

REPORT NUMBER: NCAP-KAR-18-014

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

**NISSAN MOTOR CO., LTD.
2018 NISSAN ARMADA SV 4WD 5-DOOR MPV**

NHTSA NUMBER: M20185200

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



MAY 3, 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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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2018 Nissan Armada SV 4WD 5-door MPV 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 April 19, 2018. The impact velocity of the vehicle was 56.73 km/h and the ambient temperature at the barrier face at the time of impact was 15.0°C. The target vehicle's post-test maximum crush was 817 mm at DPD4 to the right of the vehicle's centerline. The test vehicle's performance is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>258.1</td> <td>700</td> <td>254.7</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-37</td> <td>52</td> <td>-22</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.43</td> <td>1</td> <td>0.38</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1676.2</td> <td>2620</td> <td>1117.7</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-424.7</td> <td>2520</td> <td>-679.3</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10000</td> <td>-3902.6</td> <td>6800</td> <td>-2263.4</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10000</td> <td>-1641.5</td> <td>6800</td> <td>-2641.3</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	258.1	700	254.7	Maximum Chest Compression	mm	63	-37	52	-22	Nij	N/A	1	0.43	1	0.38	Neck Tension	N	4170	1676.2	2620	1117.7	Neck Compression	N	4000	-424.7	2520	-679.3	Left Femur Force	N	10000	-3902.6	6800	-2263.4	Right Femur Force	N	10000	-1641.5	6800	-2641.3
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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 Armada SV 4WD 5-door MPV at a velocity of 56.73 km/h. The test was performed at KARCO Engineering, LLC. on April 19, 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. 630) 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 817 mm at DPD4 to the right 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. Both the left and right knees contacted the knee bolster.

The passenger's visible contact points were as follows: The passenger ATD's head contacted the frontal airbag, headrest, seat back. 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)	258.1	62.4	77.4	-37	0.43	1676.2	-424.7	-3902.6	-1641.5
Passenger (5th)	254.7	57.0	72.0	-22	0.38	1117.7	-679.3	-2263.4	-2641.3

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV NHTSA No.: M20185200
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

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 Armada SV 4WD 5-Door MPV NHTSA No.: M20185200
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20185200
Model Year	2018
Make	Nissan
Model	Armada SV
Body Style	5-Door MPV
VIN	JN8AY2NC0J9555172
Body Color	Brilliant Silver
Odometer Reading (km / mi)	42 / 26
Engine Displacement (L)	5.6
Type / No. of Cylinders	V8
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	7
Overdrive	Yes
Final Drive	4WD
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	Yes
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., LTD.
Date of Manufacture	Sep-17

GVWR (kg)	3401
GAWR Front (kg)	1640
GAWR Rear (kg)	1970

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench	Bench		
Designated Seating Capacity	2	3	3	8	
Capacity Weight (VCW) (kg)				750.0	A
DSC x 68.04 (kg)				544.3	B
Cargo Weight (RCLW) (kg)*				205.7	A-B

*For trucks or MPVs, if A-B>136, RCLW=136 kg

DATA SHEET NO. 1 ... (CONTINUED)

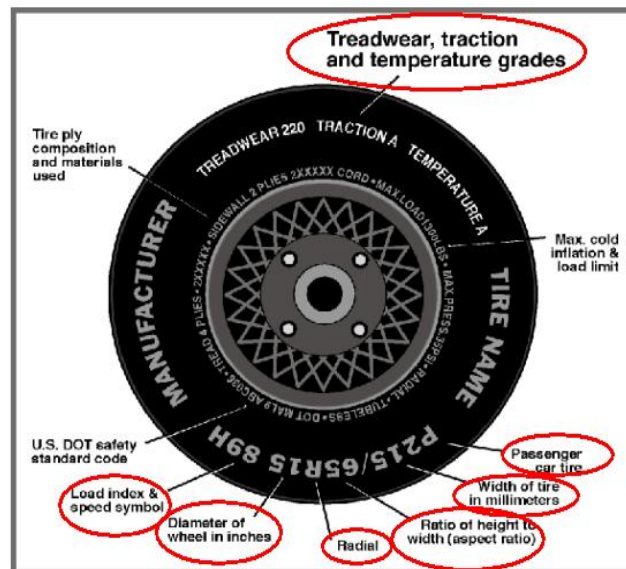
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	P265/70R18	P265/70R18
Tire Size on Vehicle	P265/70R18	P265/70R18
Tire Manufacturer	Dunlop	Dunlop
Tire Model	Grand Trek	Grand Trek
Treadwear	360	360
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	116H	116H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	V4D6 3DDR 3917	V4D6 3DDR 3917
DOT Safety Code Right	V4D6 3DDR 3817	V4D6 3DDR 3917

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

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV NHTSA No.: M20185200
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	679.0	649.5		711.0	770.5	
Right	kg	685.0	626.0		696.0	732.0	
Ratio	%	51.7%	48.3%	100.0%	48.4%	51.6%	100.0%
Total	kg	1364.0	1275.5	2639.5	1407.0	1502.5	2909.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2639.5	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	C
Calculated Vehicle Target Weight (TVTW)	kg	2916.5	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	1015	1016	1005	1013	1484
As Tested	mm	999	1002	912	922	1585
Post-Test	mm	969	996	916	931	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheelbase	mm	3070
Total Vehicle Length at Left Side	mm	4723
Total Vehicle Length at Centerline	mm	5300
Total Vehicle Length at Right Side	mm	4727
Weight of Ballast in Cargo Area	kg	181.5
Weight of Vehicle Components Removed	kg	22.0
Amount of Stoddard Solvent in Fuel Tank	L	91.52

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk Trim (4.0 kg), 3rd Row Seat (18.0 kg)

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

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV NHTSA No.: M20185200
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test
1	Total Length	5300
2	Total Width	2029
3	Bumper Top Height	840
4	Bumper Bottom Height	460
5	Longitudinal Member Top Height	620
6	Distance Between Longitudinal Members	870
7	Longitudinal Member Width	50
8	Engine Top Height	1200
9	Engine Bottom Height	284
10	Engine and Gearbox Width	740
11	Front Bumper to Engine Distance	713
12	Front Shock Absorber Fixing Height	800
13	Bonnet Leading Edge Height	1130
14	Front Shock Absorber Fixing Width	1220
15	Front Bumper to Front Axle Distance	965
16	Front Axle to A-Pillar Distance	630
17	A-Pillar to B-Pillar Distance	997
18	B-Pillar to Rear Axle Distance	1320
19	B-Pillar to C-Pillar Distance	951
20	Roof Sill Bottom Height	1690
21	Roof Sill Top Height	1827
22	Floor Sill Bottom Height	395
23	Floor Sill Top Height	510

All measurements in millimeters.

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

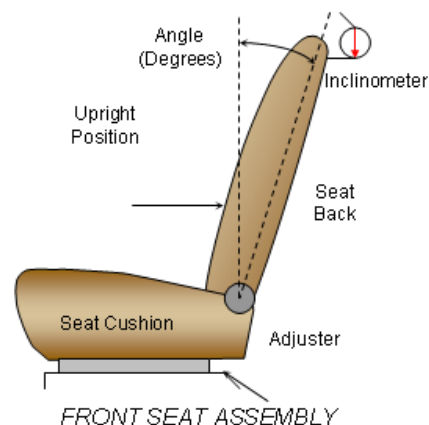
Test Date: 04/19/18

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.

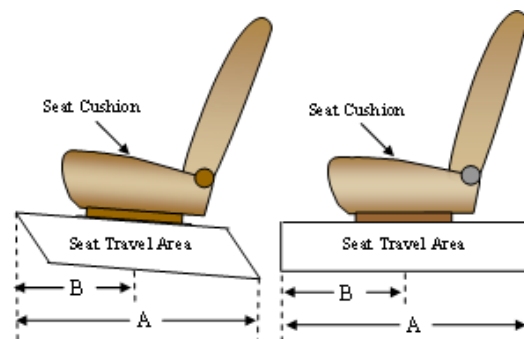
SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	10.9
Passenger Seat Back Angle	11.7



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	272 mm	136 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	4	H
Passenger Seat	4	H

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

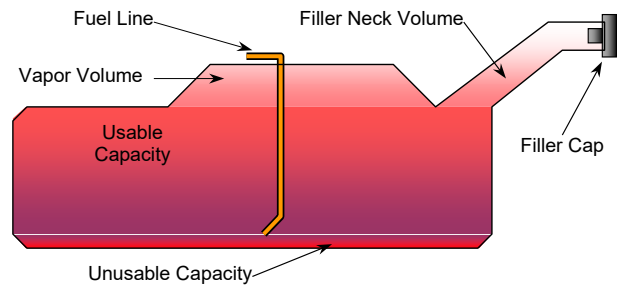
Test Date: 04/19/18

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	98.41
Usable Capacity of "Optional Tank"	N/A
92 - 94% of Usable Capacity	90.54 to 92.51
Actual Amount of Stoddard Solvent Used	91.52
1/3 of Usable Capacity	32.80

FUEL PUMP

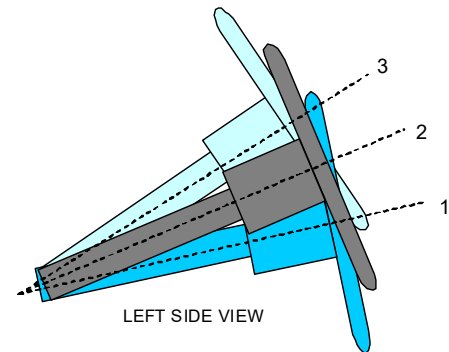
The vehicle is equipped with an electric fuel pump. The fuel pump starts pumping fuel approximately 1 second after the ignition is switched to "ON", while the engine is running, and approximately for 1.5 seconds after the engine stops running.



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.



LEFT SIDE VIEW

STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	16.9	102
Geometric Center Position, No. 2	23.9	119
Uppermost Position, No. 3	30.9	135
Telescoping Steering Wheel Travel		33
Test Position	23.9	119

DATA SHEET NO. 3

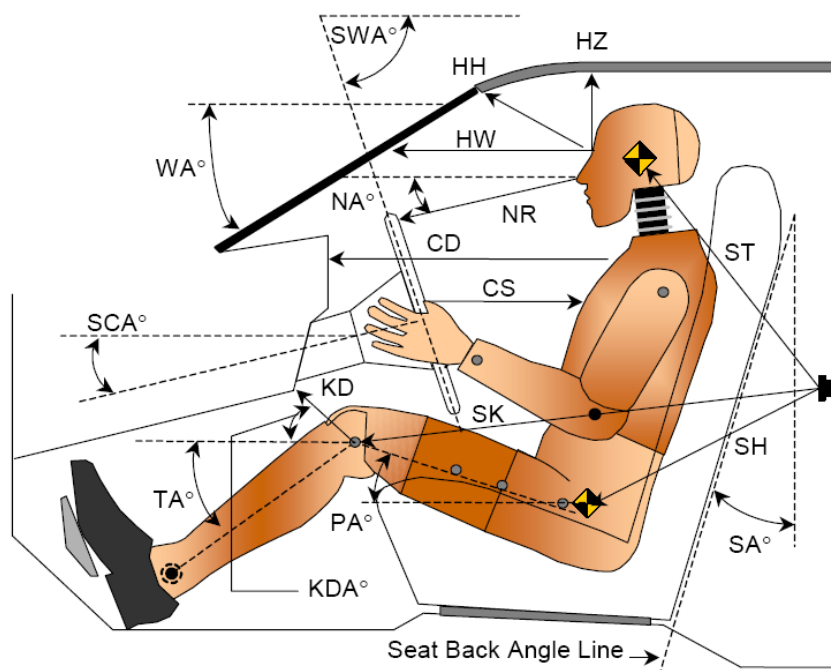
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		32.3		
SWA°	Steering Wheel Angle		23.9		
SCA°	Steering Column Angle		66.1		
SA°	Seat Back Angle (On Headrest Post)		10.9		11.7
HZ	Head to Roof	205	90.0	251	90.0
HH	Head to Header	384	25.3	360	47.0
HW	Head to Windshield	643	0.0	629	0.0
NR	Nose to Rim	349	12.1	429	35.0
CD	Chest to Dash	496	14.6	378	10.4
CS	Chest to Steering Hub	258	6.0		
RA	Rim to Abdomen	149	0.0		
KDL	Left Knee to Dash	138	29.5	82	30.4
KDR	Right Knee to Dash	116	22.1	79	31.5
PA°	Pelvic Angle		20.3		22.3
TA°	Tibia Angle		51.5		60.3
SK	Striker to Knee	630	5.9	729	0.0
ST	Striker to Head	614	75.2	572	63.2
SH	Striker to H-Point	253	13.8	395	5.7

DATA SHEET NO. 4

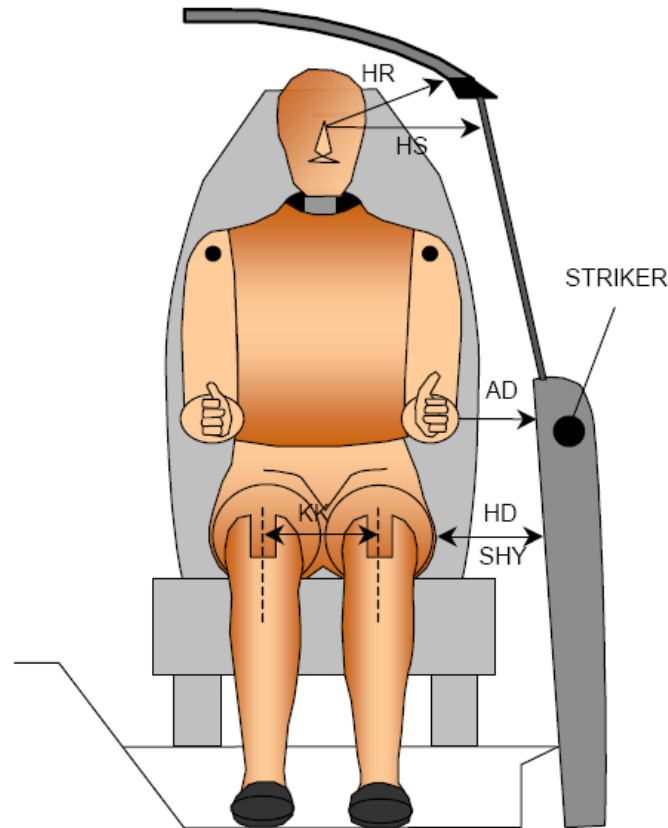
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	109	83
HD	H-Point to Door	130	188
HR	Head to Side Header	253	293
HS	Head to Side Window	345	361
KK	Knee to Knee	330	225
SHY	Striker to H-Point (Y-Direction)	257	286
AA	Ankle to Ankle	365	165

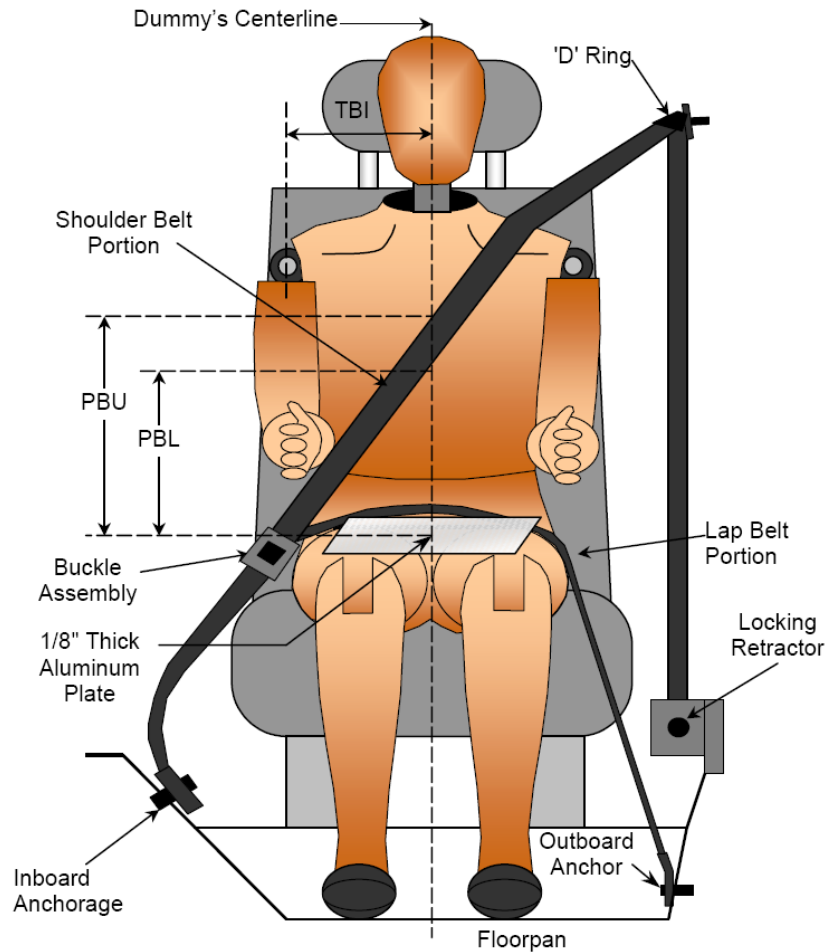
DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



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	350	332
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	270	240

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	1000	1041
Lap Belt Length as Measured on ATD	mm	945	953
Remainder of Belt on Reel	mm	690	718
Total Belt Length for Continuous Webbing Systems	mm	2635	2712

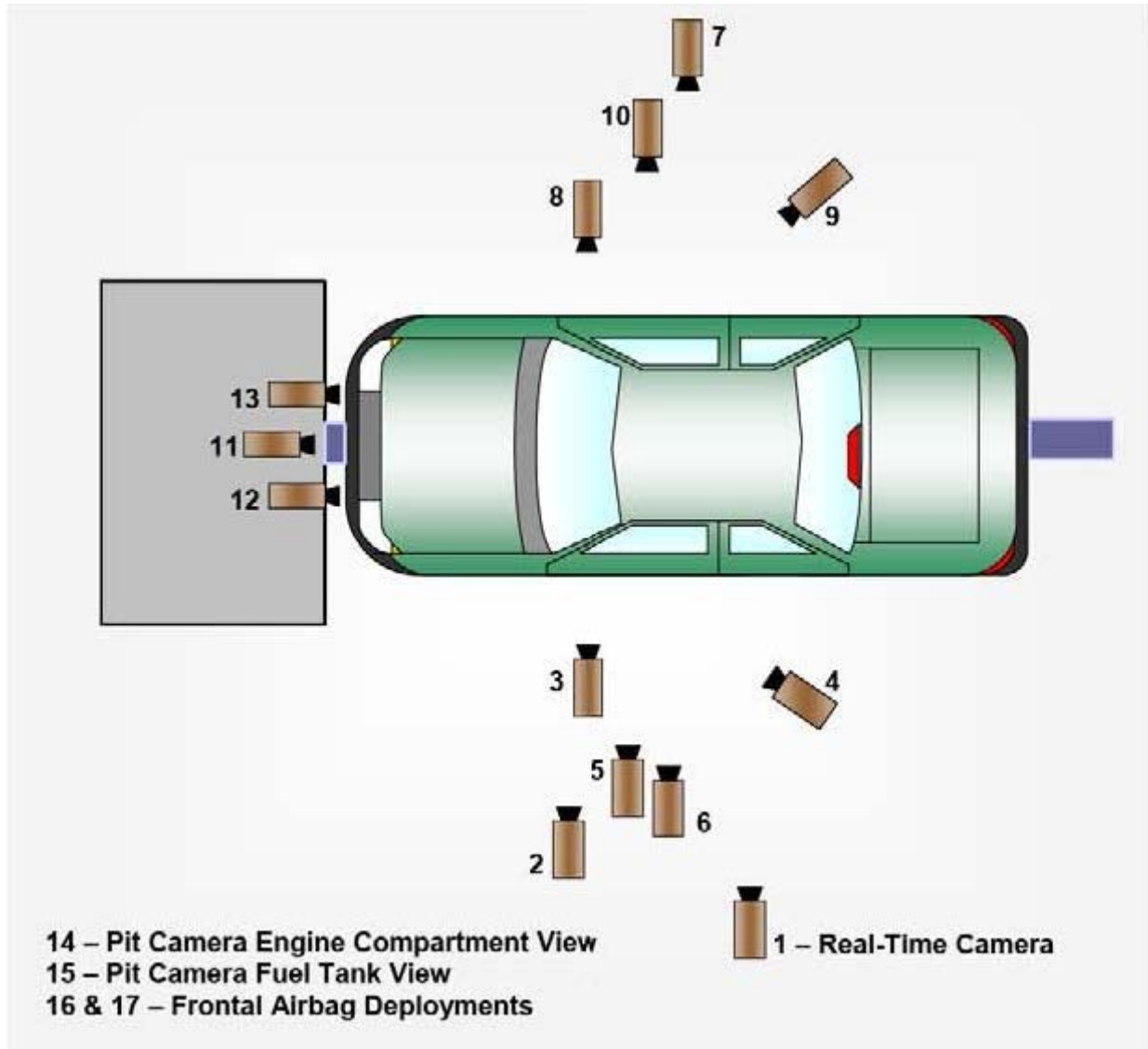
DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 ... (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

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)	-1800	510	-1700	8	1000
17	Onboard Passenger Airbag (Optional)	-1800	-510	-1700	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

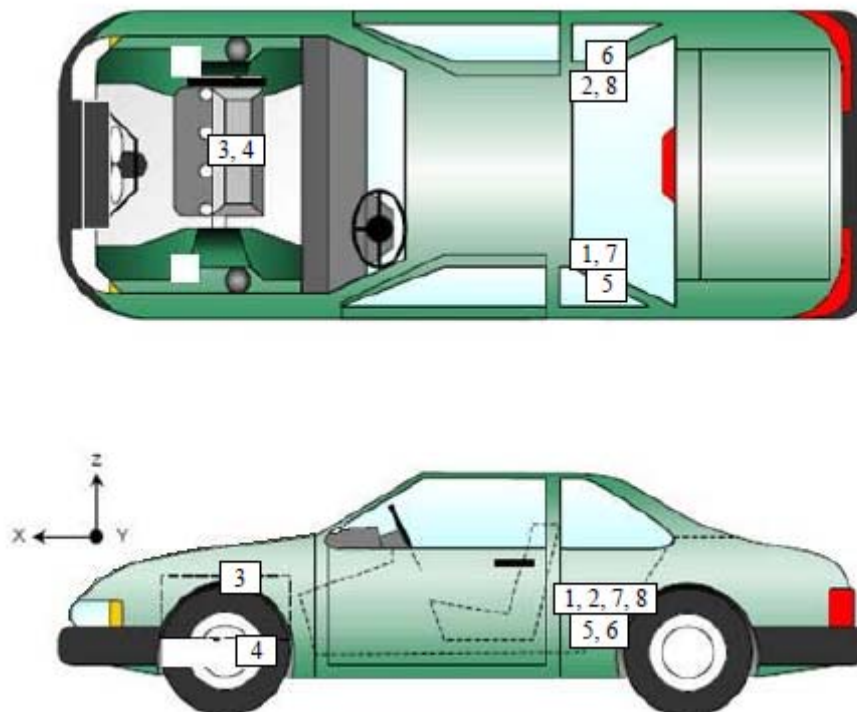
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	2160	-810	-480
2	Right Rear Accelerometer X-Direction	2160	810	-480
3	Engine Top X	4540	20	-1170
4	Engine Bottom X	3700	40	-260
5	Left Rear Accelerometer Z-Direction	2160	-810	-480
6	Right Rear Accelerometer Z-Direction	2160	-810	-480
7	Left Rear Accelerometer X-Direction Redundant	2185	-810	-480
8	Right Rear Accelerometer X-Direction Redundant	2185	810	-480

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

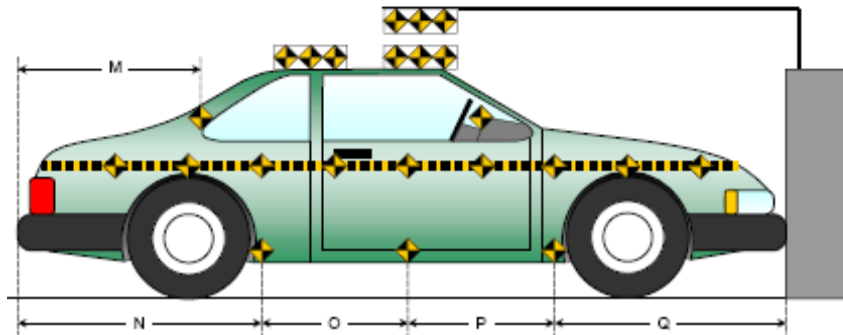
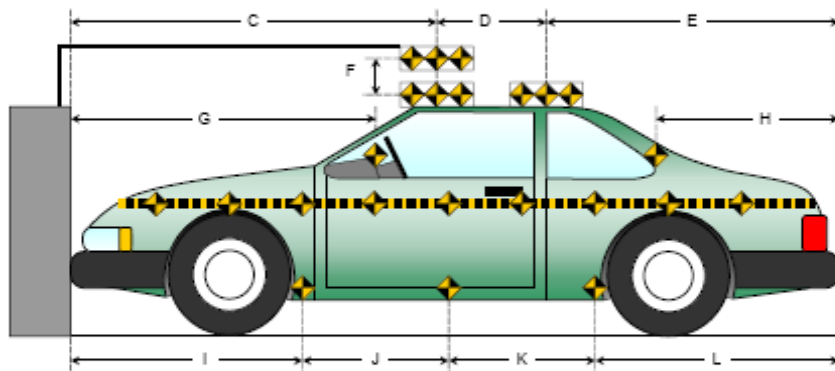
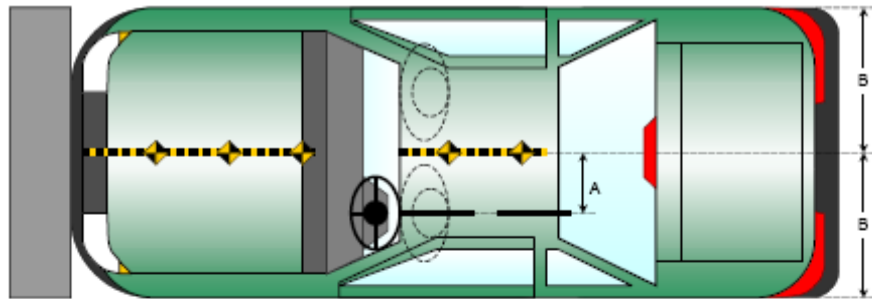
Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18

Item	Value
A	500
B	1015
C	2310
D	610
E	2372
F	305
G	1880
H	730
I	1513
J	994
K	994
L	1795
M	730
N	1793
O	994
P	994
Q	1512



All measurements in millimeters.

DATA SHEET NO. 9

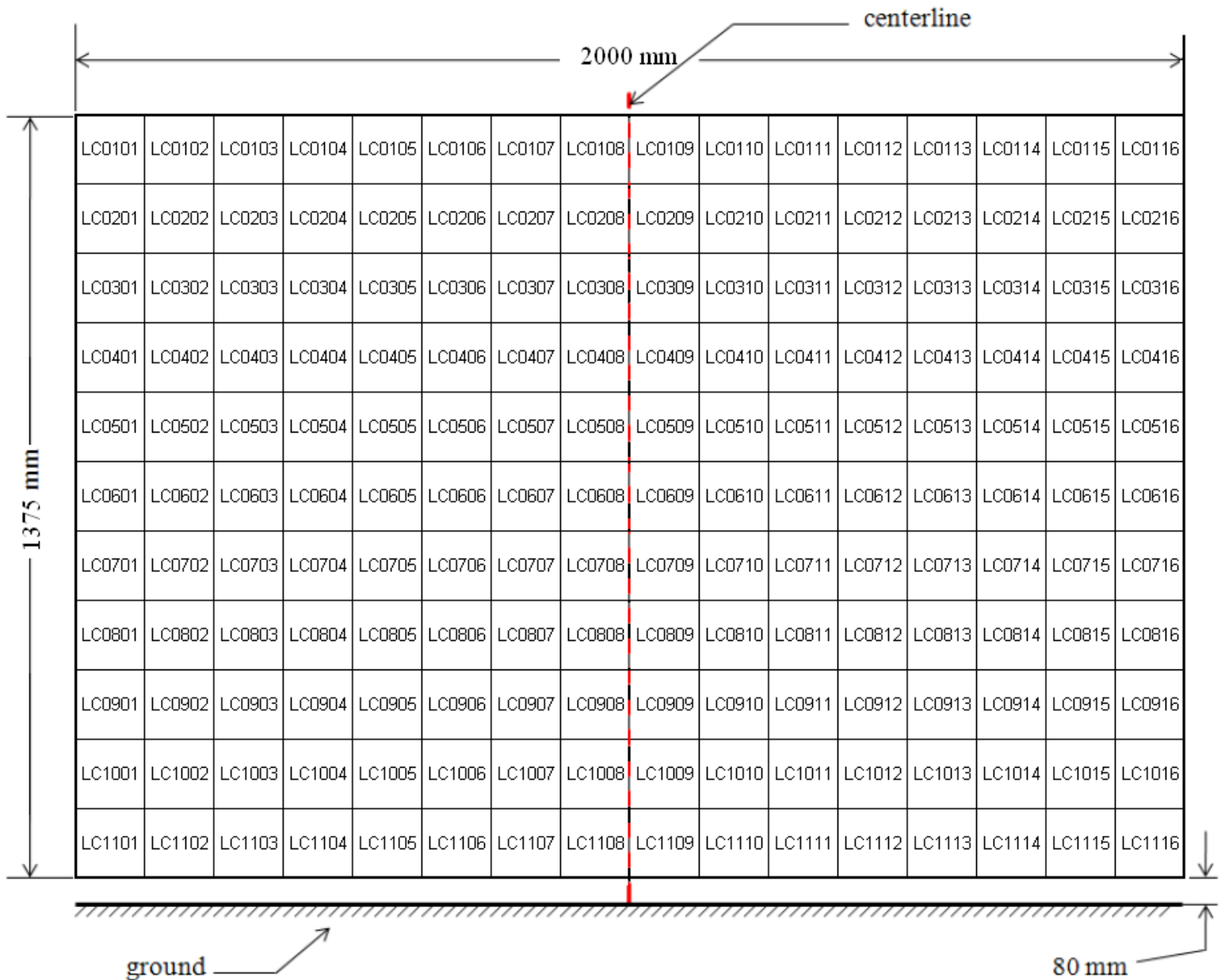
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



DATA SHEET NO. 10

TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV NHTSA No.: M20185200
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 360	P572O 5th Percentile Female ATD / 630
Head Contact	Frontal Airbag, Headrest	Frontal Airbag, Headrest, Seat Back
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Knee Bolster
Right Knee Contact	Knee Bolster	Knee Bolster

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Rear Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Seat Track Shift (mm)	27	3
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	3660
Center	mm	3741
Right Side	mm	3731
Average	mm	886

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

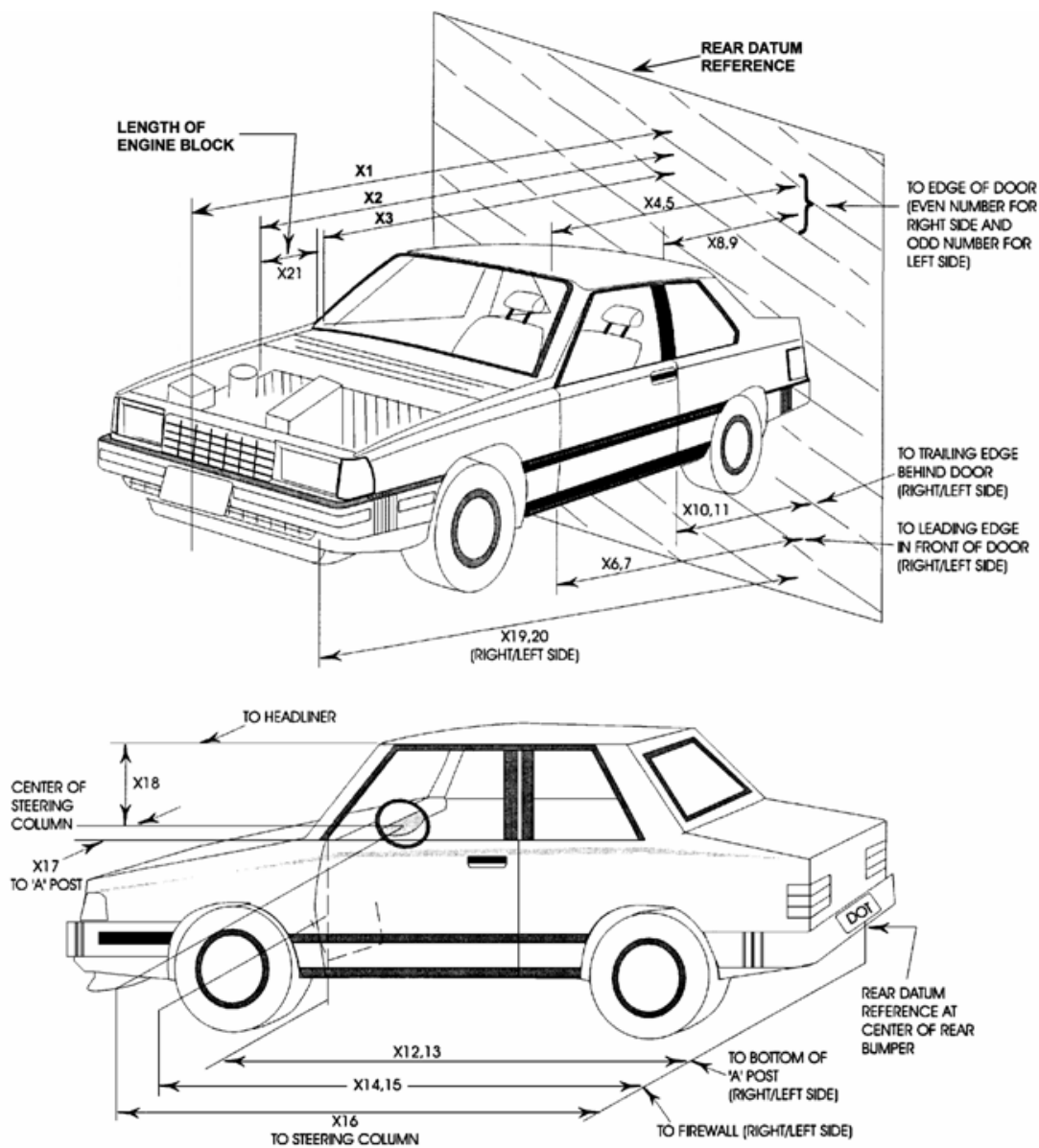
DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18

DATA SHEET NO. 12 ... (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPVNHTSA No.: M20185200Test Program: 56.3 km/h Frontal Impact NCAP TestTest Date: 04/19/18

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5300	4555	-745
2	Rear Surface of Vehicle to Front of Engine	4587	4555	-32
3	RSOV to Firewall	4095	4103	8
4	RSOV to Upper Leading Edge of Right Door	3734	3740	6
5	RSOV to Upper Leading Edge of Left Door	3735	3805	70
6	RSOV to Lower Leading Edge of Right Door	3715	3737	22
7	RSOV to Lower Leading Edge of Left Door	3707	3740	33
8	RSOV to Upper Trailing Edge of Right Door	2580	2600	20
9	RSOV to Upper Trailing Edge of Left Door	2580	2653	73
10	RSOV to Lower Trailing Edge of Right Door	2587	2610	23
11	RSOV to Lower Trailing Edge of Left Door	2585	2616	31
12	RSOV to Bottom of A-Pillar, Right Side	3646	3726	80
13	RSOV to Bottom of A-Pillar, Left Side	3646	3731	85
14	RSOV to Firewall, Right Side	4050	4057	7
15	RSOV to Firewall, Left Side	4090	4095	5
16	RSOV to Steering Column	3205	3300	95
17	Center of Steering Column to A-Pillar	435	430	-5
18	Center of Steering Column to Headliner	470	440	-30
19	RSOV to Right Side of Front Bumper	4727	4320	-407
20	RSOV to Left Side of Front Bumper	4723	4530	-193
21	Length of Engine Block	630	630	0
RD	RSOV to Right Side of Dash Panel	3400	3485	85
CD	RSOV to Center of Dash Panel	3340	3410	70
LD	RSOV to Left Side of Dash Panel	3415	3490	75

All measurements in millimeters.

