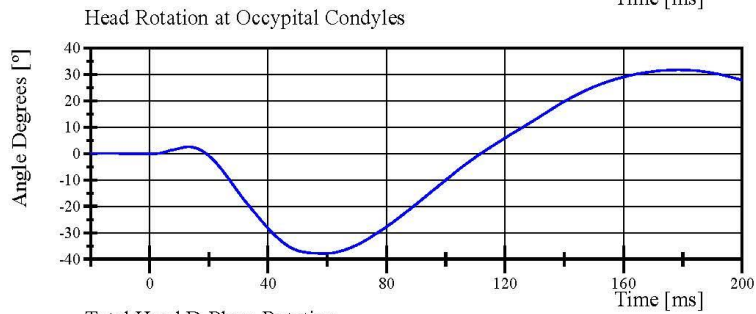
Test Date: 10/11/2018



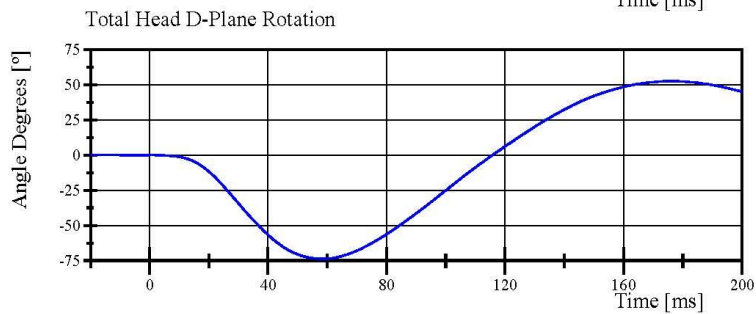
Filter Class: CFC\_60  
Max: 3.4 g at 41.2 ms  
Min: -28.3 g at 8.7 ms



Filter Class: CFC\_60  
Max: 20.9 ° at 173.4 ms  
Min: -35.7 ° at 58.3 ms



Filter Class: CFC\_60  
Max: 31.8 ° at 178.5 ms  
Min: -37.9 ° at 58.8 ms



Filter Class: CFC\_60  
Max: 52.6 ° at 176.0 ms  
Min: -73.6 ° at 58.5 ms

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

10.11.2018 13:31:16 1830

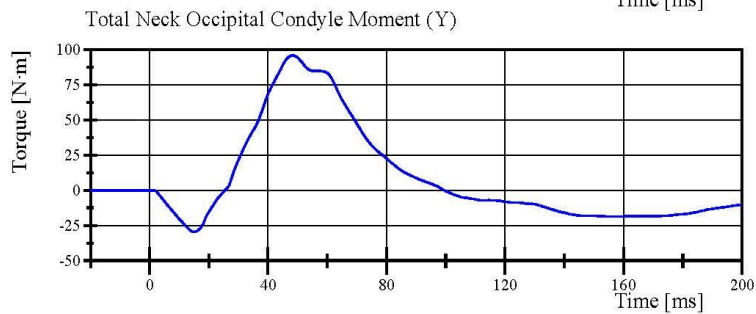
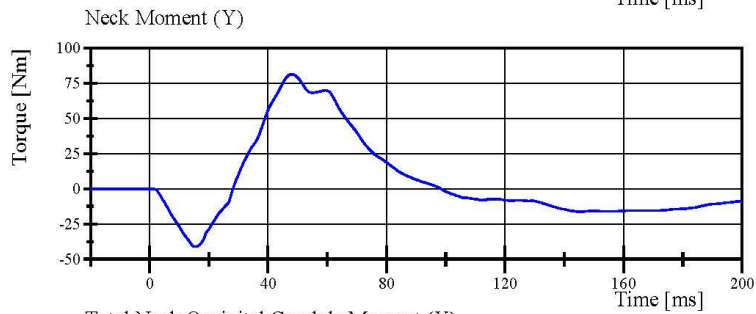
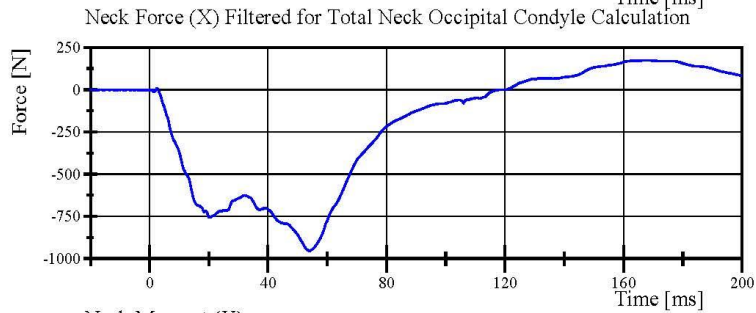
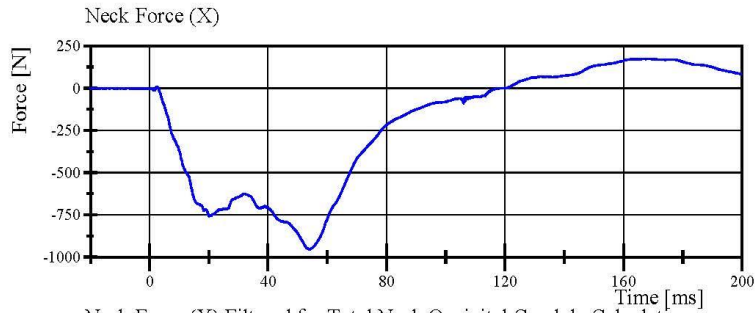


# Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018



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

10.11.2018 13:31:17 1830



## Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 51-4

Test Date: 10/12/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.009 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	38.3 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.79 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.37 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.03 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.71 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	100.9 °	Yes
Time of Peak	72 - 82 ms	77.9 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	160.6 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-53) - (-80) N·m	-71.2 N·m	Yes
Time of Peak	65 - 79 ms	72.2 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	147.7 ms	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Neck S/N: 4728**

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

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10.12.2018 06:37:46 1971

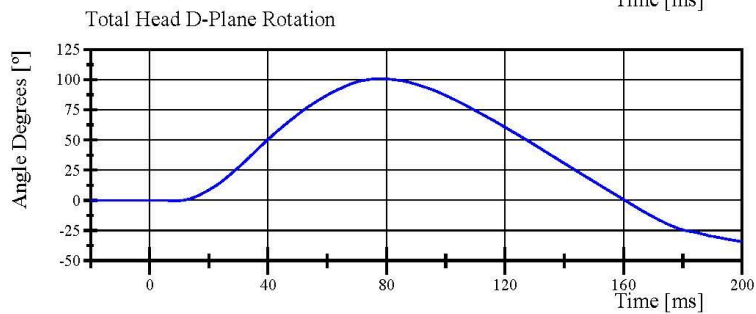
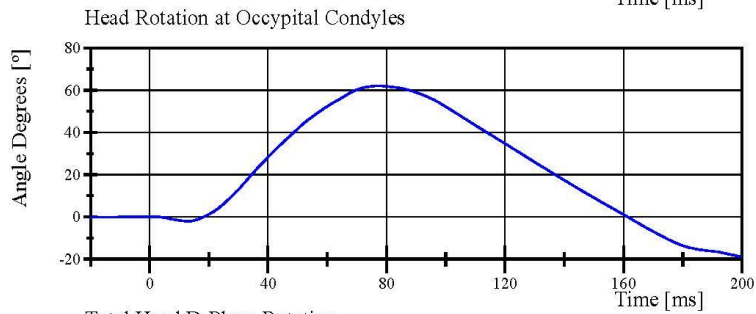
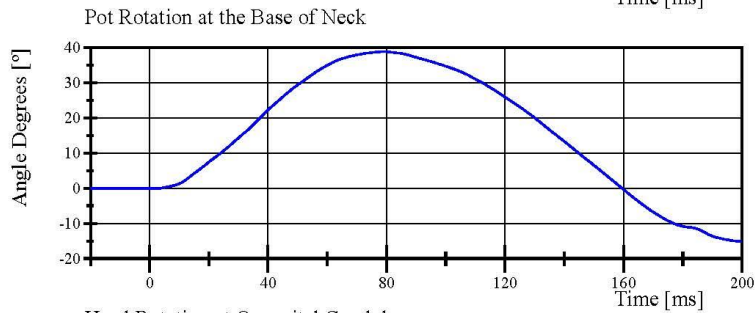
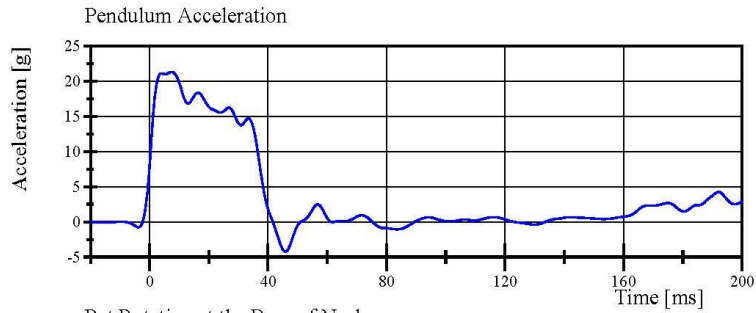


# Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 51-4

Test Date: 10/12/2018



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

10.12.2018 06:38:57 1971

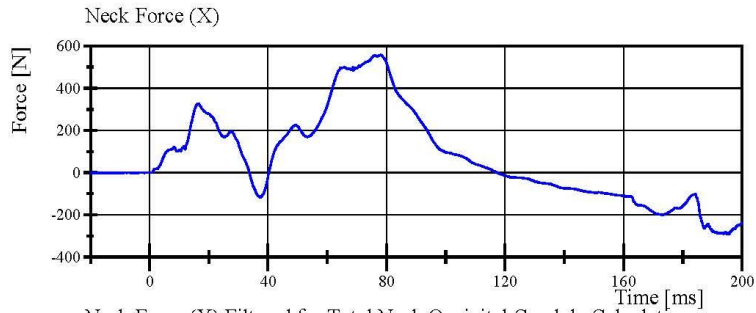


# Transportation Research Center Inc.

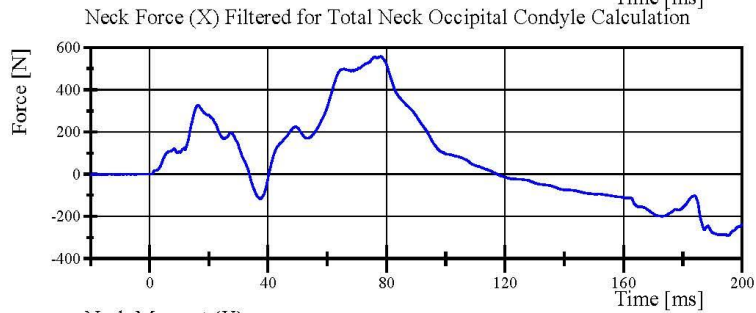
Neck Extension

HIII 50th Serial No. 037 Certification No. 51-4

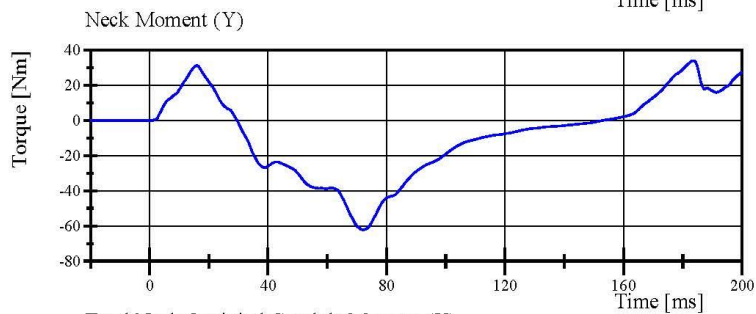
Test Date: 10/12/2018



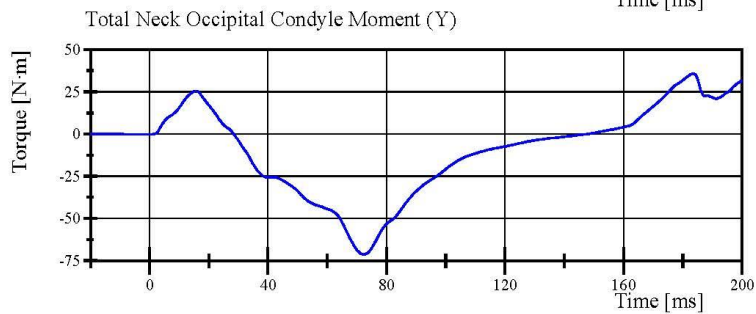
Filter Class: CFC\_1000  
Max: 557.5 N at 78.2 ms  
Min: -292.0 N at 195.3 ms



Filter Class: CFC\_600  
Max: 557.5 N at 78.2 ms  
Min: -289.7 N at 195.3 ms



Filter Class: CFC\_600  
Max: 33.9 Nm at 183.6 ms  
Min: -62.1 Nm at 72.1 ms



Filter Class: Without\_(Consta  
Max: 35.7 N.m at 183.5 ms  
Min: -71.2 N.m at 72.2 ms

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

10.12.2018 06:38:58 1971



## Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.623 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,373.5 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-67.34 mm	Yes
Internal Hysteresis	69 - 85 %	72.9 %	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Jacket S/N: 2565**

**Rib #1 Assembly S/N: 178051-35 HI6550**

**Rib #2 Assembly S/N: 36 16526**

**Rib #3 Assembly S/N: 37 16543**

**Rib #4 Assembly S/N: 38 16538**

**Rib #5 Assembly S/N: 39 HI6530**

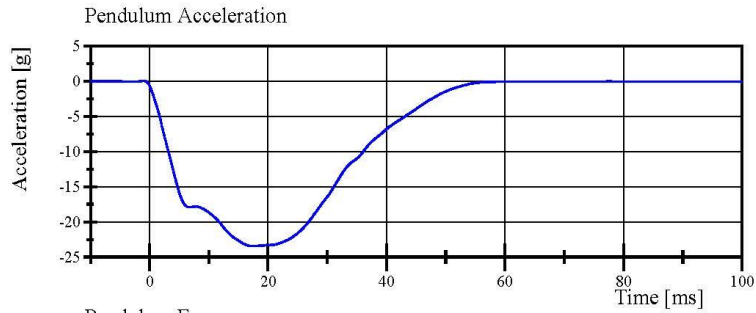
**Rib #6 Assembly S/N: 40 16548**

# Transportation Research Center Inc.

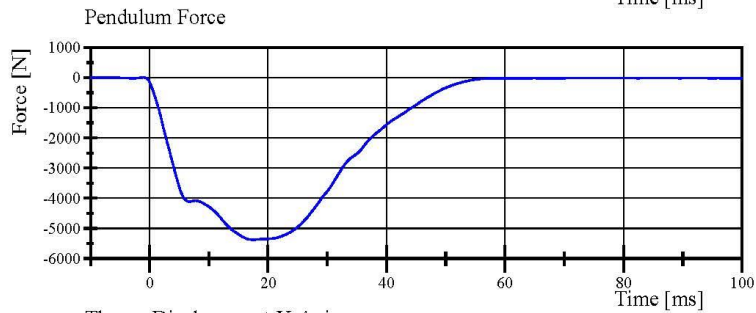
Front Thorax

HIII 50th Serial No. 037 Certification No. 51-1

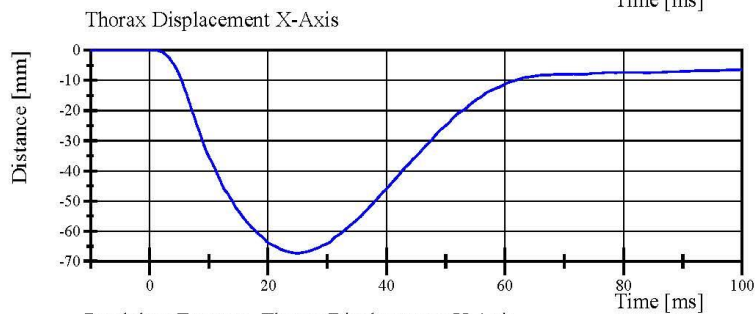
Test Date: 10/11/2018



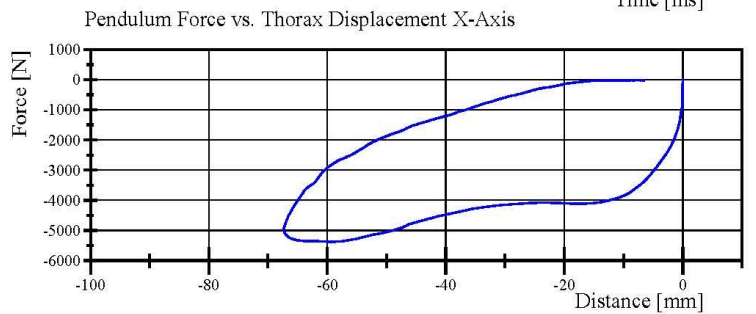
Filter Class: CFC\_180  
Max: 0.0 g at -1.0 ms  
Min: -23.4 g at 17.5 ms



Filter Class: CFC\_180  
Max: 11.0 N at -1.0 ms  
Min: -5,373.5 N at 17.5 ms



Filter Class: CFC\_600  
Max: 0.0 mm at -9.8 ms  
Min: -67.3 mm at 25.0 ms



Filter Class: CFC\_180  
Max: 11.0 N at -0.0 mm  
Min: -5,373.5 N at -59.2 mm

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

10.11.2018 10:03:40 400

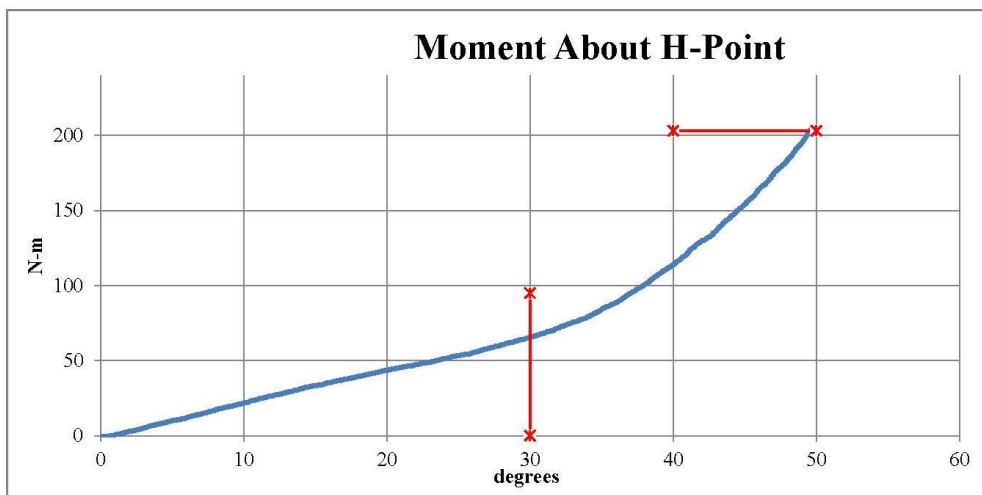


Transportation Research Center Inc.  
Hybrid III 50th Male Hip Range of Motion

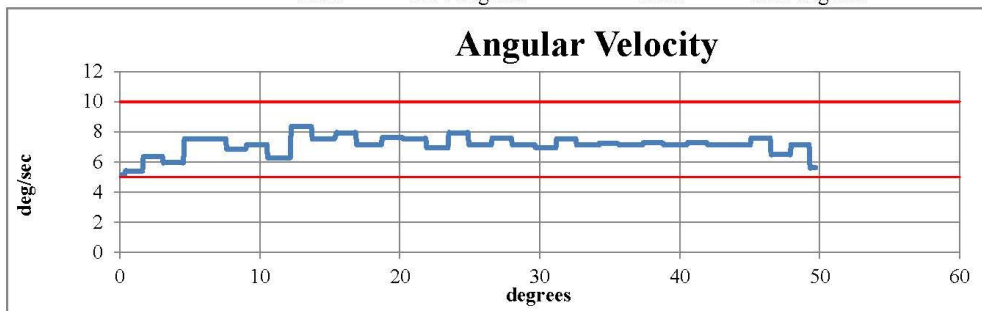


Serial Number: 037 Date: 11-Oct-2018  
Side Tested: Left Hip Time: 10:56  
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.7 °C Pass
Humidity	10 - 70	50 % Pass
Moment at 30°	0 ≤ 94.9	65.7 N-m Pass
Angle at 203 Nm	40 - 50	49.72 deg Pass
Average Velocity	5 - 10	7.13 deg/sec Pass



