REPORT NUMBER: R&D-KAR-20-003

VEHICLE TO RIGID BARRIER CRASH TEST IN SUPPORT OF NHTSA'S FRONTAL RESEARCH CRASH TEST PROGRAM LEFT SIDE 30° FRONTAL RIGID BARRIER IMPACT

HONDA OF AMERICA MFG., INC.
2020 HONDA ACCORD 4-DOOR SEDAN

NHTSA No: R20205380

PREPARED BY:
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NOVEMBER 13, 2020

FINAL REPORT

PREPARED FOR:
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
VEHICLE SAFETY RESEARCH
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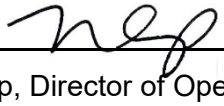
Approved By: 

Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC.

Approval Date: November 13, 2020

FINAL REPORT ACCEPTANCE BY VEHICLE SAFETY RESEARCH,
OFFICE OF STRUCTURAL AND RESTRAINTS RESEARCH DIVISION:

TOM, Vehicle Crash Testing
NHTSA, Office of Structures and Restraints Research

Date:

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
R&D-KAR-20-003		

4. Title and Subtitle	5. Report Date
Final Report of Frontal Research Crash Testing of a 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380	November 13, 2020
	6. Performing Organization Code KAR
7. Authors Mr. Matthew J. Angeles, Project Engineer, Applus IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus IDIADA KARCO	**8. Performing Organization Report No.** TR-P40202-01-NC
9. Performing Organization Name and Address Applus IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.**
	11. Contract or Grant No. DTNH22-14-D-00360L
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Research 1200 New Jersey Ave., SE, Room W46-446 Washington, D.C. 20590	**13. Type of Report and Period Covered** Final Test Report, October 1 - November 13, 2020
	14. Sponsoring Agency Code NVS-321

15. Supplementary Notes

16. Abstract

A 48.0 km/h Left Side 30° Frontal Rigid Barrier Impact Test was conducted on a 2020 Honda Accord 4-door sedan in accordance with Contract DTNH22-14-D-00360L, Task Order #693JJ918F000199. The test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at the Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on October 1, 2020.

The impact velocity of the vehicle was 48.11 km/h and the ambient temperature at the barrier face at the time of impact was 30.0°C. The vehicle's post-test maximum crush was 545.4 mm measured to left of the vehicle's centerline. The test vehicle's performance was as follows:

Measurement Description	Units	Driver Hybrid III	Passenger THOR
		Result	Result
Head Injury Criteria (HIC_{15})		257.4	356.9
Brain Injury Criteria (BrIC)			0.8
Nij		0.3	
Peak Neck Tension	N	871.5	605.4
Peak Neck Compression	N	-1010.3	-2464.4
Peak Chest Deflection	mm	-20.8	61.5
Peak Abdomen Deflection	mm		-43.8
Peak Resultant Acetabulum Force	N		3547.2
Peak Femur Force	N	-9066.2	-4061.4
Peak Tibia Index			0.5

17. Key Words	18. Distribution Statement
30° Frontal Rigid Barrier Impact Frontal Research Crash Test THOR Hybrid III	Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division 1200 New Jersey Ave., SE Washington, D.C. 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	212	

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SECTION 1

TEST PURPOSE AND PROCEDURE

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

This 48.0 km/h (29.8 mph) Left Side 30° Frontal Rigid Barrier Impact Test is part of the Frontal Research Crash Test Program outlined in Contract No. DTNH22-14-D-00360L, Task Order #693JJ918F000199. The purpose of this test is to obtain vehicle crashworthiness and occupant restraint system performance data for research purposes.

This test was conducted in accordance with the instructions set forth for a 48.0 km/h Left Side 30° Frontal Rigid Barrier Impact, outlined in Contract No. DTNH22-14-D-00360L, Task Order #693JJ918F000199. Data indicant of Federal Motor Vehicle Safety Standard FMVSS 208 - Occupant Crash Protection, FMVSS 212 – Windshield Mounting, FMVSS 219 (partial) – Windshield Zone Intrusion, and FMVSS 301 – Fuel System Integrity was obtained, in addition to the data required by Contract No. DTNH22-14-D-00360L, Task Order #693JJ918F000199.

SECTION 2
SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

A 48.0 km/h Left Side 30° Frontal Rigid Barrier Impact Test was conducted on a 2020 Honda Accord 4-door sedan. The test was performed at Applus IDIADA KARCO Engineering, LLC. on September 9, 2020.

The test was documented by one (1) real-time and eighteen (18) high-speed video cameras. Pre- and post-test photographs of the test vehicle and test setup were taken using a digital still camera. Photographic documentation of the test is presented in Appendix A of this report.

One (1) 50th percentile adult male Hybrid III anthropomorphic test device (ATD) (Serial No. 168) was seated in the left front seating position (P1 – Driver) and one 50th percentile THOR ATD (Serial No. DO9799) was seated in the right front seating position (P3 – Passenger). The driver was positioned according to instructions specified in FMVSS 208 Appendix F, Dummy Positioning Procedures for Driver and Passenger Test Dummy Conforming to Subpart E of Part 572. The passenger was positioned according to instructions specified in the THOR 50th Percentile Male Dummy Seating & Positioning Procedures: Right Front Passenger Position.

The driver was restrained with frontal, knee, curtain, and torso/pelvis airbags. The passenger was restrained with frontal and knee airbags. Both ATDs were unbelted for this test.

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

One hundred eighty-one (191) channels of data from the two (2) ATD's and the test vehicle were collected using Diversified Technical Systems, Inc. data acquisition systems. Appendix B contains dummy data plots, as well as vehicle response data plots.

There was 100% total windshield retention. There was no intrusion into the protected zone of the windshield during any portion of the impact event. The maximum static crush of the vehicle was 545.4 mm measured on the left of the vehicle's centerline.

All four vehicle doors remained closed and latched during the test. All doors remained operational after the impact event.

Structural observations include the following:

- The front end including the bumper, grille, and hood were crushed, with the damage concentrated on the left side

The driver ATD's visible contact points were:

- Head contacted the front airbag, curtain airbag, headliner, A-pillar
- Upper torso contacted the front airbag, torso/pelvis airbag, and door panel
- Lower torso contacted the front airbag
- Left leg contacted the knee airbag, knee bolster
- Right leg contacted the knee airbag, knee bolster, and steering column

The right front passenger ATD's visible contact points were:

- Head contacted the front airbag, sun visor, and headliner
- Upper torso contacted the front airbag
- Lower torso contacted the front airbag
- Left leg contacted the knee airbag and knee bolster
- Right leg contacted the knee airbag

SECTION 2 … (CONTINUED)

SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Impact Velocity	km/h	48.11
Test Vehicle Weight	kg	1661.0
Maximum Static Crush	mm	545.4
Number of Data Channels		191
Number of Real-Time Cameras		1
Number of High-Speed Cameras		18

DUMMY CONTACTS

Description	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	Hybrid III, S/N: 168		THOR, S/N: DO9799	
Head Contact	Front Airbag, Curtain Airbag, Headliner, A-Pillar	A-45, A-46	Front Airbag, Sun Visor, Headliner	A-69, A-70
Upper Torso Contact	Front Airbag, Torso/Pelvis Airbag, Door Panel	A-47	Front Airbag	N/A
Lower Torso Contact	Front Airbag	N/A	Front Airbag	N/A
Left Leg Contact	Knee Airbag, Knee Bolster	A-40, A-46	Knee Airbag, Knee Bolster	A-63, A-64, A-65, A-70
Right Leg Contact	Knee Airbag	A-46	Knee Airbag	A-70

SECTION 2 … (CONTINUED)

SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

DATA ANOMALIES

Channel Description	Explanation
P2TH FEMUR LEFT Y MOMENT	Channel failed at 76.6 ms. The Femur Left Y Moment cable was found to be damaged. The cable was repaired post-test.
P2TH MID TIBIA LEFT X ACCELERATION	No data collected. The Left Tibia Ax cable was found damged upon receipt of the ATD and the damage was deemed too close to the accelerometer head to repair. NHTSA approved running the test without recording this channel.
P2TH MID TIBIA RIGHT X ACCELERATION	No data collected. The Right Tibia Ax cable was damaged and it was deemed too close to the accelerometer head to repair. NHTSA approved running the test without recording this channel.

SECTION 2 … (CONTINUED)

SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

	Driver, Hybrid III 50th Percentile Male S/N 168				
Injury Reading	**Units**	**Limit**	**Value**	**t^1**	**t^2**
HIC 15		700	257.422	87.4	98.7
Nij		1	0.254	97.2	***NCE***
Upper Neck Force Z (Tension)	N	4170	871.549	86.6	
Upper Neck Force Z (Compression)	N	4000	-1010.334	96.5	
Upper Neck Moment Y (Flexion)	Nm	310	43.175	66.9	
Upper Neck Moment Y (Extension)	Nm	135	-17.895	115.1	
Chest Deflection	mm	63	-20.798	104.6	
3 ms Chest Clip	g	60	46.545	93.1	96.1
Femur Force, Left	N	10000	-4644.540	80.1	
Femur Force, Right	N	10000	-9066.172	81.9	

SECTION 2 … (CONTINUED)

SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

Passenger, THOR S/N DO9799					
LOCATION	**DESCRIPTION**	**UNIT**	**SOURCE**	**MAX**	**MIN**
Head	HIC 15ms		Compute	356.9	
	Brain Injury Criteria (BrIC)		Compute	0.775	
	Head Rotational Velocity X	Deg/s	60	928.6	-803.8
	Head Rotational Velocity Y	Deg/s	60	1100.9	-1760.0
	Head Rotational Velocity Z	Deg/s	60	1044.8	-1215.2
Neck	Upper Neck Z-axis Force	N	1000	605.4	-2464.4
	Upper Neck Y-axis Moment	Nm	600	18.0	-36.9
Chest	Upper Left Resultant Chest Deflection	mm	Compute	39.5	
	Upper Right Resultant Chest Deflection	mm	Compute	26.5	
	Lower Left Resultant Chest Deflection	mm	Compute	61.5	
	Lower Right Resultant Chest Deflection	mm	Compute	23.8	
Abdomen	Lower Left X-axis Deflection	mm	Compute	7.2	-43.8
	Lower Right X-axis Deflection	mm	Compute	5.8	-13.1
Acetabulum	Left Acetabulum Resultant Force	N	Compute	2360.7	
	Right Acetabulum Resultant Force	N	Compute	3547.2	
Femur	Left Femur Force, FZ	N	600	260.4	-3399.2
	Right Femur Force, FZ	N	600	259.9	-4061.4
Tibia	Left Upper Tibia, FZ	N	600	193.6	-1922.3
	Left Upper Tibia Index		Compute	0.503	
	Right Upper Tibia, FZ	N	600	208.6	-2109.9
	Right Upper Tibia Index		Compute	0.285	
	Left Lower Tibia, FZ	N	600	159.9	-1981.0
	Left Lower Tibia Index		Compute	0.278	
	Right Lower Tibia, FZ	N	600	137.1	-2421.5
	Right Lower Tibia Index		Compute	0.156	
Ankle	Left Ankle Rotation, RX	Deg	180	23.5	-32.0
	Left Ankle Rotation, RY	Deg	180	24.4	-25.6
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	78.8	-56.4
	Left Ankle In/Eversion Moment, MX	Nm	Compute	38.2	-34.1
	Right Ankle Rotation, RX	Deg	180	13.7	-18.3
	Right Ankle Rotation, RY	Deg	180	-1.9	-24.4
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	16.4	-10.6
	Right Ankle In/Eversion Moment, MX	Nm	Compute	16.7	-19.7

Anomalies:

None

SECTION 3

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

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: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	R20205380
Model Year	2020
Make	Honda
Model	Accord
Body Style	4-Door Sedan
VIN	1HGCV1F18LA084606
Body Color	Lunar Silver M.
Odometer Reading (km / mi)	10/6
Engine Displacement (L)	1.5
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	Yes
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other Safety Restraint	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of America Mfg., Inc.
Date of Manufacture	May-20

GVWR (kg)	1950
GAWR Front (kg)	1070
GAWR Rear (kg)	960

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

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

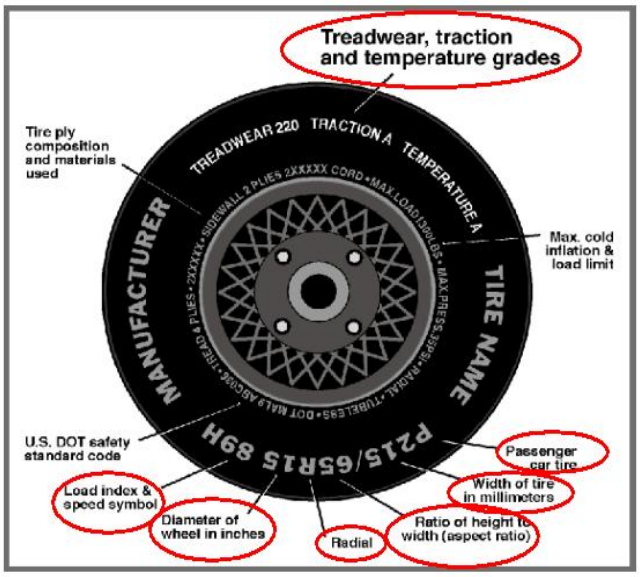
*A maximum RCLW of 136.0 kg is used for a truck, MPV, or bus

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	225/50R17	225/50R17
Tire Size on Vehicle	225/50R17	225/50R17
Tire Manufacturer	Hankook	Hankook
Tire Model	Kinergy GT	Kinergy GT
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	2 Steel, 1 Polyester, 1 Nylon	2 Steel, 1 Polyester, 1 Nylon
Load Index/Speed Symbol	94V	94V
Tire Material	Steel, Polyester, Nylon	Steel, Polyester, Nylon
DOT Safety Code Left	1T7AB 1BH0 3719	1T7AB 1BH0 3719
DOT Safety Code Right	1T7AB 1BH0 3719	1T7AB 1BH0 3719

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	432.5	289.5		468.5	363.0	
Right	kg	426.0	282.5		475.5	354.0	
Ratio	%	60.0%	40.0%	100.0%	56.8%	43.2%	100.0%
Total	kg	858.5	572.0	1430.5	944.0	717.0	1661.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1430.5	A
Weight of THOR-50M and AM50	kg	192.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	44.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1667.3	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	704	703	728	730	1130
As Tested	mm	688	687	694	698	1219
Post-Test	mm	775	694	696	691	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2825
Total Vehicle Length at Left Side	mm	4733
Total Vehicle Length at Centerline	mm	4881
Total Vehicle Length at Right Side	mm	4760
Weight of Ballast/Equipment in Cargo Area	kg	71.0
Weight of Vehicle Components Removed	kg	57.0
Amount of Stoddard Solvent in Fuel Tank	L	52.10

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Rear bumper fascia, spare tire and tools, rear trim, tail lights, trunk lid, rear seat assembly

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Units	Pre-Test
1	Total Length	mm	4881
2	Total Width	mm	1862
3*	Bumper Top Height	mm	568
4*	Bumper Bottom Height	mm	234
5*	Longitudinal Member Top Height	mm	512
6	Distance Between Longitudinal Members	mm	921
7	Longitudinal Member Width	mm	106
8*	Engine Top Height	mm	817
9*	Engine Bottom Height	mm	194
10	Engine and Gearbox Width	mm	569
11	Front Bumper to Engine Distance	mm	418
12*	Front Shock Absorber Fixing Height	mm	883
13*	Bonnet Leading Edge Height	mm	803
14	Front Shock Absorber Fixing Width	mm	1179
15	Front Bumper to Front Axle Distance	mm	926
16	Front Axle to A-Pillar Distance	mm	563
17	A-Pillar to B-Pillar Distance	mm	1059
18	B-Pillar to Rear Axle Distance	mm	1202
19	B-Pillar to C-Pillar Distance	mm	957
20*	Roof Sill Bottom Height	mm	1314
21*	Roof Sill Top Height	mm	1429
22*	Floor Sill Bottom Height	mm	190
23*	Floor Sill Top Height	mm	341

*Note: Height measurements are in reference to the ground.

DATA SHEET NO. 2

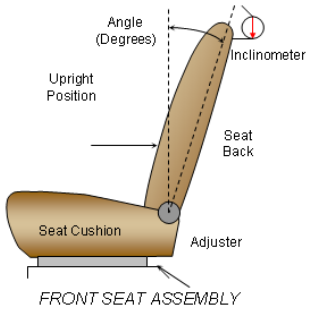
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

NOMINAL DESIGN RIDING POSITION

The driver seat back was initially set to the manufacturer's designated angle listed in FORM 208. The passenger seat back was initially set to the manufacturer's designated angle listed in FORM 208 but was moved rearward per THOR seating procedure to level the head.

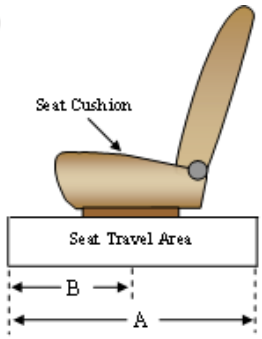


SEAT BACK ANGLE

Seating Position	Unit	FORM 208 Position	After ATD Positioning
Driver Seat Back Angle	Degrees	2.7	2.2
Passenger Seat Back Angle	Degrees	2.7	4.2

SEAT FORE / AFT POSITIONING

The driver seat travel is measured from the forward most possible position to the rear most possible position. The driver seat is set to the middle of the fore-aft travel. The passenger seat travel is measured from the forward most position to the rear most position with the seat cushion set at mid angle. The driver seat was initially positioned 25 mm rearward of mid-track before being moved as far forward as possible where the ATD did not contact any interior panels, up to mid-track.



SEAT FORE/AFT POSITIONS

Seating Position	Total Fore/Aft Travel (mm)	Placed in Position (mm)
Driver Seat	280	140
Passenger Seat	238	120

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 passenger. Position "H" is the uppermost position, followed by position "M1" and "M2." Position "L" is the lowermost position.

SEAT BELT UPPER ANCHORAGES

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

DATA SHEET NO. 2 … (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

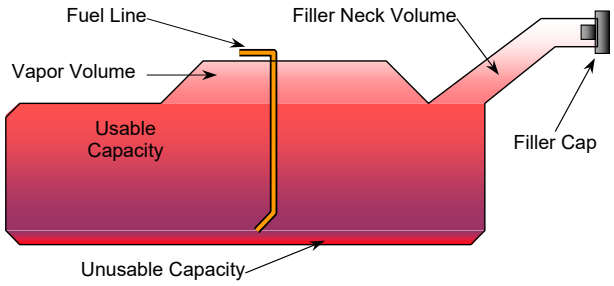
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	56.02
Usable Capacity of "Optional Tank"	
93% of Usable Capacity	52.10
Actual Amount of Stoddard Solvent Used	52.10
1/3 of Usable Capacity	18.67

FUEL PUMP

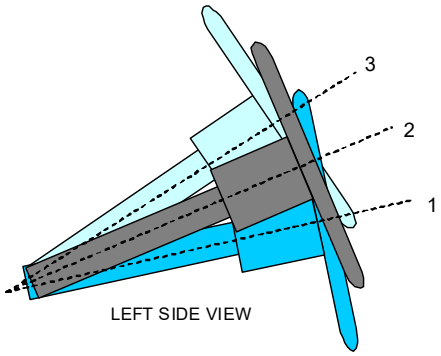
Fuel was evacuated according to the specifications provided by the manufacturer in Form 208. The electric fuel pump operates when the electrical system is activated.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

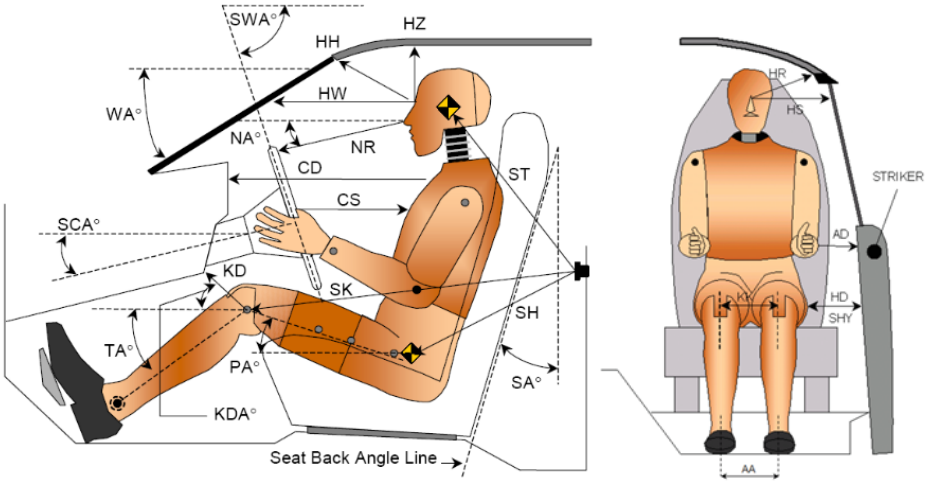
	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	17.6	95
Geometric Center Position, No. 2	20.2	116
Uppermost Position, No. 3	22.9	136
Telescoping Steering Wheel Travel		41
Test Position	20.2	116

DATA SHEET NO. 3

DUMMY CLEARANCE DIMENSIONS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20



LEFT SIDE VIEW

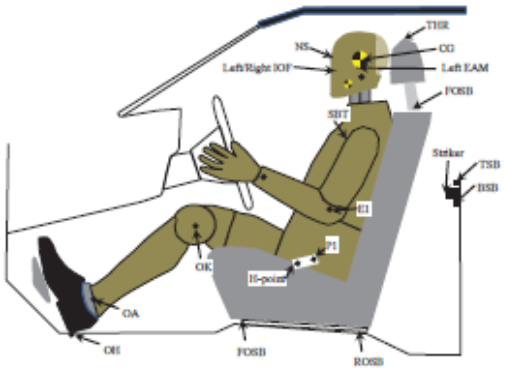
Code	Measurement Description	Driver S/N# 168		Passenger S/N# DO9799	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
HZ	Nasion to Roof (Z Distance)	218		180	
HH	Nasion to Header (3D Distance)	346		406	
HW	Nasion to Windshield Point 1 Inside (X Distance)	671		646	
NR	Tip of Nose to Top of Steering Wheel (3D Distance)	392			
CD	Chest Point 1 to Dash Point 1 (3D Distance)	542		527	
CS	Chest Point 2 to Center of Steering Wheel (X Distance)	315			
CBS	Chest Point 3 to Bottom of Steering Wheel (X Distance)	210			
IKD	Inboard Knee to Dash Point 3 (3D Distance)			105	
OKD	Outboard Knee to Dash Point 2 (3D Distance)	181		113	
HR	Nasion to Side Header (3D Distance)	229		208	
HS	Nasion to Side Window Distance (Y Distance)	362		350	
AD	Elbow to Door (Y Distance)	114		34	
HD	H-Point to Door (Y Distance)	152		145	
HLHL	Inboard Heel to Outboard Heel (Y Distance)	338		218	
KK	Inboard Knee to Outboard Knee (Y Distance)			232	
SH	Striker to H-Point (3D Distance)	432		422	
HRA	Head Restraint Post Angle		2.2		4.2
	H-Point Tool Angle		22.7		17.9
	Torso Angle		11.1		20.4
	Windshield Angle		59.6		60.6
	Head Angle (X)				-0.5
	Head Angle (Y)				0.5
	T1 Angle (X)				-0.7
	T1 Angle (Y)				2.7
	T6 Angle (X)				-0.6
	T6 Angle (Y)				23.0
	T12 Angle (X)				-0.2
	T12 Angle (Y)				31.5
	Pelvis Angle (X)				0.3
	Pelvis Angle (Y)				32.1

DATA SHEET NO. 4

DUMMY CMM MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20



Description	Units	Driver S/N# 168			Passenger S/N# DO9799		
		X	Y	Z	X	Y	Z
Center of Upper Striker Bolt	mm	2313	-816	-197	2315	795	-195
Center of Lower Striker Bolt	mm	2317	-818	-162	2319	798	-160
Center of Striker Bar	mm	2347	-818	-184	2349	798	-182
Front Outboard Seat Bolt	mm	2851	-613	305	2855	591	296
Rear Outboard Seat Bolt	mm	2448	-614	326	2452	592	317
Center of Steering Wheel Hub	mm	2906	-386	-294			
Outer Head Restraint Post	mm	2214	-454	-419	2183	441	-447
Right Head CG	mm	2484	-319	-539	2393	439	-586
Left Head CG	mm	2483	-473	-539	2394	285	-586
Right EAM	mm				2401	435	-559
Left EAM	mm						
Nasion	mm	2571	-394	-541	2486	360	-602
Right IOF	mm	2560	-363	-529	2486	393	-564
Left IOF	mm	2565	-417	-531	2486	328	-565
Tip of Nose	mm	2593	-391	-496	2489	360	-563
Tip of Chin	mm	2569	-393	-425	2491	362	-465
Chest Point 1	mm	2591	-394	-294	2546	366	-350
Chest Point 2	mm	2591	-386	-295			
Chest Point 3	mm	2647	-386	-133			
Shoulder Point 1	mm	2455	-586	-287	2393	559	-359
Shoulder Point 2	mm				2459	545	-333
Elbow	mm	2667	-672	-160	2556	645	-82
Center of H-Point Tool	mm				2559	611	38
H-Point on H-Point Tool	mm	2613	-666	121	2636	606	63
H-Point on ATD Skin	mm	2613	-567	121	2636	556	63
Outboard Knee	mm	2980	-545	-26	3037	523	-60
Inboard Knee	mm				3037	291	-61
Outboard Ankle	mm	3317	-605	199	3337	536	179
Inboard Ankle	mm	3322	-262	231	3368	324	187
Outboard Heel	mm	3340	-575	332	3354	504	326
Inboard Heel	mm	3351	-236	325	3362	286	325

Reference Point:

+X – From the rear of the vehicle to the front of the vehicle

+Y – From the left side of the vehicle to the right side of the vehicle

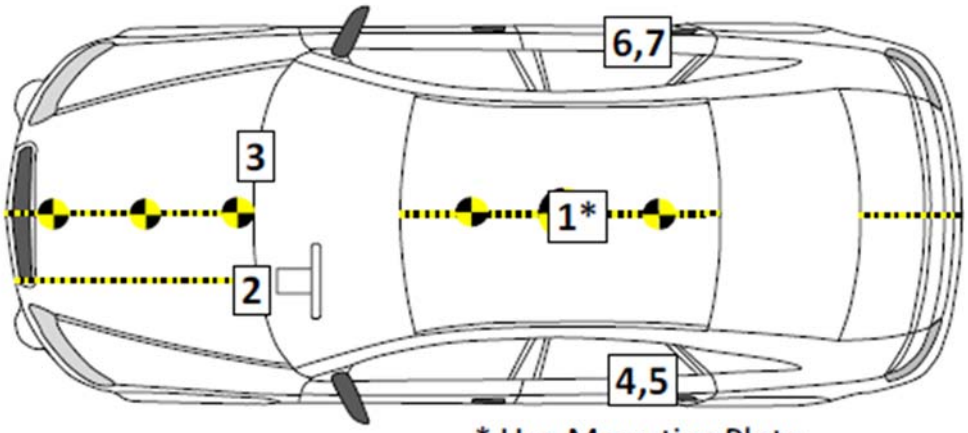
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 5

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20



* Use Mounting Plate

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS RELATIVE TO VCS

No.	Instrumentation Location	Axes	Units	Coordinates (mm)		
				X	Y	Z
1	Vehicle CG (Acceleration and Angular Rate)	x, y, z	g, °/s	2106	-1	220
2	Driver Floor Pan	x, y, z	°/s	3671	-346	140
3	Passenger Floor Pan	x, y, z	g	3670	345	151
4	Door Sill LR	x, y	g	1933	-743	148
5	Door Sill LR Redundant	x, y	g	1893	-744	247
6	Door Sill RR	x, y	g	1942	741	246
7	Door Sill RR Redundant	x, y	g	1912	742	246

Reference Point:

+X – From the rear of the vehicle to the front of the vehicle

+Y – From the left side of the vehicle to the right side of the vehicle

+Z – From the top of the vehicle to the bottom of the vehicle

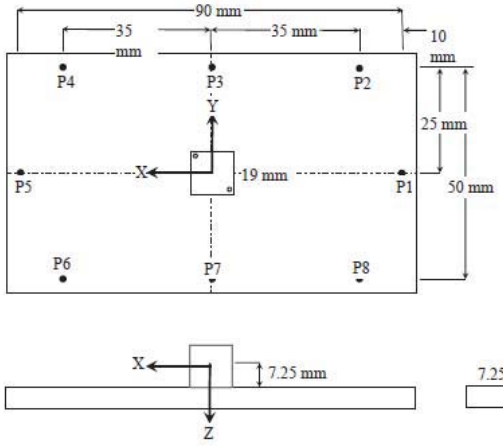
DATA SHEET NO. 5 … (CONTINUED)

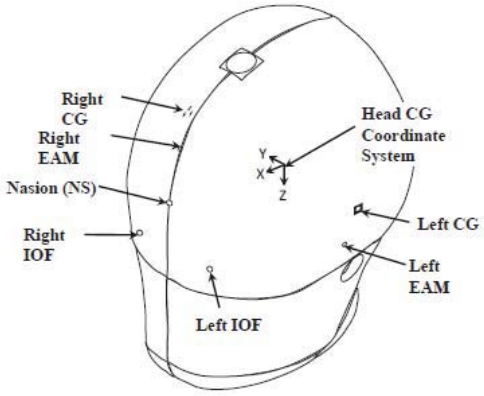
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

ANGULAR RATE SENSOR MOUNTING PLATE & THOR HEAD POINT DEFINITIONS





CG ARS MOUNTING PLATE - VEHICLE COORDINATE SYSTEM

No.	Description	Units	X	Y	Z
P1	Plate Point 1	mm	2138	2	233
P2	Plate Point 2	mm	2148	28	233
P3	Plate Point 3	mm	2183	28	233
P4	Plate Point 4	mm	2217	29	233
P5	Plate Point 5	mm	2228	4	233
P6	Plate Point 6	mm	2218	-21	232
P7	Plate Point 7	mm	2183	-22	232
P8	Plate Point 8	mm	2148	-22	233

DRIVER HEAD POINTS IN RELATION TO HEAD CG COORDINATE SYSTEM

Description	Units	x	y	z
Left CG	mm	65	-41	44
Left EAM	mm	71	-38	72
Left IOF	mm	155	3	74
Right IOF	mm	155	67	74
Nasion	mm	156	36	35
Right EAM	mm	73	108	73
Right CG	mm	66	111	45

DATA SHEET NO. 5 … (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

Location No.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Min	Time (ms)
1	Vehicle CG	x	g	1.3	137.6	-29.0	68.2
		y	g	16.6	67.7	-1.3	25.3
		z	g	13.0	33.9	-16.8	27.6
	Vehicle CG Rotation	x	°/s	44.0	59.8	-35.6	8.3
		y	°/s	63.3	5.8	-52.2	58.6
		z	°/s	24.4	68.2	-13.6	59.6
2	Driver Floor Pan	x	g	15.9	13.5	-38.6	3.8
		y	g	27.3	32.7	-10.5	26.6
		z	g	15.0	13.9	-18.4	18.0
3	Passenger Floor Pan	x	g	1.7	27.8	-25.9	68.7
		y	g	24.7	33.1	-8.1	23.7
		z	g	9.3	27.7	-8.9	22.6
4	Door Sill LR	x	g	0.9	149.6	-25.7	70.1
		y	g	14.0	33.2	-1.7	26.8
5	Door Sill LR Redundant	x	g	0.9	158.9	-28.3	69.7
		y	g	13.0	65.8	-1.3	135.6
6	Door Sill RR	x	g	1.0	164.5	-29.6	68.0
		y	g	14.7	67.5	-2.8	39.2
7	Door Sill RR Redundant	x	g	1.4	164.5	-27.8	67.9
		y	g	12.6	32.8	-1.7	27.4

Note: See Appendix B for all vehicle data plots

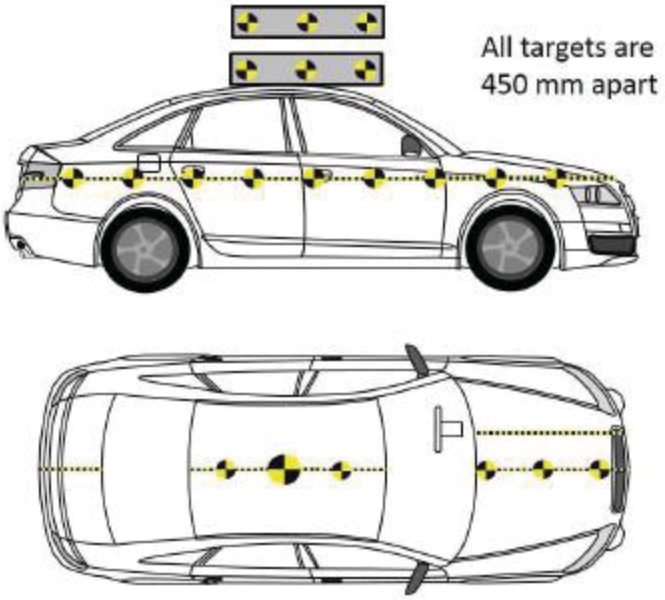
DATA SHEET NO. 6

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

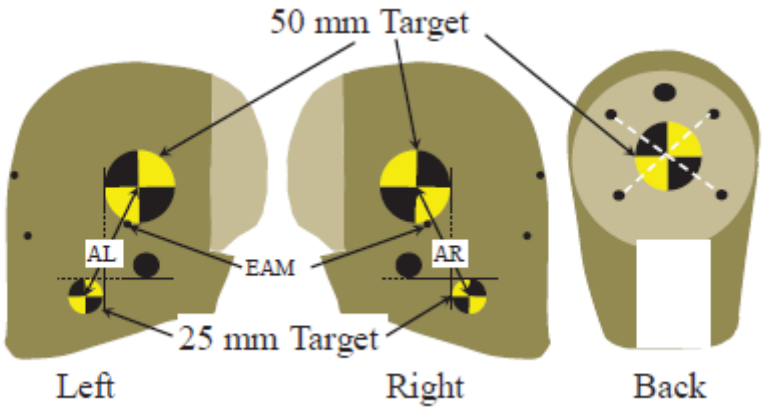
Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

VEHICLE TARGETS



ATD HEAD TARGETS



Driver

Target	Units	Measurement
AL	mm	97
AR	mm	98

DATA SHEET NO. 7

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Sensors	118
Passenger Dummy Sensors	43
Vehicle Structure Sensors	20
Airbag Timing Sensors	10
Total	191

CAMERA COVERAGE

Type of Camera	Number of Cameras Collected
High-Speed Vehicle Onboard	4
High-Speed Off-Board	14
Real-Time Panning	1
Total	19

DATA SHEET NO. 8

POST TEST OBSERVATIONS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	AM 50 / 168	THOR-50M / DO9799
Lower Leg Type		LX
Lower Leg Serial No.		
Head Contact	Front Airbag, Curtain Airbag, Headliner, A-Pillar	Front Airbag, Sun Visor, Headliner
Upper Torso Contact	Front Airbag, Torso/Pelvis Airbag, Door Panel	Front Airbag
Lower Torso Contact	Front Airbag	Front Airbag
Left Knee Contact	Knee Airbag, Knee Bolster	Knee Airbag, Knee Bolster
Right Knee Contact	Knee Airbag	Knee Airbag

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Rear Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Seat Track Shift (mm)	0 mm	0 mm
Seat Back Failure	None	None
Glazing Damage	None	

POST TEST STRUCTURAL OBSERVATIONS

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

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

DATA SHEET NO. 9

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4881	4662	-219
2	Rear Surface of Vehicle to Front of Engine	4463	4352	-111
3	RSOV to Firewall	3854	3851	-4
4	RSOV to Upper Leading Edge of Right Door	3481	3477	-4
5	RSOV to Upper Leading Edge of Left Door	3479	3476	-3
6	RSOV to Lower Leading Edge of Right Door	3457	3456	-1
7	RSOV to Lower Leading Edge of Left Door	3460	3458	-3
8	RSOV to Upper Trailing Edge of Right Door	2276	2273	-3
9	RSOV to Upper Trailing Edge of Left Door	2274	2272	-2
10	RSOV to Lower Trailing Edge of Right Door	2293	2291	-2
11	RSOV to Lower Trailing Edge of Left Door	2289	2285	-4
12	RSOV to Bottom of A-Pillar, Right Side	3401	3400	-2
13	RSOV to Bottom of A-Pillar, Left Side	3392	3389	-3
14	RSOV to Firewall, Right Side	4024	4020	-4
15	RSOV to Firewall, Left Side	4019	3987	-32
16	RSOV to Steering Column	2931	2965	34
17	Center of Steering Column to A-Pillar	461	423	-37
18	Center of Steering Column to Headliner	454	421	-33
19	RSOV to Right Side of Front Bumper	4760	4707	-54
20	RSOV to Left Side of Front Bumper	4733	4188	-545
21	Length of Engine Block	571	508	-63
RD	RSOV to Right Side of Dash Panel	3160	3165	4
CD	RSOV to Center of Dash Panel	3070	3075	5
LD	RSOV to Left Side of Dash Panel	3155	3157	2

All measurements in millimeters.

DATA SHEET NO. 10

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

VEHICLE INFORMATION

VIN: 1HGCV1F18LA084606 Wheelbase (mm): 2825

Vehicle Size Category: Passenger Car Test Weight (kg): 1661.0

ACCELEROMETER DATA

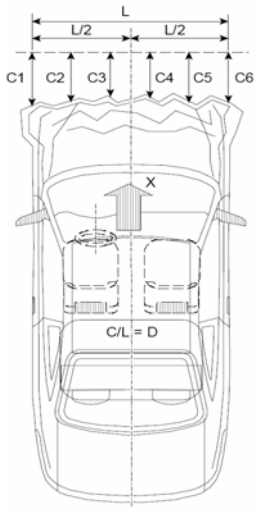
Accelerometer Locations: Vehicle CG_x

Cal. Procedure/Interval: Vibration Test / 6 months

Integration Algorithm: NHTSA Standard

Linearity: Good

Impact Velocity (km/h): 48.11



CRUSH PROFILE

Collision Deformation Classification: 12FLEW3

Midpoint of Damage: Vehcle Centerline

Damage Region Length (mm): 1298

Impact Mode: Left Side 30° Frontal

Crush Measurements

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4708	4165	-543
C2	Crush Zone 2 at Left Side	mm	4807	4266	-541
C3	Crush Zone 3 at Left Side	mm	4861	4433	-428
C4	Crush Zone 4 at Right Side	mm	4861	4732	-129
C5	Crush Zone 5 at Right Side	mm	4807	4752	-55
C6	Crush Zone 6 at Right Side	mm	4735	4684	-51
L	C1 to C6	mm	1246		

DATA SHEET NO. 11

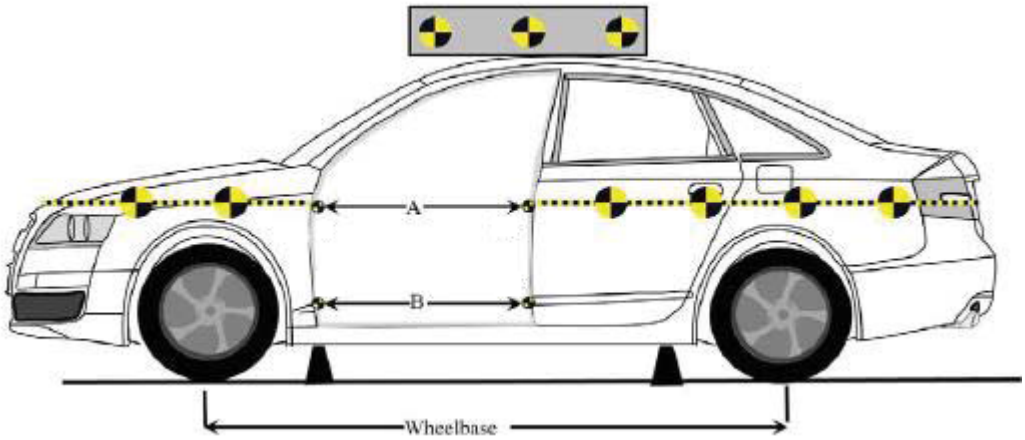
VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Driver Side Upper	mm	914	913	1
B	Driver Side Lower	mm	802	805	-2
D	Passenger Side Upper	mm	915	915	0
E	Passenger Side Lower	mm	798	799	-1



DATA SHEET NO. 11 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

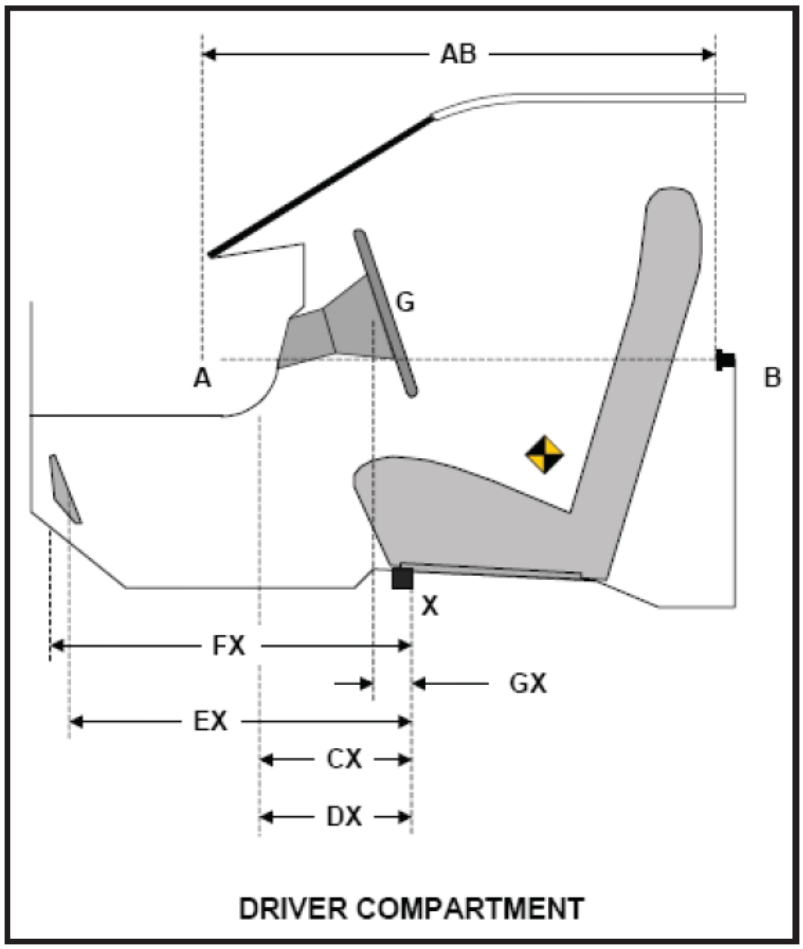
Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	887	891	-4
CX	Left Knee Bolster to X	mm	261	259	1
DX	Right Knee Bolster to X	mm	246	257	-10
EX	Brake Pedal to X	mm	583	558	25
FX	Footrest to X	mm	691	684	6
GX	Center of Steering Column Wheel Hub to X	mm	55	91	-37

X = Front of Seat Bolt



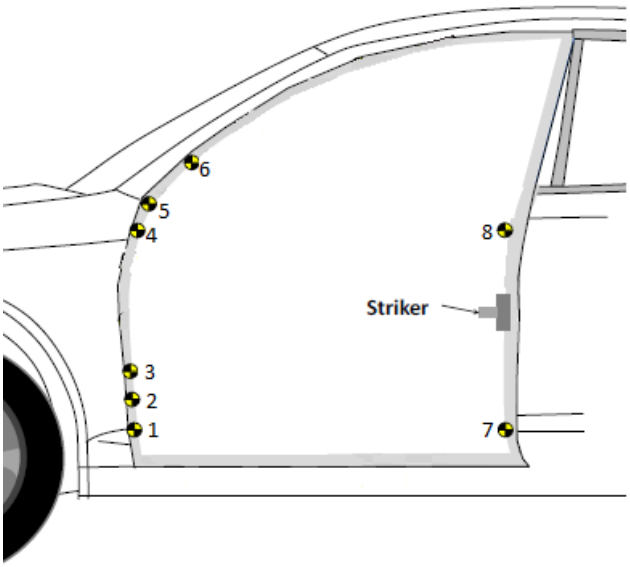
DATA SHEET NO. 11 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

DRIVER SIDE DOOR SILL INTRUSIONS



+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Point	Pre-Test			Post-Test			Difference		
	x	y	z	x	y	z	x	y	z
1	3316	-781	154	3318	-778	157	2	2	3
2	3336	-778	80	3335	-776	81	-1	2	1
3	3327	-777	5	3327	-775	4	0	2	-1
4	3260	-768	-295	3258	-767	-295	-2	1	0
5	3229	-753	-371	3228	-753	-370	-1	0	1
6	3142	-733	-446	3141	-734	-445	-1	0	1
7	2514	-782	155	2513	-779	155	-1	3	0
8	2346	-767	-295	2345	-765	-294	-1	1	1

All measurements in millimeters.

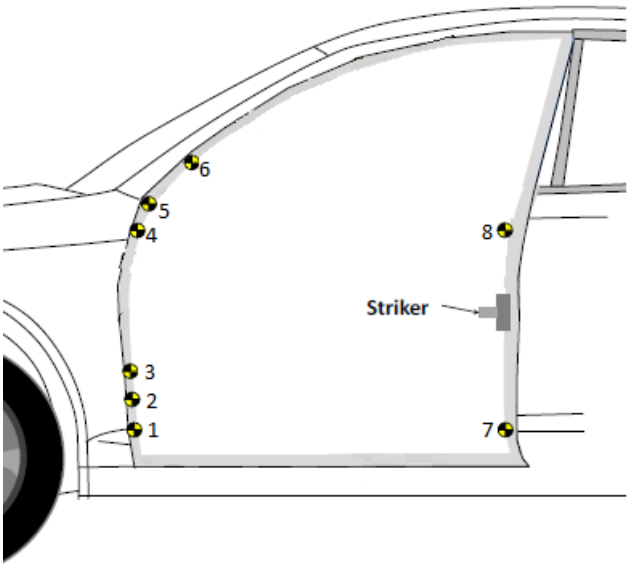
DATA SHEET NO. 11 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

PASSENGER SIDE DOOR SILL INTRUSIONS



+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Point	Pre-Test			Post-Test			Difference		
	x	y	z	x	y	z	x	y	z
1	3314	757	156	3316	758	158	1	1	2
2	3340	755	79	3341	755	78	1	1	-1
3	3329	753	4	3331	754	6	2	0	2
4	3263	745	-294	3263	746	-293	0	0	1
5	3234	731	-370	3232	732	-368	-2	1	2
6	3144	711	-446	3145	711	-446	1	0	0
7	2517	759	155	2517	758	156	0	-1	1
8	2348	746	-294	2348	745	-293	0	-1	1

All measurements in millimeters.

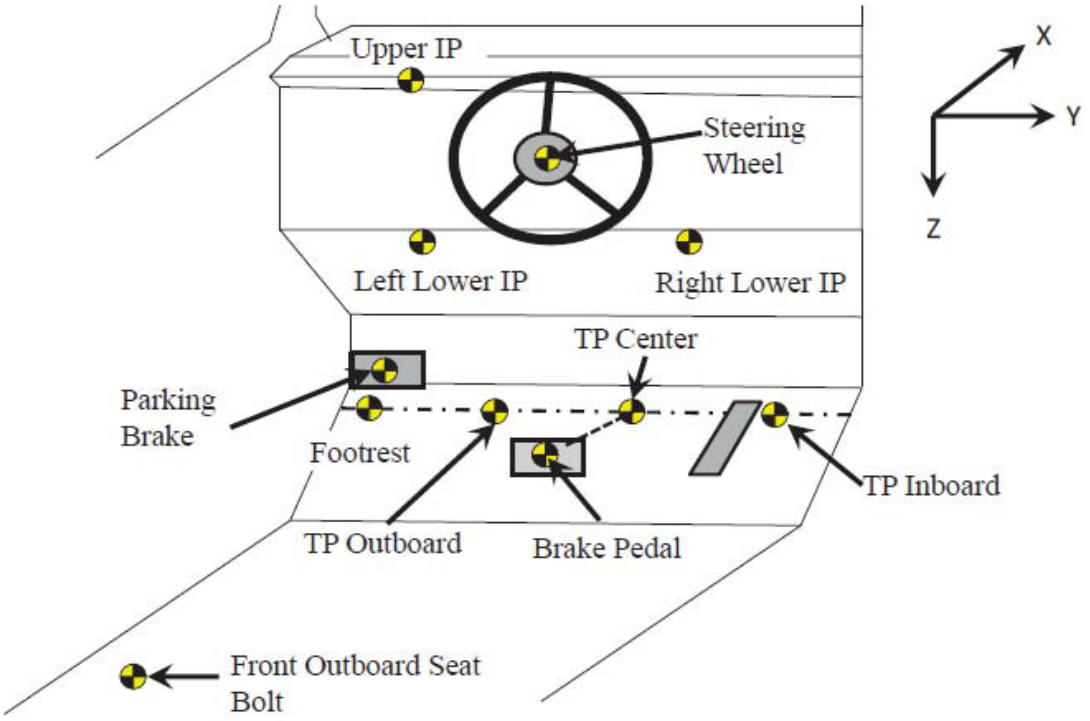
DATA SHEET NO. 11 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

DRIVER FLOOR PAN MEASUREMENTS



Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	x	y	z	x	y	z	x	y	z
TP Inboard	3652	-208	156	3646	-205	158	-6	3	2
TP Center	3673	-351	155	3661	-349	151	-11	3	-4
TP Outboard	3622	-502	155	3609	-501	152	-13	1	-3
TP Footrest	3542	-603	155	3536	-601	153	-6	2	-2
Brake Pedal	3434	-352	155	3409	-365	161	-25	-13	6
Left Lower IP	3112	-534	-149	3111	-528	-159	-1	6	-10
Right Lower IP	3097	-231	-148	3108	-238	-152	10	-6	-4
Upper IP	3076	-533	-189	3078	-527	-203	2	6	-14
Steering Wheel	2906	-382	-294	2943	-381	-327	37	1	-33
Front Outboard Bolt	2851	-613	305	2850	-609	303	-1	3	-2
Emergency Brake									

Reference point:
+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

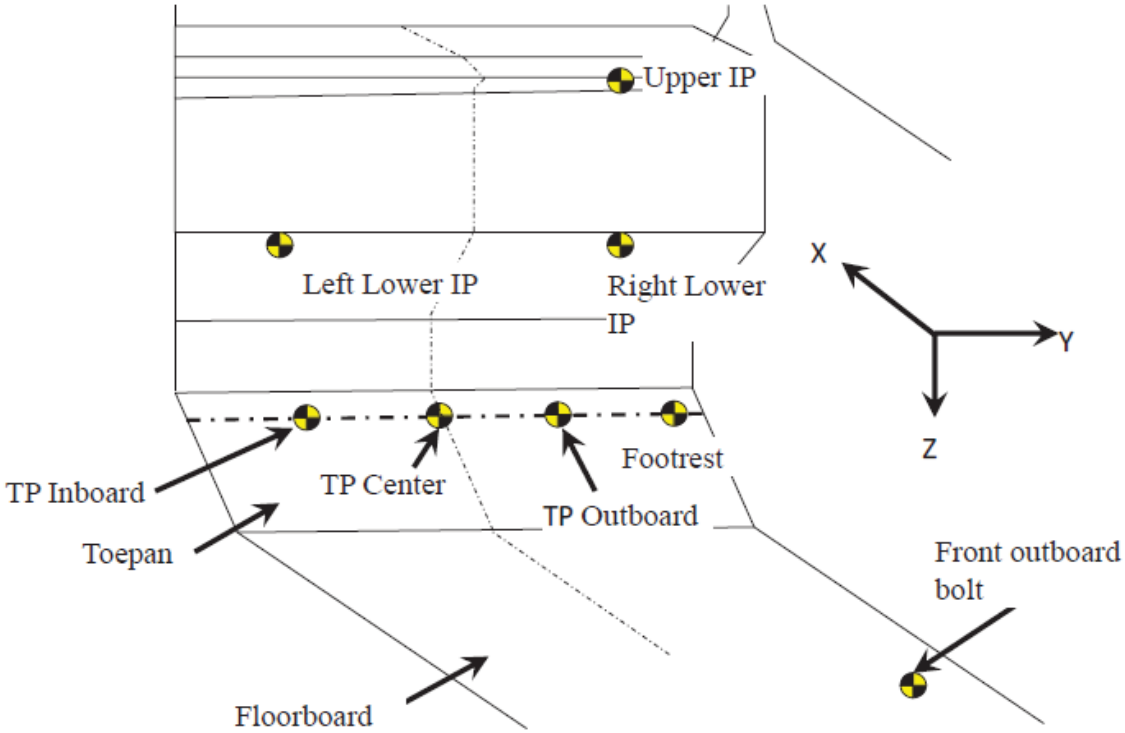
DATA SHEET NO. 11 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

PASSENGER FLOOR PAN MEASUREMENTS



Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	x	y	z	x	y	z	x	y	z
TP Inboard	3647	209	153	3648	209	160	1	0	7
TP Center	3667	359	157	3672	351	147	6	-8	-10
TP Outboard	3590	510	153	3589	512	151	-1	2	-2
TP Footrest	3530	609	154	3529	611	156	-1	2	2
Left Lower IP	3073	210	-150	3066	208	-151	-7	-3	-1
Right Lower IP	3112	511	-150	3114	508	-147	2	-3	3
Upper IP	3065	511	-212	3065	507	-212	0	-4	0
Front Outboard Seat Bolt	2855	591	296	2853	594	298	-2	3	2

Reference point:
+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 12

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

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

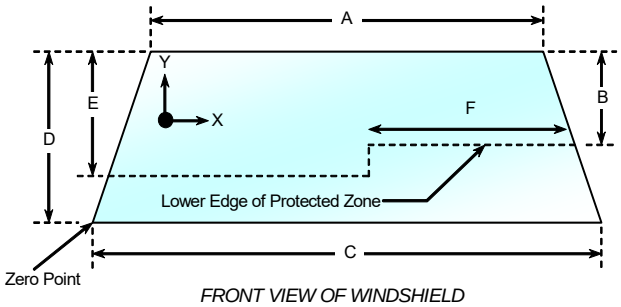
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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

Temperature of windshield molding during test: 21.2° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2050	2050	100.0%
Right Side	2050	2050	100.0%
Total	4100	4100	100.0%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1240
B	mm	335
C	mm	1508
D	mm	840
E	mm	490
F	mm	590

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. 12 … (CONTINUED)

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

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 30.0° C Test Time: 3:08 PM

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)

C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)

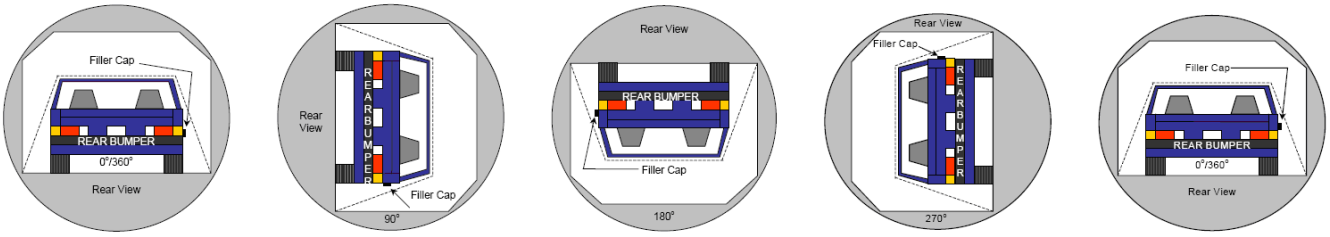
D. Spillage: There was no Stoddard solvent spillage.

DATA SHEET NO. 13

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205380

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 10/01/20



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: There was no Stoddard solvent spillage.

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	79	300	379
90° To 180°	80	300	380
180° To 270°	82	300	382
270° To 360°	78	300	378

