

REPORT NUMBER: NCAP-KAR-18-019

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

**NISSAN MOTOR CO.
2018 NISSAN MAXIMA S 4-DOOR SEDAN**

NHTSA NUMBER: M20185203

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



JUNE 13, 2018

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: _____

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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		15. Supplementary Notes																																																					
16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2018 Nissan Maxima S 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 KARCO Engineering, LLC. facility in Adelanto, California on May 30, 2018. The impact velocity of the vehicle was 56.24 km/h and the ambient temperature at the barrier face at the time of impact was 32.2°C. The target vehicle's post-test maximum crush was 349 mm at DPD3 to the left of the vehicle's centerline. The test vehicle's performance is as follows: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <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>106.2</td> <td>700</td> <td>103.3</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-19</td> <td>52</td> <td>-19</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.38</td> <td>1</td> <td>0.29</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1457.8</td> <td>2620</td> <td>506.8</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-89.0</td> <td>2520</td> <td>-229.3</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10000</td> <td>-297.6</td> <td>6800</td> <td>-3738.6</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10000</td> <td>-419.4</td> <td>6800</td> <td>-2620.3</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	106.2	700	103.3	Maximum Chest Compression	mm	63	-19	52	-19	Nij	N/A	1	0.38	1	0.29	Neck Tension	N	4170	1457.8	2620	506.8	Neck Compression	N	4000	-89.0	2520	-229.3	Left Femur Force	N	10000	-297.6	6800	-3738.6	Right Femur Force	N	10000	-419.4	6800	-2620.3
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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 DTNH22-12-D-00259. 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 Frontal NCAP Laboratory Test Procedure, dated October 2015.

SUMMARY

A load cell barrier consisting of 176 load cells was impacted by a 2018 Nissan Maxima S 4-Door sedan at a velocity of 56.24 km/h. The test was performed at KARCO Engineering, LLC. on May 30, 2018. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A of this report.

Three (3) 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 Frontal NCAP Laboratory Test Procedure.

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. 144) were calibrated 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 100% windshield retention and no intrusion into the protected zone of the windshield during the event.

The maximum static crush was 349 mm at DPD3 to the left of the vehicle's centerline. 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. The left knee contacted the knee bolster and the steering column. The right knee contacted the knee bolster.

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 bolster.

The occupant data is summarized below:

ATD Position	HIC ₁₅	T ¹ (ms)	T ² (ms)	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp. (N)	Left Femur (N)	Right Femur (N)
Driver (50th)	106.2	76.6	91.6	-19	0.38	1457.8	-89.0	-297.6	-419.4
Passenger (5th)	103.3	55.3	70.3	-19	0.29	506.8	-229.3	-3738.6	-2620.3

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

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	lbf/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: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20185203
Model Year	2018
Make	Nissan
Model	Maxima S
Body Style	4-Door Sedan
VIN	1N4AA6AP6JC382394
Body Color	Brilliant Silver
Odometer Reading (km / mi)	270 / 168
Engine Displacement (L)	3.5
Type / No. of Cylinders	V6
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	7
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
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	No
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver 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?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co.
Date of Manufacture	Mar-18

GVWR (kg)	2105
GAWR Front (kg)	1130
GAWR Rear (kg)	990

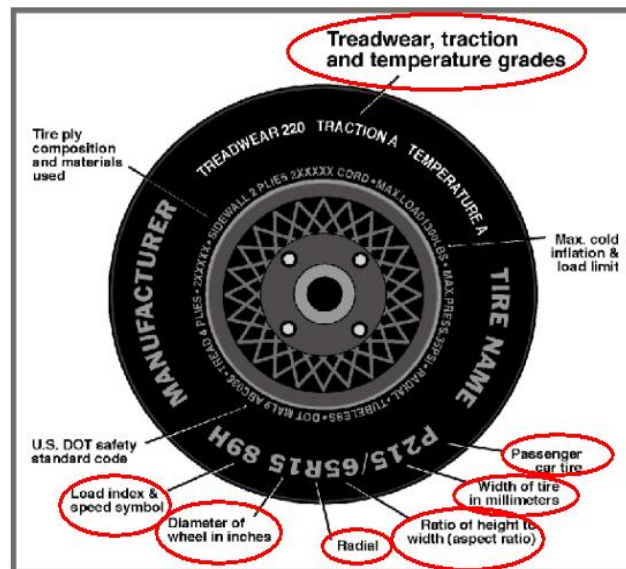
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				408.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)*				67.8	A-B

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
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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	P215/45R18	P215/45R18
Tire Size on Vehicle	P215/45R18	P215/45R18
Tire Manufacturer	Continental	Continental
Tire Model	Pro Contact TX	Pro Contact TX
Treadwear	400	400
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	96V	96V
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	6G8U WBVA 2317	6G8U WBVA 2317
DOT Safety Code Right	6G8U WBVA 2317	6G8U WBVA 2317

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

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	480.0	315.0		506.5	401.0	
Right	kg	491.0	298.5		508.5	372.0	
Ratio	%	61.3%	38.7%	100.0%	56.8%	43.2%	100.0%
Total	kg	971.0	613.5	1584.5	1015.0	773.0	1788.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1584.5	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	67.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1793.3	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	719	725	730	741	1073
As Tested	mm	708	718	701	711	1198
Post-Test	mm	809	769	708	677	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheelbase	mm	2770
Total Vehicle Length at Left Side	mm	4158
Total Vehicle Length at Centerline	mm	4910
Total Vehicle Length at Right Side	mm	4150
Weight of Ballast in Cargo Area	kg	81.8
Weight of Vehicle Components Removed	kg	16.0
Amount of Stoddard Solvent in Fuel Tank	L	63.36

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk Trim (2.0 kg), Spare Tire and Tools (14.0 kg)

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

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test
1	Total Length	4910
2	Total Width	1860
3	Bumper Top Height	613
4	Bumper Bottom Height	420
5	Longitudinal Member Top Height	570
6	Distance Between Longitudinal Members	910
7	Longitudinal Member Width	60
8	Engine Top Height	890
9	Engine Bottom Height	174
10	Engine and Gearbox Width	515
11	Front Bumper to Engine Distance	520
12	Front Shock Absorber Fixing Height	895
13	Bonnet Leading Edge Height	820
14	Front Shock Absorber Fixing Width	1160
15	Front Bumper to Front Axle Distance	1015
16	Front Axle to A-Pillar Distance	505
17	A-Pillar to B-Pillar Distance	1066
18	B-Pillar to Rear Axle Distance	1130
19	B-Pillar to C-Pillar Distance	821
20	Roof Sill Bottom Height	1295
21	Roof Sill Top Height	1405
22	Floor Sill Bottom Height	185
23	Floor Sill Top Height	345

All measurements in millimeters.

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

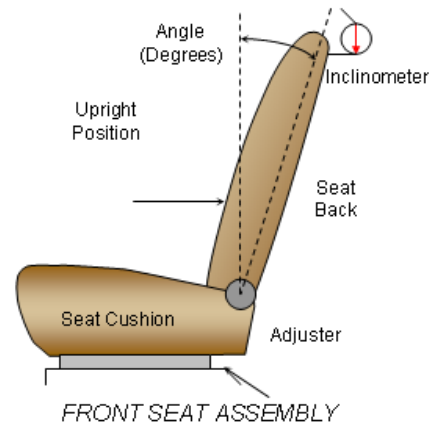
Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

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.

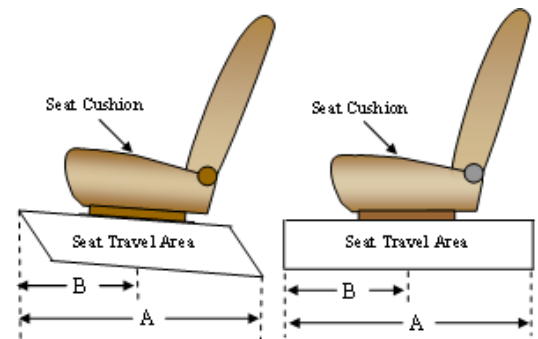
SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	7.6
Passenger Seat Back Angle	6.8



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	290 mm	145 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 "M2," and position "M1." Position "L" is the lowermost position.

SEAT BELT UPPER ANCHORAGES

Seating Position	Total No. of Positions	Placed in Position
Driver Seat	3	H
Passenger Seat	3	H

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

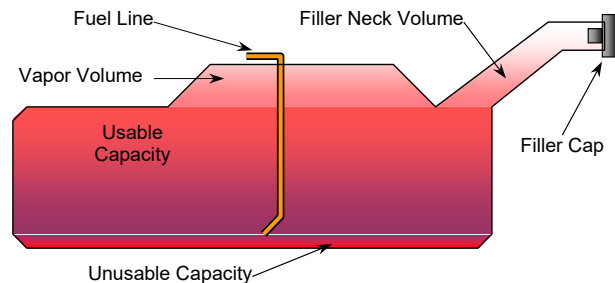
Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	68.13
Usable Capacity of "Optional Tank"	N/A
92 - 94% of Usable Capacity	62.68 to 64.04
Actual Amount of Stoddard Solvent Used	63.36
1/3 of Usable Capacity	22.71

FUEL PUMP

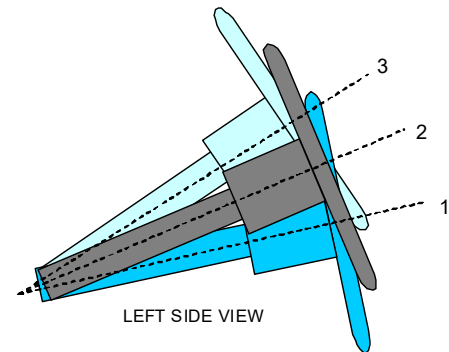
The vehicle is equipped with an electric fuel pump.
The fuel pump operates when the engine is running.



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

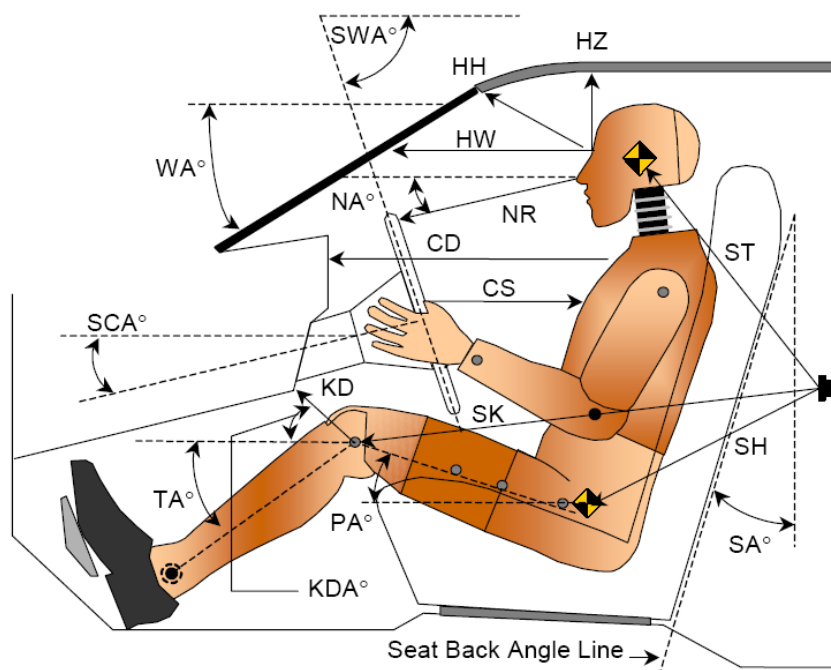
STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	23.7	91
Geometric Center Position, No. 2	25.9	121
Uppermost Position, No. 3	28.0	150
Telescoping Steering Wheel Travel		59
Test Position	25.9	121

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



LEFT SIDE VIEW

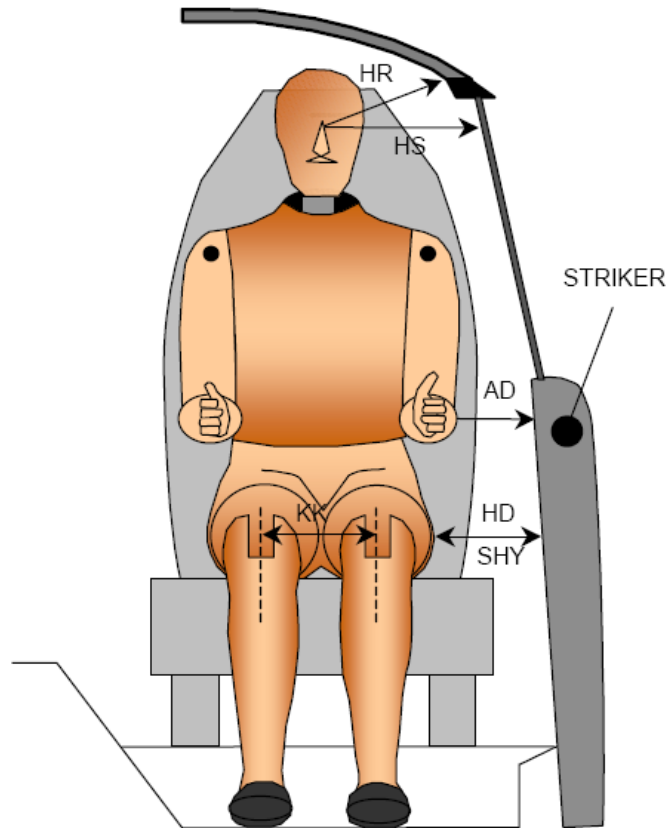
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		21.9		
SWA°	Steering Wheel Angle		67.1		
SCA°	Steering Column Angle		22.9		
SA°	Seat Back Angle (On Headrest Post)		7.6		6.8
HZ	Head to Roof	189	90.0	219	90.0
HH	Head to Header	384	24.4	325	41.9
HW	Head to Windshield	655	0.0	748	0.0
NR	Nose to Rim	387	5.5	454	28.1
CD	Chest to Dash	545	14.1	411	8.1
CS	Chest to Steering Hub	299	1.2		
RA	Rim to Abdomen	210	0.0		
KDL	Left Knee to Dash	198	25.7	121	30.6
KDR	Right Knee to Dash	190	8.6	130	26.9
PA°	Pelvic Angle		24.5		21.8
TA°	Tibia Angle		39.2		43.4
SK	Striker to Knee	574	0.9	662	1.0
ST	Striker to Head	513	79.7	491	65.3
SH	Striker to H-Point	248	36.1	358	18.9

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

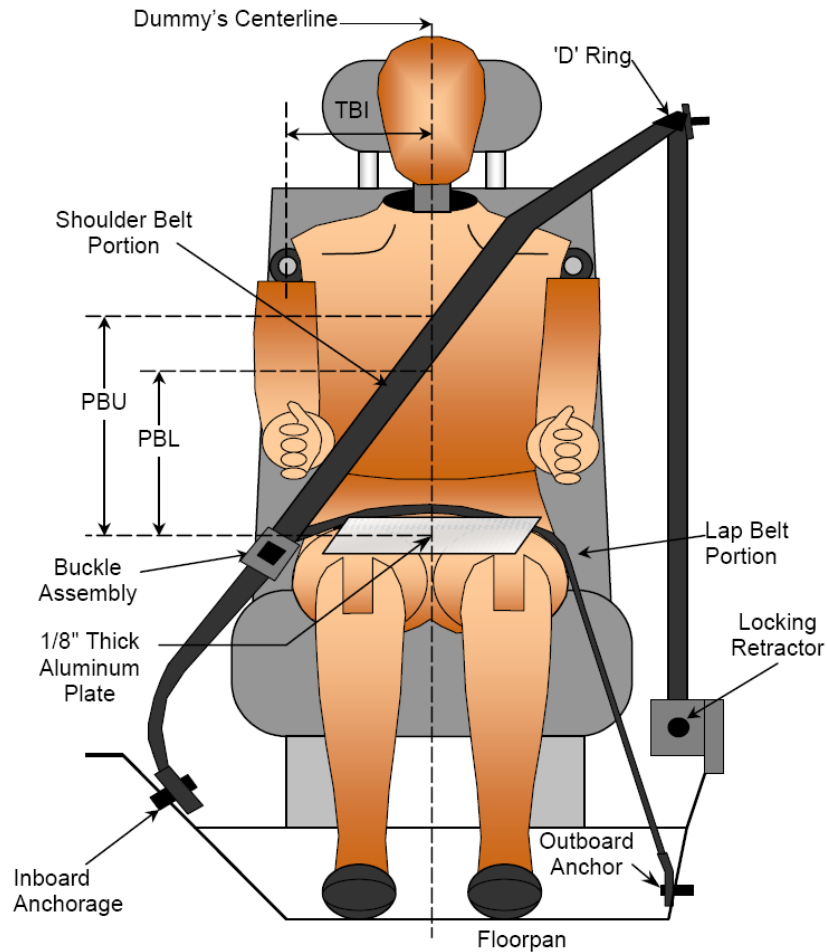
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	18	80
HD	H-Point to Door	134	188
HR	Head to Side Header	216	271
HS	Head to Side Window	346	385
KK	Knee to Knee	334	205
SHY	Striker to H-Point (Y-Direction)	253	285
AA	Ankle to Ankle	347	190

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



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	334	295
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	245	220

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	848	913
Lap Belt Length as Measured on ATD	mm	796	710
Remainder of Belt on Reel	mm	1345	1047
Total Belt Length for Continuous Webbing Systems	mm	2989	2670

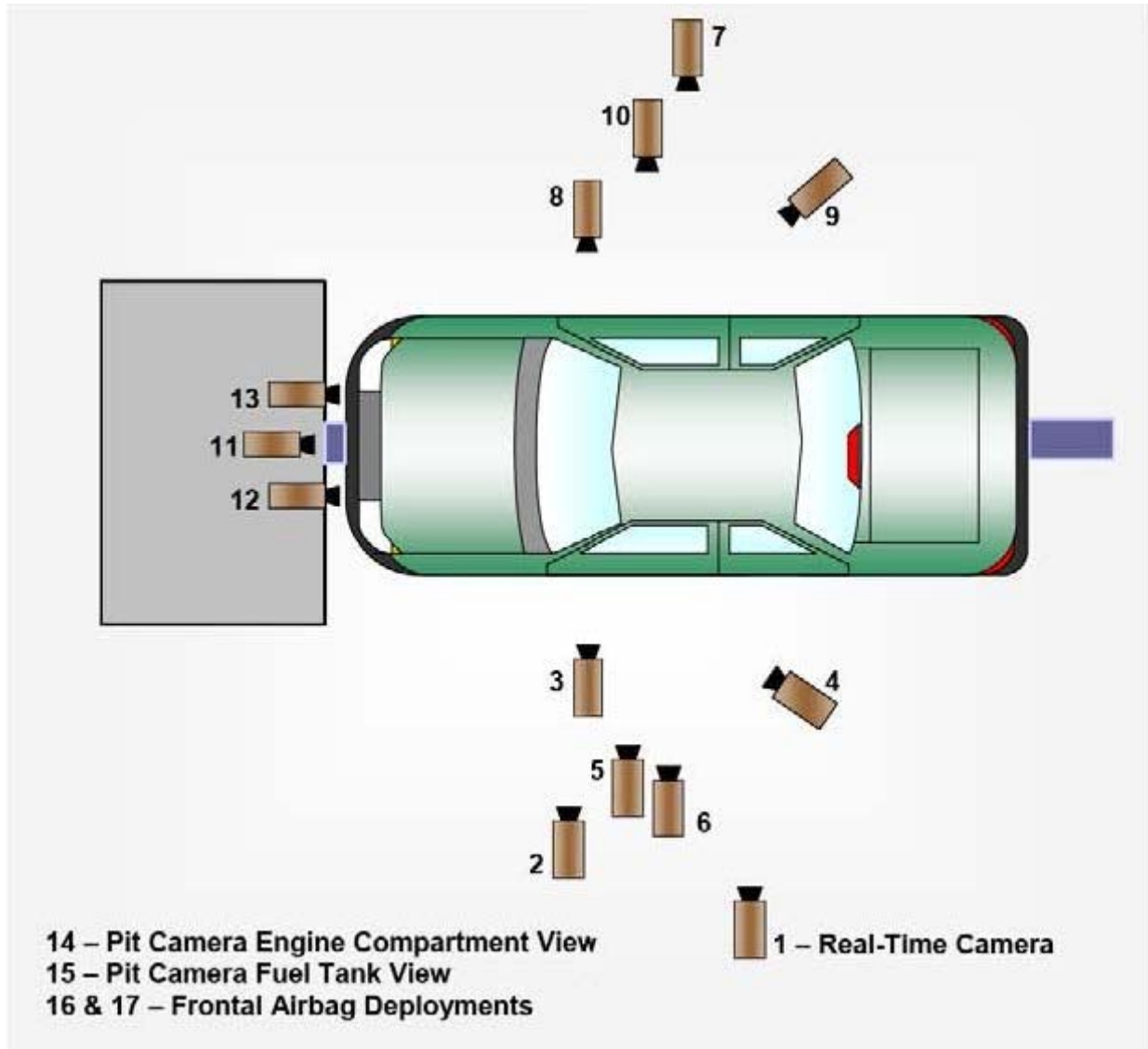
DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

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CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 ... (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

CAMERA LOCATIONS

No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Driver Close-Up	-2590	-7950	-1371	50	1000
3	Left Front Half	-1701	-6197	-1701	35	1000
4	Left Angle	-6696	-10308	-3211	105	1000
5	Steering Column - Top	-1966	-10412	-3688	35	1000
6	Steering Column - Bottom	-1972	-10412	-3379	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	Onboard Driver Airbag (Optional)	-1550	-290	-1290	8	1000
17	Onboard Passenger Airbag (Optional)	-1550	290	1290	8	1000
18	Real-Time Left View of Impact					
19	Real-Time Right View of Impact					

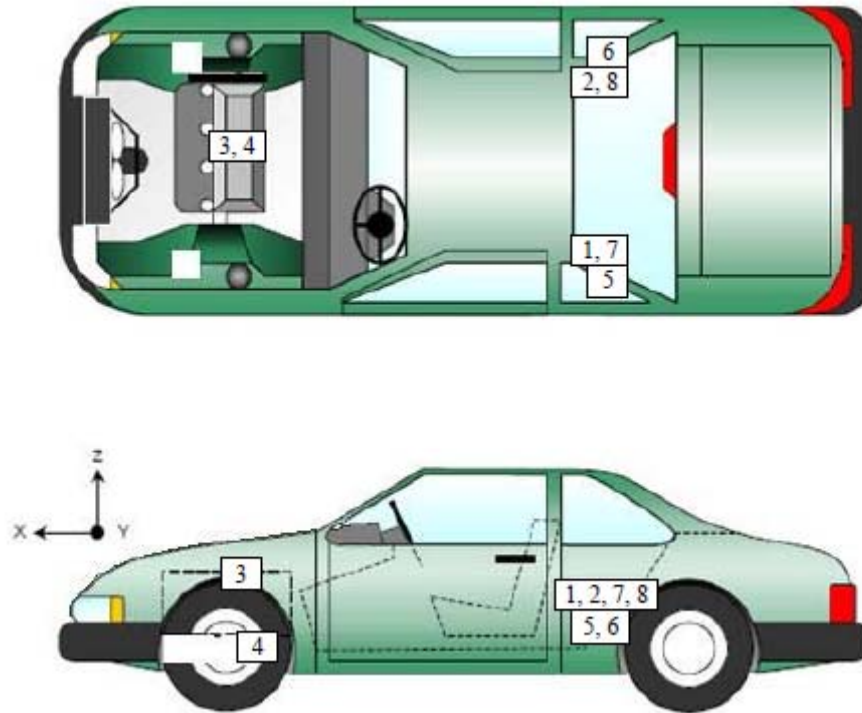
Coordinates: +X = forward impact plane
 +Y = right of monorail center
 +Z = into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	1990	-720	-340
2	Right Rear Accelerometer X-Direction	1990	720	-340
3	Engine Top X	4210	380	-780
4	Engine Bottom X	3705	330	-160
5	Left Rear Accelerometer Z-Direction	1990	-720	-340
6	Right Rear Accelerometer Z-Direction	1990	720	-340
7	Left Rear Accelerometer X-Direction Redundant	1990	-720	-340
8	Right Rear Accelerometer X-Direction Redundant	1990	720	-340

Reference Points:

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

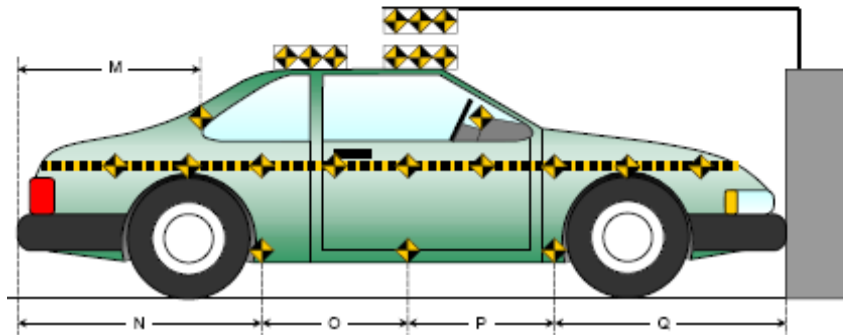
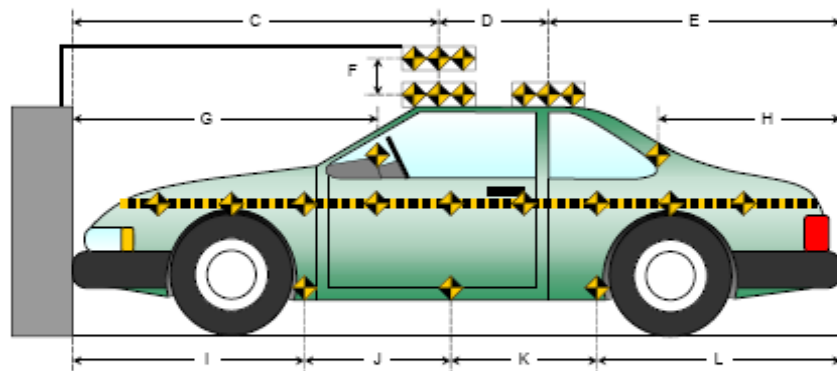
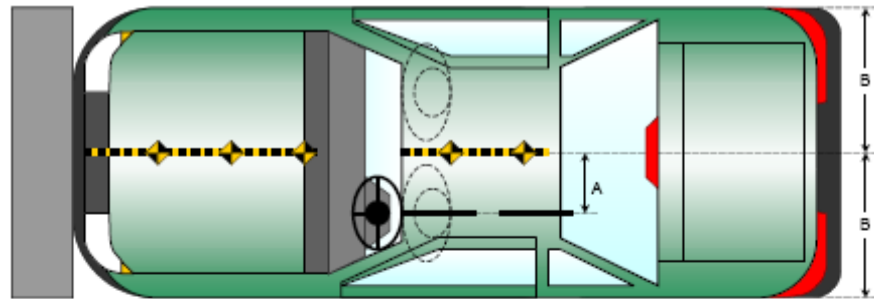
DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

Item	Value
A	370
B	930
C	2300
D	610
E	2000
F	305
G	1875
H	1160
I	1445
J	948
K	948
L	1558
M	1158
N	1555
O	948
P	948
Q	1450



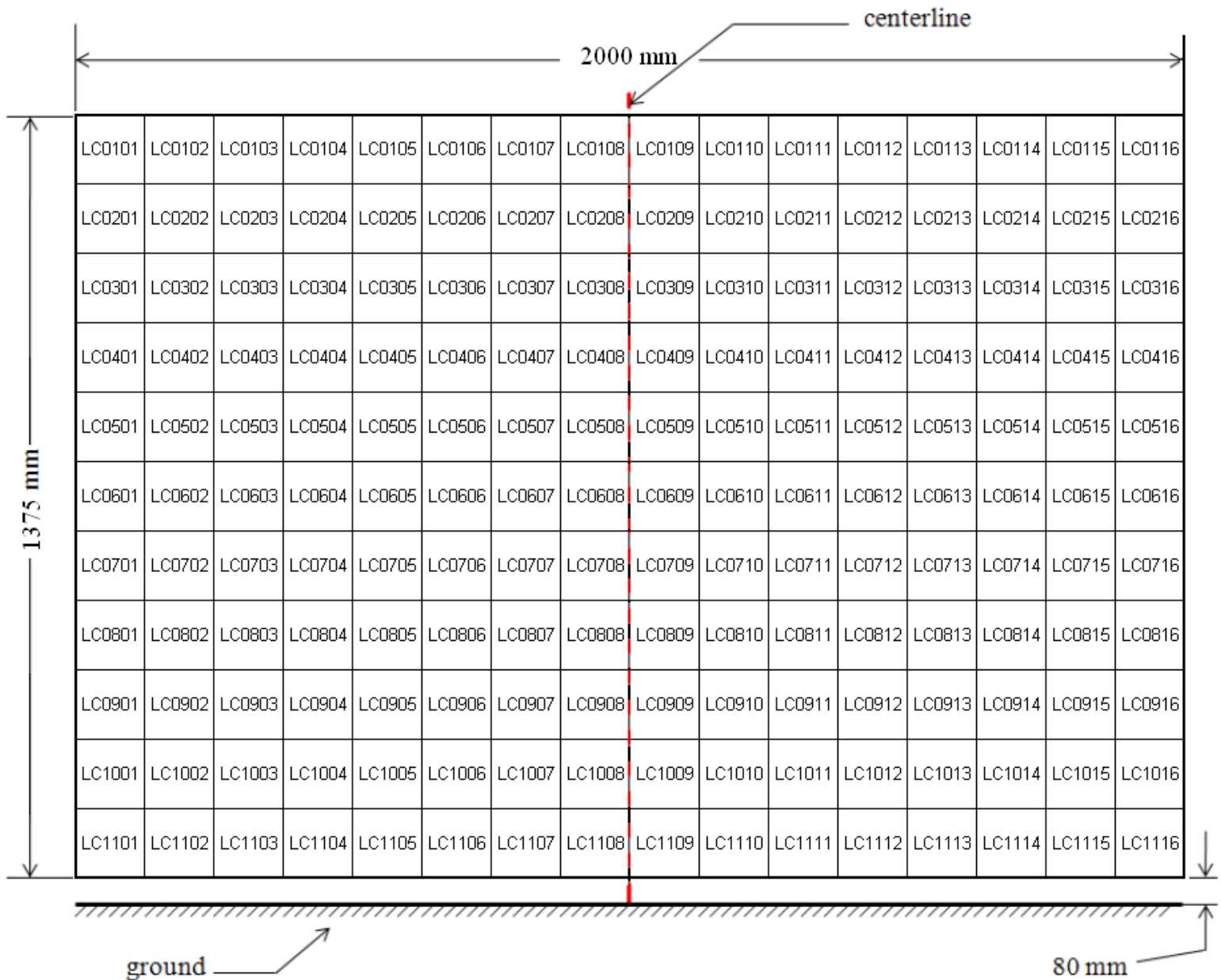
All measurements in millimeters.

DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



DATA SHEET NO. 10**TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY**

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

INSTRUMENTATION

Driver Dummy Accelerometers	47
Passenger Dummy Accelerometers	47
Vehicle Structure Accelerometers	8
Seat Belt Load Cells	0
Load Cell Barrier	528
Total	630

CAMERA COVERAGE

High-Speed Vehicle On Board	2
High-Speed Off Board	14
Real Time	3
Total	19

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 360	P572O 5th Percentile Female ATD / 141
Head Contact	Frontal Airbag, Headrest	Frontal Airbag, Headrest
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster, Steering Column	Knee Bolster
Right Knee Contact	Knee Bolster	Knee Bolster

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Locked	Locked
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
Seat Track Shift (mm)	2	0
Seat Back Failure	None	None
Glazing Damage	None	None

POST-TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

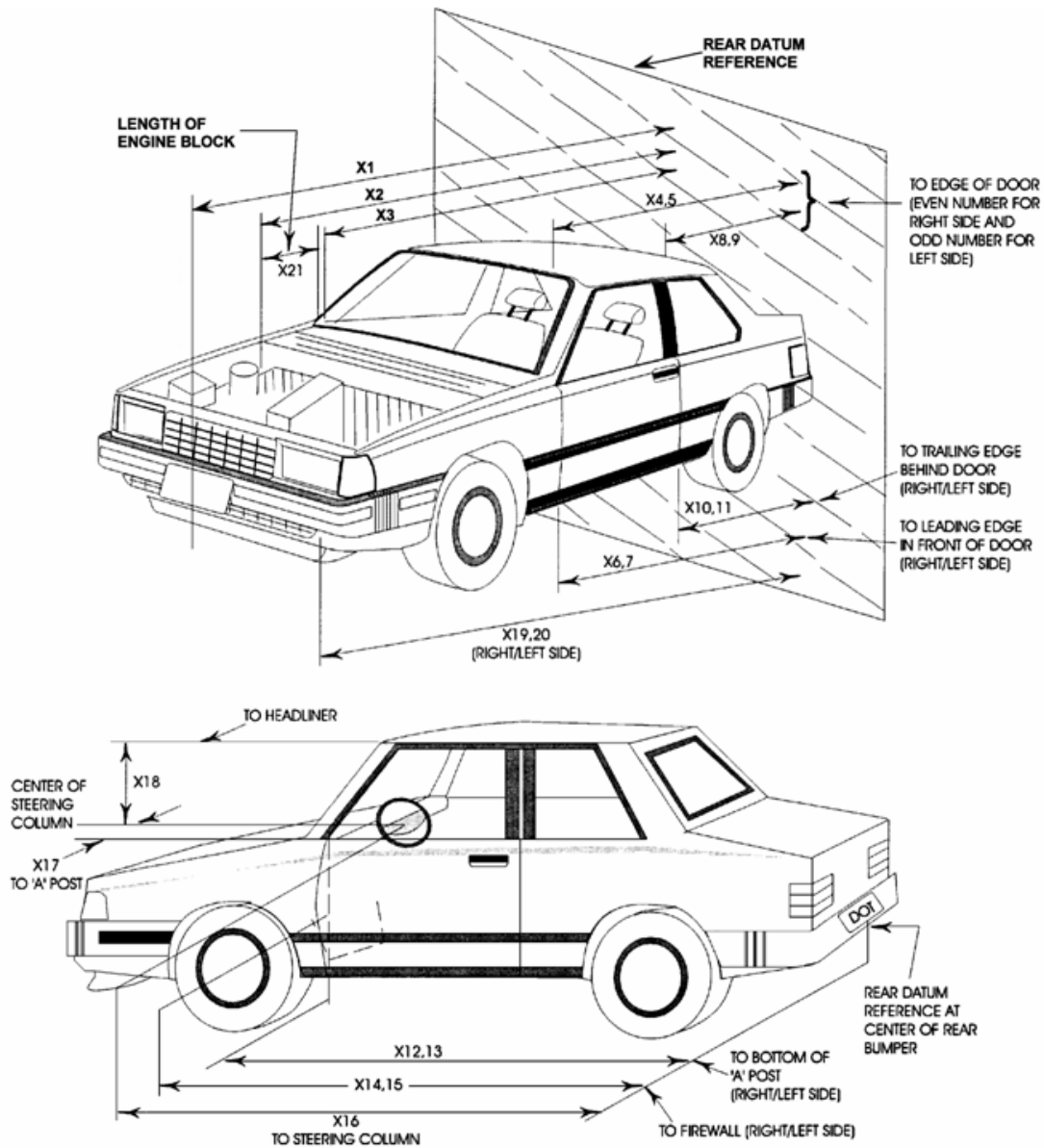
Measured Parameter	Units	Value
Left Side	mm	3960
Center	mm	3870
Right Side	mm	3875
Average	mm	3902

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	No
Side Airbag 2 (Torso/Pelvis)	Yes	No	Yes	No
Knee Airbag	No		No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



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

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4910	4570	-340
2	Rear Surface of Vehicle to Front of Engine	4390	4240	-150
3	RSOV to Firewall	3805	3611	-194
4	RSOV to Upper Leading Edge of Right Door	3395	3400	5
5	RSOV to Upper Leading Edge of Left Door	3405	3408	3
6	RSOV to Lower Leading Edge of Right Door	3360	3357	-3
7	RSOV to Lower Leading Edge of Left Door	3371	3348	-23
8	RSOV to Upper Trailing Edge of Right Door	2195	2202	7
9	RSOV to Upper Trailing Edge of Left Door	2210	2214	4
10	RSOV to Lower Trailing Edge of Right Door	2222	2217	-5
11	RSOV to Lower Trailing Edge of Left Door	2231	2217	-14
12	RSOV to Bottom of A-Pillar, Right Side	3366	3372	6
13	RSOV to Bottom of A-Pillar, Left Side	3376	3372	-4
14	RSOV to Firewall, Right Side	3720	3533	-187
15	RSOV to Firewall, Left Side	3720	3547	-173
16	RSOV to Steering Column	2855	2915	60
17	Center of Steering Column to A-Pillar	410	430	20
18	Center of Steering Column to Headliner	405	435	30
19	RSOV to Right Side of Front Bumper	4150	3945	-205
20	RSOV to Left Side of Front Bumper	4158	4115	-43
21	Length of Engine Block	535	535	0
RD	RSOV to Right Side of Dash Panel	3045	3042	-3
CD	RSOV to Center of Dash Panel	2970	3050	80
LD	RSOV to Left Side of Dash Panel	3030	3037	7

All measurements in millimeters.

