

REPORT NUMBER: NCAP-KAR-20-006

**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**NISSAN MOTOR CO., LTD.
2020 NISSAN VERSA 4-DOOR SEDAN**

NHTSA NUMBER: M20205215

**PREPARED BY:
APPLUS IDIADA KARCO ENGINEERING, LLC.
9270 HOLLY ROAD
ADELANTO, CA 92301**



DECEMBER 17, 2019

FINAL REPORT

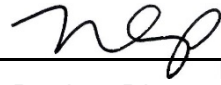
**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVE, SE
ROOM W43-410
WASHINGTON, DC 20590**

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Date: _____

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2020 Nissan Versa 4-door sedan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The test was conducted at the Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on December 3, 2019. The impact velocity of the vehicle was 55.83 km/h and the ambient temperature at the barrier face at the time of impact was 10.0°C. The target vehicle's post-test maximum crush was 295 mm at the vehicle's centerline. The test vehicle's performance is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>187.6</td> <td>700</td> <td>198.5</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-19</td> <td>52</td> <td>-12</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.24</td> <td>1</td> <td>0.58</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1460.1</td> <td>2620</td> <td>1032.9</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-376.7</td> <td>2520</td> <td>-537.0</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-1136.0</td> <td>6805</td> <td>-905.8</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-1067.1</td> <td>6805</td> <td>-818.0</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	187.6	700	198.5	Maximum Chest Compression	mm	63	-19	52	-12	Nij	N/A	1	0.24	1	0.58	Neck Tension	N	4170	1460.1	2620	1032.9	Neck Compression	N	4000	-376.7	2520	-537.0	Left Femur Force	N	10008	-1136.0	6805	-905.8	Right Femur Force	N	10008	-1067.1	6805	-818.0
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat Adjustment, Fuel System, and Steering Wheel Data	8
3	Dummy Longitudinal Clearance Dimensions	10
4	Dummy Lateral Clearance Dimensions	11
5	Seat Belt Positioning Data	12
6	High-Speed Camera Locations and Data	13
7	Vehicle Accelerometer Locations	15
8	Photographic Reference Target Locations	16
9	Load Cell Locations on Fixed Barrier	17
10	Test Vehicle Summary of Results	18
11	Post-Test Observations	19
12	Vehicle Profile Measurements	20
13	Accident Investigation Division Data	22
14	Vehicle Intrusion Measurements	23
15	Summary of Indicant FMVSS 212 and 219 (Partial) Data	25
16	FMVSS 301 Barrier Impact and Static Rollover Results	26
17	Dummy / Vehicle Temperature Stabilization Chart	28
<u>Appendix</u>		<u>Page No.</u>
A	Photographic Documentation	A
B	Dummy Response Data Traces	B
C	Dummy Qualification and Performance Verification	C
D	Test Equipment and Instrumentation Calibration	D

SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 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 number 693JJ919D000004. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing.

SUMMARY

A load cell barrier consisting of 176 load cells was impacted by a 2020 Nissan Versa 4-door sedan at a velocity of 55.83 km/h. The test was performed at Applus IDIADA KARCO Engineering, LLC. on December 3, 2019. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A of this report.

One (1) real-time cameras and sixteen (16) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of 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 seating 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 force transducers, right / left femur load cells, and lower leg instrumentation.

The driver (position 1) ATD (Serial No. 360) and the right-front passenger (position 2) ATD (Serial No. DH1644) 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 dummy and vehicle response data were recorded on an on-board data acquisition system. Appendix B contains the dummy response data traces.

There was 94.9 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush was 295 mm at the vehicle's centerline 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: the driver ATD's head contacted the frontal airbag and headrest. The upper torso contacted the frontal airbag. Both left and right knees contacted the knee airbag.

The passenger's visible contact points were as follows: the passenger ATD's head contacted the frontal airbag and headrest. The upper torso contacted the frontal airbag. Both left and right knees contacted the knee airbag.

The occupant data is summarized below:

ATD Position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50th Male)	187.6	0.24	1460.1	-376.7	38	-19	-1136.0	-1067.1
Passenger (5th Female)	198.5	0.58	1032.9	-537.0	37	-12	-905.8	-818.0

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.574
Pressure	Tire Pressures	lb/in ²	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20205215
Model Year	2020
Make	Nissan
Model	Versa
Body Style	4-Door Sedan
VIN	3N1CN8BV6LL802018
Body Color	Electric Blue
Odometer Reading (km / mi)	31 / 19
Engine Displacement (L)	1.6
Type / No. of Cylinders	4 Cylinders
Engine Placement	Transverse
Transmission Type	Manual
Transmission Speeds	5
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

Traction Control System	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	Yes
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	Yes
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other Safety Restraint	No

Does Owner's Manual provide instructions to turn off automatic door locks?

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., Ltd.
Date of Manufacture	Jul-19

GVWR (kg)	1570
GAWR Front (kg)	825
GAWR Rear (kg)	760

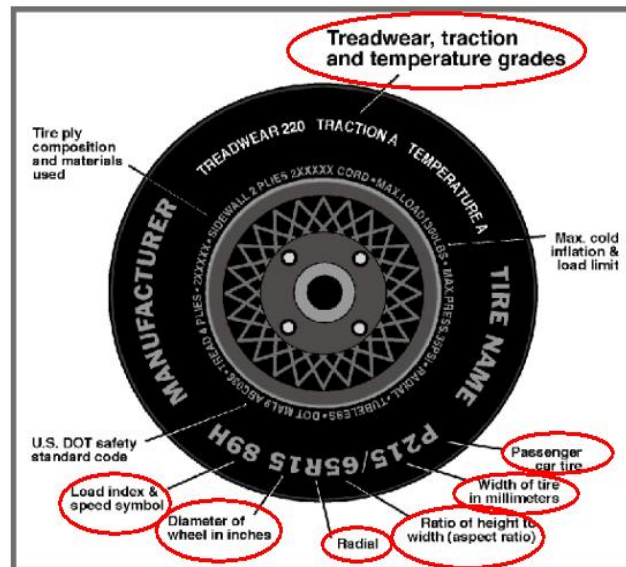
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				385.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				44.8	A-B

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
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VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	195/65 R15	195/65 R15
Tire Size on Vehicle	195/65 R15	195/65 R15
Tire Manufacturer	Continental	Continental
Tire Model	Pro Contact TX	Pro Contact TX
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index / Speed Symbol	91 H	91 H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	P5AE WM1D 2319	P5AE WM1D 2319
DOT Safety Code Right	P5AE WM1D 2319	P5AE WM1D 2319

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

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UWV)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	355.5	247.5		383.0	314.0	
Right	kg	348.0	229.5		370.5	293.0	
Ratio	%	59.6%	40.4%	100.0%	55.4%	44.6%	100.0%
Total	kg	703.5	477.0	1180.5	753.5	607.0	1360.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UWV)	kg	1180.5	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	44.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1366.3	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	681	682	673	680	1060
As Tested	mm	663	665	635	641	1171
Post-Test	mm	691	687	540	620	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheelbase	mm	2624
Total Vehicle Length at Left Side	mm	4225
Total Vehicle Length at Centerline	mm	4500
Total Vehicle Length at Right Side	mm	4234
Weight of Ballast in Cargo Area	kg	54.0
Weight of Vehicle Components Removed	kg	15.0
Amount of Stoddard Solvent in Fuel Tank	L	38.02

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Rear Trim and Spare Tire (15.0 kg)

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

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test
1	Total Length	4500
2	Total Width	1744
3	Bumper Top Height	614
4	Bumper Bottom Height	272
5	Longitudinal Member Top Height	581
6	Distance Between Longitudinal Members	840
7	Longitudinal Member Width	55
8	Engine Top Height	777
9	Engine Bottom Height	339
10	Engine and Gearbox Width	491
11	Front Bumper to Engine Distance	472
12	Front Shock Absorber Fixing Height	838
13	Bonnet Leading Edge Height	813
14	Front Shock Absorber Fixing Width	1311
15	Front Bumper to Front Axle Distance	879
16	Front Axle to A-Pillar Distance	491
17	A-Pillar to B-Pillar Distance	958
18	B-Pillar to Rear Axle Distance	1172
19	B-Pillar to C-Pillar Distance	998
20	Roof Sill Bottom Height	1336
21	Roof Sill Top Height	1377
22	Floor Sill Bottom Height	164
23	Floor Sill Top Height	274

All measurements in millimeters.

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan

NHTSA No.: M20205215

Test Program: 56.3 km/h Frontal Impact NCAP Test

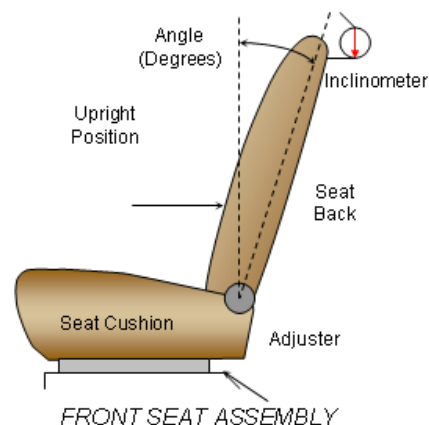
Test Date: 12/03/19

NOMINAL DESIGN RIDING POSITION

The procedure for the driver is as follows: the seat back is set to the manufacturer's designated angle. The procedure for the passenger is as follows: the seat back is set to position the transverse instrumentation platform of the dummy's head at $0^\circ \pm 0.5^\circ$. Seat back angle is measured at the headrest post.

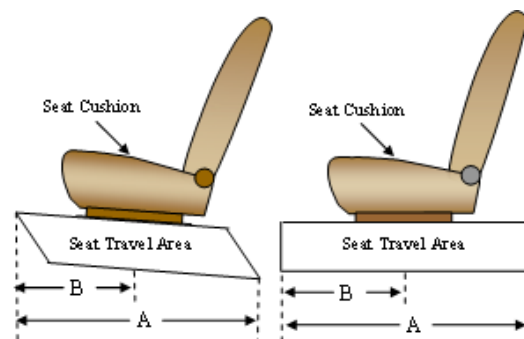
SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	4.4
Passenger Seat Back Angle	3.2



SEAT FORE / AFT POSITIONING

The total seat travel is measured from the forward most possible position to the rear most possible position. The driver's seat is set to the middle of the fore-aft travel. The passenger's seat is set to the forward most position where the ATD will not contact any interior panels.



SEAT FORE/AFT POSITIONS

Seating Position	Total Fore-Aft Travel	Placed in Position
Driver Seat	240 mm	110 mm
Passenger Seat	240 mm	0 mm

SEAT BELT UPPER ANCHORAGE

The seat belt upper anchorage is positioned to the manufacturer's design position for a 50th percentile adult male ATD for the driver, and a 5th percentile adult female ATD for the passenger. Position "H" is the uppermost position, followed by position "M", and Position "L" is the lowermost position.

SEAT BELT UPPER ANCHORAGES

Seating Position	Total No. of Positions	Placed in Position
Driver Seat	4	H
Passenger Seat	4	H

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

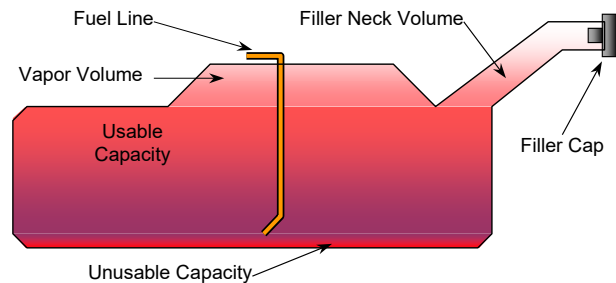
Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	40.88
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	37.61 to 38.43
Actual Amount of Stoddard Solvent Used	38.02
1/3 of Usable Capacity	13.63

FUEL PUMP

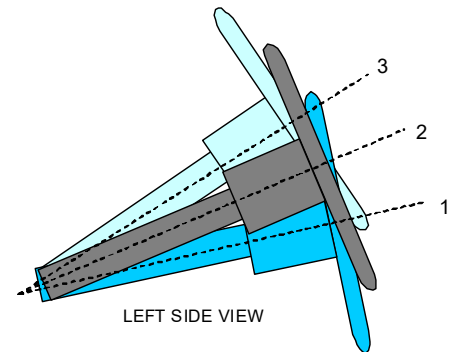
The vehicle is equipped with an electric fuel pump. The fuel pump operates after the ignition switch is turned ON and while the engine is running.



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. A digital inclinometer is used to measure a plate which is placed across the rim of the steering wheel for angular measurements.



STEERING COLUMN ASSEMBLY

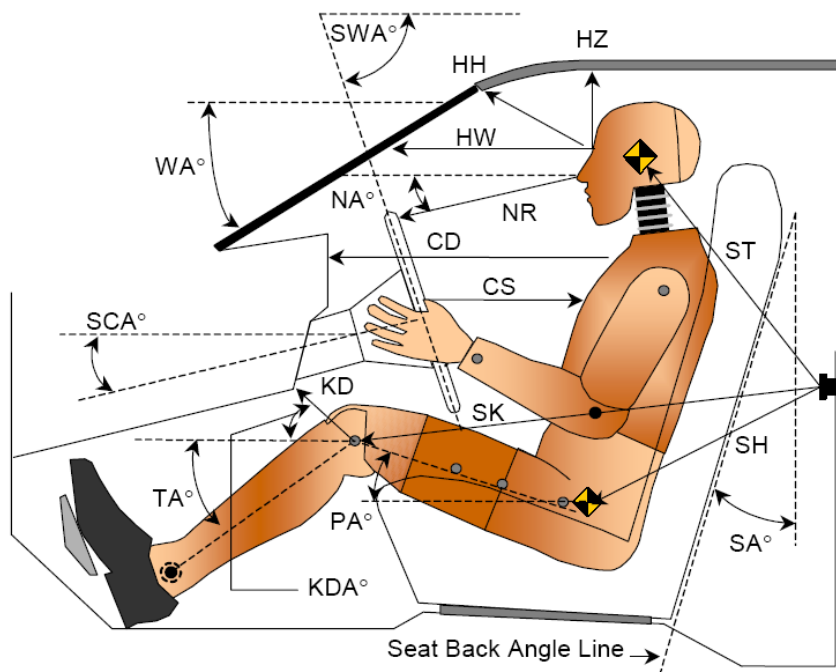
STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	21.3	86
Geometric Center Position, No. 2	23.4	106
Uppermost Position, No. 3	25.4	125
Telescoping Steering Wheel Travel		39
Test Position	23.4	106

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19



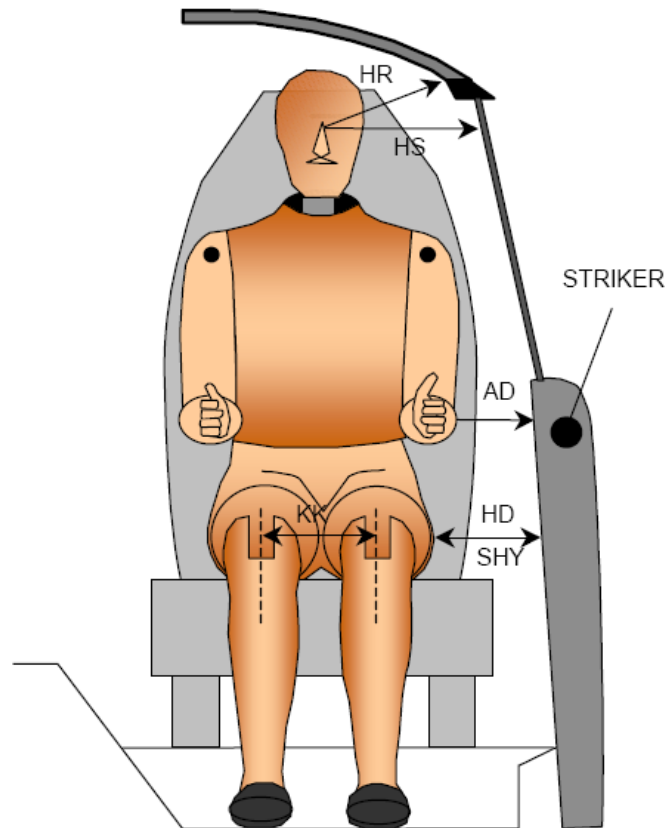
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		18.5		
SWA°	Steering Wheel Angle		65.6		
SCA°	Steering Column Angle		24.4		
SA°	Seat Back Angle (On Headrest Post)		4.4		3.2
HZ	Head to Roof	207	90.0	240	90.0
HH	Head to Header	370	25.6	335	43.9
HW	Head to Windshield	730	0.0	766	0.0
NR	Nose to Rim	415	7.6	470	20.8
CD	Chest to Dash	549	17.2	439	3.5
CS	Chest to Steering Hub	331	1.6		
RA	Rim to Abdomen	233	0.0		
KDL	Left Knee to Dash	202	31.2	137	32.8
KDR	Right Knee to Dash	205	31.9	161	42.6
PA°	Pelvic Angle		23.6		20.8
TA°	Tibia Angle		38.1		50.2
SK	Striker to Knee	522	3.2	600	3.4
ST	Striker to Head	482	86.6	442	75.8
SH	Striker to H-Point	219	48.7	307	25.9

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

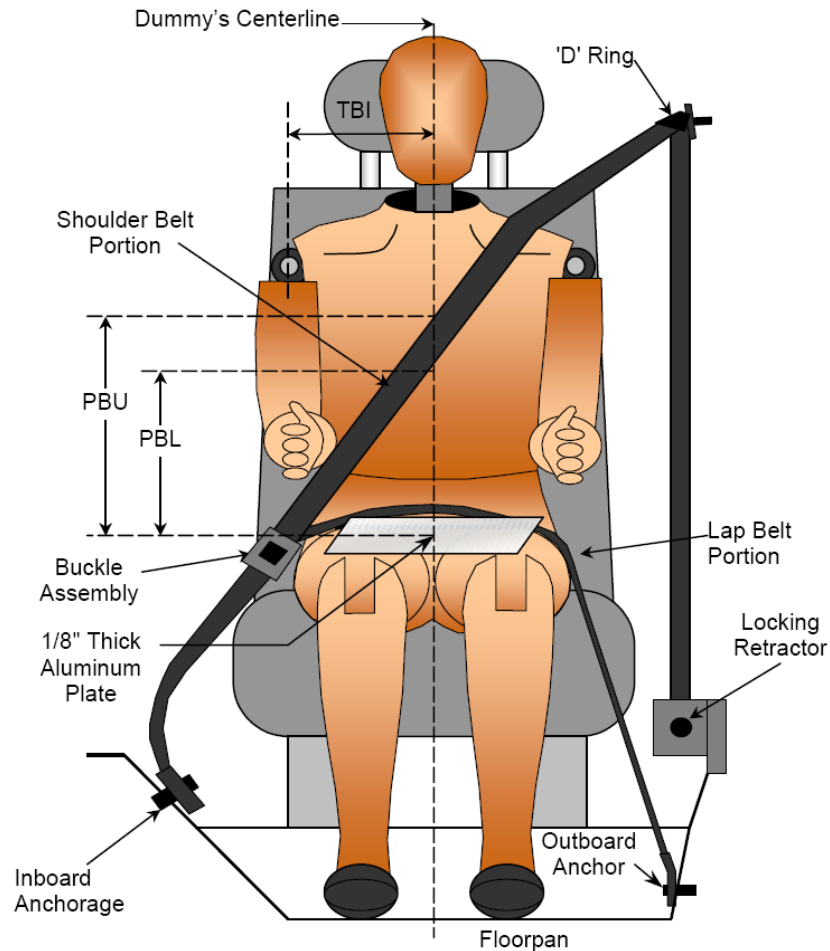
Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19



Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	118	60
HD	H-Point to Door	140	163
HR	Head to Side Header	215	268
HS	Head to Side Window	340	385
KK	Knee to Knee	280	215
SHY	Striker to H-Point (Y-Direction)	239	288
AA	Ankle to Ankle	285	195

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Code	Measurement Description	Units	Driver	Passenger
PBU	Top Surface of Aluminum Plate to Belt Upper Edge	mm	295	300
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	225	210

BELT LENGTH DATA

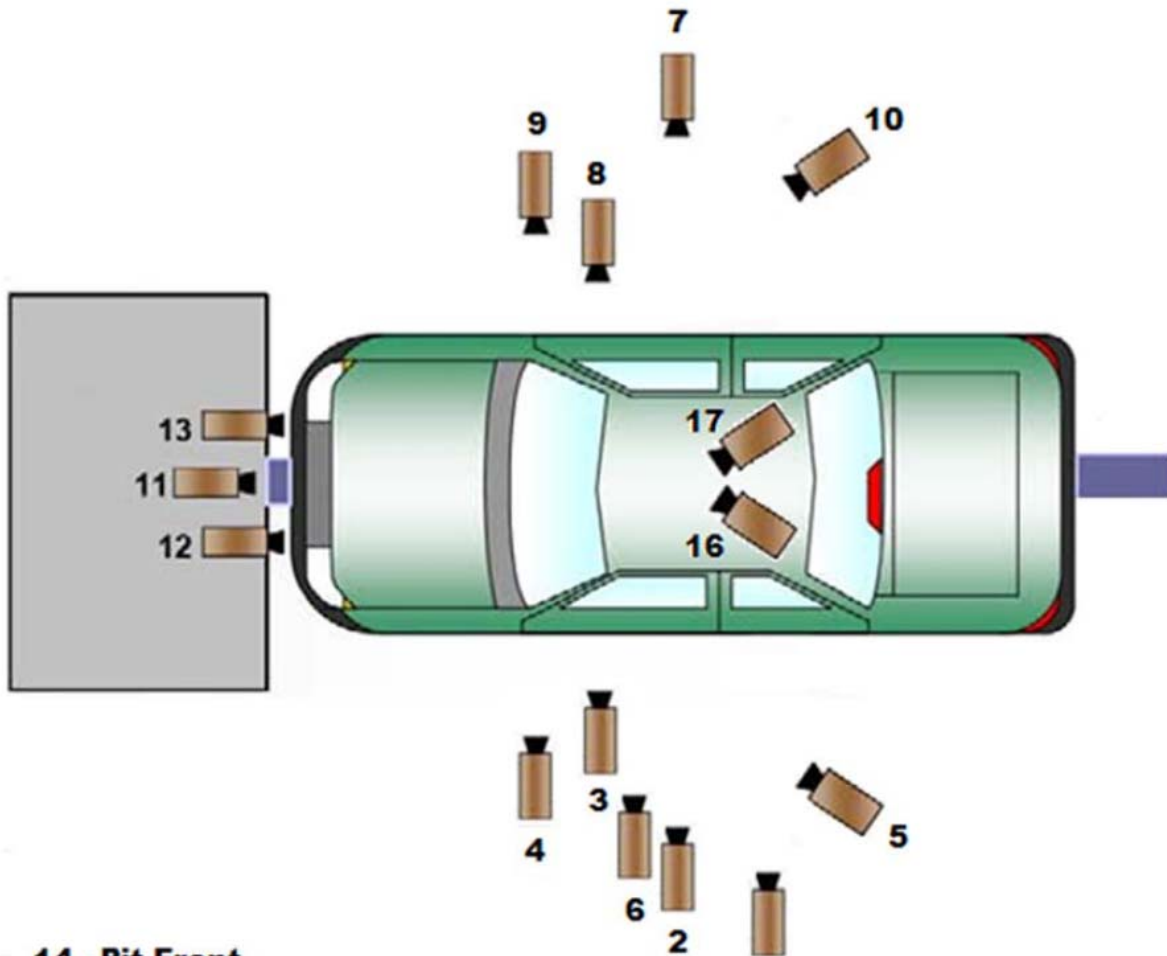
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	780	901
Lap Belt Length as Measured on ATD	mm	620	740
Remainder of Belt on Reel	mm	1170	980
Total Belt Length for Continuous Webbing Systems	mm	2570	2621

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

CAMERA POSITIONS FOR FRONTAL IMPACTS



14 - Pit Front

15 - Pit Rear

16 & 17 - Driver and Passenger Onboard

1- Real Time Camera

***Camera locations are approximate and not to scale*

DATA SHEET NO. 6 ... (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

CAMERA LOCATIONS

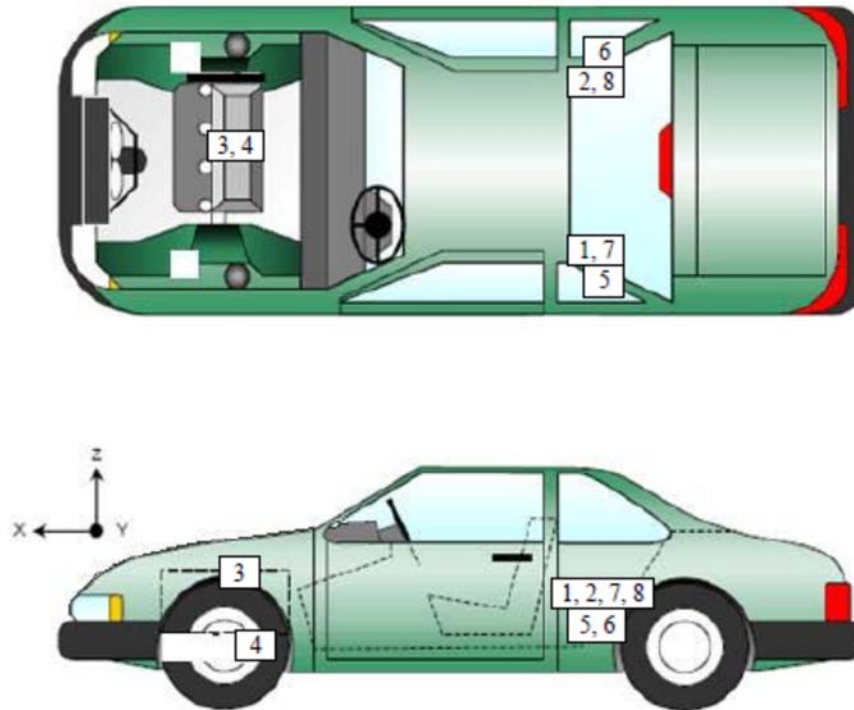
No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Left Overall	-2456	-7975	-1025	20	1000
3	Driver Close-Up	-2590	-7950	-1371	50	1000
4	Left Front Half	-1701	-6197	-1701	35	1000
5	Left Angle	-6696	-10308	-3211	105	1000
6	Steering Column	-1966	-10412	-3688	35	1000
7	Right Overall	-2336	7569	-1012	20	1000
8	Passenger Close-Up	-1733	7581	-1408	50	1000
9	Right Front Half	-1600	8214	-1811	35	1000
10	Right Angle	-6217	9516	-4830	85	1000
11	Windshield	-354	0	-5749	28	1000
12	Driver Windshield	297	-366	-2460	24	1000
13	Passenger Windshield	297	366	-2460	24	1000
14	Pit Front	-756	0	1495	20	1000
15	Pit Rear	-3398	0	1495	20	1000
16	Driver Onboard	-1492	-247	-1566	8	1000
17	Passenger Onboard	-1499	293	-1559	8	1000

Coordinates: +X = forward impact plane
 +Y = right of monorail center
 +Z = into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	1935	-670	-306
2	Right Rear Accelerometer X-Direction	1934	670	-307
3	Engine Top X	3738	-77	-784
4	Engine Bottom X	3799	-99	-383
5	Left Rear Accelerometer Z-Direction	1935	-670	-306
6	Right Rear Accelerometer Z-Direction	1934	670	-307
7	Left Rear Accelerometer X-Direction Redundant	1935	-670	-306
8	Right Rear Accelerometer X-Direction Redundant	1934	670	-307

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

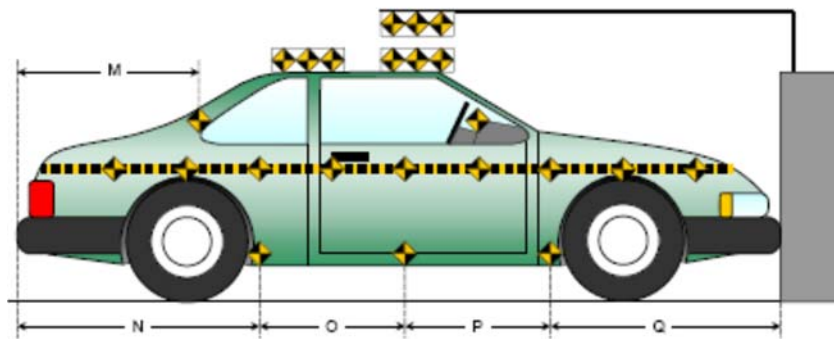
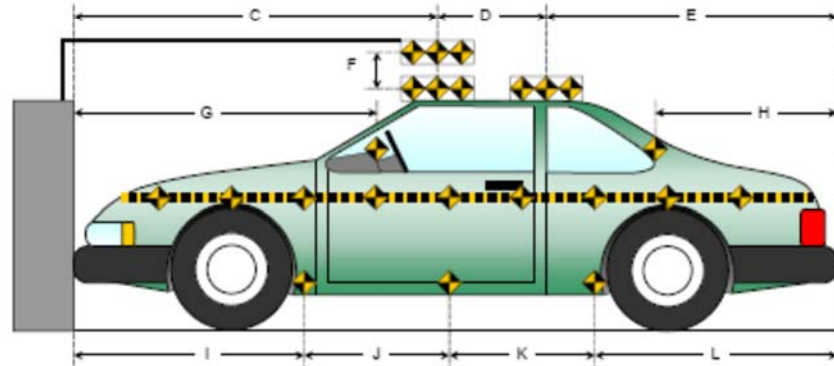
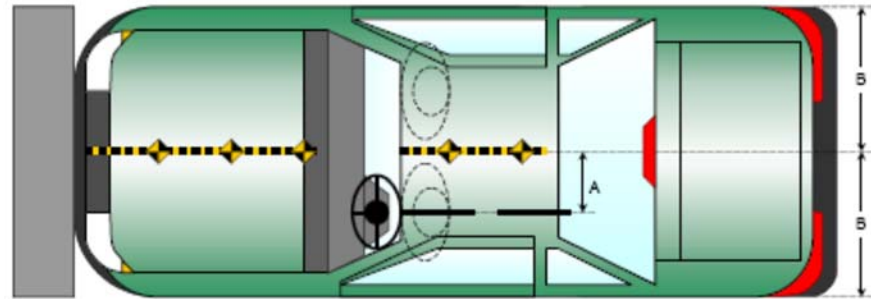
Test Vehicle: 2020 Nissan Versa 4-Door Sedan

NHTSA No.: M20205215

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 12/03/19

Item	Value
A	373
B	873
C	2071
D	607
E	1823
F	305
G	1620
H	950
I	1329
J	873
K	867
L	1431
M	951
N	1445
O	852
P	913
Q	1290



All measurements in millimeters.

DATA SHEET NO. 9

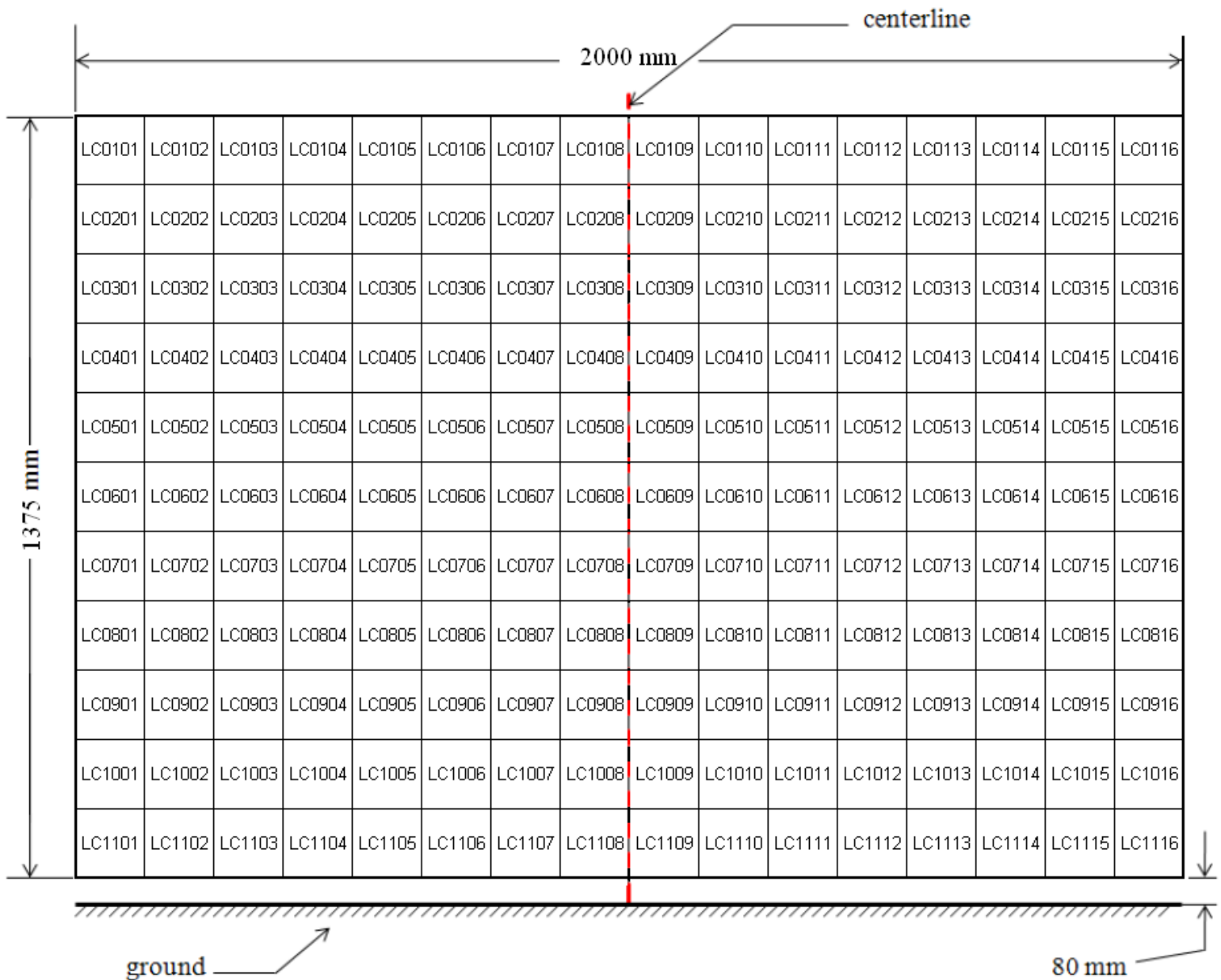
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2020 Nissan Versa 4-Door Sedan

NHTSA No.: M20205215

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 12/03/19



DATA SHEET NO. 10**TEST VEHICLE SUMMARY OF RESULTS**

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

INSTRUMENTATION

Driver Dummy Accelerometers	47
Passenger Dummy Accelerometers	47
Vehicle Structure Accelerometers	8
Load Cell Barrier	528
Total	630

CAMERA COVERAGE

High-Speed Vehicle On Board	2
High-Speed Off Board	14
Real Time	1
Total	17

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 360	P572O 5th Percentile Female ATD / DH1644
Head Contact	Frontal Airbag, Headrest	Frontal Airbag, Headrest
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Knee Airbag
Right Knee Contact	Knee Airbag	Knee Airbag

DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Rear Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Trunk/Hatch/Tailgate Opening	None	None
Seat Track Shift (mm)	0	5
Seat Back Movement from Initial Position	None	None

OTHER VEHICLE POST-TEST OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

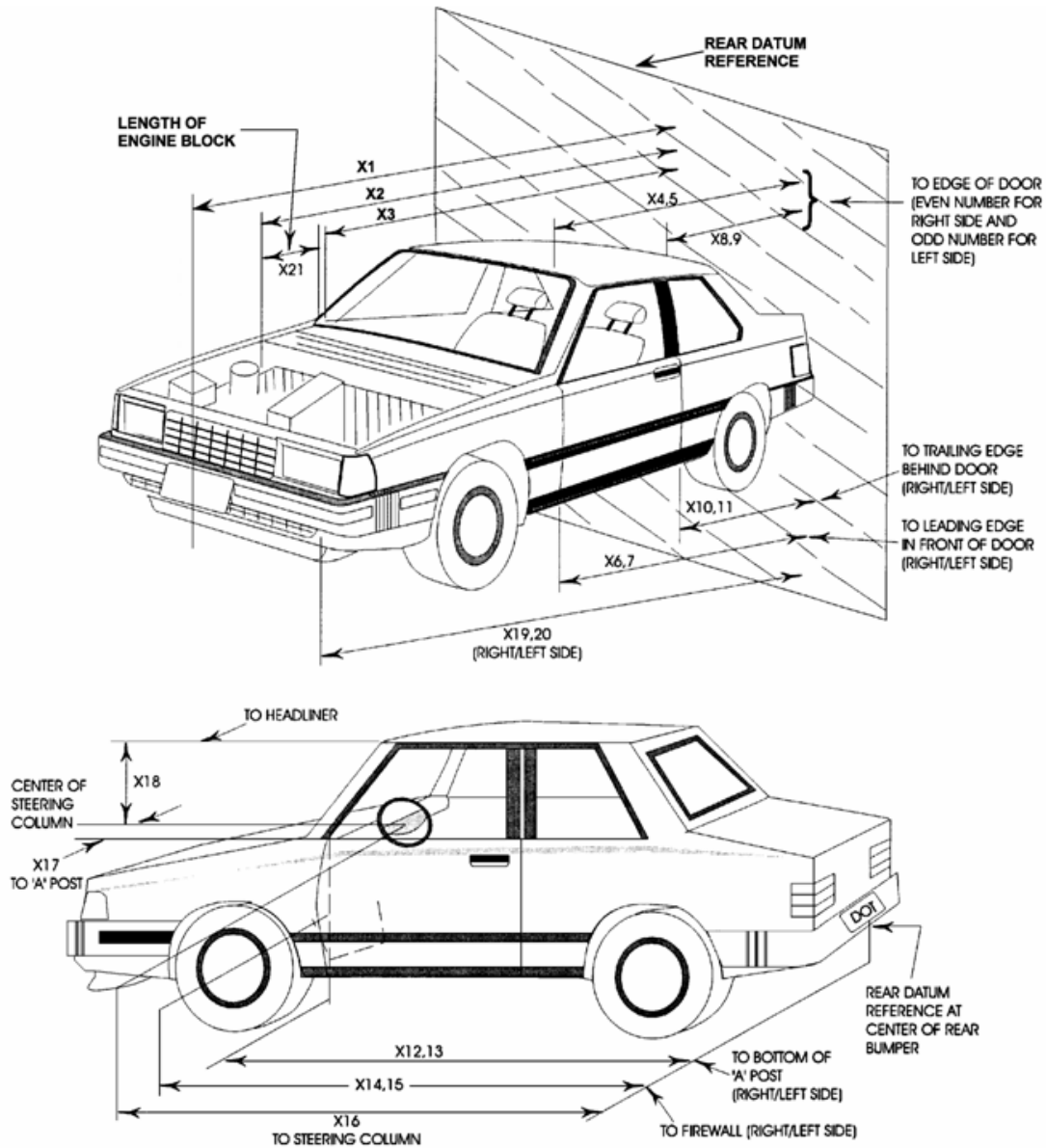
Measured Parameter	Units	Value
Left Side	mm	3970
Center	mm	4020
Right Side	mm	4250
Average	mm	4080

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19



DATA SHEET NO. 12 ... (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4500	4205	-295
2	Rear Surface of Vehicle to Front of Engine	4028	3788	-240
3	RSOV to Firewall	3677	3626	-51
4	RSOV to Upper Leading Edge of Right Door	3175	3168	-7
5	RSOV to Upper Leading Edge of Left Door	3169	3164	-5
6	RSOV to Lower Leading Edge of Right Door	3186	3177	-9
7	RSOV to Lower Leading Edge of Left Door	3171	3164	-7
8	RSOV to Upper Trailing Edge of Right Door	2093	2085	-8
9	RSOV to Upper Trailing Edge of Left Door	2089	2083	-6
10	RSOV to Lower Trailing Edge of Right Door	2121	2112	-9
11	RSOV to Lower Trailing Edge of Left Door	2109	2106	-3
12	RSOV to Bottom of A-Pillar, Right Side	3137	3132	-5
13	RSOV to Bottom of A-Pillar, Left Side	3130	3129	-1
14	RSOV to Firewall, Right Side	3651	3604	-47
15	RSOV to Firewall, Left Side	3642	3617	-25
16	RSOV to Steering Column	2880	2914	34
17	Center of Steering Column to A-Pillar	250	216	-34
18	Center of Steering Column to Headliner	717	753	36
19	RSOV to Right Side of Front Bumper	4234	4061	-173
20	RSOV to Left Side of Front Bumper	4225	4086	-139
21	Length of Engine Block	364	364	0
RD	RSOV to Right Side of Dash Panel	2900	2894	-6
CD	RSOV to Center of Dash Panel	2843	2843	0
LD	RSOV to Left Side of Dash Panel	2894	2892	-2

All measurements in millimeters.

