REPORT NUMBER: SPole-MCW-18-002

RESEARCH SIDE IMPACT POLE TEST

AMERICAN HONDA MOTOR COMPANY
2018 HONDA ACCORD 4-DOOR SEDAN
NHTSA NUMBER: R20185385

PREPARED BY:
MEDICAL COLLEGE OF WISCONSIN
5000 WEST NATIONAL AVENUE
RESEARCH 151
MILWAUKEE, WISCONSIN 53295

TEST DATE: 31 OCTOBER 2019

REPORT DATE: 12 MAY 2020

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS RESEARCH
MAIL CODE: NSR-210
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Date:_20 December 2019, revised 12 May 2020__________________

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Date: 20 December 2019, revised 12 May 2020__________________

FINAL REPORT ACCEPTANCE BY NHTSA:

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Division Chief, Structures and Restraints Research
NHTSA, Office of Vehicle Crashworthiness Research

Date:____

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COR, Structures and Restraints Research
NHTSA, Office of Vehicle Crashworthiness Research

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Technical Report Documentation Page

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15. Supplementary Notes

16. Abstract

A 32.2 km/h (20 mph), 75° Oblique Rigid Pole Research Side Impact Test was conducted on the subject 2018 Honda Accord 4-Door Sedan in accordance with the specifications of the Laboratory Test Procedure for the Research Side Impact Rigid Pole Test and the VRTC WS50M_Rev2 Seating Procedure (May 2019). The test was conducted at the Medical College of Wisconsin (MCW) in Milwaukee, Wisconsin on 31 October 2019.

The impact velocity was 31.90 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 20 °C. The test vehicle's post-test maximum static crush was 391 mm at level 3. The test vehicle's occupant performance is as follows:

	Driver ATD (WorldSID)	
	Units	Result
Head Injury Criteria (HIC_{15})	N/a	193
Brin Injury Criteria (BRIC)	N/a	.61
Lateral Shoulder Force	N	1556
Max, Thorax or Abdominal Rib Deflection	mm	27
Max. Abdominal Rib Deflection	mm	27
Maximum Lateral Pubic Force	N	-928
Maximum Sacro -Iliac Resultant Force	N	2559

The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words New Car Assessment Program (NCAP) Side impact Pole Part 572V SID-IIs	*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, D.C. 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

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Form DOT F1700.7 (8-72)

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SECTION 1
TEST PURPOSE AND PROCEDURE

This rigid pole 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 Contract Number DTNH2214D00358L by the Medical College of Wisconsin. 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 rigid pole tests conducted by NHTSA. The test was conducted using NHTSA's 'LABORATORY TEST PROCEDURE FOR THE NEW CAR ASSESSMENT PROGRAM SIDE IMPACT RIGID POLE TEST' dated October 2015 as a guideline.

SECTION 2
SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2018 Honda Accord 4-Door Sedan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 31.90 km/h. The test was conducted at the Medical College of Wisconsin, in Milwaukee, Wisconsin, on 31 October 2019. Pre-test and post-test photographs of the test vehicle and side impact dummy (WorldSID-50M) are included in APPENDIX A of this report.

One restrained side impact dummy (World-SIDE-50M) (S/N EB8888) was placed in the driver designated seating position according to instructions specified in the VRTC WS50M_Rev2 Seating Procedure, dated May 2019. The ATD was calibrated per the WorldSID 50th Percentile Male Qualification Procedures manual dated August 2016, and the WorldSID 50th Percentile Adult Male Neck Torsion Procedure dated August 2019. Camera locations and other pertinent camera information are included in this report.

The WorldSID dummy was instrumented with one-hundred thirty-three (133) dummy channels of acceleration, force, moment, angle, and displacement data were collected for this test. It was also instrumented with a Ribeye system manufactured by Boxboro Systems[3] in the chest in place of the IRTRACCs, RibEye™ Multipoint Deflection Measurement System Software User Manual (Version 5.0, April 2017).. Each rib (1 shoulder, 3 thorax, and 2 abdomen) had three LEDs placed at the middle, front and rear location to measure X, Y and Z position location The position measurements were used to calculate a change of length in each rib at each location.

During the impact the driver side seat back collapsed.

APPENDIX A contains the test images. APPENDIX B contains the vehicle and dummy response data. APPENDIX C contains the dummy configuration and performance verification data. APPENDIX D contains the test equipment and instrumentation calibration data. APPENDIX F contains the WorldSID seating worksheet.

[1] See Appendix E for WorldSID Draft Seating Procedure used for this testing.
[2] https://rosap.ntl.bts.gov/view/dot/41900
[3] http://www.boxborosystems.com/ribeye.html

Injury readings for the World SID 50M ATD were recorded as follows:

OCCUPANT SUMMARY		
	Driver ATD (World SID 50M)	
	Units	**Result**
Head Injury Criteria (HIC15) (CFC 1000)	N/A	193
Head Injury Criteria (HIC36) (CFC 1000)	N/A	307
BRIC	N/A	.61
Lateral Shoulder Force (CFC 600)	N	1556
Maximum Shoulder Deflection	mm	35.79
Maximum Thorax Rib (1-3) Deflection	mm	27.44
Maximum Abdominal Rib (1-2) Deflection	mm	26.62
Lower Spine Resultant Acceleration (CFC180)	G	42.5
Pelvis Resultant Acceleration (CFC 1000)	G	47.4
Lateral Pubic Symphysis Force (CFC 600)	N	-928
Sacro-Iliac Resultant Force (CFC 600)	N	2559
Sacro-Iliac Force Y (CFC 600)	N	-2529

VEHICLE SUMMARY		
	2018 Honda Accord 4-Door Sedan	
	Units	**Result**
Vehicle Test Weight	kg	1529
Impact Point (Horizontal) rearward of front axle	mm	1041
Impact Angle	degrees	75
Maximum Crush and Level	mm	391 at Level 3
Impact Speed	kph	31.90

TEST NOTES
Data Explanations

Data Acquisition Anomalies

Right Sacro-iliac Force Y, Pg. B-44: Channel clipped at about 39 milliseconds and 84 milliseconds at 1092 N.

Shoulder Rib Rear X, Y and Z sensor, pp B-71 – B-74: Dropout between approximately 47 and 71 milliseconds

Shoulder Rib Mid X, Y and Z sensor, pp B-75 – B–78: Dropout between approximately 56 and 61 milliseconds

Shoulder Rib Front X, Y and Z sensor, pp. B-79 – B-82: dropout between approximately 55 and 63 milliseconds

Thorax Rib 2 Mid X, Y and Z sensor, pp. B-99 – B-102: dropout between approximately 50 and 56 milliseconds and between 60 and 61 milliseconds.

Thorax Rib 2 Front X, Y and Z sensor, pp. B-103 – B-106 dropout between approximately 52 and 56 milliseconds.

Left Floor Sill Y, pg. B-150: No valid data after approximately 25 milliseconds due to possible cut wire.

Left A-Pillar Sill Y, pg. B151: No valid data after approximately 20 milliseconds due to possible cut wire.

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

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

VEHICLE INFORMATION	
NHTSA No.	R20185385
Model Year	2018
Make	Honda
Model	Accord
Body Style	Sedan
VIN	1HGCV1FI8JA079564
Body Color	Silver
Odometer Reading (km/mi)	99 mi
Engine Displacement (L)	1.5
Type/No. of Cylinders	4
Engine Placement	Lateral
Transmission Type	CVT
Transmission Speeds	n/a
Overdrive	n/a
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

VEHICLE OPTIONS	
Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Unk
Other Optional Features	N/A
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	Yes
Driver Torso Airbag	n/a
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	n/a
Driver Knee Airbag	Yes
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	n/a

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

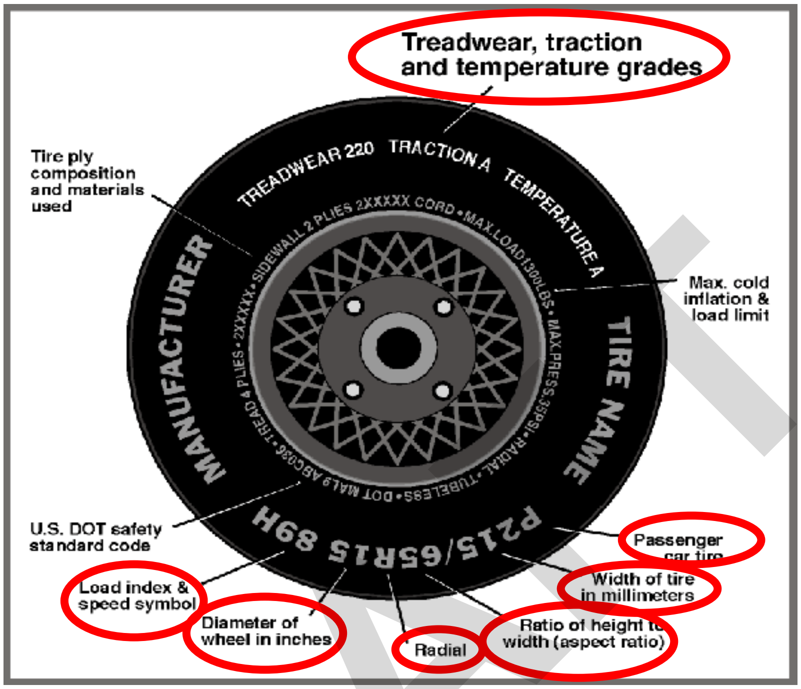
DATA FROM CERTIFICATION LABEL			
Manufactured By	Honda of America	GVWR (kg)	1950
Date of Manufacture	January 2018	GAWR Front(kg)	1070
Vehicle Type	Passenger Car	GAWR Rear (kg)	960

VEHICLE SEATING AND WEIGHT CAPACITY DATA	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	0	5	
Capacity Weight (VCW) kg				385.6	(A)
DSC X 68.04 kg				340.2	(B)
Rated Cargo Weight (RCLW)				45.4	(A-B)

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

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	Yes	n/a
Rear or Second Row Seat	n/a	n/a	Yes	Yes	Yes	n/a	n/a
Third Row Seat							

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



Vehicle Tire Information		
Measured Parameter	**Front**	**Rear**
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	225/50R17 94V	225/50R17 94V
Tire Size on Vehicle	225/50R17 94V	225/50R17 94V
Tire Manufacturer	Hankook	Hankook
Tire Model	Kinergy GT	Kinergy GT
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1	1
Tire Plies Body	4	4
Load Index/Speed Symbol	94V	94V
Tire Material	Steel, Polyester, & Nylon	Steel, Polyester, & Nylon
DOT Safety Code Left	1T7AB 1B HO	1T7AB 1B HO
DOT Safety Code Right	1T7AB 1B HO	1T7AB 1B HO

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

TIRE PRESSURES					
	Units	**LF**	**RF**	**LR**	**RR**
As Delivered	psi	207	193	200	200
Tire Placard	kpa	220	220	220	220
Owner's Manual	kpa	220	220	220	220
As Tested	kpa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS										
	Units	**As Delivered (UVW)**			**As Tested (ATW)**			**Fully Loaded**		
		Front	**Rear**	**Total**	**Front**	**Rear**	**Total**	**Front**	**Rear**	**Total**
Left	kg	426.8	287.1		452.7	337.9		455.0	339.7	
Right	kg	426.8	269.9		421.8	316.6		423.7	317.5	
Ratio	%	60.6	39.4		57.1	42.8		57.2	42.7	
Totals	kg	853.6	557.0	1410.6	874.5	654.5	1529.0	878.7	657.2	1535.9

TARGET TEST WEIGHT CALCULATION			
	Units		
Total Delivered Weight (UVW)	kg	1410.6	(A)
Actual Weight of 1 ATD (World SID 50M) Used	kg	75.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	45.3	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1531.2	(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**

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW	
Ballast	**Weight (kg)**
Ballast added: None	0
Components removed: Spare tire including floor cover, plastic covers/trunk liner, jack, and passenger side glass and window motors, exhaust, floor mats	75

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERIING WHEEL ADJUSTMENT, AND FUEL SYSTEMS DATA

SCRL ANGLE RANGE			
	SCRL (°)		
	Max	**Min**	**Mid**
Driver Seat**	10.1	5.0	7.5
Front Passenger Seat**	N/A	N/A	N/A
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat			

**Seat pan non-adjustable

SCRL ANGLE RANGE						
Seat	**As Tested SCRL Angle (Mid) (°)**	**As Tested SCRP Height (mm)**	**SCRP Height Position**	**SCRP Height (mm)**		
				Rearmost	**Mid-Fore/Aft**	**Forward-Most**
Driver's Seat	10.1	n/a	Max	n/a	n/a	n/a
	7.5	n/a	Mid	n/a	n/a	n/a
	5.0	n/a	Min	n/a	n/a	n/a
Front Passenger Seat			Max			
			Mid			
			Min			
Front Center Seat*			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat			Max			
			Mid			
			Min			
Rear Center Seat*			Max			
			Mid			
			Min			

*If applicable

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERIING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA (CONTINUED)

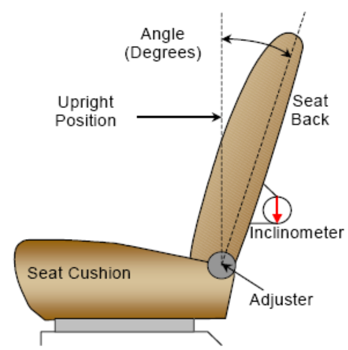
SEAT FORE/AFT TRAVEL

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents*	mm	Detents*
Driver Seat	240	25	120	12 (w/ Full Forward = 0)
Front Passenger Seat	n/a	n/a	n/a	12 (w/ Full Forward = 0)
Front Center Seat*				
Struck Side Rear Seat	Fixed	N/a	N/a	N/a
Non-Struck Side Rear Seat	Fixed	N/a	N/a	N/a
Rear Center Seat*				

*If applicable

Driver Seat Position
The driver's seat back is positioned at 2.4° rearward measured at the head rest post per Form 1 instructions. The seat was positioned at mid-track of fore and aft travel.

Right Front Passenger Seat Position
The right front passenger seat back was positioned in a similar manner as the driver's seat bac



FRONT SEAT ASSEMBLY

SEAT BACK ANGLE ADJUSTMENT

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/ Seated Dummy	53.3	n/a	2.4	n/a
Front Passenger Seat	n/a	n/a	n/a	n/a
Front Center Seat*				
Struck Side Rear Seat	Fixed	N/a	Fixed	N/a
Non-Struck Side Rear Seat	Fixed	N/a	Fixed	N/a
Rear Center Seat*				

*If applicable
***Measure at the head-rest post

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERIING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA (CONTINUED)

Seat Belt Anchorage Adjustment
Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

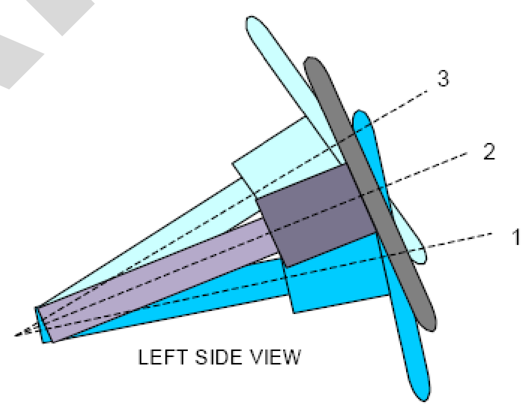
SEAT BELT ANCHORAGE ADJUSTMENT (D-RING)		
	Total No. of Positions	**Placement**
Driver Seat	4	4 up

Head Restraint Adjustment
Head restraints are adjusted to the lowest and most full forward in-use position.

HEAD RESTRAINT ADJUSTMENT		
	Total No. of Positions	**Placement**
Driver Seat	n/a	Full Up

Steering Column Adjustment
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.

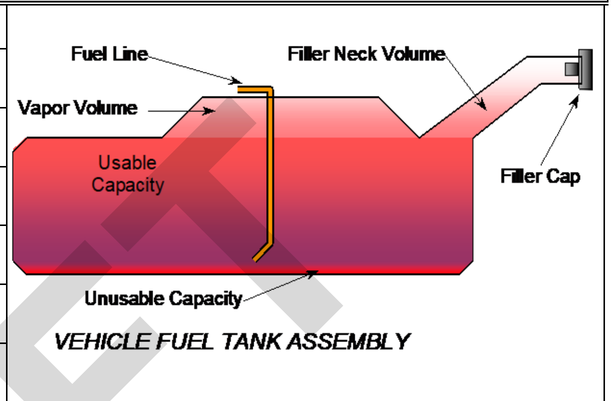
STEERING COLUMN ADJUSTMENT		
	Degrees	**Fore/Aft Position (mm)**
Lowermost, Pos. No. 1	66.8	N/a
Geometric Center, Pos. No. 2	64.1	N/a
Uppermost, Pos. No. 3	61.4	N/a
Telescoping Steering Wheel Travel	Non-telescoping	N/a
Test Position	64.1	N/a



STEERING COLUMN ASSEMBLY

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERIING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA (CONTINUED)

FUEL TANK CAPACITY DATA		
Description	**Units**	**Value**
Usable Capacity of "Standard Tank"	L	67.3
Usable Capacity of "Optional Tank"	L	N/a
Usable Capacity of Standard Tank	L	67.3
Usable Capacity of Optional Tank	L	N/a
93% of Usable Capacity	L	62.6
Actual Amount of Solvent Used in Test	L	62.6
1/3 of Usable Capacity	L	22.4



Fuel Pump
The vehicle is equipped with an electronic fuel pump. Key is "ON" position. The fuel pump is in the tank, center.

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

Table 1 WorldSID Instrumentation Data

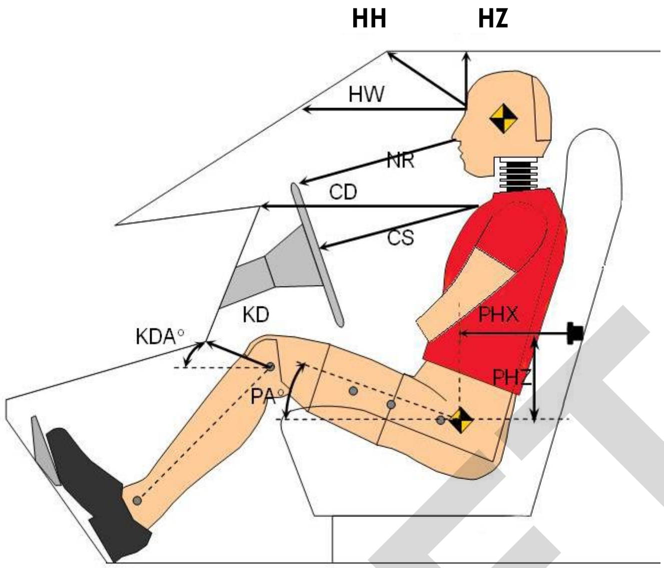
Location		Positive Direction Max.	Positive Direction Time (ms)	Negative Direction Max.	Negative Direction Time (ms)
Head Acceleration (g)	X	24.31	56.35	-7.78	135.55
	Y	39.41	64.9	-11.15	137.9
	Z	12.94	56.45	-3.988	91.75
	R	46.50	64.9	0.041	9.65
Head Angular Velocity (deg/sec)	X	1352.66	120.6	-1037.08	195.2
	Y	757.99	113.1	-425.66	62.75
	Z	1085	267.6	-766.61	120.25
Upper Neck Force (N)	X	297.99	134.9	-259.53	68.5
	Y	196.39	260.95	-575.611	59.65
	Z	725.13	50.2	-141.58	286.4
Upper Neck Moment (Nm)	X	32.85	59.5	-28.91	143.25
	Y	10.56	92.95	-22.82	125.5
	Z	7.43	242.25	-19.02	96.6
Lower Neck Force (N)	X	285.56	114.25	-495.071	61.85
	Y	229.23	256.95	-583.10	110.4
	Z	859.46	53.15	-523.34	135.9
Lower Neck Momentum (Nm)	X	42.29	254.35	-89.40	147.2
	Y	45.03	72.75	-72.72	133.2
	Z	12.30	60.9	-21.67	104.85
T1 Acceleration (g)	X	5.76	101.25	-20.34	57.9
	Y	48.69	59.35	-10.96	113.5
	Z	13.05	57.95	-5.21	101.4
	R	53.63	59.3	0.079	-18.05
T4 Acceleration (g)	X	14.28	58.1	-6.77	100.35
	Y	43.06	60.2	-15.55	95.45
	Z	4.30	69.05	-13.77	54.55
	R	46.68	57.55	0.135	-19.15
T12 Acceleration (g)	X	8.51	64.85	-13.17	37.5
	Y	41.83	55.75	-22.85	90.55
	Z	8.93	57.8	-9.02	98.3
	R	42.47	55.75	0.023	-15.2
Shoulder Force (N)	X	111.38	129.4	-767.51	63.2
	Y	0	0	-1555.91	43.55
	Z	60.98	107.2	-276.94	28.75
Pubic Symphysis (N)	Y	6.48	11.35	-927.54	40.25
Sacro-Iliac Left Force (N)	X	305.03	122.2	-328.007	55.85
	Y	0	0	-2529.1	46.45
	Z	114.82	144.8	-593.171	68.85
Sacro-Iliac Left Moment (Nm)	X	29.10	249.8	-21.97	42.55
	Y	27.82	55.8	-22.38	111.8
	Z	21.27	36.05	-31.25	68.85

Location		Positive Direction Max.	Positive Direction Time (ms)	Negative Direction Max.	Negative Direction Time (ms)
Lumbar Force (N)	X	504.23	69	-176.48	22.85
	Y	718.74	55.8	-239.39	86.65
	Z	1577.501	63.55	-87.84	140.55
Lumbar Moment (Nm)	X	45.19	56.8	-17.28	92.35
	Y	21.58	139.85	-25.88	71.05
	Z	15.44	49	-12.93	92.35
Pelvis Acceleration (g)	X	16.57	64.95	-11.18	24.25
	Y	46.96	45.65	-18.73	82.9
	Z	11.62	37.65	-8.41	55.95
	R	47.39	42.15	0.036	9.4
Left Femur Force (N)	X	33.81	26.9	-201.35	43.05
	Y	99.94	102.35	-446.48	39.35
	Z	864.07	67.55	-220.61	101.45
Left Femur Moment (Nm)	X	195.92	45.45	-8.34	20.35
	Y	93.10	44.25	-6.72	20.55
	Z	34.85	47.7	-5.33	19.1
Left Femoral Neck Force (N)	X	665.83	44.9	-22.08	19.15
	Y	74.08	18.95	-1751.01	45.7
	Z	171.67	101.6	-1563.76	45.8
Shoulder Rear Ribeye Position (mm) *(sensor dropout between 47.6 - 71.4)	X	9.27	163.5	-32.27	71.5
	Y	24.7	47.5	-2.18	21.1
	Z	7.34	106.3	-5.76	76.9
Length of Change (mm)		6.21	154.9		
Shoulder Middle Ribeye Position (mm) *(sensor dropout between 55.6 - 61.5)	X	10.11	160.4	-44.45	61.6
	Y	49.97	55.8	-2.73	23.7
	Z	8.02	105.0	-7.47	268.6
Length of Change (mm)		35.79	51.9		
Shoulder Front Ribeye Position (mm) *(sensor dropout between 56.2 – 63.6)	X	11.11	161.0	-27.59	63.7
	Y	58.71	55.5	-2.39	24.1
	Z	6.41	107.0	-7.24	270.5
Length of Change (mm)		64.83	63.7		
Thorax Rib 1 Rear Ribeye Position (mm)	X	3.32	152.1	-6.71	108.5
	Y	17.91	51.0	-1.41	250.1
	Z	18.63	56.6	-9.44	33.8
Length of Change (mm)		15.52	51.1		
Thorax Rib 1 Middle Ribeye Position (mm)	X	3.99	39.5	-7.74	108.5
	Y	27.71	48.9	-1.71	266.8
	Z	20.92	56.2	-10.62	33.9
Length of Change (mm)		27.44	50.5		

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Thorax Rib 1 Front Ribeye Position (mm)	X	6.28	39.5	-7.26	110.5
	Y	31.52	50.3	-1.41	217.8
	Z	20.14	55.9	-10.5	33.2
Length of Change (mm)		27.32	50.5		
Thorax Rib 2 Rear Ribeye Position (mm)	X	3.94	68.0	-4.56	41.3
	Y	9.16	56.8	-1.31	261.5
	Z	8.87	47	-3.04	29.2
Length of Change (mm)		8.95	56.8		
Thorax Rib 2 Middle Ribeye Position (mm) *(sensor dropout between 50.3 – 55.6)	X	3.39	68.4	-5.3	81.9
	Y	13.54	56.9	-1.98	216.2
	Z	9.98	47.1	-3.61	28.7
Length of Change (mm)		10.56	63.2		
Thorax Rib 2 Front Ribeye Position (mm) *(sensor dropout between 51.9 – 63.6)	X	3.94	68.0	-6.49	107.9
	Y	14.54	57.7	-1.81	259.0
	Z	9.48	47.1	-3.5	28.0
Length of Change (mm)		12.26	57.7		
Thorax Rib 3 Rear Ribeye Position (mm)	X	0.6	150.1	-9.3	38.8
	Y	12.45	57.1	-1.02	128.4
	Z	11.01	43.8	-2.26	26.5
Length of Change (mm)		9.73	58.1		
Thorax Rib 3 Middle Ribeye Position (mm)	X	2.52	21.8	-5.97	40.8
	Y	16.18	57.1	-1.72	129.5
	Z	11.37	43.8	-3.16	27.1
Length of Change (mm)		16.06	57.6		
Thorax Rib 3 Front Ribeye Position (mm)	X	6.88	60.1	-4.55	80.6
	Y	17.84	58.1	-3.54	117
	Z	10.31	43.8	-3.13	26.9
Length of Change (mm)		13.66	57.7		
Abdomen Rib 1 Rear Ribeye Position (mm)	X	0.2	-17.1	-12.19	46.9
	Y	19.84	55.6	-0.6	276.8
	Z	12.14	43.1	-1.25	26.3
Length of Change (mm)		14.79	57.5		
Abdomen Rib 1 Middle Ribeye Position (mm)	X	1.53	20.7	-10.33	123.8
	Y	26.74	55.7	-0.56	276.7
	Z	13.05	44.2	-1.69	26.9
Length of Change (mm)		26.62	56.1		
Abdomen Rib 1 Front Ribeye Position (mm)	X	5.8	63.9	-5.88	135.8
	Y	27.62	57.1	-0.4	259.7
	Z	12.01	43.1	-1.84	26.3
Length of Change (mm)		23.39	56.2		

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Abdomen Rib 2 Rear Ribeye Position (mm)	X	1.05	66.3	-12.32	38.8
	Y	16.48	54.7	-0.45	-7.2
	Z	9.84	43.1	-3.42	299.2
Length of Change (mm)		14.04	56.9		
Abdomen Rib 2 Middle Ribeye Position (mm)	X	6.62	64.4	-9.89	134
	Y	22.68	56.2	-0.54	-6.4
	Z	11.03	42.1	-3.69	299.6
Length of Change (mm)		22.46	56.2		
Abdomen Rib 2 Front Ribeye Position (mm)	X	12.62	62.5	-6.0	137.8
	Y	25.02	56.9	-.051	12.4
	Z	10.3	41.8	-3.37	300
Length of Change (mm)		18.87	56.0		

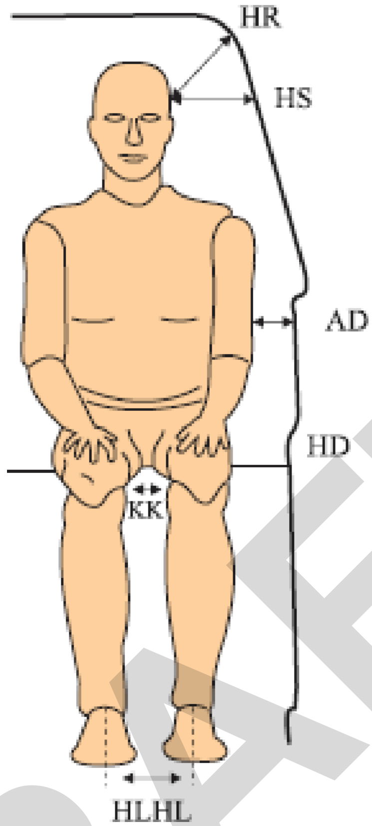
DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS



Code	Measurement Description	Driver (World SID EB8888)	
		Length (mm)	Angle (°)
HH	Head to Header	349	
HW	Head to Windshield	612	
HZ	Head to Roof Liner	186	
NR	Nose to Rim	429	
CD	Chest to Dashboard	600	
CS	Chest to Steering Wheel	360	
KDL	Left Knee to Dash	188	
KDAL	Left Knee to Dash		n/a
KDR	Right Knee to Dash	153	
KDAR	Right Knee to Dash		n/a
PAX	Pelvic Tilt Angle (X-Axis)		.5
PAY	Pelvic Tilt Angle (Y-Axis)		-1.6
PHX	H-Point to Striker (X-Axis)	273	
PHZ	H-Point to Striker (Z-Axis)	263	
HAX°	Head Tilt Angle X*		0.5
HAY°	Head Tilt Angle Y*		-1.9
TAX°	Thorax Tilt Angle X		1.5
TAY°	Thorax Tilt Angle Y		-1.2
	H-point Tool Angle		44.4
	Torso Angle		13.3
	Windshield Angle		60.4

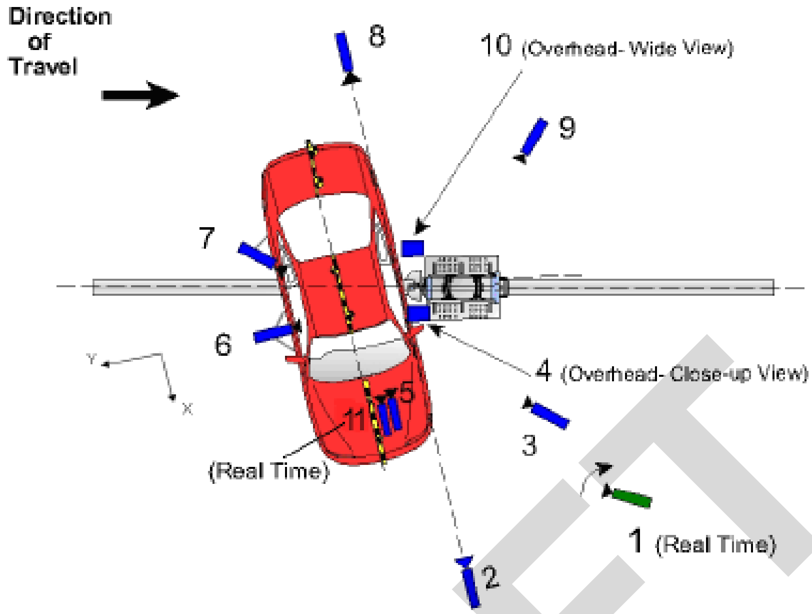
*Neck set at neutral position and not adjusted to achieve tilt angle.

DATA SHEET NO. 4
DUMMY LATERALL CLEARANCE DIMENSIONS



DUMMY LATERAL CLEARANCE DIMENSIONS		
Code	**Measurement Description**	**Length (mm)**
HR	Head to Side Header	261
HS	Head to Side Window	370
AD	Arm to Door	160
HD	Hip Point to Door	117
KK	Knee to Knee	338
HLHL	Heel to Heel	351

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA



	View	Coordinates †			Lens Length	Operating Frame Rate
		X	Y	Z		
		mm	mm	mm	mm	fps
1	Rear Time (24 – 30 fps) Pan View of Impact				N/A	30
2	Front ground Level – Impact View	3407	11,130	-1471	25	1000
3	Impact Side 45° - Forward View of Pole	4794	7255	-1221	35	1000
4	Overhead Close – Up View of Impact	-802	1998	-5895	25	1000
5	Onboard – Dummy Front View				12.5	1000
6	Onboard – Dummy Side View				12.5	1000
7	Onboard – Dummy Rear Oblique View				12.5	1000
8	Rear Ground Level – Impact View	-1738	-6657	-1469	35	1000
9	Impact Side 45° - Rearward Pole View	5420	-6320	-1478	25	1000
10	Overhead Wide – View Impact	-1198	1853	-5895	12.5	1000
11	Real – Time (24 – 30 fps)Dummy Front View				N/A	30

Origin		Orientation	
X	Impact Point	X	+(X) Forward
Y	Impact Point	Y	+(Y) Right
Z	Ground	Z	+(Z) Down

**All measurements accurate to +/- 6 mm*
Note: Vehicle was at a 71.5° angle to the rigid pole

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA (CONTINUED)

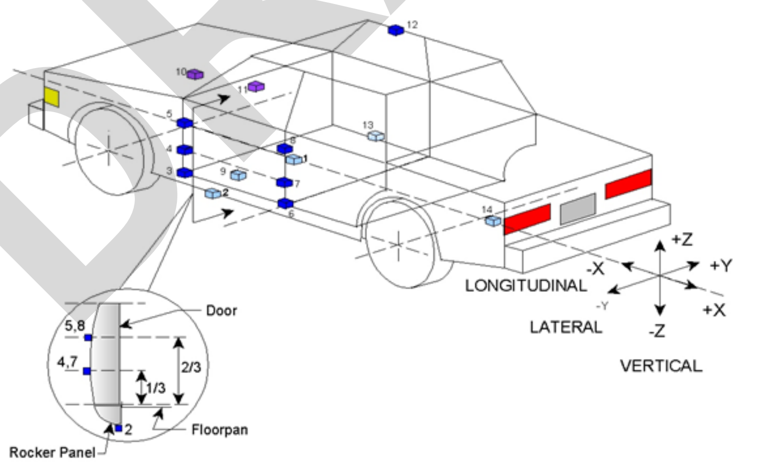
INSTRUMENTATION	
	Number of channels
Driver Dummy	133
Vehicle Structure	36
Pole Load Cells	8
Total No. of Data Channels	177

DATA SHEET NO. 6
Table 2. VEHICLE ACCELEROMETER LOCATIONS AND DATA

Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
1	Vehicle CG	3137	45	12				
	Longitudinal (g)				2.00	12.15	-5.78	21.50
	Lateral (g)				17.49	12.45	-1.48	39.65
	Vertical (g)				12.84	32.00	-8.37	21.90
	Resultant (g)				17.92	12.35		
2	Left Floor Sill	3137	-757	179				
	Lateral (g)*				2845.53	53.20	-527.07	63.20
3	Left A-Pillar Sill	3477	-759	184				
	Lateral (g)*				2650.84	27.20	-1106.35	298.40
4	Left Lower A-Pillar	3424	-837	-142				
	Lateral (g)				33.04	48.45	-0.44	0.95
5	Left Mid A-Pillar	3426	-830	-359				
	Lateral (g)				60.99	37.65	-0.51	1.25
6	Left B-Pillar Sill	2174	-756	161				
	Lateral (g)				61.62	17.20	-44.27	22.95
7	Left Lower B-Pillar	2284	-838	-245				
	Lateral (g)				49.19	17.10	-14.98	25.55
8	Left Mid B-Pillar	2284	-827	-437				
	Lateral (g)				48.93	17.20	-10.82	53.10
9	Driver Seat Track at Dummy H-Point	2481	-567	78				
	Lateral (g)				69.14	24.10	-25.00	43.90
10	Engine Top	4220	190	-435				
	Longitudinal (g)				4.27	137.00	-12.12	48.45
	Lateral (g)				19.15	44.55	-0.94	194.30
11	Firewall	3711	324	-222				
	Lateral (g)				17.11	47.50	-0.79	4.65
12	Right Roof at Vertical Impact Reference Line	2165	548	-1067				
	Lateral (g)				22.96	40.00	-0.33	300.00
13	Right Sill at Vertical Impact Reference Line	2258	773	180				
	Lateral (g)				20.69	13.50	-0.74	224.50
14	Rear Floorpan Behind Rear Axle at Centerline	1057	9	-128				
	Longitudinal (g)				2.39	120.60	-4.96	64.05
	Lateral (g)				15.40	68.35	-0.70	202.15

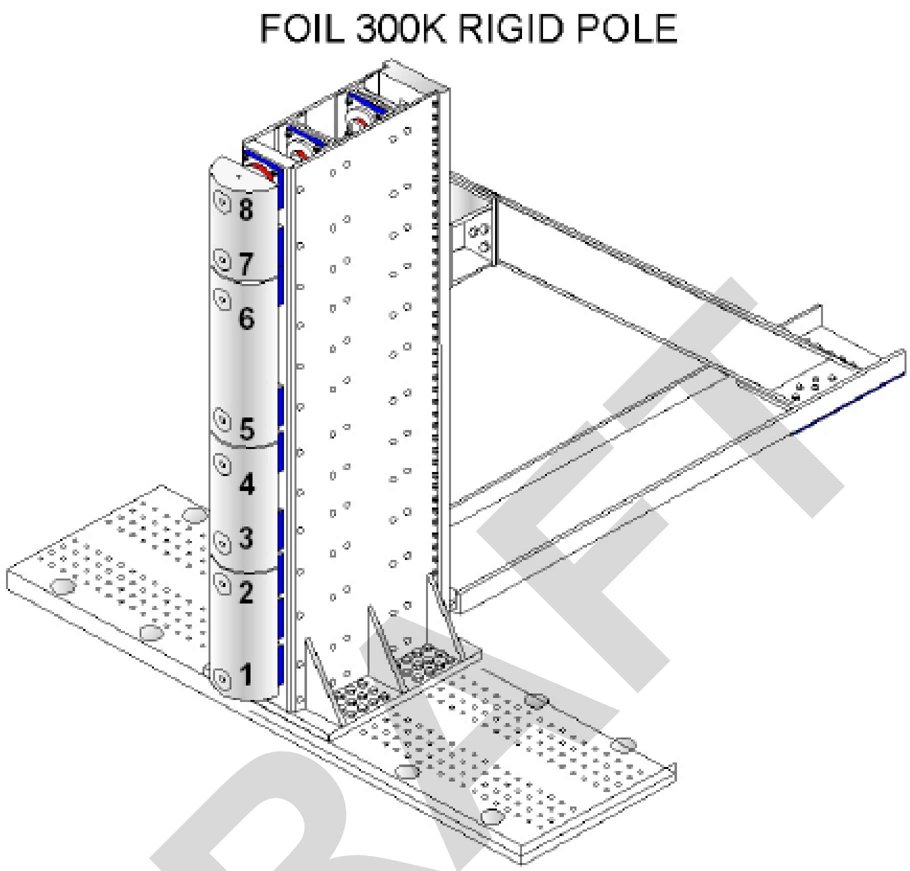
Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
15	Left Front Door Mid Centerline	2892	-786	-154				
	Lateral (g)				99.78	7.25	-35.77	13.90
16	Left Front Door Mid Rear	2864	-796	-324				
	Lateral (g)				174.36	18.00	-40.68	22.80
17	Left Front Door Upper Centerline	2544	-789	-210				
	Lateral (g)				122.29	10.05	-111.43	17.70
18	Left Rear Door Mid Rear	1851	-799	-388				
	Lateral (g)				37.90	18.05	-16.55	24.05
19	Left Rear Door Upper Centerline	1674	-788	-209				
	Lateral (g)				38.56	19.85	-6.18	58.10
20	Rear Deck (g)	221	0	8				
	Longitudinal (g)				2.29	127.1	-7.04	65.8
	Lateral (g)				18.64	67.7	-1.3	222.7
	Vertical (g)				10.64	48.0	-5.86	61.9
	Resultant (g)				19.85	67.0		

* Data questionable, see data anomalies at beginning of this report.



Origin		Orientation	
X	Test Vehicle Rear Bumper	X	+ Forward
Y	Test Vehicle Centerline	Y	+ Right
Z	Ground Plane	Z	+ Down

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA



Load Cell Locations	
ID	**Height From Ground (mm)**
1	77
2	477
3	632
4	969
5	1167
6	1638
7	1808
8	2030

*Measured From Top of Platform

DATA SHEET NO. 6DATA SHEET NO. 8
POST TEST OBSERVATIONS

TEST DUMMY INFORMATION AND CONTACT POINTS	
Dummy Body Part	**Driver World SID 50 M**
Face	To side header AB
Top of Head	To side header AB
Left Side of Head	To side header AB
Back of Head	To side header AB – side header and grab handle
Left Shoulder	To rear upper door panel and torso bag
Upper Torso	To torso AB and side seat bolster
Lower Torso	To torso AB and side seat bolster
Left Hip	To torso AB and lower door and armrest
Left Knee	N/A

POST TEST DOOR PERFORMANCE					
Description	**Struck Side**		**Non-Struck Side**		**Rear Hatch/ Other Door**
	Front	**Rear**	**Front**	**Rear**	
Remained Closed and Operational	N	Y	Y	Y	Y
Total Separation from Vehicle at Hinges or Latches	N	N	N	N	N
Latch or Hinge Systems Pulled Out of Their Anchorages	N	N	N	N	N
Disengaged from Latched Position	N	N	N	N	N
Latch Separated from Striker	N	N	N	N	N
Jammed Shut	Y	N	N	N	N
If Door Opened at Striker, Record Width of Opening at Striker (mm)	n/a	n/a	n/a	n/a	n/a

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	Yes	No	No	No
Seat Back Collapse	Yes	No	No	No

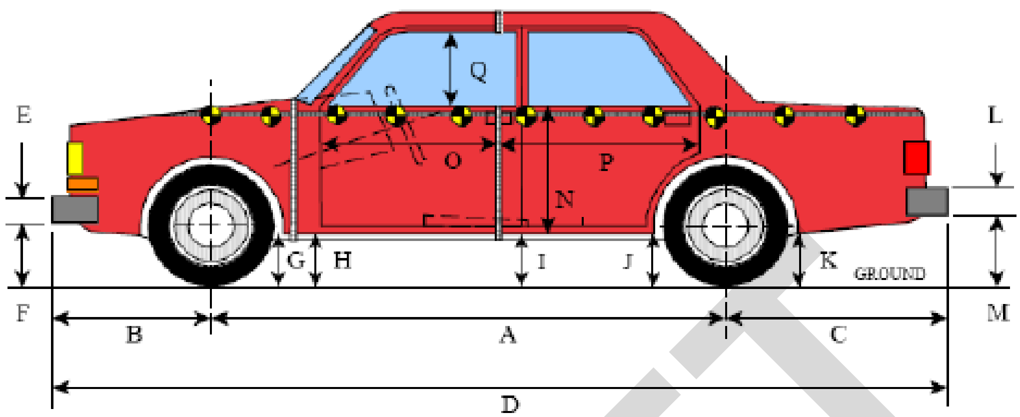
DATA SHEET NO. 8
POST TEST OBSERVATIONS (CONTINUED)

POST TEST STRUCTURAL OBSERVATIONS	
Critical Areas of Performance	**Observations/Conclusions**
Pillar Performance	None Noted
Sill Separation	None Noted
Windshield Damage	At A-pillar and across front
Window Damage	Driver side glass
Other Notable Effects	None noted

SUPPLEMENTAL RESTRAINT INFORMATION				
Restraint Type	**Struck Side Driver**		**Struck Side Rear Passenger**	
	Mounted	**Deployed**	**Mounted**	**Deployed**
Frontal Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso Airbag	Yes	Yes	No	No
Seat Belt Pretensioner	Yes	Yes	No	n/a
Seat Belt Load Limiter	Yes	n/a	No	n/a
Other	No	n/a	No	n/a

IMPACT SPEED / LOCATION			
Measured Parameter	**Units**	**Tolerance**	**Value**
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1311
Actual Impact Point (Aft of Front Axle)	mm		1302
Horizontal Offset (+ forward / - rear)	mm	+/- 38 of Intended Impact Point	9
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	degrees	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	0
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	31.90

DATA SHEET NO. 9
VEHICLE PROFILE MEASURMENTS



VEHICLE PRE- AND POST- TEST MEASUREMENT INFORMATION (± 3MM)				
Code	**Description**	**Pre Test**	**Post Test**	**Difference**
		mm	**mm**	**mm**
A	Wheelbase	2830	2770	60
B	Front Axle to FSOV	945	988	-43
C	Rear Axle to RSOV	1110	1110	0
D	Total Length at Centerline	4885	4868	17
E	Front Bumper Thickness	306	306	0
F	Front Bumper Bottom to Ground	226	237	-11
G	Sill Height at Front Wheel Well	214	216	-2
H	Sill Height at Front Door Leading Edge	216	217	-1
I	Sill Height at B-Pillar	250	217	33
J1	Sill Height at Rear Wheel Well	189	153	36
J2	Pinch Weld Height at Rear Wheel Well	210	218	-8
K	Sill Height Aft of Rear Wheel Well	271	257	14
L	Rear Bumper Thickness	167	167	0
M	Rear Bumper Bottom to Ground	427	340	87
N	Sill Height to Window Bottom Sill	710	710	0
O	Front Door Leading Edge to Impact C/L	1180	956	224
P	Rear Door Trailing Edge to Impact C/L	835	835	0
Q	Front Window Opening	420	380	40
R	Right Side Length	4885	4868	17
S	Left Side Length	4885	4868	17
T	Vehicle Width at B-Pillar	1842	1712	130

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS (CONTINUED)

Note: All dimensions are in millimeters with a tolerance of ±3 mm

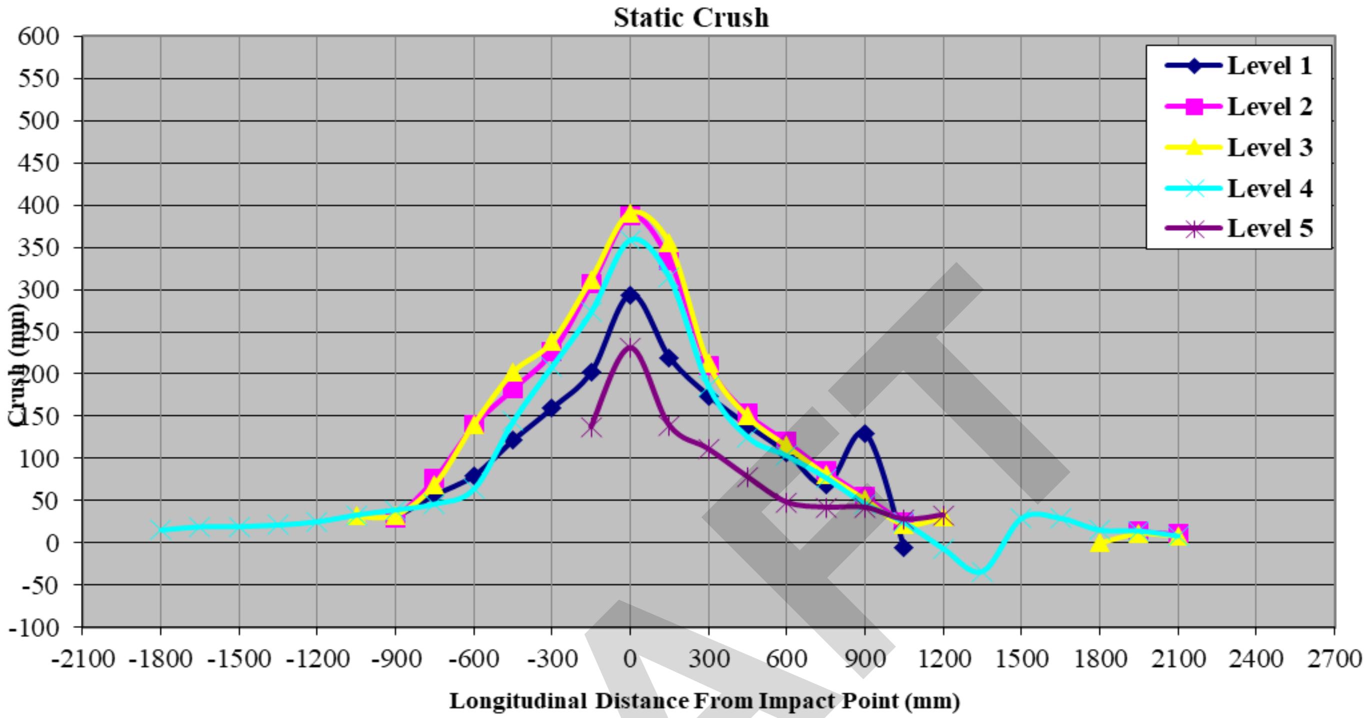
TEST VEHICLE STATIC CRUSH

Level	1			2			3			4			5		
	173			487			586			936			1359		
DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush
-1800										455	470	15			
-1650										428	447	19			
-1500										405	424	19			
-1350										388	409	21			
-1200										374	399	25			
-1050							230	262	32	360	393	33			
-900	277	308	31	238	267	29	232	265	33	350	389	39			
-750	296	353	57	243	320	77	235	304	69	341	387	46			
-600	323	403	80	245	385	140	237	377	140	330	394	64			
-450	322	444	122	245	428	183	237	439	202	320	464	144			
-300	320	480	160	245	472	227	238	476	238	315	524	209			
-150	318	521	203	246	553	307	238	550	312	309	583	274	580	717	137
0	310	604	294	248	635	387	239	630	391	299	658	359	505	736	231
150	310	529	219	248	582	334	240	595	355	290	604	314	545	684	139
300	299	473	174	250	460	210	241	454	213	287	472	185	540	651	111
450	293	432	139	253	406	153	243	393	150	285	410	125	539	617	78
600	277	384	107	253	373	120	245	360	115	278	381	103	536	584	48
750	272	341	69	250	335	85	245	326	81	274	351	77	538	580	42
900	266	396	130	245	300	55	240	292	52	275	321	46	542	584	42
1050	260	254	-6	237	261	24	234	256	22	278	302	24	551	579	28
1200							229	260	31	282	275	-7	558	591	33
1350										288	254	-34			
1500										294	323	29			
1650										299	328	29			
1800										320	335	15			
1950				253	267	14	259	270	11	337	351	14			
2100				273	284	11	282	290	8	356	364	8			
2250															

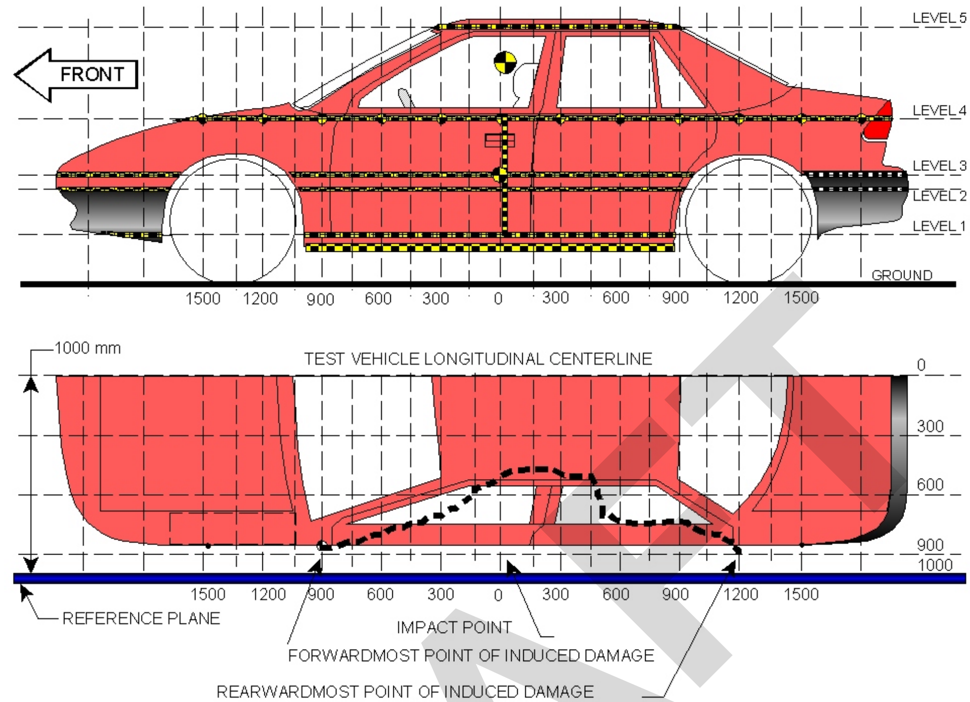
NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head
.