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

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

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

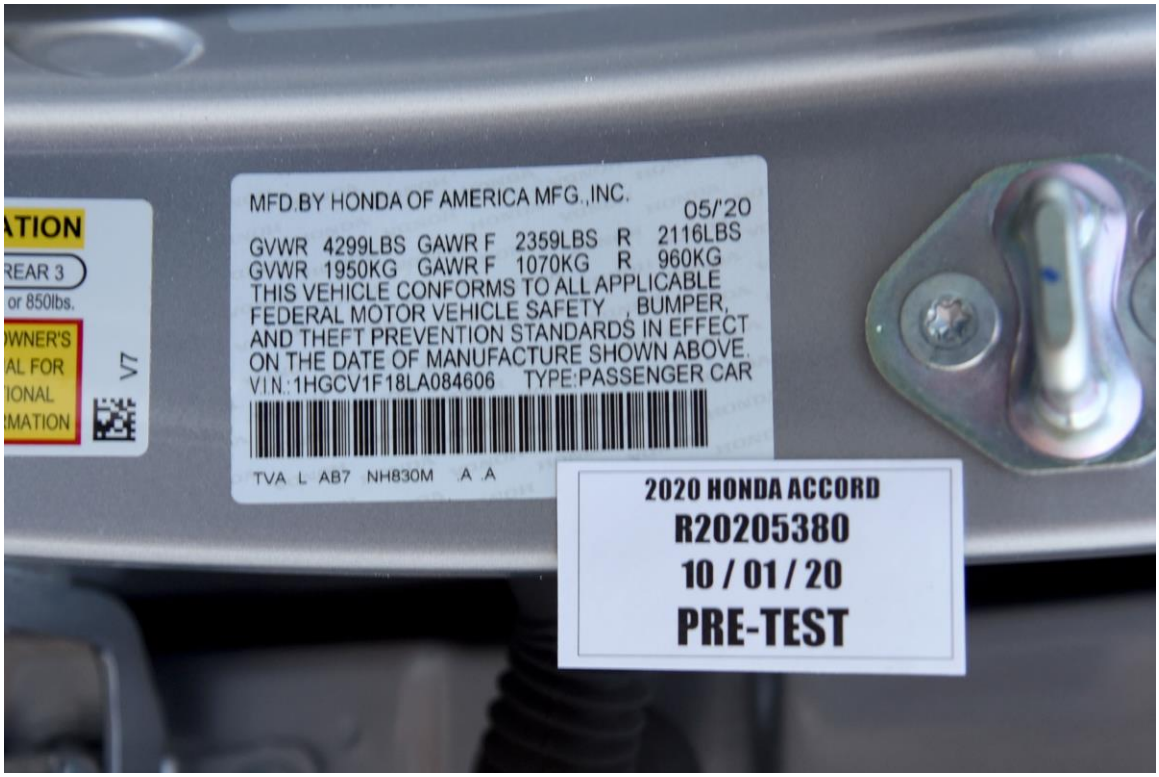


FIGURE 1. Test Vehicle Certification Label

FIGURE 2. Test Vehicle Tire Placard

FIGURE 3. Right Front ¾ View, As Received

FIGURE 4. Left Rear ¾ View, As Received

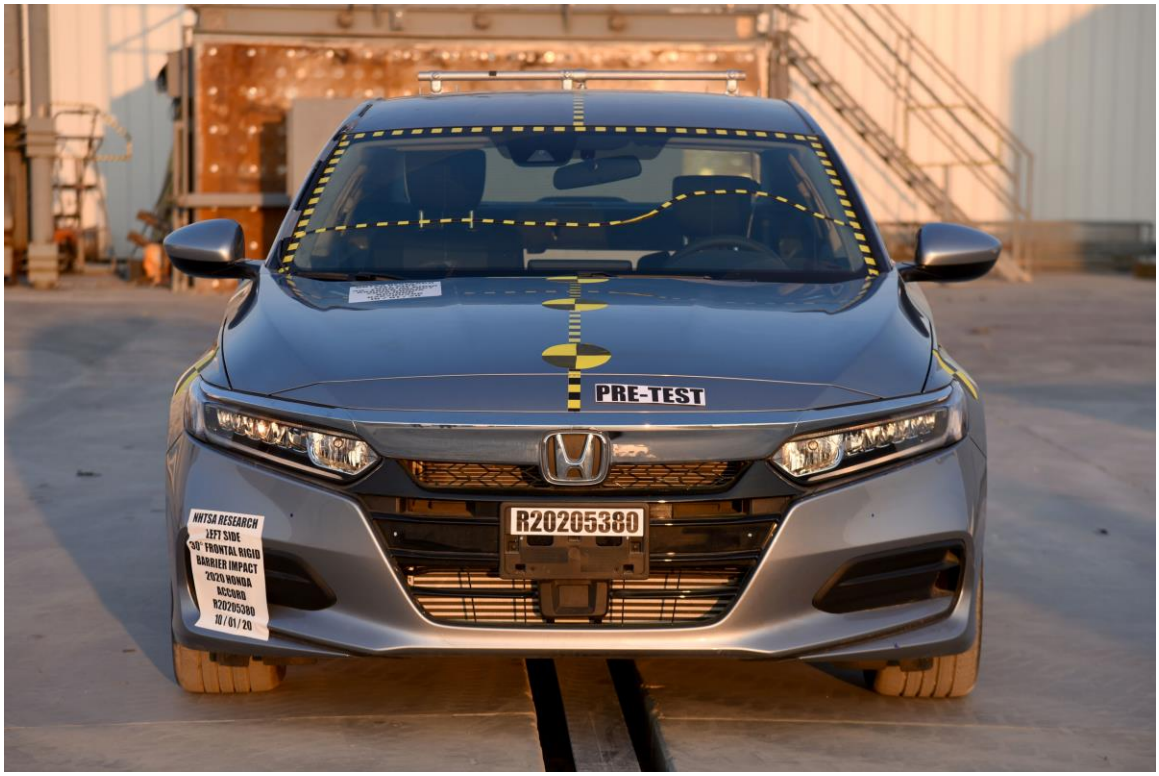


FIGURE 5. Pre-Test Front View of Test Vehicle

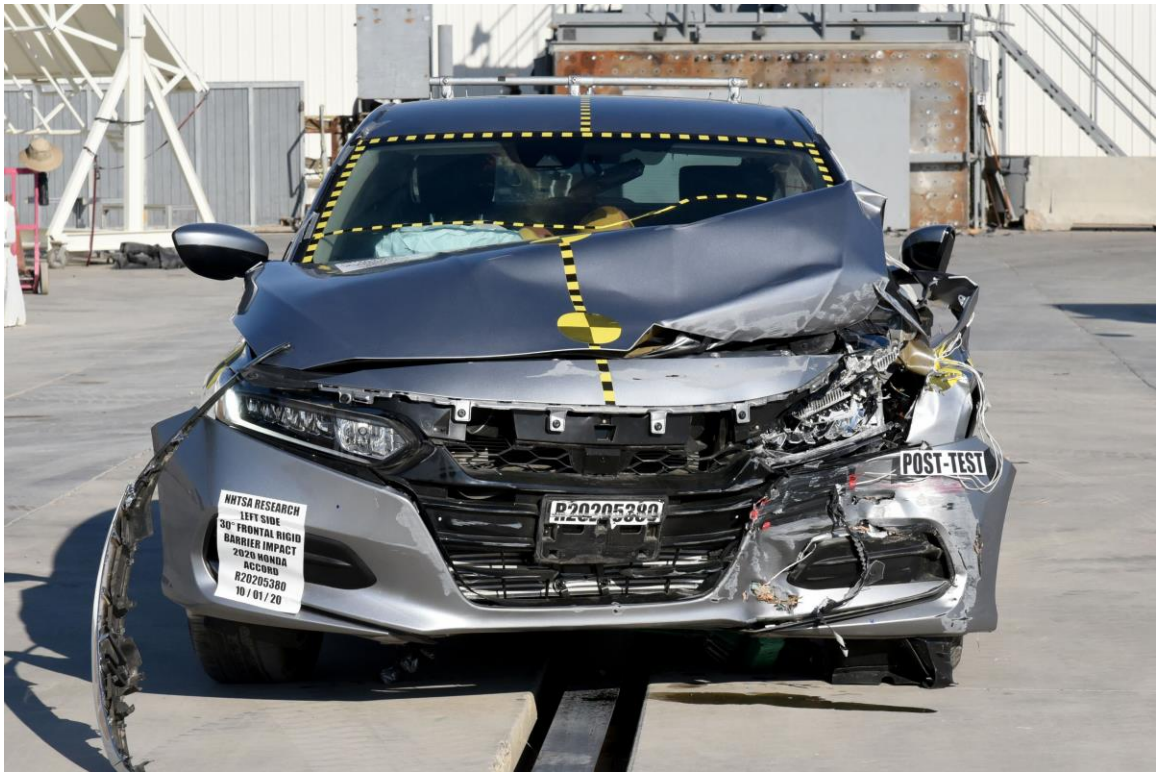


FIGURE 6. Post-Test Front View of Test Vehicle

FIGURE 7. Pre-Test Left View of Test Vehicle

FIGURE 8. Post-Test Left View of Test Vehicle

FIGURE 9. Pre-Test Right View of Test Vehicle

FIGURE 10. Post-Test Right View of Test Vehicle

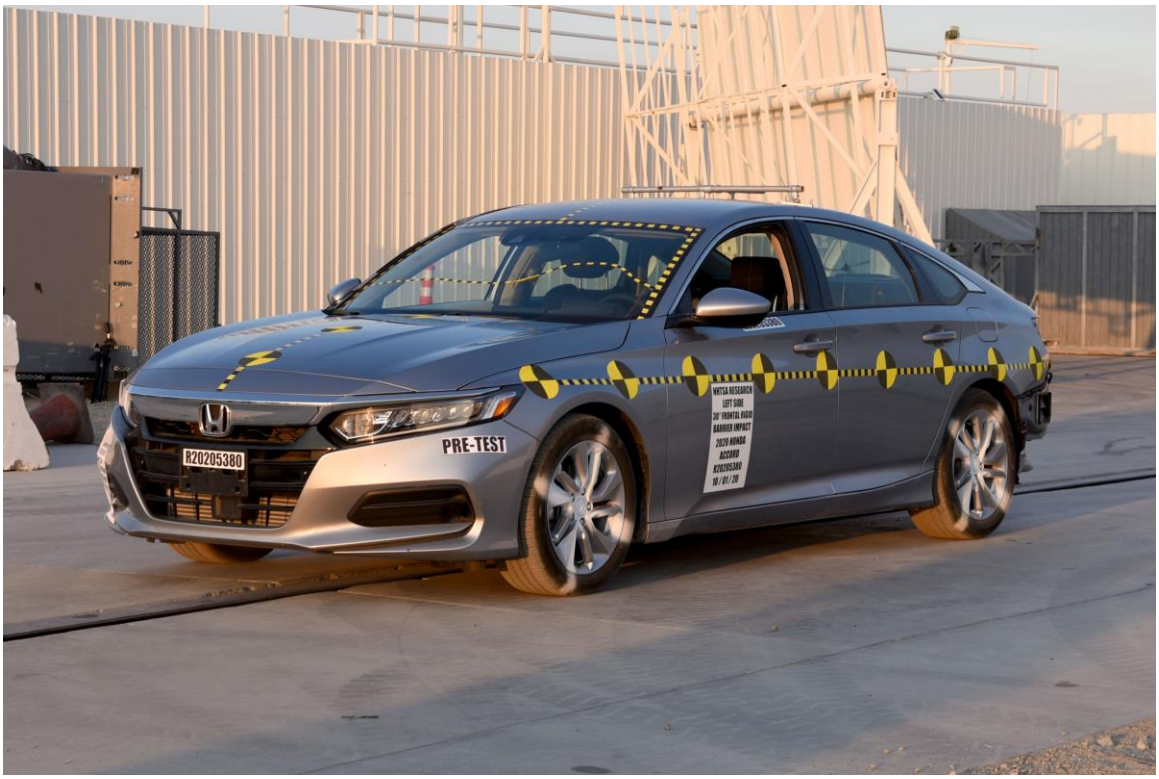


FIGURE 11. Pre-Test Left Front ¾ View of Test Vehicle

FIGURE 12. Post-Test Left Front ¾ View of Test Vehicle

FIGURE 13. Pre-Test Right Front ¾ View of Test Vehicle

FIGURE 14. Post-Test Right Front ¾ View of Test Vehicle

FIGURE 15. Pre-Test Right Rear ¾ View of Test Vehicle

FIGURE 16. Post-Test Right Rear ¾ View of Test Vehicle

FIGURE 17. Pre-Test Rear View of Test Vehicle

FIGURE 18. Post-Test Rear View of Test Vehicle

FIGURE 19. Pre-Test Left Rear ¾ View of Test Vehicle

FIGURE 20. Post-Test Left Rear ¾ View of Test Vehicle

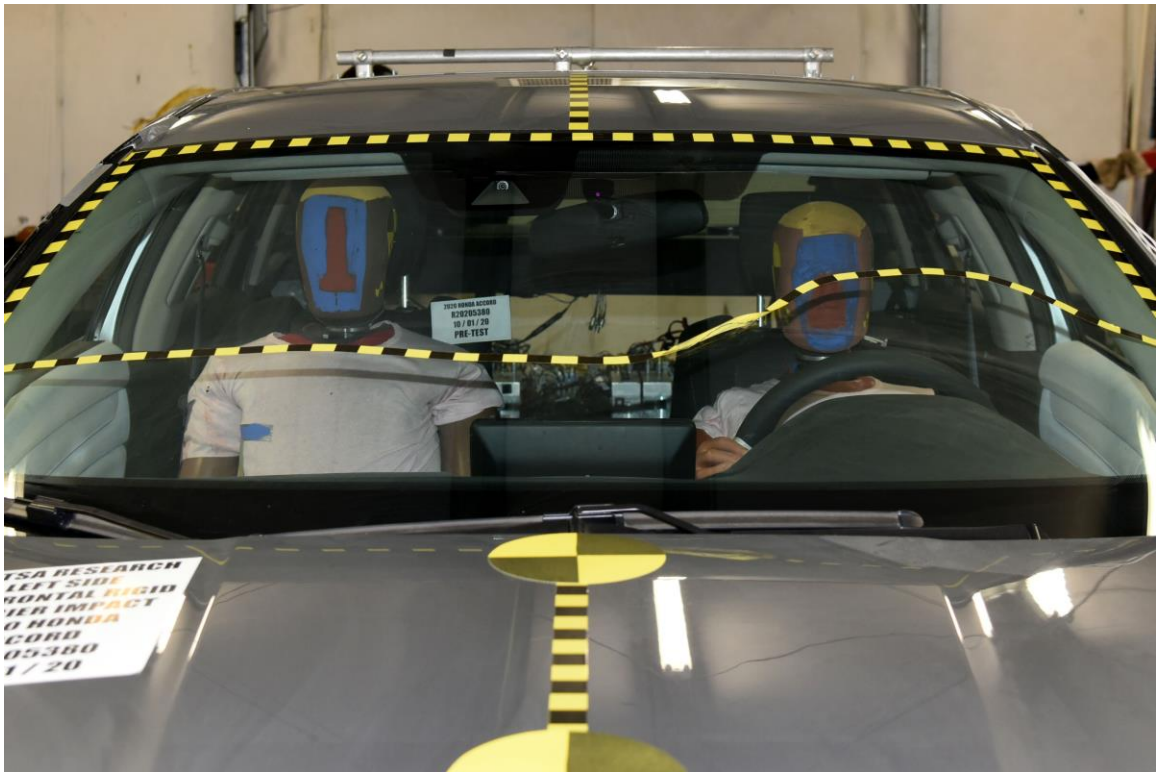


FIGURE 21. Pre-Test Windshield View

FIGURE 22. Post-Test Windshield View

FIGURE 23. Pre-Test Engine Compartment View

Photograph Not Available

FIGURE 24. Post-Test Engine Compartment View

FIGURE 25. Pre-Test Fuel Filler Cap View

FIGURE 26. Post-Test Fuel Filler Cap View

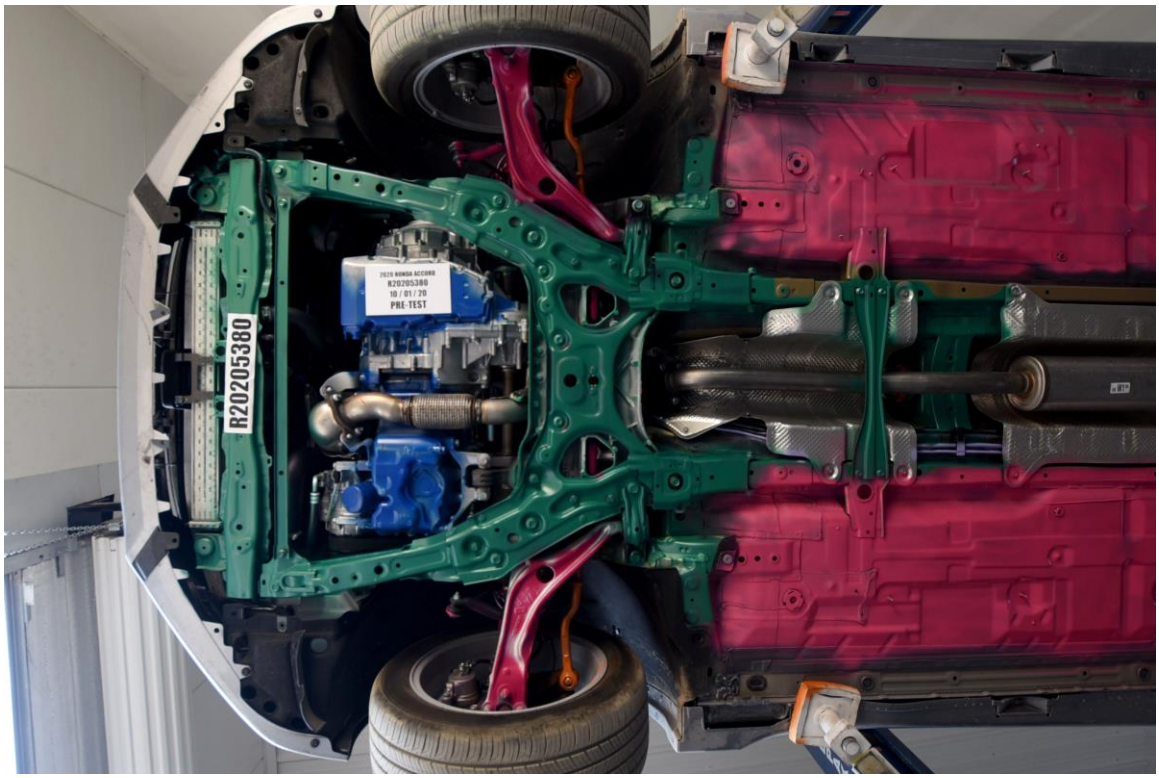


FIGURE 27. Pre-Test Front Underbody View

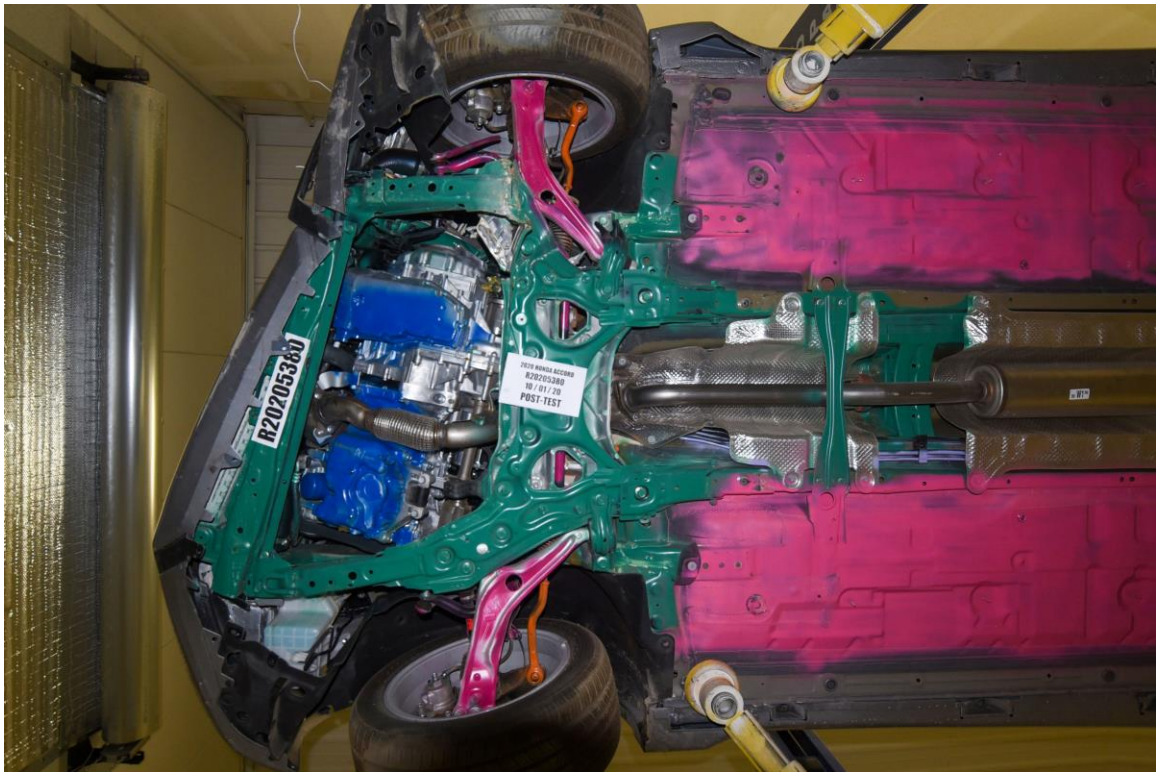


FIGURE 28. Post-Test Front Underbody View

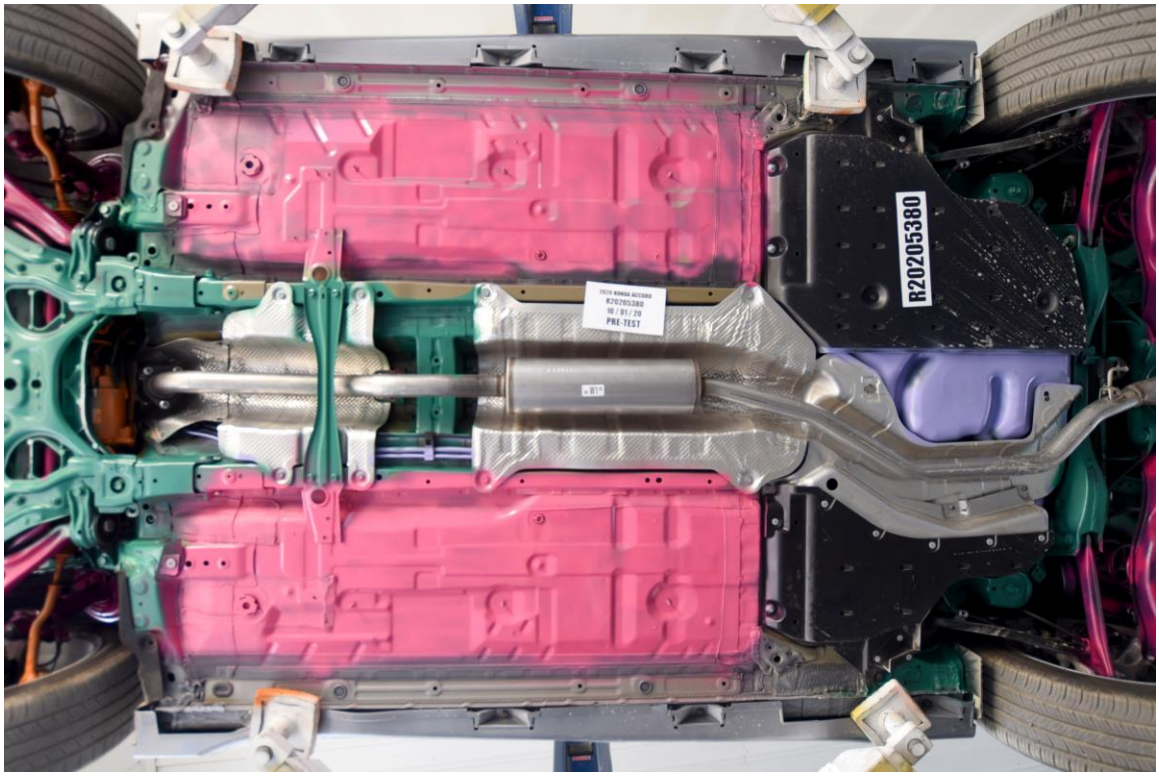


FIGURE 29. Pre-Test Mid Underbody View

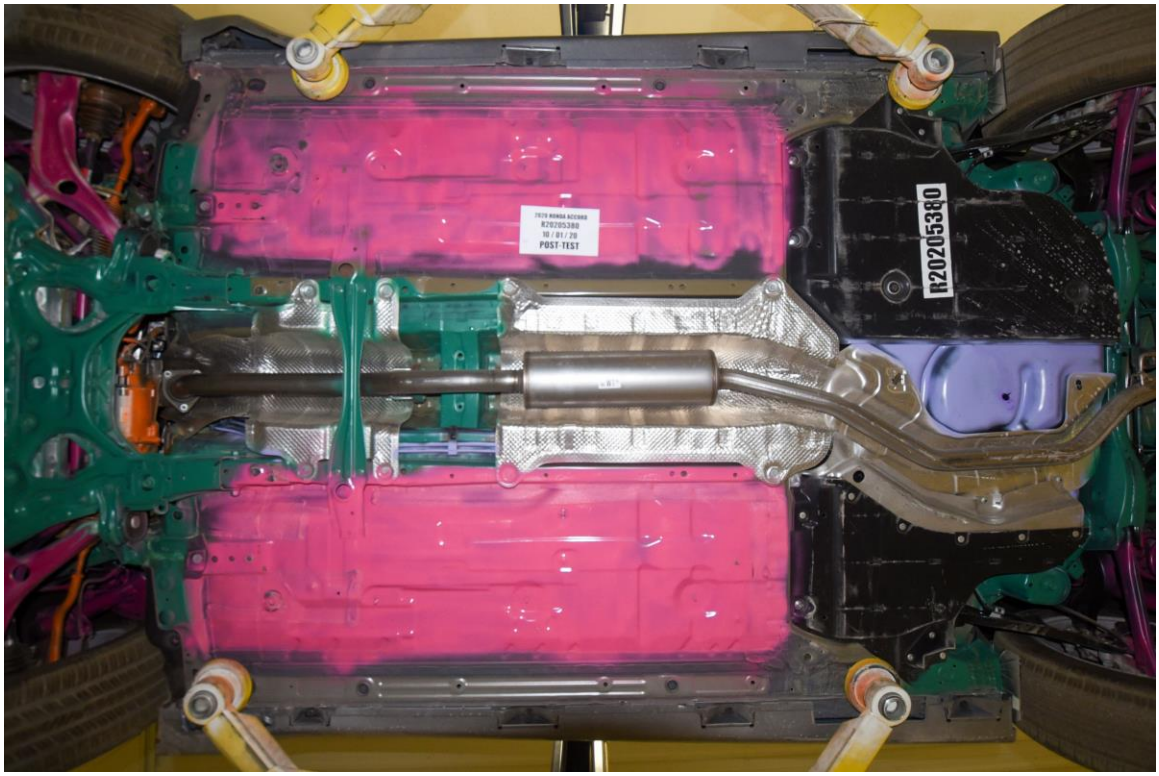


FIGURE 30. Post-Test Mid Underbody View

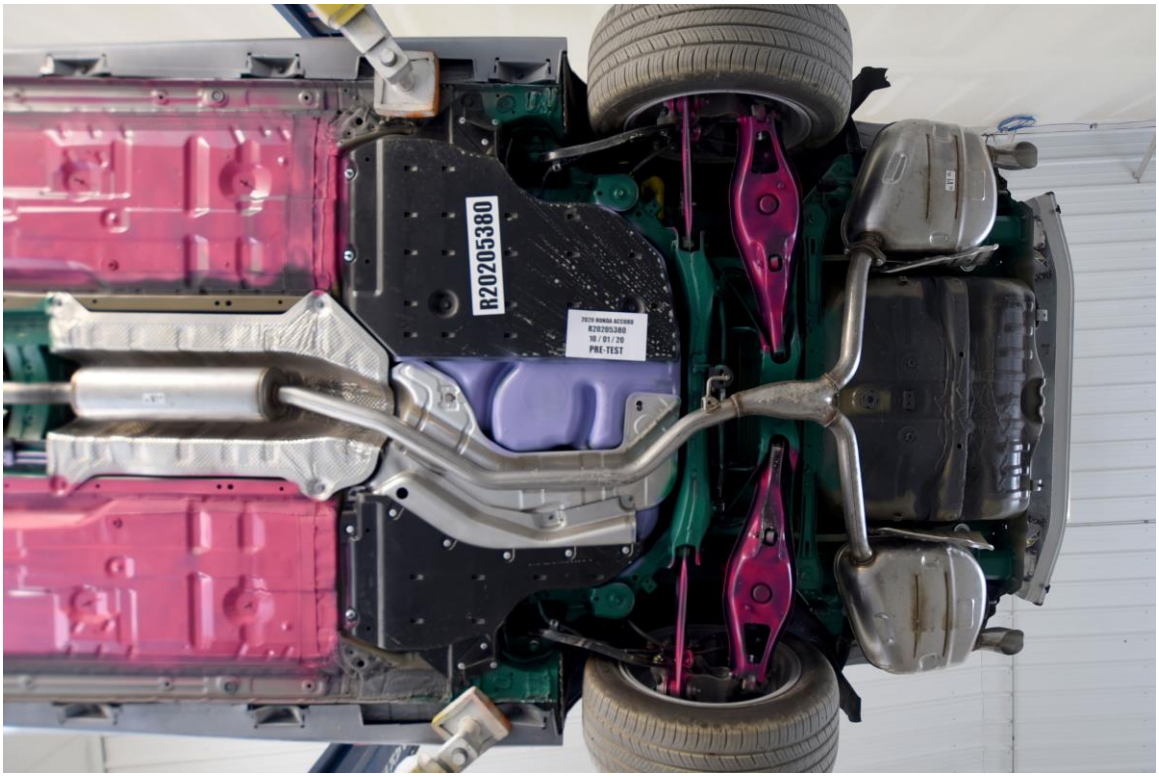


FIGURE 31. Pre-Test Rear Underbody View

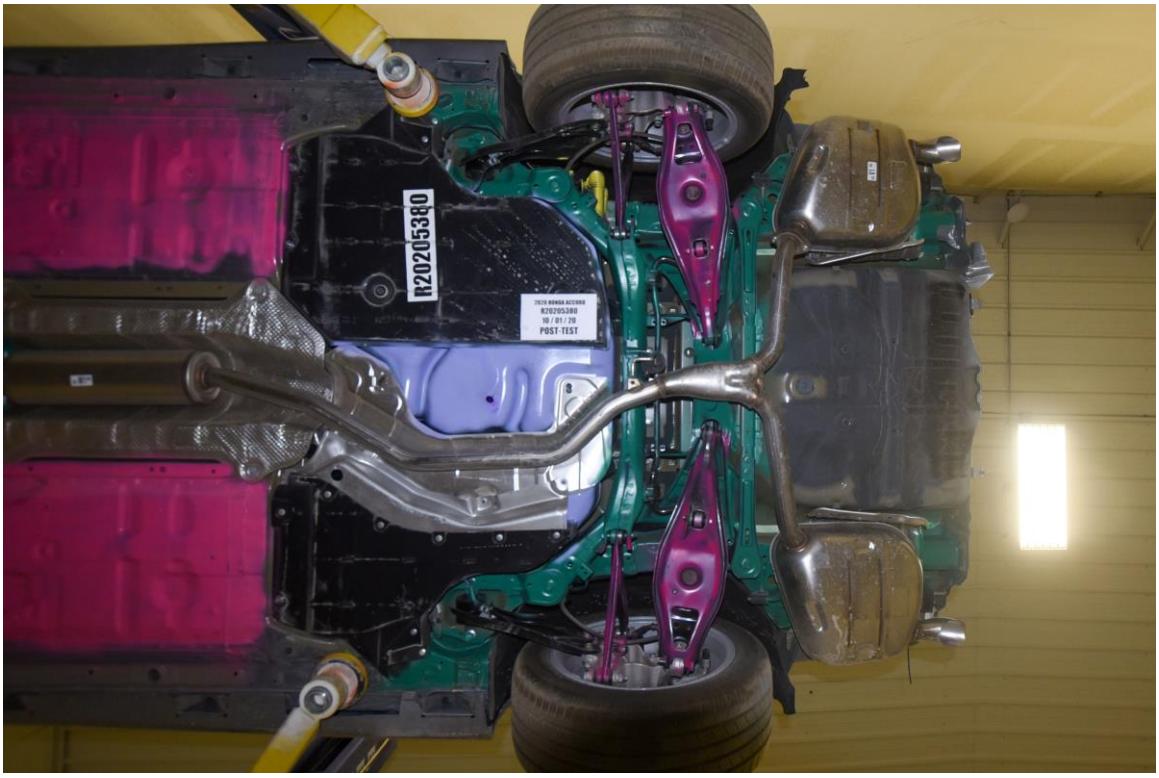


FIGURE 32. Post-Test Rear Underbody View

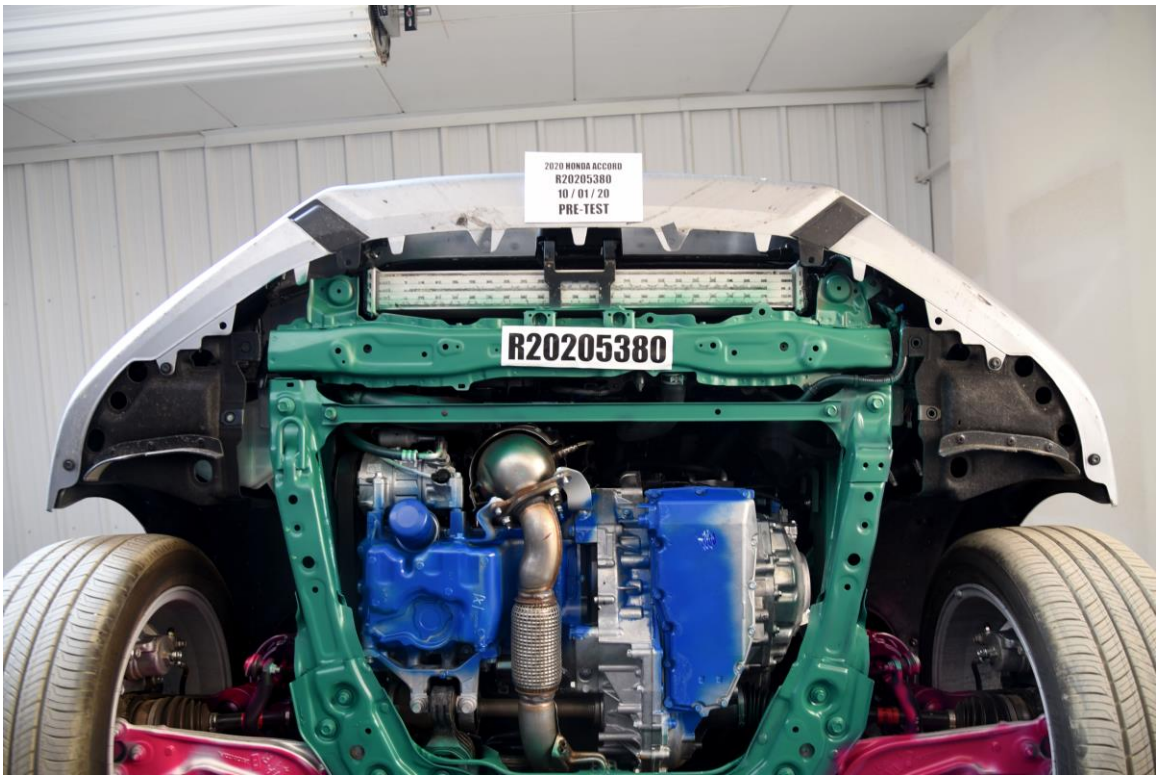


FIGURE 33. Pre-Test Bumper to Rail Attachments and Crush Initiators

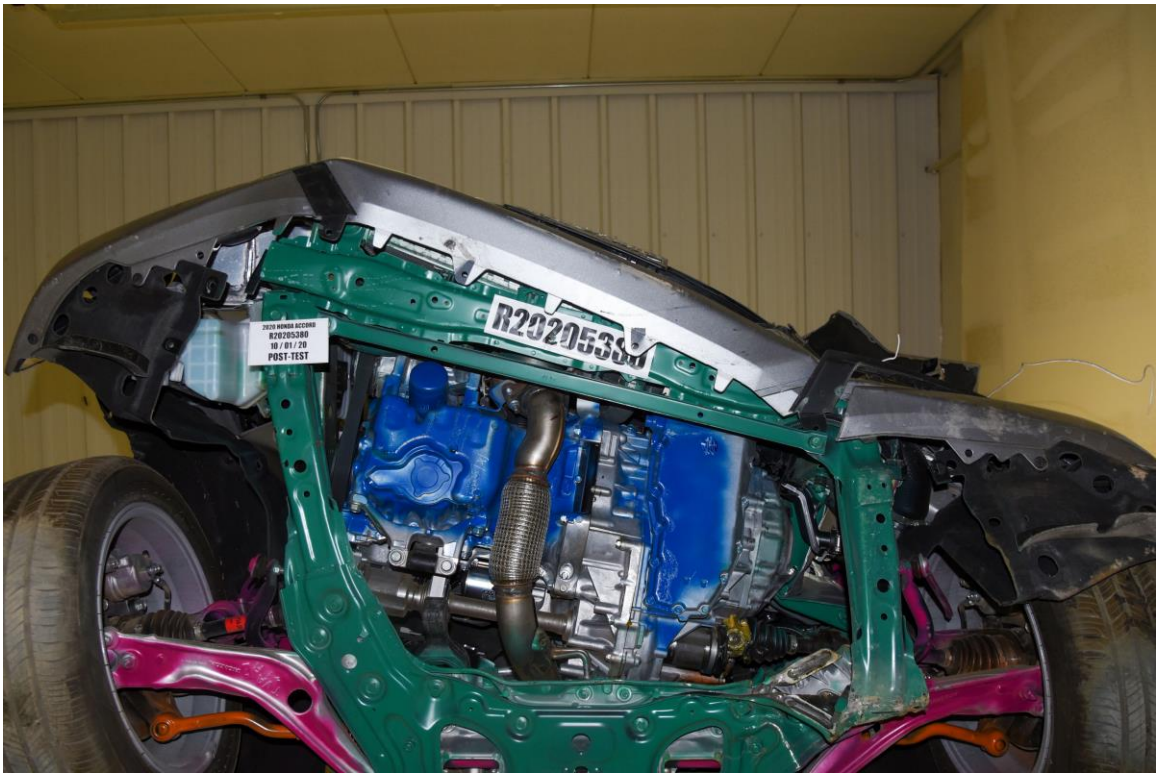


FIGURE 34. Post-Test Bumper to Rail Attachments and Crush Initiators

FIGURE 35. Pre-Test Driver Side Bumper to Rail Attachments and Crush Initiators

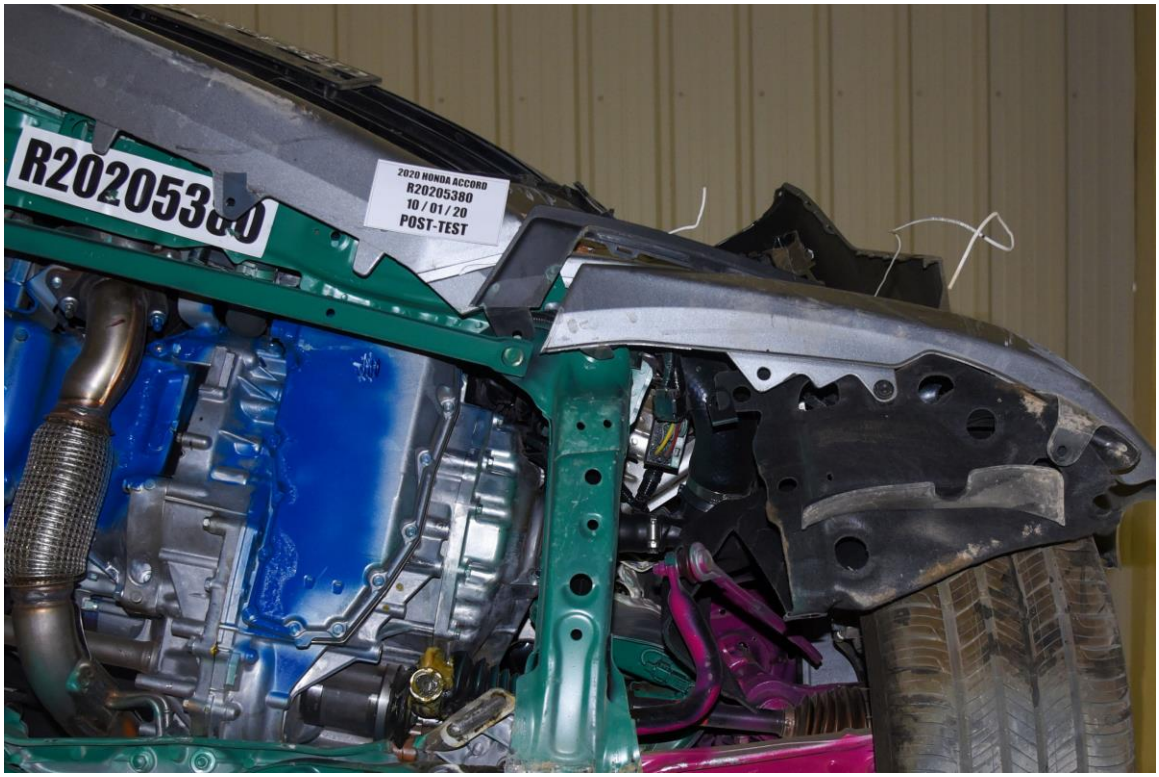


FIGURE 36. Post-Test Driver Side Bumper to Rail Attachments and Crush Initiators

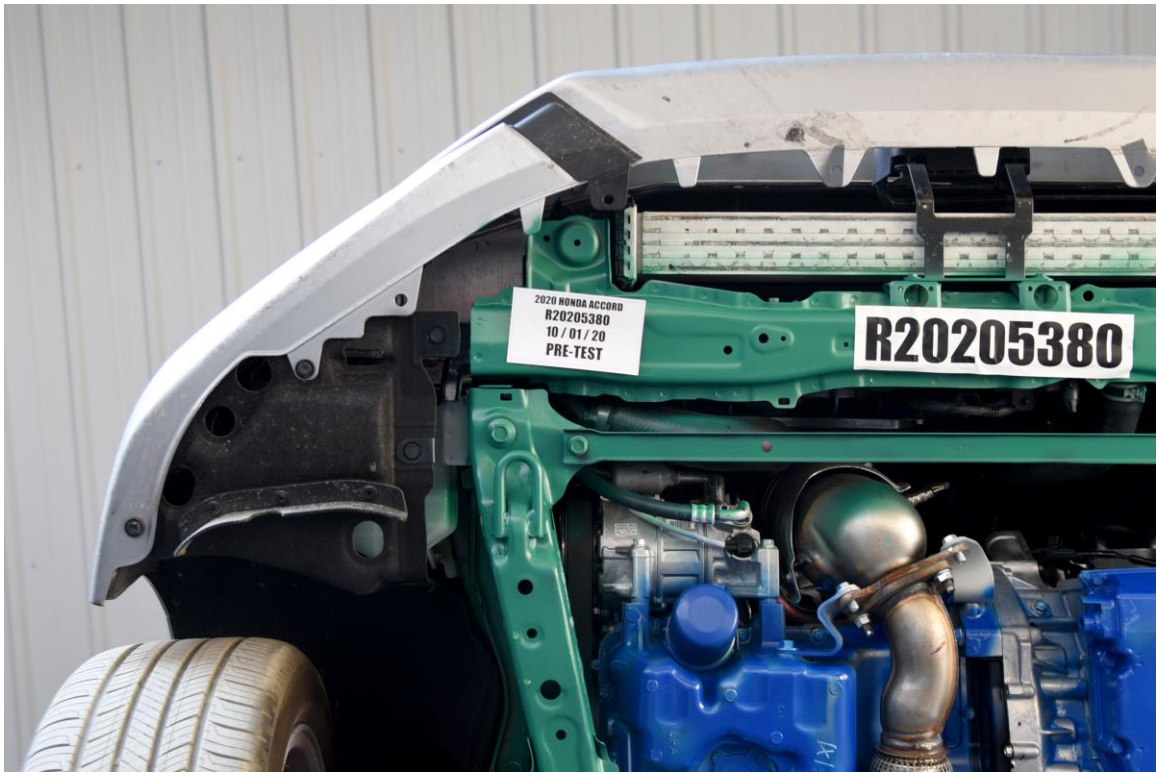


FIGURE 37. Pre-Test Passenger Side Bumper to Rail Attachments and Crush Initiators

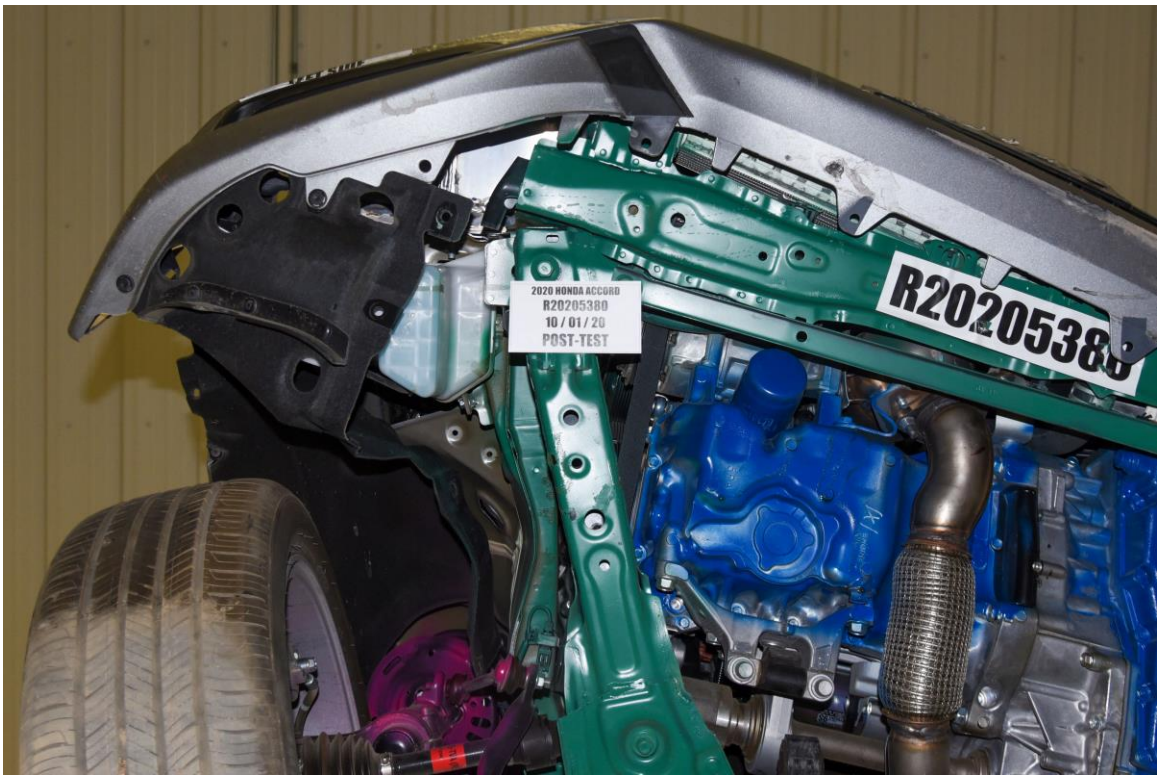


FIGURE 38. Post-Test Passenger Side Bumper to Rail Attachments and Crush Initiators

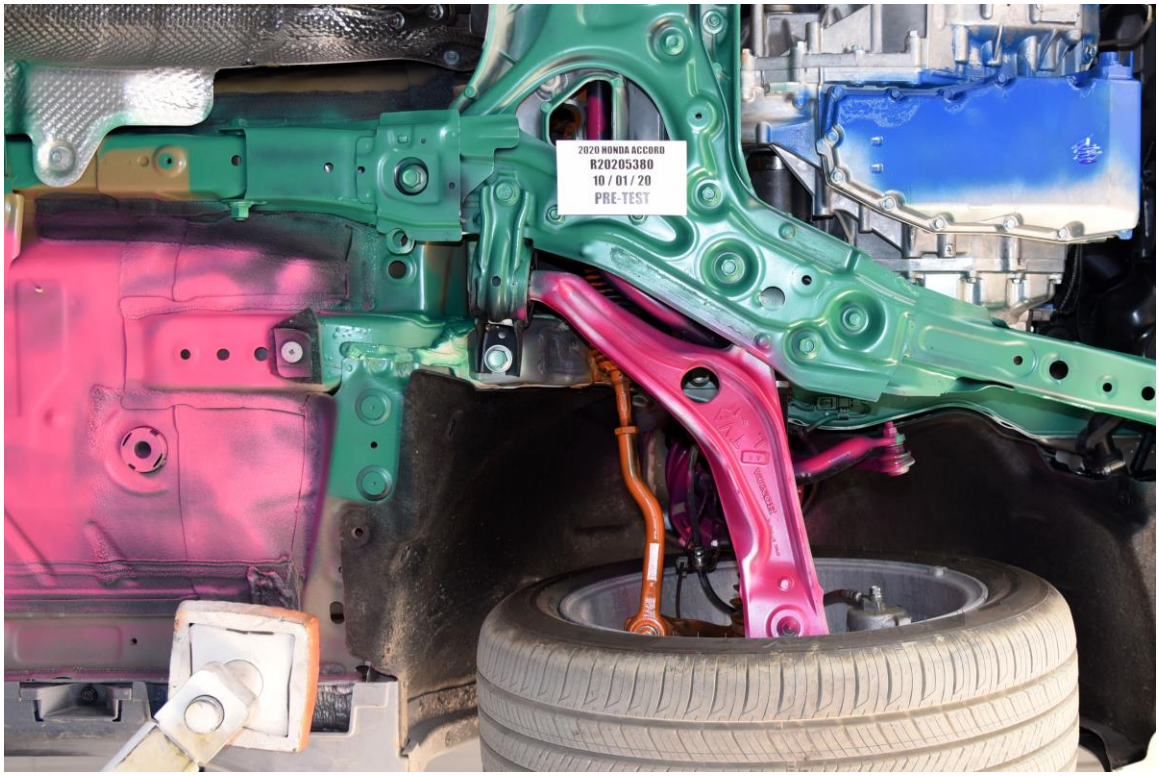


FIGURE 39. Pre-Test Driver Side Rocker

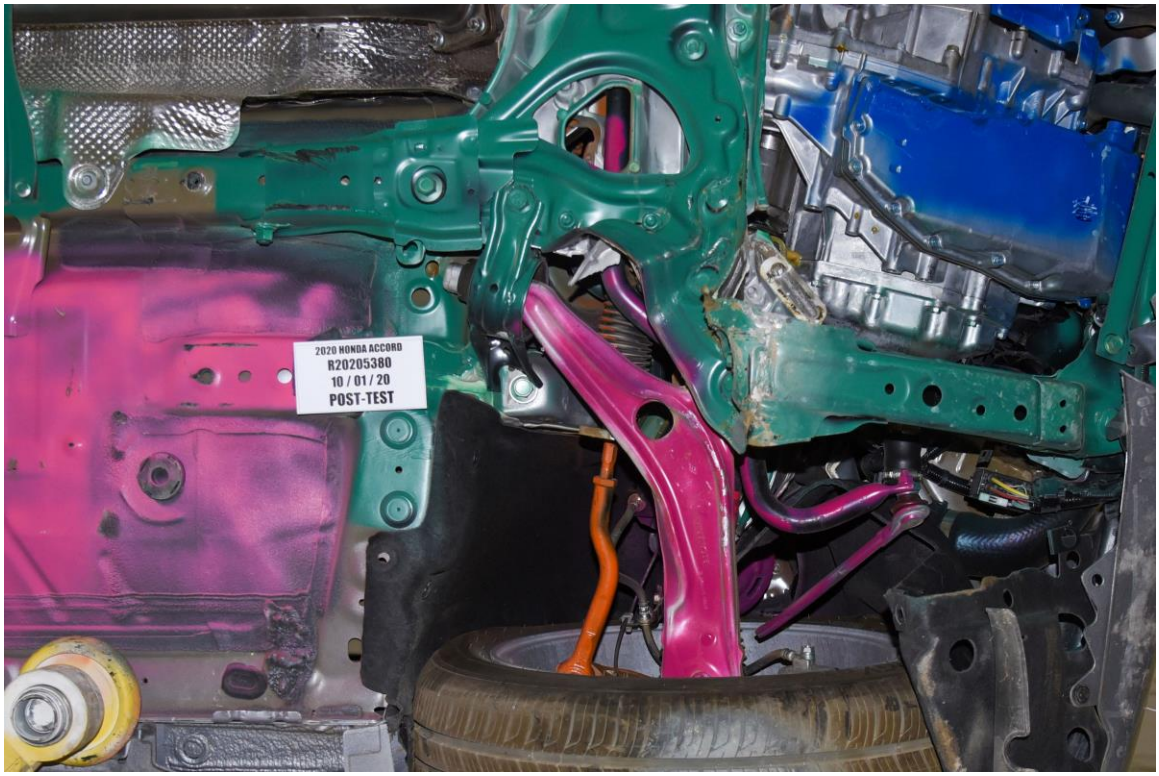


FIGURE 40. Post-Test Driver Side Rocker

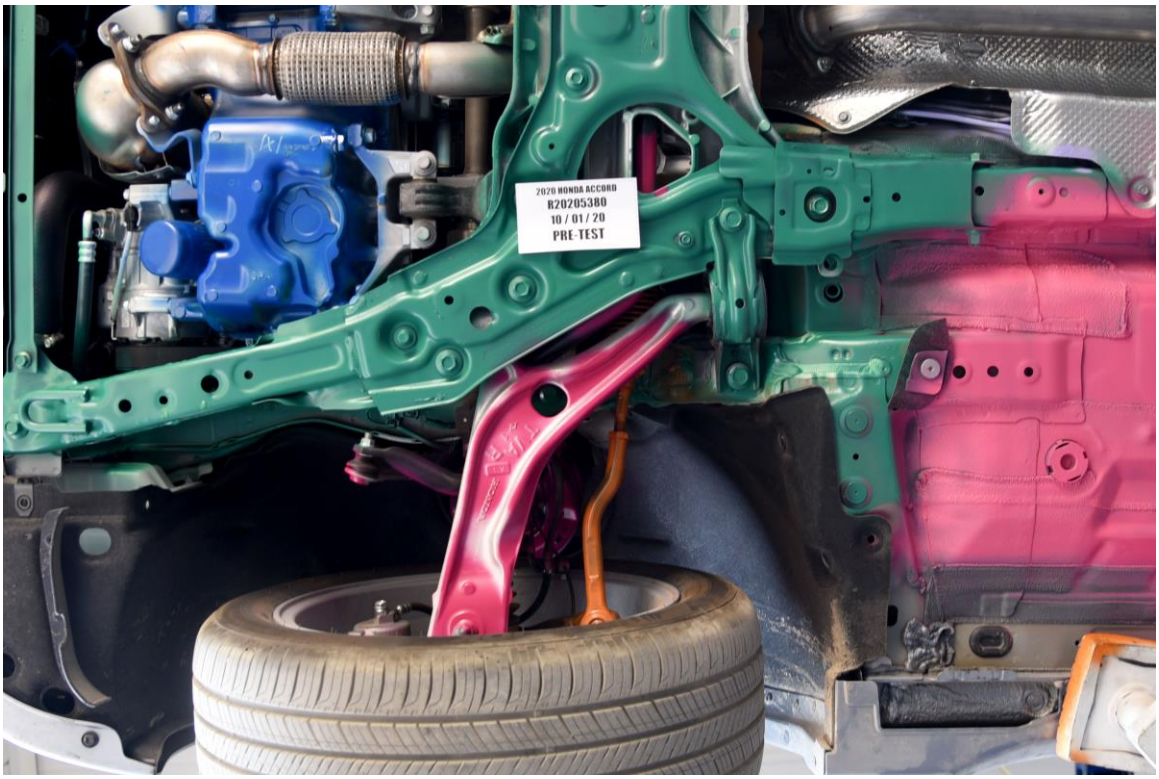


FIGURE 41. Pre-Test Passenger Side Rocker

FIGURE 42. Post-Test Passenger Side Rocker

FIGURE 43. Pre-Test Driver Front Windshield View

FIGURE 44. Post-Test Driver Front Windshield View

FIGURE 45. Pre-Test Driver Side Front Window View

FIGURE 46. Post-Test Driver Side Front Window View

FIGURE 47. Pre-Test View of Driver Door Clearance

FIGURE 48. Post-Test View of Driver Door Clearance

FIGURE 49. Pre-Test Left Side View of Driver and Interior

FIGURE 50. Post-Test Left Side View of Driver and Interior

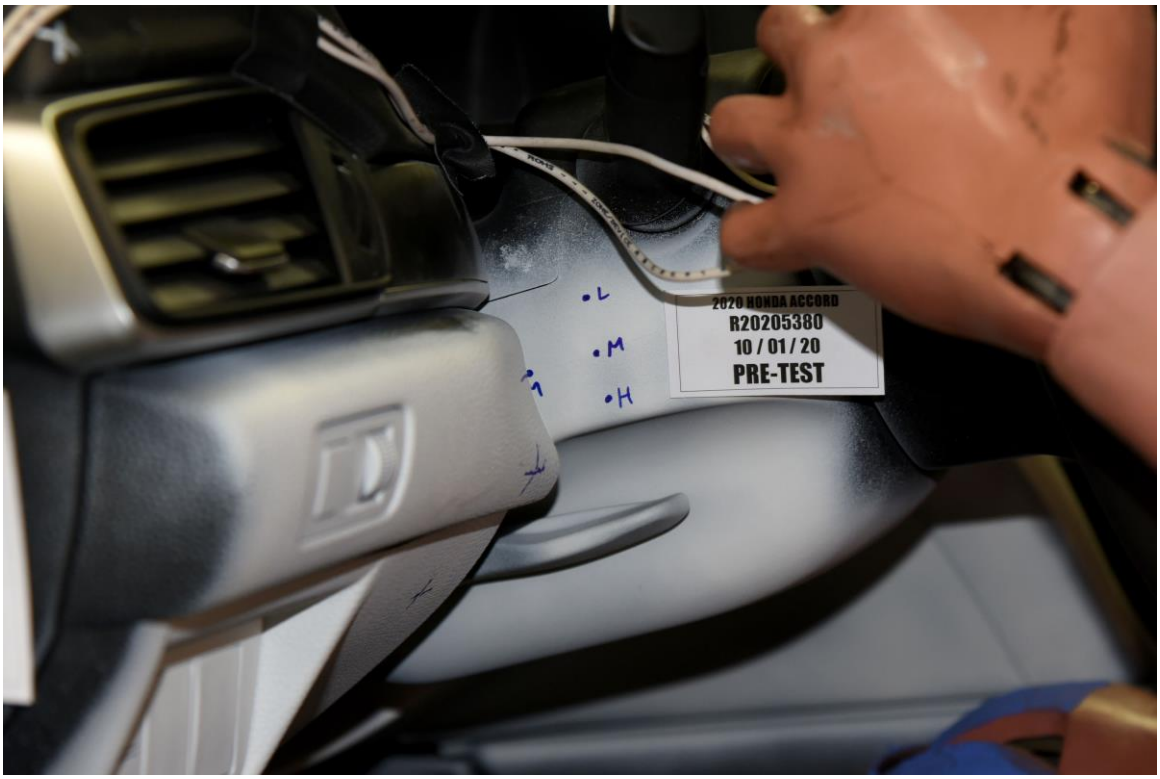


FIGURE 51. Pre-Test Left Side View of Steering Wheel Position

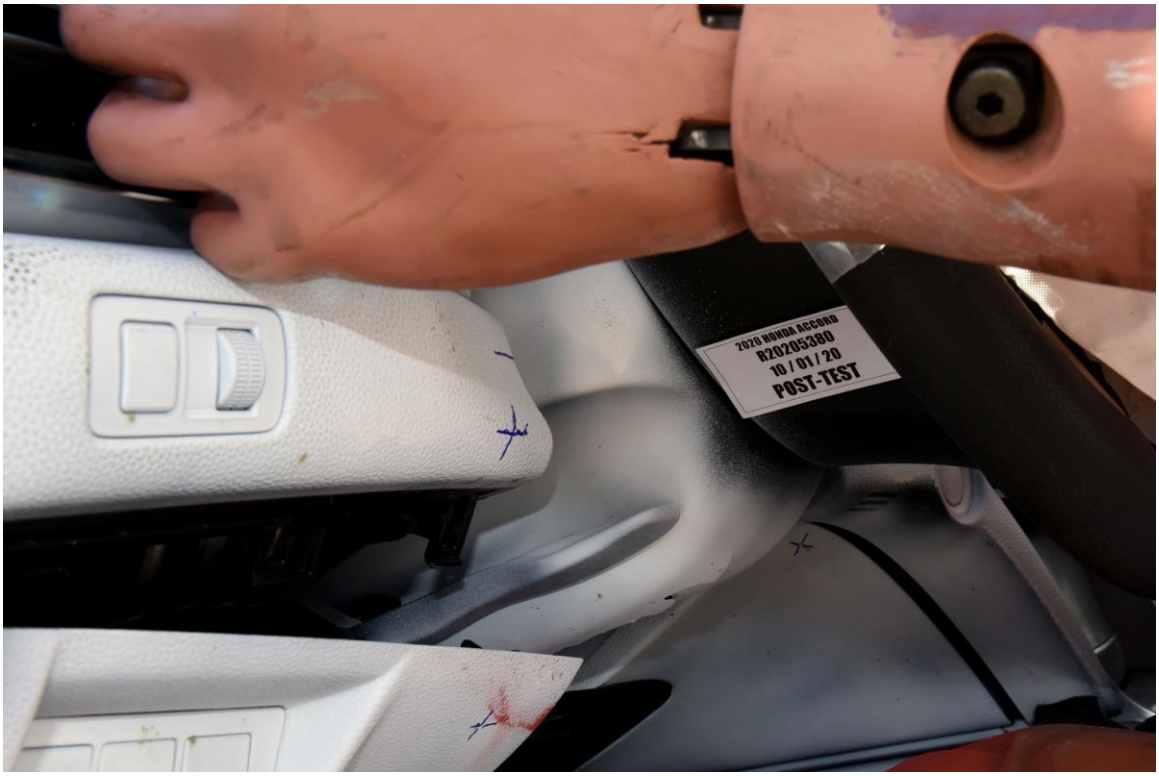


FIGURE 52. Post-Test Left Side View of Steering Wheel Position

FIGURE 53. Pre-Test Overhead View of Driver Thighs on Seat

FIGURE 54. Post-Test Overhead View of Driver Thighs on Seat

FIGURE 55. Pre-Test View of Driver Abdomen

FIGURE 56. Post-Test View of Driver Abdomen

FIGURE 57. Pre-Test Right Side View of Driver and Interior

FIGURE 58. Post-Test Right Side View of Driver and Interior

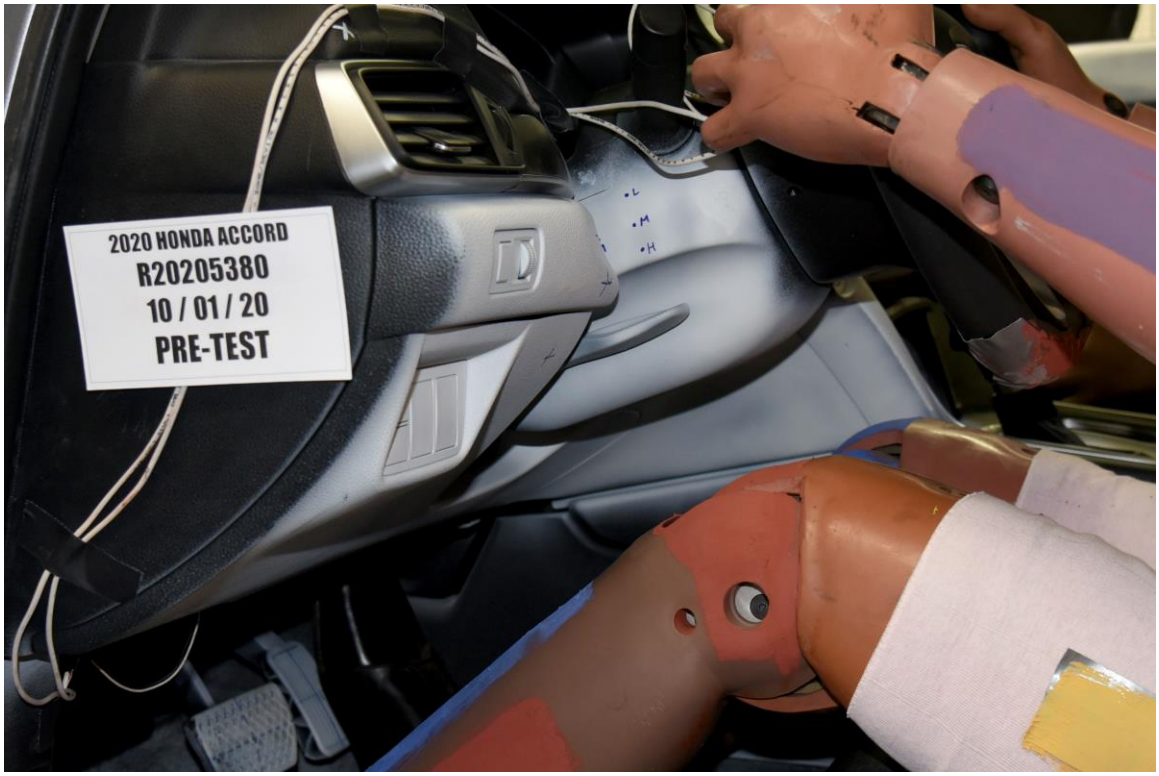


FIGURE 59. Pre-Test View of Driver Left Knee and Bolster

FIGURE 60. Post-Test View of Driver Left Knee and Bolster

FIGURE 61. Pre-Test View of Driver Right Knee and Bolster

FIGURE 62. Post-Test View of Driver Right Knee and Bolster

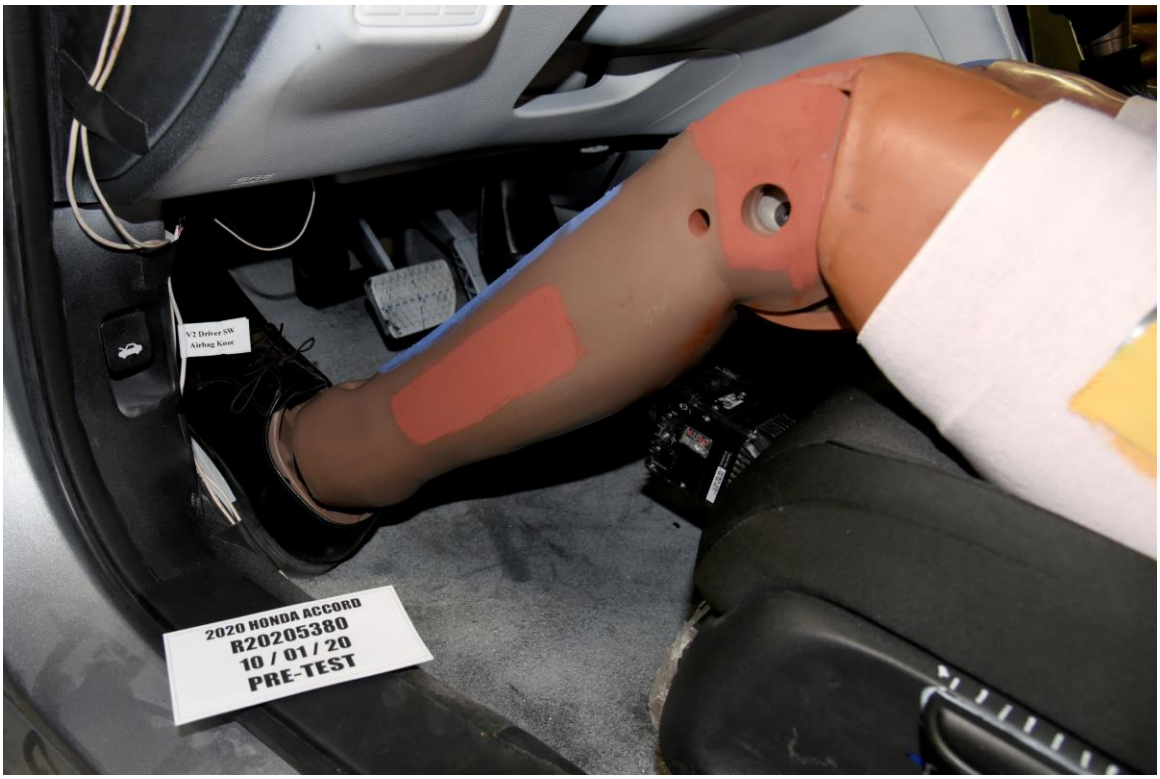


FIGURE 63. Pre-Test View of the Driver Left Leg

FIGURE 64. Post-Test View of the Driver Left Leg

FIGURE 65. Pre-Test View of the Driver Feet

FIGURE 66. Post-Test View of the Driver Feet

FIGURE 67. Pre-Test Driver Adjustable D-Ring

FIGURE 68. Post-Test Driver Adjustable D-Ring

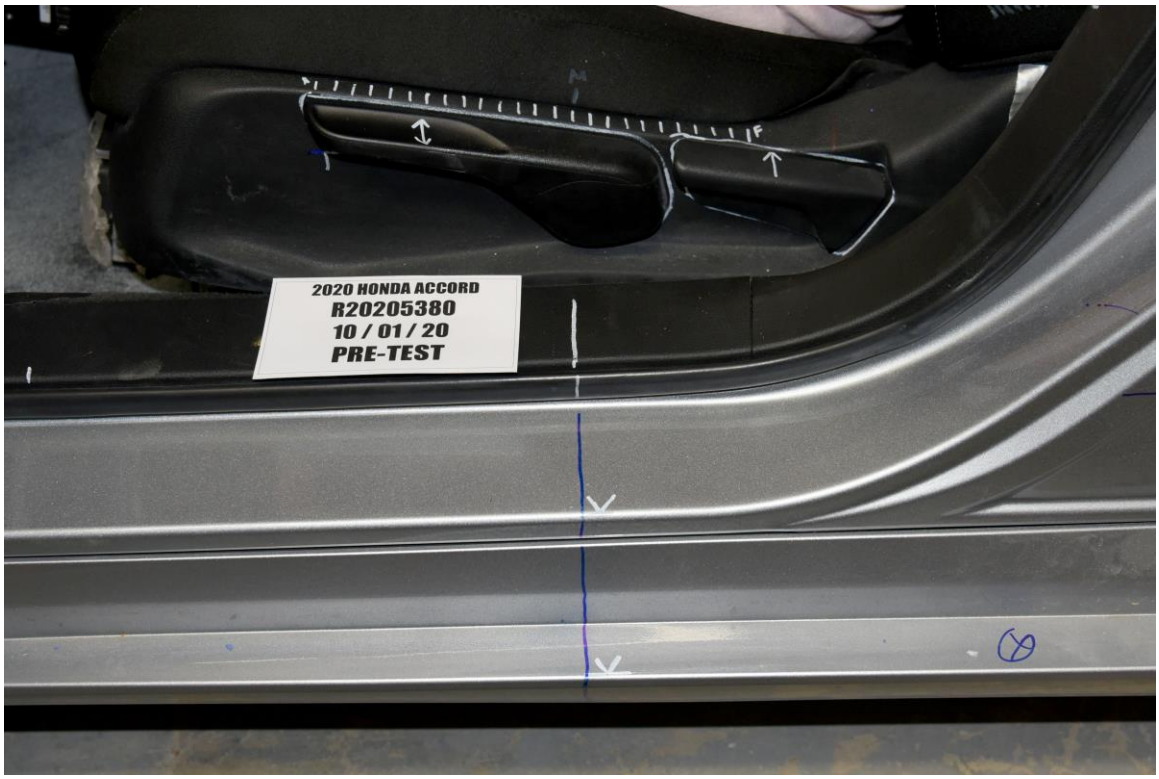


FIGURE 69. Pre-Test Driver Seat Fore-Aft Markings

FIGURE 70. Post-Test Driver Seat Fore-Aft Markings

FIGURE 71. Pre-Test Driver Seat Back Markings

FIGURE 72. Post-Test Driver Seat Back Markings

FIGURE 73. Pre-Test Close-Up View of Driver Door Latch

FIGURE 74. Post-Test Close-Up View of Driver Door Latch

FIGURE 75. Pre-Test Driver Inner Door Panel

FIGURE 76. Post-Test Driver Inner Door Panel

FIGURE 77. Pre-Test Left Side View of Driver Knee Bolster

FIGURE 78. Post-Test Left Side View of Driver Knee Bolster

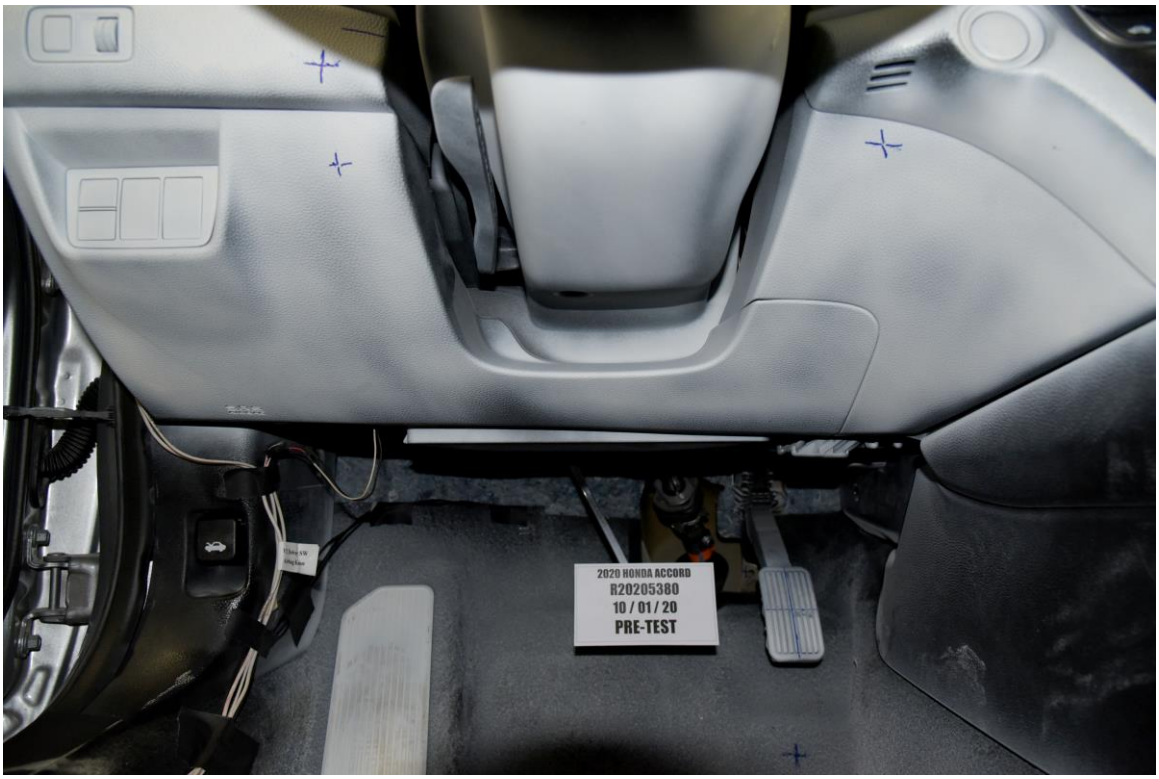


FIGURE 79. Pre-Test Overall View of Driver Knee Bolster

FIGURE 80. Post-Test Overall View of Driver Knee Bolster

FIGURE 81. Pre-Test Right Side View of Driver Knee Bolster

FIGURE 82. Post-Test Right Side View of Driver Knee Bolster

FIGURE 83. Pre-Test View of Driver Floor Pan from Outside of Vehicle

FIGURE 84. Post-Test View of Driver Floor Pan from Outside of Vehicle

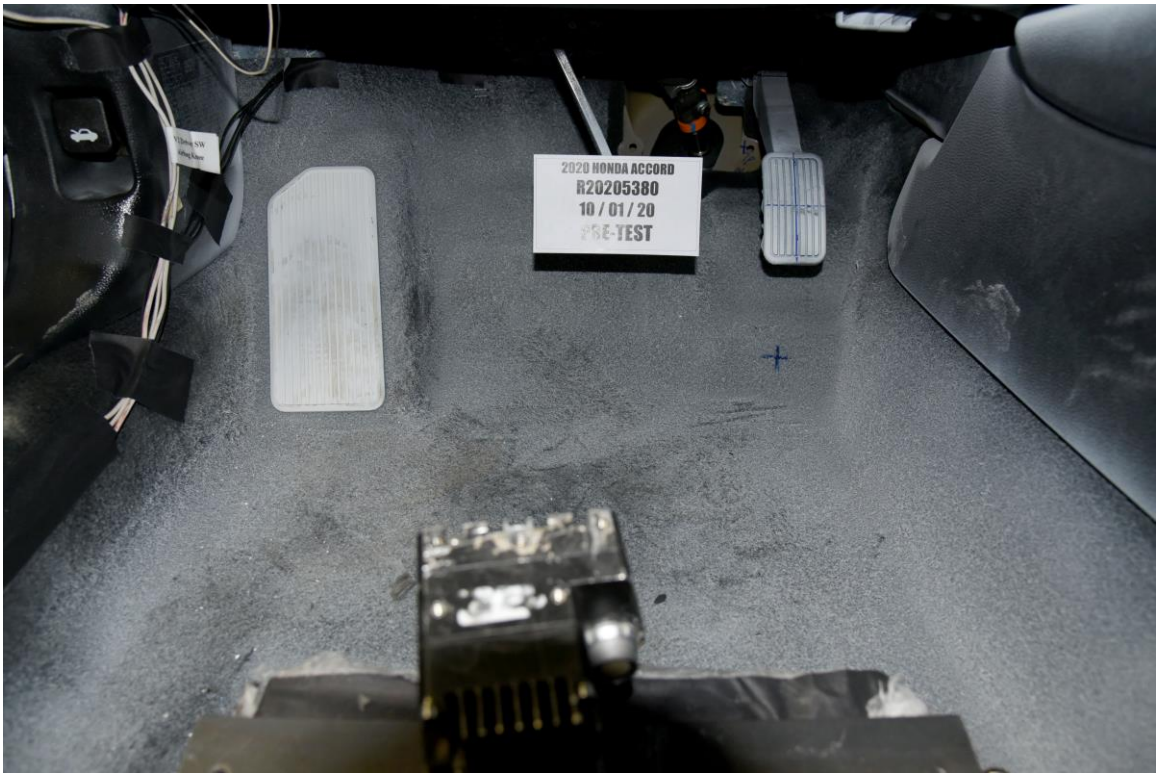


FIGURE 85. Pre-Test View of Driver Floor Pan from Top of Seat

FIGURE 86. Post-Test View of Driver Floor Pan from Top of Seat

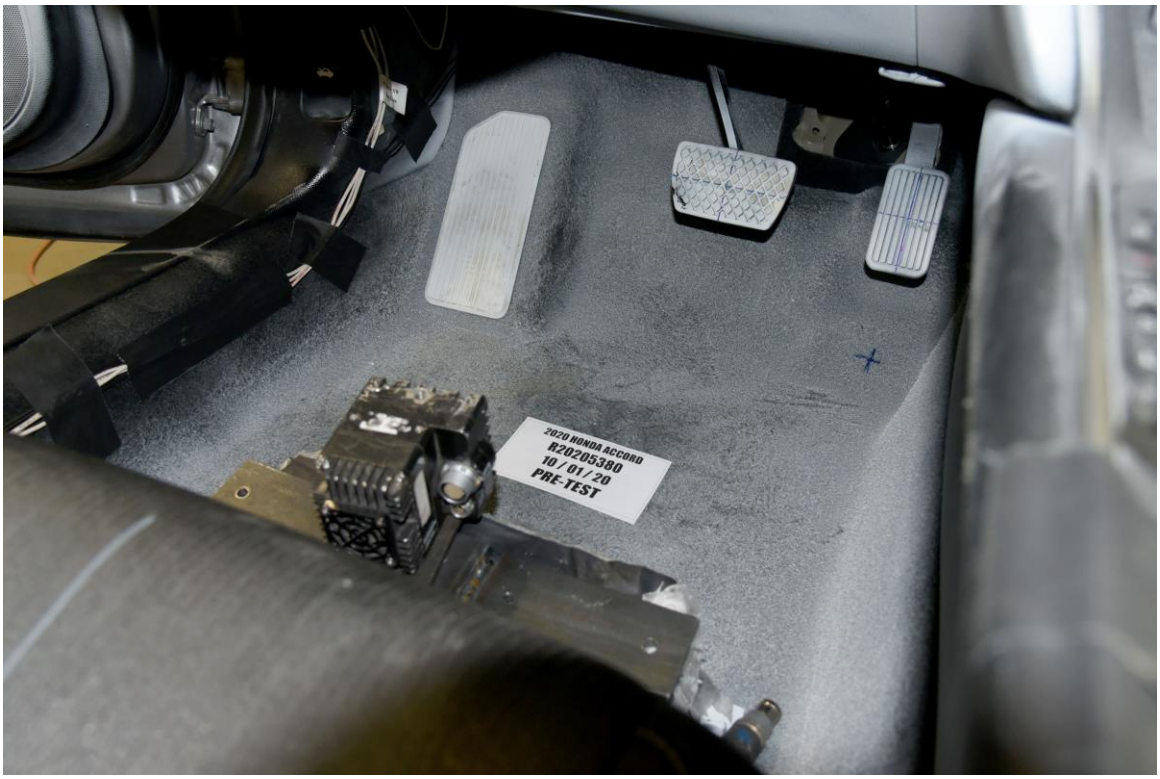


FIGURE 87. Pre-Test View of Driver Floor Pan from Center of Vehicle

FIGURE 88. Post-Test View of Driver Floor Pan from Center of Vehicle

FIGURE 89. Post-Test Driver Dummy Contact with Front Airbag

FIGURE 90. Post-Test Driver Dummy Contact with Side Airbag

FIGURE 91. Post-Test Driver Dummy Contact with Knee Airbag

FIGURE 91a. Post-Test Driver Dummy Contact with Headliner and A-Pillar

FIGURE 91b. Post-Test Driver Dummy Contact with Door Panel

FIGURE 91c. Post-Test Driver Dummy Contact with Torso/Pelvis Airbag

FIGURE 92. Pre-Test Passenger Front Windshield View

FIGURE 93. Post-Test Passenger Front Windshield View

FIGURE 94. Pre-Test Passenger Side Front Window View

FIGURE 95. Post-Test Passenger Side Front Window View

FIGURE 96. Pre-Test View of Passenger Door Clearance

FIGURE 97. Post-Test View of Passenger Door Clearance

FIGURE 98. Pre-Test Right Side View of Passenger and Interior

FIGURE 99. Post-Test Right Side View of Passenger and Interior

FIGURE 100. Pre-Test Overhead View of Passenger Thighs on Seat

FIGURE 101. Post-Test Overhead View of Passenger Thighs on Seat

FIGURE 102. Pre-Test View of Passenger Abdomen

FIGURE 103. Post-Test View of Passenger Abdomen

FIGURE 104. Pre-Test Left Side Passenger and Interior View

FIGURE 105. Post-Test Left Side Passenger and Interior View

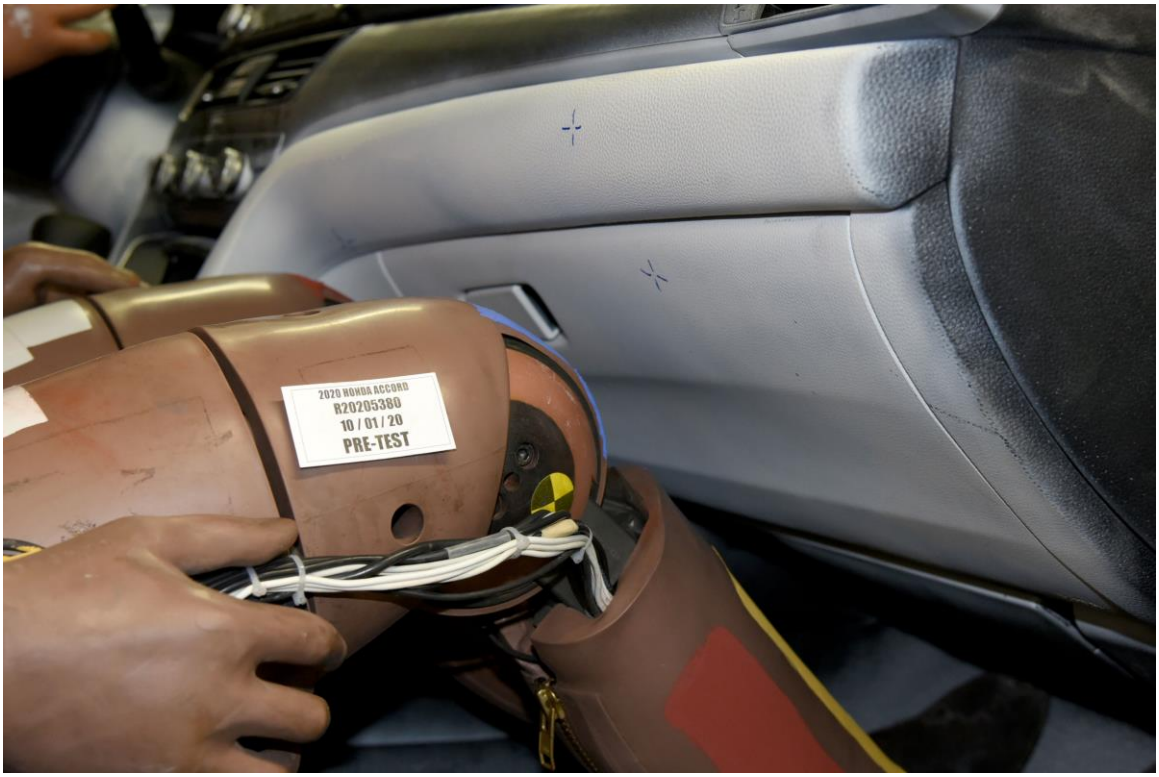


FIGURE 106. Pre-Test View of Passenger Right Knee and Bolster

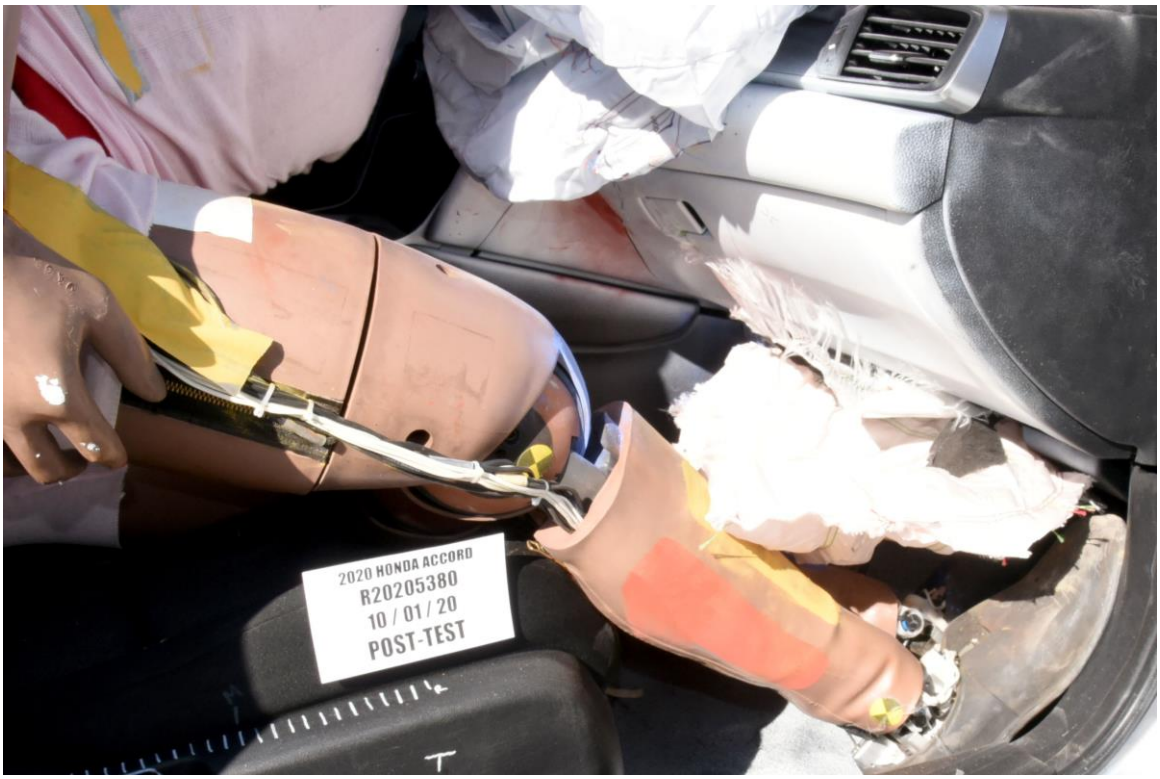


FIGURE 107. Post-Test View of Passenger Right Knee and Bolster

FIGURE 108. Pre-Test View of Passenger Left Knee and Bolster

FIGURE 109. Post-Test View of Passenger Left Knee and Bolster

FIGURE 110. Pre-Test View of the Passenger Feet

FIGURE 111. Post-Test View of the Passenger Feet

FIGURE 112. Pre-Test Passenger Adjustable D-Ring

FIGURE 113. Post-Test Passenger Adjustable D-Ring

FIGURE 114. Pre-Test Right Front Passenger Seat Fore-Aft Markings

FIGURE 115. Post-Test Right Front Passenger Seat Fore-Aft Markings

FIGURE 116. Pre-Test Passenger Seat Back Markings

FIGURE 117. Post-Test Passenger Seat Back Markings

FIGURE 118. Pre-Test Close-up View of Passenger Door Latch

FIGURE 119. Post-Test Close-up View of Passenger Door Latch

FIGURE 120. Pre-Test Passenger Inner Door Panel

FIGURE 121. Post-Test Passenger Inner Door Panel

Photograph Not Available

FIGURE 122. Pre-Test Right Side View of Passenger Knee Bolster

FIGURE 123. Post-Test Right Side View of Passenger Knee Bolster

Photograph Not Available

FIGURE 124. Pre-Test Center View of Passenger Knee Bolster

FIGURE 125. Post-Test Center View of Passenger Knee Bolster

Photograph Not Available

FIGURE 126. Pre-Test Left Side View of Passenger Knee Bolster

FIGURE 127. Post-Test Left Side View of Passenger Knee Bolster

Photograph Not Available

FIGURE 128. Pre-Test View of Passenger Floor Pan from Outside of Vehicle

FIGURE 129. Post-Test View of Passenger Floor Pan from Outside of Vehicle

Photograph Not Available

FIGURE 130. Pre-Test View of Passenger Floor Pan from Top of Front Seat

FIGURE 131. Post-Test View of Passenger Floor Pan from Top of Front Seat

Photograph Not Available

FIGURE 133. Post-Test View of Passenger Floor Pan from Center of Vehicle

FIGURE 133. Post-Test View of Passenger Floor Pan from Center of Vehicle

FIGURE 134. Post-Test Passenger Dummy Contact with Front Airbag

Photograph Not Applicable

FIGURE 135. Post-Test Passenger Dummy Contact with Side Airbag

FIGURE 136. Post-Test Passenger Dummy Contact with Knee Airbag

FIGURE 136a. Post-Test Passenger Dummy Contact with Headliner

FIGURE 136b. Post-Test Passenger Dummy Contact with Knee Bolster

FIGURE 136c. Post-Test Passenger Dummy Contact with Front Airbag

Photograph Not Available

FIGURE 137. Photograph of Ballast Installed in Vehicle

Photograph Not Applicable

FIGURE 138. Post-Test Stoddard Solvent Spillage Location View

FIGURE 139. Post-Test Speed Trap Read-Out

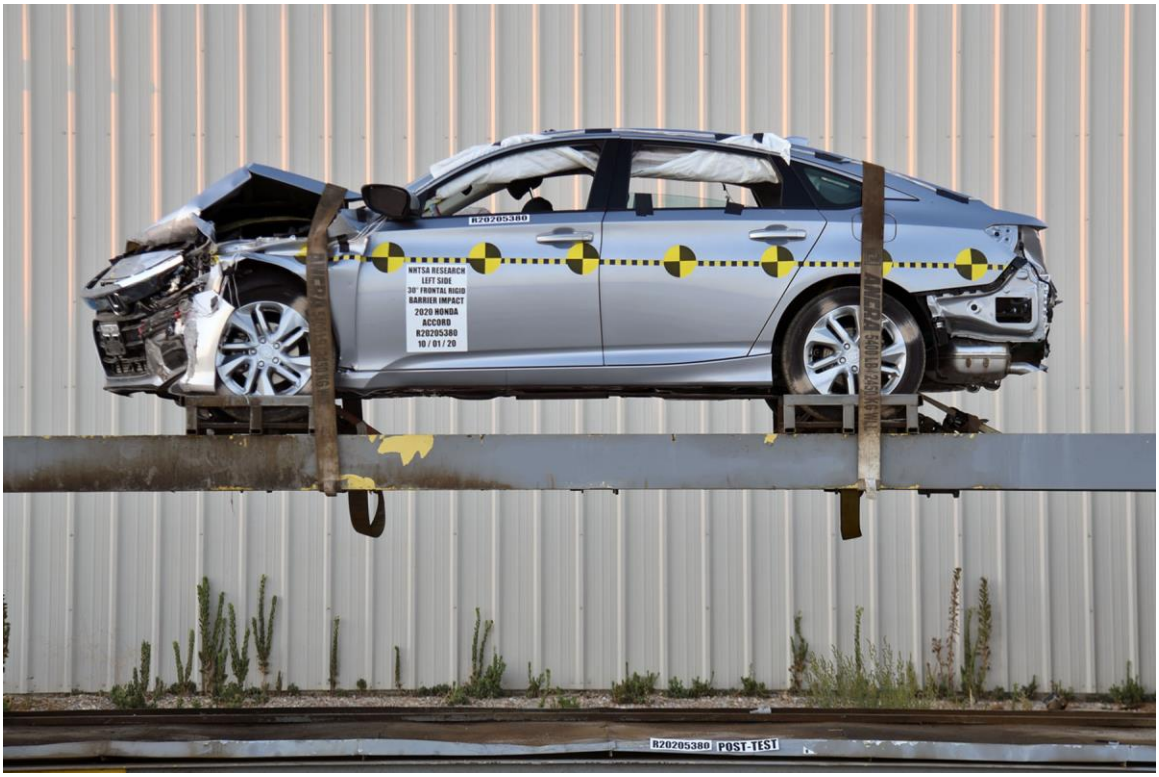


FIGURE 140. Vehicle at 0° on Static Rollover Device

FIGURE 141. Vehicle at 90° on Static Rollover Device

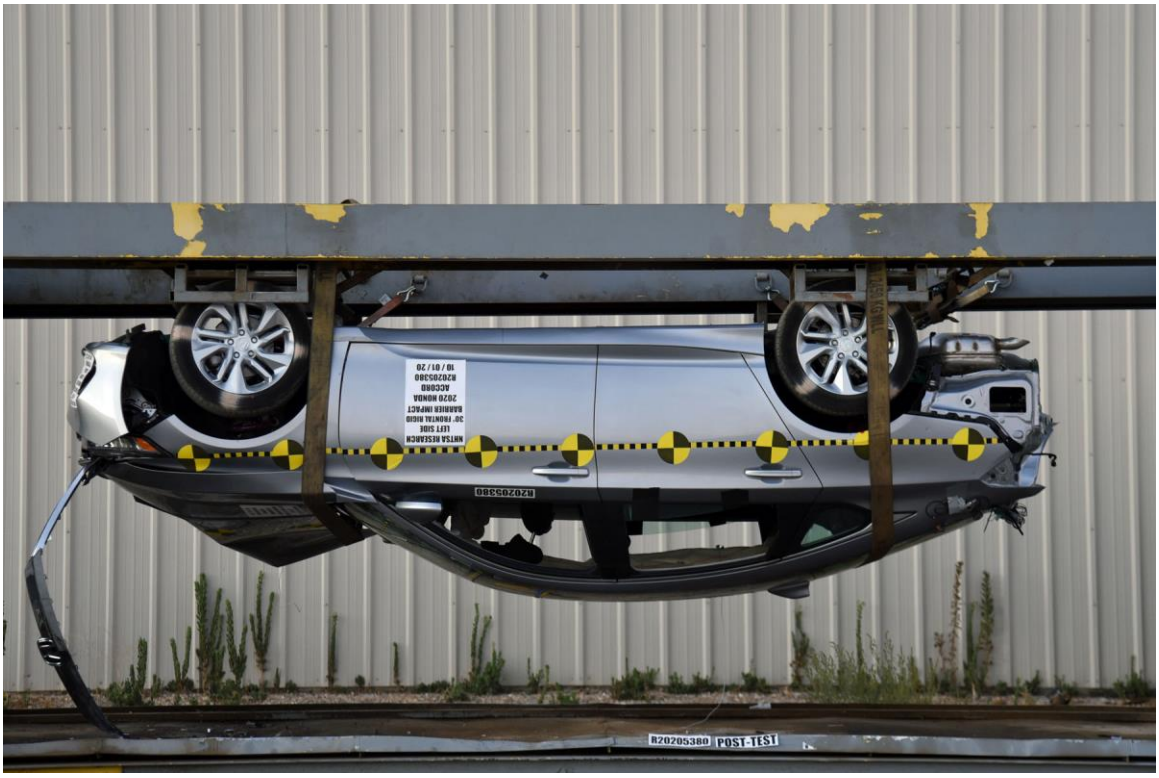


FIGURE 142. Vehicle at 180° on Static Rollover Device

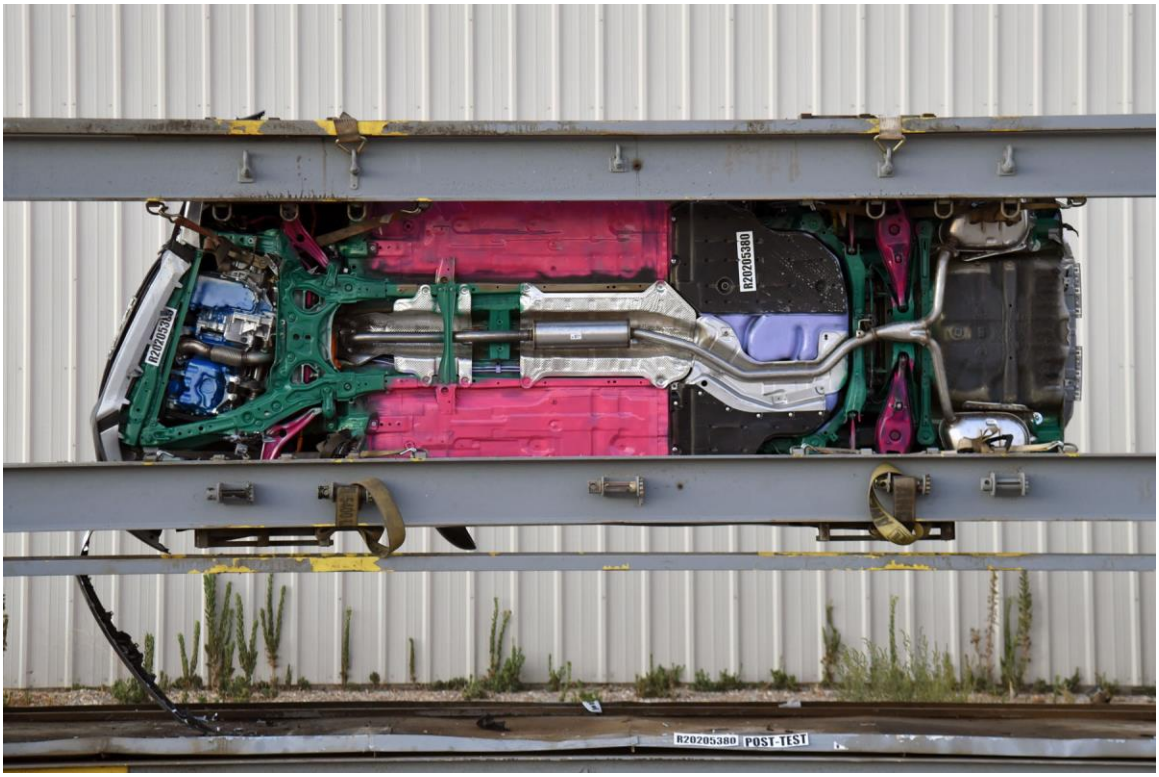


FIGURE 143. Vehicle at 270° on Static Rollover Device

FIGURE 144. Vehicle at 360° on Static Rollover Device

FIGURE 145. Frontal Impact Event

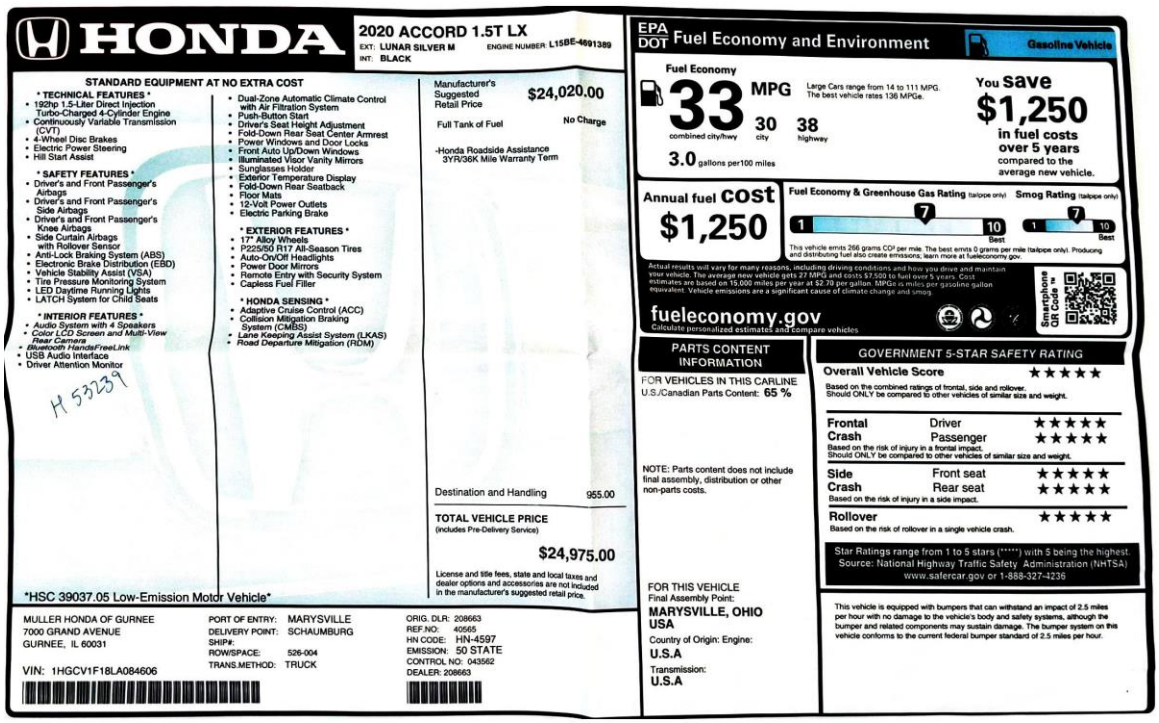


FIGURE 146. Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

TABLE OF DATA PLOTS … (CONTINUED)

TABLE OF DATA PLOTS … (CONTINUED)

TABLE OF DATA PLOTS … (CONTINUED)

TABLE OF DATA PLOTS … (CONTINUED)

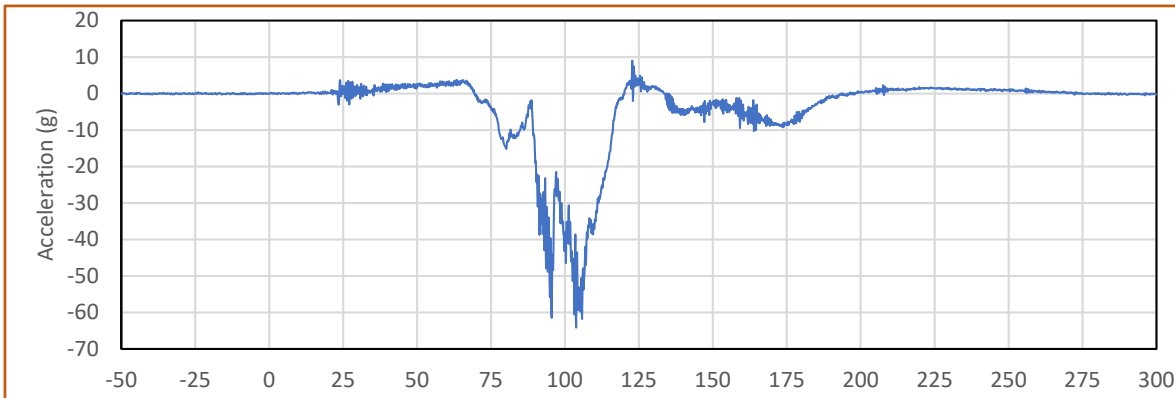
TABLE OF DATA PLOTS … (CONTINUED)

Test Vehicle: 2020 Honda Accord 4-Door Sedan

Test Program: Left Side 30° Frontal Rigid Barrier Impact

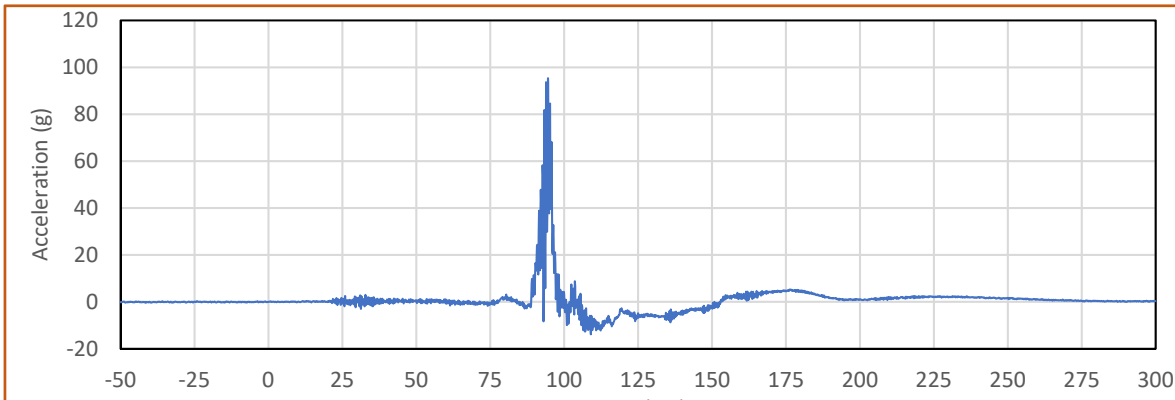
NHTSA No.: R20205380

Test Date: 10/1/2020



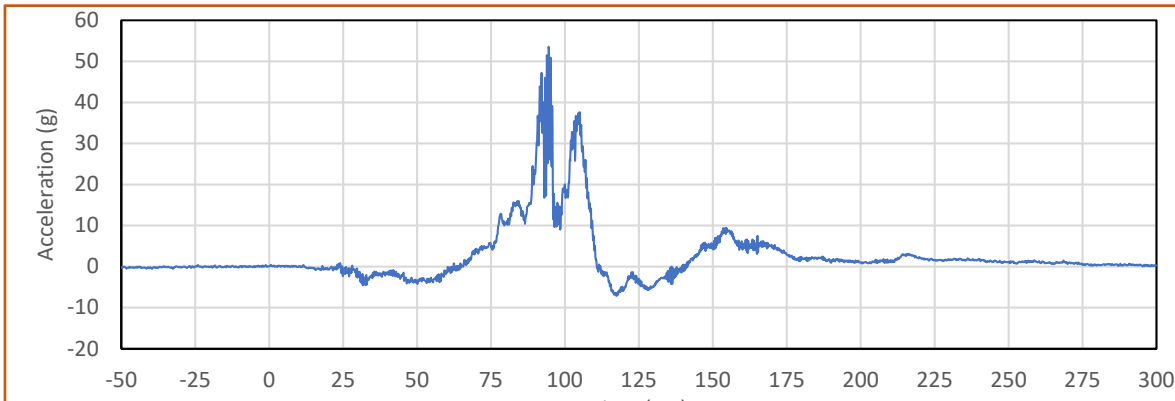
P2TH HEAD CG X ACCELERATION

13HEAD0000THACXA
Max:9.0@122.8
Min:-64.2@103.8
SAE Class 1000



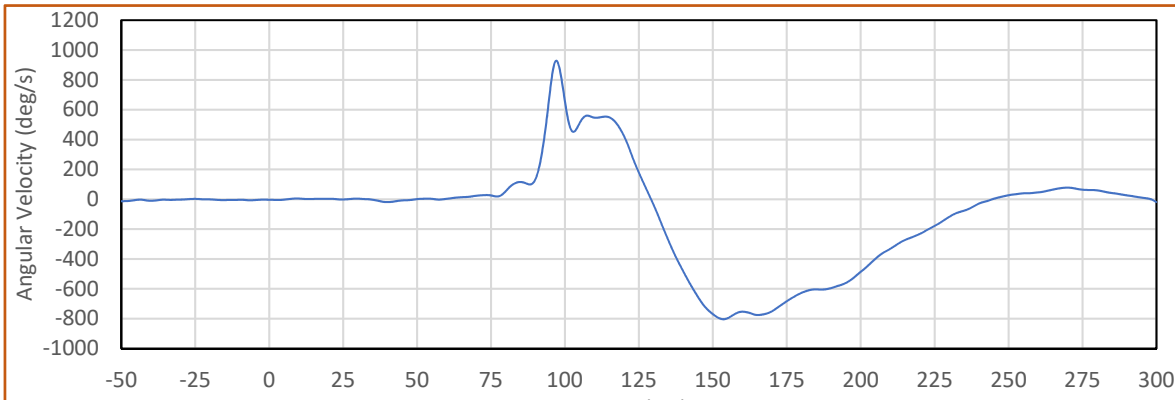
P2TH HEAD CG Y ACCELERATION

13HEAD0000THACYA
Max:95.3@94.5
Min:-13.8@109.0
SAE Class 1000



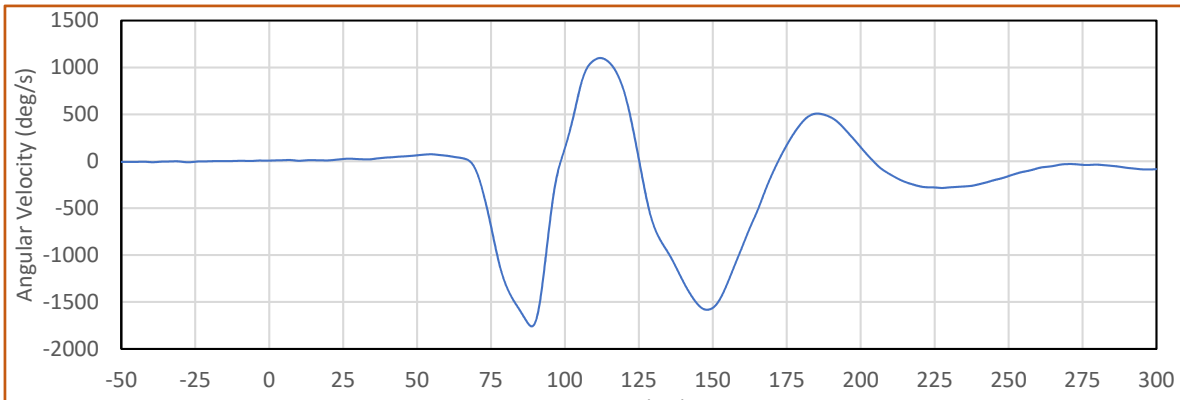
P2TH HEAD CG Z ACCELERATION

13HEAD0000THACZA
Max:53.5@94.5
Min:-7.1@117.4
SAE Class 1000



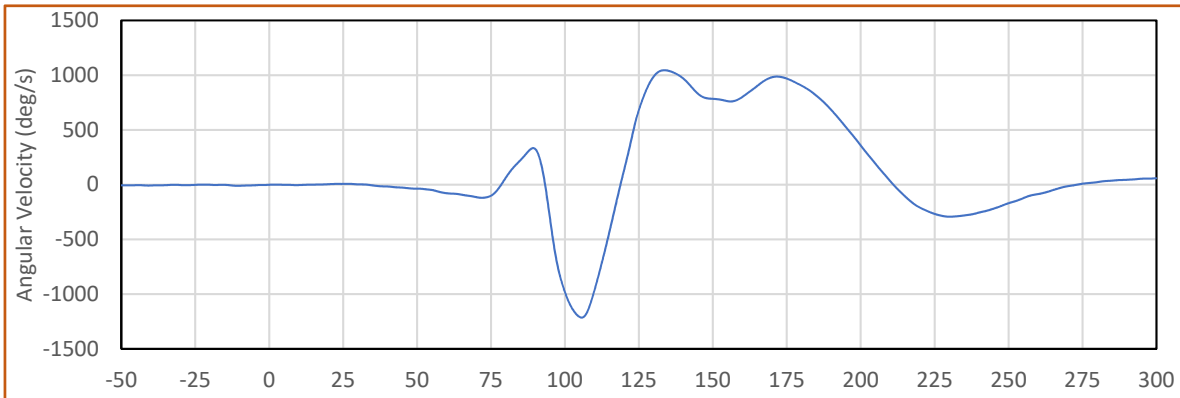
P2TH HEAD CG ANGULAR VELOCITY ABOUT X

13HEAD0000THAVXD
Max:928.6@97.1
Min:-803.8@153.6
SAE Class 60



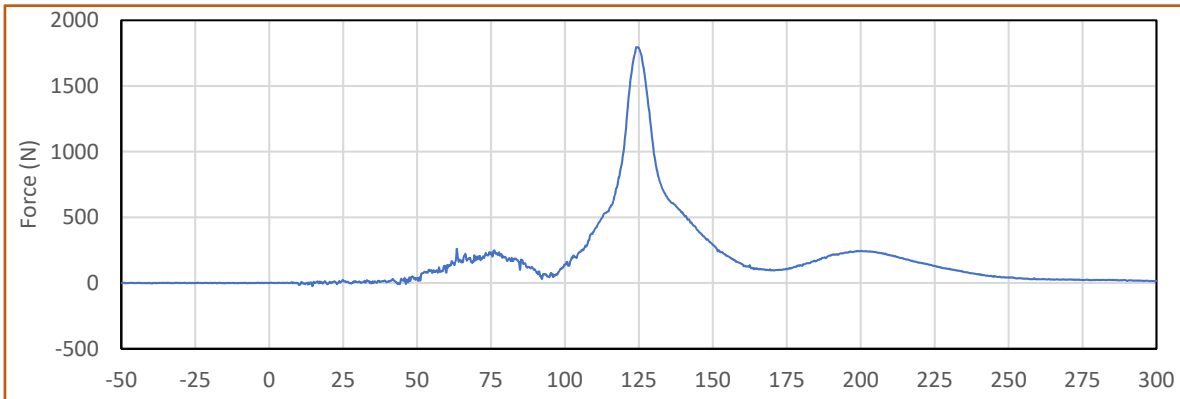
13HEAD0000THAVYD
Max:1100.9@111.9
Min:-1760.0@88.8
SAE Class 60

P2TH HEAD CG ANGULAR VELOCITY ABOUT Y



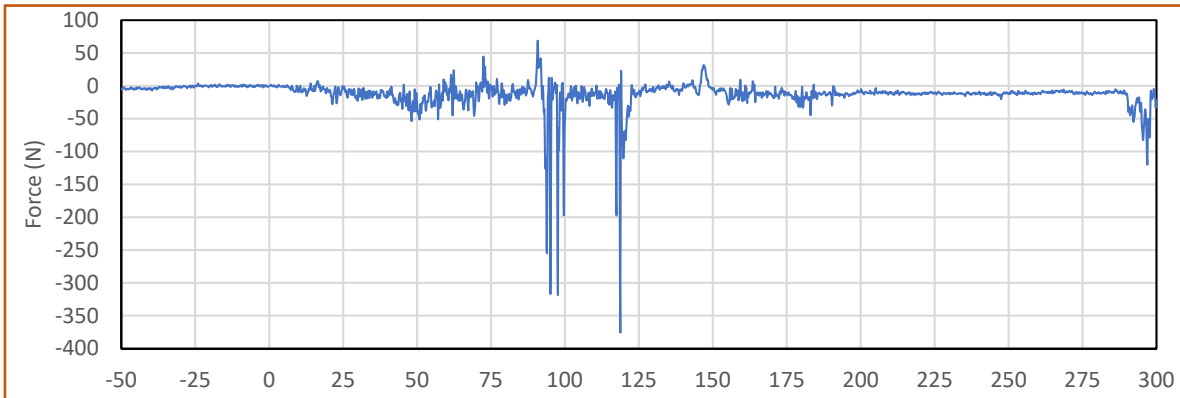
13HEAD0000THAVZD
Max:1044.8@133.7
Min:-1215.2@105.7
SAE Class 60