DATA SHEET NO. 13**ACCIDENT INVESTIGATION DIVISION DATA**

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

VEHICLE INFORMATION

VIN: 3N1CN8BV6LL802018 Wheelbase (mm): 2624
 Vehicle Size Category: Passenger Car Test Weight (kg): 1360.5

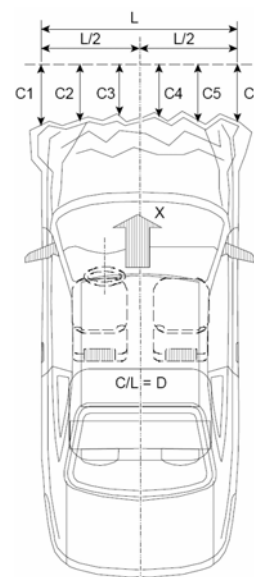
ACCELEROMETER DATA

Accelerometer Locations: Left Rear Crossmember
 Cal. Procedure/Interval: Vibration Test / 6 months
 Integration Algorithm: NHTSA Standard
 Impact Velocity (km/h): 55.83
 Velocity Change (km/h): 65.0
 Time of Separation (msec): 76.7

Linearity: Good

CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 1579
 Impact Mode: Full Frontal



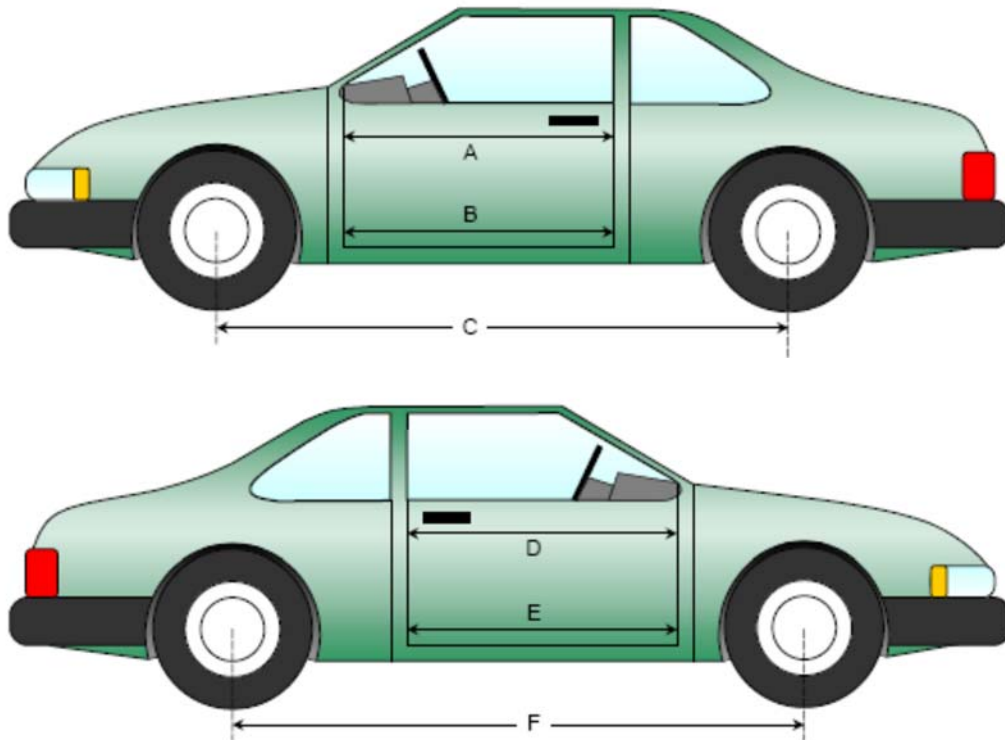
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	275	414	139
C2	Crush Zone 2 at Left Side	mm	83	325	242
C3	Crush Zone 3 at Left Side	mm	15	301	286
C4	Crush Zone 4 at Right Side	mm	15	299	284
C5	Crush Zone 5 at Right Side	mm	83	332	249
C6	Crush Zone 6 at Right Side	mm	267	439	172
L	C1 to C6	mm	1579		

DATA SHEET NO. 14**VEHICLE INTRUSION MEASUREMENTS**Test Vehicle: 2020 Nissan Versa 4-Door SedanNHTSA No.: M20205215Test Program: 56.3 km/h Frontal Impact NCAP TestTest Date: 12/03/19**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1080	1081	-1
B	Left Side Lower	mm	1062	1058	4
D	Right Side Upper	mm	1082	1084	-2
E	Right Side Lower	mm	1066	1065	1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2624	2572	52
F	Right Side Wheelbase	mm	2624	2610	14



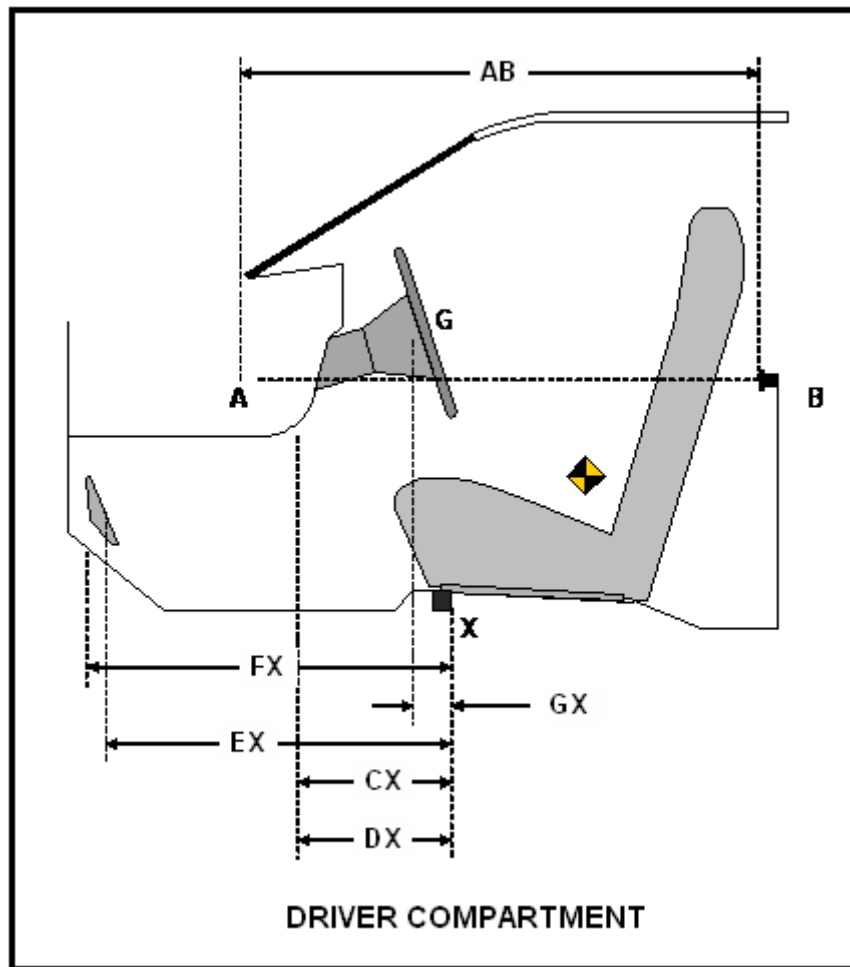
DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	955	956	-1
CX	Left Knee Bolster to X	mm	356	357	-1
DX	Right Knee Bolster to X	mm	366	363	3
EX	Brake Pedal to X	mm	598	557	41
FX	Foot Rest to X	mm	601	597	4
GX	Center of Steering Wheel Hub to X	mm	91	123	-32

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

SUMMARY OF INDICANT FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

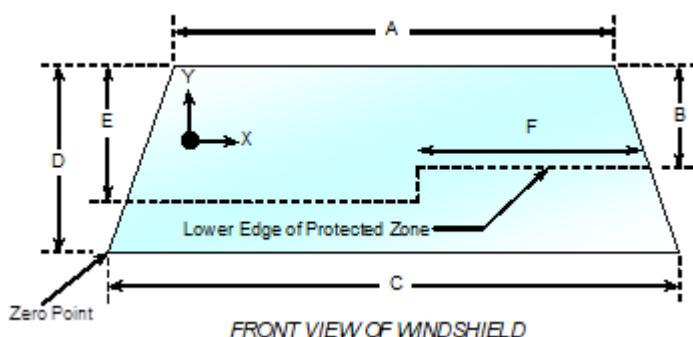
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber molding and rubber cement.

The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles 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	2256	2180	96.6%
Right Side	2256	2104	93.3%
Total	4512	4284	94.9%



Item	Units	Value
A	mm	1132
B	mm	412
C	mm	1330
D	mm	1025
E	mm	525
F	mm	453

AREAS OF PROTECTED ZONE FAILURES

- A. Provide Coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield.

X	Y

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y

DATA SHEET NO. 16

FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS

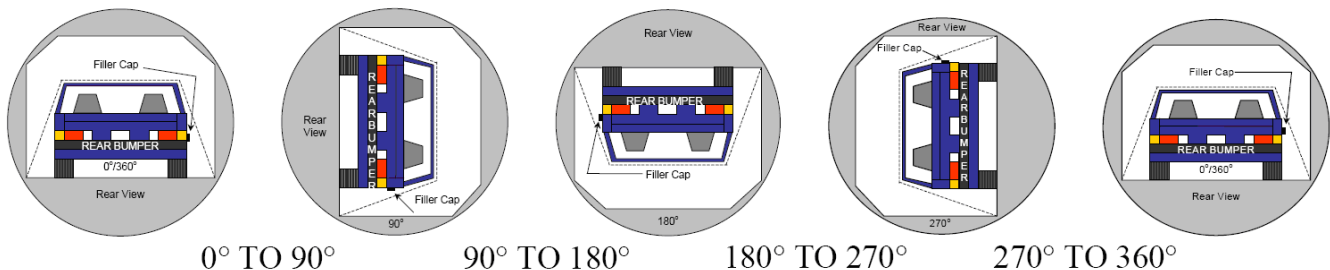
Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 10.0° C Test Time: 3:30 PM

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./minute)
- D. Spillage: There was no Stoddard solvent spillage.



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: There was no Stoddard solvent spillage.

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	79	300	379
90° To 180°	81	300	381
180° To 270°	81	300	381
270° To 360°	80	300	380

DATA SHEET NO. 16 ... (CONTINUED)**FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS**Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No.: M20205215Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 12/03/19**FMVSS 301 SPILLAGE TABLE**

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

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 17

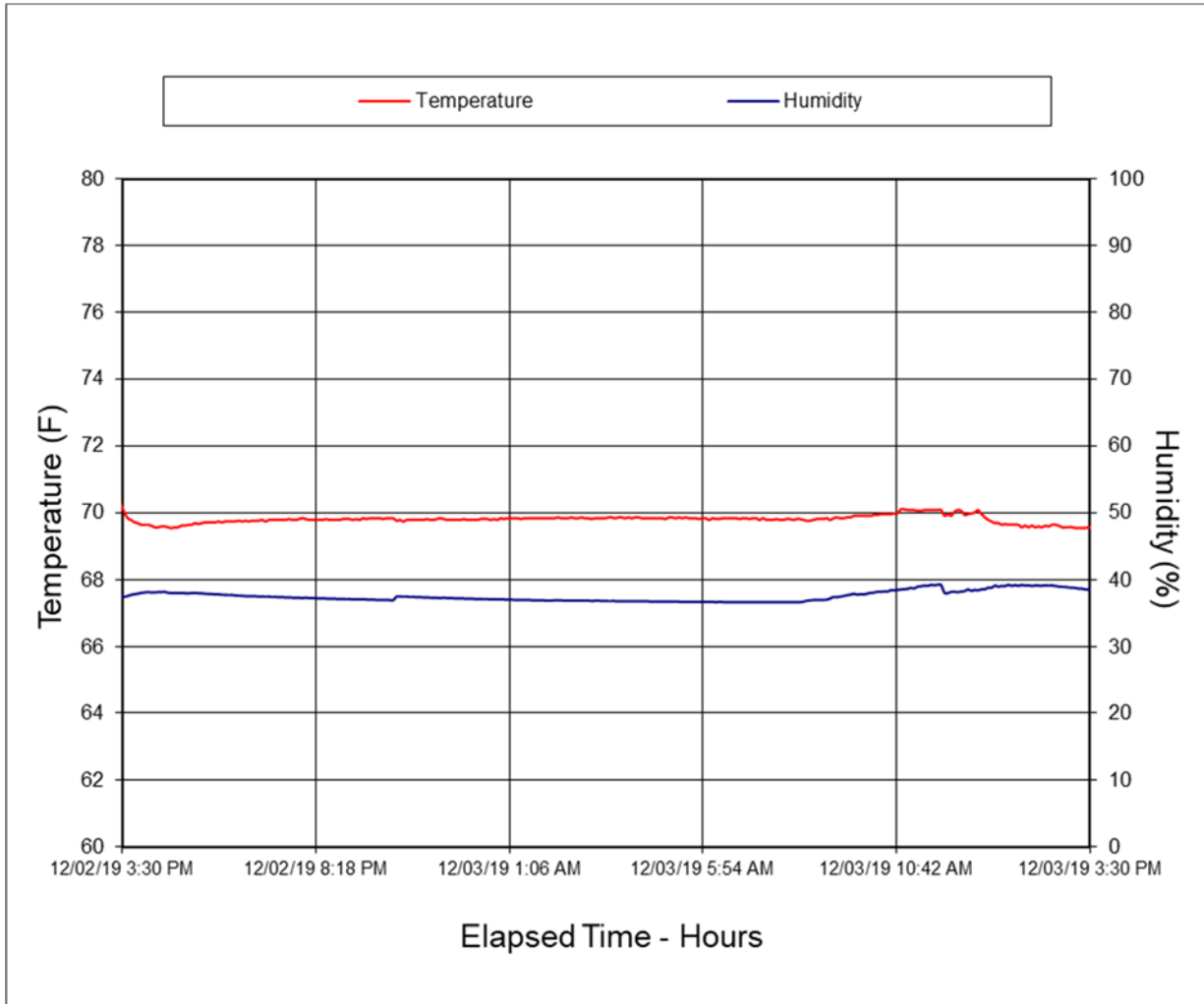
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2020 Nissan Versa 4-Door Sedan

NHTSA No.: M20205215

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 12/03/19



APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

TABLE OF PHOTOGRAPHS

Figure		Page
1	Load Cell Location	A-1
2	Pre-Test Load Cell Wall	A-1
3	Post-Test Load Cell Wall	A-2
4	Manufacturer's Label	A-2
5	Tire Placard	A-3
6	2020 Nissan Versa Frontal as Delivered	A-3
7	Left Rear $\frac{3}{4}$ View, as Received	A-4
8	Pre-Test Front View of Test Vehicle	A-4
9	Post-Test Front View of Test Vehicle	A-5
10	Pre-Test Left View of Test Vehicle	A-5
11	Post-Test Left View of Test Vehicle	A-6
12	Pre-Test Right View of Test Vehicle	A-6
13	Post-Test Right View of Test Vehicle	A-7
14	Pre-Test Right Front $\frac{3}{4}$ View	A-7
15	Post-Test Right Front $\frac{3}{4}$ View	A-8
16	Pre-Test Left Rear $\frac{3}{4}$ View	A-8
17	Post-Test Left Rear $\frac{3}{4}$ View	A-9
18	Pre-Test Windshield View	A-9
19	Post-Test Windshield View	A-10
20	Pre-Test Engine Compartment View	A-10
21	Post-Test Engine Compartment View	A-11
22	Pre-Test Fuel Filler Cap View	A-11
23	Post-Test Fuel Filler Cap View	A-12
24	Pre-Test Front Underbody View	A-12
25	Post-Test Front Underbody View	A-13
26	Pre-Test Rear Underbody View	A-13
27	Post-Test Rear Underbody View	A-14
28	Pre-Test Dummy Cable Routing	A-14
29	Post-Test Dummy Cable Routing	A-15
30	Pre-Test Driver Dummy Front View	A-15
31	Post-Test Driver Dummy Front View	A-16
32	Pre-Test Driver Dummy Window View	A-16
33	Post-Test Driver Dummy Window View	A-17
34	Pre-Test Driver Dummy and Vehicle Interior View	A-17
35	Post-Test Driver Dummy and Vehicle Interior View	A-18
36	Pre-Test Driver's Seat Fore-Aft Markings	A-18

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
37	Post-Test Driver's Seat Fore-Aft Markings	A-19
38	Pre-Test View of Belt Anchorage for Driver Dummy	A-19
39	Post-Test View of Belt Anchorage for Driver Dummy	A-20
40	Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy	A-20
41	Post-Test View of Belt Buckle and Latch Plate for Driver Dummy	A-21
42	Pre-Test Driver Dummy Feet	A-21
43	Post-Test Driver Dummy Feet	A-22
44	Pre-Test Driver's Side Knee Bolster	A-22
45	Post-Test Driver's Side Knee Bolster	A-23
46	Pre-Test Driver's Side Floorpan	A-23
47	Post-Test Driver's Side Floorpan	A-24
48	Post-Test Driver Dummy Face	A-24
49	Post-Test Driver Dummy Contact with Airbag	A-25
50	Post-Test Driver Dummy Contact with Headrest	A-25
50a	Post-Test Driver Dummy Contact with Knee Airbag	A-26
51	Pre-Test View of the Steering Wheel	A-26
52	Post-Test View of the Steering Wheel	A-27
53	Pre-Test Passenger Dummy Front View	A-27
54	Post-Test Passenger Dummy Front View	A-28
55	Pre-Test Passenger Dummy Window View	A-28
56	Post-Test Passenger Dummy Window View	A-29
57	Pre-Test Passenger Dummy and Vehicle Interior View	A-29
58	Post-Test Passenger Dummy and Vehicle Interior View	A-30
59	Pre-Test Passenger's Seat Fore-Aft Markings	A-30
60	Post-Test Passenger's Seat Fore-Aft Markings	A-31
61	Pre-Test View of Belt Anchorage for Passenger Dummy	A-31
62	Post-Test View of Belt Anchorage for Passenger Dummy	A-32
63	Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy	A-32
64	Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy	A-33
65	Pre-Test Passenger Dummy Feet	A-33
66	Post-Test Passenger Dummy Feet	A-34
67	Pre-Test Passenger's Side Knee Bolster	A-34
68	Post-Test Passenger's Side Knee Bolster	A-35
69	Pre-Test Passenger's Side Floorpan	A-35
70	Post-Test Passenger's Side Floorpan	A-36
71	Post-Test Passenger Dummy Face	A-36

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
72	Post-Test Passenger Dummy Contact with Airbag	A-37
73	Post-Test Passenger Dummy Contact with Headrest	A-37
73a	Post-Test Passenger Dummy Contact with Knee Airbag	A-38
74	Photograph of Ballast Installed in Vehicle	A-38
75	Post-Test Stoddard Solvent Spillage Location View	A-39
76	Post-Test Speed Trap Read-Out	A-39
77	Vehicle at 0° on Static Rollover Device	A-40
78	Vehicle at 90° on Static Rollover Device	A-40
79	Vehicle at 180° on Static Rollover Device	A-41
80	Vehicle at 270° on Static Rollover Device	A-41
81	Vehicle at 360° on Static Rollover Device	A-42
82	2020 Nissan Versa Frontal Impact Event	A-42
83	Monroney Label Photograph	A-43

