REPORT NUMBER: NCAP-KAR-22-002

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

VOLKSWAGEN DE MEXICO
2022 VOLKSWAGEN TAOS 5-DOOR MPV

NHTSA NUMBER: M20225803

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

APRIL 28, 2022

FINAL REPORT

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE : NRM-100
1200 NEW JERSEY AVE, SE
WASHINGTON, DC 20590

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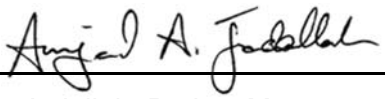
Prepared By: 

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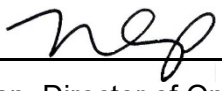
Approved By: 

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Approval Date: April 28, 2022

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

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Final Report of New Car Assessment Program Frontal Impact Testing of a 2022 Volkswagen Taos 5-Door MPV NHTSA No. M20225803	April 28, 2022
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7. Authors Mr. Amjad A. Jadallah, Project Manager, Applus+ IDIADA KARCO Mr. Alex Beltran, Engineering Manager, Applus+ IDIADA KARCO	**8. Performing Organization Report No.** TR-P42070-01-NC
9. Performing Organization Name and Address Applus+ IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.**
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	14. Sponsoring Agency Code NRM-100

15. Supplementary Notes

16. Abstract

A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2022 Volkswagen Taos 5-Door MVP in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. The test was conducted at the Applus+ IDIADA KARCO Engineering, LLC. facility in Adelanto, California on April 14, 2022.

The impact velocity of the vehicle was 56.14 km/h and the ambient temperature at the barrier face at the time of impact was 28.9°C. The target vehicle's post-test maximum crush was 466mm at DPD2 to the left of the vehicle's centerline. The test vehicle's performance is as follows:

Measurement Description	Units	Driver ATD		Passenger ATD	
		Threshold	Result	Threshold	Result
Head Injury Criteria (HIC_{15})	N/A	700	284.5	700	224.2
Maximum Chest Compression	mm	63	-31	52	-19
Nij	N/A	1	0.32	1	0.45
Neck Tension	N	4170	1838.6	2620	601.2
Neck Compression	N	4000	-125.5	2520	-919.5
Left Femur Force	N	10000	-458.4	6800	-2860.1
Right Femur Force	N	10000	-329.1	6800	-1920.4

17. Key Words	18. Distribution Statement
56.14 km/h (35 mph) Full Frontal Rigid Barrier Impact Test New Car Assessment Program (NCAP)	National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	149	

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

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Procedure dated May 2018 for NCAP Full Frontal Rigid Barrier Impact Testing.

SUMMARY

A load cell barrier consisting of 176 load cells was impacted by a 2022 Volkswagen Taos 5-Door MPV at a velocity of 56.14 km/h. The test was performed at Applus+ IDIADA KARCO Engineering, LLC. on April 14, 2022. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A of this report.

One (1) real-time cameras and sixteen (16) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

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

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

The driver (position 1) ATD (Serial No. 360) and the right-front passenger (position 2) ATD (Serial No. DH1644) were qualified prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 104 channels of dummy and vehicle response data were recorded on an on-board data acquisition system. Appendix B contains the dummy response data traces. Appendix D contains a complete list of instrumentation used for dummies and the vehicle.

There was 100 percent windshield retention and intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the test vehicle was 466 mm at DPD2 to the left of the vehicle's centerline. Both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD Position	HIC_{15}	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50th Male)	284.5	0.32	1838.5	-125.5	42	-31	-458.4	-329.1
Passenger (5th Female)	224.2	0.45	601.2	-919.5	43	-19	-2860.1	-1920.4

GENERAL COMMENTS:

Driver Left Upper Tibia MY, Noise Spikes Present from 15.4 to 28.1 ms.
Driver Right Upper Tibia MX, Channel Failure at 38.2 ms.
Driver Right Upper Tibia MY, Channel Failure at 35.0 ms.
Driver Lap Belt Force, Not Installed
Passenger Lap Belt Force, Not Installed

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

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	^oF	^oC	=(Tf -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: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20225803
Model Year	2022
Make	Volkswagen
Model	Taos
Body Style	5-Door MPV
VIN	3VVAX7B21NM045915
Body Color	Deep Black Pearl
Odometer Reading (km / mi)	39 / 24
Engine Displacement (L)	1.5
Type / No. of Cylinders	Inline 4-Cylinder
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	AWD
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	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	Volkswagen De Mexico
Date of Manufacture	Dec-21

GVWR (kg)	2090
GAWR Front (kg)	1070
GAWR Rear (kg)	1070

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

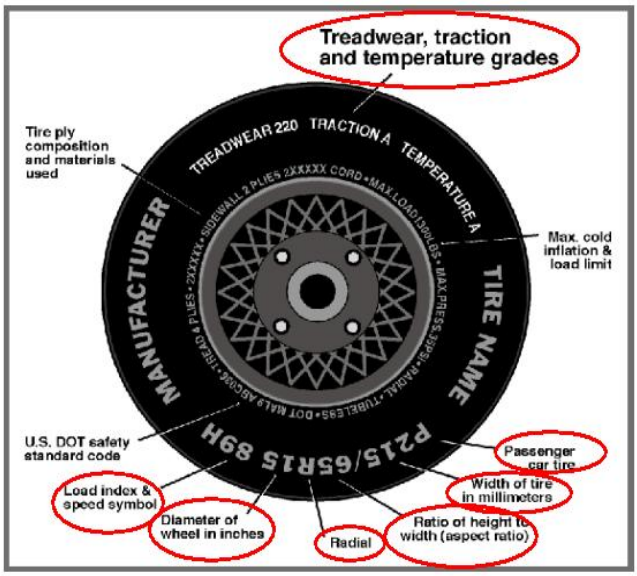
Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Split Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				425.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				84.8	*A-B*

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	250	250
Recommended Tire Size	225/55 R17	225/55 R17
Tire Size on Vehicle	225/55 R17	225/55 R17
Tire Manufacturer	Hankook	Hankook
Tire Model	Kineregy GT	Kineregy GT
Treadwear	540	540
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index / Speed Symbol	97H	97H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	15MKC 1BHO 2021	15MKC 1BHO 2021
DOT Safety Code Right	15MKC 1BHO 2021	15MKC 1BHO 2021

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	460.0	332.5		461.5	406.0	
Right	kg	435.5	328.0		499.0	408.0	
Ratio	%	57.6%	42.4%	100.0%	54.1%	45.9%	100.0%
Total	kg	895.5	660.5	1556.0	960.5	814.0	1774.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1556.0	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	84.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1781.8	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	841	849	845	849	1136
As Tested	mm	823	823	816	822	1228
Post-Test	mm	847	860	797	819	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheelbase	mm	2677
Total Vehicle Length at Left Side	mm	3885
Total Vehicle Length at Centerline	mm	4458
Total Vehicle Length at Right Side	mm	3891
Weight of Ballast in Cargo Area	kg	73.5
Weight of Vehicle Components Removed	kg	18.5
Amount of Stoddard Solvent in Fuel Tank	L	53.87

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Rear trunk trim (4.0 kg), Spare Tire (10.5 kg), and Spare Tire Tools (4.0 kg)

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test
1	Total Length	4458
2	Total Width	1792
3	Bumper Top Height	650
4	Bumper Bottom Height	535
5	Longitudinal Member Top Height	666
6	Distance Between Longitudinal Members	1038
7	Longitudinal Member Width	100
8	Engine Top Height	891
9	Engine Bottom Height	223
10	Engine and Gearbox Width	524
11	Front Bumper to Engine Distance	420
12	Front Shock Absorber Fixing Height	967
13	Bonnet Leading Edge Height	898
14	Front Shock Absorber Fixing Width	1086
15	Front Bumper to Front Axle Distance	871
16	Front Axle to A-Pillar Distance	377
17	A-Pillar to B-Pillar Distance	1185
18	B-Pillar to Rear Axle Distance	1116
19	B-Pillar to C-Pillar Distance	969
20	Roof Sill Bottom Height	1517
21	Roof Sill Top Height	1577
22	Floor Sill Bottom Height	319
23	Floor Sill Top Height	386

All measurements in millimeters.

DATA SHEET NO. 2

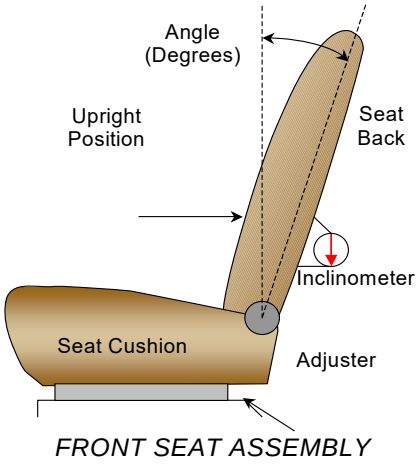
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

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° ± 0.5°. Seat back angle is measured with a flat edge along the seat back.



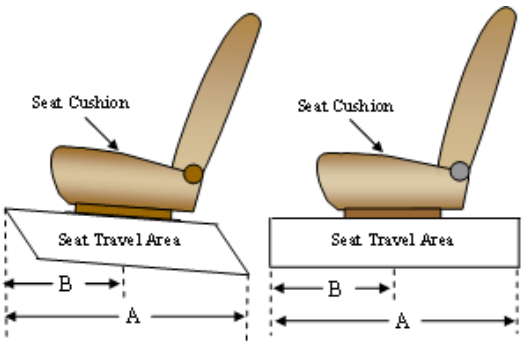
FRONT SEAT ASSEMBLY

SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	16.0
Passenger Seat Back Angle	15.7

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	310 mm	155 mm
Passenger Seat	254 mm	127 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 "L" is the lowermost position, followed by position "M1". Position "H" is the uppermost position.

SEAT BELT UPPER ANCHORAGES

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

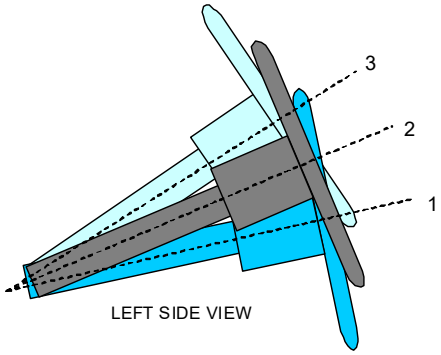
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. A digital inclinometer is used to measure a plate which is placed across the rim of the steering wheel for angular measurements.



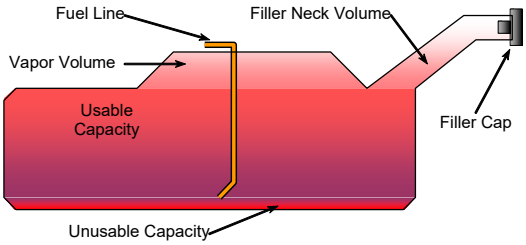
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	23.7	80
Geometric Center Position, No. 2	26.3	109
Uppermost Position, No. 3	28.9	138
Telescoping Steering Wheel Travel		58
Test Position	26.3	109

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The pump will work at “ignition on” until pressure in the system has reached working pressure in the system; then it will stop pumping fuel until the engine has been started.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	57.92
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	57.92
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	53.87
Actual amount of Solvent Used in Test	53.87
1/3 of Usable Capacity	19.31

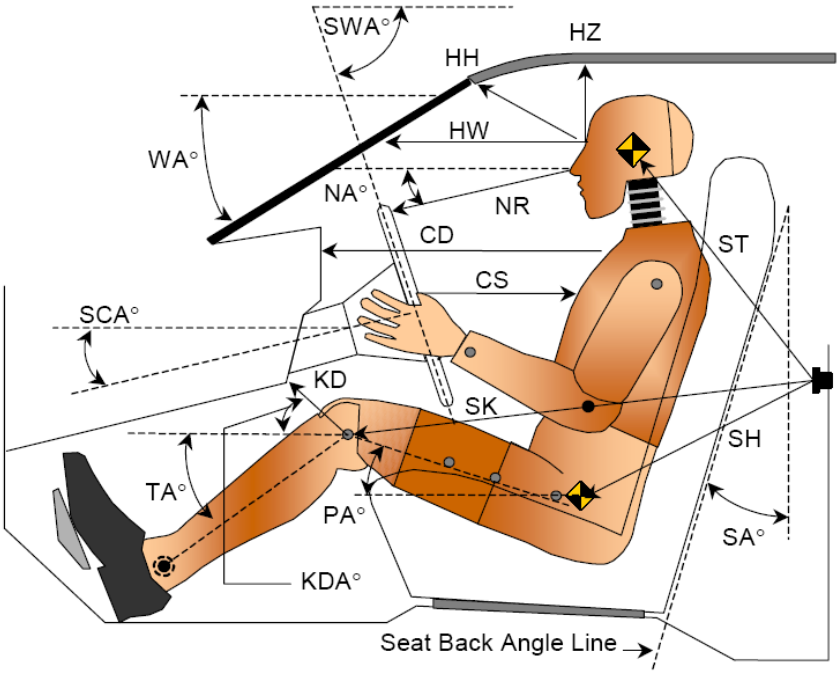
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022



LEFT SIDE VIEW

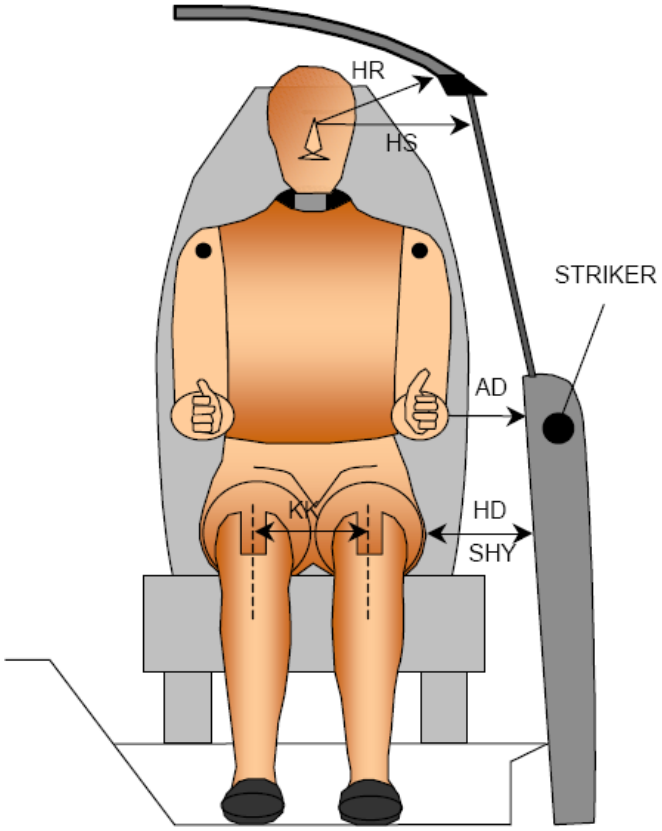
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		28.2		
SWA°	Steering Wheel Angle		62.7		
SCA°	Steering Column Angle		27.3		
SA°	Seat Back Angle (On Seatback Post)		16.0		16.1
HZ	Head to Roof	247	90.0	271	90.0
HH	Head to Header	332	32.1	339	31.6
HW	Head to Windshield	672	0.0	688	0.0
NR	Nose to Rim	404	6.7	409	12.4
CD	Chest to Dash	554	18.1	362	2.6
CS	Chest to Steering Hub	336	0.0		
RA	Rim to Abdomen	219	0.0		
KDL	Left Knee to Dash	197	33.3	108	36.1
KDR	Right Knee to Dash	150	43.8	112	16.1
PA°	Pelvic Angle		23.4		21.6
TA°	Tibia Angle		50.7		60.8
SK	Striker to Knee	611		748	
ST	Striker to Head	536		525	
SH	Striker to H-Point	386		485	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022



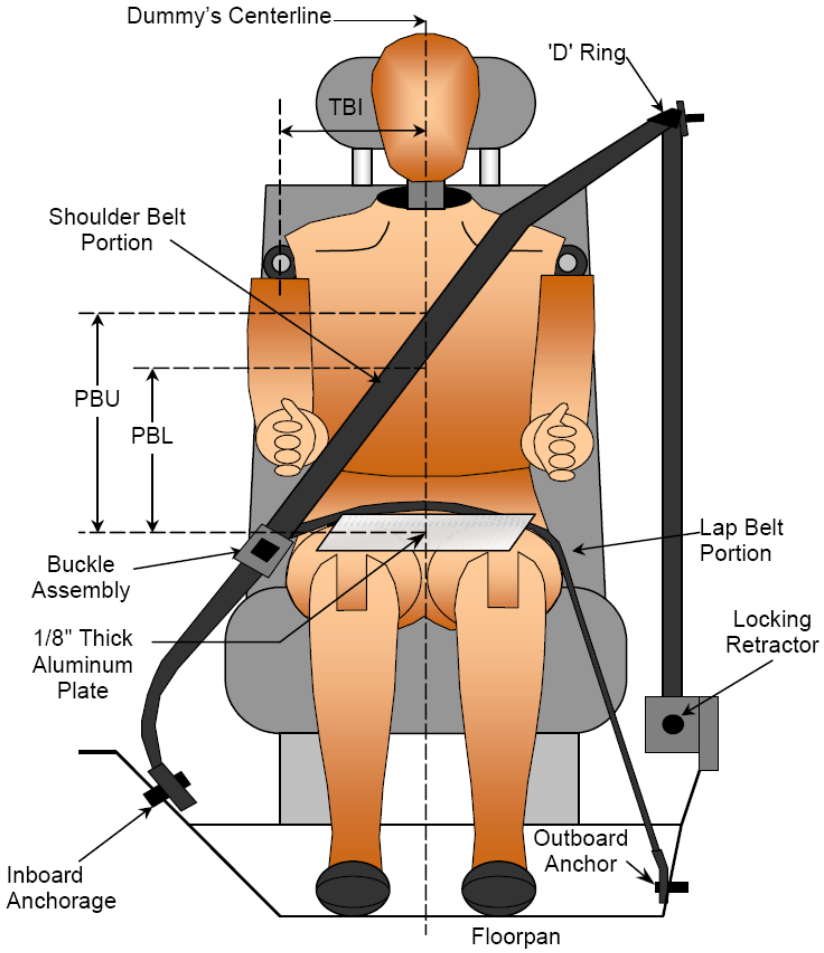
Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	130	85
HD	H-Point to Door	150	172
HR	Head to Side Header	260	291
HS	Head to Side Window	360	5
KK	Knee to Knee	390	160
SHY	Striker to H-Point (Y-Direction)	228	260
AA	Ankle to Ankle	360	175

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022



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	330	300
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	250	225

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	848	915
Lap Belt Length as Measured on ATD	mm	635	740
Remainder of Belt on Reel	mm	960	835
Total Belt Length for Continuous Webbing Systems	mm	2443	2490

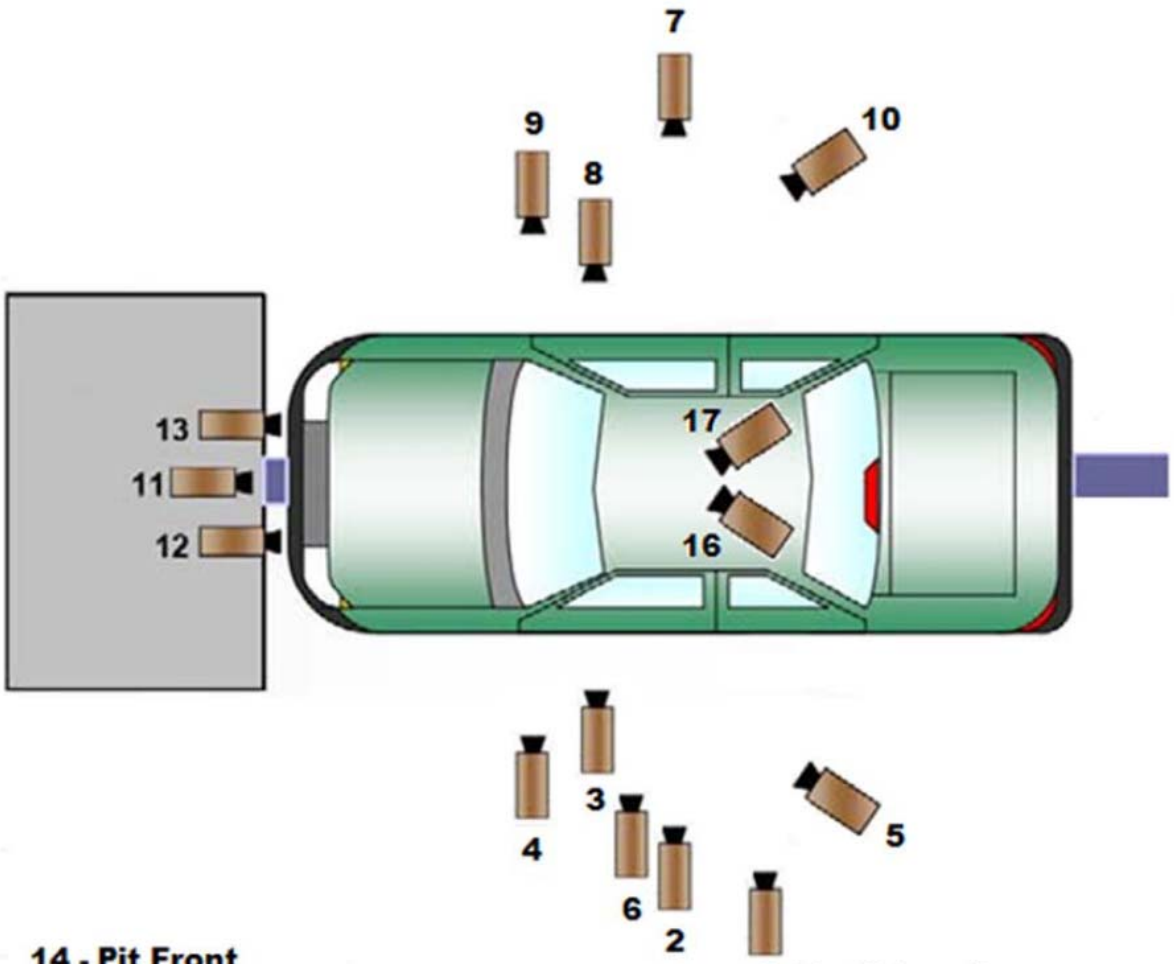
DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

DATA SHEET NO. 6 … (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

CAMERA LOCATIONS

No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Left Overall	-2456	-7975	-1025	20	1000
3	Driver Close-Up	-2590	-7950	-1371	50	1000
4	Left Front Half	-1701	-6197	-1701	35	1000
5	Left Angle	-6696	-10308	-3211	105	1000
6	Steering Column	-1966	-10412	-3688	35	1000
7	Right Overall	-2336	7569	-1012	20	1000
8	Passenger Close-Up	-1733	7581	-1408	50	1000
9	Right Front Half	-1600	8214	-1811	35	1000
10	Right Angle	-6217	9516	-4830	85	1000
11	Windshield	-354	0	-5749	28	1000
12	Driver Windshield	297	-366	-2460	24	1000
13	Passenger Windshield	297	366	-2460	24	1000
14	Pit Front	-756	0	1495	21	1000
15	Pit Rear	-3398	0	1495	15	1000
16	Driver Onboard	-1250	-275	-1510	8	1000
17	Passenger Onboard	-1250	275	-1510	8	1000

Coordinates: +X = forward impact plane

+Y = right of monorail center

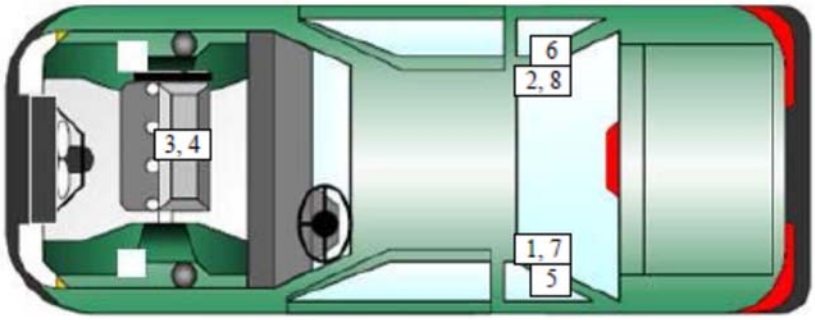
+Z = into ground

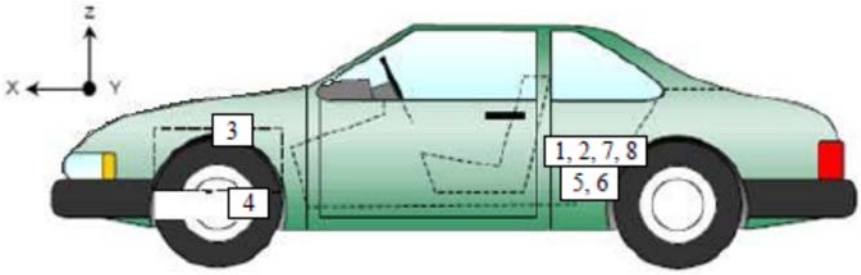
DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022





VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	2750	-715	365
2	Right Rear Accelerometer X-Direction	2770	715	365
3	Engine Top X	945	360	890
4	Engine Bottom X	760	65	220
5	Left Rear Accelerometer Z-Direction	2750	-715	365
6	Right Rear Accelerometer Z-Direction	2770	715	365
7	Left Rear Accelerometer X-Direction Redundant	2750	-715	365
8	Right Rear Accelerometer X-Direction Redundant	2770	715	365

Reference Points: X – Rear Surface of Vehicle (+ forward)

Y – Vehicle Centerline (+ to right)

Z – Ground Plane (+ down)

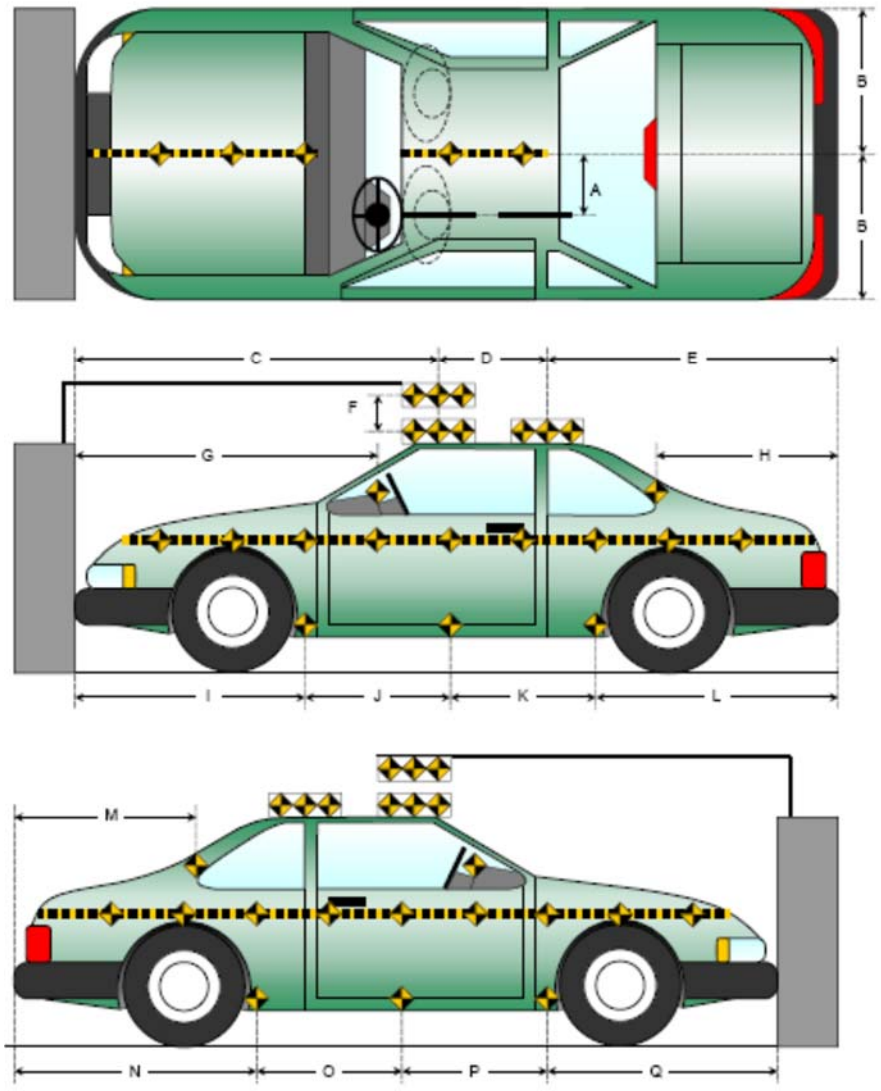
DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

Item	Value
A	400
B	896
C	2055
D	610
E	1790
F	305
G	1672
H	654
I	1351
J	898
K	892
L	1317
M	655
N	1317
O	896
P	899
Q	1346



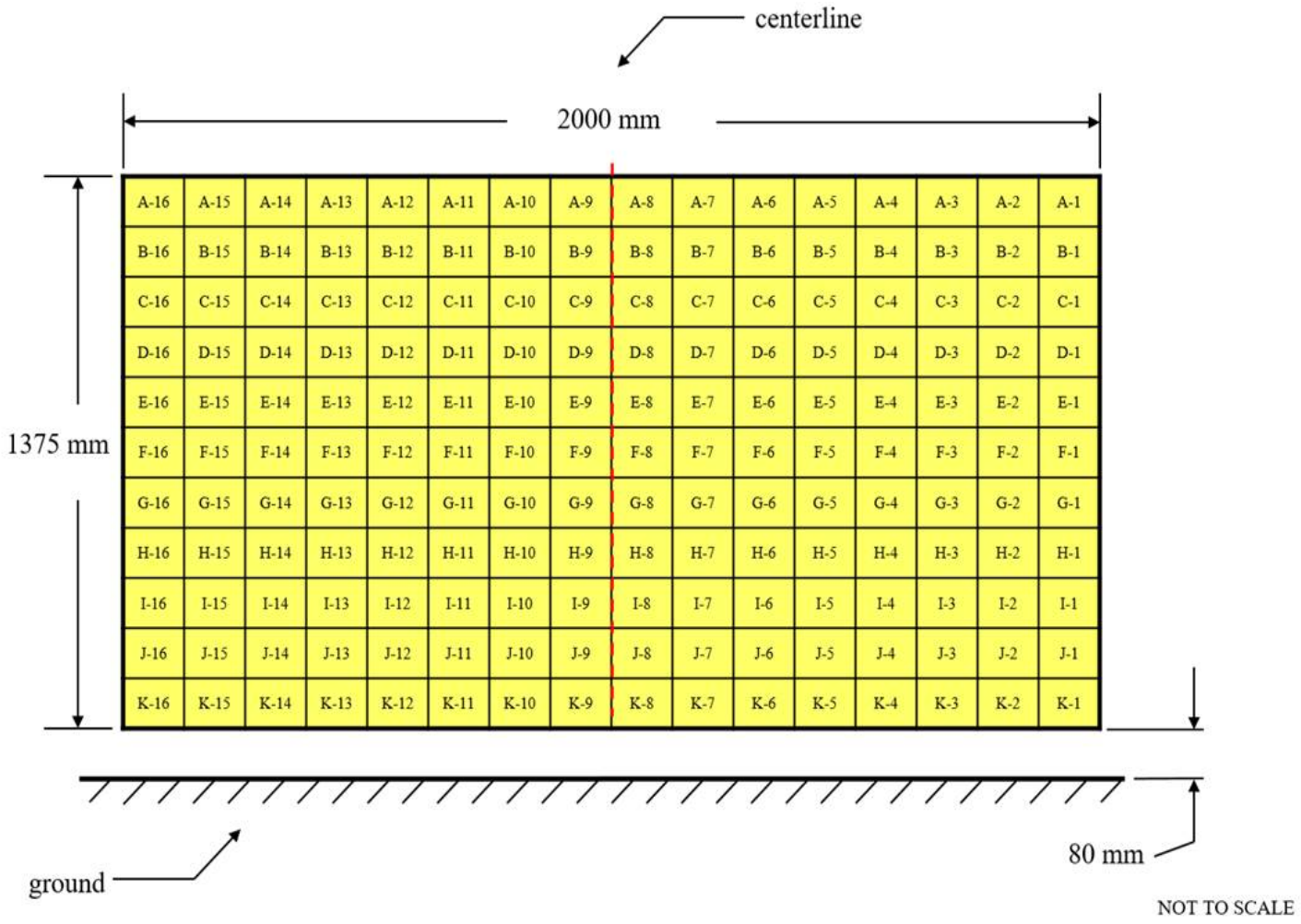
All measurements in millimeters.

DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022



DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

INSTRUMENTATION

Driver Dummy Sensors	47
Passenger Dummy Sensors	47
Vehicle Structure Accelerometers	8
Seat Belt Load Cells	2
Load Cell Barrier	528
Total	632

CAMERA COVERAGE

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

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type/Serial No.	HIII 50th Percentile Male ATD / 360	HIII 5th Percentile Female ATD / DH1644
Head Contact	Frontal Airbag, Curtain Airbag, Headrest	Frontal Airbag, Curtain Airbag, Headrest
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	Frontal Airbag	Frontal Aibag
Left Knee Contact	Knee Bolster	Knee Bolster
Right Knee Contact	Knee Bolster	Knee Bolster

DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION

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

OTHER VEHICLE POST-TEST 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	1626
Center	mm	1511
Right Side	mm	1499
Average	mm	1545

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

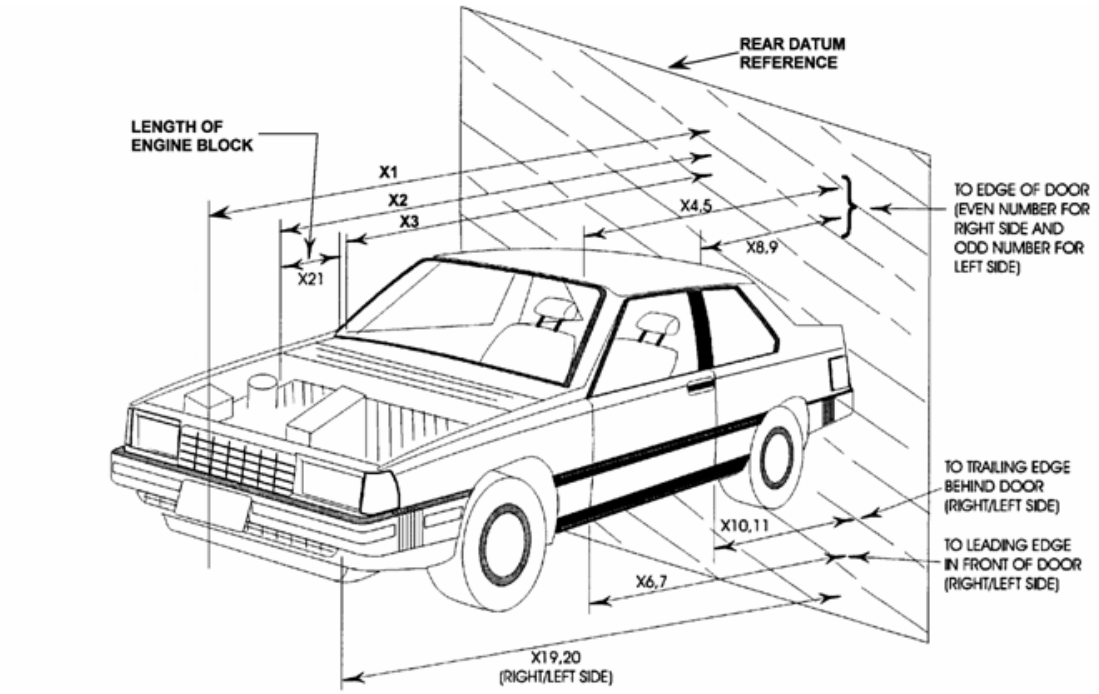
Restraint Type	Driver		Passenger	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	Yes	Yes
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	No	Yes	No
Knee Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

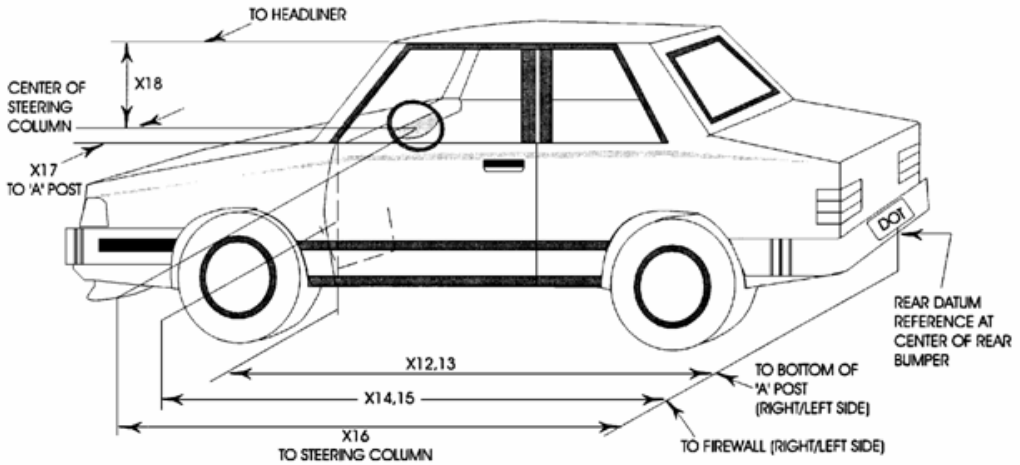
DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022





DATA SHEET NO. 12 … (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4458	4133	-325
2	Rear Surface of Vehicle to Front of Engine	4017	3851	-165
3	RSOV to Firewall	3490	3476	-14
4	RSOV to Upper Leading Edge of Right Door	3089	3089	0
5	RSOV to Upper Leading Edge of Left Door	3084	3085	1
6	RSOV to Lower Leading Edge of Right Door	3082	3085	4
7	RSOV to Lower Leading Edge of Left Door	3078	3080	2
8	RSOV to Upper Trailing Edge of Right Door	2008	2011	3
9	RSOV to Upper Trailing Edge of Left Door	1991	1992	1
10	RSOV to Lower Trailing Edge of Right Door	2051	2053	3
11	RSOV to Lower Trailing Edge of Left Door	2046	2050	4
12	RSOV to Bottom of A-Pillar, Right Side	3154	3179	25
13	RSOV to Bottom of A-Pillar, Left Side	3177	3179	2
14	RSOV to Firewall, Right Side	3490	3476	-14
15	RSOV to Firewall, Left Side	3481	3442	-39
16	RSOV to Steering Column	2619	2688	69
17	Center of Steering Column to A-Pillar	425	491	66
18	Center of Steering Column to Headliner	520	540	20
19	RSOV to Right Side of Front Bumper	3891	3894	3
20	RSOV to Left Side of Front Bumper	3885	3796	-89
21	Length of Engine Block	501	472	-29
RD	RSOV to Right Side of Dash Panel	2838	2844	6
CD	RSOV to Center of Dash Panel	2770	2775	6
LD	RSOV to Left Side of Dash Panel	2835	2843	7

All measurements in millimeters.

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

VEHICLE INFORMATION

VIN: 3VVAX7B21NM045915 Wheelbase (mm): 2677

Vehicle Size Category: MPV Test Weight (kg): 1774.5

ACCELEROMETER DATA

Accelerometer Locations: Left Rear Crossmember

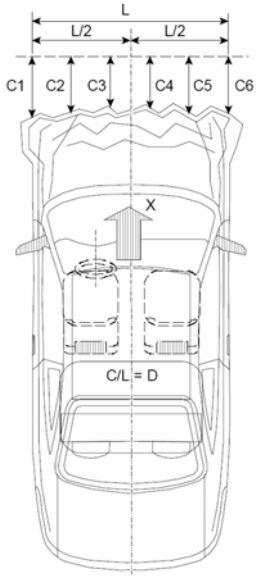
Cal. Procedure/Interval: Vibration Test / 6 months

Integration Algorithm: NHTSA Standard Linearity: Good

Impact Velocity (km/h): 56.14

Velocity Change (km/h): 64.3

Time of Separation (msec): 59.0



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1238

Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	151	487	336
C2	Crush Zone 2 at Left Side	mm	28	493	466
C3	Crush Zone 3 at Left Side	mm	7	472	465
C4	Crush Zone 4 at Right Side	mm	5	466	462
C5	Crush Zone 5 at Right Side	mm	24	481	457
C6	Crush Zone 6 at Right Side	mm	149	507	358
L	C1 to C6	mm	1238		

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

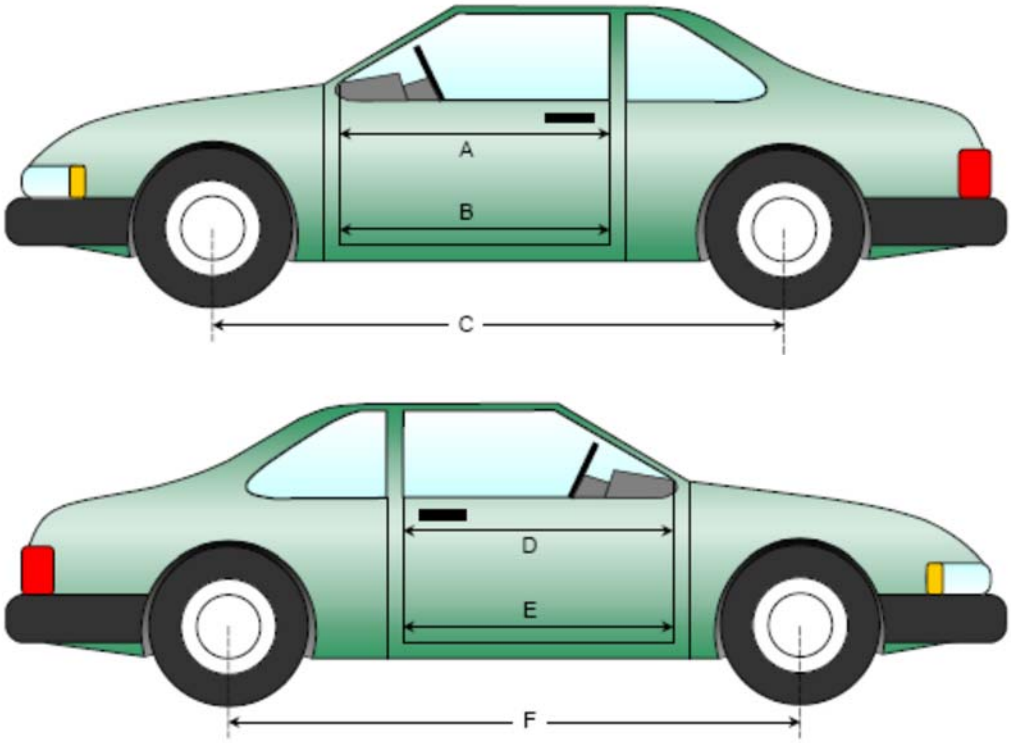
Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1093	1093	0
B	Left Side Lower	mm	1032	1032	0
D	Right Side Upper	mm	1080	1078	2
E	Right Side Lower	mm	1031	1032	1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2677	2671	-6
F	Right Side Wheelbase	mm	2677	2630	-47



DATA SHEET NO. 14 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

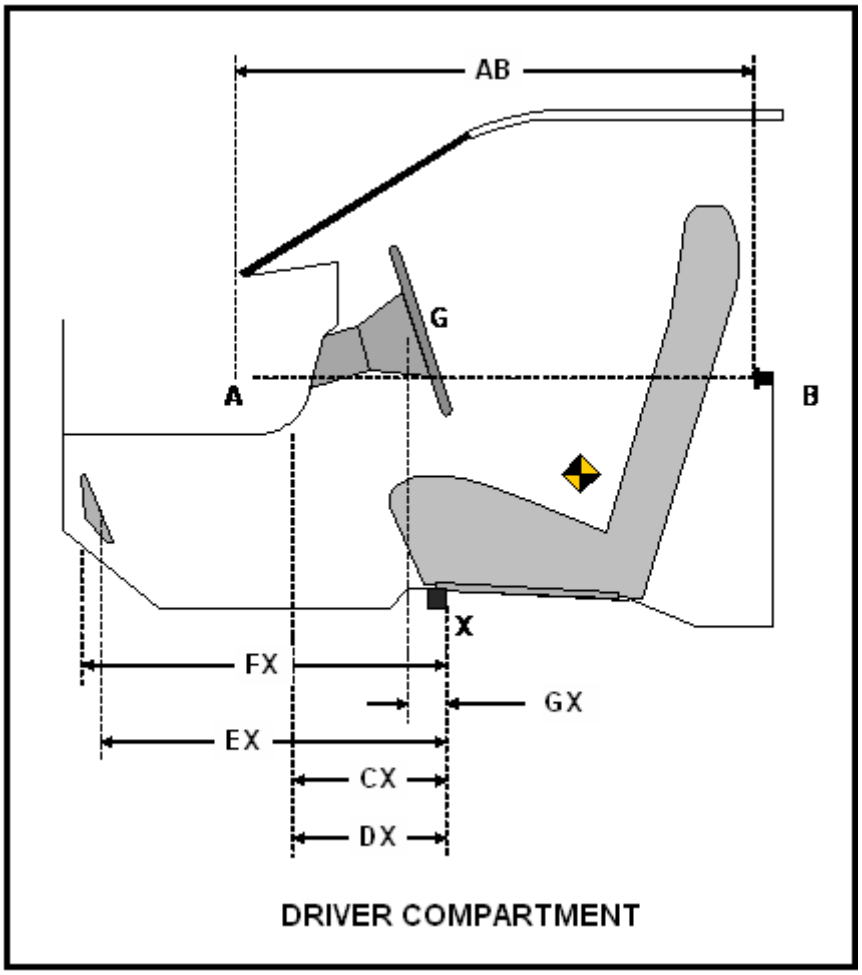
Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	953	952	2
CX	Left Knee Bolster to X	mm	270	273	-4
DX	Right Knee Bolster to X	mm	274	281	-7
EX	Brake Pedal to X	mm	519	520	-1
FX	Foot Rest to X	mm	552	545	7
GX	Center of Steering Wheel Hub to X	mm	63	129	-67

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

SUMMARY OF INDICANT FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

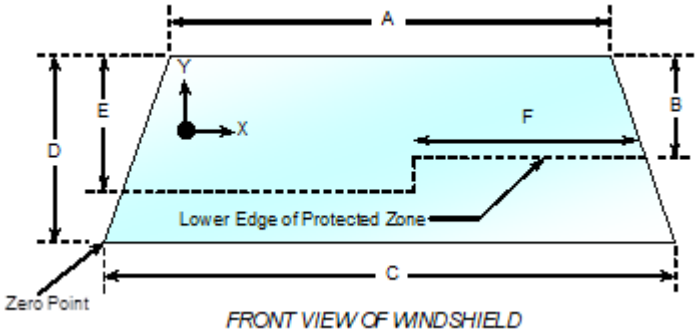
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber molding and rubber cement.