1 The vertical impact reference line was set at (0, 0, 0) with the seat set mid track per the COR

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS
(CONTINUED)



DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

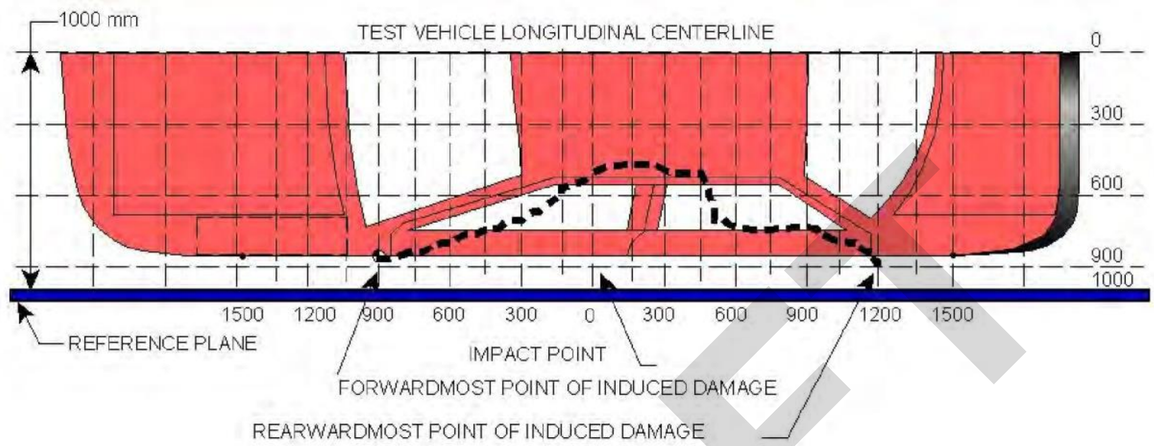


MAXIMUM EXTERIOR CRUSH MEASUREMENTS				
Level	**Measurement Description**	**Height Above Ground (mm)**	**Maximum Exterior Static Crush (mm)**	**Distance from Impact (mm)**
1	Sill Top	173	294	0
2	Occupant Hip Point	487	387	0
3	Mid-Door	586	391	0
4	Window Sill	936	359	0
5	Window Top	1359	231	0

Note: All vehicle measurements taken at the vertical impact reference line.

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

For guidance regarding damage profile distance measurements, please refer to the latest version of that *NHTSA Test Reference Guide, Volume 1: Vehicle Tests*.



VEHICLE DAMAGE PROFILE DISTANCES

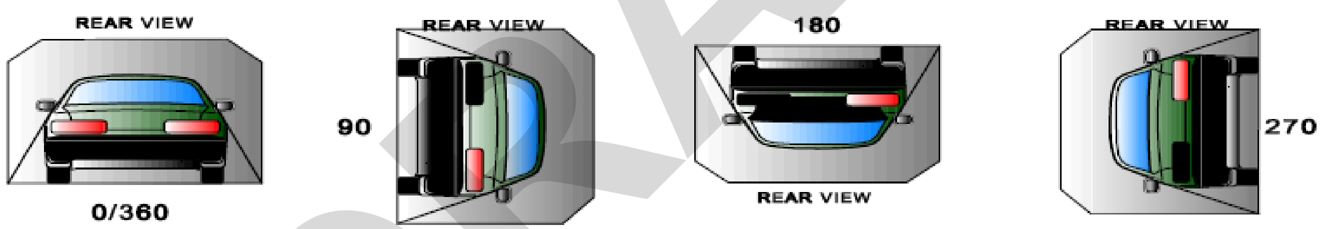
DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-1050	3	260	260	0
2	-600	3	363	250	113
3	-150	3	533	245	288
4	300	3	408	240	168
5	750	3	312	260	52
6	1200	3	235	235	0

DATA SHEET NO. 12
FMVSS 301 STATIC ROLLOVER RESULTS

Temperature at Time of Impact: 18^{o} C   Test Time: 6:00 pm

STODDARD SOLVENT SPILLAGE MEASUREMENTS				
Period	**Description**	**Maximum Allowable Spillage**	**Spillage**	
			Amount	**Location**
A	From Impact Until Vehicle Motion Ceases	1 oz	0	N/a
B	5 Minutes After Vehicle Motion Ceases	5 oz	0	N/a
C	Next 25 Minutes	1 oz/minute	0	N/a
D				

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE			
Test phase	**Rotation Time (sec.)**	**Hold Time (sec.)**	**Total Time (sec.)**
0° to 90°	66	300	366
90° to 180°	65	300	365
180° to 270°	64	300	364
270° to 360°	64	300	364

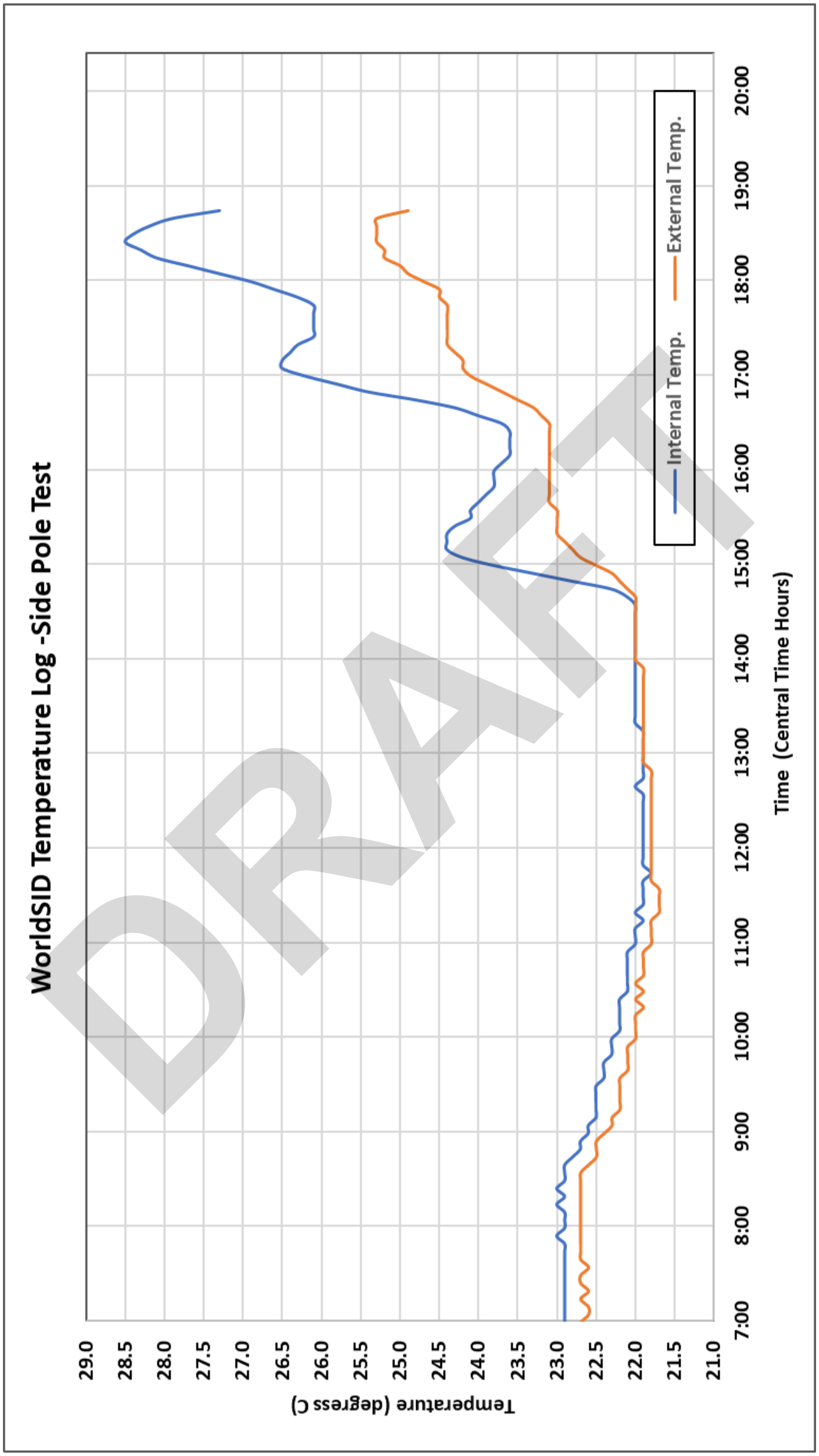
DATA SHEET NO. 12
FMVSS 301 STATIC ROLLOVER RESULTS (CONTINUED)

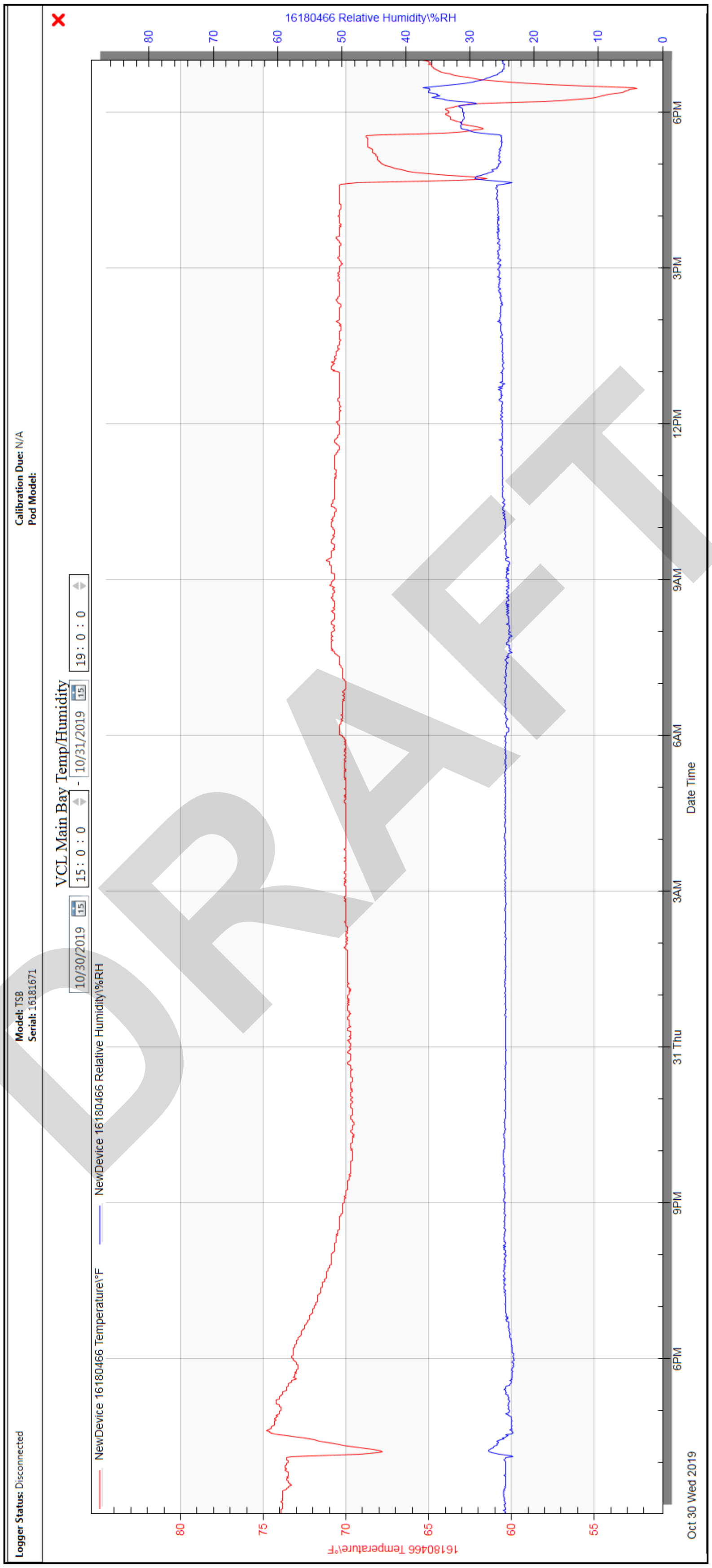
FMVSS No. 301 Rollover Spillage Table				
	First Five Minutes (oz)	**Sixth Minute (oz)**	**Seventh Minute (oz)**	**Eighth Minute (oz)**
0° to 90°	0	0	0	N/a
90° to 180°	0	0	0	N/a
180° to 270°	0	0	0	N/a
270° to 360°	0	0	0	N/a

Spillage Location	
0° to 90°	N/a
90° to 180°	N/a
180° to 270°	N/a
270° to 360°	N/a

DATA SHEET NO. 13
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

	Temperature
	(°C)
Crash Laboratory Temp.	18
WorldSID Internal Temp.	26.9
WorldSID Externa Temp.	24.7


WorldSID Temperature Log -Side Pole Test
Temperature (degress C)
29.0
28.5
28.0
27.5
27.0
26.5
26.0
25.5
25.0
24.5
24.0
23.5
23.0
22.5
22.0
21.5
21.0
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
Time (Central Time Hours)
Internal Temp.
External Temp.
DRAFT


Logger Status: Disconnected
Model: TS8
Serial: 16181671
Calibration Due: N/A
Pod Model:
VCL Main Bay Temp/Humidity
10/30/2019 15 : 0 : 0 - 10/31/2019 19 : 0 : 0
NewDevice 16180466 Temperature\°F
NewDevice 16180466 Relative Humidity\%RH
16180466 Relative Humidity\%RH
16180466 Temperature\°F
Date Time
Oct 30 Wed 2019
6PM
9PM
31 Thu
3AM
6AM
9AM
12PM
3PM
6PM
DRAFT

APPENDIX A
PHOTOGRAPHS

Figure A-1 As Delivered Right Front 3/4 View of Test Vehicle

Figure A-2 As Delivered Left Rear 3/4 View of Test Vehicle

Figure A-3 Pre-Test Frontal View of Test Vehicle

Figure A-4 Post-Test Frontal View of Test Vehicle

Figure A-5 Pre-Test Left Front 3/4 View of Test Vehicle

Figure A-6 Post-Test Left Front 3/4 View of Test Vehicle

Figure A-7 Pre-Test Left Side View of Test Vehicle

Figure A-8 Post-Test Left Side View of Test Vehicle

Figure A-9 Pre-Test Left Rear 3/4 View of Test Vehicle

Figure A-10 Post-Test Left Rear 3/4 View of Test Vehicle

Figure A-11 Pre-Test Rear View of Test Vehicle
View

Figure A-12 Post-Test Rear View of Test Vehicle

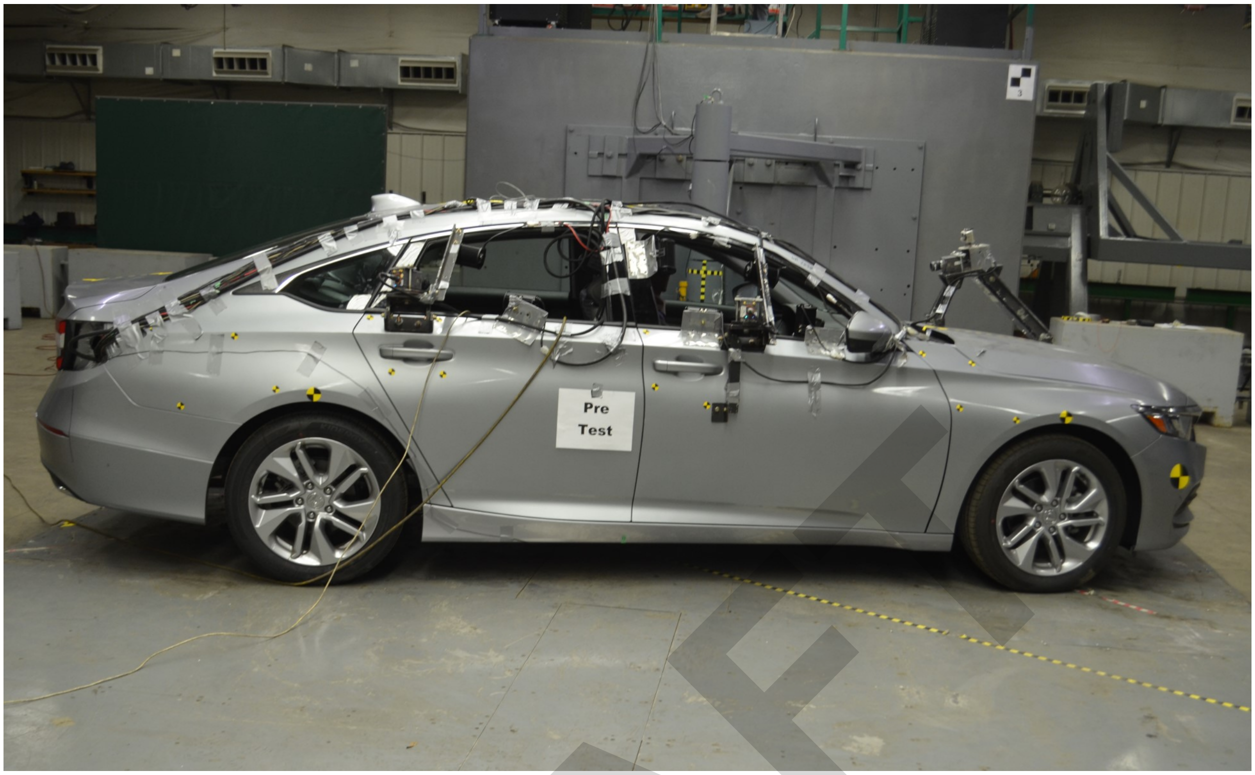


Figure A-13 Pre-Test Right Side View of Test Vehicle

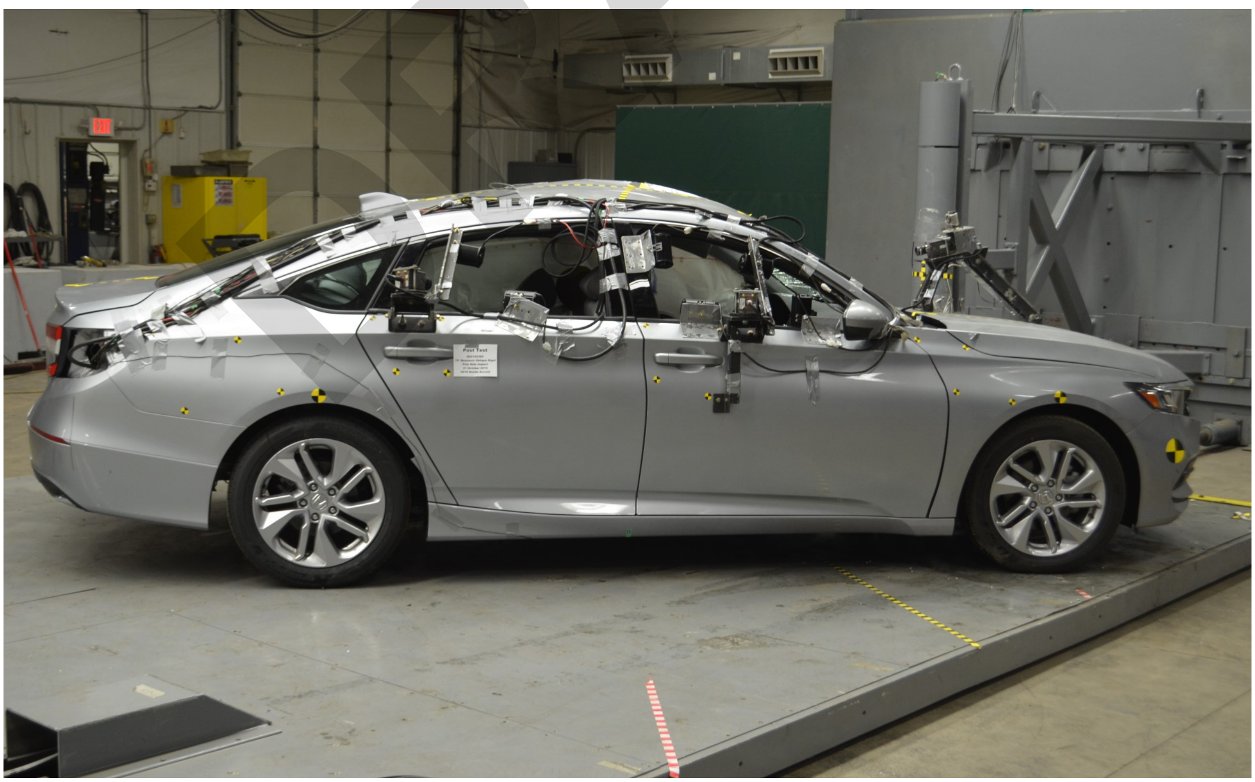


Figure A-14 Post-Test Right Side View of Test Vehicle

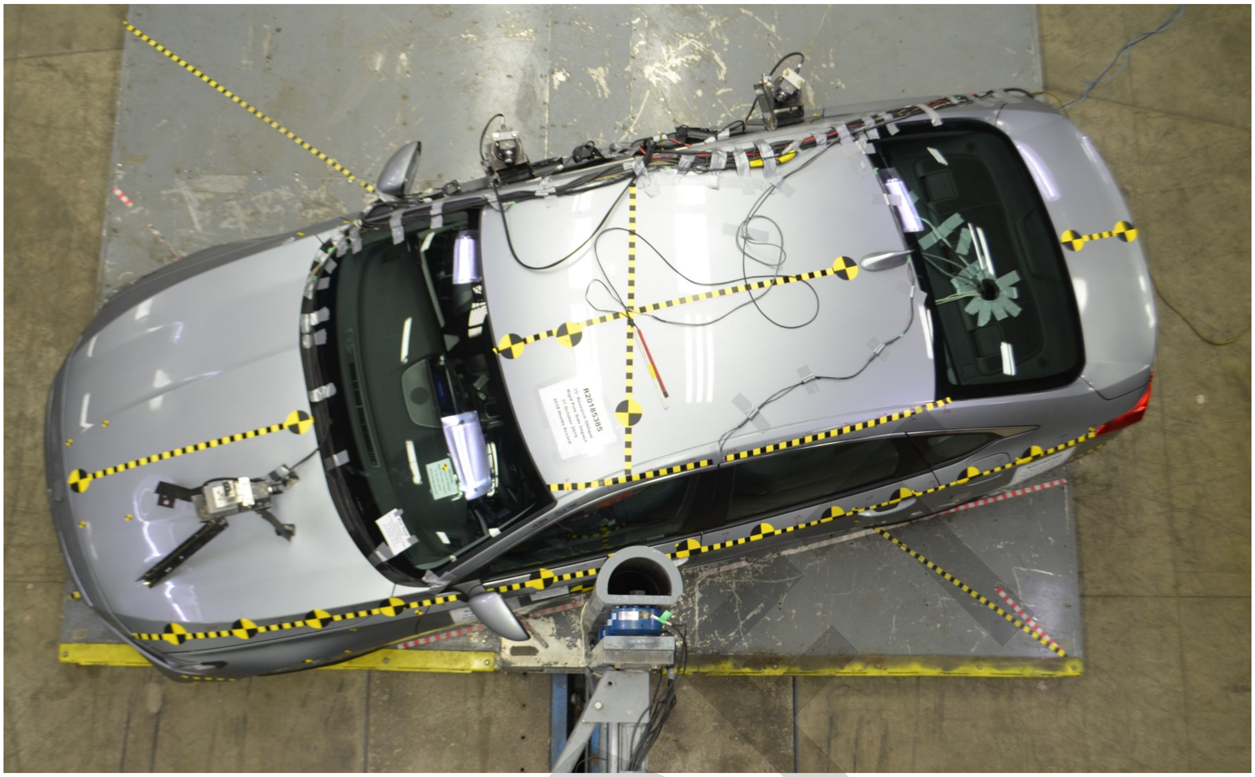


Figure A-15 Pre-Test Overhead View of Test Area

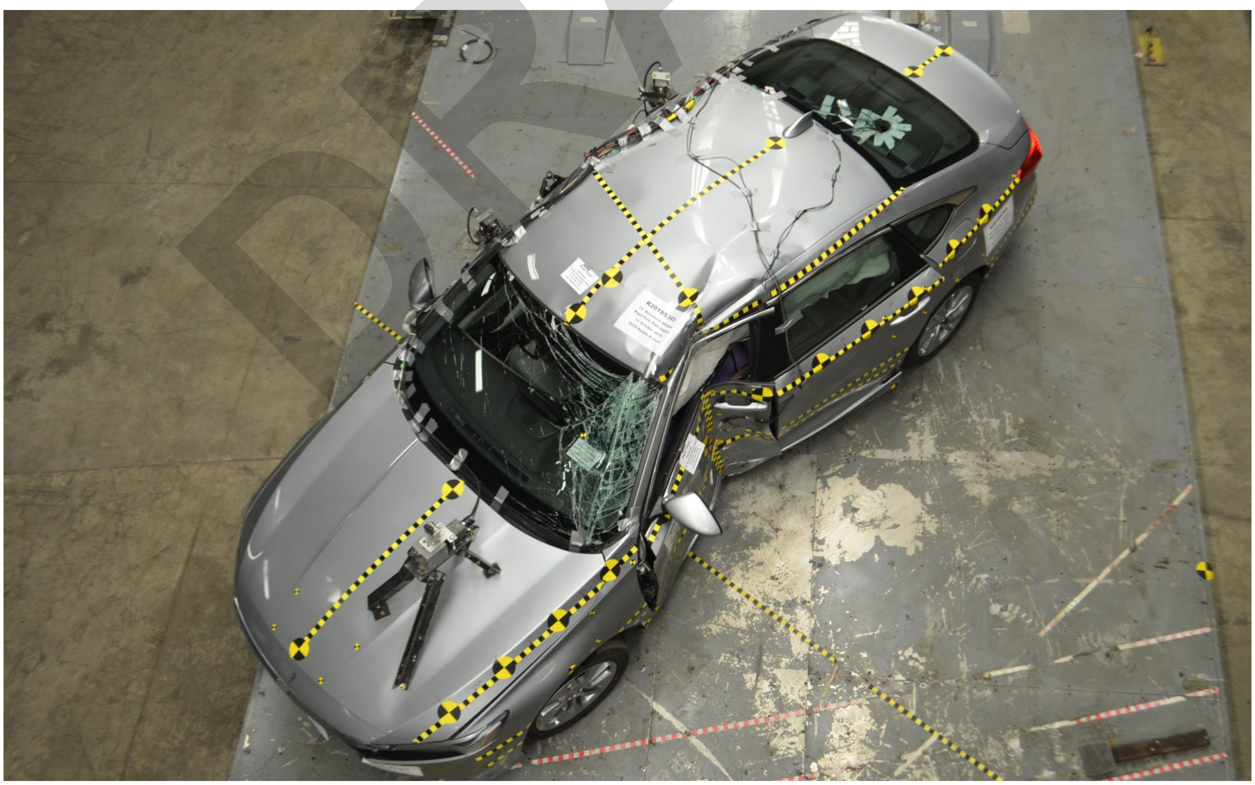


Figure A-16 Post-Test Overhead View of Test Area

Figure A-17 Pre-Test Left Side View of Pole Positioned Against Side of Vehicle

Figure A-18 Pre-Test Right Side View of Pole Positioned Against Side of Vehicle

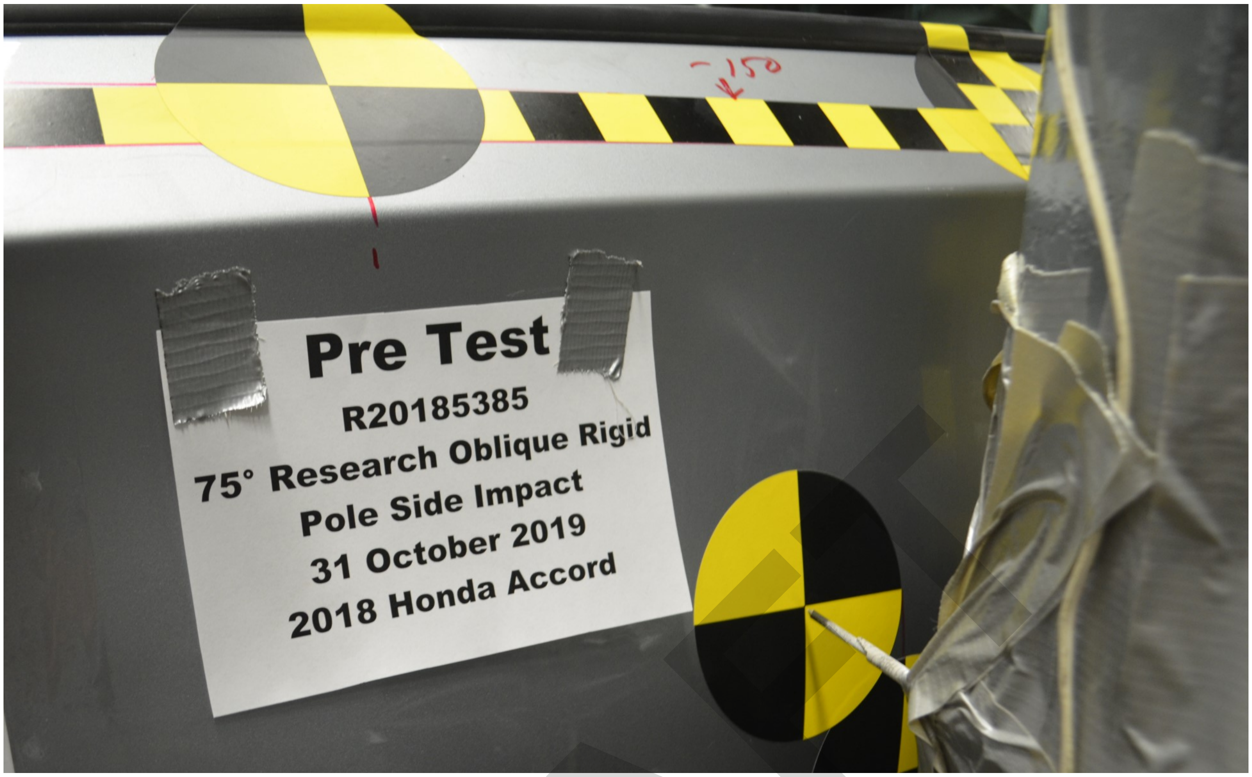


Figure A-19 Pre-Test Close-Up View of Impact Point Target

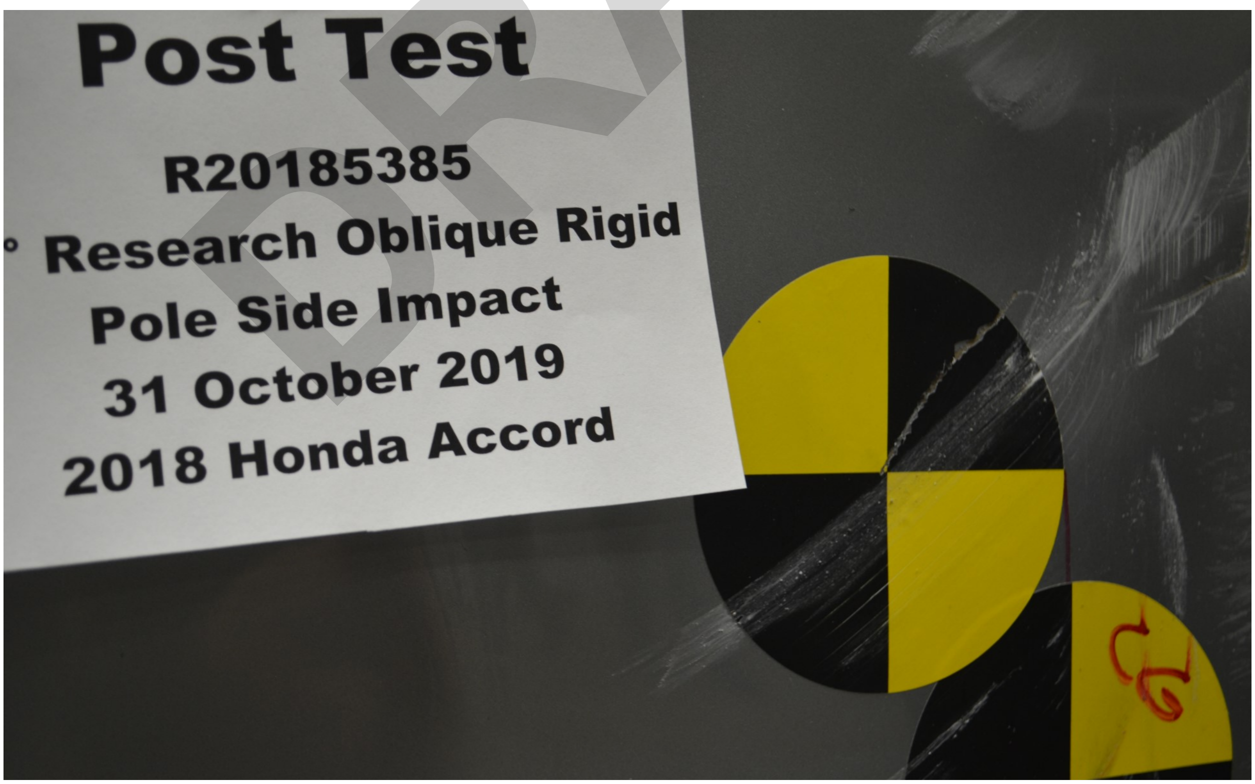


Figure A-20 Post-Test Close-Up View of Impact Point Target Showing Impact Location

Figure A-21 Pre-Test Front Close-Up View of Dummy Head and Chest

Figure A-22 Post-Test Front Close-Up View of Dummy

Figure A-23 Pre-Test Left Side View of Dummy Showing Belt and Chalking

Figure A-24 Pre-Test Left Side View of Dummy Shoulder and Door Top View

Figure A-25 Post-Test Left Side View of Dummy Shoulder and Door Top View
View

Figure A-26 Pre-Test Front View of Seat Back Prior to Dummy Positioning


Figure A-27 Pre-Test Front Close-Up View of Dummy Head & Shoulders in Relation to Head Restraint

Figure A-28 Pre-Test Front View of Seat Pan Prior to Dummy Positioning

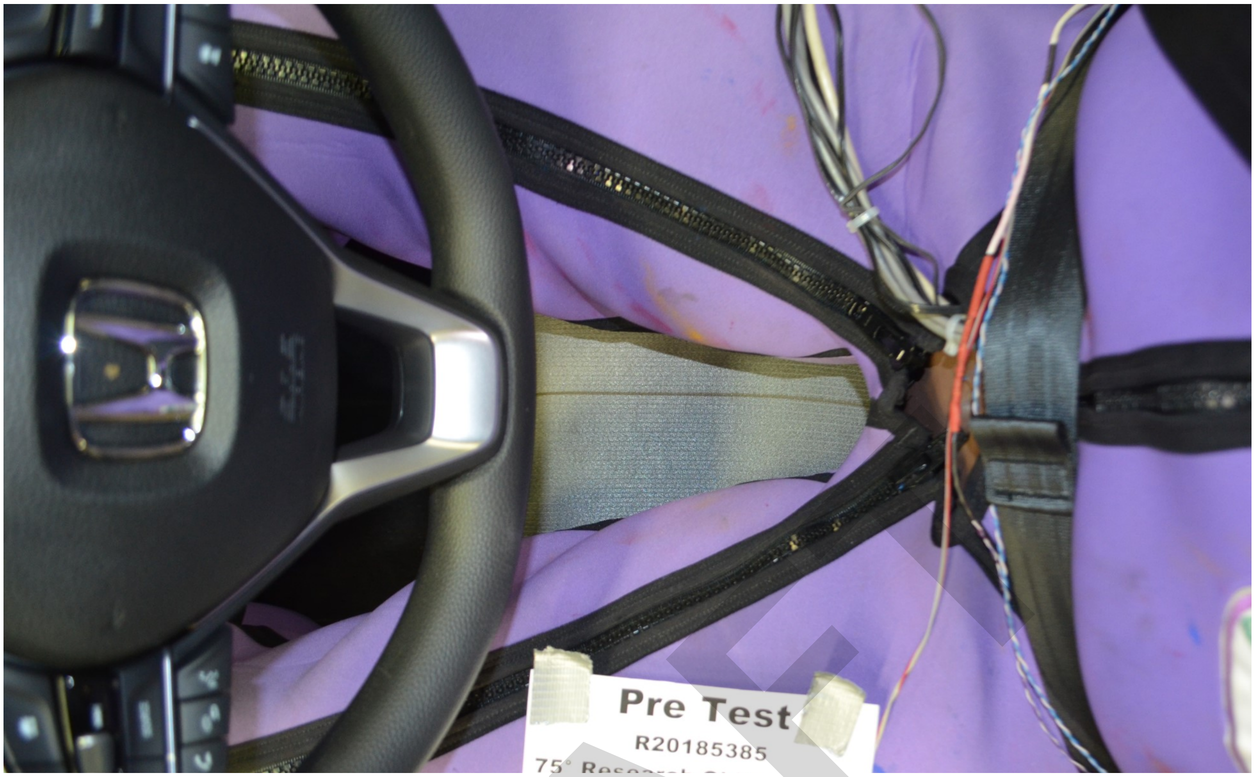


Figure A-29 Pre-Test Overhead View of Dummy Thighs on Seat Pan

Photograph Not Available

Figure A-30 Pre-Test Left Side View of Dummy Neck Showing Position of Adjustable Neck Bracket