Max: 8.34 deg/sec Min: 5.16 deg/sec



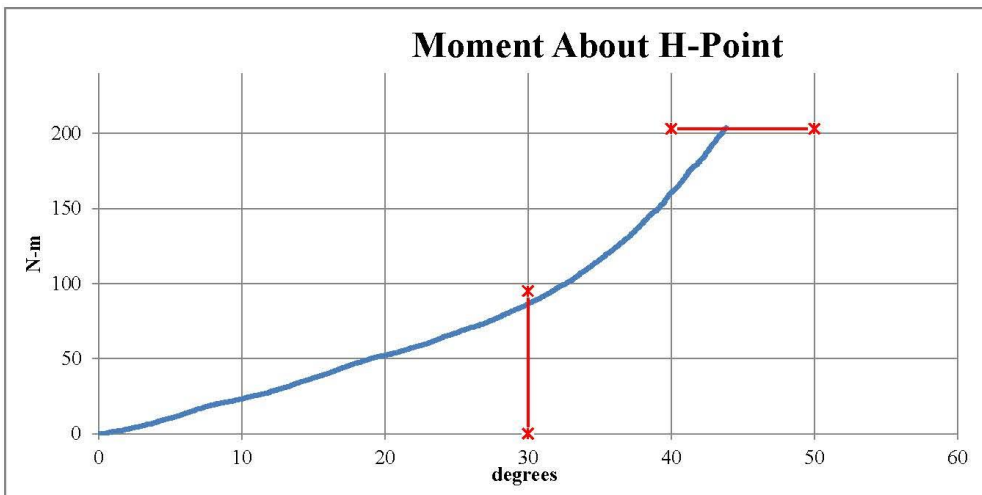
Comments:  
Pelvis Skin S/N: N/A  
Lumbar Spine S/N: 0551  
Lumbar Cable S/N: N/A

Transportation Research Center Inc.  
Hybrid III 50th Male Hip Range of Motion

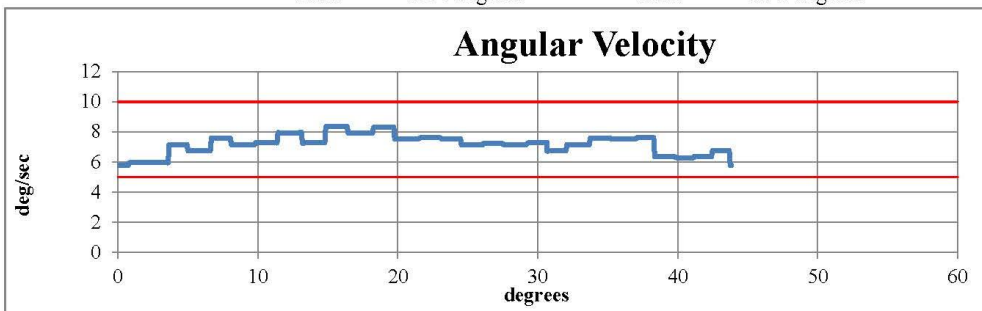


Serial Number: 037 Date: 11-Oct-2018  
Side Tested: Right Hip Time: 11:57  
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.2 °C Pass
Humidity	10 - 70	49 % Pass
Moment at 30°	0 ≤ 94.9	86.72 N-m Pass
Angle at 203 Nm	40 - 50	43.84 deg Pass
Average Velocity	5 - 10	7.16 deg/sec Pass



Max: 8.34 deg/sec Min: 5.78 deg/sec



Comments:  
Pelvis Skin S/N: N/A  
Lumbar Spine S/N: 0551  
Lumbar Cable S/N: N/A

## Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 51-1  
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.090 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,449.00 N	Yes

**Test meets specifications.**

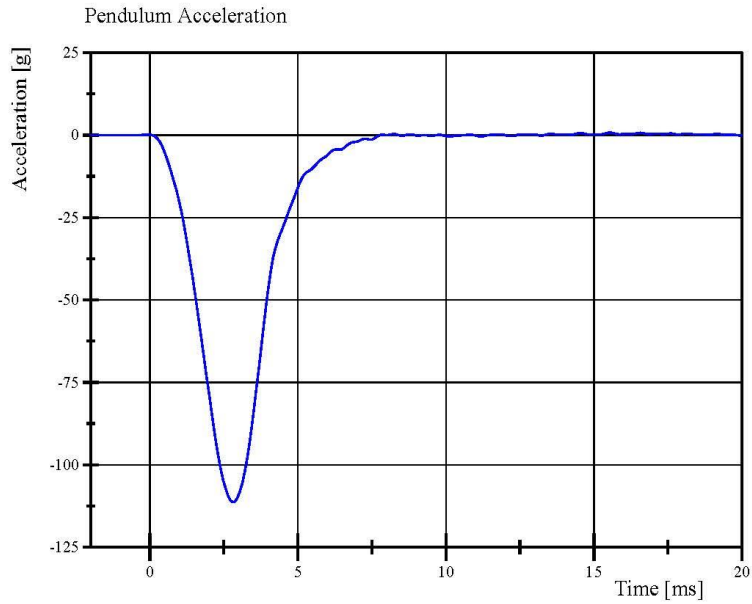
**Condition: Used**

**Comments:**

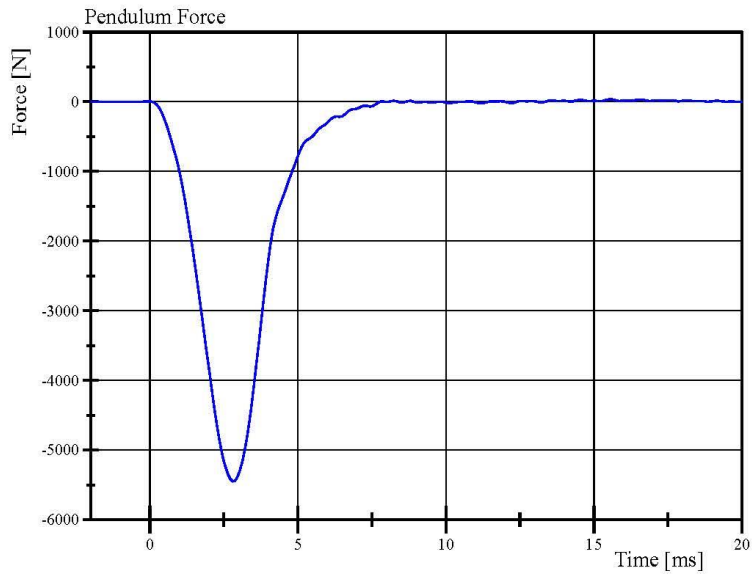
**Knee Skin S/N: 2672**

# Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 51-1  
Test Date: 10/11/2018



Filter Class: CFC\_600  
Max: 0.8 g at 15.5 ms  
Min: -111.4 g at 2.8 ms



Filter Class: CFC\_600  
Max: 38.0 N at 15.5 ms  
Min: -5,449.0 N at 2.8 ms

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

10.11.2018 09:34:50 1773



## Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 51-1  
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.089 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,452.01 N	Yes

**Test meets specifications.**

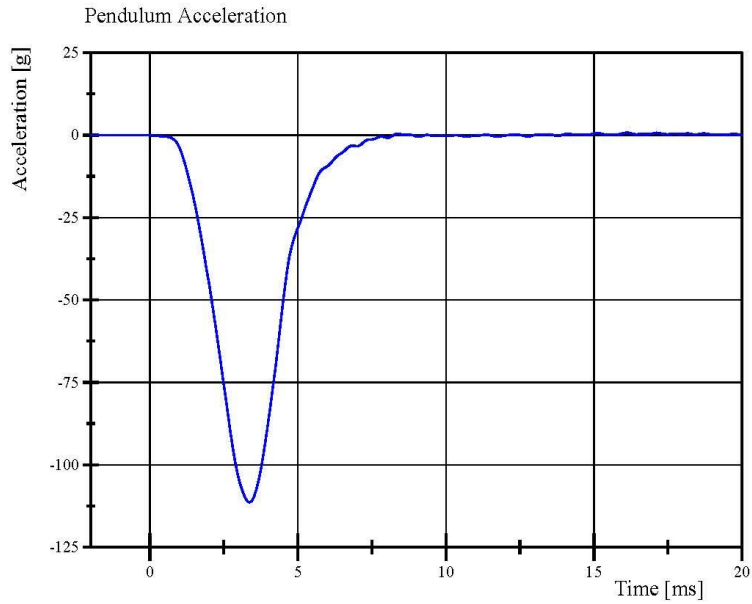
**Condition: Used**

**Comments:**

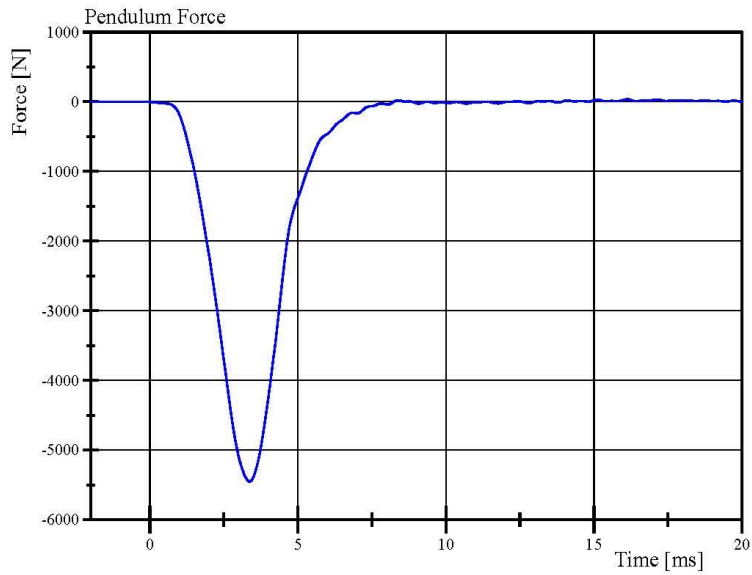
**Knee Skin S/N: 3131**

# Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 51-1  
Test Date: 10/11/2018



Filter Class: CFC\_600  
Max: 0.7 g at 16.1 ms  
Min: -111.4 g at 3.4 ms



Filter Class: CFC\_600  
Max: 36.3 N at 16.1 ms  
Min: -5,452.0 N at 3.4 ms

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

10.11.2018 09:38:58 1766



**Post-Test Calibration Sheets**

**Front Passenger S/N 037**

**Transportation Research Center Inc.**  
**572E HIII 50th Male Dummy**  
**External Dimensions**  
**Serial No. 037**  
**Calibration No. 52**

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	512	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	91	Yes
F	Thigh Clearance	139.7 - 154.9	146	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	199	Yes
K	Buttock Knee Length	579.1 - 604.5	601	Yes
L	Popliteal Height	429.3 - 454.7	440	Yes
M	Knee Pivot Height	485.1 - 500.4	494	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	425	Yes
W	Foot Breadth	91.4 - 106.7	96	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	865	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

## Transportation Research Center Inc.

Front Head Drop  
HIII 50th Serial No. 037 Certification No. 52-1  
Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	248.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-2.4 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

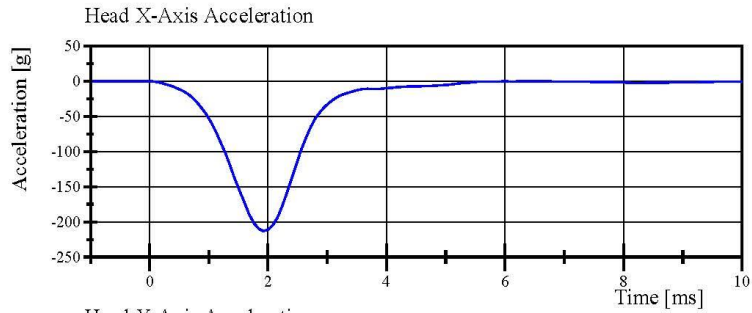
**Head Skin S/N:** N/A

# Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 52-1

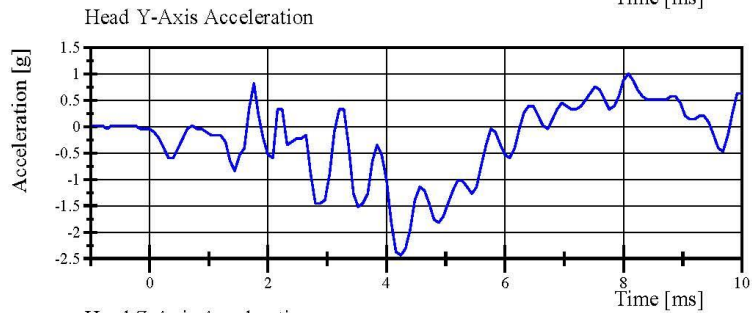
Test Date: 11/2/2018



Filter Class: CFC\_1000

Max: 0.1 g at 6.4 ms

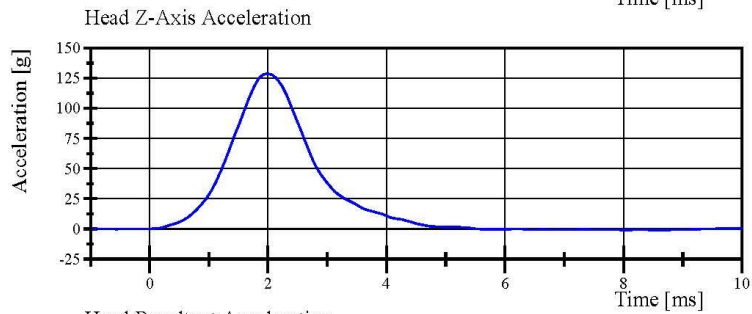
Min: -212.9 g at 1.9 ms



Filter Class: CFC\_1000

Max: 1.0 g at 8.1 ms

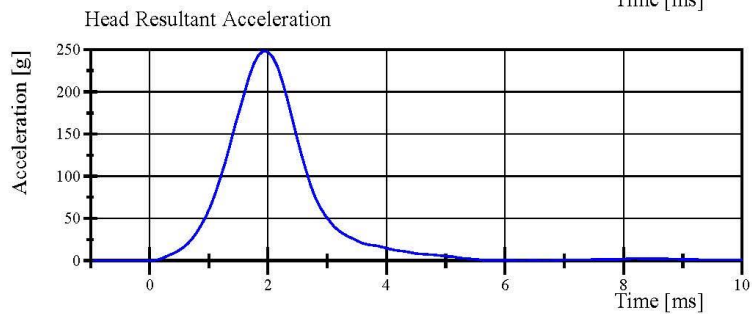
Min: -2.4 g at 4.2 ms



Filter Class: CFC\_1000

Max: 128.8 g at 2.0 ms

Min: -0.9 g at 8.6 ms



Filter Class: CFC\_1000

Max: 248.5 g at 1.9 ms

Min: 0.1 g at -0.9 ms

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

11.02.2018 06:44:59 579



## Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 52-1

Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.941 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.6 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-26.59 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-19.97 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.07 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.07 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-71.6 °	Yes
Time of Peak	57 - 64 ms	58.2 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	119.7 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	101.2 N·m	Yes
Time of Peak	47 - 58 ms	50.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	100.4 ms	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Neck S/N: 4728**

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

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11.02.2018 07:08:14 1835

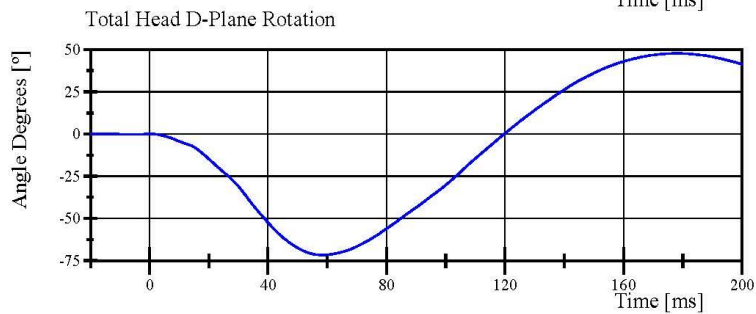
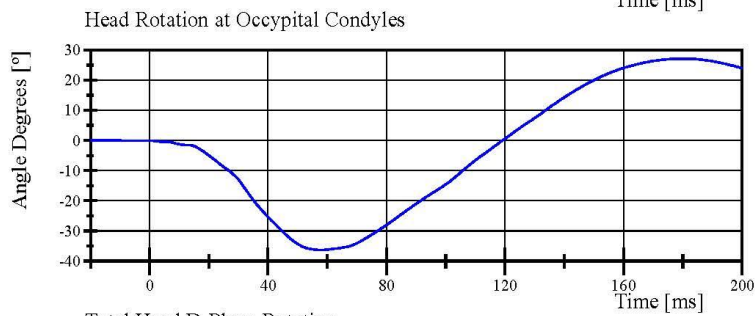
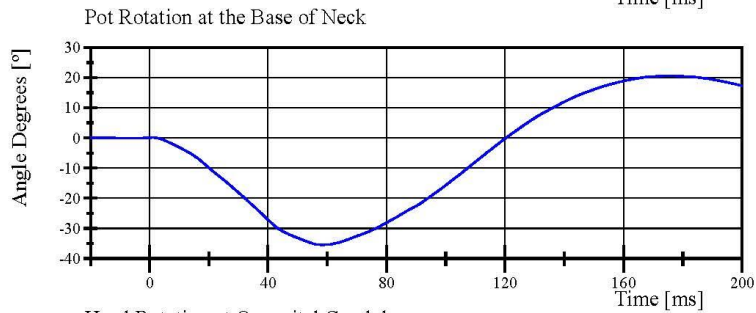
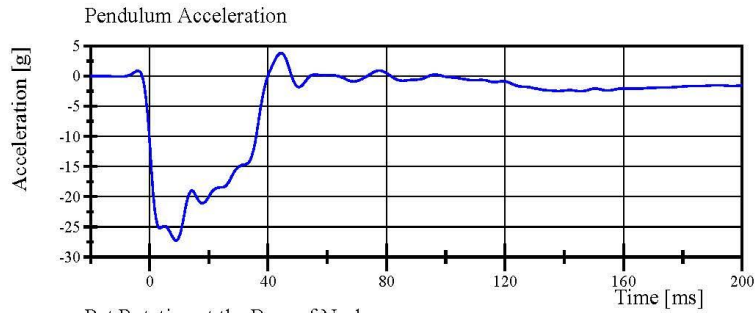


# Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 52-1

Test Date: 11/2/2018



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

11.02.2018 07:09:02 1835

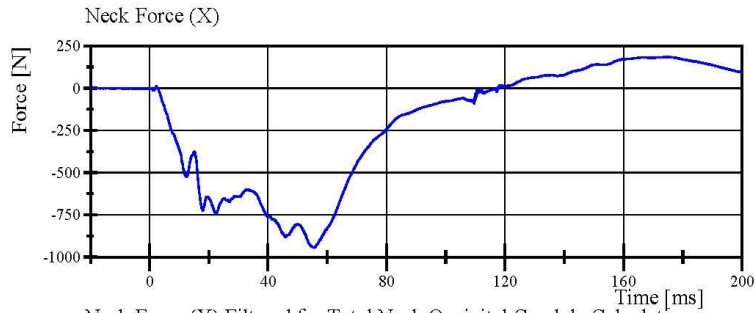


# Transportation Research Center Inc.

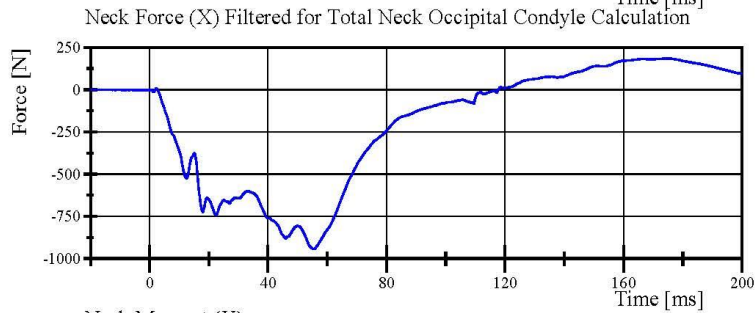
Neck Flexion

HIII 50th Serial No. 037 Certification No. 52-1

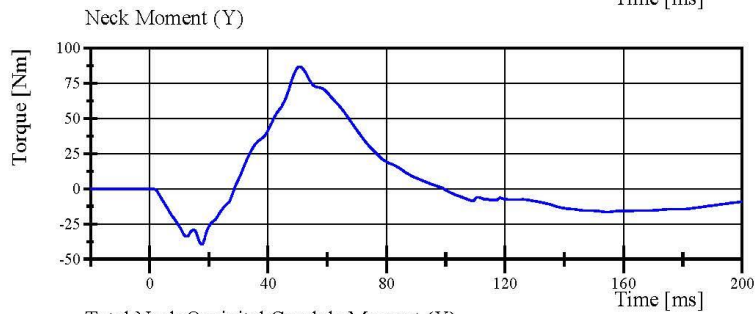
Test Date: 11/2/2018



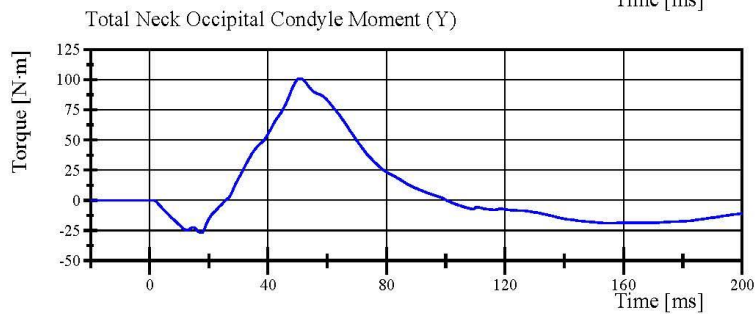
Filter Class: CFC\_1000  
Max: 185.0 N at 175.7 ms  
Min: -942.9 N at 55.6 ms



Filter Class: CFC\_600  
Max: 184.7 N at 175.7 ms  
Min: -942.8 N at 55.6 ms



Filter Class: CFC\_600  
Max: 86.9 Nm at 50.7 ms  
Min: -39.4 Nm at 17.7 ms



Filter Class: Without\_(Consta  
Max: 101.2 N.m at 50.8 ms  
Min: -26.9 N.m at 17.4 ms

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

11.02.2018 07:09:03 1835



## Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 52-2

Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.010 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.9 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.92 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	15.93 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.69 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.69 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	97.7 °	Yes
Time of Peak	72 - 82 ms	78.6 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	162.7 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-53) - (-80) N·m	-70.0 N·m	Yes
Time of Peak	65 - 79 ms	73.2 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	147.9 ms	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Neck S/N: 4728**

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

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11.02.2018 08:25:37 1977

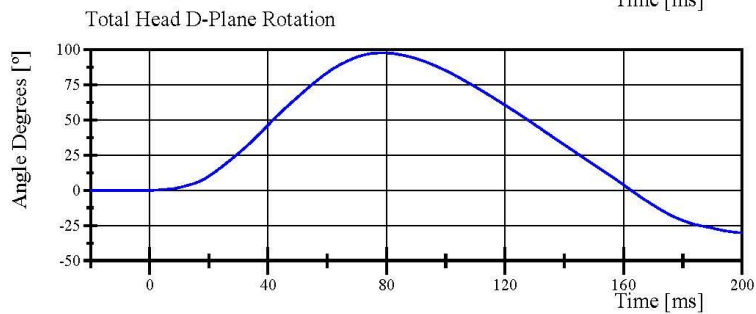
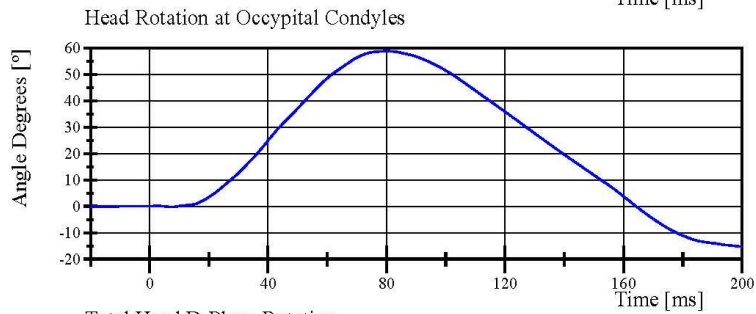
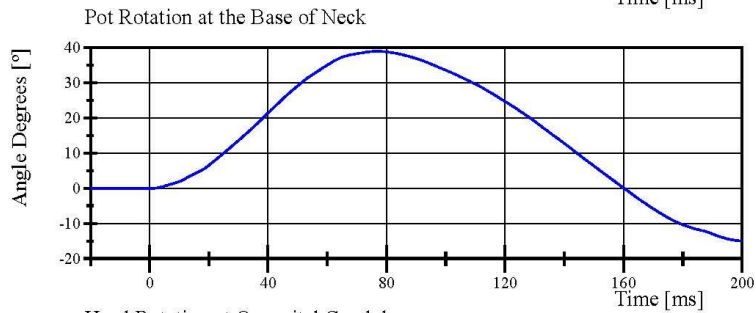
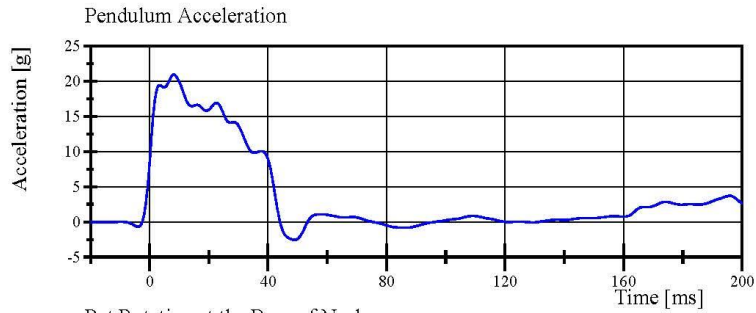


# Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 52-2

Test Date: 11/2/2018



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

11.02.2018 08:25:58 1977

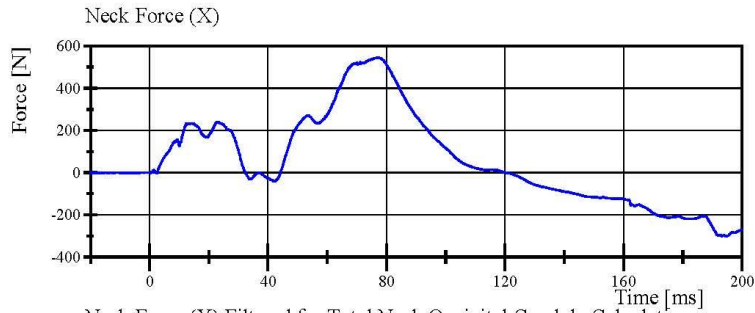


# Transportation Research Center Inc.

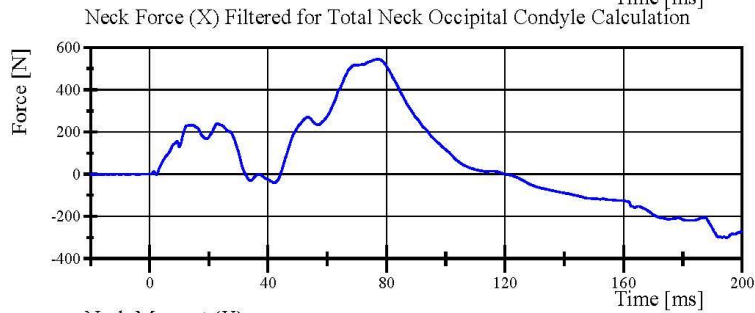
Neck Extension

HIII 50th Serial No. 037 Certification No. 52-2

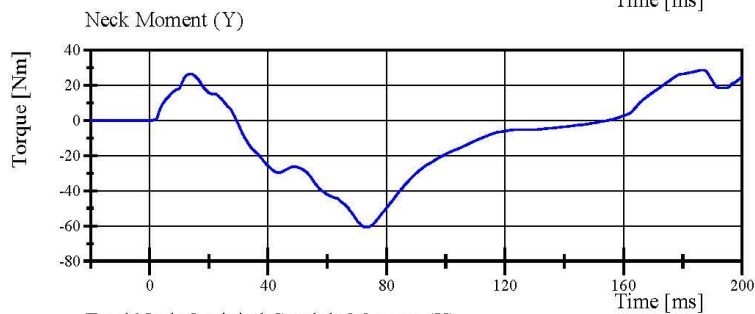
Test Date: 11/2/2018



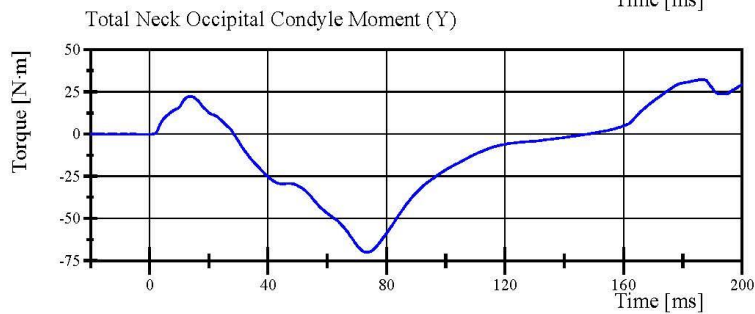
Filter Class: CFC\_1000  
Max: 545.7 N at 77.4 ms  
Min: -300.3 N at 194.9 ms



Filter Class: CFC\_600  
Max: 545.3 N at 77.3 ms  
Min: -300.0 N at 194.9 ms



Filter Class: CFC\_600  
Max: 28.7 Nm at 186.8 ms  
Min: -60.7 Nm at 73.0 ms



Filter Class: Without\_(Consta  
Max: 32.3 N.m at 186.3 ms  
Min: -70.0 N.m at 73.2 ms

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

11.02.2018 08:25:59 1977



## Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 52-1

Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.620 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,324.0 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-68.95 mm	Yes
Internal Hysteresis	69 - 85 %	72.8 %	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

**Jacket S/N:** 2565

**Rib #1 Assembly S/N:** 178051-35 HI6550

**Rib #2 Assembly S/N:** 36 16526

**Rib #3 Assembly S/N:** 37 16543

**Rib #4 Assembly S/N:** 38 16538

**Rib #5 Assembly S/N:** 39 HI6530

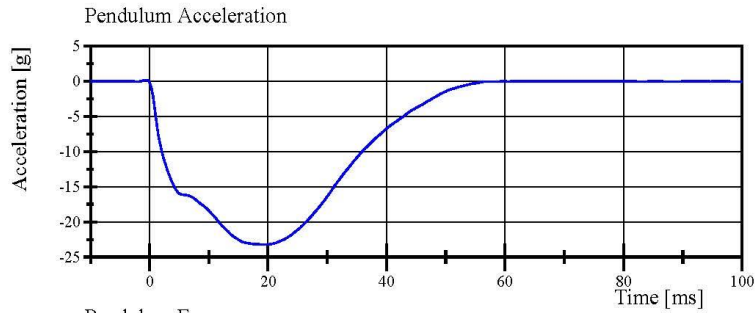
**Rib #6 Assembly S/N:** 40 16548

# Transportation Research Center Inc.

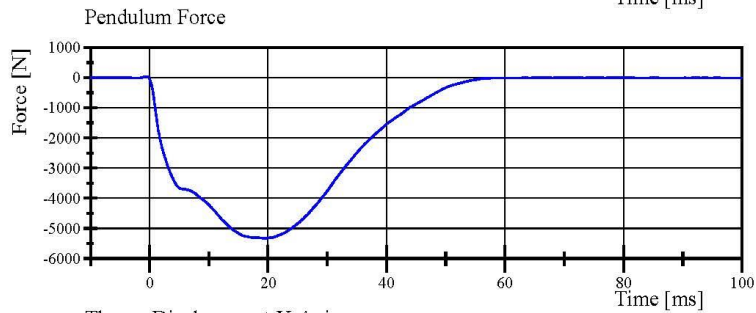
Front Thorax

HIII 50th Serial No. 037 Certification No. 52-1

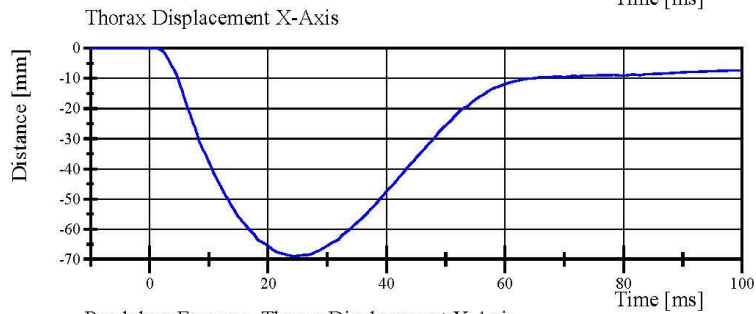
Test Date: 11/2/2018



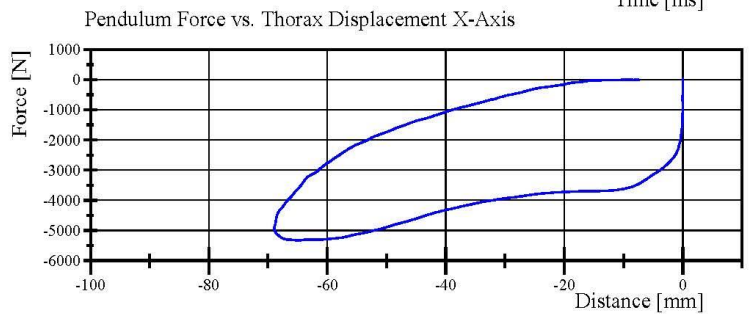
Filter Class: CFC\_180  
Max: 0.2 g at -0.6 ms  
Min: -23.2 g at 19.4 ms



Filter Class: CFC\_180  
Max: 44.2 N at -0.6 ms  
Min: -5,324.0 N at 19.4 ms



Filter Class: CFC\_600  
Max: 0.0 mm at -10.0 ms  
Min: -69.0 mm at 24.4 ms



Filter Class: CFC\_180  
Max: 44.2 N at -0.0 mm  
Min: -5,324.0 N at -64.9 mm

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

11.02.2018 10:17:40 384



# Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

NHTSA

Serial Number: 037

Date: 02-Nov-2018

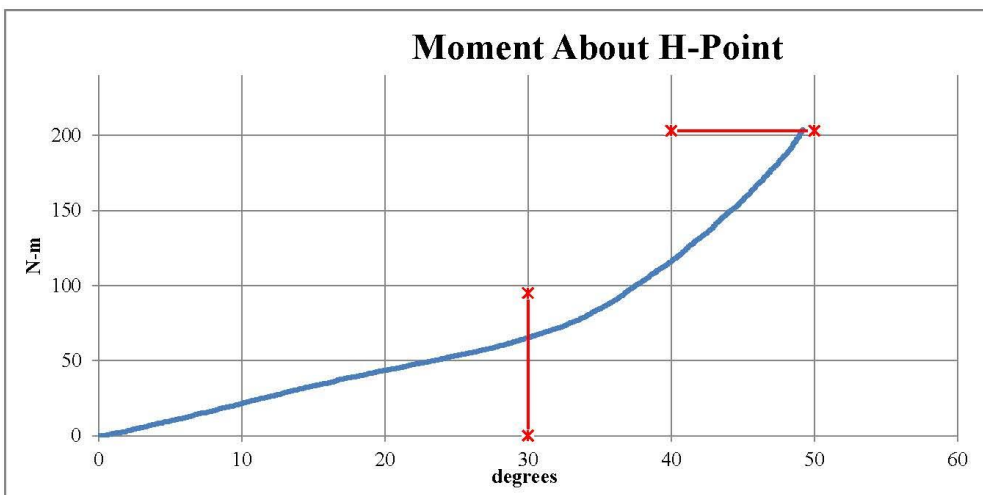
Side Tested: Left Hip

Time: 8:06

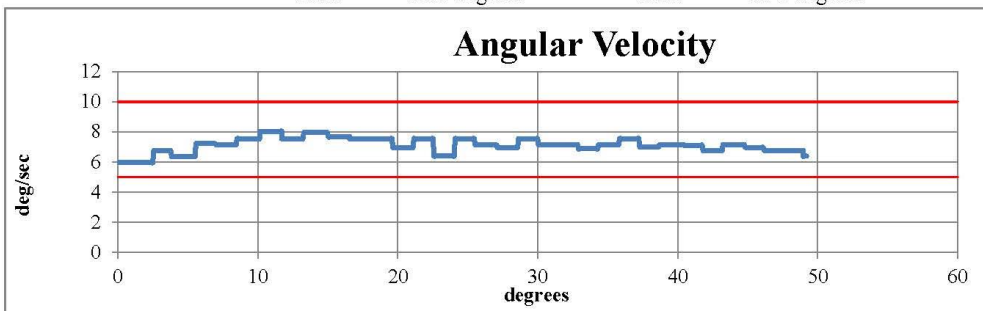
Test Number: 1



TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	20.9 °C Pass
Humidity	10 - 70	41 % Pass
Moment at 30°	0 ≤ 94.9	65.45 N-m Pass
Angle at 203 Nm	40 - 50	49.21 deg Pass
Average Velocity	5 - 10	7.11 deg/sec Pass