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

Temperature of windshield molding during test: 21.4°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2238	2238	100.0%
Right Side	2238	2238	100.0%
Total	4475	4475	100.0%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1230
B	mm	380
C	mm	1435
D	mm	905
E	mm	490
F	mm	550

AREAS OF PROTECTED ZONE FAILURES

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

X	Y

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

X	Y

DATA SHEET NO. 16

FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 28.9°C Test Time: 3:06 PM

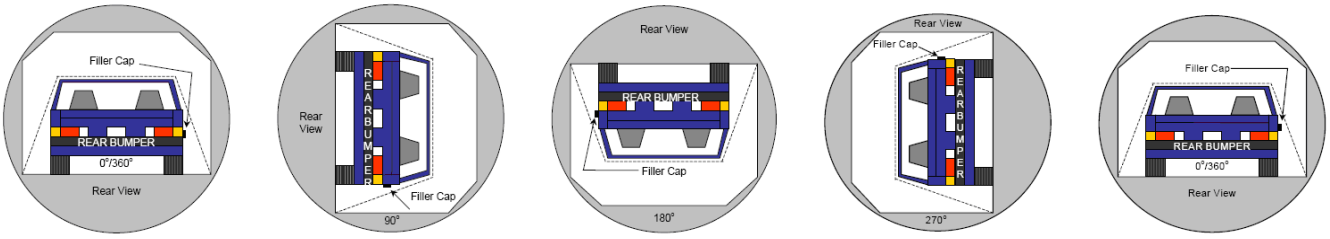
Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: N/A oz.
(Maximum allowable = 1 oz.)

B. For the 5 minute period after motion ceases: N/A oz.
(Maximum allowable = 5 oz.)

C. For the following 25 minutes: N/A oz.
(Maximum allowable = 1 oz./minute)

D. Spillage: _____



0° TO 90° 90° TO 180° 180° TO 270° 270° TO 360°

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: N/A

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	83	300	383
90° To 180°	82	300	382
180° To 270°	82	300	382
270° To 360°	85	300	385

DATA SHEET NO. 16 … (CONTINUED)

FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

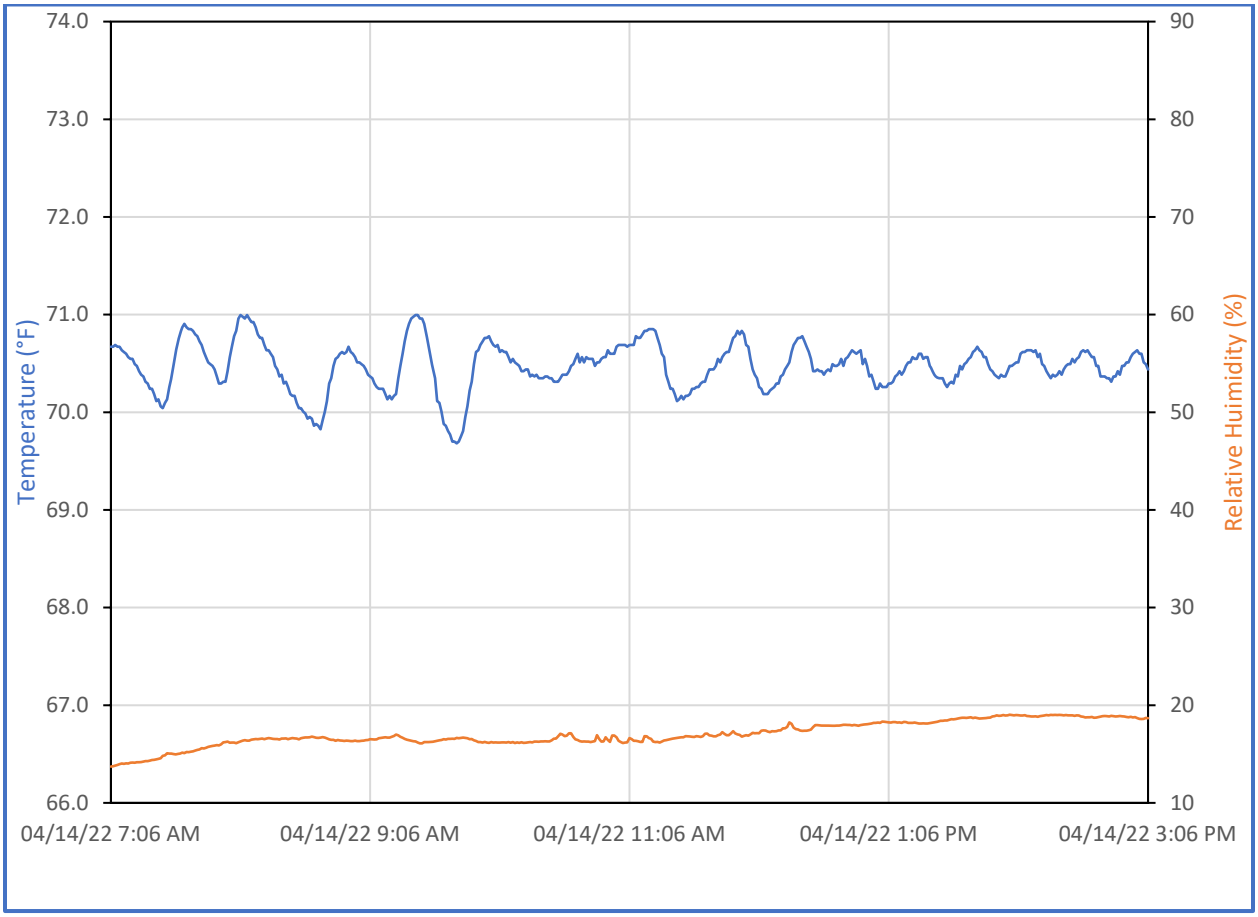
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2022 Volkswagen Taos 5-Door MPV NHTSA No.: M20225803

Test Program: 56.3 km/h Frontal Impact NCAP Test Test Date: 04/14/2022



APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

FIGURE 1. Load Cell Location

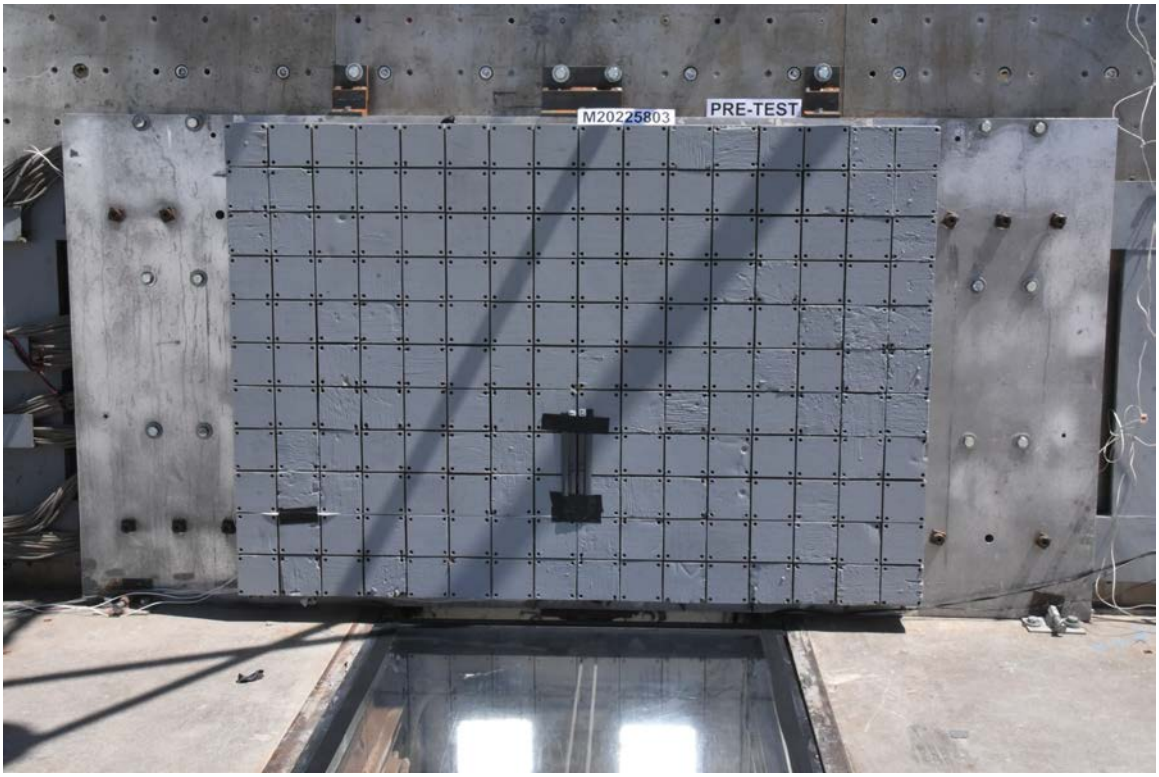


FIGURE 2. Pre-Test Load Cell Wall

FIGURE 3. Post-Test Load Cell Wall

FIGURE 4. Manufacturer's Label

FIGURE 5. Tire Placard

FIGURE 6. 2022 Volkswagen Taos Frontal as Delivered

FIGURE 7. Left Rear ¾ View, as Received

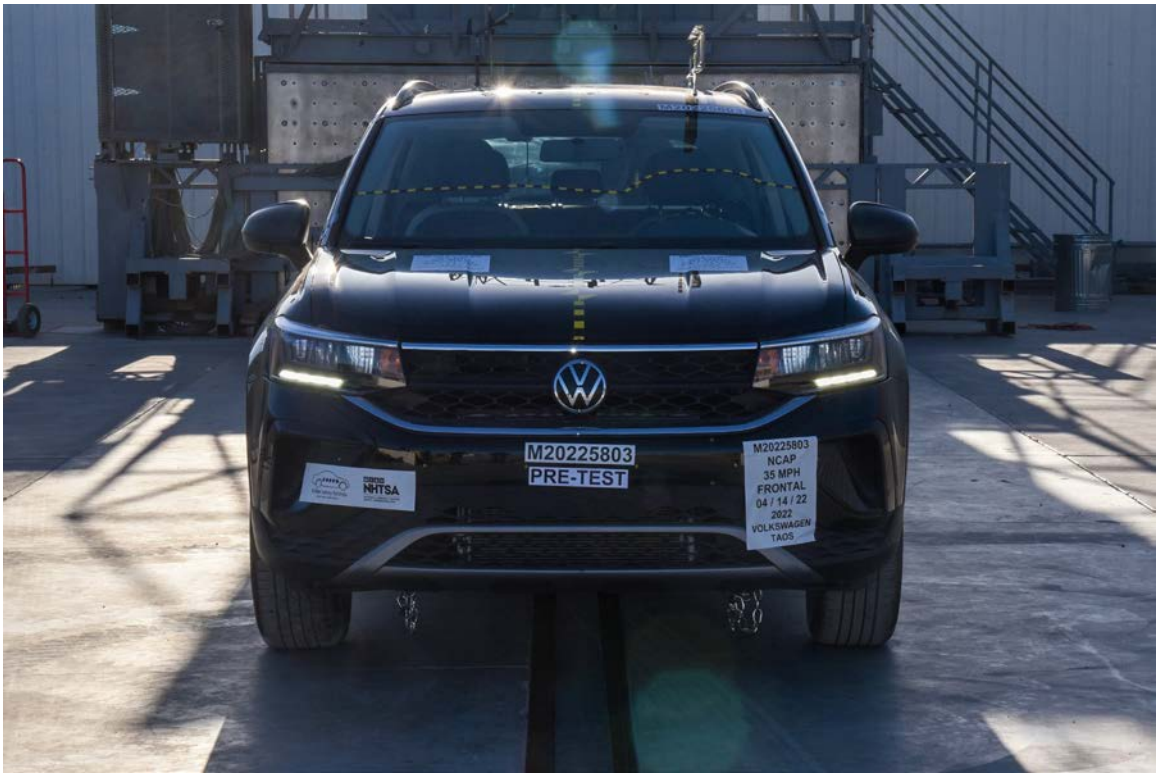


FIGURE 8. Pre-Test Front View of Test Vehicle

FIGURE 9. Post-Test Front View of Test Vehicle

FIGURE 10. Pre-Test Left View of Test Vehicle

FIGURE 11. Post-Test Left View of Test Vehicle

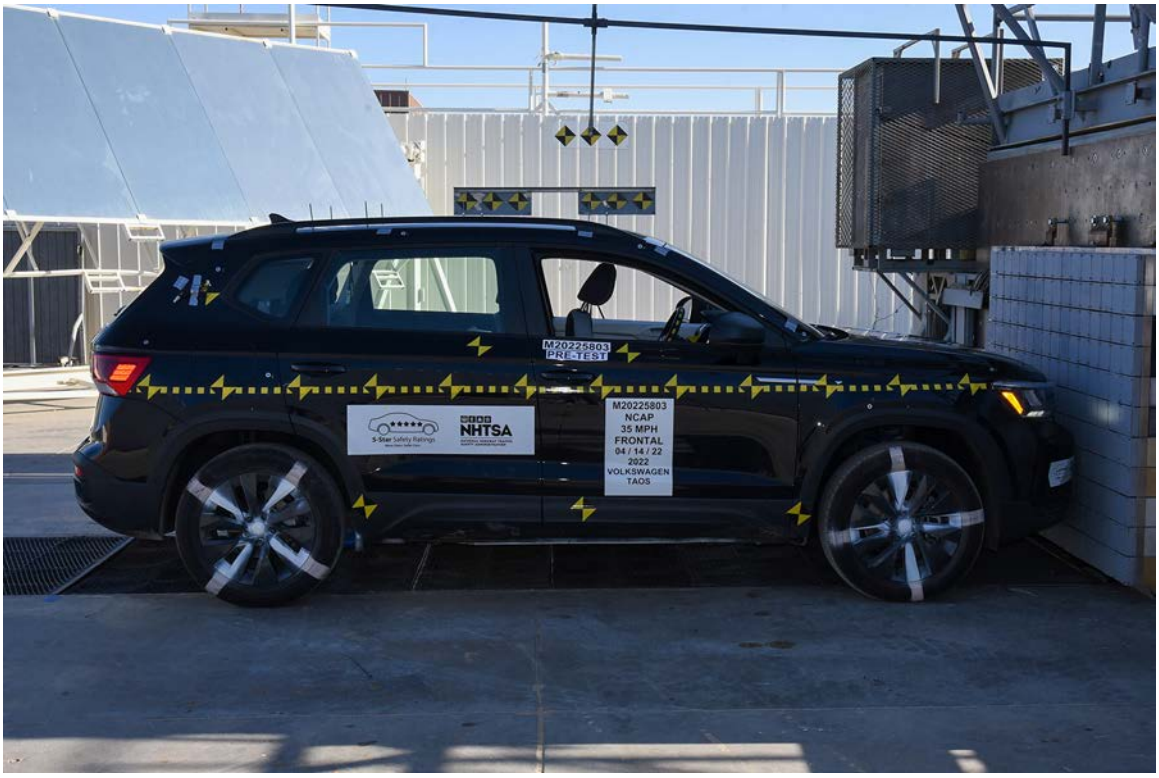


FIGURE 12. Pre-Test Right View of Test Vehicle

FIGURE 13. Post-Test Right View of Test Vehicle

FIGURE 14. Pre-Test Right Front ¾ View

FIGURE 15. Post-Test Right Front ¾ View

FIGURE 16. Pre-Test Left Rear ¾ View

FIGURE 17. Post-Test Left Rear ¾ View

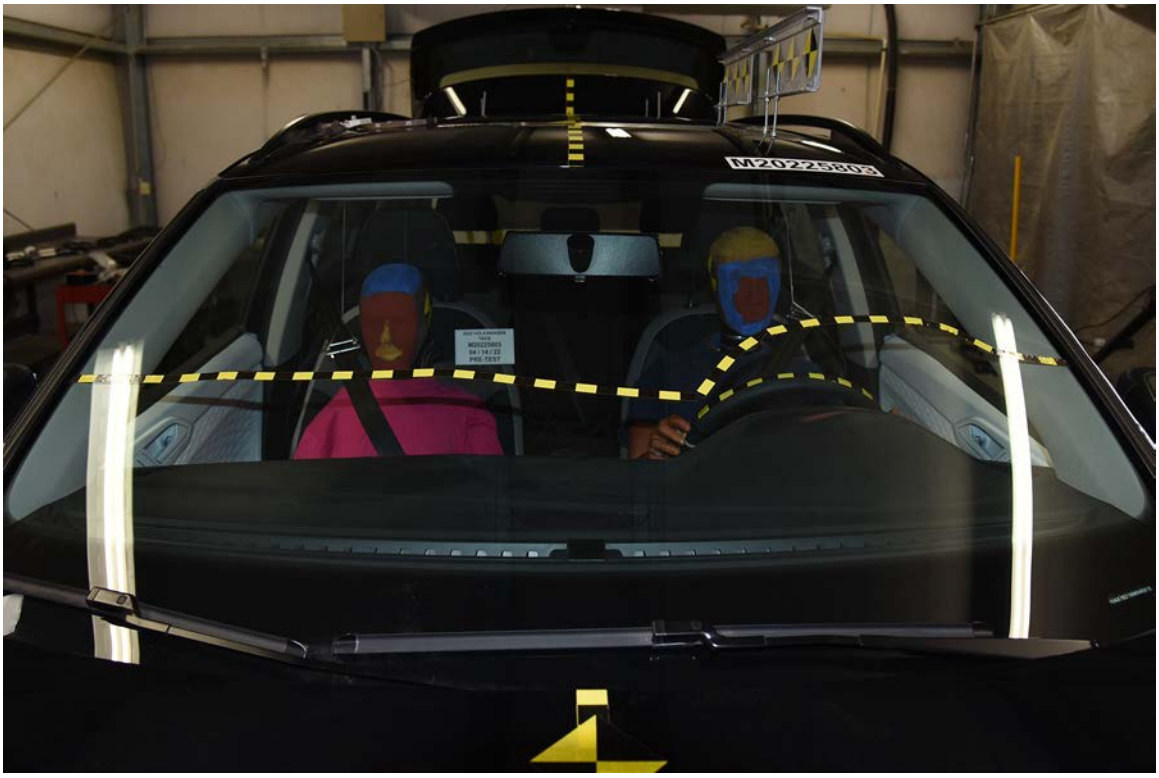


FIGURE 18. Pre-Test Windshield View

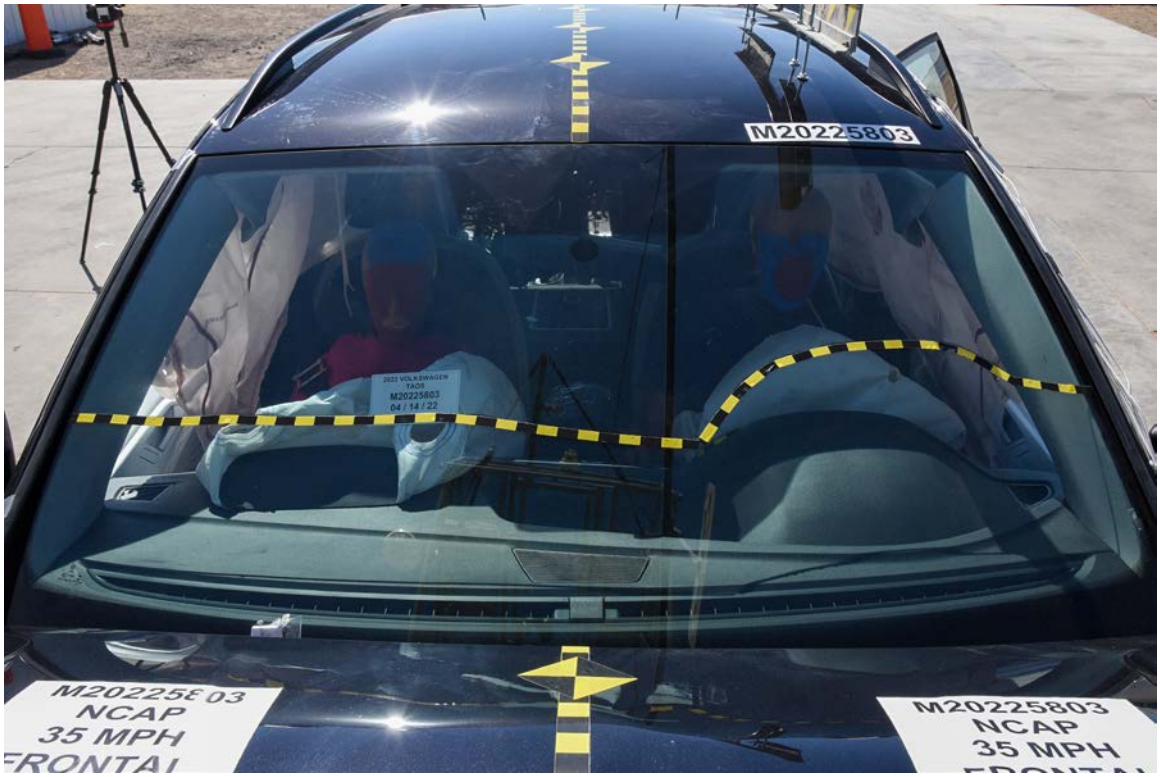


FIGURE 19. Post-Test Windshield View

FIGURE 20. Pre-Test Engine Compartment View

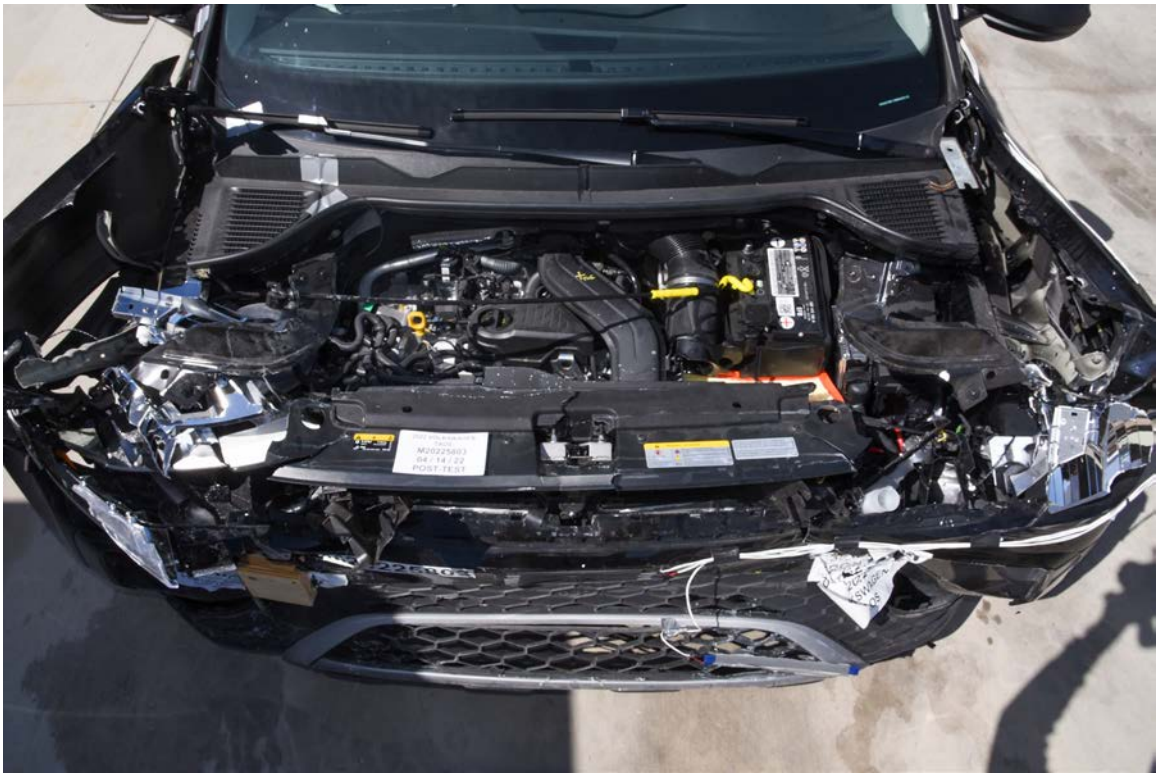


FIGURE 21. Post-Test Engine Compartment View

FIGURE 22. Pre-Test Fuel Filler Cap View

FIGURE 23. Post-Test Fuel Filler Cap View

FIGURE 24. Pre-Test Front Underbody View

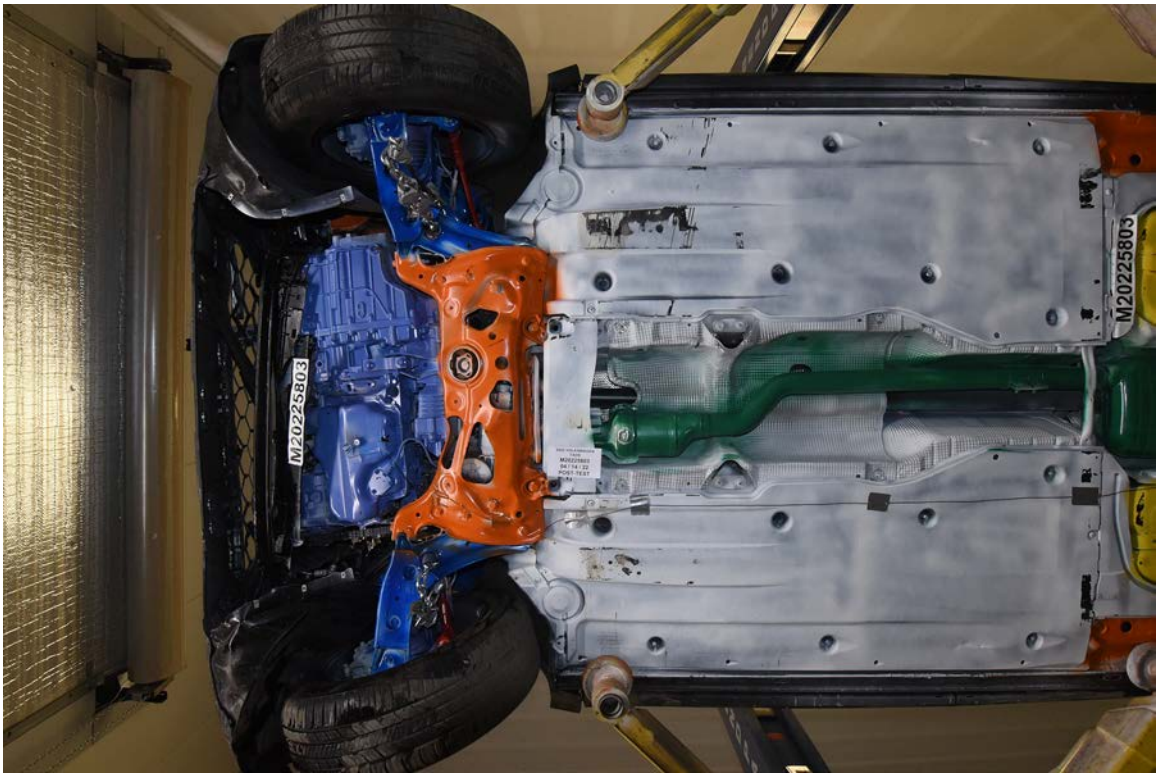


FIGURE 25. Post-Test Front Underbody View

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 View of Belt Buckle and Latch Plate for Driver Dummy