P2TH HEAD CG ANGULAR VELOCITY ABOUT Z



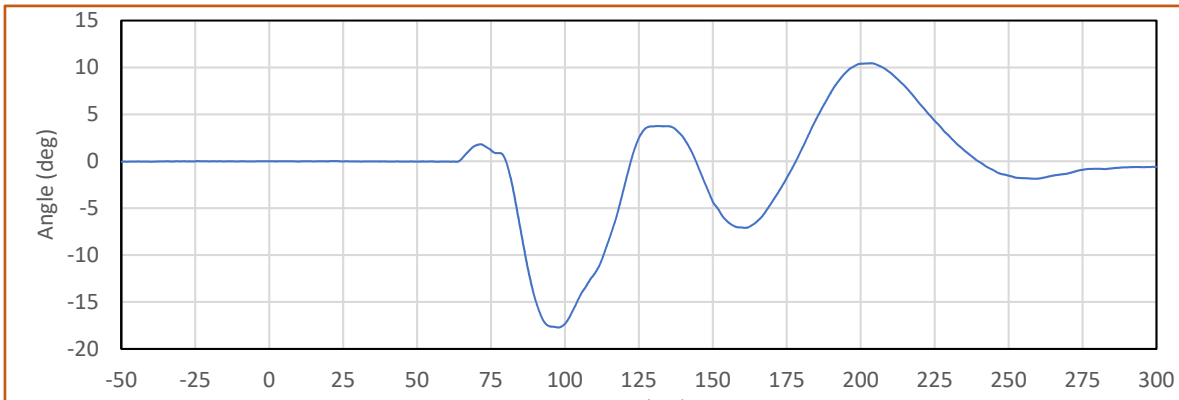
13NECKFR00THFOZA
Max:1795.2@124.1
Min:-24.6@14.6
SAE Class 1000

P2TH FRONT NECK SPRING TOWER LOAD CELL



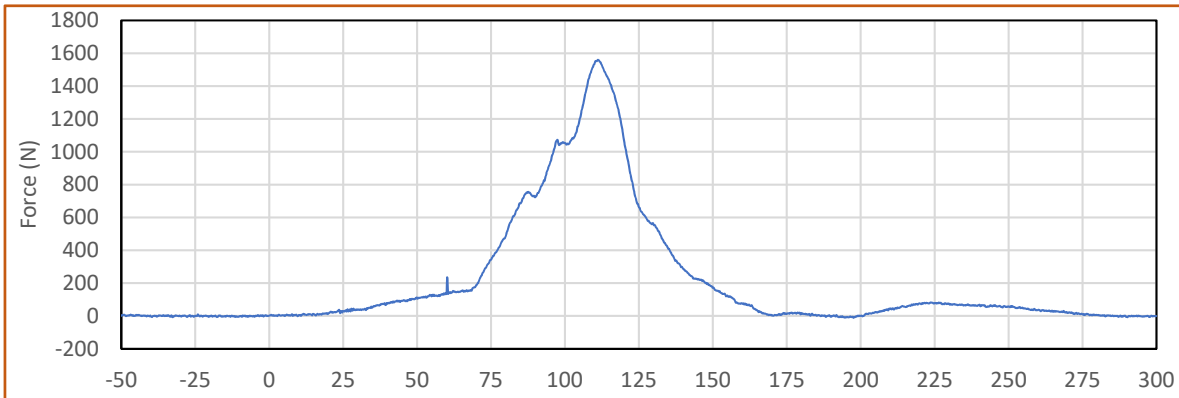
13NECKRE00THFOZA
Max:68.8@90.8
Min:-375.6@118.7
SAE Class 1000

P2TH REAR NECK SPRING TOWER LOAD CELL



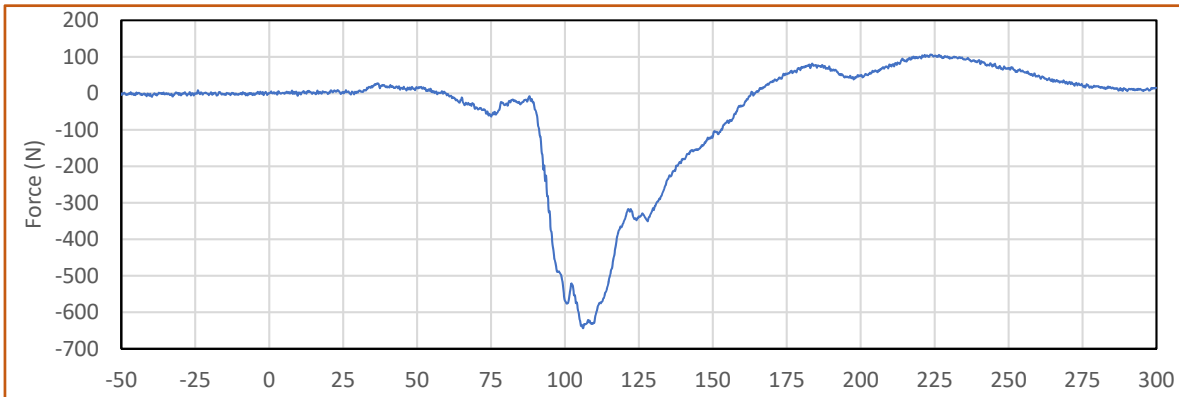
13NECKUP00THANYC
Max:10.4@203.4
Min:-17.7@97.8
SAE Class 180

P2TH OCCIPITAL CONDYLE ROTATION POTENTIOMETER



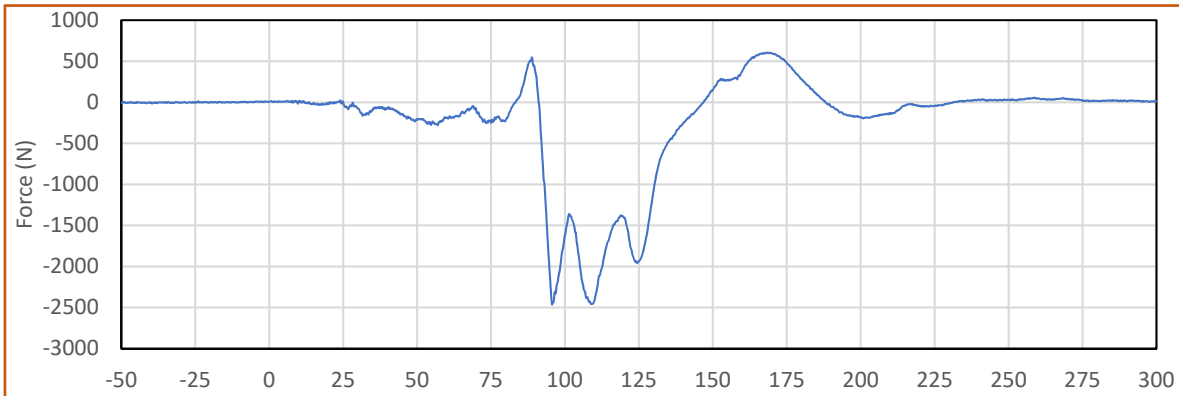
13NECKUP00THFOXA
Max:1559.8@111.1
Min:-11.7@197.6
SAE Class 1000

P2TH UPPER NECK X FORCE



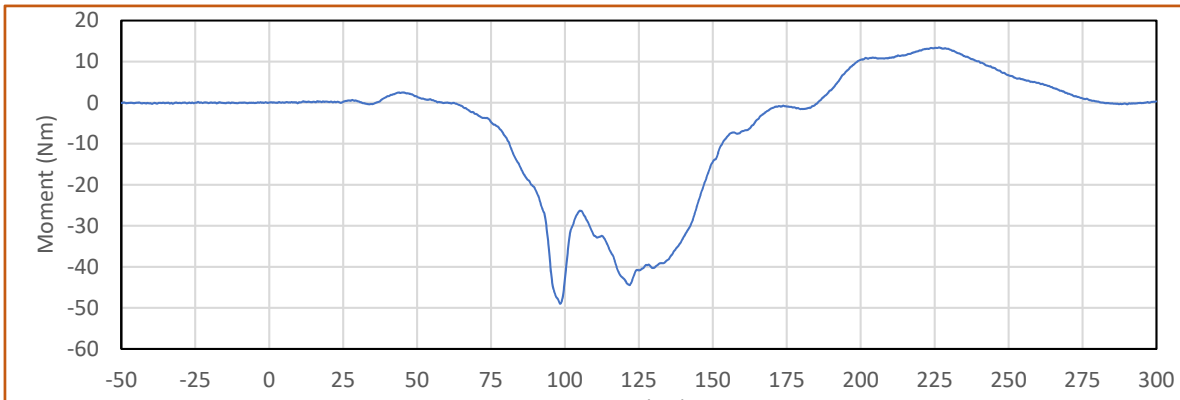
13NECKUP00THFOYA
Max:10.4@203.4
Min:-17.7@97.8
SAE Class 180

P2TH UPPER NECK Y FORCE



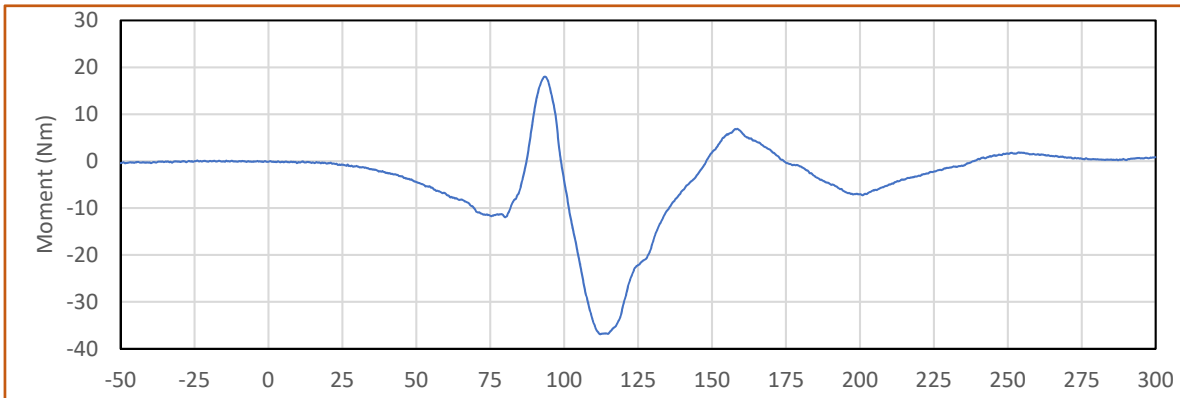
13NECKUP00THFOZA
Max:605.4@168.2
Min:-2464.4@95.7
SAE Class 1000

P2TH UPPER NECK Z FORCE



P2TH UPPER NECK X MOMENT

13NECKUP00THMOXB
Max:13.5@226.4
Min:-49.0@98.4
SAE Class 600



P2TH UPPER NECK Y MOMENT

13NECKUP00THMOYB
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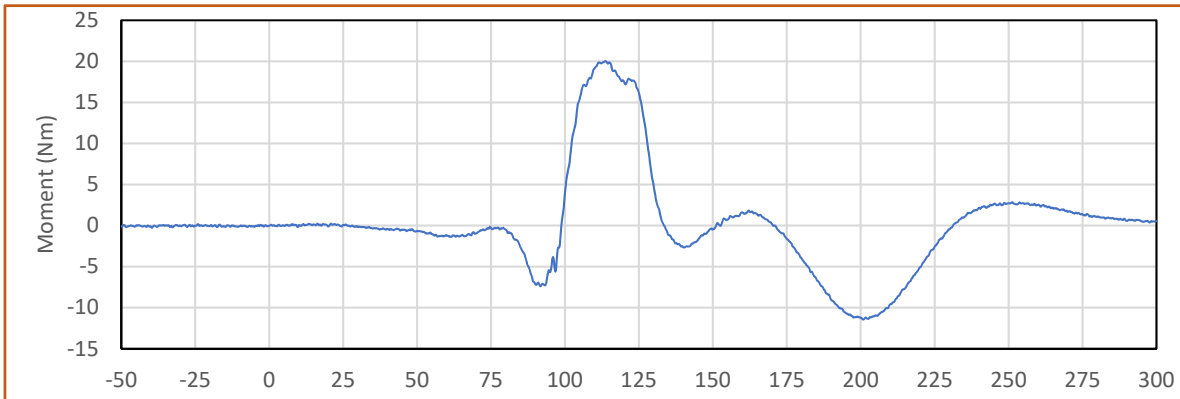
Min:-36.9@112.1
SAE Class 600

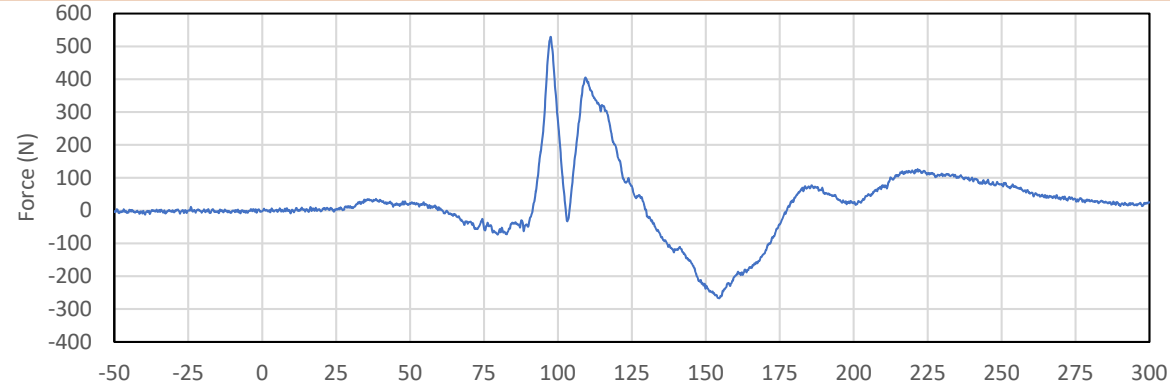


P2TH UPPER NECK Z MOMENT

13NECKUP00THMOZB
Max:20.0@113.7
Min:-11.5@200.9
SAE Class 600

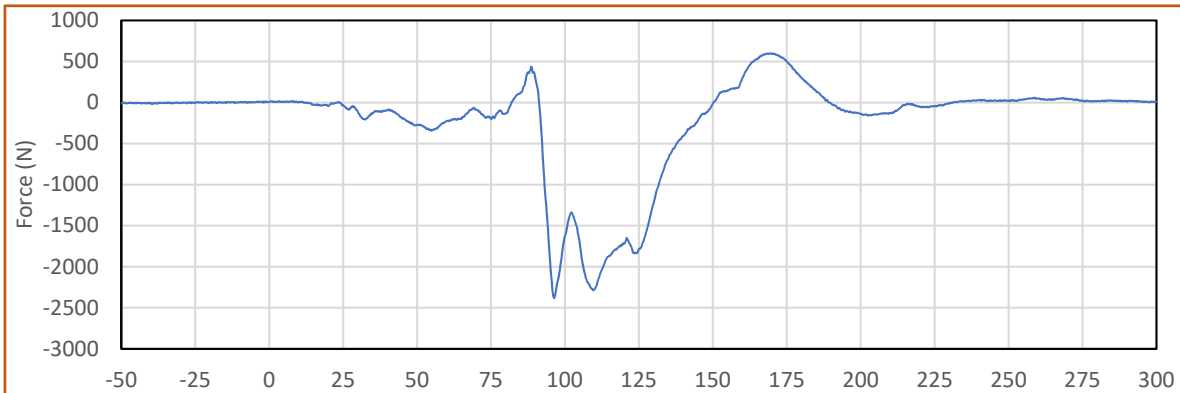
P2TH LOWER NECK X FORCE

13NECKLO00THFOXA
Max:634.5@90.7
Min:-1044.8@110.8
SAE Class 1000



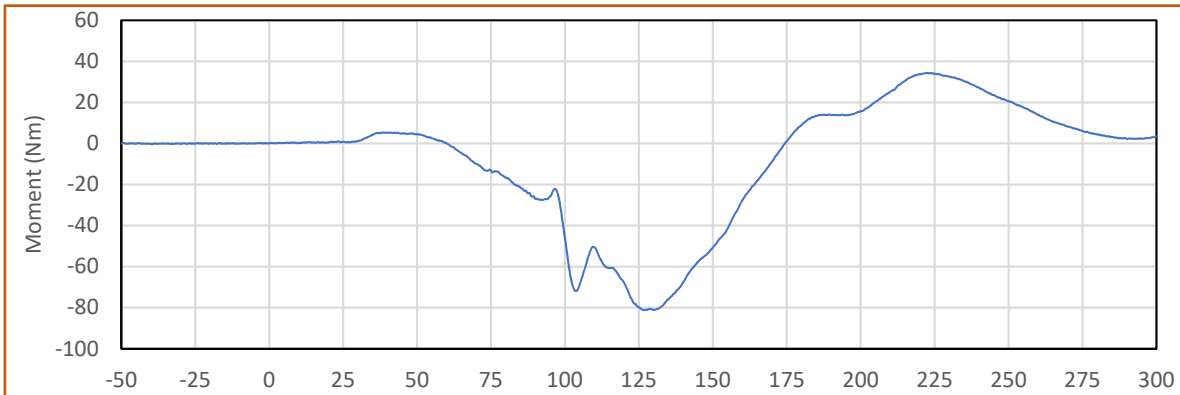
P2TH LOWER NECK Y FORCE

13NECKLO00THFOYA
Max:529.0@97.5
Min:-267.1@154.6
SAE Class 1000



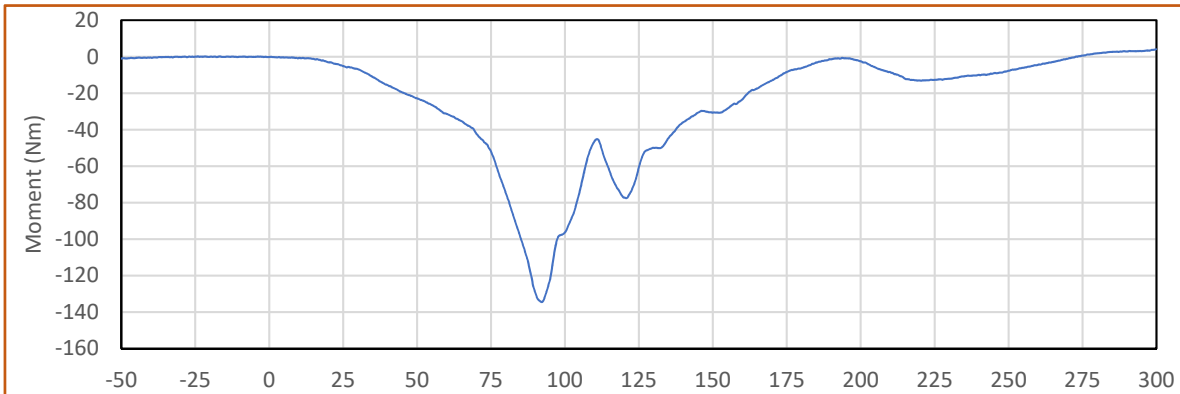
P2TH LOWER NECK Z FORCE

13NECKLO00THFOZA
Max:597.8@169.7
Min:-2382.4@96.4
SAE Class 1000



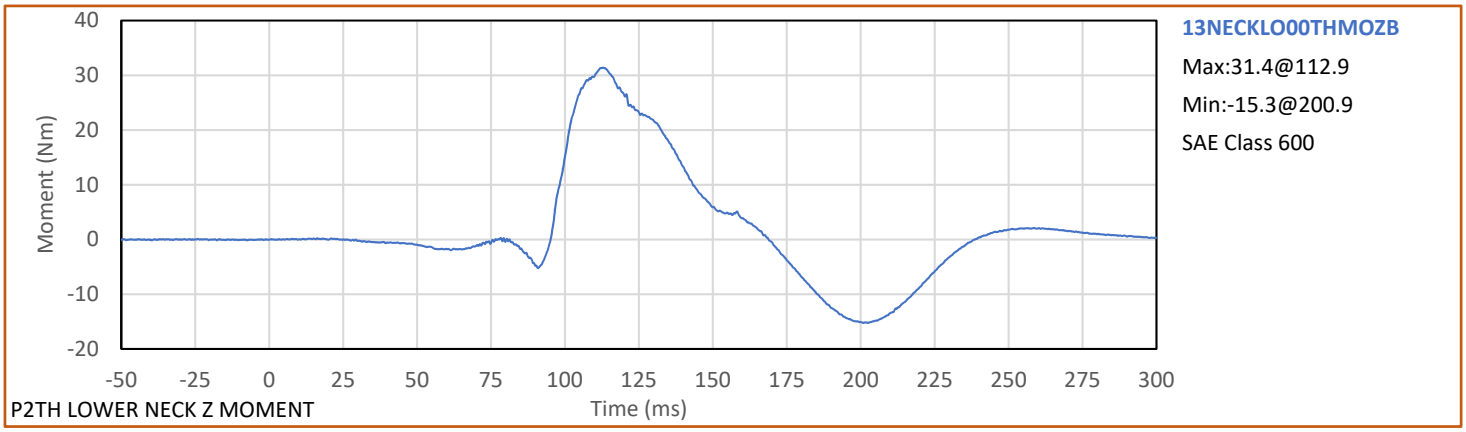
P2TH LOWER NECK X MOMENT

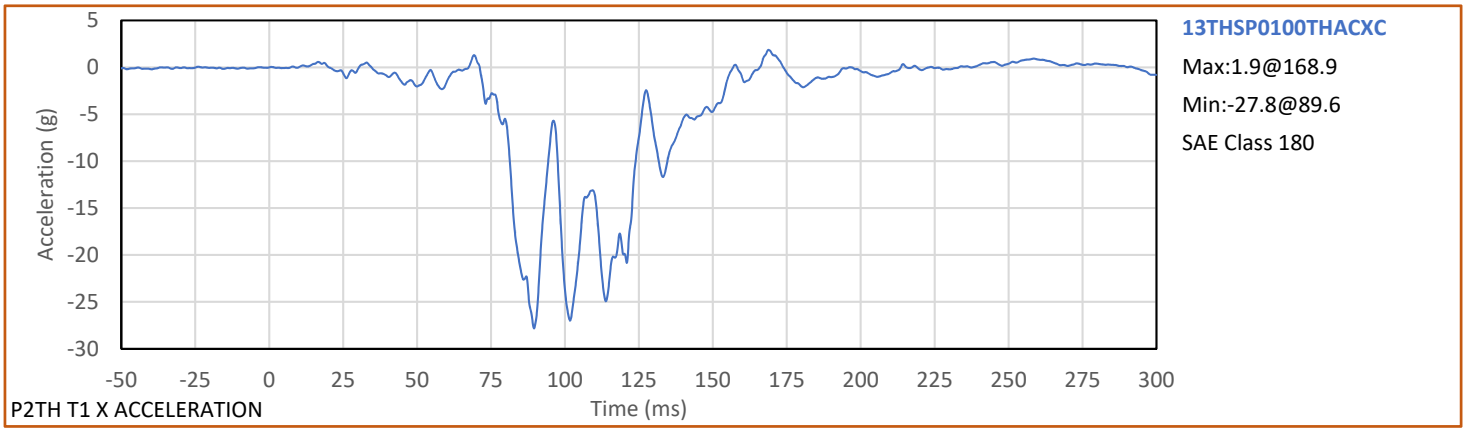
13NECKLO00THMOXB
Max:34.3@222.5
Min:-81.2@126.6
SAE Class 600

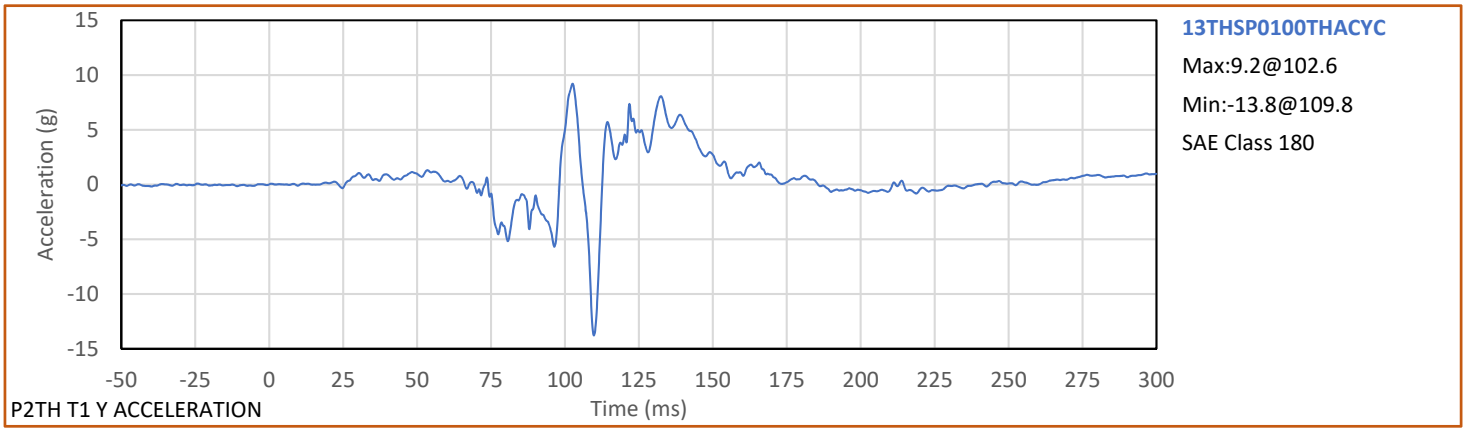


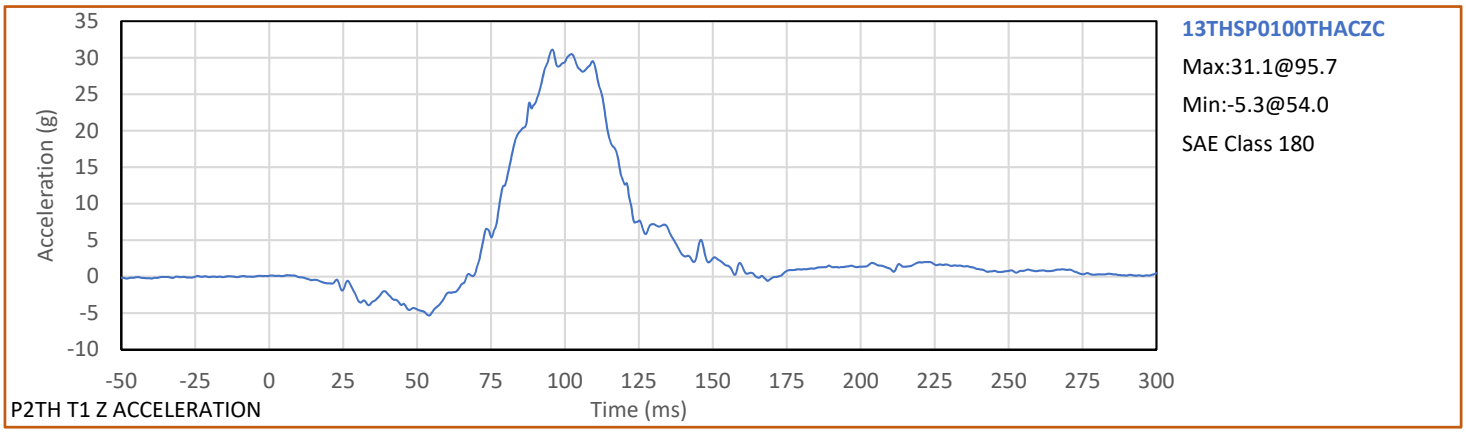
P2TH LOWER NECK Y MOMENT

13NECKLO00THMOYB
Max:4.1@299.9
Min:-134.5@92.1
SAE Class 600


Moment (Nm)
Time (ms)
P2TH LOWER NECK Z MOMENT
13NECKLO00THMOZB
Max:31.4@112.9
Min:-15.3@200.9
SAE Class 600


Acceleration (g)
Time (ms)
P2TH T1 X ACCELERATION
13THSP0100THACXC
Max:1.9@168.9
Min:-27.8@89.6
SAE Class 180


Acceleration (g)
Time (ms)
P2TH T1 Y ACCELERATION
13THSP0100THACYC
Max:9.2@102.6
Min:-13.8@109.8
SAE Class 180


Acceleration (g)
Time (ms)
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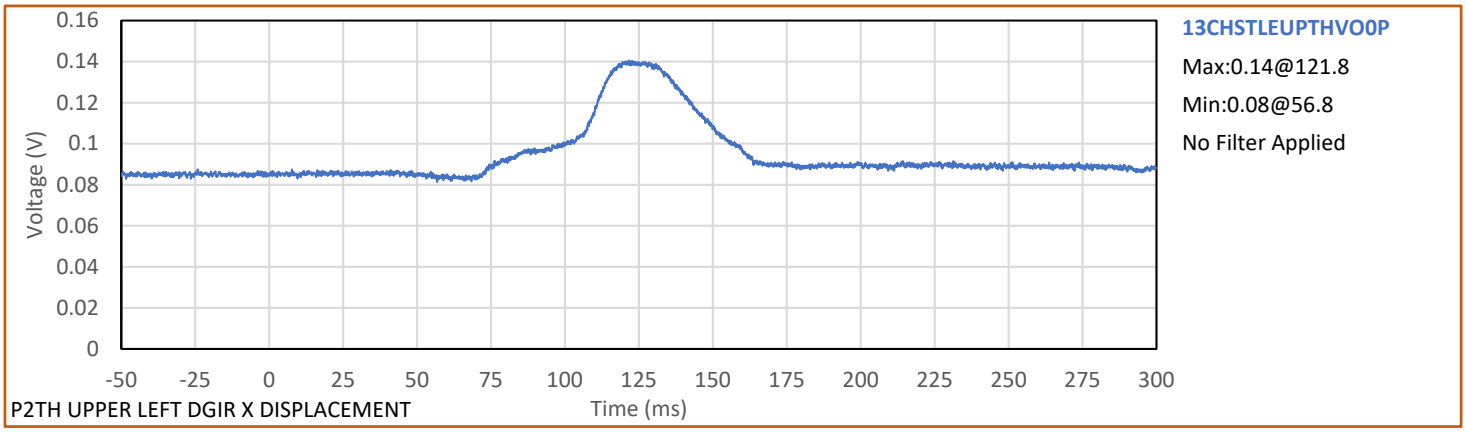
Max:31.1@95.7
Min:-5.3@54.0
SAE Class 180


Voltage (V)
Time (ms)
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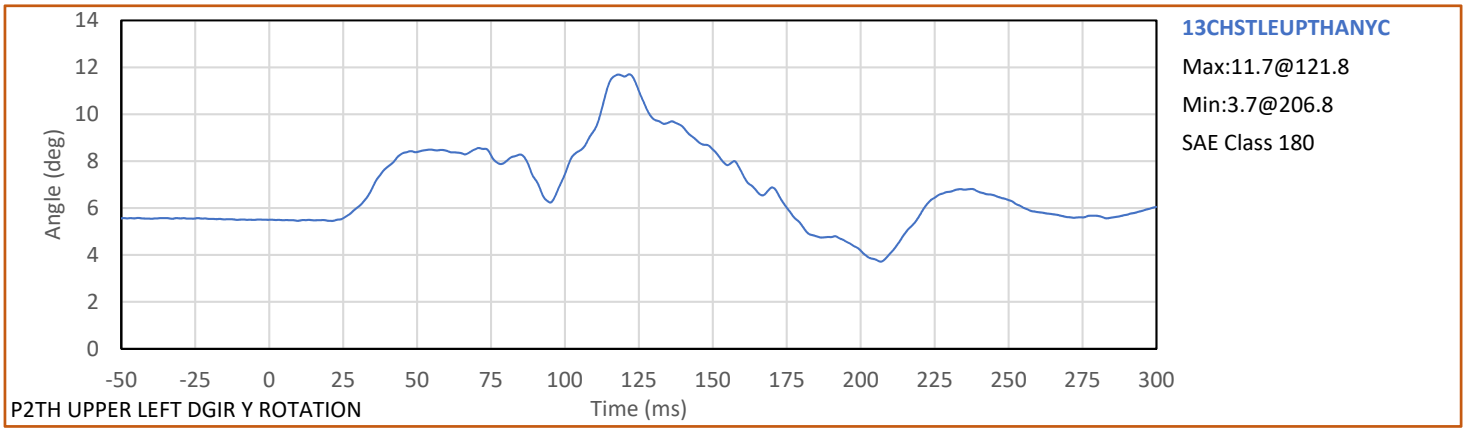
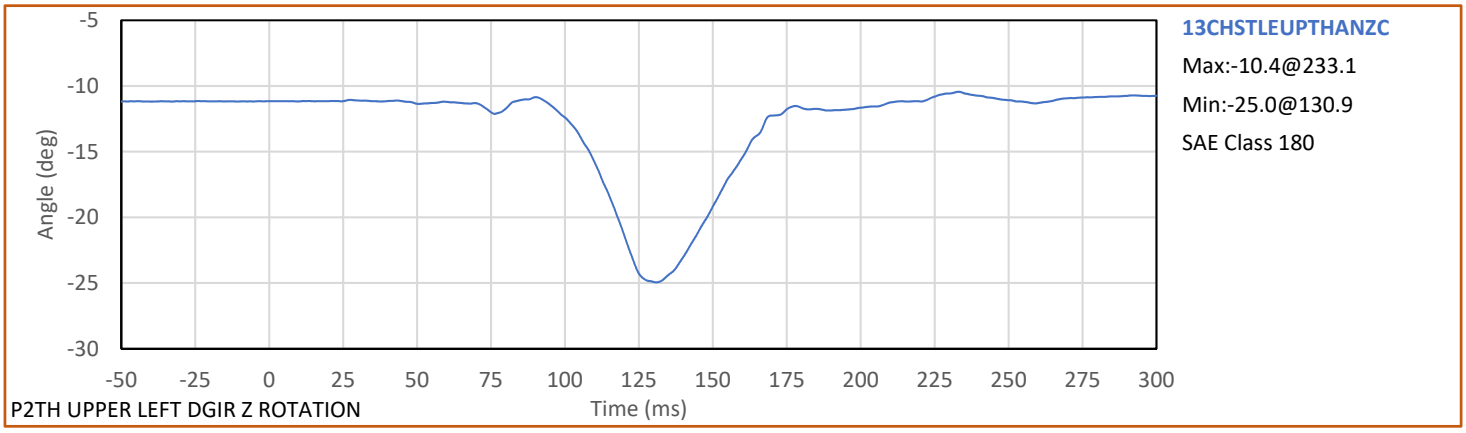
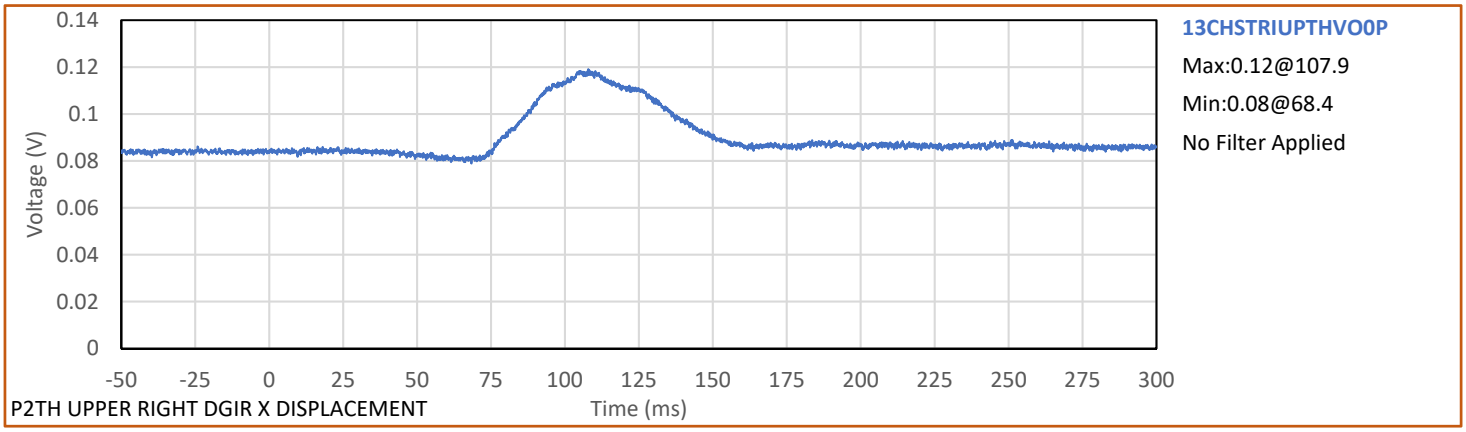
13CHSTLEUPTHVO0P
Max:0.14@121.8
Min:0.08@56.8
No Filter Applied


Angle (deg)
Time (ms)
P2TH UPPER LEFT DGIR Y ROTATION
13CHSTLEUPTHANYC
Max:11.7@121.8
Min:3.7@206.8
SAE Class 180


Angle (deg)
Time (ms)
P2TH UPPER LEFT DGIR Z ROTATION
13CHSTLEUPTHANZC
Max:-10.4@233.1
Min:-25.0@130.9
SAE Class 180


Voltage (V)
Time (ms)
P2TH UPPER RIGHT DGIR X DISPLACEMENT
13CHSTRIUPTHVO0P
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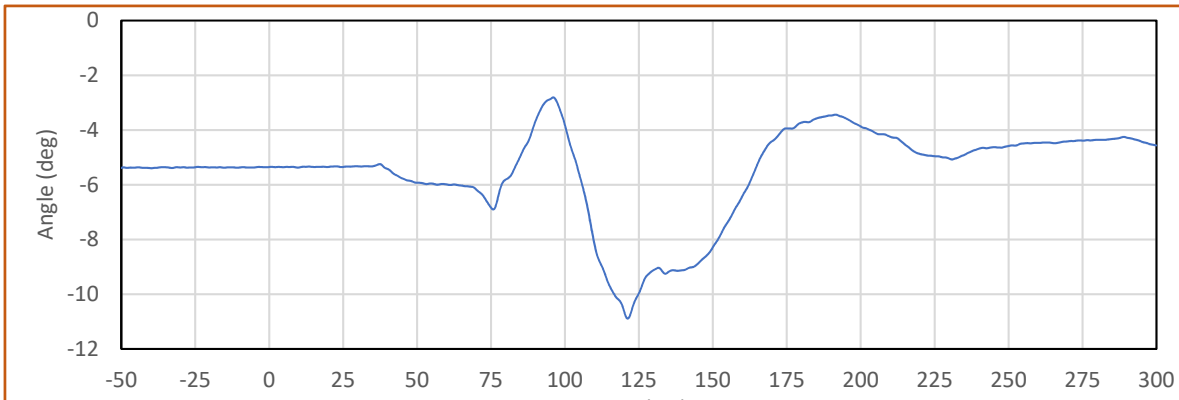
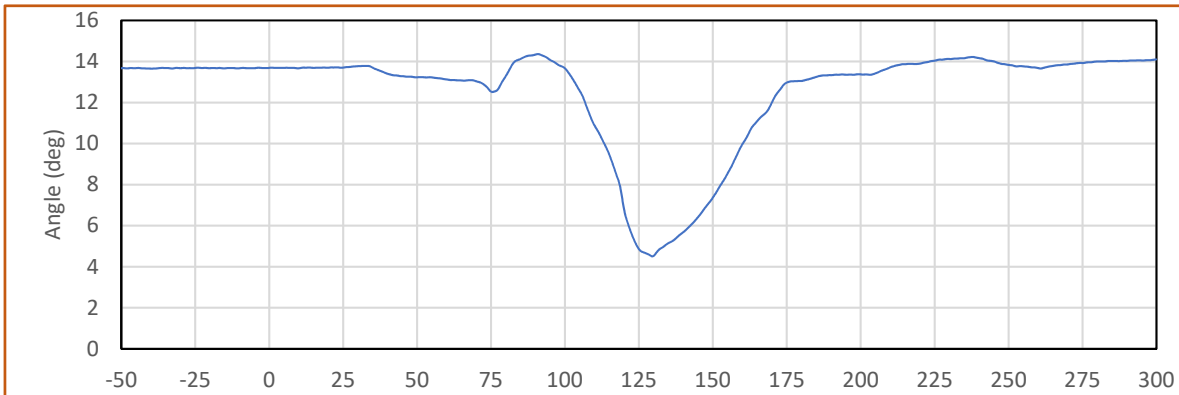
Min:0.08@68.4
No Filter Applied



P2TH UPPER RIGHT DGIR Y ROTATION

13CHSTRIUPTHANYC
Max:-2.8@96.1
Min:-10.9@121.2
SAE Class 180



P2TH UPPER RIGHT DGIR Z ROTATION

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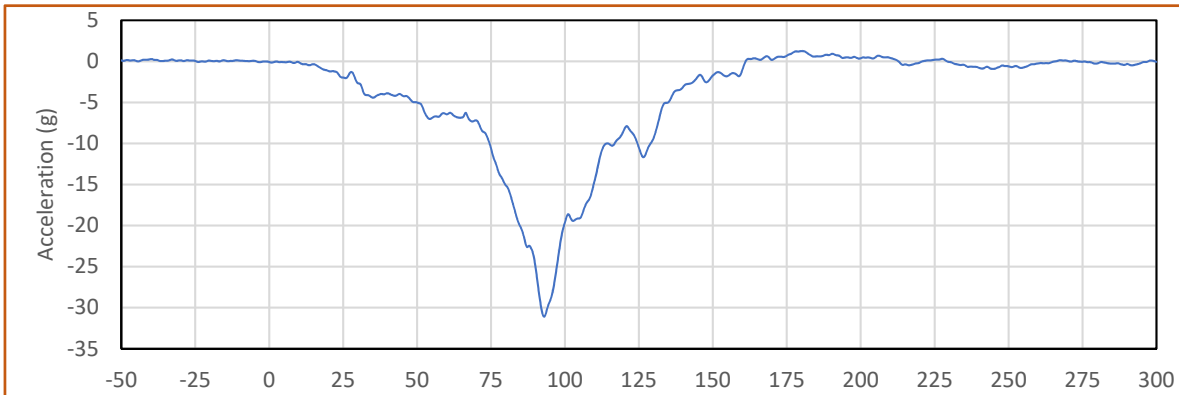
Max:14.4@90.9
Min:4.5@129.6
SAE Class 180



P2TH T6 X ACCELERATION

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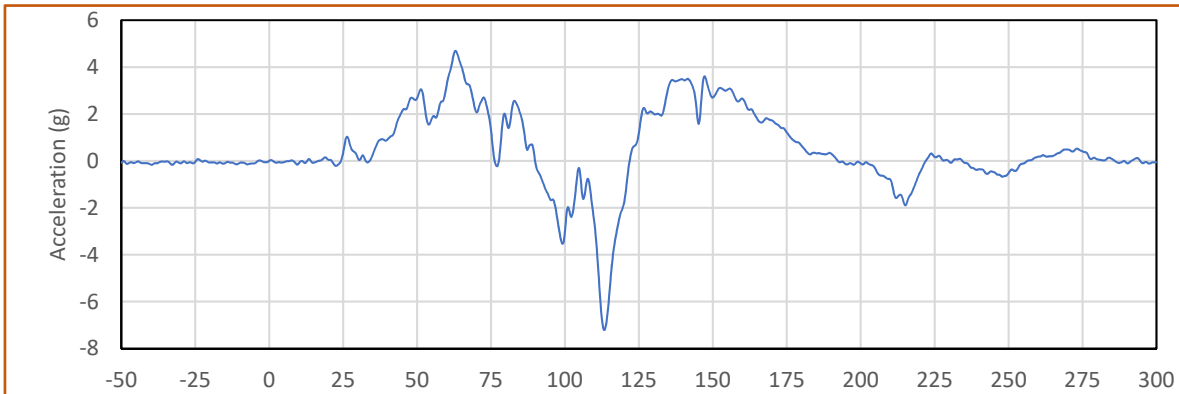
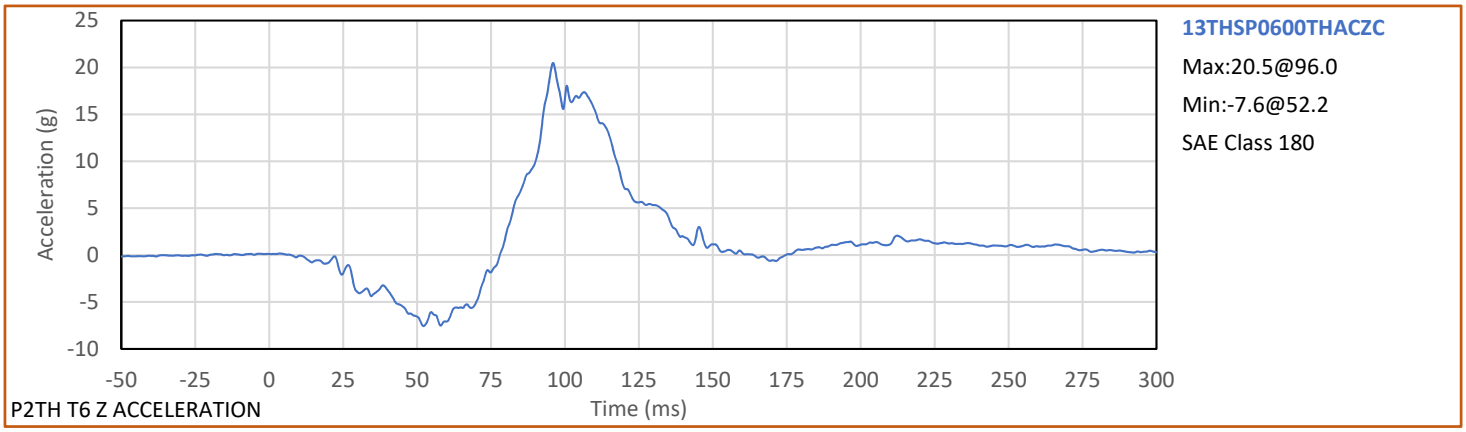
Max:1.3@180.2
Min:-31.1@92.9
SAE Class 180



P2TH T6 Y ACCELERATION

13THSP0600THACYC
Max:4.7@63.0
Min:-7.2@113.3
SAE Class 180


Acceleration (g)
Time (ms)
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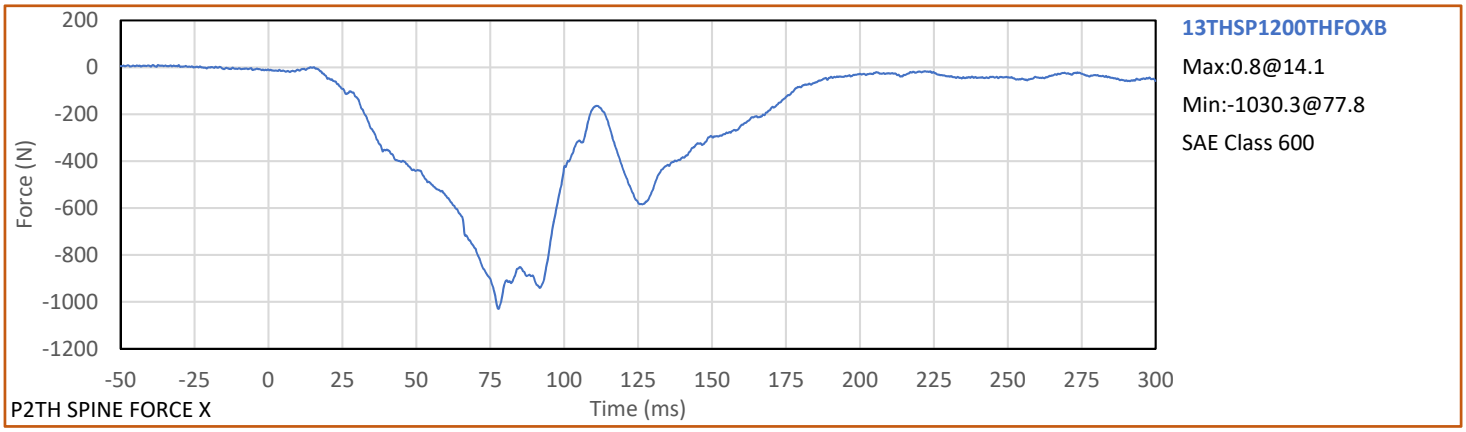
Max:20.5@96.0
Min:-7.6@52.2
SAE Class 180
P2TH T6 Z ACCELERATION


Force (N)
Time (ms)
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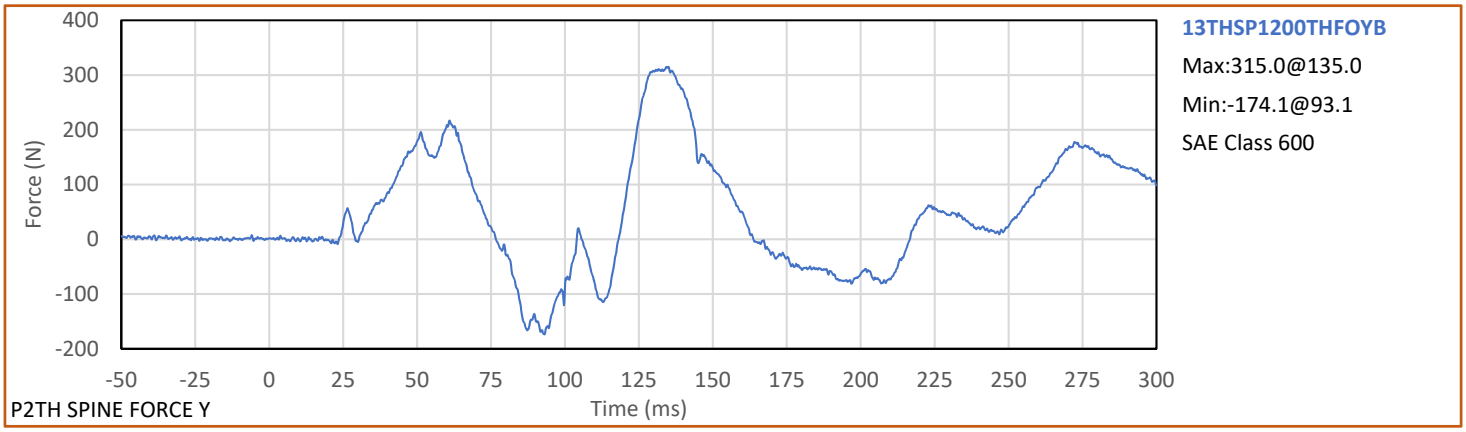
Max:0.8@14.1
Min:-1030.3@77.8
SAE Class 600
P2TH SPINE FORCE X


Force (N)
Time (ms)
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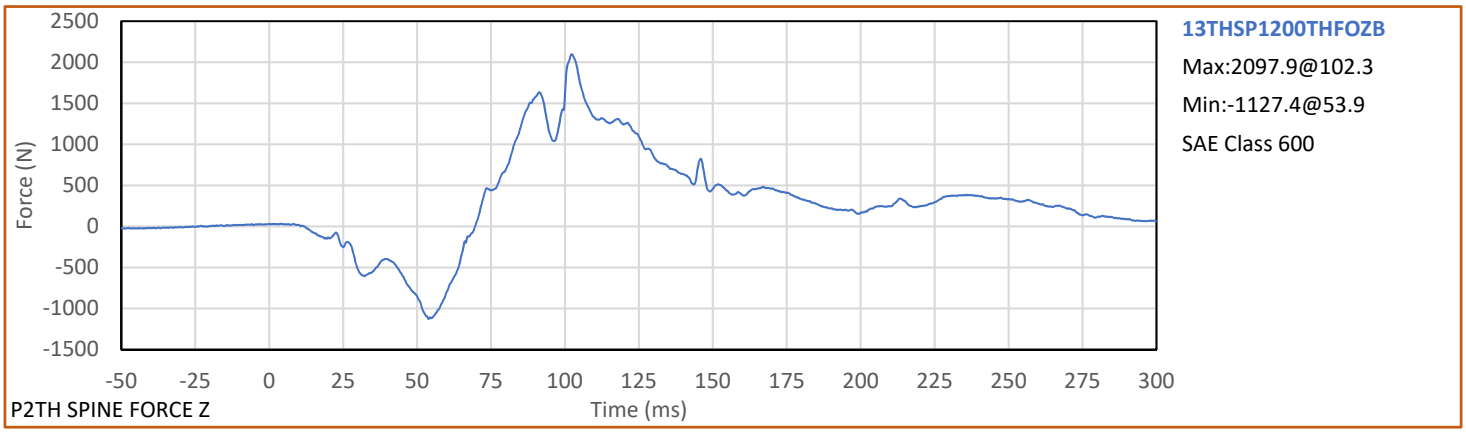
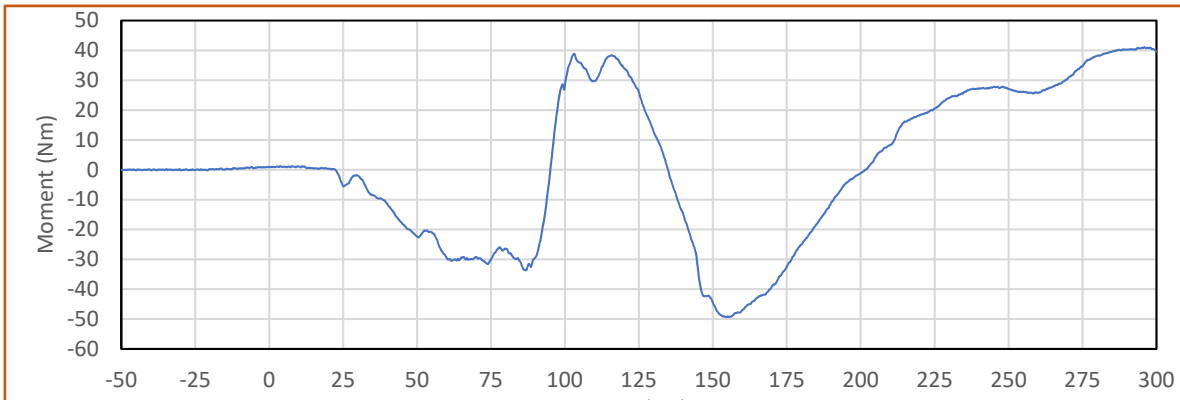
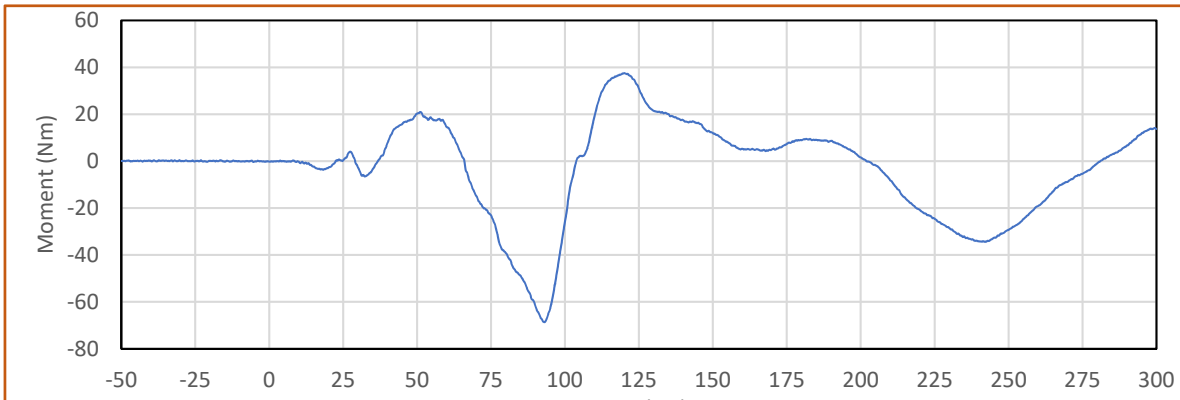
Max:315.0@135.0
Min:-174.1@93.1
SAE Class 600
P2TH SPINE FORCE Y


Force (N)
Time (ms)
13THSP1200THFOZB
Max:2097.9@102.3
Min:-1127.4@53.9
SAE Class 600
P2TH SPINE FORCE Z



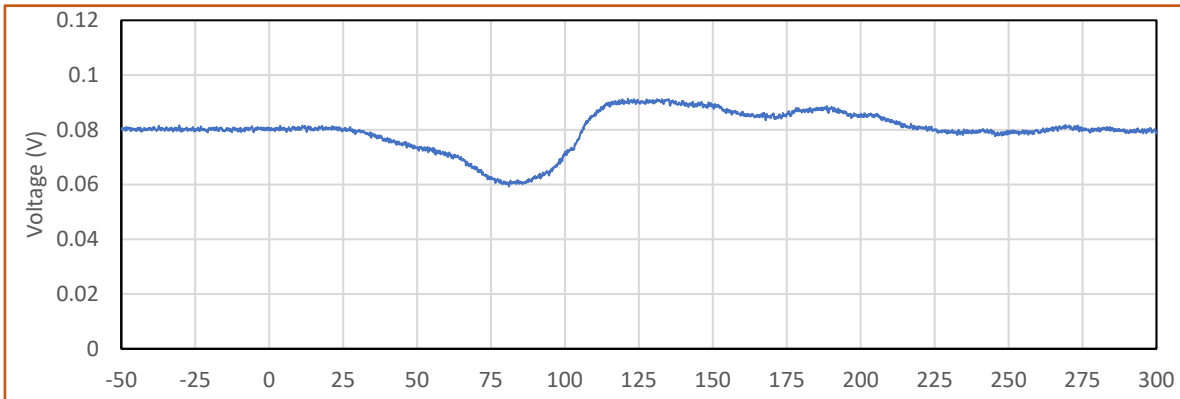
P2TH SPINE MOMENT X

13THSP1200THMOXB
Max:41.1@295.9
Min:-49.4@154.5
SAE Class 600



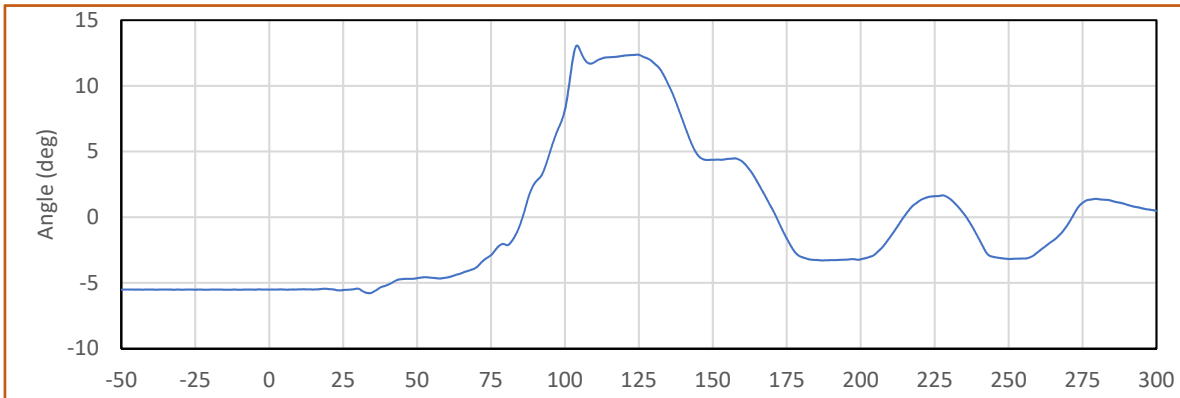
P2TH SPINE MOMENT Y

13THSP1200THMOYB
Max:37.5@120.1
Min:-68.7@93.1
SAE Class 600



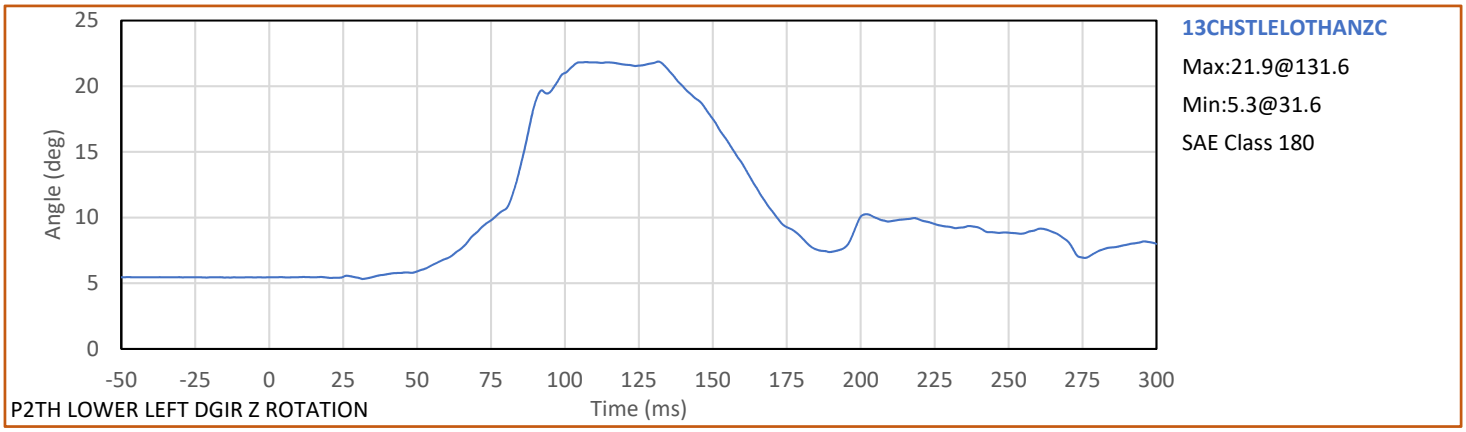
P2TH LOWER LEFT DGIR X DISPLACEMENT

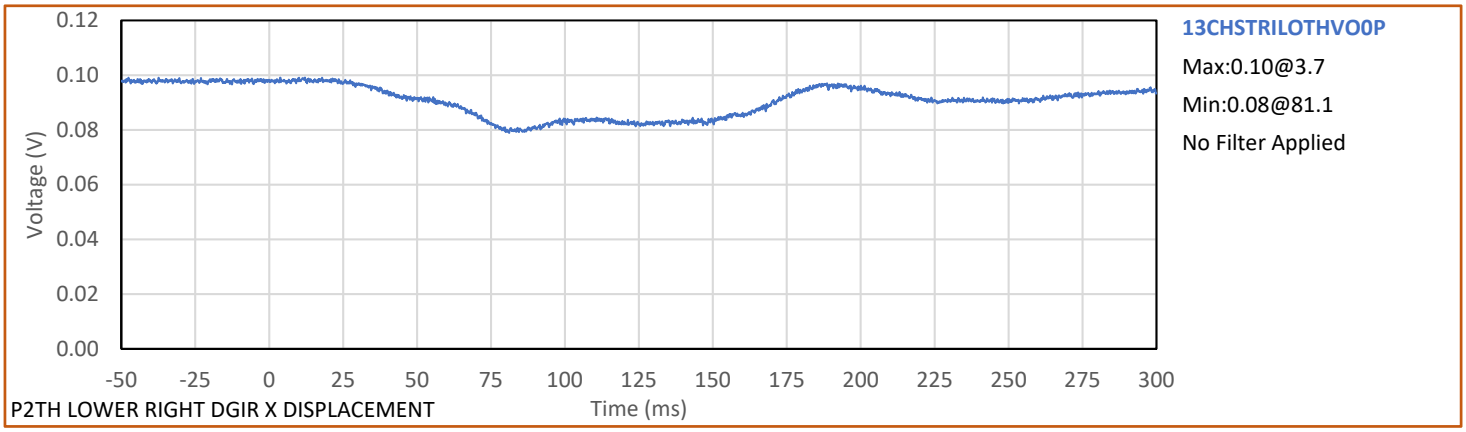
13CHSTLELOTHVO0P
Max:0.09@121.3
Min:0.06@81.1
No Filter Applied

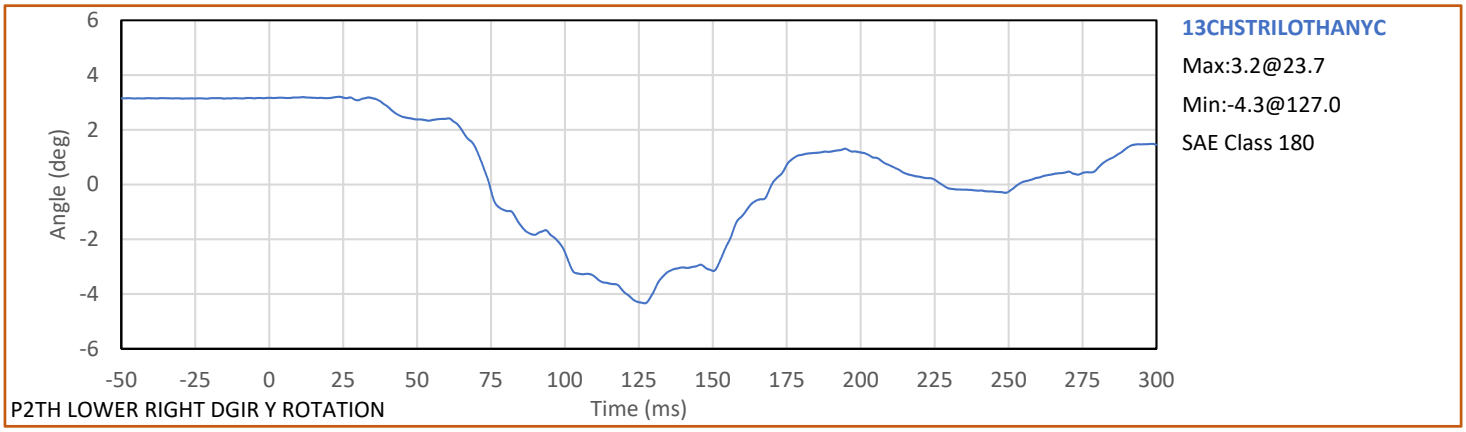


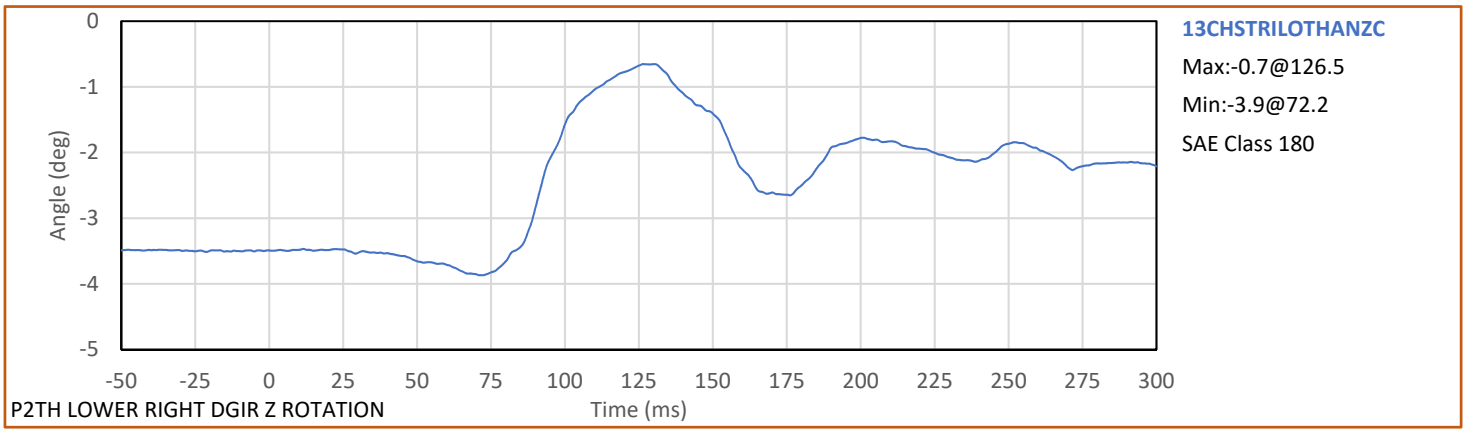
P2TH LOWER LEFT DGIR Y ROTATION

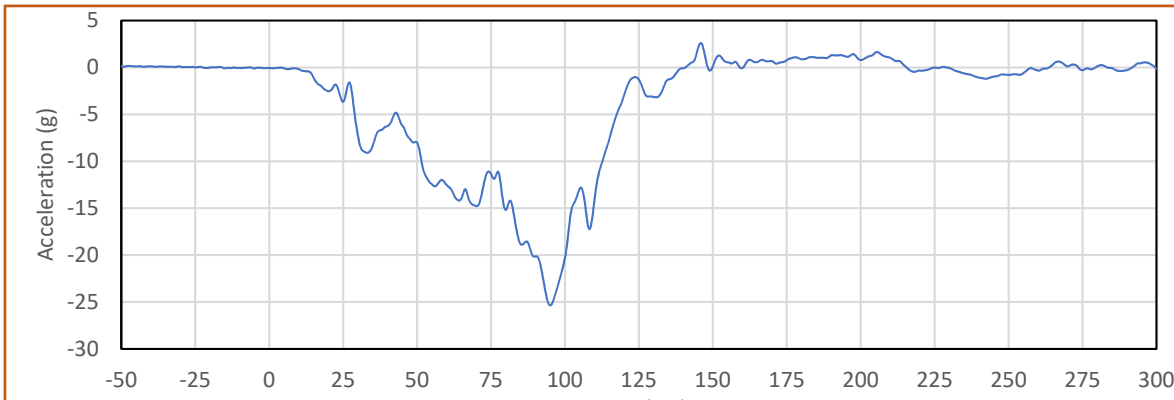
13CHSTLELOTHANYC
Max:13.1@104.1
Min:-5.8@33.9
SAE Class 180


Angle (deg)
Time (ms)
P2TH LOWER LEFT DGIR Z ROTATION
13CHSTLELOTHANZC
Max:21.9@131.6
Min:5.3@31.6
SAE Class 180


Voltage (V)
Time (ms)
P2TH LOWER RIGHT DGIR X DISPLACEMENT
13CHSTRILOTHVO0P
Max:0.10@3.7
Min:0.08@81.1
No Filter Applied

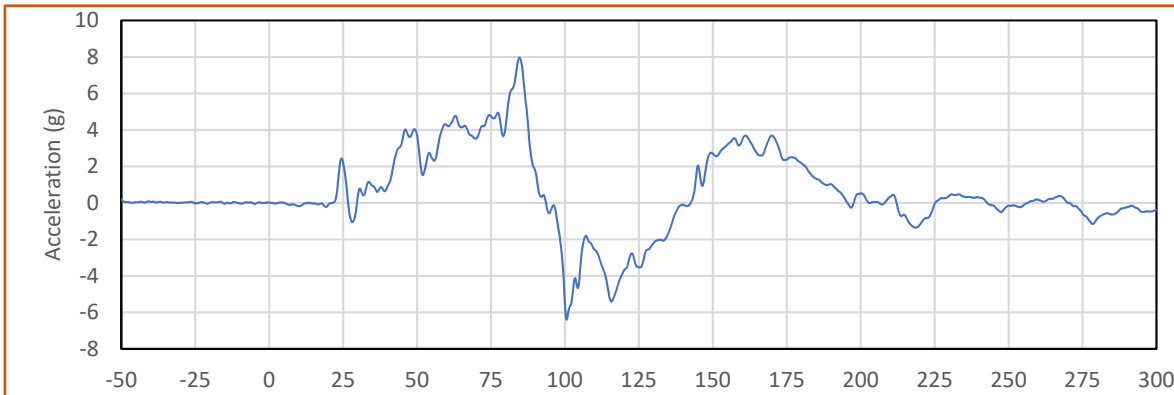

Angle (deg)
Time (ms)
P2TH LOWER RIGHT DGIR Y ROTATION
13CHSTRILOTHANYC
Max:3.2@23.7
Min:-4.3@127.0
SAE Class 180


Angle (deg)
Time (ms)
P2TH LOWER RIGHT DGIR Z ROTATION
13CHSTRILOTHANZC
Max:-0.7@126.5
Min:-3.9@72.2
SAE Class 180



P2TH T12 X ACCELERATION

13THSP1200THACXC
Max:2.6@146.0
Min:-25.4@95.0
SAE Class 180

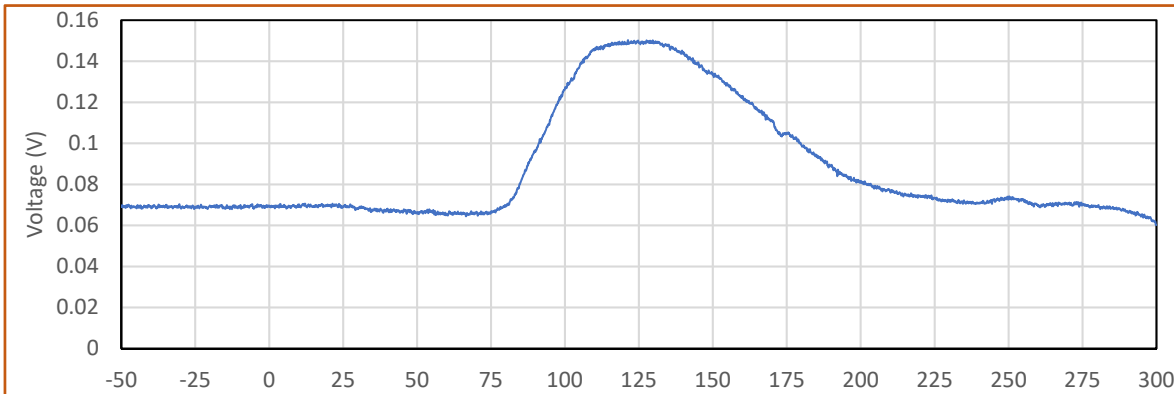


P2TH T12 Y ACCELERATION

13THSP1200THACYC
Max:8.0@84.7
Min:-6.4@100.6
SAE Class 180

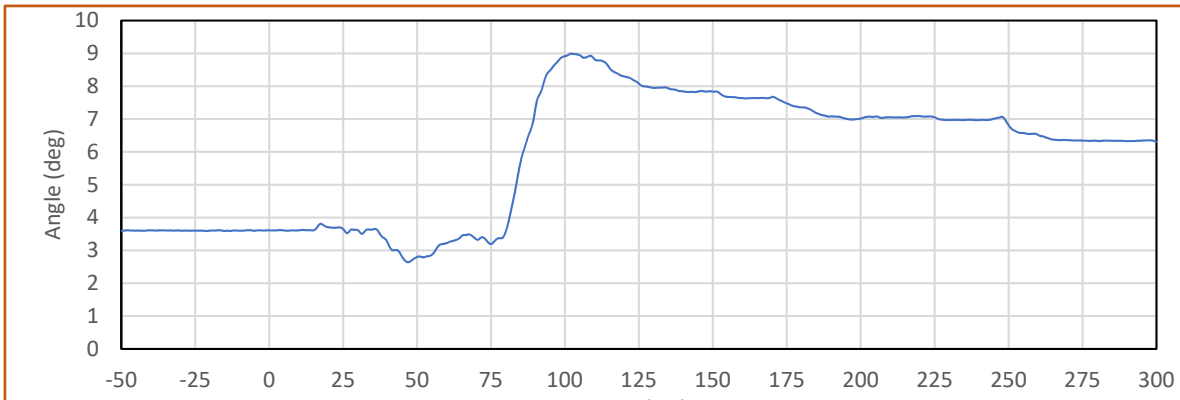
P2TH T12 Z ACCELERATION

13THSP1200THACZC
Max:15.0@96.0
Min:-14.1@68.4
SAE Class 180



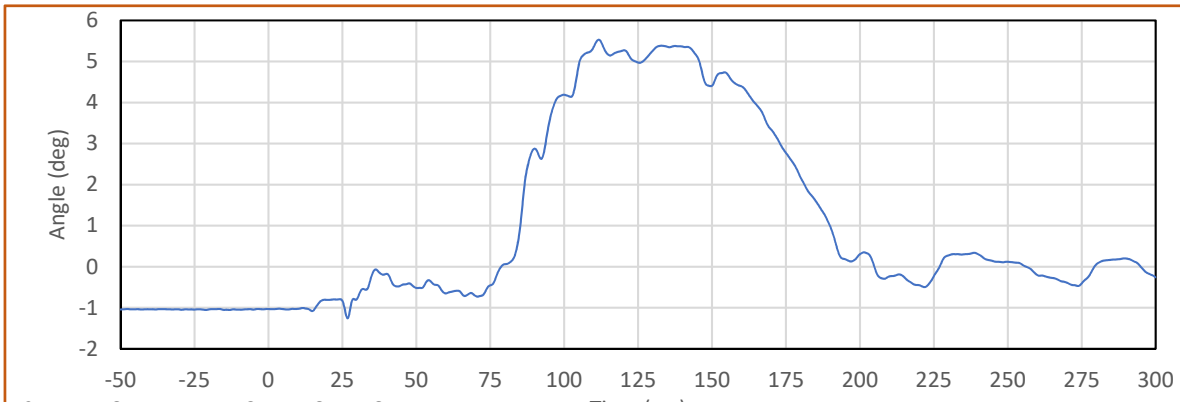
P2TH ABDOMEN LEFT DGIR X DISPLACEMENT

13ABDOLE00THVO0P
Max:0.15@121.3
Min:0.06@299.9
No Filter Applied



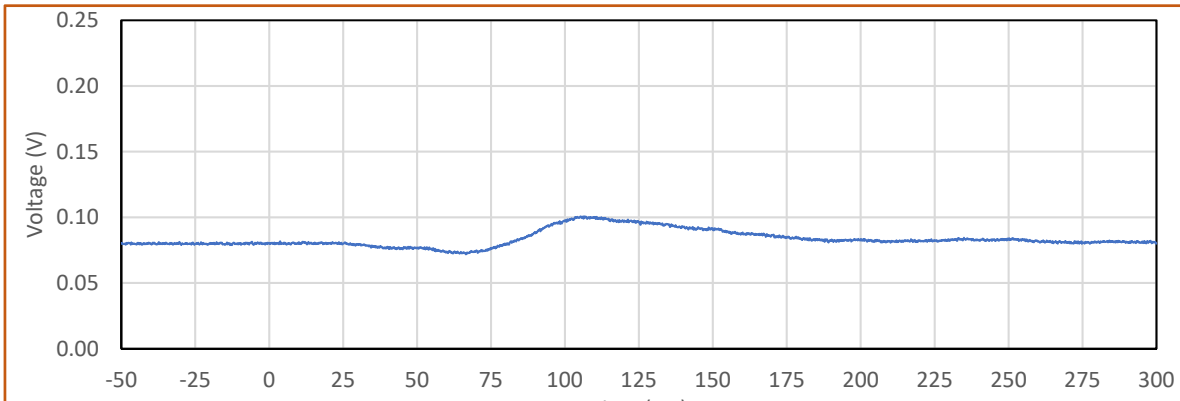
P2TH ABDOMEN LEFT DGIR Y ROTATION

13ABDOLE00THANYC
Max:9.0@102.2
Min:2.6@46.9
SAE Class 180



P2TH ABDOMEN LEFT DGIR Z ROTATION

13ABDOLE00THANZC
Max:5.5@111.7
Min:-1.3@26.8
SAE Class 180

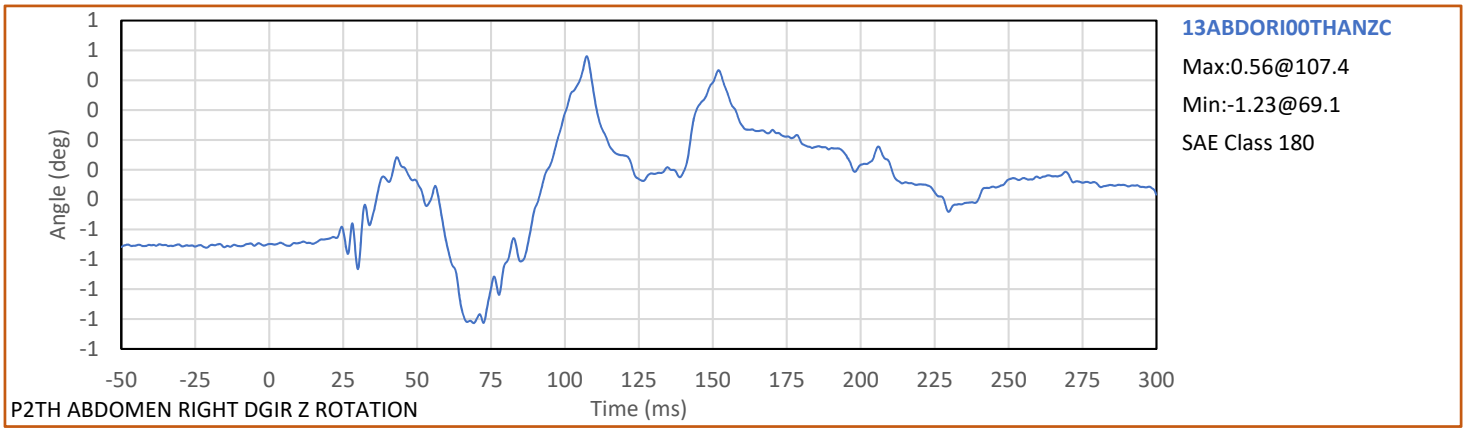


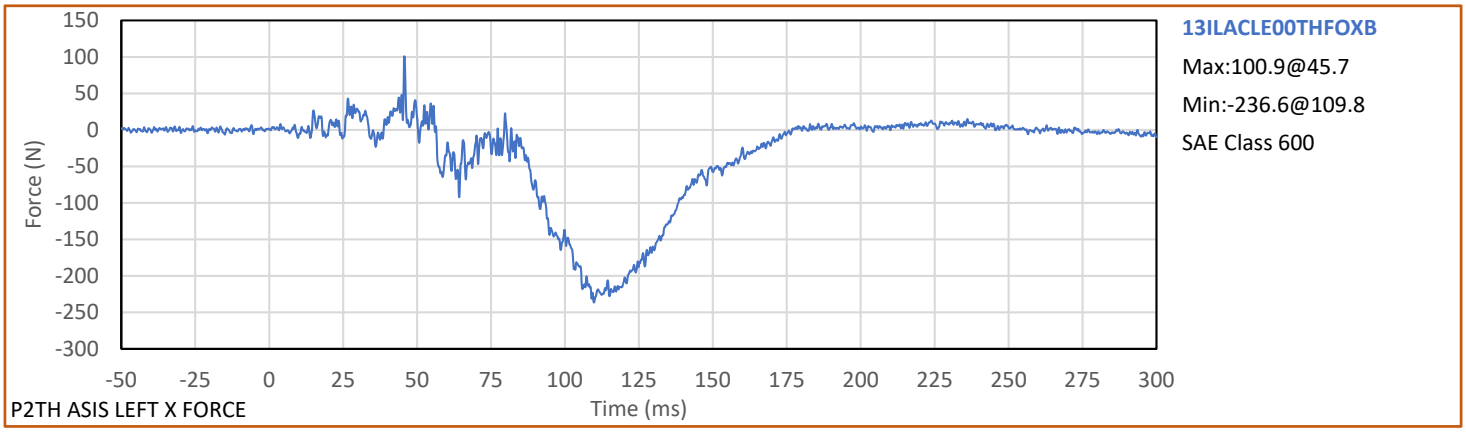
P2TH ABDOMEN RIGHT DGIR X DISPLACEMENT

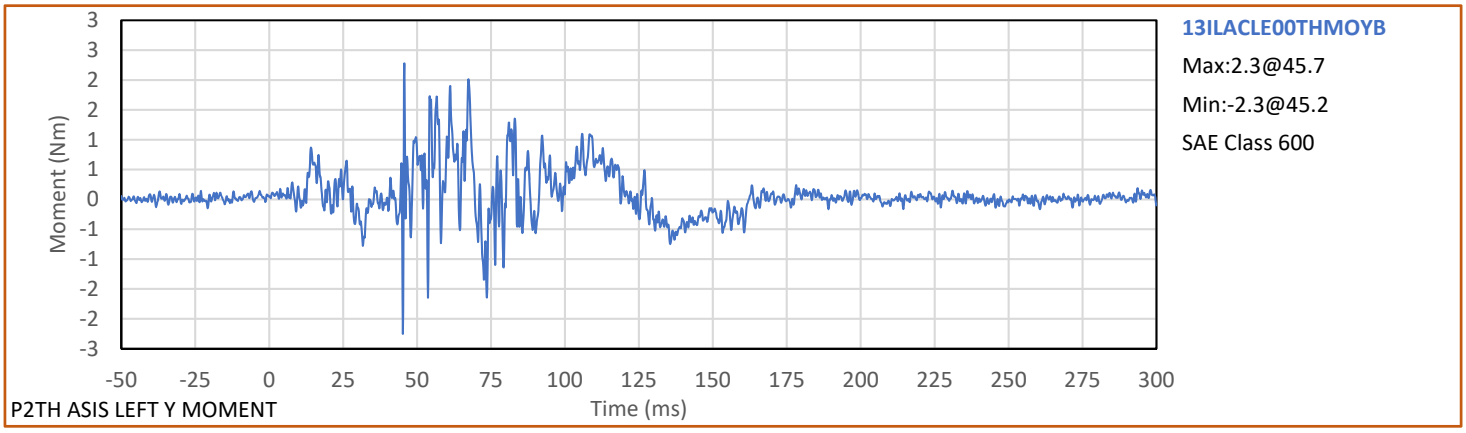
13ABDORI00THVO0P
Max:0.10@106.6
Min:0.07@66.5
No Filter Applied

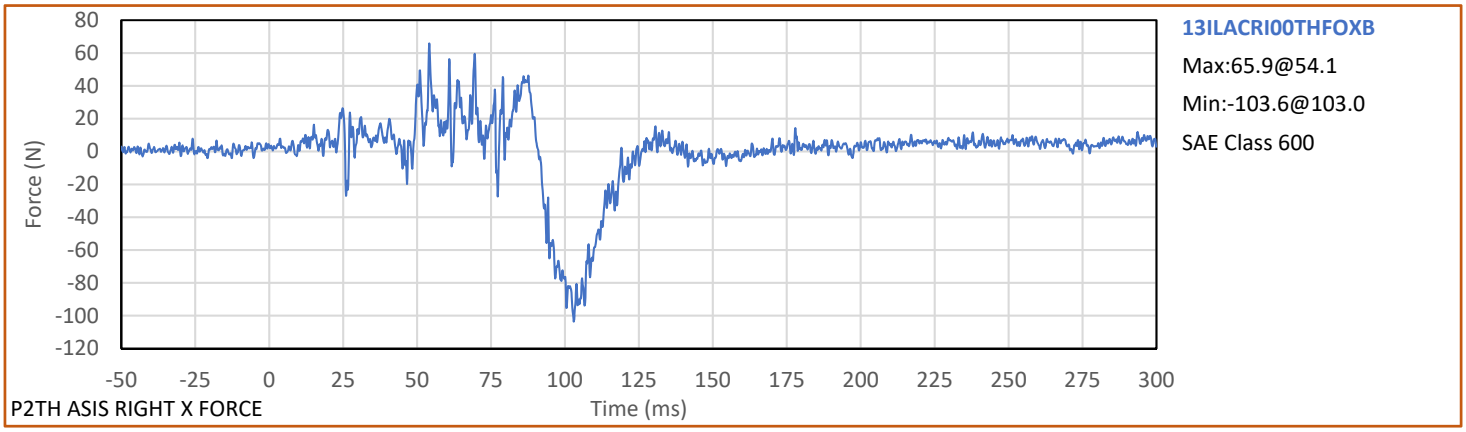
P2TH ABDOMEN RIGHT DGIR Y ROTATION

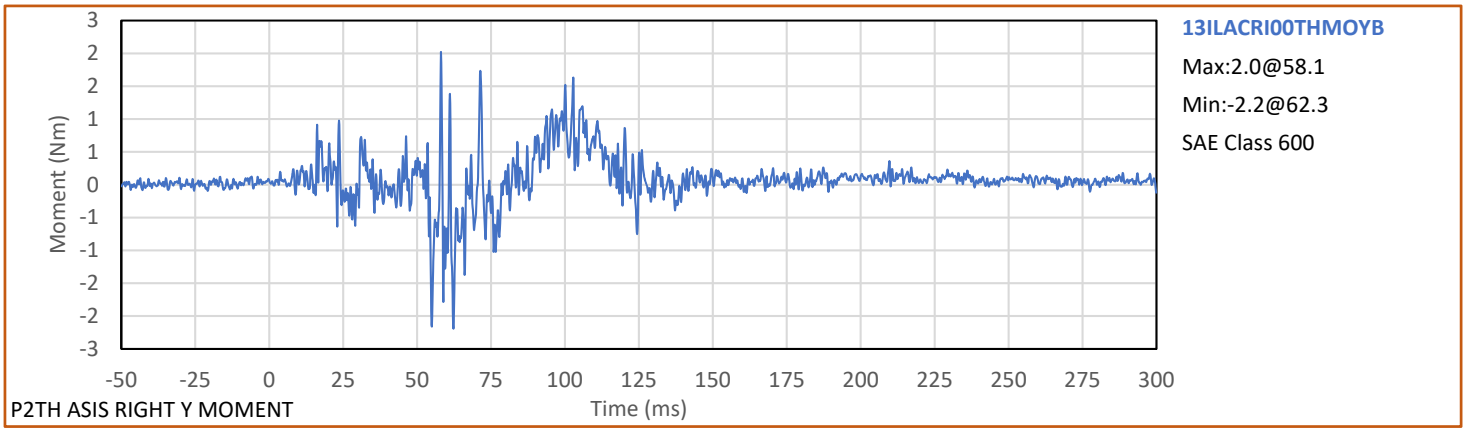
13ABDORI00THANYC
Max:-2.7@47.3
Min:-7.3@118.6
SAE Class 180