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

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

VEHICLE INFORMATION

VIN: 1N4AA6AP6JC382394 Wheelbase (mm): 2770
Vehicle Size Category: Passenger Car Test Weight (kg): 1788.0

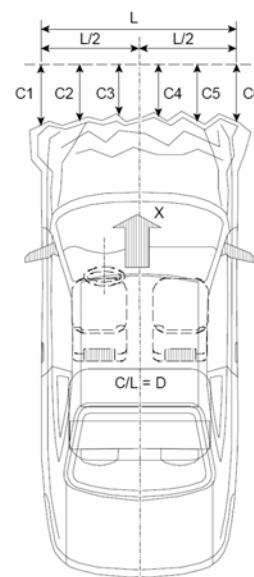
ACCELEROMETER DATA

Accelerometer Locations: Left Rear Crossmember
Cal. Procedure/Interval: Vibration Test / 6 months
Integration Algorithm: NHTSA Standard
Impact Velocity (km/h): 56.24
Velocity Change (km/h): 65.5
Time of Separation (msec): 68.8

Linearity: Good

CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1600
Impact Mode: Full Frontal



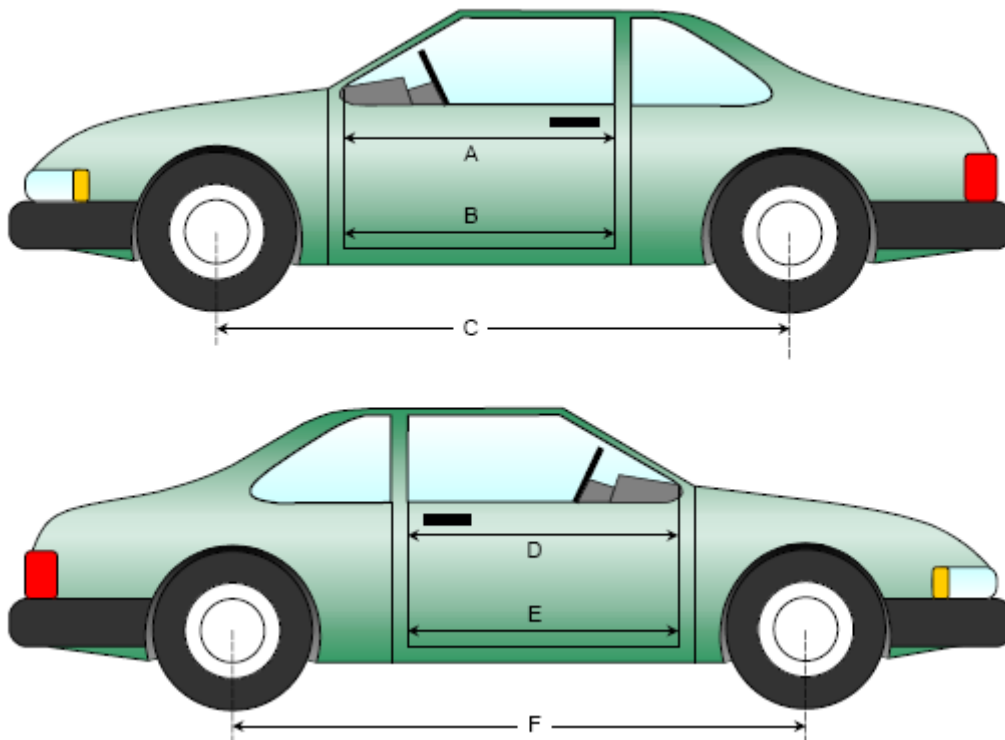
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	410	503	93
C2	Crush Zone 2 at Left Side	mm	119	447	328
C3	Crush Zone 3 at Left Side	mm	25	374	349
C4	Crush Zone 4 at Right Side	mm	25	314	289
C5	Crush Zone 5 at Right Side	mm	119	341	222
C6	Crush Zone 6 at Right Side	mm	410	314	-96
L	C1 to C6	mm	1600		

DATA SHEET NO. 14**VEHICLE INTRUSION MEASUREMENTS**Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1065	1064	1
B	Left Side Lower	mm	1019	1020	-1
D	Right Side Upper	mm	1062	1064	-2
E	Right Side Lower	mm	1012	1020	-8

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2770	2755	15
F	Right Side Wheelbase	mm	2770	2700	70



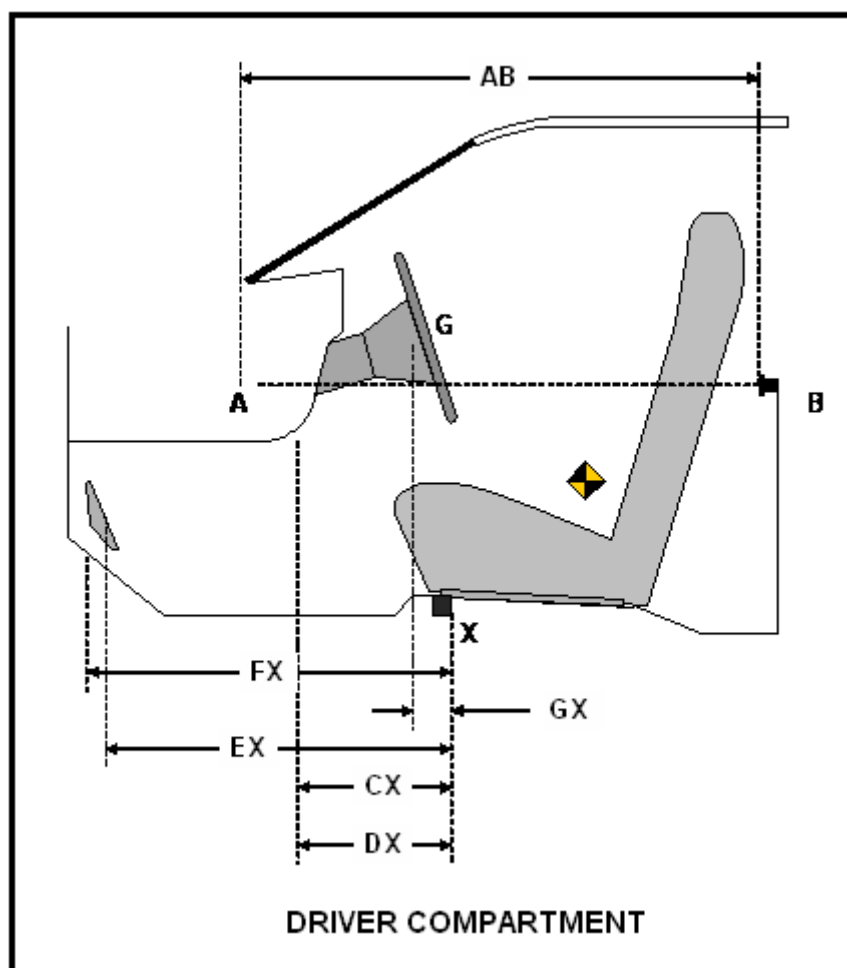
DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	962	957	5
CX	Left Knee Bolster to X	mm	370	345	25
DX	Right Knee Bolster to X	mm	360	350	10
EX	Brake Pedal to X	mm	565	600	-35
FX	Foot Rest to X	mm	575	540	35
GX	Center of Steering Wheel Hub to X	mm	95	75	20

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

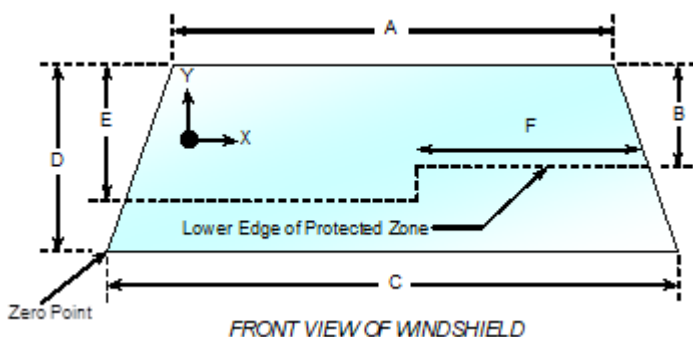
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber molding and rubber cement.

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: 21.0° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2282.5	2282.5	100.0%
Right Side	2282.5	2282.5	100.0%
Total	4562	4562	100.0%



Item	Units	Value
A	mm	1250
B	mm	347
C	mm	1455
D	mm	930
E	mm	490
F	mm	500

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. 15 ... (CONTINUED)

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 32.2° C Test Time: 1:00 PM

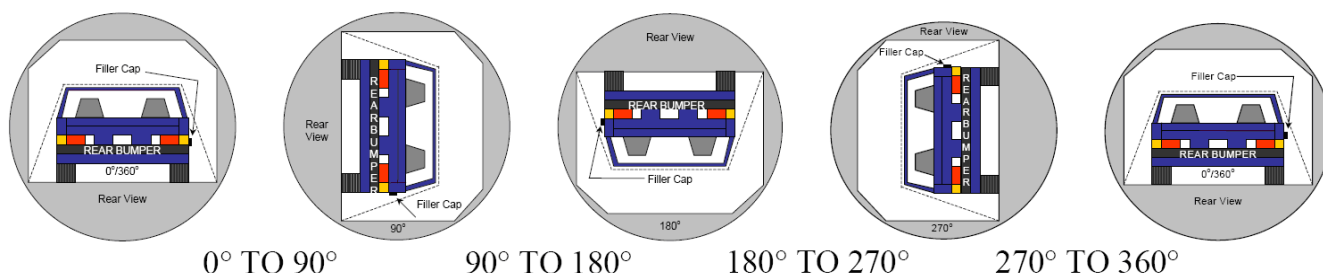
Stoddard Solvent Spillage Measurements

- 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.

DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



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°	78	300	378
270° To 360°	79	300	379

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

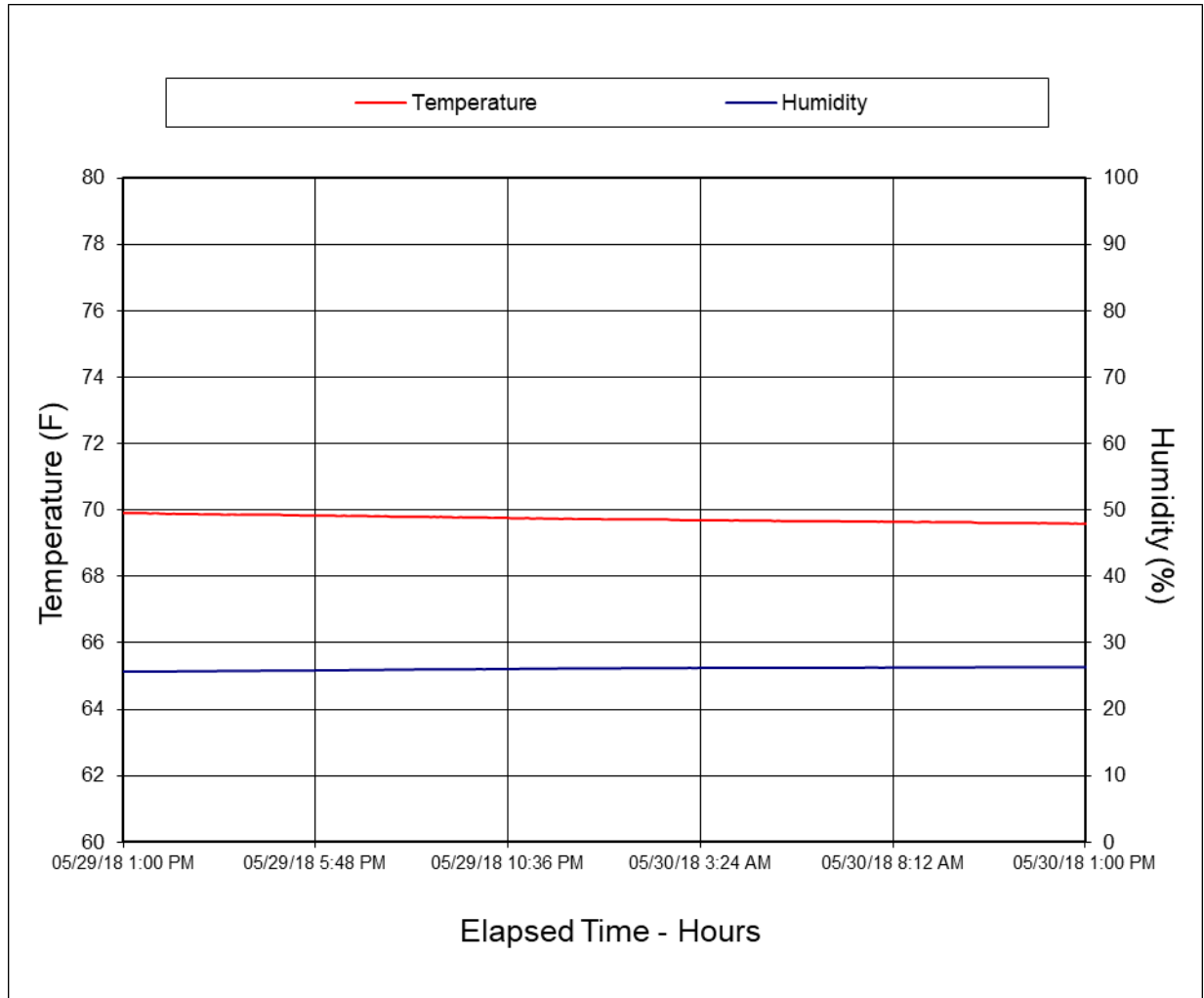
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan NHTSA No.: M20185203

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 05/30/18



APPENDIX A
PHOTOGRAPHS

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FIGURE 1. Load Cell Location

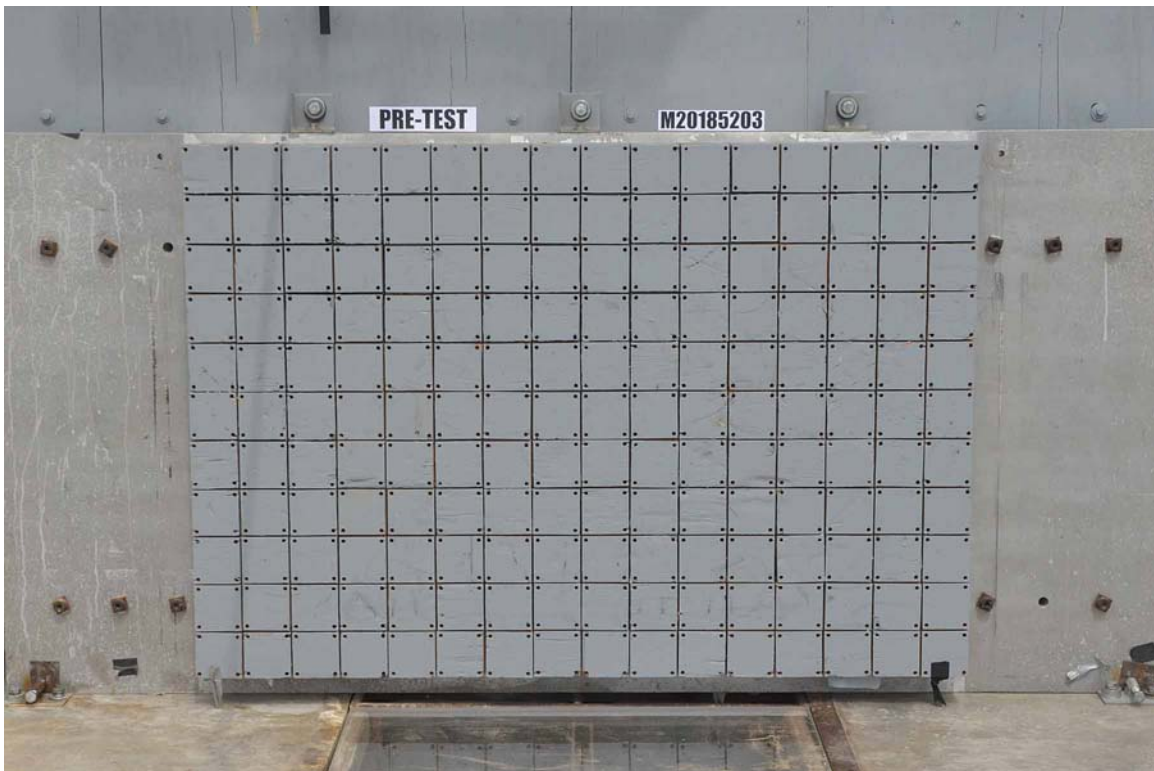


FIGURE 2. Pre-Test Load Cell Wall



FIGURE 3. Post-Test Load Cell Wall



FIGURE 4. Manufacturer's Label

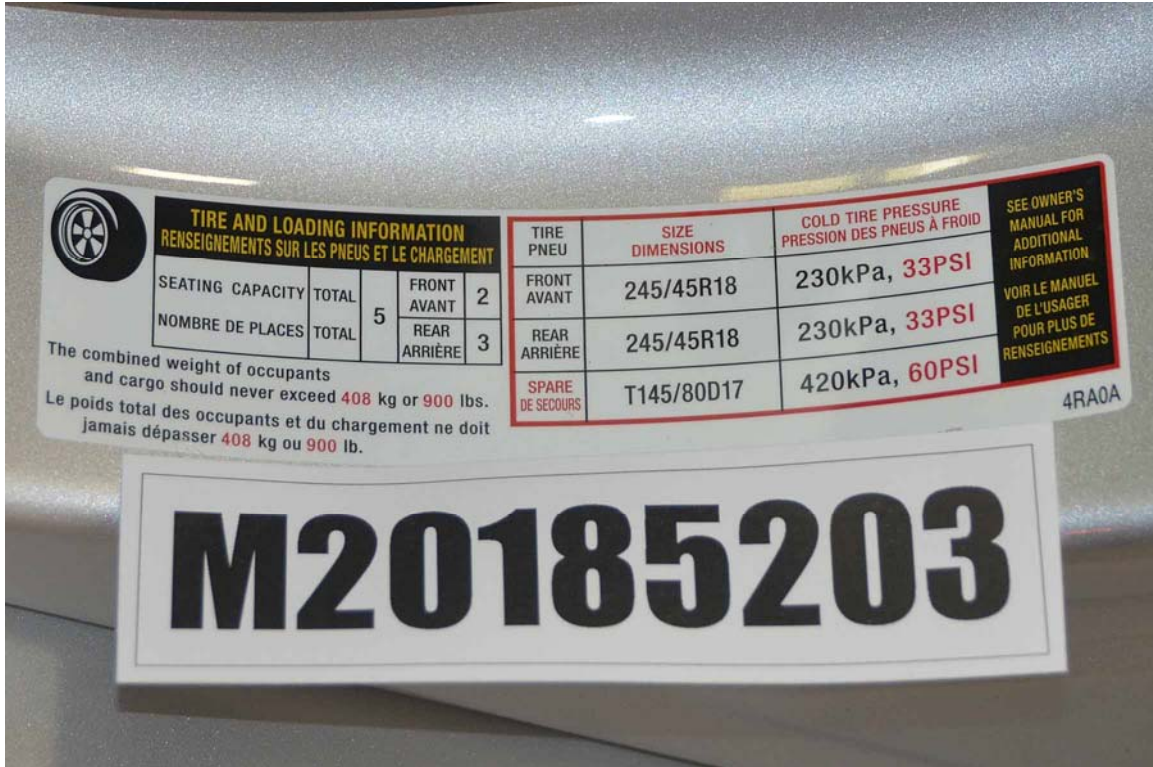


FIGURE 5. Tire Placard



FIGURE 6. 2018 Nissan Maxima Frontal as Delivered



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

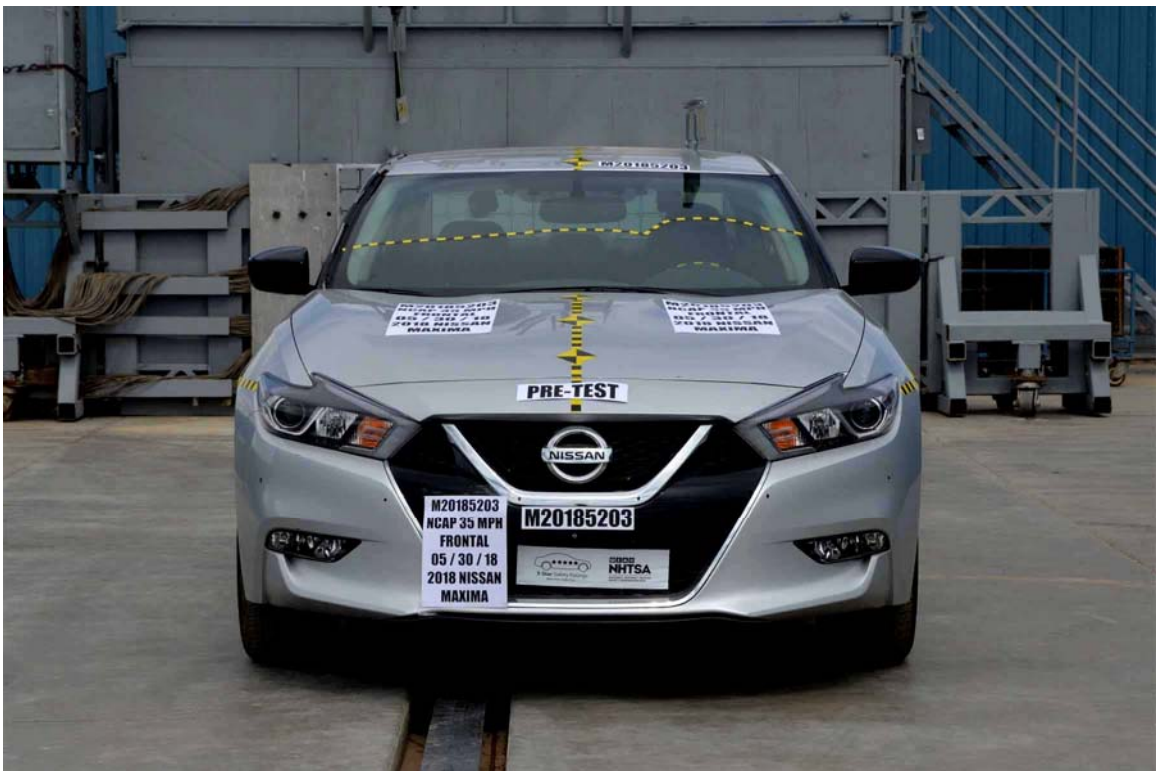


FIGURE 8. Pre-Test Front View of Test Vehicle



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 3/4 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