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

FIGURE 42. Pre-Test Driver Dummy Feet

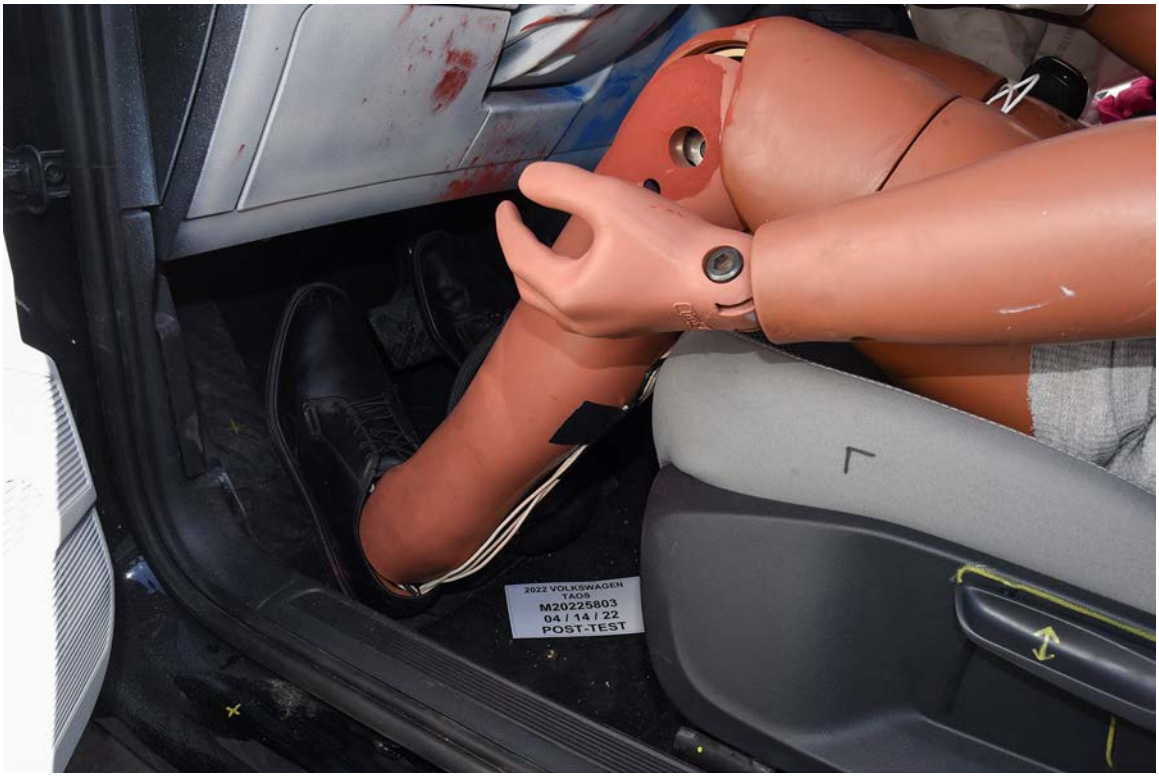


FIGURE 43. Post-Test Driver Dummy Feet

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

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

FIGURE 46. Pre-Test Driver's Side Floorpan

FIGURE 47. Post-Test Driver's Side Floorpan

FIGURE 48. Post-Test Driver Dummy Face

FIGURE 49. Post-Test Driver Dummy Contact with Airbag

FIGURE 50. Post-Test Driver Dummy Contact with Headrest

FIGURE 50a. Post-Test Driver Dummy Contact with Headliner

FIGURE 50b. Post-Test Driver Dummy Contact with Curtain Airbag

FIGURE 50c. Post-Test Driver Dummy Contact with Knee Bolster

FIGURE 51. Pre-Test View of the Steering Wheel

FIGURE 52. Post-Test View of the Steering Whee

FIGURE 53. Pre-Test Passenger Dummy Front View

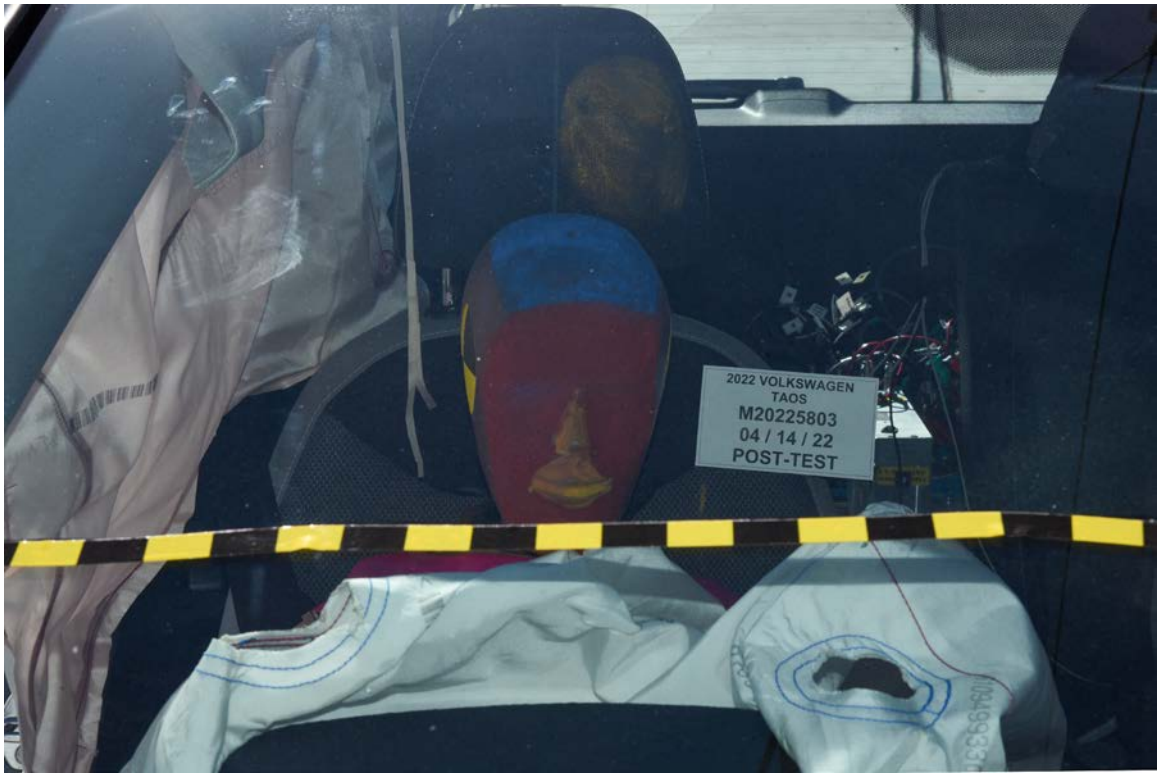


FIGURE 54. Post-Test Passenger Dummy Front View

FIGURE 55. Pre-Test Passenger Dummy Window View

FIGURE 56. Post-Test Passenger Dummy Window View

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

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

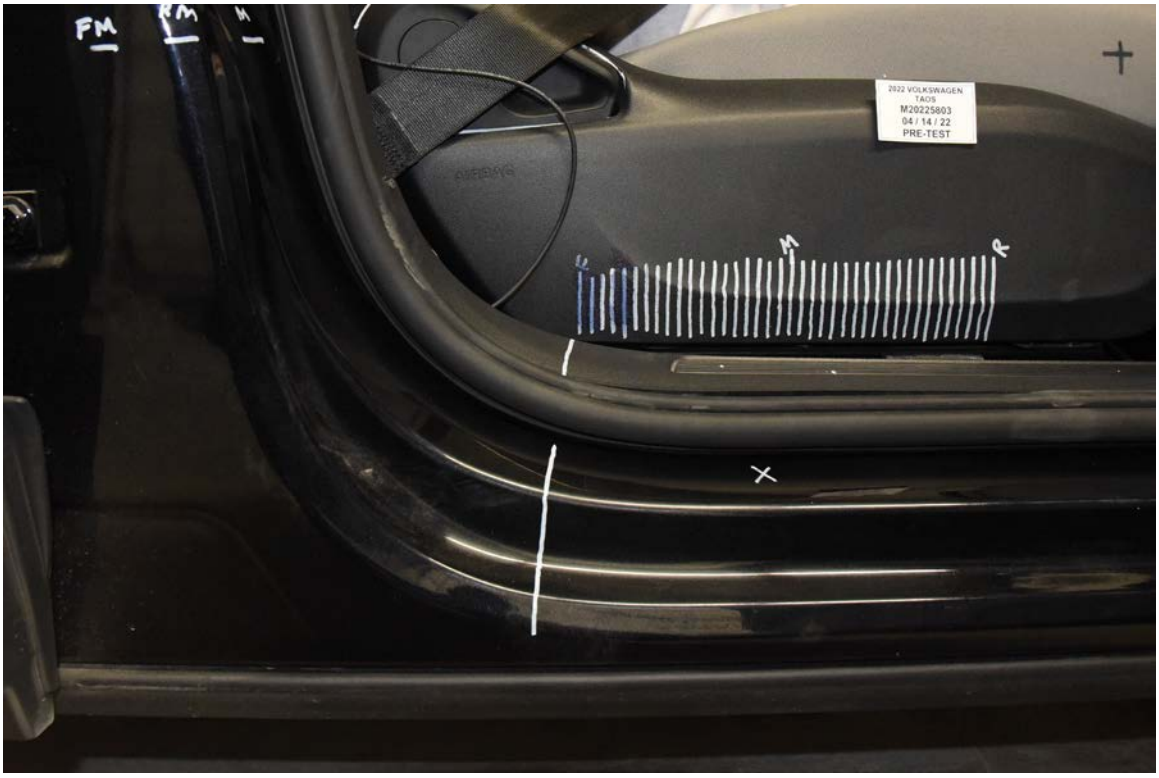


FIGURE 59. Pre-Test Passenger's Seat Fore-Aft Markings

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

FIGURE 61. Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy

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

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

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

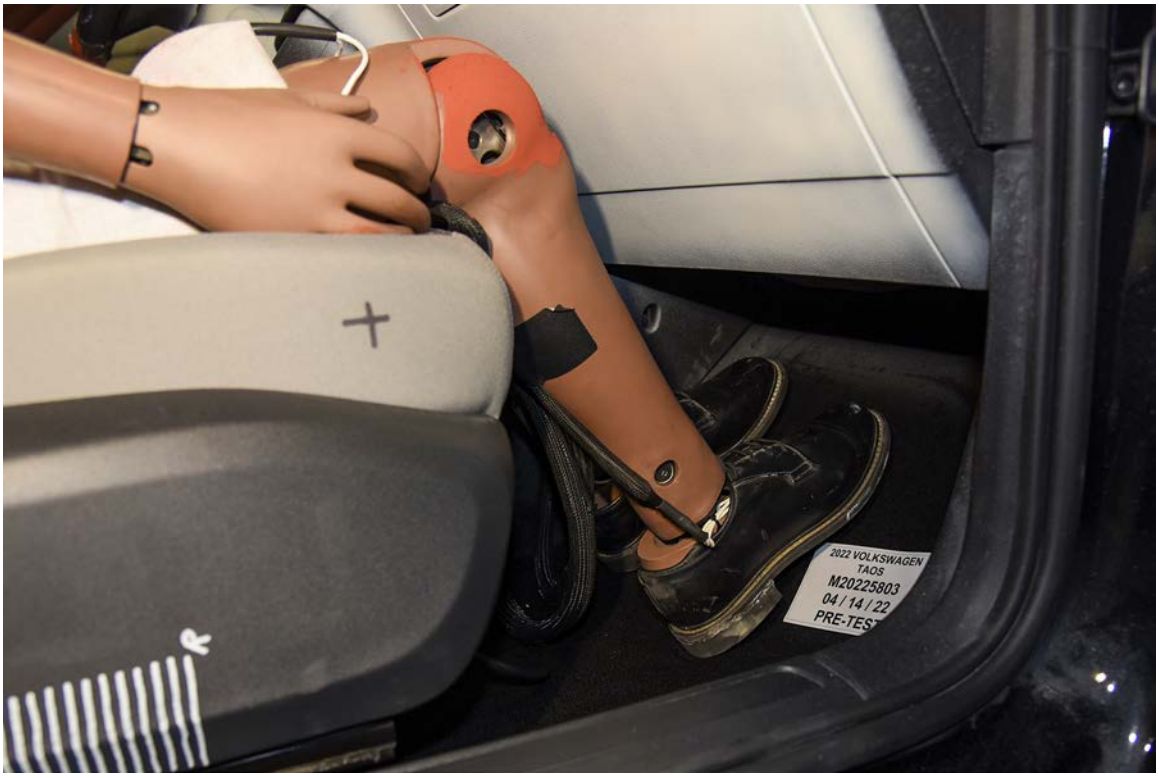


FIGURE 65. Pre-Test Passenger Dummy Feet

FIGURE 66. Post-Test Passenger Dummy Feet

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

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

FIGURE 69. Pre-Test Passenger's Side Floorpan

FIGURE 70. Post-Test Passenger's Side Floorpan

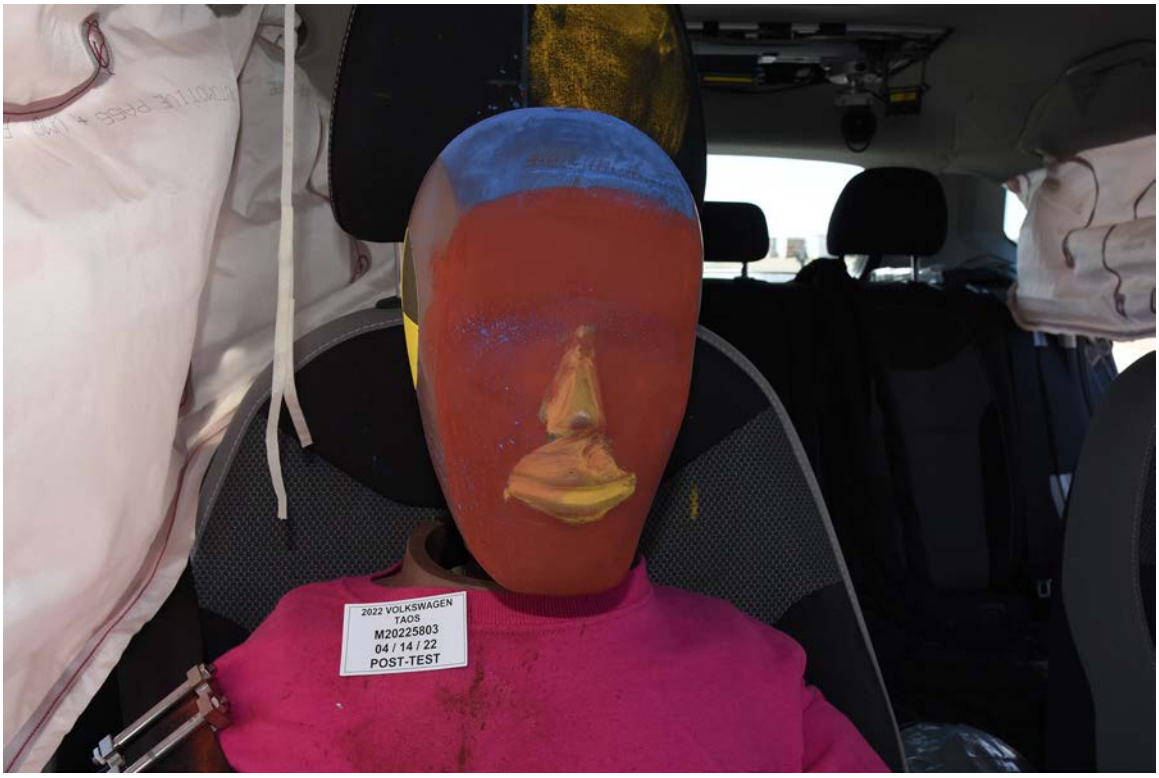


FIGURE 71. Post-Test Passenger Dummy Face

FIGURE 72. Post-Test Passenger Dummy Contact with Airbag

FIGURE 73. Post-Test Passenger Dummy Contact with Headrest

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

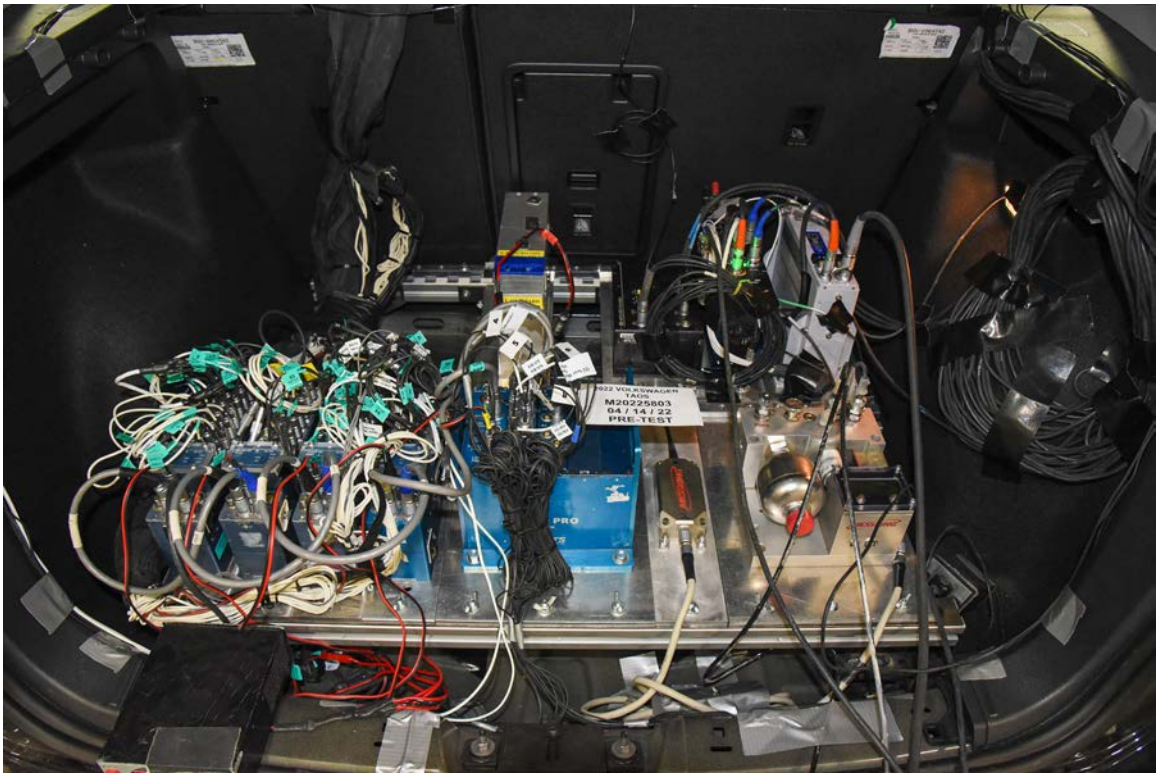


FIGURE 74. Photograph of Ballast Installed in Vehicle

Photograph Not Applicable

No Stoddard Solvent Spillage

FIGURE 75. Post-Test Stoddard Solvent Spillage Location View

FIGURE 76. Post-Test Speed Trap Read-Out

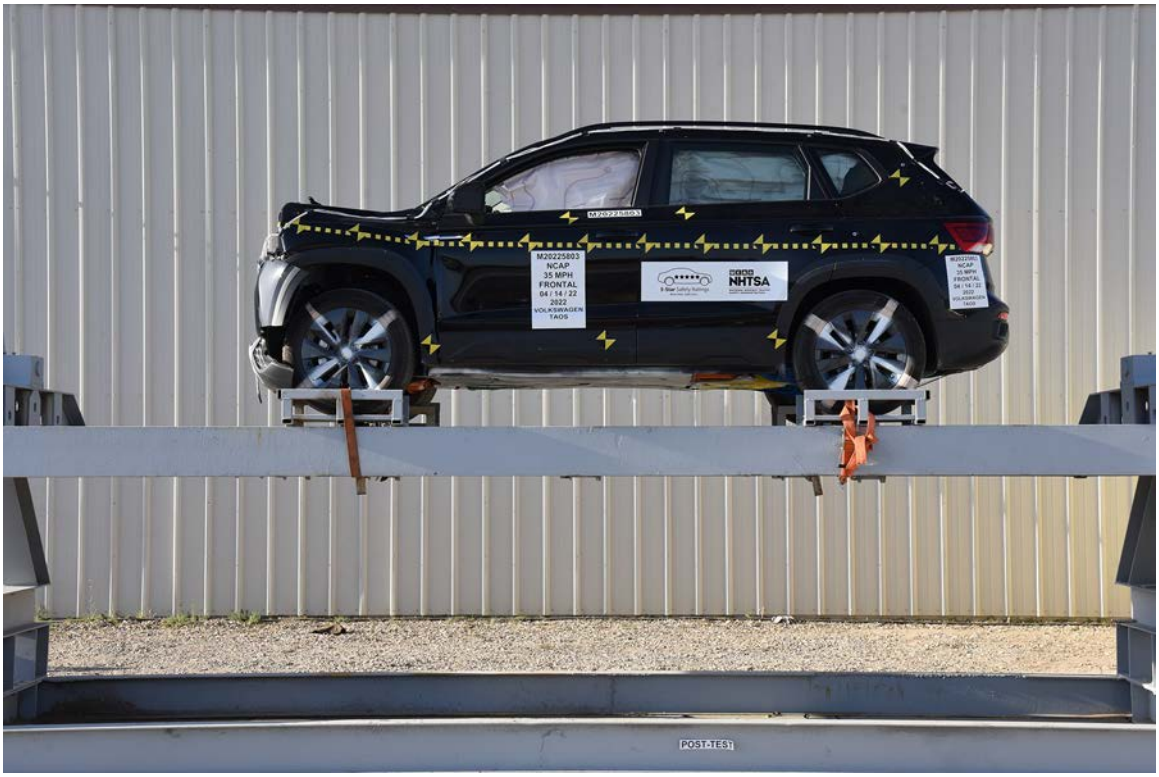


FIGURE 77. Vehicle at 0° on Static Rollover Device

FIGURE 78. Vehicle at 90° on Static Rollover Device

FIGURE 79. Vehicle at 180° on Static Rollover Device

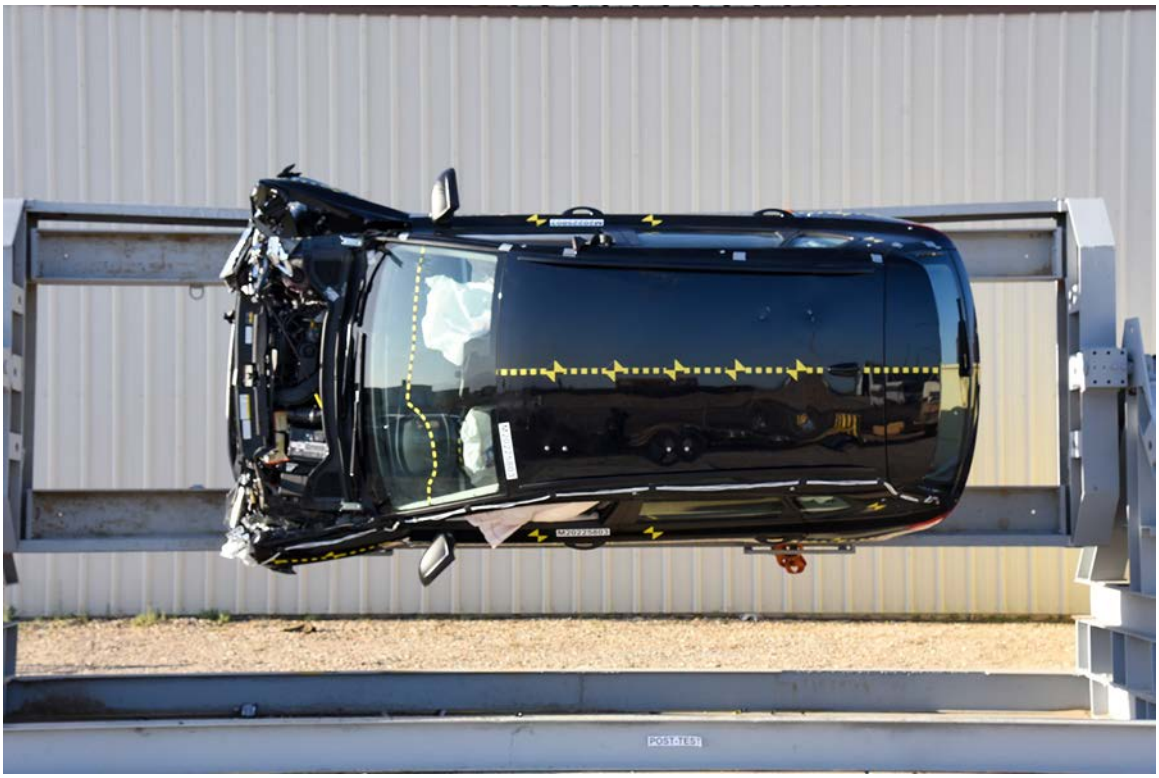


FIGURE 80. Vehicle at 270° on Static Rollover Device

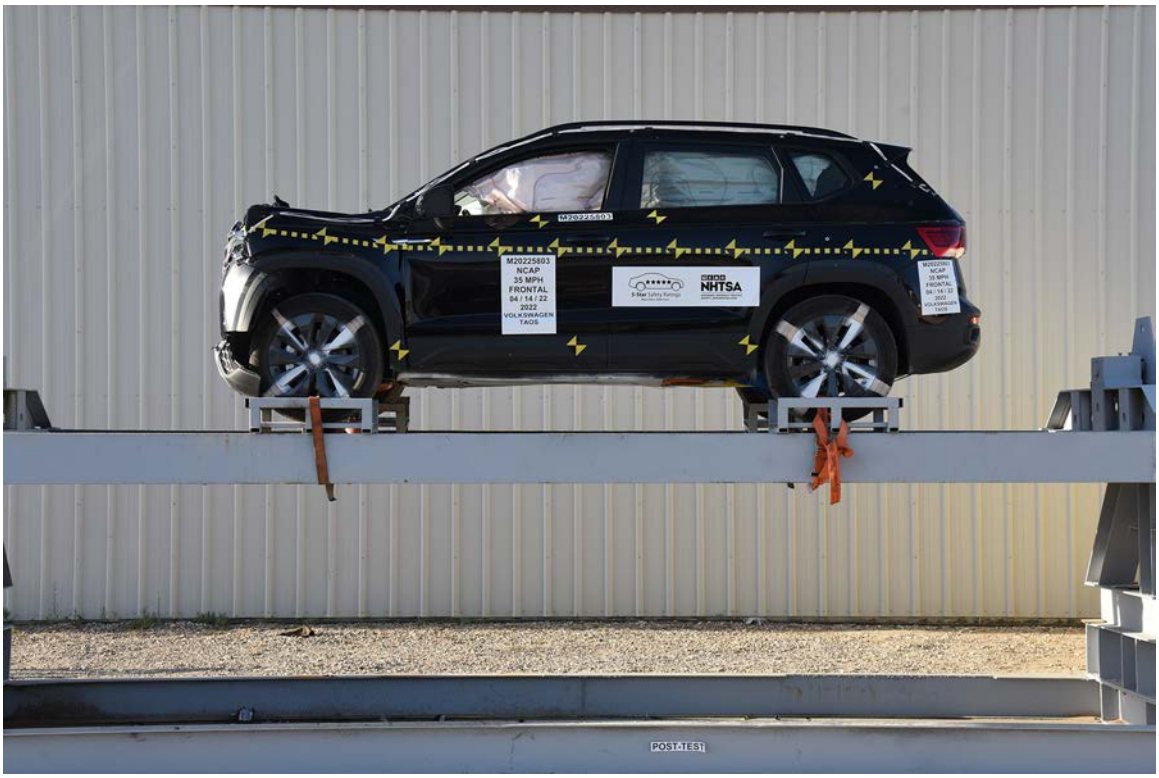


FIGURE 81. Vehicle at 360° on Static Rollover Device

FIGURE 82. 2022 Volkswagen Taos Frontal Impact Event

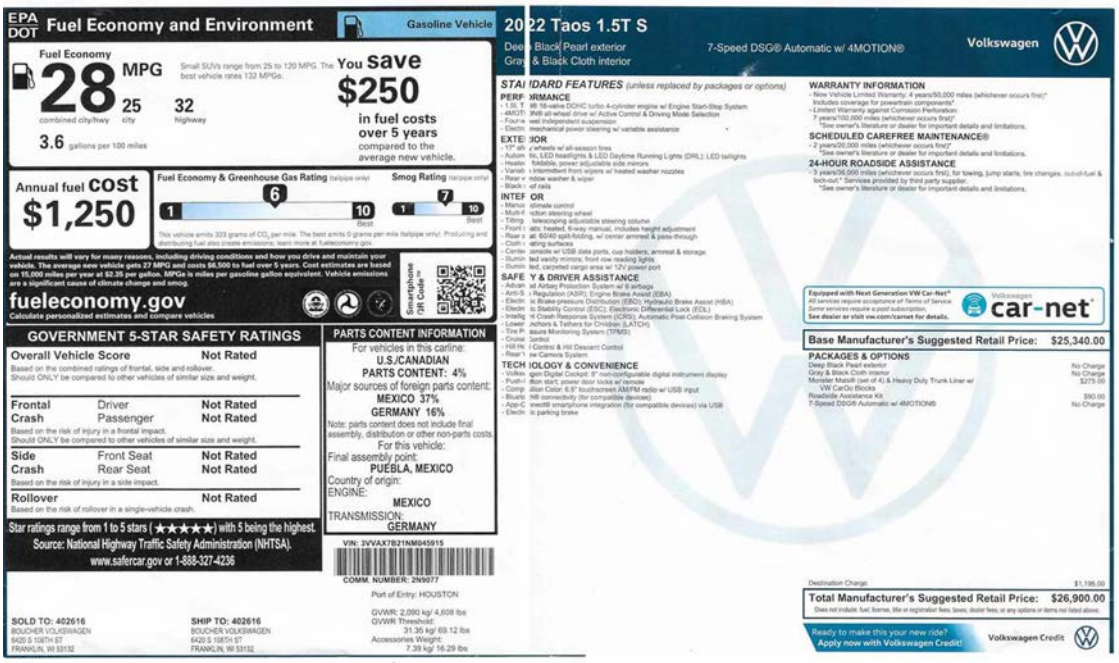


FIGURE 83. Monroney Label Photograph

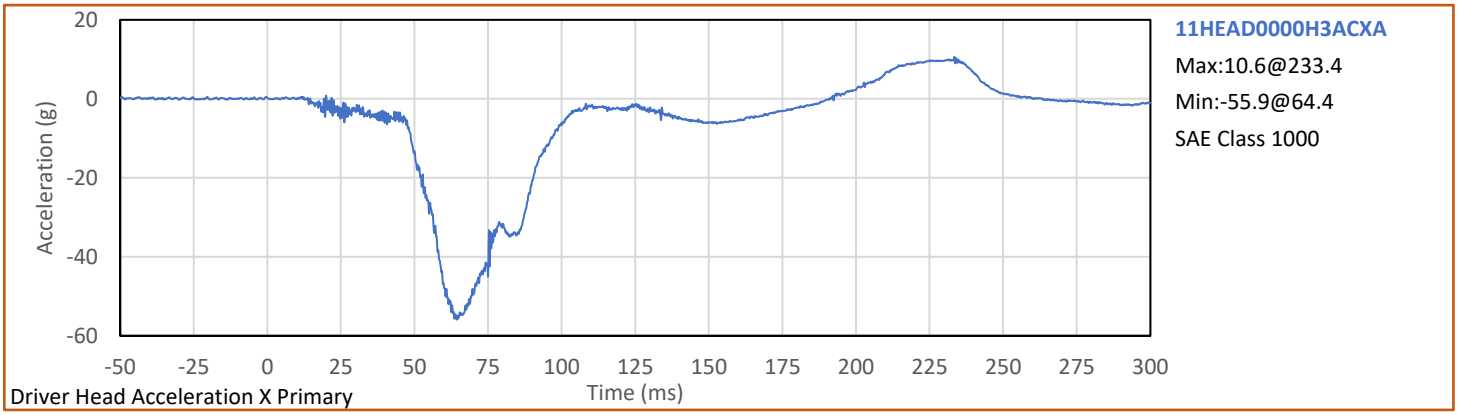
APPENDIX B
DUMMY RESPONSE DATA TRACES

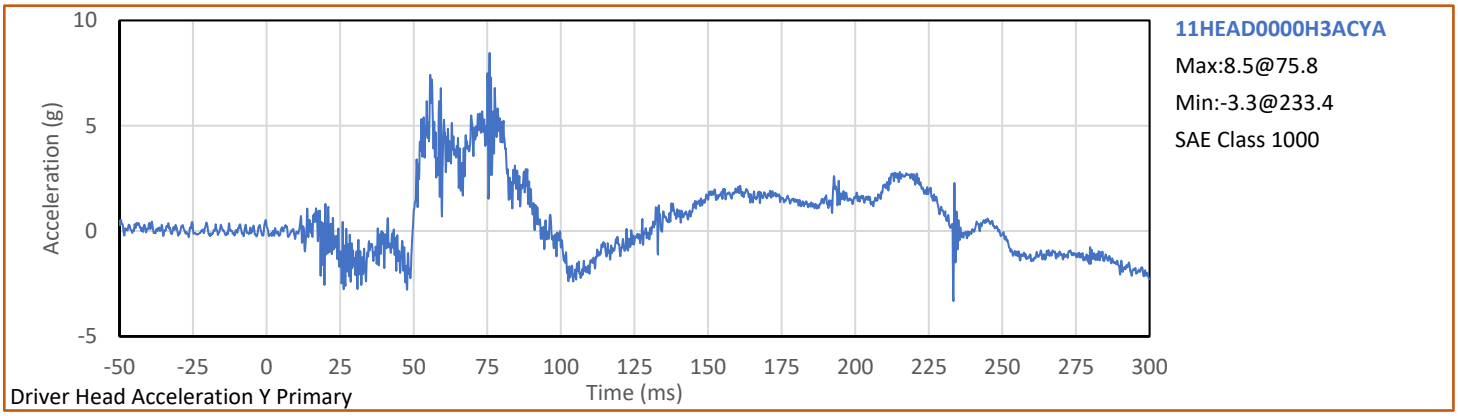
TABLE OF DATA PLOTS

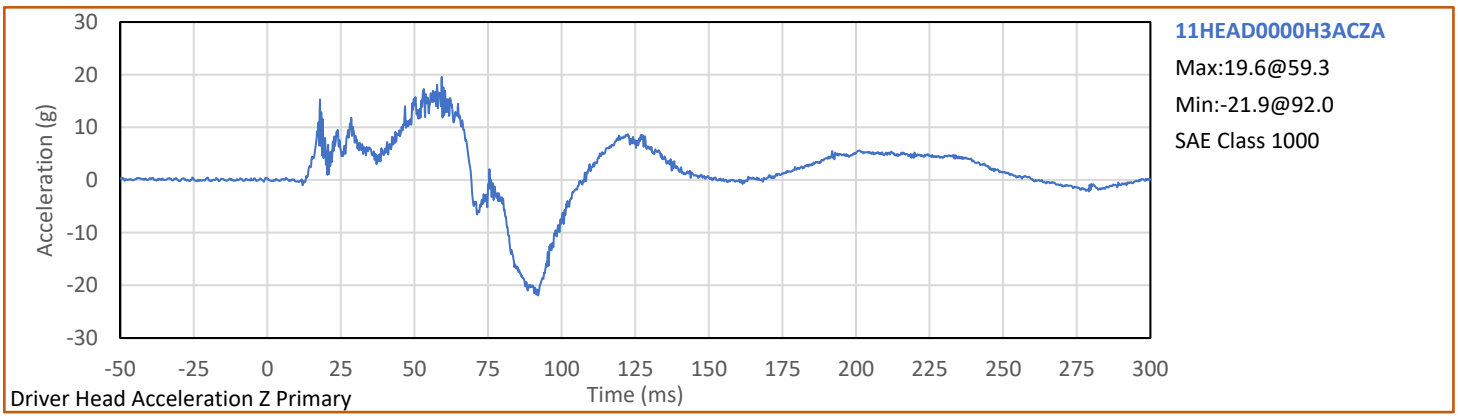
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.gov

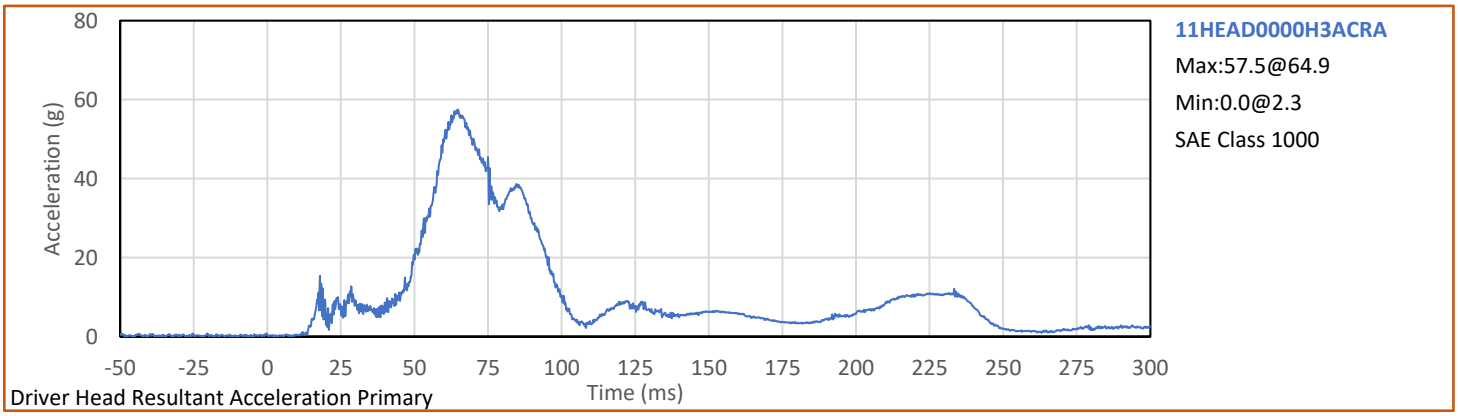
Driver Head X Acceleration Redundant
Driver Head Y Acceleration Redundant
Driver Head Z Acceleration Redundant
Driver Upper Neck Force Y
Driver Upper Neck Moment X
Driver Upper Neck Moment Z
Driver Chest X Acceleration Redundant
Driver Chest Y Acceleration Redundant
Driver Chest Z Acceleration Redundant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

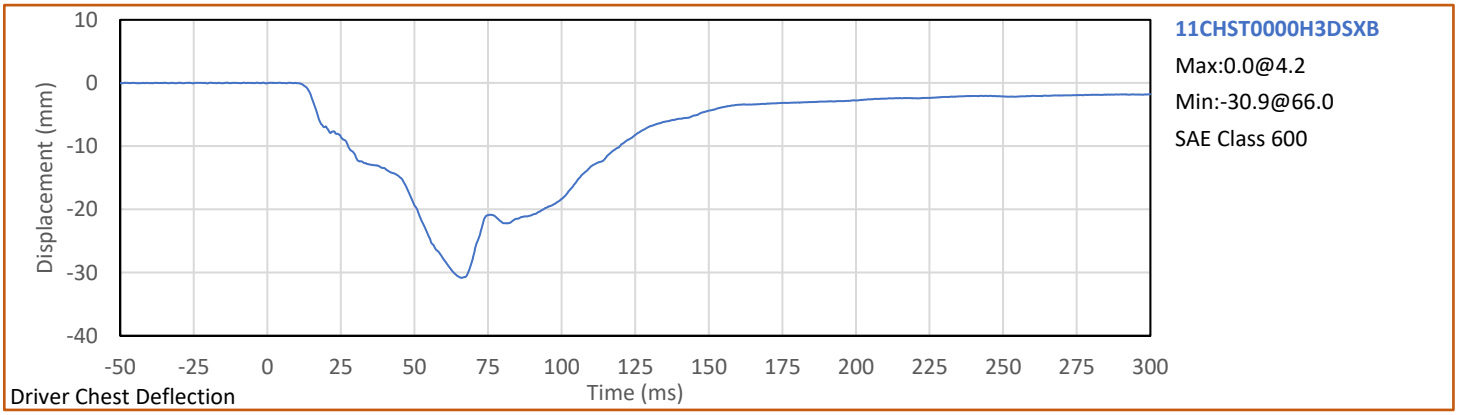
Passenger Chest X Acceleration Redundant
Passenger Chest Y Acceleration Redundant
Passenger Chest Z Acceleration Redundant
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Left Femur Force Redundant
Passenger Right Femur Force Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Passenger Head Angular Velocity X
Passenger Head Angular Velocity Y
Passenger Head Angular Velocity Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember X Redundant
Right Rear Seat Crossmember X Redundant
Vehicle Engine Top X
Vehicle Engine Bottom X
Load Cell Barrier Forces and Moments


Acceleration (g)
Time (ms)
Driver Head Acceleration X Primary
11HEAD0000H3ACXA
Max:10.6@233.4
Min:-55.9@64.4
SAE Class 1000

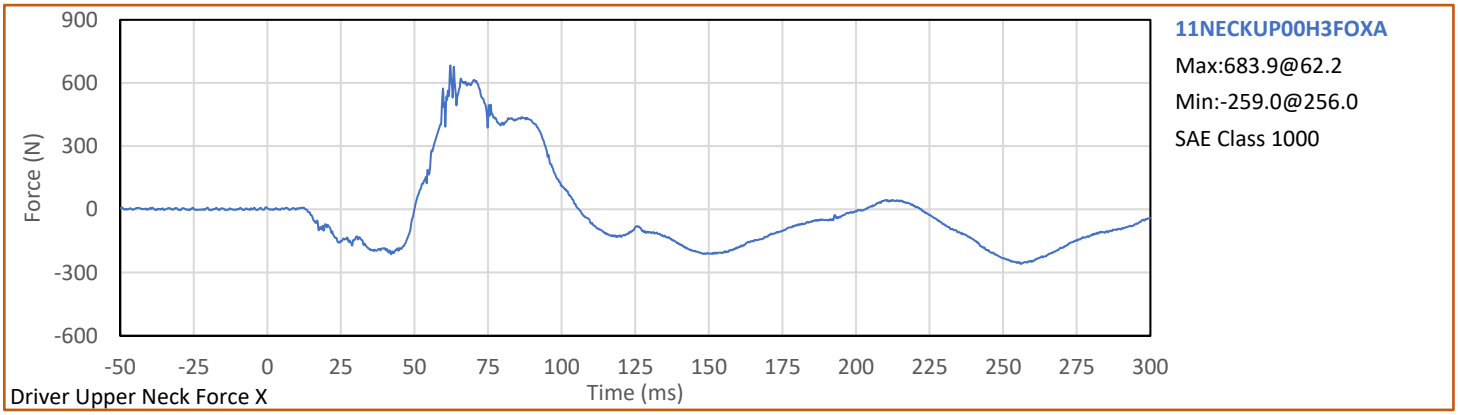

Acceleration (g)
Time (ms)
Driver Head Acceleration Y Primary
11HEAD0000H3ACYA
Max:8.5@75.8
Min:-3.3@233.4
SAE Class 1000

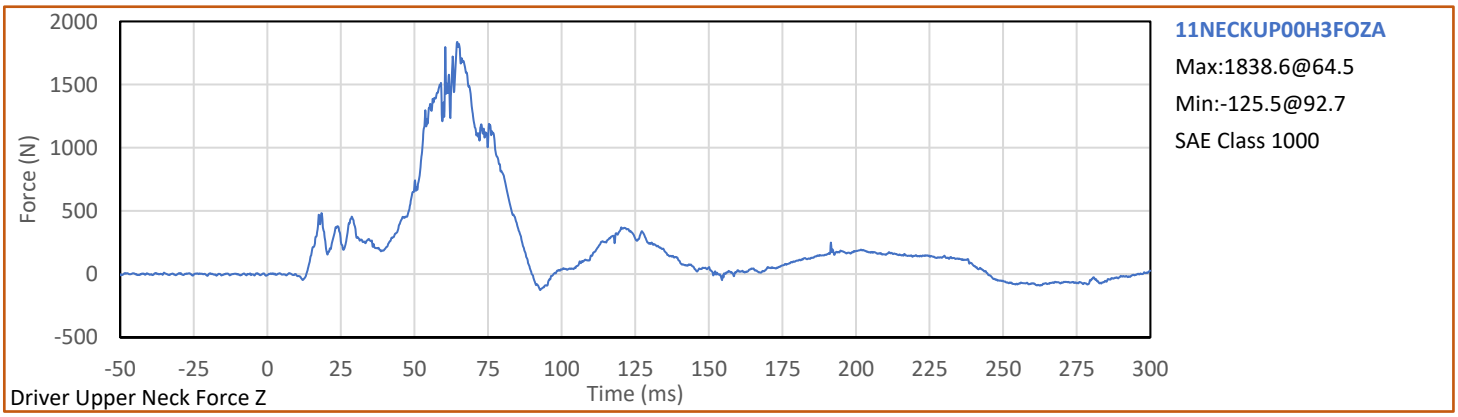

Acceleration (g)
Time (ms)
Driver Head Acceleration Z Primary
11HEAD0000H3ACZA
Max:19.6@59.3
Min:-21.9@92.0
SAE Class 1000

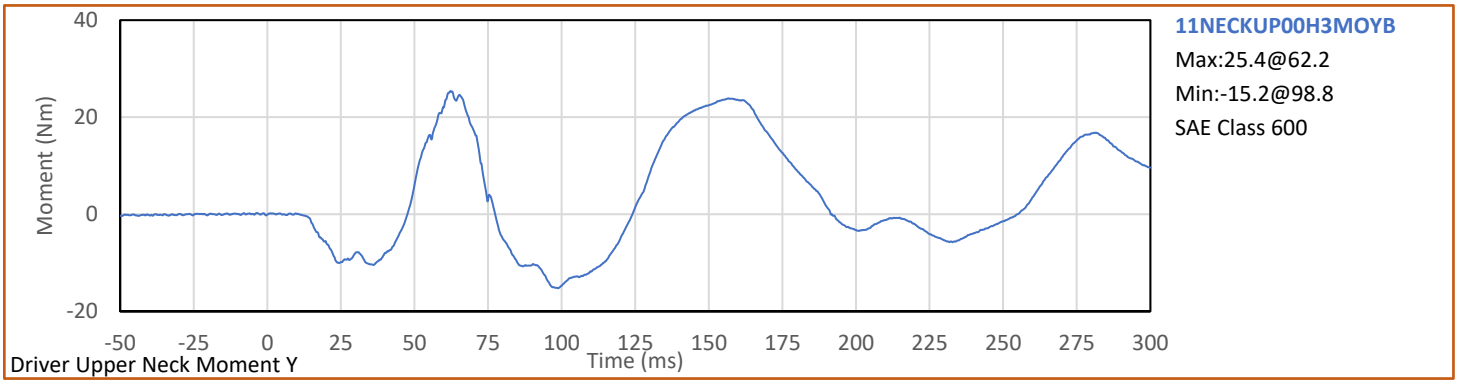

Acceleration (g)
Time (ms)
Driver Head Resultant Acceleration Primary
11HEAD0000H3ACRA
Max:57.5@64.9
Min:0.0@2.3
SAE Class 1000

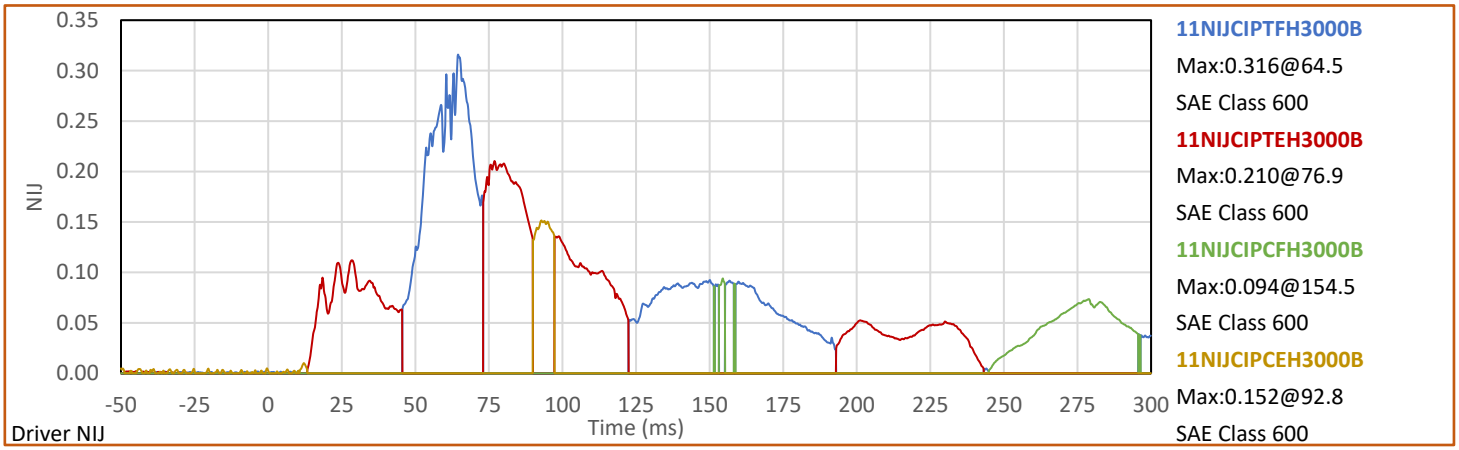


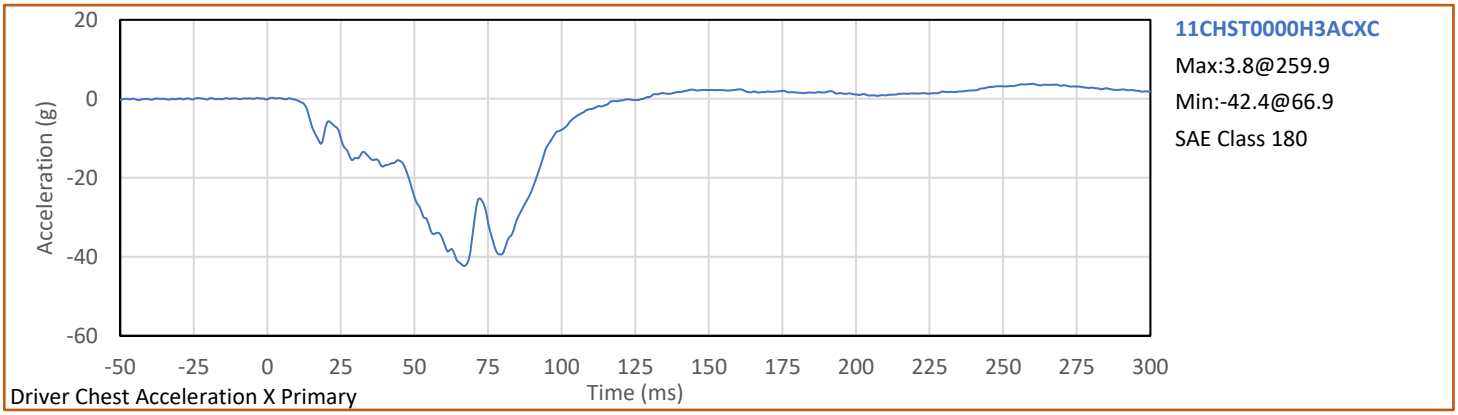
Driver Chest Deflection


Force (N)
Time (ms)
Driver Upper Neck Force X
11NECKUP00H3FOXA
Max:683.9@62.2
Min:-259.0@256.0
SAE Class 1000

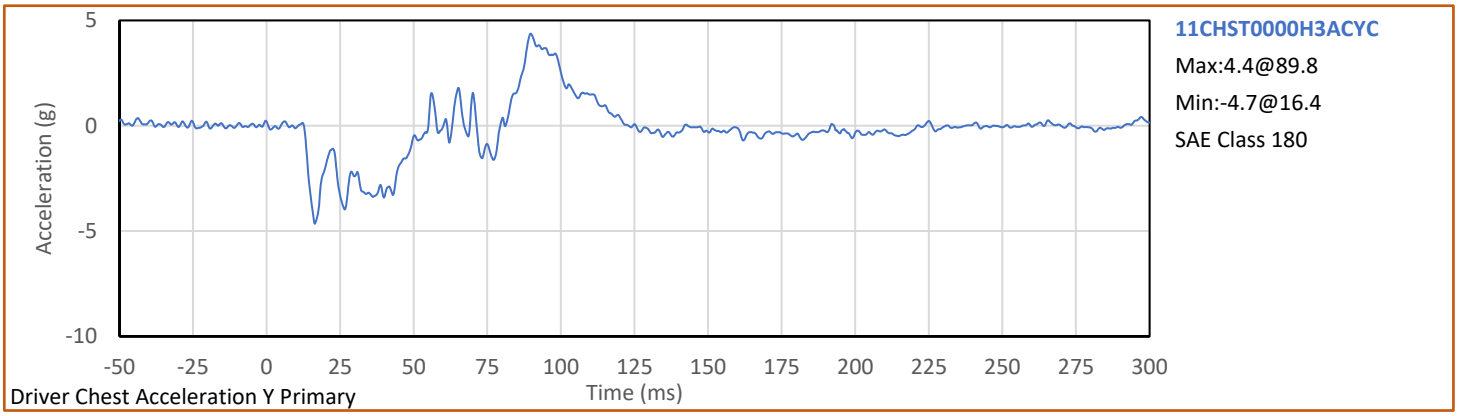

Force (N)
Time (ms)
Driver Upper Neck Force Z
11NECKUP00H3FOZA
Max:1838.6@64.5
Min:-125.5@92.7
SAE Class 1000


Moment (Nm)
Time (ms)
Driver Upper Neck Moment Y
11NECKUP00H3MOYB
Max:25.4@62.2
Min:-15.2@98.8
SAE Class 600

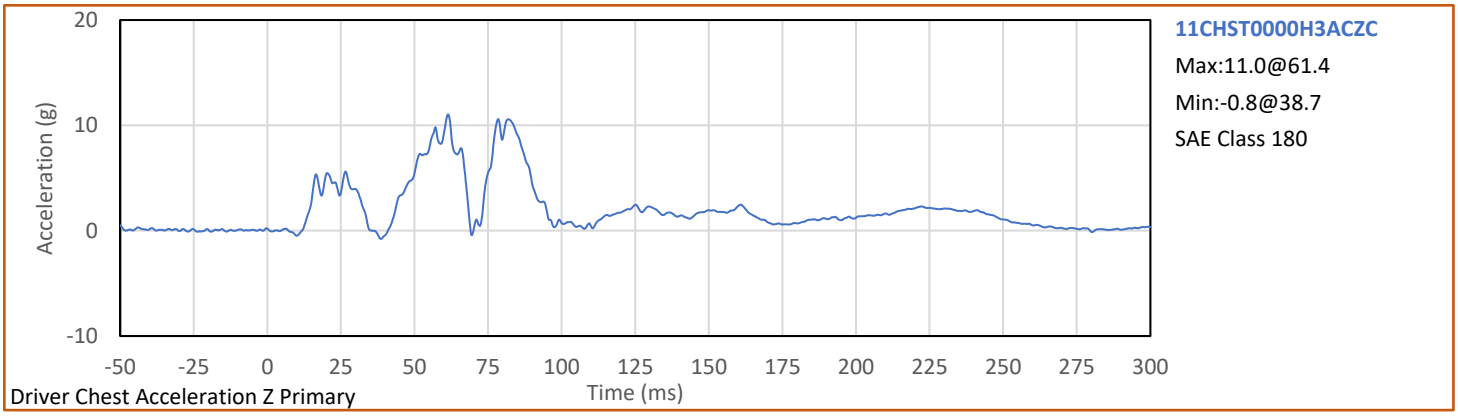

NIJ
Time (ms)
Driver NIJ
11NIJCIPTFH3000B
Max:0.316@64.5
SAE Class 600
11NIJCIPTEH3000B
Max:0.210@76.9
SAE Class 600
11NIJCIPCFH3000B
Max:0.094@154.5
SAE Class 600
11NIJCIPCEH3000B
Max:0.152@92.8
SAE Class 600



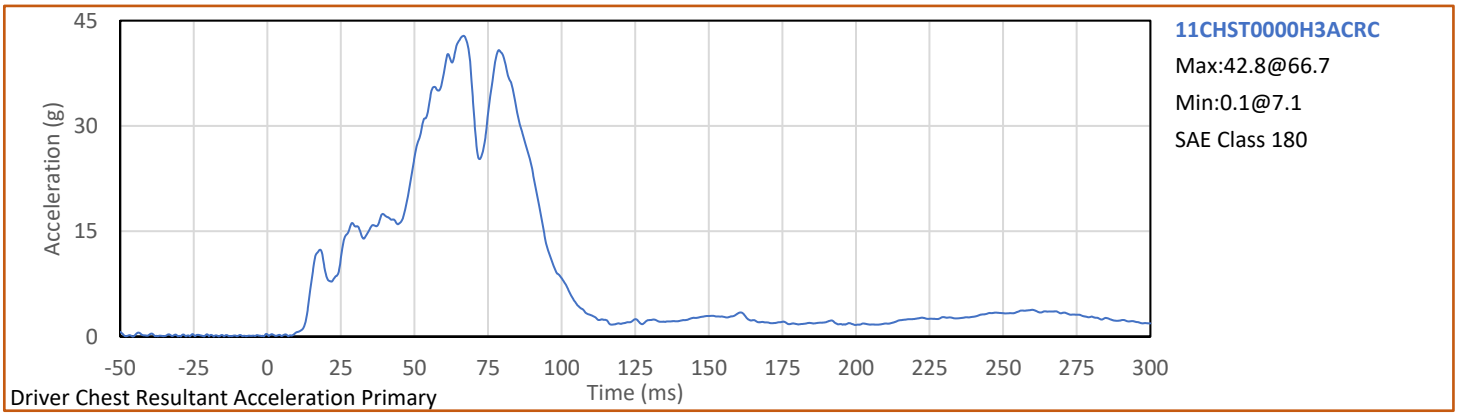
Driver Chest Acceleration X Primary



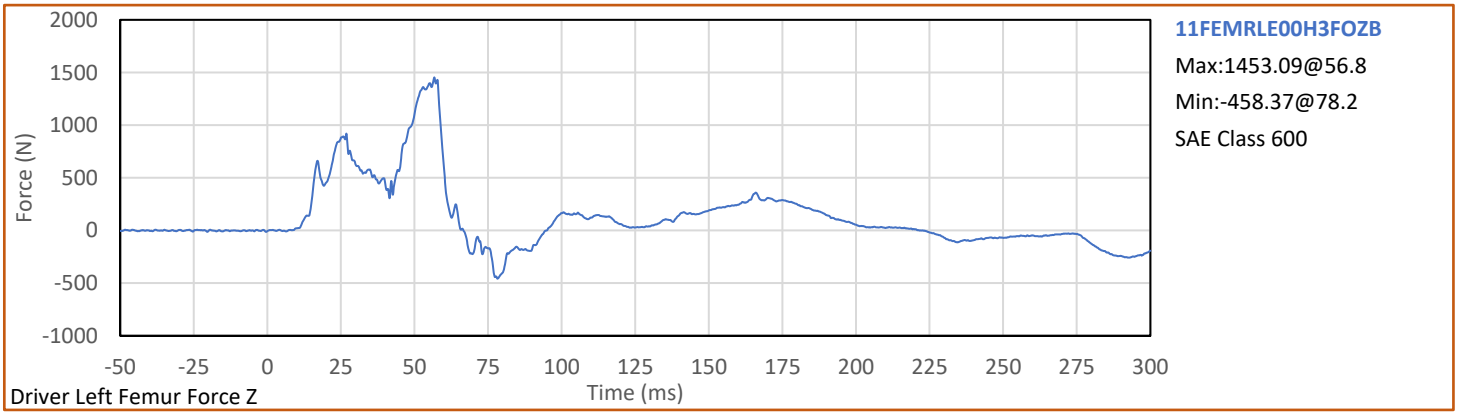
Driver Chest Acceleration Y Primary



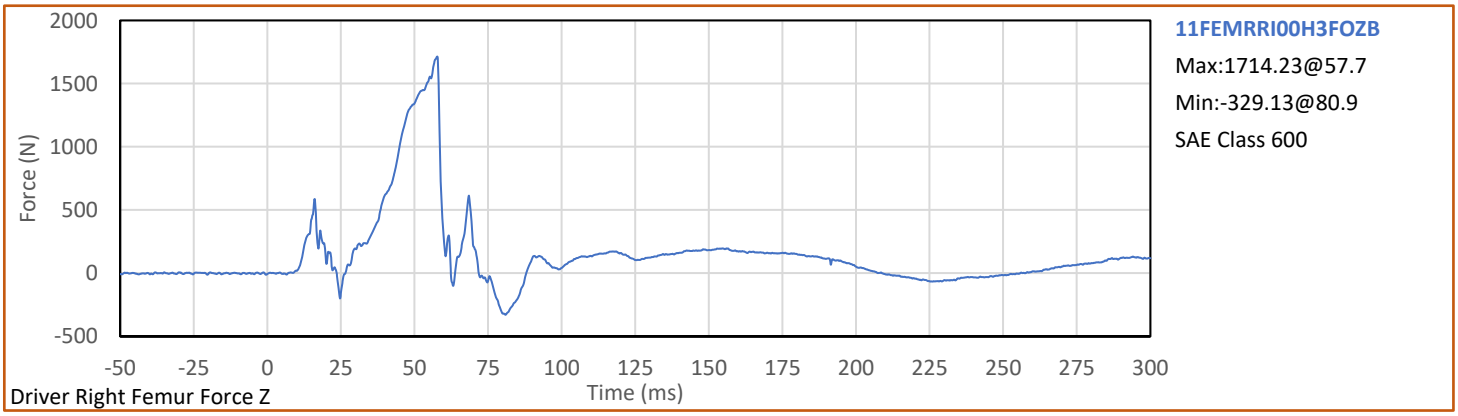
Driver Chest Acceleration Z Primary



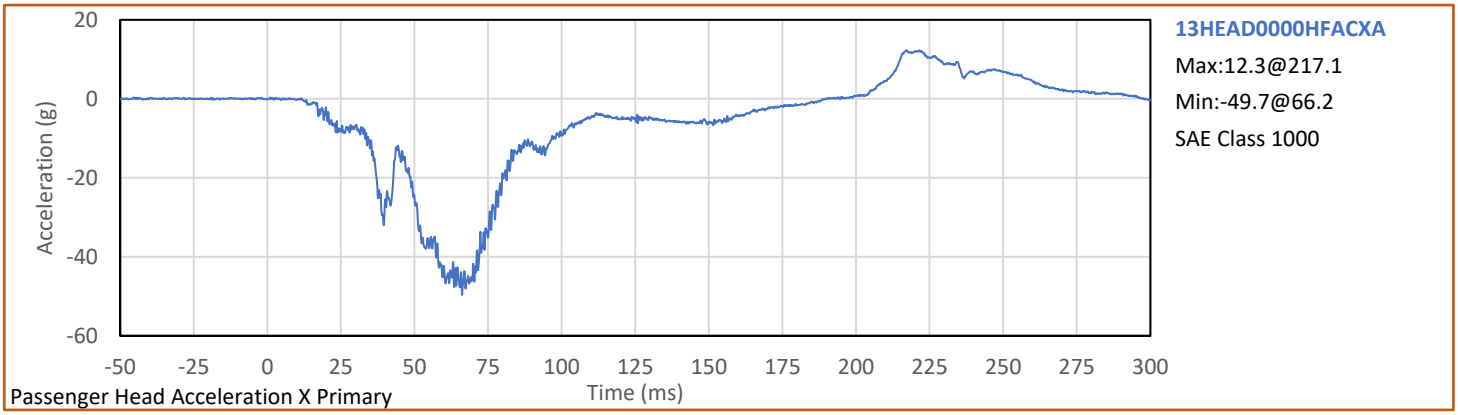
Driver Chest Resultant Acceleration Primary