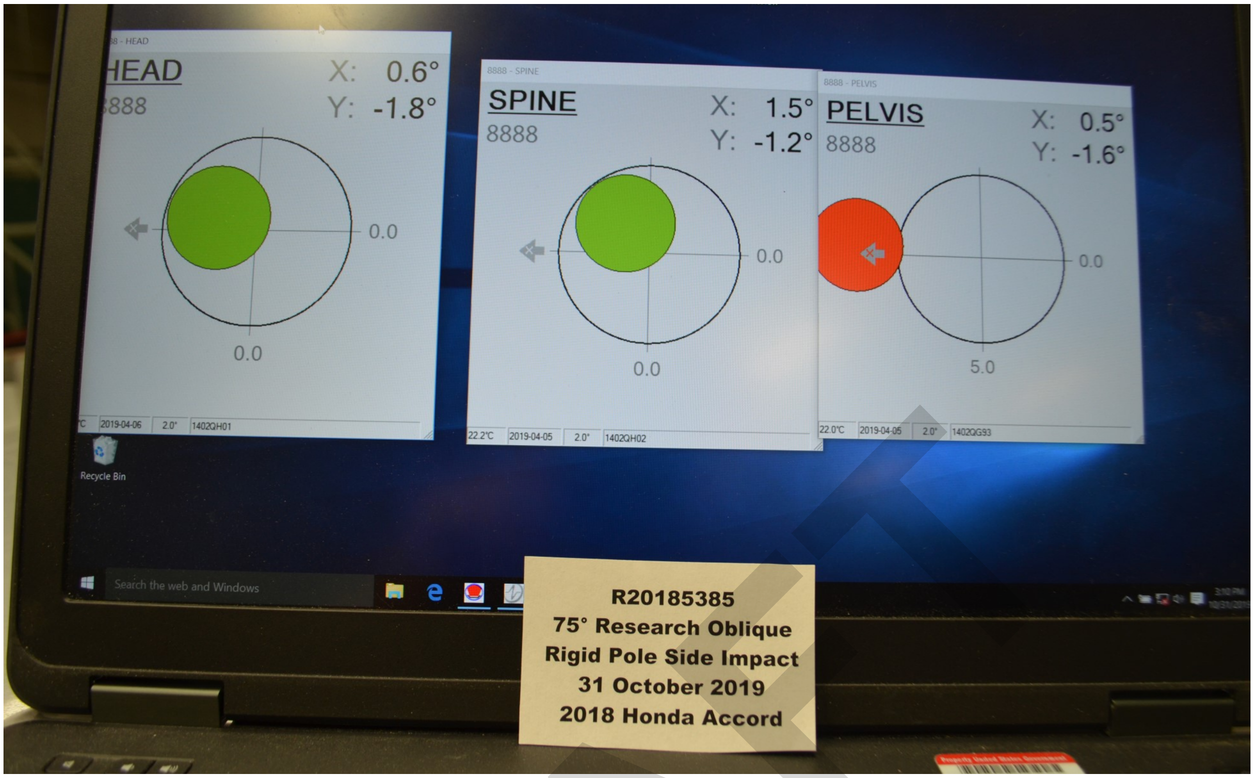


Figure A-31 Pre-Test Tilt Sensor View

Figure A-32 Pre-Test Placement of Dummy Feet

Figure A-33 Pre-Test View of Belt Anchorage for Dummy

Figure A-34 Pre-Test Left Side View of Steering Wheel

Figure A-35 Pre-Test View of Disengaged Parking Brake

Figure A-36 Pre-Test View of Parking Brake

Figure A-37 Pre-Test Close-Up Left Side View of Driver Seat Track

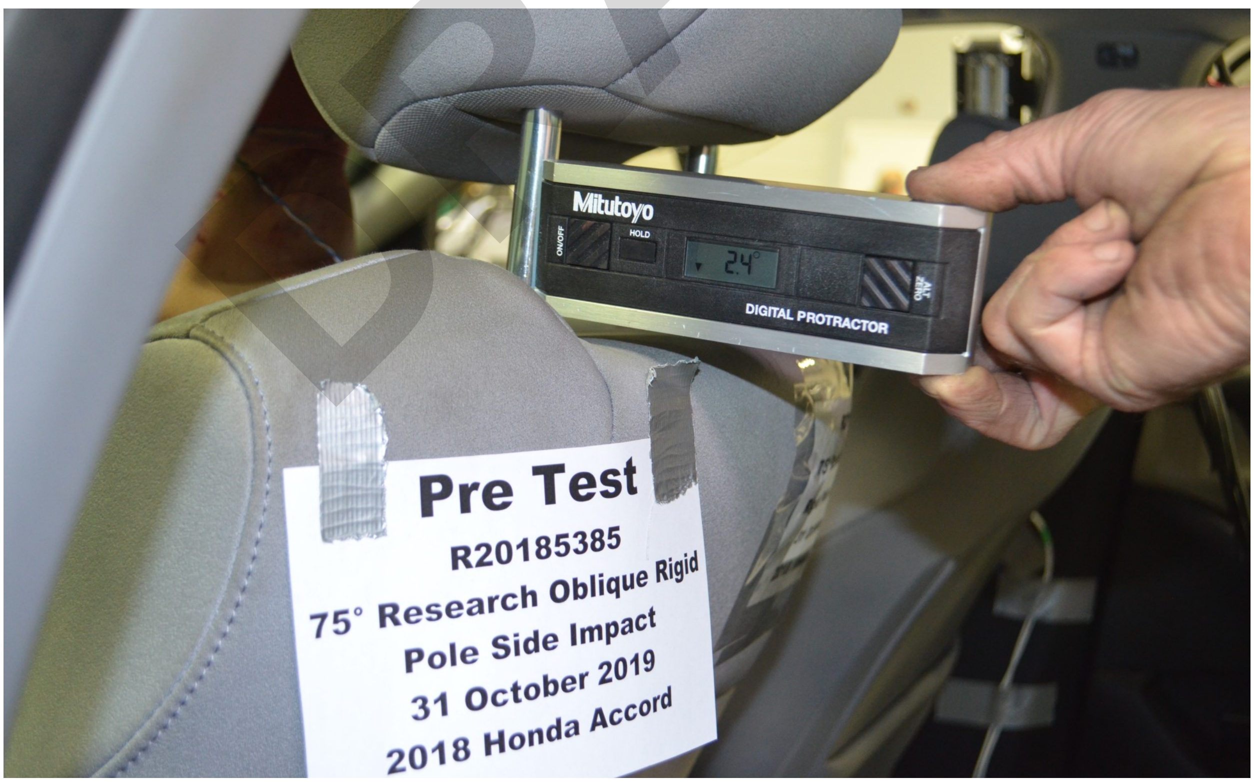


Figure A-38 Pre-Test Close-Up of Driver Head Restraint

Figure A-39 Pre-Test Dummy and Door Clearance View

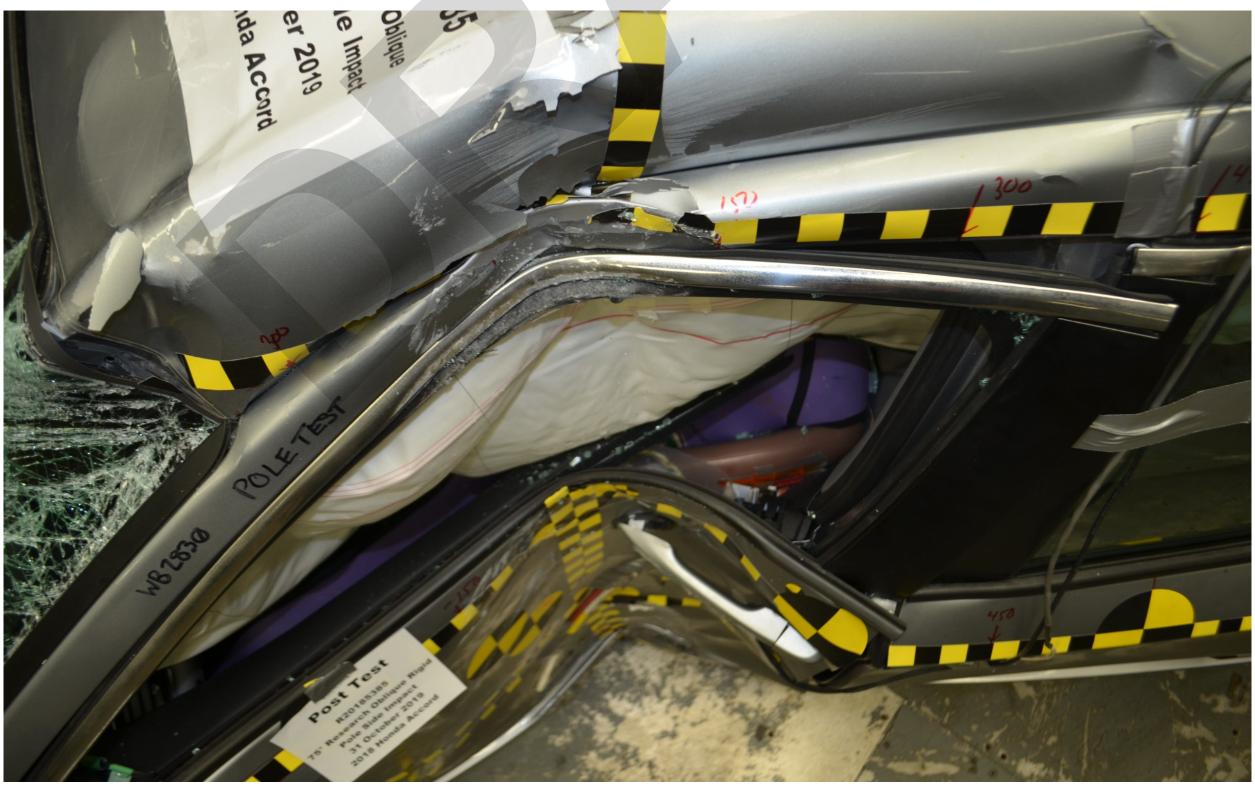


Figure A-40 Post-Test Dummy and Door Clearance View

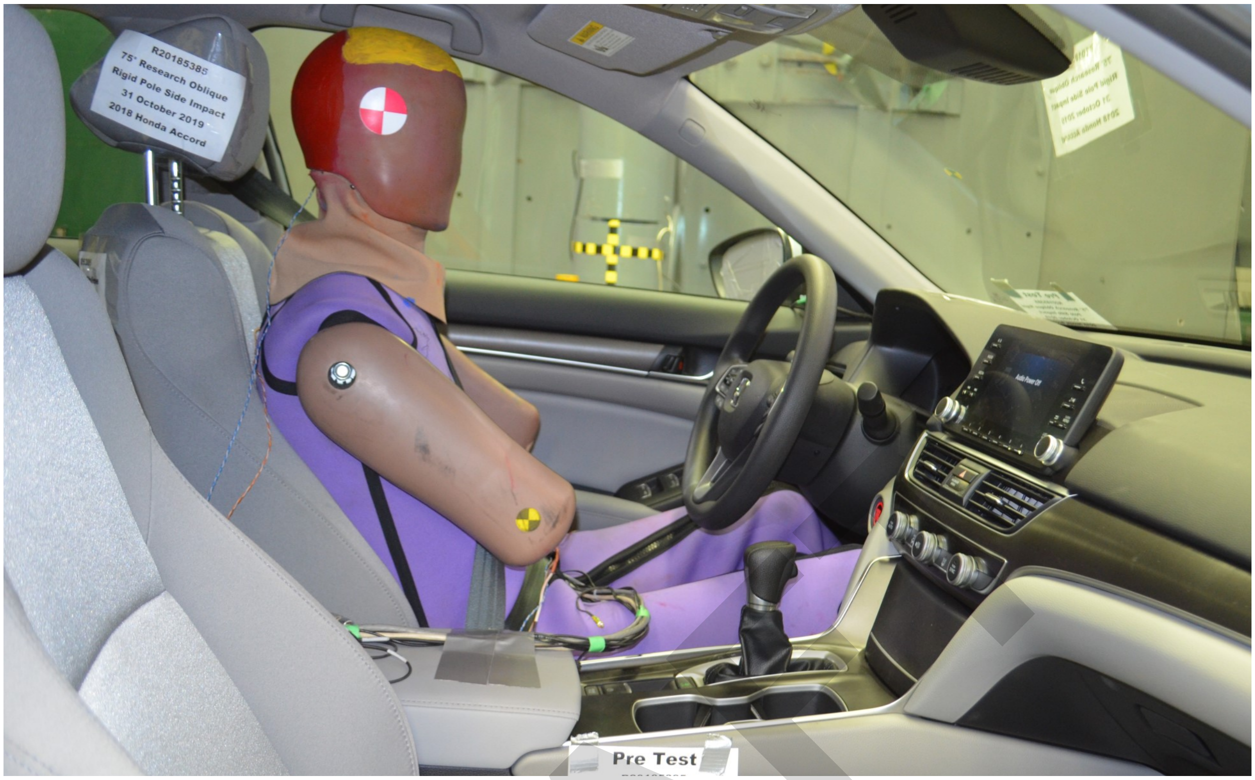


Figure A-41 Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment

Figure A-42 Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment

Figure A-43 Pre-Test Inner Door Panel View

Figure A-44 Post-Test Inner Door Panel View

Photograph Not Available

Figure A-45 Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

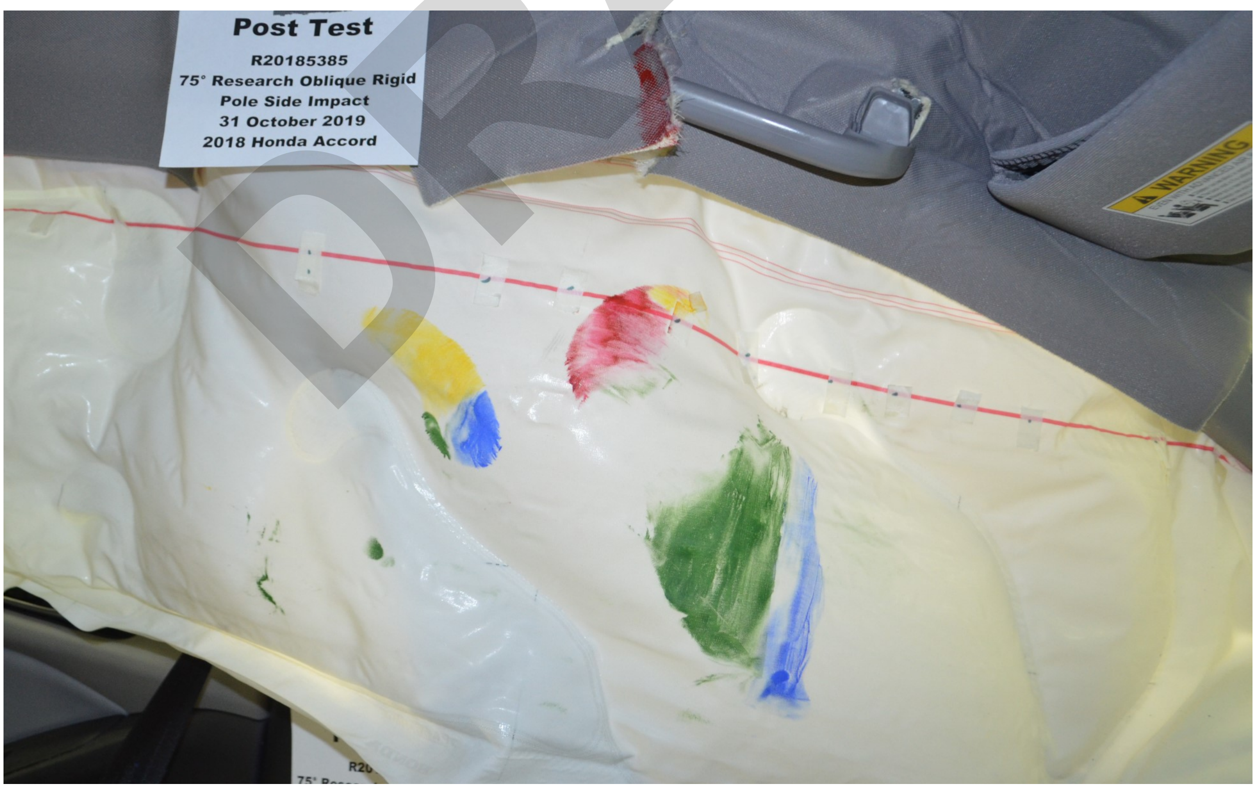


Figure A-46 Post-Test Dummy Close-Up Head Contact with Side Airbag View

Figure A-47 Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View

Figure A-48 Post-Test Dummy Close-Up Torso Contact with Side Airbag View

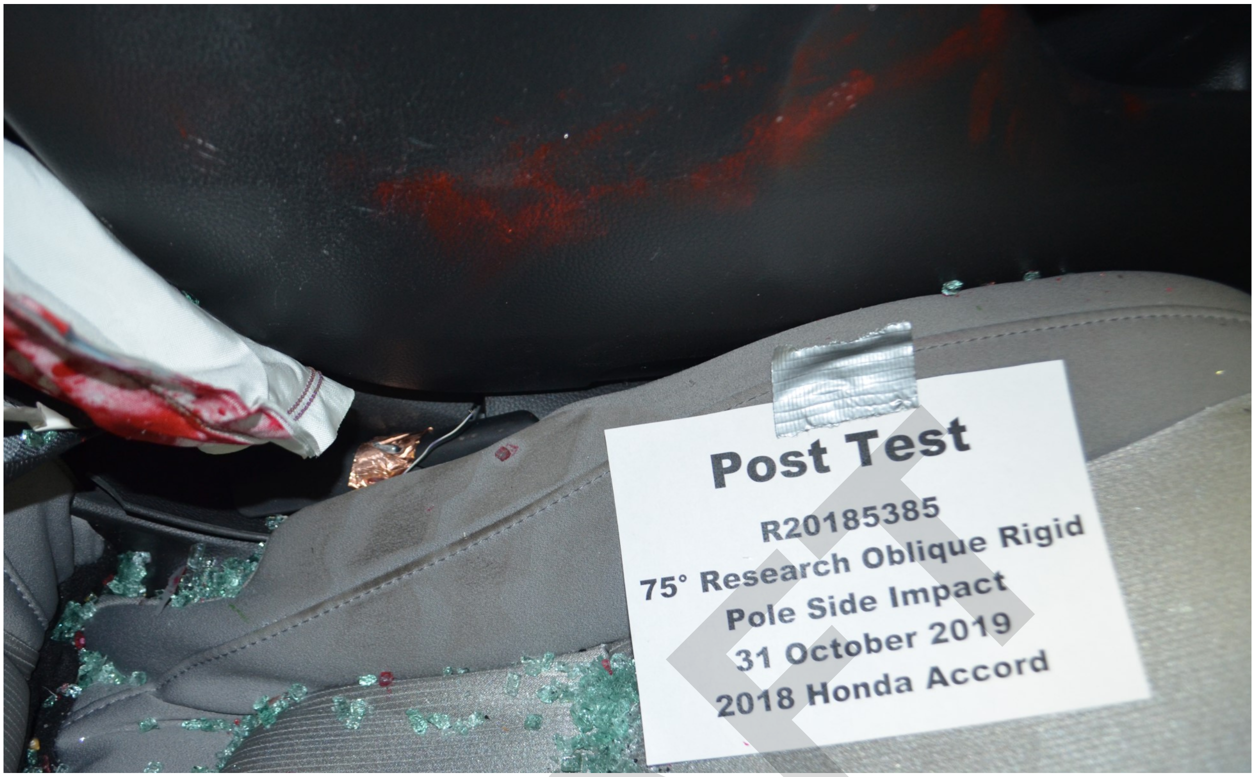


Figure A-49 Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View

Figure A-50 Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View

Figure A-51 Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View

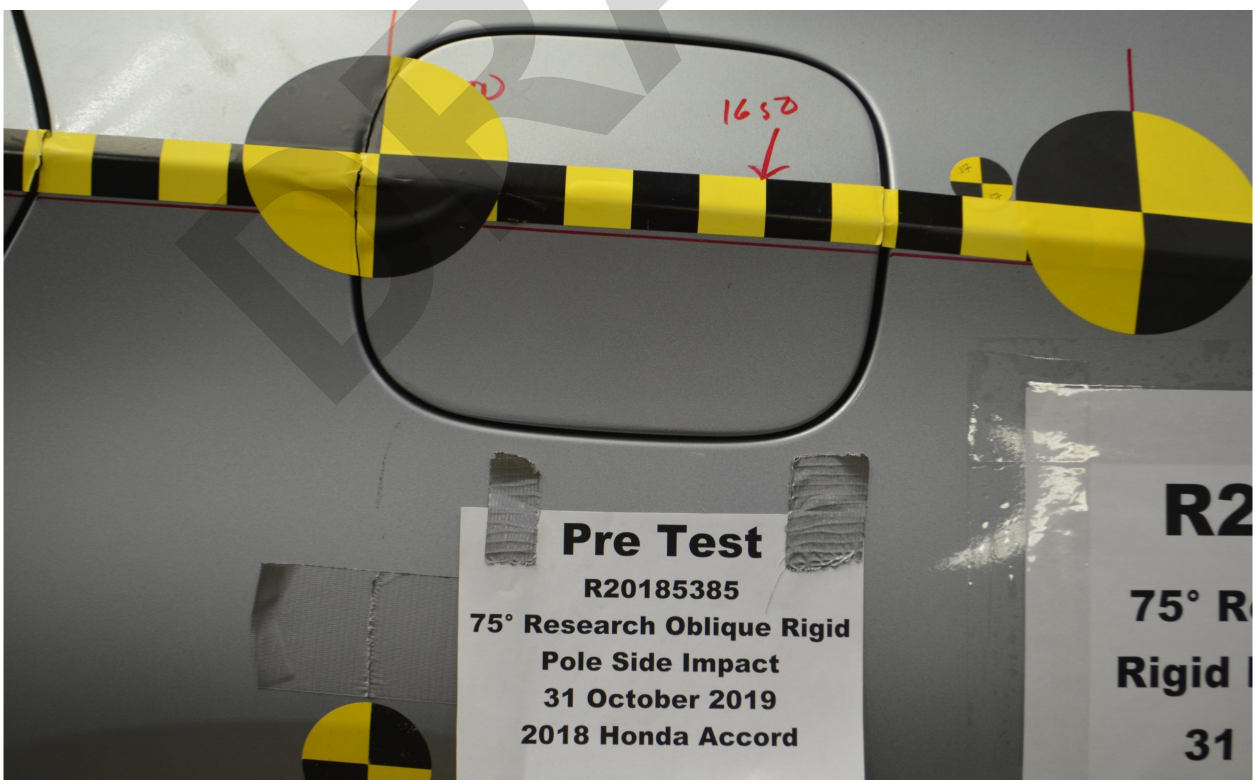


Figure A-52 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

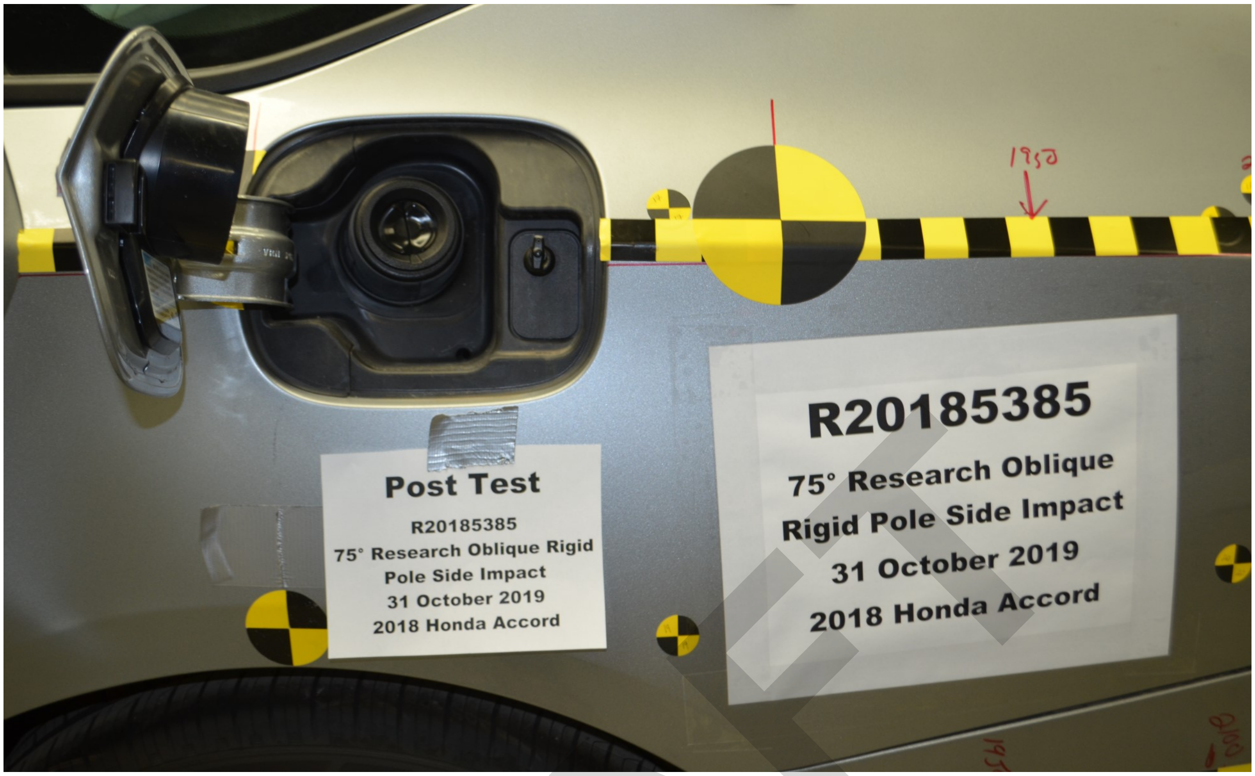


Figure A-53 Post-Test View of Fuel Filler Cap or Fuel Filler Neck

Figure A-54 Close-Up View of Vehicle Certification Label

Figure A-55 Close-Up View of Vehicle Tire Information Placard or Label

Photograph Not Applicable

Figure A-56 Close-Up View of Load Capacity Label

Figure A-57 Pre-Test Pole Barrier Front View

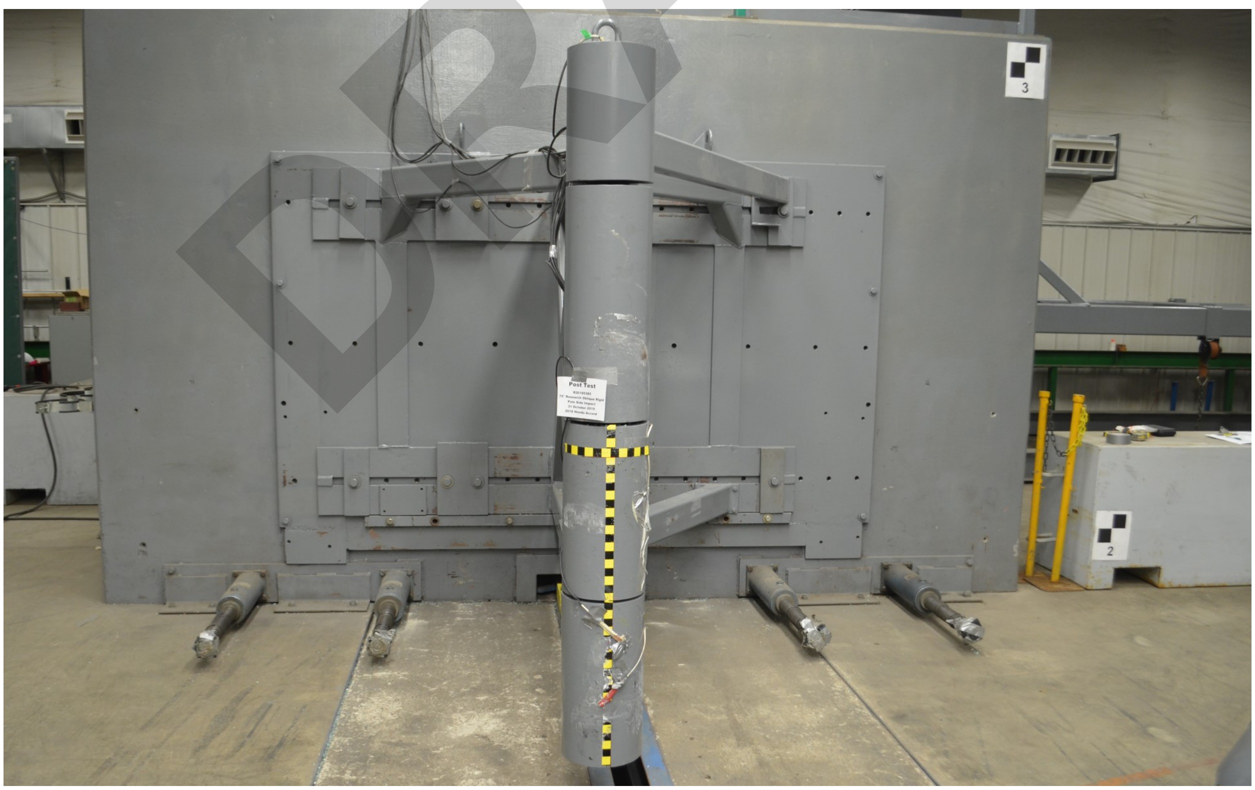


Figure A-58 Post-Test Pole Barrier Front View

Figure A-59 Pre-Test Pole Barrier Side View

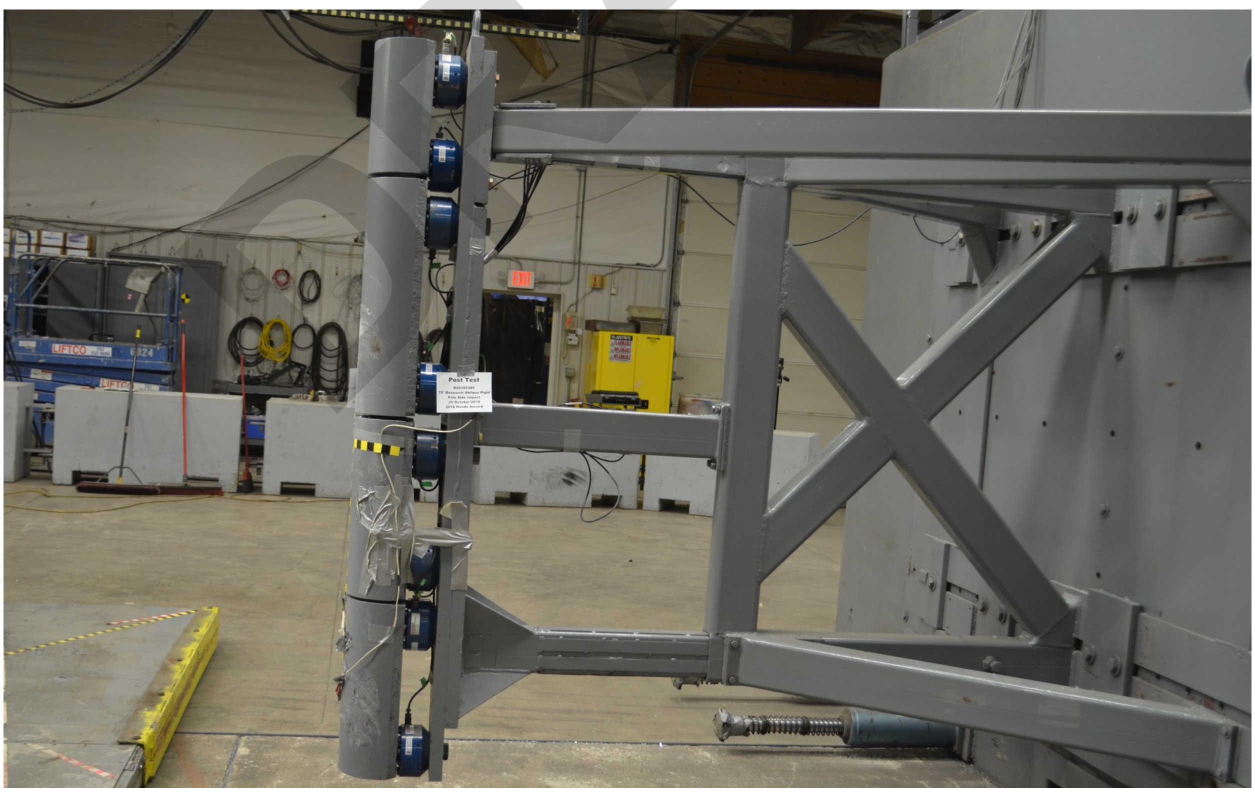


Figure A-60 Post-Test Pole Barrier Side View

Photograph Not Applicable

Figure A-61 Pre-Test Ballast View

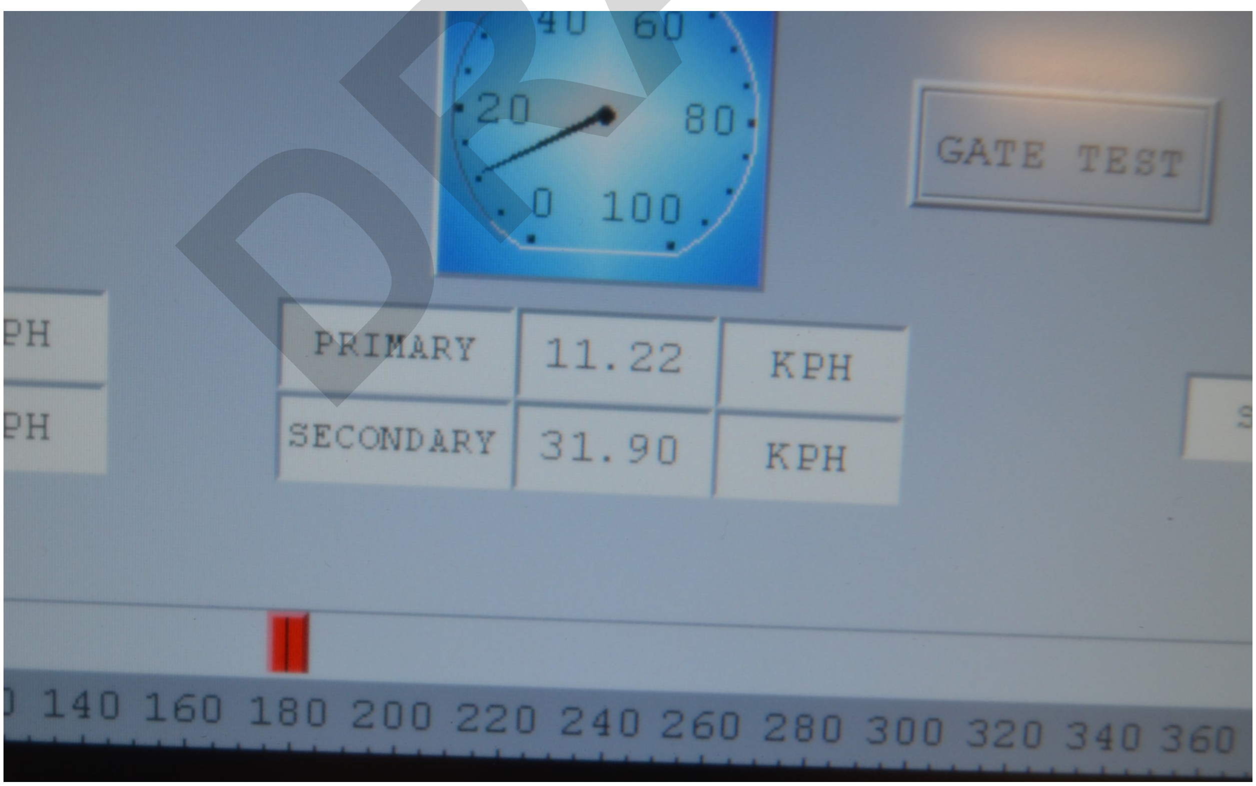
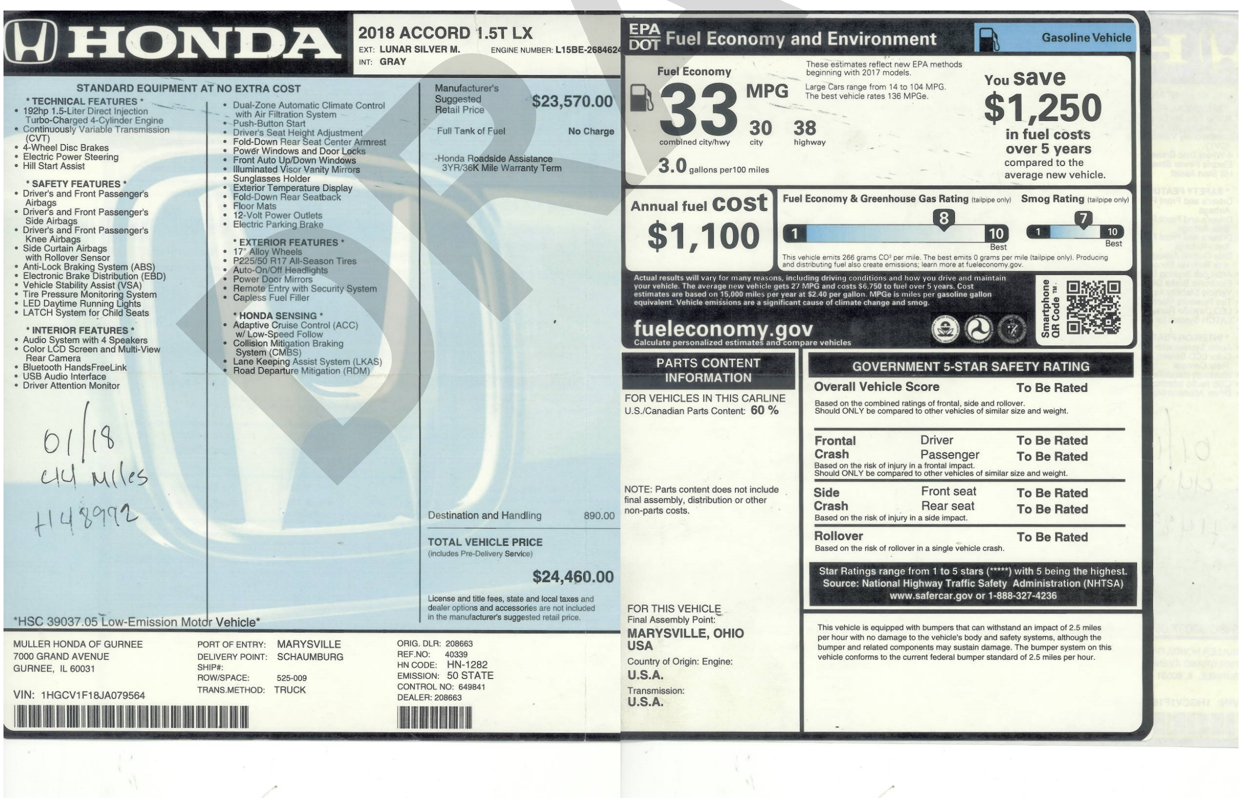


Figure A-62 Post-Test Primary and Redundant Speed Trap Read Out

Figure A-63 Impact Event



HONDA

2018 ACCORD 1.5T LX
EXT: LUNAR SILVER M.
INT: GRAY
ENGINE NUMBER: L15BE-2684624

STANDARD EQUIPMENT AT NO EXTRA COST

* TECHNICAL FEATURES *
- 192hp 1.5-Liter Direct Injection Turbo-Charged 4-Cylinder Engine
- Continuously Variable Transmission (CVT)
- 4-Wheel Disc Brakes
- Electric Power Steering
- Hill Start Assist

* SAFETY FEATURES *
- Driver's and Front Passenger's Airbags
- Driver's and Front Passenger's Side Airbags
- Driver's and Front Passenger's Knee Airbags
- Side Curtain Airbags with Rollover Sensor
- Anti-Lock Braking System (ABS)
- Electronic Brake Distribution (EBD)
- Vehicle Stability Assist (VSA)
- Tire Pressure Monitoring System
- LED Daytime Running Lights
- LATCH System for Child Seats

* INTERIOR FEATURES *
- Audio System with 4 Speakers
- Color LCD Screen and Multi-View Rear Camera
- Bluetooth HandsFreeLink
- USB Audio Interface
- Driver Attention Monitor

- Dual-Zone Automatic Climate Control with Air Filtration System
- Push-Button Start
- Driver's Seat Height Adjustment
- Fold-Down Rear Seat Center Armrest
- Power Windows and Door Locks
- Front Auto Up/Down Windows
- Illuminated Visor Vanity Mirrors
- Sunglasses Holder
- Exterior Temperature Display
- Fold-Down Rear Seatback
- Floor Mats
- 12-Volt Power Outlets
- Electric Parking Brake

* EXTERIOR FEATURES *
- 17" Alloy Wheels
- P225/50 R17 All-Season Tires
- Auto-On/Off Headlights
- Power Door Mirrors
- Remote Entry with Security System
- Capless Fuel Filler

* HONDA SENSING *
- Adaptive Cruise Control (ACC) w/ Low-Speed Follow
- Collision Mitigation Braking System (CMBS)
- Lane Keeping Assist System (LKAS)
- Road Departure Mitigation (RDM)

01/18
44 miles
#148992

Manufacturer's Suggested Retail Price	$23,570.00
Full Tank of Fuel	No Charge
-Honda Roadside Assistance 3YR/36K Mile Warranty Term	
Destination and Handling	890.00
TOTAL VEHICLE PRICE (includes Pre-Delivery Service)	$24,460.00

License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

HSC 39037.05 Low-Emission Motor Vehicle

MULLER HONDA OF GURNEE
7000 GRAND AVENUE
GURNEE, IL 60031

VIN: 1HGCV1F18JA079564

PORT OF ENTRY: MARYSVILLE
DELIVERY POINT: SCHAUMBURG
SHIP#:
ROW/SPACE: 525-009
TRANS.METHOD: TRUCK

ORIG. DLR: 208663
REF.NO: 40339
HN CODE: HN-1282
EMISSION: 50 STATE
CONTROL NO: 649841
DEALER: 208663

EPA DOT Fuel Economy and Environment
Gasoline Vehicle

Fuel Economy
33 MPG combined city/hwy
30 city
38 highway
3.0 gallons per100 miles

These estimates reflect new EPA methods beginning with 2017 models.
Large Cars range from 14 to 104 MPG. The best vehicle rates 136 MPGe.

You save $1,250 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $1,100

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 8 (1–10 Best)
Smog Rating (tailpipe only): 7 (1–10 Best)

This vehicle emits 266 grams CO^2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $6,750 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.40 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code ™

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: 60 %

NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

FOR THIS VEHICLE
Final Assembly Point:
MARYSVILLE, OHIO USA
Country of Origin: Engine:
U.S.A.
Transmission:
U.S.A.

GOVERNMENT 5-STAR SAFETY RATING

Overall Vehicle Score		To Be Rated
Frontal Crash	Driver	To Be Rated
	Passenger	To Be Rated
Side Crash	Front seat	To Be Rated
	Rear seat	To Be Rated
Rollover		To Be Rated

Overall: Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.
Frontal: Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.
Side: Based on the risk of injury in a side impact.
Rollover: Based on the risk of rollover in a single vehicle crash.

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

This vehicle is equipped with bumpers that can withstand an impact of 2.5 miles per hour with no damage to the vehicle's body and safety systems, although the bumper and related components may sustain damage. The bumper system on this vehicle conforms to the current federal bumper standard of 2.5 miles per hour.

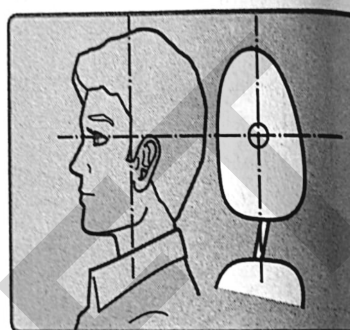
Figure A-64 Monroney Label

VEHICLE CONTROLS

Adjusting the Front and Rear Outer* Head Restraints

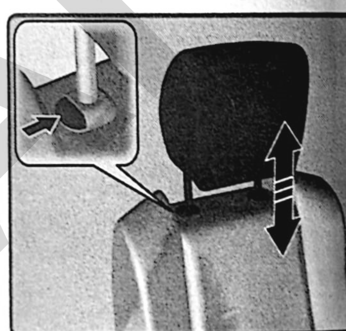
Your vehicle is equipped with head restraints in all seating positions. Head restraints are most effective for protection against whiplash and other rear-impact crash injuries.

The center of the back of the occupant's head should rest against the center of the restraint. The tops of the occupant's ears should be level with the center height of the restraint.



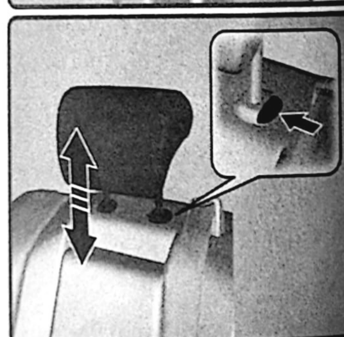
To raise the head restraint: Pull it upward.

To lower the head restraint: Push it down while pressing the release button.



To remove the head restraint: Pull the restraint up as far as it will go. Then push the release button and pull the restraint up and out.

To reinstall a head restraint: Insert the legs back in place, then adjust the head restraint to an appropriate height while pressing the release button. Pull up on the restraint to make sure it is locked in position.



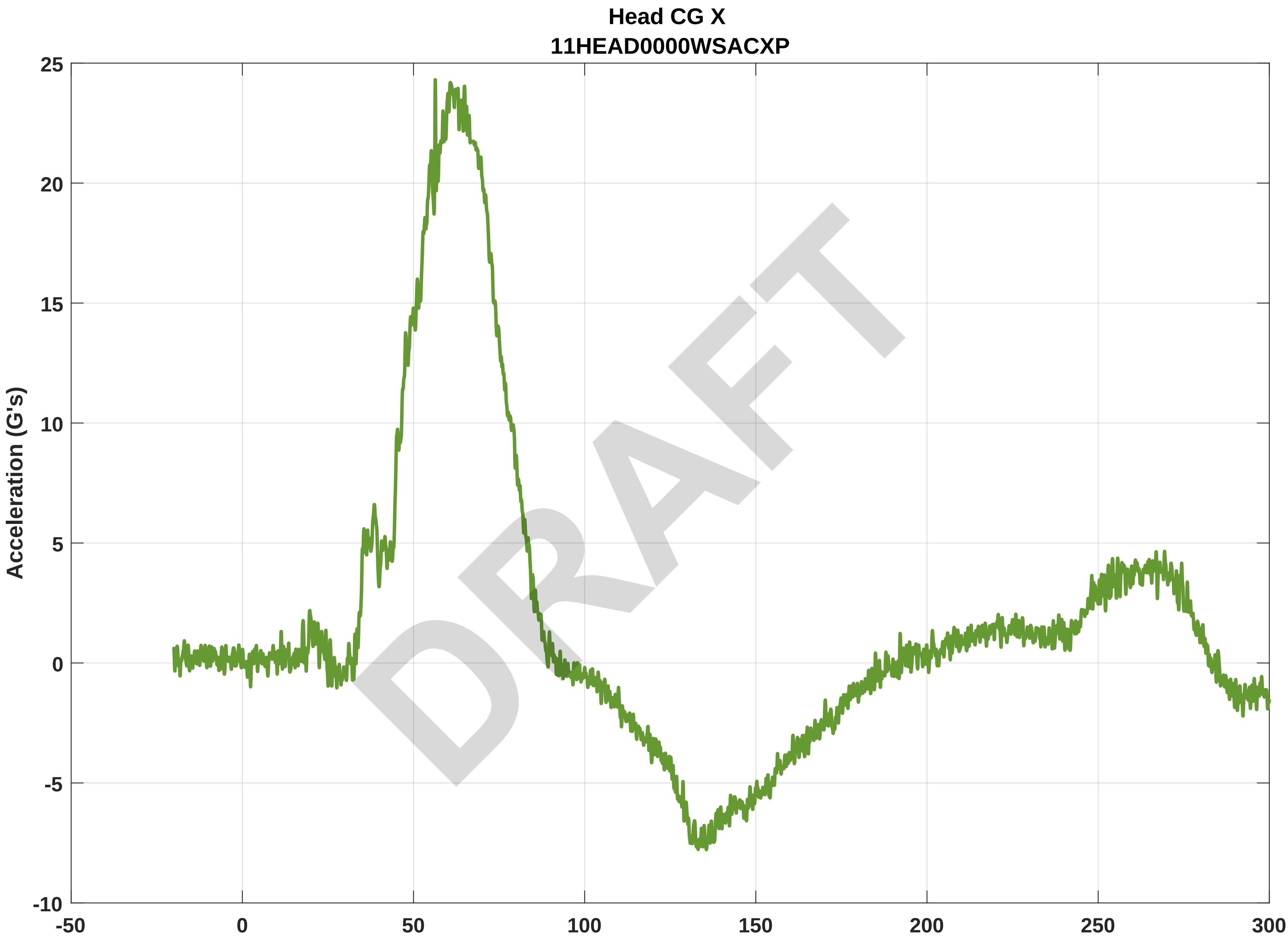
For a head restraint system to work properly:

- Do not hang any items on the head restraints or from the restraint legs
- Do not place any object between an occupant and the seat-back.
- Install each restraint in its proper location.