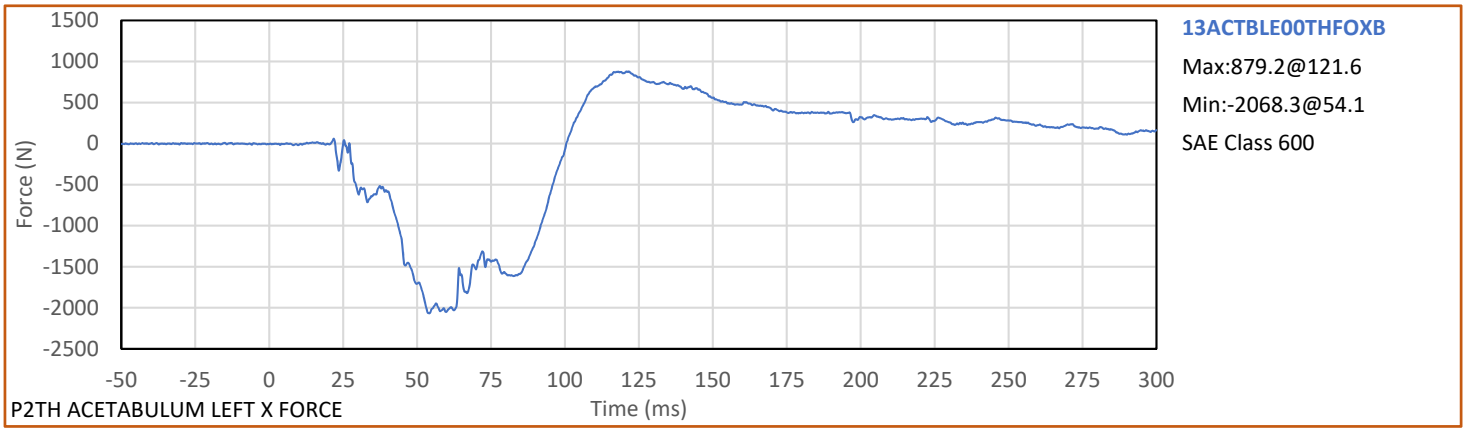

Angle (deg)
Time (ms)
P2TH ABDOMEN RIGHT DGIR Z ROTATION
13ABDORI00THANZC
Max:0.56@107.4
Min:-1.23@69.1
SAE Class 180

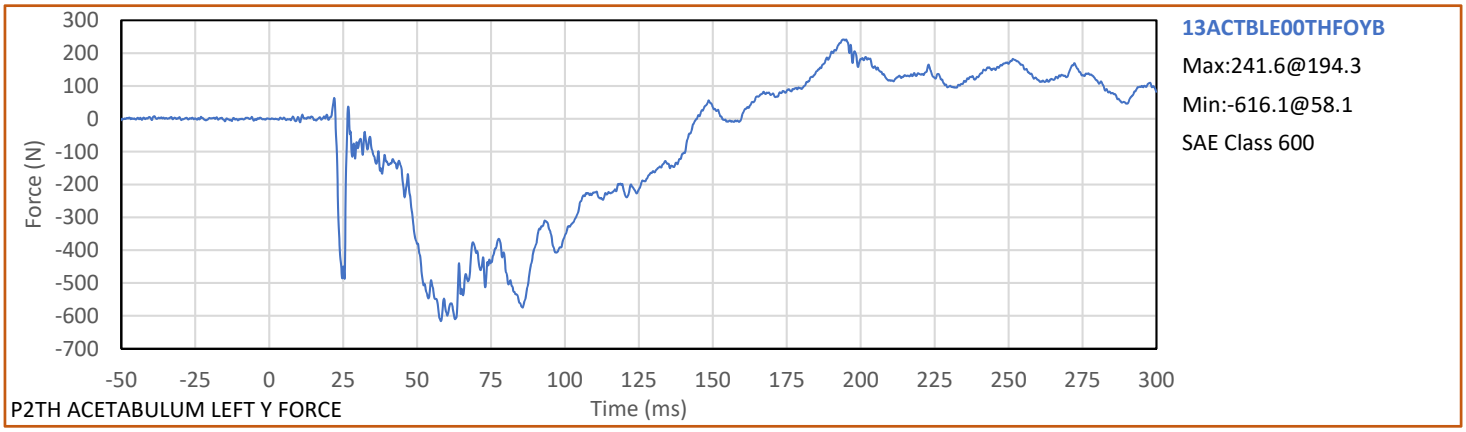

Force (N)
Time (ms)
P2TH ASIS LEFT X FORCE
13ILACLE00THFOXB
Max:100.9@45.7
Min:-236.6@109.8
SAE Class 600

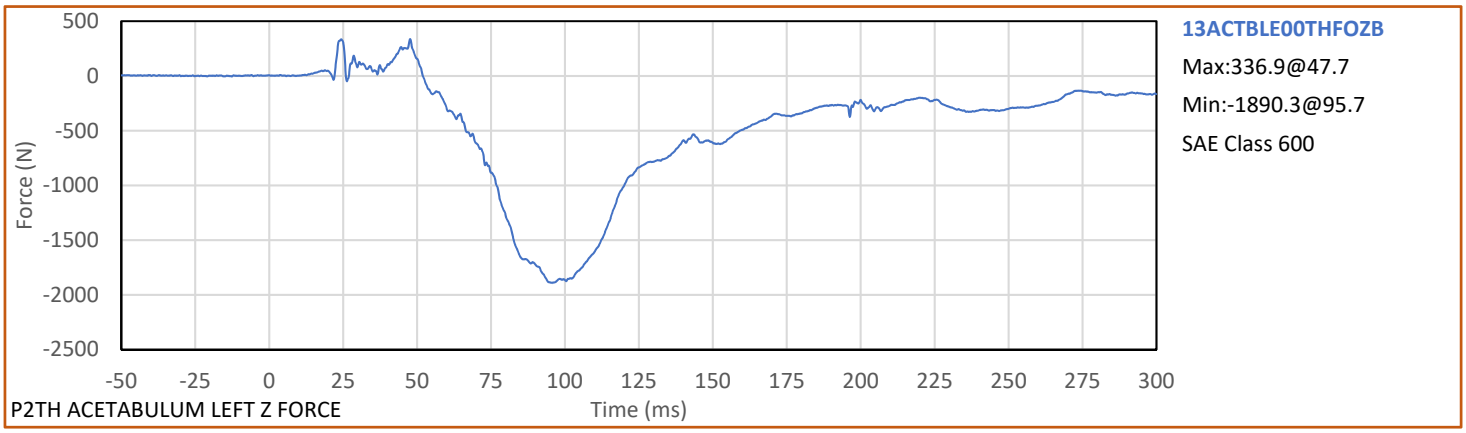

Moment (Nm)
Time (ms)
P2TH ASIS LEFT Y MOMENT
13ILACLE00THMOYB
Max:2.3@45.7
Min:-2.3@45.2
SAE Class 600

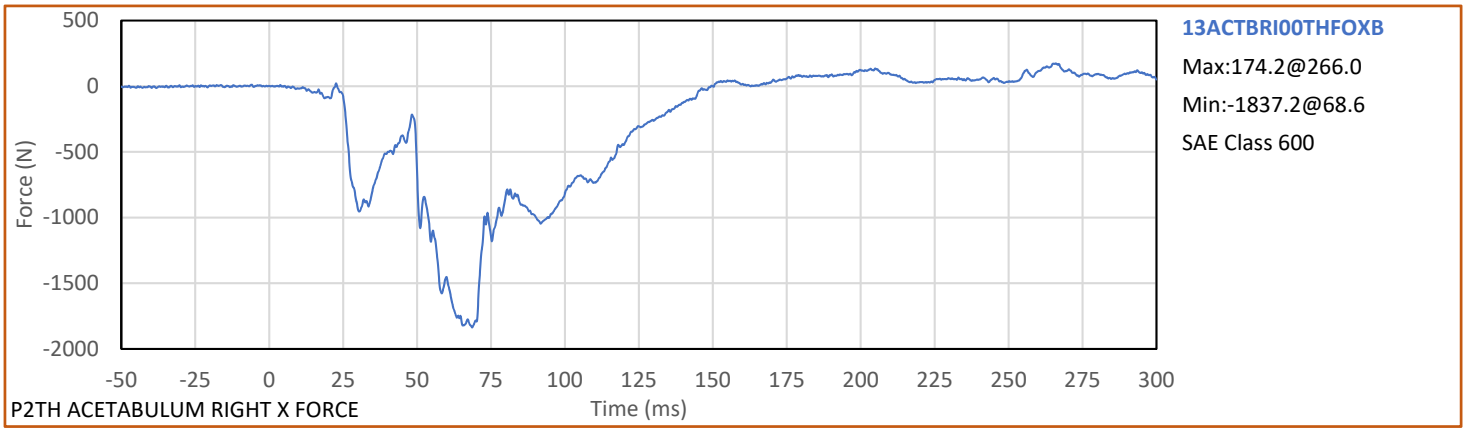

Force (N)
Time (ms)
P2TH ASIS RIGHT X FORCE
13ILACRI00THFOXB
Max:65.9@54.1
Min:-103.6@103.0
SAE Class 600

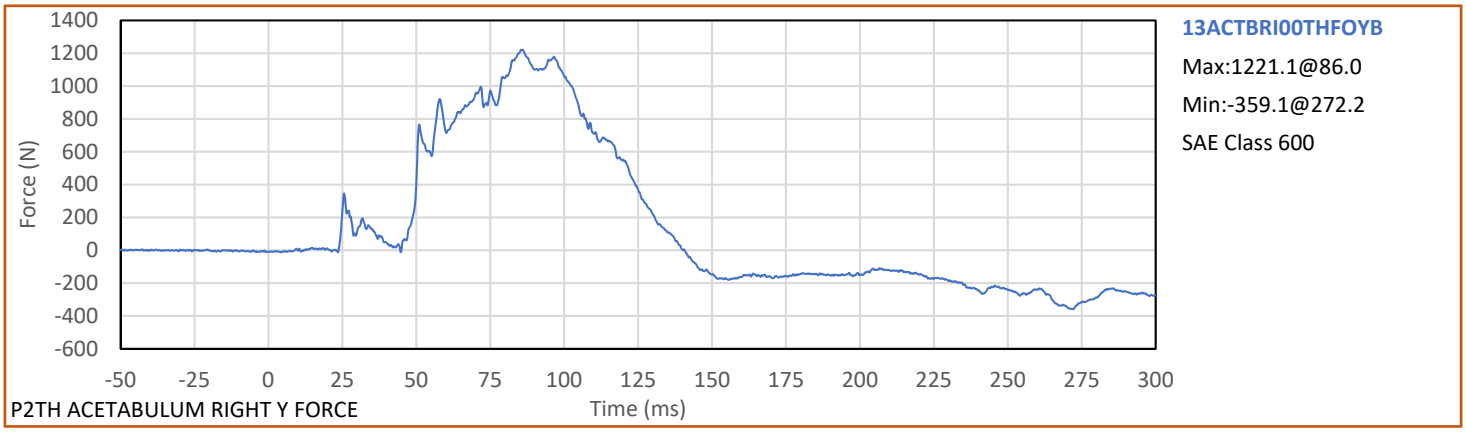

Moment (Nm)
Time (ms)
P2TH ASIS RIGHT Y MOMENT
13ILACRI00THMOYB
Max:2.0@58.1
Min:-2.2@62.3
SAE Class 600

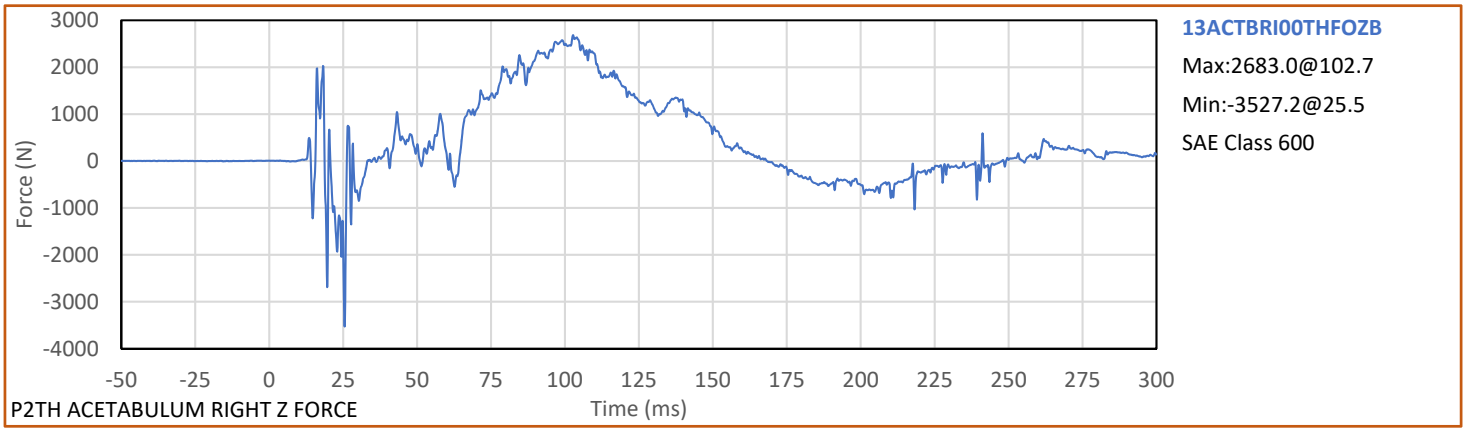

Force (N)
Time (ms)
P2TH ACETABULUM LEFT X FORCE
13ACTBLE00THFOXB
Max:879.2@121.6
Min:-2068.3@54.1
SAE Class 600

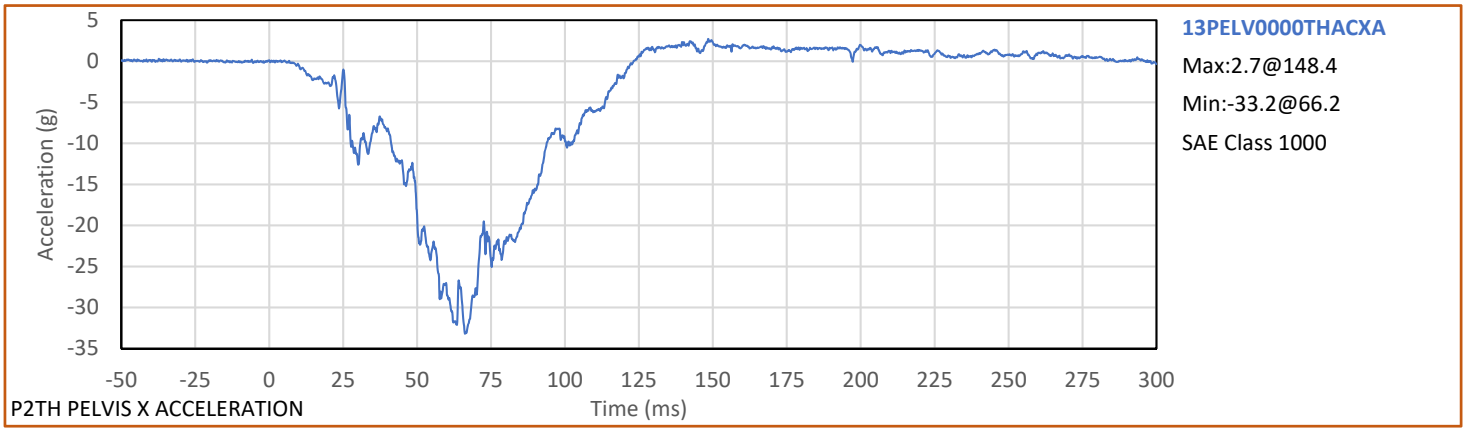

Force (N)
Time (ms)
P2TH ACETABULUM LEFT Y FORCE
13ACTBLE00THFOYB
Max:241.6@194.3
Min:-616.1@58.1
SAE Class 600

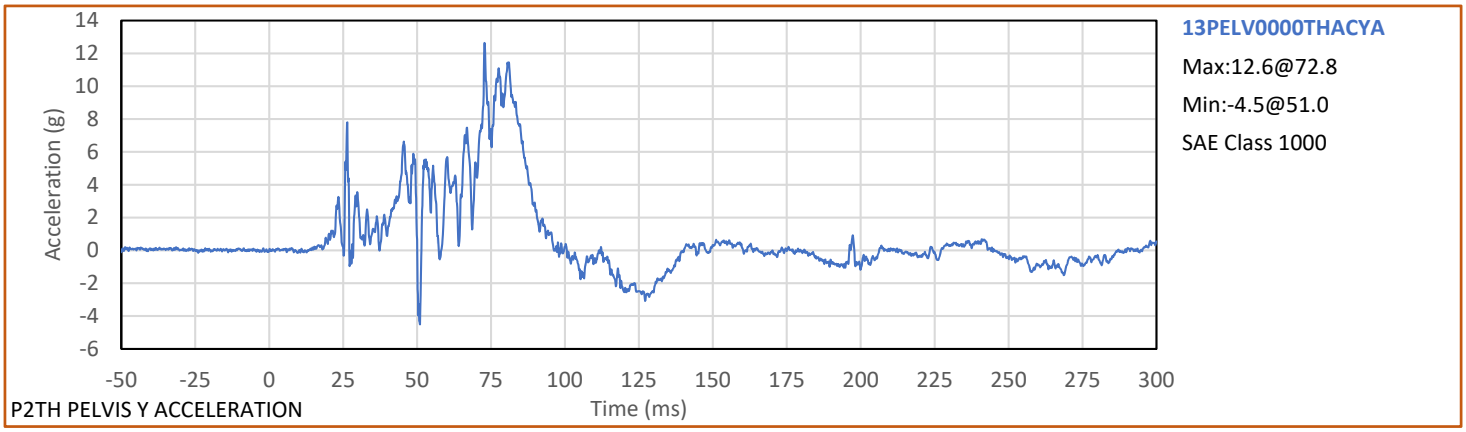

Force (N)
Time (ms)
P2TH ACETABULUM LEFT Z FORCE
13ACTBLE00THFOZB
Max:336.9@47.7
Min:-1890.3@95.7
SAE Class 600

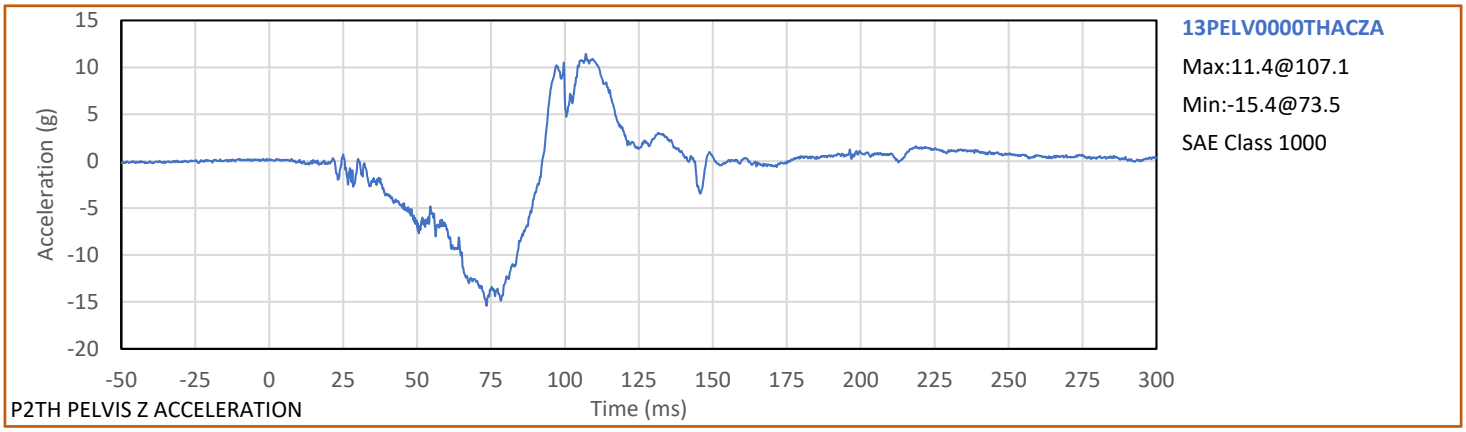

13ACTBRI00THFOXB
Max:174.2@266.0
Min:-1837.2@68.6
SAE Class 600
Force (N)
Time (ms)
P2TH ACETABULUM RIGHT X FORCE

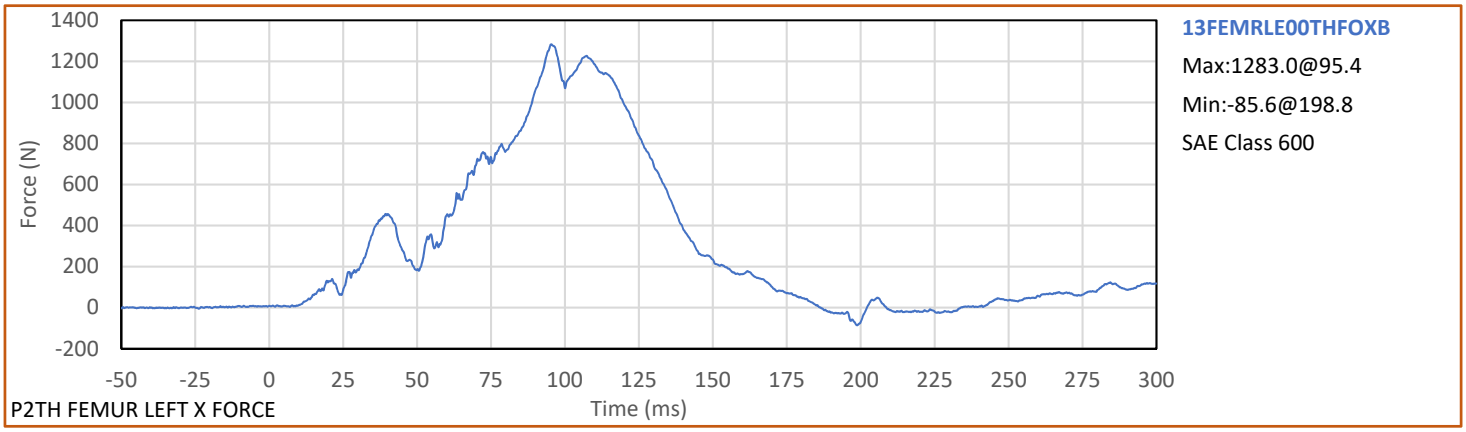

13ACTBRI00THFOYB
Max:1221.1@86.0
Min:-359.1@272.2
SAE Class 600
Force (N)
Time (ms)
P2TH ACETABULUM RIGHT Y FORCE

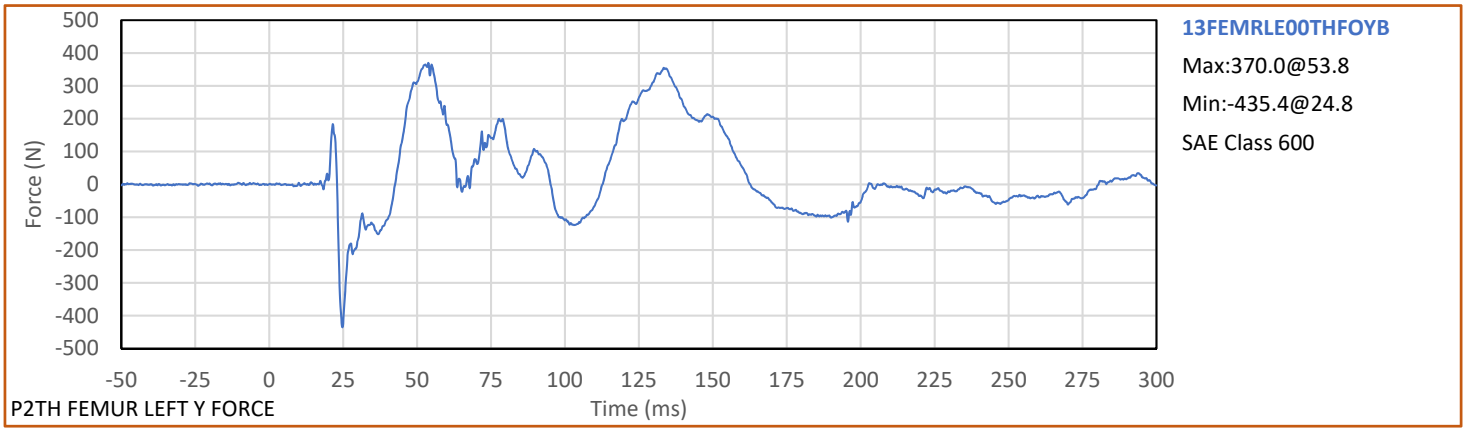

13ACTBRI00THFOZB
Max:2683.0@102.7
Min:-3527.2@25.5
SAE Class 600
Force (N)
Time (ms)
P2TH ACETABULUM RIGHT Z FORCE


13PELV0000THACXA
Max:2.7@148.4
Min:-33.2@66.2
SAE Class 1000
Acceleration (g)
Time (ms)
P2TH PELVIS X ACCELERATION


Acceleration (g)
Time (ms)
P2TH PELVIS Y ACCELERATION
13PELV0000THACYA
Max:12.6@72.8
Min:-4.5@51.0
SAE Class 1000


Acceleration (g)
Time (ms)
P2TH PELVIS Z ACCELERATION
13PELV0000THACZA
Max:11.4@107.1
Min:-15.4@73.5
SAE Class 1000


Force (N)
Time (ms)
P2TH FEMUR LEFT X FORCE
13FEMRLE00THFOXB
Max:1283.0@95.4
Min:-85.6@198.8
SAE Class 600

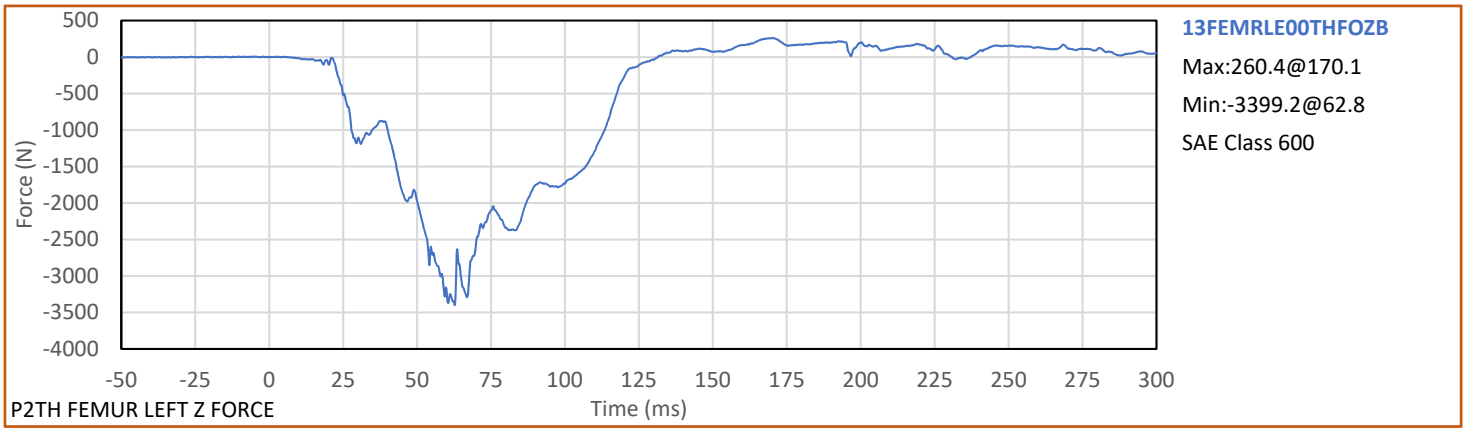

Force (N)
Time (ms)
P2TH FEMUR LEFT Y FORCE
13FEMRLE00THFOYB
Max:370.0@53.8
Min:-435.4@24.8
SAE Class 600

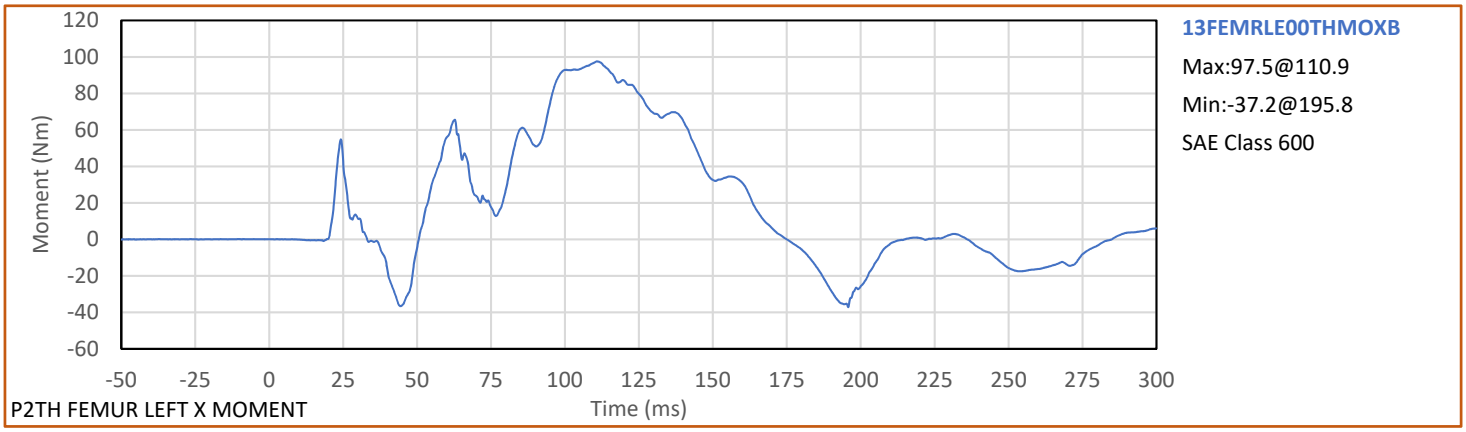
Test Vehicle: 2020 Honda Accord 4-Door Sedan

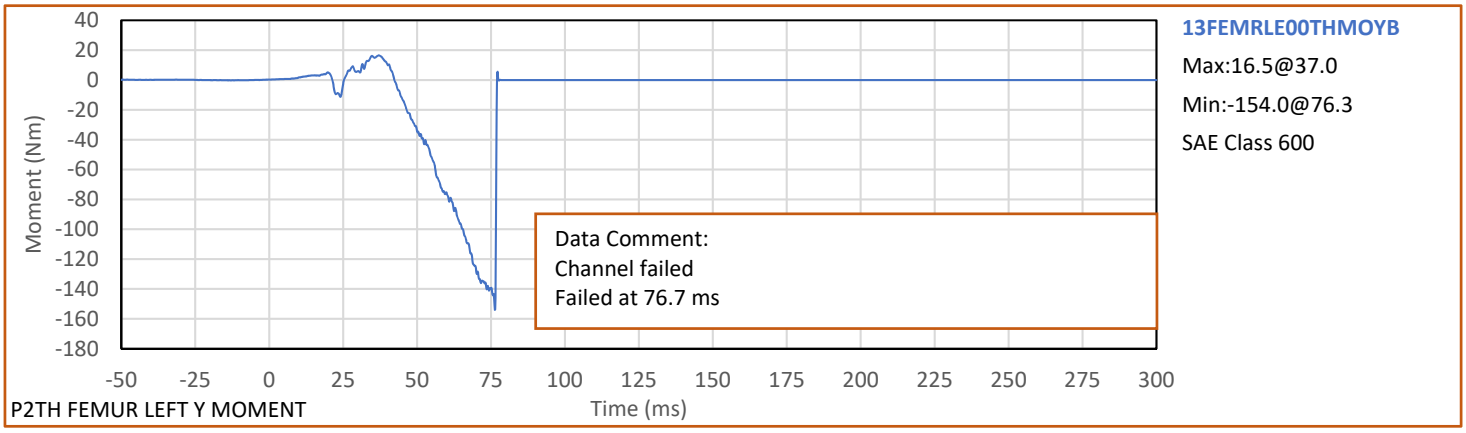
Test Program: Left Side 30° Frontal Rigid Barrier Impact

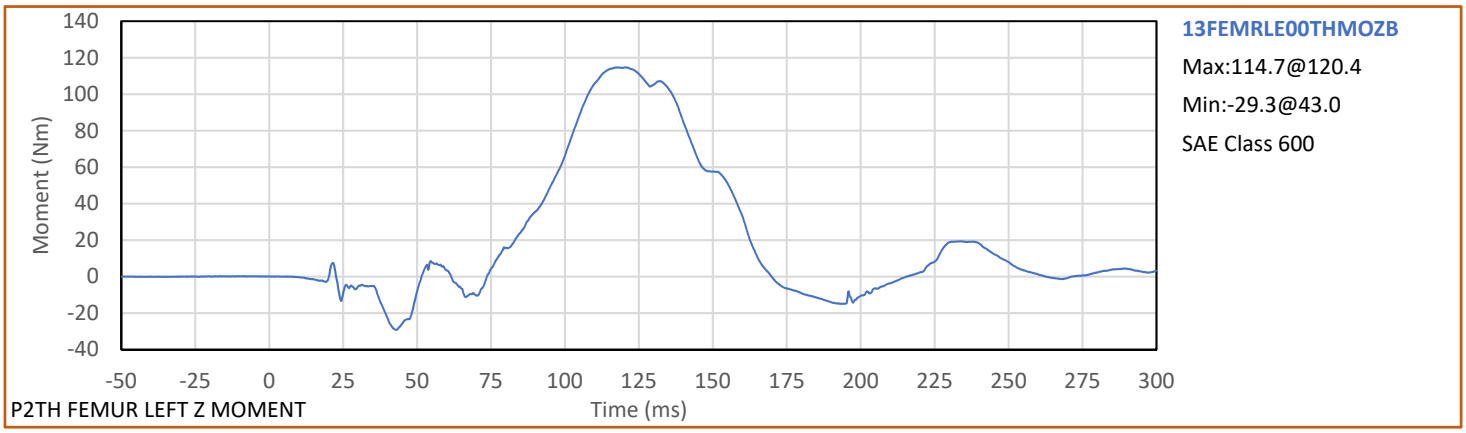
NHTSA No.: R20205380

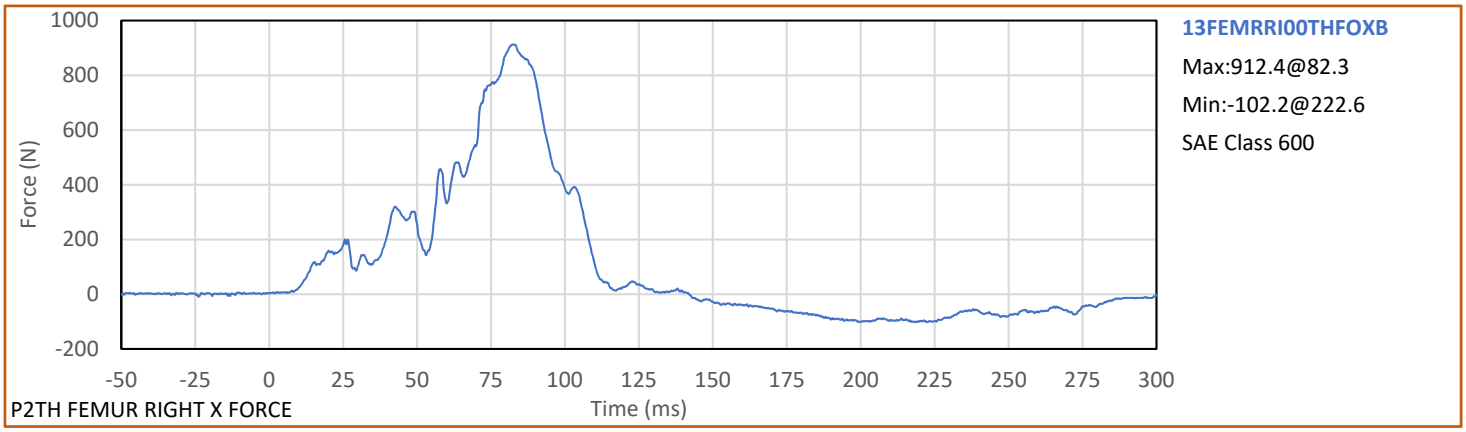
Test Date: 10/1/2020

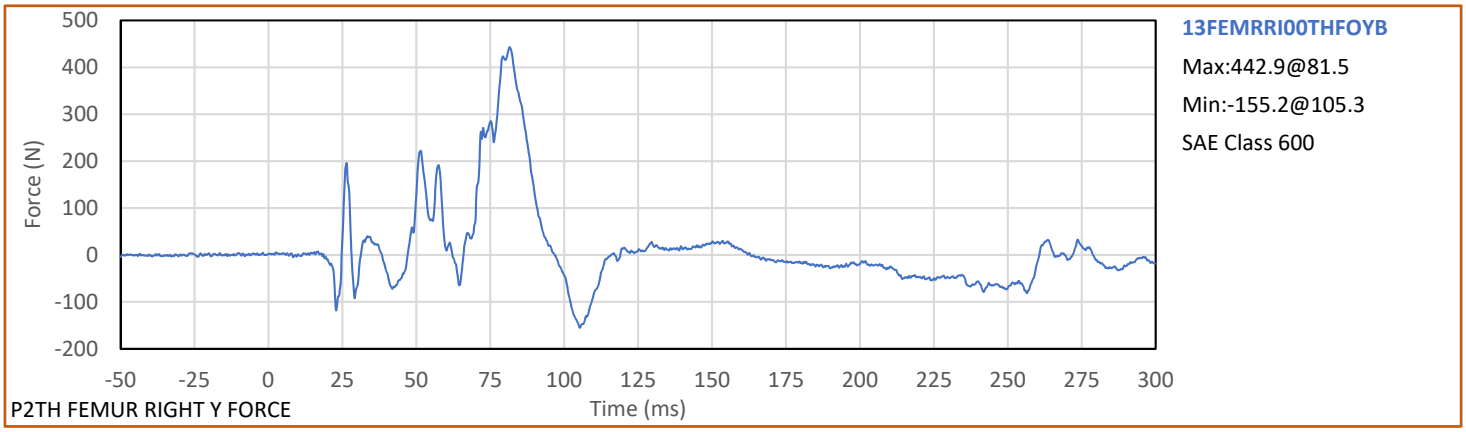


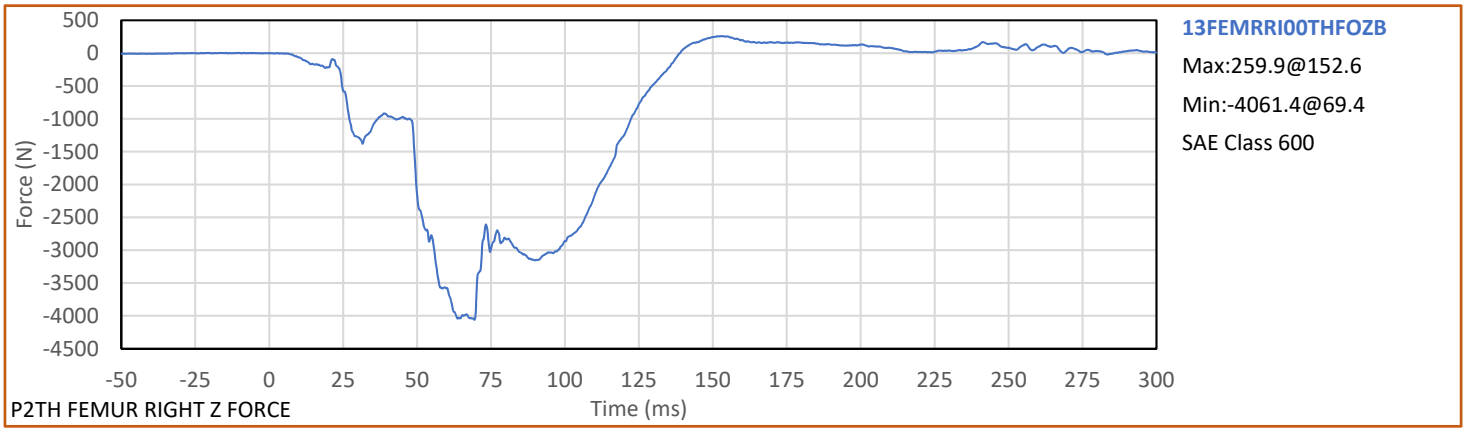


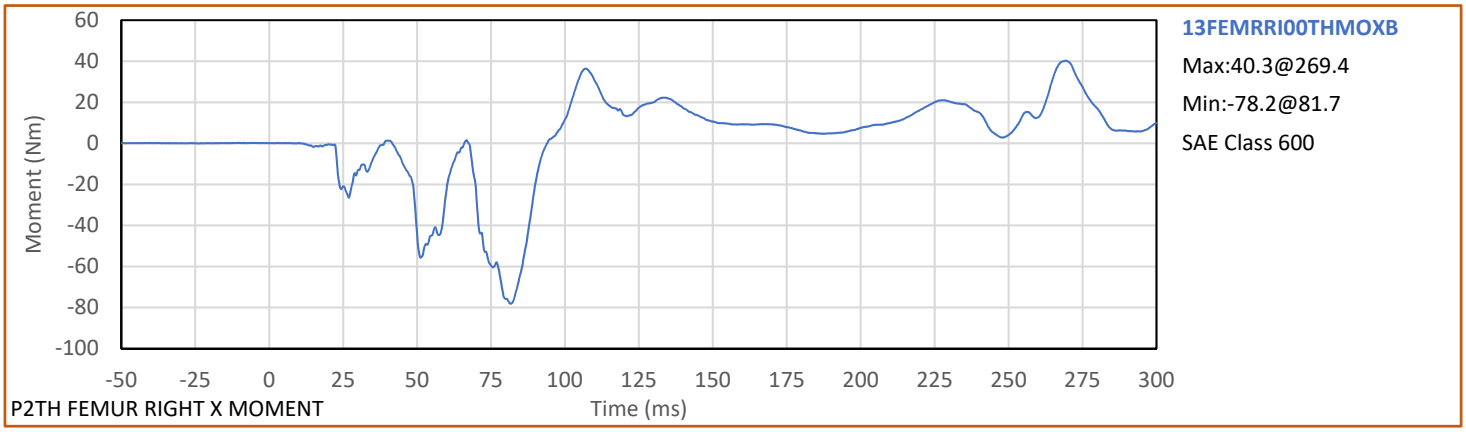


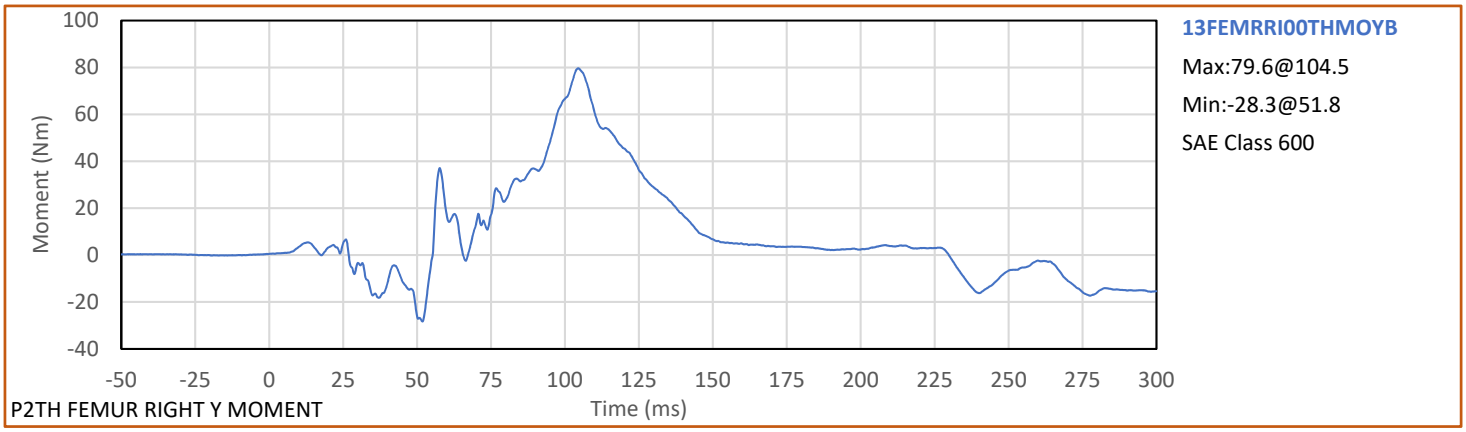


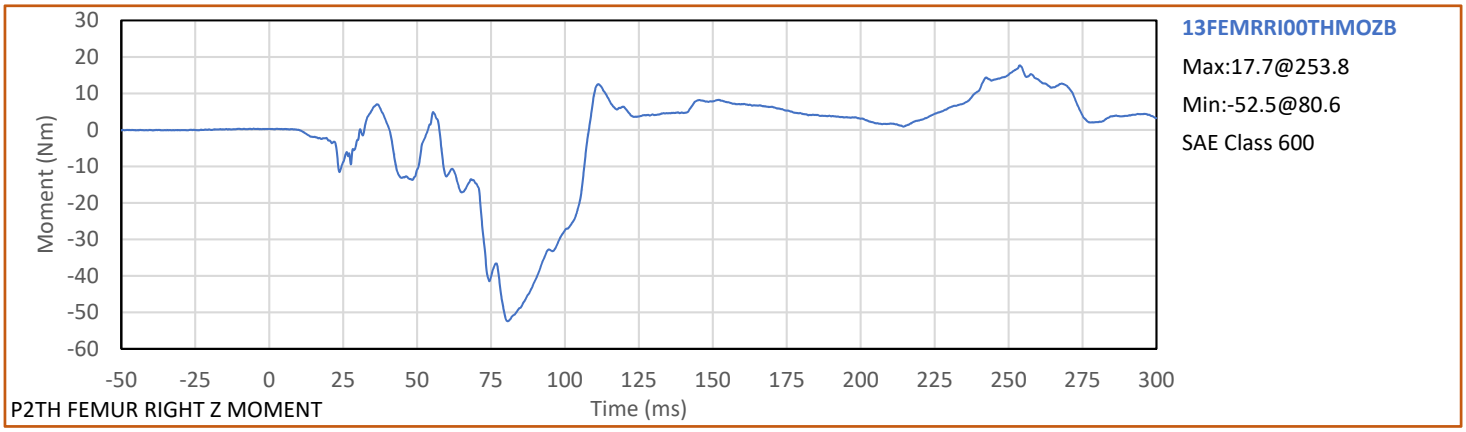

Force (N)
Time (ms)
P2TH FEMUR RIGHT X FORCE
13FEMRRI00THFOXB
Max:912.4@82.3
Min:-102.2@222.6
SAE Class 600

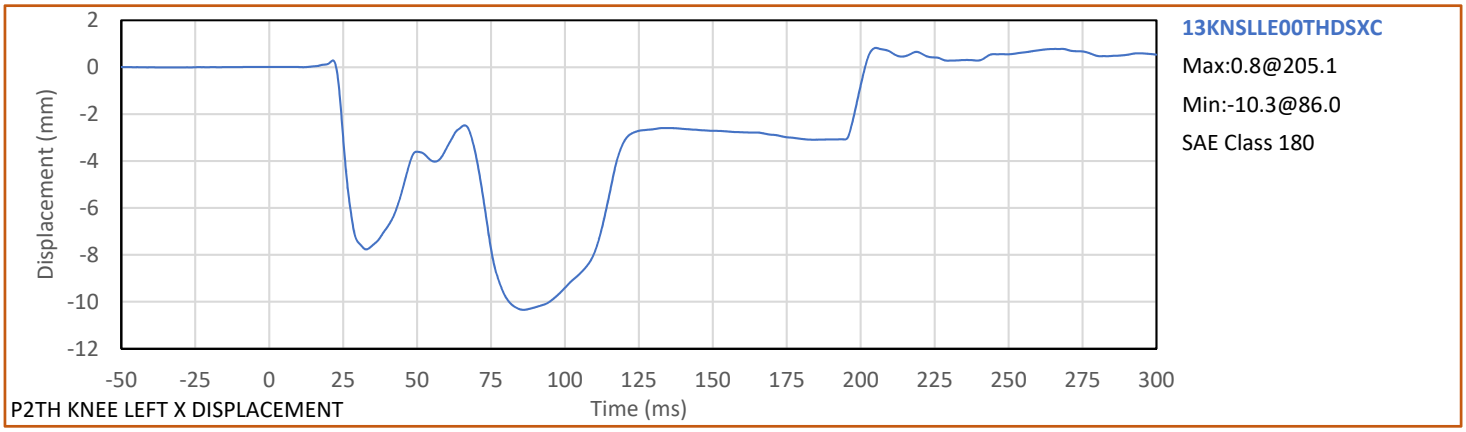

Force (N)
Time (ms)
P2TH FEMUR RIGHT Y FORCE
13FEMRRI00THFOYB
Max:442.9@81.5
Min:-155.2@105.3
SAE Class 600

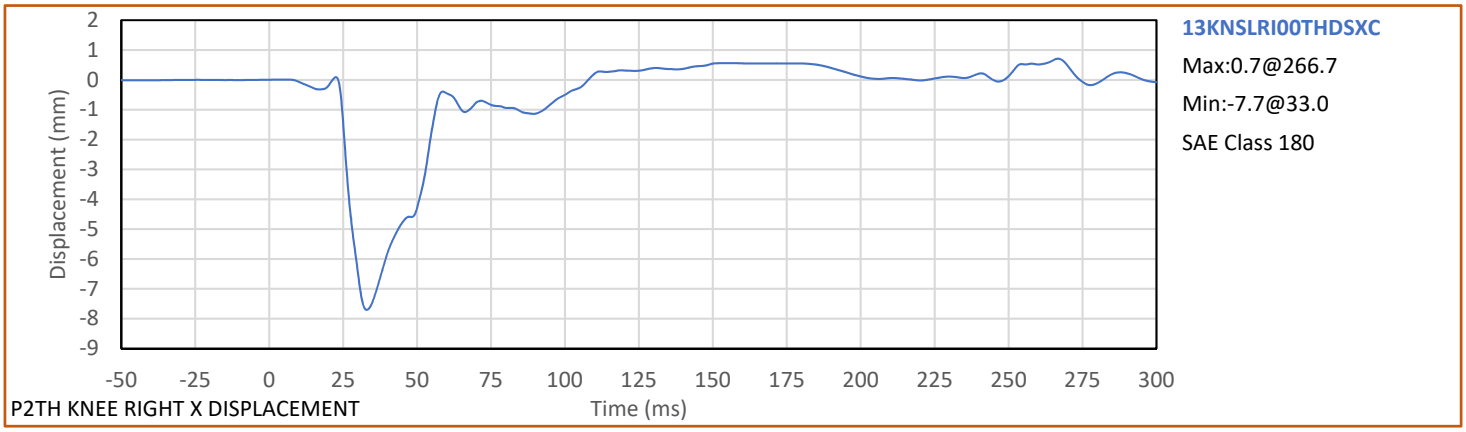

Force (N)
Time (ms)
P2TH FEMUR RIGHT Z FORCE
13FEMRRI00THFOZB
Max:259.9@152.6
Min:-4061.4@69.4
SAE Class 600

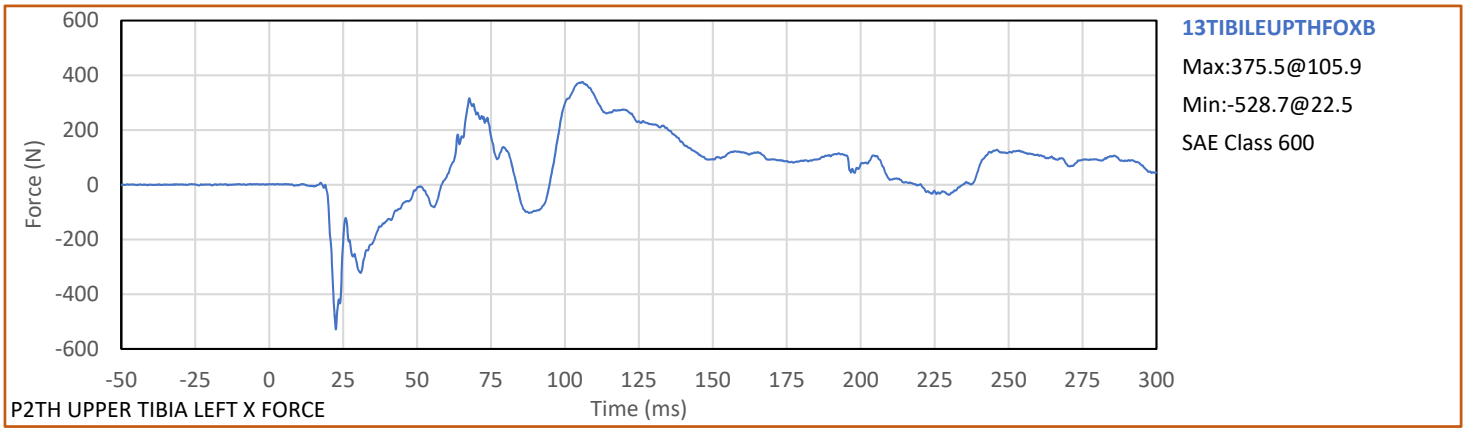

Moment (Nm)
Time (ms)
P2TH FEMUR RIGHT X MOMENT
13FEMRRI00THMOXB
Max:40.3@269.4
Min:-78.2@81.7
SAE Class 600

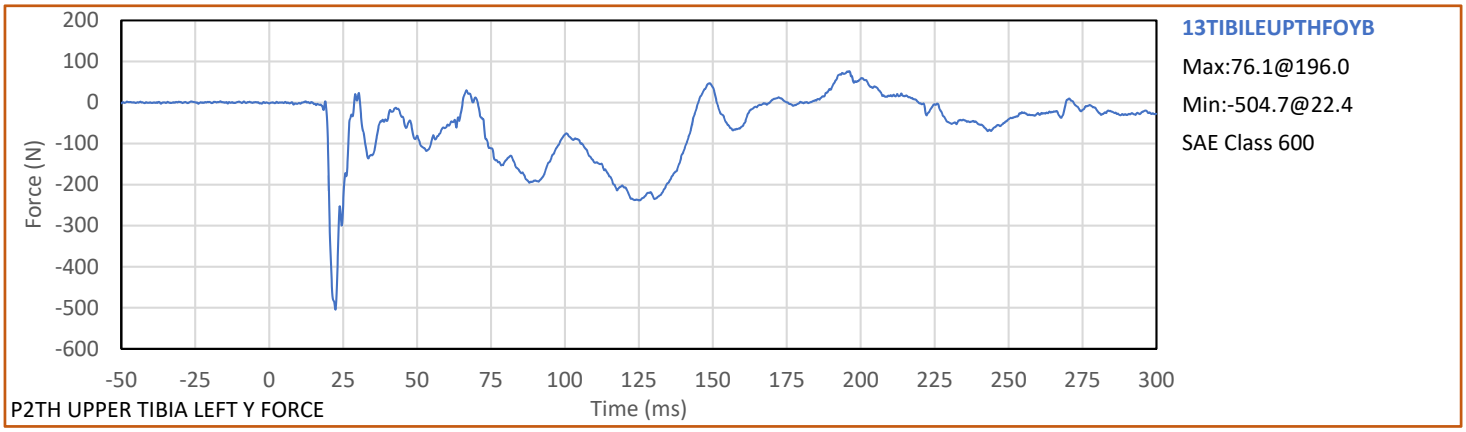

Moment (Nm)
Time (ms)
P2TH FEMUR RIGHT Y MOMENT
13FEMRRI00THMOYB
Max:79.6@104.5
Min:-28.3@51.8
SAE Class 600

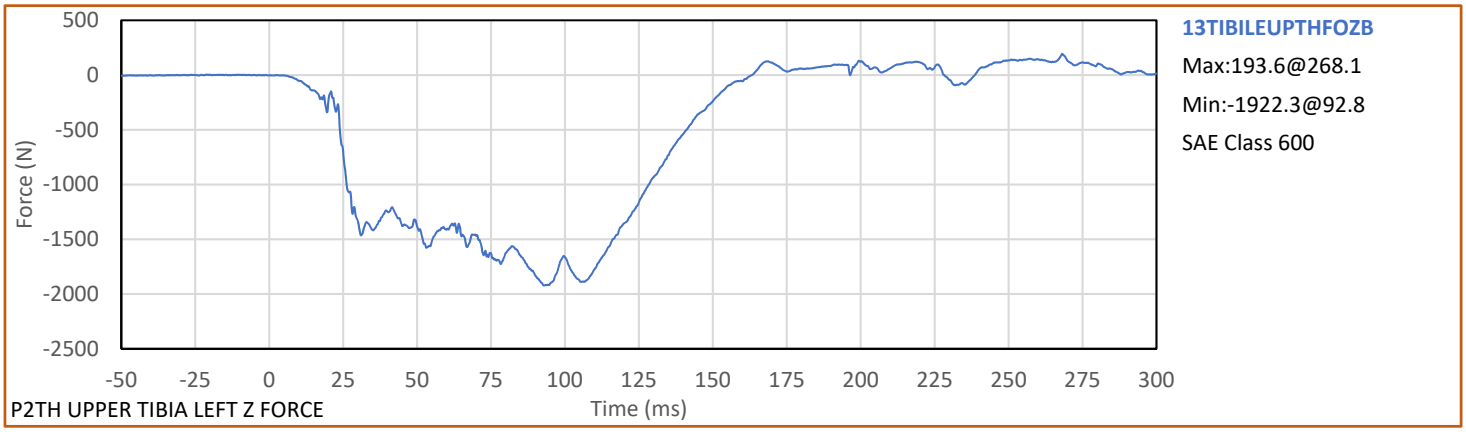

Moment (Nm)
Time (ms)
P2TH FEMUR RIGHT Z MOMENT
13FEMRRI00THMOZB
Max:17.7@253.8
Min:-52.5@80.6
SAE Class 600

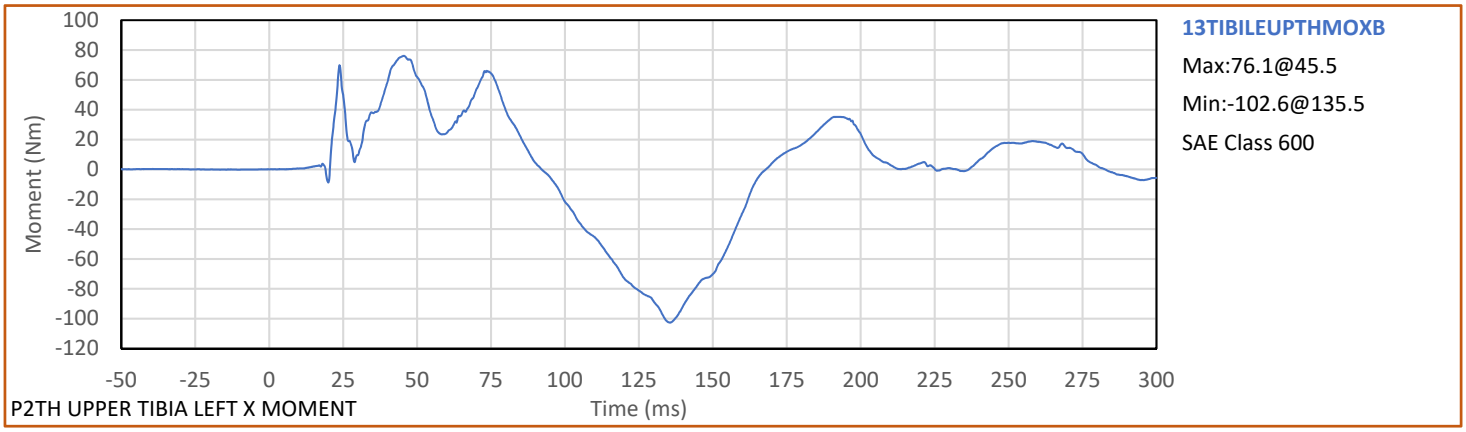

Displacement (mm)
Time (ms)
P2TH KNEE LEFT X DISPLACEMENT
13KNSLLE00THDSXC
Max:0.8@205.1
Min:-10.3@86.0
SAE Class 180

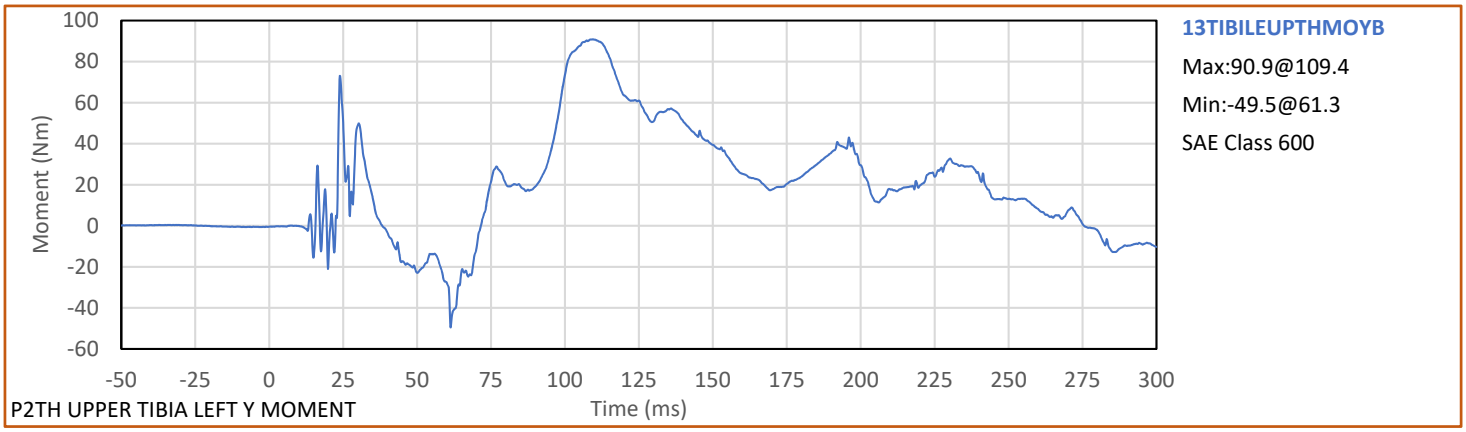

Displacement (mm)
Time (ms)
P2TH KNEE RIGHT X DISPLACEMENT
13KNSLRI00THDSXC
Max:0.7@266.7
Min:-7.7@33.0
SAE Class 180

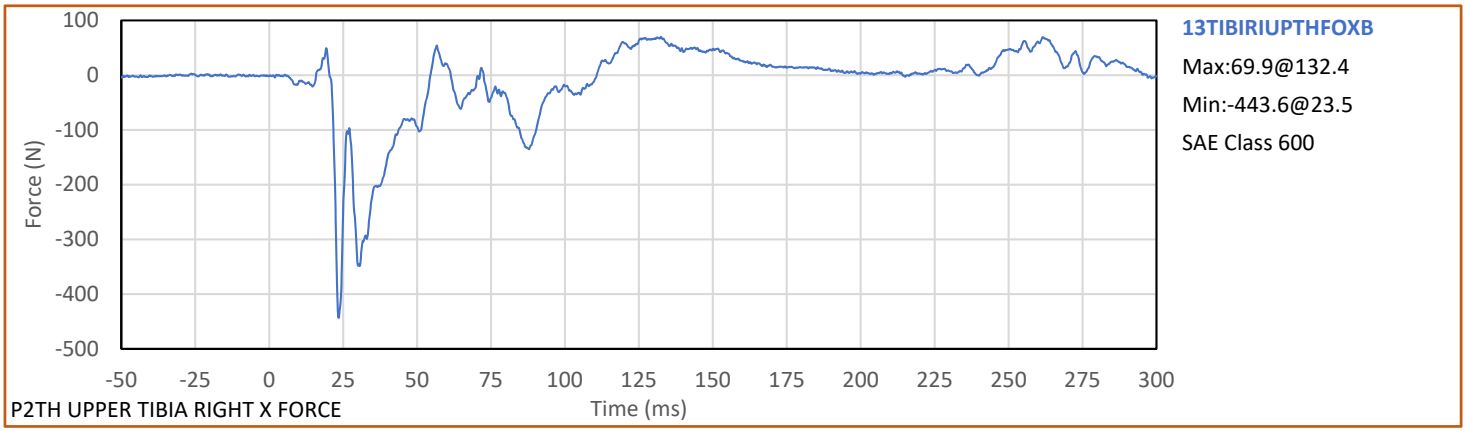

Force (N)
Time (ms)
P2TH UPPER TIBIA LEFT X FORCE
13TIBILEUPTHFOXB
Max:375.5@105.9
Min:-528.7@22.5
SAE Class 600

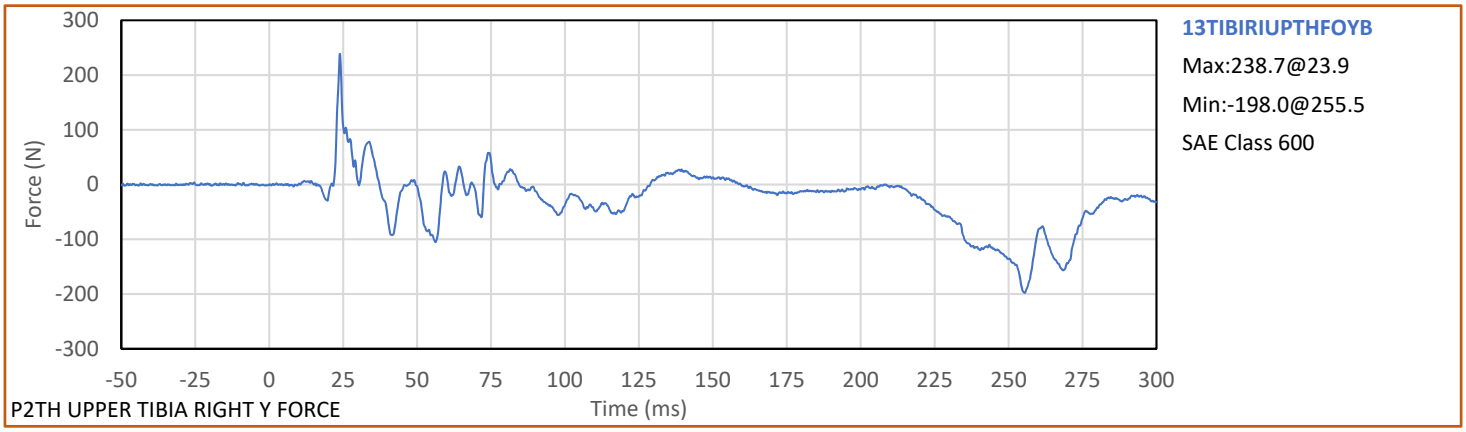

Force (N)
Time (ms)
P2TH UPPER TIBIA LEFT Y FORCE
13TIBILEUPTHFOYB
Max:76.1@196.0
Min:-504.7@22.4
SAE Class 600

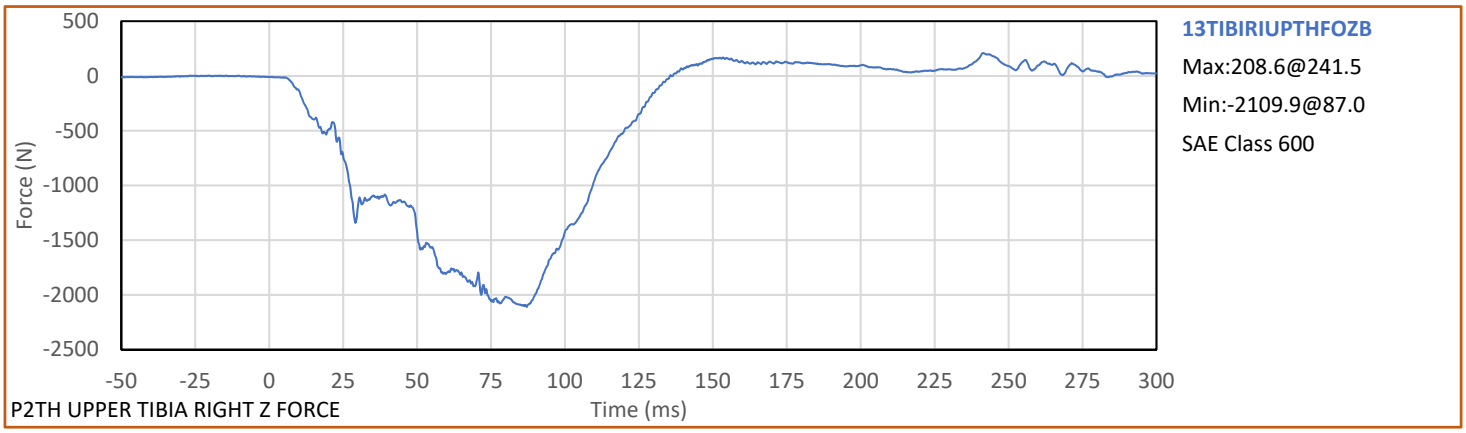

Force (N)
Time (ms)
P2TH UPPER TIBIA LEFT Z FORCE
13TIBILEUPTHFOZB
Max:193.6@268.1
Min:-1922.3@92.8
SAE Class 600


Moment (Nm)
Time (ms)
P2TH UPPER TIBIA LEFT X MOMENT
13TIBILEUPTHMOXB
Max:76.1@45.5
Min:-102.6@135.5
SAE Class 600


Moment (Nm)
Time (ms)
P2TH UPPER TIBIA LEFT Y MOMENT
13TIBILEUPTHMOYB
Max:90.9@109.4
Min:-49.5@61.3
SAE Class 600

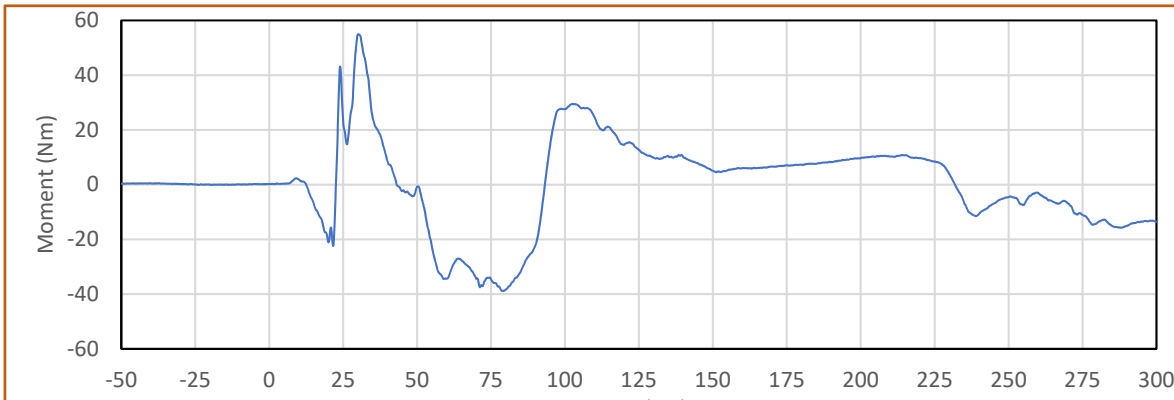

Force (N)
Time (ms)
P2TH UPPER TIBIA RIGHT X FORCE
13TIBIRIUPTHFOXB
Max:69.9@132.4
Min:-443.6@23.5
SAE Class 600


Force (N)
Time (ms)
P2TH UPPER TIBIA RIGHT Y FORCE
13TIBIRIUPTHFOYB
Max:238.7@23.9
Min:-198.0@255.5
SAE Class 600


Force (N)
Time (ms)
P2TH UPPER TIBIA RIGHT Z FORCE
13TIBIRIUPTHFOZB
Max:208.6@241.5
Min:-2109.9@87.0
SAE Class 600

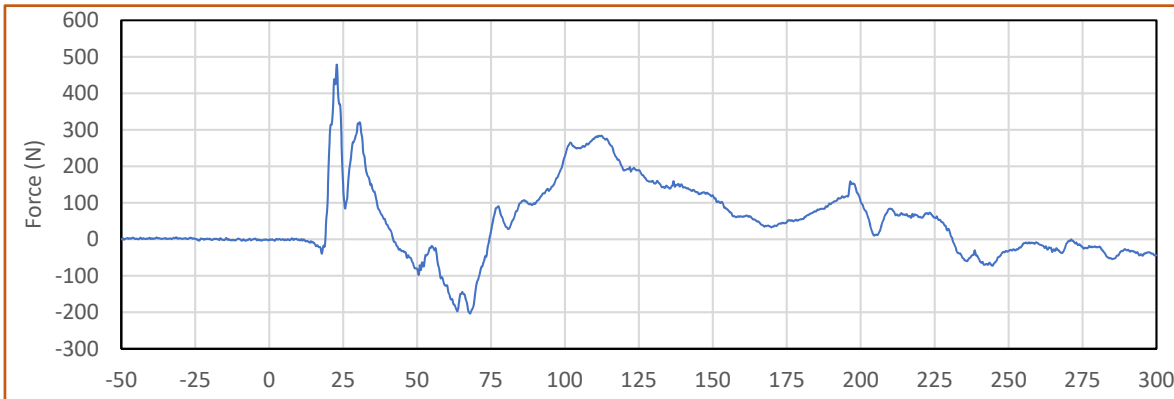
P2TH UPPER TIBIA RIGHT X MOMENT

13TIBIRIUPTHMOXB
Max:66.7@78.3
Min:-24.2@273.3
SAE Class 600



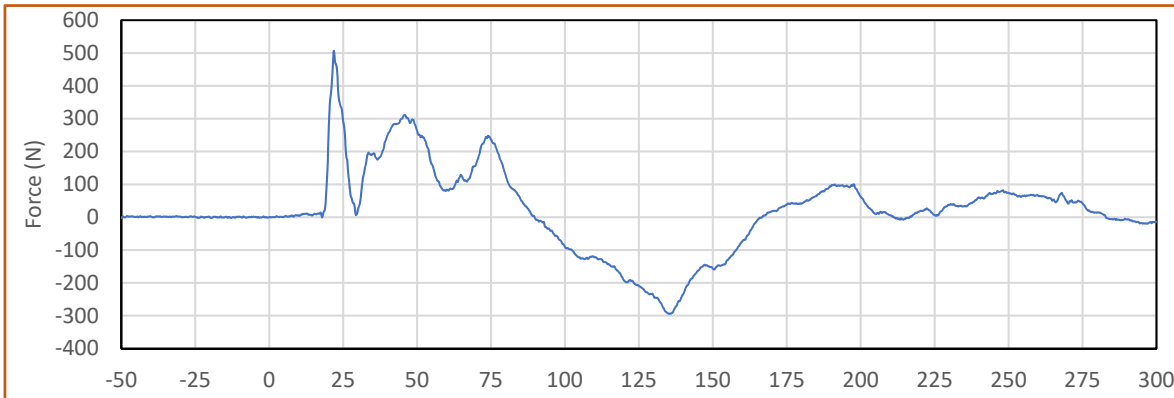
P2TH UPPER TIBIA RIGHT Y MOMENT

13TIBIRIUPTHMOYB
Max:55.0@30.1
Min:-38.9@79.1
SAE Class 600



P2TH LOWER TIBIA LEFT X FORCE

13TIBILELOTHFOXB
Max:478.5@22.8
Min:-203.8@67.9
SAE Class 600



P2TH LOWER TIBIA LEFT Y FORCE

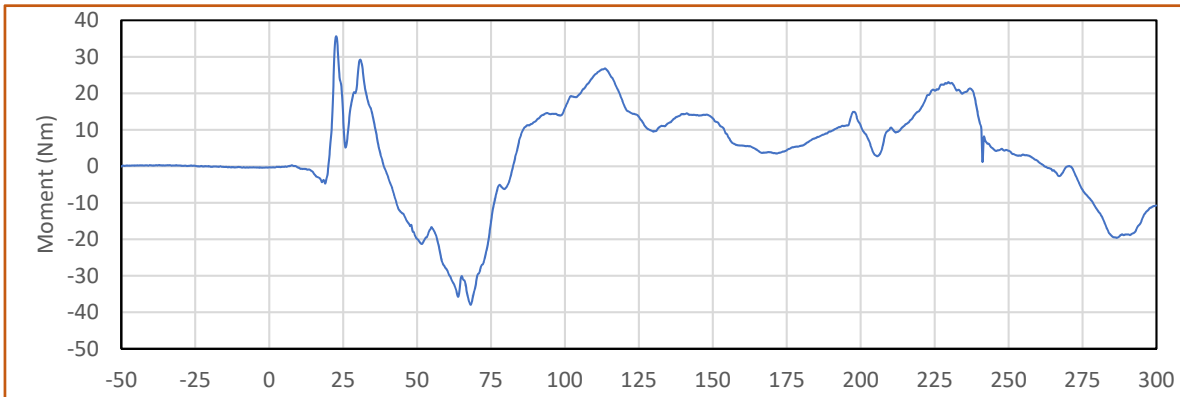
13TIBILELOTHFOYB
Max:506.9@21.9
Min:-294.2@135.7
SAE Class 600

P2TH LOWER TIBIA LEFT Z FORCE

13TIBILELOTHFOZB
Max:159.9@267.9
Min:-1981.0@78.2
SAE Class 600

P2TH LOWER TIBIA LEFT X MOMENT

13TIBILELOTHMOXB
Max:53.5@146.9
Min:-57.0@22.4
SAE Class 600



P2TH LOWER TIBIA LEFT Y MOMENT

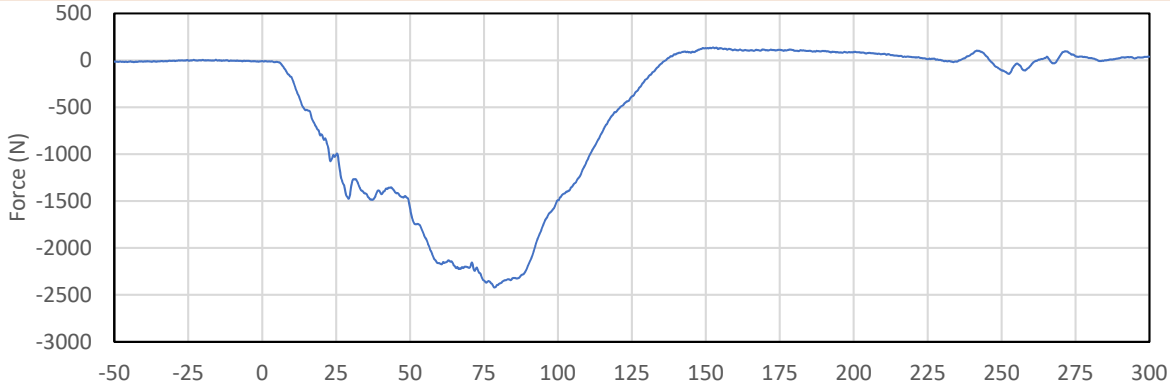
13TIBILELOTHMOYB
Max:35.6@22.7
Min:-38.0@68.1
SAE Class 600

P2TH LOWER TIBIA RIGHT X FORCE

13TIBIRILOTHFOXB
Max:471.1@23.6
Min:-161.0@72.1
SAE Class 600

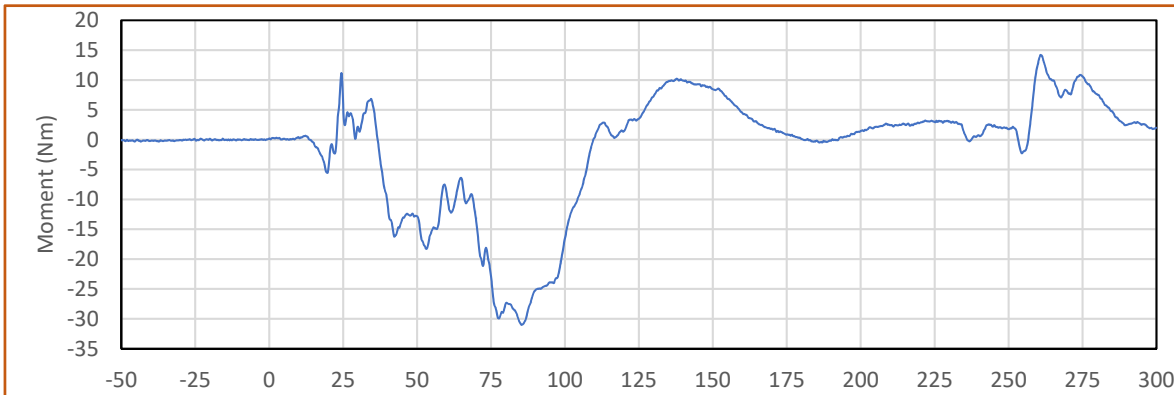
P2TH LOWER TIBIA RIGHT Y FORCE

13TIBIRILOTHFOYB
Max:242.7@76.9
Min:-184.6@24.2
SAE Class 600



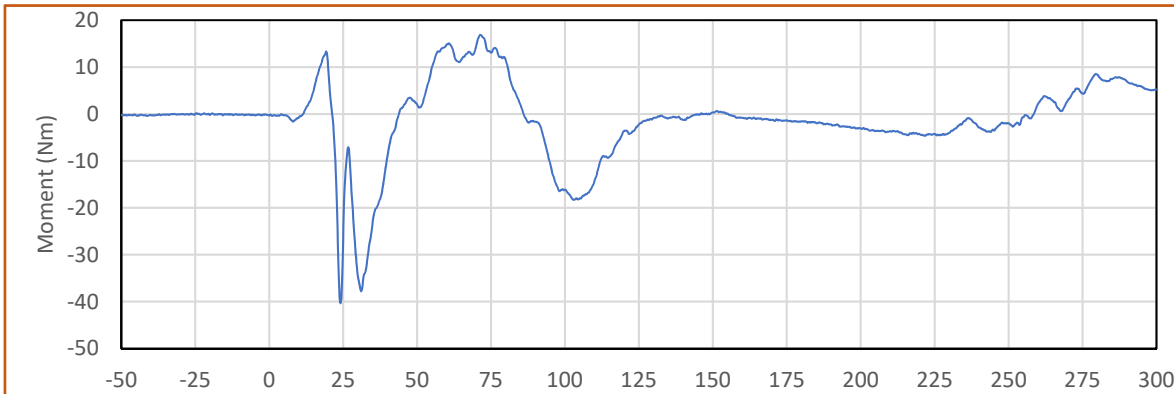
P2TH LOWER TIBIA RIGHT Z FORCE

13TIBIRILOTHFOZB
Max:137.1@152.4
Min:-2421.5@78.5
SAE Class 600



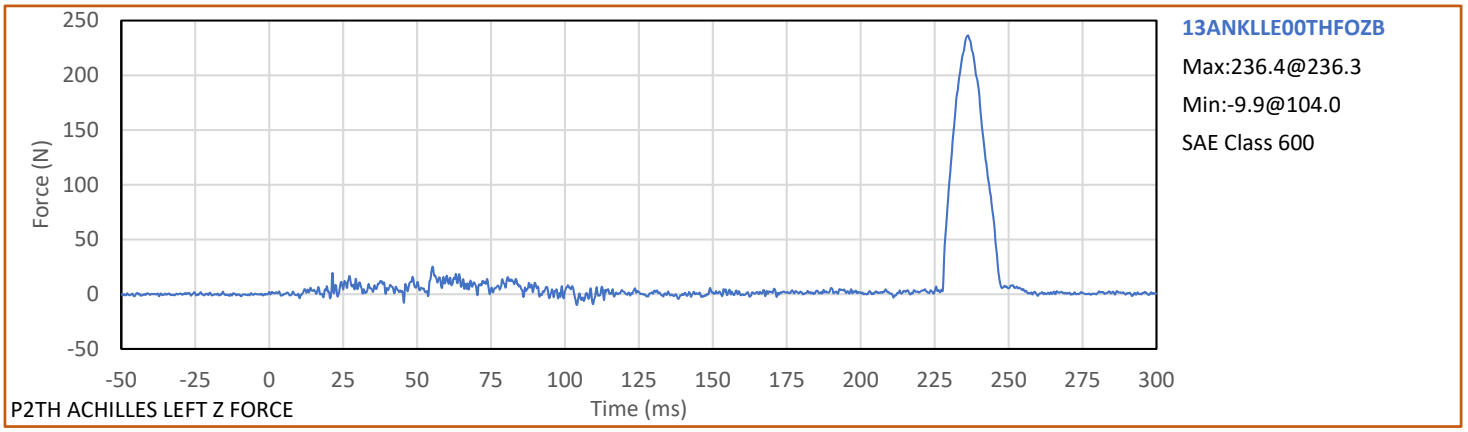
P2TH LOWER TIBIA RIGHT X MOMENT

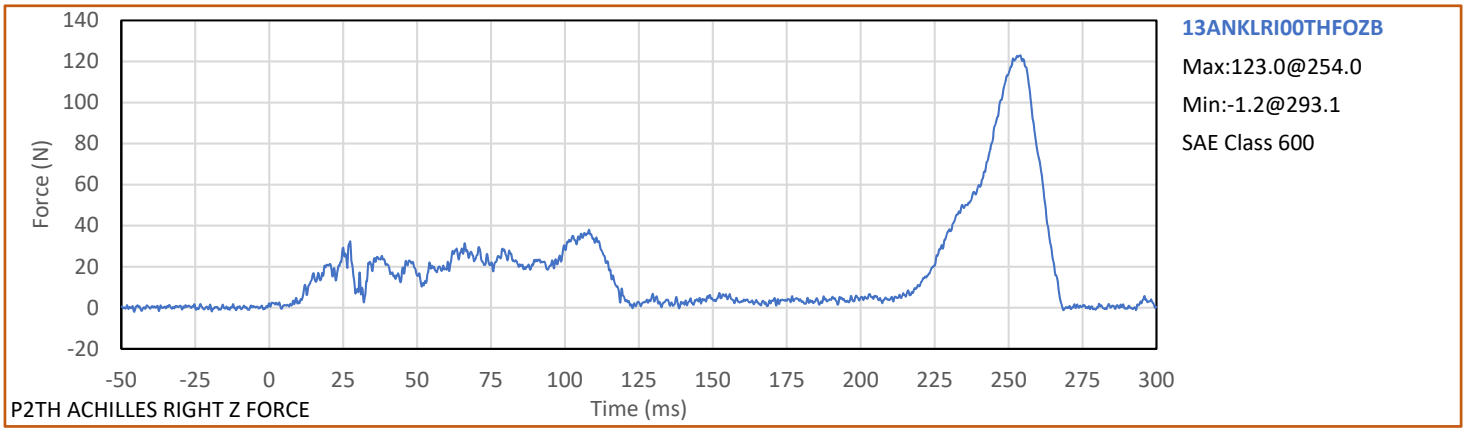
13TIBIRILOTHMOXB
Max:14.2@260.9
Min:-31.0@85.4
SAE Class 600