Driver Left Femur Force Z

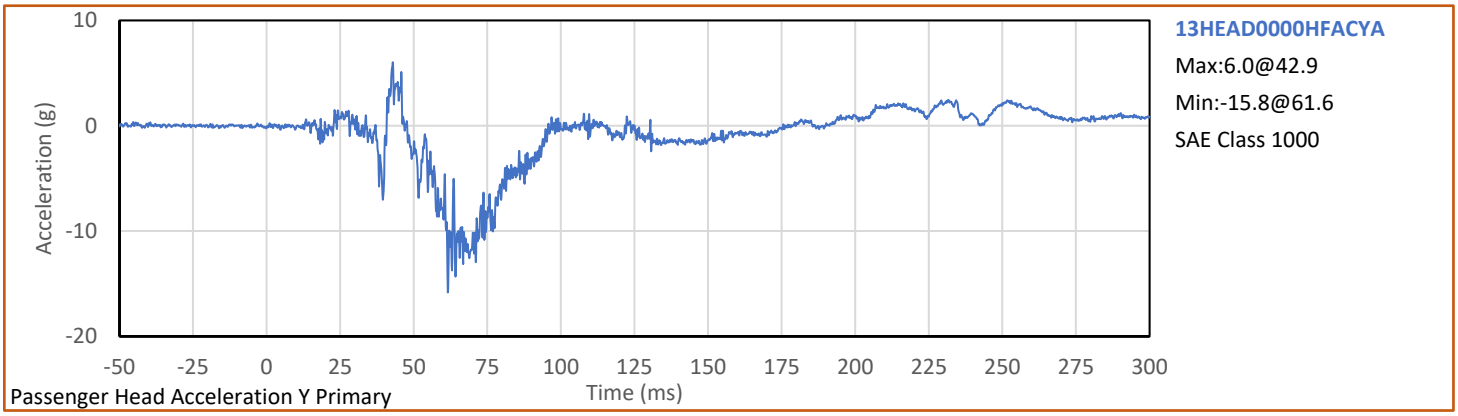


Driver Right Femur Force Z



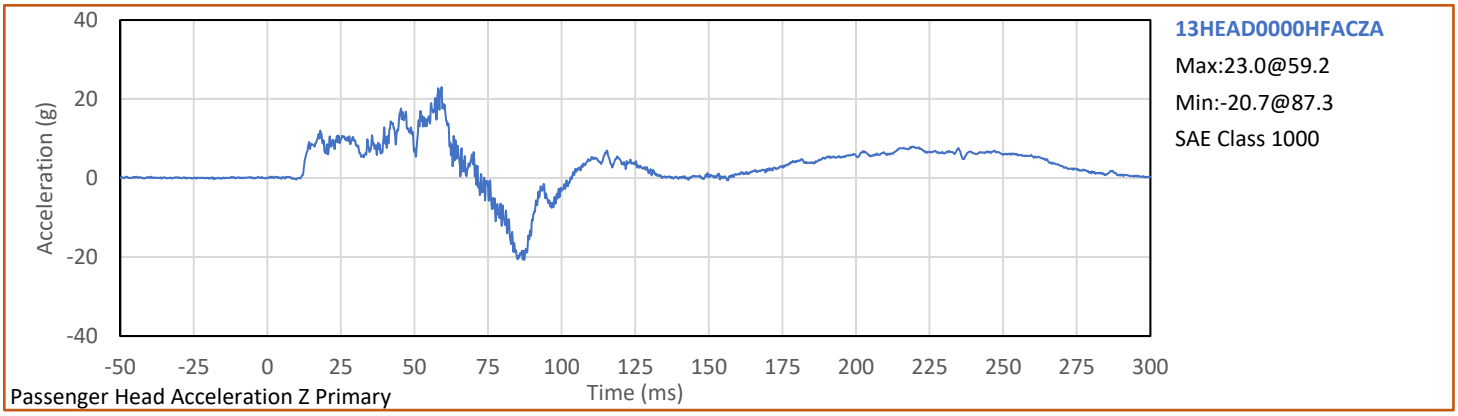
Passenger Head Acceleration X Primary

13HEAD0000HFACXA
Max:12.3@217.1
Min:-49.7@66.2
SAE Class 1000



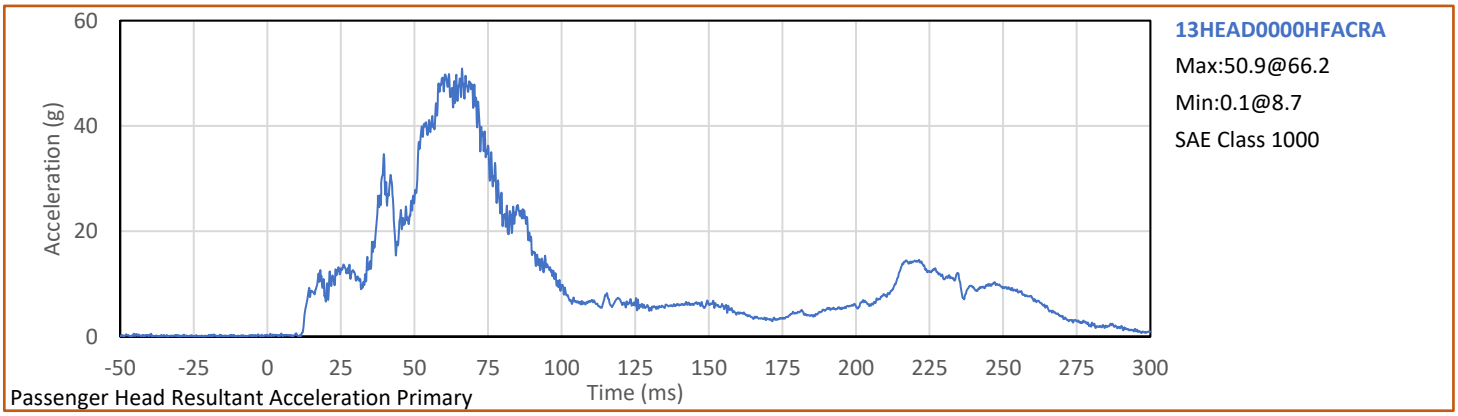
Passenger Head Acceleration Y Primary

13HEAD0000HFACYA
Max:6.0@42.9
Min:-15.8@61.6
SAE Class 1000



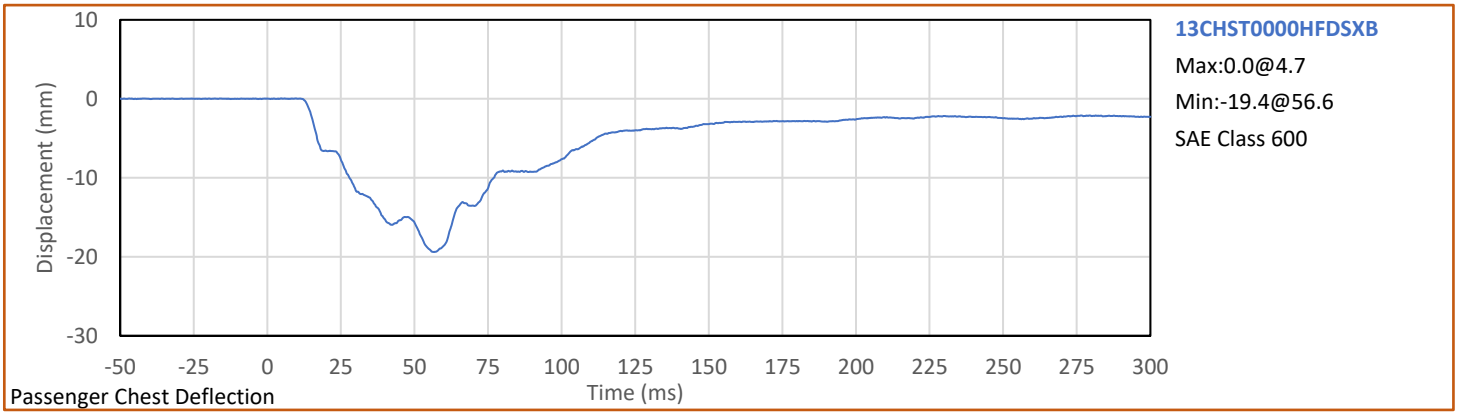
Passenger Head Acceleration Z Primary

13HEAD0000HFACZA
Max:23.0@59.2
Min:-20.7@87.3
SAE Class 1000

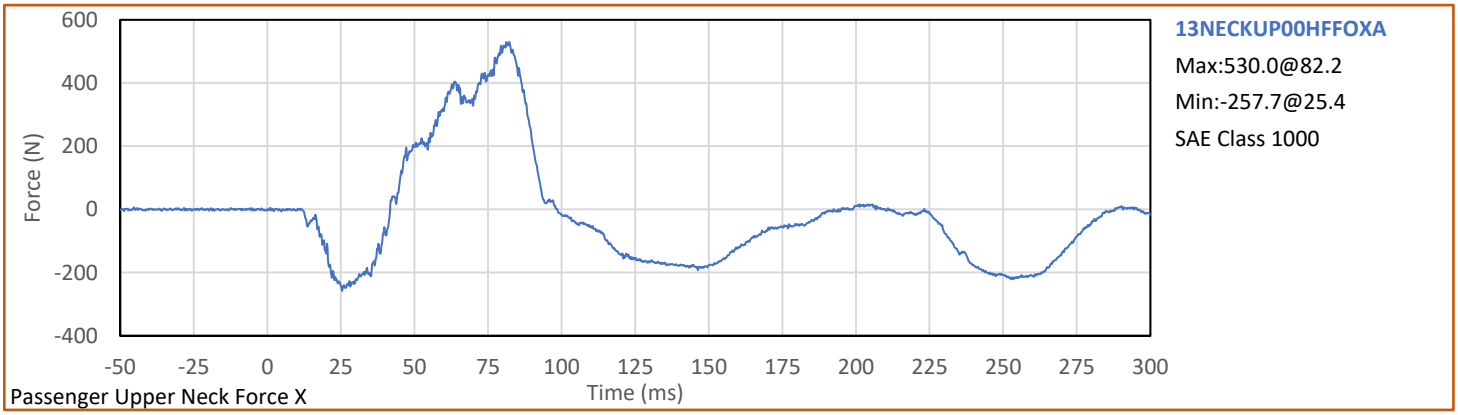


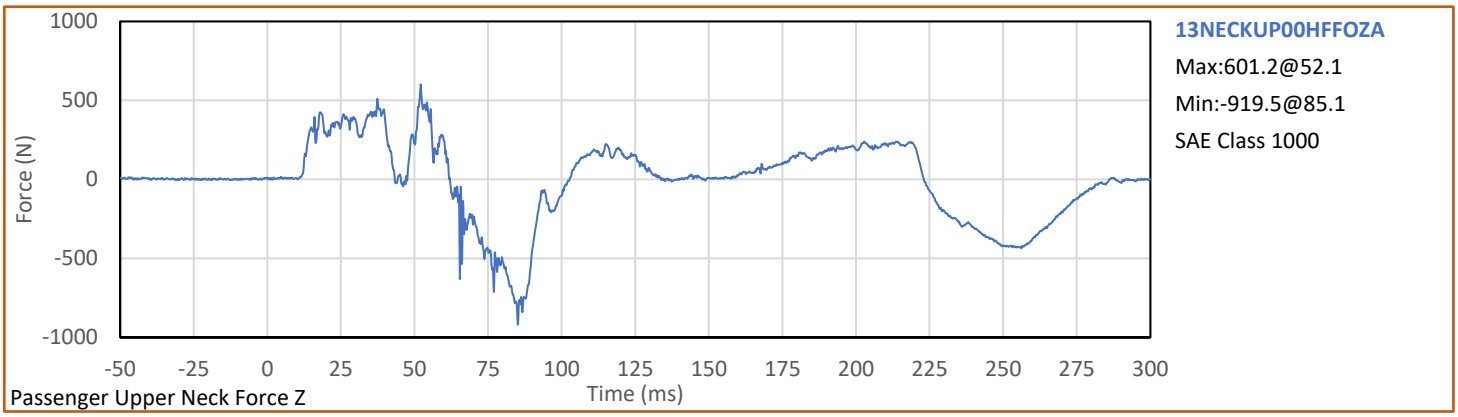
Passenger Head Resultant Acceleration Primary

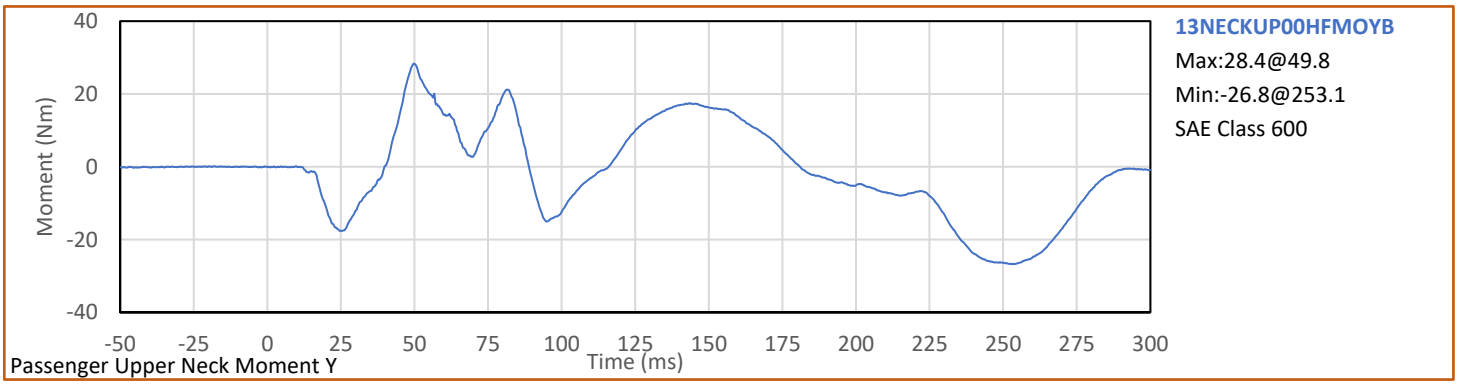
13HEAD0000HFACRA
Max:50.9@66.2
Min:0.1@8.7
SAE Class 1000

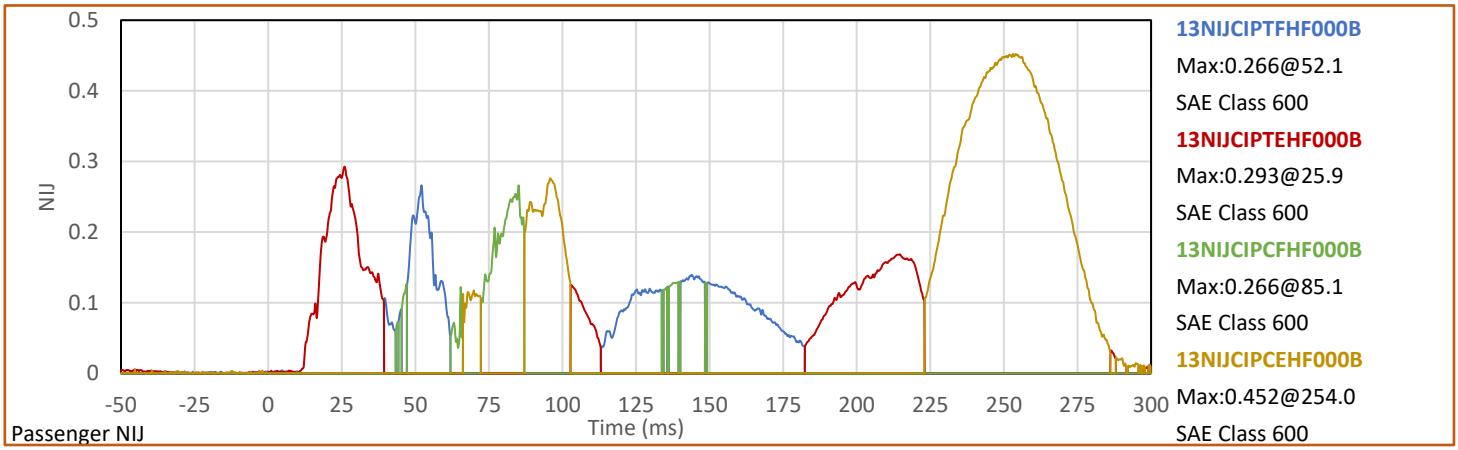


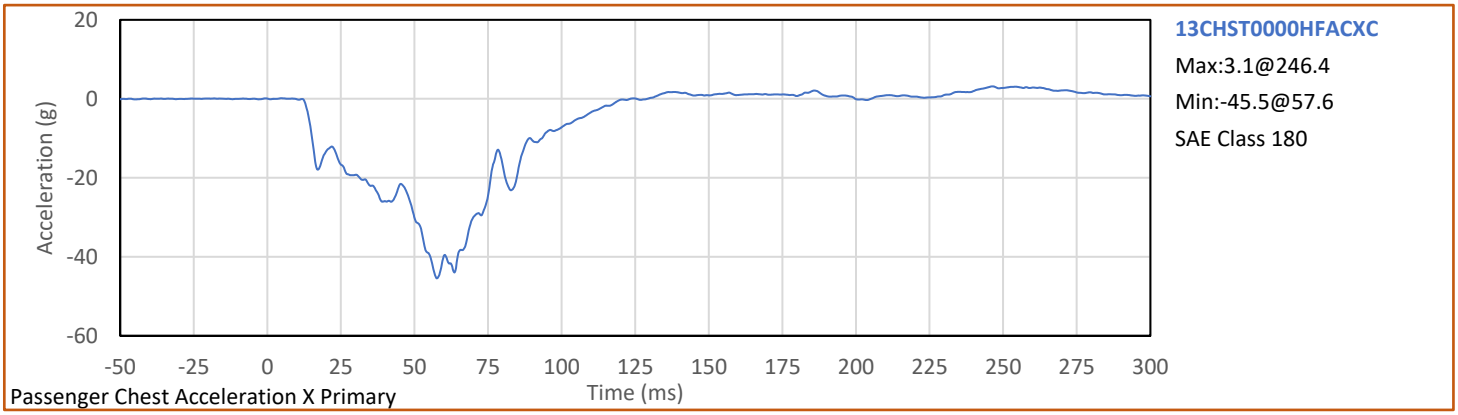
Passenger Chest Deflection

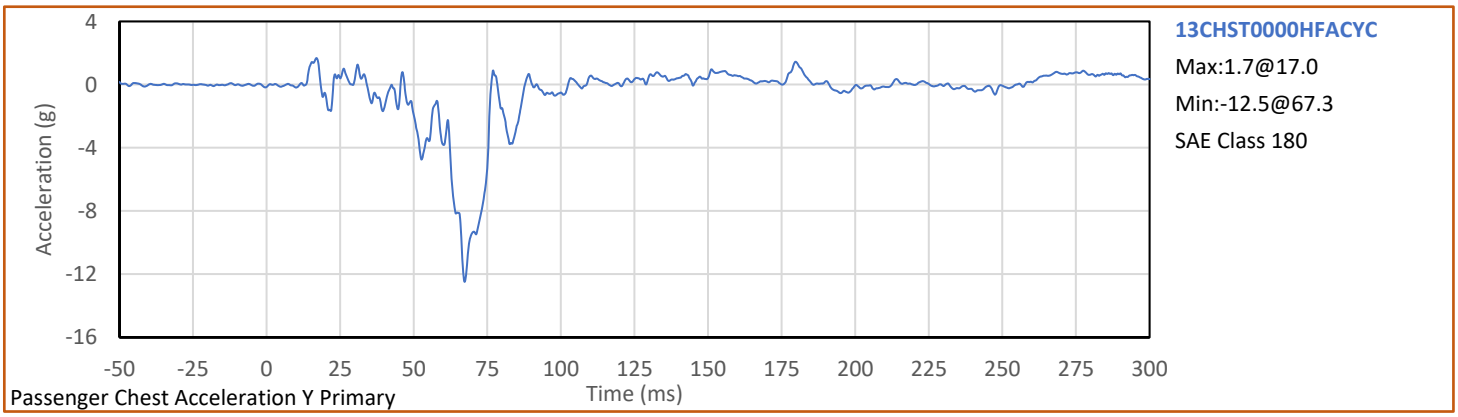

Force (N)
Time (ms)
Passenger Upper Neck Force X
13NECKUP00HFFOXA
Max:530.0@82.2
Min:-257.7@25.4
SAE Class 1000

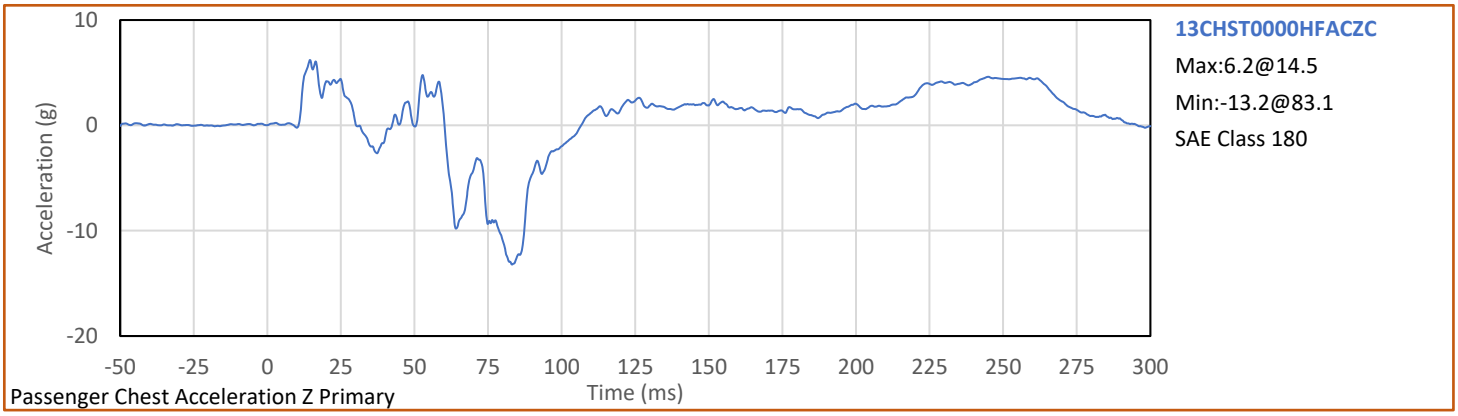

Force (N)
Time (ms)
Passenger Upper Neck Force Z
13NECKUP00HFFOZA
Max:601.2@52.1
Min:-919.5@85.1
SAE Class 1000

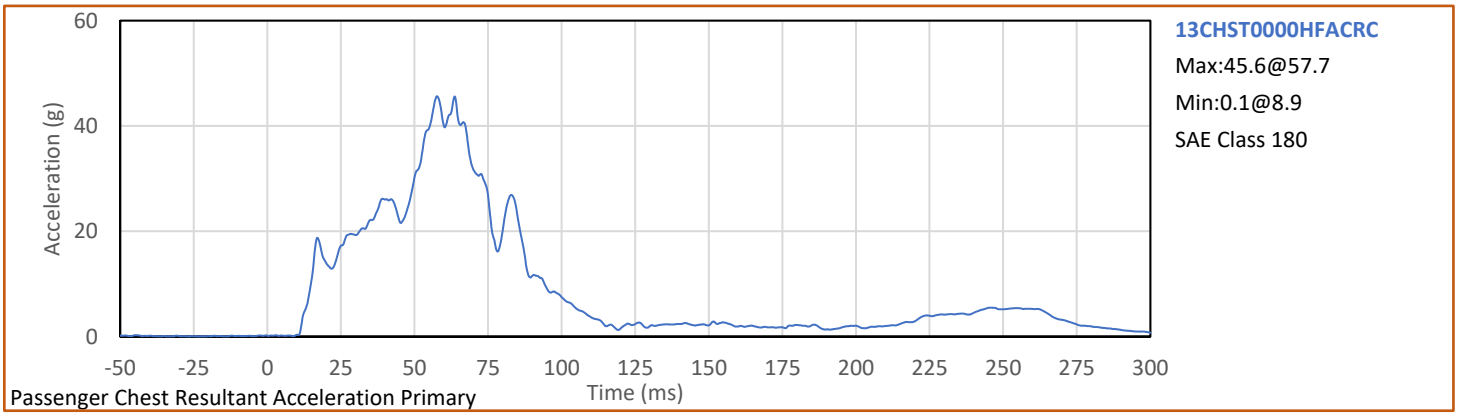

Moment (Nm)
Time (ms)
Passenger Upper Neck Moment Y
13NECKUP00HFMOYB
Max:28.4@49.8
Min:-26.8@253.1
SAE Class 600

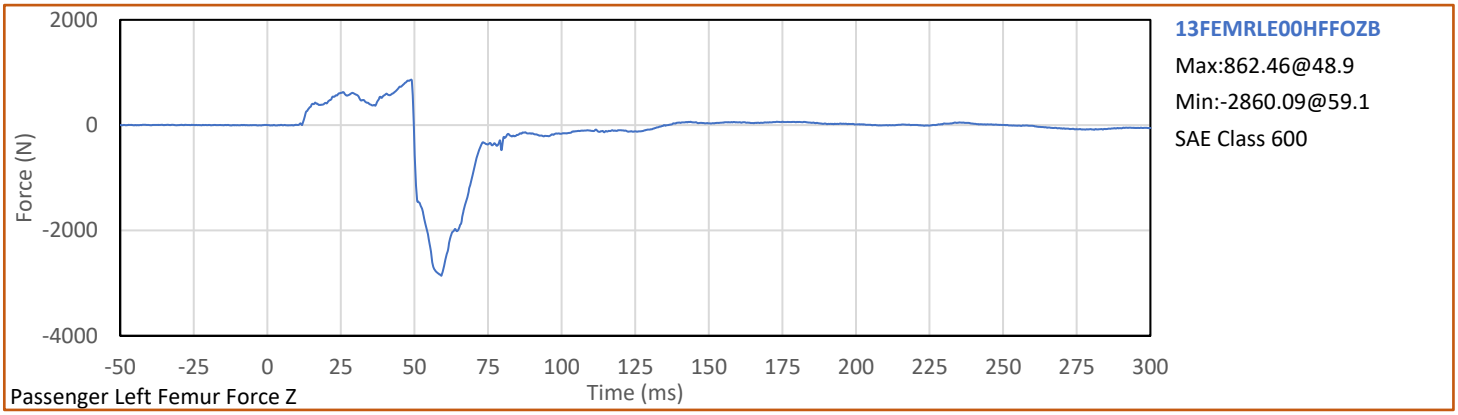

NIJ
Time (ms)
Passenger NIJ
13NIJCIPTFHF000B
Max:0.266@52.1
SAE Class 600
13NIJCIPTEHF000B
Max:0.293@25.9
SAE Class 600
13NIJCIPCFHF000B
Max:0.266@85.1
SAE Class 600
13NIJCIPCEHF000B
Max:0.452@254.0
SAE Class 600


20
0
-20
-40
-60
Acceleration (g)
-50 -25 0 25 50 75 100 125 150 175 200 225 250 275 300
Time (ms)
13CHST0000HFACXC
Max:3.1@246.4
Min:-45.5@57.6
SAE Class 180
Passenger Chest Acceleration X Primary

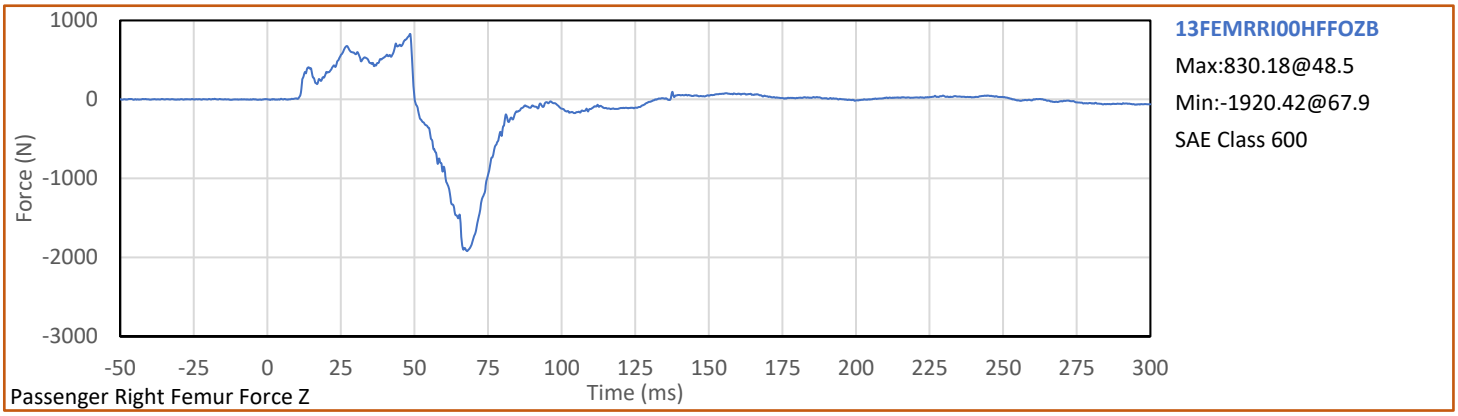

4
0
-4
-8
-12
-16
Acceleration (g)
-50 -25 0 25 50 75 100 125 150 175 200 225 250 275 300
Time (ms)
13CHST0000HFACYC
Max:1.7@17.0
Min:-12.5@67.3
SAE Class 180
Passenger Chest Acceleration Y Primary


10
0
-10
-20
Acceleration (g)
-50 -25 0 25 50 75 100 125 150 175 200 225 250 275 300
Time (ms)
13CHST0000HFACZC
Max:6.2@14.5
Min:-13.2@83.1
SAE Class 180
Passenger Chest Acceleration Z Primary


60
40
20
0
Acceleration (g)
-50 -25 0 25 50 75 100 125 150 175 200 225 250 275 300
Time (ms)
13CHST0000HFACRC
Max:45.6@57.7
Min:0.1@8.9
SAE Class 180
Passenger Chest Resultant Acceleration Primary



Passenger Left Femur Force Z



Passenger Right Femur Force Z

APPENDIX C
DUMMY QUALIFICATION AND PERFORMANCE VERIFICATION DATA

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

Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
ATD Damage Checklist

ATD Serial No.: 360 Test Date: 2022-04-06

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.	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:

No Problems Found

Technician: G. Holguin

Approved By: J. Hernandez

Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
External Measurements

ATD Serial No.: 360 Test Date: 2022-04-06

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	26	Pass
A - Total sitting height	mm	879	889	883	Pass
B - Shoulder pivot height	mm	505	521	512	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	144	Pass
G - Back of elbow to wrist pivot	mm	290	305	297	Pass
H - Head back to backline	mm	41	46	44	Pass
I - Shoulder to elbow length	mm	330	345	333	Pass
J - Elbow rest height	mm	190	211	198	Pass
K - Buttock to knee length	mm	579	604	599	Pass
L - Popliteal length	mm	429	455	435	Pass
M - Knee pivot height	mm	485	500	491	Pass
N - Buttock popliteal length	mm	452	477	462	Pass
O - Chest depth without jacket	mm	213	229	218	Pass
P - Foot length	mm	251	267	257	Pass
V - Shoulder breadth	mm	422	437	428	Pass
W - Foot breadth	mm	91	107	100	Pass
Y - Chest circum. (w/chest jacket)	mm	970	1001	988	Pass
Z - Waist circum.	mm	836	866	847	Pass
AA - Location for chest circum.	mm	429	434	431	Pass
BB - Location for waist circum.	mm	226	231	228	Pass
			Overall Test Results		Pass

Technician: G. Holguin

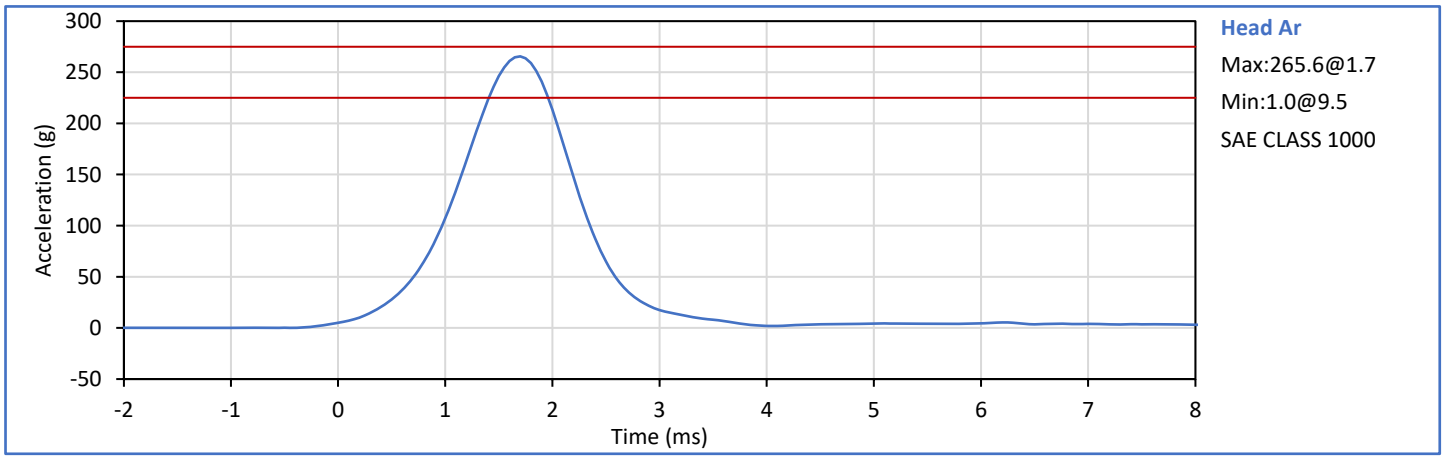
Approved By: J. Hernandez

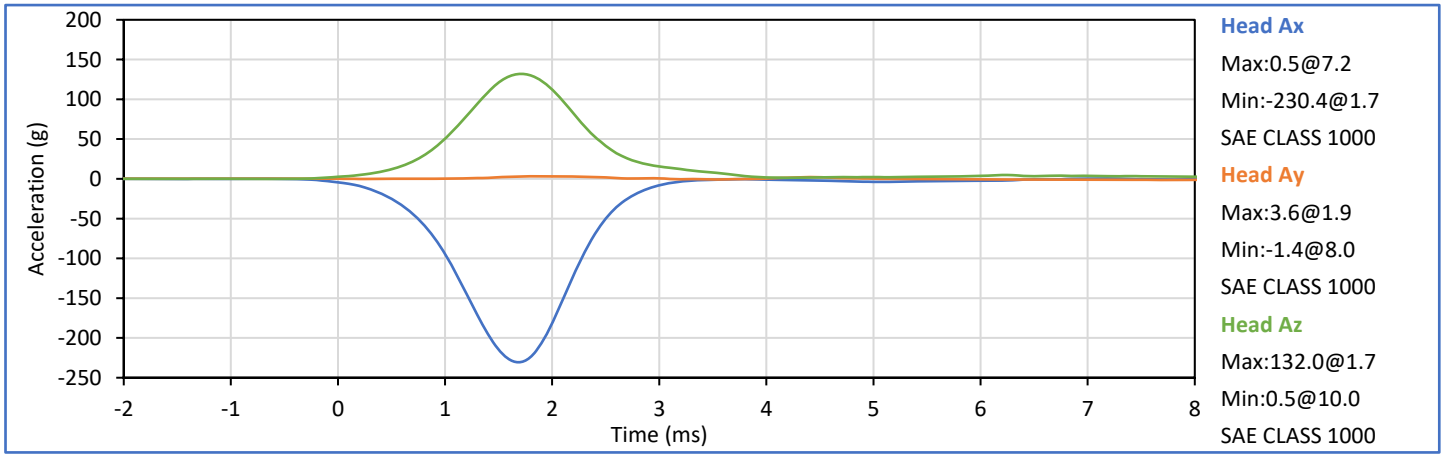
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Head Drop

ATD Serial No.: 360 Test Date: 2022-04-06

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Peak Resultant Acceleration	g	225.0	275.0	265.6	Pass
Peak Lateral Acceleration	g	-15.0	15.0	3.6	Pass
Oscillations After Main Pulse	%	0.0	10.0	0.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: G. Holguin

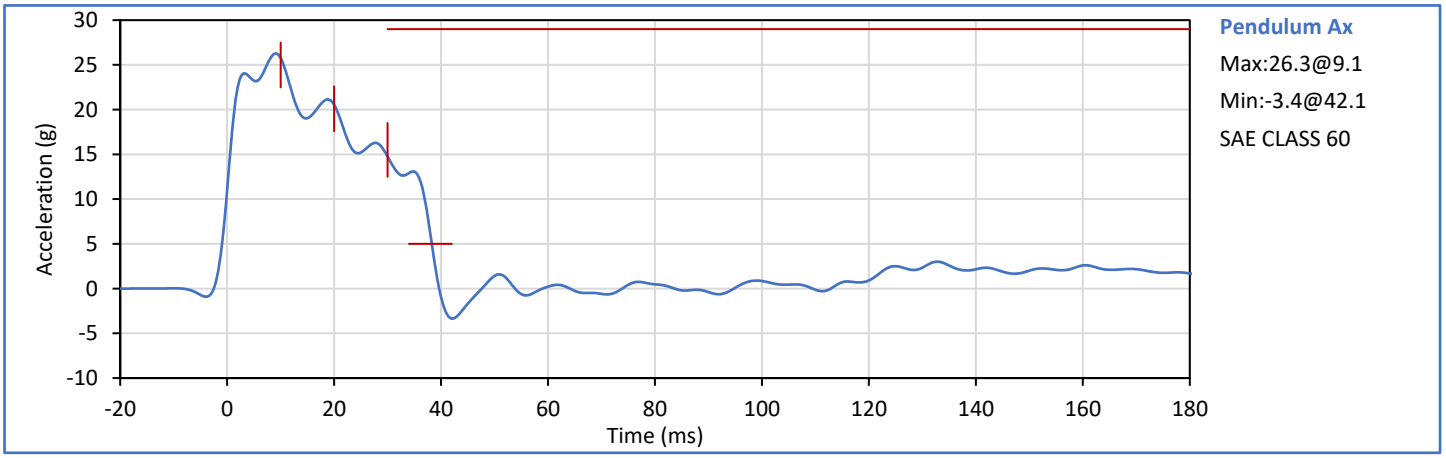
Approved By: J. Hernandez

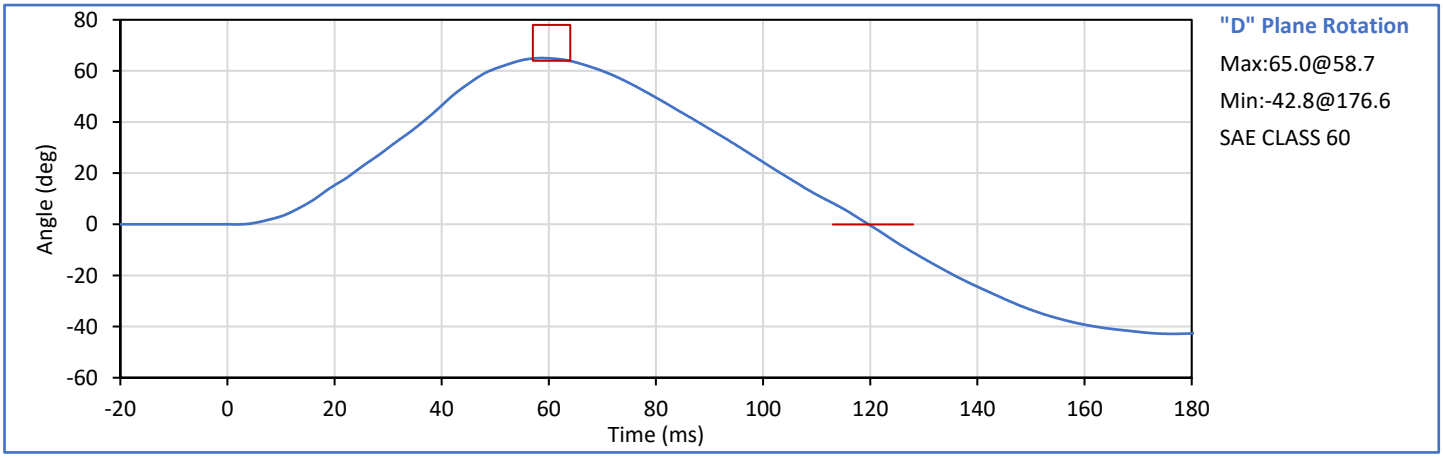
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 360 Test Date: 2022-04-07

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.1	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Pendulum Velocity	m/s	6.89	7.13	7.00	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	25.8	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	20.5	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	14.8	Pass
Peak Pendulum Decel After 30 ms	g	0.0	29.0	14.8	Pass
Deceleration Decay to Cross 5g	ms	34.0	42.0	38.3	Pass
"D" Plane Rotation peak	deg	64.0	78.0	65.0	Pass
	ms	57.0	64.0	58.7	Pass
"D" Plane Rotation Decay to Zero	ms	113.0	128.0	119.7	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	91.8	Pass
	ms	47.0	58.0	52.2	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	97.5	Pass
			Overall Test Results		Pass