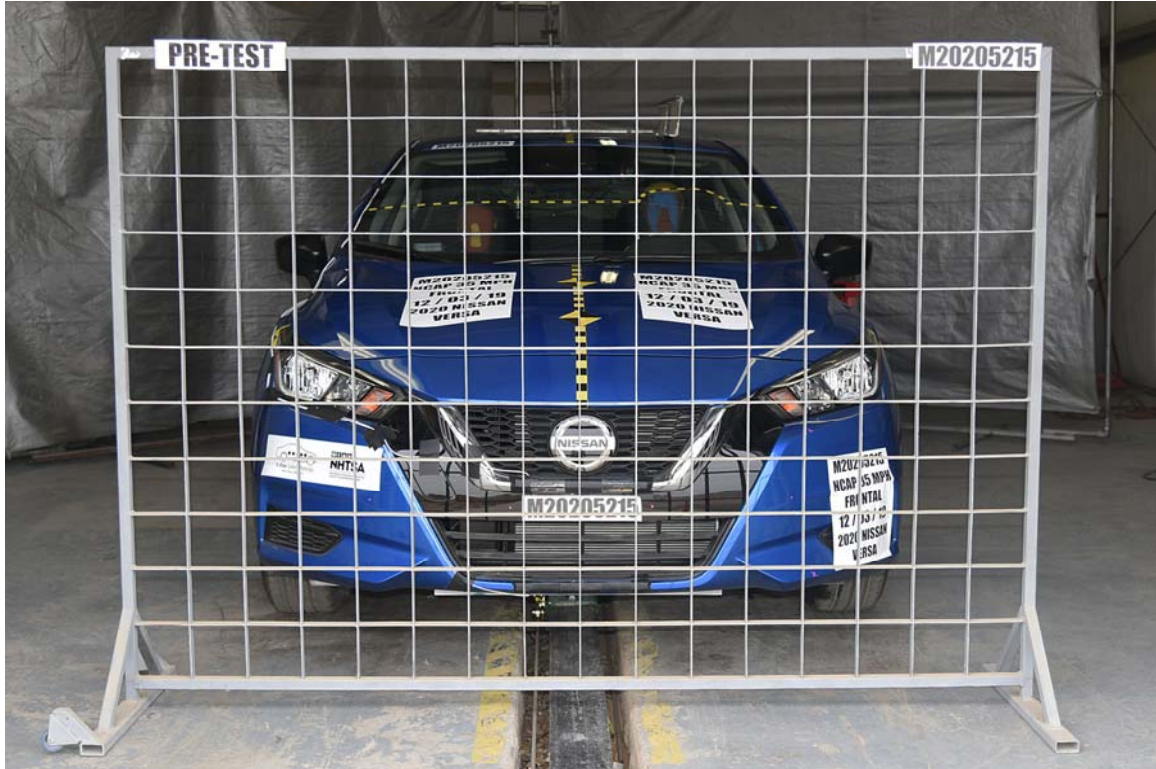


FIGURE 1. Load Cell Location

Photograph Not Available

FIGURE 2. Pre-Test Load Cell Wall

Photograph Not Available

FIGURE 3. Post-Test Load Cell Wall



FIGURE 4. Manufacturer's Label

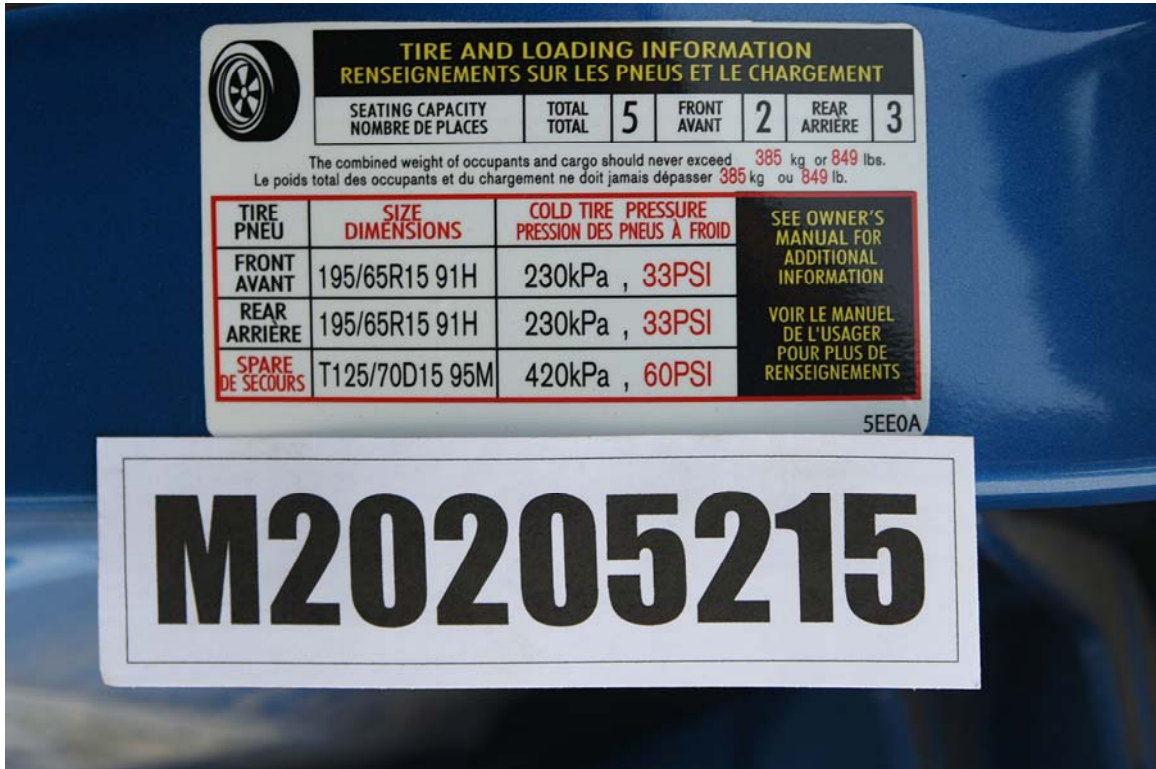


FIGURE 5. Tire Placard



FIGURE 6. 2020 Nissan Versa Frontal as Delivered



FIGURE 7. Left Rear $\frac{3}{4}$ View, as Received



FIGURE 8. Pre-Test Front View of Test Vehicle



FIGURE 9. Post-Test Front View of Test Vehicle



FIGURE 10. Pre-Test Left View of Test Vehicle



FIGURE 11. Post-Test Left View of Test Vehicle



FIGURE 12. Pre-Test Right View of Test Vehicle



FIGURE 13. Post-Test Right View of Test Vehicle



FIGURE 14. Pre-Test Right Front ¾ View



FIGURE 15. Post-Test Right Front $\frac{3}{4}$ View



FIGURE 16. Pre-Test Left Rear $\frac{3}{4}$ View



FIGURE 17. Post-Test Left Rear $\frac{3}{4}$ View

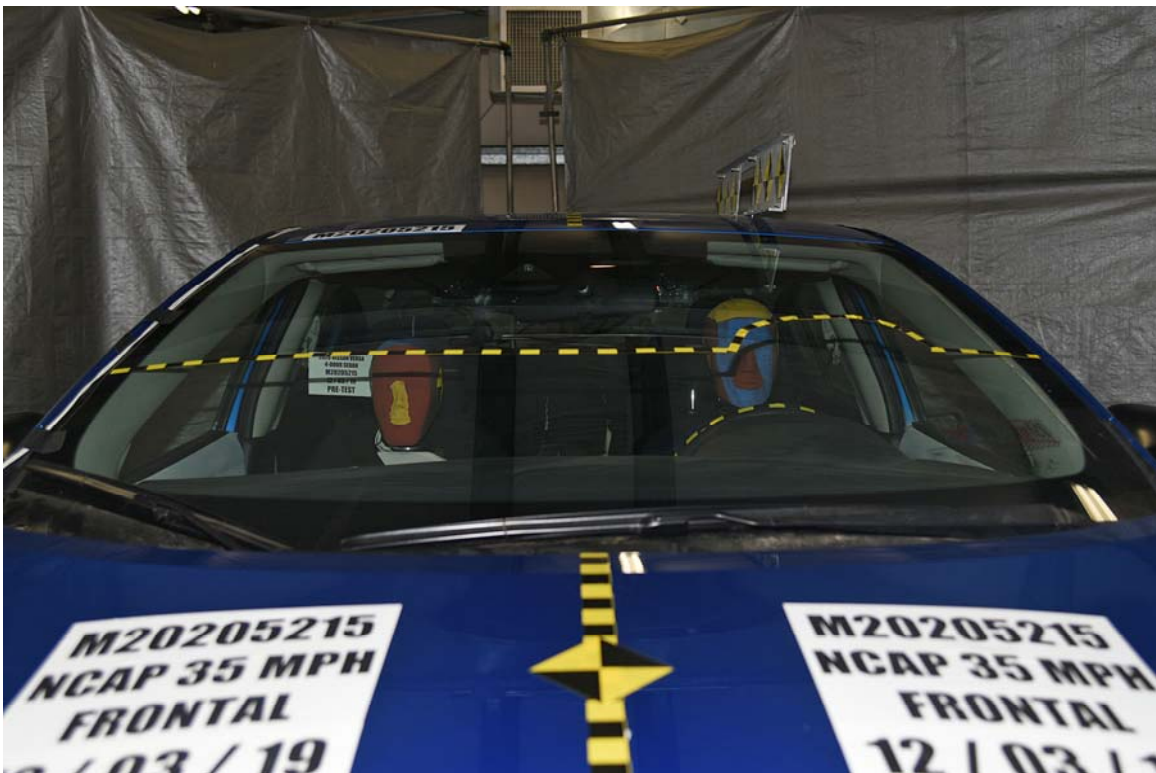


FIGURE 18. Pre-Test Windshield View



FIGURE 19. Post-Test Windshield View

Photograph Not Available

FIGURE 20. Pre-Test Engine Compartment View



FIGURE 21. Post-Test Engine Compartment View



FIGURE 22. Pre-Test Fuel Filler Cap View



FIGURE 23. Post-Test Fuel Filler Cap View

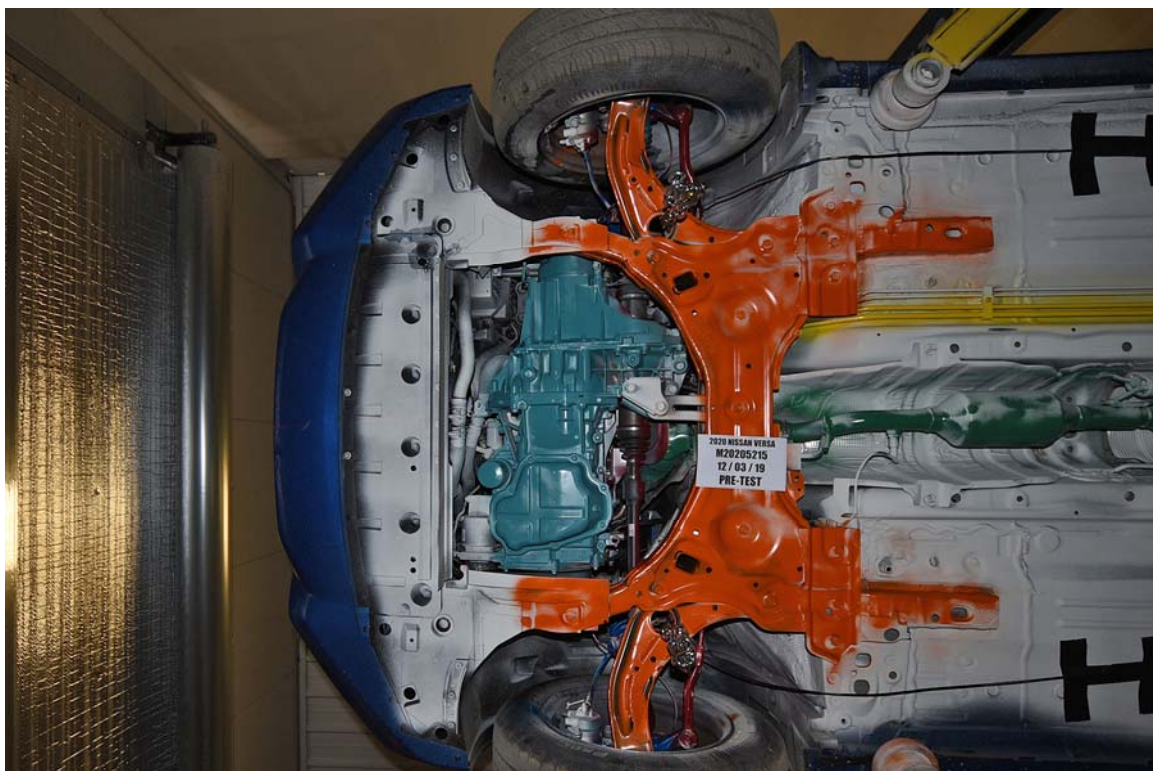


FIGURE 24. Pre-Test Front Underbody View



FIGURE 25. Post-Test Front Underbody View



FIGURE 26. Pre-Test Rear Underbody View



FIGURE 27. Post-Test Rear Underbody View



FIGURE 28. Pre-Test Dummy Cable Routing



FIGURE 29. Post-Test Dummy Cable Routing



FIGURE 30. Pre-Test Driver Dummy Front View



FIGURE 31. Post-Test Driver Dummy Front View



FIGURE 32. Pre-Test Driver Dummy Window View



FIGURE 33. Post-Test Driver Dummy Window View



FIGURE 34. Pre-Test Driver Dummy and Vehicle Interior View



FIGURE 35. Post-Test Driver Dummy and Vehicle Interior View



FIGURE 36. Pre-Test Driver's Seat Fore-Aft Markings



FIGURE 37. Post-Test Driver's Seat Fore-Aft Markings

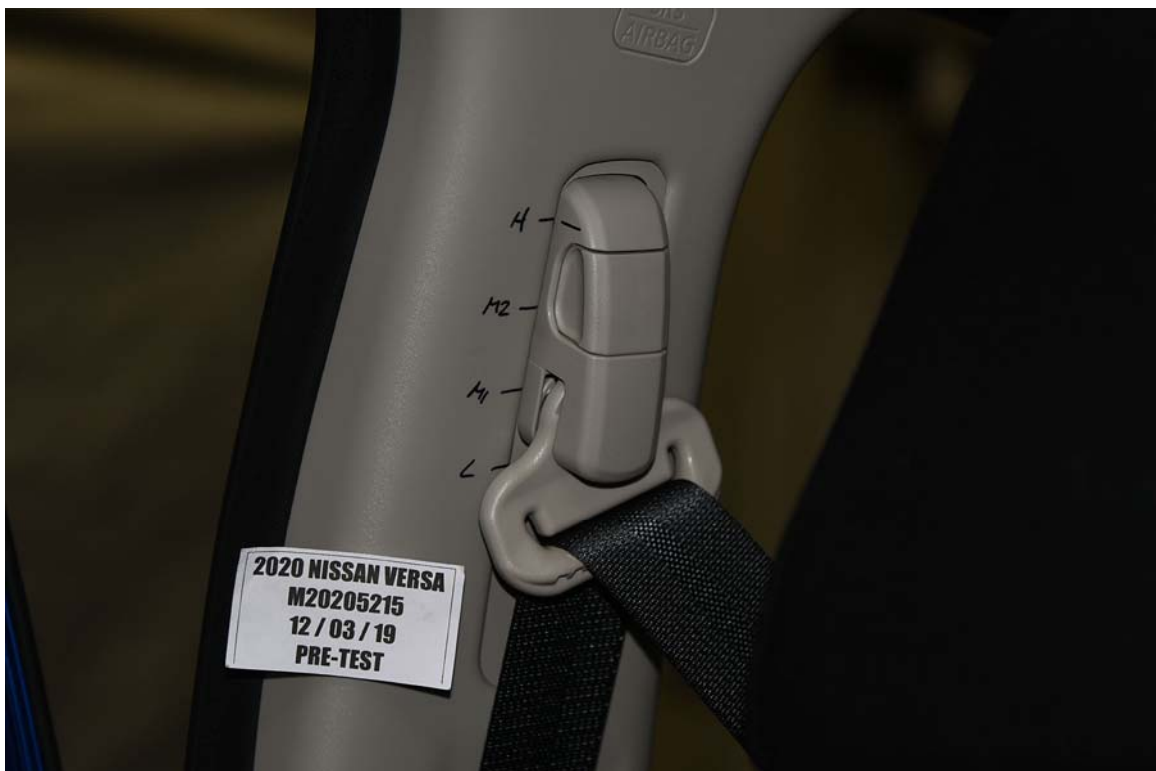


FIGURE 38. Pre-Test View of Belt Anchorage for Driver Dummy



FIGURE 39. Post-Test View of Belt Anchorage for Driver Dummy



FIGURE 40. Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy



FIGURE 41. Post-Test View of Belt Buckle and Latch Plate for Driver Dummy



FIGURE 42. Pre-Test Driver Dummy Feet



FIGURE 43. Post-Test Driver Dummy Feet



FIGURE 44. Pre-Test Driver's Side Knee Bolster



FIGURE 45. Post-Test Driver's Side Knee Bolster



FIGURE 46. Pre-Test Driver's Side Floorpan



FIGURE 47. Post-Test Driver's Side Floorpan



FIGURE 48. Post-Test Driver Dummy Face



FIGURE 49. Post-Test Driver Dummy Contact with Airbag



FIGURE 50. Post-Test Driver Dummy Contact with Headrest



FIGURE 50a. Post-Test Driver Dummy Contact with Knee Airbag

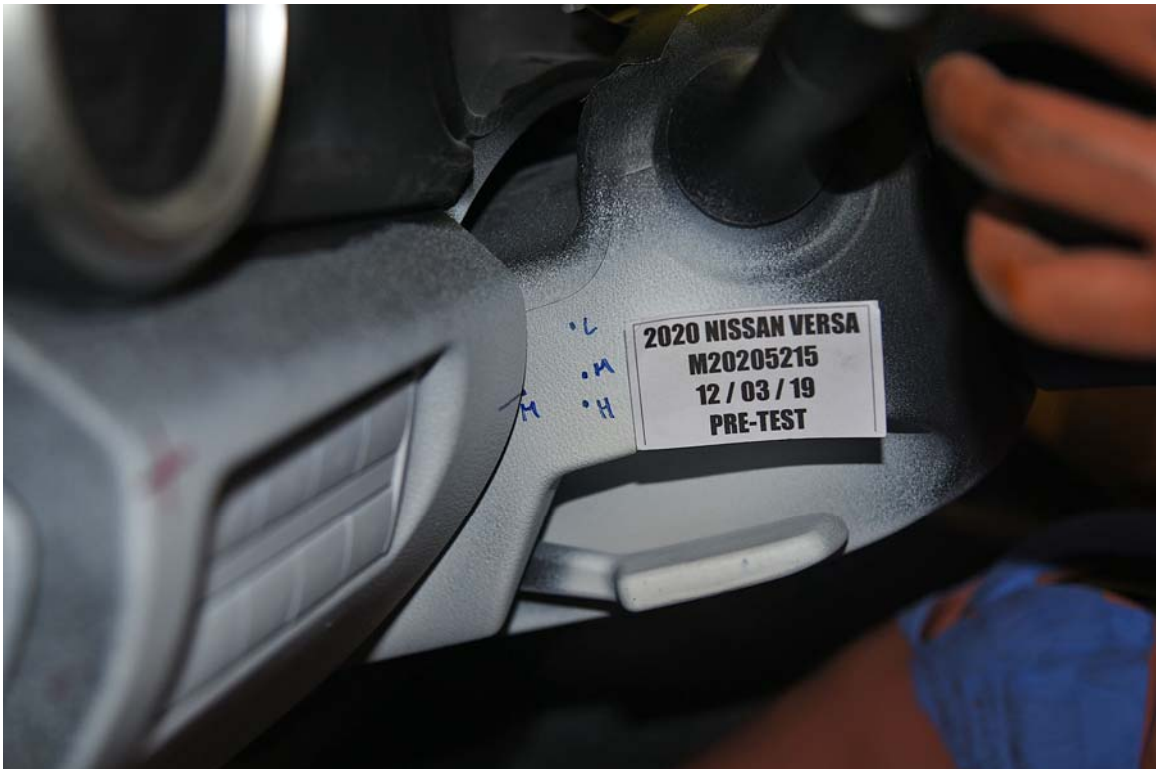


FIGURE 51. Pre-Test View of the Steering Wheel



FIGURE 52. Post-Test View of the Steering Wheel



FIGURE 53. Pre-Test Passenger Dummy Front View



FIGURE 54. Post-Test Passenger Dummy Front View



FIGURE 55. Pre-Test Passenger Dummy Window View



FIGURE 56. Post-Test Passenger Dummy Window View



FIGURE 57. Pre-Test Passenger Dummy and Vehicle Interior View



FIGURE 58. Post-Test Passenger Dummy and Vehicle Interior View



FIGURE 59. Pre-Test Passenger's Seat Fore-Aft Markings



FIGURE 60. Post-Test Passenger's Seat Fore-Aft Markings



FIGURE 61. Pre-Test View of Belt Anchorage for Passenger Dummy



FIGURE 62. Post-Test View of Belt Anchorage for Passenger Dummy



FIGURE 63. Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy



FIGURE 64. Post-Test View of Belt Buckle and Latch Plate for Passenger Dummy



FIGURE 65. Pre-Test Passenger Dummy Feet



FIGURE 66. Post-Test Passenger Dummy Feet



FIGURE 67. Pre-Test Passenger's Side Knee Bolster



FIGURE 68. Post-Test Passenger's Side Knee Bolster



FIGURE 69. Pre-Test Passenger's Side Floorpan



FIGURE 70. Post-Test Passenger's Side Floorpan



FIGURE 71. Post-Test Passenger Dummy Face



FIGURE 72. Post-Test Passenger Dummy Contact with Airbag



FIGURE 73. Post-Test Passenger Dummy Contact with Headrest



FIGURE 73a. Post-Test Passenger Dummy Contact with Knee Airbag

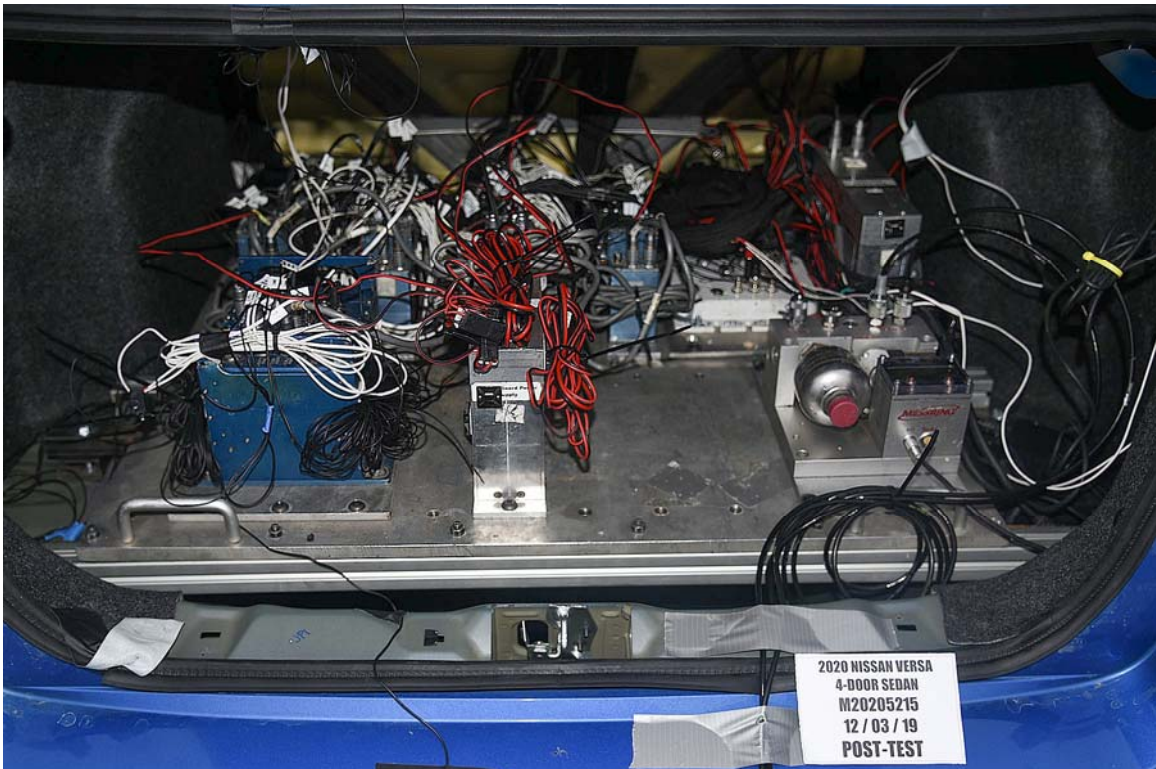


FIGURE 74. Photograph of Ballast Installed in Vehicle

Photograph Not Applicable

No Stoddard Solvent Spillage

FIGURE 75. Post-Test Stoddard Solvent Spillage Location View



FIGURE 76. Post-Test Speed Trap Read-Out



FIGURE 77. Vehicle at 0° on Static Rollover Device



FIGURE 78. Vehicle at 90° on Static Rollover Device

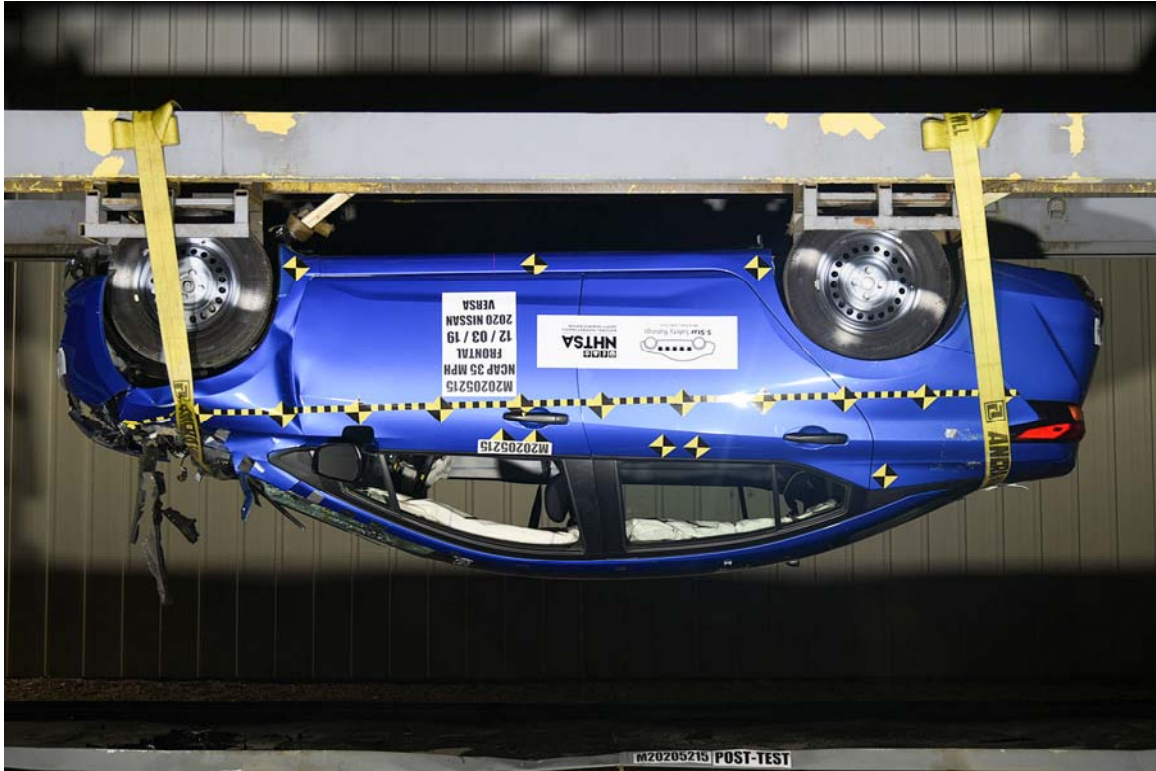


FIGURE 79. Vehicle at 180° on Static Rollover Device

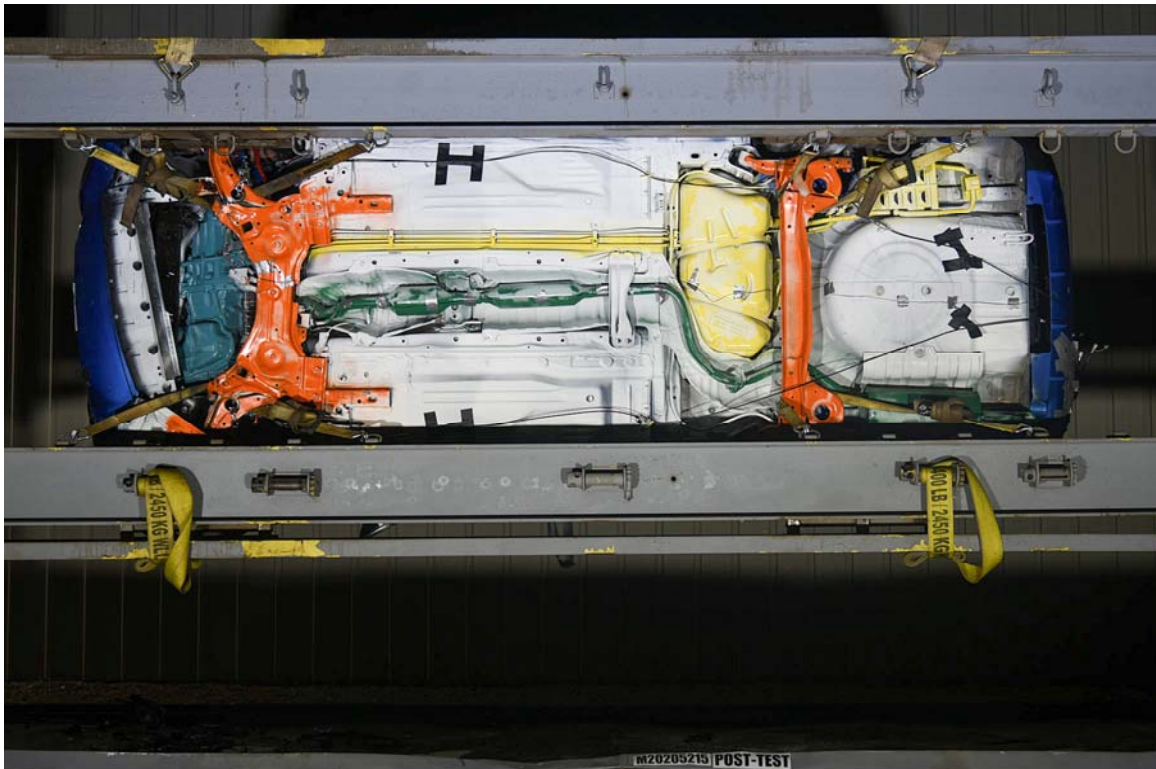


FIGURE 80. Vehicle at 270° on Static Rollover Device



FIGURE 81. Vehicle at 360° on Static Rollover Device



FIGURE 82. 2020 Nissan Versa Frontal Impact Event

2020 NISSAN VERSA S 5 SPEED MANUAL

Scan QR code for general model information and options

Standard Equipment Included at No Extra Charge

Mechanical & Performance
1.6L DOHC 16-Valve 4-Cylinder Engine
5-Speed Manual Transmission
Hill Start Assist
Front Disc/Rear Drum Brakes

Safety & Security
Automatic Emergency Braking (AEB) with Pedestrian Detection
Rear Automatic Braking (RAB)
Lane Departure Warning (LDW)
High Beam Assist (HSA)
RearView Monitor
Nissan Advanced Air Bag System (AABS) with Driver and Passenger Dual-Stage Supplemental Front Impact Air Bags
Seat-Mounted Driver and Front Passenger Side-Impact Supplemental Air Bags
Side-Mounted Rear Outboard-Passenger Side-Impact Supplemental Air Bags
Driver and Front Passenger Knee Air Bags
Front and Rear Seat Belts with Front Pretensioners and Load Limiters
Anti-lock Braking System (ABS)
Vehicle Dynamic Control System (VDC)
Traction Control System (TCS)
Tire Pressure Monitoring System (TPMS) with Easy-Fill Tire Alert
LATCH system (Lower Anchors and Tethers for Children)
Nissan Vehicle Immobilizer System

Comfort & Convenience (cont.)
6-Passenger Seating Capacity
6-Way Manually Adjustable Driver Seat
Heigh-Adjustable Front Head Restraints
Club Seat Trim
7" Color Touchscreen Display Audio System
Bluetooth® Hands-Free Phone System+
Streaming Audio via Bluetooth+
Interface for iPod® and Other Compatible Devices
Hands-Free Text Messaging Assistant+
Sirius Eyes Free®/Google Assistant™
Voice Recognition+
AM/FM with RDS, MP3 and Aux-in
4 Speakers
115 12-volt DC Power Outlet and (3) USB Ports (2-Charge Only)

Exterior
17" Steel Wheels with Full Wheel Covers
Temporary Spare Tire
Haloogen Headlamps
Black Rear Power Adjusting Exterior Mirrors
Black Resin Door Handles

Comfort & Convenience
Power Windows w/ Driver's One-Touch Auto Up/Down
Power Door Locks w/ Speed Sensing Auto-Locking
Cruise Control
Barnes® Steering Wheel Controls for Audio and Cruise Control
Manual Climate Control
Manual Tilt/Telescoping Steering Wheel
Flat Blade Variable Intermittent Windshield Wipers with Mist Cycle
Manual Rearview Mirror
Auto On/Off Headlamps with Delay Timing
Rear Window Defogger with Timer
Remote Keyless Entry with (2) FOBs including Lock/Unlock and Trunk Release Push Button Start

Manufacturer's Suggested Retail Base Price: \$14,730.00

Options Included by Manufacturer
SPLASH GUARDS 235.00
CARPETED FLOOR MATS 155.00

DESTINATION CHARGES 895.00

Total* \$16,015.00

Fuel Economy and Environment

Fuel Economy
30 MPG
combined city/hwy
3.3 gallons per 100 miles

COMPACT CARS range from 14 to 118 MPG. The best vehicle rated 138 MPG.

You save \$750
in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,350

Fuel Economy & Greenhouse Gas Rating
1 7 10
The vehicle emits 286 grams CO₂ per mile. The best emits 9 grams per mile (passenger vehicle). Reducing and saving fuel also costs emissions. Learn more at fuel-economy.gov

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

Side Crash Front seat Not Rated
Rear seat Not Rated
Based on the risk of injury in a side impact.

Rollover Not Rated
Based on the risk of rollover in a single vehicle crash.

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

DELIVERY

VEHICLE COLORS:
EXT: ELECTRIC BLUE M
INT: CHARCOAL

FINAL ASSEMBLY POINT:
AQUAS/ABV/MEX

TRANSPORT METHOD:
TRUCK

DEALER:
TOM HESSER NISSAN, LLC
300 O'NEILL HIGHWAY
DUNMORE PA
15512

Security+Plus Extended Protection Plan
This vehicle qualifies for Nissan's
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

VIN: 3N1CN8VL802015
EMS: 50 STATE EM5015
MDL: 10050-002015 B01-0
OPT: 8-84020150

*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.

FIGURE 83. Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration X Primary	B-1
2	Driver Head Acceleration Y Primary	B-1
3	Driver Head Acceleration Z Primary	B-1
4	Driver Head Resultant Acceleration Primary	B-1
5	Driver Chest X Deflection	B-2
6	Driver Upper Neck Force X	B-3
7	Driver Upper Neck Force Z	B-3
8	Driver Upper Neck Moment Y	B-3
9	Driver Nij	B-3
10	Driver Chest Acceleration X Primary	B-4
11	Driver Chest Acceleration Y Primary	B-4
12	Driver Chest Acceleration Z Primary	B-4
13	Driver Chest Resultant Acceleration Primary	B-4
14	Driver Left Femur Force Z	B-5
15	Driver Right Femur Force Z	B-5
16	Passenger Head Acceleration X Primary	B-6
17	Passenger Head Acceleration Y Primary	B-6
18	Passenger Head Acceleration Z Primary	B-6
19	Passenger Head Resultant Acceleration Primary	B-6
20	Passenger Chest X Deflection	B-7
21	Passenger Upper Neck Force X	B-8
22	Passenger Upper Neck Force Z	B-8
23	Passenger Upper Neck Moment Y	B-8
24	Passenger Nij	B-8
25	Passenger Chest Acceleration X Primary	B-9
26	Passenger Chest Acceleration Y Primary	B-9
27	Passenger Chest Acceleration Z Primary	B-9
28	Passenger Chest Resultant Acceleration Primary	B-9
29	Passenger Left Femur Force Z	B-10
30	Passenger Right Femur Force Z	B-10

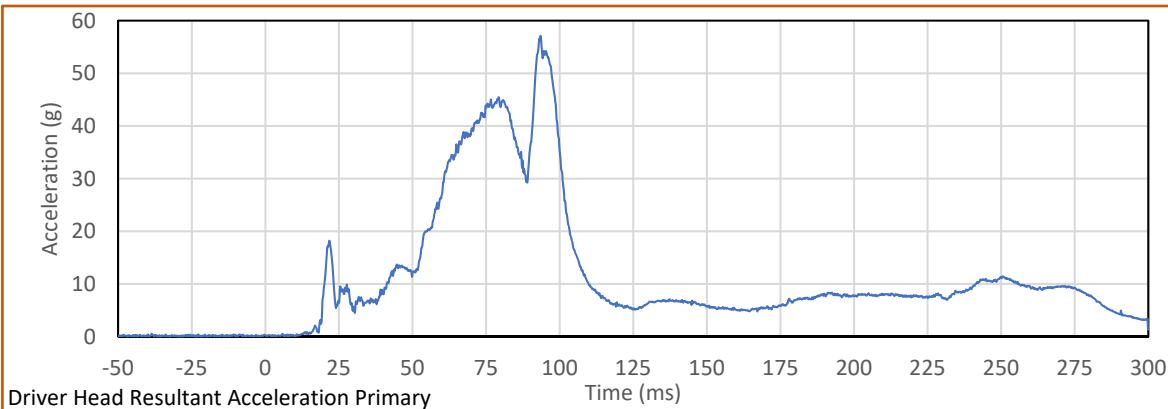
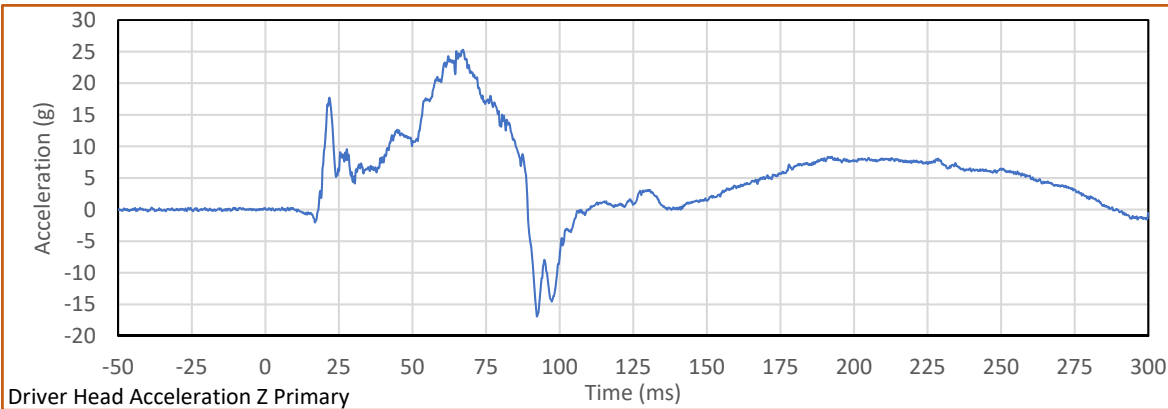
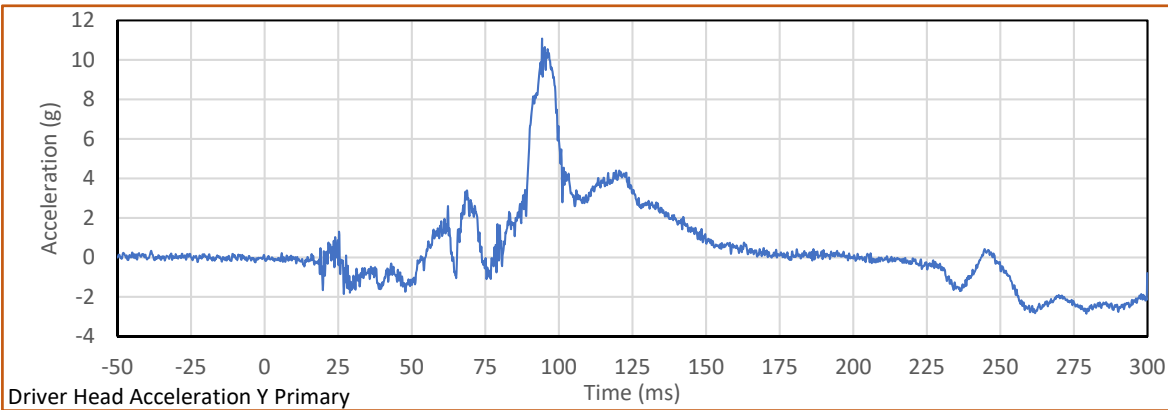
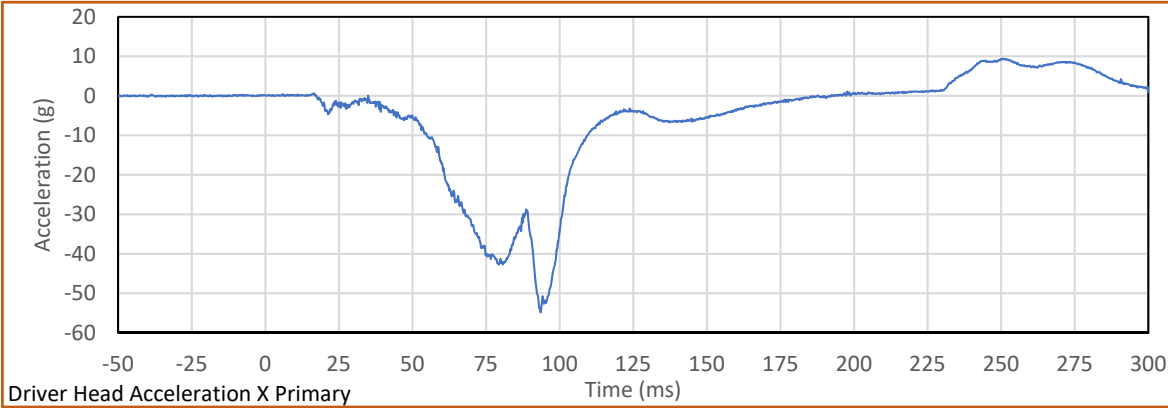
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.gov

Driver Head X Acceleration Redundant
Driver Head Y Acceleration Redundant
Driver Head Z Acceleration 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 Left Femur Force Z Redundant
Driver Right Femur Force Z 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 X Acceleration Redundant
Passenger Head Y Acceleration Redundant
Passenger Head Z Acceleration Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Z
Passenger Upper Neck Moment Y

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 Left Femur Force Redundant
Passenger Right Femur Force 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

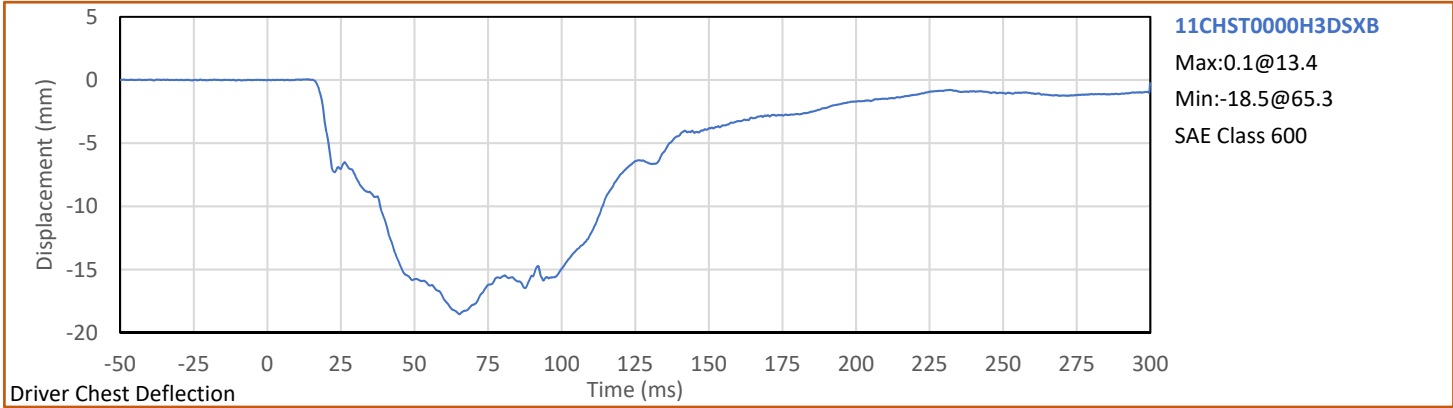
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Test Program: 56.3 km/h Frontal Impact NCAP Test

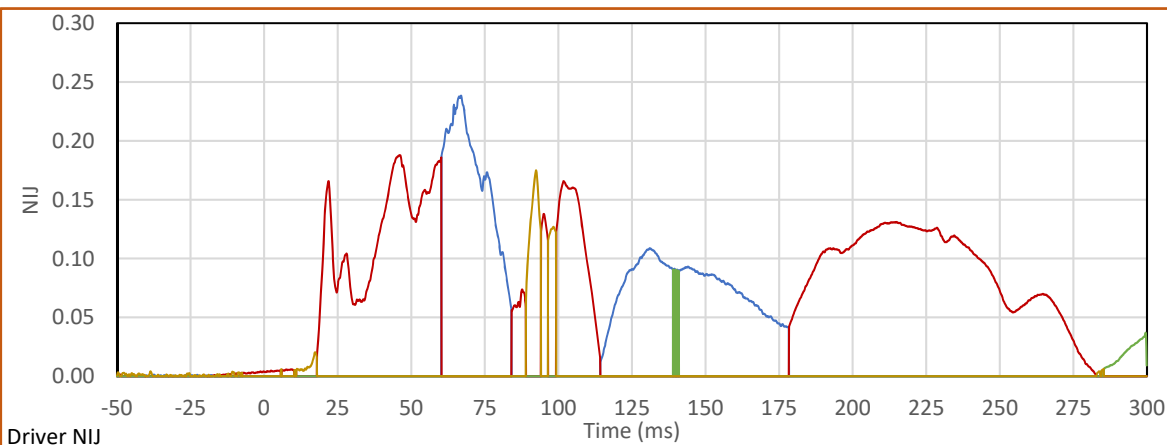
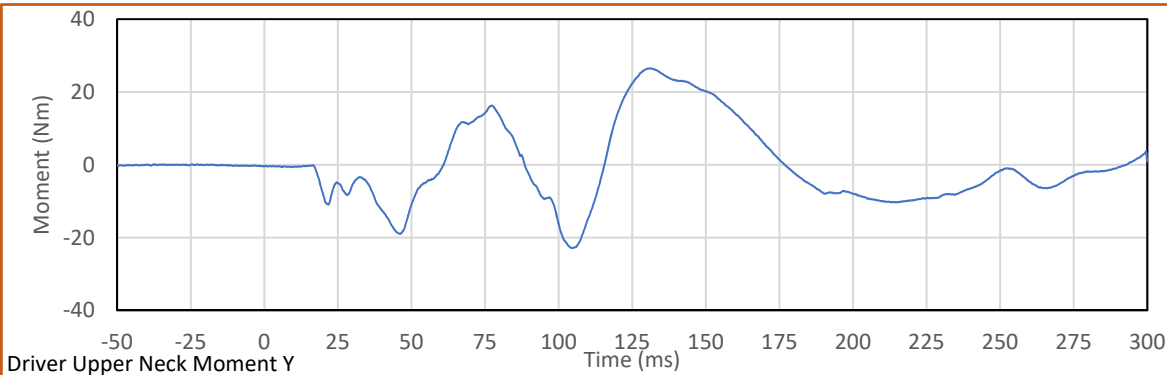
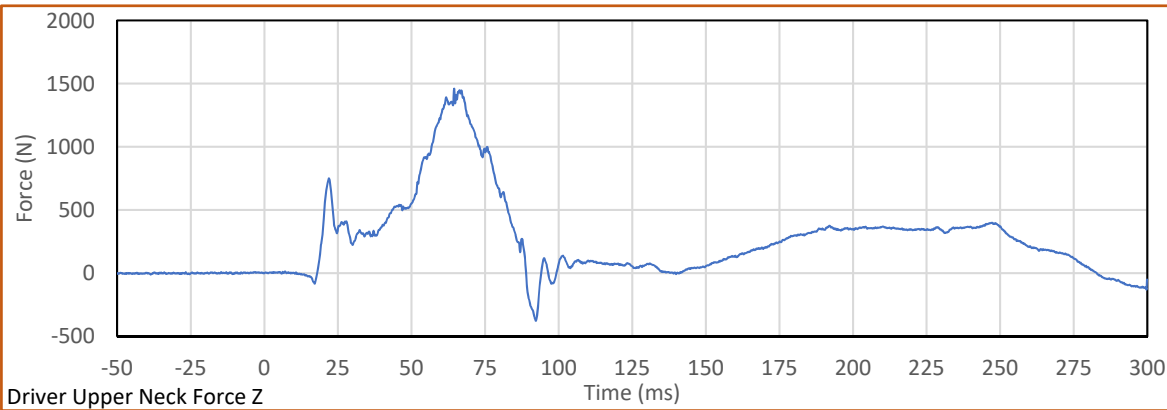
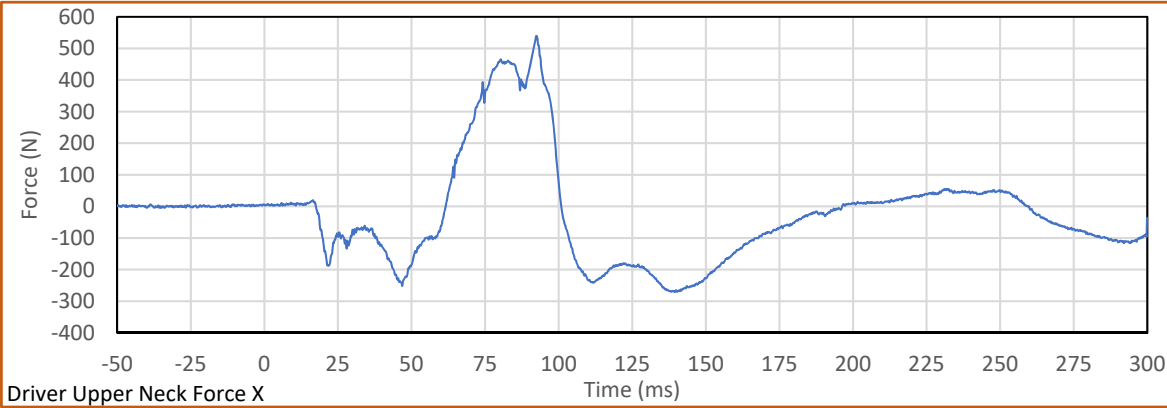
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Test Date: 12/3/2019

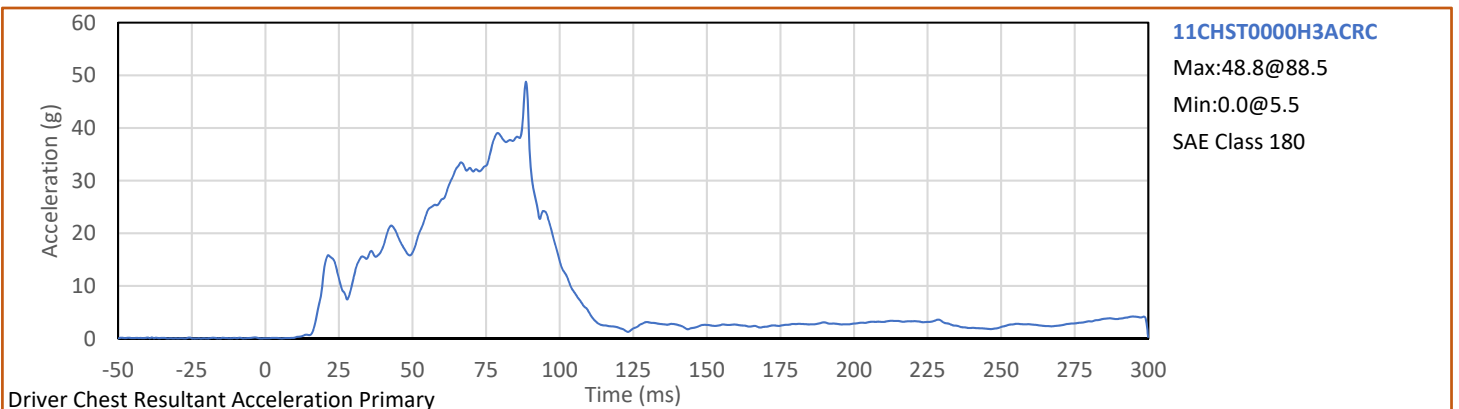
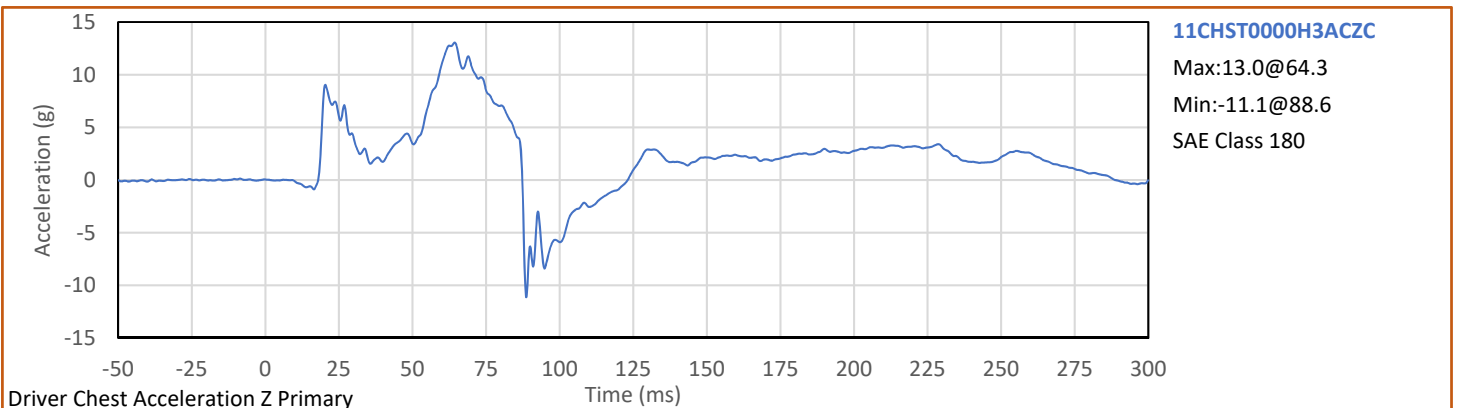
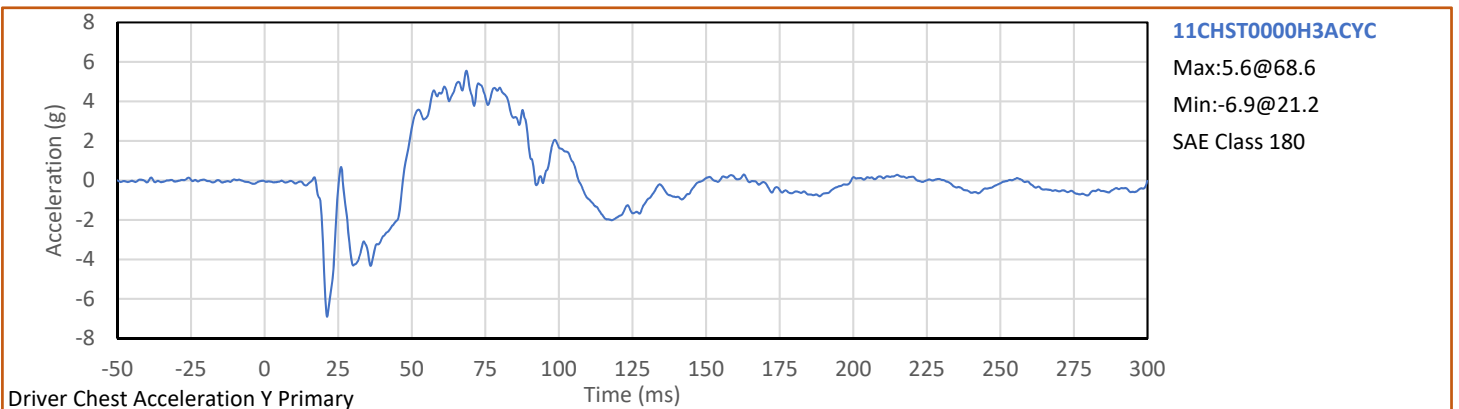
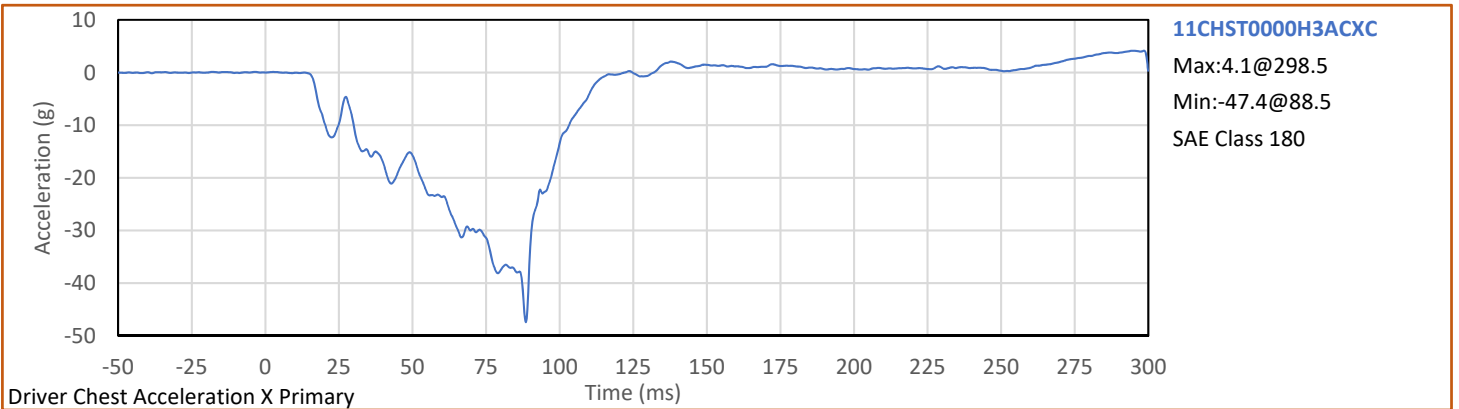