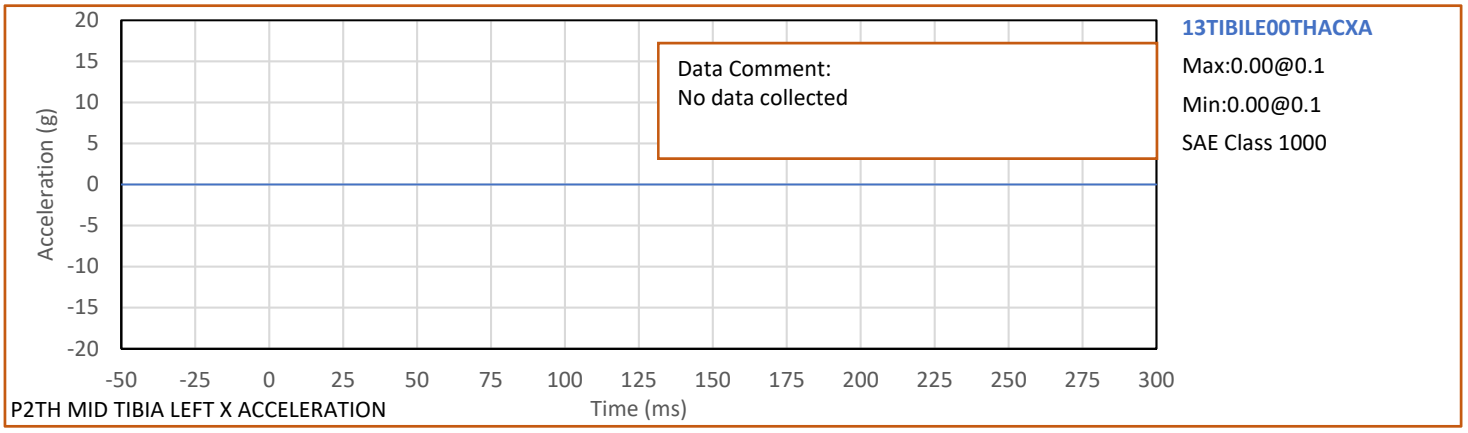


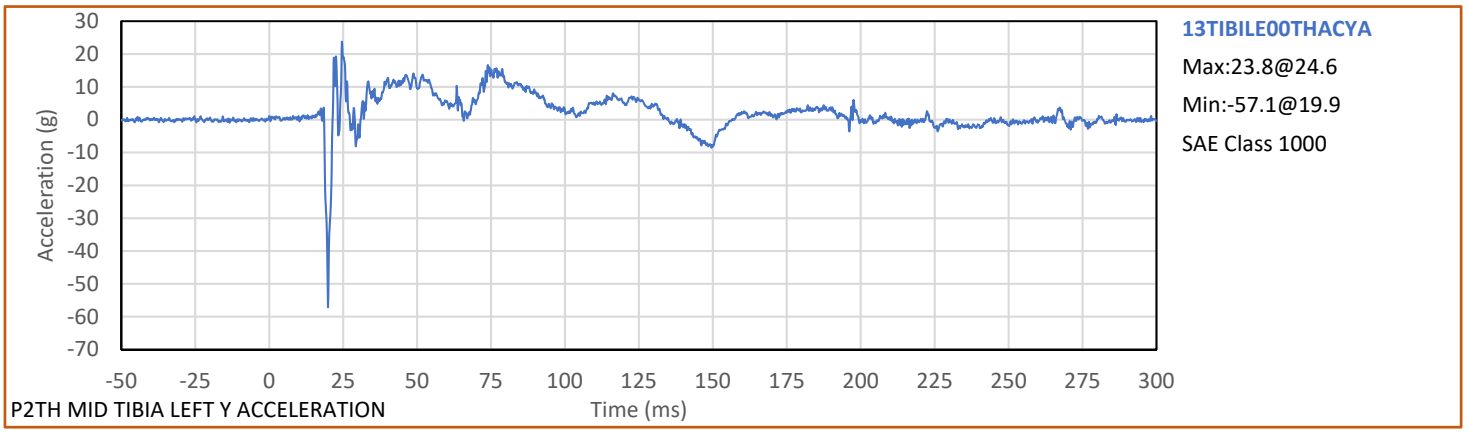
P2TH LOWER TIBIA RIGHT Y MOMENT

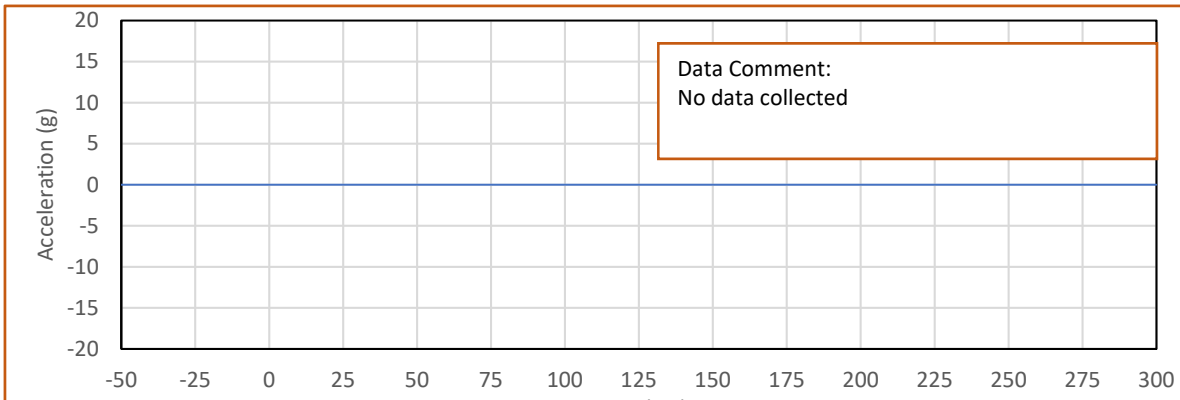
13TIBIRILOTHMOYB
Max:16.9@71.4
Min:-40.4@24.1
SAE Class 600


Force (N)
Time (ms)
P2TH ACHILLES LEFT Z FORCE
13ANKLLE00THFOZB
Max:236.4@236.3
Min:-9.9@104.0
SAE Class 600


Force (N)
Time (ms)
P2TH ACHILLES RIGHT Z FORCE
13ANKLRI00THFOZB
Max:123.0@254.0
Min:-1.2@293.1
SAE Class 600

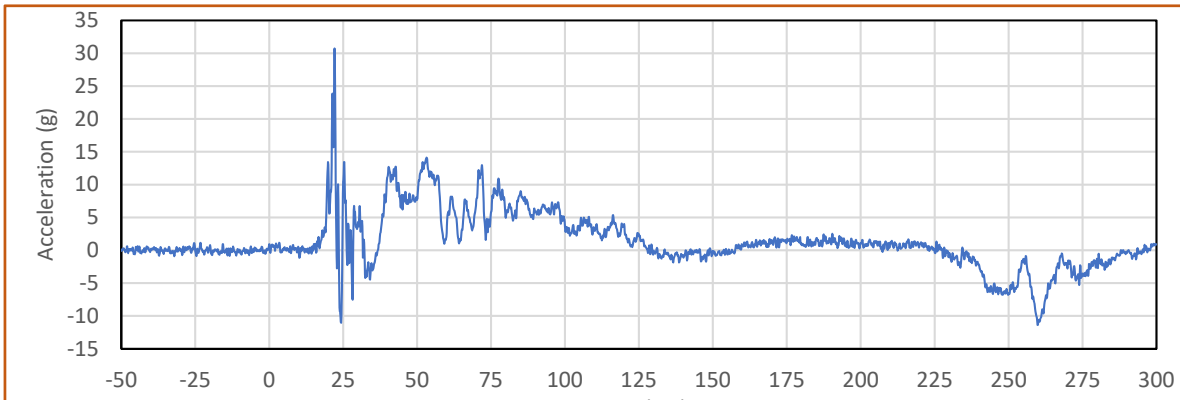

Acceleration (g)
Time (ms)
P2TH MID TIBIA LEFT X ACCELERATION
Data Comment:
No data collected
13TIBILE00THACXA
Max:0.00@0.1
Min:0.00@0.1
SAE Class 1000


Acceleration (g)
Time (ms)
P2TH MID TIBIA LEFT Y ACCELERATION
13TIBILE00THACYA
Max:23.8@24.6
Min:-57.1@19.9
SAE Class 1000



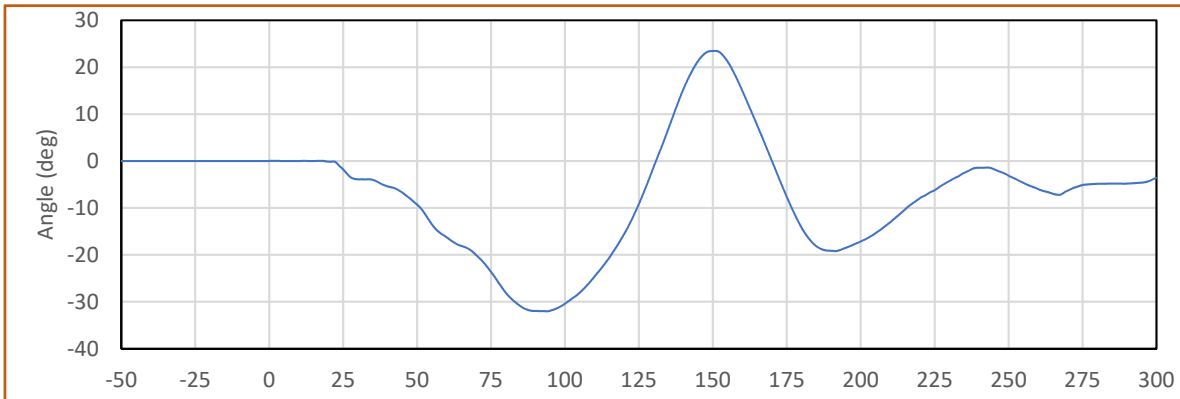
P2TH MID TIBIA RIGHT X ACCELERATION

13TIBIRI00THACXA
Max:0.00@0.1
Min:0.00@0.1
SAE Class 1000



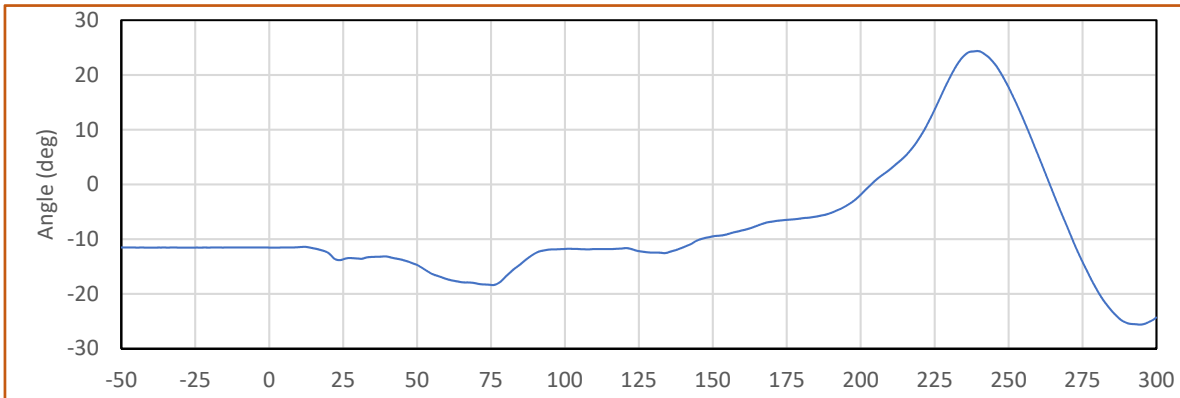
P2TH MID TIBIA RIGHT Y ACCELERATION

13TIBIRI00THACYA
Max:30.7@22.1
Min:-11.4@259.8
SAE Class 1000



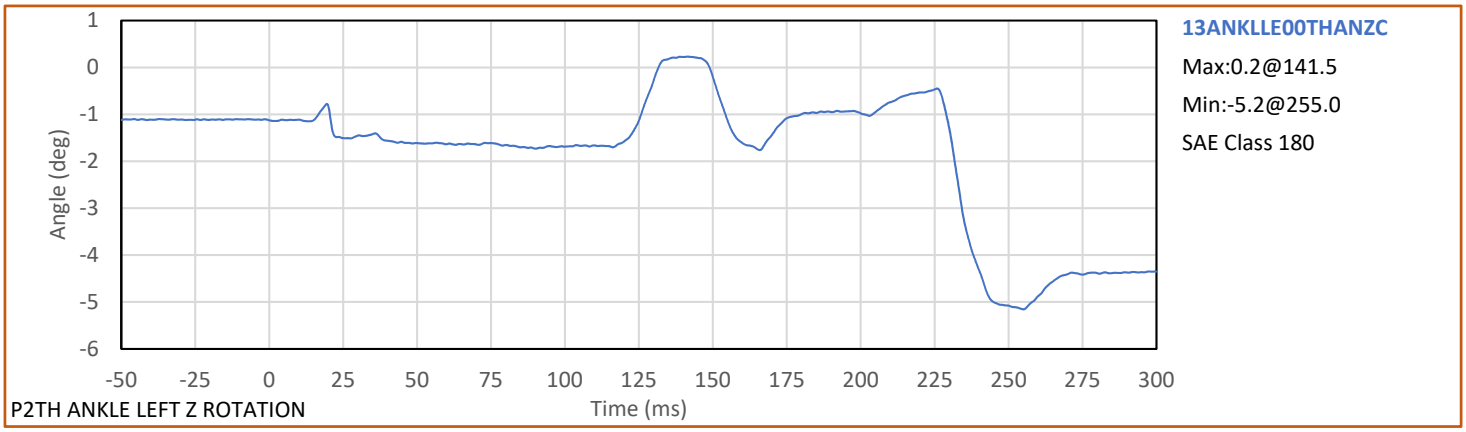
P2TH ANKLE LEFT X ROTATION

13ANKLLE00THANXC
Max:23.5@150.9
Min:-32.0@93.9
SAE Class 180

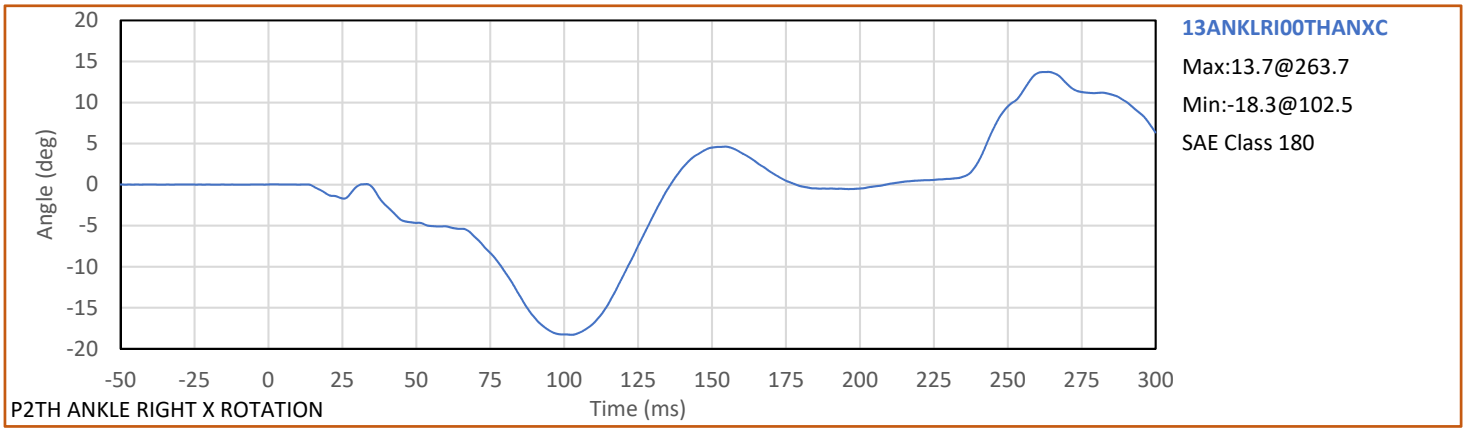


P2TH ANKLE LEFT Y ROTATION

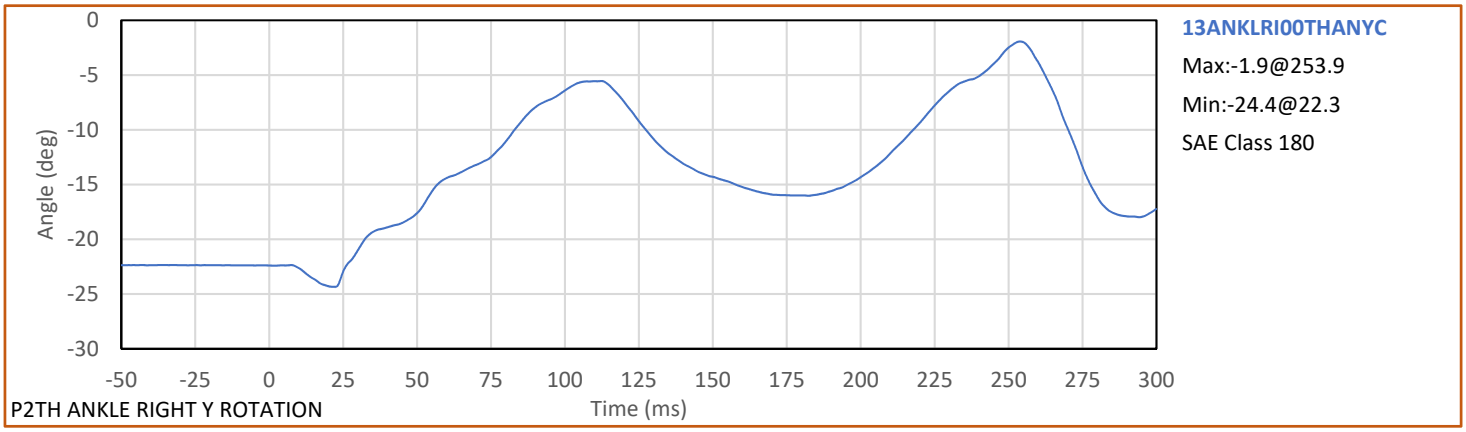
13ANKLLE00THANYC
Max:24.4@239.5
Min:-25.6@294.5
SAE Class 180



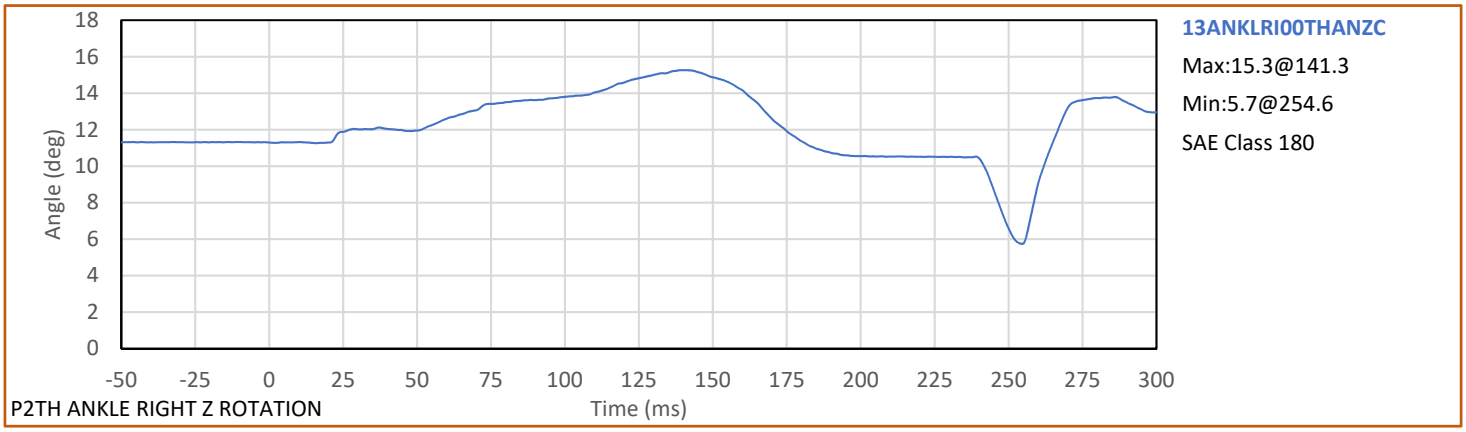
13ANKLLE00THANZC
Max:0.2@141.5
Min:-5.2@255.0
SAE Class 180



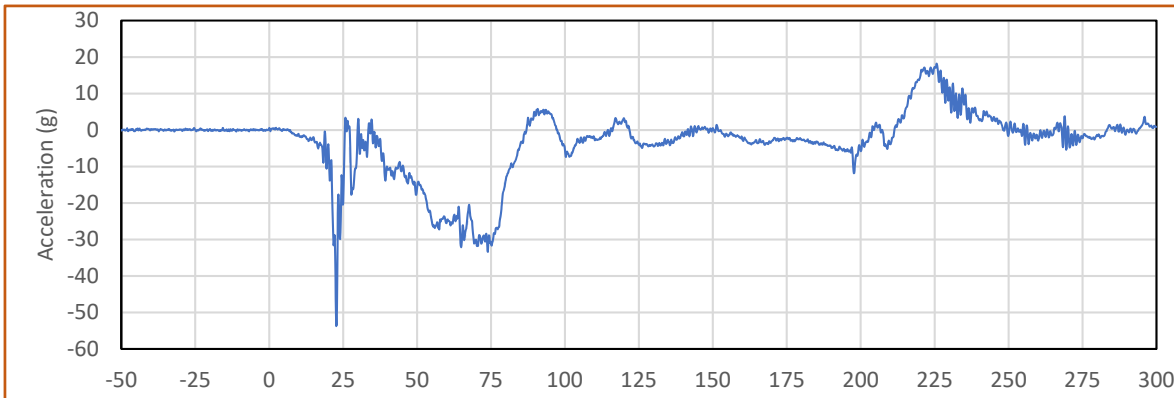
13ANKLRI00THANXC
Max:13.7@263.7
Min:-18.3@102.5
SAE Class 180



13ANKLRI00THANYC
Max:-1.9@253.9
Min:-24.4@22.3
SAE Class 180

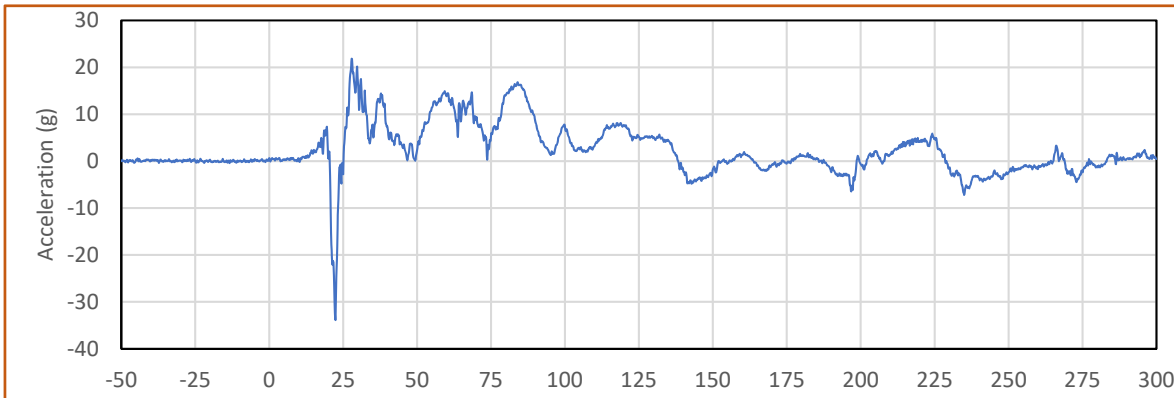


13ANKLRI00THANZC
Max:15.3@141.3
Min:5.7@254.6
SAE Class 180



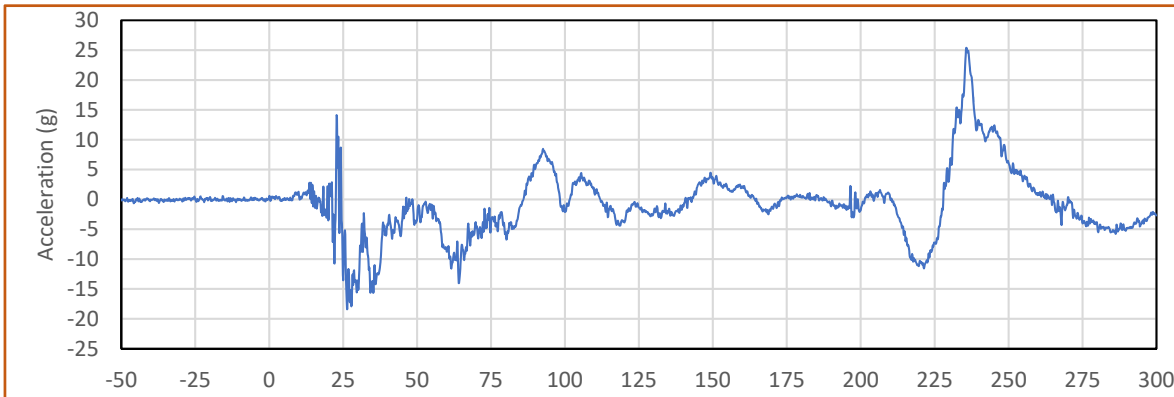
P2TH FOOT LEFT X ACCELERATION

13FOOTLE00THACXA
Max:18.2@225.7
Min:-53.8@22.7
SAE Class 1000



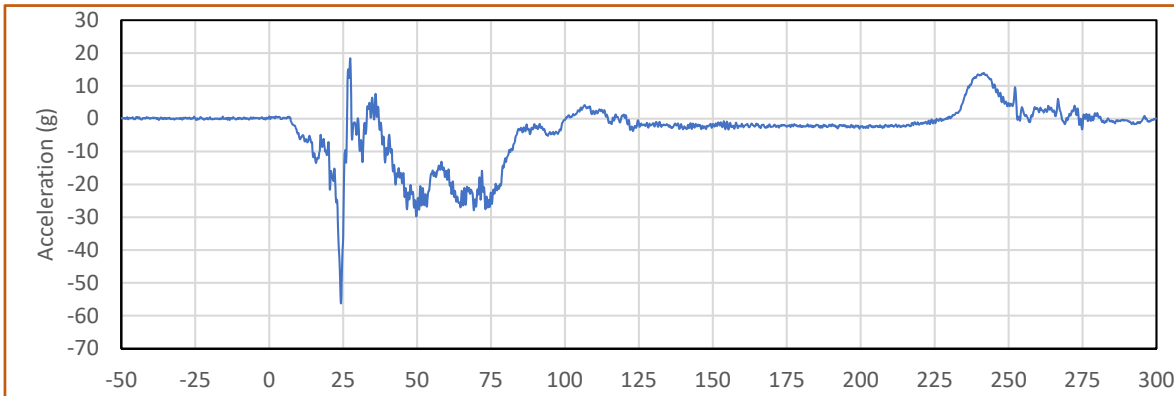
P2TH FOOT LEFT Y ACCELERATION

13FOOTLE00THACYA
Max:21.9@27.9
Min:-33.9@22.4
SAE Class 1000



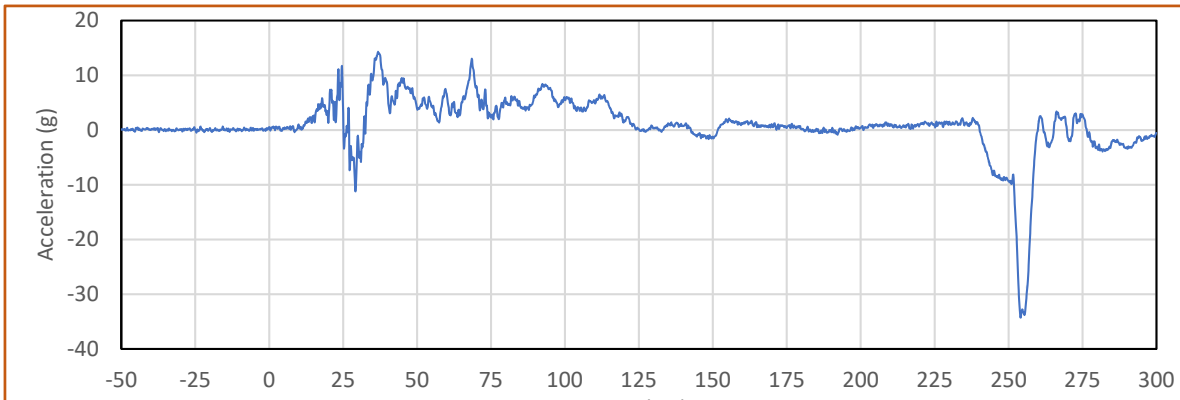
P2TH FOOT LEFT Z ACCELERATION

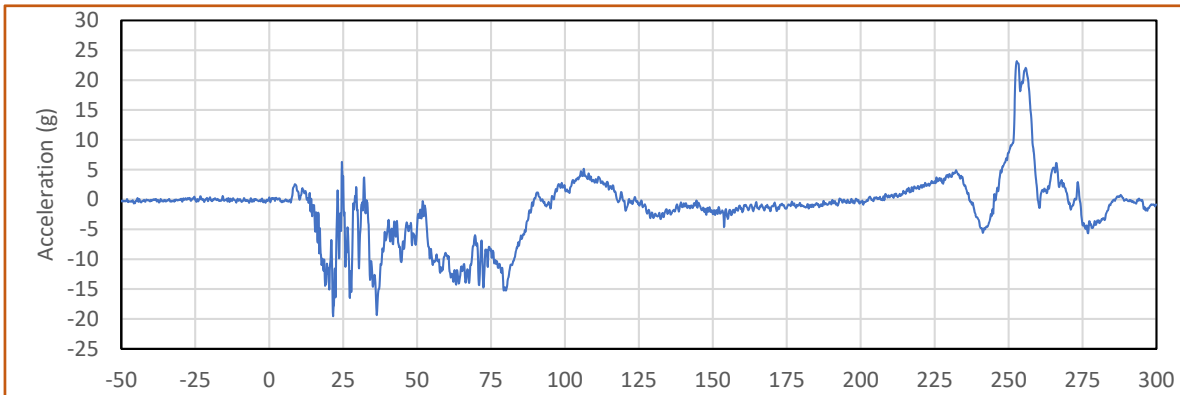
13FOOTLE00THACZA
Max:25.4@235.7
Min:-18.4@26.3
SAE Class 1000



P2TH FOOT RIGHT X ACCELERATION

13FOOTRI00THACXA
Max:18.4@27.4
Min:-56.3@24.3
SAE Class 1000


Acceleration (g)
Time (ms)
P2TH FOOT RIGHT Y ACCELERATION
13FOOTRI00THACYA
Max:14.3@36.8
Min:-34.3@254.1
SAE Class 1000

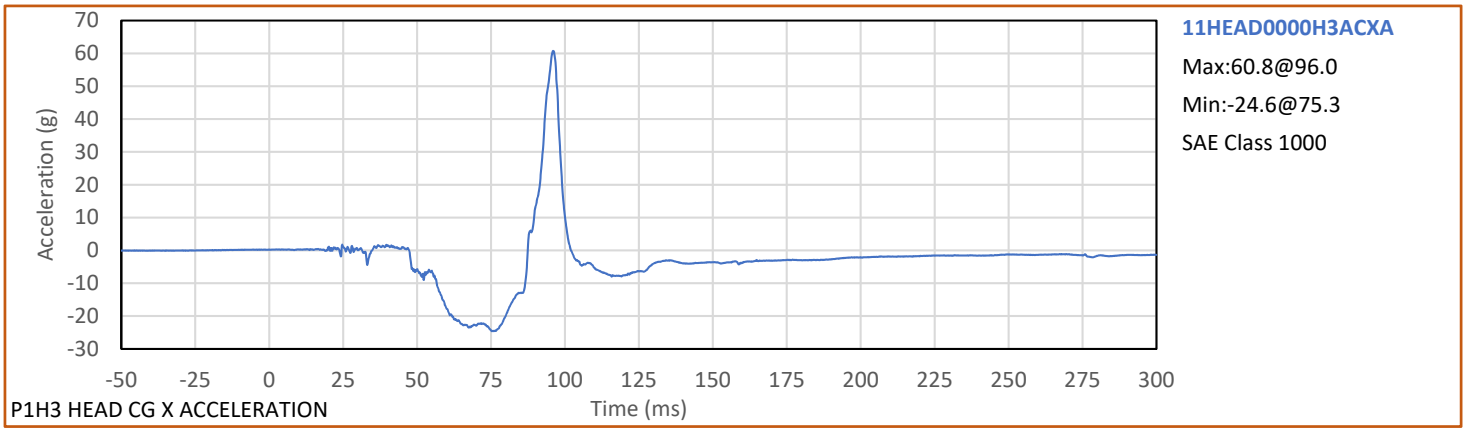

Acceleration (g)
Time (ms)
P2TH FOOT RIGHT Z ACCELERATION
13FOOTRI00THACZA
Max:23.2@252.8
Min:-19.5@21.6
SAE Class 1000

Test Vehicle: 2020 Honda Accord 4-Door Sedan

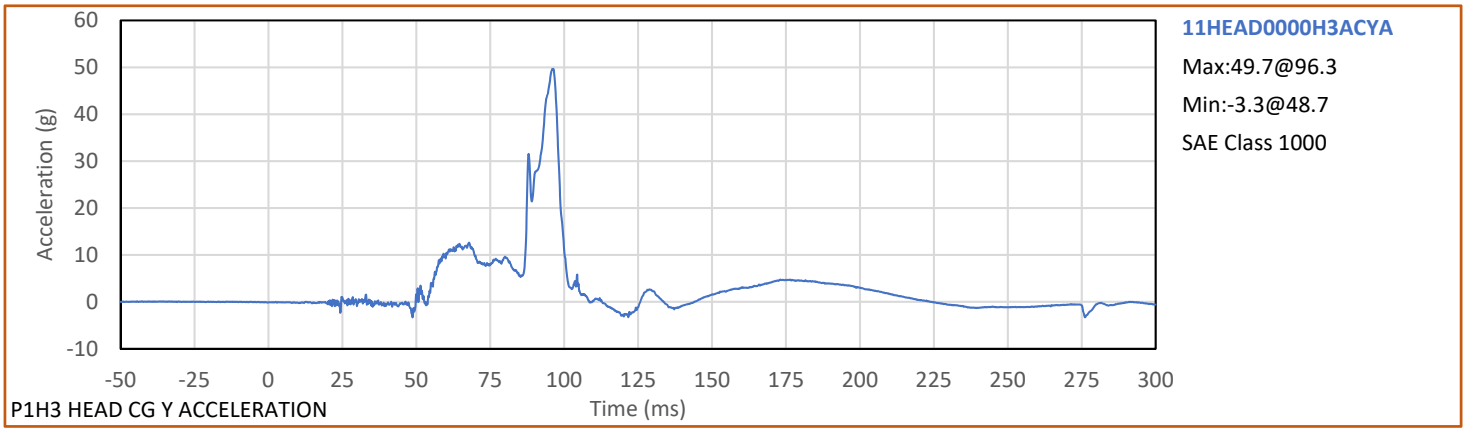
Test Program: Left Side 30° Frontal Rigid Barrier Impact

NHTSA No.: R20205380

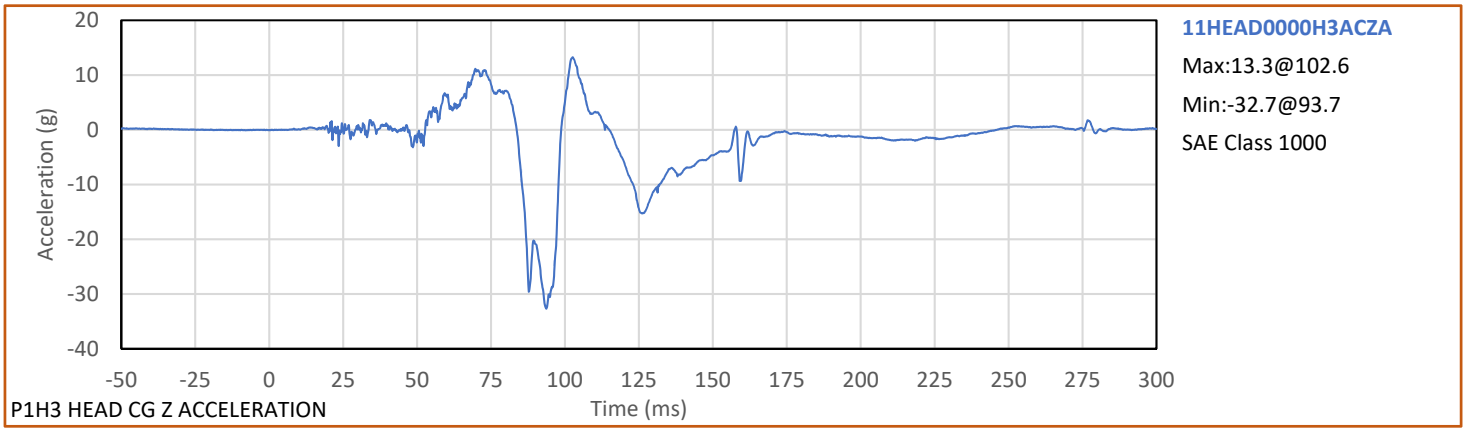
Test Date: 10/1/2020



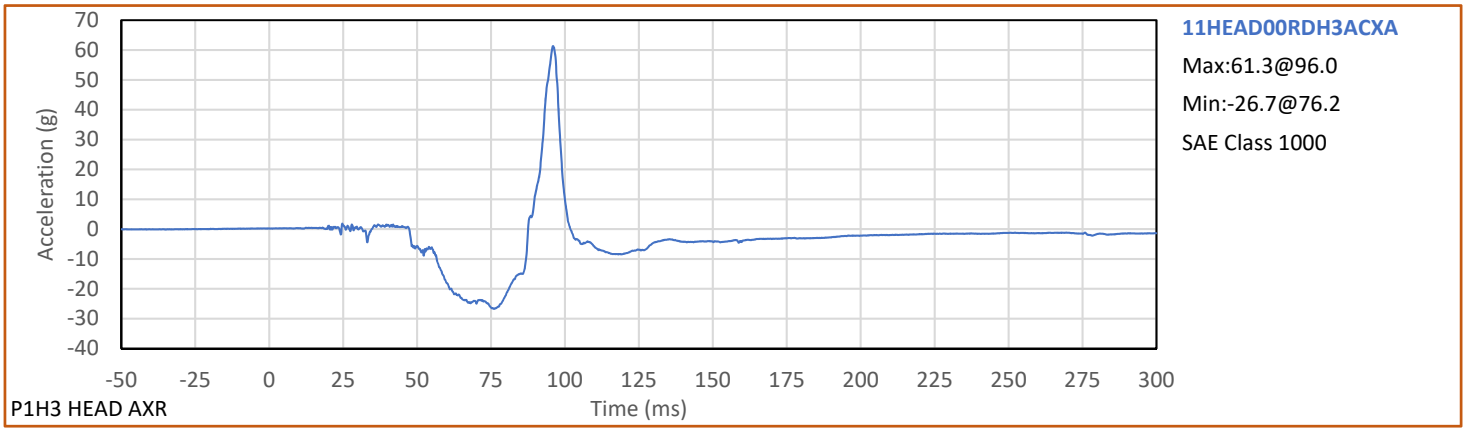
P1H3 HEAD CG X ACCELERATION



P1H3 HEAD CG Y ACCELERATION



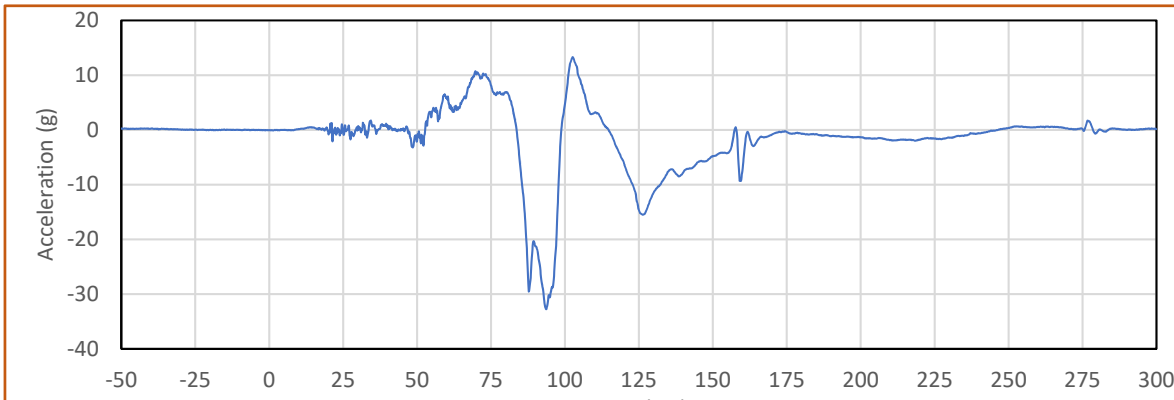
P1H3 HEAD CG Z ACCELERATION



P1H3 HEAD AXR

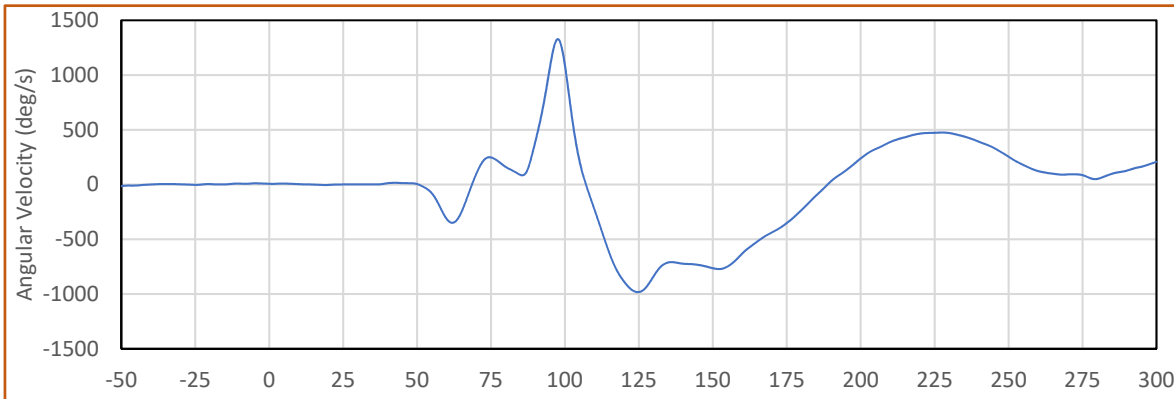
P1H3 HEAD AYR

11HEAD00RDH3ACYA
Max:48.0@96.3
Min:-3.5@48.7
SAE Class 1000



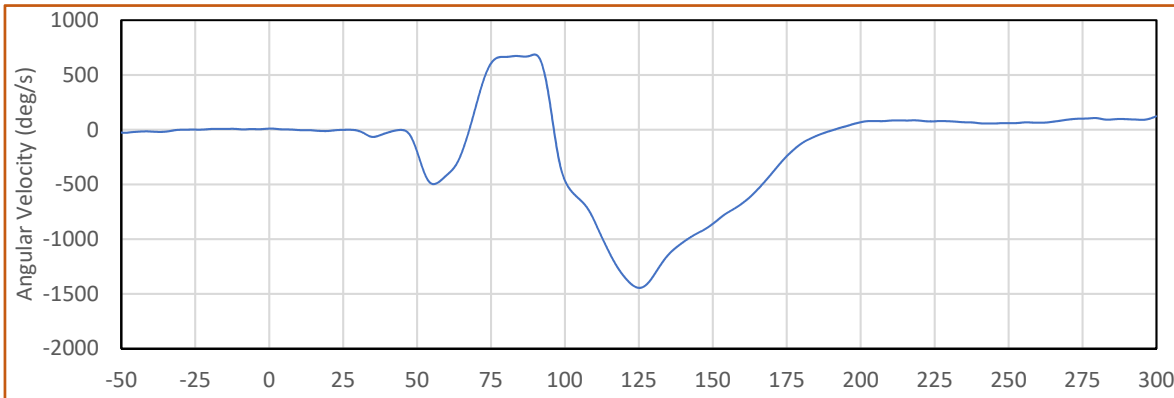
P1H3 HEAD AZR

11HEAD00RDH3ACZA
Max:13.3@102.6
Min:-32.8@93.6
SAE Class 1000



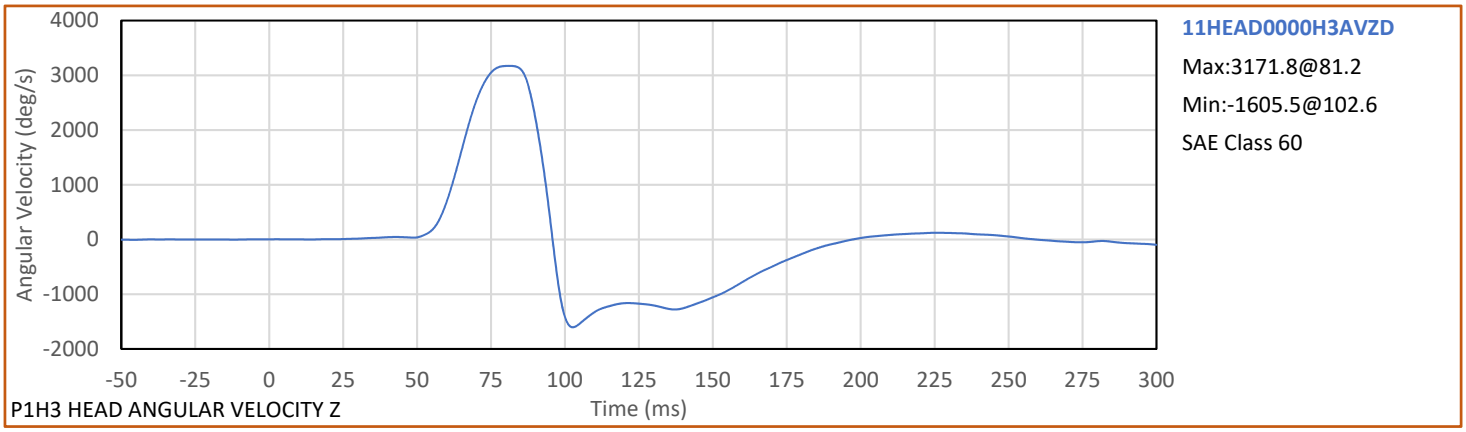
P1H3 HEAD ANGULAR VELOCITY X

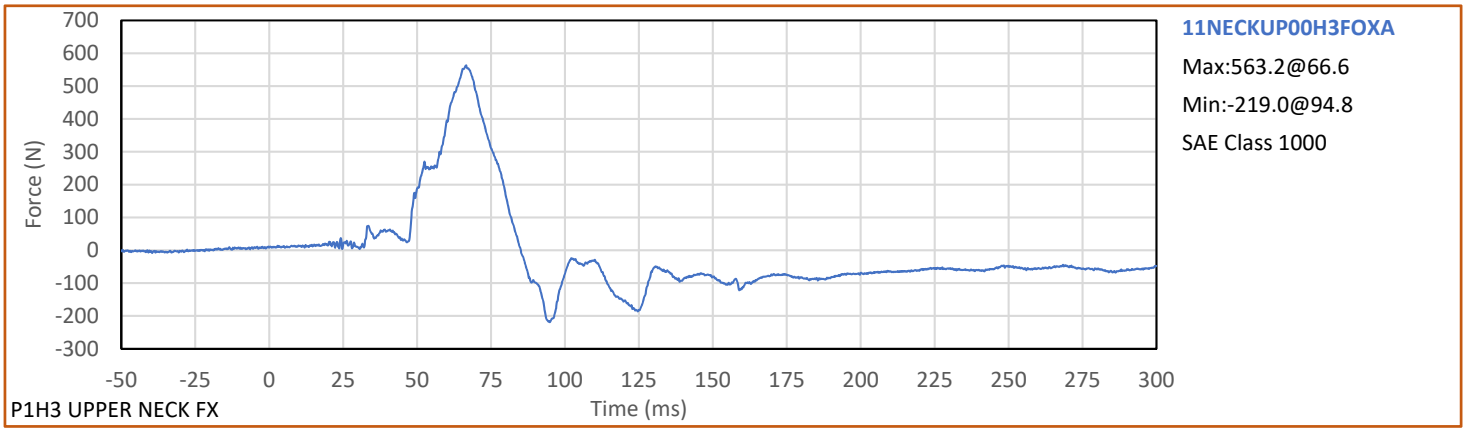
11HEAD0000H3AVXD
Max:1328.5@97.6
Min:-983.8@124.7
SAE Class 60

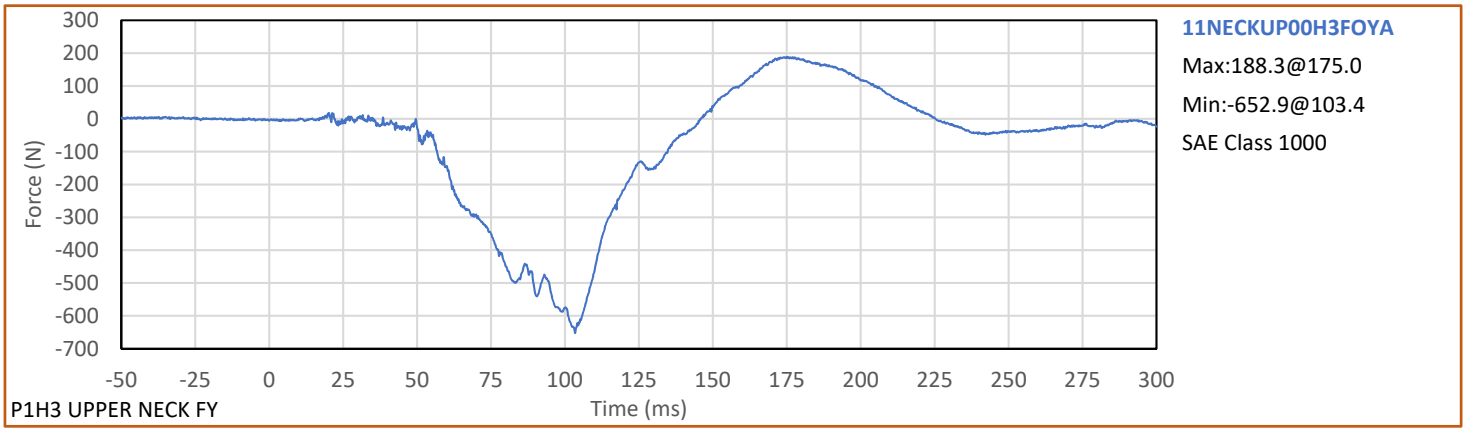


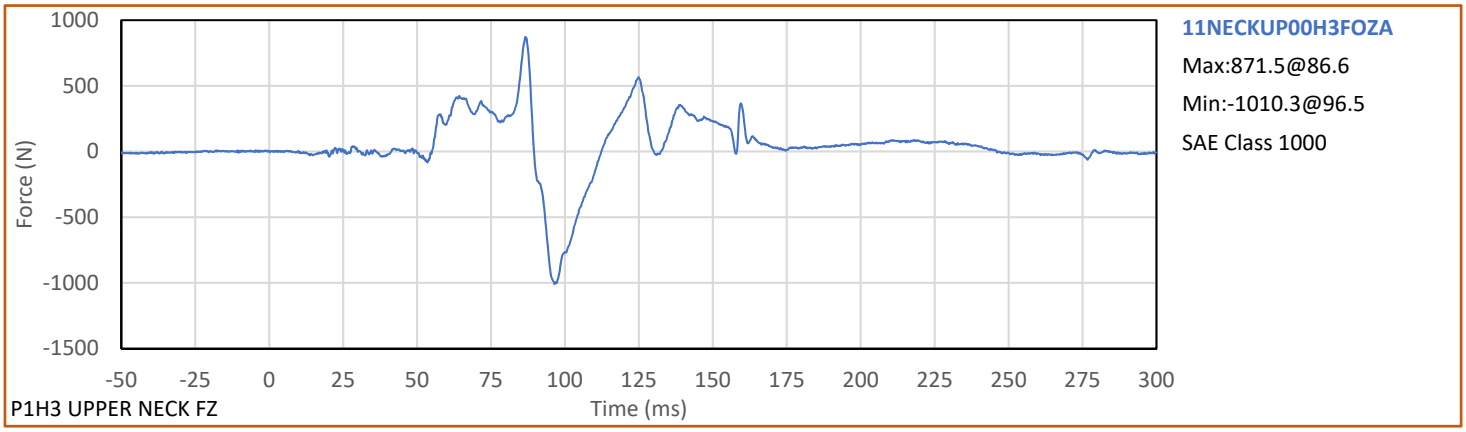
P1H3 HEAD ANGULAR VELOCITY Y

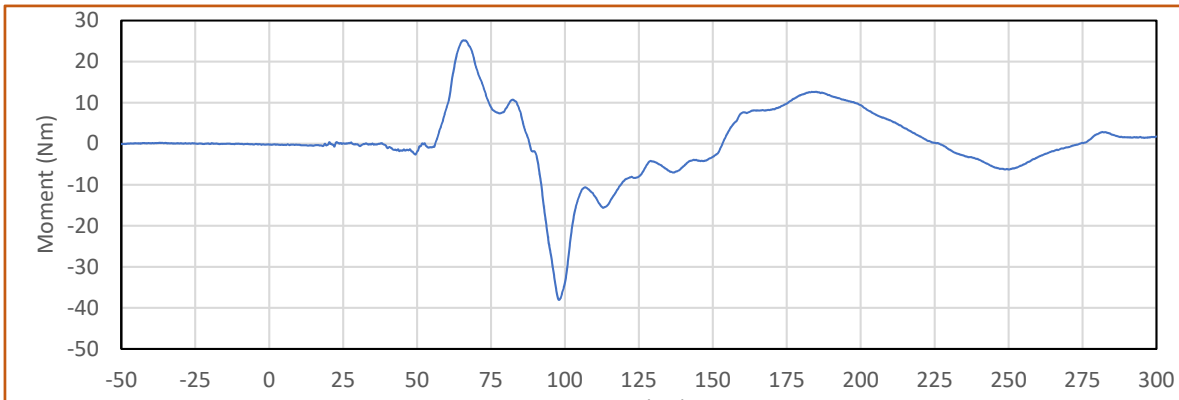
11HEAD0000H3AVYD
Max:686.2@89.8
Min:-1446.0@125.2
SAE Class 60


Angular Velocity (deg/s)
Time (ms)
11HEAD0000H3AVZD
Max:3171.8@81.2
Min:-1605.5@102.6
SAE Class 60
P1H3 HEAD ANGULAR VELOCITY Z


Force (N)
Time (ms)
11NECKUP00H3FOXA
Max:563.2@66.6
Min:-219.0@94.8
SAE Class 1000
P1H3 UPPER NECK FX

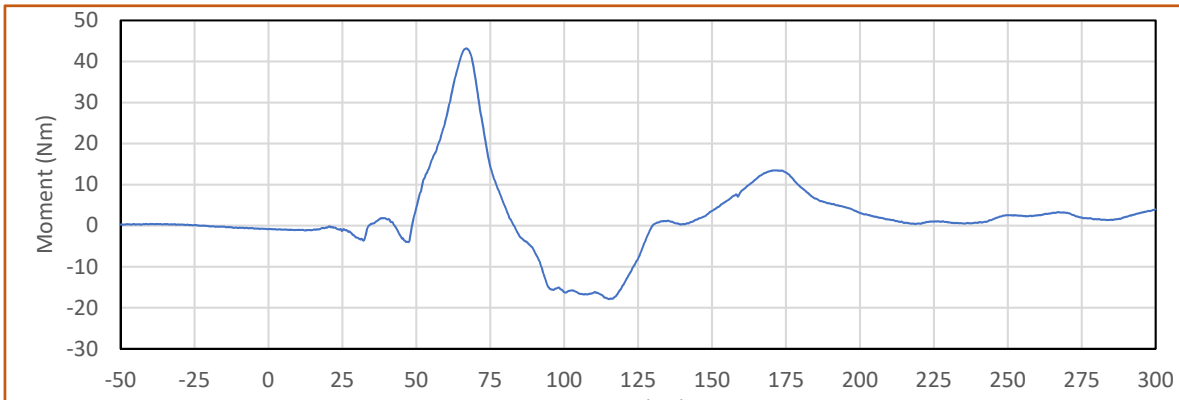

Force (N)
Time (ms)
11NECKUP00H3FOYA
Max:188.3@175.0
Min:-652.9@103.4
SAE Class 1000
P1H3 UPPER NECK FY


Force (N)
Time (ms)
11NECKUP00H3FOZA
Max:871.5@86.6
Min:-1010.3@96.5
SAE Class 1000
P1H3 UPPER NECK FZ



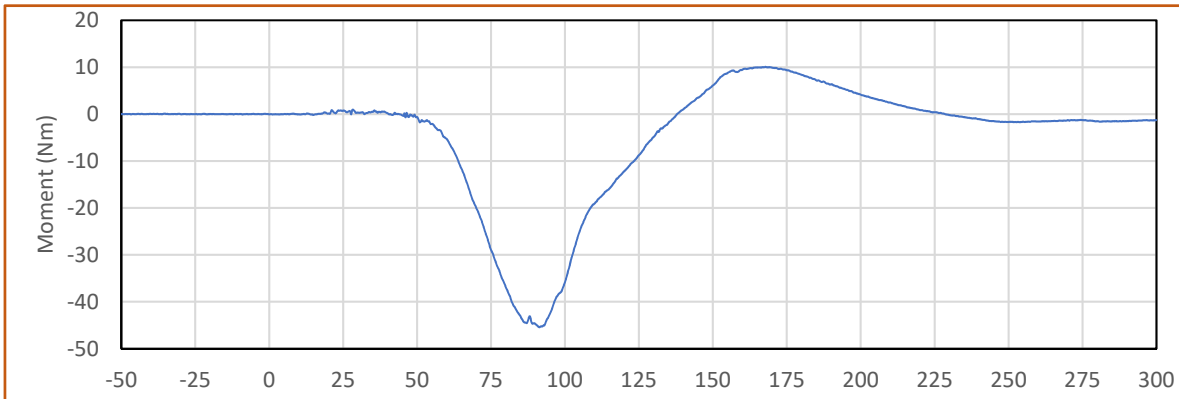
P1H3 UPPER NECK MX

11NECKUP00H3MOXB
Max:25.2@65.6
Min:-38.1@98.0
SAE Class 600



P1H3 UPPER NECK MY

11NECKUP00H3MOYB
Max:43.2@66.9
Min:-17.9@115.1
SAE Class 600



P1H3 UPPER NECK MZ

11NECKUP00H3MOZB
Max:10.1@167.7
Min:-45.4@91.3
SAE Class 600

P1H3 LOWER NECK FX

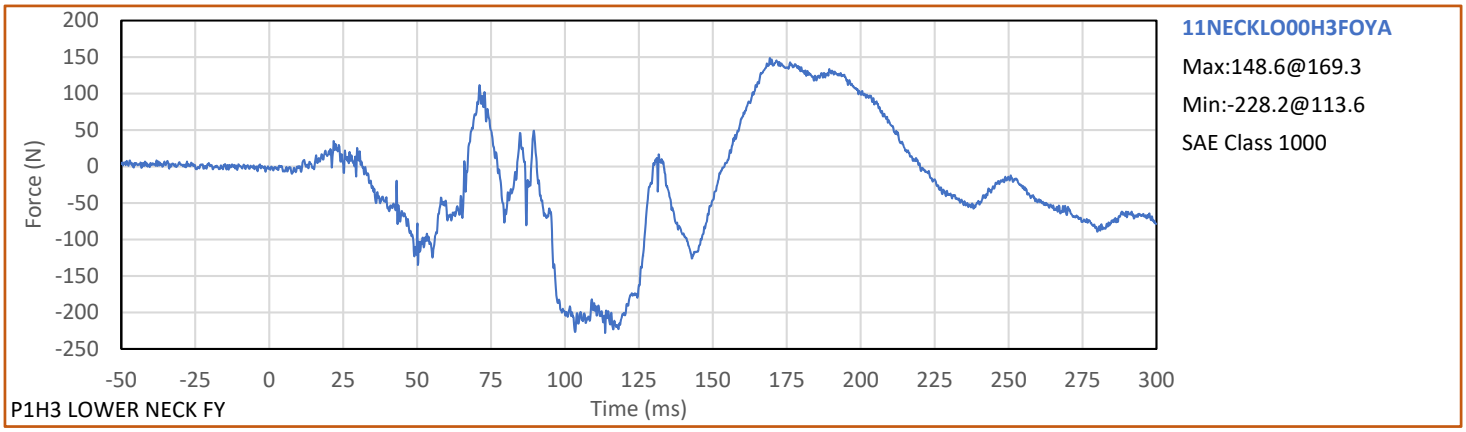
11NECKLO00H3FOXA
Max:718.6@87.2
Min:-448.8@98.0
SAE Class 1000

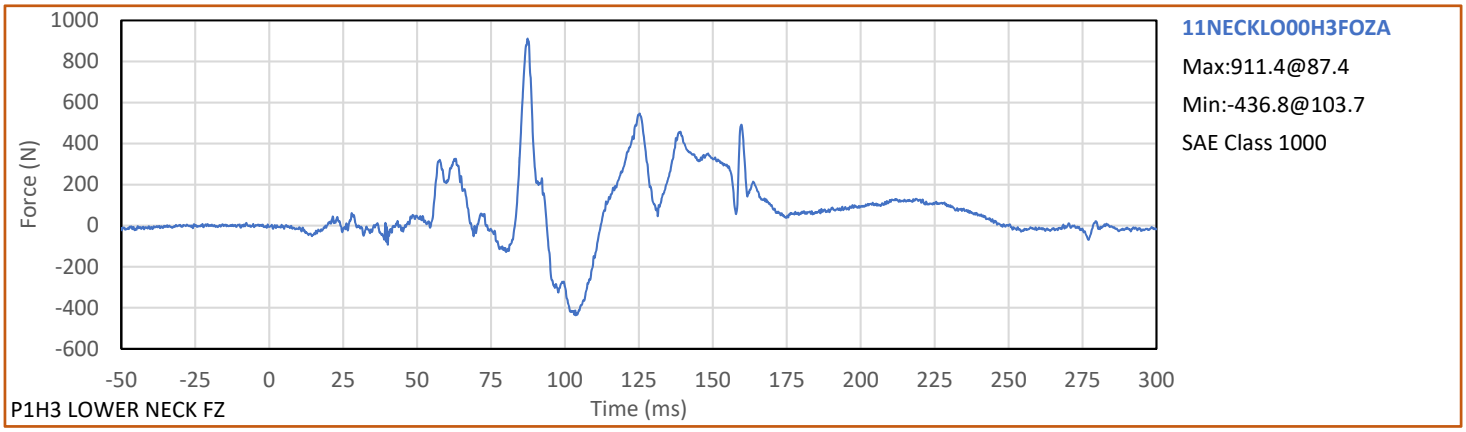
Test Vehicle: 2020 Honda Accord 4-Door Sedan

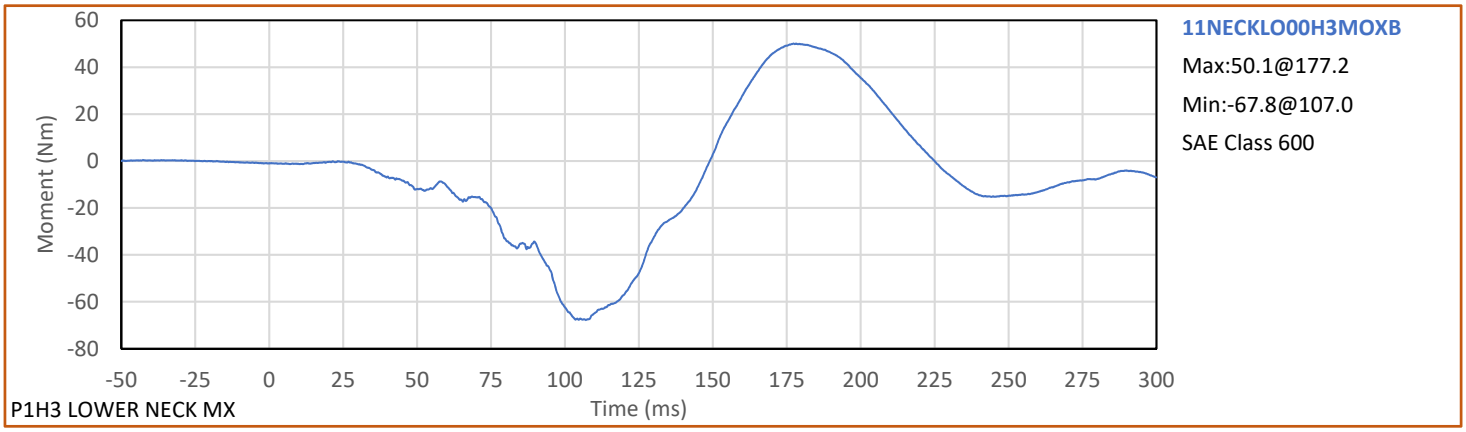
Test Program: Left Side 30° Frontal Rigid Barrier Impact

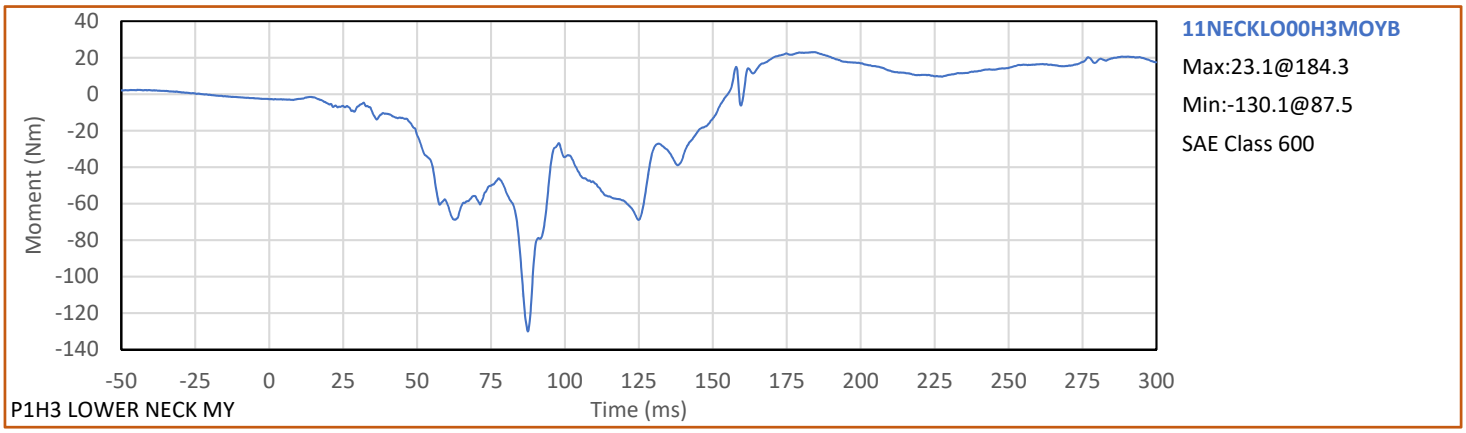
NHTSA No.: R20205380

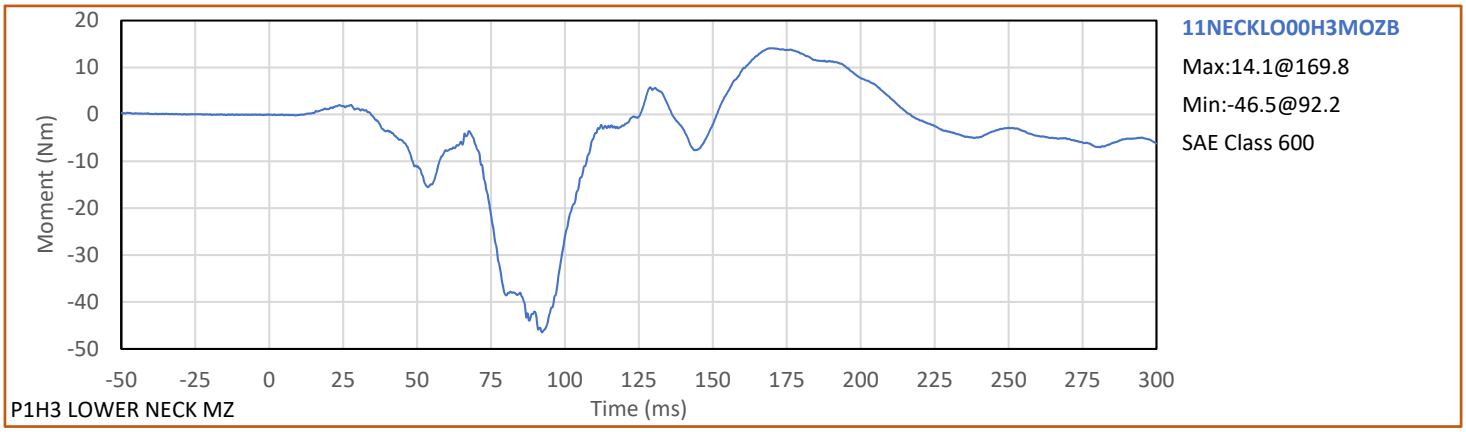
Test Date: 10/1/2020

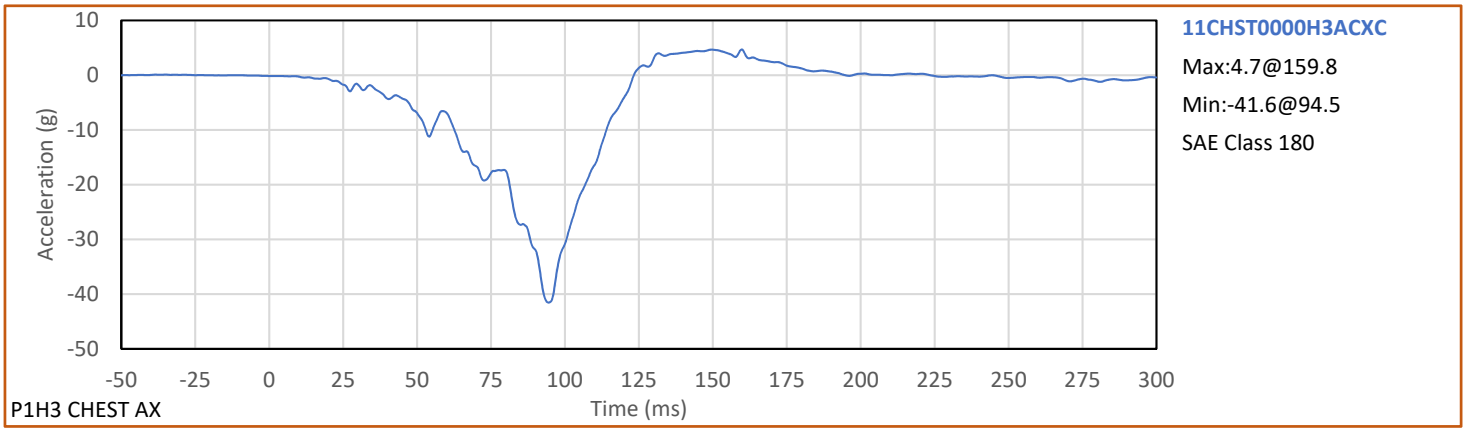


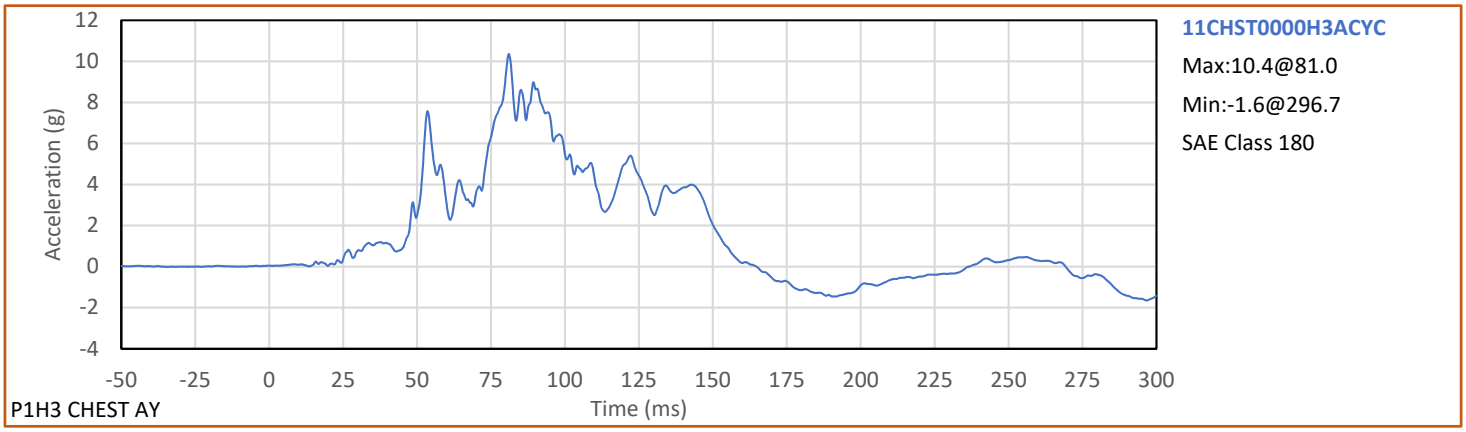


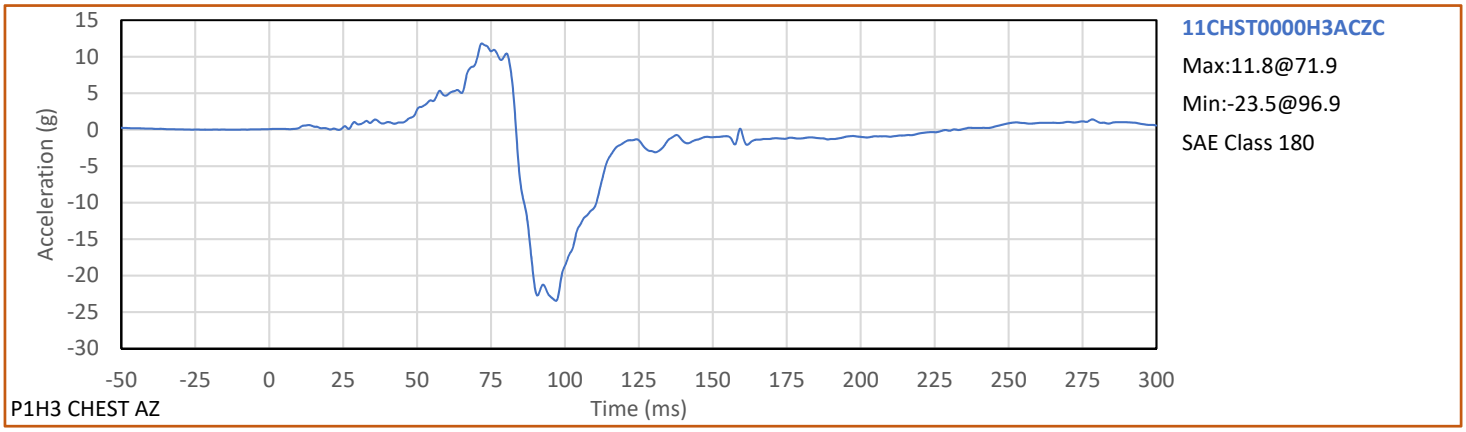


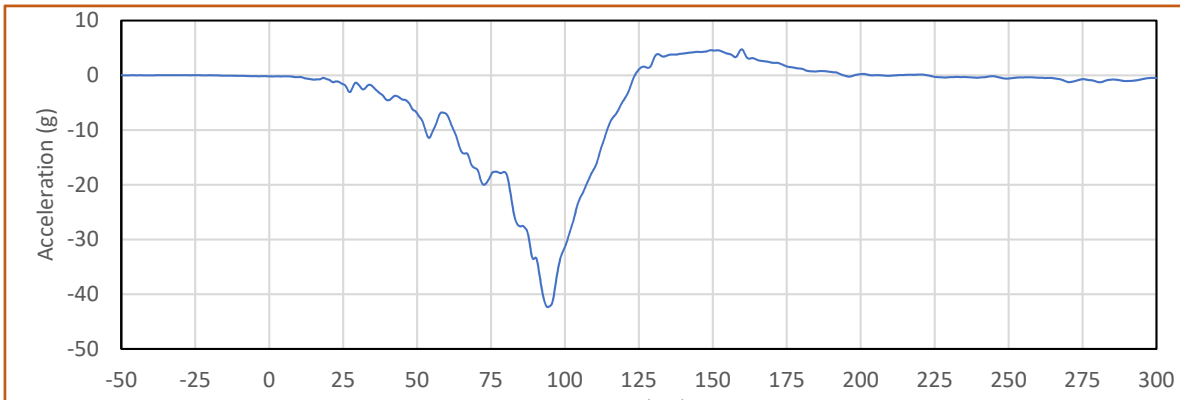



Moment (Nm)
Time (ms)
P1H3 LOWER NECK MZ
11NECKLO00H3MOZB
Max:14.1@169.8
Min:-46.5@92.2
SAE Class 600


Acceleration (g)
Time (ms)
P1H3 CHEST AX
11CHST0000H3ACXC
Max:4.7@159.8
Min:-41.6@94.5
SAE Class 180

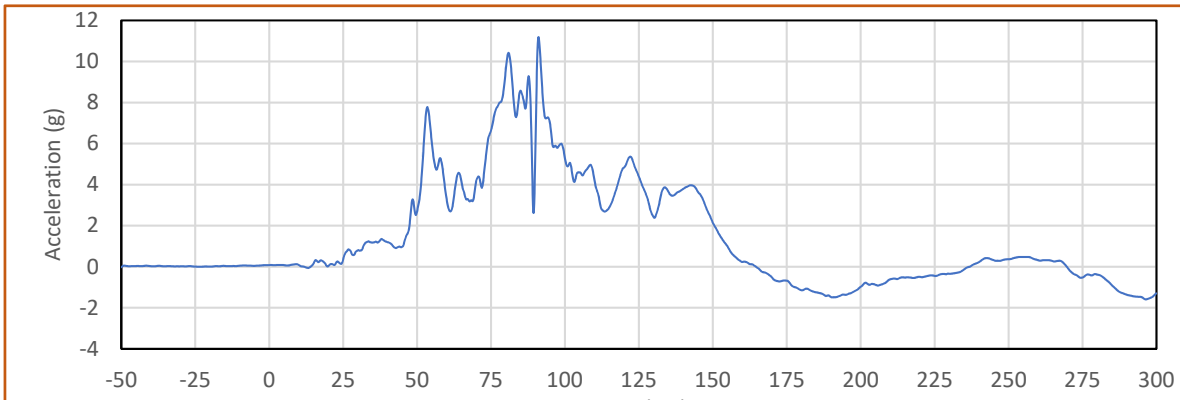

Acceleration (g)
Time (ms)
P1H3 CHEST AY
11CHST0000H3ACYC
Max:10.4@81.0
Min:-1.6@296.7
SAE Class 180


Acceleration (g)
Time (ms)
P1H3 CHEST AZ
11CHST0000H3ACZC
Max:11.8@71.9
Min:-23.5@96.9
SAE Class 180