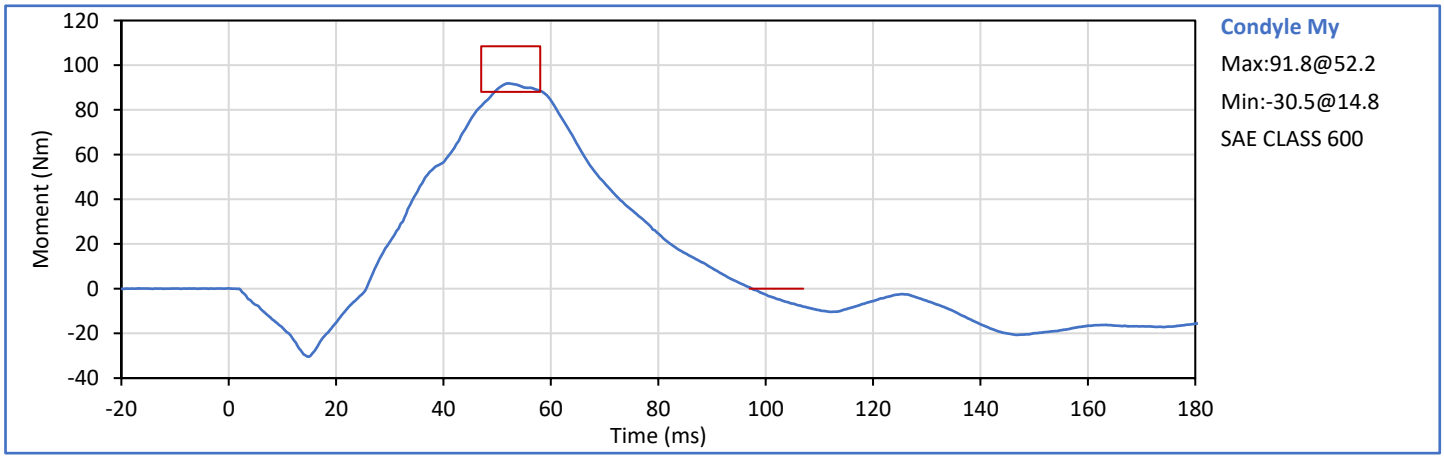
Technician: G. Holguin

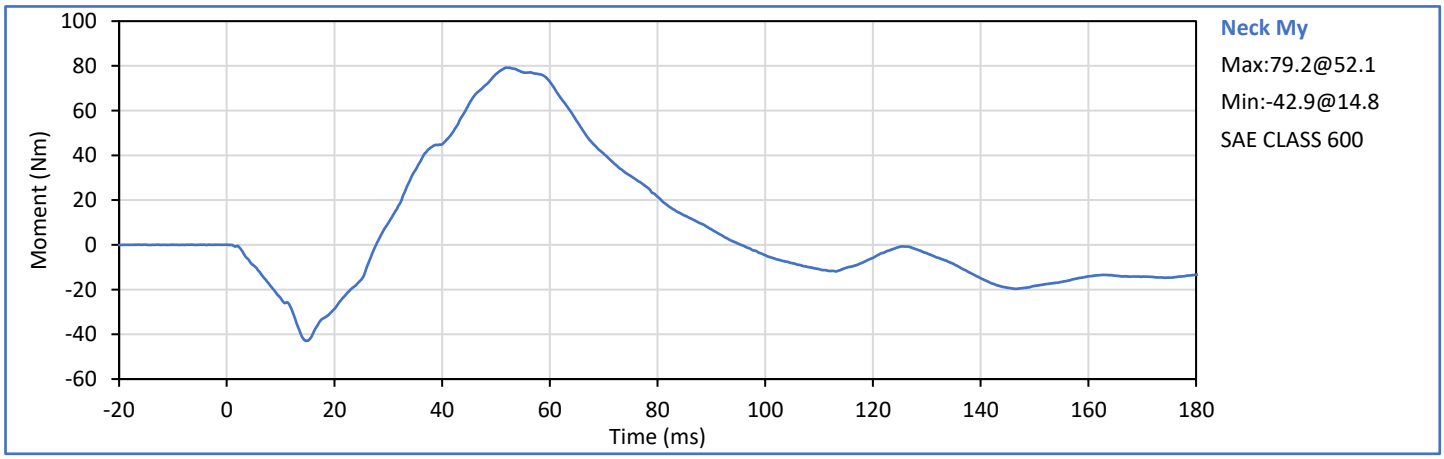
Approved By: J. Hernandez

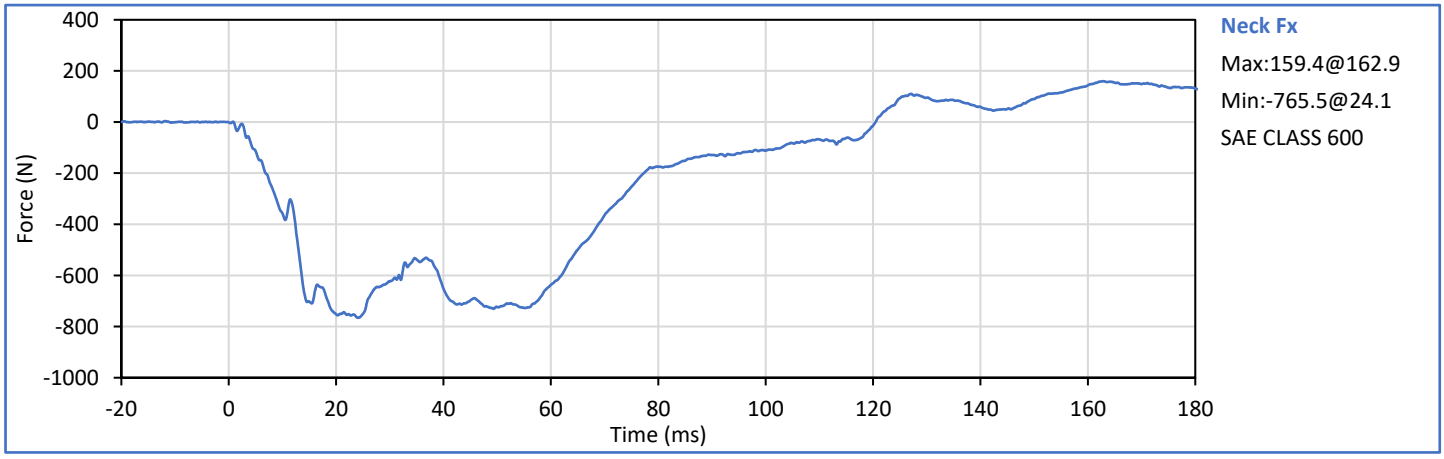
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 360 Test Date: 2022-04-07





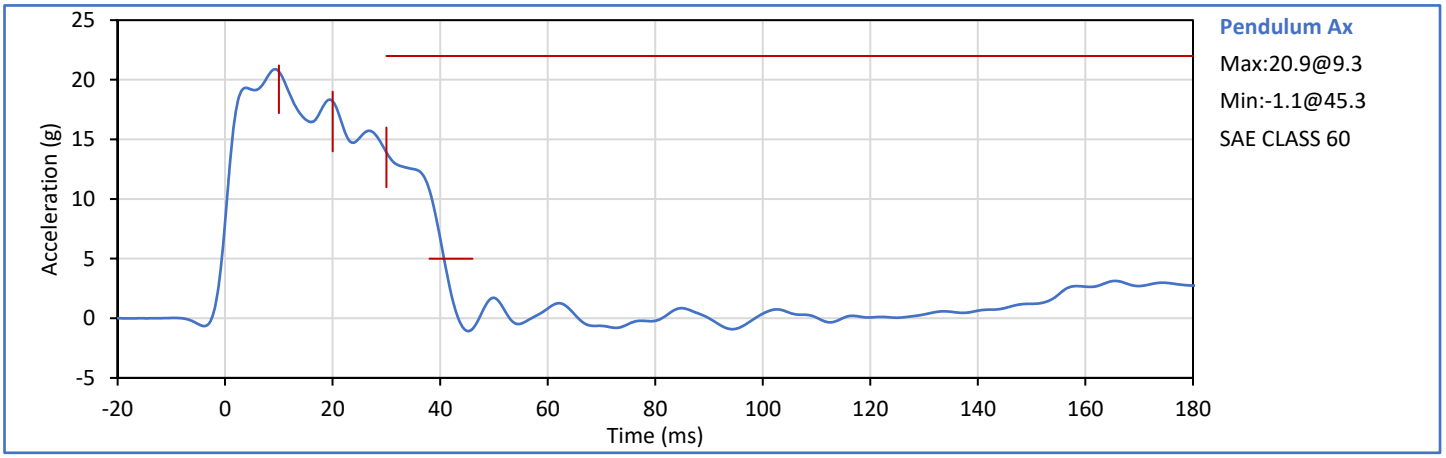


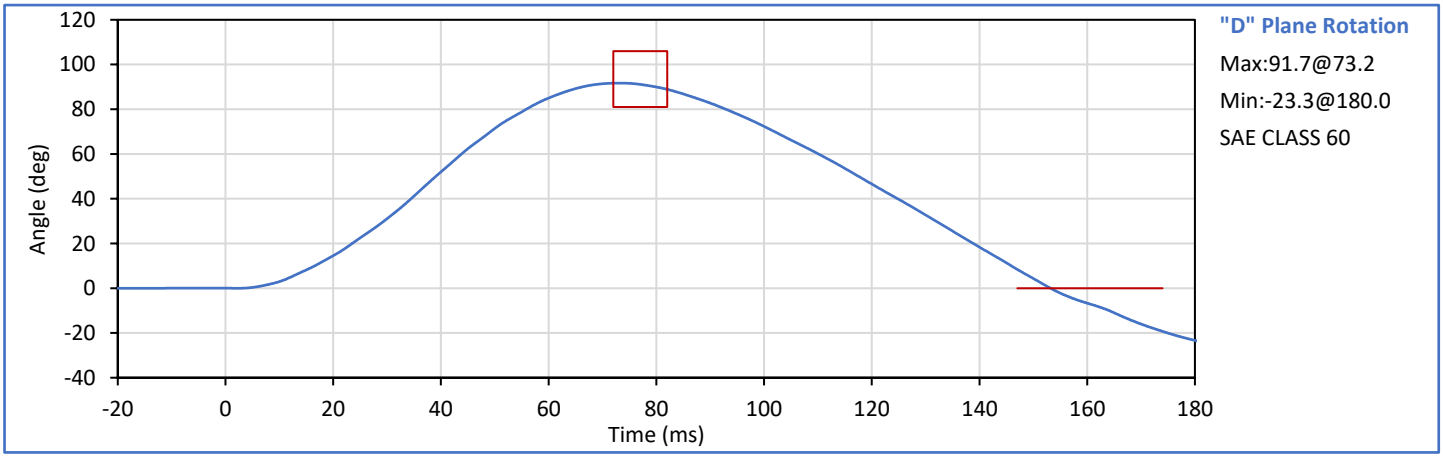
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 360 Test Date: 2022-04-07

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.1	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Pendulum Velocity	m/s	5.94	6.19	6.02	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	20.7	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.2	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.9	Pass
Peak Pendulum Decel After 30 ms	g	0.0	22.0	13.9	Pass
Deceleration Decay to Cross 5g	ms	38.0	46.0	40.7	Pass
"D" Plane Rotation peak	deg	81.0	106.0	91.7	Pass
	ms	72.0	82.0	73.2	Pass
"D" Plane Rotation Decay to Zero	ms	147.0	174.0	153.2	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-75.4	Pass
	ms	65.0	79.0	67.7	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	132.0	Pass
			Overall Test Results		Pass



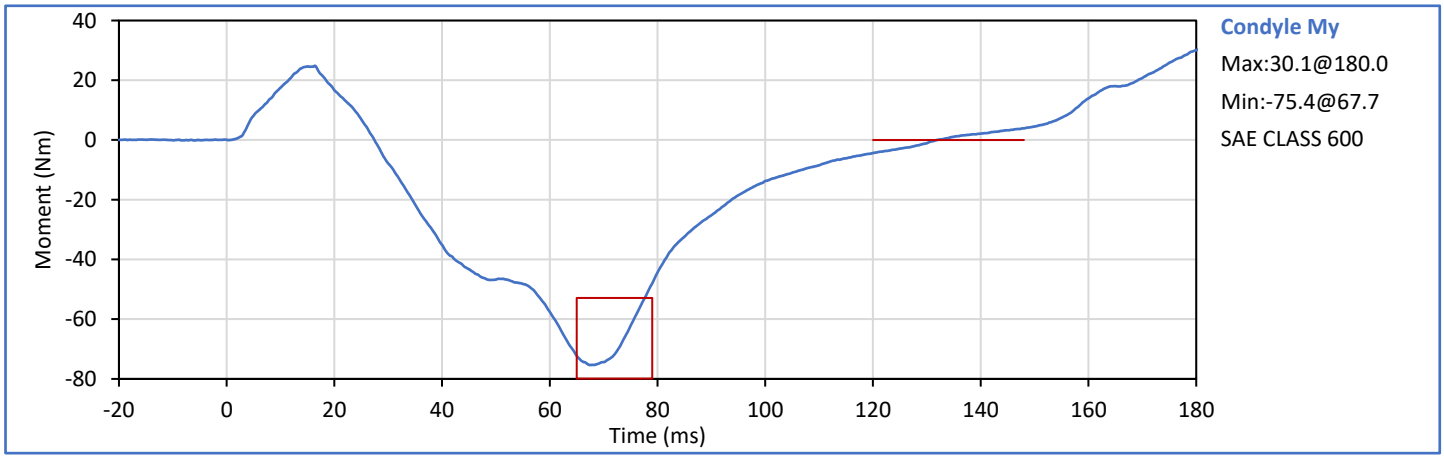


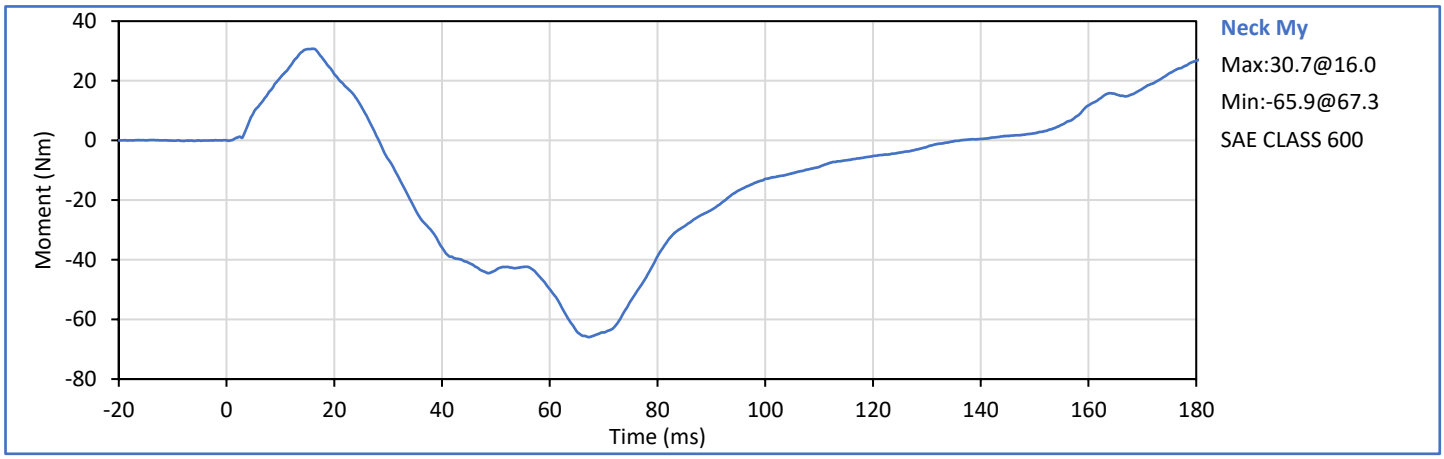
Technician: G. Holguin

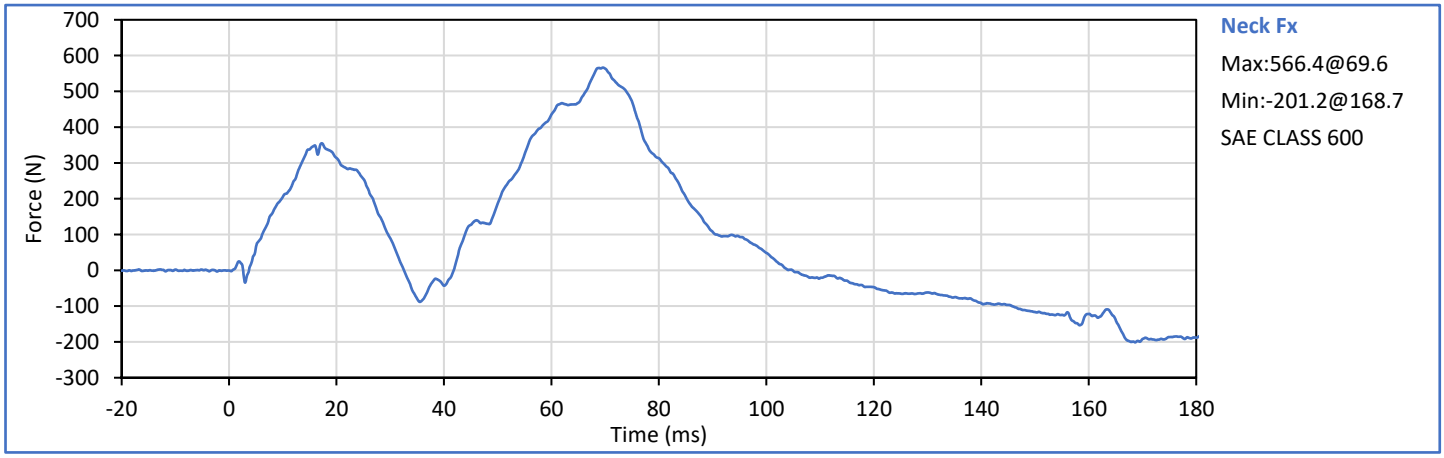
Approved By: J. Hernandez

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 360 Test Date: 2022-04-07





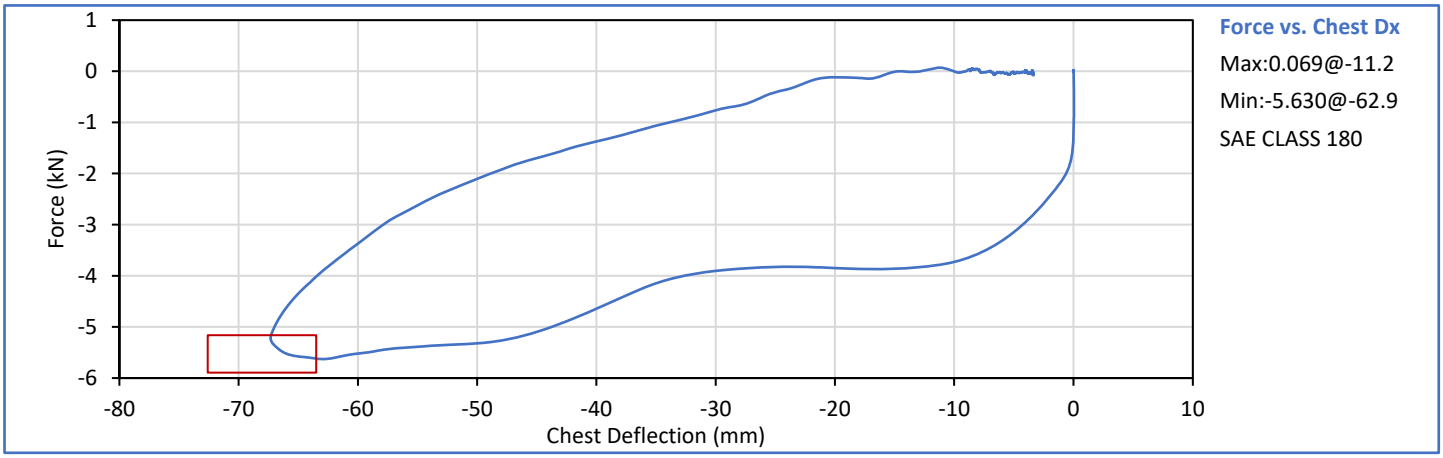


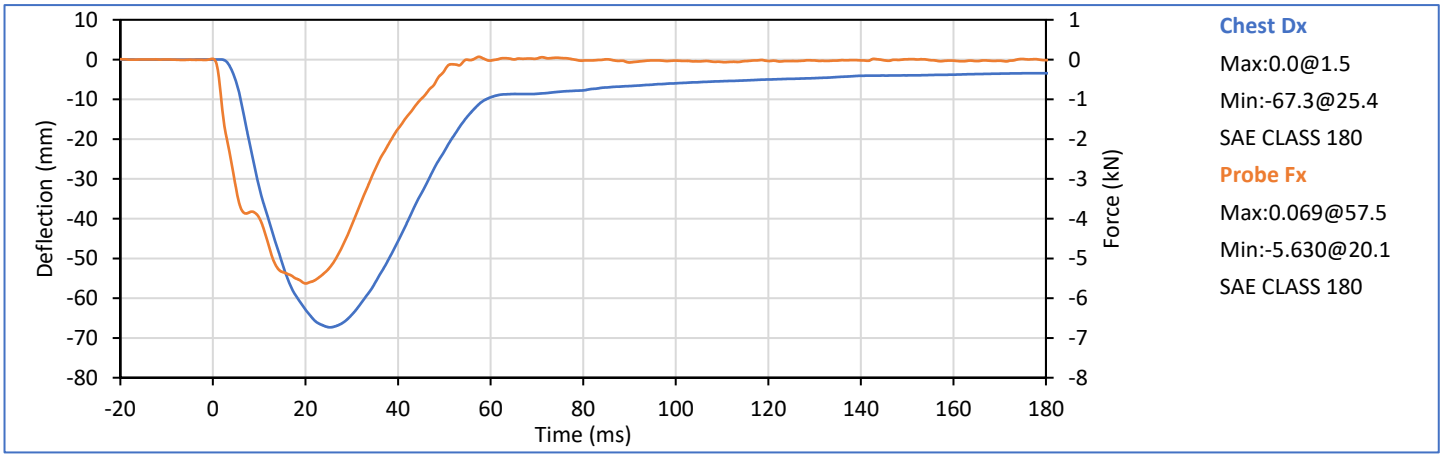
Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
Thorax Impact

ATD Serial No.: 360 Test Date: 2022-04-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Probe Velocity	m/s	6.58	6.82	6.71	Pass
Peak Chest Deflection	mm	-72.6	-63.5	-67.3	Pass
Peak Probe Force	kN	-5.893	-5.159	-5.630	Pass
Internal Hysterisis	%	69.0	85.0	69.6	Pass
			Overall Test Results		Pass





Technician: G. Holguin

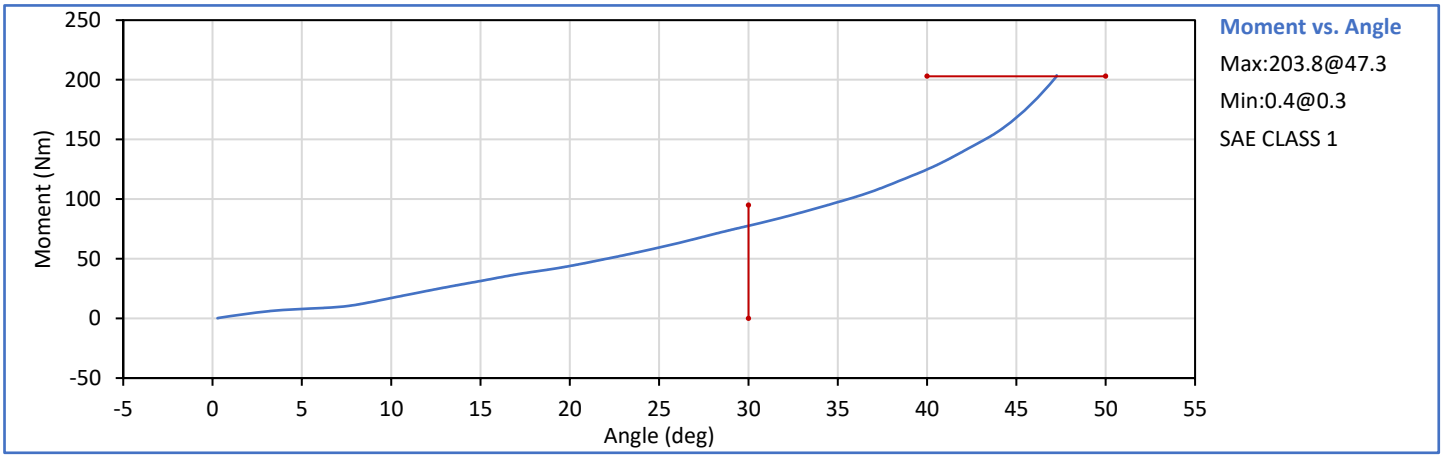
Approved By: J. Hernandez

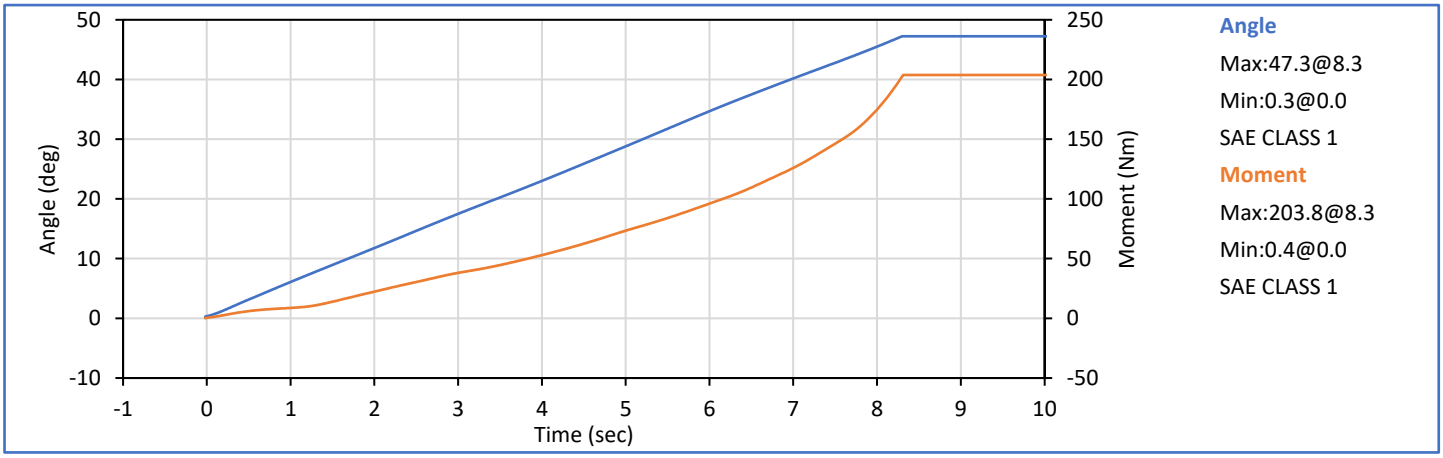
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Hip Range of Motion (Left)

ATD Serial No.: 360 Test Date: 2022-04-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	25	Pass
Left Hip Rotation Rate	deg/s	5.0	10.0	5.7	Pass
Left Femur Torque at 30°	Nm	0.0	95.0	77.6	Pass
Left Hip Rotation at 203 Nm	deg	40.0	50.0	47.3	Pass
			Overall Test Results		Pass





Technician: G. Holguin

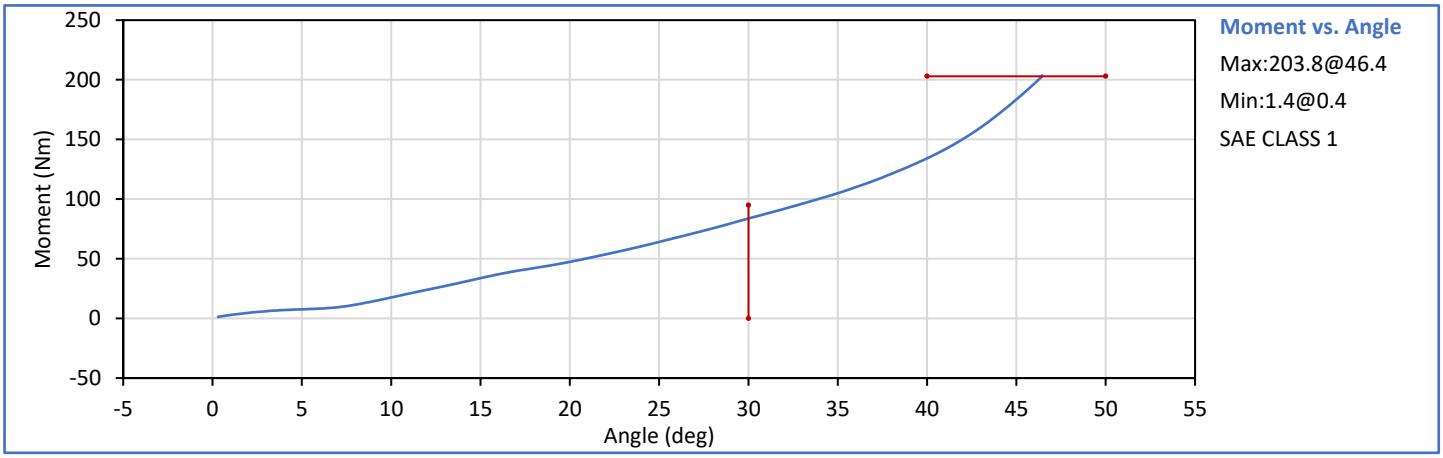
Approved By: J. Hernandez

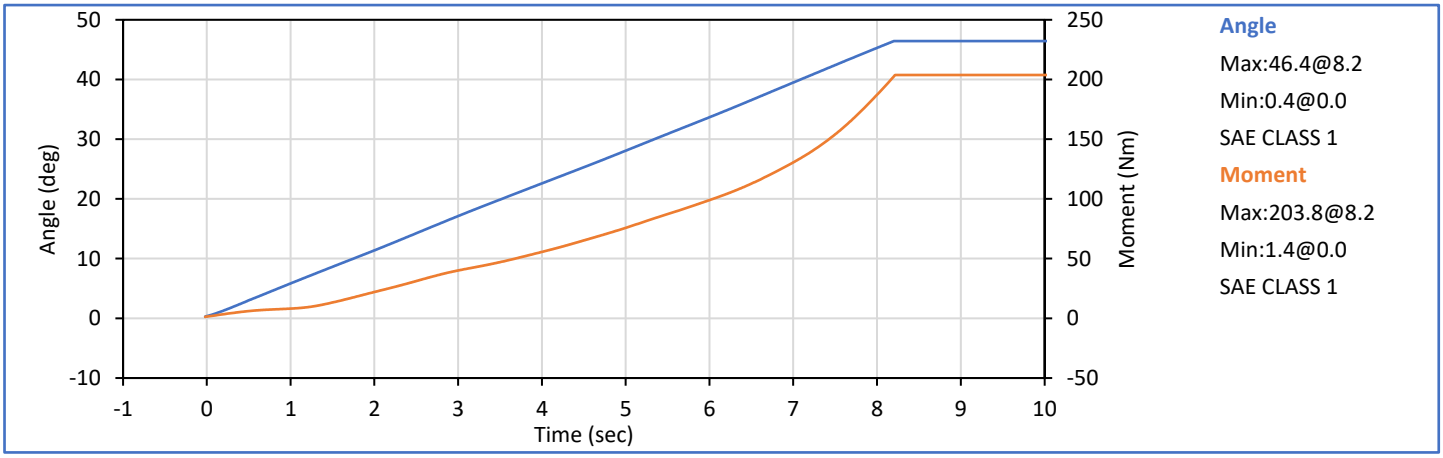
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Hip Range of Motion (Right)

ATD Serial No.: 360 Test Date: 2022-04-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	25	Pass
Right Hip Rotation Rate	deg/s	5.0	10.0	5.6	Pass
Right Femur Torque at 30°	Nm	0.0	95.0	83.6	Pass
Right Hip Rotation at 203 Nm	deg	40.0	50.0	46.4	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

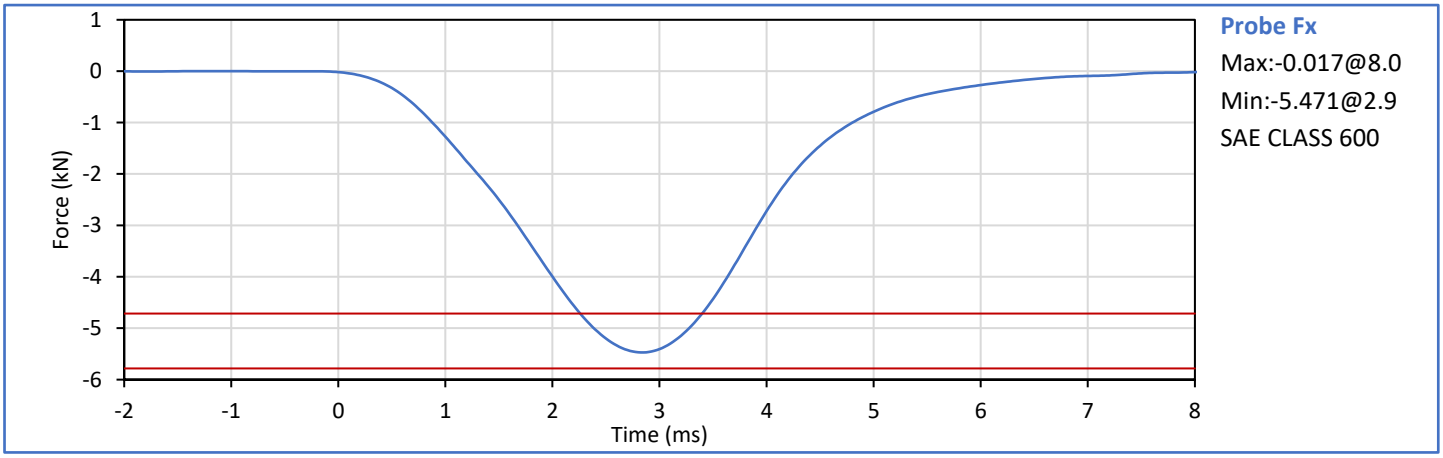
Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
Knee Impact (Left)

ATD Serial No.: 360

Test Date: 2022-04-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Probe Velocity	m/s	2.070	2.130	2.110	Pass
Peak Resistive Force	kN	-5.782	-4.715	-5.471	Pass
			Overall Test Results		Pass



Technician: G. Holguin

Approved By: J. Hernandez

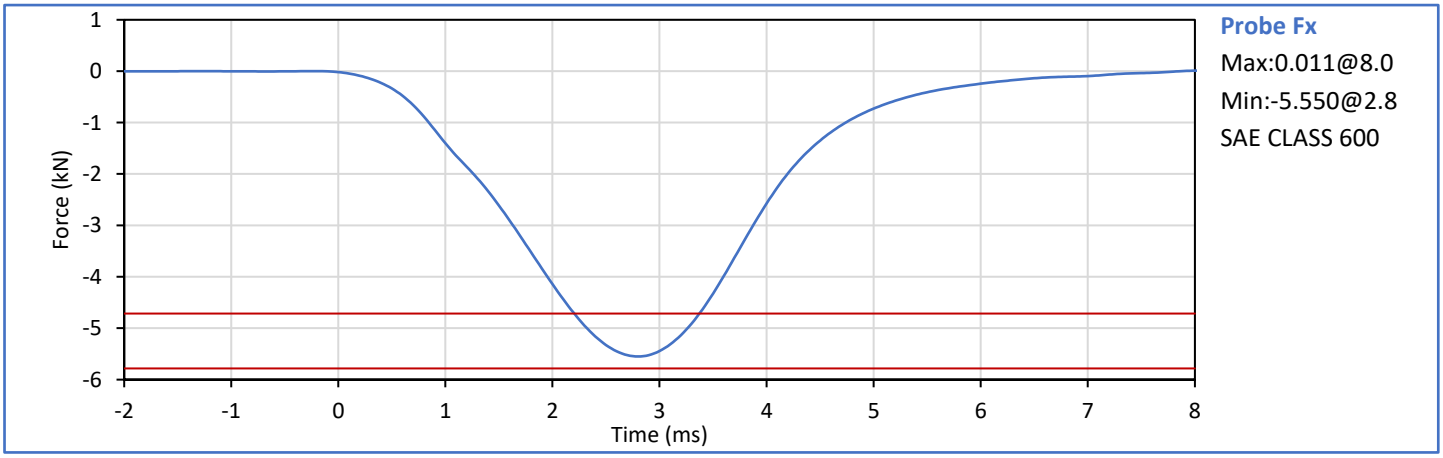
Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
Knee Impact (Right)

ATD Serial No.: 360

Test Date: 2022-04-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Probe Velocity	m/s	2.070	2.130	2.109	Pass
Peak Resistive Force	kN	-5.782	-4.715	-5.550	Pass
			Overall Test Results		Pass



Technician: G. Holguin

Approved By: J. Hernandez

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

Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Damage Checklist

ATD Serial No.: DH1644 Test Date: 2022-04-06

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:

No Problems Found

Technician: G. Holguin

Approved By: J. Hernandez

Applus IDIADA
KARCO

Hybrid III 5th Percentile Female ATD
External Measurements

ATD Serial No.: DH1644 Test Date: 2022-04-06

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	47	Pass
A - Total sitting height	mm	775	800	791	Pass
B - Shoulder pivot height	mm	432	457	446	Pass
C - 'H' point height	mm	81	86	84	Pass
D - 'H' point location from backline	mm	145	150	149	Pass
E - Shoulder pivot from backline	mm	69	84	74	Pass
F - Thigh clearance	mm	119	135	130	Pass
G - Back of elbow to wrist pivot	mm	244	259	255	Pass
H - Head back to backline	mm	41	46	43	Pass
I - Shoulder to elbow length	mm	277	297	282	Pass
J - Elbow rest height	mm	183	203	199	Pass
K - Buttock to knee length	mm	521	546	530	Pass
L - Popliteal length	mm	356	376	374	Pass
M - Knee pivot height	mm	394	419	401	Pass
N - Buttock popliteal length	mm	414	439	419	Pass
O - Chest depth without jacket	mm	175	191	185	Pass
P - Foot length	mm	219	234	226	Pass
R - Buttock to Knee Pivot Length	mm	457	483	472	Pass
S - Head Breadth	mm	137	147	142	Pass
T - Head Depth	mm	178	188	182	Pass
U - Hip Breadth	mm	300	315	303	Pass
V - Shoulder breadth	mm	351	366	360	Pass
W - Foot breadth	mm	79	94	87	Pass
X - Head circum.	mm	528	549	538	Pass
Y - Chest circum. (w/chest jacket)	mm	851	881	871	Pass
Z - Waist circum.	mm	760	790	765	Pass
AA - Location for chest circum.	mm	333	358	342	Pass
BB - Location for waist circum.	mm	160	170	168	Pass
			Overall Test Results		Pass

Technician:  Approved By: 

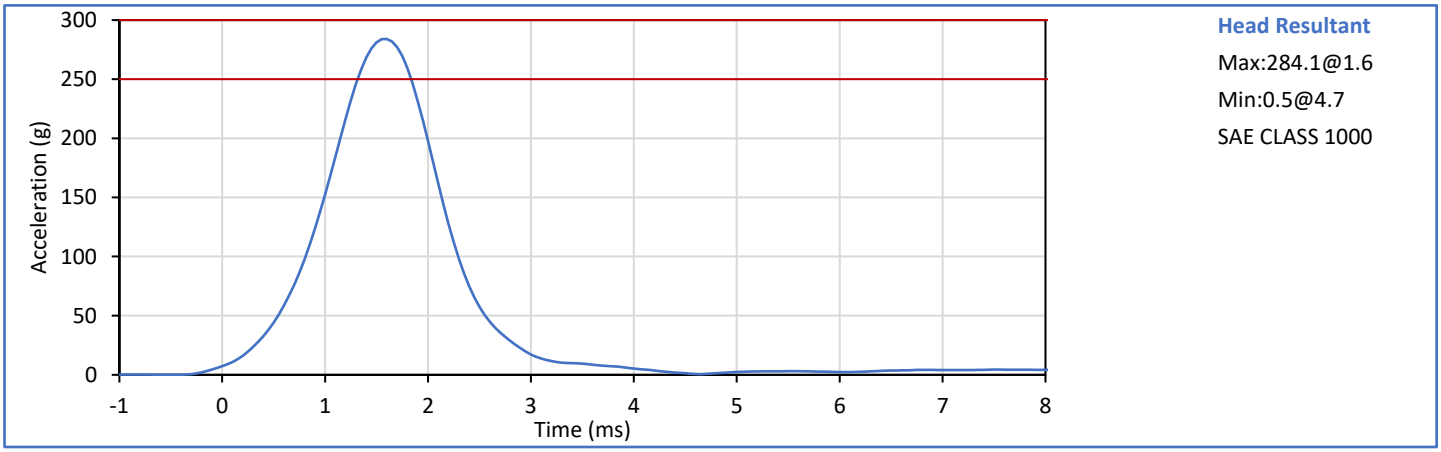
G. Holguin J. Hernandez

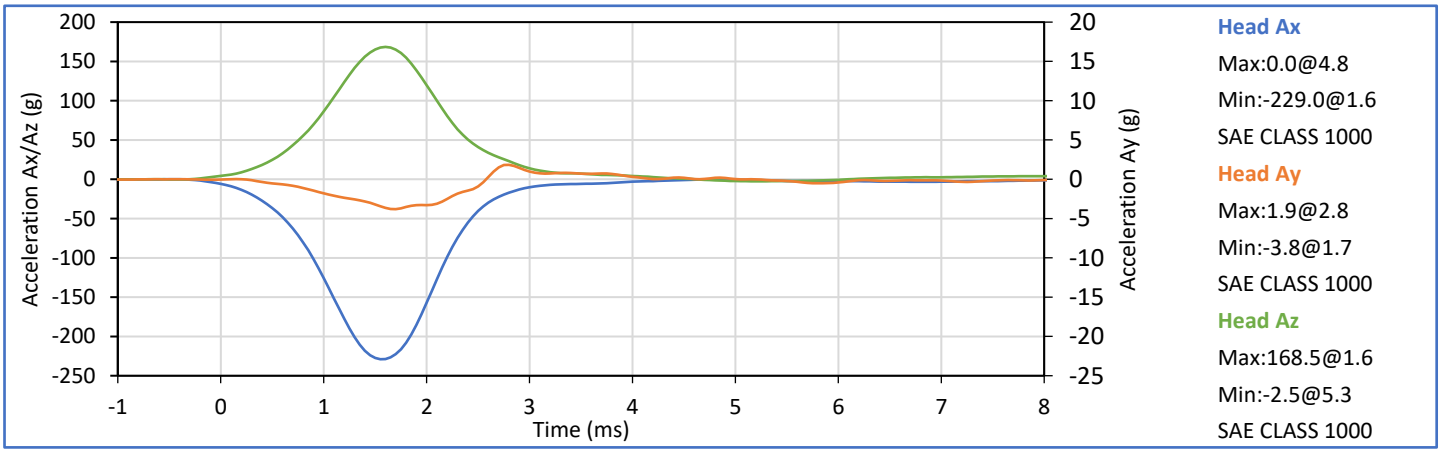
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Head Drop Test

ATD Serial No.: DH1644 Test Date: 2022-04-06

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	23	Pass
Peak Resultant Acceleration	g	250.0	300.0	284.1	Pass
Peak Lateral Acceleration	g	-15.0	15.0	-3.8	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

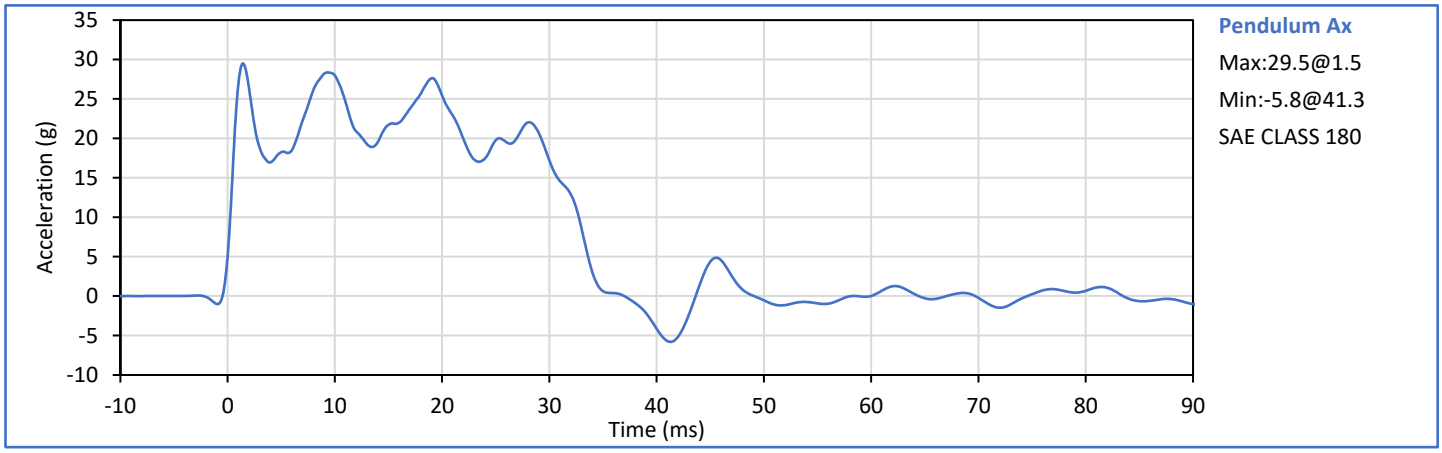
Applus IDIADA KARCO

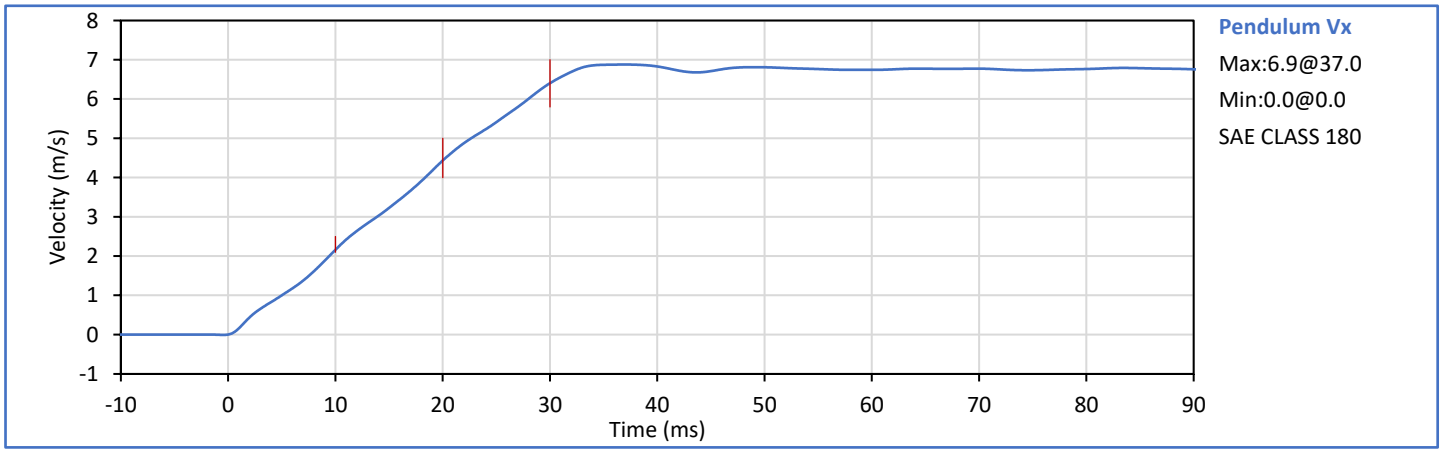
Hybrid III 5th Percentile Female ATD
Neck Flexion Test