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Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20205215
Test Date: 12/3/2019

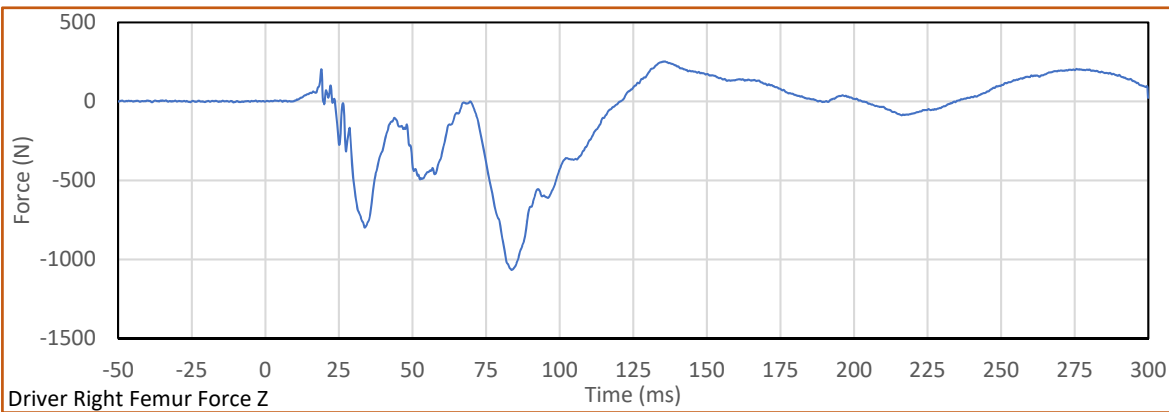
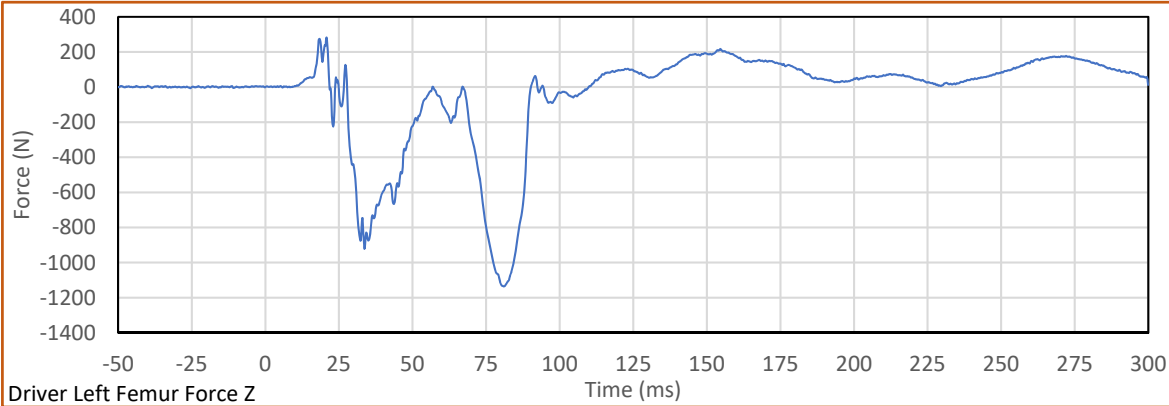






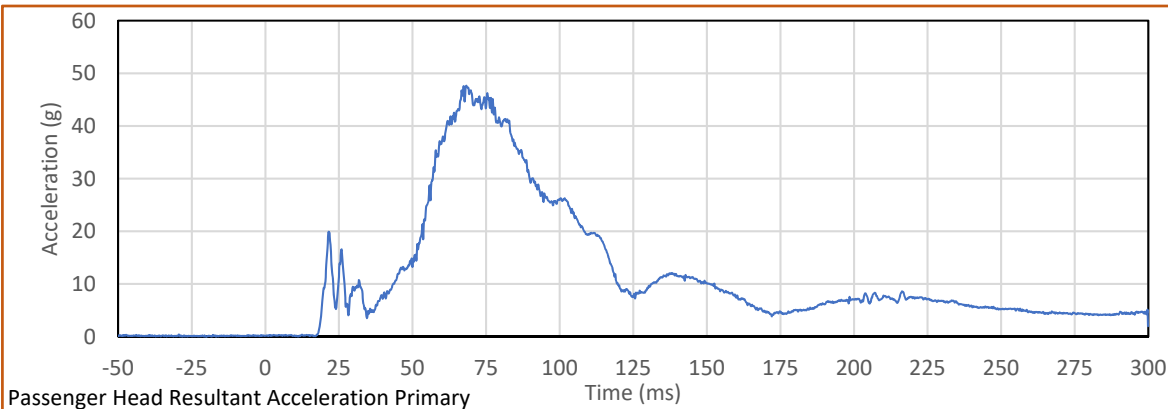
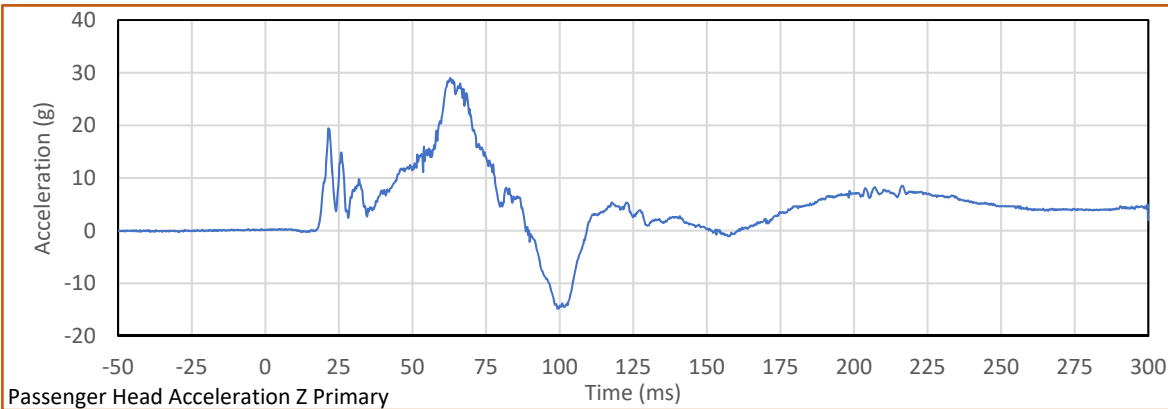
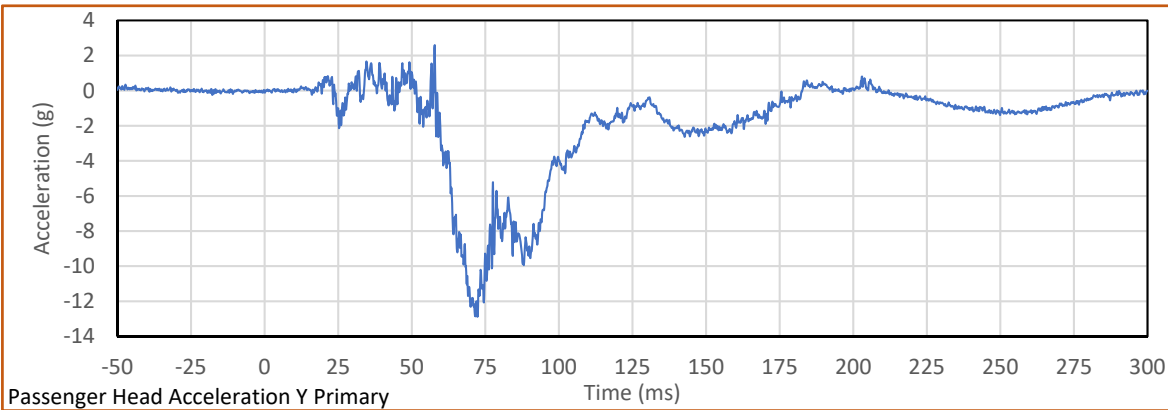
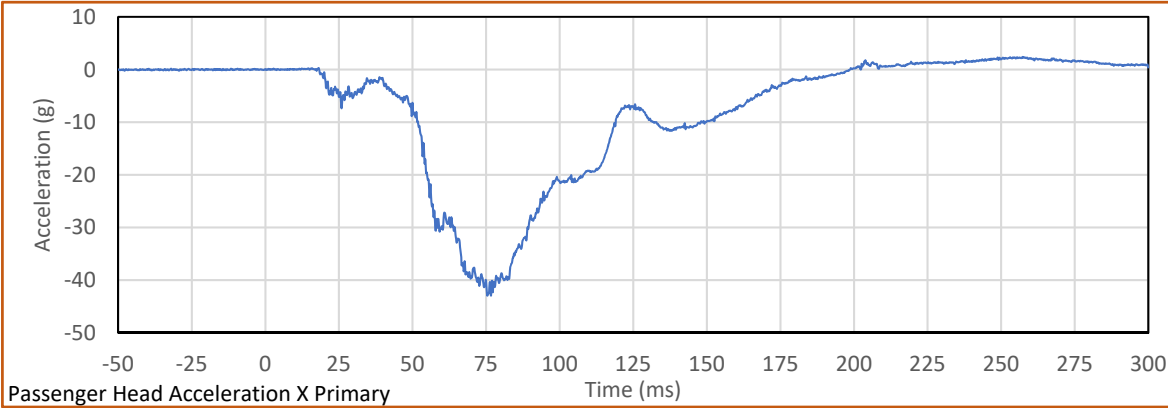
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Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20205215
Test Date: 12/3/2019



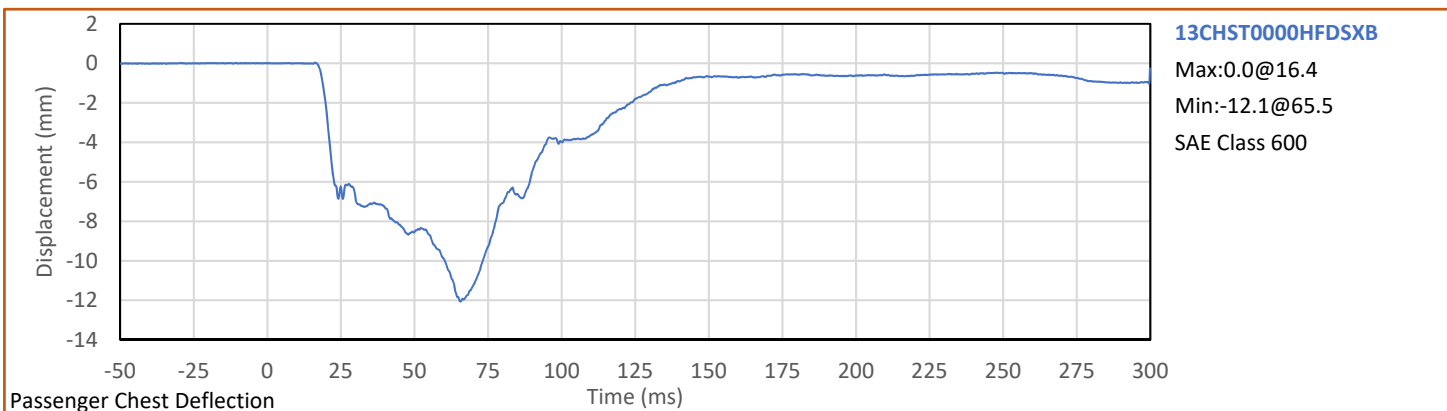
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Test Program: 56.3 km/h Frontal Impact NCAP Test

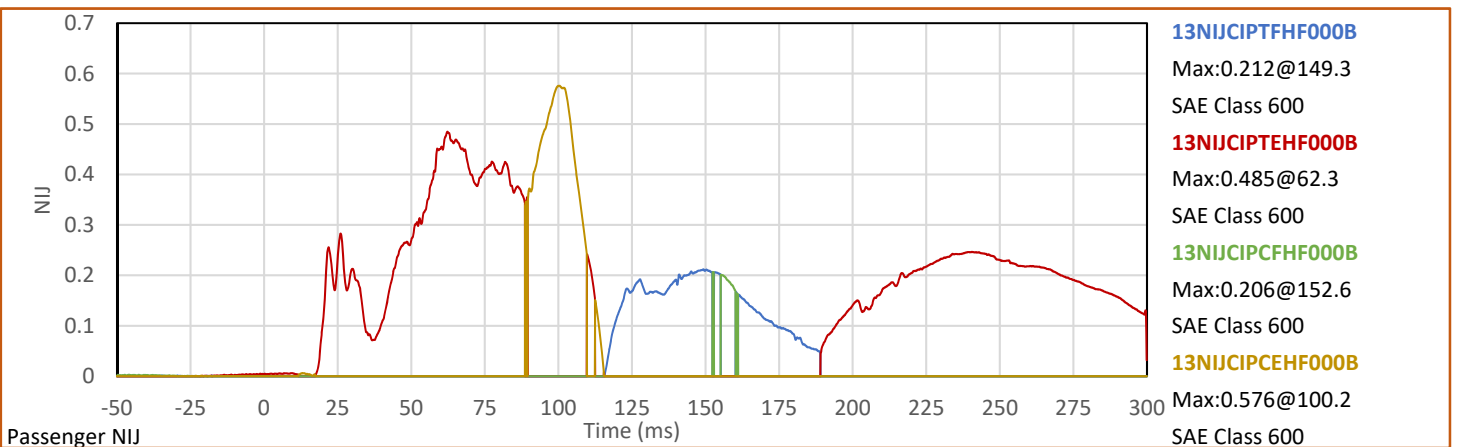
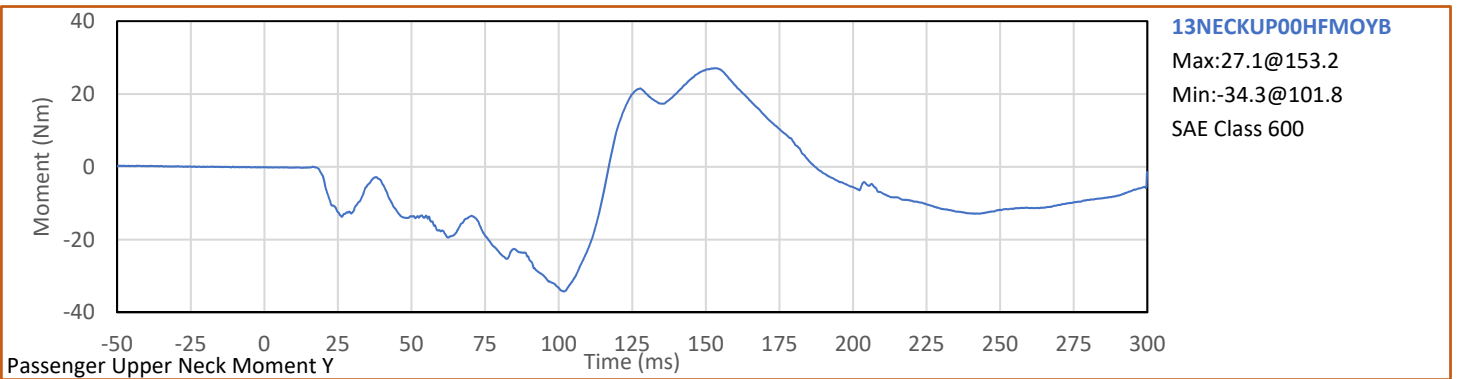
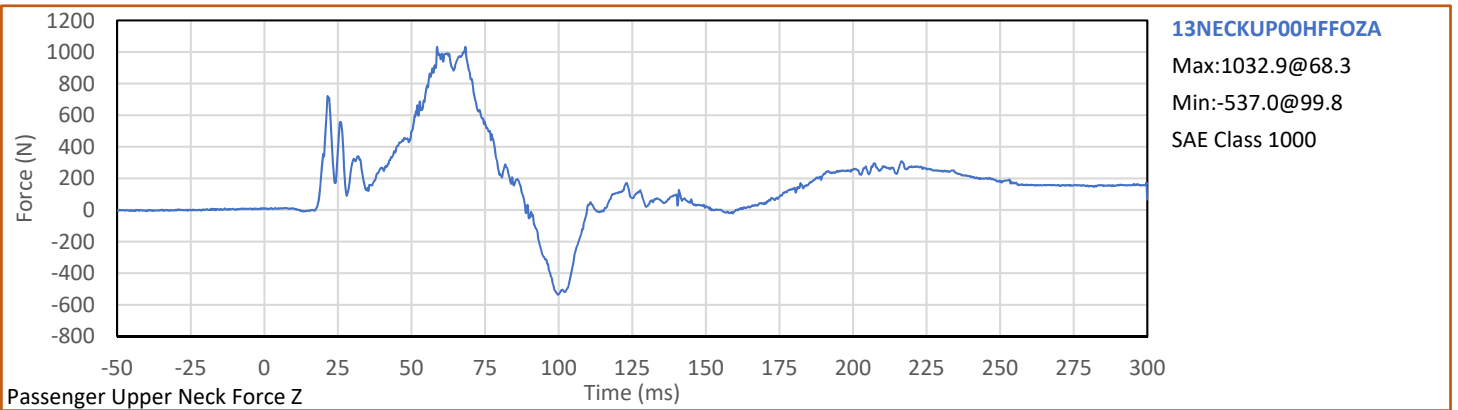
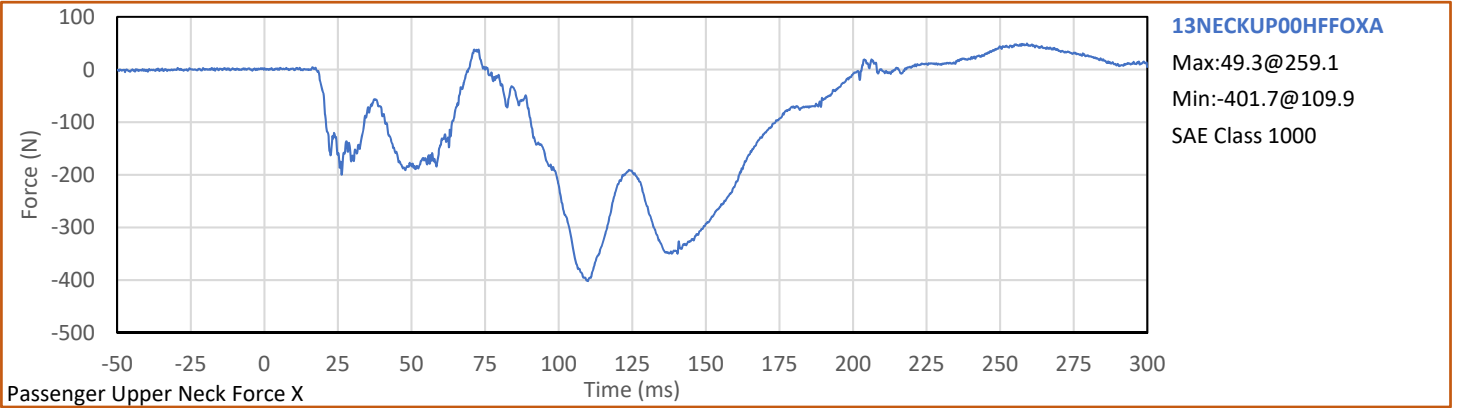
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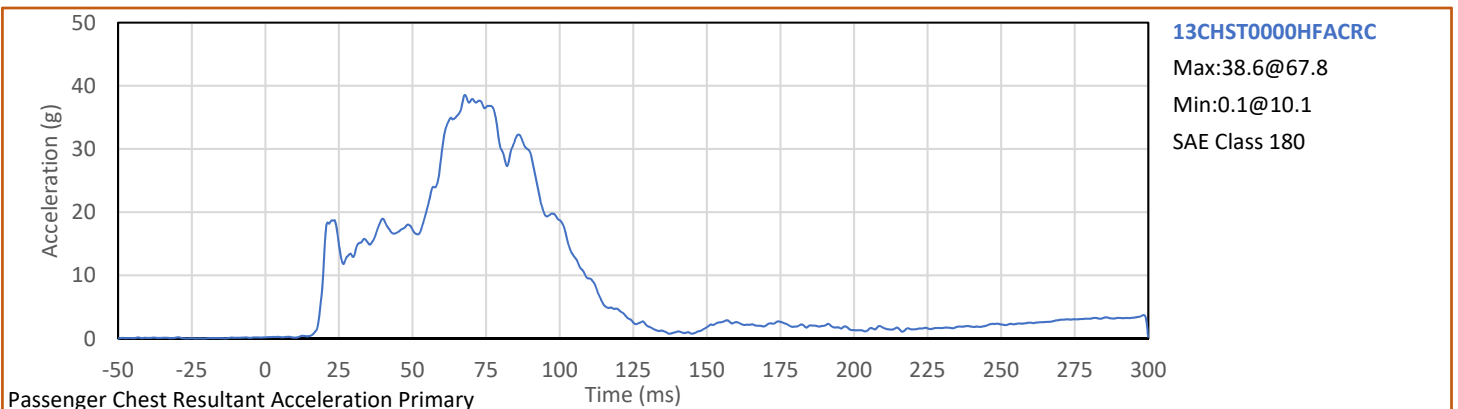
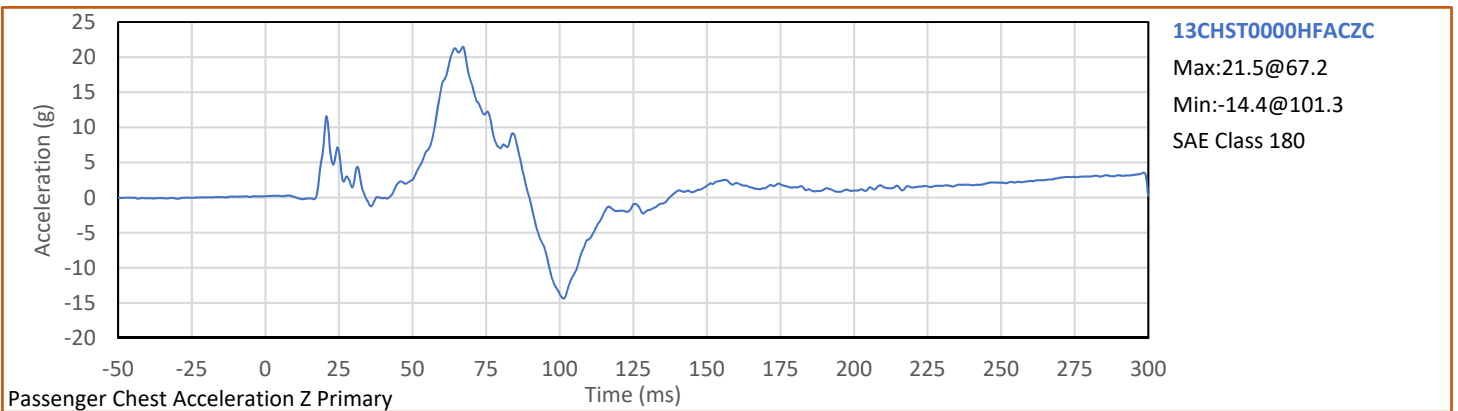
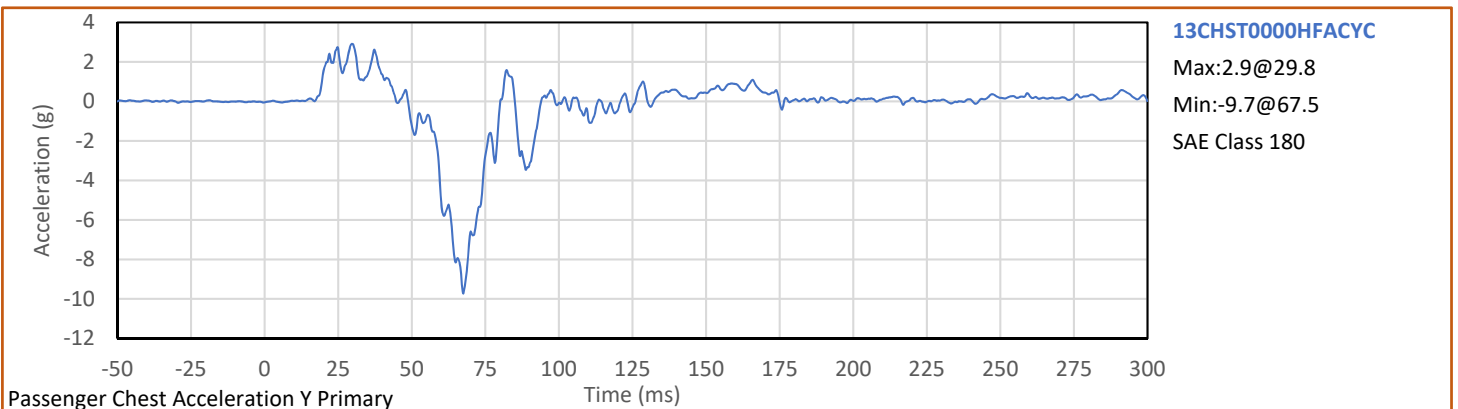
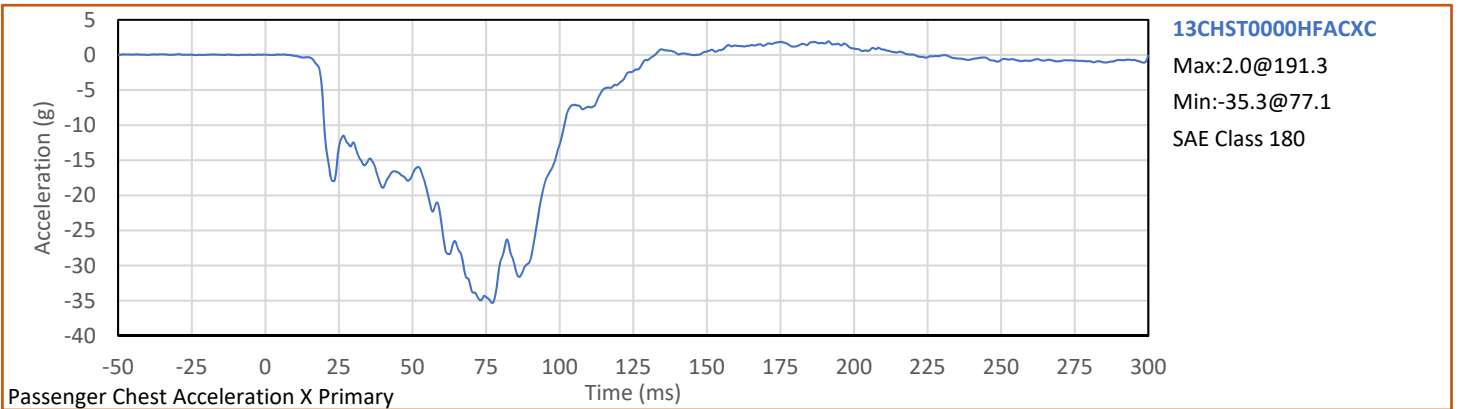
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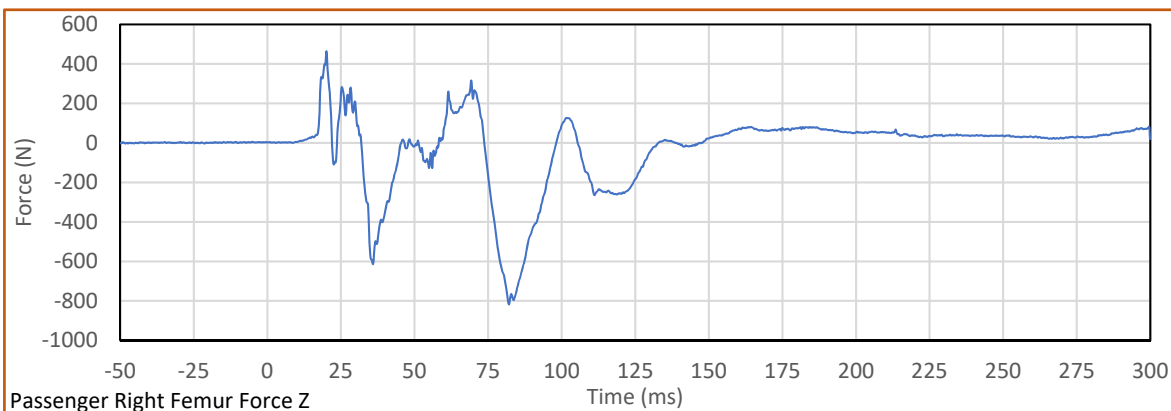
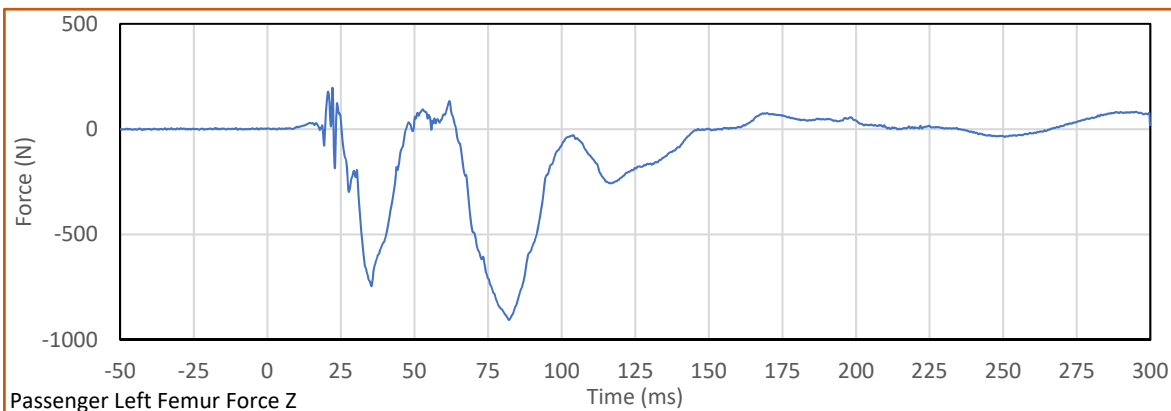
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Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20205215
Test Date: 12/3/2019



Test Vehicle: 2020 Nissan Versa 4-Door Sedan
Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20205215
Test Date: 12/3/2019



APPENDIX C
DUMMY QUALIFICATION AND PERFORMANCE VERIFICATION

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
Hybrid III 50th Percentile Male ATD
S/N: 360

ATD Serial No.: 360

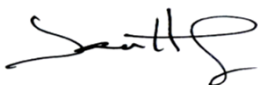
Test Date: 2019-11-12

Dummy Item	Inspect for	Comments	Damage	OK
Entire ATD	Perform general cleaning			✓
Outer Skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck bracket	Upper neck firmly attached to lower bracket			✓
Neck	Broken or cracked rubber			✓
	Looseness at the condyle joint			✓
Nodding block	Cracked or out of position			✓
Lumbar Spine	Broken or cracked rubber			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Displ. Assembly	Bent shaft			✓
	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer Mounting	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "resting" position			✓
Pelvis	Broken			✓
Other	Describe below as needed			✓

Describe any repairs or replacement of parts or other findings:

No Problems Found

Technician:



J. Hernandez

Approved By:



P. Puzzuto

ATD Serial No.: 360

Test Date: 2019-11-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	26	Pass
A - Total sitting height	mm	879	889	885	Pass
B - Shoulder pivot height	mm	505	521	512	Pass
C - 'H' point height	mm	84	89	87	Pass
D - 'H' point location from backline	mm	135	140	140	Pass
E - Shoulder pivot from backline	mm	84	94	89	Pass
F - Thigh clearance	mm	140	155	152	Pass
G - Back of elbow to wrist pivot	mm	290	305	299	Pass
H - Head back to backline	mm	41	46	45	Pass
I - Shoulder to elbow length	mm	330	345	338	Pass
J - Elbow rest height	mm	190	211	201	Pass
K - Buttock to knee length	mm	579	604	596	Pass
L - Popliteal length	mm	429	455	447	Pass
M - Knee pivot height	mm	485	500	497	Pass
N - Buttock popliteal length	mm	452	477	462	Pass
O - Chest depth without jacket	mm	213	229	222	Pass
P - Foot length	mm	251	267	257	Pass
V - Shoulder breadth	mm	422	437	433	Pass
W - Foot breadth	mm	91	107	100	Pass
Y - Chest circum. (w/chest jacket)	mm	970	1001	984	Pass
Z - Waist circum.	mm	836	866	850	Pass
AA - Location for chest circum.	mm	429	434	432	Pass
BB - Location for waist circum.	mm	226	231	227	Pass
				Overall Test Results	Pass

Technician:



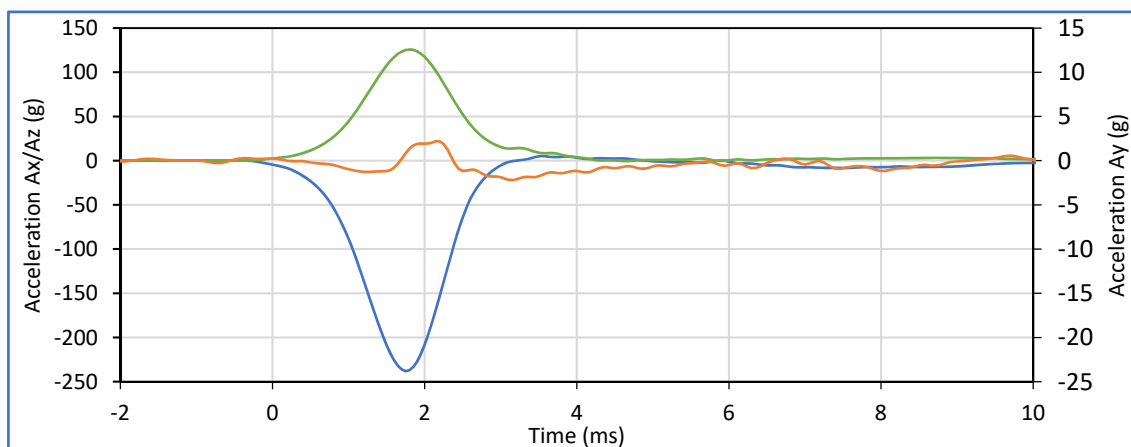
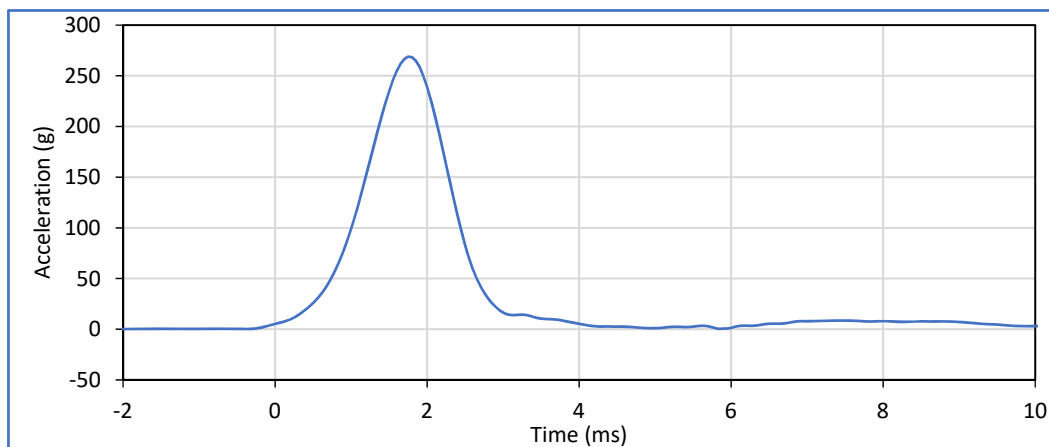
J. Hernandez

Approved By:



P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Peak Resultant Acceleration	g	225.0	275.0	268.9	Pass
Peak Lateral Acceleration	g	-15.0	15.0	2.2	Pass
Oscillations After Main Pulse	%	0.0	10.0	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass



Technician:

J. Hernandez

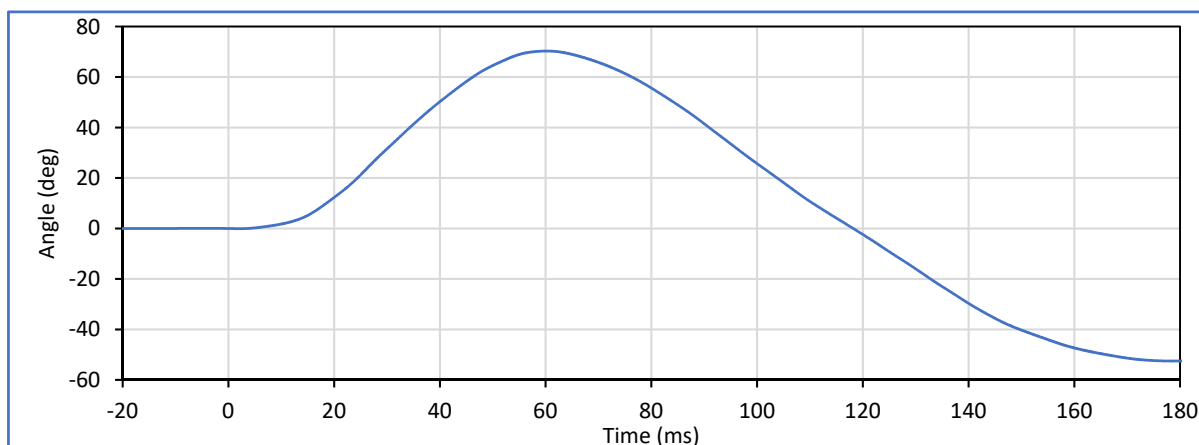
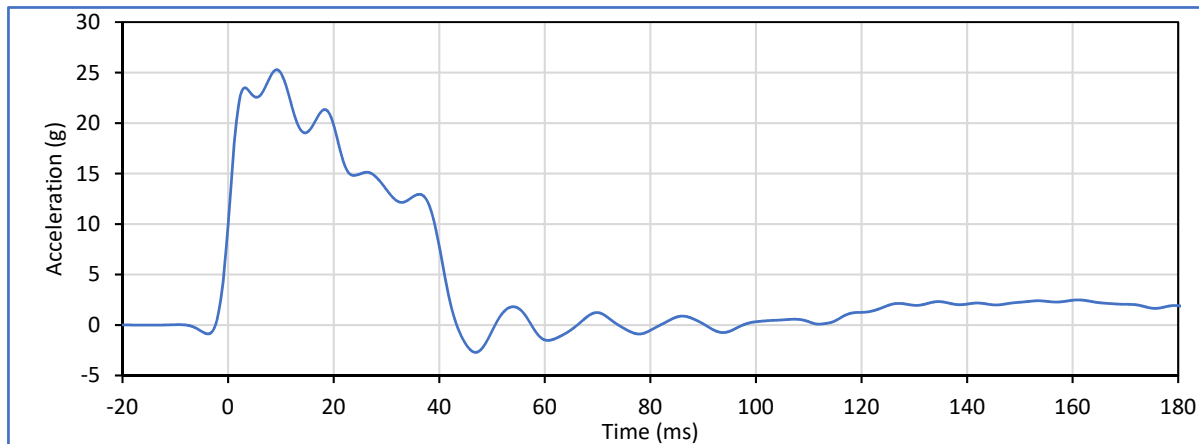
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	26	Pass
Pendulum Velocity	m/s	6.89	7.13	6.97	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	24.9	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	19.8	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	13.4	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	13.4	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	41.0	Pass
"D" Plane Rotation peak	deg	64.0	78.0	70.3	Pass
	ms	57.0	64.0	60.3	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	118.2	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	102.3	Pass
	ms	47.0	58.0	54.1	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	99.6	Pass
Overall Test Results				Pass	