DATA SHEET NO. 13**ACCIDENT INVESTIGATION DIVISION DATA**Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPVNHTSA No.: M20185200Test Program: 56.3 km/h Frontal Impact NCAP TestTest Date: 04/19/18**VEHICLE INFORMATION**VIN: JN8AY2NC0J9555172Wheelbase (mm): 3070Vehicle Size Category: MPVTest Weight (kg): 2909.5**ACCELEROMETER DATA**Accelerometer Locations: Left Rear CrossmemberCal. Procedure/Interval: Vibration Test / 6 monthsIntegration Algorithm: NHTSA StandardImpact Velocity (km/h): 56.73Velocity Change (km/h): 63.9Time of Separation (msec): 67.6Linearity: Good**CRUSH PROFILE**

Collision Deformation Classification:

12FDEW3

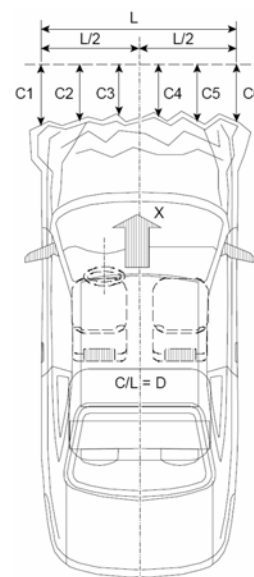
Midpoint of Damage:

Vehicle Centerline

Damage Region Length (mm):

1612

Impact Mode:

Full Frontal

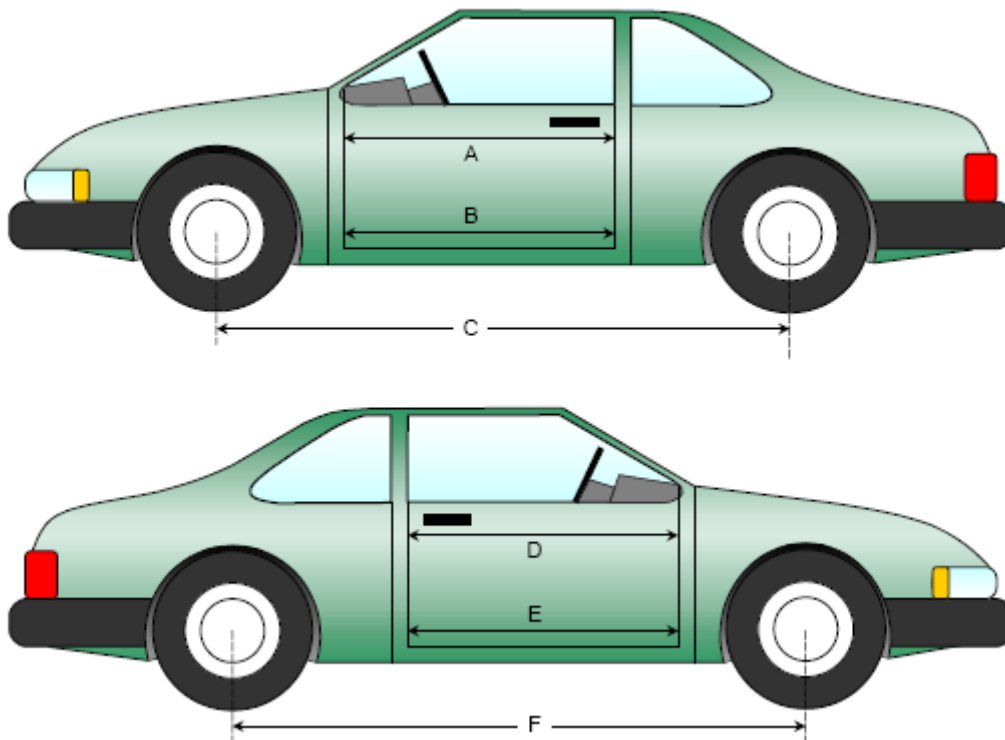
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	176	711	535
C2	Crush Zone 2 at Left Side	mm	37	815	778
C3	Crush Zone 3 at Left Side	mm	13	823	810
C4	Crush Zone 4 at Right Side	mm	13	830	817
C5	Crush Zone 5 at Right Side	mm	37	830	793
C6	Crush Zone 6 at Right Side	mm	176	823	647
L	C1 to C6	mm	1612		

DATA SHEET NO. 14**VEHICLE INTRUSION MEASUREMENTS**Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPVNHTSA No.: M20185200Test Program: 56.3 km/h Frontal Impact NCAP TestTest Date: 04/19/18**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	997	999	-2
B	Left Side Lower	mm	886	888	-2
D	Right Side Upper	mm	1001	1002	-1
E	Right Side Lower	mm	891	891	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3070	3030	40
F	Right Side Wheelbase	mm	3070	3050	20



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

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

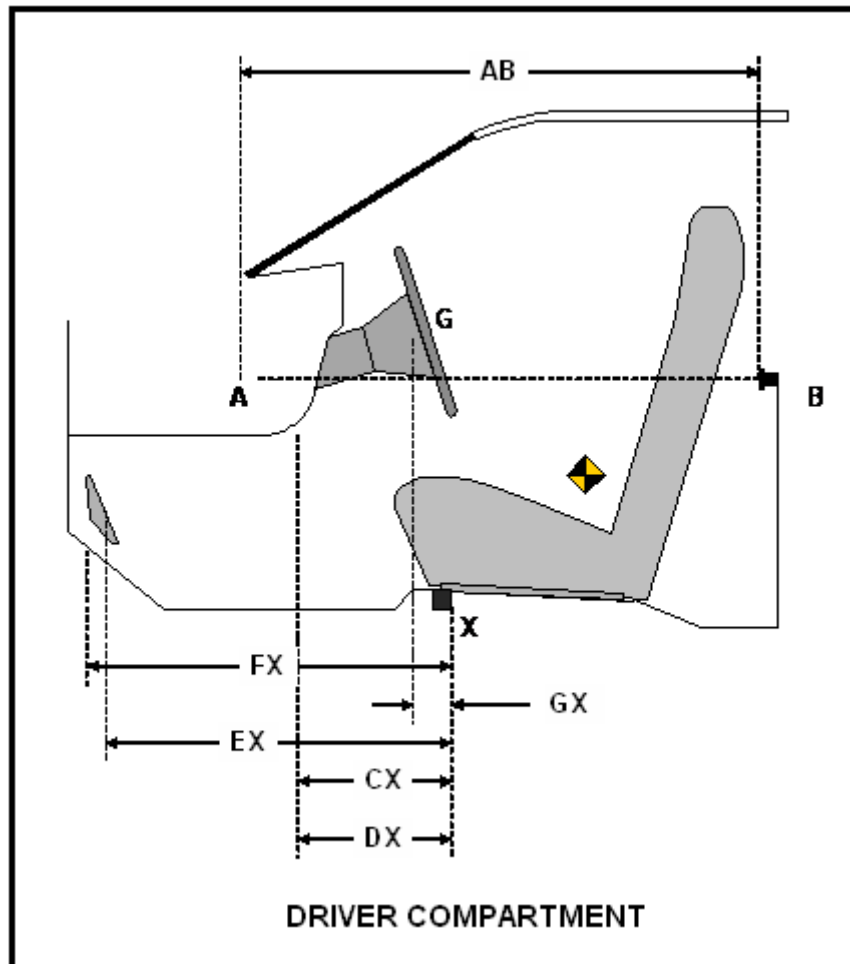
Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	842	844	-2
CX	Left Knee Bolster to X	mm	310	370	-60
DX	Right Knee Bolster to X	mm	310	370	-60
EX	Brake Pedal to X	mm	513	640	-127
FX	Foot Rest to X	mm	535	550	-15
GX	Center of Steering Wheel Hub to X	mm	100	120	-20

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

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

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV NHTSA No.: M20185200
 Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

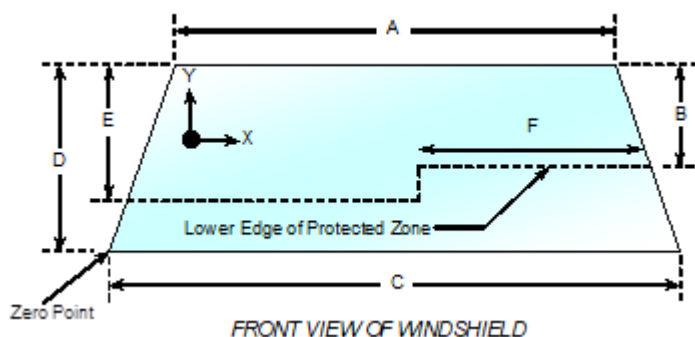
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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

Temperature of windshield molding during test: 20.9° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2326	2326	100.0%
Right Side	2326	2326	100.0%
Total	4652	4652	100.0%



Item	Units	Value
A	mm	1437
B	mm	350
C	mm	1680
D	mm	767
E	mm	472
F	mm	510

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 Armada SV 4WD 5-Door MPV NHTSA No.: M20185200
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/19/18

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 15.0° C Test Time: 3:39 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

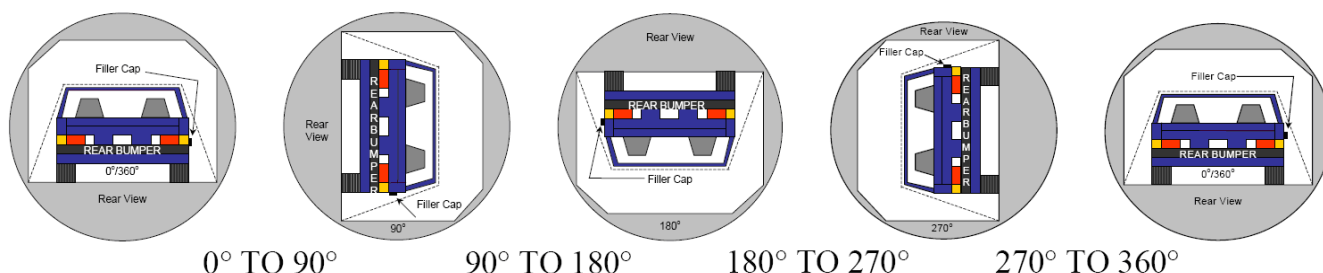
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



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°	80	300	380
180° To 270°	82	300	382
270° To 360°	81	300	381

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

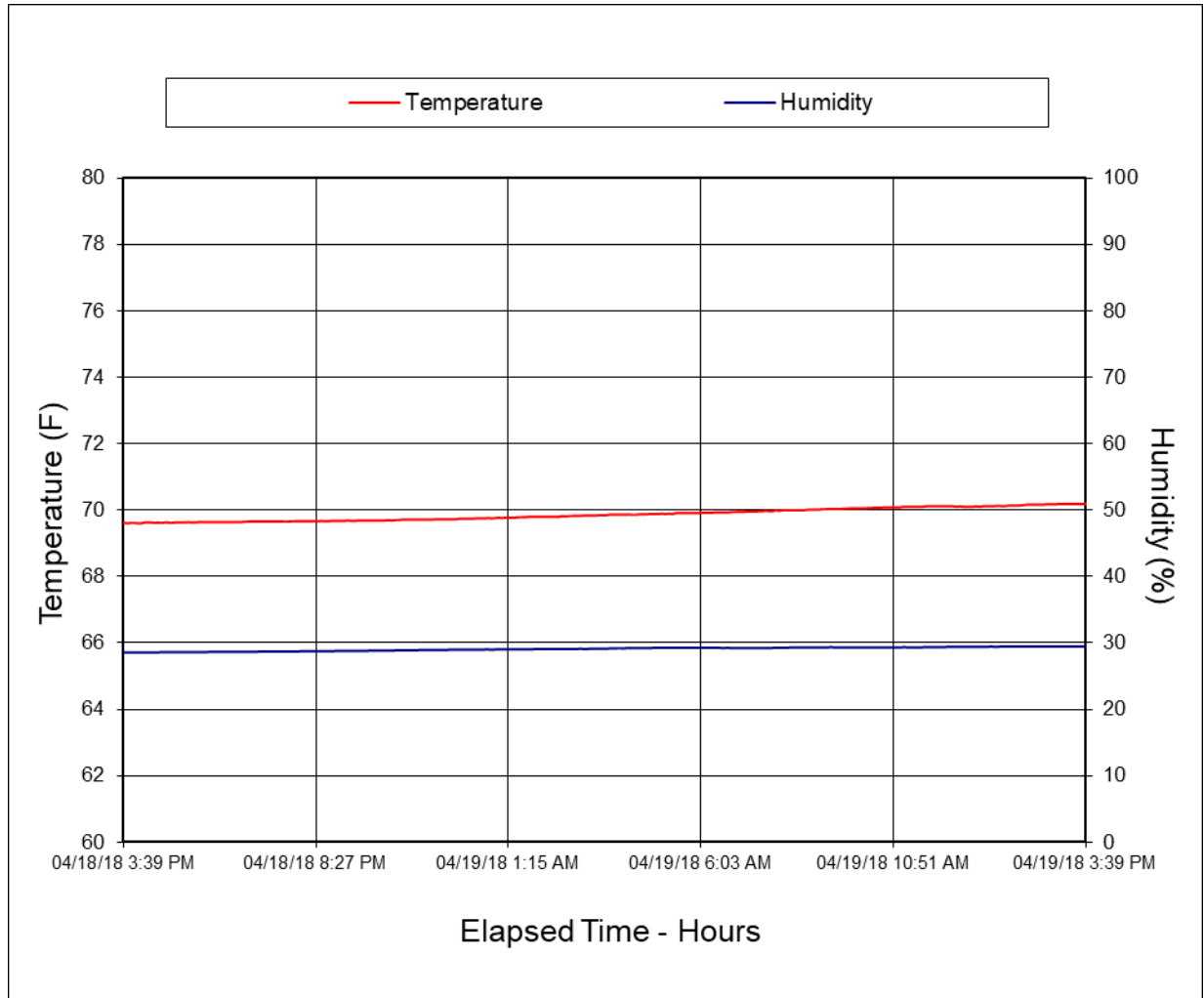
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV

NHTSA No.: M20185200

Test Program: 56.3 km/h Frontal Impact NCAP Test

Test Date: 04/19/18



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

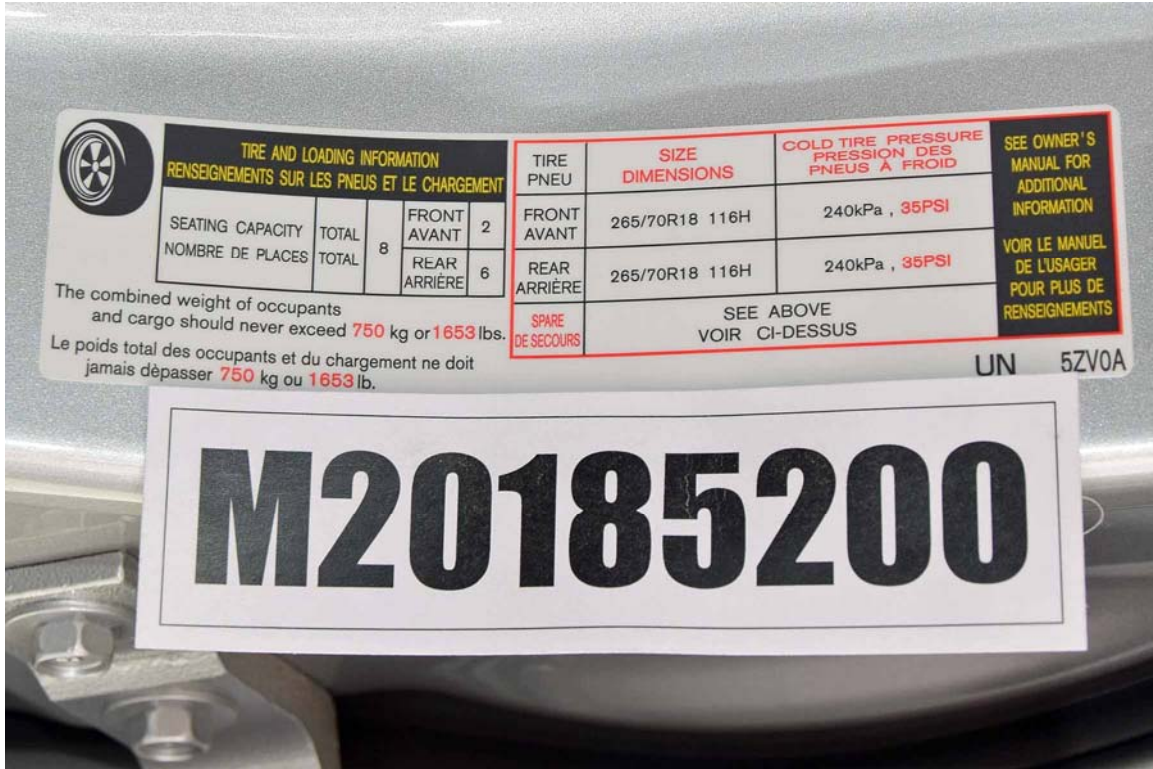


FIGURE 5. Tire Placard



FIGURE 6. 2018 Nissan Armada SV 4WD Frontal as Delivered



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

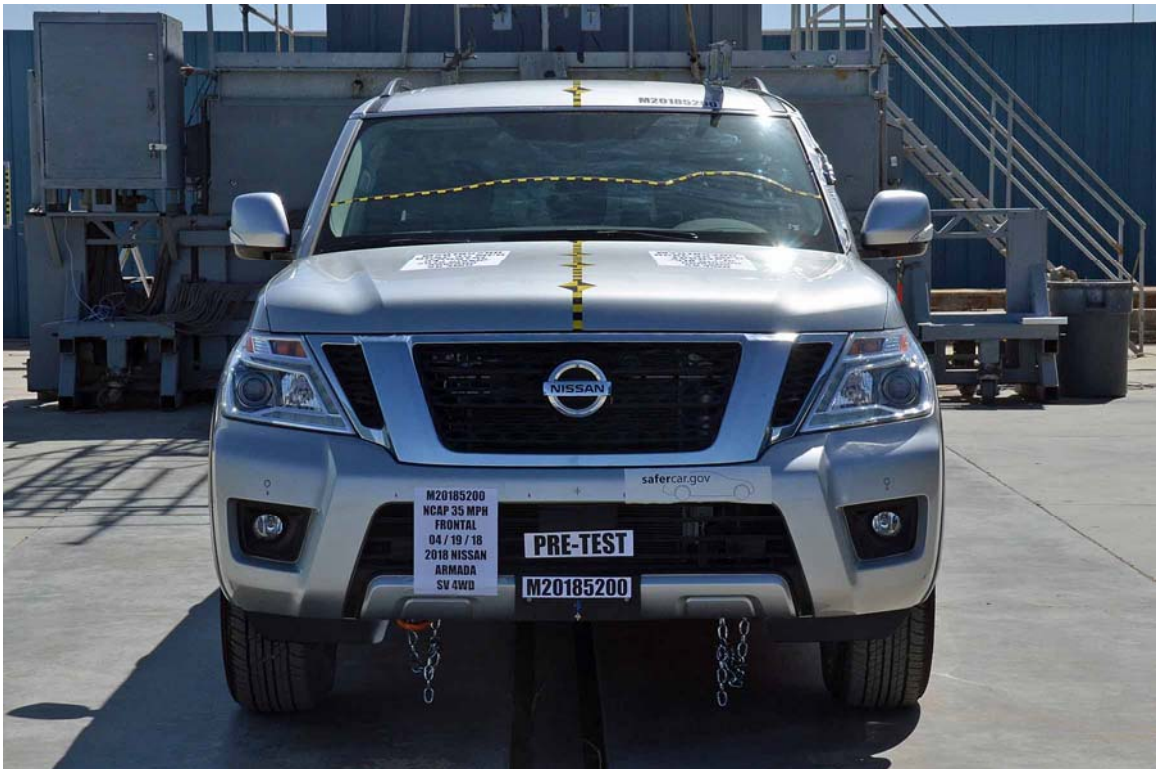


FIGURE 8. Pre-Test Front View of Test Vehicle

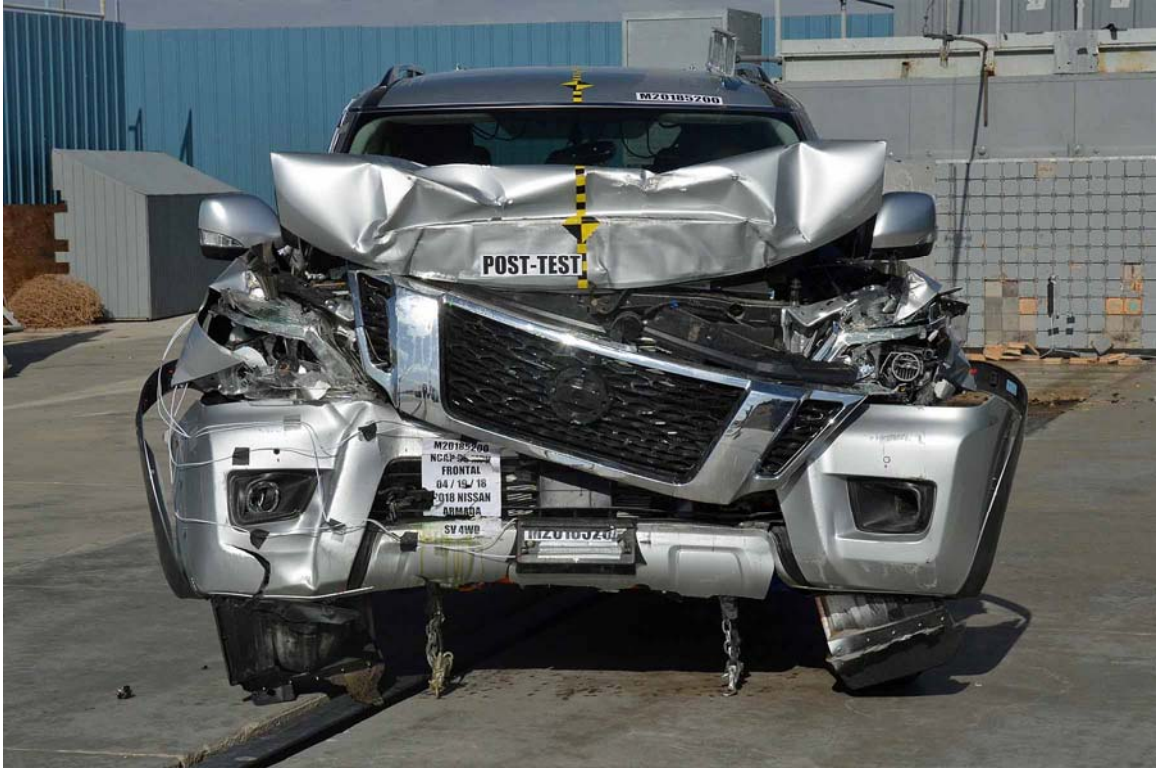


FIGURE 9. Post-Test Front View of Test Vehicle



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

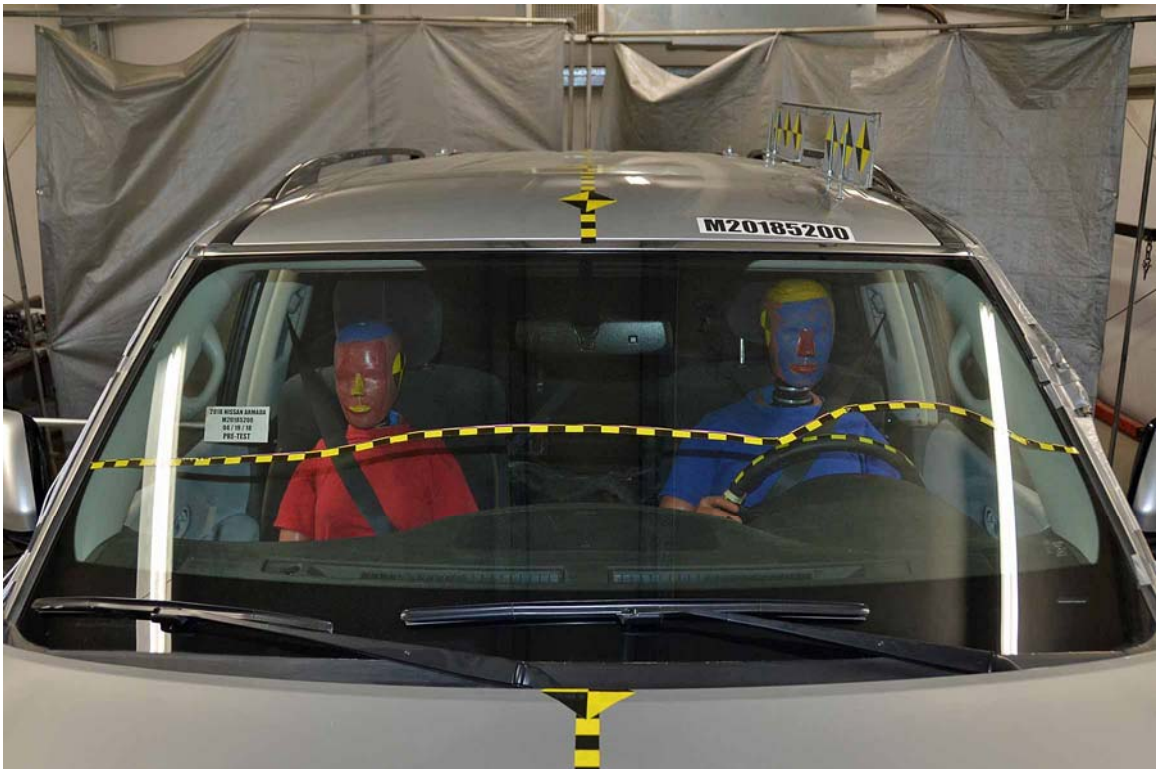


FIGURE 18. Pre-Test Windshield View



FIGURE 19. Post-Test Windshield View

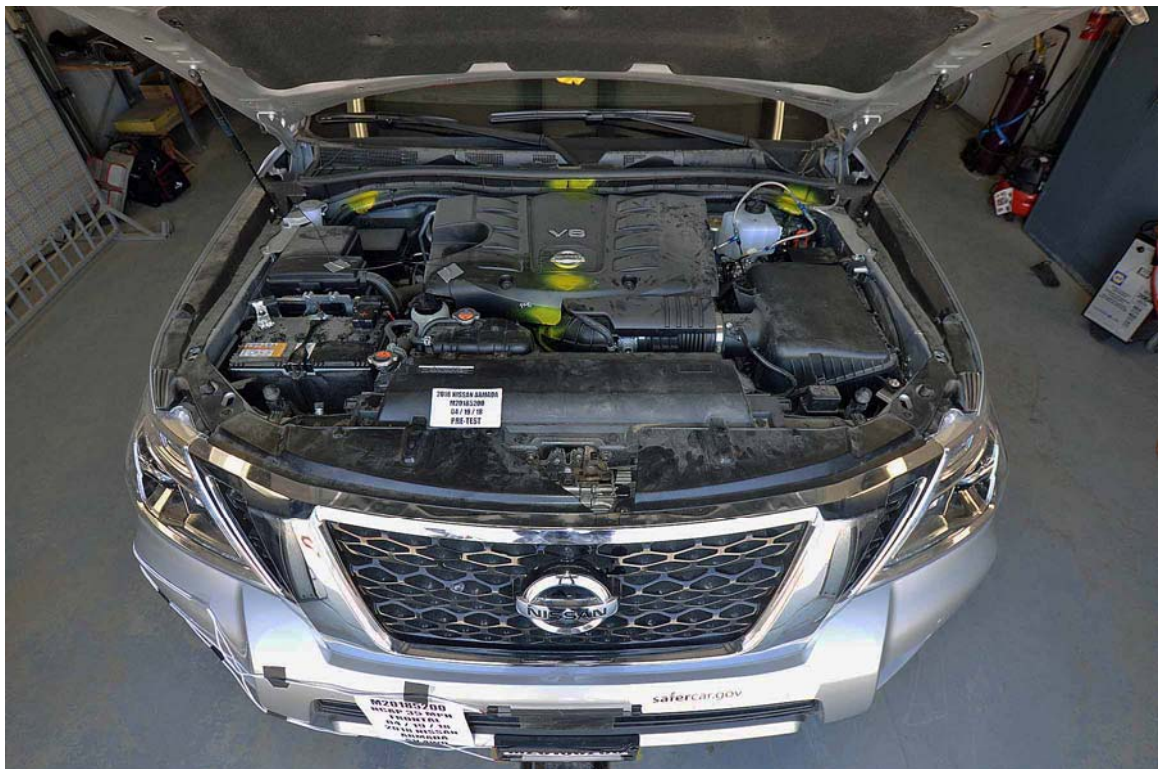


FIGURE 20. Pre-Test Engine Compartment View



FIGURE 21. Post-Test Engine Compartment View



FIGURE 22. Pre-Test Fuel Filler Cap View



FIGURE 23. Post-Test Fuel Filler Cap View

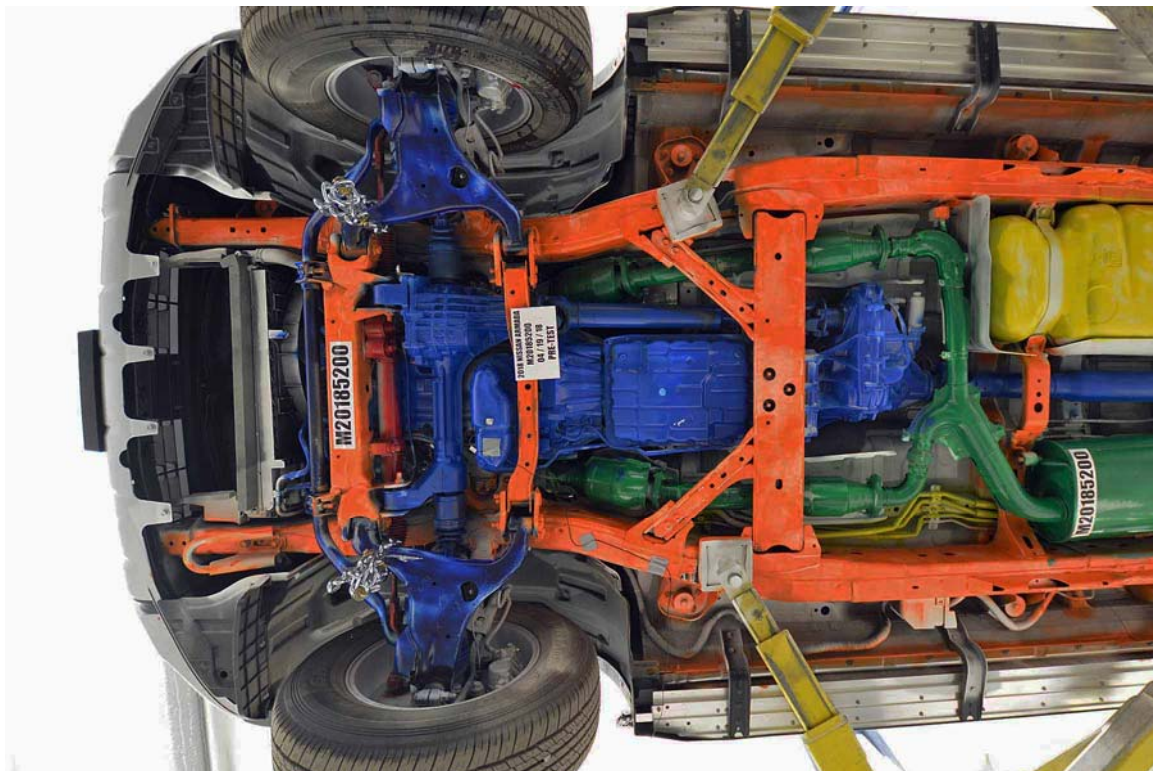


FIGURE 24. Pre-Test Front Underbody View

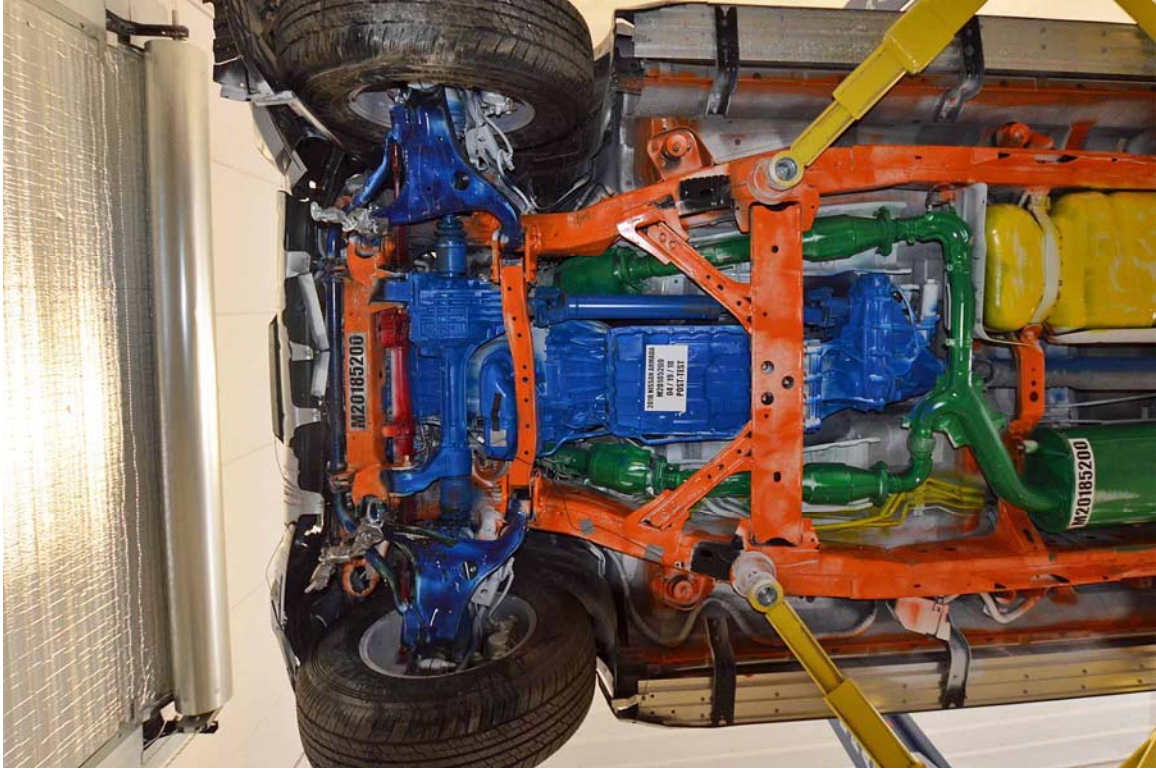


FIGURE 25. Post-Test Front Underbody View

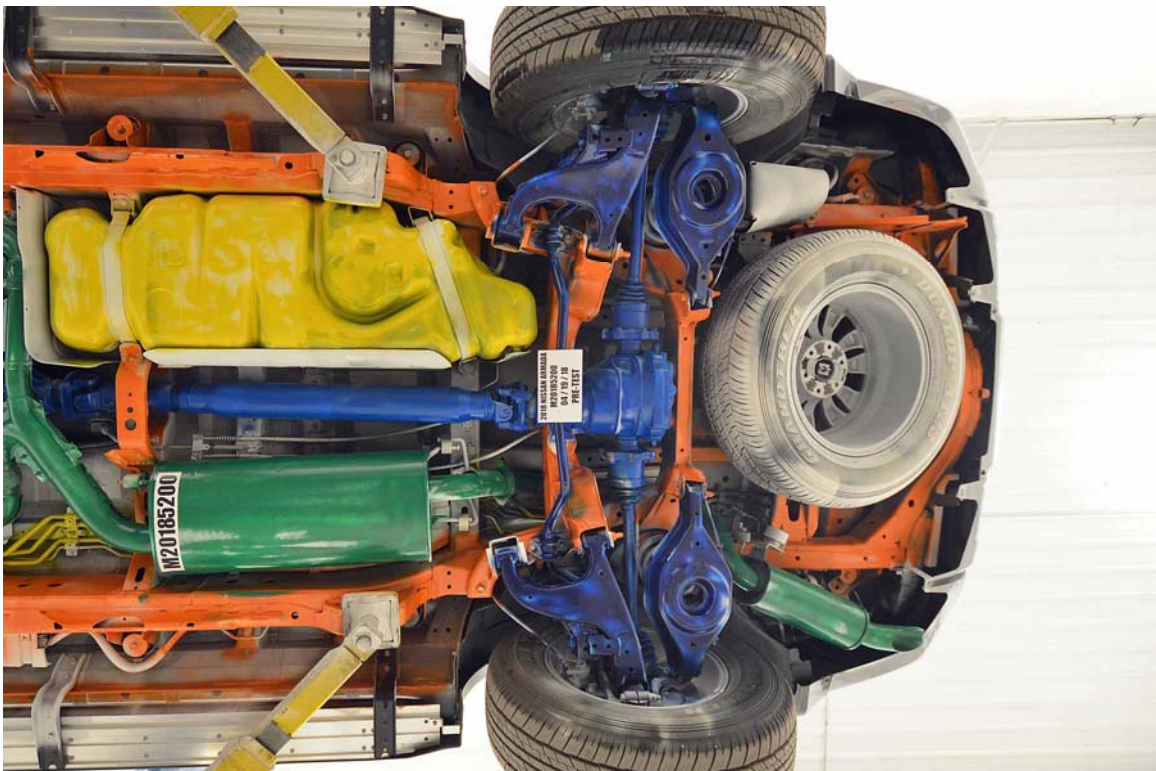


FIGURE 26. Pre-Test Rear Underbody View



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

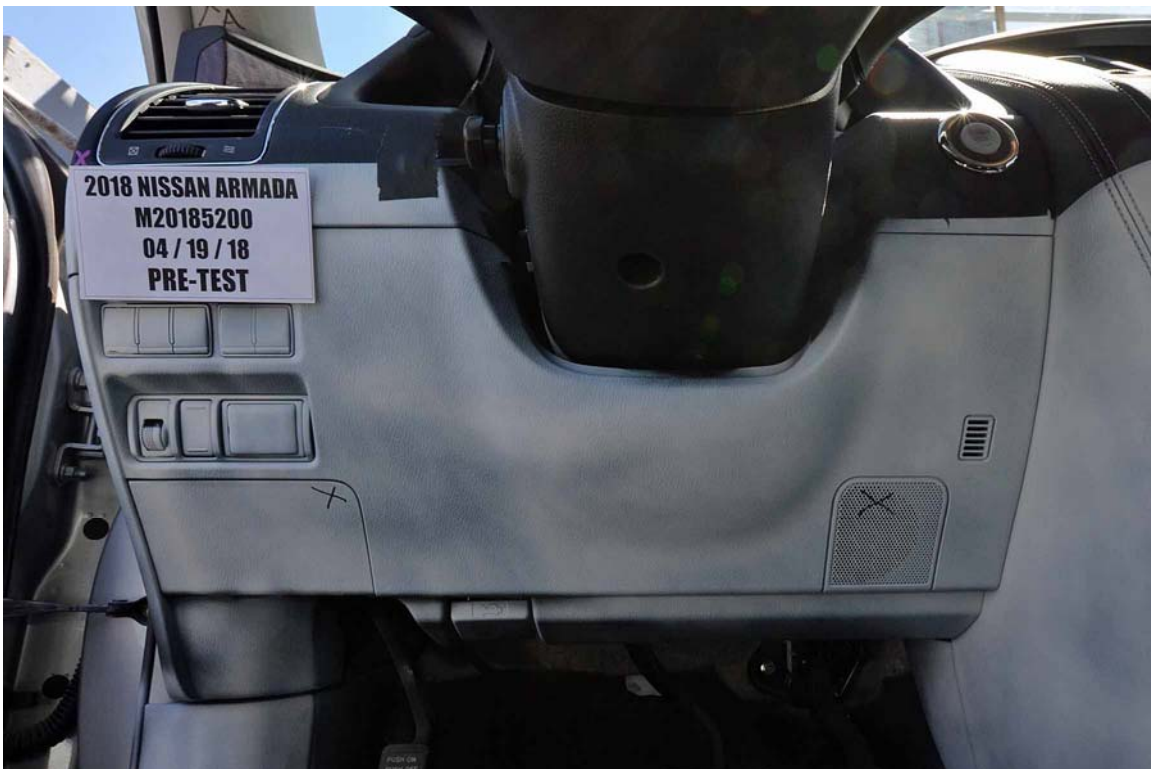


FIGURE 42. Pre-Test Driver's Side Knee Bolster



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



FIGURE 48. Post-Test Driver Dummy Contact with Headrest



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



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 Seat Back

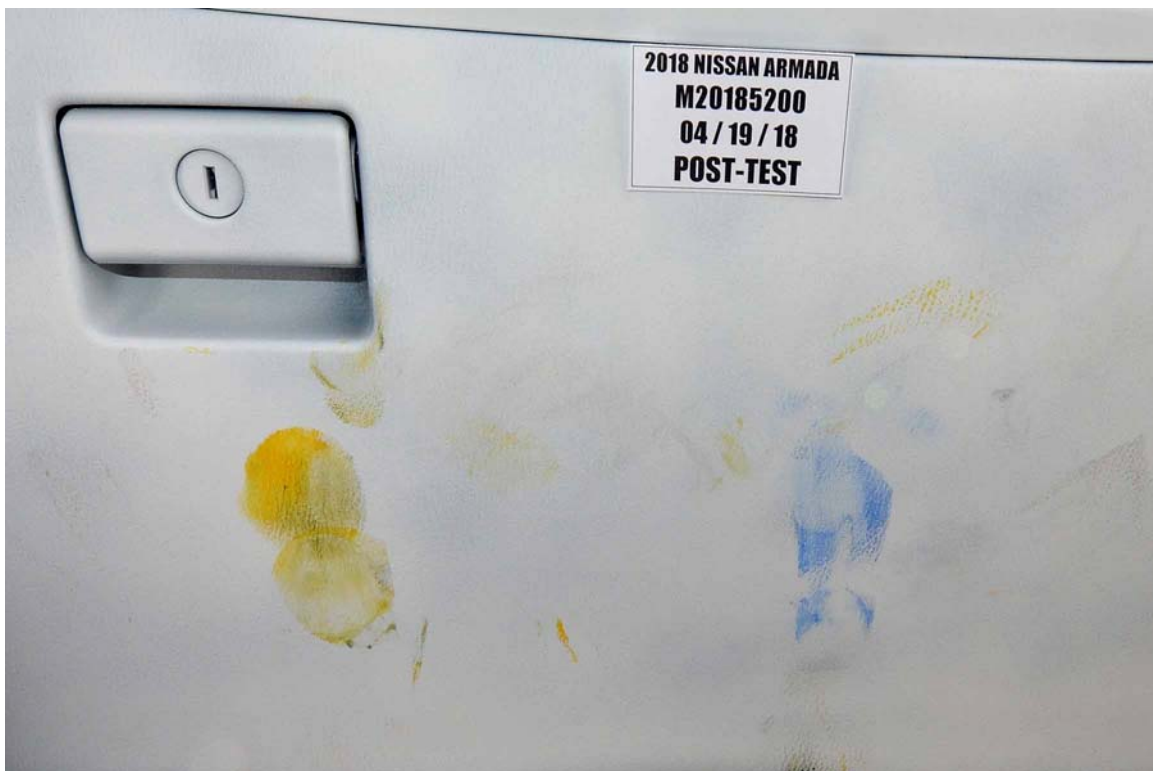


FIGURE 69b. Post-Test Passenger Dummy Contact with Knee Bolster



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

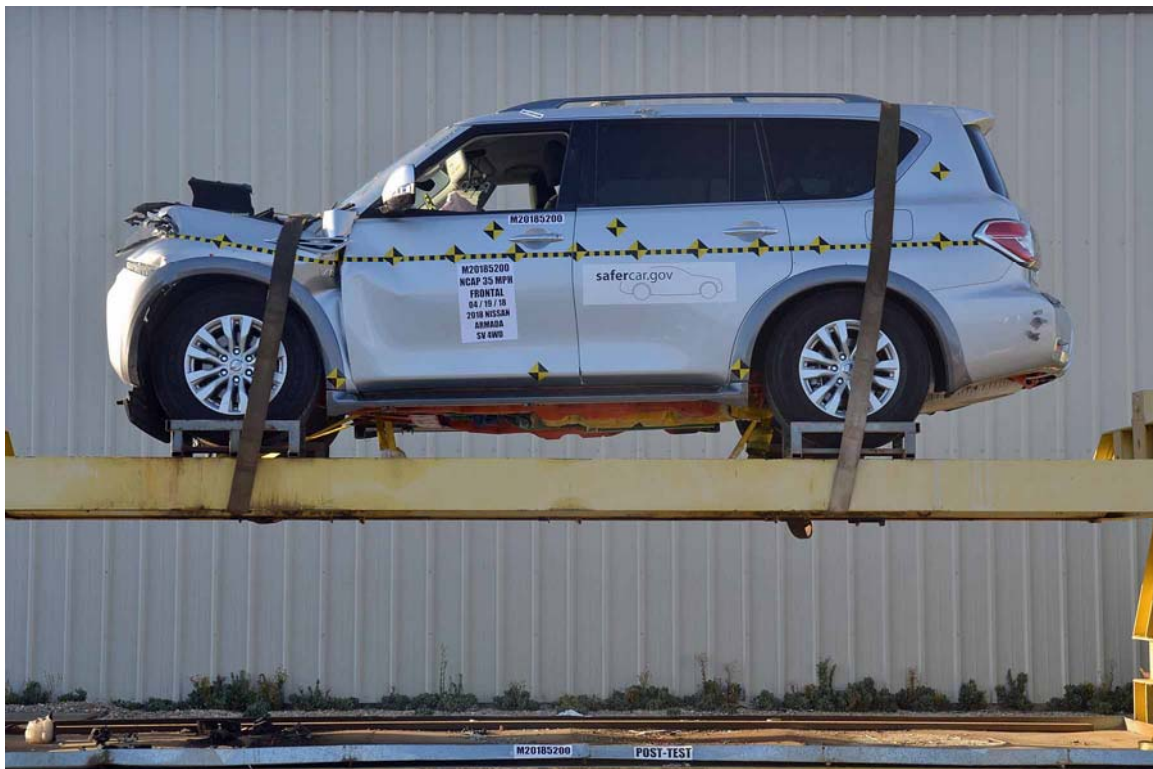


FIGURE 73. Vehicle at 0° on Static Rollover Device



FIGURE 74. Vehicle at 90° on Static Rollover Device



FIGURE 75. Vehicle at 180° on Static Rollover Device

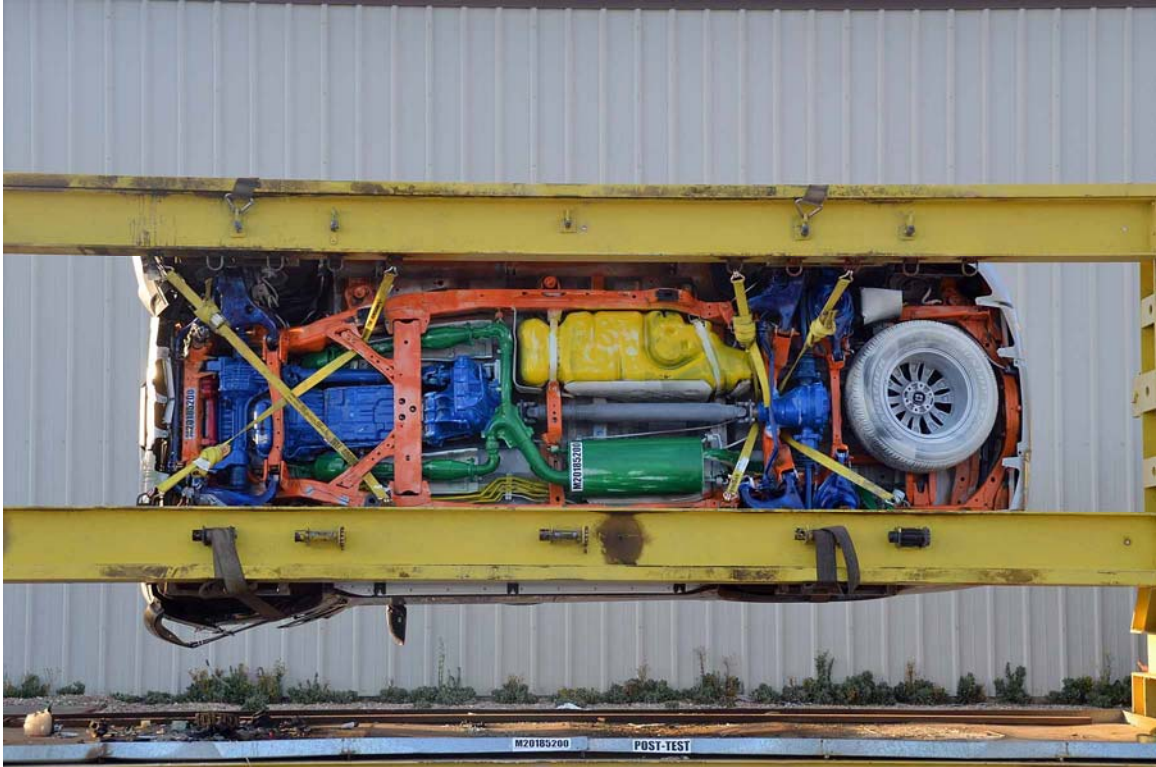


FIGURE 76. Vehicle at 270° on Static Rollover Device

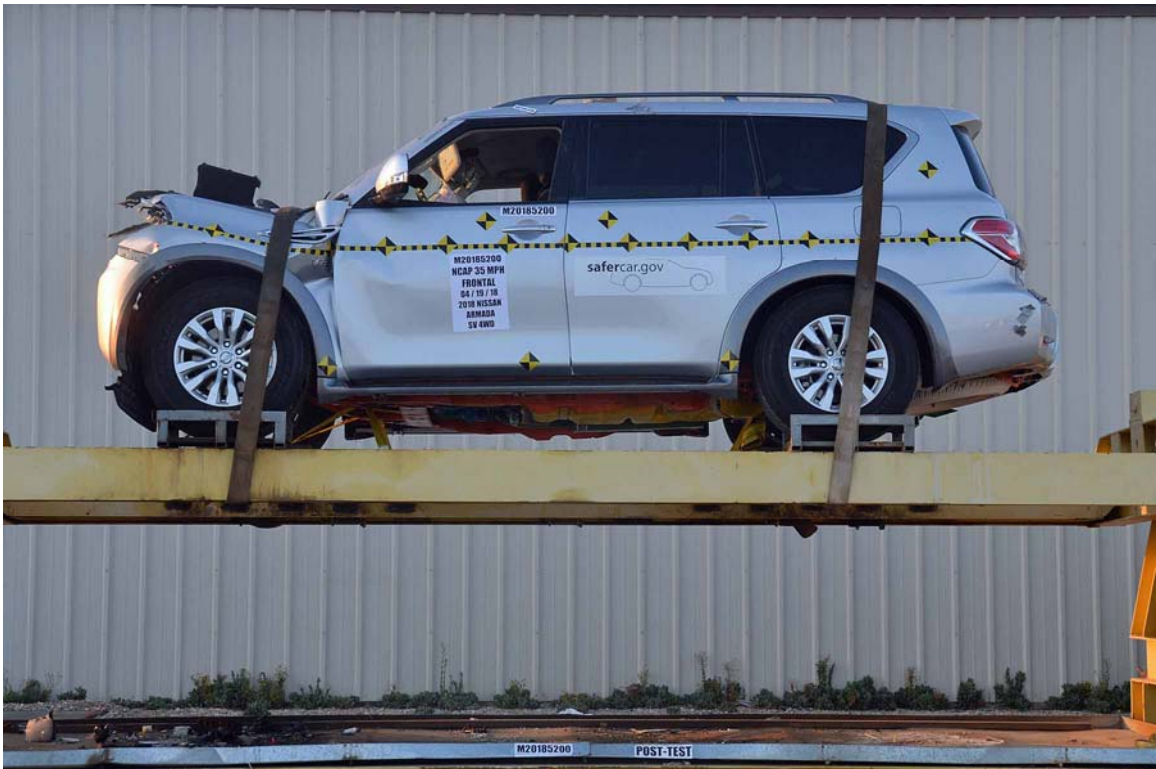


FIGURE 77. Vehicle at 360° on Static Rollover Device



FIGURE 78. 2018 Nissan Armada SV 4WD Frontal Impact Event



2018 NISSAN ARMADA SV 4WD

Scan QR code for general model information & options

Manufacturer's Suggested Retail Base Price: \$48,500.00

Options Included by Manufacturer

- CARPETED FLOOR MATS** 310.00
- CARPETED FLOOR MATS (3-Row)**
- CARPETED CARGO MAT**
- CARGO PACKAGE** 225.00
- Cargo Area Protector**
- Cargo Net**
- First Aid Kit**
- DRIVER PACKAGE** 600.00
- Front Fog Lights**
- Auto-Dimming Interior Rear View Mirror**
- w/ Homelink® Universal Transceiver**
- Power Folding 60/40 3rd Row Seat**
- Power Liftgate**
- Trailer Towing Harness, Pre-wire and Connector for Brake Controller**

DESTINATION CHARGES 1,295.00

Total \$50,930.00

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

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy

15 MPG
combined city/hwy

13 city
18 highway

6.7 gallons per 100 miles

STANDARD SUVs range from 12 to 33 MPG. The best vehicle rates 136 MPG.

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

Annual fuel cost \$2,400

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

1 **2** **3** **4** **5** **6** **7** **8** **9** **10**

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 \$6,760 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.40 per gallon. MPG is miles per gallon city equivalent. Vehicle emissions are a significant factor in climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

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

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

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

DELIVERY

VEHICLE COLORS: EXT-BRILLIANT SILVER, INT: CHARCOAL

FINAL ASSEMBLY POINT: LOS ANGELES

TRANSPORT METHOD: TRUCK

DEALER: LARRY H MILLER NIS CORONA, 2575 WARDLOW ROAD, CORONA, CA 92682

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: JN8AY2NC6J955172
EMS: 80 STATE EMISSIONS
MDL: 0618-555172, K23-G
OPT: B-L02M2K01296C20

20171012230201A55635

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

FIGURE 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
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15	Driver Right Femur Force Z	B-5
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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

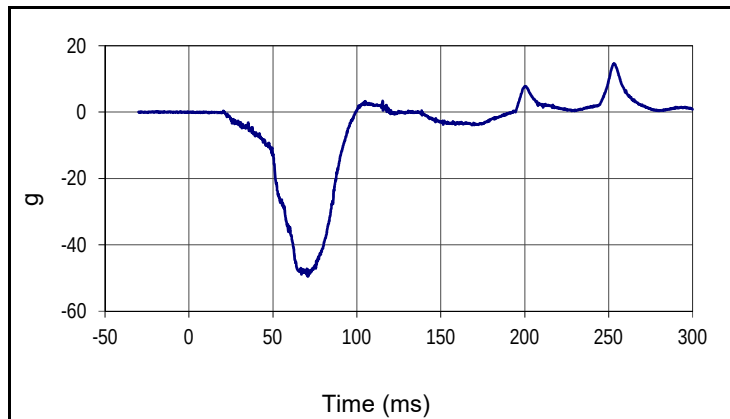
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

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

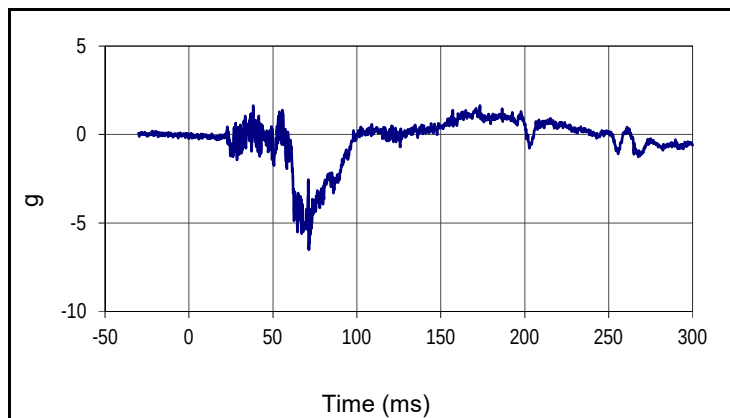
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Left Femur Force Redundant
Passenger Right Femur Force Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia 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 Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

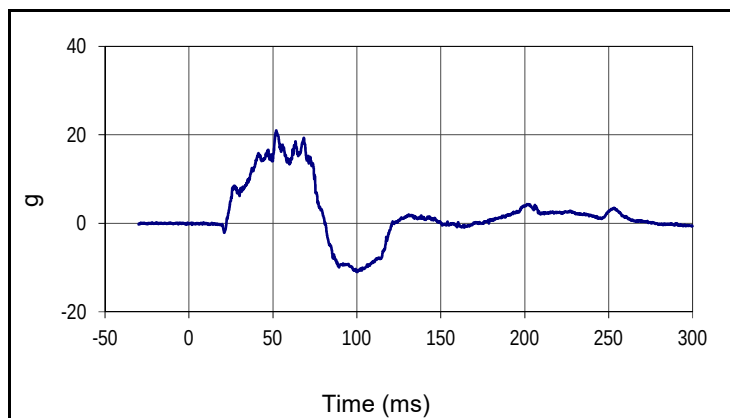
NHTSA No.: M20185200
 Test Date: 04/19/18



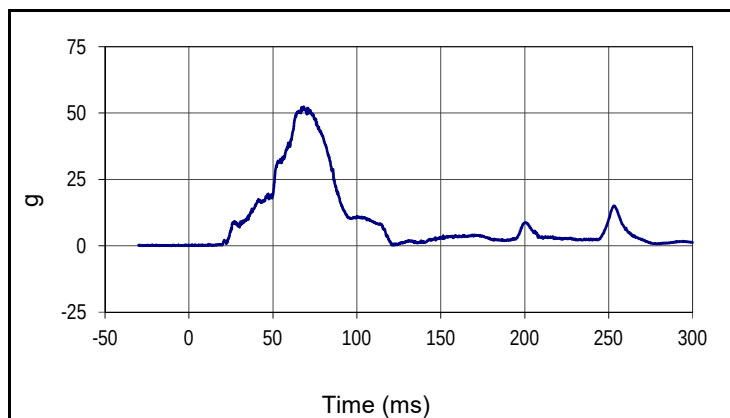
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Plot No.		SAE Class	Units
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Max	Time	Min	Time
14.7	253.3	-49.5	71.0



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
1.6	173.3	-6.5	71.4



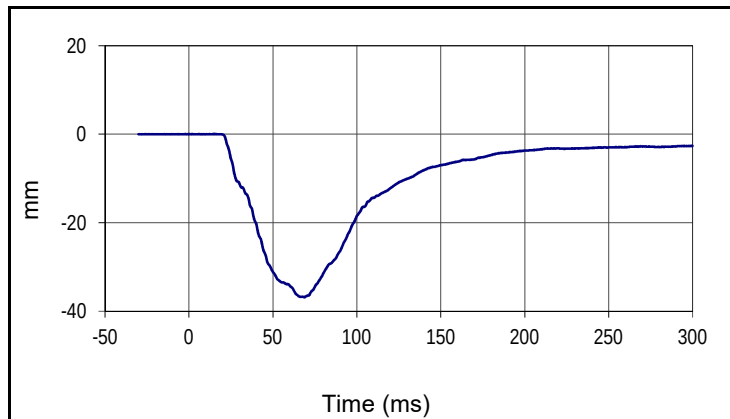
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Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
21.0	52.0	-11.0	100.3



Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
52.4	68.4	0.0	4.7

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

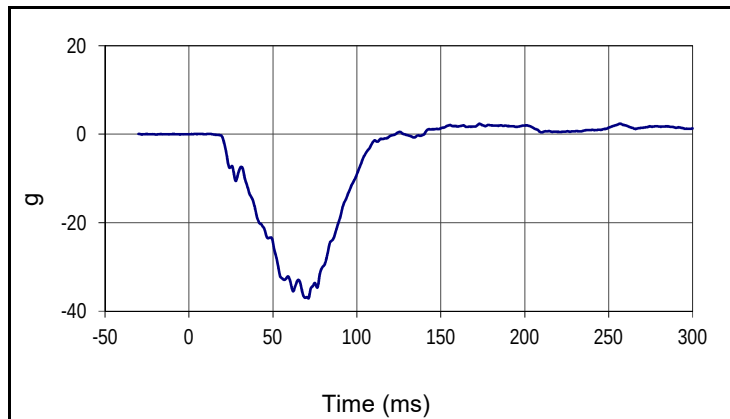
NHTSA No.: M20185200
 Test Date: 04/19/18



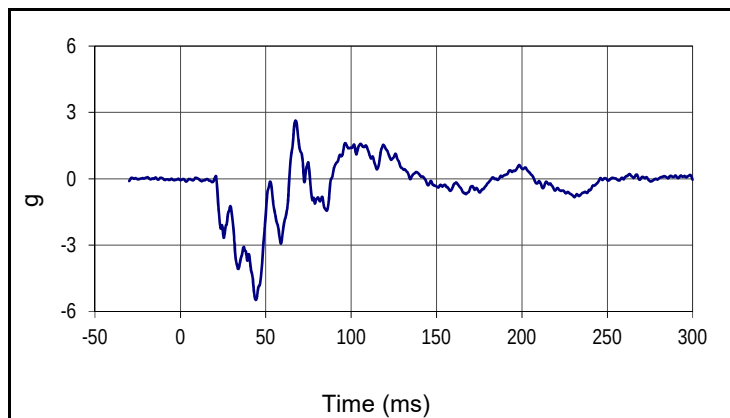
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Driver Chest Deflection			
Plot No.		SAE Class	Units
005		600	mm
Max	Time	Min	Time
0.0	1.7	-36.9	68.8

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

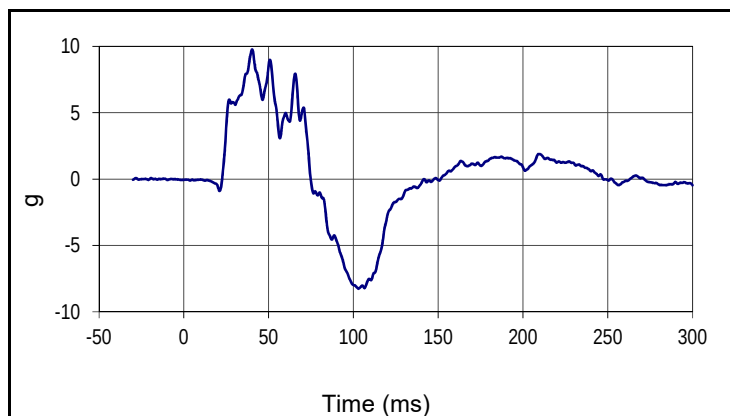
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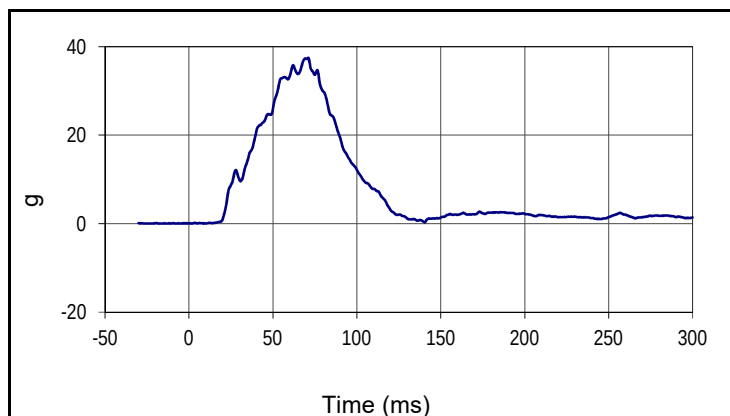
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Driver Chest Acceleration X Primary			
Plot No.		SAE Class	Units
006		180	g
Max	Time	Min	Time
2.4	256.7	-37.1	71.1



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.		SAE Class	Units
007		180	g
Max	Time	Min	Time
2.6	67.4	-5.5	44.2



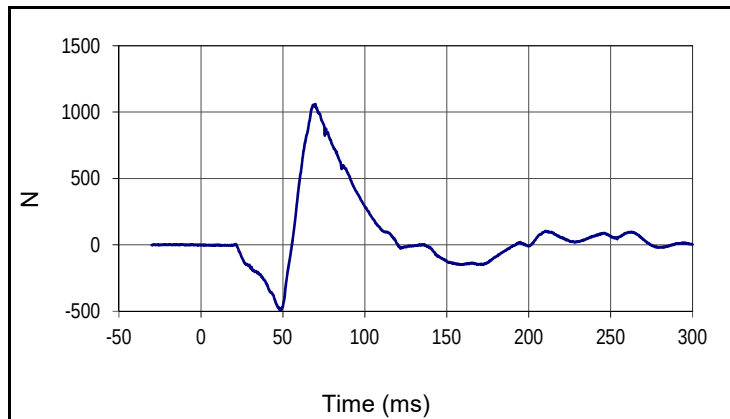
Curve Description			
Driver Chest Acceleration Z Primary			
Plot No.		SAE Class	Units
008		180	g
Max	Time	Min	Time
9.8	40.2	-8.3	103.0



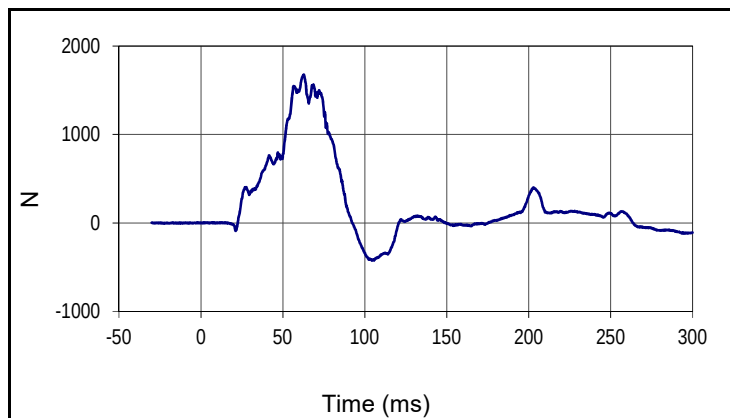
Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.		SAE Class	Units
009		180	g
Max	Time	Min	Time
37.5	71.1	0.0	10.0

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

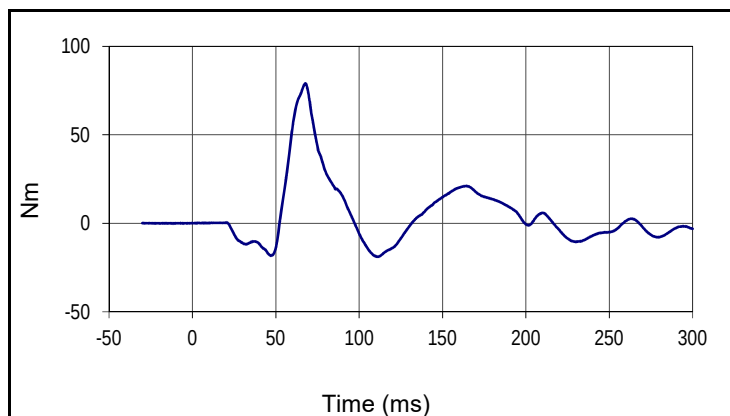
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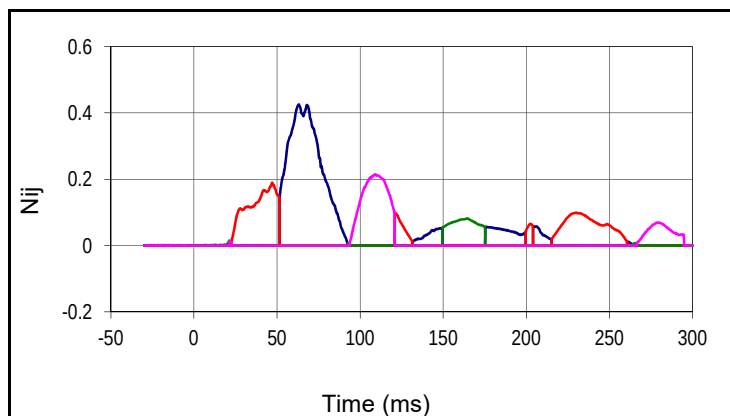
Curve Description			
Driver Upper Neck Force X			
Plot No.		SAE Class	Units
010		1000	N
Max	Time	Min	Time
1060.7	69.8	-491.5	49.0



Curve Description			
Driver Upper Neck Force Z			
Plot No.		SAE Class	Units
011		1000	N
Max	Time	Min	Time
1676.2	62.8	-424.7	104.3



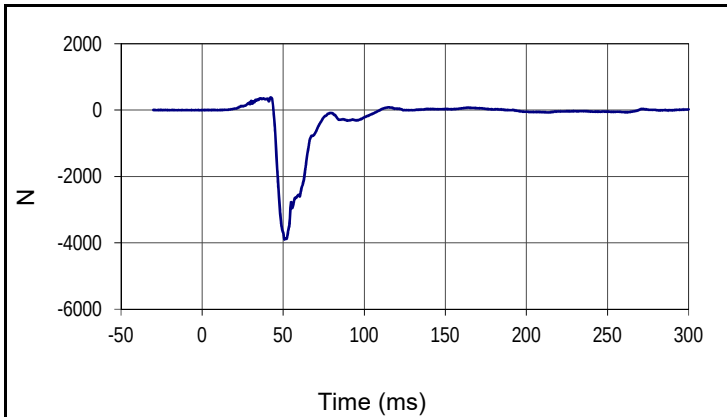
Curve Description			
Driver Upper Neck Moment Y			
Plot No.		SAE Class	Units
012		600	Nm
Max	Time	Min	Time
79.0	67.8	-18.9	111.2



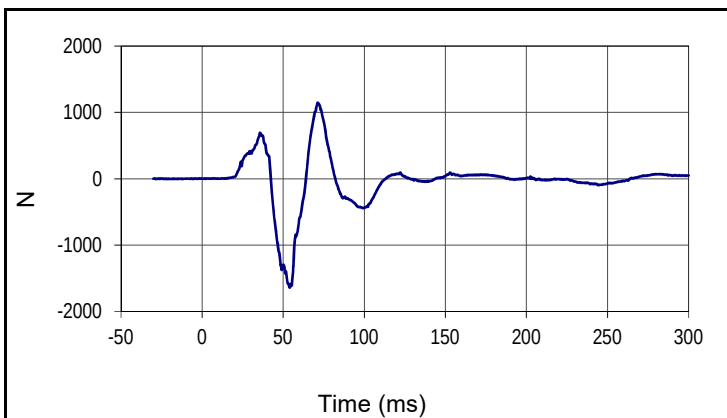
Curve Description		
Driver Nij		
Units	Max	Time
Ntf	0.43	63.0
Units	Max	Time
Nte	0.19	47.0
Units	Max	Time
Ncf	0.08	164.7
Units	Max	Time
Nce	0.21	109.2

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20185200
 Test Date: 04/19/18



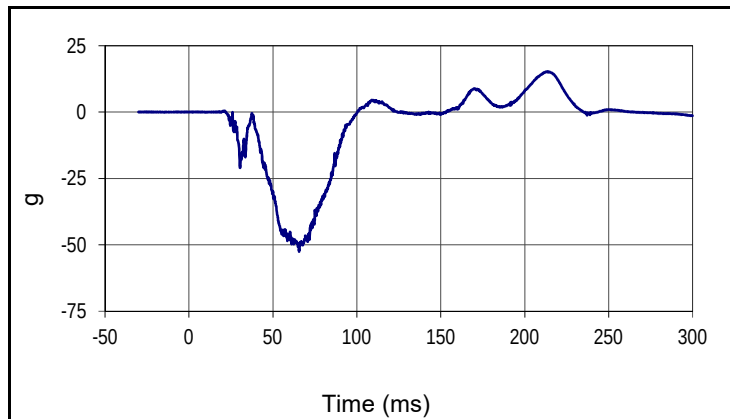
Curve Description			
Driver Left Femur Force Z			
Plot No.		SAE Class	Units
014		600	N
Max	Time	Min	Time
379.7	42.2	-3902.6	50.8



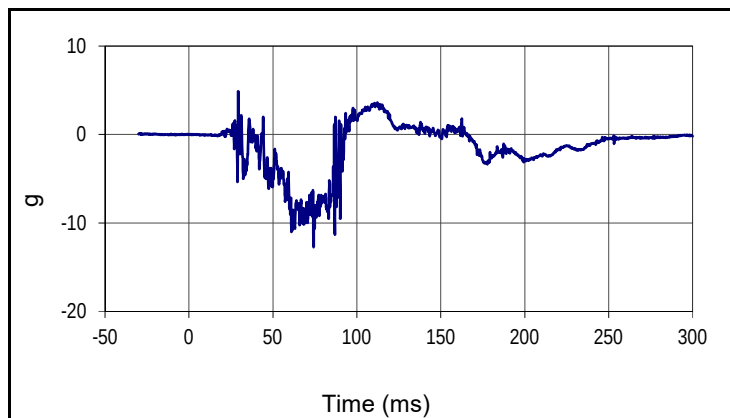
Curve Description			
Driver Right Femur Force Z			
Plot No.		SAE Class	Units
015		600	N
Max	Time	Min	Time
1146.0	71.3	-1641.5	54.0