Max: 8.02 deg/sec      Min: 5.96 deg/sec



**Comments:**

Pelvis Skin S/N: N/A

Lumbar Spine S/N: 0551

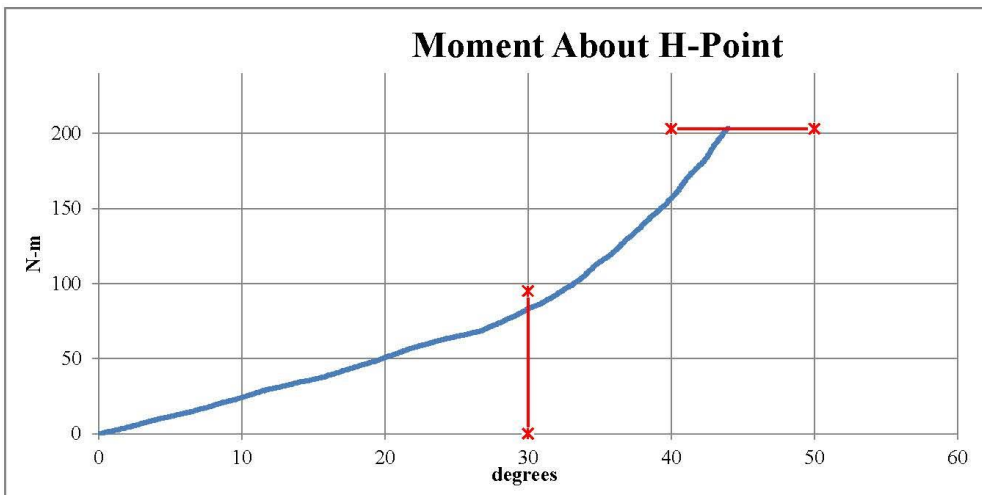
Lumbar Cable S/N: N/A

Transportation Research Center Inc.  
Hybrid III 50th Male Hip Range of Motion

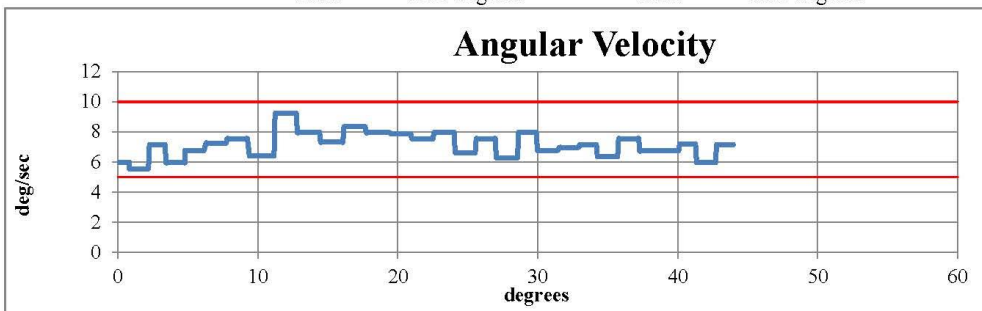


Serial Number: 037 Date: 02-Nov-2018  
Side Tested: Right Hip Time: 9:09  
Test Number: 1

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.8 °C Pass
Humidity	10 - 70	40 % Pass
Moment at 30°	0 ≤ 94.9	83.51 N-m Pass
Angle at 203 Nm	40 - 50	43.97 deg Pass
Average Velocity	5 - 10	7.13 deg/sec Pass



Max: 9.23 deg/sec Min: 5.56 deg/sec



Comments:  
Pelvis Skin S/N: N/A  
Lumbar Spine S/N: 0551  
Lumbar Cable S/N: N/A

## Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 52-1  
Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.075 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,376.99 N	Yes

**Test meets specifications.**

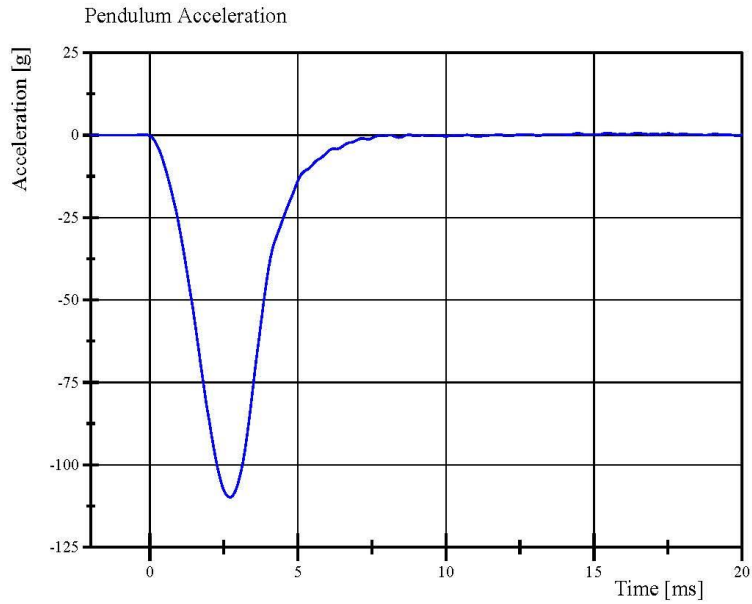
**Condition: Used**

**Comments:**

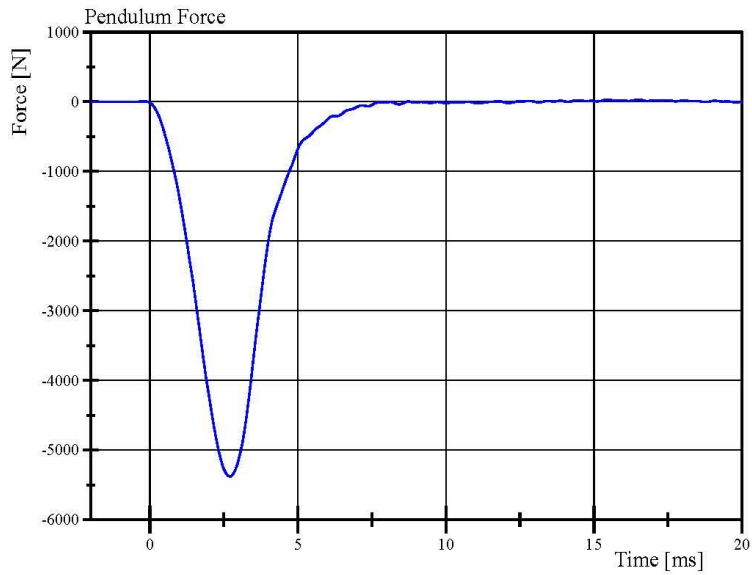
**Knee Skin S/N: 2672**

# Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 52-1  
Test Date: 11/2/2018



Filter Class: CFC\_600  
Max: 0.7 g at 16.5 ms  
Min: -109.9 g at 2.7 ms



Filter Class: CFC\_600  
Max: 32.4 N at 16.5 ms  
Min: -5,377.0 N at 2.7 ms

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

11.02.2018 07:39:45 1736



## Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 52-1  
Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.075 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,403.08 N	Yes

**Test meets specifications.**

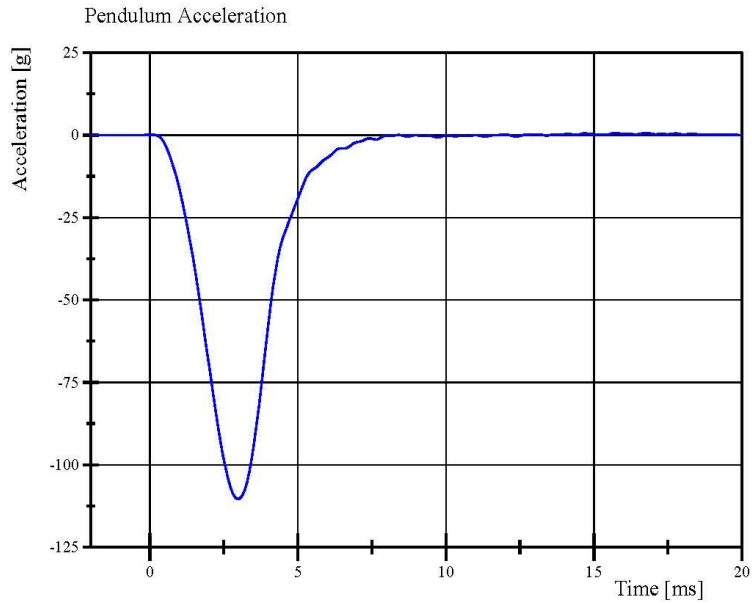
**Condition: Used**

**Comments:**

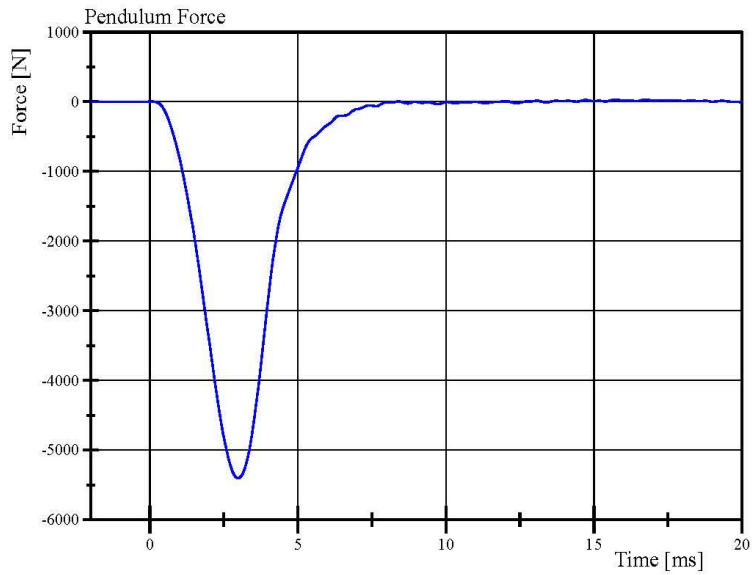
**Knee Skin S/N: 3131**

# Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 50th Serial No. 037 Certification No. 52-1  
Test Date: 11/2/2018



Filter Class: CFC\_600  
Max: 0.7 g at 15.8 ms  
Min: -110.4 g at 3.0 ms



Filter Class: CFC\_600  
Max: 32.5 N at 15.8 ms  
Min: -5,403.1 N at 3.0 ms

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

11.02.2018 07:43:04 1734



**Pre-Test Calibration Sheets**

**Front Passenger S/N 426**

**Transportation Research Center Inc.**  
**5720 HIII 5th Dummy**  
**External Dimensions**  
**Serial No. 426 Calibration No. 45**

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	781	Yes
B	Shoulder Pivot Height	431.8 - 457.2	443	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	79	Yes
F	Thigh Clearance	119.4 - 134.6	130	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	250	Yes
H	Head Back to Backline	43.2 - 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	285	Yes
J	Elbow Rest Height	182.8 - 203.2	196	Yes
K	Buttock Knee Length	520.7 - 546.1	534	Yes
L	Popliteal Height	355.6 - 376.0	359	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	429	Yes
O	Chest Depth without Jacket	175.3 - 190.5	182	Yes
P	Foot Length	218.5 - 233.7	224	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	141	Yes
T	Head Depth	177.8 - 188.0	180	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	356	Yes
W	Foot Breadth	78.8 - 94.0	85	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	870	Yes
Z	Waist Circumference	759.5 - 789.9	775	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	164	Yes

Revised 8/10/12



## Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	284.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	4.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

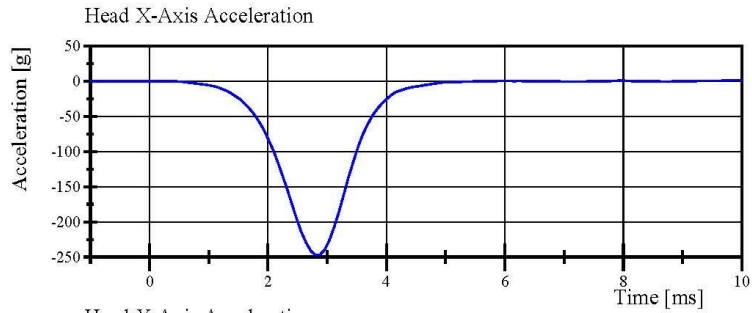
**Head Skin S/N: 1348**

# Transportation Research Center Inc.

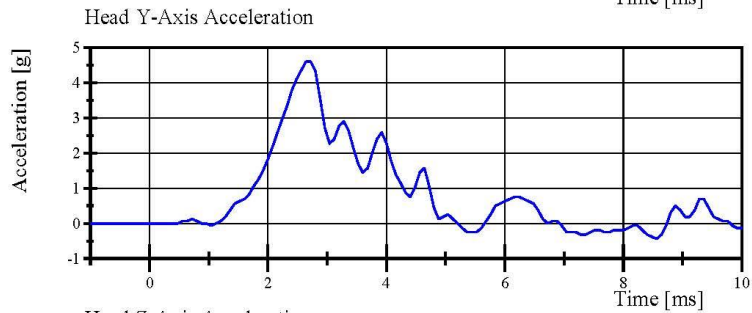
Front Head Drop

HIII 5th Serial No. 426 Certification No. 45-1

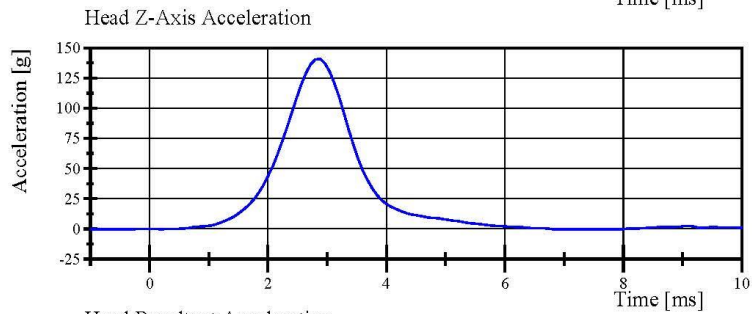
Test Date: 10/11/2018



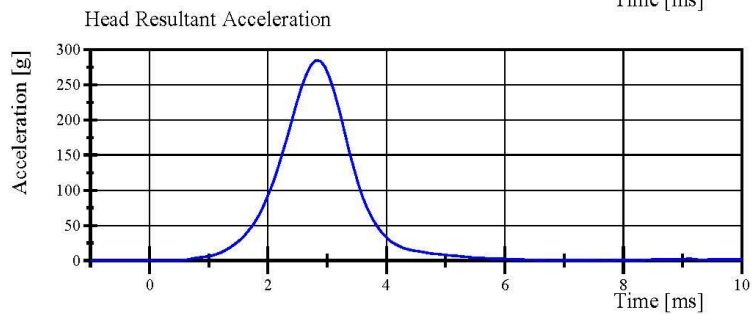
Filter Class: CFC\_1000  
Max: 1.4 g at 10.0 ms  
Min: -247.0 g at 2.8 ms



Filter Class: CFC\_1000  
Max: 4.6 g at 2.6 ms  
Min: -0.4 g at 8.6 ms



Filter Class: CFC\_1000  
Max: 140.8 g at 2.9 ms  
Min: -0.4 g at 7.2 ms



Filter Class: CFC\_1000  
Max: 284.2 g at 2.8 ms  
Min: 0.0 g at -1.0 ms

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

10.11.2018 10:50:50 570



## Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.062 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.35 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.50 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.43 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-79.2 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	77.9 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	87.6 ms	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

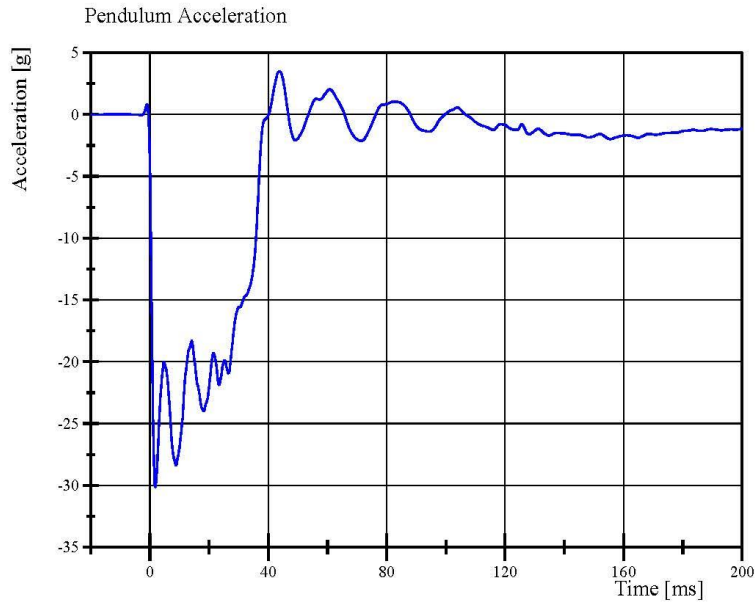
**Neck S/N:** DM2392

# Transportation Research Center Inc.

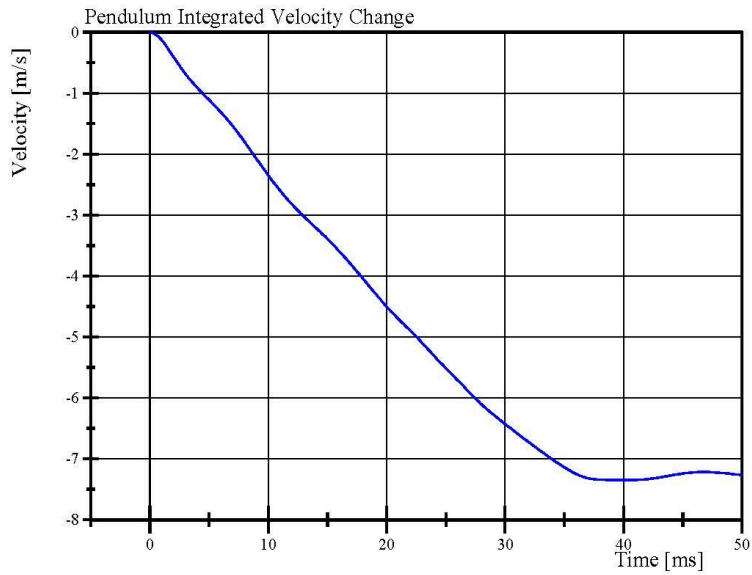
Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018