Technician:

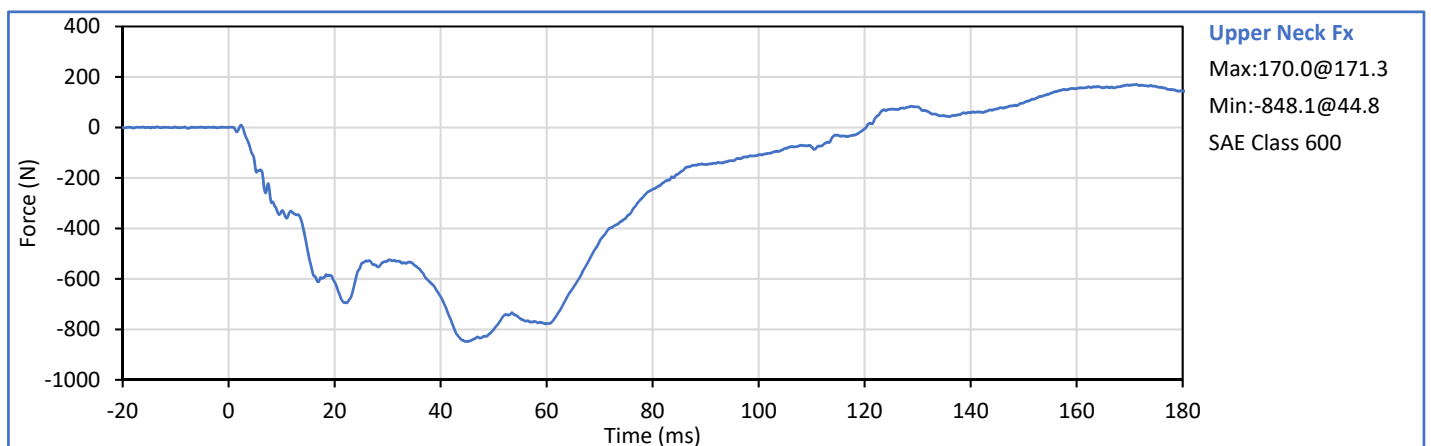
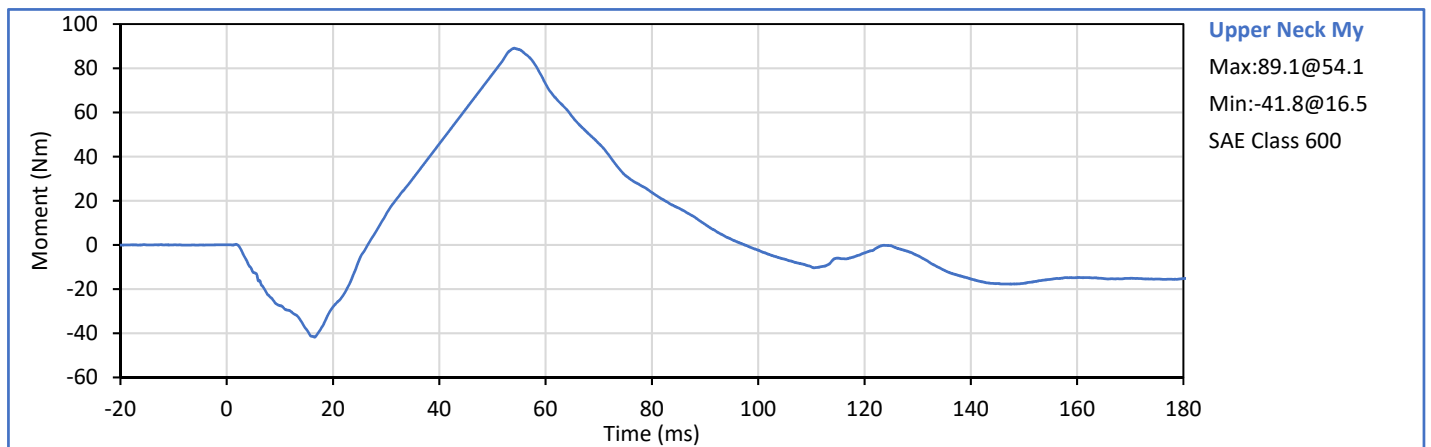
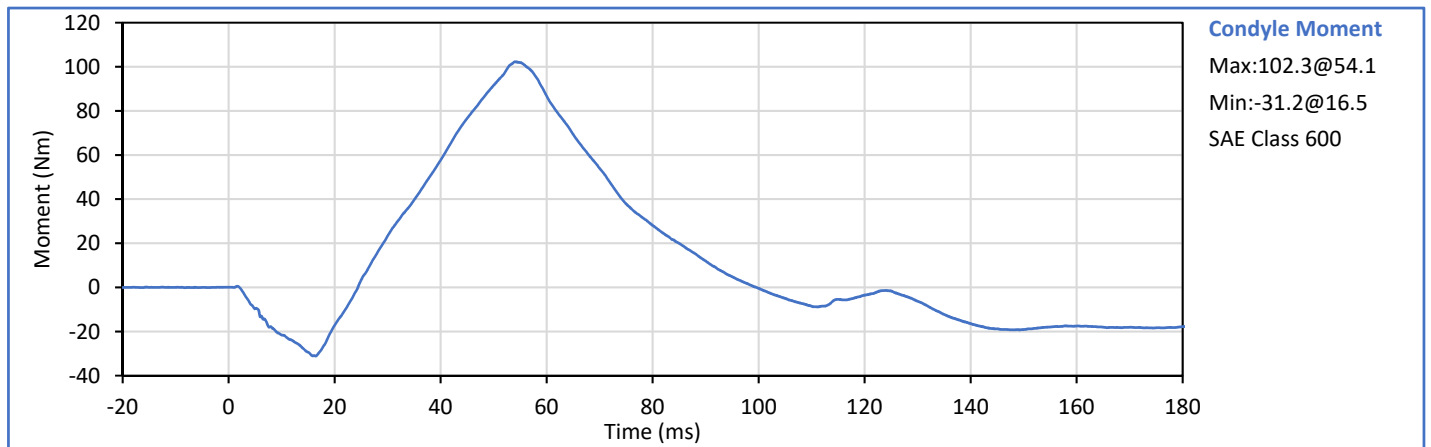
J. Hernandez

J. Hernandez

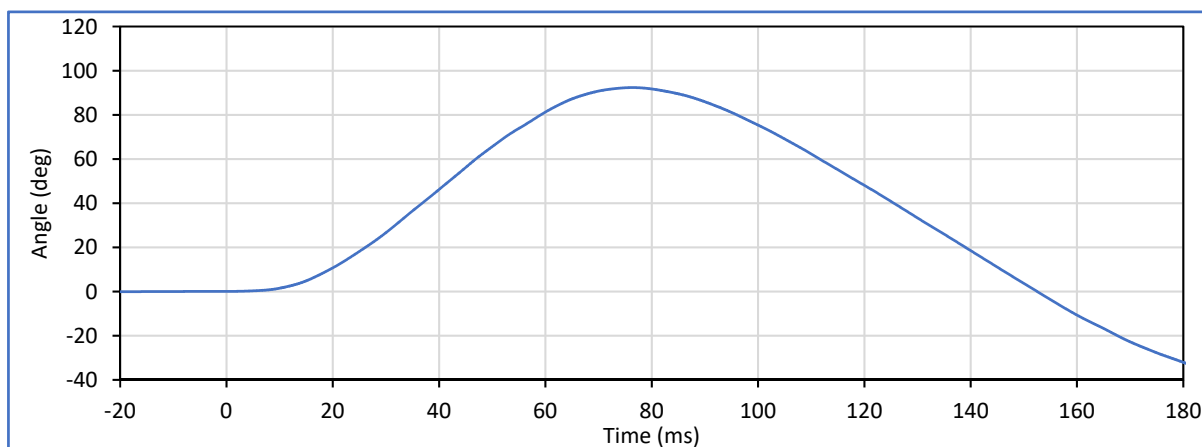
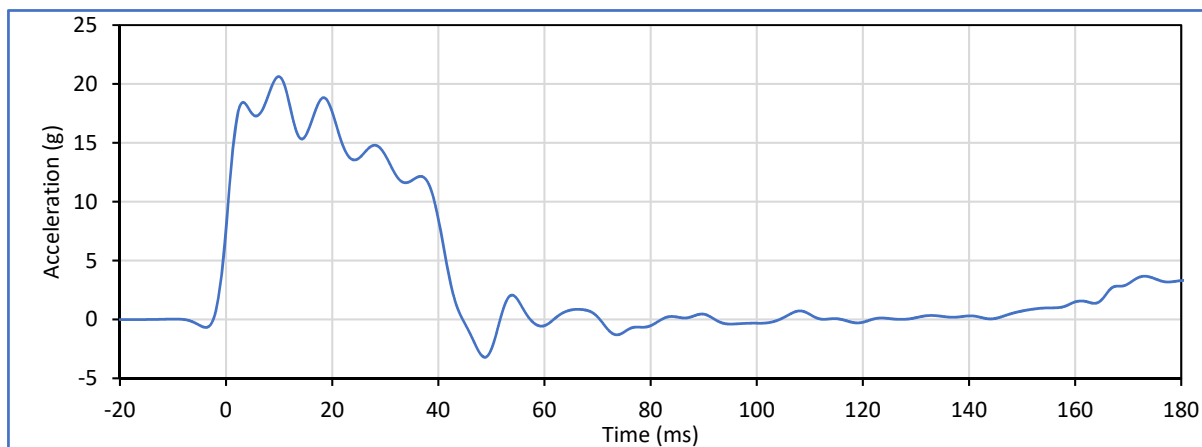
Approved By:

P. Puzzuto

P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	26	Pass
Pendulum Velocity	m/s	5.94	6.19	6.05	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	20.6	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	17.6	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.9	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	13.9	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	41.5	Pass
"D" Plane Rotation peak	deg	81.0	106.0	92.4	Pass
	ms	72.0	82.0	76.4	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	152.6	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-72.1	Pass
	ms	65.0	79.0	71.4	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	140.3	Pass
Overall Test Results				Pass	



Technician:

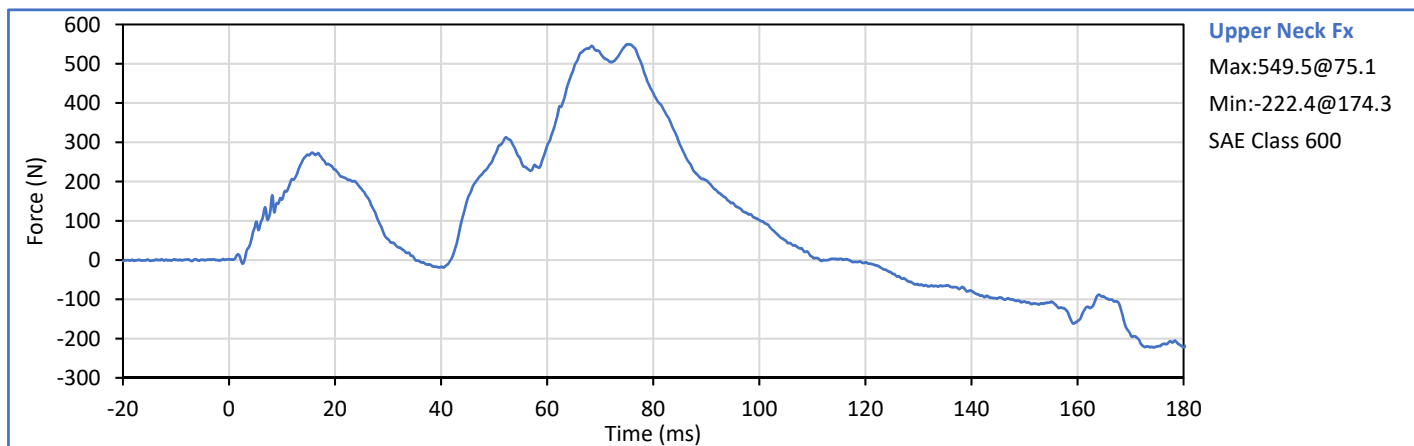
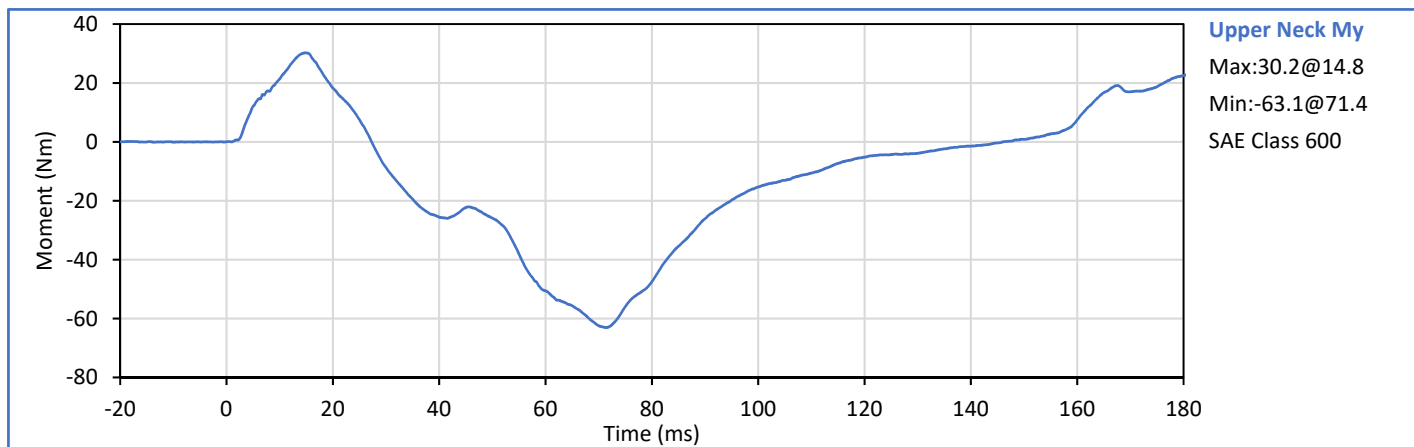
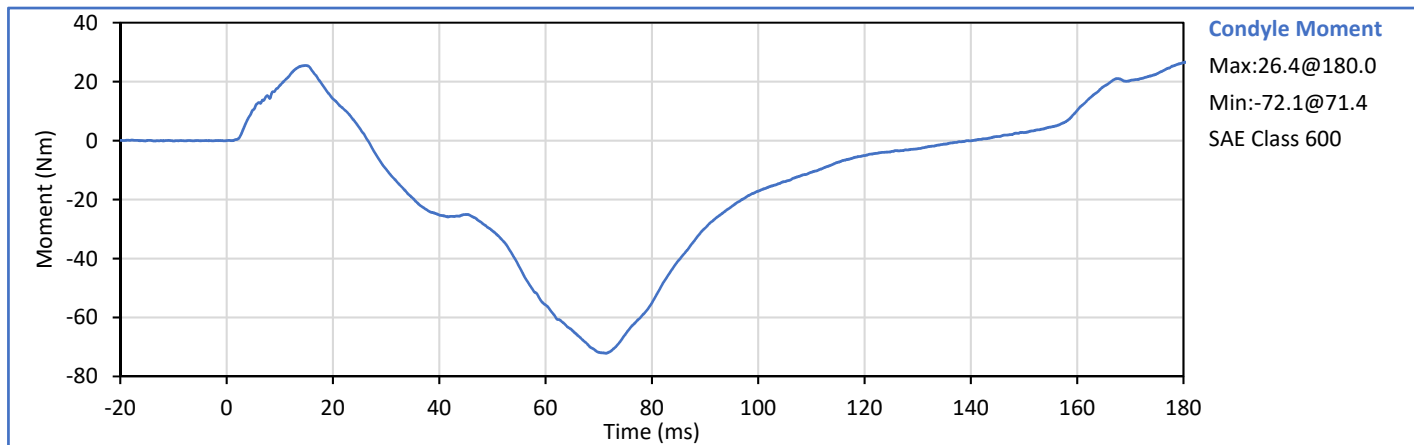
J. Hernandez

J. Hernandez

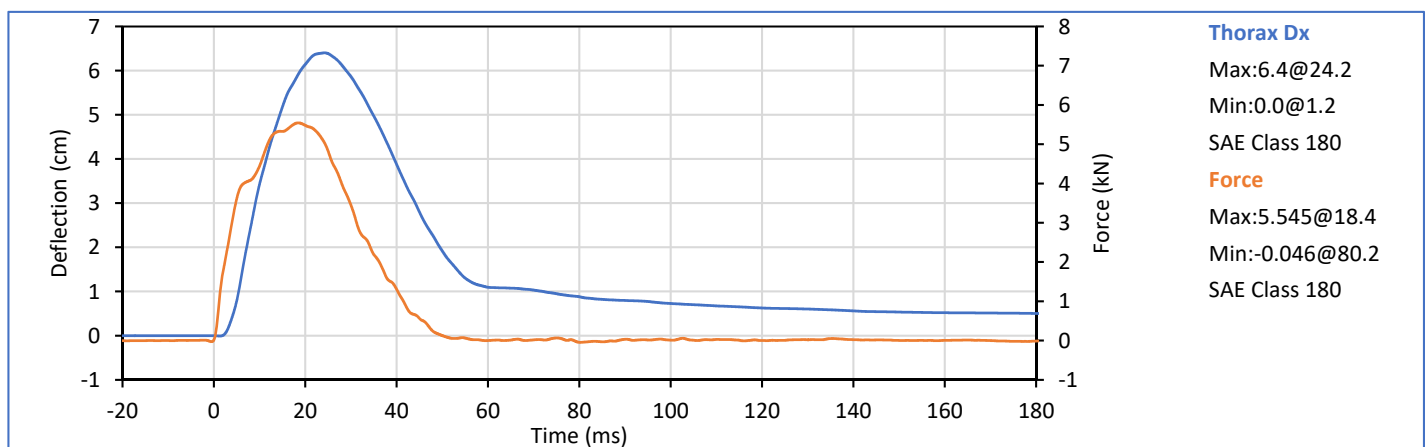
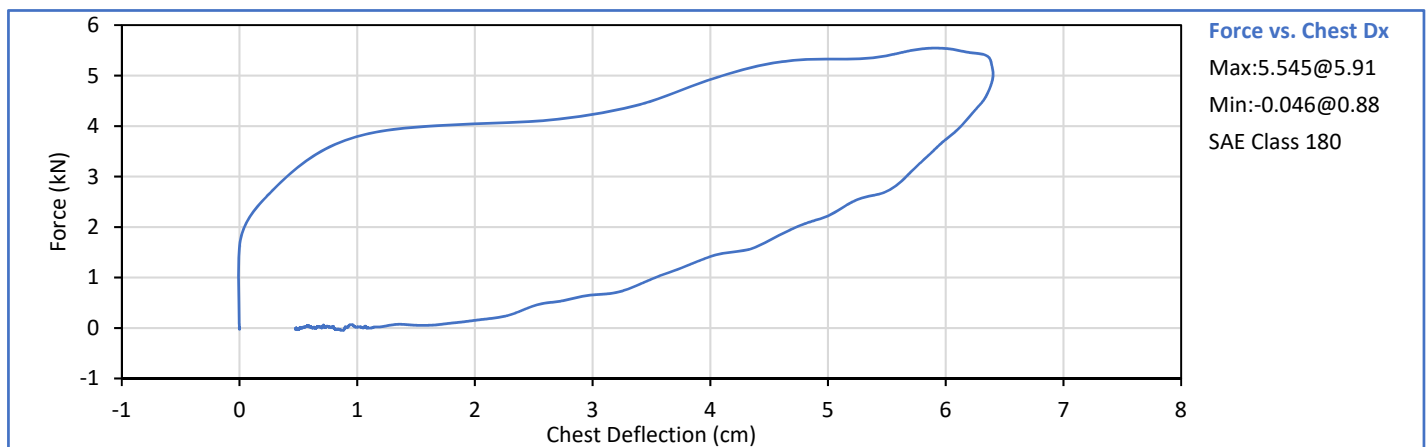
Approved By:

P. Puzzuto

P. Puzzuto



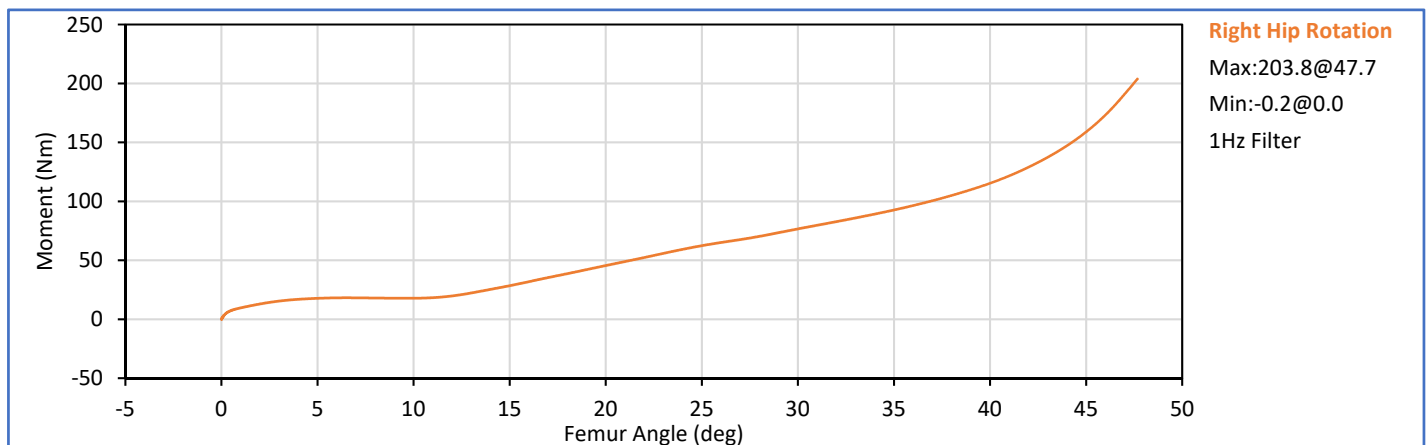
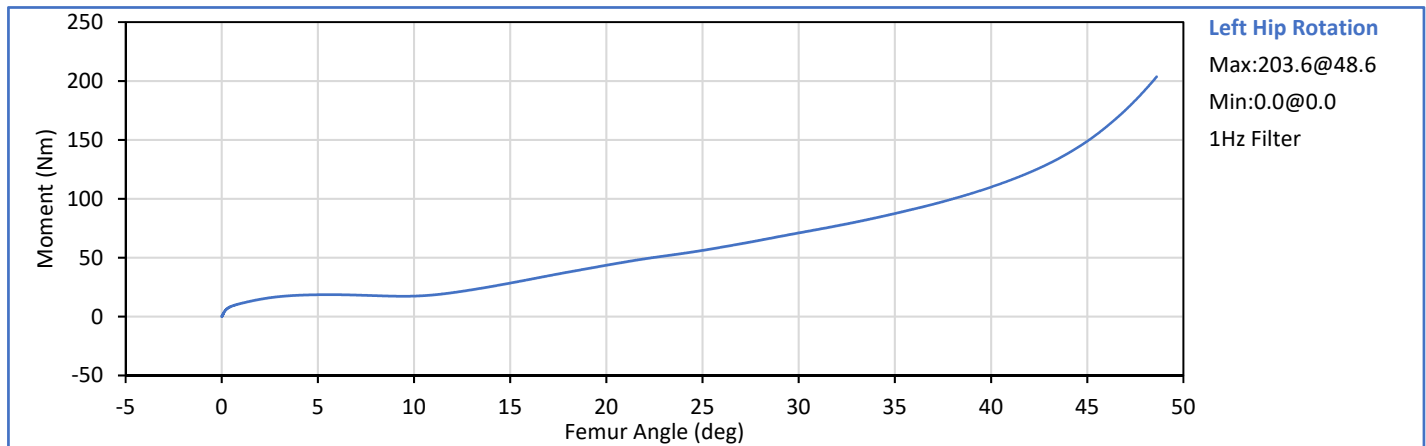
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	33	Pass
Probe Velocity	m/s	6.58	6.82	6.66	Pass
Peak Chest Deflection	cm	6.35	7.26	6.40	Pass
Peak Probe Force	kN	5.159	5.893	5.545	Pass
Internal Hysteresis	%	69.0	85.0	72.7	Pass
Overall Test Results				Pass	

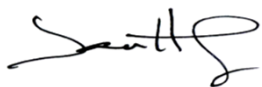


Technician: J. Hernandez

Approved By: P. Puzzuto

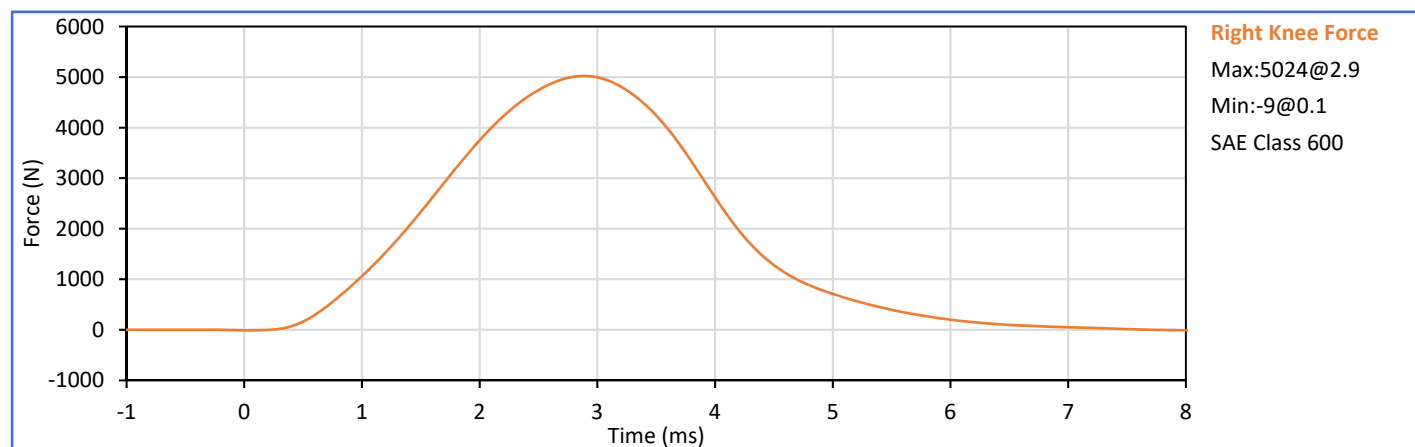
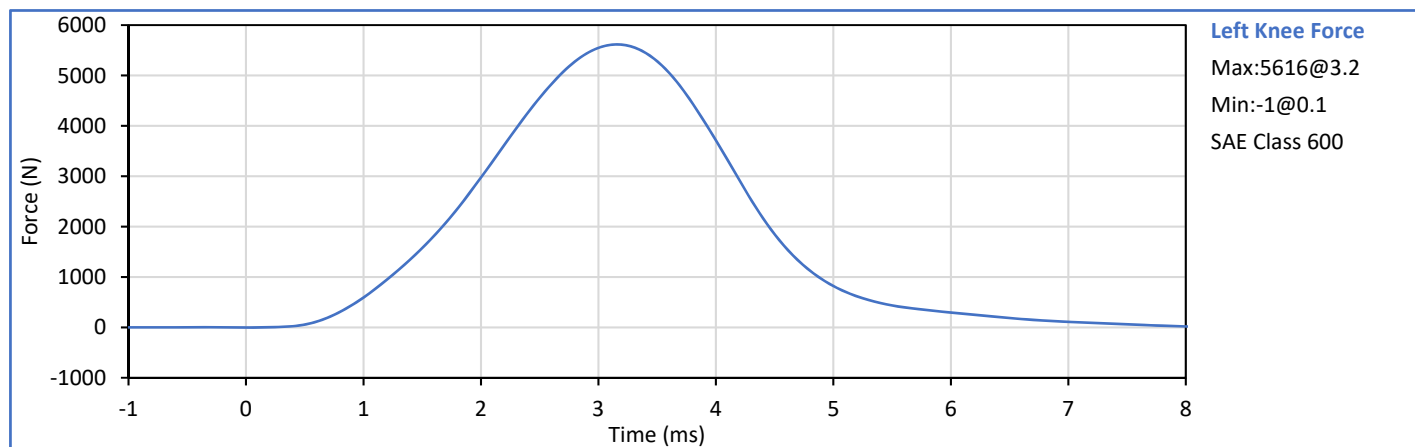
Tested Parameter		Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature		°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity		%	10	70	27	Pass
Left Hip	Left Hip Rotation Rate	deg/s	5.0	10.0	6.1	Pass
	Left Femur Torque at 30°	Nm	0.0	95.0	71.1	Pass
	Left Hip Rotation at 203 Nm	deg	40.0	50.0	48.6	Pass
Right Hip	Right Hip Rotation Rate	deg/s	5.0	10.0	6.0	Pass
	Right Femur Torque at 30°	Nm	0.0	95.0	76.7	Pass
	Right Hip Rotation at 203 Nm	deg	40.0	50.0	47.6	Pass
Overall Test Results						Pass



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.2	Pass
	Laboratory Relative Humidity	%	10	70	21	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.103	Pass
Knee	Peak Resistive Force	N	4715	5782	5616	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.097	Pass
Knee	Peak Resistive Force	N	4715	5782	5024	Pass
Overall Test Results						Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX C
Pre-Test ATD Configuration And Performance Verification Data
Hybrid III 5th Percentile Female ATD
S/N: DH1644

ATD Serial No.: DH1644

Test Date: 2019-11-11

Dummy Item	Inspect for	Comments	Damage	Okay
Entire ATD	Perform general cleaning			✓
Outer Skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck bracket	Upper neck firmly attached to lower bracket			✓
Neck	Broken or cracked rubber			✓
	Looseness at the condyle joint			✓
Nodding block	Cracked or out of position			✓
Lumbar Spine	Broken or cracked rubber			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Displ. Assembly	Bent shaft			✓
	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer Mounting	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "resting" position			✓
Pelvis	Broken			✓
Other	Describe below as needed			✓

Describe any repairs or replacement of parts or other findings:

No Problems Found

Technician:



J. Hernandez

Approved By:



P. Puzzuto

ATD Serial No.: DH1644

Test Date: 2019-11-11

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
A - Total sitting height	mm	775	800	783	Pass
B - Shoulder pivot height	mm	432	457	453	Pass
C - 'H' point height	mm	81	86	85	Pass
D - 'H' point location from backline	mm	145	150	149	Pass
E - Shoulder pivot from backline	mm	69	84	75	Pass
F - Thigh clearance	mm	119	135	124	Pass
G - Back of elbow to wrist pivot	mm	244	259	257	Pass
H - Head back to backline	mm	41	46	44	Pass
I - Shoulder to elbow length	mm	277	297	284	Pass
J - Elbow rest height	mm	183	203	193	Pass
K - Buttock to knee length	mm	521	546	537	Pass
L - Popliteal length	mm	356	376	371	Pass
M - Knee pivot height	mm	394	419	401	Pass
N - Buttock popliteal length	mm	414	439	424	Pass
O - Chest depth without jacket	mm	175	191	186	Pass
P - Foot length	mm	219	234	230	Pass
R - Buttock to Knee Pivot Length	mm	457	483	472	Pass
S - Head Breadth	mm	137	147	143	Pass
T - Head Depth	mm	178	188	183	Pass
U - Hip Breadth	mm	300	315	304	Pass
V - Shoulder breadth	mm	351	366	357	Pass
W - Foot breadth	mm	79	94	89	Pass
X - Head circum.	mm	528	549	532	Pass
Y - Chest circum. (w/chest jacket)	mm	851	881	865	Pass
Z - Waist circum.	mm	760	790	770	Pass
AA - Location for chest circum.	mm	333	358	337	Pass
BB - Location for waist circum.	mm	160	170	166	Pass
Overall Test Results					Pass

Technician:



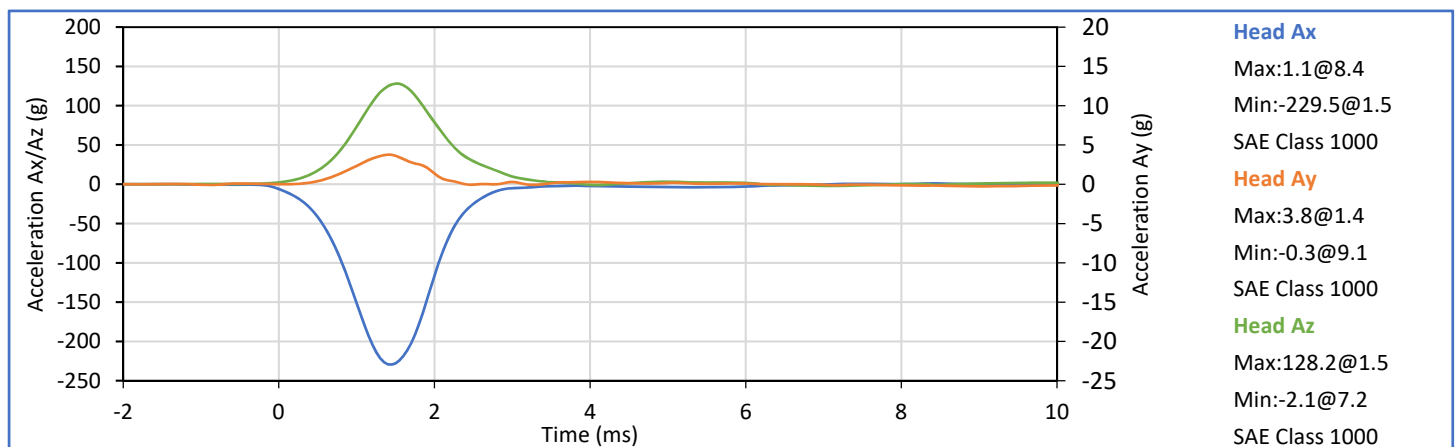
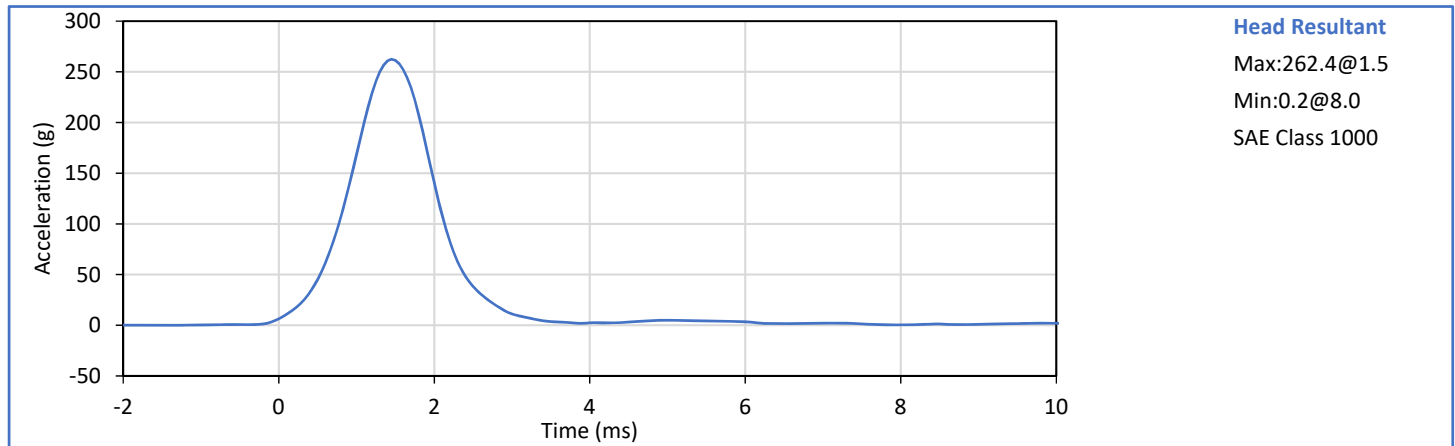
J. Hernandez

Approved By:



P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	18	Pass
Peak Resultant Acceleration	g	250.0	300.0	262.4	Pass
Peak Lateral Acceleration	g	-15.0	15.0	3.8	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	



Technician:

J. Hernandez

J. Hernandez

Approved By:

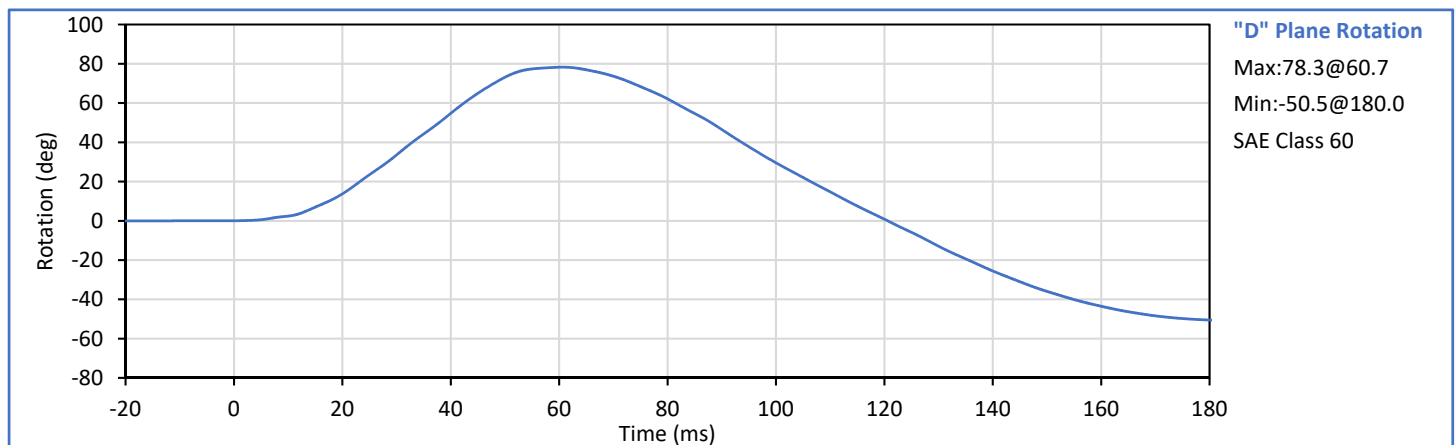
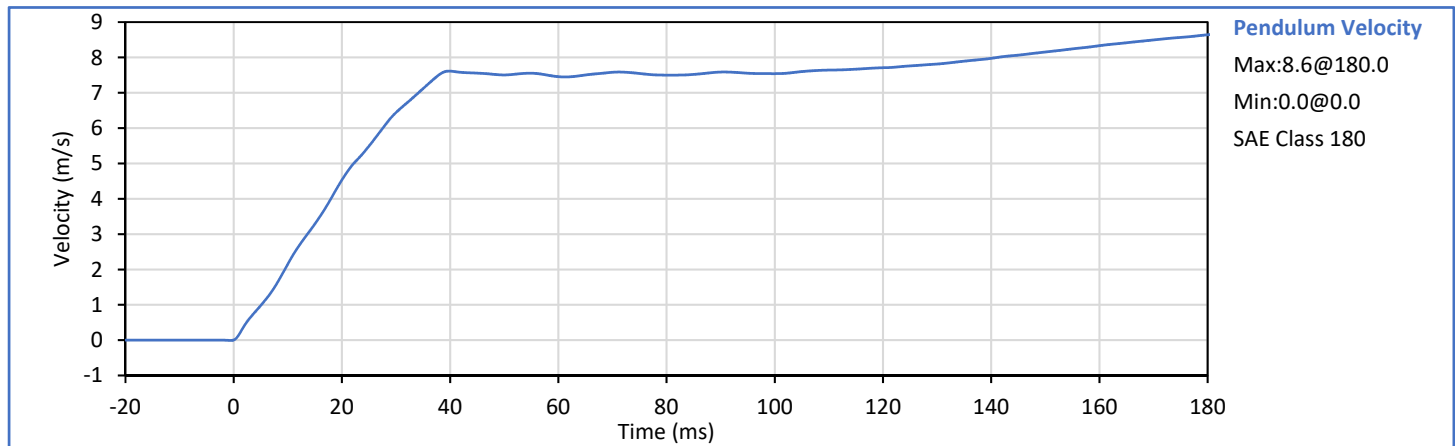
P. Puzzuto