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

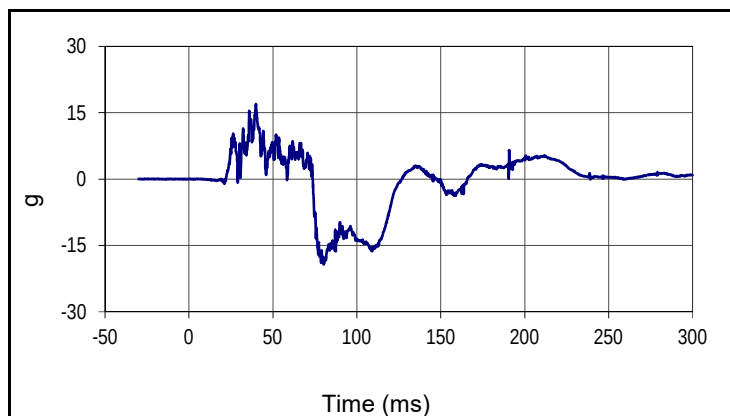
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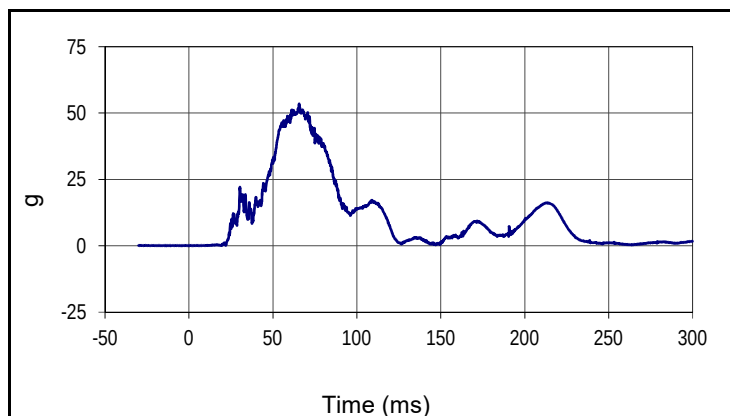
Curve Description			
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Plot No.		SAE Class	Units
016		1000	g
Max	Time	Min	Time
15.3	213.5	-52.5	65.6



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.		SAE Class	Units
017		1000	g
Max	Time	Min	Time
4.8	29.3	-12.7	74.2



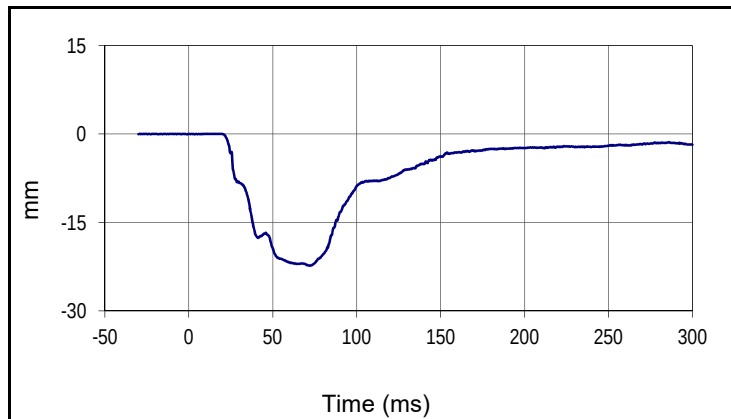
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.		SAE Class	Units
018		1000	g
Max	Time	Min	Time
16.9	39.8	-19.3	80.2



Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.		SAE Class	Units
019		1000	g
Max	Time	Min	Time
53.5	65.6	0.0	0.0

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

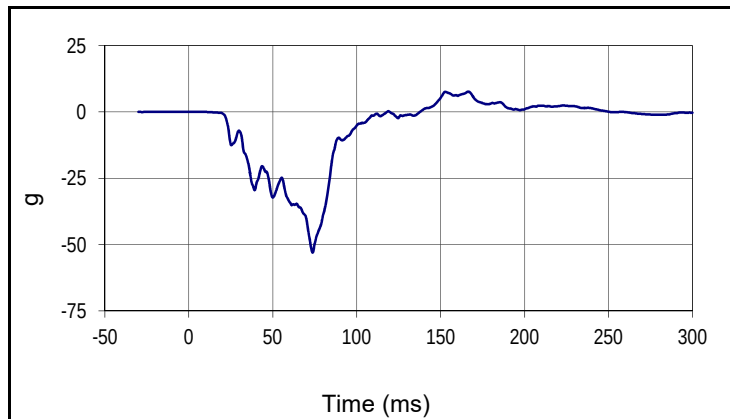
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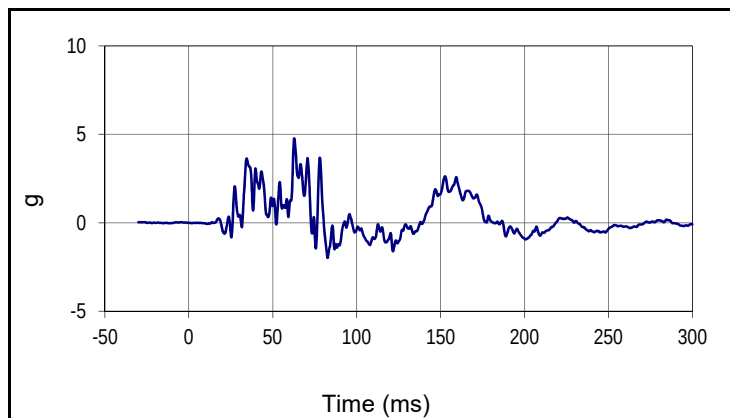
Curve Description			
Passenger Chest Deflection			
Plot No.		SAE Class	Units
020		600	mm
Max	Time	Min	Time
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Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

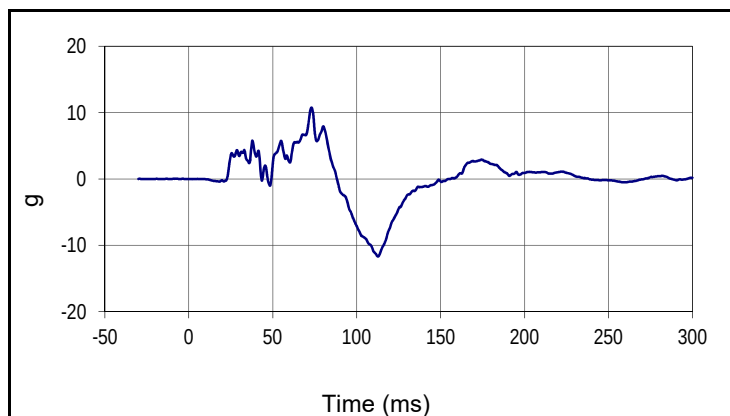
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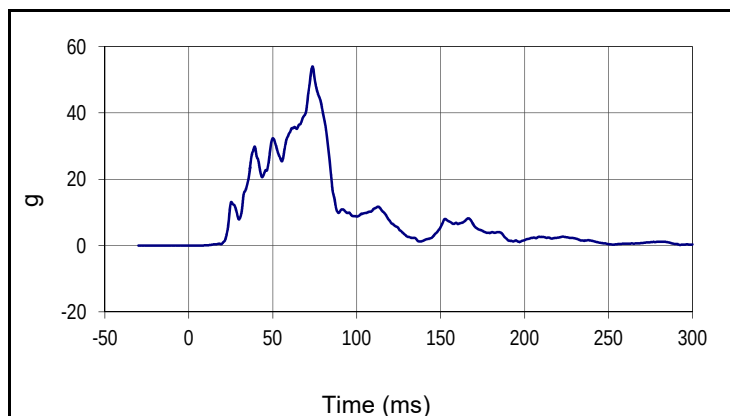
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.		SAE Class	Units
021		180	g
Max	Time	Min	Time
7.6	166.4	-53.0	73.7



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.		SAE Class	Units
022		180	g
Max	Time	Min	Time
4.8	62.8	-2.0	82.6



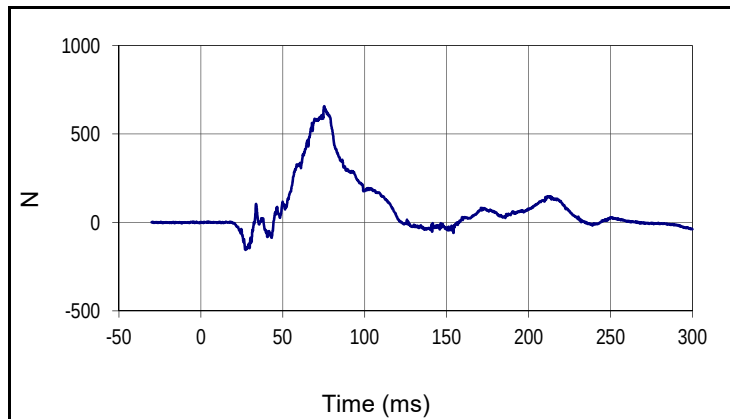
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.		SAE Class	Units
023		180	g
Max	Time	Min	Time
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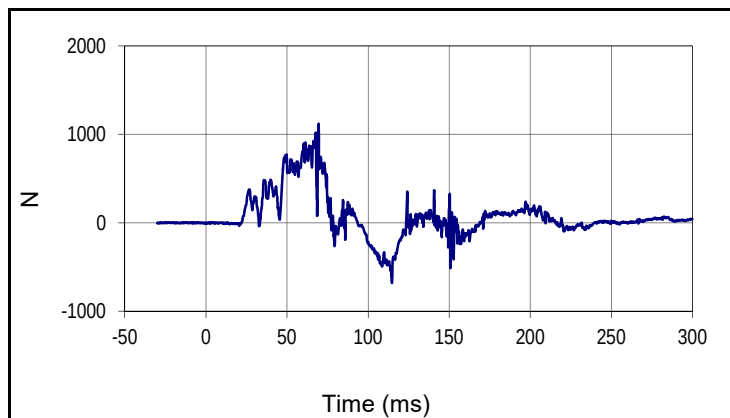
Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.		SAE Class	Units
024		180	g
Max	Time	Min	Time
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Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

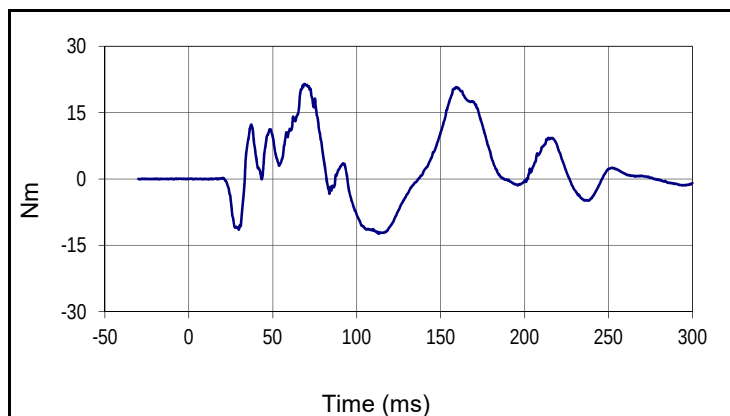
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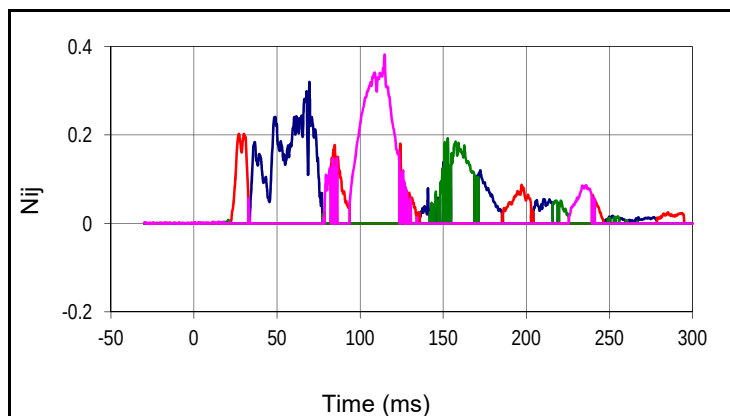
Curve Description			
Passenger Upper Neck Force X			
Plot No.		SAE Class	Units
025		1000	N
Max	Time	Min	Time
657.5	75.3	-154.3	27.2



Curve Description			
Passenger Upper Neck Force Z			
Plot No.		SAE Class	Units
026		1000	N
Max	Time	Min	Time
1117.7	69.5	-679.3	114.7



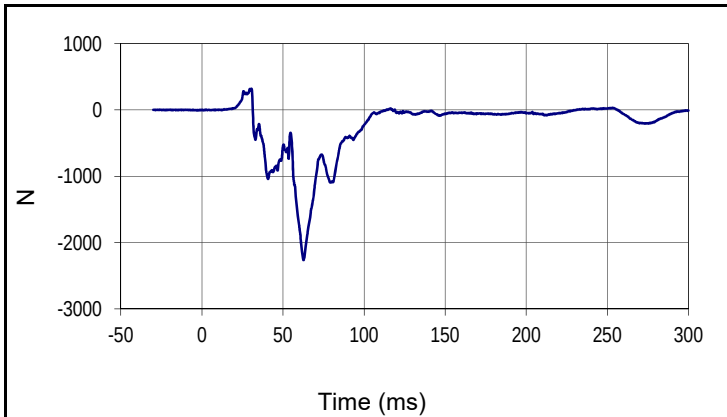
Curve Description			
Passenger Upper Neck Moment Y			
Plot No.		SAE Class	Units
027		600	Nm
Max	Time	Min	Time
21.4	69.1	-12.4	112.9



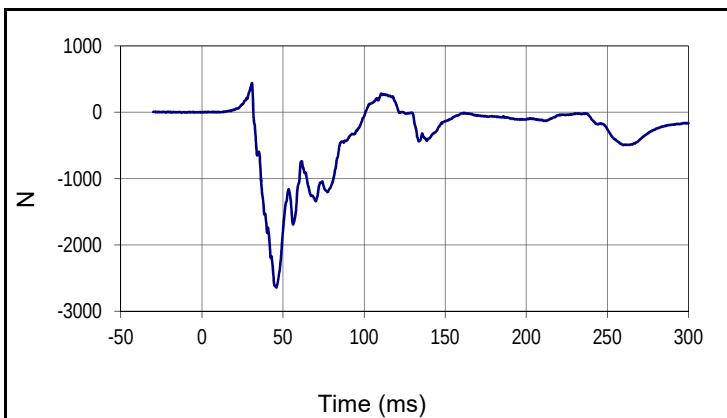
Curve Description		
Passenger Nij		
Units	Max	Time
Ntf	0.32	69.5
Units	Max	Time
Nte	0.20	30.1
Units	Max	Time
Ncf	0.19	152.7
Units	Max	Time
Nce	0.38	114.7

Test Vehicle: 2018 Nissan Armada SV 4WD 5-Door MPV
 Test Program: 56.3 km/h Frontal Impact NCAP Test

NHTSA No.: M20185200
 Test Date: 04/19/18



Curve Description			
Passenger Left Femur Force Z			
Plot No.		SAE Class	Units
029		600	N
Max	Time	Min	Time
317.9	30.6	-2263.4	62.7



Curve Description			
Passenger Right Femur Force Z			
Plot No.		SAE Class	Units
030		600	N
Max	Time	Min	Time
438.6	30.8	-2641.3	45.9

APPENDIX C
ATD CALIBRATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA



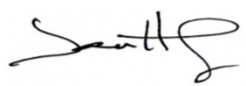
**Hybrid III 50th Percentile Male
ATD Damage Checklist**

ATD Serial No.: 360

Test Date: 2018-04-11

Dummy Item	Inspect for	Comments	Damage	Okay
Entire ATD	Perform general cleaning			✓
Outer Skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck bracket	Upper neck firmly attached to lower bracket			✓
Neck	Broken or cracked rubber			✓
	Looseness at the condyle joint			✓
Nodding block	Cracked or out of position			✓
Lumbar Spine	Broken or cracked rubber			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Displ.	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: 

Approved By: 

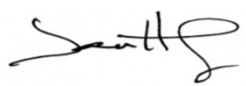


Hybrid III 50th Percentile Male
External Measurements

ATD Serial No.: 360

Test Date: 2018-04-16

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	29	Pass
A - Total sitting height	mm	879	889	885	Pass
B - Shoulder pivot height	mm	505	521	516	Pass
C - 'H' point height	mm	84	89	86	Pass
D - 'H' point location from backline	mm	135	140	138	Pass
E - Shoulder pivot from backline	mm	84	94	88	Pass
F - Thigh clearance	mm	140	155	150	Pass
G - Back of elbow to wrist pivot	mm	290	305	296	Pass
H - Head back to backline	mm	41	46	43	Pass
I - Shoulder to elbow length	mm	330	345	337	Pass
J - Elbow rest height	mm	190	211	205	Pass
K - Buttock to knee length	mm	579	604	596	Pass
L - Popliteal length	mm	429	455	436	Pass
M - Knee pivot height	mm	485	500	494	Pass
N - Buttock popliteal length	mm	452	477	474	Pass
O - Chest depth without jacket	mm	213	229	223	Pass
P - Foot length	mm	251	267	262	Pass
V - Shoulder breadth	mm	422	437	427	Pass
W - Foot breadth	mm	91	107	99	Pass
Y - Chest circum. (w/chest jacket)	mm	970	1001	991	Pass
Z - Waist circum.	mm	836	866	853	Pass
AA - Location for chest circum.	mm	429	434	433	Pass
BB - Location for waist circum.	mm	226	231	231	Pass
Overall Test Results				Pass	

Technician: 

Approved By: 



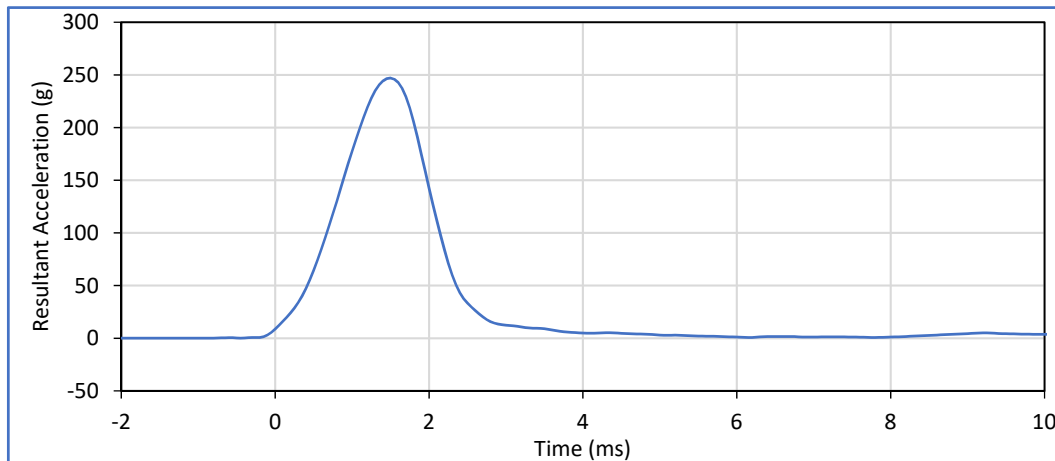
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Info@karco.com www.karco.com

Hybrid III 50th Percentile Male Head Drop

ATD Serial No.: 360

Test Date: 2018-04-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	22	Pass
Peak Resultant Acceleration	g	225.0	275.0	247.0	Pass
Peak Lateral Acceleration	g	-15.0	15.0	4.6	Pass
Oscillations After Main Pulse	%	0.0	10.0	2.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass

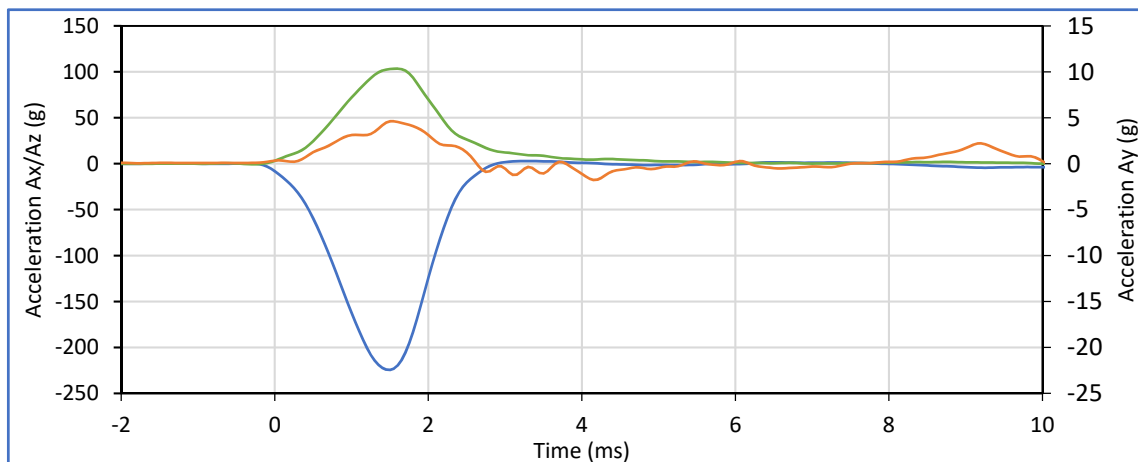


Head Resultant

Max:247.0@1.5

Min:0.7@6.2

SAE Class 1000



Head Ax

Max:2.9@3.3

Min:-224.4@1.5

SAE Class 1000

Head Ay

Max:4.6@1.6

Min:-1.8@4.2

SAE Class 1000

Head Az

Max:103.5@1.6

Min:0.1@10.0

SAE Class 1000

Technician: T. Lowman

T. Lowman

Approved By: P. Puzzuto

P. Puzzuto

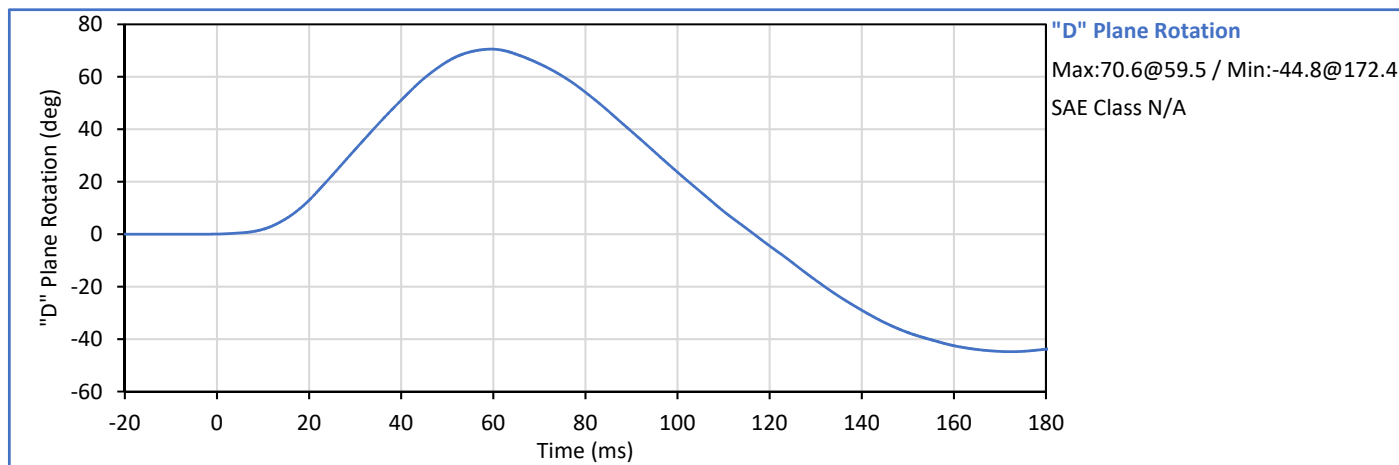
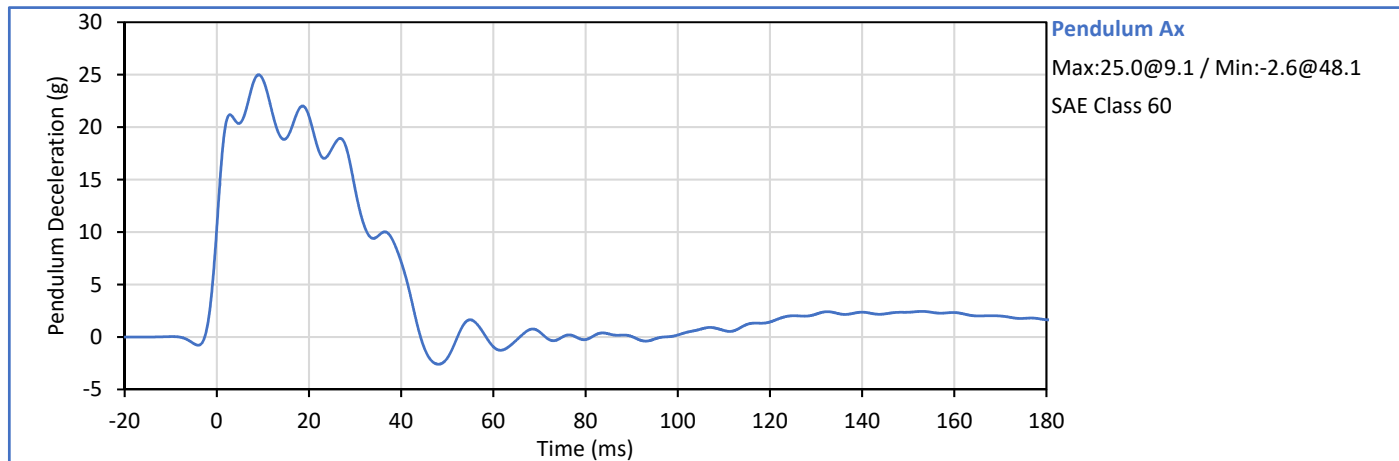


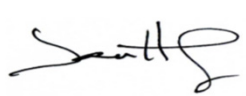
Hybrid III 50th Percentile Male
Neck Flexion Test

ATD Serial No.: 360

Test Date: 2018-04-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	6.89	7.13	7.00	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	24.5	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	21.0	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	14.1	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	14.1	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	41.5	Pass
"D" Plane Rotation peak	deg	64.0	78.0	70.6	Pass
	ms	57.0	64.0	59.5	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	116.7	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	94.9	Pass
	ms	47.0	58.0	54.4	Pass
Moment Decay, Peak to Zero	deg	97.0	107.0	97.2	Pass
Overall Test Results				Pass	



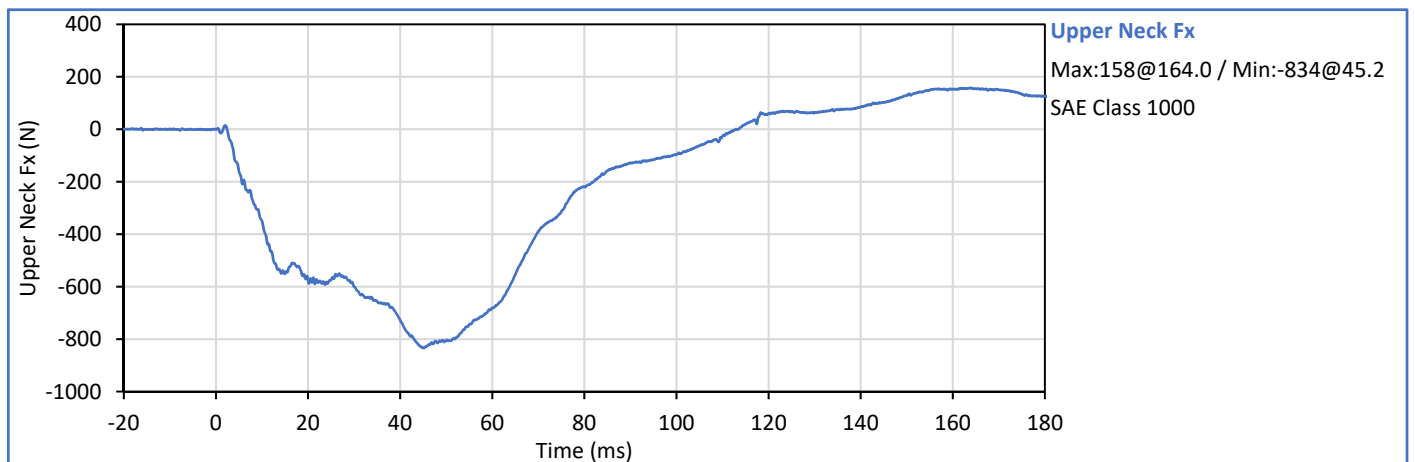
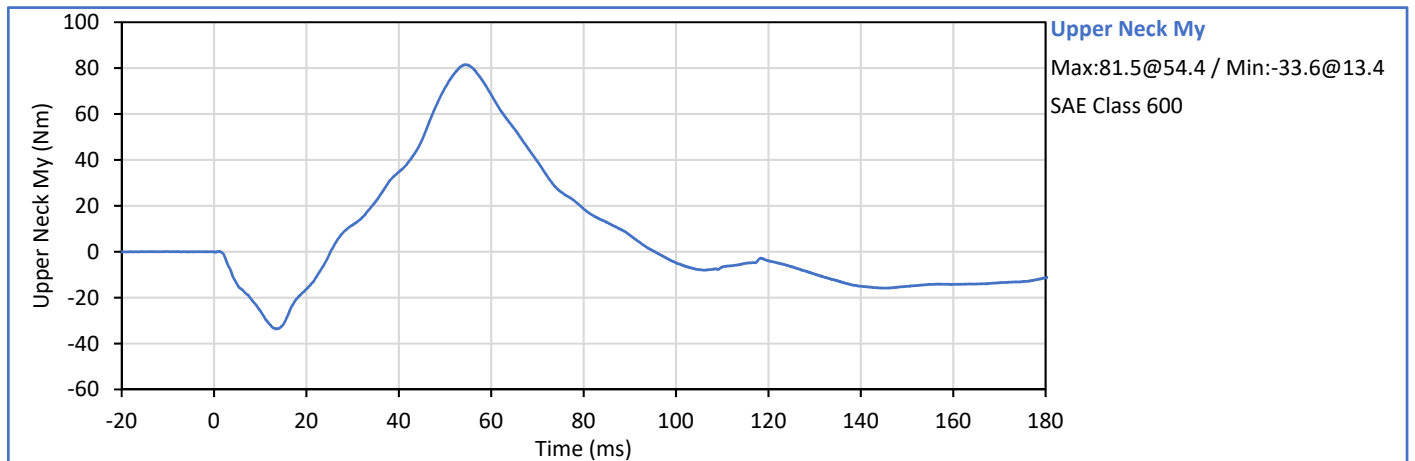
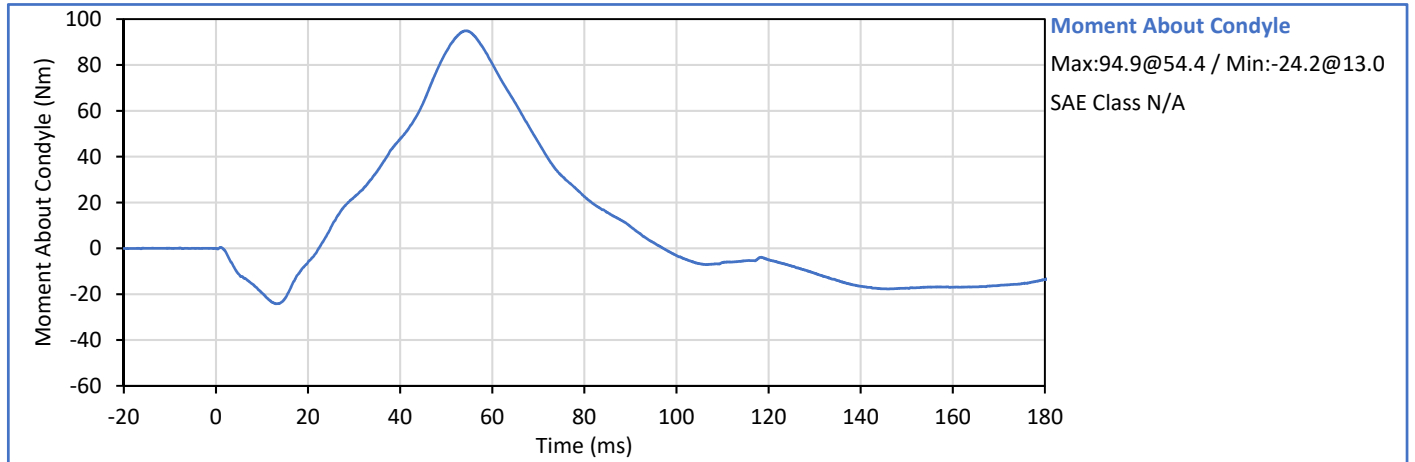
Technician: 

Approved By: 



ATD Serial No.: 360

Test Date: 2018-04-13



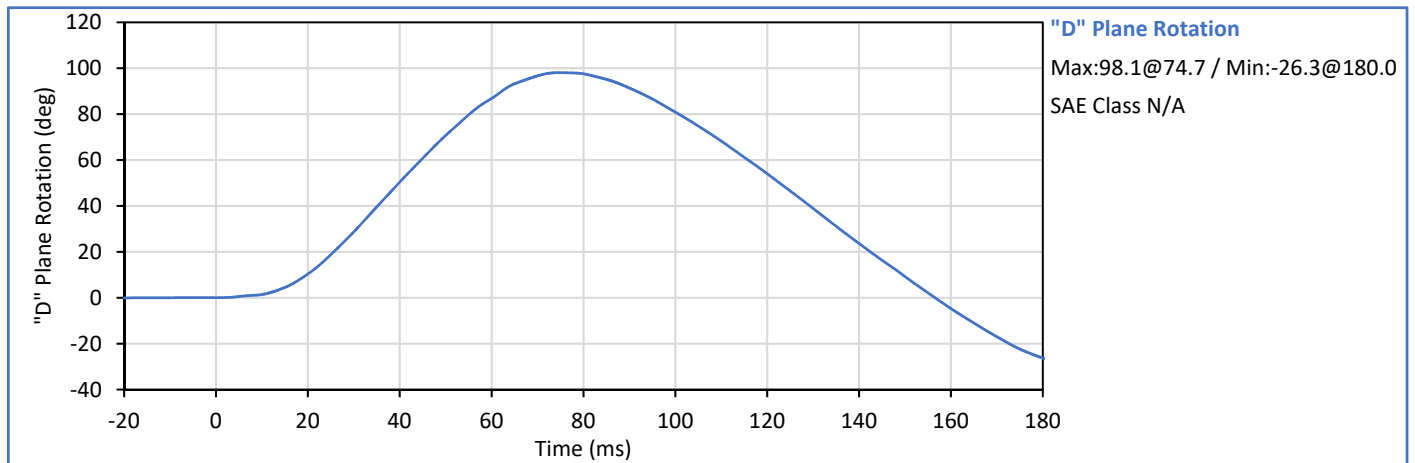
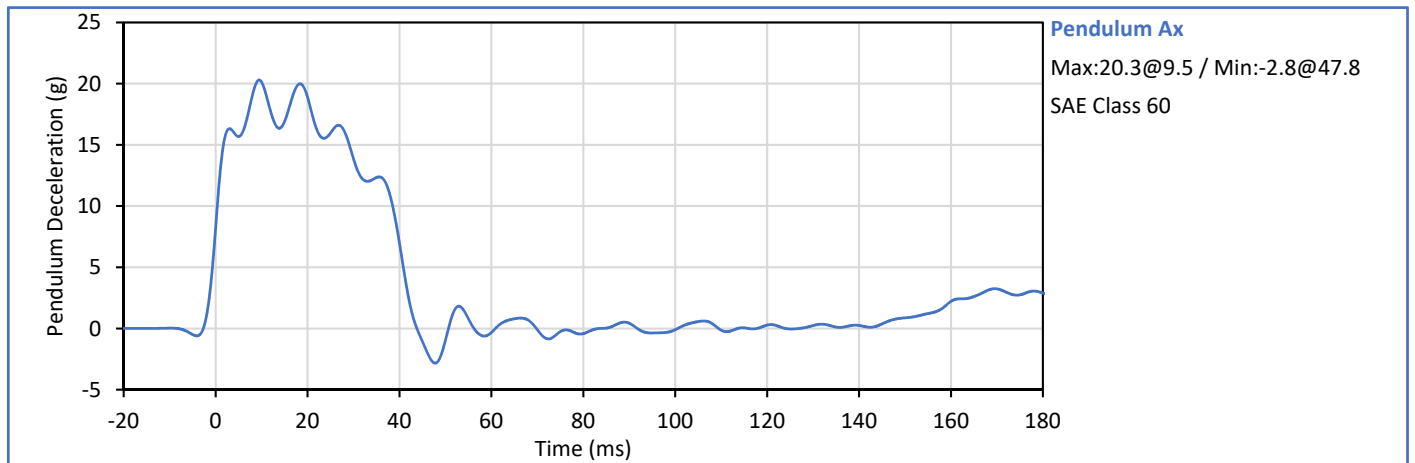


Hybrid III 50th Percentile Male Neck Extension Test

ATD Serial No.: 360

Test Date: 2018-04-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	5.94	6.19	6.07	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	20.1	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.9	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.9	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	13.9	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	40.9	Pass
"D" Plane Rotation peak	deg	81.0	106.0	98.1	Pass
	ms	72.0	82.0	74.7	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	156.7	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-66.0	Pass
	ms	65.0	79.0	70.2	Pass
Moment Decay, Peak to Zero	deg	120.0	148.0	135.9	Pass
Overall Test Results				Pass	