Filter Class: CFC\_180  
Max: 3.5 g at 43.9 ms  
Min: -30.1 g at 1.9 ms



Filter Class: CFC\_180  
Max: 0.0 m/s at 0.0 ms  
Min: -7.4 m/s at 40.1 ms

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

10.11.2018 11:27:27 1814



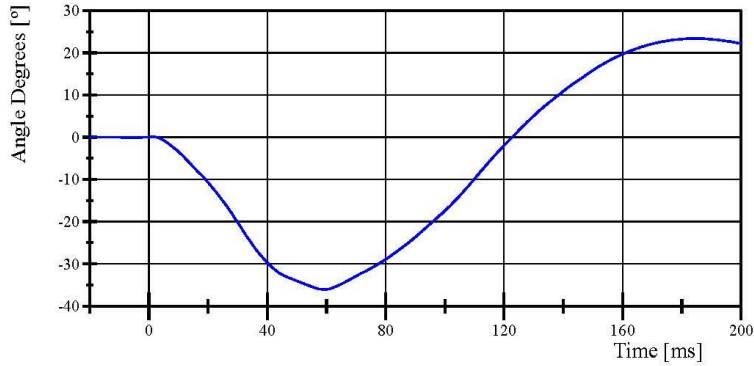
# Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

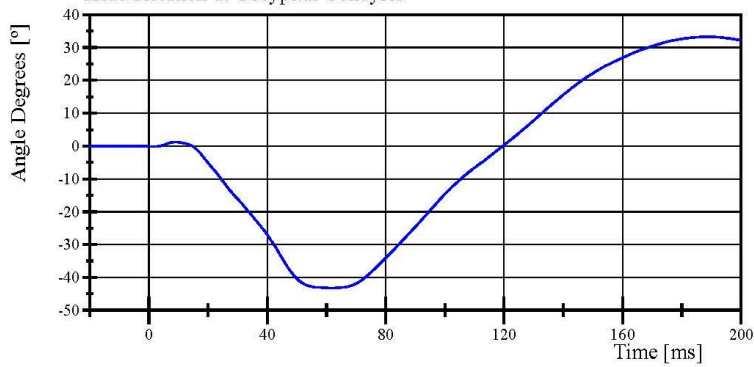
Test Date: 10/11/2018

Pot Rotation at the Base of Neck



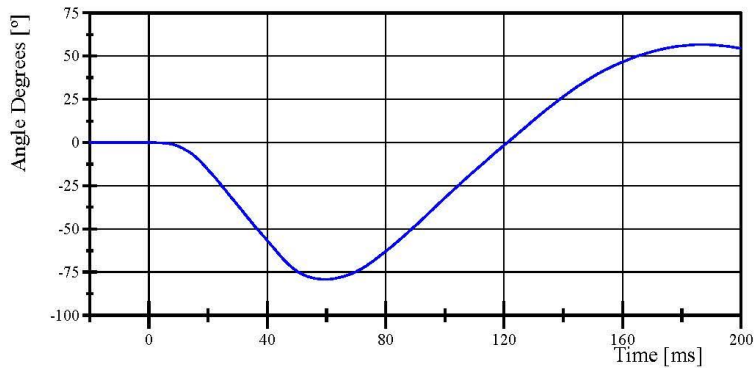
Filter Class: CFC\_60  
Max: 23.4 ° at 184.8 ms  
Min: -36.0 ° at 59.2 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 33.3 ° at 188.8 ms  
Min: -43.2 ° at 61.7 ms

Total Head D-Plane Rotation



Filter Class: CFC\_60  
Max: 56.6 ° at 186.8 ms  
Min: -79.2 ° at 59.8 ms

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

10.11.2018 11:27:28 1814

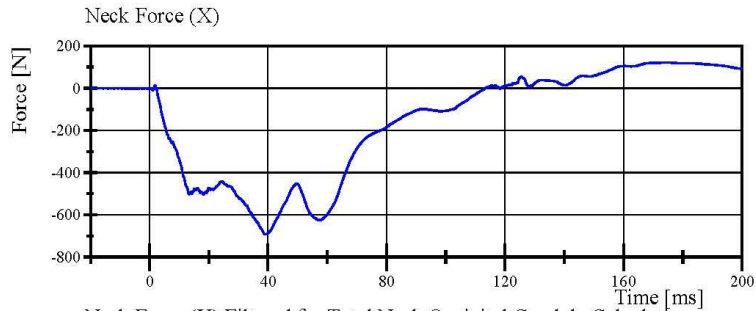


# Transportation Research Center Inc.

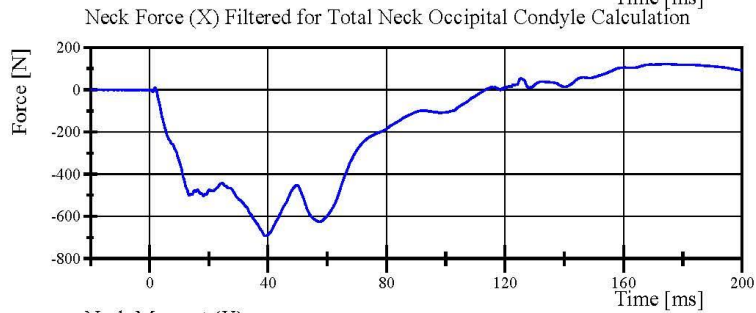
Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

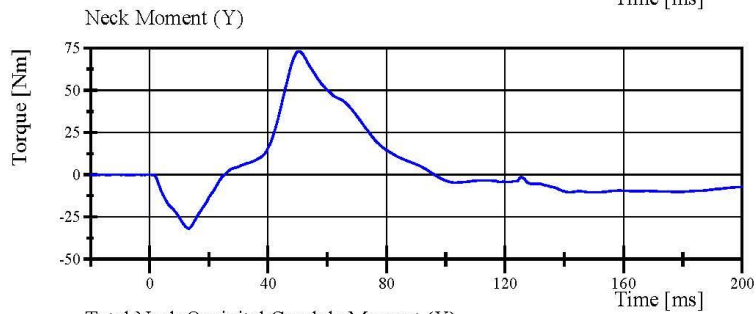
Test Date: 10/11/2018



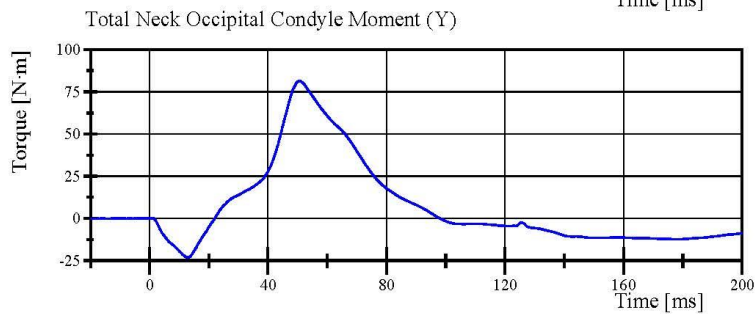
Filter Class: CFC\_1000  
Max: 122.8 N at 174.9 ms  
Min: -692.7 N at 39.2 ms



Filter Class: CFC\_600  
Max: 122.4 N at 174.9 ms  
Min: -692.5 N at 39.2 ms



Filter Class: CFC\_600  
Max: 73.1 Nm at 50.3 ms  
Min: -31.9 Nm at 13.3 ms



Filter Class: Without\_(Consta  
Max: 81.3 N·m at 50.7 ms  
Min: -23.0 N·m at 13.1 ms

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

10.11.2018 11:27:29 1814



## Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.105 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.85 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.62 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.29 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	110.4 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-56.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	105.9 ms	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

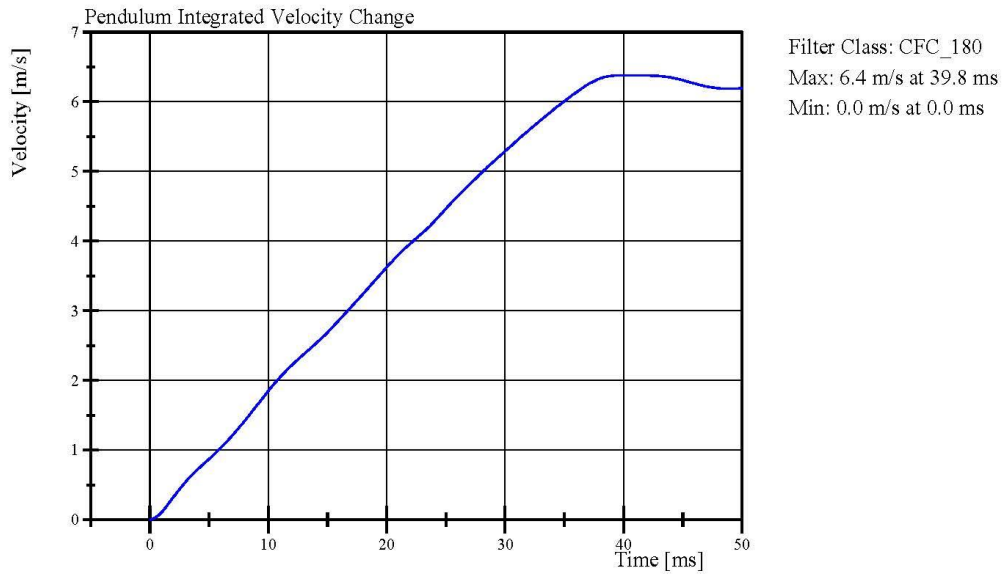
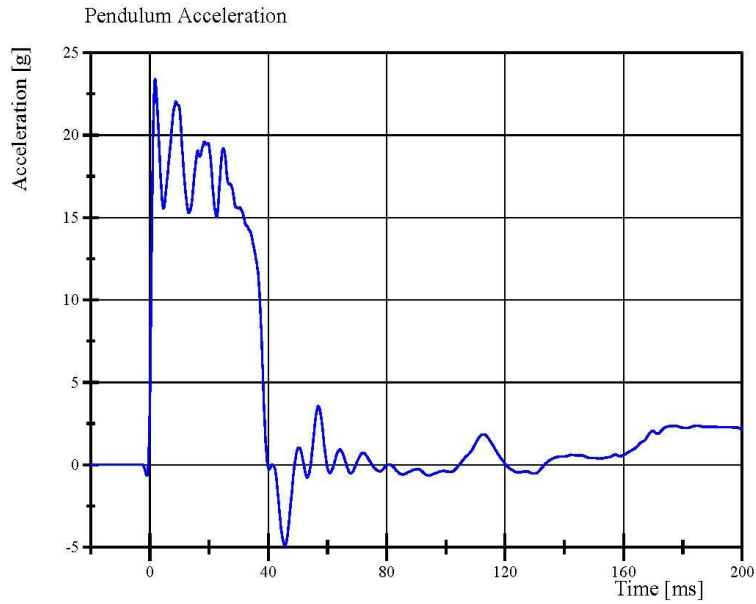
**Neck S/N:** DM2392

# Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

Test Date: 10/11/2018



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

10.11.2018 13:09:48 1959



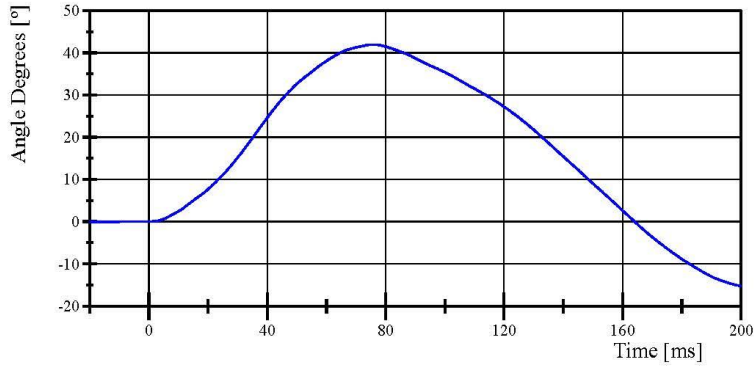
# Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

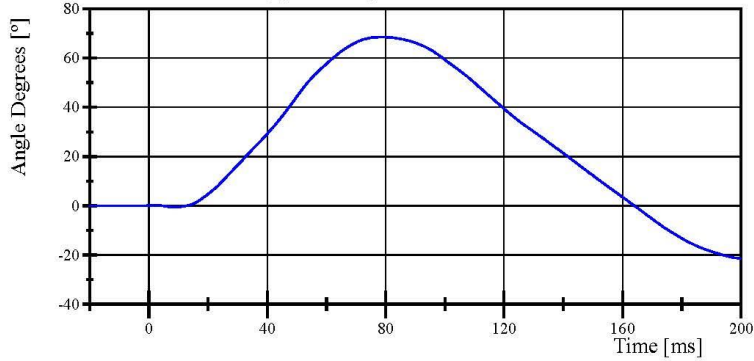
Test Date: 10/11/2018

Pot Rotation at the Base of Neck



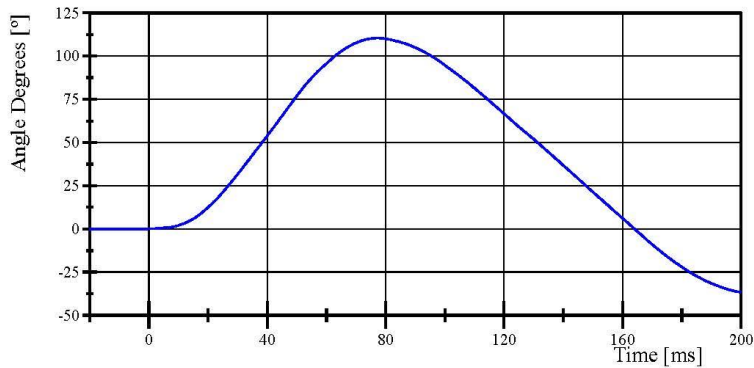
Filter Class: CFC\_60  
Max: 41.9 ° at 75.8 ms  
Min: -15.2 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 68.6 ° at 79.0 ms  
Min: -21.5 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC\_60  
Max: 110.4 ° at 77.3 ms  
Min: -36.8 ° at 200.0 ms

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

10.11.2018 13:09:49 1959

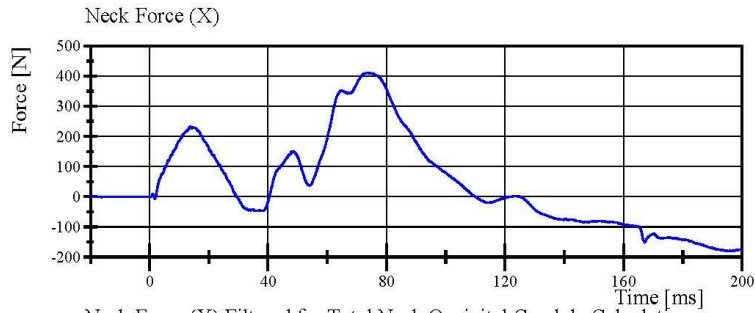


# Transportation Research Center Inc.

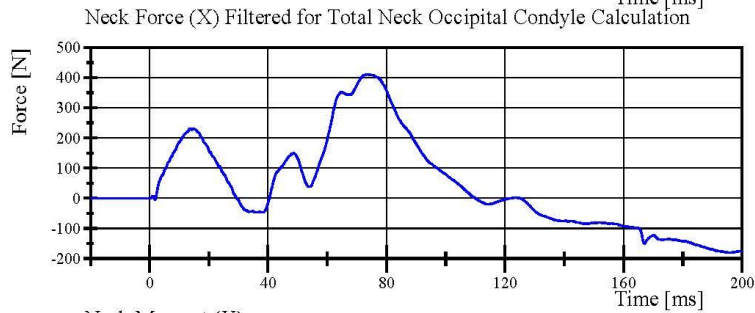
Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

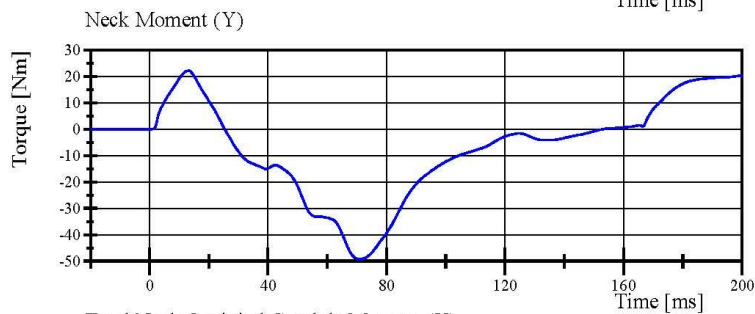
Test Date: 10/11/2018



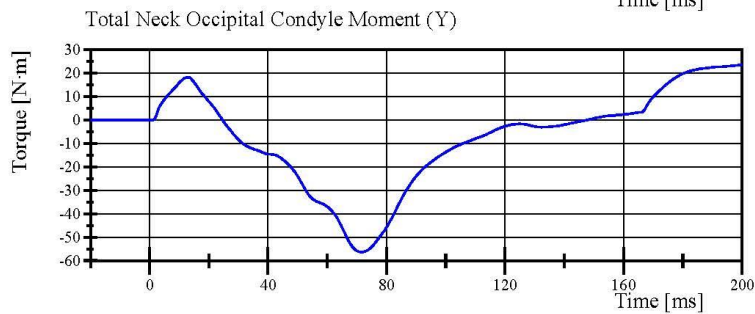
Filter Class: CFC\_1000  
Max: 411.8 N at 73.5 ms  
Min: -179.9 N at 195.6 ms



Filter Class: CFC\_600  
Max: 411.4 N at 73.5 ms  
Min: -179.6 N at 195.6 ms



Filter Class: CFC\_600  
Max: 22.2 Nm at 13.3 ms  
Min: -49.3 Nm at 70.9 ms



Filter Class: Without\_(Consta  
Max: 23.4 N·m at 200.0 ms  
Min: -56.3 N·m at 71.6 ms

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

10.11.2018 13:09:50 1959



## Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.726 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,377.6 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,378.6 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-51.7 mm	Yes
Internal Hysteresis	69 - 85 %	74.7 %	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

**Jacket S/N:** DG9935

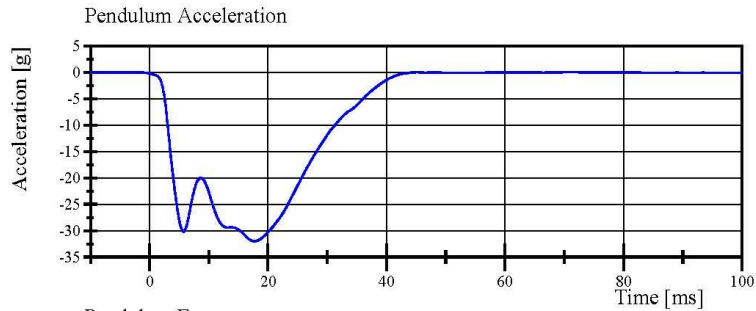
**Rib Set S/N:** DJ1164

# Transportation Research Center Inc.

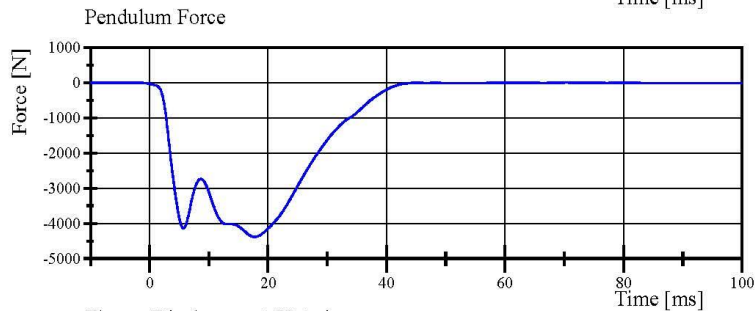
Front Thorax

HIII 5th Serial No. 426 Certification No. 45-1

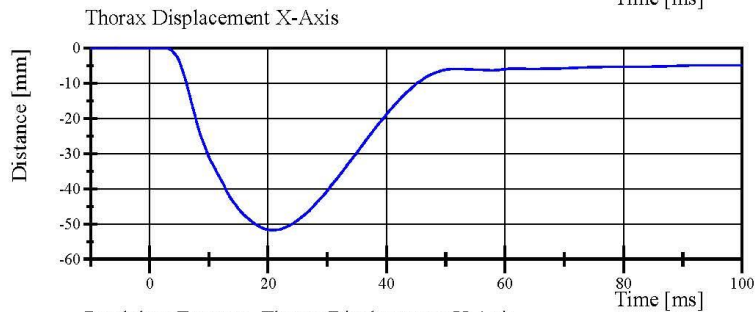
Test Date: 10/11/2018



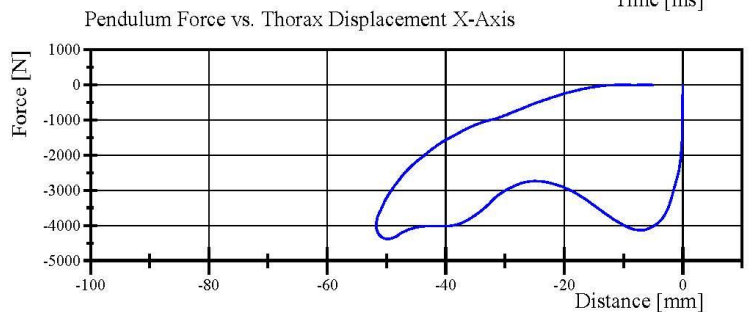
Filter Class: CFC\_180  
Max: 0.0 g at 70.4 ms  
Min: -32.0 g at 17.7 ms