P. Puzzuto

ATD Serial No.: DH1644

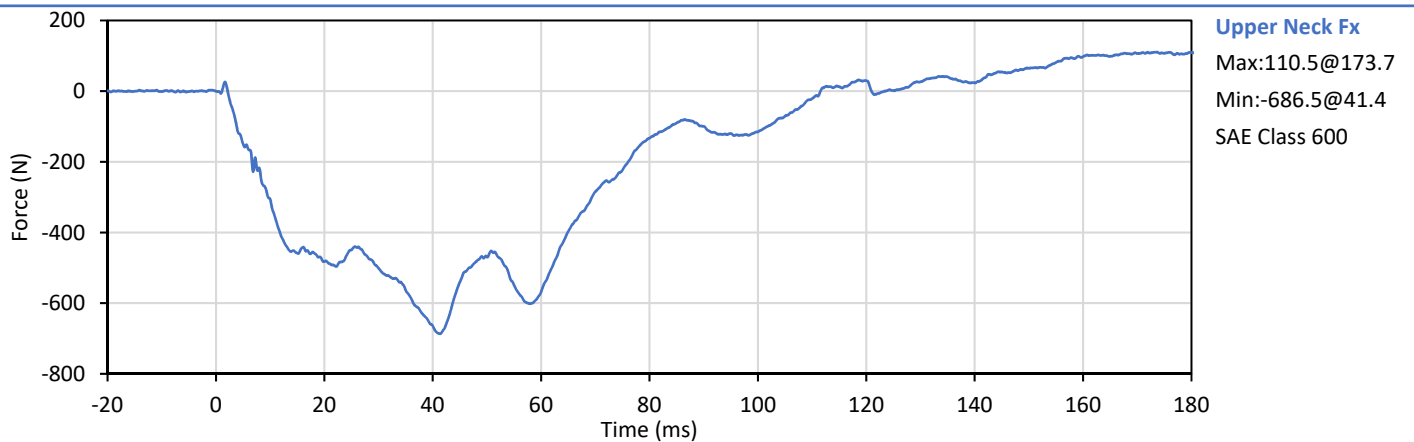
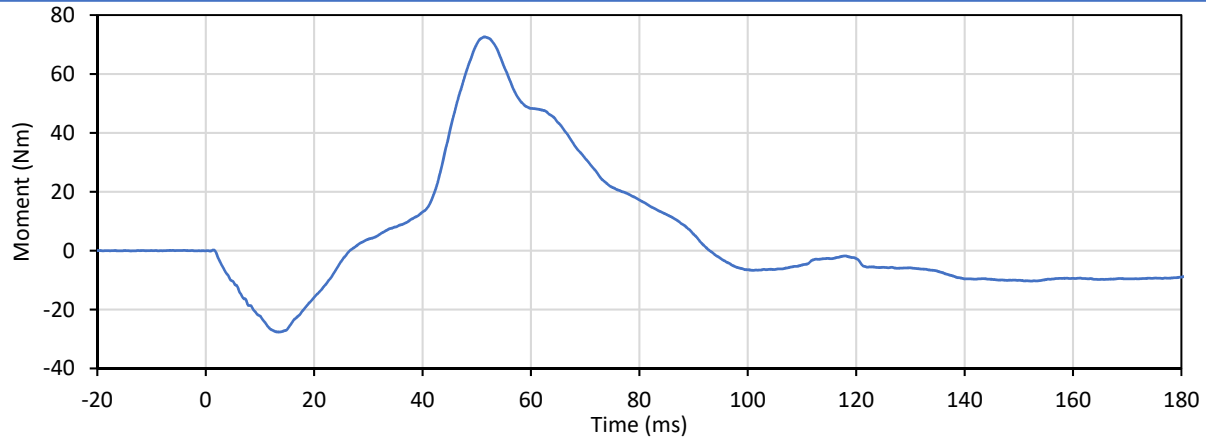
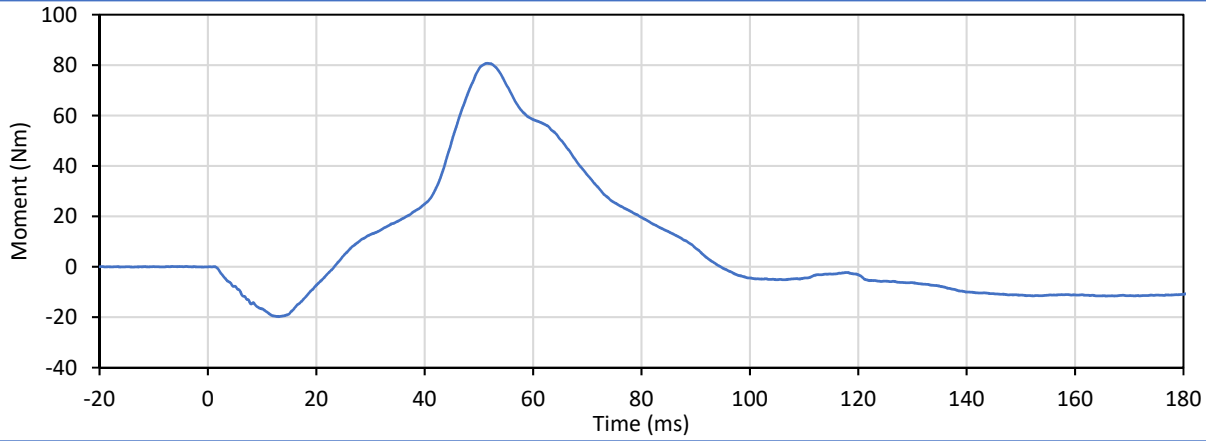
Test Date: 2019-11-14

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Pendulum Velocity	m/s	6.89	7.13	6.99	Pass
Pendulum Velocity at 10 ms	m/s	2.10	2.50	2.15	Pass
Pendulum Velocity at 20 ms	m/s	4.00	5.00	4.53	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.44	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	78.3	Pass
Peak Moment in Rotation	Nm	69.0	83.0	80.7	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	88.5	Pass
Overall Test Results				Pass	Pass

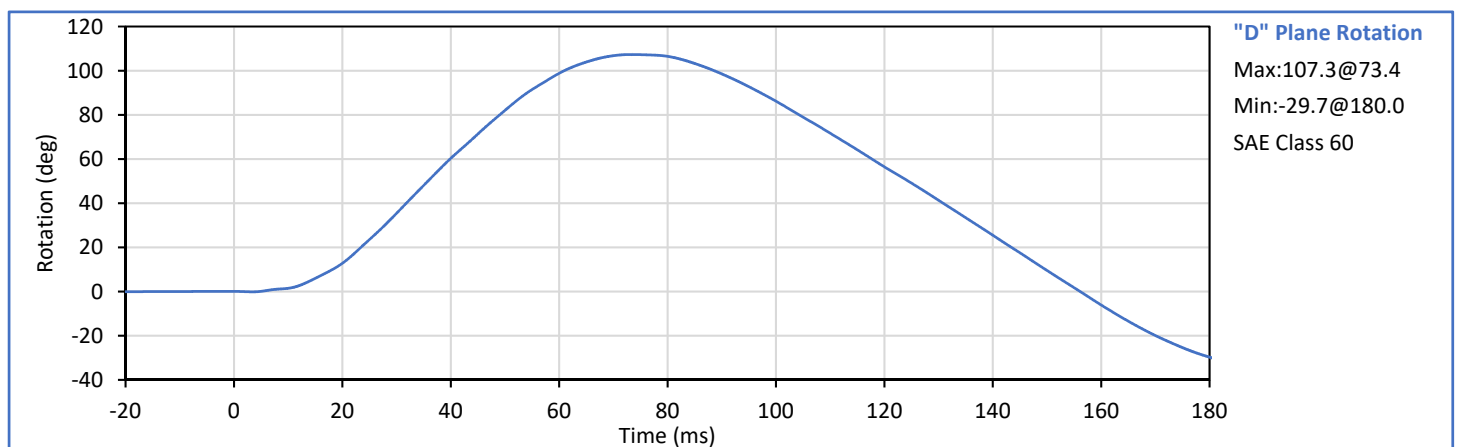
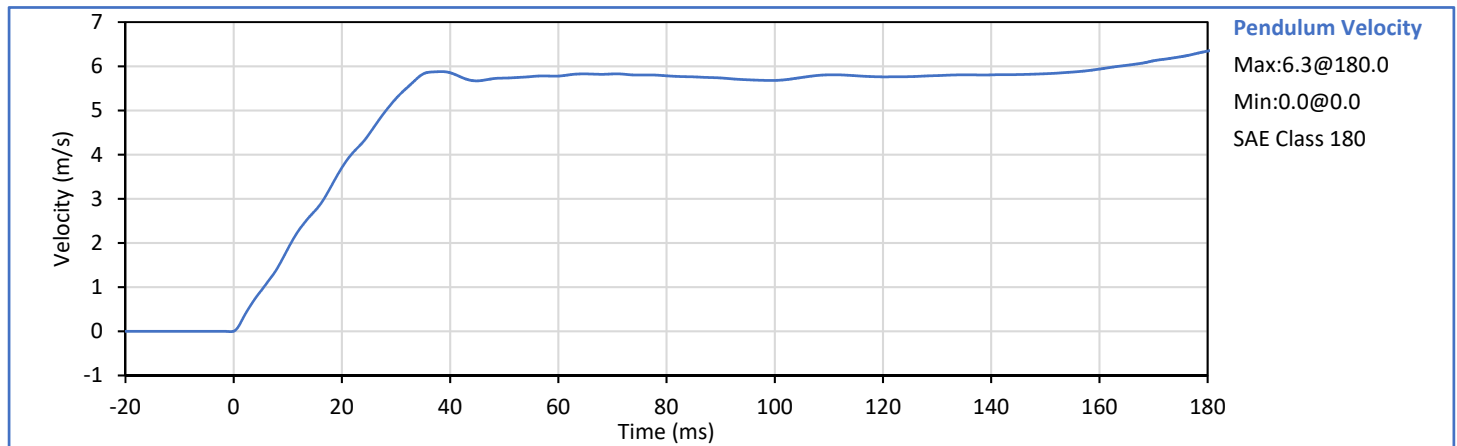


Technician: J. Hernandez

Approved By: P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Pendulum Velocity	m/s	5.95	6.19	6.18	Pass
Pendulum Velocity at 10 ms	m/s	1.50	1.90	1.87	Pass
Pendulum Velocity at 20 ms	m/s	3.10	3.90	3.70	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	5.27	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	107.3	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-58.6	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	100.9	Pass
Overall Test Results				Pass	Pass



Technician:

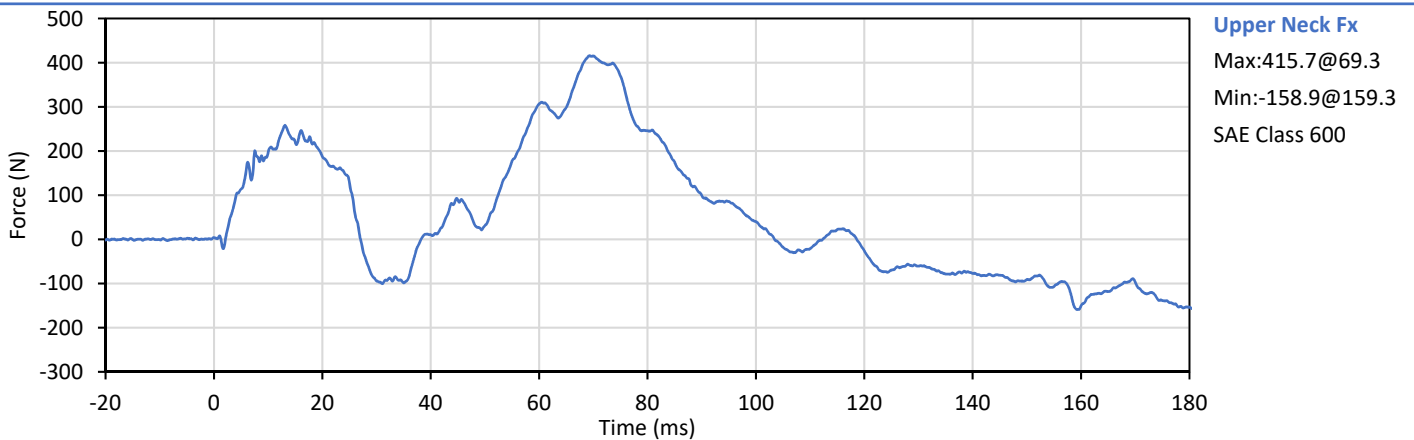
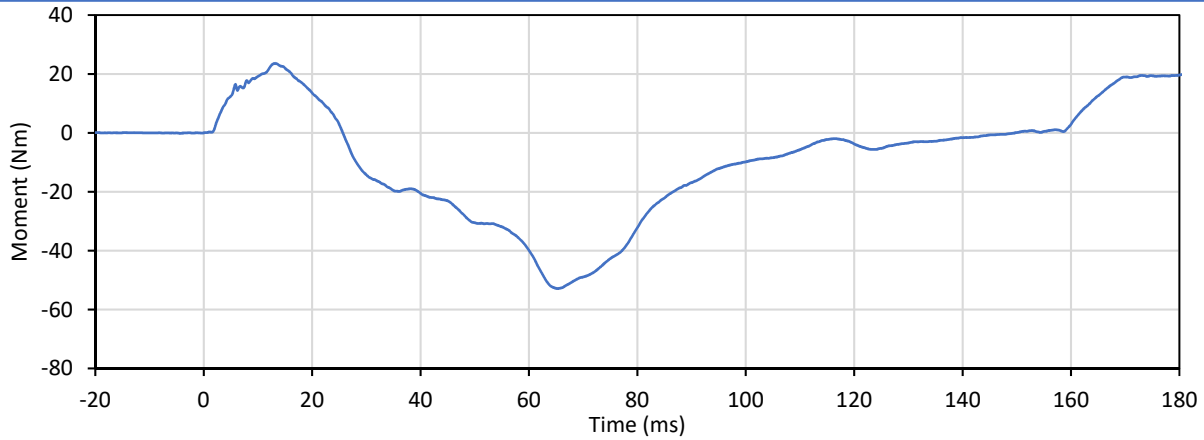
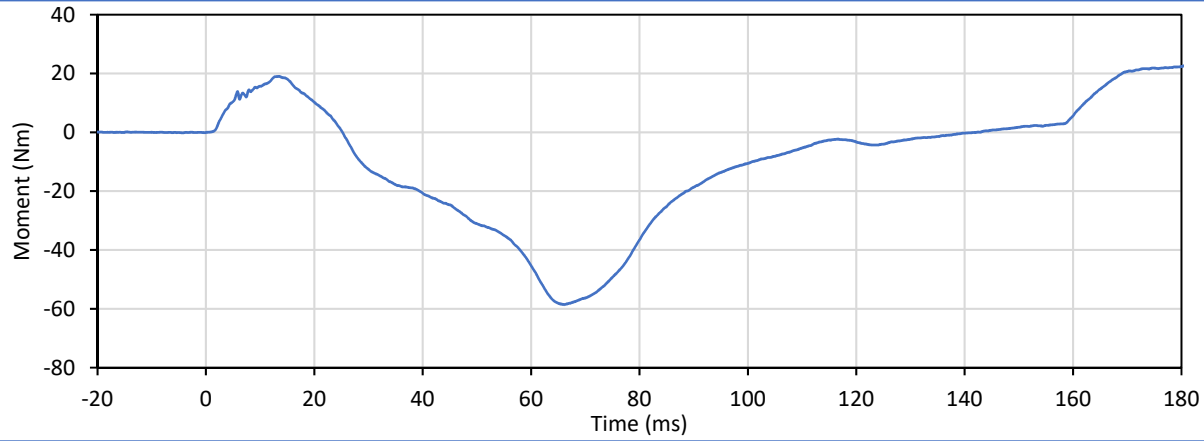
J. Hernandez

J. Hernandez

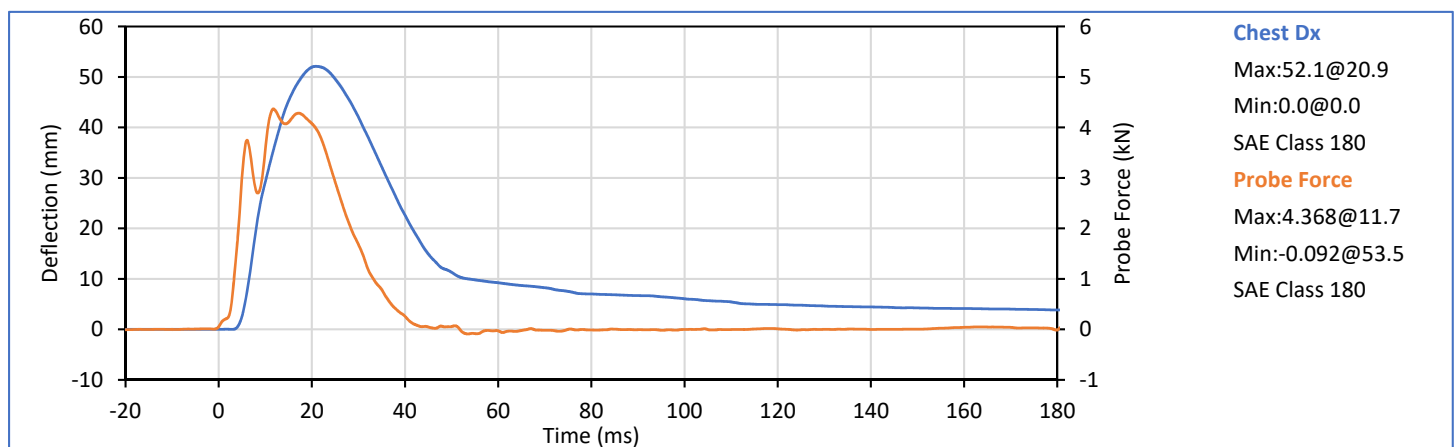
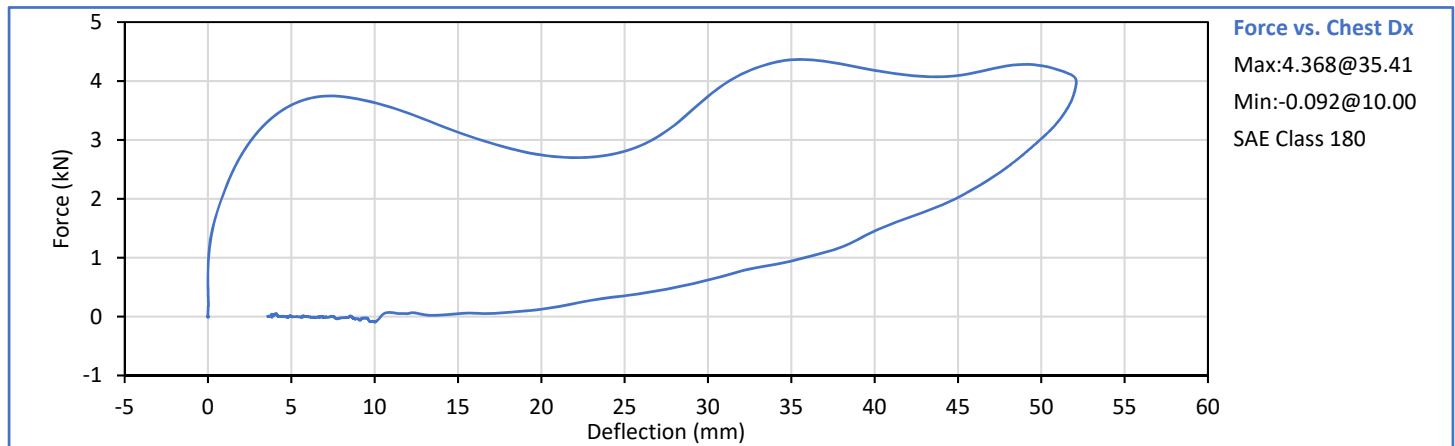
Approved By:

P. Puzzuto

P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	34	Pass
Probe Velocity	m/s	6.59	6.83	6.72	Pass
Peak Chest Deflection	mm	50.0	58.0	52.1	Pass
Peak Probe Force, 50 and 58 mm	kN	3.900	4.400	4.261	Pass
Peak Probe Force, 18 and 50 mm	kN	0.000	4.600	4.368	Pass
Internal Hysteresis	%	69.0	85.0	77.4	Pass
Overall Test Results					Pass



Technician:

J. Hernandez

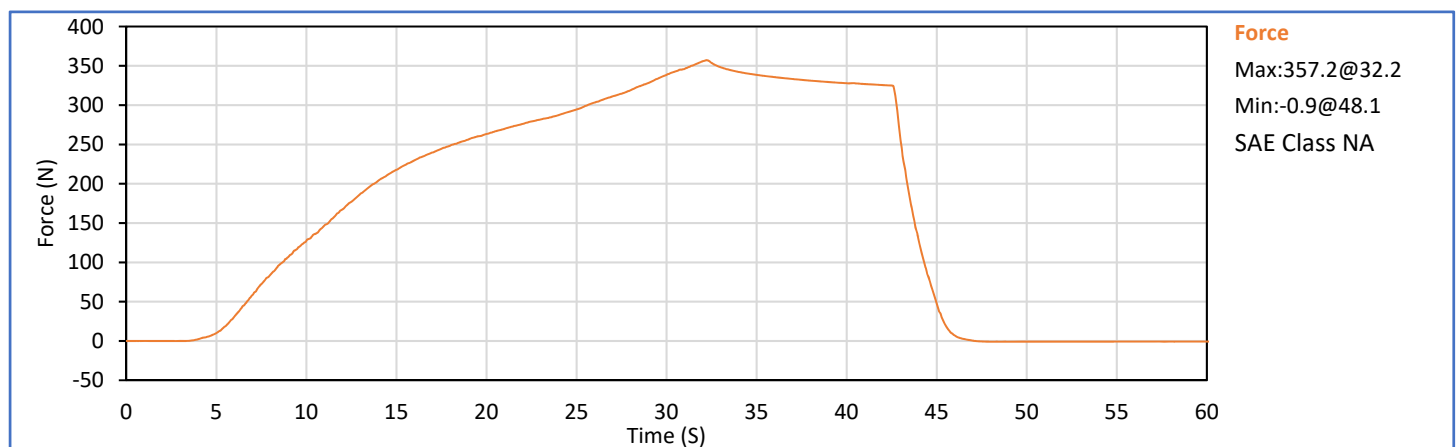
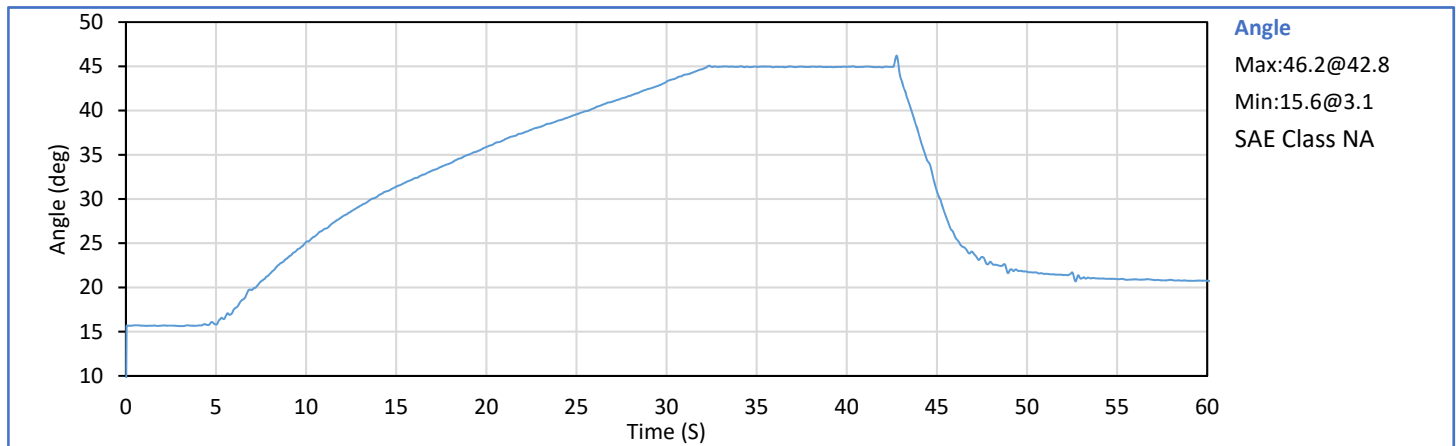
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Orientation Angle	deg	0.0	20.0	15.1	Pass
Test Initial Angle	deg	11.0	19.0	15.7	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	333.9	Pass
Torso Flexion Rate	deg/s	0.50	1.50	1.06	Pass
Final Reference Plane Angle	deg	-8.0	8.0	3.9	Pass
Overall Test Results				Pass	



Technician:

J. Hernandez

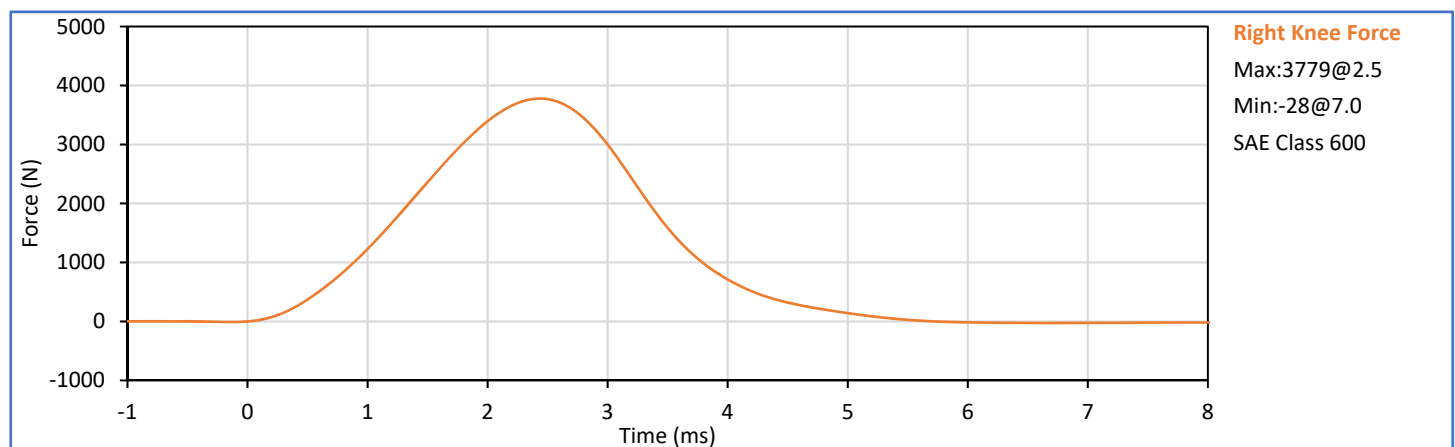
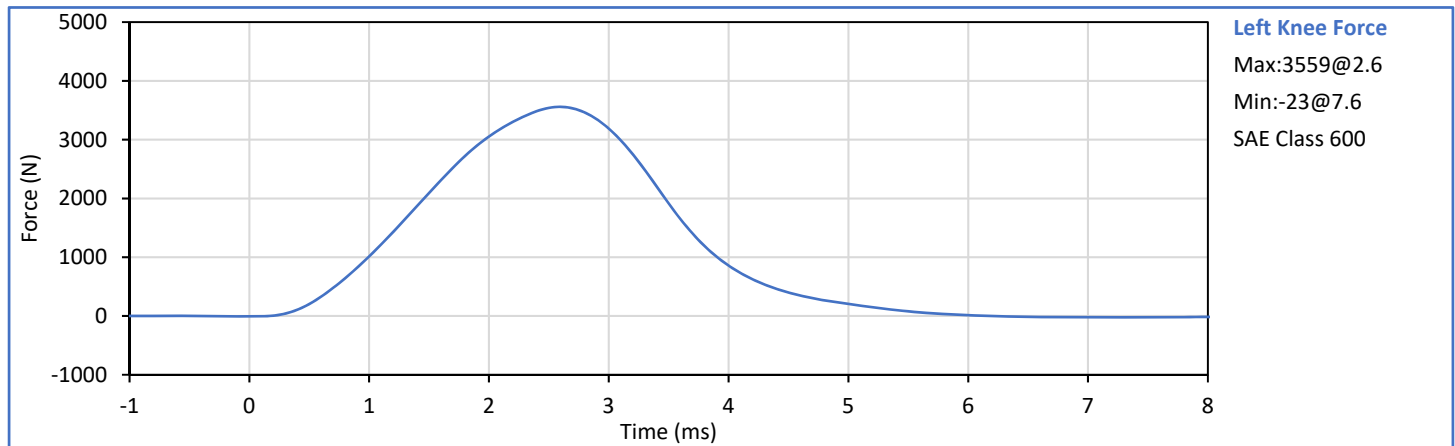
J. Hernandez

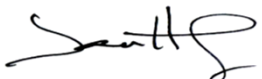
Approved By:

P. Puzzuto

P. Puzzuto

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.1	Pass
	Laboratory Humidity	%	10	70	29	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.092	Pass
Knee	Peak Resistive Force	N	3450	4060	3559	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.094	Pass
Knee	Peak Resistive Force	N	3450	4060	3779	Pass
Overall Test Results					Pass	



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

APPENDIX C
Post-Test ATD Qualification and Performance Verification
Hybrid III 50th Percentile Male ATD
S/N: 360

ATD Serial No.: 360

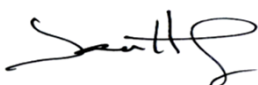
Test Date: 2019-12-04

Dummy Item	Inspect for	Comments	Damage	OK
Entire ATD	Perform general cleaning			✓
Outer Skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck bracket	Upper neck firmly attached to lower bracket			✓
Neck	Broken or cracked rubber			✓
	Looseness at the condyle joint			✓
Nodding block	Cracked or out of position			✓
Lumbar Spine	Broken or cracked rubber			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Displ. Assembly	Bent shaft			✓
	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer Mounting	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "resting" position			✓
Pelvis	Broken			✓
Other	Describe below as needed			✓

Describe any repairs or replacement of parts or other findings:

No Problems Found

Technician:



J. Hernandez

Approved By:



P. Puzzuto

ATD Serial No.: 360

Test Date: 2019-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
A - Total sitting height	mm	879	889	884	Pass
B - Shoulder pivot height	mm	505	521	519	Pass
C - 'H' point height	mm	84	89	88	Pass
D - 'H' point location from backline	mm	135	140	138	Pass
E - Shoulder pivot from backline	mm	84	94	90	Pass
F - Thigh clearance	mm	140	155	147	Pass
G - Back of elbow to wrist pivot	mm	290	305	296	Pass
H - Head back to backline	mm	41	46	46	Pass
I - Shoulder to elbow length	mm	330	345	344	Pass
J - Elbow rest height	mm	190	211	202	Pass
K - Buttock to knee length	mm	579	604	589	Pass
L - Popliteal length	mm	429	455	447	Pass
M - Knee pivot height	mm	485	500	497	Pass
N - Buttock popliteal length	mm	452	477	468	Pass
O - Chest depth without jacket	mm	213	229	222	Pass
P - Foot length	mm	251	267	259	Pass
V - Shoulder breadth	mm	422	437	434	Pass
W - Foot breadth	mm	91	107	103	Pass
Y - Chest circum. (w/chest jacket)	mm	970	1001	990	Pass
Z - Waist circum.	mm	836	866	847	Pass
AA - Location for chest circum.	mm	429	434	433	Pass
BB - Location for waist circum.	mm	226	231	228	Pass
			Overall Test Results		Pass

Technician:



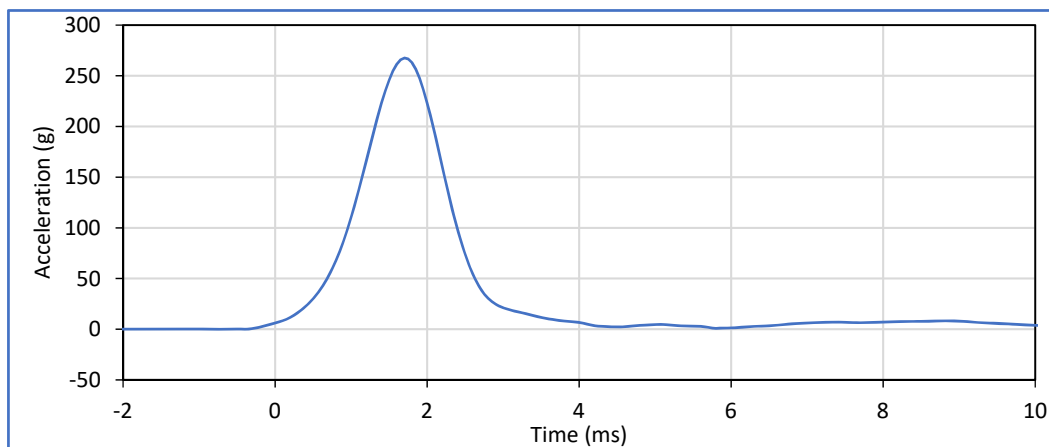
J. Hernandez

Approved By:



P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	39	Pass
Peak Resultant Acceleration	g	225.0	275.0	267.6	Pass
Peak Lateral Acceleration	g	-15.0	15.0	-6.5	Pass
Oscillations After Main Pulse	%	0.0	10.0	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass

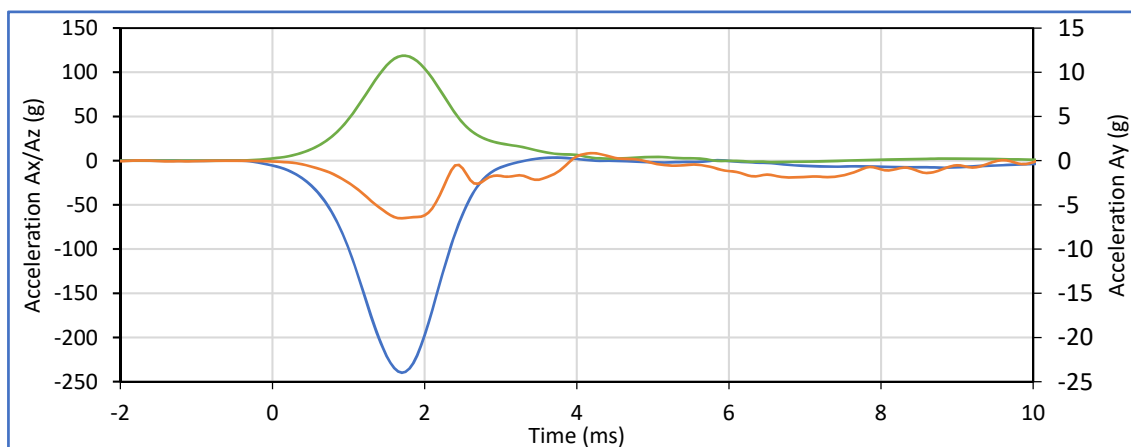


Head Resultant

Max:267.6@1.7

Min:0.9@5.8

SAE Class 1000



Head Ax

Max:3.6@3.7

Min:-239.7@1.7

SAE Class 1000

Head Ay

Max:0.8@4.2

Min:-6.5@1.7

SAE Class 1000

Head Az

Max:118.8@1.8

Min:-1.7@6.6

SAE Class 1000

Technician:

J. Hernandez

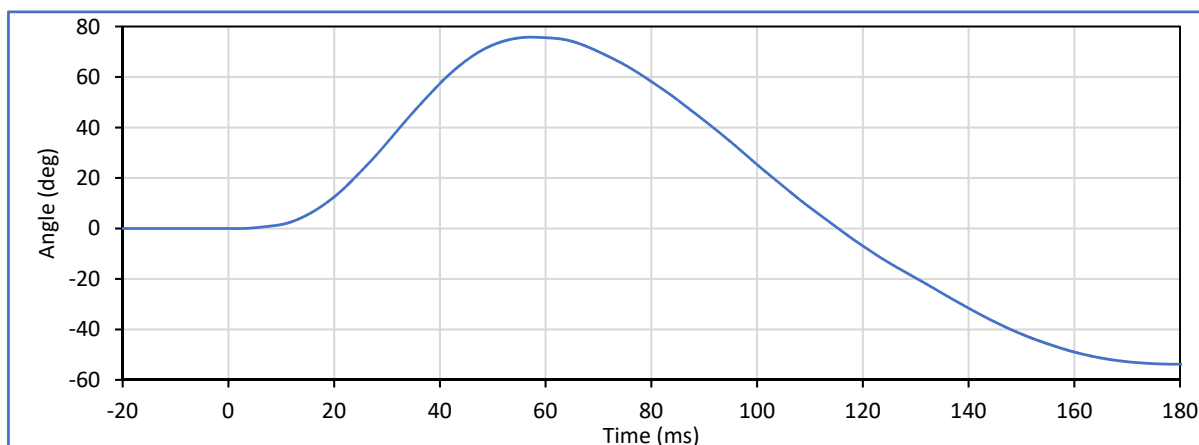
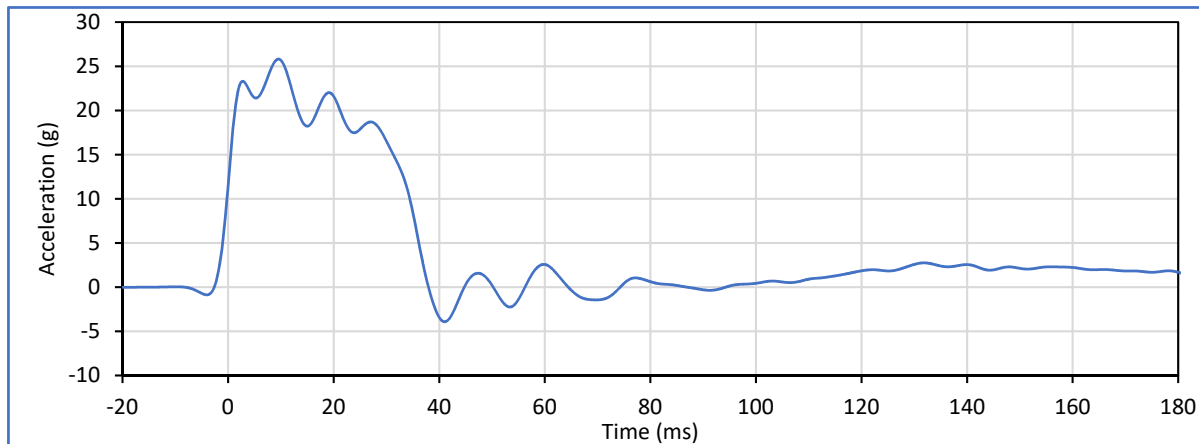
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	41	Pass
Pendulum Velocity	m/s	6.89	7.13	6.92	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	25.7	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	21.6	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	16.5	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	16.5	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	36.1	Pass
"D" Plane Rotation peak	deg	64.0	78.0	75.8	Pass
	ms	57.0	64.0	57.3	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	115.4	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	95.4	Pass
	ms	47.0	58.0	47.6	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	102.1	Pass
Overall Test Results				Pass	