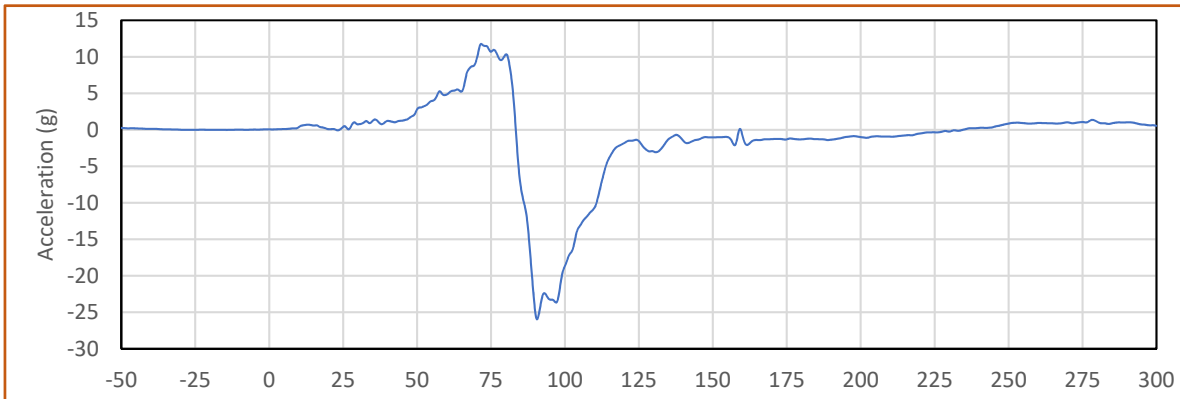
P1H3 CHEST AXR

11CHST00RDH3ACXC
Max:4.7@159.7
Min:-42.4@94.2
SAE Class 180



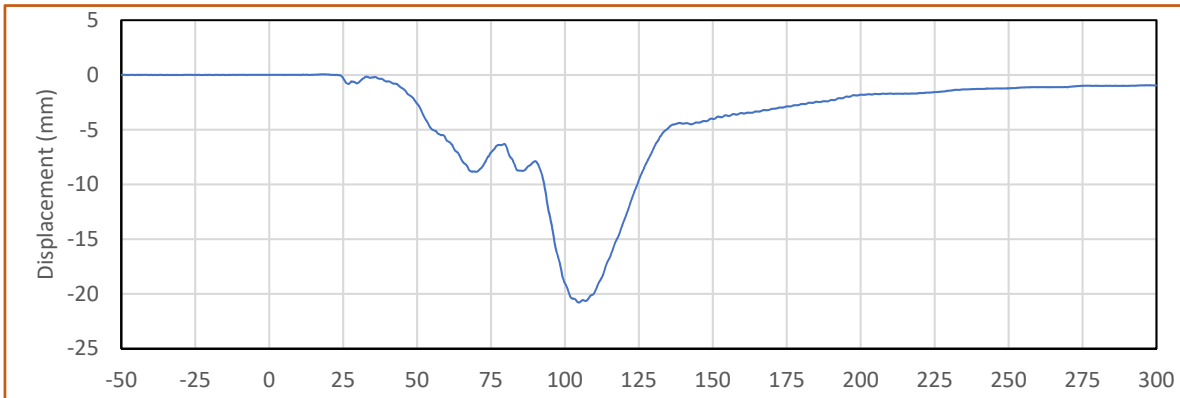
P1H3 CHEST AYR

11CHST00RDH3ACYC
Max:11.2@91.1
Min:-1.6@296.4
SAE Class 180



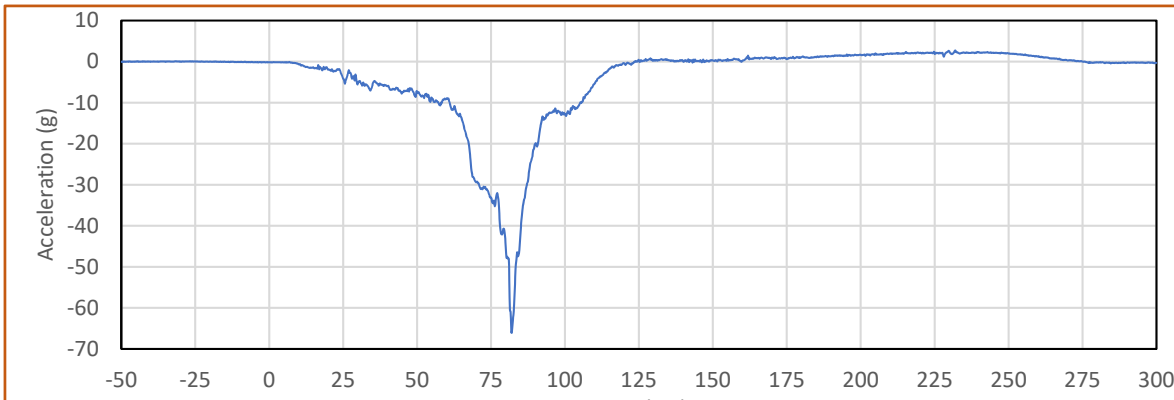
P1H3 CHEST AZR

11CHST00RDH3ACZC
Max:11.8@71.7
Min:-26.0@90.5
SAE Class 180



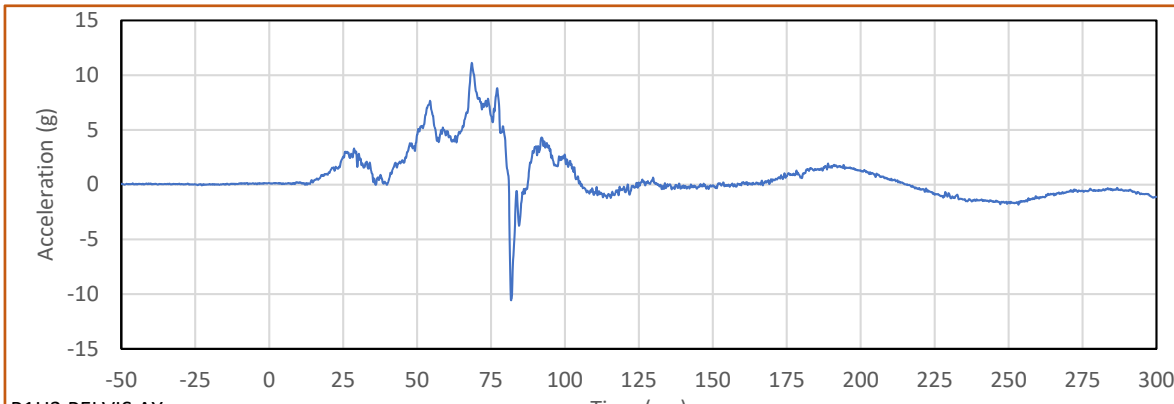
P1H3 CHEST DX

11CHST0000H3DSXB
Max:0.1@17.5
Min:-20.8@104.6
SAE Class 600



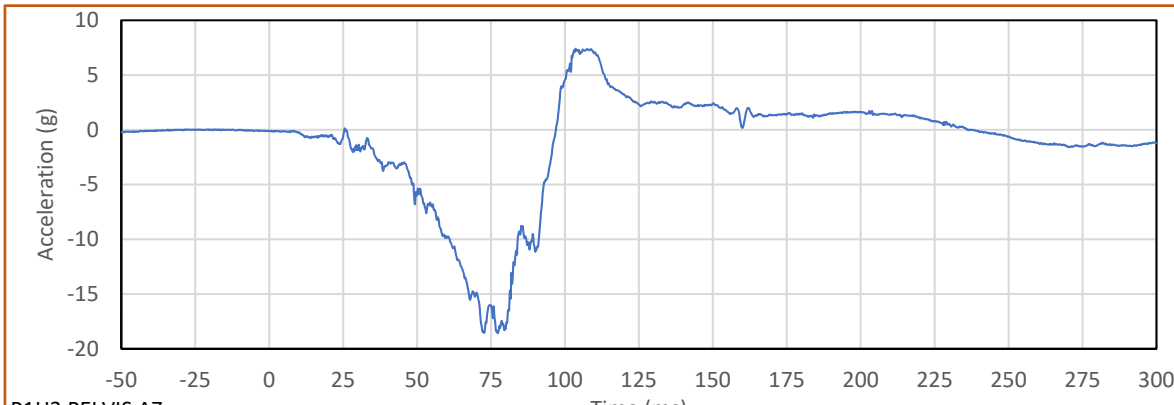
P1H3 PELVIS AX

11PELV0000H3ACXA
Max:2.7@232.0
Min:-66.1@82.0
SAE Class 1000



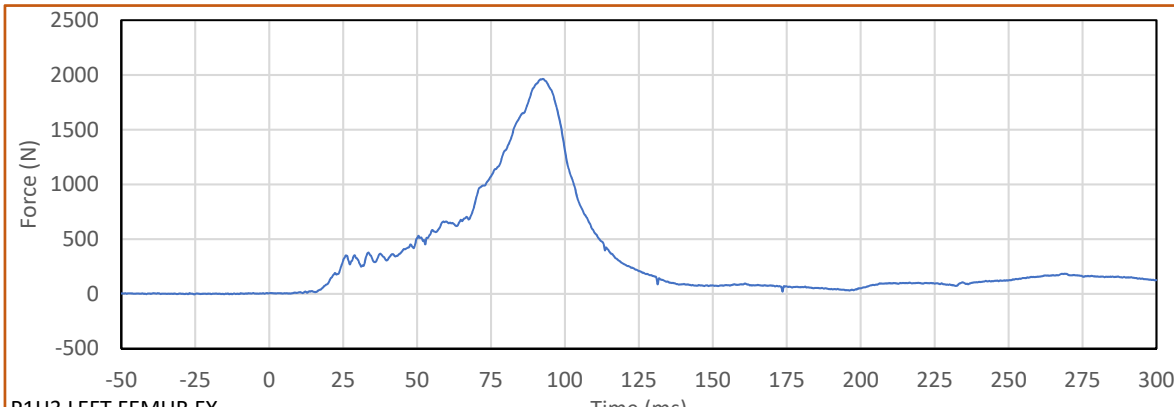
P1H3 PELVIS AY

11PELV0000H3ACYA
Max:11.1@68.5
Min:-10.6@81.8
SAE Class 1000



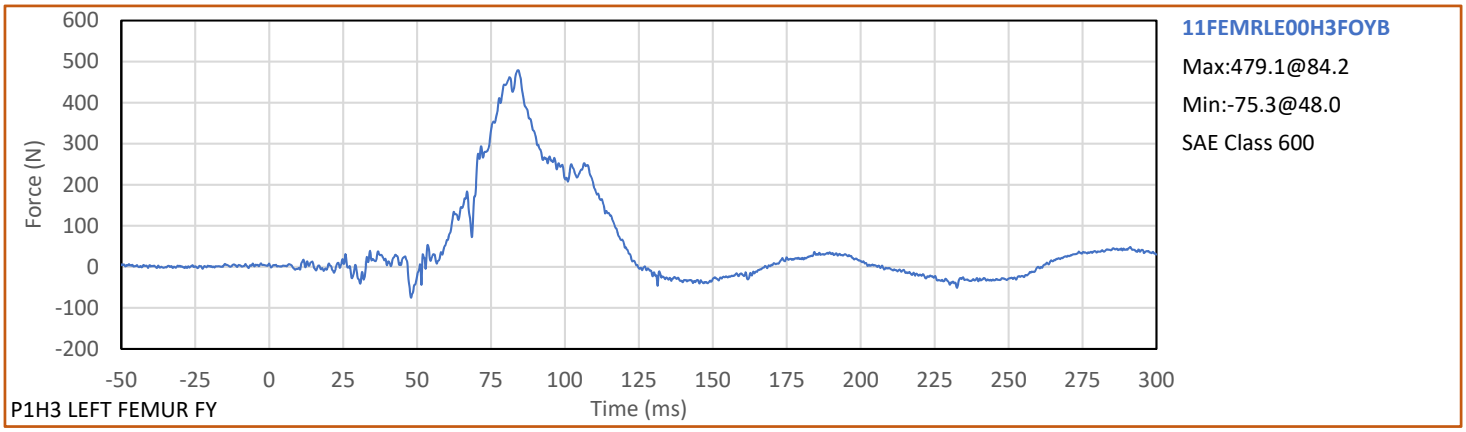
P1H3 PELVIS AZ

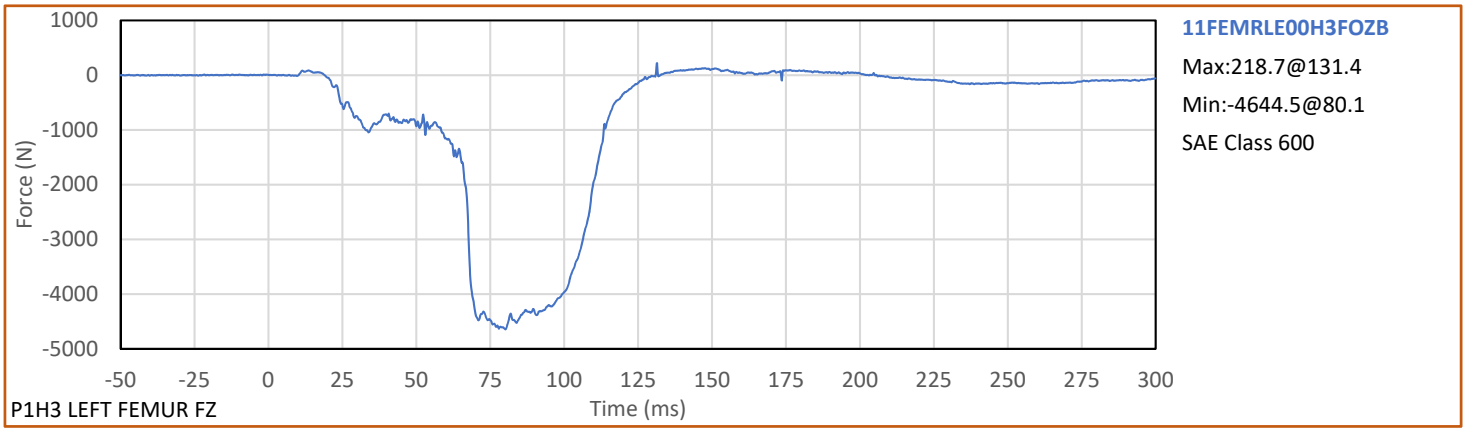
11PELV0000H3ACZA
Max:7.4@103.6
Min:-18.6@77.3
SAE Class 1000

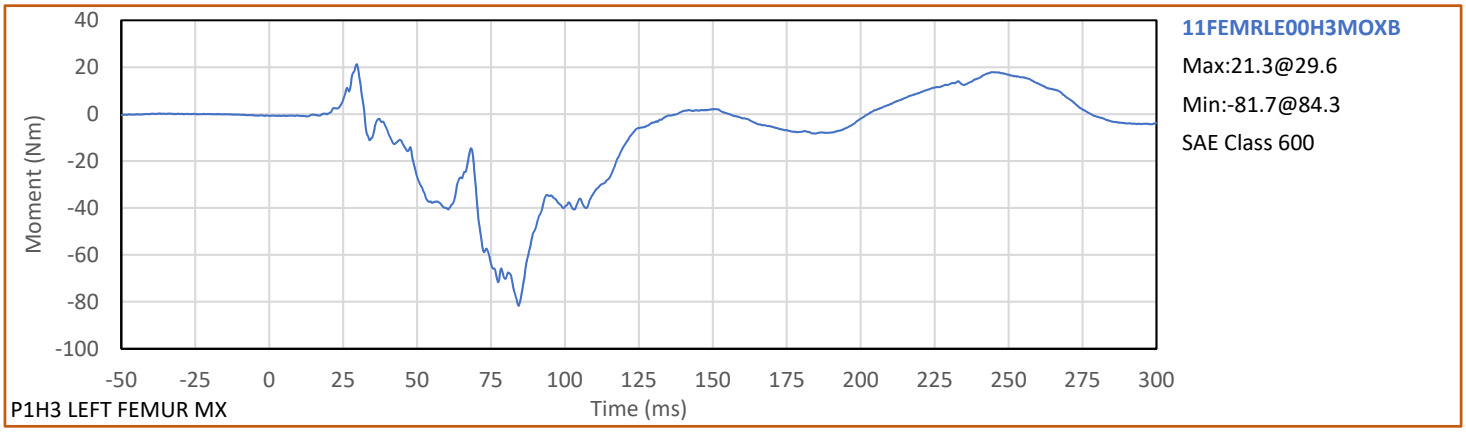


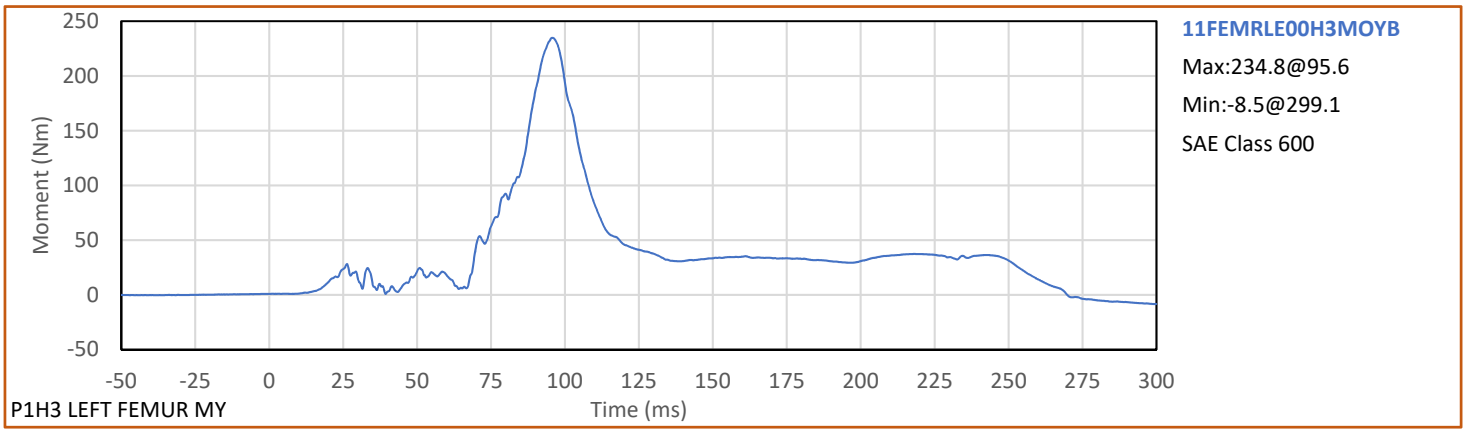
P1H3 LEFT FEMUR FX

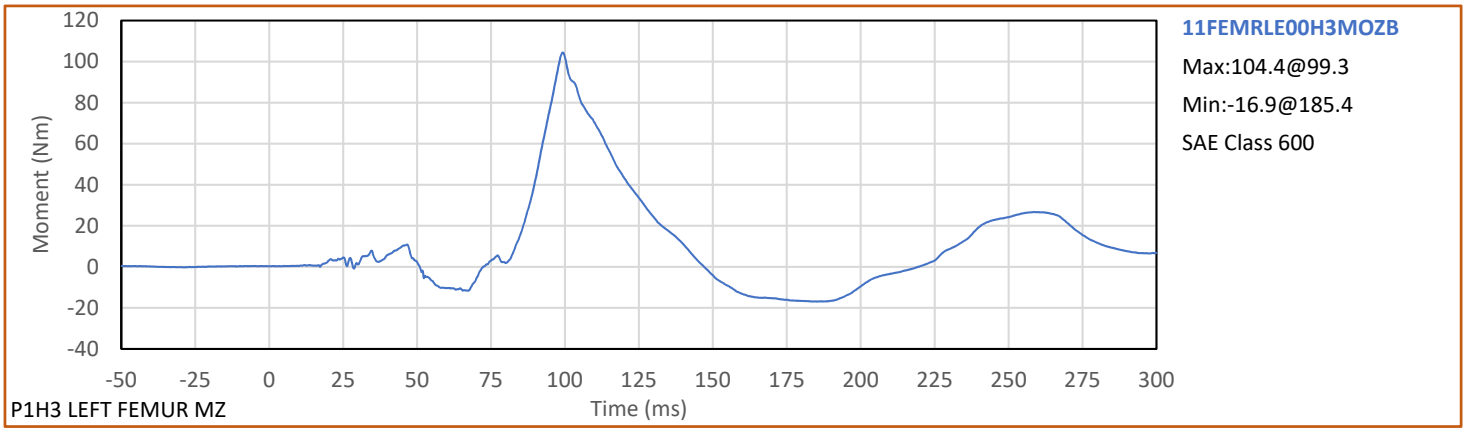
11FEMRLE00H3FOXB
Max:1962.9@92.5
Min:1.8@4.6
SAE Class 600

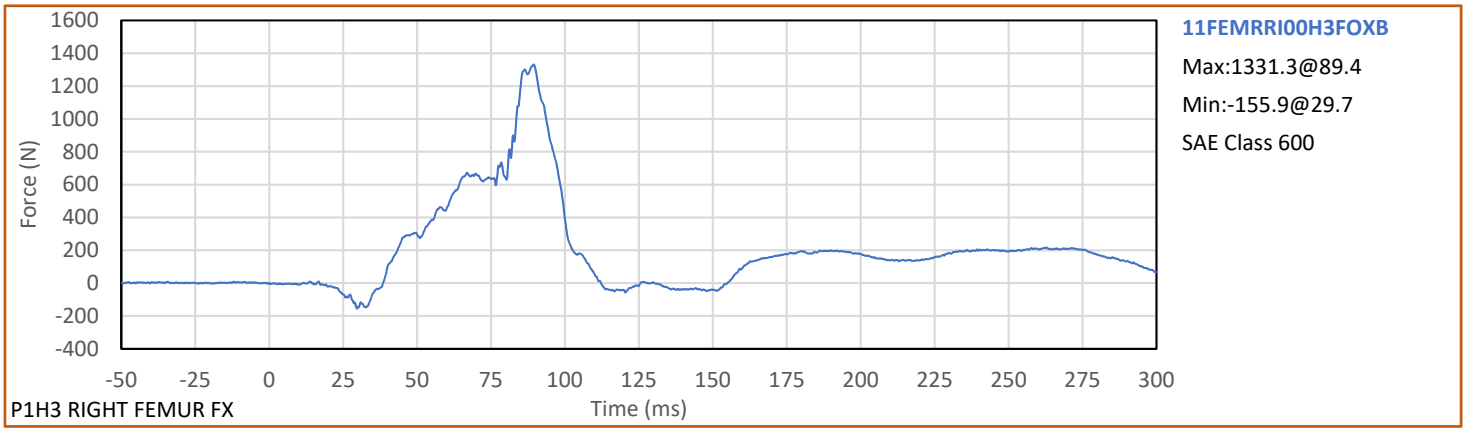

Force (N)
Time (ms)
P1H3 LEFT FEMUR FY
11FEMRLE00H3FOYB
Max:479.1@84.2
Min:-75.3@48.0
SAE Class 600

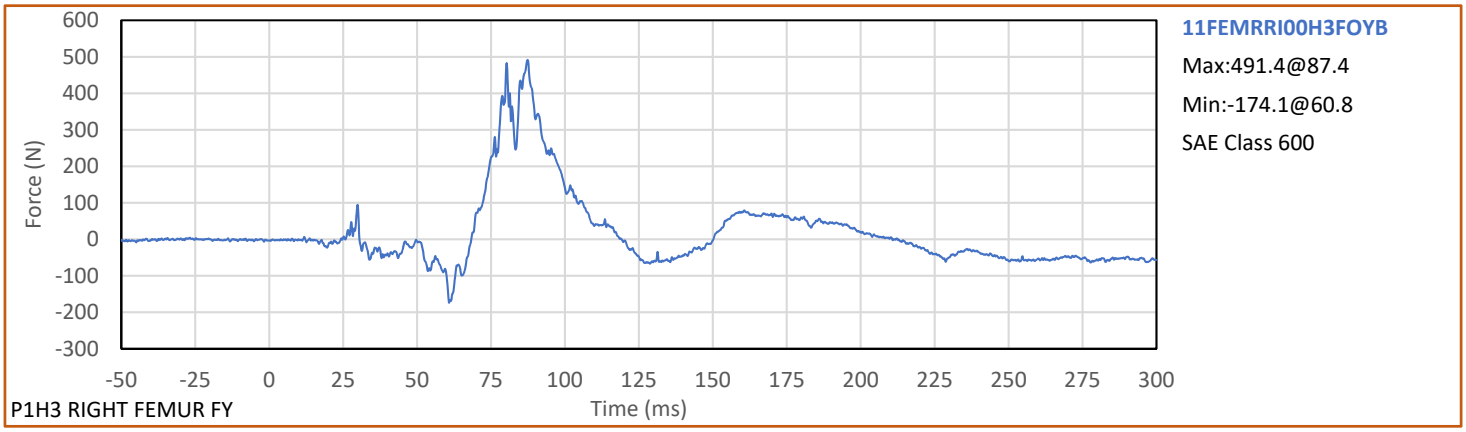

Force (N)
Time (ms)
P1H3 LEFT FEMUR FZ
11FEMRLE00H3FOZB
Max:218.7@131.4
Min:-4644.5@80.1
SAE Class 600

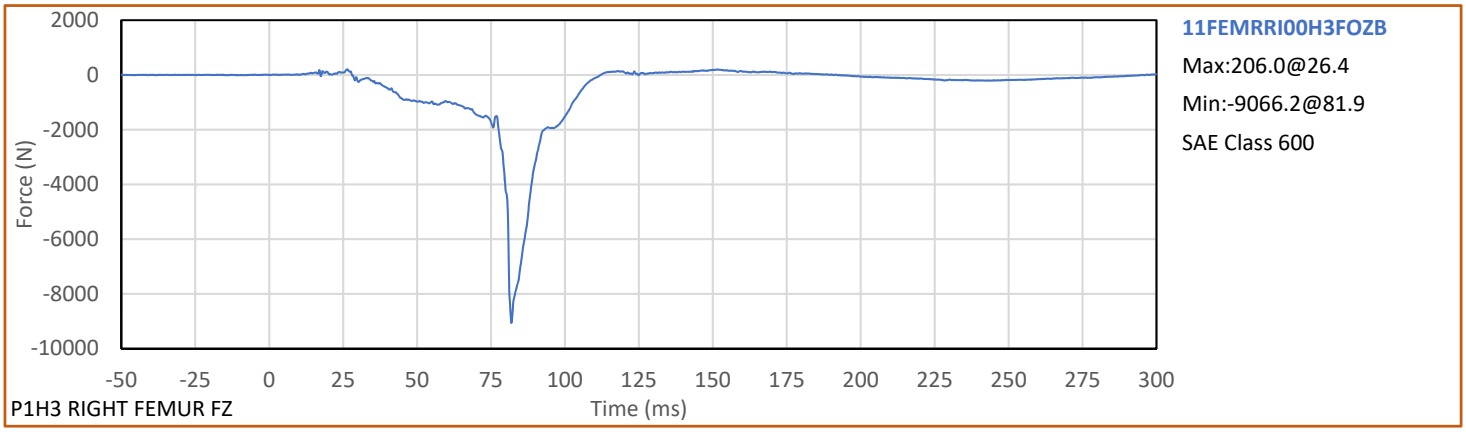

Moment (Nm)
Time (ms)
P1H3 LEFT FEMUR MX
11FEMRLE00H3MOXB
Max:21.3@29.6
Min:-81.7@84.3
SAE Class 600

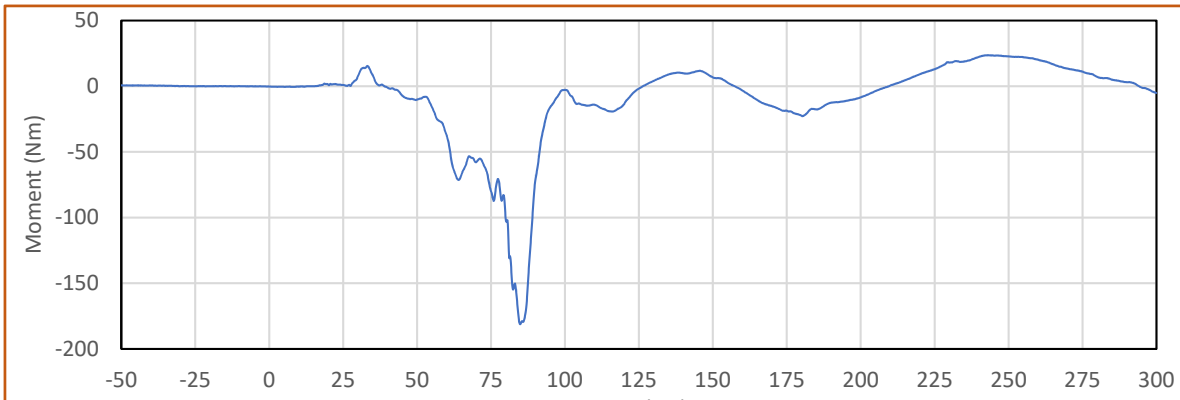

Moment (Nm)
Time (ms)
P1H3 LEFT FEMUR MY
11FEMRLE00H3MOYB
Max:234.8@95.6
Min:-8.5@299.1
SAE Class 600


Moment (Nm)
Time (ms)
P1H3 LEFT FEMUR MZ
11FEMRLE00H3MOZB
Max:104.4@99.3
Min:-16.9@185.4
SAE Class 600


Force (N)
Time (ms)
P1H3 RIGHT FEMUR FX
11FEMRRI00H3FOXB
Max:1331.3@89.4
Min:-155.9@29.7
SAE Class 600

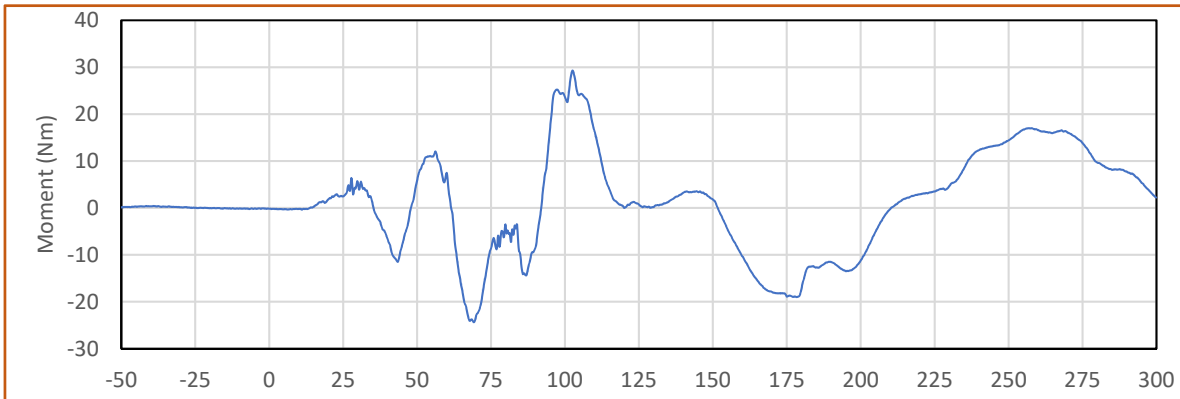

Force (N)
Time (ms)
P1H3 RIGHT FEMUR FY
11FEMRRI00H3FOYB
Max:491.4@87.4
Min:-174.1@60.8
SAE Class 600


Force (N)
Time (ms)
P1H3 RIGHT FEMUR FZ
11FEMRRI00H3FOZB
Max:206.0@26.4
Min:-9066.2@81.9
SAE Class 600

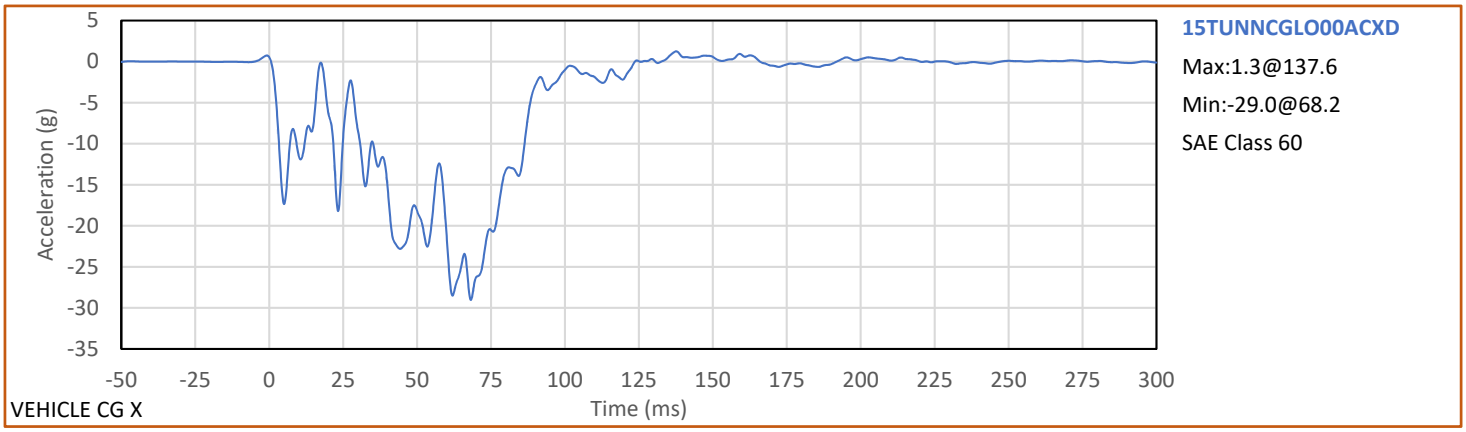


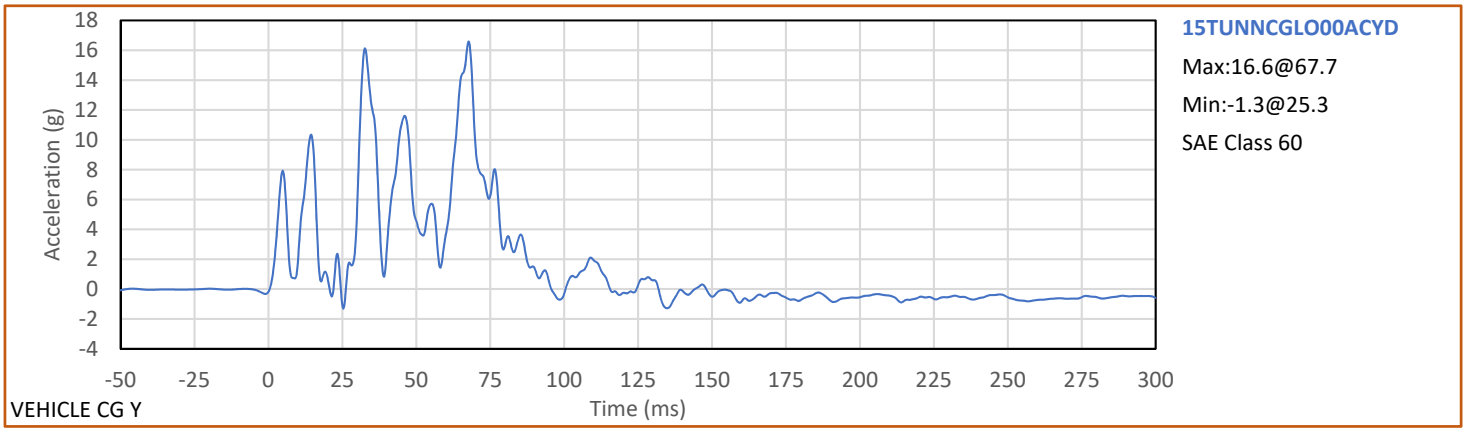
11FEMRRI00H3MOXB
Max:23.6@243.1
Min:-181.2@84.8
SAE Class 600

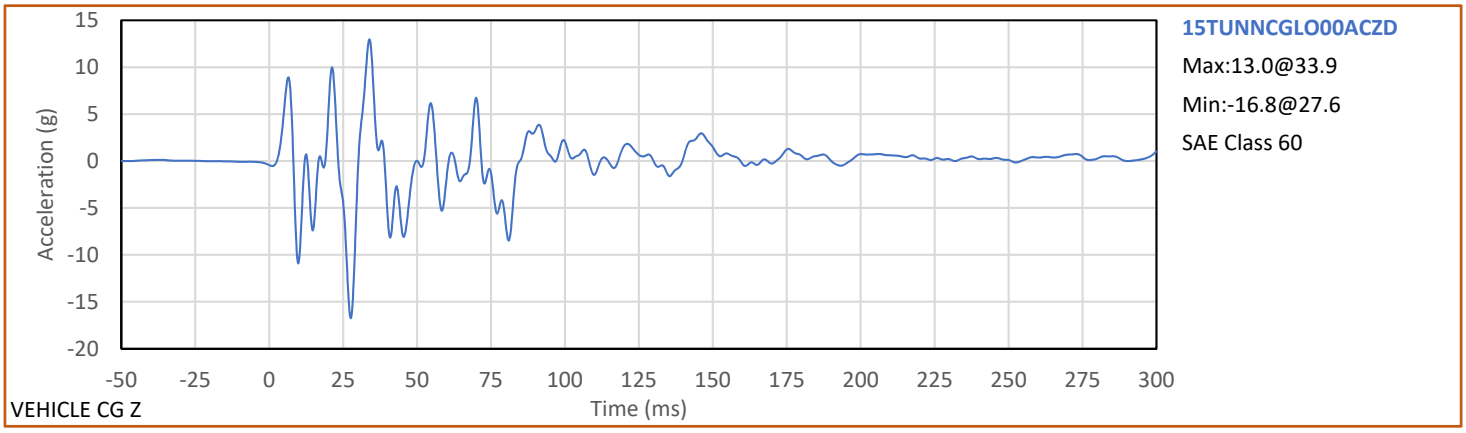
11FEMRRI00H3MOYB
Max:133.0@92.9
Min:-36.0@81.8
SAE Class 600

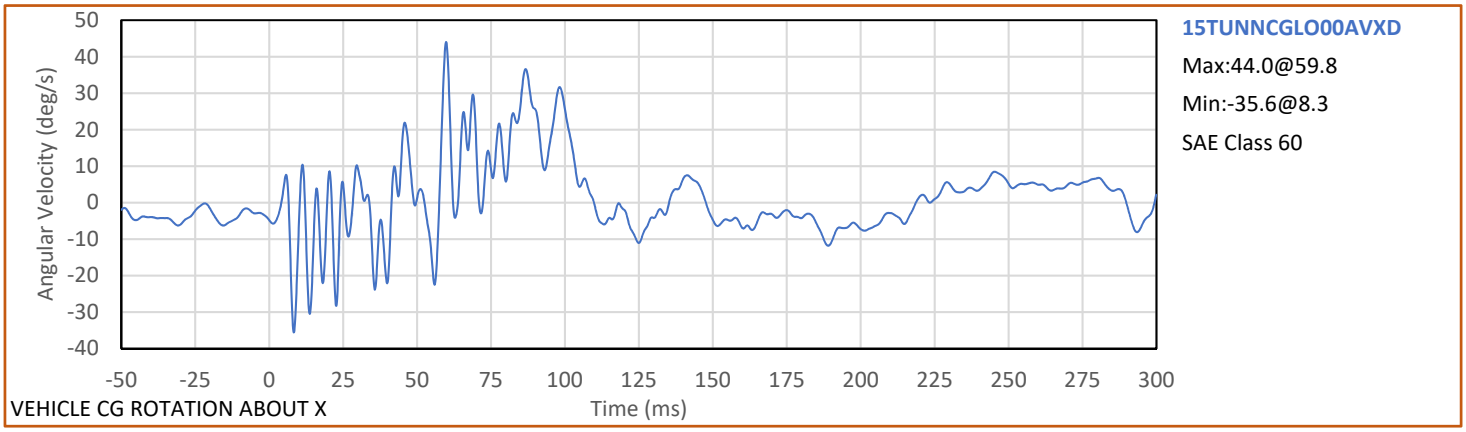


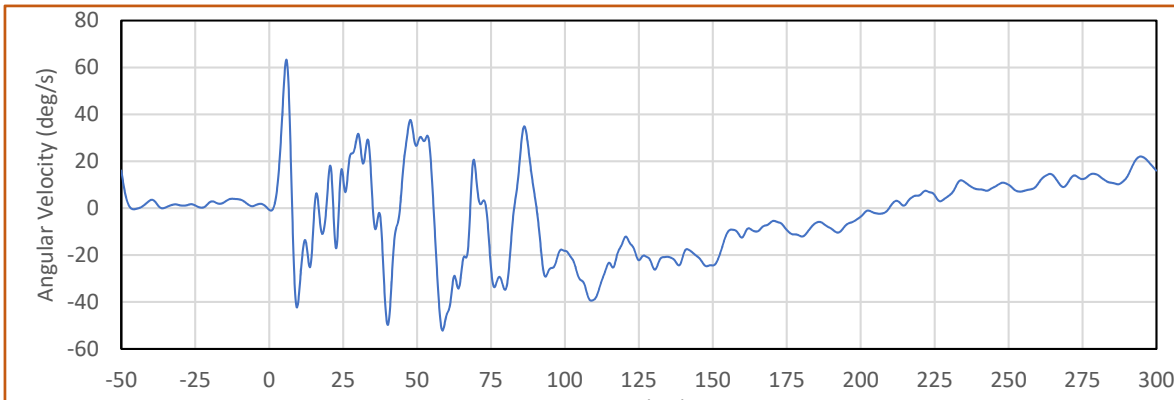
11FEMRRI00H3MOZB
Max:29.3@102.6
Min:-24.4@69.2
SAE Class 600


Acceleration (g)
Time (ms)
VEHICLE CG X
15TUNNCGLO00ACXD
Max:1.3@137.6
Min:-29.0@68.2
SAE Class 60


Acceleration (g)
Time (ms)
VEHICLE CG Y
15TUNNCGLO00ACYD
Max:16.6@67.7
Min:-1.3@25.3
SAE Class 60

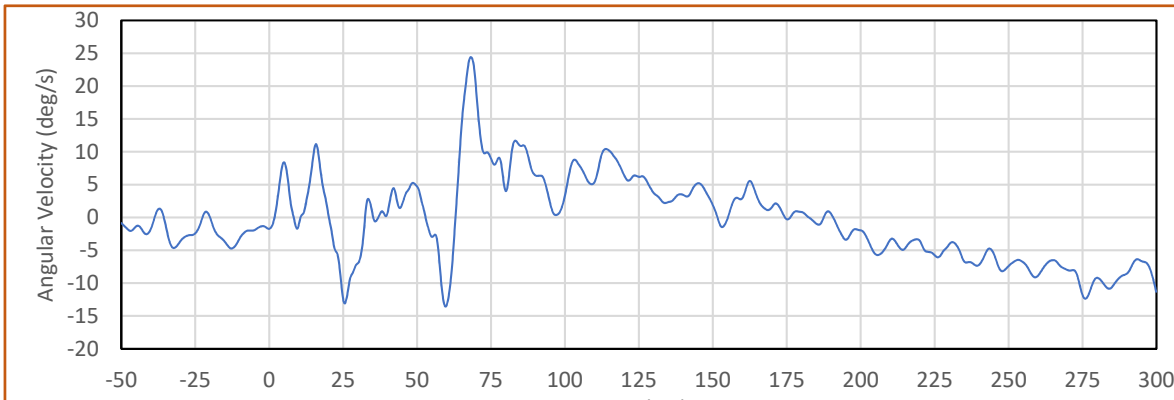

Acceleration (g)
Time (ms)
VEHICLE CG Z
15TUNNCGLO00ACZD
Max:13.0@33.9
Min:-16.8@27.6
SAE Class 60


Angular Velocity (deg/s)
Time (ms)
VEHICLE CG ROTATION ABOUT X
15TUNNCGLO00AVXD
Max:44.0@59.8
Min:-35.6@8.3
SAE Class 60



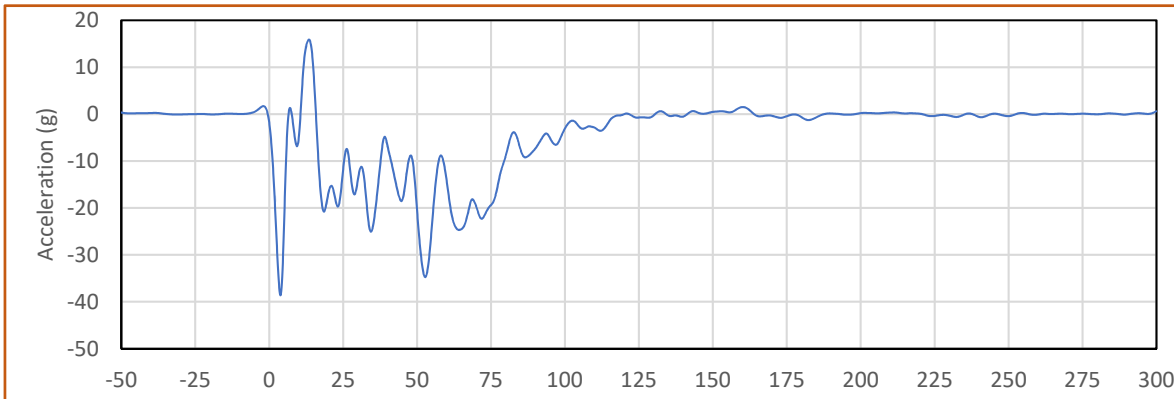
15TUNNCGLO00AVYD
Max:63.3@5.8
Min:-52.2@58.6
SAE Class 60

VEHICLE CG ROTATION ABOUT Y



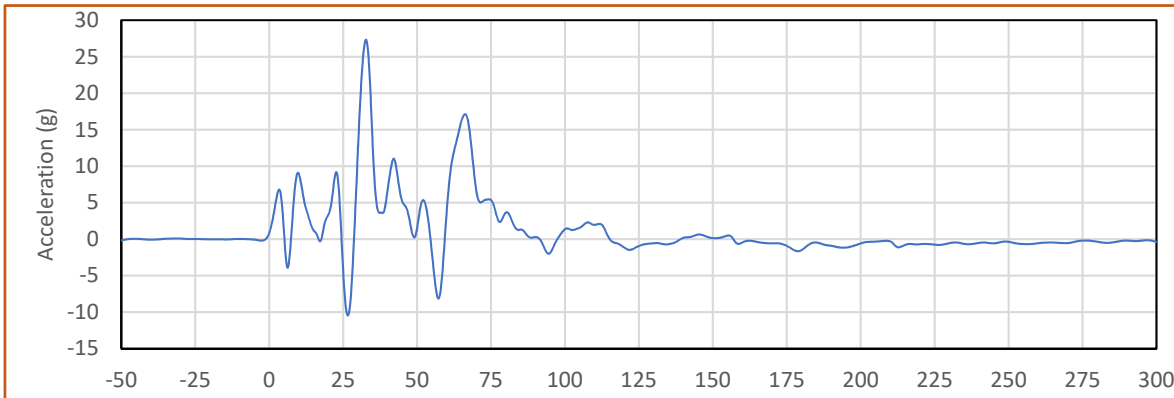
15TUNNCGLO00AVZD
Max:24.4@68.2
Min:-13.6@59.6
SAE Class 60

VEHICLE CG ROTATION ABOUT Z



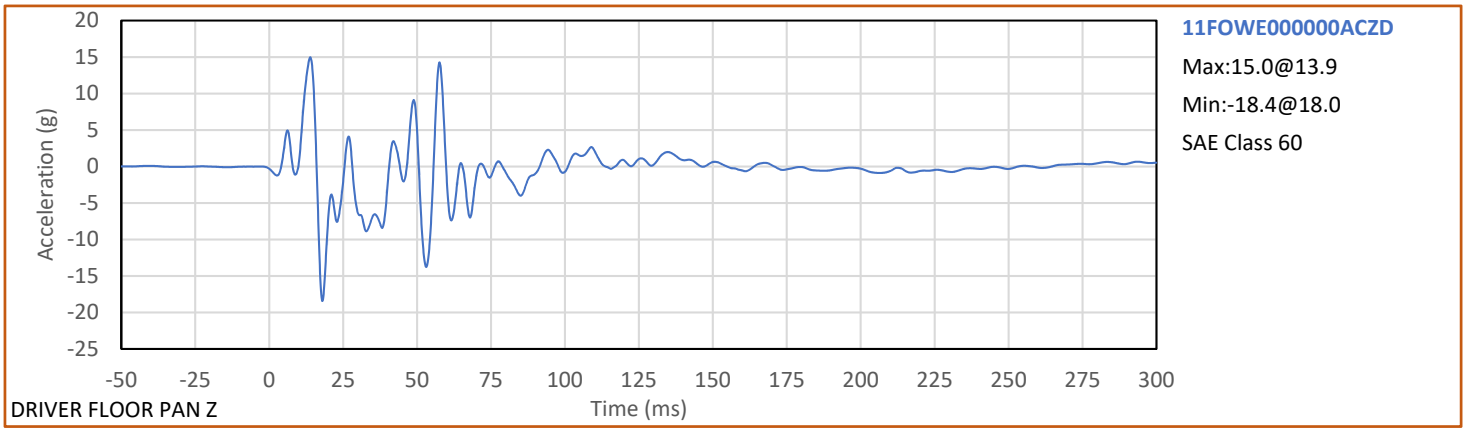
11FOWE000000ACXD
Max:15.9@13.5
Min:-38.6@3.8
SAE Class 60

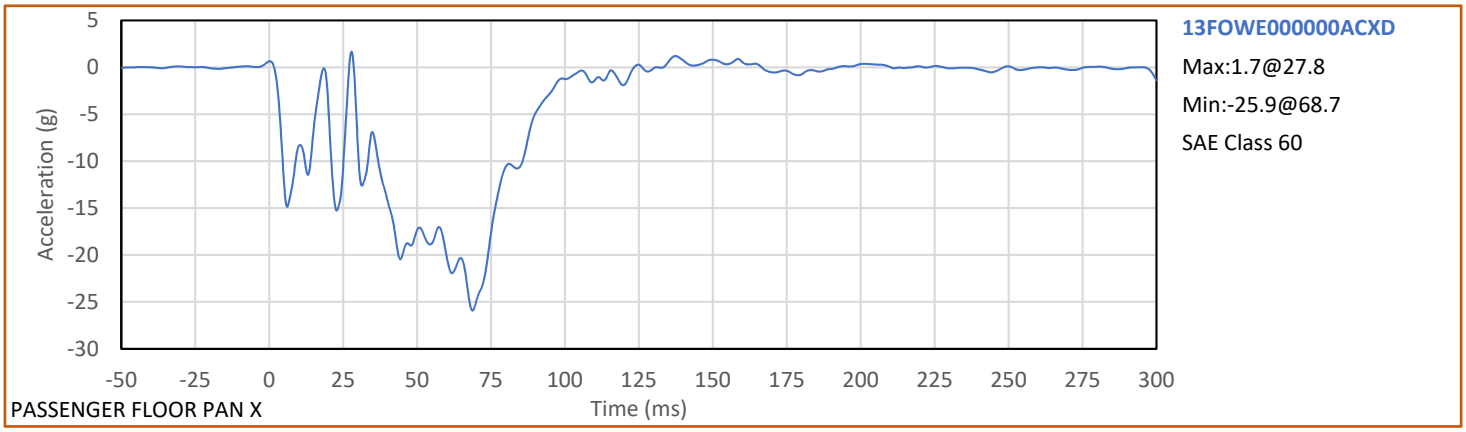
DRIVER FLOOR PAN X

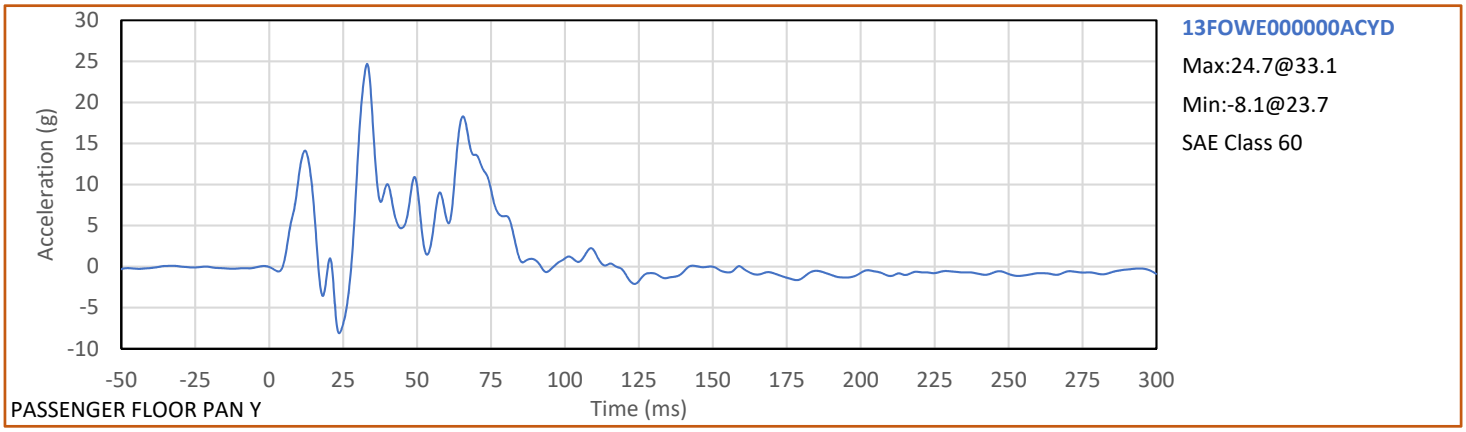


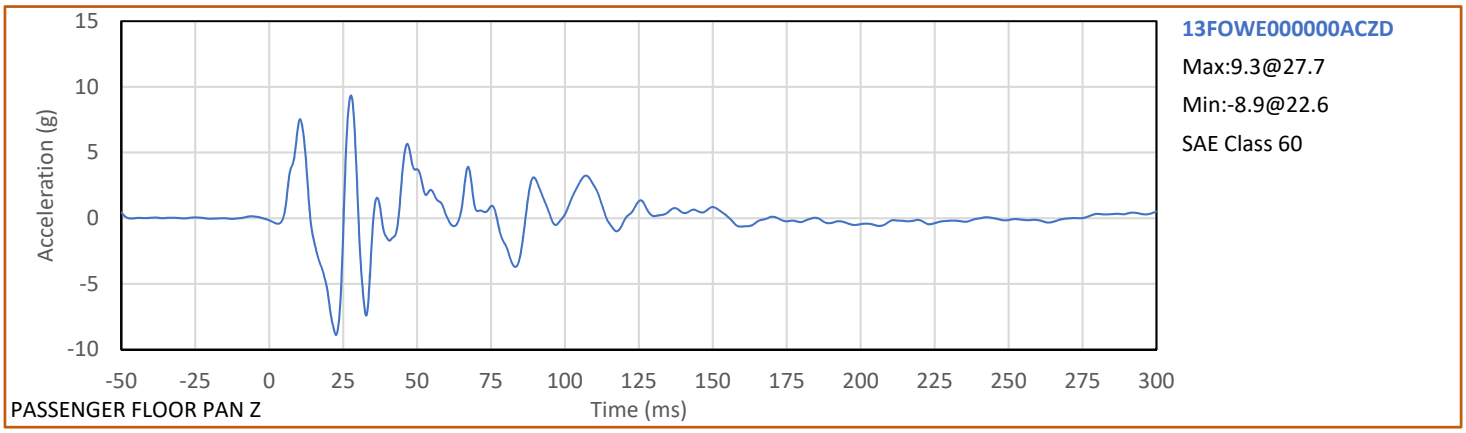
11FOWE000000ACYD
Max:27.3@32.7
Min:-10.5@26.6
SAE Class 60

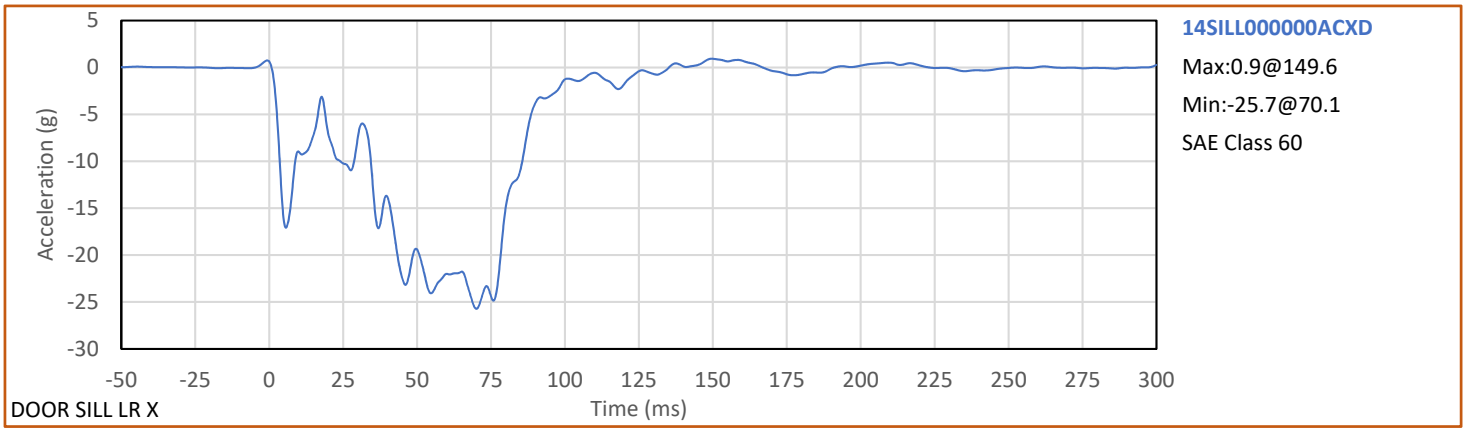
DRIVER FLOOR PAN Y

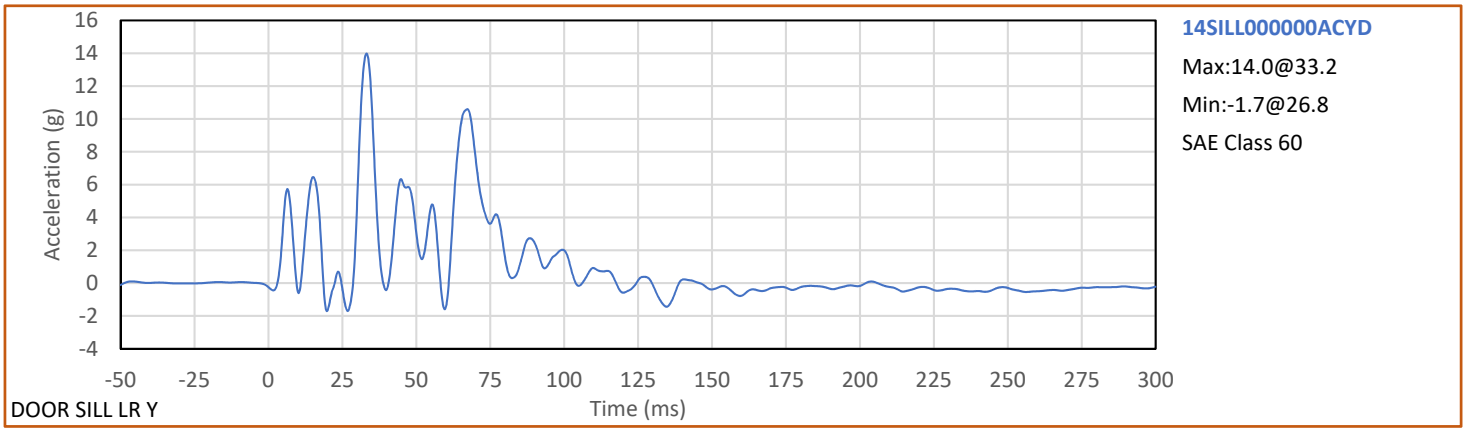

11FOWE000000ACZD
Max:15.0@13.9
Min:-18.4@18.0
SAE Class 60
Acceleration (g)
Time (ms)
DRIVER FLOOR PAN Z

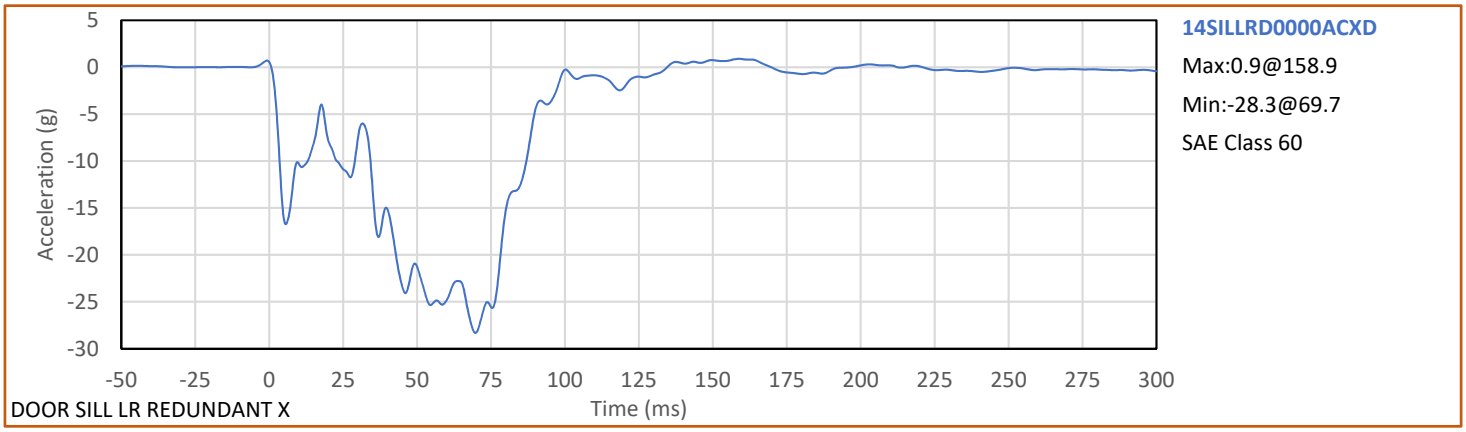

13FOWE000000ACXD
Max:1.7@27.8
Min:-25.9@68.7
SAE Class 60
Acceleration (g)
Time (ms)
PASSENGER FLOOR PAN X

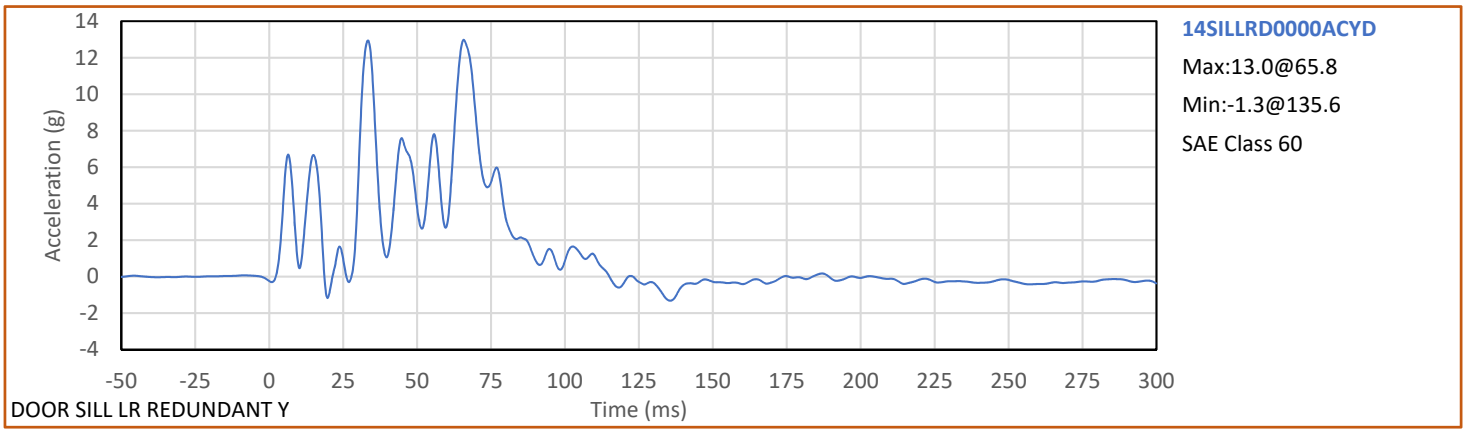

13FOWE000000ACYD
Max:24.7@33.1
Min:-8.1@23.7
SAE Class 60
Acceleration (g)
Time (ms)
PASSENGER FLOOR PAN Y

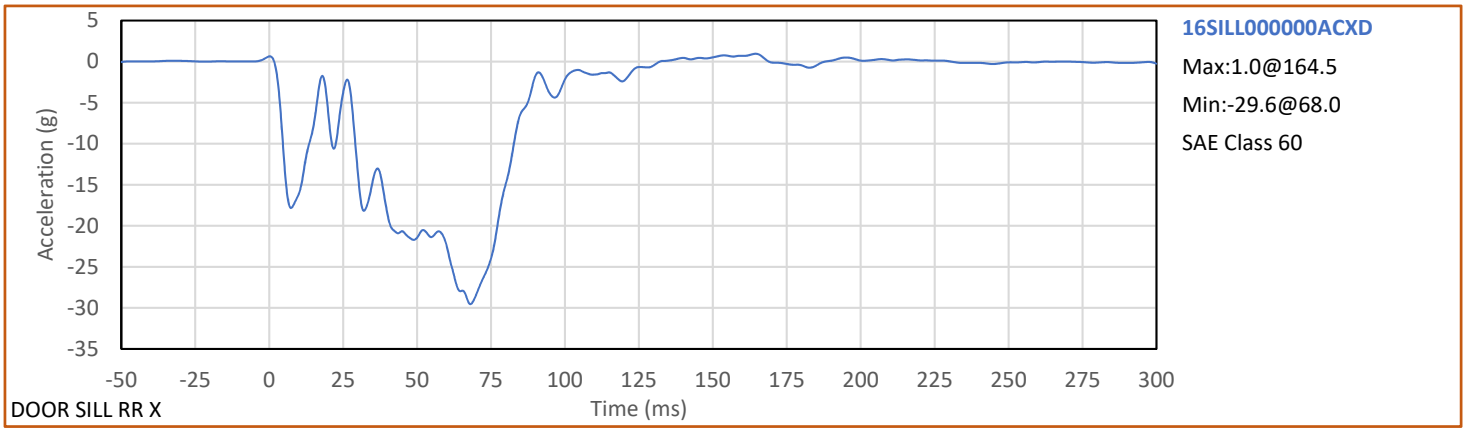

13FOWE000000ACZD
Max:9.3@27.7
Min:-8.9@22.6
SAE Class 60
Acceleration (g)
Time (ms)
PASSENGER FLOOR PAN Z

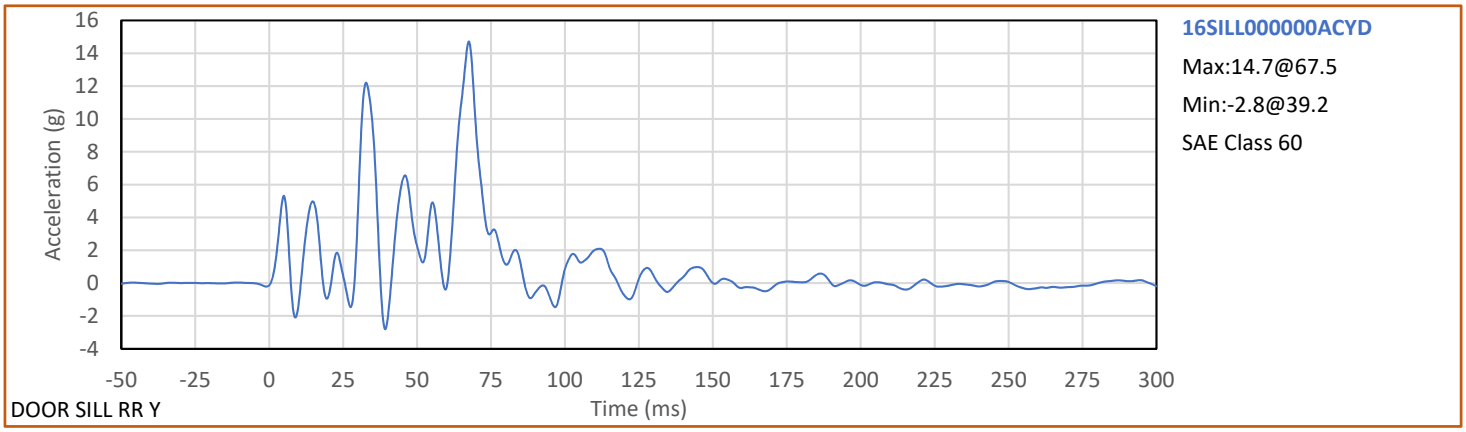

14SILL000000ACXD
Max:0.9@149.6
Min:-25.7@70.1
SAE Class 60
Acceleration (g)
Time (ms)
DOOR SILL LR X

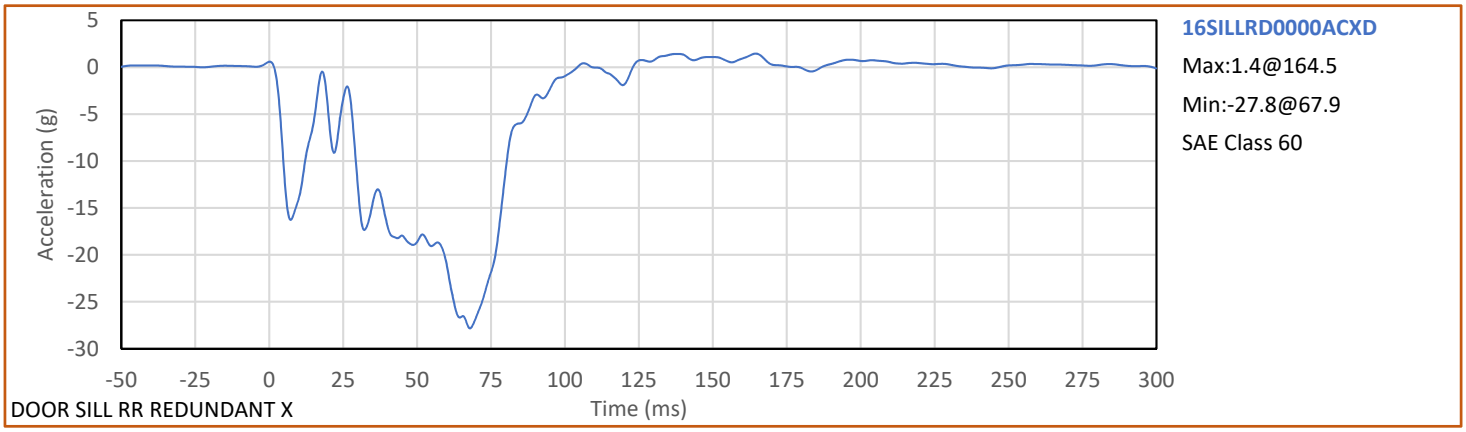

14SILL000000ACYD
Max:14.0@33.2
Min:-1.7@26.8
SAE Class 60
Acceleration (g)
Time (ms)
DOOR SILL LR Y

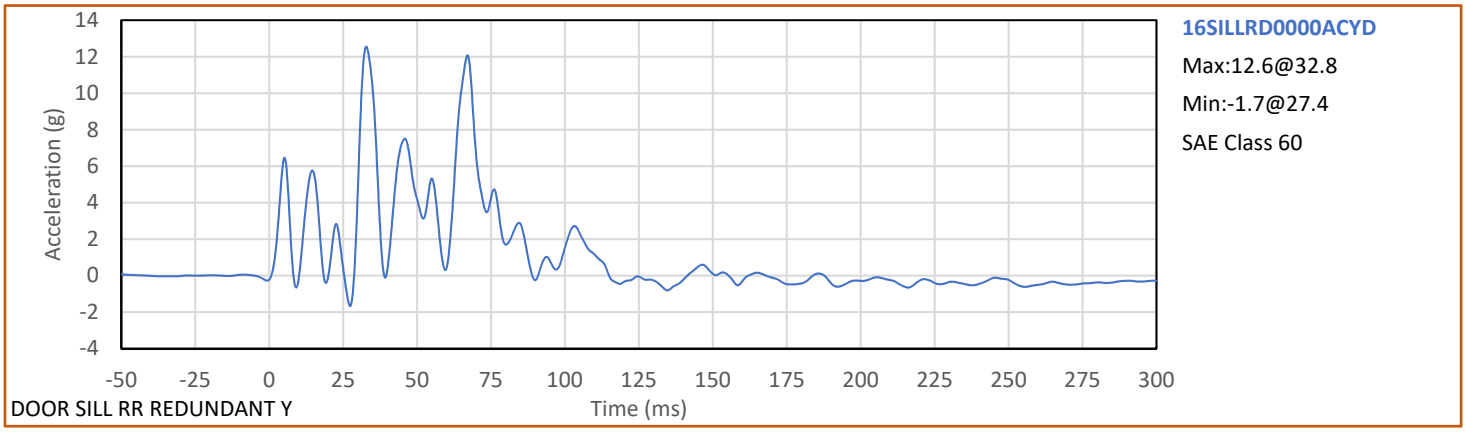

14SILLRD0000ACXD
Max:0.9@158.9
Min:-28.3@69.7
SAE Class 60
Acceleration (g)
Time (ms)
DOOR SILL LR REDUNDANT X

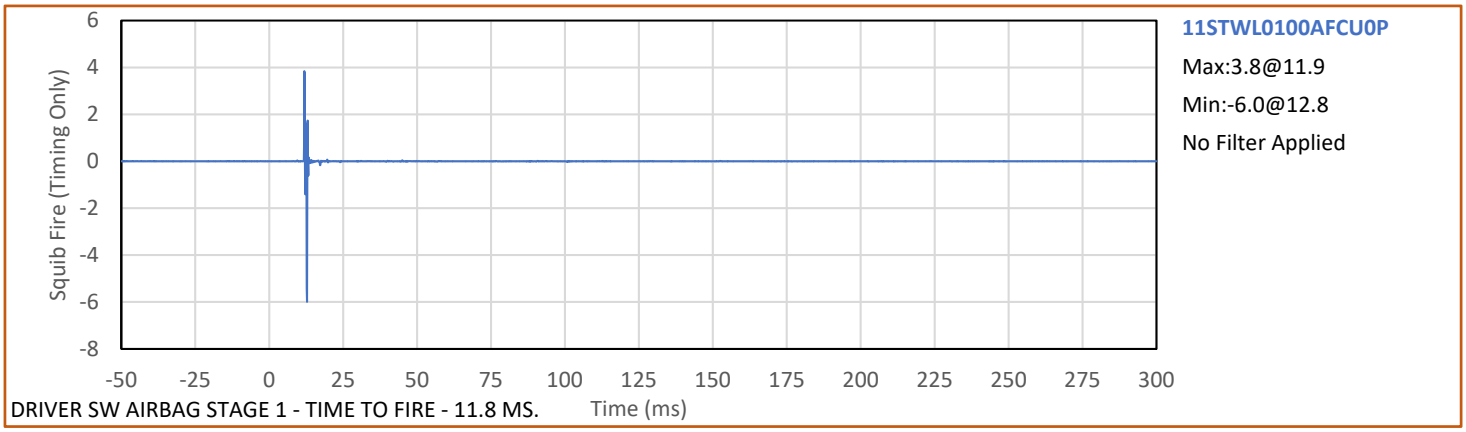

14SILLRD0000ACYD
Max:13.0@65.8
Min:-1.3@135.6
SAE Class 60
Acceleration (g)
Time (ms)
DOOR SILL LR REDUNDANT Y


Acceleration (g)
Time (ms)
16SILL000000ACXD
Max:1.0@164.5
Min:-29.6@68.0
SAE Class 60
DOOR SILL RR X

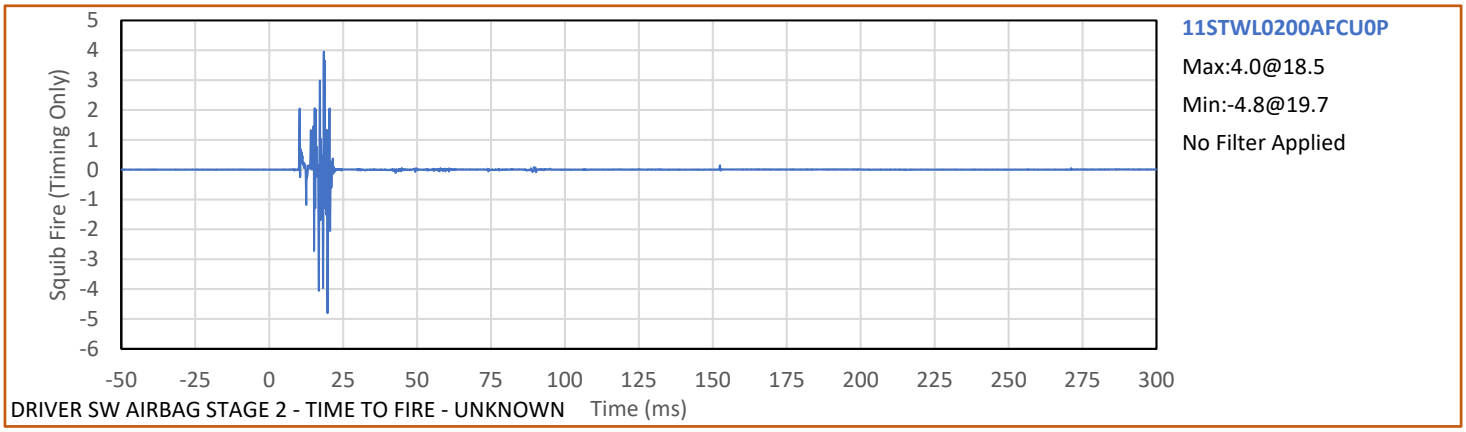

Acceleration (g)
Time (ms)
16SILL000000ACYD
Max:14.7@67.5
Min:-2.8@39.2
SAE Class 60
DOOR SILL RR Y


Acceleration (g)
Time (ms)
16SILLRD0000ACXD
Max:1.4@164.5
Min:-27.8@67.9
SAE Class 60
DOOR SILL RR REDUNDANT X

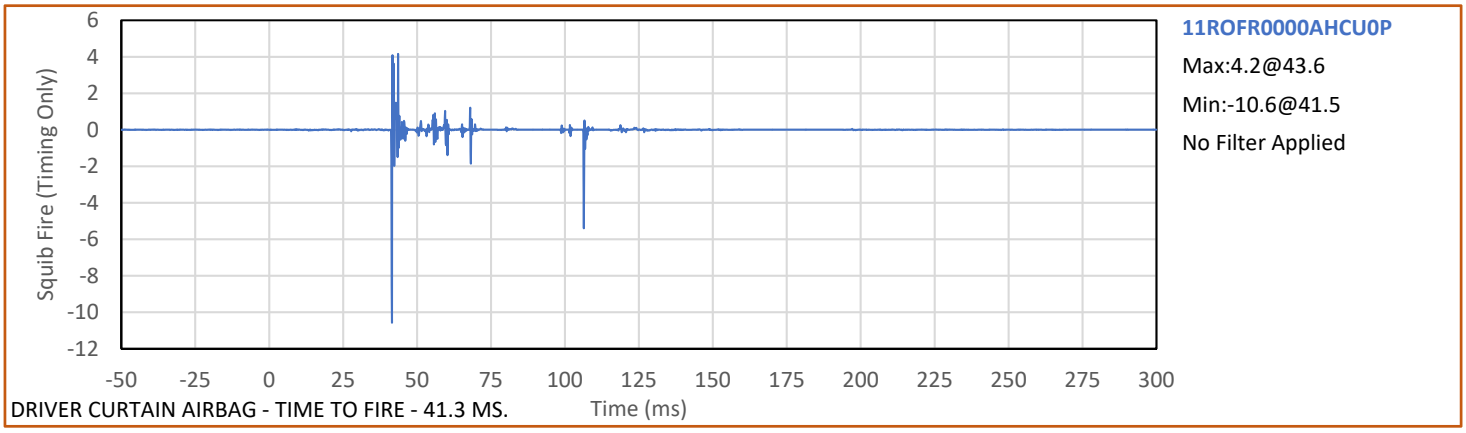

Acceleration (g)
Time (ms)
16SILLRD0000ACYD
Max:12.6@32.8
Min:-1.7@27.4
SAE Class 60
DOOR SILL RR REDUNDANT Y



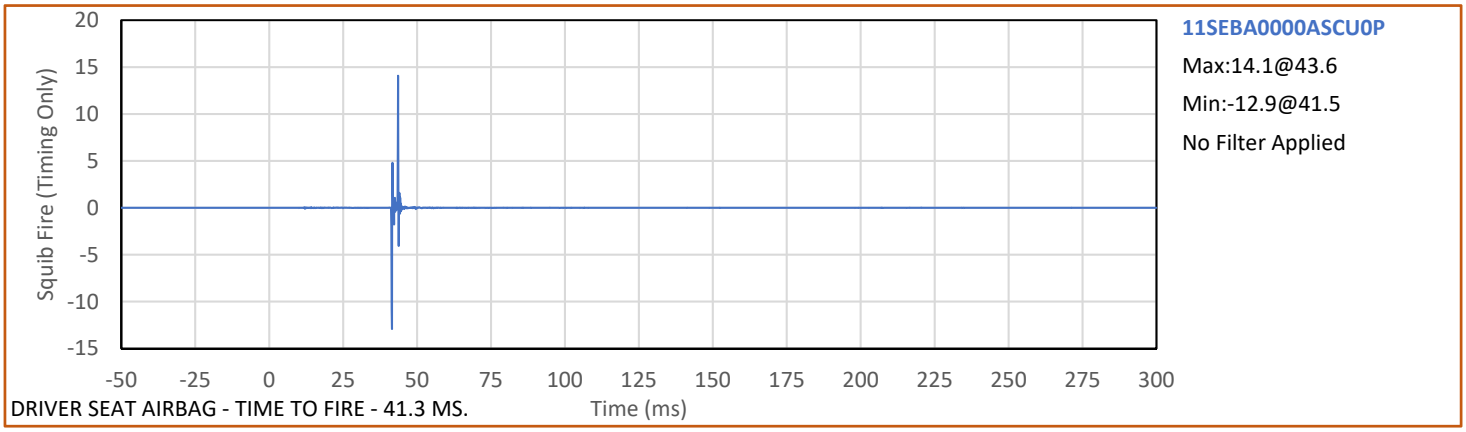
DRIVER SW AIRBAG STAGE 1 - TIME TO FIRE - 11.8 MS.



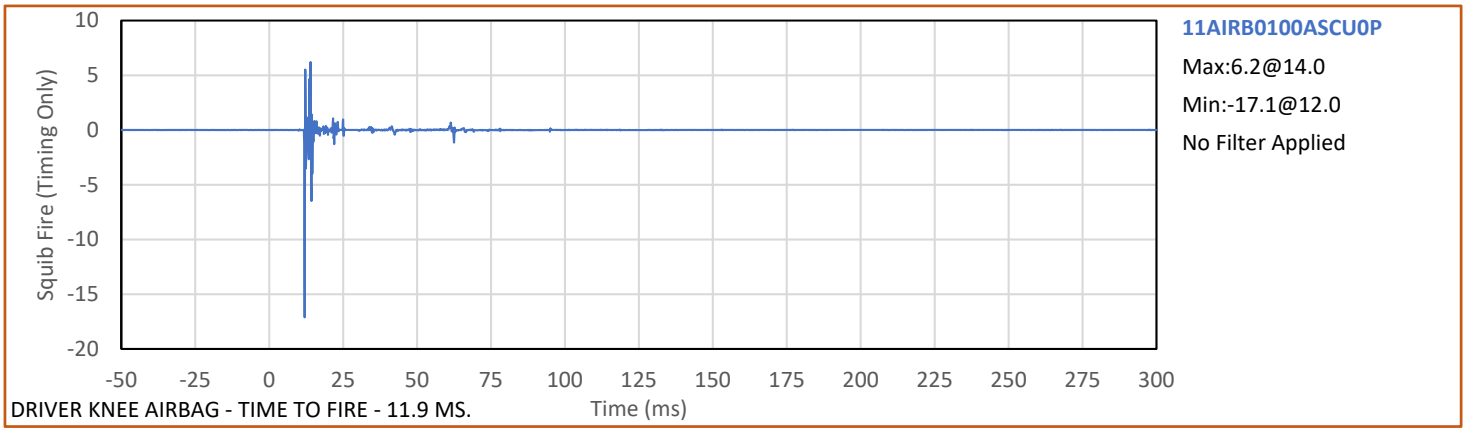
DRIVER SW AIRBAG STAGE 2 - TIME TO FIRE - UNKNOWN



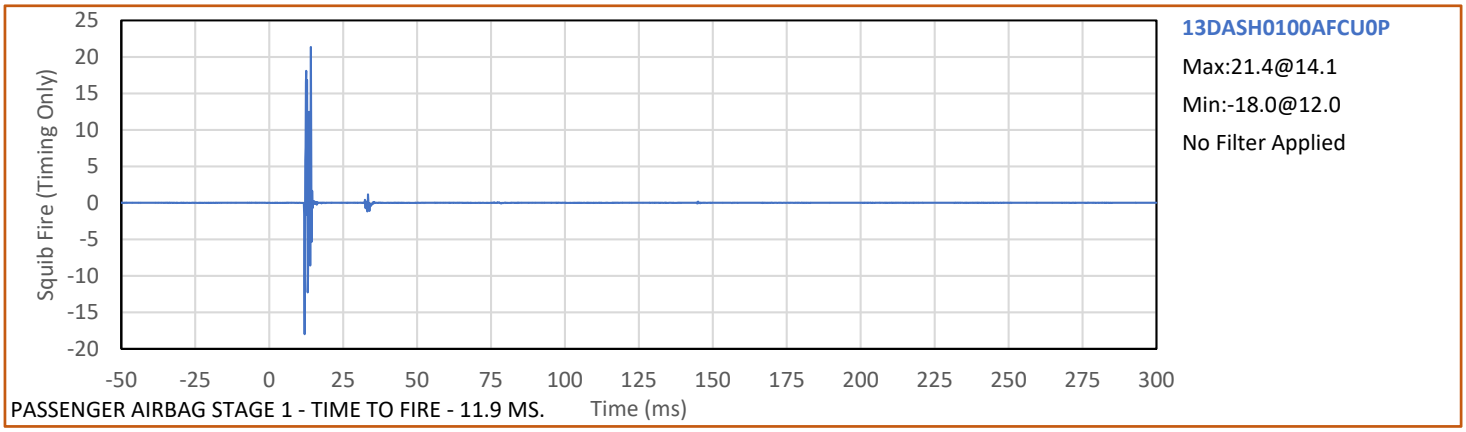
DRIVER CURTAIN AIRBAG - TIME TO FIRE - 41.3 MS.



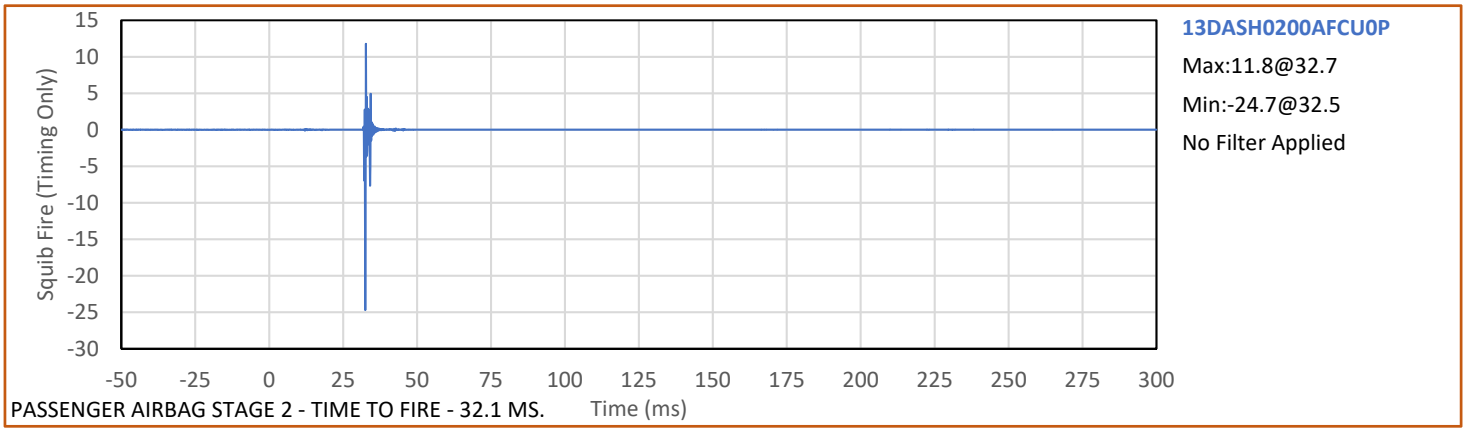
DRIVER SEAT AIRBAG - TIME TO FIRE - 41.3 MS.



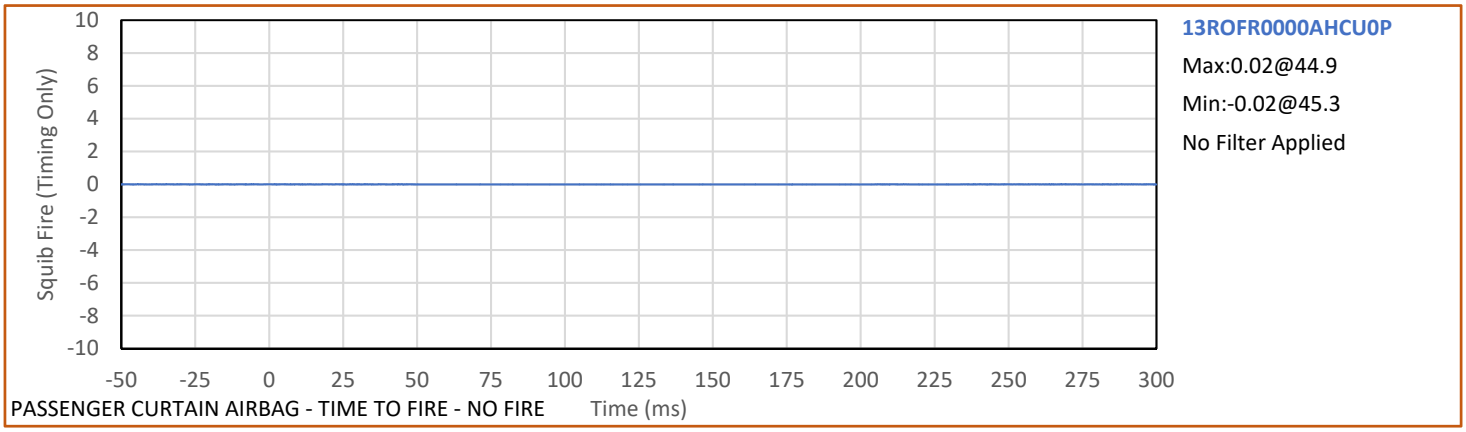
DRIVER KNEE AIRBAG - TIME TO FIRE - 11.9 MS.



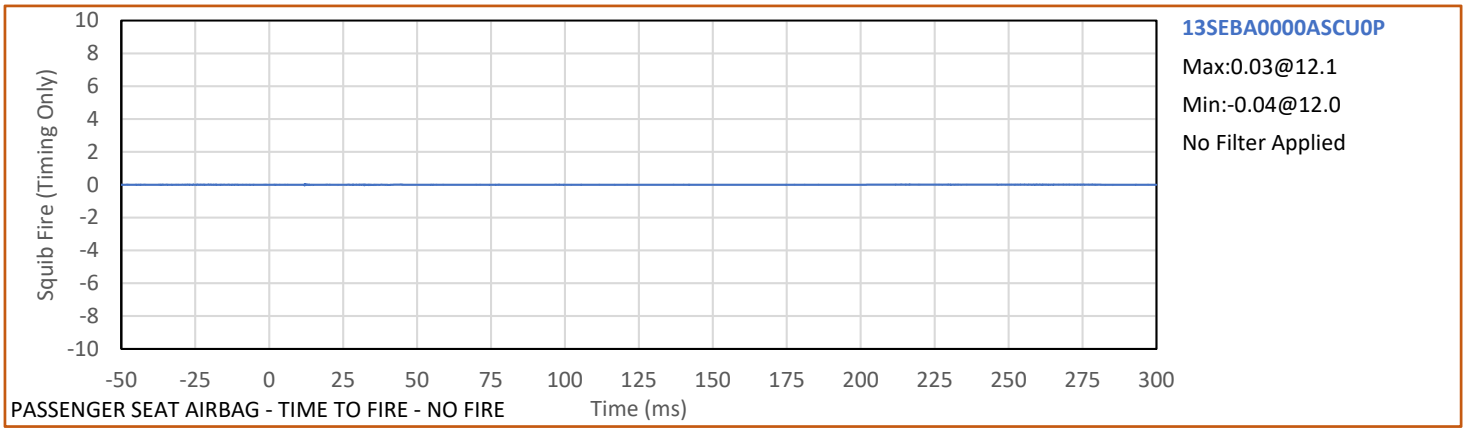
PASSENGER AIRBAG STAGE 1 - TIME TO FIRE - 11.9 MS.