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

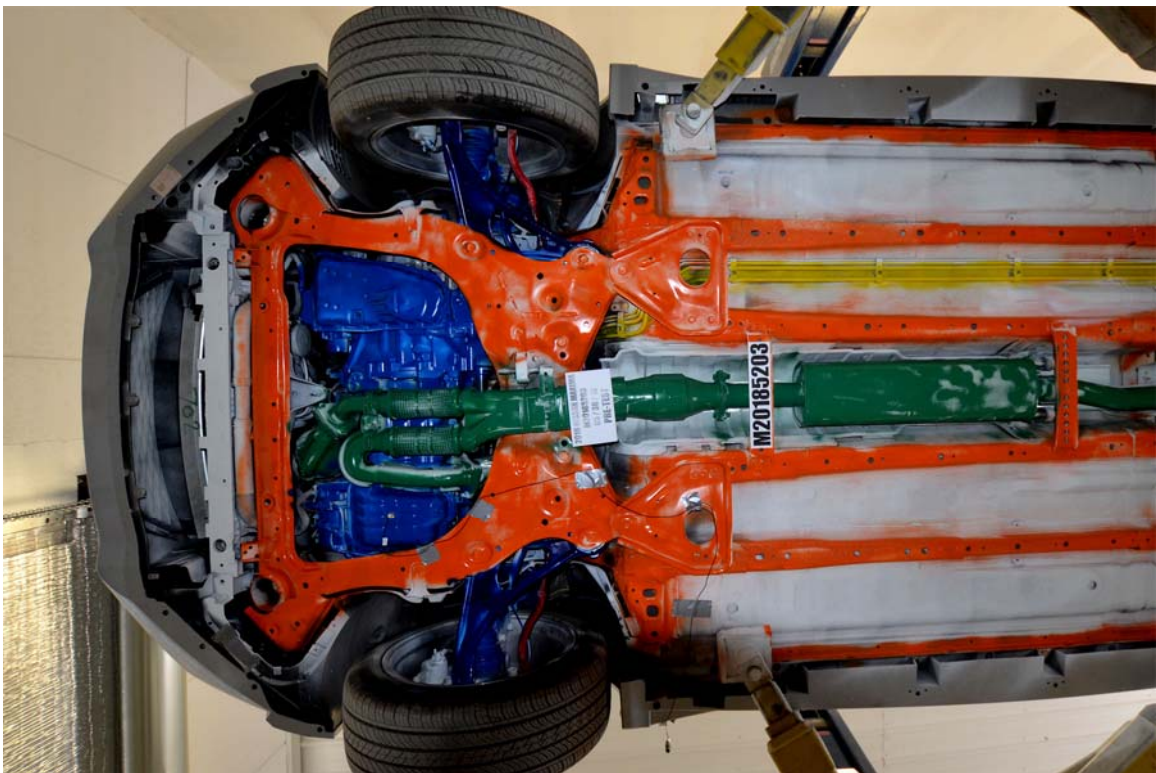


FIGURE 24. Pre-Test Front Underbody View

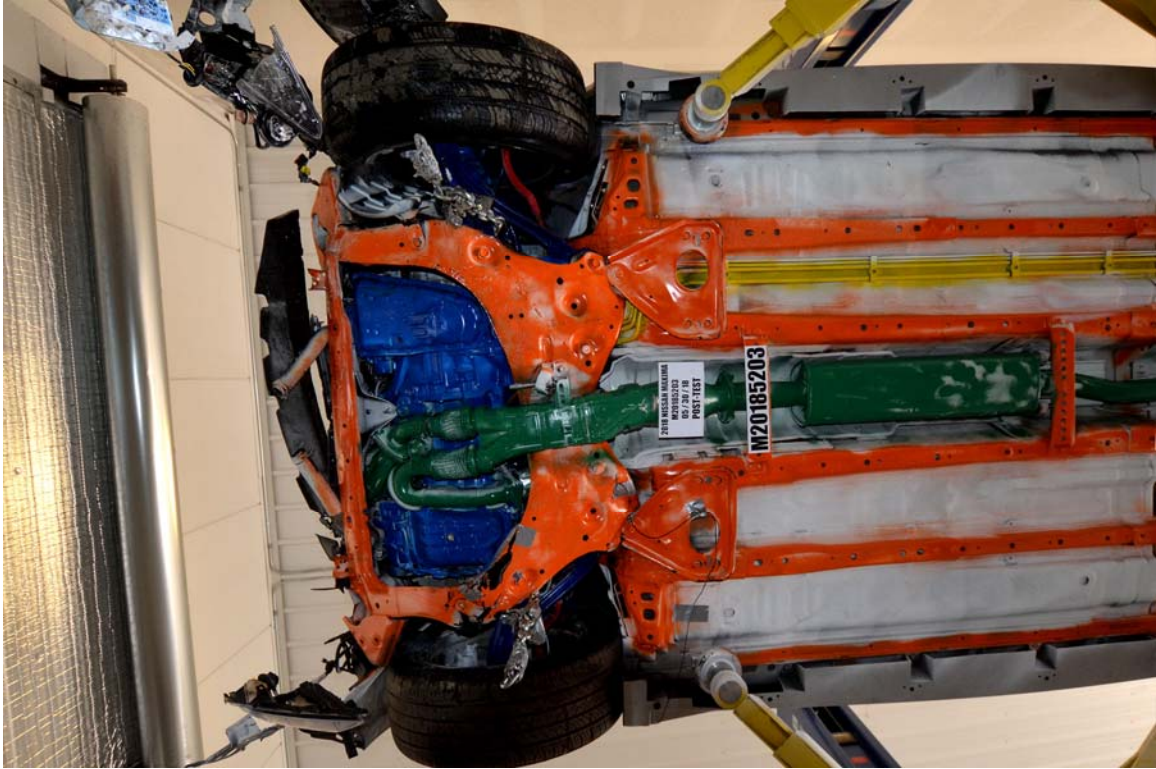


FIGURE 25. Post-Test Front Underbody View

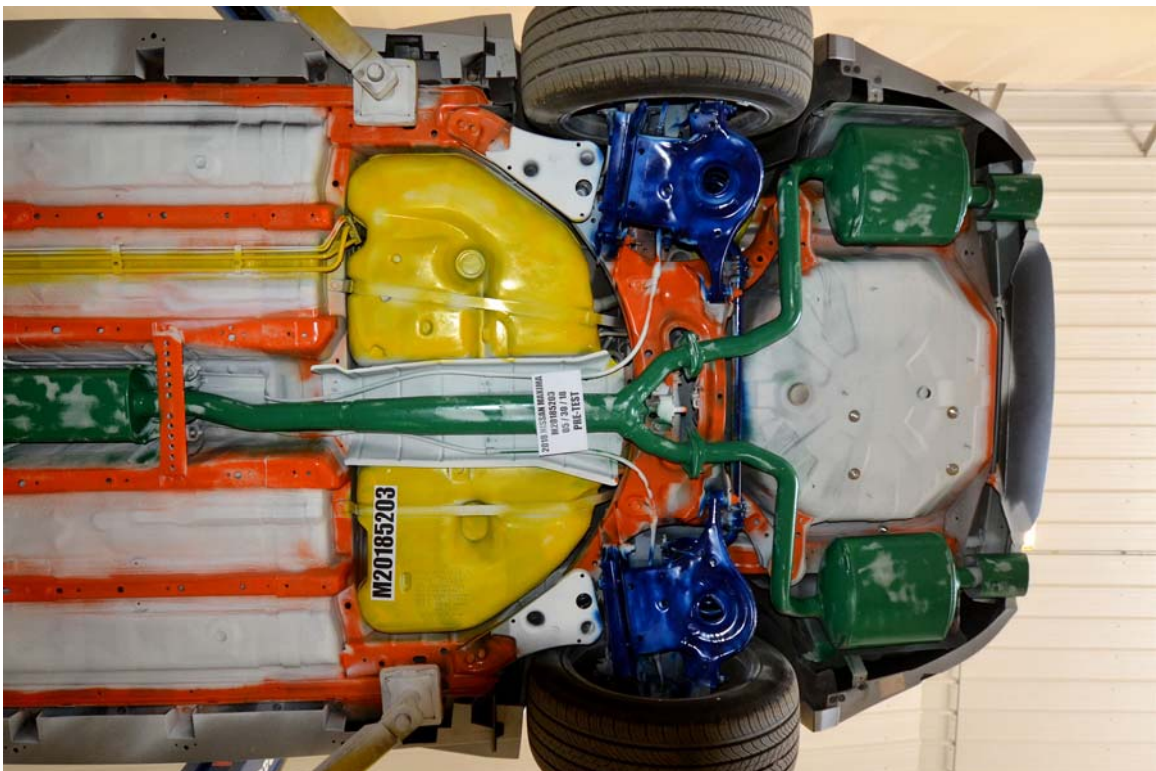


FIGURE 26. Pre-Test Rear Underbody View

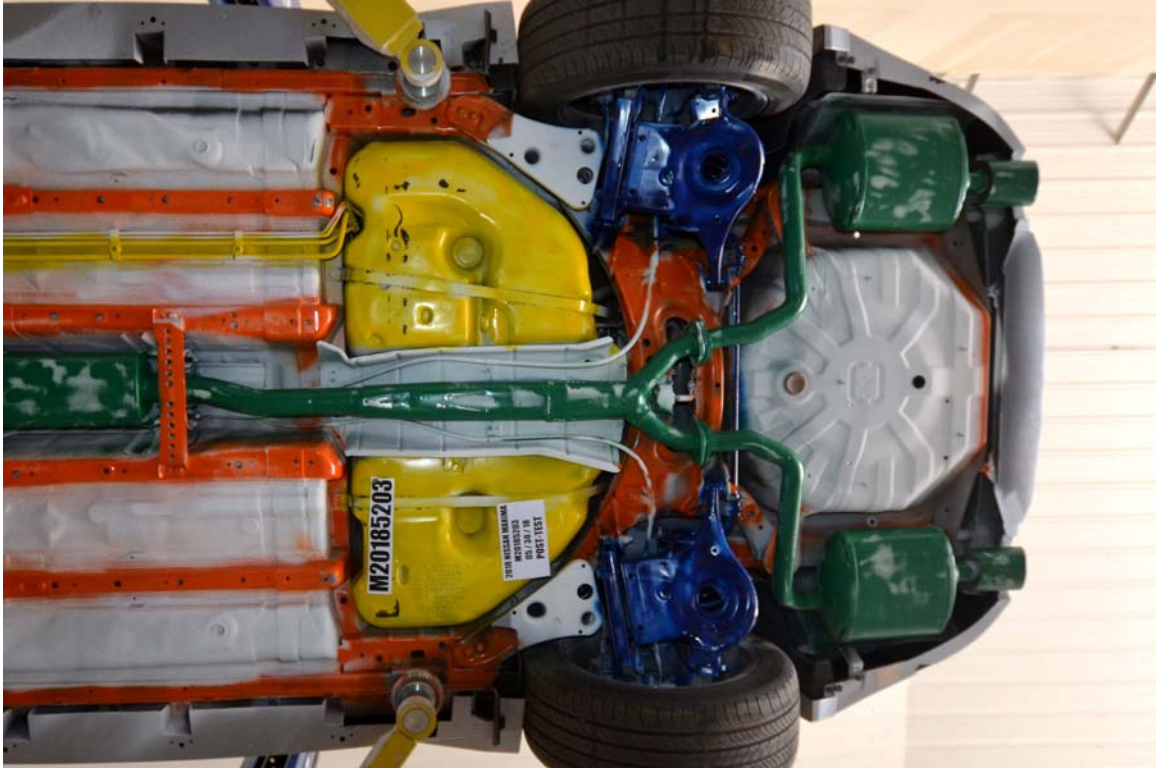


FIGURE 27. Post-Test Rear Underbody View



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 Driver Dummy Feet



FIGURE 41. Post-Test Driver Dummy Feet



FIGURE 42. Pre-Test Driver's Side Knee Bolster



FIGURE 43. Post-Test Driver's Side Knee Bolster



FIGURE 44. Pre-Test Driver's Side Floorpan



FIGURE 45. Post-Test Driver's Side Floorpan



FIGURE 46. Post-Test Driver Dummy Face



FIGURE 47. Post-Test Driver Dummy Contact with Airbag

Photograph Not Available

Dummy Paint Did Not Transfer Upon Contact

FIGURE 48. Post-Test Driver Dummy Contact with Headrest



FIGURE 48a. Post-Test Driver Dummy Contact with Knee Bolster



FIGURE 48b. Post-Test Driver Dummy Contact with Steering Column



FIGURE 49. Pre-Test View of the Steering Wheel

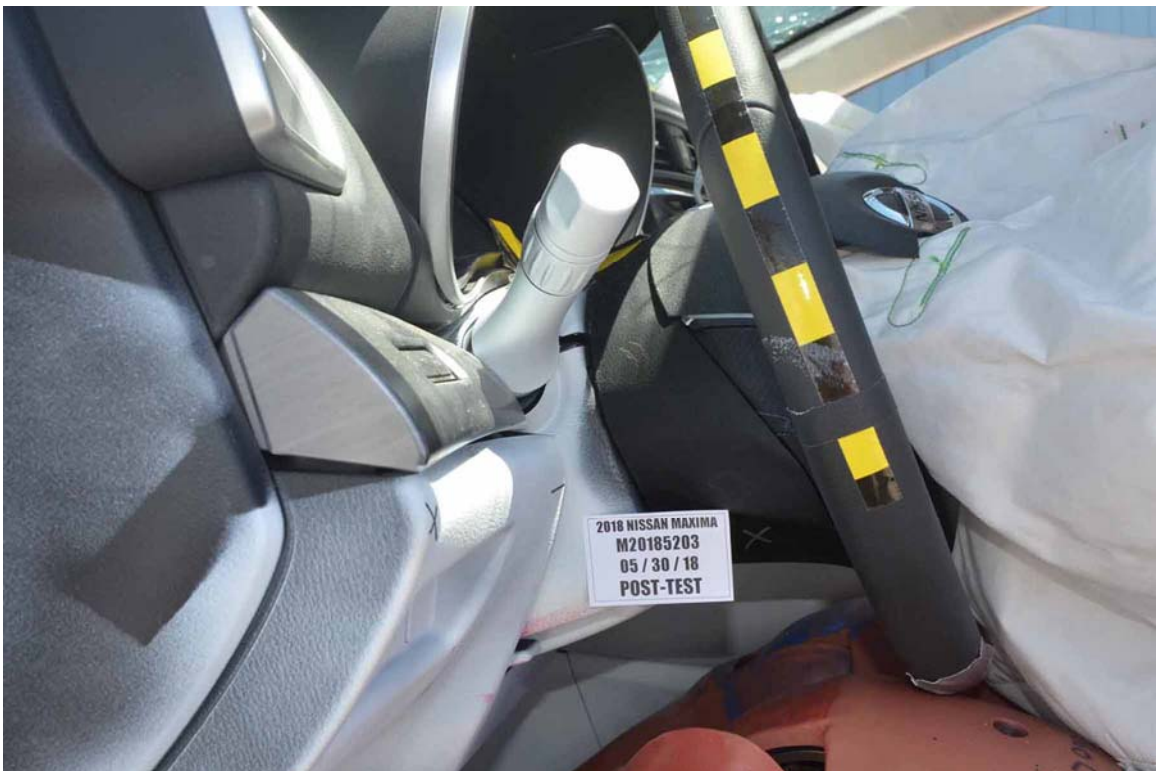


FIGURE 50. Post-Test View of the Steering Wheel



FIGURE 51. Pre-Test Passenger Dummy Front View

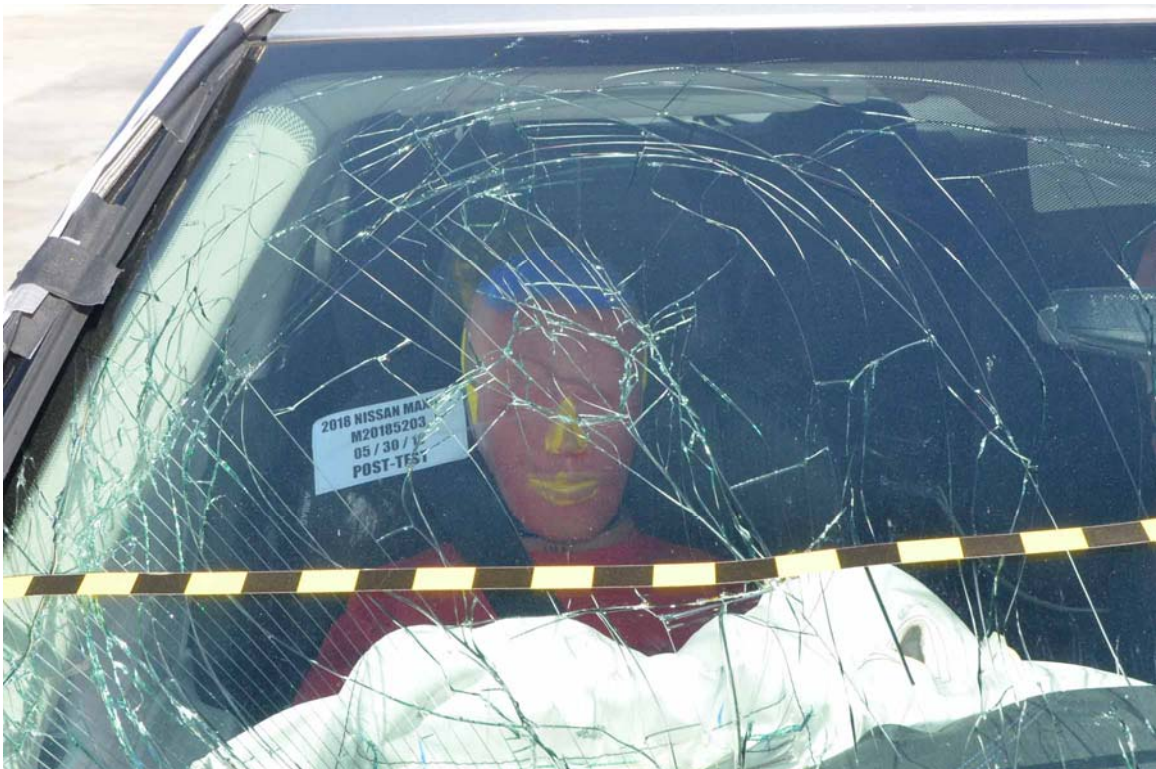


FIGURE 52. Post-Test Passenger Dummy Front View



FIGURE 53. Pre-Test Passenger Dummy Window View



FIGURE 54. Post-Test Passenger Dummy Window View



FIGURE 55. Pre-Test Passenger Dummy and Vehicle Interior View



FIGURE 56. Post-Test Passenger Dummy and Vehicle Interior View



FIGURE 57. Pre-Test Passenger's Seat Fore-Aft Markings



FIGURE 58. Post-Test Passenger's Seat Fore-Aft Markings



FIGURE 59. Pre-Test View of Belt Anchorage for Passenger Dummy



FIGURE 60. Post-Test View of Belt Anchorage for Passenger Dummy



FIGURE 61. Pre-Test Passenger Dummy Feet



FIGURE 62. Post-Test Passenger Dummy Feet



FIGURE 63. Pre-Test Passenger's Side Knee Bolster



FIGURE 64. Post-Test Passenger's Side Knee Bolster



FIGURE 65. Pre-Test Passenger's Side Floorpan



FIGURE 66. Post-Test Passenger's Side Floorpan



FIGURE 67. Post-Test Passenger Dummy Face



FIGURE 68. Post-Test Passenger Dummy Contact with Airbag



FIGURE 69. Post-Test Passenger Dummy Contact with Headrest



FIGURE 69a. Post-Test Passenger Dummy Contact with Knee Bolster



FIGURE 70. Photograph of Ballast Installed in Vehicle

Photograph Not Applicable

No Stoddard
Solvent Spillage

FIGURE 71. Post-Test Stoddard Solvent Spillage Location View



FIGURE 72. Post-Test Speed Trap Read-Out

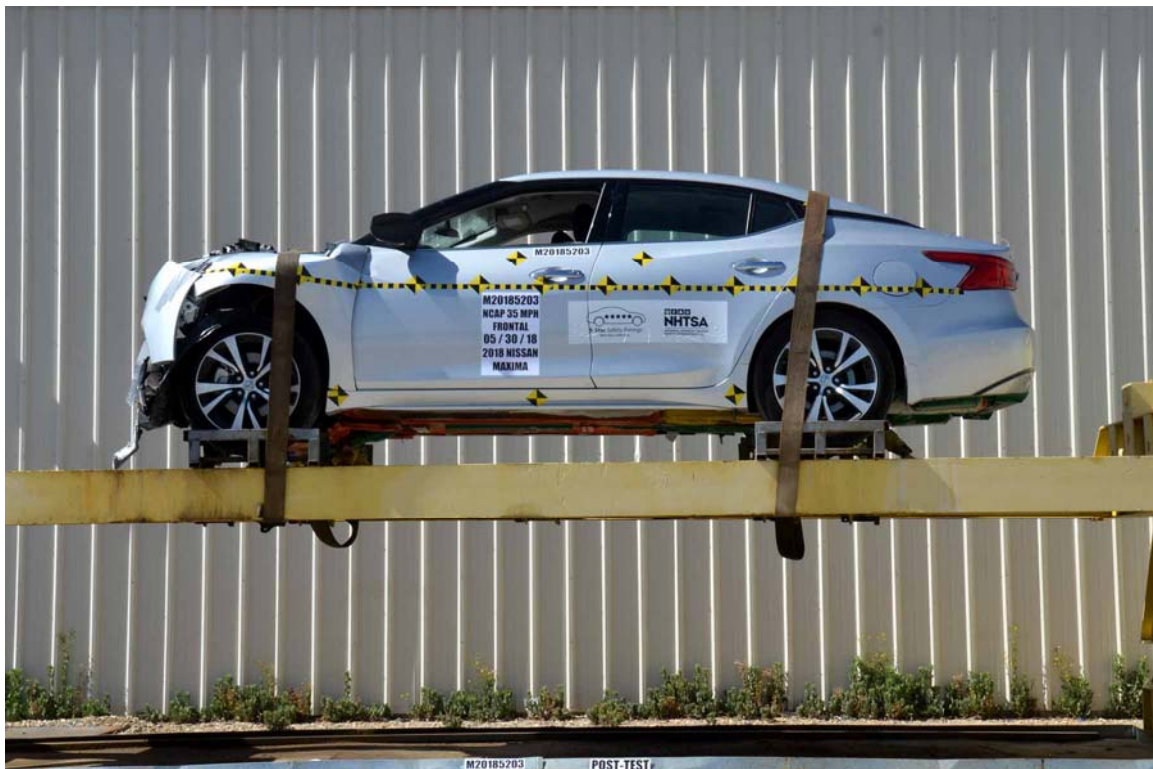


FIGURE 73. Vehicle at 0° on Static Rollover Device

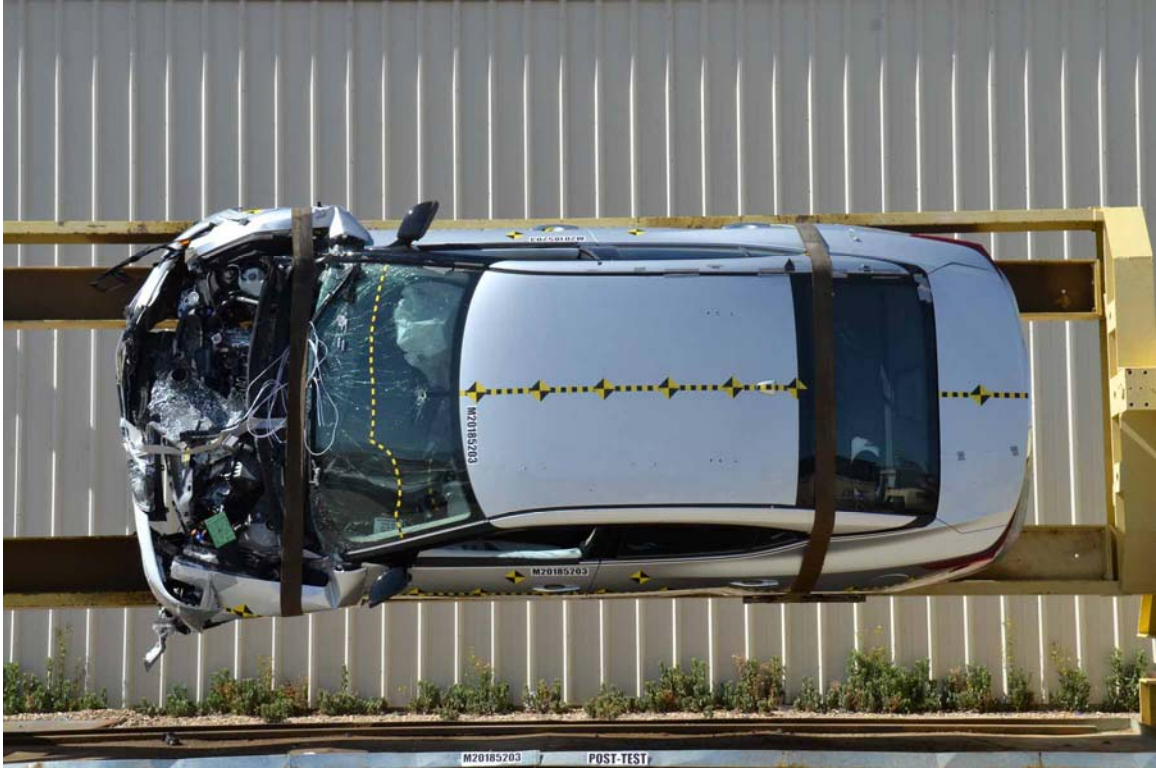


FIGURE 74. Vehicle at 90° on Static Rollover Device



FIGURE 75. Vehicle at 180° on Static Rollover Device



FIGURE 76. Vehicle at 270° on Static Rollover Device

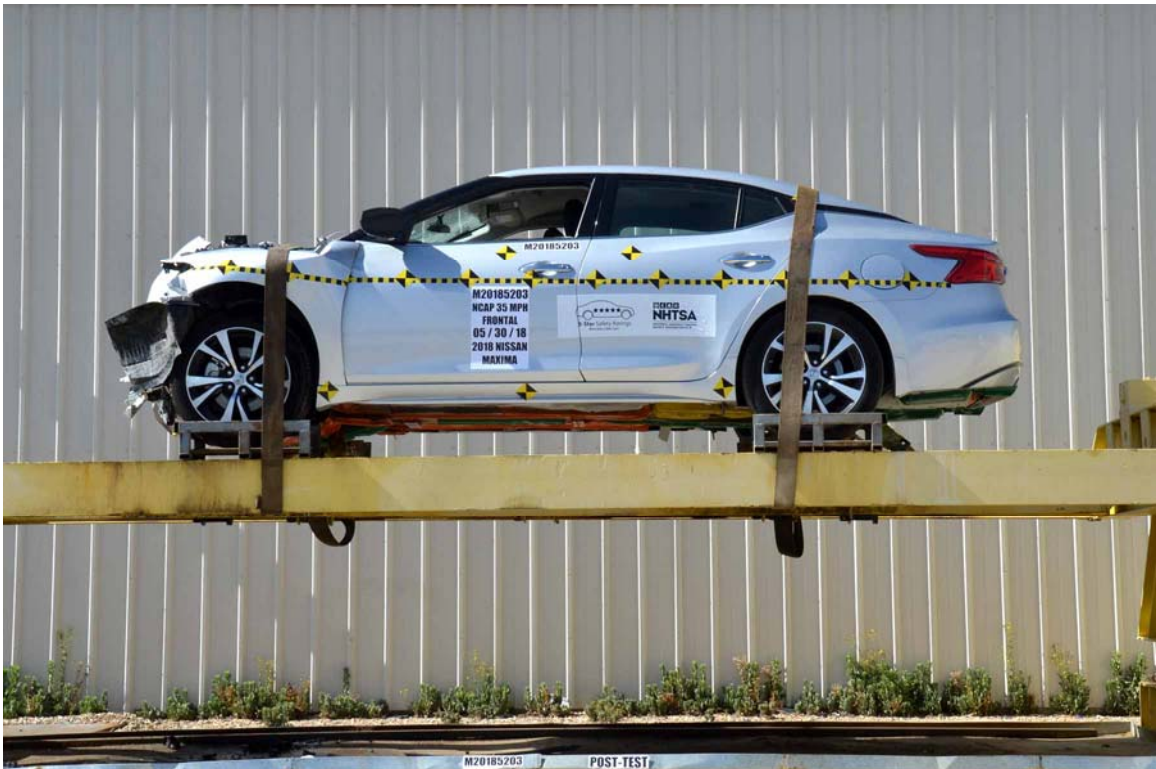


FIGURE 77. Vehicle at 360° on Static Rollover Device



FIGURE 78. 2018 Nissan Maxima Frontal Impact Event

2018 NISSAN MAXIMA S

Scan QR code for general model information & options

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
 3.5-Liter DDHC 24-Valve V6 Engine
 300 Horsepower & 261 lb-ft Torque
 Xtronic Transmission w/manual shift mode
 Drive Mode Selector (Normal & Sport)
 18" Machined Aluminum Alloy Wheels

SAFETY & SECURITY
 Driver & Front Passenger, Side-Impact, & Curtain Air Bags
 Lower Anchors & Tethers for Children (LATCH)
 Intelligent Forward Collision Warning (FCW)
 Automatic Emergency Braking (AEB)
 4-Wheel Anti-Lock Braking System (ABS)
 Vehicle Dynamic Control (VDC)
 w/ Traction Control System (TCS)
 Electronic Brake Force Distribution (EBD)
 & Brake Assist (BA)
 Tire Pressure Monitoring System (TPMS)
 & Easy-Fill Tire Alert
 Nissan Vehicle Immobilizer System
 Vehicle Security System

EXTERIOR
 Halogen Headlights
 Intelligent Auto Headlights
 LED Signature Daytime Running Lights
 Front Fog Lights (Halogen)

COMFORT & CONVENIENCE
 NissanConnect® w/ Navigation
 featuring Apple CarPlay™ and Android Auto™
 Nissan Navigation System
 Apple CarPlay™ and Android Auto™
 8" Color Display w/ Multi-Touch Control
 Nissan Voice Recognition For Navigation & Audio
 SiriusXM® Satellite Radio
 SiriusXM® Traffic and Travel Link
 Bluetooth® Hands-Free Phone System
 Streaming Audio via Bluetooth®
 AM/FM/CD Audio System w/ 8 Speakers
 7" Advanced Drive Assist Display (ADD)
 Dual-Zone Automatic Temperature Control
 Rear-View Monitor (RVM)
 Remote Engine Start w/ Intelligent Climate Control
 8-Way Power Driver's & 4-Way Power Front Passenger's Seat
 Cloth Seats
 "Zero Gravity" Front Seats
 60/40 Split Fold Down Rear Seats
 Razor Steel Faceted Finishers
 Leather-Wrapped "D-Shaped" Steering Wheel
 Cruise Control
 Nissan Intelligent Key® w/ Push Button Ignition
 HomeLink® Universal Transceiver
 Two Front Illuminated USB Connection Ports

*For more information, see dealer, owner's manual, or www.NissanUSA.com for model-specific information.
 **Optional Equipment replaces Standard where applicable.

Manufacturer's Suggested Retail Base Price: \$33,270.00

Options Included by Manufacturer:
 SPLASH GUARDS 200.00
 FLOOR MATS, TRUNK MAT, TRUNK NET, & FIRST AID KIT 300.00
 TWO REAR ILLUMINATED USB CHARGER PORTS 120.00

DESTINATION CHARGES: 885.00

Total* \$34,775.00

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy **25** MPG
 combined city/hwy 21 city 30 highway
 4.0 gallons per 100 miles

Annual fuel cost \$1,700

Fuel Economy & Greenhouse Gas Rating (mpg only) Smog Rating (toxic only)
 1 5 10 13 18 Best

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$8,716 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.85 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov
 Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

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

Frontal Crash Driver Not Rated
 Passenger Not Rated

Side Crash Front seat ★★★★★
 Rear seat ★★★★★
 Based on the risk of injury in a side impact.

Rollover ★★★★★
 Based on the risk of rollover in a single-vehicle crash.

DELIVERY

VEHICLE COLORS:
 EXT: BRILLIANT SILVER
 INT: CHARCOAL

FINAL ASSEMBLY POINT:
 SMYRNA

TRANSPORT METHOD:
 TRUCK

DEALER:
 LIA NISSAN
 2233 CENTRAL AVE
 SCHEENECTADY NY 12304

DROP SHIP:
 LIA NISSAN
 2233 CENTRAL AVENUE
 SCHEENECTADY NY 12304

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

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

VIN: 1NAAAAPJC362394
EMS: 50 STATE EMISSIONS
MDL: 16116-362394 K23-G
OPT: 1-B10L92H9C03266

20180302225254AS1894

FIGURE 79. 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 Chest Acceleration X Primary	B-3
7	Driver Chest Acceleration Y Primary	B-3
8	Driver Chest Acceleration Z Primary	B-3
9	Driver Chest Resultant Acceleration Primary	B-3
10	Driver Upper Neck Force X	B-4
11	Driver Upper Neck Force Z	B-4
12	Driver Upper Neck Moment Y	B-4
13	Driver Nij	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 Chest Acceleration X Primary	B-8
22	Passenger Chest Acceleration Y Primary	B-8
23	Passenger Chest Acceleration Z Primary	B-8
24	Passenger Chest Resultant Acceleration Primary	B-8
25	Passenger Upper Neck Force X	B-9
26	Passenger Upper Neck Force Z	B-9
27	Passenger Upper Neck Moment Y	B-9
28	Passenger Nij	B-9
29	Passenger Left Femur Force Z	B-10
30	Passenger Right Femur Force Z	B-10

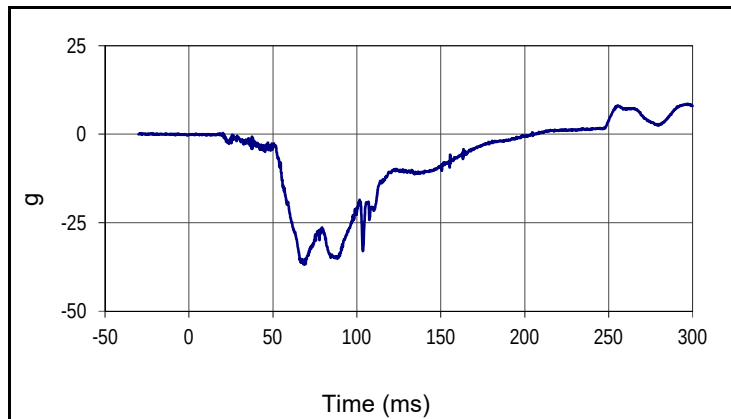
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

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
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

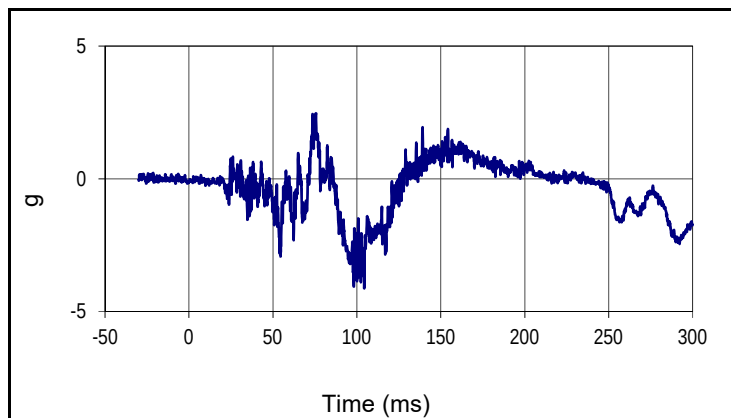
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Left Femur Force Redundant
Passenger Right Femur Force Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia 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
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

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

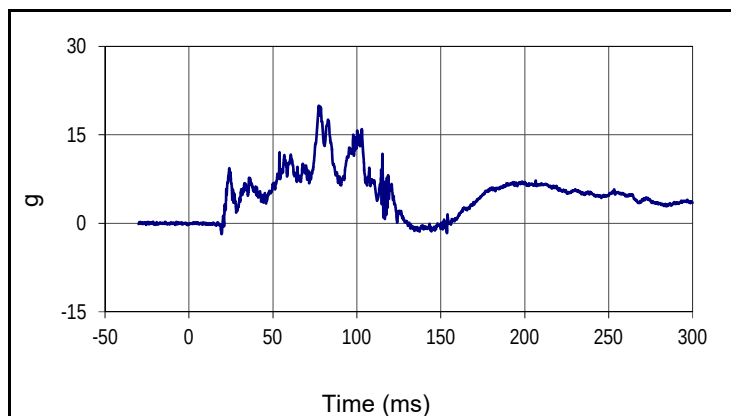
NHTSA No.: M20185203
 Test Date: 05/30/18



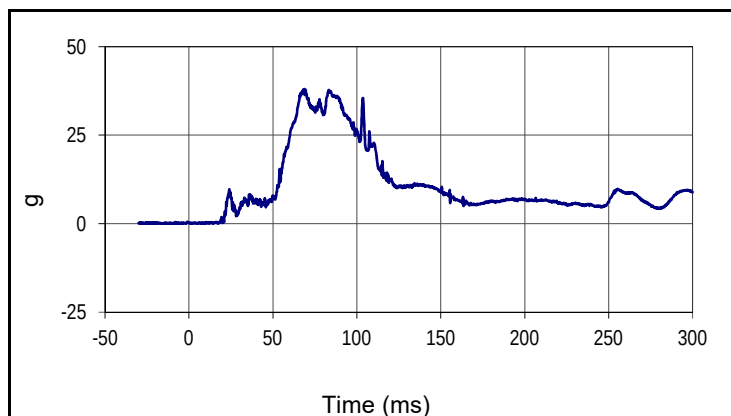
Curve Description			
Driver Head Acceleration X Primary			
Plot No.		SAE Class	Units
001		1000	g
Max	Time	Min	Time
8.6	297.1	-36.8	68.5



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
2.5	75.6	-4.1	104.4



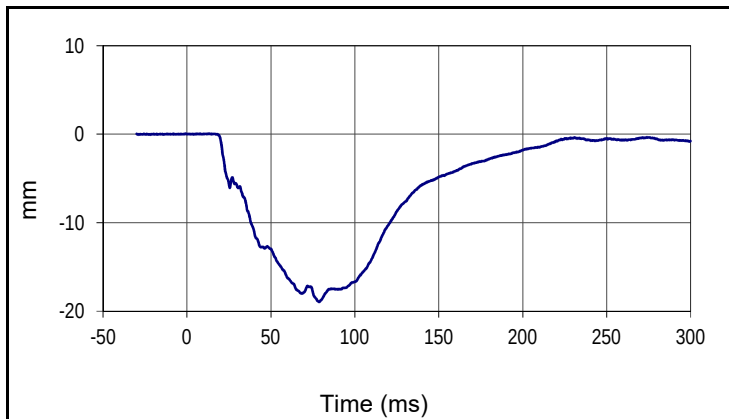
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
19.9	77.3	-1.8	19.4



Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
38.0	68.5	0.0	5.6

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

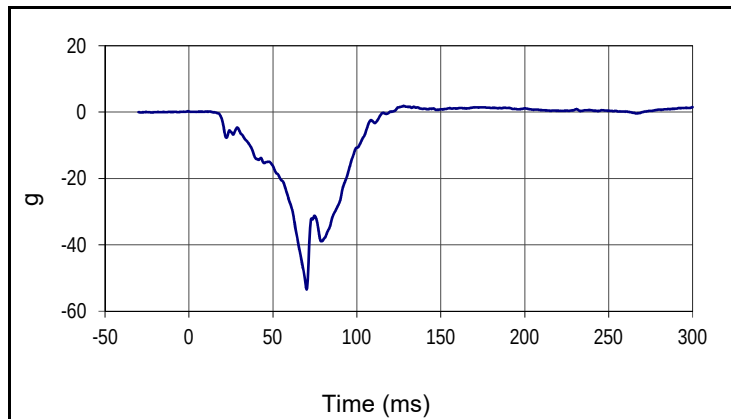
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 Test Date: 05/30/18



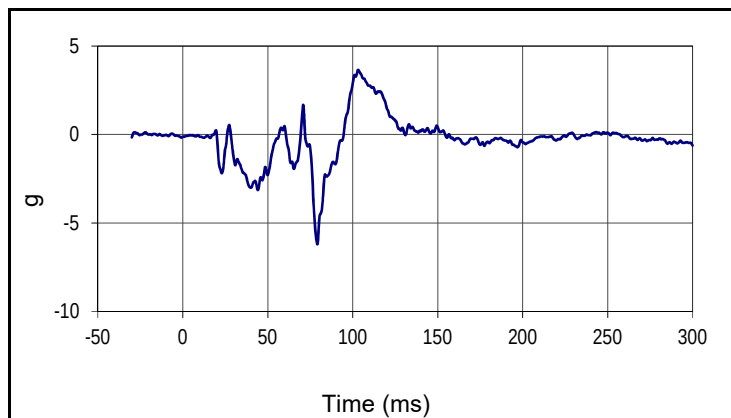
Curve Description			
Driver Chest Deflection			
Plot No.		SAE Class	Units
005		600	mm
Max	Time	Min	Time
0.1	13.1	-19.0	78.8

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

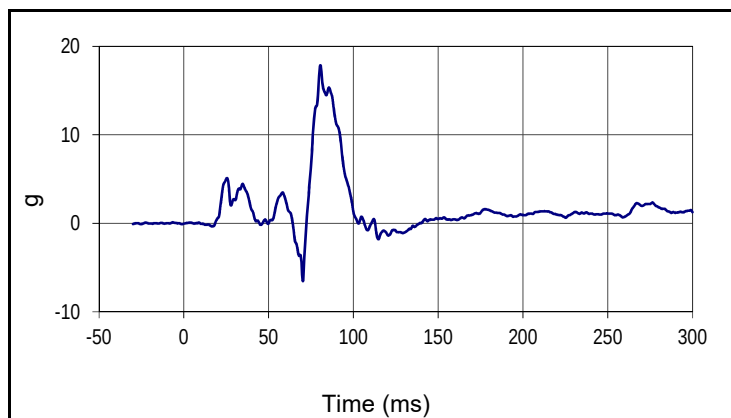
NHTSA No.: M20185203
 Test Date: 05/30/18



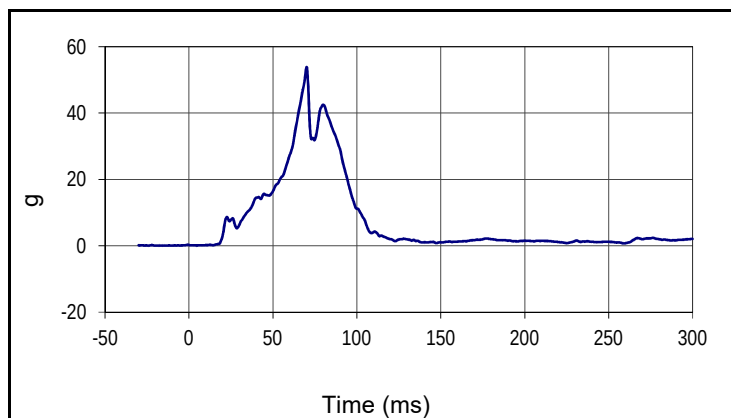
Curve Description			
Driver Chest Acceleration X Primary			
Plot No.		SAE Class	Units
006		180	g
Max	Time	Min	Time
1.9	127.9	-53.4	70.1



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.		SAE Class	Units
007		180	g
Max	Time	Min	Time
3.7	103.1	-6.2	79.1



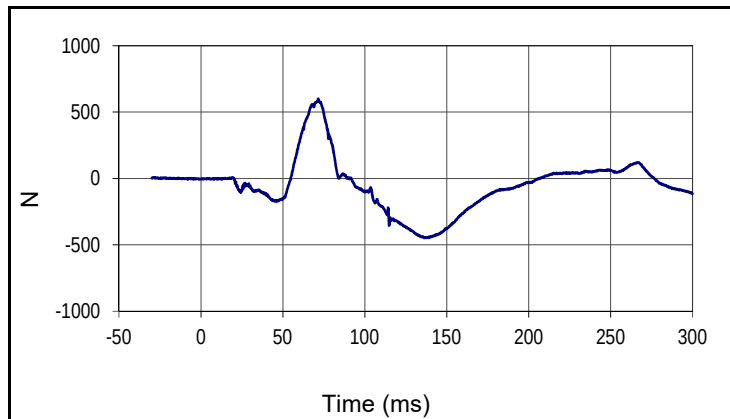
Curve Description			
Driver Chest Acceleration Z Primary			
Plot No.		SAE Class	Units
008		180	g
Max	Time	Min	Time
17.9	80.5	-6.5	70.2



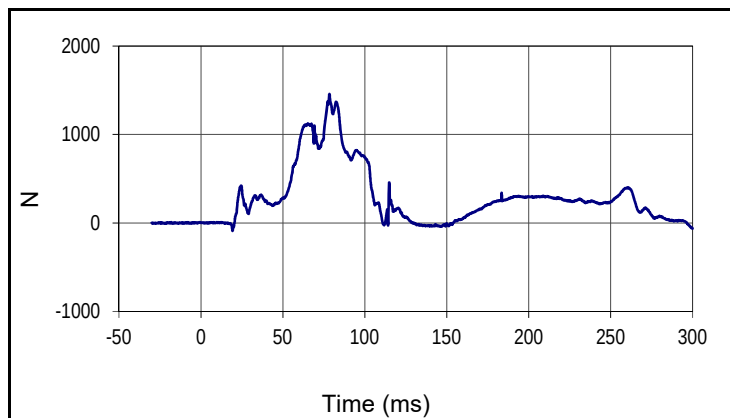
Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.		SAE Class	Units
009		180	g
Max	Time	Min	Time
53.8	70.1	0.1	4.7

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

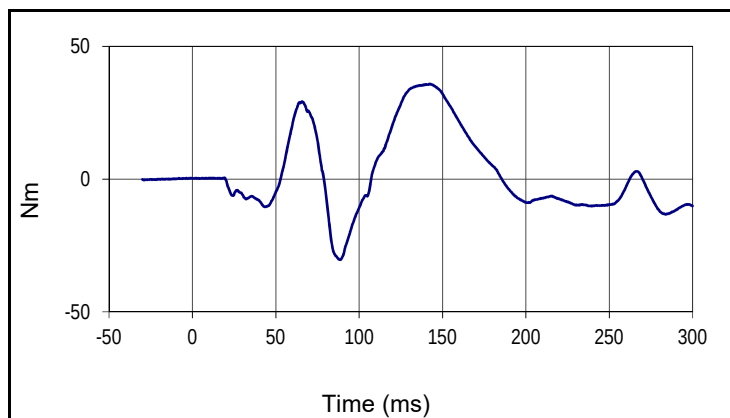
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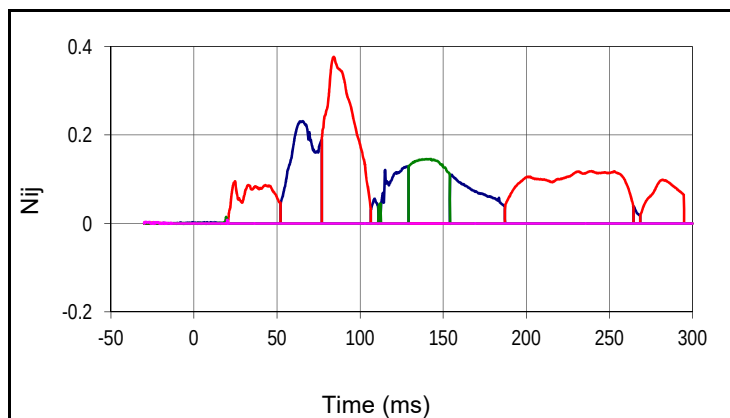
Curve Description			
Driver Upper Neck Force X			
Plot No.		SAE Class	Units
010		1000	N
Max	Time	Min	Time
600.1	71.5	-448.0	136.2



Curve Description			
Driver Upper Neck Force Z			
Plot No.		SAE Class	Units
011		1000	N
Max	Time	Min	Time
1457.8	78.4	-89.0	19.3



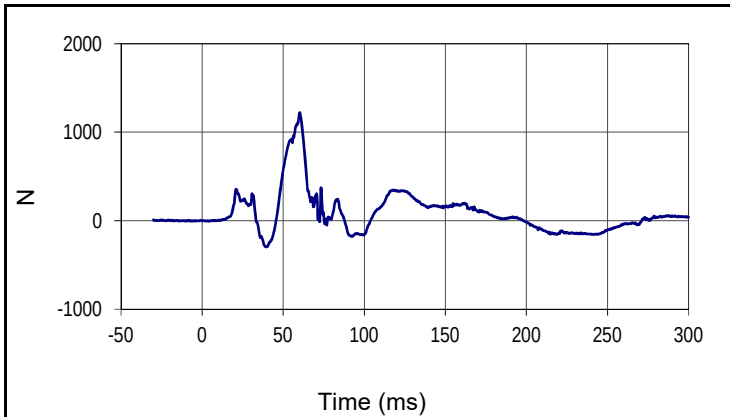
Curve Description			
Driver Upper Neck Moment Y			
Plot No.		SAE Class	Units
012		600	Nm
Max	Time	Min	Time
35.9	142.7	-30.4	88.4



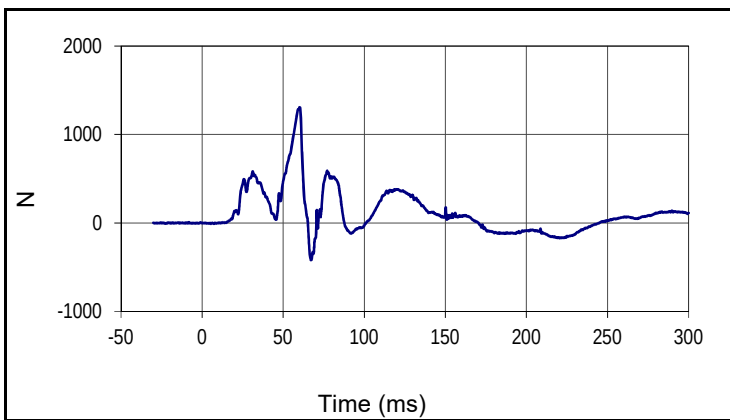
Curve Description		
Driver Nij		
Units	Max	Time
Ntf	0.23	65.6
Units	Max	Time
Nte	0.38	84.1
Units	Max	Time
Ncf	0.15	142.7
Units	Max	Time
Nce	0.01	20.1

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20185203
 Test Date: 05/30/18