Technician:

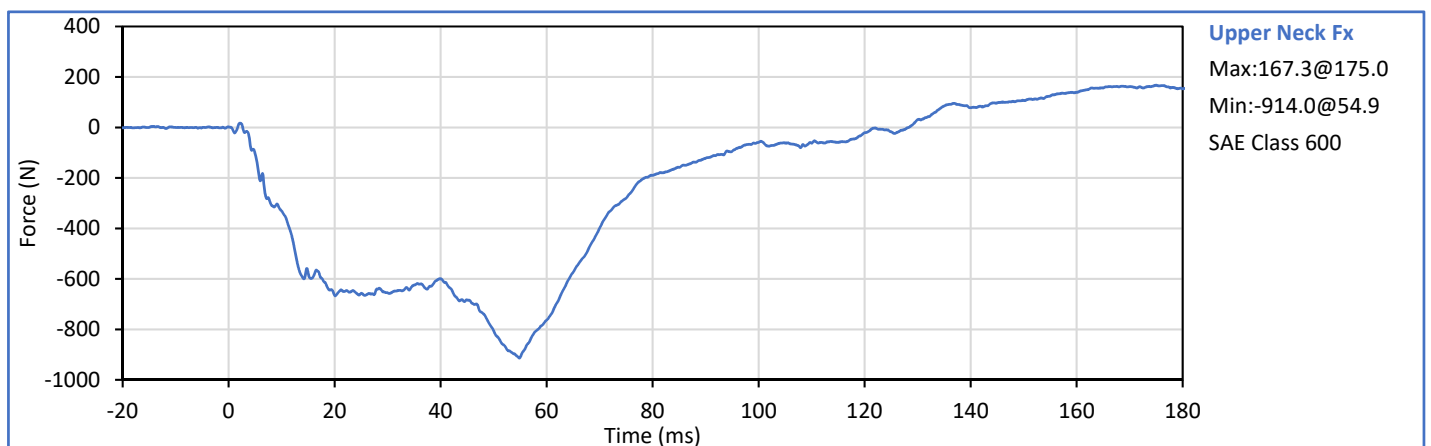
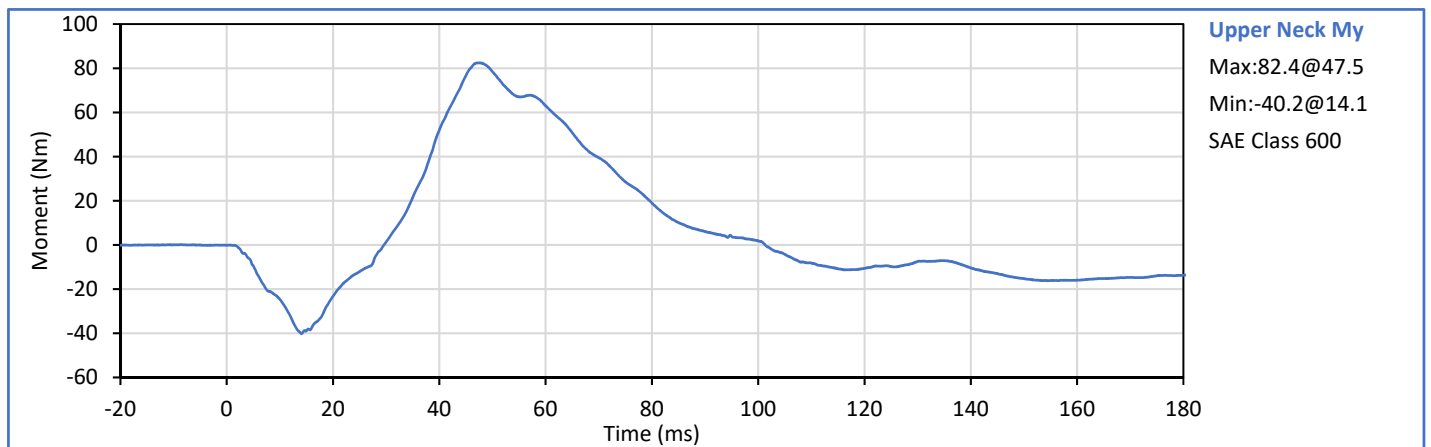
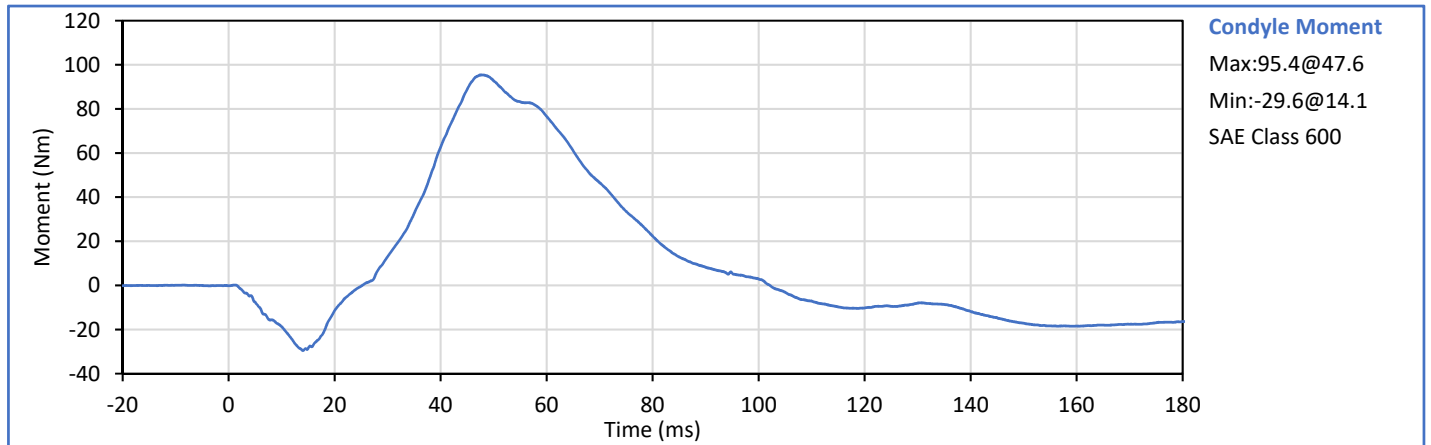
J. Hernandez

J. Hernandez

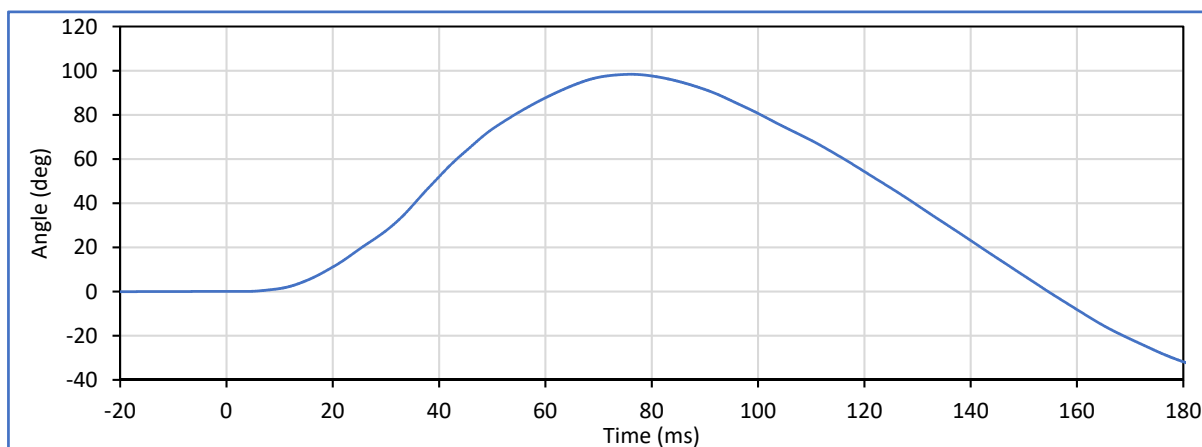
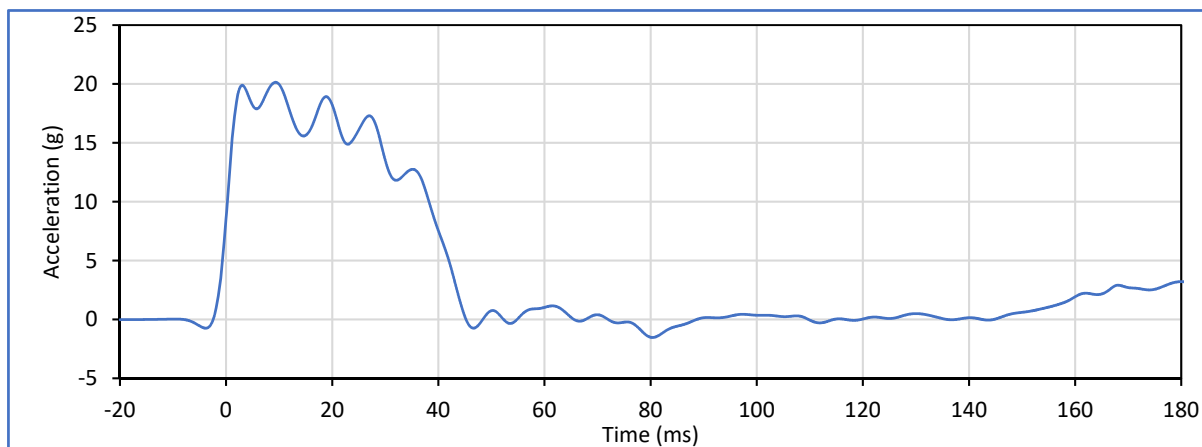
Approved By:

P. Puzzuto

P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	40	Pass
Pendulum Velocity	m/s	5.94	6.19	6.05	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	20.0	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.2	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.5	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	13.5	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	42.0	Pass
"D" Plane Rotation peak	deg	81.0	106.0	98.4	Pass
	ms	72.0	82.0	76.1	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	154.6	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-76.5	Pass
	ms	65.0	79.0	65.5	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	132.7	Pass
Overall Test Results				Pass	



Technician:

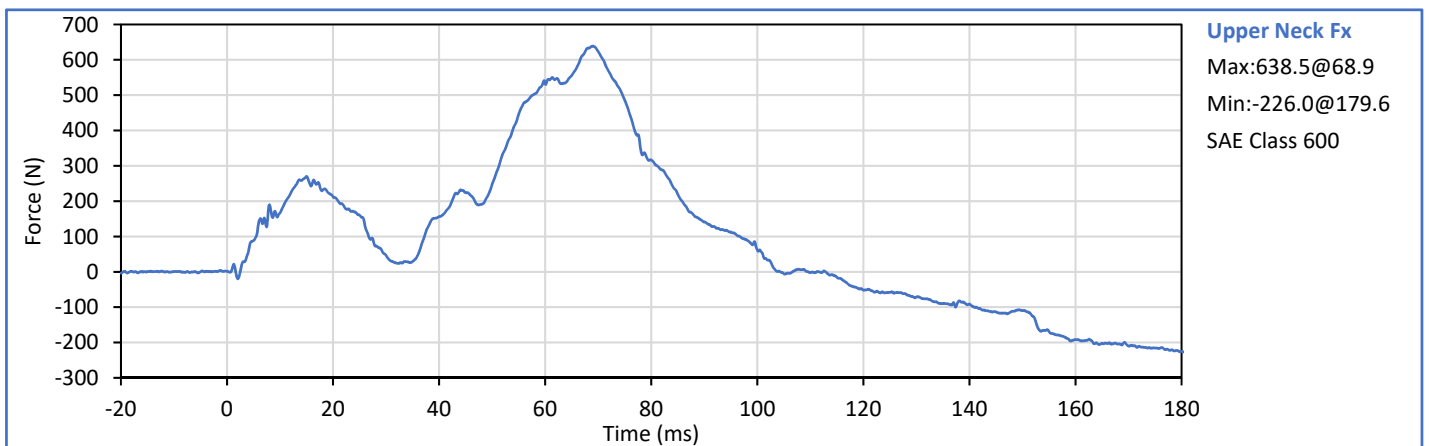
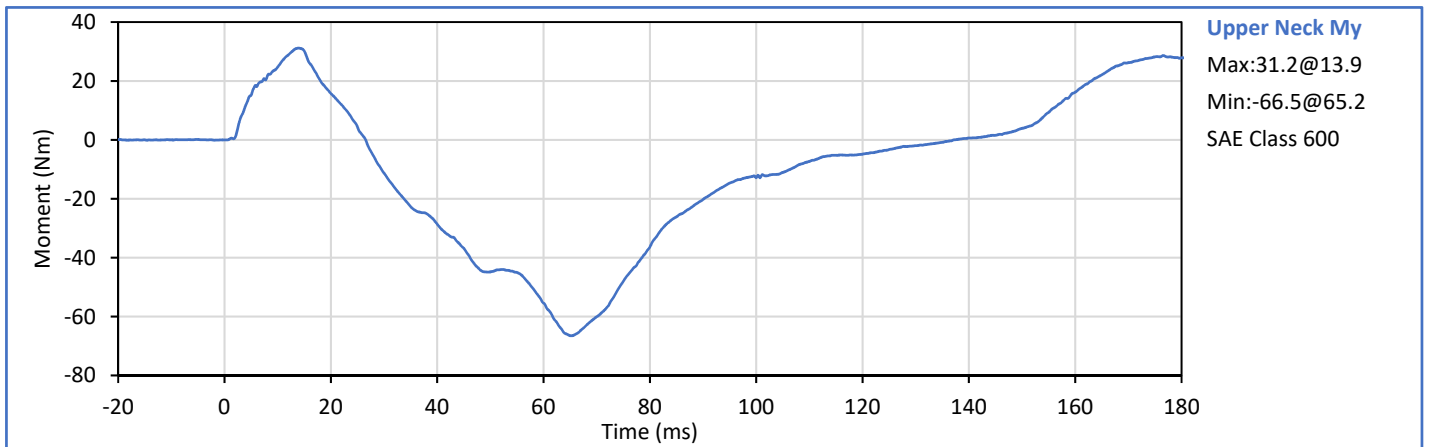
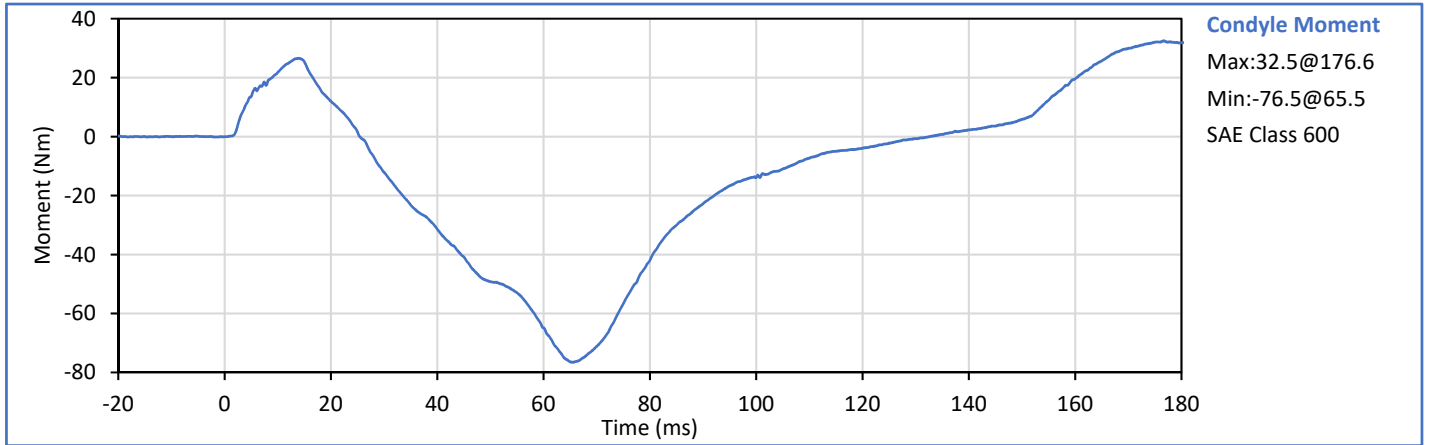
J. Hernandez

J. Hernandez

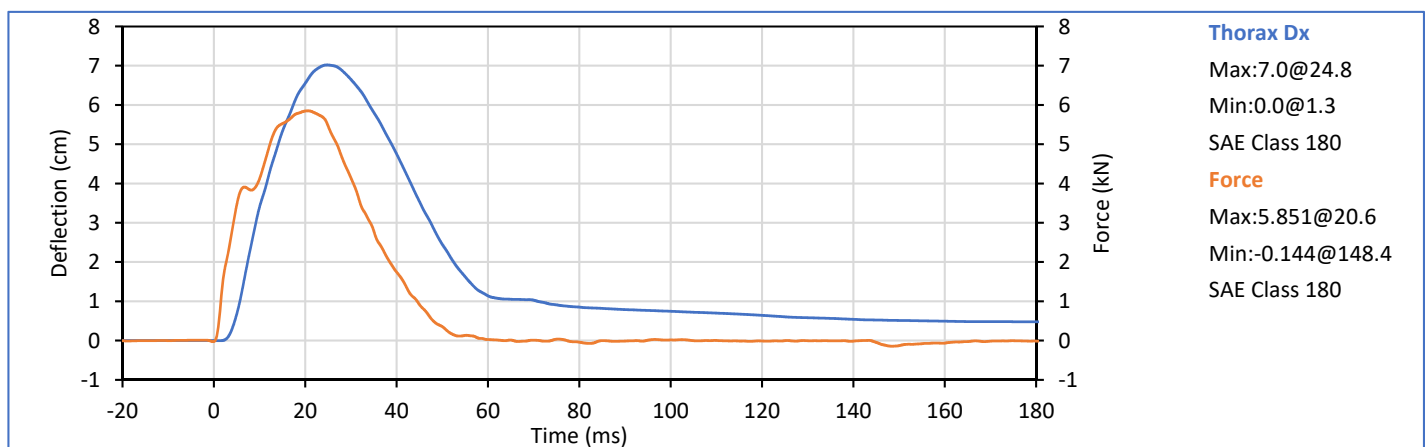
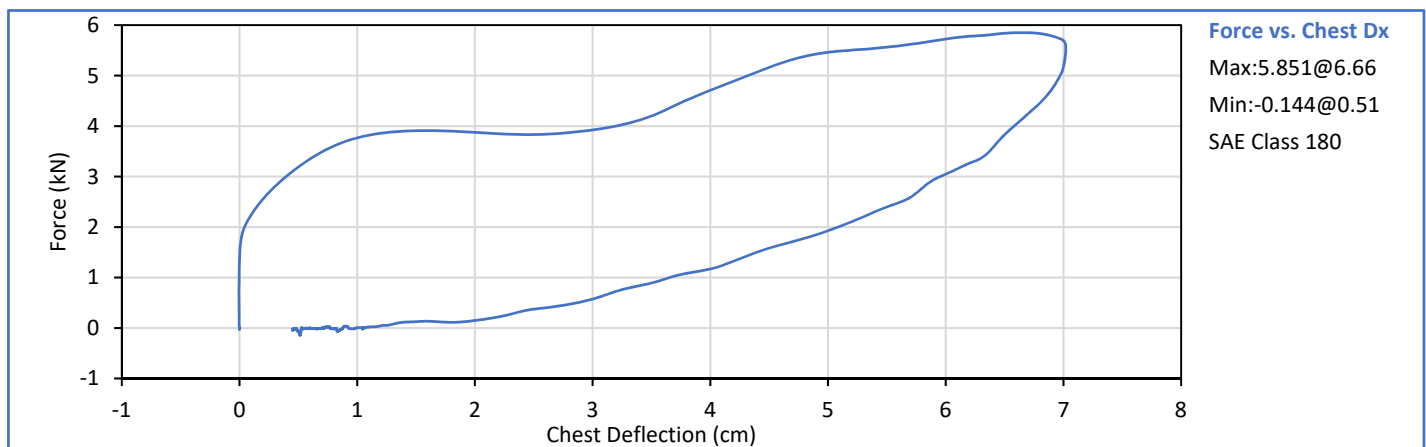
Approved By:

P. Puzzuto

P. Puzzuto



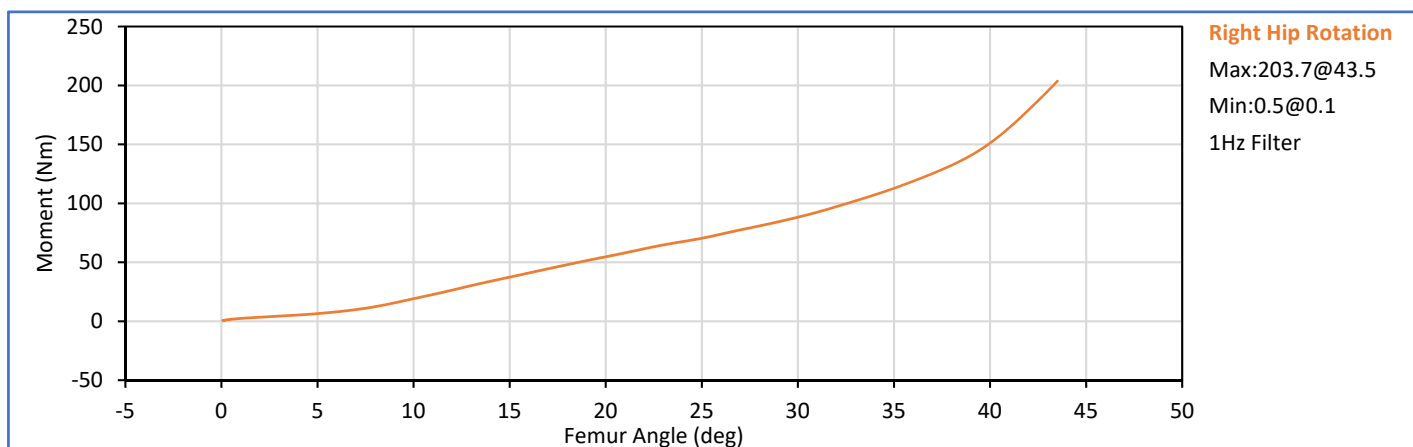
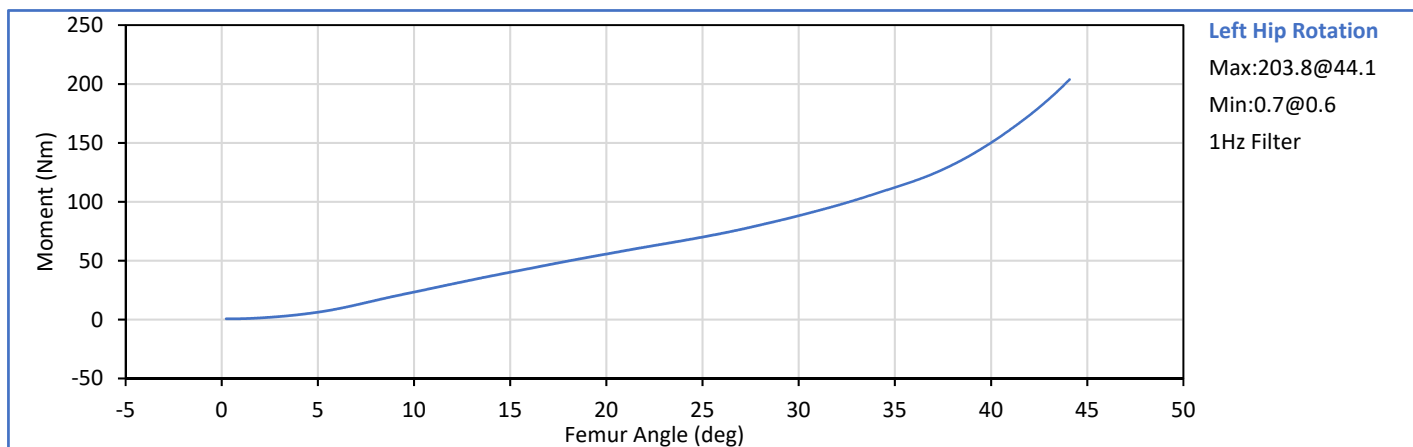
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	35	Pass
Probe Velocity	m/s	6.58	6.82	6.69	Pass
Peak Chest Deflection	cm	6.35	7.26	7.02	Pass
Peak Probe Force	kN	5.159	5.893	5.851	Pass
Internal Hysteresis	%	69.0	85.0	70.6	Pass
Overall Test Results					Pass

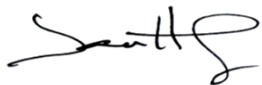


Technician: J. Hernandez

Approved By: P. Puzzuto

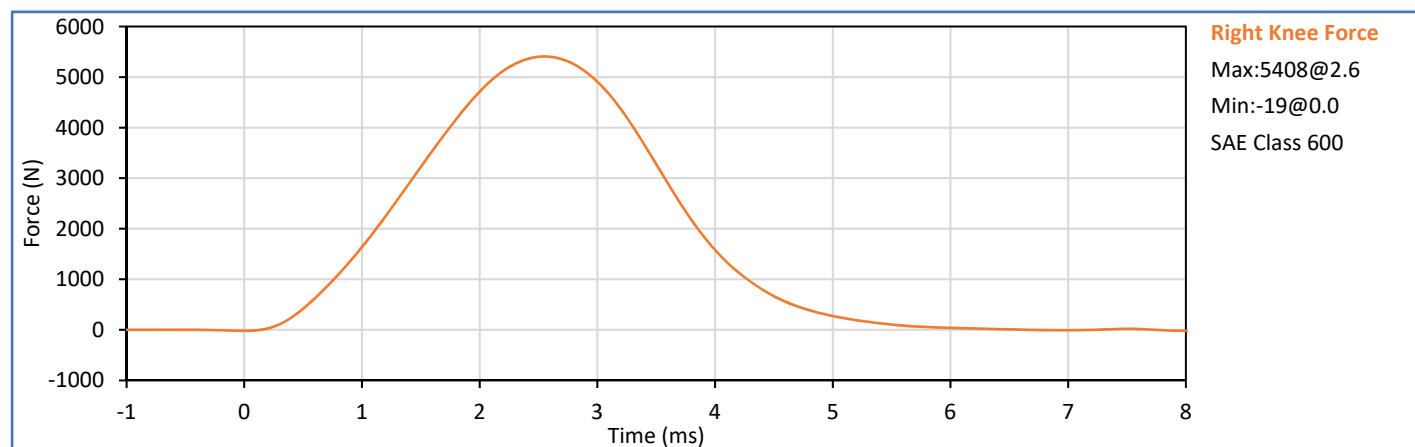
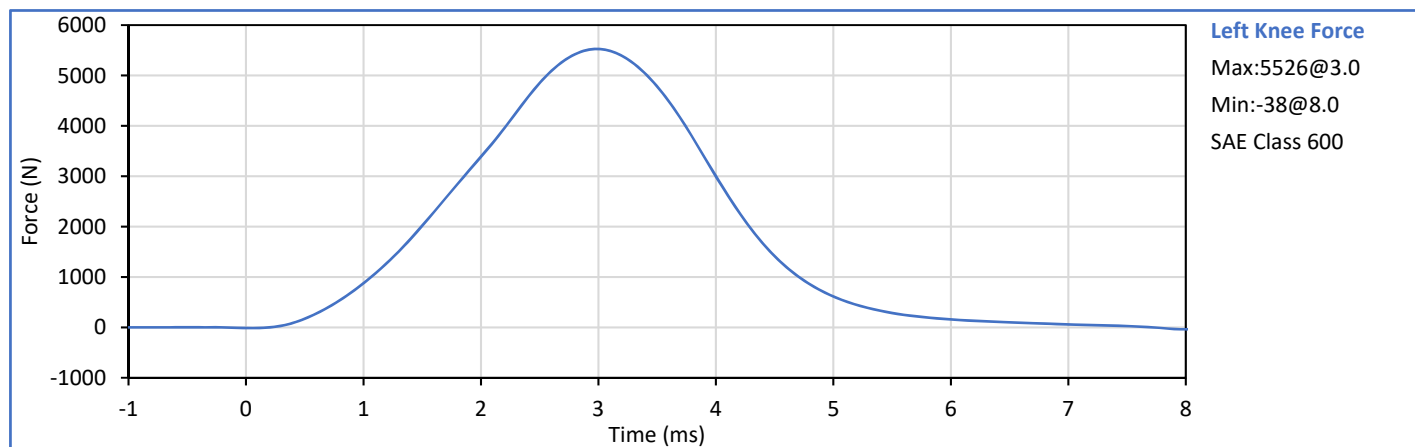
Tested Parameter		Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature		°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity		%	10	70	37	Pass
Left Hip	Left Hip Rotation Rate	deg/s	5.0	10.0	5.7	Pass
	Left Femur Torque at 30°	Nm	0.0	95.0	88.3	Pass
	Left Hip Rotation at 203 Nm	deg	40.0	50.0	44.0	Pass
Right Hip	Right Hip Rotation Rate	deg/s	5.0	10.0	5.8	Pass
	Right Femur Torque at 30°	Nm	0.0	95.0	88.3	Pass
	Right Hip Rotation at 203 Nm	deg	40.0	50.0	43.5	Pass
Overall Test Results						Pass



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	20.6	Pass
	Laboratory Relative Humidity	%	10	70	41	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.100	Pass
Knee	Peak Resistive Force	N	4715	5782	5526	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.087	Pass
Knee	Peak Resistive Force	N	4715	5782	5408	Pass
Overall Test Results					Pass	



Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX C
Post-Test ATD Qualification and Performance Verification
Hybrid III 5th Percentile Female ATD
S/N: DH1644

ATD Serial No.: DH1644

Test Date: 2019-12-04

Dummy Item	Inspect for	Comments	Damage	Okay
Entire ATD	Perform general cleaning			✓
Outer Skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck bracket	Upper neck firmly attached to lower bracket			✓
Neck	Broken or cracked rubber			✓
	Looseness at the condyle joint			✓
Nodding block	Cracked or out of position			✓
Lumbar Spine	Broken or cracked rubber			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Displ. Assembly	Bent shaft			✓
	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer Mounting	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "resting" position			✓
Pelvis	Broken			✓
Other	Describe below as needed			✓

Describe any repairs or replacement of parts or other findings:

No Problems Found

Technician:



J. Hernandez

Approved By:



P. Puzzuto

ATD Serial No.: DH1644

Test Date: 2019-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
A - Total sitting height	mm	775	800	788	Pass
B - Shoulder pivot height	mm	432	457	453	Pass
C - 'H' point height	mm	81	86	86	Pass
D - 'H' point location from backline	mm	145	150	148	Pass
E - Shoulder pivot from backline	mm	69	84	78	Pass
F - Thigh clearance	mm	119	135	128	Pass
G - Back of elbow to wrist pivot	mm	244	259	254	Pass
H - Head back to backline	mm	41	46	43	Pass
I - Shoulder to elbow length	mm	277	297	287	Pass
J - Elbow rest height	mm	183	203	197	Pass
K - Buttock to knee length	mm	521	546	531	Pass
L - Popliteal length	mm	356	376	367	Pass
M - Knee pivot height	mm	394	419	407	Pass
N - Buttock popliteal length	mm	414	439	428	Pass
O - Chest depth without jacket	mm	175	191	183	Pass
P - Foot length	mm	219	234	231	Pass
R - Buttock to Knee Pivot Length	mm	457	483	473	Pass
S - Head Breadth	mm	137	147	144	Pass
T - Head Depth	mm	178	188	184	Pass
U - Hip Breadth	mm	300	315	308	Pass
V - Shoulder breadth	mm	351	366	360	Pass
W - Foot breadth	mm	79	94	88	Pass
X - Head circum.	mm	528	549	535	Pass
Y - Chest circum. (w/chest jacket)	mm	851	881	868	Pass
Z - Waist circum.	mm	760	790	776	Pass
AA - Location for chest circum.	mm	333	358	339	Pass
BB - Location for waist circum.	mm	160	170	168	Pass
Overall Test Results					Pass

Technician:



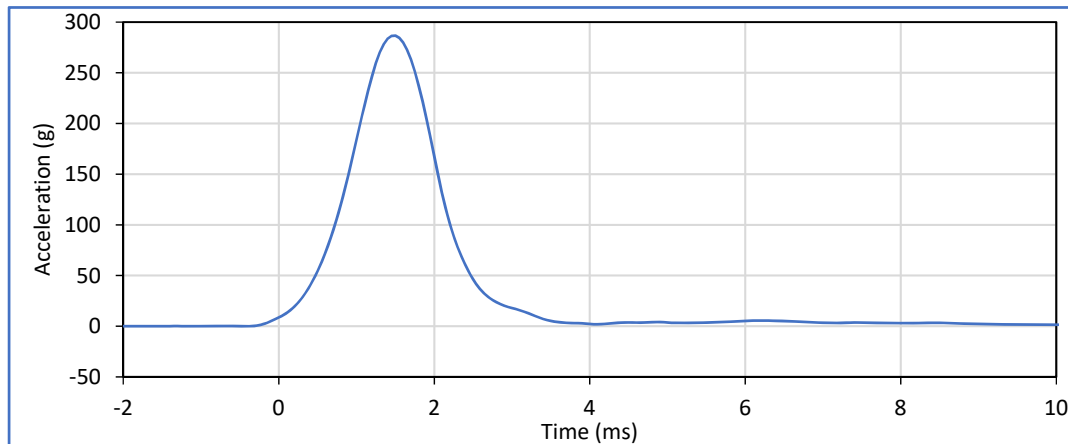
J. Hernandez

Approved By:



P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.4	Pass
Laboratory Humidity	%	10	70	22	Pass
Peak Resultant Acceleration	g	250.0	300.0	286.6	Pass
Peak Lateral Acceleration	g	-15.0	15.0	7.1	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	

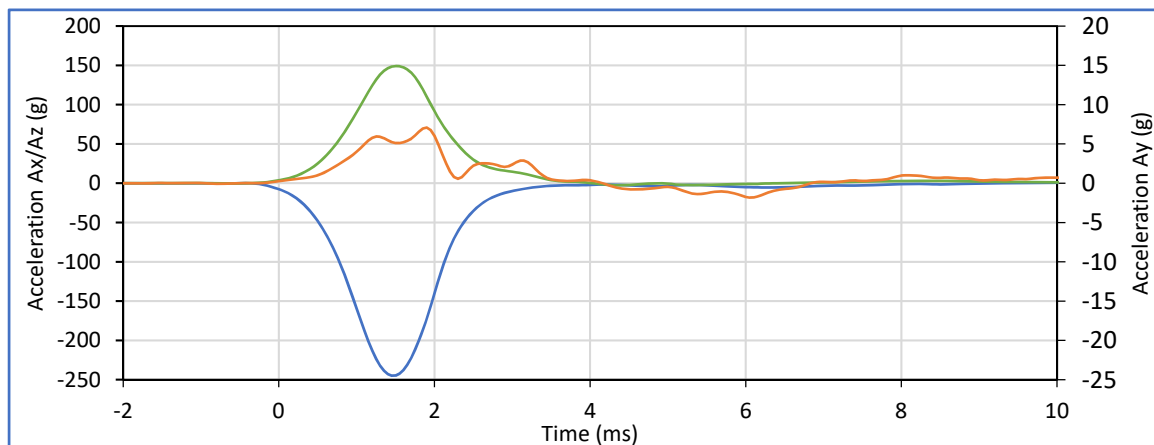


Head Resultant

Max:286.6@1.5

Min:1.3@10.0

SAE Class 1000



Head Ax

Max:0.6@9.8

Min:-244.8@1.5

SAE Class 1000

Head Ay

Max:7.1@1.9

Min:-1.8@6.1

SAE Class 1000

Head Az

Max:149.2@1.5

Min:-2.5@4.4

SAE Class 1000

Technician:

J. Hernandez

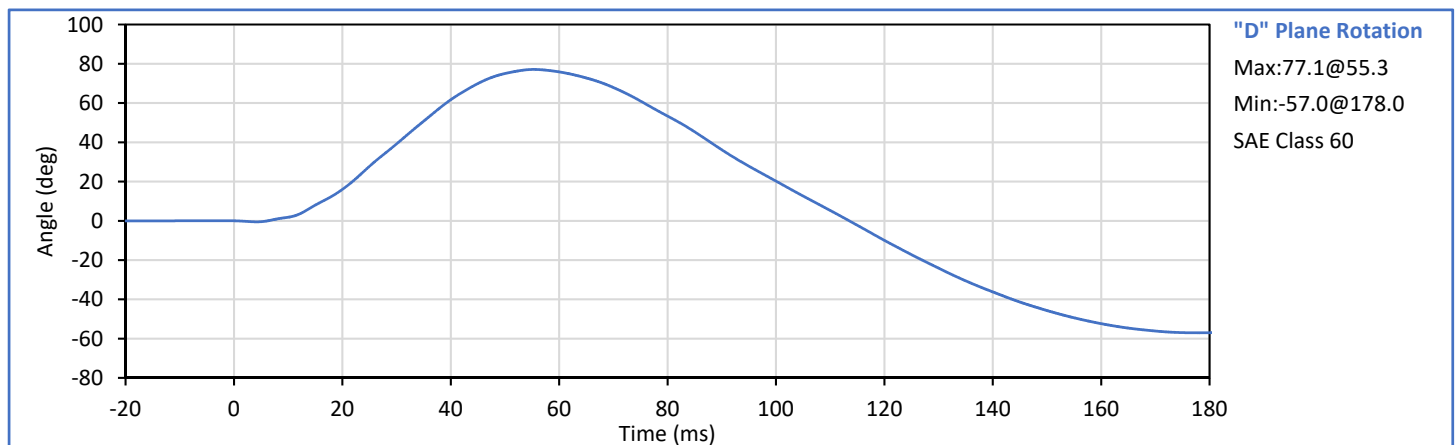
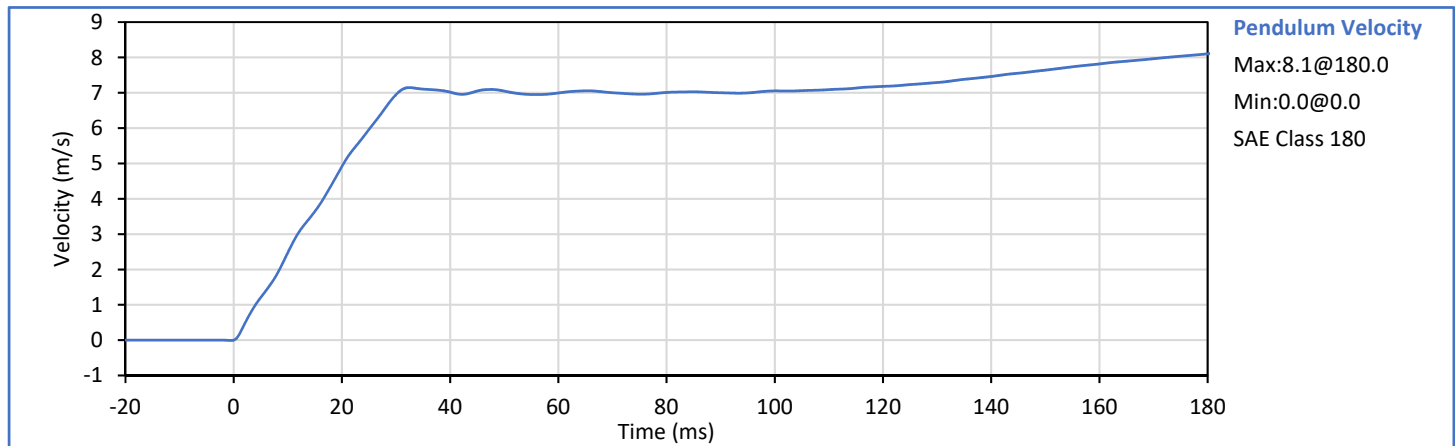
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	6.89	7.13	6.99	Pass
Pendulum Velocity at 10 ms	m/s	2.10	2.50	2.48	Pass
Pendulum Velocity at 20 ms	m/s	4.00	5.00	4.91	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.95	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	77.1	Pass
Peak Moment in Rotation	Nm	69.0	83.0	81.1	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	83.2	Pass
Overall Test Results				Pass	Pass