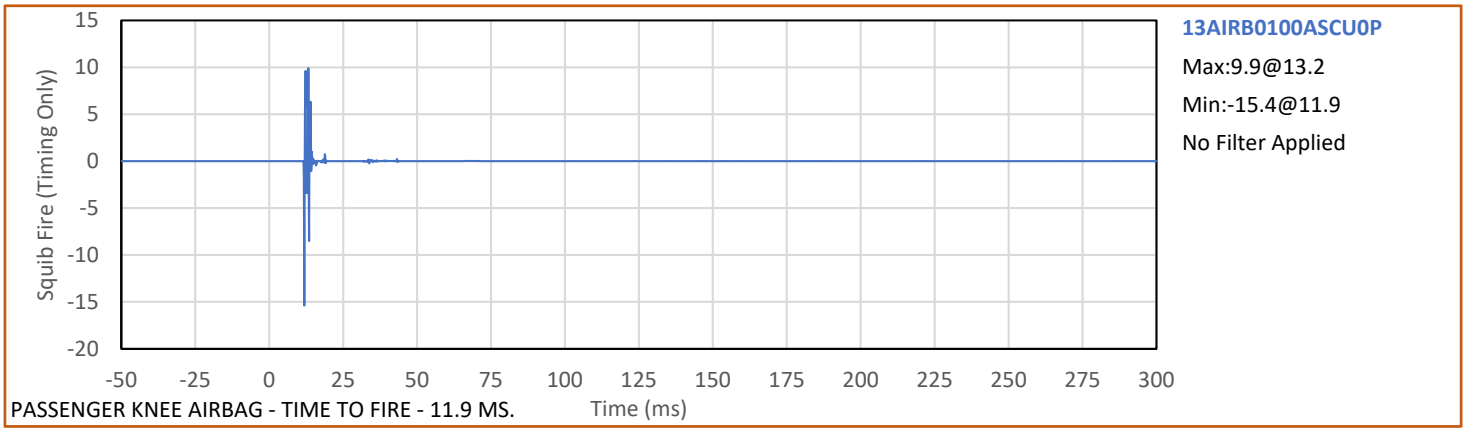
PASSENGER AIRBAG STAGE 2 - TIME TO FIRE - 32.1 MS.



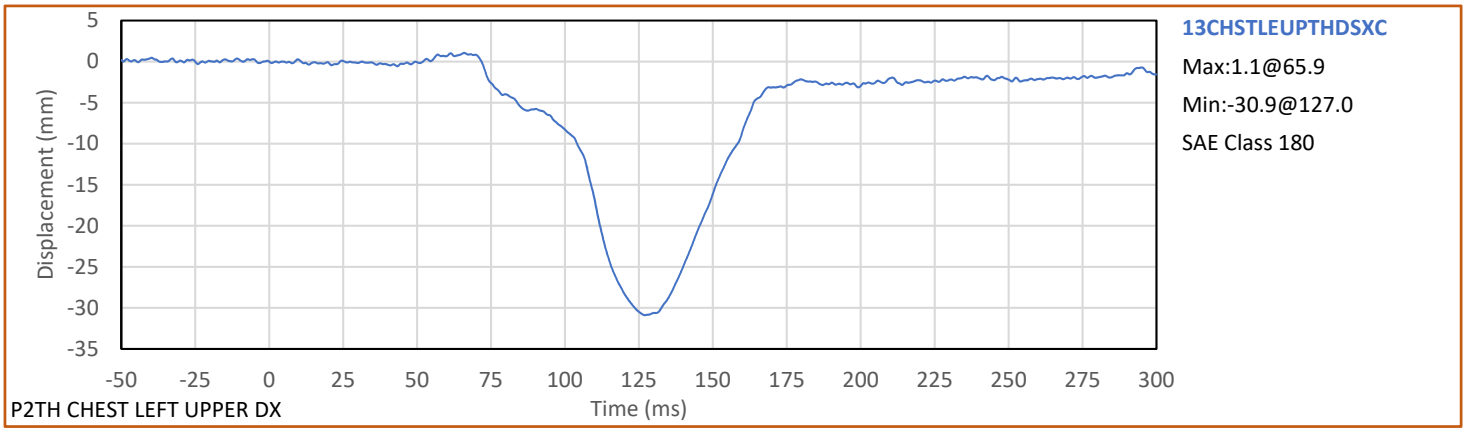
PASSENGER CURTAIN AIRBAG - TIME TO FIRE - NO FIRE

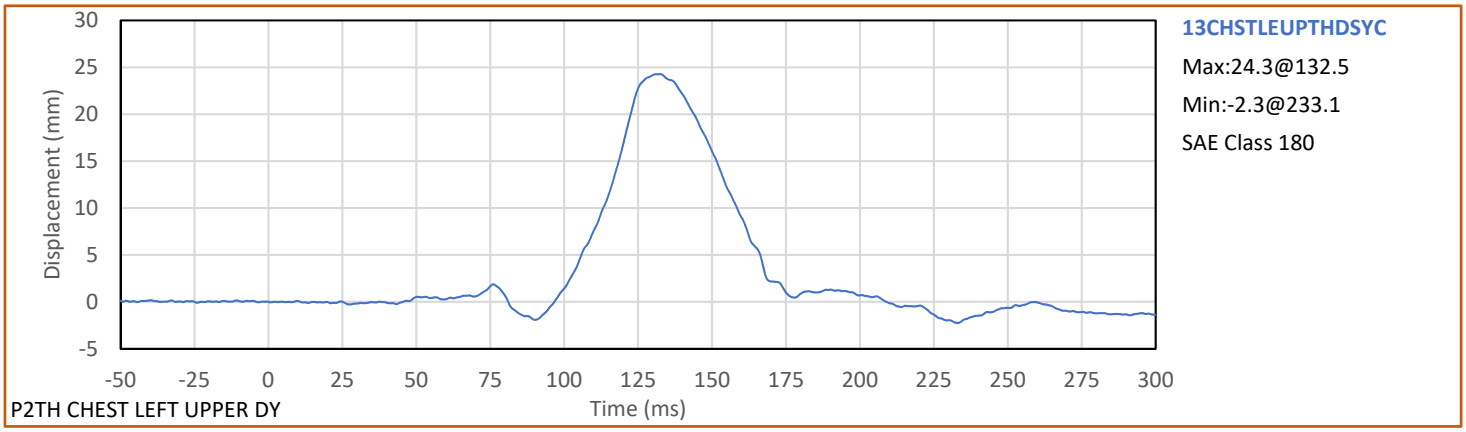


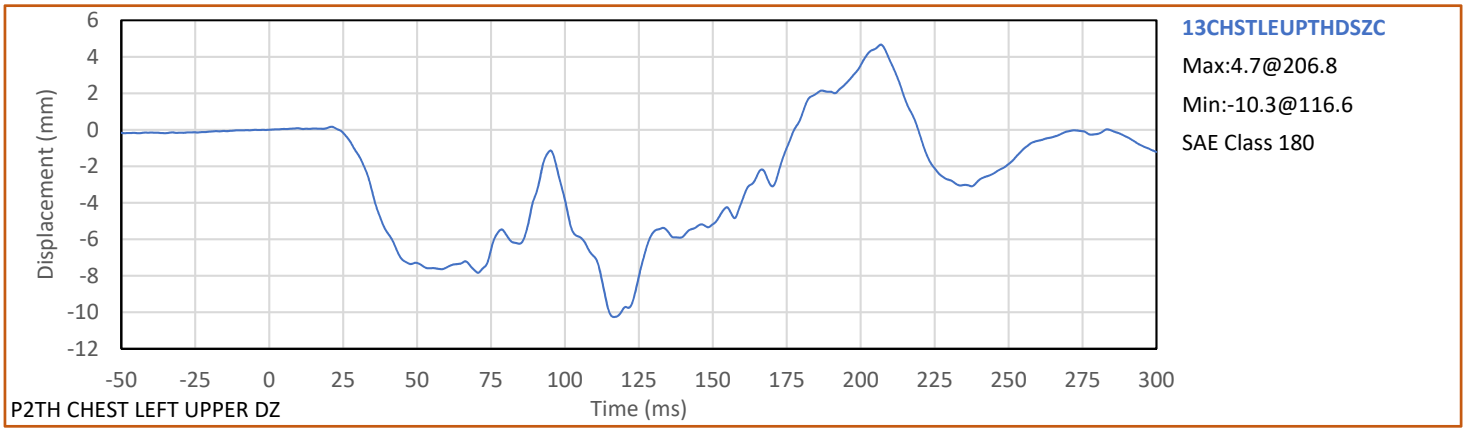
PASSENGER SEAT AIRBAG - TIME TO FIRE - NO FIRE

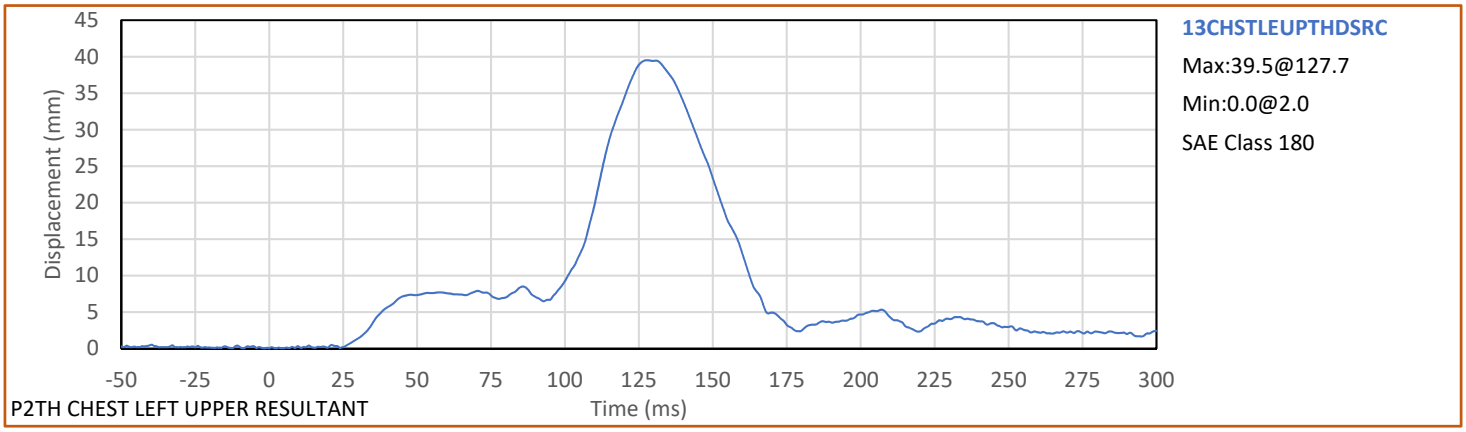


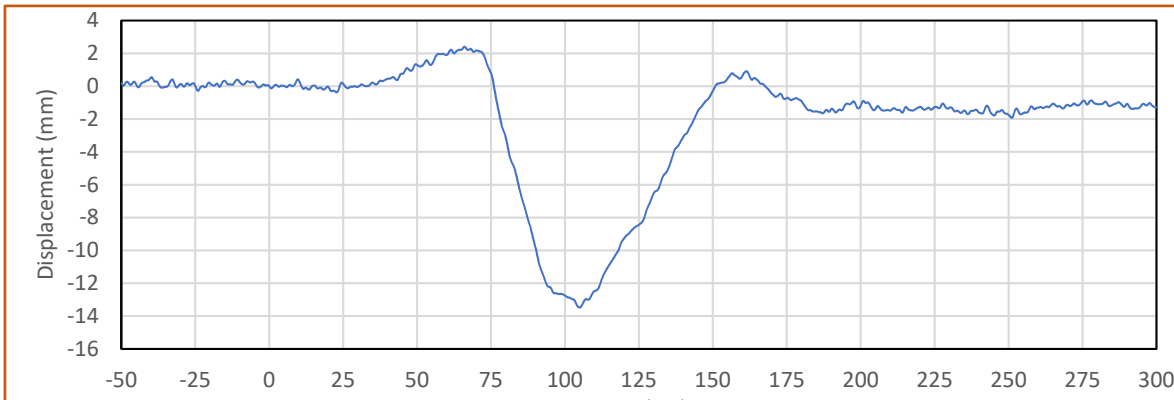
PASSENGER KNEE AIRBAG - TIME TO FIRE - 11.9 MS.


Displacement (mm)
Time (ms)
P2TH CHEST LEFT UPPER DX
13CHSTLEUPTHDSXC
Max:1.1@65.9
Min:-30.9@127.0
SAE Class 180


Displacement (mm)
Time (ms)
P2TH CHEST LEFT UPPER DY
13CHSTLEUPTHDSYC
Max:24.3@132.5
Min:-2.3@233.1
SAE Class 180

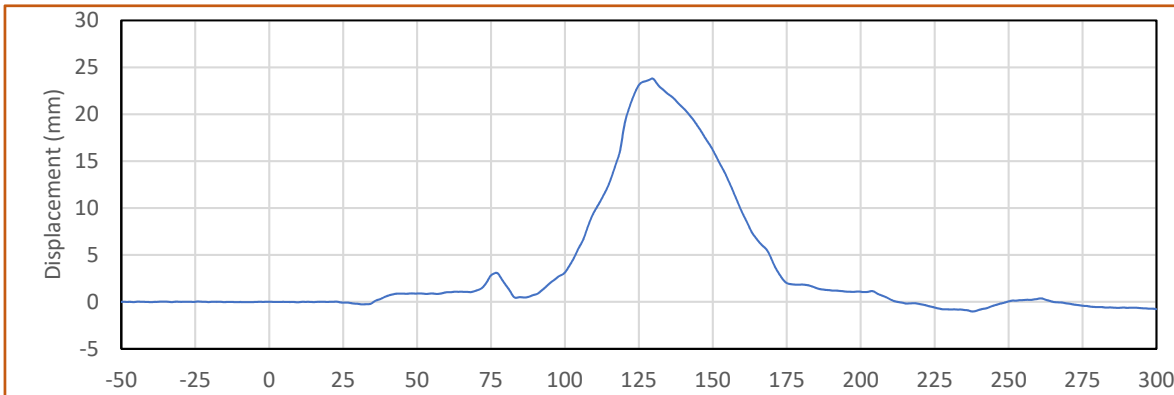

Displacement (mm)
Time (ms)
P2TH CHEST LEFT UPPER DZ
13CHSTLEUPTHDSZC
Max:4.7@206.8
Min:-10.3@116.6
SAE Class 180


Displacement (mm)
Time (ms)
P2TH CHEST LEFT UPPER RESULTANT
13CHSTLEUPTHDSRC
Max:39.5@127.7
Min:0.0@2.0
SAE Class 180



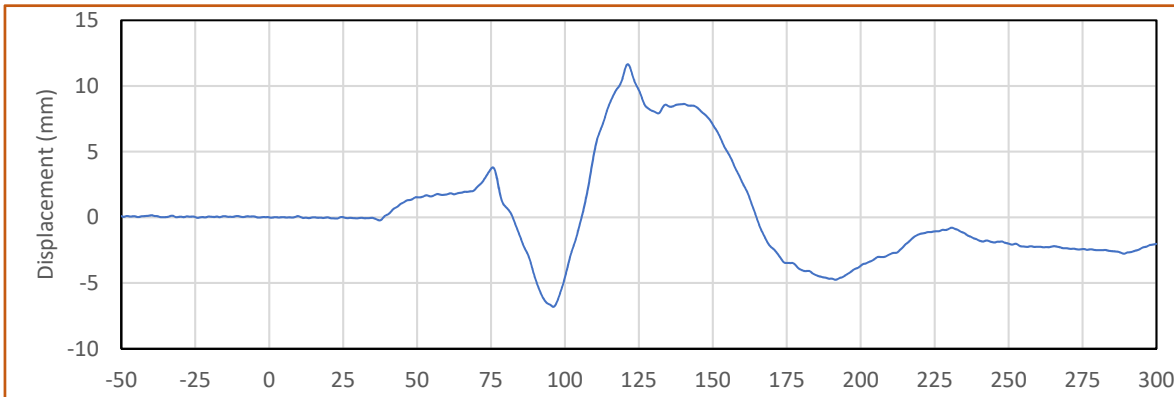
P2TH CHEST RIGHT UPPER DX

13CHSTRIUPTHDSXC
Max:2.4@66.0
Min:-13.5@104.9
SAE Class 180



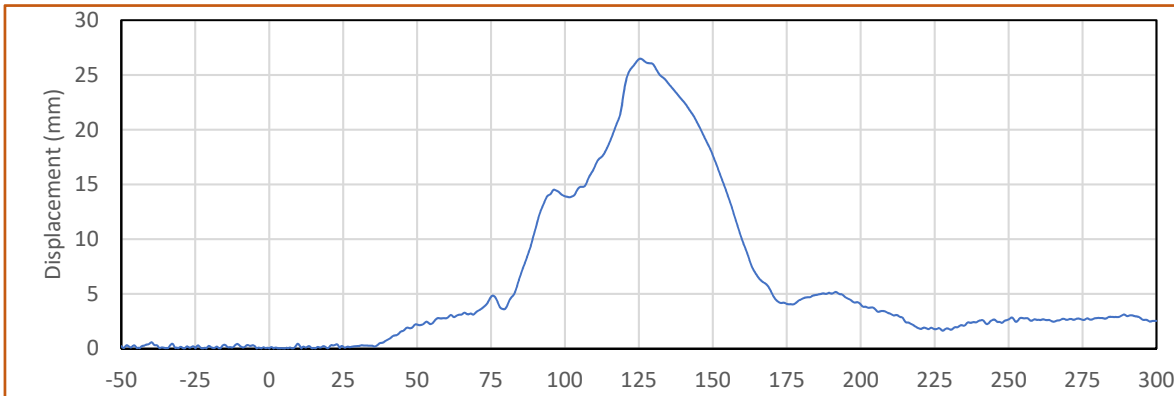
P2TH CHEST RIGHT UPPER DY

13CHSTRIUPTHDSYC
Max:23.8@129.5
Min:-1.0@237.8
SAE Class 180



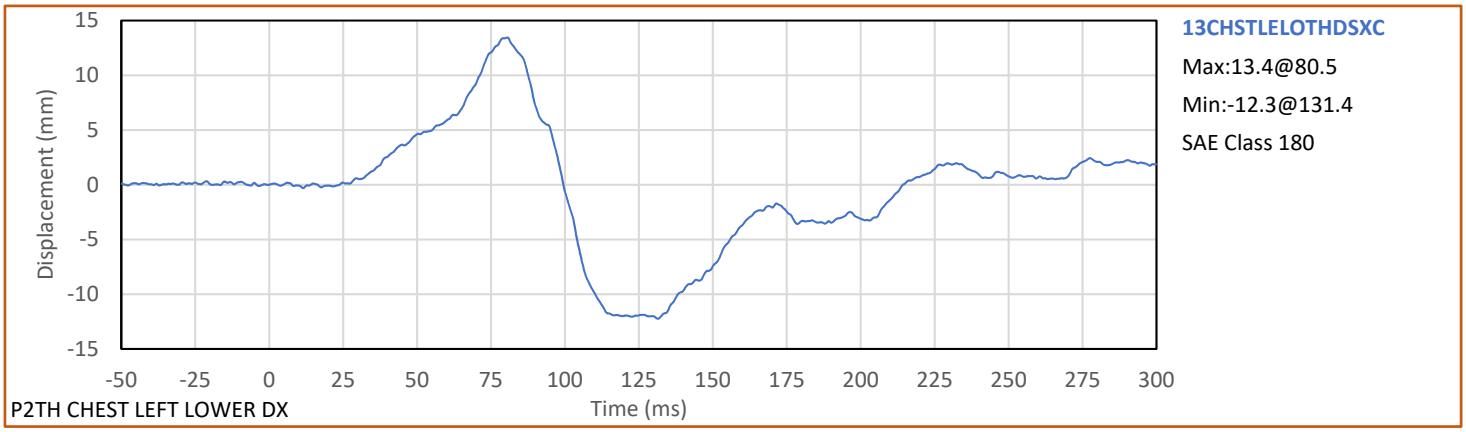
P2TH CHEST RIGHT UPPER DZ

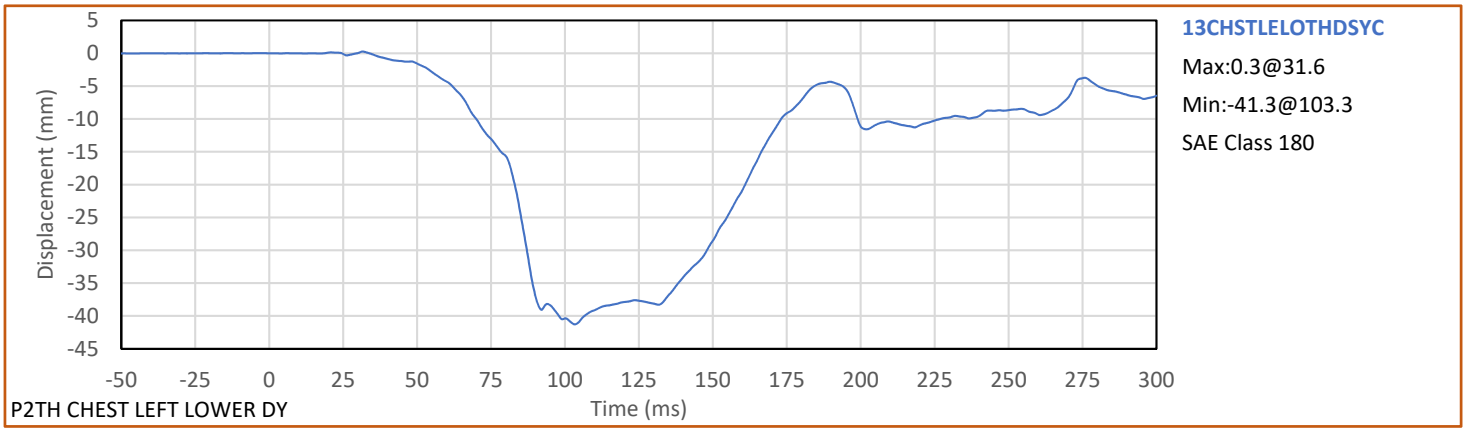
13CHSTRIUPTHDSZC
Max:11.7@121.2
Min:-6.8@96.1
SAE Class 180

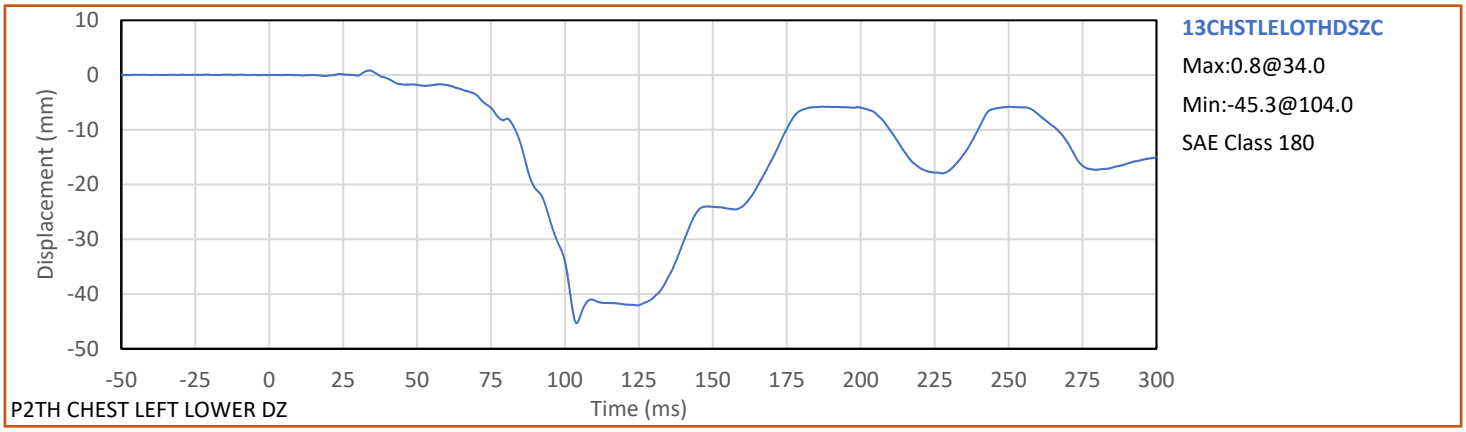


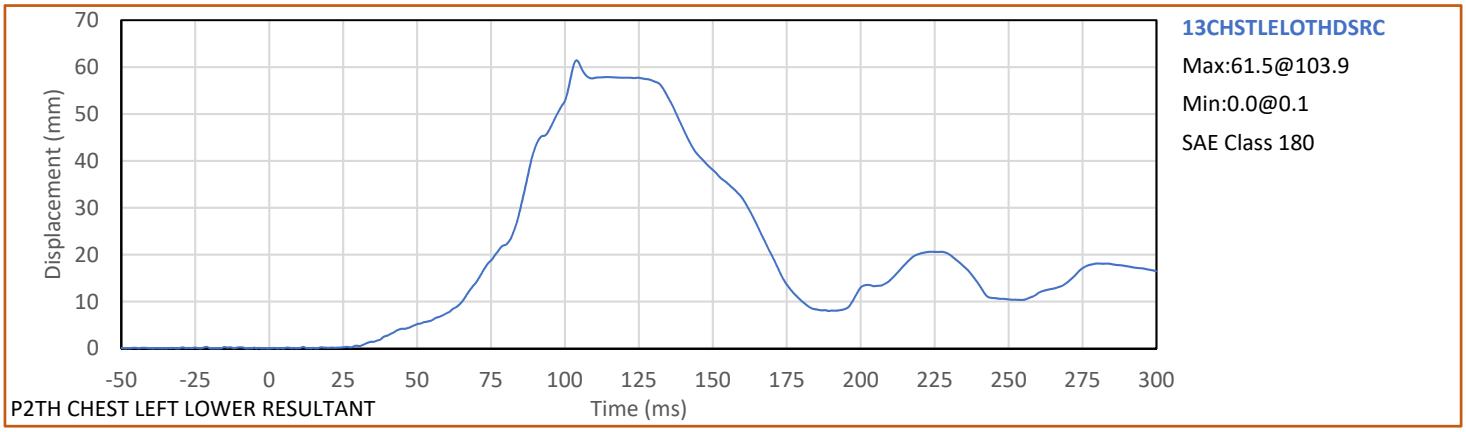
P2TH CHEST RIGHT UPPER RESULTANT

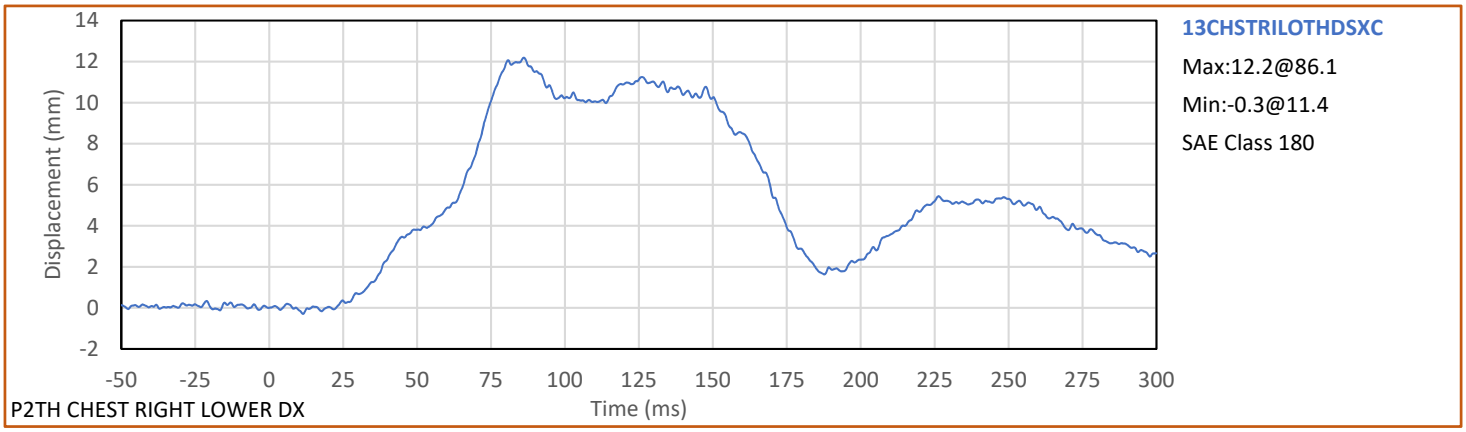
13CHSTRIUPTHDSRC
Max:26.5@125.5
Min:0.0@5.3
SAE Class 180

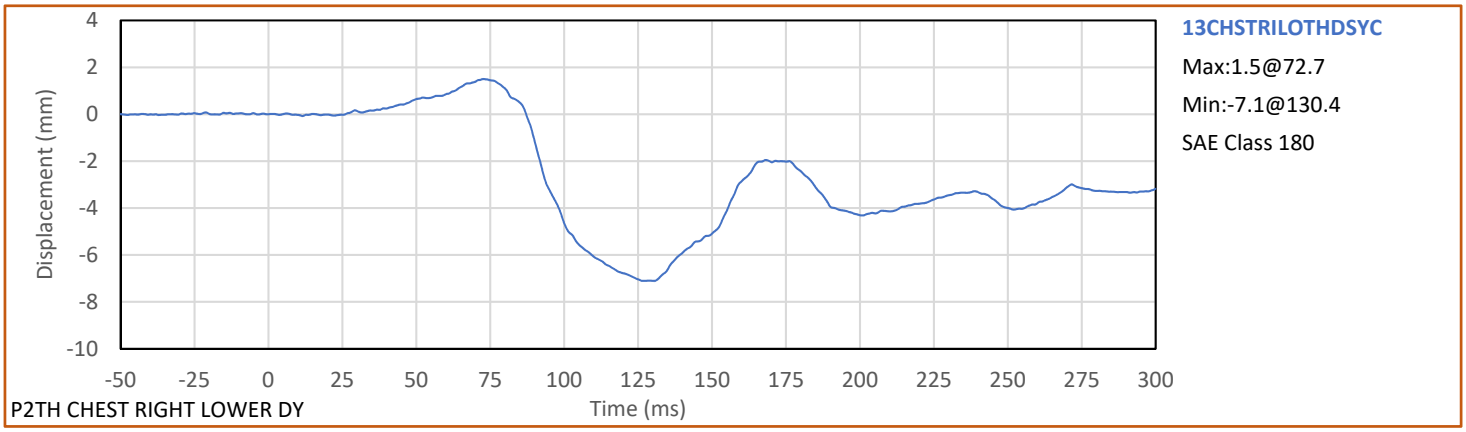

Displacement (mm)
Time (ms)
P2TH CHEST LEFT LOWER DX
13CHSTLELOTHDSXC
Max:13.4@80.5
Min:-12.3@131.4
SAE Class 180

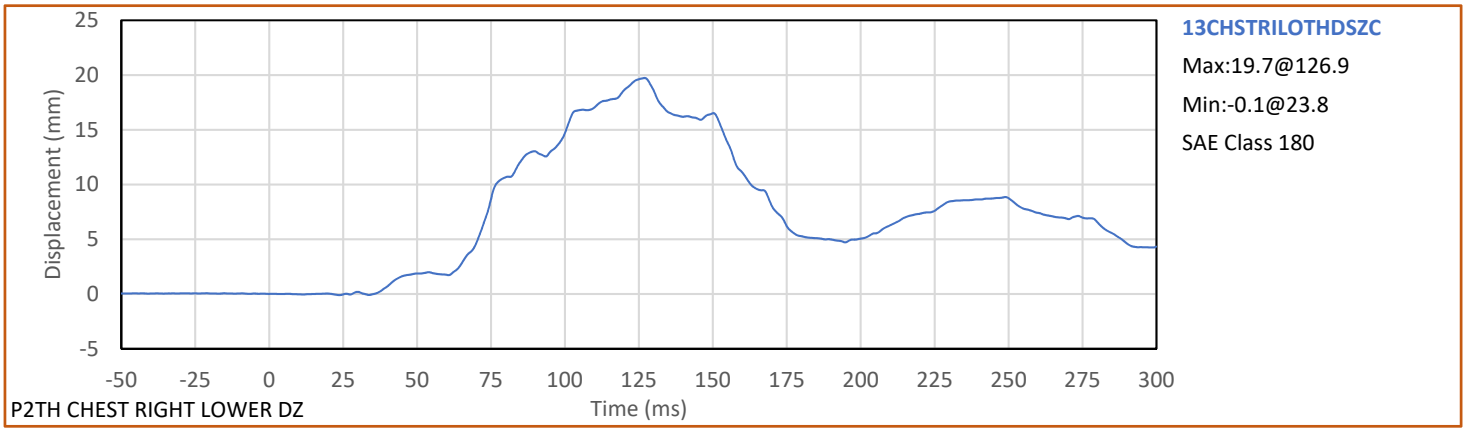

Displacement (mm)
Time (ms)
P2TH CHEST LEFT LOWER DY
13CHSTLELOTHDSYC
Max:0.3@31.6
Min:-41.3@103.3
SAE Class 180

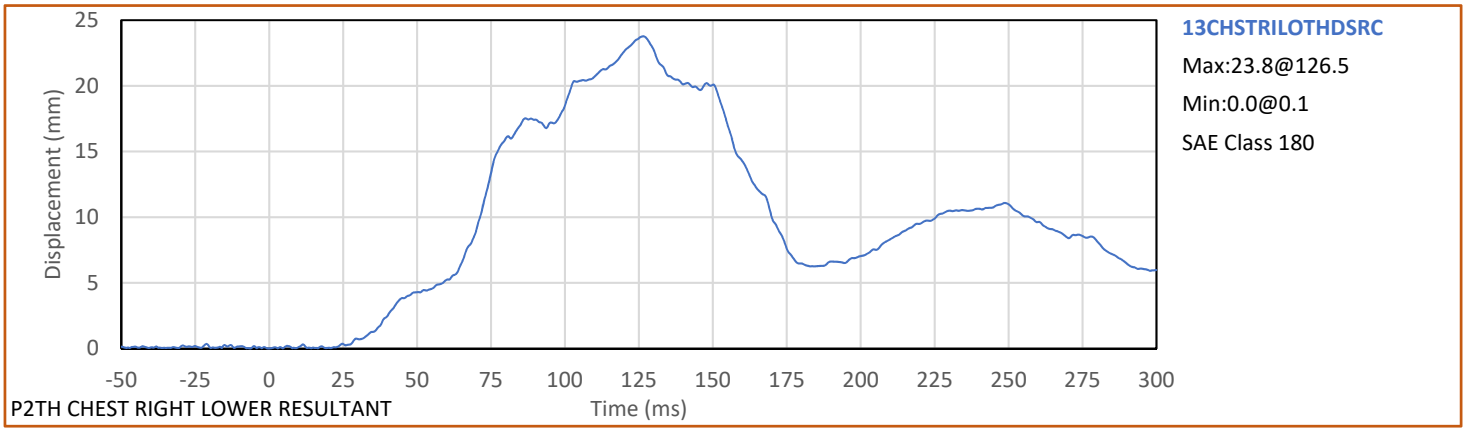

Displacement (mm)
Time (ms)
P2TH CHEST LEFT LOWER DZ
13CHSTLELOTHDSZC
Max:0.8@34.0
Min:-45.3@104.0
SAE Class 180

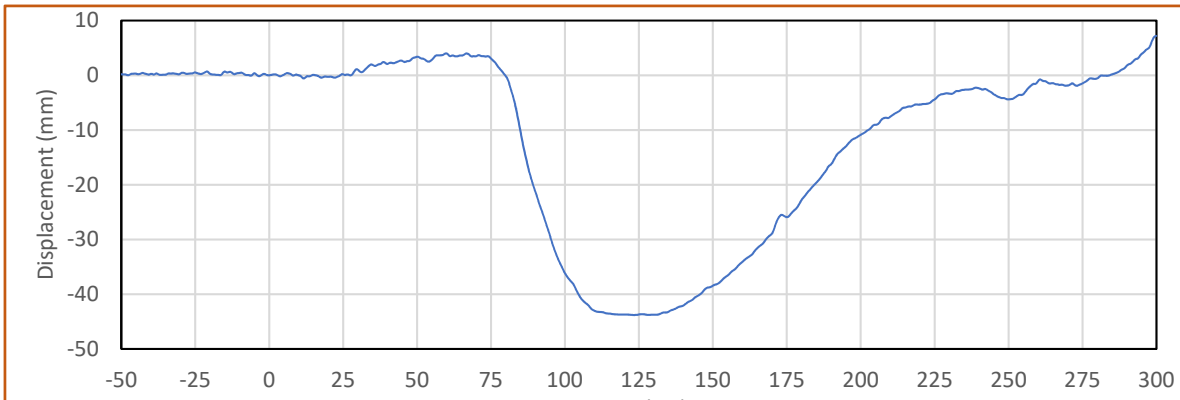

Displacement (mm)
Time (ms)
P2TH CHEST LEFT LOWER RESULTANT
13CHSTLELOTHDSRC
Max:61.5@103.9
Min:0.0@0.1
SAE Class 180


Displacement (mm)
Time (ms)
P2TH CHEST RIGHT LOWER DX
13CHSTRILOTHDSXC
Max:12.2@86.1
Min:-0.3@11.4
SAE Class 180


Displacement (mm)
Time (ms)
P2TH CHEST RIGHT LOWER DY
13CHSTRILOTHDSYC
Max:1.5@72.7
Min:-7.1@130.4
SAE Class 180


Displacement (mm)
Time (ms)
P2TH CHEST RIGHT LOWER DZ
13CHSTRILOTHDSZC
Max:19.7@126.9
Min:-0.1@23.8
SAE Class 180


Displacement (mm)
Time (ms)
P2TH CHEST RIGHT LOWER RESULTANT
13CHSTRILOTHDSRC
Max:23.8@126.5
Min:0.0@0.1
SAE Class 180

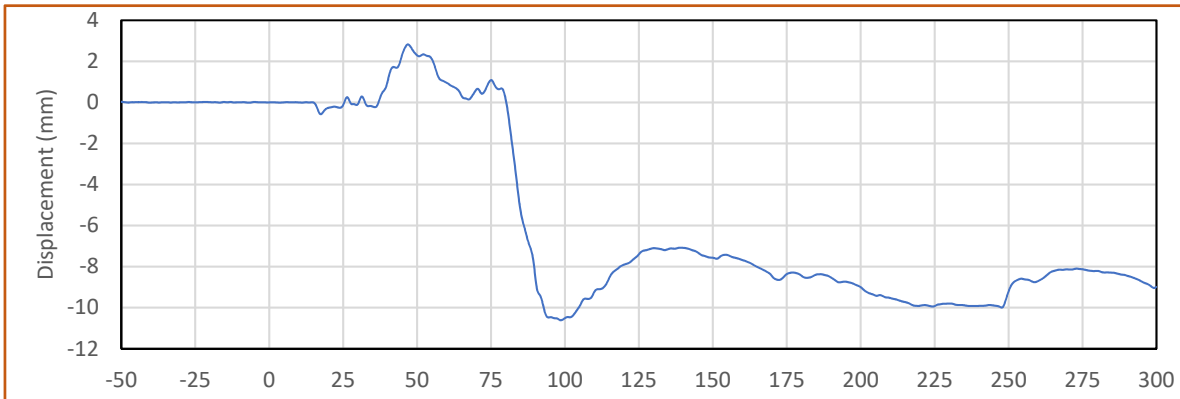


P2TH ABDOMEN LEFT LOWER DX

13ABDOLE00THDSXC
Max:7.2@299.8
Min:-43.8@123.4
SAE Class 180

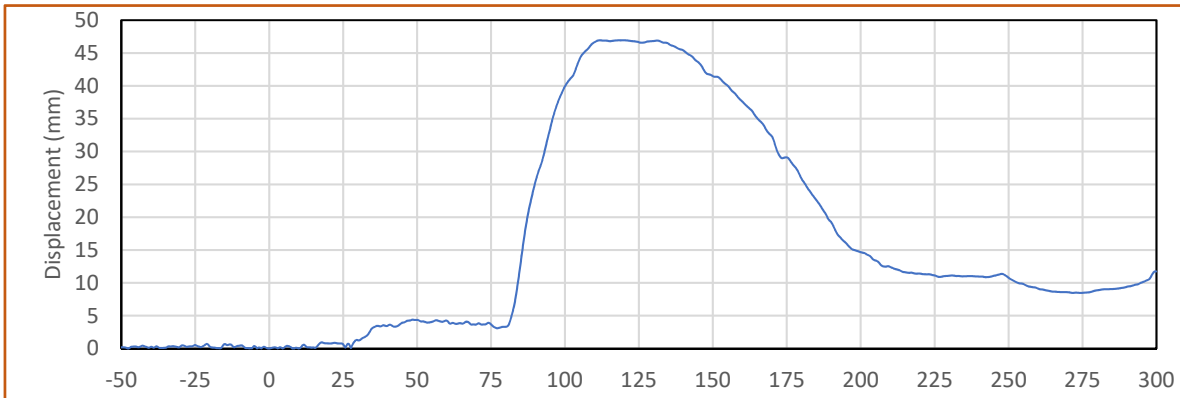
P2TH ABDOMEN LEFT LOWER DY

13ABDOLE00THDSYC
Max:0.7@26.8
Min:-15.8@111.7
SAE Class 180



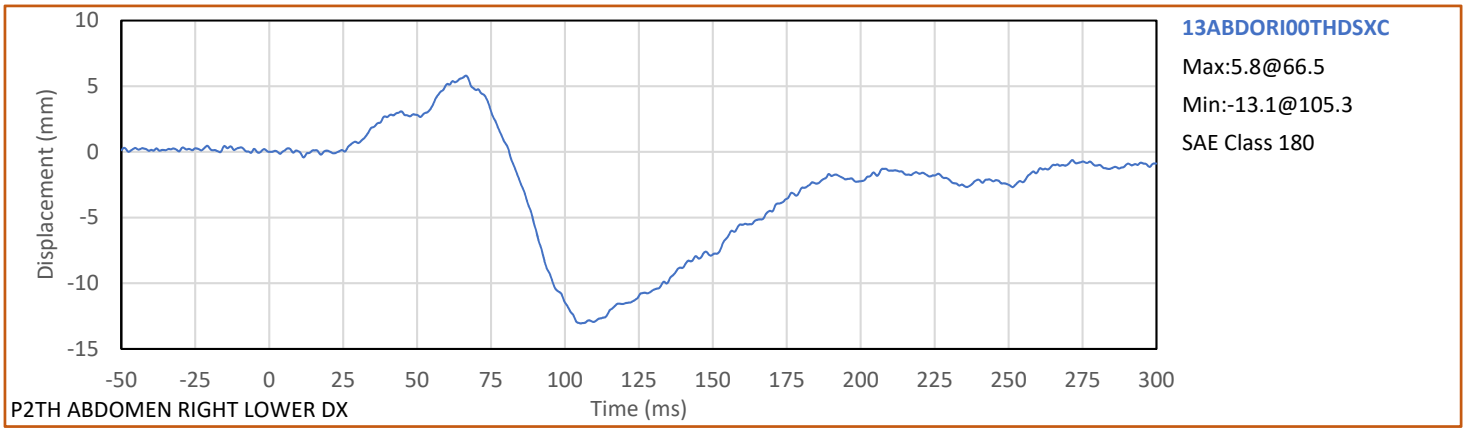
P2TH ABDOMEN LEFT LOWER DZ

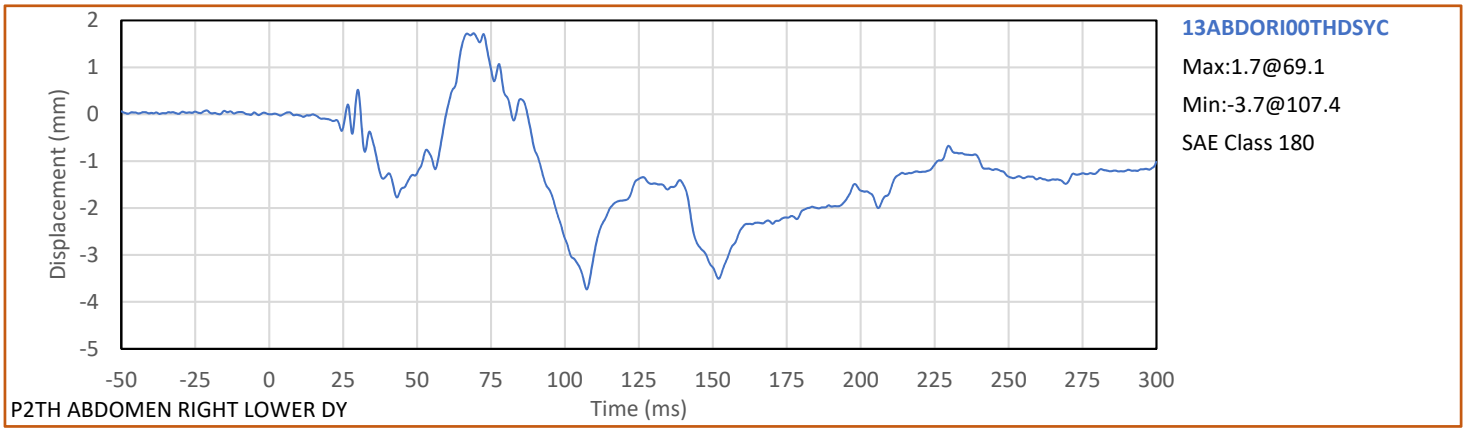
13ABDOLE00THDSZC
Max:2.8@46.9
Min:-10.6@98.6
SAE Class 180

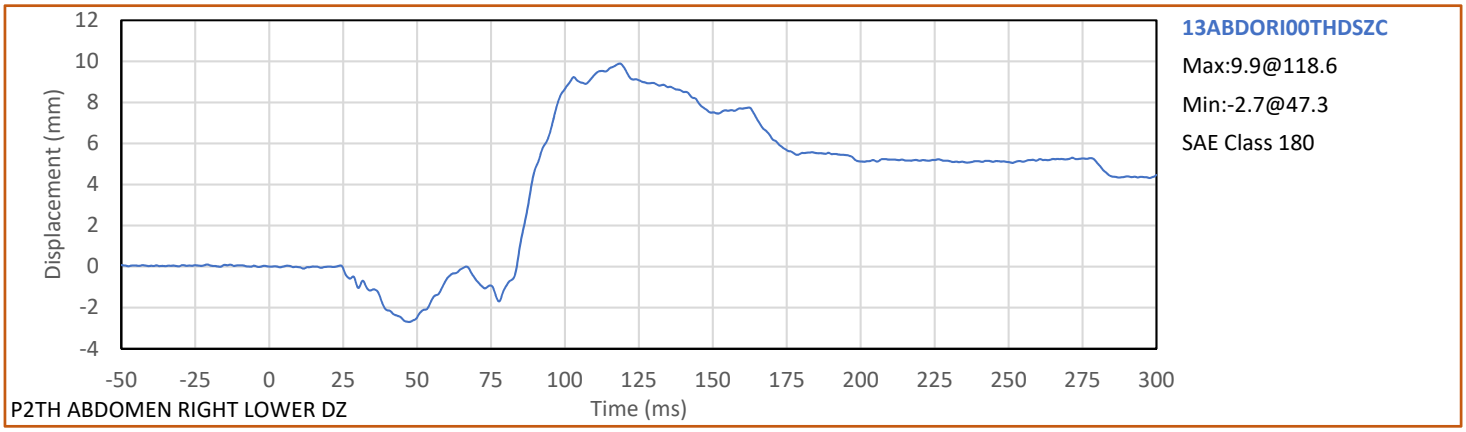


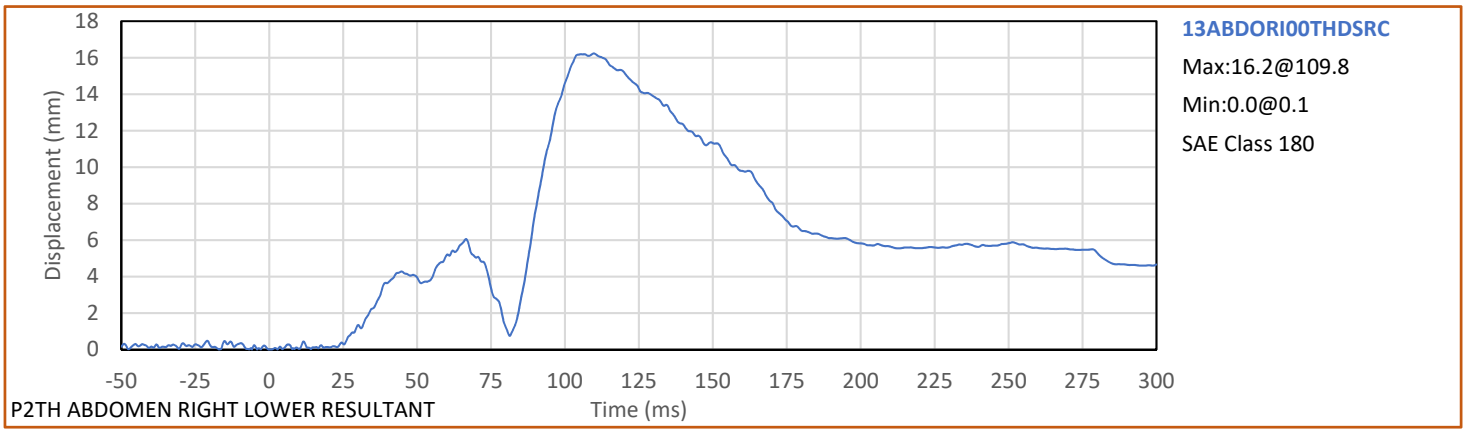
P2TH ABDOMEN LEFT LOWER RESULTANT

13ABDOLE00THDSRC
Max:46.9@120.0
Min:0.0@8.5
SAE Class 180


Displacement (mm)
Time (ms)
P2TH ABDOMEN RIGHT LOWER DX
13ABDORI00THDSXC
Max:5.8@66.5
Min:-13.1@105.3
SAE Class 180


Displacement (mm)
Time (ms)
P2TH ABDOMEN RIGHT LOWER DY
13ABDORI00THDSYC
Max:1.7@69.1
Min:-3.7@107.4
SAE Class 180


Displacement (mm)
Time (ms)
P2TH ABDOMEN RIGHT LOWER DZ
13ABDORI00THDSZC
Max:9.9@118.6
Min:-2.7@47.3
SAE Class 180


Displacement (mm)
Time (ms)
P2TH ABDOMEN RIGHT LOWER RESULTANT
13ABDORI00THDSRC
Max:16.2@109.8
Min:0.0@0.1
SAE Class 180

APPENDIX C
DUMMY QUALIFICATION AND PERFORMANCE VERIFICATION

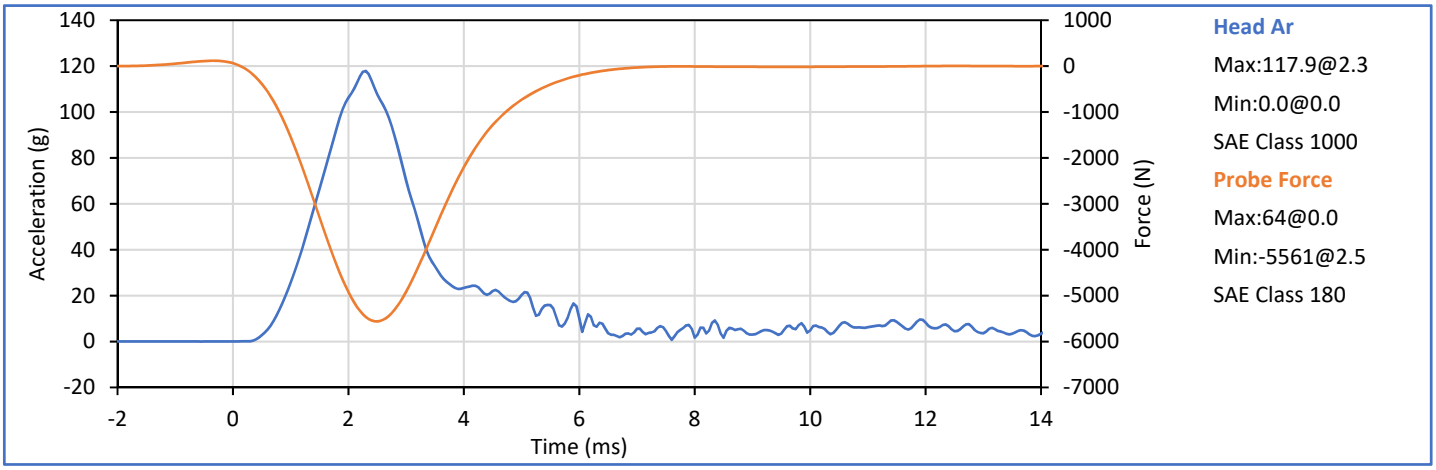
APPENDIX C
Pre-Test ATD Qualification and Performance Verification
THOR-50M 50th Percentile Male ATD, (Reduced Certification)
S/N: D09799

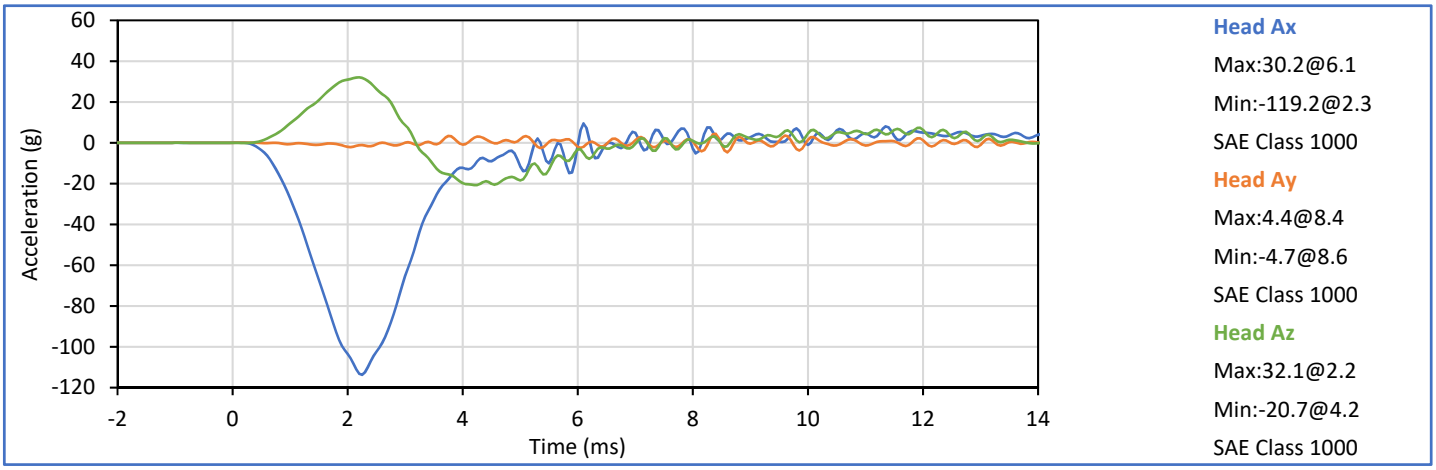
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Head Qualification

ATD Serial No.: D09799 Test Date: 2020-09-16

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	23	Pass
Probe Velocity	m/s	1.95	2.05	2.00	Pass
Peak Probe Force	kN	-6138	-5022	-5561	Pass
Peak Head Resultant Acceleration	g	105.3	128.7	117.9	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

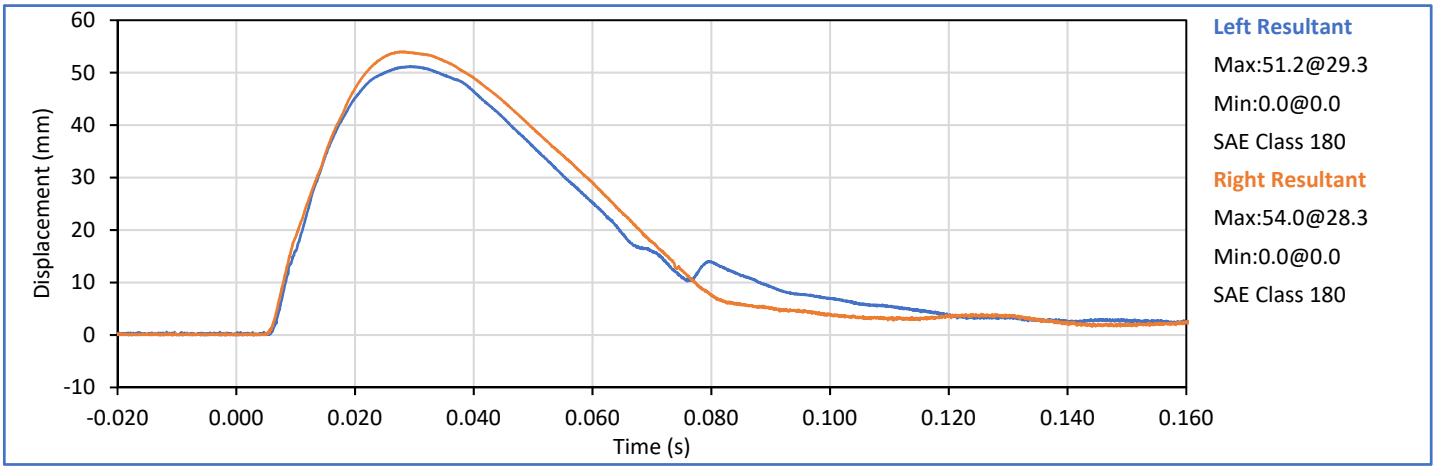
Approved By: P. Puzzuto

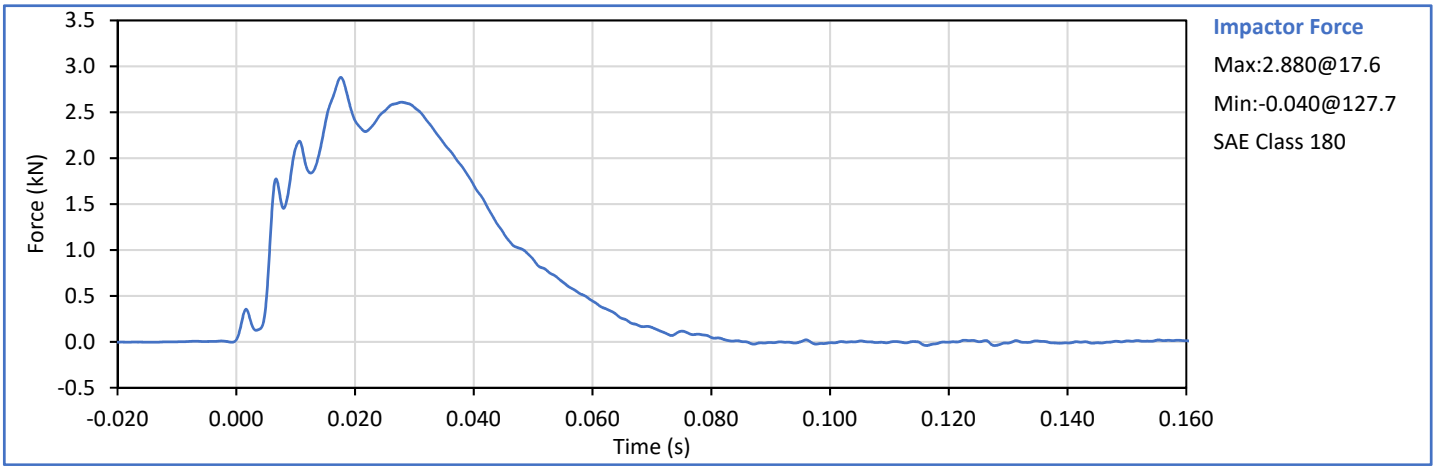
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Thorax Impact (Upper)

ATD Serial No.: D09799 Test Date: 2020-09-15

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	26	Pass
Probe Velocity	m/sec	4.25	4.35	4.30	Pass
Peak Probe Force	kN		3.039	2.880	Pass
Peak Upper Left Deflection Resultant	mm	48.3	59.0	51.2	Pass
Peak Upper Right Deflection Resultar	mm			54.0	Pass
Absolute Difference L/R Dx Resultant	mm	0.0	5.0	2.8	Pass
Force at Peak Upper Left Resultant	mm	2.409	2.944	2.587	Pass
Force at Peak Upper Right Resultant	mm			2.605	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

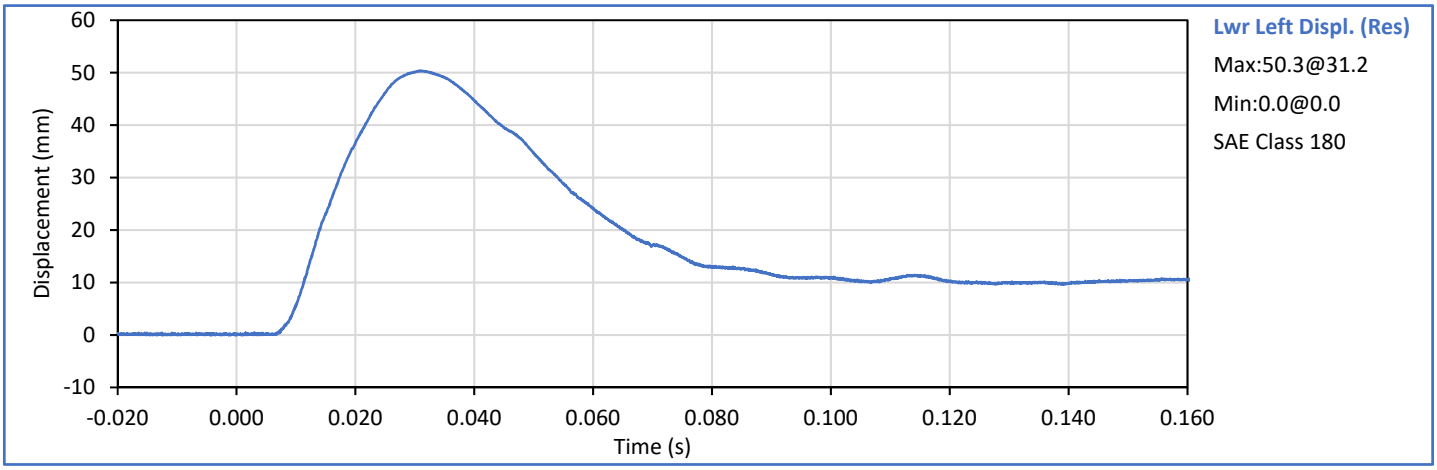
Approved By: P. Puzzuto

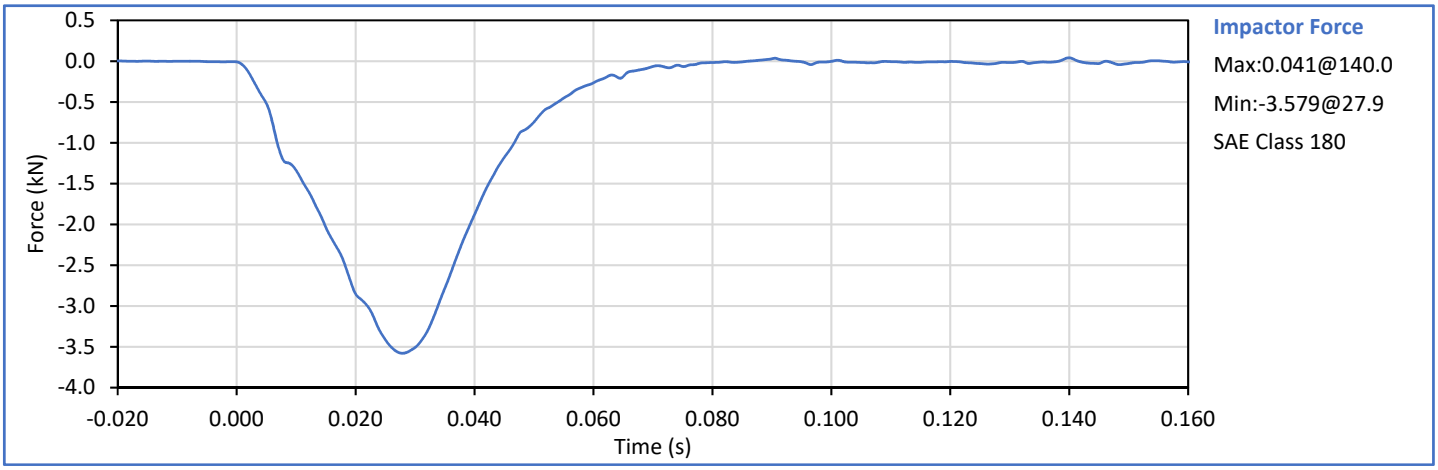
Applus IDIADA
KARCO

THOR-50M 50th Percentile Male ATD
Thorax Impact (Lower Left)

ATD Serial No.: D09799 Test Date: 2020-09-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Relative Humidity	%	10	70	36	Pass
Probe Velocity	m/sec	4.25	4.35	4.33	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.579	Pass
Lower Left Resultant Dx at Peak Fx	mm	45.8	56.0	49.3	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

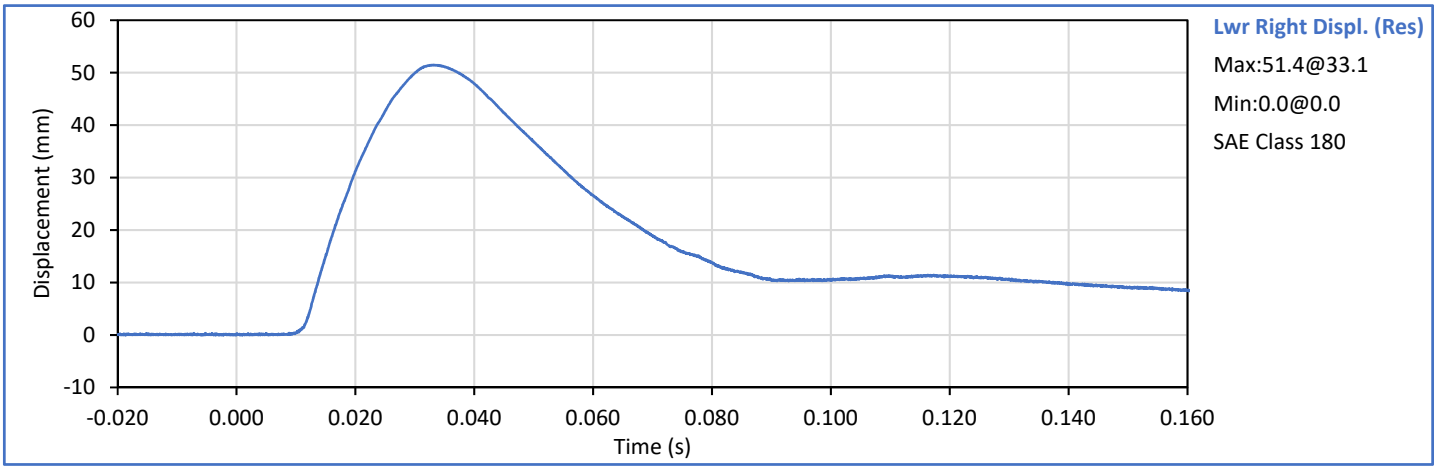
Approved By: P. Puzzuto

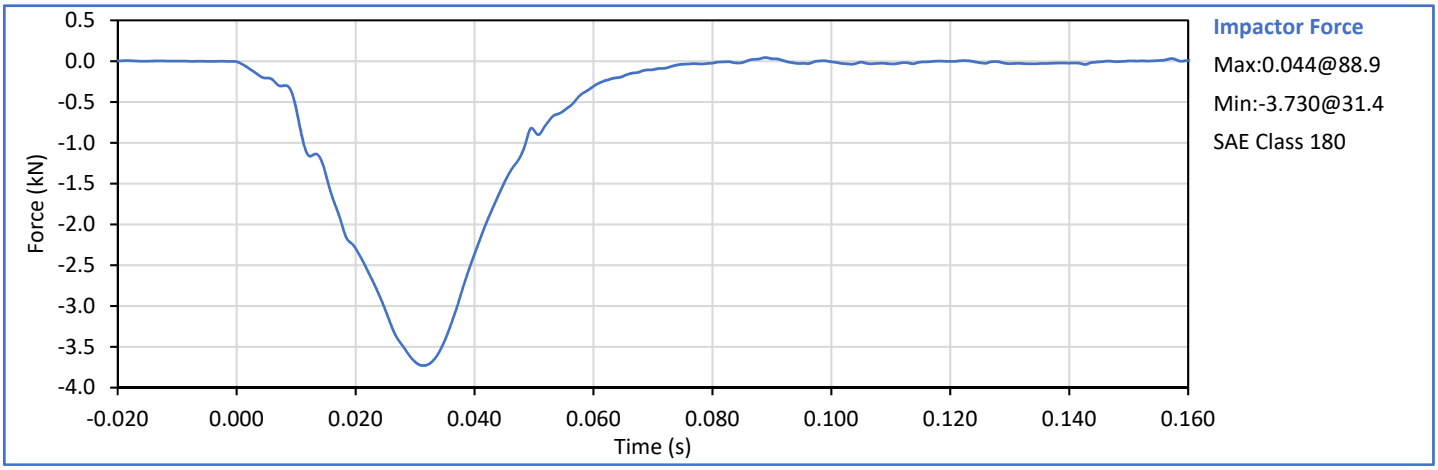
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Thorax Impact (Lower Right)

ATD Serial No.: D09799 Test Date: 2020-09-16

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	24	Pass
Probe Velocity	m/sec	4.25	4.35	4.33	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.730	Pass
Lower Right Resultant Dx at Peak Fx	mm	45.8	56.0	51.1	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

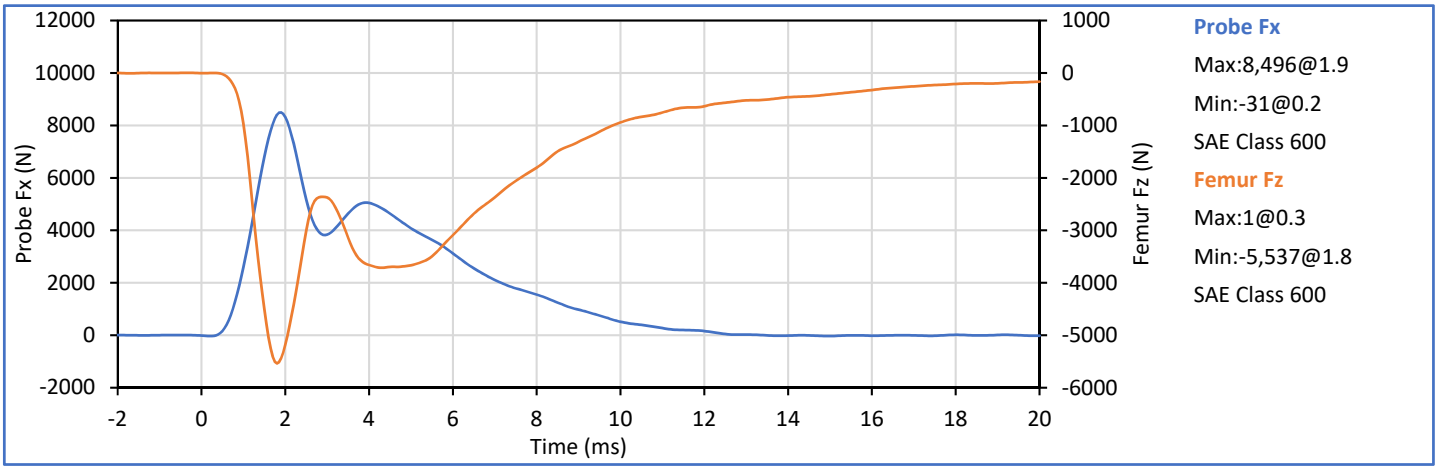
Approved By: P. Puzzuto

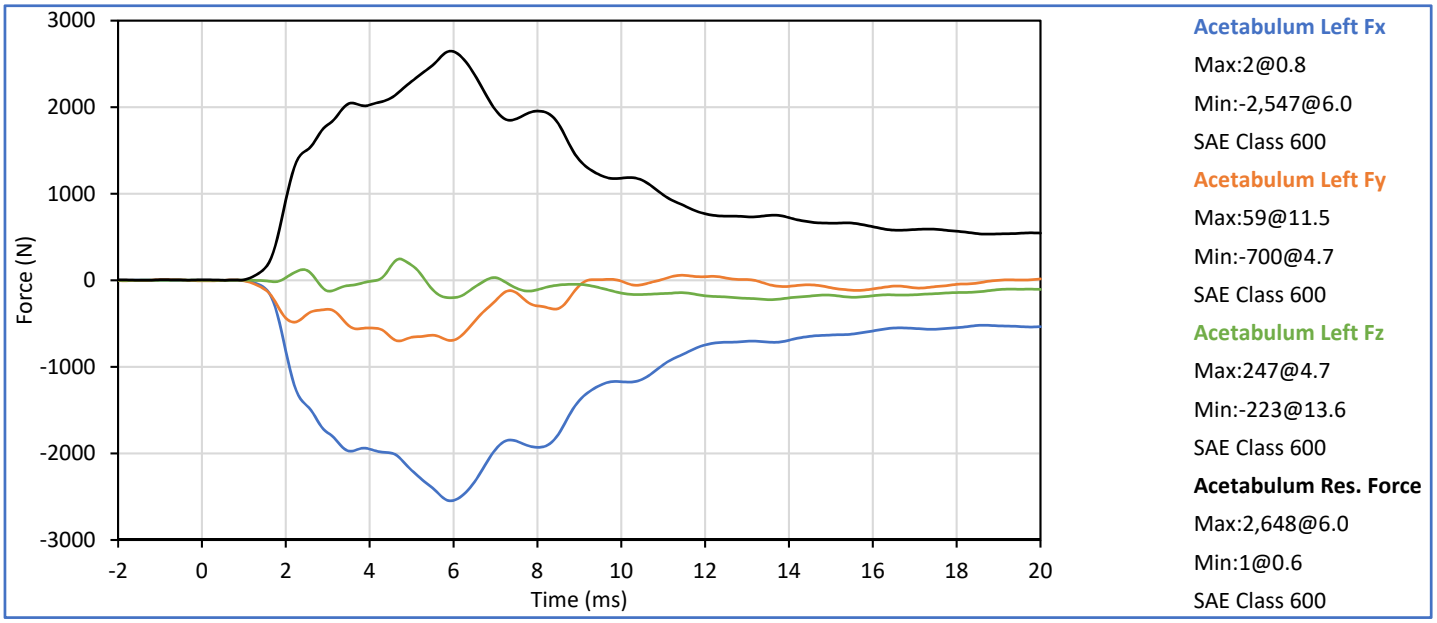
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Upper Leg (Left) Qualification
2020-09-15 TH DO9799 Leg Left 001

ATD Serial No.: D09799 Test Date: 2020-09-15

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	28	Pass
Pendulum Velocity	m/s	3.25	3.35	3.30	Pass
Peak Probe Force	N	*	*	8496	*
Peak Femur Fz	N	*	*	-5537	*
Acetabulum Force Resultant	N	*	*	2648	*
* Research data. No defined P/F corridor			Overall Test Results		Pass





Technician: J. Hernandez

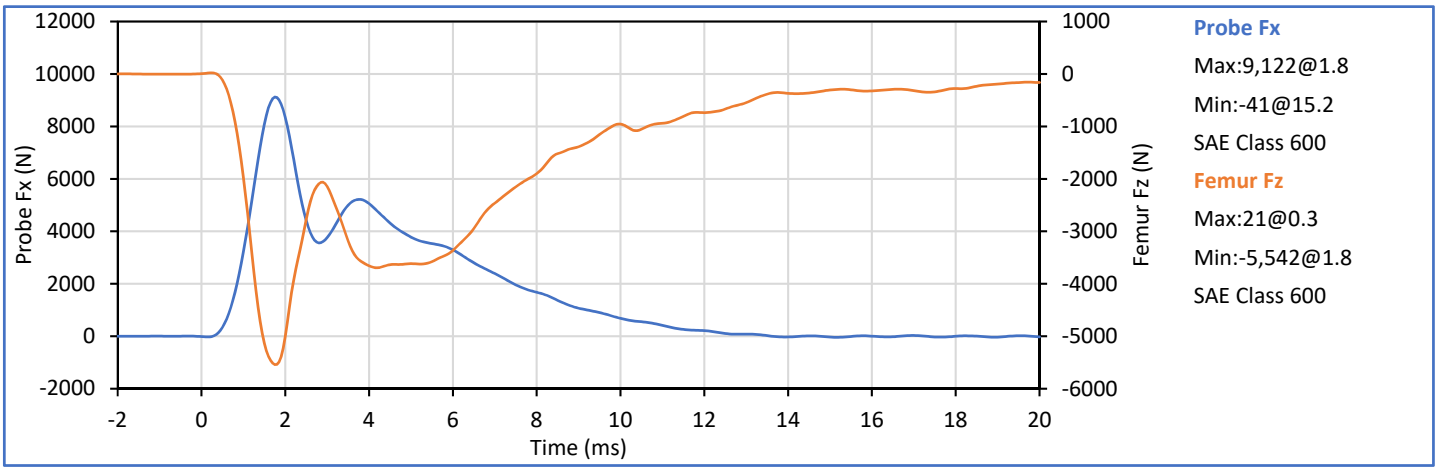
Approved By: P. Puzzuto

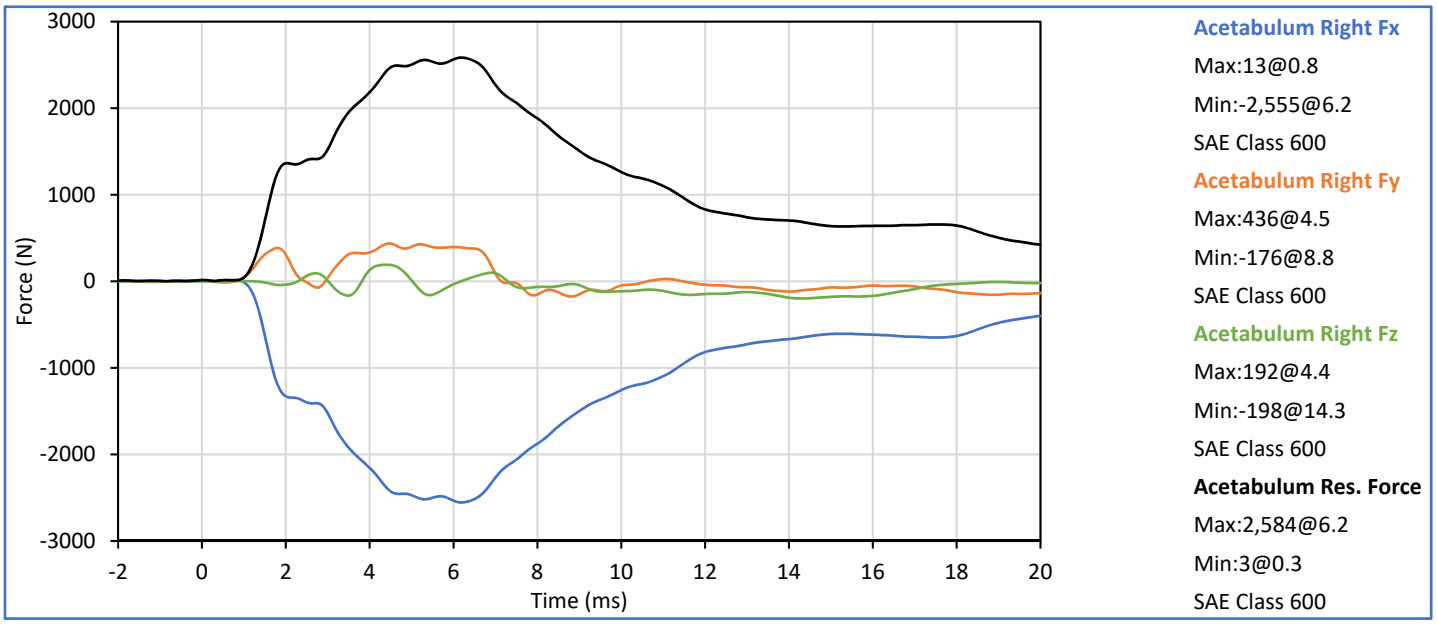
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Upper Leg (Right) Qualification
2020-09-15 TH DO9799 Leg Right 001

ATD Serial No.: D09799 Test Date: 2020-09-15

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	29	Pass
Pendulum Velocity	m/s	3.25	3.35	3.30	Pass
Peak Probe Force	N	*	*	9122	*
Peak Femur Fz	N	*	*	-5542	*
Acetabulum Force Resultant	N	*	*	2584	*
* Research data. No defined P/F corridor			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
Hybrid III 50th Percentile Male ATD, (Reduced Certification)
S/N: 168

Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
ATD Damage Checklist

ATD Serial No.: 168 Test Date: 2020-09-22

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: J. Hernandez

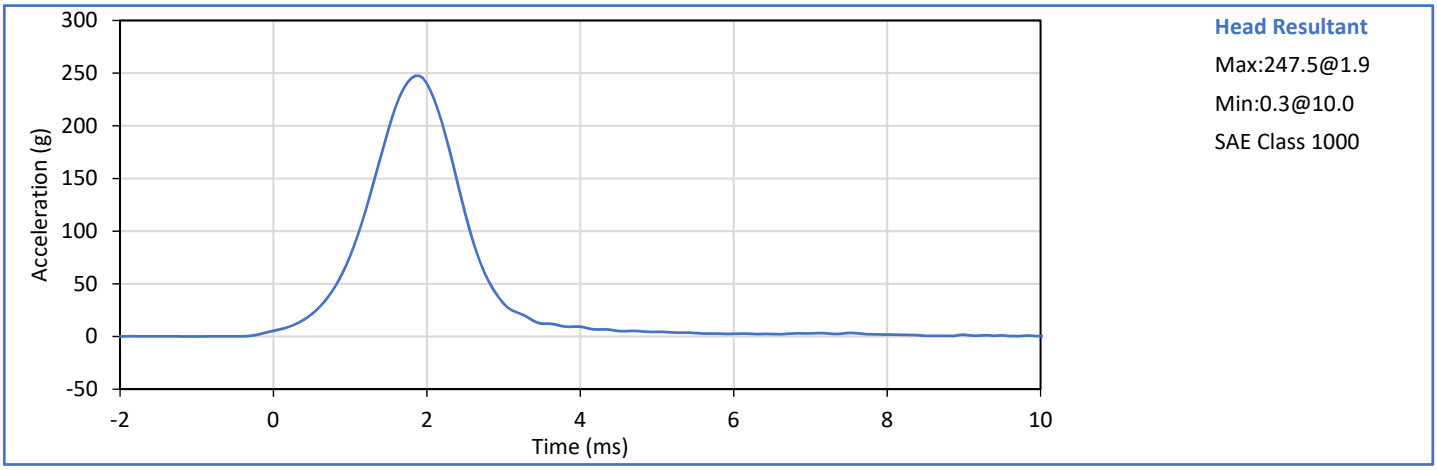
Approved By: P. Puzzuto

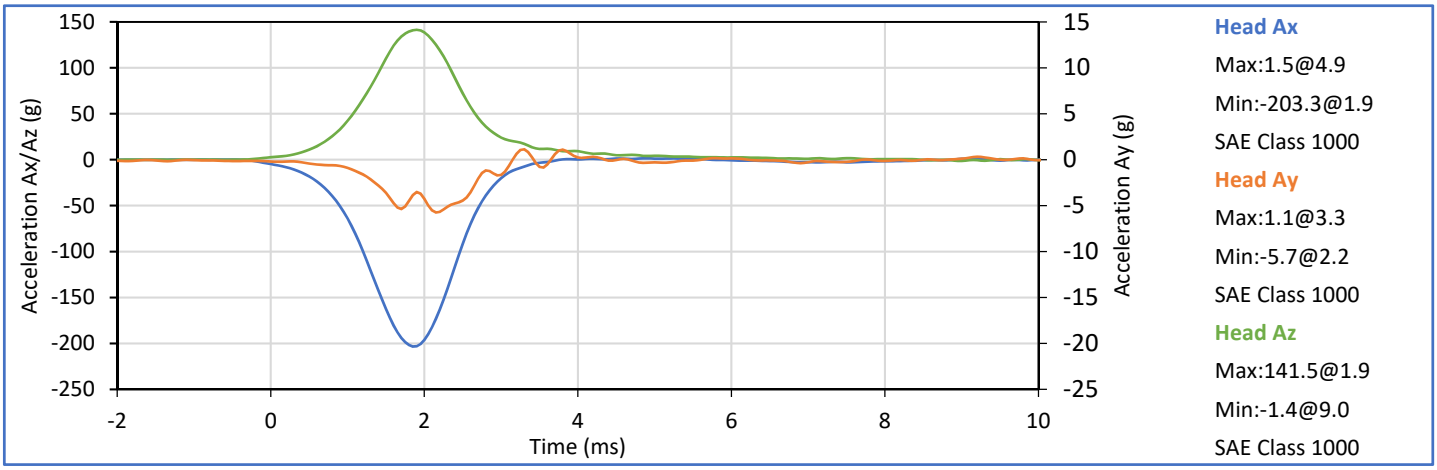
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Head Drop

ATD Serial No.: 168 Test Date: 2020-09-22

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Relative Humidity	%	10	70	33	Pass
Peak Resultant Acceleration	g	225.0	275.0	247.5	Pass
Peak Lateral Acceleration	g	-15.0	15.0	-5.7	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

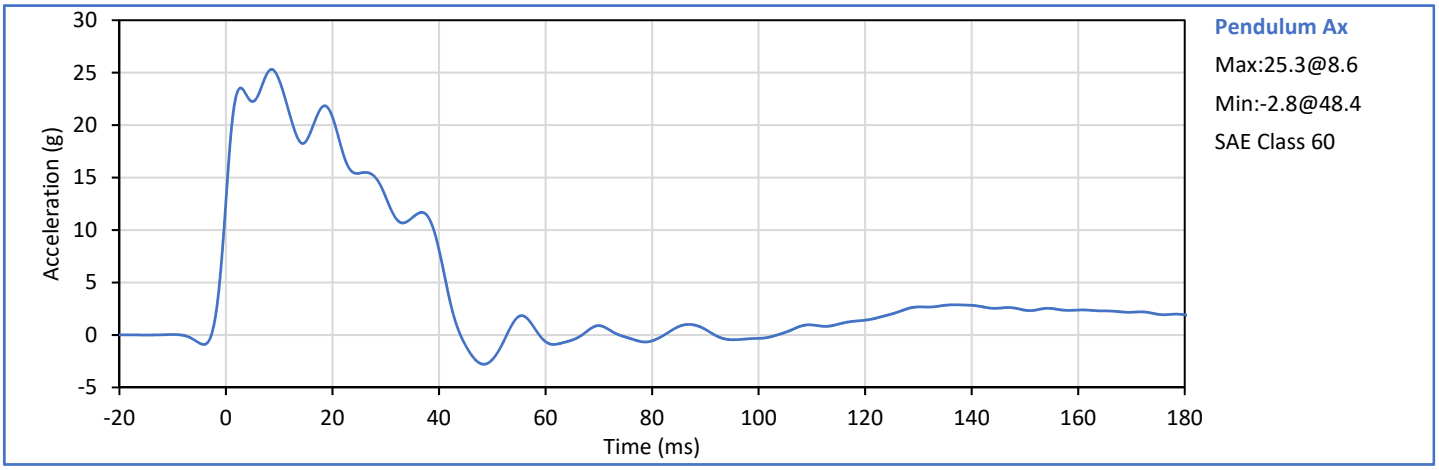
Applus IDIADA KARCO

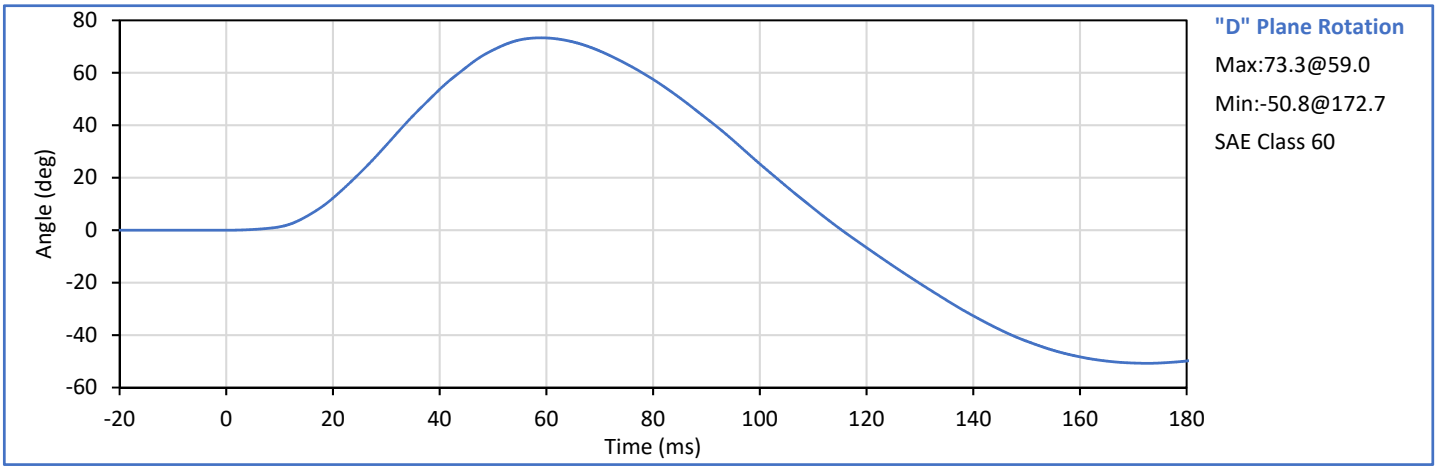
Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 168