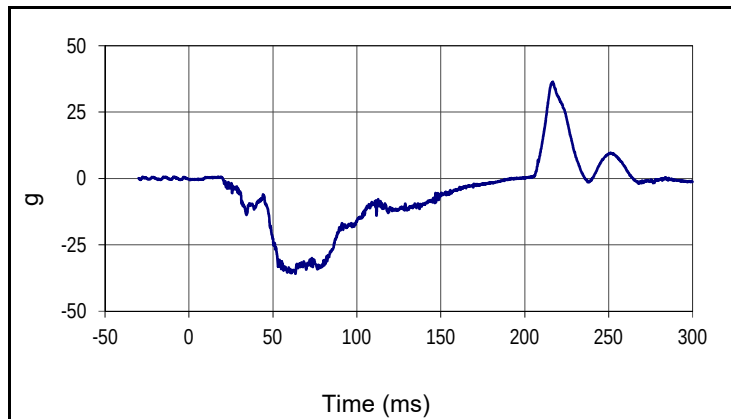
Curve Description			
Driver Left Femur Force Z			
Plot No.		SAE Class	Units
014		600	N
Max	Time	Min	Time
1221.9	60.2	-297.6	39.5



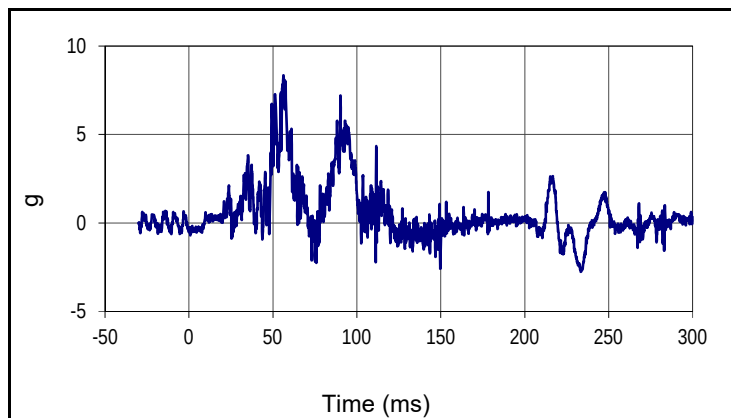
Curve Description			
Driver Right Femur Force Z			
Plot No.		SAE Class	Units
015		600	N
Max	Time	Min	Time
1308.2	60.2	-419.4	67.2

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

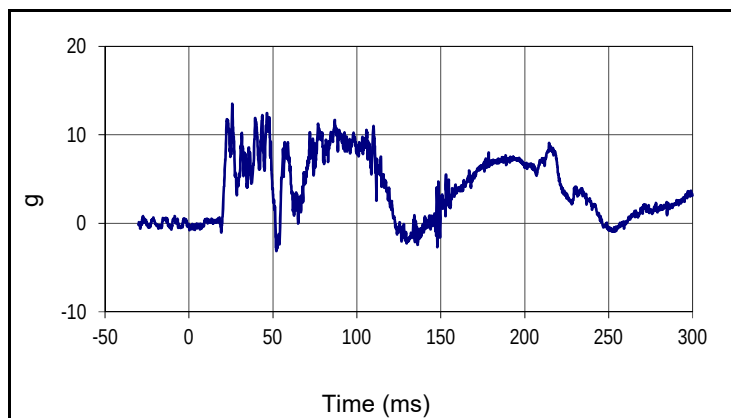
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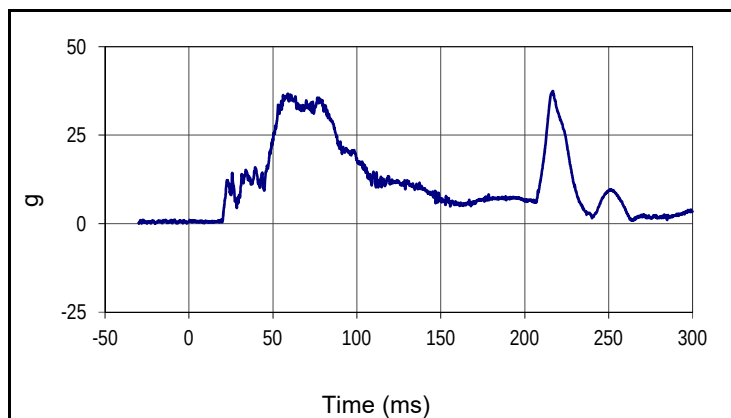
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.		SAE Class	Units
016		1000	g
Max	Time	Min	Time
36.4	216.7	-35.9	63.4



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.		SAE Class	Units
017		1000	g
Max	Time	Min	Time
8.3	56.3	-2.8	233.4



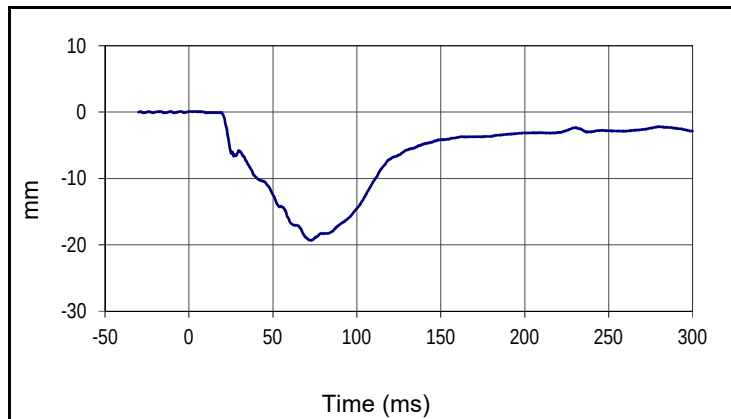
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.		SAE Class	Units
018		1000	g
Max	Time	Min	Time
13.5	25.8	-3.1	52.1



Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.		SAE Class	Units
019		1000	g
Max	Time	Min	Time
37.5	216.7	0.1	9.1

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

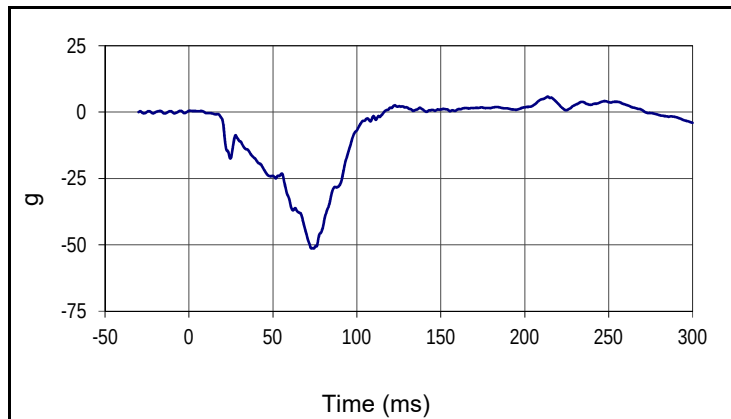
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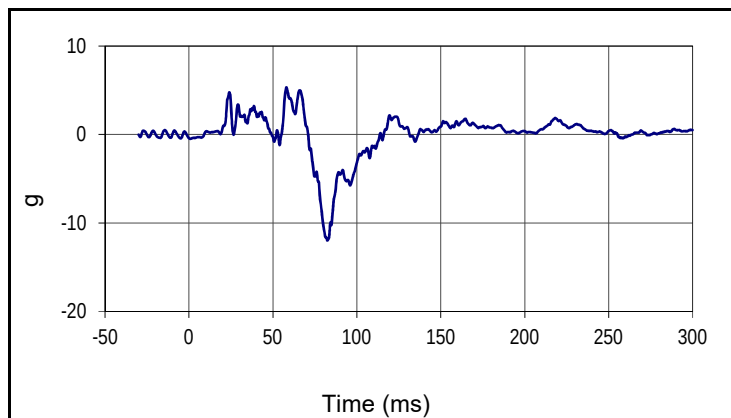
Curve Description			
Passenger Chest Deflection			
Plot No.		SAE Class	Units
020		600	mm
Max	Time	Min	Time
0.1	0.6	-19.3	72.9

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

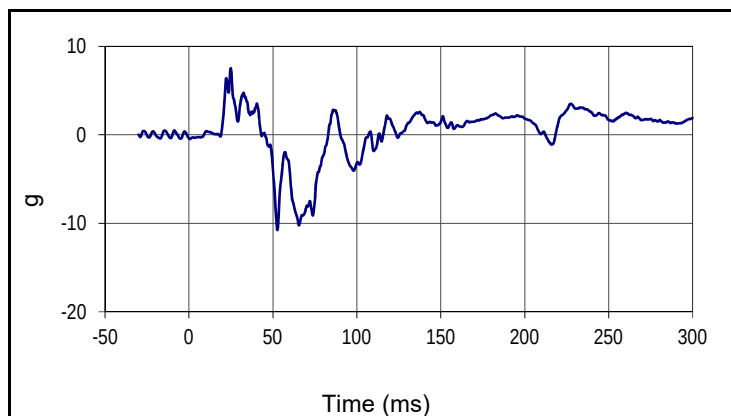
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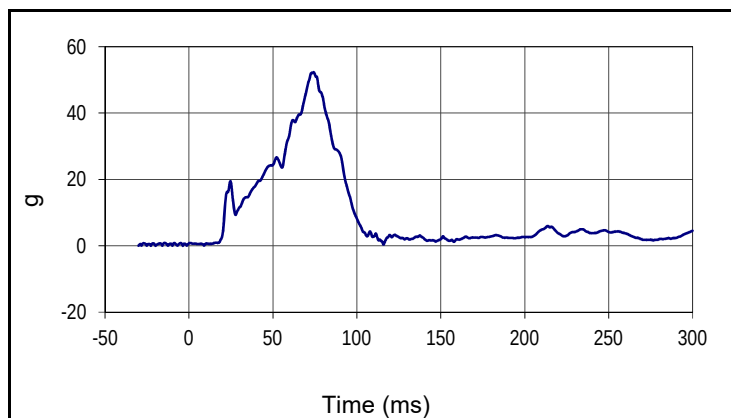
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.		SAE Class	Units
021		180	g
Max	Time	Min	Time
5.8	213.7	-51.4	74.2



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.		SAE Class	Units
022		180	g
Max	Time	Min	Time
5.3	58.0	-12.0	82.4



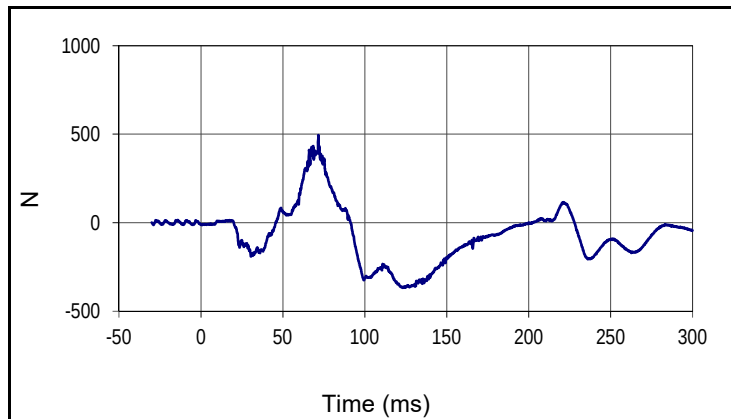
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.		SAE Class	Units
023		180	g
Max	Time	Min	Time
7.5	24.9	-10.8	52.6



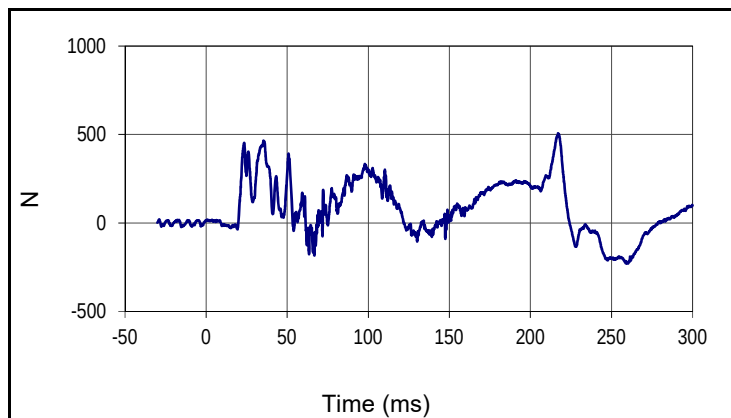
Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.		SAE Class	Units
024		180	g
Max	Time	Min	Time
52.3	74.1	0.1	9.0

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

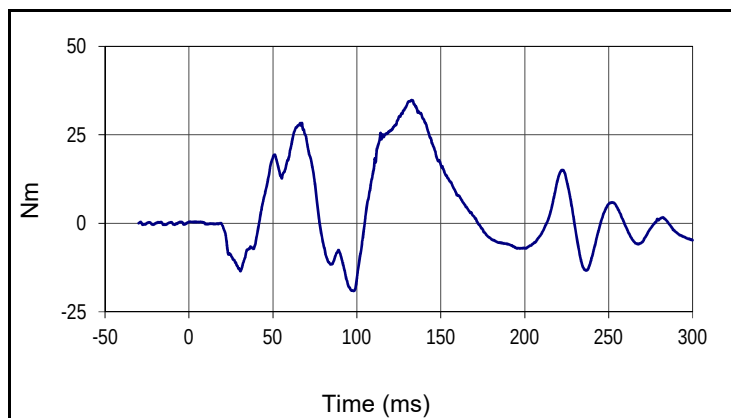
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 Test Date: 05/30/18



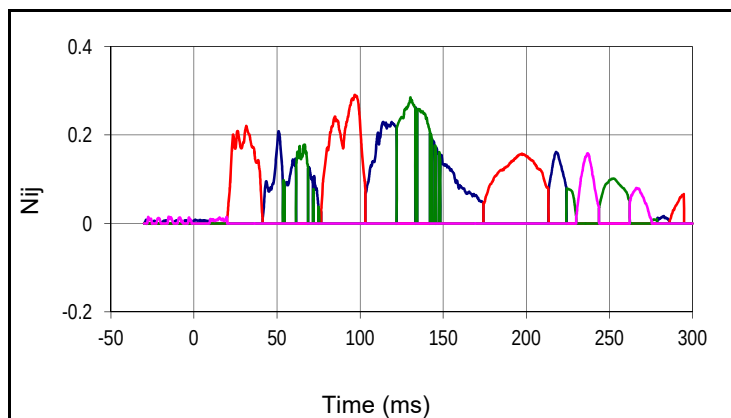
Curve Description			
Passenger Upper Neck Force X			
Plot No.		SAE Class	Units
025		1000	N
Max	Time	Min	Time
494.7	71.6	-367.7	123.3



Curve Description			
Passenger Upper Neck Force Z			
Plot No.		SAE Class	Units
026		1000	N
Max	Time	Min	Time
506.8	217.0	-229.3	259.6



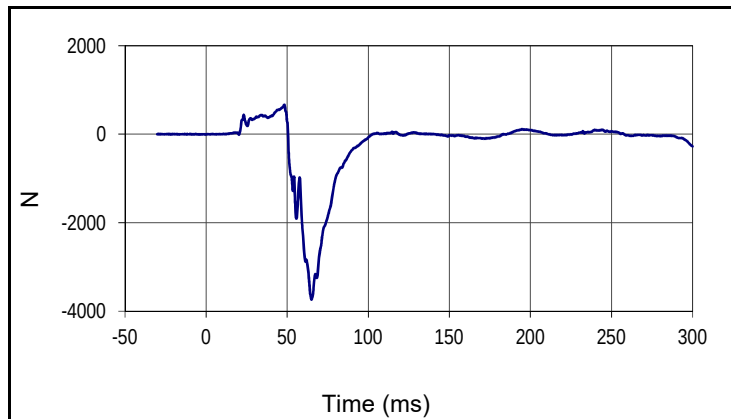
Curve Description			
Passenger Upper Neck Moment Y			
Plot No.		SAE Class	Units
027		600	Nm
Max	Time	Min	Time
34.8	132.5	-19.1	98.1



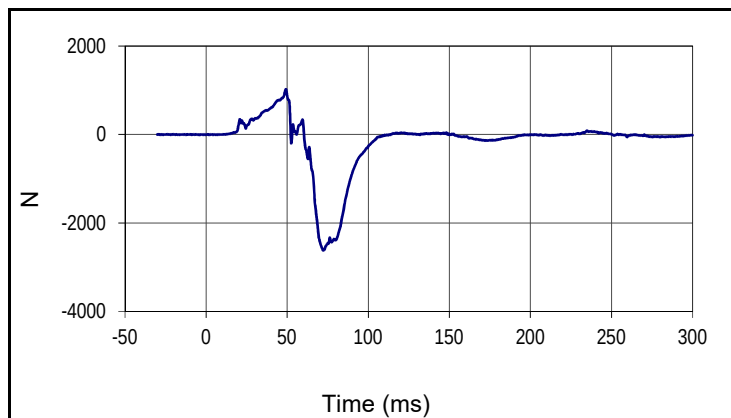
Curve Description		
Passenger Nij		
Units	Max	Time
Ntf	0.26	133.4
Units	Max	Time
Nte	0.29	96.8
Units	Max	Time
Ncf	0.28	130.3
Units	Max	Time
Nce	0.16	236.7

Test Vehicle: 2018 Nissan Maxima S 4-Door Sedan
 Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20185203
 Test Date: 05/30/18



Curve Description			
Passenger Left Femur Force Z			
Plot No.		SAE Class	Units
029		600	N
Max	Time	Min	Time
665.1	48.2	-3738.6	65.0



Curve Description			
Passenger Right Femur Force Z			
Plot No.		SAE Class	Units
030		600	N
Max	Time	Min	Time
1024.5	49.2	-2620.3	72.3

APPENDIX C
PRE-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA



**Hybrid III 50th Percentile Male
ATD Damage Checklist**

ATD Serial No.: 360

Test Date: 2018-05-18

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:

Technician:

J. Hernandez

Approved By:

P. Puzzuto



Hybrid III 50th Percentile Male
External Measurements

ATD Serial No.: 360

Test Date: 2018-05-18

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	884	Pass
B - Shoulder pivot height	mm	505	521	513	Pass
C - 'H' point height	mm	84	89	87	Pass
D - 'H' point location from backline	mm	135	140	137	Pass
E - Shoulder pivot from backline	mm	84	94	90	Pass
F - Thigh clearance	mm	140	155	149	Pass
G - Back of elbow to wrist pivot	mm	290	305	301	Pass
H - Head back to backline	mm	41	46	44	Pass
I - Shoulder to elbow length	mm	330	345	342	Pass
J - Elbow rest height	mm	190	211	208	Pass
K - Buttock to knee length	mm	579	604	586	Pass
L - Popliteal length	mm	429	455	440	Pass
M - Knee pivot height	mm	485	500	491	Pass
N - Buttock popliteal length	mm	452	477	465	Pass
O - Chest depth without jacket	mm	213	229	223	Pass
P - Foot length	mm	251	267	256	Pass
V - Shoulder breadth	mm	422	437	427	Pass
W - Foot breadth	mm	91	107	103	Pass
Y - Chest circum. (w/chest jacket)	mm	970	1001	985	Pass
Z - Waist circum.	mm	836	866	859	Pass
AA - Location for chest circum.	mm	429	434	433	Pass
BB - Location for waist circum.	mm	226	231	227	Pass
			Overall Test Results		Pass

Technician: _____

J. Hernandez

Approved By: _____

P. Puzzuto



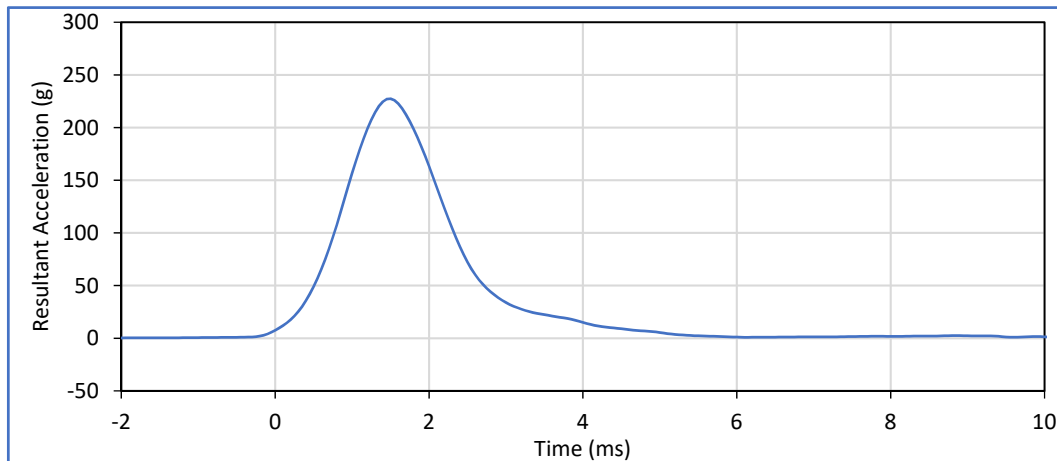
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Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

Hybrid III 50th Percentile Male Head Drop

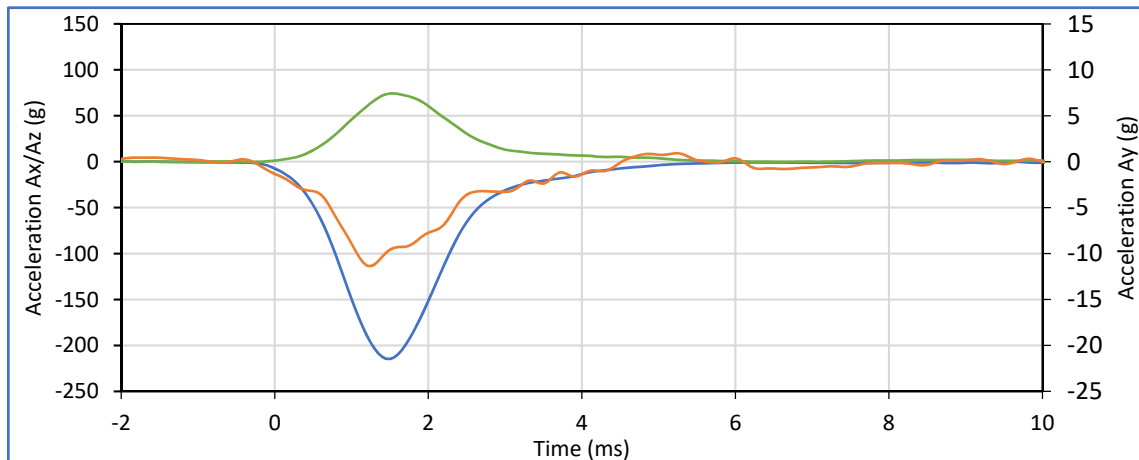
ATD Serial No.: 360

Test Date: 2018-05-22

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	31	Pass
Peak Resultant Acceleration	g	225.0	275.0	227.4	Pass
Peak Lateral Acceleration	g	-15.0	15.0	-11.4	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	



Head Resultant
Max:227.4@1.5
Min:0.9@6.2
SAE Class 1000



Head Ax
Max:-0.1@9.7
Min:-214.7@1.5
SAE Class 1000
Head Ay
Max:0.9@5.3
Min:-11.4@1.3
SAE Class 1000
Head Az
Max:74.3@1.6
Min:-0.1@6.7
SAE Class 1000

Technician: T. Lowman

Approved By: P. Puzzuto

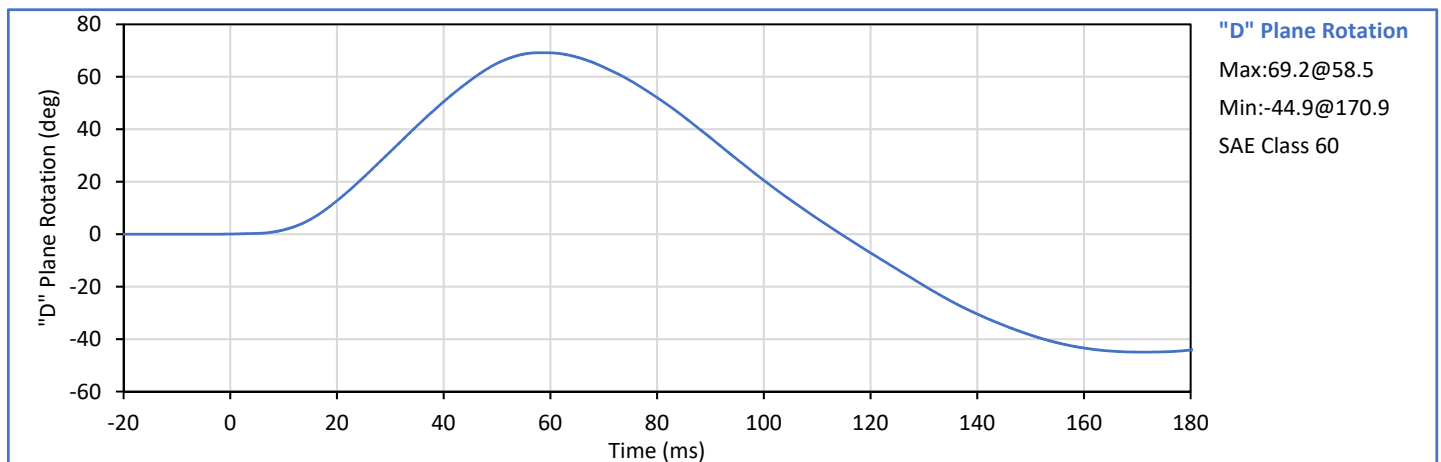
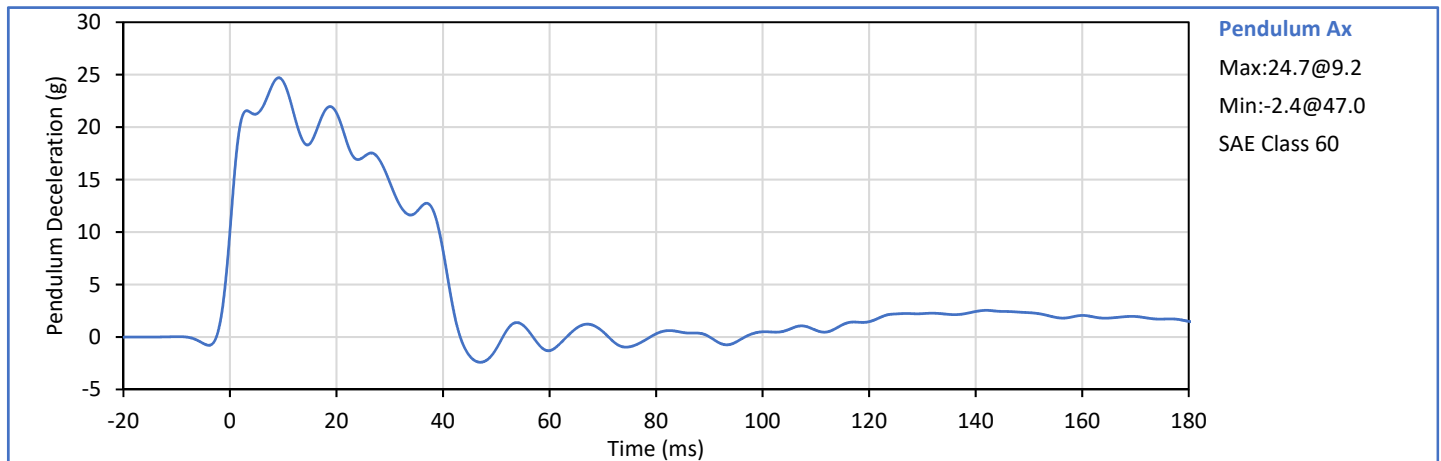


Hybrid III 50th Percentile Male
Neck Flexion Test

ATD Serial No.: 360

Test Date: 2018-05-22

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Humidity	%	10	70	39	Pass
Pendulum Velocity	m/s	6.89	7.13	6.97	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	24.3	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	21.4	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	14.7	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	14.7	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	41.1	Pass
"D" Plane Rotation peak	deg	64.0	78.0	69.2	Pass
	ms	57.0	64.0	58.5	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	114.5	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	97.4	Pass
	ms	47.0	58.0	53.1	Pass
Moment Decay, Peak to Zero	deg	97.0	107.0	97.5	Pass
Overall Test Results					Pass



Technician: J. Hernandez

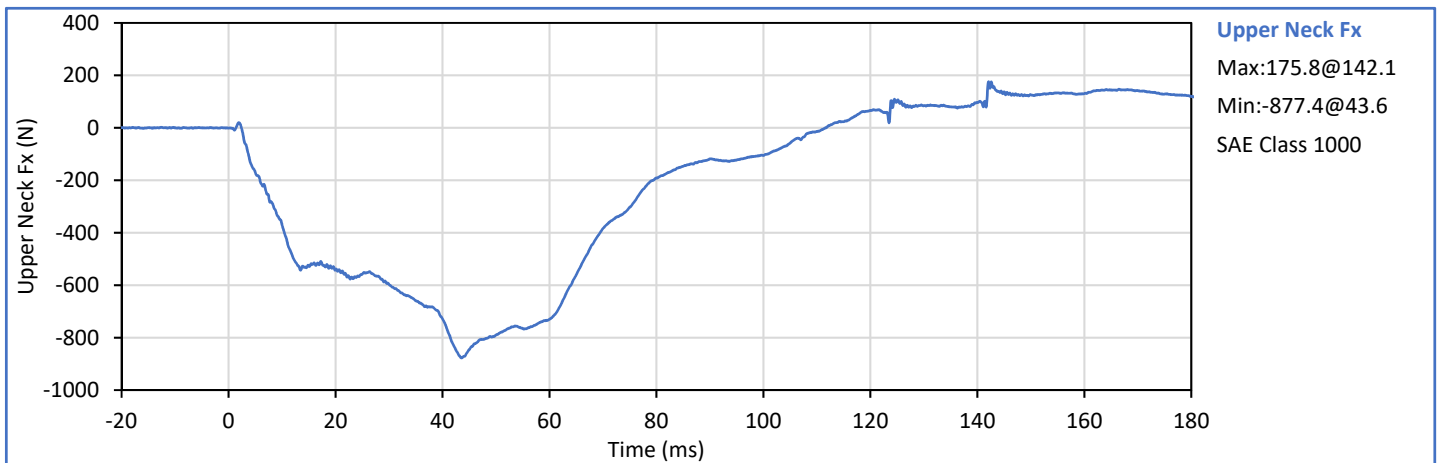
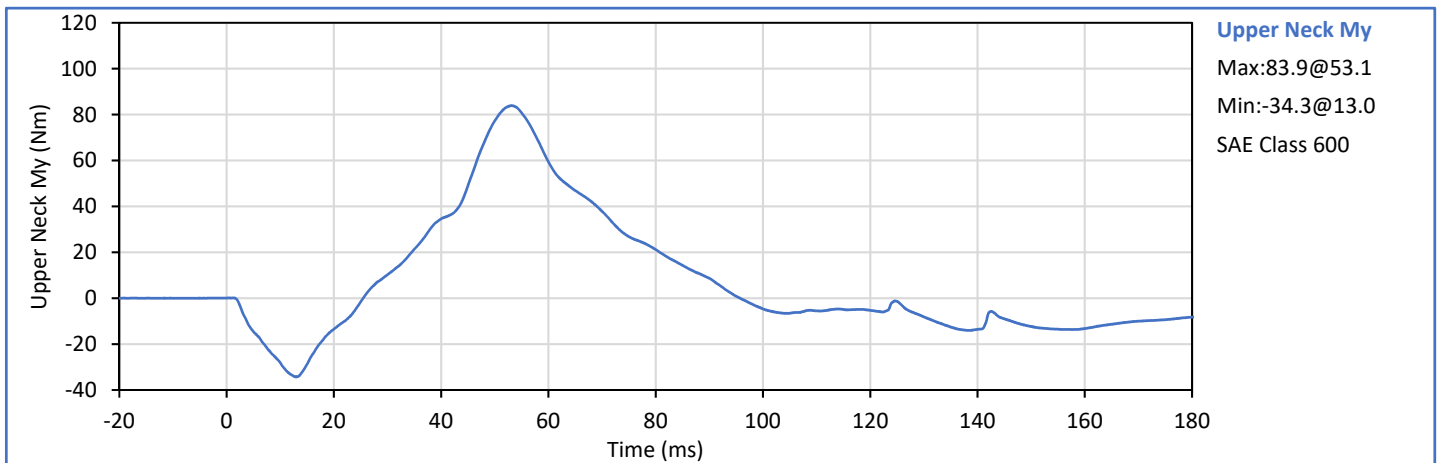
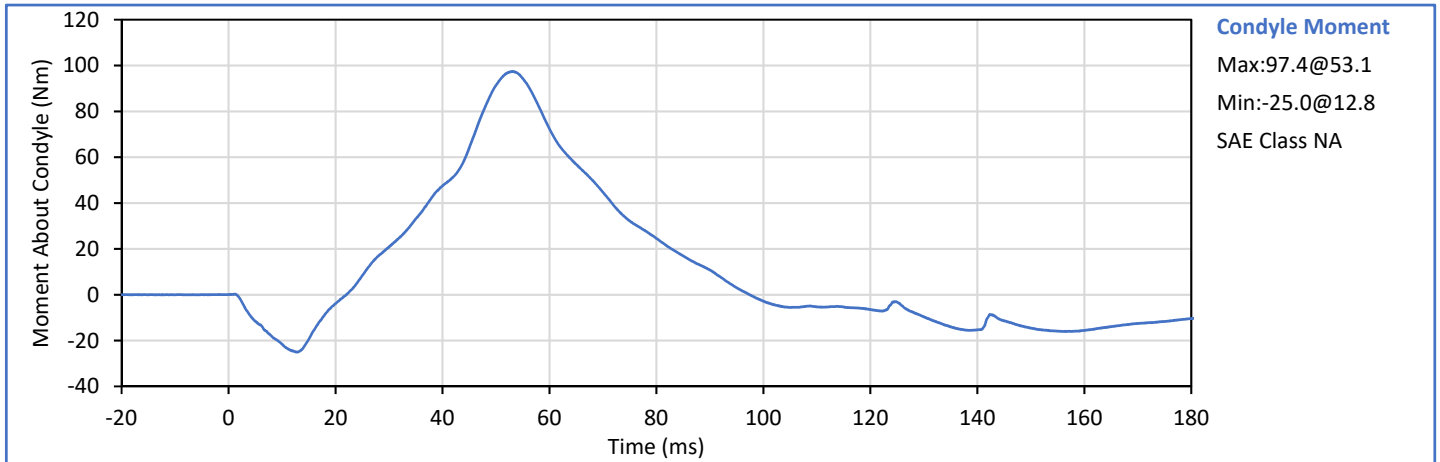
Approved By: P. Puzzuto



Hybrid III 50th Percentile Male Neck Flexion Test

ATD Serial No.: 360

Test Date: 2018-05-22



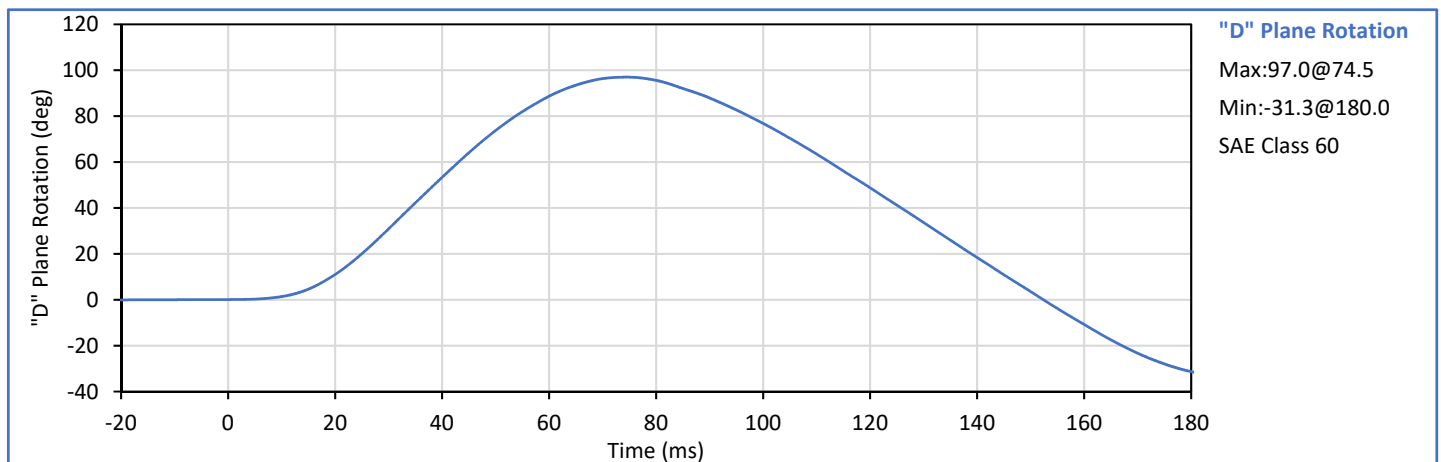
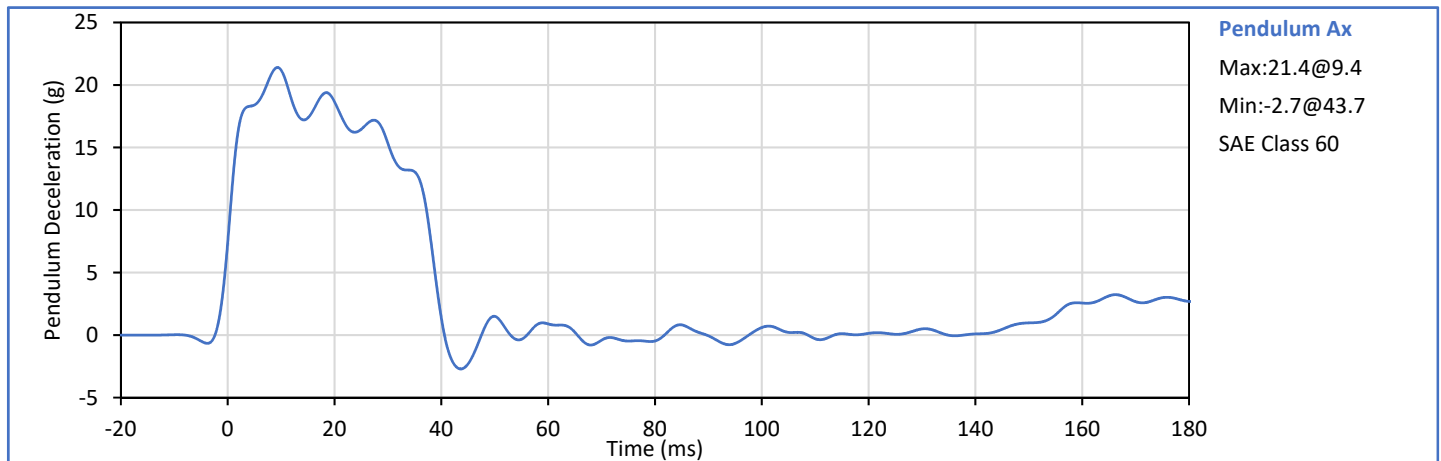


Hybrid III 50th Percentile Male
Neck Extension Test

ATD Serial No.: 360

Test Date: 2018-05-22

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	5.94	6.19	5.99	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	21.2	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.7	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	15.3	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	15.3	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	38.8	Pass
"D" Plane Rotation peak	deg	81.0	106.0	97.0	Pass
	ms	72.0	82.0	74.5	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	152.4	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-69.4	Pass
	ms	65.0	79.0	67.7	Pass
Moment Decay, Peak to Zero	deg	120.0	148.0	135.9	Pass
Overall Test Results					Pass



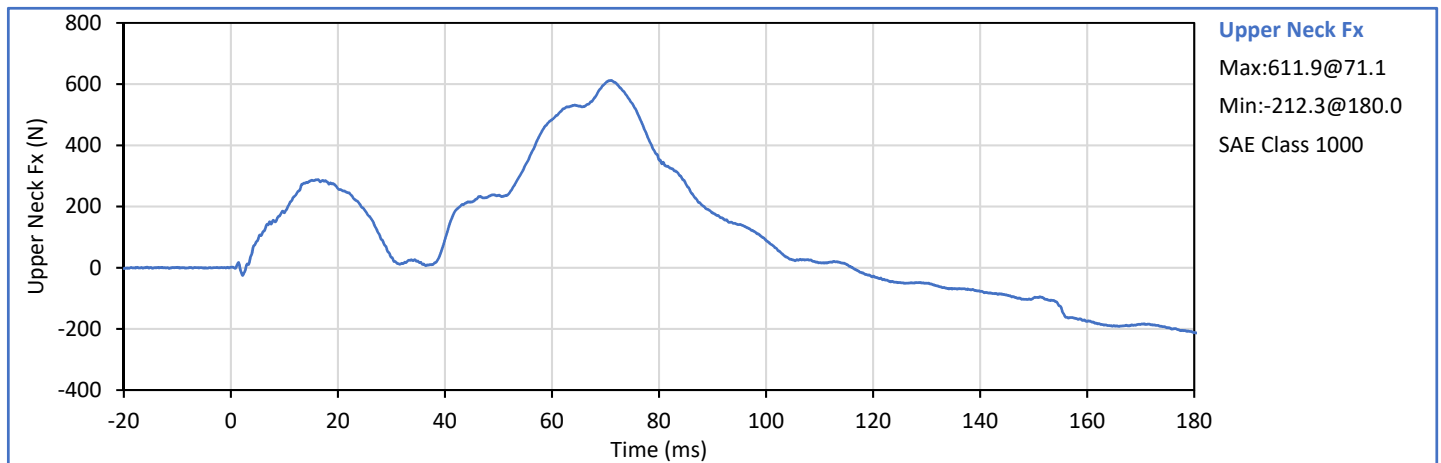
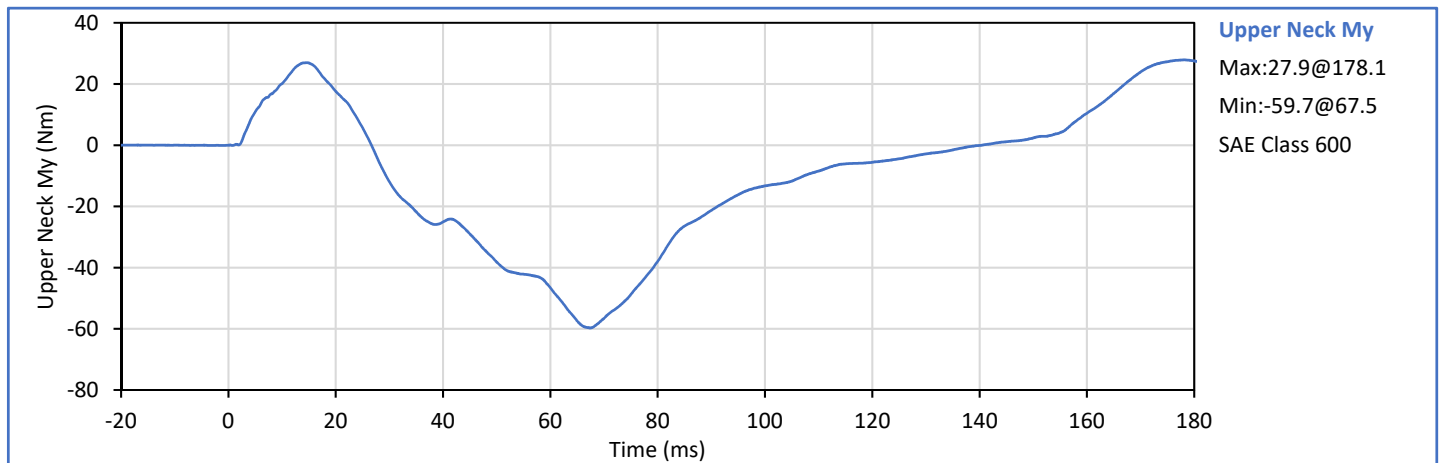
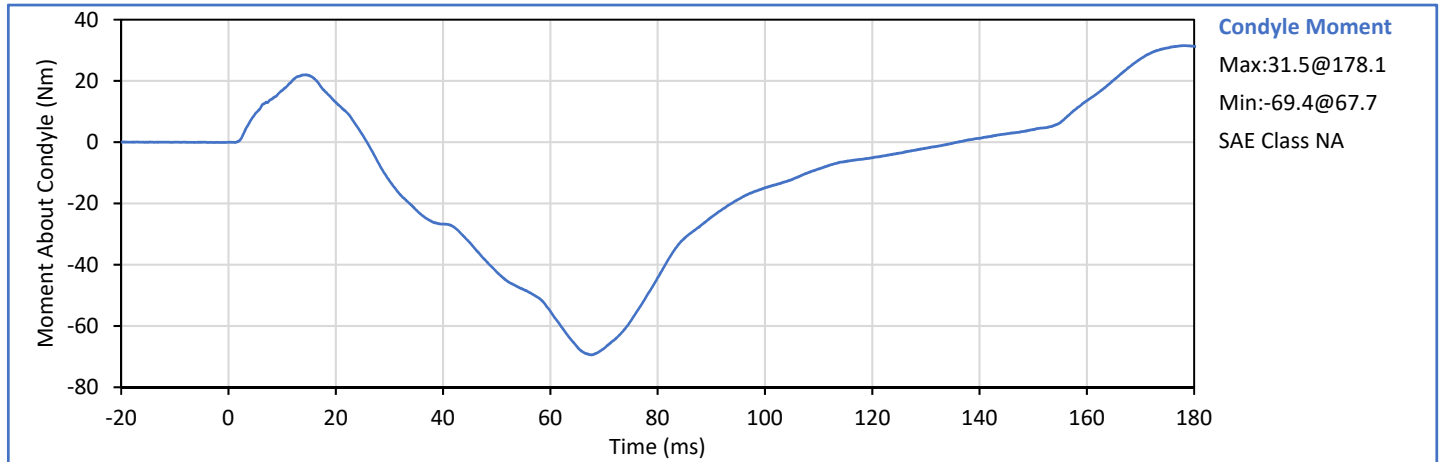
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 360

Test Date: 2018-05-22





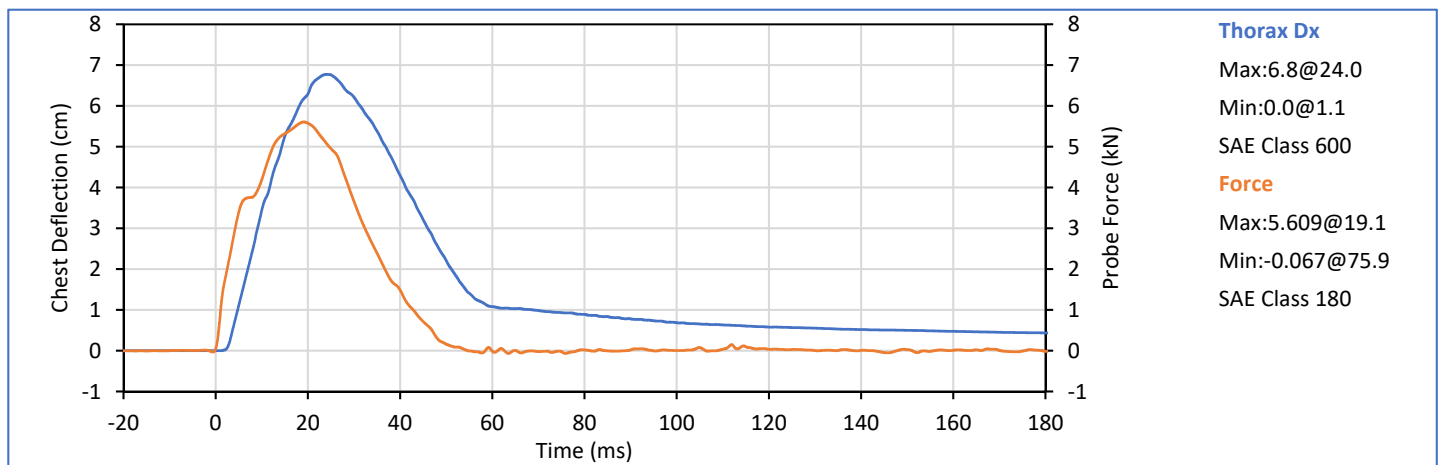
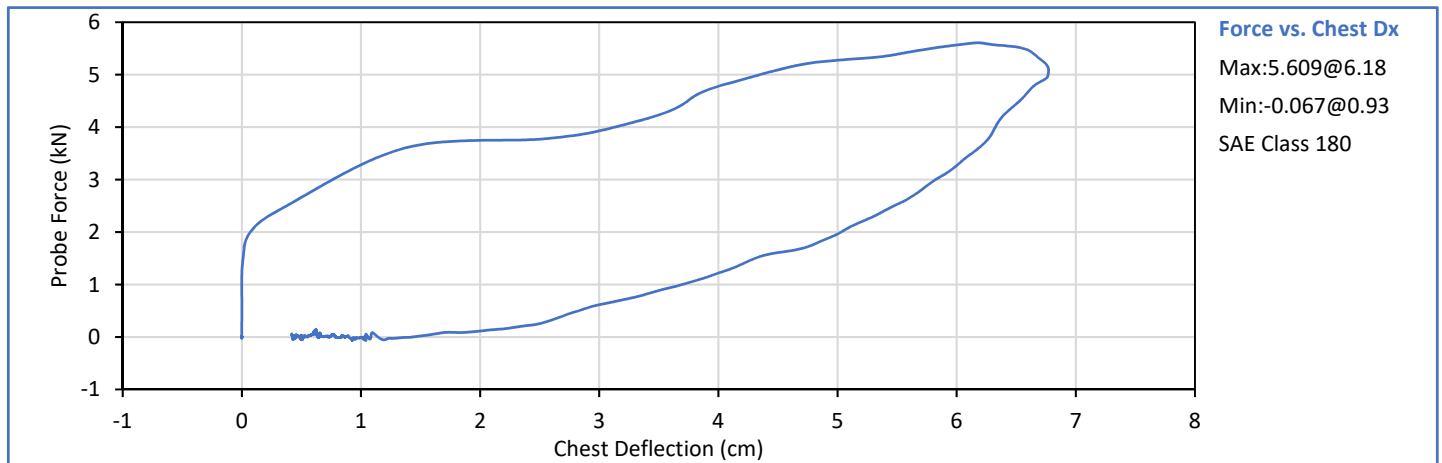
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Info@karco.com www.karco.com

Hybrid III 50th Percentile Male Thorax Impact

ATD Serial No.: 360

Test Date: 2018-05-18

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	26	Pass
Probe Velocity	m/s	6.58	6.82	6.61	Pass
Peak Chest Deflection	cm	6.35	7.26	6.77	Pass
Peak Probe Force	kN	5.159	5.893	5.609	Pass
Internal Hysteresis	%	69.0	85.0	70.4	Pass
Overall Test Results				Pass	Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

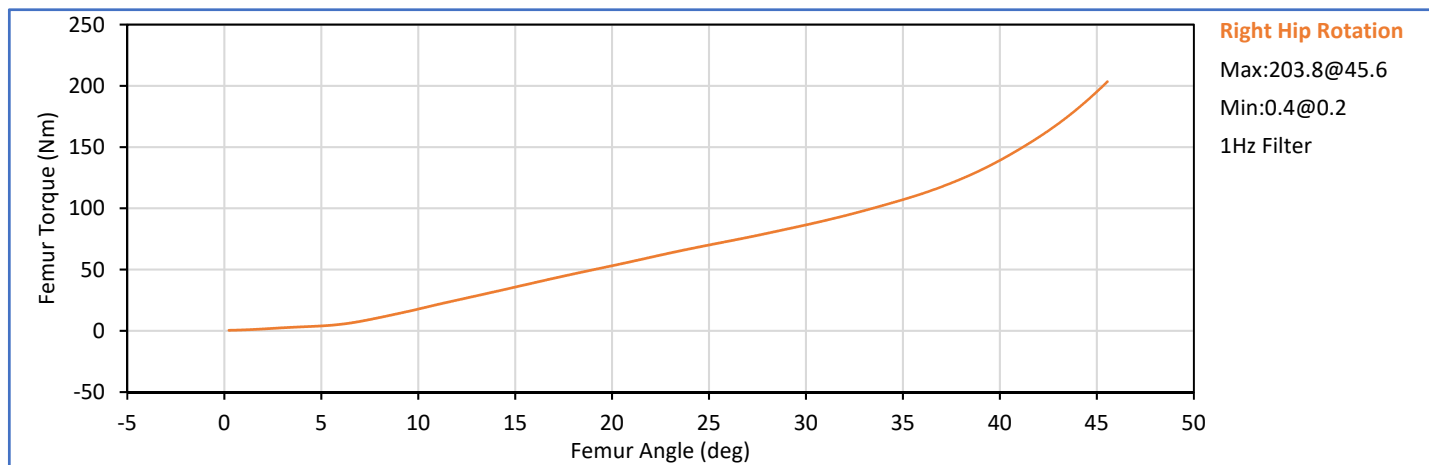
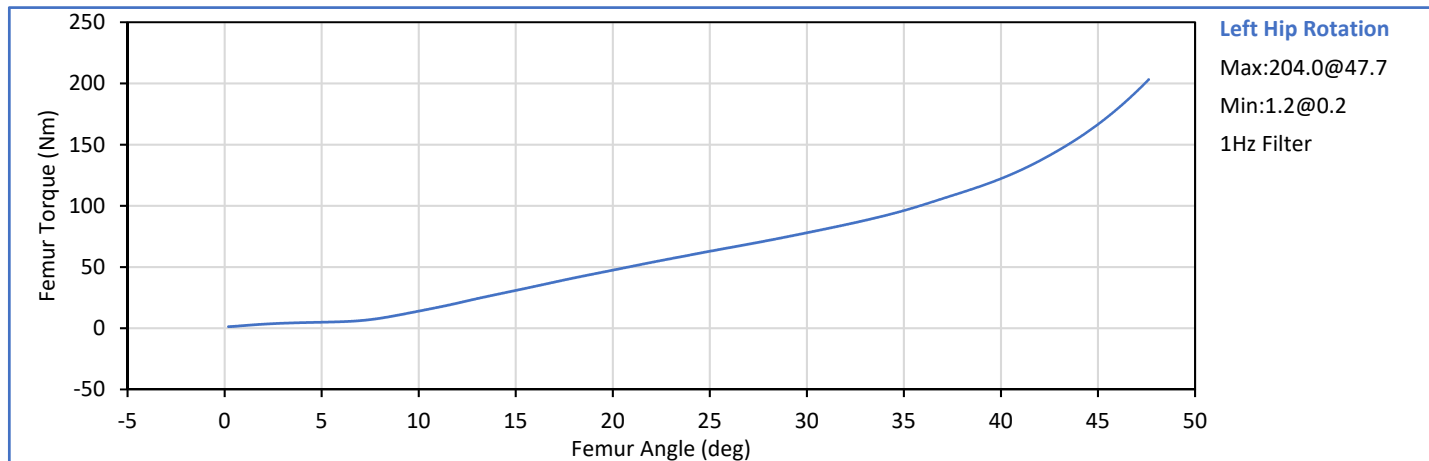


Hybrid III 50th Percentile Male
Hip Flexion (Left/Right)

ATD Serial No.: 360

Test Date: 2018-05-22

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.2	Pass
	Laboratory Humidity	%	10	70	21	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	78.0	Pass
	Left Hip Rotation at 203 Nm	deg	40.0	50.0	47.6	Pass
Right Hip	Right Hip Rotation Rate	deg/s	5.0	10.0	5.7	Pass
	Right Femur Torque at 30°	Nm	0.0	95.0	86.5	Pass
	Right Hip Rotation at 203 Nm	deg	40.0	50.0	45.5	Pass
Overall Test Results						Pass



Technician: J. Hernandez

Approved By: P. Puzzuto



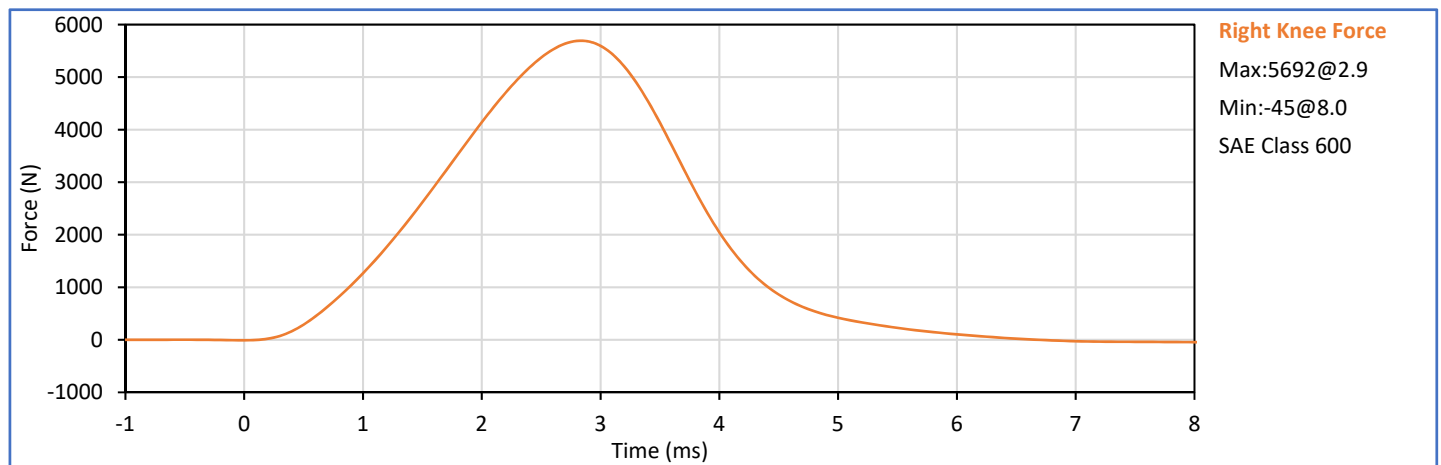
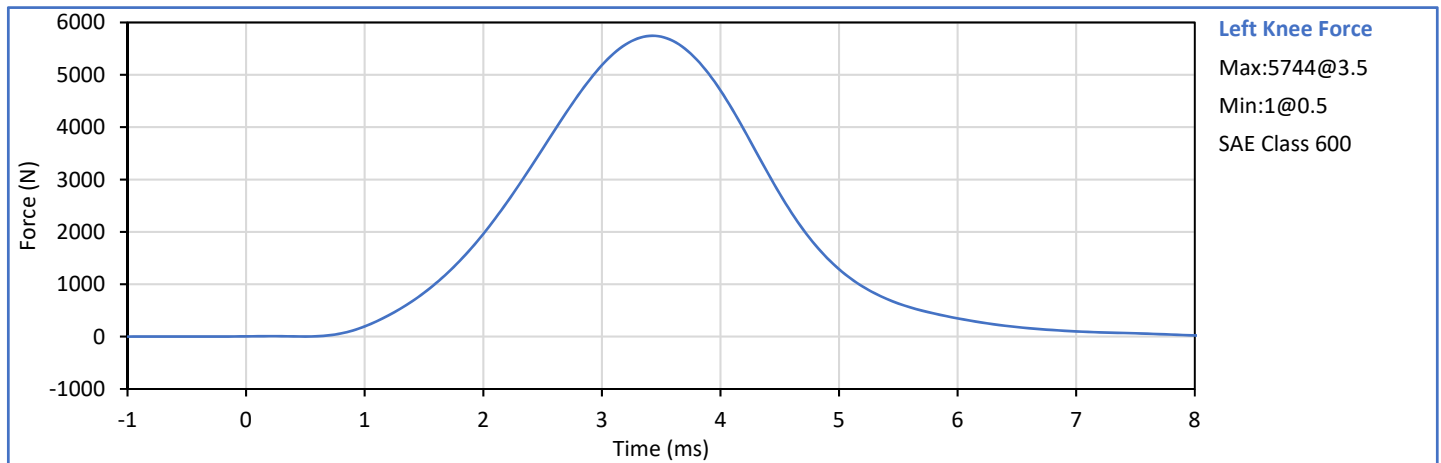
9270 Holly Road, Adelanto, CA 92301
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Hybrid III 50th Percentile Male Knee Impact (Left/Right)

ATD Serial No.: 360

Test Date: 2018-05-21

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.8	Pass
	Laboratory Humidity	%	10	70	39	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.126	Pass
Knee	Peak Resistive Force	N	4715	5782	5744	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.120	Pass
Knee	Peak Resistive Force	N	4715	5782	5692	Pass
Overall Test Results					Pass	



Technician: T. Lowman

Approved By: P. Puzzuto



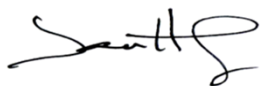
Hybrid III 5th Percentile Female Damage Checklist

ATD Serial No.: 141

Test Date: 2018-05-15

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.	Bent shaft			✓
Assembly	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer	Head mounting secure			✓
Mounting	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:

Technician: 
J. Hernandez

Approved By: 
P. Puzzuto



**Hybrid III 5th Percentile Female
External Measurements**

ATD Serial No.: 141

Test Date: 2018-05-15

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	790	Pass
B - Shoulder pivot height	mm	432	457	445	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	79	Pass
F - Thigh clearance	mm	119	135	131	Pass
G - Back of elbow to wrist pivot	mm	244	259	254	Pass
H - Head back to backline	mm	41	46	42	Pass
I - Shoulder to elbow length	mm	277	297	291	Pass
J - Elbow rest height	mm	183	203	191	Pass
K - Buttock to knee length	mm	521	546	531	Pass
L - Popliteal length	mm	356	376	370	Pass
M - Knee pivot height	mm	394	419	404	Pass
N - Buttock popliteal length	mm	414	439	427	Pass
O - Chest depth without jacket	mm	175	191	184	Pass
P - Foot length	mm	219	234	225	Pass
R - Buttock to Knee Pivot Length	mm	457	483	469	Pass
S - Head Breadth	mm	137	147	141	Pass
T - Head Depth	mm	178	188	184	Pass
U - Hip Breadth	mm	300	315	308	Pass
V - Shoulder breadth	mm	351	366	363	Pass
W - Foot breadth	mm	79	94	87	Pass
X - Head circum.	mm	528	549	538	Pass
Y - Chest circum. (w/chest jacket)	mm	851	881	869	Pass
Z - Waist circum.	mm	760	790	779	Pass
AA - Location for chest circum.	mm	333	358	337	Pass
BB - Location for waist circum.	mm	160	170	168	Pass
			Overall Test Results		Pass

Technician: _____

J. Hernandez

Approved By: _____

P. Puzzuto



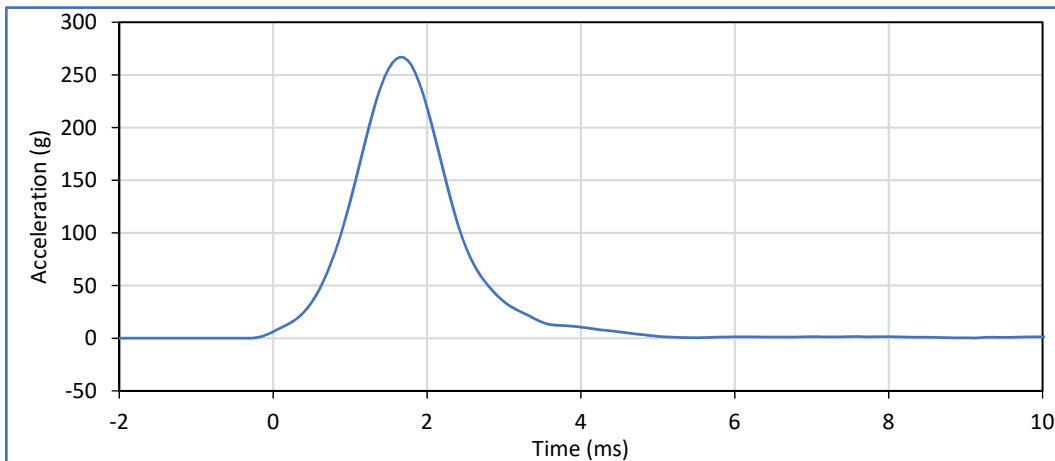
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Hybrid III 5th Percentile Female Head Drop

ATD Serial No.: 141

Test Date: 2018-05-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	31	Pass
Peak Resultant Acceleration	g	250.0	300.0	266.9	Pass
Peak Lateral Acceleration	g	-15.0	15.0	-12.1	Pass
Oscillations After Main Pulse	%	0.0	10.0	0.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	

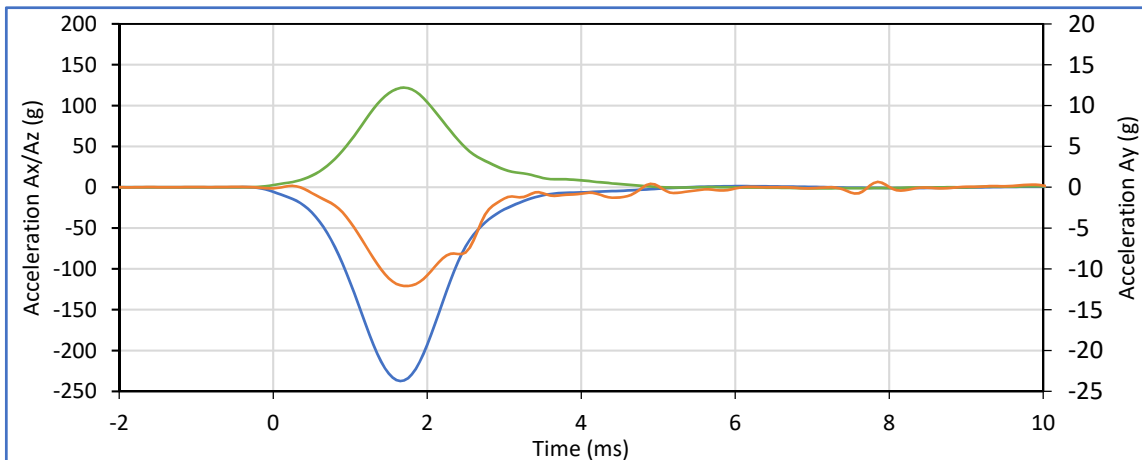


Head Resultant

Max:266.9@1.7

Min:0.3@9.1

SAE Class 1000



Head Ax

Max:1.3@6.1

Min:-237.3@1.7

SAE Class 1000

Head Ay

Max:0.7@7.9

Min:-12.1@1.8

SAE Class 1000

Head Az

Max:122.0@1.7

Min:-1.4@7.1

SAE Class 1000

Technician: T. Lowman

T. Lowman

Approved By: P. Puzzuto

P. Puzzuto

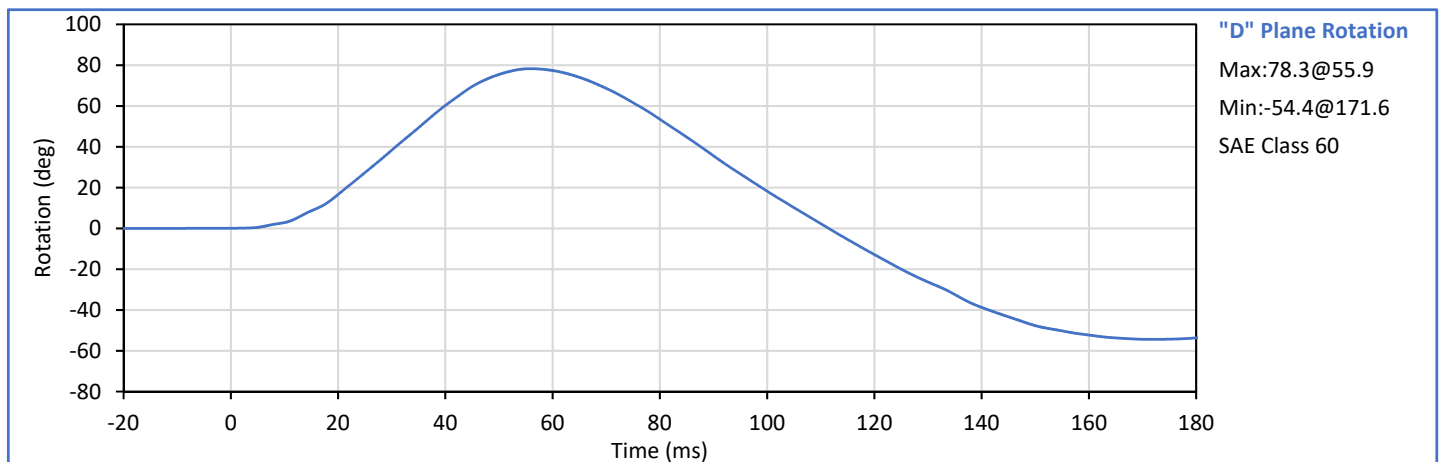
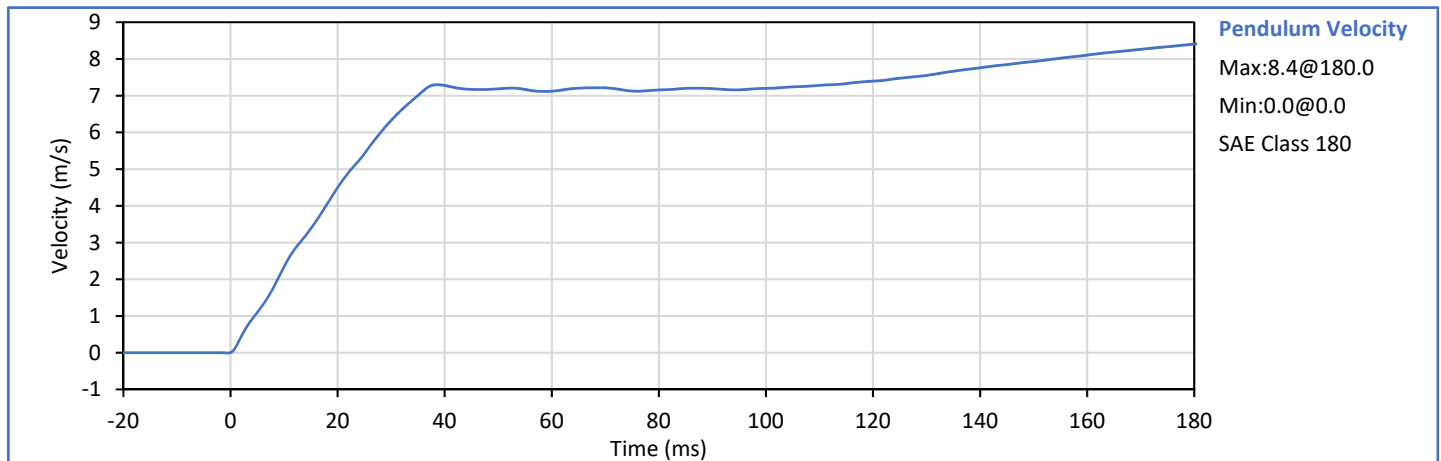


Hybrid III 5th Percentile Female Neck Flexion Test

ATD Serial No.: 141

Test Date: 2018-05-15

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	25	Pass
Pendulum Velocity	m/s	6.89	7.13	6.98	Pass
Pendulum Velocity at 10 ms	m/s	2.10	2.50	2.34	Pass
Pendulum Velocity at 20 ms	m/s	4.00	5.00	4.50	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.33	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	78.3	Pass
Peak Moment in Rotation	Nm	69.0	83.0	82.7	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	82.8	Pass
Overall Test Results				Pass	Pass