ATD Serial No.: DH1644

Test Date: 2022-04-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	21	Pass
Pendulum Velocity	m/s	6.89	7.13	6.98	Pass
Pendulum Velocity at 10 ms	m/s	2.10	2.50	2.16	Pass
Pendulum Velocity at 20 ms	m/s	4.00	5.00	4.43	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.40	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	87.2	Pass
Peak Moment in Rotation	Nm	69.0	83.0	72.8	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	85.3	Pass
			Overall Test Results		Pass





Technician: G. Holguin

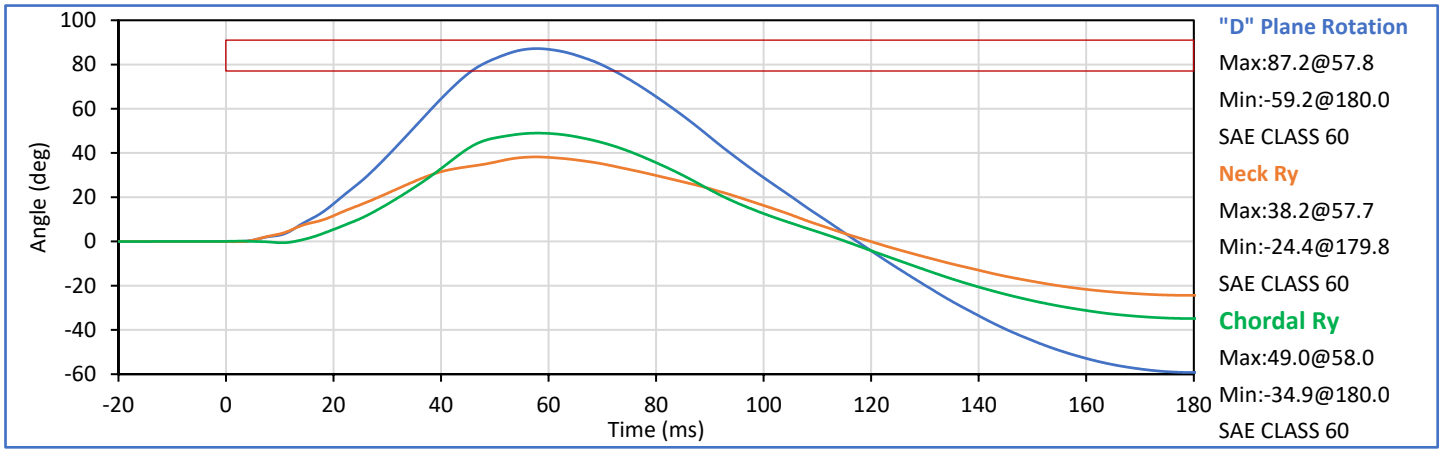
Approved By: J. Hernandez

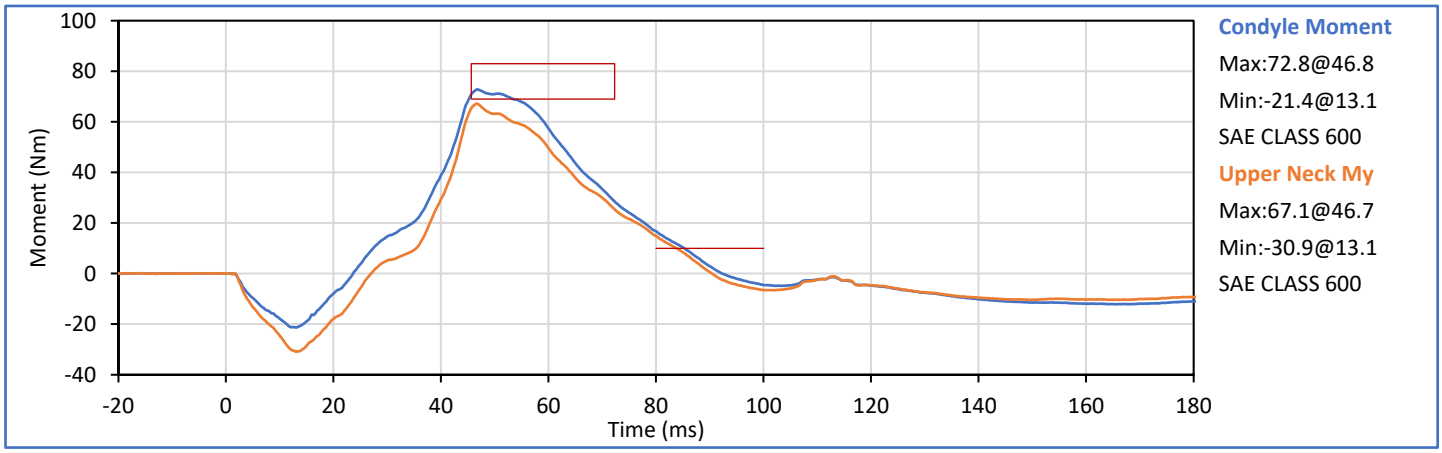
Applus IDIADA KARCO

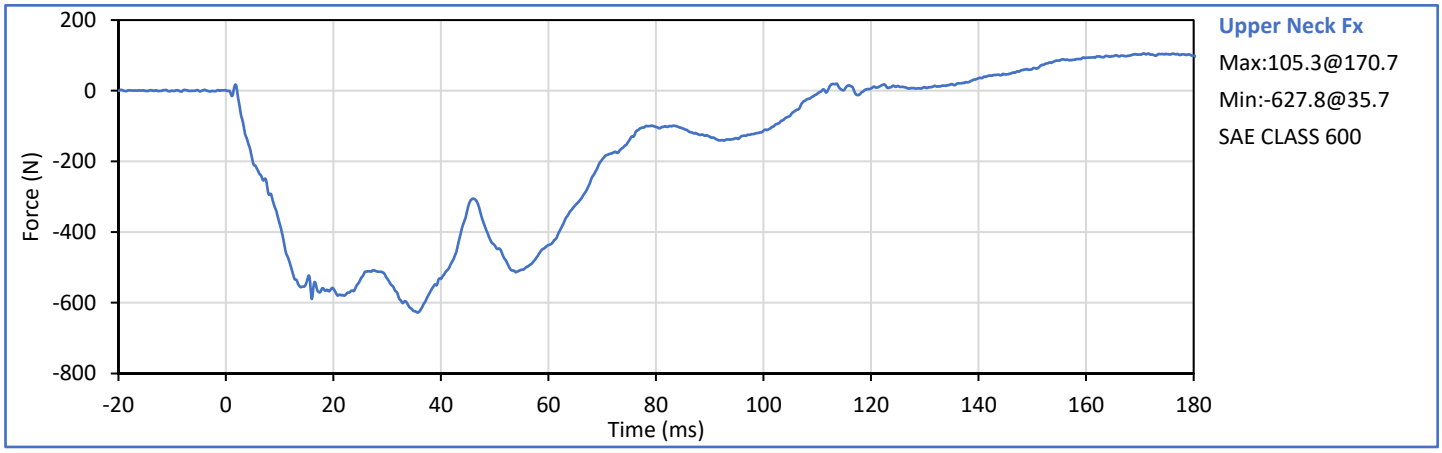
Hybrid III 5th Percentile Female ATD
Neck Flexion Test

ATD Serial No.: DH1644

Test Date: 2022-04-08





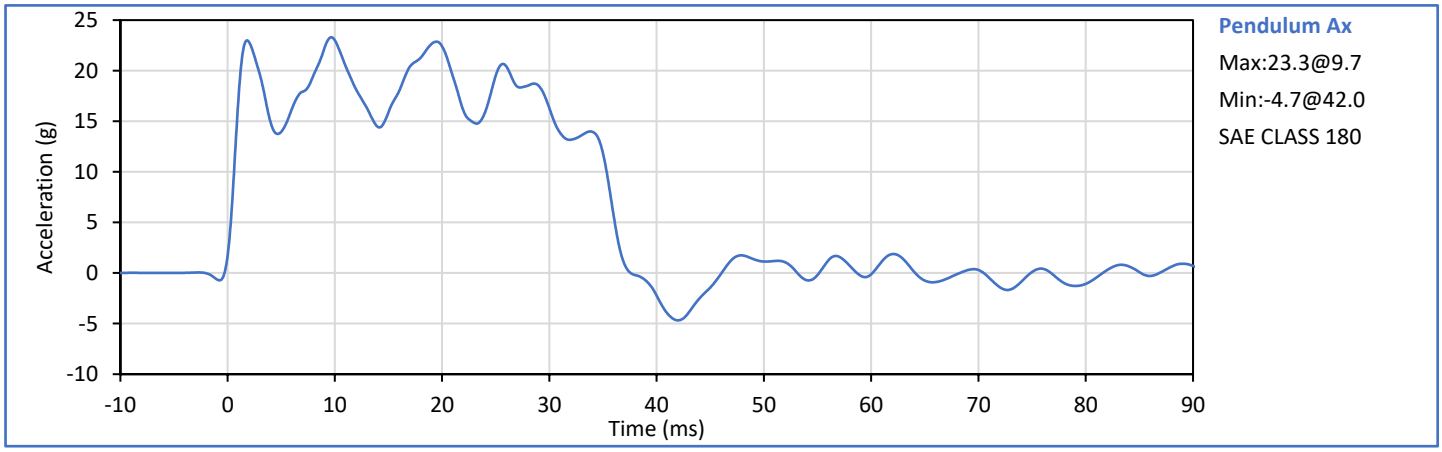


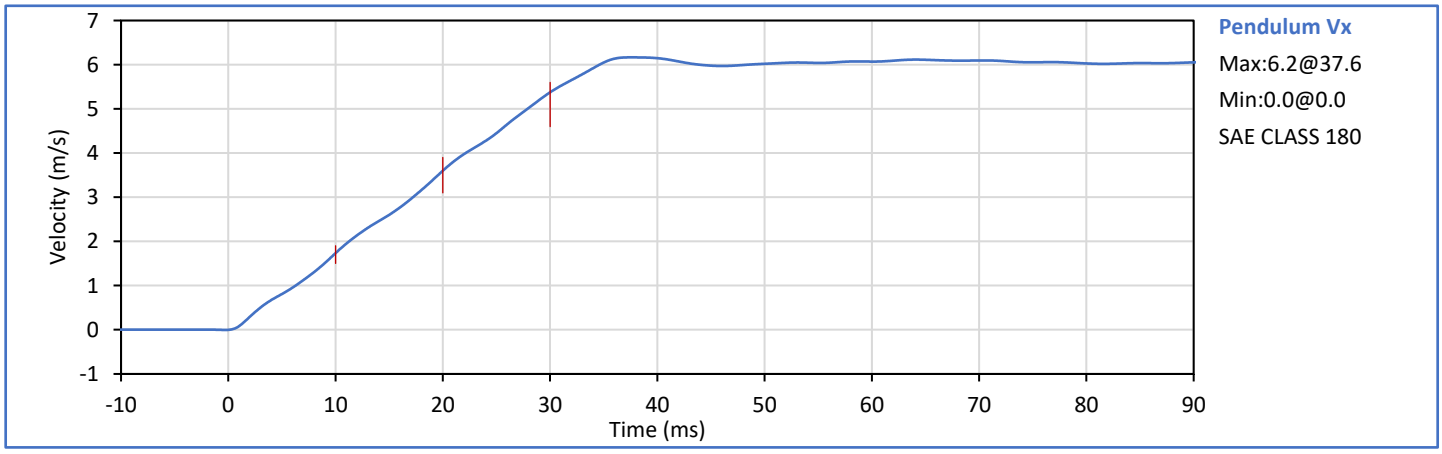
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Neck Extension Test

ATD Serial No.: DH1644 Test Date: 2022-04-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Pendulum Velocity	m/s	5.95	6.19	6.12	Pass
Pendulum Velocity at 10 ms	m/s	1.50	1.90	1.73	Pass
Pendulum Velocity at 20 ms	m/s	3.10	3.90	3.60	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	5.37	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	102.1	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-54.3	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	98.7	Pass
			Overall Test Results		Pass



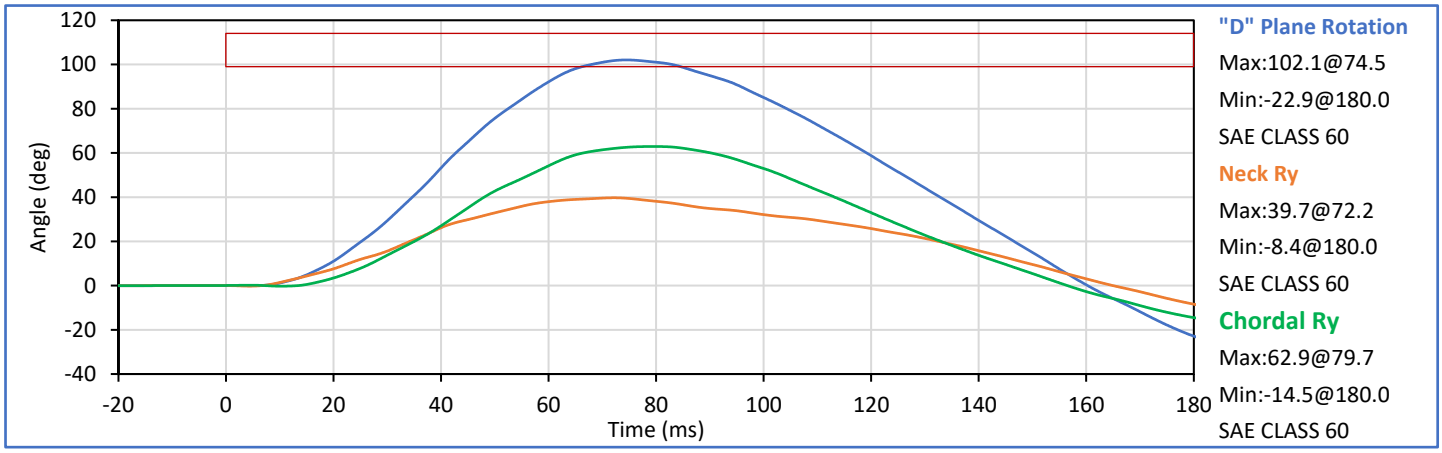


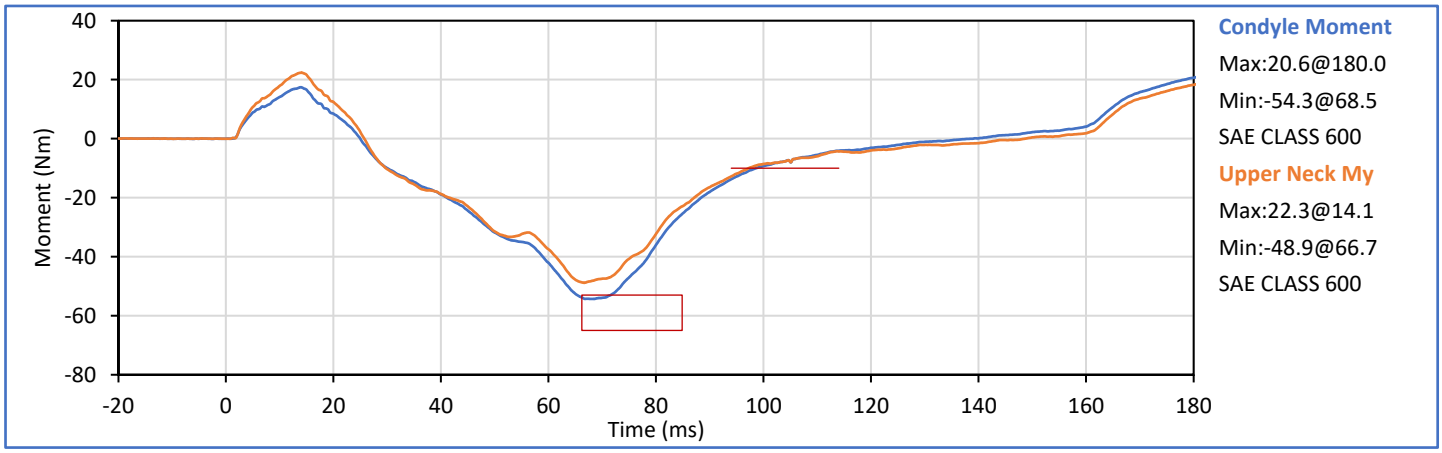
Technician: G. Holguin

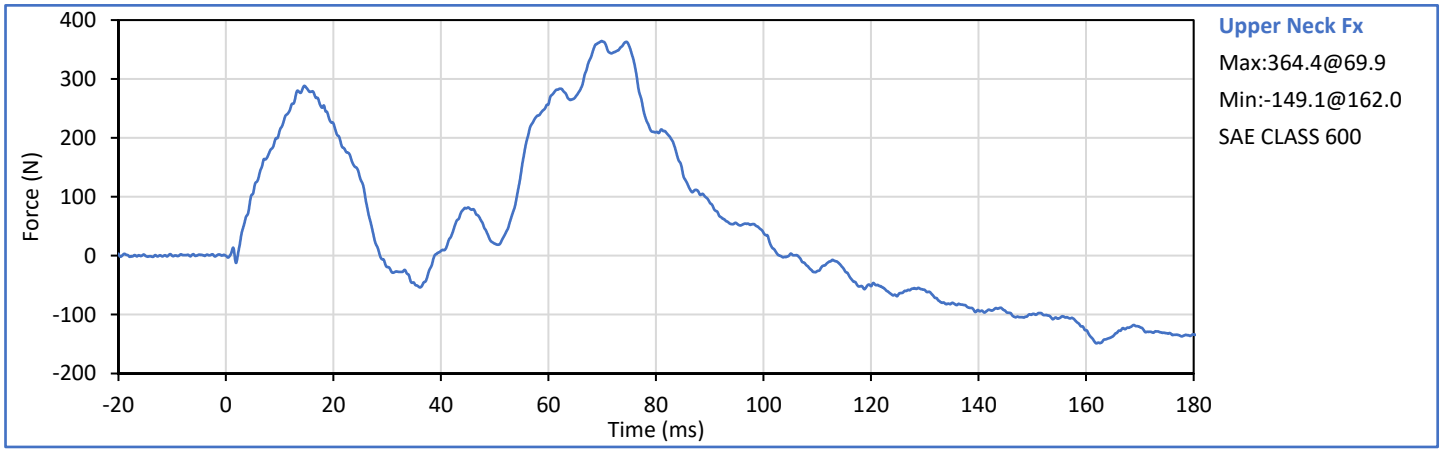
Approved By: J. Hernandez

Hybrid III 5th Percentile Female ATD
Neck Extension Test

ATD Serial No.: DH1644 Test Date: 2022-04-08







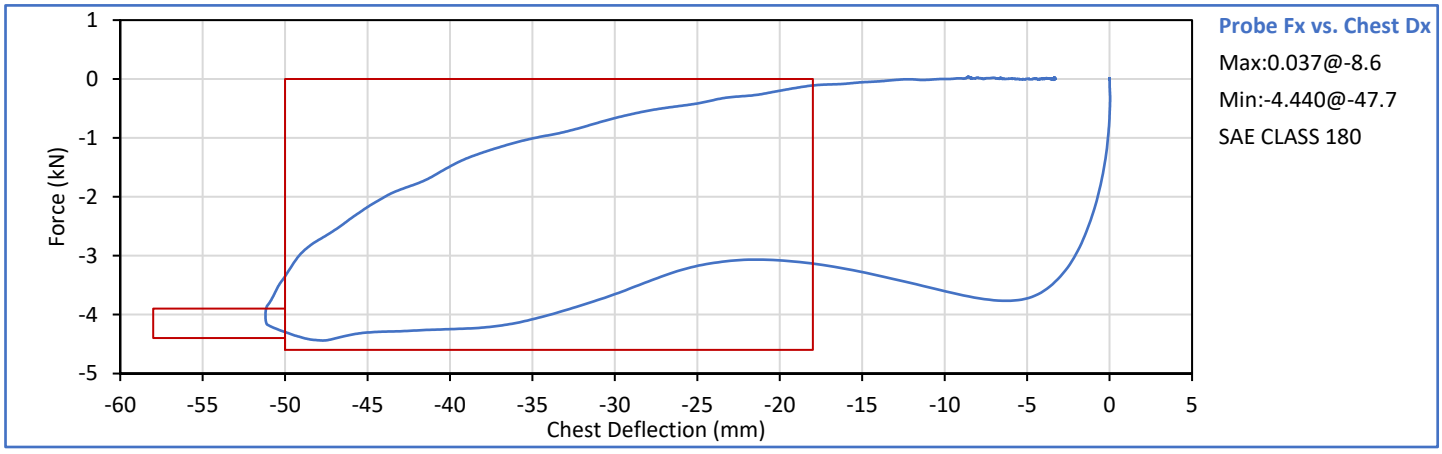
Applus IDIADA KARCO

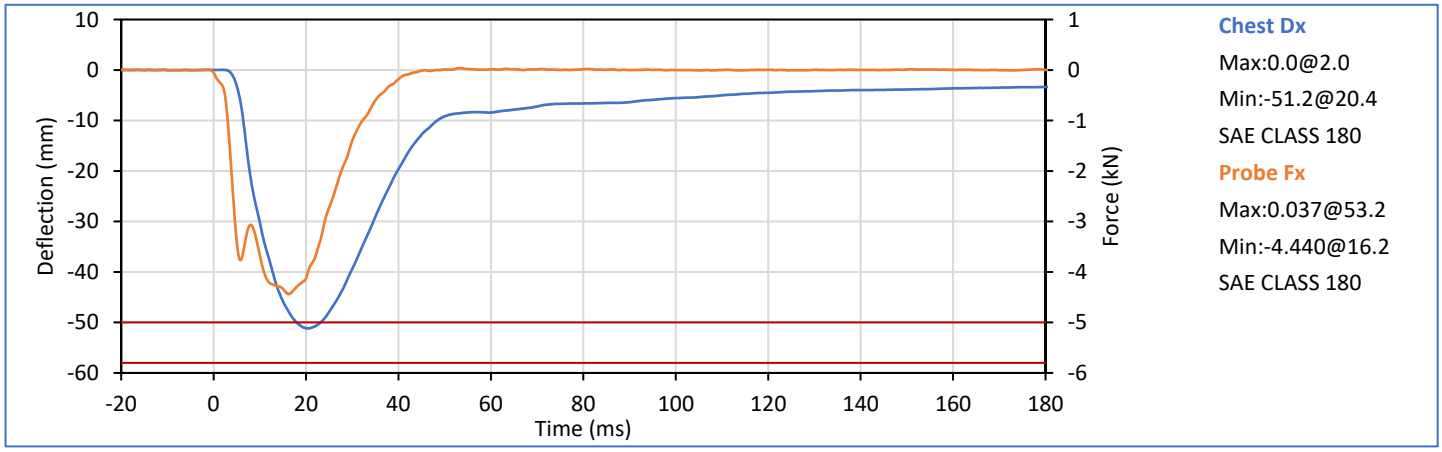
Hybrid III 5th Percentile Female ATD
Thorax Impact

ATD Serial No.: DH1644

Test Date: 2022-04-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory RelativeHumidity	%	10	70	46	Pass
Probe Velocity	m/s	6.59	6.83	6.71	Pass
Peak Chest Deflection	mm	-58.0	-50.0	-51.2	Pass
Peak Probe Force, 50 and 58 mm	kN	-4.400	-3.900	-4.297	Pass
Peak Probe Force, 18 and 50 mm	kN	-4.600	0.000	-4.440	Pass
Internal Hysterisis	%	69.0	85.0	77.6	Pass
			Overall Test Results		Pass





Technician: G. Holguin

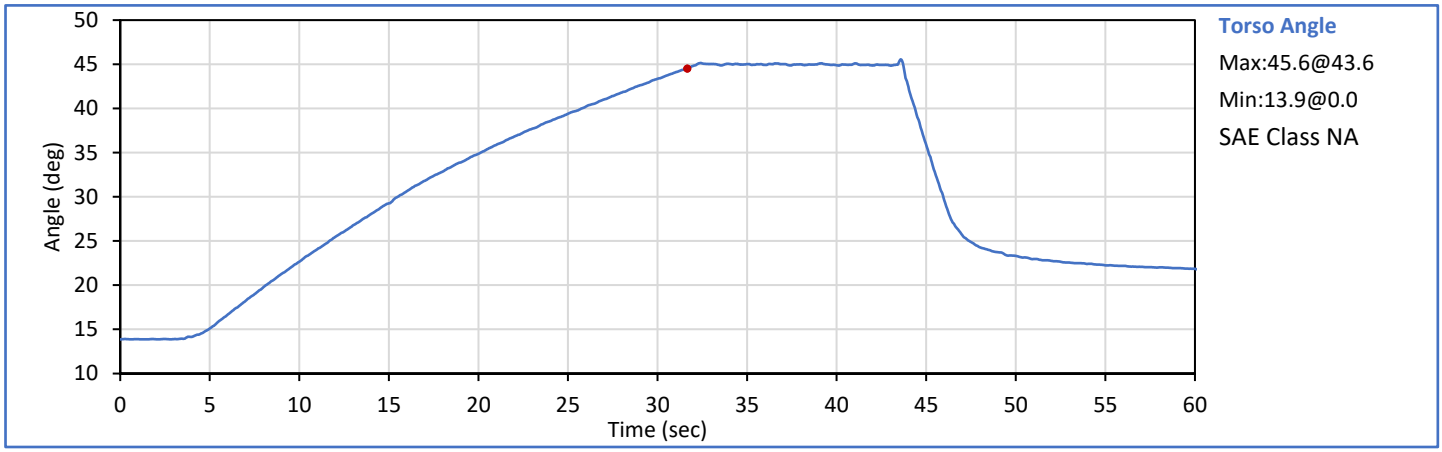
Approved By: J. Hernandez

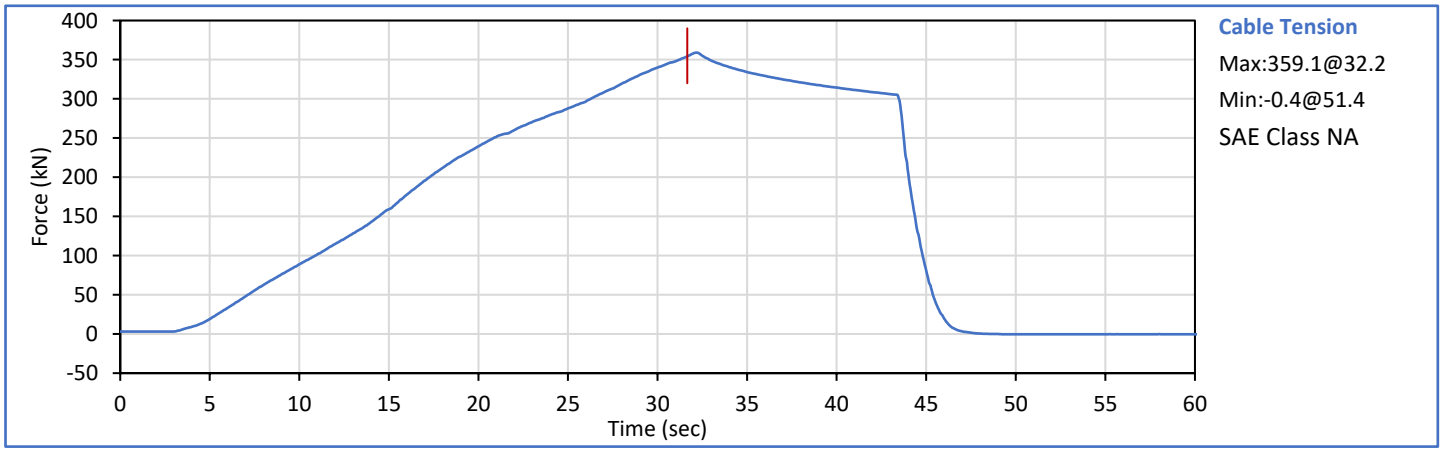
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Torso Flexion Test

ATD Serial No.: DH1644 Test Date: 2022-04-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	46	Pass
Orientation Angle	deg	0.0	20.0	14.1	Pass
Test Initial Angle	deg	11.0	19.0	13.9	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	354.2	Pass
Torso Flexion Rate	deg/s	0.50	1.50	1.13	Pass
Final Reference Plane Angle	deg	-8.0	8.0	1.2	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

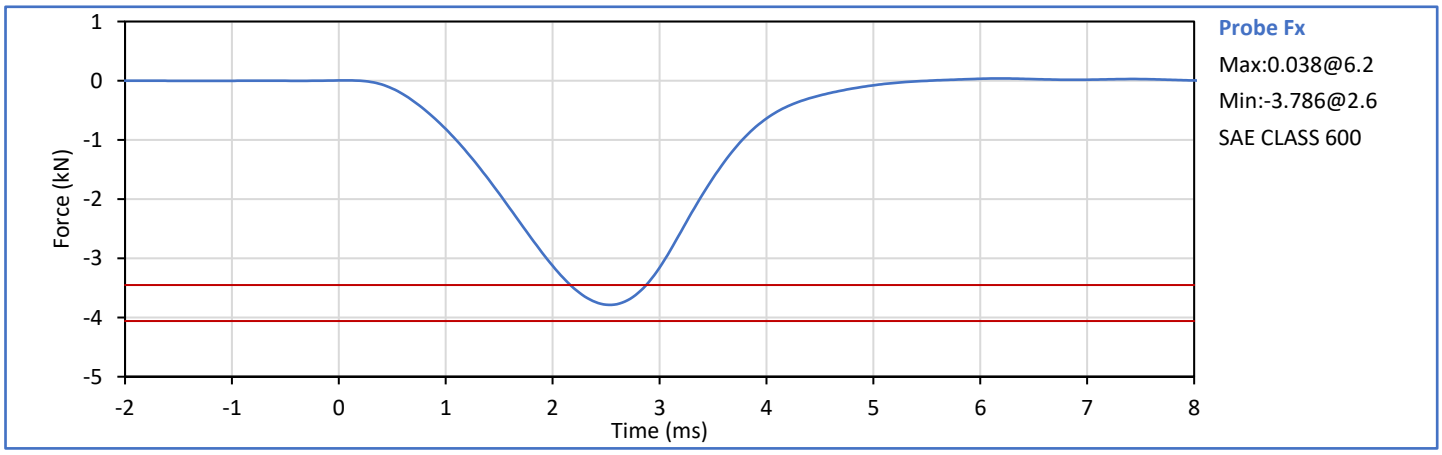
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Knee Impact (Left)

ATD Serial No.: DH1644

Test Date: 2022-04-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	20.9	Pass
Laboratory Relative Humidity	%	10	70	21	Pass
Probe Velocity	m/s	2.070	2.130	2.107	Pass
Peak Resistive Force	kN	-4.060	-3.450	-3.786	Pass
			Overall Test Results		Pass



Technician: G. Holguin

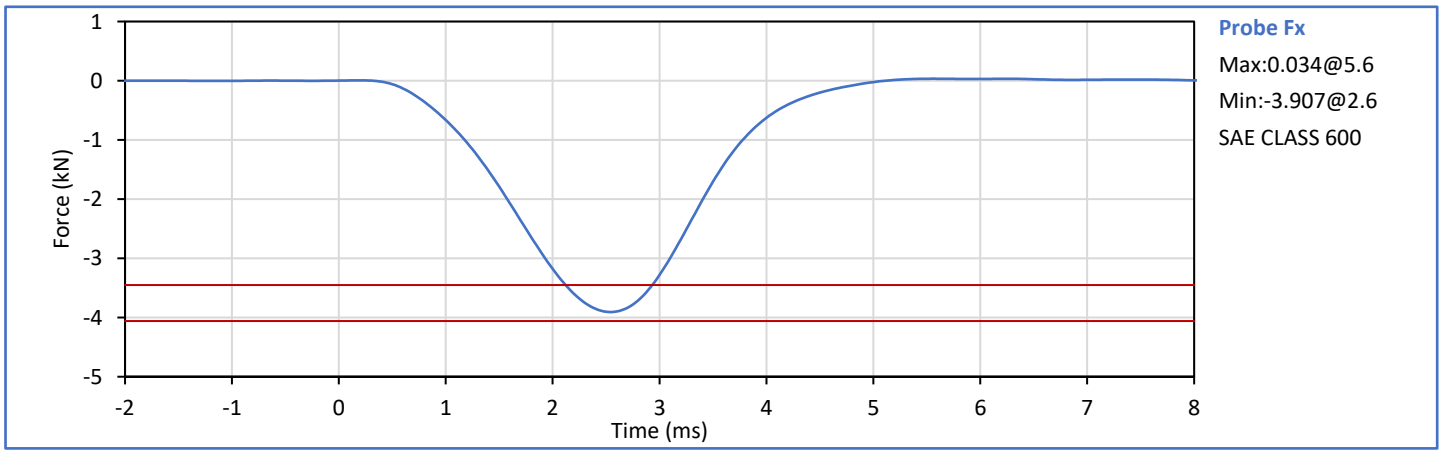
Approved By: J. Hernandez

Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Knee Impact (Right)

ATD Serial No.: DH1644 Test Date: 2022-04-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.3	Pass
Laboratory Relative Humidity	%	10	70	48	Pass
Probe Velocity	m/s	2.070	2.130	2.124	Pass
Peak Resistive Force	kN	-4.060	-3.450	-3.907	Pass
			Overall Test Results		Pass



Technician: G. Holguin

Approved By: J. Hernandez

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

Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
ATD Damage Checklist

ATD Serial No.: 360 Test Date: 2022-04-19

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.	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:

No Problems Found

Technician: G. Holguin

Approved By: J. Hernandez

Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
External Measurements

ATD Serial No.: 360 Test Date: 2022-04-19

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
A - Total sitting height	mm	879	889	882	Pass
B - Shoulder pivot height	mm	505	521	512	Pass
C - 'H' point height	mm	84	89	88	Pass
D - 'H' point location from backline	mm	135	140	139	Pass
E - Shoulder pivot from backline	mm	84	94	90	Pass
F - Thigh clearance	mm	140	155	147	Pass
G - Back of elbow to wrist pivot	mm	290	305	292	Pass
H - Head back to backline	mm	41	46	45	Pass
I - Shoulder to elbow length	mm	330	345	342	Pass
J - Elbow rest height	mm	190	211	204	Pass
K - Buttock to knee length	mm	579	604	596	Pass
L - Popliteal length	mm	429	455	443	Pass
M - Knee pivot height	mm	485	500	494	Pass
N - Buttock popliteal length	mm	452	477	463	Pass
O - Chest depth without jacket	mm	213	229	224	Pass
P - Foot length	mm	251	267	260	Pass
V - Shoulder breadth	mm	422	437	428	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	431	Pass
BB - Location for waist circum.	mm	226	231	227	Pass
			Overall Test Results		Pass

Technician: G. Holguin

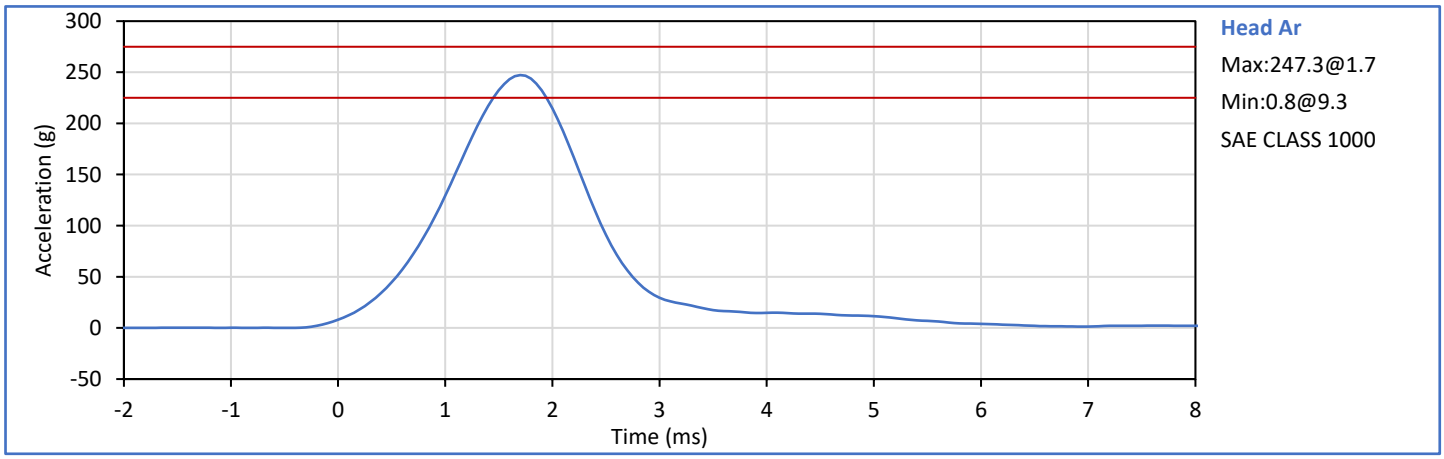
Approved By: J. Hernandez

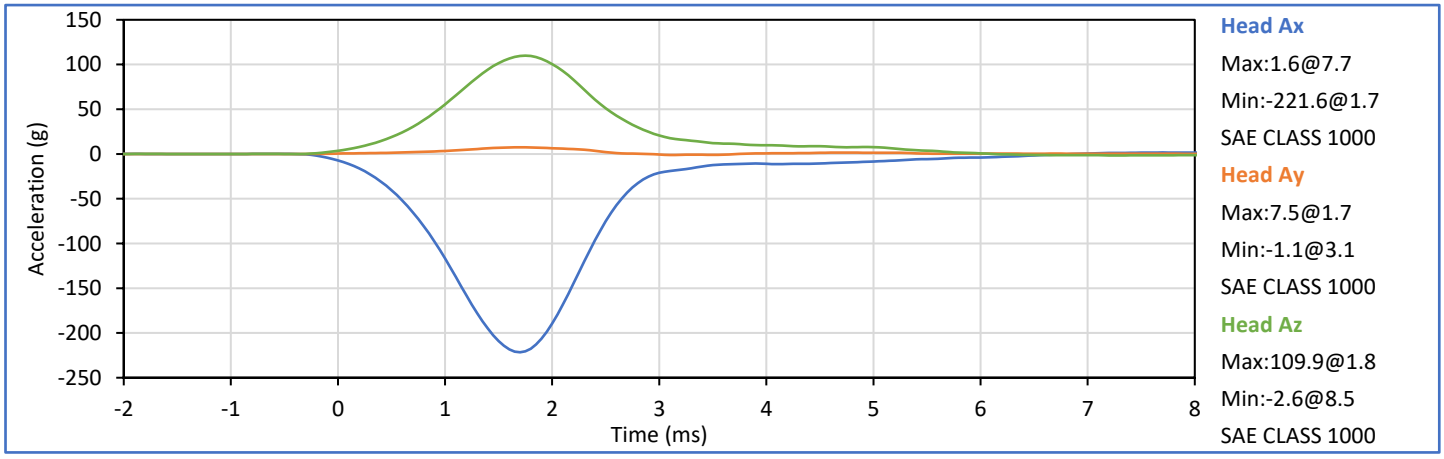
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Head Drop

ATD Serial No.: 360 Test Date: 2022-04-20

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Peak Resultant Acceleration	g	225.0	275.0	247.3	Pass
Peak Lateral Acceleration	g	-15.0	15.0	7.5	Pass
Oscillations After Main Pulse	%	0.0	10.0	0.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: G. Holguin

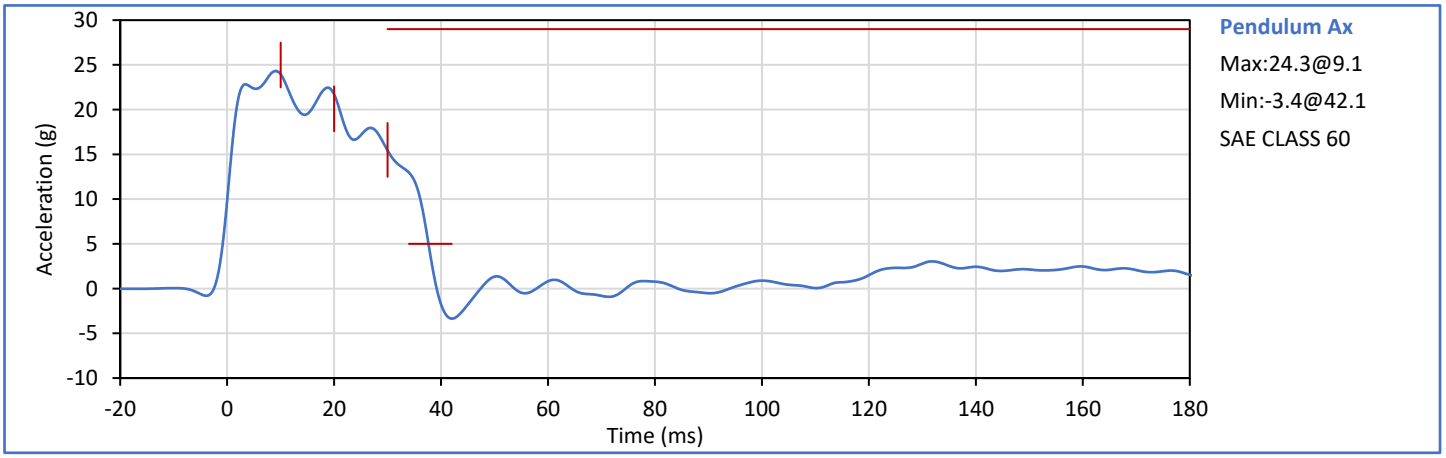
Approved By: J. Hernandez

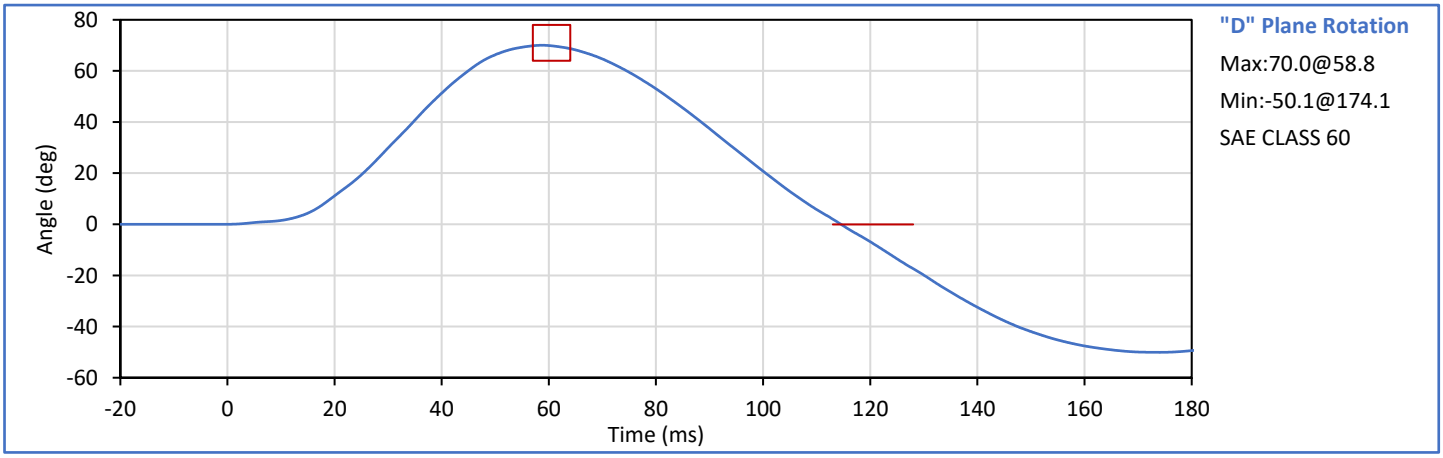
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 360 Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	6.89	7.13	6.96	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	24.0	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	21.7	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	15.4	Pass
Peak Pendulum Decel After 30 ms	g	0.0	29.0	15.4	Pass
Deceleration Decay to Cross 5g	ms	34.0	42.0	37.7	Pass
"D" Plane Rotation peak	deg	64.0	78.0	70.0	Pass
	ms	57.0	64.0	58.8	Pass
"D" Plane Rotation Decay to Zero	ms	113.0	128.0	114.6	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	90.9	Pass
	ms	47.0	58.0	51.1	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	97.3	Pass
			Overall Test Results		Pass