Technician:

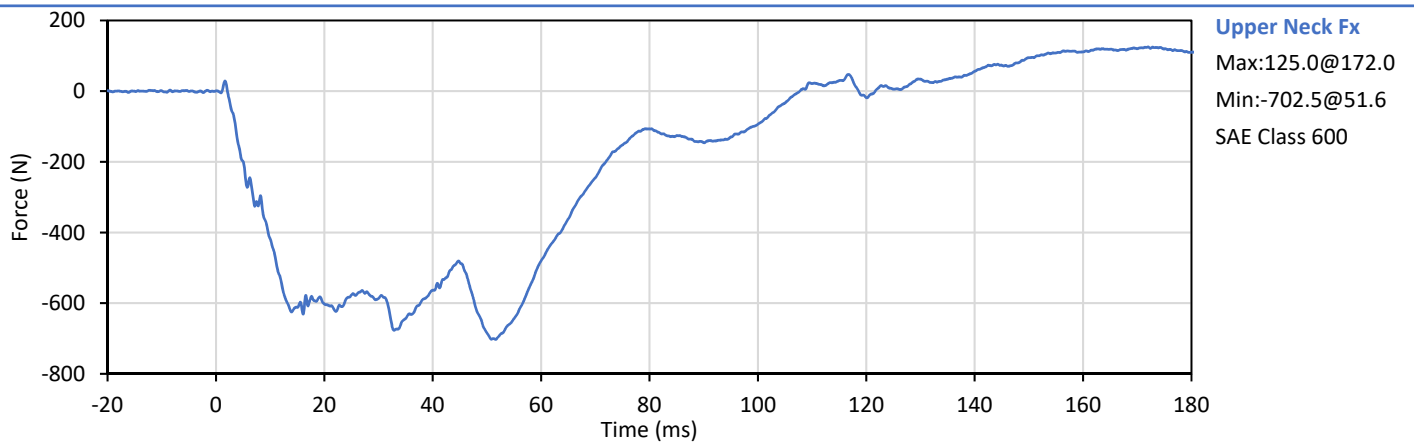
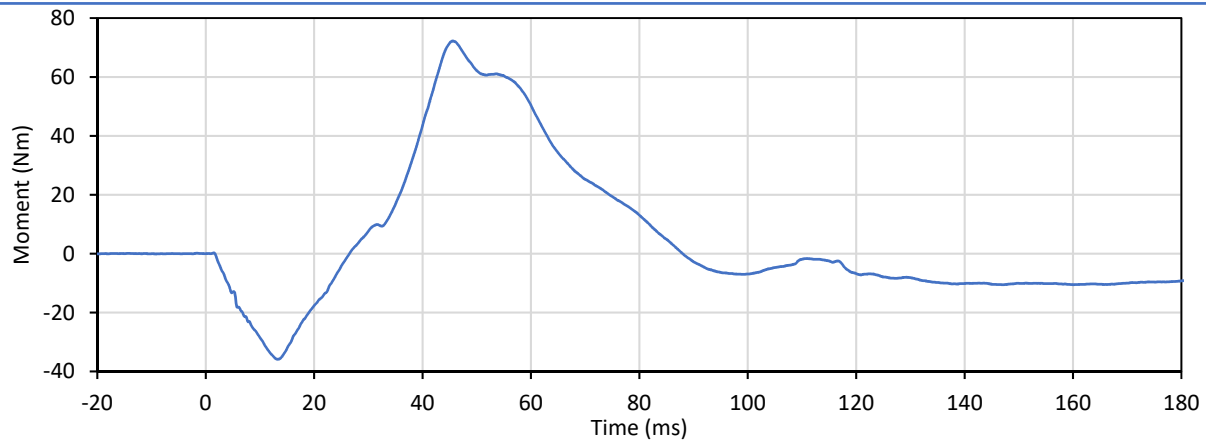
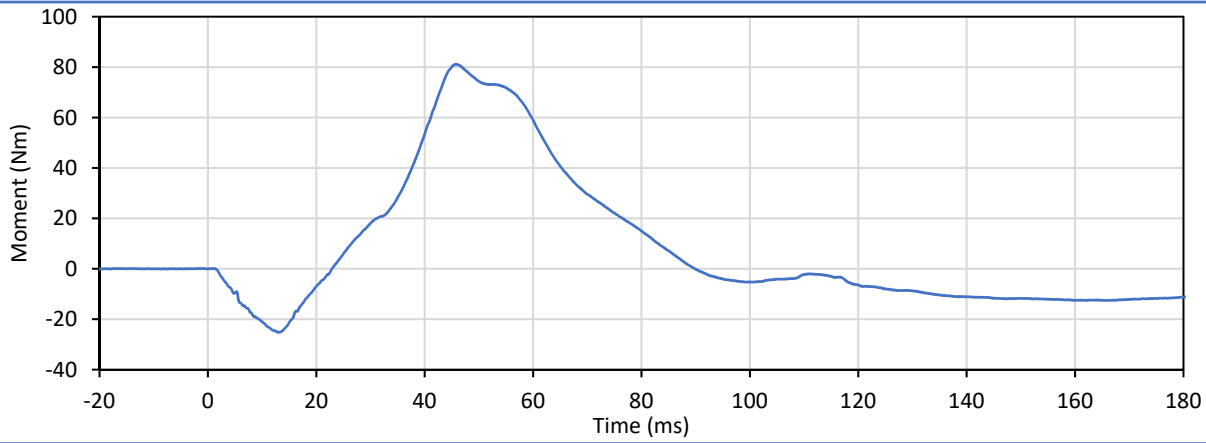
J. Hernandez

J. Hernandez

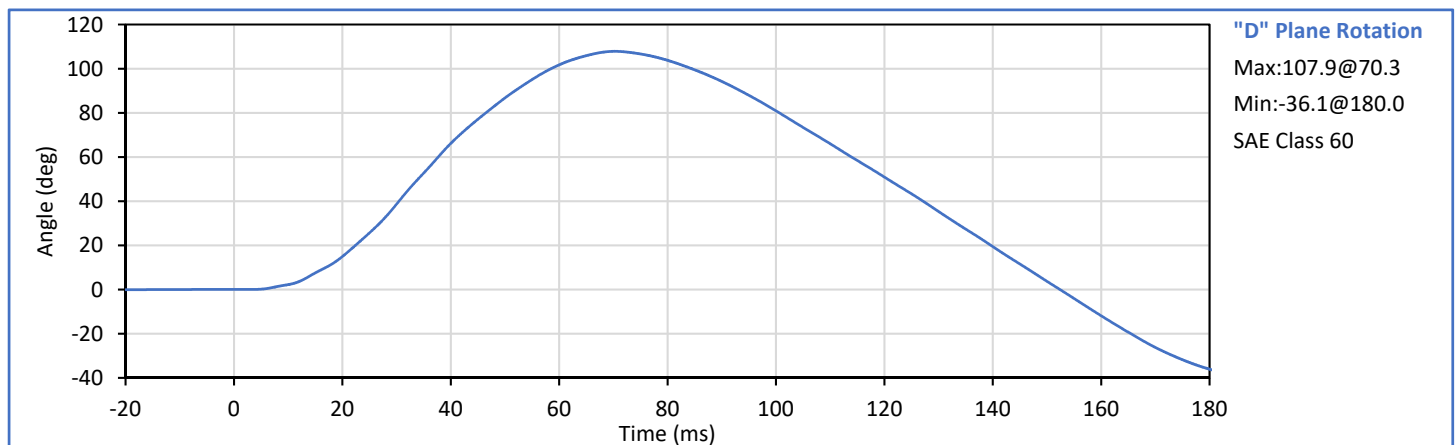
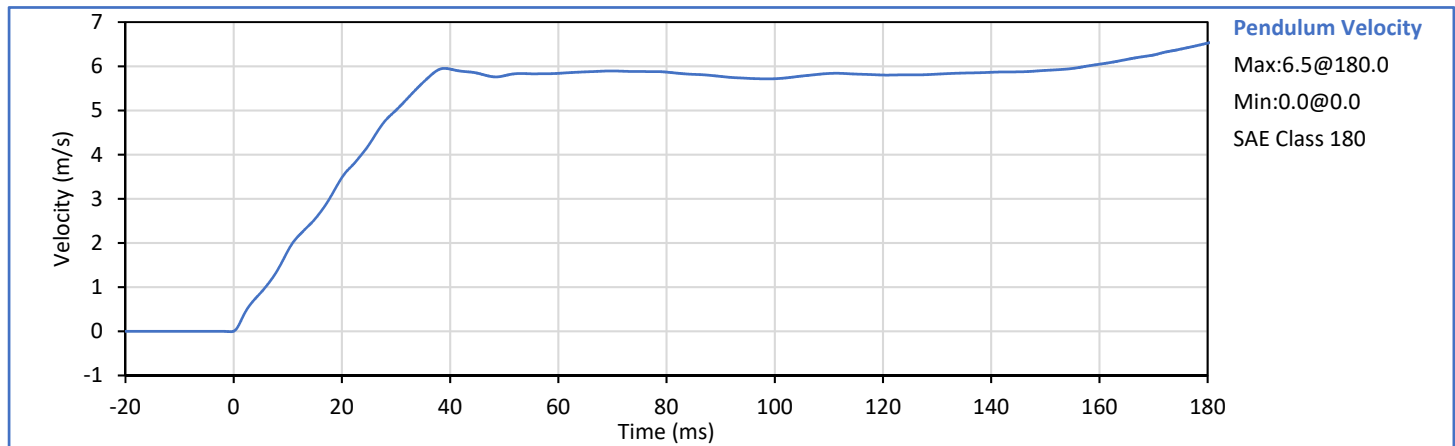
Approved By:

P. Puzzuto

P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	5.95	6.19	5.99	Pass
Pendulum Velocity at 10 ms	m/s	1.50	1.90	1.82	Pass
Pendulum Velocity at 20 ms	m/s	3.10	3.90	3.48	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	5.01	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	107.9	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-63.2	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	98.8	Pass
Overall Test Results				Pass	



Technician:

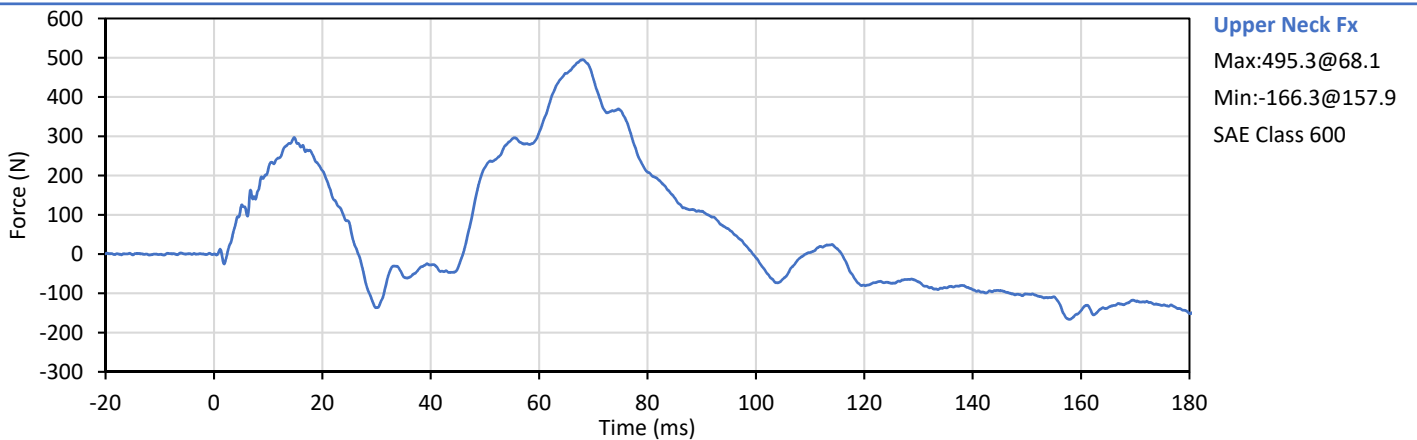
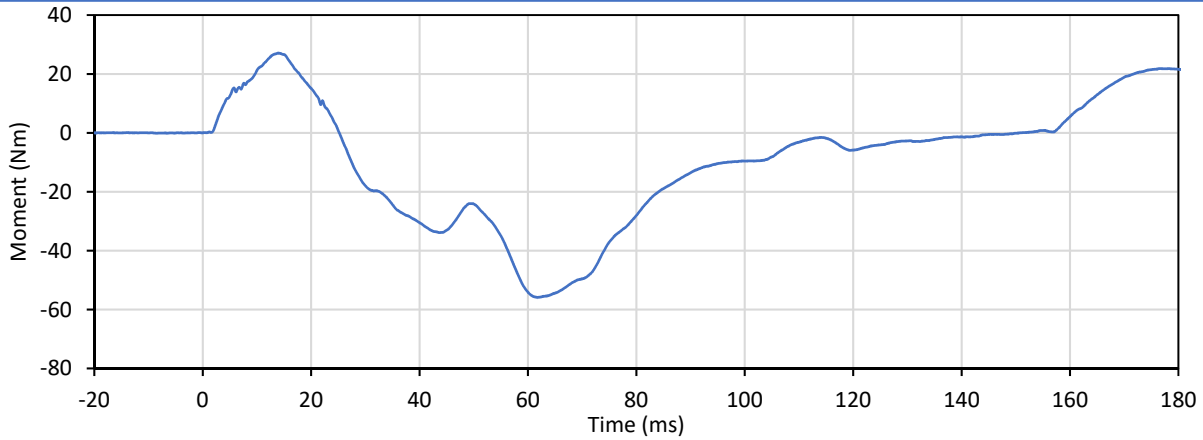
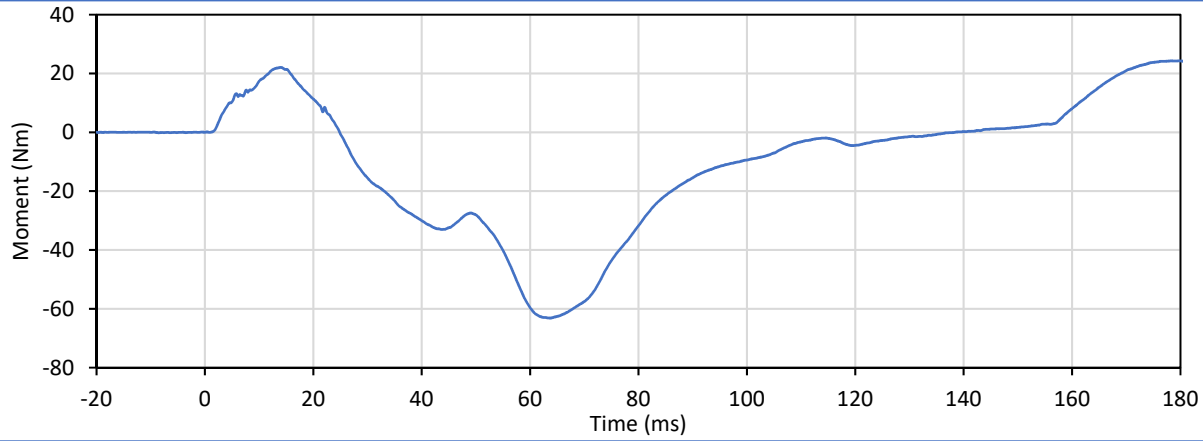
J. Hernandez

J. Hernandez

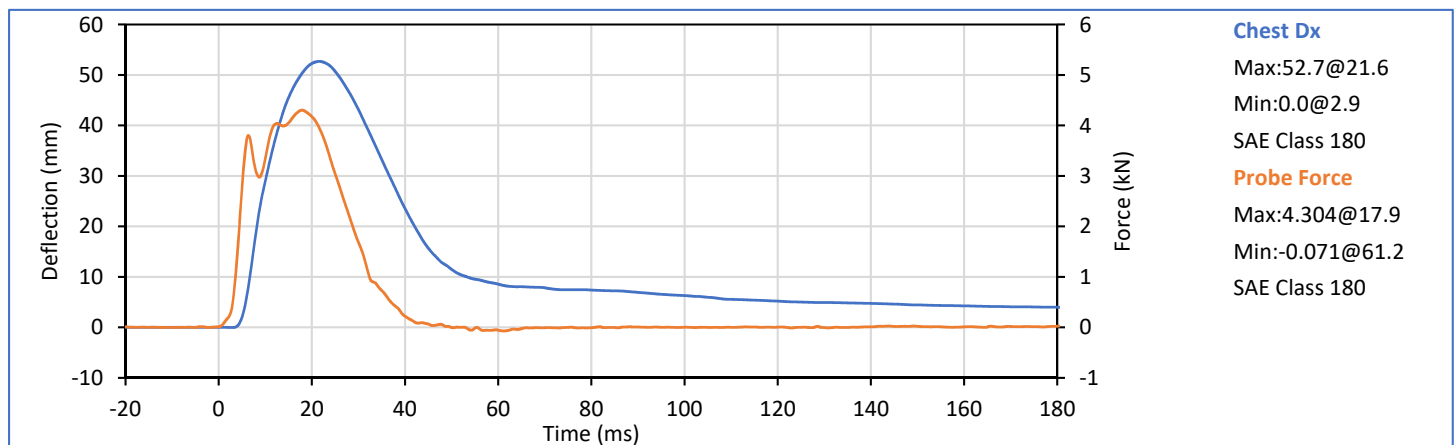
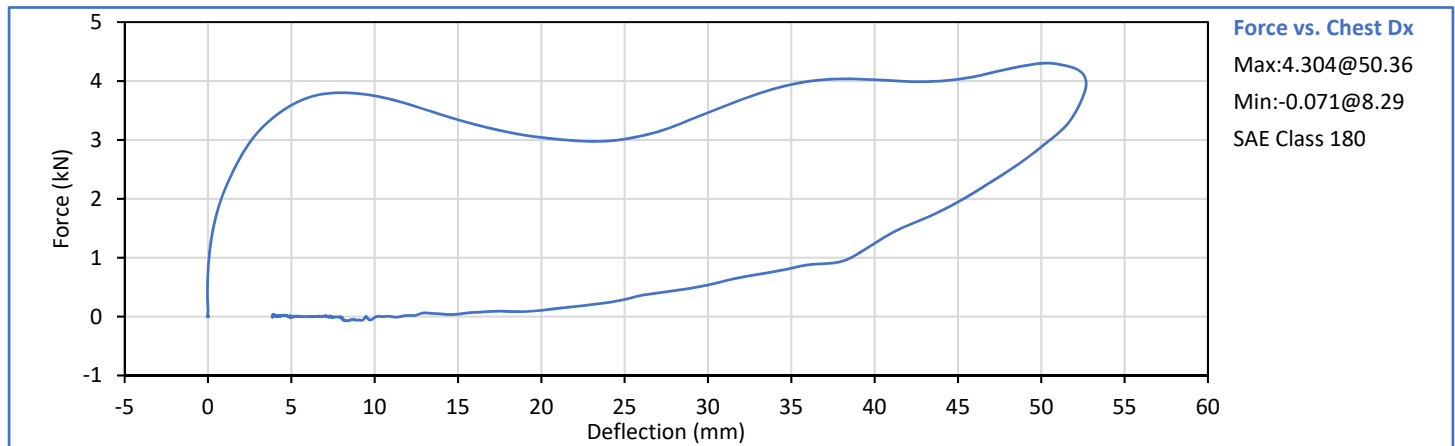
Approved By:

P. Puzzuto

P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	38	Pass
Probe Velocity	m/s	6.59	6.83	6.73	Pass
Peak Chest Deflection	mm	50.0	58.0	52.7	Pass
Peak Probe Force, 50 and 58 mm	kN	3.900	4.400	4.304	Pass
Peak Probe Force, 18 and 50 mm	kN	0.000	4.600	4.300	Pass
Internal Hysteresis	%	69.0	85.0	78.5	Pass
Overall Test Results					Pass



Technician:

J. Hernandez

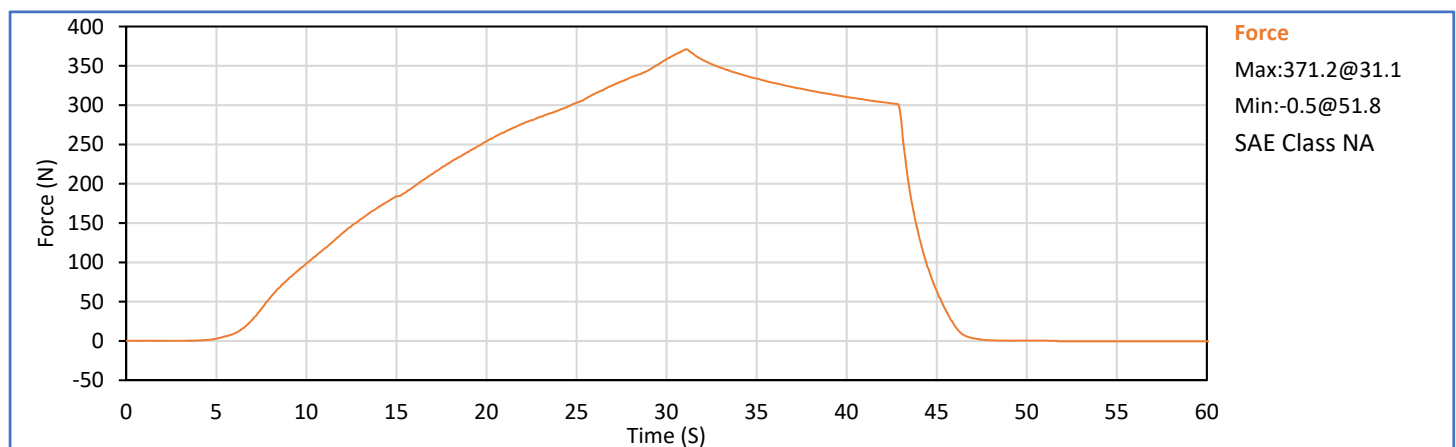
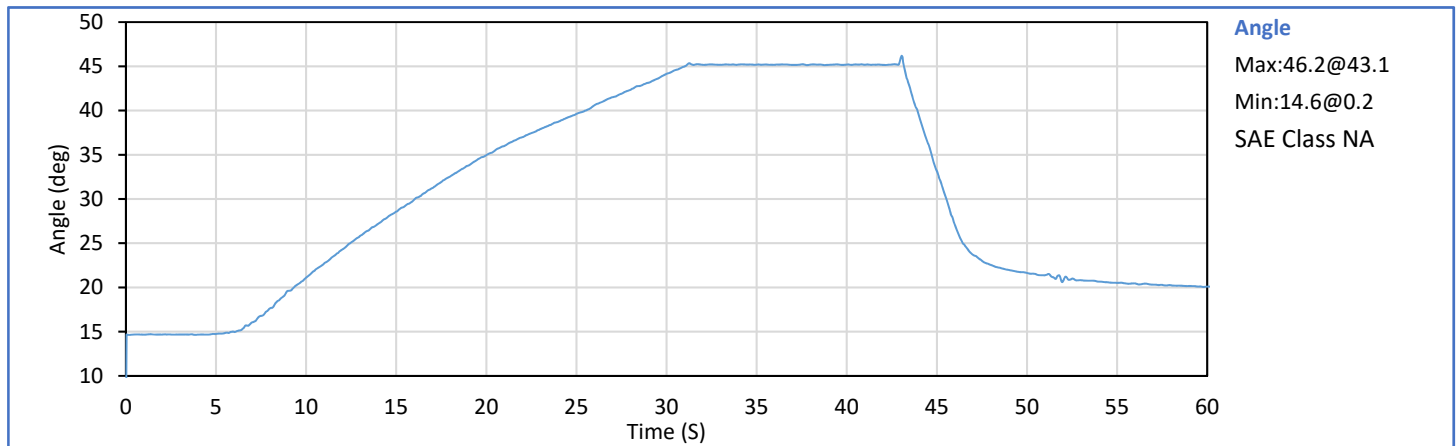
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	30	Pass
Orientation Angle	deg	0.0	20.0	15.1	Pass
Test Initial Angle	deg	11.0	19.0	14.7	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	371.0	Pass
Torso Flexion Rate	deg/s	0.50	1.50	1.20	Pass
Final Reference Plane Angle	deg	-8.0	8.0	4.9	Pass
Overall Test Results				Pass	Pass



Technician:

J. Hernandez

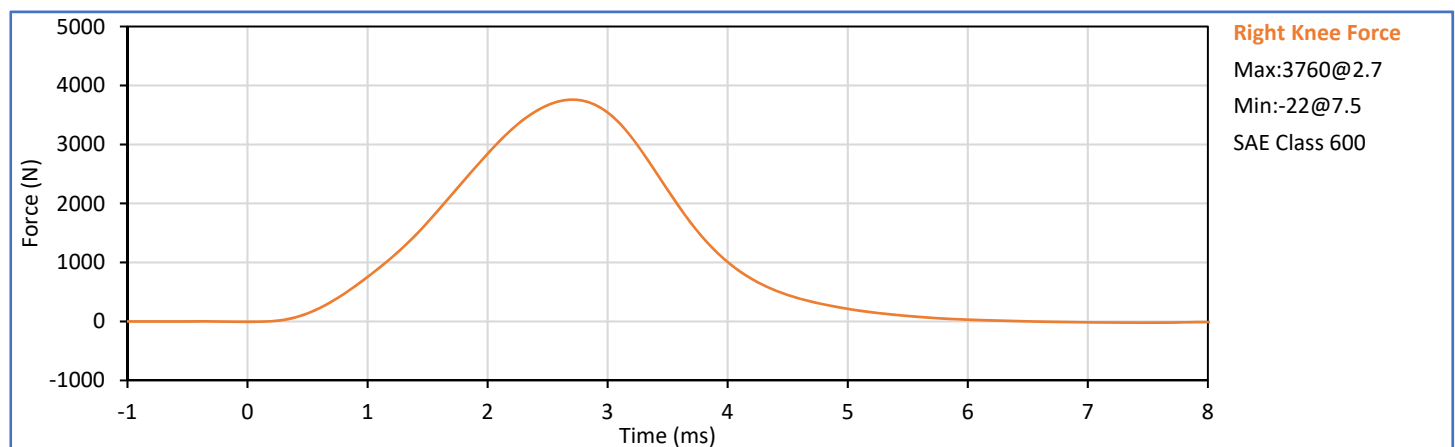
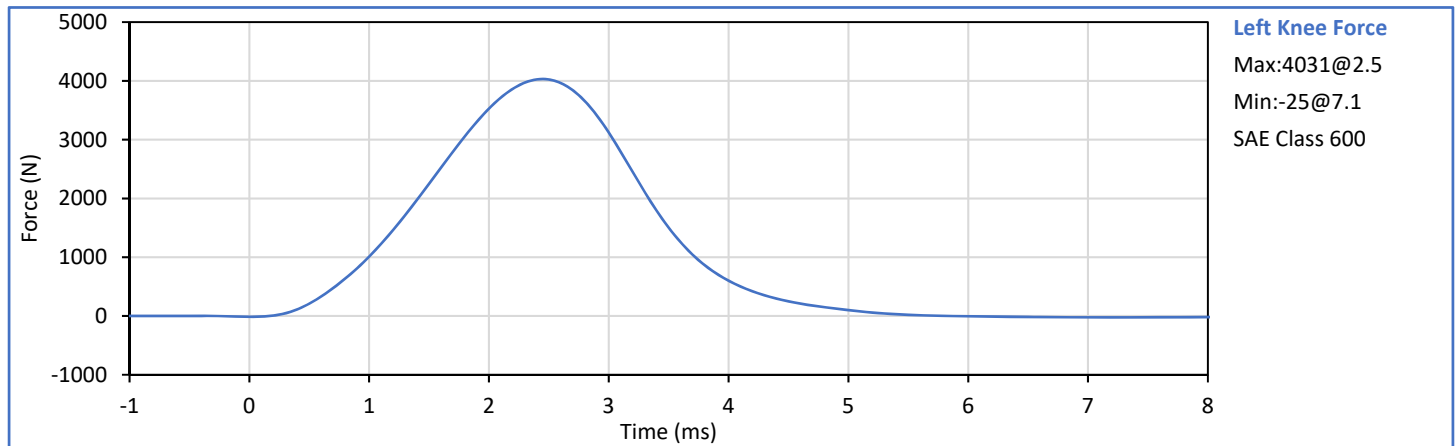
J. Hernandez

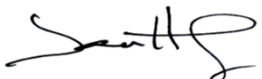
Approved By:

P. Puzzuto

P. Puzzuto

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.6	Pass
	Laboratory Humidity	%	10	70	34	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.108	Pass
Knee	Peak Resistive Force	N	3450	4060	4031	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.122	Pass
Knee	Peak Resistive Force	N	3450	4060	3760	Pass
Overall Test Results					Pass	



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P49209	Endevco	7264C-2k	2019-11-06
Head Acceleration Y Primary	P49228	Endevco	7264C-2k	2019-11-06
Head Acceleration Z Primary	A199910	MSI	64C-2000	2019-11-06
Head Acceleration X Redundant	P50103	Endevco	7264C-2k	2019-11-06
Head Acceleration Y Redundant	P49210	Endevco	7264C-2k	2019-11-06
Head Acceleration Z Redundant	P58713	Endevco	7264C-2k	2019-11-06
Head Rotation Rate X	ARS7587	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Y	ARS7426	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Z	ARS7480	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Upper Neck Force X	2185 Fx	R.A. Denton	1716ATF	2019-09-03
Upper Neck Force Y	2185 Fy	R.A. Denton	1716ATF	2019-09-03
Upper Neck Force Z	2185 Fz	R.A. Denton	1716ATF	2019-09-03
Upper Neck Moment X	2185 Mx	R.A. Denton	1716ATF	2019-09-03
Upper Neck Moment Y	2185 My	R.A. Denton	1716ATF	2019-09-03
Upper Neck Moment Z	2185 Mz	R.A. Denton	1716ATF	2019-09-03
Chest Acceleration X Primary	P52112	Endevco	7264C-2k	2019-11-16
Chest Acceleration Y Primary	P49208	Endevco	7264C-2k	2019-11-16
Chest Acceleration Z Primary	P51264	Endevco	7264C-2k	2019-11-16
Chest Acceleration X Redundant	P49461	Endevco	7264C-2k	2019-11-16
Chest Acceleration Y Redundant	P58774	Endevco	7264C-2k	2019-11-16
Chest Acceleration Z Redundant	P49168	Endevco	7264C-2k	2019-11-16
Chest Deflection	0606	Servo	14CBI-3615	2019-11-16
Pelvis Acceleration X	P49238	Endevco	7264C-2k	2019-11-16
Pelvis Acceleration Y	P58877	Endevco	7264C-2k	2019-11-16
Pelvis Acceleration Z	P50087	Endevco	7264C-2k	2019-11-16
Left Femur Force Z	DS9756 (pri)	Humanetics	3821JLN2	2019-09-03
Right Femur Force Z	DS4139 (pri)	Humanetics	3821JLN2	2019-09-03
Left Femur Force Z Redundant	DS9756 (red)	Humanetics	3821JLN2	2019-09-03
Right Femur Force Z Redundant	DS4139 (red)	Humanetics	3821JLN2	2019-09-03
Left Leg Upper Tibia Moment X	DH3309 Mx	FTSS	IF-857	2019-09-09
Left Leg Upper Tibia Moment Y	DH3309 My	FTSS	IF-857	2019-09-09
Left Leg Upper Tibia Force Z	DH3309 Fz	FTSS	IF-857	2019-09-09
Left Leg Lower Tibia Moment X	DI4186 Mx	FTSS	IF-853	2019-09-06
Left Leg Lower Tibia Moment Y	DI4186 My	FTSS	IF-853	2019-09-06
Left Leg Lower Tibia Force Z	DI4186 Fz	FTSS	IF-853	2019-09-06
Right Leg Upper Tibia Moment X	DG6679 Mx	FTSS	IF-857	2019-09-09
Right Leg Upper Tibia Moment Y	DG6679 My	FTSS	IF-857	2019-09-09
Right Leg Upper Tibia Force Z	DG6679 Fz	FTSS	IF-857	2019-09-09
Right Leg Lower Tibia Moment X	DI4188 Mx	FTSS	IF-853	2019-09-06
Right Leg Lower Tibia Moment Y	DI4188 My	FTSS	IF-853	2019-09-06
Right Leg Lower Tibia Force Z	DI4188 Fz	FTSS	IF-853	2019-09-06
Left Ankle Acceleration X	03E20-N09	Entran	EGEB6Q-2k	2019-11-16
Left Ankle Acceleration Z	03D30-N13	Entran	EGEB6Q-2k	2019-11-16
Left Toe Acceleration Z	03H07-Z10	Entran	EGEB6Q-2k	2019-11-16
Right Ankle Acceleration X	03E29-N20	Entran	EGEB6Q-2k	2019-11-16
Right Ankle Acceleration Z	03E18-F02	Entran	EGEB6Q-2k	2019-11-16
Right Toe Acceleration Z	05H31-Z04	Entran	EGEB6Q-2k	2019-11-16
Seat Belt Outside Lap Force	300	FTSS	IF-964	2019-10-02
Seat Belt Upper Diagonal Force	315	FTSS	IF-964	2019-10-02

Table 2 - Right Front Passenger ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P51889	Endevco	7264C-2k	2019-11-25
Head Acceleration Y Primary	P51861	Endevco	7264C-2k	2019-11-25
Head Acceleration Z Primary	P52077	Endevco	7264C-2k	2019-11-25
Head Acceleration X Redundant	P58835	Endevco	7264C-2k	2019-11-25
Head Acceleration Y Redundant	P51703	Endevco	7264C-2k	2019-11-25
Head Acceleration Z Redundant	P52096	Endevco	7264C-2k	2019-11-25
Head Rotation Rate X	ARS7455	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Y	ARS7537	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Z	ARS7582	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Upper Neck Force X	2254 Fx	R.A. Denton	1716ATF	2019-02-22
Upper Neck Force Y	2254 Fy	R.A. Denton	1716ATF	2019-02-22
Upper Neck Force Z	2254 Fz	R.A. Denton	1716ATF	2019-02-22
Upper Neck Moment X	2254 Mx	R.A. Denton	1716ATF	2019-02-22
Upper Neck Moment Y	2254 My	R.A. Denton	1716ATF	2019-02-22
Upper Neck Moment Z	2254 Mz	R.A. Denton	1716ATF	2019-02-22
Chest Acceleration X Primary	P58860	Endevco	7264C-2k	2019-11-25
Chest Acceleration Y Primary	P51876	Endevco	7264C-2k	2019-11-25
Chest Acceleration Z Primary	P58711	Endevco	7264C-2k	2019-11-25
Chest Acceleration X Redundant	P52049	Endevco	7264C-2k	2019-11-25
Chest Acceleration Y Redundant	P51862	Endevco	7264C-2k	2019-11-25
Chest Acceleration Z Redundant	P52048	Endevco	7264C-2k	2019-11-25
Chest Deflection	0724	Servo	14CBI-3615	2019-11-25
Pelvis Acceleration X	P52090	Endevco	7264C-2k	2019-11-25
Pelvis Acceleration Y	P58849	Endevco	7264C-2k	2019-11-25
Pelvis Acceleration Z	P58756	Endevco	7264C-2k	2019-11-25
Left Femur Force Z	106 (pri)	R.A. Denton	3821JTF	2019-02-22
Right Femur Force Z	112 (pri)	R.A. Denton	3821JTF	2019-02-22
Left Femur Force Z Redundant	106 (red)	R.A. Denton	3821JTF	2019-02-22
Right Femur Force Z Redundant	112 (red)	R.A. Denton	3821JTF	2019-02-22
Left Upper Tibia Moment X	414 Mx	R.A. Denton	3643	2019-03-06
Left Upper Tibia Moment Y	414 My	R.A. Denton	3643	2019-03-06
Left Upper Tibia Force Z	414 Fz	R.A. Denton	3643	2019-03-06
Left Lower Tibia Moment X	405 Mx	R.A. Denton	3644	2019-02-22
Left Lower Tibia Moment Y	405 My	R.A. Denton	3644	2019-02-22
Left Lower Tibia Force Z	405 Fz	R.A. Denton	3644	2019-02-22
Right Upper Tibia Moment X	DH3284 Mx	FTSS	IF-857	2019-02-22
Right Upper Tibia Moment Y	DH3284 My	FTSS	IF-857	2019-02-22
Right Upper Tibia Force Z	DH3284 Fz	FTSS	IF-857	2019-02-22
Right Lower Tibia Moment X	497 Mx	R.A. Denton	3644	2019-02-22
Right Lower Tibia Moment Y	497 My	R.A. Denton	3644	2019-02-22
Right Lower Tibia Force Z	497 Fz	R.A. Denton	3644	2019-02-22
Left Ankle Acceleration X	P52057	Endevco	7264C-2k	2019-11-26
Left Ankle Acceleration Z	03E18-F07	Entran	EGEB6Q-2k	2019-11-26
Left Toe Acceleration Z	P49224	Endevco	7264C-2k	2019-11-26
Right Ankle Acceleration X	P52019	Endevco	7264C-2k	2019-11-26
Right Ankle Acceleration Z	P58755	Endevco	7264C-2k	2019-11-26
Right Toe Acceleration Z	P52076	Endevco	7264C-2k	2019-11-26
Seat Belt Outside Lap Force	313	FTSS	IF-964	2019-10-02
Seat Belt Upper Diagonal Force	251	FTSS	IF-964	2019-10-02

Table 3 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Left Rear Primary Ax	Accels\10884	Endevco	757F-2k	2019-11-27
Right Rear Primary Ax	Accels\10824	Endevco	757F-2k	2019-11-27
Engine Top Ax	Accels\10841	Endevco	757F-2k	2019-11-27
Engine Bottom Ax	Accels\10849	Endevco	757F-2k	2019-11-27
Left Rear Az	Accels\10913	Endevco	757F-2k	2019-11-27
Right Rear Az	Accels\10906	Endevco	757F-2k	2019-11-27
Left Rear Redundant Ax	Accels\10890	Endevco	757F-2k	2019-11-27
Right Rear Redundant Ax	Accels\10908	Endevco	757F-2k	2019-11-27