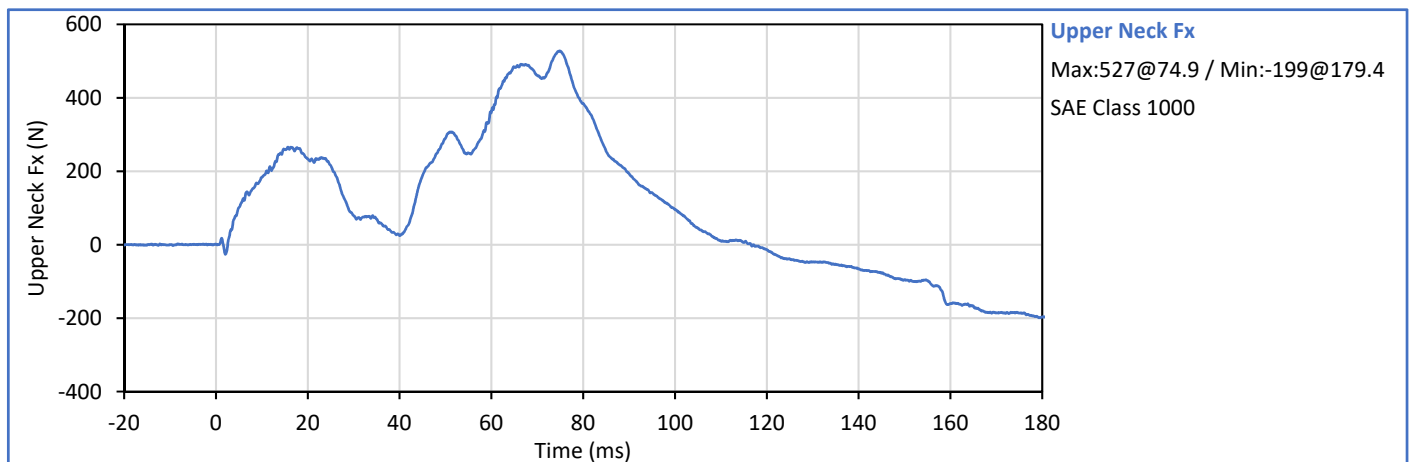
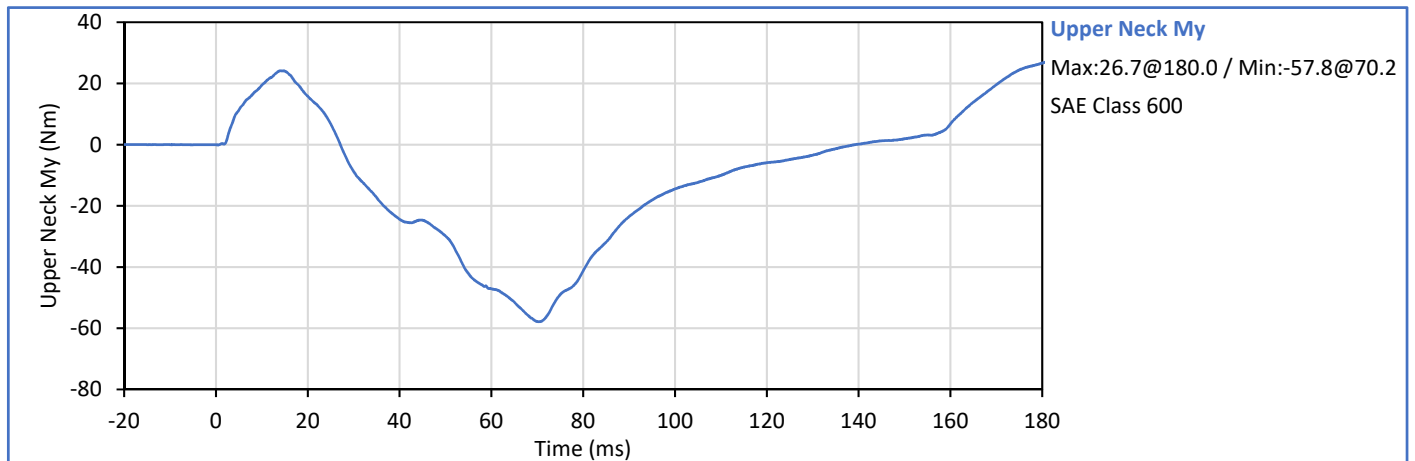
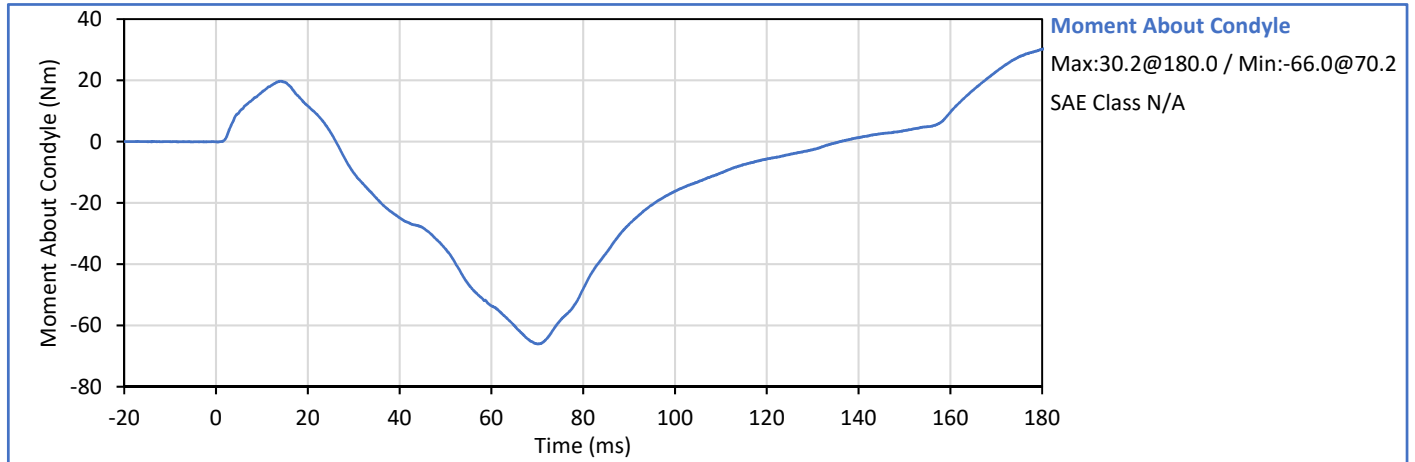
Technician: *Smith*

Approved By: *Plugg*



ATD Serial No.: 360

Test Date: 2018-04-13





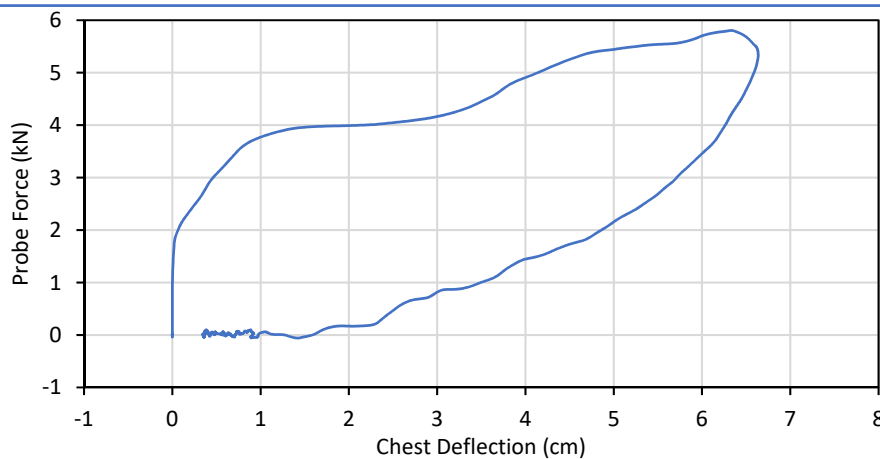
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Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

Hybrid III 50th Percentile Male Thorax Impact

ATD Serial No.: 360

Test Date: 2018-04-16

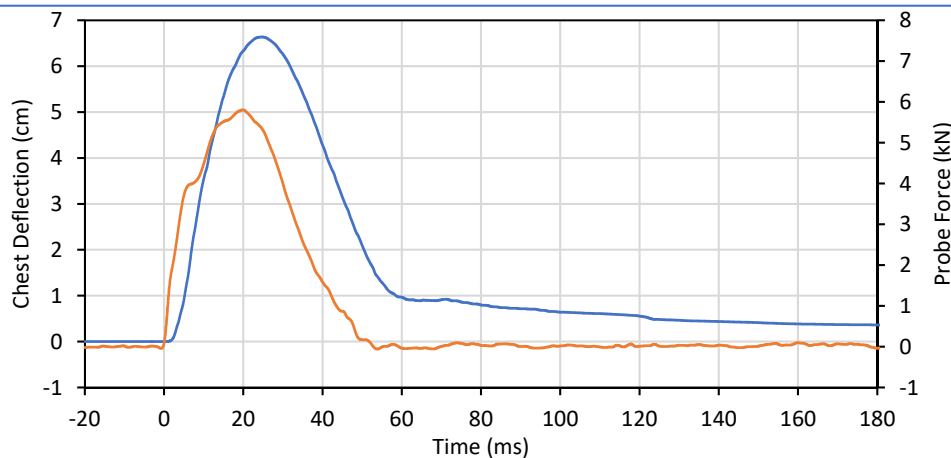
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Humidity	%	10	70	25	Pass
Probe Velocity	m/s	6.58	6.82	6.72	Pass
Peak Chest Deflection	cm	6.35	7.26	6.64	Pass
Peak Probe Force	kN	5.159	5.893	5.805	Pass
Internal Hysteresis	%	69.0	85.0	70.8	Pass
Overall Test Results					Pass



Probe Force

Max:5.805@6.33 / Min:-0.06@1.42

SAE Class N/A



Thorax Dx

Max:6.64@24.8 / Min:0.00@0.5

SAE Class 600

Probe Force

Max:5.805@20.0 / Min:-0.058@53.8

SAE Class 180

Technician: Smith

Approved By: Plum

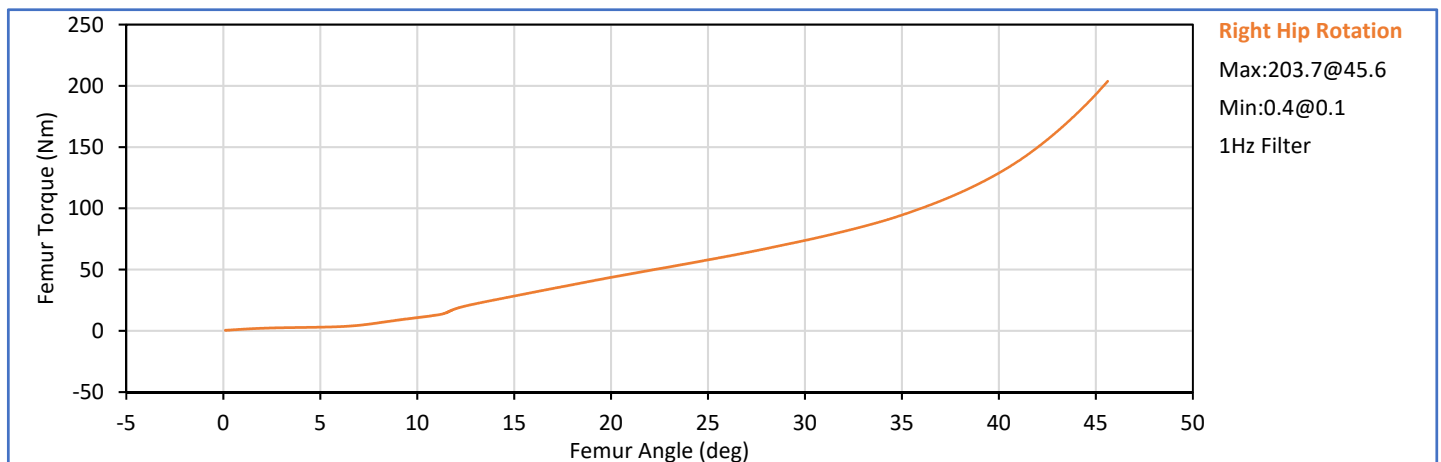
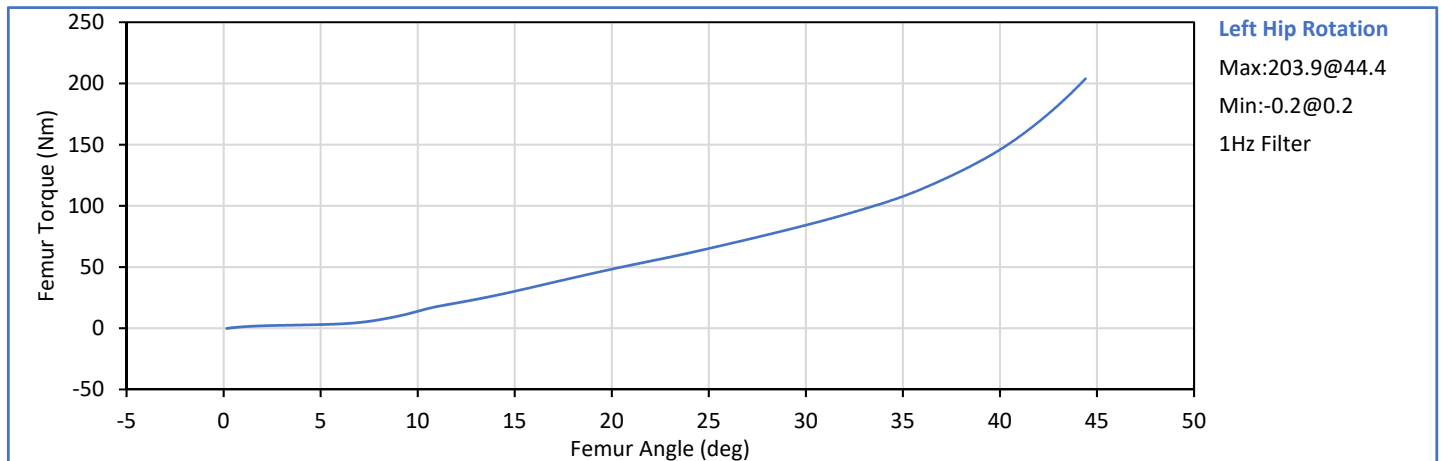


Hybrid III 50th Percentile Male
Hip Flexion (Left/Right)

ATD Serial No.: 360

Test Date: 2018-04-16

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.9	Pass
	Laboratory Humidity	%	10	70	25	Pass
Left Hip	Left Hip Rotation Rate	deg/s	5.0	10.0	6.1	Pass
	Left Femur Torque at 30°	Nm	0.0	95.0	84.3	Pass
	Left Hip Rotation at 203 Nm	deg	40.0	50.0	44.3	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	73.9	Pass
	Right Hip Rotation at 203 Nm	deg	40.0	50.0	45.6	Pass
Overall Test Results						Pass



Technician: J. Hernandez

Approved By: P. Puzzuto



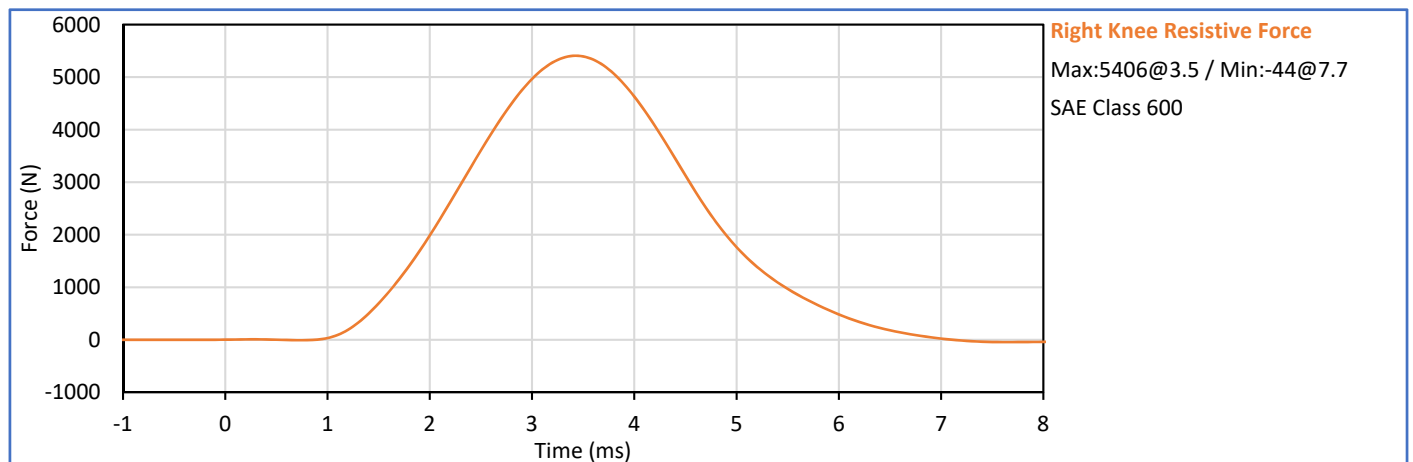
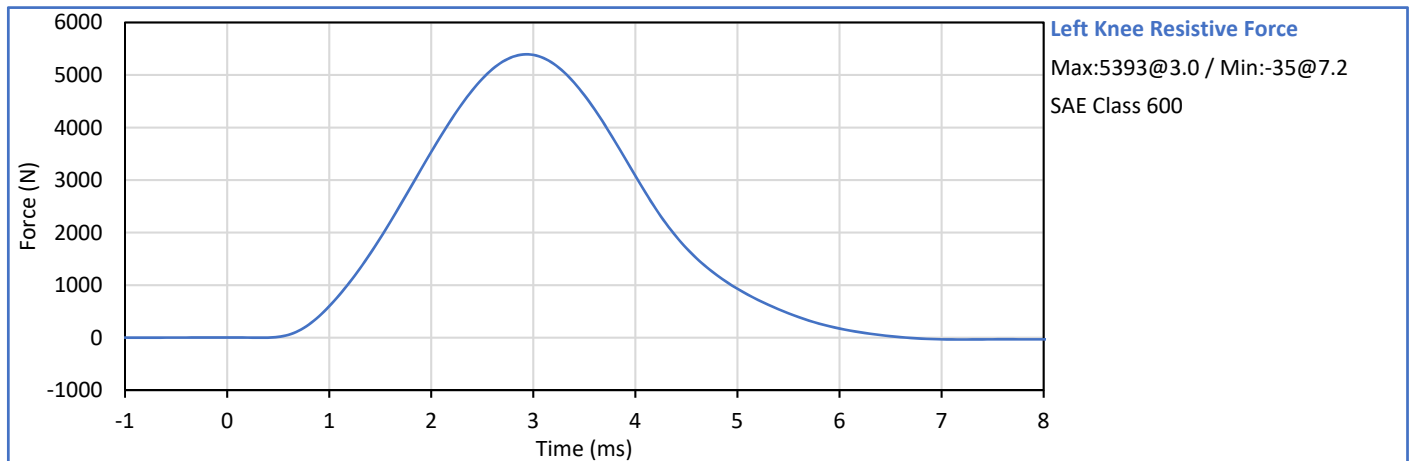
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Hybrid III 50th Percentile Male Knee Impact (Left/Right)

ATD Serial No.: 360

Test Date: 2018-04-11

Tested Parameter		Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature		°C	18.9	25.6	22.3	Pass
Laboratory Humidity		%	10	70	27	Pass
Left Knee	Probe Velocity	m/s	2.070	2.130	2.119	Pass
	Peak Resistive Force	N	4715	5782	5393	Pass
Right Knee	Probe Velocity	m/s	2.070	2.130	2.120	Pass
	Peak Resistive Force	N	4715	5782	5406	Pass
Overall Test Results						Pass



Technician: JfJ

Approved By: Plungito



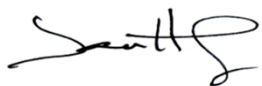
Hybrid III 5th Percentile Female Damage Checklist

ATD Serial No.: 630

Test Date: 2018-04-10

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.: 630

Test Date: 2018-04-16

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	23	Pass
A - Total sitting height	mm	775	800	783	Pass
B - Shoulder pivot height	mm	432	457	451	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	75	Pass
F - Thigh clearance	mm	119	135	129	Pass
G - Back of elbow to wrist pivot	mm	244	259	251	Pass
H - Head back to backline	mm	41	46	42	Pass
I - Shoulder to elbow length	mm	277	297	287	Pass
J - Elbow rest height	mm	183	203	196	Pass
K - Buttock to knee length	mm	521	546	527	Pass
L - Popliteal length	mm	356	376	362	Pass
M - Knee pivot height	mm	394	419	405	Pass
N - Buttock popliteal length	mm	414	439	424	Pass
O - Chest depth without jacket	mm	175	191	187	Pass
P - Foot length	mm	219	234	225	Pass
R - Buttock to Knee Pivot Length	mm	457	483	470	Pass
S - Head Breadth	mm	137	147	144	Pass
T - Head Depth	mm	178	188	186	Pass
U - Hip Breadth	mm	300	315	310	Pass
V - Shoulder breadth	mm	351	366	356	Pass
W - Foot breadth	mm	79	94	90	Pass
X - Head circum.	mm	528	549	537	Pass
Y - Chest circum. (w/chest jacket)	mm	851	881	866	Pass
Z - Waist circum.	mm	760	790	770	Pass
AA - Location for chest circum.	mm	333	358	337	Pass
BB - Location for waist circum.	mm	160	170	166	Pass
			Overall Test Results		Pass

Technician: _____

J. Hernandez

Approved By: _____

P. Puzzuto



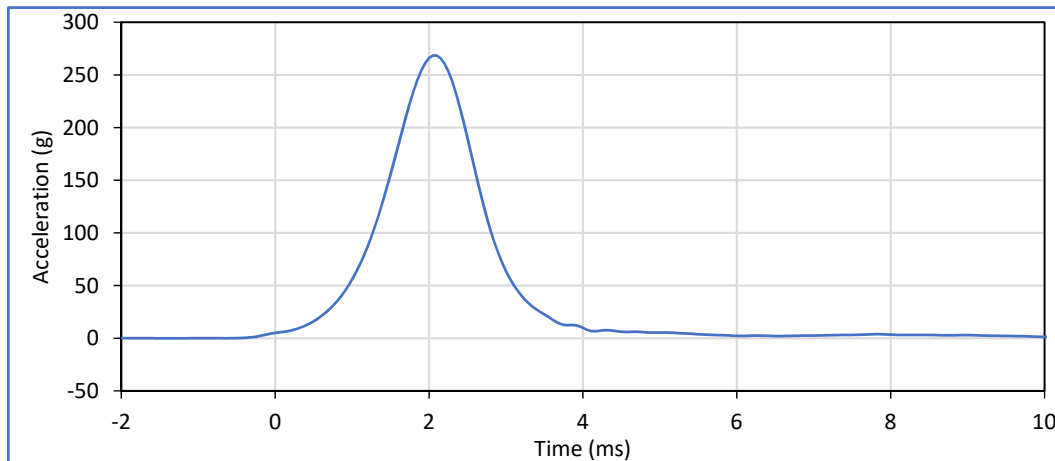
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Hybrid III 5th Percentile Female Head Drop

ATD Serial No.: 630

Test Date: 2018-04-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	22.2	Pass
Laboratory Humidity	%	10	70	25	Pass
Peak Resultant Acceleration	g	250.0	300.0	268.4	Pass
Peak Lateral Acceleration	g	-15.0	15.0	1.7	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass

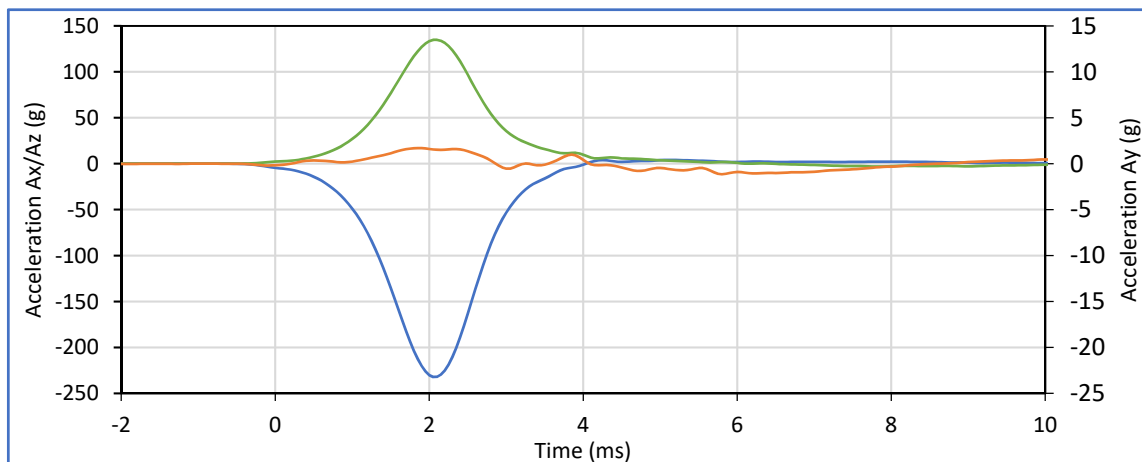


Head Resultant

Max:268.4@2.1

Min:1.3@10.0

SAE Class 1000



Head Ax

Max:4.2@5.1

Min:-232.1@2.1

SAE Class 1000

Head Ay

Max:1.7@1.9

Min:-1.1@5.8

SAE Class 1000

Head Az

Max:134.9@2.1

Min:-3.1@7.9

SAE Class 1000

Technician: T. Lowman

T. Lowman

Approved By: P. Puzzuto

P. Puzzuto

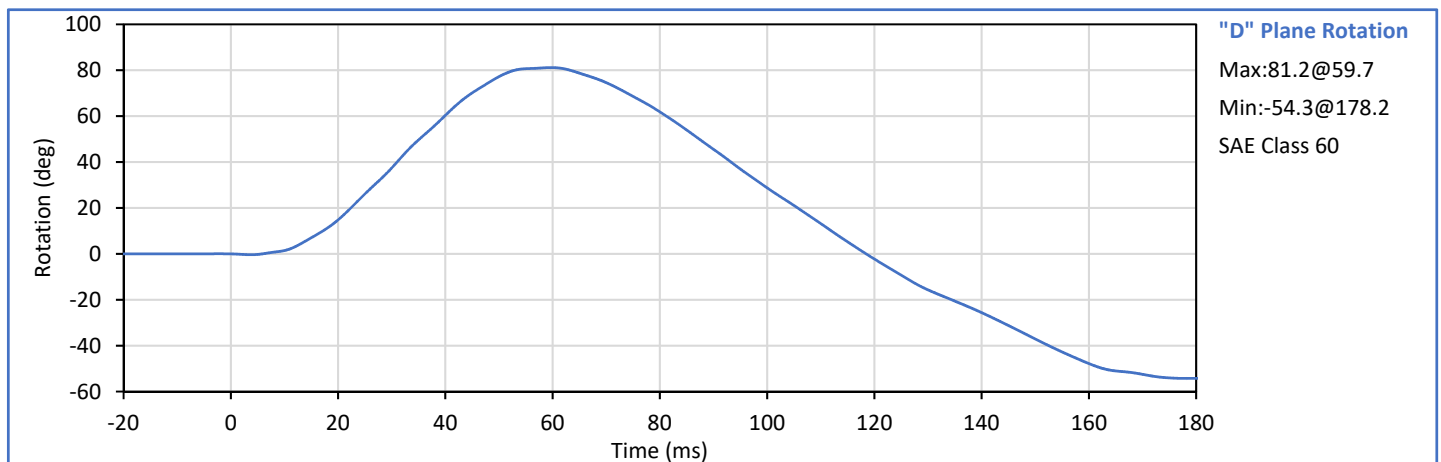
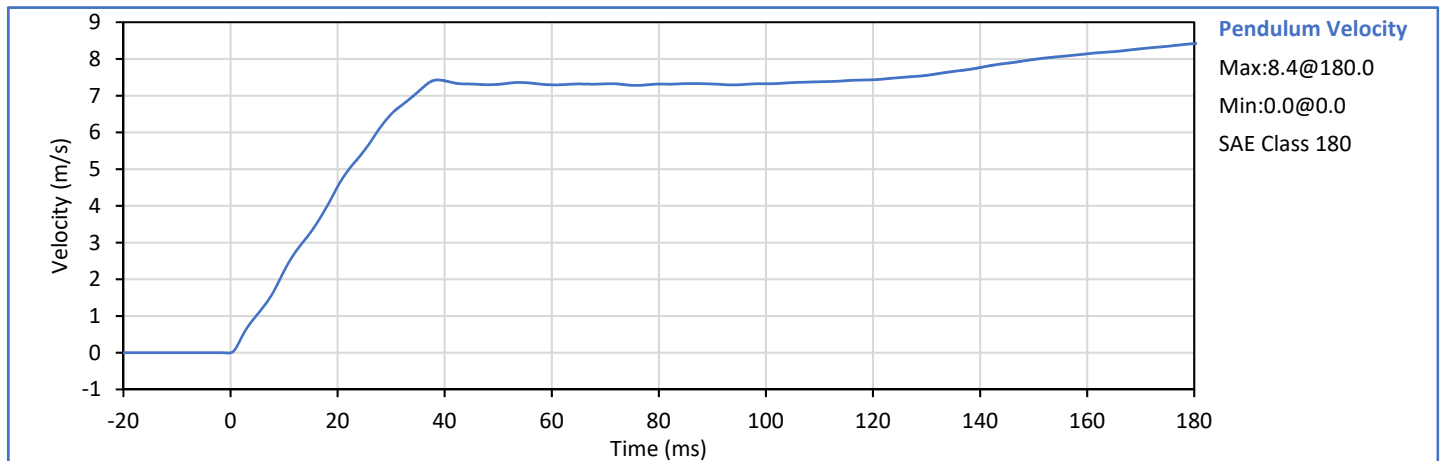


Hybrid III 5th Percentile Female Neck Flexion Test

ATD Serial No.: 630

Test Date: 2018-04-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	6.89	7.13	7.08	Pass
Pendulum Velocity at 10 ms	m/s	2.10	2.50	2.22	Pass
Pendulum Velocity at 20 ms	m/s	4.00	5.00	4.53	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.50	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	81.2	Pass
Peak Moment in Rotation	Nm	69.0	83.0	79.4	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	84.8	Pass
Overall Test Results				Pass	Pass



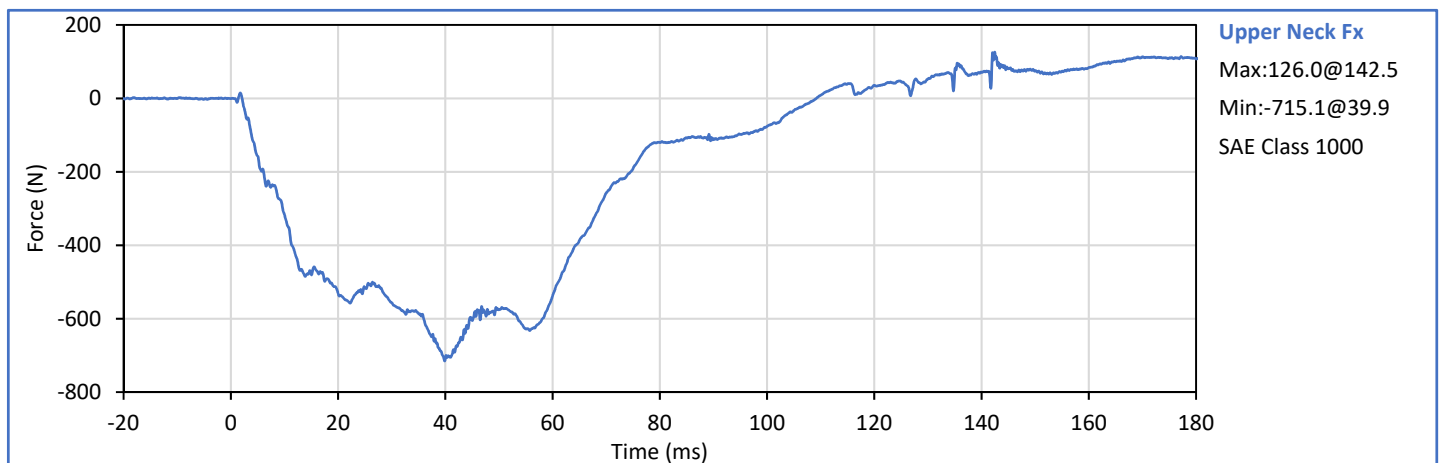
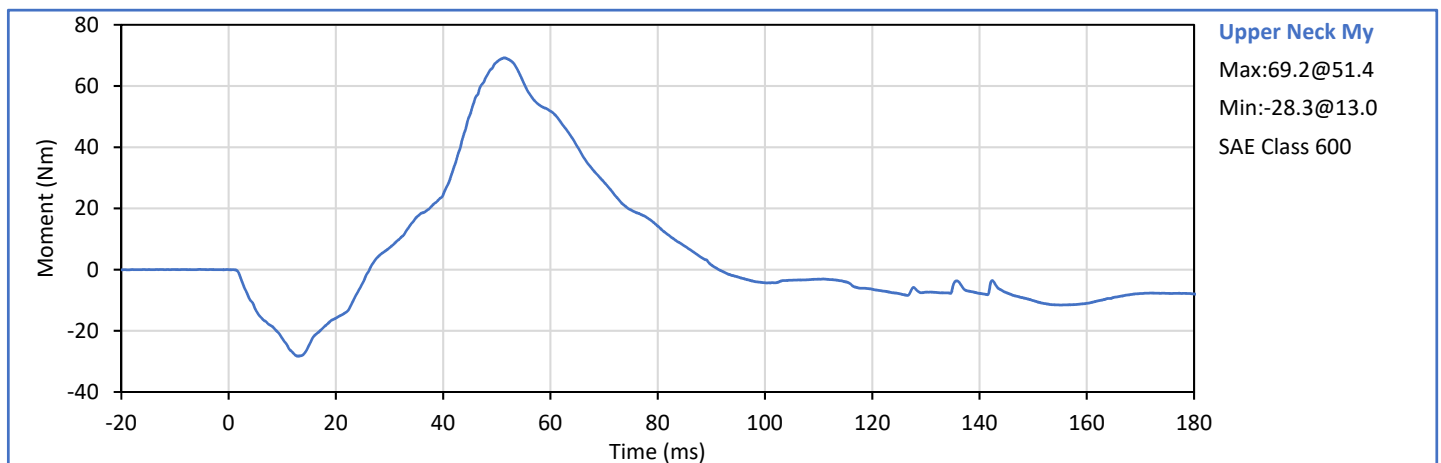
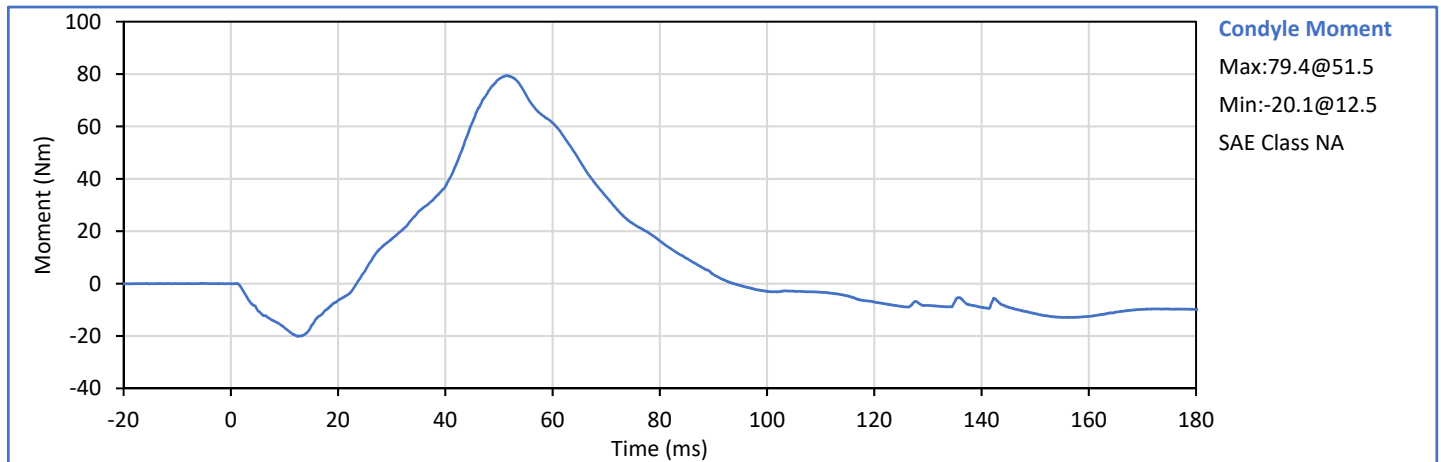
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 630