Figure A-65 Head Restraint Use and Adjustment Information from Vehicle Owner Manual

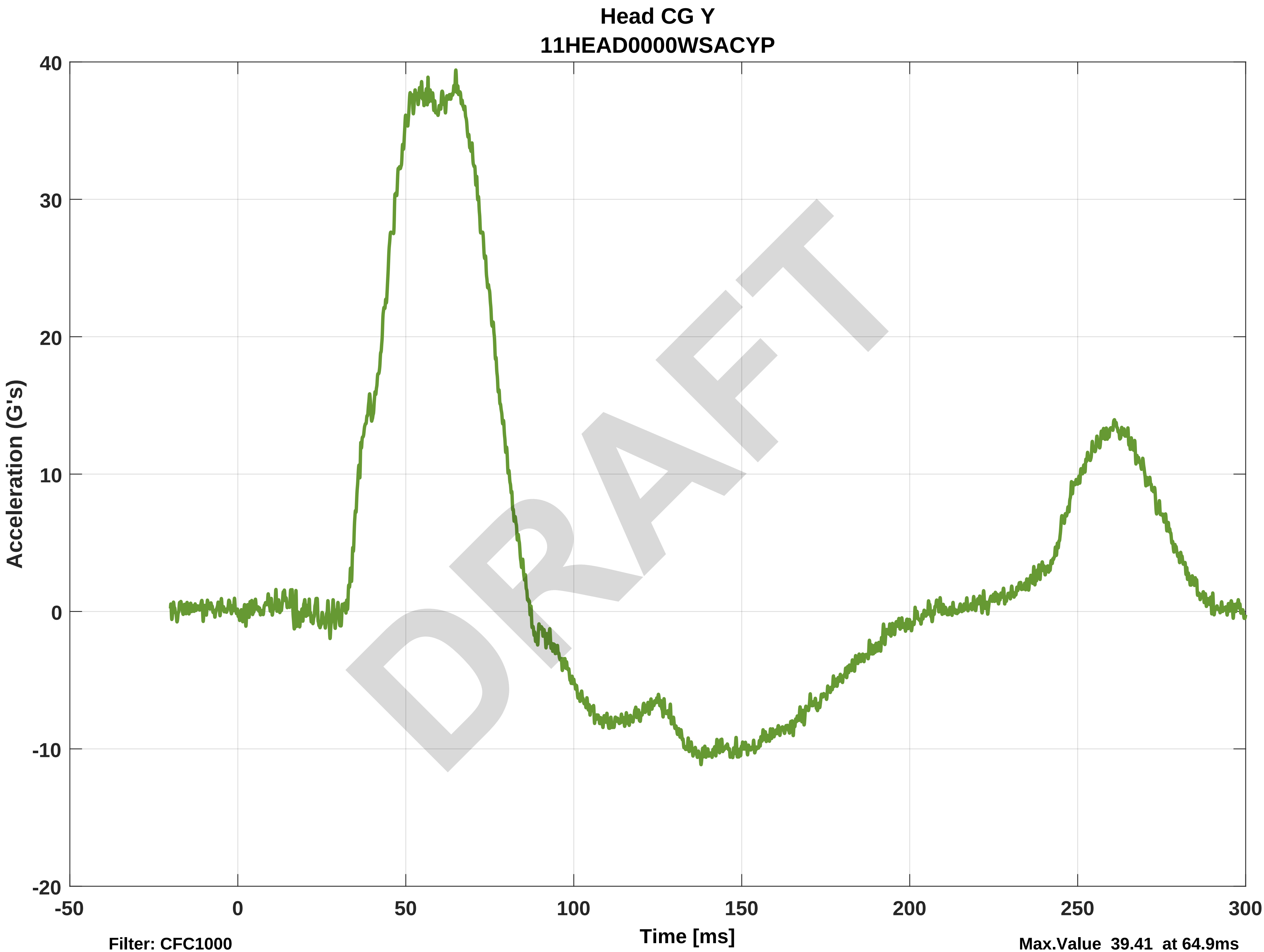
APPENDIX B.1

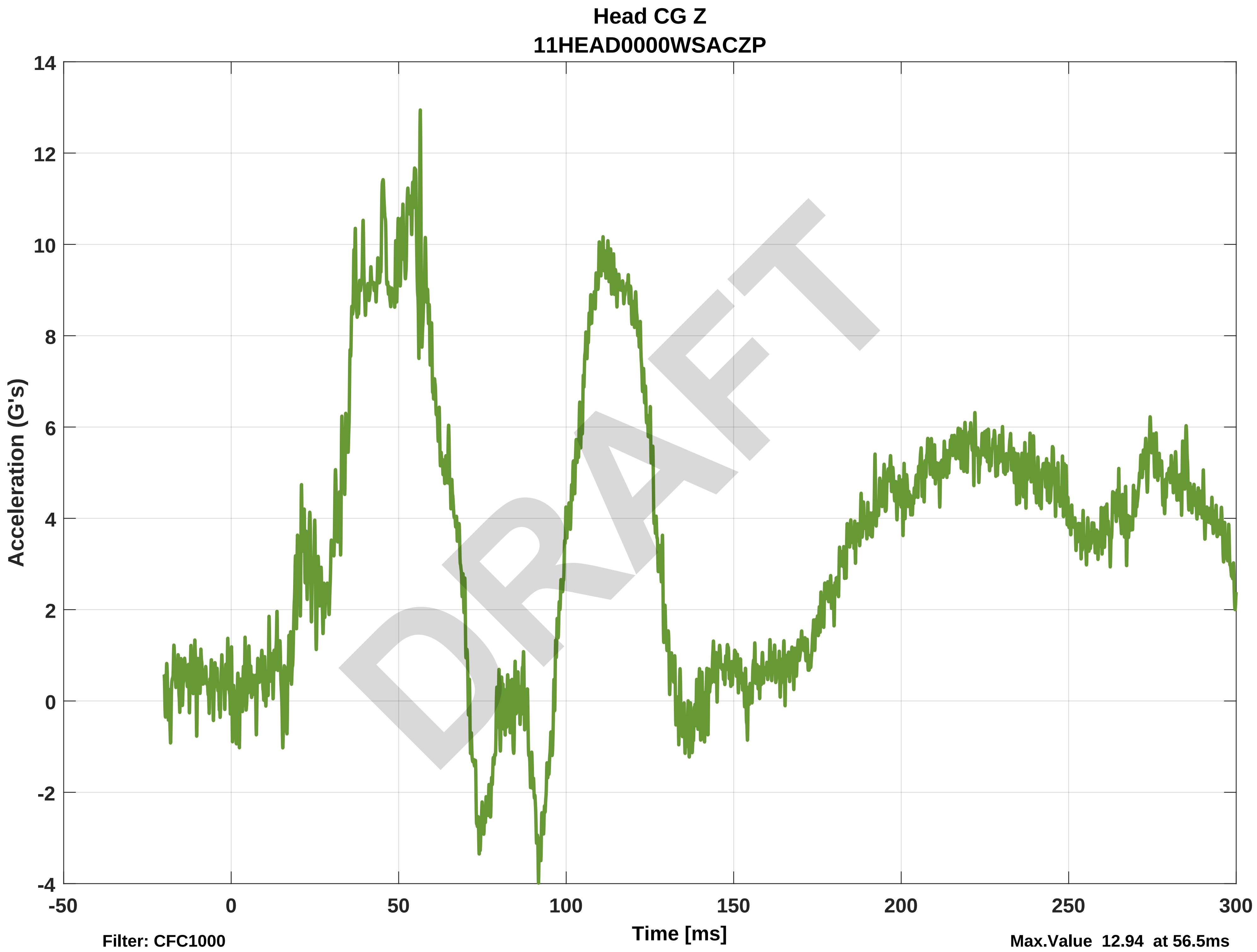
VEHICLE AND DUMMY RESPONSE DATA PLOTS

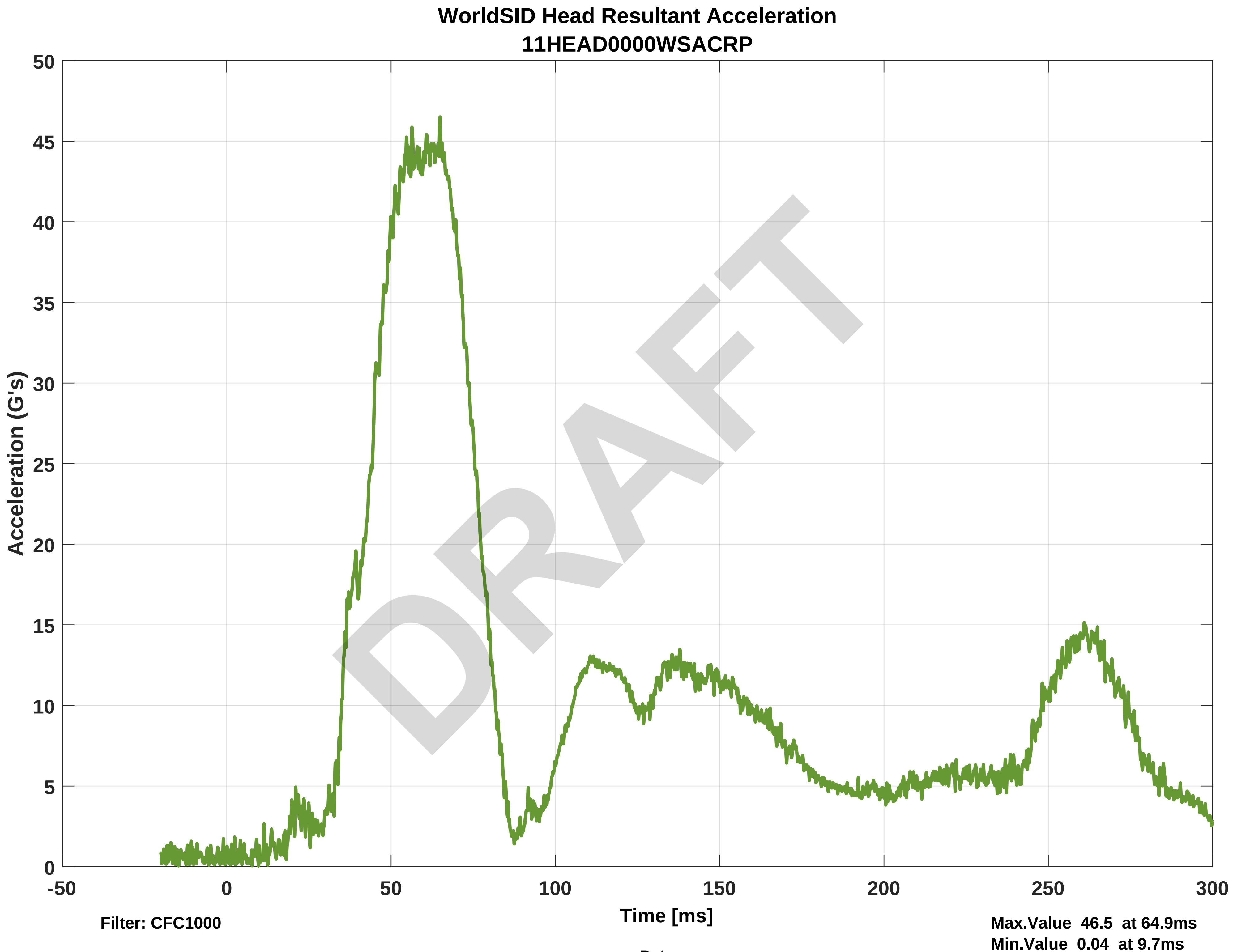


Filter: CFC1000

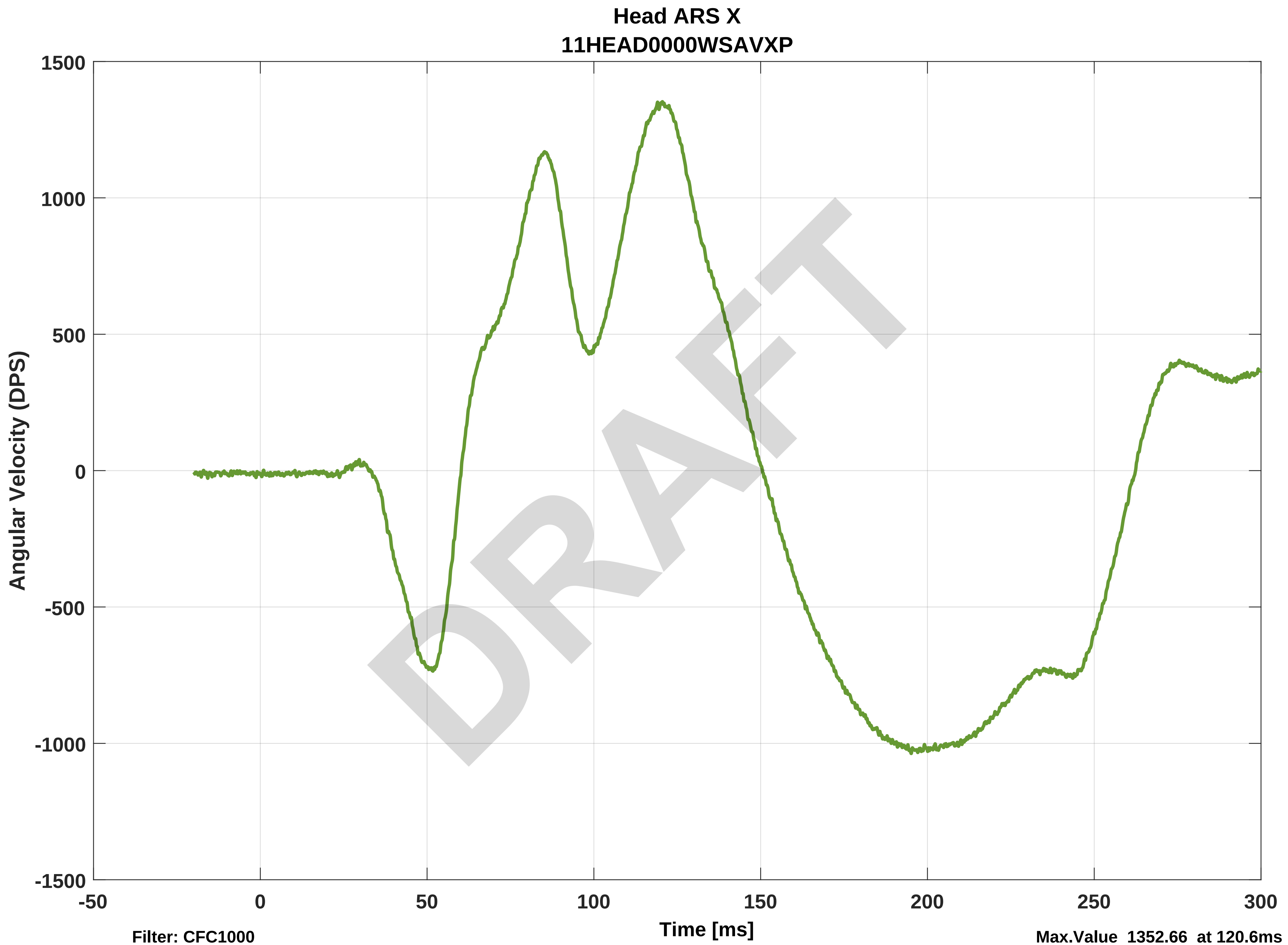
Max.Value 24.31 at 56.4ms
Min.Value -7.78 at 135.6ms

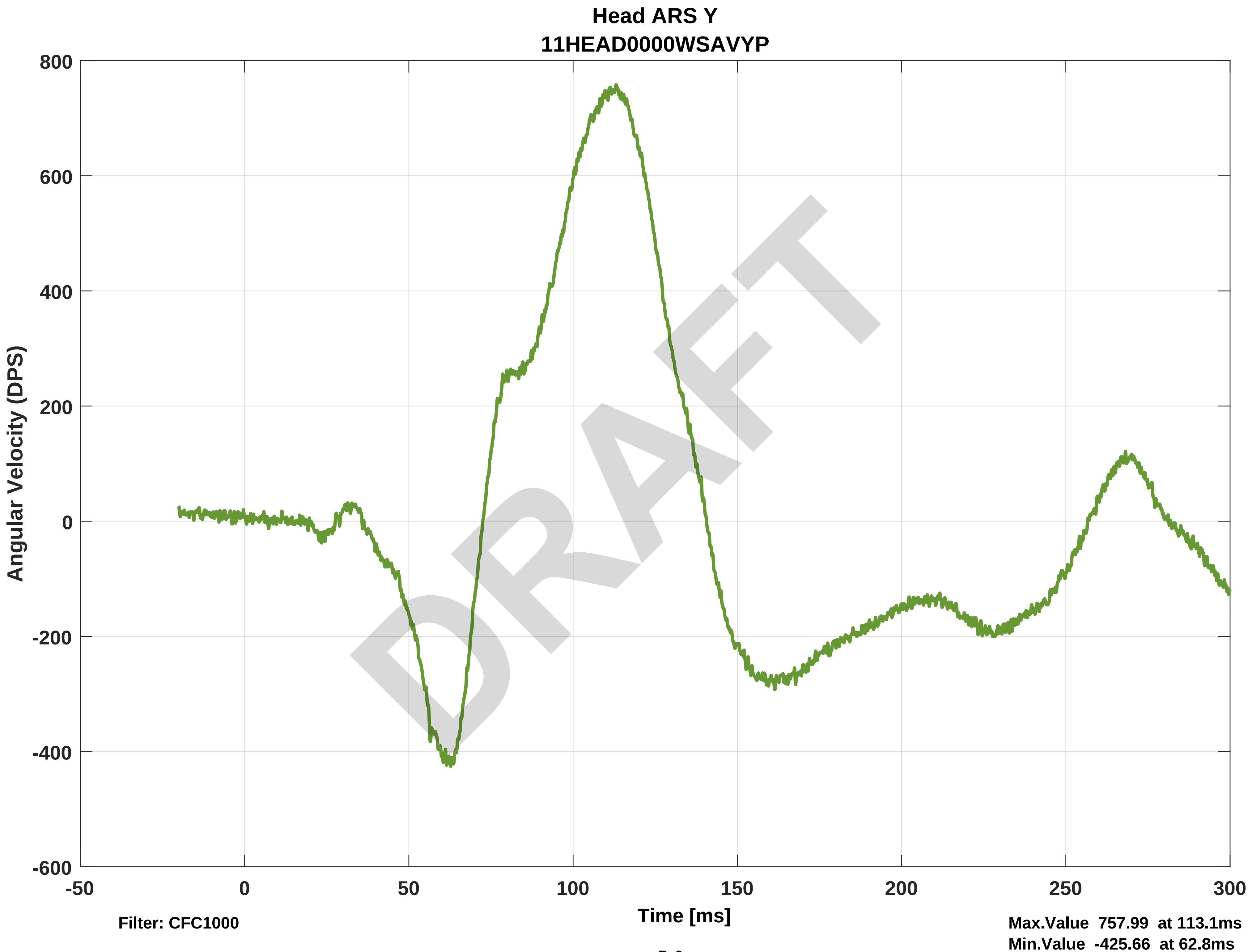

Head CG Y
11HEAD0000WSACYP
Acceleration (G's)
40
30
20
10
0
-10
-20
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 39.41 at 64.9ms
Min.Value -11.15 at 137.9ms

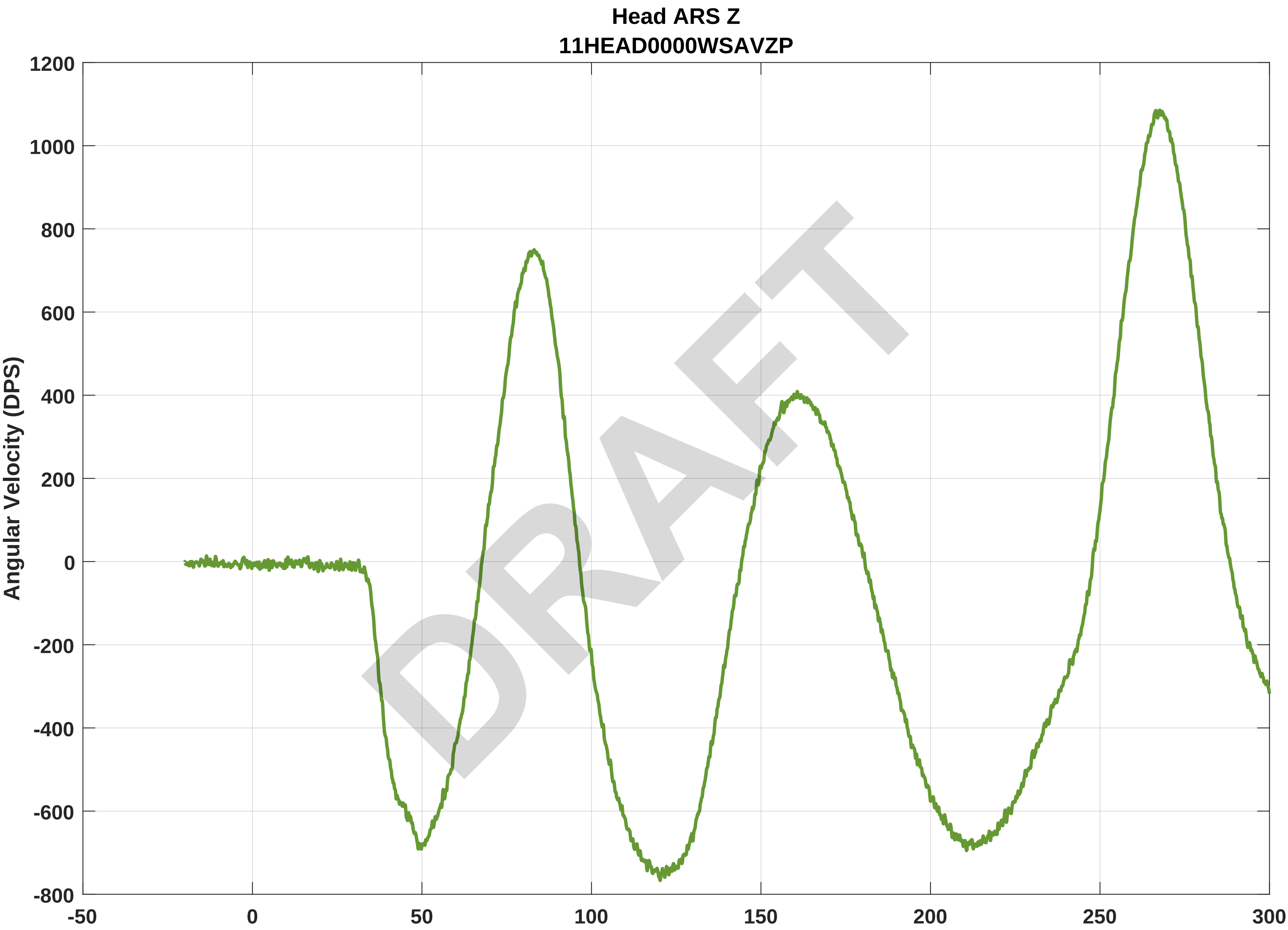

Head CG Z
11HEAD0000WSACZP
Acceleration (G's)
14
12
10
8
6
4
2
0
-2
-4
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 12.94 at 56.5ms
Min.Value -3.99 at 91.8ms



WorldSID Head Resultant Acceleration
11HEAD0000WSACRP
Acceleration (G's)
50
45
40
35
30
25
20
15
10
5
0
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 46.5 at 64.9ms
Min.Value 0.04 at 9.7ms


Head ARS X
11HEAD0000WSAVXP
Angular Velocity (DPS)
1500
1000
500
0
-500
-1000
-1500
-50
0
50
100
150
200
250
300
Time [ms]
Filter: CFC1000
Max.Value 1352.66 at 120.6ms
Min.Value -1037.08 at 195.2ms
DRAFT


Head ARS Y
11HEAD0000WSAVYP
800
600
400
200
0
-200
-400
-600
Angular Velocity (DPS)
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 757.99 at 113.1ms
Min.Value -425.66 at 62.8ms



Filter: CFC1000

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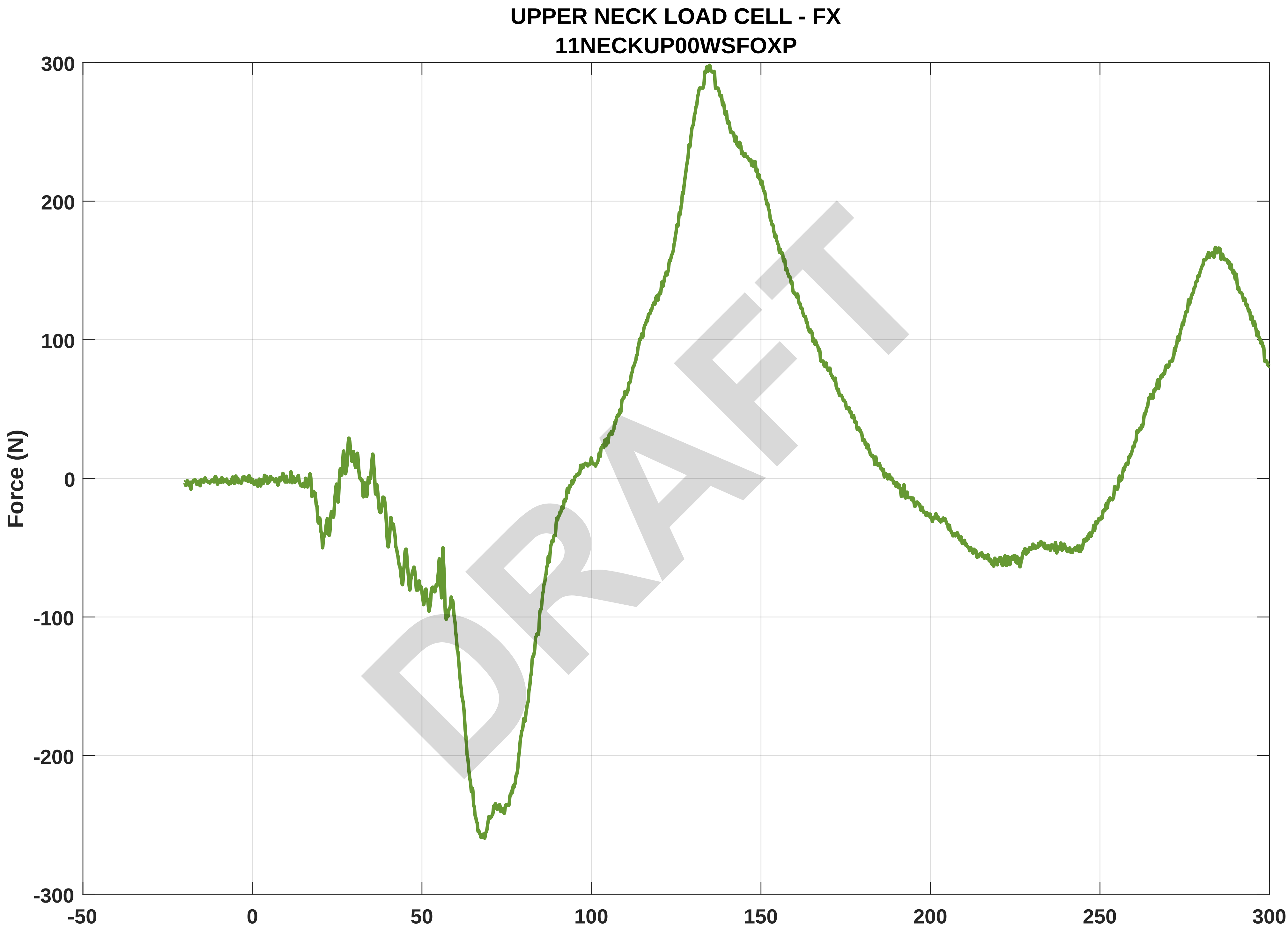
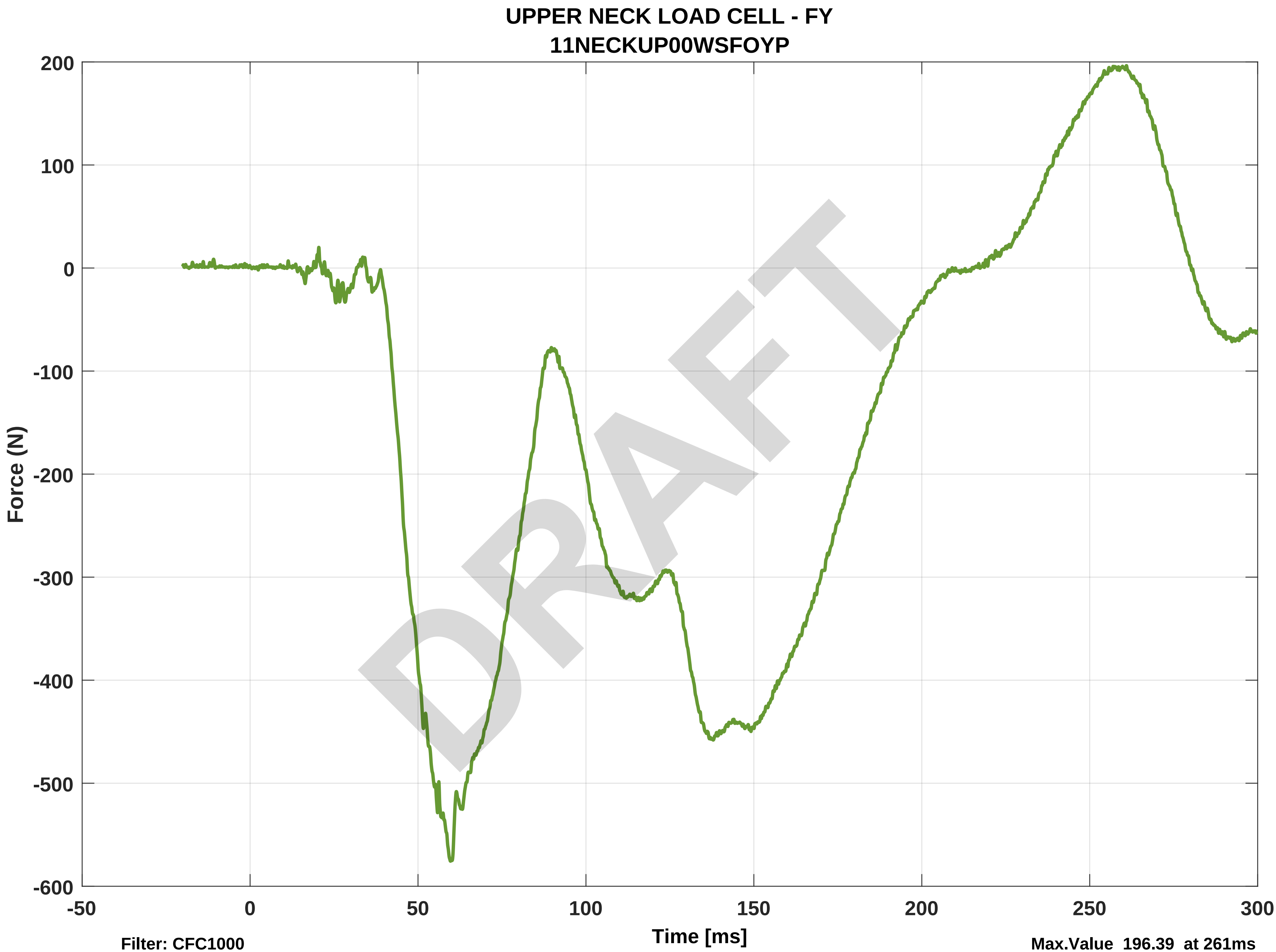
Min.Value -766.61 at 120.3ms



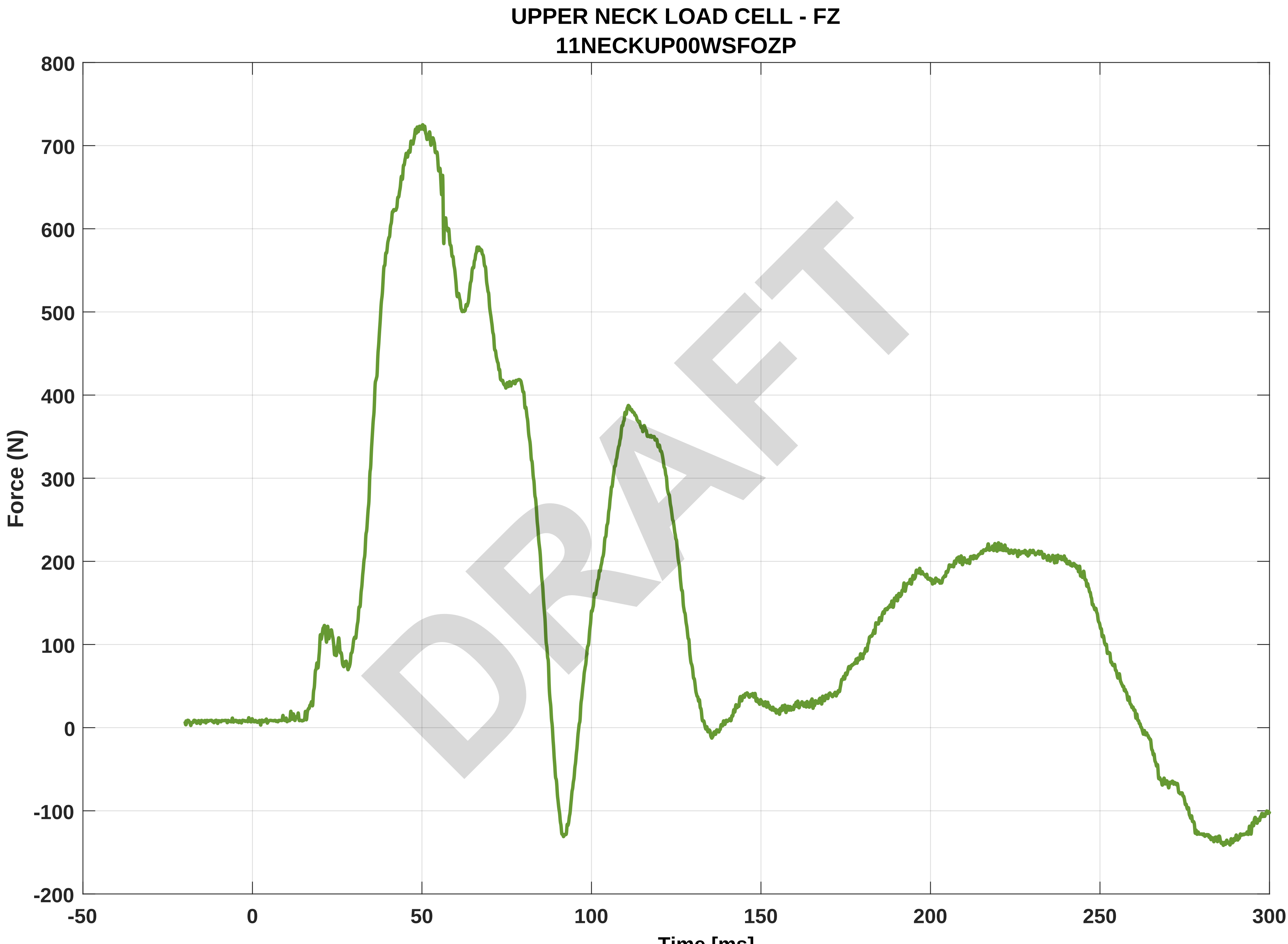
Filter: CFC1000

Max.Value 297.99 at 134.9ms
Min.Value -259.53 at 68.5ms



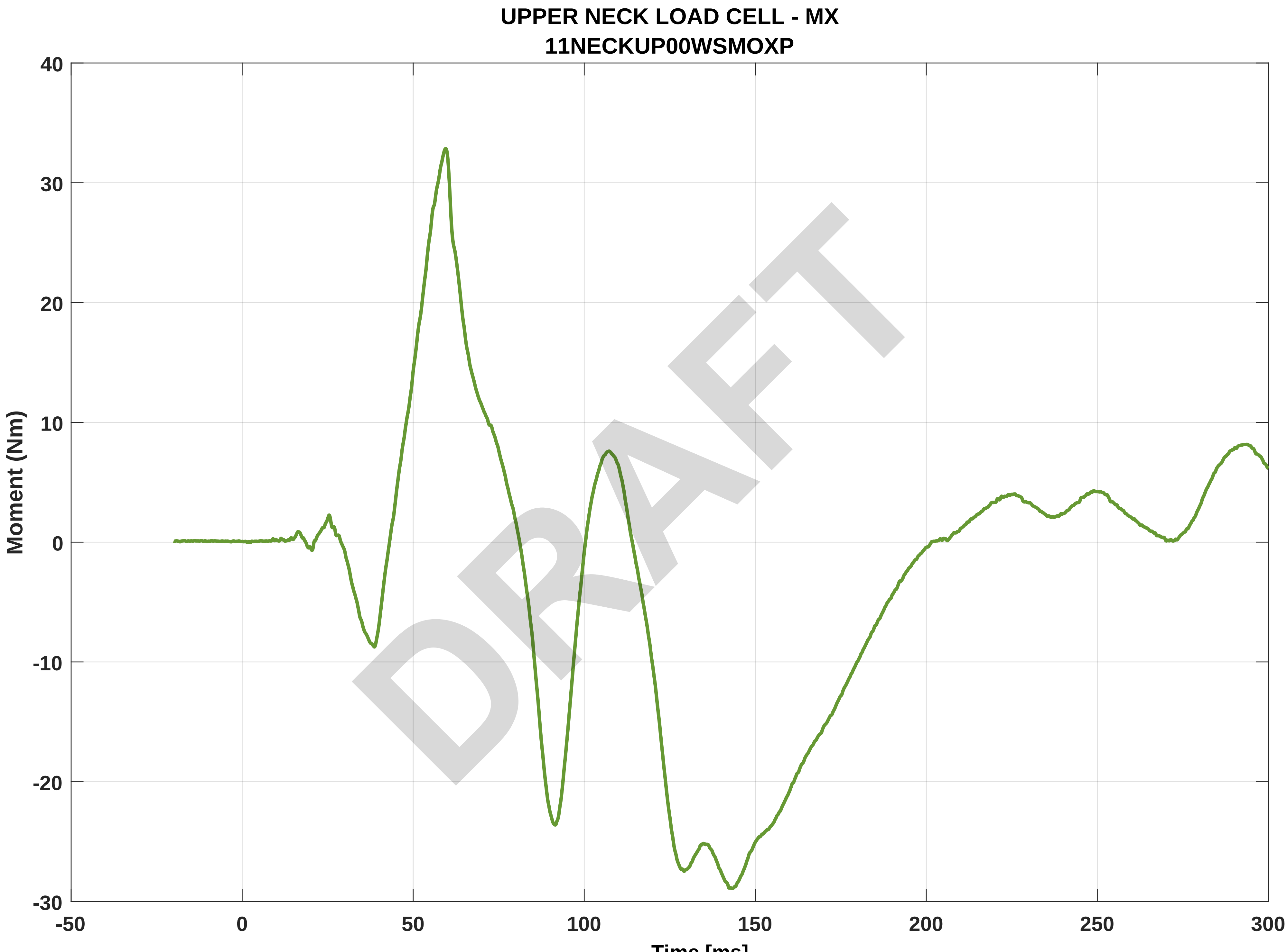
Filter: CFC1000

Max.Value 196.39 at 261ms
Min.Value -575.61 at 59.7ms



Filter: CFC1000

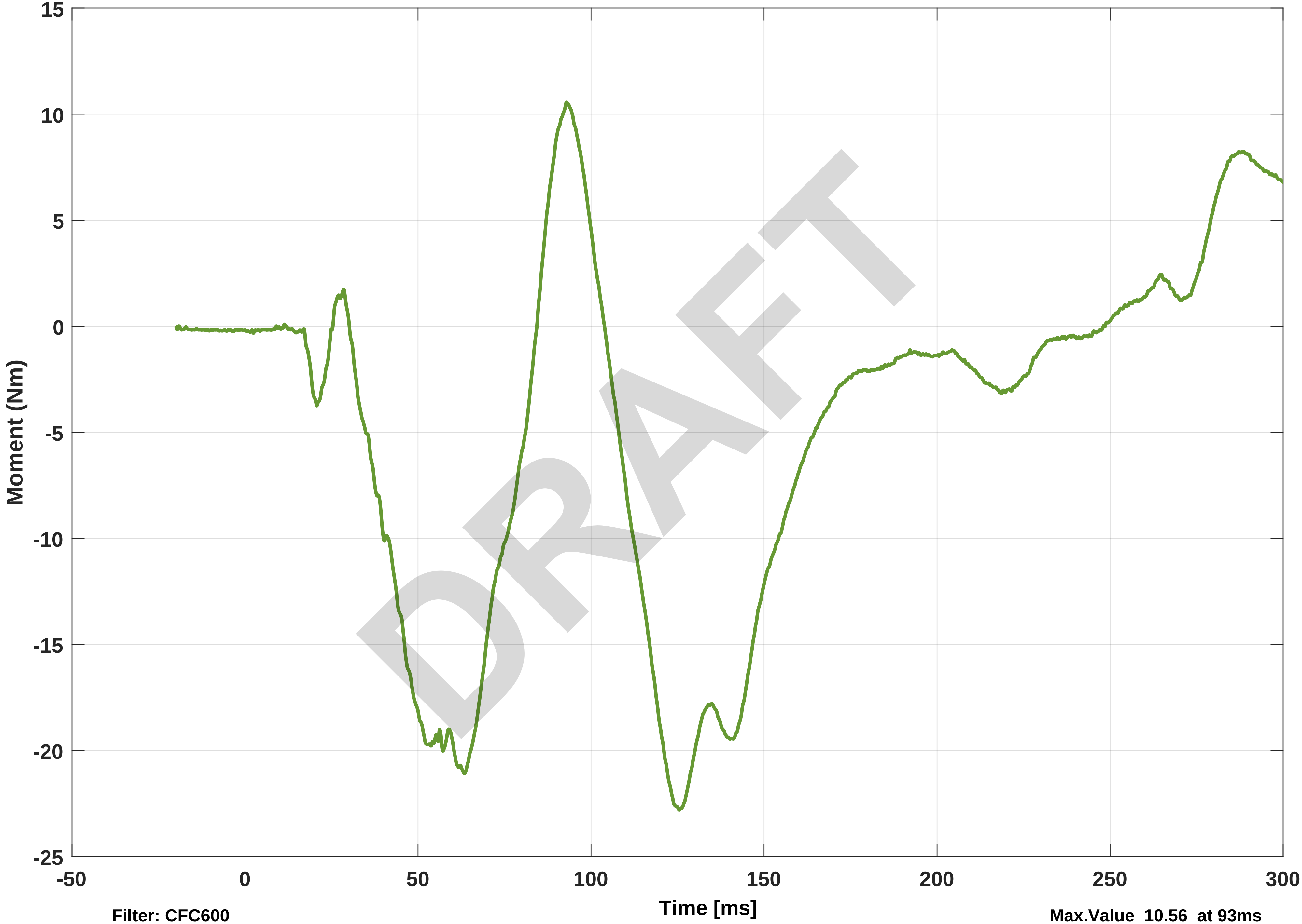
Max.Value 725.13 at 50.2ms
Min.Value -141.57 at 286.4ms



Filter: CFC600

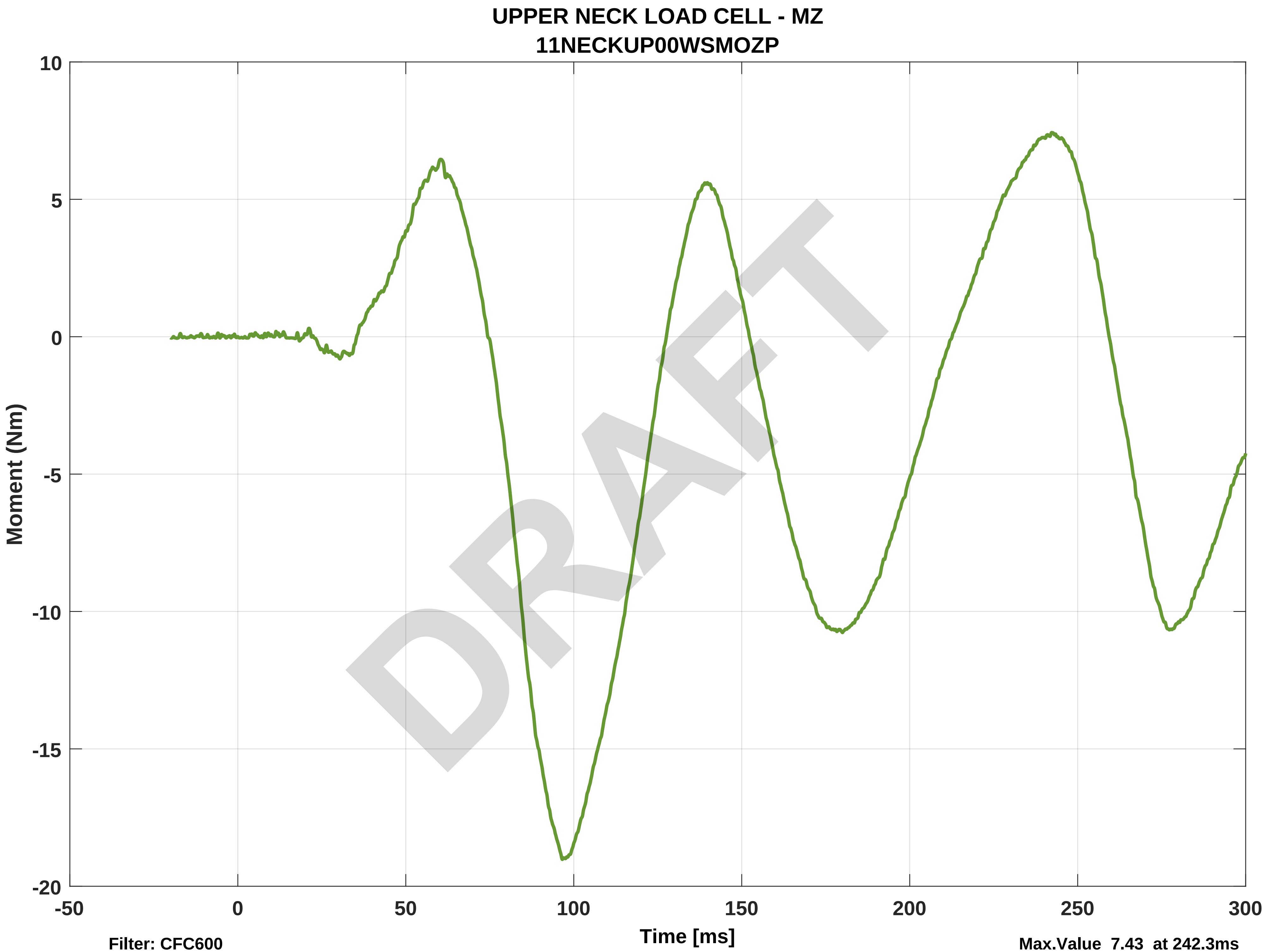
Max.Value 32.85 at 59.5ms
Min.Value -28.91 at 143.3ms

UPPER NECK LOAD CELL - MY
11NECKUP00WSMOYP

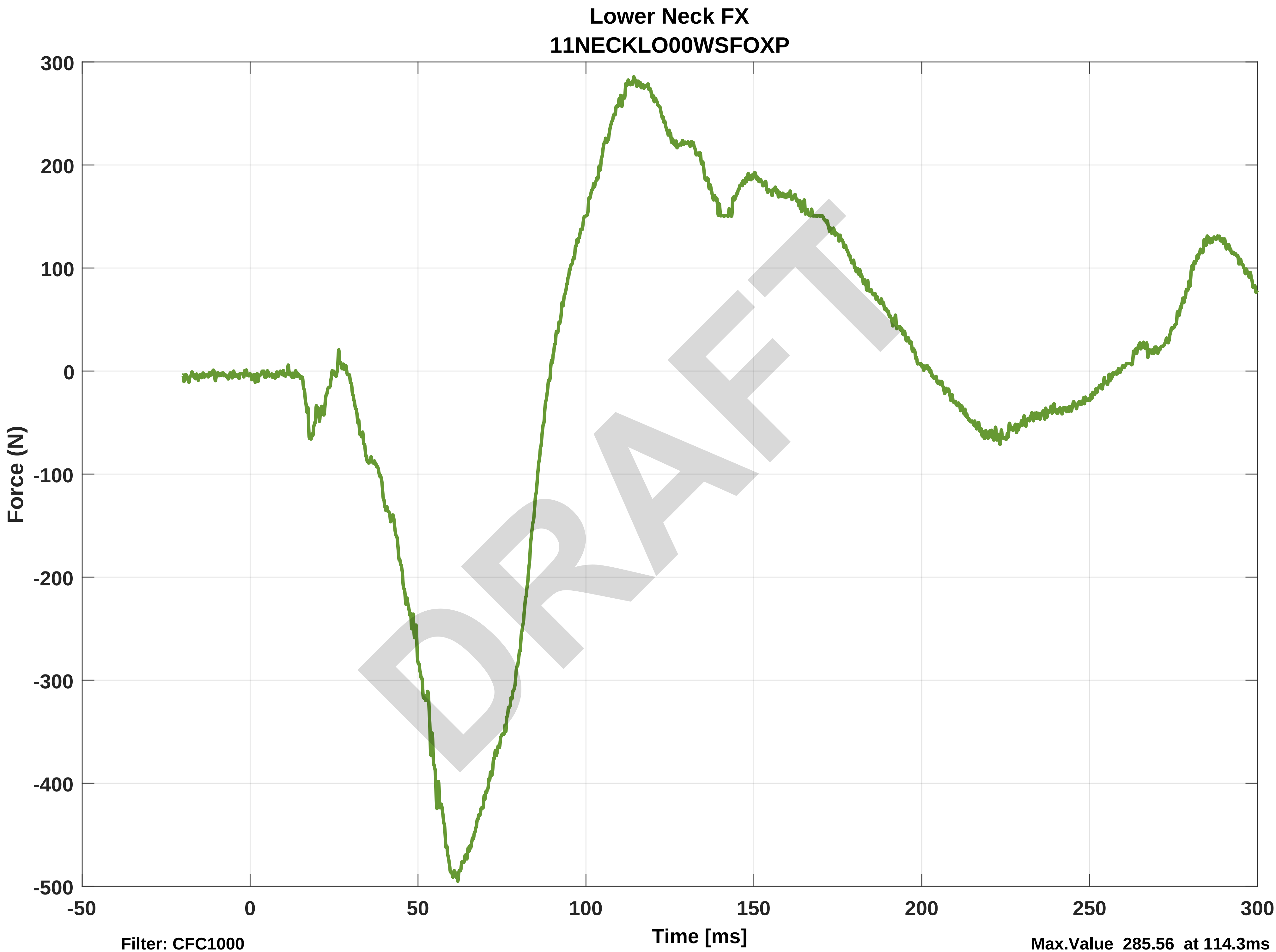


Filter: CFC600

Max.Value 10.56 at 93ms
Min.Value -22.82 at 125.5ms

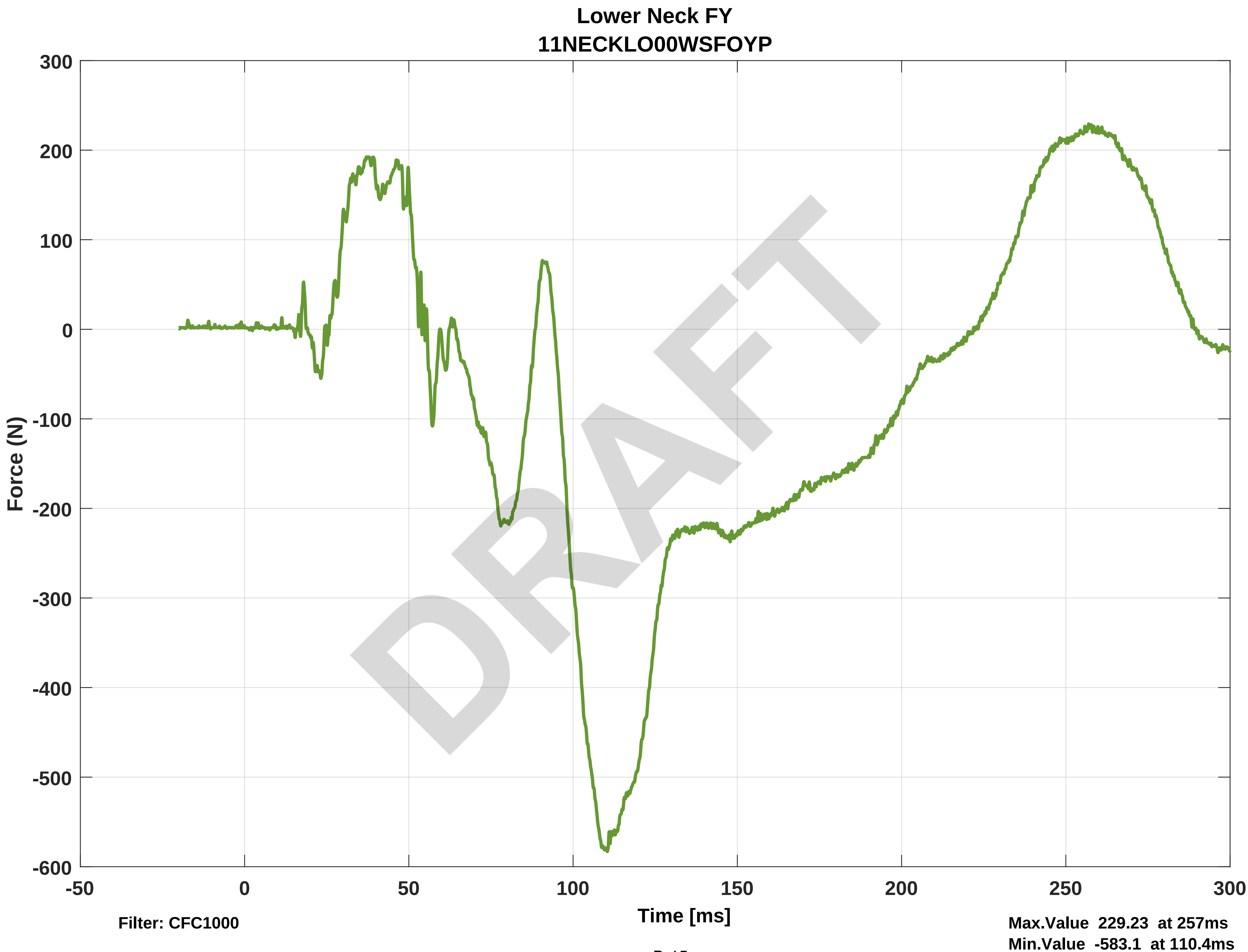


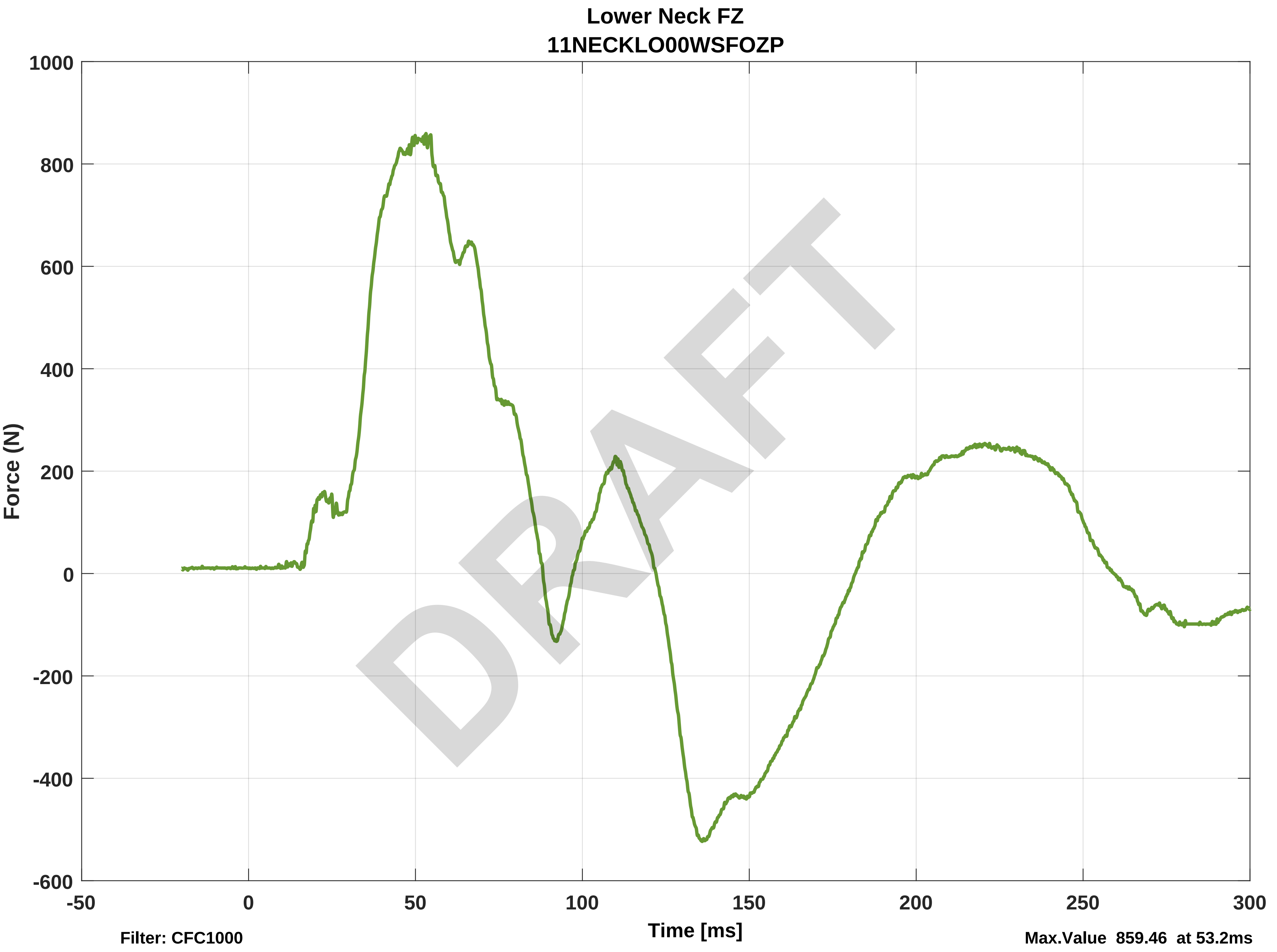
UPPER NECK LOAD CELL - MZ
11NECKUP00WSMOZP
10
5
0
-5
-10
-15
-20
Moment (Nm)
-50
0
50
100
150
200
250
300
Time [ms]
Filter: CFC600
Max.Value 7.43 at 242.3ms
Min.Value -19.02 at 96.6ms
DRAFT



Filter: CFC1000

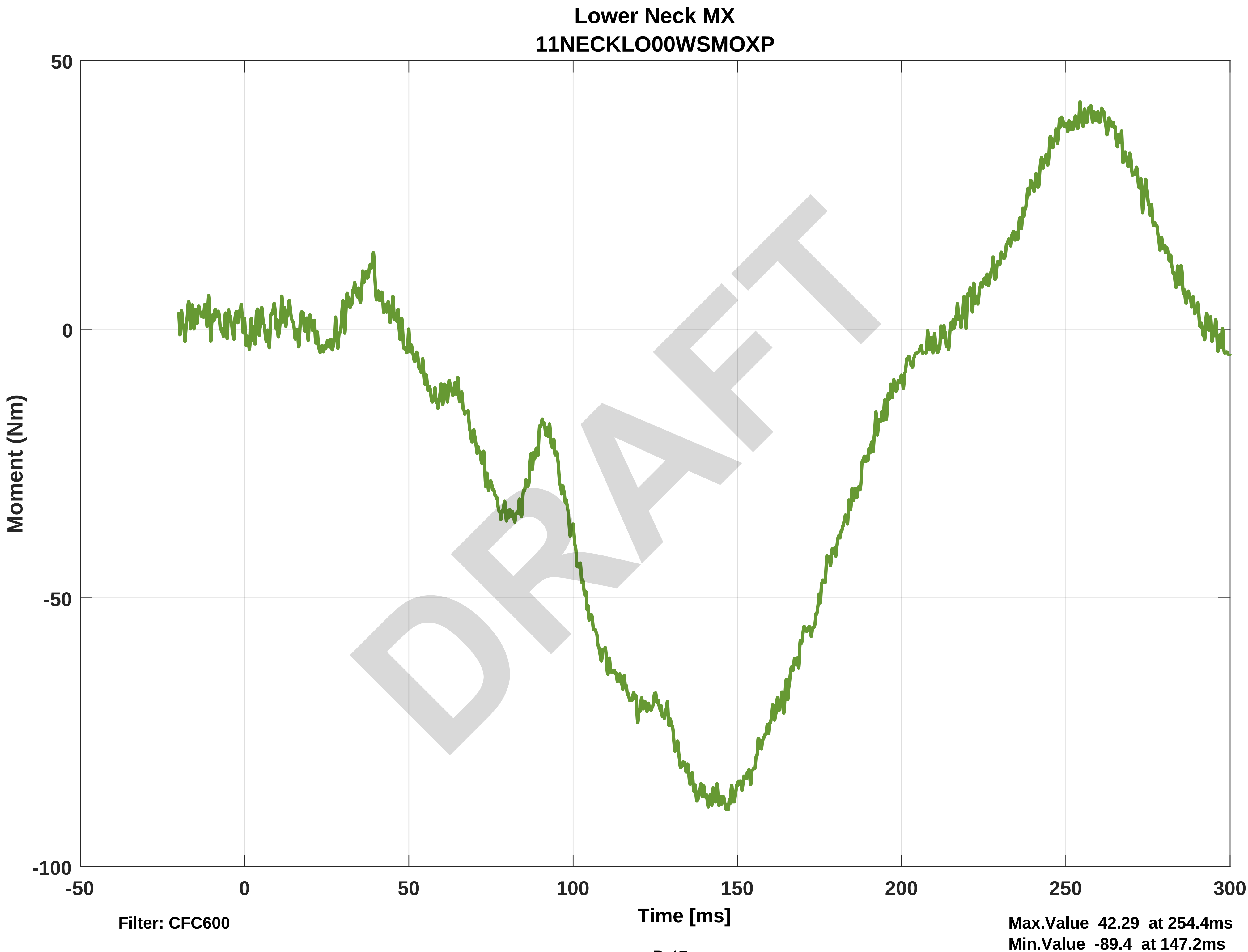
Max.Value 285.56 at 114.3ms
Min.Value -495.07 at 61.9ms

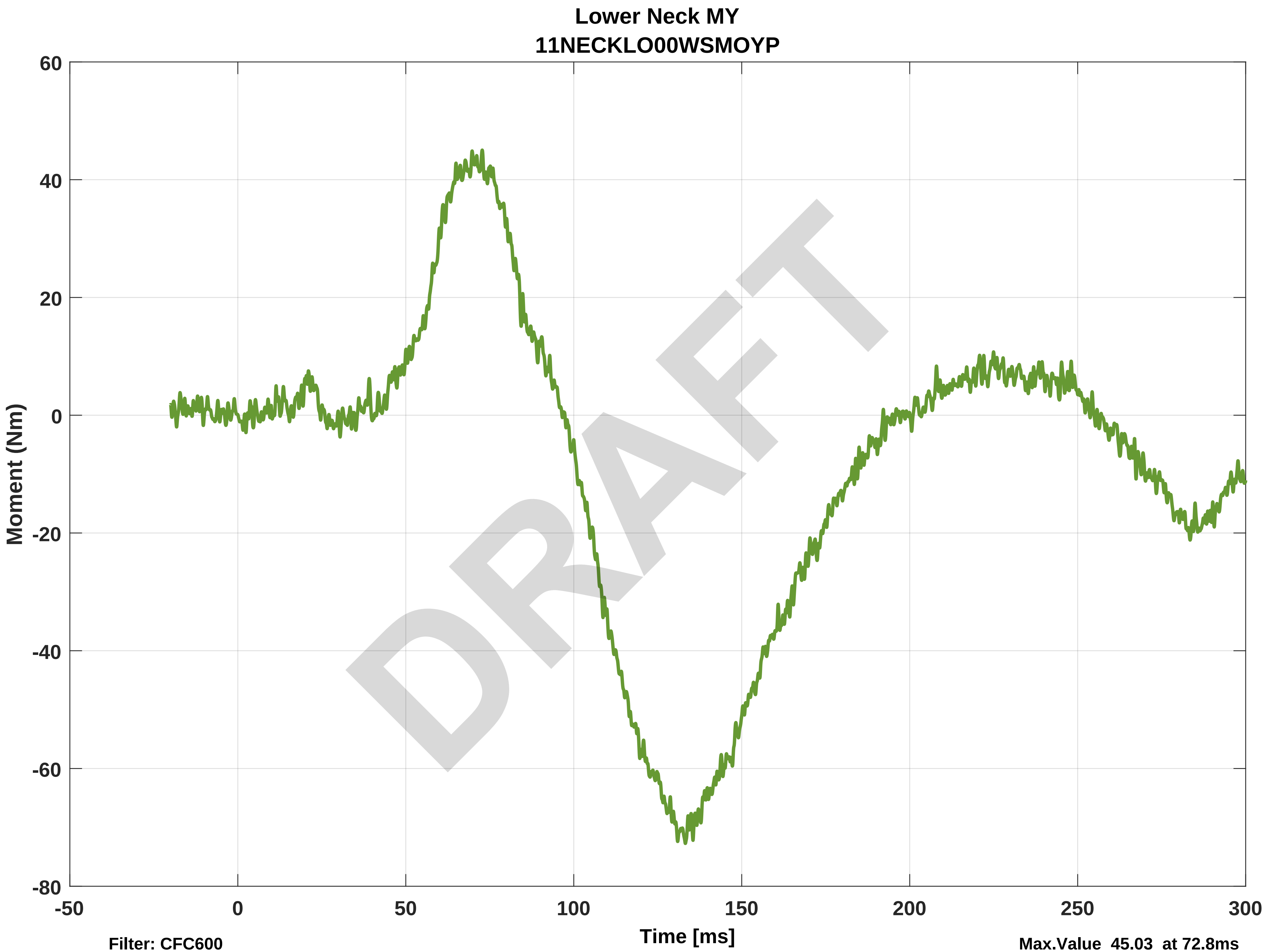

Lower Neck FY
11NECKLO00WSFOYP
Force (N)
300
200
100
0
-100
-200
-300
-400
-500
-600
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 229.23 at 257ms
Min.Value -583.1 at 110.4ms



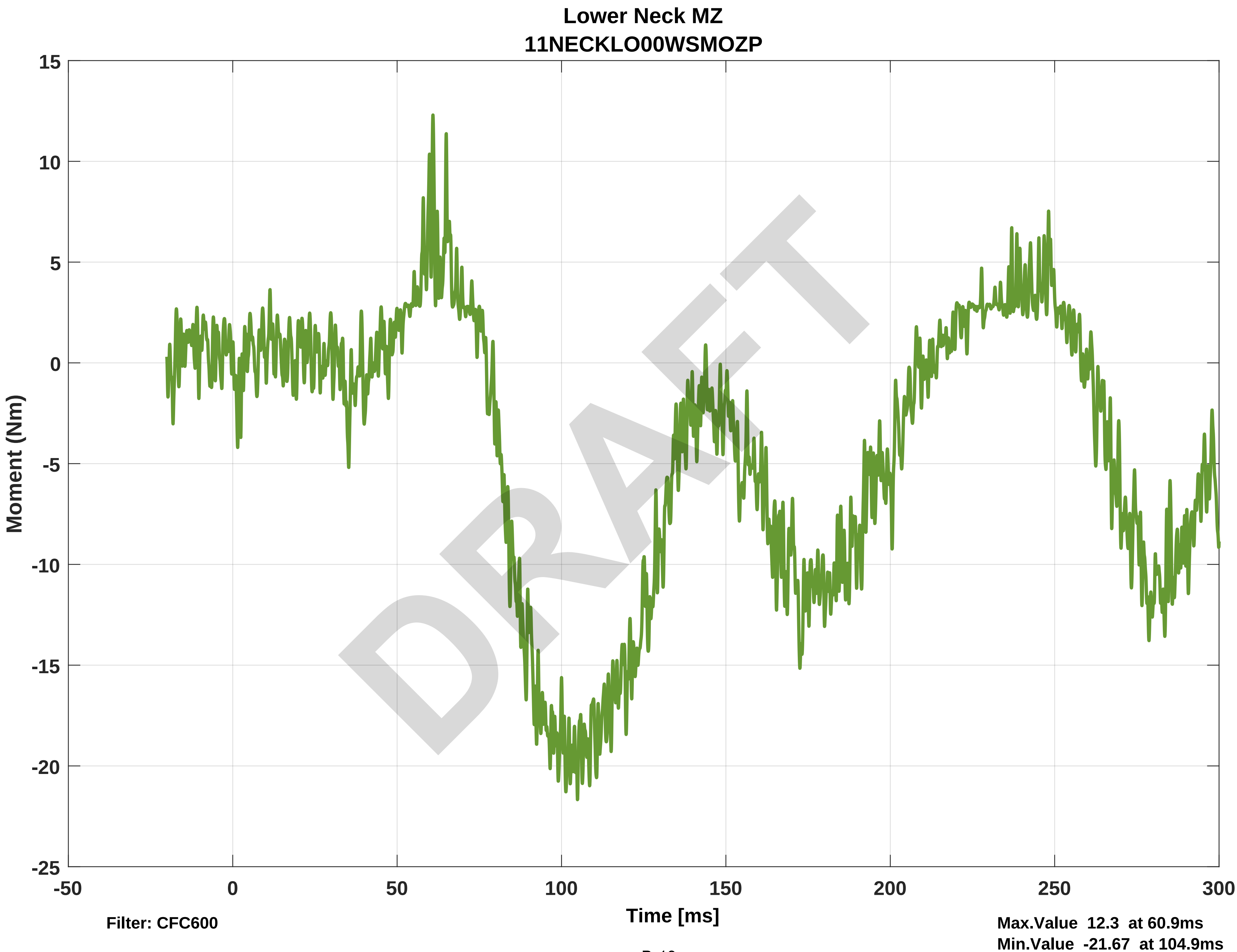
Filter: CFC1000

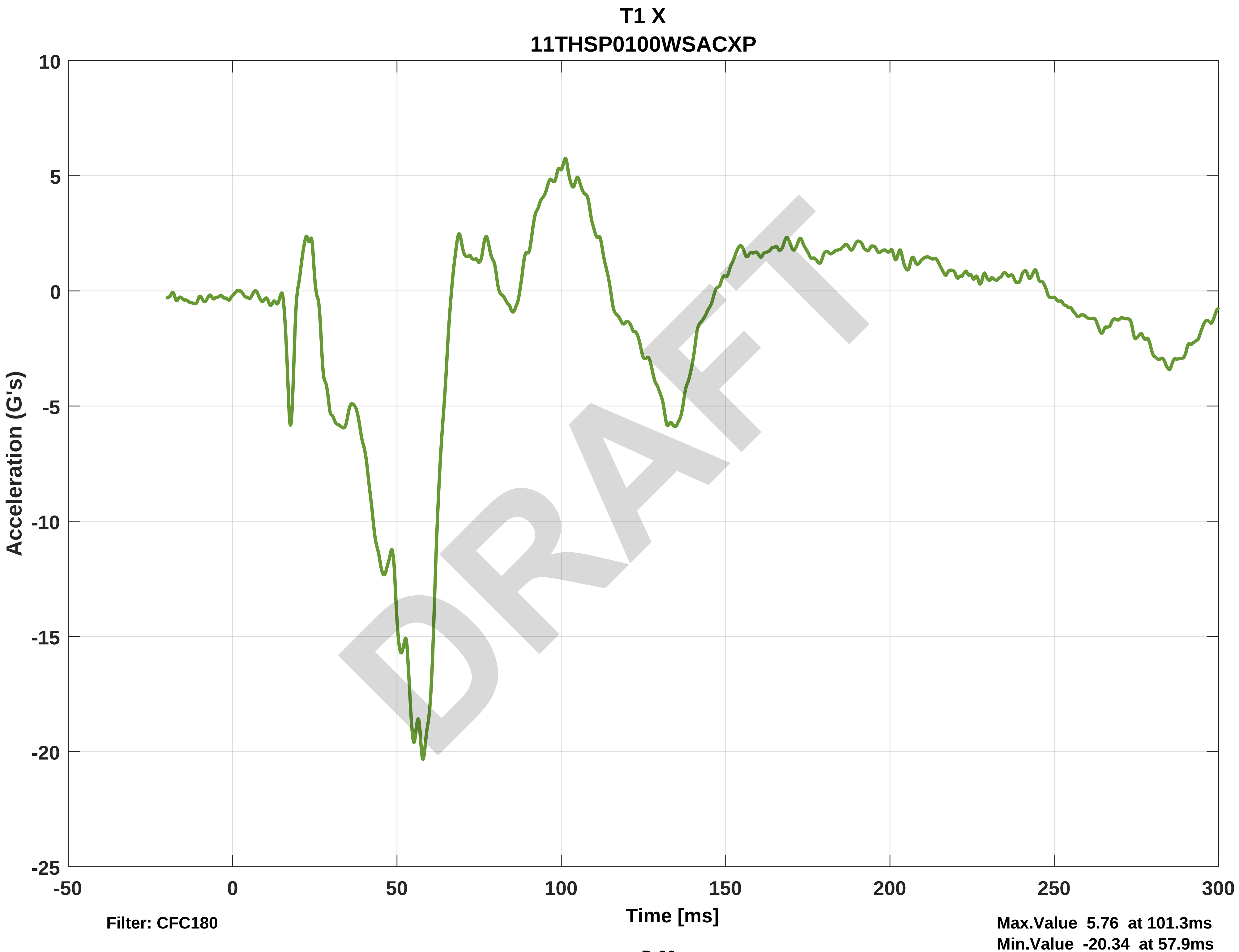
Max.Value 859.46 at 53.2ms
Min.Value -523.34 at 135.9ms

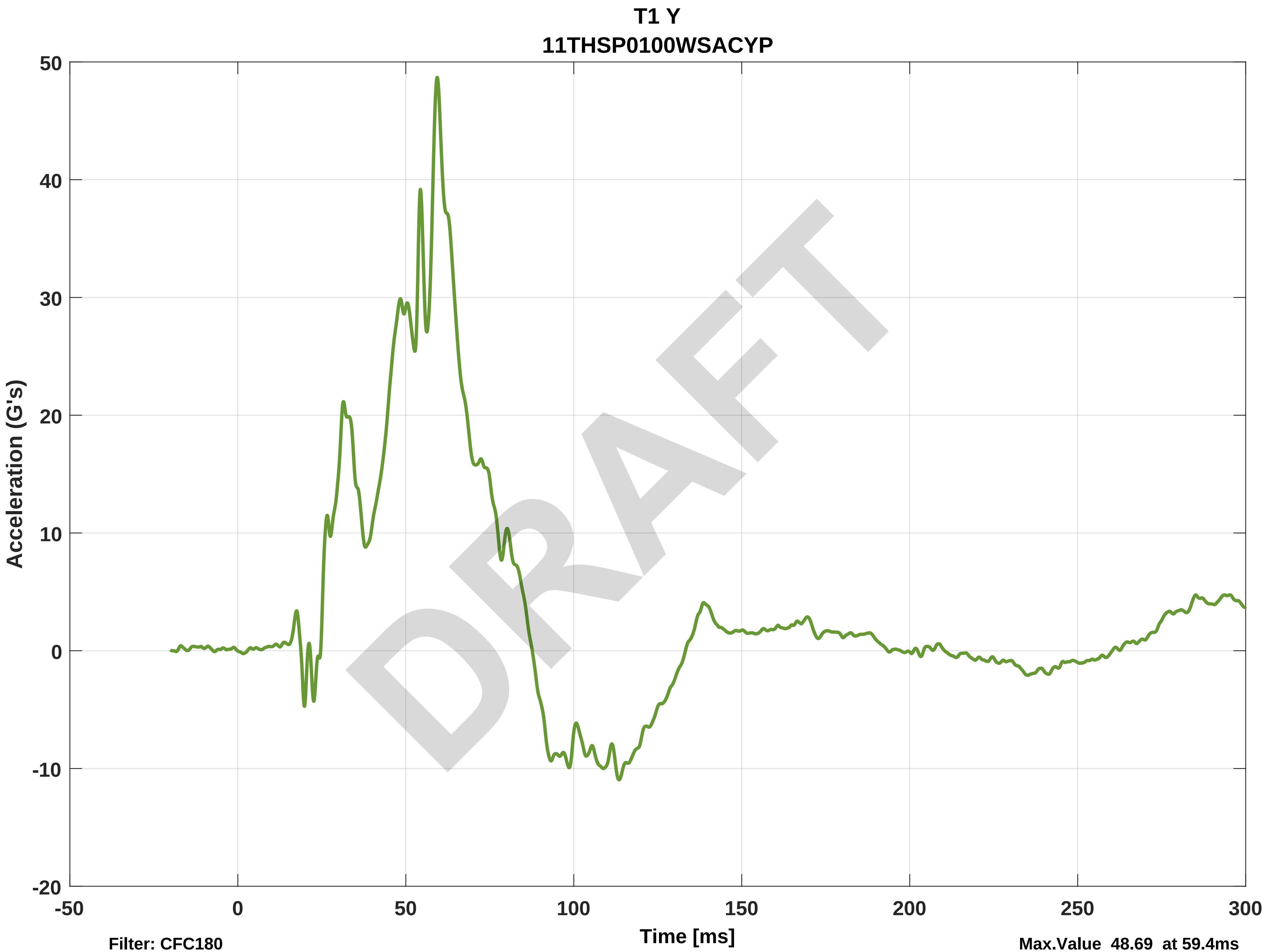

Lower Neck MX
11NECKLO00WSMOXP
Moment (Nm)
50
0
-50
-100
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC600
Max.Value 42.29 at 254.4ms
Min.Value -89.4 at 147.2ms



Lower Neck MY
11NECKLO00WSMOYP
Moment (Nm)
60
40
20
0
-20
-40
-60
-80
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC600
Max.Value 45.03 at 72.8ms
Min.Value -72.72 at 133.2ms

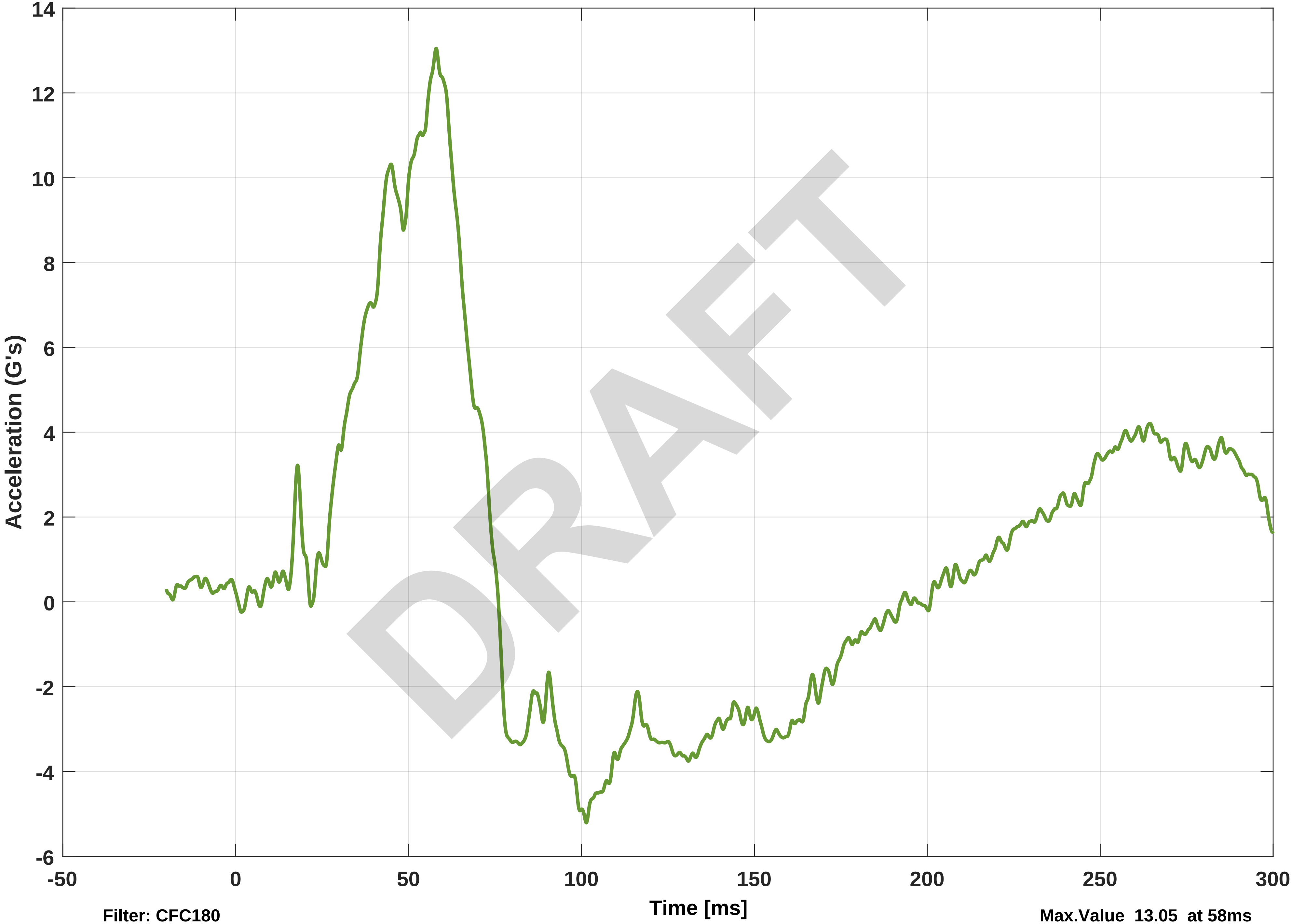

Lower Neck MZ
11NECKLO00WSMOZP
Moment (Nm)
Time [ms]
15
10
5
0
-5
-10
-15
-20
-25
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC600
Max.Value 12.3 at 60.9ms
Min.Value -21.67 at 104.9ms


T1 X
11THSP0100WSACXP
Acceleration (G's)
10
5
0
-5
-10
-15
-20
-25
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC180
Max.Value 5.76 at 101.3ms
Min.Value -20.34 at 57.9ms



T1 Y
11THSP0100WSACYP
50
40
30
20
10
0
-10
-20
-50
0
50
100
150
200
250
300
Acceleration (G's)
Time [ms]
DRAFT
Filter: CFC180
Max.Value 48.69 at 59.4ms
Min.Value -10.96 at 113.5ms

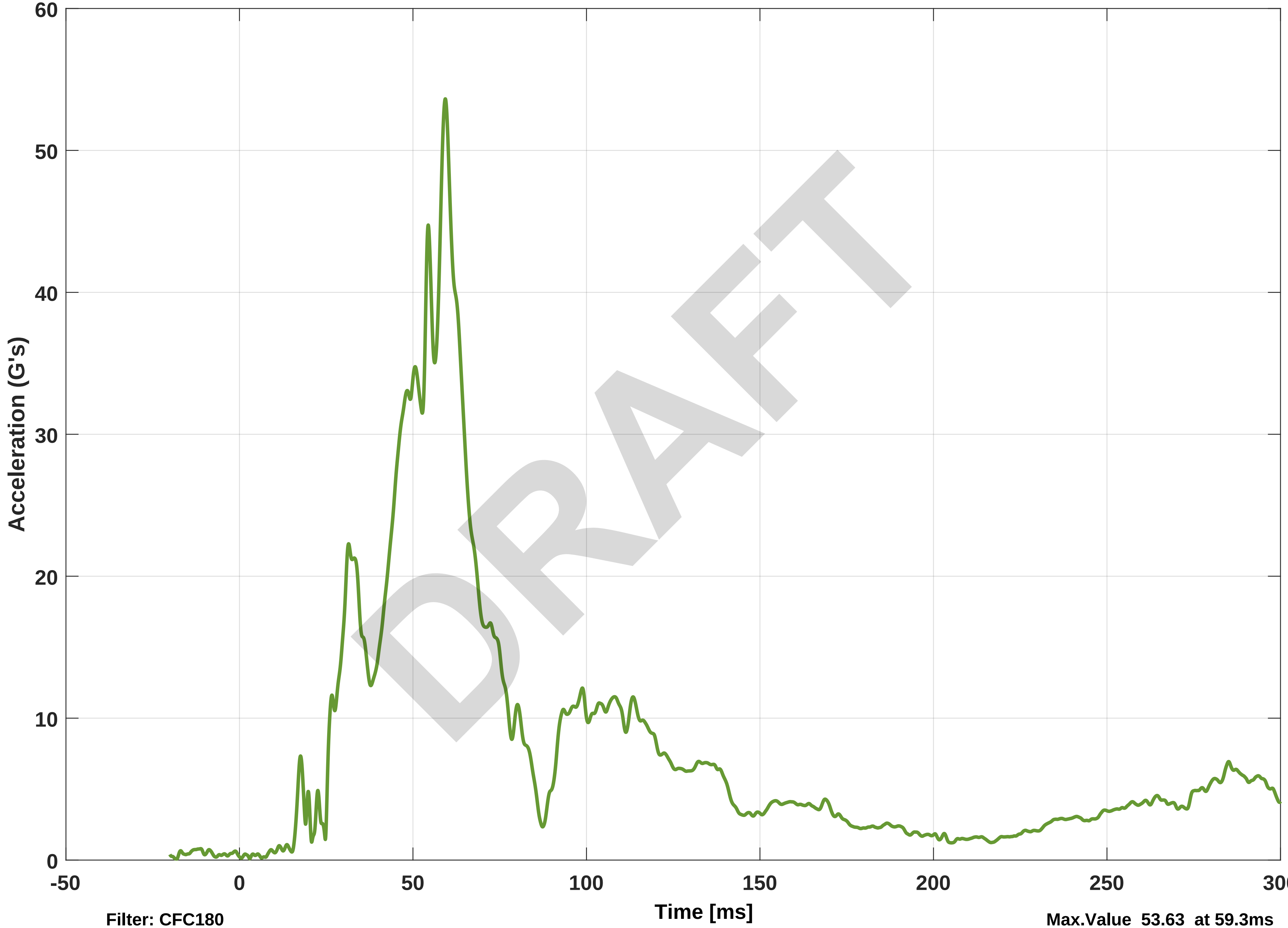
T1 Z
11THSP0100WSACZP



Filter: CFC180

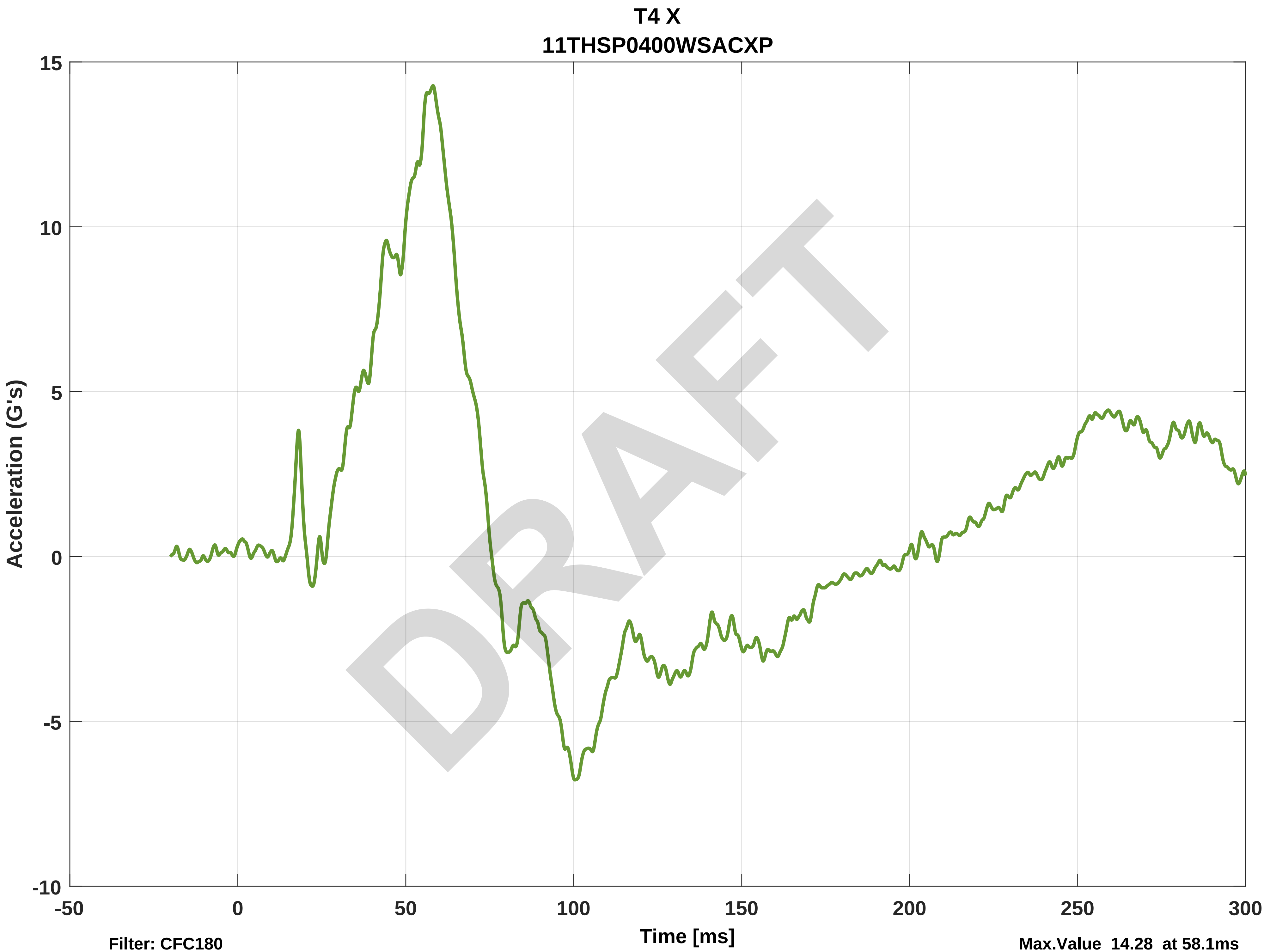
Max.Value 13.05 at 58ms
Min.Value -5.21 at 101.4ms

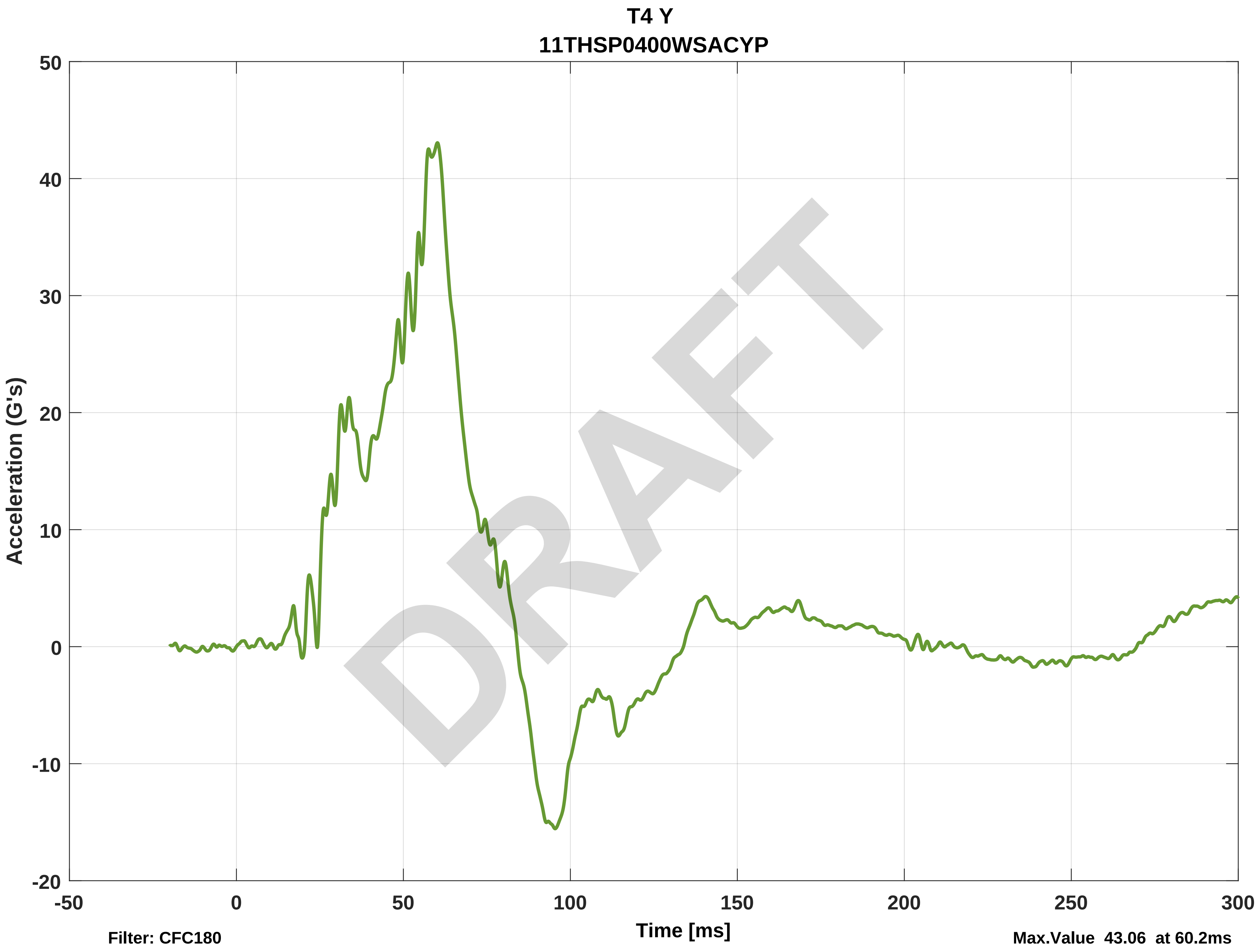
WorldSID T1 Resultant Acceleration
11THSP0100WSACRP

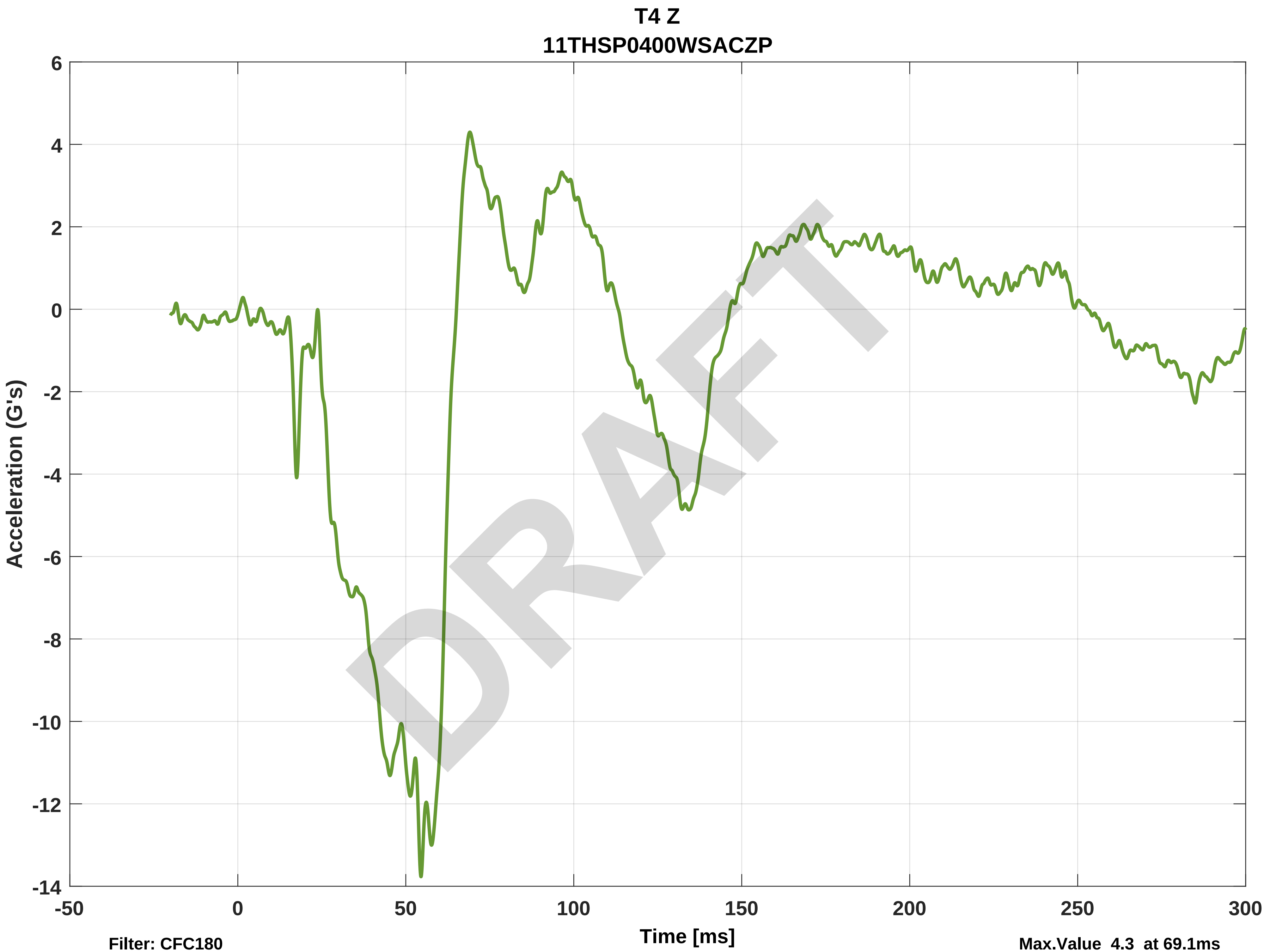


Filter: CFC180

Max.Value 53.63 at 59.3ms
Min.Value 0.08 at -18.1ms

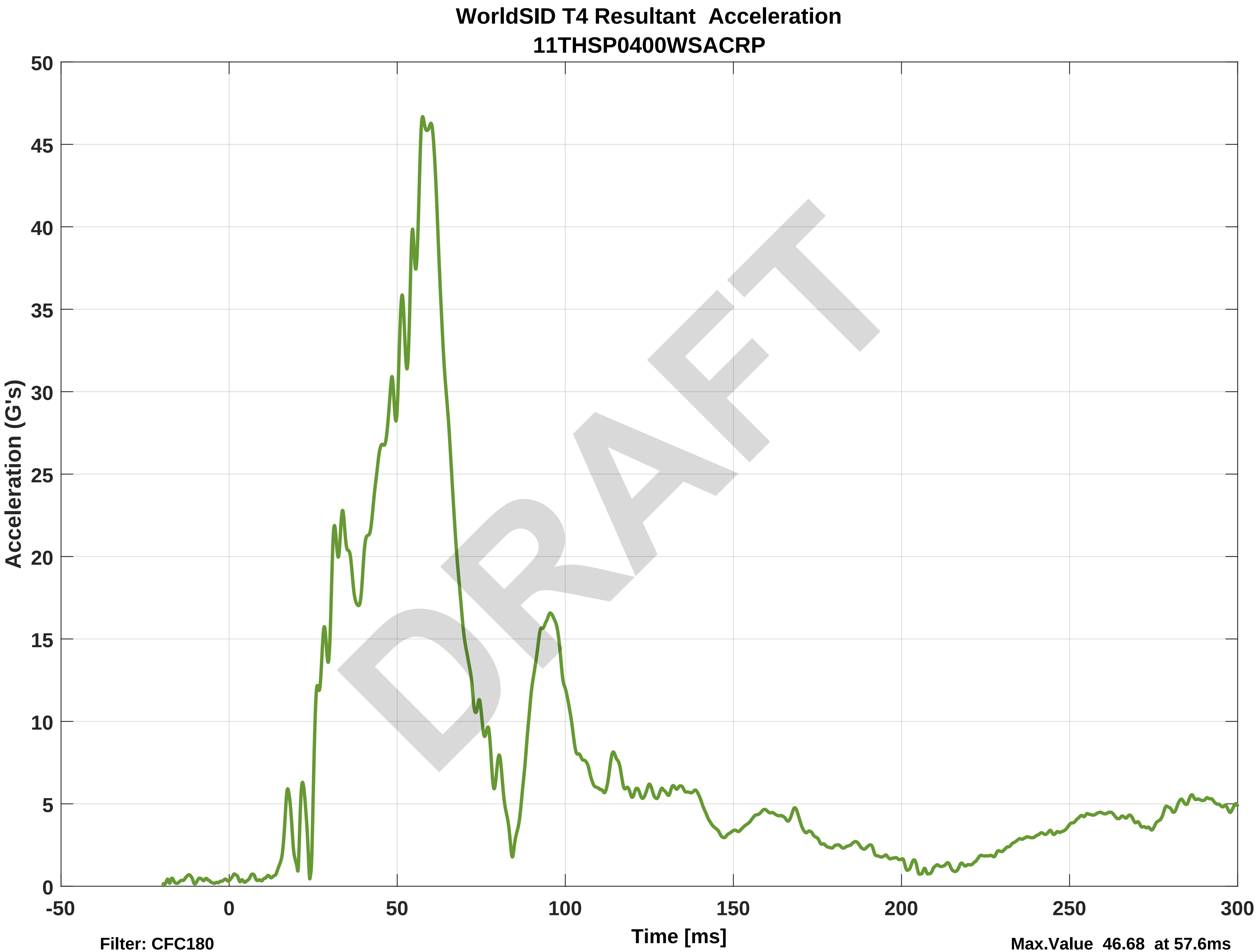

T4 X
11THSP0400WSACXP
Acceleration (G's)
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC180
Max.Value 14.28 at 58.1ms
Min.Value -6.77 at 100.4ms


T4 Y
11THSP0400WSACYP
Acceleration (G's)
Time [ms]
50
40
30
20
10
0
-10
-20
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC180
Max.Value 43.06 at 60.2ms
Min.Value -15.55 at 95.5ms



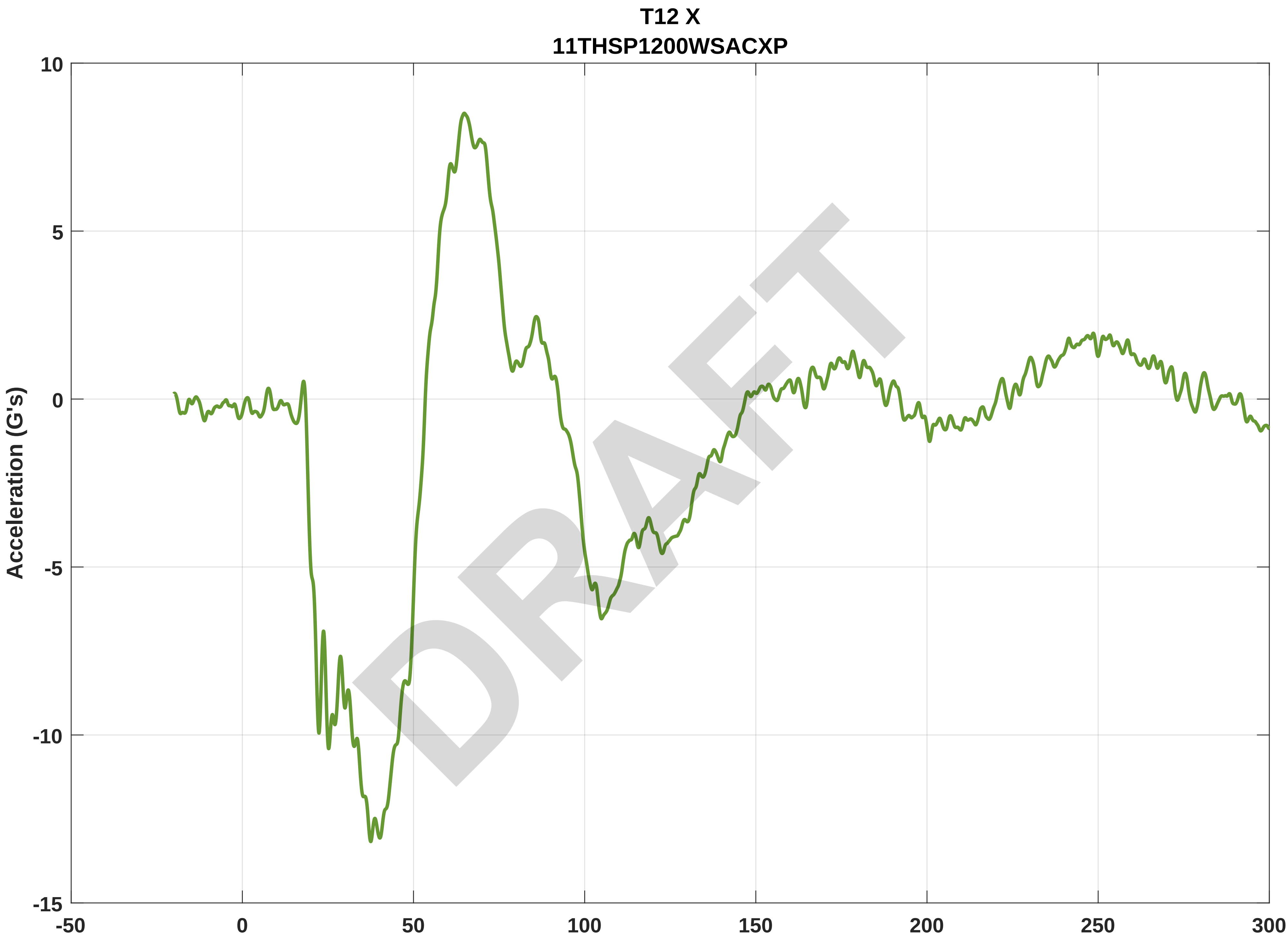
Filter: CFC180

Max.Value 4.3 at 69.1ms
Min.Value -13.77 at 54.6ms



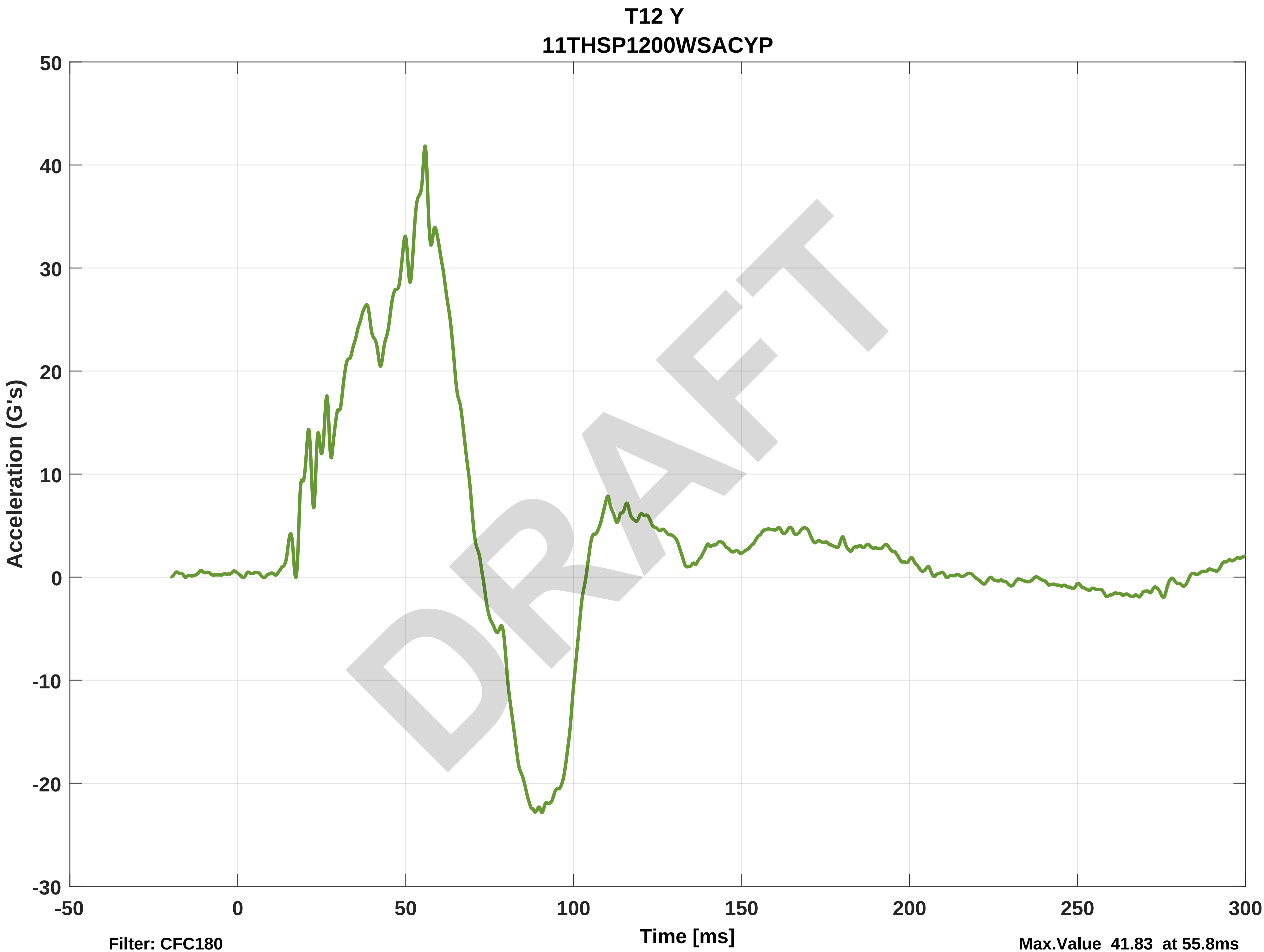
Filter: CFC180

Max.Value 46.68 at 57.6ms
Min.Value 0.13 at -19.2ms



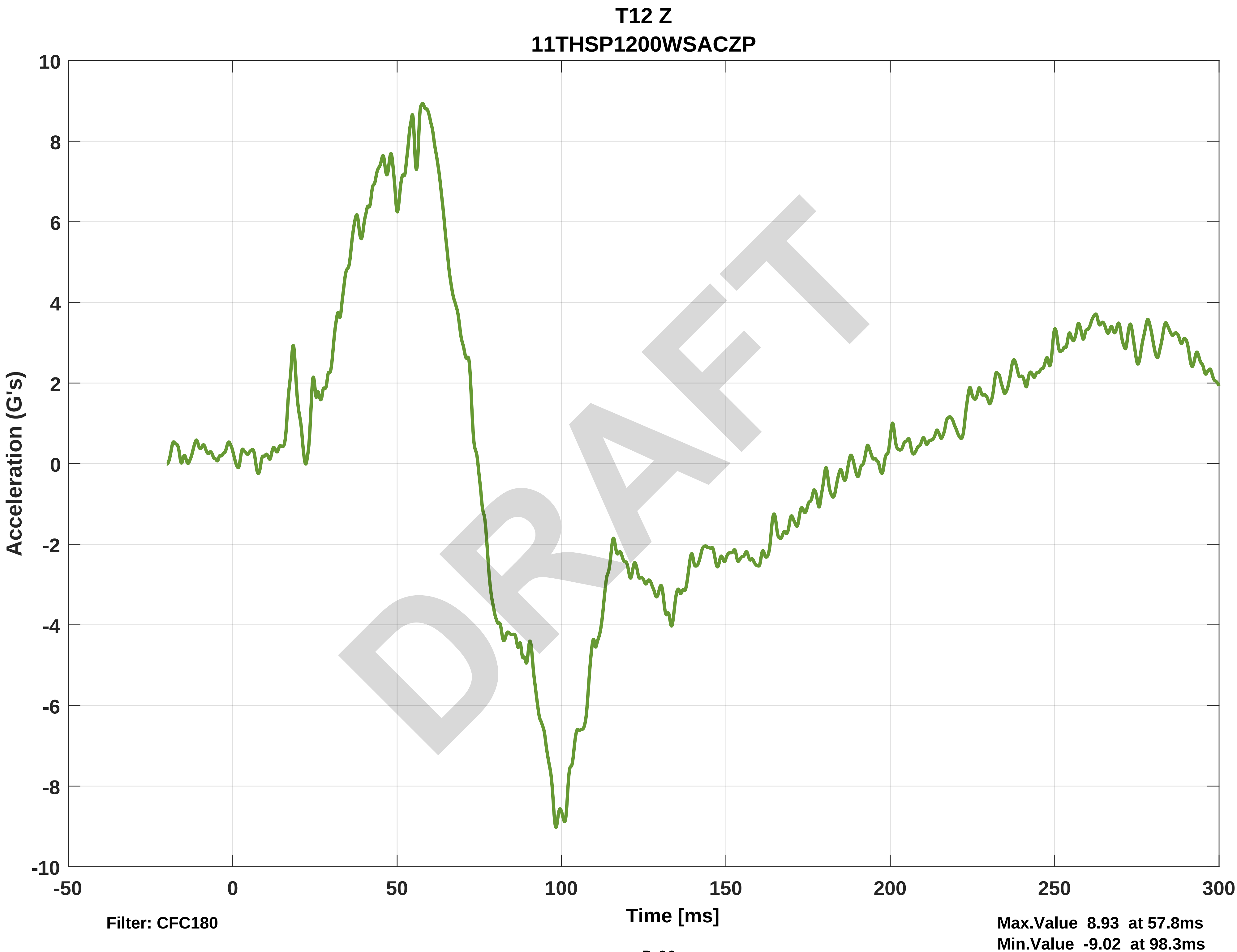
Filter: CFC180

Max.Value 8.51 at 64.9ms
Min.Value -13.17 at 37.5ms

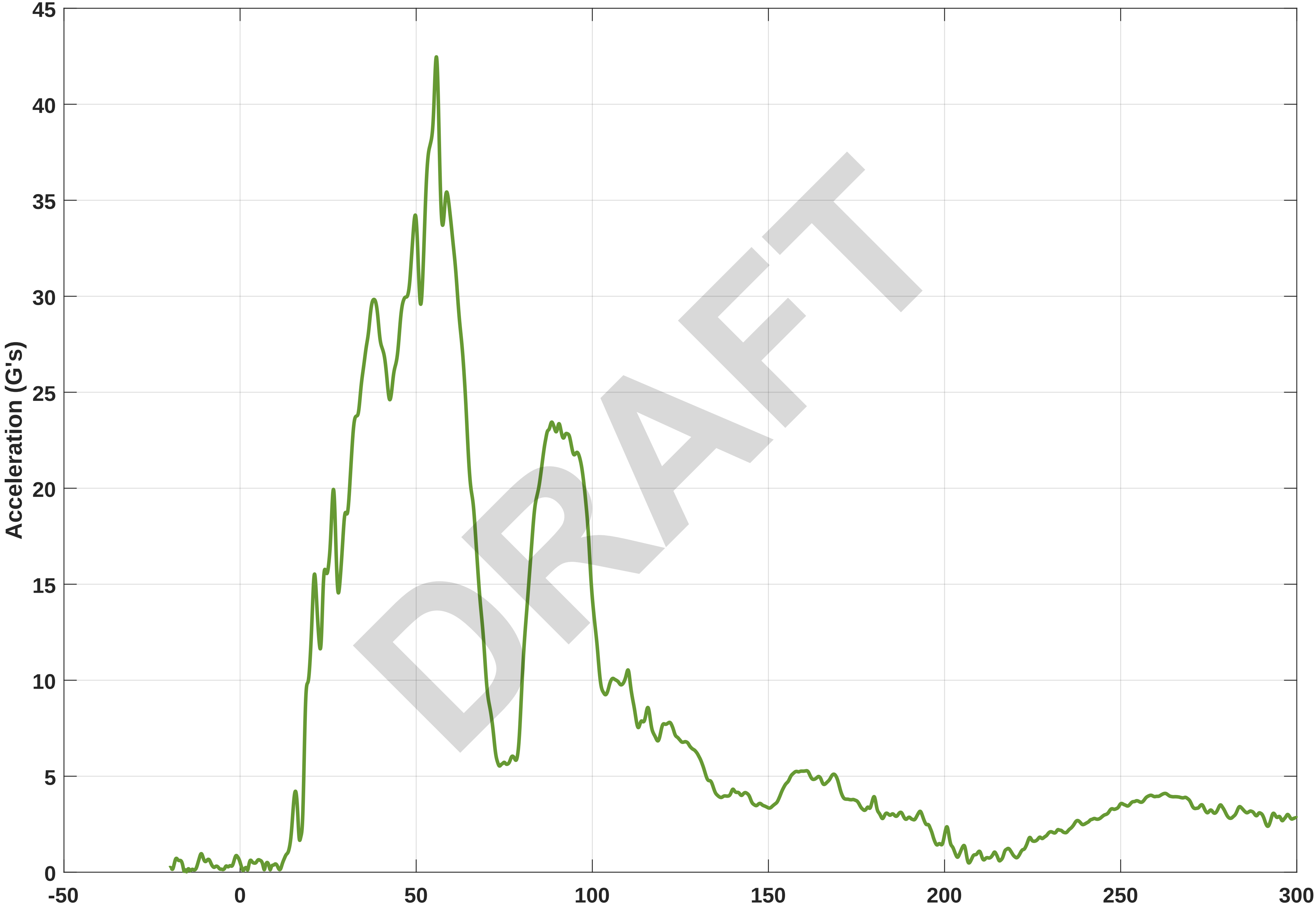


Filter: CFC180

Max.Value 41.83 at 55.8ms
Min.Value -22.85 at 90.6ms


T12 Z
11THSP1200WSACZP
Acceleration (G's)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-50
0
50
100
150
200
250
300
Time [ms]
Filter: CFC180
Max.Value 8.93 at 57.8ms
Min.Value -9.02 at 98.3ms

WorldSID T12 Resultant Acceleration
11THSP1200WSACRP

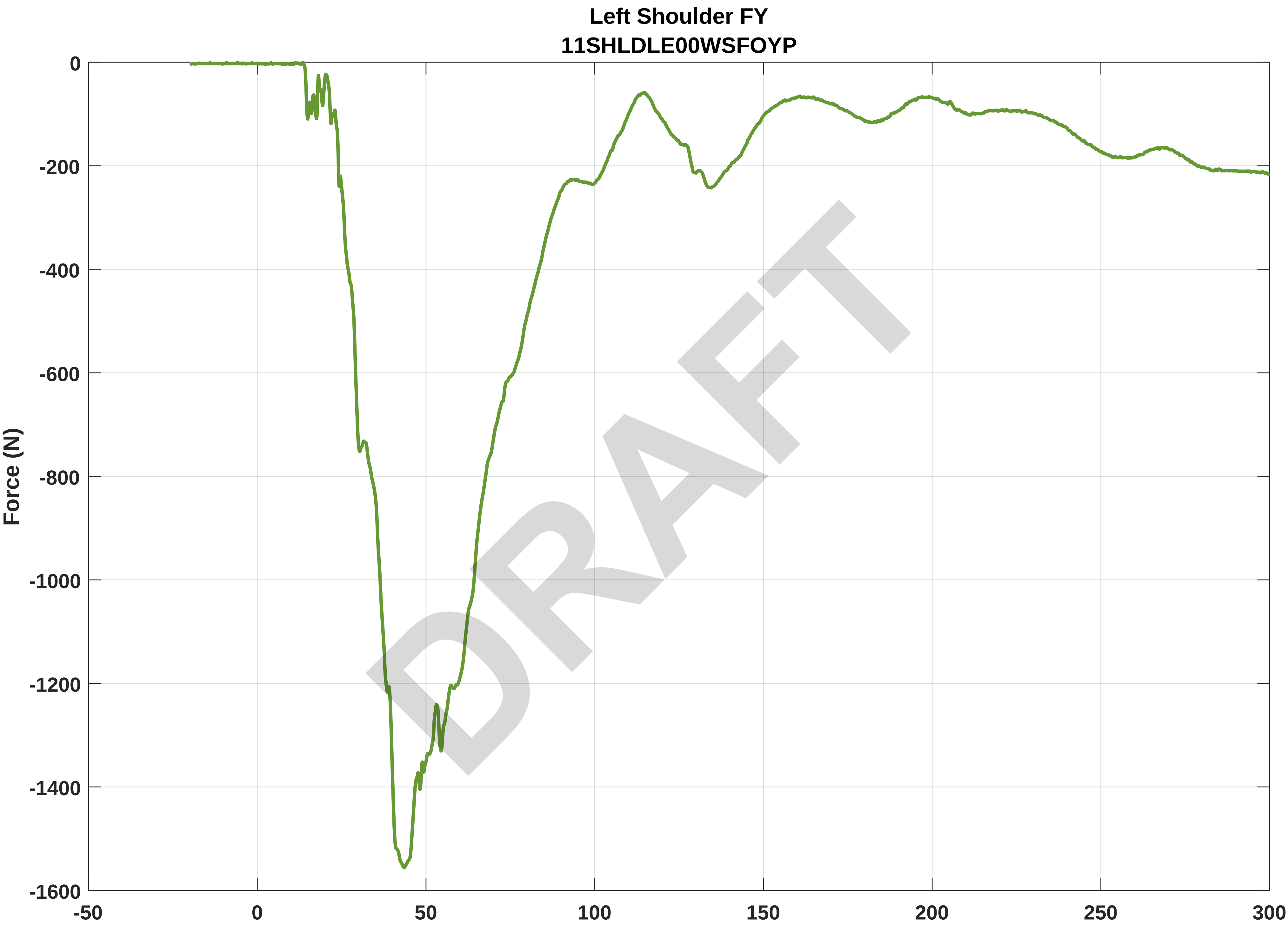


Filter: CFC180

Max.Value 42.47 at 55.8ms
Min.Value 0.02 at -15.2ms

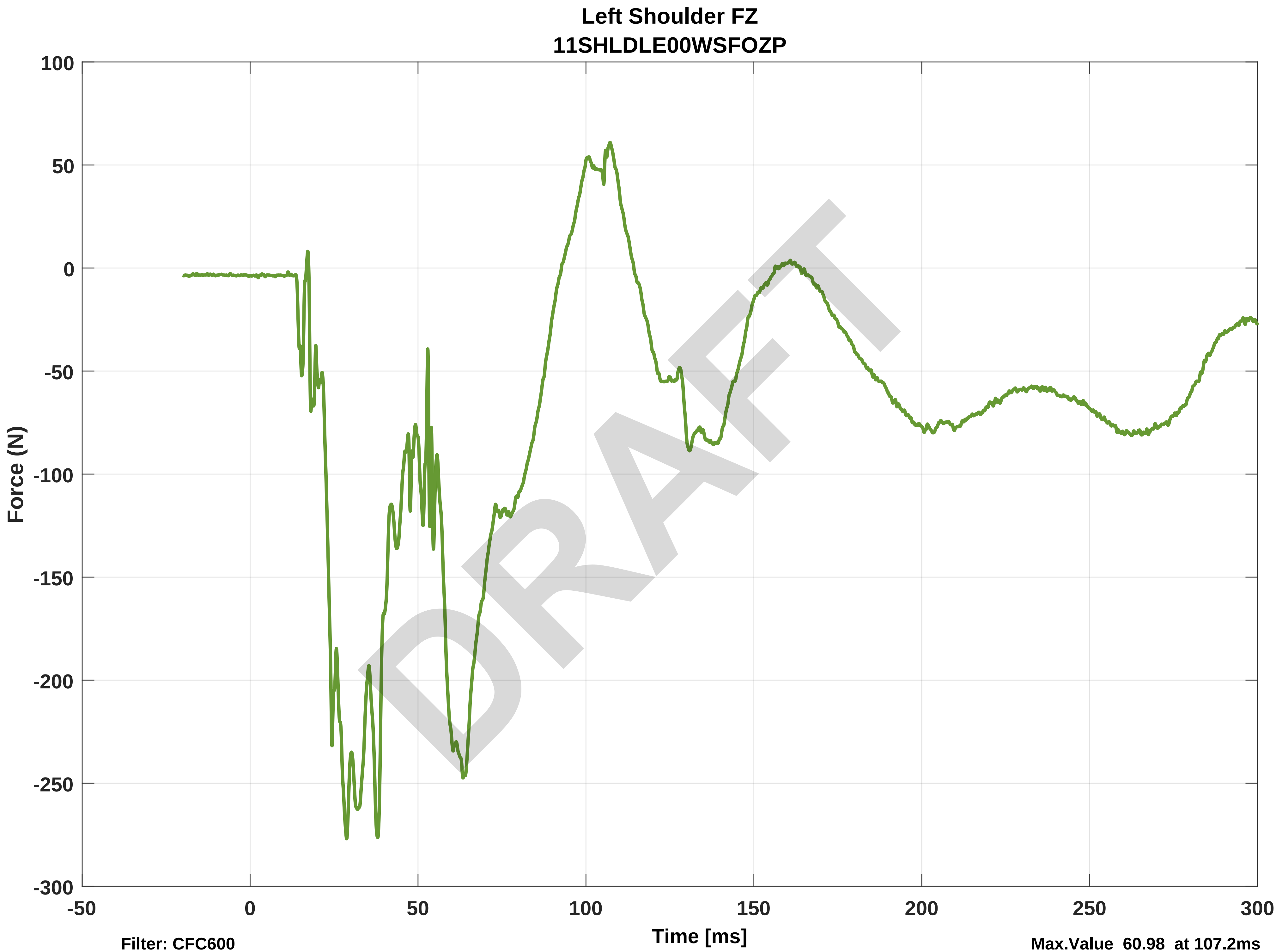
Filter: CFC600

Max.Value 111.37 at 129.4ms
Min.Value -767.51 at 63.2ms



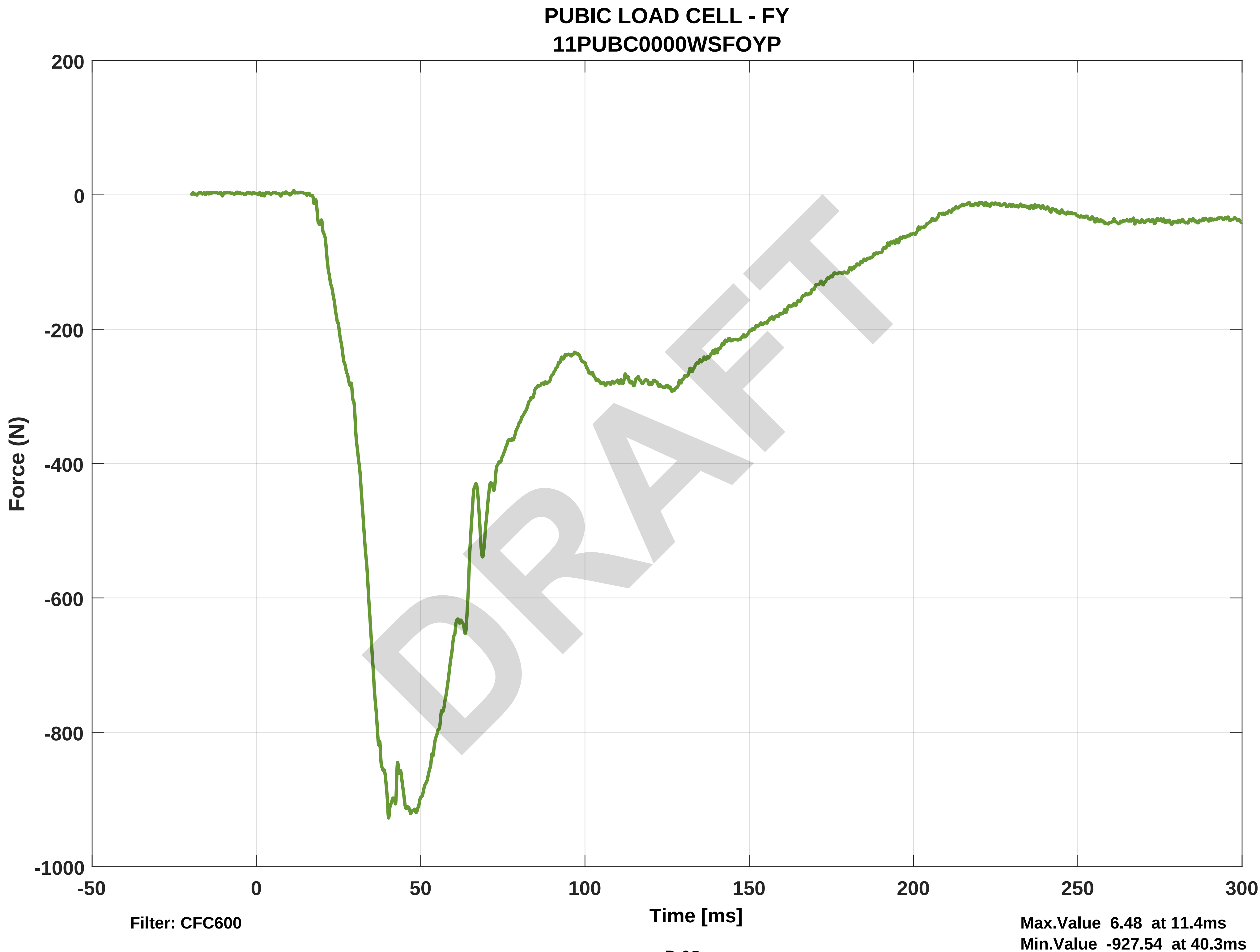
Filter: CFC600

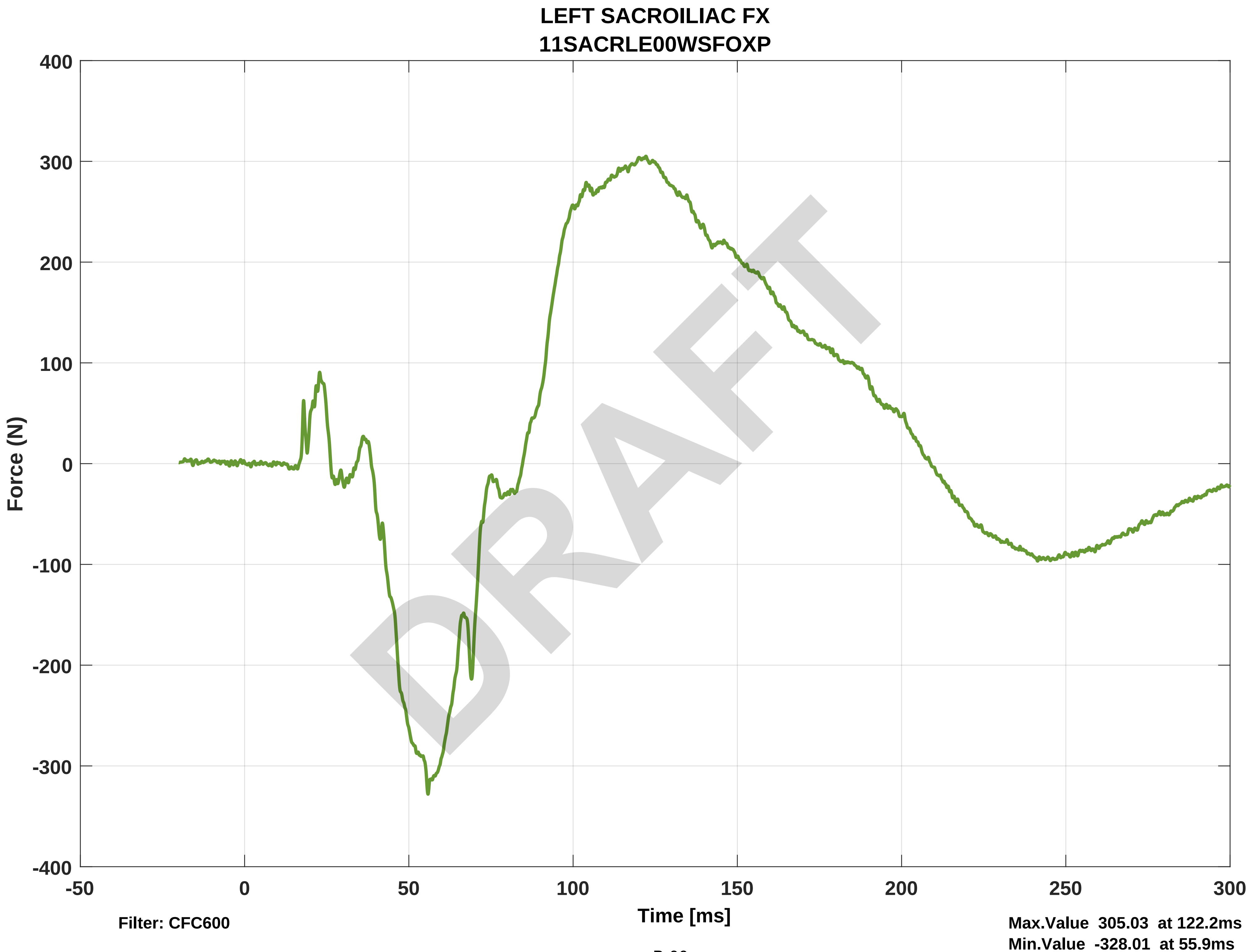
Max.Value -0.25 at 13.5ms
Min.Value -1555.91 at 43.6ms

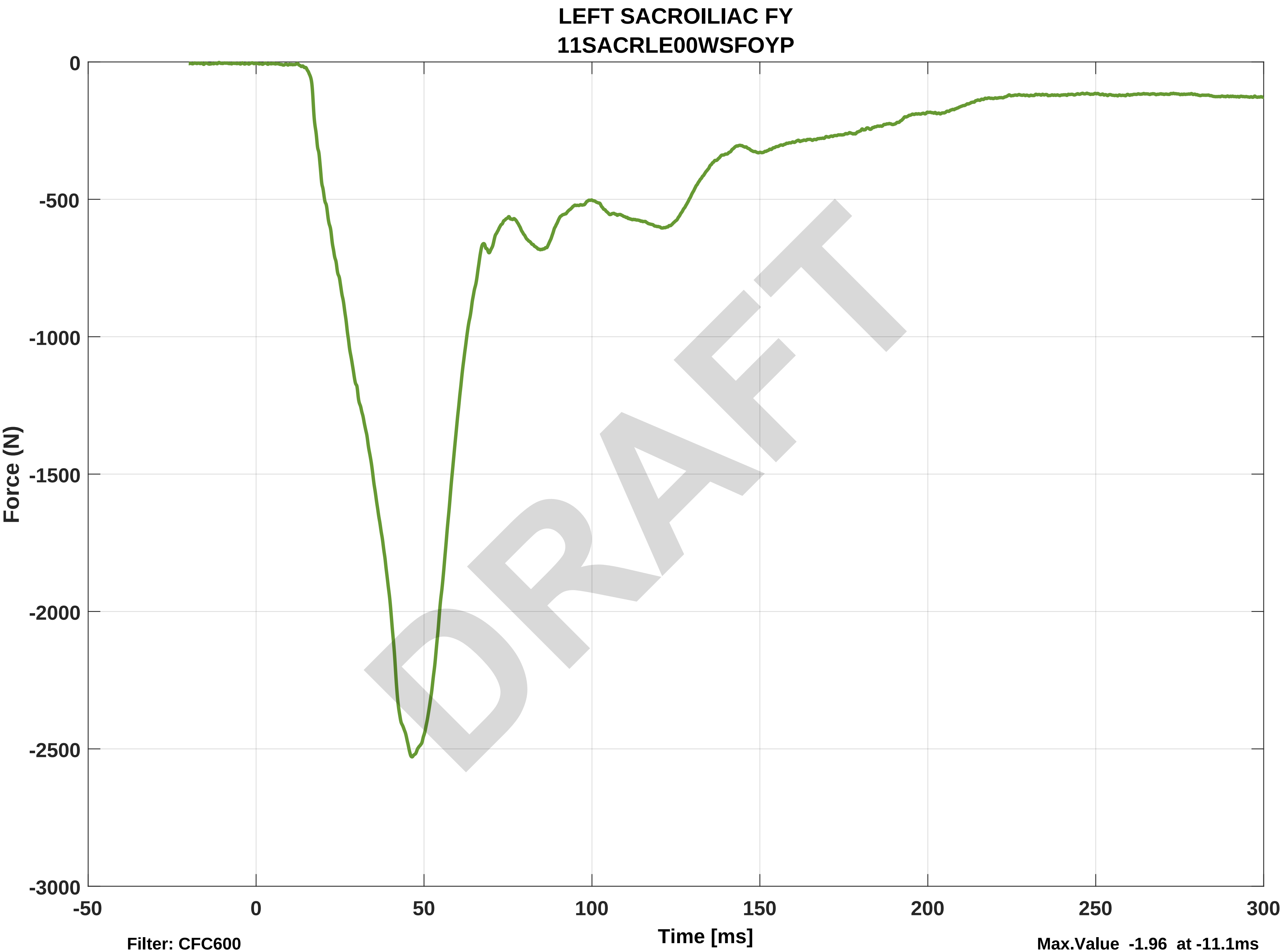


Filter: CFC600

Max.Value 60.98 at 107.2ms
Min.Value -276.94 at 28.8ms

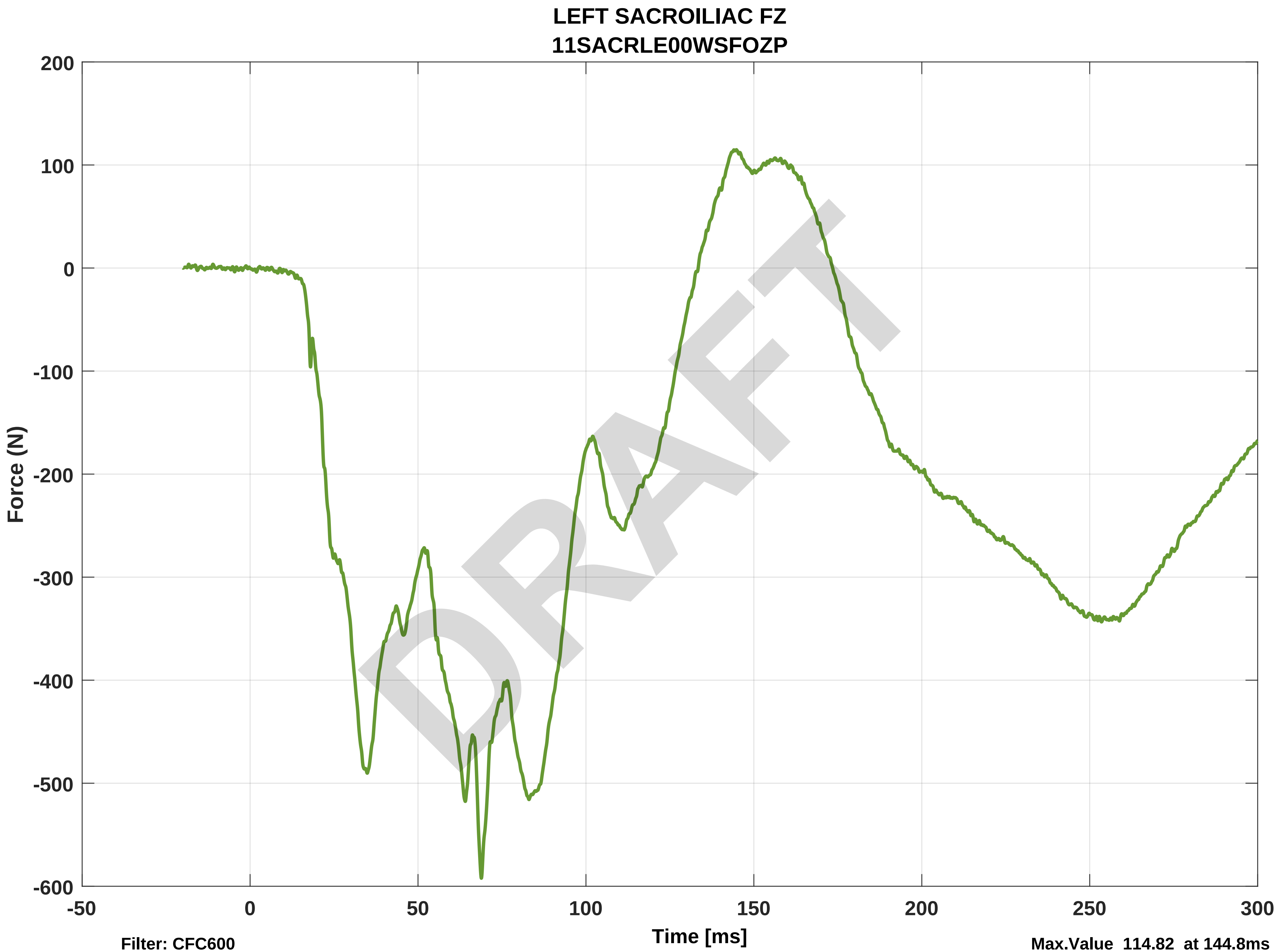

PUBIC LOAD CELL - FY
11PUBC0000WSFOYP
200
0
-200
-400
-600
-800
-1000
-50
0
50
100
150
200
250
300
Force (N)
Time [ms]
DRAFT
Filter: CFC600
Max.Value 6.48 at 11.4ms
Min.Value -927.54 at 40.3ms


LEFT SACROILIAC FX
11SACRLE00WSFOXP
400
300
200
100
0
-100
-200
-300
-400
Force (N)
-50
0
50
100
150
200
250
300
Time [ms]
Filter: CFC600
Max.Value 305.03 at 122.2ms
Min.Value -328.01 at 55.9ms
DRAFT



Filter: CFC600

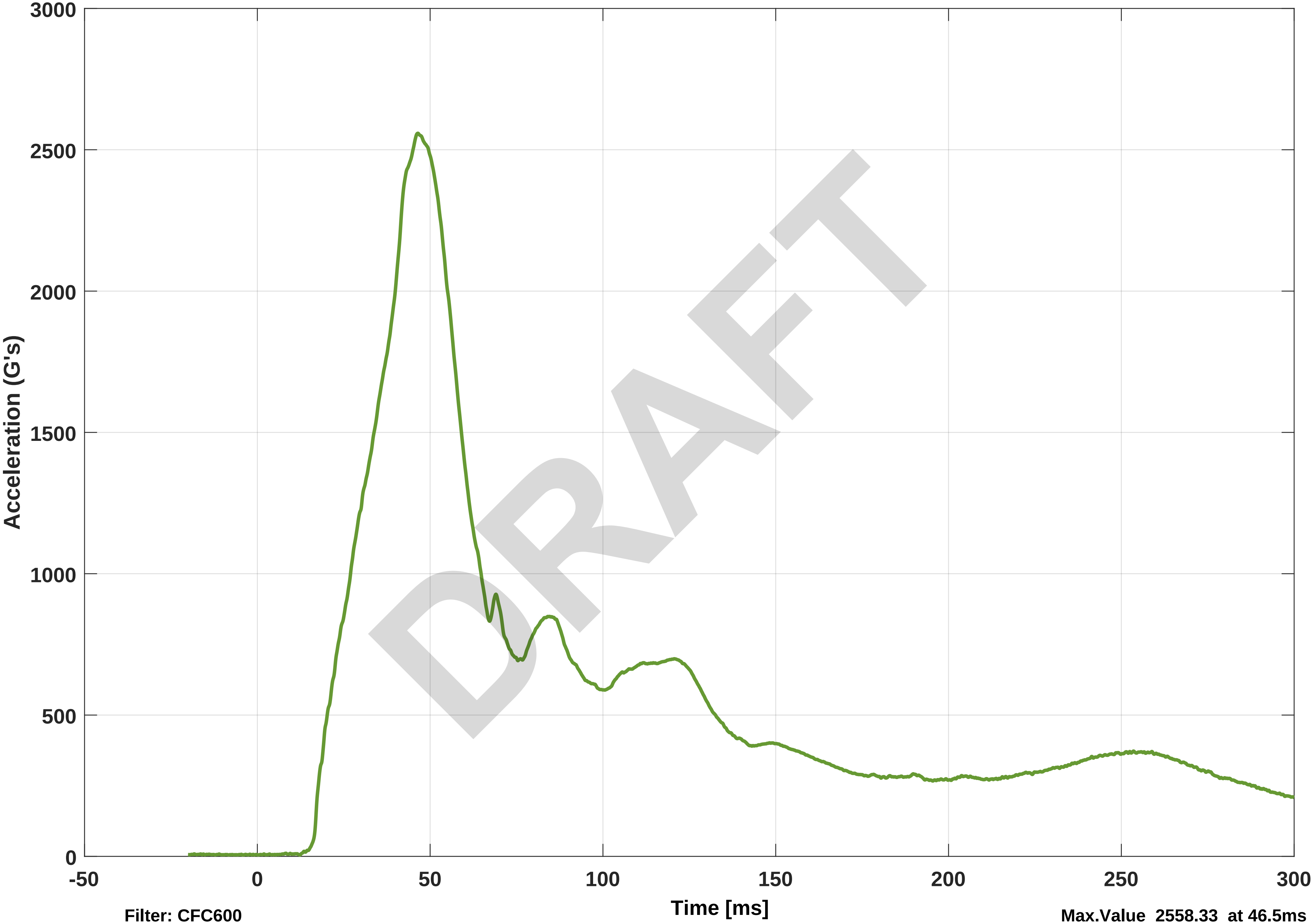
Max.Value -1.96 at -11.1ms
Min.Value -2529.1 at 46.5ms



Filter: CFC600

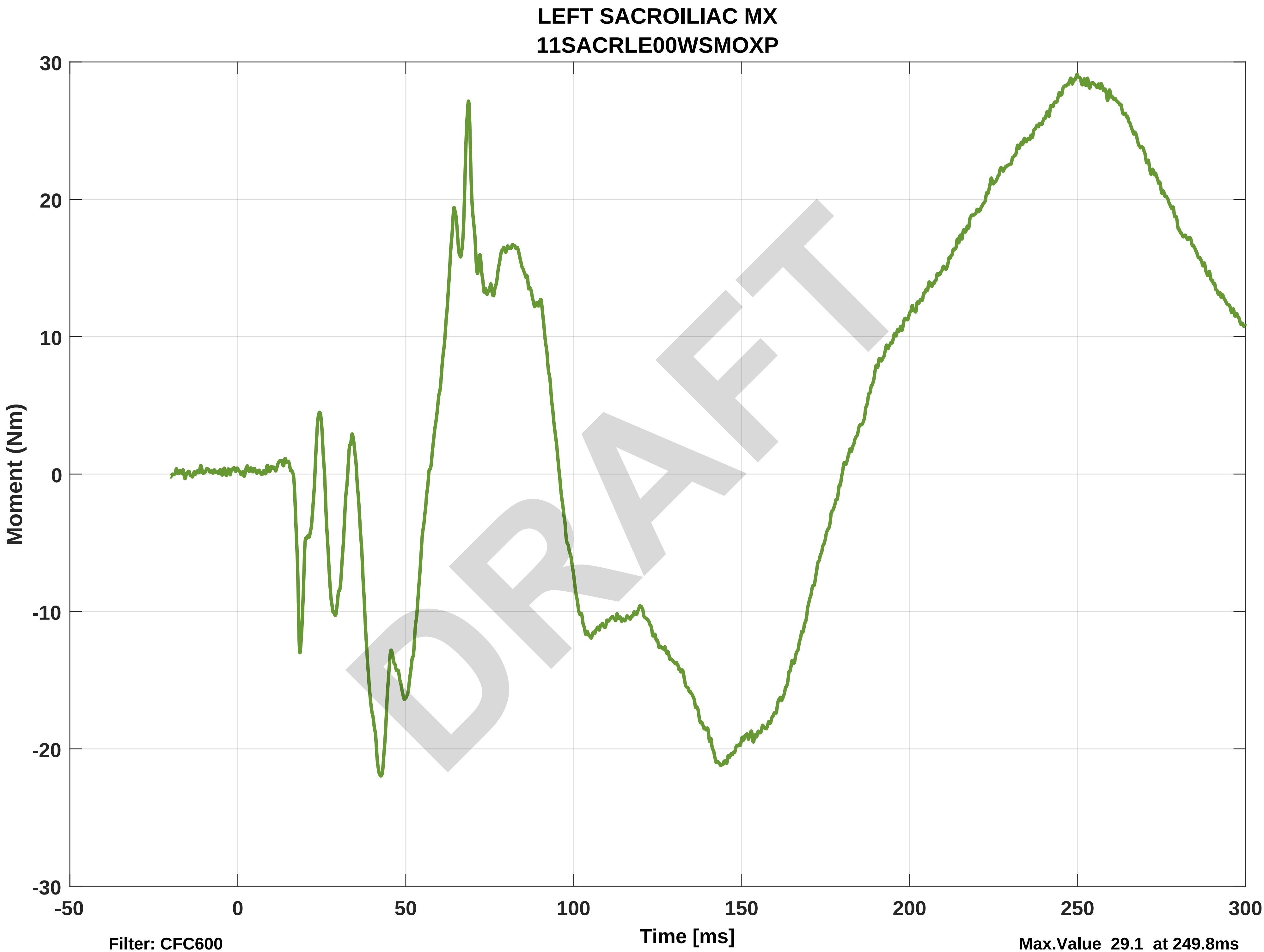
Max.Value 114.82 at 144.8ms
Min.Value -592.17 at 68.9ms

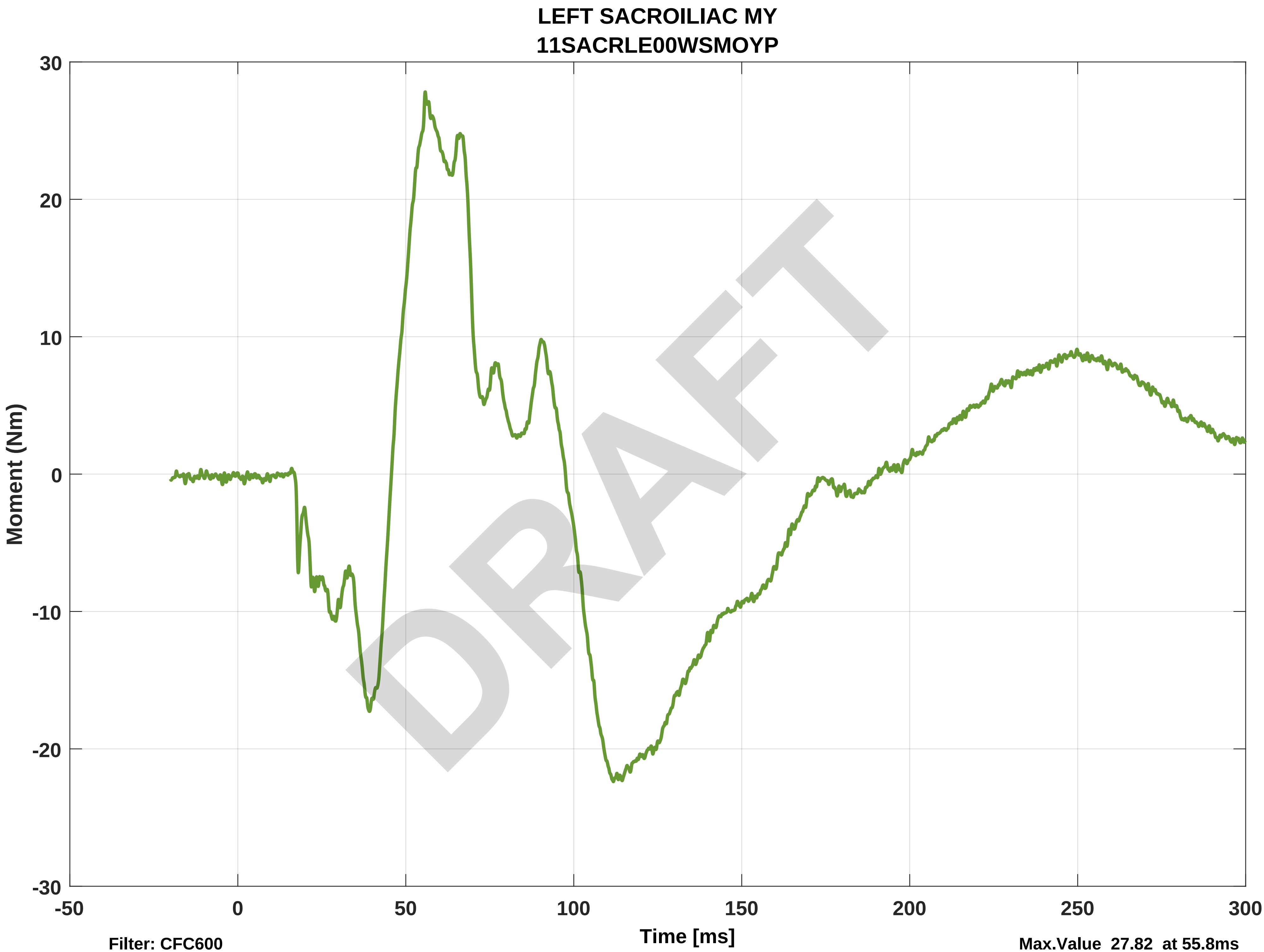
WorldSID LEFT SACROILIAC Resultant Force
11SACRLE00WSFOXP

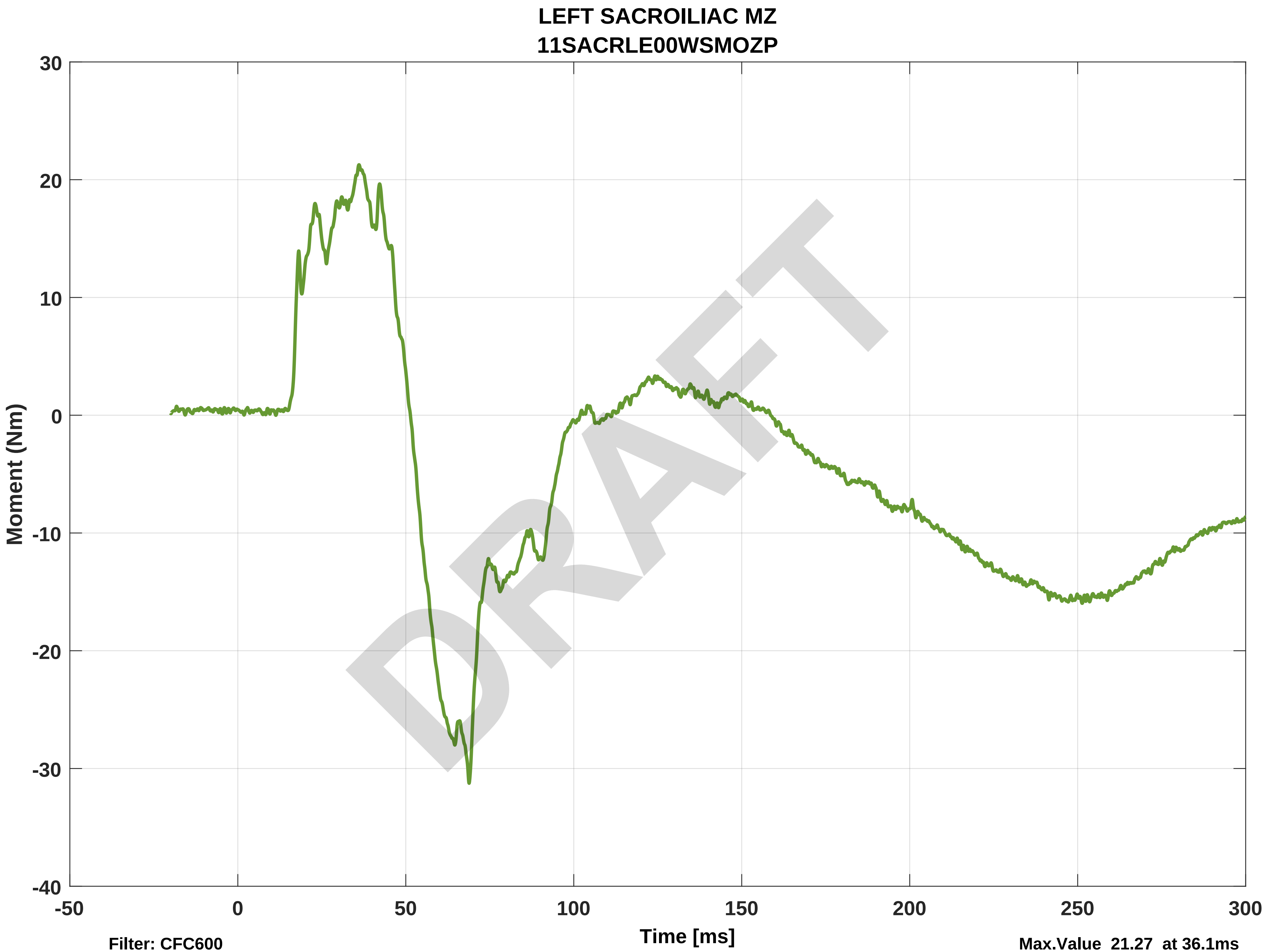


Filter: CFC600

Max.Value 2558.33 at 46.5ms
Min.Value 4.74 at -4.3ms

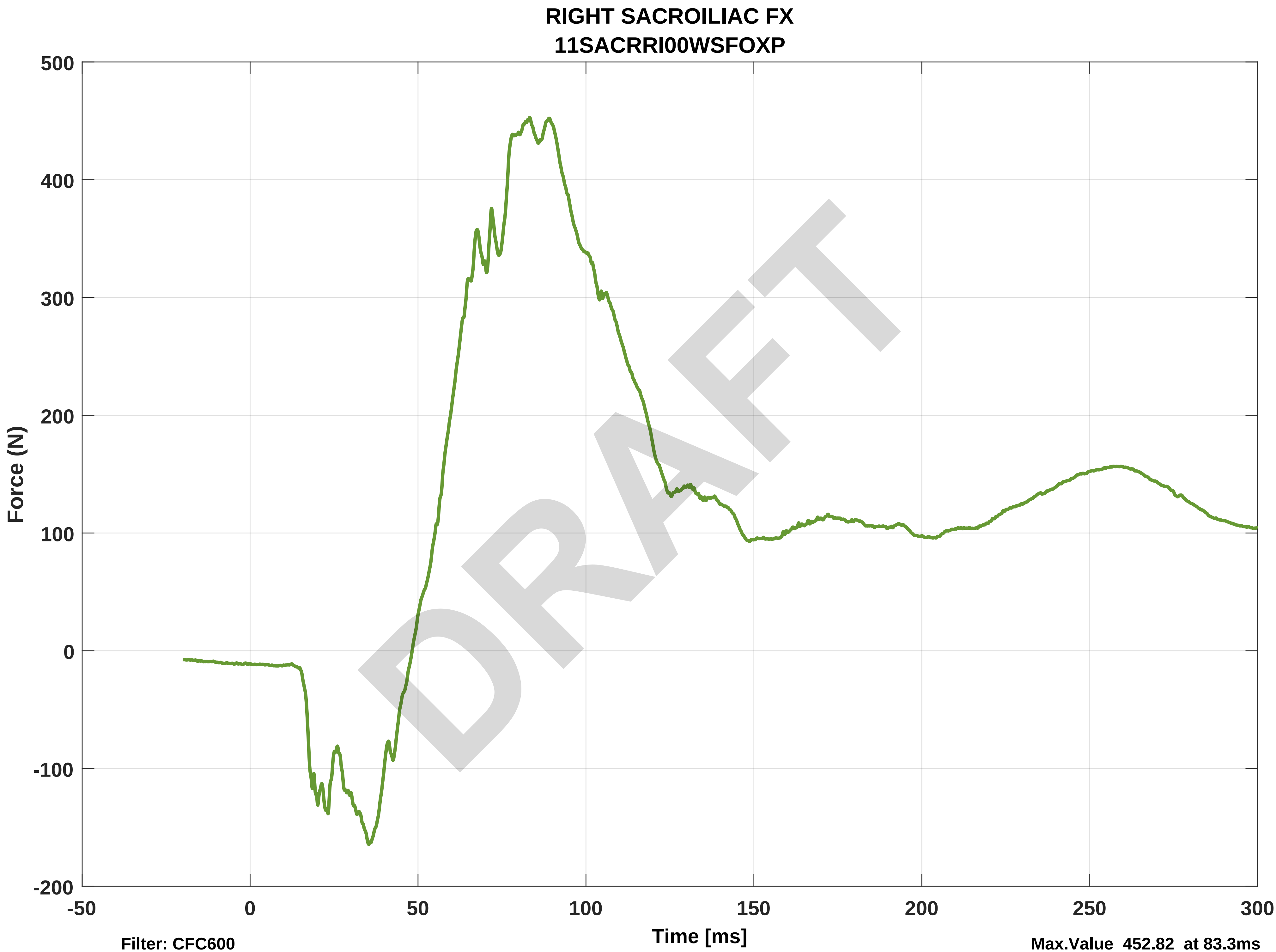

LEFT SACROILIAC MX
11SACRLE00WSMOXP
Moment (Nm)
30
20
10
0
-10
-20
-30
-50
0
50
100
150
200
250
300
Time [ms]
Filter: CFC600
Max.Value 29.1 at 249.8ms
Min.Value -21.97 at 42.6ms
DRAFT


LEFT SACROILIAC MY
11SACRLE00WSMOYP
Moment (Nm)
Time [ms]
30
20
10
0
-10
-20
-30
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC600
Max.Value 27.82 at 55.8ms
Min.Value -22.38 at 111.8ms



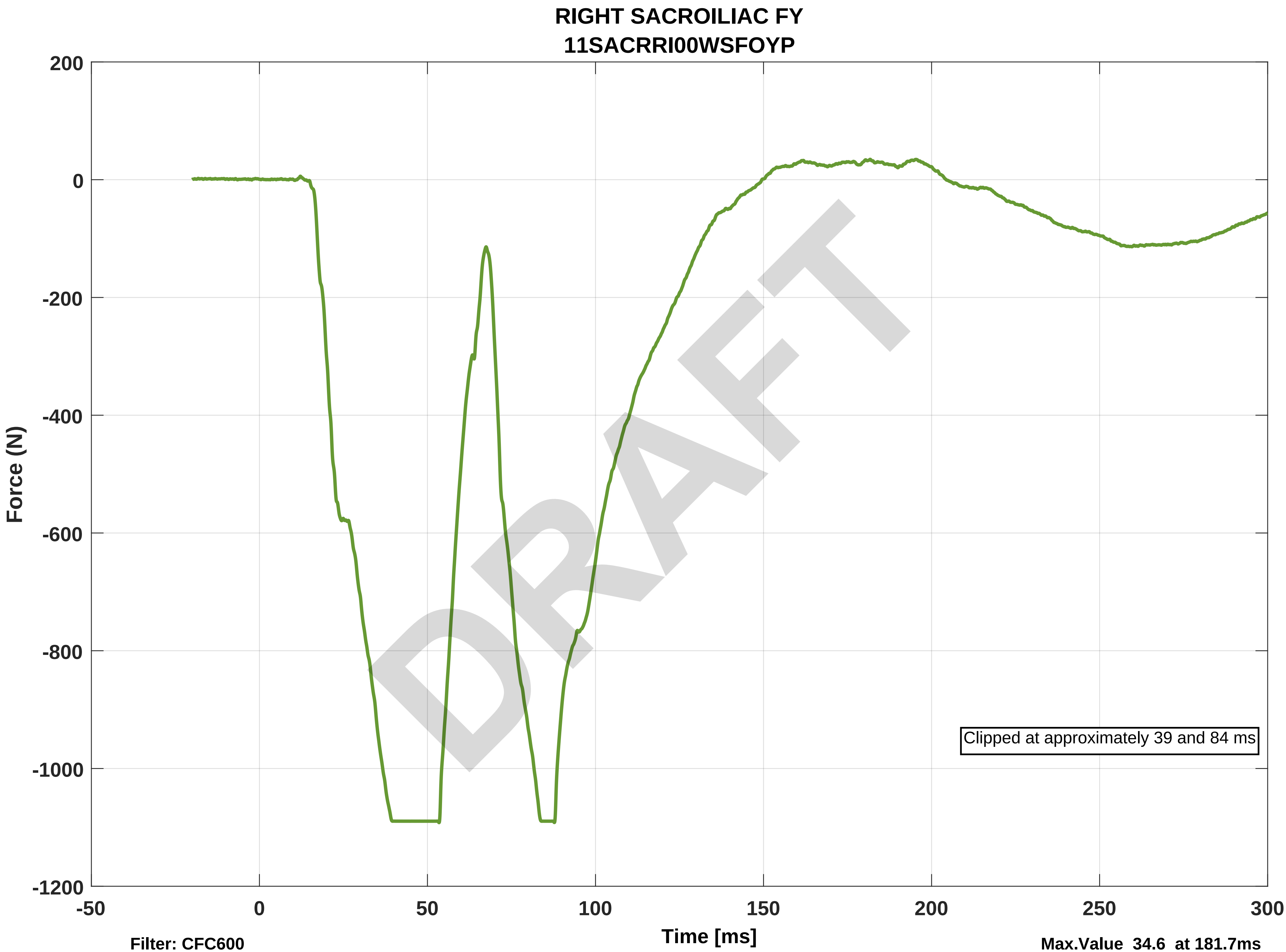
Filter: CFC600

Max.Value 21.27 at 36.1ms
Min.Value -31.25 at 68.9ms

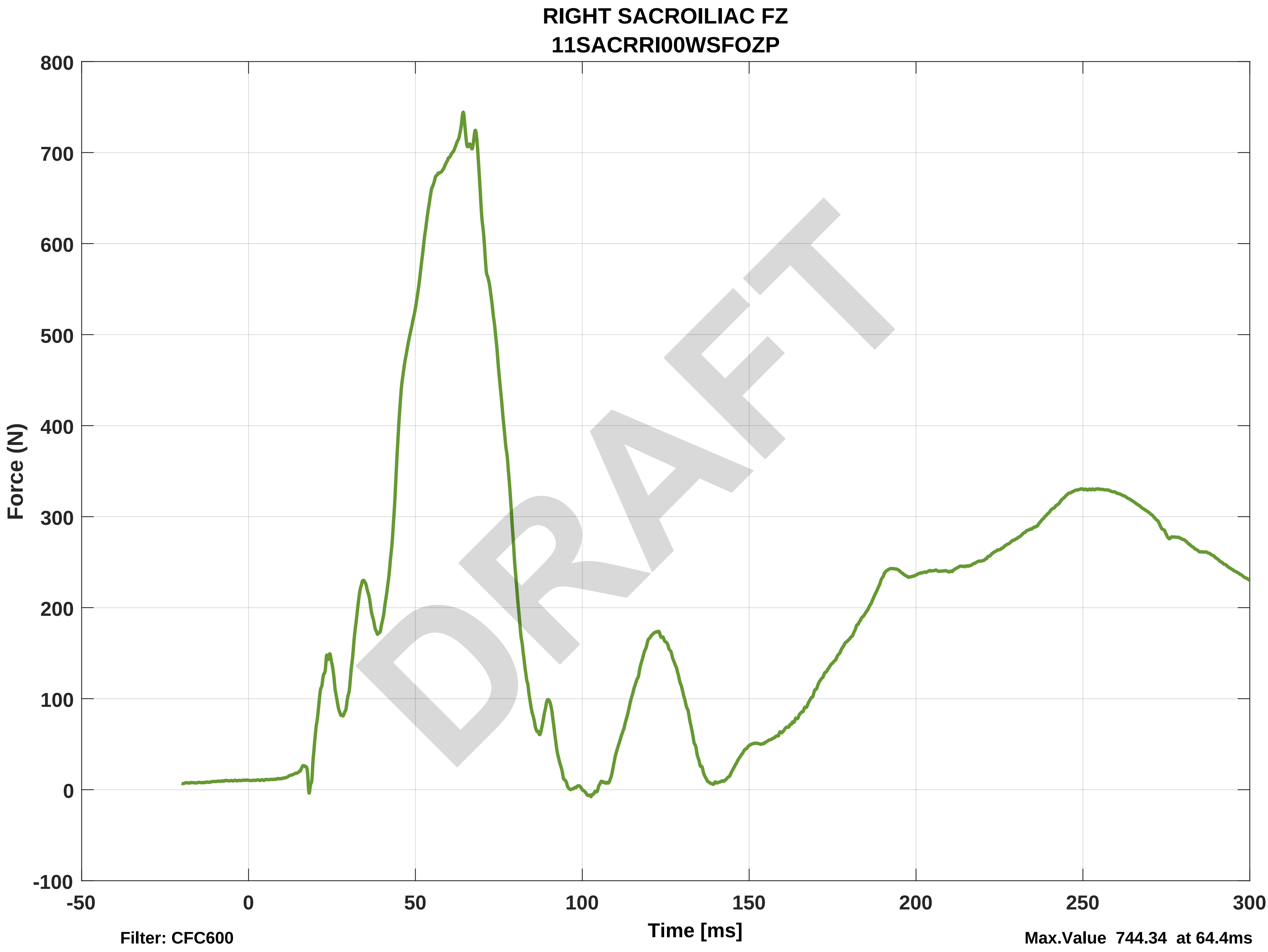


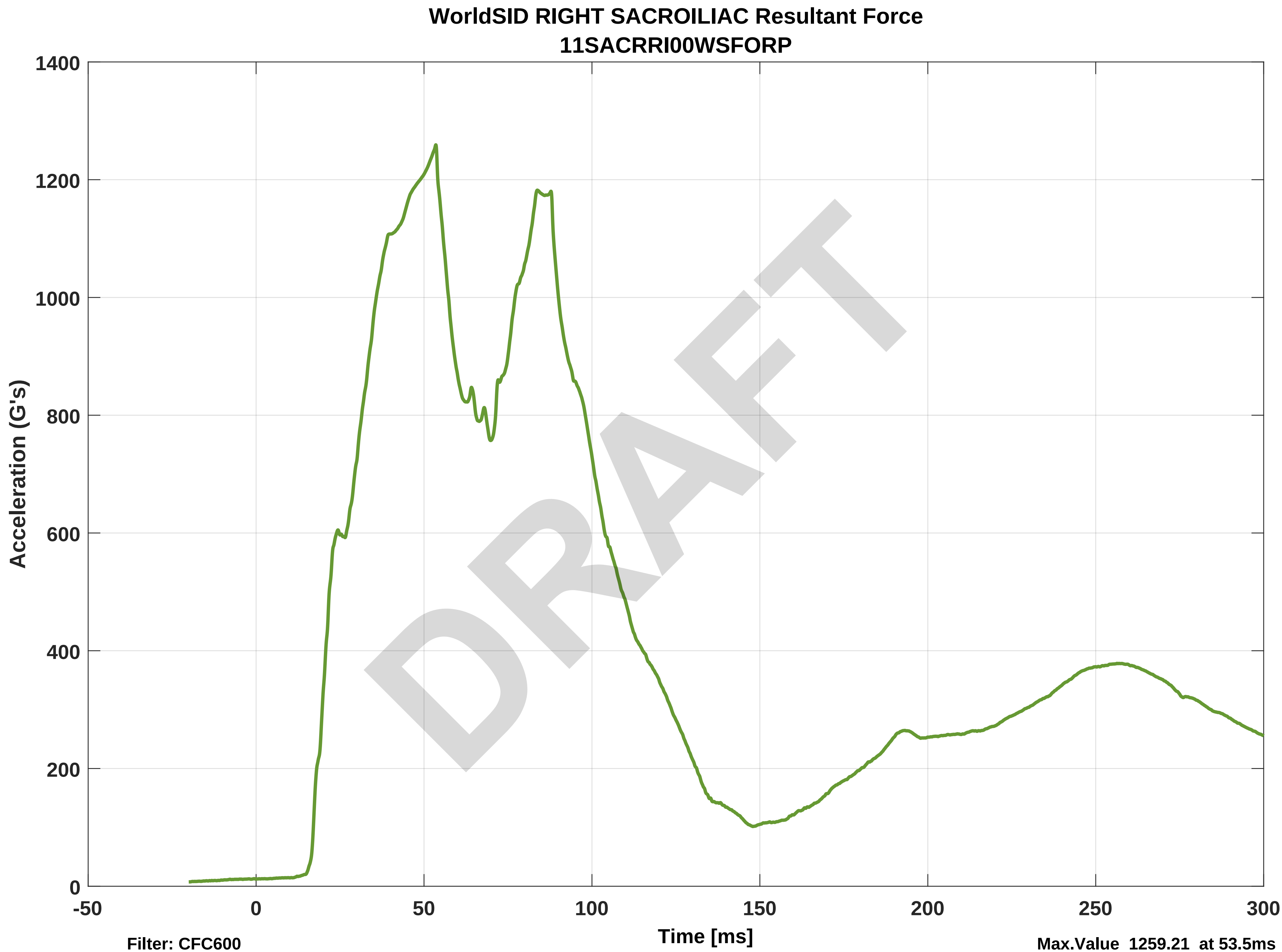
Filter: CFC600

Max.Value 452.82 at 83.3ms
Min.Value -164.37 at 35.3ms

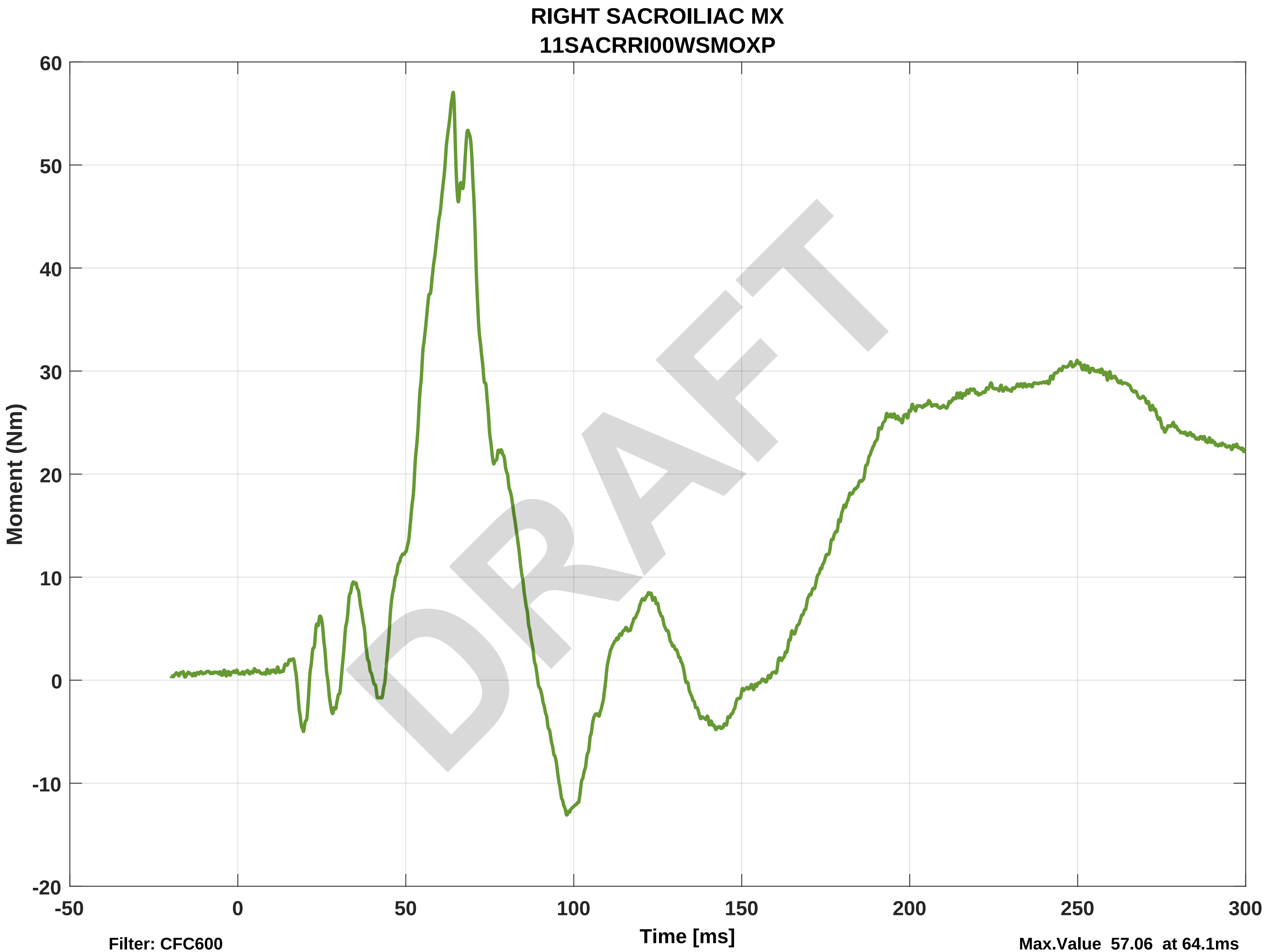


RIGHT SACROILIAC FY
11SACRRI00WSFOYP
200
0
-200
-400
-600
-800
-1000
-1200
-50
0
50
100
150
200
250
300
Force (N)
Time [ms]
Clipped at approximately 39 and 84 ms
DRAFT
Filter: CFC600
Max.Value 34.6 at 181.7ms
Min.Value -1091.9 at 53.5ms


RIGHT SACROILIAC FZ
11SACRRI00WSFOZP
800
700
600
500
400
300
200
100
0
-100
Force (N)
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC600
Max.Value 744.34 at 64.4ms
Min.Value -7.73 at 102.6ms

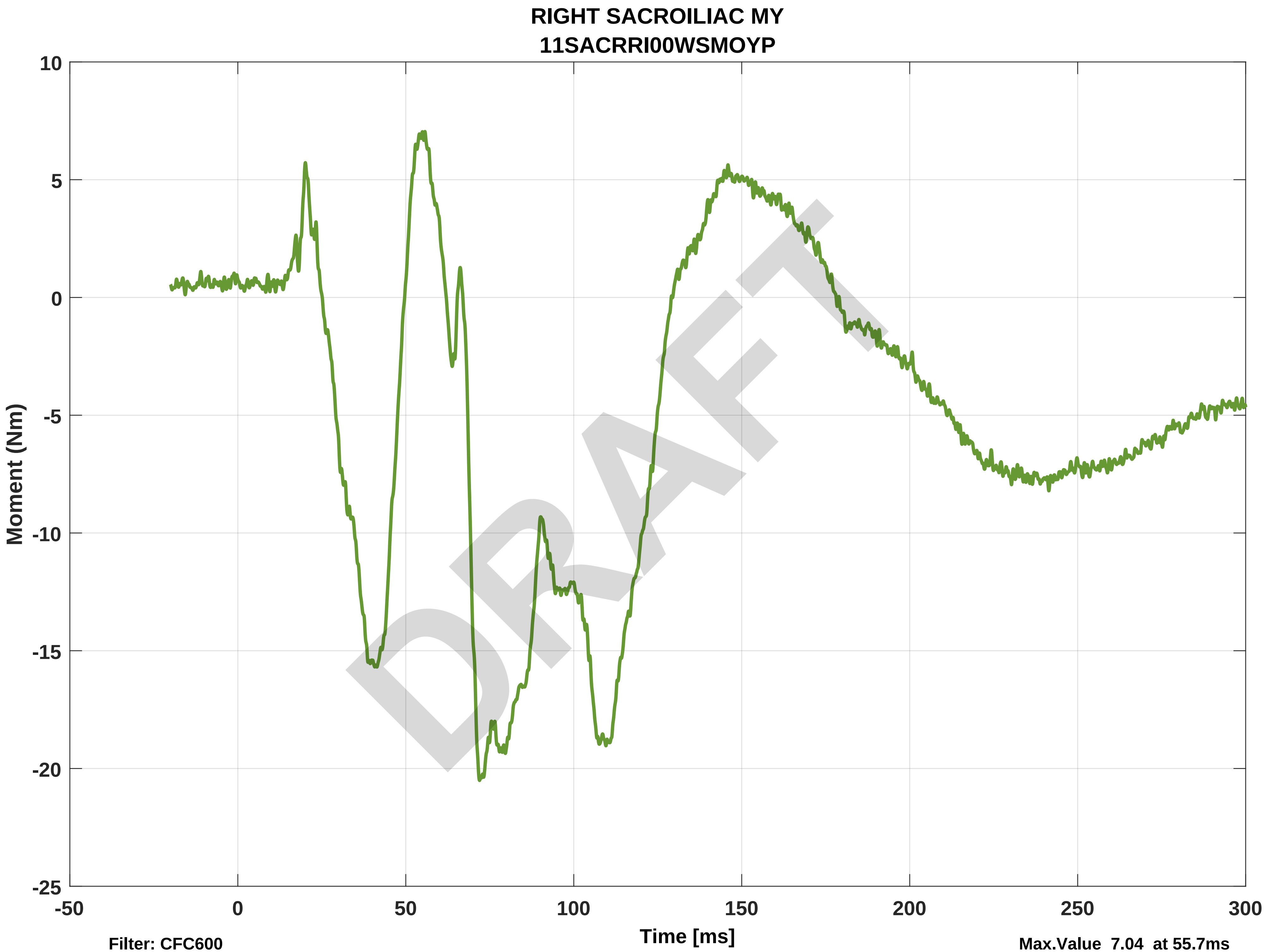


WorldSID RIGHT SACROILIAC Resultant Force
11SACRRI00WSFORP
Acceleration (G's)
1400
1200
1000
800
600
400
200
0
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC600
Max.Value 1259.21 at 53.5ms
Min.Value 7.43 at -20.1ms