Test Date: 2020-09-22

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	32	Pass
Pendulum Velocity	m/s	6.89	7.13	7.00	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	24.3	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	20.8	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	13.1	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	13.1	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	41.3	Pass
"D" Plane Rotation peak	deg	64.0	78.0	73.3	Pass
	ms	57.0	64.0	59.0	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	115.4	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	99.2	Pass
	ms	47.0	58.0	54.6	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	101.8	Pass
			Overall Test Results		Pass





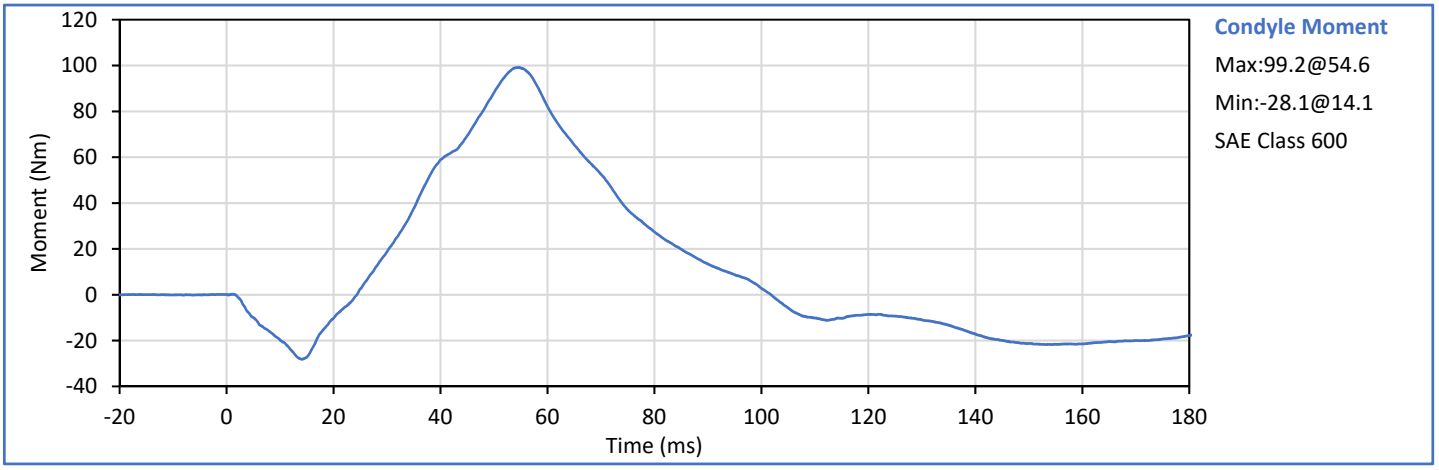
Technician: J. Hernandez

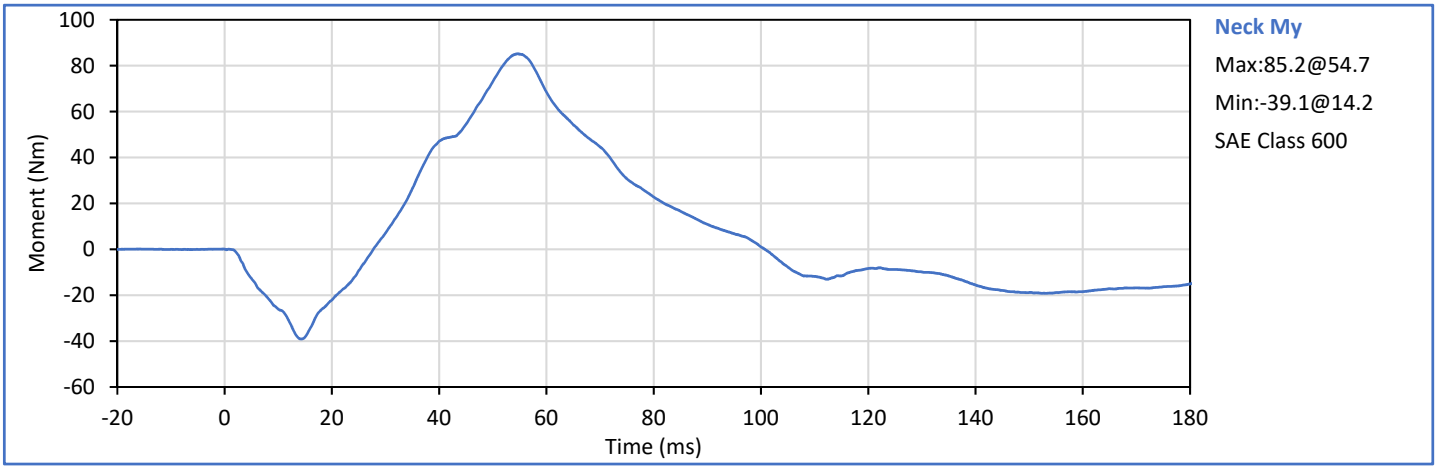
Approved By: P. Puzzuto

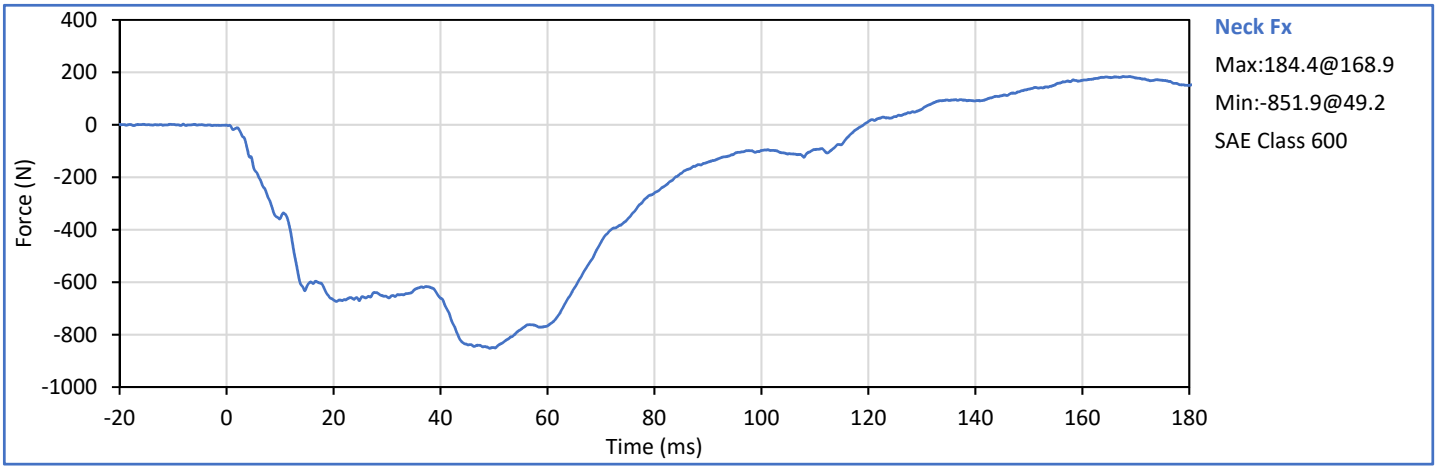
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 168 Test Date: 2020-09-22





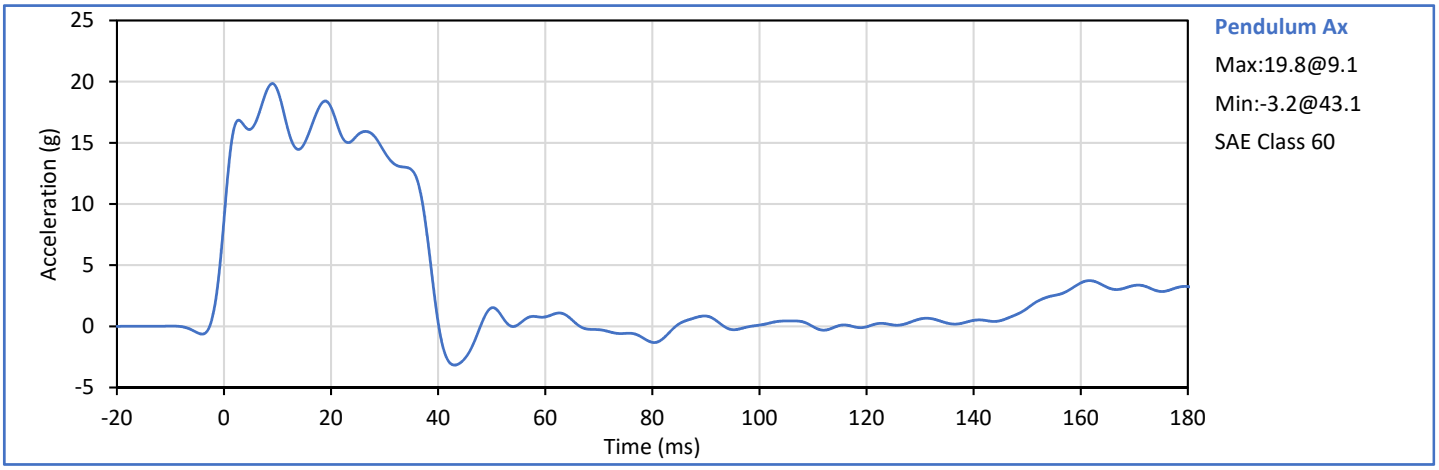


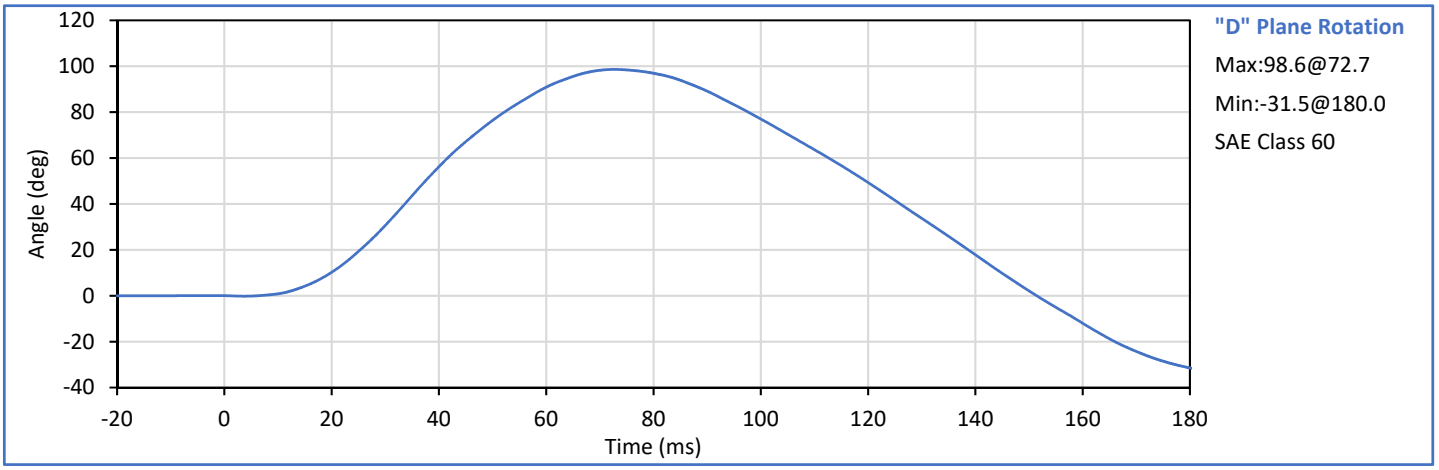
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 168 Test Date: 2020-09-22

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	32	Pass
Pendulum Velocity	m/s	5.94	6.19	6.09	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	19.3	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	17.9	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	14.2	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	14.2	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	38.6	Pass
"D" Plane Rotation peak	deg	81.0	106.0	98.6	Pass
	ms	72.0	82.0	72.7	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	151.5	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-76.9	Pass
	ms	65.0	79.0	68.0	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	137.1	Pass
			Overall Test Results		Pass





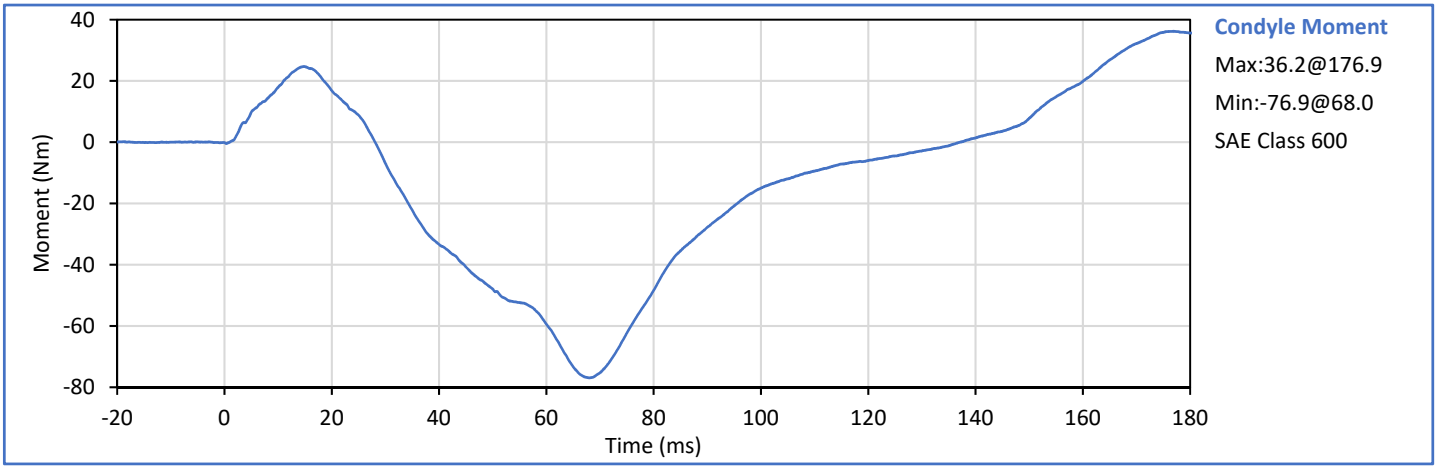
Technician: J. Hernandez

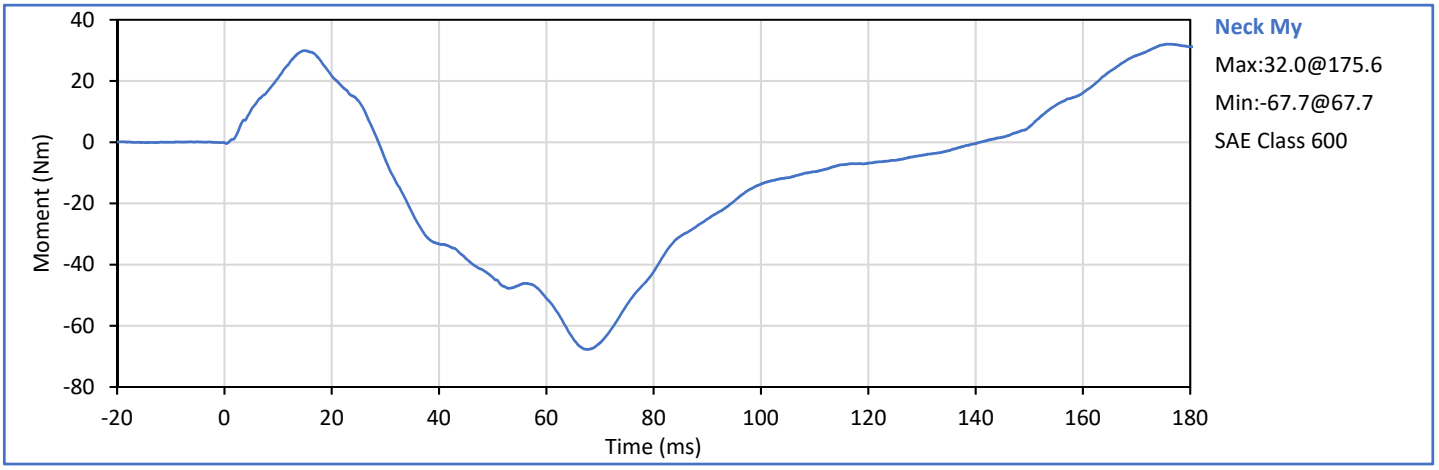
Approved By: P. Puzzuto

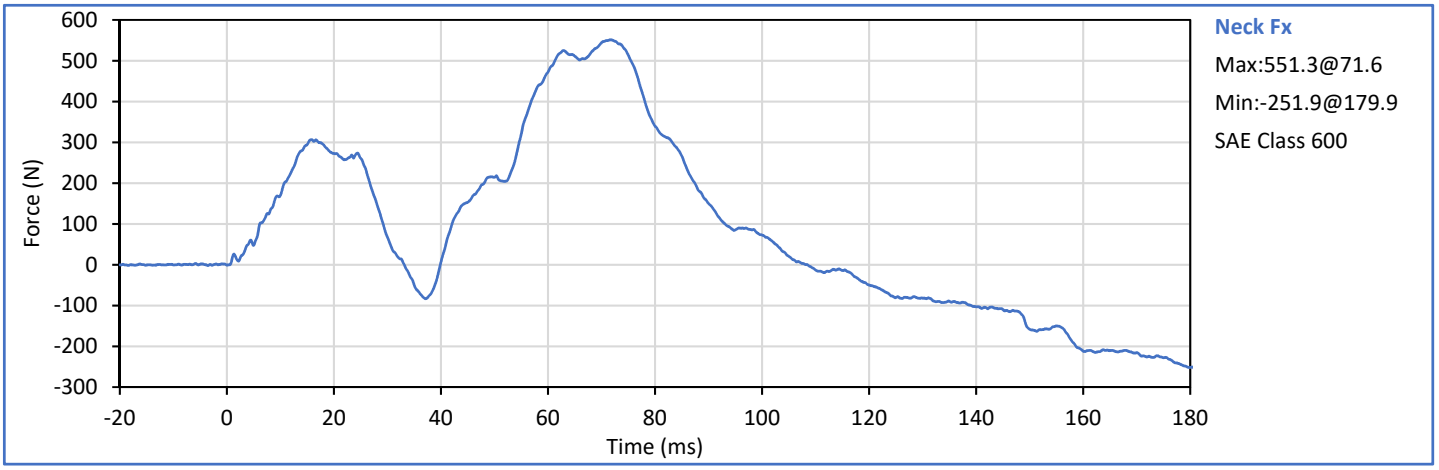
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 168 Test Date: 2020-09-22





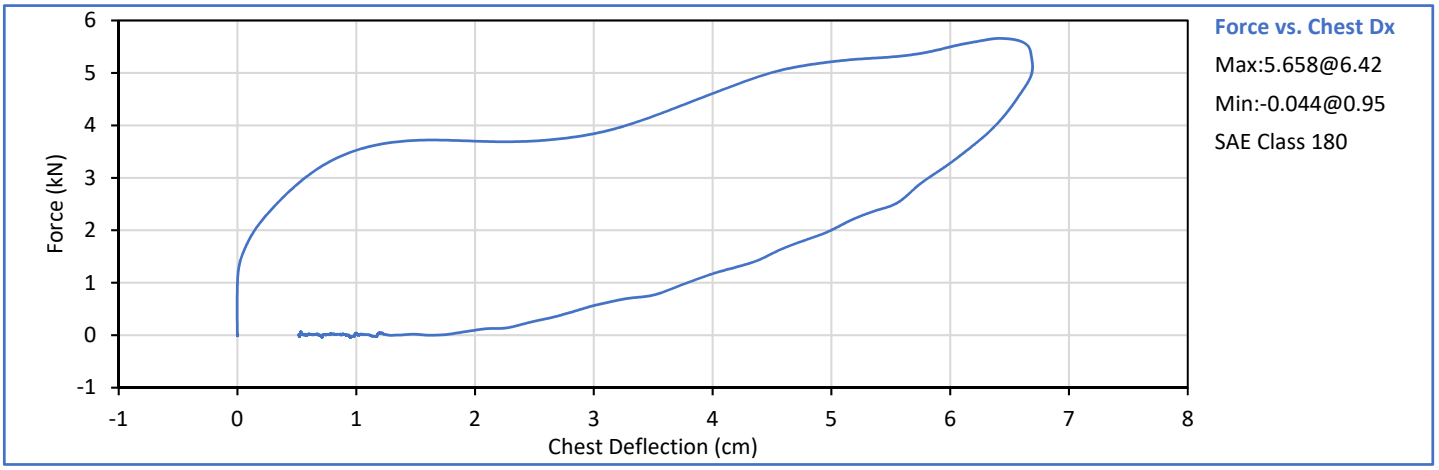


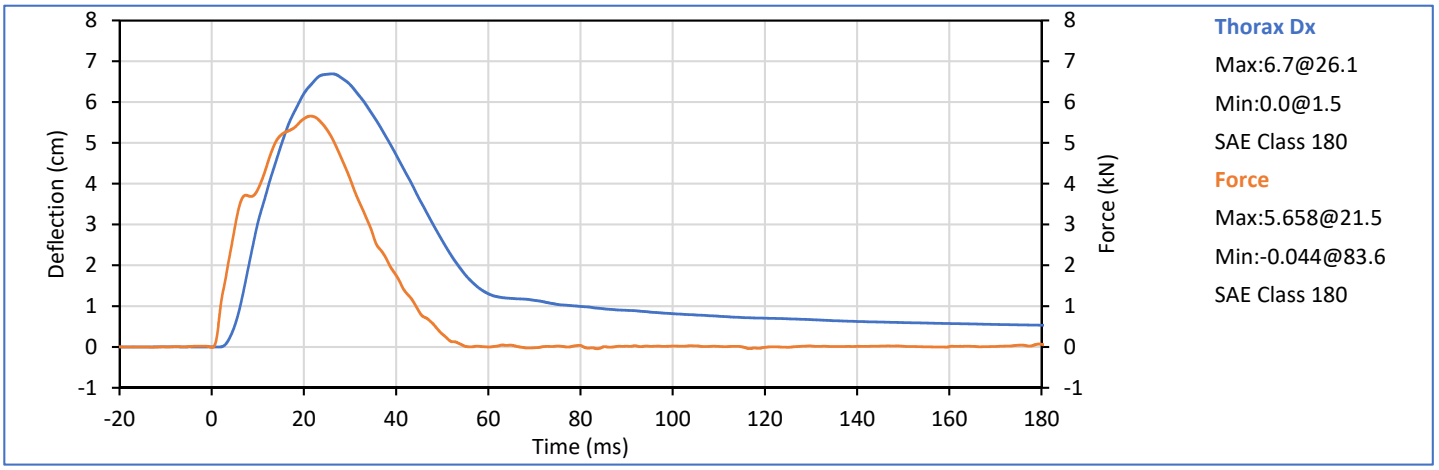
Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
Thorax Impact

ATD Serial No.: 168 Test Date: 2020-09-21

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
Probe Velocity	m/s	6.58	6.82	6.70	Pass
Peak Chest Deflection	cm	6.35	7.26	6.69	Pass
Peak Probe Force	kN	5.159	5.893	5.658	Pass
Internal Hysterisis	%	69.0	85.0	71.9	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

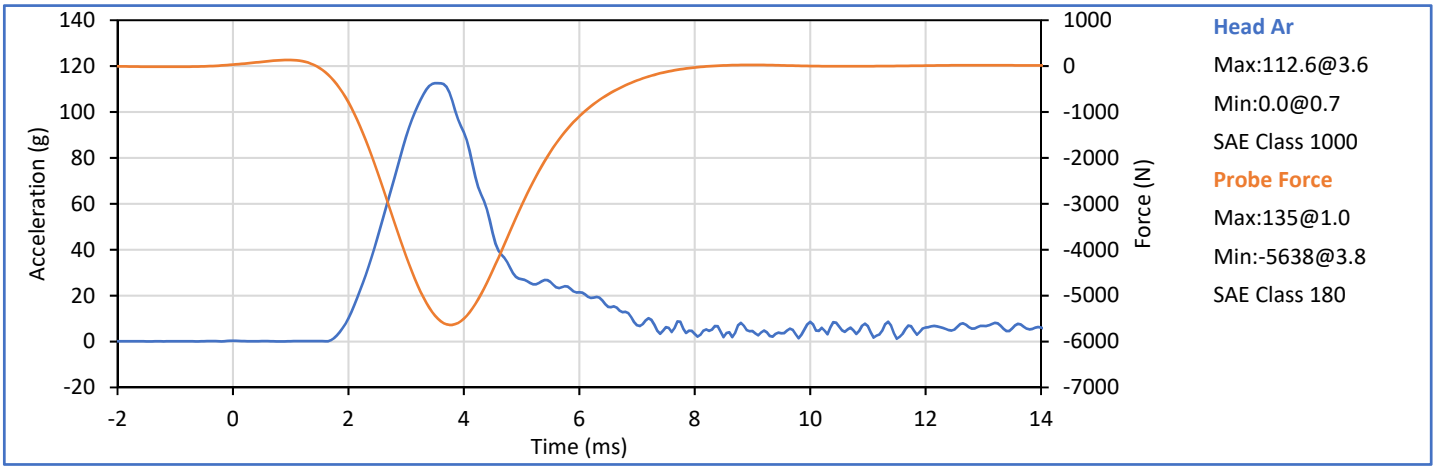
APPENDIX C
Post-Test ATD Qualification and Performance Verification
THOR-50M 50th Percentile Male ATD, (Reduced Certification)
S/N: D09799

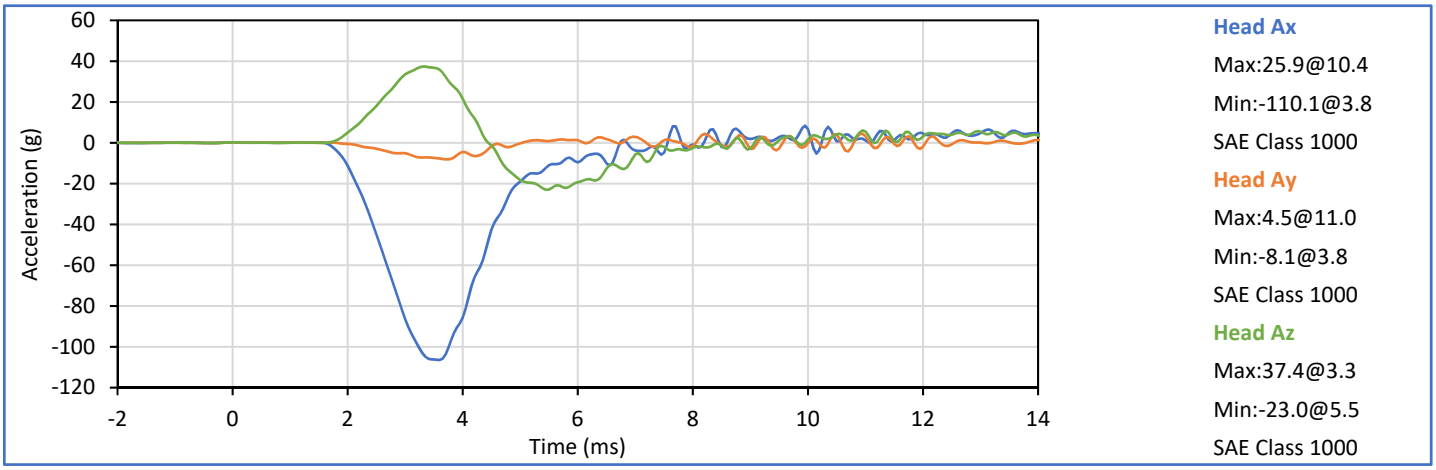
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Head Qualification

ATD Serial No.: D09799 Test Date: 2020-10-09

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	31	Pass
Probe Velocity	m/s	1.95	2.05	2.04	Pass
Peak Probe Force	kN	-6138	-5022	-5638	Pass
Peak Head Resultant Acceleration	g	105.3	128.7	112.6	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

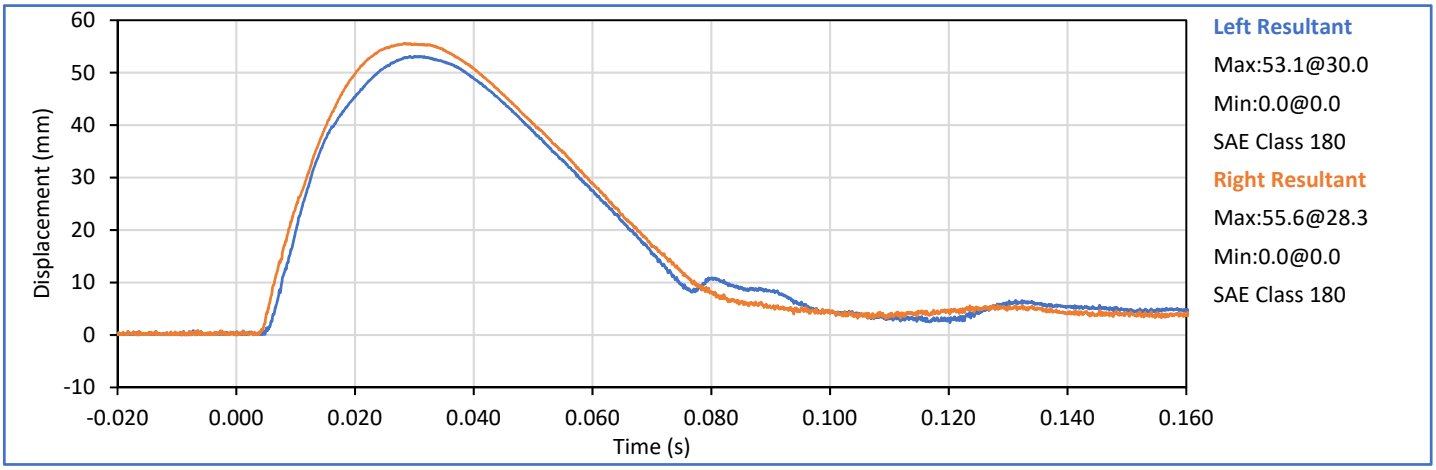
Approved By: P. Puzzuto

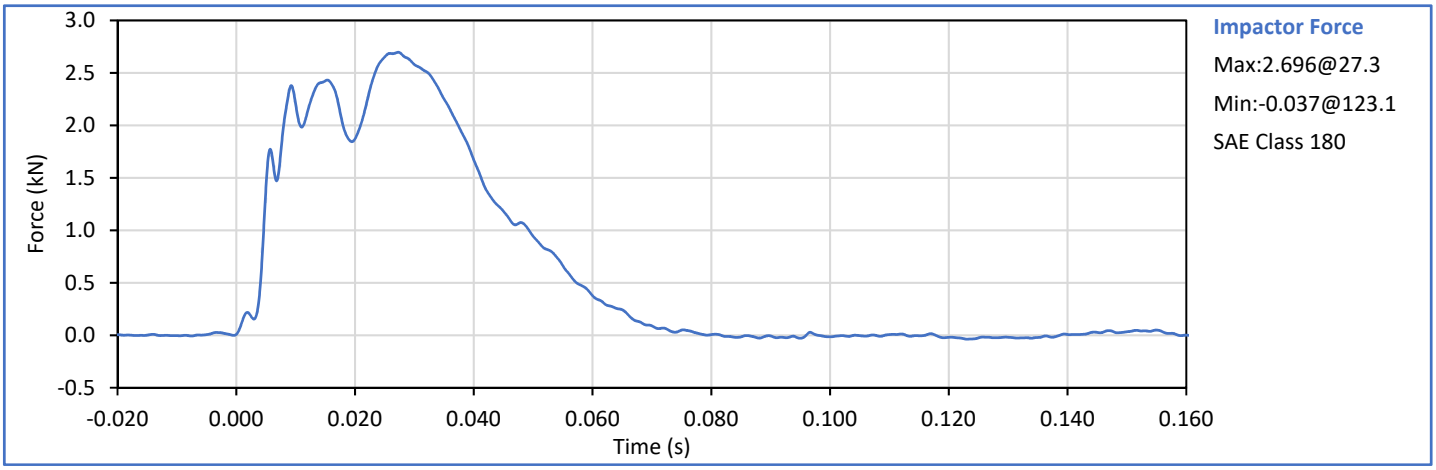
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Thorax Impact (Upper)

ATD Serial No.: D09799 Test Date: 2020-10-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.6	Pass
Laboratory Relative Humidity	%	10	70	34	Pass
Probe Velocity	m/sec	4.25	4.35	4.33	Pass
Peak Probe Force	kN		3.039	2.696	Pass
Peak Upper Left Deflection Resultant	mm	48.3	59.0	53.1	Pass
Peak Upper Right Deflection Resultar	mm			55.6	Pass
Absolute Difference L/R Dx Resultant	mm	0.0	5.0	2.5	Pass
Force at Peak Upper Left Resultant	mm	2.409	2.944	2.579	Pass
Force at Peak Upper Right Resultant	mm			2.652	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

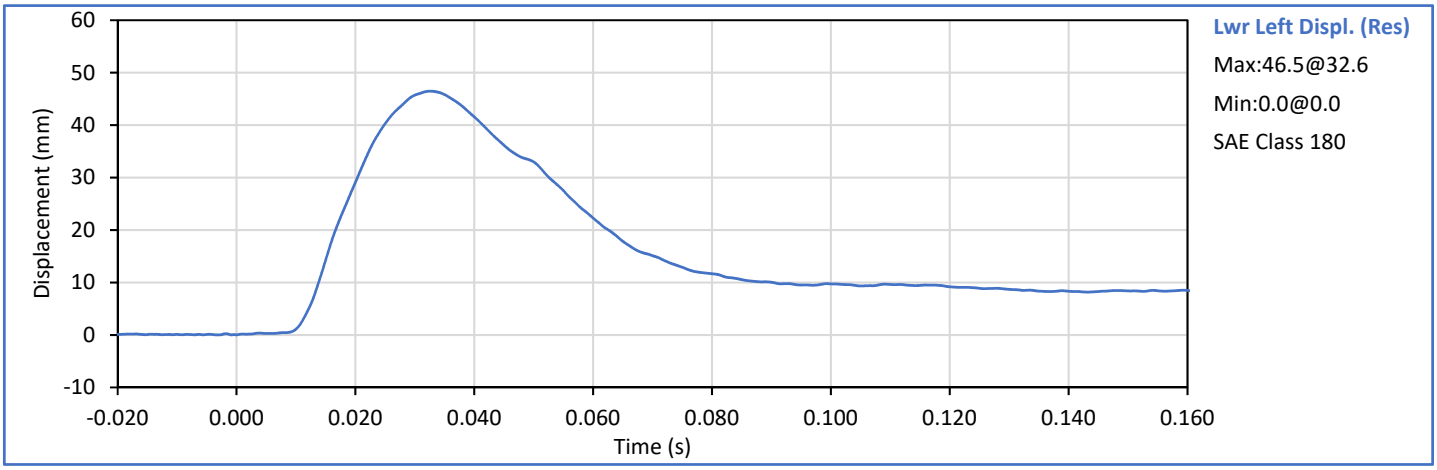
Approved By: P. Puzzuto

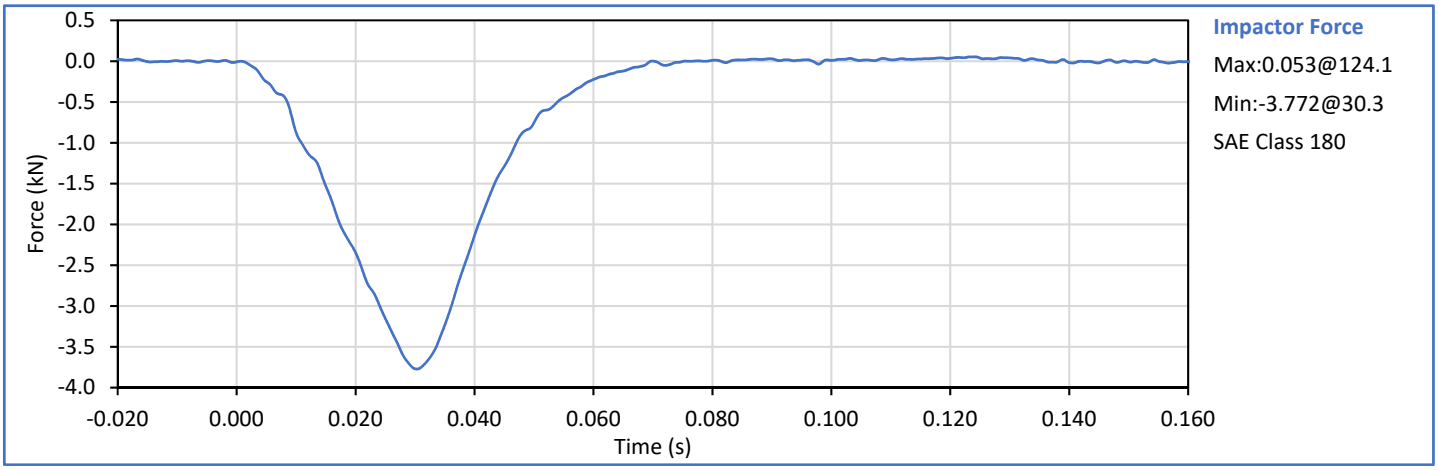
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Thorax Impact (Lower Left)

ATD Serial No.: D09799 Test Date: 2020-10-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Relative Humidity	%	10	70	34	Pass
Probe Velocity	m/sec	4.25	4.35	4.33	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.772	Pass
Lower Left Resultant Dx at Peak Fx	mm	45.8	56.0	45.9	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

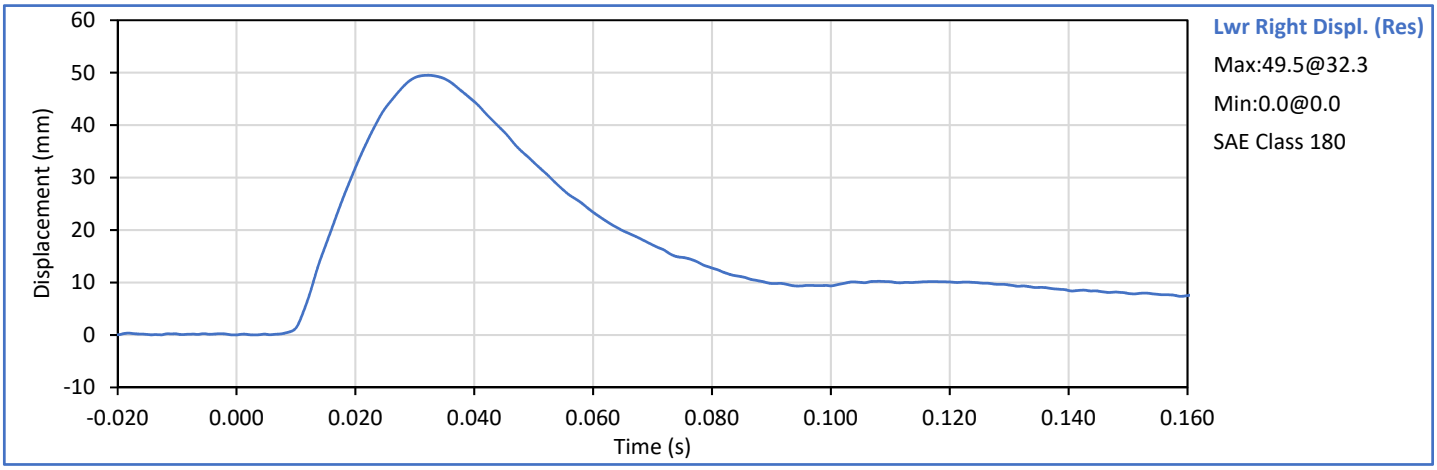
Approved By: P. Puzzuto

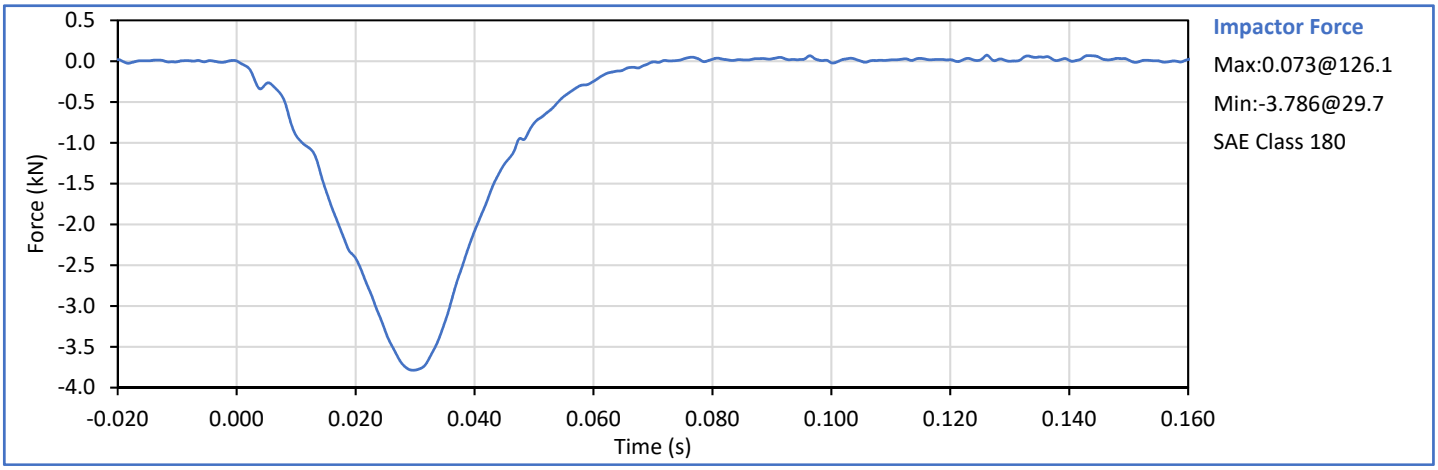
Applus IDIADA
KARCO

THOR-50M 50th Percentile Male ATD
Thorax Impact (Lower Right)

ATD Serial No.: D09799 Test Date: 2020-10-12

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	34	Pass
Probe Velocity	m/sec	4.25	4.35	4.33	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.786	Pass
Lower Right Resultant Dx at Peak Fx	mm	45.8	56.0	48.9	Pass
NHTSA Corridor 2019-05			Overall Test Results		Pass





Technician: J. Hernandez

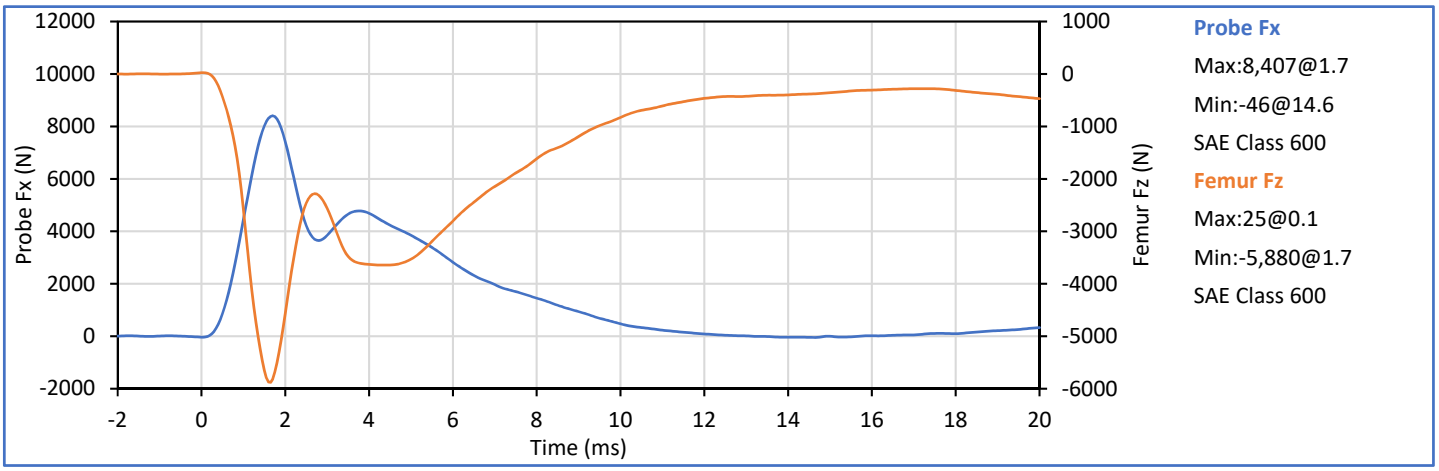
Approved By: P. Puzzuto

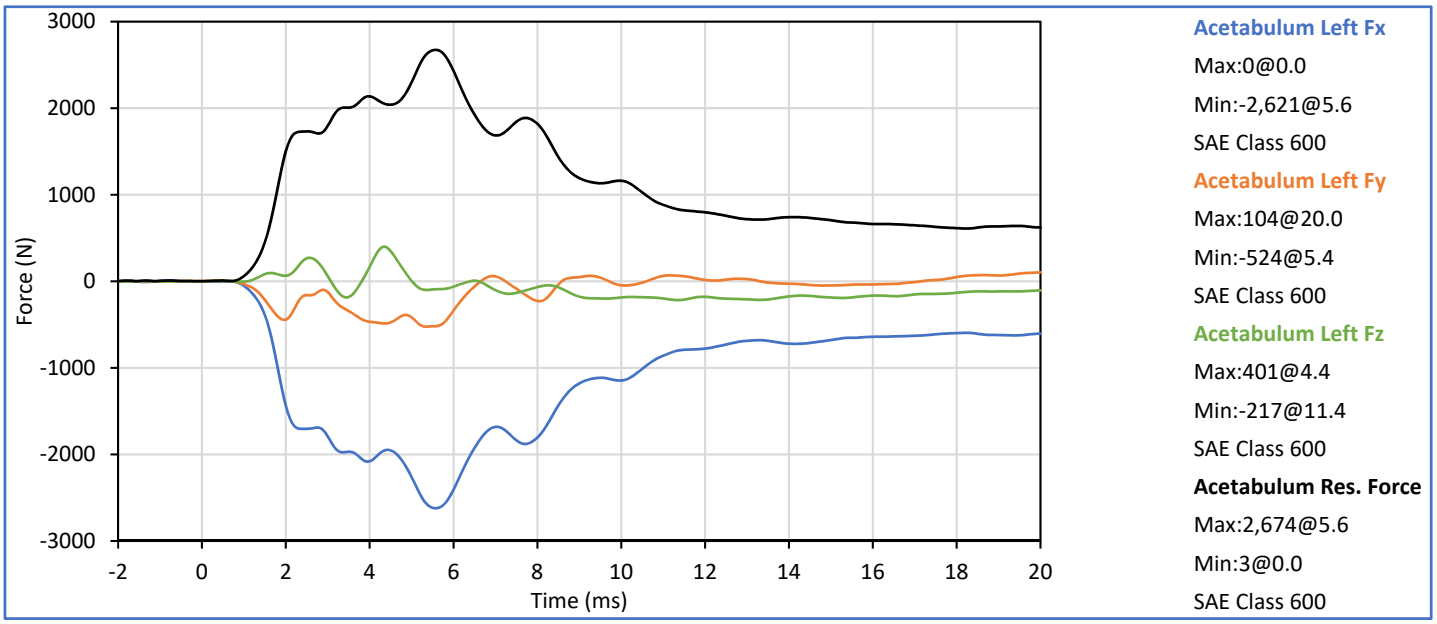
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Upper Leg (Left) Qualification

ATD Serial No.: D09799 Test Date: 2020-10-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Relative Humidity	%	10	70	34	Pass
Pendulum Velocity	m/s	3.25	3.35	3.32	Pass
Peak Probe Force	N	*	*	8407	*
Peak Femur Fz	N	*	*	-5880	*
Acetabulum Force Resultant	N	*	*	2674	*
* Research data. No defined P/F corridor			Overall Test Results		Pass





Technician: J. Hernandez

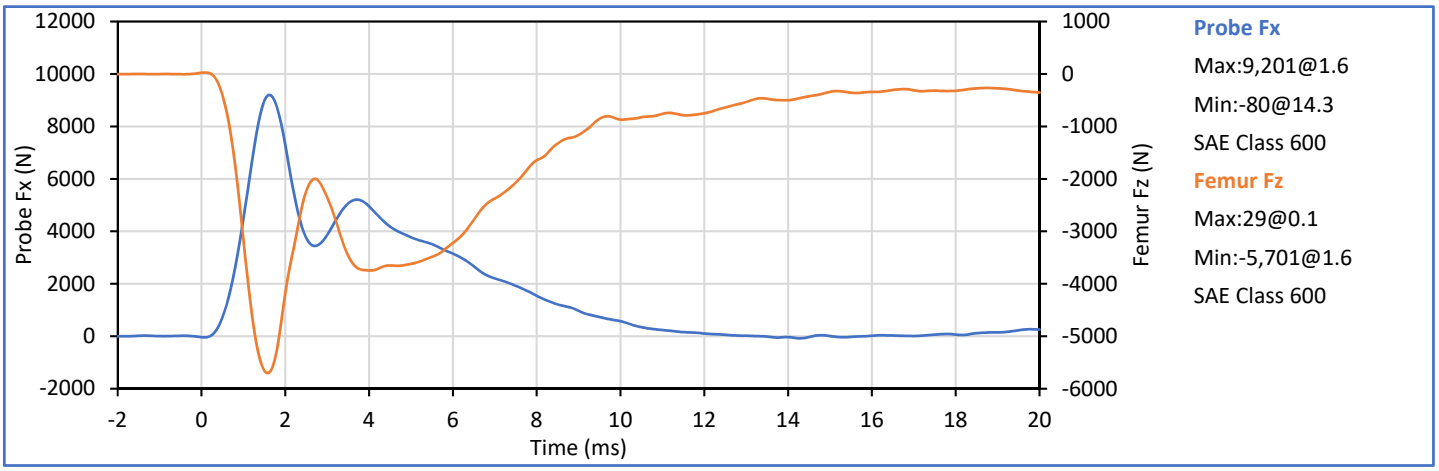
Approved By: P. Puzzuto

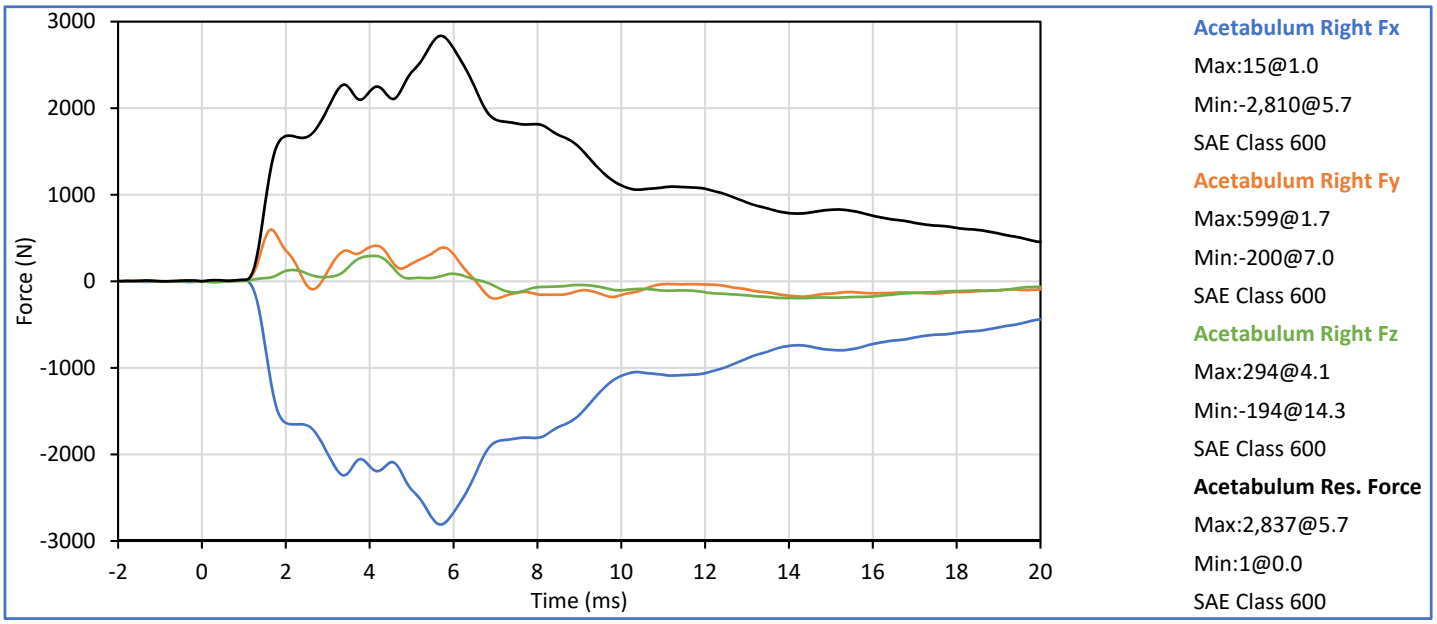
Applus IDIADA KARCO

THOR-50M 50th Percentile Male ATD
Upper Leg (Right) Qualification

ATD Serial No.: D09799 Test Date: 2020-10-12

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	31	Pass
Pendulum Velocity	m/s	3.25	3.35	3.32	Pass
Peak Probe Force	N	*	*	9201	*
Peak Femur Fz	N	*	*	-5701	*
Acetabulum Force Resultant	N	*	*	2837	*
* Research data. No defined P/F corridor			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX C
Post-Test ATD Qualification and Performance Verification
Hybrid III 50th Percentile Male ATD, (Compressed Certification)
S/N: 168

Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
ATD Damage Checklist

ATD Serial No.: 168 Test Date: 2020-10-07

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: J. Hernandez

Approved By: P. Puzzuto

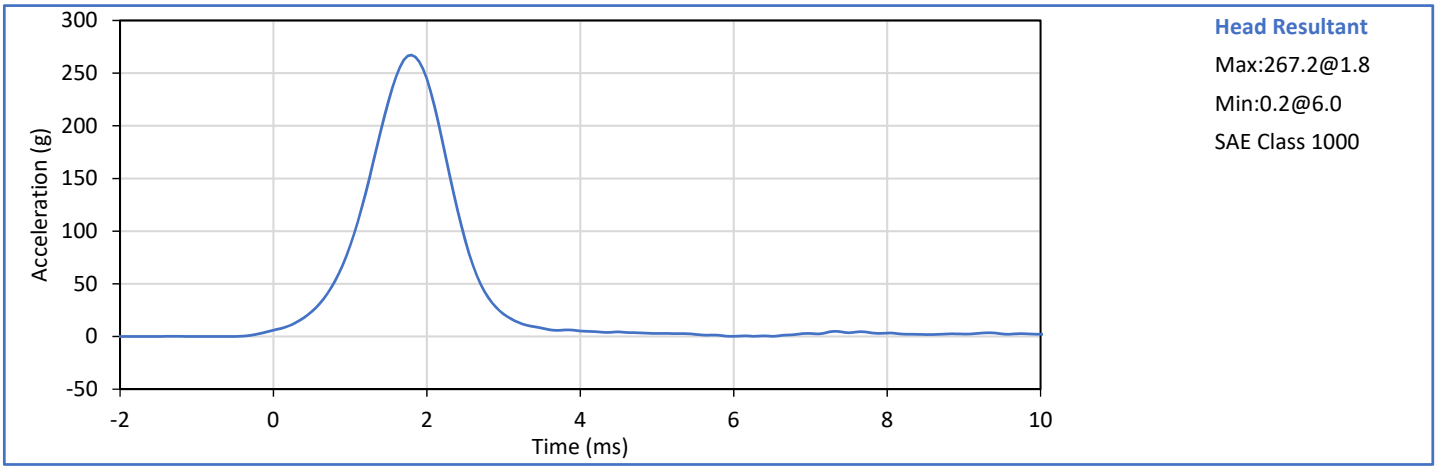
Applus IDIADA
KARCO

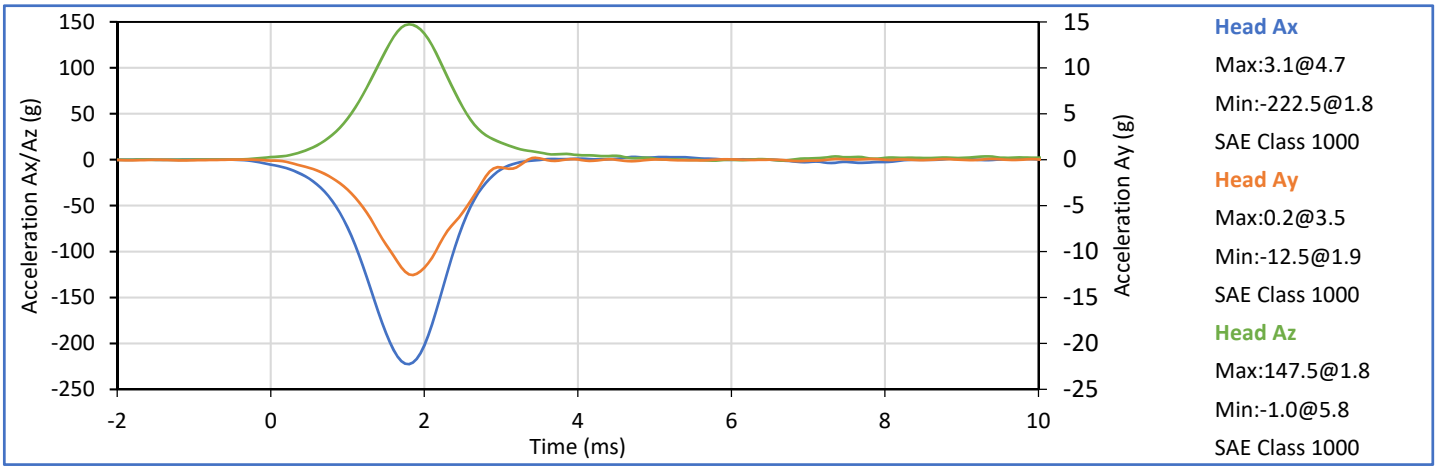
Hybrid III 50th Percentile Male ATD
Head Drop

ATD Serial No.: 168

Test Date: 2020-10-07

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	25	Pass
Peak Resultant Acceleration	g	225.0	275.0	267.2	Pass
Peak Lateral Acceleration	g	-15.0	15.0	-12.5	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

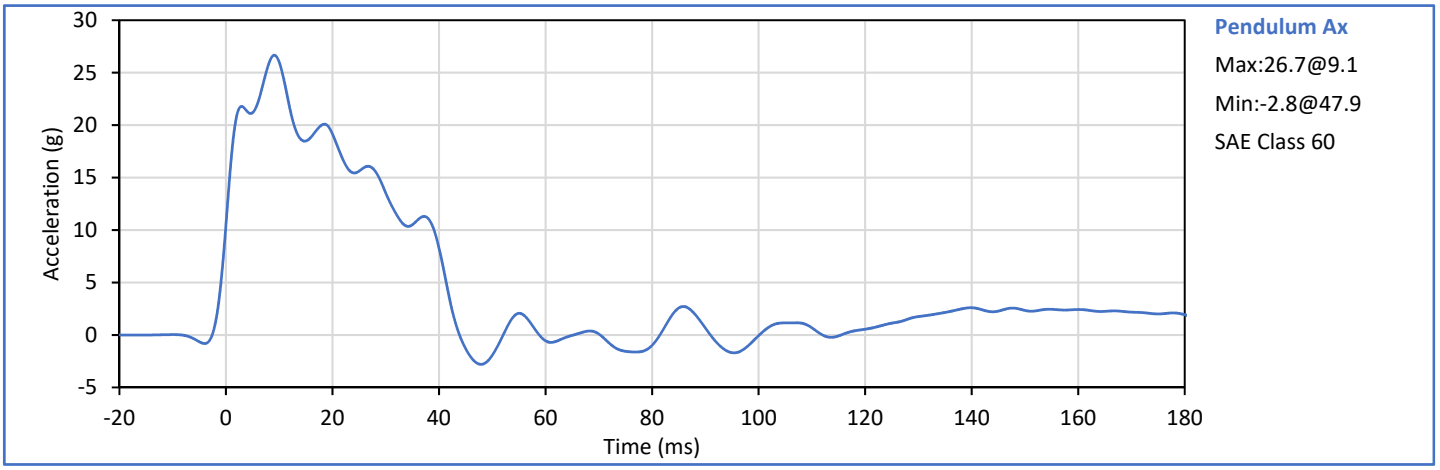
Approved By: P. Puzzuto

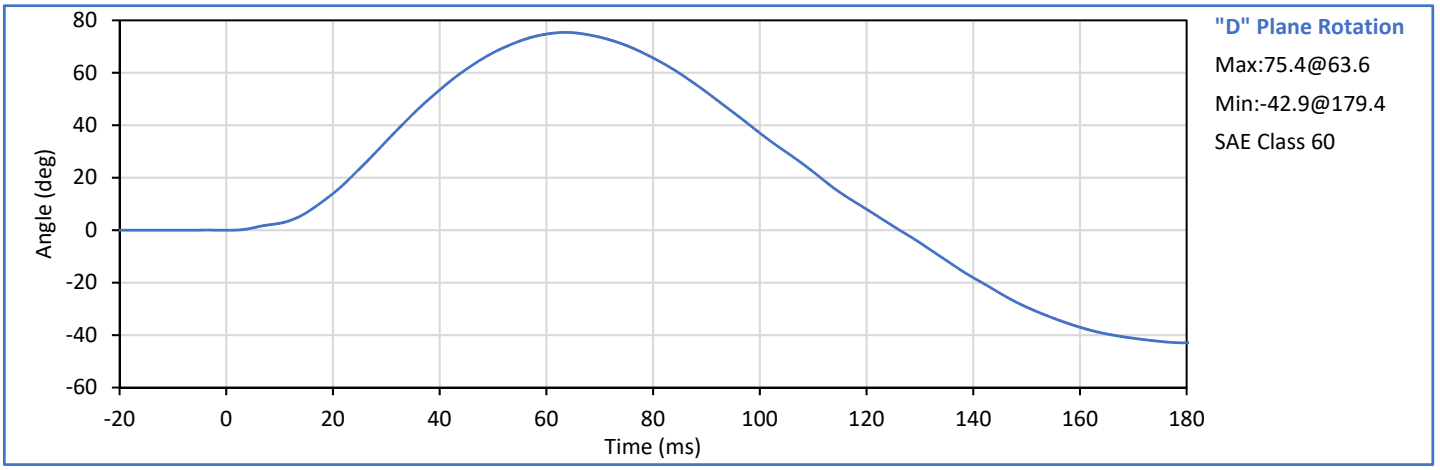
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 168 Test Date: 2020-10-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	6.89	7.13	6.92	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	26.0	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	19.1	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	13.5	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	13.5	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	41.3	Pass
"D" Plane Rotation peak	deg	64.0	78.0	75.4	Pass
	ms	57.0	64.0	63.6	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	126.3	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	89.0	Pass
	ms	47.0	58.0	54.9	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	103.4	Pass
			Overall Test Results		Pass



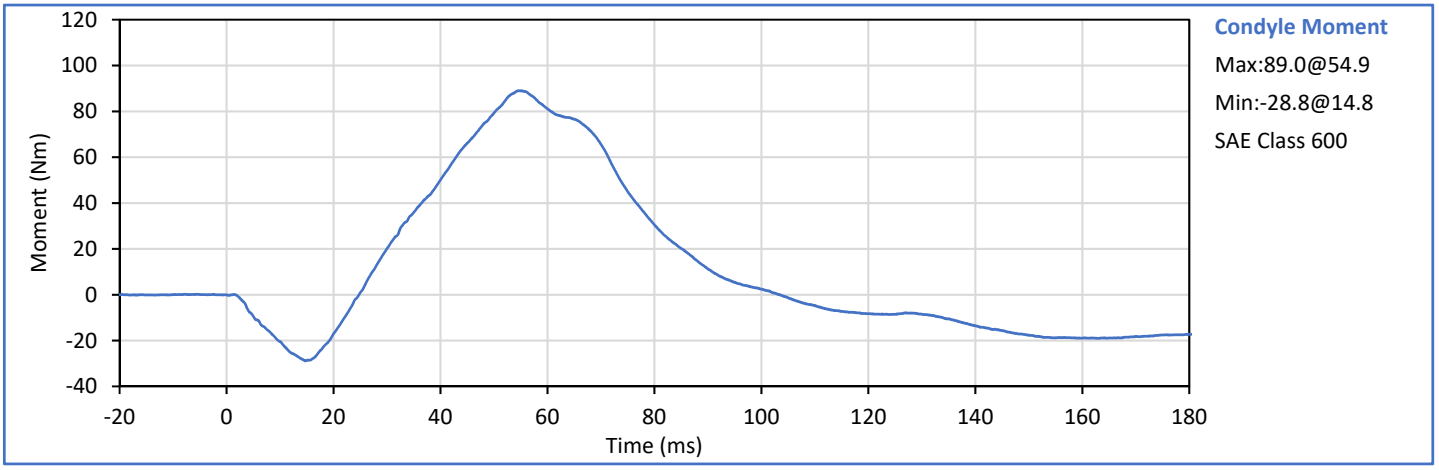


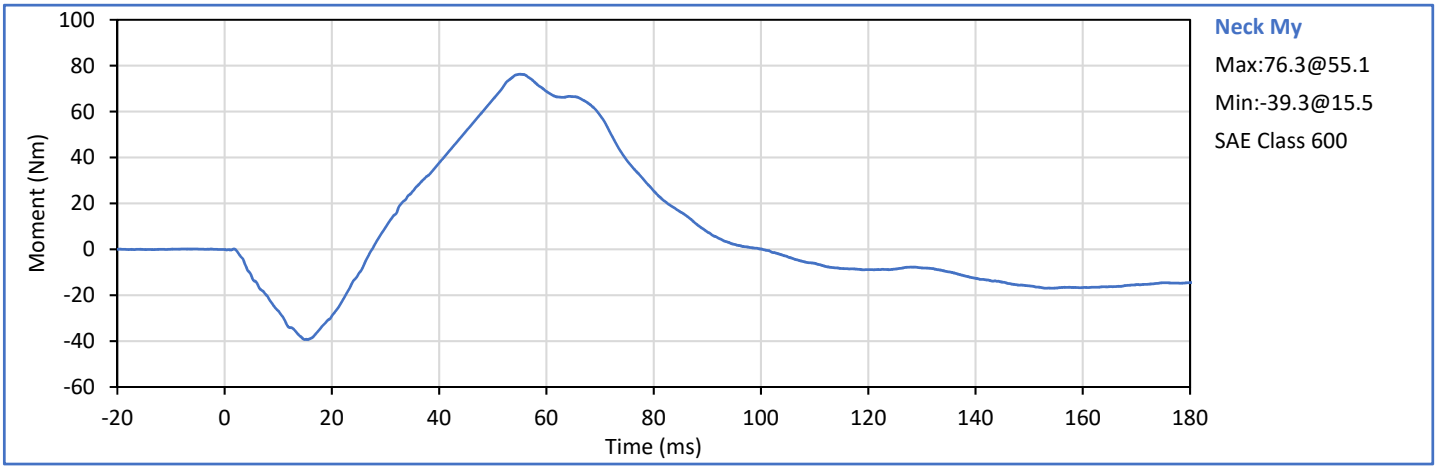
Technician: J. Hernandez

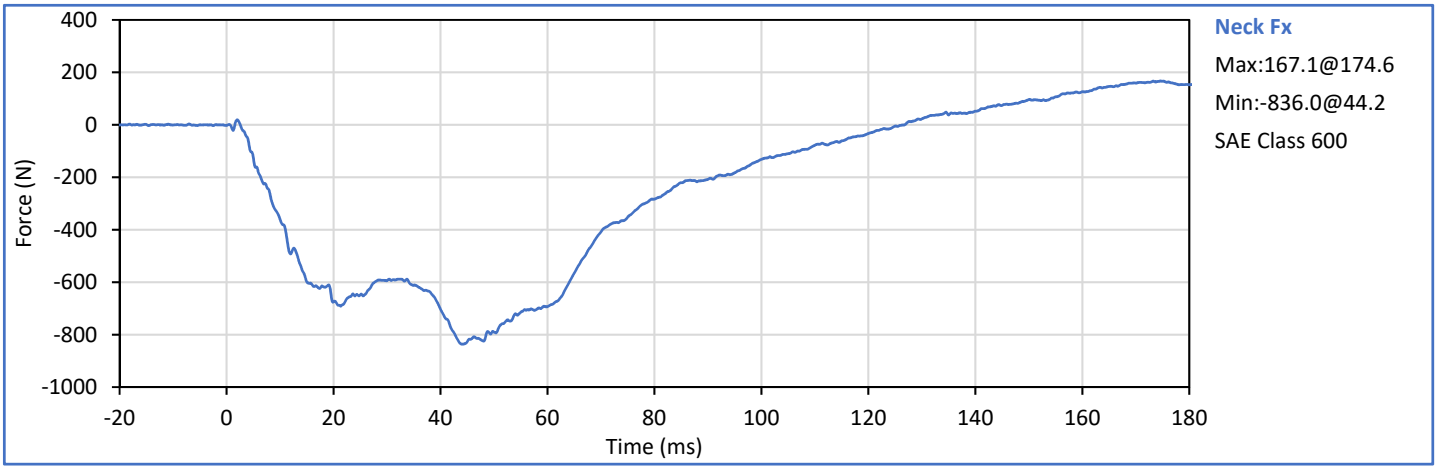
Approved By: P. Puzzuto

Hybrid III 50th Percentile Male ATD
Neck Flexion Test

ATD Serial No.: 168 Test Date: 2020-10-08





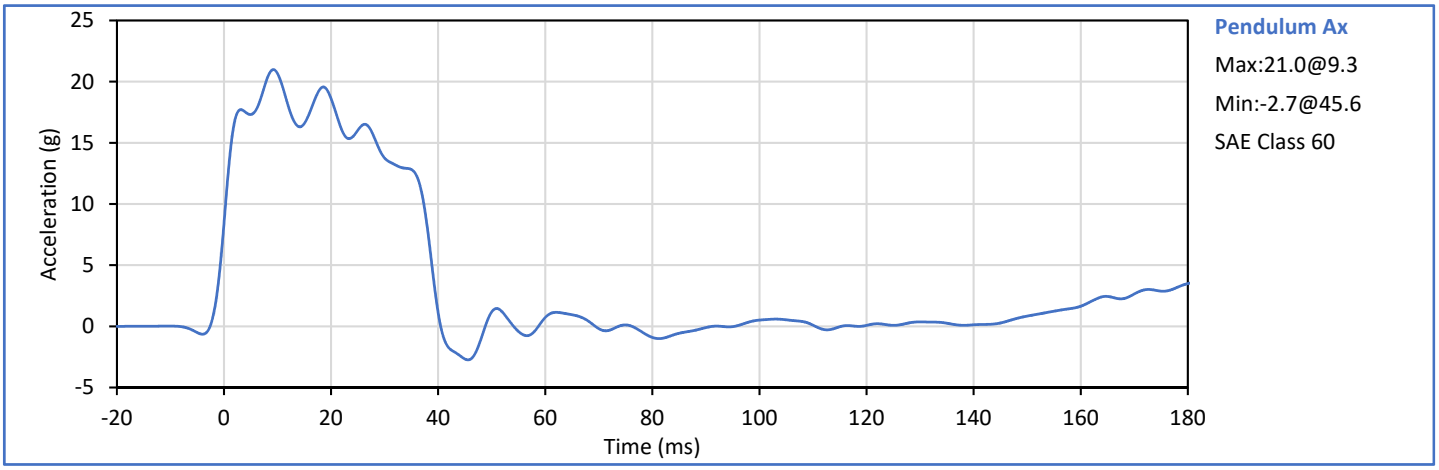


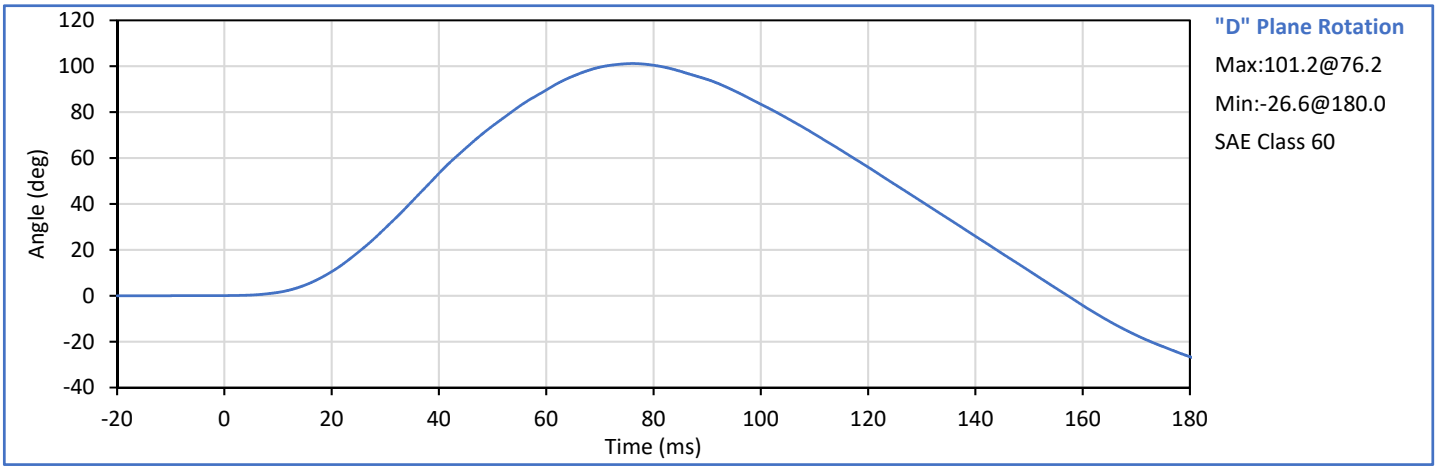
Applus IDIADA KARCO

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 168 Test Date: 2020-10-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.94	6.19	6.08	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	20.7	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.6	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.8	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	13.8	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	38.8	Pass
"D" Plane Rotation peak	deg	81.0	106.0	101.2	Pass
	ms	72.0	82.0	76.2	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	157.3	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-71.8	Pass
	ms	65.0	79.0	70.8	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	145.4	Pass
			Overall Test Results		Pass



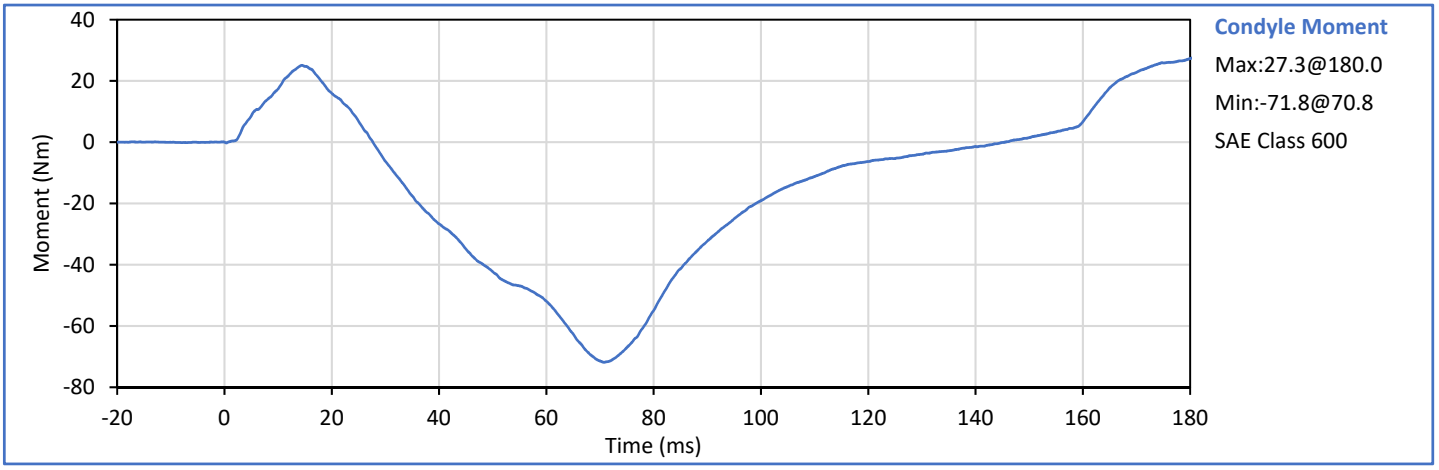


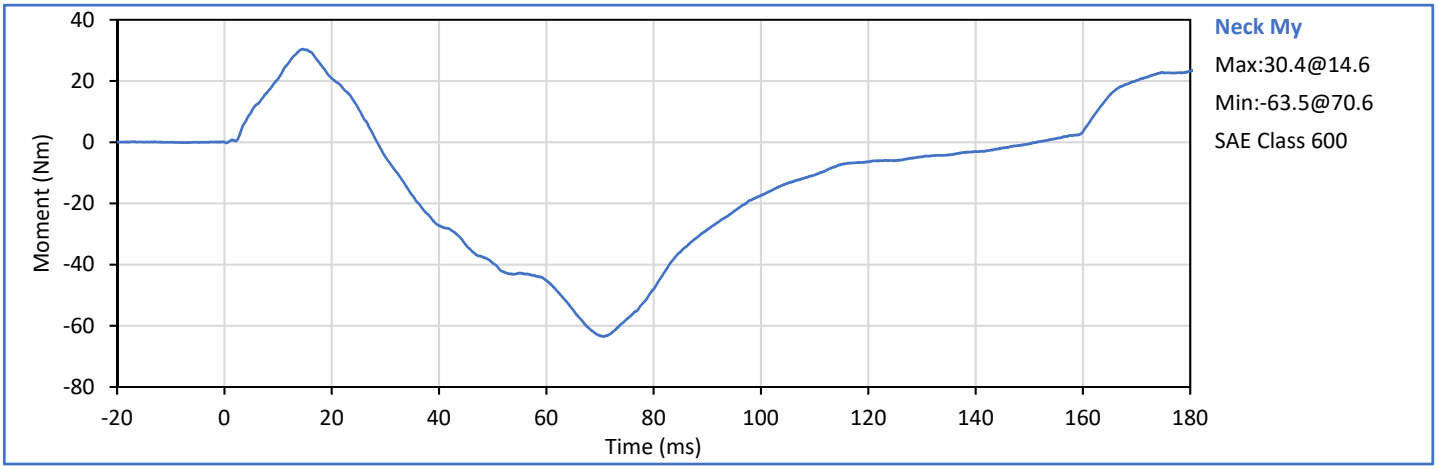
Technician: J. Hernandez

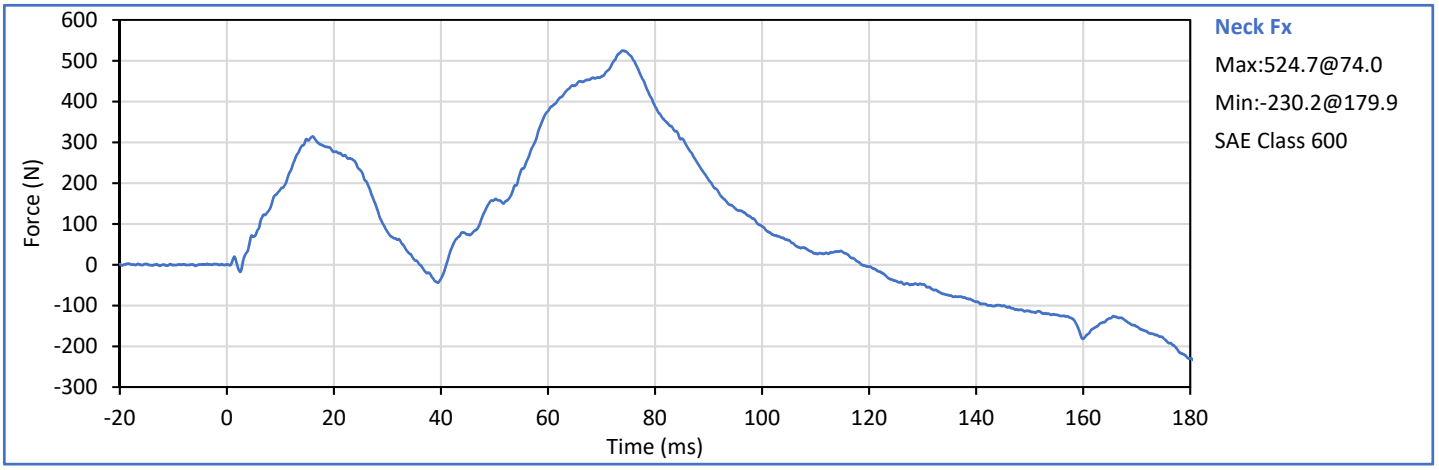
Approved By: P. Puzzuto

Hybrid III 50th Percentile Male ATD
Neck Extension Test

ATD Serial No.: 168 Test Date: 2020-10-08





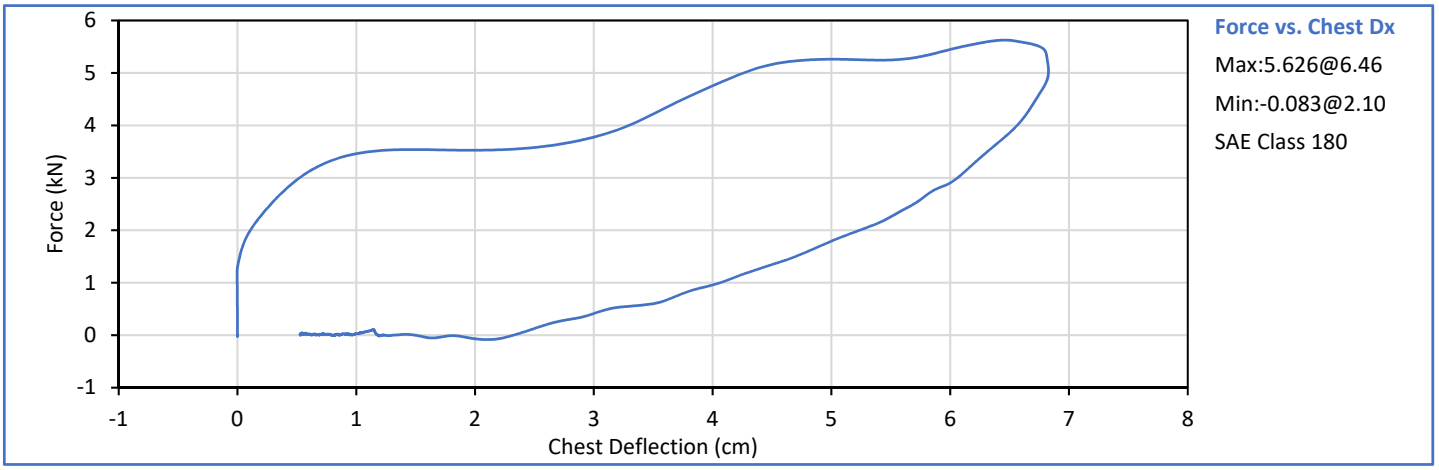


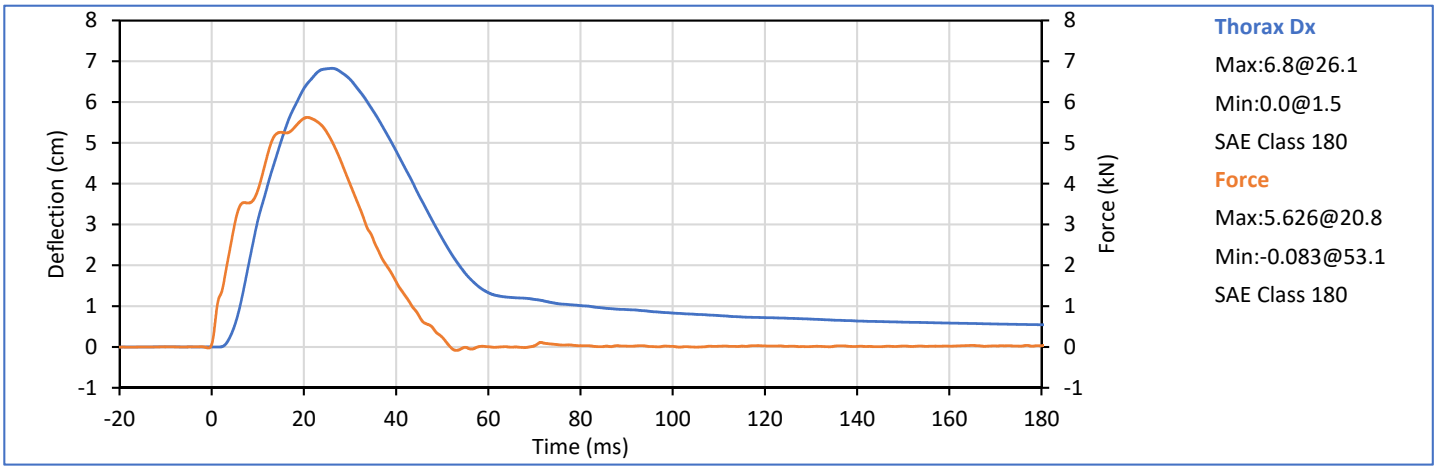
Applus IDIADA
KARCO

Hybrid III 50th Percentile Male ATD
Thorax Impact

ATD Serial No.: 168 Test Date: 2020-10-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	21	Pass
Probe Velocity	m/s	6.58	6.82	6.71	Pass
Peak Chest Deflection	cm	6.35	7.26	6.83	Pass
Peak Probe Force	kN	5.159	5.893	5.626	Pass
Internal Hysterisis	%	69.0	85.0	74.0	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto