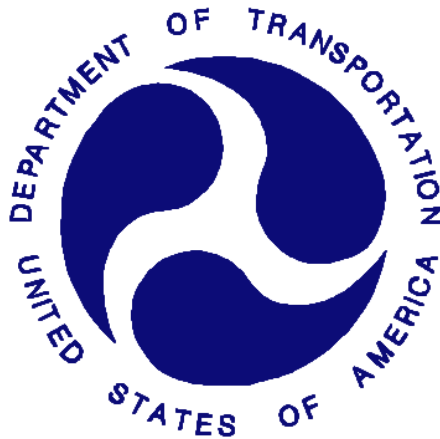


**RESEARCH FMVSS 214
MOVING DEFORMABLE BARRIER SIDE IMPACT**

**FORD MOTOR COMPANY
2020 Ford Ranger**

**PREPARED BY:
Transportation Research Center Inc.
10820 State Route 347
P. O. Box B-67
East Liberty, OH 43319**



Report Date: October 28, 2021

FINAL REPORT

**PREPARED FOR:
Vehicle Research and Test Center
P. O. Box 37
East Liberty, OH 43319**

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TRC TEST NUMBER: 210318

Project Manager, John Shultz

Report Approved October 28, 2021:

Transportation Research Center Inc.

Final Report Accepted by:

_____ Date: _____
Allison Loudon
Project Engineer
Vehicle Research & Test Center

Technical Report Documentation Page

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16. Abstract A 48/24 km/h 90° Moving Deformable Barrier Research Side Impact Test was conducted on the subject 2020 Ford Ranger in accordance with the specifications of the Laboratory Test Procedure for the Moving Deformable Barrier test. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on March 18, 2021. The impact velocity of the Moving Deformable Barrier (MDB) was 52.85 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.0°C. The target vehicle post test maximum crush was 165 mm at level 2. The test vehicle's performance was as follows:																														
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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE AND TEST PROCEDURE

This moving deformable barrier side impact test is a part of the Federal Motor Vehicle Safety Standard 214 Side Impact Protection program. It was conducted for the National Highway Traffic Safety Administration's (NHTSA) under 693JJ918D000019 by Transportation Research Center Inc.. The purpose of this test was to evaluate the repeatability, reproducibility, and durability of the WorldSID 50th percentile male ATD (WorldSID-50M) equipped with RibEye™, to determine whether the dummy is a viable option to replace the EuroSID-2 dummy with rib extension modifiers (ES-2re) in future side impact moving deformable barrier crash tests conducted by NHTSA. The test was conducted using NHTSA's 'LABORATORY TEST PROCEDURE FOR FMVSS No. 214, DYNAMIC SIDE IMPACT PROTECTION – Moving Deformable Barrier Test' dated September 2012 as a guideline. WorldSID-50M dummy was used instead of the ES-2re listed in the test procedure.”

SECTION 2

SUMMARY OF TEST RESULTS

A 2020 Ford Ranger was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 52.85 km/h (32.84 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on March 18, 2021. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (WorldSID-50M and WorldSID-05F with RibEye) are included in Appendix A.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the Research Side Impact Moving Barrier Test Procedure, dated July 2017. The WorldSID-50M was seated per NHTSA report <https://rosap.nhtl.bts.gov/view/dot/41900>. The side impact event was documented by 11 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

- DRIVER ATD (WorldSID-50M)
- Head CG tri-axial accelerometer
- Head angular rate sensor
- Upper and lower neck load cells
- Shoulder load cell
- RibEye measurement system in thorax ribs 1-3 and abdominal ribs 1 and 2, with three LEDs per rib
- Upper (T1), middle (T4), and lower spine (T12) tri-axial accelerometers
- Lumbar load cell
- Pelvic tri-axial accelerometers
- Pubic load cell
- Left and right sacroiliac load cells
- Left femur load cell

- PASSENGER ATD (WorldSID-05F)
- Head CG tri-axial accelerometer
- Head angular rate sensor
- Upper and lower neck load cells
- Shoulder load cell
- RibEye measurement system in thorax ribs 1-3 and abdominal ribs 1 and 2, with three LEDs per rib
- Upper (T1), middle (T4), and lower spine (T12) tri-axial accelerometers
- Lumbar load cell
- Pelvic tri-axial accelerometers
- Pubic load cell
- Left and right sacroiliac load cells
- Left femur load cell

APPENDIX B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in APPENDIX C of this report. APPENDIX D of this report contains the test equipment and instrumentation calibration data. Worksheets and plots found in Appendix E describe dummy positions in detail.

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (WorldSID-50M)	
	Units	Result
Head Injury Criterion (HIC15)	N/A	22
Brain Injury Criterion (BrIC)	N/A	0.39
Peak Shoulder Force	N	-492.34
Peak Thoracic Rib Deflection	mm	7.81
Peak Abdominal Rib Deflection	mm	9.24
Pubic Symphysis Force	N	-392.11
Peak Resultant Sacro-Iliac Force	N	1717.44

Measurement Description	Passenger ATD (WorldSID-05F)	
	Units	Result
Head Injury Criterion (HIC15)	N/A	51
Brain Injury Criterion (BrIC)	N/A	0.66
Peak Shoulder Force	N	1795.62
Peak Thoracic Rib Deflection	mm	11.69
Peak Abdominal Rib Deflection	mm	6.82
Pubic Symphysis Force	N	-796.16
Peak Resultant Sacro-Iliac Force	N	1605.36

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes		
Knee Airbag	No	N/A		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other Safety Restraint	No	N/A	No	N/A

GENERAL COMMENTS

All doors remained closed throughout the test. No fuel spillage occurred during the impact and the static rollover test was not performed.

Data Acquisition Explanations

RIGHT SIDE SILL AT REAR SEAT AZ; QD after 50.0 ms

Ribeye Error Codes:

- 1 if the top sensor is blocked or sees too much ambient light
- 2 if the bottom sensor is blocked or sees too much ambient light
- 3 if both top and bottom sensors are blocked or see too much ambient light
- 4 if the middle sensor is blocked or sees too much ambient light
- 5 if the middle and top sensors are blocked or see too much ambient light
- 6 if the middle and bottom sensors are blocked or see too much ambient light
- 7 if all three sensors are blocked or see too much ambient light
- 8 if a divide-by-zero condition occurred in the data processing
- 9 if data goes past the end of the calibration curves

**error codes may be positive or negative in data and will occur to all x, y, and z channels*

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

**DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

TEST VEHICLE INFORMATION AND OPTIONS

Model Year	2020
Make	Ford
Model	Ranger XL
Body Style	Truck
VIN	1FTER1EH3LLA66738
Body Color	Oxford White
Odometer Reading (km/mi)	158 mi.
Engine Displacement (L)	2.3
Type/No. Cylinders	Straight/4
Engine Placement	Inline
Transmission Type	Automatic
Transmission Speeds	10
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	No

Does owner's manual provide instructions to turn off automatic door locks?

---¹

DATA FROM CERTIFICATION LABEL

Manufactured By	FORD MOTOR COMPANY
Date of Manufacturer	7/20
Vehicle Type	Passenger Car

GVWR (lbs)	2744
GAWR Front (lbs)	1309
GAWR Rear (lbs)	1588

VEHICLE SEATING AND WEIGHT CAPACITY DATA

	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	2	N/A	4
Vehicle Capacity Weight (VCW) (kg)				841.0
DSC X 68.04 kg				272.2
Rated Cargo and Luggage Weight (RCLW) (kg)				568.8

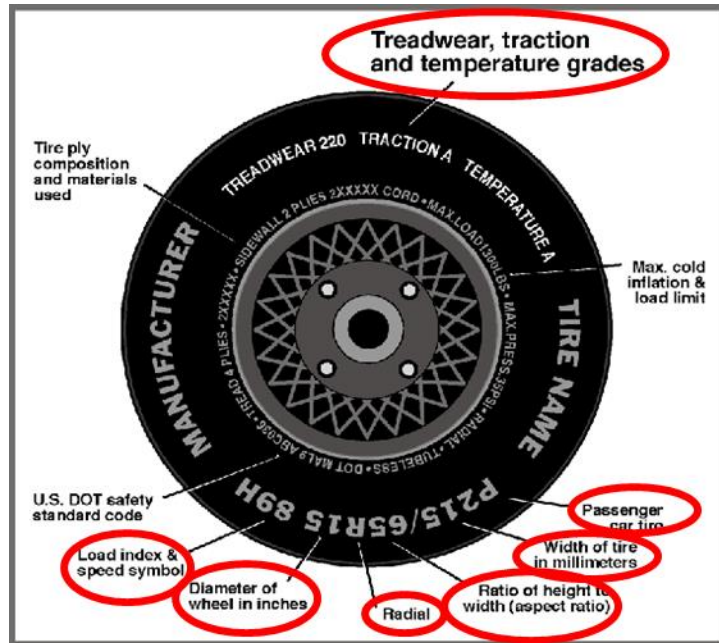
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	Yes	N/A	N/A	N/A	N/A	Yes	N/A
Rear or Second Row Seat	Yes	N/A	N/A	N/A	Yes	N/A	N/A
Third row seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

¹ Vehicle did not come with an owner's manual

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

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	255/70R16 111T	255/70R16 111T
Tire Size on Vehicle	255/70R16	255/70R16
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler H/T	Dueler H/T
Treadwear	520	520
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	111T	111T
Tire Material	Polyester/Steel/Nylon	Polyester/Steel/Nylon
DOT Safety Code Left	9BOK DHT 2620	9BOK DHT 2620
DOT Safety Code Right	9BOK DHT 2620	9BOK DHT 2620

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

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	240	240	240	240
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	--- ¹	--- ¹	--- ¹	--- ¹
As Tested	kPa	240	240	240	240

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21 kPa	207	207	207	207

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	549.0	413.4		623.2	509.2		614.8	523.6	
Right	kg	519.0	381.8		522.0	463.0		518.8	466.0	
Ratio	%	57.3	42.7		54.1	45.9		53.4	46.6	
Totals	kg	1068.0	795.2	1863.2	1145.2	972.2	2117.4	1133.6	989.6	2123.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1863.2	(A)
Weight of 1 WorldSID (75kg) & 1 SID-IIs (49kg) ATD	kg	124.0	(B)
Rated Cargo/Luggage Weight (RCLW) ²	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2123.2	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? YES NO

TEST VEHICLE ATTITUDES AND CG

	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	967	963	Yes
RF	mm	977	977	Yes
RR	mm	1046	1046	Yes
LR	mm	1028	1025	Yes
Vehicle CG (Aft of Front Axle)	mm	+1496	+1474	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+57	+54	

***The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well. Indicate "Yes" or "No" for "Meets Requirement".

¹ Vehicle did not come with an owner's manual

² Rated cargo and luggage weight limited to 136.0 kg or 300.0 lbs.

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

Test Vehicle: 2020 Ford Ranger
Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

Test height adjustable suspension setting, if applicable: N/A

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plates in truck bed	57.4
Components removed: None	0.0

DATA SHEET NO. 2

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	14.8	9.6	12.2
Front Passenger Seat	19.3	14.5	16.9
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	N/A	N/A	10.6
Non-Struck Side Rear Seat	N/A	N/A	11.3
Rear Center Seat*	N/A	N/A	N/A

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forward-Most
Driver Seat	12.2	301	Max	330	337	343
			Mid	311	301	290
			Min	302	297	292
Front Passenger Seat	16.9	228	Max	254	260	365
			Mid	220	228	234
			Min	209	216	226
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	10.6	309	Max	N/A	N/A	N/A
			Mid	N/A	309	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	11.3	252	Max	N/A	N/A	N/A
			Mid	N/A	252	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	254	38	131	19
Front Passenger Seat	255	38	131	19
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	0	Fixed	0	Fixed
Non-Struck Side Rear Seat	0	Fixed	0	Fixed
Rear Center Seat*	N/A	N/A	N/A	N/A

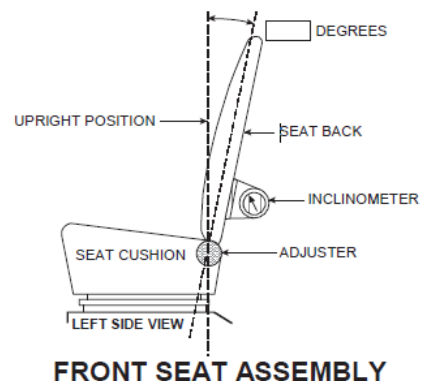
* If applicable.

NORMAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.

Driver seat: The driver's seat back was positioned according to the manufacturer's information as provided on Form 1; resulting in a head rest post angle of 2.9° rearward measured at the head rest post. The seat was positioned at mid-track fore and aft travel. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back.

Rear Passenger Seat: The left rear passenger seat back is seat back fixed. The seat track travel was fixed.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/ Seated Dummy	47.1	25	2.9	8
Front Passenger Seat	49.1	25	5.1	8
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	1.5	Fixed	N/A	Fixed
Non-Struck Side Rear Seat	1.4	Fixed	N/A	Fixed
Rear Center Seat*	N/A	N/A	N/A	N/A

* If applicable.

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted with the information provided by the manufacturer on Form No. 1

	Total # of Positions	Placed in Position #
Driver Seat	1; Fixed	Fixed
Rear Seat	1; Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the lowest and most full rearward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	3 up, 7 fwd	3 up, full up
Rear Seat	1, Fixed	Fixed

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2020 Ford Ranger

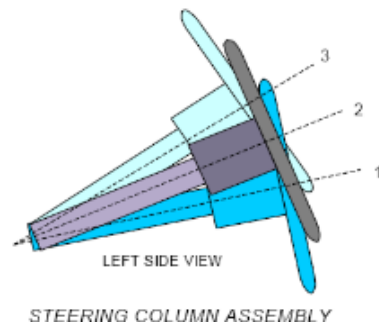
Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel geometric locus it describes when moved through its full range of motion.

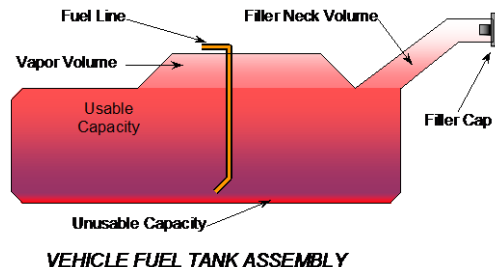
	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	20.1	0
Geometric Center, Position No. 2	22.9	20
Uppermost, Position No. 3	25.6	40
Telescoping Steering Wheel Travel		40
Test Position	22.9	20



FUEL PUMP

Describe the fuel pump type, details about how it operates and the location of the fuel filler neck:

The electronic fuel pump operates for a prescribed amount of time to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within two seconds following ignition operation the fuel pump will shut-off. The fuel pump operates continuously while the engine is running. If the engine stalls the fuel pump is deactivated. A fuel system shut-off system is also equipped which is designed to stop the fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	71.2
Usable Capacity of "Optional" Tank (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	--- ¹
Usable Capacity of Optional Tank (see Owner's Manual)	--- ¹
93% of Usable Capacity	66.2
Actual Amount of Solvent Used in Test	66.2
1/3 of Usable Capacity	23.7

Is the Actual Amount of Solvent Used in the test equal to 93% +/- 1% of the Usable Capacity stated on Form No. 1? YES NO

¹ Vehicle did not come with an owner's manual

TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

Driver Dummy Serial Number: EB8888

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Head Acceleration (g)	X	6.23	200.05	-8.21	45.60
	Y	19.87	59.25	-4.29	94.10
	Z	5.17	67.55	-12.10	17.35
	R	20.26	59.75		
Head Angular Rate (deg/sec)	X	327.18	21.95	-553.43	120.50
	Y	441.59	161.80	-358.19	83.45
	Z	551.67	102.05	-831.74	54.45
Upper Neck Force (N)	X	139.13	63.45	-166.27	123.75
	Y	41.71	27.65	-174.37	94.10
	Z	233.41	51.45	-142.46	103.55
Upper Neck Moment (Nm)	X	5.00	137.40	-26.19	66.55
	Y	13.77	137.30	-18.54	73.35
	Z	12.99	69.55	-5.91	130.85
Lower Neck Force (N)	X	93.55	197.45	-165.45	122.80
	Y	108.64	25.35	-117.87	16.30
	Z	394.95	50.50	-237.72	102.90
Lower Neck Moment (Nm)	X	5.56	164.70	-38.09	85.00
	Y	38.47	124.85	-23.47	62.75
	Z	13.29	70.05	-4.61	183.45
Driver Shoulder Force (N)	X	72.92	115.20	-500.55	15.80
	Y	305.13	56.20	-492.34	28.35
	Z	283.64	32.80	-112.25	122.90
Shoulder Rear Ribeye Position (mm)	X	-36.18	55.95	-60.23	117.60
	Y	-81.46	128.00	-88.76	59.55
	Z	-40.35	128.05	-69.53	47.50
Length of Change (mm)		2.34	46.35	-3.45	225.55
Shoulder Middle Ribeye Position (mm)	X	-3.22	55.20	-27.44	118.35
	Y	-92.08	29.45	-99.50	60.20
	Z	-40.23	120.45	-73.99	47.00
Length of Change (mm)		2.80	28.20	-5.20	60.15
Shoulder Front Ribeye Position (mm)	X	29.67	52.10	5.85	119.20
	Y	-80.29	32.90	-86.62	115.45
	Z	-44.92	120.40	-76.79	47.50
Length of Change (mm)		1.51	28.10	-7.44	57.85

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

Driver Dummy Serial Number: EB8888

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Thorax Rib 1 Rear Ribeye Position (mm)	X	-24.35	38.60	-36.39	53.30
	Y	-95.78	125.75	-105.21	125.20
	Z	3.95	125.75	-7.61	34.95
Length of Change (mm)		4.50	33.30	-2.92	125.15
Thorax Rib 1 Middle Ribeye Position (mm)	X	11.57	38.20	-1.99	53.70
	Y	-102.86	29.35	-109.38	89.50
	Z	3.66	121.75	-7.39	34.90
Length of Change (mm)		5.06	29.30	-1.11	84.40
Thorax Rib 1 Front Ribeye Position (mm)	X	45.68	37.90	33.12	53.45
	Y	-95.31	30.00	-102.85	196.70
	Z	1.81	121.70	-8.40	34.20
Length of Change (mm)		3.14	28.30	-2.70	196.75
Thorax Rib 2 Rear Ribeye Position (mm)	X	-18.23	38.65	-29.02	51.40
	Y	-94.61	36.35	-101.52	117.10
	Z	39.33	-40.50	33.67	36.60
Length of Change (mm)		7.81	36.55	-0.20	-17.90
Thorax Rib 2 Middle Ribeye Position (mm)	X	19.90	36.20	6.72	52.40
	Y	-103.00	36.50	-111.75	293.30
	Z	42.44	167.05	35.91	39.20
Length of Change (mm)		6.51	31.70	-1.39	293.15
Thorax Rib 2 Front Ribeye Position (mm)	X	54.59	37.55	42.20	55.20
	Y	-92.89	35.60	-103.08	12.50
	Z	45.66	-12.90	39.76	39.20
Length of Change (mm)		6.13	28.10	-1.87	239.65
Thorax Rib 3 Rear Ribeye Position (mm)	X	-40.67	40.50	-49.35	53.20
	Y	-88.38	26.70	-95.62	291.10
	Z	-34.73	157.60	-41.11	37.40
Length of Change (mm)		5.63	37.05	-1.21	291.30
Thorax Rib 3 Middle Ribeye Position (mm)	X	-6.86	38.85	-17.79	52.70
	Y	-94.90	28.25	-102.48	85.40
	Z	-33.70	5.80	-40.96	37.40
Length of Change (mm)		5.91	28.40	-1.07	189.80

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

Driver Dummy Serial Number: EB8888

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Thorax Rib 3 Front Ribeye Position (mm)	X	23.83	37.90	13.16	-47.45
	Y	-86.30	27.70	-92.94	87.20
	Z	-35.18	-49.10	-41.76	37.70
Length of Change (mm)		2.25	27.65	-1.61	92.00
Abdomen Rib 1 Rear Ribeye Position (mm)	X	-25.79	39.70	-32.09	53.00
	Y	-89.01	26.90	-103.37	207.25
	Z	-1.00	207.25	-9.16	74.50
Length of Change (mm)		7.07	26.70	-2.26	207.35
Abdomen Rib 1 Middle Ribeye Position (mm)	X	9.38	38.90	0.79	54.30
	Y	-95.91	32.40	-104.72	148.95
	Z	-0.68	-27.15	-8.44	74.05
Length of Change (mm)		7.46	32.95	-0.91	103.30
Abdomen Rib 1 Front Ribeye Position (mm)	X	42.02	37.70	33.04	-28.75
	Y	-88.92	34.55	-97.47	145.75
	Z	0.66	-49.15	-6.46	68.10
Length of Change (mm)		4.13	34.70	-1.33	243.60
Abdomen Rib 2 Rear Ribeye Position (mm)	X	-9.38	14.15	-17.08	291.50
	Y	-84.97	35.30	-102.68	209.50
	Z	33.77	20.80	21.60	74.50
Length of Change (mm)		7.61	39.00	-6.32	209.45
Abdomen Rib 2 Middle Ribeye Position (mm)	X	22.00	40.95	11.75	296.00
	Y	-93.89	44.00	-105.85	291.50
	Z	32.67	20.20	18.81	73.30
Length of Change (mm)		9.24	36.00	-2.41	291.65
Abdomen Rib 2 Front Ribeye Position (mm)	X	53.21	40.15	42.45	288.30
	Y	-87.44	44.60	-97.92	260.10
	Z	32.76	22.40	19.96	74.00
Length of Change (mm)		6.48	29.65	-0.38	11.75
T1 Acceleration (g)	X	7.32	54.90	-3.61	105.35
	Y	17.19	65.60	-5.87	15.40
	Z	10.47	65.60	-6.34	18.80
	R	21.33	65.50		

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021
 Driver Dummy Serial Number: EB8888

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
T4 Acceleration (g)	X	3.54	100.40	-7.55	64.20
	Y	7.42	19.65	-20.07	28.40
	Z	7.13	65.30	-2.50	18.75
	R	20.40	28.40		
T12 Acceleration (g)	X	5.12	15.90	-3.61	104.80
	Y	28.49	27.45	-3.42	20.75
	Z	8.90	19.55	-5.15	39.55
	R	29.04	27.45		
Pubic Symphysis (N)	Y	37.67	16.80	-392.11	37.85
Left Sacro-Iliac Force (N)	X	184.82	16.05	-348.29	39.55
	Y	58.60	94.45	-1685.60	34.30
	Z	282.78	104.00	-278.63	28.10
Left Sacro-Iliac Moment (Nm)	X	9.78	66.45	-35.55	33.55
	Y	20.56	40.90	-8.66	16.15
	Z	41.51	29.80	-7.29	67.60
Right Sacro-Iliac Force (N)	X	108.57	110.20	-398.08	36.05
	Y	59.12	121.75	-981.04	34.40
	Z	255.90	53.55	-174.25	105.25
Right Sacro-Iliac Moment (Nm)	X	26.67	65.05	-19.69	26.60
	Y	17.74	40.00	-0.36	-42.70
	Z	33.15	16.10	-8.14	121.40
Lumbar Force (N)	X	208.96	118.25	-329.62	16.20
	Y	425.60	47.45	-26.28	207.85
	Z	717.71	54.05	-620.42	104.80
Lumbar Moment (Nm)	X	29.44	48.50	-3.17	20.00
	Y	11.29	16.30	-5.60	125.05
	Z	5.55	41.05	-6.18	293.75
Pelvis Acceleration (g)	X	21.30	16.15	-8.12	30.65
	Y	30.25	29.00	-8.90	88.55
	Z	21.28	16.00	-4.21	81.30
	R	31.49	16.10		

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021
 Driver Dummy Serial Number: EB8888

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Left Femur Force (N)	X	92.24	77.25	-182.05	28.25
	Y	71.13	27.80	-112.33	103.50
	Z	403.04	44.00	-150.29	0.20
Left Femur Moment (Nm)	X	96.50	48.10	-31.94	83.45
	Y	72.79	49.35	-36.72	92.20
	Z	11.07	53.45	-13.31	90.45
Left Femoral Neck Force (N)	X	283.11	50.20	-350.31	91.15
	Y	169.53	83.70	-588.65	33.00
	Z	191.74	74.65	-592.57	32.10
Left Outer Knee Force (N)	Y	190.82	52.65	-117.89	33.30
Left Inner Knee Force (N)	Y	143.65	32.40	-63.66	19.90

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021
 Passenger Dummy Serial Number: DK1774

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Head Acceleration (g)	X	2.59	20.35	-9.70	54.35
	Y	27.00	54.85	-1.31	283.85
	Z	7.61	51.20	-9.01	76.80
	R	28.99	54.85		
Head Angular Rate (deg/sec)	X	250.52	47.90	-1236.20	61.70
	Y	794.02	99.75	-1321.93	61.80
	Z	1003.10	106.15	-849.93	64.10
Upper Neck Force (N)	X	39.06	131.40	-264.17	55.95
	Y	266.05	55.45	-30.60	40.30
	Z	292.77	52.65	-363.95	75.25
Upper Neck Moment (Nm)	X	1.51	23.55	-36.98	55.40
	Y	22.41	78.00	-20.71	53.90
	Z	11.69	76.85	-6.20	135.10
Lower Neck Force (N)	X	202.97	76.80	-140.06	54.70
	Y	216.21	58.20	-284.18	45.80
	Z	409.09	53.10	-347.55	75.15
Lower Neck Moment (Nm)	X	20.63	57.05	-4.40	128.50
	Y	21.71	66.25	-10.05	141.30
	Z	12.29	74.95	-7.46	133.50
Driver Shoulder Force (N)	X	114.88	38.05	-241.08	53.30
	Y	1795.62	48.50	-179.31	22.00
	Z	59.22	94.40	-158.78	68.75
Shoulder Rear Ribeye Position (mm)	X	-31.90	173.80	-63.05	53.35
	Y	-44.96	49.95	-67.40	75.80
	Z	-35.90	96.50	-45.70	73.40
Length of Change (mm)		2.37	59.35	-3.13	33.55
Shoulder Middle Ribeye Position (mm)	X	-0.86	174.20	-30.18	53.20
	Y	-48.03	52.80	-78.04	75.20
	Z	-35.27	94.90	-47.20	74.10
Length of Change (mm)		22.14	52.75	-2.49	33.55
Shoulder Front Ribeye Position (mm)	X	28.66	173.60	9.46	53.00
	Y	-42.73	54.20	-67.84	33.30
	Z	-41.50	94.30	-51.61	74.10
Length of Change (mm)		25.99	54.05	-0.99	19.25

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021
 Passenger Dummy Serial Number: DK1774

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Thorax Rib 1 Rear Ribeye Position (mm)	X	-25.35	71.10	-36.21	50.15
	Y	-70.97	49.95	-80.29	17.10
	Z	-4.36	55.00	-9.24	64.50
Length of Change (mm)		4.44	49.85	-0.89	22.30
Thorax Rib 1 Middle Ribeye Position (mm)	X	1.88	71.10	-8.67	50.10
	Y	-79.61	51.00	-92.55	16.60
	Z	-3.89	53.10	-9.51	65.00
Length of Change (mm)		11.39	50.95	-0.86	16.65
Thorax Rib 1 Front Ribeye Position (mm)	X	32.88	71.10	28.00	50.15
	Y	-66.09	51.30	-78.09	16.60
	Z	-3.12	52.80	-8.09	64.00
Length of Change (mm)		11.69	51.10	-0.39	16.60
Thorax Rib 2 Rear Ribeye Position (mm)	X	-10.57	35.50	-13.05	26.60
	Y	-77.20	43.70	-79.48	116.55
	Z	32.44	116.70	30.78	76.90
Length of Change (mm)		1.03	37.75	-0.77	116.65
Thorax Rib 2 Middle Ribeye Position (mm)	X	21.12	35.45	16.54	93.90
	Y	-90.68	48.10	-94.32	130.70
	Z	31.72	53.15	29.37	76.90
Length of Change (mm)		2.73	49.85	-0.72	131.00
Thorax Rib 2 Front Ribeye Position (mm)	X	50.44	74.10	46.85	43.30
	Y	-76.07	49.90	-79.80	131.40
	Z	37.14	55.65	35.27	75.50
Length of Change (mm)		3.47	49.90	-0.66	288.25
Thorax Rib 3 Rear Ribeye Position (mm)	X	-40.58	35.50	-44.36	27.00
	Y	-75.36	190.80	-79.62	191.10
	Z	-30.91	116.55	-32.36	49.20
Length of Change (mm)		1.19	190.70	-1.51	191.20
Thorax Rib 3 Middle Ribeye Position (mm)	X	-13.15	35.30	-17.40	27.30
	Y	-87.76	211.20	-90.86	148.10
	Z	-29.32	276.40	-30.97	74.45
Length of Change (mm)		0.66	128.35	-1.88	148.05

TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA

(CONTINUED)

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

Passenger Dummy Serial Number: DK1774

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Thorax Rib 3 Front Ribeye Position (mm)	X	11.25	36.10	7.63	44.70
	Y	-75.30	207.30	-79.94	208.00
	Z	-32.69	128.40	-34.10	74.50
Length of Change (mm)		1.79	207.35	-2.45	208.10
Abdomen Rib 1 Rear Ribeye Position (mm)	X	-24.37	-42.60	-28.46	26.70
	Y	-77.77	-19.70	-79.42	41.85
	Z	-6.70	22.50	-8.69	56.40
Length of Change (mm)		0.18	-6.70	-1.95	42.30
Abdomen Rib 1 Middle Ribeye Position (mm)	X	2.95	-29.00	-2.23	151.50
	Y	-87.20	216.30	-93.61	216.95
	Z	-7.66	23.50	-10.54	54.70
Length of Change (mm)		2.03	216.30	-3.99	217.00
Abdomen Rib 1 Front Ribeye Position (mm)	X	30.01	-33.70	25.10	39.80
	Y	-77.56	-24.60	-80.13	47.75
	Z	-6.95	22.50	-9.25	55.05
Length of Change (mm)		1.20	47.25	-0.95	47.85
Abdomen Rib 2 Rear Ribeye Position (mm)	X	-3.44	13.50	-13.08	152.90
	Y	-77.81	49.90	-81.17	82.30
	Z	33.90	35.95	29.08	197.00
Length of Change (mm)		0.19	-11.40	-3.00	167.35
Abdomen Rib 2 Middle Ribeye Position (mm)	X	22.33	-41.40	11.37	156.95
	Y	-87.26	46.90	-92.96	227.30
	Z	31.79	36.00	26.03	199.20
Length of Change (mm)		3.52	49.85	-1.38	227.30
Abdomen Rib 2 Front Ribeye Position (mm)	X	50.32	11.80	40.82	156.00
	Y	-73.91	49.70	-80.70	22.70
	Z	34.31	36.00	28.99	198.00
Length of Change (mm)		6.82	49.85	-0.25	-16.45
T1 Acceleration (g)	X	10.90	78.65	-14.95	47.15
	Y	43.06	48.10	-11.71	72.70
	Z	10.78	45.95	-5.71	79.35
	R	46.47	48.10		

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021
 Passenger Dummy Serial Number: DK1774

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
T4 Acceleration (g)	X	8.54	75.15	-11.68	48.15
	Y	41.93	48.15	-10.70	20.20
	Z	9.55	54.30	-4.98	79.90
	R	44.40	48.15		
T12 Acceleration (g)	X	4.41	67.70	-7.68	44.15
	Y	46.95	49.45	-8.71	18.50
	Z	11.51	19.20	-10.64	51.55
	R	47.94	49.50		
Pubic Symphysis (N)	Y	42.77	23.80	-796.17	50.20
Left Sacro-Iliac Force (N)	X	7.20	81.50	-30.36	46.85
	Y	68.40	77.60	-1589.33	42.50
	Z	219.04	42.95	-45.52	59.70
Left Sacro-Iliac Moment (Nm)	X	0.64	5.30	-46.00	42.60
	Y	22.87	51.20	-3.81	111.80
	Z	12.84	36.40	-18.30	50.90
Right Sacro-Iliac Force (N)	X	454.27	51.65	-58.15	14.35
	Y	189.73	57.05	-391.05	40.35
	Z	612.47	50.55	-48.43	81.90
Right Sacro-Iliac Moment (Nm)	X	49.59	50.35	-11.76	81.95
	Y	6.10	44.40	-11.85	109.60
	Z	6.75	36.35	-28.74	51.45
Lumbar Force (N)	X	545.24	49.90	-37.99	80.85
	Y	1160.98	47.70	-67.73	78.75
	Z	262.68	19.90	-625.69	51.05
Lumbar Moment (Nm)	X	70.85	46.85	-0.70	46.05
	Y	6.34	40.45	-18.23	51.30
	Z	5.08	198.00	-9.55	54.10
Pelvis Acceleration (g)	X	10.98	35.30	-10.23	50.50
	Y	46.05	37.65	-8.94	94.10
	Z	12.54	34.35	-4.11	44.70
	R	46.85	37.65		

**TABLE 1 WORLDSID-50M AND WORLDSID-05F INSTRUMENTATION DATA
(CONTINUED)**

Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021
 Passenger Dummy Serial Number: DK1774

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Left Femur Force (N)	X	358.30	49.15	-83.81	24.55
	Y	30.23	133.20	-116.56	51.40
	Z	97.16	24.50	-923.72	48.25
Left Femur Moment (Nm)	X	35.53	51.55	-13.21	90.00
	Y	164.01	49.40	-2.97	16.55
	Z	24.20	50.65	-13.39	26.00
Left Femoral Neck Force (N)	X	338.77	50.75	-219.17	25.95
	Y	990.91	49.30	-99.43	24.70
	Z	209.86	50.15	-342.78	48.25
Left Outer Knee Force (N)	Y	1701.43	48.60	-96.42	41.25
Left Inner Knee Force (N)	Y	5526.49	48.60	-33.55	17.75

Positive Direction

Longitudinal Forward
 Lateral Rightward
 Vertical Downward

Negative Direction

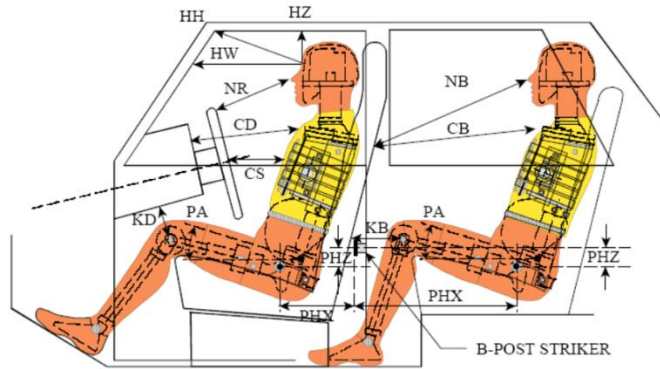
Longitudinal Rearward
 Lateral Leftward
 Vertical Upward

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
REAR DUMMY PHX & PHZ
MEASUREMENTS FOR A 4-DOOR
VEHICLE WOULD USE THE C-POST
STRIKER AS A REFERENCE POINT

Code	Measurement Description	Driver WorldSID-50M SN # EB8888		Passenger WorldSID-05F SN # DK1774	
		Length (mm)	Angle	Length (mm)	Angle
HH	Header to Header	379			
HW	Header to Windshield	650			
HZ	Head to Roof Liner	215		279	
NR	Nose to Rim/Seat Back	446		318	
CD	Chest to Dash/Seat Back	614		355	
CS	Chest to Steering Wheel	358			
KD(L)/KDA(L)°	Left Knee to Dash/Seat Back	135	47.5	83	70.0
KD(R)/KDA(R)°	Right Knee to Dash/Seat Back	112	28.6	83	70.9
PAX°	Pelvic Tilt Angle X		-1.6		-0.9
PAY°	Pelvic Tilt Angle Y		1.1		28.1
PHX	Hip Point to Striker (X-Axis)	332		-408	
PHZ	Hip Point to Striker (Z-Axis)	140		123	
HAX°	Head Tilt Angle X		-0.3		0.4
HAY ¹ °	Head Tilt Angle Y		-2.1		-2.0
TAX°	Thorax Tilt Angle X		-0.1		0.2
TAY°	Thorax Tilt Angle Y		-0.5		7.7
	Head Rest Angle		2.9		N/A
	H-Point Tool Angle		39.9		44.9
	Torso Angle		14.6		72.1
	Windshield Angle		58.4		

Note: All measurements are in millimeters. 2-door vehicle shown. Rear dummy HX, HZ, PHX and PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

All tilt sensor angles are recorded digitally

WorldSID-50M neck was adjusted 0 notches

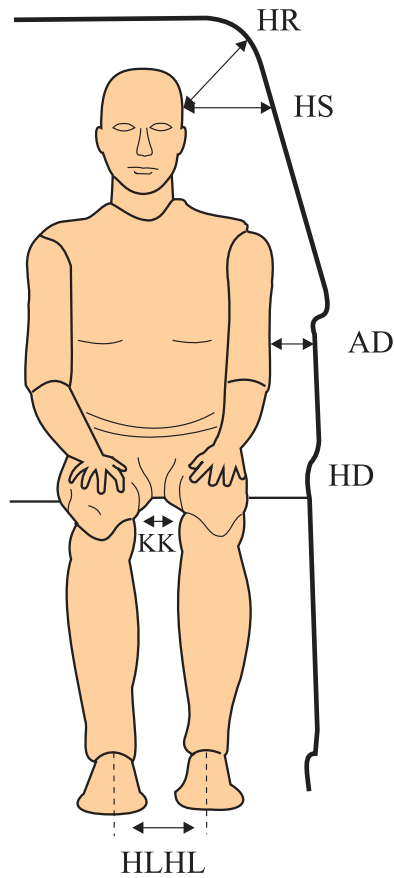
WorldSID-5F neck was adjusted 6 notches up

**DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



Code	Measurement Description	Driver WorldSID-50M SN # EB8888	Passenger WorldSID-05F SN # DK1774
HR	Head to Side Header	226	256
HS	Head to Side Window	339	381
AD	Arm to Door	131	131
HD	Hip Point to Door	94	95
KK	Knee to Knee	445	342
HLHL	Heel to Heel	259	185

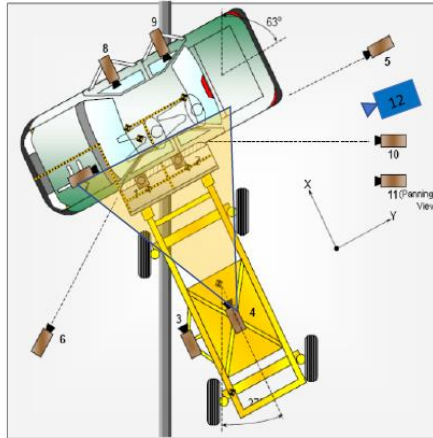
Note: All measurements are in millimeters.

**DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



CAMERA LOCATIONS AND DATA

Camera No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Wide View	-1578	0	-5692	8.5	1000
2	Overhead Close-Up View	-1387	0	-5962	28	1000
3	Impact Point	-1522	-907	-861	25	1000
4	Struck-Side View at Impact	-2250	0	-1429	8.5	1000
5	Rear Impact View of Struck Side	0	9358	-1482	20	1000
6	Front Oblique Impact View of Struck Side	-2352	-4126	-1456	20	1000
7	Driver Dummy Front View (Onboard)				25	1000
8	Driver Dummy Side View (Onboard)				8.5	1000
9	Rear Passenger Dummy Side View (Onboard)				8.5	1000
10	Real-Time Rear View of Impact				Zoom	1000
11	Real-Time Pan View of Impact				Zoom	30
12	Real-Time Left Rear View of Impact				Zoom	30

Reference: Impact Point projected to Ground; +X = To Front of MDB, +Y = To Right of MDB, +Z = Down *All measurements accurate to ± 6 mm.

If applicable, explain why camera(s) did not operate as intended: N/A

INSTRUMENTATION

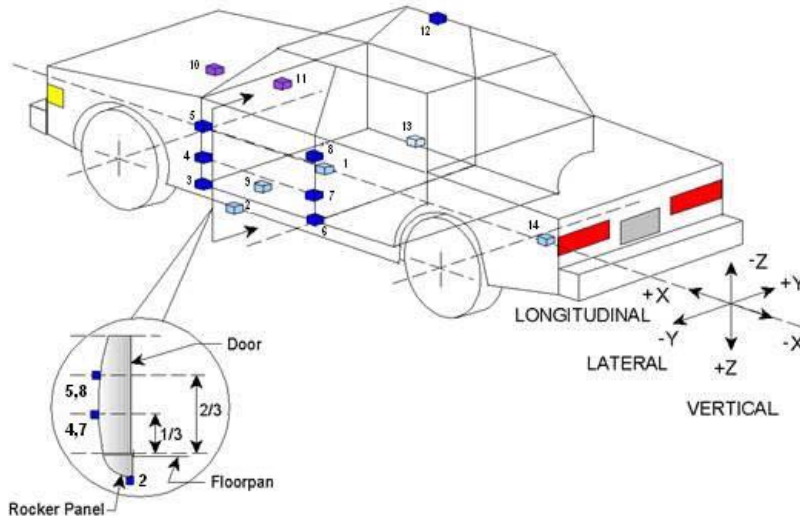
Driver Dummy Channels	135
Passenger Dummy Channels	135
Vehicle Structure Accelerometers	37
MDB Accelerometers	5
Contact Channels	10
TOTAL	322

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
1	Vehicle CG	3112	-16	-89				
	Longitudinal (g)				11.44	13.20	-17.11	7.15
	Lateral (g)				47.21	6.50	-6.89	49.55
	Vertical (g)				22.15	34.15	-33.59	7.10
	Resultant (g)				59.74	6.80		
2	Vehicle CG ARS	3106	27	-91				
	Longitudinal (g)				272.51	9.10	-121.60	263.80
	Lateral (g)				94.48	26.35	-81.77	9.45
	Vertical (g)				119.32	35.35	-3.41	-9.05
3	Right Sill at Front Seat	3445	697	-73				
	Longitudinal (g)				11.19	15.80	-10.13	46.25
	Lateral (g)				31.02	9.90	-9.30	64.60
	Vertical (g)				6.03	68.30	-16.81	11.50
	Resultant (g)				34.45	10.30		
4	Right Side Sill At Rear Seat	2676	683	-55				
	Longitudinal (g)				11.39	15.75	-9.62	46.15
	Lateral (g)				36.55	7.60	-9.01	63.25
	Vertical (g)				--- ¹	--- ¹	--- ¹	--- ¹
	Resultant (g)				--- ¹	--- ¹		
5	Left Side Sill At Front Seat	3441	-681	-81				
	Lateral (g)				148.77	5.20	-87.78	13.05
6	Left Side Sill At Rear Seat	2647	-680	-62				
	Lateral (g)				92.88	6.25	-18.33	25.10

¹See Data Acquisition Explanations.

DATA SHEET NO. 6 (CONTINUED)
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
7	Lower A-Post	3778	-718	-216				
	Lateral (g)				81.90	9.15	-37.15	14.50
8	Middle A-Post	3813	-805	-522				
	Lateral (g)				46.70	9.25	-3.39	20.35
9	Lower B-Post	2764	-742	-216				
	Lateral (g)				144.81	4.35	-53.38	18.40
10	Middle B-Post	2751	-729	-713				
	Lateral (g)				132.23	14.30	-56.02	21.45
11	Front Seat Track	2961	-563	-9				
	Lateral (g)				83.85	5.90	-31.46	22.50
12	Rear Seat Structure	2477	-659	-129				
	Lateral (g)				67.74	6.55	-14.93	12.20
13	Right Rear Occupant Compartment	2647	409	-34				
	Lateral (g)				38.83	7.50	-8.75	63.00
14	Engine Block	4537	51	-442				
	Longitudinal (g)				3.62	108.90	-11.23	54.60
	Lateral (g)				32.62	46.45	-11.02	20.55
15	Rear Floorpan Above Axle	1367	-44	-216				
	Longitudinal (g)				3.24	57.45	-13.28	30.90
	Lateral (g)				17.90	43.15	-3.10	106.60
	Vertical (g)				13.05	78.10	-16.84	39.60
	Resultant (g)				22.29	29.60		
16	Rear Deck	233	-5	-249				
	Longitudinal (g)				5.12	39.10	-12.81	31.35
	Lateral (g)				22.84	50.10	-6.86	116.15
	Vertical (g)				9.88	48.90	-13.89	37.65
	Resultant (g)				24.08	49.45		
17	Rear Deck ARS	212	24	-248				
	Longitudinal (g)				296.86	85.10	-141.46	248.35
	Lateral (g)				218.26	40.75	-175.24	36.90
	Vertical (g)				71.61	96.15	-41.98	44.10
18	Left Front Door Mid Centerline	3245	-768	-354				
	Lateral (g)				121.85	11.75	-104.81	27.10
19	Left Front Door Mid Rear	2814	-769	-364				
	Lateral (g)				176.90	12.00	-97.58	18.10
20	Left Front Door Upper Centerline	3248	-756	-602				
	Lateral (g)				110.98	18.15	-82.47	32.60

**DATA SHEET NO. 6 (CONTINUED)
VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
21	Left Rear Door Mid Rear	2364	-783	-343				
	Lateral (g)				90.90	11.45	-72.53	16.00
22	Left Rear Door Upper Centerline	2479	-765	-656				
	Lateral (g)				91.72	15.60	-53.51	4.45

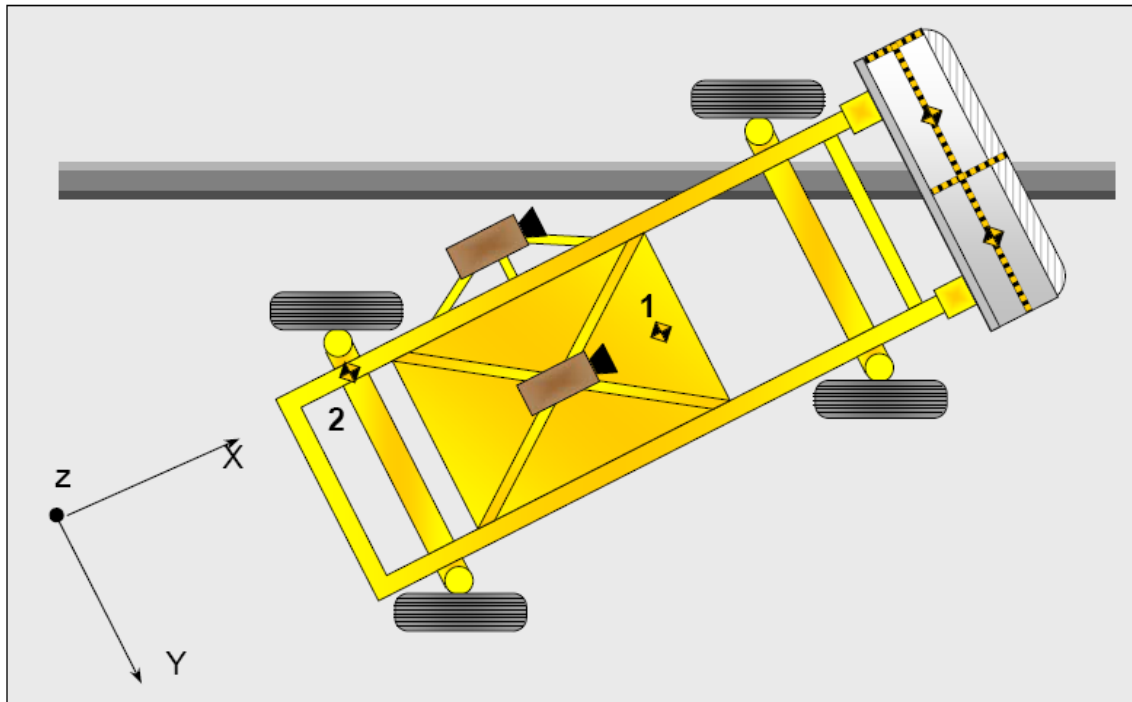
*0,0,0 located at rear bumper

**DATA SHEET NO. 7
MDB ACCELEROMETER DATA**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



MDB ACCELEROMETER LOCATIONS

Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
1	MDB CG	-2179	0	-505				
	Longitudinal (g)				1.94	116.85	-23.92	29.70
	Lateral (g)				0.56	-25.40	-7.63	46.15
	Vertical (g)				5.40	34.10	-5.88	41.30
	Resultant (g)				24.63	29.80		
2	MDB Rear	-3648	-650	-618				
	Longitudinal (g)				1.79	168.35	-23.87	24.45
	Lateral (g)				2.42	59.55	-2.94	50.15

Reference: X – Face of MDB (+ forward)
 Y – MDB centerline (+ to right)
 Z – Ground plane (+ down)

**DATA SHEET NO. 8
POST TEST OBSERVATIONS**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (WorldSID-50M)	Rear Seat Dummy (WorldSID-05F)
Face	SCAB	SCAB
Top of Head	SCAB	SCAB
Left Side of Head	SCAB	SCAB
Back of head	None	None
Left Shoulder	SAB	Door panel
Upper Torso	SAB, Side seat bolster	Door panel
Lower Torso	SAB, Side seat bolster	Door panel
Left Hip	Door panel	Door panel
Left Knee	Door panel	Door panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

* Indicate "Yes", "No", or "NA".

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

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

**DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side (Driver)		Struck Side (Rear Passenger)	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	Yes		
Knee Airbag	No	N/A		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other	No	N/A	No	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3210
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		504
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+7
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	0

**DATA SHEET NO. 9
MDB SUMMARY OF RESULTS**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Frame	4115
Wheel Base of Framework Carriage	2591
CG Location of Front Axle	1106

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	419.8	263.0	682.8
Right	kg	362.0	319.4	681.4
Ratio	%	57.3	42.7	100.0
Totals	kg	781.8	582.4	1364.2

SPEED AND ANGLE AT IMPACT DATA

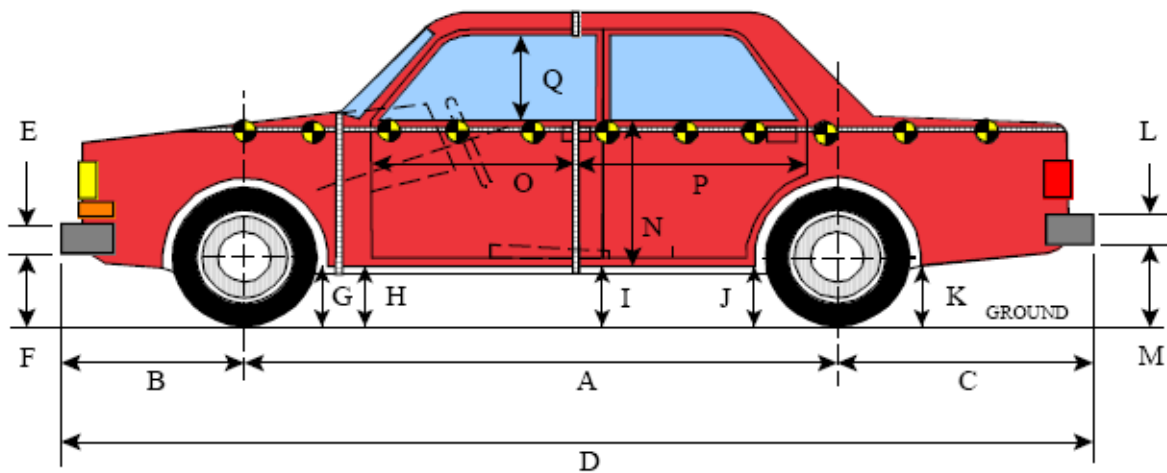
Measured Parameter	Units	Tolerance	Value
Trap No. 1 Velocity (Primary)	km/h	52.1 to 53.7	52.85
Trap No. 2 Velocity (Redundant)	km/h	52.1 to 53.7	52.84
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

**DATA SHEET NO. 10
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3210	3210	0
B	Front Axle to FSOV	930	930	0
C	Rear Axle to RSOV	1220	1220	0
D	Total Length at Centerline	5360	5350	10
E	Front Bumper Thickness	250	250	0
F	Front Bumper Bottom to Ground	420	430	-10
G	Sill Height at Front Wheel Well	425	445	-20
H	Sill Height at Front Door Leading Edge	438	472	-34
I	Sill Height at B Pillar	450	460	-10
J1	Sill Height at Rear Wheel Well	460	475	-15
J2	Pinch Weld Height at Rear Wheel Well	390	409	-19
K	Sill Height Aft of Rear Wheel Well	513	555	-42
L	Rear Bumper Thickness	125	125	0
M	Rear Bumper Bottom to Ground	525	560	-35
N	Sill Height to Bottom of Front Window Sill	825	810	15
O	Front Door Leading Edge to Impact CL	757	757	0
P	Rear Door Trailing Edge to Impact CL	1005	983	22
Q	Front Window Opening	445	436	9
R	Right Side Length	5175	5200	-25
S	Left Side Length	5175	5170	5
T	Maximum Vehicle Width at B-Pillars	1810	1770	40
U	Maximum Vehicle Width	1860	1870	-10

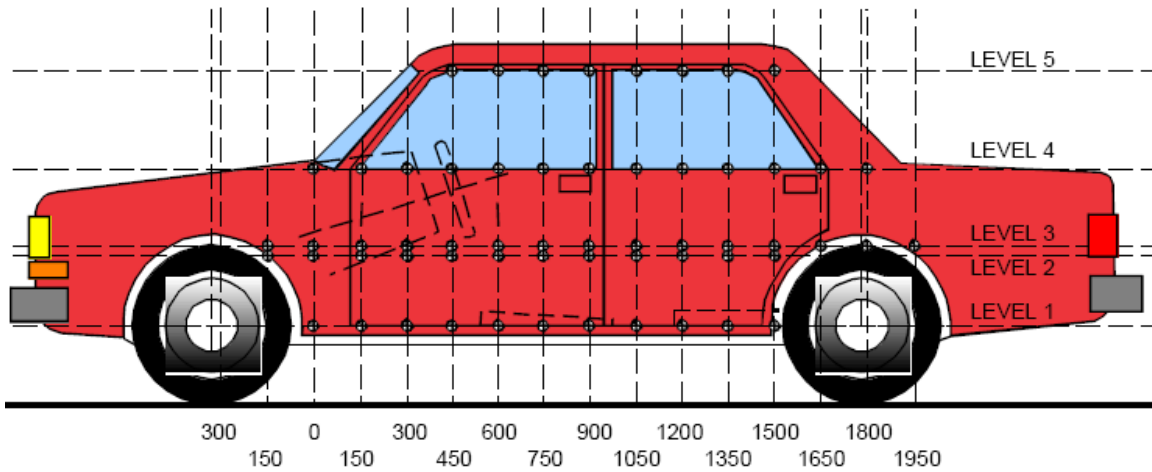
**All Dimensions in mm

DATA SHEET NO. 11
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	515	159	1350
2	Occupant H-Point	839	165	1350
3	Mid-Door	930	136	1650
4	Window Sill	1206	80	1350
5	Window Top	1742	39	1650

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 11 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-300			920	799				943	842				-23	-43	
-150		916	909	811			925	924	843			-9	-15	-32	
0	879	899	893	822		874	899	899	846		5	0	-6	-24	
150	869	893	895	823		779	851	865	842		90	42	30	-19	
300	867	894	897	834		751	798	824	847		116	96	73	-13	
450	865	895	898	846		735	795	831	852		130	100	67	-6	
600	865	895	899	854		729	800	830	852		136	95	69	2	
750	864	894	900	860		727	791	816	849		137	103	84	11	
900	862	892	900	865	619	722	768	797	846	615	140	124	103	19	4
1050	859	892	901	870	631	718	756	788	843	621	141	136	113	27	10
1200	857	893	901	875	636	717	744	793	838	618	140	149	108	37	18
1350	854	892	899	877	641	695	727	771	797	635	159	165	128	80	6
1500	848	893	899	879	639	701	738	779	809	608	147	155	120	70	31
1650	843	893	899	880	645	699	738	763	820	606	144	155	136	60	39
1800	826	893	898	882	628	800	803	816	821	585	26	90	82	61	43
1950	841	888	892	877		828	888	896	893		13	0	-4	-16	
2100		895	893	877			900	902	895			-5	-9	-18	

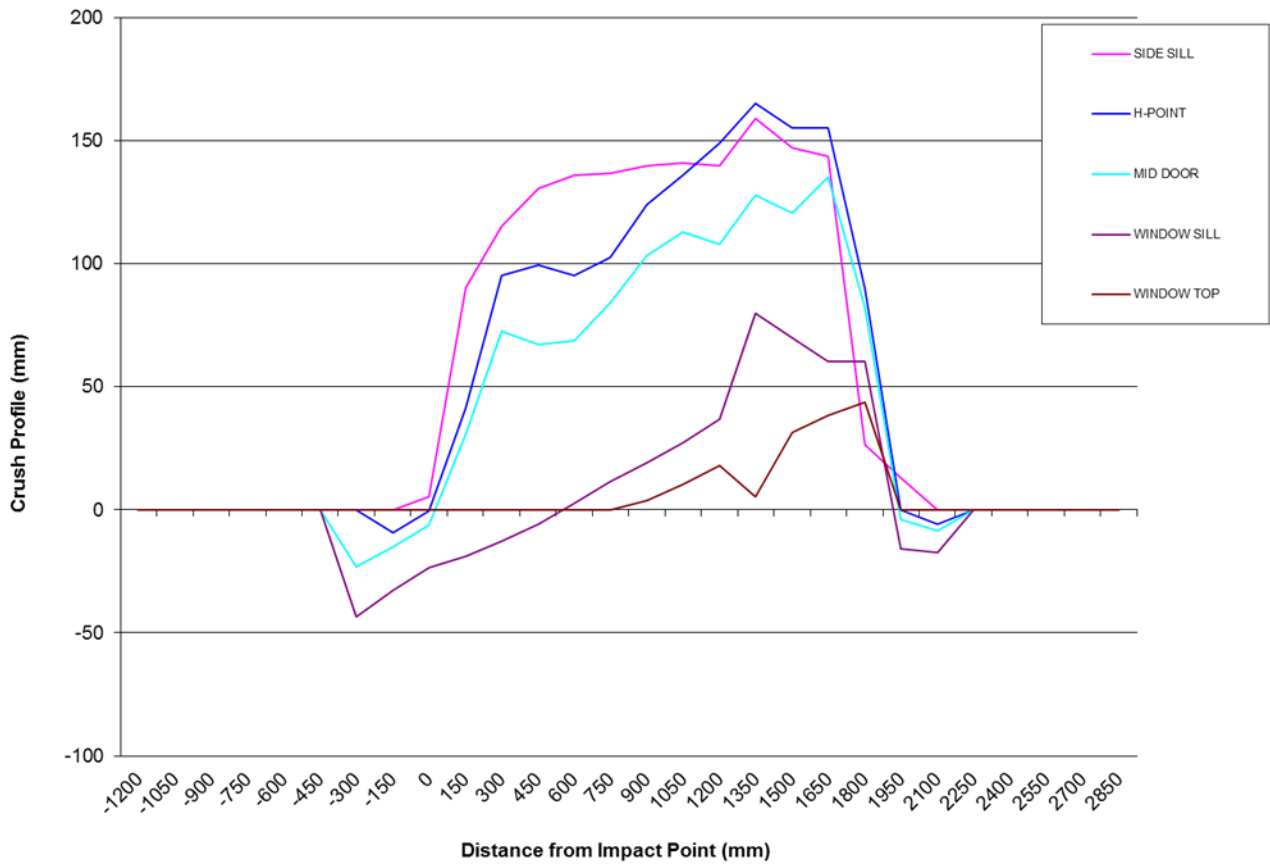
NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The vertical impact reference line was set at (0, 0, 0).

DATA SHEET NO. 11 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021

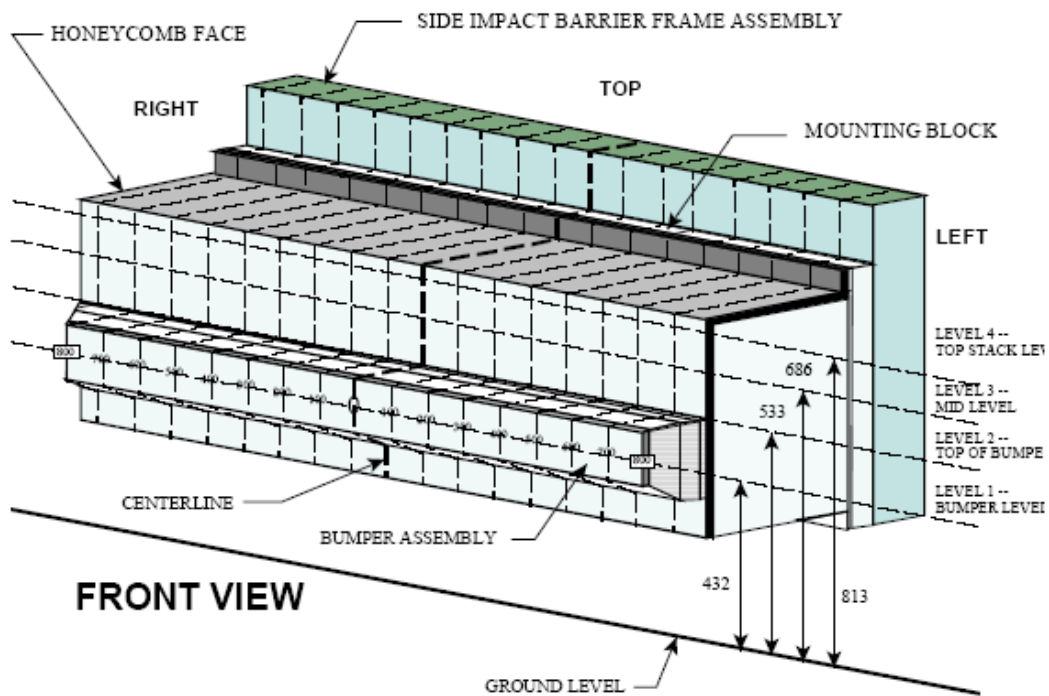


DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



NOTE: Dimensions are shown in millimeters, mm

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Row	Vertical Location		From Centerline		Maximum Crush
	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	118
B	Top of Bumper	533	800	Right	127
C	Mid-Level	686	800	Right	146
D	Top of Stack	813	800	Right	157

DEFORMABLE BARRIER STATIC CRUSH

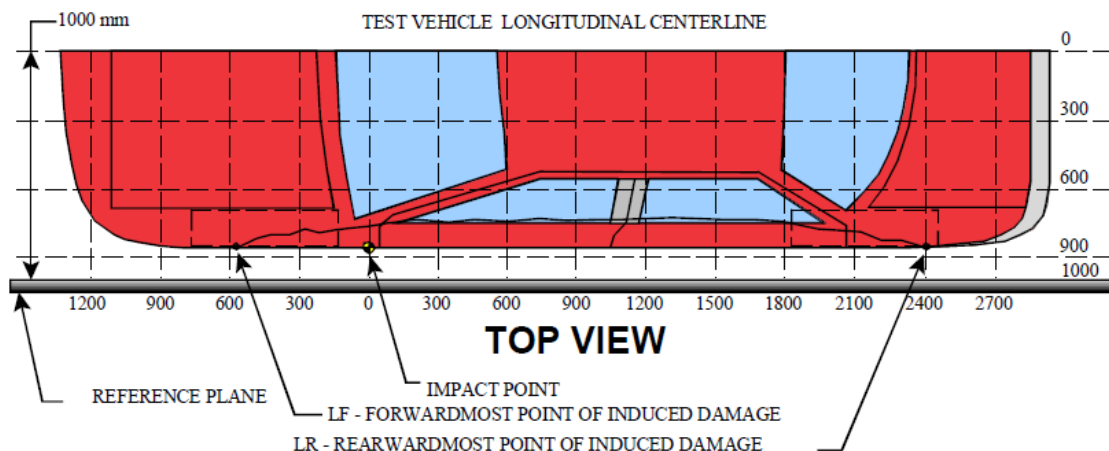
Stack Level	Distance Right of Center									C/L	Distance Left of Center								
	800	700	600	500	400	300	200	100	0		100	200	300	400	500	600	700	800	
1	118	109	95	80	64	61	62	62	63	64	66	67	69	72	81	92	96		
2	127	73	70	67	67	66	68	69	69	70	70	71	73	76	79	82	85		
3	146	85	28	17	10	23	23	10	10	10	10	11	12	15	18	40	96		
4	157	94	67	41	22	24	25	21	21	17	19	24	30	41	54	66	113		

**DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1 ¹	1950	1	828	841	0
2	1500	2	738	893	155
3	1200	2	744	893	149
4	750	1	727	864	137
5	450	1	735	865	130
6 ¹	0	1	874	879	0

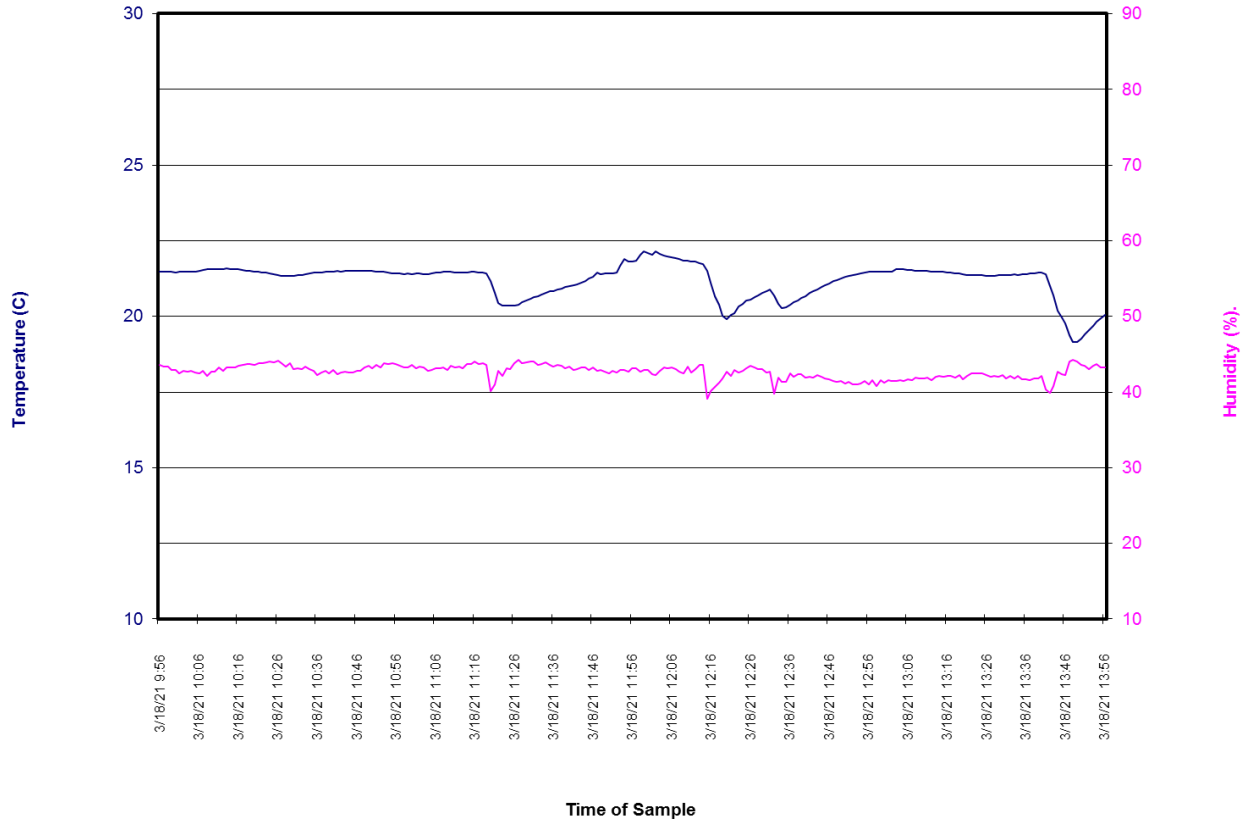
MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)*
1	800 mm left of center	4	113
2	500 mm left of center	2	76
3	200 mm left of center	2	70
4	200 mm right of center	2	68
5	500 mm right of center	1	80
6	800 mm right of center	4	157

¹ DPD 1 and 6 is defined as zero crush since the crush does not extend to the end of the vehicle

DATA SHEET NO. 14
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA
 Test Vehicle: 2020 Ford Ranger
 Test Program: Moving Deformable Barrier Side Impact Test Date: 3/18/2021

2020 Ford Ranger Left MDB Impact 210318: Test Time 19:33

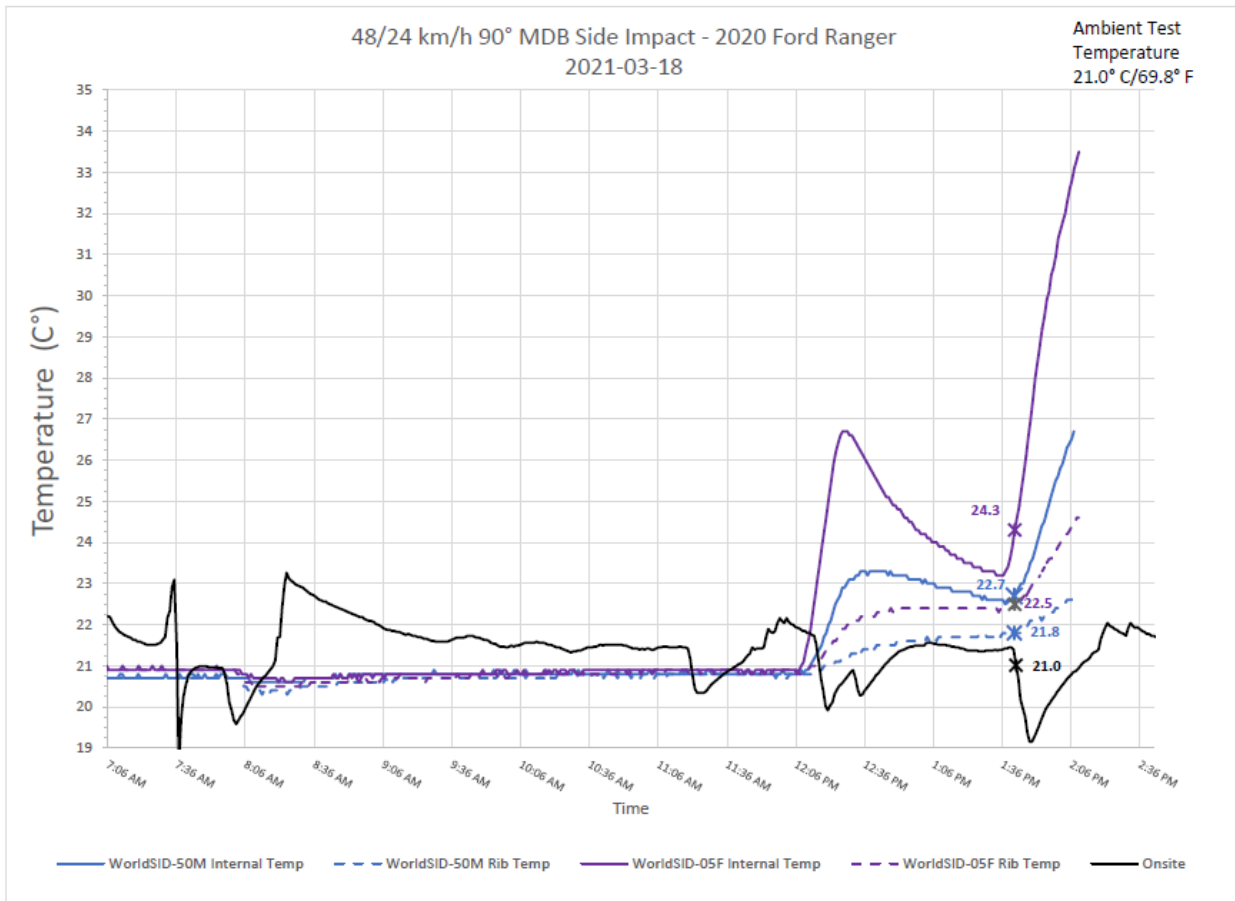


DATA SHEET NO. 14 (CONTINUED)
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2020 Ford Ranger

Test Program: Moving Deformable Barrier Side Impact

Test Date: 3/18/2021



**APPENDIX A
PHOTOGRAPHS**

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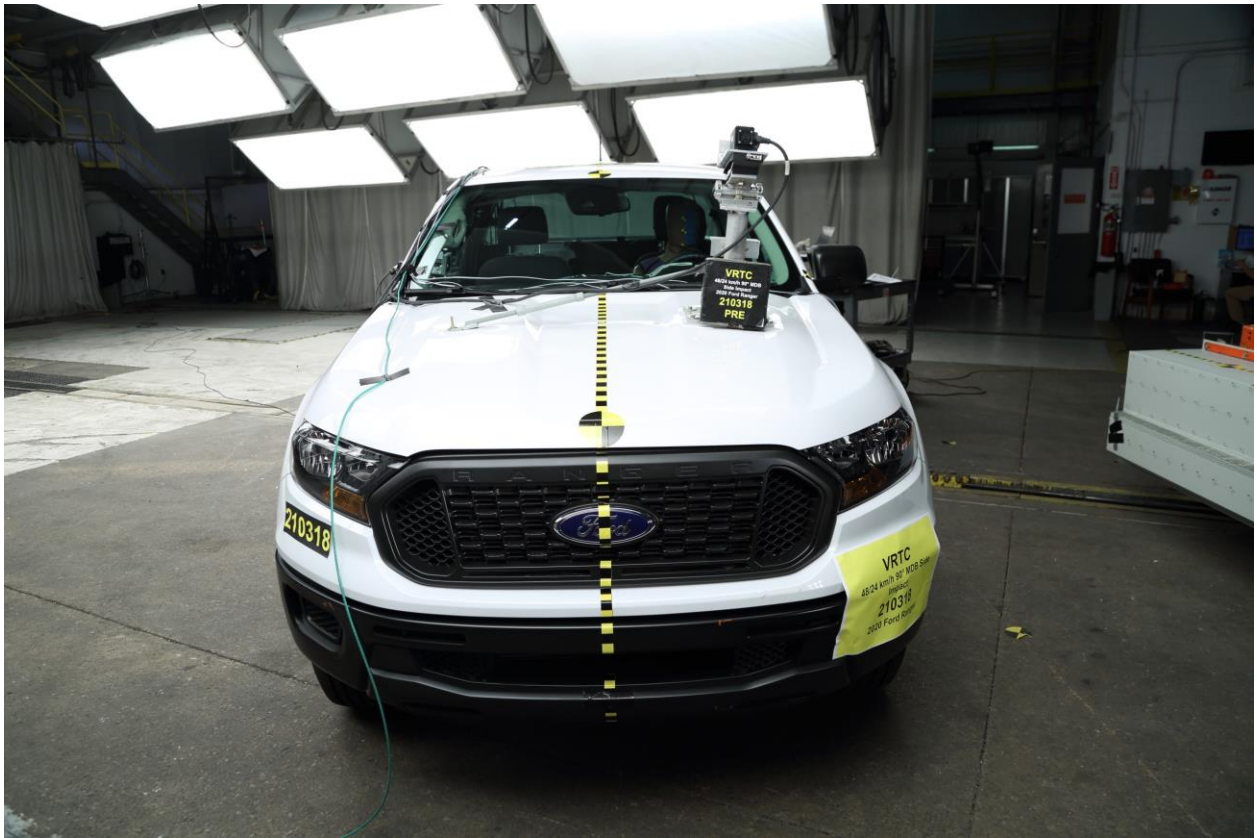
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093	Close-Up View of Vehicle's Tire Information Placard or Label	A-53
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001 As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



002 As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



003 Pre-Test Frontal View of Test Vehicle



004 Post-Test Frontal View of Test Vehicle



005 Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



006 Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



007 Pre-Test Left Side View of Test Vehicle



008 Post-Test Left Side View of Test Vehicle



009 Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



010 Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



011 Pre-Test Rear View of Test Vehicle



012 Post-Test Rear View of Test Vehicle



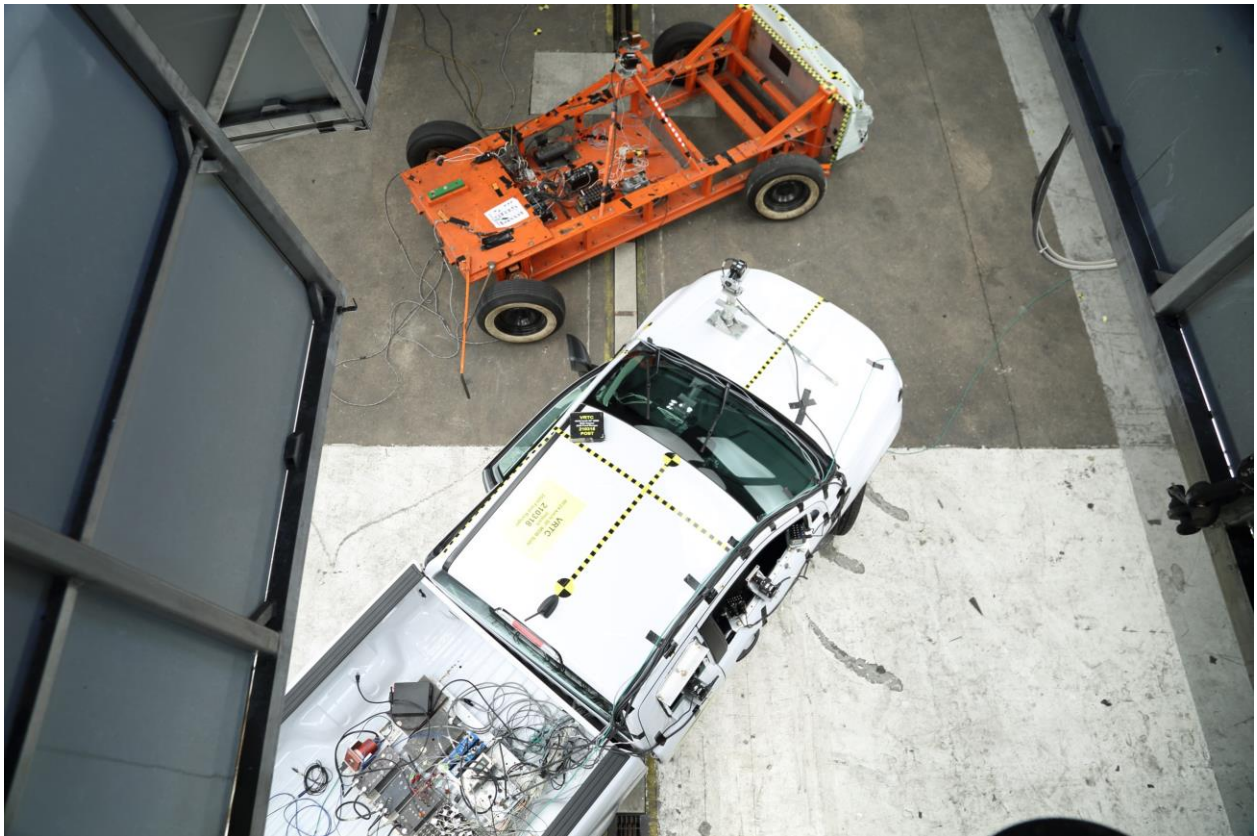
013 Pre-Test Right Side View of Test Vehicle



014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area



017 Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



018 Pre-Test Right Side View MDB Positioned Against Side of Test Vehicle



019 Pre-Test Close-Up View of Impact Point Target



020 Post-Test Close-Up View of Impact Point Target



021 Pre-Test Left Front Door Latch Close-Up



022 Post-Test Left Front Door Latch Close-Up



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023 Pre-Test Left Rear Door Latch Close-Up

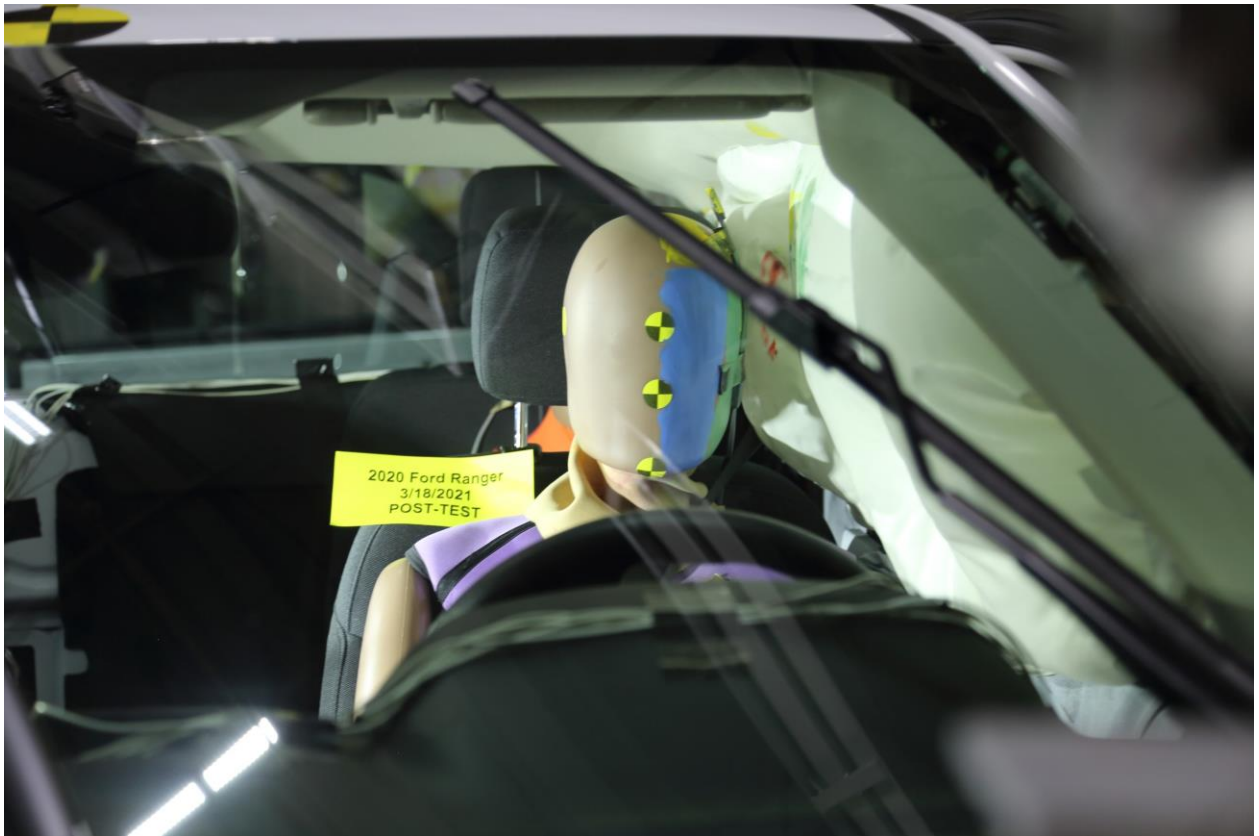


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024 Post-Test Left Rear Door Latch Close-Up



025 Pre-Test Front Close-Up View of Driver Dummy



026 Post-Test Front Close-Up View of Driver Dummy



027 Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking

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028 Pre-Test Left Side View of Driver Dummy Shoulder and Door Top



029 Post-Test Left Side View of Driver Dummy Shoulder and Door Top



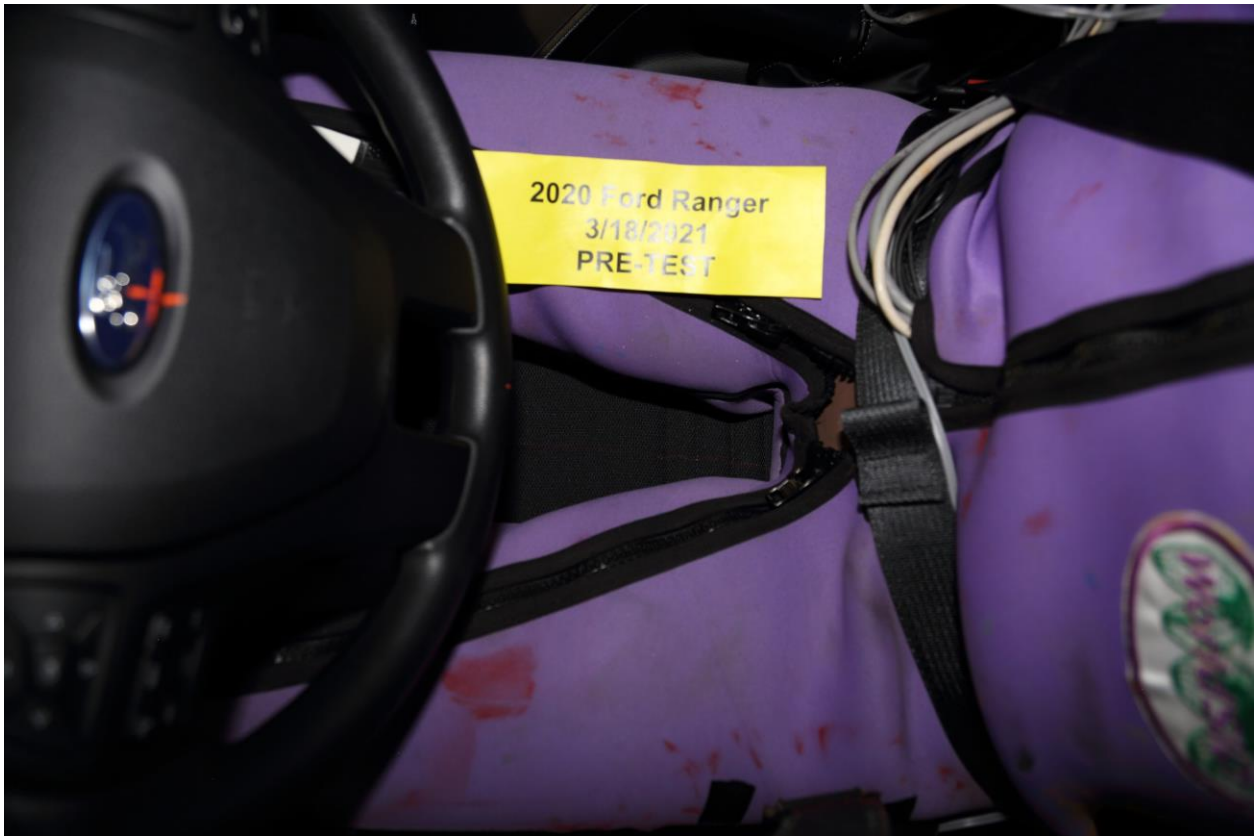
030 Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



031 Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



032 Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



033 Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



034 Pre-Test Placement of Driver's Dummy Feet



035 Pre-Test View of Belt Anchorage for Driver Dummy



036 Pre-Test Left Side View of Steering Wheel



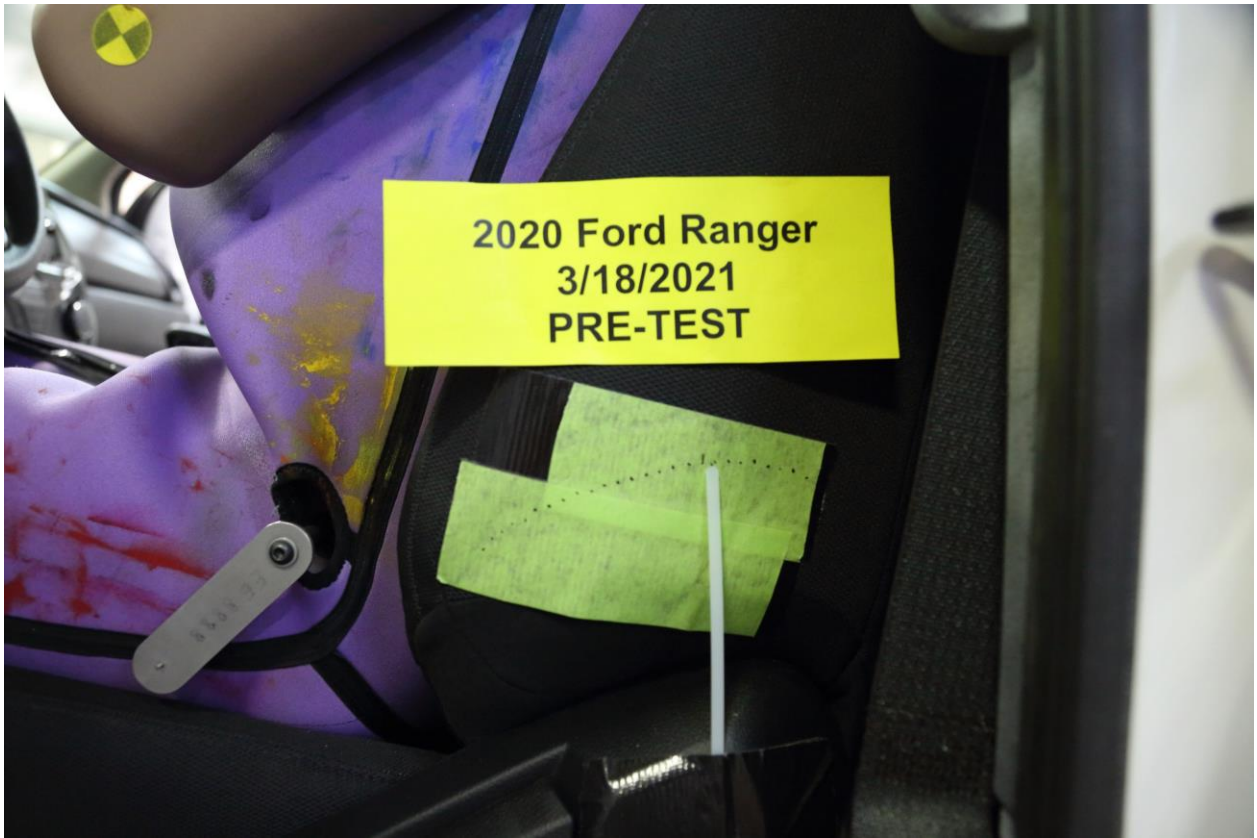
037 View of Disengaged Parking Brake



038 Pre-Test View of Parking Brake



039 Pre-Test Close-Up Left Side View of Driver Seat Track



040 Pre-Test Close-Up Left Side View of Driver Seat Back



041 Pre-Test Close-Up View of Driver Seat Back or Head Restraint



042 Pre-Test Driver Dummy and Door Clearance View



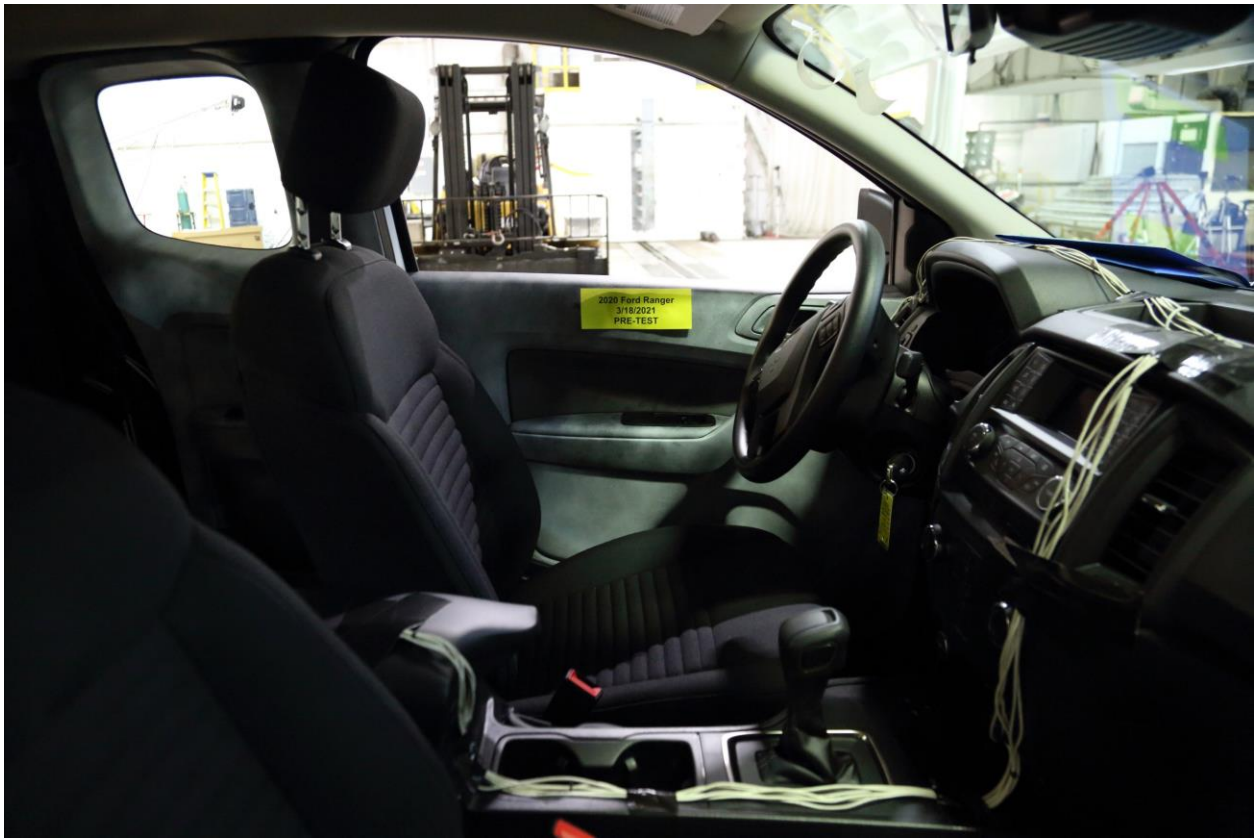
043 Post-Test Driver Dummy and Door Clearance View



044 Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



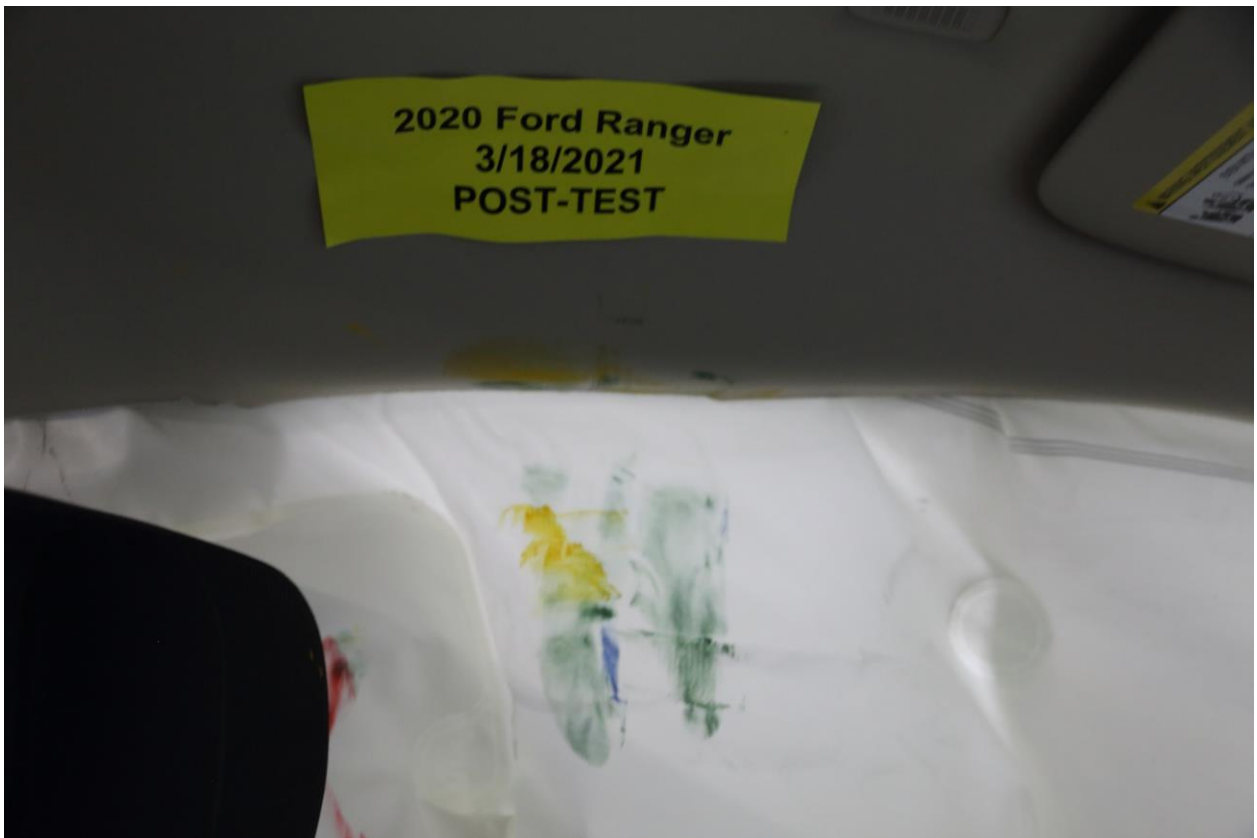
045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



046 Pre-Test Driver Inner Door Panel View



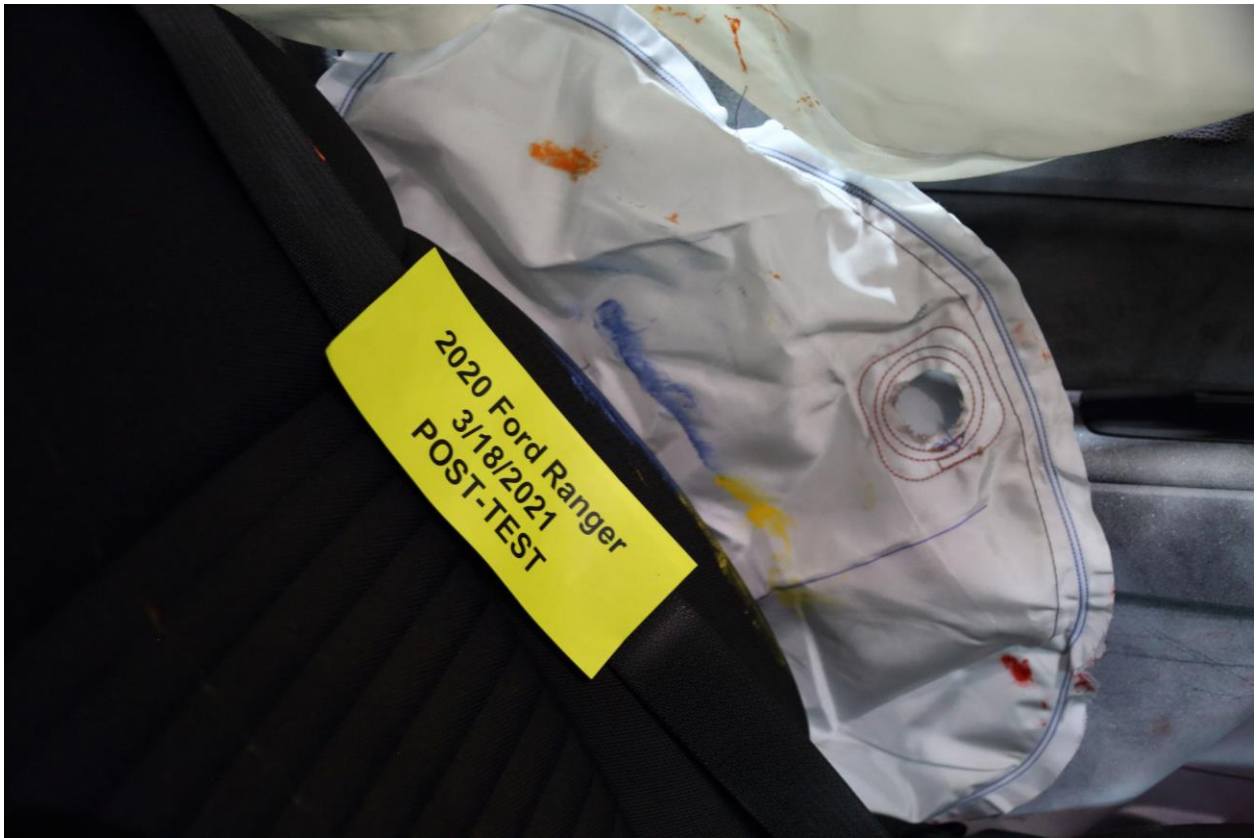
047 Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations



048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View



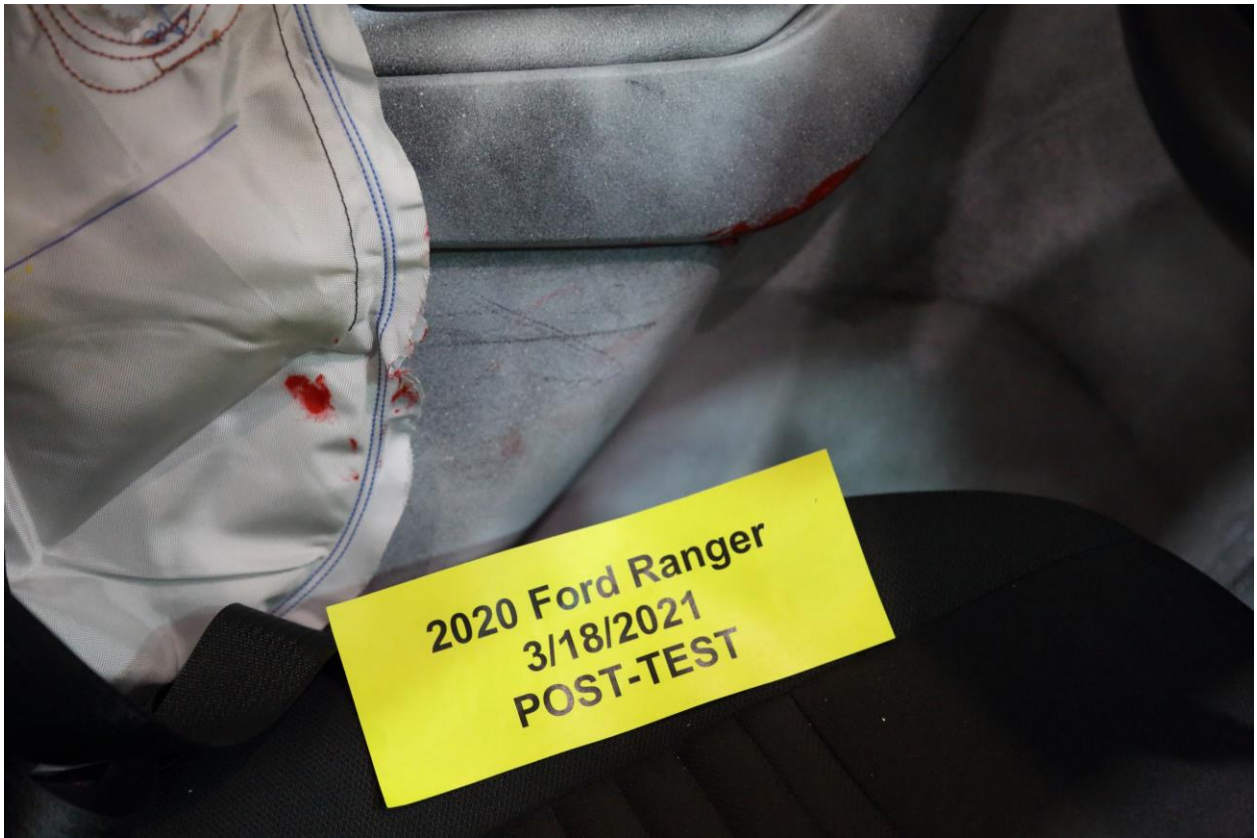
049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



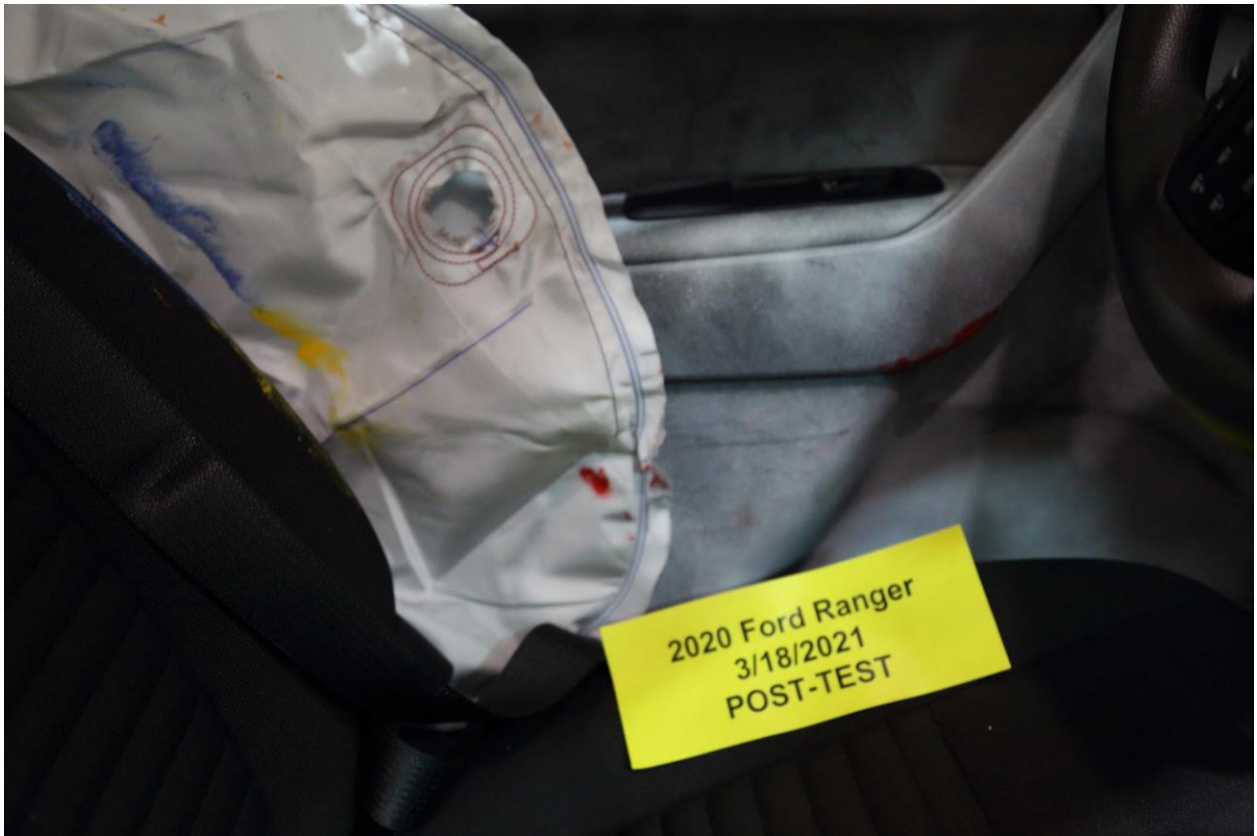
050 Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View



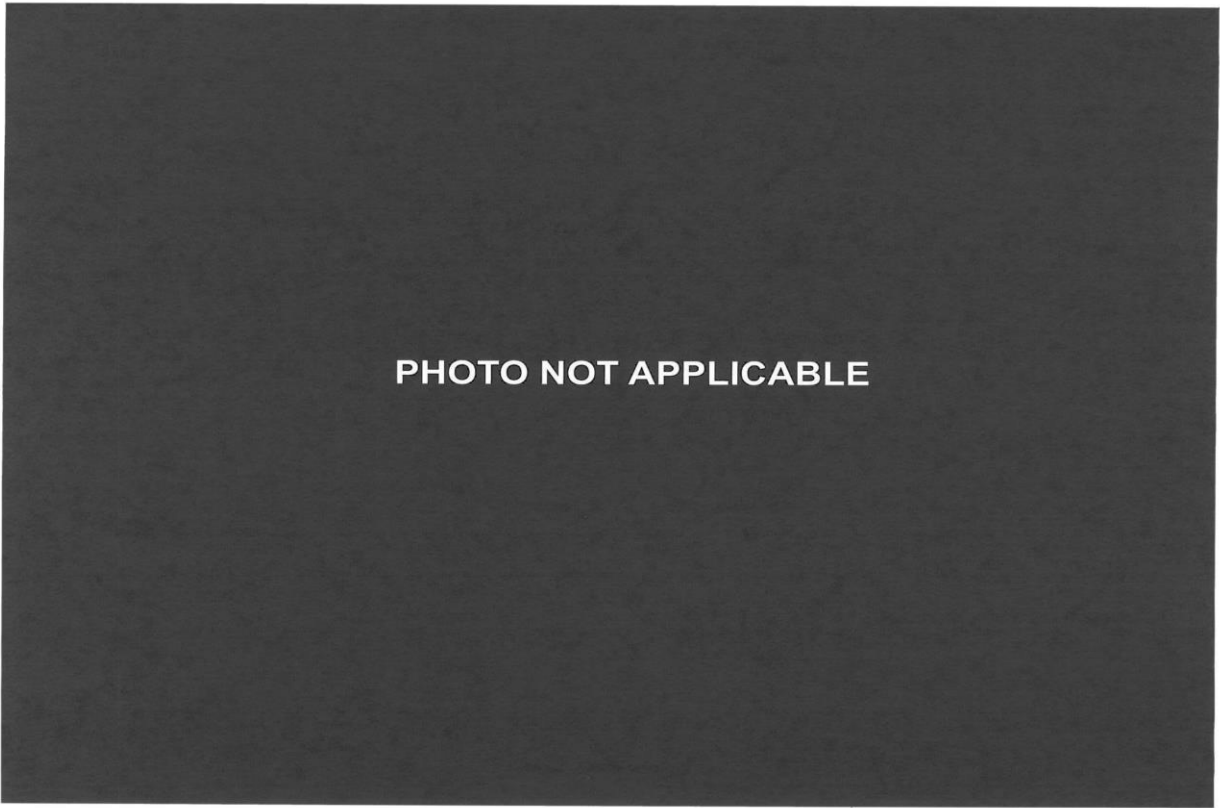
051 Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



052 Post-Test Driver Dummy Close-Up Pelvis Contact View



053 Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



054 Post-Test Driver Dummy Close-Up Knee Contact View



055 Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking



056 Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View



057 Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View



058 Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



059 Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



060 Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



061 Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



PHOTO NOT APPLICABLE

062 Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



PHOTO NOT APPLICABLE

063 Pre-Test View of Rear Passenger Dummy's Head Showing Dummy Head is Level



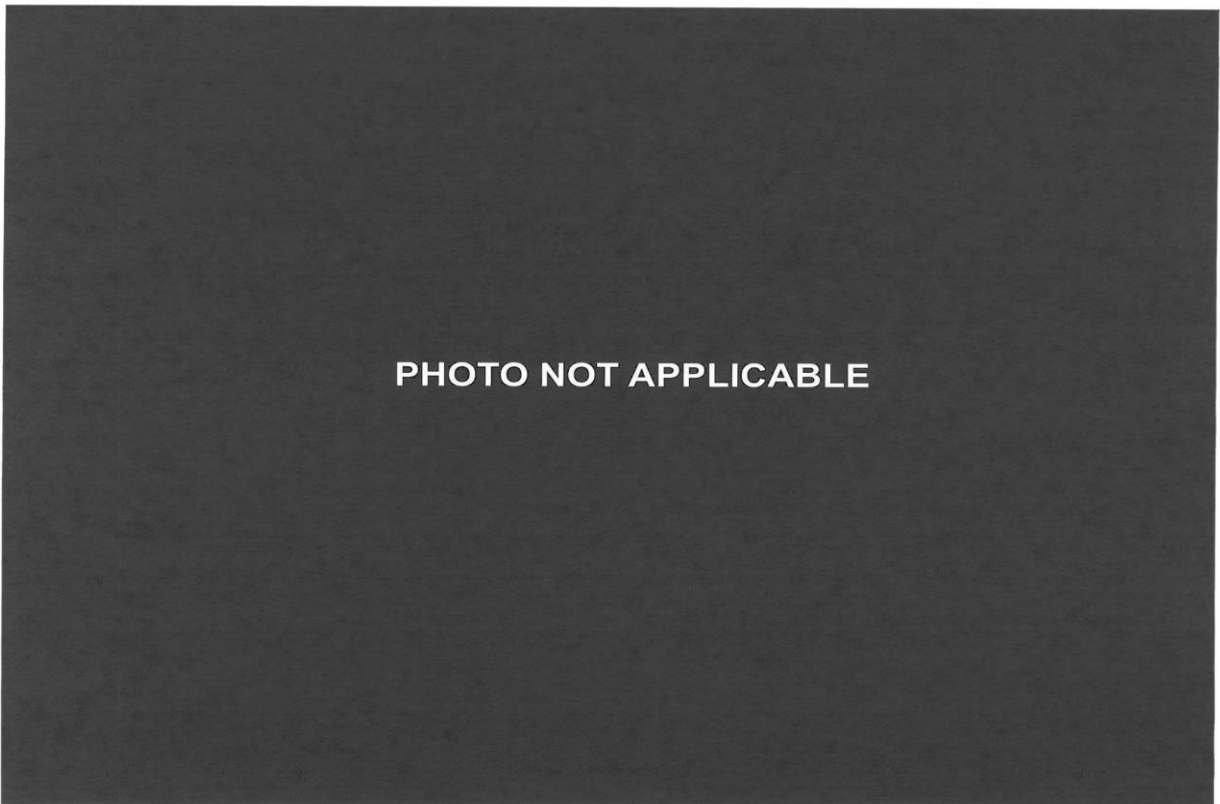
064 Pre-Test Placement of Rear Passenger Dummy's Feet



065 Pre-Test View of Belt Anchorage for Rear Passenger Dummy



066 Pre-Test Close-Up Left Side View of Rear Passenger Seat Track

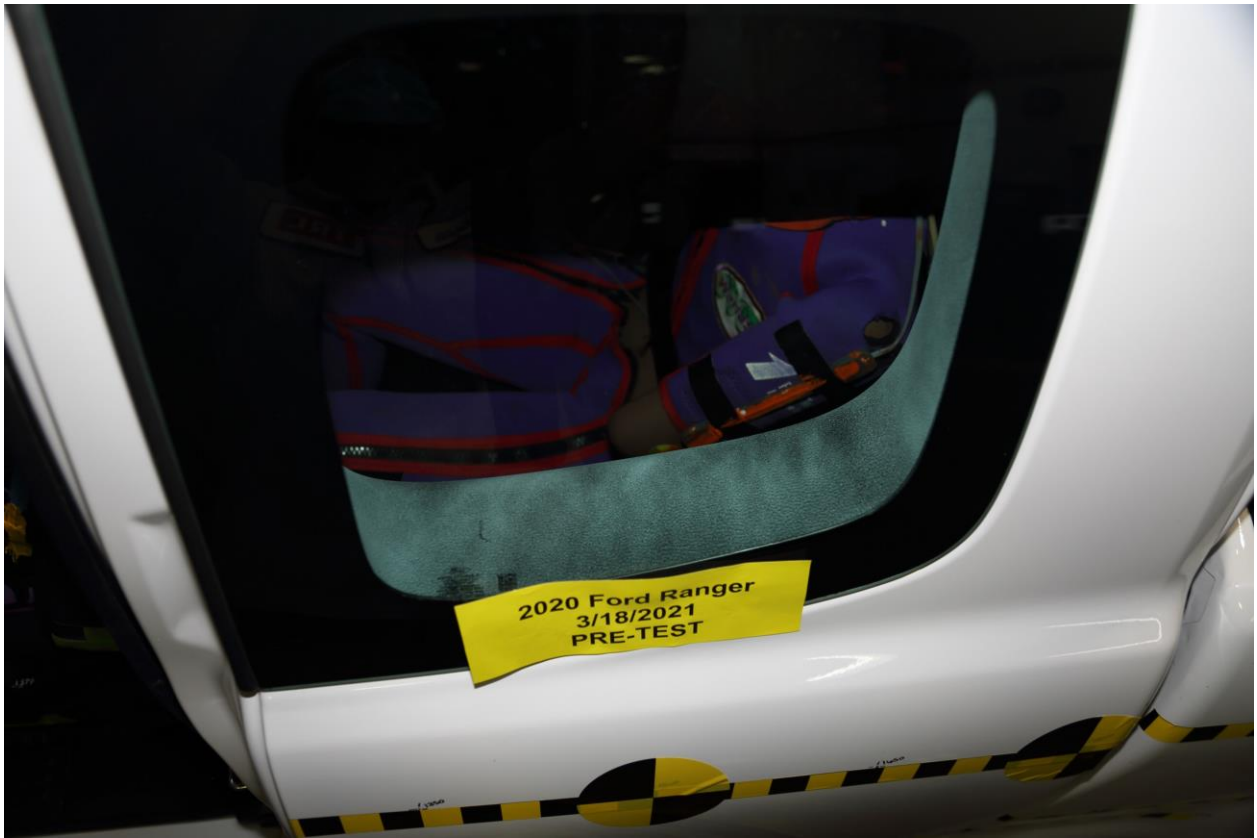


067 Pre-test Close-Up Left Side View of Rear Passenger Seat Back

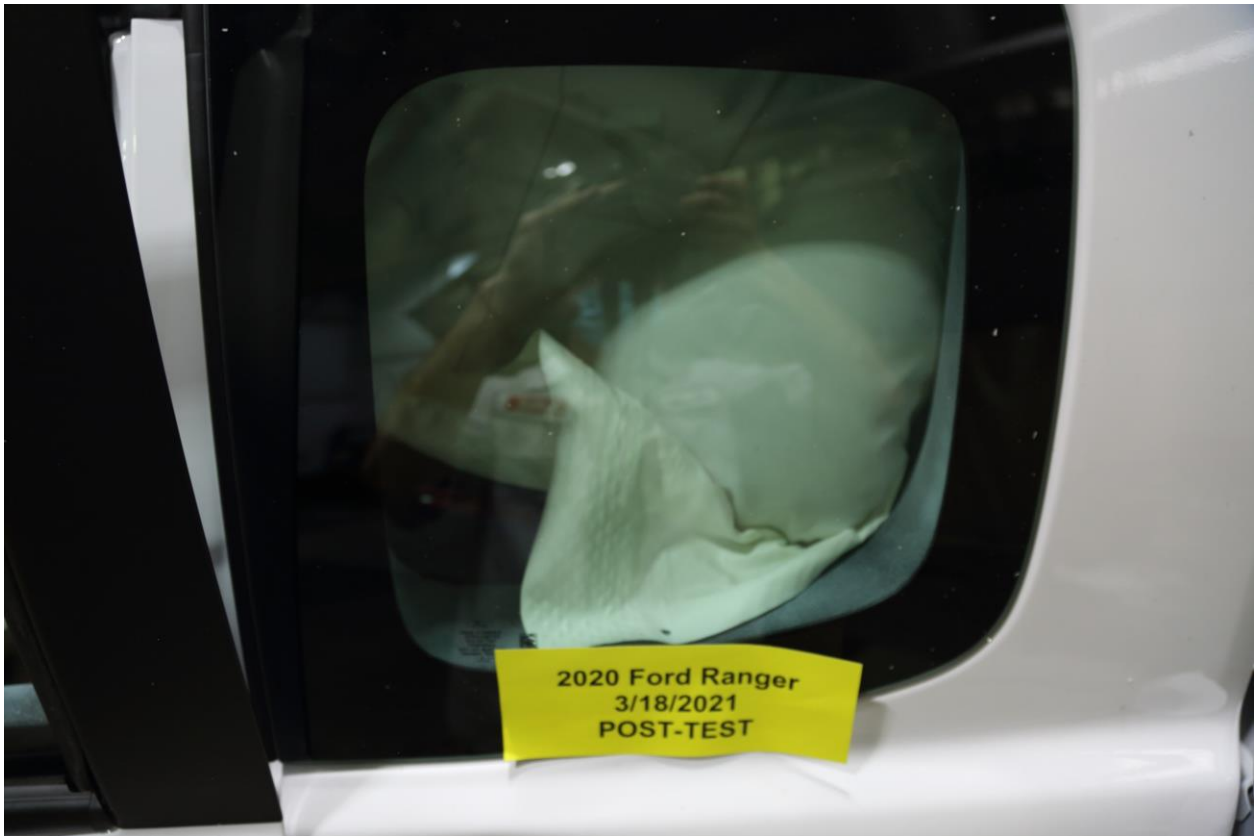
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068 Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint

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069 Pre-Test Rear Passenger Dummy and Door Clearance View



070 Post-Test Rear Passenger Dummy and Door Clearance View



071 Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



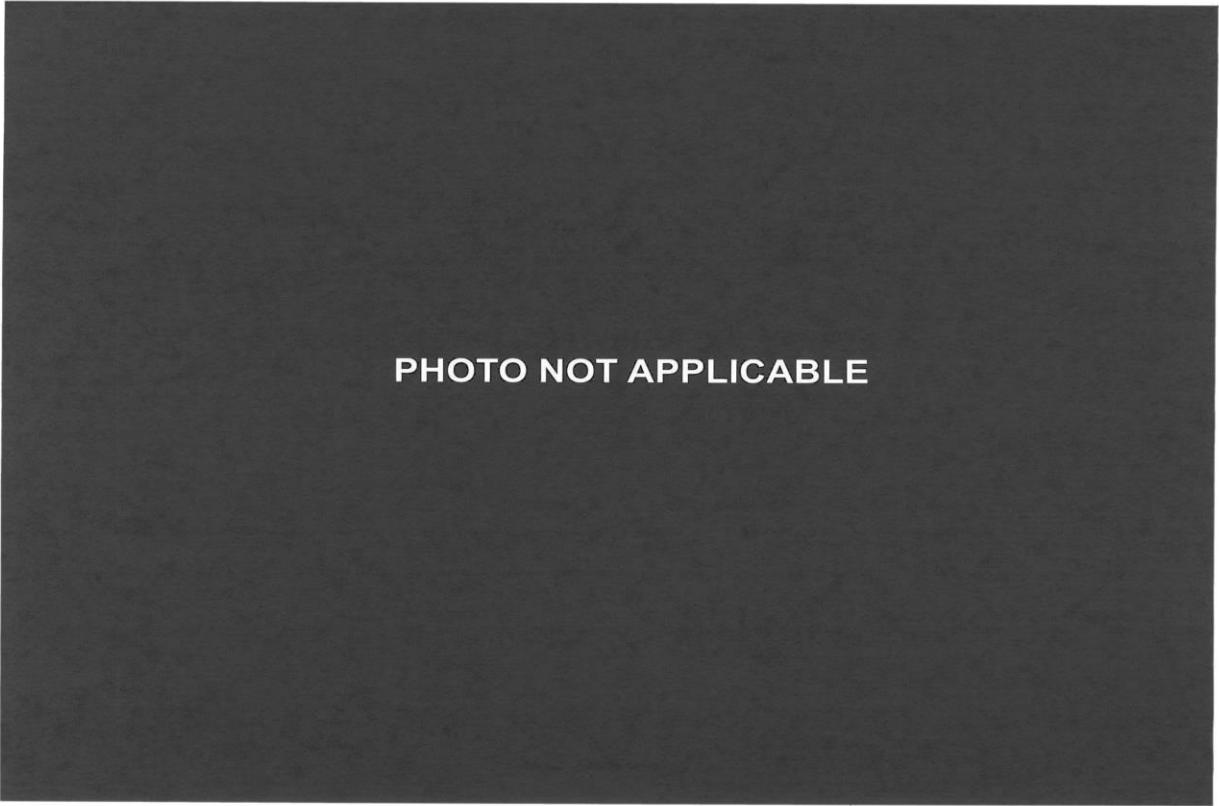
072 Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



073 Pre-Test Rear Passenger Inner Door Panel View



074 Post-Test Rear Passenger Inner Door Panel View



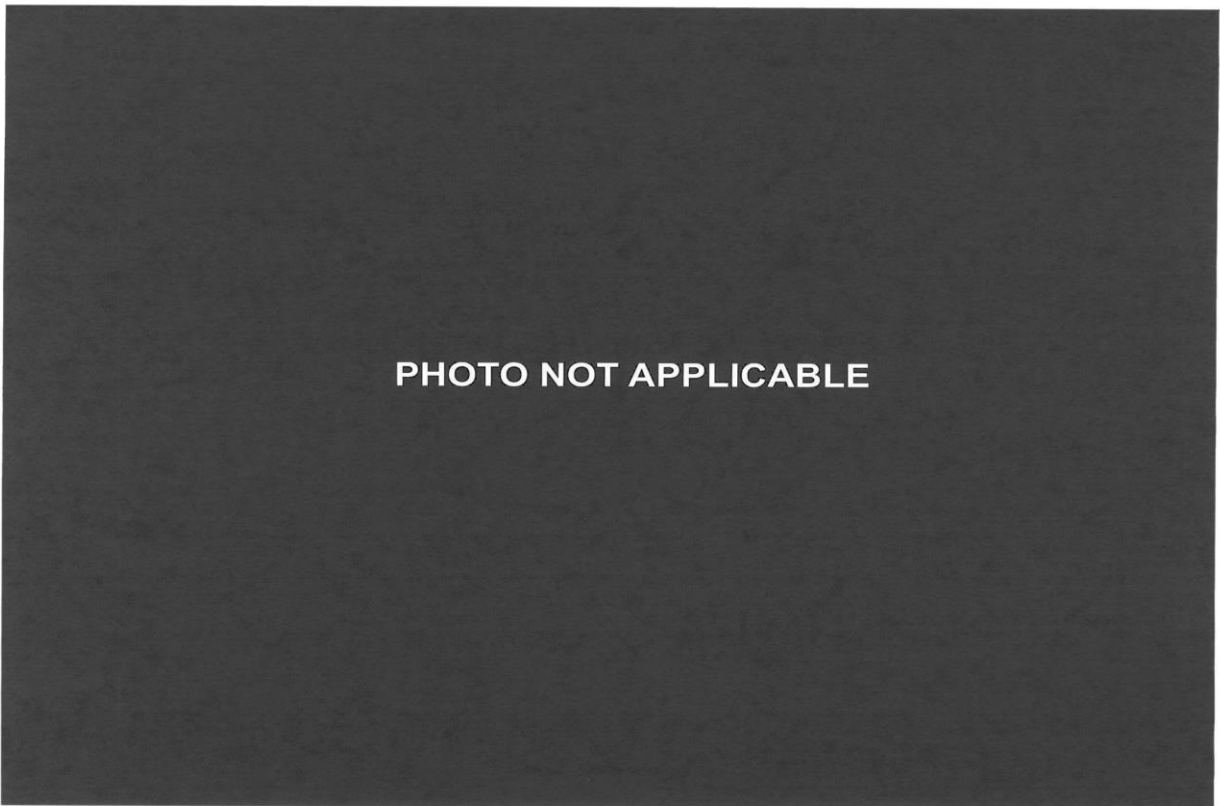
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View



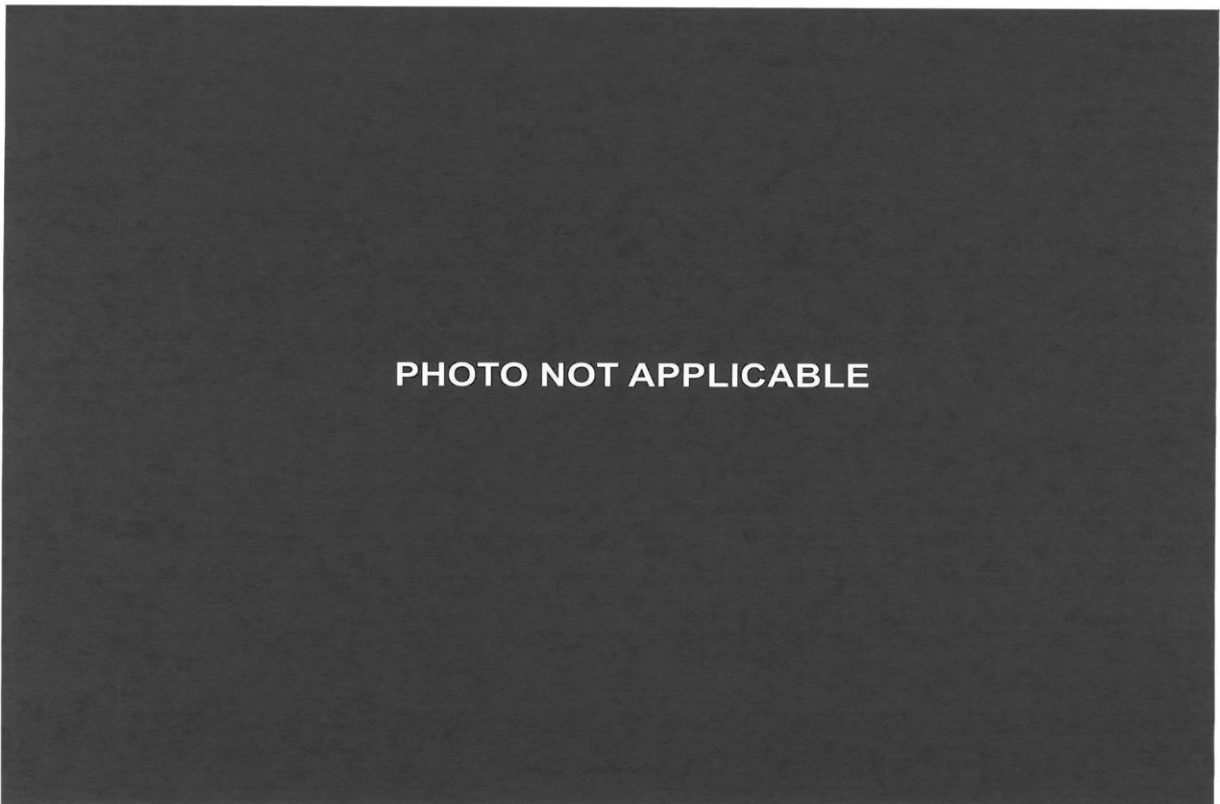
077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



078 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View



079 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View



080 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View



081 Post-Test Rear Passenger Dummy Close-Up Knee Contact View

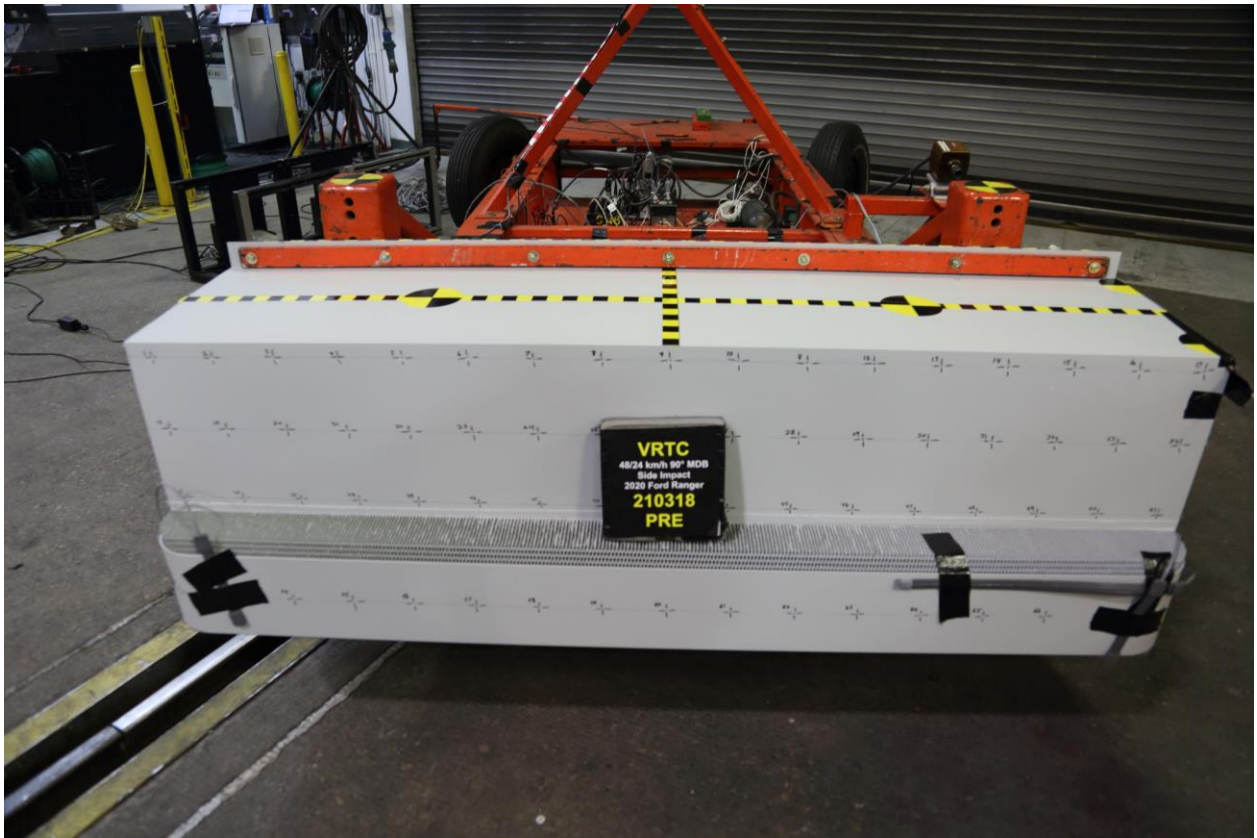
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082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



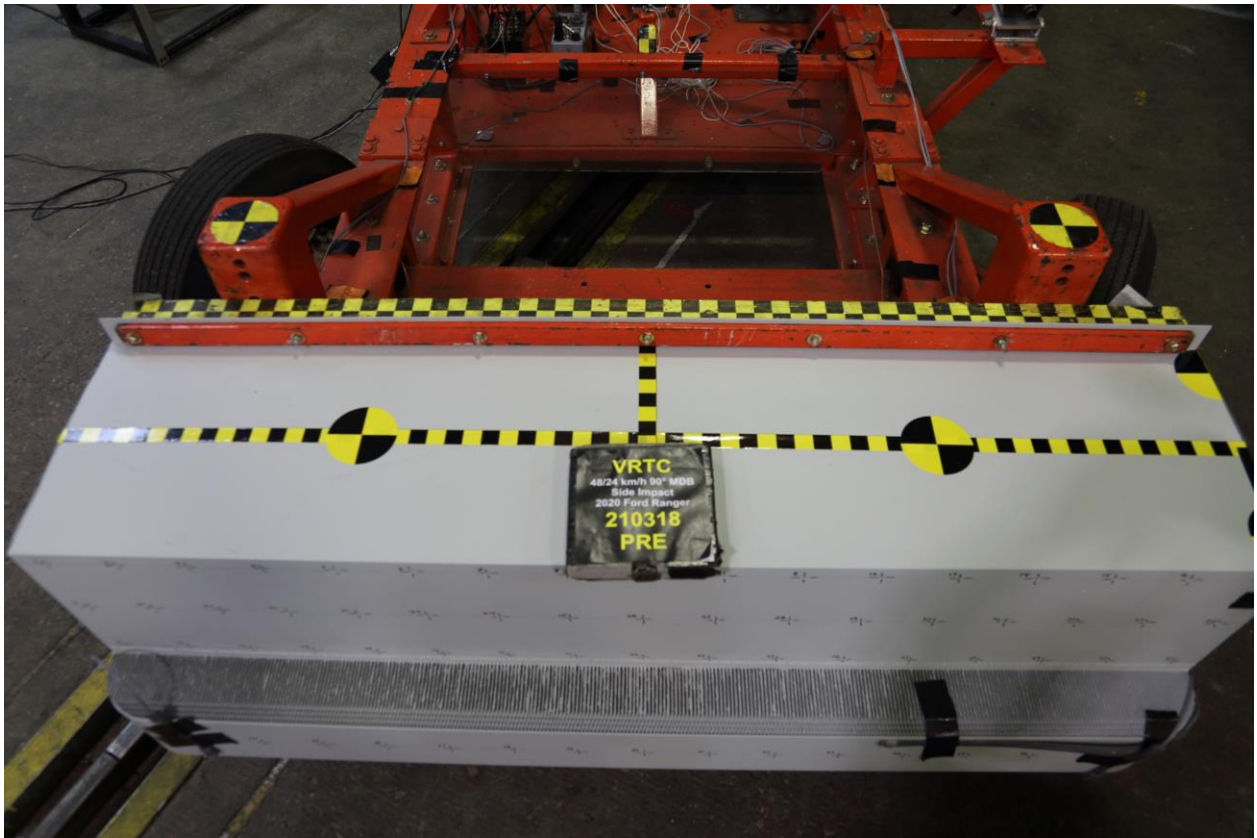
083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face



087 Post-Test Top View of MDB Impactor Face



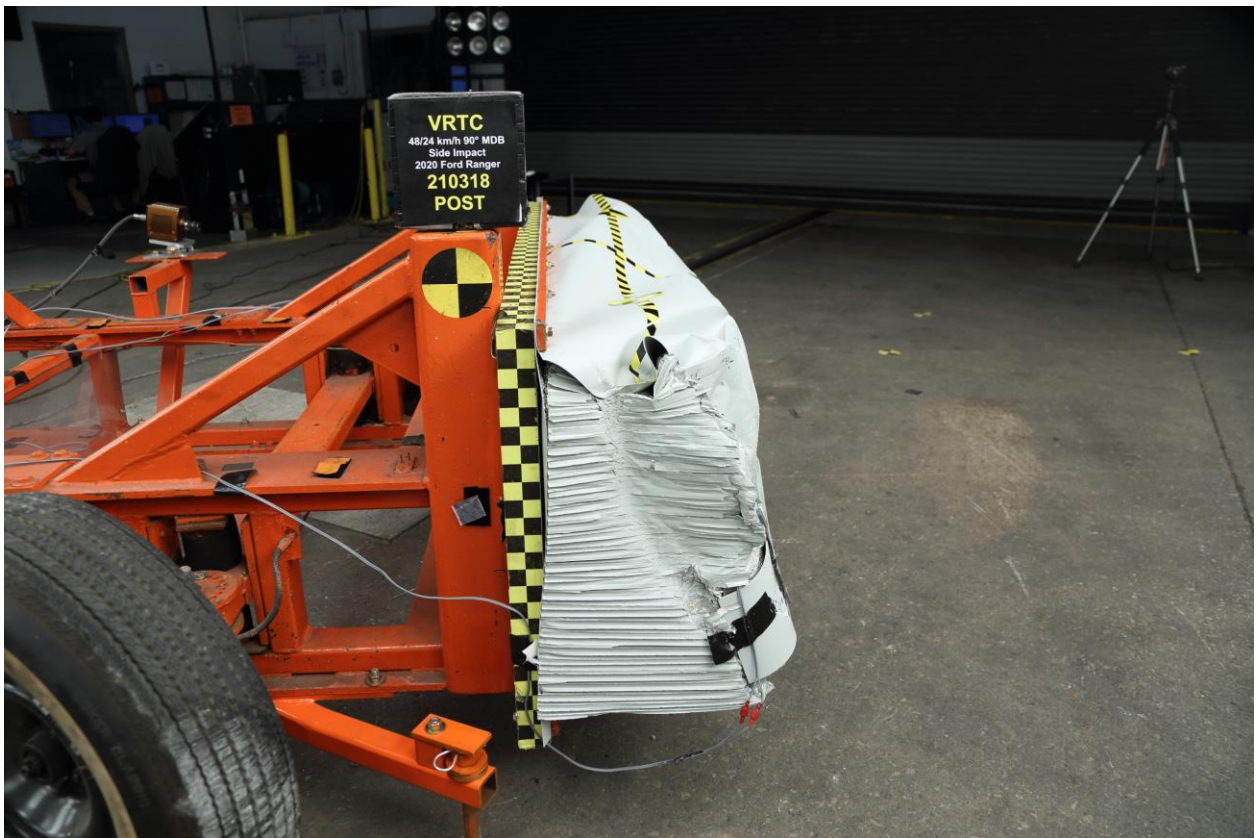
088 Pre-Test Left Side View of MDB Impactor Face



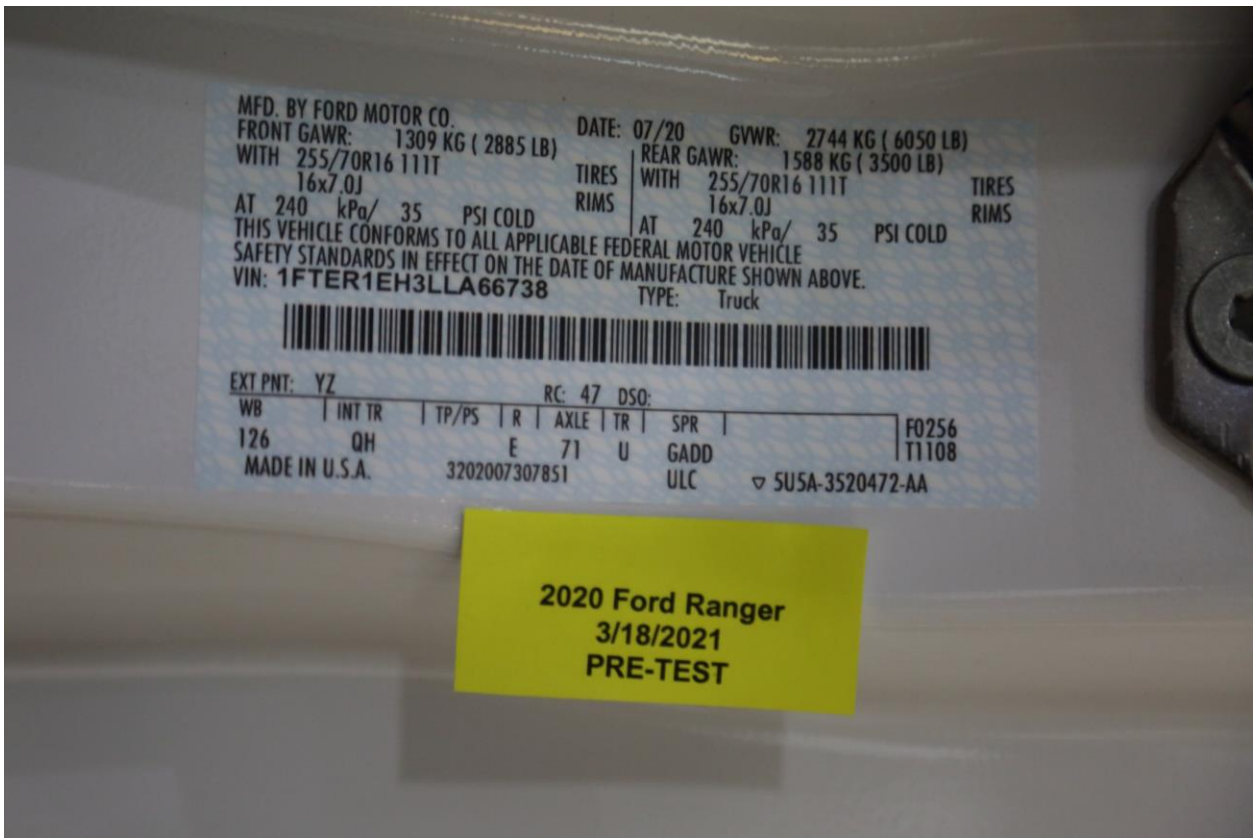
089 Post-Test Left Side View of MDB Impactor Face



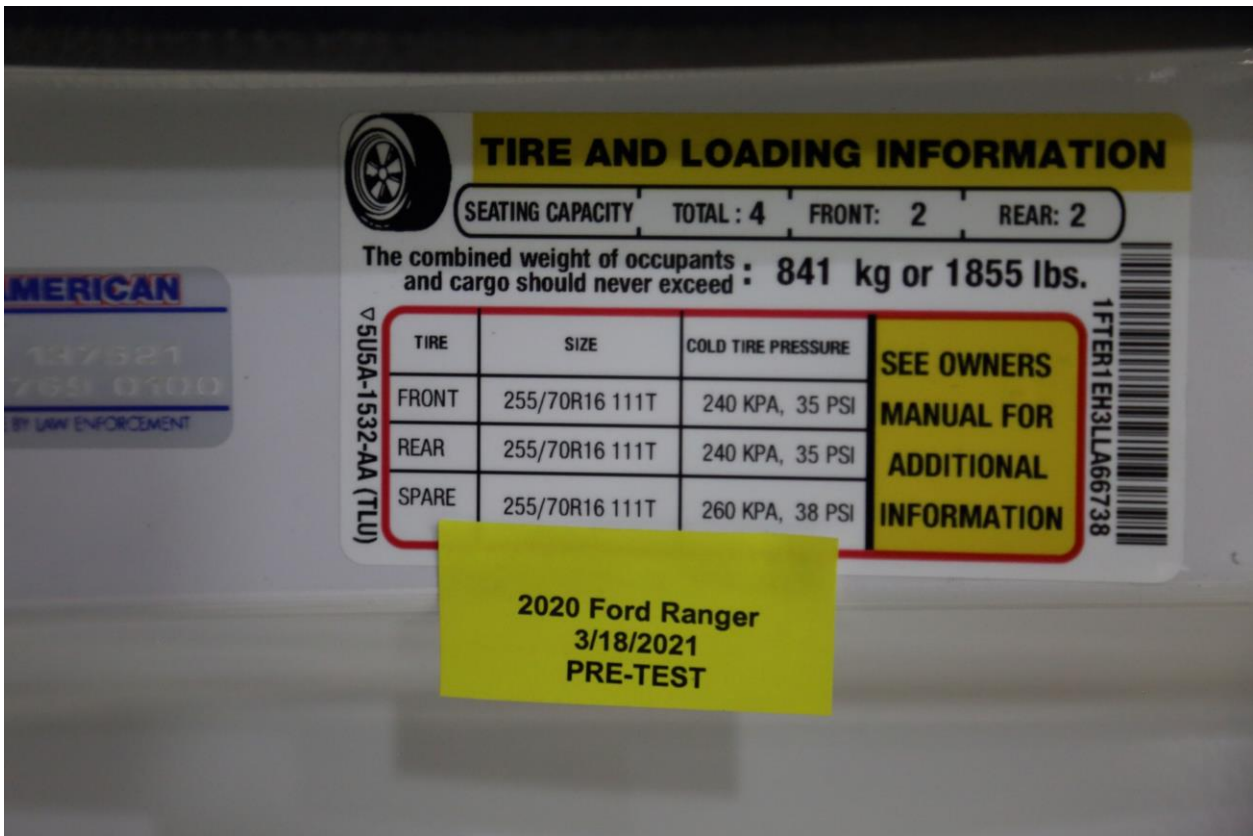
090 Pre-Test Right Side View of MDB Impactor Face



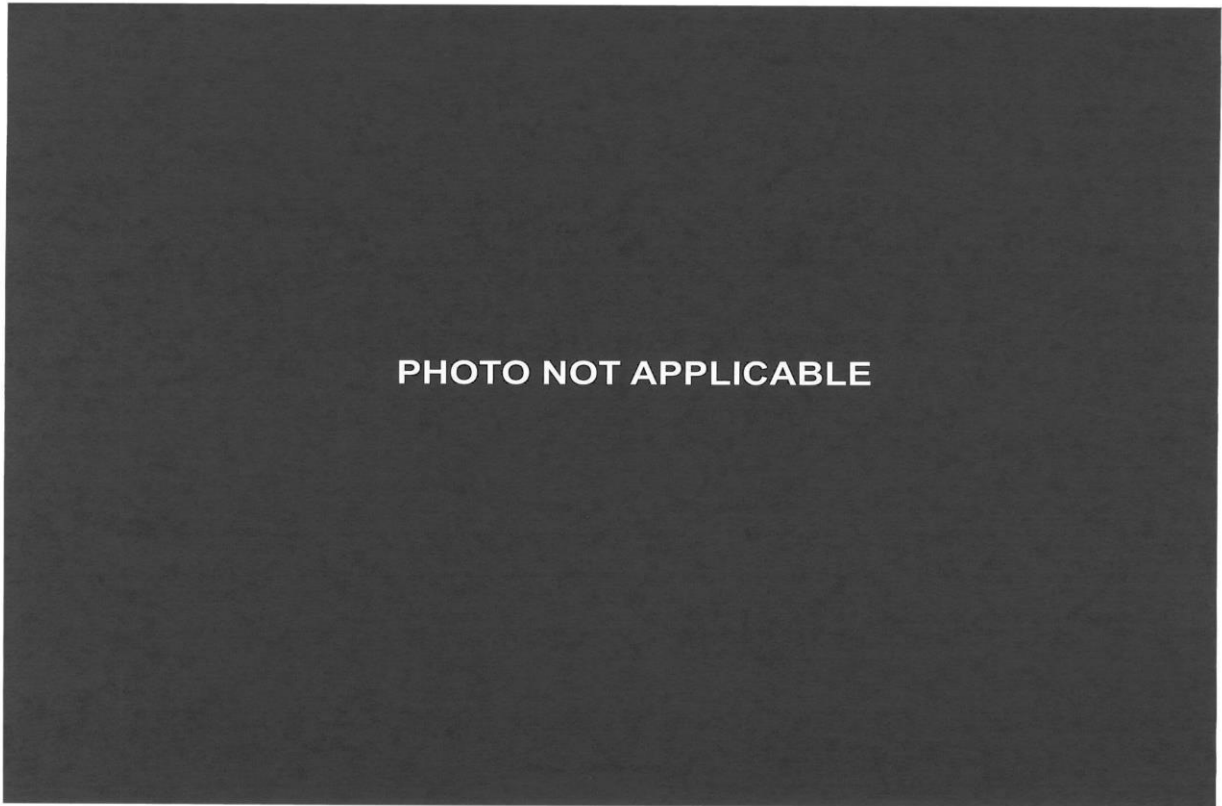
091 Post-Test Right Side View of MDB Impactor Face



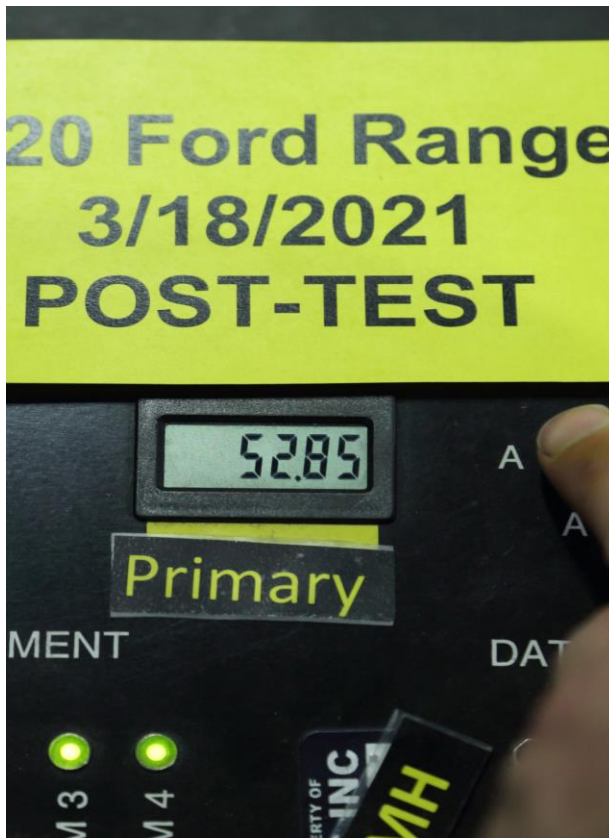
092 Close-Up View of Vehicle's Certification Label



093 Close-Up View of Vehicle's Tire Information Placard or Label



094 Pre-Test Ballast View



095 No. Post-Test Primary and Redundant Speed Trap Read-Out



PHOTO NOT APPLICABLE

096 FMVSS No. 301 Static Rollover 0 Degrees



PHOTO NOT APPLICABLE

097 FMVSS No. 301 Static Rollover 90 Degrees



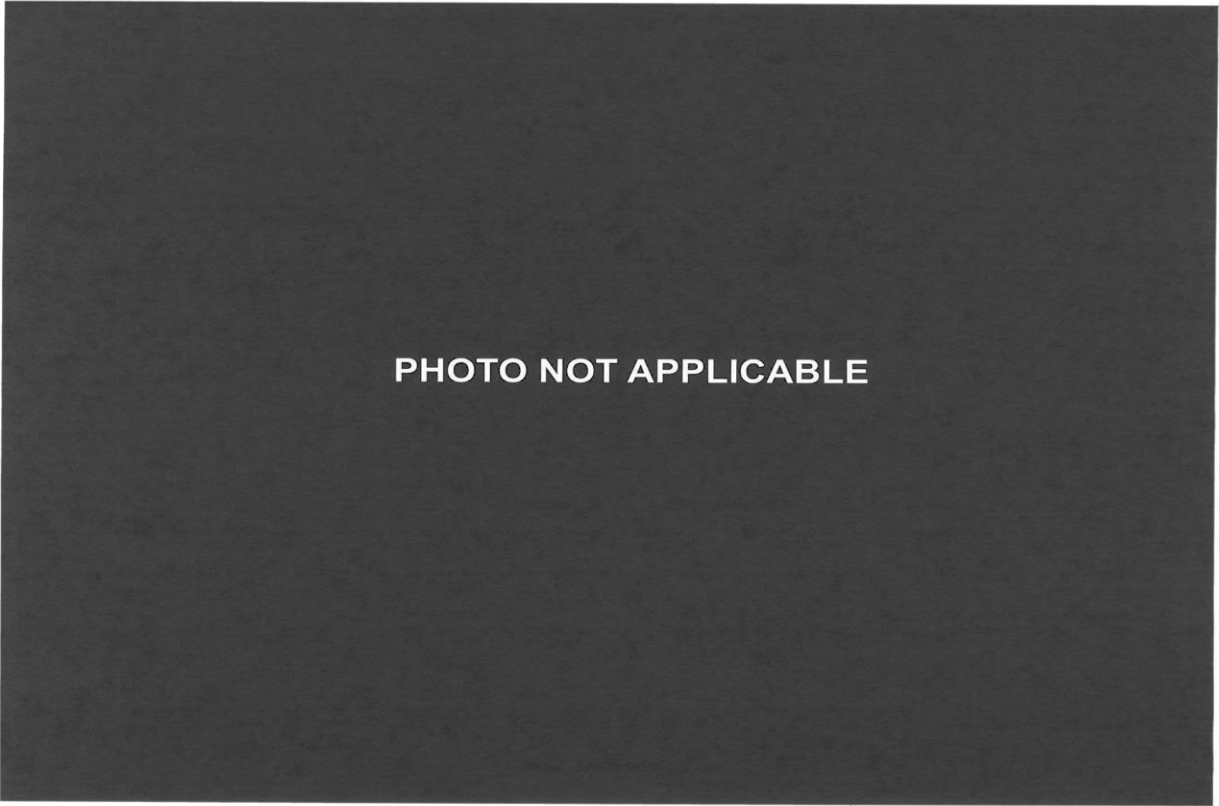
PHOTO NOT APPLICABLE

098 FMVSS No. 301 Static Rollover 180 Degrees



PHOTO NOT APPLICABLE

099 FMVSS No. 301 Static Rollover 270 Degrees



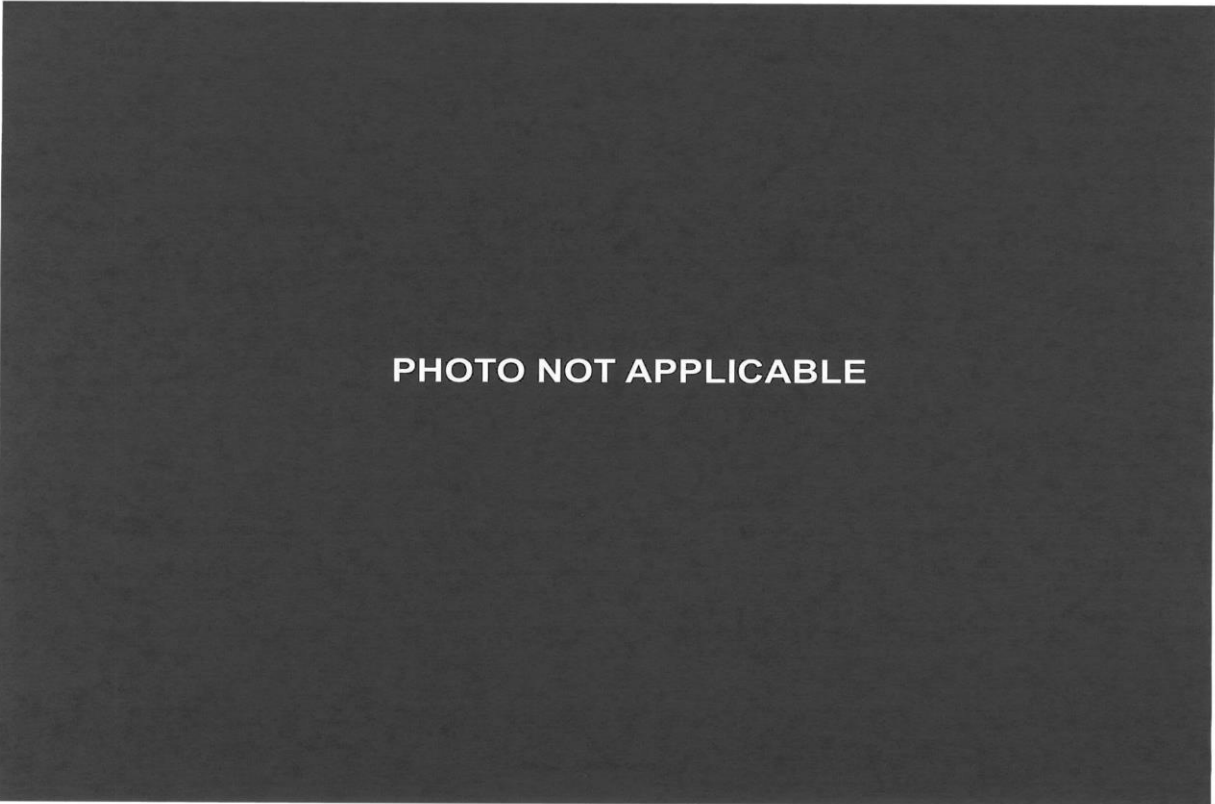
100 FMVSS No. 301 Static Rollover 360 Degrees



101 Impact Event

<p>Go Further ford.com</p>		VEHICLE DESCRIPTION RANGER 2020 SUPERDUTY 4X2 - 6' BOX XL 135 WHEELBASE 2.3L ECOBOOST ENGINE ELEC 10-SPEED AUTO TRANS		LL A66738		EPA DOT Fuel Economy and Environment Gasoline Vehicle	
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE EXTERIOR <ul style="list-style-type: none"> DAYTIME RUNNING LIGHTS EASY FUEL CAPLESS FILLER FUEL TANK - 18.0 GALLON FULLY BOXED STEEL FRAME GRILLE - BLACK HEADLAMPS - AUTOLAMP (CONOFF) HEADLAMPS-HALOGEN LOCKING TAILGATE PICKUP BOX TIE DOWN HOOKS TRAILER SWAY CONTROL WHEEL LIP MOLDINGS WIPERS - INTERMITTENT 		INTERIOR <ul style="list-style-type: none"> A/C W/MANUAL CLIMATE CONTROL, SINGLE ZONE DRIVER SEAT - 4-WAY MANUAL W/MANUAL LUMBAR DUAL SLIDING SUNVISORS LOCKING GLOVE BOX POWERPOINTS - 12V (2) TELITELESCOPE STR COLUMN 		FUNCTIONAL <ul style="list-style-type: none"> 4-WHEEL ANTILOCK BRAKE SYS AUTO START STOP TECH CURVE CONTROL ELECTRONIC PWR ASST STEER FACE-TO-OFF INTERIOR LIGHT FORDPASS™ CONNECT 4GW-FI HOTSPOT™ TELEMATICS MODEM HILL START ASSIST PRE-COLLISION ASSIST W/AEB REAR VIEW CAMERA REMOTE START- FORDPASS APP 		SAFETY/SECURITY <ul style="list-style-type: none"> AIRBAGS - SAFETY CANOPY® BELT-MINDER CHIME CTR HIGH MOUNT STOP LAMP MYKEY SECURELOCK® ANTI-THEFT SYS TIRE PRESSURE MONIT SYS 	
INCLUDED ON THIS VEHICLE EQUIPMENT GROUP 101A <ul style="list-style-type: none"> XL SERIES CRUISE CONTROL SYNC, AM/FM RADIO, 8-SPKRS 		MSRP 1,135.00		PRICE INFORMATION BASE PRICE TOTAL OPTIONS/OTHER 24,410.00 1,135.00		MSRP 25,545.00 1,195.00	
OPTIONAL EQUIPMENT/OTHER 265/70R16 A/S BSW TIRE FRONT LICENSE PLATE BRACKET		MSRP NO CHARGE		TOTAL VEHICLE & OPTIONS/OTHER DESTINATION & DELIVERY 25,545.00 1,195.00		fuel economygov Calculate personalized estimates and compare vehicles	
SOLD TO Kings Ford Inc P.O. BOX 498368 Cincinnati OH 45249		RAMP ONE 47A 016 CO4G		FRNL ASSEMBLY PLANT MICHIGAN		TOTAL MSRP \$26,740.00	
SHP TO OF OTHER THAN SOLD TO		RAMP TWO		METHOD OF TRANS. CONVOY		ITEM # 47-P601 Q1T 2	
SHP THROUGH		This label is affixed pursuant to the Federal Automobile Information Disclosure Act. Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.		FORD CREDIT Whether you decide to lease or finance your vehicle, you'll find the choices that are right for you. See your dealer for details or visit www.ford.com/finance .		WARNING: Operating, servicing and maintaining a passenger vehicle, pickup truck, van, or off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to www.P65Warnings.ca.gov/passenger-vehicle .	

102 Monroney Label



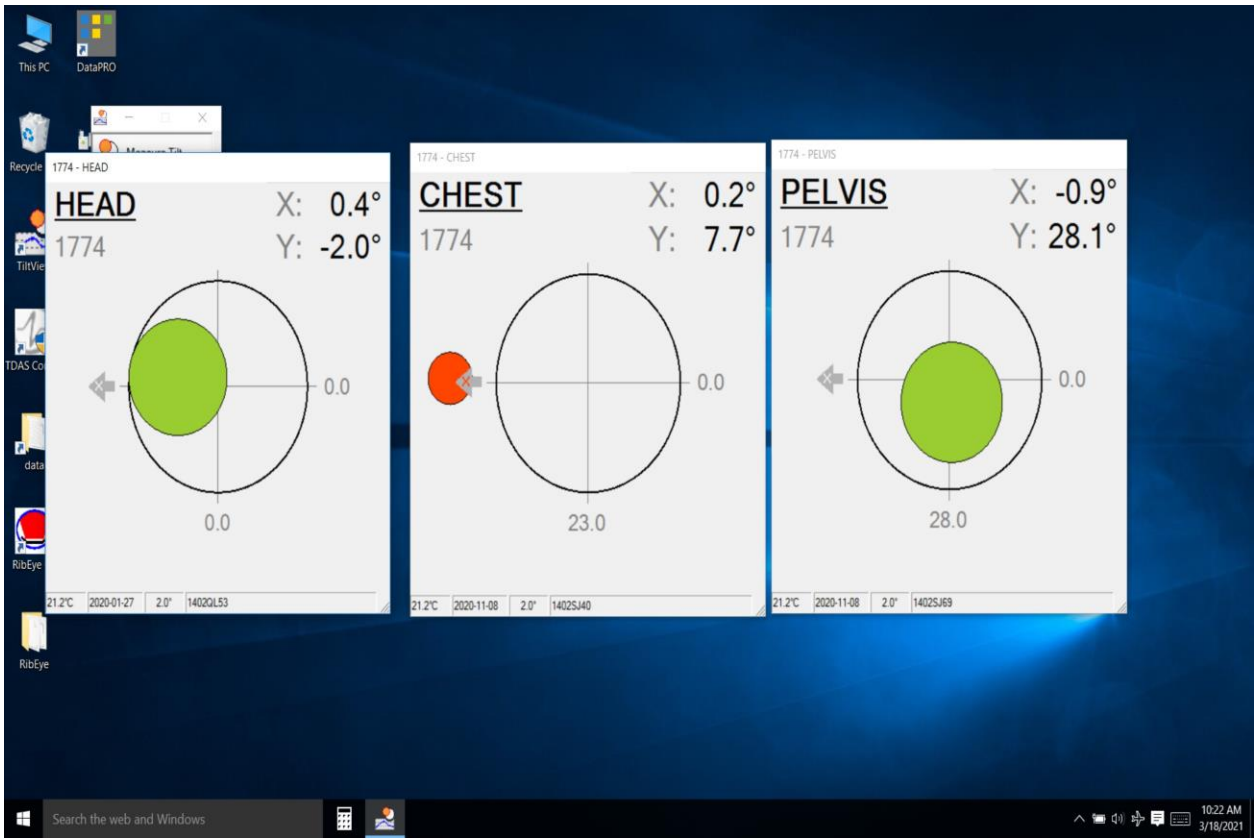
103 Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

PHOTO NOT APPLICABLE

104 Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



105 WorldSID-50M Pre-Test Tilt Sensor View



No. 106 WorldSID-05F Pre-Test Tilt Sensor View



No. 107 WorldSID-05F Thorax Rib 2 Inclinator No. 107 WorldSID-05F Thorax Rib 2 Inclinator

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

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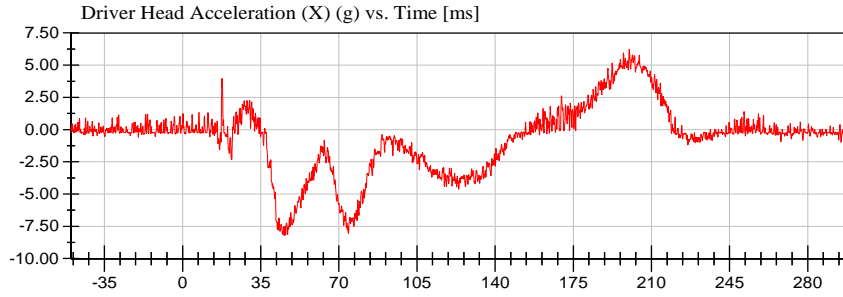
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VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



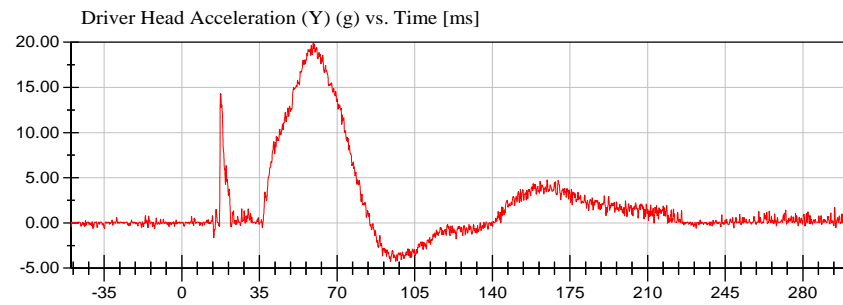
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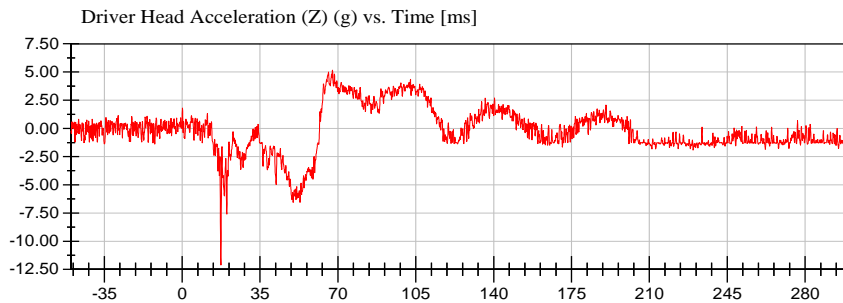
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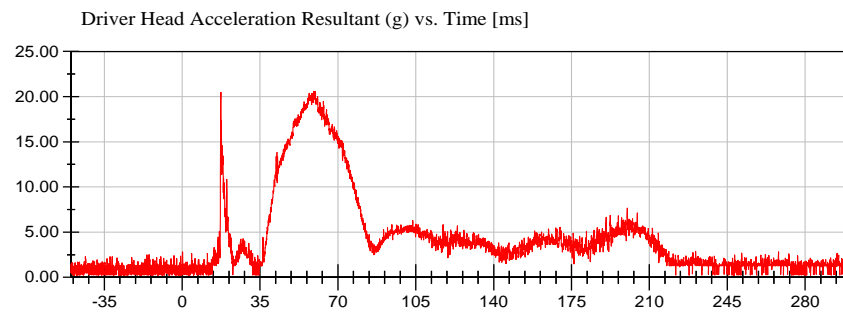
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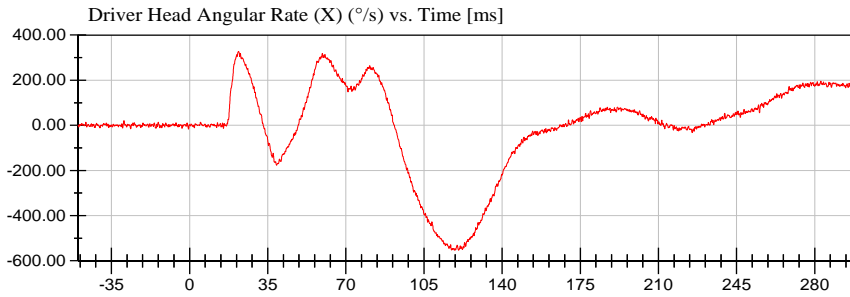
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VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



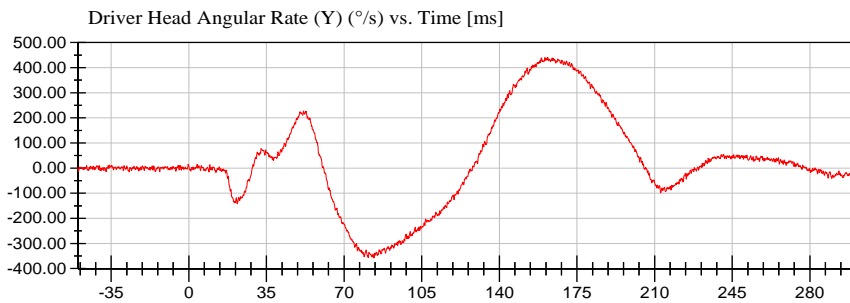
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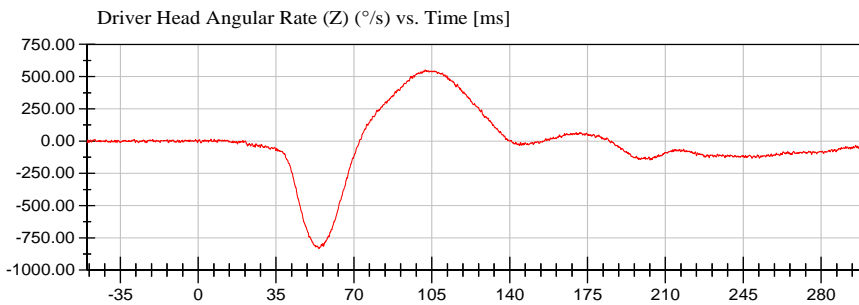
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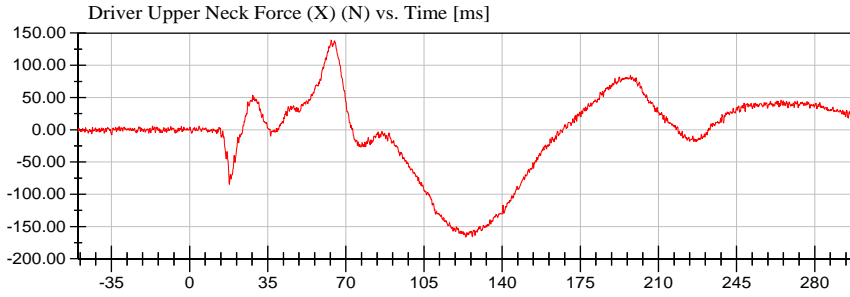
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Test Number: 210318 ()

Test Date: 03/18/2021



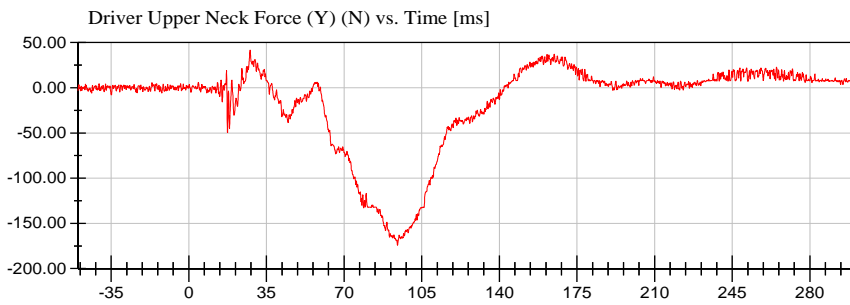
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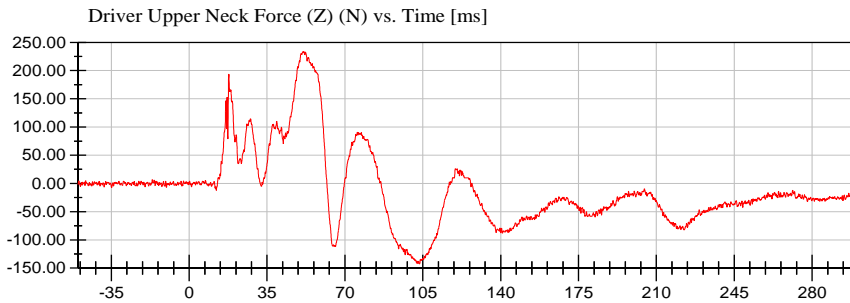
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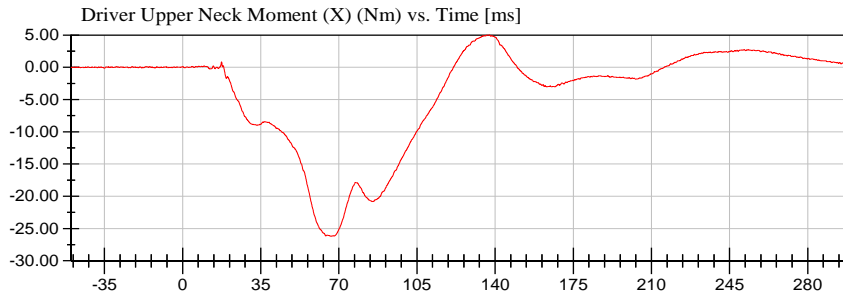


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



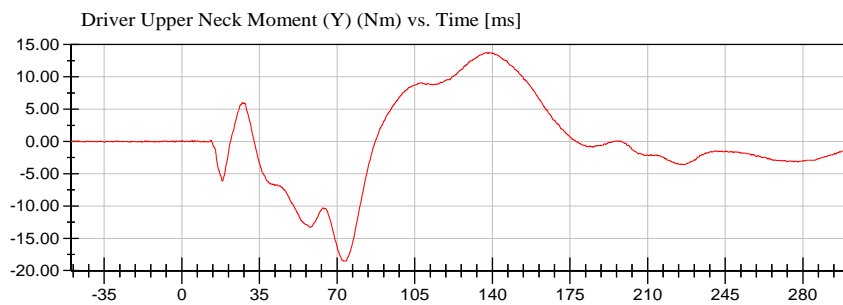
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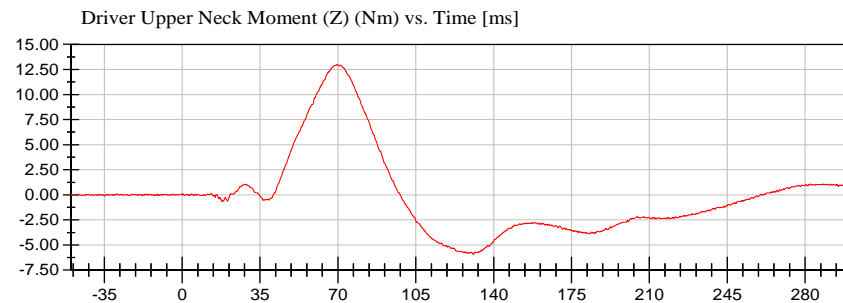
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-18.54 Nm at 73.35 ms

CFC_600



<Max>

12.99 Nm at 69.55 ms

<Min>

-5.90 Nm at 130.85 ms

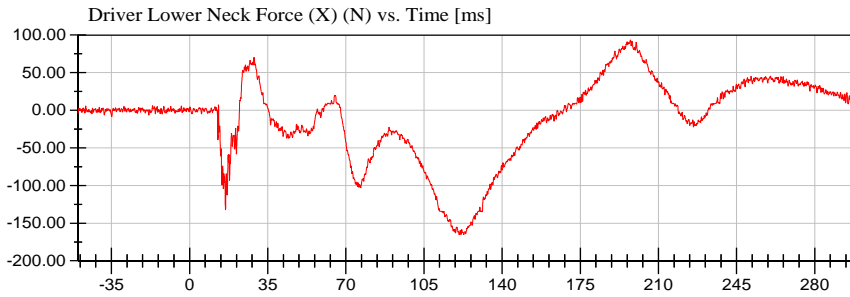
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



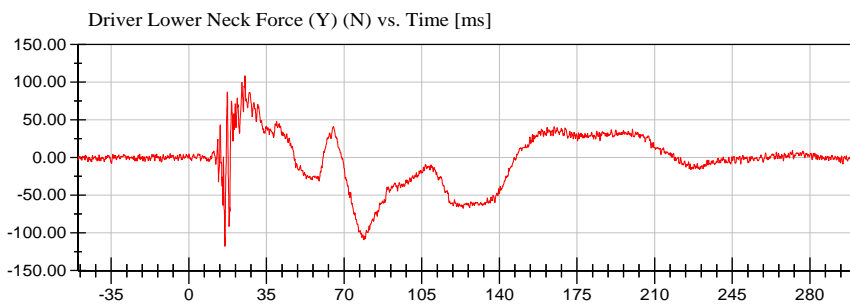
<Max>

93.55 N at 197.45 ms

<Min>

-165.45 N at 122.80 ms

CFC_1000



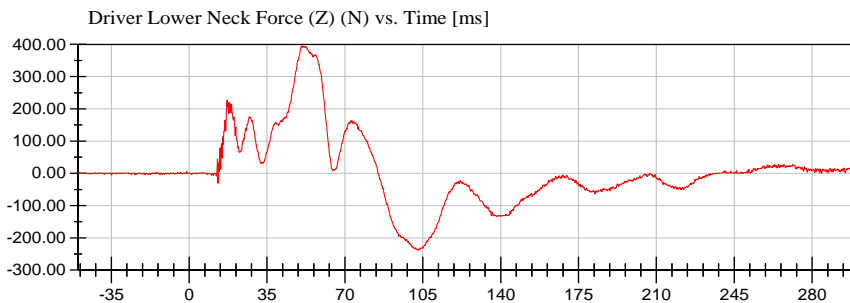
<Max>

108.64 N at 25.35 ms

<Min>

-117.87 N at 16.30 ms

CFC_1000



<Max>

394.95 N at 50.50 ms

<Min>

-237.72 N at 102.90 ms

CFC_1000

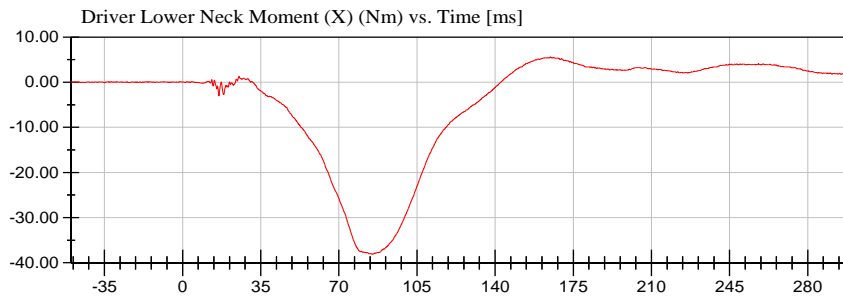


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



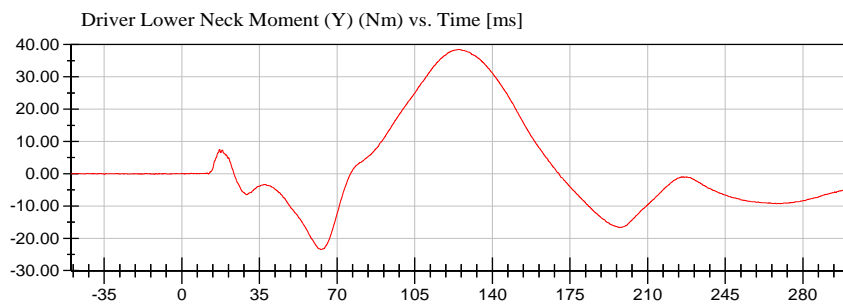
<Max>

5.56 Nm at 164.70 ms

<Min>

-38.09 Nm at 85.00 ms

CFC_600



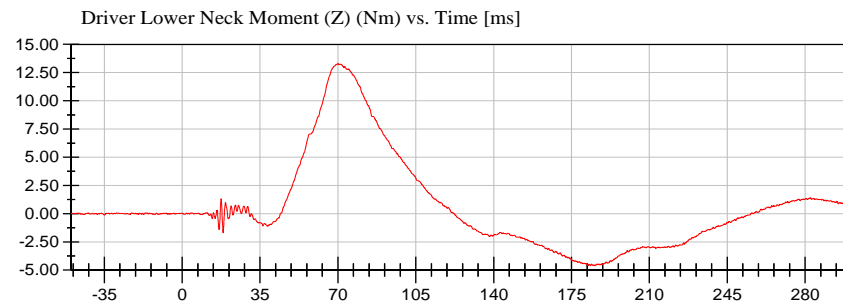
<Max>

38.47 Nm at 124.85 ms

<Min>

-23.47 Nm at 62.75 ms

CFC_600



<Max>

13.29 Nm at 70.05 ms

<Min>

-4.61 Nm at 183.45 ms

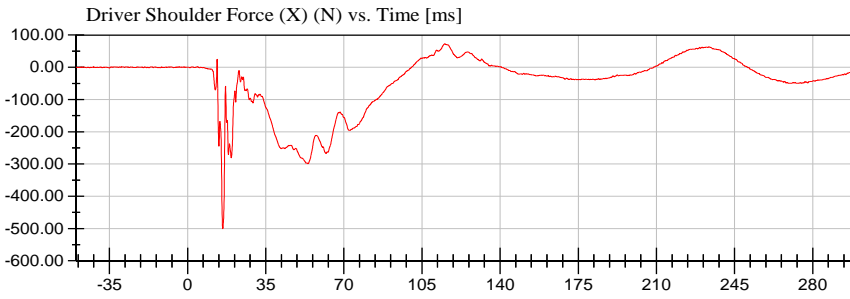
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



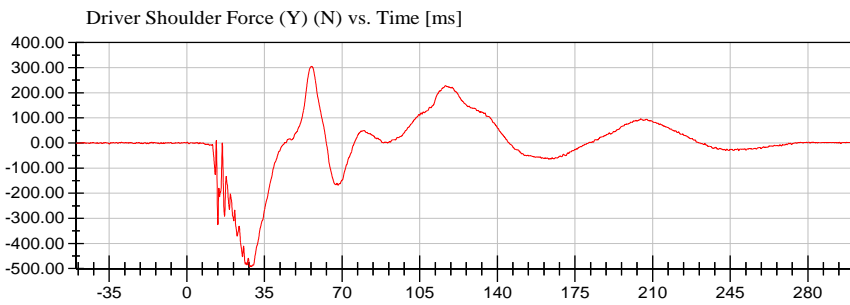
<Max>

72.92 N at 115.20 ms

<Min>

-500.55 N at 15.80 ms

CFC_600



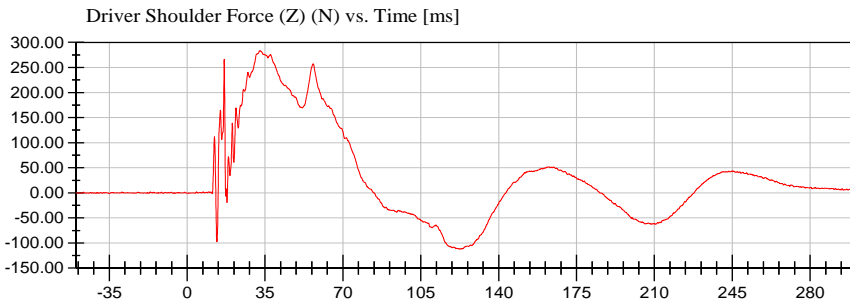
<Max>

305.13 N at 56.20 ms

<Min>

-492.34 N at 28.35 ms

CFC_600



<Max>

283.64 N at 32.80 ms

<Min>

-112.25 N at 122.90 ms

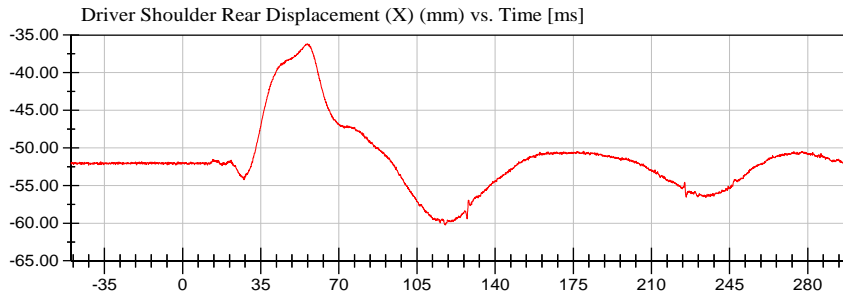
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



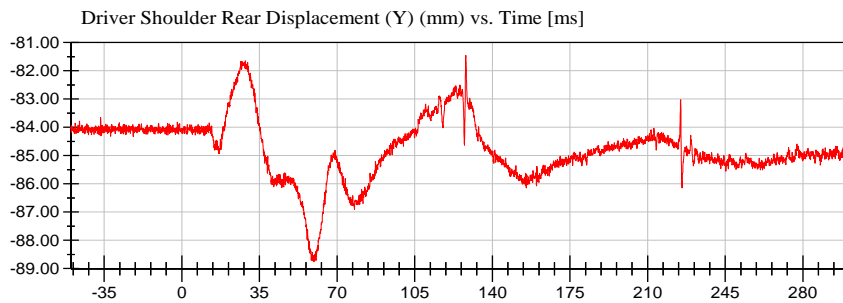
<Max>

-36.18 mm at 55.95 ms

<Min>

-60.23 mm at 117.60 ms

Unfiltered



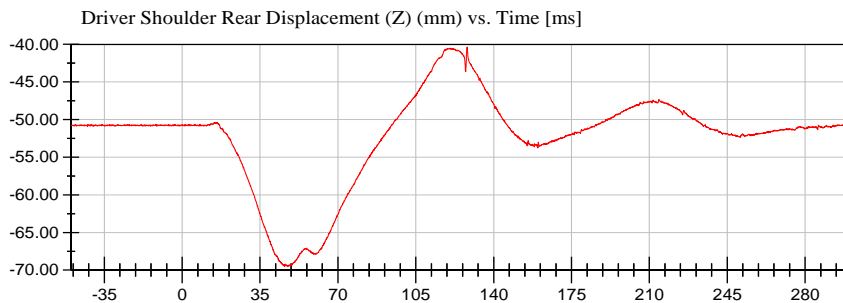
<Max>

-81.46 mm at 128.00 ms

<Min>

-88.76 mm at 59.55 ms

Unfiltered



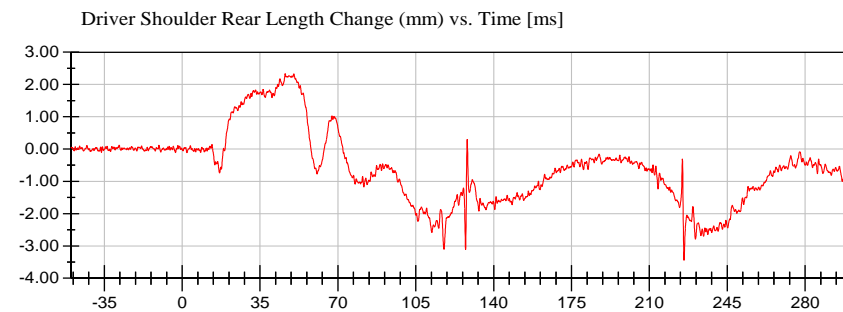
<Max>

-40.35 mm at 128.05 ms

<Min>

-69.53 mm at 47.50 ms

Unfiltered



<Max>

2.34 mm at 46.35 ms

<Min>

-3.45 mm at 225.55 ms

CFC_600

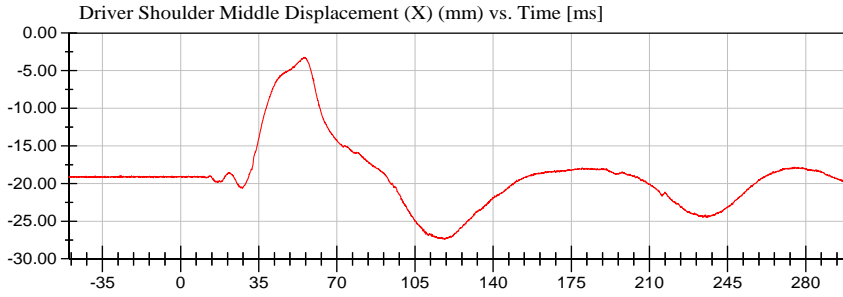


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



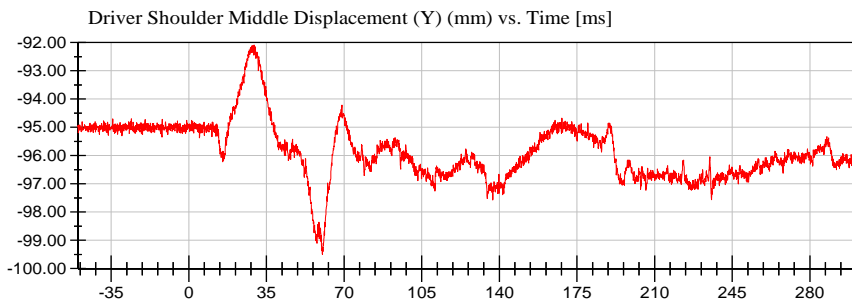
<Max>

-3.22 mm at 55.20 ms

<Min>

-27.43 mm at 118.35 ms

Unfiltered



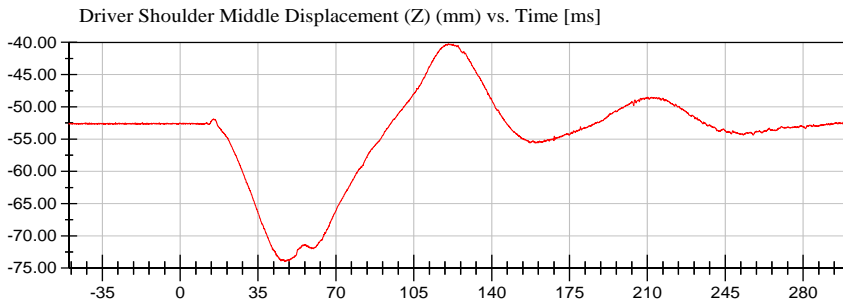
<Max>

-92.08 mm at 29.45 ms

<Min>

-99.50 mm at 60.20 ms

Unfiltered



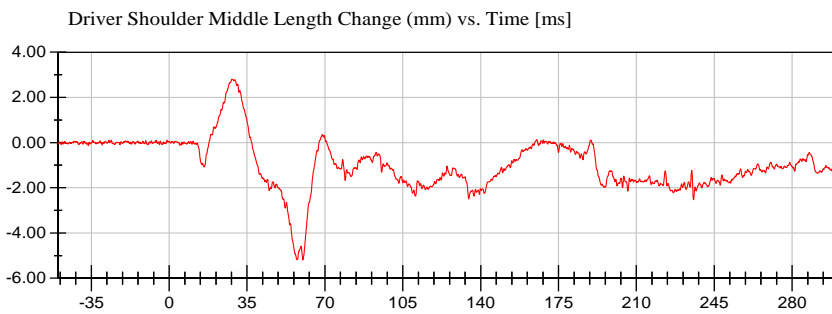
<Max>

-40.23 mm at 120.45 ms

<Min>

-73.99 mm at 47.00 ms

Unfiltered



<Max>

2.80 mm at 28.20 ms

<Min>

-5.20 mm at 60.15 ms

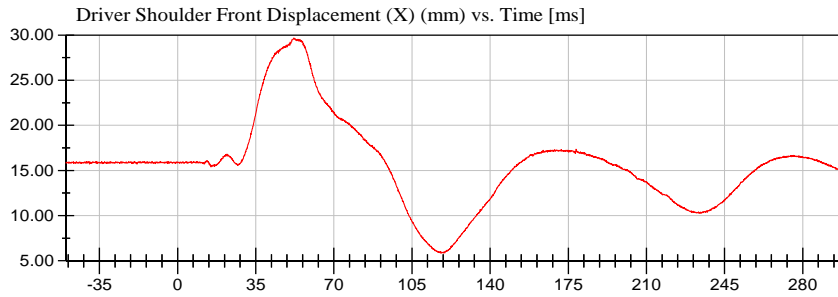
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



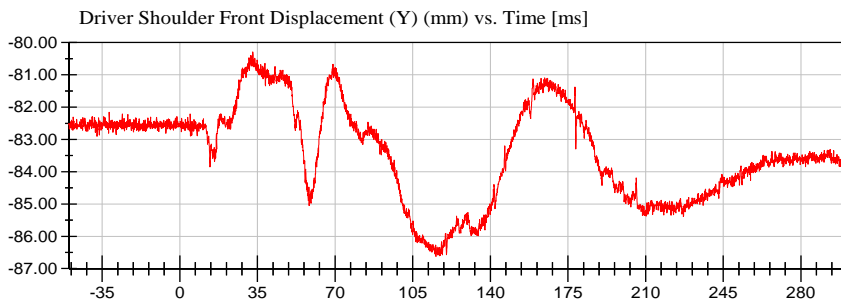
<Max>

29.67 mm at 52.10 ms

<Min>

5.85 mm at 119.20 ms

Unfiltered



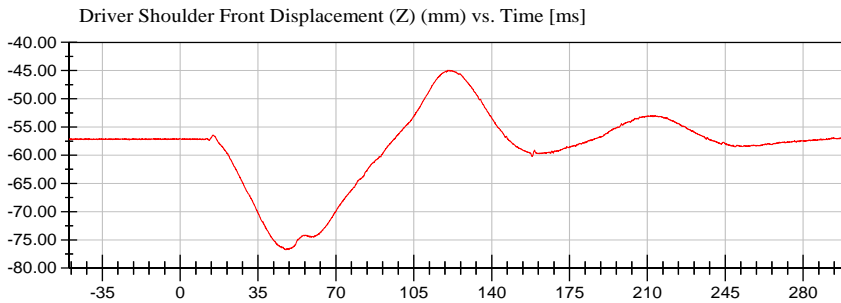
<Max>

-80.29 mm at 32.90 ms

<Min>

-86.62 mm at 115.45 ms

Unfiltered



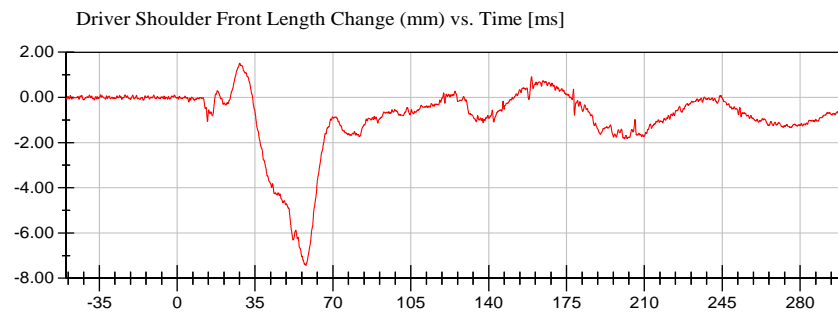
<Max>

-44.92 mm at 120.40 ms

<Min>

-76.79 mm at 47.50 ms

Unfiltered



<Max>

1.51 mm at 28.10 ms

<Min>

-7.44 mm at 57.85 ms

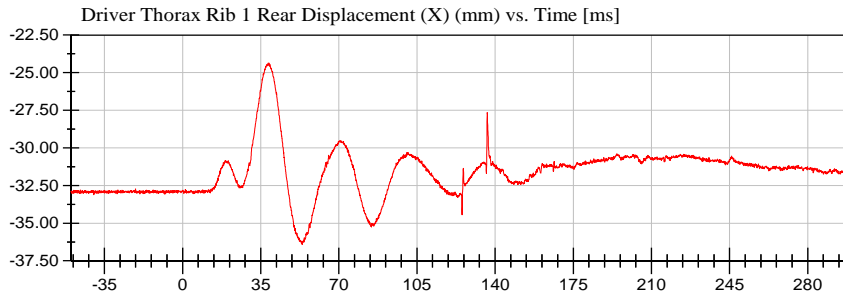
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



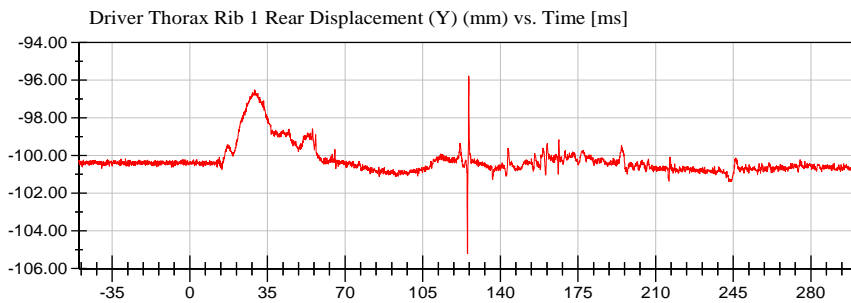
<Max>

-24.35 mm at 38.60 ms

<Min>

-36.39 mm at 53.30 ms

Unfiltered



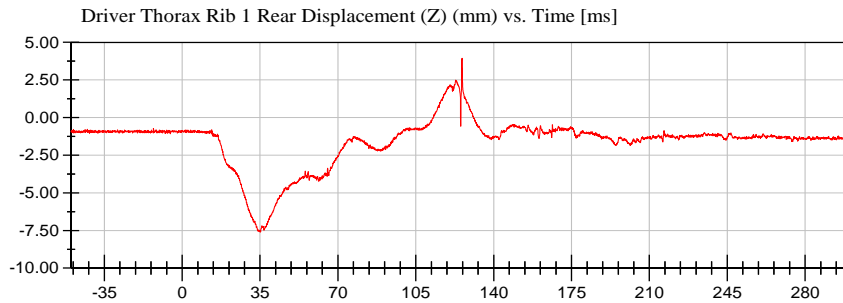
<Max>

-95.78 mm at 125.75 ms

<Min>

-105.21 mm at 125.20 ms

Unfiltered



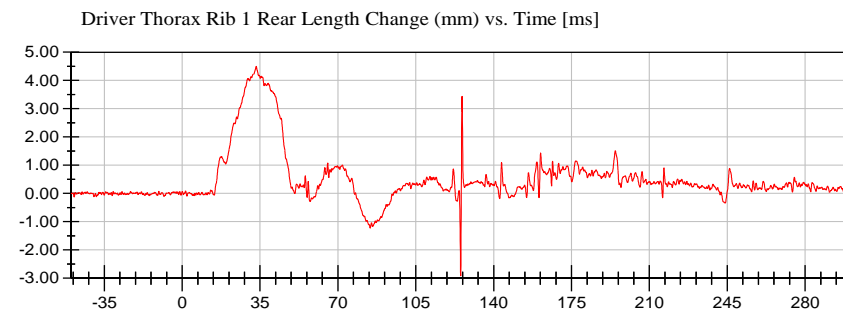
<Max>

3.95 mm at 125.75 ms

<Min>

-7.61 mm at 34.95 ms

Unfiltered



<Max>

4.50 mm at 33.30 ms

<Min>

-2.91 mm at 125.15 ms

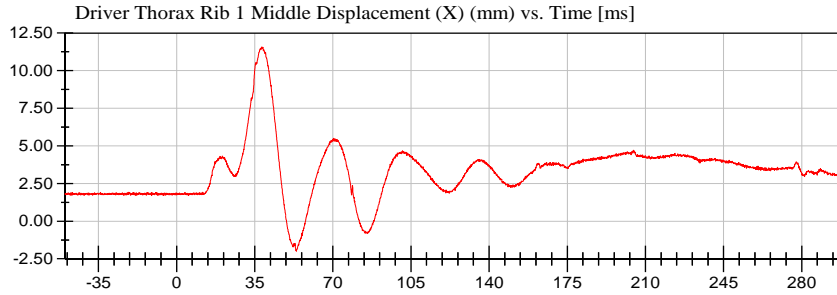
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



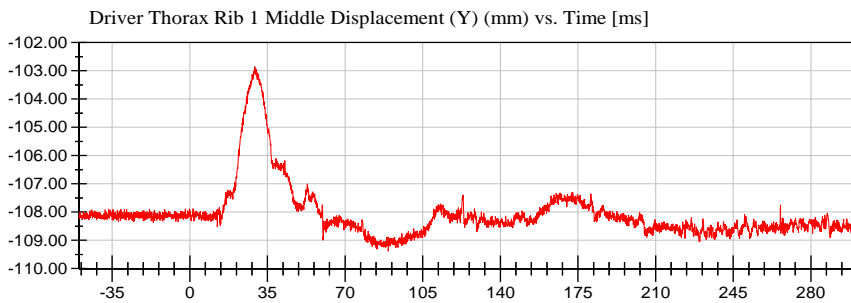
<Max>

11.57 mm at 38.20 ms

<Min>

-1.99 mm at 53.70 ms

Unfiltered



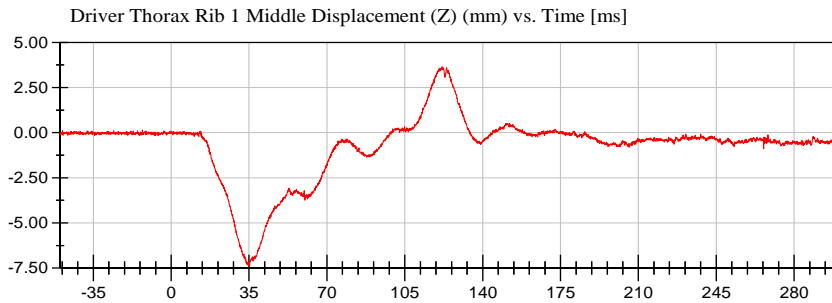
<Max>

-102.86 mm at 29.35 ms

<Min>

-109.38 mm at 89.50 ms

Unfiltered



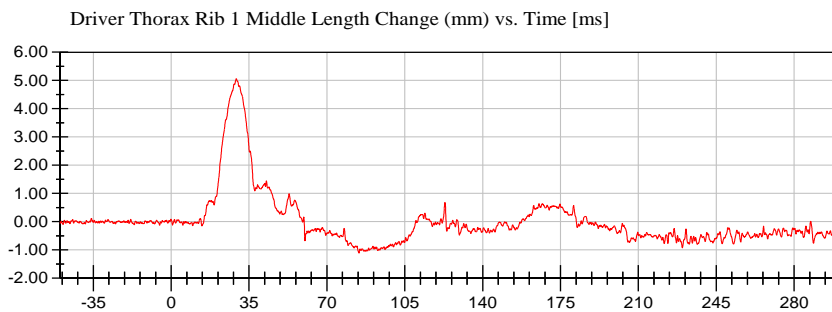
<Max>

3.66 mm at 121.75 ms

<Min>

-7.39 mm at 34.90 ms

Unfiltered



<Max>

5.06 mm at 29.30 ms

<Min>

-1.11 mm at 84.40 ms

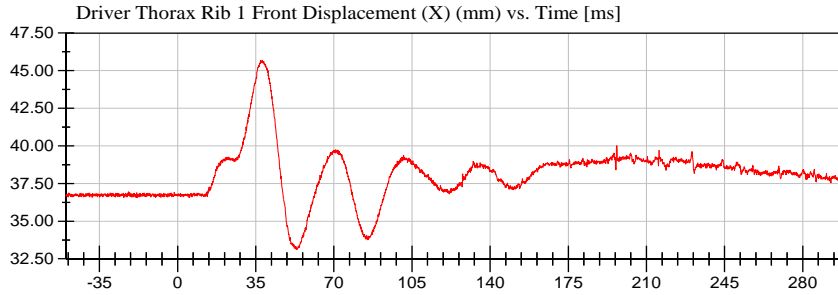
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



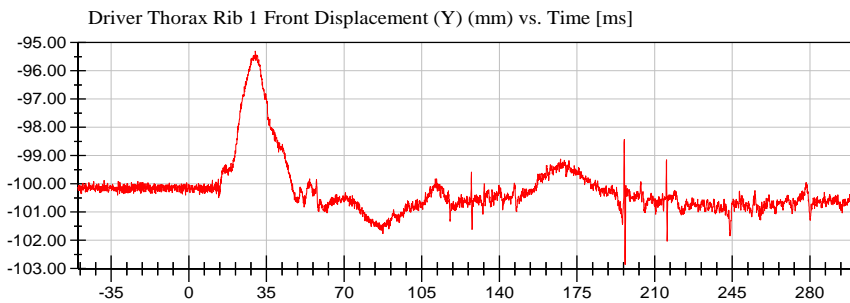
<Max>

45.68 mm at 37.90 ms

<Min>

33.12 mm at 53.45 ms

Unfiltered



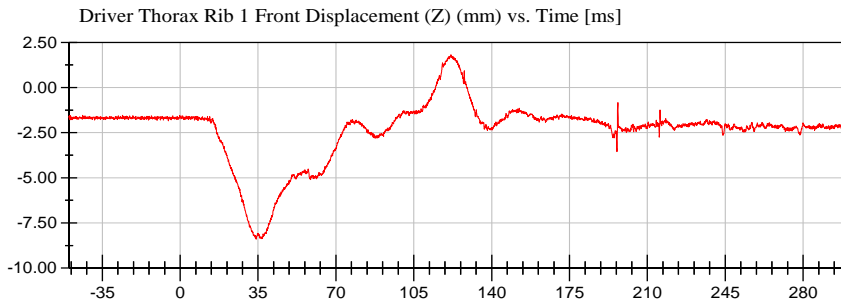
<Max>

-95.31 mm at 30.00 ms

<Min>

-102.85 mm at 196.70 ms

Unfiltered



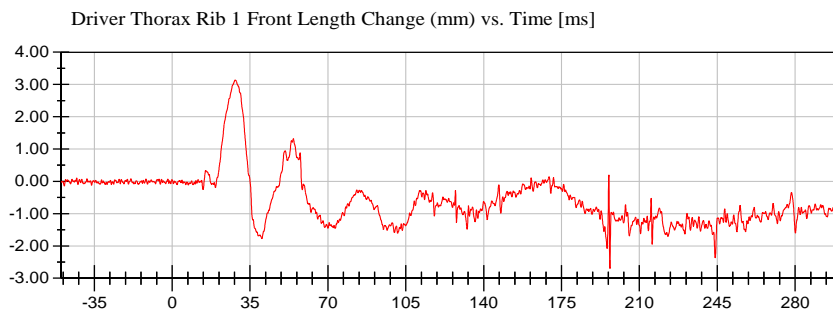
<Max>

1.81 mm at 121.70 ms

<Min>

-8.40 mm at 34.20 ms

Unfiltered



<Max>

3.14 mm at 28.30 ms

<Min>

-2.70 mm at 196.75 ms

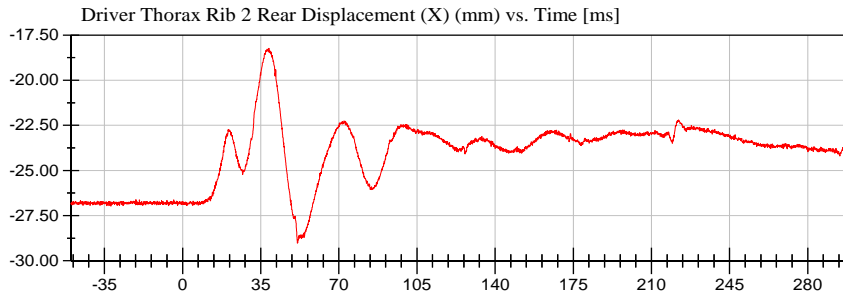
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



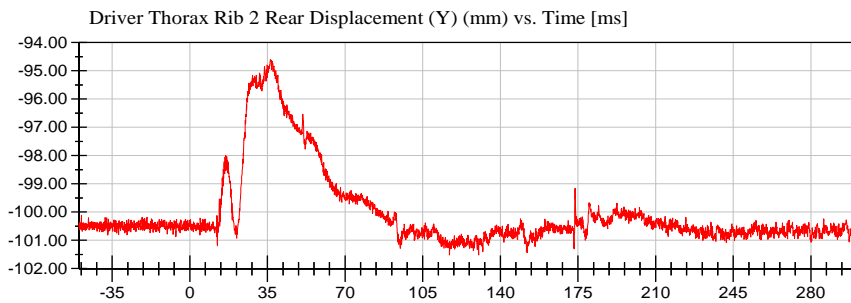
<Max>

-18.23 mm at 38.65 ms

<Min>

-29.02 mm at 51.40 ms

Unfiltered



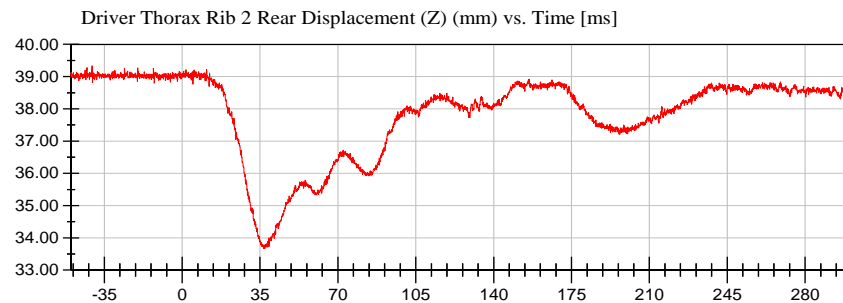
<Max>

-94.61 mm at 36.35 ms

<Min>

-101.52 mm at 117.10 ms

Unfiltered



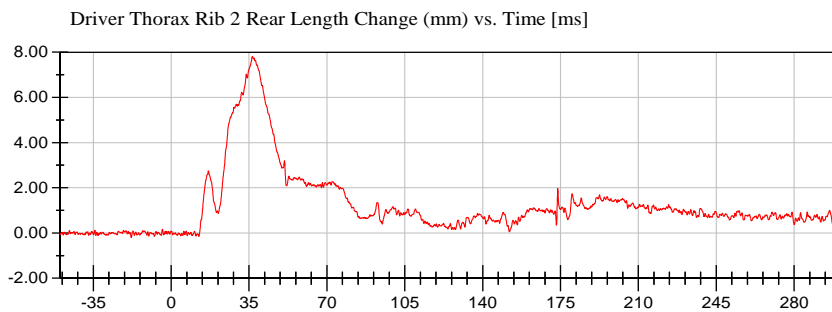
<Max>

39.33 mm at -40.50 ms

<Min>

33.67 mm at 36.60 ms

Unfiltered



<Max>

7.81 mm at 36.55 ms

<Min>

-0.20 mm at -17.90 ms

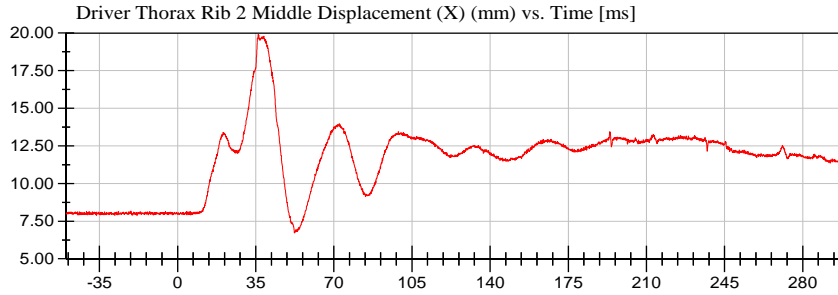
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



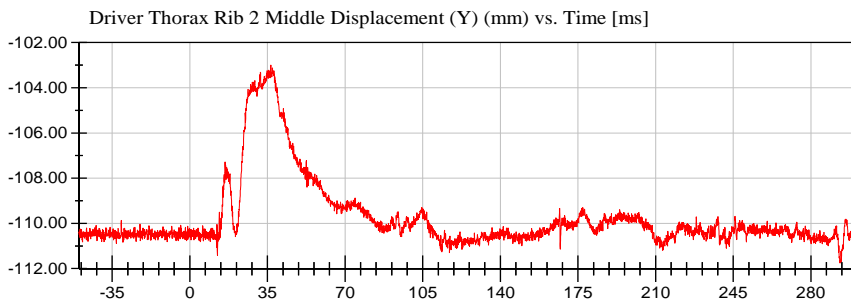
<Max>

19.90 mm at 36.20 ms

<Min>

6.72 mm at 52.40 ms

Unfiltered



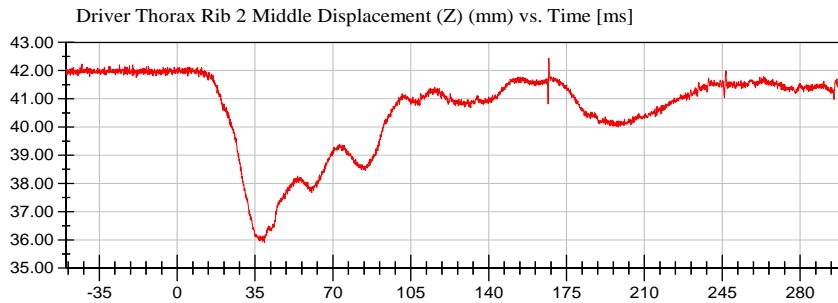
<Max>

-103.00 mm at 36.50 ms

<Min>

-111.75 mm at 293.30 ms

Unfiltered



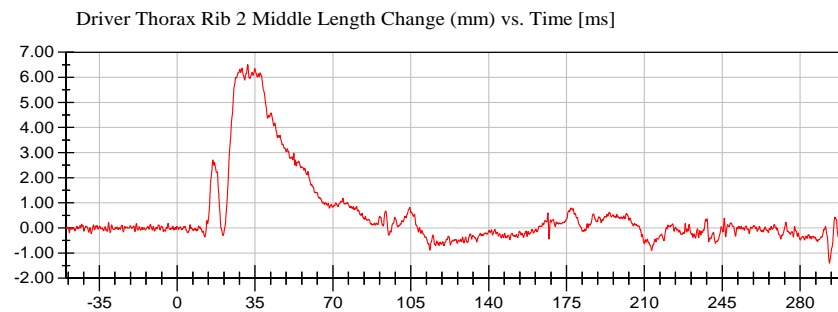
<Max>

42.44 mm at 167.05 ms

<Min>

35.91 mm at 39.20 ms

Unfiltered



<Max>

6.51 mm at 31.70 ms

<Min>

-1.39 mm at 293.15 ms

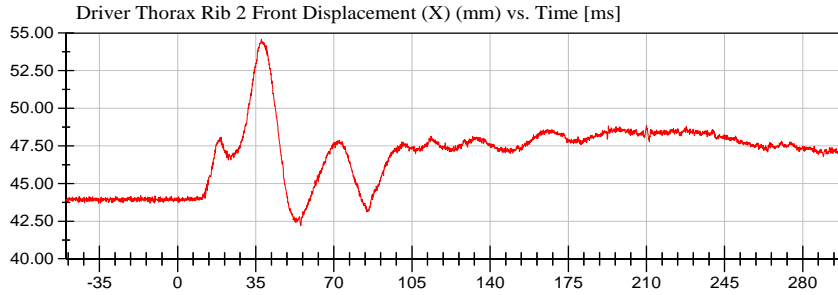
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



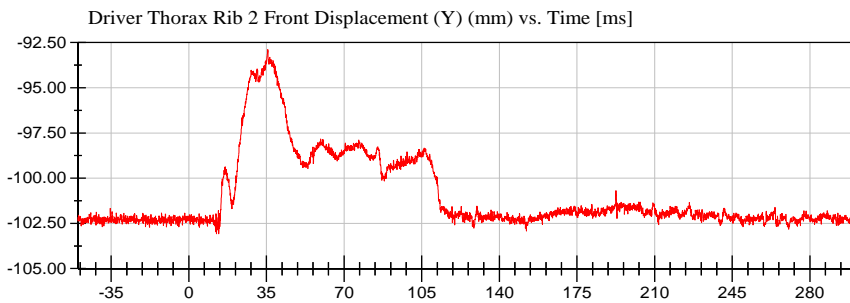
<Max>

54.58 mm at 37.55 ms

<Min>

42.20 mm at 55.20 ms

Unfiltered



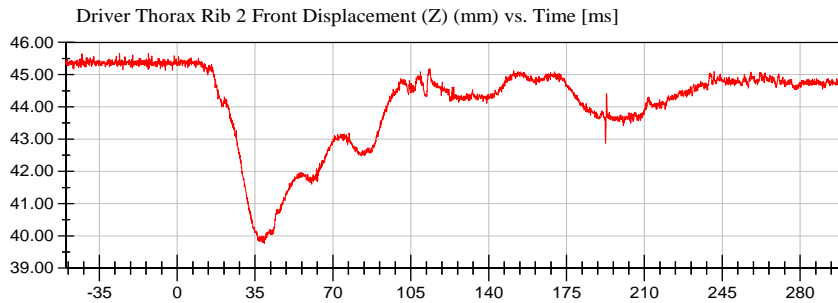
<Max>

-92.89 mm at 35.60 ms

<Min>

-103.08 mm at 12.50 ms

Unfiltered



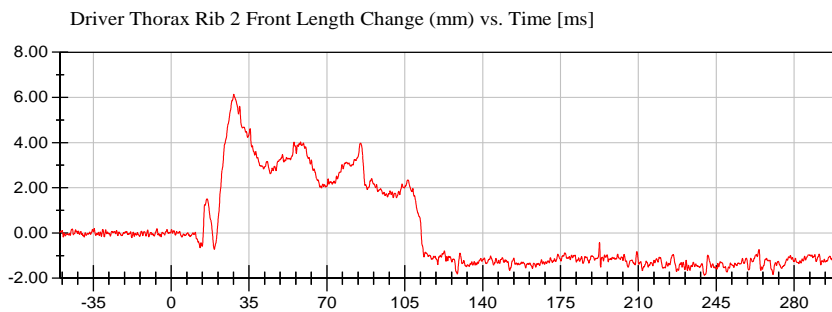
<Max>

45.66 mm at -12.90 ms

<Min>

39.76 mm at 39.20 ms

Unfiltered



<Max>

6.13 mm at 28.10 ms

<Min>

-1.87 mm at 239.65 ms

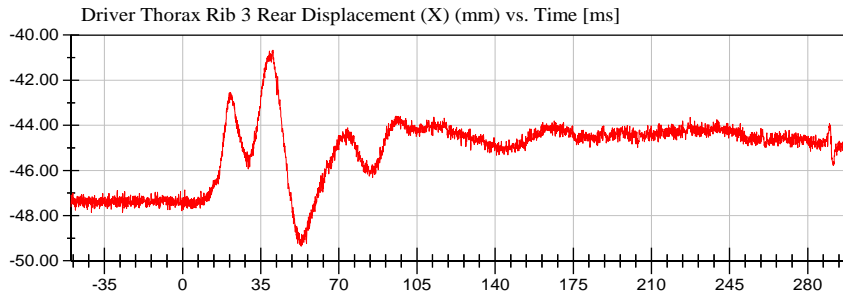
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



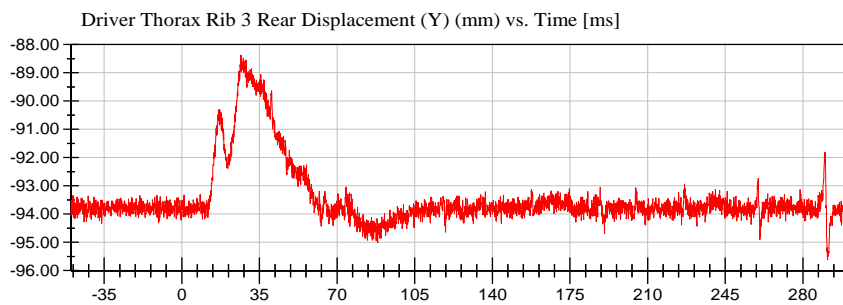
<Max>

-40.67 mm at 40.50 ms

<Min>

-49.35 mm at 53.20 ms

Unfiltered



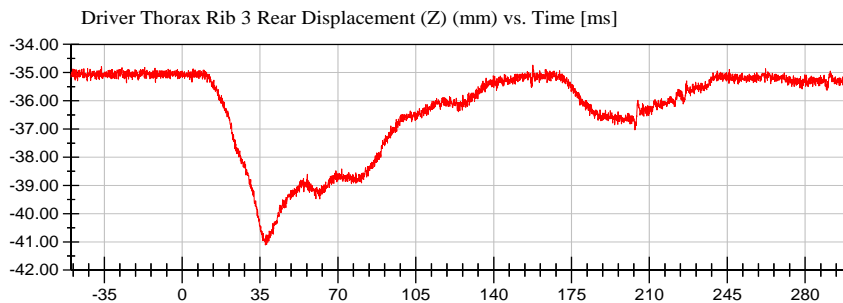
<Max>

-88.38 mm at 26.70 ms

<Min>

-95.62 mm at 291.10 ms

Unfiltered



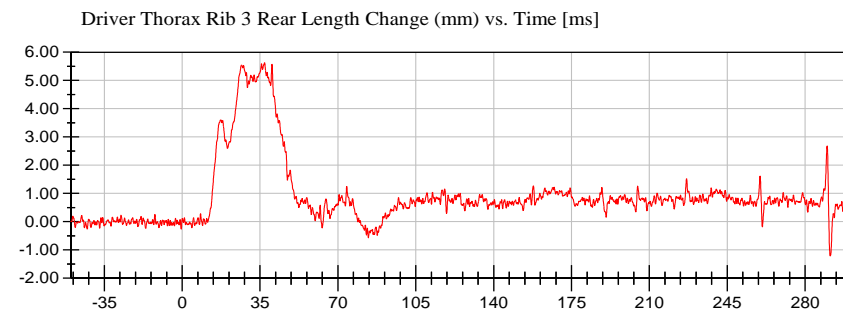
<Max>

-34.73 mm at 157.60 ms

<Min>

-41.11 mm at 37.40 ms

Unfiltered



<Max>

5.62 mm at 37.05 ms

<Min>

-1.21 mm at 291.30 ms

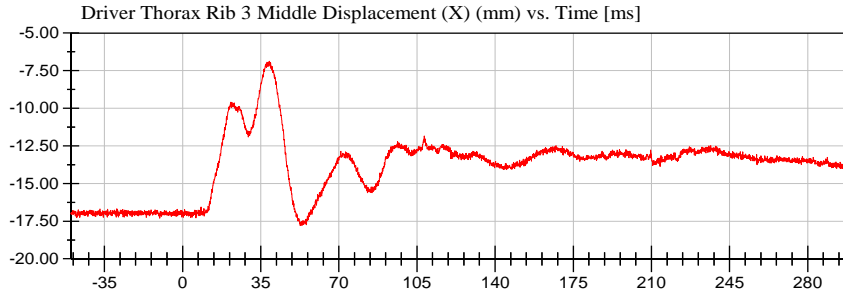
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



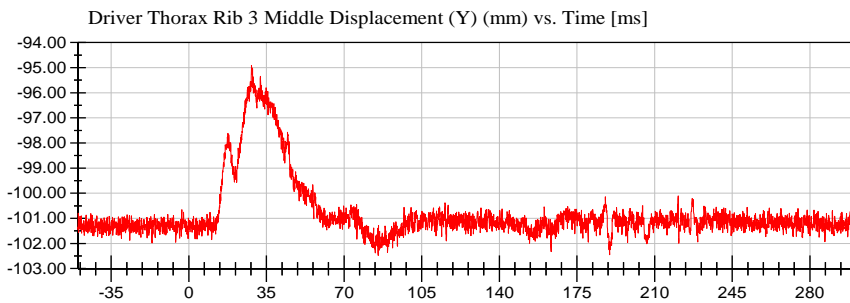
<Max>

-6.86 mm at 38.85 ms

<Min>

-17.79 mm at 52.70 ms

Unfiltered



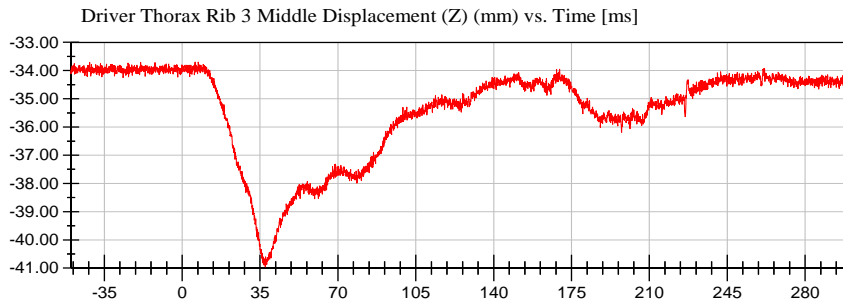
<Max>

-94.90 mm at 28.25 ms

<Min>

-102.48 mm at 85.40 ms

Unfiltered



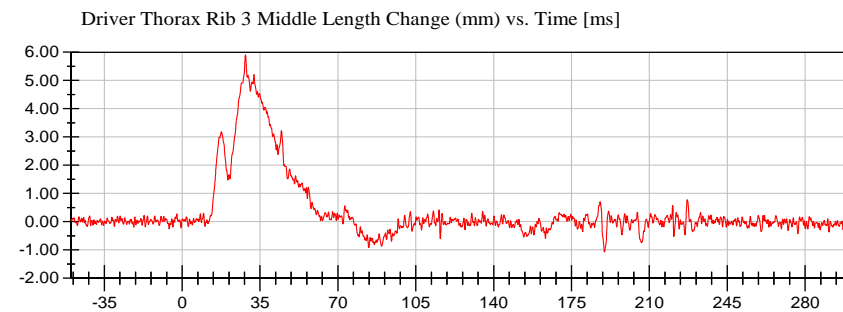
<Max>

-33.70 mm at 5.80 ms

<Min>

-40.96 mm at 37.40 ms

Unfiltered



<Max>

5.91 mm at 28.40 ms

<Min>

-1.07 mm at 189.80 ms

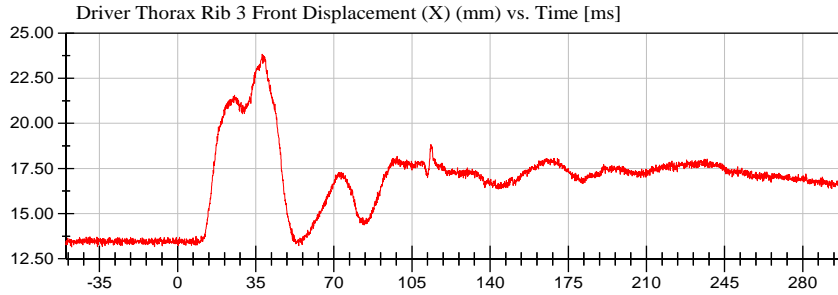
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



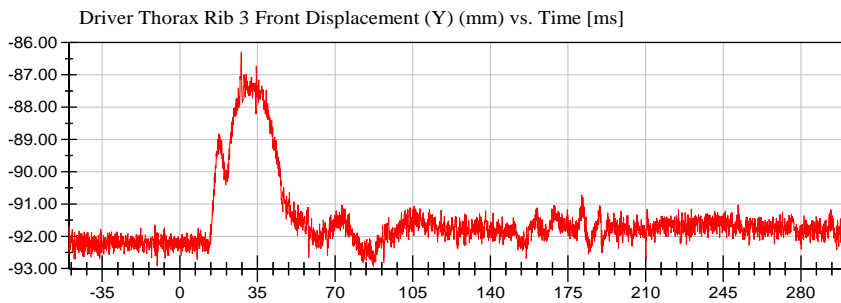
<Max>

23.83 mm at 37.90 ms

<Min>

13.16 mm at -47.45 ms

Unfiltered



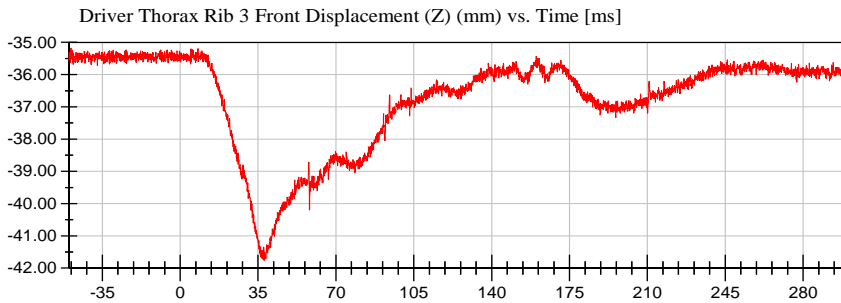
<Max>

-86.29 mm at 27.70 ms

<Min>

-92.94 mm at 87.20 ms

Unfiltered



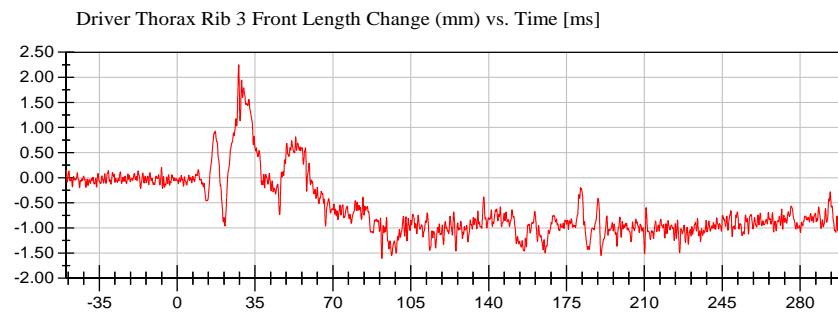
<Max>

-35.18 mm at -49.10 ms

<Min>

-41.76 mm at 37.70 ms

Unfiltered



<Max>

2.25 mm at 27.65 ms

<Min>

-1.61 mm at 92.00 ms

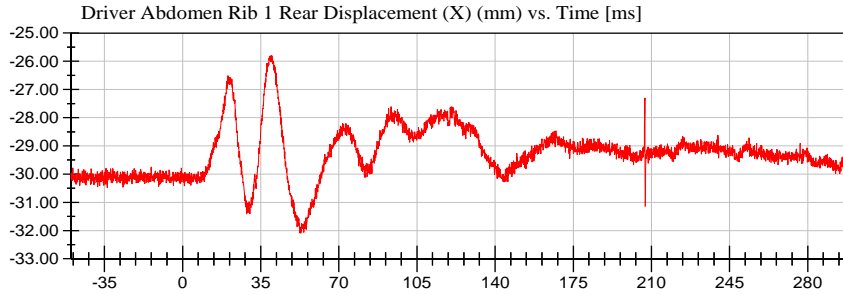
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



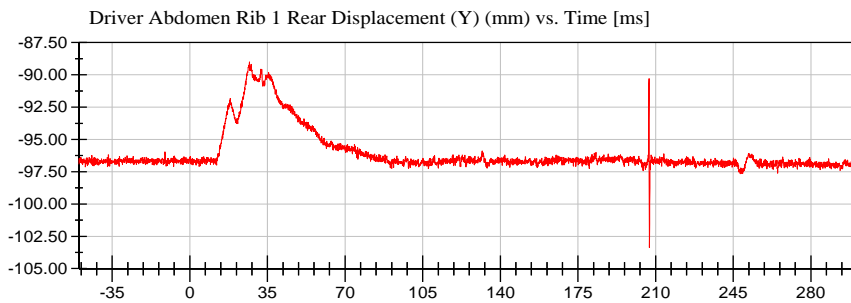
<Max>

-25.79 mm at 39.70 ms

<Min>

-32.09 mm at 53.00 ms

Unfiltered



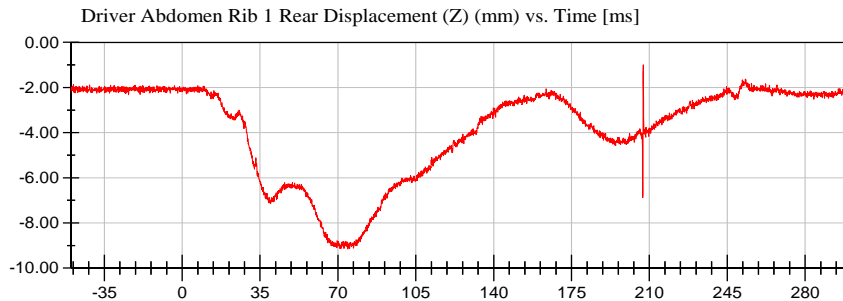
<Max>

-89.01 mm at 26.90 ms

<Min>

-103.37 mm at 207.25 ms

Unfiltered



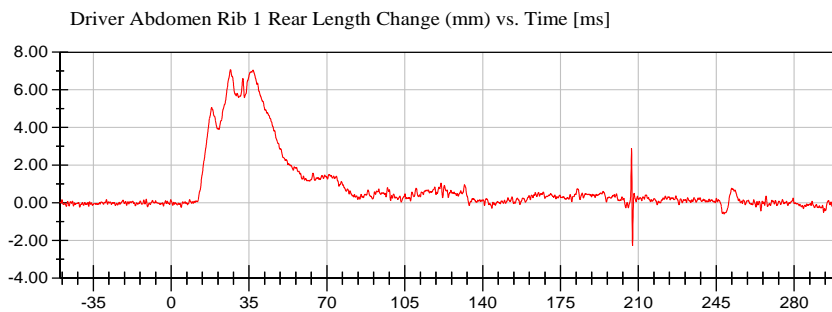
<Max>

-1.00 mm at 207.25 ms

<Min>

-9.16 mm at 74.50 ms

Unfiltered



<Max>

7.07 mm at 26.70 ms

<Min>

-2.26 mm at 207.35 ms

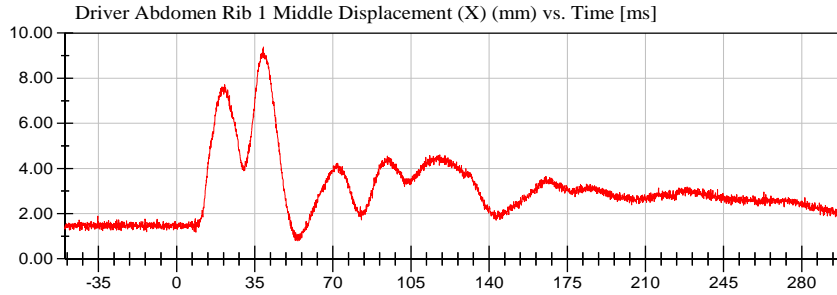
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



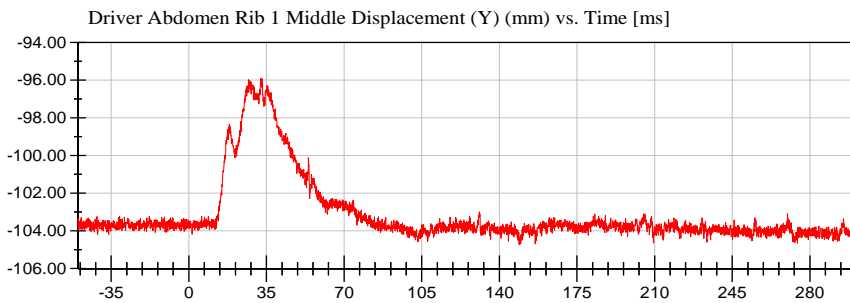
<Max>

9.38 mm at 38.90 ms

<Min>

0.79 mm at 54.30 ms

Unfiltered



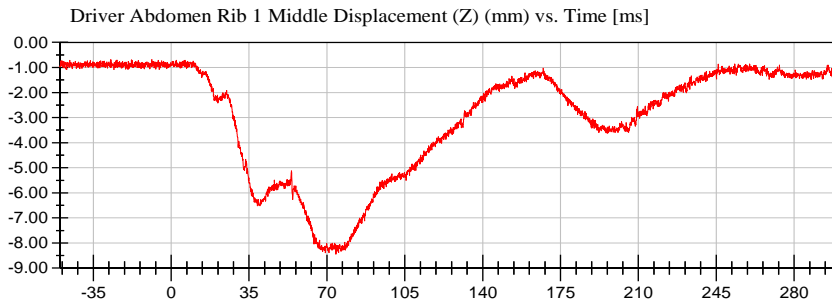
<Max>

-95.91 mm at 32.40 ms

<Min>

-104.72 mm at 148.95 ms

Unfiltered



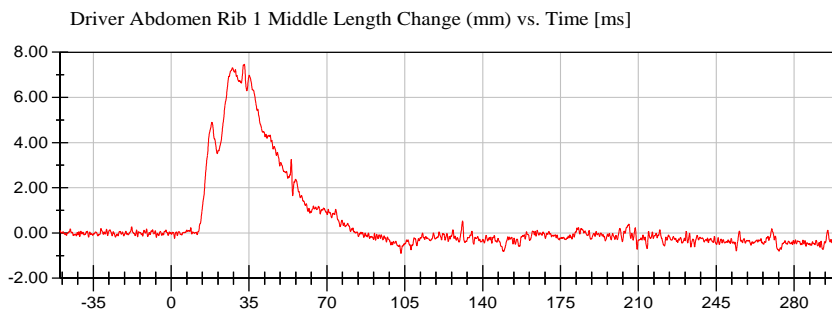
<Max>

-0.68 mm at -27.15 ms

<Min>

-8.44 mm at 74.05 ms

Unfiltered



<Max>

7.46 mm at 32.95 ms

<Min>

-0.91 mm at 103.30 ms

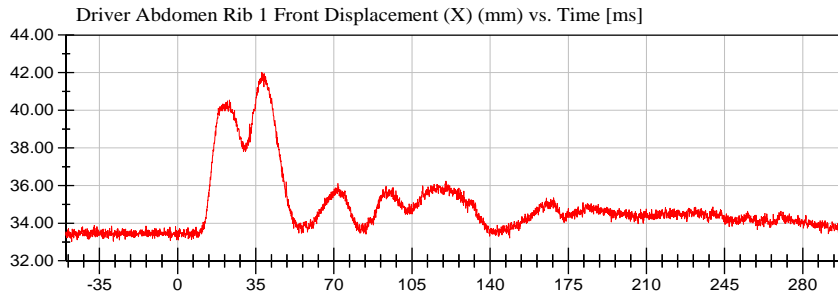
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



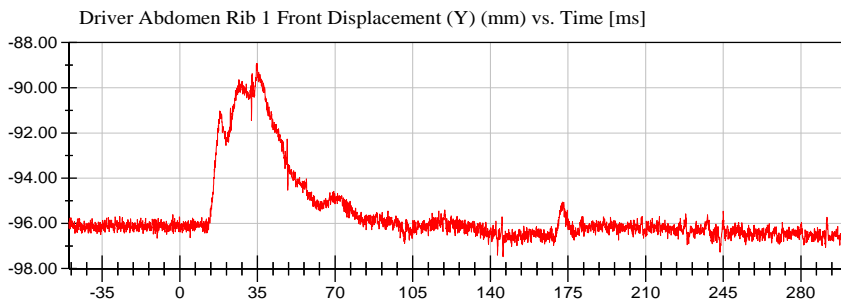
<Max>

42.02 mm at 37.70 ms

<Min>

33.04 mm at -28.75 ms

Unfiltered



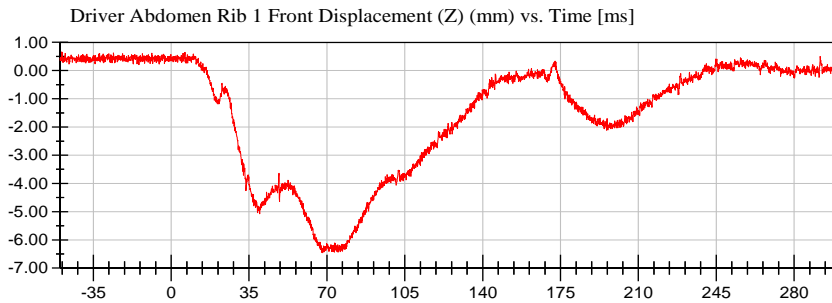
<Max>

-88.92 mm at 34.55 ms

<Min>

-97.47 mm at 145.75 ms

Unfiltered



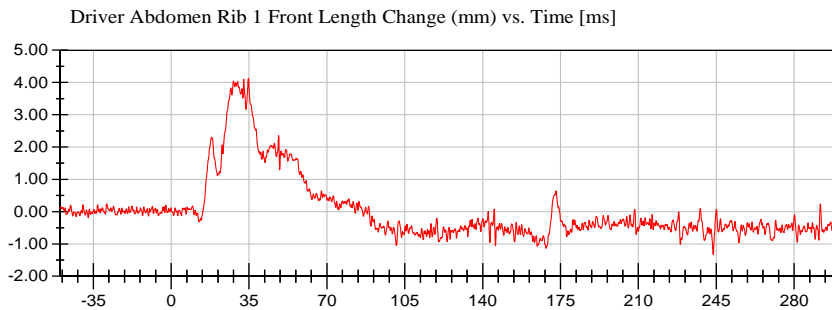
<Max>

0.66 mm at -49.15 ms

<Min>

-6.46 mm at 68.10 ms

Unfiltered



<Max>

4.13 mm at 34.70 ms

<Min>

-1.33 mm at 243.60 ms

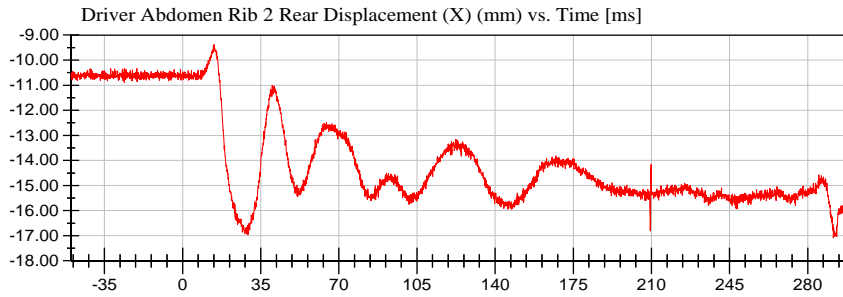
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



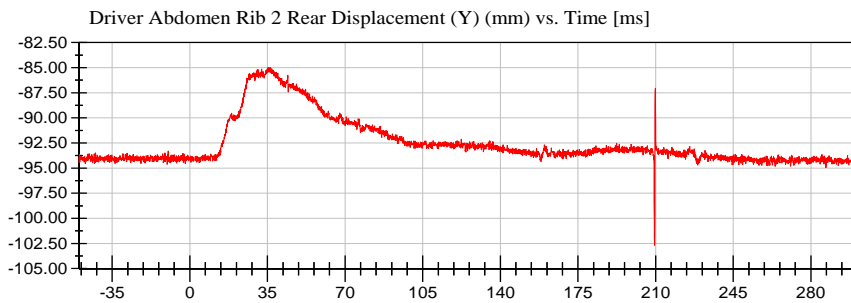
<Max>

-9.38 mm at 14.15 ms

<Min>

-17.08 mm at 291.50 ms

Unfiltered



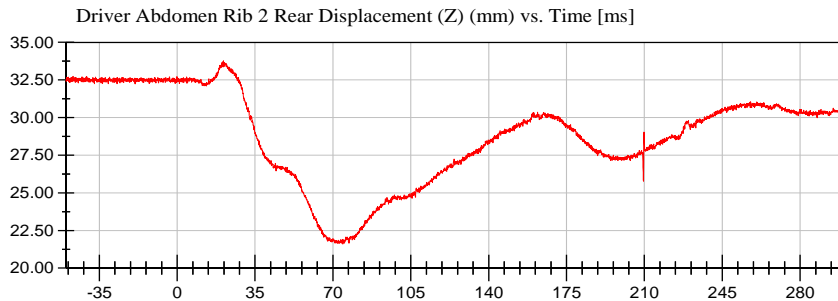
<Max>

-84.97 mm at 35.30 ms

<Min>

-102.68 mm at 209.50 ms

Unfiltered



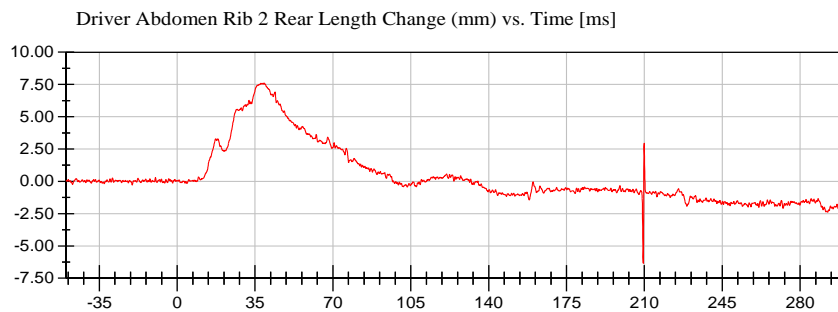
<Max>

33.77 mm at 20.80 ms

<Min>

21.60 mm at 74.50 ms

Unfiltered



<Max>

7.61 mm at 39.00 ms

<Min>

-6.32 mm at 209.45 ms

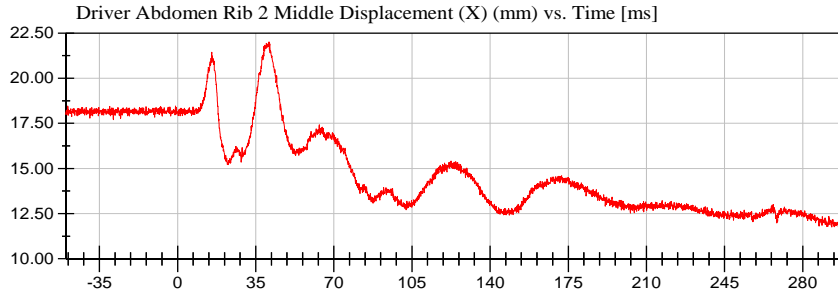
CFC_600



VRTC

Test Lab: CTF
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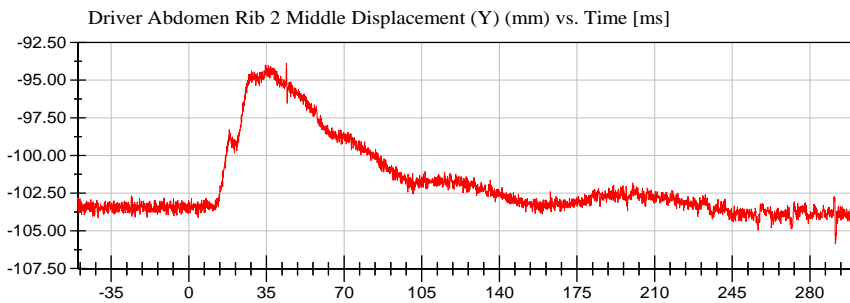
<Max>

22.00 mm at 40.95 ms

<Min>

11.75 mm at 296.00 ms

Unfiltered



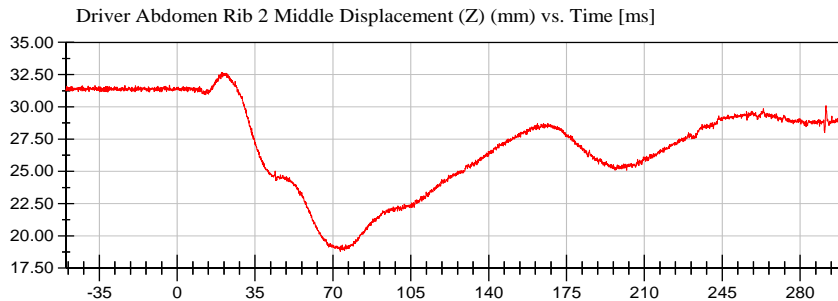
<Max>

-93.89 mm at 44.00 ms

<Min>

-105.85 mm at 291.50 ms

Unfiltered



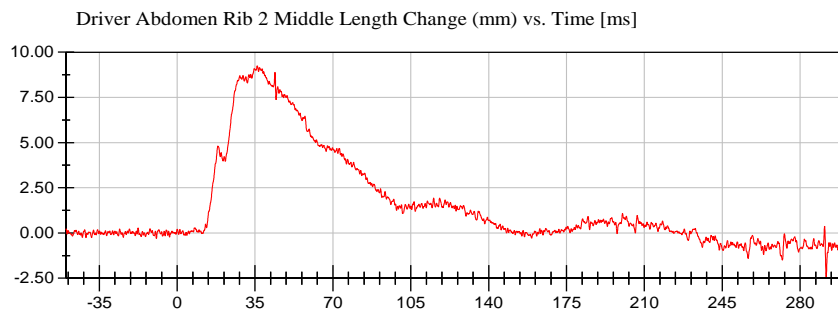
<Max>

32.67 mm at 20.20 ms

<Min>

18.81 mm at 73.30 ms

Unfiltered



<Max>

9.24 mm at 36.00 ms

<Min>

-2.41 mm at 291.65 ms

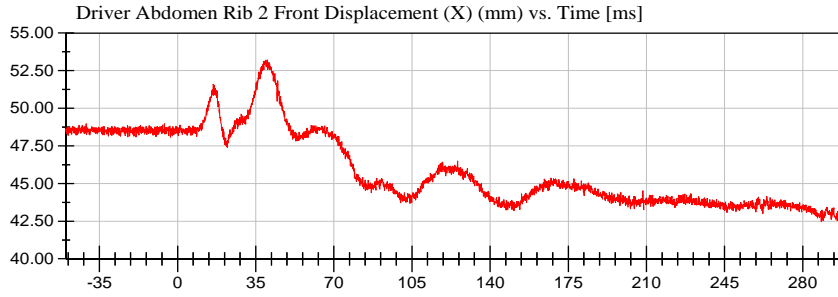
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



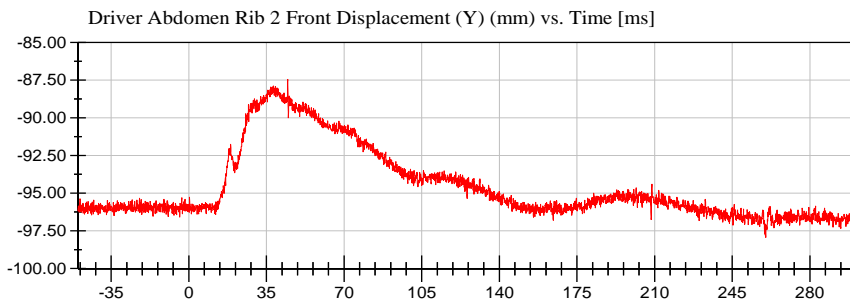
<Max>

53.21 mm at 40.15 ms

<Min>

42.45 mm at 288.30 ms

Unfiltered



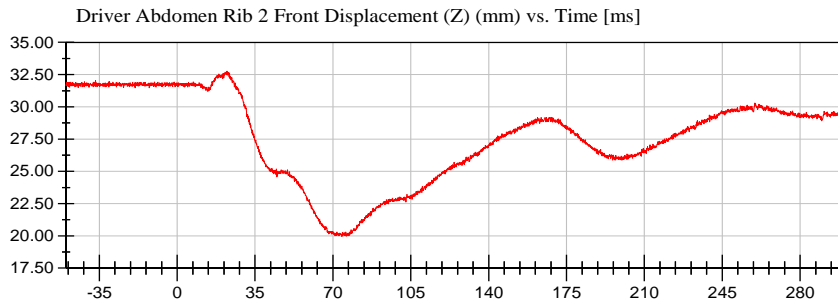
<Max>

-87.44 mm at 44.60 ms

<Min>

-97.92 mm at 260.10 ms

Unfiltered



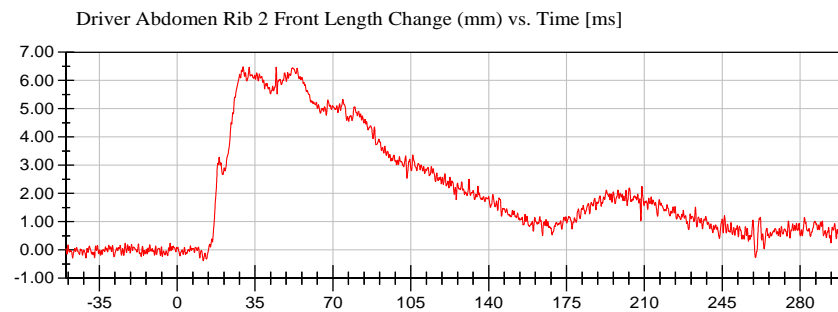
<Max>

32.76 mm at 22.40 ms

<Min>

19.96 mm at 74.00 ms

Unfiltered



<Max>

6.48 mm at 29.65 ms

<Min>

-0.38 mm at 11.75 ms

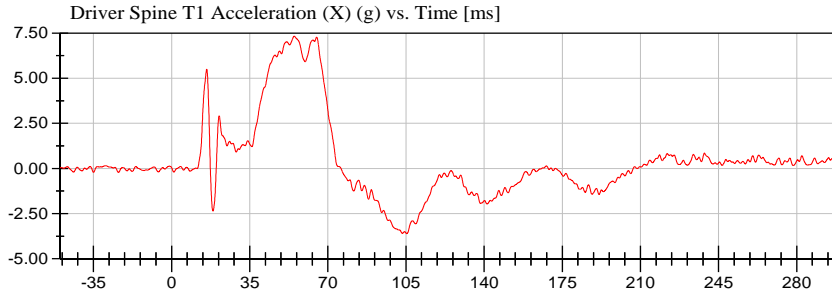
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



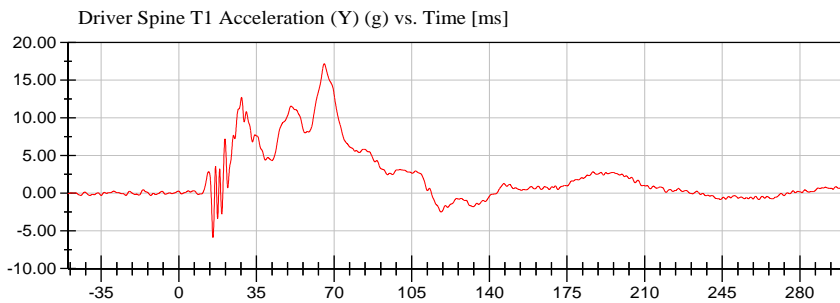
<Max>

7.32 g at 54.90 ms

<Min>

-3.61 g at 105.35 ms

CFC_180



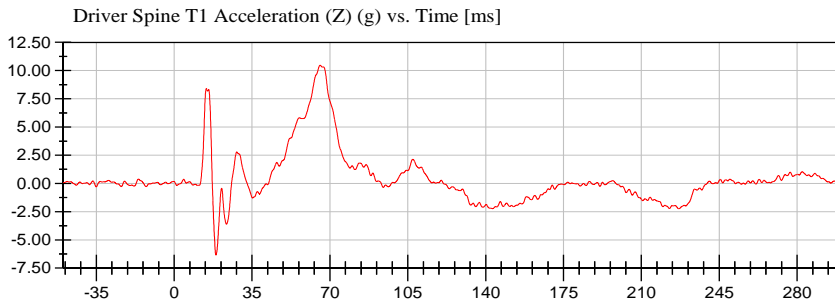
<Max>

17.19 g at 65.60 ms

<Min>

-5.87 g at 15.40 ms

CFC_180



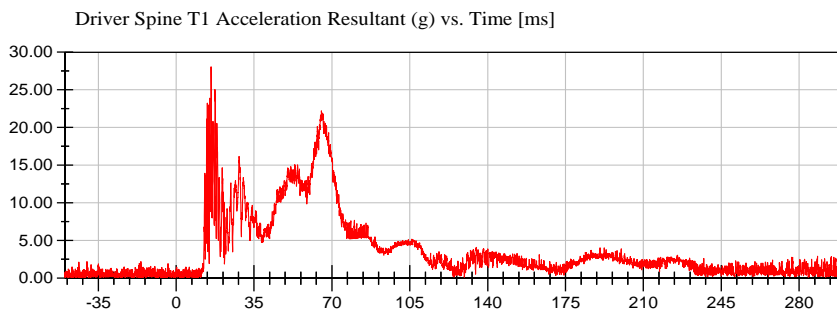
<Max>

10.47 g at 65.60 ms

<Min>

-6.34 g at 18.80 ms

CFC_180



<Max>

28.06 g at 15.75 ms

<Min>

0.09 g at -48.90 ms

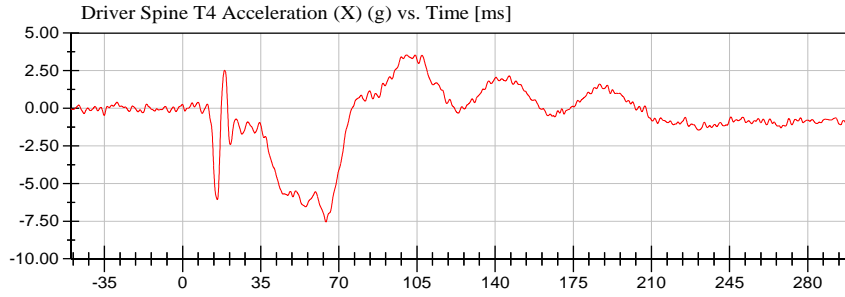
Prefiltered_> CFC 1000



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



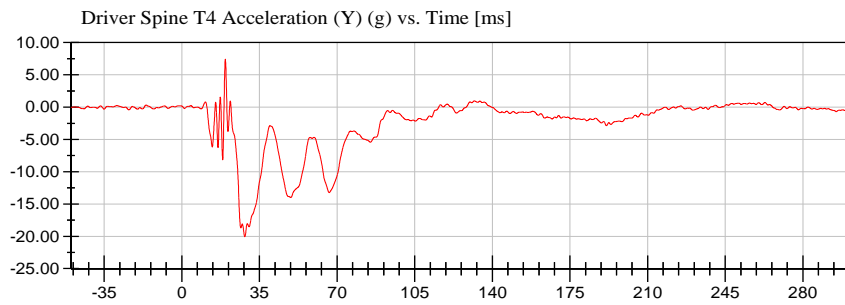
<Max>

3.54 g at 100.40 ms

<Min>

-7.55 g at 64.20 ms

CFC_180



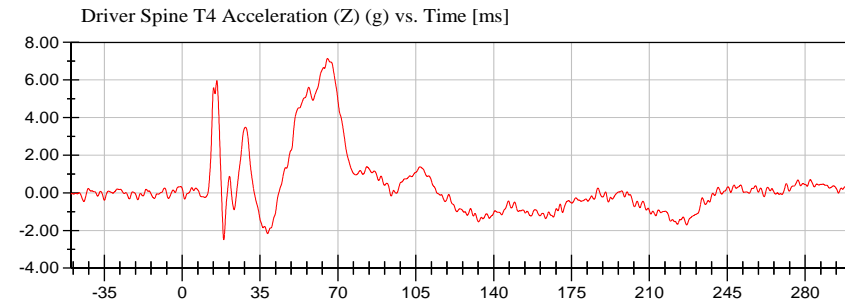
<Max>

7.42 g at 19.65 ms

<Min>

-20.07 g at 28.40 ms

CFC_180



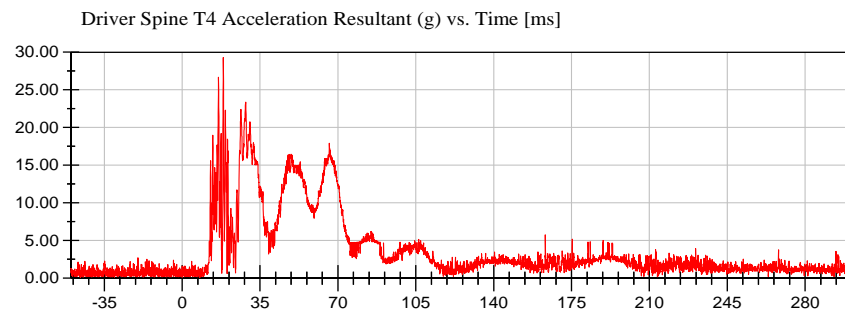
<Max>

7.13 g at 65.30 ms

<Min>

-2.50 g at 18.75 ms

CFC_180



<Max>

29.29 g at 18.50 ms

<Min>

0.11 g at -45.70 ms

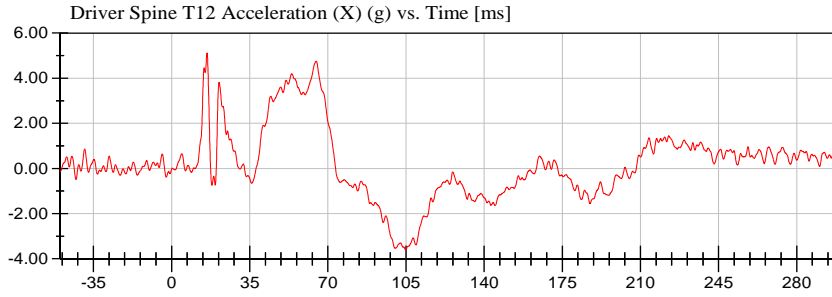
Prefiltered_> CFC 1000



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



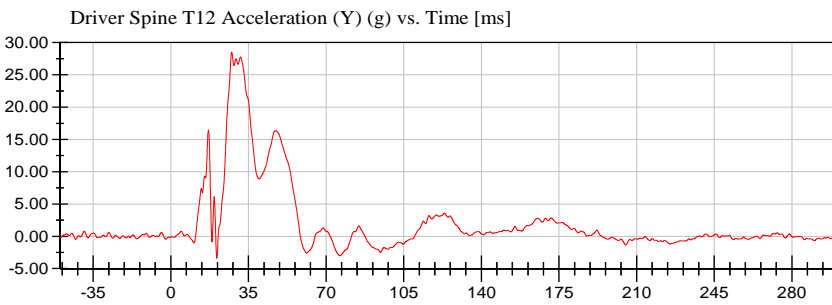
<Max>

5.12 g at 15.90 ms

<Min>

-3.61 g at 104.80 ms

CFC_180



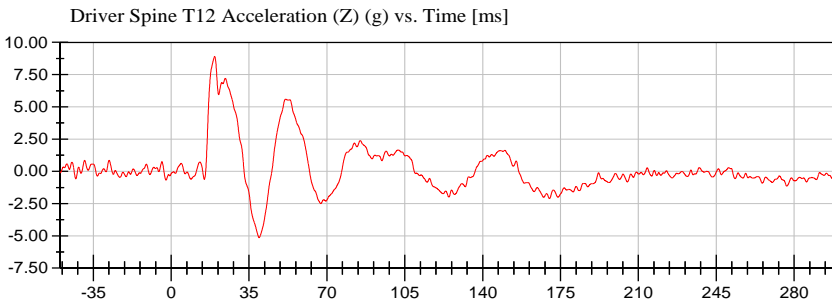
<Max>

28.49 g at 27.45 ms

<Min>

-3.42 g at 20.75 ms

CFC_180



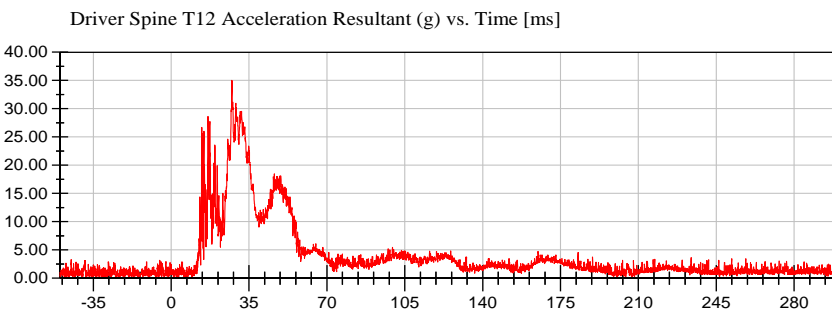
<Max>

8.90 g at 19.55 ms

<Min>

-5.15 g at 39.55 ms

CFC_180



<Max>

35.04 g at 27.30 ms

<Min>

0.27 g at -49.85 ms

Prefiltered_> CFC 1000

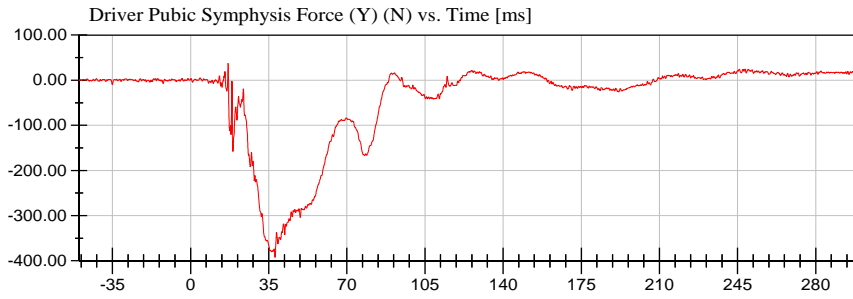


VRTC

Test Date: 03/18/2021

Test Lab: CTF

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<Max>

37.67 N at 16.80 ms

<Min>

-392.11 N at 37.85 ms

CFC_600

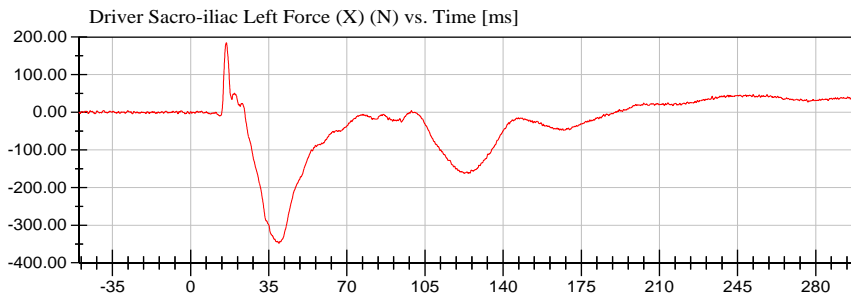


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



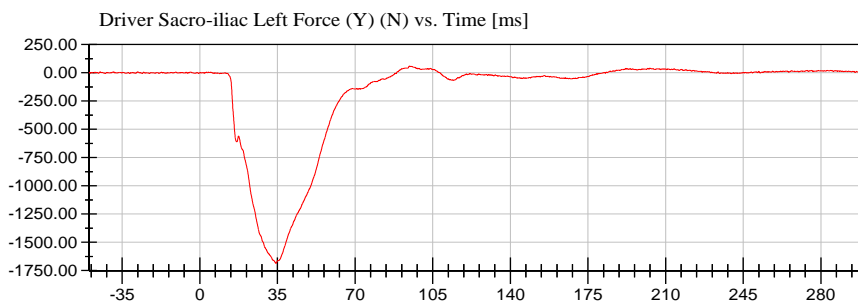
<Max>

184.82 N at 16.05 ms

<Min>

-348.29 N at 39.55 ms

CFC_600



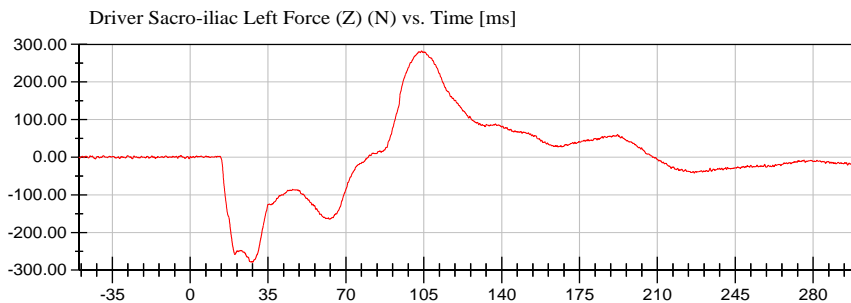
<Max>

58.60 N at 94.45 ms

<Min>

-1,685.60 N at 34.30 ms

CFC_600



<Max>

282.78 N at 104.00 ms

<Min>

-278.63 N at 28.10 ms

CFC_600

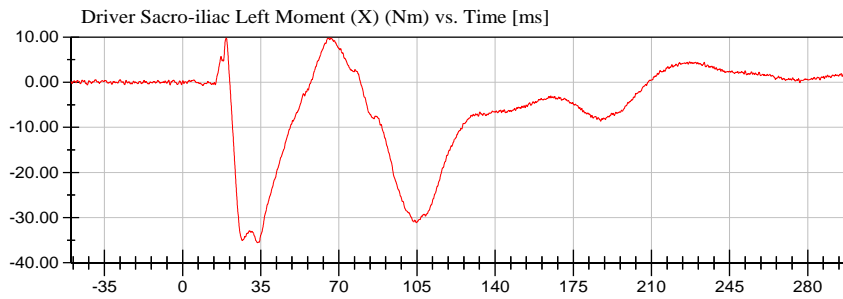


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



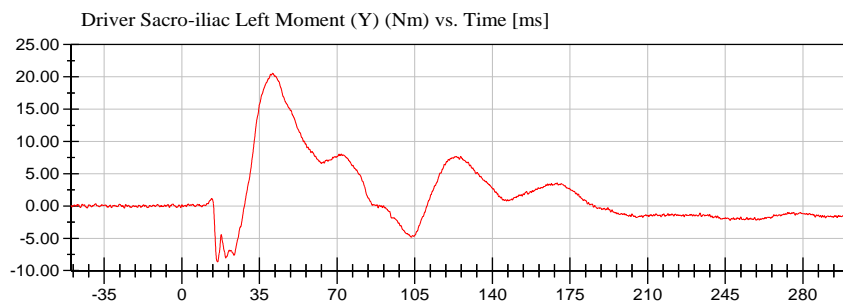
<Max>

9.78 Nm at 66.45 ms

<Min>

-35.55 Nm at 33.55 ms

CFC_600



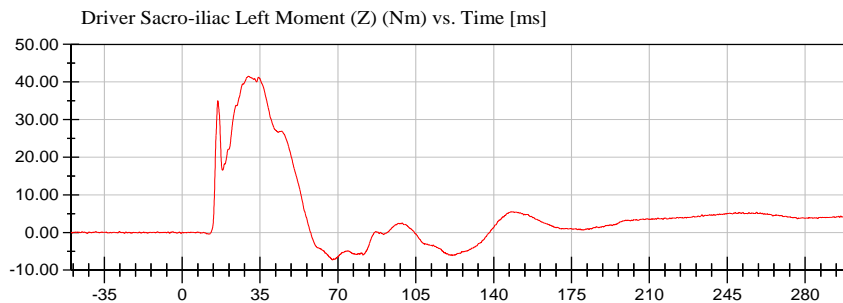
<Max>

20.56 Nm at 40.90 ms

<Min>

-8.66 Nm at 16.15 ms

CFC_600



<Max>

41.51 Nm at 29.80 ms

<Min>

-7.29 Nm at 67.60 ms

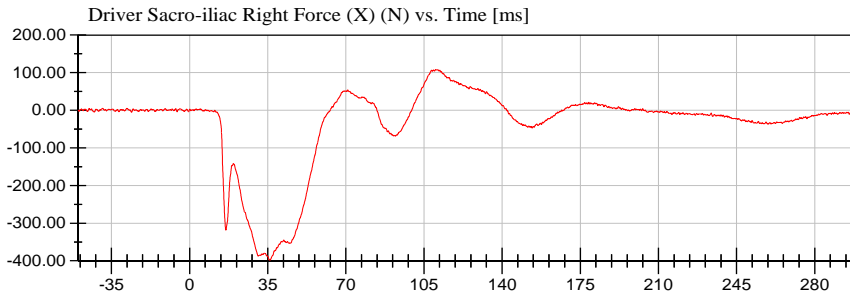
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



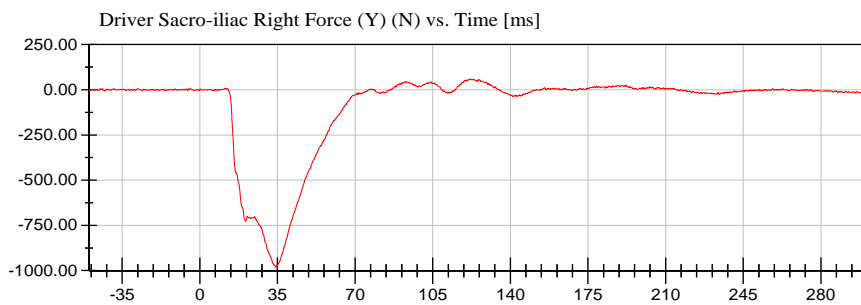
<Max>

108.57 N at 110.20 ms

<Min>

-398.08 N at 36.05 ms

CFC_600



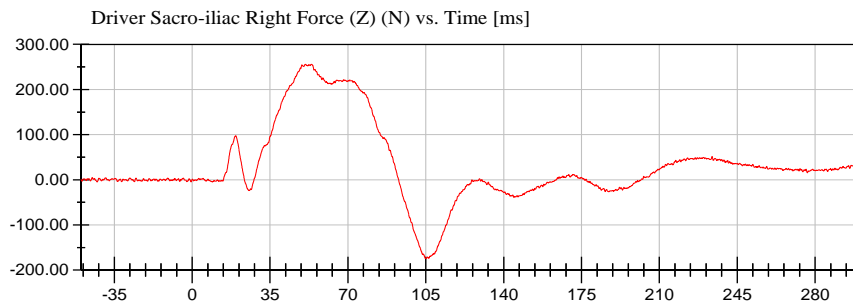
<Max>

59.12 N at 121.75 ms

<Min>

-981.04 N at 34.40 ms

CFC_600



<Max>

255.90 N at 53.55 ms

<Min>

-174.25 N at 105.25 ms

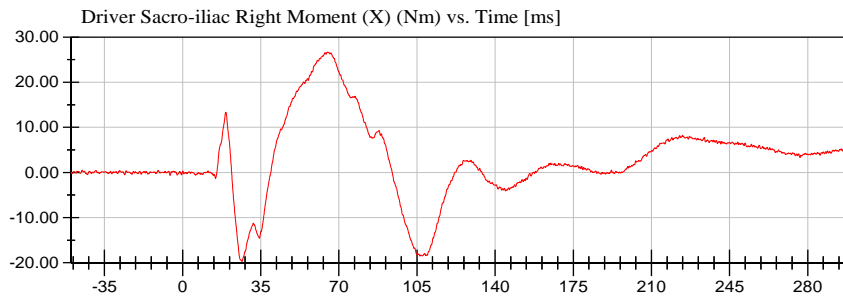
CFC_600



VRTC

Test Lab: CTF
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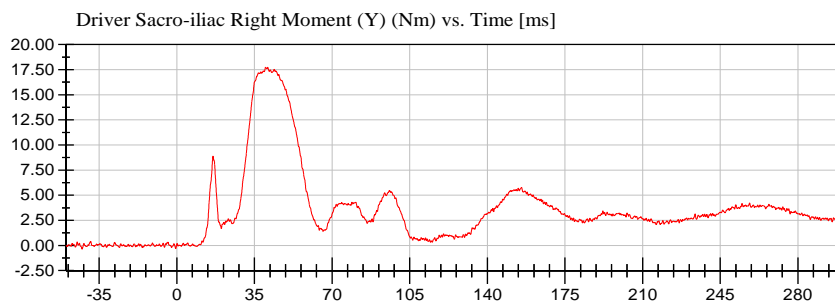
<Max>

26.67 Nm at 65.05 ms

<Min>

-19.69 Nm at 26.60 ms

CFC_600



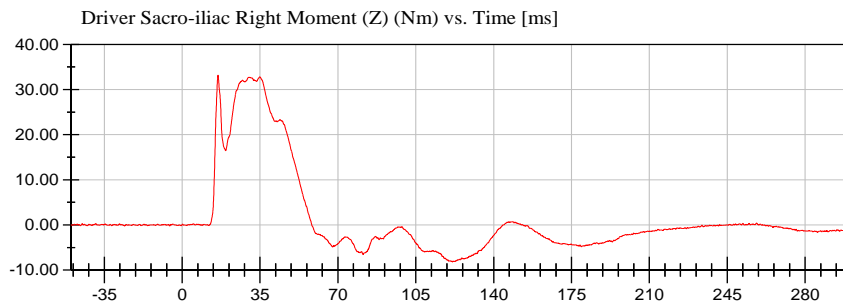
<Max>

17.74 Nm at 40.00 ms

<Min>

-0.36 Nm at -42.70 ms

CFC_600



<Max>

33.15 Nm at 16.10 ms

<Min>

-8.14 Nm at 121.40 ms

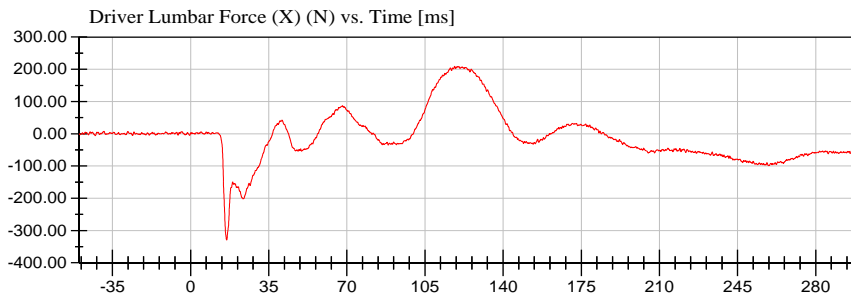
CFC_600



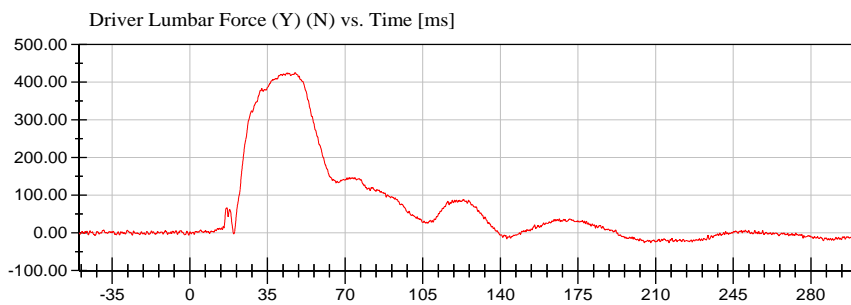
VRTC

Test Lab: CTF
Test Number: 210318 ()

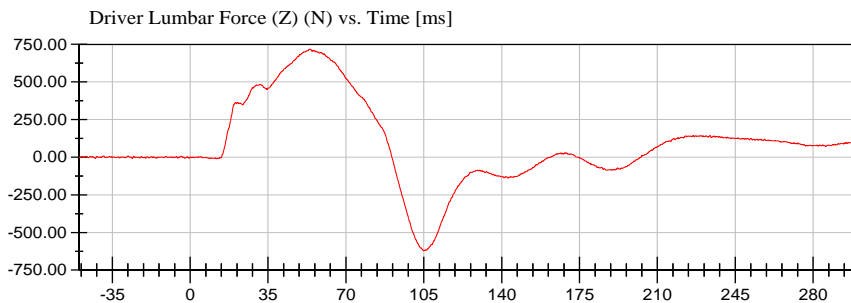
Test Date: 03/18/2021



<Max>
208.96 N at 118.25 ms
<Min>
-329.62 N at 16.20 ms
CFC_600



<Max>
425.60 N at 47.45 ms
<Min>
-26.28 N at 207.85 ms
CFC_600



<Max>
717.71 N at 54.05 ms
<Min>
-620.42 N at 104.80 ms
CFC_600

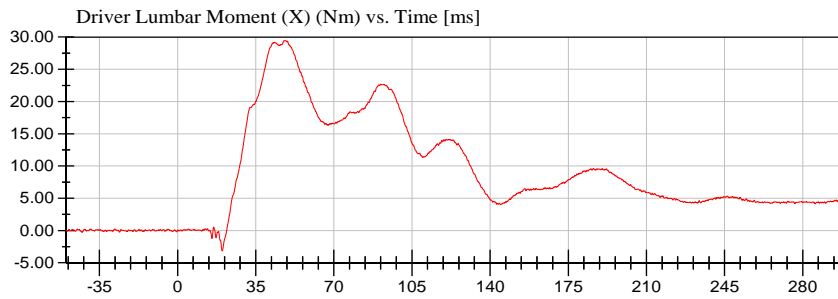


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



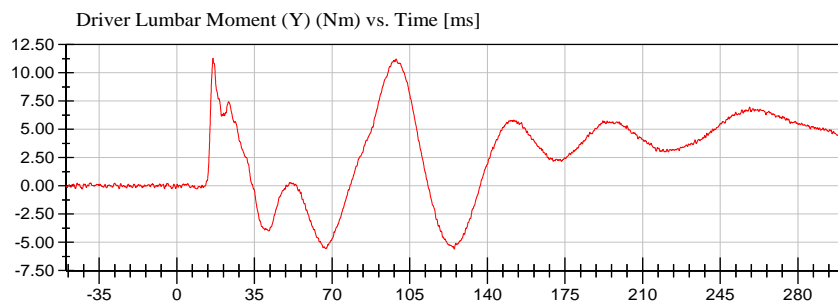
<Max>

29.44 Nm at 48.50 ms

<Min>

-3.17 Nm at 20.00 ms

CFC_600



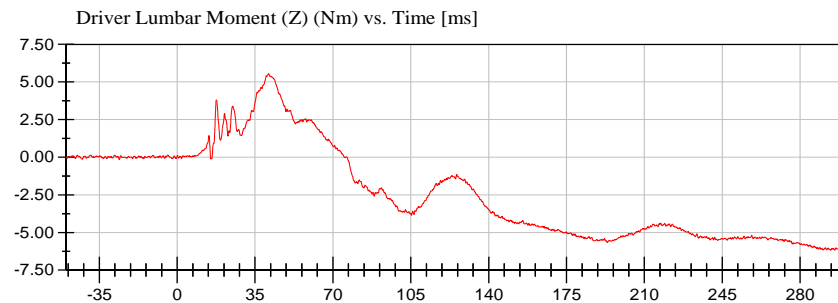
<Max>

11.29 Nm at 16.30 ms

<Min>

-5.60 Nm at 125.05 ms

CFC_600



<Max>

5.55 Nm at 41.05 ms

<Min>

-6.18 Nm at 293.75 ms

CFC_600

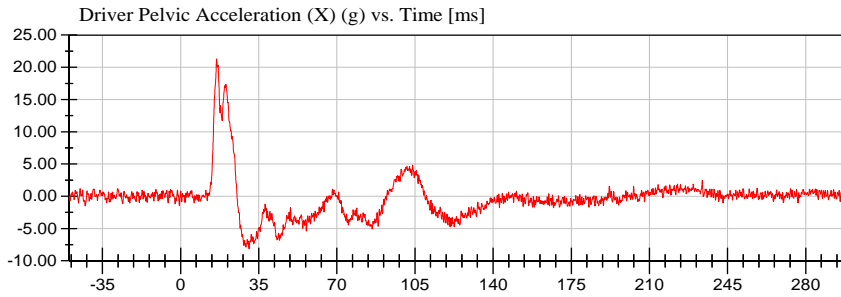


VRTC

Test Lab: CTF

Test Number: 210318 ()

Test Date: 03/18/2021



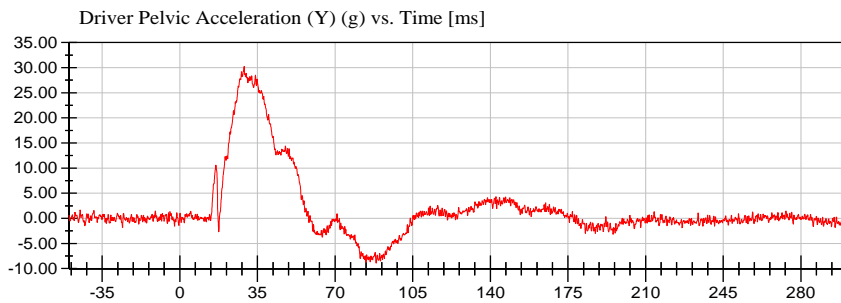
<Max>

21.30 g at 16.15 ms

<Min>

-8.12 g at 30.65 ms

CFC_1000



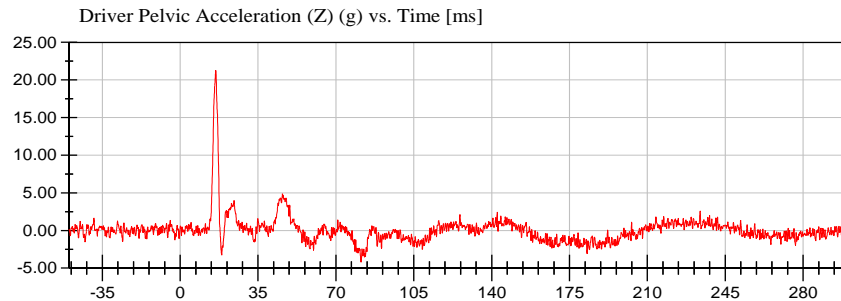
<Max>

30.25 g at 29.00 ms

<Min>

-8.90 g at 88.55 ms

CFC_1000



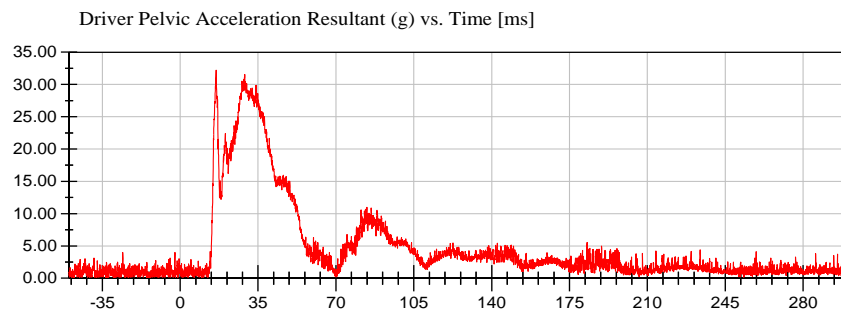
<Max>

21.28 g at 16.00 ms

<Min>

-4.21 g at 81.30 ms

CFC_1000



<Max>

32.20 g at 16.20 ms

<Min>

0.14 g at -45.30 ms

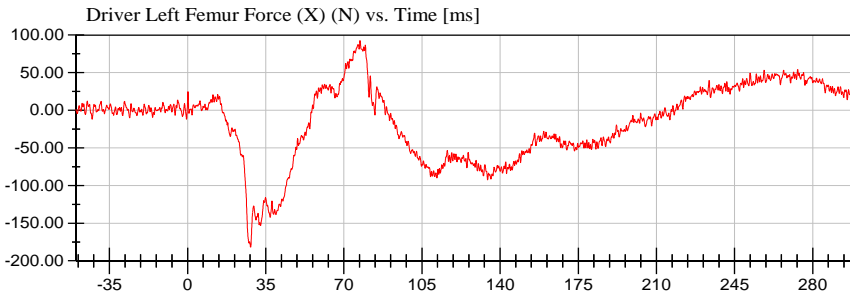
Prefiltered_> CFC 1000



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



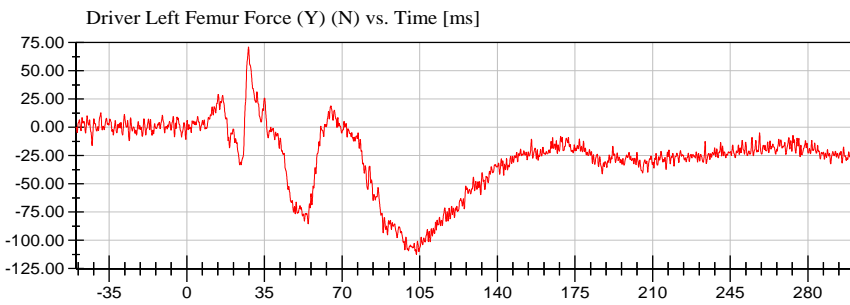
<Max>

92.24 N at 77.25 ms

<Min>

-182.05 N at 28.25 ms

CFC_600



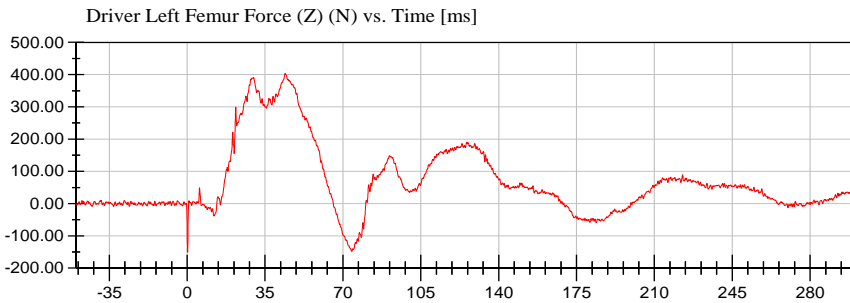
<Max>

71.13 N at 27.80 ms

<Min>

-112.33 N at 103.50 ms

CFC_600



<Max>

403.04 N at 44.00 ms

<Min>

-150.29 N at 0.20 ms

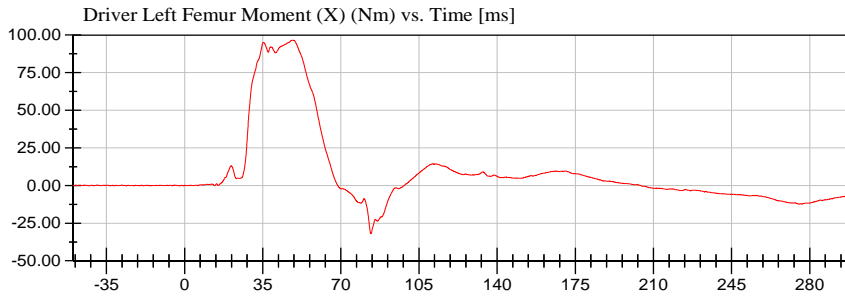
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



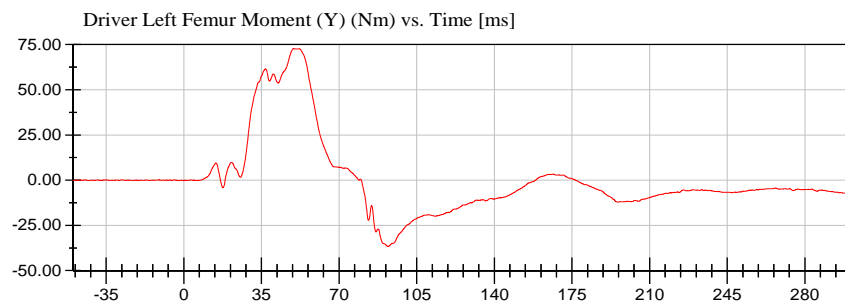
<Max>

96.49 Nm at 48.10 ms

<Min>

-31.94 Nm at 83.45 ms

CFC_600



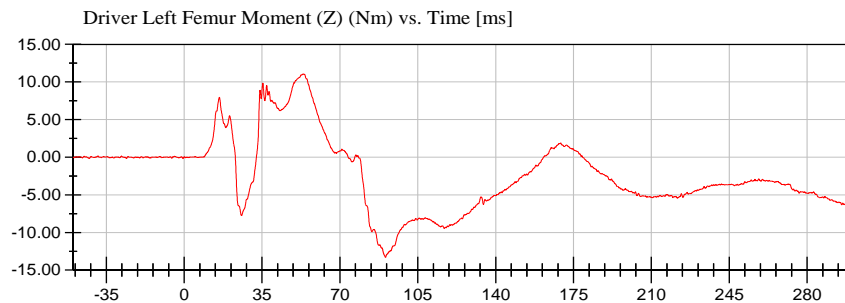
<Max>

72.79 Nm at 49.35 ms

<Min>

-36.71 Nm at 92.20 ms

CFC_600



<Max>

11.07 Nm at 53.45 ms

<Min>

-13.30 Nm at 90.45 ms

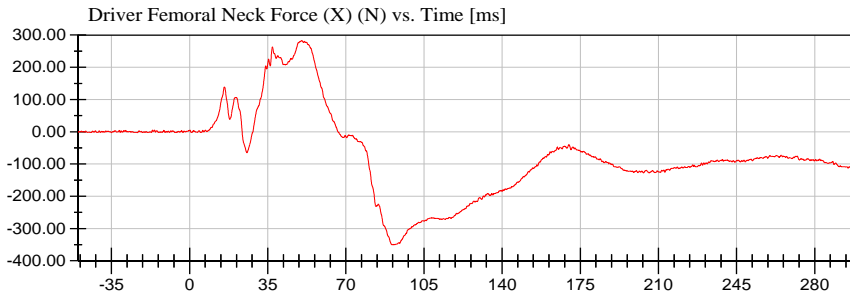
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



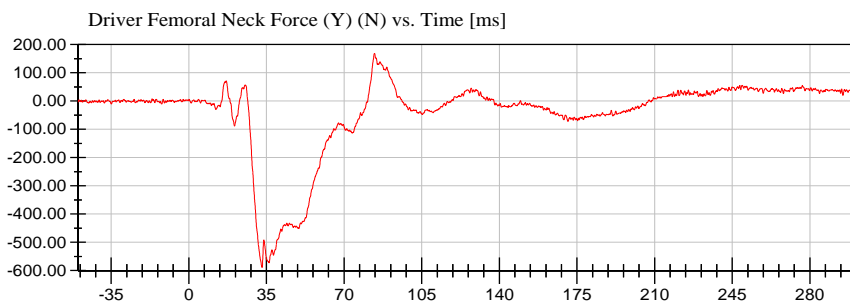
<Max>

283.11 N at 50.20 ms

<Min>

-350.31 N at 91.15 ms

CFC_600



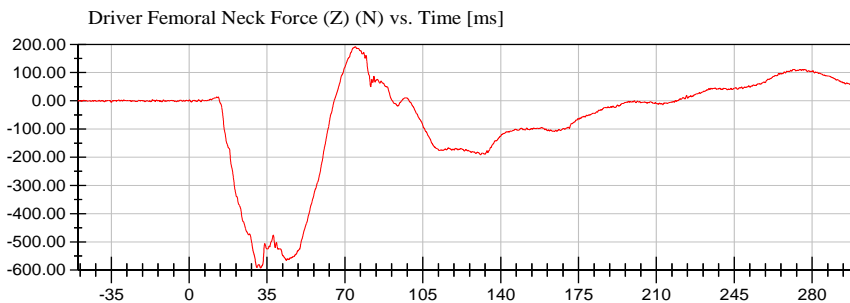
<Max>

169.53 N at 83.70 ms

<Min>

-588.65 N at 33.00 ms

CFC_600



<Max>

191.74 N at 74.65 ms

<Min>

-592.57 N at 32.10 ms

CFC_600

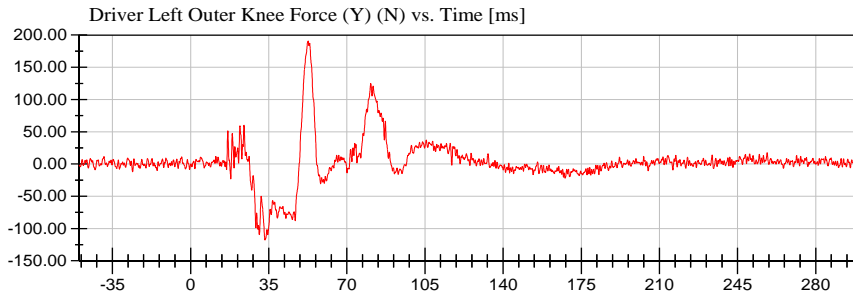


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



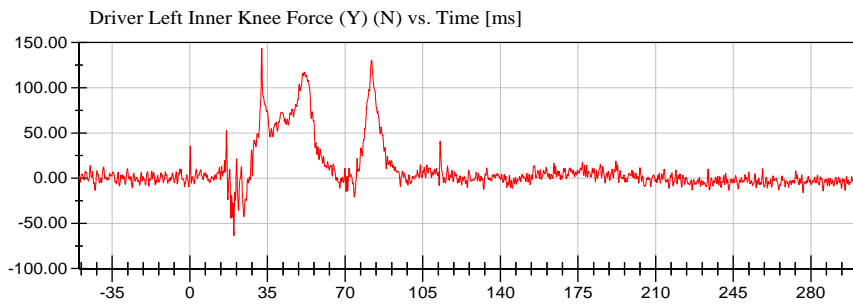
<Max>

190.82 N at 52.65 ms

<Min>

-117.89 N at 33.30 ms

CFC_600



<Max>

143.65 N at 32.40 ms

<Min>

-63.66 N at 19.90 ms

CFC_600

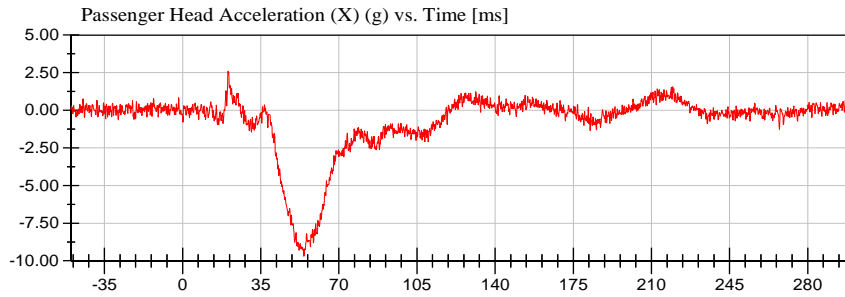


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



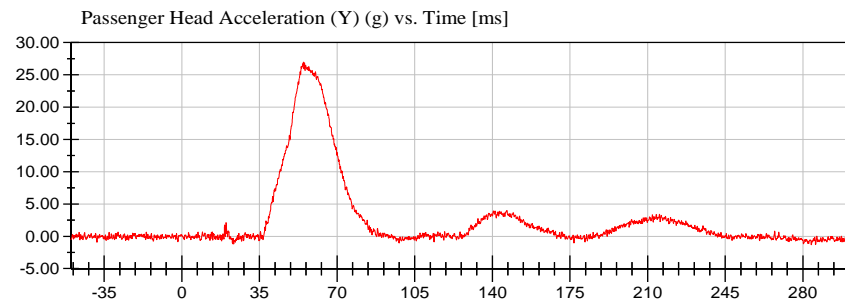
<Max>

2.59 g at 20.35 ms

<Min>

-9.70 g at 54.35 ms

CFC_1000



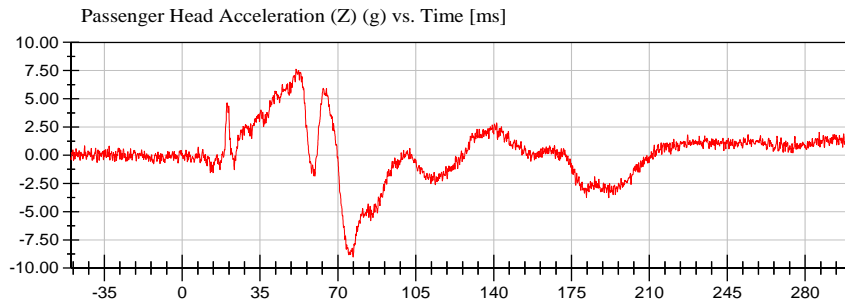
<Max>

27.00 g at 54.85 ms

<Min>

-1.31 g at 283.85 ms

CFC_1000



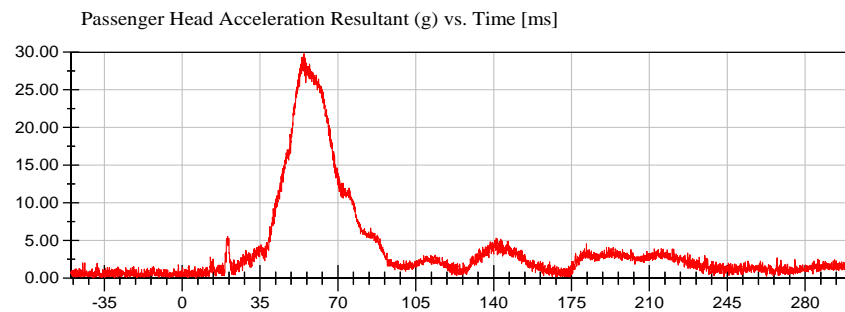
<Max>

7.61 g at 51.20 ms

<Min>

-9.01 g at 76.80 ms

CFC_1000



<Max>

29.85 g at 54.80 ms

<Min>

0.03 g at -40.00 ms

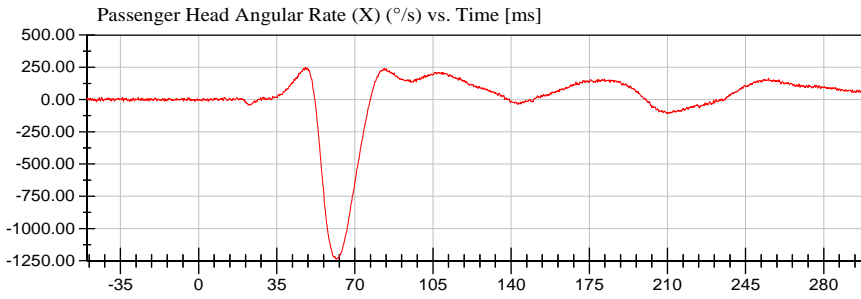
Prefiltered_> CFC 1000



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



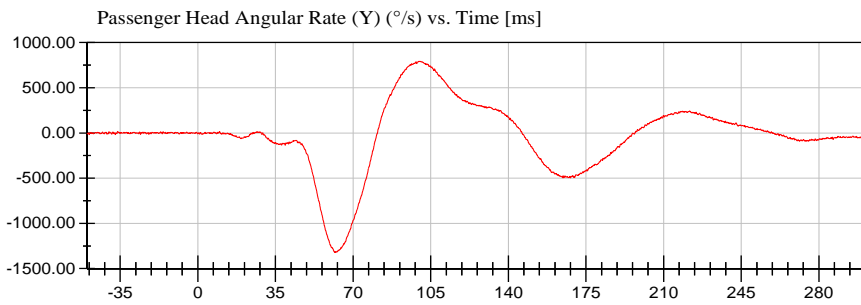
<Max>

250.52 °/s at 47.90 ms

<Min>

-1,236.20 °/s at 61.70 ms

CFC_1000



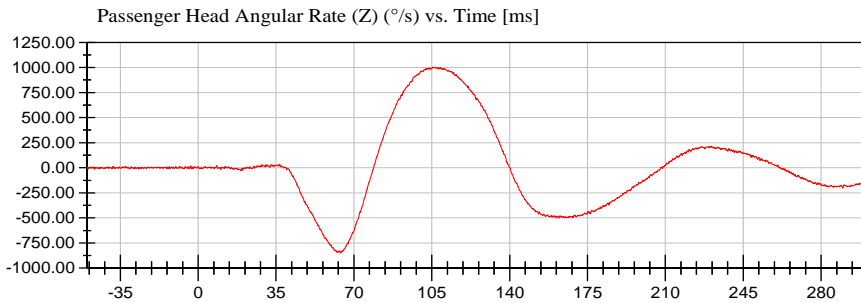
<Max>

794.02 °/s at 99.75 ms

<Min>

-1,321.93 °/s at 61.80 ms

CFC_1000



<Max>

1,003.10 °/s at 106.15 ms

<Min>

-849.93 °/s at 64.10 ms

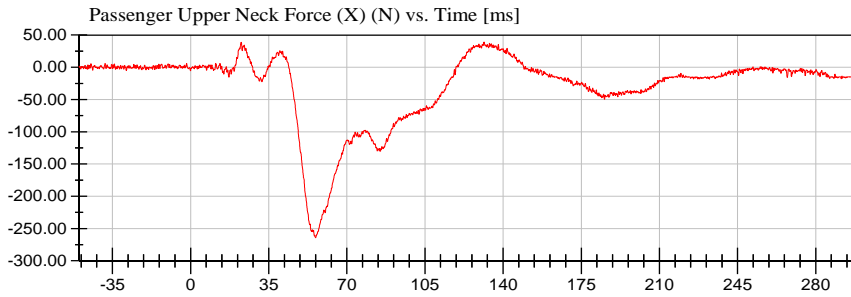
CFC_1000



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



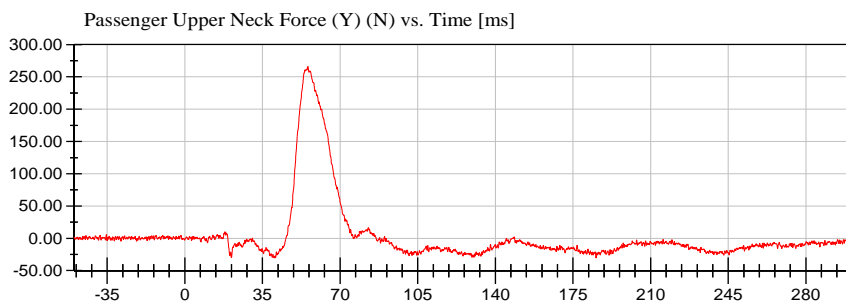
<Max>

39.06 N at 131.40 ms

<Min>

-264.17 N at 55.95 ms

CFC_1000



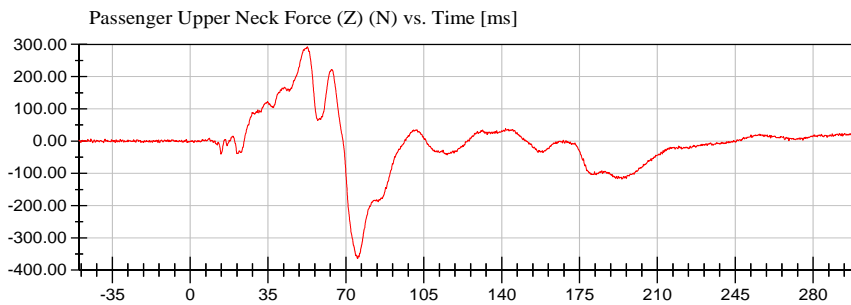
<Max>

266.05 N at 55.45 ms

<Min>

-30.59 N at 40.30 ms

CFC_1000



<Max>

292.77 N at 52.65 ms

<Min>

-363.95 N at 75.25 ms

CFC_1000

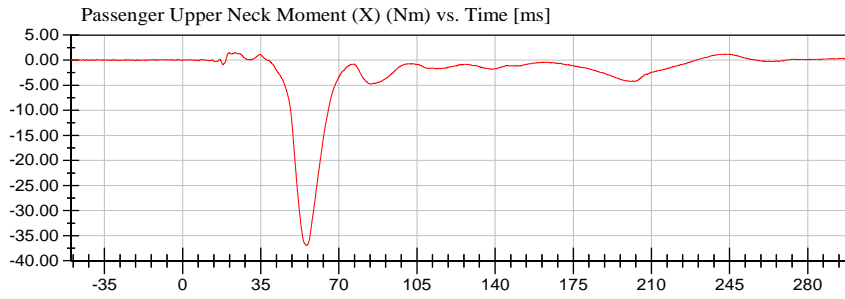


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



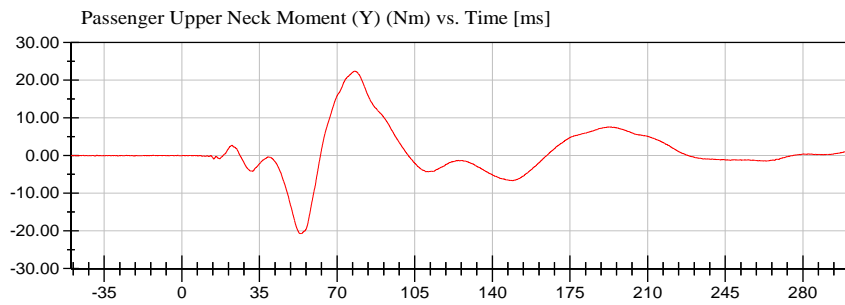
<Max>

1.51 Nm at 23.55 ms

<Min>

-36.98 Nm at 55.40 ms

CFC_600



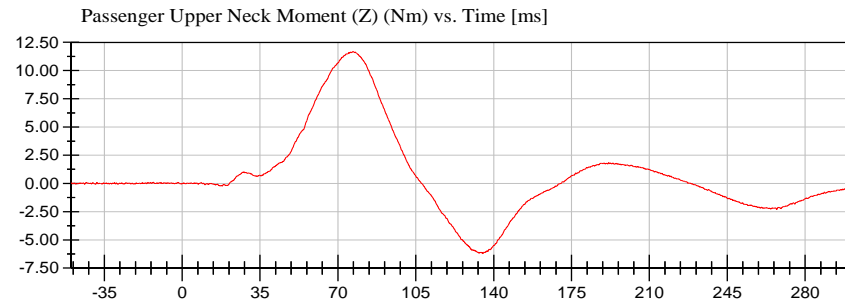
<Max>

22.41 Nm at 78.00 ms

<Min>

-20.71 Nm at 53.90 ms

CFC_600



<Max>

11.69 Nm at 76.85 ms

<Min>

-6.20 Nm at 135.10 ms

CFC_600

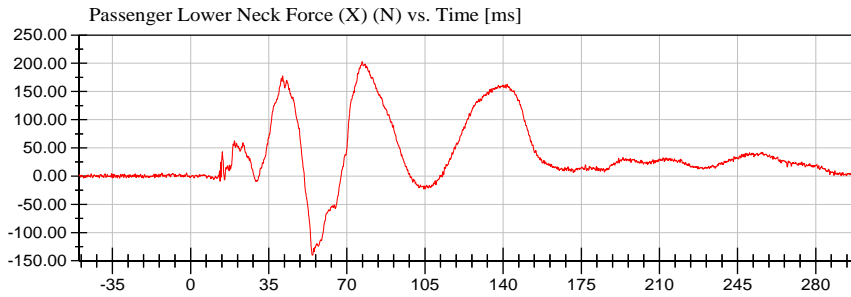


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



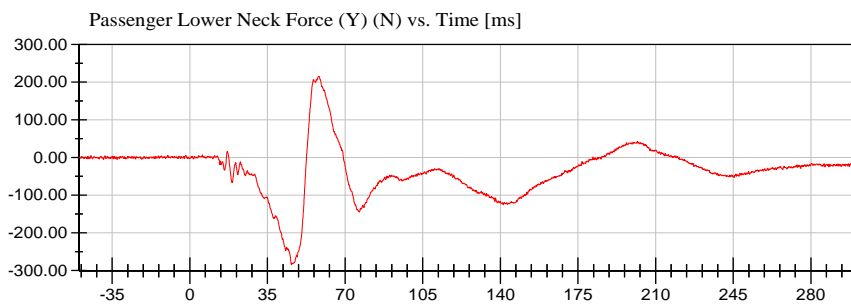
<Max>

202.97 N at 76.80 ms

<Min>

-140.06 N at 54.70 ms

CFC_1000



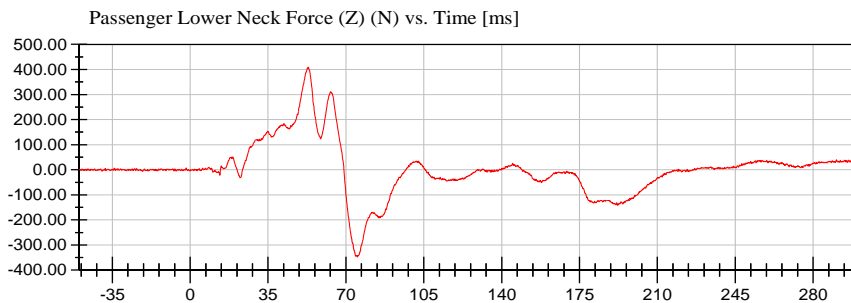
<Max>

216.21 N at 58.20 ms

<Min>

-284.18 N at 45.80 ms

CFC_1000



<Max>

409.09 N at 53.10 ms

<Min>

-347.55 N at 75.15 ms

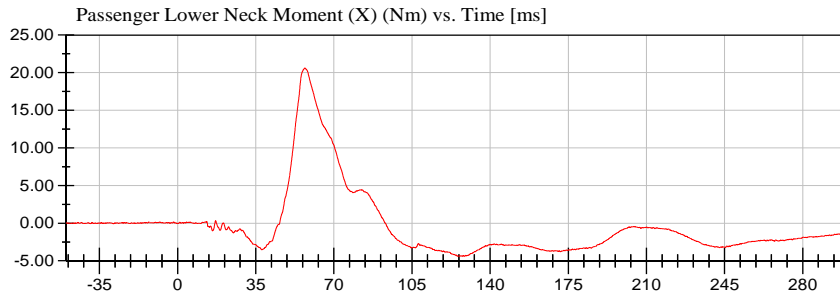
CFC_1000



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



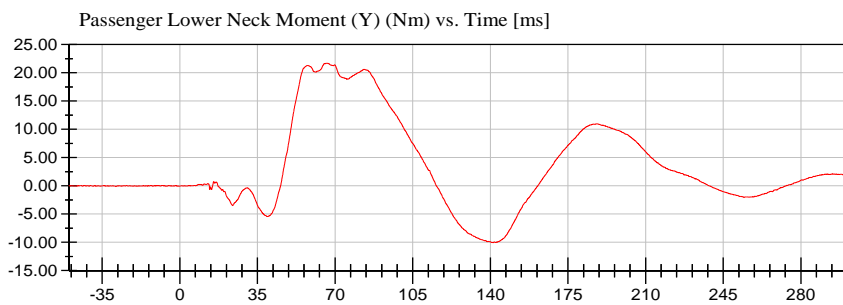
<Max>

20.63 Nm at 57.05 ms

<Min>

-4.40 Nm at 128.50 ms

CFC_600



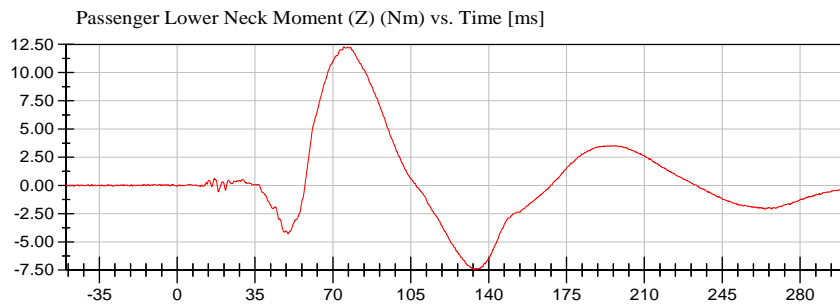
<Max>

21.71 Nm at 66.25 ms

<Min>

-10.05 Nm at 141.30 ms

CFC_600



<Max>

12.29 Nm at 74.95 ms

<Min>

-7.46 Nm at 133.50 ms

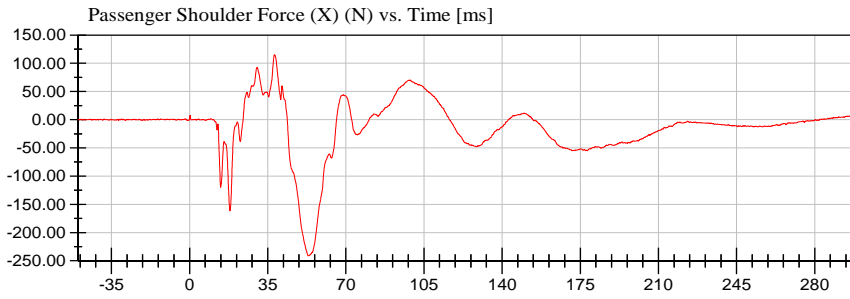
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



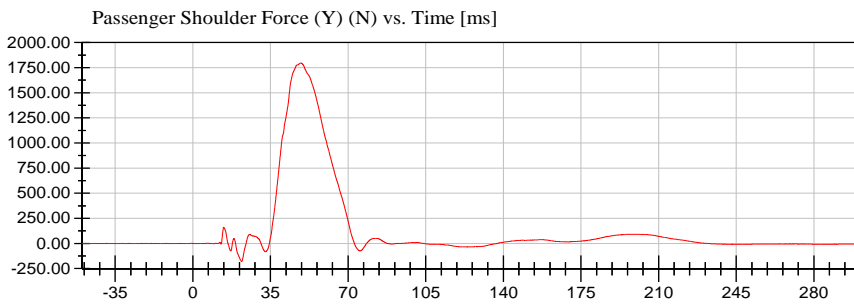
<Max>

114.88 N at 38.05 ms

<Min>

-241.08 N at 53.30 ms

CFC_600



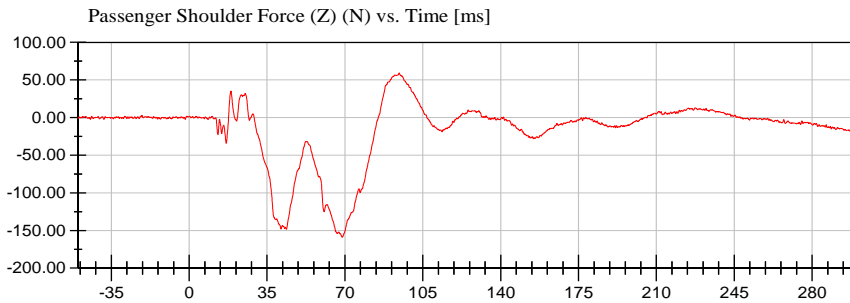
<Max>

1,795.62 N at 48.50 ms

<Min>

-179.31 N at 22.00 ms

CFC_600



<Max>

59.22 N at 94.40 ms

<Min>

-158.78 N at 68.75 ms

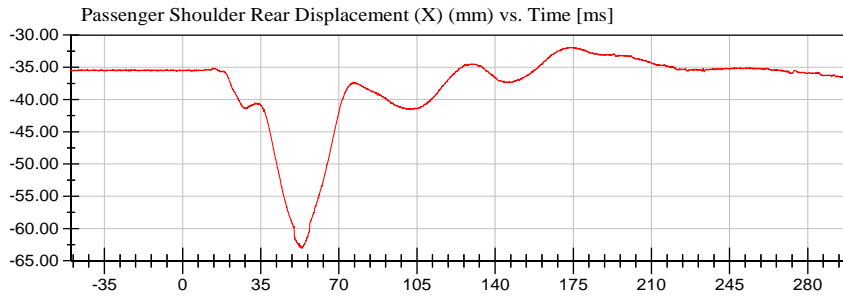
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



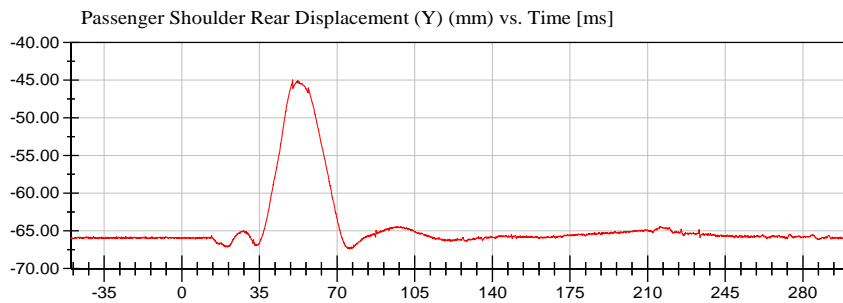
<Max>

-31.90 mm at 173.80 ms

<Min>

-63.05 mm at 53.35 ms

Unfiltered



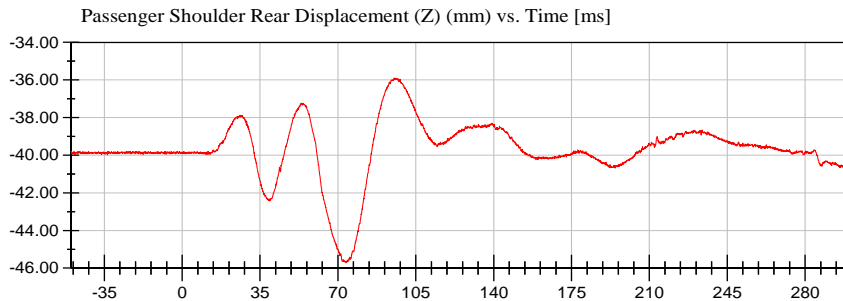
<Max>

-44.96 mm at 49.95 ms

<Min>

-67.40 mm at 75.80 ms

Unfiltered



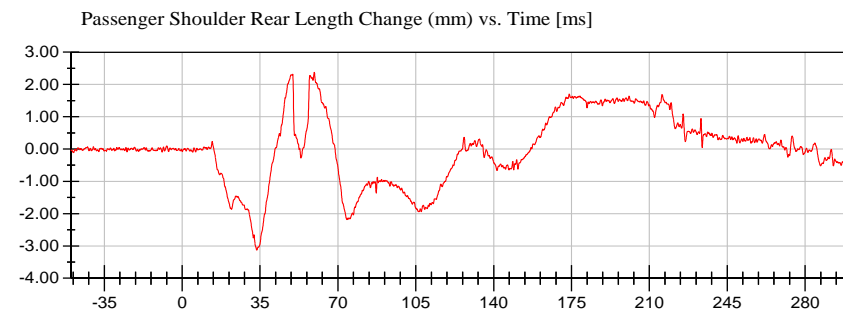
<Max>

-35.90 mm at 96.50 ms

<Min>

-45.70 mm at 73.40 ms

Unfiltered



<Max>

2.37 mm at 59.35 ms

<Min>

-3.13 mm at 33.55 ms

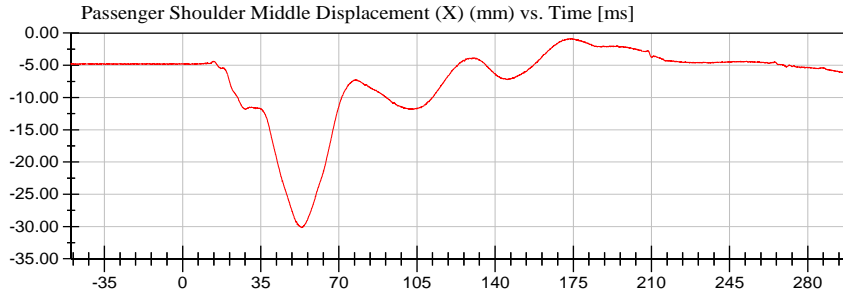
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



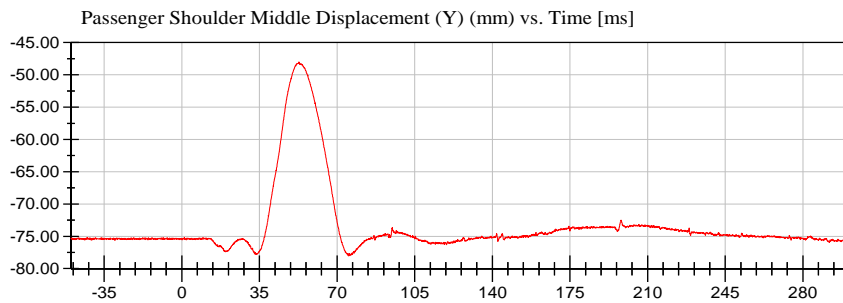
<Max>

-0.86 mm at 174.20 ms

<Min>

-30.18 mm at 53.20 ms

Unfiltered



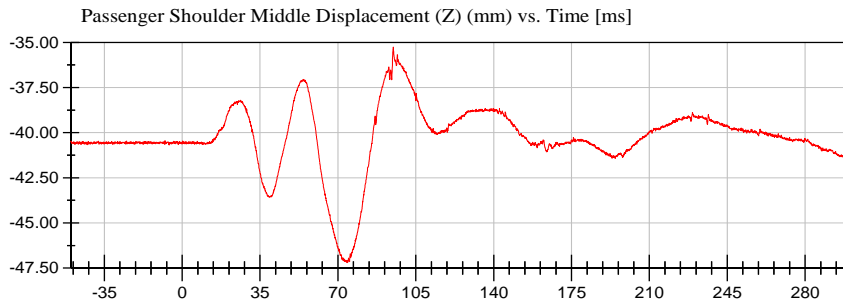
<Max>

-48.03 mm at 52.80 ms

<Min>

-78.04 mm at 75.20 ms

Unfiltered



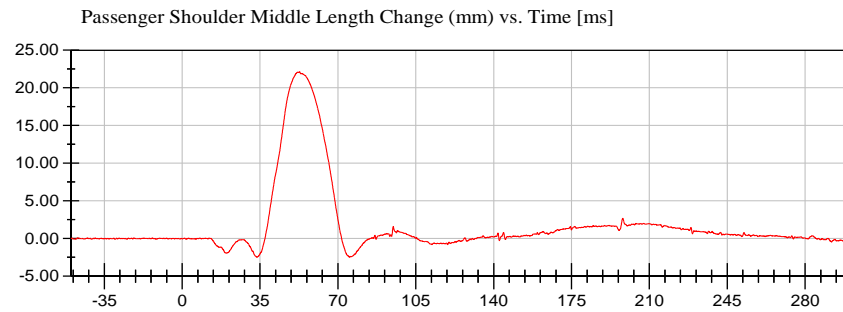
<Max>

-35.27 mm at 94.90 ms

<Min>

-47.20 mm at 74.10 ms

Unfiltered



<Max>

22.14 mm at 52.75 ms

<Min>

-2.49 mm at 33.55 ms

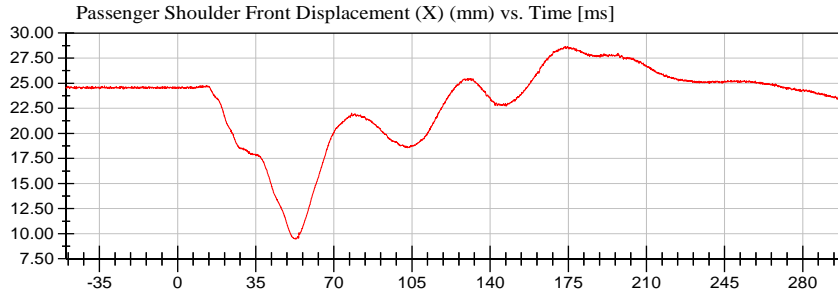
CFC_600



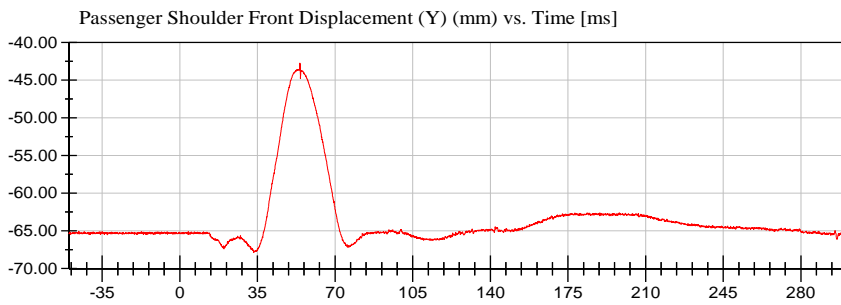
VRTC

Test Lab: CTF
Test Number: 210318 ()

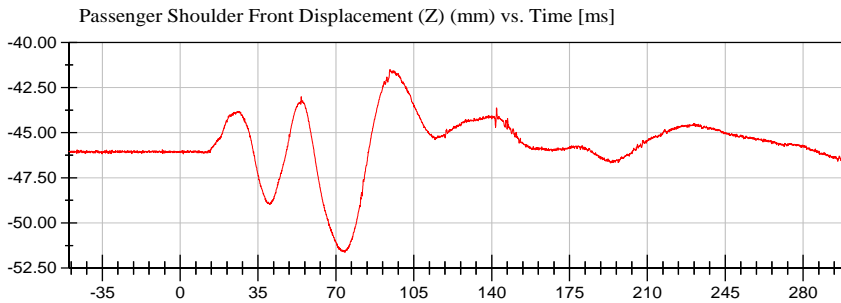
Test Date: 03/18/2021



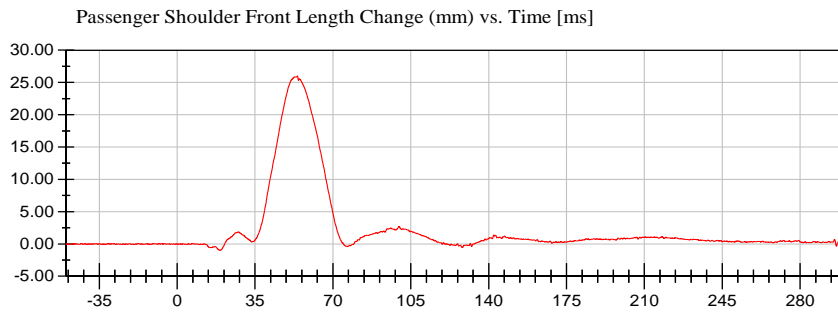
<Max>
28.66 mm at 173.60 ms
<Min>
9.46 mm at 53.00 ms
Unfiltered



<Max>
-42.73 mm at 54.20 ms
<Min>
-67.84 mm at 33.30 ms
Unfiltered



<Max>
-41.50 mm at 94.30 ms
<Min>
-51.61 mm at 74.10 ms
Unfiltered



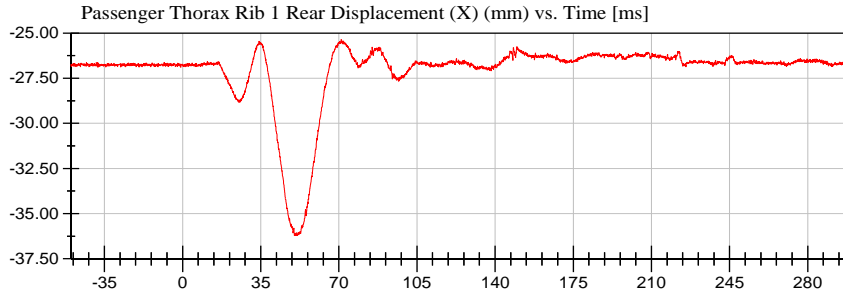
<Max>
25.99 mm at 54.05 ms
<Min>
-0.99 mm at 19.25 ms
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



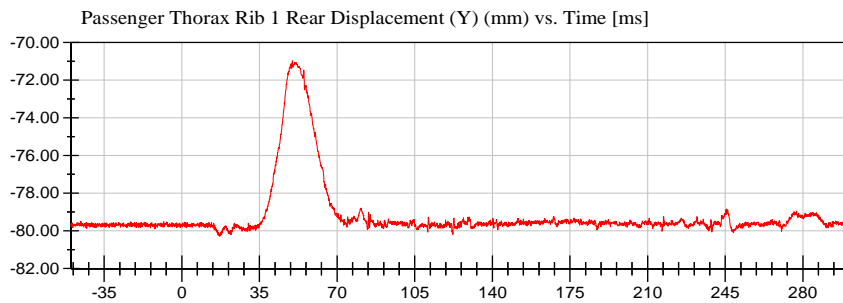
<Max>

-25.35 mm at 71.10 ms

<Min>

-36.21 mm at 50.15 ms

Unfiltered



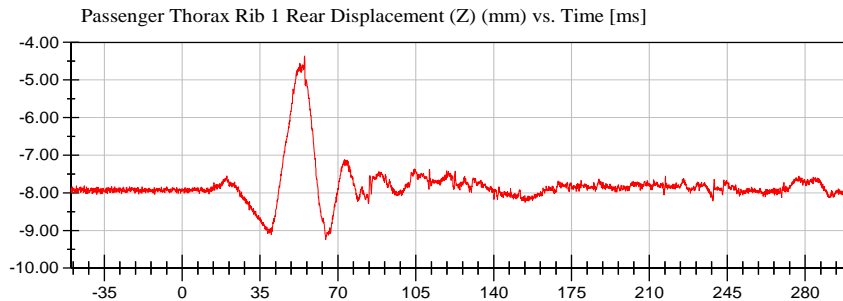
<Max>

-70.97 mm at 49.95 ms

<Min>

-80.29 mm at 17.10 ms

Unfiltered



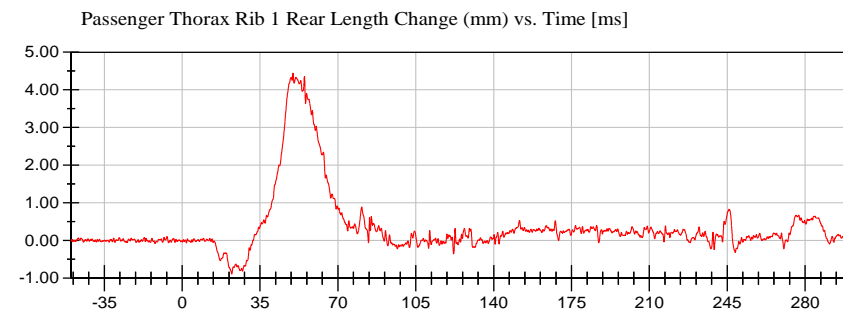
<Max>

-4.36 mm at 55.00 ms

<Min>

-9.24 mm at 64.50 ms

Unfiltered



<Max>

4.44 mm at 49.85 ms

<Min>

-0.89 mm at 22.30 ms

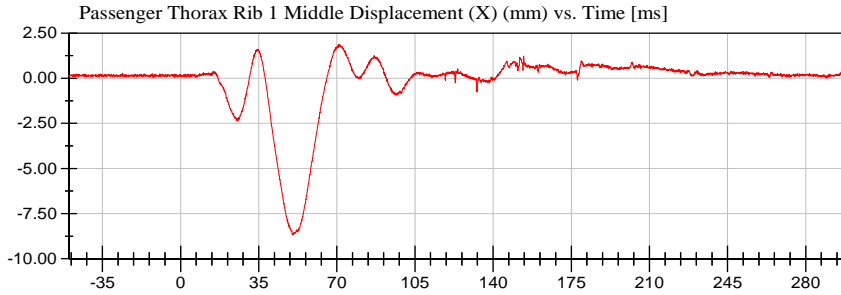
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



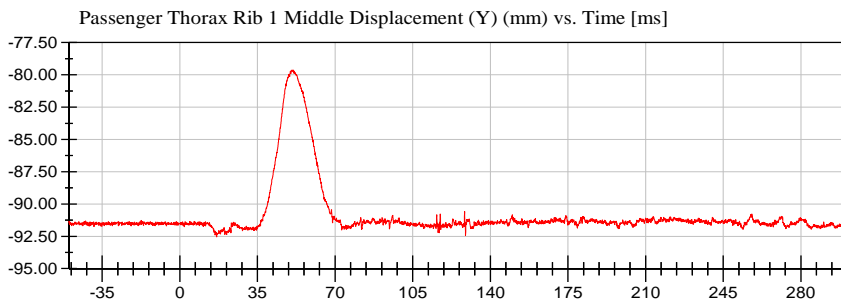
<Max>

1.87 mm at 71.10 ms

<Min>

-8.67 mm at 50.10 ms

Unfiltered



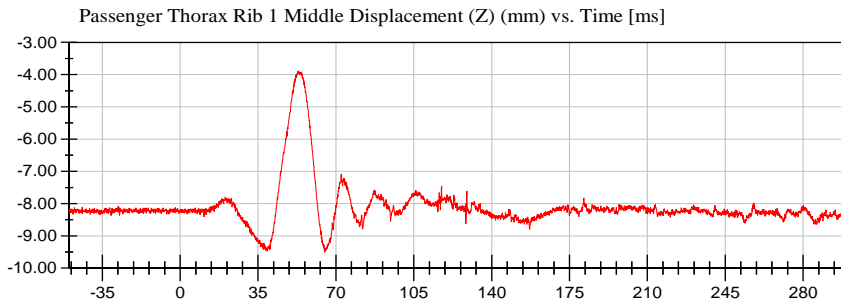
<Max>

-79.61 mm at 51.00 ms

<Min>

-92.55 mm at 16.60 ms

Unfiltered



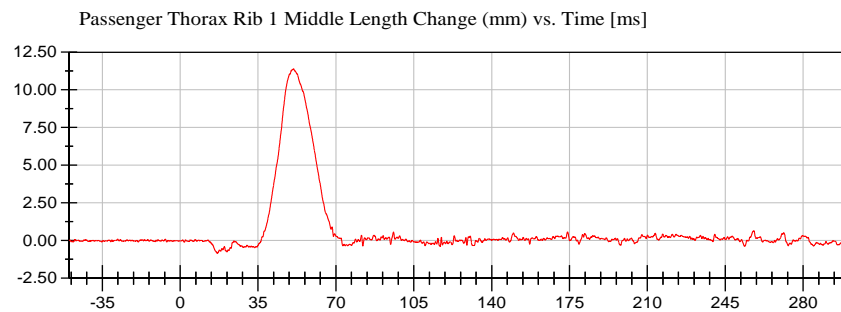
<Max>

-3.89 mm at 53.10 ms

<Min>

-9.51 mm at 65.00 ms

Unfiltered



<Max>

11.39 mm at 50.95 ms

<Min>

-0.86 mm at 16.65 ms

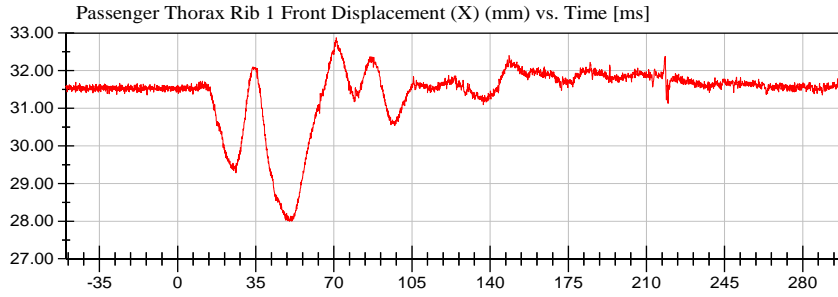
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



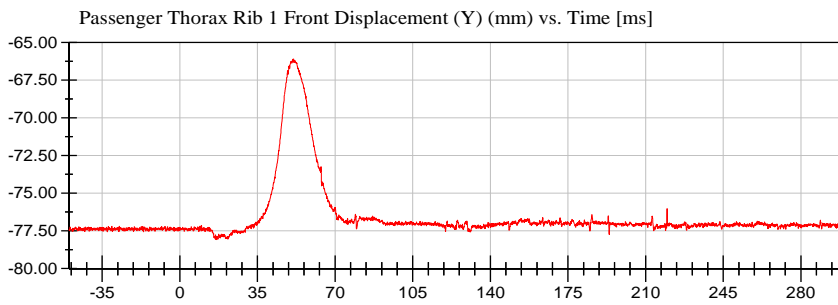
<Max>

32.88 mm at 71.10 ms

<Min>

28.00 mm at 50.15 ms

Unfiltered



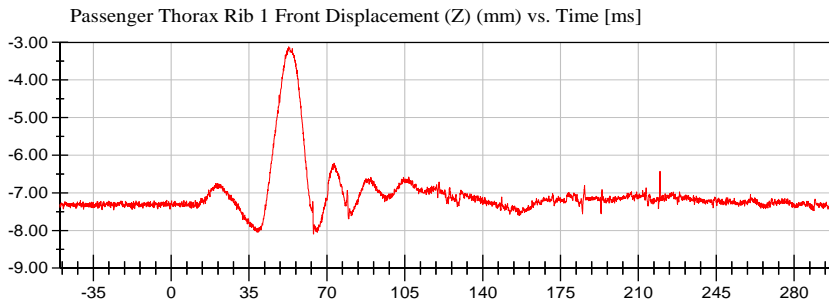
<Max>

-66.09 mm at 51.30 ms

<Min>

-78.08 mm at 16.60 ms

Unfiltered



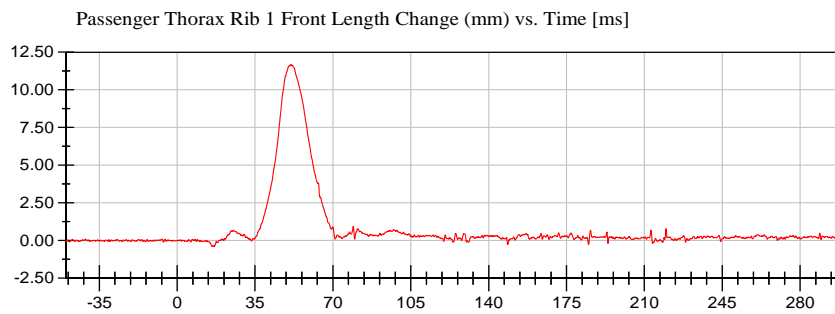
<Max>

-3.12 mm at 52.80 ms

<Min>

-8.09 mm at 64.00 ms

Unfiltered



<Max>

11.69 mm at 51.10 ms

<Min>

-0.39 mm at 16.60 ms

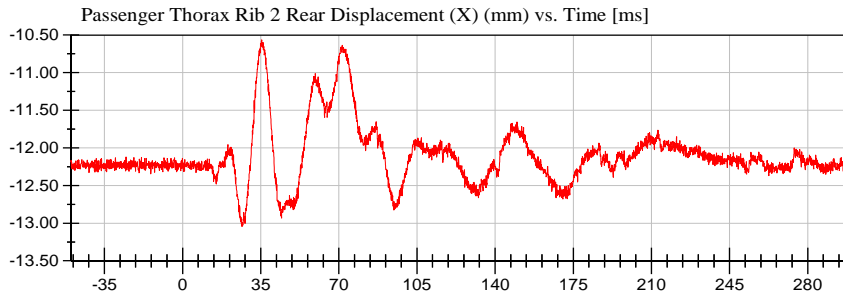
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



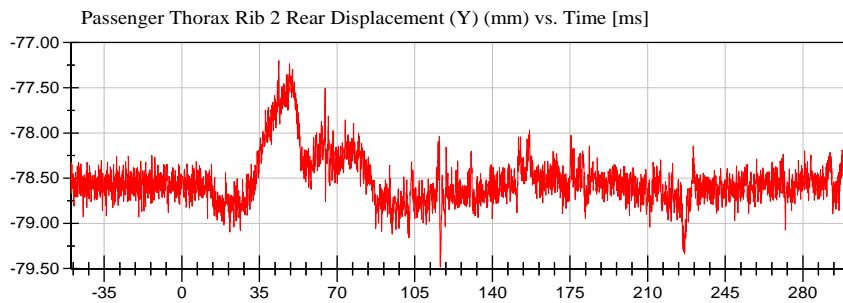
<Max>

-10.57 mm at 35.50 ms

<Min>

-13.04 mm at 26.60 ms

Unfiltered



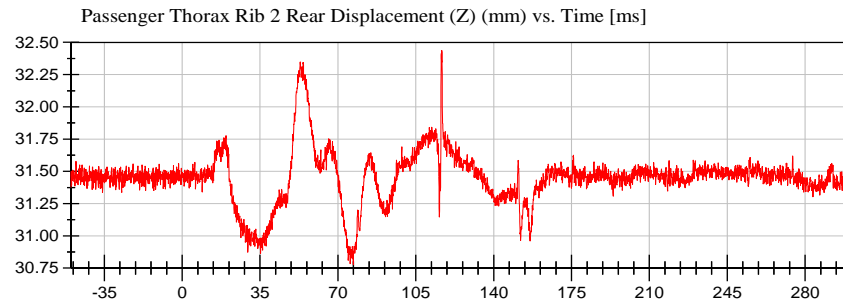
<Max>

-77.20 mm at 43.70 ms

<Min>

-79.48 mm at 116.55 ms

Unfiltered



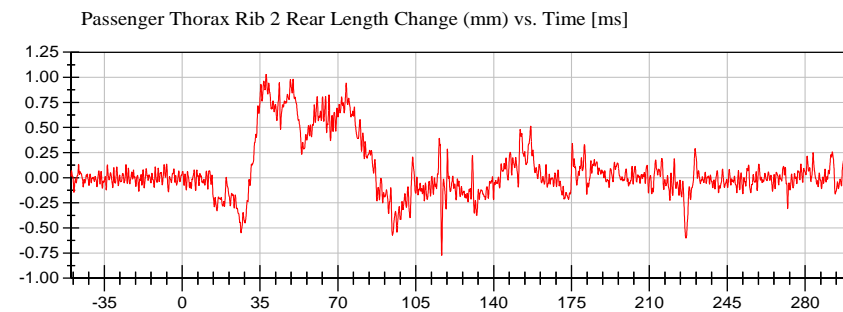
<Max>

32.44 mm at 116.70 ms

<Min>

30.78 mm at 76.90 ms

Unfiltered



<Max>

1.03 mm at 37.75 ms

<Min>

-0.77 mm at 116.65 ms

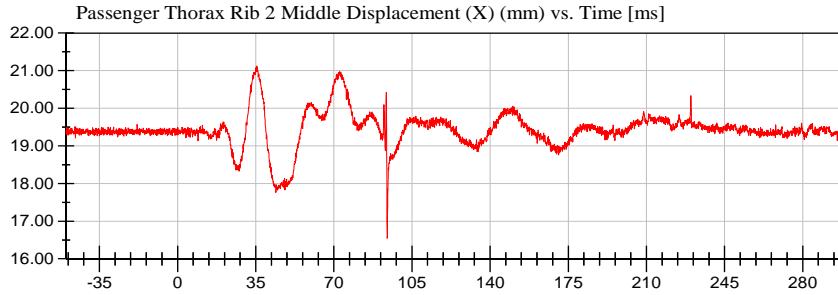
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



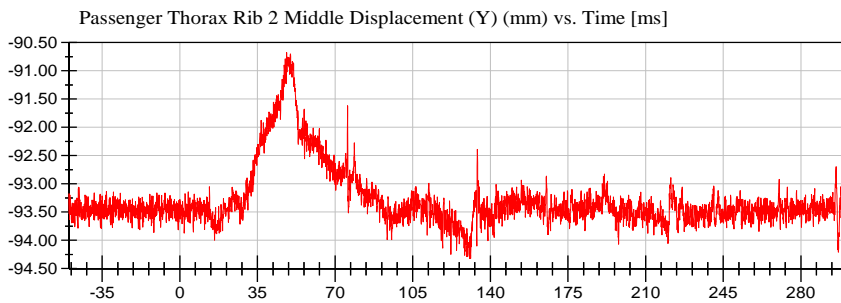
<Max>

21.12 mm at 35.45 ms

<Min>

16.54 mm at 93.90 ms

Unfiltered



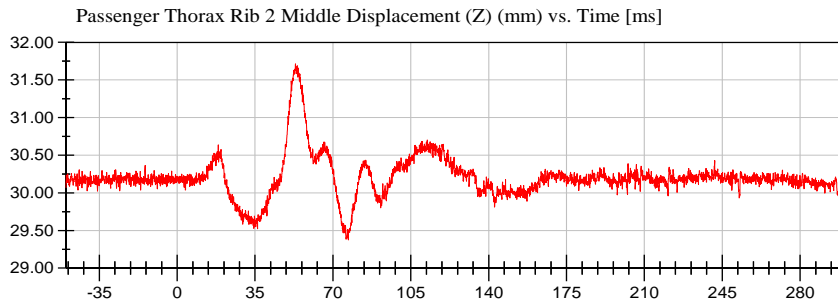
<Max>

-90.68 mm at 48.10 ms

<Min>

-94.32 mm at 130.70 ms

Unfiltered



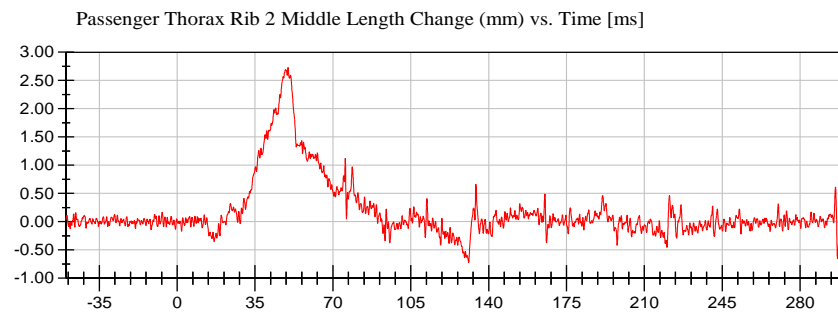
<Max>

31.71 mm at 53.15 ms

<Min>

29.37 mm at 76.90 ms

Unfiltered



<Max>

2.73 mm at 49.85 ms

<Min>

-0.72 mm at 131.00 ms

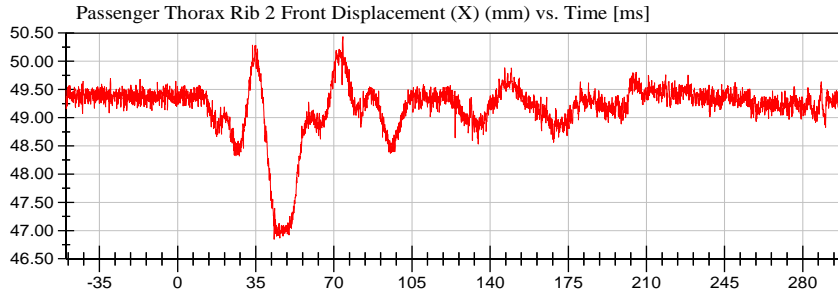
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



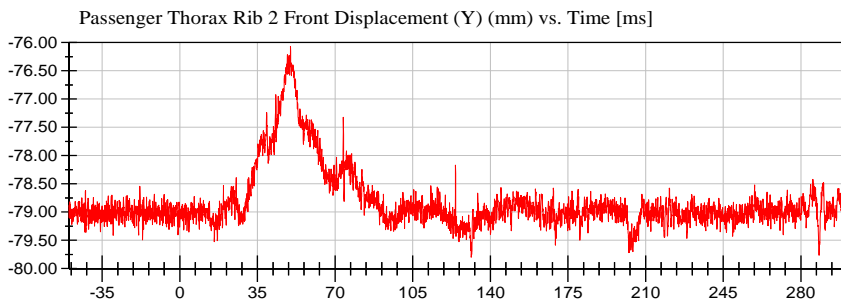
<Max>

50.44 mm at 74.10 ms

<Min>

46.85 mm at 43.30 ms

Unfiltered



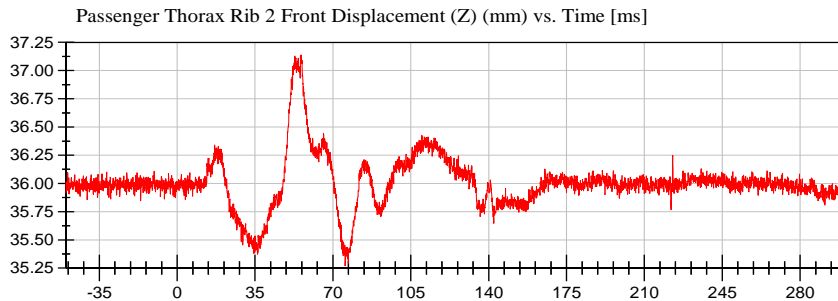
<Max>

-76.07 mm at 49.90 ms

<Min>

-79.80 mm at 131.40 ms

Unfiltered



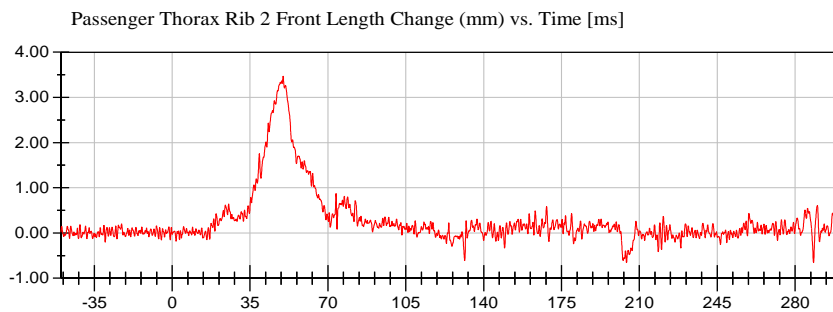
<Max>

37.14 mm at 55.65 ms

<Min>

35.27 mm at 75.50 ms

Unfiltered



<Max>

3.47 mm at 49.90 ms

<Min>

-0.66 mm at 288.25 ms

CFC_600

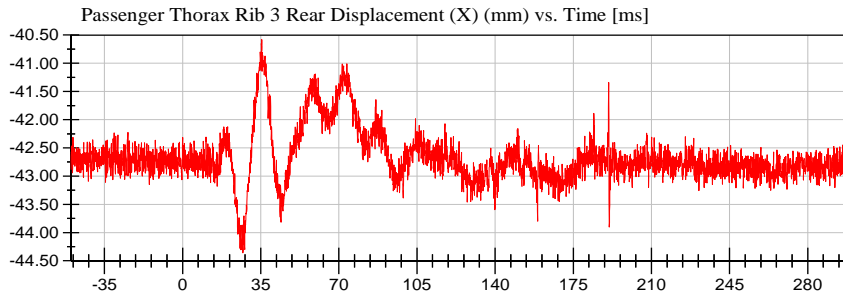


VRTC

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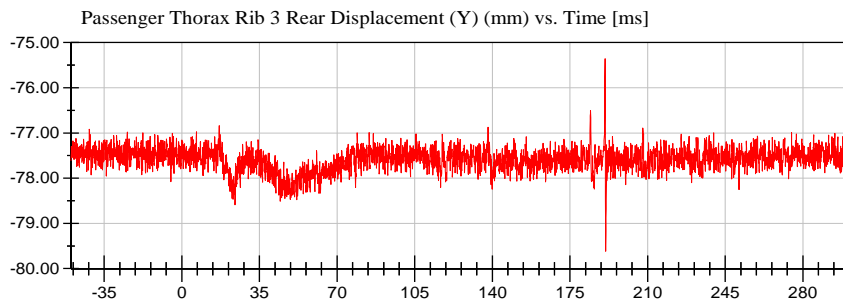
<Max>

-40.58 mm at 35.50 ms

<Min>

-44.36 mm at 27.00 ms

Unfiltered



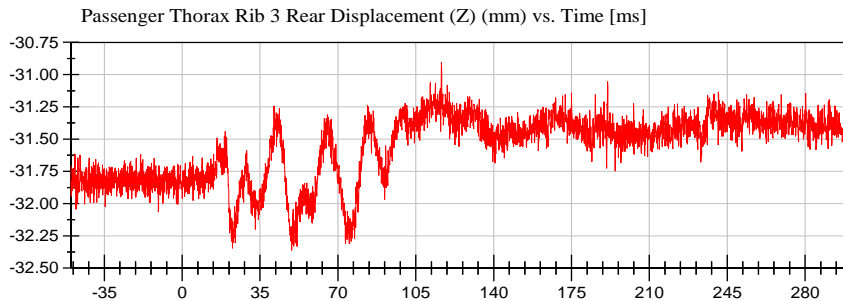
<Max>

-75.36 mm at 190.80 ms

<Min>

-79.62 mm at 191.10 ms

Unfiltered



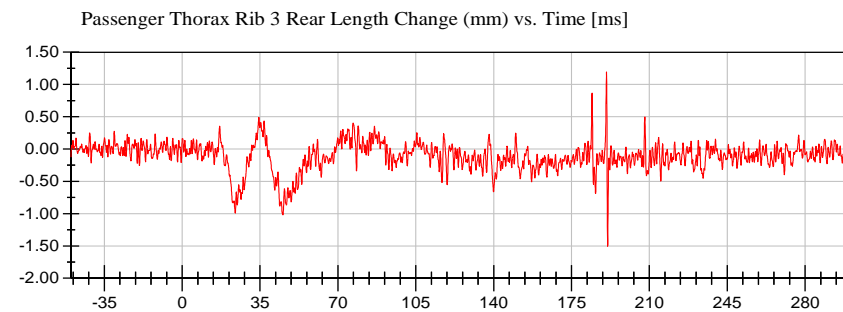
<Max>

-30.91 mm at 116.55 ms

<Min>

-32.36 mm at 49.20 ms

Unfiltered



<Max>

1.19 mm at 190.70 ms

<Min>

-1.51 mm at 191.20 ms

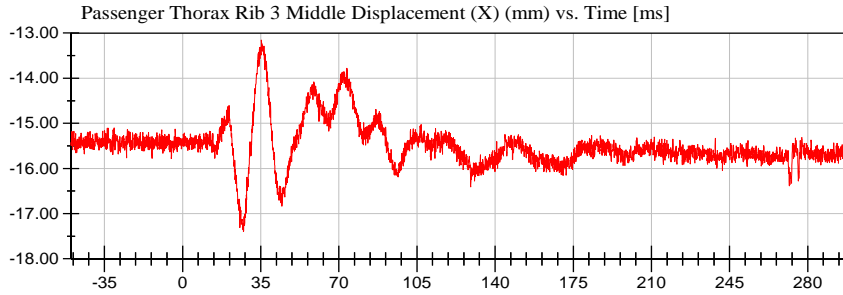
CFC_600



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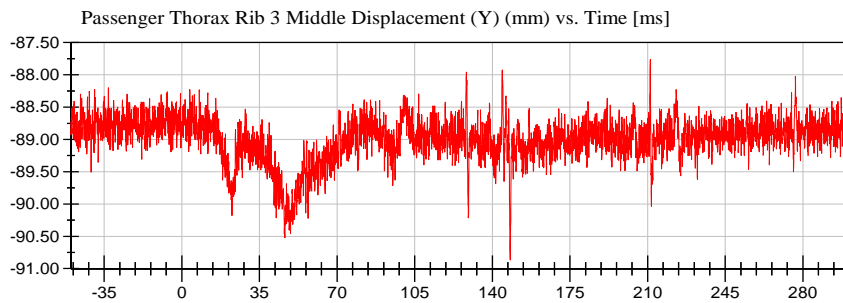
<Max>

-13.15 mm at 35.30 ms

<Min>

-17.40 mm at 27.30 ms

Unfiltered



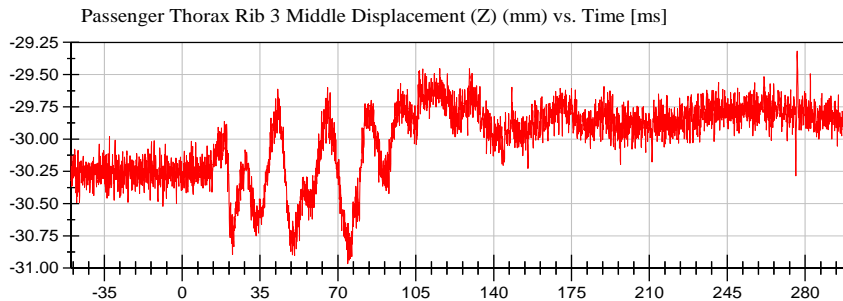
<Max>

-87.76 mm at 211.20 ms

<Min>

-90.86 mm at 148.10 ms

Unfiltered



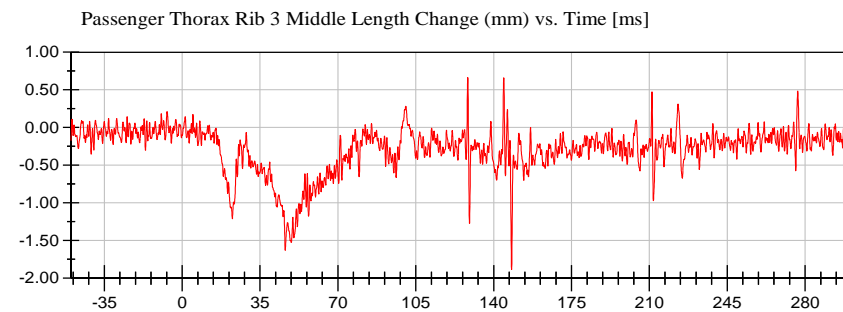
<Max>

-29.32 mm at 276.40 ms

<Min>

-30.97 mm at 74.45 ms

Unfiltered



<Max>

0.66 mm at 128.35 ms

<Min>

-1.88 mm at 148.05 ms

CFC_600

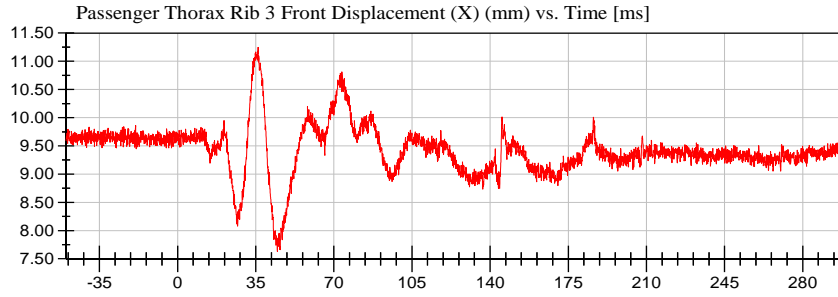


VRTC

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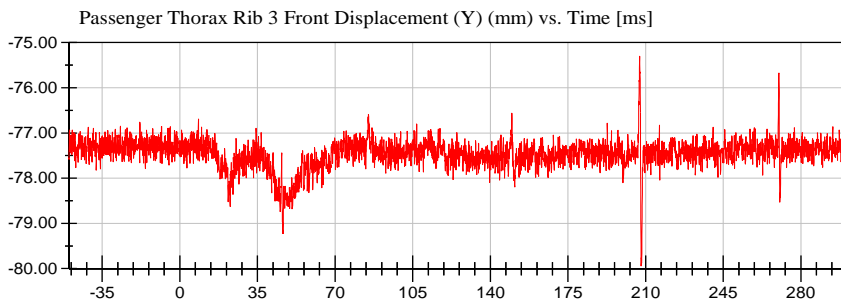
<Max>

11.25 mm at 36.10 ms

<Min>

7.63 mm at 44.70 ms

Unfiltered



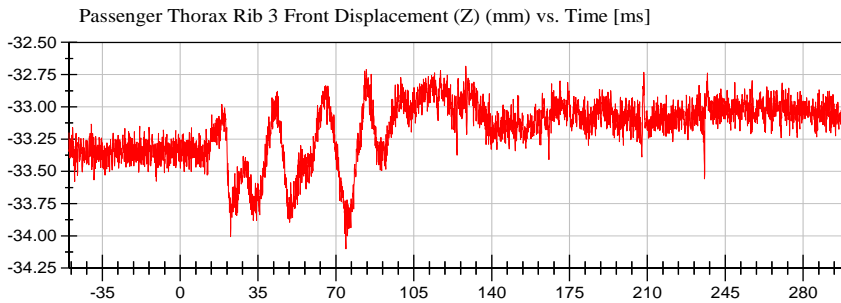
<Max>

-75.30 mm at 207.30 ms

<Min>

-79.94 mm at 208.00 ms

Unfiltered



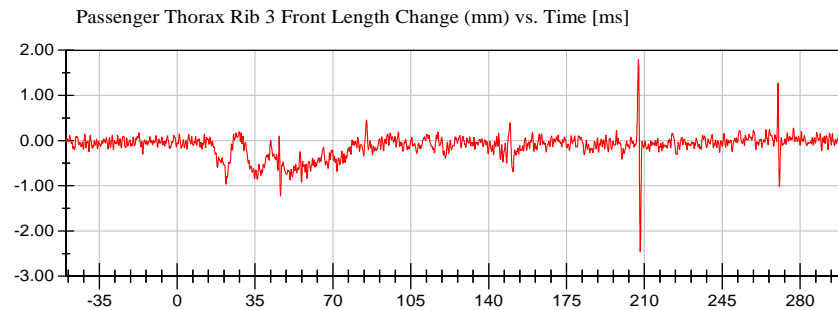
<Max>

-32.69 mm at 128.40 ms

<Min>

-34.10 mm at 74.50 ms

Unfiltered



<Max>

1.79 mm at 207.35 ms

<Min>

-2.45 mm at 208.10 ms

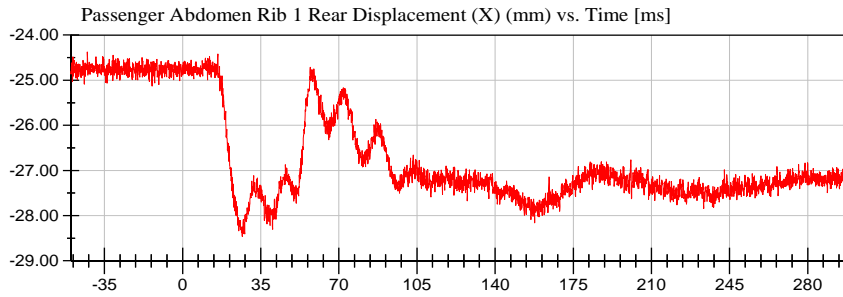
CFC_600



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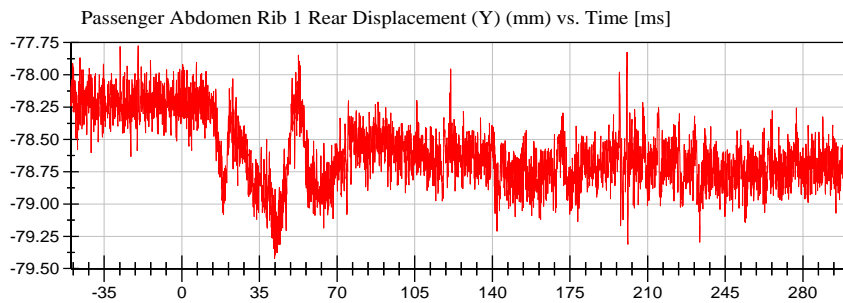
<Max>

-24.37 mm at -42.60 ms

<Min>

-28.46 mm at 26.70 ms

Unfiltered



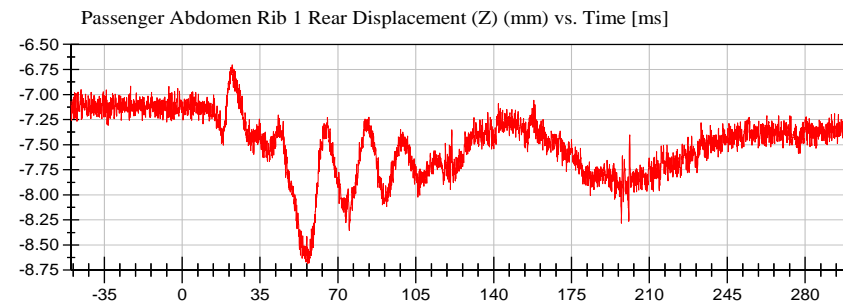
<Max>

-77.77 mm at -19.70 ms

<Min>

-79.42 mm at 41.85 ms

Unfiltered



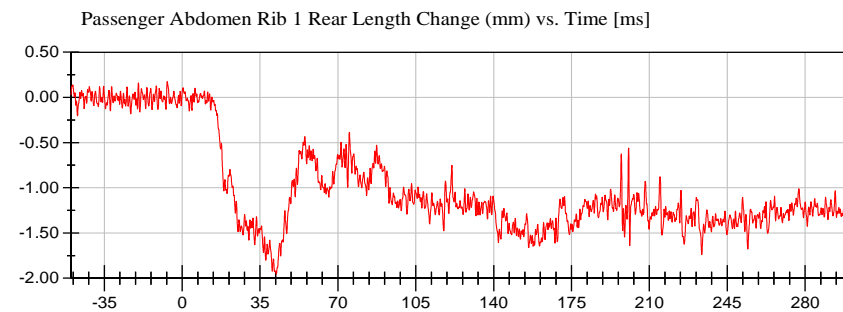
<Max>

-6.70 mm at 22.50 ms

<Min>

-8.68 mm at 56.40 ms

Unfiltered



<Max>

0.18 mm at -6.70 ms

<Min>

-1.95 mm at 42.30 ms

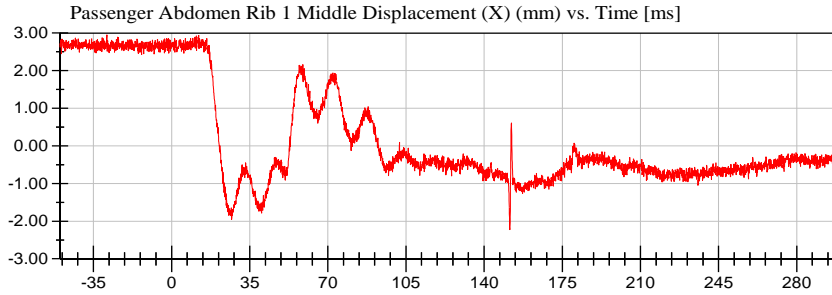
CFC_600



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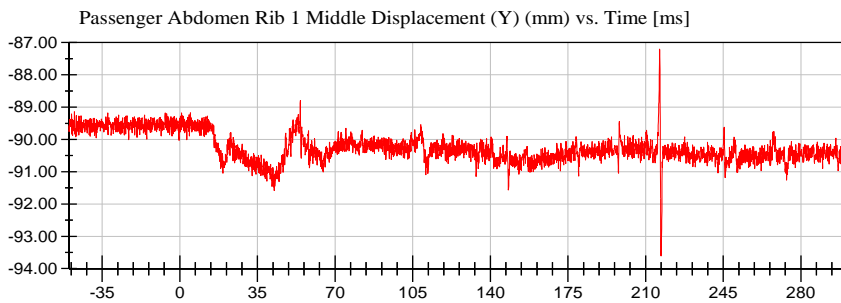
<Max>

2.95 mm at -29.00 ms

<Min>

-2.23 mm at 151.50 ms

Unfiltered



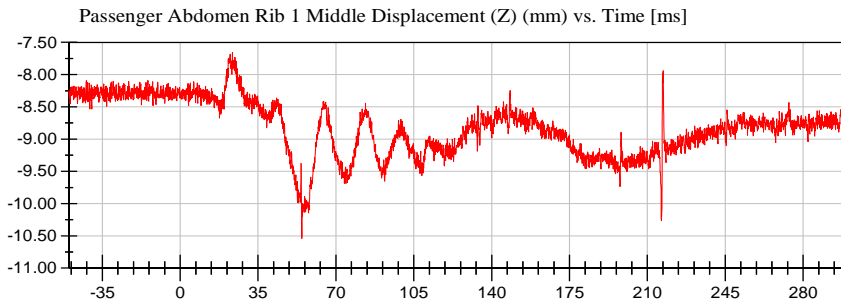
<Max>

-87.20 mm at 216.30 ms

<Min>

-93.61 mm at 216.95 ms

Unfiltered



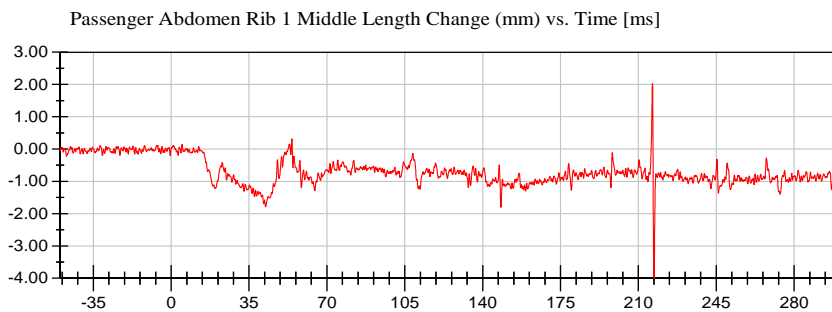
<Max>

-7.66 mm at 23.50 ms

<Min>

-10.54 mm at 54.70 ms

Unfiltered



<Max>

2.03 mm at 216.30 ms

<Min>

-3.99 mm at 217.00 ms

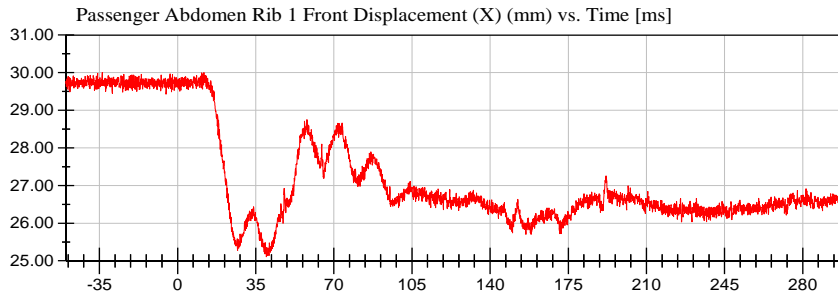
CFC_600



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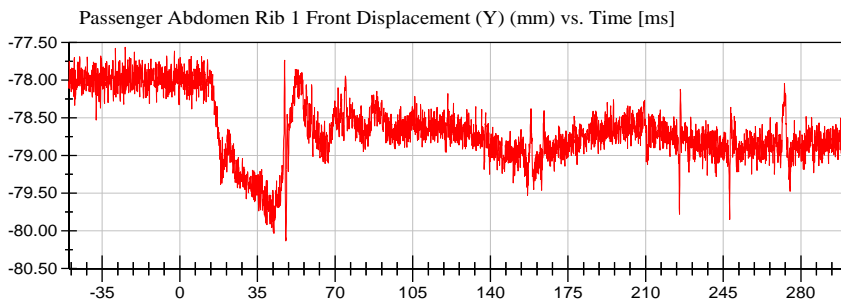
<Max>

30.00 mm at -33.70 ms

<Min>

25.10 mm at 39.80 ms

Unfiltered



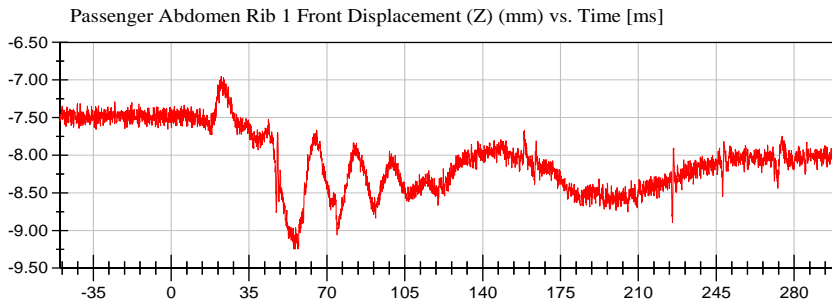
<Max>

-77.56 mm at -24.60 ms

<Min>

-80.13 mm at 47.75 ms

Unfiltered



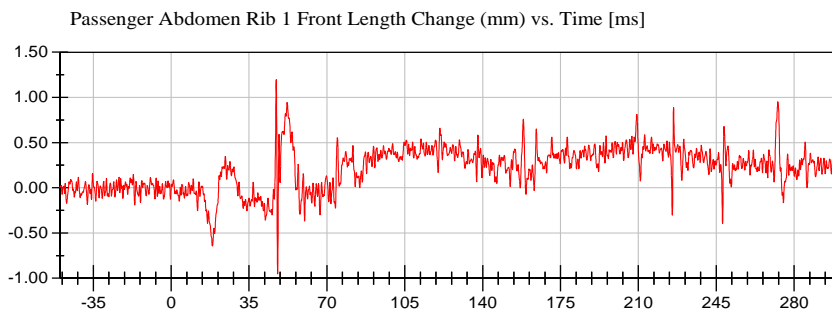
<Max>

-6.95 mm at 22.50 ms

<Min>

-9.25 mm at 55.05 ms

Unfiltered



<Max>

1.19 mm at 47.25 ms

<Min>

-0.95 mm at 47.85 ms

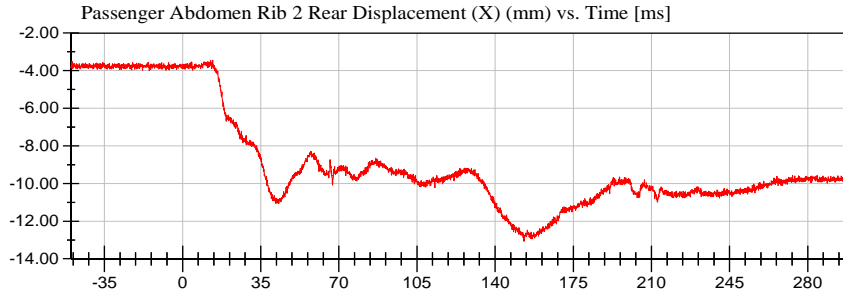
CFC_600



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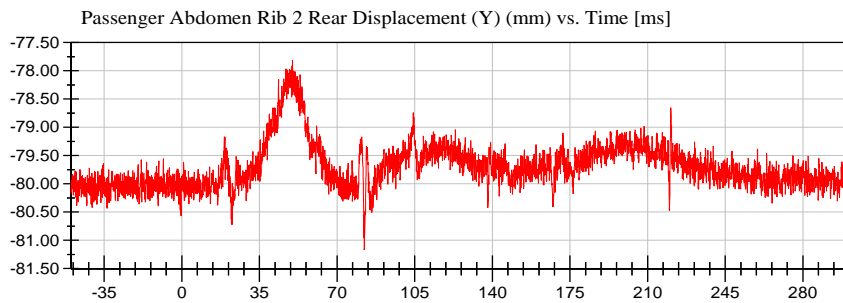
<Max>

-3.44 mm at 13.50 ms

<Min>

-13.08 mm at 152.90 ms

Unfiltered



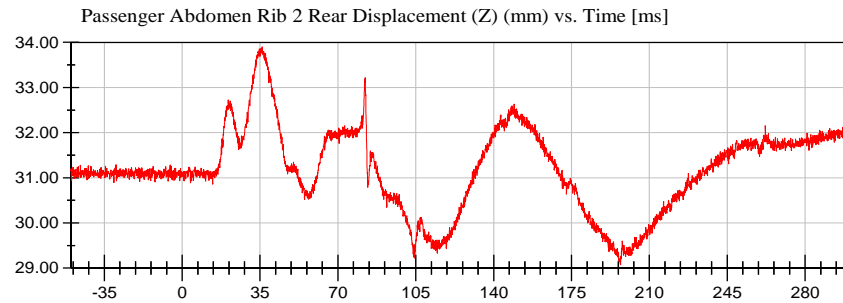
<Max>

-77.81 mm at 49.90 ms

<Min>

-81.16 mm at 82.30 ms

Unfiltered



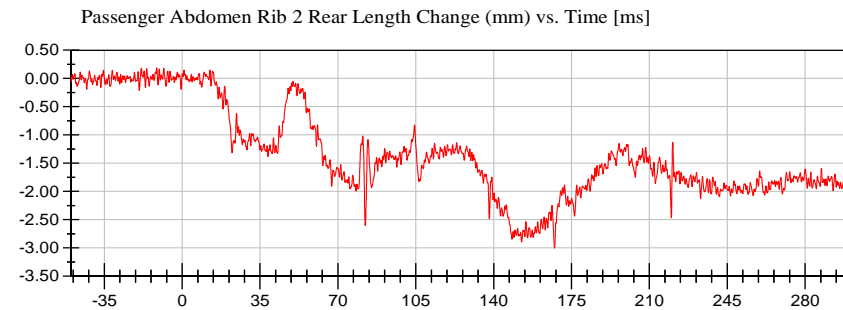
<Max>

33.90 mm at 35.95 ms

<Min>

29.08 mm at 197.00 ms

Unfiltered



<Max>

0.19 mm at -11.40 ms

<Min>

-3.00 mm at 167.35 ms

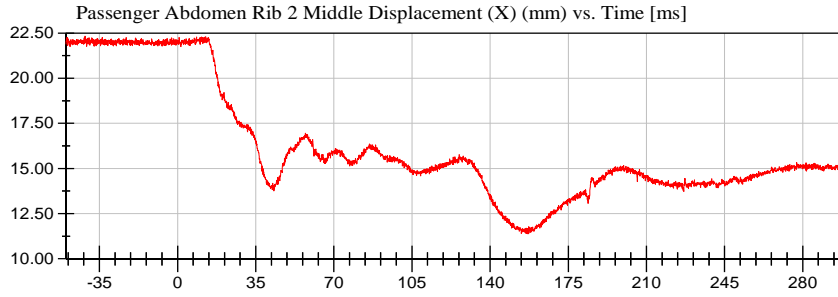
CFC_600



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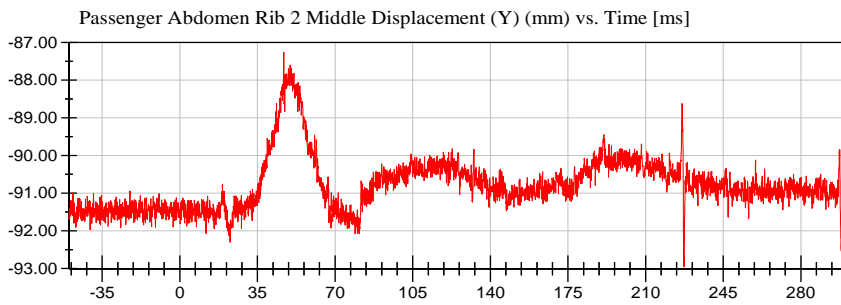
<Max>

22.33 mm at -41.40 ms

<Min>

11.37 mm at 156.95 ms

Unfiltered



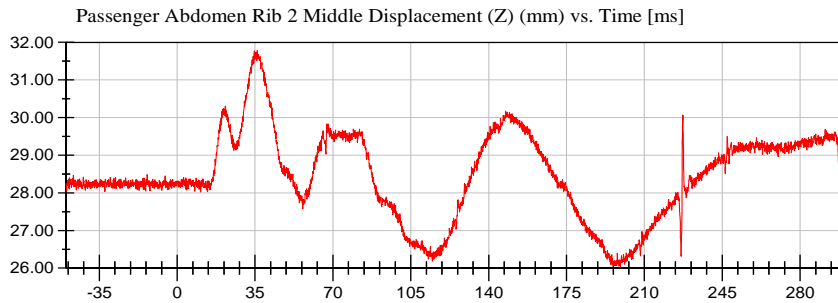
<Max>

-87.26 mm at 46.90 ms

<Min>

-92.96 mm at 227.30 ms

Unfiltered



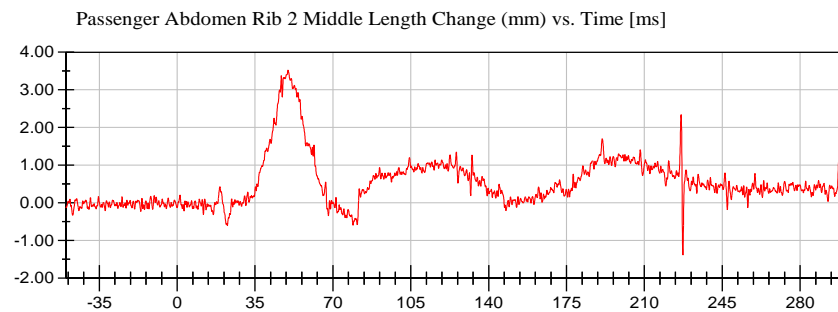
<Max>

31.79 mm at 36.00 ms

<Min>

26.03 mm at 199.20 ms

Unfiltered



<Max>

3.52 mm at 49.85 ms

<Min>

-1.38 mm at 227.30 ms

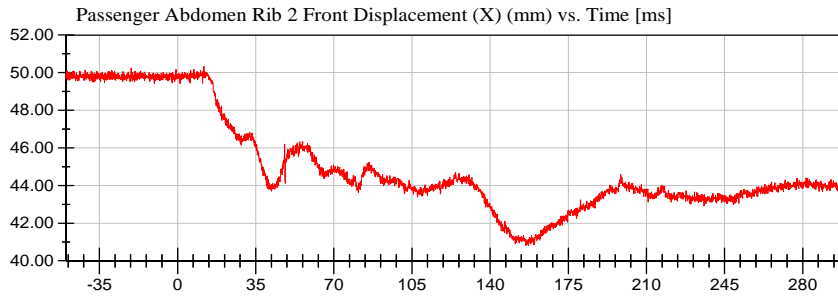
CFC_600



VRTC

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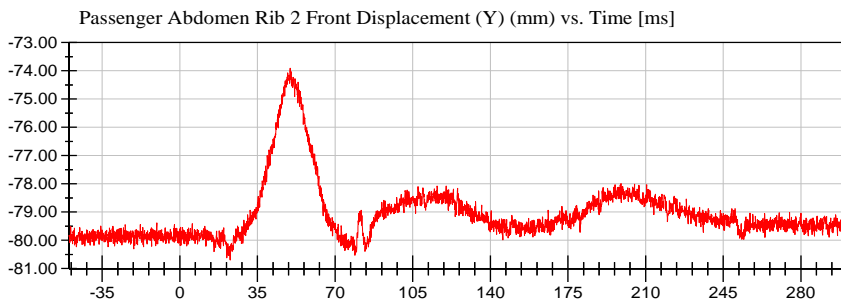
<Max>

50.32 mm at 11.80 ms

<Min>

40.82 mm at 156.00 ms

Unfiltered



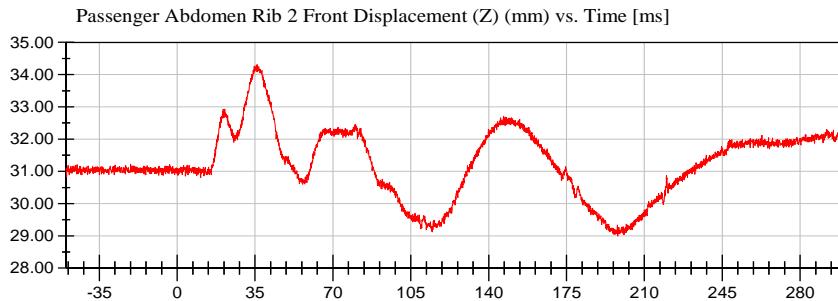
<Max>

-73.91 mm at 49.70 ms

<Min>

-80.70 mm at 22.70 ms

Unfiltered



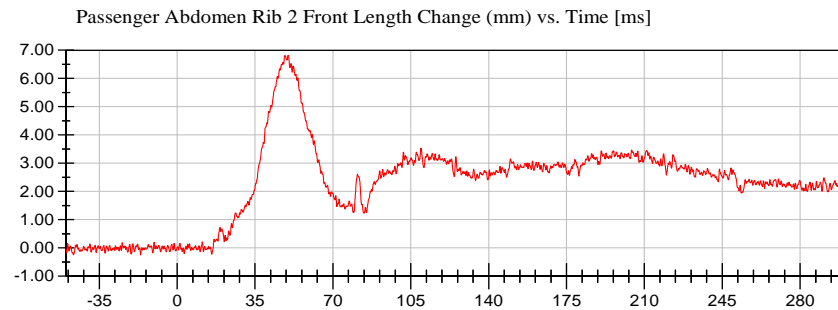
<Max>

34.31 mm at 36.00 ms

<Min>

28.99 mm at 198.00 ms

Unfiltered



<Max>

6.82 mm at 49.85 ms

<Min>

-0.25 mm at -16.45 ms

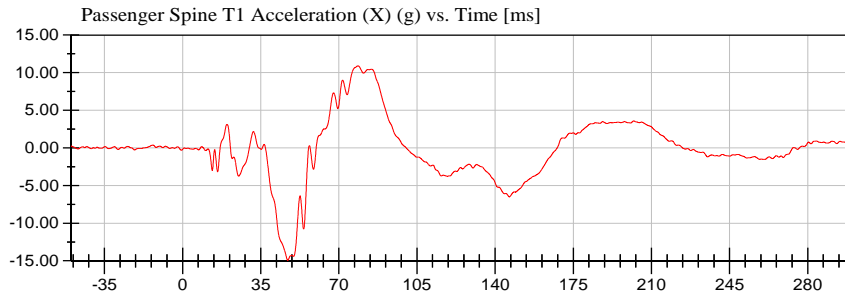
CFC_600



VRTC

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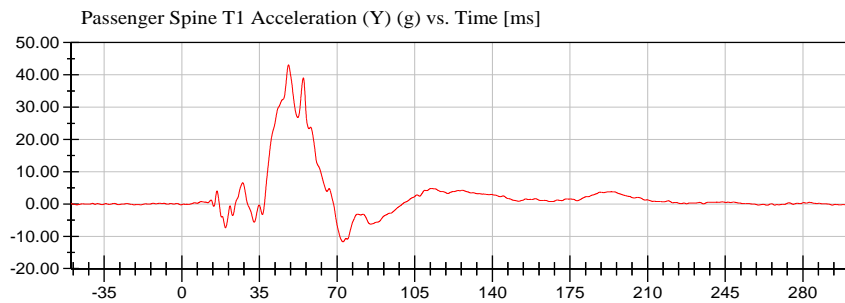
<Max>

10.90 g at 78.65 ms

<Min>

-14.95 g at 47.15 ms

CFC_180



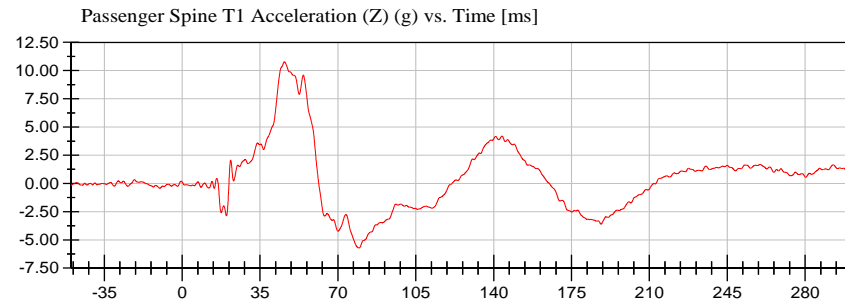
<Max>

43.06 g at 48.10 ms

<Min>

-11.71 g at 72.70 ms

CFC_180



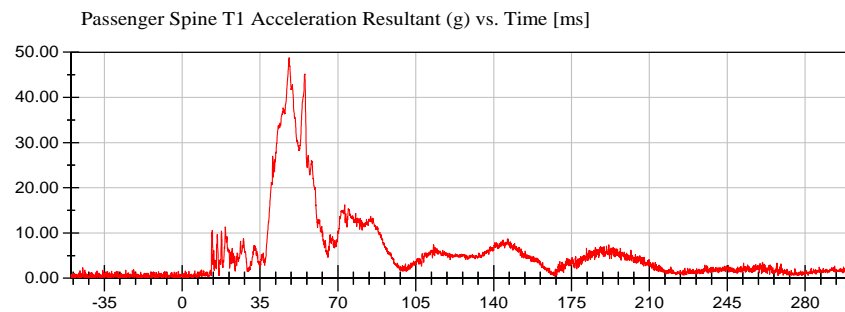
<Max>

10.78 g at 45.95 ms

<Min>

-5.71 g at 79.35 ms

CFC_180



<Max>

48.81 g at 48.05 ms

<Min>

0.08 g at -13.65 ms

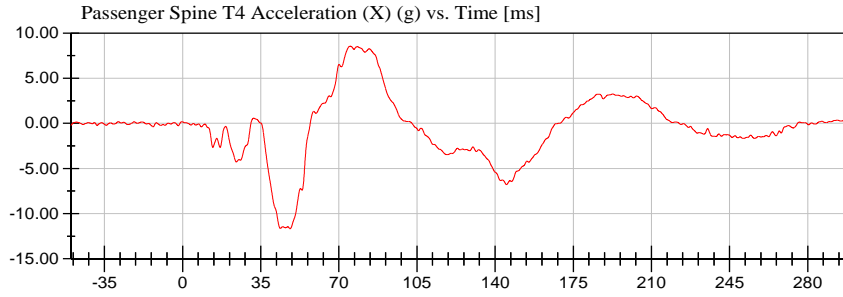
Prefiltered_> CFC 1000



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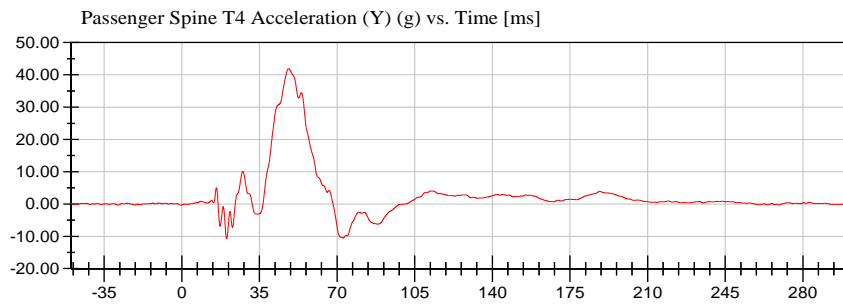
<Max>

8.54 g at 75.15 ms

<Min>

-11.68 g at 48.15 ms

CFC_180



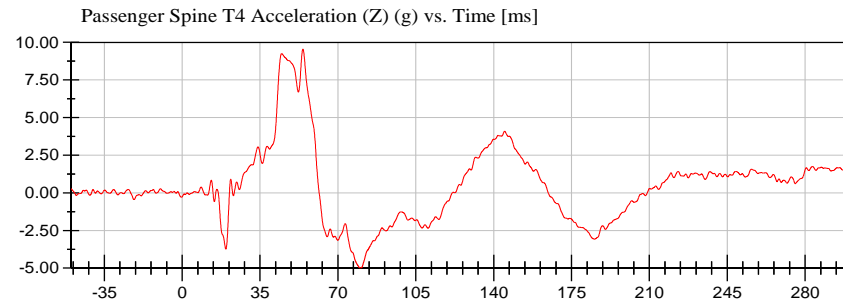
<Max>

41.93 g at 48.15 ms

<Min>

-10.70 g at 20.20 ms

CFC_180



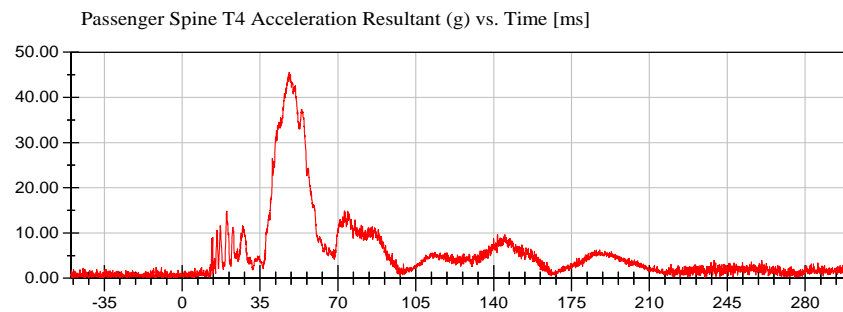
<Max>

9.55 g at 54.30 ms

<Min>

-4.98 g at 79.90 ms

CFC_180



<Max>

45.52 g at 48.10 ms

<Min>

0.14 g at -48.65 ms

Prefiltered_> CFC 1000

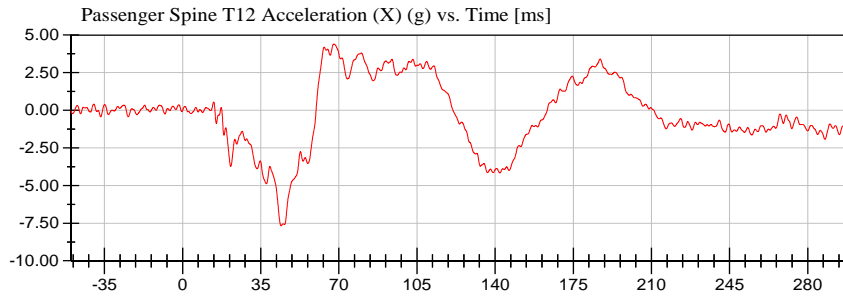


VRTC

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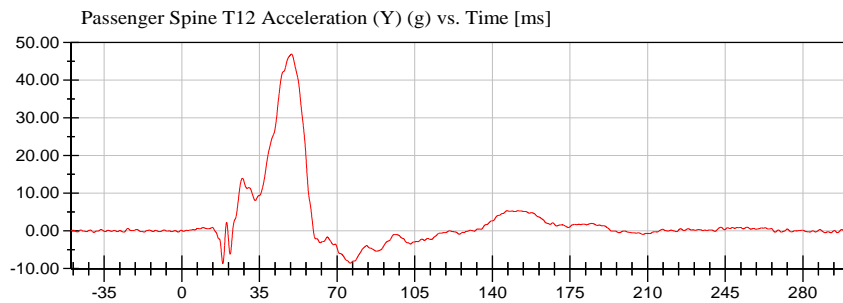
<Max>

4.40 g at 67.70 ms

<Min>

-7.68 g at 44.15 ms

CFC_180



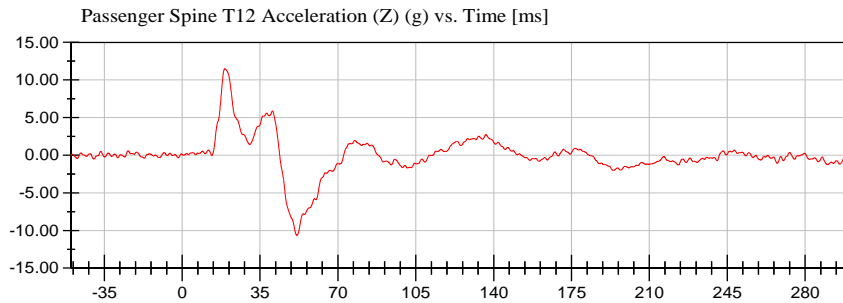
<Max>

46.95 g at 49.45 ms

<Min>

-8.71 g at 18.50 ms

CFC_180



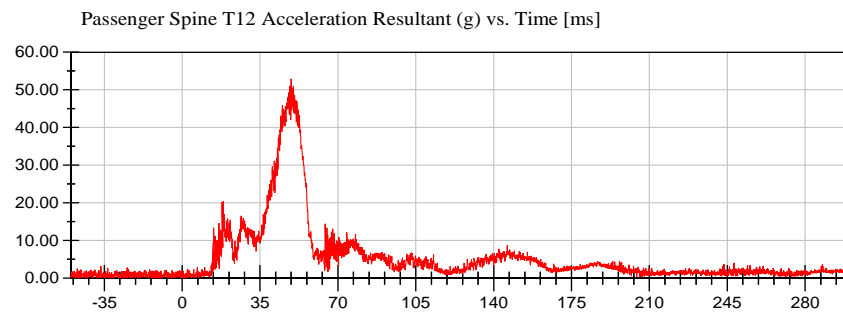
<Max>

11.51 g at 19.20 ms

<Min>

-10.64 g at 51.55 ms

CFC_180



<Max>

52.90 g at 49.00 ms

<Min>

0.06 g at -26.60 ms

Prefiltered_> CFC 1000

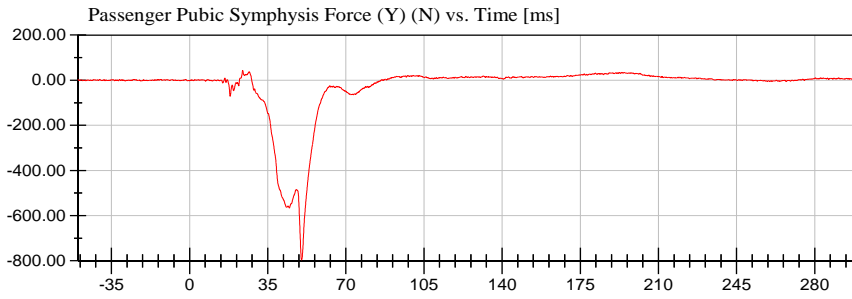


VRTC

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<Max>

42.77 N at 23.80 ms

<Min>

-796.16 N at 50.20 ms

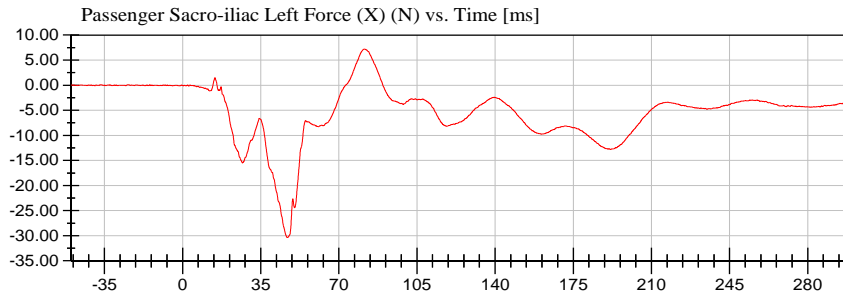
CFC_600



VRTC

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Test Date: 03/18/2021



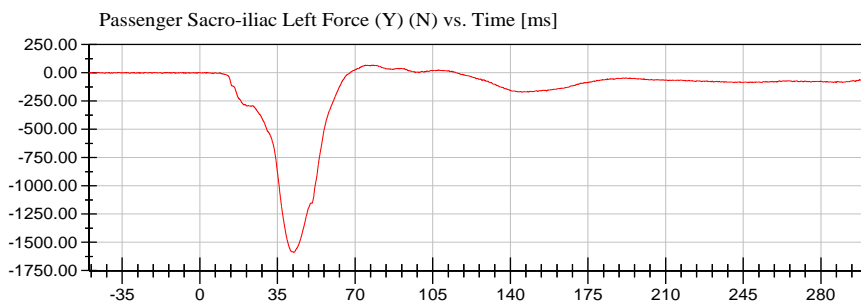
<Max>

7.20 N at 81.50 ms

<Min>

-30.36 N at 46.85 ms

CFC_600



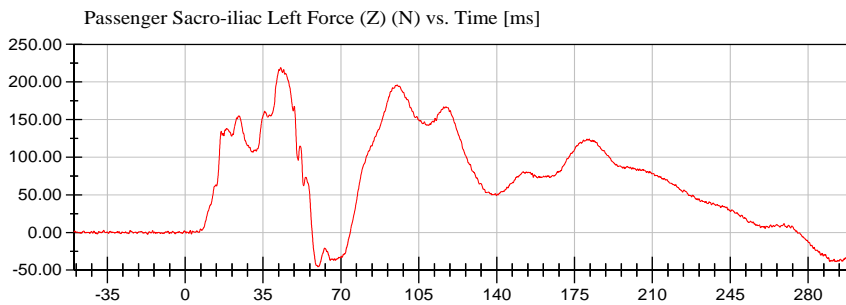
<Max>

68.40 N at 77.60 ms

<Min>

-1,589.33 N at 42.50 ms

CFC_600



<Max>

219.04 N at 42.95 ms

<Min>

-45.52 N at 59.70 ms

CFC_600

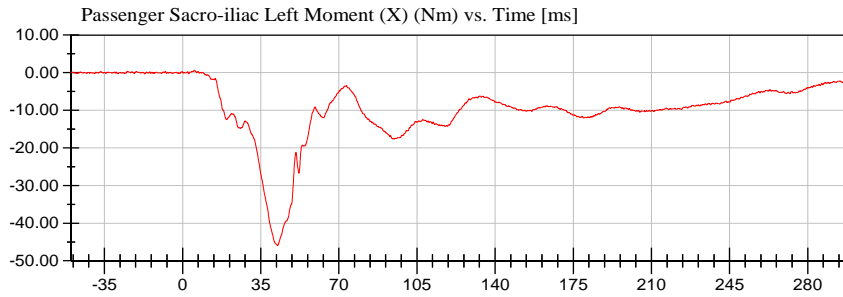


VRTC

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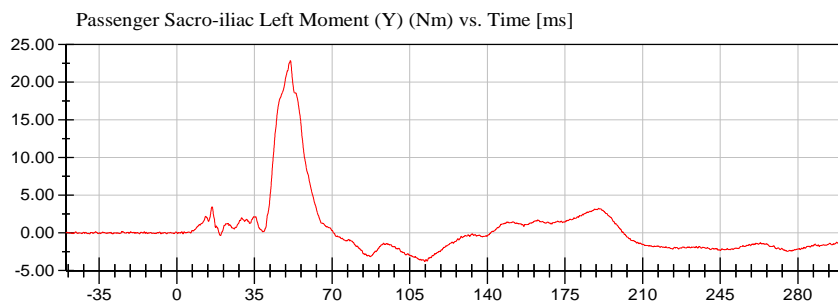
<Max>

0.64 Nm at 5.30 ms

<Min>

-46.00 Nm at 42.60 ms

CFC_600



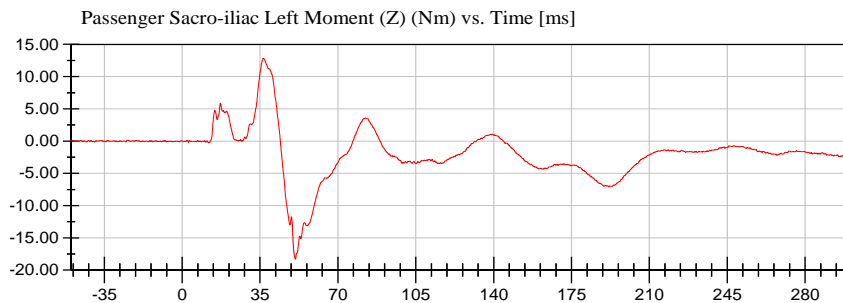
<Max>

22.87 Nm at 51.20 ms

<Min>

-3.81 Nm at 111.80 ms

CFC_600



<Max>

12.84 Nm at 36.40 ms

<Min>

-18.30 Nm at 50.90 ms

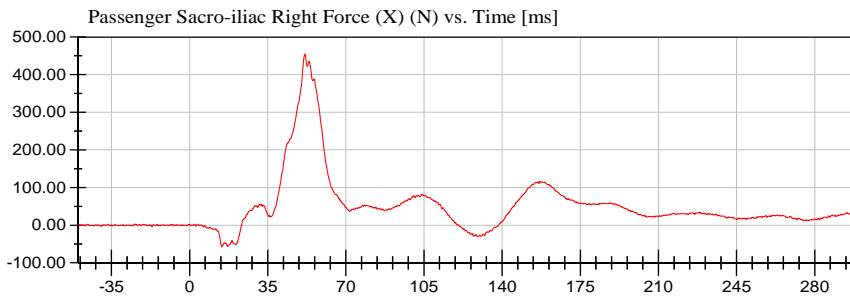
CFC_600



VRTC

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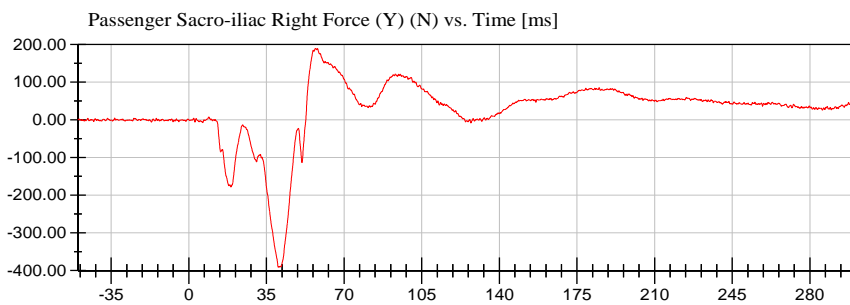
<Max>

454.27 N at 51.65 ms

<Min>

-58.15 N at 14.35 ms

CFC_600



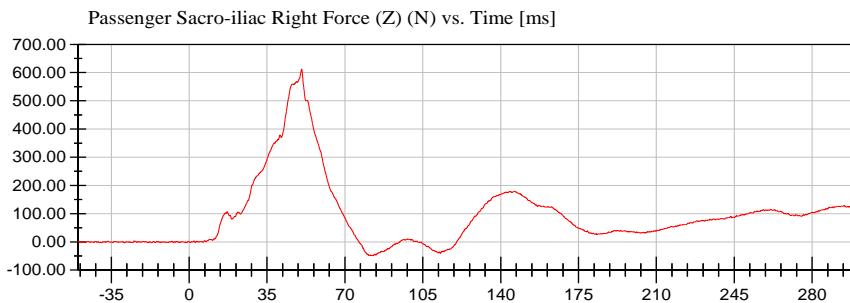
<Max>

189.73 N at 57.05 ms

<Min>

-391.05 N at 40.35 ms

CFC_600



<Max>

612.47 N at 50.55 ms

<Min>

-48.43 N at 81.90 ms

CFC_600

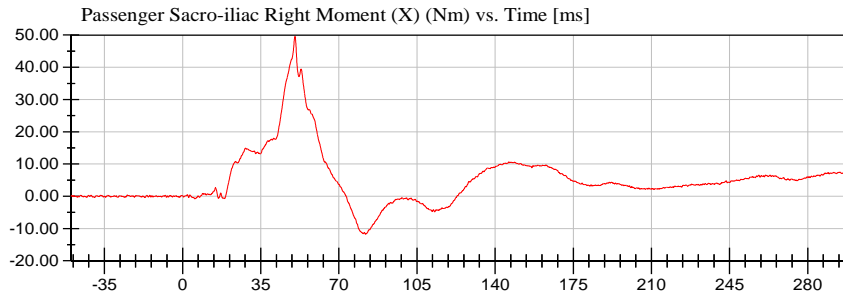


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



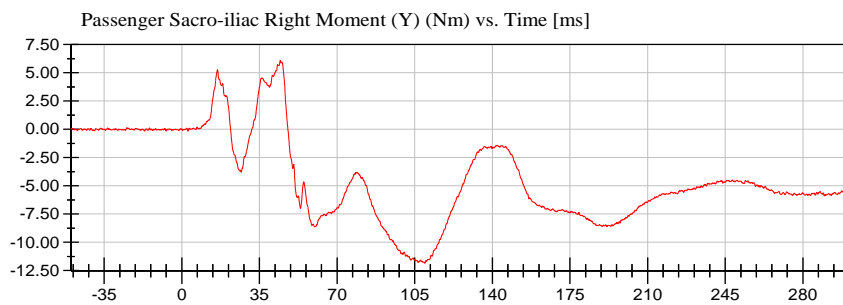
<Max>

49.59 Nm at 50.35 ms

<Min>

-11.75 Nm at 81.95 ms

CFC_600



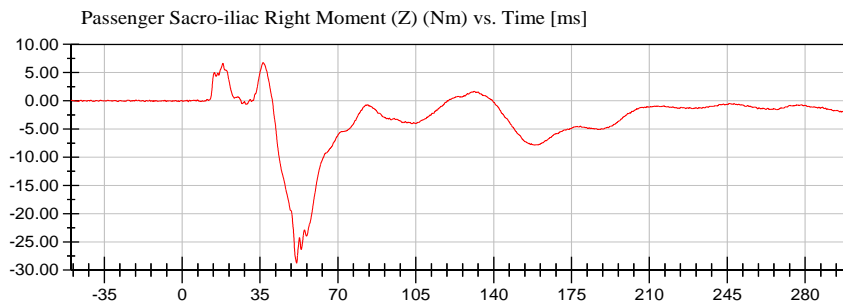
<Max>

6.10 Nm at 44.40 ms

<Min>

-11.85 Nm at 109.60 ms

CFC_600



<Max>

6.75 Nm at 36.35 ms

<Min>

-28.74 Nm at 51.45 ms

CFC_600

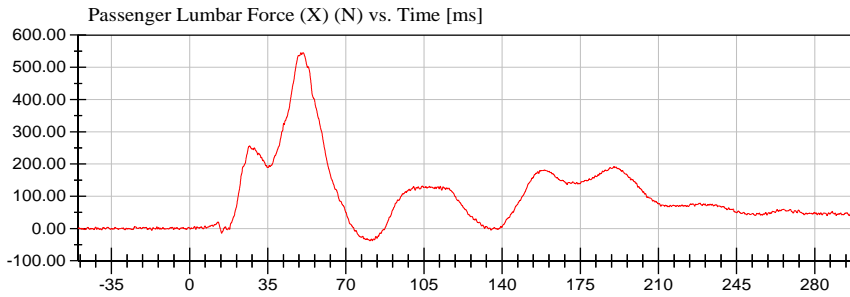


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



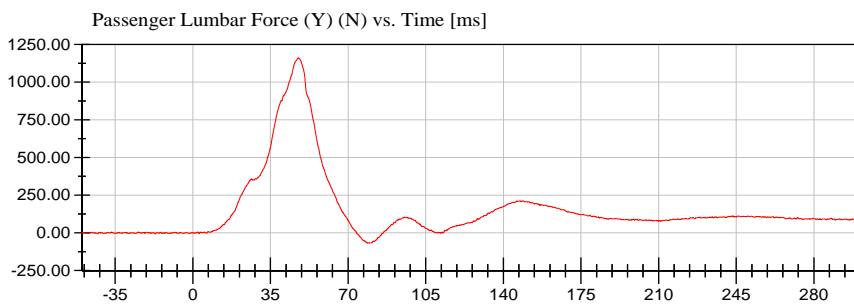
<Max>

545.24 N at 49.90 ms

<Min>

-37.99 N at 80.85 ms

CFC_600



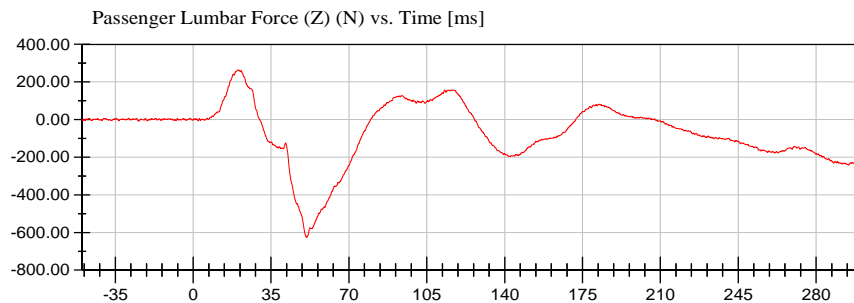
<Max>

1,160.98 N at 47.70 ms

<Min>

-67.73 N at 78.75 ms

CFC_600



<Max>

262.68 N at 19.90 ms

<Min>

-625.69 N at 51.05 ms

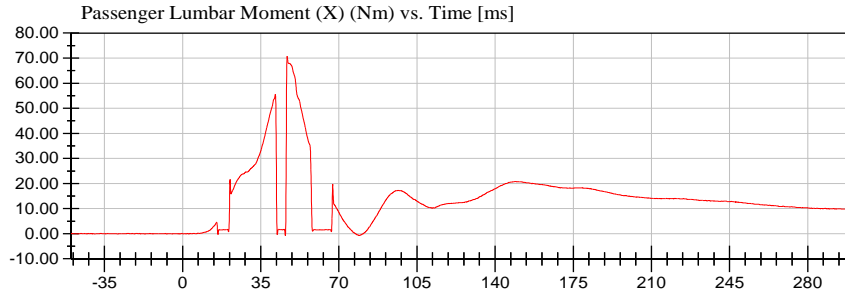
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



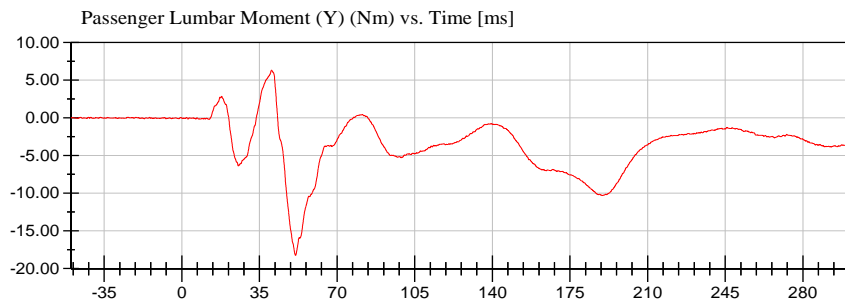
<Max>

70.85 Nm at 46.85 ms

<Min>

-0.70 Nm at 46.05 ms

CFC_600



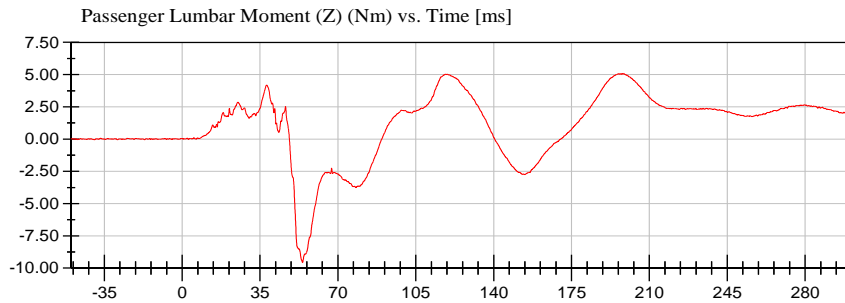
<Max>

6.34 Nm at 40.45 ms

<Min>

-18.23 Nm at 51.30 ms

CFC_600



<Max>

5.08 Nm at 198.00 ms

<Min>

-9.55 Nm at 54.10 ms

CFC_600

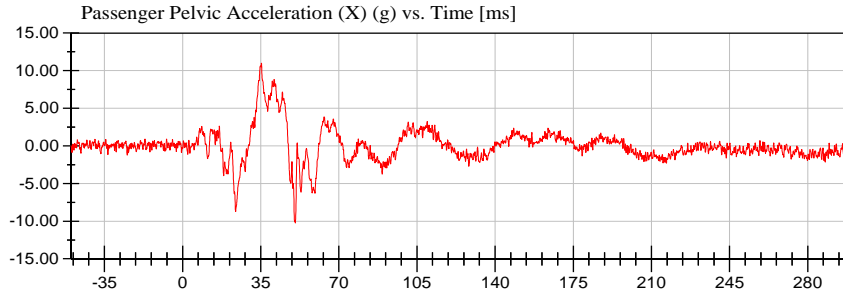


VRTC

Test Date: 03/18/2021

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Test Number: 210318 ()



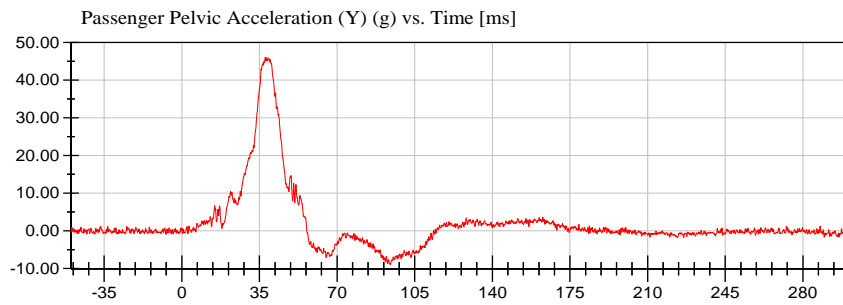
<Max>

10.98 g at 35.30 ms

<Min>

-10.23 g at 50.50 ms

CFC_1000



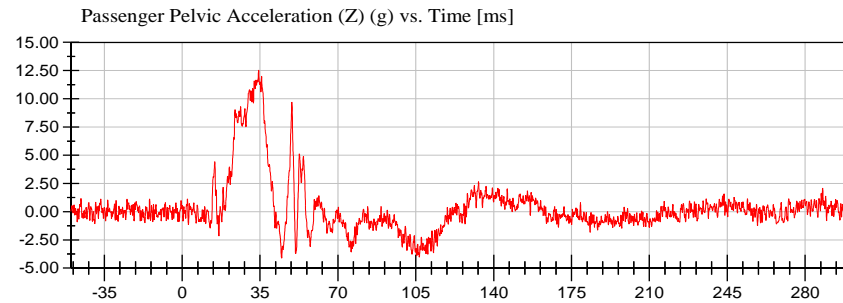
<Max>

46.05 g at 37.65 ms

<Min>

-8.94 g at 94.10 ms

CFC_1000



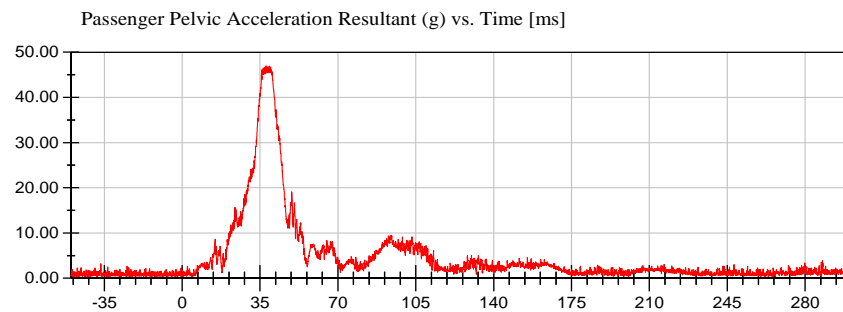
<Max>

12.54 g at 34.35 ms

<Min>

-4.11 g at 44.70 ms

CFC_1000



<Max>

47.00 g at 37.70 ms

<Min>

0.28 g at -28.25 ms

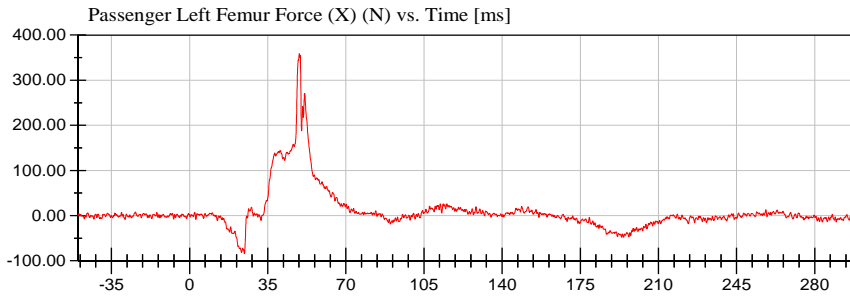
Prefiltered_> CFC 1000



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



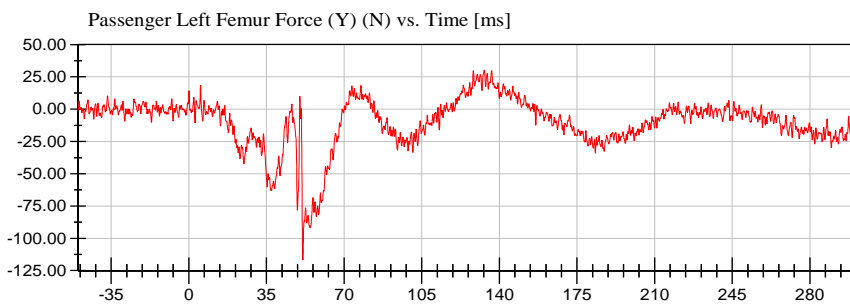
<Max>

358.30 N at 49.15 ms

<Min>

-83.80 N at 24.55 ms

CFC_600



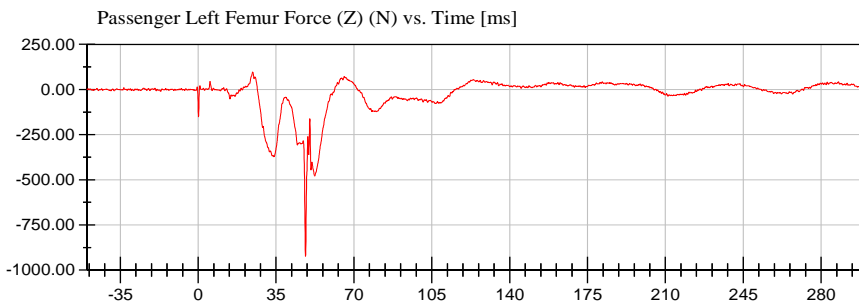
<Max>

30.23 N at 133.20 ms

<Min>

-116.56 N at 51.40 ms

CFC_600



<Max>

97.16 N at 24.50 ms

<Min>

-923.72 N at 48.25 ms

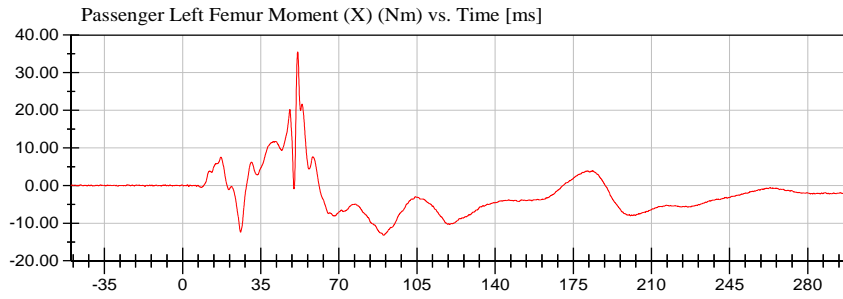
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

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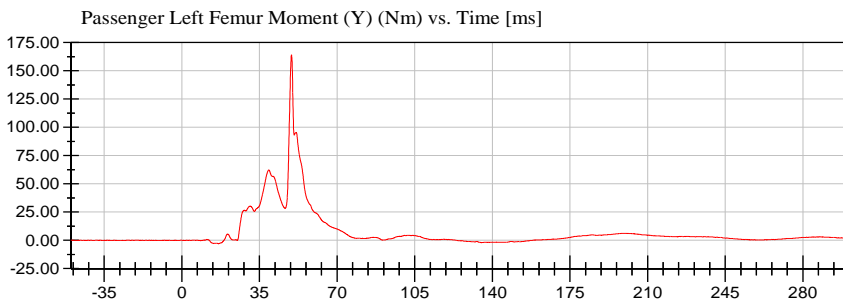
<Max>

35.53 Nm at 51.55 ms

<Min>

-13.21 Nm at 90.00 ms

CFC_600



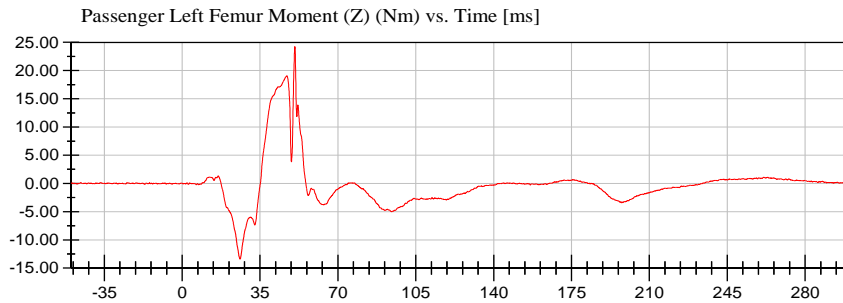
<Max>

164.01 Nm at 49.40 ms

<Min>

-2.97 Nm at 16.55 ms

CFC_600



<Max>

24.20 Nm at 50.65 ms

<Min>

-13.39 Nm at 26.00 ms

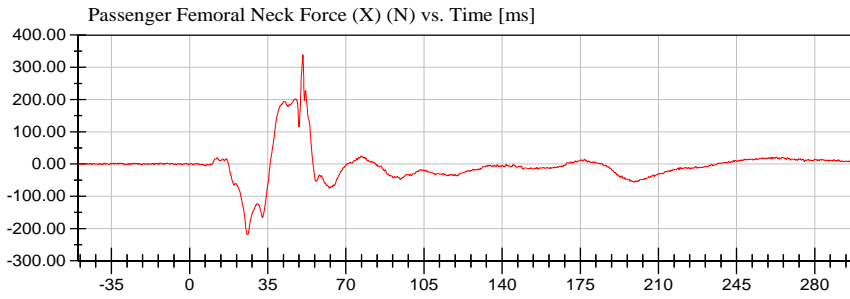
CFC_600



VRTC

Test Lab: CTF
Test Number: 210318 ()

Test Date: 03/18/2021



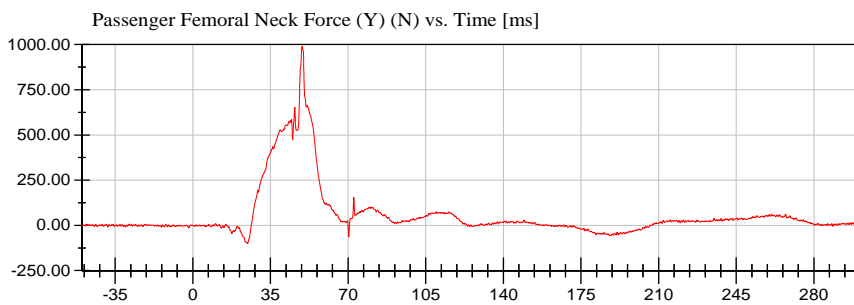
<Max>

338.77 N at 50.75 ms

<Min>

-219.17 N at 25.95 ms

CFC_600



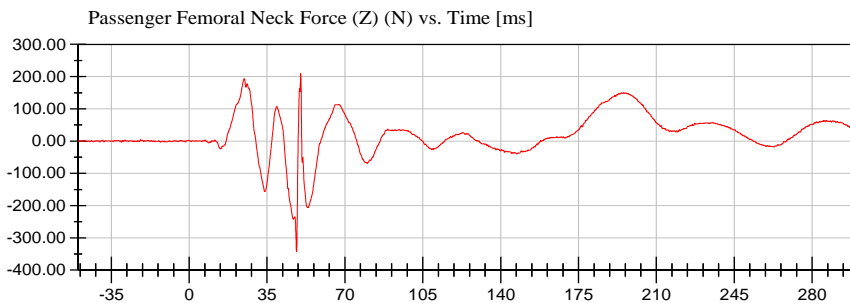
<Max>

990.91 N at 49.30 ms

<Min>

-99.43 N at 24.70 ms

CFC_600



<Max>

209.86 N at 50.15 ms

<Min>

-342.78 N at 48.25 ms

CFC_600

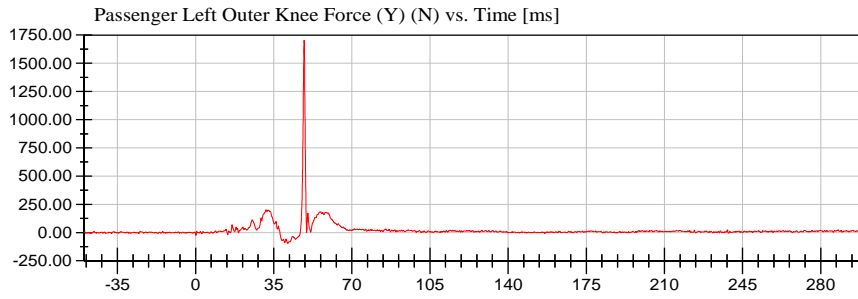


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



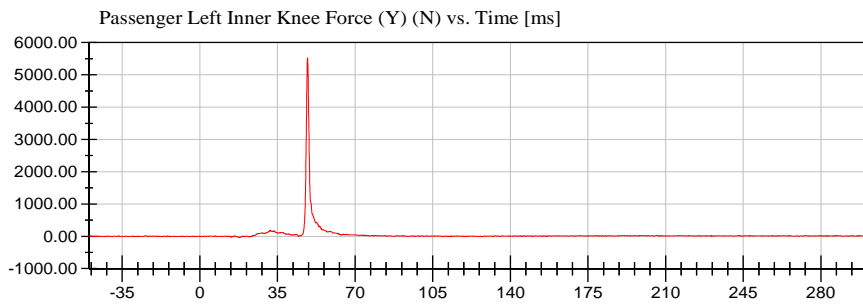
<Max>

1,701.43 N at 48.60 ms

<Min>

-96.42 N at 41.25 ms

CFC_600



<Max>

5,526.49 N at 48.60 ms

<Min>

-33.55 N at 17.75 ms

CFC_600

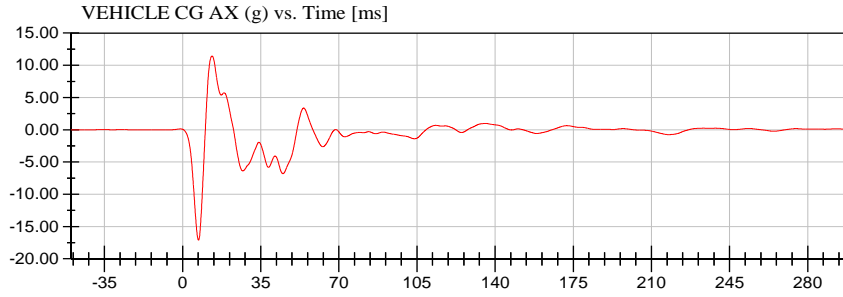


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



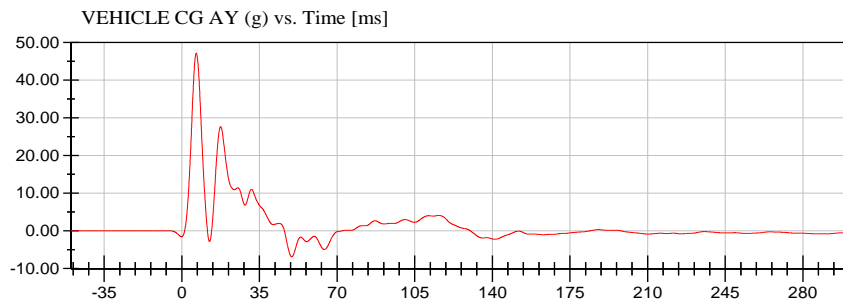
<Max>

11.44 g at 13.20 ms

<Min>

-17.11 g at 7.15 ms

CFC_60



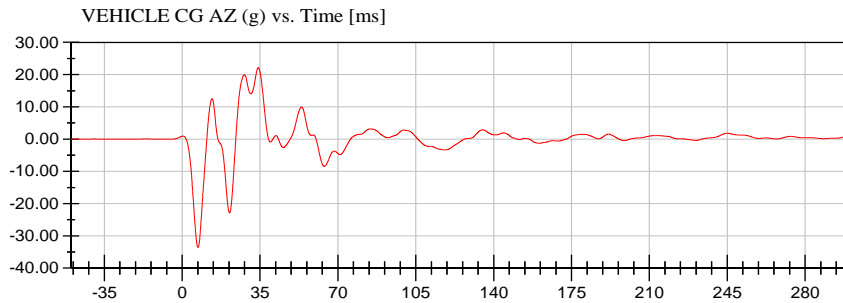
<Max>

47.21 g at 6.50 ms

<Min>

-6.89 g at 49.55 ms

CFC_60



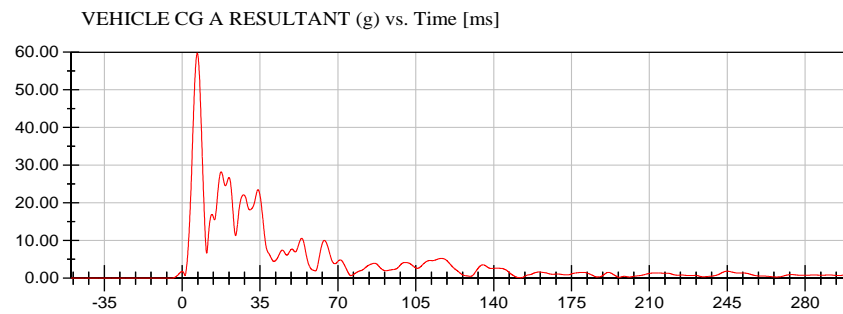
<Max>

22.15 g at 34.15 ms

<Min>

-33.59 g at 7.10 ms

CFC_60



<Max>

59.74 g at 6.80 ms

<Min>

0.01 g at -30.50 ms

CFC_60

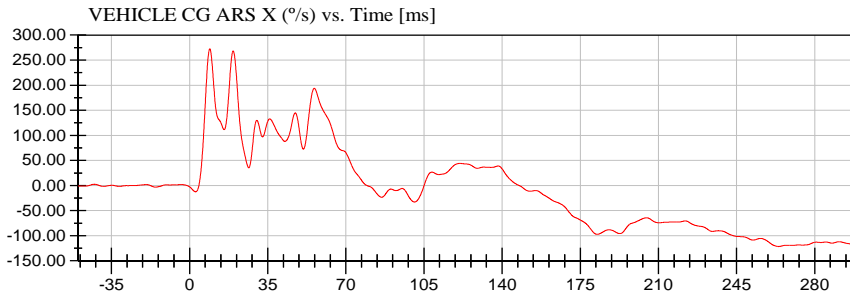


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



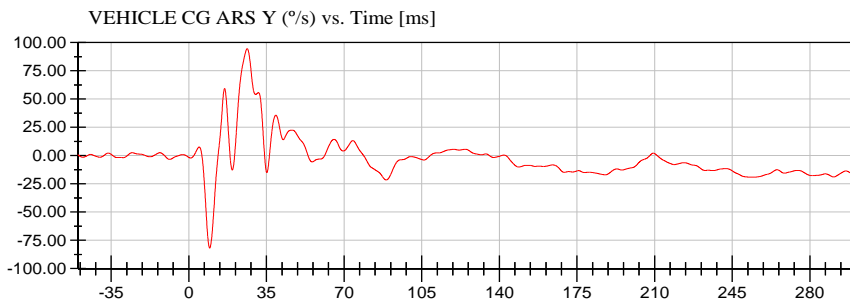
<Max>

272.51 °/s at 9.10 ms

<Min>

-121.60 °/s at 263.80 ms

CFC_60



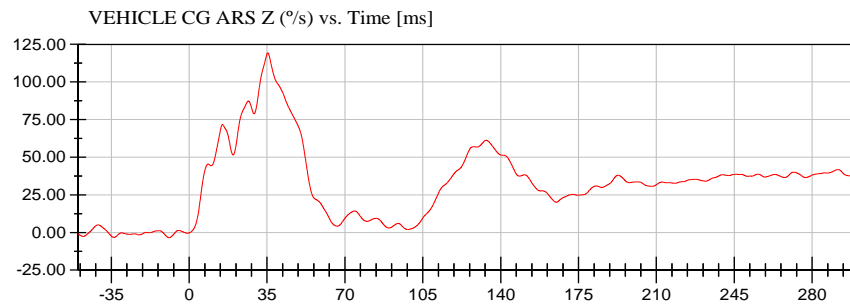
<Max>

94.48 °/s at 26.35 ms

<Min>

-81.77 °/s at 9.45 ms

CFC_60



<Max>

119.32 °/s at 35.35 ms

<Min>

-3.41 °/s at -9.05 ms

CFC_60

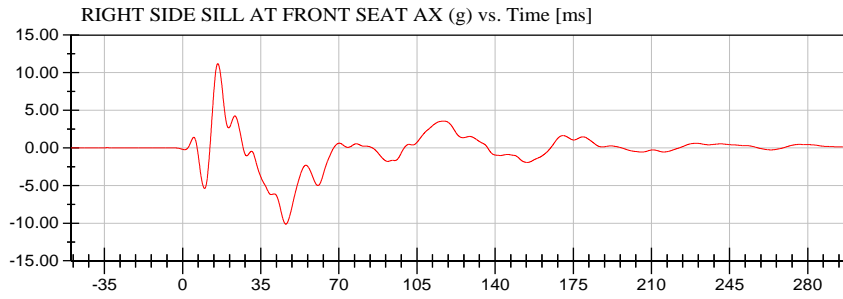


VRTC

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Test Lab: CTF

Test Number: 210318 ()



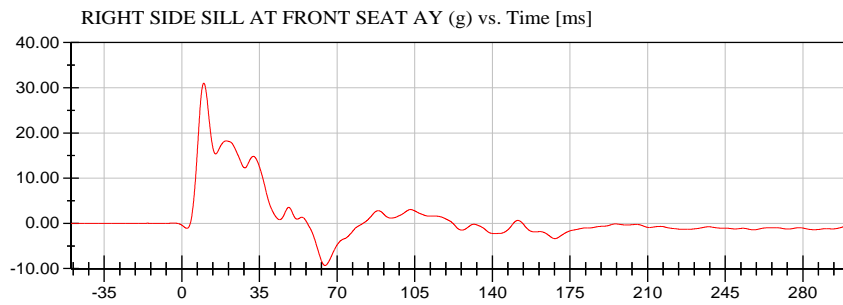
<Max>

11.19 g at 15.80 ms

<Min>

-10.13 g at 46.25 ms

CFC_60



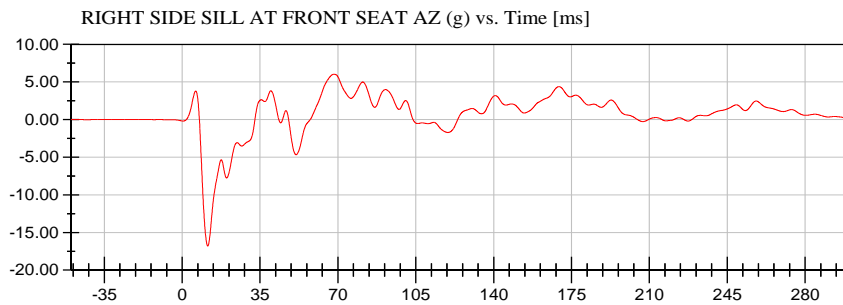
<Max>

31.02 g at 9.90 ms

<Min>

-9.30 g at 64.60 ms

CFC_60



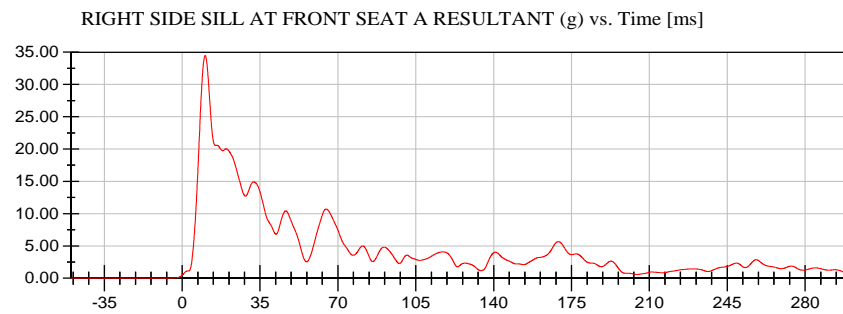
<Max>

6.03 g at 68.30 ms

<Min>

-16.81 g at 11.50 ms

CFC_60



<Max>

34.45 g at 10.30 ms

<Min>

0.00 g at -46.70 ms

CFC_60

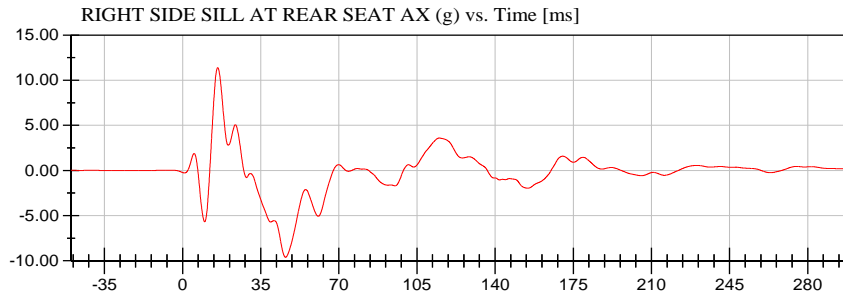


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



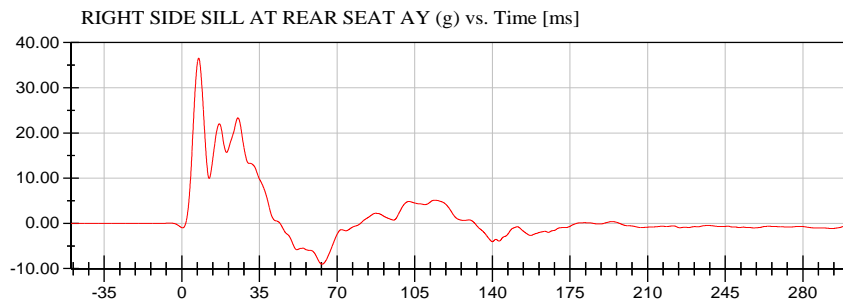
<Max>

11.39 g at 15.75 ms

<Min>

-9.62 g at 46.15 ms

CFC_60



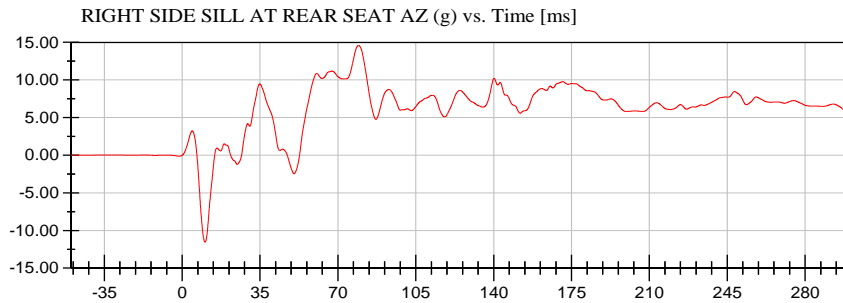
<Max>

36.55 g at 7.60 ms

<Min>

-9.01 g at 63.25 ms

CFC_60



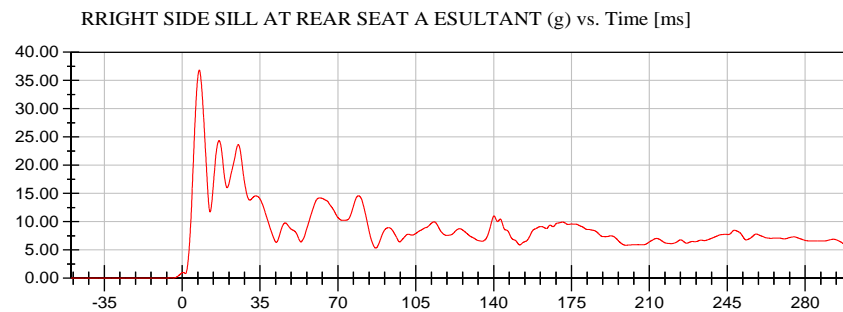
<Max>

14.58 g at 79.25 ms

<Min>

-11.54 g at 10.25 ms

CFC_60



<Max>

36.83 g at 7.70 ms

<Min>

0.01 g at -22.90 ms

CFC_60

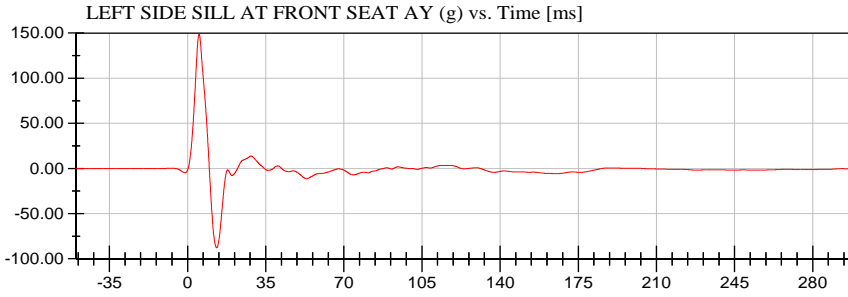


VRTC

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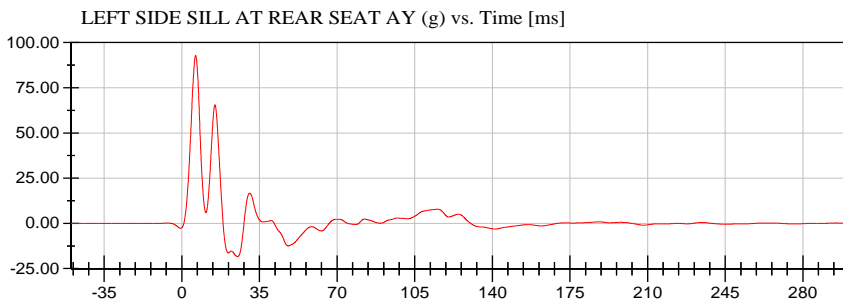
<Max>

148.77 g at 5.20 ms

<Min>

-87.78 g at 13.05 ms

CFC_60



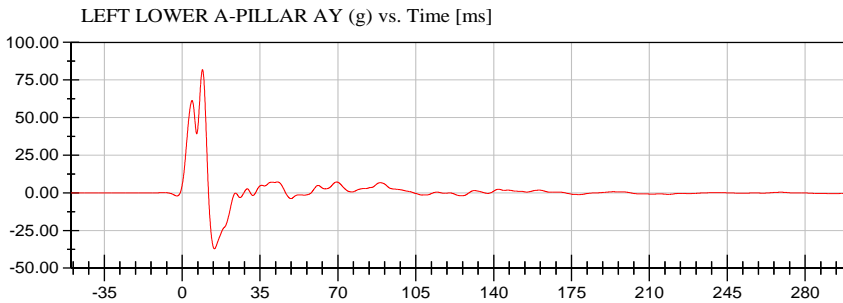
<Max>

92.88 g at 6.25 ms

<Min>

-18.33 g at 25.10 ms

CFC_60



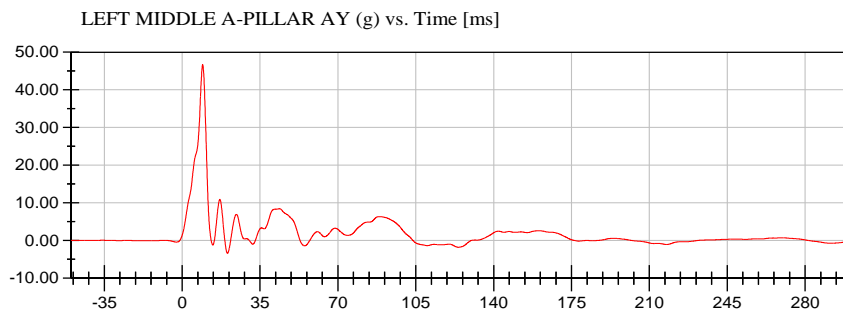
<Max>

81.90 g at 9.15 ms

<Min>

-37.15 g at 14.50 ms

CFC_60



<Max>

46.70 g at 9.25 ms

<Min>

-3.39 g at 20.35 ms

CFC_60

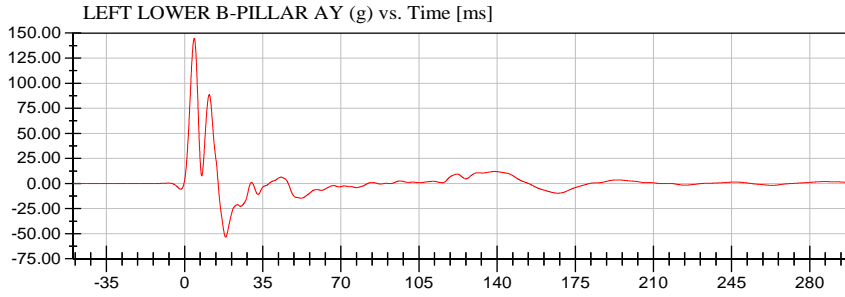


VRTC

Test Date: 03/18/2021

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Test Number: 210318 ()



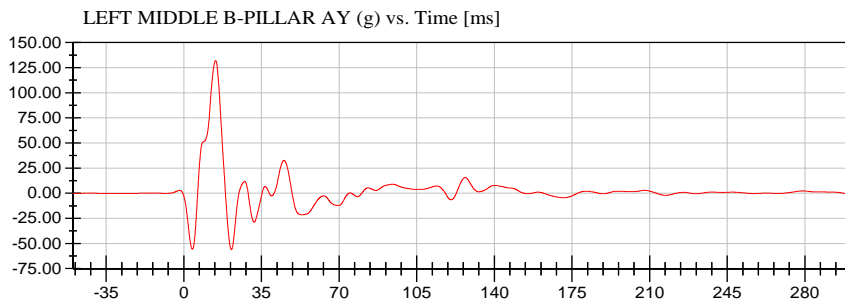
<Max>

144.81 g at 4.35 ms

<Min>

-53.38 g at 18.40 ms

CFC_60



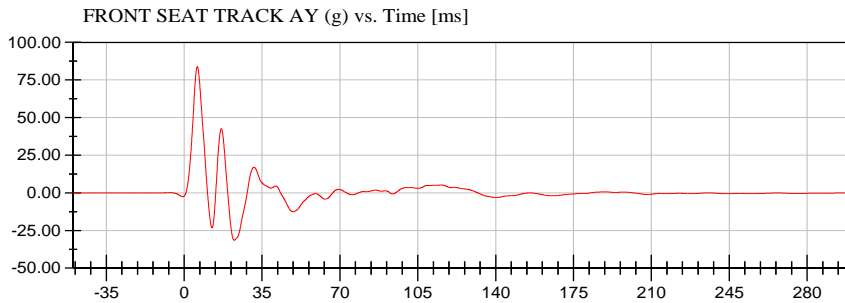
<Max>

132.23 g at 14.30 ms

<Min>

-56.02 g at 21.45 ms

CFC_60



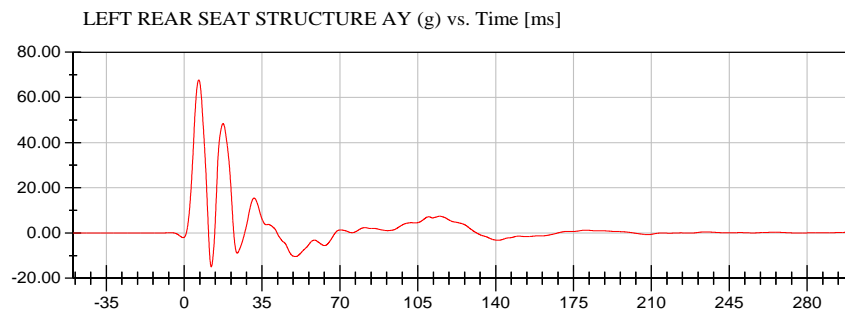
<Max>

83.85 g at 5.90 ms

<Min>

-31.46 g at 22.50 ms

CFC_60



<Max>

67.74 g at 6.55 ms

<Min>

-14.93 g at 12.20 ms

CFC_60

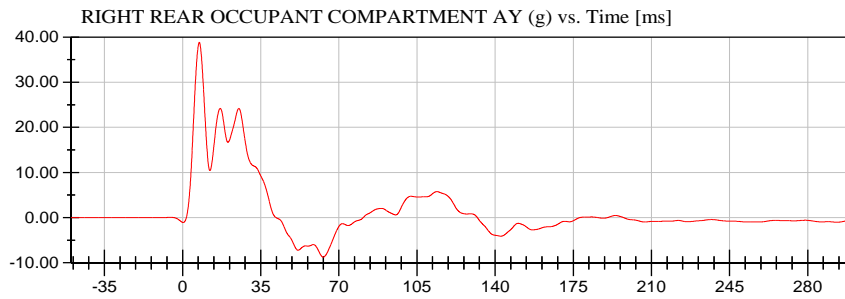


VRTC

Test Date: 03/18/2021

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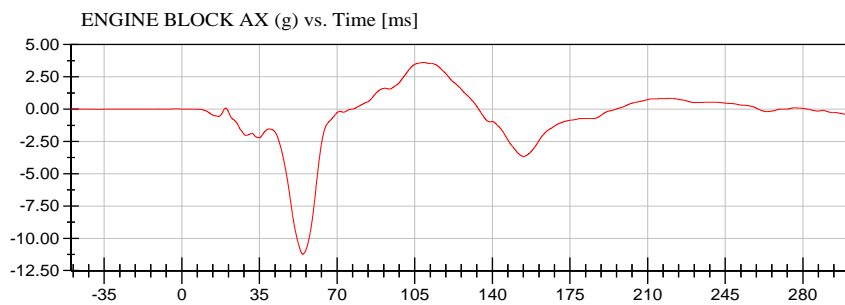
<Max>

38.82 g at 7.50 ms

<Min>

-8.75 g at 63.00 ms

CFC_60



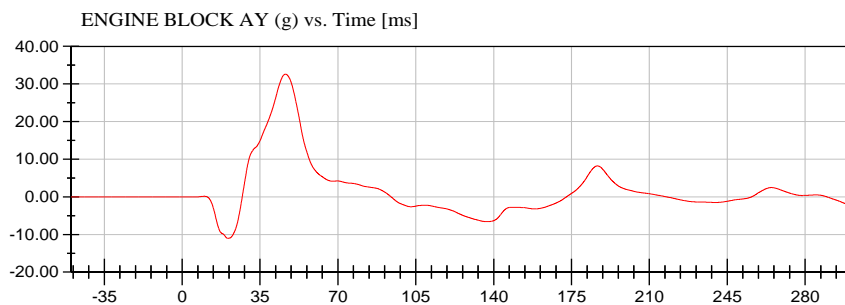
<Max>

3.62 g at 108.90 ms

<Min>

-11.23 g at 54.60 ms

CFC_60



<Max>

32.62 g at 46.45 ms

<Min>

-11.02 g at 20.55 ms

CFC_60

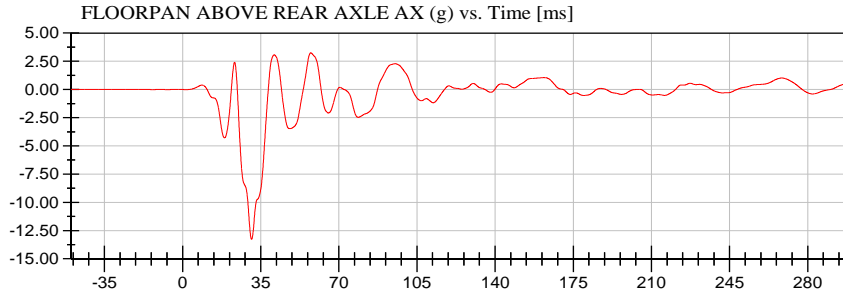


VRTC

Test Date: 03/18/2021

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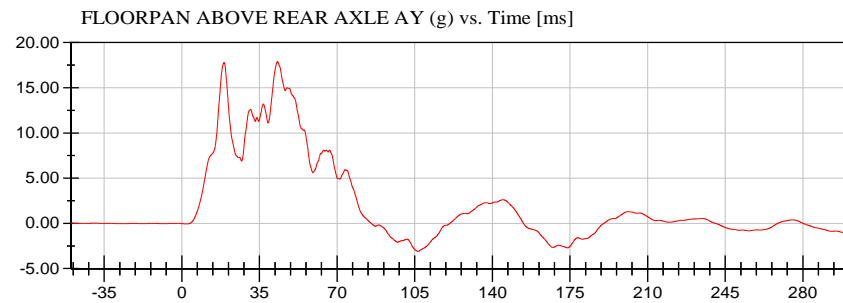
<Max>

3.24 g at 57.45 ms

<Min>

-13.28 g at 30.90 ms

CFC_60



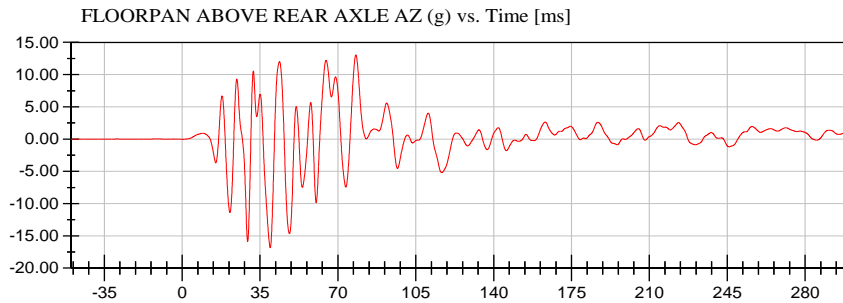
<Max>

17.90 g at 43.15 ms

<Min>

-3.10 g at 106.60 ms

CFC_60



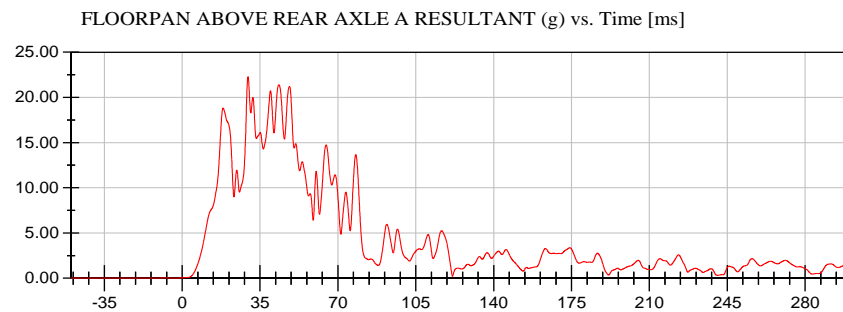
<Max>

13.05 g at 78.10 ms

<Min>

-16.84 g at 39.60 ms

CFC_60



<Max>

22.29 g at 29.60 ms

<Min>

0.01 g at -42.50 ms

CFC_60

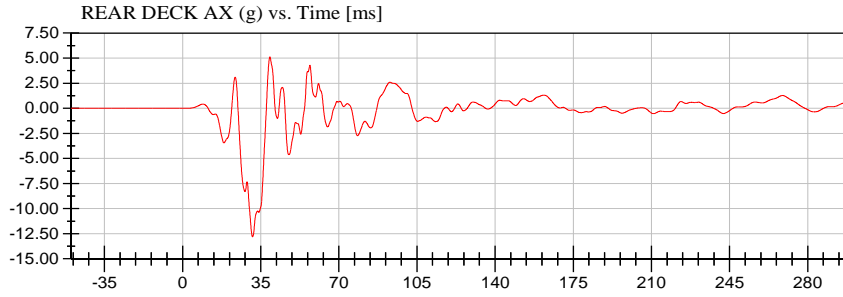


VRTC

Test Date: 03/18/2021

Test Lab: CTF

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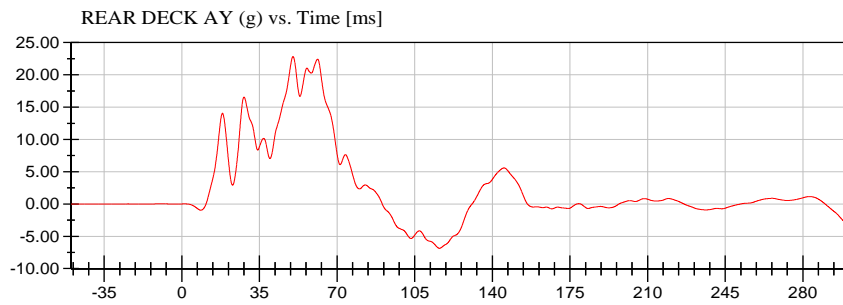
<Max>

5.12 g at 39.10 ms

<Min>

-12.81 g at 31.35 ms

CFC_60



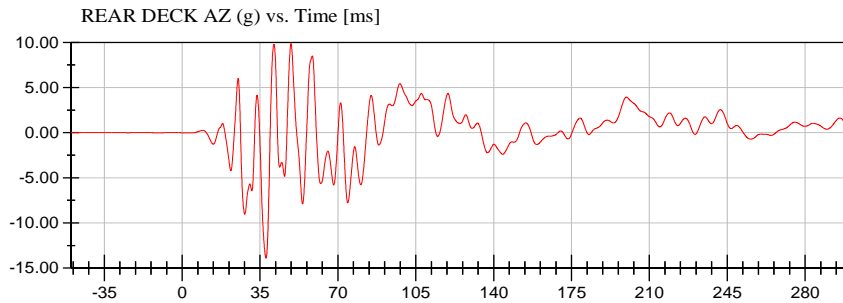
<Max>

22.84 g at 50.10 ms

<Min>

-6.86 g at 116.15 ms

CFC_60



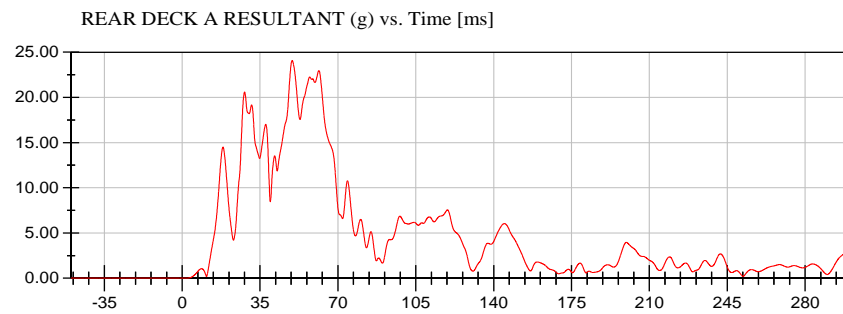
<Max>

9.88 g at 48.90 ms

<Min>

-13.89 g at 37.65 ms

CFC_60



<Max>

24.08 g at 49.45 ms

<Min>

0.00 g at -49.15 ms

CFC_60

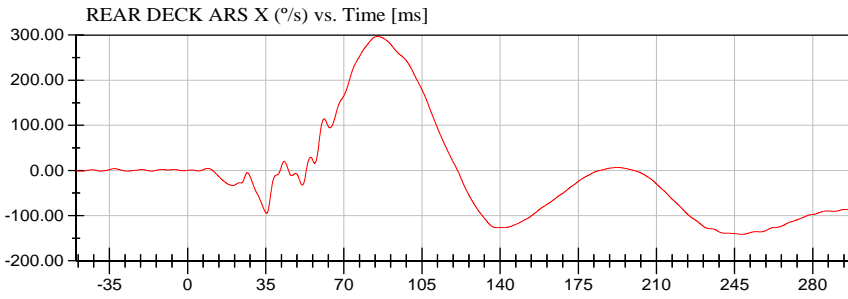


VRTC

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Test Lab: CTF

Test Number: 210318 ()



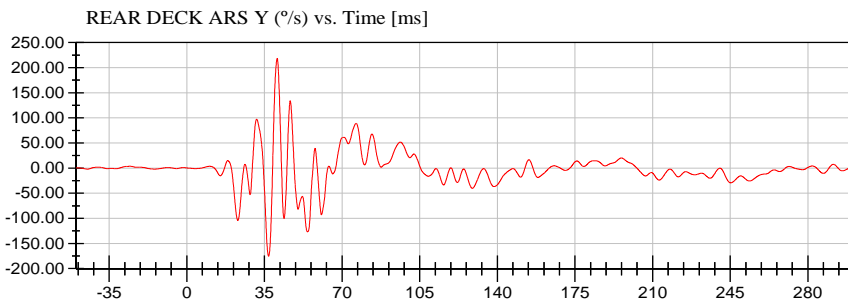
<Max>

296.86 °/s at 85.10 ms

<Min>

-141.45 °/s at 248.35 ms

CFC_60



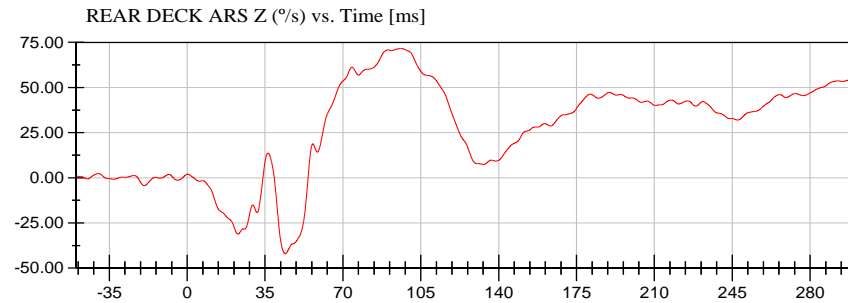
<Max>

218.26 °/s at 40.75 ms

<Min>

-175.24 °/s at 36.90 ms

CFC_60



<Max>

71.61 °/s at 96.15 ms

<Min>

-41.98 °/s at 44.10 ms

CFC_60



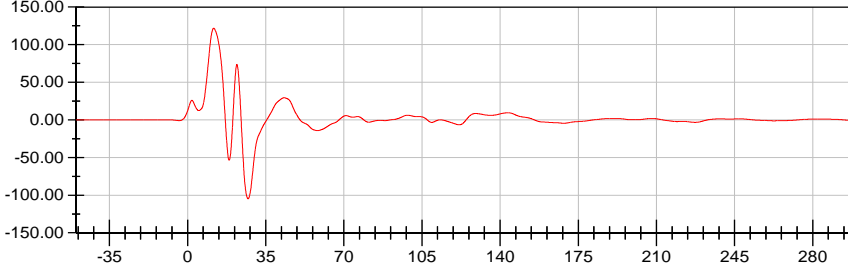
VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()

Left Front Door Mid Centerline (Y) (g) vs. Time [ms]



<Max>

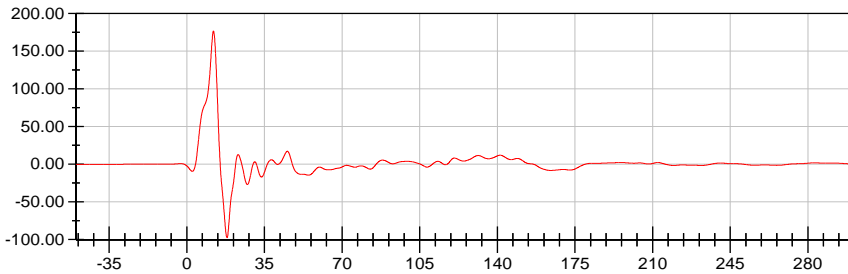
121.85 g at 11.75 ms

<Min>

-104.81 g at 27.10 ms

CFC_60

Left Front Door Mid Rear (Y) (g) vs. Time [ms]



<Max>

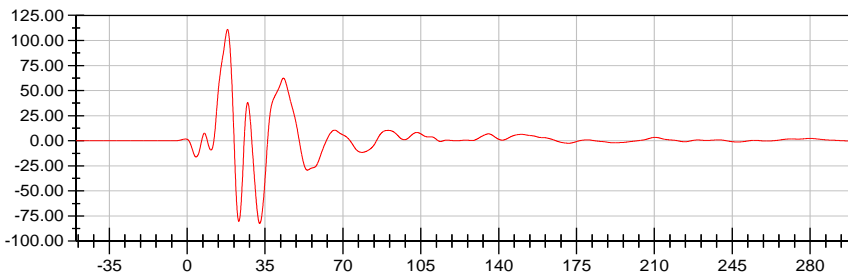
176.90 g at 12.00 ms

<Min>

-97.58 g at 18.10 ms

CFC_60

Left Front Door Upper Centerline (Y) (g) vs. Time [ms]



<Max>

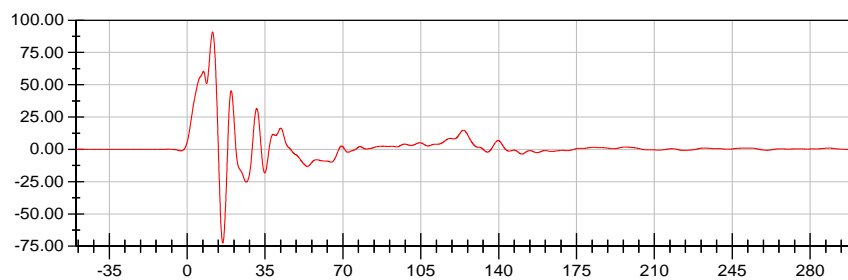
110.98 g at 18.15 ms

<Min>

-82.47 g at 32.60 ms

CFC_60

Left Rear Door Mid Rear (Y) (g) vs. Time [ms]



<Max>

90.90 g at 11.45 ms

<Min>

-72.53 g at 16.00 ms

CFC_60

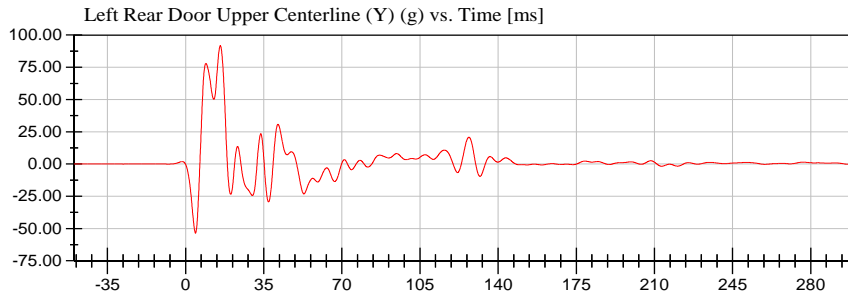


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



<Max>

91.72 g at 15.60 ms

<Min>

-53.51 g at 4.45 ms

CFC_60

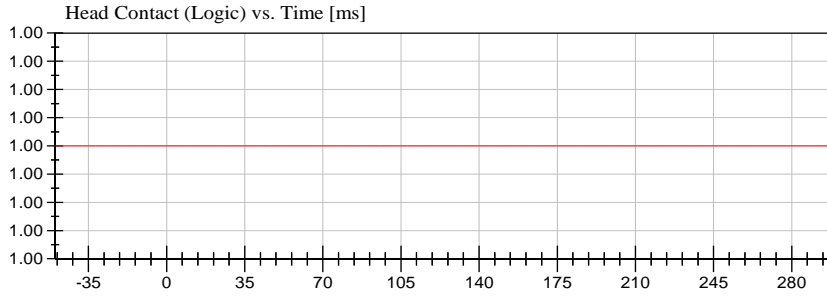


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



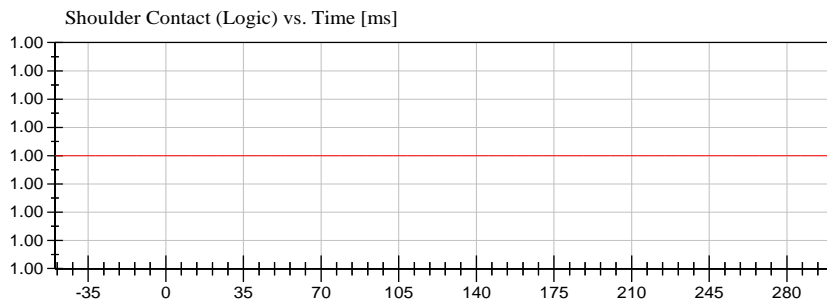
<Max>

1.00 Logic at -50.00 ms

<Min>

1.00 Logic at -50.00 ms

Unfiltered



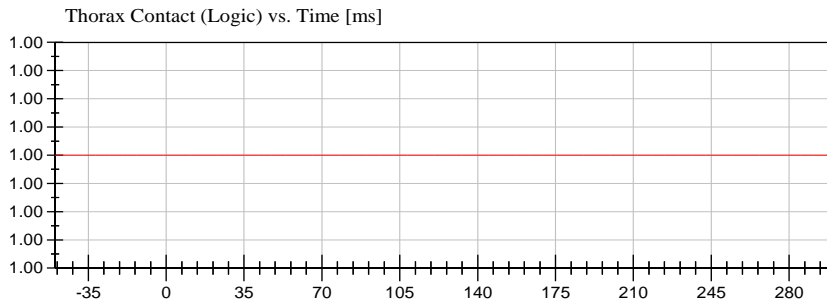
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1.00 Logic at -50.00 ms

<Min>

1.00 Logic at -50.00 ms

Unfiltered



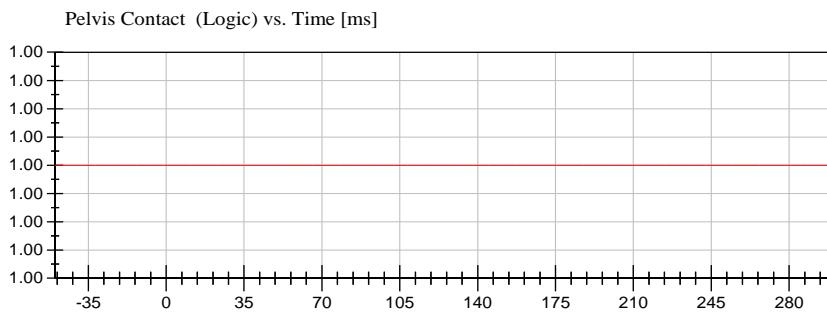
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1.00 Logic at -50.00 ms

<Min>

1.00 Logic at -50.00 ms

Unfiltered



<Max>

1.00 Logic at -50.00 ms

<Min>

1.00 Logic at -50.00 ms

Unfiltered

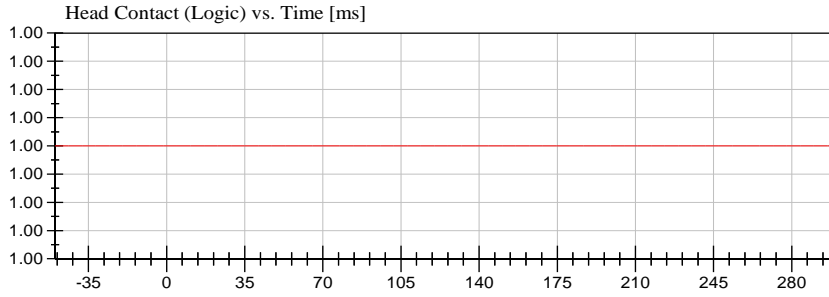


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



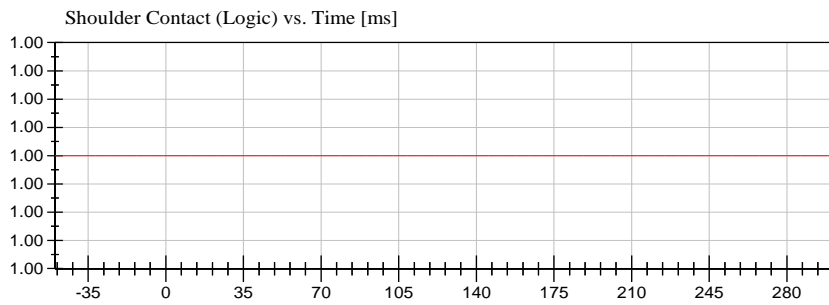
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1.00 Logic at -50.00 ms

Unfiltered



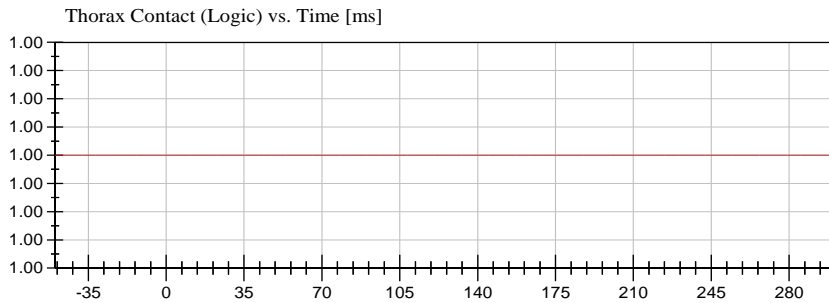
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1.00 Logic at -50.00 ms

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1.00 Logic at -50.00 ms

Unfiltered



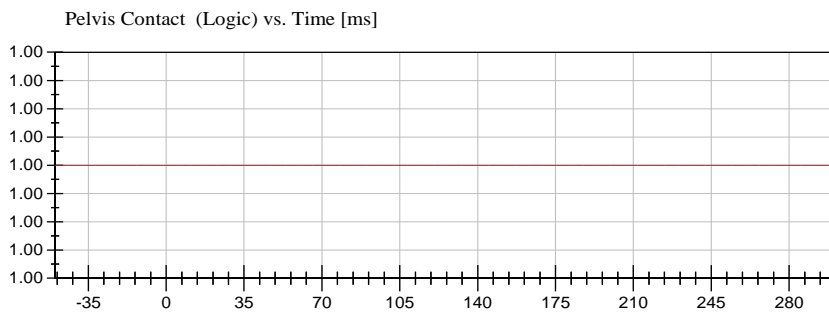
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1.00 Logic at -50.00 ms

Unfiltered



<Max>

1.00 Logic at -50.00 ms

<Min>

1.00 Logic at -50.00 ms

Unfiltered

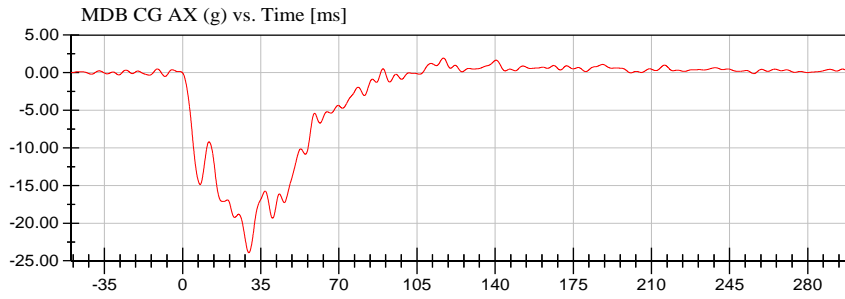


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



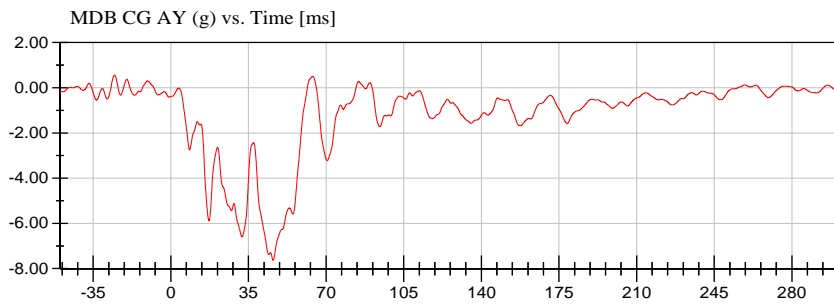
<Max>

1.94 g at 116.85 ms

<Min>

-23.92 g at 29.70 ms

CFC_60



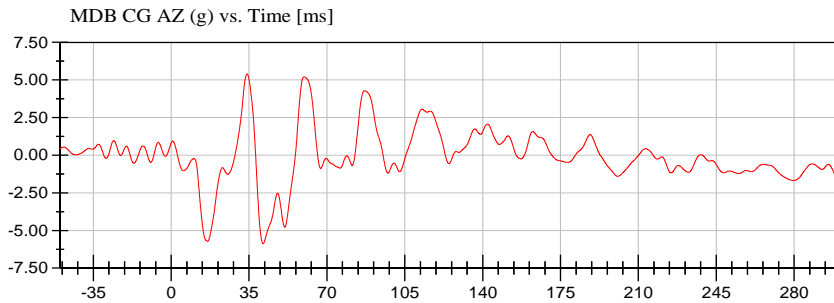
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0.56 g at -25.40 ms

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-7.63 g at 46.15 ms

CFC_60



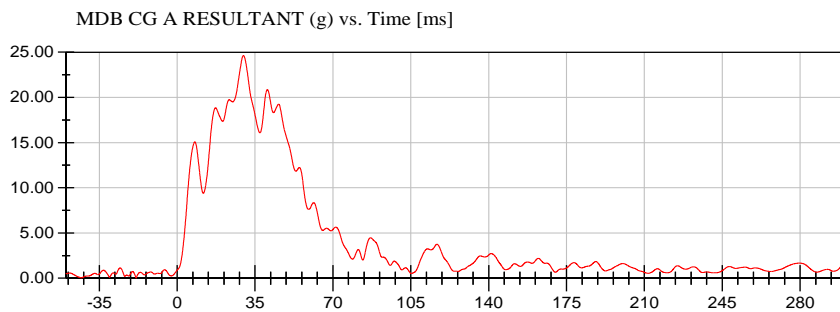
<Max>

5.40 g at 34.10 ms

<Min>

-5.88 g at 41.30 ms

CFC_60



<Max>

24.63 g at 29.80 ms

<Min>

0.02 g at -18.45 ms

CFC_60

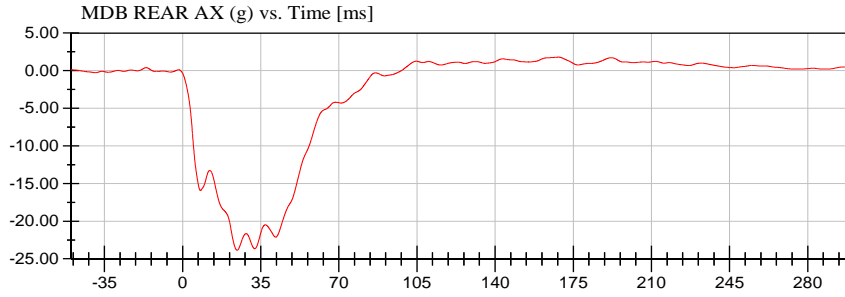


VRTC

Test Date: 03/18/2021

Test Lab: CTF

Test Number: 210318 ()



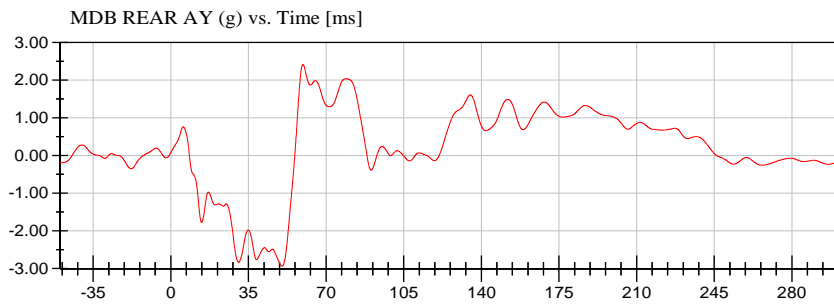
<Max>

1.79 g at 168.35 ms

<Min>

-23.87 g at 24.45 ms

CFC_60



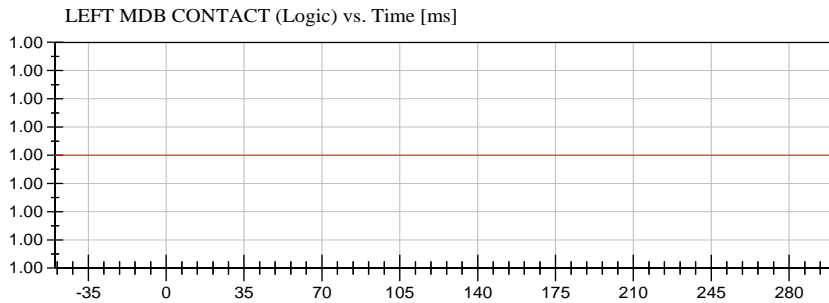
<Max>

2.41 g at 59.55 ms

<Min>

-2.94 g at 50.15 ms

CFC_60



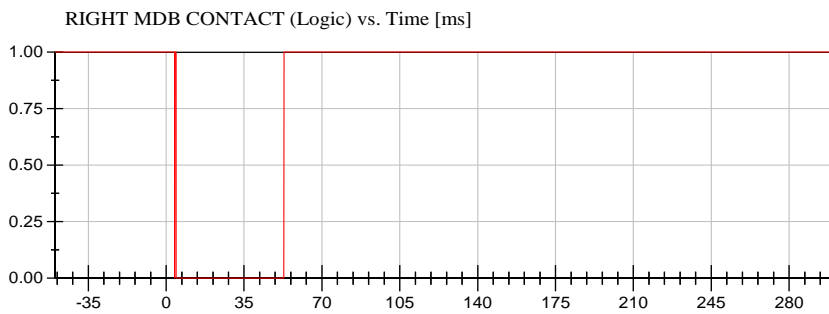
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1.00 Logic at -50.00 ms

<Min>

1.00 Logic at -50.00 ms

Unfiltered



<Max>

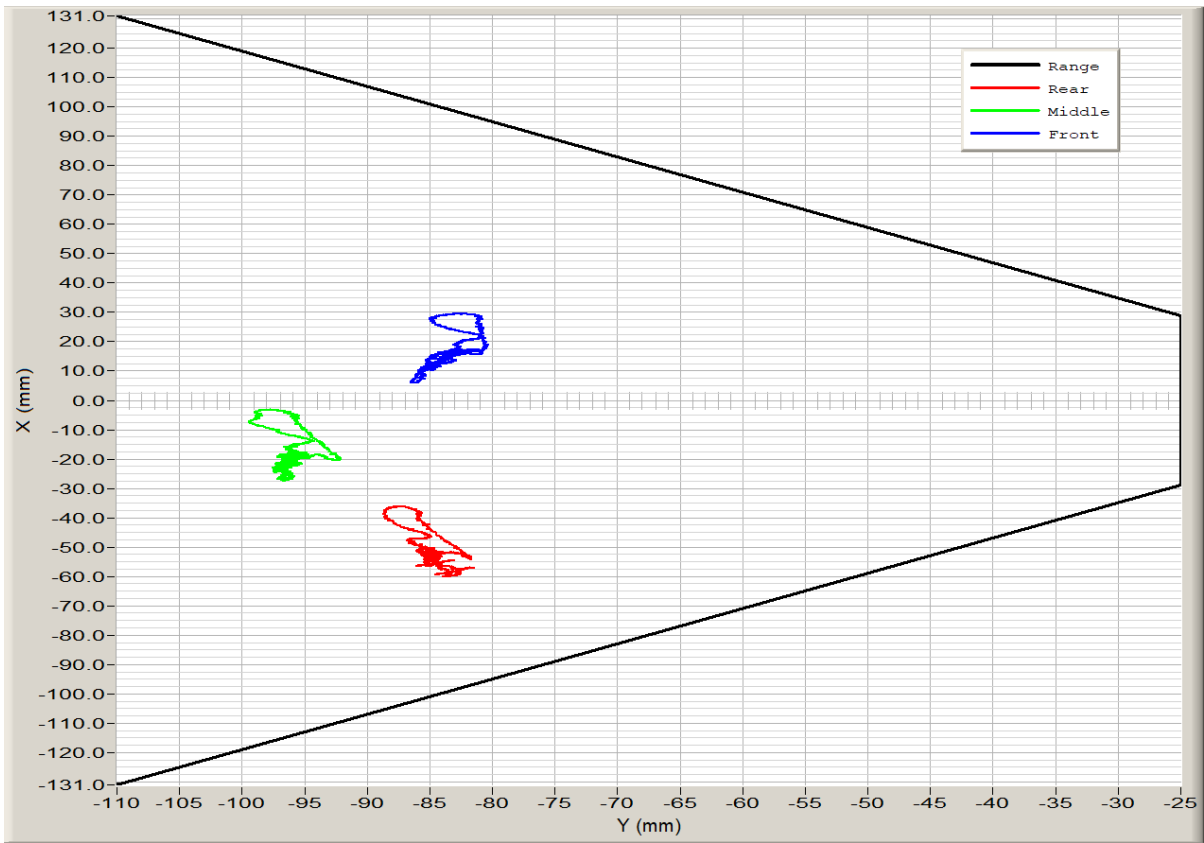
1.00 Logic at -50.00 ms

<Min>

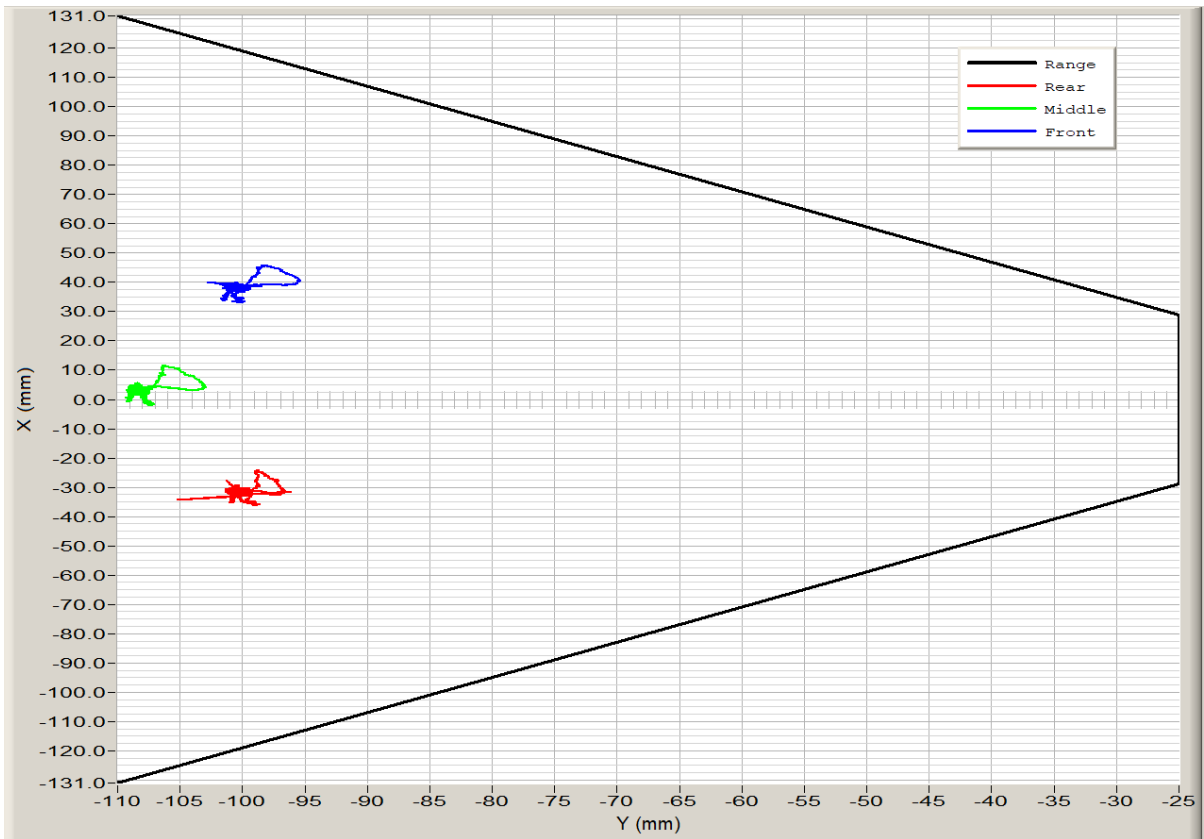
0.00 Logic at 3.80 ms

Unfiltered

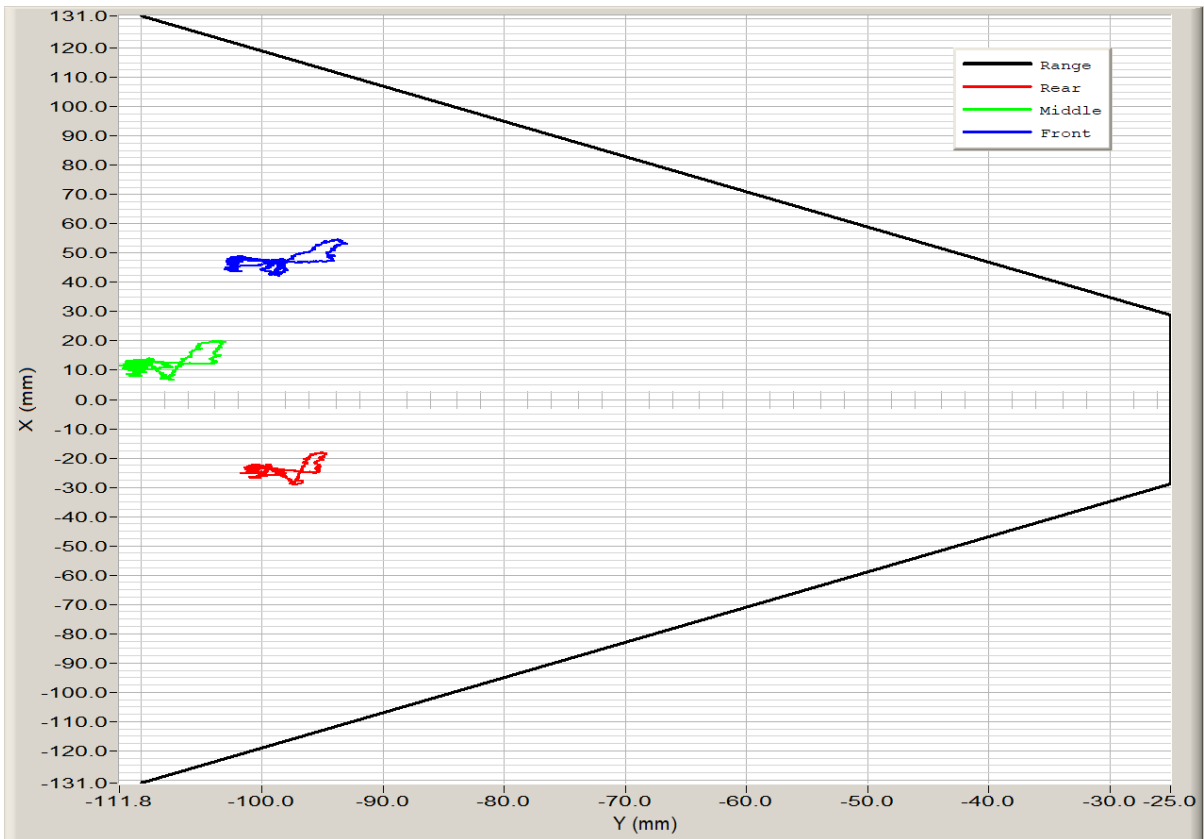




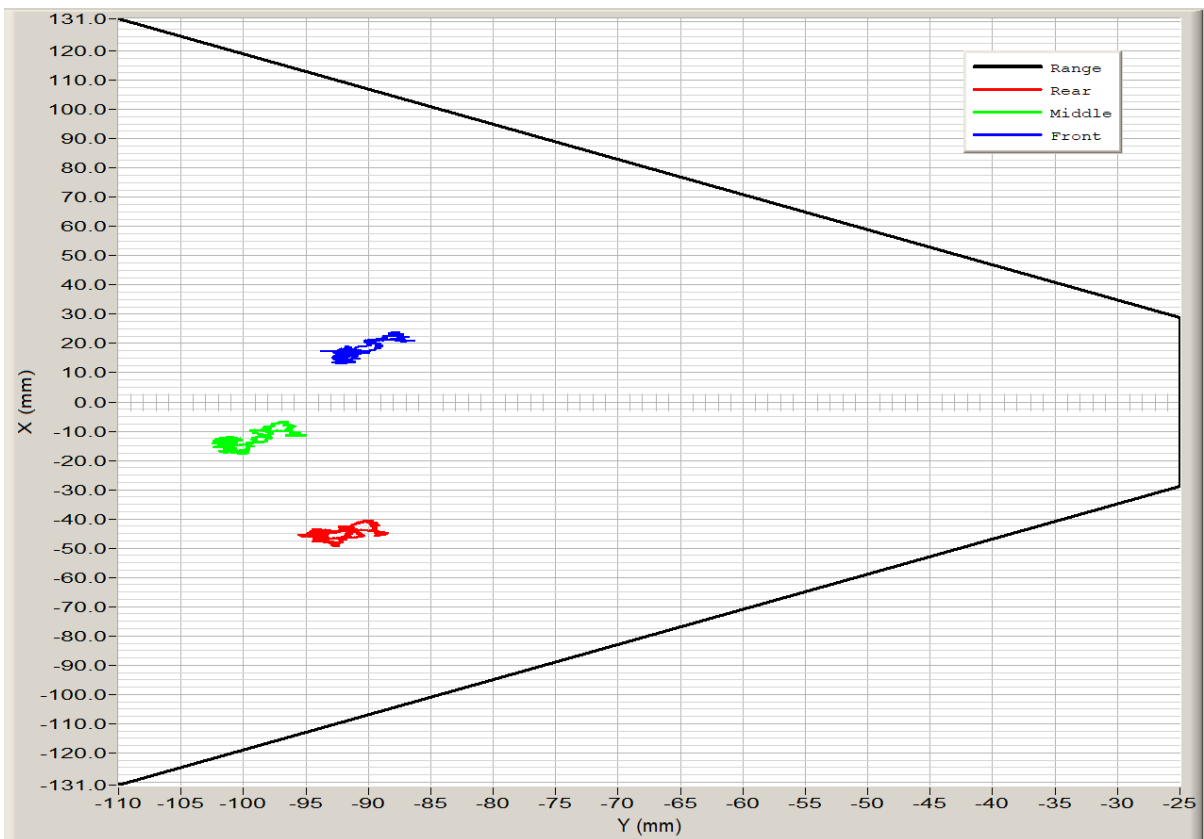
50th_Shoulder_XY



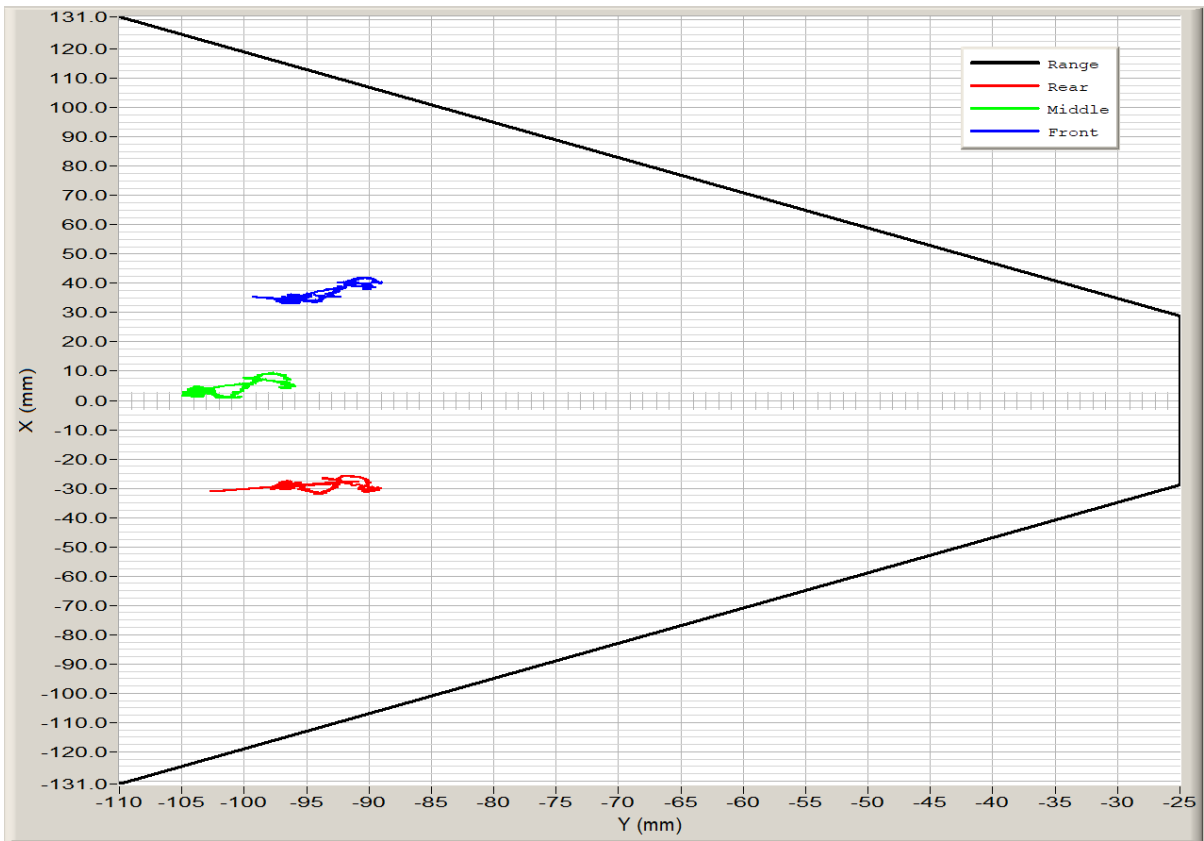
50th_Thorax_1_XY



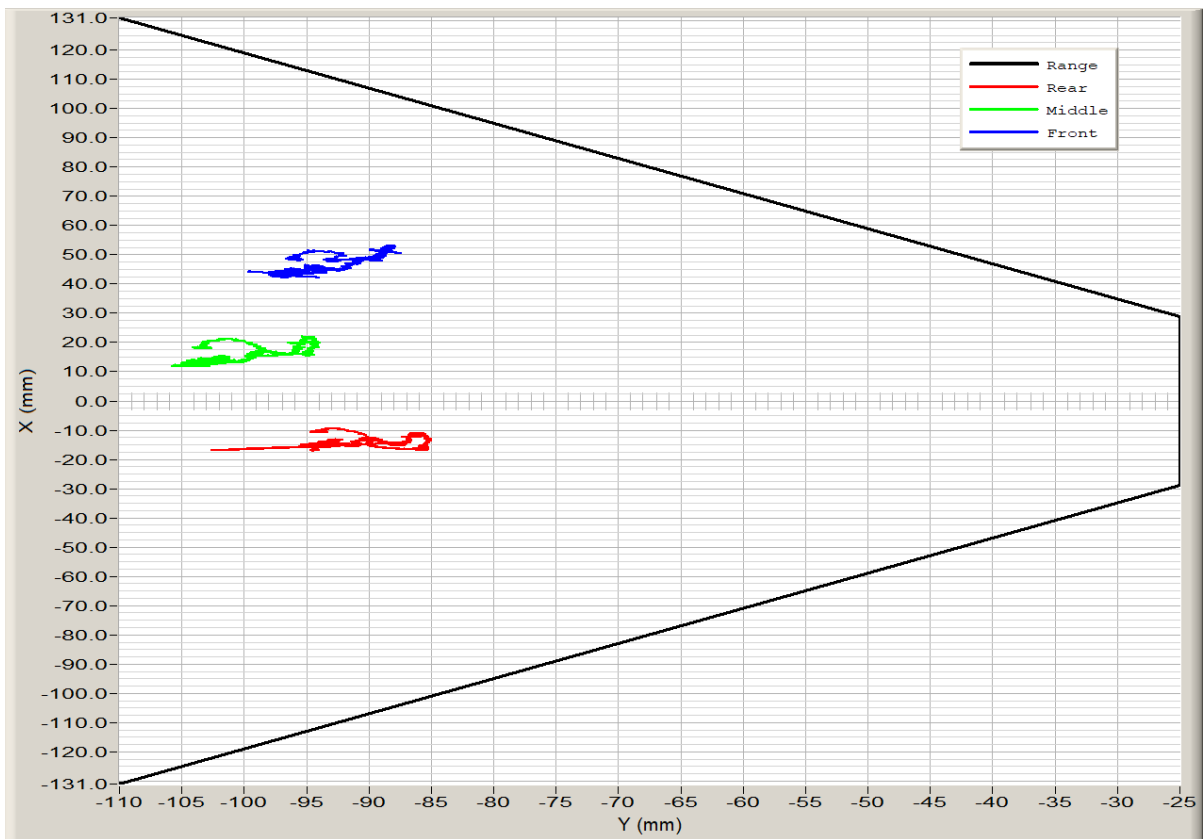
50th_Thorax_2_XY



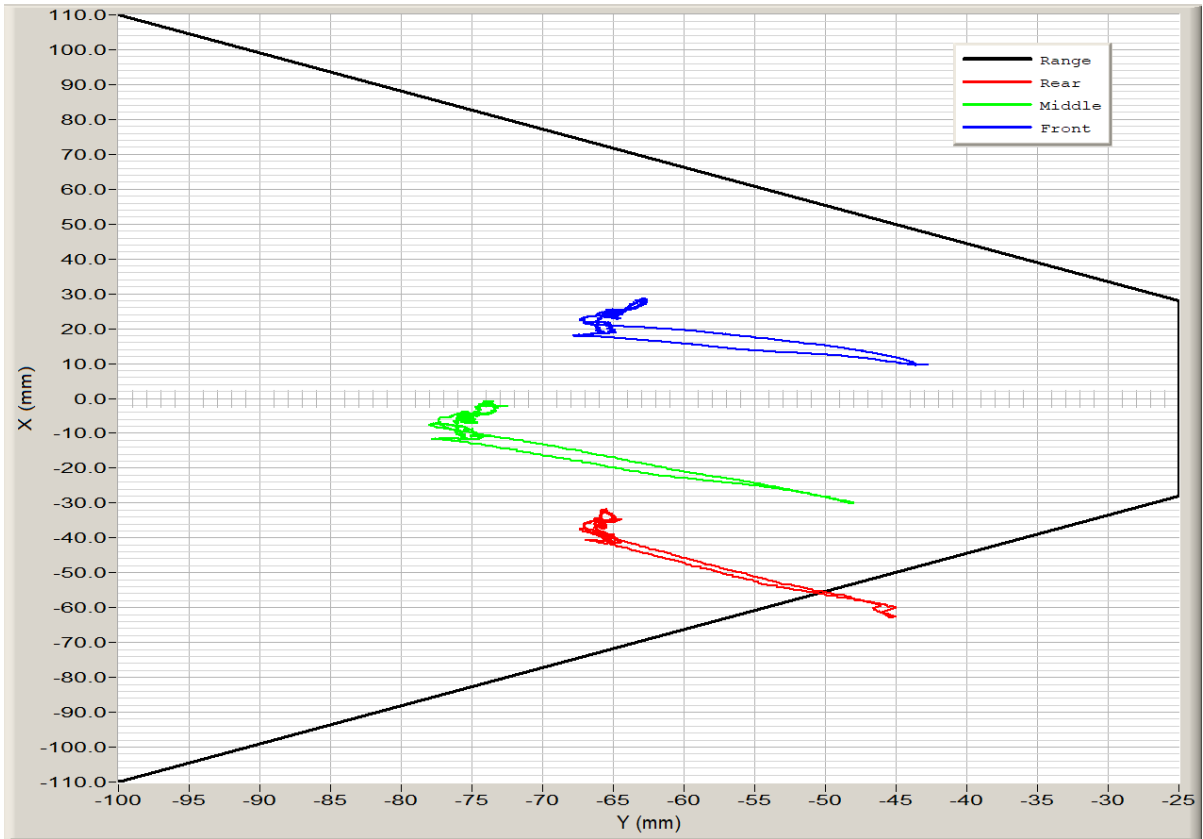
50th_Thorax_3_XY



50th_Abdomen_1_XY



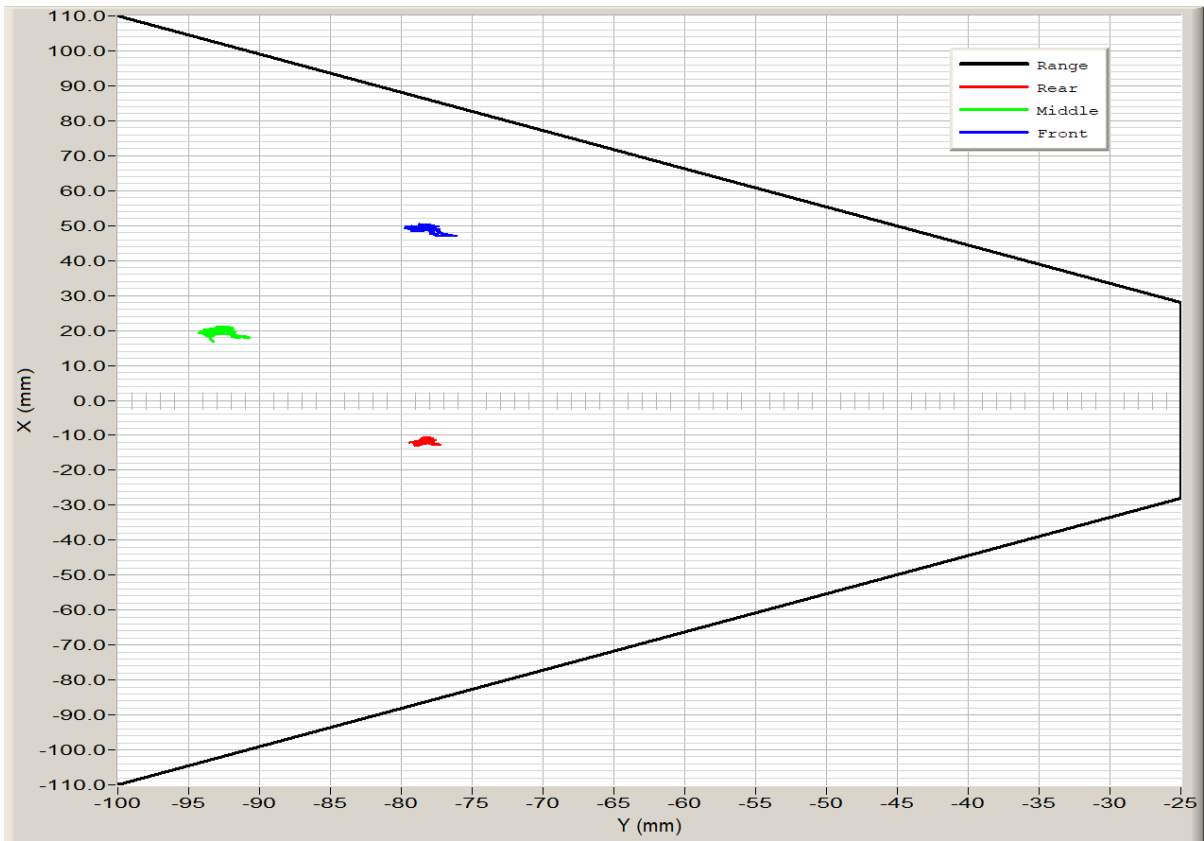
50th_Abdomen_2_XY



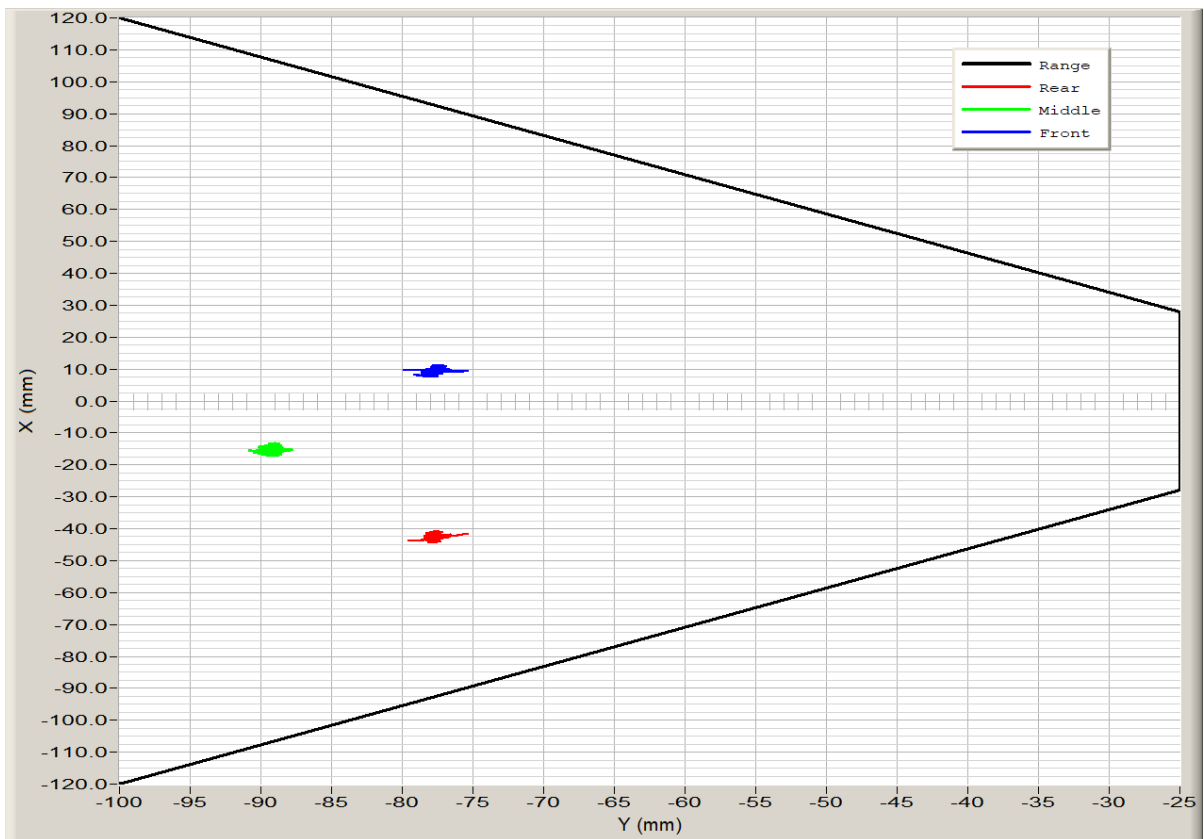
5th_Shoulder_XY



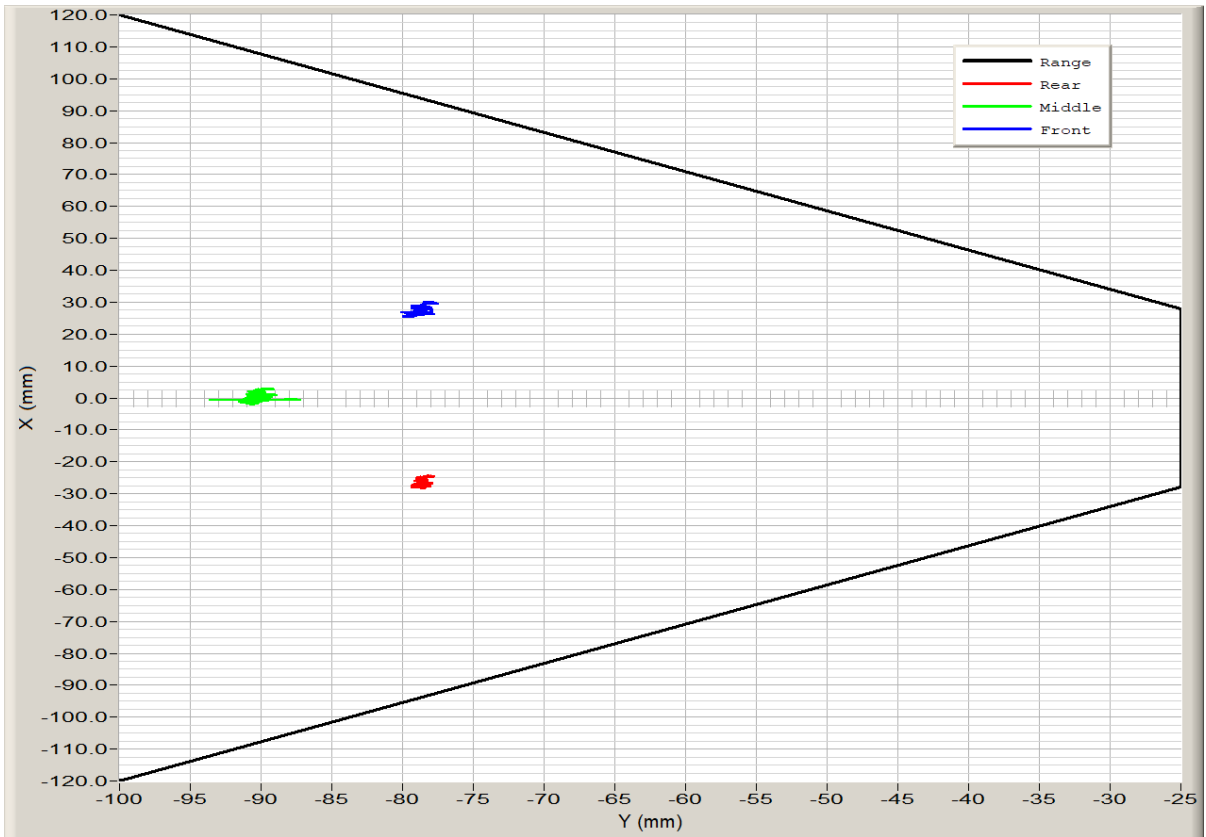
5th_Thorax_1_XY



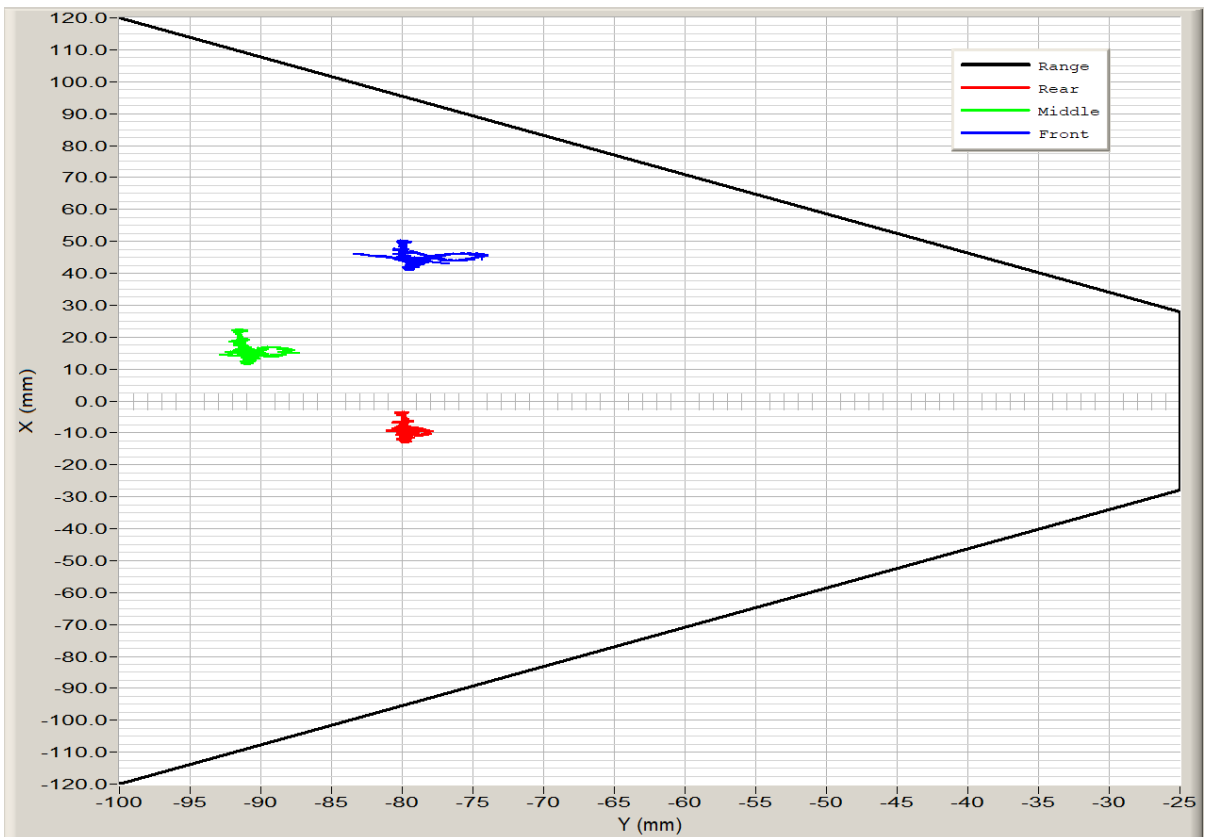
5th_Thorax_2_XY



5th_Thorax_3_XY



5th_Abdomen_1_XY



5th_Abdomen_2_XY

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

TABLE OF QUALIFICATION MEASUREMENTS AND PLOTS

WorldSID-50M (Driver) Dummy

Description

Table 1. External Measurements

Table 2. Front Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)

Head (X) Acceleration (G's) vs. Time (ms)

Head (Y) Acceleration (G's) vs. Time (ms)

Head (Z) Acceleration (G's) vs. Time (ms)

Table 3. Left Lateral Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)

Head (X) Acceleration (G's) vs. Time (ms)

Head (Y) Acceleration (G's) vs. Time (ms)

Head (Z) Acceleration (G's) vs. Time (ms)

Table 4. Right Lateral Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)

Head (X) Acceleration (G's) vs. Time (ms)

Head (Y) Acceleration (G's) vs. Time (ms)

Head (Z) Acceleration (G's) vs. Time (ms)

Table 5. Left Lateral Neck Pendulum Test

Pendulum Acceleration (G's) vs. Time (ms)

Pendulum Velocity (m/s) vs. Time (ms)

Flexion Angle (°) vs. Time (ms)

Forward Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Rear Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Center Headform Potentiometer Rotation at CG (°) vs. Time (ms)

Neck Force Y (N) vs. Time (ms)

Neck Force Y (N) Filtered for Total Neck Occipital Condyle Moment Calculation vs. Time (ms)

Neck Moment X (Nm) vs. Time (ms)

Total Neck Occipital Condyle Moment X (Nm) vs. Time (ms)

Table 6. Right Lateral Neck Pendulum Test

Pendulum Acceleration (G's) vs. Time (ms)

Pendulum Velocity (m/s) vs. Time (ms)

Flexion Angle (°) vs. Time (ms)

Forward Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Rear Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Center Headform Potentiometer Rotation at CG (°) vs. Time (ms)

Neck Force Y (N) vs. Time (ms)

Neck Force Y (N) Filtered for Total Neck Occipital Condyle Moment Calculation vs. Time (ms)

Neck Moment X (Nm) vs. Time (ms)

Total Neck Occipital Condyle Moment X (Nm) vs. Time (ms)

Table 7. Left Lateral Shoulder Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Impactor Force (N) vs. Time (ms)

Shoulder Displacement (mm) vs. Time (ms)

Table 8. Left Lateral Thorax with Arm Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Impactor Force (N) vs. Time (ms)

TABLE OF QUALIFICATION MEASUREMENTS AND PLOTS (CONTUNUED)

WorldSID-50M (Driver) Dummy

Description

Upper Spine Acceleration (G's) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)
Upper Thorax Rib Displacement (mm) vs. Time (ms)
Center Thorax Rib Displacement (mm) vs. Time (ms)
Lower Thorax Rib Displacement (mm) vs. Time (ms)

Table 9. Left Lateral Thorax without Arm Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Impactor Force (N) vs. Time (ms)
Upper Spine Acceleration (G's) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)
Upper Thorax Rib Displacement (mm) vs. Time (ms)
Center Thorax Rib Displacement (mm) vs. Time (ms)
Lower Thorax Rib Displacement (mm) vs. Time (ms)

Table 10. Left Lateral Abdomen Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Impactor Force (N) vs. Time (ms)
Upper Abdominal Rib Displacement (mm) vs. Time (ms)
Lower Abdominal Rib Displacement (mm) vs. Time (ms)
Lower Spine Acceleration (G's) vs. Time (ms)

Table 11. Left Lateral Pelvis Impact Test

Impactor Acceleration (G's) vs. Time (ms)
Impactor Force (N) vs. Time (ms)
Pelvis Acceleration Y (G's) vs. Time (ms)
Lower Spine Acceleration Y (G's) vs. Time (ms)

TABLE OF QUALIFICATION MEASUREMENTS AND PLOTS

WorldSID-5F (Rear Passenger) Dummy

Description

Table 1. External Measurements

Table 2. Front Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)

Head (X) Acceleration (G's) vs. Time (ms)

Head (Y) Acceleration (G's) vs. Time (ms)

Head (Z) Acceleration (G's) vs. Time (ms)

Table 3. Left Lateral Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)

Head (X) Acceleration (G's) vs. Time (ms)

Head (Y) Acceleration (G's) vs. Time (ms)

Head (Z) Acceleration (G's) vs. Time (ms)

Table 4. Right Lateral Head Drop Test

Resultant Head Acceleration (G's) vs. Time (ms)

Head (X) Acceleration (G's) vs. Time (ms)

Head (Y) Acceleration (G's) vs. Time (ms)

Head (Z) Acceleration (G's) vs. Time (ms)

Table 5. Left Lateral Neck Pendulum Test

Pendulum Acceleration (G's) vs. Time (ms)

Pendulum Velocity (m/s) vs. Time (ms)

Flexion Angle (°) vs. Time (ms)

Forward Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Rear Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Center Headform Potentiometer Rotation at CG (°) vs. Time (ms)

Neck Force Y (N) vs. Time (ms)

Neck Force Y (N) Filtered for Total Neck Occipital Condyle Moment Calculation vs. Time (ms)

Neck Moment X (Nm) vs. Time (ms)

Total Neck Occipital Condyle Moment X (Nm) vs. Time (ms)

Table 6. Right Lateral Neck Pendulum Test

Pendulum Acceleration (G's) vs. Time (ms)

Pendulum Velocity (m/s) vs. Time (ms)

Flexion Angle (°) vs. Time (ms)

Forward Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Rear Potentiometer Rotation at Base of Pendulum (°) vs. Time (ms)

Center Headform Potentiometer Rotation at CG (°) vs. Time (ms)

Neck Force Y (N) vs. Time (ms)

Neck Force Y (N) Filtered for Total Neck Occipital Condyle Moment Calculation vs. Time (ms)

Neck Moment X (Nm) vs. Time (ms)

Total Neck Occipital Condyle Moment X (Nm) vs. Time (ms)

Table 7. Left Lateral Shoulder Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Impactor Force (N) vs. Time (ms)

Shoulder Displacement (mm) vs. Time (ms)

Table 8. Left Lateral Thorax with Arm Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Impactor Force (N) vs. Time (ms)

TABLE OF QUALIFICATION MEASUREMENTS AND PLOTS (CONTUNUED)

WorldSID-5F (Rear Passenger) Dummy

Description

Upper Spine Acceleration (G's) vs. Time (ms)

Lower Spine Acceleration (G's) vs. Time (ms)

Upper Thorax Rib Displacement (mm) vs. Time (ms)

Center Thorax Rib Displacement (mm) vs. Time (ms)

Lower Thorax Rib Displacement (mm) vs. Time (ms)

Table 9. Left Lateral Thorax without Arm Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Impactor Force (N) vs. Time (ms)

Upper Spine Acceleration (G's) vs. Time (ms)

Lower Spine Acceleration (G's) vs. Time (ms)

Upper Thorax Rib Displacement (mm) vs. Time (ms)

Center Thorax Rib Displacement (mm) vs. Time (ms)

Lower Thorax Rib Displacement (mm) vs. Time (ms)

Table 10. Left Lateral Abdomen Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Impactor Force (N) vs. Time (ms)

Upper Abdominal Rib Displacement (mm) vs. Time (ms)

Lower Abdominal Rib Displacement (mm) vs. Time (ms)

Lower Spine Acceleration (G's) vs. Time (ms)

Table 11. Left Lateral Pelvis Impact Test

Impactor Acceleration (G's) vs. Time (ms)

Impactor Force (N) vs. Time (ms)

Pelvis Acceleration Y (G's) vs. Time (ms)

Lower Spine Acceleration Y (G's) vs. Time (ms)

Pre-Test Calibration Sheets
Driver S/N EB8888

Transportation Research Center Inc.
WorldSID-50M
External Measurements
Serial No. EB8888 Certification No. 07

WorldSID-50M Angular Reference Measurements					
Parameter	Symbol	Tilt Sensor (°)	Inclinometer (°)		
			Center	Left	Right
Head X-Axis	A1	0	n/a	n/a	n/a
Head Y-Axis	A2	2.2	n/a	2	Note 1
Neck Bracket X-Axis	A3	n/a	-0.5	n/a	n/a
Neck Bracket Y-Axis	A4	n/a	-3.1	n/a	n/a
Thorax X-Axis	A5	1.3	n/a	n/a	n/a
Thorax Y-Axis	A6	3.9	n/a	n/a	n/a
Pelvis X-Axis	A7	0.7	n/a	n/a	n/a
Pelvis Y-Axis	A8	10.2	n/a	n/a	n/a
H-point Tool	A9	n/a	n/a	33.1	33.9

WorldSID-50M External Linear Dimensions				
Parameter	Symbol	Specification (mm)		
		Center	Left	Right
Seated Height	L1	870	n/a	n/a
Hip Pivot Height	L2	n/a	89	89
Hip Pivot to Back Line	L3	n/a	187	177
Thigh Clearance	L4	n/a	181	180
Knee Height	L5	n/a	580	583
Knee to Backline	L6	n/a	667	670
Head Back to Seat Back	L7	156	n/a	n/a
Thorax Rib 1 Front to Back	L8	n/a	209	209
Abdomen Rib 2 Front to Back	L9	n/a	223	226
Arm Length	L10	n/a	330	330
Width Across Arms	L11	482	n/a	n/a
Waist Width	L12	341	n/a	n/a

Note 1: No land marks on the right side of head. Unable to align level.

Transportation Research Center Inc.

Front Head Drop
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/24/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	211 - 261 g	238.8 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-7.5 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	2.76 %	Yes

Test meets specifications.

Condition: Used

Comments:

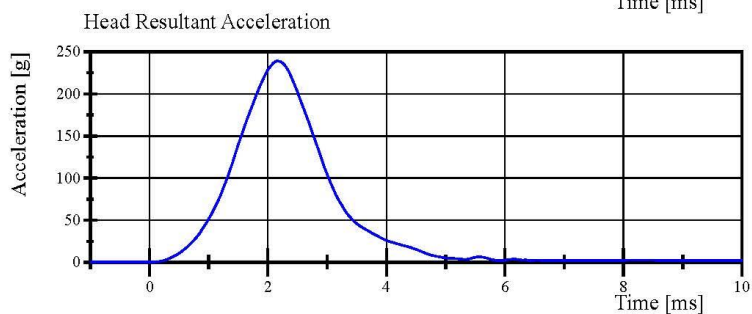
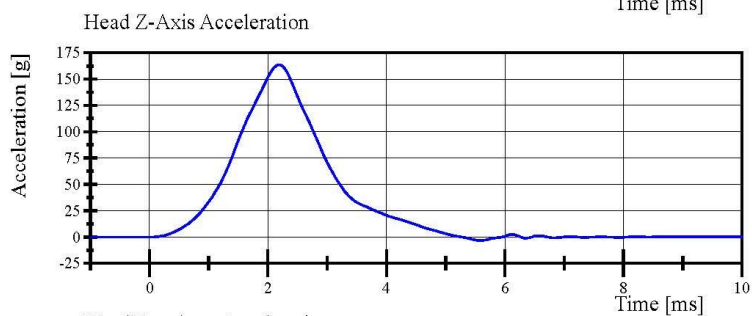
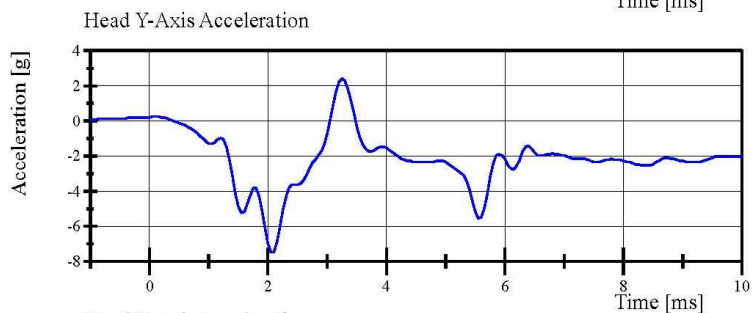
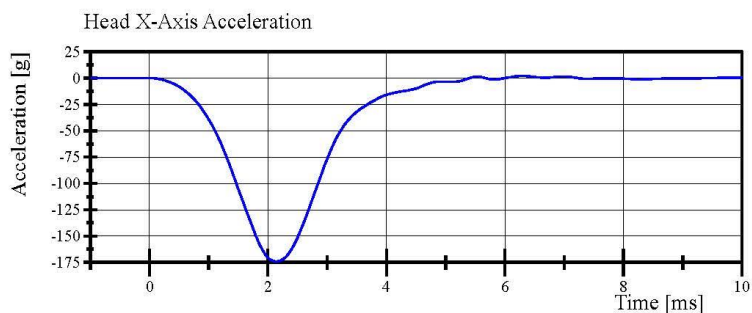
Head Skin S/N: EG2845

Transportation Research Center Inc.

Front Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 7-1

Test Date: 2/24/2021



Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

02.24.2021 08:45:04 951



Transportation Research Center Inc.

Left Lateral Head Drop
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/24/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Head Resultant Acceleration	107 - 126 g	117.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-1.8 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	2.95 %	Yes

Test meets specifications.

Condition: Used

Comments:

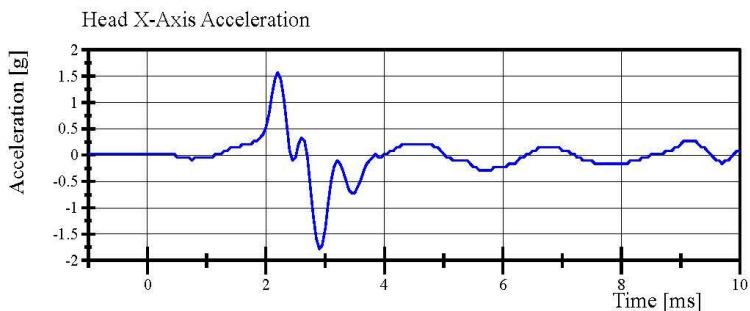
Head Skin S/N: EG2845

Transportation Research Center Inc.

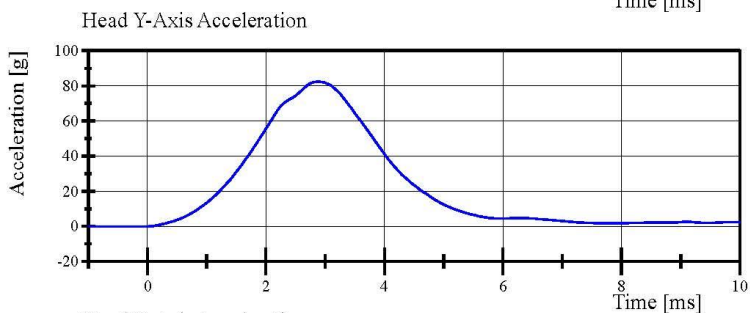
Left Lateral Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 7-1

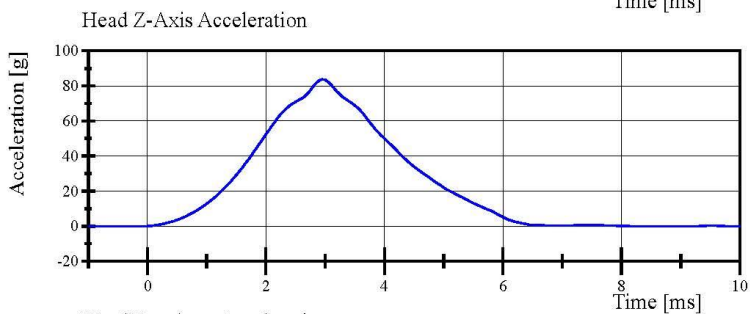
Test Date: 2/24/2021



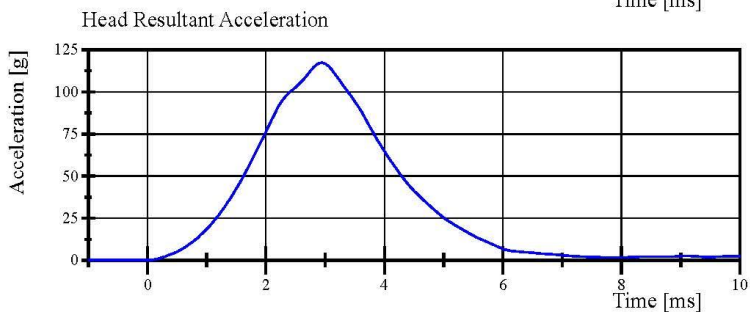
Filter Class: CFC_1000
Max: 1.6 g at 2.2 ms
Min: -1.8 g at 2.9 ms



Filter Class: CFC_1000
Max: 82.3 g at 2.9 ms
Min: -0.1 g at -0.9 ms



Filter Class: CFC_1000
Max: 83.7 g at 3.0 ms
Min: -0.0 g at -0.6 ms



Filter Class: CFC_1000
Max: 117.3 g at 3.0 ms
Min: 0.1 g at -1.0 ms

Specification Source: WorldSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

02.24.2021 08:48:55 945



Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 7-1

Test Date: 2/24/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	107 - 126 g	115.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-3.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	1.94 %	Yes

Test meets specifications.

Condition: Used

Comments:

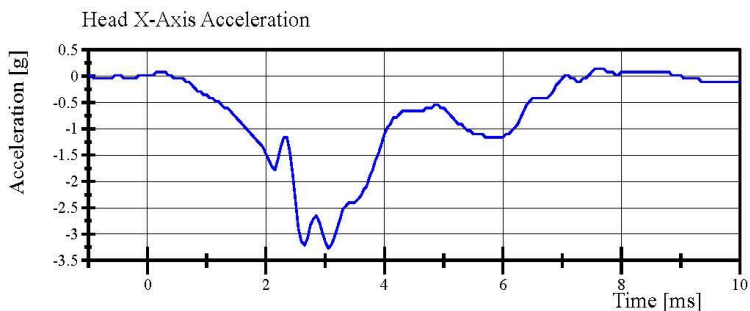
Head Skin S/N: EG2845

Transportation Research Center Inc.

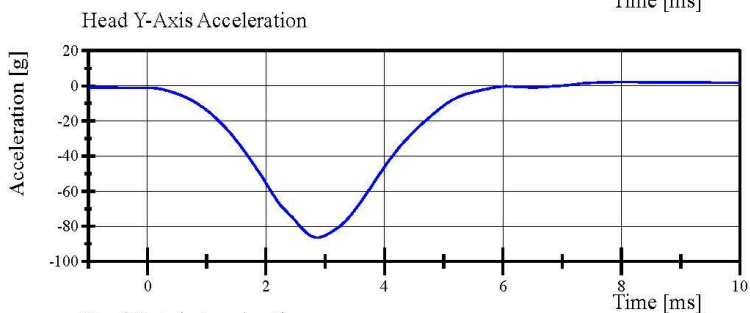
Right Lateral Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 7-1

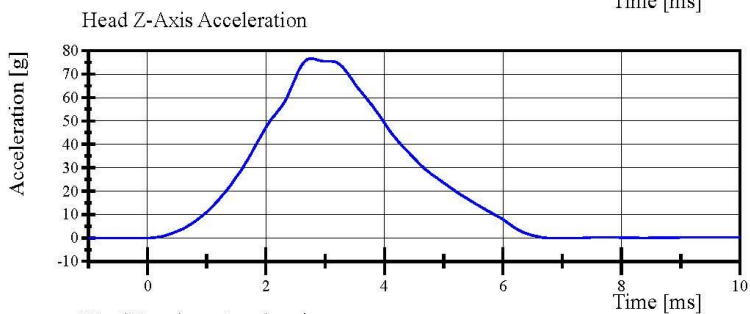
Test Date: 2/24/2021



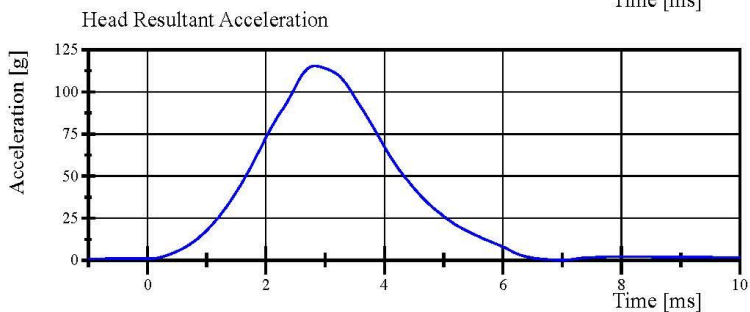
Filter Class: CFC_1000
Max: 0.1 g at 7.6 ms
Min: -3.3 g at 3.1 ms



Filter Class: CFC_1000
Max: 2.2 g at 8.0 ms
Min: -86.5 g at 2.9 ms



Filter Class: CFC_1000
Max: 76.7 g at 2.8 ms
Min: -0.2 g at 6.9 ms



Filter Class: CFC_1000
Max: 115.3 g at 2.9 ms
Min: 0.2 g at 7.0 ms

Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

02.24.2021 08:52:53 945



Transportation Research Center Inc.

Left Lateral Neck
 WorldSID 50th Serial No. EB8888 Certification No. 7-1
 Test Date: 2/23/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	(-3.30) - (-3.50) m/s	-3.333 m/s	Yes
Pendulum Integrated Velocity Change at 4 ms	0.87 - 1.09 m/s	0.986 m/s	Yes
Change at 8 ms	1.72 - 2.1 m/s	1.904 m/s	Yes
Change at 12 ms	2.63 - 3.17 m/s	2.844 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-53.5 deg	Yes
Headform Flexion Decay - from Peak to Zero Degrees	58 - 72 ms	59.5 ms	Yes
Total Neck Occipital Condyles Moment	54 - 67 N·m	61.0 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	71 - 87 ms	75.4 ms	Yes
Maximum Forward Pot Rotation			
Peak	(-32) - (-39) °	-34.9 °	Yes
Time of Peak	56 - 68 ms	61.1 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-29) - (-36) °	-31.1 °	Yes
Time of Peak	56 - 68 ms	56.7 ms	Yes
Maximum Headform Angular Rate	(-2,047) - (-2,503) %/s	-2,292.5 %/s	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE8804

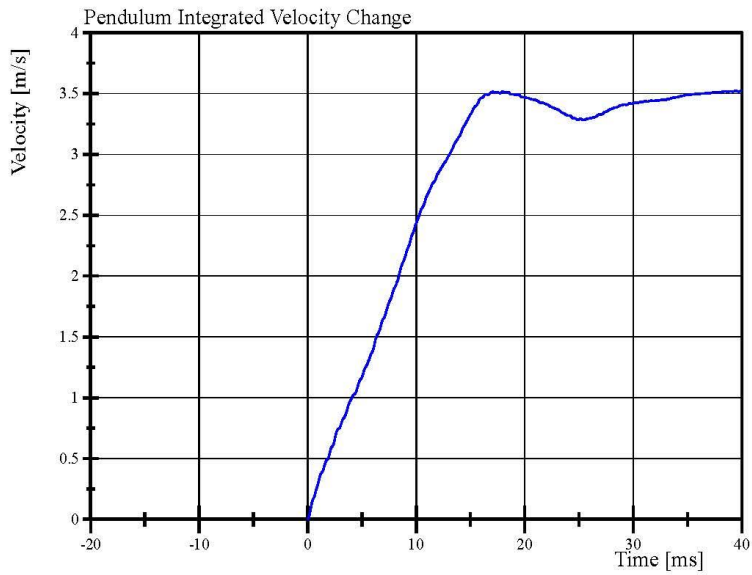
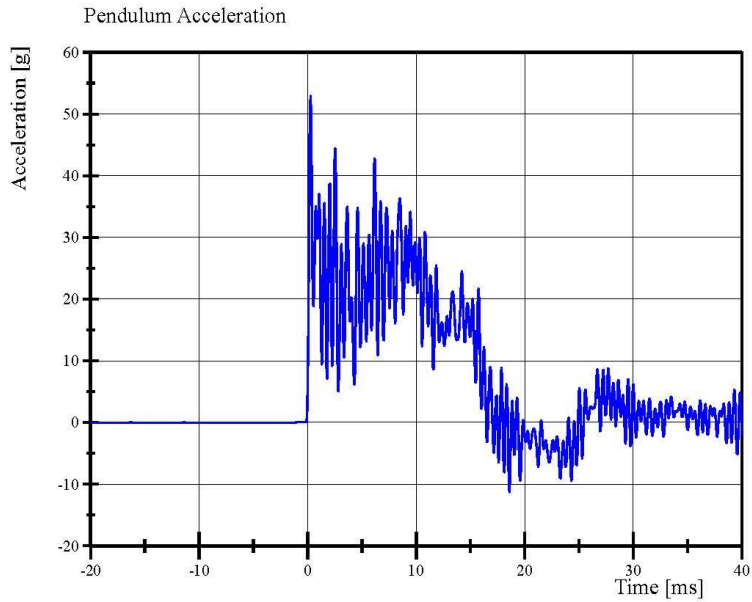
Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
 WorldSID 50th_Qalification Manual 11_09_2020

02.23.2021 12:42:31 4006



Transportation Research Center Inc.

Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



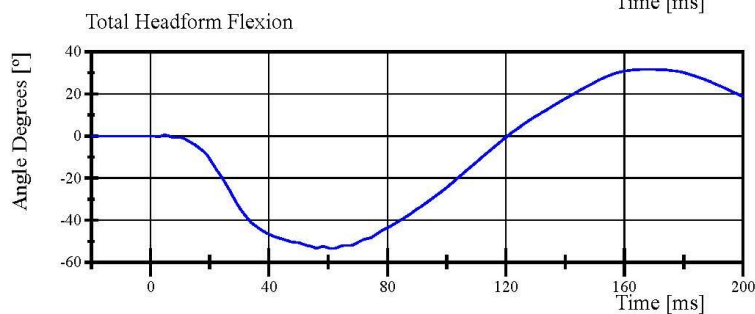
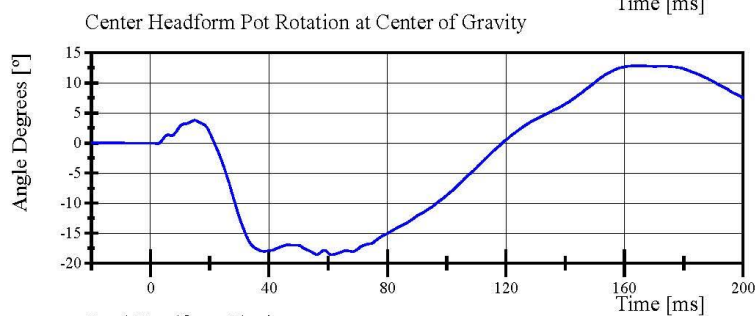
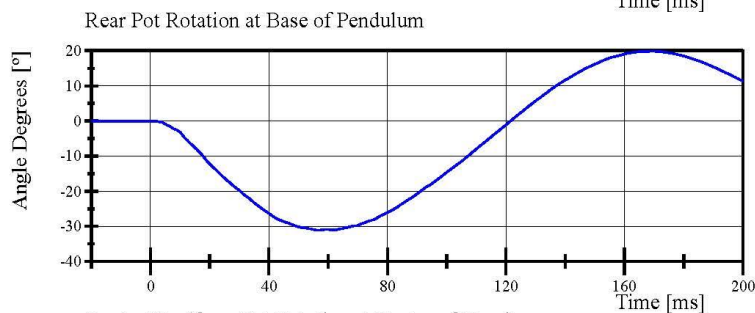
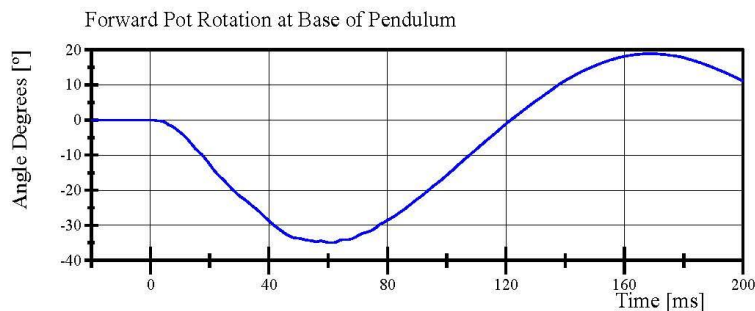
Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

02.23.2021 12:43:15 4006



Transportation Research Center Inc.

Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



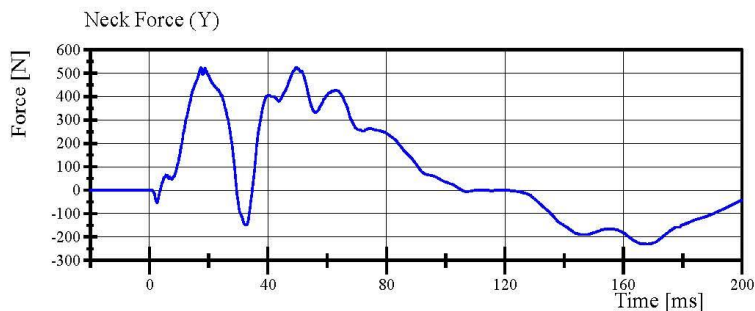
Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

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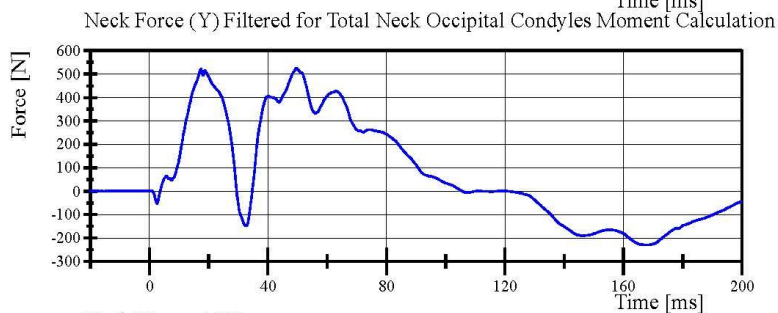


Transportation Research Center Inc.

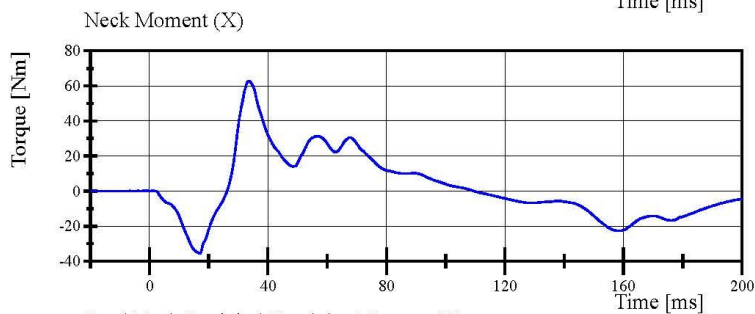
Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



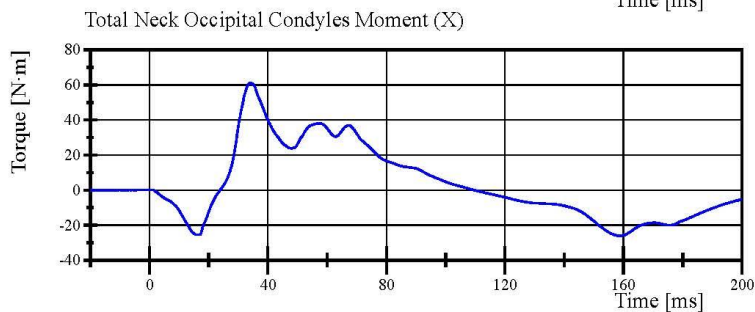
Filter Class: CFC_1000
Max: 525.5 N at 49.6 ms
Min: -230.5 N at 167.7 ms



Filter Class: CFC_600
Max: 525.1 N at 49.6 ms
Min: -230.4 N at 168.1 ms



Filter Class: CFC_600
Max: 62.8 Nm at 33.5 ms
Min: -35.4 Nm at 17.0 ms



Filter Class: Without_(Constar
Max: 61.0 N.m at 34.2 ms
Min: -26.0 N.m at 158.6 ms

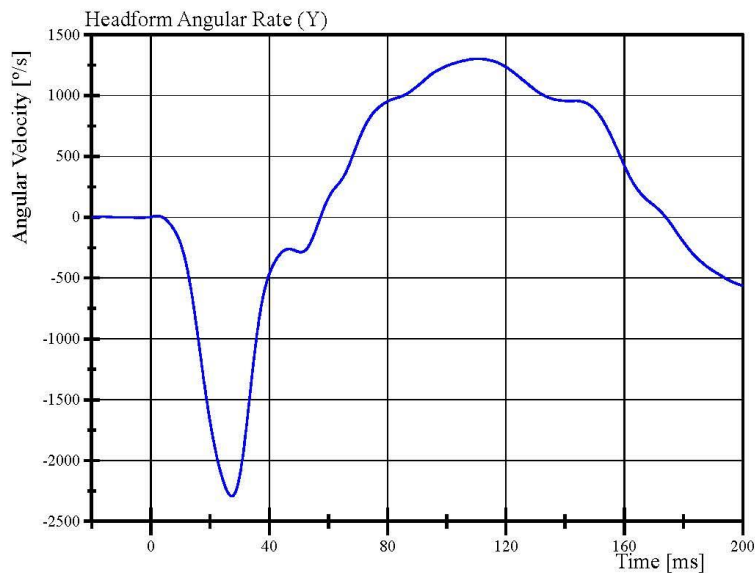
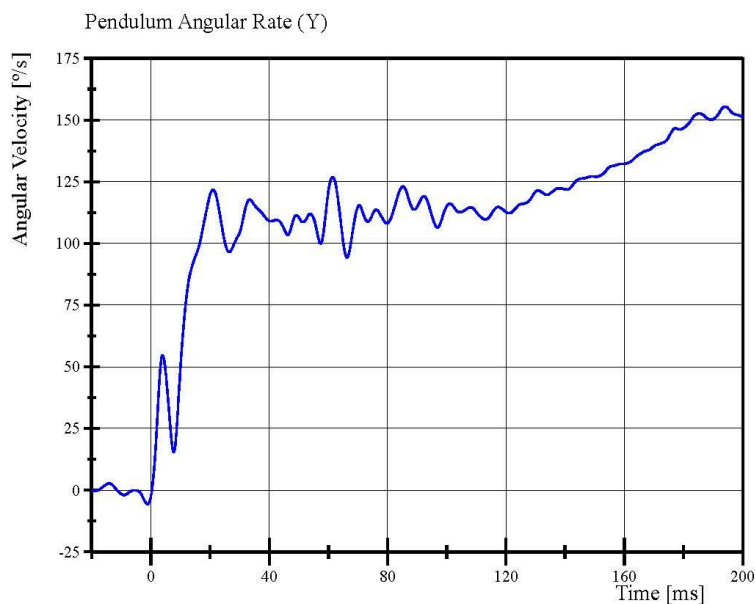
Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

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Transportation Research Center Inc.

Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

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Transportation Research Center Inc.

Right Lateral Neck
 WorldSID 50th Serial No. EB8888 Certification No. 7-1
 Test Date: 2/23/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	3.30 - 3.50 m/s	3.332 m/s	Yes
Pendulum Integrated Velocity Change at 4 ms	(-0.87) - (-1.09) m/s	-0.951 m/s	Yes
Change at 8 ms	(-1.72) - (-2.1) m/s	-1.869 m/s	Yes
Change at 12 ms	(-2.63) - (-3.17) m/s	-2.864 m/s	Yes
Maximum Headform Flexion	50 - 61 deg	53.0 deg	Yes
Headform Flexion Decay - from Peak to Zero Degrees	58 - 72 ms	59.3 ms	Yes
Total Neck Occipital Condyles Moment	(-54) - (-67) N·m	-62.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	71 - 87 ms	75.5 ms	Yes
Maximum Forward Pot Rotation			
Peak	32 - 39 °	34.4 °	Yes
Time of Peak	56 - 68 ms	61.5 ms	Yes
Maximum Rear Pot Rotation			
Peak	29 - 36 °	30.7 °	Yes
Time of Peak	56 - 68 ms	62.0 ms	Yes
Maximum Headform Angular Rate	2,047 - 2,503 %/s	2,286.4 %/s	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE8804

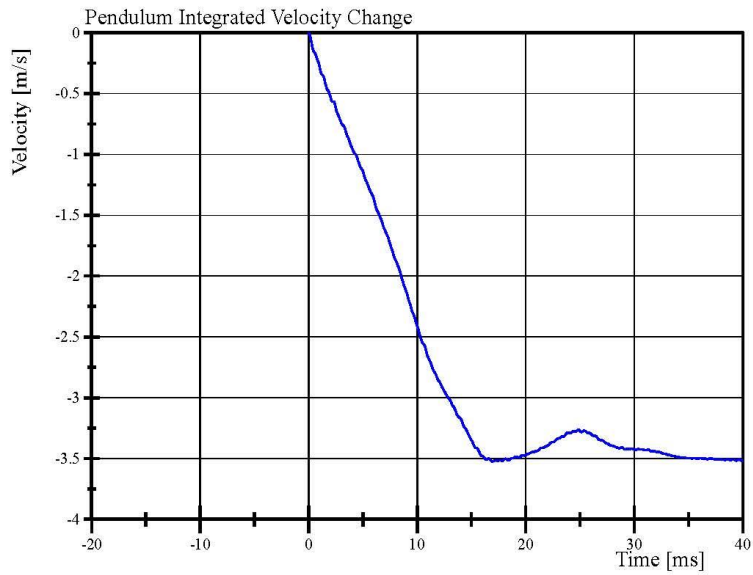
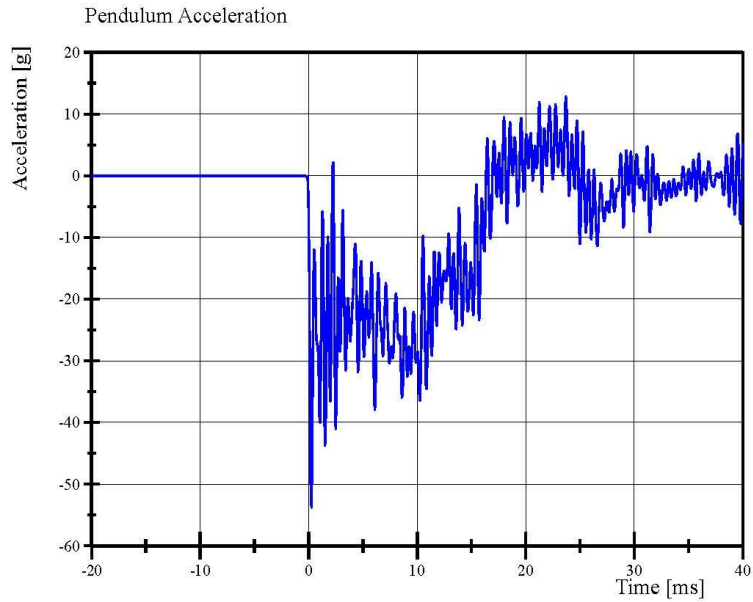
Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
 WorldSID 50th_Qalification Manual 11_09_2020

02.23.2021 12:45:08 4010



Transportation Research Center Inc.

Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



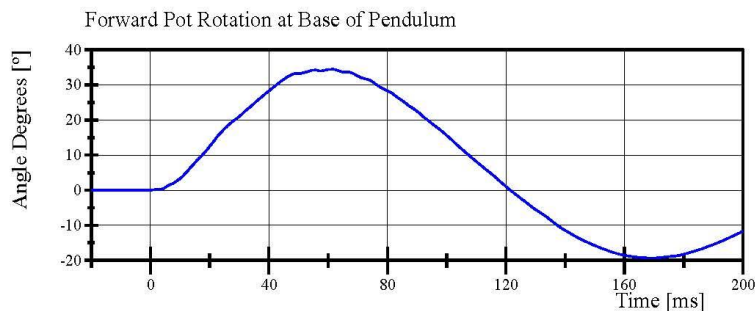
Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

02.23.2021 12:45:23 4010

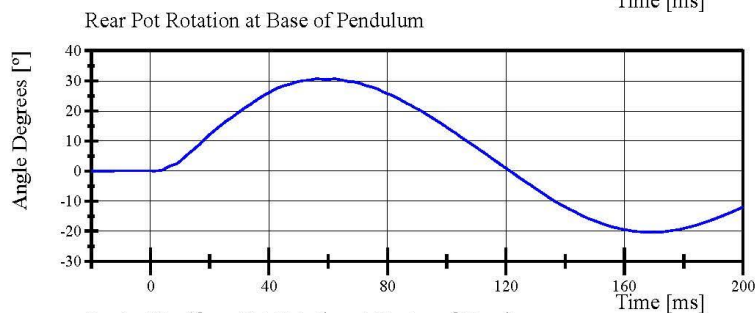


Transportation Research Center Inc.

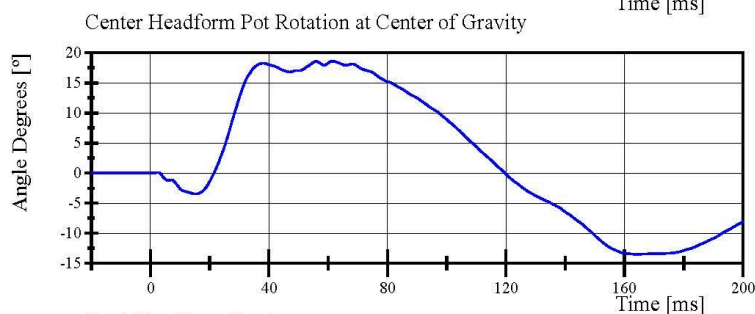
Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



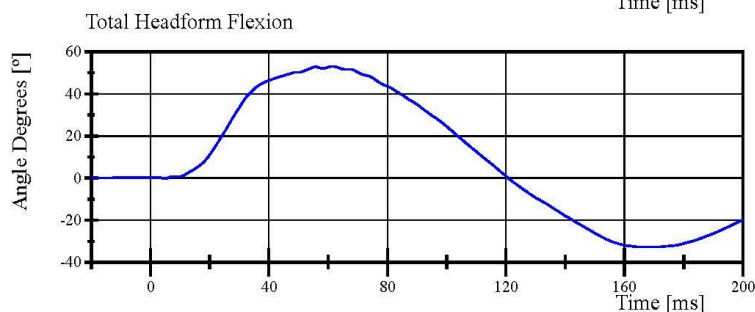
Filter Class: CFC_180
Max: 34.4 ° at 61.5 ms
Min: -19.3 ° at 169.4 ms



Filter Class: CFC_180
Max: 30.7 ° at 62.0 ms
Min: -20.4 ° at 170.0 ms



Filter Class: CFC_180
Max: 18.6 ° at 61.4 ms
Min: -13.5 ° at 164.3 ms



Filter Class: CFC_180
Max: 53.0 ° at 61.5 ms
Min: -32.7 ° at 169.0 ms

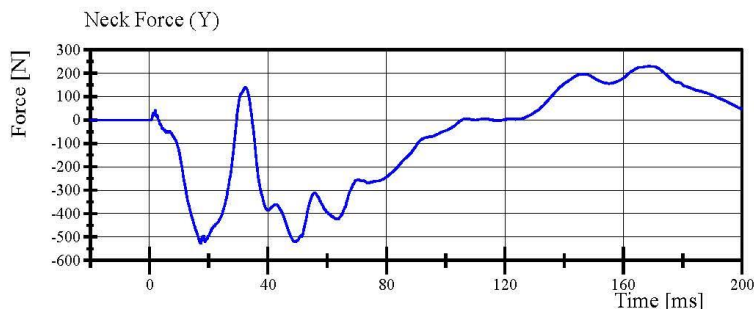
Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

02.23.2021 12:45:23 4010

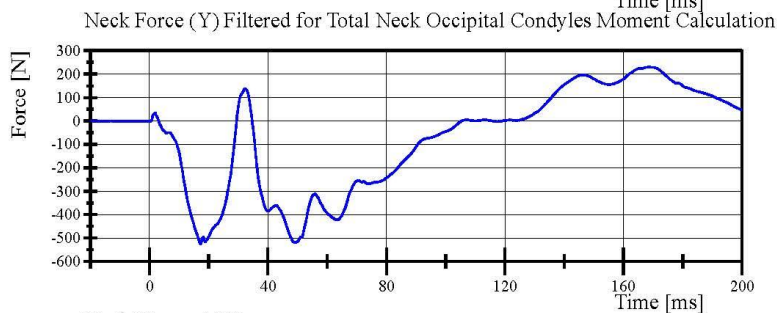


Transportation Research Center Inc.

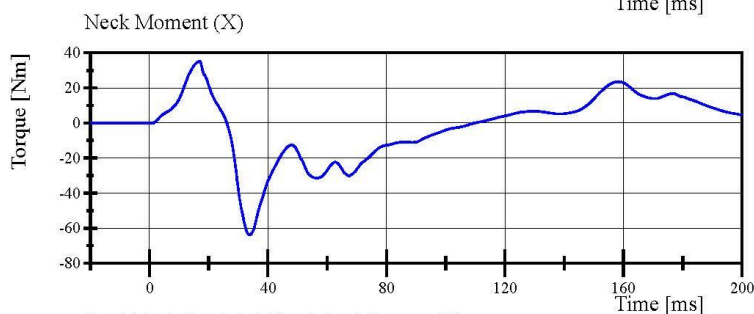
Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



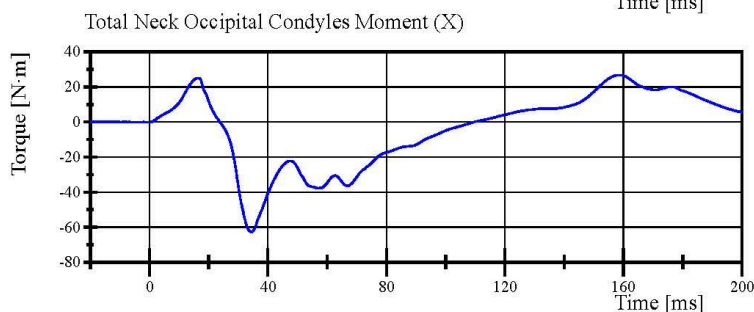
Filter Class: CFC_1000
Max: 229.9 N at 168.4 ms
Min: -527.0 N at 17.3 ms



Filter Class: CFC_600
Max: 229.8 N at 168.9 ms
Min: -526.4 N at 17.3 ms



Filter Class: CFC_600
Max: 35.0 Nm at 16.9 ms
Min: -63.9 Nm at 33.8 ms



Filter Class: Without_(Constar
Max: 26.7 N.m at 158.7 ms
Min: -62.7 N.m at 34.3 ms

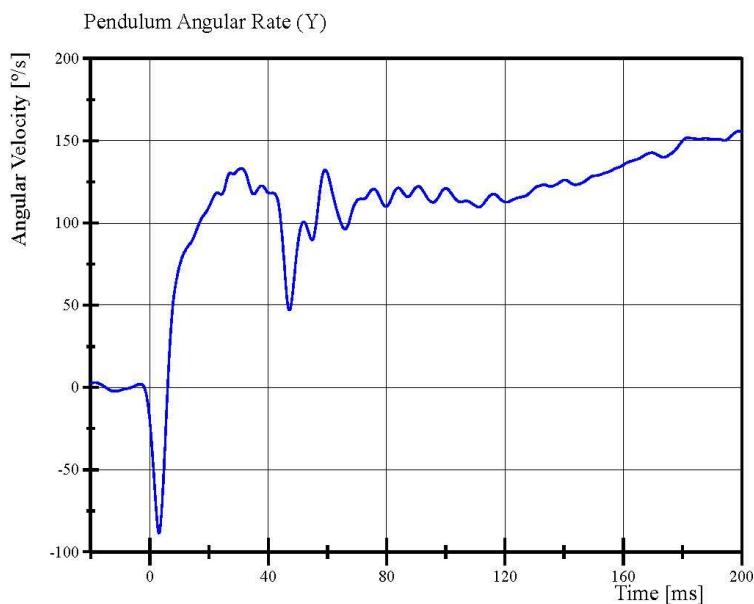
Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

02.23.2021 12:45:23 4010

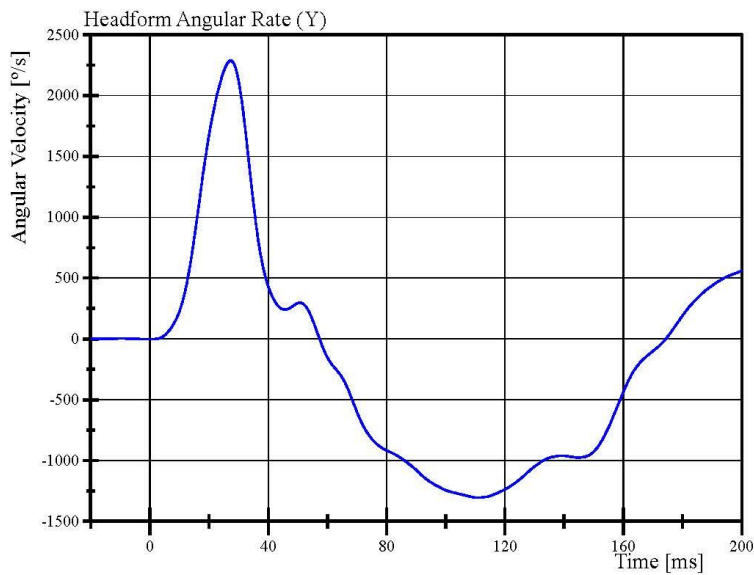


Transportation Research Center Inc.

Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/23/2021



Filter Class: CFC_60
Max: 155.9 °/s at 199.2 ms
Min: -88.6 °/s at 3.1 ms



Filter Class: CFC_60
Max: 2,286.4 °/s at 27.3 ms
Min: -1,304.1 °/s at 110.8 ms

Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

02.23.2021 12:45:24 4010



Transportation Research Center Inc.

Left Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 7-1

Test Date: 2/23/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	5.1 - 5.3 m/s	5.18 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.09 - 2.37 m/s	2.355 m/s	Yes
Change at 15 ms	3.19 - 3.63 m/s	3.516 m/s	Yes
Change at 20 ms	4.27 - 4.87 m/s	4.670 m/s	Yes
Peak Fixture Rotation	(-41.5) - (-51) °	-47.10 °	Yes
Decay Time to 0 deg from Peak Angle	35 - 43 ms	39.5 ms	Yes
Peak Head Angular Velocity Z-axis	(-1,345) - (-1,655) %/s	-1,548.5 %/s	Yes
Peak Lower Neck Moment Z-axis	34 - 42 N·m	38.3 N·m	Yes

Test meets specifications.

Condition: Used

Comments:

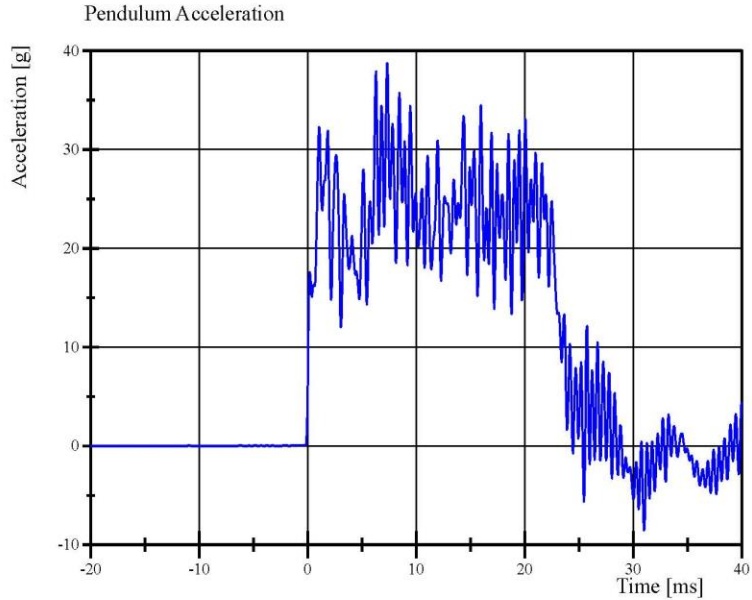
Neck S/N: EE8804

Transportation Research Center Inc.

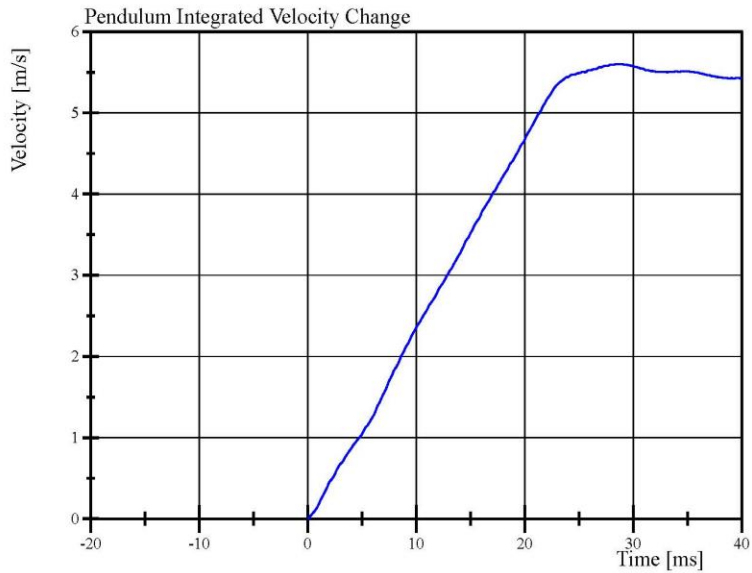
Left Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 7-1

Test Date: 2/23/2021



Filter Class: CFC_1000
Max: 38.7 g at 7.4 ms
Min: -8.5 g at 31.0 ms



Filter Class: CFC_1000
Max: 5.6 m/s at 28.5 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

02.23.2021 14:11:27 4006

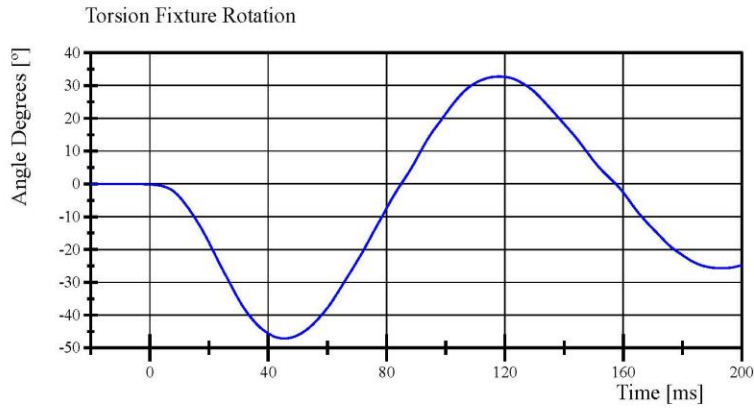


Transportation Research Center Inc.

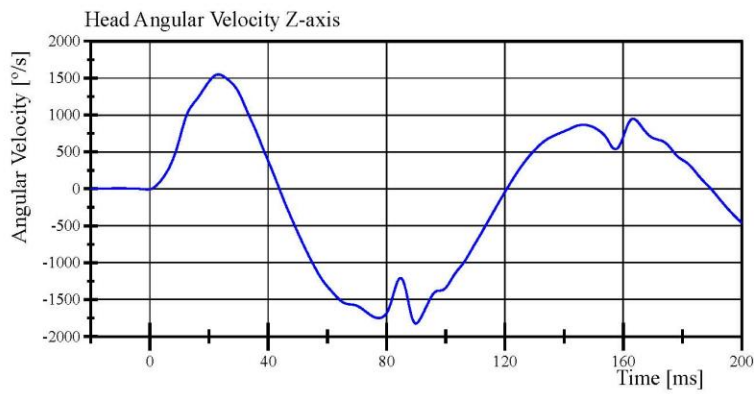
Left Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 7-1

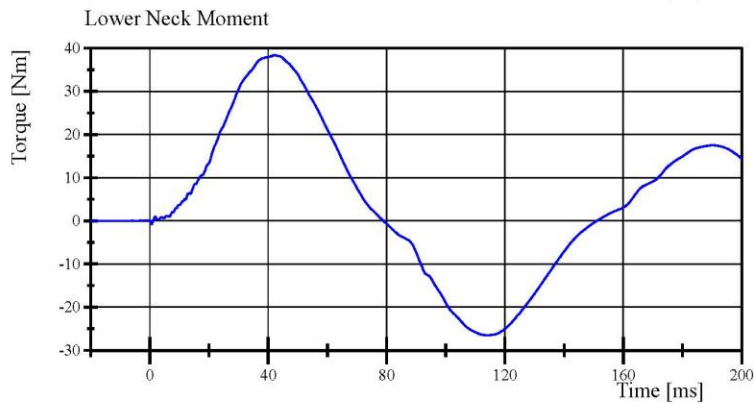
Test Date: 2/23/2021



Filter Class: CFC_60
Max: 32.7 ° at 118.0 ms
Min: -47.1 ° at 45.5 ms



Filter Class: CFC_60
Max: 1,548.5 °/s at 23.2 ms
Min: -1,822.7 °/s at 89.9 ms



Filter Class: CFC_600
Max: 38.3 Nm at 42.4 ms
Min: -26.5 Nm at 113.9 ms

Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

02.23.2021 14:11:27 4006



Transportation Research Center Inc.

Right Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 7-1

Test Date: 2/23/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	5.1 - 5.3 m/s	5.18 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.09 - 2.37 m/s	2.352 m/s	Yes
Change at 15 ms	3.19 - 3.63 m/s	3.559 m/s	Yes
Change at 20 ms	4.27 - 4.87 m/s	4.712 m/s	Yes
Peak Fixture Rotation	41.5 - 51 °	46.26 °	Yes
Decay Time to 0 deg from Peak Angle	35 - 43 ms	38.8 ms	Yes
Peak Head Angular Velocity Z-axis	1,345 - 1,655 %/s	1,564.2 %/s	Yes
Peak Lower Neck Moment Z-axis	(-34) - (-42) N·m	-38.9 N·m	Yes

Test meets specifications.

Condition: Used

Comments:

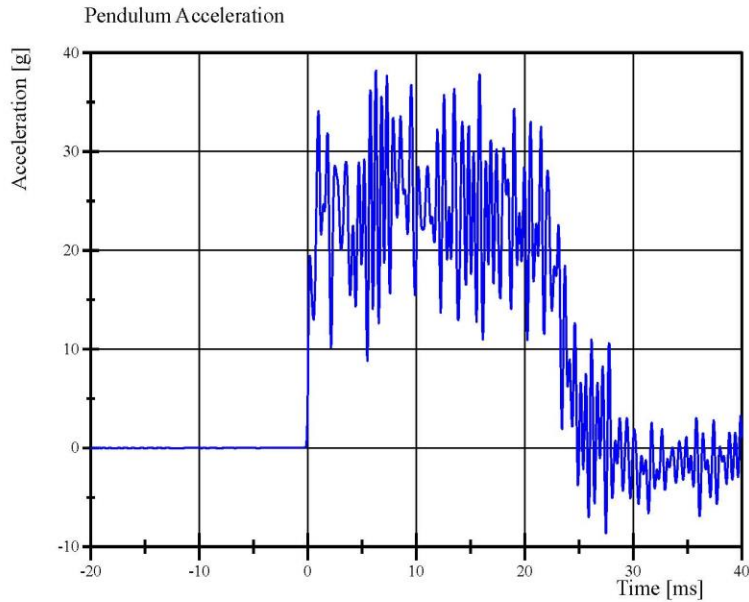
Neck S/N: EE8804

Transportation Research Center Inc.

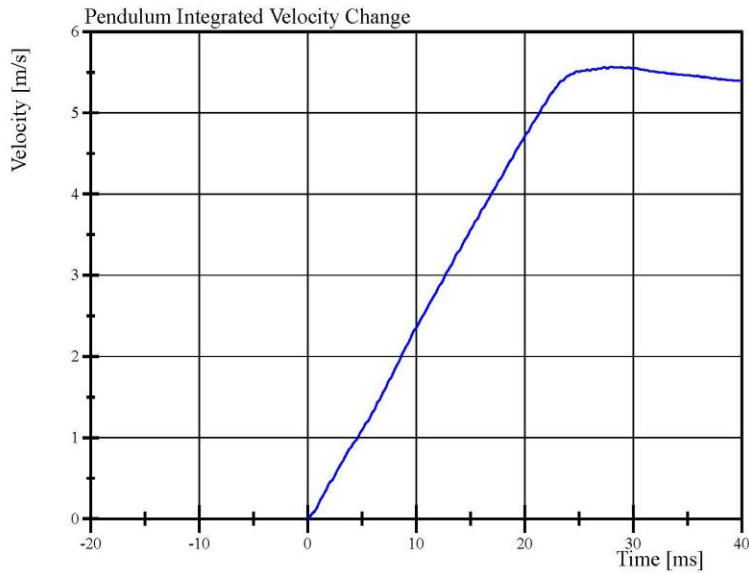
Right Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 7-1

Test Date: 2/23/2021



Filter Class: CFC_1000
Max: 38.2 g at 6.3 ms
Min: -8.6 g at 27.5 ms



Filter Class: CFC_1000
Max: 5.6 m/s at 28.0 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

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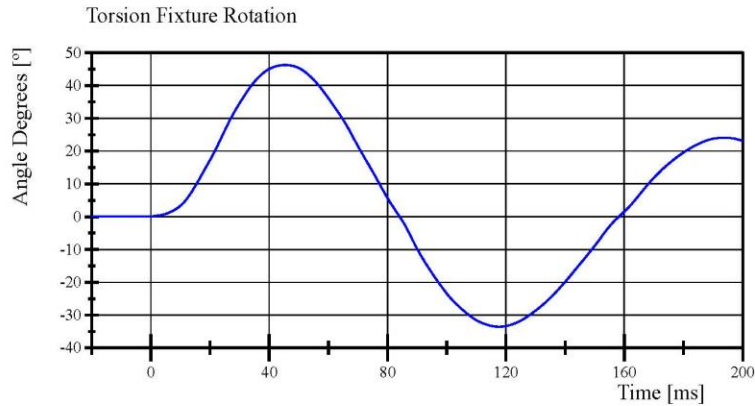


Transportation Research Center Inc.

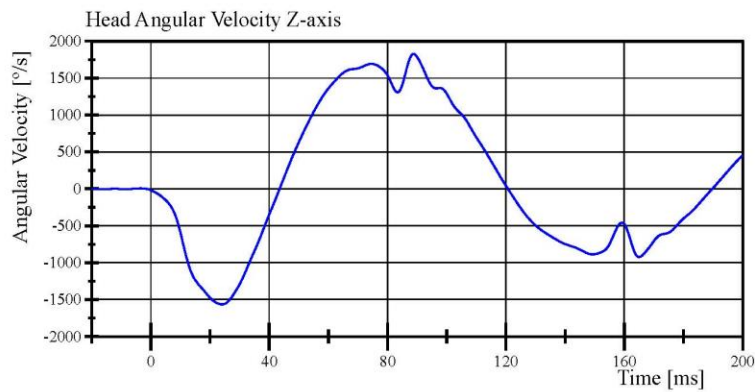
Right Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 7-1

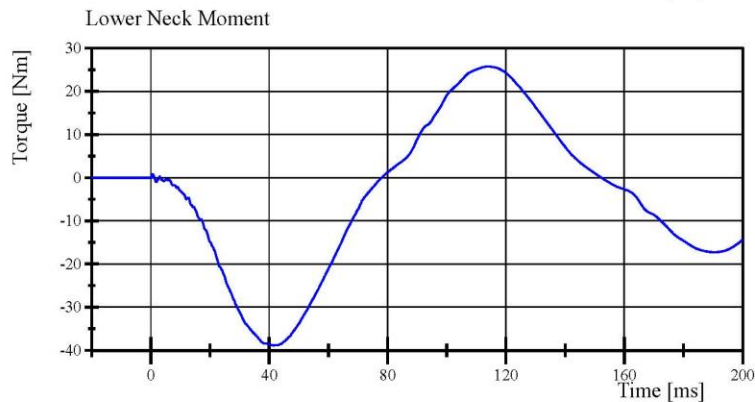
Test Date: 2/23/2021



Filter Class: CFC_60
Max: 46.3 ° at 45.3 ms
Min: -33.6 ° at 117.7 ms



Filter Class: CFC_60
Max: 1,826.8 °/s at 88.8 ms
Min: -1,564.2 °/s at 24.1 ms



Filter Class: CFC_600
Max: 25.8 Nm at 114.1 ms
Min: -38.9 Nm at 41.4 ms

Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

02.23.2021 14:50:07 4007



Transportation Research Center Inc.

Left Lateral Shoulder
WorldSID 50th Serial No. EB8888 Certification No. 8-1
Test Date: 3/8/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Force	2,600 - 3,300 N	2,911.2 N	Yes
Shoulder Force	(-1,470) - (-1,800) N	-1,661.3 N	Yes
Shoulder Rib Length Change	37 - 46 mm	41.5 mm	Yes

Test meets specifications.

Condition: Used

Comments:

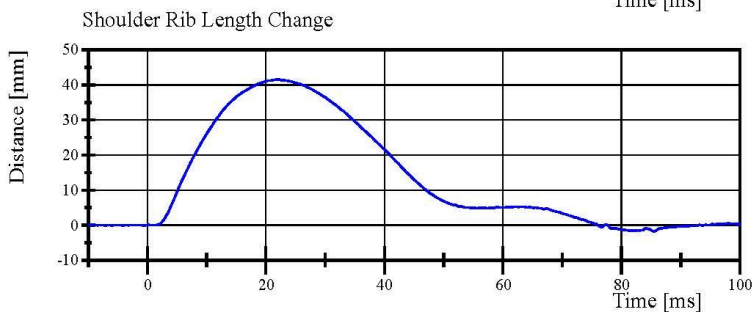
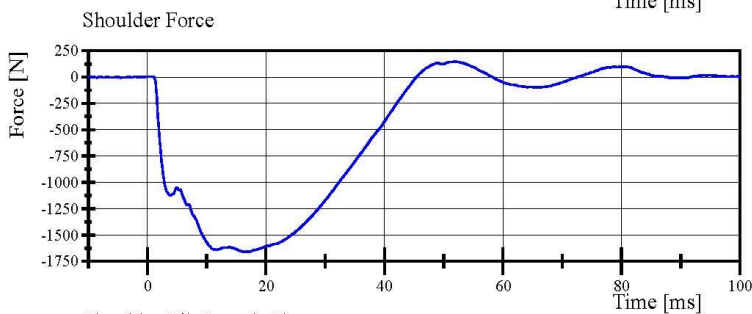
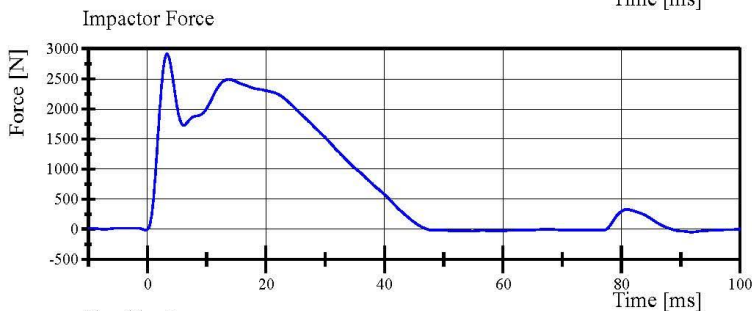
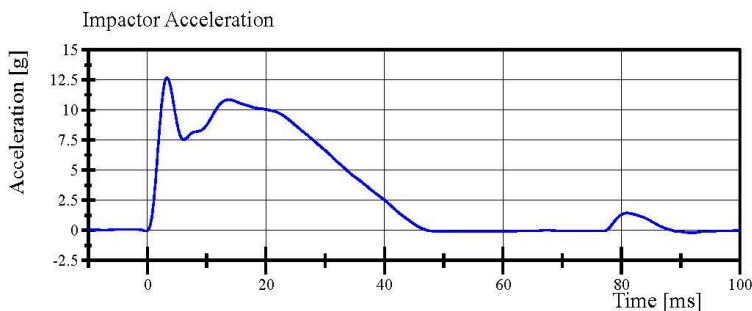
Arm S/N: EG3799

Shoulder Rib S/N: DW1916

RibEye S/N: 124

Transportation Research Center Inc.

Left Lateral Shoulder
WorldSID 50th Serial No. EB8888 Certification No. 8-1
Test Date: 3/8/2021



Transportation Research Center Inc.

Left Lateral Thorax with Arm
WorldSID 50th Serial No. EB8888 Certification No. 8-7
Test Date: 3/10/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.71 m/s	Yes
Impactor Force	5,300 - 6,200 N	5,716.7 N	Yes
Peak Thorax Rib 1 Length Change	35 - 47 mm	40.9 mm	Yes
Peak Thorax Rib 2 Length Change	46 - 56 mm	46.5 mm	Yes
Peak Thorax Rib 3 Length Change	33.5 - 40.5 mm	34.12 mm	Yes
Peak T4 Acceleration, y-axis	28 - 37 g	33.8 g	Yes
Peak T12 Acceleration, y-axis	22 - 28 g	24.2 g	Yes

Test meets specifications.

Condition: Used

Comments:

Arm S/N: EG3799

Shoulder Rib S/N: DW1916

Thorax Rib 1 S/N: EB5400

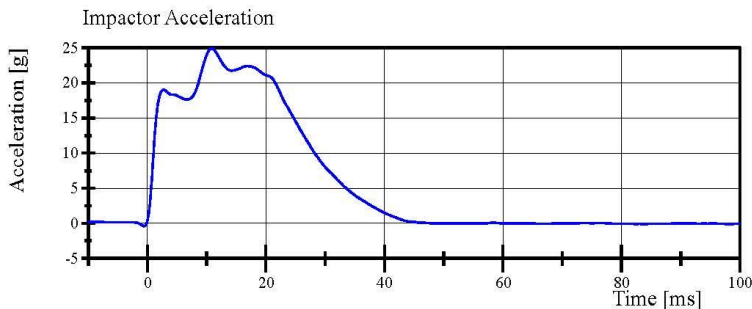
Thorax Rib 2 S/N: EB5401

Thorax Rib 3 S/N: EB5402

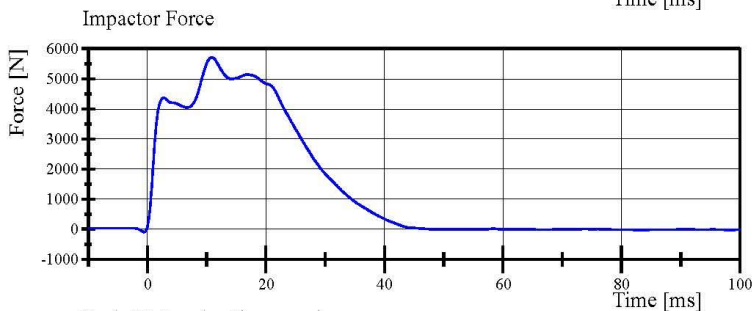
RibEye S/N: 124

Transportation Research Center Inc.

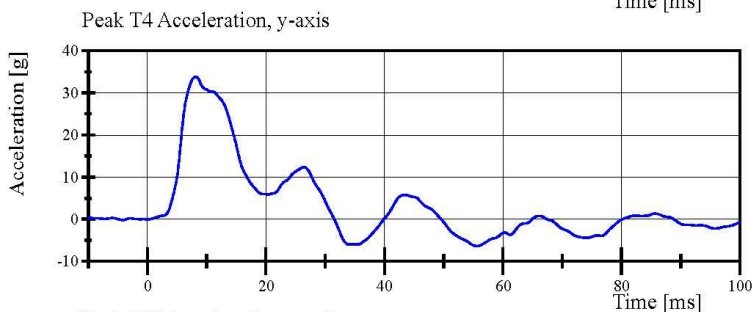
Left Lateral Thorax with Arm
WorldSID 50th Serial No. EB8888 Certification No. 8-7
Test Date: 3/10/2021



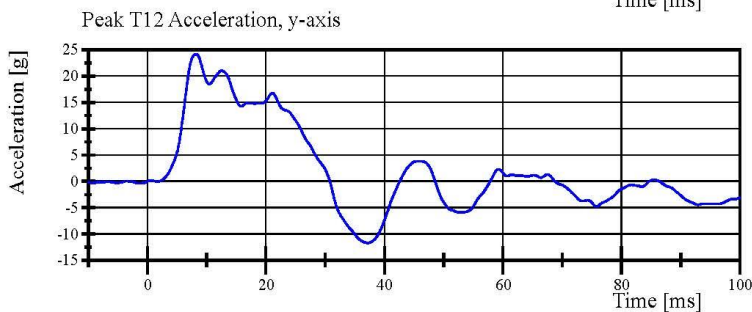
Filter Class: CFC_180
Max: 24.9 g at 10.9 ms
Min: -0.4 g at -0.6 ms



Filter Class: CFC_180
Max: 5,716.7 N at 10.9 ms
Min: -90.4 N at -0.6 ms



Filter Class: CFC_180
Max: 33.8 g at 8.2 ms
Min: -6.4 g at 55.6 ms



Filter Class: CFC_180
Max: 24.2 g at 8.2 ms
Min: -11.7 g at 37.2 ms

Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.10.2021 15:15:52 996

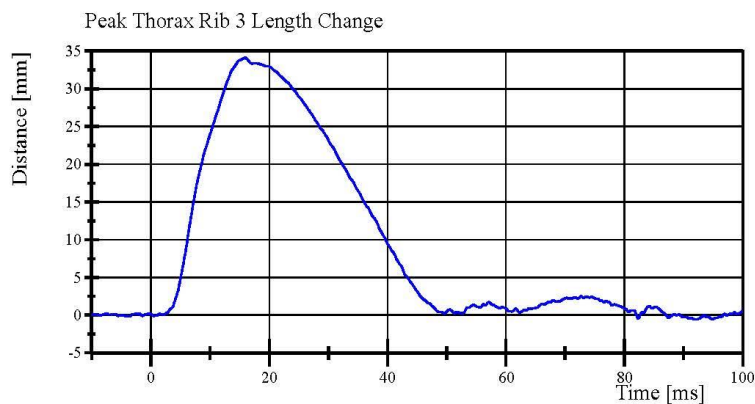
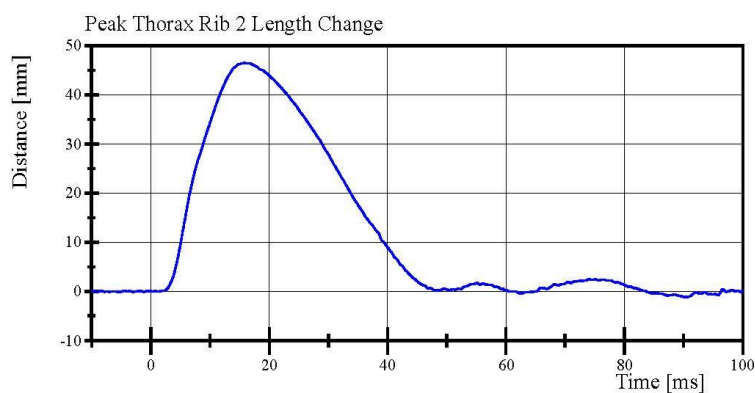
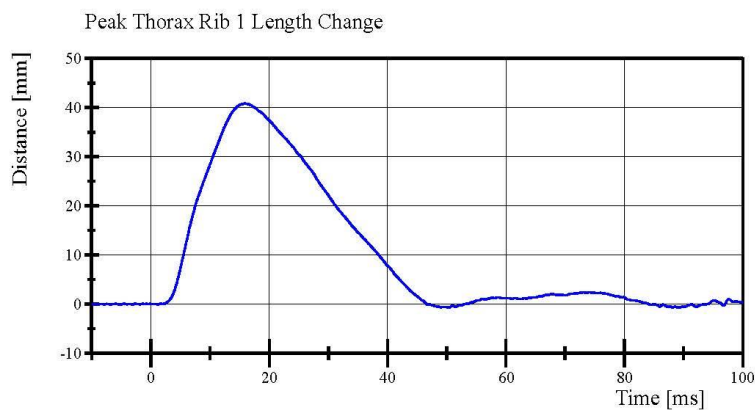


Report Number: EB8888_WSH08

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Transportation Research Center Inc.

Left Lateral Thorax with Arm
WorldSID 50th Serial No. EB8888 Certification No. 8-7
Test Date: 3/10/2021



Transportation Research Center Inc.

Left Lateral Thorax without Arm
WorldSID 50th Serial No. EB8888 Certification No. 8-3
Test Date: 3/8/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Impactor Force	3,200 - 3,800 N	3,547.6 N	Yes
Peak Thorax Rib 1 Length Change	33 - 43 mm	34.7 mm	Yes
Peak Thorax Rib 2 Length Change	35 - 43 mm	41.2 mm	Yes
Peak Thorax Rib 3 Length Change	32 - 40 mm	36.1 mm	Yes
Peak T4 Acceleration, y-axis	14 - 20 g	17.1 g	Yes
Peak T12 Acceleration, y-axis	14 - 22 g	16.0 g	Yes

Test meets specifications.

Condition: Used

Comments:

Thorax Rib 1 S/N: EB5400

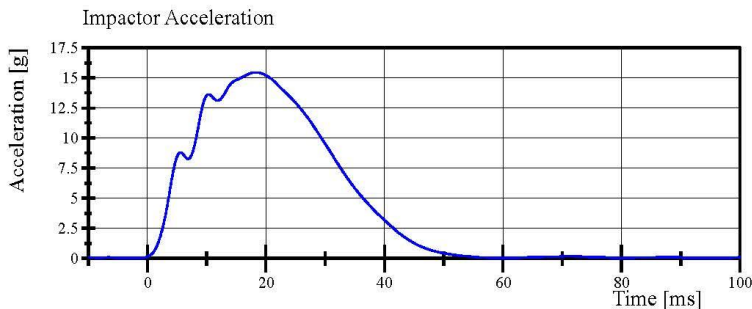
Thorax Rib 2 S/N: EB5401

Thorax Rib 3 S/N: EB5402

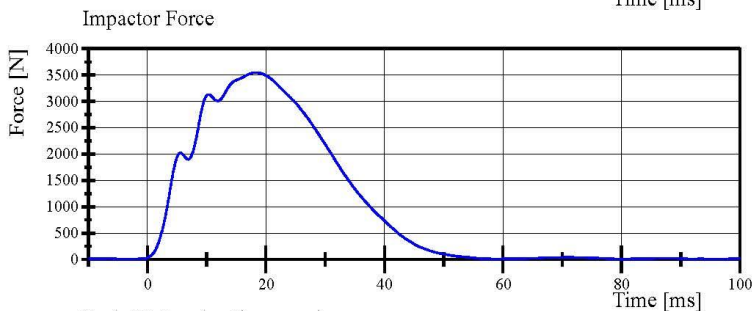
RibEye S/N: 124

Transportation Research Center Inc.

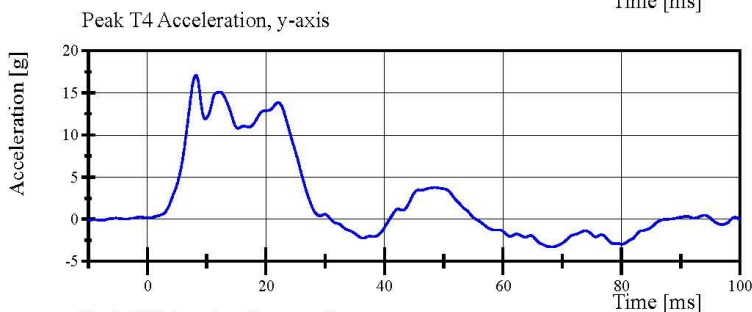
Left Lateral Thorax without Arm
WorldSID 50th Serial No. EB8888 Certification No. 8-3
Test Date: 3/8/2021



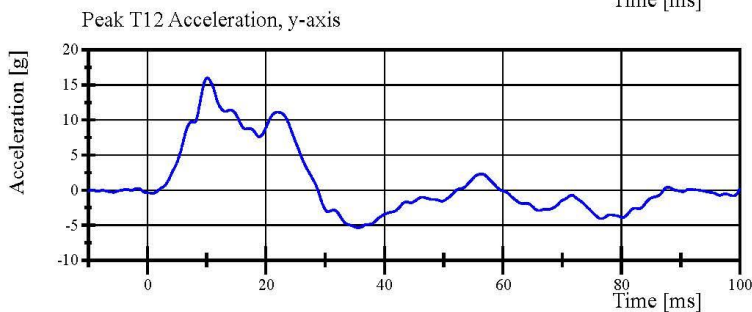
Filter Class: CFC_180
Max: 15.5 g at 18.3 ms
Min: 0.0 g at 80.1 ms



Filter Class: CFC_180
Max: 3,547.6 N at 18.3 ms
Min: 4.8 N at 80.1 ms



Filter Class: CFC_180
Max: 17.1 g at 8.2 ms
Min: -3.3 g at 68.4 ms

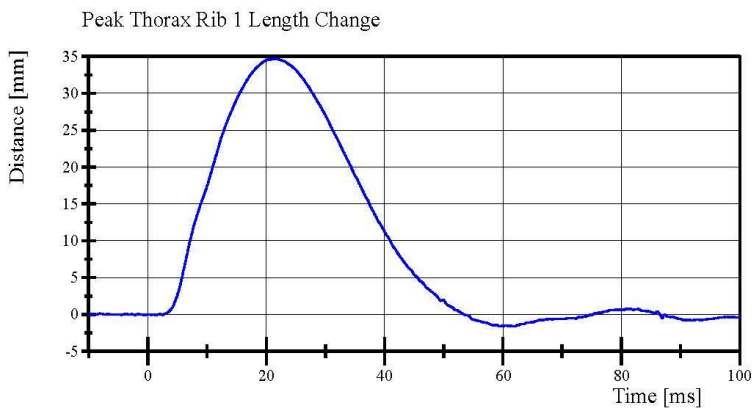


Filter Class: CFC_180
Max: 16.0 g at 10.1 ms
Min: -5.4 g at 35.7 ms

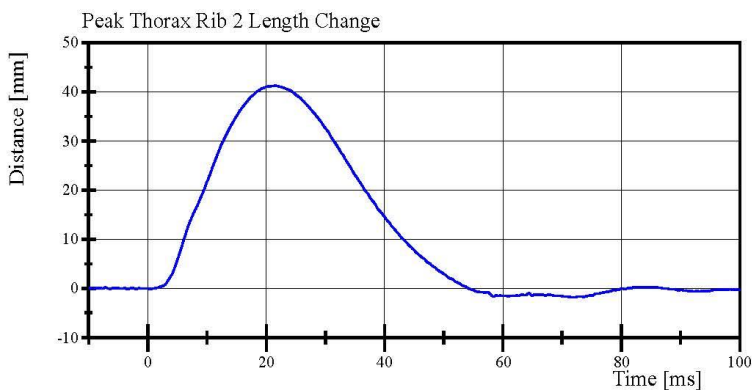


Transportation Research Center Inc.

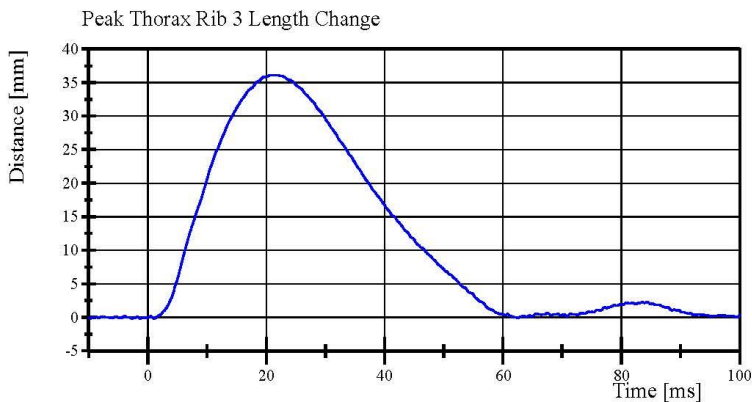
Left Lateral Thorax without Arm
WorldSID 50th Serial No. EB8888 Certification No. 8-3
Test Date: 3/8/2021



Filter Class: CFC_600
Max: 34.7 mm at 21.6 ms
Min: -1.6 mm at 61.9 ms



Filter Class: CFC_600
Max: 41.2 mm at 21.6 ms
Min: -1.8 mm at 72.0 ms



Filter Class: CFC_600
Max: 36.1 mm at 20.9 ms
Min: -0.2 mm at 1.1 ms



Transportation Research Center Inc.

Left Lateral Abdomen
WorldSID 50th Serial No. EB8888 Certification No. 8-1
Test Date: 3/8/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Force	2,700 - 3,100 N	3,037.8 N	Yes
Peak Abdomen Rib 1 Length Change	32.5 - 39.5 mm	32.82 mm	Yes
Peak Abdomen Rib 2 Length Change	32 - 38 mm	32.5 mm	Yes
Peak T12 Acceleration, y-axis	14.5 - 19.5 g	17.96 g	Yes

Test meets specifications.

Condition: Used

Comments:

Abdomen Rib #1 S/N: DY5252

Abdomen Rib #2 S/N: DY5253

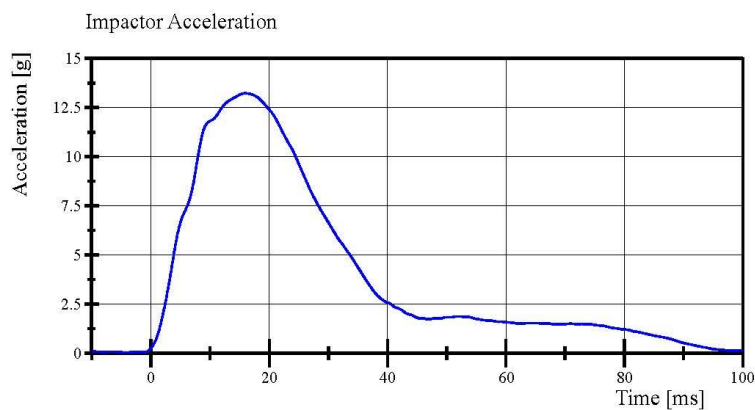
RibEye S/N: 124

Transportation Research Center Inc.

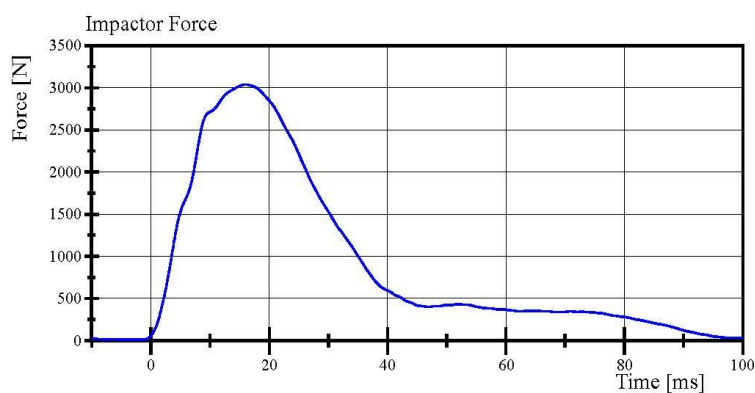
Left Lateral Abdomen

WorldSID 50th Serial No. EB8888 Certification No. 8-1

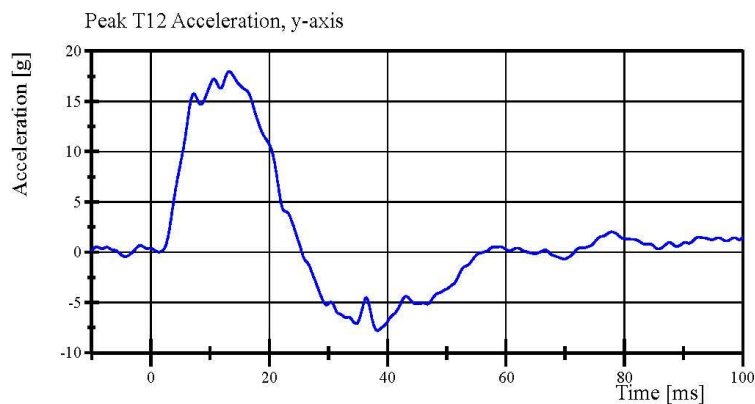
Test Date: 3/8/2021



Filter Class: CFC_180
Max: 13.2 g at 16.0 ms
Min: 0.0 g at -4.1 ms



Filter Class: CFC_180
Max: 3,037.8 N at 16.0 ms
Min: 10.0 N at -4.1 ms



Filter Class: CFC_180
Max: 18.0 g at 13.3 ms
Min: -7.8 g at 38.3 ms

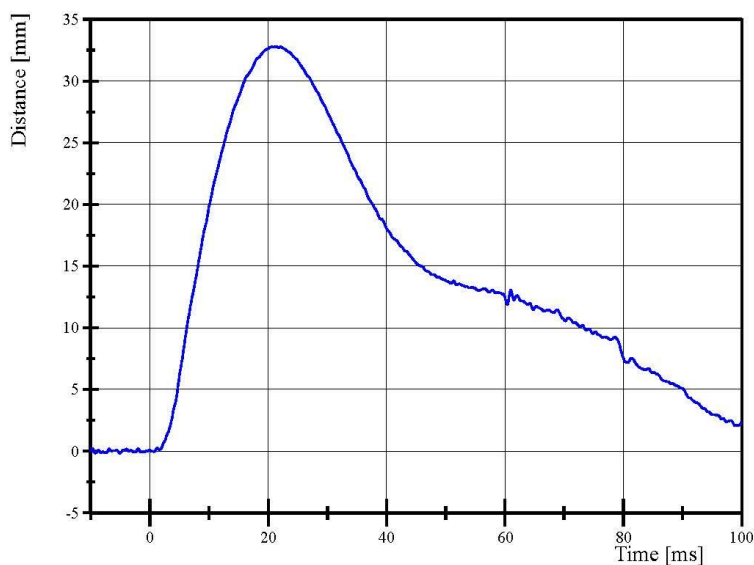
Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID 50th Serial No. EB8888 Certification No. 8-1

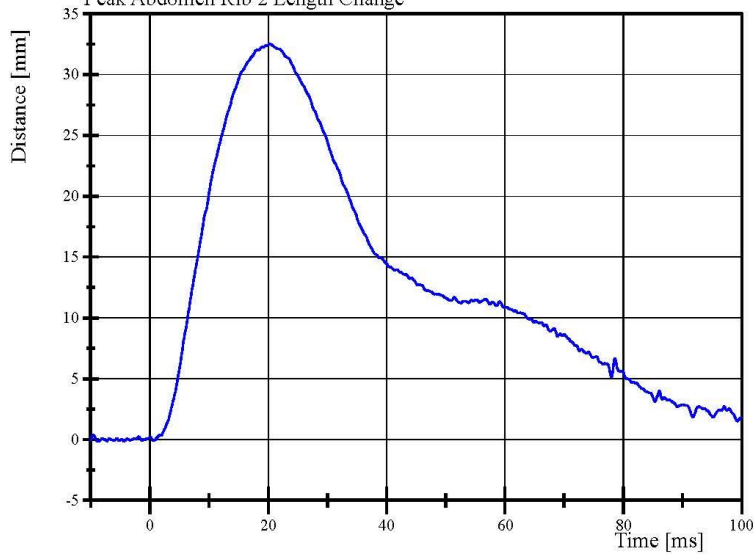
Test Date: 3/8/2021

Peak Abdomen Rib 1 Length Change



Filter Class: CFC_600
Max: 32.8 mm at 21.3 ms
Min: -0.2 mm at -5.0 ms

Peak Abdomen Rib 2 Length Change



Filter Class: CFC_600
Max: 32.5 mm at 20.3 ms
Min: -0.1 mm at -4.3 ms

Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

03.08.2021 10:39:43 997



Report Number: EB8888_WSH08

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Transportation Research Center Inc.

Left Lateral Pelvis
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.71 m/s	Yes
Impactor Force	6,800 - 8,200 N	7,502.0 N	Yes
Pelvis Lateral Acceleration	38.5 - 48.5 g	41.70 g	Yes
Peak T12 Acceleration, y-axis	10 - 14 g	12.6 g	Yes
Pubic Lateral Force	(-1,300) - (-1,590) N	-1,372.9 N	Yes
Sacroiliac Lateral Force	(-1,860) - (-2,280) N	-2,083.6 N	Yes

Test meets specifications.

Condition: Used

Comments:

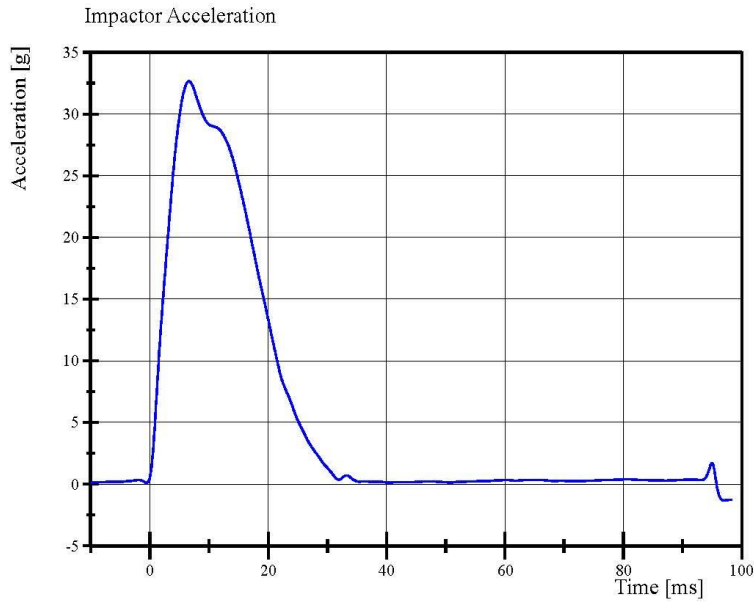
Pelvis S/N: EC3628

Transportation Research Center Inc.

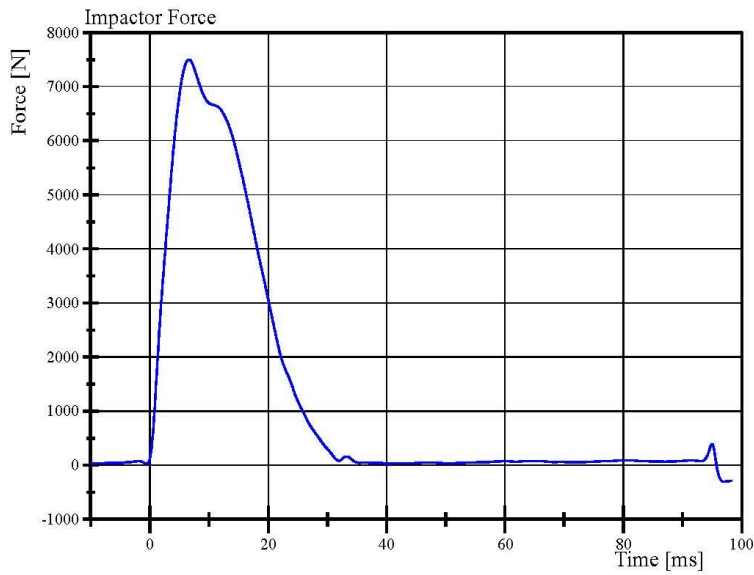
Left Lateral Pelvis

WorldSID 50th Serial No. EB8888 Certification No. 7-1

Test Date: 2/25/2021



Filter Class: CFC_180
Max: 32.7 g at 6.6 ms
Min: -1.3 g at 97.0 ms



Filter Class: CFC_180
Max: 7,502.0 N at 6.6 ms
Min: -302.4 N at 97.0 ms

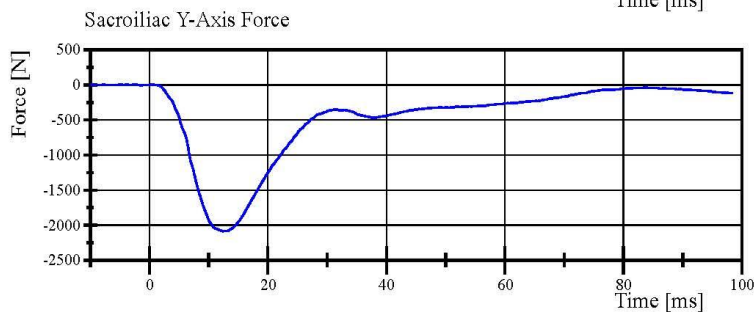
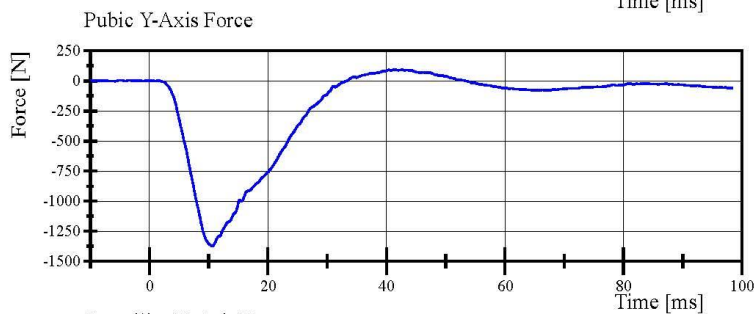
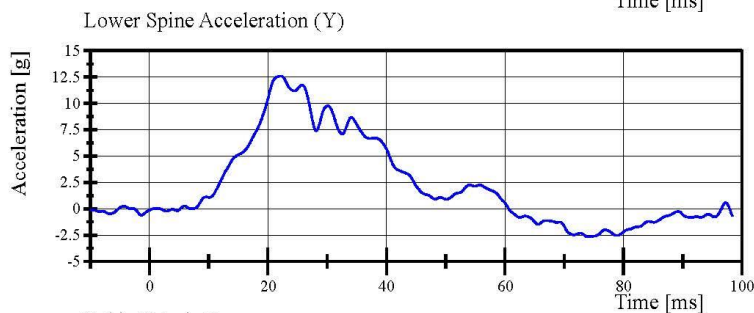
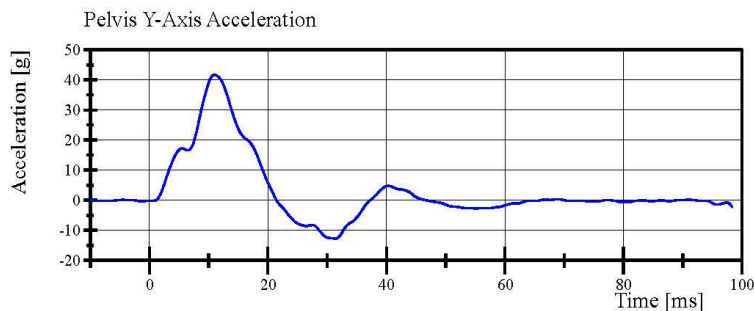
Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

02.25.2021 13:58:39 1033



Transportation Research Center Inc.

Left Lateral Pelvis
WorldSID 50th Serial No. EB8888 Certification No. 7-1
Test Date: 2/25/2021



Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

02.25.2021 13:58:40 1033



Post-Test Calibration Sheets
Driver S/N EB8888

Transportation Research Center Inc.
WorldSID-50M
External Measurements
Serial No. EB8888 Certification No. 09

WorldSID-50M Angular Reference Measurements					
Parameter	Symbol	Tilt Sensor (°)	Inclinometer (°)		
			Center	Left	Right
Head X-Axis	A1	0	n/a	n/a	n/a
Head Y-Axis	A2	2.2	n/a	2	Note 1
Neck Bracket X-Axis	A3	n/a	-0.5	n/a	n/a
Neck Bracket Y-Axis	A4	n/a	-3.1	n/a	n/a
Thorax X-Axis	A5	1.3	n/a	n/a	n/a
Thorax Y-Axis	A6	3.9	n/a	n/a	n/a
Pelvis X-Axis	A7	0.7	n/a	n/a	n/a
Pelvis Y-Axis	A8	10.2	n/a	n/a	n/a
H-point Tool	A9	n/a	n/a	33.1	33.9

WorldSID-50M External Linear Dimensions				
Parameter	Symbol	Specification (mm)		
		Center	Left	Right
Seated Height	L1	870	n/a	n/a
Hip Pivot Height	L2	n/a	89	89
Hip Pivot to Back Line	L3	n/a	187	177
Thigh Clearance	L4	n/a	181	180
Knee Height	L5	n/a	580	583
Knee to Backline	L6	n/a	667	670
Head Back to Seat Back	L7	156	n/a	n/a
Thorax Rib 1 Front to Back	L8	n/a	209	209
Abdomen Rib 2 Front to Back	L9	n/a	223	226
Arm Length	L10	n/a	330	330
Width Across Arms	L11	482	n/a	n/a
Waist Width	L12	341	n/a	n/a

Note 1: No land marks on the right side of head. Unable to align level.

Transportation Research Center Inc.

Front Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Peak Head Resultant Acceleration	211 - 261 g	234.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	7.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	1.33 %	Yes

Test meets specifications.

Condition: Used

Comments:

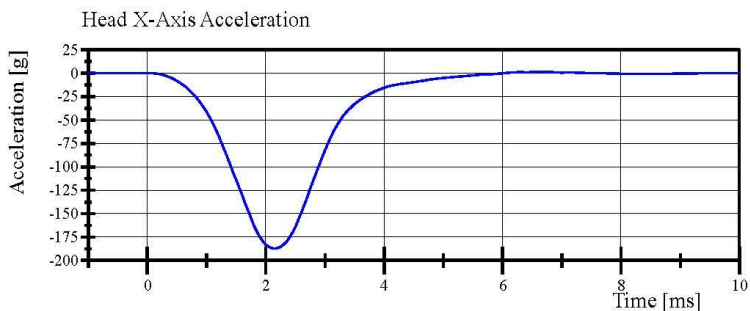
Head Skin S/N: EG2845

Transportation Research Center Inc.

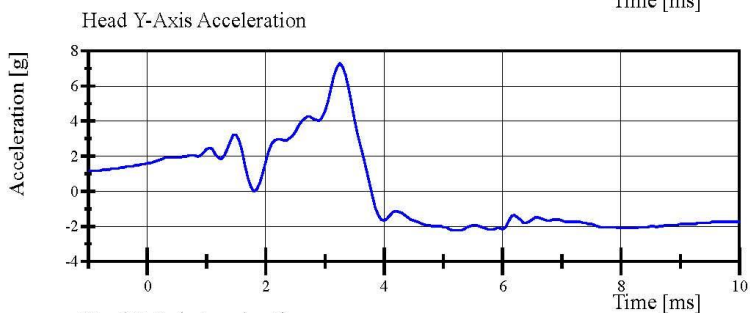
Front Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 9-1

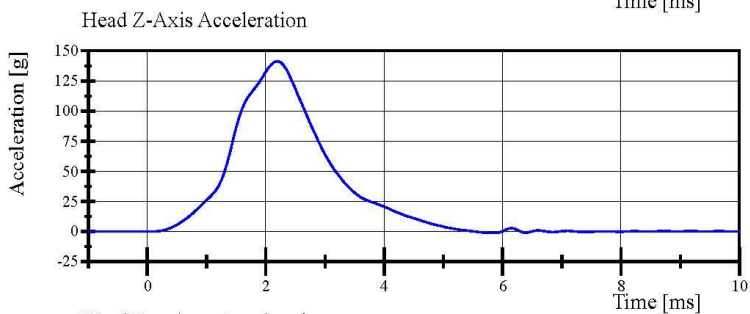
Test Date: 3/25/2021



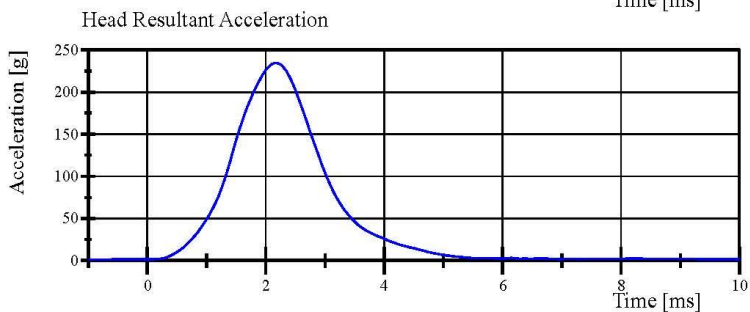
Filter Class: CFC_1000
Max: 1.8 g at 6.7 ms
Min: -187.3 g at 2.2 ms



Filter Class: CFC_1000
Max: 7.3 g at 3.3 ms
Min: -2.2 g at 5.2 ms



Filter Class: CFC_1000
Max: 141.5 g at 2.2 ms
Min: -1.2 g at 5.8 ms



Filter Class: CFC_1000
Max: 234.5 g at 2.2 ms
Min: 1.2 g at -1.0 ms

Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 08:19:21 951



Report Number: EB8888_WSH09

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Transportation Research Center Inc.

Left Lateral Head Drop
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Peak Head Resultant Acceleration	107 - 126 g	113.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	1.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	2.20 %	Yes

Test meets specifications.

Condition: Used

Comments:

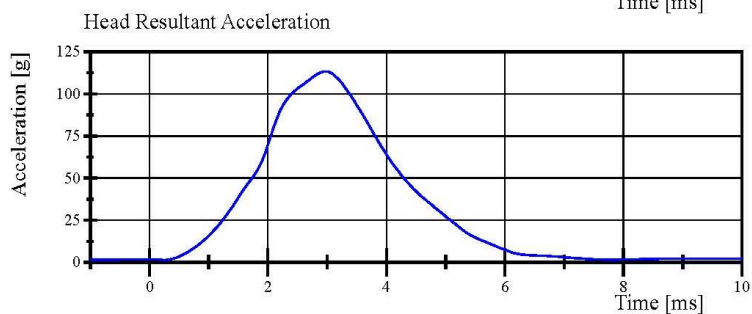
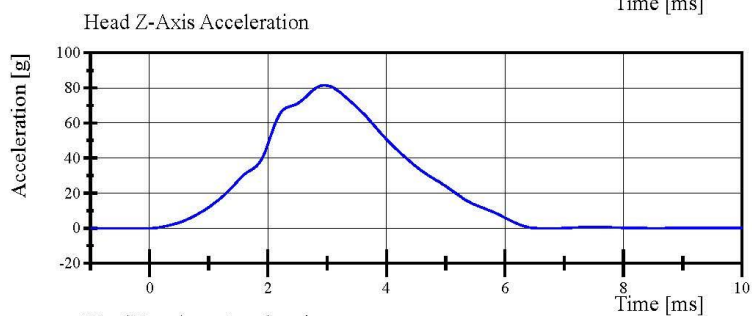
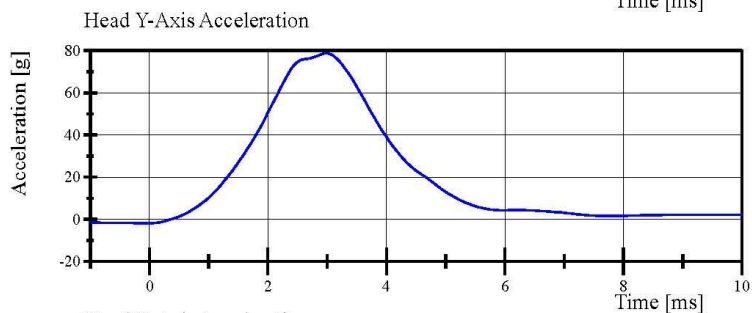
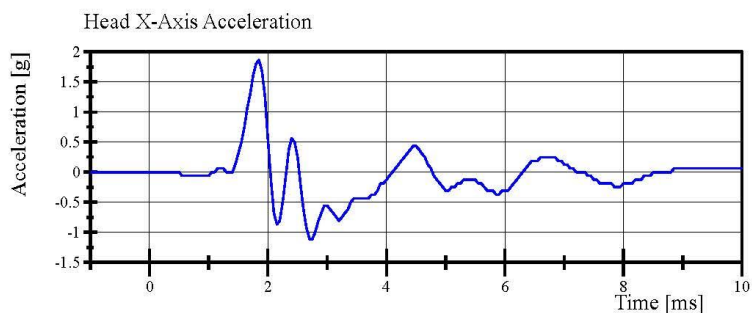
Head Skin S/N: EG2845

Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021



Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 08:39:23 942



Report Number: EB8888_WSH09

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Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Peak Head Resultant Acceleration	107 - 126 g	116.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-3.7 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	2.53 %	Yes

Test meets specifications.

Condition: Used

Comments:

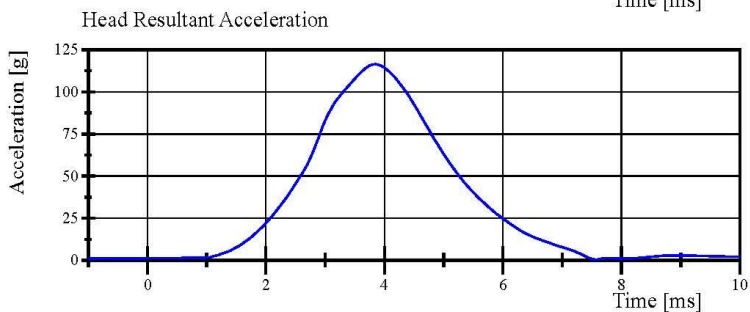
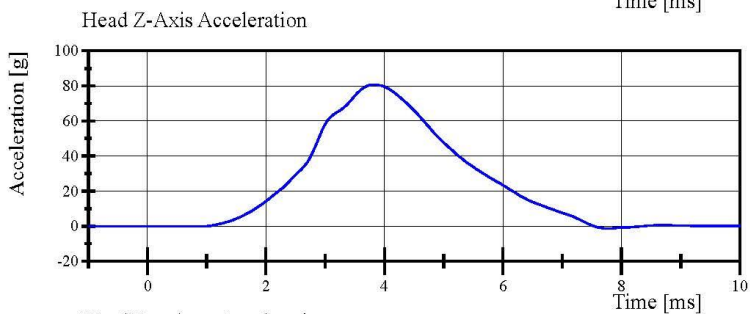
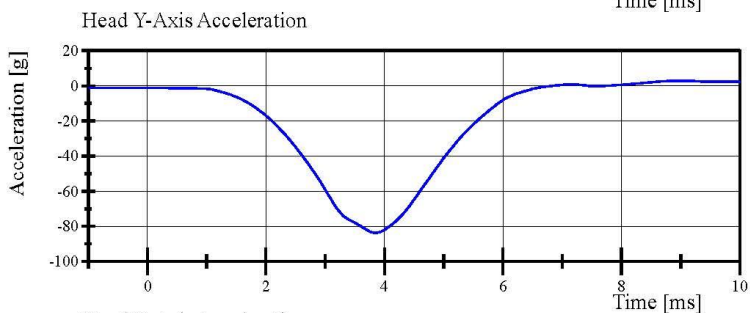
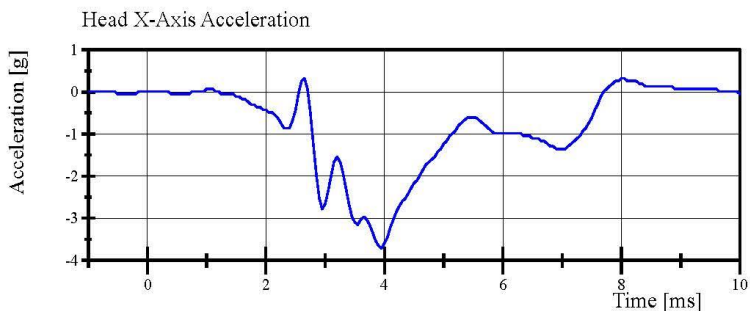
Head Skin S/N: EG2845

Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021



Specification Source: WordSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 08:45:39 928



Report Number: EB8888_WSH09

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Transportation Research Center Inc.

Left Lateral Neck
 WorldSID 50th Serial No. EB8888 Certification No. 9-1
 Test Date: 3/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	(-3.30) - (-3.50) m/s	-3.323 m/s	Yes
Pendulum Integrated Velocity Change at 4 ms	0.87 - 1.09 m/s	1.001 m/s	Yes
Change at 8 ms	1.72 - 2.1 m/s	1.952 m/s	Yes
Change at 12 ms	2.63 - 3.17 m/s	2.940 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-53.4 deg	Yes
Headform Flexion Decay - from Peak to Zero Degrees	58 - 72 ms	60.6 ms	Yes
Total Neck Occipital Condyles Moment	54 - 67 N·m	59.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	71 - 87 ms	75.9 ms	Yes
Maximum Forward Pot Rotation			
Peak	(-32) - (-39) °	-34.6 °	Yes
Time of Peak	56 - 68 ms	61.7 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-29) - (-36) °	-31.0 °	Yes
Time of Peak	56 - 68 ms	61.9 ms	Yes
Maximum Headform Angular Rate	(-2,047) - (-2,503) °/s	-2,278.2 °/s	Yes

Test meets specifications.

Condition: Used

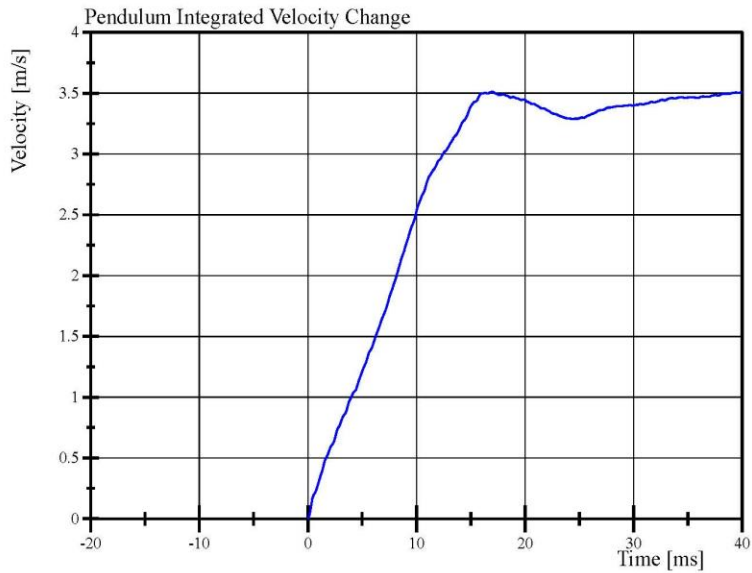
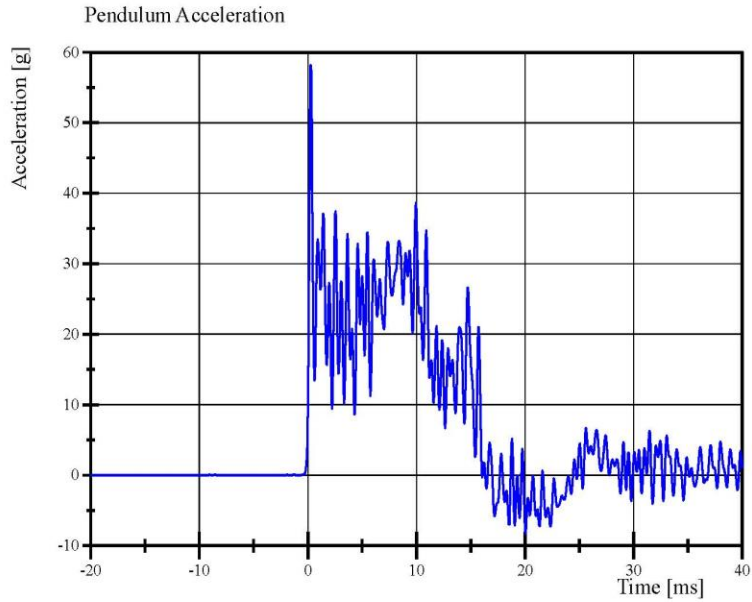
Comments:

Neck S/N: EE8804



Transportation Research Center Inc.

Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



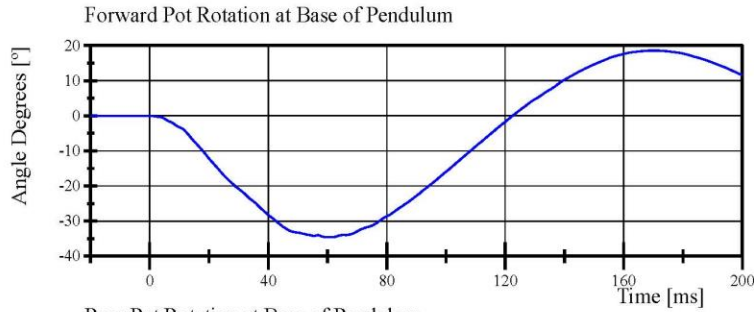
Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

03.25.2021 11:05:18 4010

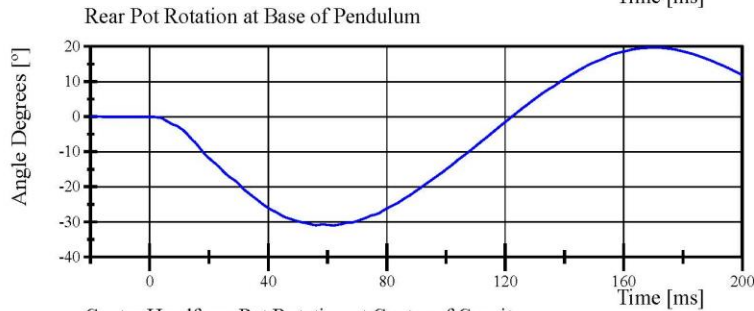


Transportation Research Center Inc.

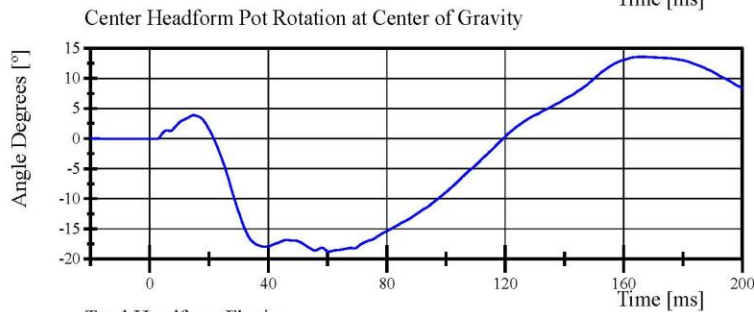
Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



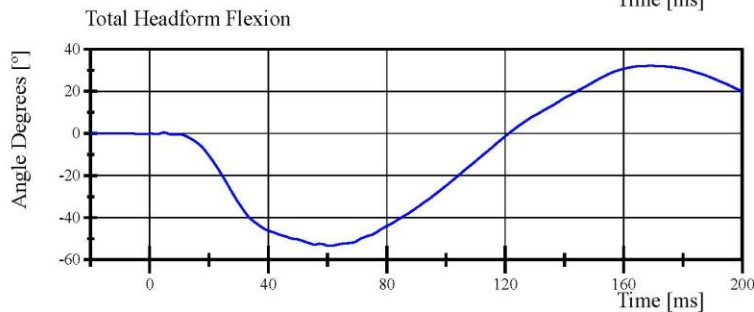
Filter Class: CFC_180
Max: 18.6 ° at 170.2 ms
Min: -34.6 ° at 61.7 ms



Filter Class: CFC_180
Max: 19.7 ° at 170.9 ms
Min: -31.0 ° at 61.9 ms



Filter Class: CFC_180
Max: 13.6 ° at 165.6 ms
Min: -18.8 ° at 60.5 ms



Filter Class: CFC_180
Max: 32.1 ° at 169.2 ms
Min: -53.4 ° at 60.6 ms

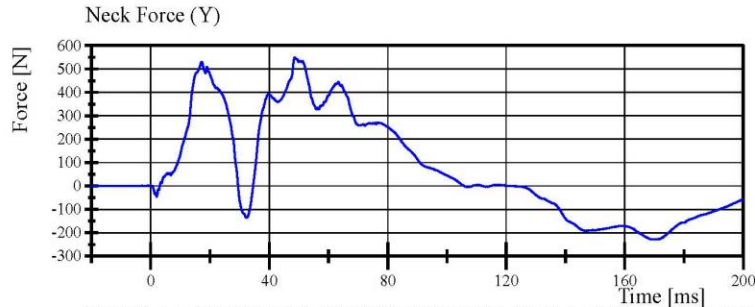
Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 11:05:18 4010

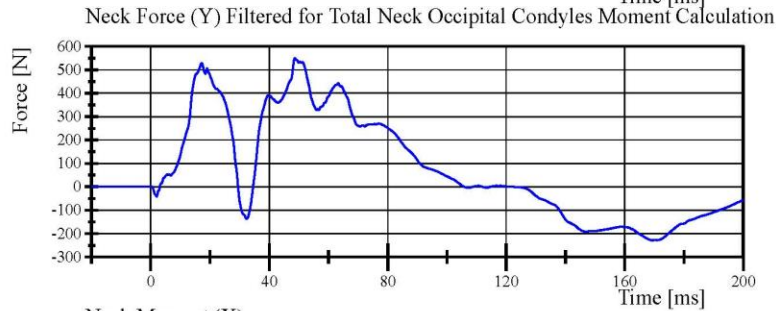


Transportation Research Center Inc.

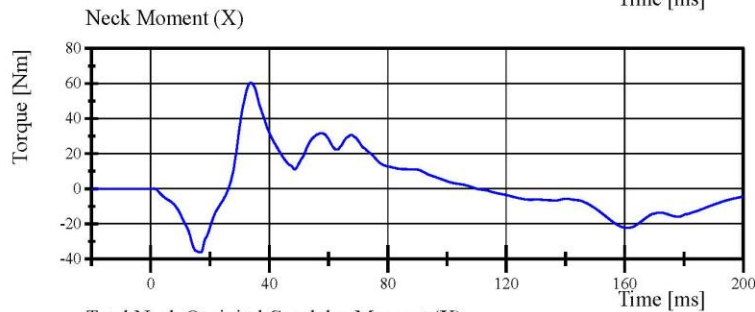
Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



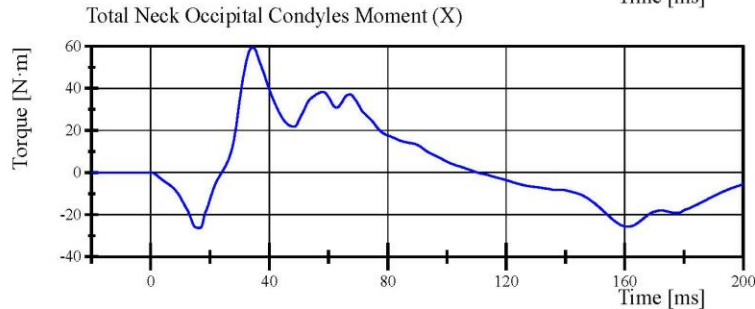
Filter Class: CFC_1000
Max: 550.1 N at 48.6 ms
Min: -228.5 N at 169.1 ms



Filter Class: CFC_600
Max: 549.5 N at 48.7 ms
Min: -228.5 N at 169.3 ms



Filter Class: CFC_600
Max: 60.4 Nm at 33.8 ms
Min: -36.3 Nm at 16.8 ms



Filter Class: Without_(Constar
Max: 59.3 N.m at 34.4 ms
Min: -26.3 N.m at 16.3 ms

Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 11:05:19 4010

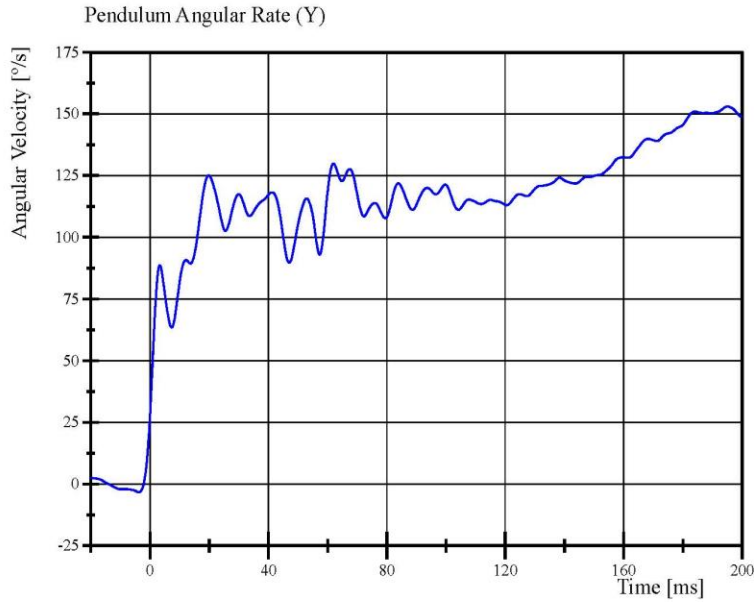
Report Number: EB8888_WSH09

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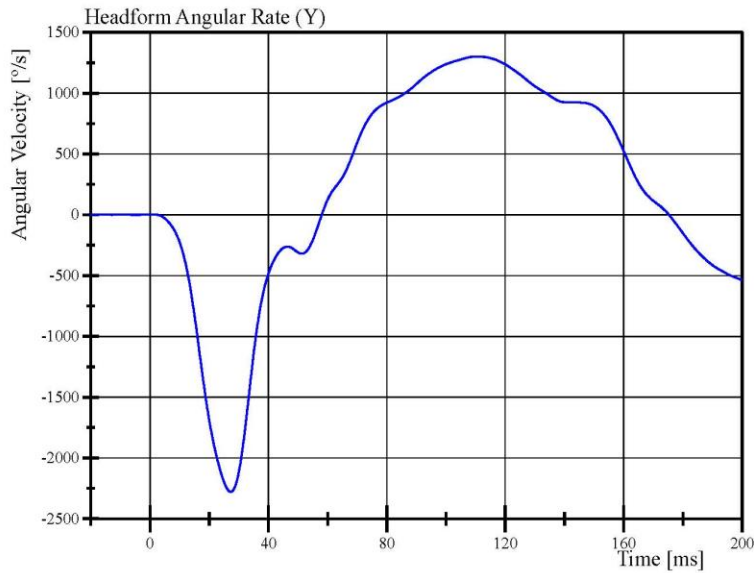


Transportation Research Center Inc.

Left Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



Filter Class: CFC_60
Max: 153.0 °/s at 195.0 ms
Min: -3.4 °/s at -3.8 ms



Filter Class: CFC_60
Max: 1,300.9 °/s at 110.5 ms
Min: -2,278.2 °/s at 27.3 ms



Transportation Research Center Inc.

Right Lateral Neck
 WorldSID 50th Serial No. EB8888 Certification No. 9-1
 Test Date: 3/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	3.30 - 3.50 m/s	3.332 m/s	Yes
Pendulum Integrated Velocity Change at 4 ms	(-0.87) - (-1.09) m/s	-0.969 m/s	Yes
Change at 8 ms	(-1.72) - (-2.1) m/s	-1.938 m/s	Yes
Change at 12 ms	(-2.63) - (-3.17) m/s	-2.901 m/s	Yes
Maximum Headform Flexion	50 - 61 deg	53.8 deg	Yes
Headform Flexion Decay - from Peak to Zero Degrees	58 - 72 ms	61.0 ms	Yes
Total Neck Occipital Condyles Moment	(-54) - (-67) N·m	-62.2 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	71 - 87 ms	76.9 ms	Yes
Maximum Forward Pot Rotation			
Peak	32 - 39 °	34.8 °	Yes
Time of Peak	56 - 68 ms	61.2 ms	Yes
Maximum Rear Pot Rotation			
Peak	29 - 36 °	31.1 °	Yes
Time of Peak	56 - 68 ms	62.2 ms	Yes
Maximum Headform Angular Rate	2,047 - 2,503 %/s	2,289.6 %/s	Yes

Test meets specifications.

Condition: Used

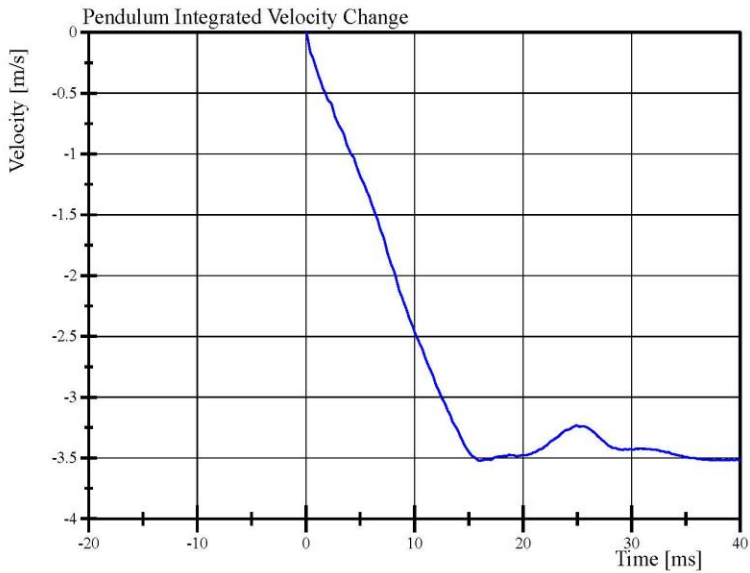
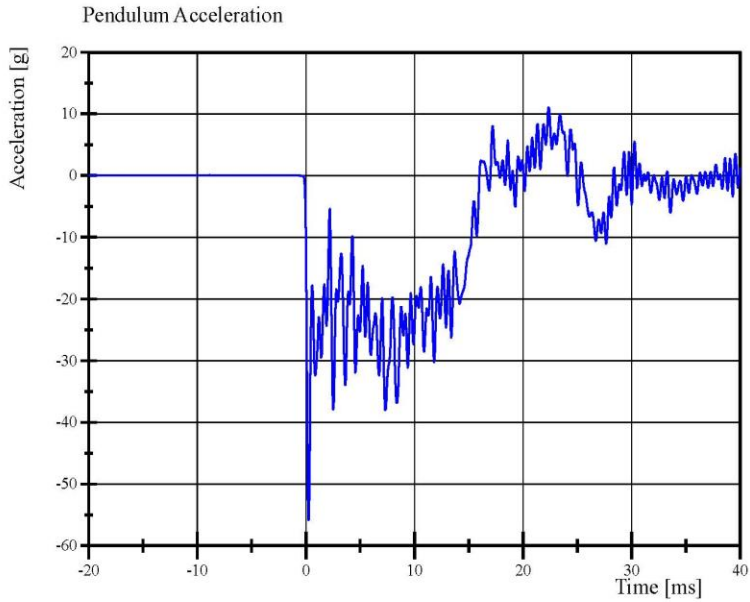
Comments:

Neck S/N: EE8804



Transportation Research Center Inc.

Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

03.25.2021 12:40:55 4008

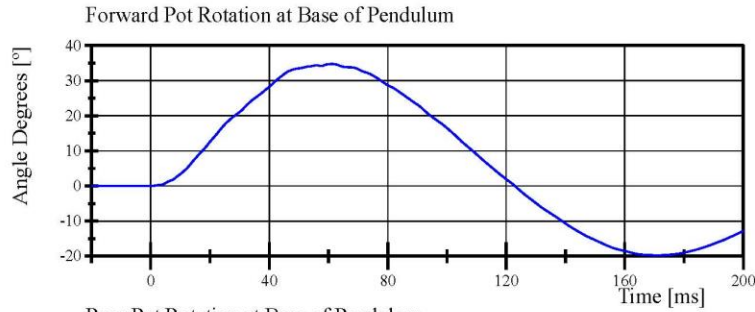


Report Number: EB8888_WSH09

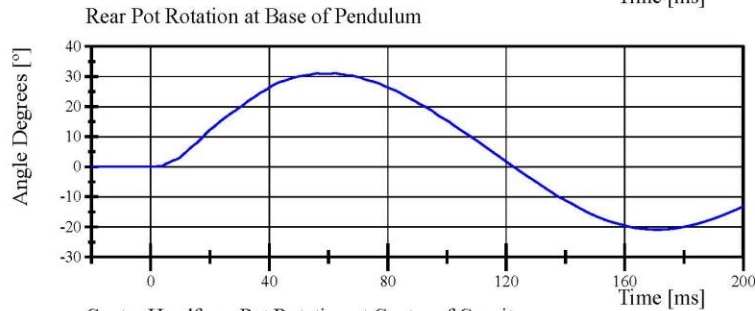
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Transportation Research Center Inc.

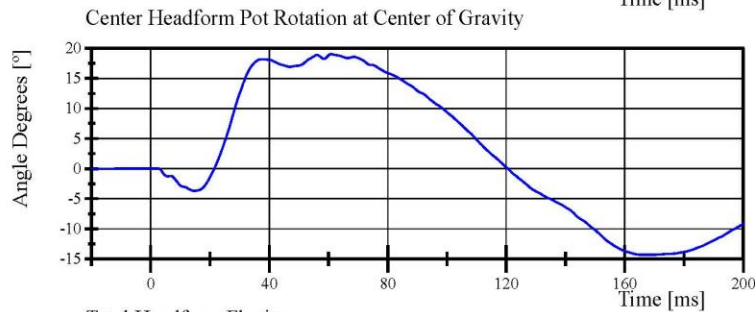
Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



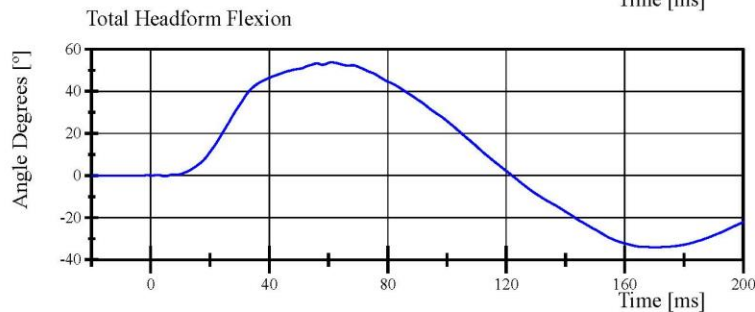
Filter Class: CFC_180
Max: 34.8 ° at 61.2 ms
Min: -19.8 ° at 171.0 ms



Filter Class: CFC_180
Max: 31.1 ° at 62.2 ms
Min: -20.9 ° at 171.1 ms



Filter Class: CFC_180
Max: 19.0 ° at 60.9 ms
Min: -14.3 ° at 165.5 ms



Filter Class: CFC_180
Max: 53.8 ° at 61.0 ms
Min: -34.1 ° at 170.7 ms

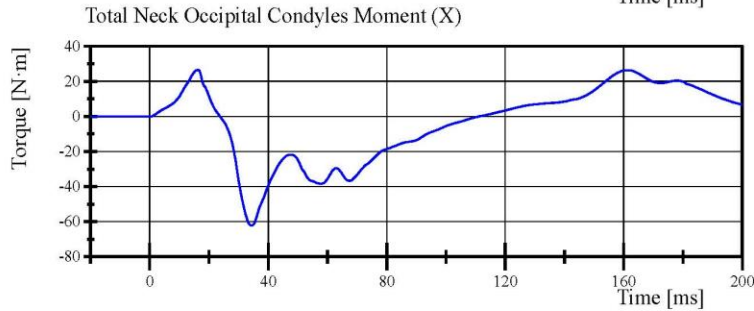
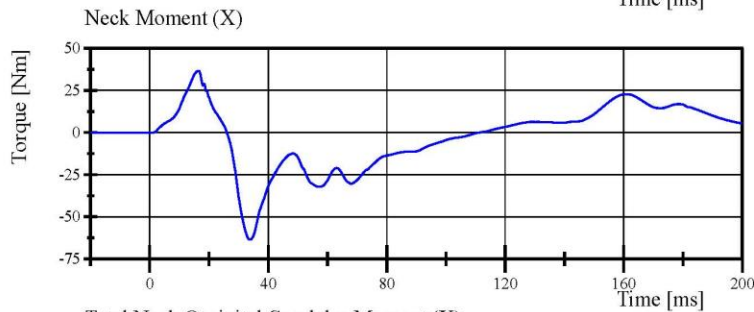
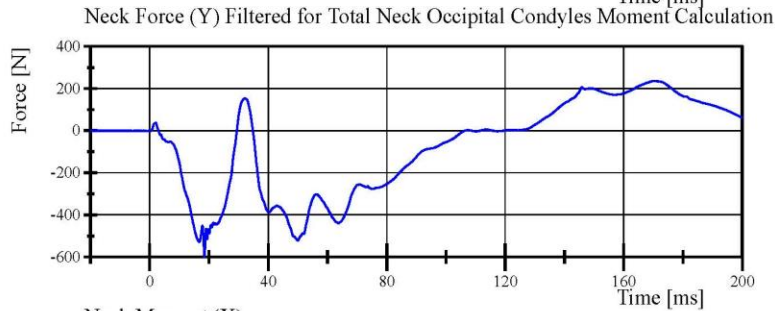
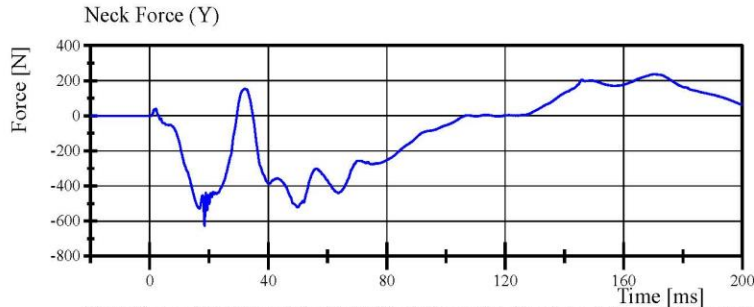
Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 12:40:55 4008



Transportation Research Center Inc.

Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



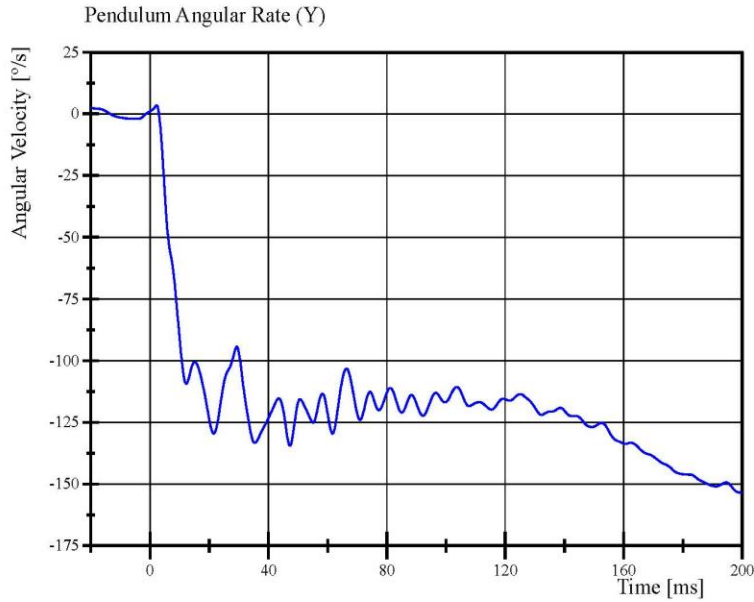
Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 12:40:55 4008

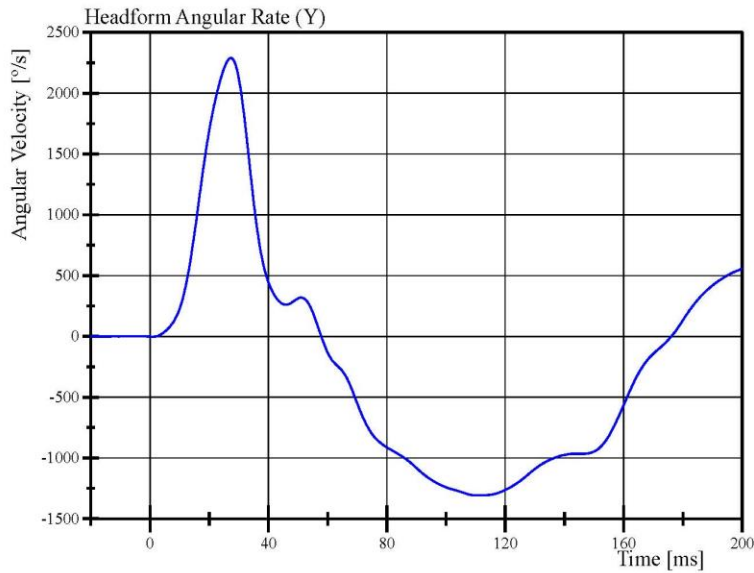


Transportation Research Center Inc.

Right Lateral Neck
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



Filter Class: CFC_60
Max: 3.4 °/s at 2.3 ms
Min: -153.6 °/s at 200.0 ms



Filter Class: CFC_60
Max: 2,289.6 °/s at 27.4 ms
Min: -1,307.8 °/s at 111.0 ms

Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

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Transportation Research Center Inc.

Left Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	5.1 - 5.3 m/s	5.18 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.09 - 2.37 m/s	2.364 m/s	Yes
Change at 15 ms	3.19 - 3.63 m/s	3.565 m/s	Yes
Change at 20 ms	4.27 - 4.87 m/s	4.771 m/s	Yes
Peak Fixture Rotation	(-41.5) - (-51) °	-48.01 °	Yes
Decay Time to 0 deg from Peak Angle	35 - 43 ms	40.4 ms	Yes
Peak Head Angular Velocity Z-axis	(-1,345) - (-1,655) %/s	-1,590.8 %/s	Yes
Peak Lower Neck Moment Z-axis	34 - 42 N·m	37.5 N·m	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE8804

Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

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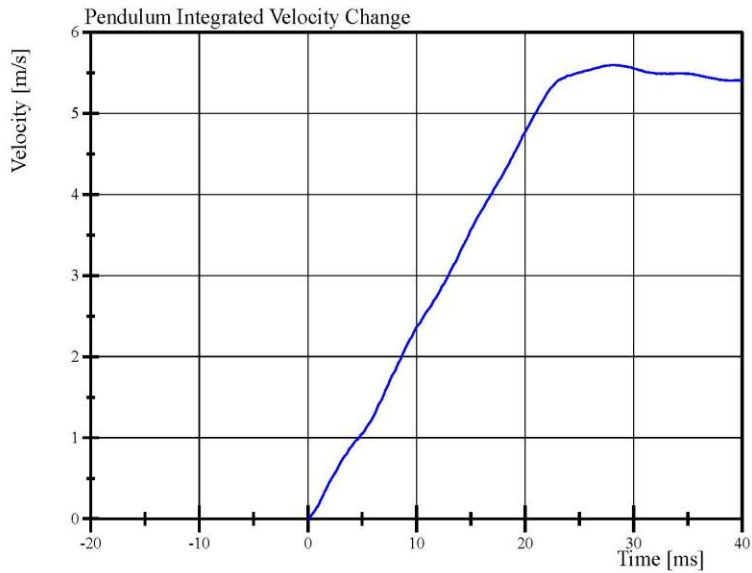
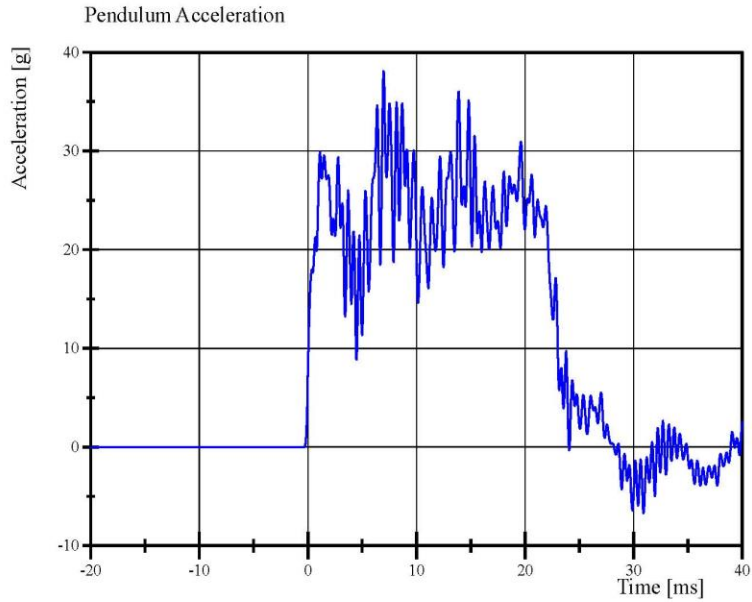


Transportation Research Center Inc.

Left Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021



Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

03.25.2021 13:52:31 4010



Report Number: EB8888_WSH09

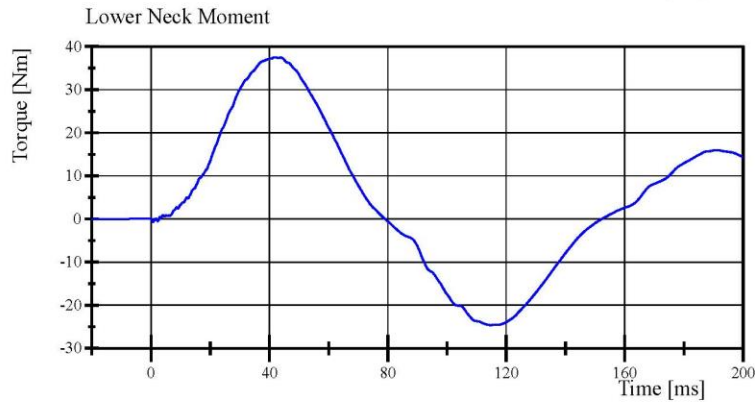
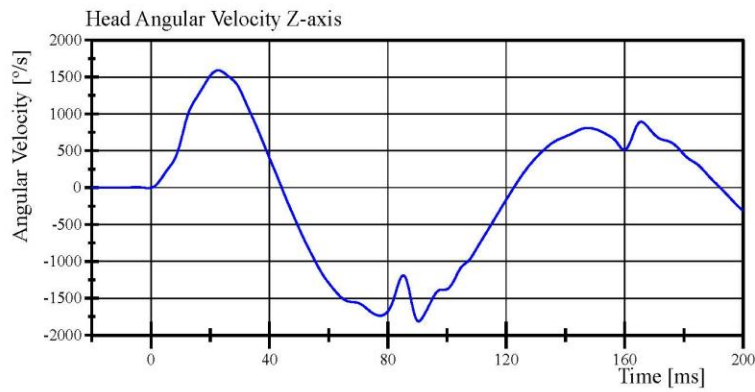
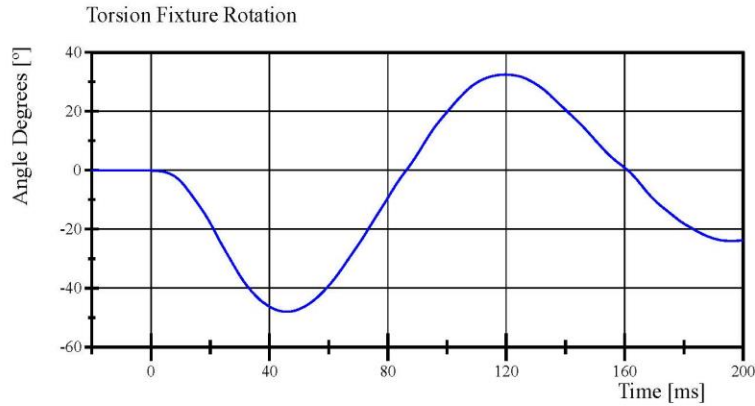
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Transportation Research Center Inc.

Left Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021



Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

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Transportation Research Center Inc.

Right Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/25/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Velocity	5.1 - 5.3 m/s	5.18 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.09 - 2.37 m/s	2.249 m/s	Yes
Change at 15 ms	3.19 - 3.63 m/s	3.373 m/s	Yes
Change at 20 ms	4.27 - 4.87 m/s	4.527 m/s	Yes
Peak Fixture Rotation	41.5 - 51 °	47.63 °	Yes
Decay Time to 0 deg from Peak Angle	35 - 43 ms	40.1 ms	Yes
Peak Head Angular Velocity Z-axis	1,345 - 1,655 °/s	1,572.6 °/s	Yes
Peak Lower Neck Moment Z-axis	(-34) - (-42) N·m	-37.9 N·m	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE8804

Specification Source: WorldSID 50th(W5) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

Report Number: EB8888_WSH09

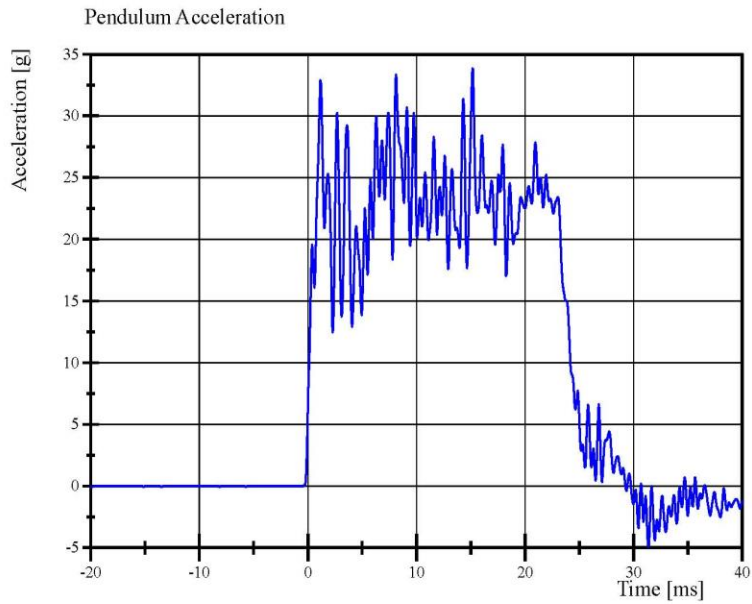
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03.25.2021 14:24:23 4009

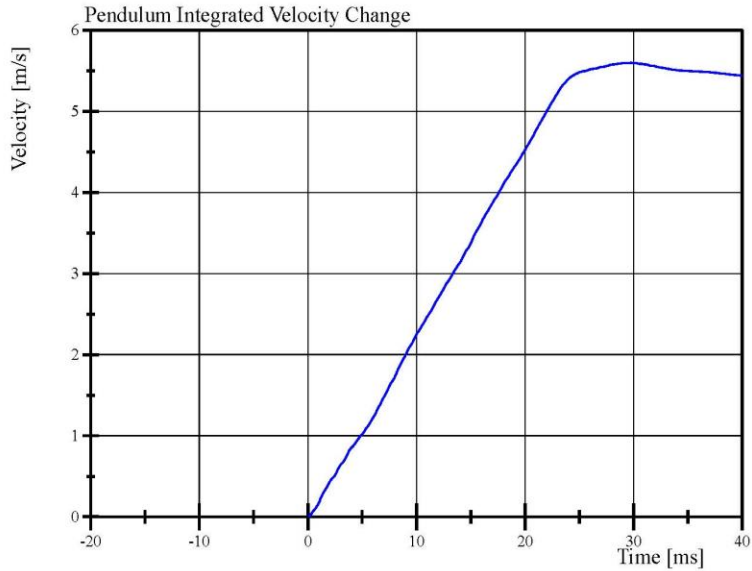


Transportation Research Center Inc.

Right Lateral Torsion
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/25/2021



Filter Class: CFC_1000
Max: 33.9 g at 15.2 ms
Min: -4.9 g at 31.4 ms



Filter Class: CFC_1000
Max: 5.6 m/s at 29.8 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: WordSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qalification Manual 11_09_2020

03.25.2021 14:25:37 4009

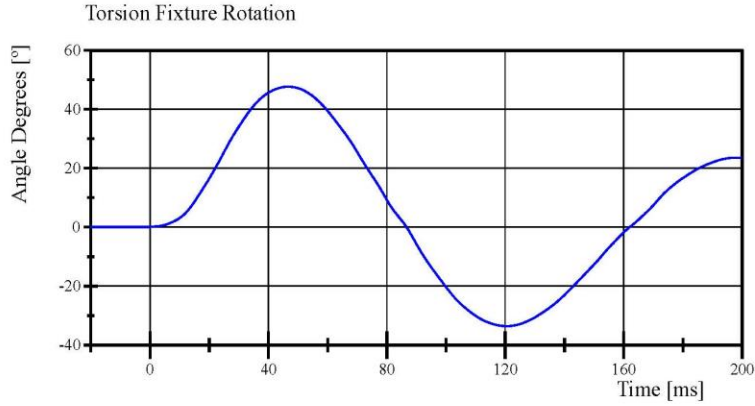


Transportation Research Center Inc.

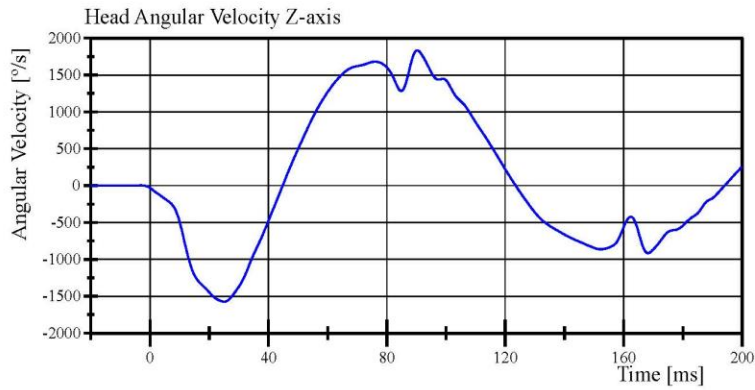
Right Lateral Torsion

WorldSID 50th Serial No. EB8888 Certification No. 9-1

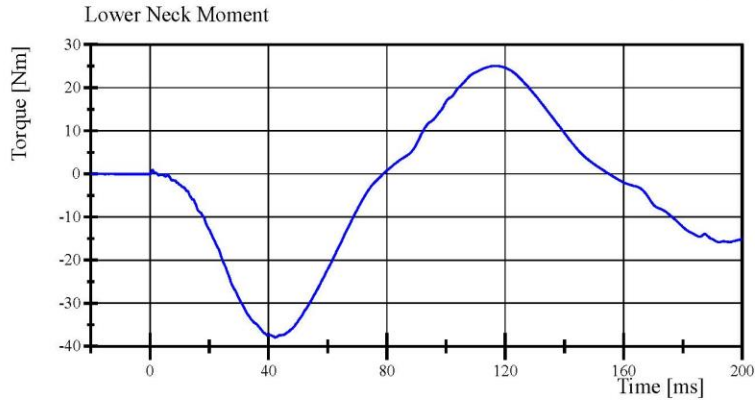
Test Date: 3/25/2021



Filter Class: CFC_60
Max: 47.6 ° at 46.6 ms
Min: -33.6 ° at 120.5 ms



Filter Class: CFC_60
Max: 1,833.1 °/s at 90.3 ms
Min: -1,572.6 °/s at 25.1 ms



Filter Class: CFC_600
Max: 25.0 Nm at 116.2 ms
Min: -37.9 Nm at 42.2 ms

Specification Source: WorldSID 50th(WS) VRTC Nov 2020.xlsx
WorldSID 50th_Qualification Manual 11_09_2020

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Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/26/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Force	2,600 - 3,300 N	3,027.4 N	Yes
Shoulder Force	(-1,470) - (-1,800) N	-1,668.3 N	Yes
Shoulder Rib Length Change	37 - 46 mm	41.2 mm	Yes

Test meets specifications.

Condition: Used

Comments:

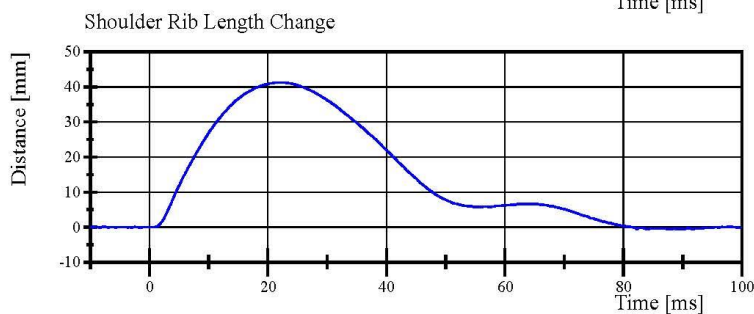
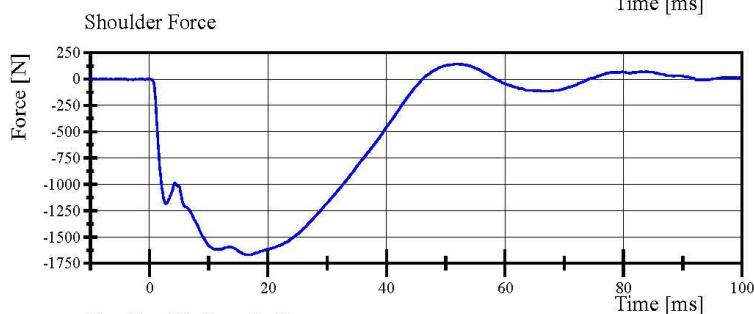
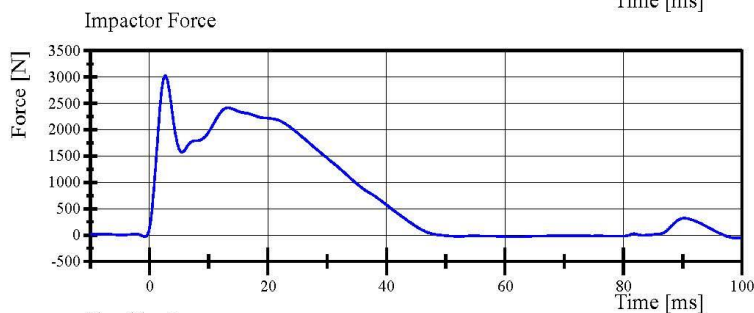
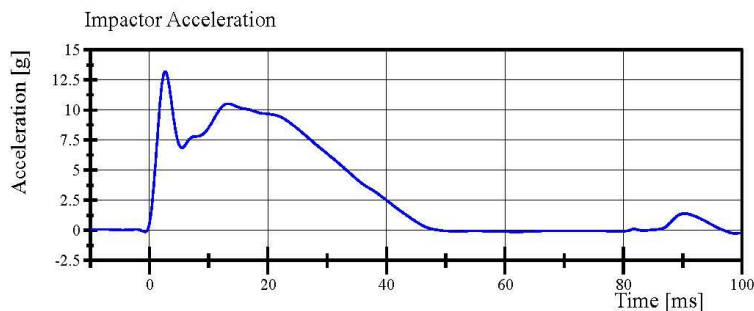
Arm S/N: EG3799

Shoulder Rib S/N: DW1916

RibEye S/N: 124

Transportation Research Center Inc.

Left Lateral Shoulder
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021



Transportation Research Center Inc.

Left Lateral Thorax with Arm
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.70 m/s	Yes
Impactor Force	5,300 - 6,200 N	5,783.1 N	Yes
Peak Thorax Rib 1 Length Change	35 - 47 mm	41.0 mm	Yes
Peak Thorax Rib 2 Length Change	46 - 56 mm	48.3 mm	Yes
Peak Thorax Rib 3 Length Change	33.5 - 40.5 mm	34.97 mm	Yes
Peak T4 Acceleration, y-axis	28 - 37 g	32.8 g	Yes
Peak T12 Acceleration, y-axis	22 - 28 g	23.5 g	Yes

Test meets specifications.

Condition: Used

Comments:

Arm S/N: EG3799

Shoulder Rib S/N: DW1916

Thorax Rib 1 S/N: EB5400

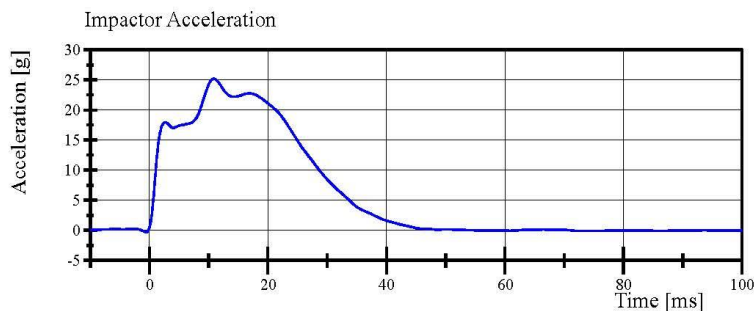
Thorax Rib 2 S/N: EB5401

Thorax Rib 3 S/N: EB5402

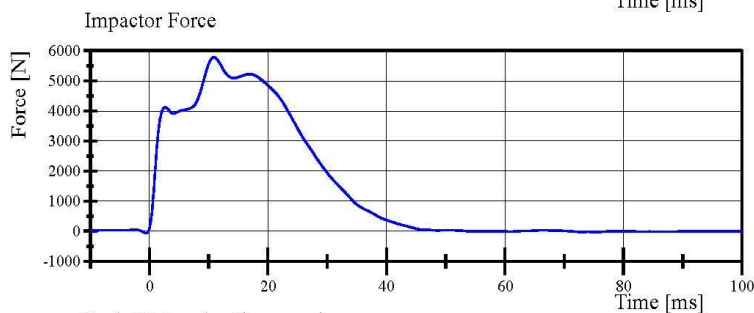
RibEye S/N: 124

Transportation Research Center Inc.

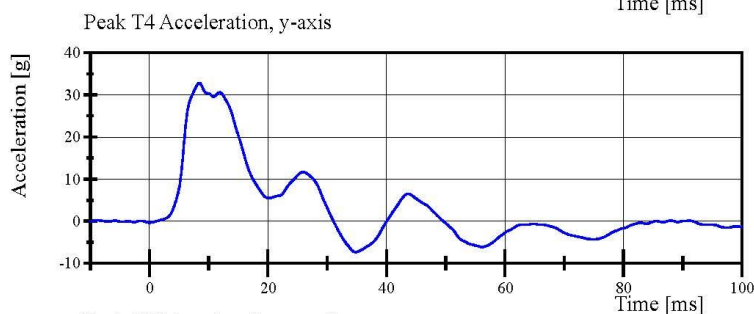
Left Lateral Thorax with Arm
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021



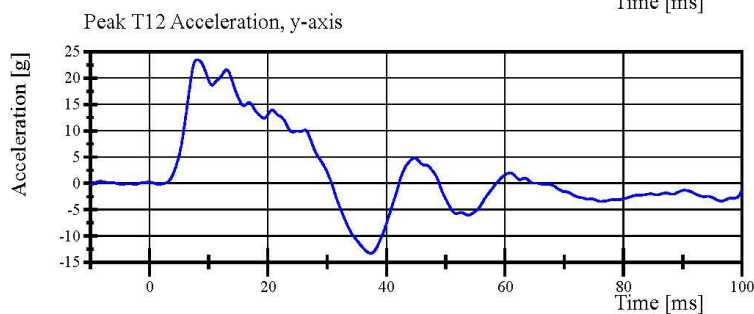
Filter Class: CFC_180
Max: 25.2 g at 10.9 ms
Min: -0.3 g at -0.6 ms



Filter Class: CFC_180
Max: 5,783.1 N at 10.9 ms
Min: -68.8 N at -0.6 ms



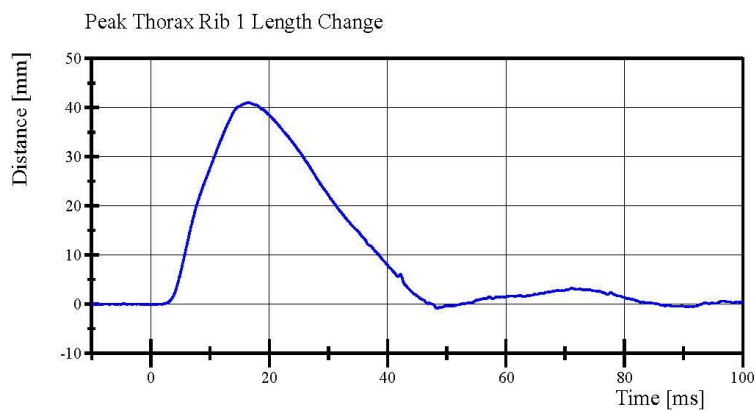
Filter Class: CFC_180
Max: 32.8 g at 8.4 ms
Min: -7.4 g at 34.9 ms



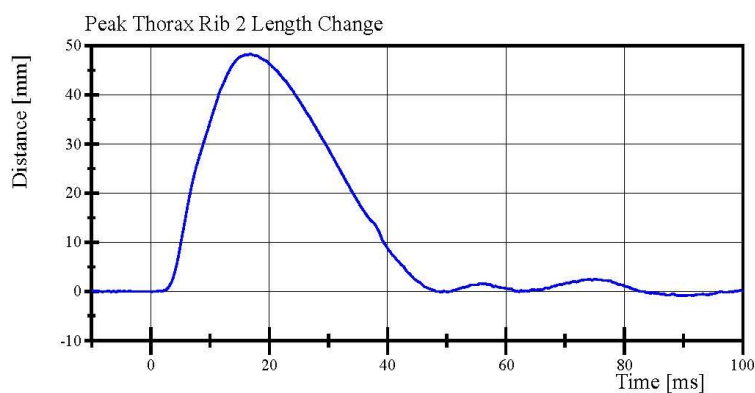
Filter Class: CFC_180
Max: 23.5 g at 8.1 ms
Min: -13.3 g at 37.4 ms

Transportation Research Center Inc.

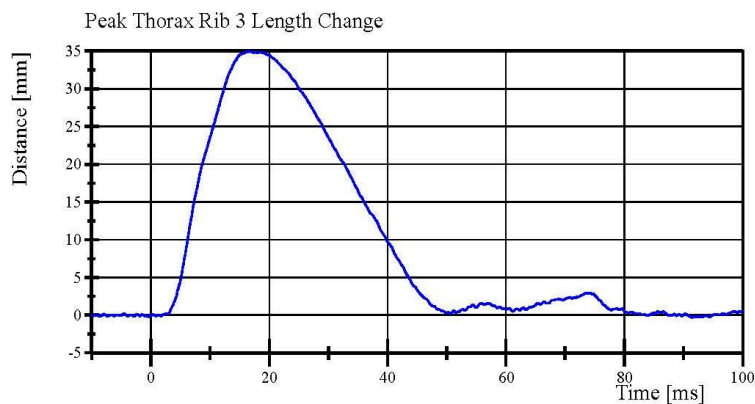
Left Lateral Thorax with Arm
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021



Filter Class: CFC_600
Max: 41.0 mm at 16.5 ms
Min: -0.8 mm at 48.4 ms



Filter Class: CFC_600
Max: 48.3 mm at 16.8 ms
Min: -0.9 mm at 91.6 ms



Filter Class: CFC_600
Max: 35.0 mm at 16.7 ms
Min: -0.3 mm at 91.5 ms



Transportation Research Center Inc.

Left Lateral Thorax without Arm
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Impactor Force	3,200 - 3,800 N	3,449.3 N	Yes
Peak Thorax Rib 1 Length Change	33 - 43 mm	36.6 mm	Yes
Peak Thorax Rib 2 Length Change	35 - 43 mm	42.1 mm	Yes
Peak Thorax Rib 3 Length Change	32 - 40 mm	33.7 mm	Yes
Peak T4 Acceleration, y-axis	14 - 20 g	15.4 g	Yes
Peak T12 Acceleration, y-axis	14 - 22 g	14.8 g	Yes

Test meets specifications.

Condition: Used

Comments:

Thorax Rib 1 S/N: EB5400

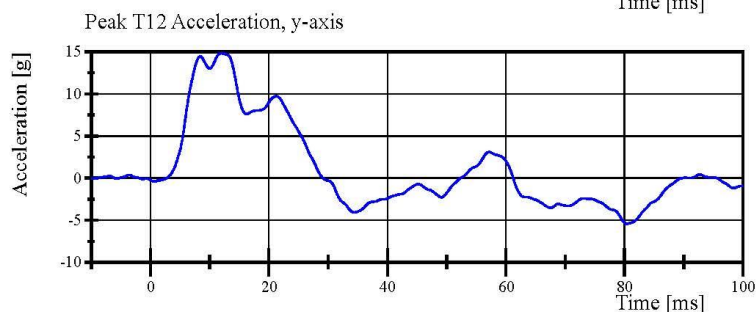
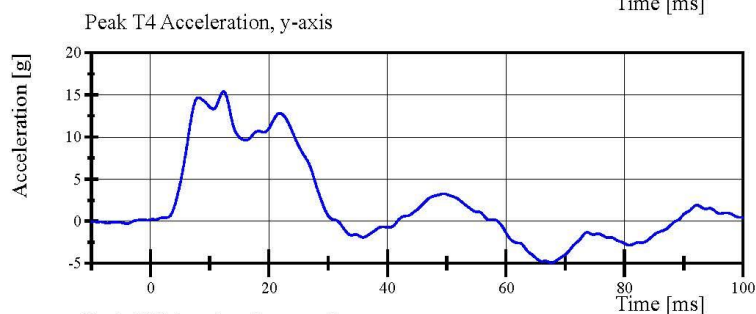
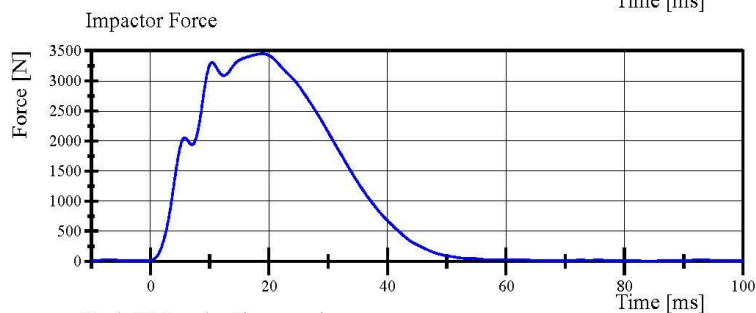
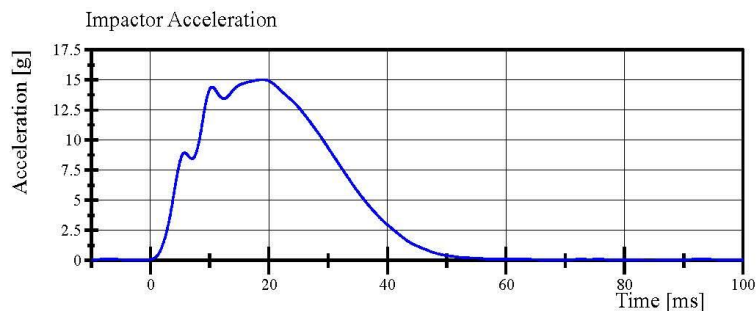
Thorax Rib 2 S/N: EB5401

Thorax Rib 3 S/N: EB5402

RibEye S/N: 124

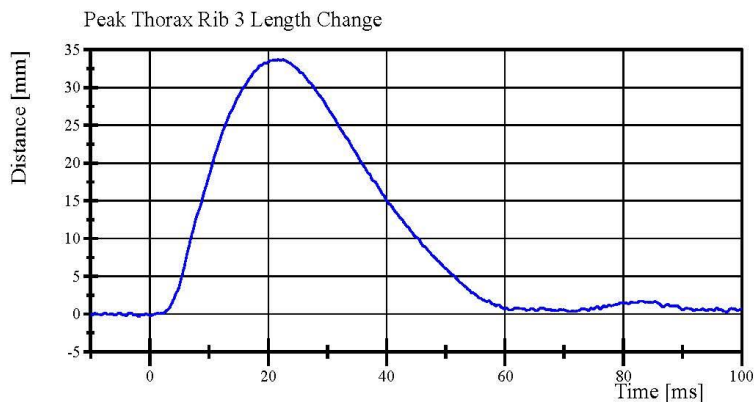
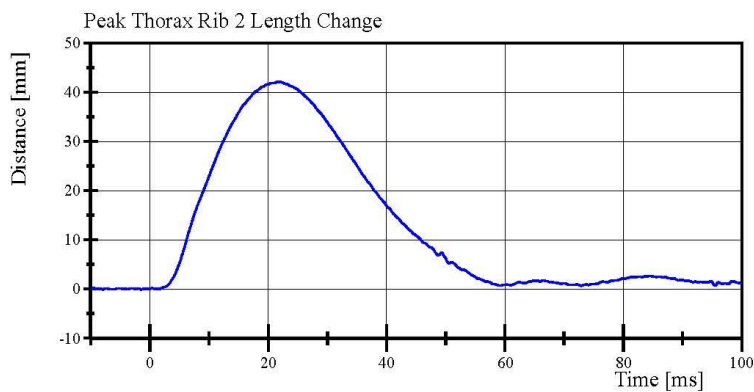
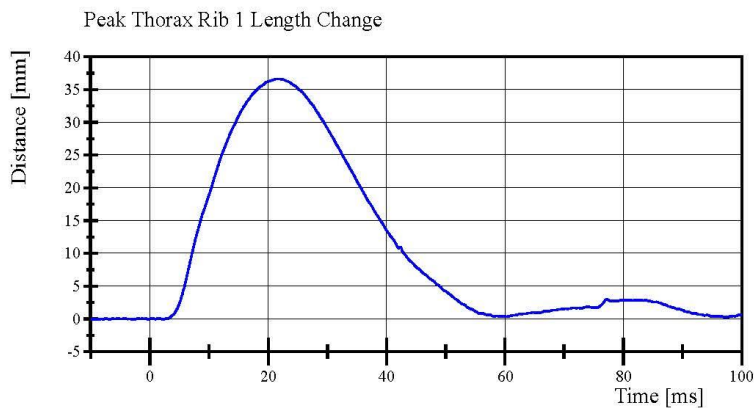
Transportation Research Center Inc.

Left Lateral Thorax without Arm
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021



Transportation Research Center Inc.

Left Lateral Thorax without Arm
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021



Transportation Research Center Inc.

Left Lateral Abdomen
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/26/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Impactor Force	2,700 - 3,100 N	3,006.5 N	Yes
Peak Abdomen Rib 1 Length Change	32.5 - 39.5 mm	35.48 mm	Yes
Peak Abdomen Rib 2 Length Change	32 - 38 mm	34.5 mm	Yes
Peak T12 Acceleration, y-axis	14.5 - 19.5 g	17.94 g	Yes

Test meets specifications.

Condition: Used

Comments:

Abdomen Rib #1 S/N: DY5252

Abdomen Rib #2 S/N: DY5253

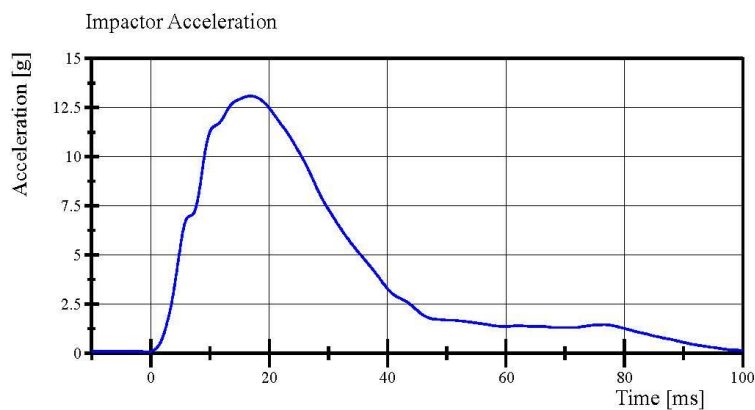
RibEye S/N: 124

Transportation Research Center Inc.

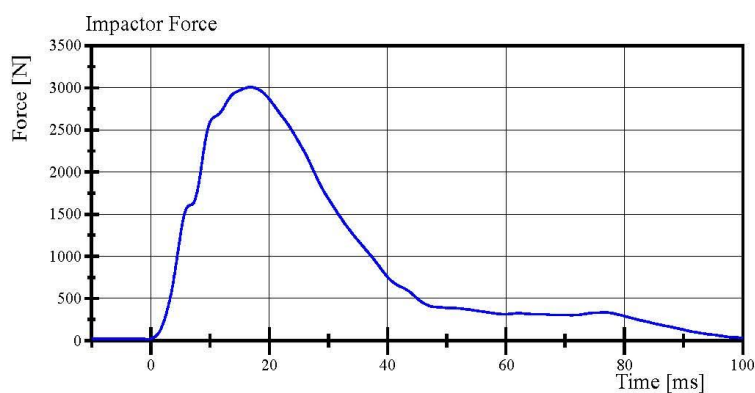
Left Lateral Abdomen

WorldSID 50th Serial No. EB8888 Certification No. 9-1

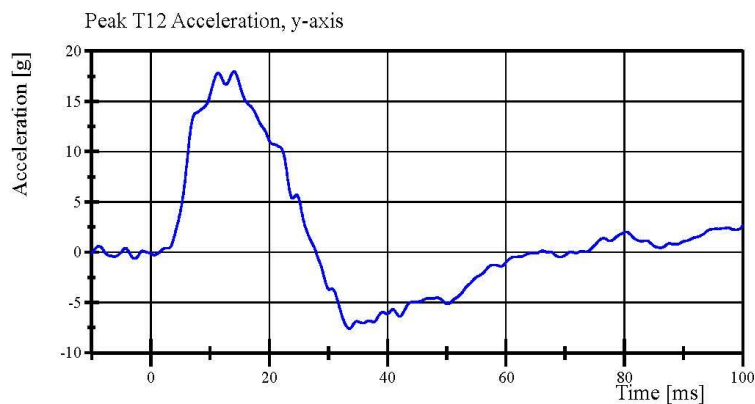
Test Date: 3/26/2021



Filter Class: CFC_180
Max: 13.1 g at 16.9 ms
Min: 0.1 g at -0.5 ms



Filter Class: CFC_180
Max: 3,006.5 N at 16.9 ms
Min: 16.4 N at -0.5 ms



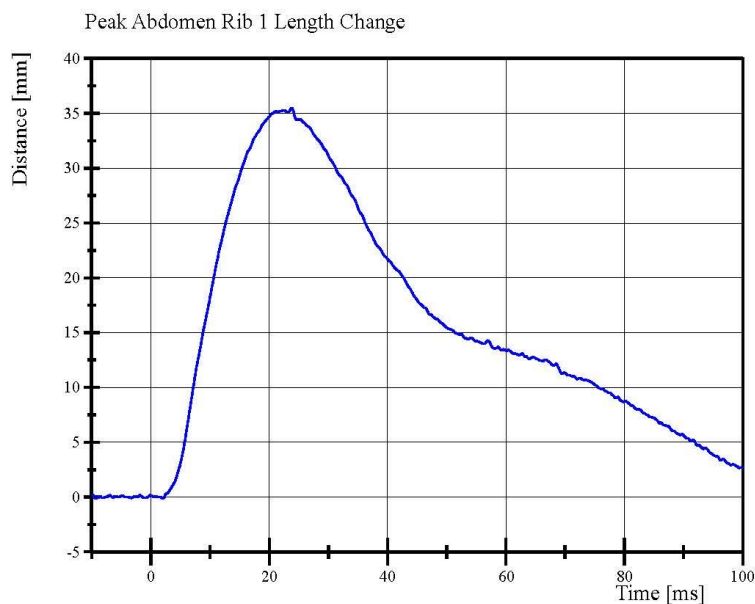
Filter Class: CFC_180
Max: 17.9 g at 14.1 ms
Min: -7.6 g at 33.6 ms

Transportation Research Center Inc.

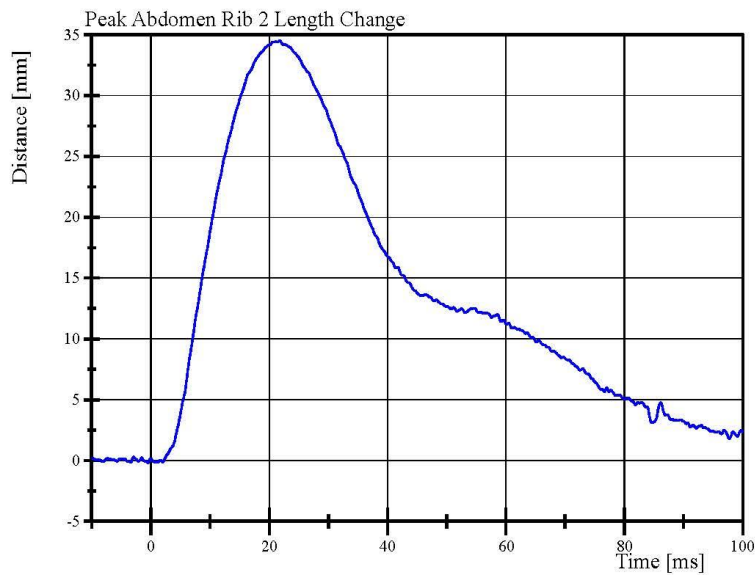
Left Lateral Abdomen

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/26/2021



Filter Class: CFC_600
Max: 35.5 mm at 23.8 ms
Min: -0.1 mm at -9.4 ms



Filter Class: CFC_600
Max: 34.5 mm at 21.8 ms
Min: -0.2 mm at -0.5 ms

Transportation Research Center Inc.

Left Lateral Pelvis
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/29/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.71 m/s	Yes
Impactor Force	6,800 - 8,200 N	7,475.3 N	Yes
Pelvis Lateral Acceleration	38.5 - 48.5 g	42.15 g	Yes
Peak T12 Acceleration, y-axis	10 - 14 g	12.4 g	Yes
Pubic Lateral Force	(-1,300) - (-1,590) N	-1,359.1 N	Yes
Sacroiliac Lateral Force	(-1,860) - (-2,280) N	-2,118.0 N	Yes

Test meets specifications.

Condition: Used

Comments:

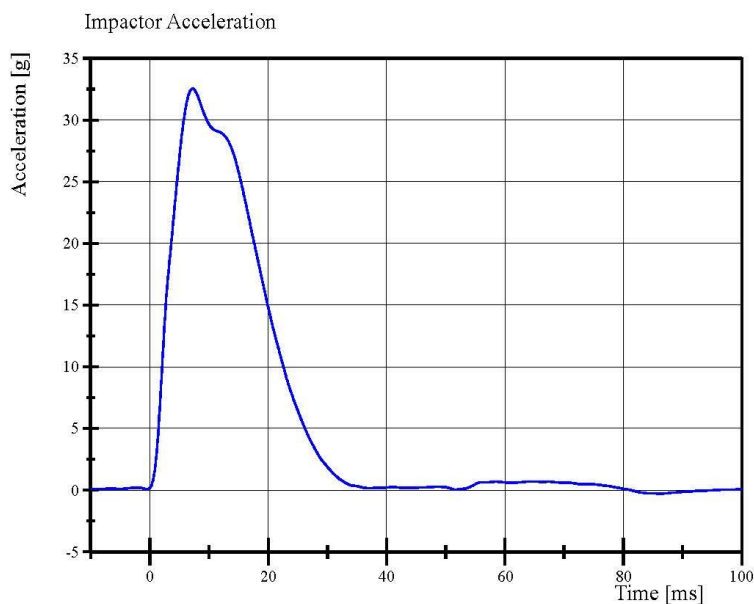
Pelvis S/N: EC3628

Transportation Research Center Inc.

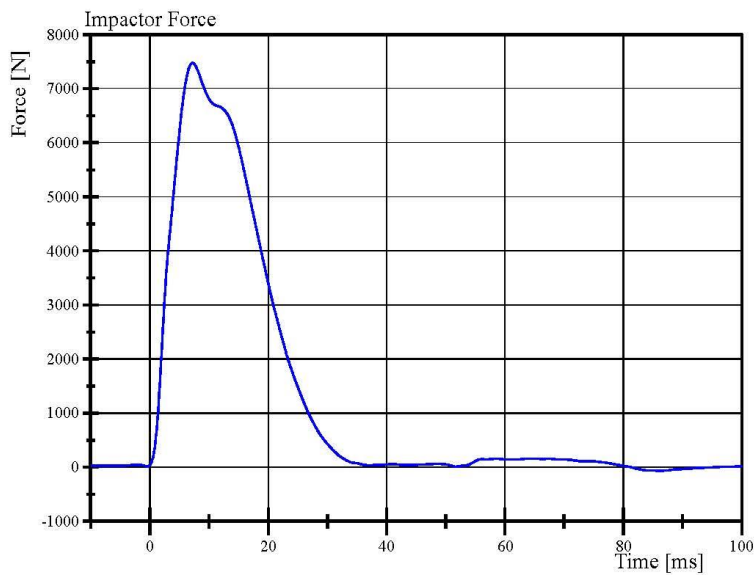
Left Lateral Pelvis

WorldSID 50th Serial No. EB8888 Certification No. 9-1

Test Date: 3/29/2021



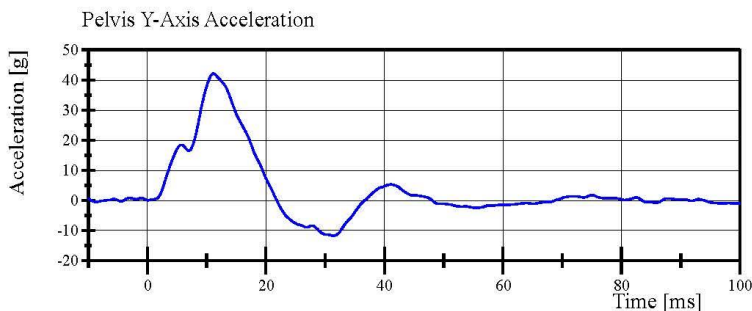
Filter Class: CFC_180
Max: 32.6 g at 7.2 ms
Min: -0.3 g at 86.2 ms



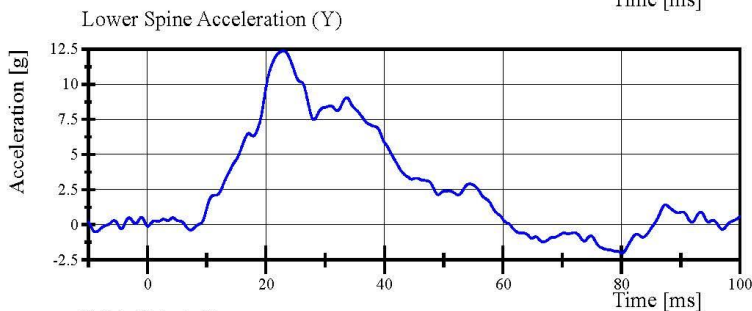
Filter Class: CFC_180
Max: 7,475.3 N at 7.2 ms
Min: -65.0 N at 86.2 ms

Transportation Research Center Inc.

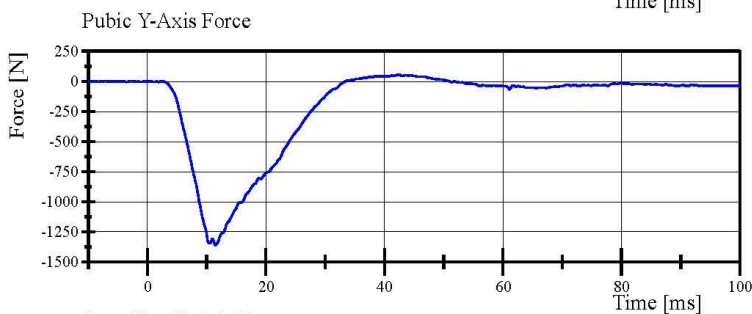
Left Lateral Pelvis
WorldSID 50th Serial No. EB8888 Certification No. 9-1
Test Date: 3/29/2021



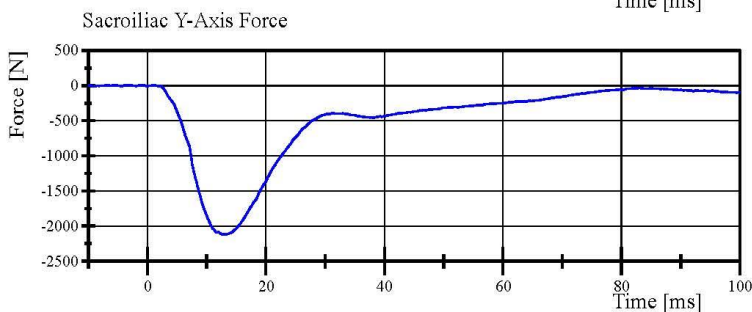
Filter Class: CFC_180
Max: 42.1 g at 11.1 ms
Min: -11.7 g at 31.5 ms



Filter Class: CFC_180
Max: 12.4 g at 23.0 ms
Min: -2.0 g at 80.1 ms



Filter Class: CFC_600
Max: 55.1 N at 42.5 ms
Min: -1,359.1 N at 11.5 ms



Filter Class: CFC_600
Max: 9.0 N at -0.9 ms
Min: -2,118.0 N at 12.7 ms

Pre-Test Calibration Sheets
Passenger S/N DK1774

**WorldSID-05F Head Front Qualification
Test Results Summary**

Dummy Serial Number: DK1774

Tested Components
Head: DM1000

Test ID: 210301-5
Test Date: 3/1/2021
Test Time: 9:06 AM

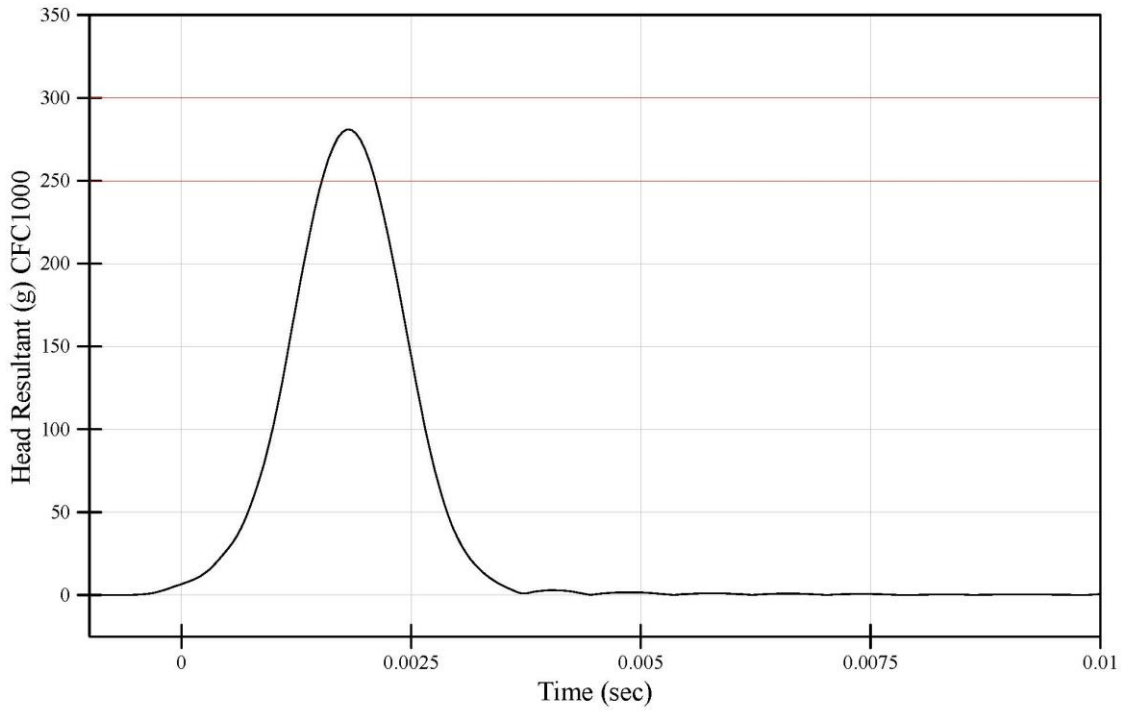
Test Results

<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.7	Pass
Test Humidity (%)	10 - 70	51	Pass
Peak Resultant Acceleration (g)	250.0 - 300.0	280.9	Pass
Peak Acceleration, y-axis (g)	-15.00 - 15.00	-6.07	Pass
Oscillations occurring after the main acceleration pulse (%)	-10.0 - 10.0	1.0	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210301-5 processed

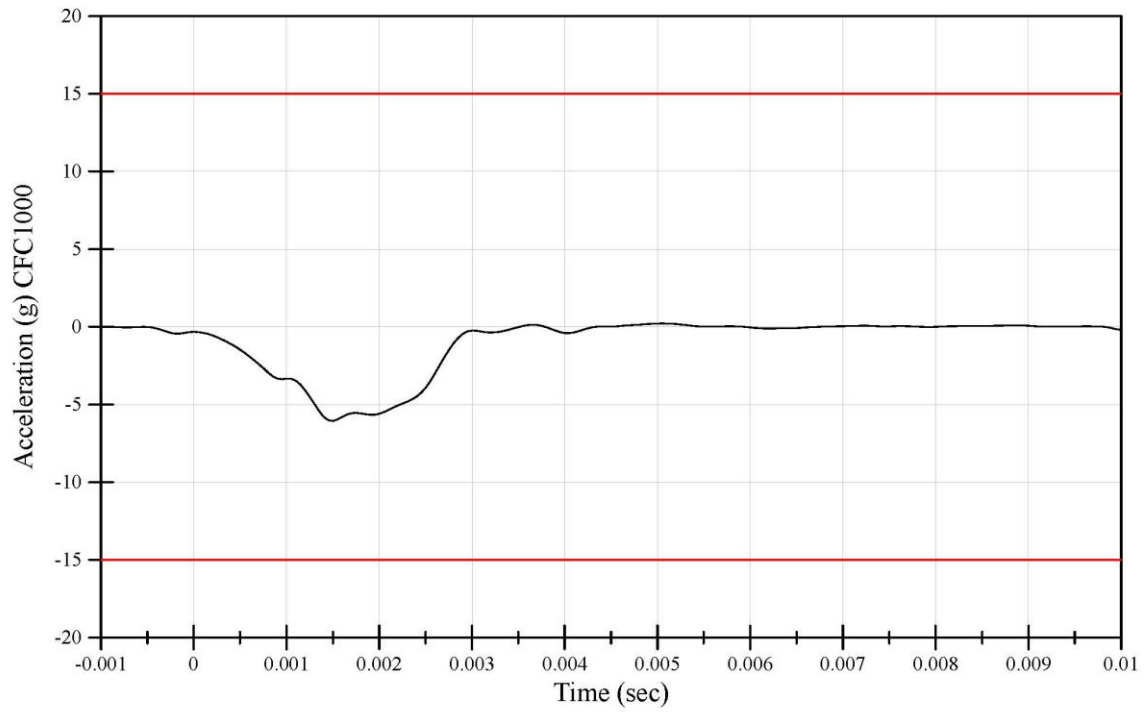
WorldSID-05F Head Front Qualification
Peak Resultant Acceleration
Head Serial Number: DM1000



File Name: 210301-5 processed

3/1/2021 9:06 AM

WorldSID-05F Head Front Qualification
Peak Lateral Y Acceleration
Head Serial Number: DM1000



File Name: 210301-5 processed

3/1/2021 9:06 AM

**WorldSID-05F Head Left Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

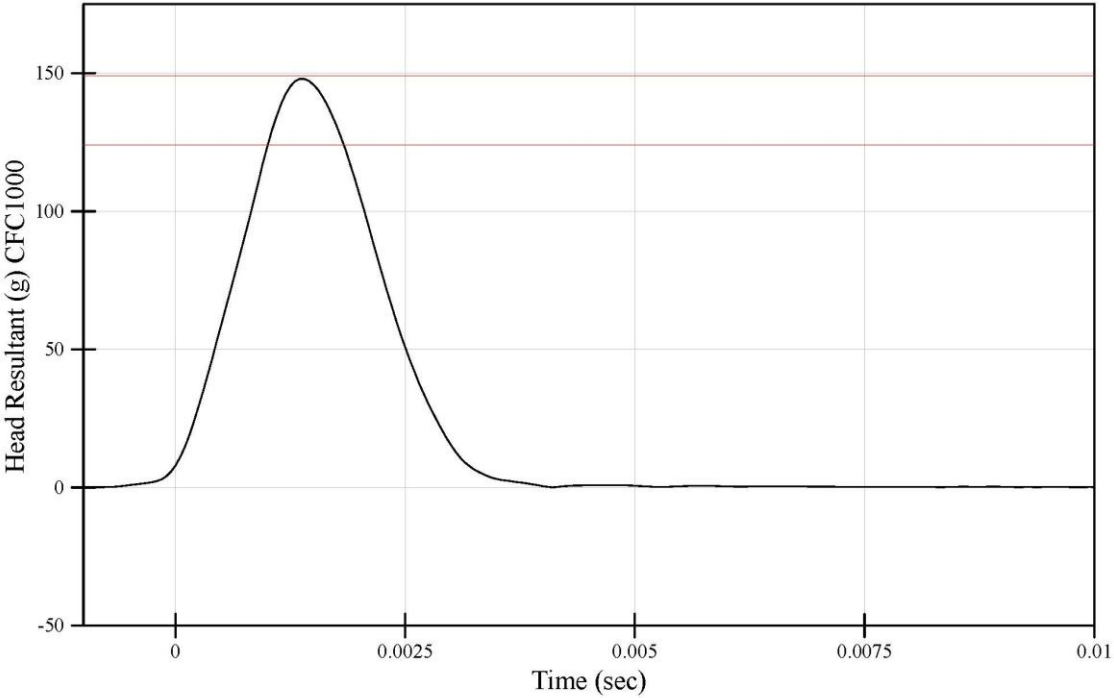
<u>Tested Components</u> Head: DM1000	Test ID: 210301-6 Test Date: 3/1/2021 Test Time: 9:16 AM
--	--

Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.9	Pass
Test Humidity (%)	10 - 70	52	Pass
Peak Resultant Acceleration (g)	124.0 - 149.0	147.9	Pass
Peak Acceleration, x-axis (g)	-15.00 - 15.00	13.31	Pass
Oscillations occurring after the main acceleration pulse (%)	-10.0 - 10.0	0.6	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210301-6 processed

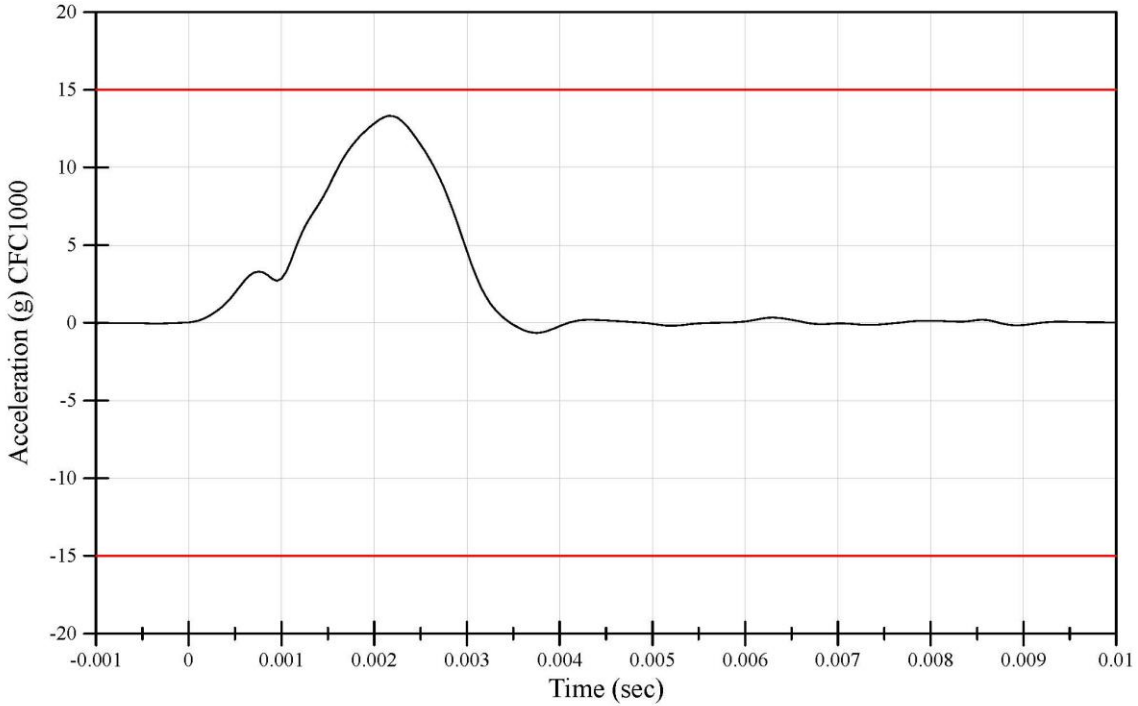
WorldSID-05F Head Left Lateral Qualification
Peak Resultant Acceleration
Head Serial Number: DM1000



File Name: 210301-6 processed

3/1/2021 9:16 AM

WorldSID-05F Head Left Lateral Qualification
Peak Lateral X Acceleration
Head Serial Number: DM1000



File Name: 210301-6 processed

3/1/2021 9:16 AM

**WorldSID-05F Head Right Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

Tested Components
Head: DM1000

Test ID: 210301-8
Test Date: 3/1/2021
Test Time: 9:29 AM

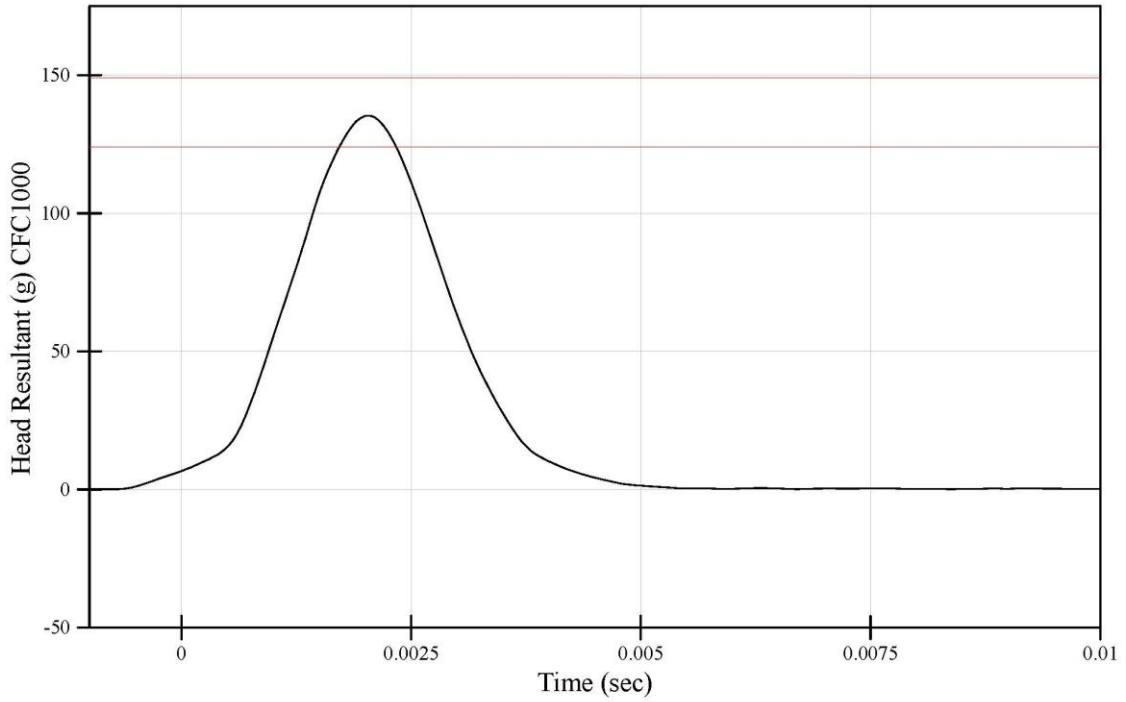
Test Results

<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.9	Pass
Test Humidity (%)	10 - 70	52	Pass
Peak Resultant Acceleration (g)	124.0 - 149.0	135.3	Pass
Peak Acceleration, x-axis (g)	-15.00 - 15.00	-9.41	Pass
Oscillations occurring after the main acceleration pulse (%)	-10.0 - 10.0	0.4	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210301-8 processed

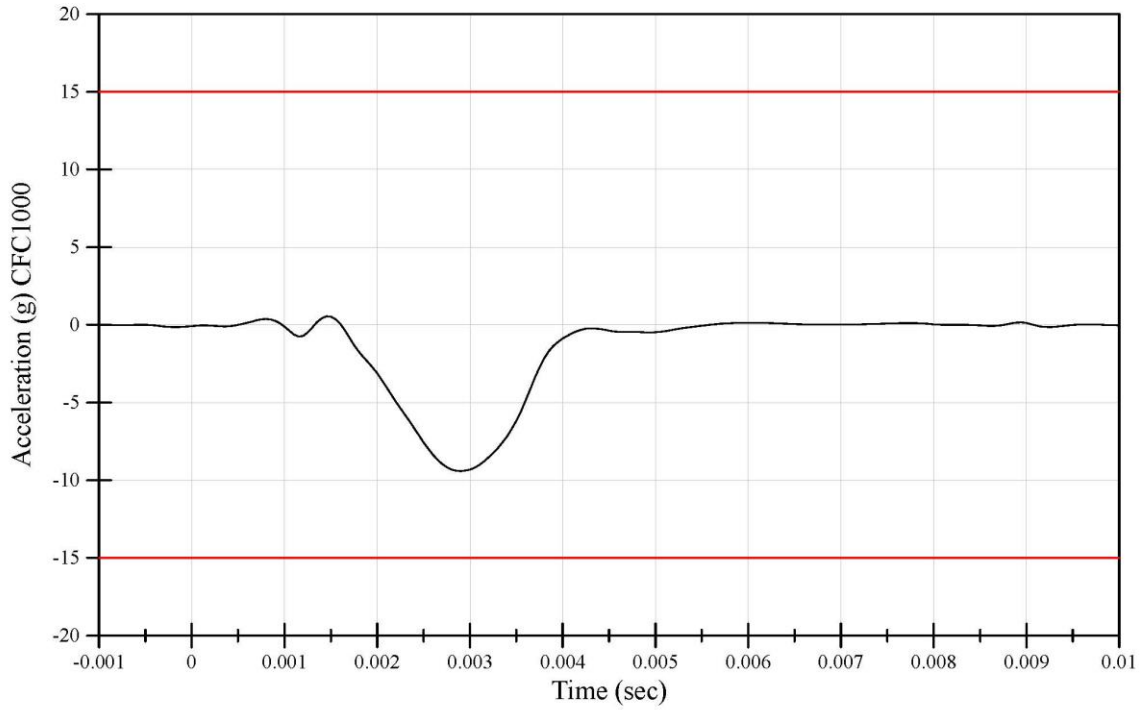
WorldSID-05F Head Right Lateral Qualification
Peak Resultant Acceleration
Head Serial Number: DM1000



File Name: 210301-8 processed

3/1/2021 9:29 AM

WorldSID-05F Head Right Lateral Qualification
Peak Lateral Y Acceleration
Head Serial Number: DM1000



File Name: 210301-8 processed

3/1/2021 9:29 AM

**WorldSID-05F Neck Left Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

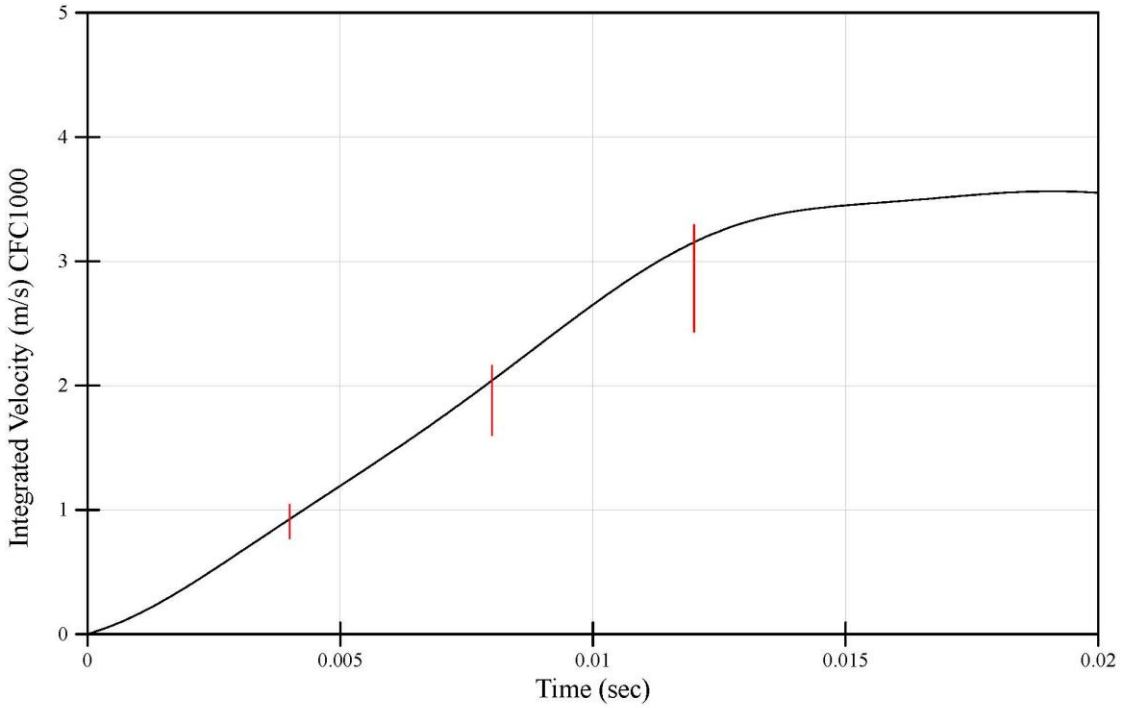
<u>Tested Components</u> Neck: DX6209	Test ID: 210217-4 Test Date: 2/17/2021 Test Time: 10:00 AM
--	--

Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	20.8	Pass
Test Humidity (%)	10 - 70	18	Pass
Test Velocity (m/s)	3.30 - 3.50	3.43	Pass
Pendulum Velocity at 4 ms after T0 (m/s)	0.77 - 1.04	0.92	Pass
Pendulum Velocity at 8 ms after T0 (m/s)	1.60 - 2.16	2.04	Pass
Pendulum Velocity at 12 ms after T0 (m/s)	2.43 - 3.29	3.15	Pass
Peak Headform Flexion Angle (deg)	-71.4 - (-58.5)	-59.4	Pass
Peak Headform Flexion Angle Decay Time to 0 degrees (ms)	57.3 - 76.5	67.1	Pass
Peak X-Axis Moment at Occipital Condyle (Nm)	34.2 - 51.0	39.2	Pass
Peak X-Axis Moment at Occipital Condyle Decay Time to 0 Nm (ms)	69.4 - 93.3	80.5	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210217-4 processed

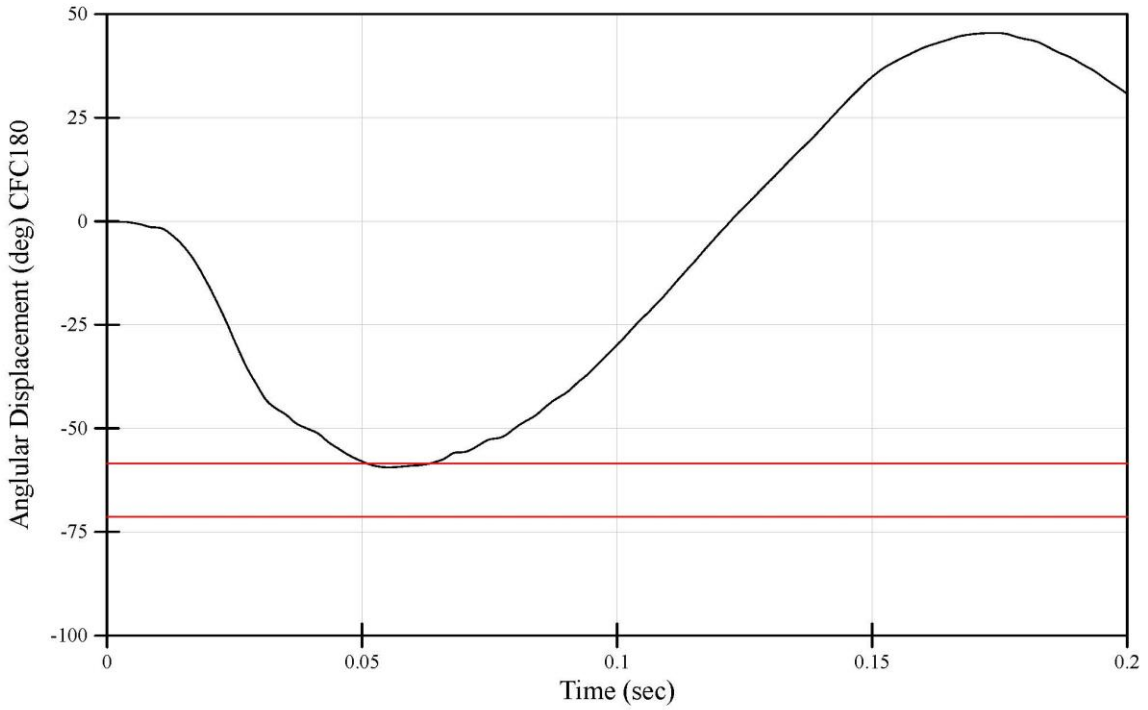
WorldSID-05F Neck Left Lateral Qualification
Probe Acceleration
Neck Serial Number: DK1774



File Name: 210217-4 processed

2/17/2021 10:00 AM

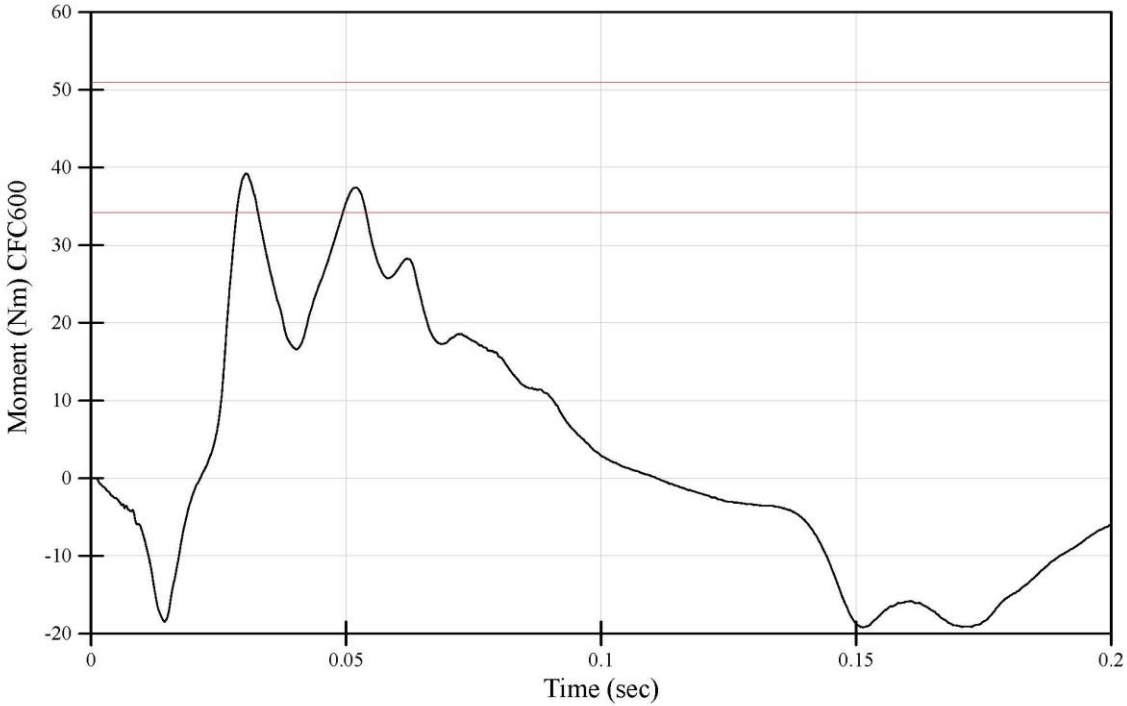
WorldSID-05F Neck Left Lateral Qualification
Peak Headform Flexion Angle
Neck Serial Number: DK1774



File Name: 210217-4 processed

2/17/2021 10:00 AM

WorldSID-05F Neck Left Lateral Qualification
Peak Moment at Occipital Condyle
Neck Serial Number: DK1774



File Name: 210217-4 processed

2/17/2021 10:00 AM

**WorldSID-05F Neck Right Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

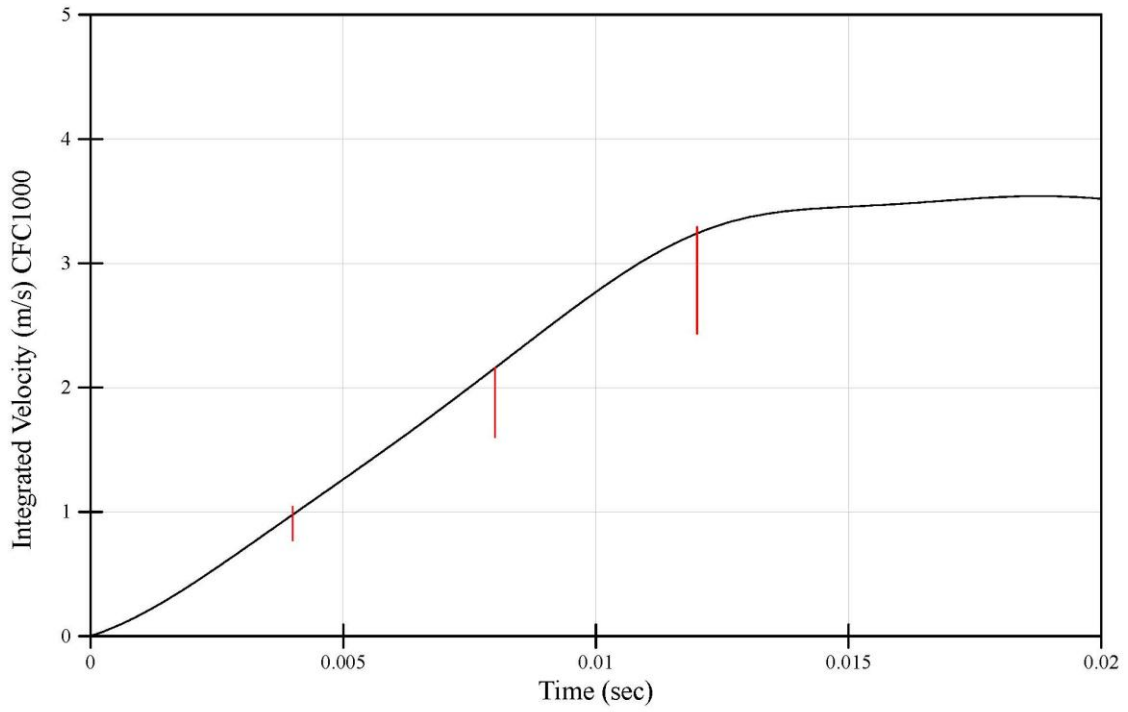
<u>Tested Components</u> Neck: DX6209	Test ID: 210217-5 Test Date: 2/17/2021 Test Time: 10:49 AM
--	--

Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.2	Pass
Test Humidity (%)	10 - 70	18	Pass
Test Velocity (m/s)	3.30 - 3.50	3.45	Pass
Pendulum Velocity at 4 ms after T0 (m/s)	0.77 - 1.04	0.98	Pass
Pendulum Velocity at 8 ms after T0 (m/s)	1.60 - 2.16	2.16	Pass
Pendulum Velocity at 12 ms after T0 (m/s)	2.43 - 3.29	3.24	Pass
Peak Headform Flexion Angle (deg)	58.5 - 71.4	65.5	Pass
Peak Headform Flexion Angle Decay Time to 0 degrees (ms)	57.3 - 76.5	64.4	Pass
Peak X-Axis Moment at Occipital Condyle (Nm)	-51.0 - (-34.2)	-38.7	Pass
Peak X-Axis Moment at Occipital Condyle Decay Time to 0 Nm (ms)	69.4 - 93.3	81.2	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210217-5 processed

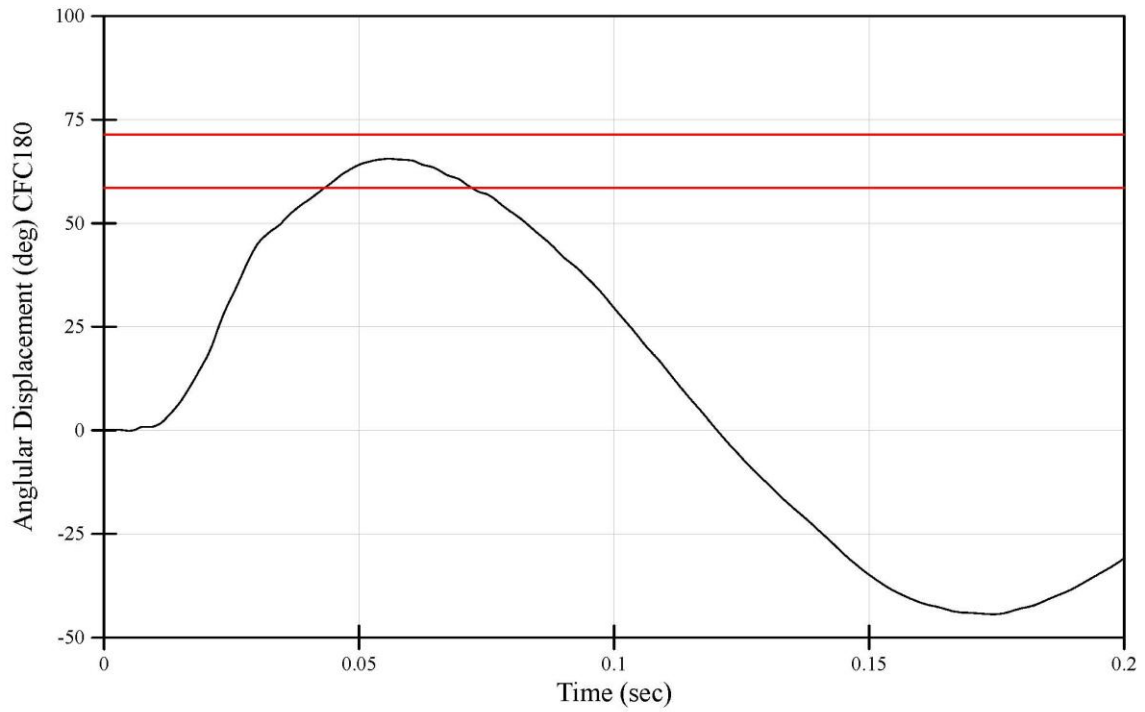
WorldSID-05F Neck Right Lateral Qualification
Probe Acceleration
Neck Serial Number: DK1774



File Name: 210217-5 processed

2/17/2021 10:49 AM

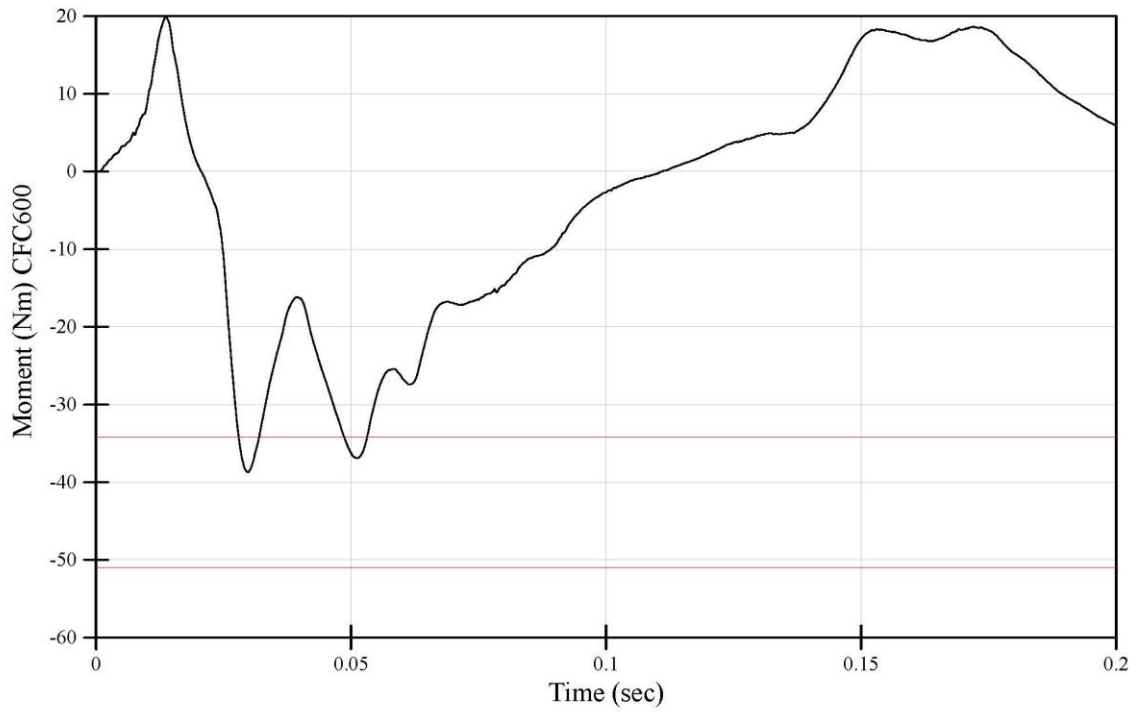
WorldSID-05F Neck Right Lateral Qualification
Peak Headform Flexion Angle
Neck Serial Number: DK1774



File Name: 210217-5 processed

2/17/2021 10:49 AM

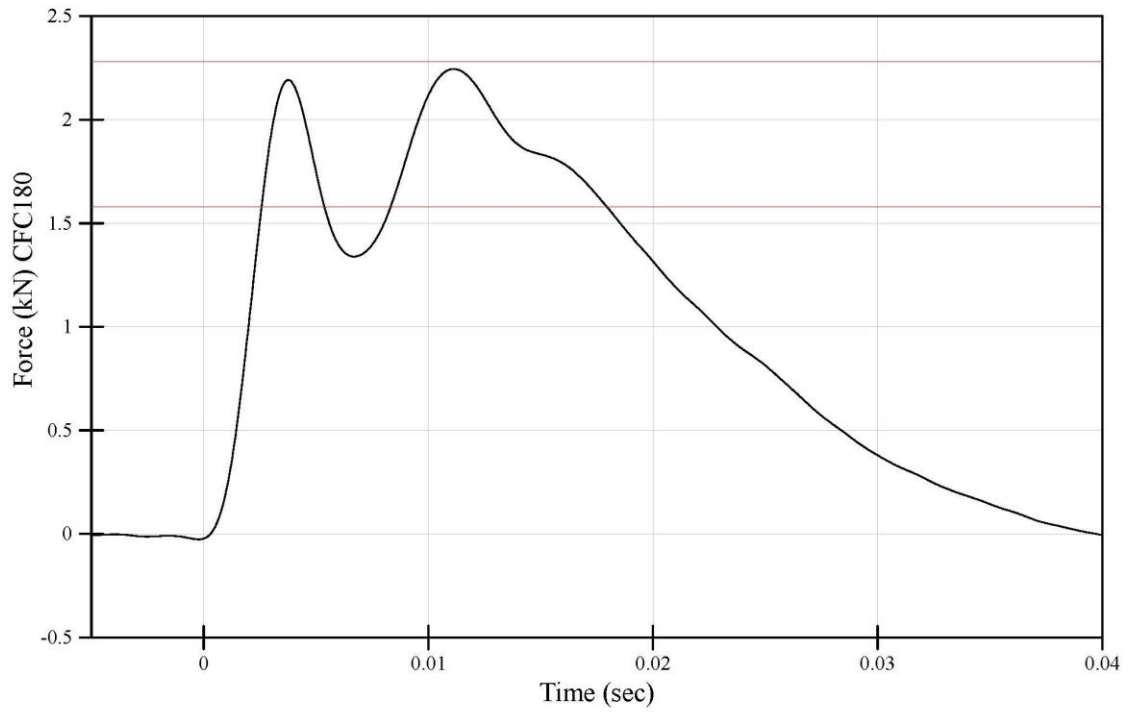
WorldSID-05F Neck Right Lateral Qualification
Peak Moment at Occipital Condyle
Neck Serial Number: DK1774



File Name: 210217-5 processed

2/17/2021 10:49 AM

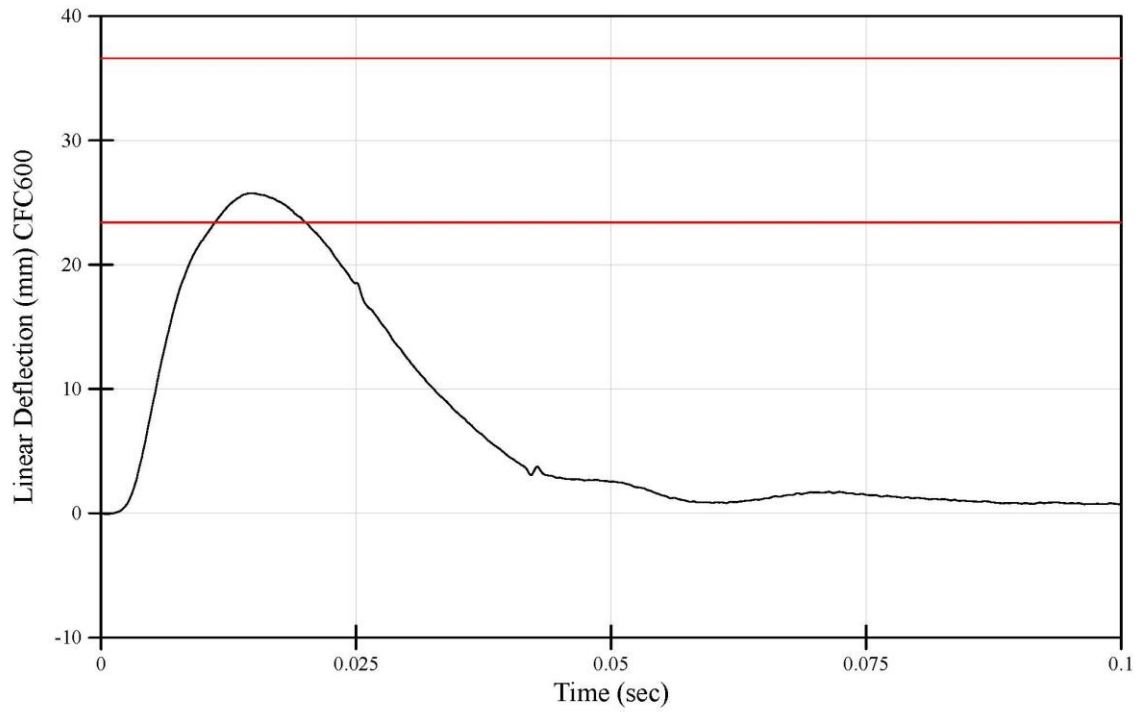
WorldSID-05F Shoulder Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210222-4 processed

2/22/2021 5:08 PM

WorldSID05F Shoulder Qualification
Peak Shoulder Rib Deflection
Dummy Serial Number: DK1774



File Name: 210222-4 processed

2/22/2021 5:08 PM

**WorldSID-05F Thorax with Arm Qualification
Test Results Summary**

Dummy Serial Number: DK1774

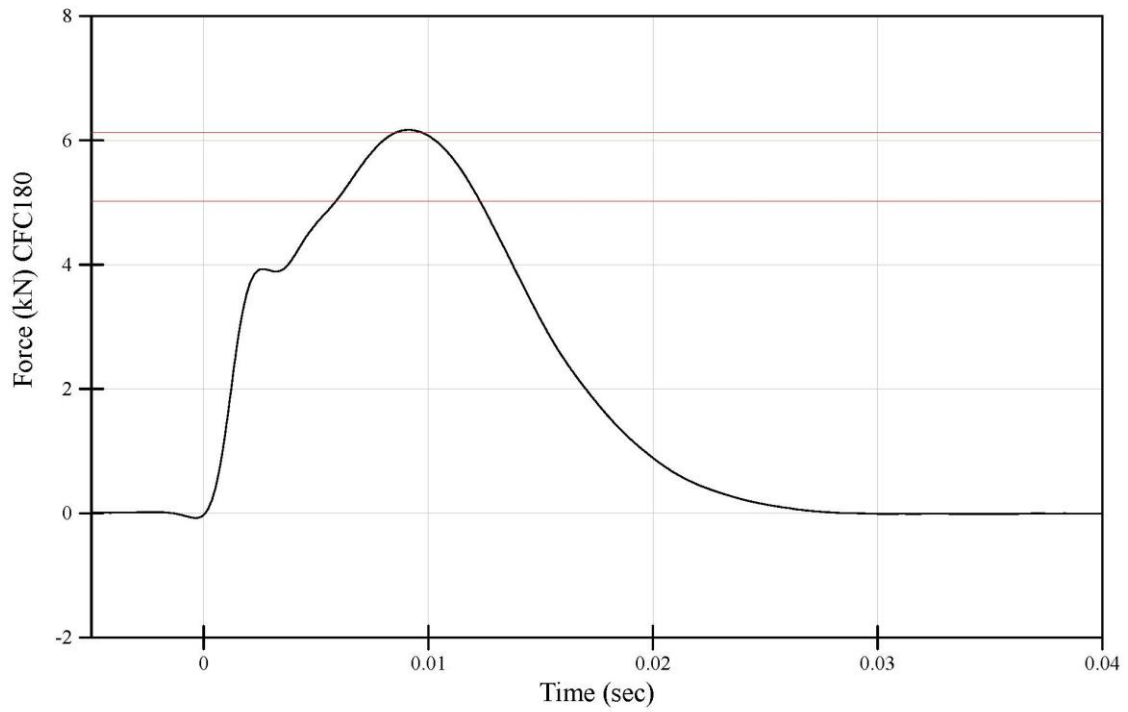
<u>Tested Components</u>		Test ID: 210223-2
Shoulder Rib: DM6270	Abdomen Rib 1: DM5165	Test Date: 2/23/2021
Thorax Rib 1: DM2783	Abdomen Rib 2: DM5167	Test Time: 11:11 AM
Thorax Rib 2: DM2784	RibEye: 161	
Thorax Rib 3: DM2787	Impacted Arm: DJ1634	

<u>Test Results</u>			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.4	Pass
Test Humidity (%)	10 - 70	61	Pass
Test Velocity (m/s)	6.60 - 6.80	6.68	Pass
Thorax Rib Temperature Sensor (°C)	20.6 - 23.8	22.0	Pass
Peak Probe Force (kN)	5.02 - 6.13	6.17	Fail
Peak T4 Y Acceleration	34.7 - 52.0	68.5	Fail
Peak T12 Y Acceleration	44.5 - 54.9	62.5	Fail
Peak Thorax Rib 1 Y Length Change (mm)	18.3 - 26.4	17.6	Fail
Peak Thorax Rib 2 Y Length Change (mm)	21.6 - 26.4	18.7	Fail
Peak Thorax Rib 3 Y Length Change (mm)	19.7 - 26.6	14.7	Fail

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210223-2 processed

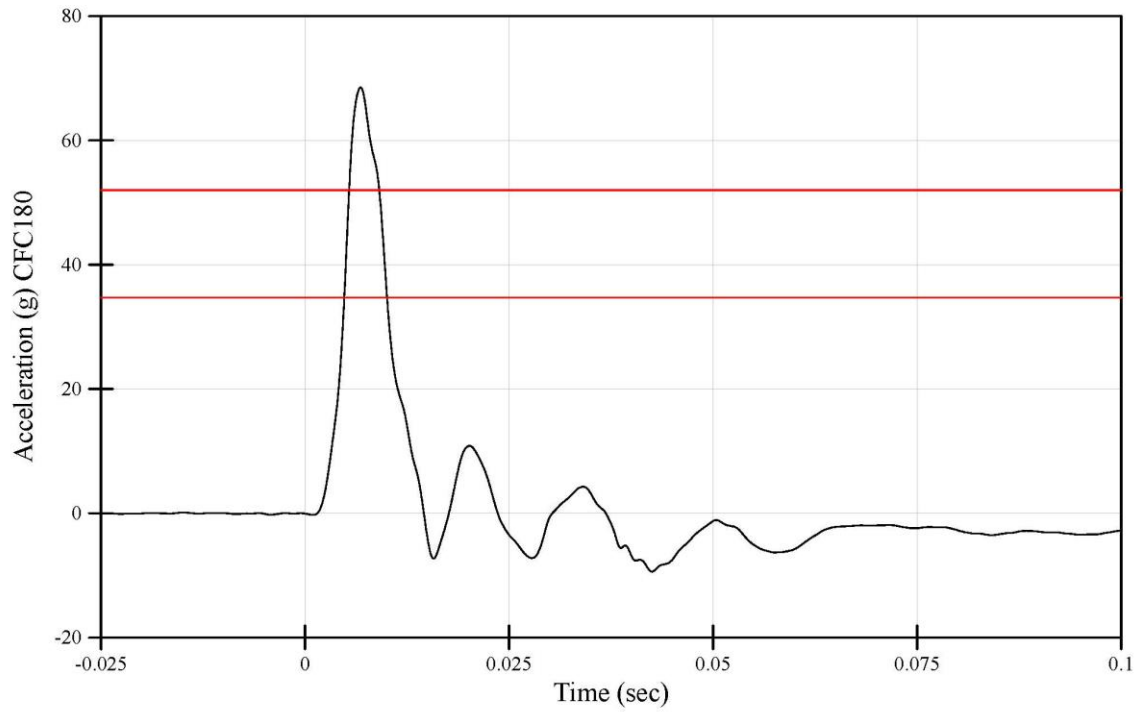
WorldSID-05F Left Thorax with Arm Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210223-2 processed

2/23/2021 11:11 AM

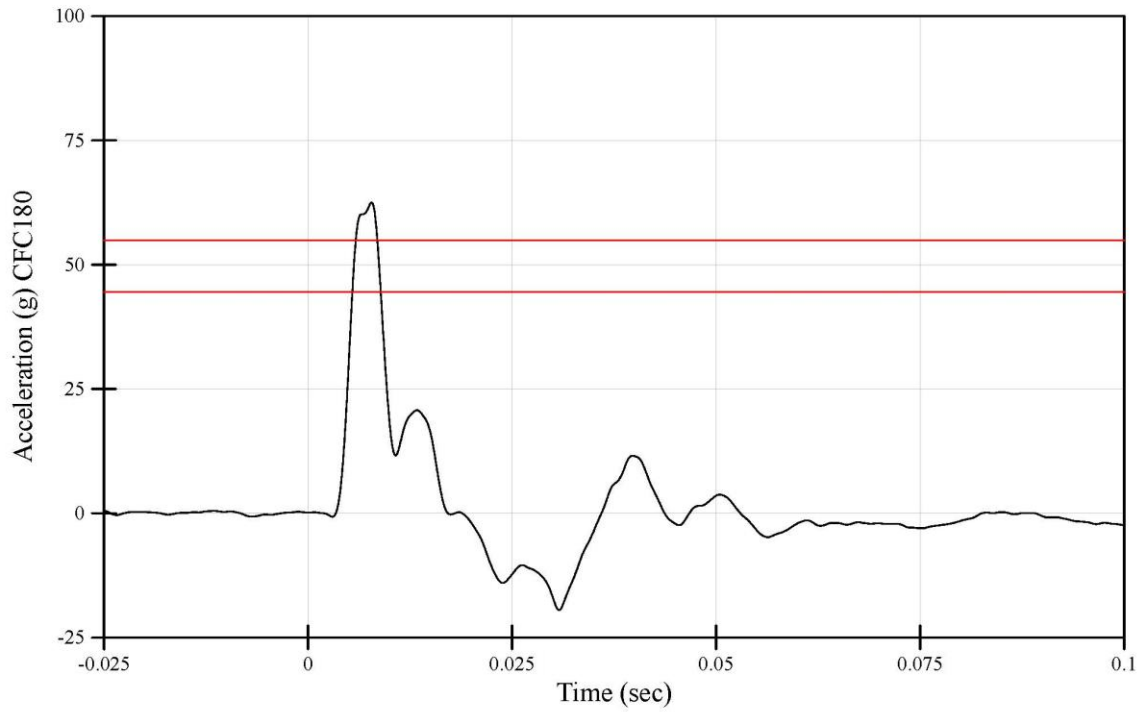
WorldSID-05F Left Thorax with Arm Qualification
Peak T4 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210223-2 processed

2/23/2021 11:11 AM

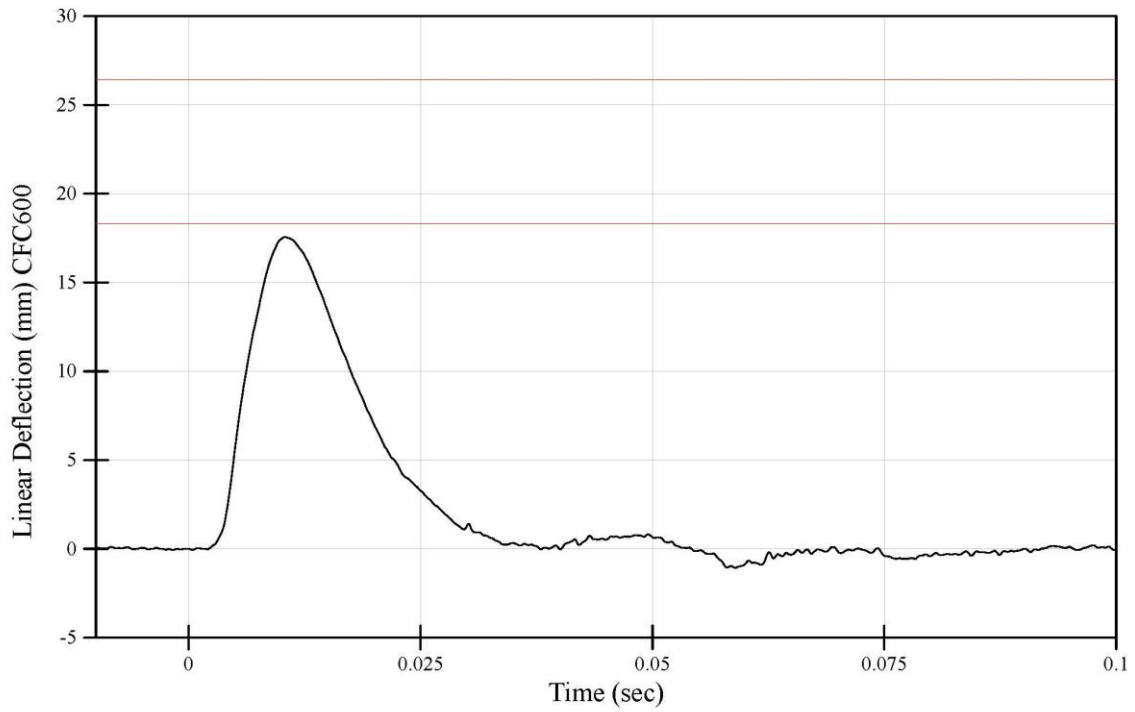
WorldSID-05F Left Thorax with Arm Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210223-2 processed

2/23/2021 11:11 AM

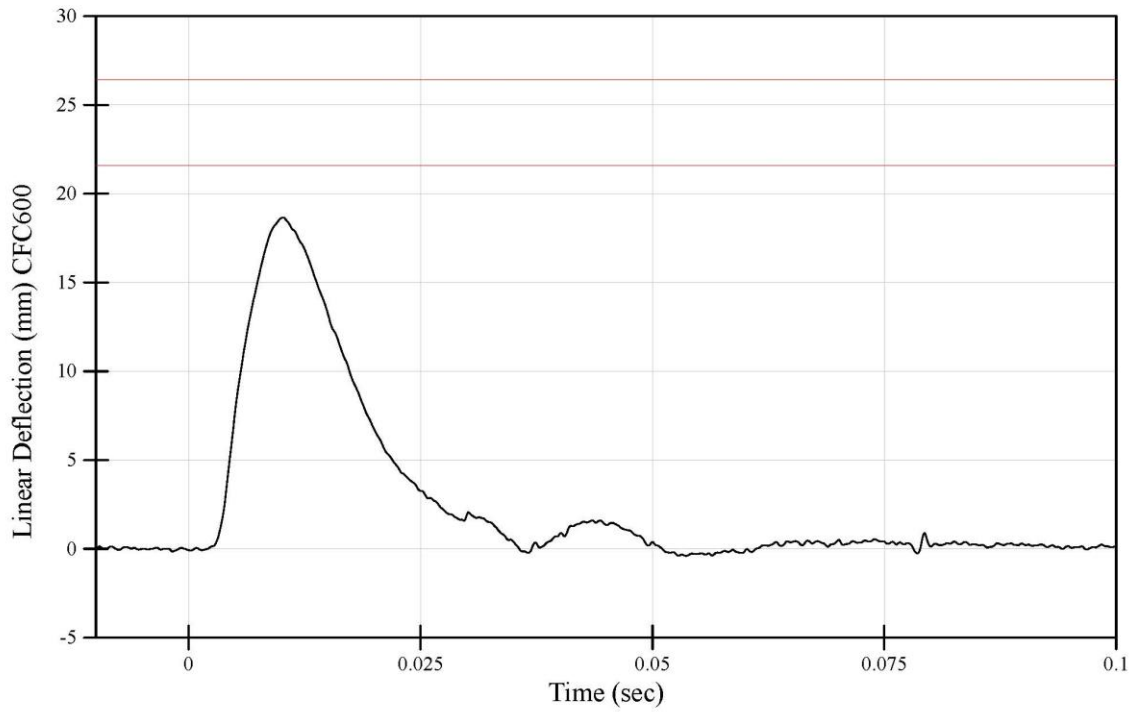
WorldSID-05F Left Thorax with Arm Qualification
Peak Thorax Rib 1 Compression
Dummy Serial Number: DK1774



File Name: 210223-2 processed

2/23/2021 11:11 AM

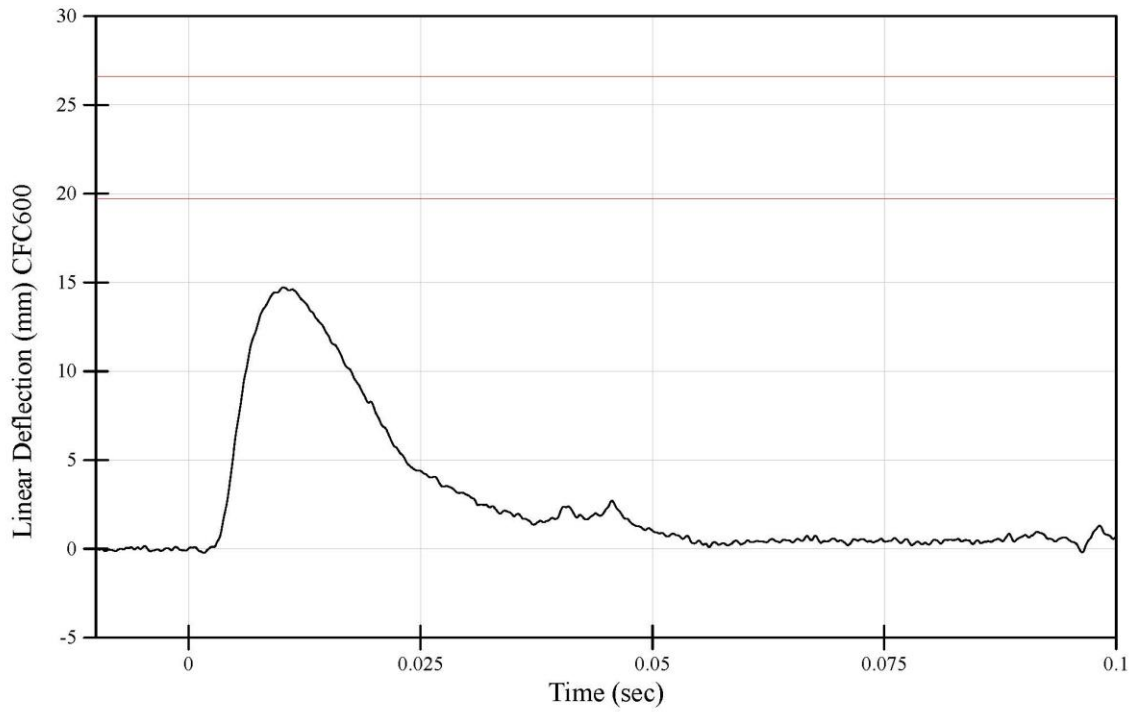
WorldSID-05F Left Thorax with Arm Qualification
Peak Thorax Rib 2 Compression
Dummy Serial Number: DK1774



File Name: 210223-2 processed

2/23/2021 11:11 AM

WorldSID-05F Left Thorax with Arm Qualification
Peak Thorax Rib 3 Compression
Dummy Serial Number: DK1774



File Name: 210223-2 processed

2/23/2021 11:11 AM

**WorldSID-05F Thorax without Arm Qualification
Test Results Summary**

Dummy Serial Number: DK1774

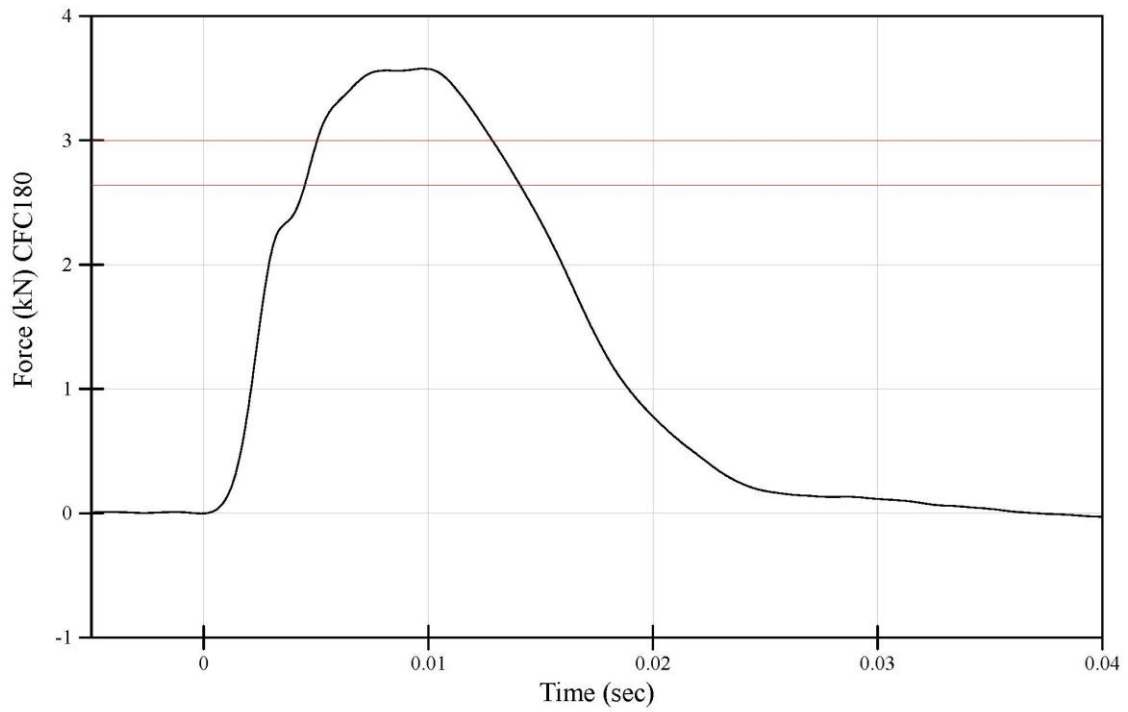
<u>Tested Components</u>		Test ID: 210223-5
Shoulder Rib: DM6270	Abdomen Rib 1: DM5165	Test Date: 2/23/2021
Thorax Rib 1: DM2783	Abdomen Rib 2: DM5167	Test Time: 4:26 PM
Thorax Rib 2: DM2784	RibEye: 161	
Thorax Rib 3: DM2787		

<u>Test Results</u>			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.1	Pass
Test Humidity (%)	10 - 70	64	Pass
Test Velocity (m/s)	4.20 - 4.40	4.29	Pass
Thorax Rib Temperature Sensor (°C)	20.6 - 23.8	22.5	Pass
Peak Probe Force (kN)	2.64 - 3.22	3.58	Fail
Peak T4 Y Acceleration	21.2 - 27.5	34.8	Fail
Peak T12 Y Acceleration	20.6 - 28.9	35.2	Fail
Peak Thorax Rib 1 Y Length Change (mm)	20.5 - 27.7	18.0	Fail
Peak Thorax Rib 2 Y Length Change (mm)	21.7 - 26.7	19.5	Fail
Peak Thorax Rib 3 Y Length Change (mm)	20.9 - 27.3	17.5	Fail

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210223-5 processed

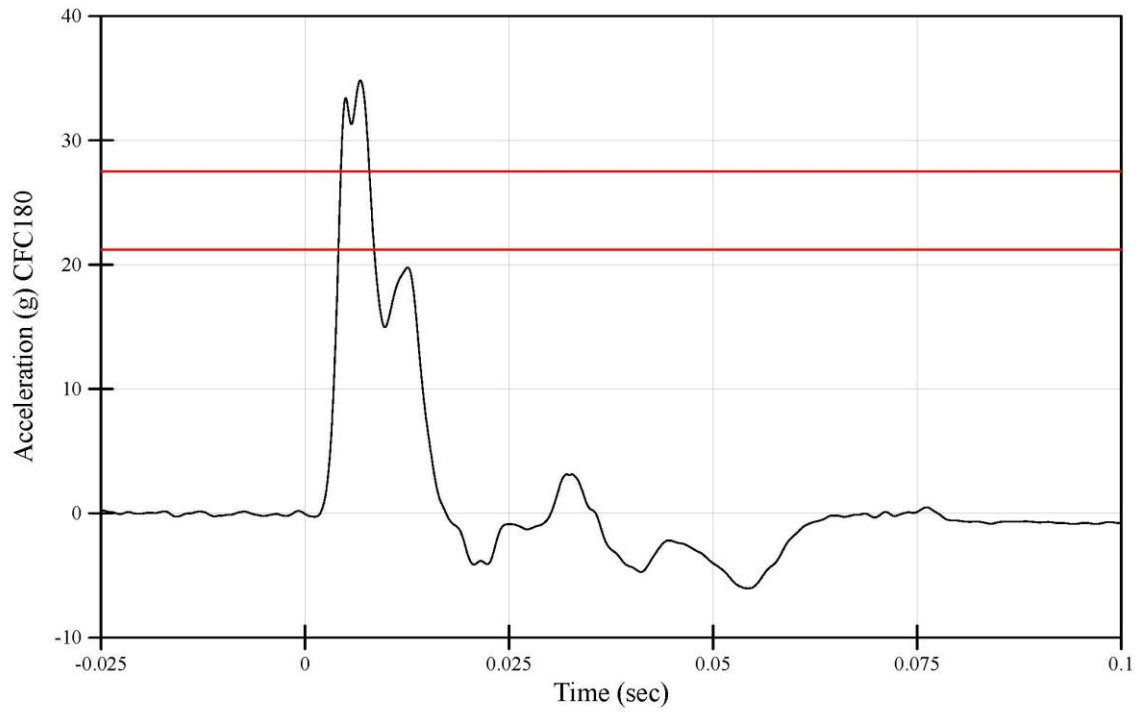
WorldSID-05F Left Thorax without Arm Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210223-5 processed

2/23/2021 4:26 PM

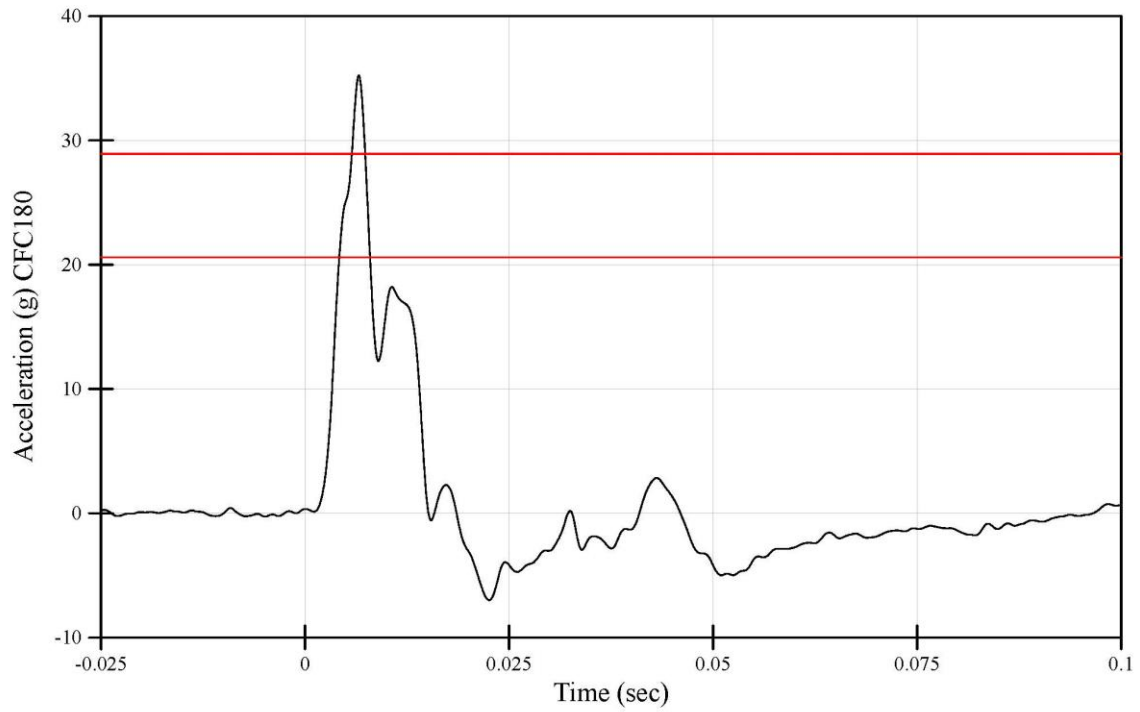
WorldSID-05F Left Thorax without Arm Qualification
Peak T4 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210223-5 processed

2/23/2021 4:26 PM

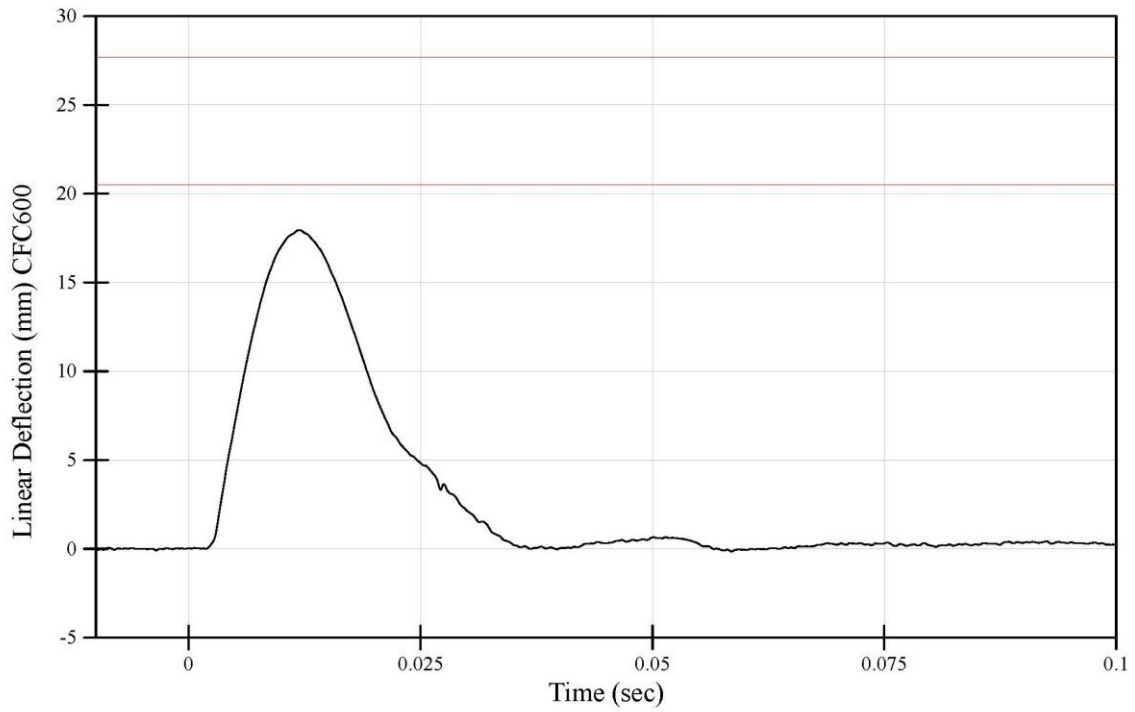
WorldSID-05F Left Thorax without Arm Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210223-5 processed

2/23/2021 4:26 PM

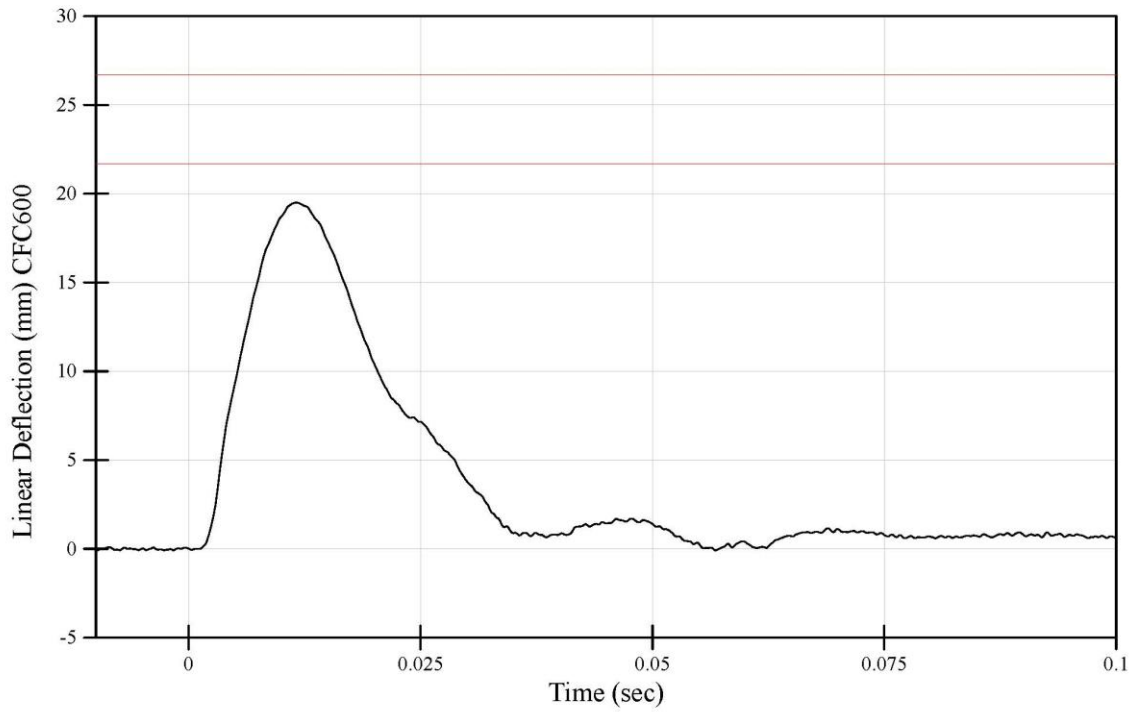
WorldSID-05F Left Thorax without Arm Qualification
Peak Thorax Rib 1 Compression
Dummy Serial Number: DK1774



File Name: 210223-5 processed

2/23/2021 4:26 PM

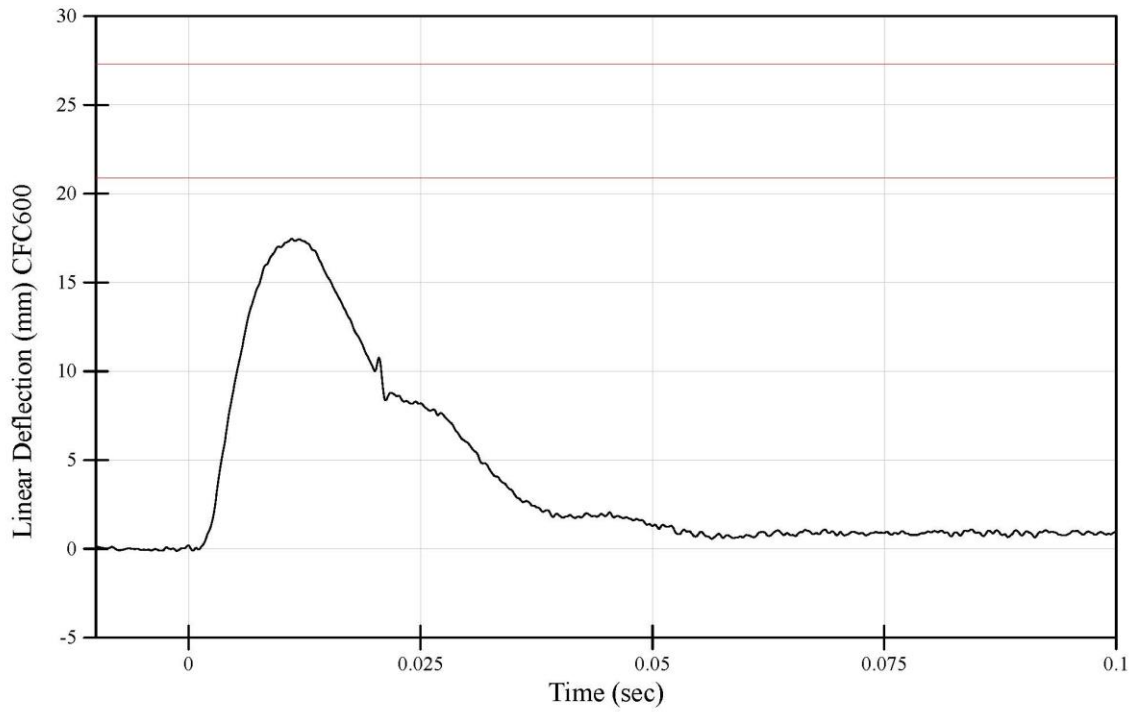
WorldSID-05F Left Thorax without Arm Qualification
Peak Thorax Rib 2 Compression
Dummy Serial Number: DK1774



File Name: 210223-5 processed

2/23/2021 4:26 PM

WorldSID-05F Left Thorax without Arm Qualification
Peak Thorax Rib 3 Compression
Dummy Serial Number: DK1774



File Name: 210223-5 processed

2/23/2021 4:26 PM

**WorldSID-05F Left Abdomen Qualification
Test Results Summary**

Dummy Serial Number: DK1774

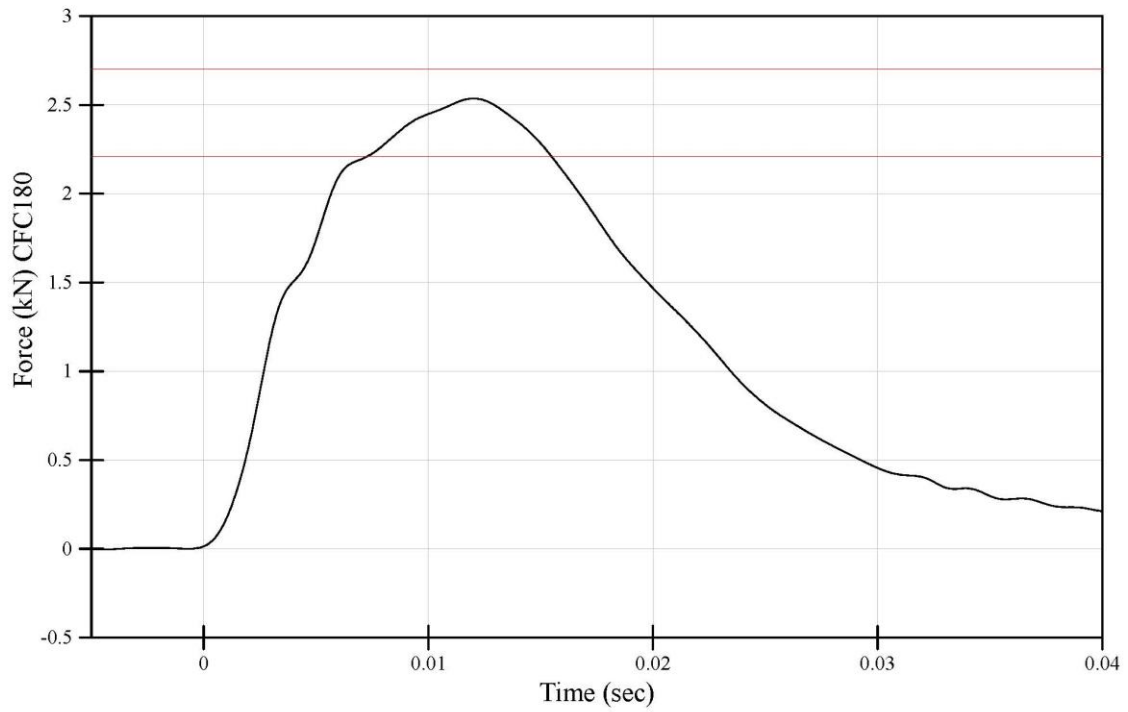
Tested Components		Test ID: 210224-3
Shoulder Rib: DM6270	Abdomen Rib 1: DM5165	Test Date: 2/24/2021
Thorax Rib 1: DM2783	Abdomen Rib 2: DM5167	Test Time: 11:30 AM
Thorax Rib 2: DM2784	RibEye: 161	
Thorax Rib 3: DM2787		

Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	22.2	Pass
Test Humidity (%)	10 - 70	62	Pass
Test Velocity (m/s)	4.20 - 4.40	4.29	Pass
Thorax Rib Temperature Sensor (°C)	20.6 - 23.8	23.6	Pass
Peak Probe Force (kN)	2.21 - 2.70	2.54	Pass
Peak T12 Acceleration (g)	24.4 - 30.6	29.0	Pass
Peak Abdomen Rib 1 Length Change (mm)	23.1 - 31.2	23.3	Pass
Peak Abdomen Rib 2 Length Change (mm)	22.7 - 27.8	24.1	Pass

* WorldSID-50M Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210224-3 processed

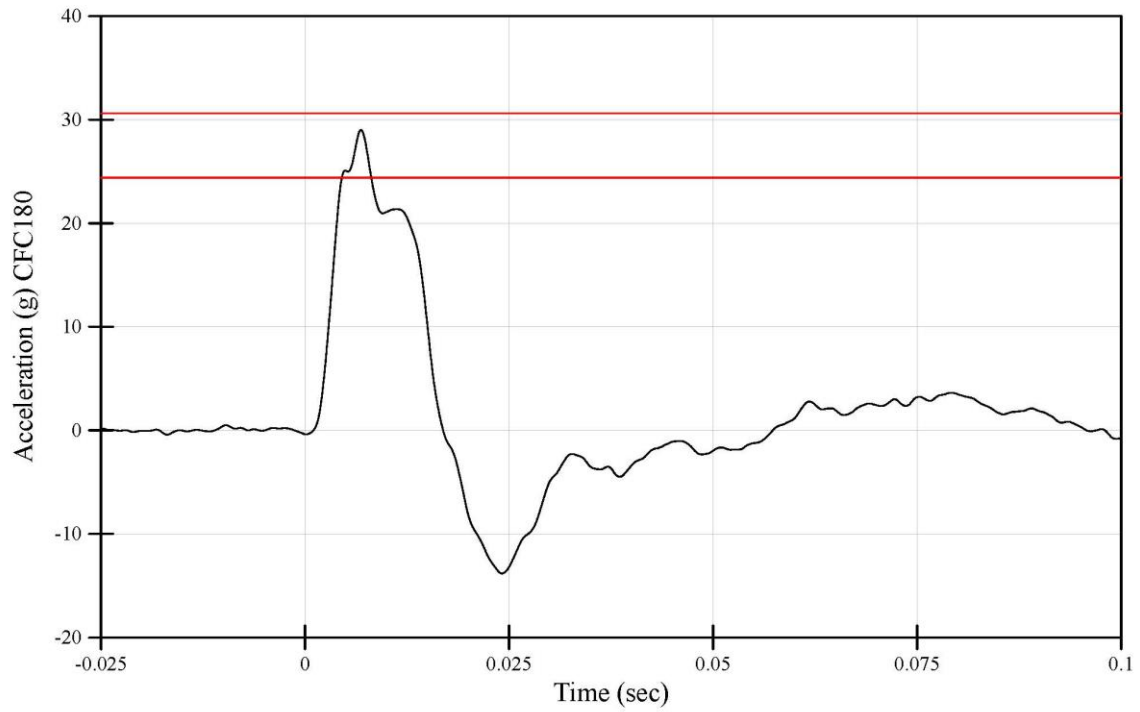
WorldSID-05F Abdomen Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210224-3 processed

2/24/2021 11:30 AM

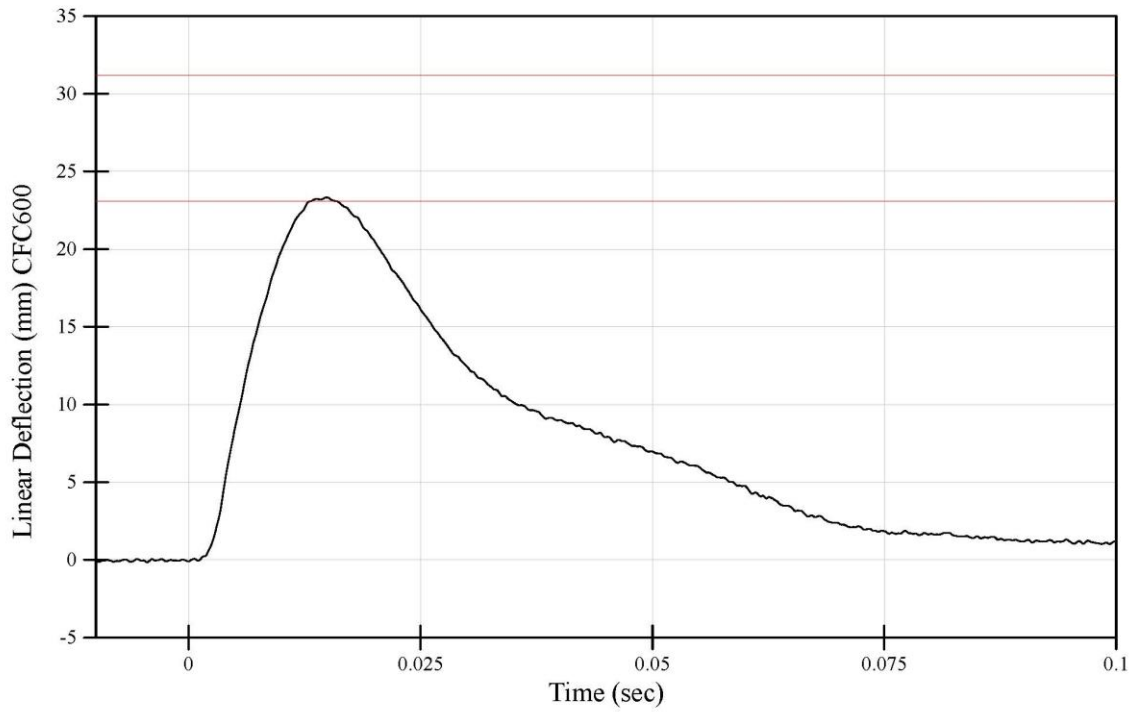
WorldSID-05F Abdomen Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210224-3 processed

2/24/2021 11:30 AM

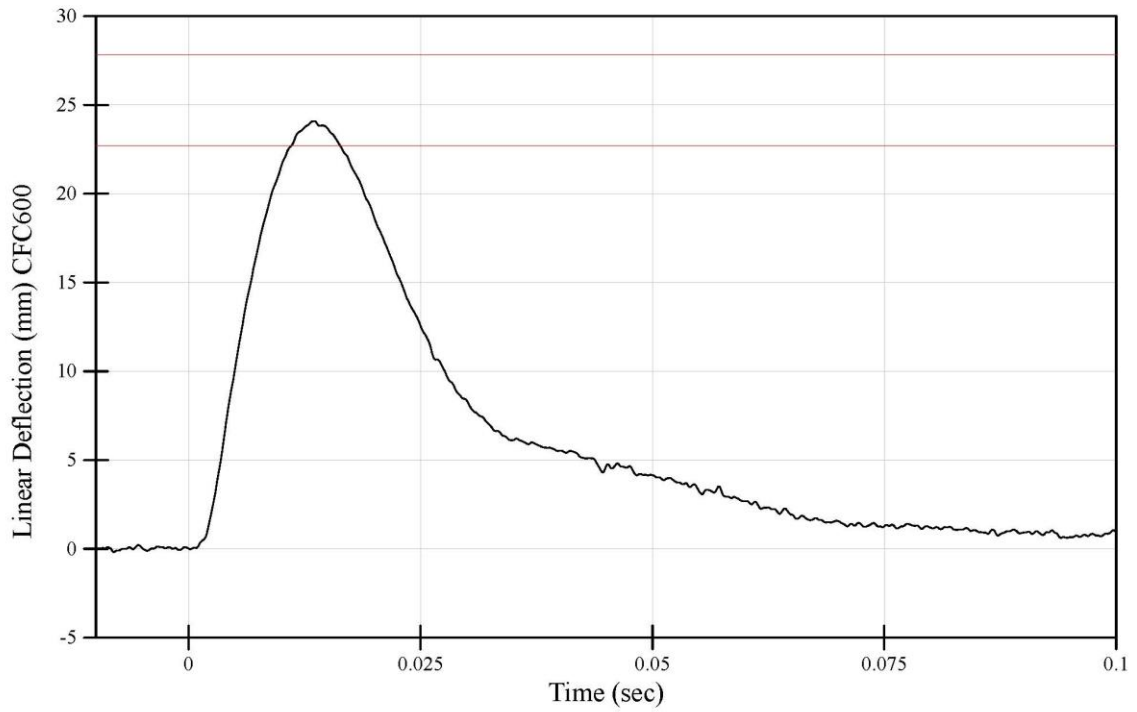
WorldSID-05F Abdomen Qualification
Peak Abdomen Rib 1 Compression
Dummy Serial Number: DK1774



File Name: 210224-3 processed

2/24/2021 11:30 AM

WorldSID-05F Abdomen Qualification
Peak Abdomen Rib 2 Compression
Dummy Serial Number: DK1774



File Name: 210224-3 processed

2/24/2021 11:30 AM

**WorldSID-05F Left Pelvis Qualification
Test Results Summary**

Dummy Serial Number: DK1774

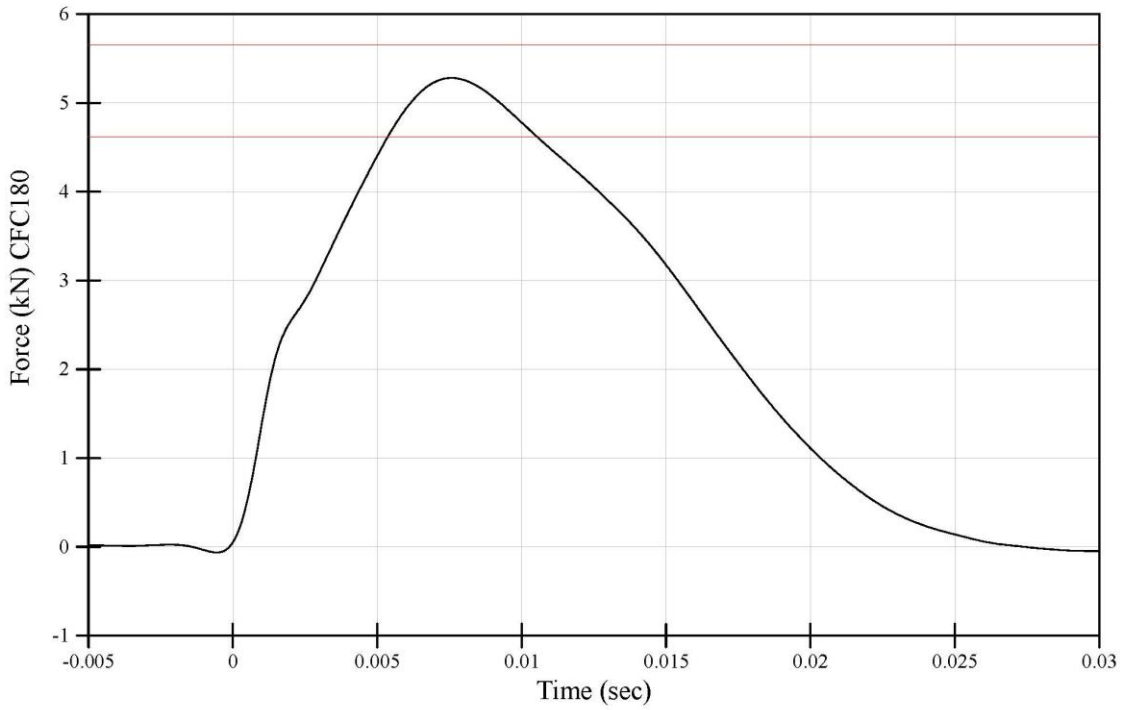
<u>Tested Components</u> Pelvis Bone: DW2458	Test ID: 210224-2 Test Date: 2/24/2021 Test Time: 8:38 AM
---	---

Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.7	Pass
Test Humidity (%)	10 - 70	60	Pass
Test Velocity (m/s)	6.60 - 6.80	6.69	Pass
Peak Probe Force (kN)	4.62 - 5.65	5.28	Pass
Peak Pubic Force FY (N)	-1200.0 - (-770.0)	-1031.8	Pass
Peak T12 Acceleration (g)	11.8 - 15.8	19.4	Fail
Peak Pelvis Acceleration (g)	48.6 - 74.4	45.0	Fail

* WorldSID-50M Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210224-2 processed

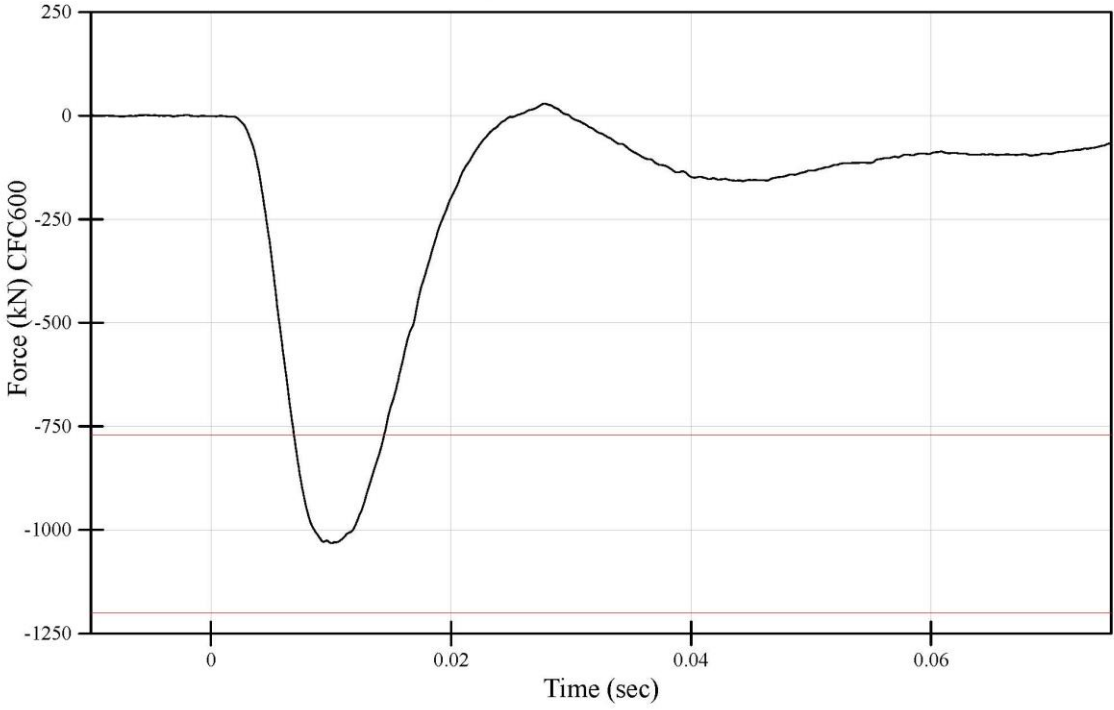
WorldSID-05F Left Pelvis Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210224-2 processed

2/24/2021 8:31 AM

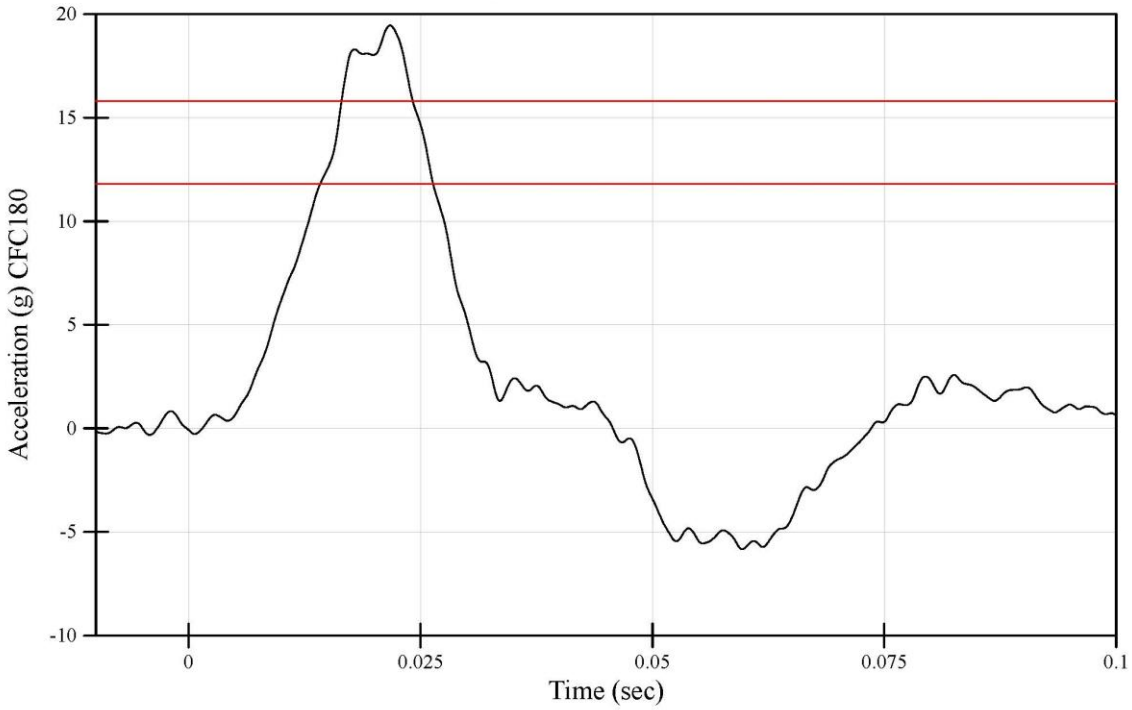
WorldSID-05F Left Pelvis Qualification
Peak Pubic Y axis Force
Dummy Serial Number: DK1774



File Name: 210224-2 processed

2/24/2021 8:31 AM

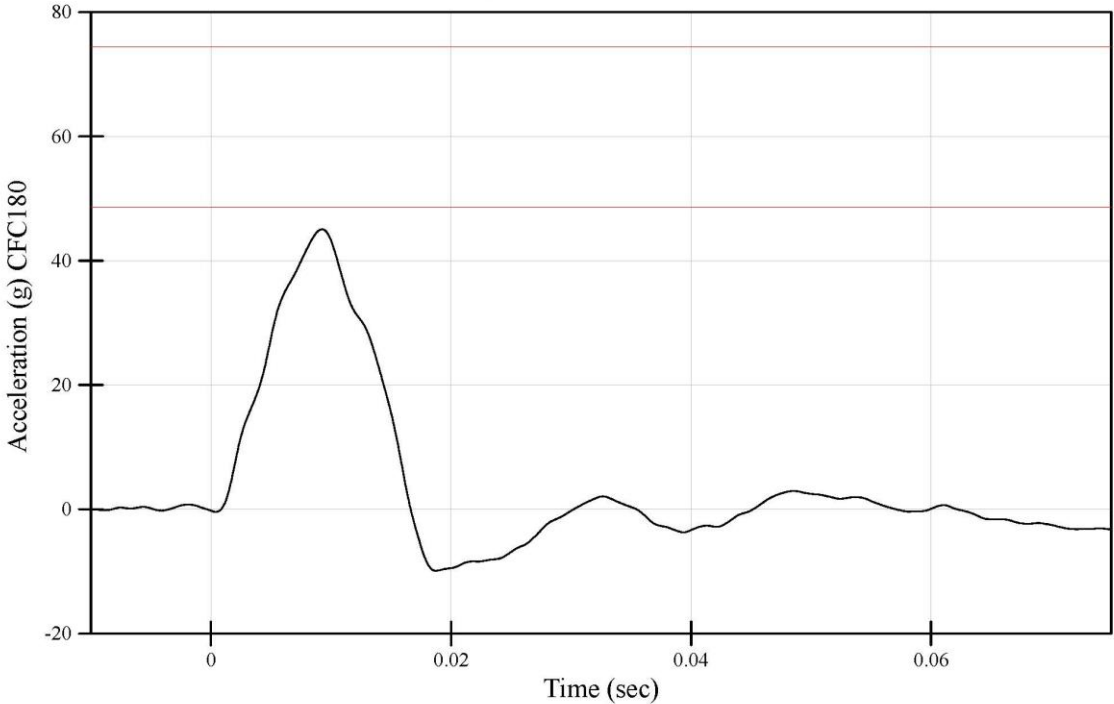
WorldSID-05F Left Pelvis Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210224-2 processed

2/24/2021 8:31 AM

WorldSID-05F Left Pelvis Qualification
Peak Pelvis Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210224-2 processed

2/24/2021 8:31 AM

Post-Test Calibration Sheets
Passenger S/N DK1774

**WorldSID-05F Head Front Qualification
Test Results Summary**

Dummy Serial Number: DK1774

Tested Components
Head: DM1000

Test ID: 210412-5
Test Date: 4/12/2021
Test Time: 9:35 AM

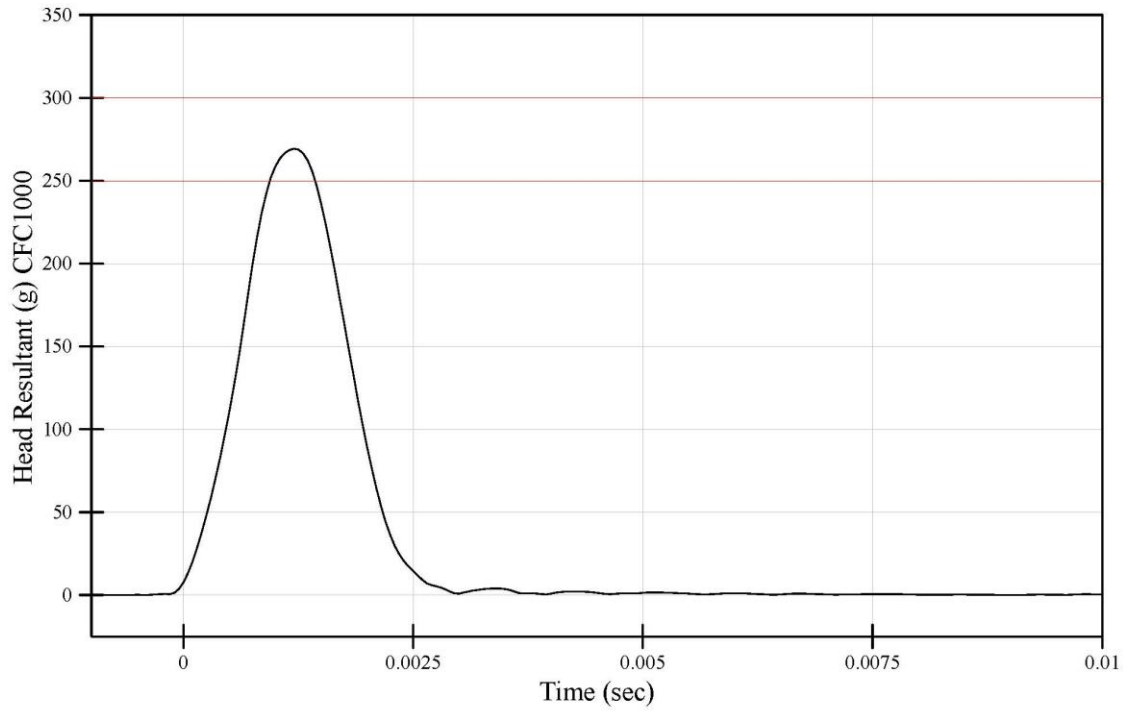
Test Results

<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.7	Pass
Test Humidity (%)	10 - 70	57	Pass
Peak Resultant Acceleration (g)	250.0 - 300.0	269.3	Pass
Peak Acceleration, y-axis (g)	-15.00 - 15.00	-3.09	Pass
Oscillations occurring after the main acceleration pulse (%)	-10.0 - 10.0	1.5	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210412-5 processed

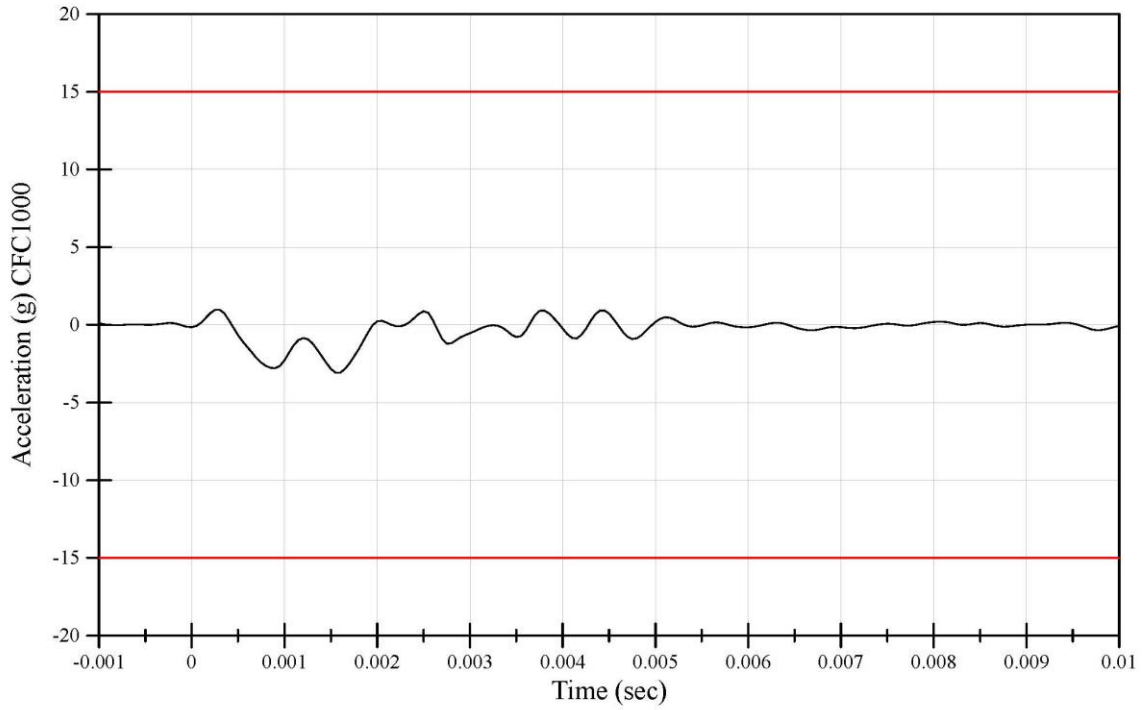
WorldSID-05F Head Front Qualification
Peak Resultant Acceleration
Head Serial Number: DM1000



File Name: 210412-5 processed

4/12/2021 9:35 AM

WorldSID-05F Head Front Qualification
Peak Lateral Y Acceleration
Head Serial Number: DM1000



File Name: 210412-5 processed

4/12/2021 9:35 AM

**WorldSID-05F Head Left Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

Tested Components

Head: DM1000

Test ID: 210412-3

Test Date: 4/12/2021

Test Time: 8:20 AM

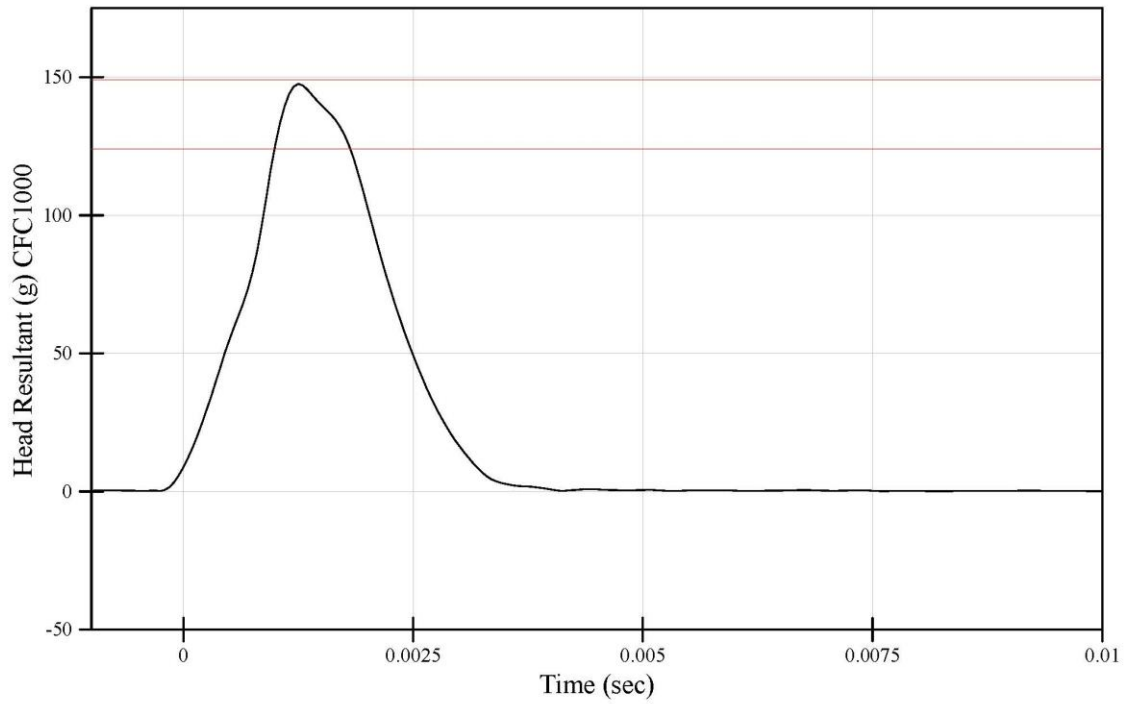
Test Results

<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.6	Pass
Test Humidity (%)	10 - 70	59	Pass
Peak Resultant Acceleration (g)	124.0 - 149.0	147.5	Pass
Peak Acceleration, x-axis (g)	-15.00 - 15.00	-9.79	Pass
Oscillations occurring after the main acceleration pulse (%)	-10.0 - 10.0	0.5	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210412-3 processed

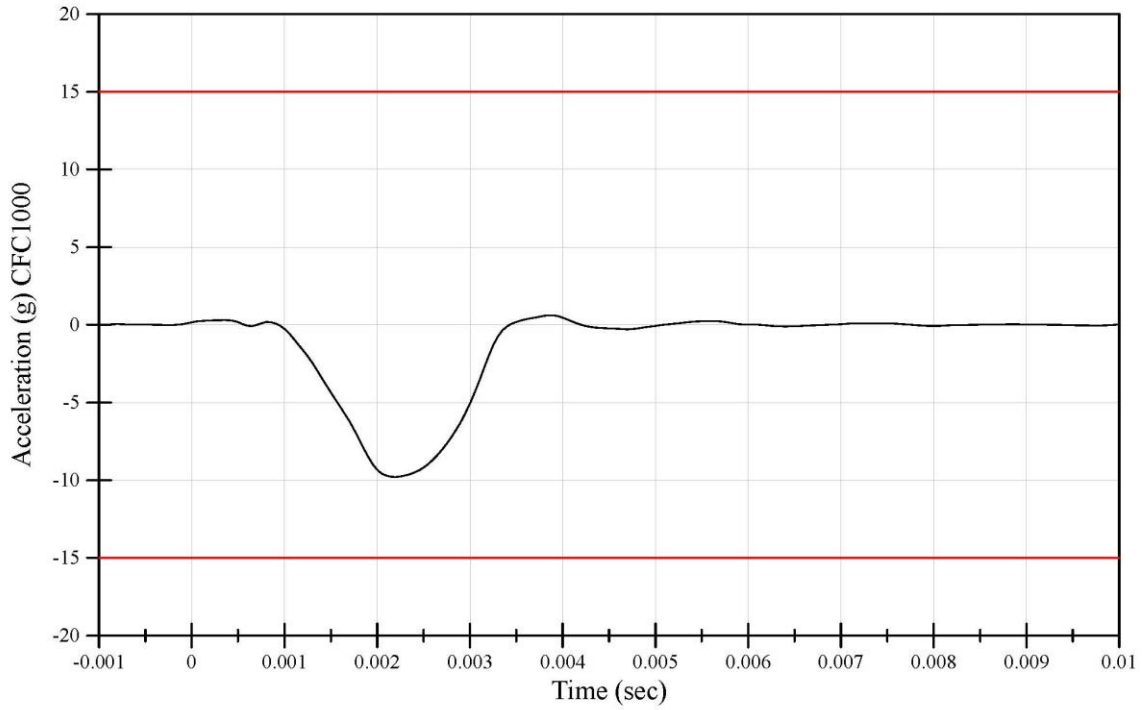
WorldSID-05F Head Left Lateral Qualification
Peak Resultant Acceleration
Head Serial Number: DM1000



File Name: 210412-3 processed

4/12/2021 8:20 AM

WorldSID-05F Head Left Lateral Qualification
Peak Lateral X Acceleration
Head Serial Number: DM1000



File Name: 210412-3 processed

4/12/2021 8:20 AM

**WorldSID-05F Head Right Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

Tested Components

Head: DM1000

Test ID: 210412-4

Test Date: 4/12/2021

Test Time: 9:05 AM

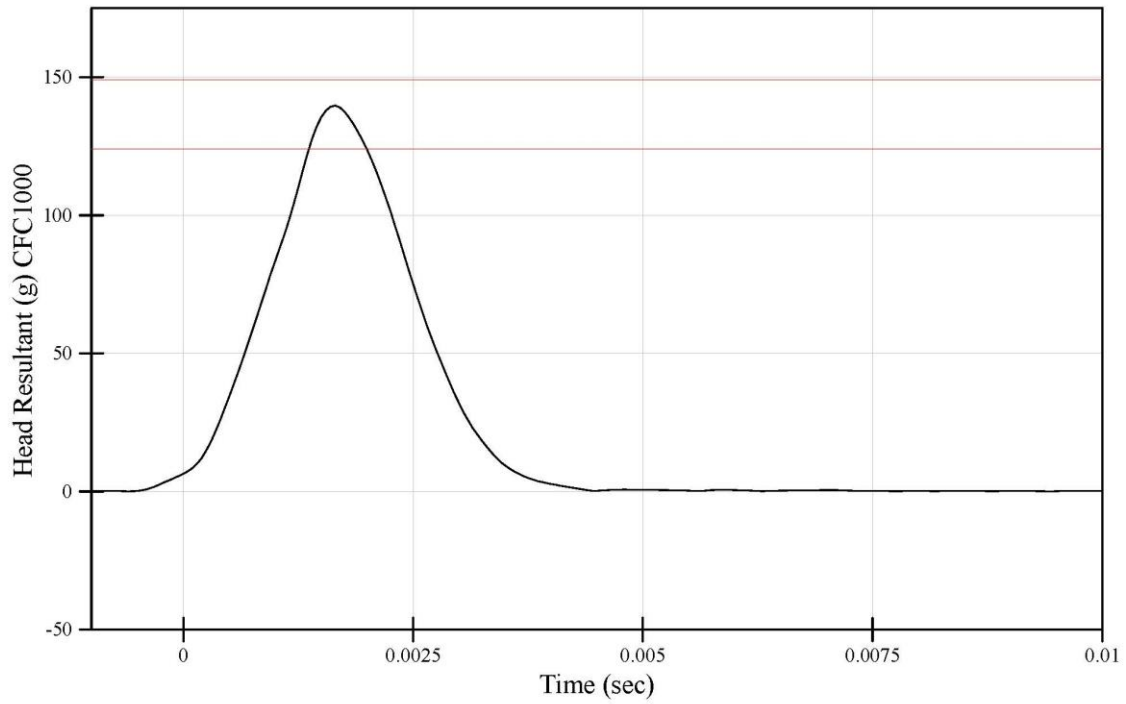
Test Results

<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.6	Pass
Test Humidity (%)	10 - 70	58	Pass
Peak Resultant Acceleration (g)	124.0 - 149.0	139.7	Pass
Peak Acceleration, x-axis (g)	-15.00 - 15.00	-4.97	Pass
Oscillations occurring after the main acceleration pulse (%)	-10.0 - 10.0	0.5	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210412-4 processed

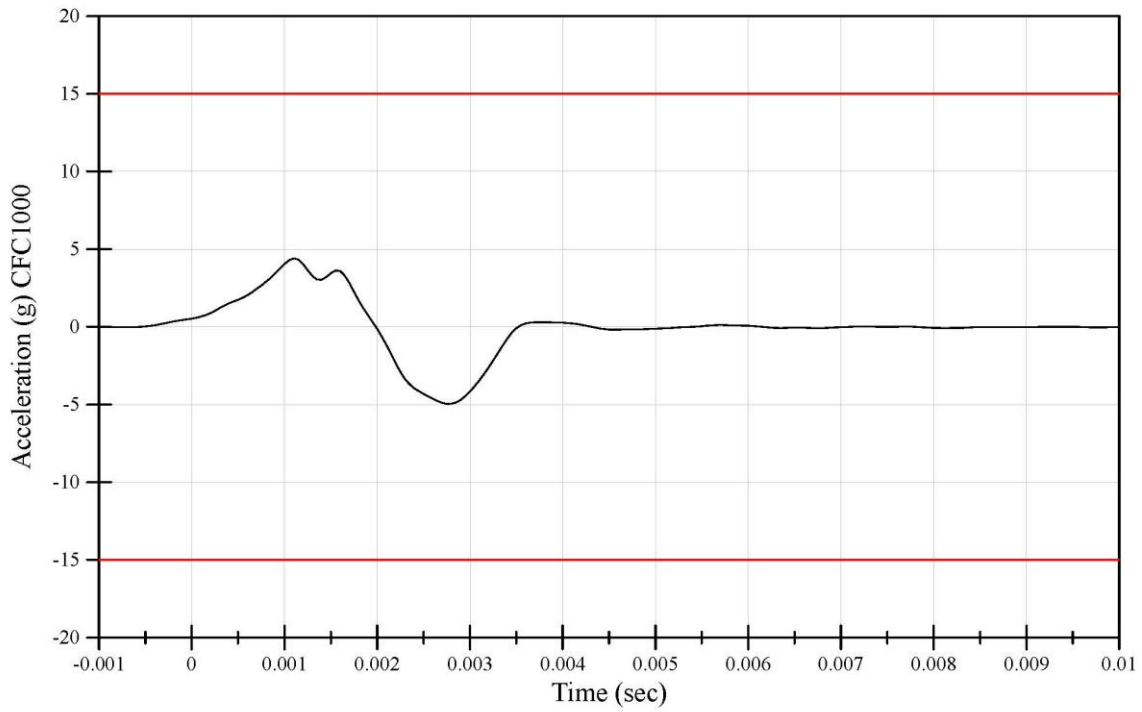
WorldSID-05F Head Right Lateral Qualification
Peak Resultant Acceleration
Head Serial Number: DM1000



File Name: 210412-4 processed

4/12/2021 9:05 AM

WorldSID-05F Head Right Lateral Qualification
Peak Lateral Y Acceleration
Head Serial Number: DM1000



File Name: 210412-4 processed

4/12/2021 9:05 AM

**WorldSID-05F Neck Left Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

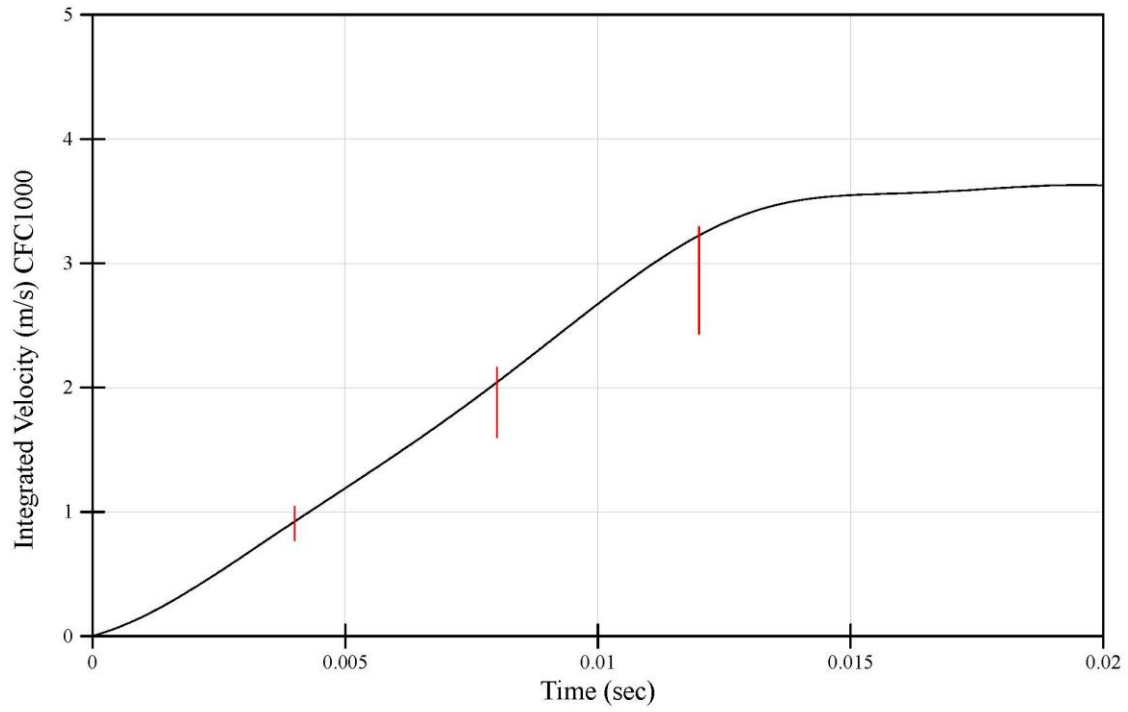
<u>Tested Components</u> Neck: DX6209	Test ID: 210407-10 Test Date: 4/7/2021 Test Time: 3:14 PM
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Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	20.6	Pass
Test Humidity (%)	10 - 70	54	Pass
Test Velocity (m/s)	3.30 - 3.50	3.50	Pass
Pendulum Velocity at 4 ms after T0 (m/s)	0.77 - 1.04	0.92	Pass
Pendulum Velocity at 8 ms after T0 (m/s)	1.60 - 2.16	2.04	Pass
Pendulum Velocity at 12 ms after T0 (m/s)	2.43 - 3.29	3.22	Pass
Peak Headform Flexion Angle (deg)	-71.4 - (-58.5)	-67.3	Pass
Peak Headform Flexion Angle Decay			
Time to 0 degrees (ms)	57.3 - 76.5	65.4	Pass
Peak X-Axis Moment at Occipital Condyle (Nm)	34.2 - 51.0	38.3	Pass
Peak X-Axis Moment at Occipital Condyle			
Decay Time to 0 Nm (ms)	69.4 - 93.3	80.2	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210407-10 processed

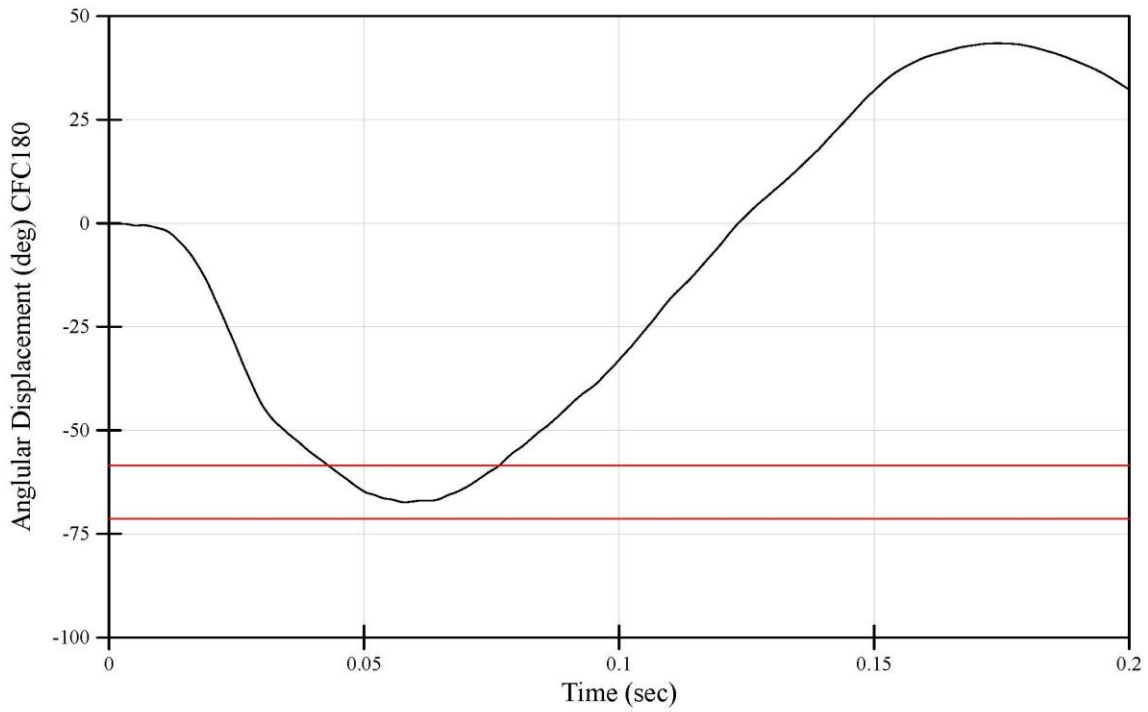
WorldSID-05F Neck Left Lateral Qualification
Probe Acceleration
Neck Serial Number: DK1774



File Name: 210407-10 processed

4/7/2021 3:14 PM

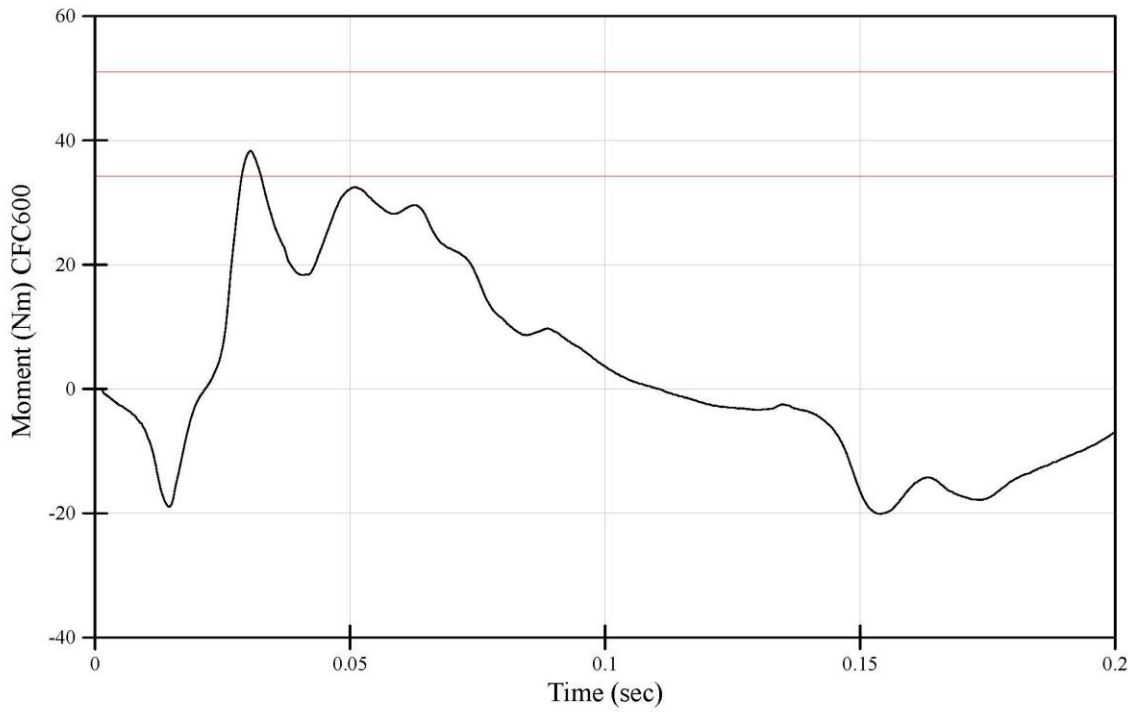
WorldSID-05F Neck Left Lateral Qualification
Peak Headform Flexion Angle
Neck Serial Number: DK1774



File Name: 210407-10 processed

4/7/2021 3:14 PM

WorldSID-05F Neck Left Lateral Qualification
Peak Moment at Occipital Condyle
Neck Serial Number: DK1774



File Name: 210407-10 processed

4/7/2021 3:14 PM

**WorldSID-05F Neck Right Lateral Qualification
Test Results Summary**

Dummy Serial Number: DK1774

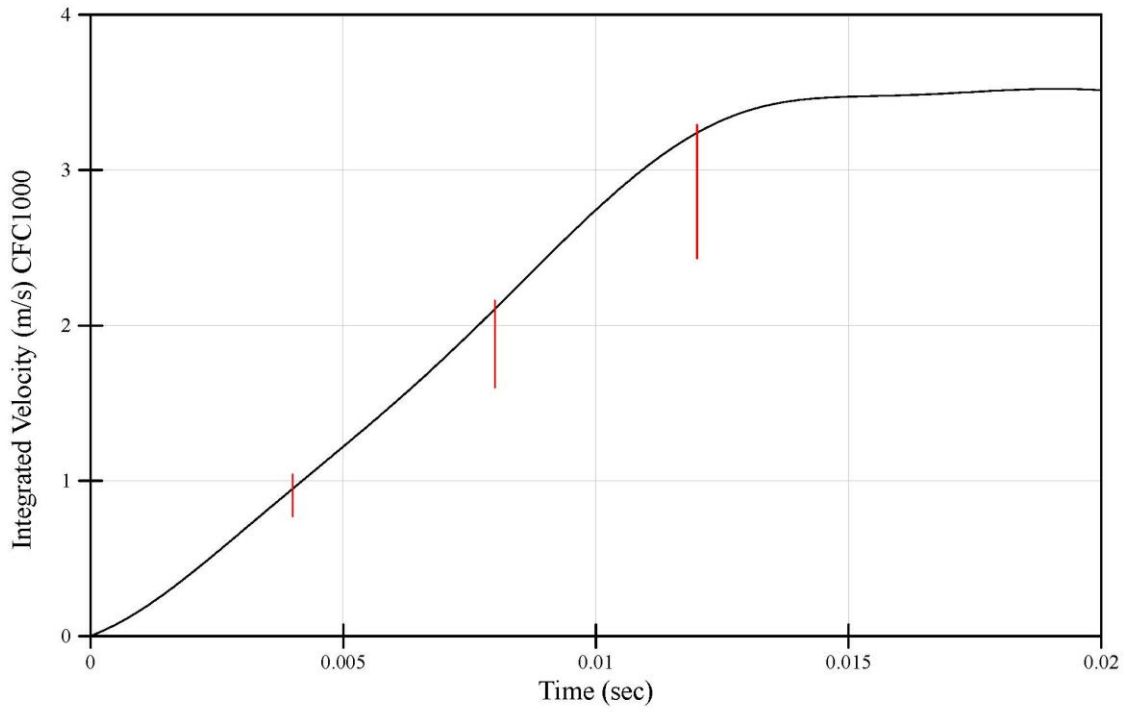
<u>Tested Components</u> Neck: DX6209	Test ID: 210407-12 Test Date: 4/7/2021 Test Time: 4:32 PM
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Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	20.8	Pass
Test Humidity (%)	10 - 70	56	Pass
Test Velocity (m/s)	3.30 - 3.50	3.43	Pass
Pendulum Velocity at 4 ms after T0 (m/s)	0.77 - 1.04	0.95	Pass
Pendulum Velocity at 8 ms after T0 (m/s)	1.60 - 2.16	2.11	Pass
Pendulum Velocity at 12 ms after T0 (m/s)	2.43 - 3.29	3.24	Pass
Peak Headform Flexion Angle (deg)	58.5 - 71.4	65.8	Pass
Peak Headform Flexion Angle Decay Time to 0 degrees (ms)	57.3 - 76.5	60.1	Pass
Peak X-Axis Moment at Occipital Condyle (Nm)	-51.0 - (-34.2)	-37.4	Pass
Peak X-Axis Moment at Occipital Condyle Decay Time to 0 Nm (ms)	69.4 - 93.3	81.8	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210407-12 processed

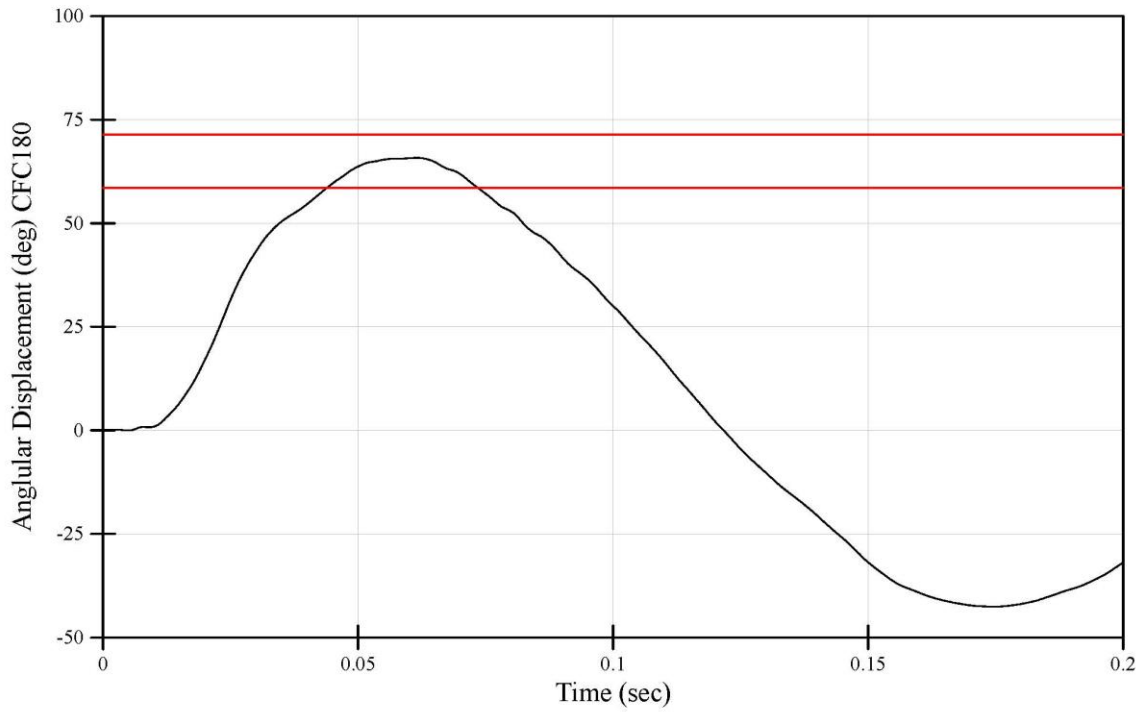
WorldSID-05F Neck Right Lateral Qualification
Probe Acceleration
Neck Serial Number: DK1774



File Name: 210407-12 processed

4/7/2021 4:32 PM

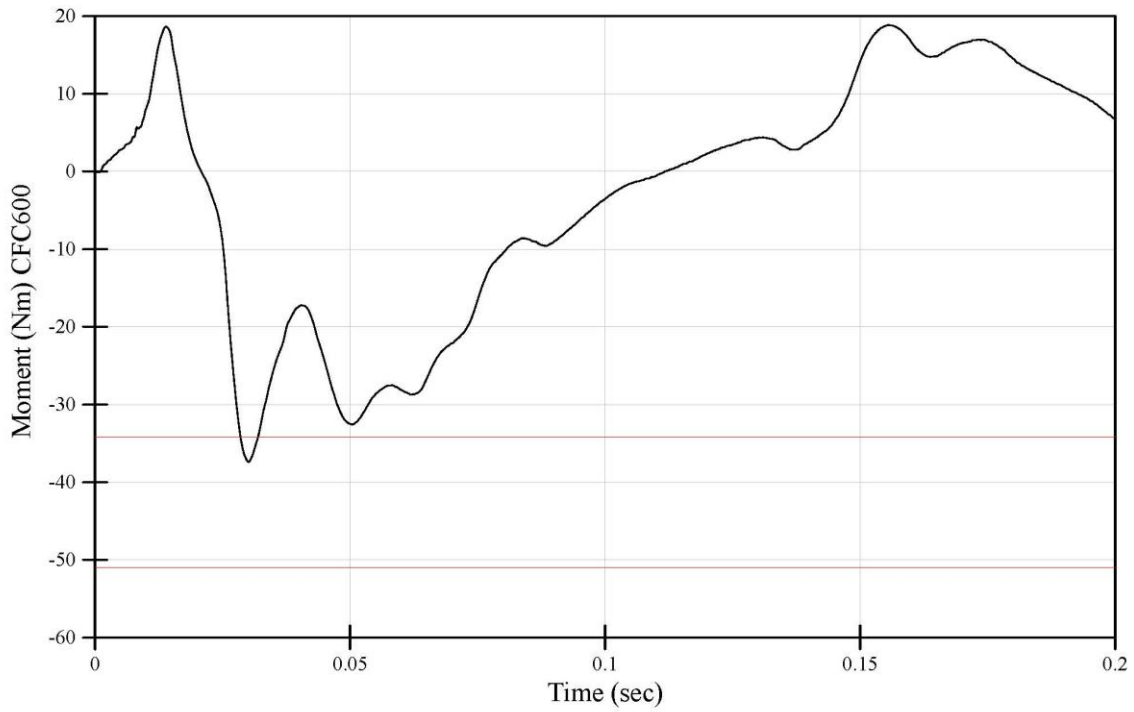
WorldSID-05F Neck Right Lateral Qualification
Peak Headform Flexion Angle
Neck Serial Number: DK1774



File Name: 210407-12 processed

4/7/2021 4:32 PM

WorldSID-05F Neck Right Lateral Qualification
Peak Moment at Occipital Condyle
Neck Serial Number: DK1774



File Name: 210407-12 processed

4/7/2021 4:32 PM

**WorldSID-05F Shoulder Qualification
Test Results Summary**

Dummy Serial Number: DK1774

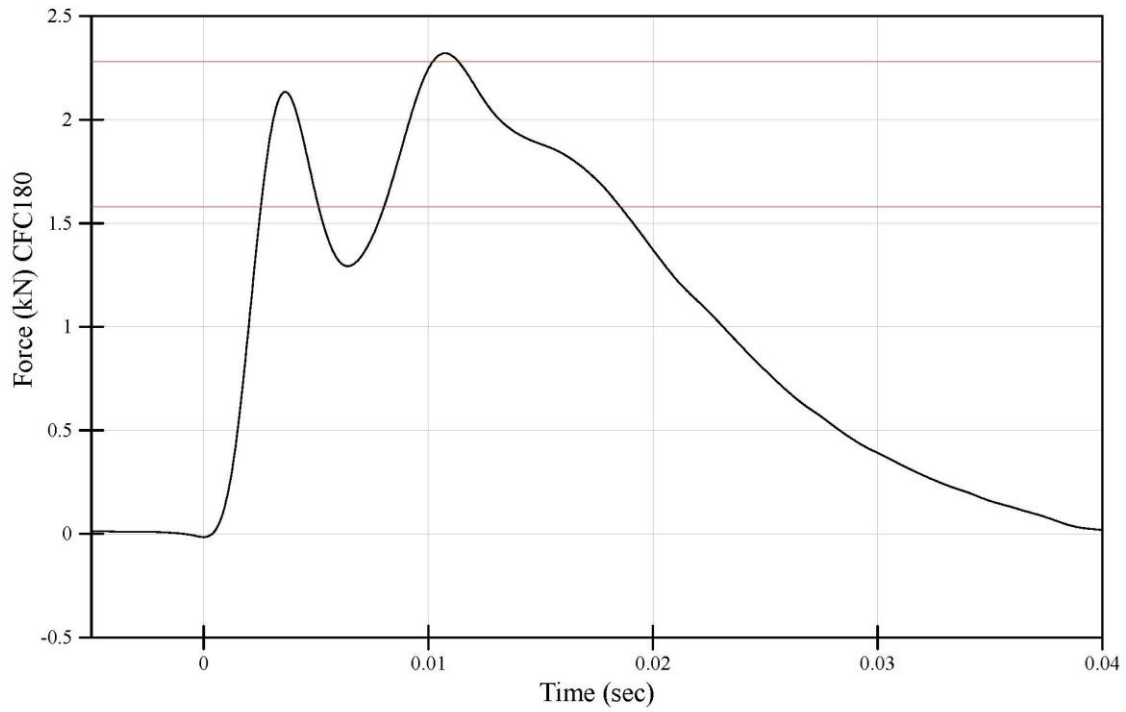
<u>Tested Components</u>		Test ID: 210405-2
Shoulder Pad: W5-P01	Thorax Rib 3: DM2787	Test Date: 4/5/2021
Shoulder Rib: DM6270	RibEye: 161	Test Time: 8:27 AM
Thorax Rib 1: DM2783	Impacted Arm: DJ1634	
Thorax Rib 2: DM2784		

<u>Test Results</u>			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.6	Pass
Test Humidity (%)	10 - 70	49	Pass
Test Velocity (m/s)	4.20 - 4.40	4.23	Pass
Thorax Rib Temperature Sensor (°C)	20.6 - 23.8	21.4	Pass
Peak Probe Force (kN)	1.58 - 2.28	2.32	Fail
Peak Shoulder Rib Length Change (mm)	23.4 - 36.6	26.1	Pass

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210405-2 processed

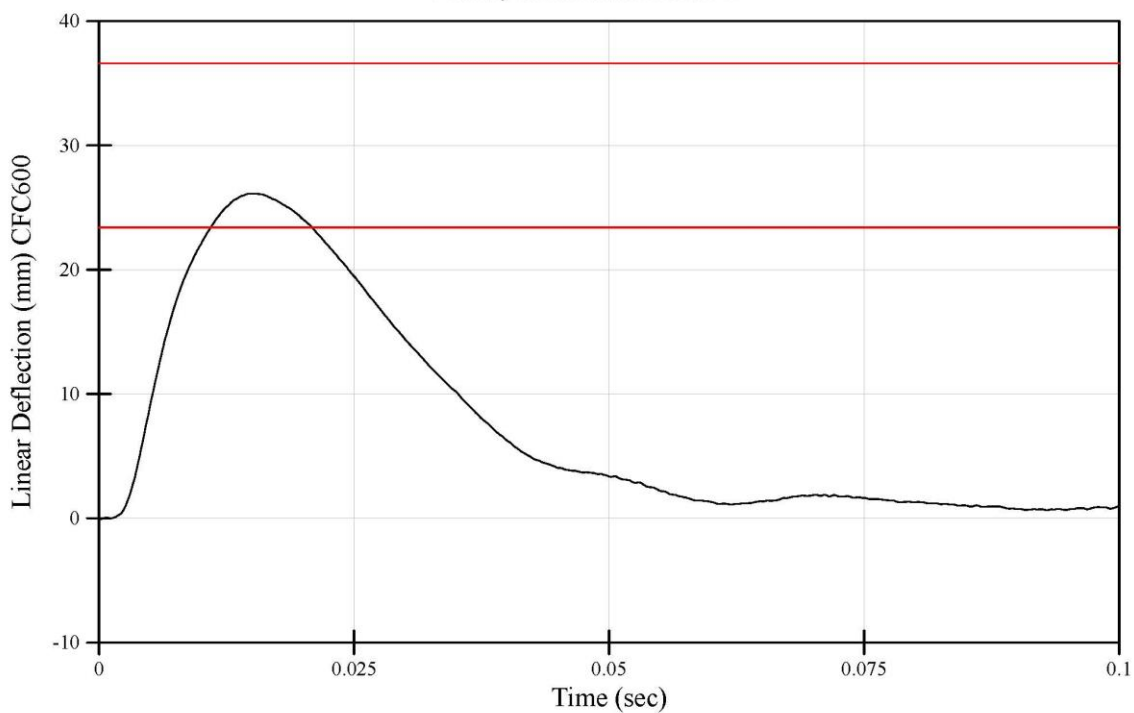
WorldSID-05F Shoulder Qualification
Peak Pendulum Force
Dummy Serial Number: DK 1774



File Name: 210405-2 processed

4/5/2021 8:27 AM

WorldSID05F Shoulder Qualification
Peak Shoulder Rib Deflection
Dummy Serial Number: DK1774



File Name: 210405-2 processed

4/5/2021 8:27 AM

**WorldSID-05F Left Thorax with Arm Qualification
Test Results Summary**

Dummy Serial Number: DK1774

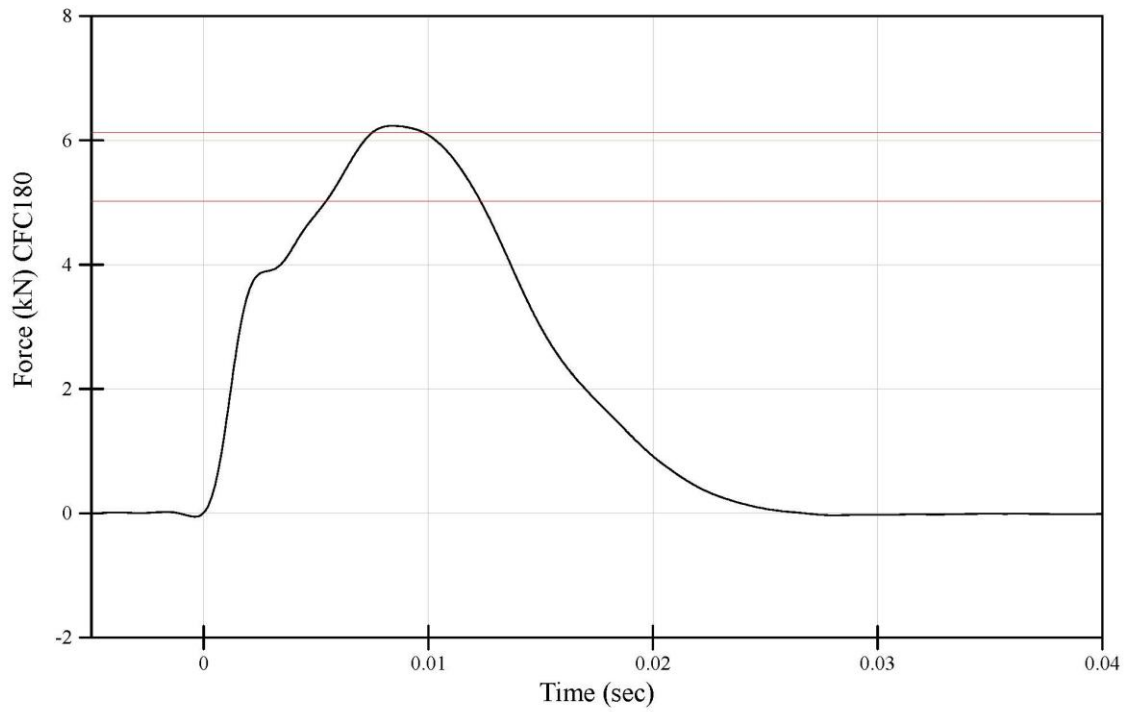
<u>Tested Components</u>		Test ID: 210405-4
Thorax Rib 1: DM2783	RibEye: 161	Test Date: 4/5/2021
Thorax Rib 2: DM2784	Impacted Arm: DJ1634	Test Time: 10:37 AM
Thorax Rib 3: DM2787		

<u>Test Results</u>			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.7	Pass
Test Humidity (%)	10 - 70	53	Pass
Test Velocity (m/s)	6.60 - 6.80	6.67	Pass
Thorax Rib Temperature Sensor (°C)	20.6 - 23.8	21.7	Pass
Peak Probe Force (kN)	5.02 - 6.13	6.23	Fail
Peak T4 Y Acceleration	34.7 - 52.0	61.3	Fail
Peak T12 Y Acceleration	44.5 - 54.9	64.5	Fail
Peak Thorax Rib 1 Y Length Change (mm)	18.3 - 26.4	18.3	Fail
Peak Thorax Rib 2 Y Length Change (mm)	21.6 - 26.4	18.1	Fail
Peak Thorax Rib 3 Y Length Change (mm)	19.7 - 26.6	16.2	Fail

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210405-4 processed

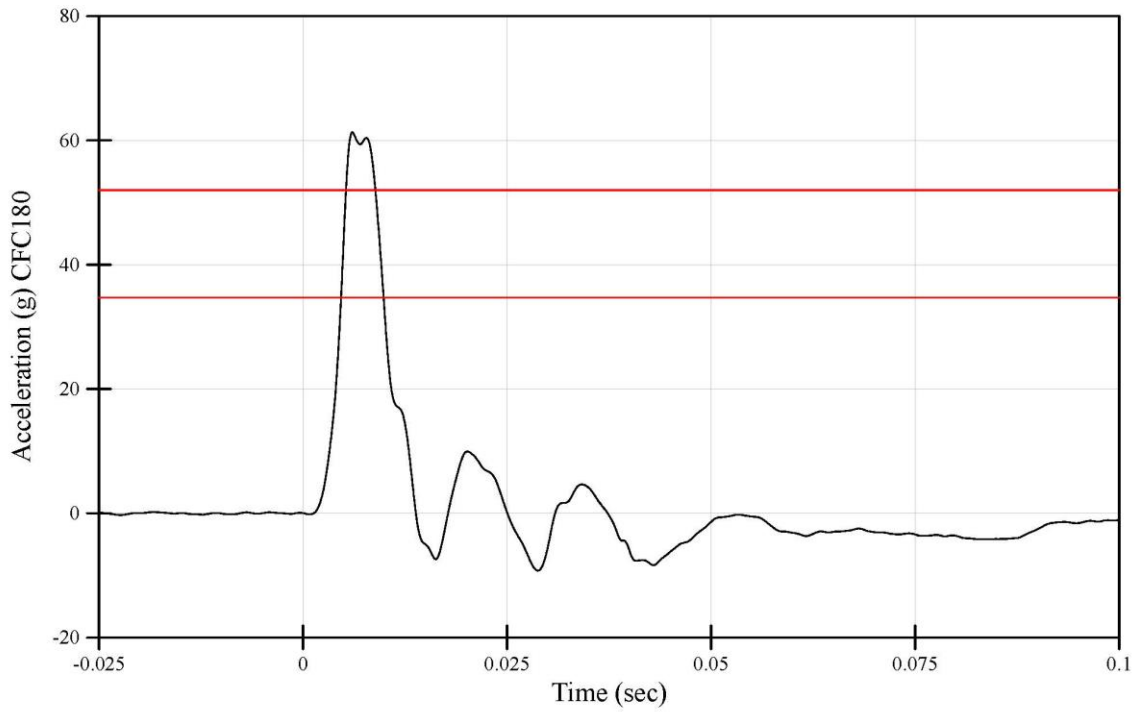
WorldSID-05F Left Thorax with Arm Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210405-4 processed

4/5/2021 10:37 AM

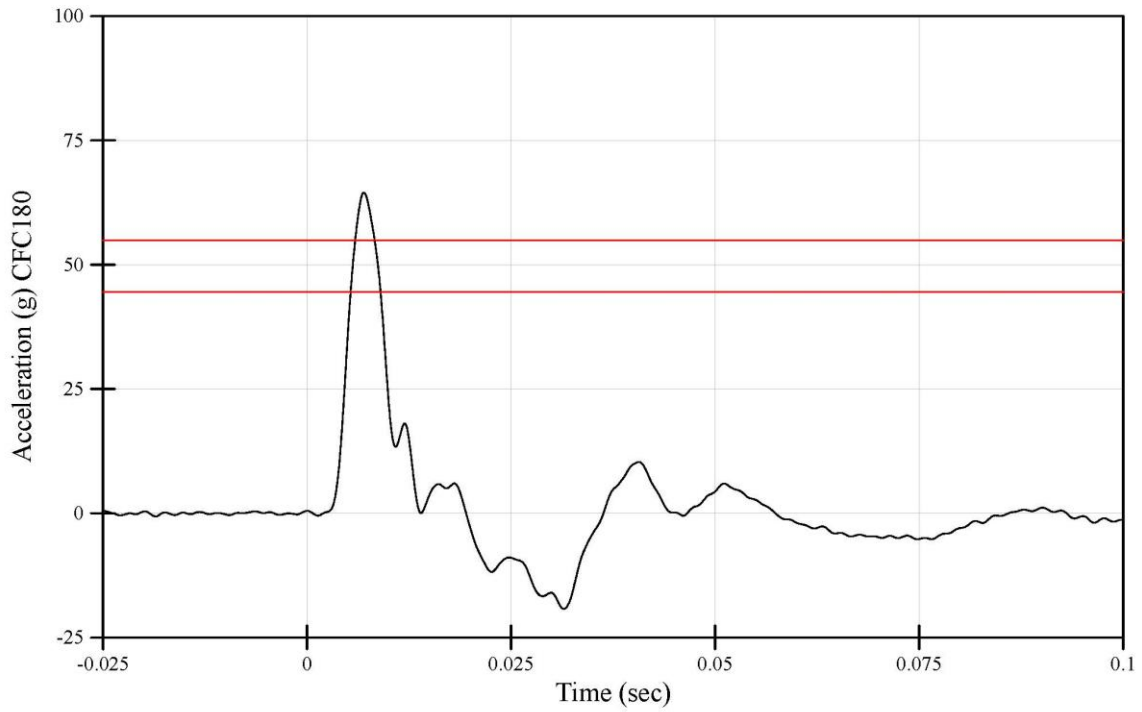
WorldSID-05F Left Thorax with Arm Qualification
Peak T4 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210405-4 processed

4/5/2021 10:37 AM

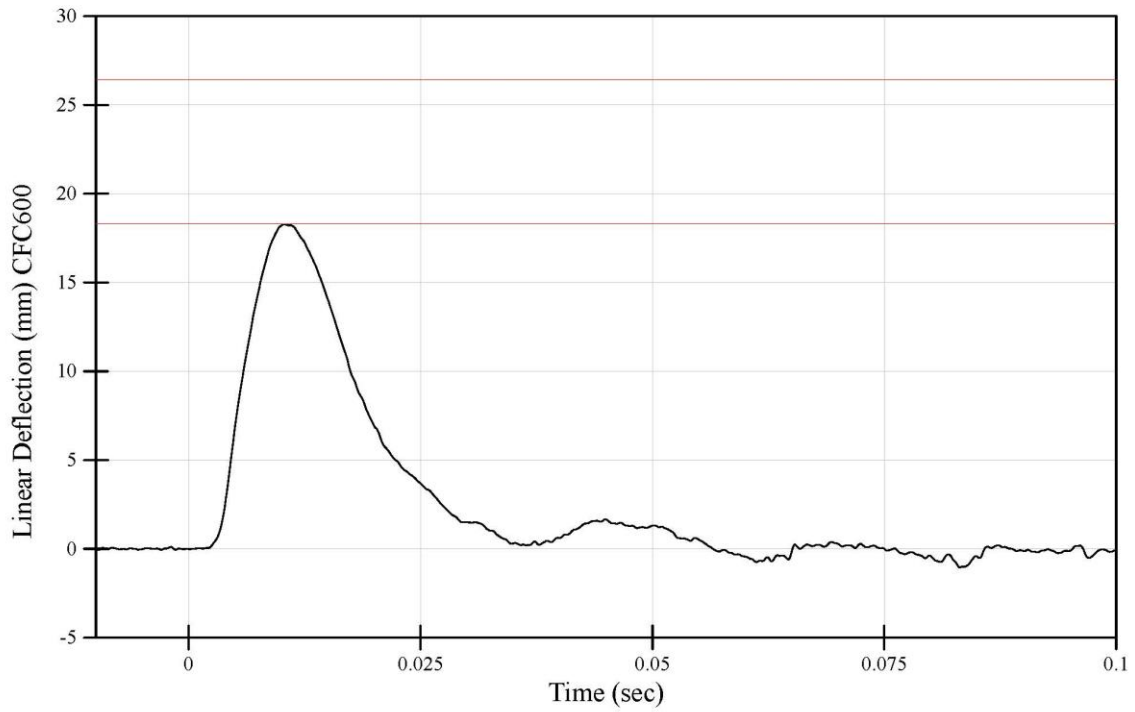
WorldSID-05F Left Thorax with Arm Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210405-4 processed

4/5/2021 10:37 AM

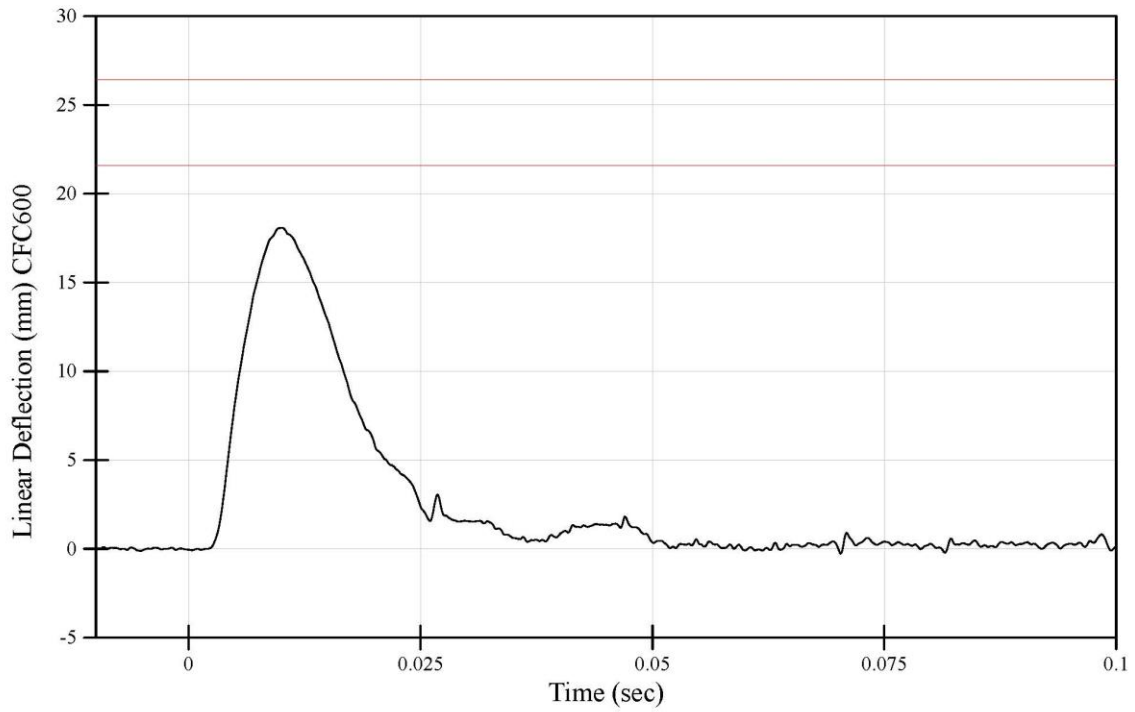
WorldSID-05F Left Thorax with Arm Qualification
Peak Thorax Rib 1 Compression
Dummy Serial Number: DK1774



File Name: 210405-4 processed

4/5/2021 10:37 AM

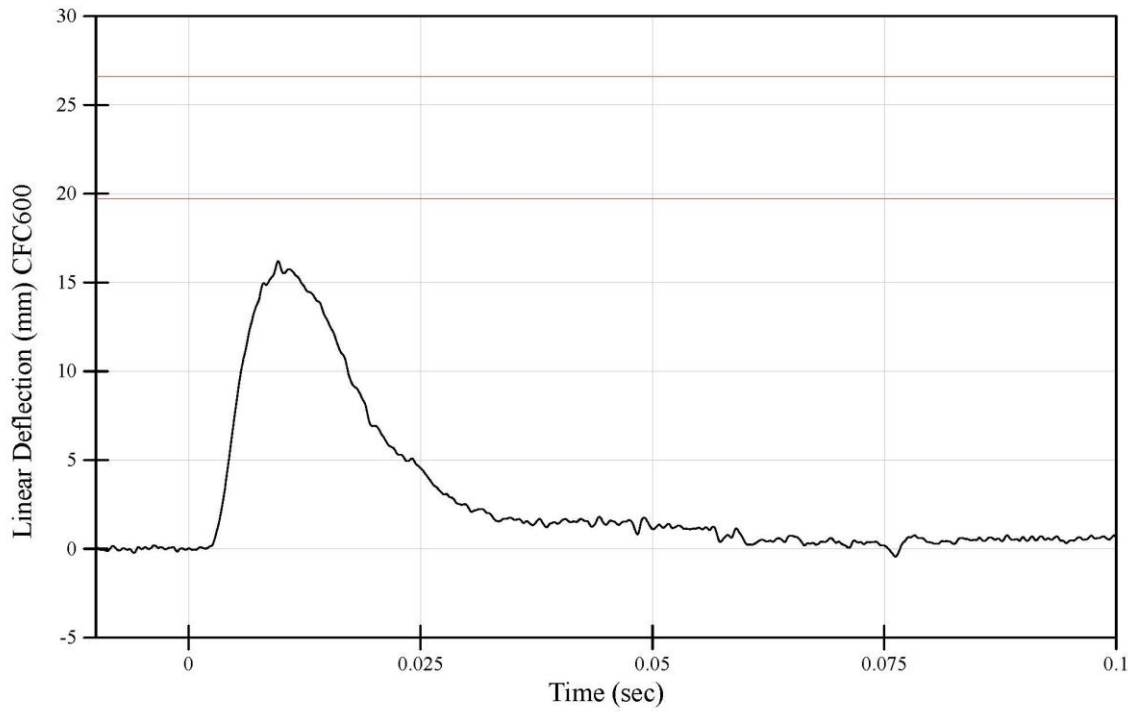
WorldSID-05F Left Thorax with Arm Qualification
Peak Thorax Rib 2 Compression
Dummy Serial Number: DK1774



File Name: 210405-4 processed

4/5/2021 10:37 AM

WorldSID-05F Left Thorax with Arm Qualification
Peak Thorax Rib 3 Compression
Dummy Serial Number: DK1774



File Name: 210405-4 processed

4/5/2021 10:37 AM

**WorldSID-05F Left Thorax without Arm Qualification
Test Results Summary**

Dummy Serial Number: DK1774

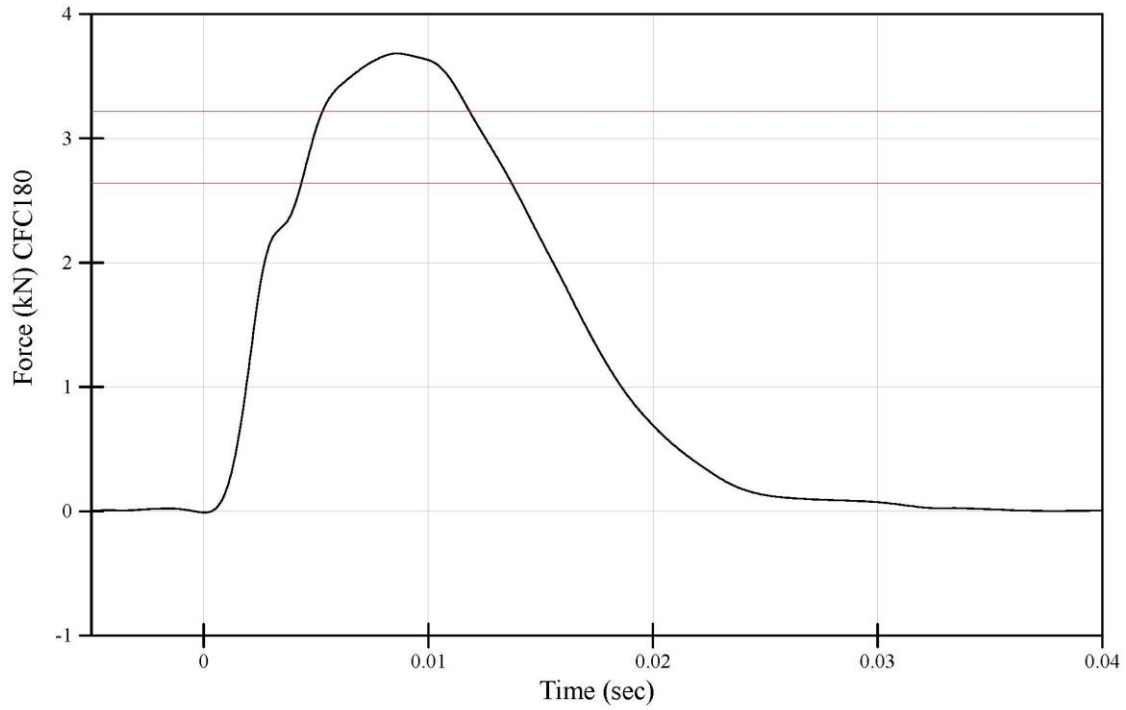
<u>Tested Components</u> Thorax Rib 1: DM2783 Thorax Rib 2: DM2784 Thorax Rib 3: DM2787 RibEye: 161	Test ID: 210405-6 Test Date: 4/5/2021 Test Time: 3:13 PM
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Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	20.7	Pass
Test Humidity (%)	10 - 70	52	Pass
Test Velocity (m/s)	4.20 - 4.40	4.28	Pass
Thorax Rib Temperature Sensor (°C)	20.6 - 23.8	21.3	Pass
Peak Probe Force (kN)	2.64 - 3.22	3.68	Fail
Peak T4 Y Acceleration	21.2 - 27.5	37.5	Fail
Peak T12 Y Acceleration	20.6 - 28.9	31.3	Fail
Peak Thorax Rib 1 Y Length Change (mm)	20.5 - 27.7	19.7	Fail
Peak Thorax Rib 2 Y Length Change (mm)	21.7 - 26.7	18.5	Fail
Peak Thorax Rib 3 Y Length Change (mm)	20.9 - 27.3	18.0	Fail

* WorldSID-05F Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210405-6 processed

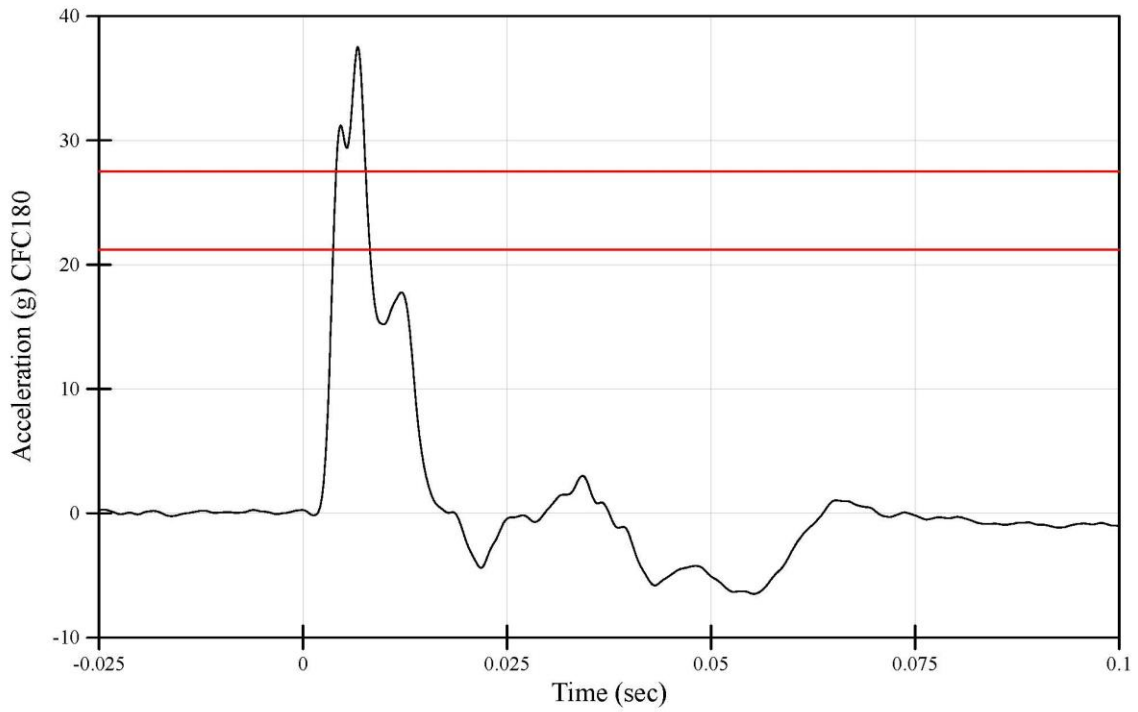
WorldSID-05F Left Thorax without Arm Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210405-6 processed

4/5/2021 3:13 PM

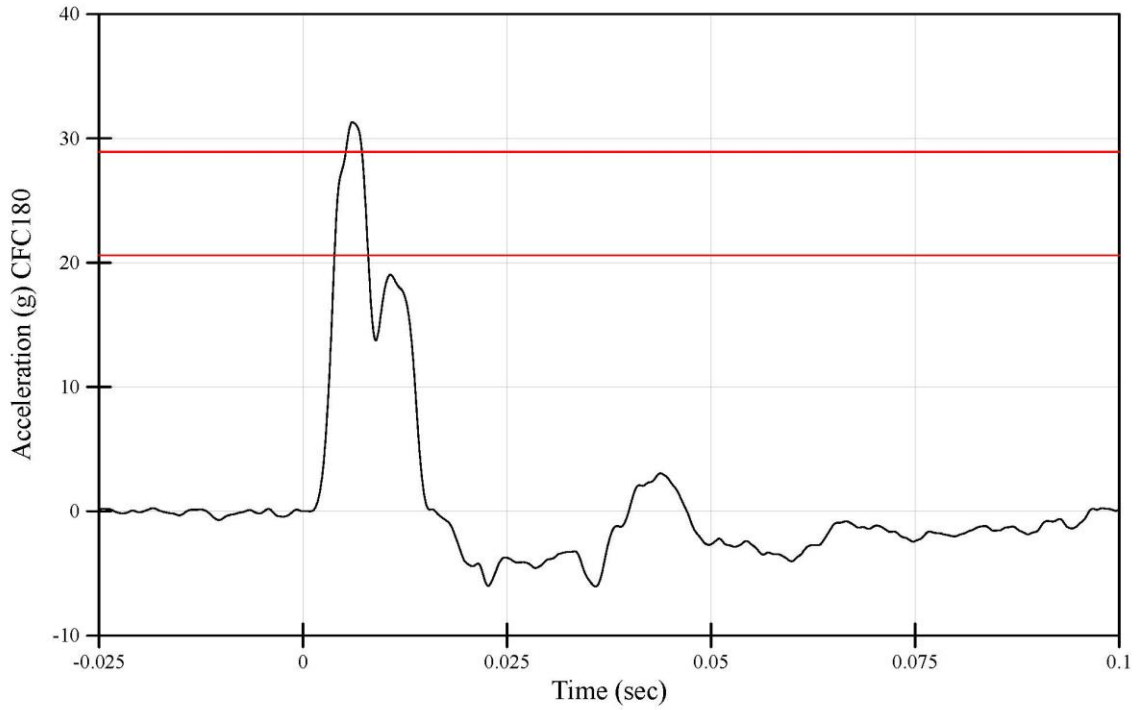
WorldSID-05F Left Thorax without Arm Qualification
Peak T4 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210405-6 processed

4/5/2021 3:13 PM

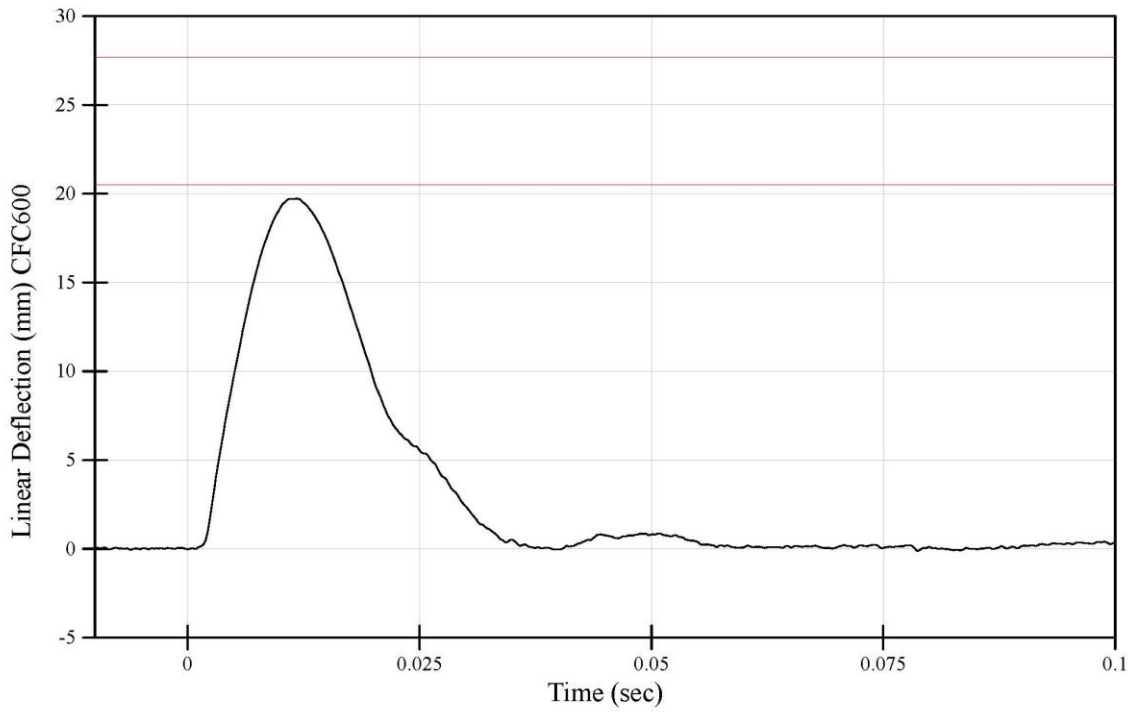
WorldSID-05F Left Thorax without Arm Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210405-6 processed

4/5/2021 3:13 PM

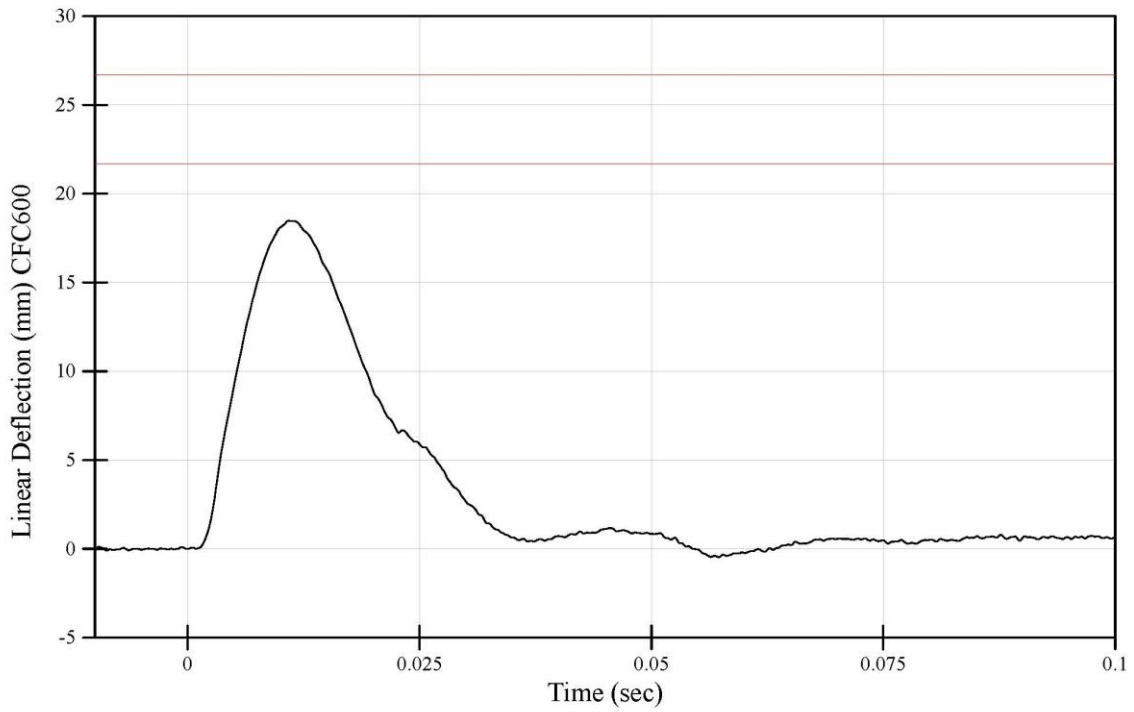
WorldSID-05F Left Thorax without Arm Qualification
Peak Thorax Rib 1 Compression
Dummy Serial Number: DK1774



File Name: 210405-6 processed

4/5/2021 3:13 PM

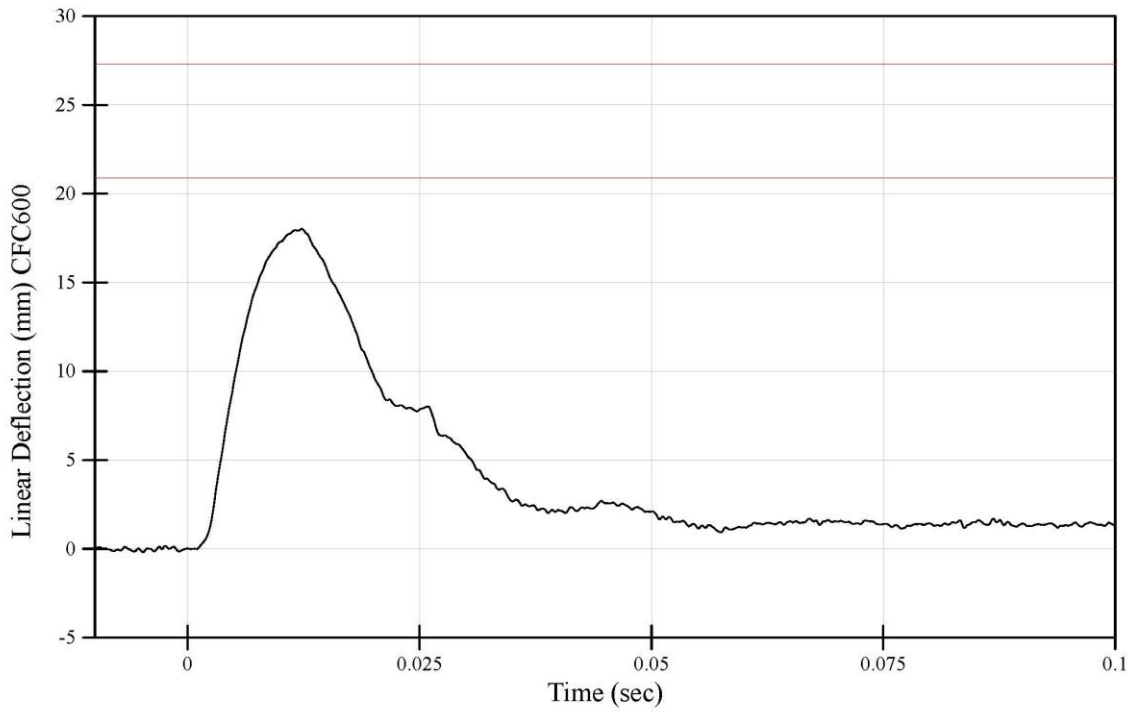
WorldSID-05F Left Thorax without Arm Qualification
Peak Thorax Rib 2 Compression
Dummy Serial Number: DK1774



File Name: 210405-6 processed

4/5/2021 3:13 PM

WorldSID-05F Left Thorax without Arm Qualification
Peak Thorax Rib 3 Compression
Dummy Serial Number: DK1774



File Name: 210405-6 processed

4/5/2021 3:13 PM

**WorldSID-05F Left Abdomen Qualification
Test Results Summary**

Dummy Serial Number: DK1774

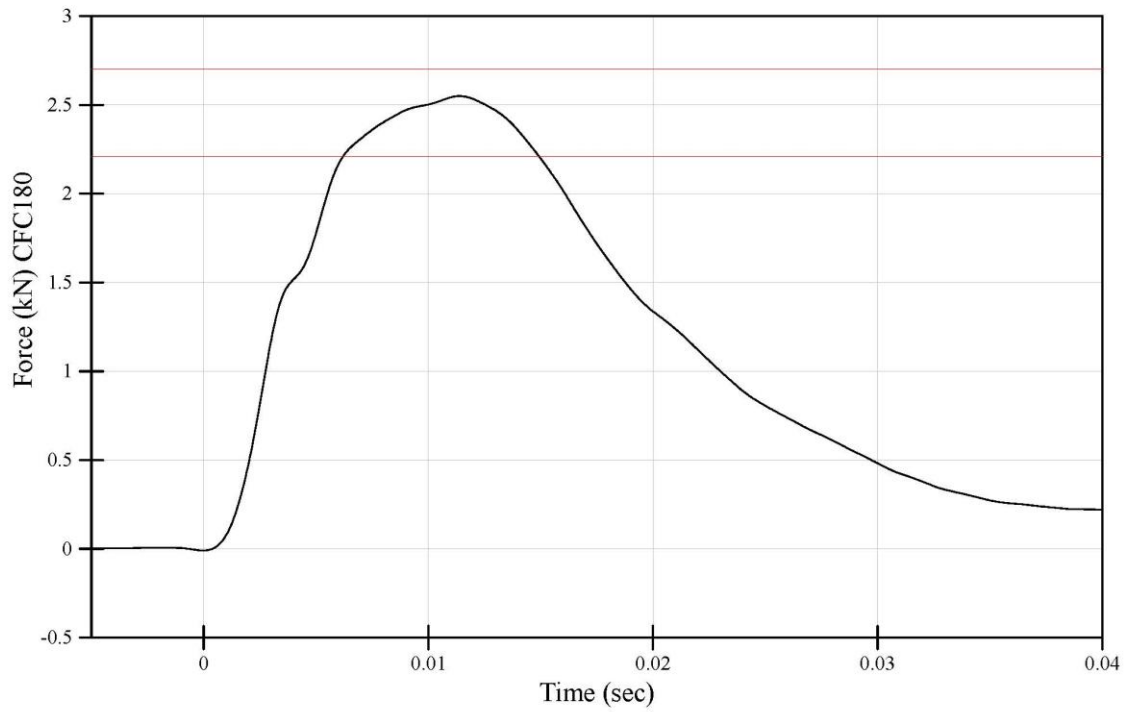
<u>Tested Components</u>	Test ID: 210406-2
Abdomen Rib 1: DM5165	Test Date: 4/6/2021
Abdomen Rib 2: DM5167	Test Time: 9:40 AM
RibEye: 161	

Test Results			
<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	21.2	Pass
Test Humidity (%)	10 - 70	57	Pass
Test Velocity (m/s)	4.20 - 4.40	4.32	Pass
Thorax Rib Temperature Sensor (°C)	20.6 - 23.8	22.1	Pass
Peak Probe Force (kN)	2.21 - 2.70	2.55	Pass
Peak T12 Acceleration (g)	24.4 - 30.6	30.7	Fail
Peak Abdomen Rib 1 Length Change (mm)	23.1 - 31.2	22.9	Fail
Peak Abdomen Rib 2 Length Change (mm)	22.7 - 27.8	23.2	Pass

* WorldSID-50M Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210406-2 processed

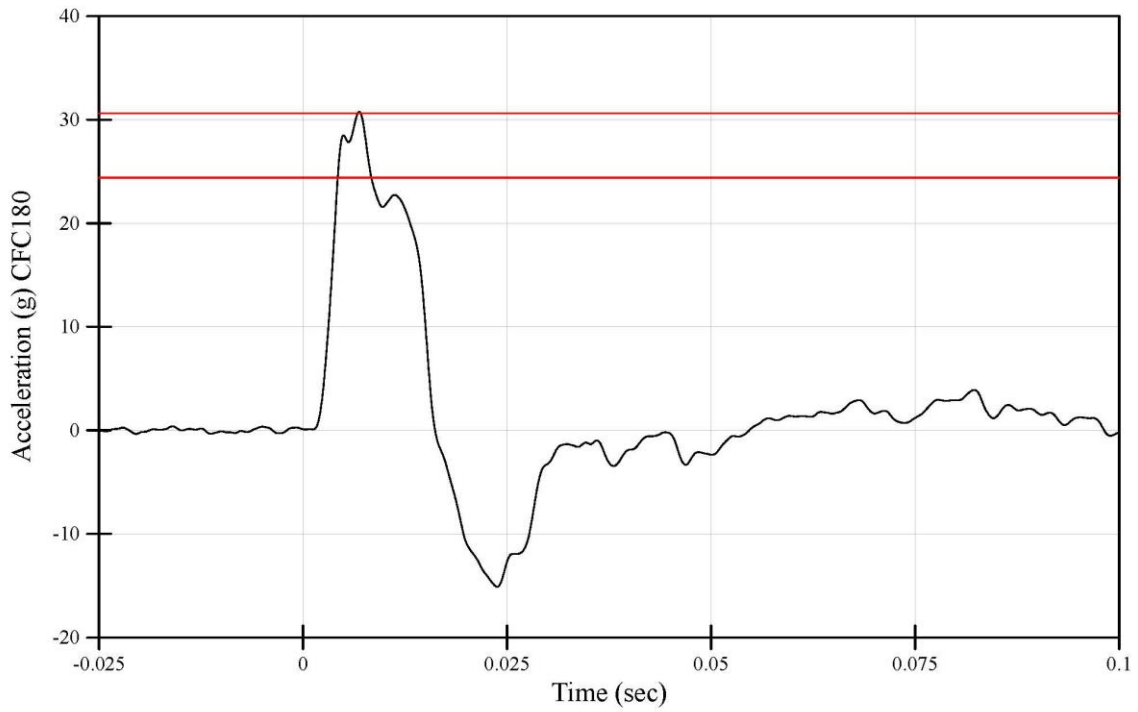
WorldSID-05F Left Abdomen Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210406-2 processed

4/6/2021 9:40 AM

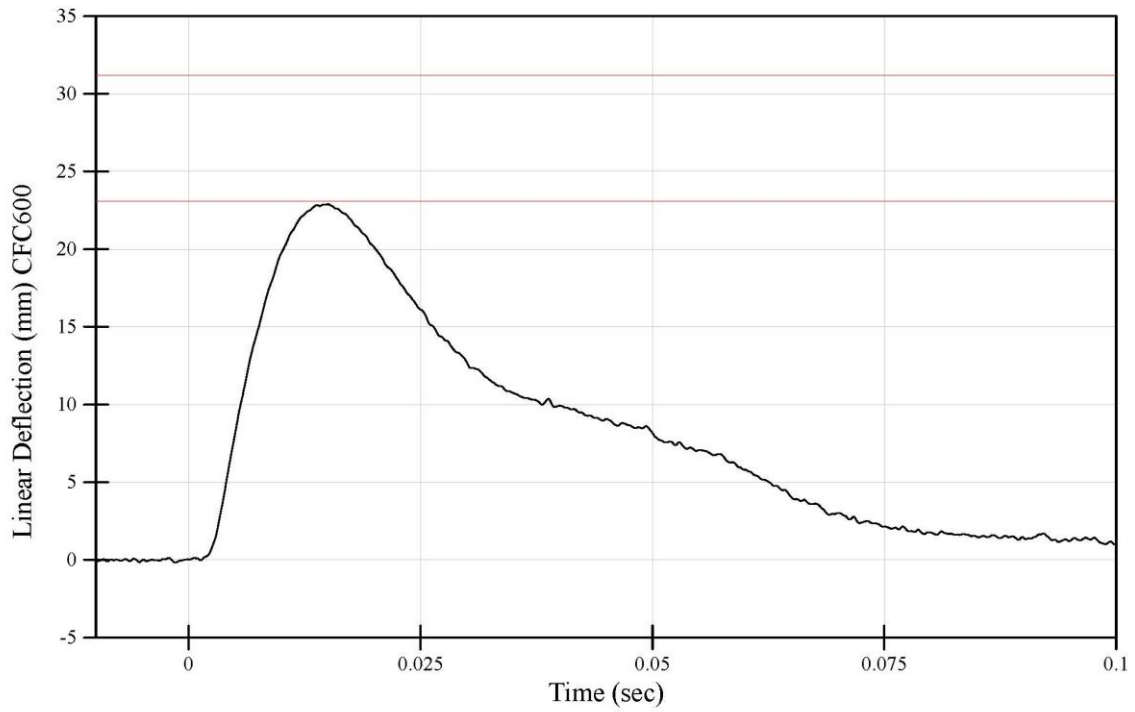
WorldSID-05F Left Abdomen Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210406-2 processed

4/6/2021 9:40 AM

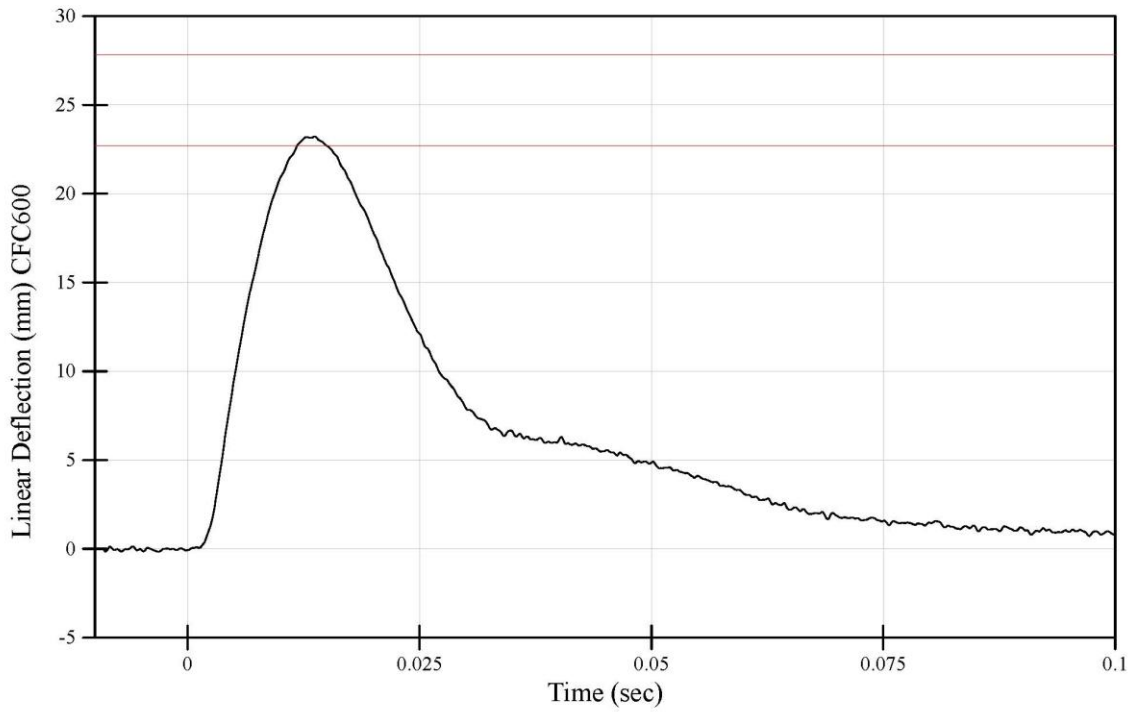
WorldSID-05F Left Abdomen Qualification
Peak Abdomen Rib 1 Compression
Dummy Serial Number: DK1774



File Name: 210406-2 processed

4/6/2021 9:40 AM

WorldSID-05F Left Abdomen Qualification
Peak Abdomen Rib 2 Compression
Dummy Serial Number: DK1774



File Name: 210406-2 processed

4/6/2021 9:40 AM

**WorldSID-05F Left Pelvis Qualification
Test Results Summary**

Dummy Serial Number: DK1774

Tested Components

Pelvis Flesh:
Pelvic Bone: DW2458

Test ID: 210405-8
Test Date: 4/5/2021
Test Time: 5:13 PM

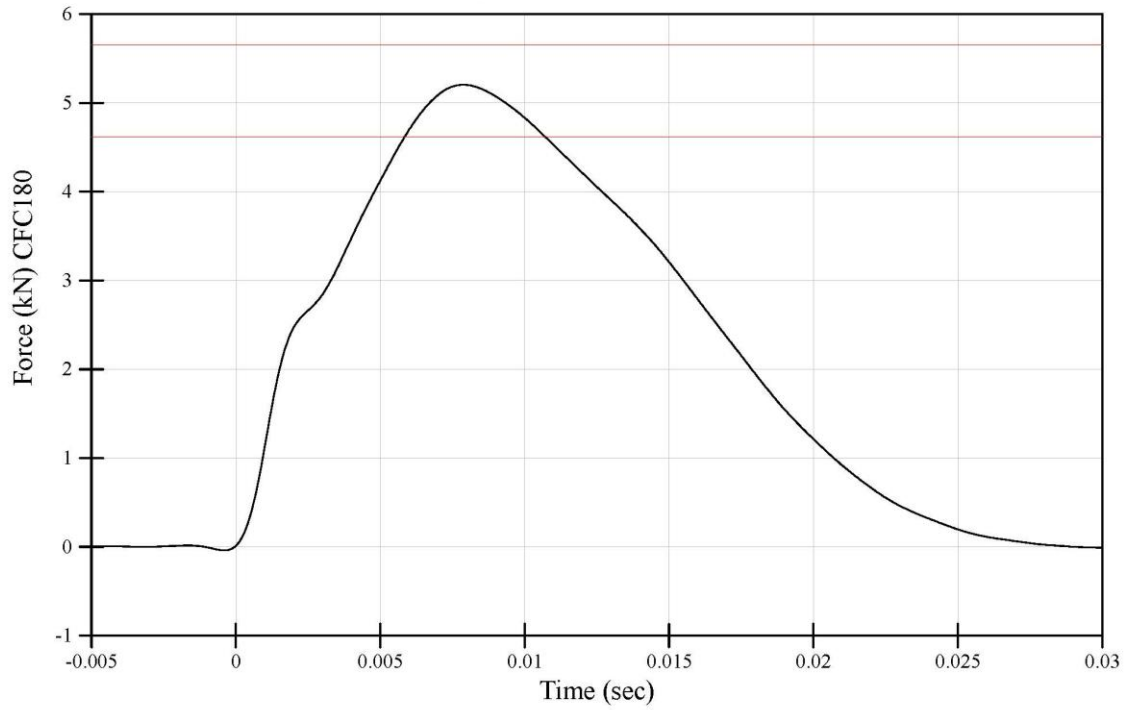
Test Results

<u>Test Parameter</u>	<u>Specification Range*</u>	<u>Result</u>	<u>Pass/Fail</u>
Test Temperature (°C)	20.6 - 22.2	20.8	Pass
Test Humidity (%)	10 - 70	54	Pass
Test Velocity (m/s)	6.60 - 6.80	6.68	Pass
Peak Probe Force (kN)	4.62 - 5.65	5.20	Pass
Peak Pubic Force FY (N)	-1200.0 - (-770.0)	-919.1	Pass
Peak T12 Acceleration (g)	11.8 - 15.8	18.9	Fail
Peak Pelvis Acceleration (g)	48.6 - 74.4	43.4	Fail

* WorldSID-50M Qualification Manual - Humanetics WorldSID Small Female - Rev E

File Name: 210405-8 processed

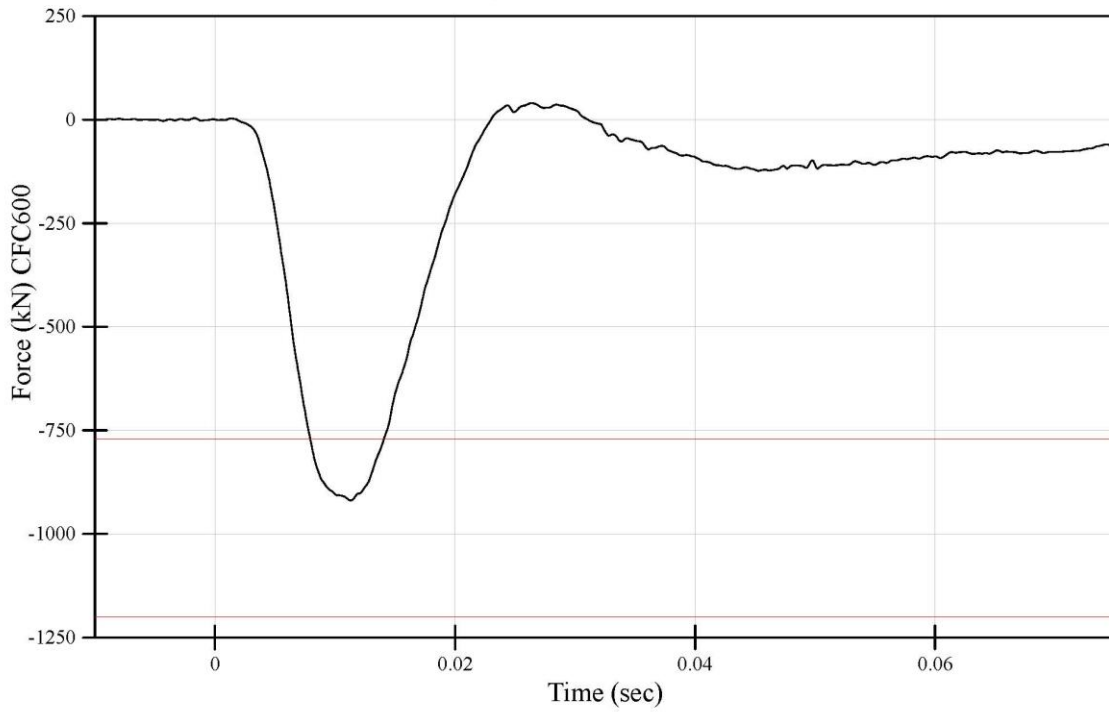
WorldSID-05F Left Pelvis Qualification
Peak Pendulum Force
Dummy Serial Number: DK1774



File Name: 210405-8 processed

4/5/2021 5:13 PM

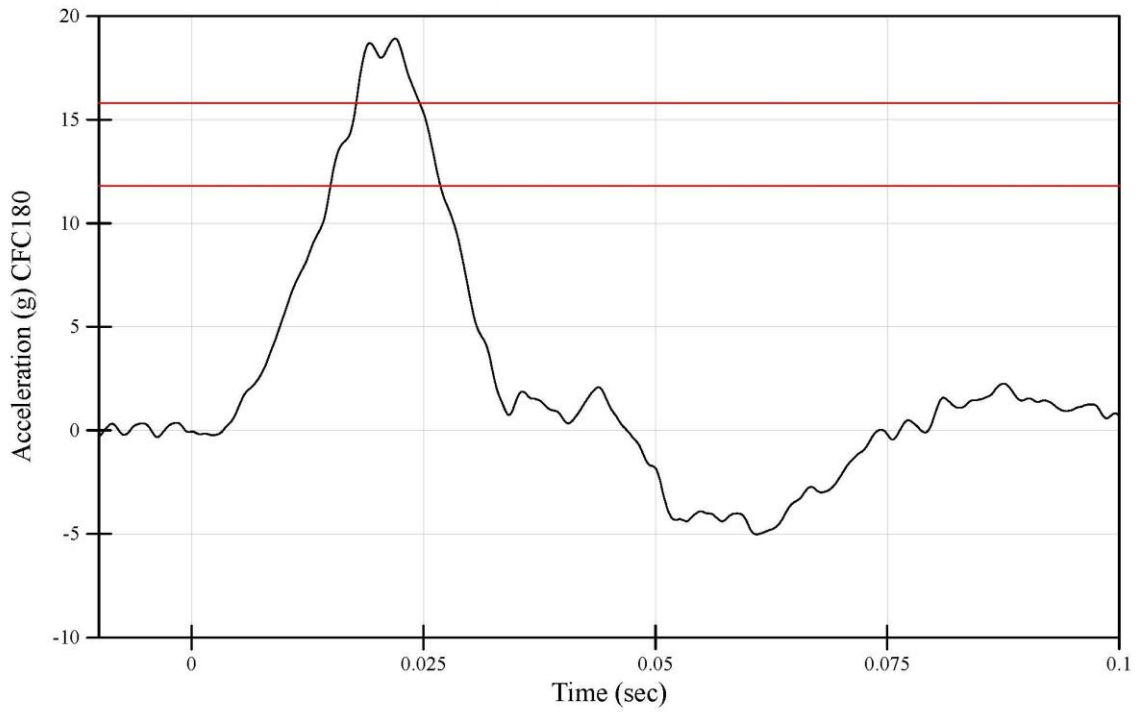
WorldSID-05F Left Pelvis Qualification
Peak Pubic Y axis Force
Dummy Serial Number: DK1774



File Name: 210405-8 processed

4/5/2021 5:13 PM

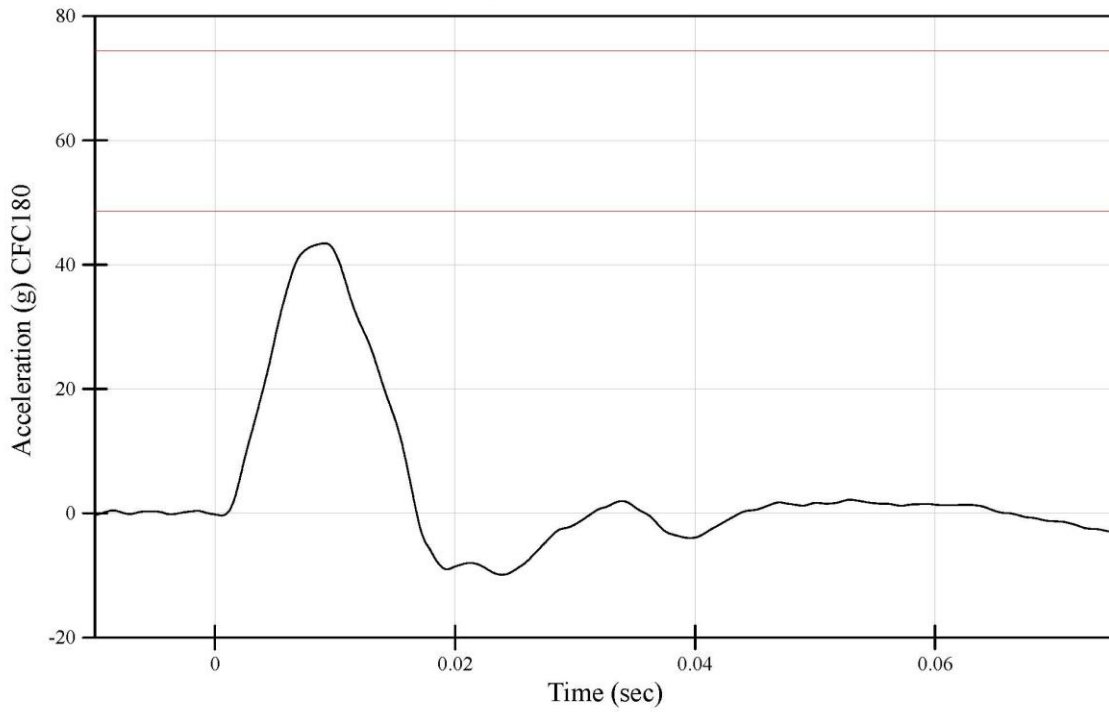
WorldSID-05F Left Pelvis Qualification
Peak T12 Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210405-8 processed

4/5/2021 5:13 PM

WorldSID-05F Left Pelvis Qualification
Peak Pelvis Y Axis Acceleration
Dummy Serial Number: DK1774



File Name: 210405-8 processed

4/5/2021 5:13 PM

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – DUMMY INSTRUMENTATION (WorldSID-50M with RibEye™)

		WorldSID-50M S/N EB8888		
		Serial Number	Manufacturer	Calibration Date
Head Accelerometers (g)	X	12324-1	Endevco	22-Jul-2020
	Y	12324-3	Endevco	22-Jul-2020
	Z	12324-2	Endevco	22-Jul-2020
Head Angular Rates Sensors (deg/sec)	X	ARS12047	DTS	4-Aug-2020
	Y	ARS15094	DTS	4-Aug-2020
	Z	ARS11060	DTS	4-Aug-2020
Upper Neck Force (N)	X	DO9753	Humanetics	21-Jul-2020
	Y	DO9753	Humanetics	21-Jul-2020
	Z	DO9753	Humanetics	21-Jul-2020
Upper Neck Moment (Nm)	X	DO9753	Humanetics	21-Jul-2020
	Y	DO9753	Humanetics	21-Jul-2020
	Z	DO9753	Humanetics	21-Jul-2020
Lower Neck Force (N)	X	EB8143	Humanetics	21-Jul-2020
	Y	EB8143	Humanetics	21-Jul-2020
	Z	EB8143	Humanetics	21-Jul-2020
Lower Neck Moment (Nm)	X	EB8143	Humanetics	21-Jul-2020
	Y	EB8143	Humanetics	21-Jul-2020
	Z	EB8143	Humanetics	21-Jul-2020
Upper Spine Accelerometers (T1) (g)	X	EC1630	Humanetics	21-Jul-2020
	Y	EC1630	Humanetics	21-Jul-2020
	Z	EC1630	Humanetics	21-Jul-2020
Middle Spine Accelerometers (T4) (g)	X	12037-3	Endevco	21-Jul-2020
	Y	12037-2	Endevco	21-Jul-2020
	Z	12037-1	Endevco	21-Jul-2020
Lower Spine Accelerometers (T12) (g)	X	12352-3	Endevco	21-Jul-2020
	Y	12352-2	Endevco	21-Jul-2020
	Z	12352-1	Endevco	21-Jul-2020
Shoulder Force (N)	X	12375-3	Endevco	22-Jul-2020
	Y	12375-2	Endevco	22-Jul-2020
	Z	12375-1	Endevco	22-Jul-2020
Pubic Symphysis Force (N)	Y	EC4386	Humanetics	21-Jul-2020
Sacro-Iliac Left Force (N)	X	EG4066	Humanetics	21-Jul-2020
	Y	EG4066	Humanetics	21-Jul-2020
	Z	EG4066	Humanetics	21-Jul-2020
Sacro-Iliac Left Moment (Nm)	X	EG4066	Humanetics	21-Jul-2020
	Y	EG4066	Humanetics	21-Jul-2020
	Z	EG4066	Humanetics	21-Jul-2020

TABLE 1 – DUMMY INSTRUMENTATION (WorldSID-50M with RibEye™) (CONTINUED)

		WorldSID-50M S/N EB8888		
		Serial Number	Manufacturer	Calibration Date
Sacro-Iliac Right Force (N)	X	EG4066	Humanetics	21-Jul-2020
	Y	EG4066	Humanetics	21-Jul-2020
	Z	EG4066	Humanetics	21-Jul-2020
Sacro-Iliac Right Moment (Nm)	X	EG4066	Humanetics	21-Jul-2020
	Y	EG4066	Humanetics	21-Jul-2020
	Z	EG4066	Humanetics	21-Jul-2020
Lumbar Force (N)	X	EC2349	Humanetics	21-Jul-2020
	Y	EC2349	Humanetics	21-Jul-2020
	Z	EC2349	Humanetics	21-Jul-2020
Lumbar Moment (Nm)	X	EC2349	Humanetics	21-Jul-2020
	Y	EC2349	Humanetics	21-Jul-2020
	Z	EC2349	Humanetics	21-Jul-2020
Pelvis Accelerometers (g)	X	11905-3	Endevco	22-Jul-2020
	Y	11905-2	Endevco	22-Jul-2020
	Z	11905-1	Endevco	22-Jul-2020
Left Femur Force (N)	X	EA4925TPS	Humanetics	29-Jul-2020
	Y	EA4925TPS	Humanetics	29-Jul-2020
	Z	EA4925TPS	Humanetics	29-Jul-2020
Left Femur Moment (Nm)	X	EA4925TPS	Humanetics	29-Jul-2020
	Y	EA4925TPS	Humanetics	29-Jul-2020
	Z	EA4925TPS	Humanetics	29-Jul-2020
Left Femoral Neck Force (N)	X	EB6234T	Humanetics	21-Jul-2020
	Y	EB6234T	Humanetics	21-Jul-2020
	Z	EB6234T	Humanetics	21-Jul-2020
Left Outer Knee Force (N)	Y	93	Humanetics	21-Jul-2020
Left Inner Knee Force (N)	Y	95	Humanetics	21-Jul-2020

TABLE 1 – DUMMY INSTRUMENTATION (WorldSID-50M with RibEye™) (CONTINUED)

			WorldSID-50M S/N EB8888		
			Serial Number	Manufacturer	Calibration Date
Shoulder RibEye (mm)	Front	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Middle	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Rear	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
Thorax Rib 1 RibEye (mm)	Front	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Middle	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Rear	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
Thorax Rib 2 RibEye (mm)	Front	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Middle	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Rear	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
Thorax Rib 3 RibEye (mm)	Front	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Middle	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Rear	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020

TABLE 1 – DUMMY INSTRUMENTATION (WorldSID-50M with RibEye™) (CONTINUED)

			WorldSID-50M S/N EB8888		
			Serial Number	Manufacturer	Calibration Date
Abdomen Rib 1 RibEye (mm)	Front	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Middle	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Rear	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
Abdomen Rib 2 RibEye (mm)	Front	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Middle	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020
	Rear	X	124	Boxboro Systems	7-Jul-2020
		Y	124	Boxboro Systems	7-Jul-2020
		Z	124	Boxboro Systems	7-Jul-2020

TABLE 2 – DUMMY INSTRUMENTATION (WorldSID-05F with RibEye™)

		WorldSID-05F S/N DK1774		
		Serial Number	Manufacturer	Calibration Date
Head Accelerometers (g)	X	12346-3	Endevco	28-Oct-2020
	Y	12346-1	Endevco	28-Oct-2020
	Z	12346-2	Endevco	28-Oct-2020
Head Angular Rates Sensors (deg/sec)	X	ARS11034	DTS	3-Sep-2020
	Y	ARS14271	DTS	4-Aug-2020
	Z	ARS14273	DTS	4-Aug-2020
Upper Neck Force (N)	X	EB8759	Humanetics	27-Oct-2020
	Y	EB8759	Humanetics	27-Oct-2020
	Z	EB8759	Humanetics	27-Oct-2020
Upper Neck Moment (Nm)	X	EB8759	Humanetics	27-Oct-2020
	Y	EB8759	Humanetics	27-Oct-2020
	Z	EB8759	Humanetics	27-Oct-2020
Lower Neck Force (N)	X	DW9074	Humanetics	4-Nov-2020
	Y	DW9074	Humanetics	4-Nov-2020
	Z	DW9074	Humanetics	4-Nov-2020
Lower Neck Moment (Nm)	X	DW9074	Humanetics	4-Nov-2020
	Y	DW9074	Humanetics	4-Nov-2020
	Z	DW9074	Humanetics	4-Nov-2020
Shoulder Force (N)	X	DW9661	Humanetics	3-Sep-2020
	Y	DW9661	Humanetics	3-Sep-2020
	Z	DW9661	Humanetics	3-Sep-2020
Upper Spine Accelerometers (T1) (g)	X	12116-2	Endevco	28-Oct-2020
	Y	12116-1	Endevco	28-Oct-2020
	Z	12116-3	Endevco	28-Oct-2020
Middle Spine Accelerometers (T4) (g)	X	12075-3	Endevco	28-Oct-2020
	Y	12075-2	Endevco	28-Oct-2020
	Z	12075-1	Endevco	28-Oct-2020
Lower Spine Accelerometers (T12) (g)	X	12363-3	Endevco	28-Oct-2020
	Y	12363-2	Endevco	28-Oct-2020
	Z	12363-1	Endevco	28-Oct-2020
Pubic Symphysis Force (N)	Y	EF8492	Humanetics	27-Oct-2020
Sacro-Iliac Left Force (N)	X	EG1102	Humanetics	11-Sep-2020
	Y	EG1102	Humanetics	11-Sep-2020
	Z	EG1102	Humanetics	11-Sep-2020
Sacro-Iliac Left Moment (Nm)	X	EG1102	Humanetics	11-Sep-2020
	Y	EG1102	Humanetics	11-Sep-2020
	Z	EG1102	Humanetics	11-Sep-2020

TABLE 2 – DUMMY INSTRUMENTATION (WorldSID-05F with RibEye™) (CONTINUED)

		WorldSID-05F S/N DK1774		
		Serial Number	Manufacturer	Calibration Date
Sacro-Iliac Right Force (N)	X	EG1102	Humanetics	11-Sep-2020
	Y	EG1102	Humanetics	11-Sep-2020
	Z	EG1102	Humanetics	11-Sep-2020
Sacro-Iliac Right Moment (Nm)	X	EG1102	Humanetics	11-Sep-2020
	Y	EG1102	Humanetics	11-Sep-2020
	Z	EG1102	Humanetics	11-Sep-2020
Lumbar Force (N)	X	DW9492	Humanetics	29-Jul-2020
	Y	DW9492	Humanetics	29-Jul-2020
	Z	DW9492	Humanetics	29-Jul-2020
Lumbar Moment (Nm)	X	DW9492	Humanetics	29-Jul-2020
	Y	DW9492	Humanetics	29-Jul-2020
	Z	DW9492	Humanetics	29-Jul-2020
Pelvis Accelerometers (g)	X	12398-3	Endevco	28-Oct-2020
	Y	12398-2	Endevco	28-Oct-2020
	Z	12398-1	Endevco	28-Oct-2020
Left Femur Force (N)	X	DZ5708T	Humanetics	27-Oct-2020
	Y	DZ5708T	Humanetics	27-Oct-2020
	Z	DZ5708T	Humanetics	27-Oct-2020
Left Femur Moment (Nm)	X	DZ5708T	Humanetics	27-Oct-2020
	Y	DZ5708T	Humanetics	27-Oct-2020
	Z	DZ5708T	Humanetics	27-Oct-2020
Left Femoral Neck Force (N)	X	DK5906	Humanetics	13-Jul-2020
	Y	DK5906	Humanetics	13-Jul-2020
	Z	DK5906	Humanetics	13-Jul-2020
Left Outer Knee Force (N)	Y	EC4098	Humanetics	27-Oct-2020
Left Inner Knee Force (N)	Y	EG2793	Humanetics	27-Oct-2020

TABLE 2 – DUMMY INSTRUMENTATION (WorldSID-05F with RibEye™) (CONTINUED)

			WorldSID-05F S/N DK1774		
			Serial Number	Manufacturer	Calibration Date
Shoulder RibEye (mm)	Front	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Middle	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Rear	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
Thorax Rib 1 RibEye (mm)	Front	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Middle	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Rear	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
Thorax Rib 2 RibEye (mm)	Front	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Middle	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Rear	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
Thorax Rib 3 RibEye (mm)	Front	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Middle	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Rear	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020

TABLE 2 – DUMMY INSTRUMENTATION (WorldSID-05F with RibEye™) (CONTINUED)

			WorldSID-05F S/N DK1774		
			Serial Number	Manufacturer	Calibration Date
Abdomen Rib 1 RibEye (mm)	Front	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Middle	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Rear	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
Abdomen Rib 2 RibEye (mm)	Front	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Middle	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020
	Rear	X	161	Boxboro Systems	2-Nov-2020
		Y	161	Boxboro Systems	2-Nov-2020
		Z	161	Boxboro Systems	2-Nov-2020

TABLE 3 – VEHICLE INSTRUMENTATION

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity (g)	X	P94567	Endevco	20-Nov-2020
	Y	P33547	Endevco	20-Nov-2020
	Z	P75115	Endevco	20-Nov-2020
Vehicle Center of Gravity Angular Rate (deg/sec)	X	ARS8290	DTS	6-Jul-2020
	Y	ARS9185	DTS	6-Jul-2020
	Z	ARS8001	DTS	6-Jul-2020
Right Side Sill At Front Seat (g)	X	P34046	Endevco	11-Feb-2021
	Y	P50393	Endevco	11-Feb-2021
	Z	P57803	Endevco	11-Feb-2021
Right Side Sill At Rear Seat (g)	X	P76454	Endevco	1-Feb-2021
	Y	P58611	Endevco	1-Feb-2021
	Z	P61295	Endevco	1-Feb-2021
Left Side Sill At Front Seat (g)	Y	P87119	Endevco	17-Mar-2021
Left Side Sill At Rear Seat (g)	Y	P94483	Endevco	4-Feb-2021
Left Lower A-Pillar (g)	Y	P76171	Endevco	20-Nov-2020
Left Middle A-Pillar (g)	Y	P76114	Endevco	20-Nov-2020
Left Lower B-Pillar (g)	Y	T20648	Endevco	15-Mar-2021
Left Middle B-Pillar (g)	Y	T25513	Endevco	15-Mar-2021
Front Seat Track (g)	Y	P34205	Endevco	11-Feb-2021
Rear Seat Structure (g)	Y	P87134	Endevco	11-Feb-2021
Right Rear Occupant Compartment (g)	Y	P58557	Endevco	11-Feb-2021
Engine Block (g)	X	P91613	Endevco	11-Feb-2021
	Y	P91965	Endevco	11-Feb-2021
Floorpan Above Rear Axle (g)	X	P58537	Endevco	20-Nov-2020
	Y	P74456	Endevco	20-Nov-2020
	Z	P58494	Endevco	20-Nov-2020
Rear Deck (g)	X	T16770	Endevco	1-Mar-2021
	Y	P61501	Endevco	1-Mar-2021
	Z	T11835	Endevco	1-Mar-2021
Rear Deck Angular Rate (deg/sec)	X	ARS12511	DTS	11-Sep-2020
	Y	ARS8813	DTS	11-Sep-2020
	Z	ARS12500	DTS	11-Sep-2020
Left Front Door Mid Centerline Acceleration (g)	Y	P50491	Endevco	12-Jan-2021
Left Front Door Mid Rear Acceleration (g)	Y	P57946	Endevco	12-Jan-2021
Left Front Door Upper Centerline (g)	Y	P88038	Endevco	12-Jan-2021
Left Rear Door Mid Rear (g)	Y	P90297	Endevco	11-Feb-2021
Left Rear Door Upper Centerline (g)	Y	P88030	Endevco	11-Feb-2021

TABLE 4 – MDB INSTRUMENTATION

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity (g)	X	P58472	Endevco	8-Feb-2021
	Y	T11389	Endevco	11-Feb-2021
	Z	P33965	Endevco	11-Feb-2021
MDB Rear (g)	X	T23821	Endevco	11-Sep-2020
	Y	T23805	Endevco	11-Sep-2020

Sign Convention
SAE J211 MAR95

Accelerometers:
+X: Forward
+Y: Rightward
+Z: Downward

Potentiometers:
+Chest longitudinal deflection: Outward
+Chest lateral deflection: Rightward
+Seat belt displacement: Outward
+Seat belt extension: Elongation
+Knee slider displacement: Distance between femur and tibia increased (in relation to a seated dummy)

Rotation potentiometers:
+About the X-axis: Left foot-eversion
Right foot-inversion
+About the Y-axis: Left/right foot-dorsiflexion
+About the Z-axis: Left foot-internal
Right foot-external

Load cells:
+Femur force: Tension
+Seat belt force: Tension
+Barrier force: Tension

Neck load cells:
+X force: Head pushed rearward
+Y force: Head pushed leftward
+Z force: Head pulled upward (tension on neck)
+X moment: Left ear rotating toward left shoulder
+Y moment: Chin rotating toward chest
+Z moment: Chin rotating toward left shoulder

Tibia load cells:
+X force: Ankle forward, knee rearward
+Y force: Ankle rightward, knee leftward
+Z force: Tension
+X moment: Bottom of tibia moving leftward
+Y moment: Bottom of tibia moving rearward

Sign Convention (Continued)
SAE J211 MAR95

Lumbar load cells: +X force: Chest rearward, pelvis forward
+Y force: Chest leftward, pelvis rightward
+Z force: Chest upward, pelvis downward
+X moment: Left shoulder toward left hip
+Y moment: Sternum toward front of legs
+Z moment: Right shoulder forward, left shoulder rearward

Frequency Response Classes
SAE J211 MAR95

<u>Typical Test Measurements</u>	<u>Channel Class</u>
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	600
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head Form Accelerations	1000

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
1	11HEAD0000WSACXP	Driver Head Acceleration (X)	1000	+	yes	2000
2	11HEAD0000WSACYP	Driver Head Acceleration (Y)	1000	+	yes	2000
3	11HEAD0000WSACZP	Driver Head Acceleration (Z)	1000	+	yes	2000
3A	11HEAD0000WSACRP	Driver Head Acceleration Resultant	1000			
4	11HEAD0000WSAVXP	Driver Head Angular Rate (X)	1000	+	yes	8000
5	11HEAD0000WSAVYP	Driver Head Angular Rate (Y)	1000	+	yes	8000
6	11HEAD0000WSAVZP	Driver Head Angular Rate (Z)	1000	+	yes	8000
7	11NECKUP00WSFOXP	Driver Upper Neck Force (X)	1000	+	yes	10000
8	11NECKUP00WSFOYP	Driver Upper Neck Force (Y)	1000	+	yes	10000
9	11NECKUP00WSFOZP	Driver Upper Neck Force (Z)	1000	+	yes	12000
10	11NECKUP00WSMOXP	Driver Upper Neck Moment (X)	600	+	yes	300
11	11NECKUP00WSMOYP	Driver Upper Neck Moment (Y)	600	+	yes	300
12	11NECKUP00WSMOZP	Driver Upper Neck Moment (Z)	600	+	yes	200
13	11NECKLO00WSFOXP	Driver Lower Neck Force (X)	1000	+	yes	10000
14	11NECKLO00WSFOYP	Driver Lower Neck Force (Y)	1000	+	yes	10000
15	11NECKLO00WSFOZP	Driver Lower Neck Force (Z)	1000	+	yes	12000
16	11NECKLO00WSMOXP	Driver Lower Neck Moment (X)	600	+	yes	300
17	11NECKLO00WSMOYP	Driver Lower Neck Moment (Y)	600	+	yes	300
18	11NECKLO00WSMOZP	Driver Lower Neck Moment (Z)	600	+	yes	200
19	11SHLDLE00WSFOXP	Driver Shoulder Force (X)	600	+	yes	5000
20	11SHLDLE00WSFOYP	Driver Shoulder Force (Y)	600	+	yes	10000
21	11SHLDLE00WSFOZP	Driver Shoulder Force (Z)	600	+	yes	5000
22	11SHRILEREWSDSX0	Driver Shoulder Rear Displacement (X)	0	+	no	60
23	11SHRILEREWSDSY0	Driver Shoulder Rear Displacement (Y)	0	+	no	60
24	11SHRILEREWSDSZ0	Driver Shoulder Rear Displacement (Z)	0	+	no	60
25	11SHRILEREWSDSL B	Driver Shoulder Rear Length Change	600	+	no	60
26	11SHRILEMIWSDSX0	Driver Shoulder Middle Displacement (X)	0	+	no	60
27	11SHRILEMIWSDSY0	Driver Shoulder Middle Displacement (Y)	0	+	no	60
28	11SHRILEMIWSDSZ0	Driver Shoulder Middle Displacement (Z)	0	+	no	60
29	11SHRILEMIWSDSL B	Driver Shoulder Middle Length Change	600	+	no	60
30	11SHRILEFRWSDSX0	Driver Shoulder Front Displacement (X)	0	+	no	60
31	11SHRILEFRWSDSY0	Driver Shoulder Front Displacement (Y)	0	+	no	60
32	11SHRILEFRWSDSZ0	Driver Shoulder Front Displacement (Z)	0	+	no	60
33	11SHRILEFRWSDSL B	Driver Shoulder Front Length Change	600	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
34	11TRRILUREWSDSX0	Driver Thorax Rib 1 Rear Displacement (X)	0	+	no	60
35	11TRRILUREWSDSY0	Driver Thorax Rib 1 Rear Displacement (Y)	0	+	no	60
36	11TRRILUREWSDSZ0	Driver Thorax Rib 1 Rear Displacement (Z)	0	+	no	60
37	11TRRILUREWSDSLB	Driver Thorax Rib 1 Rear Length Change	600	+	no	60
38	11TRRILUMIWSDSX0	Driver Thorax Rib 1 Middle Displacement (X)	0	+	no	60
39	11TRRILUMIWSDSY0	Driver Thorax Rib 1 Middle Displacement (Y)	0	+	no	60
40	11TRRILUMIWSDSZ0	Driver Thorax Rib 1 Middle Displacement (Z)	0	+	no	60
41	11TRRILUMIWSDSLB	Driver Thorax Rib 1 Middle Length Change	600	+	no	60
42	11TRRILUFRWSDSX0	Driver Thorax Rib 1 Front Displacement (X)	0	+	no	60
43	11TRRILUFRWSDSY0	Driver Thorax Rib 1 Front Displacement (Y)	0	+	no	60
44	11TRRILUFRWSDSZ0	Driver Thorax Rib 1 Front Displacement (Z)	0	+	no	60
45	11TRRILUFRWSDSLB	Driver Thorax Rib 1 Front Length Change	600	+	no	60
46	11TRRILMREWSDSX0	Driver Thorax Rib 2 Rear Displacement (X)	0	+	no	60
47	11TRRILMREWSDSY0	Driver Thorax Rib 2 Rear Displacement (Y)	0	+	no	60
48	11TRRILMREWSDSZ0	Driver Thorax Rib 2 Rear Displacement (Z)	0	+	no	60
49	11TRRILMREWSDSLB	Driver Thorax Rib 2 Rear Length Change	600	+	no	60
50	11TRRILMMIWSDSX0	Driver Thorax Rib 2 Middle Displacement (X)	0	+	no	60
51	11TRRILMMIWSDSY0	Driver Thorax Rib 2 Middle Displacement (Y)	0	+	no	60
52	11TRRILMMIWSDSZ0	Driver Thorax Rib 2 Middle Displacement (Z)	0	+	no	60
53	11TRRILMMIWSDSLB	Driver Thorax Rib 2 Middle Length Change	600	+	no	60
54	11TRRILMFRWSDSX0	Driver Thorax Rib 2 Front Displacement (X)	0	+	no	60
55	11TRRILMFRWSDSY0	Driver Thorax Rib 2 Front Displacement (Y)	0	+	no	60
56	11TRRILMFRWSDSZ0	Driver Thorax Rib 2 Front Displacement (Z)	0	+	no	60
57	11TRRILMFRWSDSLB	Driver Thorax Rib 2 Front Length Change	600	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
58	11TRRILLREWSDSX0	Driver Thorax Rib 3 Rear Displacement (X)	0	+	no	60
59	11TRRILLREWSDSY0	Driver Thorax Rib 3 Rear Displacement (Y)	0	+	no	60
60	11TRRILLREWSDSZ0	Driver Thorax Rib 3 Rear Displacement (Z)	0	+	no	60
61	11TRRILLREWSDSLB	Driver Thorax Rib 3 Rear Length Change	600	+	no	60
62	11TRRILLMIWSDSX0	Driver Thorax Rib 3 Middle Displacement (X)	0	+	no	60
63	11TRRILLMIWSDSY0	Driver Thorax Rib 3 Middle Displacement (Y)	0	+	no	60
64	11TRRILLMIWSDSZ0	Driver Thorax Rib 3 Middle Displacement (Z)	0	+	no	60
65	11TRRILLMIWSDSLB	Driver Thorax Rib 3 Middle Length Change	600	+	no	60
66	11TRRILLFRWSDSX0	Driver Thorax Rib 3 Front Displacement (X)	0	+	no	60
67	11TRRILLFRWSDSY0	Driver Thorax Rib 3 Front Displacement (Y)	0	+	no	60
68	11TRRILLFRWSDSZ0	Driver Thorax Rib 3 Front Displacement (Z)	0	+	no	60
69	11TRRILLFRWSDSLB	Driver Thorax Rib 3 Front Length Change	600	+	no	60
70	11ABRILUREWSDSX0	Driver Abdomen Rib 1 Rear Displacement (X)	0	+	no	60
71	11ABRILUREWSDSY0	Driver Abdomen Rib 1 Rear Displacement (Y)	0	+	no	60
72	11ABRILUREWSDSZ0	Driver Abdomen Rib 1 Rear Displacement (Z)	0	+	no	60
73	11ABRILUREWSDSLB	Driver Abdomen Rib 1 Rear Length Change	600	+	no	60
74	11ABRILUMIWSDSX0	Driver Abdomen Rib 1 Middle Displacement (X)	0	+	no	60
75	11ABRILUMIWSDSY0	Driver Abdomen Rib 1 Middle Displacement (Y)	0	+	no	60
76	11ABRILUMIWSDSZ0	Driver Abdomen Rib 1 Middle Displacement (Z)	0	+	no	60
77	11ABRILUMIWSDSLB	Driver Abdomen Rib 1 Middle Length Change	600	+	no	60
78	11ABRILUFRWSDSX0	Driver Abdomen Rib 1 Front Displacement (X)	0	+	no	60
79	11ABRILUFRWSDSY0	Driver Abdomen Rib 1 Front Displacement (Y)	0	+	no	60
80	11ABRILUFRWSDSZ0	Driver Abdomen Rib 1 Front Displacement (Z)	0	+	no	60
81	11ABRILUFRWSDSLB	Driver Abdomen Rib 1 Front Length Change	600	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
82	11ABRILLREWSDSX0	Driver Abdomen Rib 2 Rear Displacement (X)	0	+	no	60
83	11ABRILLREWSDSY0	Driver Abdomen Rib 2 Rear Displacement (Y)	0	+	no	60
84	11ABRILLREWSDSZ0	Driver Abdomen Rib 2 Rear Displacement (Z)	0	+	no	60
85	11ABRILLREWSDSLB	Driver Abdomen Rib 2 Rear Length Change	600	+	no	60
86	11ABRILLMIWSDSX0	Driver Abdomen Rib 2 Middle Displacement (X)	0	+	no	60
87	11ABRILLMIWSDSY0	Driver Abdomen Rib 2 Middle Displacement (Y)	0	+	no	60
88	11ABRILLMIWSDSZ0	Driver Abdomen Rib 2 Middle Displacement (Z)	0	+	no	60
89	11ABRILLMIWSDSLB	Driver Abdomen Rib 2 Middle Length Change	600	+	no	60
90	11ABRILLFRWSDSX0	Driver Abdomen Rib 2 Front Displacement (X)	0	+	no	60
91	11ABRILLFRWSDSY0	Driver Abdomen Rib 2 Front Displacement (Y)	0	+	no	60
92	11ABRILLFRWSDSZ0	Driver Abdomen Rib 2 Front Displacement (Z)	0	+	no	60
93	11ABRILLFRWSDSLB	Driver Abdomen Rib 2 Front Length Change	600	+	no	60
94	11THSP0100WSACXP	Driver Spine T1 Acceleration (X)	180	+	yes	2000
95	11THSP0100WSACYP	Driver Spine T1 Acceleration (Y)	180	+	yes	2000
96	11THSP0100WSACZP	Driver Spine T1 Acceleration (Z)	180	+	yes	2000
96A	11THSP0100WSACRP	Driver Spine T1 Acceleration Resultant	180			
97	11THSP0400WSACXP	Driver Spine T4 Acceleration (X)	180	+	yes	2000
98	11THSP0400WSACYP	Driver Spine T4 Acceleration (Y)	180	+	yes	2000
99	11THSP0400WSACZP	Driver Spine T4 Acceleration (Z)	180	+	yes	2000
99A	11THSP0400WSACRP	Driver Spine T4 Acceleration Resultant	180			
100	11THSP1200WSACXP	Driver Spine T12 Acceleration (X)	180	+	yes	2000
101	11THSP1200WSACYP	Driver Spine T12 Acceleration (Y)	180	+	yes	2000
102	11THSP1200WSACZP	Driver Spine T12 Acceleration (Z)	180	+	yes	2000
102A	11THSP1200WSACRP	Driver Spine T12 Acceleration Resultant	180			
103	11PUBC0000WSFOYP	Driver Pubic Symphysis Force (Y)	600	+	yes	12000
104	11SACRLE00WSFOXP	Driver Sacro-iliac Left Force (X)	600	+	yes	6000
105	11SACRLE00WSFOYP	Driver Sacro-iliac Left Force (Y)	600	+	yes	12000
106	11SACRLE00WSFOZP	Driver Sacro-iliac Left Force (Z)	600	+	yes	6000
107	11SACRLE00WSMOXP	Driver Sacro-iliac Left Moment (X)	600	+	yes	800
108	11SACRLE00WSMOYP	Driver Sacro-iliac Left Moment (Y)	600	+	yes	400
109	11SACRLE00WSMOZP	Driver Sacro-iliac Left Moment (Z)	600	+	yes	400
110	11SACRRI00WSFOXP	Driver Sacro-iliac Right Force (X)	600	+	yes	6000
111	11SACRRI00WSFOYP	Driver Sacro-iliac Right Force (Y)	600	+	yes	12000
112	11SACRRI00WSFOZP	Driver Sacro-iliac Right Force (Z)	600	+	yes	6000

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
113	11SACRRI00WSMOXP	Driver Sacro-iliac Right Moment (X)	600	+	yes	800
114	11SACRRI00WSMOYP	Driver Sacro-iliac Right Moment (Y)	600	+	yes	400
115	11SACRRI00WSMOZP	Driver Sacro-iliac Right Moment (Z)	600	+	yes	400
116	11LUSP0000WSFOXP	Driver Lumbar Force (X)	600	+	yes	10000
117	11LUSP0000WSFOYP	Driver Lumbar Force (Y)	600	+	yes	10000
118	11LUSP0000WSFOZP	Driver Lumbar Force (Z)	600	+	yes	12000
119	11LUSP0000WSMOXP	Driver Lumbar Moment (X)	600	+	yes	300
120	11LUSP0000WSMOYP	Driver Lumbar Moment (Y)	600	+	yes	300
121	11LUSP0000WSMOZP	Driver Lumbar Moment (Z)	600	+	yes	200
122	11PELV0000WSACXP	Driver Pelvic Acceleration (X)	1000	+	yes	2000
123	11PELV0000WSACYP	Driver Pelvic Acceleration (Y)	1000	+	yes	2000
124	11PELV0000WSACZP	Driver Pelvic Acceleration (Z)	1000	+	yes	2000
124A	11PELV0000WSACRP	Driver Pelvic Acceleration Resultant	1000			
125	11FEMRLE00WSFOXP	Driver Left Femur Force (X)	600	+	yes	15000
126	11FEMRLE00WSFOYP	Driver Left Femur Force (Y)	600	+	yes	15000
127	11FEMRLE00WSFOZP	Driver Left Femur Force (Z)	600	+	yes	15000
128	11FEMRLE00WSMOXP	Driver Left Femur Moment (X)	600	+	yes	350
129	11FEMRLE00WSMOYP	Driver Left Femur Moment (Y)	600	+	yes	200
130	11FEMRLE00WSMOZP	Driver Left Femur Moment (Z)	600	+	yes	350
131	11FEACLE00WSFOXP	Driver Femoral Neck Force (X)	600	+	yes	10000
132	11FEACLE00WSFOYP	Driver Femoral Neck Force (Y)	600	+	yes	25000
133	11FEACLE00WSFOZP	Driver Femoral Neck Force (Z)	600	+	yes	10000
134	11KNEELE0UWSFOYP	Driver Left Outer Knee Force (Y)	600	+	yes	20000
135	11KNEELEINWSFOYP	Driver Left Inner Knee Force (Y)	600	+	yes	20000
136	14HEAD0000WFACXP	Passenger Head Acceleration (X)	1000	+	yes	2000
137	14HEAD0000WFACYP	Passenger Head Acceleration (Y)	1000	+	yes	2000
138	14HEAD0000WFACZP	Passenger Head Acceleration (Z)	1000	+	yes	2000
138A	14HEAD0000WFACRP	Passenger Head Acceleration Resultant	1000			
139	14HEAD0000WFAVXP	Passenger Head Angular Rate (X)	1000	+	yes	8000
140	14HEAD0000WFAVYP	Passenger Head Angular Rate (Y)	1000	+	yes	8000
141	14HEAD0000WFAVZP	Passenger Head Angular Rate (Z)	1000	+	yes	8000
142	14NECKUP00WFFOXP	Passenger Upper Neck Force (X)	1000	+	yes	10000
143	14NECKUP00WFFOYP	Passenger Upper Neck Force (Y)	1000	+	yes	10000
144	14NECKUP00WFFOZP	Passenger Upper Neck Force (Z)	1000	+	yes	12000
145	14NECKUP00WFMOXP	Passenger Upper Neck Moment (X)	600	+	yes	300
146	14NECKUP00WFMOYP	Passenger Upper Neck Moment (Y)	600	+	yes	300
147	14NECKUP00WFMOZP	Passenger Upper Neck Moment (Z)	600	+	yes	200
148	14NECKLO00WFFOXP	Passenger Lower Neck Force (X)	1000	+	yes	10000
149	14NECKLO00WFFOYP	Passenger Lower Neck Force (Y)	1000	+	yes	10000
150	14NECKLO00WFFOZP	Passenger Lower Neck Force (Z)	1000	+	yes	12000
151	14NECKLO00WFMOXP	Passenger Lower Neck Moment (X)	600	+	yes	300
152	14NECKLO00WFMOYP	Passenger Lower Neck Moment (Y)	600	+	yes	300
153	14NECKLO00WFMOZP	Passenger Lower Neck Moment (Z)	600	+	yes	200
154	14SHLDLE00WFFOXP	Passenger Shoulder Force (X)	600	+	yes	4500
155	14SHLDLE00WFFOYP	Passenger Shoulder Force (Y)	600	+	yes	4500
156	14SHLDLE00WFFOZP	Passenger Shoulder Force (Z)	600	+	yes	6000

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
157	14SHRILEREWFDSX0	Passenger Shoulder Rear Displacement (X)	0	+	no	60
158	14SHRILEREWFDSY0	Passenger Shoulder Rear Displacement (Y)	0	+	no	60
159	14SHRILEREWFDSZ0	Passenger Shoulder Rear Displacement (Z)	0	+	no	60
160	14SHRILEREWFDSL B	Passenger Shoulder Rear Length Change	600	+	no	60
161	14SHRILEMIWFDSX0	Passenger Shoulder Middle Displacement (X)	0	+	no	60
162	14SHRILEMIWFDSY0	Passenger Shoulder Middle Displacement (Y)	0	+	no	60
163	14SHRILEMIWFDSZ0	Passenger Shoulder Middle Displacement (Z)	0	+	no	60
164	14SHRILEMIWFDSL B	Passenger Shoulder Middle Length Change	600	+	no	60
165	14SHRILEFRWFDSX0	Passenger Shoulder Front Displacement (X)	0	+	no	60
166	14SHRILEFRWFDSY0	Passenger Shoulder Front Displacement (Y)	0	+	no	60
167	14SHRILEFRWFDSZ0	Passenger Shoulder Front Displacement (Z)	0	+	no	60
168	14SHRILEFRWFDSL B	Passenger Shoulder Front Length Change	600	+	no	60
169	14TRRILUREWFDSX0	Passenger Thorax Rib 1 Rear Displacement (X)	0	+	no	60
170	14TRRILUREWFDSY0	Passenger Thorax Rib 1 Rear Displacement (Y)	0	+	no	60
171	14TRRILUREWFDSZ0	Passenger Thorax Rib 1 Rear Displacement (Z)	0	+	no	60
172	14TRRILUREWFDSL B	Passenger Thorax Rib 1 Rear Length Change	600	+	no	60
173	14TRRILUMIWFDSX0	Passenger Thorax Rib 1 Middle Displacement (X)	0	+	no	60
174	14TRRILUMIWFDSY0	Passenger Thorax Rib 1 Middle Displacement (Y)	0	+	no	60
175	14TRRILUMIWFDSZ0	Passenger Thorax Rib 1 Middle Displacement (Z)	0	+	no	60
176	14TRRILUMIWFDSL B	Passenger Thorax Rib 1 Middle Length Change	600	+	no	60
177	14TRRILUFRWFDSX0	Passenger Thorax Rib 1 Front Displacement (X)	0	+	no	60
178	14TRRILUFRWFDSY0	Passenger Thorax Rib 1 Front Displacement (Y)	0	+	no	60
179	14TRRILUFRWFDSZ0	Passenger Thorax Rib 1 Front Displacement (Z)	0	+	no	60
180	14TRRILUFRWFDSL B	Passenger Thorax Rib 1 Front Length Change	600	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
181	14TRRILMREWFDSX0	Passenger Thorax Rib 2 Rear Displacement (X)	0	+	no	60
182	14TRRILMREWFDSY0	Passenger Thorax Rib 2 Rear Displacement (Y)	0	+	no	60
183	14TRRILMREWFDSZ0	Passenger Thorax Rib 2 Rear Displacement (Z)	0	+	no	60
184	14TRRILMREWFDSL B	Passenger Thorax Rib 2 Rear Length Change	600	+	no	60
185	14TRRILMMIWFDSX0	Passenger Thorax Rib 2 Middle Displacement (X)	0	+	no	60
186	14TRRILMMIWFDSY0	Passenger Thorax Rib 2 Middle Displacement (Y)	0	+	no	60
187	14TRRILMMIWFDSZ0	Passenger Thorax Rib 2 Middle Displacement (Z)	0	+	no	60
188	14TRRILMMIWFDSL B	Passenger Thorax Rib 2 Middle Length Change	600	+	no	60
189	14TRRILMFRWFDSX0	Passenger Thorax Rib 2 Front Displacement (X)	0	+	no	60
190	14TRRILMFRWFDSY0	Passenger Thorax Rib 2 Front Displacement (Y)	0	+	no	60
191	14TRRILMFRWFDSZ0	Passenger Thorax Rib 2 Front Displacement (Z)	0	+	no	60
192	14TRRILMFRWFDSL B	Passenger Thorax Rib 2 Front Length Change	600	+	no	60
193	14TRRILLREWFDSX0	Passenger Thorax Rib 3 Rear Displacement (X)	0	+	no	60
194	14TRRILLREWFDSY0	Passenger Thorax Rib 3 Rear Displacement (Y)	0	+	no	60
195	14TRRILLREWFDSZ0	Passenger Thorax Rib 3 Rear Displacement (Z)	0	+	no	60
196	14TRRILLREWFDSL B	Passenger Thorax Rib 3 Rear Length Change	600	+	no	60
197	14TRRILLMIWFDSX0	Passenger Thorax Rib 3 Middle Displacement (X)	0	+	no	60
198	14TRRILLMIWFDSY0	Passenger Thorax Rib 3 Middle Displacement (Y)	0	+	no	60
199	14TRRILLMIWFDSZ0	Passenger Thorax Rib 3 Middle Displacement (Z)	0	+	no	60
200	14TRRILLMIWFDSL B	Passenger Thorax Rib 3 Middle Length Change	600	+	no	60
201	14TRRILLFRWFDSX0	Passenger Thorax Rib 3 Front Displacement (X)	0	+	no	60
202	14TRRILLFRWFDSY0	Passenger Thorax Rib 3 Front Displacement (Y)	0	+	no	60
203	14TRRILLFRWFDSZ0	Passenger Thorax Rib 3 Front Displacement (Z)	0	+	no	60
204	14TRRILLFRWFDSL B	Passenger Thorax Rib 3 Front Length Change	600	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
205	14ABRILUREWFDSX0	Passenger Abdomen Rib 1 Rear Displacement (X)	0	+	no	60
206	14ABRILUREWFDSY0	Passenger Abdomen Rib 1 Rear Displacement (Y)	0	+	no	60
207	14ABRILUREWFDSZ0	Passenger Abdomen Rib 1 Rear Displacement (Z)	0	+	no	60
208	14ABRILUREWFDSL B	Passenger Abdomen Rib 1 Rear Length Change	600	+	no	60
209	14ABRILUMIWFDSX0	Passenger Abdomen Rib 1 Middle Displacement (X)	0	+	no	60
210	14ABRILUMIWFDSY0	Passenger Abdomen Rib 1 Middle Displacement (Y)	0	+	no	60
211	14ABRILUMIWFDSZ0	Passenger Abdomen Rib 1 Middle Displacement (Z)	0	+	no	60
212	14ABRILUMIWFDSL B	Passenger Abdomen Rib 1 Middle Length Change	600	+	no	60
213	14ABRILUFRWFDSX0	Passenger Abdomen Rib 1 Front Displacement (X)	0	+	no	60
214	14ABRILUFRWFDSY0	Passenger Abdomen Rib 1 Front Displacement (Y)	0	+	no	60
215	14ABRILUFRWFDSZ0	Passenger Abdomen Rib 1 Front Displacement (Z)	0	+	no	60
216	14ABRILUFRWFDSL B	Passenger Abdomen Rib 1 Front Length Change	600	+	no	60
217	14ABRILLREWFDSX0	Passenger Abdomen Rib 2 Rear Displacement (X)	0	+	no	60
218	14ABRILLREWFDSY0	Passenger Abdomen Rib 2 Rear Displacement (Y)	0	+	no	60
219	14ABRILLREWFDSZ0	Passenger Abdomen Rib 2 Rear Displacement (Z)	0	+	no	60
220	14ABRILLREWFDSL B	Passenger Abdomen Rib 2 Rear Length Change	600	+	no	60
221	14ABRILLMIWFDSX0	Passenger Abdomen Rib 2 Middle Displacement (X)	0	+	no	60
222	14ABRILLMIWFDSY0	Passenger Abdomen Rib 2 Middle Displacement (Y)	0	+	no	60
223	14ABRILLMIWFDSZ0	Passenger Abdomen Rib 2 Middle Displacement (Z)	0	+	no	60
224	14ABRILLMIWFDSL B	Passenger Abdomen Rib 2 Middle Length Change	600	+	no	60
225	14ABRILLFRWFDSX0	Passenger Abdomen Rib 2 Front Displacement (X)	0	+	no	60
226	14ABRILLFRWFDSY0	Passenger Abdomen Rib 2 Front Displacement (Y)	0	+	no	60
227	14ABRILLFRWFDSZ0	Passenger Abdomen Rib 2 Front Displacement (Z)	0	+	no	60
228	14ABRILLFRWFDSL B	Passenger Abdomen Rib 2 Front Length Change	600	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
229	14THSP0100WFACXP	Passenger Spine T1 Acceleration (X)	180	+	yes	2000
230	14THSP0100WFACYP	Passenger Spine T1 Acceleration (Y)	180	+	yes	2000
231	14THSP0100WFACZP	Passenger Spine T1 Acceleration (Z)	180	+	yes	2000
231A	14THSP0100WFACRP	Passenger Spine T1 Acceleration Resultant	180			
232	14THSP0400WFACXP	Passenger Spine T4 Acceleration (X)	180	+	yes	2000
233	14THSP0400WFACYP	Passenger Spine T4 Acceleration (Y)	180	+	yes	2000
234	14THSP0400WFACZP	Passenger Spine T4 Acceleration (Z)	180	+	yes	2000
234A	14THSP0400WFACRP	Passenger Spine T4 Acceleration Resultant	180			
235	14THSP1200WFACXP	Passenger Spine T12 Acceleration (X)	180	+	yes	2000
236	14THSP1200WFACYP	Passenger Spine T12 Acceleration (Y)	180	+	yes	2000
237	14THSP1200WFACZP	Passenger Spine T12 Acceleration (Z)	180	+	yes	2000
237A	14THSP1200WFACRP	Passenger Spine T12 Acceleration Resultant	180			
238	14PUBC0000WFFOYP	Passenger Pubic Symphysis Force (Y)	600	+	yes	12000
239	14SACRLE00WFFOXP	Passenger Sacro-iliac Left Force (X)	600	+	yes	200
240	14SACRLE00WFFOYP	Passenger Sacro-iliac Left Force (Y)	600	+	yes	10000
241	14SACRLE00WFFOZP	Passenger Sacro-iliac Left Force (Z)	600	+	yes	5000
242	14SACRLE00WFMOXP	Passenger Sacro-iliac Left Moment (X)	600	+	yes	600
243	14SACRLE00WFMOYP	Passenger Sacro-iliac Left Moment (Y)	600	+	yes	275
244	14SACRLE00WFMOZP	Passenger Sacro-iliac Left Moment (Z)	600	+	yes	300
245	14SACRRI00WFFOXP	Passenger Sacro-iliac Right Force (X)	600	+	yes	5000
246	14SACRRI00WFFOYP	Passenger Sacro-iliac Right Force (Y)	600	+	yes	10000
247	14SACRRI00WFFOZP	Passenger Sacro-iliac Right Force (Z)	600	+	yes	5000
248	14SACRRI00WFMOXP	Passenger Sacro-iliac Right Moment (X)	600	+	yes	600
249	14SACRRI00WFMOYP	Passenger Sacro-iliac Right Moment (Y)	600	+	yes	275
250	14SACRRI00WFMOZP	Passenger Sacro-iliac Right Moment (Z)	600	+	yes	300
251	14LUSP0000WFFOXP	Passenger Lumbar Force (X)	600	+	yes	10000
252	14LUSP0000WFFOYP	Passenger Lumbar Force (Y)	600	+	yes	10000
253	14LUSP0000WFFOZP	Passenger Lumbar Force (Z)	600	+	yes	12000

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
254	14LUSP0000WFMOXP	Passenger Lumbar Moment (X)	600	+	yes	220
255	14LUSP0000WFMOYP	Passenger Lumbar Moment (Y)	600	+	yes	220
256	14LUSP0000WFMOZP	Passenger Lumbar Moment (Z)	600	+	yes	125
257	14PELV0000WFACXP	Passenger Pelvic Acceleration (X)	1000	+	yes	2000
258	14PELV0000WFACYP	Passenger Pelvic Acceleration (Y)	1000	+	yes	2000
259	14PELV0000WFACZP	Passenger Pelvic Acceleration (Z)	1000	+	yes	2000
259A	14PELV0000WFACRP	Passenger Pelvic Acceleration Resultant	1000			
260	14FEMRLE00WFFOXP	Passenger Left Femur Force (X)	600	+	yes	15000
261	14FEMRLE00WFFOYP	Passenger Left Femur Force (Y)	600	+	yes	15000
262	14FEMRLE00WFFOZP	Passenger Left Femur Force (Z)	600	+	yes	15000
263	14FEMRLE00WFMOXP	Passenger Left Femur Moment (X)	600	+	yes	300
264	14FEMRLE00WFMOYP	Passenger Left Femur Moment (Y)	600	+	yes	350
265	14FEMRLE00WFMOZP	Passenger Left Femur Moment (Z)	600	+	yes	350
266	14FEACLE00WFFOXP	Passenger Femoral Neck Force (X)	600	+	yes	10000
267	14FEACLE00WFFOYP	Passenger Femoral Neck Force (Y)	600	+	yes	25000
268	14FEACLE00WFFOZP	Passenger Femoral Neck Force (Z)	600	+	yes	10000
269	14KNEELEINWFFOYP	Passenger Left Outer Knee Force (Y)	600	+	yes	20000
270	14KNEELEOUWFFOYP	Passenger Left Inner Knee Force (Y)	600	+	yes	20000
271	12VEHCCG0000ACXA	VEHICLE CG AX	60	+	yes	2000
272	12VEHCCG0000ACYA	VEHICLE CG AY	60	+	yes	2000
273	12VEHCCG0000ACZA	VEHICLE CG AZ	60	+	yes	2000
273A	12VEHCCG0000ACRA	VEHICLE CG A RESULTANT	60			
274	12VEHCCG0000AVXA	VEHICLE CG ARS X	60	+	yes	8000
275	12VEHCCG0000AVYA	VEHICLE CG ARS Y	60	+	yes	8000
276	12VEHCCG0000AVZA	VEHICLE CG ARS Z	60	+	yes	8000
277	13SILBRIFR00ACXA	RIGHT SIDE SILL AT FRONT SEAT AX	60	+	yes	2000
278	13SILBRIFR00ACYA	RIGHT SIDE SILL AT FRONT SEAT AY	60	+	yes	2000
279	13SILBRIFR00ACZA	RIGHT SIDE SILL AT FRONT SEAT AZ	60	+	yes	2000
279A	13SILBRIFR00ACRA	RIGHT SIDE SILL AT FRONT SEAT A RESULTANT	60			
280	16SILBRIRE00ACXA	RIGHT SIDE SILL AT REAR SEAT AX	60	+	yes	2000
281	16SILBRIRE00ACYA	RIGHT SIDE SILL AT REAR SEAT AY	60	+	yes	2000
282	16SILBRIRE00ACZA	RIGHT SIDE SILL AT REAR SEAT AZ	60	+	yes	2000
282A	16SILBRIRE00ACRA	RIGHT SIDE SILL AT REAR SEAT A RESULTANT	60			
283	11SILBLEFR00ACYA	LEFT SIDE SILL AT FRONT SEAT AY	60	+	yes	2000
284	14SILBLERE00ACYA	LEFT SIDE SILL AT REAR SEAT AY	60	+	yes	2000
285	11APILLO0000ACYA	LEFT LOWER A-PILLAR AY	60	+	yes	2000
286	11APILMI0000ACYA	LEFT MIDDLE A-PILLAR AY	60	+	yes	2000
287	11BPILLO0000ACYA	LEFT LOWER B-PILLAR AY	60	+	yes	2000

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
288	11BPILMI0000ACYA	LEFT MIDDLE B-PILLAR AY	60	+	yes	2000
289	11SETR000000ACYA	FRONT SEAT TRACK AY	60	+	yes	2000
290	14SETRLERE00ACYA	LEFT REAR SEAT STRUCTURE AY	60	+	yes	2000
291	16OCCRIRE000ACYA	RIGHT REAR OCCUPANT COMPARTMENT AY	60	+	yes	2000
292	12ENGNT00000ACXA	ENGINE BLOCK AX	60	+	yes	2000
293	12ENGNT00000ACYA	ENGINE BLOCK AY	60	+	yes	2000
294	15FORA000000ACXA	FLOORPAN ABOVE REAR AXLE AX	60	+	yes	2000
295	15FORA000000ACYA	FLOORPAN ABOVE REAR AXLE AY	60	+	yes	2000
296	15FORA000000ACZA	FLOORPAN ABOVE REAR AXLE AZ	60	+	yes	2000
296A	15FORA000000ACRA	FLOORPAN ABOVE REAR AXLE A RESULTANT	60			
297	10FORARD0000ACXA	REAR DECK AX	60	+	yes	2000
298	10FORARD0000ACYA	REAR DECK AY	60	+	yes	2000
299	10FORARD0000ACZA	REAR DECK AZ	60	+	yes	2000
299A	10FORARD0000ACRA	REAR DECK A RESULTANT	60			
300	10FORARD0000AVXA	REAR DECK ARS X	60	+	yes	8000
301	10FORARD0000AVYA	REAR DECK ARS Y	60	+	yes	8000
302	10FORARD0000AVZA	REAR DECK ARS Z	60	+	yes	8000
303	11DOORMIMI71ACYA	Left Front Door Mid Centerline (Y)	60	+	yes	2000
304	11DOORMIRE71ACYA	Left Front Door Mid Rear (Y)	60	+	yes	2000
305	11DOORMIUP71ACYA	Left Front Door Upper Centerline (Y)	60	+	yes	2000
306	14DOORMIRE71ACYA	Left Rear Door Mid Rear (Y)	60	+	yes	2000
307	14DOORMIUP71ACYA	Left Rear Door Upper Centerline (Y)	60	+	yes	2000
308	11HEADCONT00VO00	Head Contact	0	+	no	1
309	11SHOUCONT00VO00	Shoulder Contact	0	+	no	1
310	11THORCONT00VO00	Thorax Contact	0	+	no	1
311	11PELVCONT00VO00	Pelvis Contact	0	+	no	1
312	14HEADCONT00VO00	Head Contact	0	+	no	1
313	14SHOUCONT00VO00	Shoulder Contact	0	+	no	1
314	14THORCONT00VO00	Thorax Contact	0	+	no	1
315	14PELVCONT00VO00	Pelvis Contact	0	+	no	1
316	M0MBARCG0000ACXA	MDB CG AX	60	+	yes	2000
317	M0MBARCG0000ACYA	MDB CG AY	60	+	yes	2000
318	M0MBARCG0000ACZA	MDB CG AZ	60	+	yes	2000
318A	M0MBARCG0000ACRA	MDB CG A RESULTANT	60	+	yes	
319	M0FRAMRE0000ACXA	MDB REAR AX	60	+	yes	2000
320	M0FRAMRE0000ACYA	MDB REAR AY	60	+	yes	2000
321	M0MBARLE0000VO00	LEFT MDB CONTACT	0	+	no	1
322	M0MBARRI0000VO00	RIGHT MDB CONTACT	0	+	no	1

APPENDIX E
SEATING PROCEDURE WORKSHEETS AND PLOTS

Driver WSID 50th Seating Worksheet

Vehicle	2020 Ford Ranger	Technician	F. Xu
VIN #	1FTER1EH3LLA66738	Position	
ATD	VRTC WSID 50th EB8888	Date	3/18/2021
Test #	210318		

SCRL Angle	Max	14.8	WSID 50th Tilt Sensors		X	Y	
	Min -	9.6		Head	0°±2	-0.3	-2.1
	Difference	5.2					
	/2	2.6		T6	0°±2	-0.1	-0.5
	Min +	2.6					
Mid Angle	12.2	Pelvis	0°±2	-1.6	1.1		

Seat Back Angle	W/Level °	N/A	HEAD REST POST		FINAL HEAD REST
Seat Pan Angle	W/Level °	N/A	ANGLE	2.9	POST ANGLE

Pelvis Angle	WSID 50th 0° +/-2.5°	Manual Inclinometer	41	Tilt Sensor	1.1
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Collected Points			
Name	Meas X	Meas Y	Meas Z
SBU -	-29.3888	-8.0017	-17.8497
SBL -	-29.4052	-7.53091	17.98755
STRIKER -	0	0	0
FOSB -	507.2402	258.1781	415.3174
FISB -	508.7865	552.9359	413.9899
ROSB -	121.600	195.614	414.682
RISB -	120.167	615.022	412.169
PCP - (Pedal Center Point)	1138.524	536.919	298.397
RHP - (Right Heel Point)	1002.761	537.109	446.868
LHP - (Left Heel Point)	1000.220	272.295	452.510
S0 -	609.535	402.009	-224.299
TS -	688.083	406.940	-383.106
BS -	543.034	398.027	-59.775
SC1 -	800.909	300.476	-114.746
OSCAR H-POINT -	302.130	211.330	149.085
DR PROJECTED WSID H-POINT AT MID-POSITION -	322.000	129.000	240.000
DRIVER STP 15.27 MID-POSITION -	322.000	144.363	239.533
DRIVER STP STEP 18.6 TRIAL 1 -	322.577	129.000	240.000
DR PROJECTED WSID H-POINT STEP 18.6.2 TRIAL 1 -	322.000	129.000	240.000
DRIVER STP STEP 18.6 TRIAL 2 -	322.000	129.000	240.000
DR PROJECTED WSID H-POINT STEP 18.6.2 TRIAL 2 -	322.000	129.000	240.000
DRIVER STP STEP 18.6 TRIAL 3 -	322.000	129.000	240.000
DR PROJECTED WSID H-POINT STEP 18.6.2 TRIAL 3 -	322.000	129.000	240.000
RHDCG -	160.544	487.162	-524.838
3DLHCG -	183.897	330.768	-523.862
LHDCG -	158.350	327.908	-525.643
BON -	254.693	408.931	-525.096
TN -	250.588	407.571	-468.555
TC -	237.013	408.594	-401.086
SHLD R1 -	208.076	408.507	-298.712
THX R1 -	243.775	408.805	-222.407
THX R2 -	278.343	409.753	-157.111
THX R3 -	295.786	410.399	-110.599
ABD R1 -	312.435	414.658	-55.833
ABD R2 -	331.768	415.823	-10.959
TPS -	360.980	410.297	13.122
C1 -	218.954	407.967	-275.390
C2 -	252.031	402.038	-218.303
C3 -	317.189	410.491	-54.438
SHT -	132.974	189.579	-258.648
E1 -	330.269	171.216	-121.438
P1 -	276.550	174.083	93.504
H-POINT -	331.833	177.408	139.660
H-POINT 2 -	331.341	202.980	140.559

OK -	721.261	193.855	31.821
IK -	709.607	638.378	25.671
OA -	980.918	278.269	346.119
IA -	960.964	499.998	339.862
OH -	993.888	273.714	468.834
IH -	1004.435	532.507	459.615
OP -	-63.171	317.550	-366.961
R -	253.954	409.047	-739.603
H -	607.786	408.671	-662.766
W1 -	905.043	409.807	-524.286
W1 - Outside	918.827	409.898	-526.218
W2 - Outside	1166.807	408.598	-373.612
D1 -	830.066	408.480	-339.474
D2 -	801.199	258.505	-55.460
D3 -	795.722	584.130	-21.370
HRP -	254.933	220.359	-650.098
HSP -	254.422	69.528	-526.043
ADP -	329.531	40.687	-121.976
HDP -	330.984	83.346	139.270

Calculated Measurements					
Name	Cal X	Cal Y	Cal Z	Cal 3D Distance	Deg
HZ -			215		
HH -				379	
HW -	650				
NR -				446	
CD -				614	
CS -	358				
CBS -	226				
IKD -				112	
OKD -				135	
HR -				226	
HS -		339			
AD -		131			
HD -		94			
HLHL -				259	
KK -				445	
SH -				401	
HRA -					2.9
H-POINT TOOL ANGLE -					39.9
TORSO ANGLE -					14.6
WINDSHIELD ANGLE -					58.4

Rear Passenger WSID 5th Seating Worksheet

Vehicle	2020 Ford Ranger	Technician	F. Xu
VIN #	1FTER1EH3LLA66738	Position	
ATD	VRTC WSID 5th DK1774	Date	3/18/2021
SEATING #			

Seat Back Angle	W/Level °	N/A	HEAD REST	
Seat Pan Angle	W/Level °	N/A	POST ANGLE	N/A
				FINAL HEAD REST
				POST ANGLE

Pelvis Angle Manual Inclinometer 44

Collected Points			
Name	Meas X	Meas Y	Meas Z
SBU -	-30.252	-16.720	-17.354
SBL -	-30.279	-16.259	18.454
STRIKER -	-0.053	-1.410	-0.652
FOSB -			
FISB -			
ROSB -			
RISB -			
RHP -			
LHP -			
OSCAR H-POINT -			
LHDCG -	-495.132	333.621	-468.452
BON -	-407.641	409.603	-478.926
TN -	-406.380	410.243	-436.193
TC -	-414.101	411.960	-358.123
C1 -	-445.239	405.515	-238.652
SHT -	-545.873	214.602	-249.064
E1 -	-377.037	192.932	-130.026
P1 -	-460.068	173.407	80.158
H-POINT -	-408.399	181.131	131.630
H-POINT 2 -	-405.953	212.424	128.429
OK -	-53.193	245.054	-0.317
IK -	-66.723	585.920	-18.543
OA -	27.312	289.640	347.842
IA -	15.055	472.228	343.668
OH -	-28.658	315.747	446.591
IH -	-49.836	499.148	443.338
OP -	-659.196	346.629	-416.466
R -	-410.005	407.124	-757.614
SB -	-104.634	425.848	-336.388
KBL -	10.662	295.335	-18.778
KBR -	1.625	539.791	-29.948
HRP -	-408.198	231.924	-663.691
HSP -	-406.926	28.802	-478.446
ADP -	-377.326	61.709	-131.799
HDP -	-409.139	86.094	132.885

WS05F Tilt Sensors	X	Y
Head	0.4	-2
T6	0.2	7.7
Pelvis	-0.9	28.1

Calculated Measurements					
Name	Cal X	Cal Y	Cal Z	Cal 3D Distance	Deg
HZ -			279		
NB -				318	
CB -				355	
IKB -				83	
OKB -				83	
HR -				256	
HS -	381				
AD -	131				
HD -	95				
HLHL -				185	
KK -				342	
SH -				512	
HRA -					N/A
H-POINT TOOL ANGLE -					44.9
TORSO ANGLE -					72.1
SEATBACK ANGLE -					20.0