Filter Class: CFC\_180  
Max: 6.2 N at 70.4 ms  
Min: -4,378.6 N at 17.7 ms



Filter Class: CFC\_600  
Max: 0.0 mm at -5.1 ms  
Min: -51.7 mm at 20.9 ms



Filter Class: CFC\_180  
Max: 6.2 N at -5.7 mm  
Min: -4,378.6 N at -49.8 mm

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

10.11.2018 10:19:53 381



# Transportation Research Center Inc.



Hybrid III Small Female Torso Flexion

NHTSA

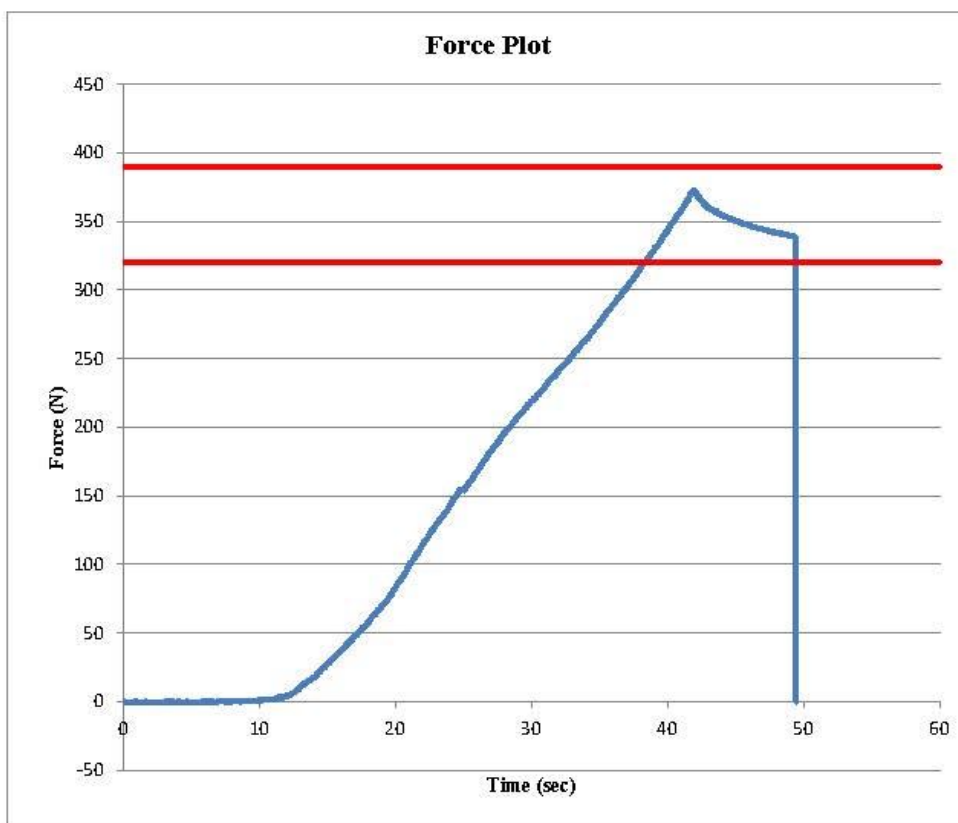
Serial Number: 426

Date: 10/11/2018

Test Number: 1

Time: 13:49

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.6 °C Pass
Humidity	10 - 70	48 % Pass
Average Angular Velocity	0.5 - 1.5	0.91 deg/sec Pass
Initial Angle	0 - 20	17.79 deg Pass
Peak Force at 45.31°	320 - 390	372.57 N Pass
Final Angle	-8 - 8	5.55 deg Pass



Comments:  
Abdomen S/N: 1047  
Pelvis S/N: 885  
Lumbar S/N: N/A

## Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 45-1  
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.130 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,824.7 N	Yes

**Test meets specifications.**

**Condition:** Used

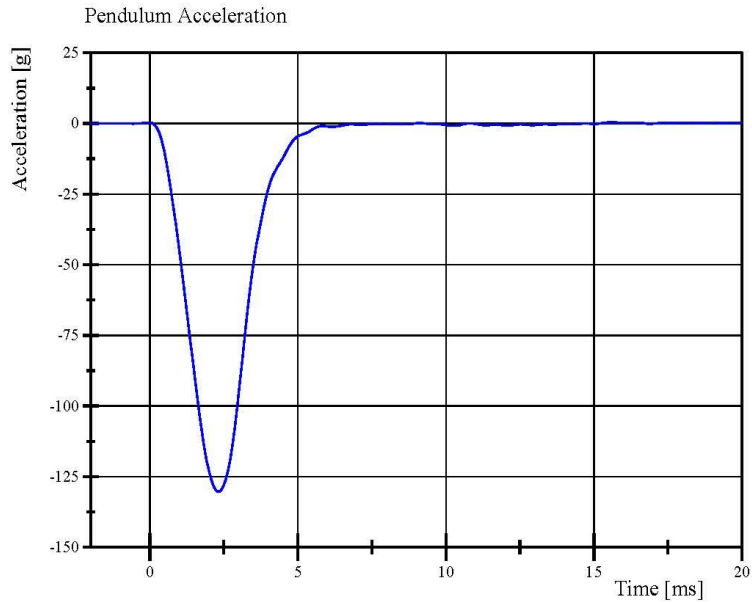
**Comments:**

**Knee Skin S/N:** 1366

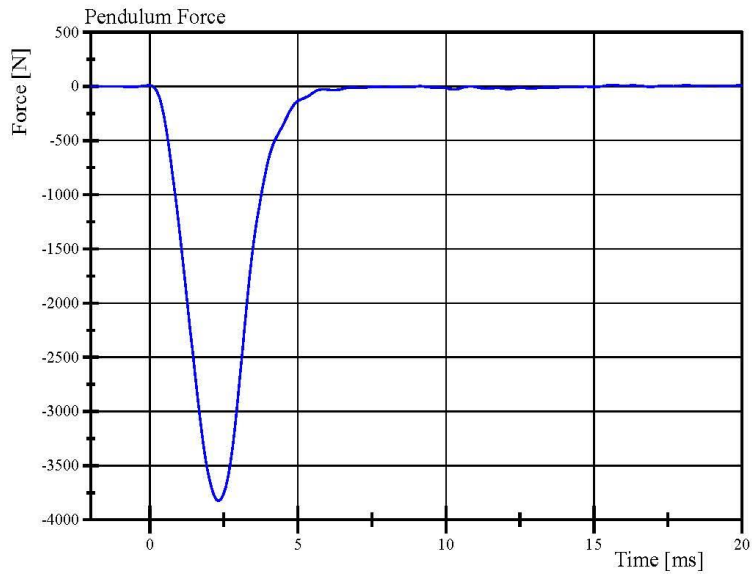
**Knee Insert S/N:** N/A

# Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 45-1  
Test Date: 10/11/2018



Filter Class: CFC\_600  
Max: 0.4 g at 15.6 ms  
Min: -130.4 g at 2.3 ms



Filter Class: CFC\_600  
Max: 12.2 N at 15.6 ms  
Min: -3,824.7 N at 2.3 ms

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

10.11.2018 09:52:30 1747



## Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 45-1  
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.107 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,675.6 N	Yes

**Test meets specifications.**

**Condition: Used**

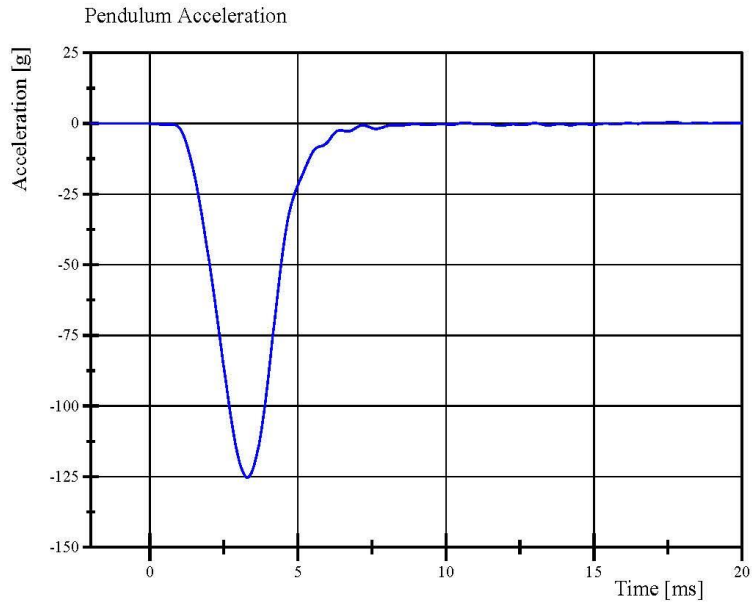
**Comments:**

**Knee Skin S/N: 1402**

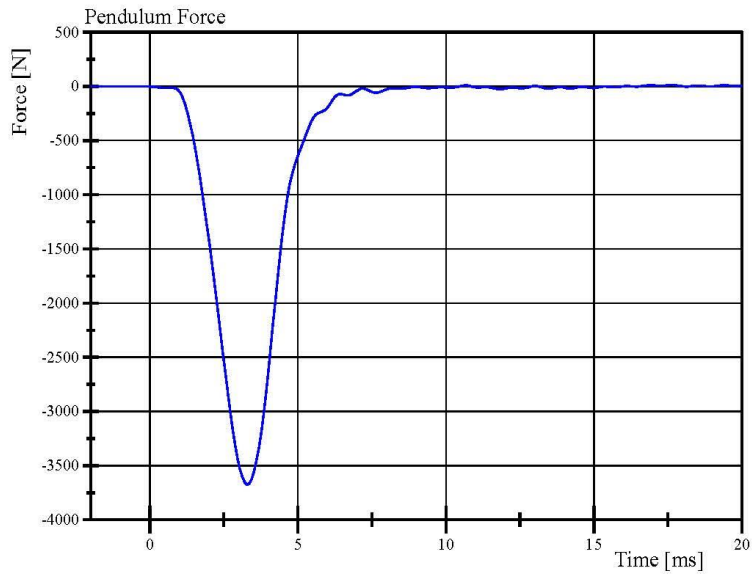
**Knee Insert S/N: N/A**

# Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 45-1  
Test Date: 10/11/2018



Filter Class: CFC\_600  
Max: 0.4 g at 17.6 ms  
Min: -125.4 g at 3.3 ms



Filter Class: CFC\_600  
Max: 13.0 N at 17.6 ms  
Min: -3,675.6 N at 3.3 ms

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

10.11.2018 09:59:05 1751



**Post-Test Calibration Sheets**

**Front Passenger S/N 426**

**Transportation Research Center Inc.**  
**5720 HIII 5th Dummy**  
**External Dimensions**  
**Serial No. 426 Calibration No. 46**

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	781	Yes
B	Shoulder Pivot Height	431.8 - 457.2	443	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	79	Yes
F	Thigh Clearance	119.4 - 134.6	130	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	250	Yes
H	Head Back to Backline	43.2 - 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	285	Yes
J	Elbow Rest Height	182.8 - 203.2	196	Yes
K	Buttock Knee Length	520.7 - 546.1	534	Yes
L	Popliteal Height	355.6 - 376.0	359	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	429	Yes
O	Chest Depth without Jacket	175.3 - 190.5	182	Yes
P	Foot Length	218.5 - 233.7	224	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	141	Yes
T	Head Depth	177.8 - 188.0	180	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	356	Yes
W	Foot Breadth	78.8 - 94.0	85	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	870	Yes
Z	Waist Circumference	759.5 - 789.9	775	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	164	Yes

Revised 8/10/12



## Transportation Research Center Inc.

Front Head Drop  
HIII 5th Serial No. 426 Certification No. 46-1  
Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	282.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	3.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

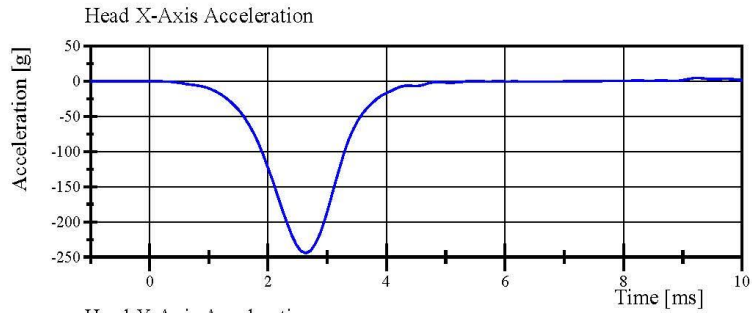
**Head Skin S/N: 1348**

# Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 46-1

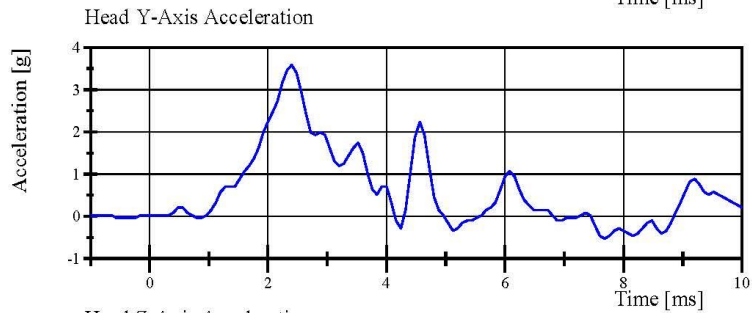
Test Date: 11/2/2018



Filter Class: CFC\_1000

Max: 4.7 g at 9.3 ms

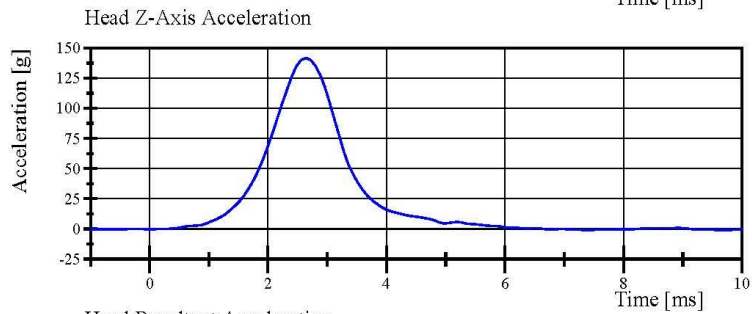
Min: -244.3 g at 2.6 ms



Filter Class: CFC\_1000

Max: 3.6 g at 2.4 ms

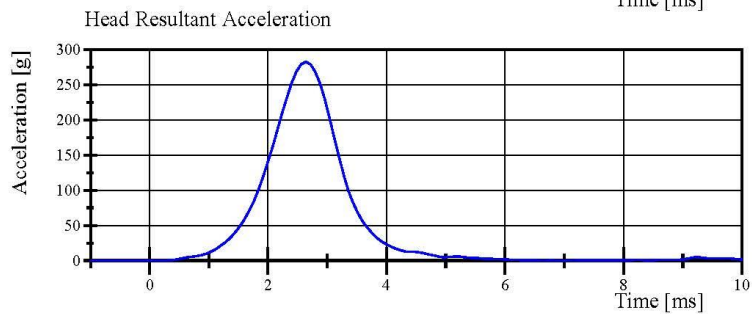
Min: -0.5 g at 7.7 ms



Filter Class: CFC\_1000

Max: 141.8 g at 2.6 ms

Min: -0.9 g at 7.4 ms



Filter Class: CFC\_1000

Max: 282.5 g at 2.6 ms

Min: 0.0 g at -0.6 ms

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

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## Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 46-2

Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.051 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.31 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.44 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.39 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-80.6 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	78.9 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	88.9 ms	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

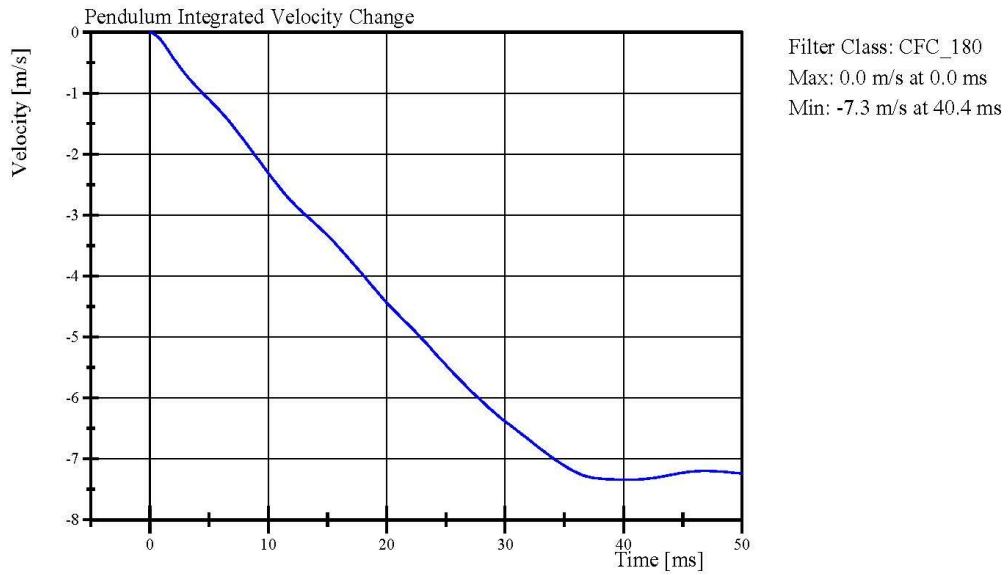
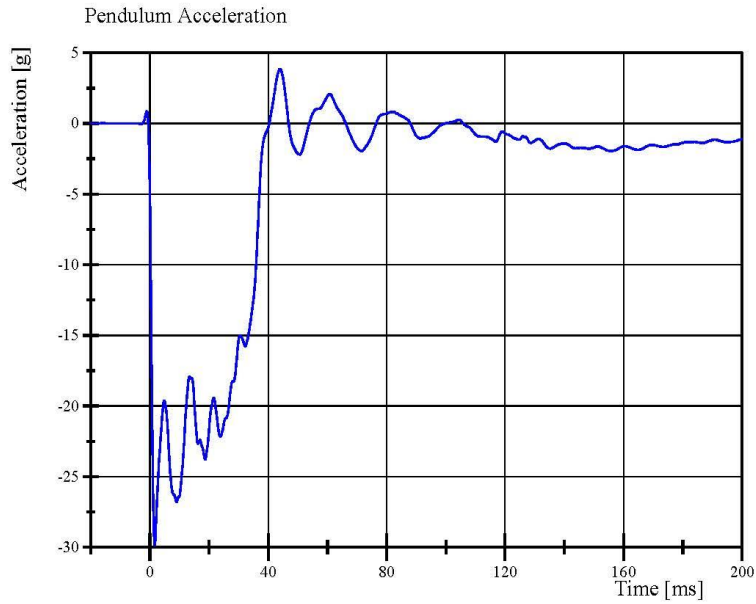
**Neck S/N:** DM2392

# Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 46-2

Test Date: 11/2/2018



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

11.02.2018 16:16:50 1819



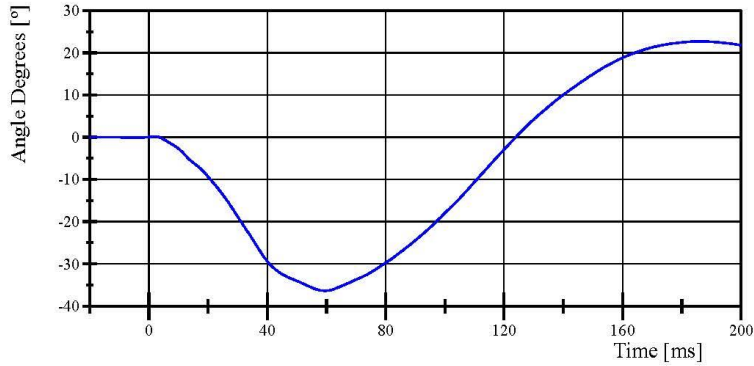
# Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 46-2

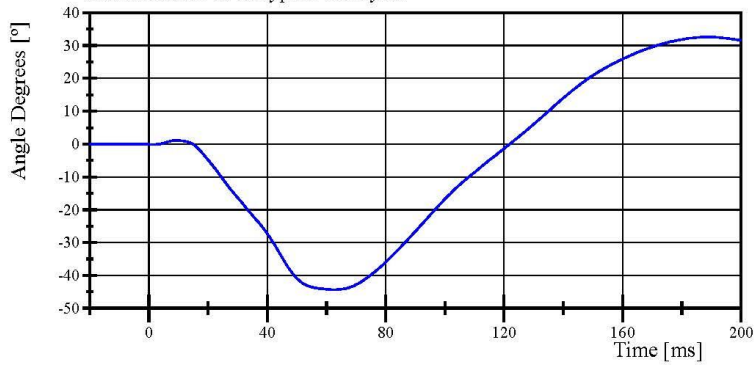
Test Date: 11/2/2018

Pot Rotation at the Base of Neck



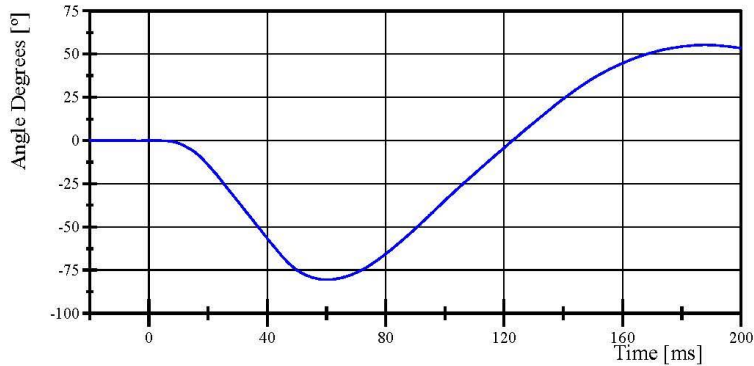
Filter Class: CFC\_60  
Max: 22.7 ° at 186.1 ms  
Min: -36.4 ° at 59.5 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 32.6 ° at 188.7 ms  
Min: -44.3 ° at 62.5 ms

Total Head D-Plane Rotation



Filter Class: CFC\_60  
Max: 55.3 ° at 187.8 ms  
Min: -80.6 ° at 60.3 ms

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

11.02.2018 16:16:50 1819

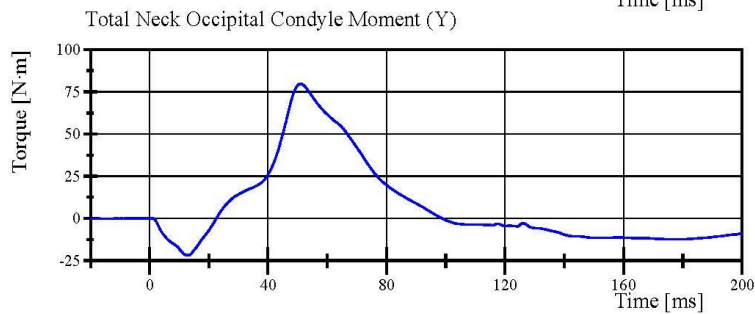
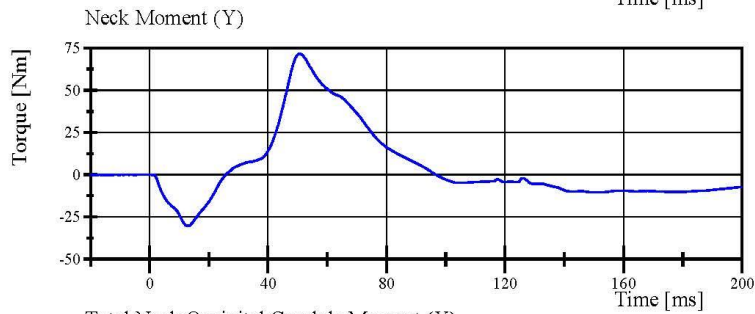
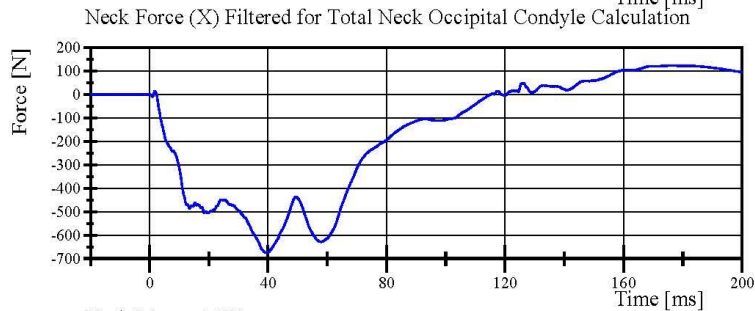
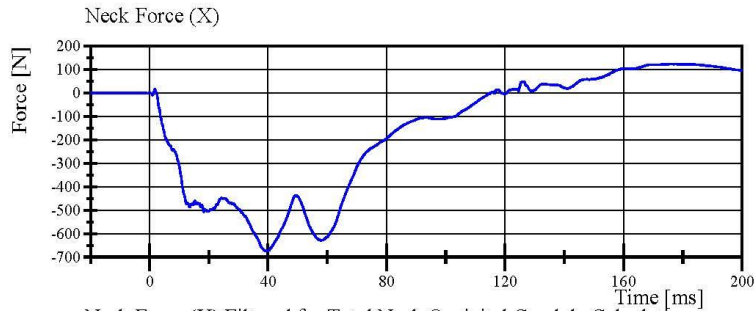


# Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 46-2

Test Date: 11/2/2018



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

11.02.2018 16:16:51 1819



## Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 46-2

Test Date: 11/5/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.101 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.80 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.61 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.20 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	108.7 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-55.9 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	106.2 ms	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

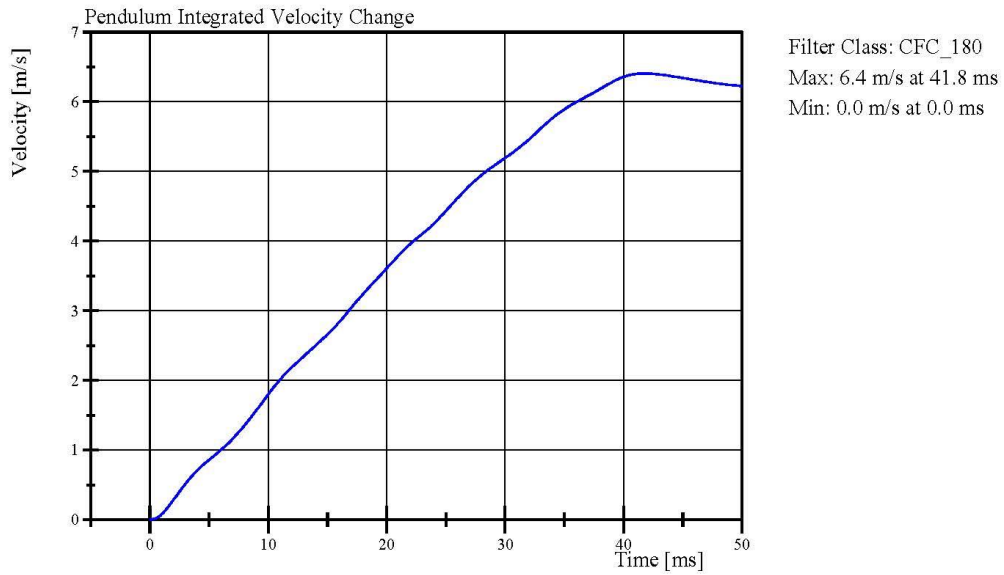
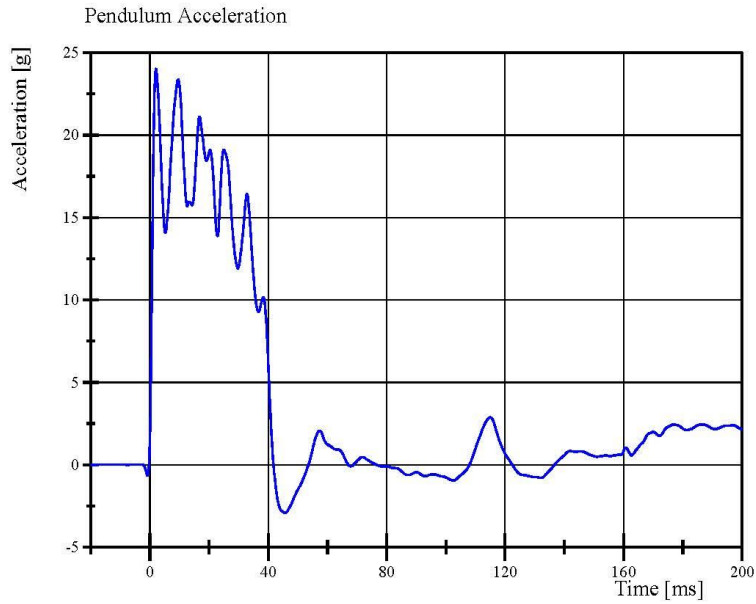
**Neck S/N:** DM2392

# Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 46-2

Test Date: 11/5/2018



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

11.05.2018 08:04:46 1956



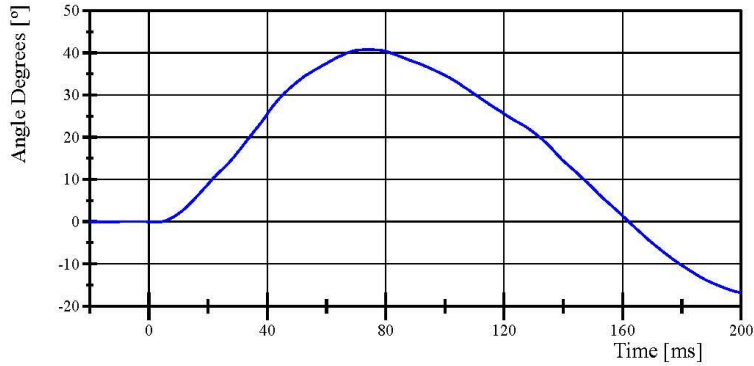
# Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 46-2

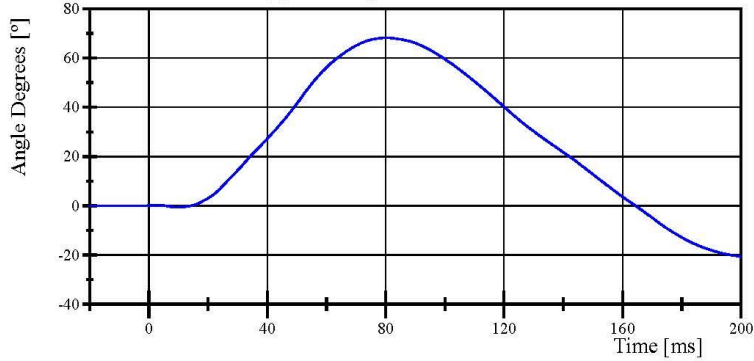
Test Date: 11/5/2018

Pot Rotation at the Base of Neck



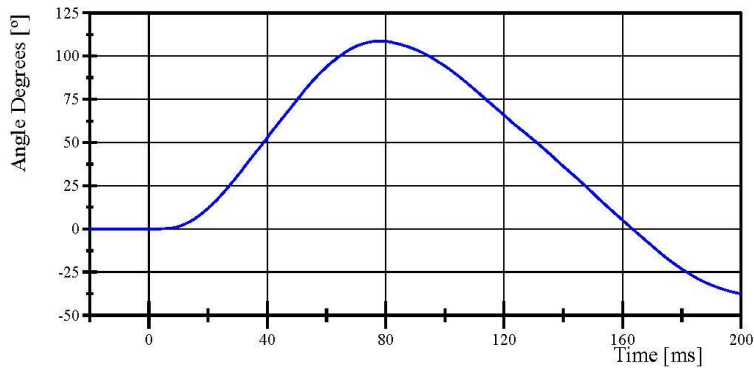
Filter Class: CFC\_60  
Max: 40.8 ° at 73.9 ms  
Min: -16.8 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 68.2 ° at 80.2 ms  
Min: -20.7 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC\_60  
Max: 108.7 ° at 78.2 ms  
Min: -37.5 ° at 200.0 ms

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

11.05.2018 08:04:47 1956

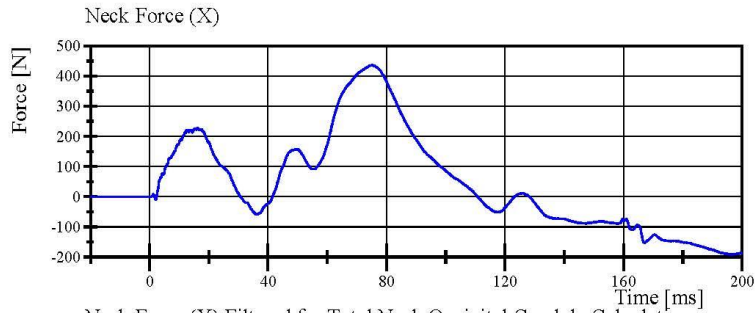


# Transportation Research Center Inc.

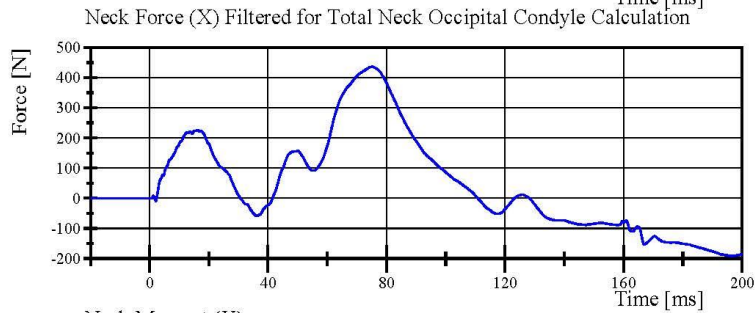
Neck Extension

HIII 5th Serial No. 426 Certification No. 46-2

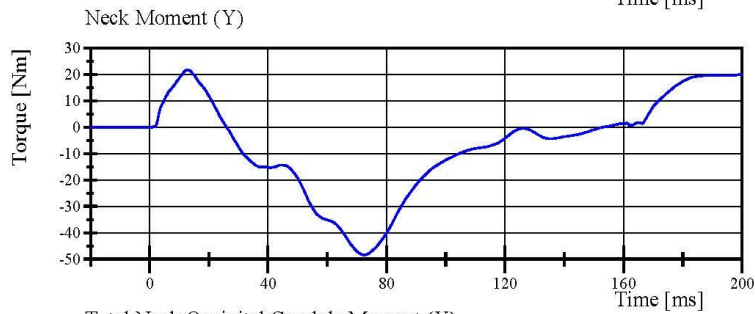
Test Date: 11/5/2018



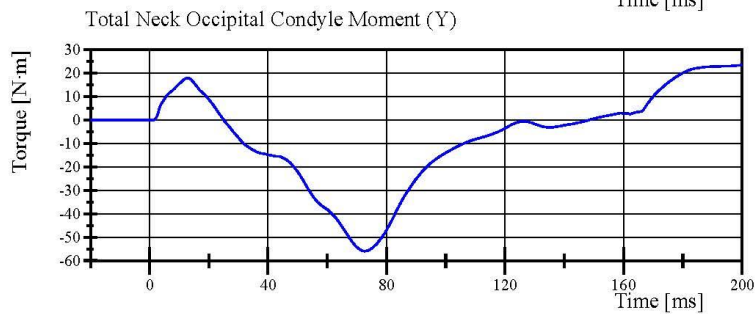
Filter Class: CFC\_1000  
Max: 436.5 N at 75.0 ms  
Min: -190.9 N at 196.0 ms



Filter Class: CFC\_600  
Max: 436.5 N at 75.2 ms  
Min: -190.6 N at 196.1 ms



Filter Class: CFC\_600  
Max: 21.8 Nm at 12.8 ms  
Min: -48.3 Nm at 72.5 ms



Filter Class: Without\_(Consta  
Max: 23.4 N.m at 200.0 ms  
Min: -55.9 N.m at 72.7 ms

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

11.05.2018 08:04:47 1956



## Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 46-1

Test Date: 11/5/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.726 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,386.5 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,458.1 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-51.2 mm	Yes
Internal Hysteresis	69 - 85 %	75.1 %	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

**Jacket S/N:** DG9935

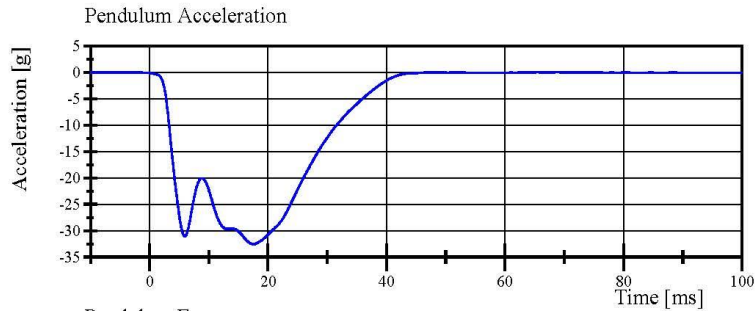
**Rib Set S/N:** DJ1164

# Transportation Research Center Inc.

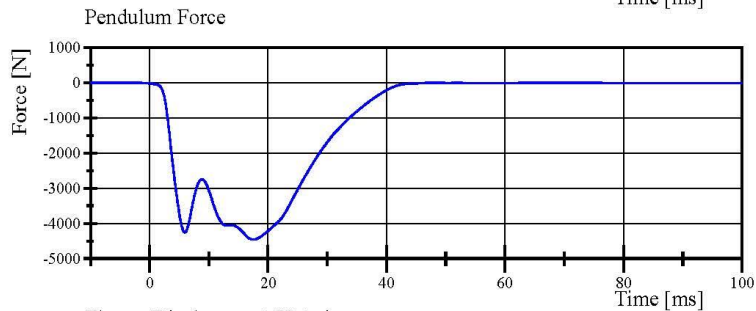
Front Thorax

HIII 5th Serial No. 426 Certification No. 46-1

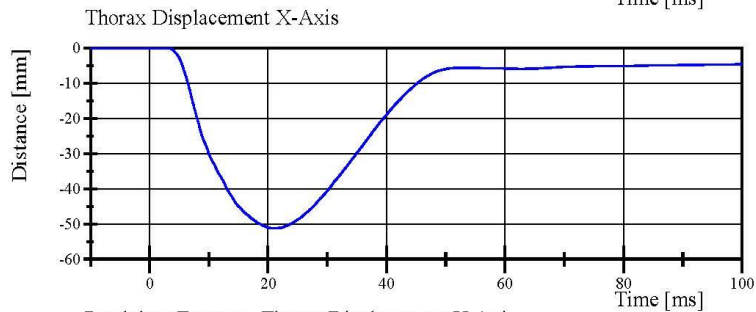
Test Date: 11/5/2018



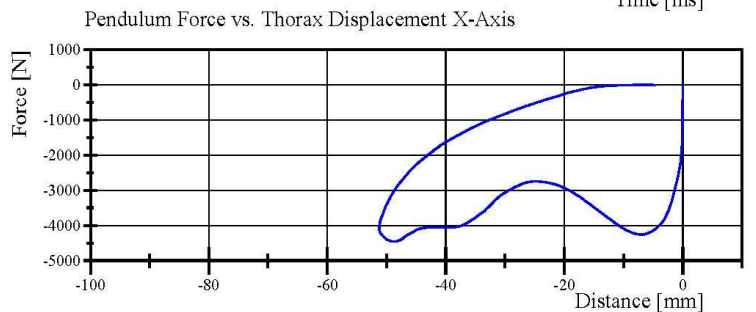
Filter Class: CFC\_180  
Max: 0.0 g at 68.8 ms  
Min: -32.5 g at 17.5 ms



Filter Class: CFC\_180  
Max: 5.4 N at 68.8 ms  
Min: -4,458.1 N at 17.5 ms



Filter Class: CFC\_600  
Max: 0.0 mm at -7.6 ms  
Min: -51.2 mm at 20.7 ms



Filter Class: CFC\_180  
Max: 5.4 N at -5.5 mm  
Min: -4,458.1 N at -48.8 mm

# Transportation Research Center Inc.



Hybrid III Small Female Torso Flexion

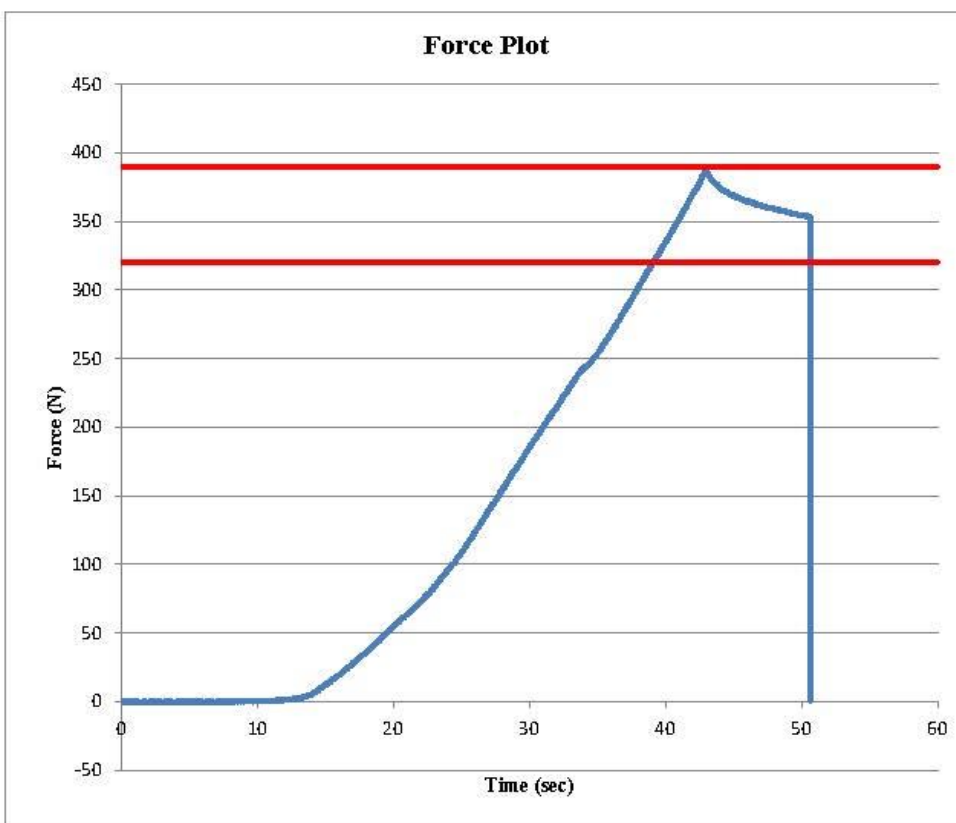
NHTSA

Serial Number: 426 Date: 11/5/2018

Test Number: 1 Time: 14:56

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.8 °C Pass
Humidity	10 - 70	45 % Pass
Average Angular Velocity	0.5 - 1.5	0.94 deg/sec Pass
Initial Angle	0 - 20	17.58 deg Pass
Peak Force at 45.42°	320 - 390	386.26 N Pass
Final Angle	-8 - 8	4.5 deg Pass



Comments:  
 Abdomen S/N: 1047  
 Pelvis S/N: 885  
 Lumbar S/N: N/A

## Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 46-1  
Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.086 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,806.6 N	Yes

**Test meets specifications.**

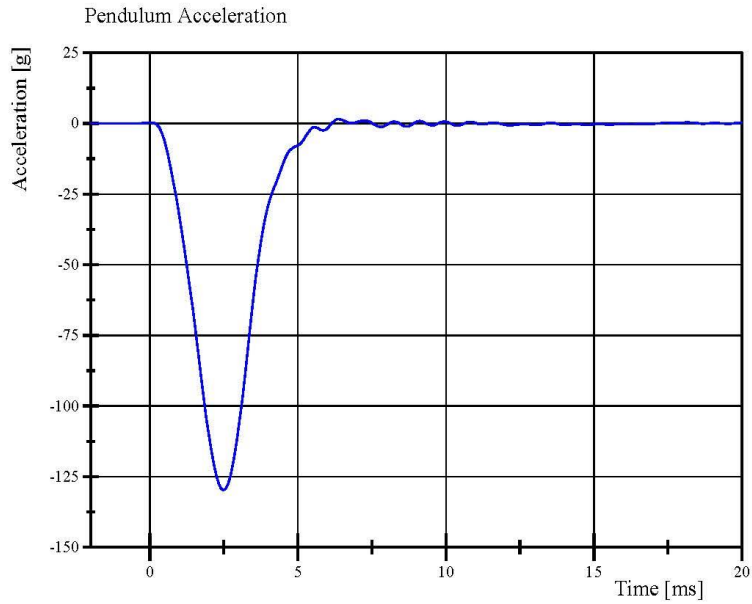
**Condition: Used**

**Comments:**

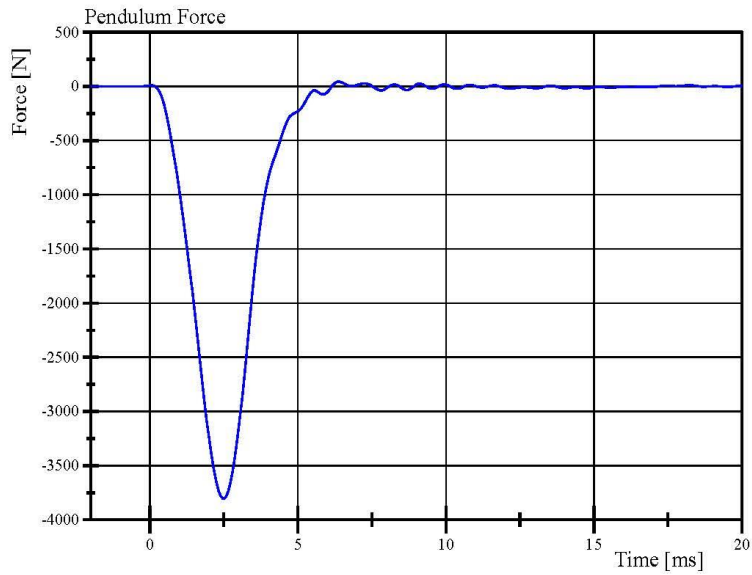
**Knee Skin S/N: 1366**

# Transportation Research Center Inc.

Left Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 46-1  
Test Date: 11/2/2018



Filter Class: CFC\_600  
Max: 1.5 g at 6.4 ms  
Min: -129.8 g at 2.5 ms



Filter Class: CFC\_600  
Max: 44.6 N at 6.4 ms  
Min: -3,806.6 N at 2.5 ms

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

11.02.2018 14:21:50 1824



## Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 46-1  
Test Date: 11/2/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.086 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,985.3 N	Yes

**Test meets specifications.**

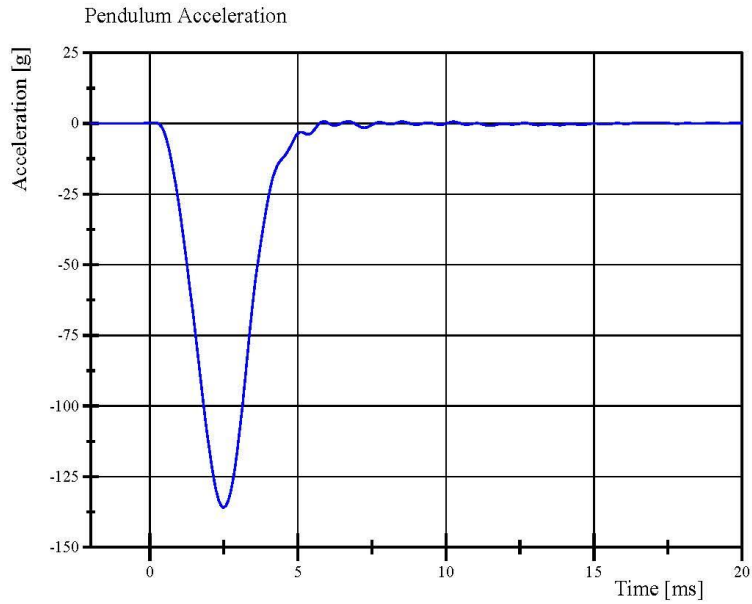
**Condition: Used**

**Comments:**

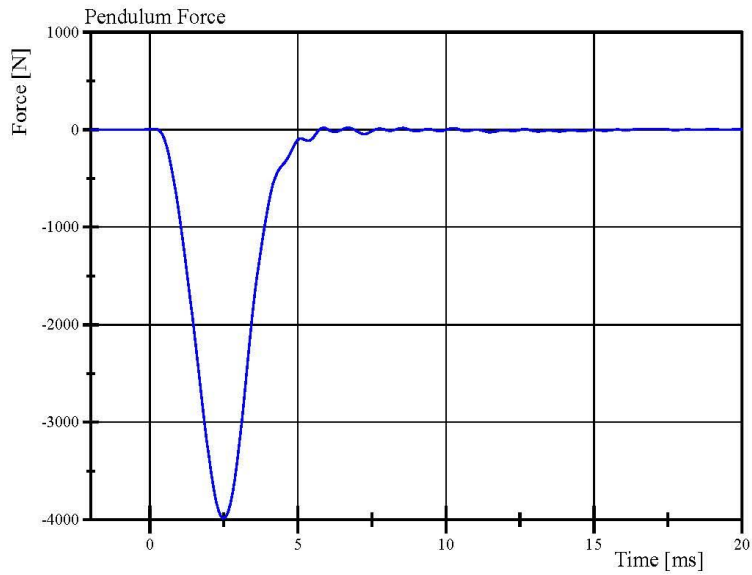
**Knee Skin S/N: 1402**

# Transportation Research Center Inc.

Right Knee Femur Response Test  
HIII 5th Serial No. 426 Certification No. 46-1  
Test Date: 11/2/2018



Filter Class: CFC\_600  
Max: 0.7 g at 6.7 ms  
Min: -135.9 g at 2.5 ms



Filter Class: CFC\_600  
Max: 20.8 N at 6.7 ms  
Min: -3,985.3 N at 2.5 ms

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

11.02.2018 14:25:19 1827



**APPENDIX D**  
**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION**

**TABLE 1 – Driver Dummy Instrumentation**

Instrumentation			Axis/Location	Hybrid III 50th S/N 037		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P94536	Endevco	19-Sep-2018	
		Y	P94650	Endevco	19-Sep-2018	
		Z	P94622	Endevco	19-Sep-2018	
	Redundant	X	P94431	Endevco	19-Sep-2018	
		Y	P94487	Endevco	19-Sep-2018	
		Z	P94645	Endevco	19-Sep-2018	
Head Angular Rate Sensors			X	ARS13049	DTS	8-Dec-2018
			Y	ARS13039	DTS	8-Dec-2018
			Z	ARS13573	DTS	8-Dec-2018
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	2021	Humanetics	2-Apr-2018
Chest Accelerometers	Primary	X	P87834	Endevco	19-Sep-2018	
		Y	P61255	Endevco	20-Sep-2018	
		Z	P45008	Endevco	20-Sep-2018	
	Redundant	X	P91177	Endevco	19-Sep-2018	
		Y	P94570	Endevco	20-Sep-2018	
		Z	P91172	Endevco	20-Sep-2018	
Chest Potentiometer			X	CST037	Servo	29-Mar-2018
Pelvis Accelerometers			X	P91185	Endevco	19-Sep-2018
			Y	P91876	Endevco	19-Sep-2018
			Z	P91180	Endevco	19-Sep-2018
Femur Load Cells	Left	Primary	Z	DI4215-FZ1	Denton	30-Mar-2018
		Redundant	Z	DI4215-FZ2	Denton	30-Mar-2018
	Right	Primary	Z	DI4216-FZ1	Denton	30-Mar-2018
		Redundant	Z	DI4216-FZ2	Denton	30-Mar-2018
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-94	Denton	30-Mar-2018
		Lower	MX, MY, FZ	3644-370	Denton	2-Apr-2018
	Right	Upper	MX, MY, FZ	3643-413	Denton	2-Apr-2018
		Lower	MX, MY, FZ	3644-401	Denton	2-Apr-2018
Foot Accelerometers	Left	Rear	X	P90848	Endevco	19-Sep-2018
			Z	P91498	Endevco	19-Sep-2018
		Front	Z	P90841	Endevco	19-Sep-2018
	Right	Rear	X	P93467	Endevco	19-Sep-2018
			Z	P97619	Endevco	19-Sep-2018
		Front	Z	P94523	Endevco	19-Sep-2018
Seat Belt Load Cells			Lap	N/A		
			Shoulder	N/A		

**TABLE 2 – Front Passenger Dummy Instrumentation**

Instrumentation			Axis/Location	Hybrid III 5th S/N 426		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P90285	Endevco	1-Oct-2018	
		Y	P90302	Endevco	1-Oct-2018	
		Z	P94534	Endevco	1-Oct-2018	
	Redundant	X	P89014	Endevco	1-Oct-2018	
		Y	P90855	Endevco	1-Oct-2018	
		Z	P94525	Endevco	1-Oct-2018	
Head Angular Rate Sensors			X	ARS14247	DTS	1-Dec-2018
			Y	ARS14299	DTS	1-Dec-2018
			Z	ARS14303	DTS	1-Dec-2018
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	2207	Denton	1-Oct-2018
Chest Accelerometers	Primary	X	P93543	Endevco	1-Oct-2018	
		Y	P93533	Endevco	1-Oct-2018	
		Z	P93402	Endevco	1-Oct-2018	
	Redundant	X	P91664	Endevco	1-Oct-2018	
		Y	P93546	Endevco	1-Oct-2018	
		Z	P93547	Endevco	1-Oct-2018	
Chest Potentiometer			X	CST426	Servo	1-Oct-2018
Pelvis Accelerometers			X	P93514	Endevco	1-Oct-2018
			Y	P87467	Endevco	1-Oct-2018
			Z	P93766	Endevco	1-Oct-2018
Femur Load Cells	Left	Primary	Z	DI4214-FZ1	Denton	1-Oct-2018
		Redundant	Z	DI4214-FZ2	Denton	1-Oct-2018
	Right	Primary	Z	DI4217-FZ1	Denton	1-Oct-2018
		Redundant	Z	DI4217-FZ2	Denton	1-Oct-2018
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-92	Denton	1-Oct-2018
		Lower	MX, MY, FZ	3644-92	Denton	1-Oct-2018
	Right	Upper	MX, MY, FZ	3643-484	Denton	1-Oct-2018
		Lower	MX, MY, FZ	3644-369	Denton	1-Oct-2018
Foot Accelerometers	Left	Rear	X	P90866	Endevco	1-Oct-2018
			Z	P91909	Endevco	1-Oct-2018
		Front	Z	P97890	Endevco	1-Oct-2018
	Right	Rear	X	P97640	Endevco	1-Oct-2018
			Z	P91471	Endevco	1-Oct-2018
		Front	Z	P91907	Endevco	1-Oct-2018
Seat Belt Load Cells		Lap	N/A			
		Shoulder	N/A			

**TABLE 3 – Vehicle Instrumentation**

Instrumentation			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember/Rear Seat Accelerometers	Left	Primary	X	P94740	Endevco	24-Oct-2018
			Z	P88043	Endevco	24-Oct-2018
		Redundant	X	P73570	Endevco	24-Oct-2018
	Right	Primary	X	P80466	Endevco	24-Oct-2018
			Z	P73587	Endevco	24-Oct-2018
		Redundant	X	P97719	Endevco	24-Oct-2018
Engine Accelerometers	Top		X	P87978	Endevco	24-Oct-2018
	Bottom		X	P75115	Endevco	24-Oct-2018