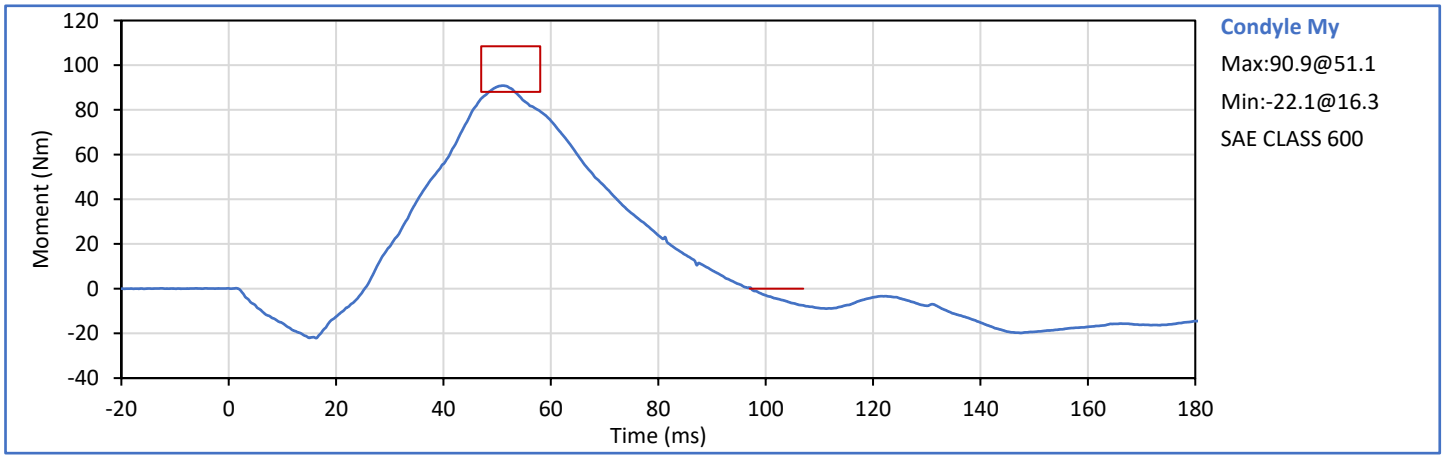
Technician: G. Holguin

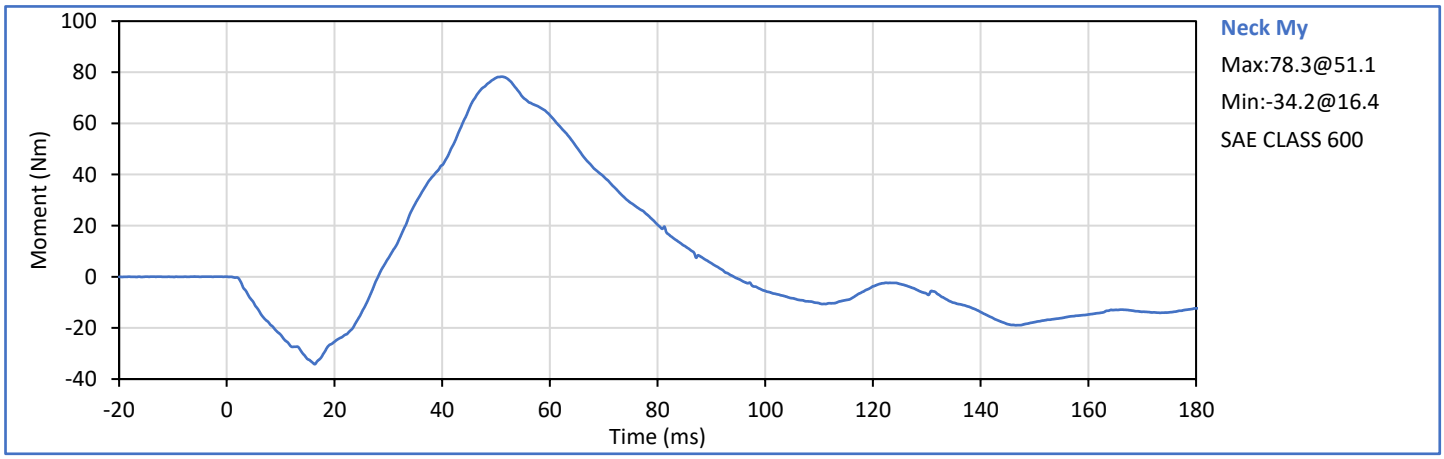
Approved By: J. Hernandez

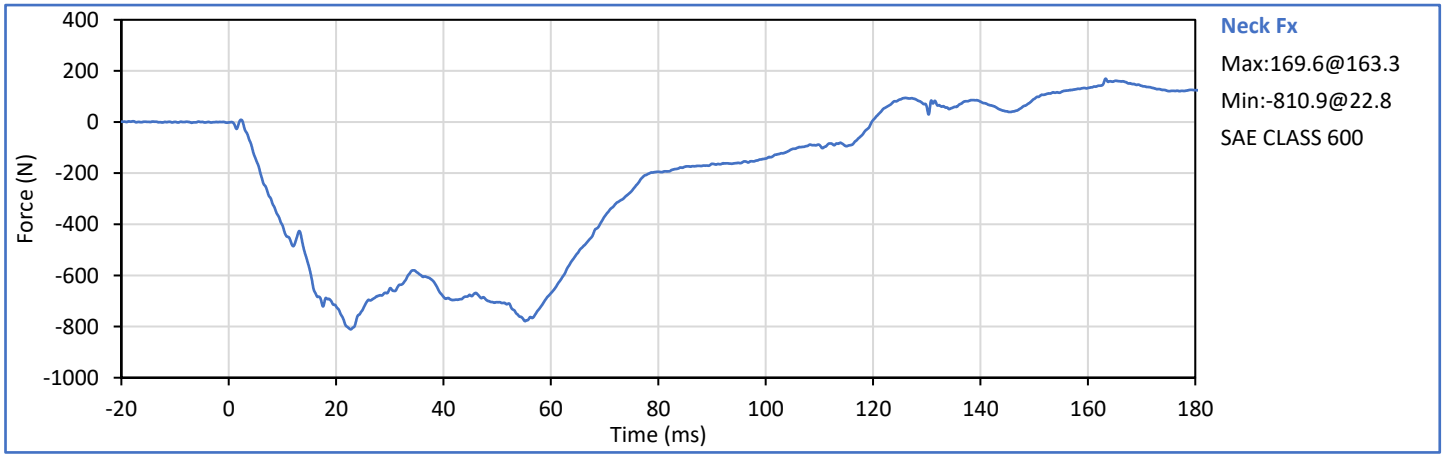
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 360 Test Date: 2022-04-21





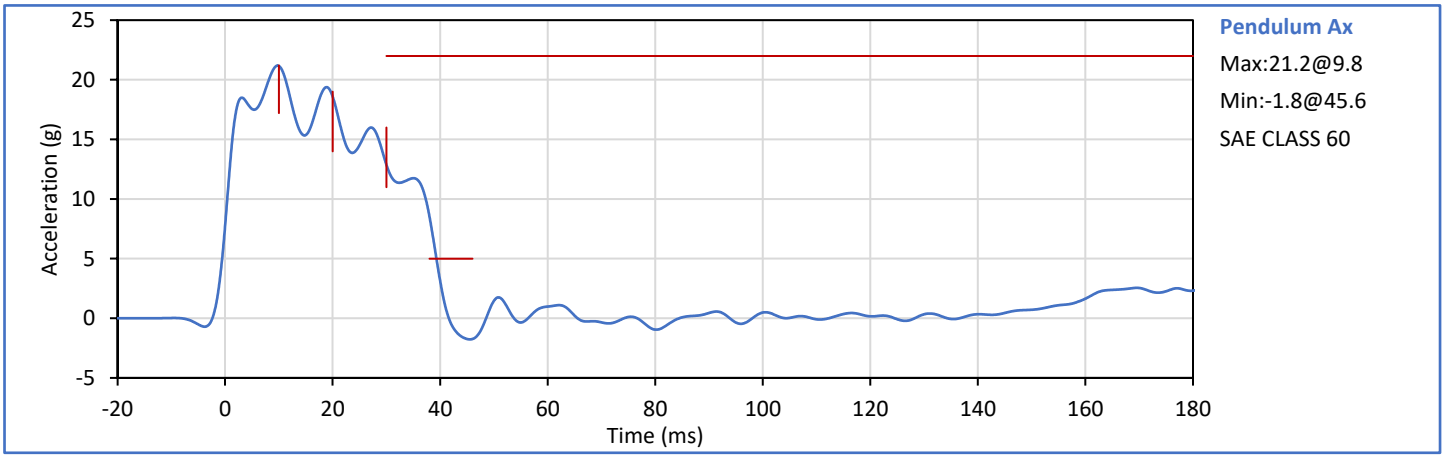


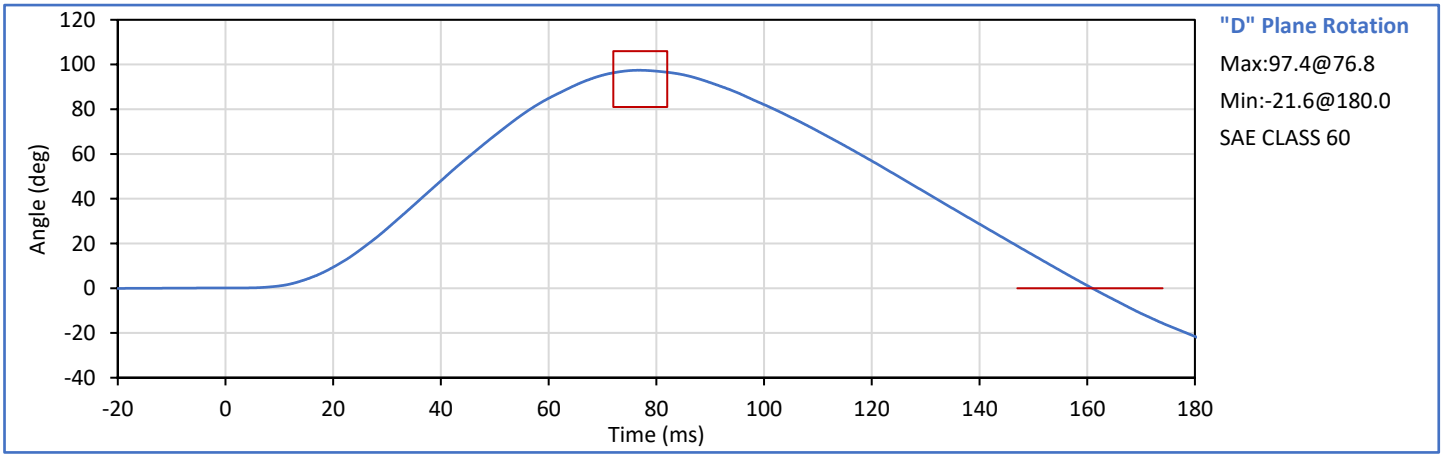
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 360 Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.94	6.19	6.11	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	21.2	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.6	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	12.9	Pass
Peak Pendulum Decel After 30 ms	g	0.0	22.0	12.9	Pass
Deceleration Decay to Cross 5g	ms	38.0	46.0	39.3	Pass
"D" Plane Rotation peak	deg	81.0	106.0	97.4	Pass
	ms	72.0	82.0	76.8	Pass
"D" Plane Rotation Decay to Zero	ms	147.0	174.0	161.0	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-76.5	Pass
	ms	65.0	79.0	65.9	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	129.3	Pass
			Overall Test Results		Pass



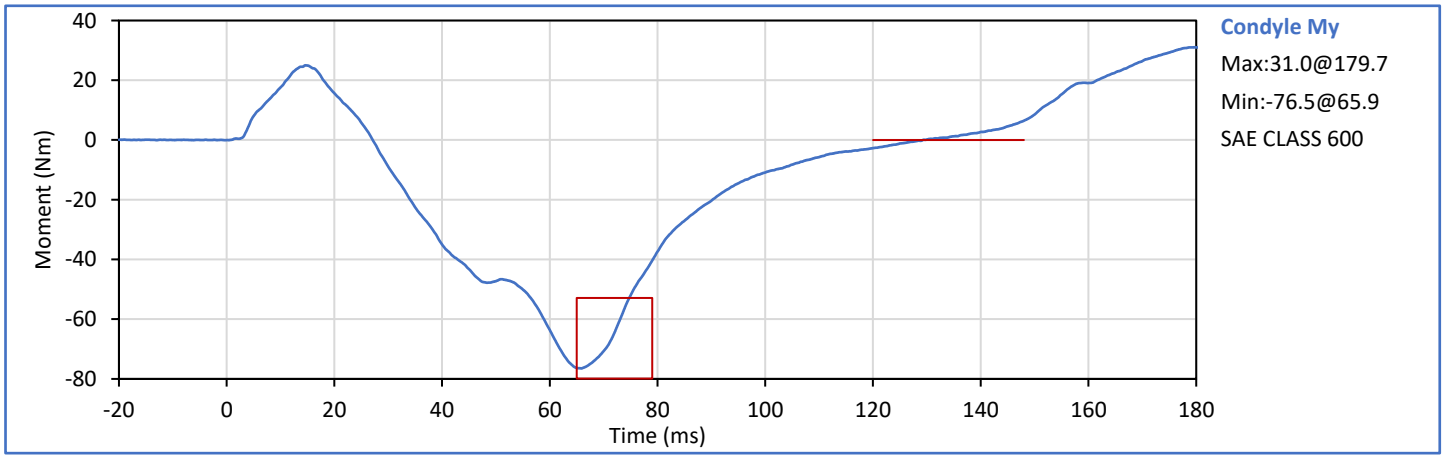


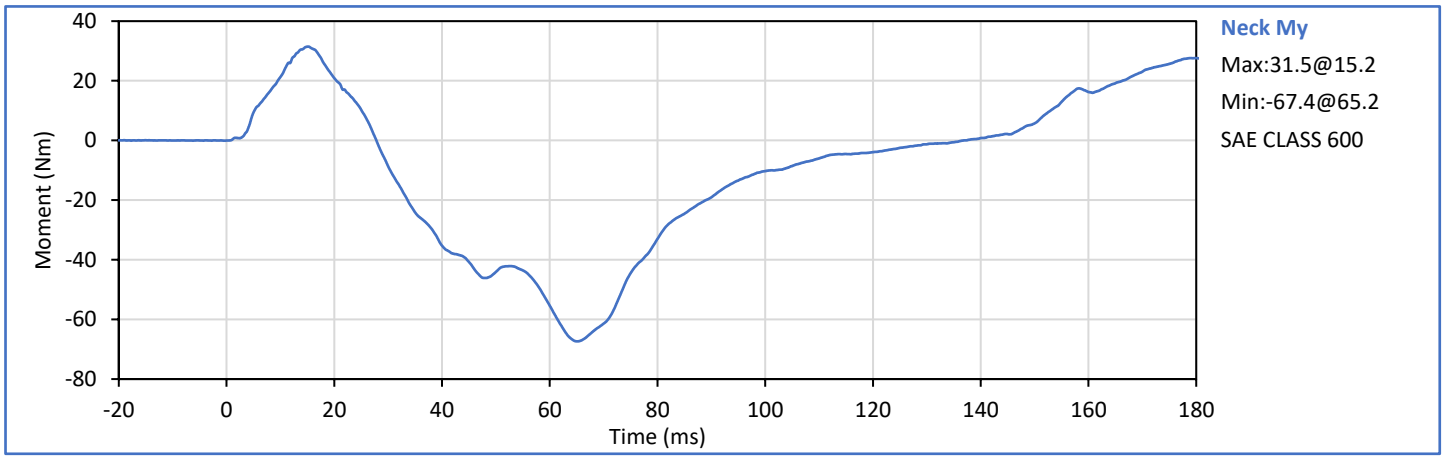
Technician: G. Holguin

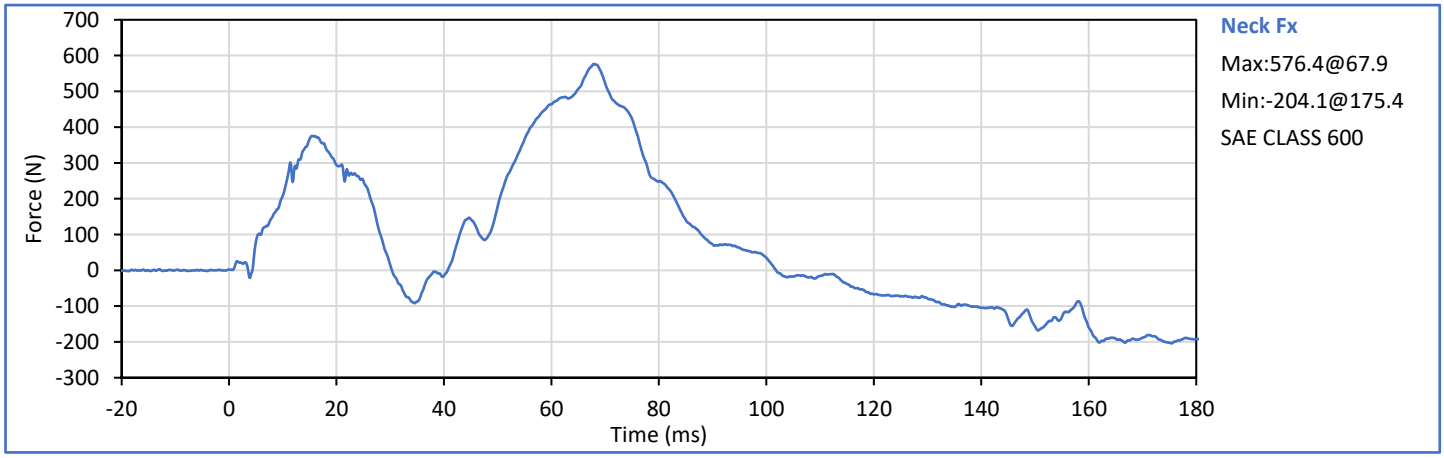
Approved By: J. Hernandez

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 360 Test Date: 2022-04-21







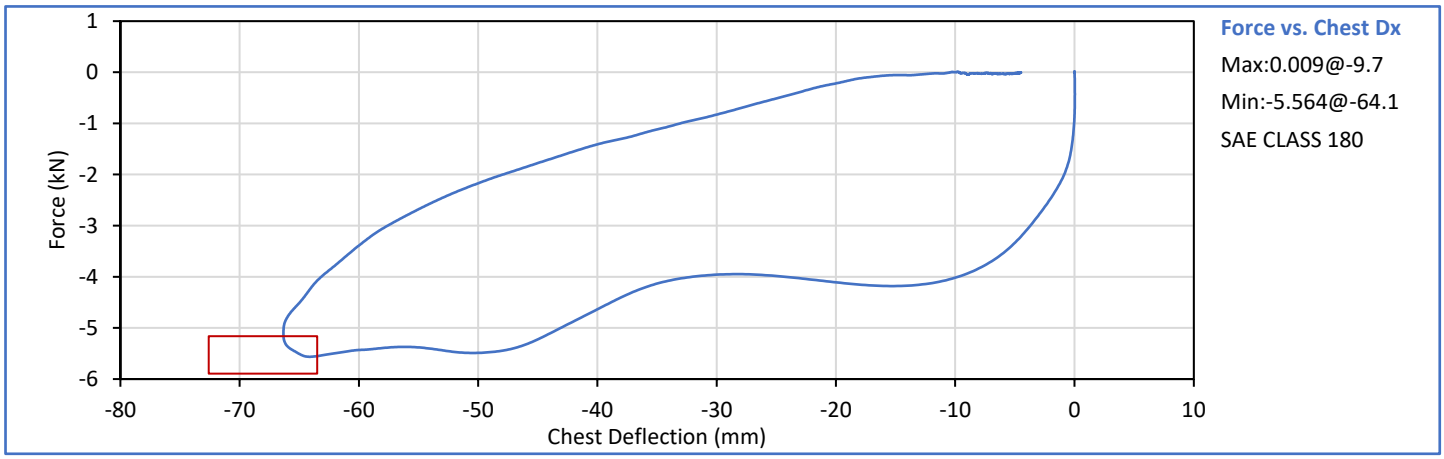
Applus IDIADA
KARCO

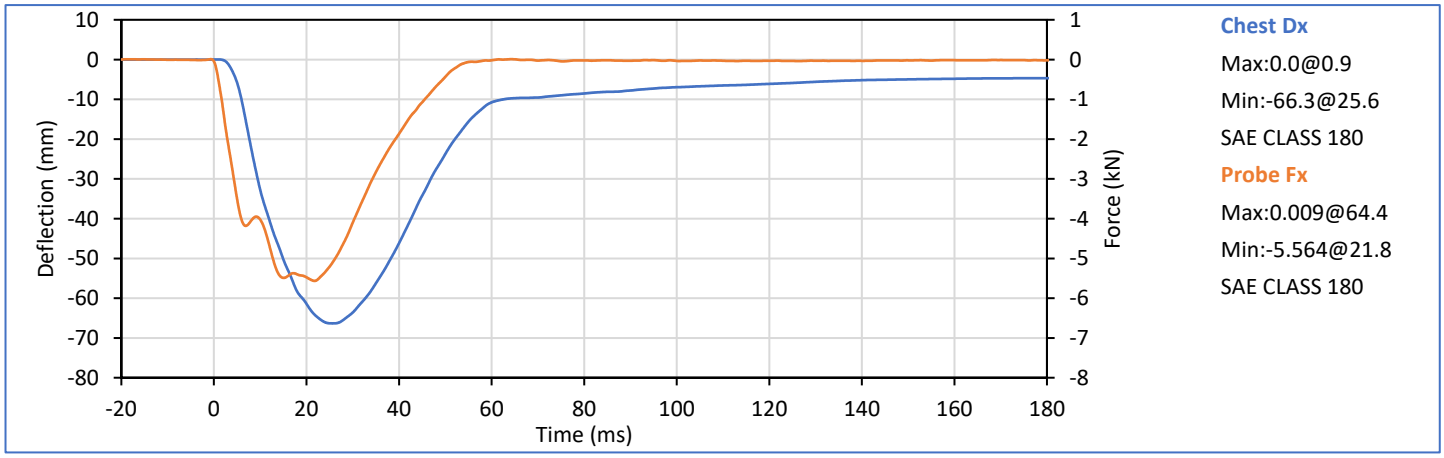
Hybrid III 50th Percentile Male ATD
Thorax Impact

ATD Serial No.: 360

Test Date: 2022-04-19

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Probe Velocity	m/s	6.58	6.82	6.72	Pass
Peak Chest Deflection	mm	-72.6	-63.5	-66.3	Pass
Peak Probe Force	kN	-5.893	-5.159	-5.564	Pass
Internal Hysterisis	%	69.0	85.0	70.3	Pass
			Overall Test Results		Pass





Technician: G. Holguin

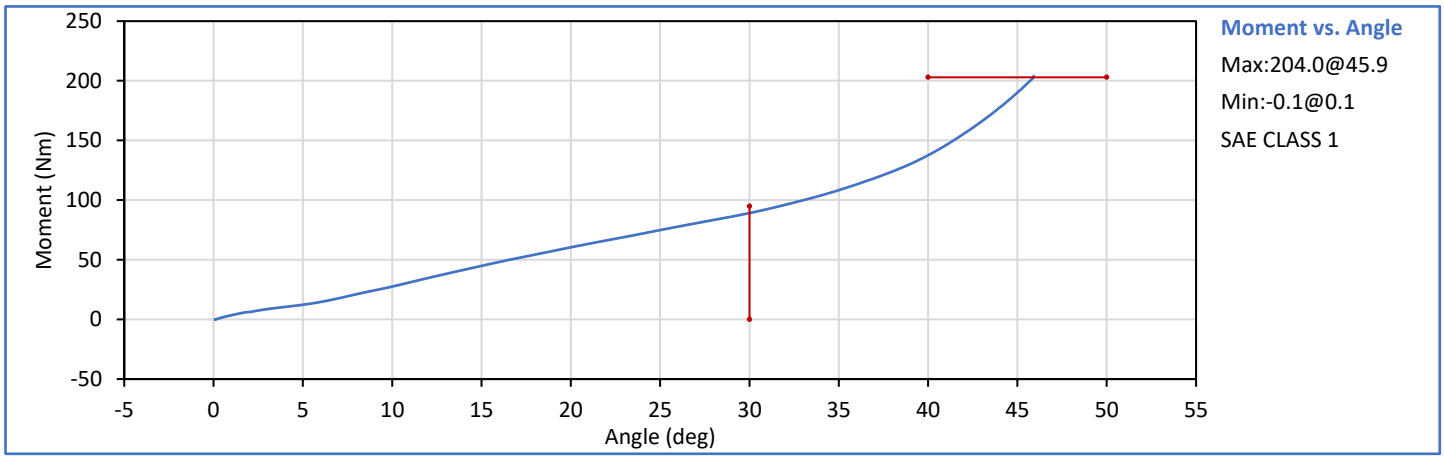
Approved By: J. Hernandez

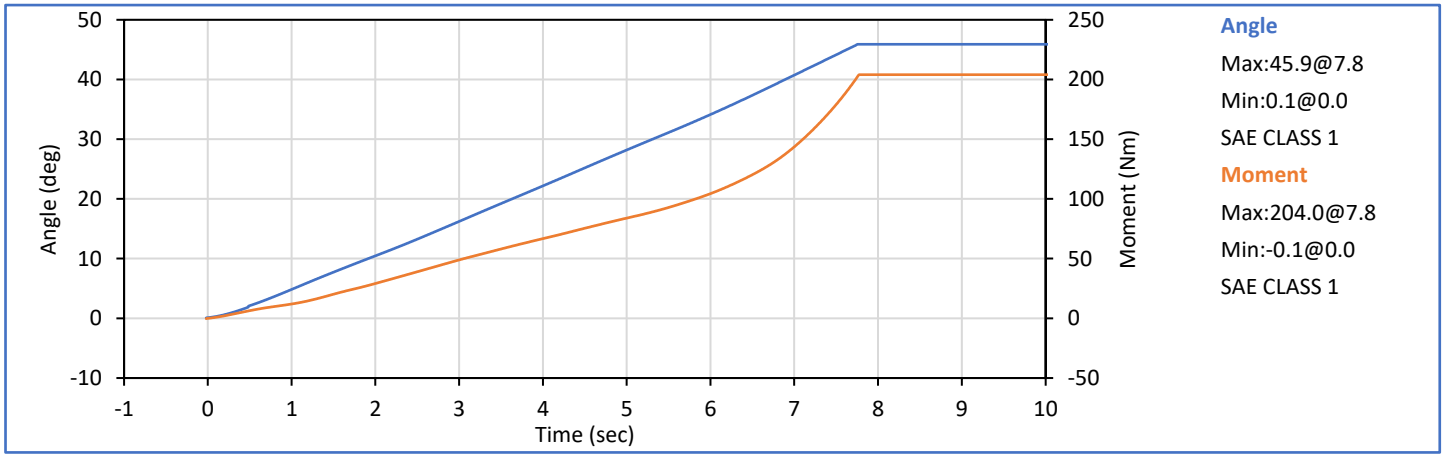
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Hip Range of Motion (Left)

ATD Serial No.: 360 Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.8	Pass
Laboratory Relative Humidity	%	10	70	31	Pass
Left Hip Rotation Rate	deg/s	5.0	10.0	5.9	Pass
Left Femur Torque at 30°	Nm	0.0	95.0	89.1	Pass
Left Hip Rotation at 203 Nm	deg	40.0	50.0	45.9	Pass
			Overall Test Results		Pass





Technician: G. Holguin

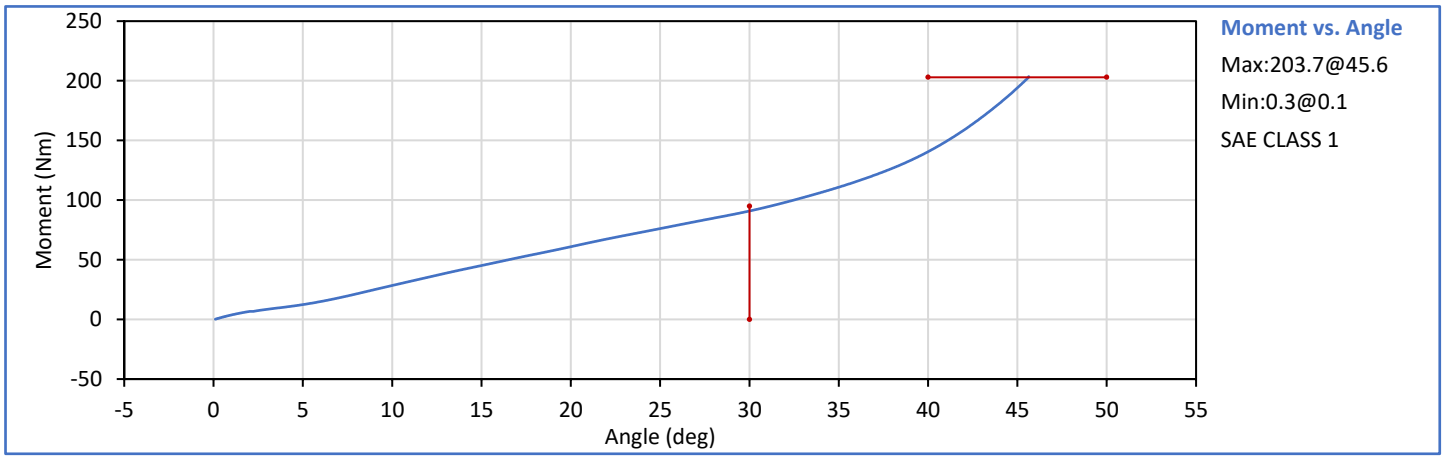
Approved By: J. Hernandez

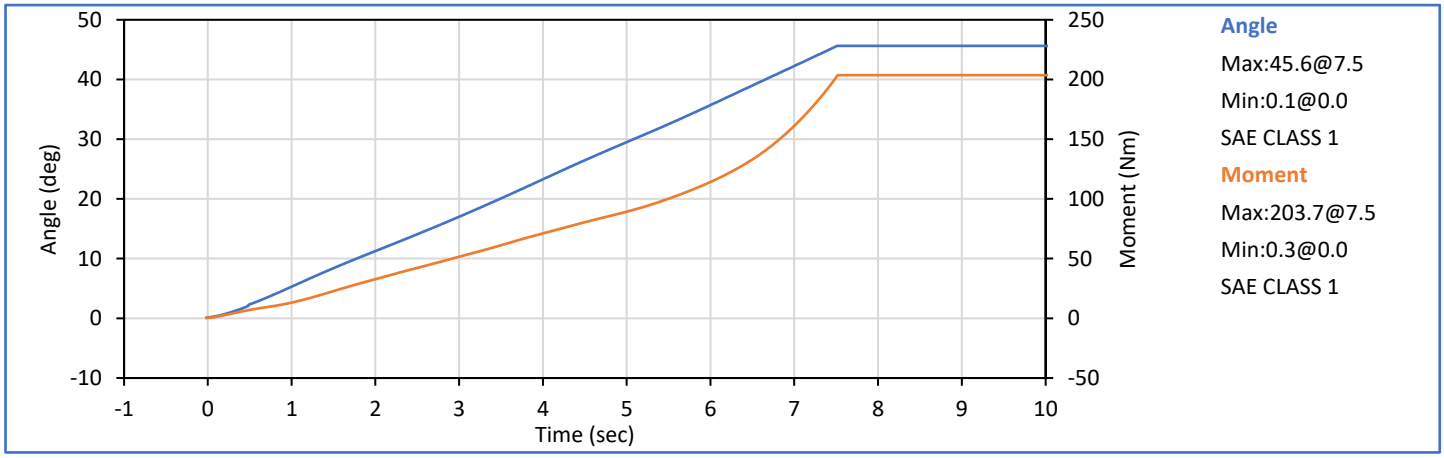
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Hip Range of Motion (Right)

ATD Serial No.: 360 Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.8	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Right Hip Rotation Rate	deg/s	5.0	10.0	6.1	Pass
Right Femur Torque at 30°	Nm	0.0	95.0	90.8	Pass
Right Hip Rotation at 203 Nm	deg	40.0	50.0	45.6	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

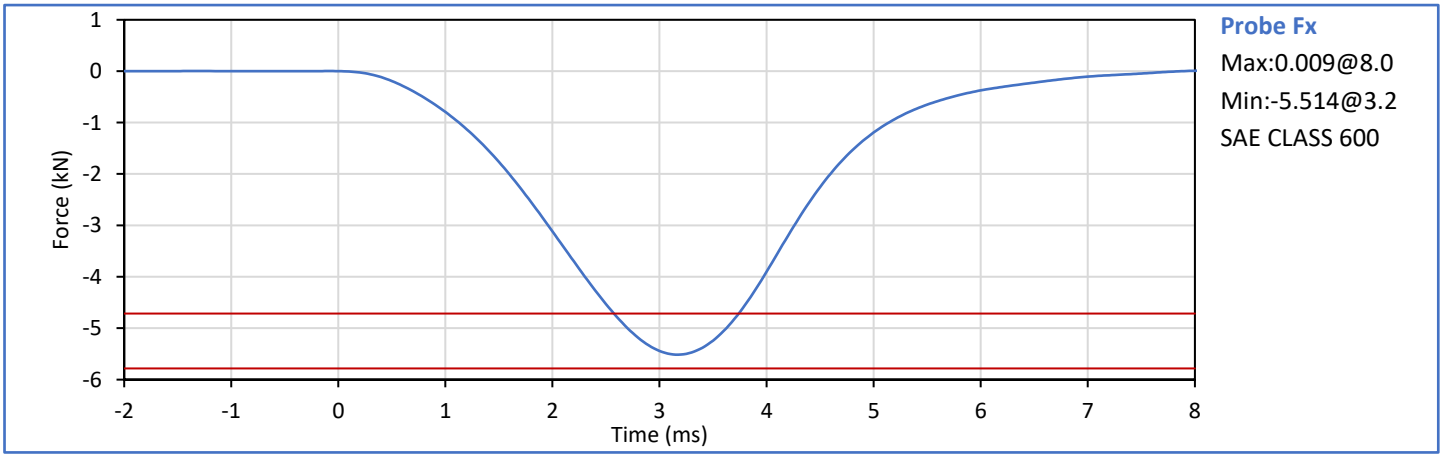
Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
Knee Impact (Left)

ATD Serial No.: 360

Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	32	Pass
Probe Velocity	m/s	2.070	2.130	2.104	Pass
Peak Resistive Force	kN	-5.782	-4.715	-5.514	Pass
			Overall Test Results		Pass



Technician: G. Holguin

Approved By: J. Hernandez

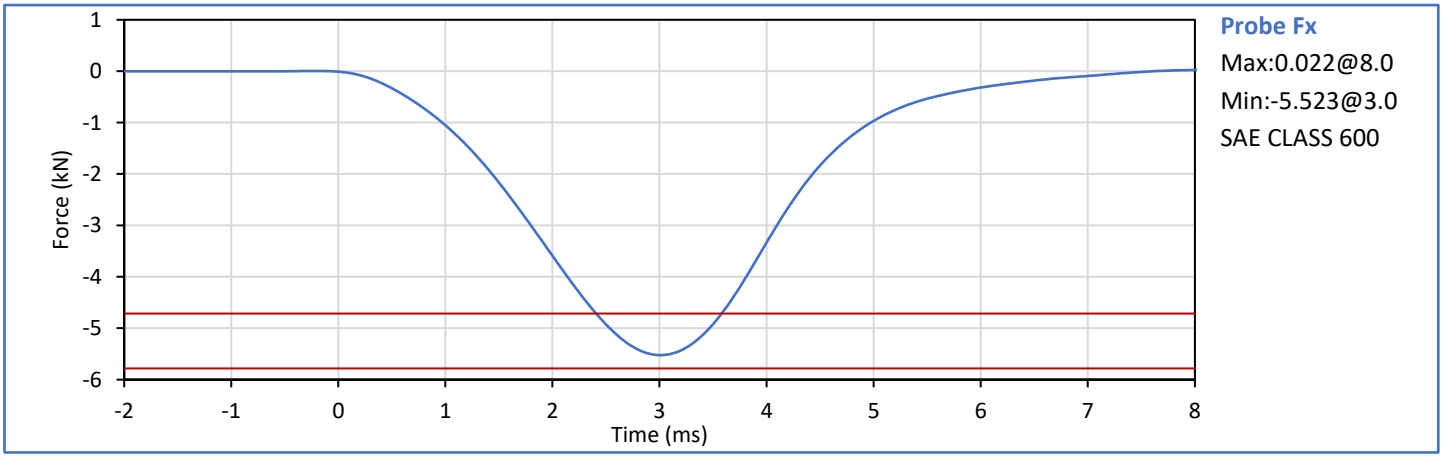
Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
Knee Impact (Right)

ATD Serial No.: 360

Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.4	Pass
Laboratory Relative Humidity	%	10	70	31	Pass
Probe Velocity	m/s	2.070	2.130	2.106	Pass
Peak Resistive Force	kN	-5.782	-4.715	-5.523	Pass
			Overall Test Results		Pass



Technician: G. Holguin

Approved By: J. Hernandez

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

Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Damage Checklist

ATD Serial No.: DH1644 Test Date: 2022-04-18

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:

No Problems Found

Technician: G. Holguin

Approved By: J. Hernandez

Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
External Measurements

ATD Serial No.: DH1644 Test Date: 2022-04-18

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	47	Pass
A - Total sitting height	mm	775	800	789	Pass
B - Shoulder pivot height	mm	432	457	446	Pass
C - 'H' point height	mm	81	86	85	Pass
D - 'H' point location from backline	mm	145	150	148	Pass
E - Shoulder pivot from backline	mm	69	84	72	Pass
F - Thigh clearance	mm	119	135	126	Pass
G - Back of elbow to wrist pivot	mm	244	259	249	Pass
H - Head back to backline	mm	41	46	44	Pass
I - Shoulder to elbow length	mm	277	297	283	Pass
J - Elbow rest height	mm	183	203	198	Pass
K - Buttock to knee length	mm	521	546	532	Pass
L - Popliteal length	mm	356	376	365	Pass
M - Knee pivot height	mm	394	419	410	Pass
N - Buttock popliteal length	mm	414	439	429	Pass
O - Chest depth without jacket	mm	175	191	181	Pass
P - Foot length	mm	219	234	232	Pass
R - Buttock to Knee Pivot Length	mm	457	483	476	Pass
S - Head Breadth	mm	137	147	141	Pass
T - Head Depth	mm	178	188	184	Pass
U - Hip Breadth	mm	300	315	304	Pass
V - Shoulder breadth	mm	351	366	363	Pass
W - Foot breadth	mm	79	94	89	Pass
X - Head circum.	mm	528	549	542	Pass
Y - Chest circum. (w/chest jacket)	mm	851	881	864	Pass
Z - Waist circum.	mm	760	790	766	Pass
AA - Location for chest circum.	mm	333	358	342	Pass
BB - Location for waist circum.	mm	160	170	167	Pass
			Overall Test Results		Pass

Technician: G. Holguin

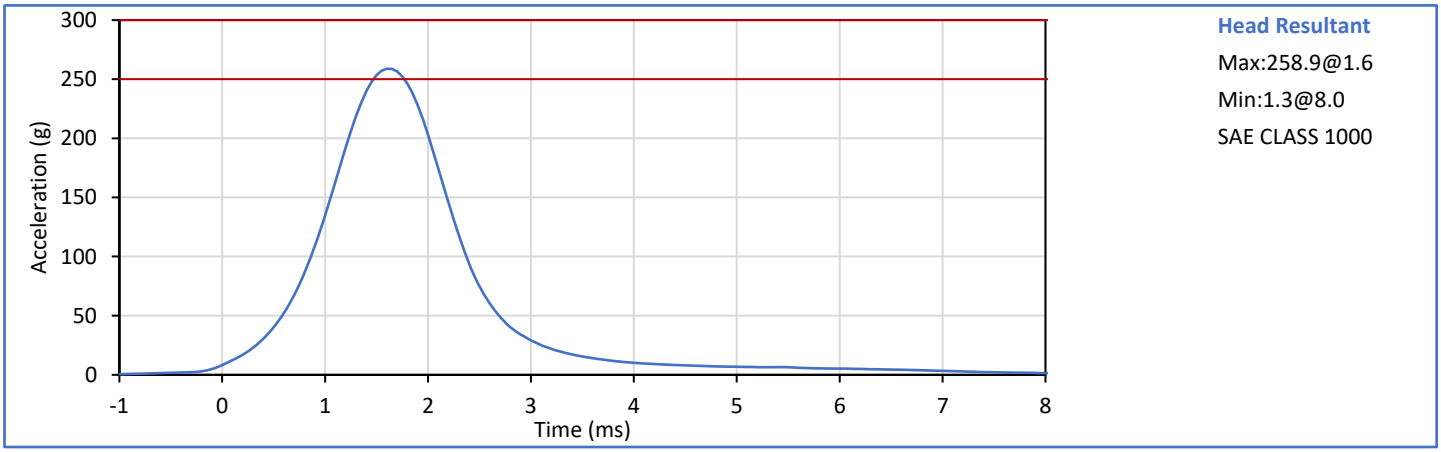
Approved By: J. Hernandez

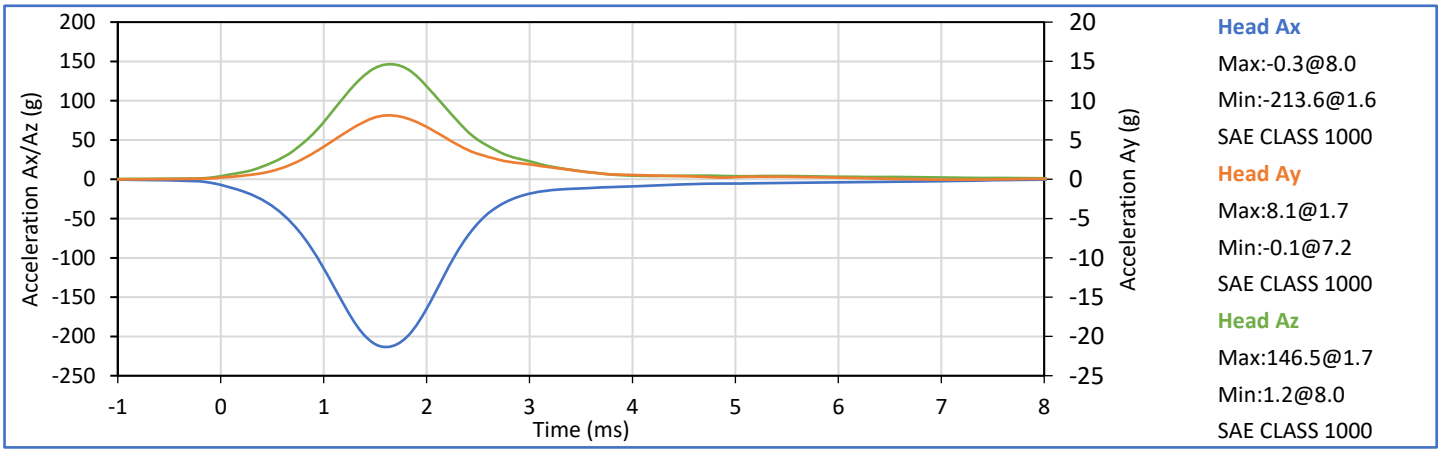
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Head Drop Test

ATD Serial No.: DH1644 Test Date: 2022-04-20

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.8	Pass
Laboratory Humidity	%	10	70	36	Pass
Peak Resultant Acceleration	g	250.0	300.0	258.9	Pass
Peak Lateral Acceleration	g	-15.0	15.0	8.1	Pass
Oscillations After Main Pulse	%	0.0	10.0	2.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

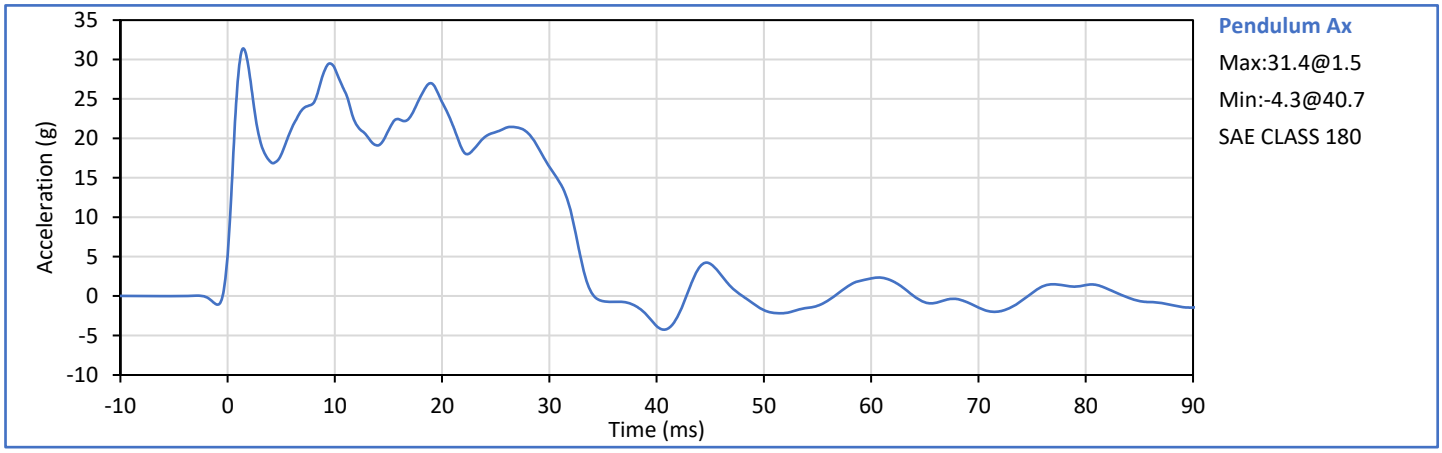
Applus IDIADA KARCO

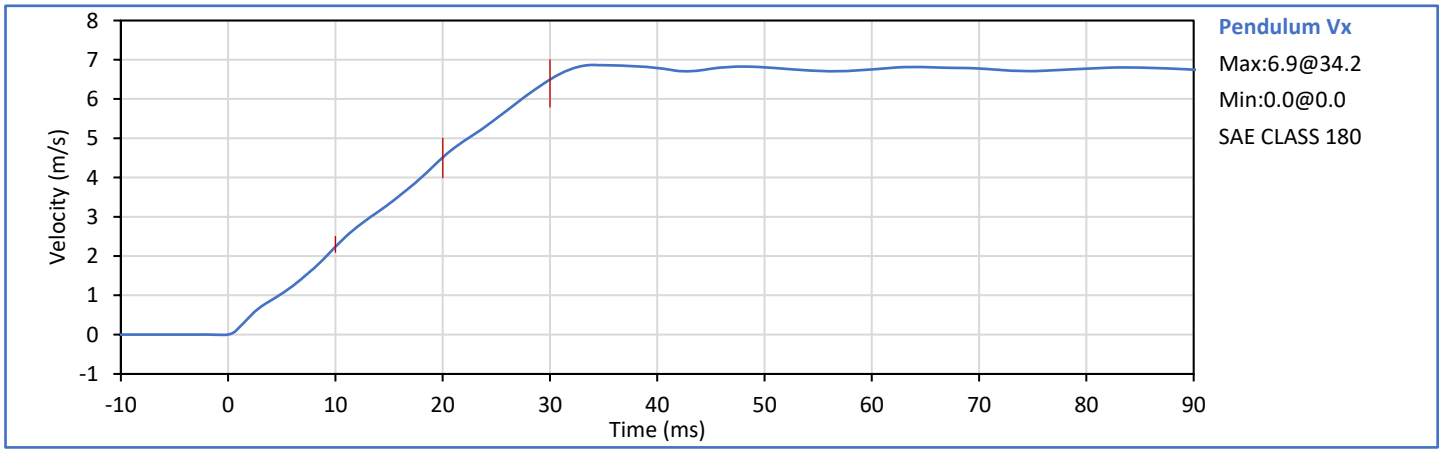
Hybrid III 5th Percentile Female ATD
Neck Flexion Test