Test Date: 2018-04-16



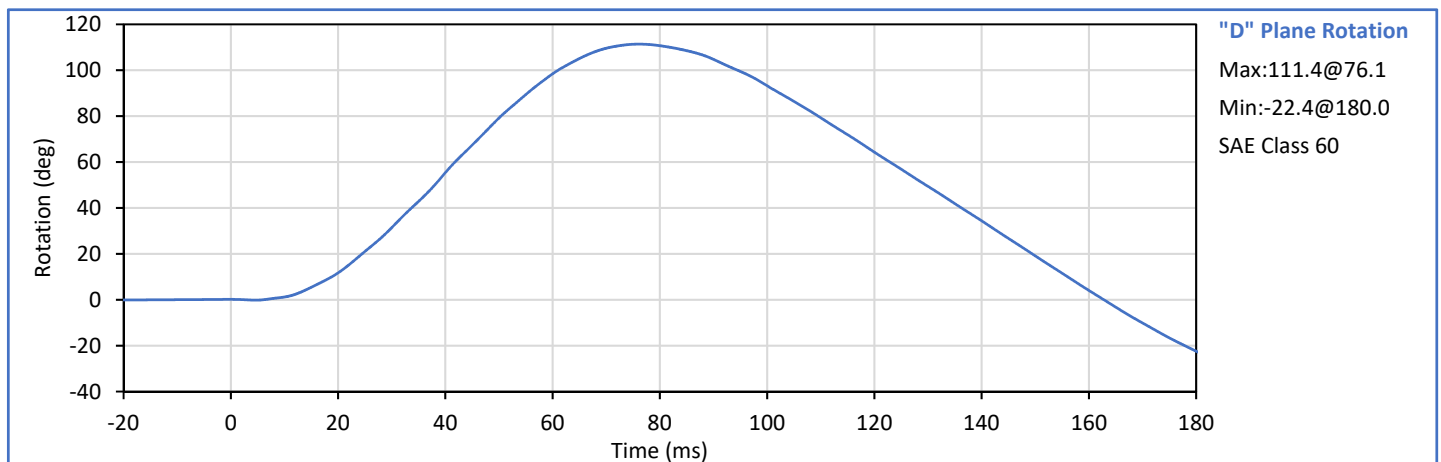
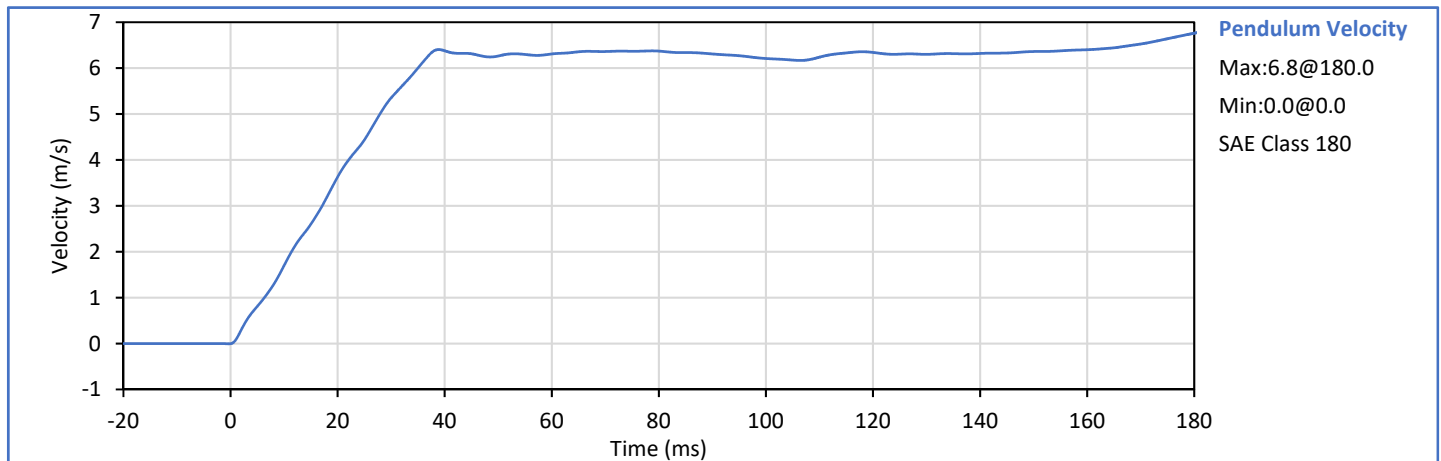


**Hybrid III 5th Percentile Female
Neck Extension Test**

ATD Serial No.: 630

Test Date: 2018-04-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	5.95	6.19	6.17	Pass
Pendulum Velocity at 10 ms	m/s	1.50	1.90	1.70	Pass
Pendulum Velocity at 20 ms	m/s	3.10	3.90	3.63	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	5.35	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	111.4	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-57.6	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	102.5	Pass
Overall Test Results				Pass	Pass



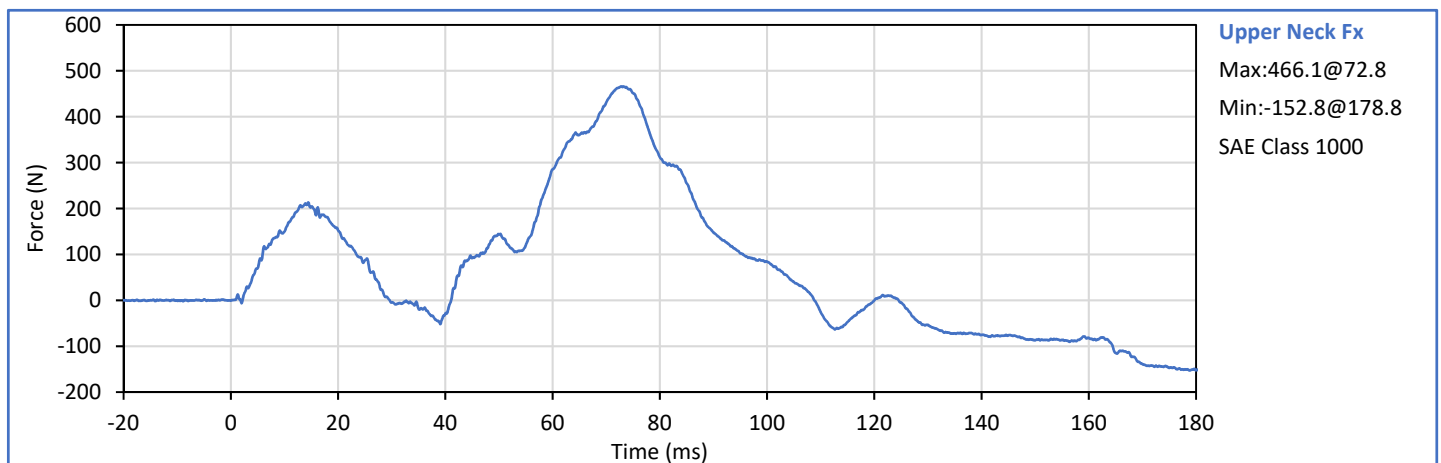
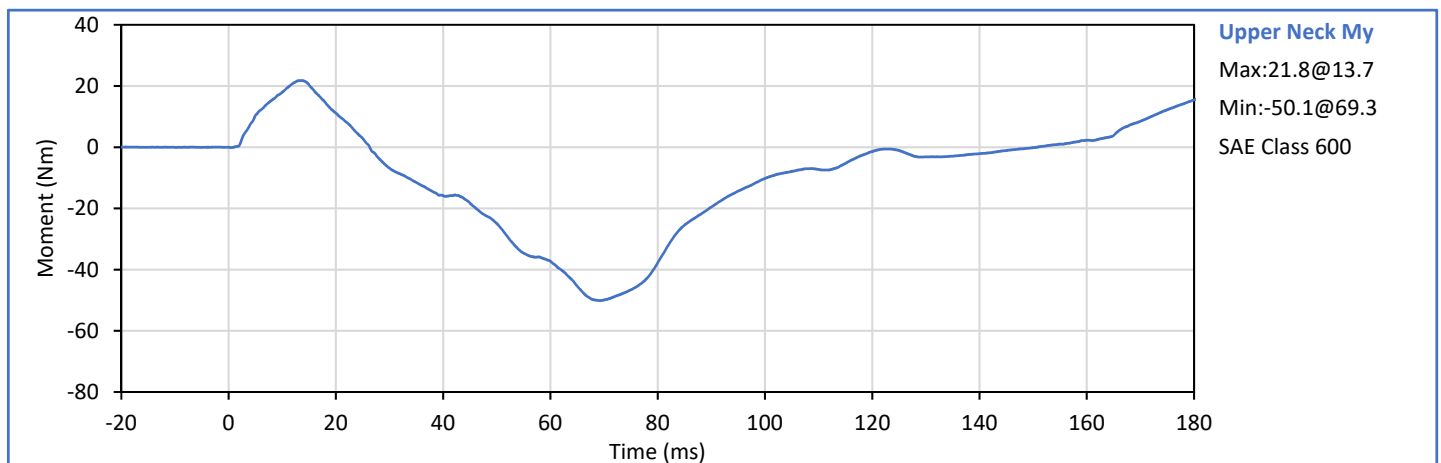
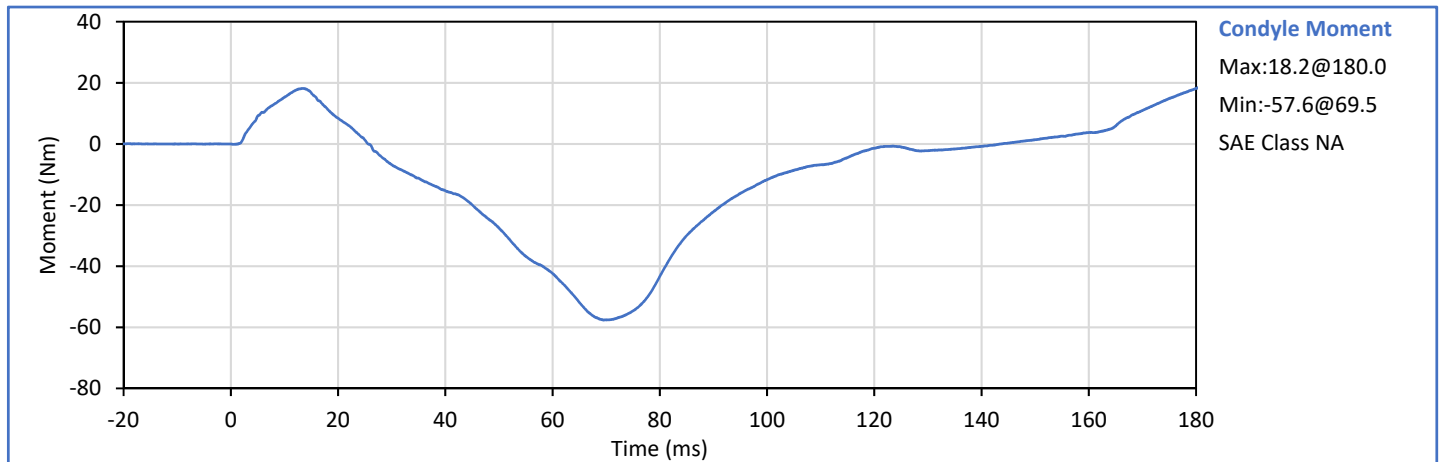
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 630

Test Date: 2018-04-16





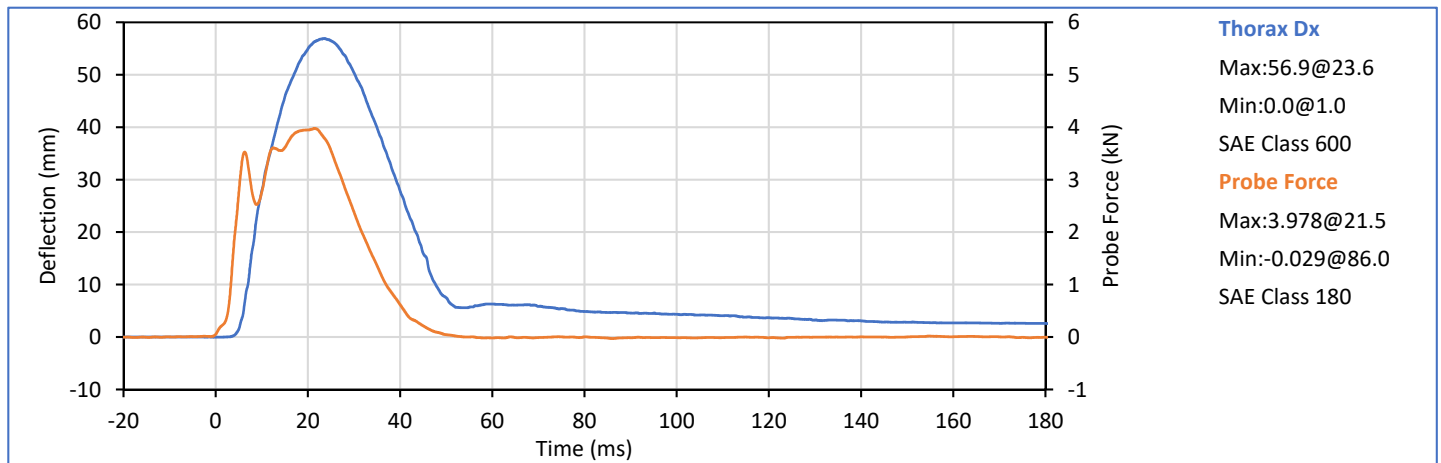
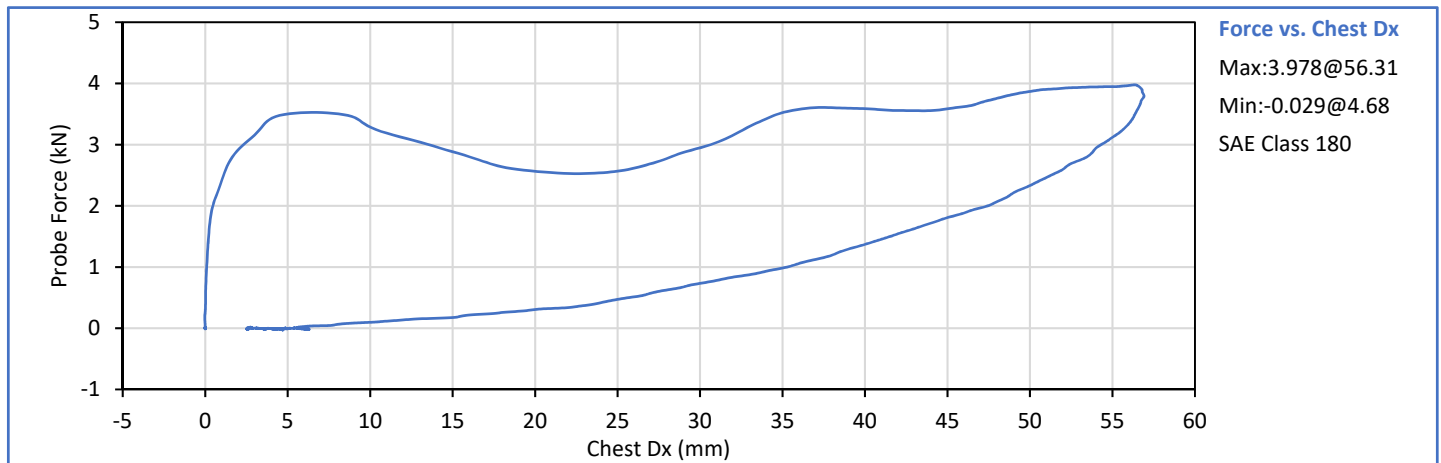
9270 Holly Road, Adelanto, CA 92301
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Info@karco.com www.karco.com

Hybrid III 5th Percentile Female Thorax Impact

ATD Serial No.: 630

Test Date: 2018-04-11

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	27	Pass
Probe Velocity	m/s	6.59	6.83	6.67	Pass
Peak Chest Deflection	mm	50.0	58.0	56.9	Pass
Peak Probe Force, 50 and 58 mm	kN	3.900	4.400	3.978	Pass
Peak Probe Force, 18 and 50 mm	kN	0.000	4.600	3.870	Pass
Internal Hysteresis	%	69.0	85.0	70.1	Pass
Overall Test Results					Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

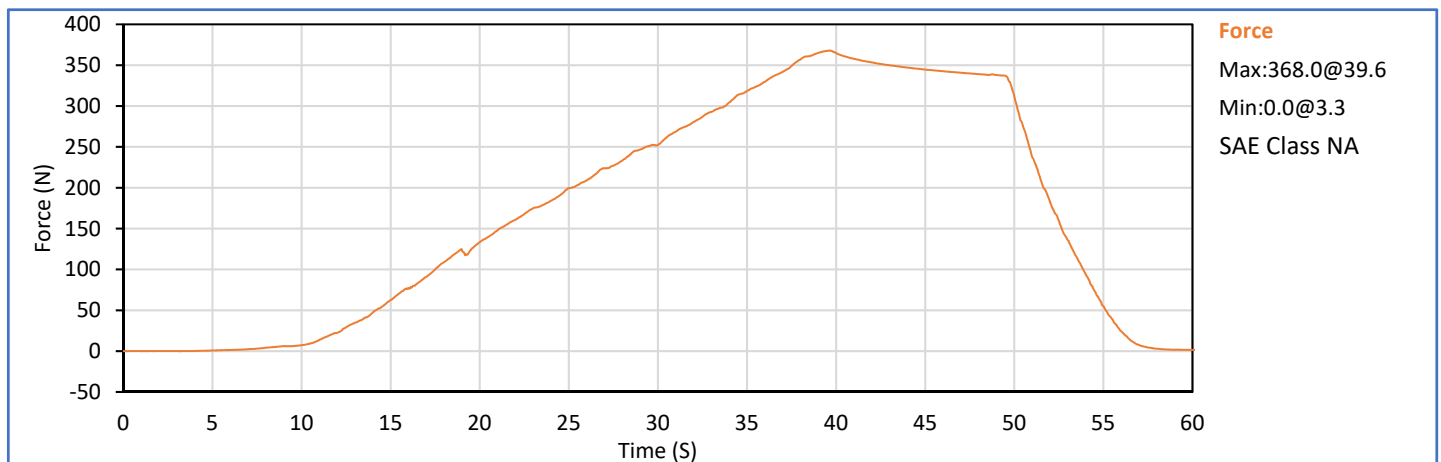
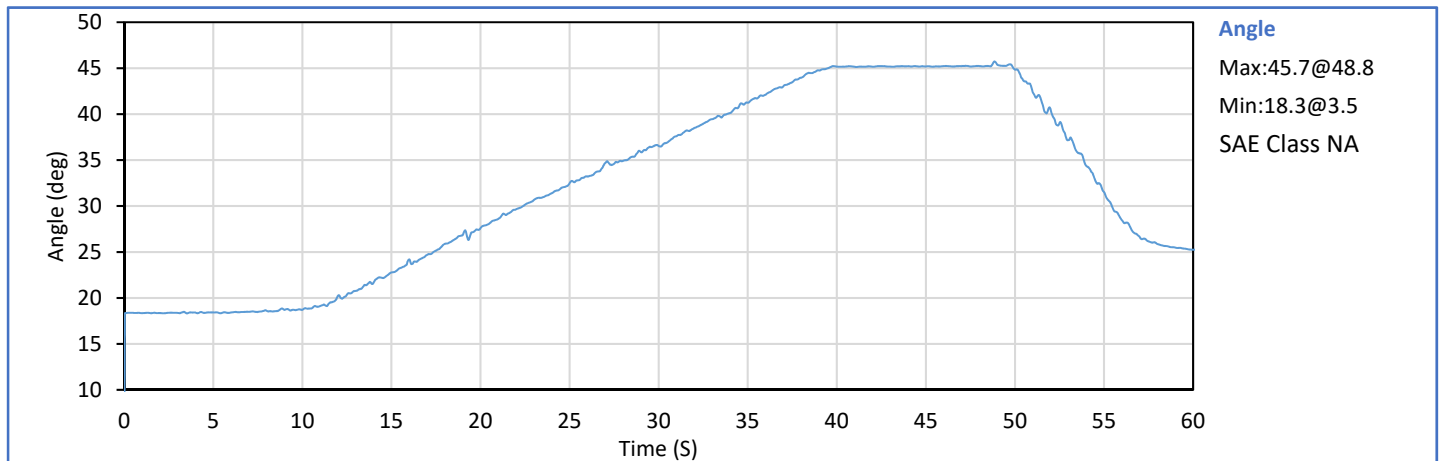


**Hybrid III 5th Percentile Female
Torso Flexion Test**

ATD Serial No.: 630

Test Date: 2018-04-11

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	27	Pass
Orientation Angle	deg	0.0	20.0	13.8	Pass
Test Initial Angle	deg	11.0	19.0	18.4	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	367.5	Pass
Torso Flexion Rate	deg/s	0.50	1.50	0.92	Pass
Final Reference Plane Angle	deg	-8.0	8.0	4.9	Pass
Overall Test Results					Pass



Technician: J. Hernandez

Approved By: P. Puzzuto



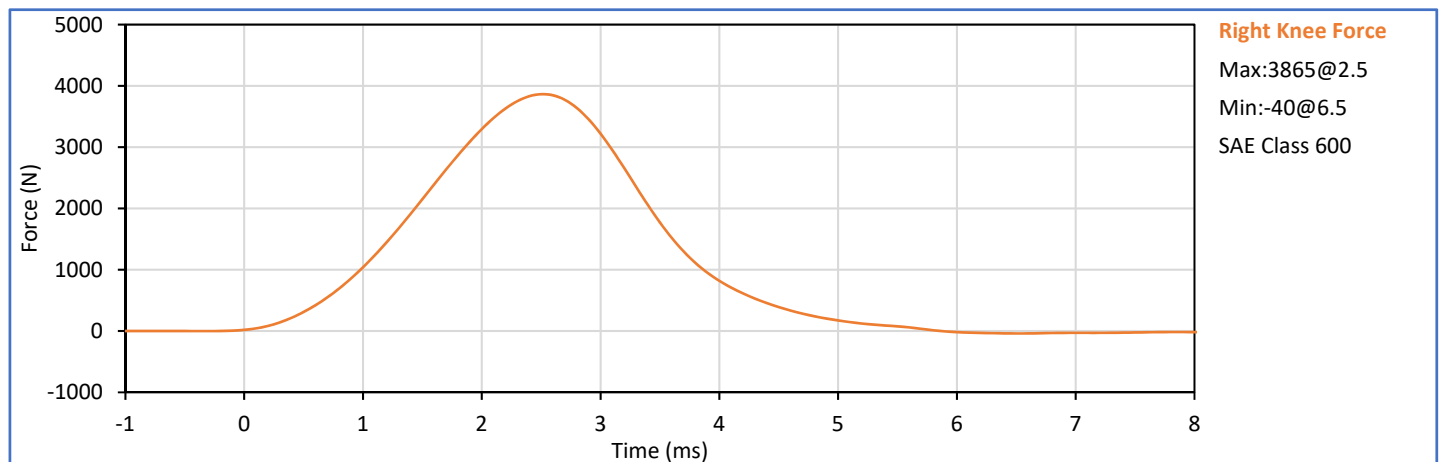
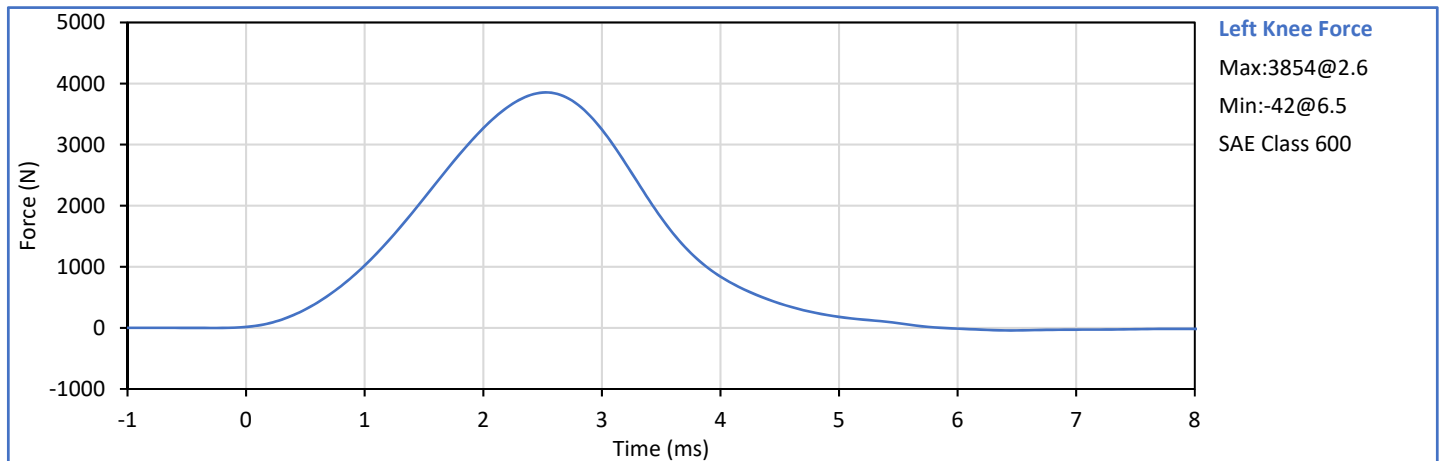
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Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

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

ATD Serial No.: 630

Test Date: 2018-04-10

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	23.2	Pass
	Laboratory Humidity	%	10	70	24	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.078	Pass
Knee	Peak Resistive Force	N	3450	4060	3854	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.081	Pass
Knee	Peak Resistive Force	N	3450	4060	3865	Pass
Overall Test Results					Pass	



Technician: T. Lowman

Approved By: P. Puzzuto

APPENDIX C
POST-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA



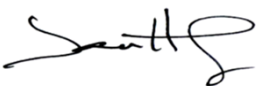
**Hybrid III 50th Percentile Male
ATD Damage Checklist**

ATD Serial No.: 360

Test Date: 2018-04-23

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: 2018-04-23

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
A - Total sitting height	mm	879	889	888	Pass
B - Shoulder pivot height	mm	505	521	513	Pass
C - 'H' point height	mm	84	89	88	Pass
D - 'H' point location from backline	mm	135	140	140	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	299	Pass
H - Head back to backline	mm	41	46	46	Pass
I - Shoulder to elbow length	mm	330	345	339	Pass
J - Elbow rest height	mm	190	211	202	Pass
K - Buttock to knee length	mm	579	604	587	Pass
L - Popliteal length	mm	429	455	436	Pass
M - Knee pivot height	mm	485	500	493	Pass
N - Buttock popliteal length	mm	452	477	462	Pass
O - Chest depth without jacket	mm	213	229	222	Pass
P - Foot length	mm	251	267	262	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	983	Pass
Z - Waist circum.	mm	836	866	853	Pass
AA - Location for chest circum.	mm	429	434	432	Pass
BB - Location for waist circum.	mm	226	231	227	Pass
			Overall Test Results		Pass

Technician: _____

J. Hernandez

Approved By: _____

P. Puzzuto

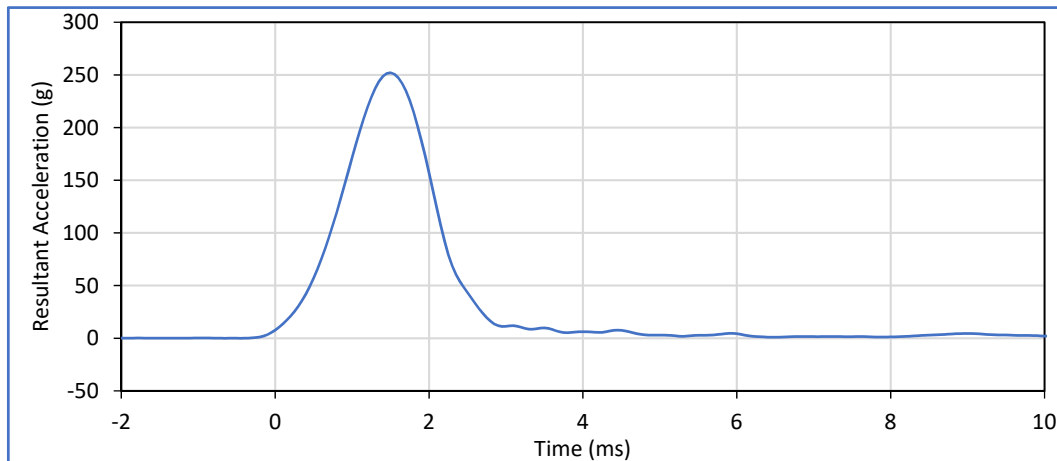


Hybrid III 50th Percentile Male
Head Drop

ATD Serial No.: 360

Test Date: 2018-04-23

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.9	Pass
Laboratory Humidity	%	10	70	28	Pass
Peak Resultant Acceleration	g	225.0	275.0	252.1	Pass
Peak Lateral Acceleration	g	-15.0	15.0	4.6	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	

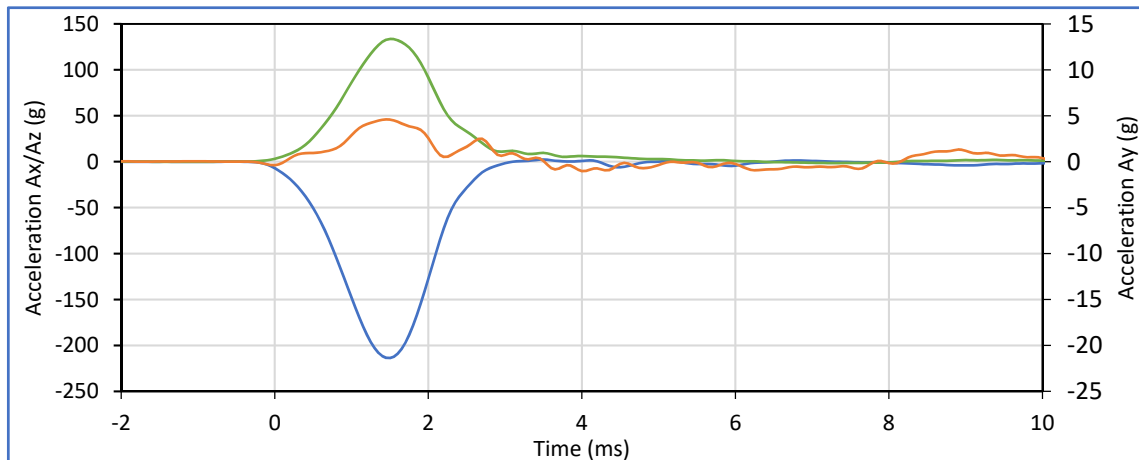


Head Resultant

Max:252.1@1.5

Min:0.9@6.5

SAE Class 1000



Head Ax

Max:2.4@3.5

Min:-213.6@1.5

SAE Class 1000

Head Ay

Max:4.6@1.5

Min:-1.0@4.0

SAE Class 1000

Head Az

Max:133.7@1.5

Min:-1.5@7.3

SAE Class 1000

Technician:

T. Lowman

T. Lowman

Approved By:

P. Puzzuto

P. Puzzuto

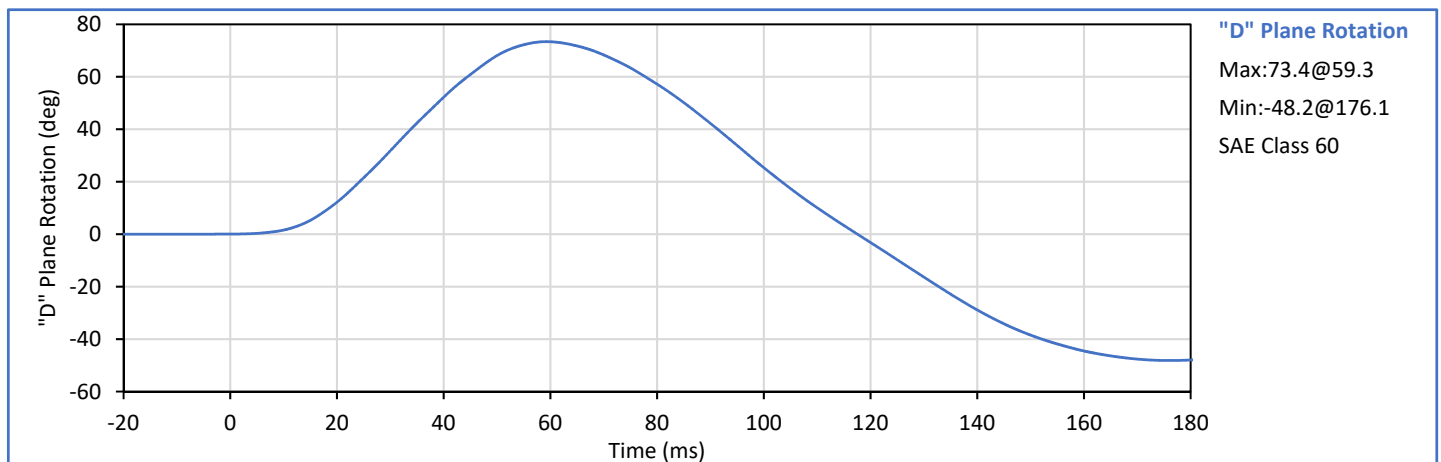
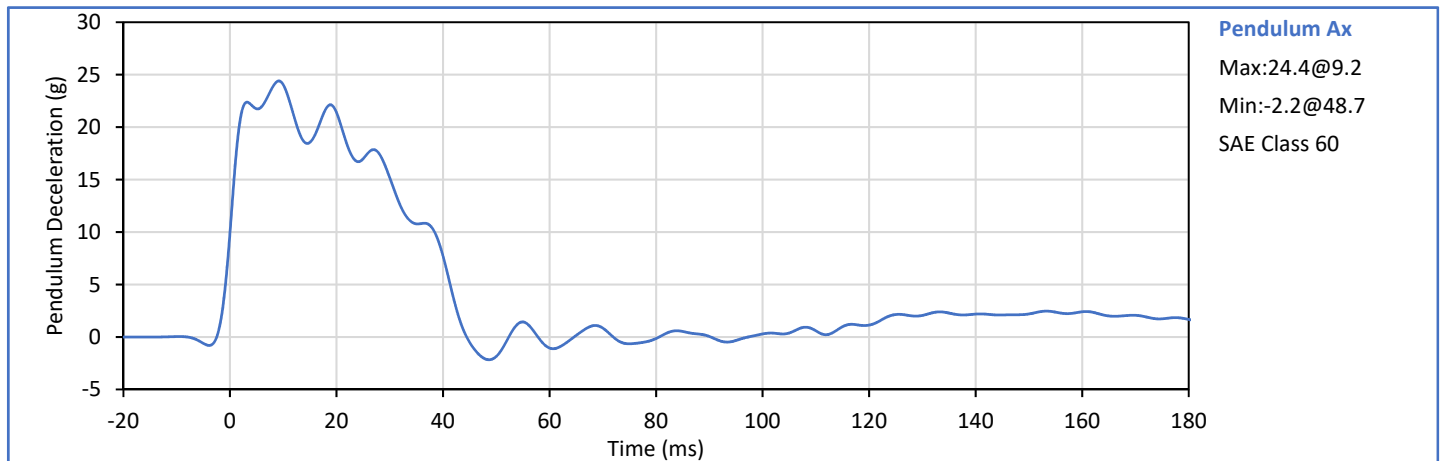


Hybrid III 50th Percentile Male
Neck Flexion Test

ATD Serial No.: 360

Test Date: 2018-04-22

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.1	Pass
Laboratory Humidity	%	10	70	21	Pass
Pendulum Velocity	m/s	6.89	7.13	6.99	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	24.0	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	21.4	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	15.2	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	15.2	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	41.3	Pass
"D" Plane Rotation peak	deg	64.0	78.0	73.4	Pass
	ms	57.0	64.0	59.3	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	117.6	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	100.2	Pass
	ms	47.0	58.0	54.2	Pass
Moment Decay, Peak to Zero	deg	97.0	107.0	98.3	Pass
Overall Test Results					Pass