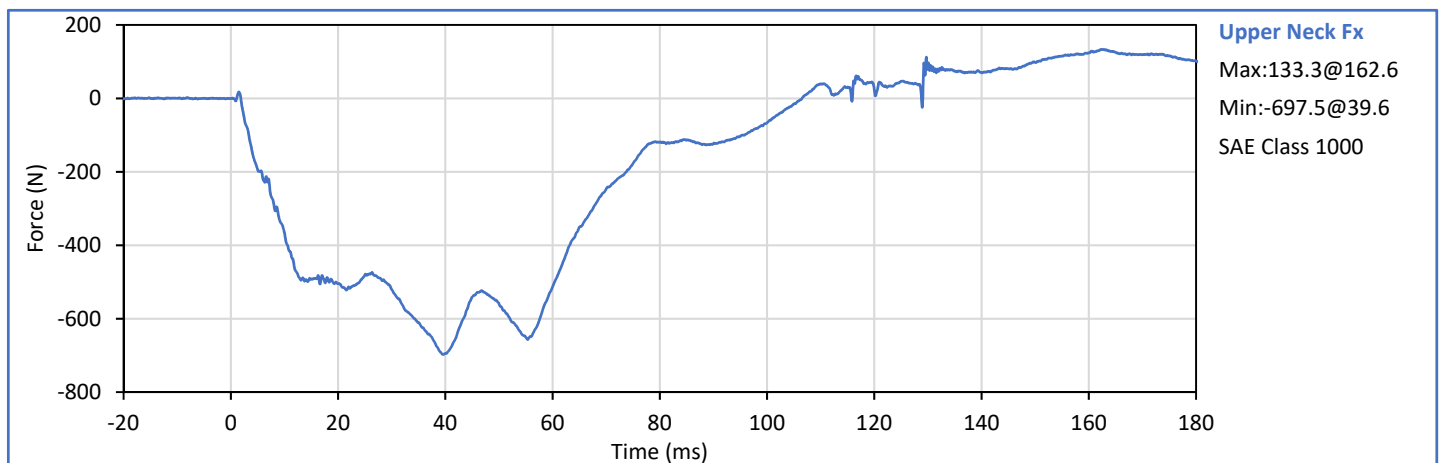
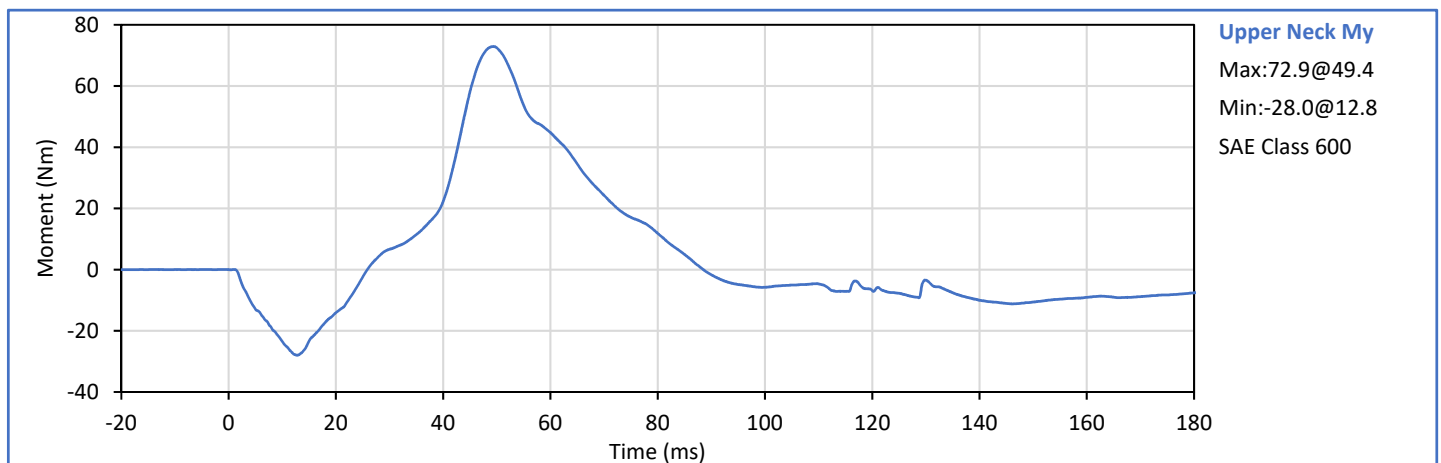
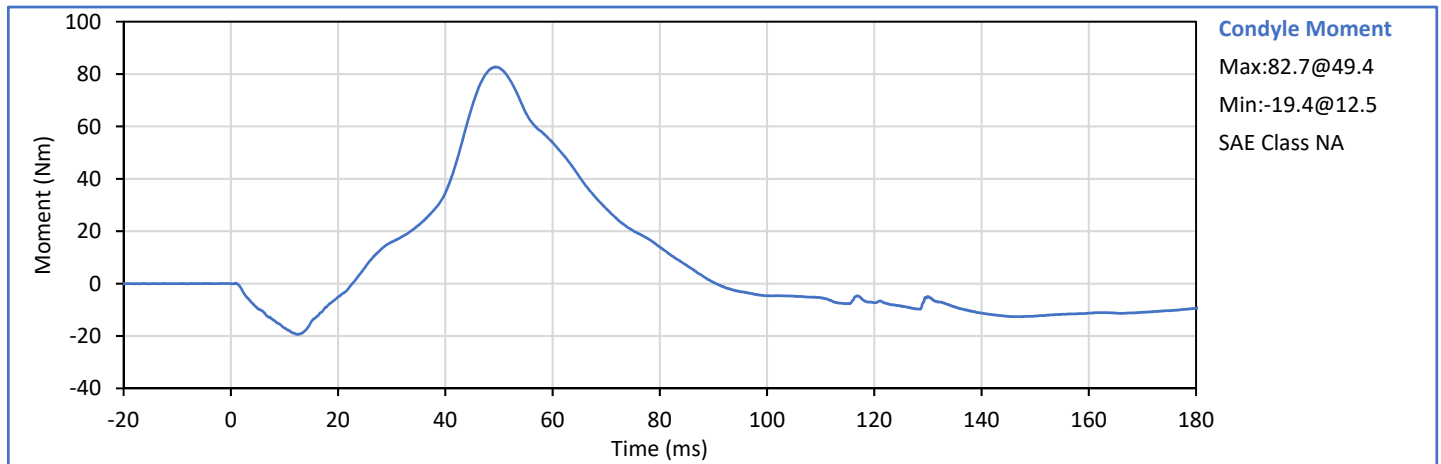
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 141

Test Date: 2018-05-15



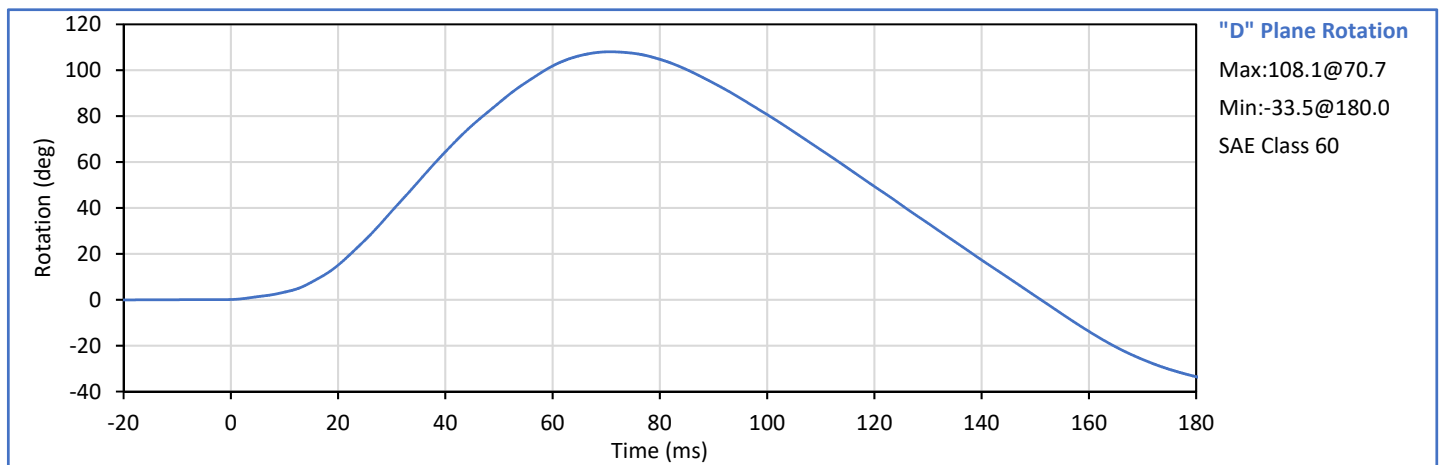
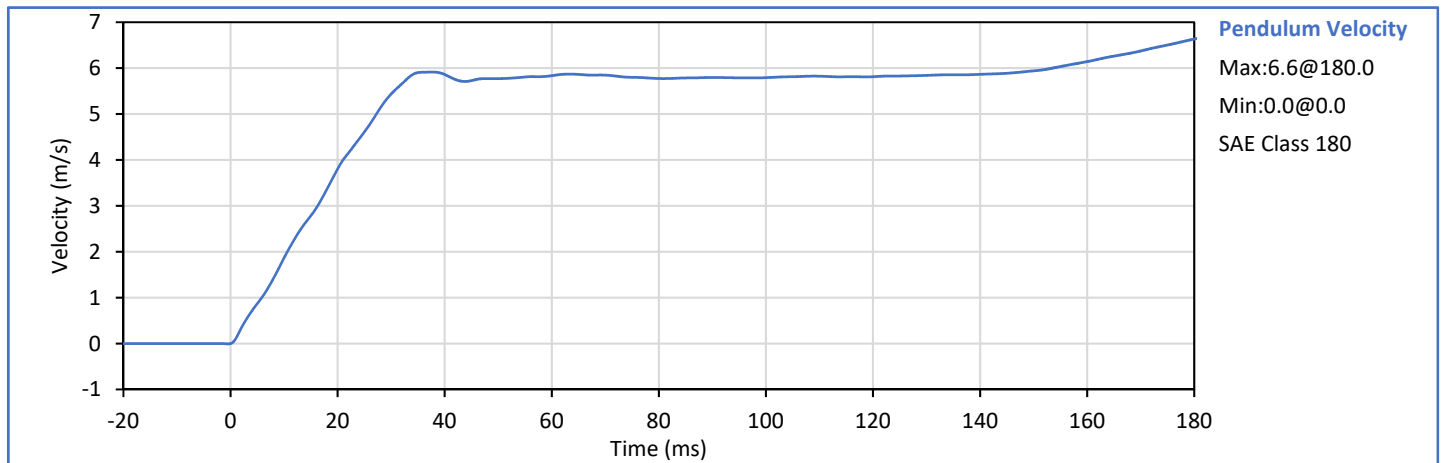


**Hybrid III 5th Percentile Female
Neck Extension Test**

ATD Serial No.: 141

Test Date: 2018-05-15

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	25	Pass
Pendulum Velocity	m/s	5.95	6.19	6.15	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	3.80	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	5.44	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	108.1	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-59.6	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	96.1	Pass
Overall Test Results				Pass	Pass



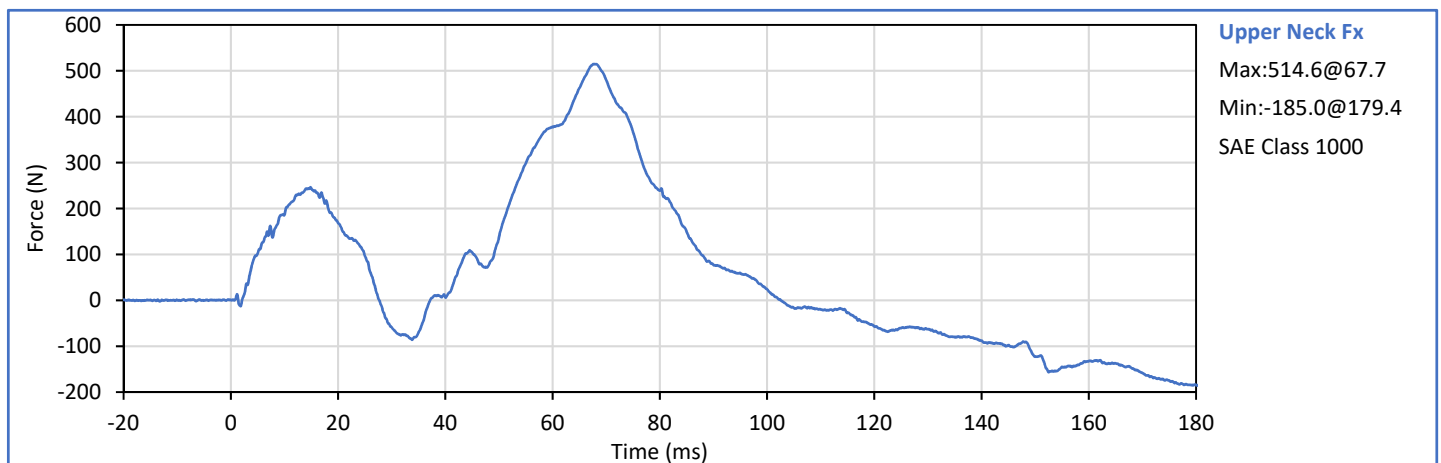
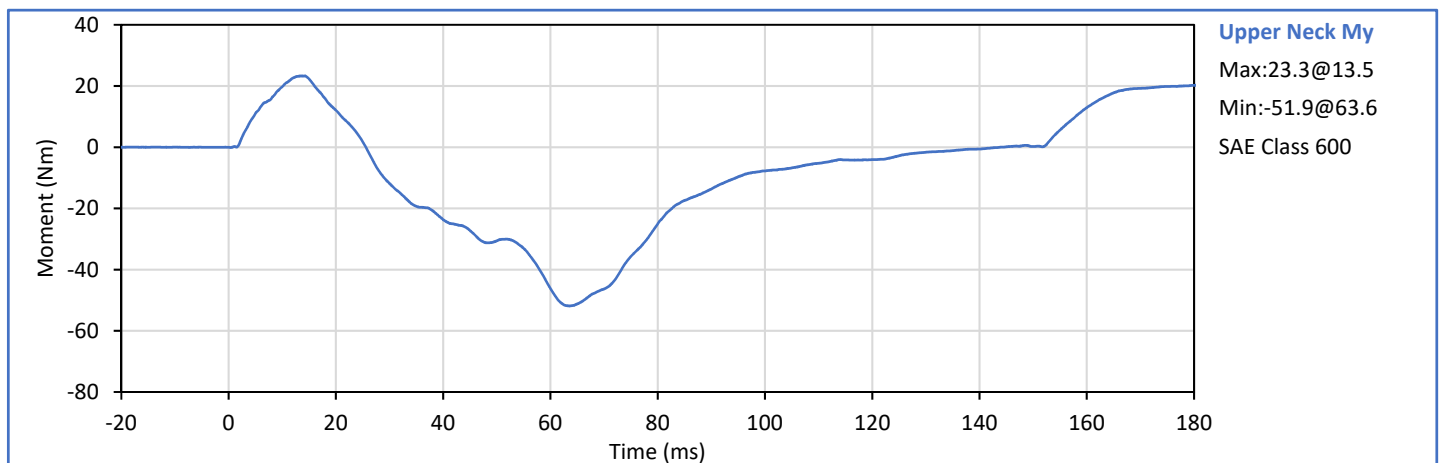
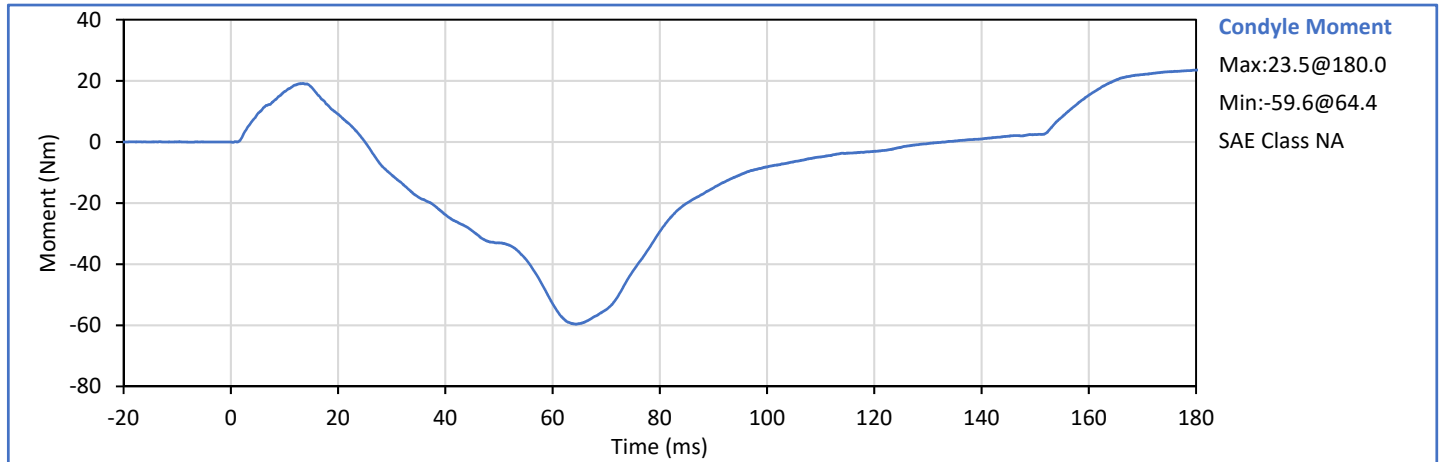
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 141

Test Date: 2018-05-15





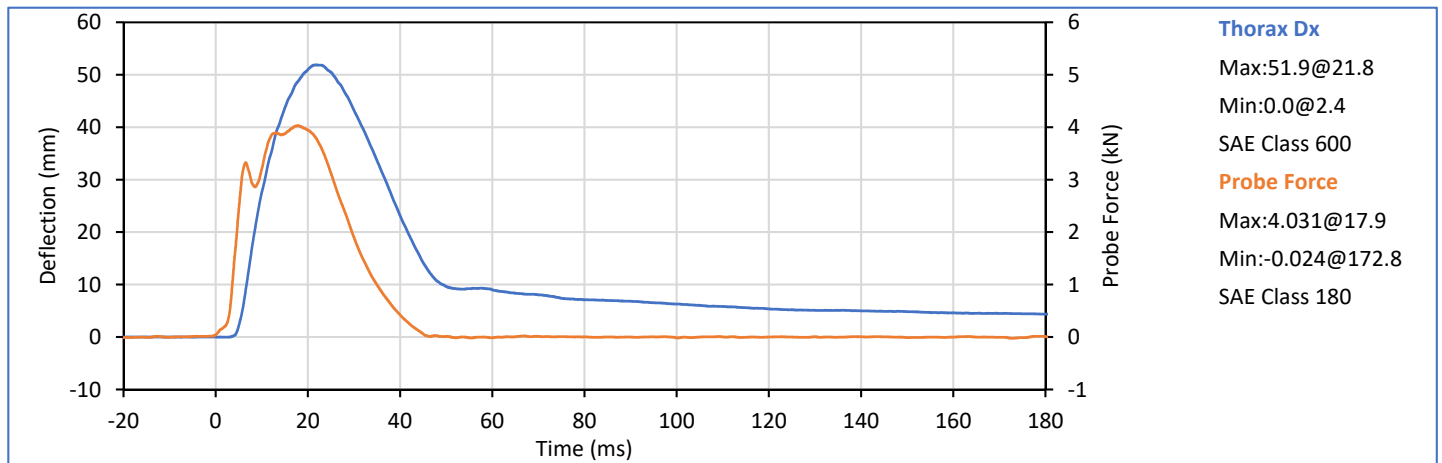
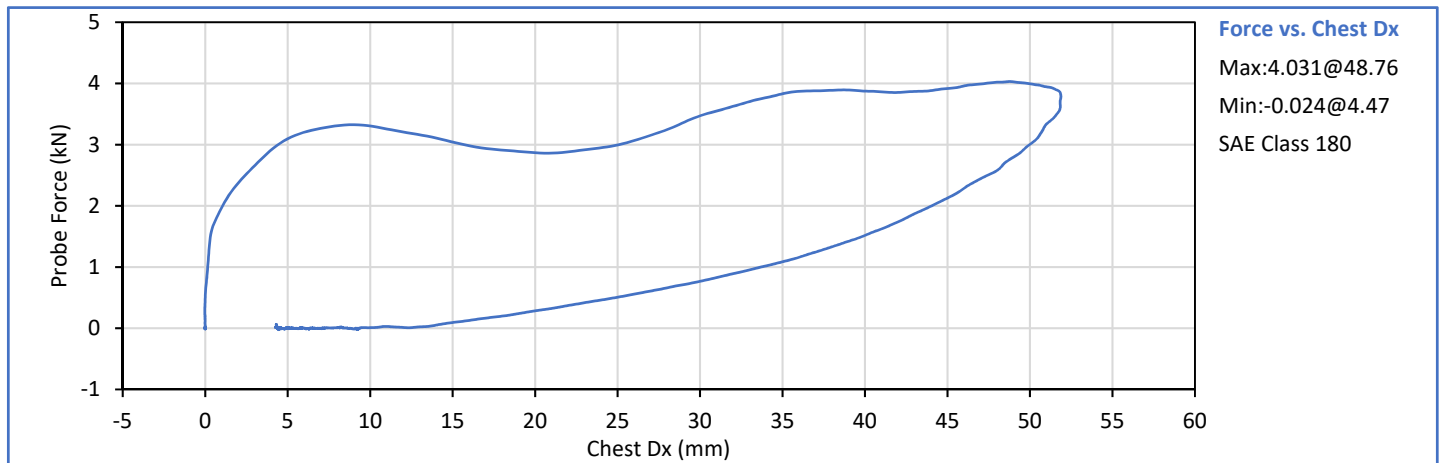
9270 Holly Road, Adelanto, CA 92301
 Tel: +1 760 246 1672 Fax: +1 760 246 8112
 Info@karco.com www.karco.com

Hybrid III 5th Percentile Female Thorax Impact

ATD Serial No.: 141

Test Date: 2018-05-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	34	Pass
Probe Velocity	m/s	6.59	6.83	6.61	Pass
Peak Chest Deflection	mm	50.0	58.0	51.9	Pass
Peak Probe Force, 50 and 58 mm	kN	3.900	4.400	4.031	Pass
Peak Probe Force, 18 and 50 mm	kN	0.000	4.600	4.031	Pass
Internal Hysterisis	%	69.0	85.0	74.0	Pass
Overall Test Results					Pass



Technician: J. Hernandez

Approved By: P. Puzzuto



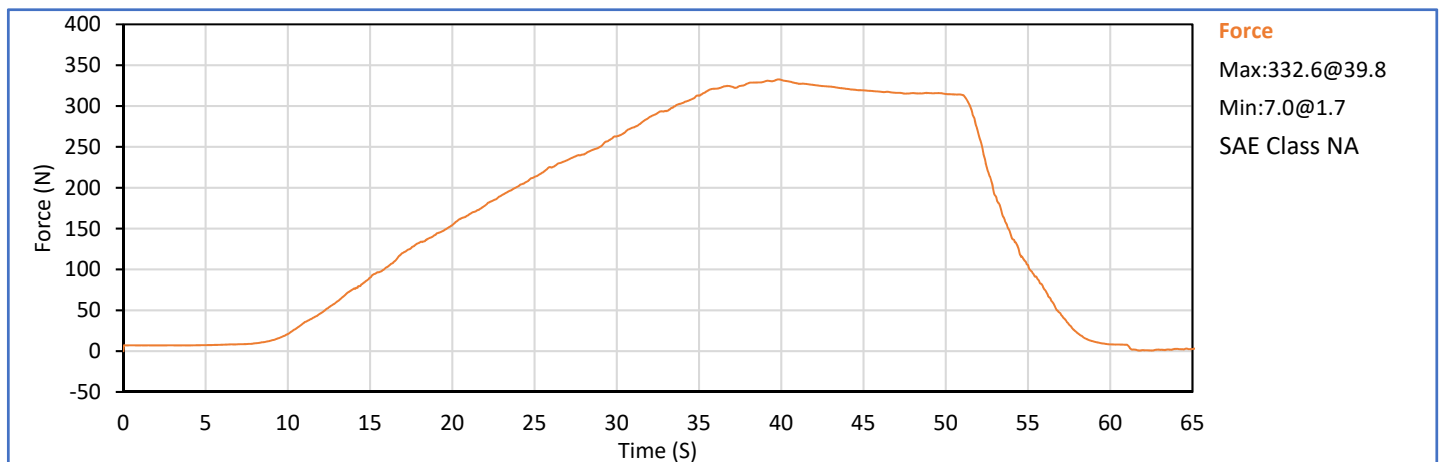
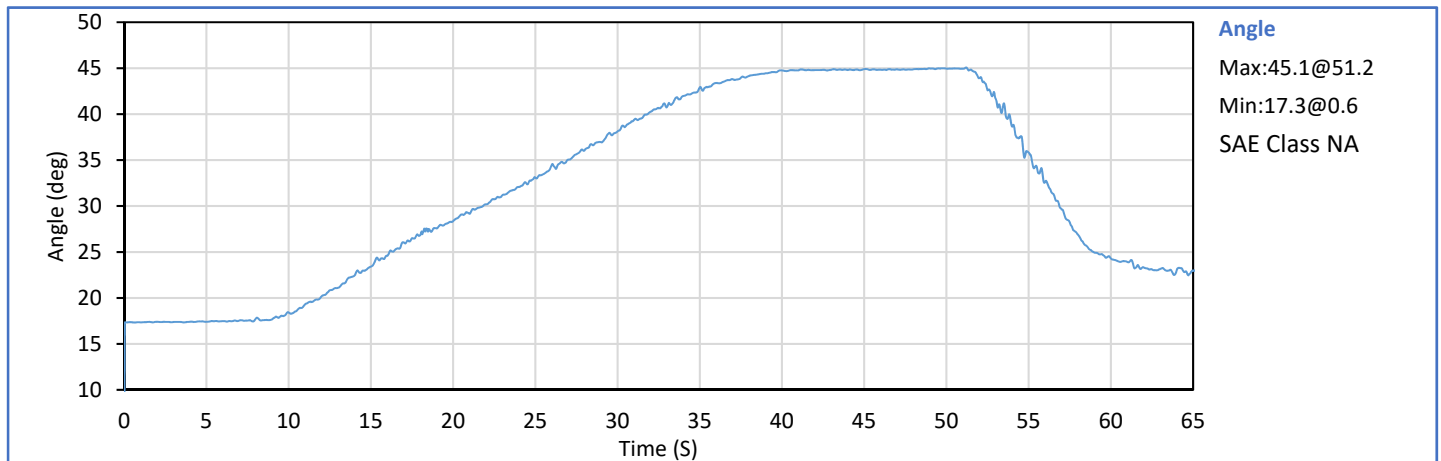
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

Hybrid III 5th Percentile Female Torso Flexion Test

ATD Serial No.: 141

Test Date: 2018-01-10

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
Orientation Angle	deg	0.0	20.0	15.1	Pass
Test Initial Angle	deg	11.0	19.0	17.3	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	332.6	Pass
Torso Flexion Rate	deg/s	0.50	1.50	0.88	Pass
Final Reference Plane Angle	deg	-8.0	8.0	4.2	Pass
Overall Test Results				Pass	



Technician: J. Hernandez

Approved By: P. Puzzuto



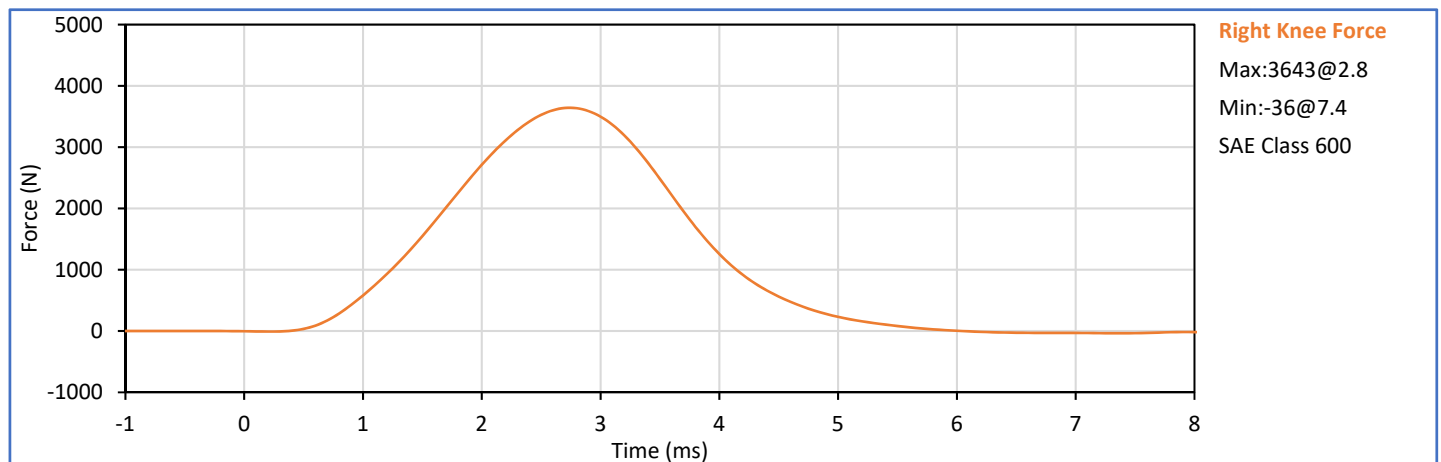
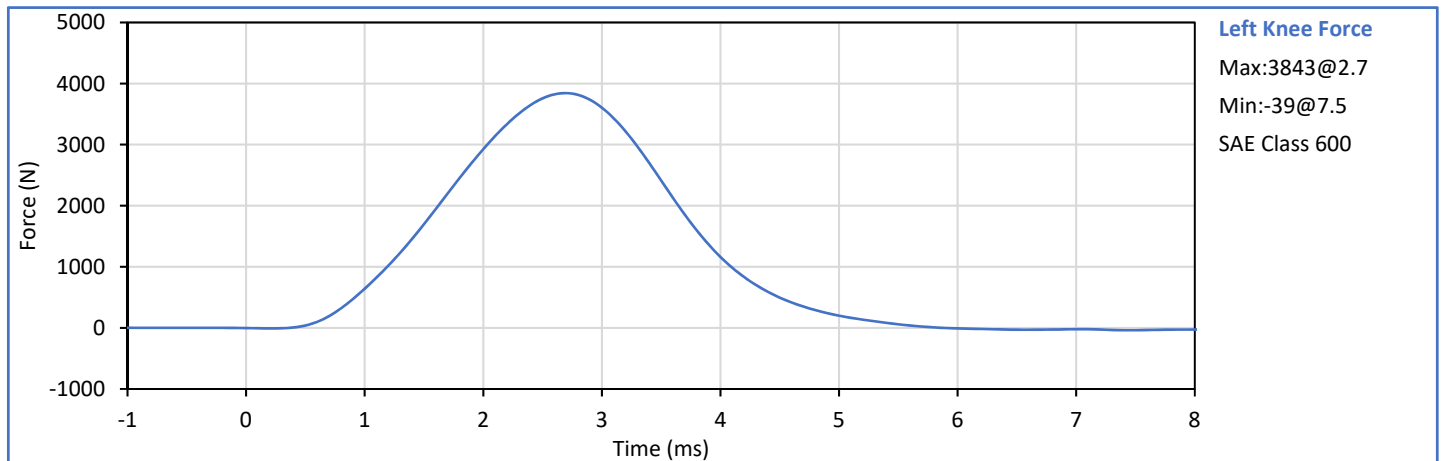
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

Hybrid III 5th Percentile Female Knee Impact (Left/Right)

ATD Serial No.: 141

Test Date: 2018-05-16

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.1	Pass
	Laboratory Humidity	%	10	70	31	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.127	Pass
Knee	Peak Resistive Force	N	3450	4060	3843	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.090	Pass
Knee	Peak Resistive Force	N	3450	4060	3643	Pass
Overall Test Results					Pass	



Technician: T. Lowman

Approved By: P. Puzzuto

APPENDIX C
POST-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA



**Hybrid III 50th Percentile Male
ATD Damage Checklist**

ATD Serial No.: 360

Test Date: 2018-06-04

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:

Technician:

J. Hernandez

Approved By:

P. Puzzuto



Hybrid III 50th Percentile Male
External Measurements

ATD Serial No.: 360

Test Date: 2018-06-04

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	887	Pass
B - Shoulder pivot height	mm	505	521	517	Pass
C - 'H' point height	mm	84	89	87	Pass
D - 'H' point location from backline	mm	135	140	139	Pass
E - Shoulder pivot from backline	mm	84	94	91	Pass
F - Thigh clearance	mm	140	155	151	Pass
G - Back of elbow to wrist pivot	mm	290	305	297	Pass
H - Head back to backline	mm	41	46	46	Pass
I - Shoulder to elbow length	mm	330	345	343	Pass
J - Elbow rest height	mm	190	211	204	Pass
K - Buttock to knee length	mm	579	604	589	Pass
L - Popliteal length	mm	429	455	440	Pass
M - Knee pivot height	mm	485	500	495	Pass
N - Buttock popliteal length	mm	452	477	464	Pass
O - Chest depth without jacket	mm	213	229	220	Pass
P - Foot length	mm	251	267	258	Pass
V - Shoulder breadth	mm	422	437	431	Pass
W - Foot breadth	mm	91	107	103	Pass
Y - Chest circum. (w/chest jacket)	mm	970	1001	980	Pass
Z - Waist circum.	mm	836	866	851	Pass
AA - Location for chest circum.	mm	429	434	432	Pass
BB - Location for waist circum.	mm	226	231	228	Pass
				Overall Test Results	Pass

Technician:

J. Hernandez

Approved By:

P. Puzzuto



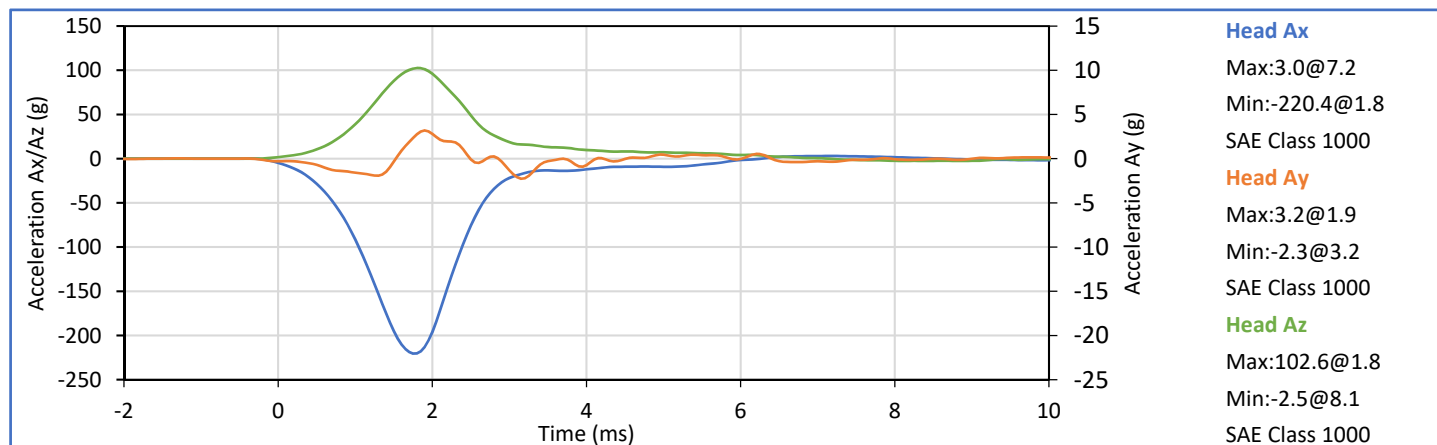
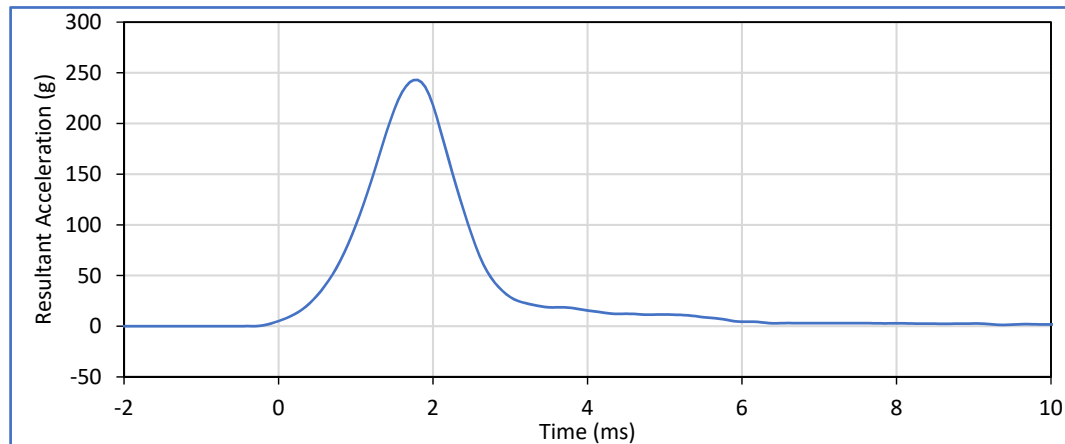
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
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Hybrid III 50th Percentile Male Head Drop

ATD Serial No.: 360

Test Date: 2018-06-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	24.0	Pass
Laboratory Humidity	%	10	70	27	Pass
Peak Resultant Acceleration	g	225.0	275.0	243.0	Pass
Peak Lateral Acceleration	g	-15.0	15.0	3.2	Pass
Oscillations After Main Pulse	%	0.0	10.0	2.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass



Technician: _____

T. Lowman

T. Lowman

Approved By: _____

P. Puzzuto

P. Puzzuto

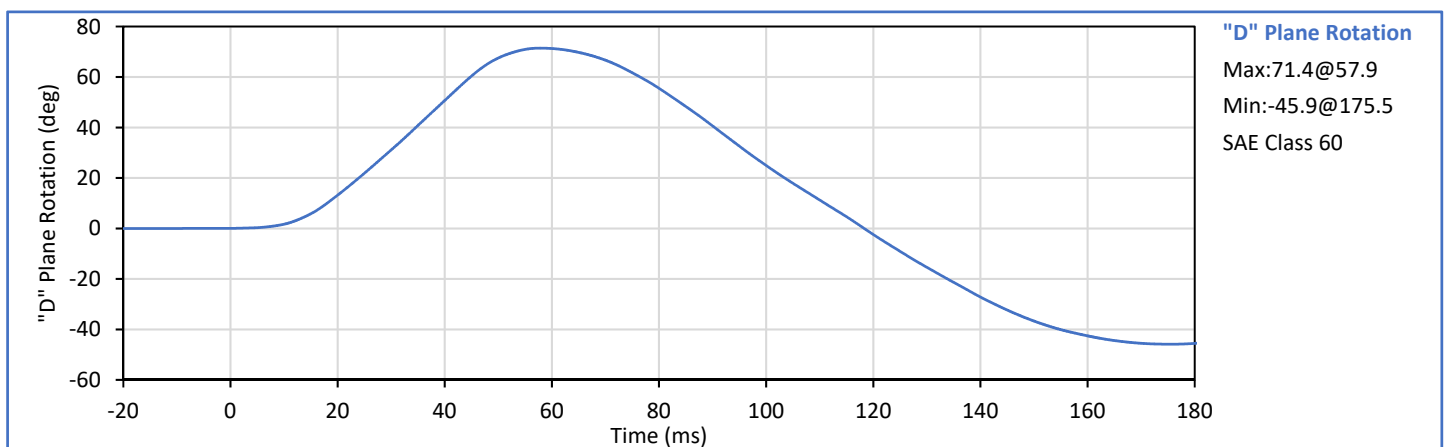
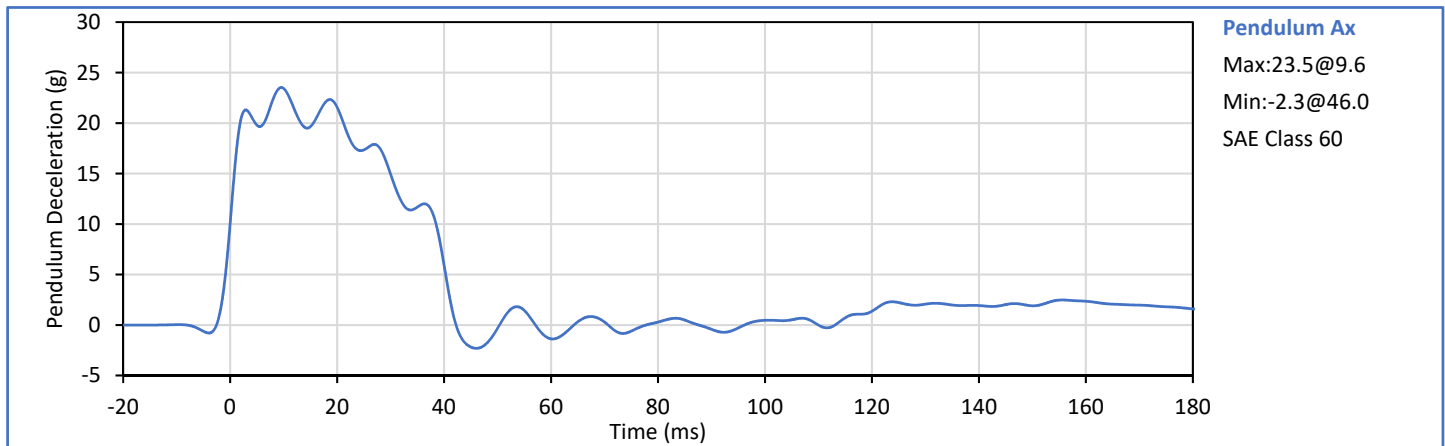


Hybrid III 50th Percentile Male
Neck Flexion Test

ATD Serial No.: 360

Test Date: 2018-06-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	31	Pass
Pendulum Velocity	m/s	6.89	7.13	6.98	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	23.4	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	21.6	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	14.9	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	14.9	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	40.3	Pass
"D" Plane Rotation peak	deg	64.0	78.0	71.4	Pass
	ms	57.0	64.0	57.9	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	118.4	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	96.1	Pass
	ms	47.0	58.0	51.0	Pass
Moment Decay, Peak to Zero	deg	97.0	107.0	97.7	Pass
Overall Test Results					Pass



Technician:

J. Hernandez

Approved By:

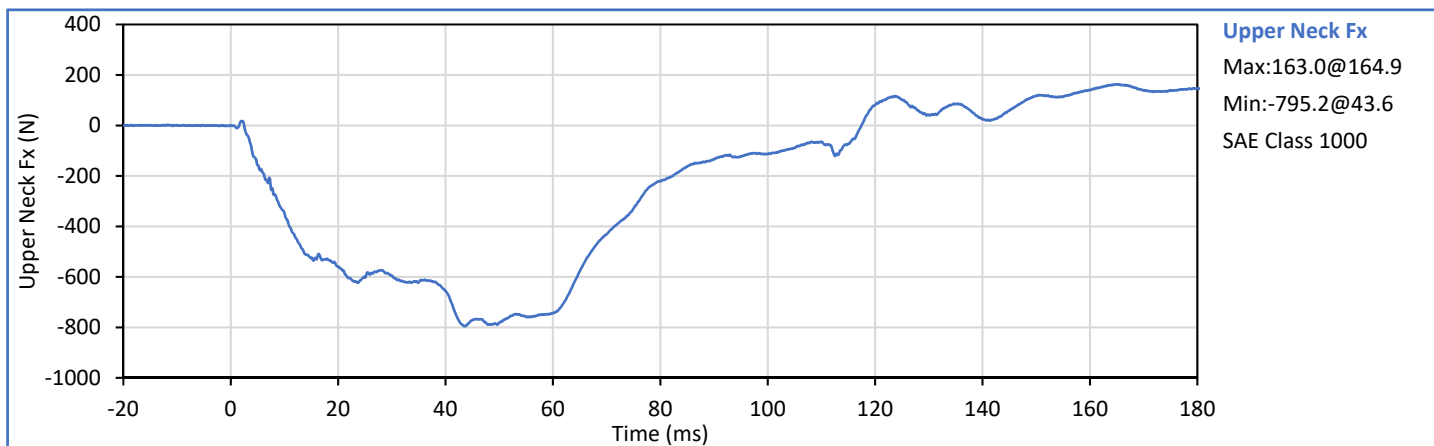
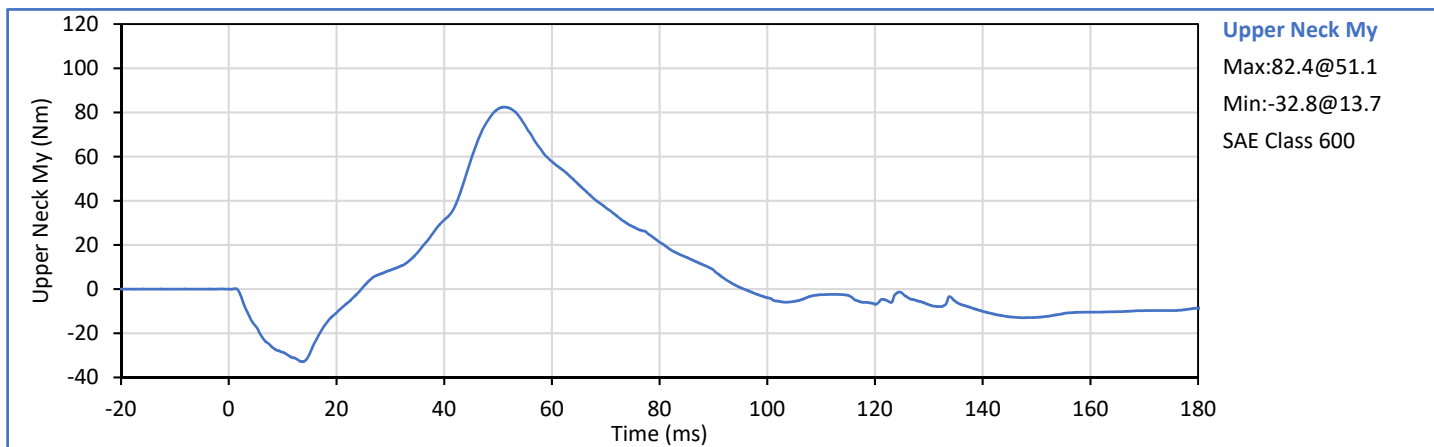
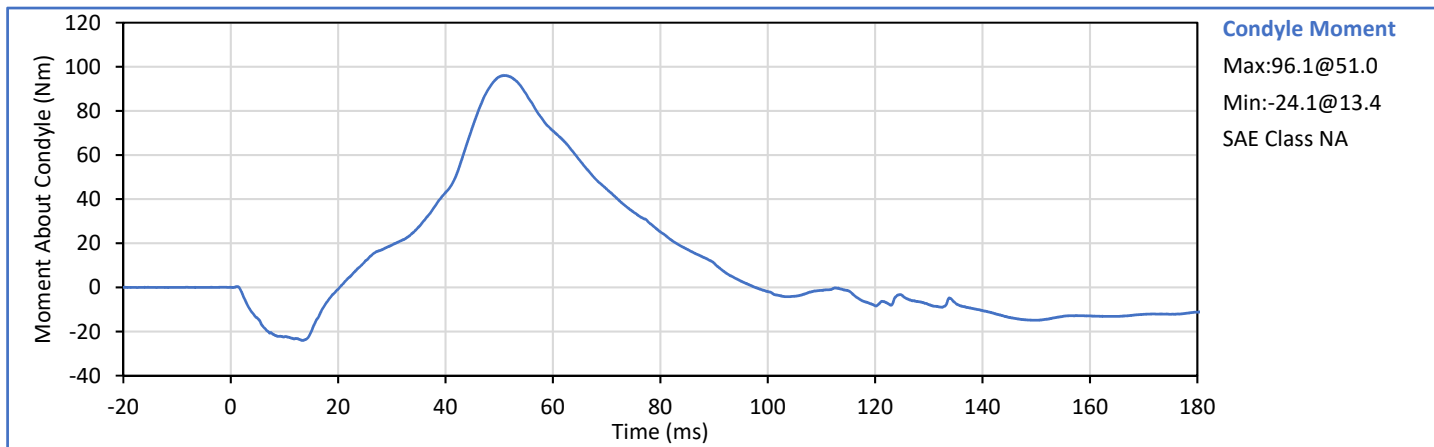
P. Puzzuto



Hybrid III 50th Percentile Male Neck Flexion Test

ATD Serial No.: 360

Test Date: 2018-06-04



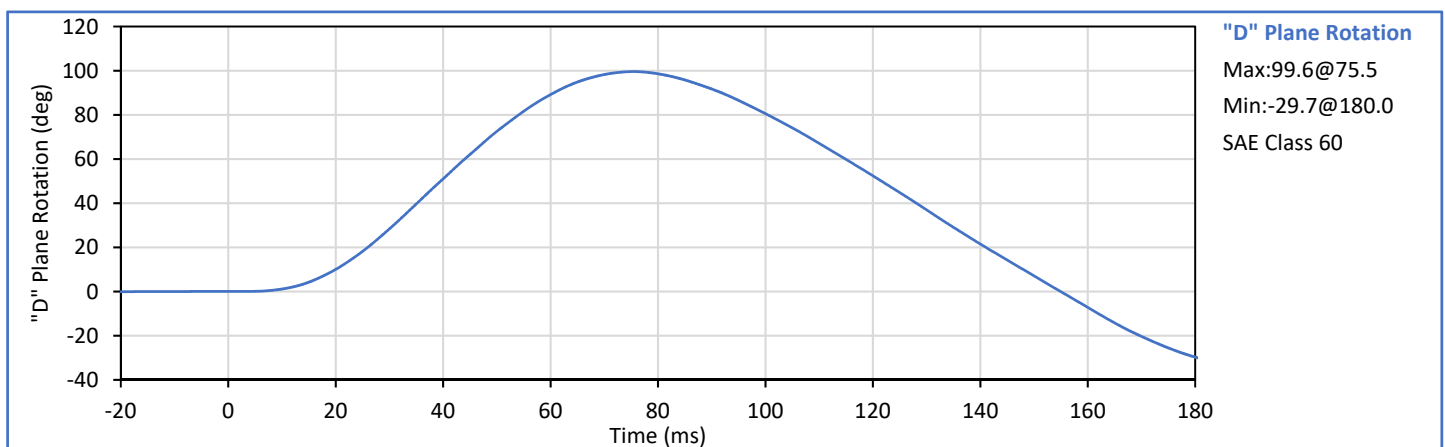
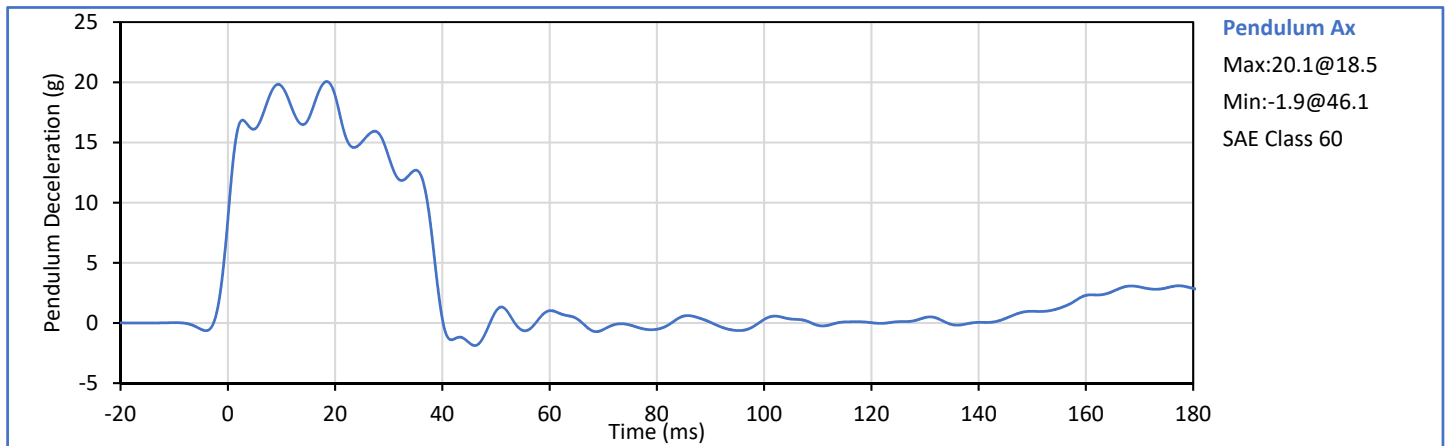


Hybrid III 50th Percentile Male
Neck Extension Test

ATD Serial No.: 360

Test Date: 2018-06-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	31	Pass
Pendulum Velocity	m/s	5.94	6.19	6.06	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	19.7	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.9	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.8	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	13.8	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	38.6	Pass
"D" Plane Rotation peak	deg	81.0	106.0	99.6	Pass
	ms	72.0	82.0	75.5	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	155.0	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-68.1	Pass
	ms	65.0	79.0	68.9	Pass
Moment Decay, Peak to Zero	deg	120.0	148.0	137.3	Pass
Overall Test Results					Pass



Technician: _____

J. Hernandez

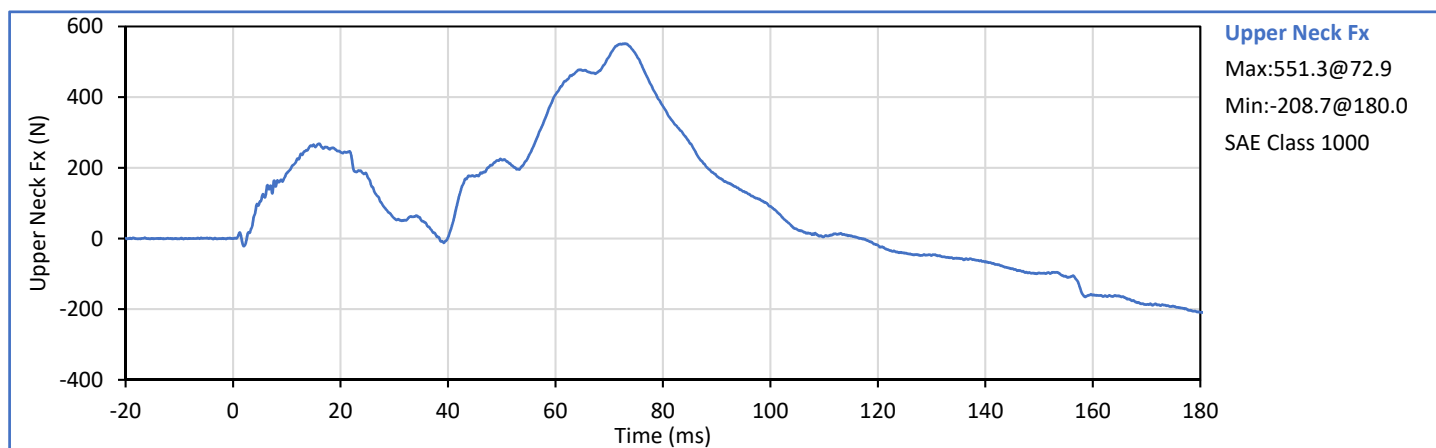
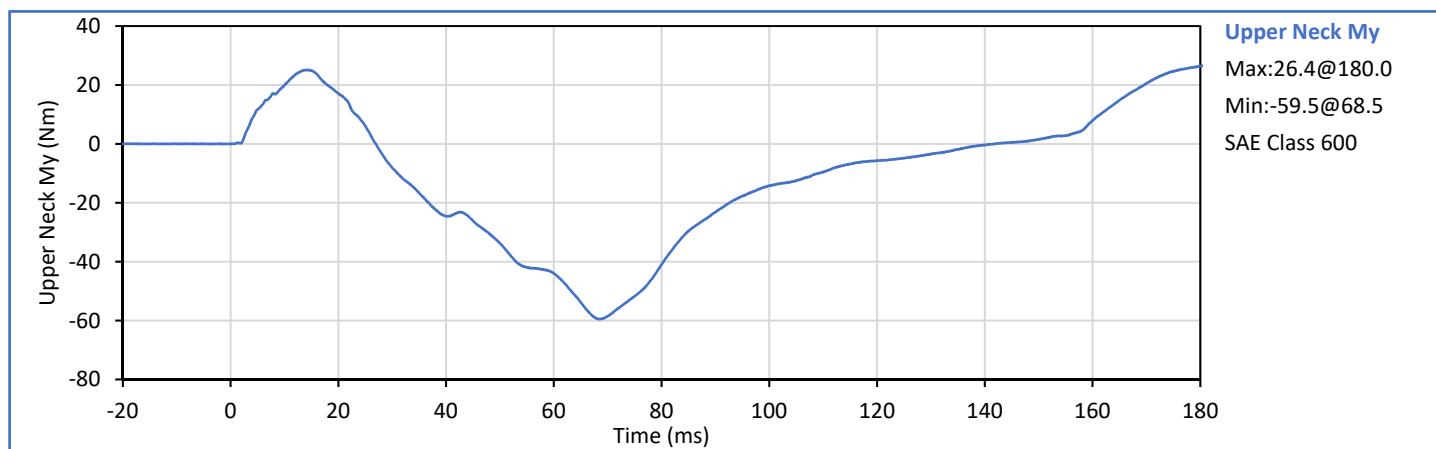
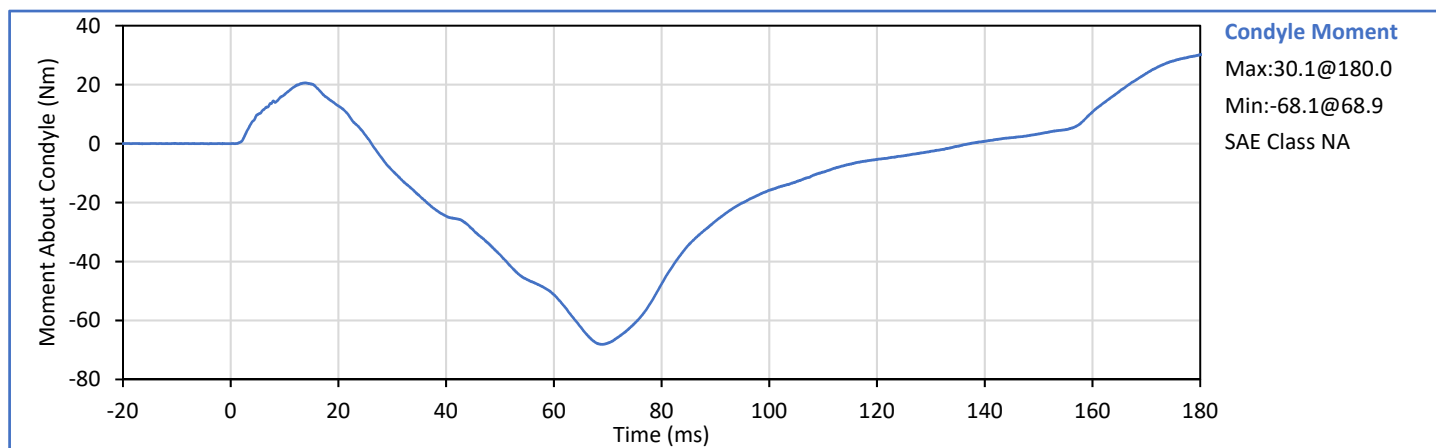
Approved By: _____

P. Puzzuto



ATD Serial No.: 360

Test Date: 2018-06-04

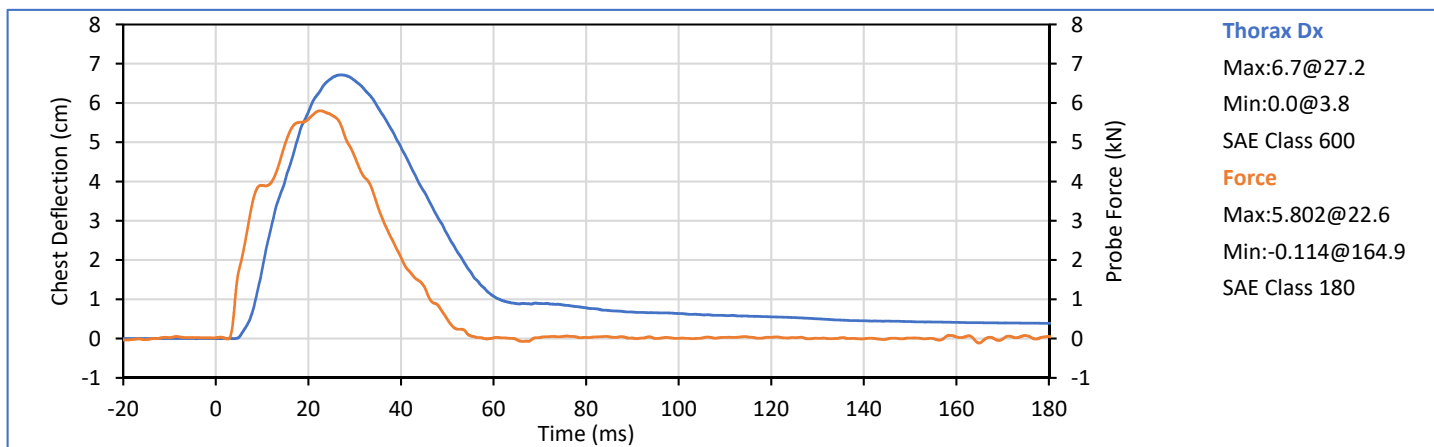
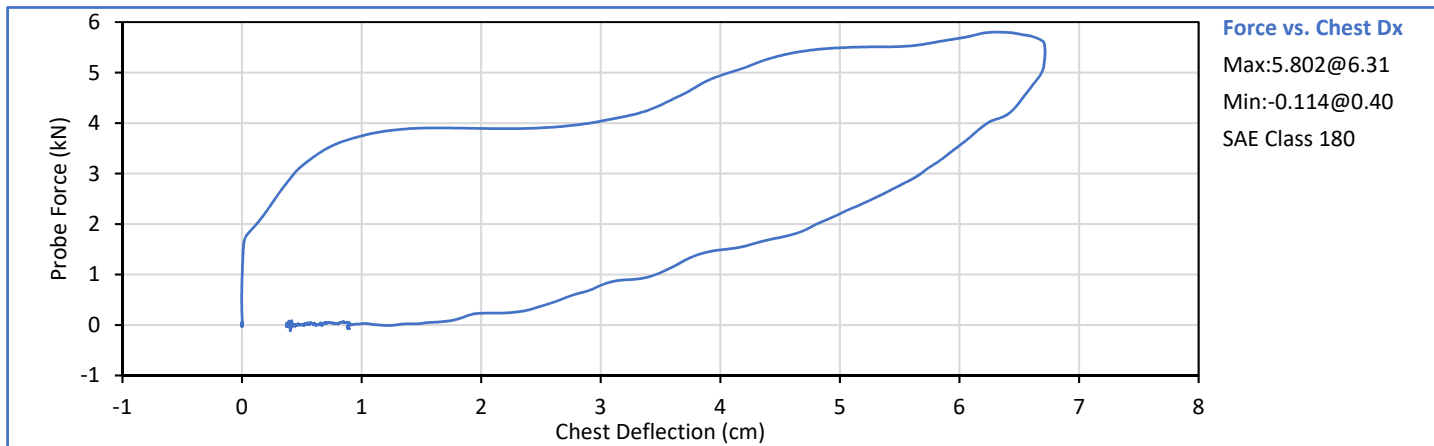




ATD Serial No.: 360

Test Date: 2018-06-02

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	26	Pass
Probe Velocity	m/s	6.58	6.82	6.68	Pass
Peak Chest Deflection	cm	6.35	7.26	6.72	Pass
Peak Probe Force	kN	5.159	5.893	5.802	Pass
Internal Hysteresis	%	69.0	85.0	69.5	Pass
Overall Test Results					Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

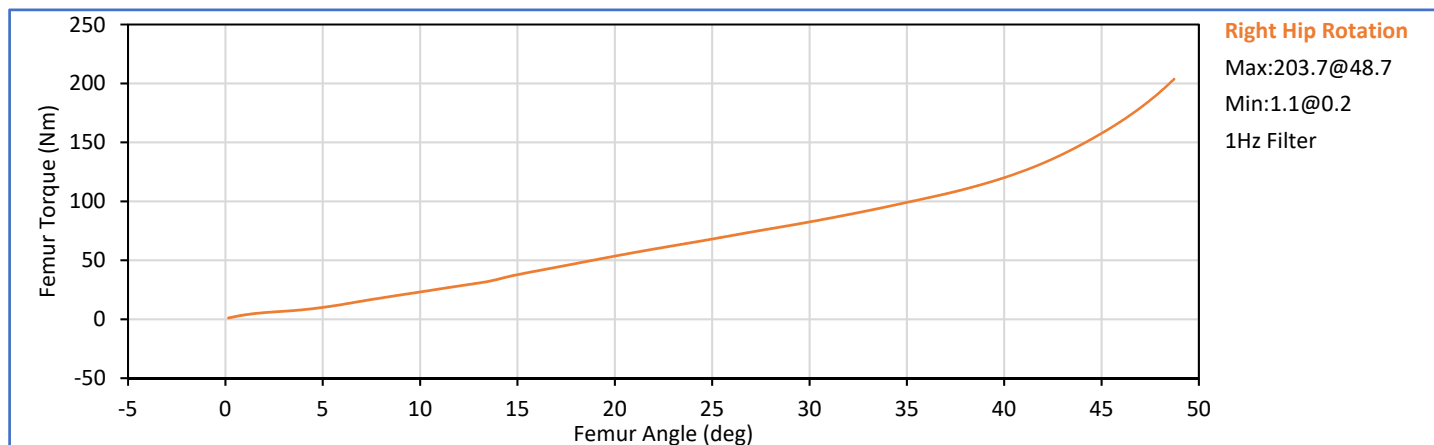
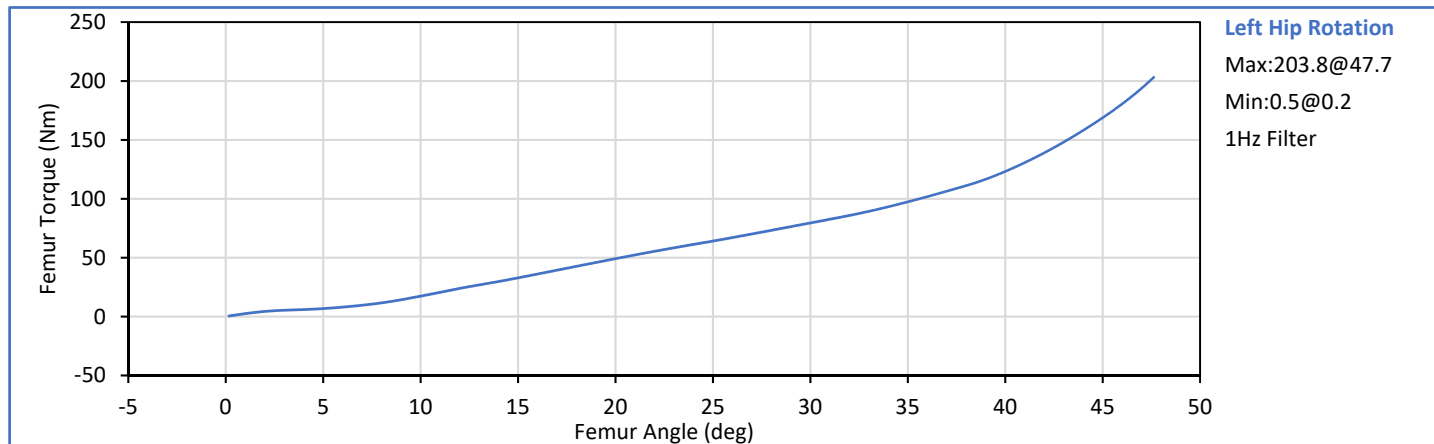


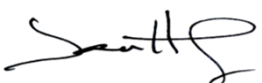
Hybrid III 50th Percentile Male
Hip Flexion (Left/Right)

ATD Serial No.: 360

Test Date: 2018-06-05

Tested Parameter		Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature		°C	18.9	25.6	21.2	Pass
Laboratory Humidity		%	10	70	21	Pass
Left Hip	Left Hip Rotation Rate	deg/s	5.0	10.0	5.8	Pass
	Left Femur Torque at 30°	Nm	0.0	95.0	79.6	Pass
	Left Hip Rotation at 203 Nm	deg	40.0	50.0	47.6	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	82.6	Pass
	Right Hip Rotation at 203 Nm	deg	40.0	50.0	48.7	Pass
Overall Test Results						Pass



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

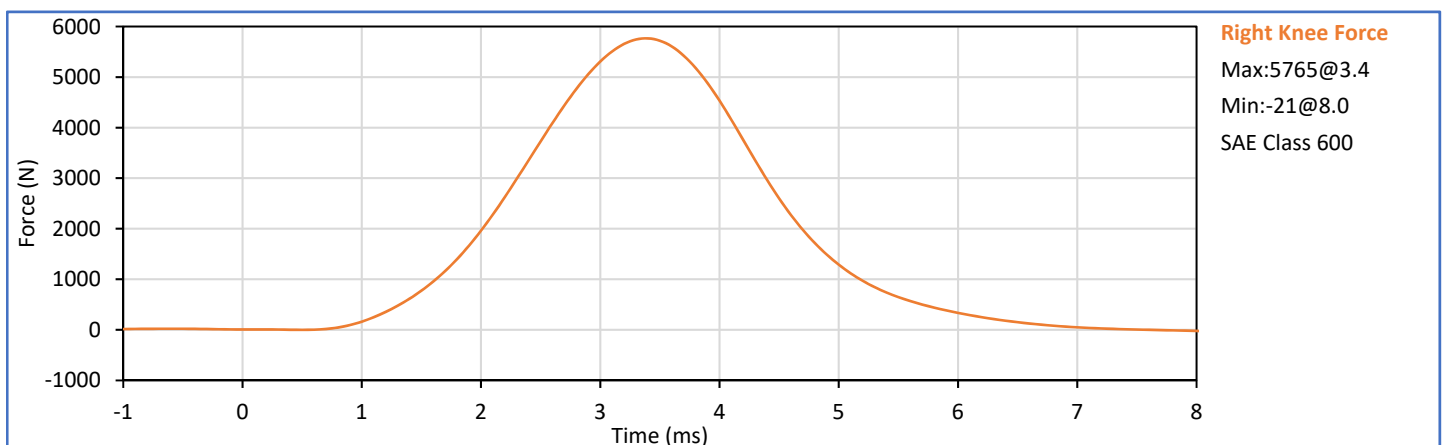
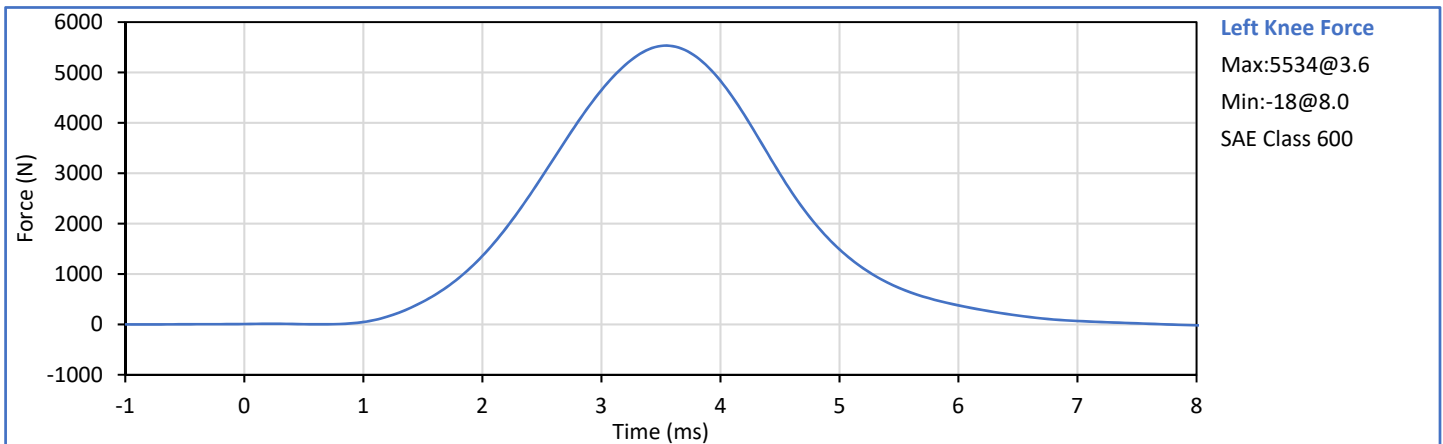


Hybrid III 50th Percentile Male
Knee Impact (Left/Right)

ATD Serial No.: 360

Test Date: 2018-06-05

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.2	Pass
	Laboratory Humidity	%	10	70	21	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.070	Pass
Knee	Peak Resistive Force	N	4715	5782	5534	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.070	Pass
Knee	Peak Resistive Force	N	4715	5782	5765	Pass
Overall Test Results					Pass	



Technician: T. Lowman

Approved By: P. Puzzuto



**Hybrid III 5th Percentile Female
Damage Checklist**

ATD Serial No.: 141

Test Date: 2018-06-02

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.	Bent shaft			✓
Assembly	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer	Head mounting secure			✓
Mounting	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:

Technician:

J. Hernandez

Approved By:

P. Puzzuto



Hybrid III 5th Percentile Female
External Measurements

ATD Serial No.: 141

Test Date: 2018-06-02

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

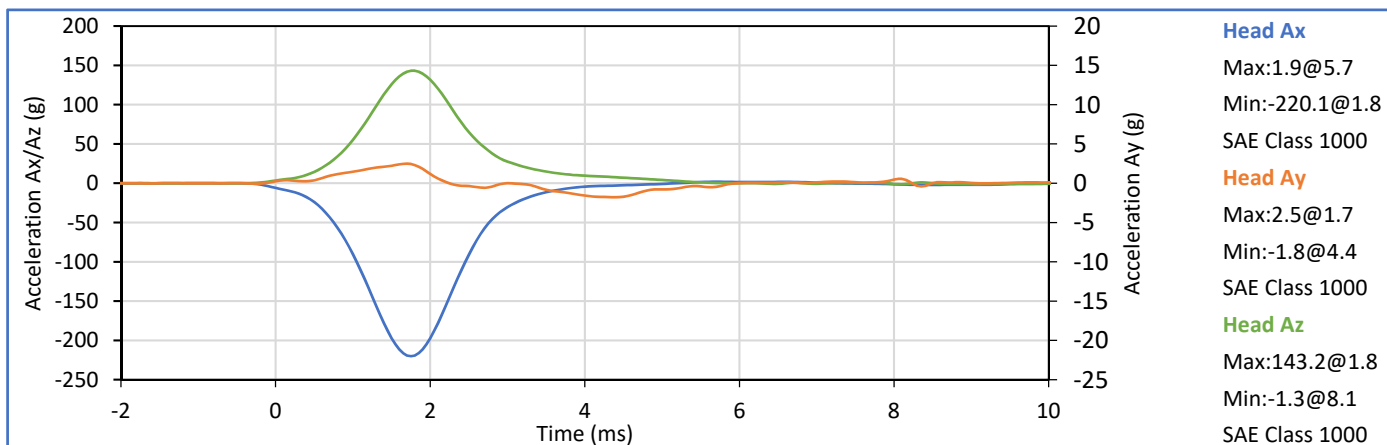
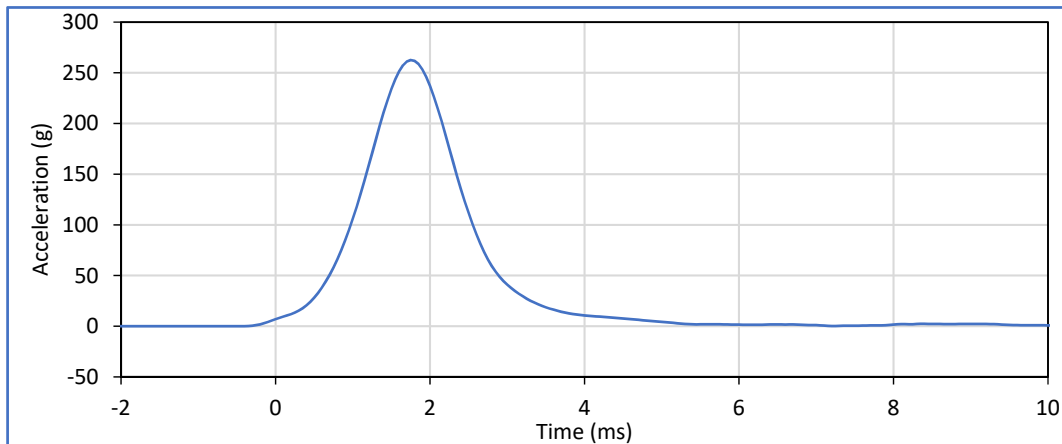