ATD Serial No.: DH1644

Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	47	Pass
Pendulum Velocity	m/s	6.89	7.13	7.08	Pass
Pendulum Velocity at 10 ms	m/s	2.10	2.50	2.24	Pass
Pendulum Velocity at 20 ms	m/s	4.00	5.00	4.51	Pass
Pendulum Velocity at 30 ms	m/s	5.80	7.00	6.49	Pass
Peak "D" Plane Rotation	deg	77.0	91.0	86.7	Pass
Peak Moment in Rotation	Nm	69.0	83.0	81.6	Pass
Positive Moment Decay to 10 Nm	ms	80.0	100.0	83.5	Pass
			Overall Test Results		Pass





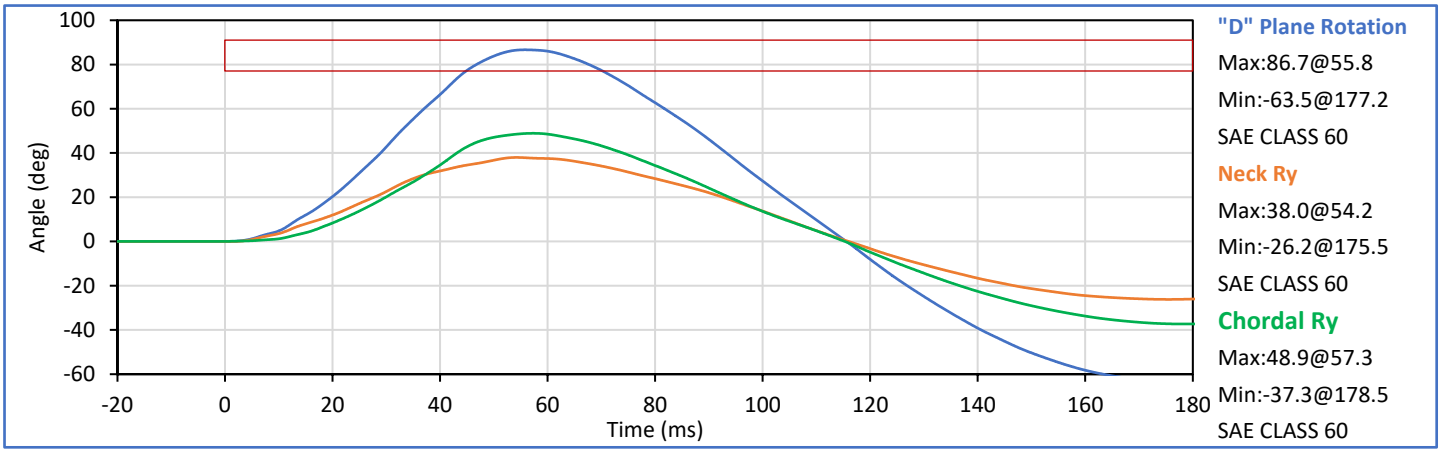
Technician: G. Holguin

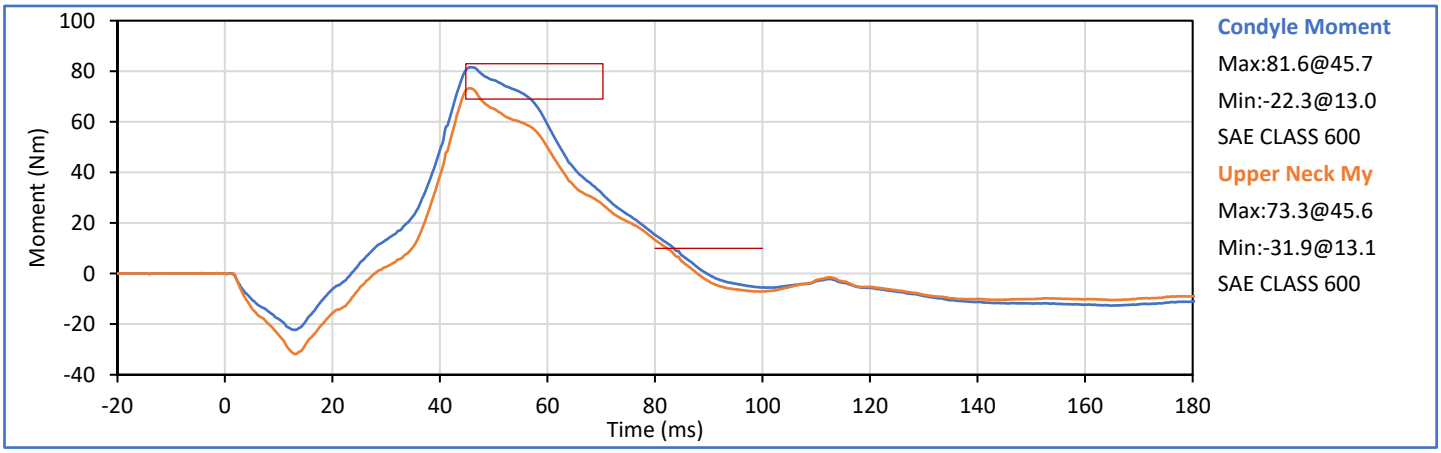
Approved By: J. Hernandez

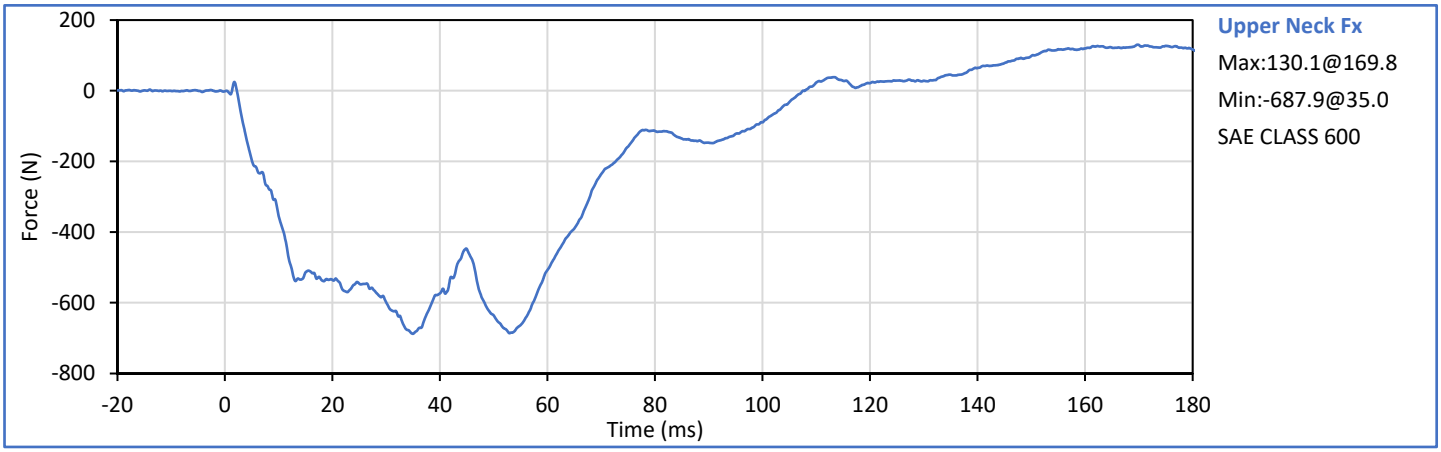
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Neck Flexion Test

ATD Serial No.: DH1644 Test Date: 2022-04-21





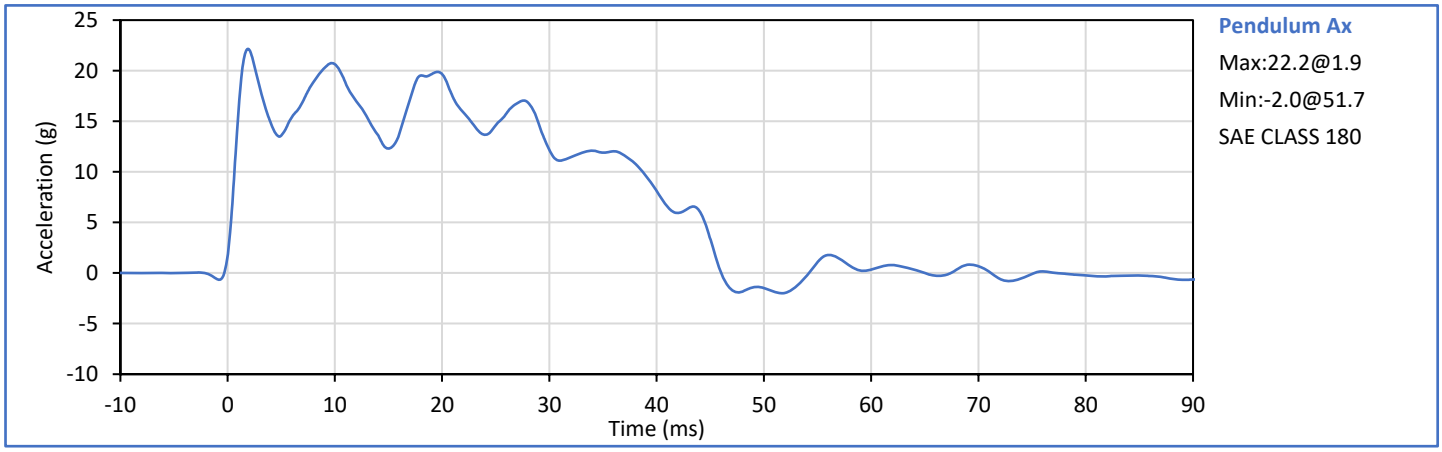


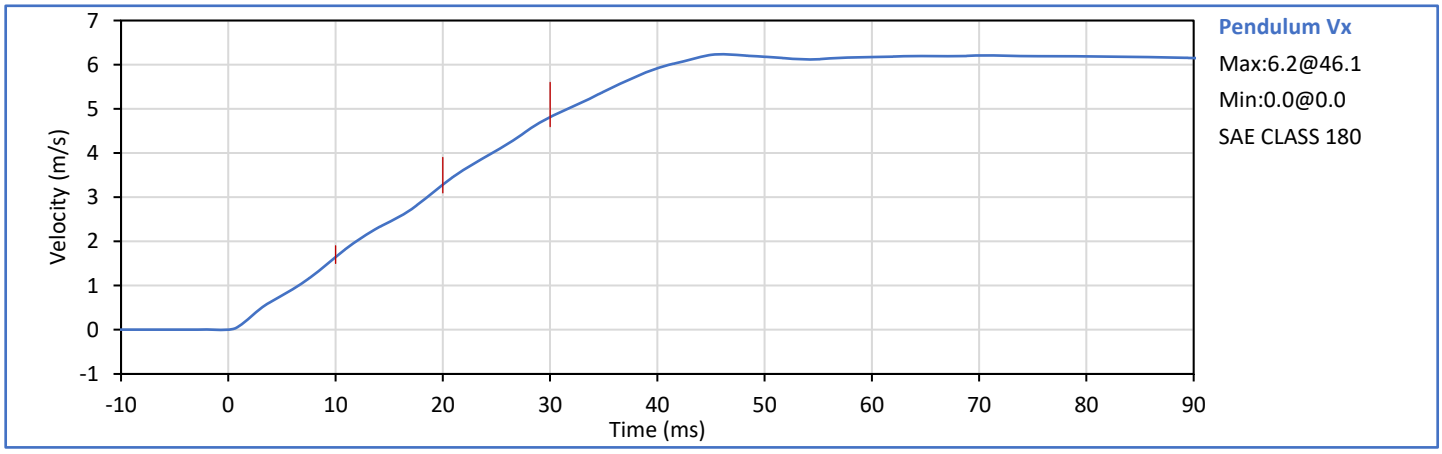
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Neck Extension Test

ATD Serial No.: DH1644 Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	33	Pass
Pendulum Velocity	m/s	5.95	6.19	6.07	Pass
Pendulum Velocity at 10 ms	m/s	1.50	1.90	1.64	Pass
Pendulum Velocity at 20 ms	m/s	3.10	3.90	3.28	Pass
Pendulum Velocity at 30 ms	m/s	4.60	5.60	4.81	Pass
Peak "D" Plane Rotation	deg	99.0	114.0	102.7	Pass
Peak Moment in Rotation	Nm	-65.0	-53.0	-62.9	Pass
Negative Moment Decay to -10 Nm	ms	94.0	114.0	99.2	Pass
			Overall Test Results		Pass





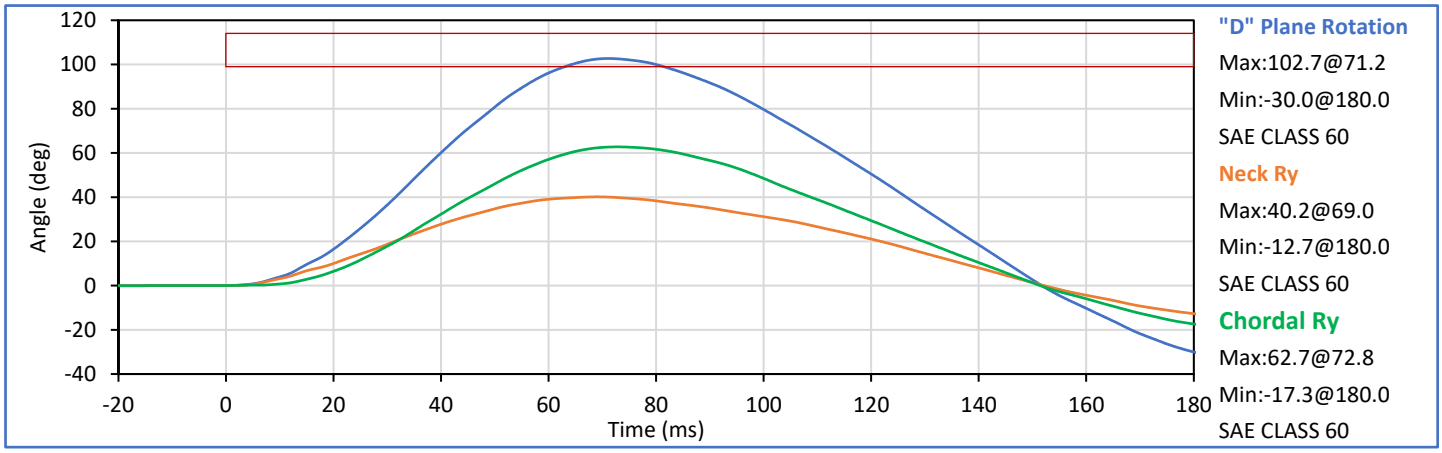
Technician: G. Holguin

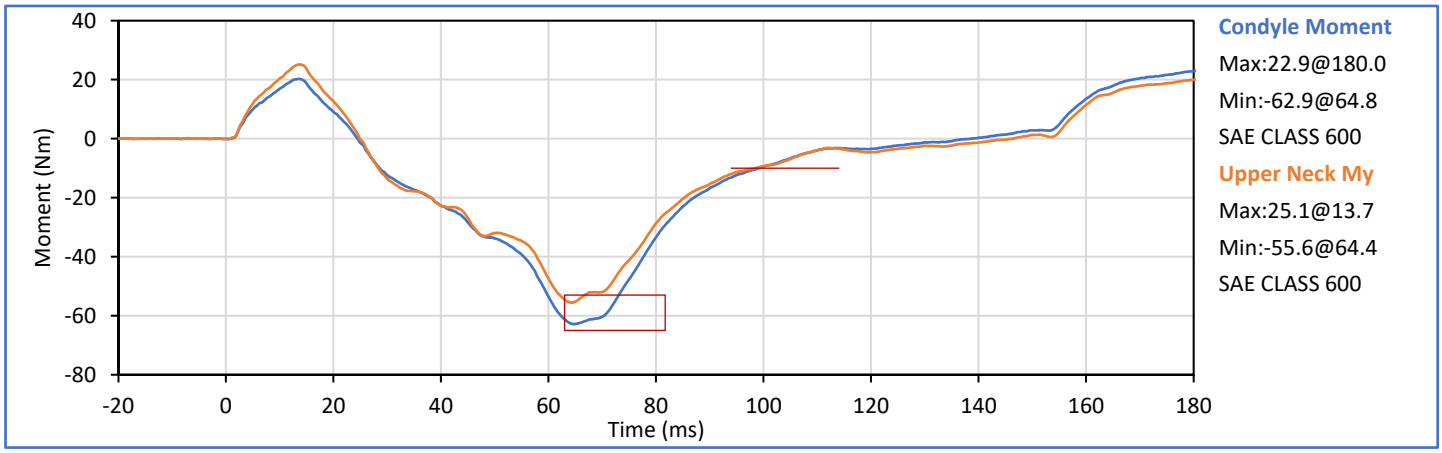
Approved By: J. Hernandez

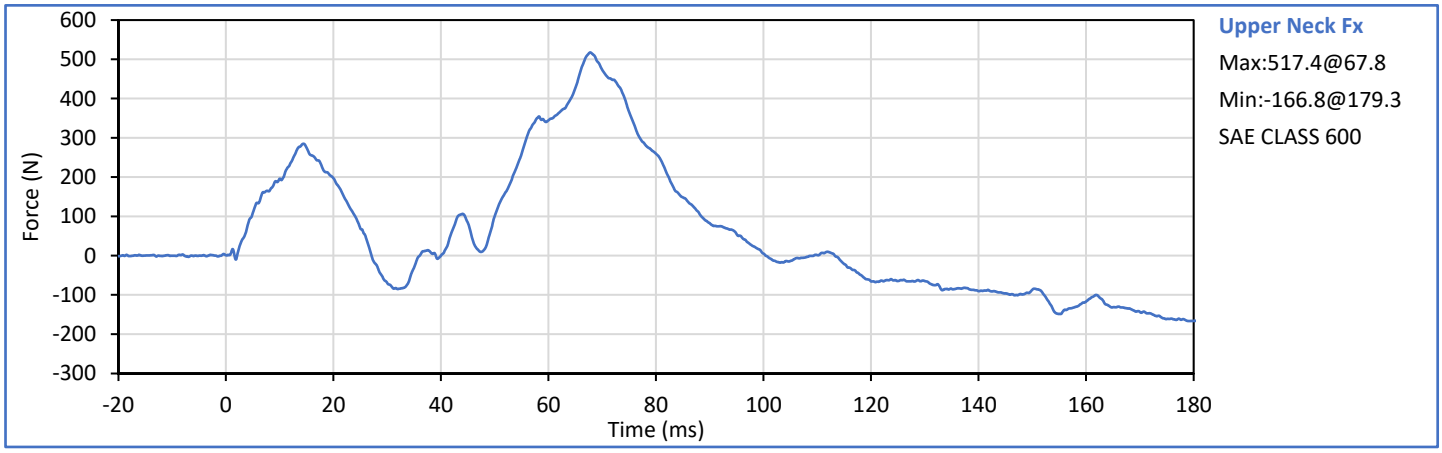
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Neck Extension Test

ATD Serial No.: DH1644 Test Date: 2022-04-21







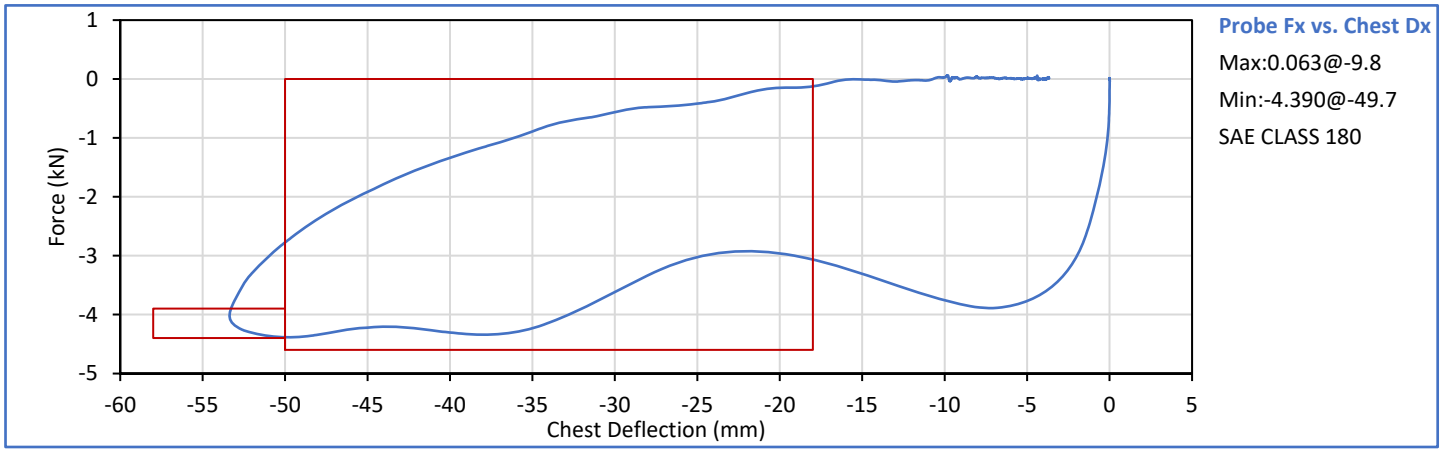
Applus IDIADA KARCO

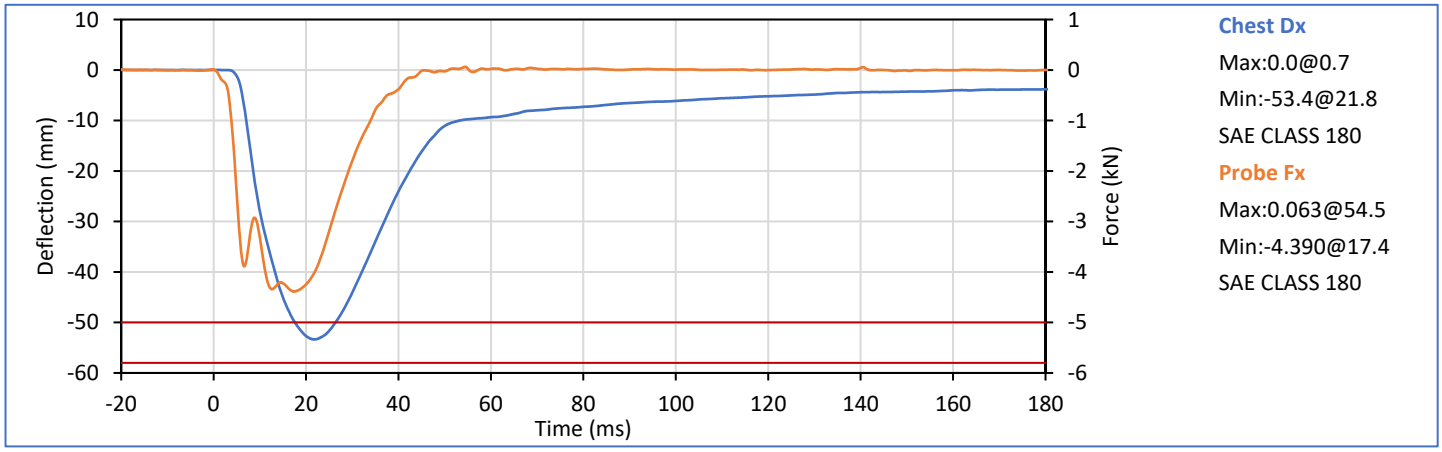
Hybrid III 5th Percentile Female ATD
Thorax Impact

ATD Serial No.: DH1644

Test Date: 2022-04-18

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory RelativeHumidity	%	10	70	46	Pass
Probe Velocity	m/s	6.59	6.83	6.73	Pass
Peak Chest Deflection	mm	-58.0	-50.0	-53.4	Pass
Peak Probe Force, 50 and 58 mm	kN	-4.400	-3.900	-4.385	Pass
Peak Probe Force, 18 and 50 mm	kN	-4.600	0.000	-4.390	Pass
Internal Hysterisis	%	69.0	85.0	77.7	Pass
			Overall Test Results		Pass





Technician: G. Holguin

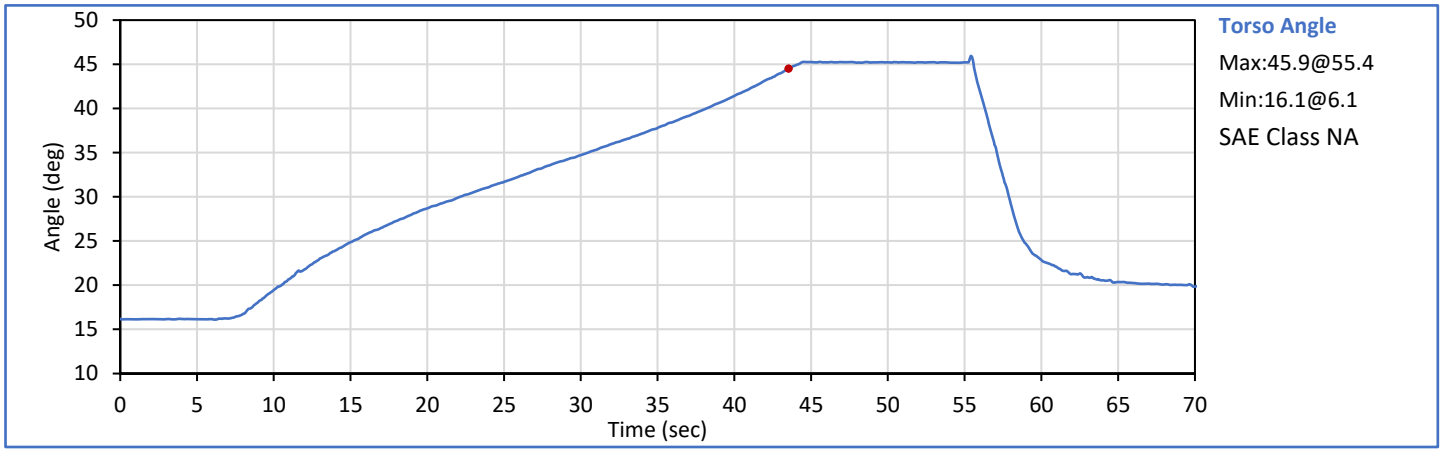
Approved By: J. Hernandez

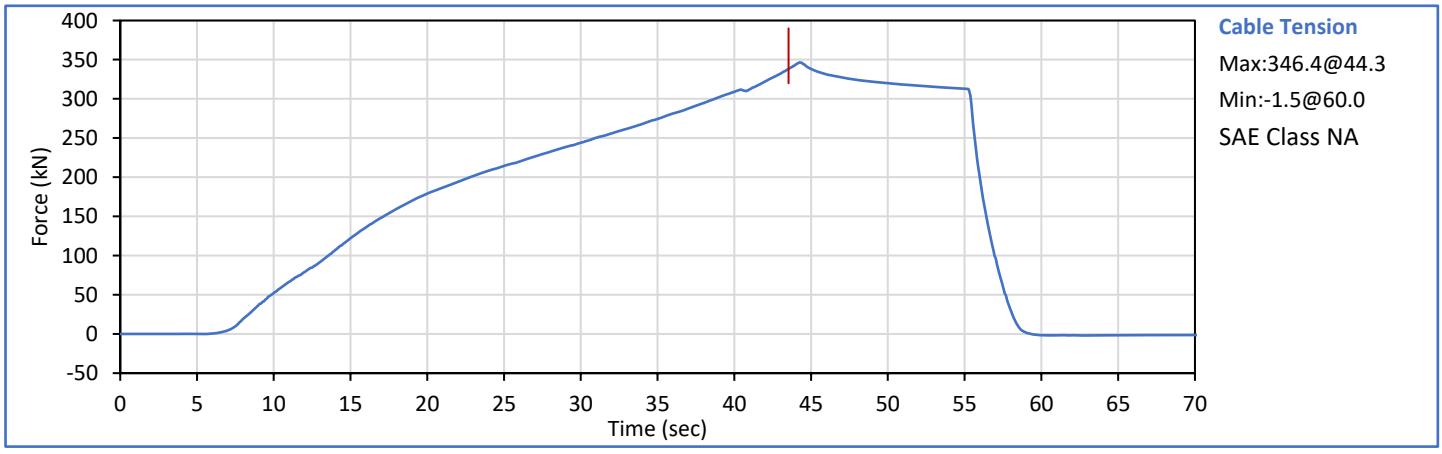
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Torso Flexion Test

ATD Serial No.: DH1644 Test Date: 2022-04-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	46	Pass
Orientation Angle	deg	0.0	20.0	15.9	Pass
Test Initial Angle	deg	11.0	19.0	16.1	Pass
Peak Force at 45° (+/-0.5°)	N	320.0	390.0	338.1	Pass
Torso Flexion Rate	deg/s	0.50	1.50	0.77	Pass
Final Reference Plane Angle	deg	-8.0	8.0	3.6	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

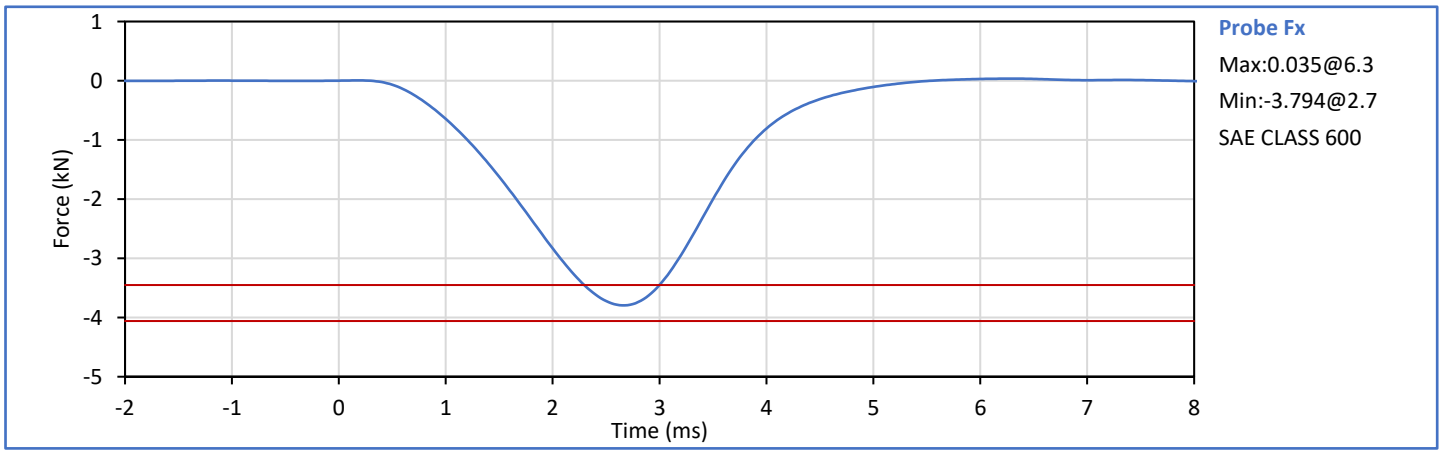
Applus IDIADA
KARCO

Hybrid III 5th Percentile Female ATD
Knee Impact (Left)

ATD Serial No.: DH1644

Test Date: 2022-04-20

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.6	Pass
Laboratory Relative Humidity	%	10	70	15	Pass
Probe Velocity	m/s	2.070	2.130	2.101	Pass
Peak Resistive Force	kN	-4.060	-3.450	-3.794	Pass
			Overall Test Results		Pass



Technician: G. Holguin

Approved By: J. Hernandez

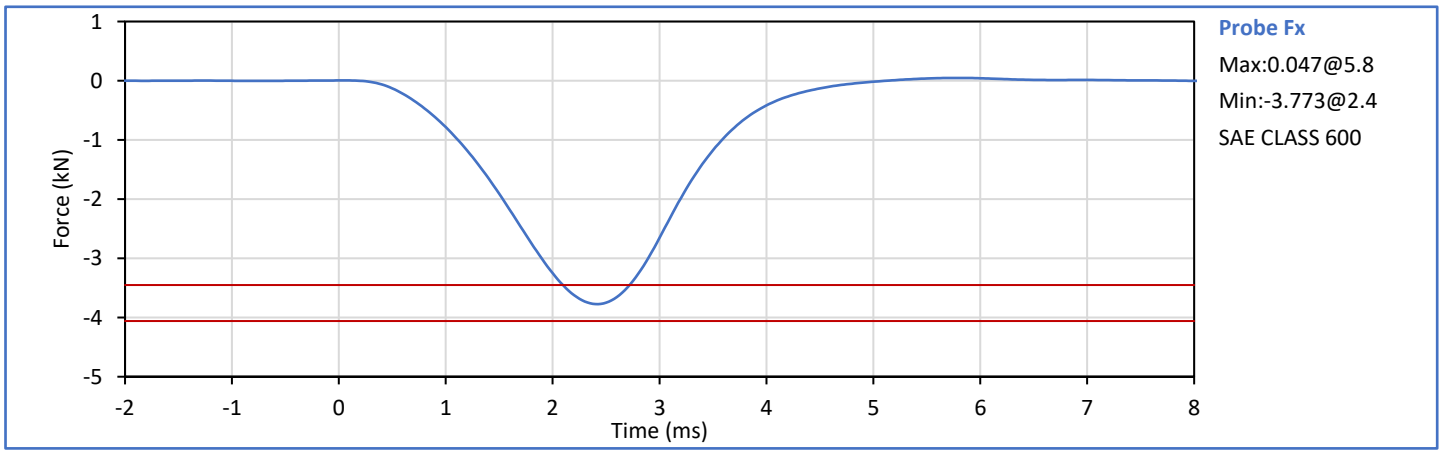
Applus IDIADA KARCO

Hybrid III 5th Percentile Female ATD
Knee Impact (Right)

ATD Serial No.: DH1644

Test Date: 2022-04-20

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.6	Pass
Laboratory Relative Humidity	%	10	70	15	Pass
Probe Velocity	m/s	2.070	2.130	2.105	Pass
Peak Resistive Force	kN	-4.060	-3.450	-3.773	Pass
			Overall Test Results		Pass



Technician: G. Holguin

Approved By: J. Hernandez

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

H3-50M ATD S/N: 360

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P49209	Endevco	7264C-2k	2022-04-06
Head Acceleration Y Primary	P49228	Endevco	7264C-2k	2022-04-06
Head Acceleration Z Primary	P50101	Endevco	7264C-2k	2022-04-06
Head Acceleration X Redundant	P50103	Endevco	7264C-2k	2022-04-06
Head Acceleration Y Redundant	P49210	Endevco	7264C-2k	2022-04-06
Head Acceleration Z Redundant	P58713	Endevco	7264C-2k	2022-04-06
Head Rotation Rate X	ARS7587	DTS	ARS PRO-8k (2kHz)	2022-03-15
Head Rotation Rate Y	ARS7426	DTS	ARS PRO-8k (2kHz)	2022-03-15
Head Rotation Rate Z	ARS7480	DTS	ARS PRO-8k (2kHz)	2022-03-15
Upper Neck Force X	782 Fx	R.A. Denton	1716A	2022-03-30
Upper Neck Force Y	782 Fy	R.A. Denton	1716A	2022-03-30
Upper Neck Force Z	782 Fz	R.A. Denton	1716A	2022-03-30
Upper Neck Moment X	782 Mx	R.A. Denton	1716A	2022-03-30
Upper Neck Moment Y	782 My	R.A. Denton	1716A	2022-03-30
Upper Neck Moment Z	782 Mz	R.A. Denton	1716A	2022-03-30
Chest Acceleration X Primary	P52112	Endevco	7264C-2k	2022-04-06
Chest Acceleration Y Primary	P49208	Endevco	7264C-2k	2022-04-06
Chest Acceleration Z Primary	P51264	Endevco	7264C-2k	2022-04-06
Chest Acceleration X Redundant	P49461	Endevco	7264C-2k	2022-04-06
Chest Acceleration Y Redundant	P58774	Endevco	7264C-2k	2022-04-06
Chest Acceleration Z Redundant	P49168	Endevco	7264C-2k	2022-04-06
Chest Deflection	0606 (H3)	Servo	14CBI-3615	2022-04-07
Pelvis Acceleration X	P49238	Endevco	7264C-2k	2022-04-06
Pelvis Acceleration Y	P58877	Endevco	7264C-2k	2022-04-06
Pelvis Acceleration Z	P50087	Endevco	7264C-2k	2022-04-06
Left Femur Force Z	107 (pri)	R.A. Denton	3821JTF	2022-03-29
Right Femur Force Z	102 (pri)	R.A. Denton	3821JTF	2022-03-29
Left Femur Force Z Redundant	107 (red)	R.A. Denton	3821JTF	2022-03-29
Right Femur Force Z Redundant	102 (red)	R.A. Denton	3821JTF	2022-03-29
Left Upper Tibia Moment X	DH3054 Mx	R.A. Denton	IF-857	2022-03-28
Left Upper Tibia Moment Y	DH3054 My	R.A. Denton	IF-857	2022-03-28
Left Upper Tibia Force Z	DH3054 Fz	R.A. Denton	IF-857	2022-03-28
Left Lower Tibia Moment X	497 Mx	R.A. Denton	3644	2022-03-29
Left Lower Tibia Moment Y	497 My	R.A. Denton	3644	2022-03-29
Left Lower Tibia Force Z	497 Fz	R.A. Denton	3644	2022-03-29
Right Upper Tibia Moment X	DH3302 Mx	FTSS	IF-857	2022-03-29
Right Upper Tibia Moment Y	DH3302 My	FTSS	IF-857	2022-03-29
Right Upper Tibia Force Z	DH3302 Fz	FTSS	IF-857	2022-03-29
Right Lower Tibia Moment X	494 Mx	R.A. Denton	3644	2022-03-29
Right Lower Tibia Moment Y	494 My	R.A. Denton	3644	2022-03-29
Right Lower Tibia Force Z	494 Fz	R.A. Denton	3644	2022-03-29
Left Ankle Acceleration X	03E20-N09	Entran	EGEB6Q-2k	2022-04-09
Left Ankle Acceleration Z	03D30-N13	Entran	EGEB6Q-2k	2022-04-09
Left Toe Acceleration Z	03H07-Z10	Entran	EGEB6Q-2k	2022-04-09
Right Ankle Acceleration X	03E29-N20	Entran	EGEB6Q-2k	2022-04-09
Right Ankle Acceleration Z	03E18-F02	Entran	EGEB6Q-2k	2022-04-09
Right Toe Acceleration Z	03D09-N01	Entran	EGEB6Q-2k	2022-04-09
Seat Belt Outside Lap Force	177	FTSS	IF-964	2021-09-06
Seat Belt Upper Diagonal Force	313	FTSS	IF-964	2021-09-06

Table 2 - Right Front Passenger ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P51889	Endevco	7264C-2k	2022-04-05
Head Acceleration Y Primary	P51861	Endevco	7264C-2k	2022-04-05
Head Acceleration Z Primary	P52077	Endevco	7264C-2k	2022-04-05
Head Acceleration X Redundant	P58835	Endevco	7264C-2k	2022-04-05
Head Acceleration Y Redundant	P51703	Endevco	7264C-2k	2022-04-05
Head Acceleration Z Redundant	P52096	Endevco	7264C-2k	2022-04-05
Head Rotation Rate X	ARS7367	DTS	ARS PRO-8k (2kHz)	2022-03-15
Head Rotation Rate Y	ARS7377	DTS	ARS PRO-8k (2kHz)	2022-03-15
Head Rotation Rate Z	ARS7498	DTS	ARS PRO-8k (2kHz)	2022-03-15
Upper Neck Force X	452 Fx	R.A. Denton	1716A	2022-03-30
Upper Neck Force Y	452 Fy	R.A. Denton	1716A	2022-03-30
Upper Neck Force Z	452 Fz	R.A. Denton	1716A	2022-03-30
Upper Neck Moment X	452 Mx	R.A. Denton	1716A	2022-03-30
Upper Neck Moment Y	452 My	R.A. Denton	1716A	2022-03-30
Upper Neck Moment Z	452 Mz	R.A. Denton	1716A	2022-03-30
Chest Acceleration X Primary	P58860	Endevco	7264C-2k	2022-04-05
Chest Acceleration Y Primary	P51876	Endevco	7264C-2k	2022-04-05
Chest Acceleration Z Primary	P58711	Endevco	7264C-2k	2022-04-05
Chest Acceleration X Redundant	P52049	Endevco	7264C-2k	2022-04-05
Chest Acceleration Y Redundant	P51862	Endevco	7264C-2k	2022-04-05
Chest Acceleration Z Redundant	P52048	Endevco	7264C-2k	2022-04-05
Chest Deflection	0724 (HF)	Servo	14CBI-3615	2022-04-07
Pelvis Acceleration X	P52090	Endevco	7264C-2k	2022-04-05
Pelvis Acceleration Y	P58849	Endevco	7264C-2k	2022-04-05
Pelvis Acceleration Z	P58756	Endevco	7264C-2k	2022-04-05
Left Femur Force Z	110 (pri)	R.A. Denton	3821JTF	2022-03-29
Right Femur Force Z	113 (pri)	R.A. Denton	3821JTF	2022-03-29
Left Femur Force Z Redundant	110 (red)	R.A. Denton	3821JTF	2022-03-29
Right Femur Force Z Redundant	113 (red)	R.A. Denton	3821JTF	2022-03-29
Left Upper Tibia Moment X	468 Mx	R.A. Denton	3643	2022-03-29
Left Upper Tibia Moment Y	468 My	R.A. Denton	3643	2022-03-29
Left Upper Tibia Force Z	468 Fz	R.A. Denton	3643	2022-03-29
Left Lower Tibia Moment X	399 Mx	R.A. Denton	3644	2022-03-29
Left Lower Tibia Moment Y	399 My	R.A. Denton	3644	2022-03-29
Left Lower Tibia Force Z	399 Fz	R.A. Denton	3644	2022-03-29
Right Upper Tibia Moment X	482 Mx	R.A. Denton	3643	2022-03-29
Right Upper Tibia Moment Y	482 My	R.A. Denton	3643	2022-03-29
Right Upper Tibia Force Z	482 Fz	R.A. Denton	3643	2022-03-29
Right Lower Tibia Moment X	499 Mx	R.A. Denton	3644	2022-03-29
Right Lower Tibia Moment Y	499 My	R.A. Denton	3644	2022-03-29
Right Lower Tibia Force Z	499 Fz	R.A. Denton	3644	2022-03-29
Left Ankle Acceleration X	P52057	Endevco	7264C-2k	2022-04-05
Left Ankle Acceleration Z	03E18-F07	Entran	EGEB6Q-2k	2022-04-05
Left Toe Acceleration Z	P49224	Endevco	7264C-2k	2022-04-05
Right Ankle Acceleration X	P52019	Endevco	7264C-2k	2022-04-05
Right Ankle Acceleration Z	P58755	Endevco	7264C-2k	2022-04-05
Right Toe Acceleration Z	P52076	Endevco	7264C-2k	2022-04-05
Seat Belt Outside Lap Force	300	FTSS	IF-964	2021-09-06
Seat Belt Upper Diagonal Force	315	FTSS	IF-964	2021-09-06

Table 3 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Left Rear Primary Ax	A358576	MSI	52F-2k	2022-01-18
Right Rear Primary Ax	A361340	MSI	52F-2k	2021-11-15
Engine Top Ax	A354866	MSI	52F-2k	2021-11-03
Engine Bottom Ax	A356506	MSI	52F-2k	2021-11-03
Left Rear Az	A356492	MSI	52F-2k	2021-11-15
Right Rear Az	A361479	MSI	52F-2k	2022-01-14
Left Rear Redundant Ax	A356485	MSI	52F-2k	2021-11-03
Right Rear Redundant Ax	A361501	MSI	52F-2k	2021-11-15