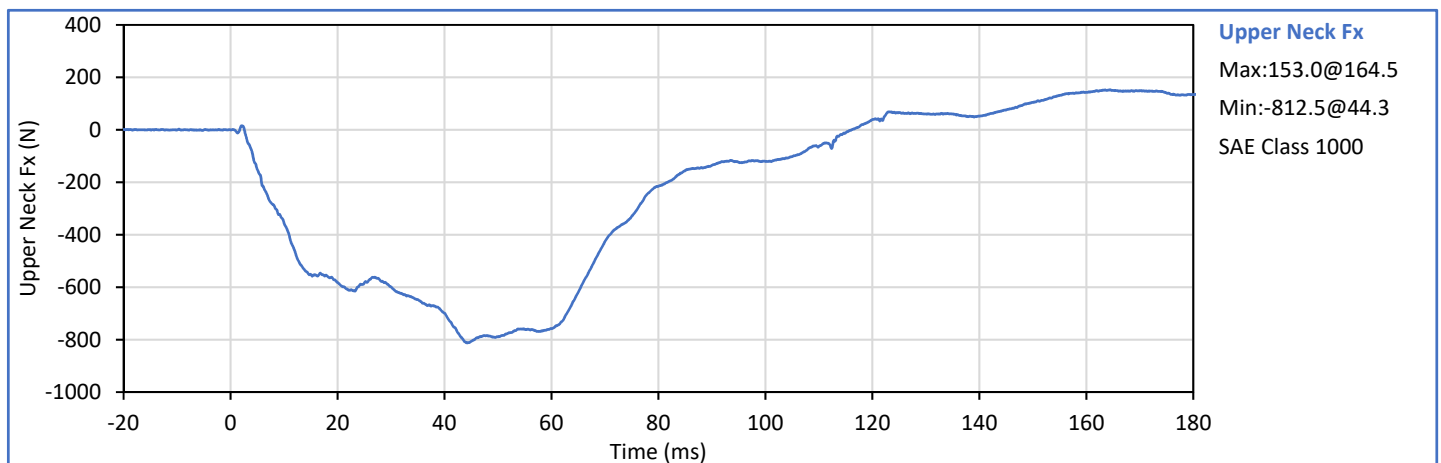
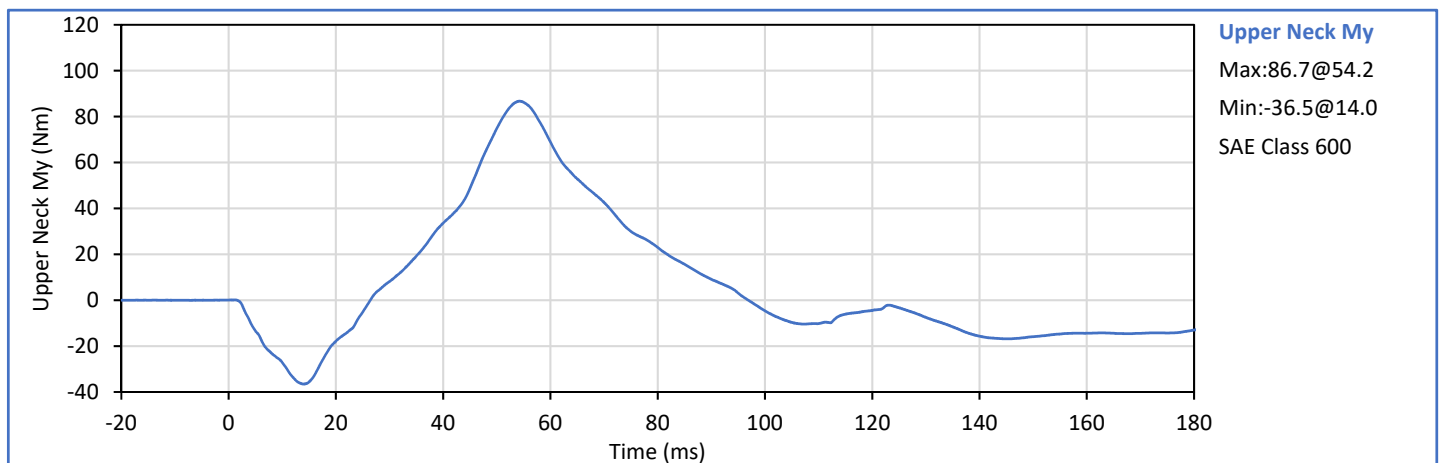
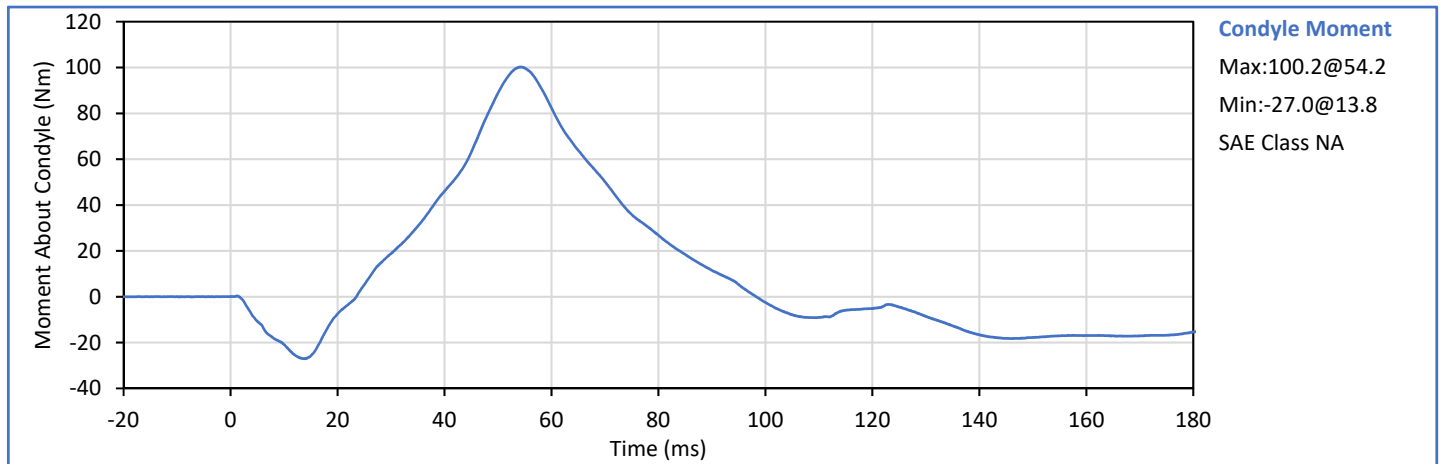
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 360

Test Date: 2018-04-22

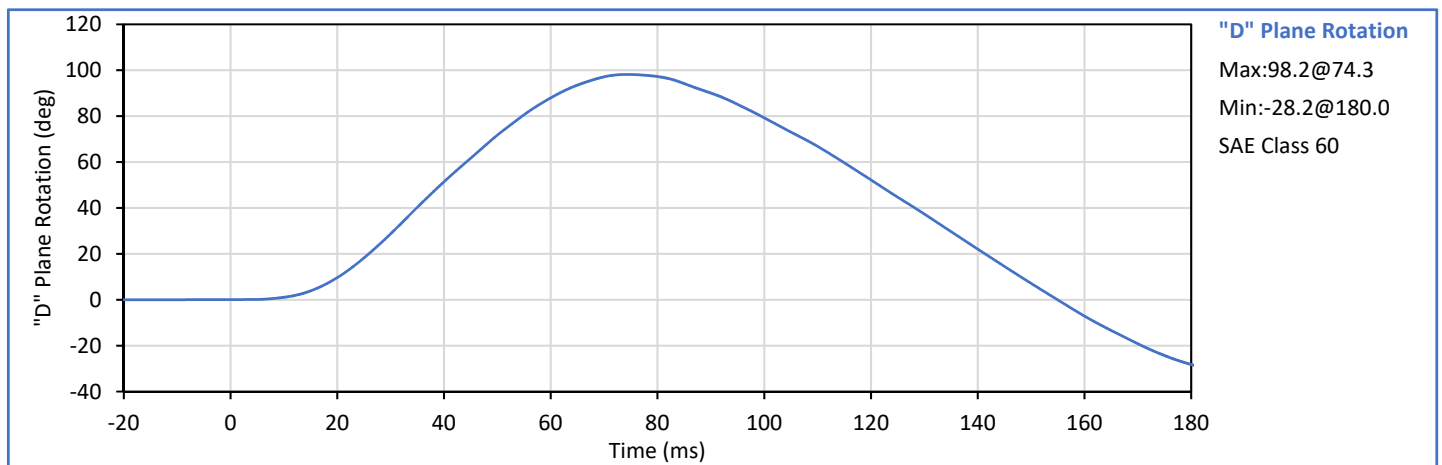
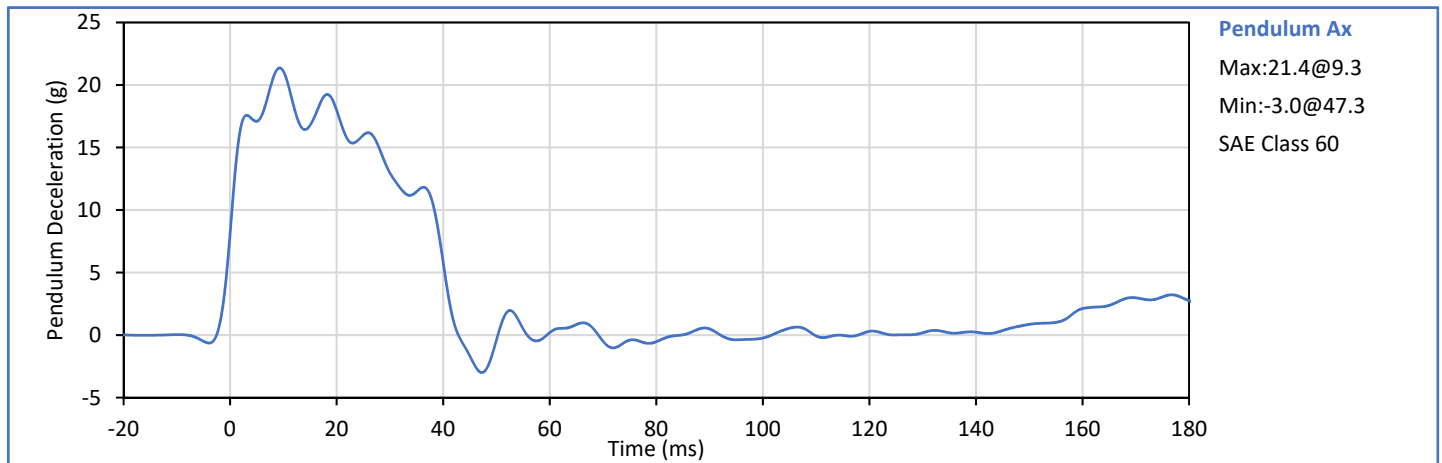




ATD Serial No.: 360

Test Date: 2018-04-22

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	5.94	6.19	6.00	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	21.1	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.0	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.0	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	13.0	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	40.3	Pass
"D" Plane Rotation peak	deg	81.0	106.0	98.2	Pass
	ms	72.0	82.0	74.3	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	155.0	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-72.4	Pass
	ms	65.0	79.0	69.6	Pass
Moment Decay, Peak to Zero	deg	120.0	148.0	138.4	Pass
Overall Test Results					Pass



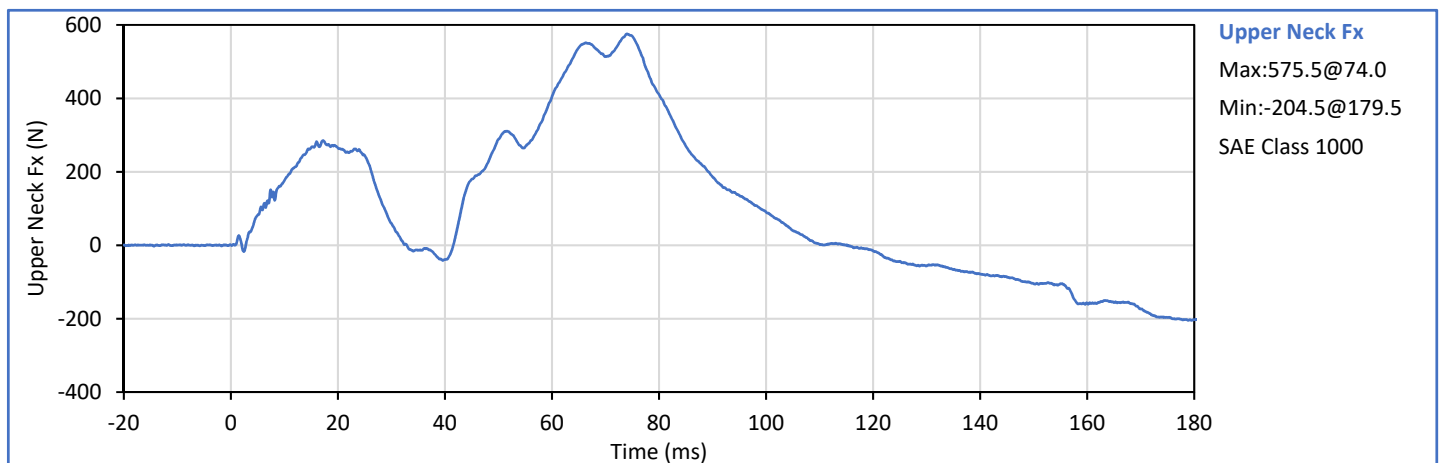
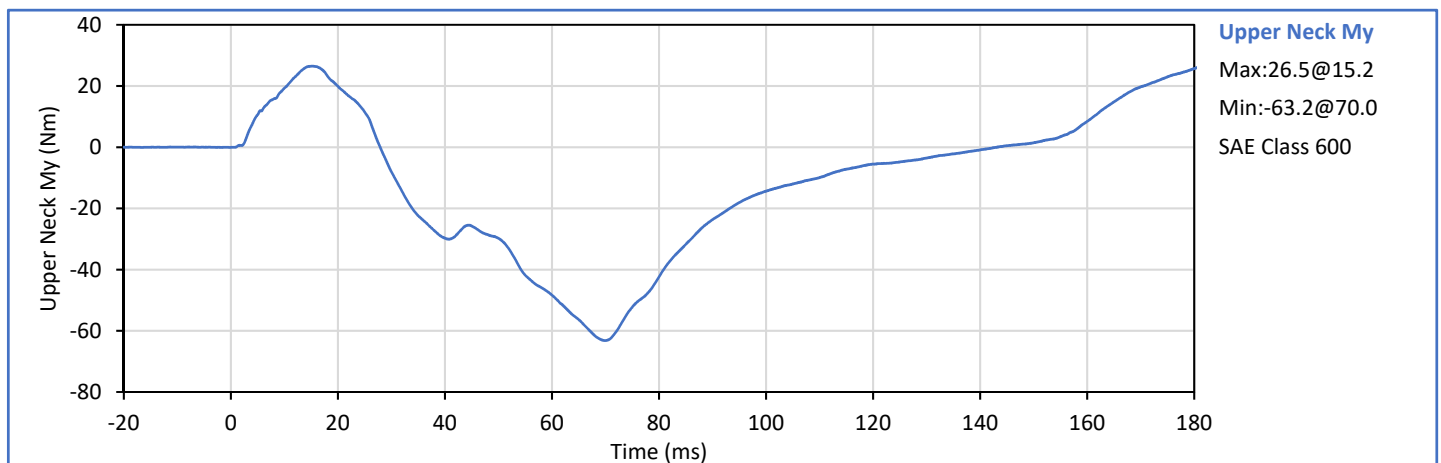
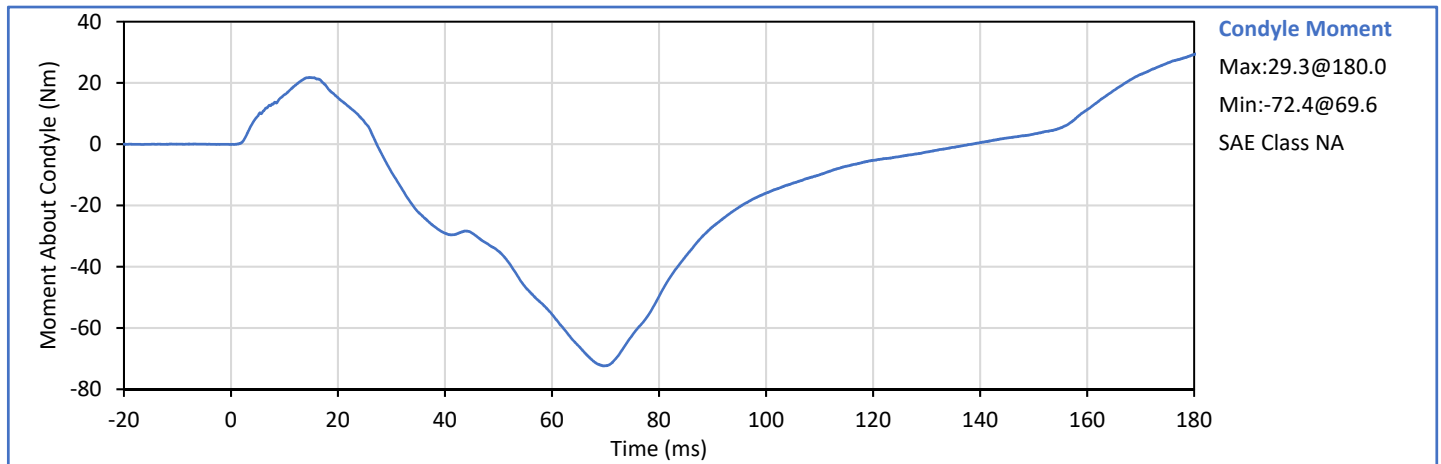
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 360

Test Date: 2018-04-22





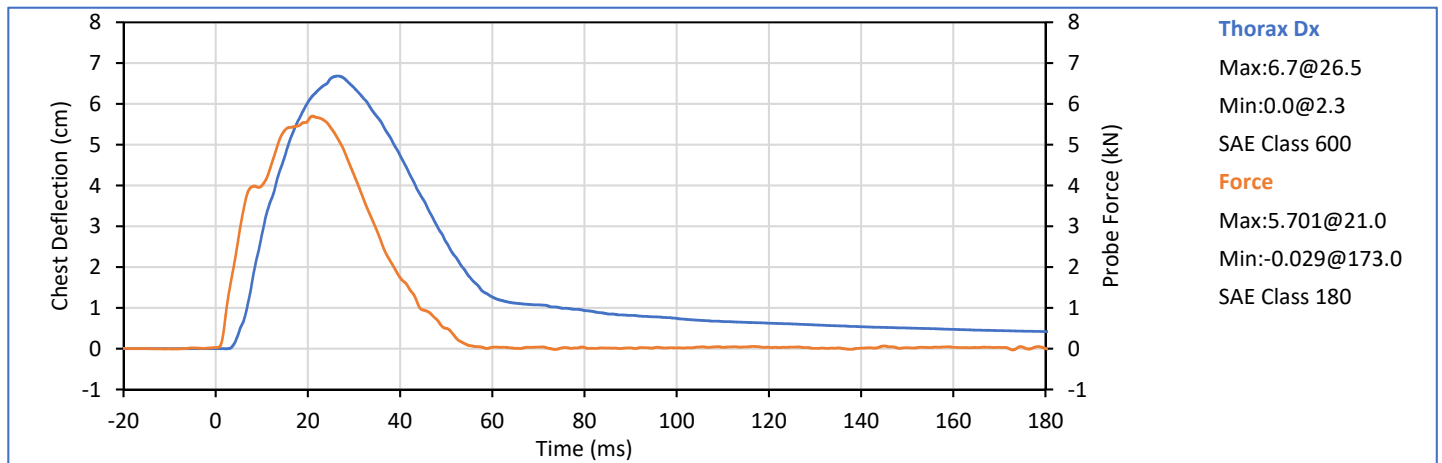
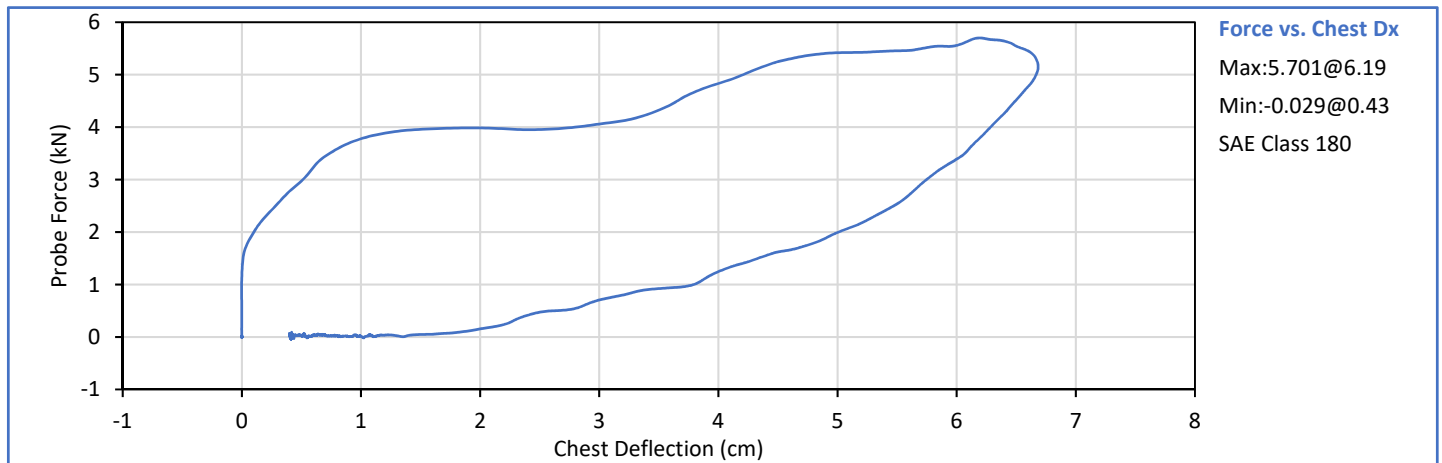
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Hybrid III 50th Percentile Male Thorax Impact

ATD Serial No.: 360

Test Date: 2018-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	22	Pass
Probe Velocity	m/s	6.58	6.82	6.74	Pass
Peak Chest Deflection	cm	6.35	7.26	6.68	Pass
Peak Probe Force	kN	5.159	5.893	5.701	Pass
Internal Hysteresis	%	69.0	85.0	71.5	Pass
Overall Test Results				Pass	Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

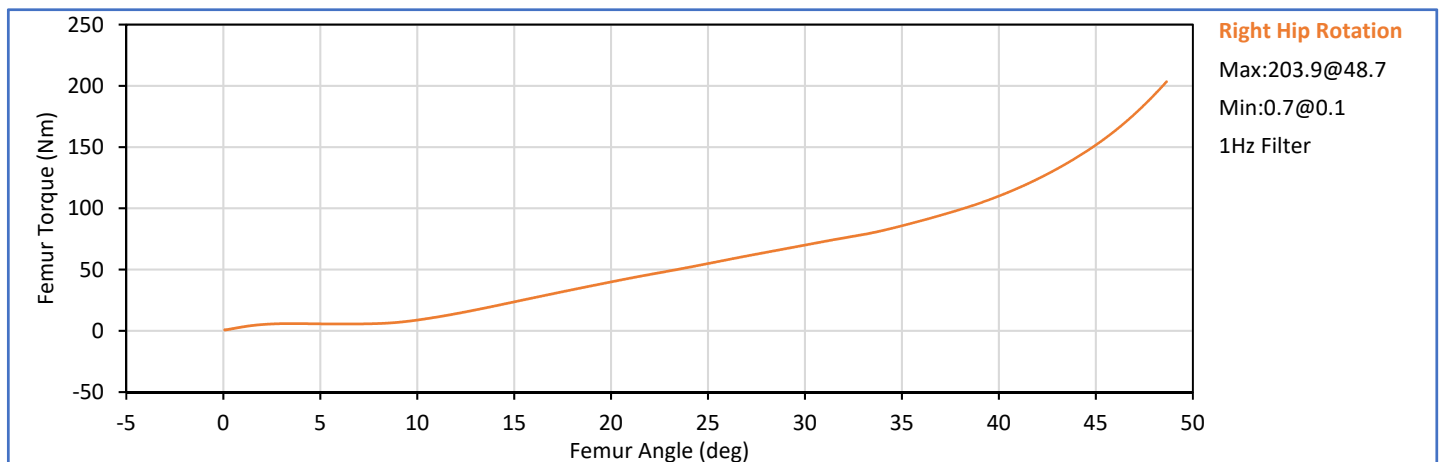
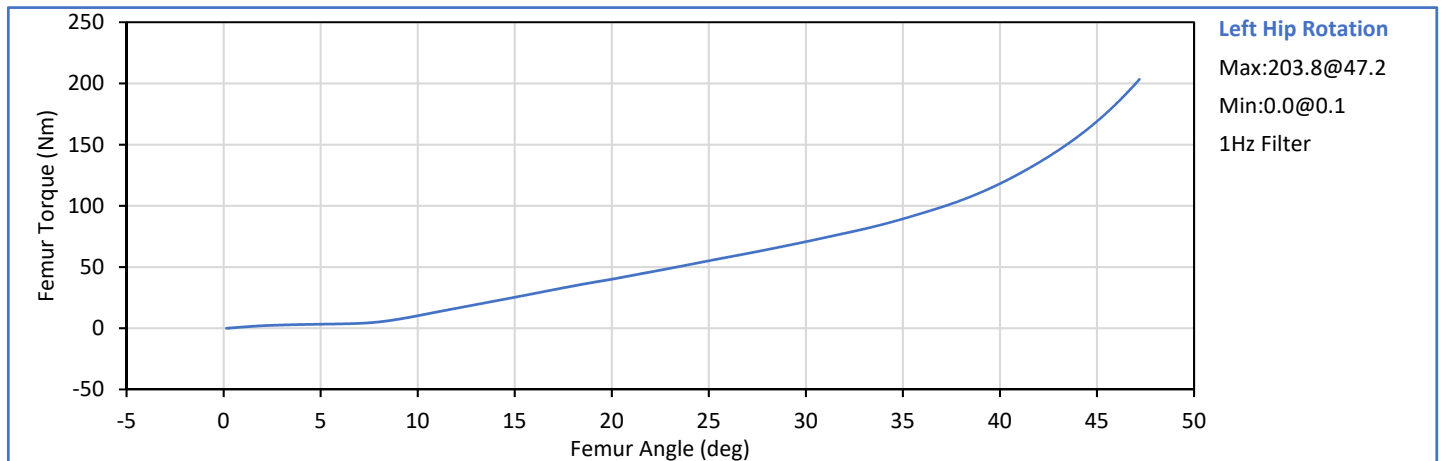


Hybrid III 50th Percentile Male
Hip Flexion (Left/Right)

ATD Serial No.: 360

Test Date: 2018-04-21

	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	5.9	Pass
	Left Femur Torque at 30°	Nm	0.0	95.0	70.8	Pass
	Left Hip Rotation at 203 Nm	deg	40.0	50.0	47.2	Pass
Right Hip	Right Hip Rotation Rate	deg/s	5.0	10.0	6.0	Pass
	Right Femur Torque at 30°	Nm	0.0	95.0	70.1	Pass
	Right Hip Rotation at 203 Nm	deg	40.0	50.0	48.6	Pass
Overall Test Results						Pass



Technician: J. Hernandez

Approved By: P. Puzzuto



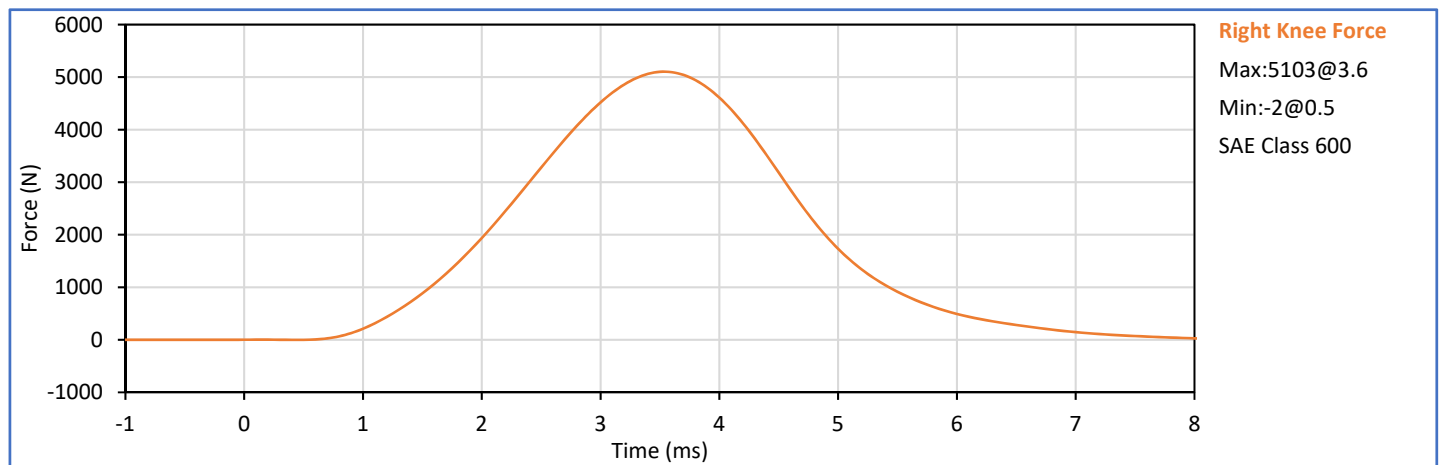
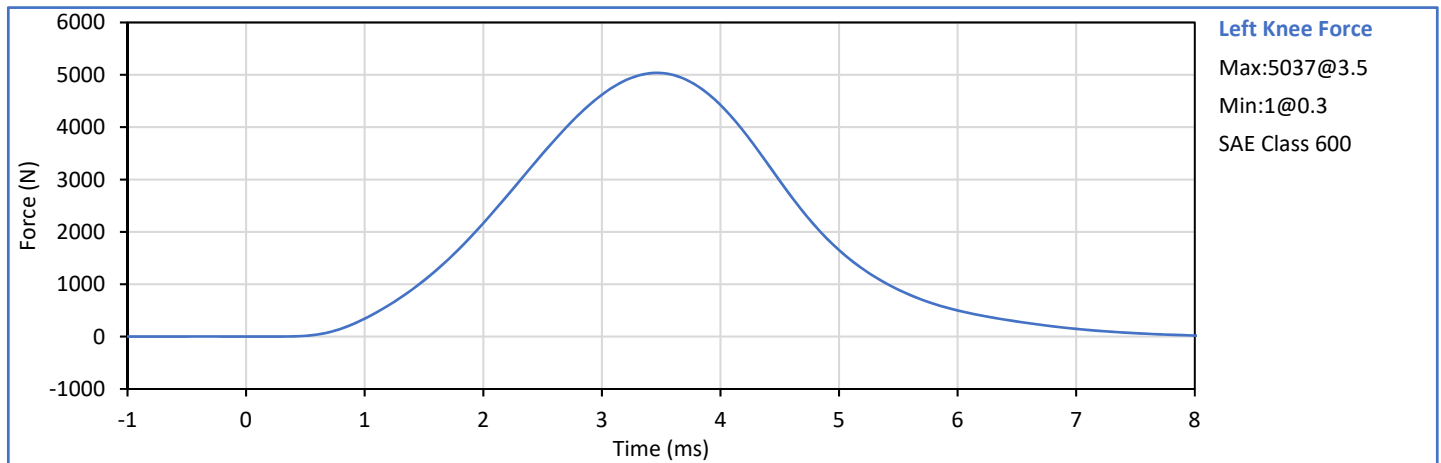
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Hybrid III 50th Percentile Male Knee Impact (Left/Right)

ATD Serial No.: 360

Test Date: 2018-04-23

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	21.8	Pass
	Laboratory Humidity	%	10	70	24	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.106	Pass
Knee	Peak Resistive Force	N	4715	5782	5037	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.111	Pass
Knee	Peak Resistive Force	N	4715	5782	5103	Pass
Overall Test Results						Pass



Technician: T. Lowman

Approved By: P. Puzzuto



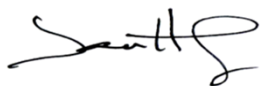
Hybrid III 5th Percentile Female Damage Checklist

ATD Serial No.: 630

Test Date: 2018-04-23

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.: 630

Test Date: 2018-04-23

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
A - Total sitting height	mm	775	800	790	Pass
B - Shoulder pivot height	mm	432	457	455	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	76	Pass
F - Thigh clearance	mm	119	135	127	Pass
G - Back of elbow to wrist pivot	mm	244	259	252	Pass
H - Head back to backline	mm	41	46	44	Pass
I - Shoulder to elbow length	mm	277	297	285	Pass
J - Elbow rest height	mm	183	203	197	Pass
K - Buttock to knee length	mm	521	546	533	Pass
L - Popliteal length	mm	356	376	370	Pass
M - Knee pivot height	mm	394	419	408	Pass
N - Buttock popliteal length	mm	414	439	432	Pass
O - Chest depth without jacket	mm	175	191	186	Pass
P - Foot length	mm	219	234	225	Pass
R - Buttock to Knee Pivot Length	mm	457	483	474	Pass
S - Head Breadth	mm	137	147	141	Pass
T - Head Depth	mm	178	188	183	Pass
U - Hip Breadth	mm	300	315	310	Pass
V - Shoulder breadth	mm	351	366	362	Pass
W - Foot breadth	mm	79	94	90	Pass
X - Head circum.	mm	528	549	535	Pass
Y - Chest circum. (w/chest jacket)	mm	851	881	863	Pass
Z - Waist circum.	mm	760	790	781	Pass
AA - Location for chest circum.	mm	333	358	345	Pass
BB - Location for waist circum.	mm	160	170	165	Pass
			Overall Test Results		Pass

Technician: _____

J. Hernandez

Approved By: _____

P. Puzzuto



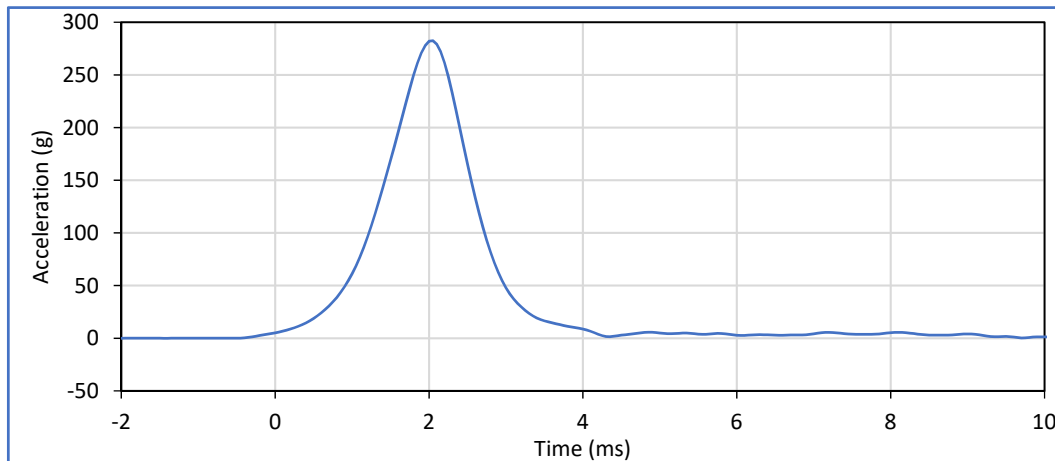
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Hybrid III 5th Percentile Female Head Drop

ATD Serial No.: 630

Test Date: 2018-04-23

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	22.6	Pass
Laboratory Humidity	%	10	70	28	Pass
Peak Resultant Acceleration	g	250.0	300.0	282.5	Pass
Peak Lateral Acceleration	g	-15.0	15.0	6.1	Pass
Oscillations After Main Pulse	%	0.0	10.0	2.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass

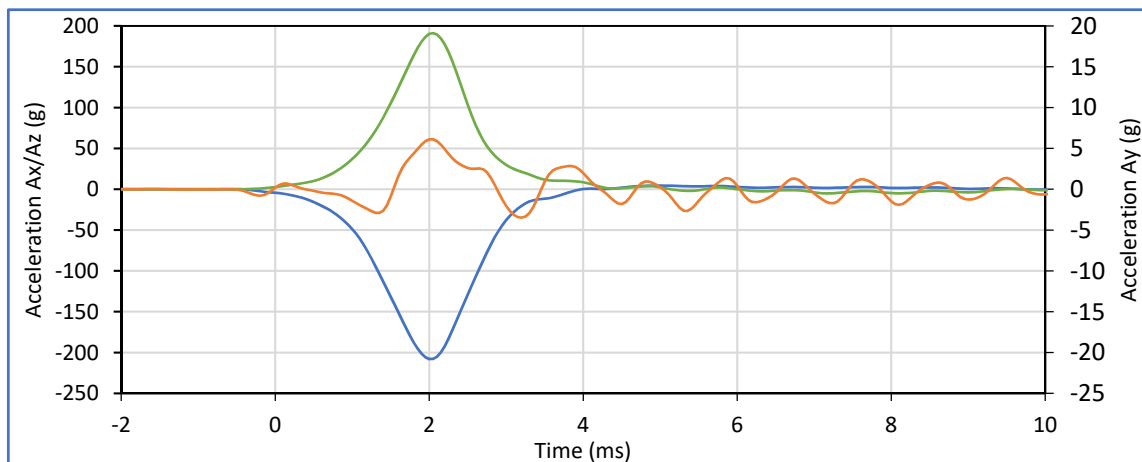


Head Resultant

Max:282.5@2.1

Min:0.2@9.7

SAE Class 1000



Head Ax

Max:4.4@5.0

Min:-207.9@2.0

SAE Class 1000

Head Ay

Max:6.1@2.1

Min:-3.5@3.2

SAE Class 1000

Head Az

Max:191.3@2.1

Min:-5.1@7.2

SAE Class 1000

Technician:

T. Lowman

Approved By:

P. Puzzuto

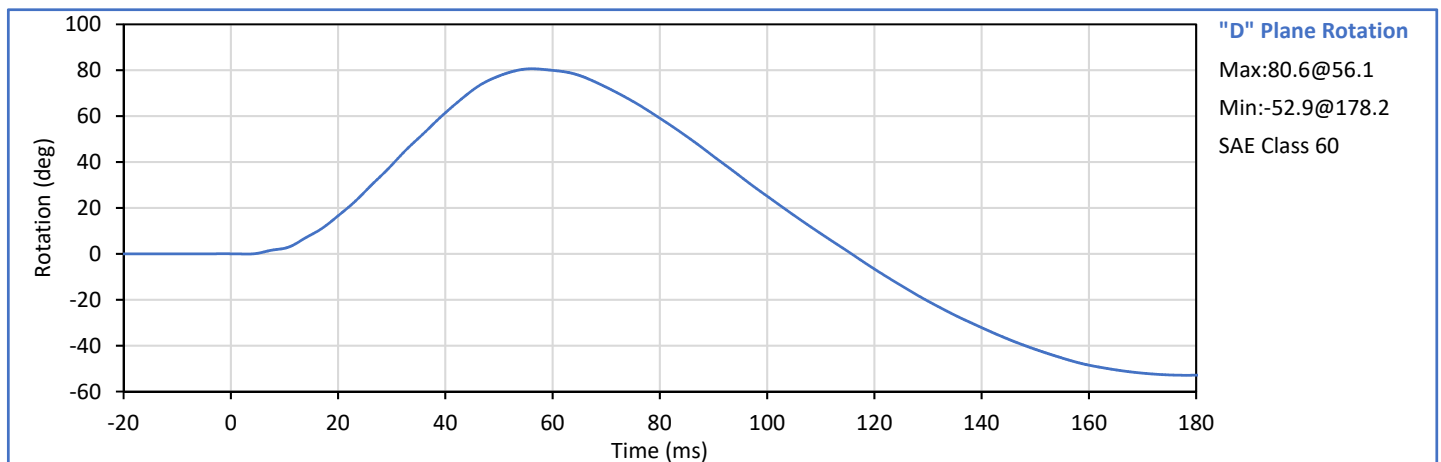
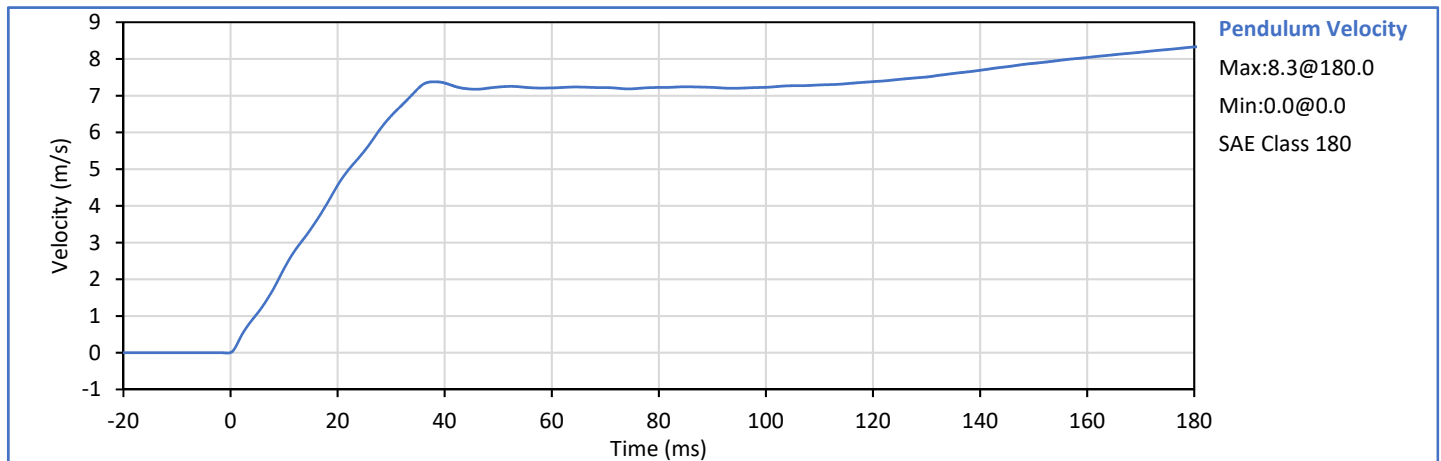


**Hybrid III 5th Percentile Female
Neck Flexion Test**

ATD Serial No.: 630

Test Date: 2018-04-23

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	24	Pass
Pendulum Velocity	m/s	6.89	7.13	7.11	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	4.56	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.45	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	80.6	Pass
Peak Moment in Rotation	Nm	69.0	83.0	78.9	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	84.8	Pass
Overall Test Results				Pass	Pass



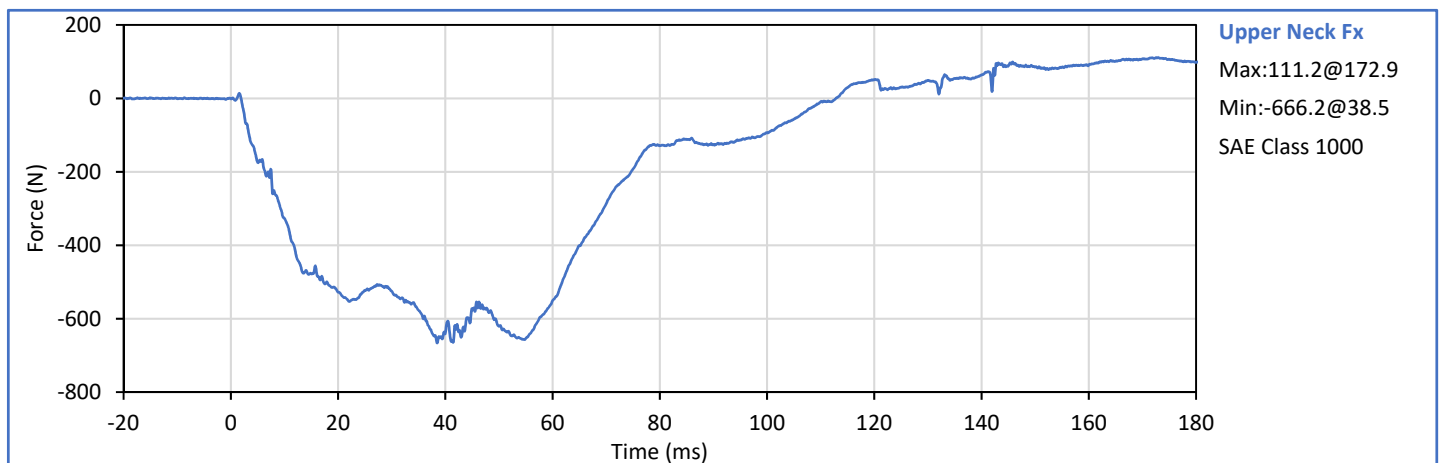
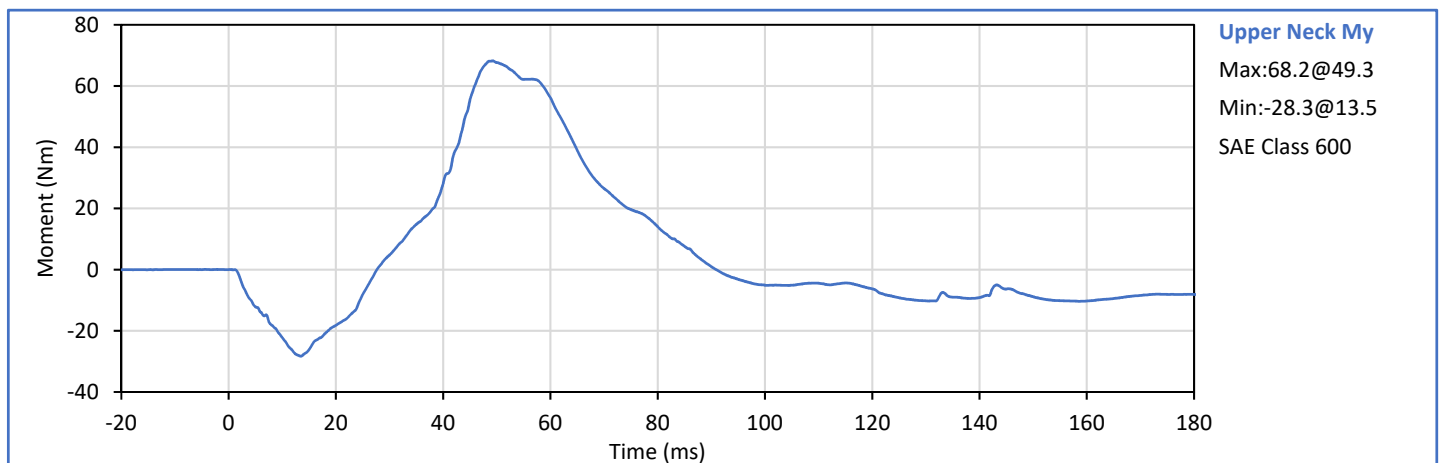
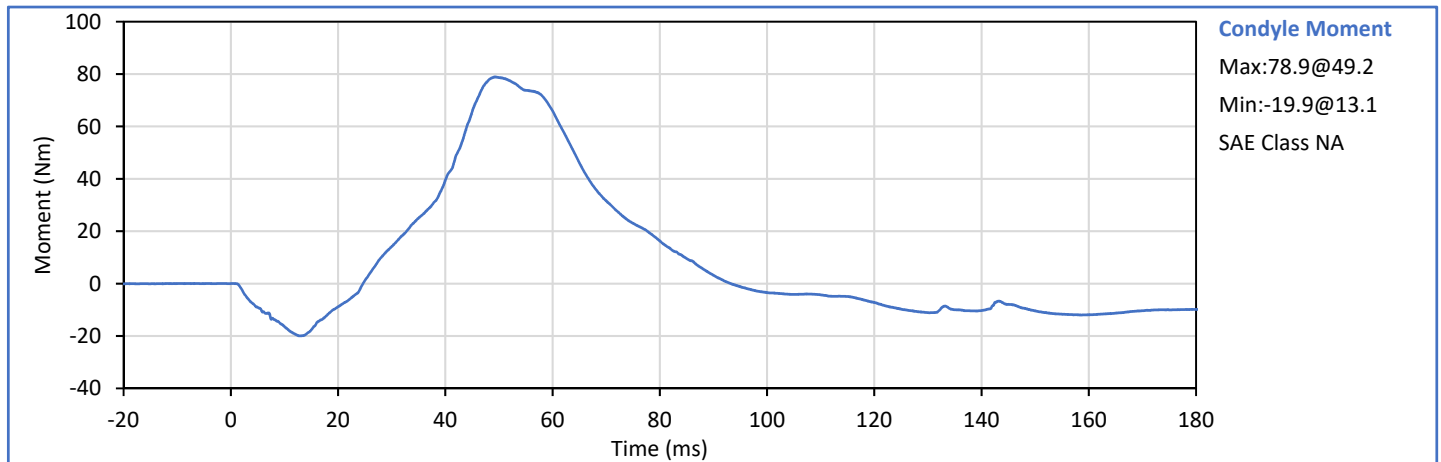
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 630

Test Date: 2018-04-23





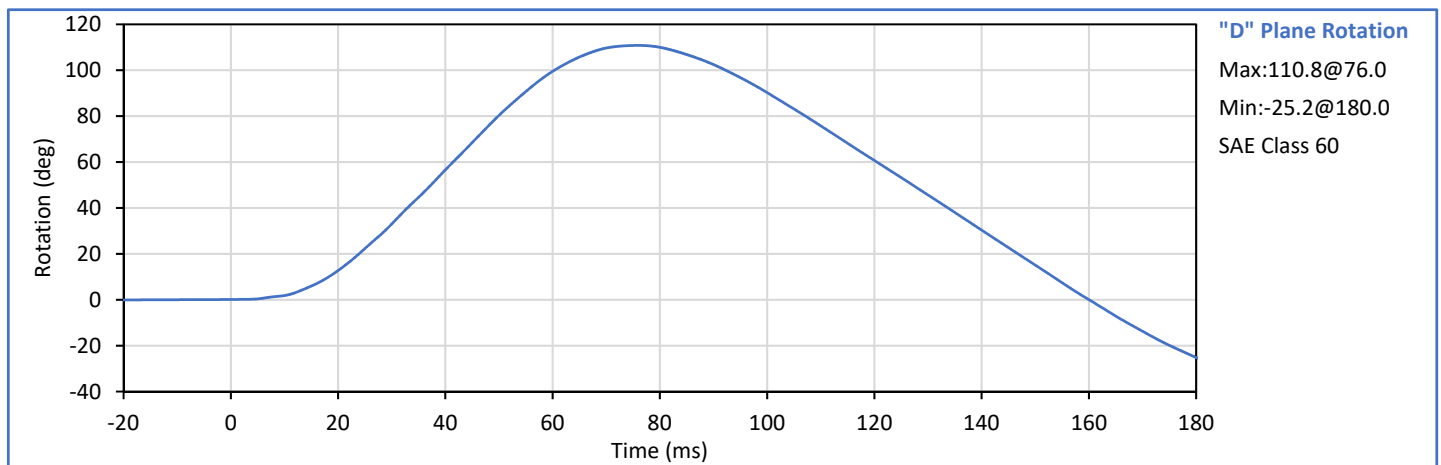
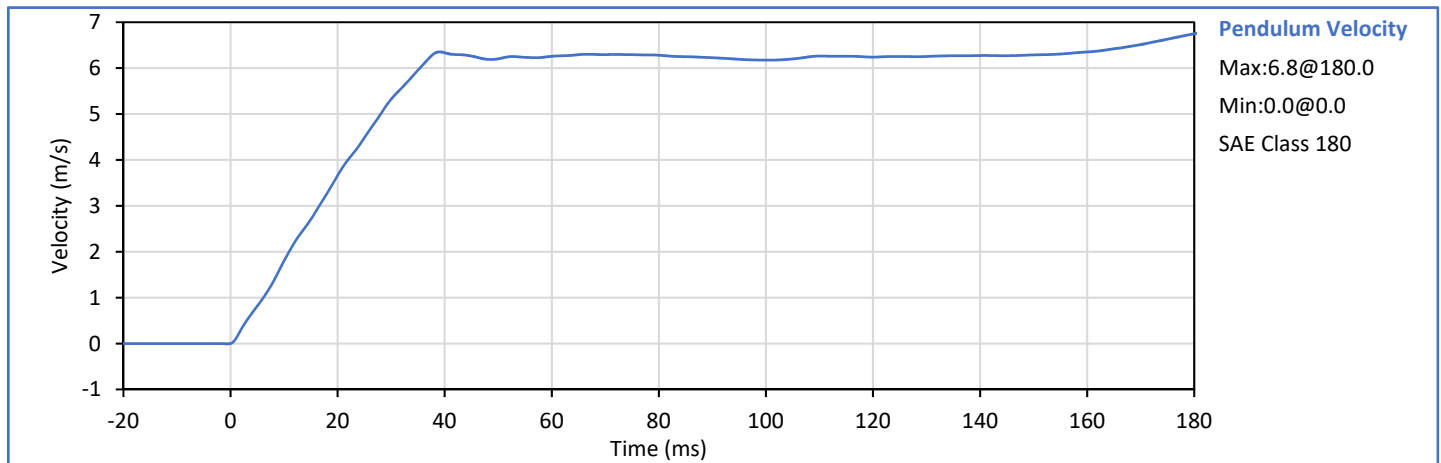
9270 Holly Road, Adelanto, CA 92301
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Hybrid III 5th Percentile Female Neck Extension Test

ATD Serial No.: 630

Test Date: 2018-04-23

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	24	Pass
Pendulum Velocity	m/s	5.95	6.19	6.01	Pass
Pendulum Velocity at 10 ms	m/s	1.50	1.90	1.80	Pass
Pendulum Velocity at 20 ms	m/s	3.10	3.90	3.66	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	5.32	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	110.8	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-56.9	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	100.0	Pass
Overall Test Results				Pass	Pass



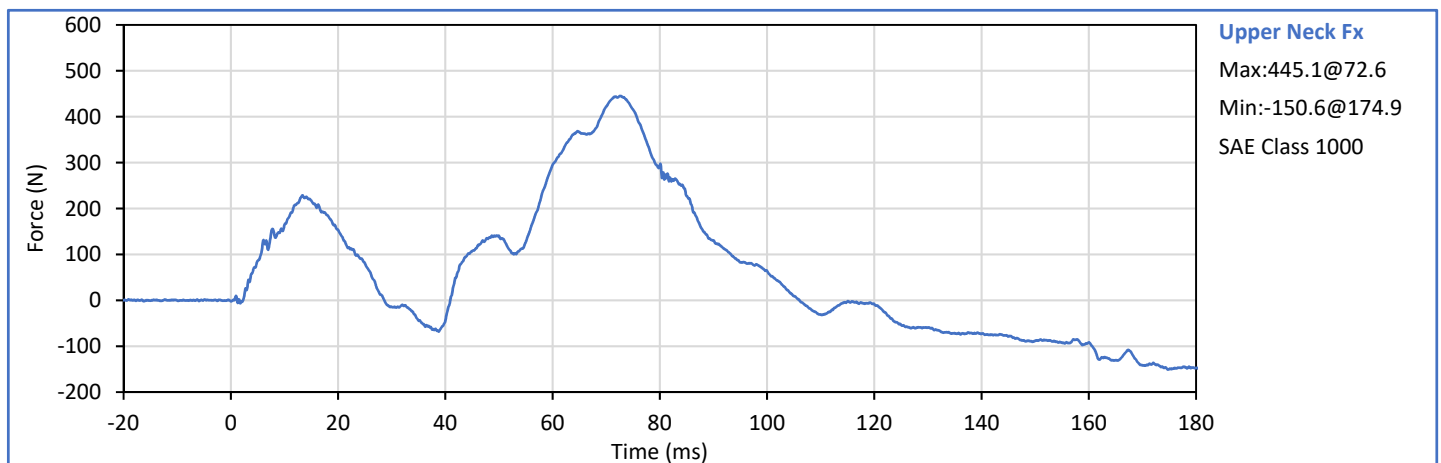
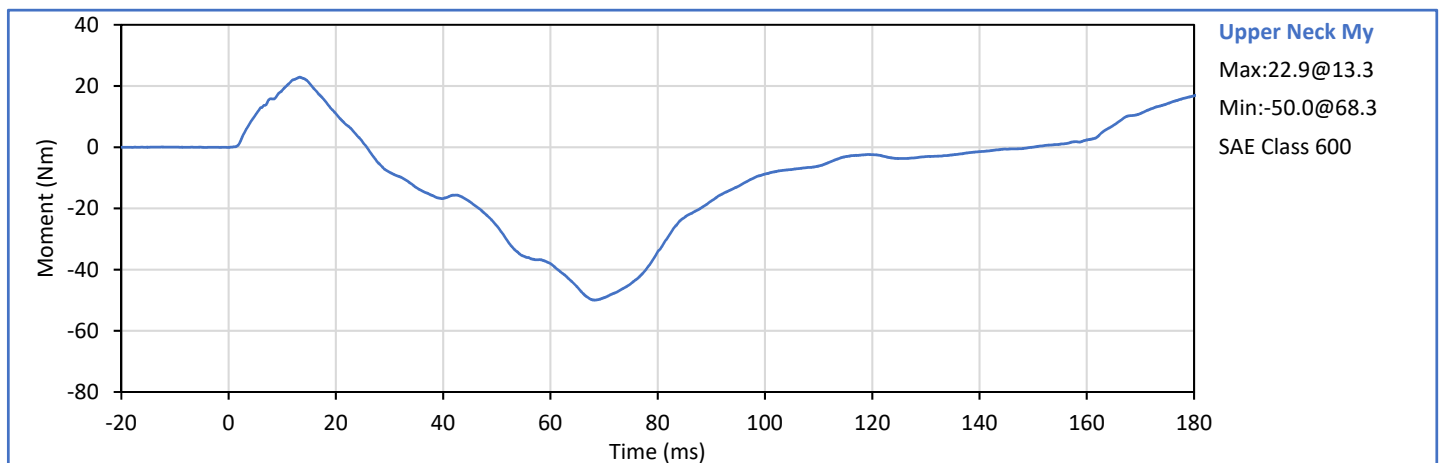
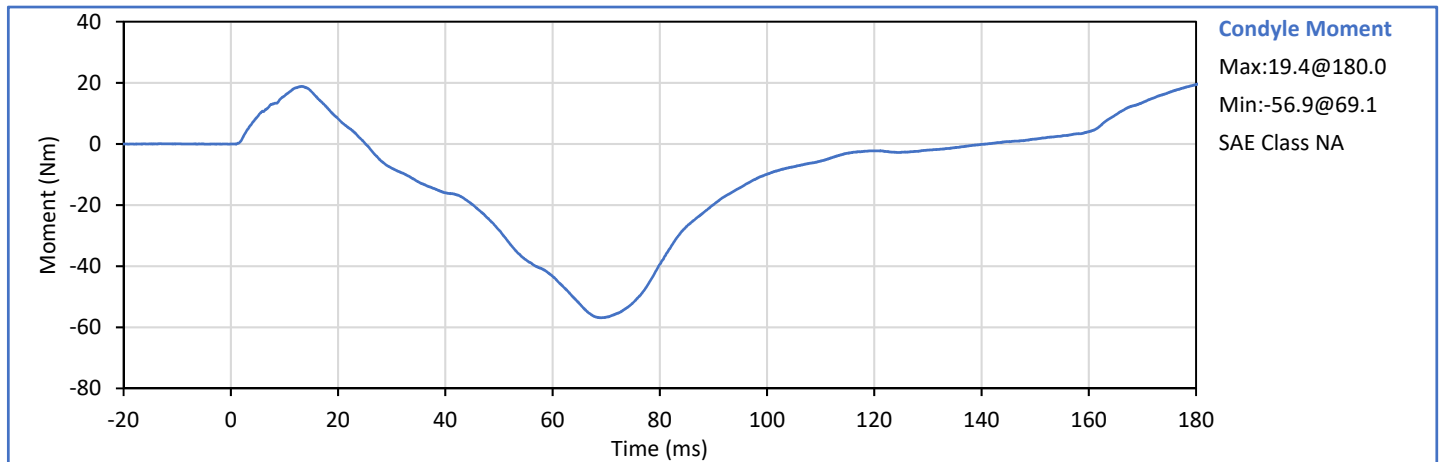
Technician: J. Hernandez

Approved By: P. Puzzuto



ATD Serial No.: 630

Test Date: 2018-04-23





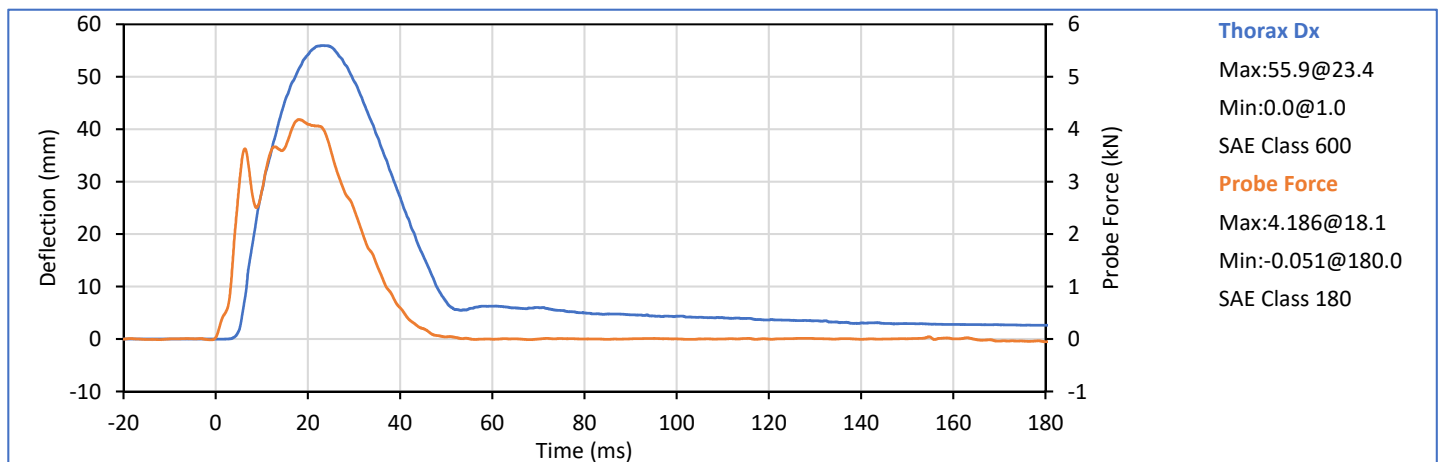
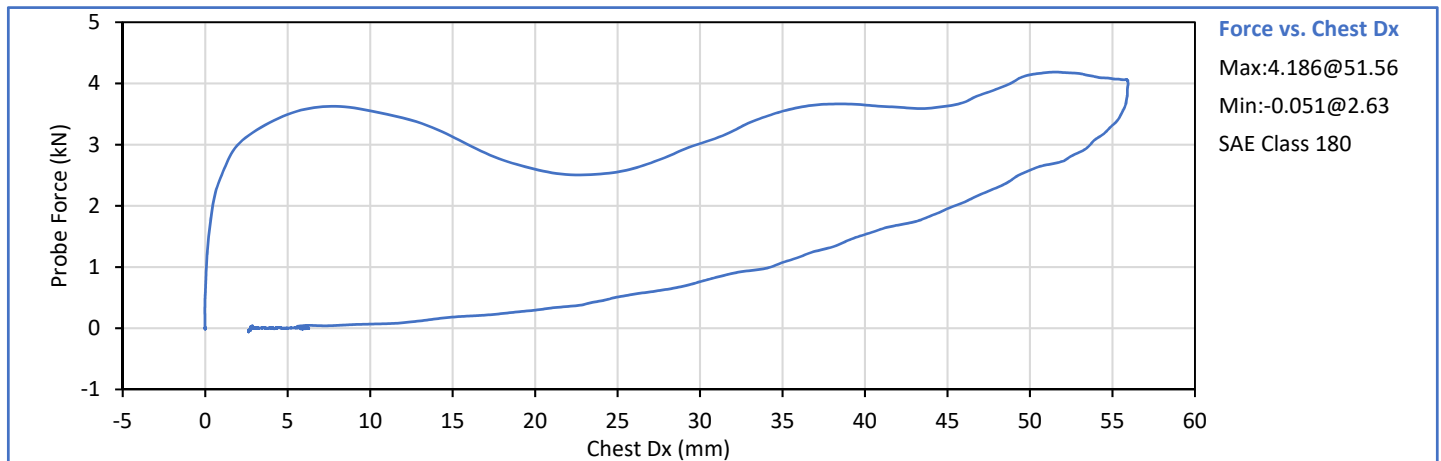
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Hybrid III 5th Percentile Female Thorax Impact

ATD Serial No.: 630

Test Date: 2018-04-20

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	33	Pass
Probe Velocity	m/s	6.59	6.83	6.68	Pass
Peak Chest Deflection	mm	50.0	58.0	55.9	Pass
Peak Probe Force, 50 and 58 mm	kN	3.900	4.400	4.186	Pass
Peak Probe Force, 18 and 50 mm	kN	0.000	4.600	4.141	Pass
Internal Hysteresis	%	69.0	85.0	70.2	Pass
Overall Test Results					Pass



Technician: J. Hernandez

Approved By: P. Puzzuto



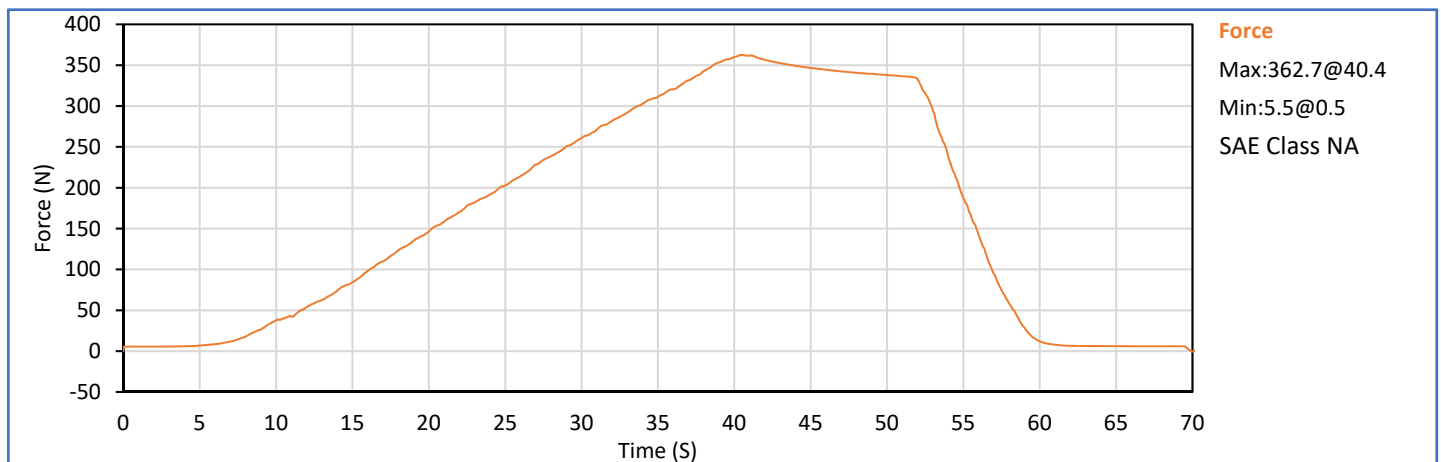
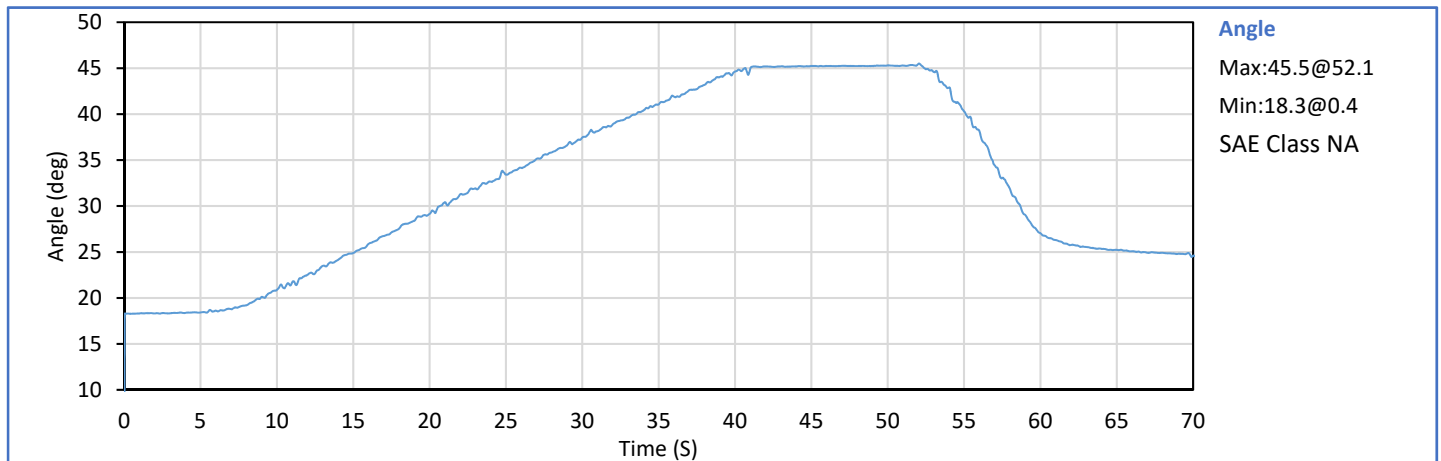
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Hybrid III 5th Percentile Female Torso Flexion Test

ATD Serial No.: 630

Test Date: 2018-04-20

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.6	Pass
Laboratory Humidity	%	10	70	26	Pass
Orientation Angle	deg	0.0	20.0	14.7	Pass
Test Initial Angle	deg	11.0	19.0	18.3	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	360.2	Pass
Torso Flexion Rate	deg/s	0.50	1.50	0.79	Pass
Final Reference Plane Angle	deg	-8.0	8.0	5.0	Pass
Overall Test Results				Pass	Pass



Technician: J. Hernandez

Approved By: P. Puzzuto



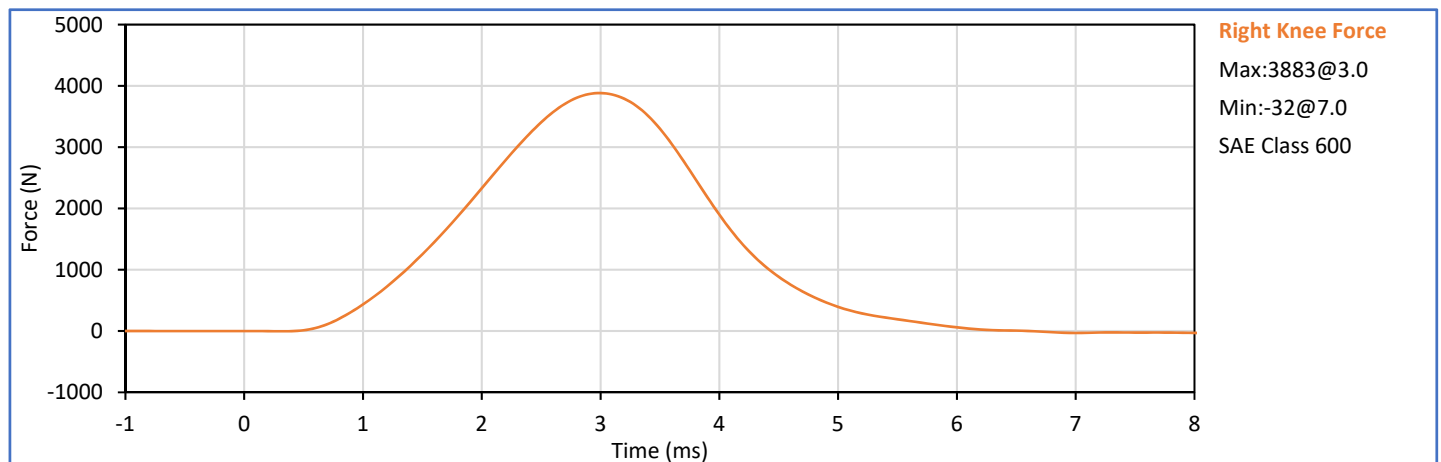
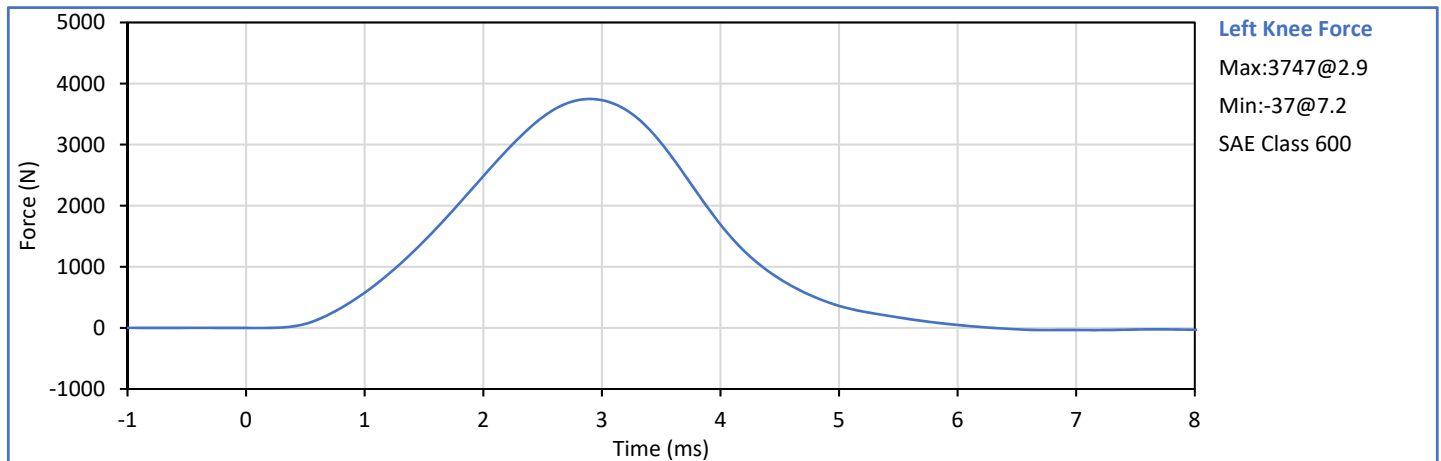
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Hybrid III 5th Percentile Female Knee Impact (Left/Right)

ATD Serial No.: 630

Test Date: 2018-04-23

	Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
	Laboratory Temperature	°C	18.9	25.6	22.4	Pass
	Laboratory Humidity	%	10	70	24	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.120	Pass
Knee	Peak Resistive Force	N	3450	4060	3747	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.124	Pass
Knee	Peak Resistive Force	N	3450	4060	3883	Pass
Overall Test Results						Pass



Technician: T. Lowman

Approved By: P. Puzzuto