Hybrid III 5th Percentile Female Head Drop

ATD Serial No.: 141

Test Date: 2018-06-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	24.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Peak Resultant Acceleration	g	250.0	300.0	262.6	Pass
Peak Lateral Acceleration	g	-15.0	15.0	2.5	Pass
Oscillations After Main Pulse	%	0.0	10.0	0.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	



Technician:

T. Lowman

T. Lowman

Approved By:

P. Puzzuto

P. Puzzuto

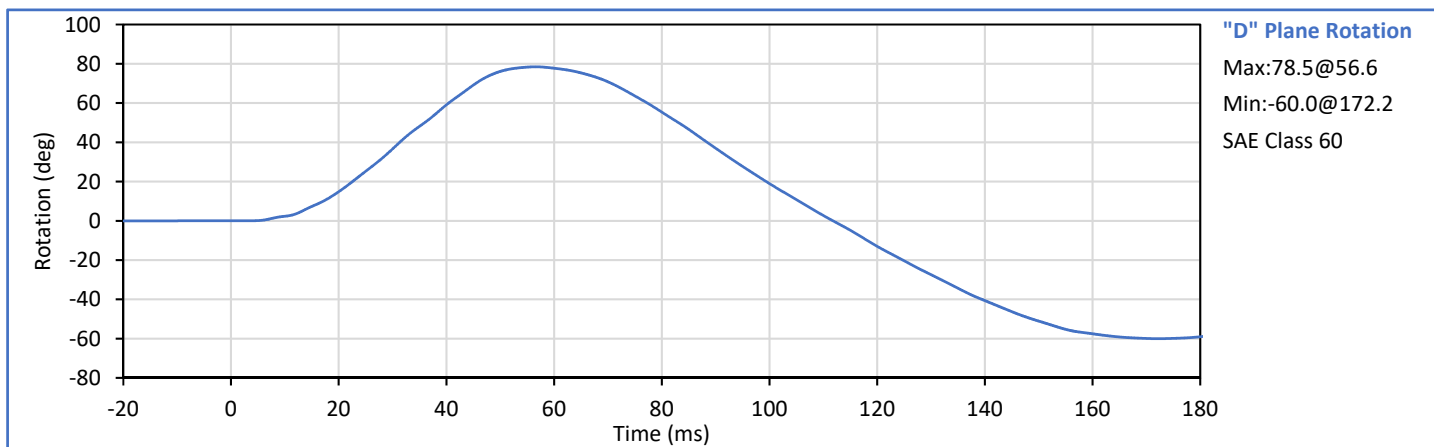
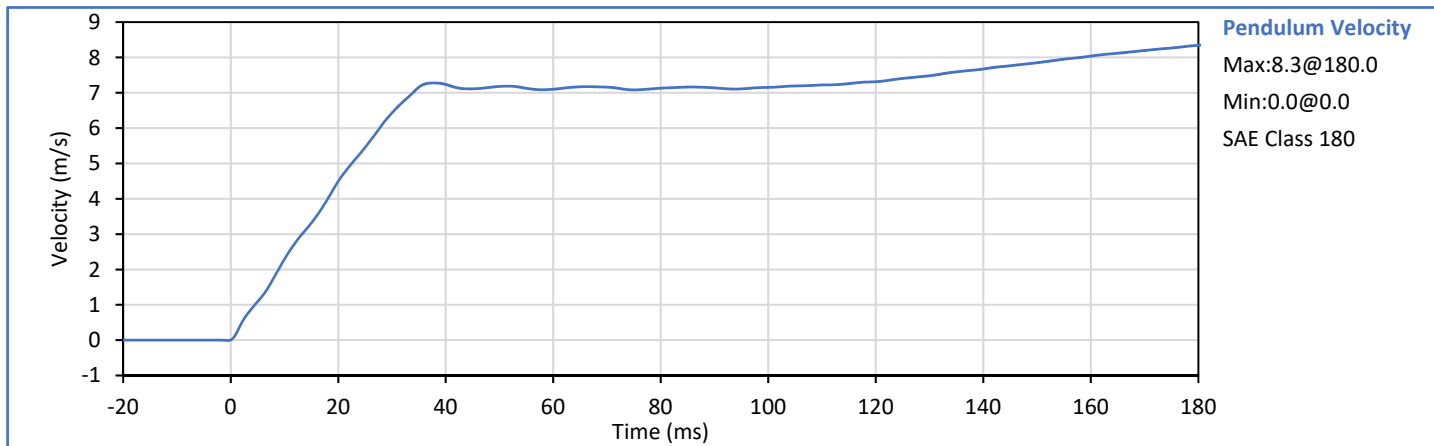


**Hybrid III 5th Percentile Female
Neck Flexion Test**

ATD Serial No.: 141

Test Date: 2018-06-04

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	6.89	7.13	6.98	Pass
Pendulum Velocity at 10 ms	m/s	2.10	2.50	2.29	Pass
Pendulum Velocity at 20 ms	m/s	4.00	5.00	4.50	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.43	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	78.5	Pass
Peak Moment in Rotation	Nm	69.0	83.0	81.0	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	83.9	Pass
Overall Test Results					Pass



Technician:

J. Hernandez

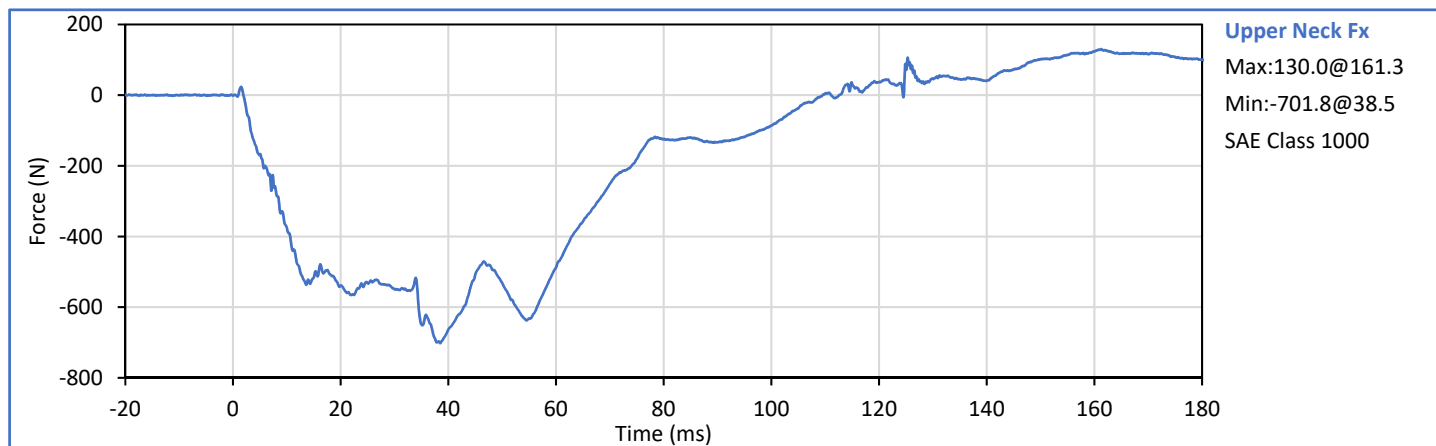
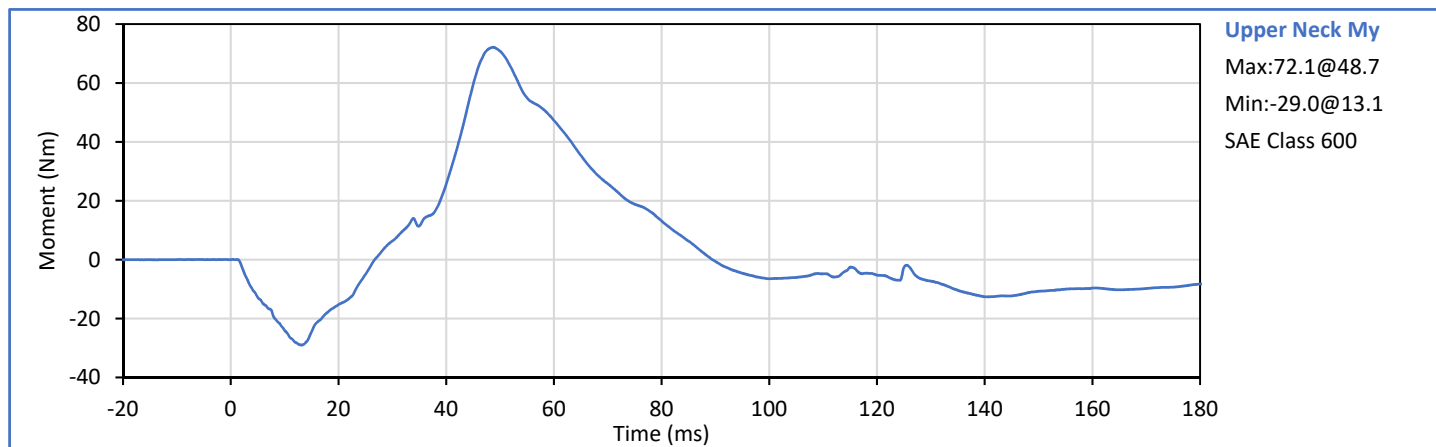
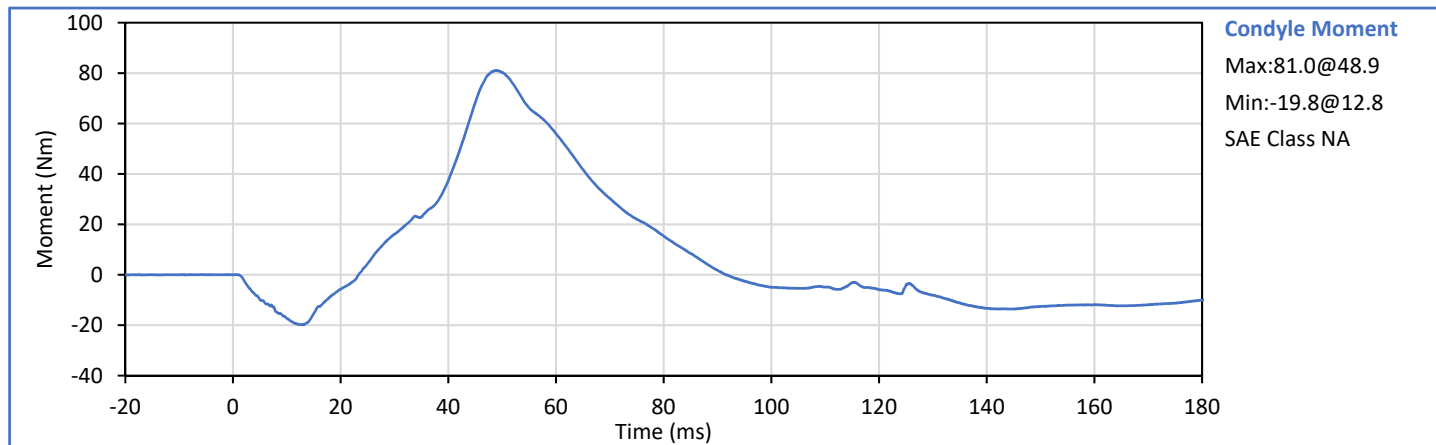
Approved By:

P. Puzzuto



ATD Serial No.: 141

Test Date: 2018-06-04



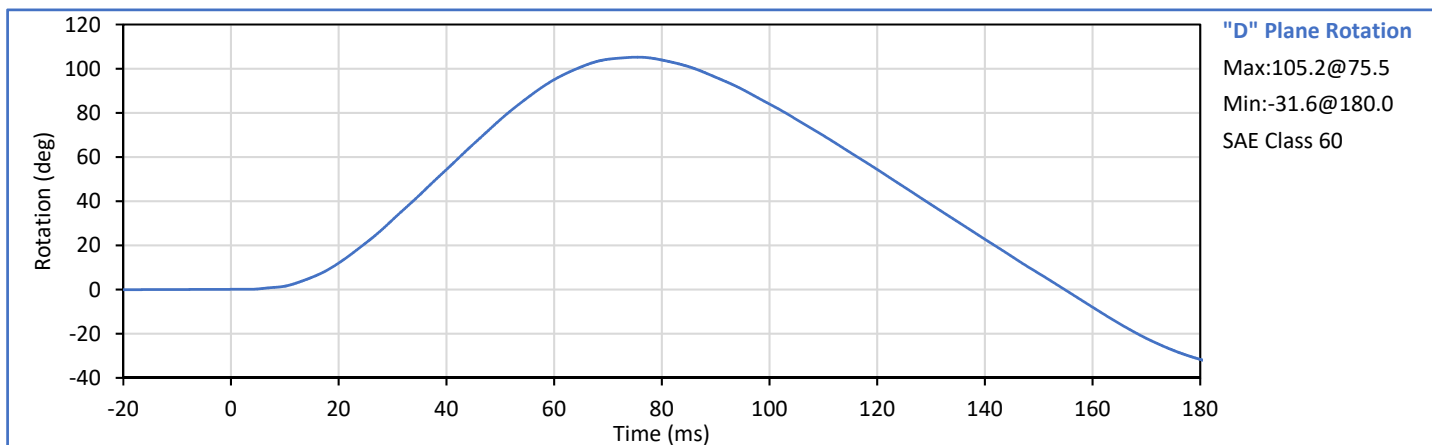
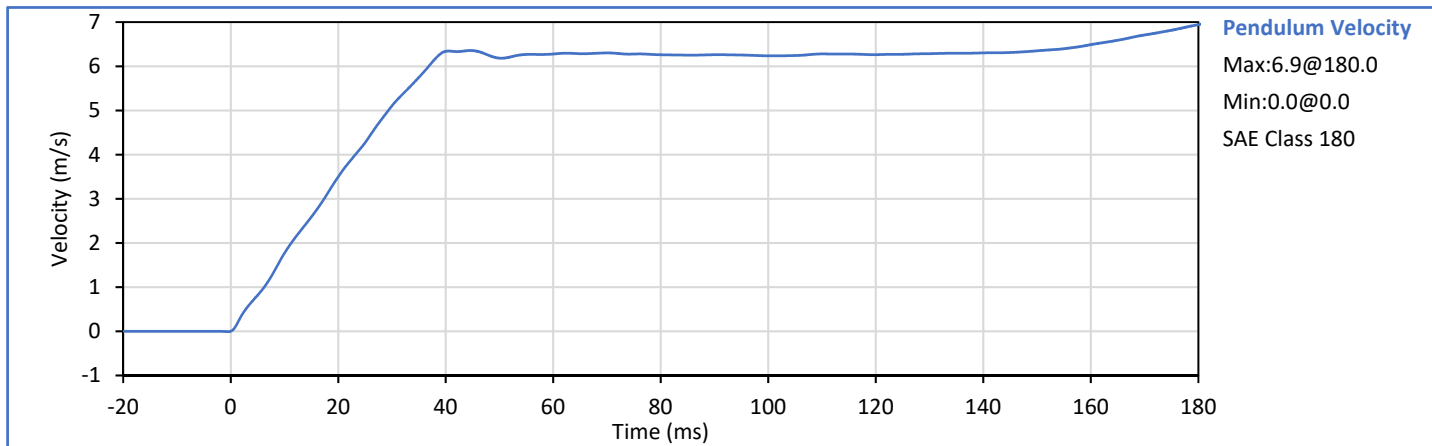


Hybrid III 5th Percentile Female
Neck Extension Test

ATD Serial No.: 141

Test Date: 2018-06-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	28	Pass
Pendulum Velocity	m/s	5.95	6.19	6.16	Pass
Pendulum Velocity at 10 ms	m/s	1.50	1.90	1.77	Pass
Pendulum Velocity at 20 ms	m/s	3.10	3.90	3.50	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	5.11	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	105.2	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-55.1	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	101.1	Pass
Overall Test Results					Pass



Technician:

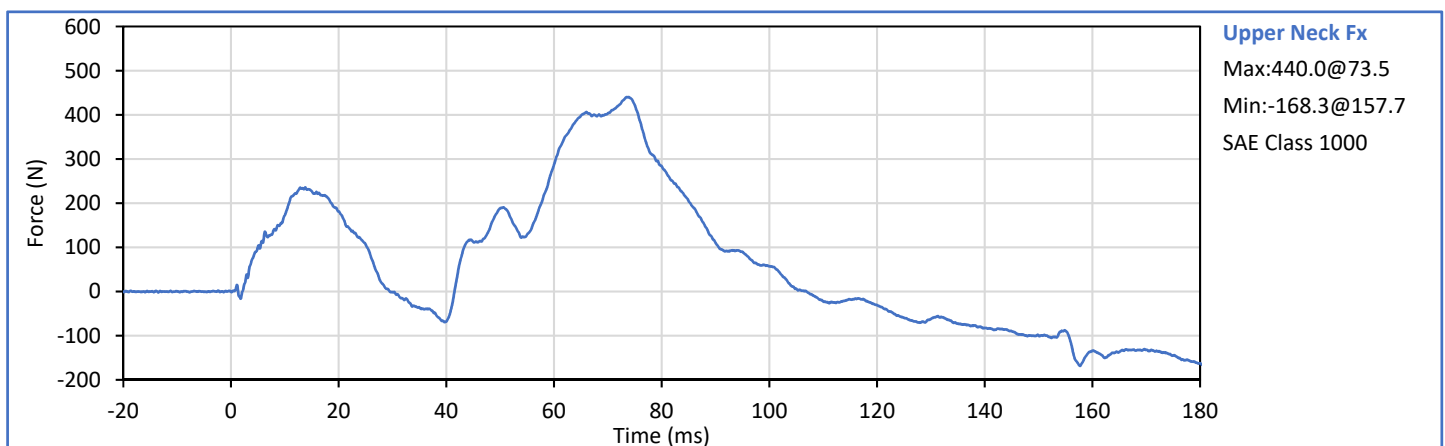
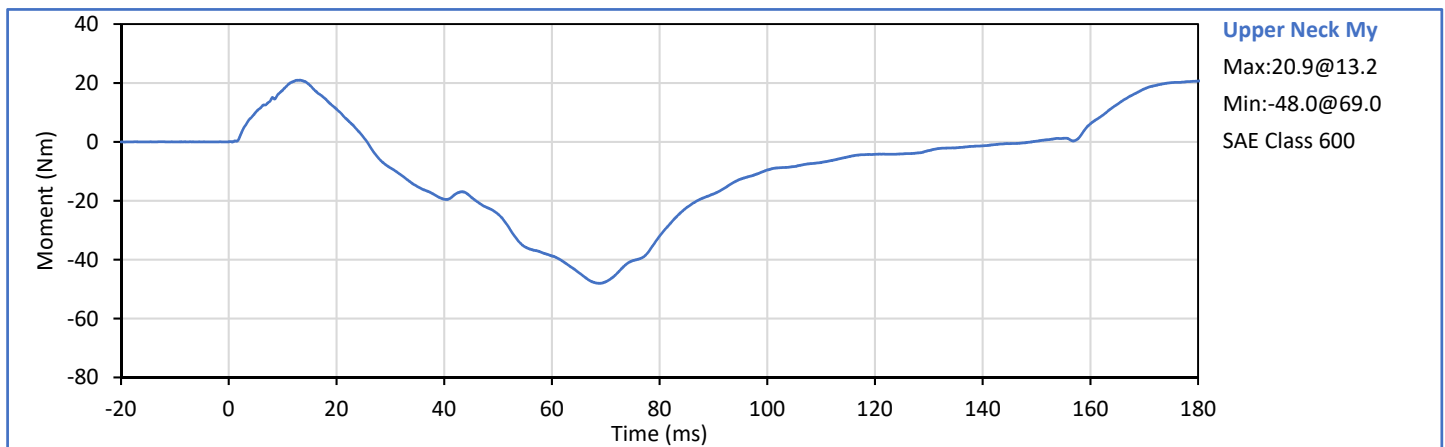
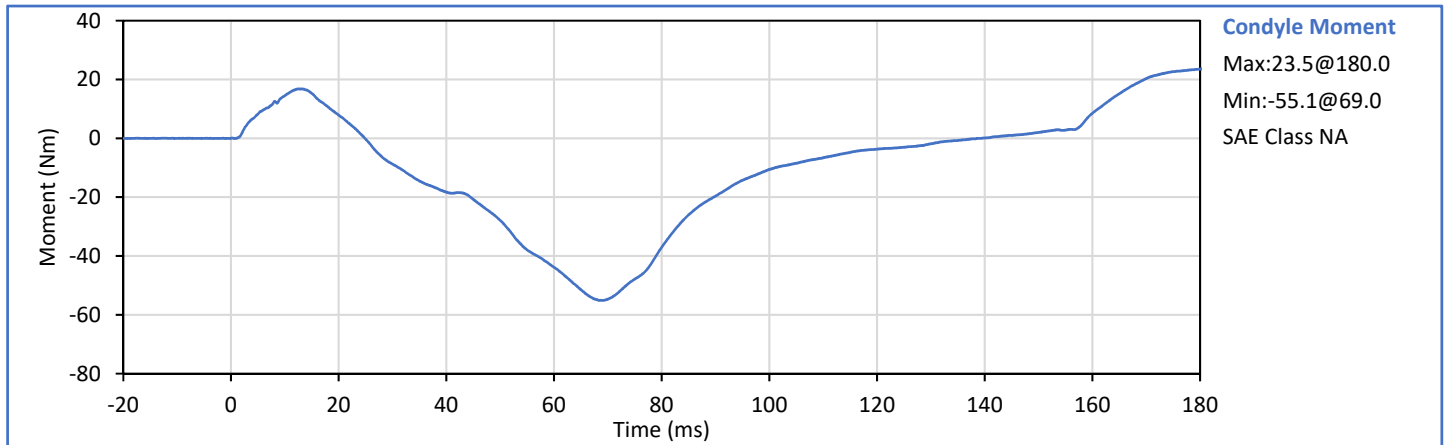
J. Hernandez

Approved By:

P. Puzzuto

ATD Serial No.: 141

Test Date: 2018-06-04



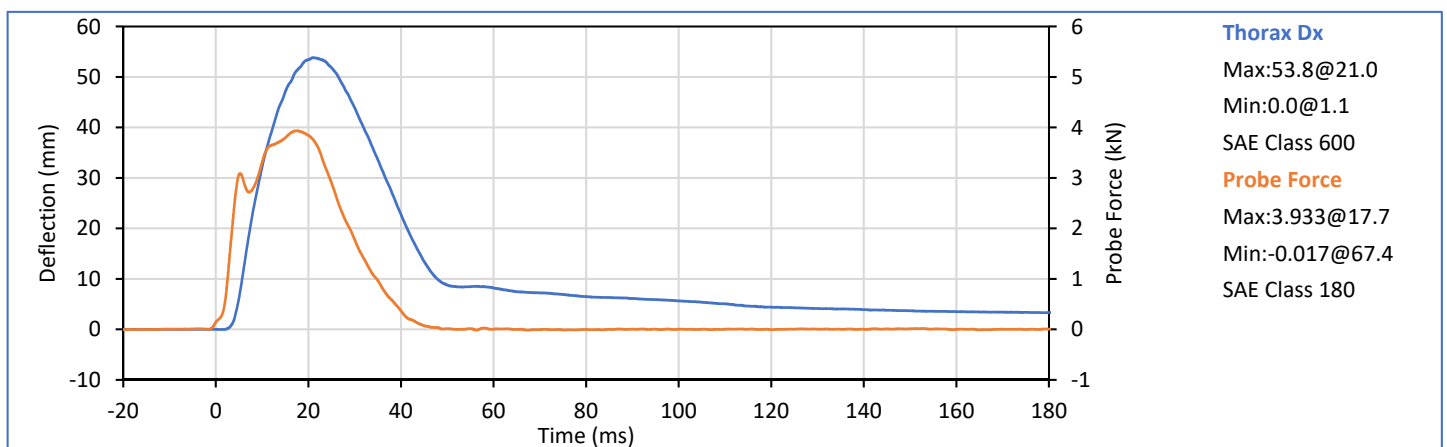
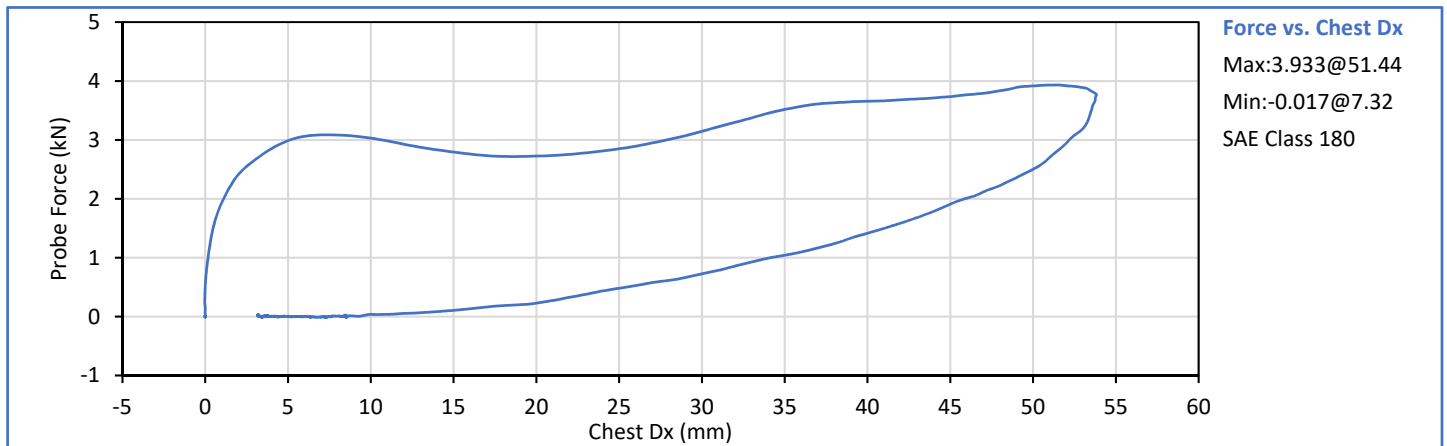


Hybrid III 5th Percentile Female Thorax Impact

ATD Serial No.: 141

Test Date: 2018-06-02

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	33	Pass
Probe Velocity	m/s	6.59	6.83	6.61	Pass
Peak Chest Deflection	mm	50.0	58.0	53.8	Pass
Peak Probe Force, 50 and 58 mm	kN	3.900	4.400	3.933	Pass
Peak Probe Force, 18 and 50 mm	kN	0.000	4.600	3.916	Pass
Internal Hysteresis	%	69.0	85.0	72.6	Pass
Overall Test Results					Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

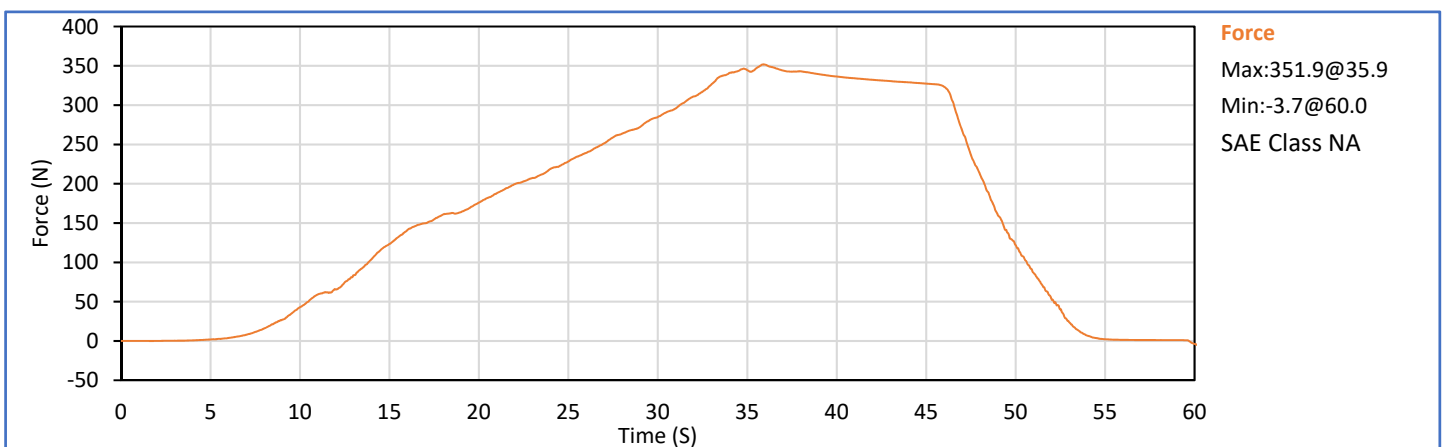
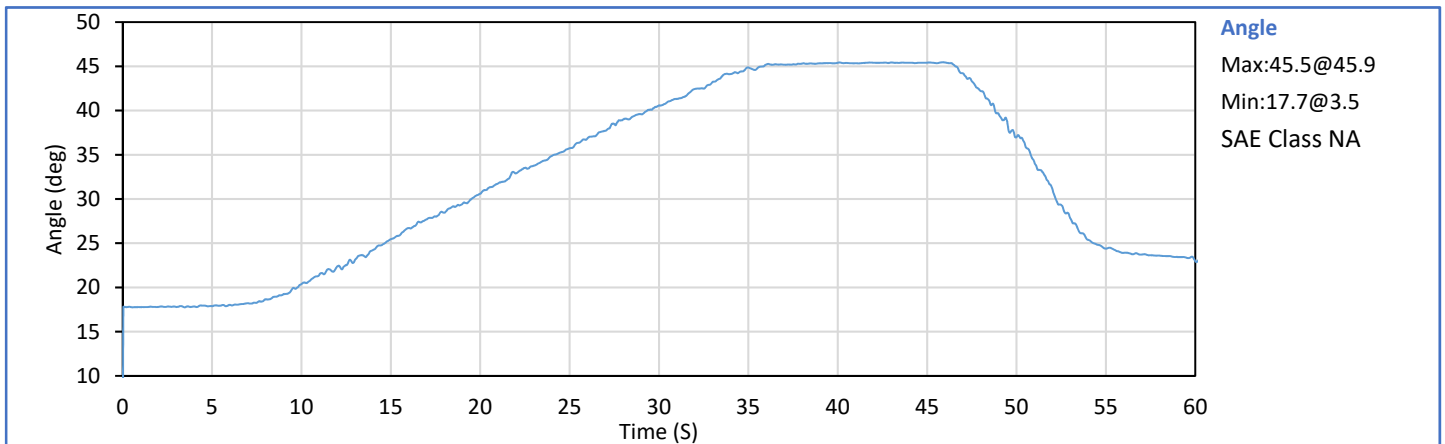


Hybrid III 5th Percentile Female Torso Flexion Test

ATD Serial No.: 141

Test Date: 2018-06-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	28	Pass
Orientation Angle	deg	0.0	20.0	15.1	Pass
Test Initial Angle	deg	11.0	19.0	17.8	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	351.6	Pass
Torso Flexion Rate	deg/s	0.50	1.50	0.95	Pass
Final Reference Plane Angle	deg	-8.0	8.0	3.7	Pass
Overall Test Results					Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

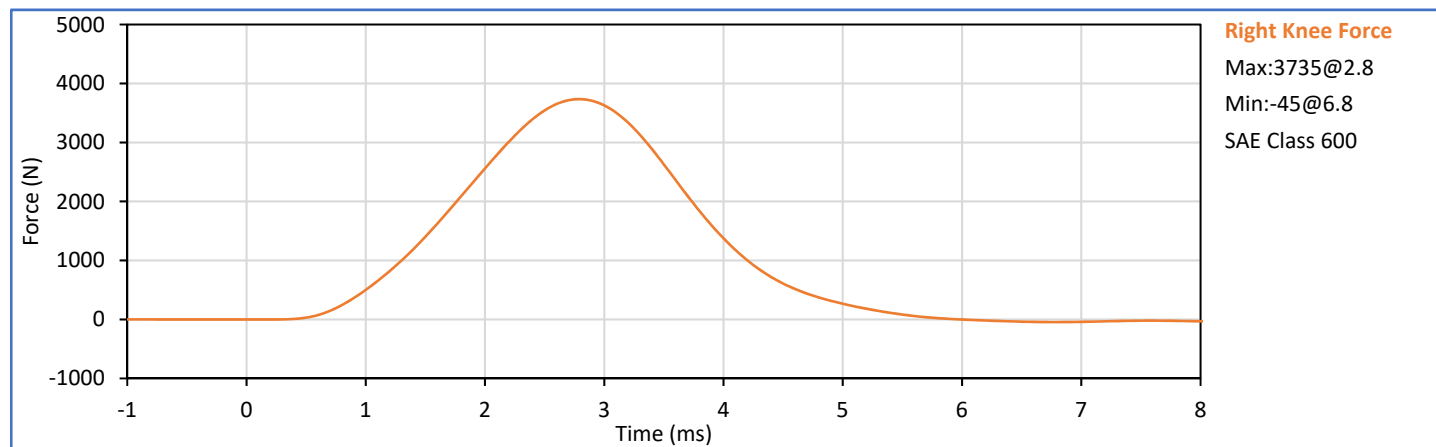
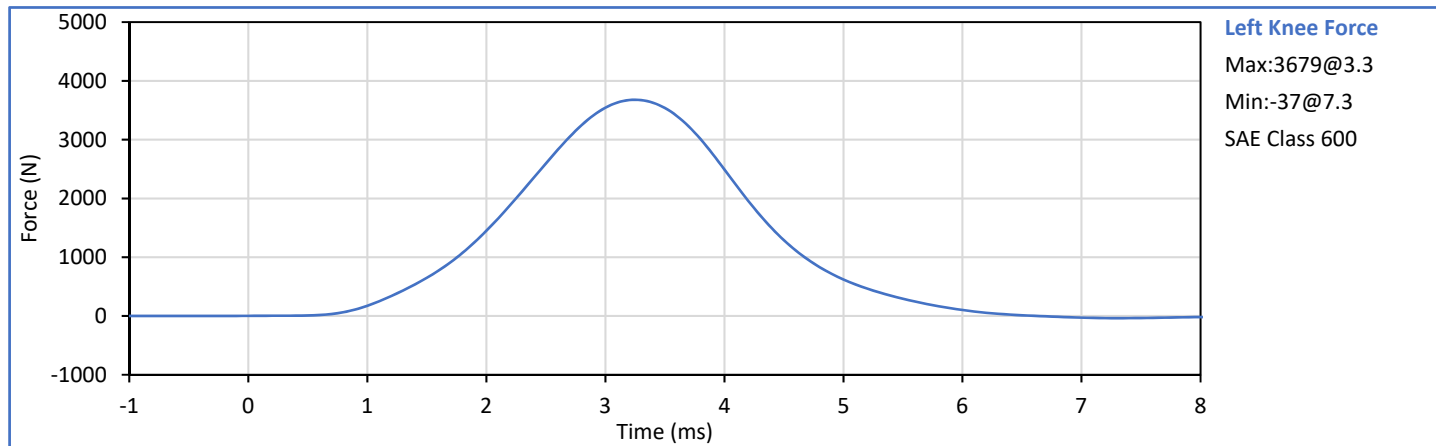


**Hybrid III 5th Percentile Female
Knee Impact (Left/Right)**

ATD Serial No.: 141

Test Date: 2018-06-04

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.1	Pass
	Laboratory Humidity	%	10	70	22	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.120	Pass
Knee	Peak Resistive Force	N	3450	4060	3679	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.122	Pass
Knee	Peak Resistive Force	N	3450	4060	3735	Pass
Overall Test Results					Pass	



Technician:

T. Lowman

Approved By:

P. Puzzuto