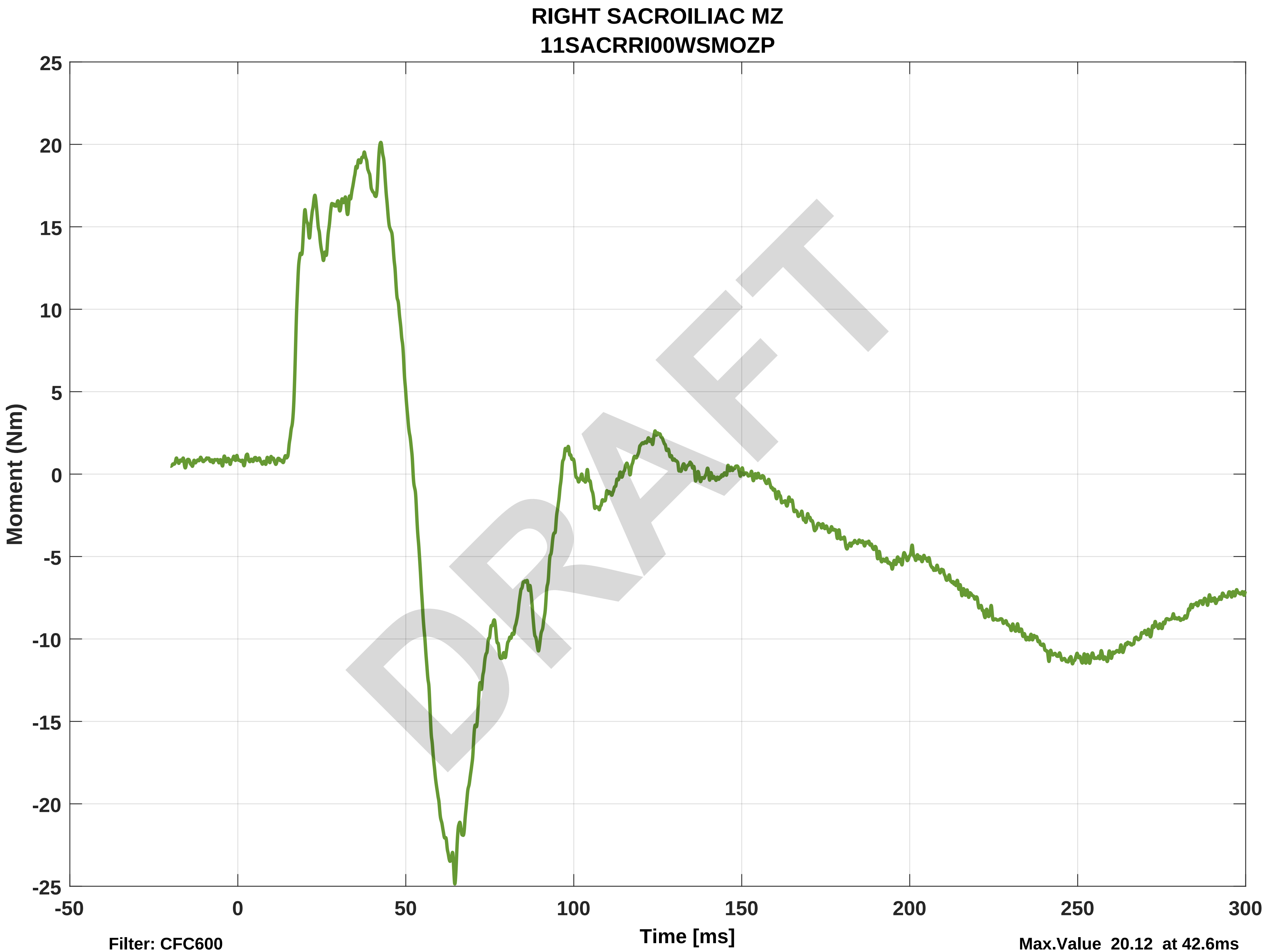
Filter: CFC600

Max.Value 57.06 at 64.1ms
Min.Value -13.09 at 97.9ms



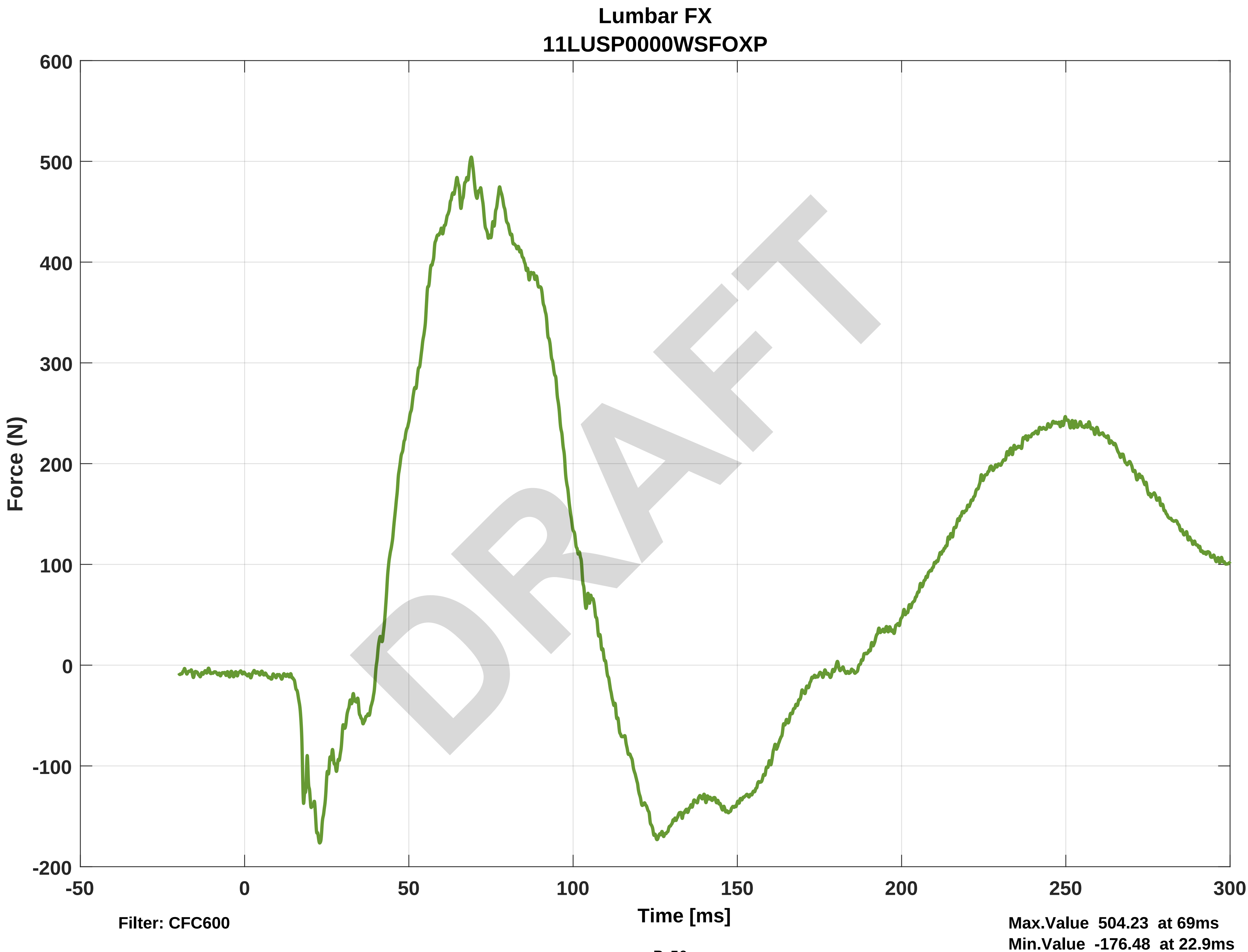
Filter: CFC600

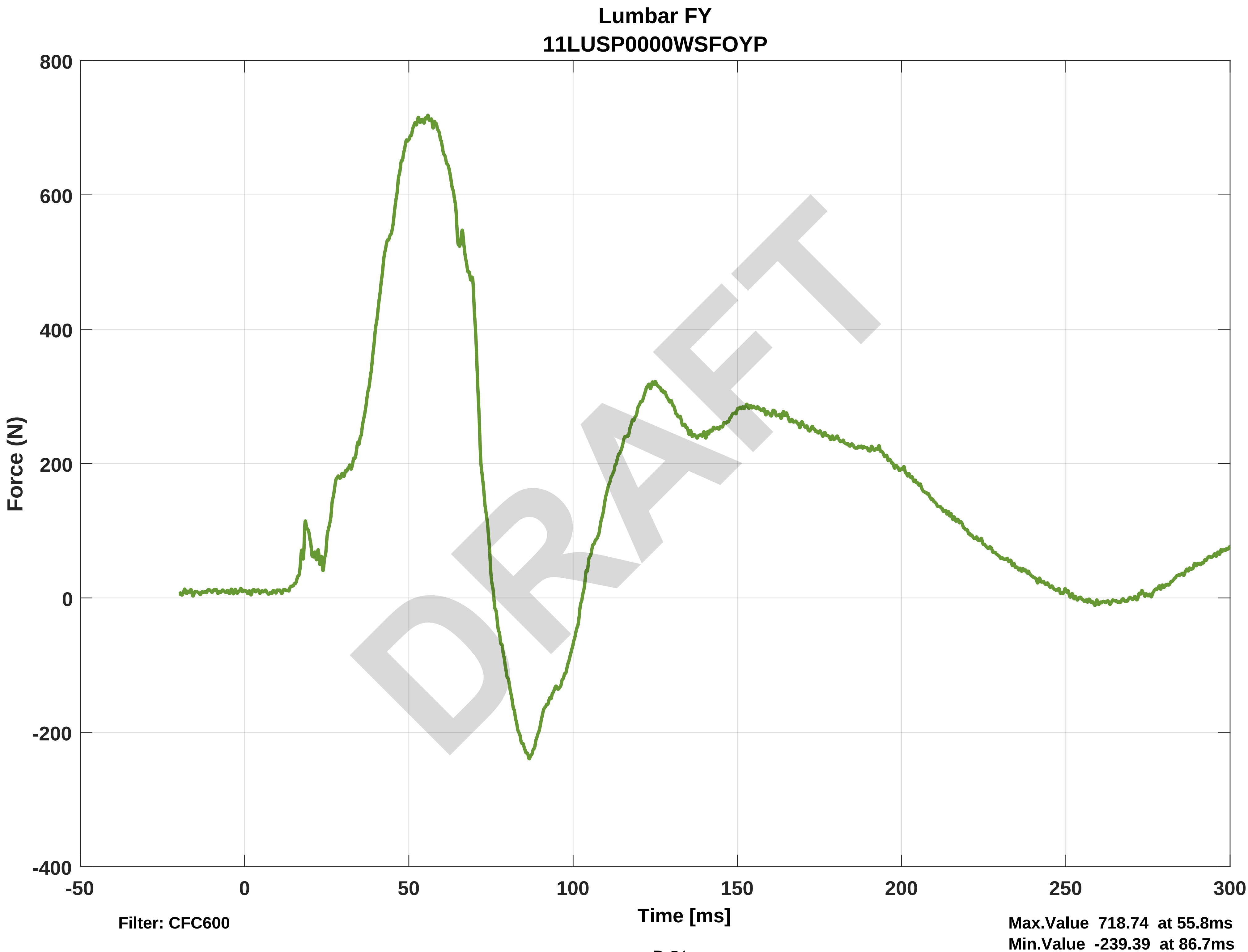
Max.Value 7.04 at 55.7ms
Min.Value -20.51 at 72ms



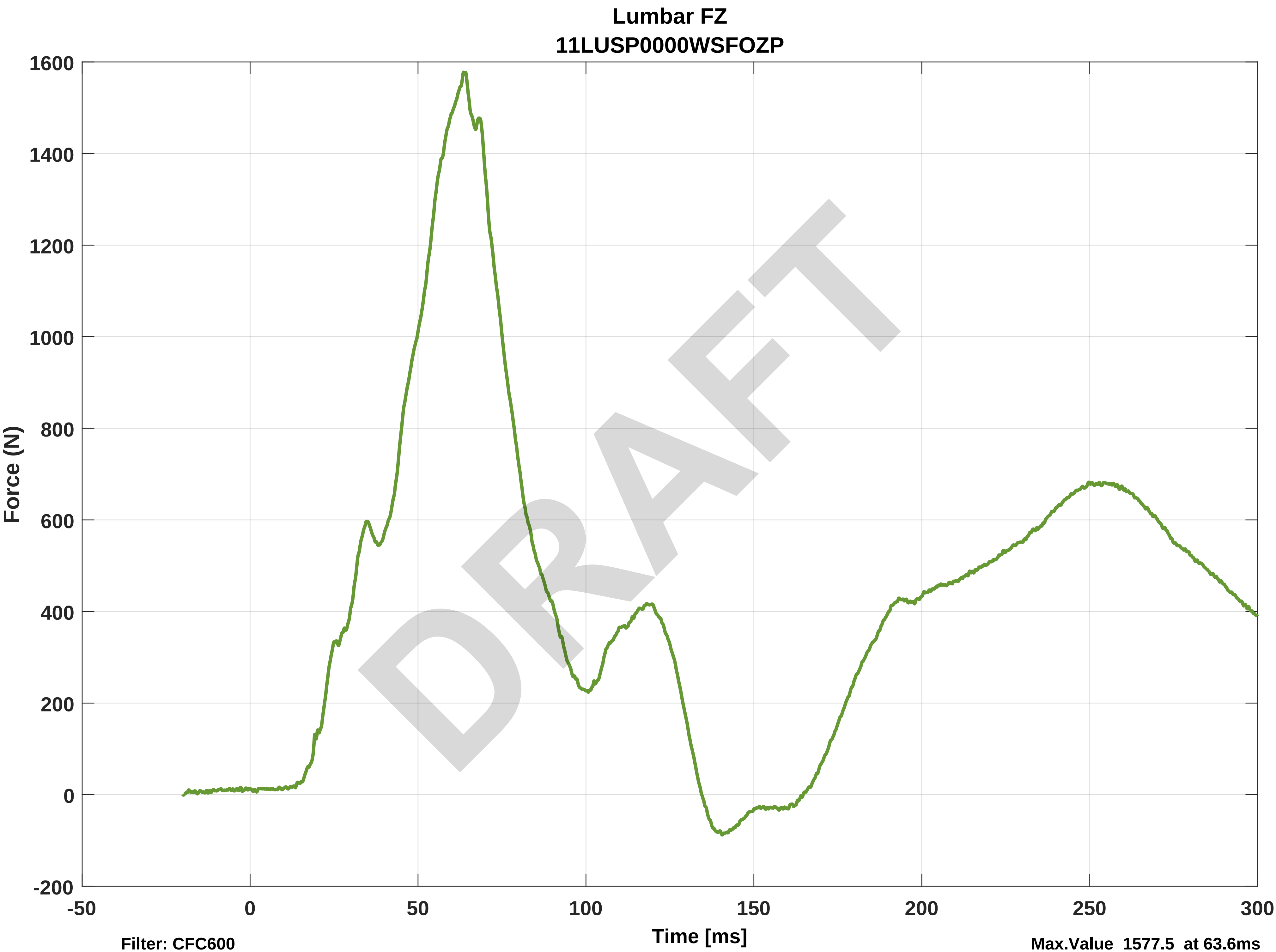
Filter: CFC600

Max.Value 20.12 at 42.6ms
Min.Value -24.86 at 64.6ms


Lumbar FX
11LUSP0000WSFOXP
600
500
400
300
200
100
0
-100
-200
Force (N)
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC600
Max.Value 504.23 at 69ms
Min.Value -176.48 at 22.9ms

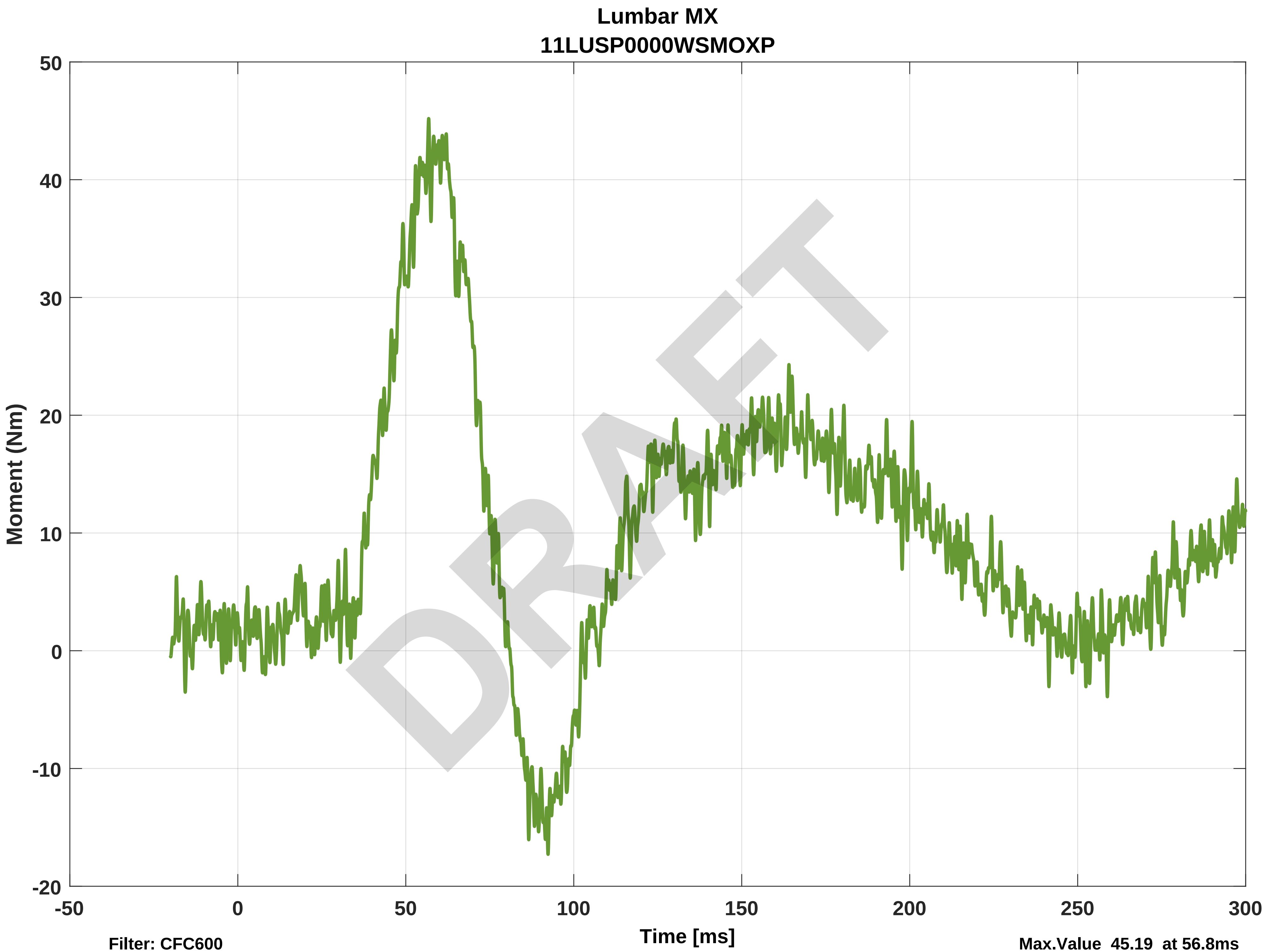


Lumbar FY
11LUSP0000WSFOYP
800
600
400
200
0
-200
-400
-50
0
50
100
150
200
250
300
Force (N)
Time [ms]
DRAFT
Filter: CFC600
Max.Value 718.74 at 55.8ms
Min.Value -239.39 at 86.7ms



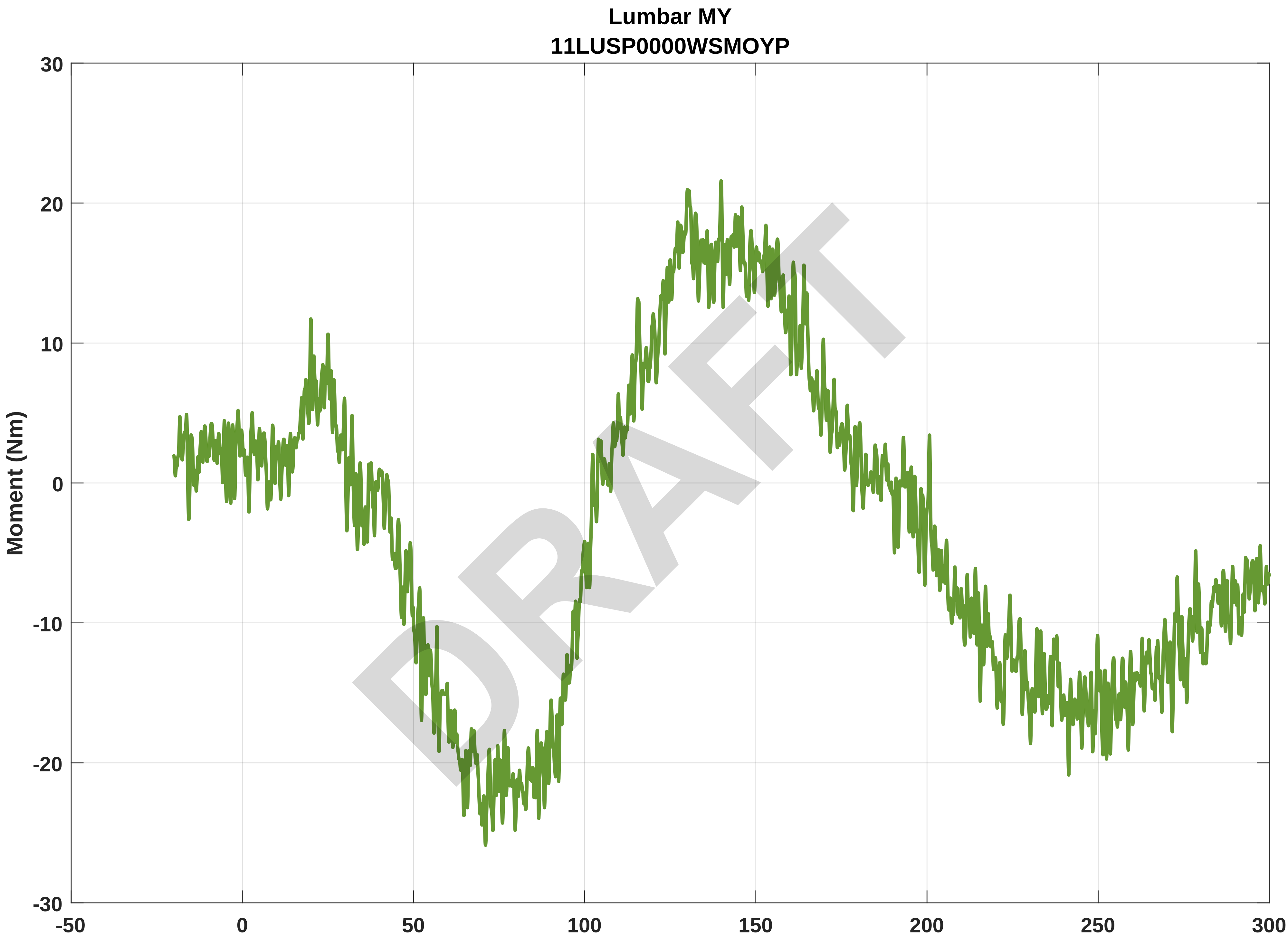
Filter: CFC600

Max.Value 1577.5 at 63.6ms
Min.Value -87.84 at 140.6ms



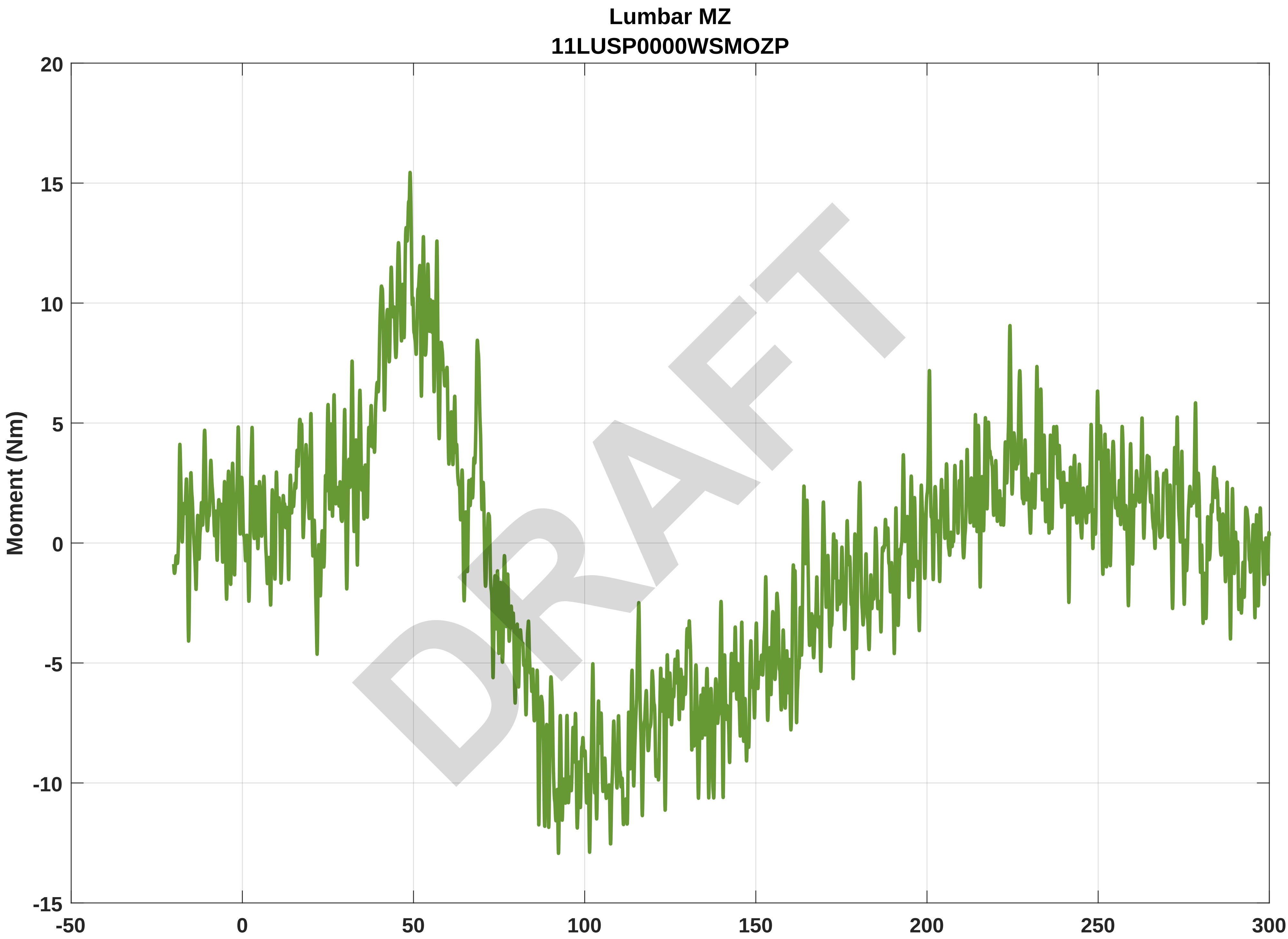
Filter: CFC600

Max.Value 45.19 at 56.8ms
Min.Value -17.28 at 92.4ms



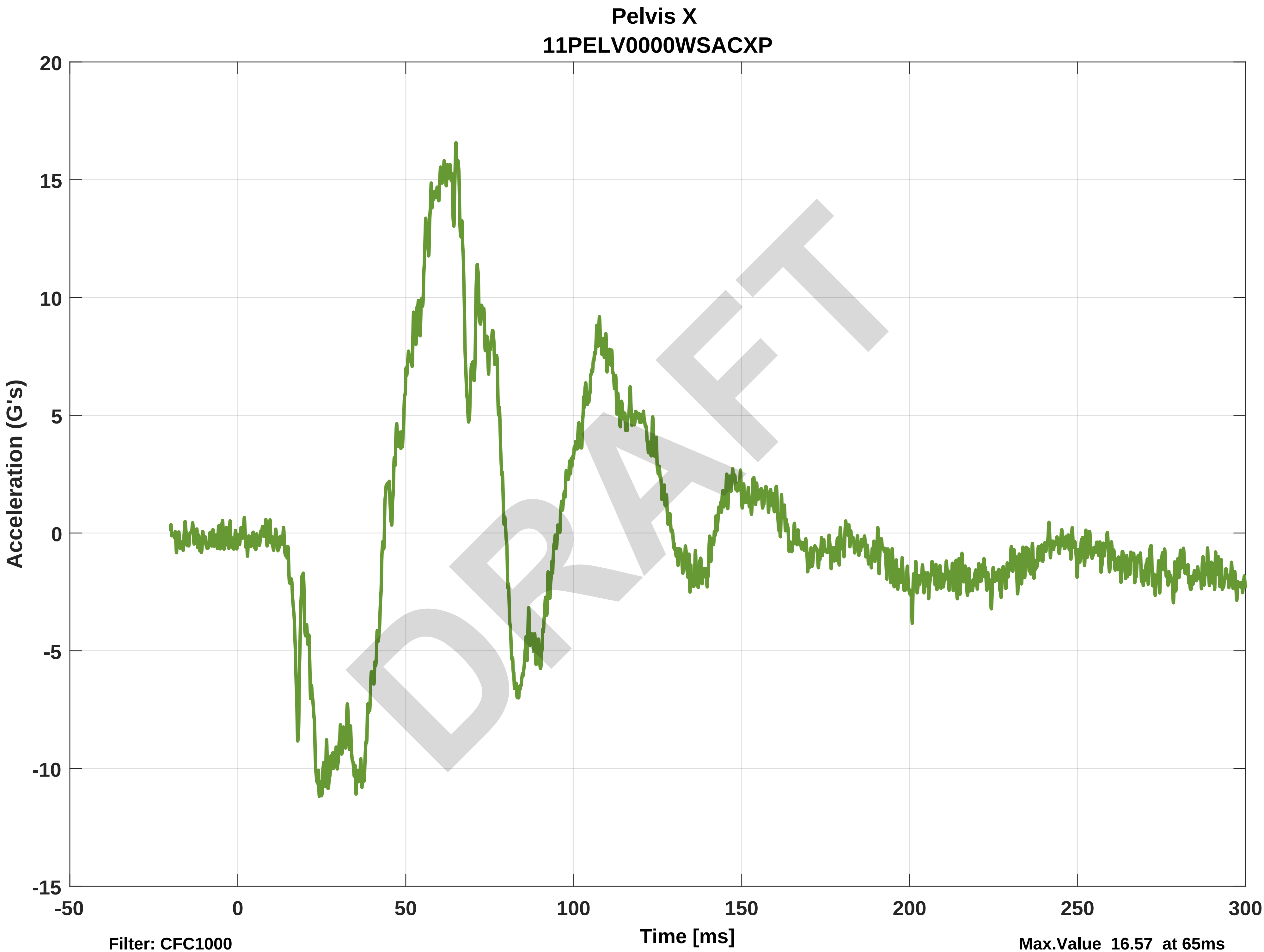
Filter: CFC600

Max.Value 21.58 at 139.9ms
Min.Value -25.88 at 71.1ms



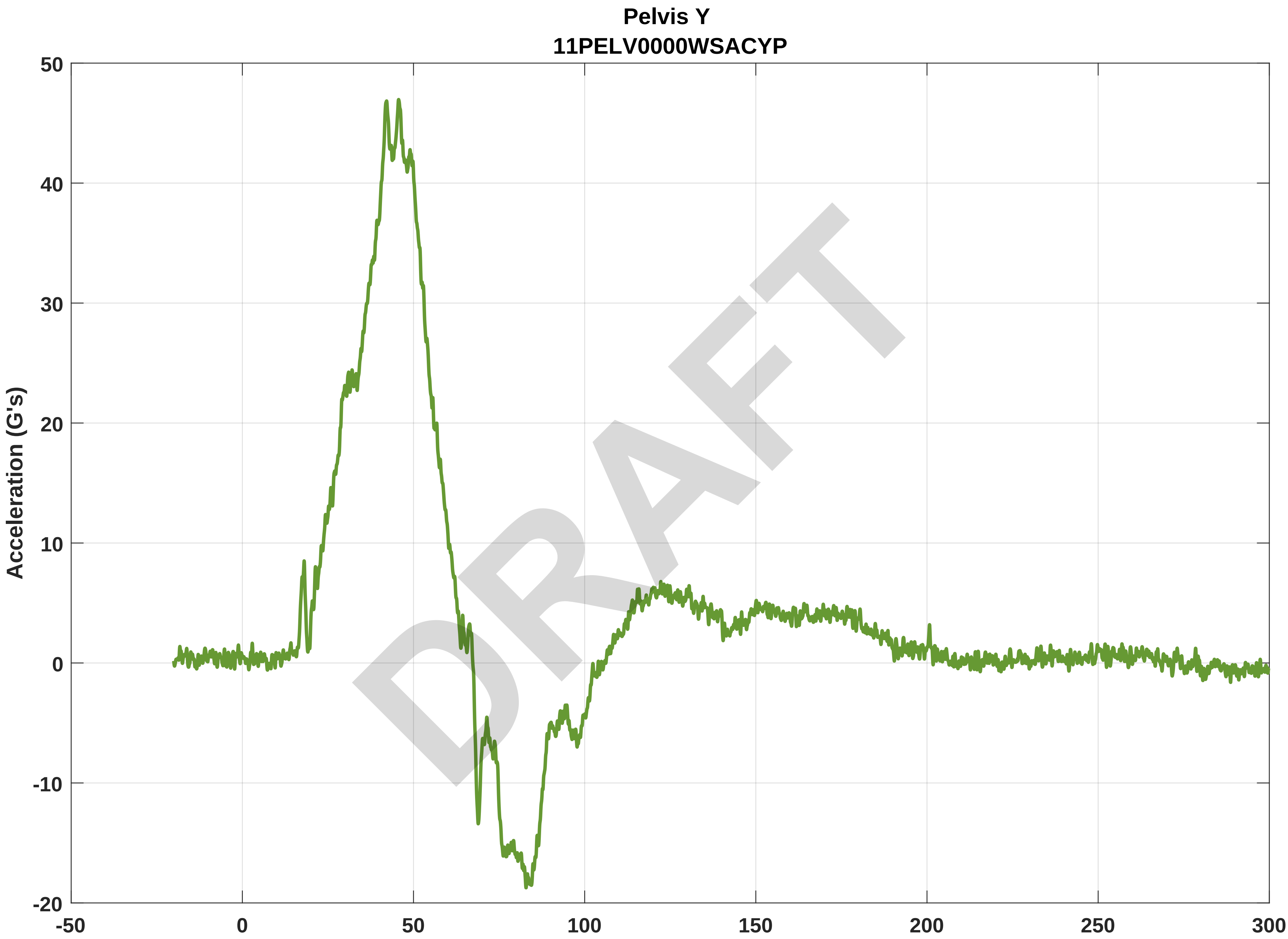
Filter: CFC600

Max.Value 15.44 at 49ms
Min.Value -12.93 at 92.4ms



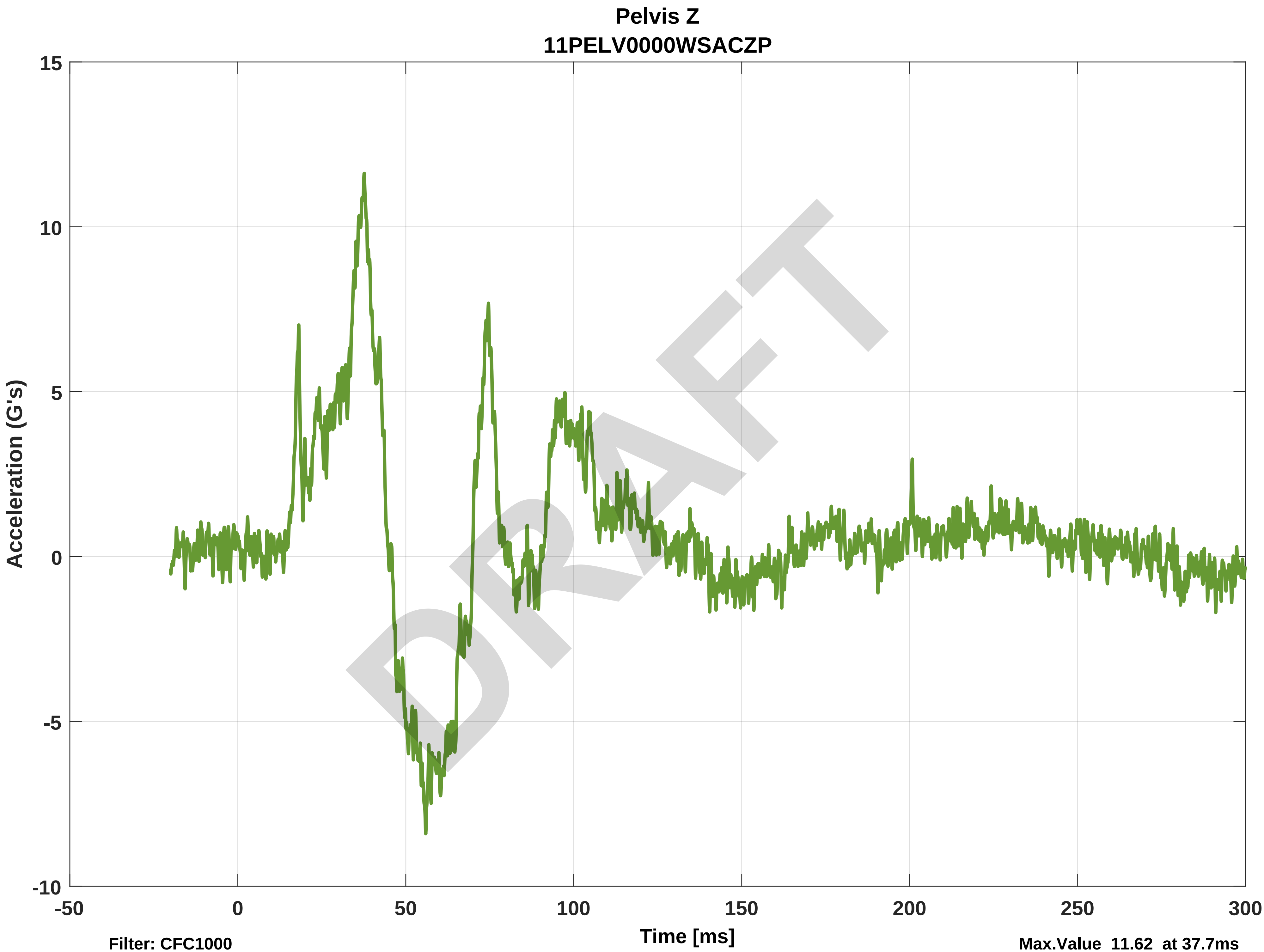
Filter: CFC1000

Max.Value 16.57 at 65ms
Min.Value -11.18 at 24.3ms



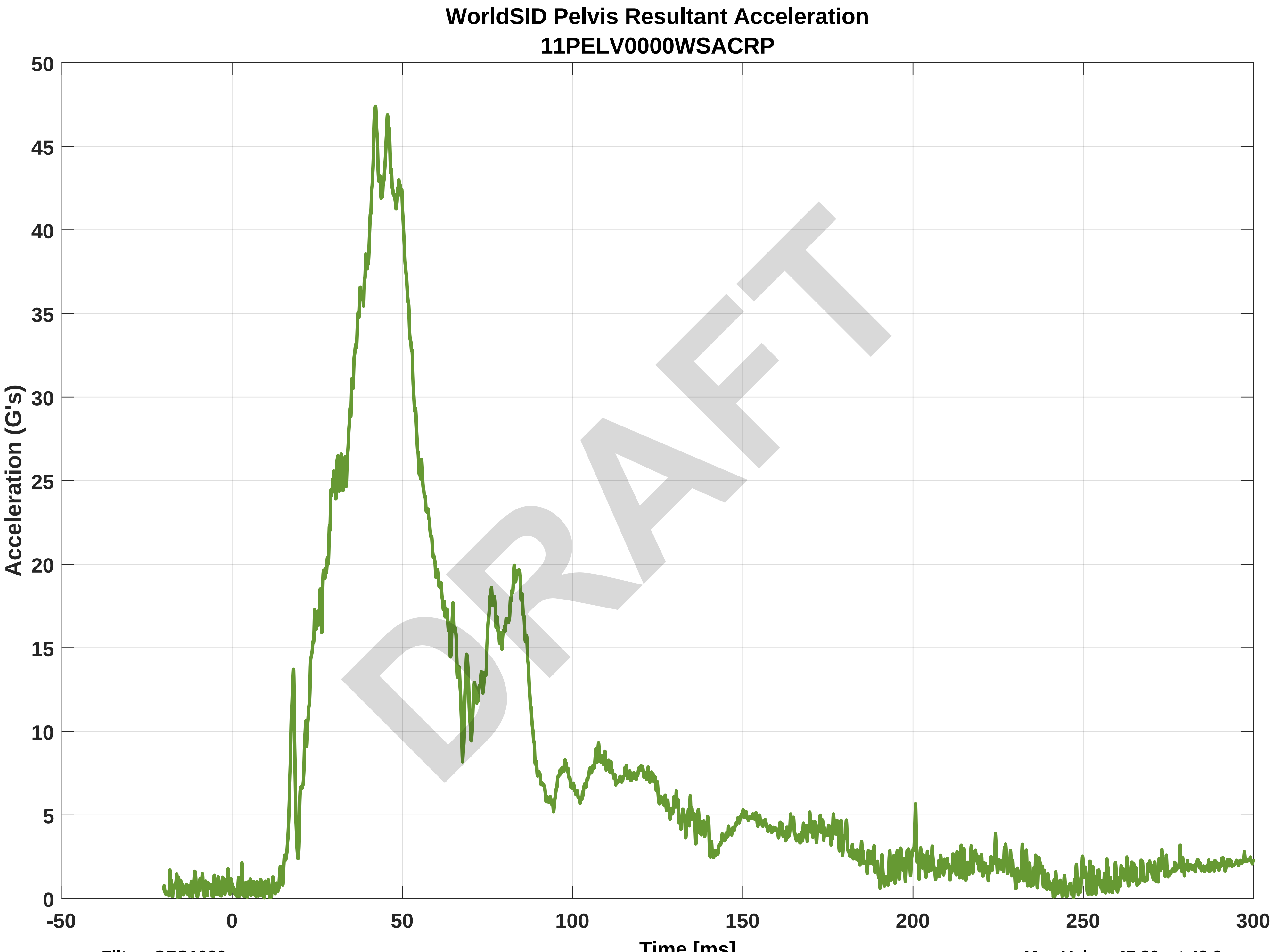
Filter: CFC1000

Max.Value 46.96 at 45.7ms
Min.Value -18.73 at 82.9ms



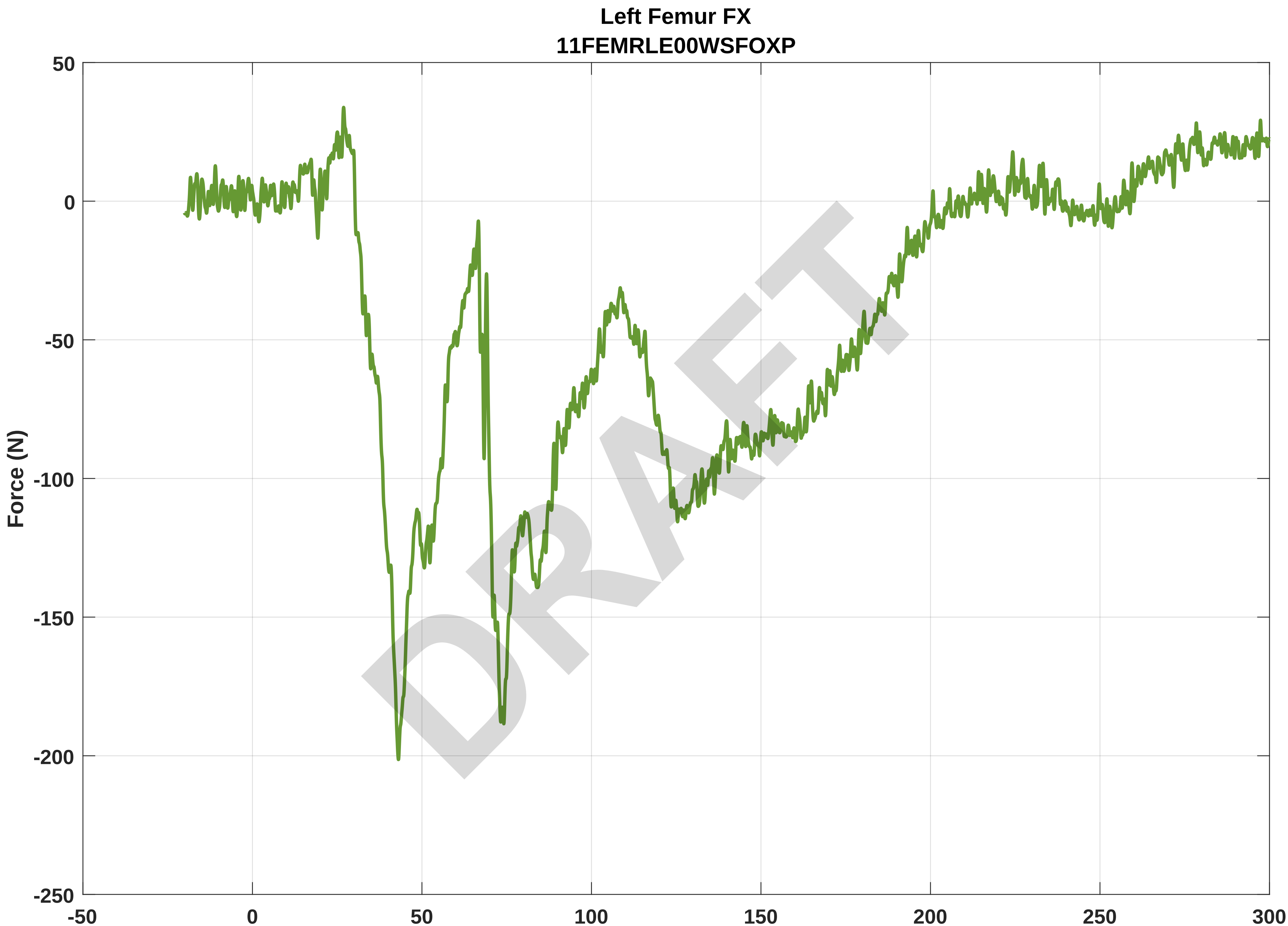
Filter: CFC1000

Max.Value 11.62 at 37.7ms
Min.Value -8.41 at 56ms



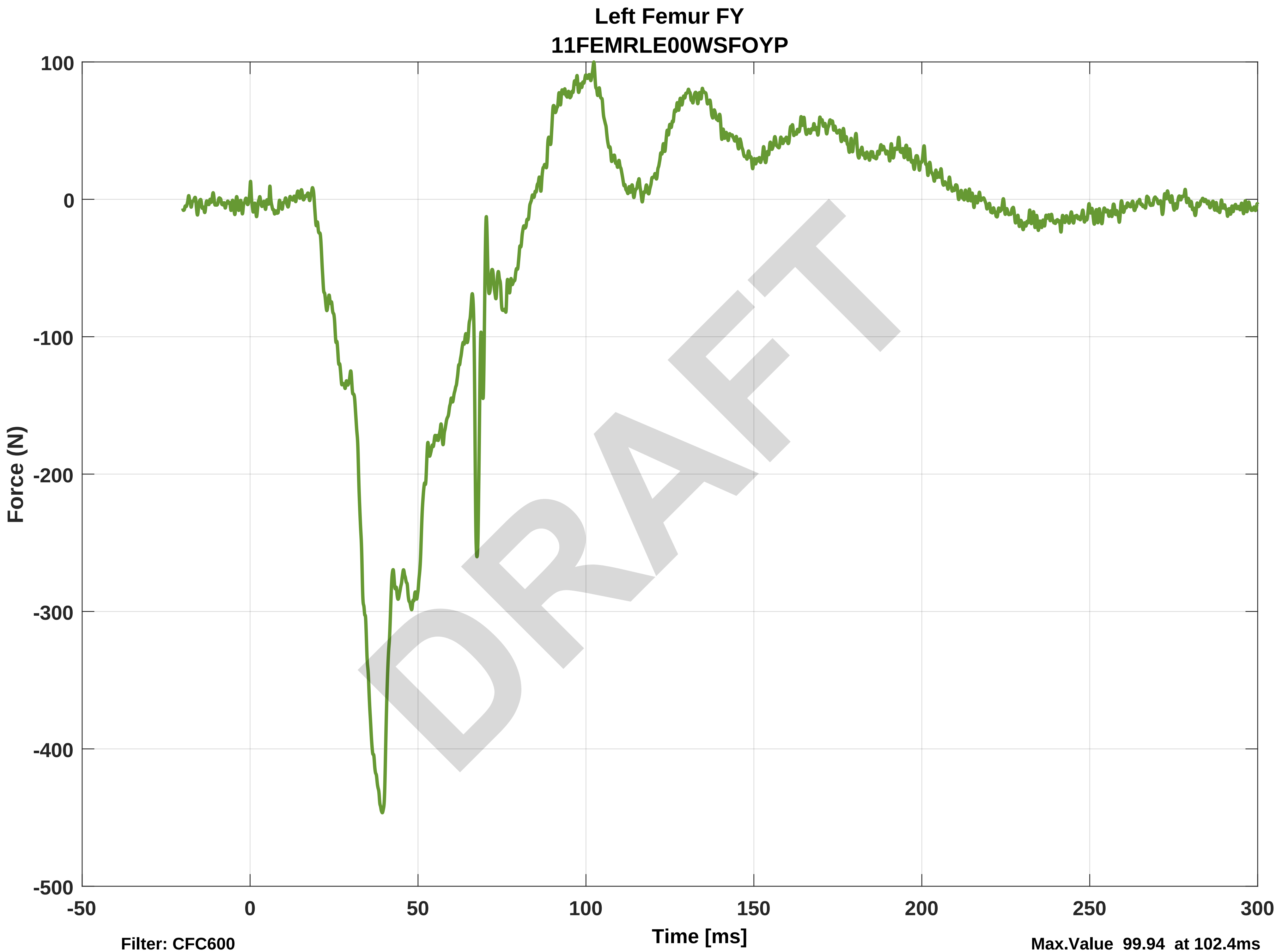
Filter: CFC1000

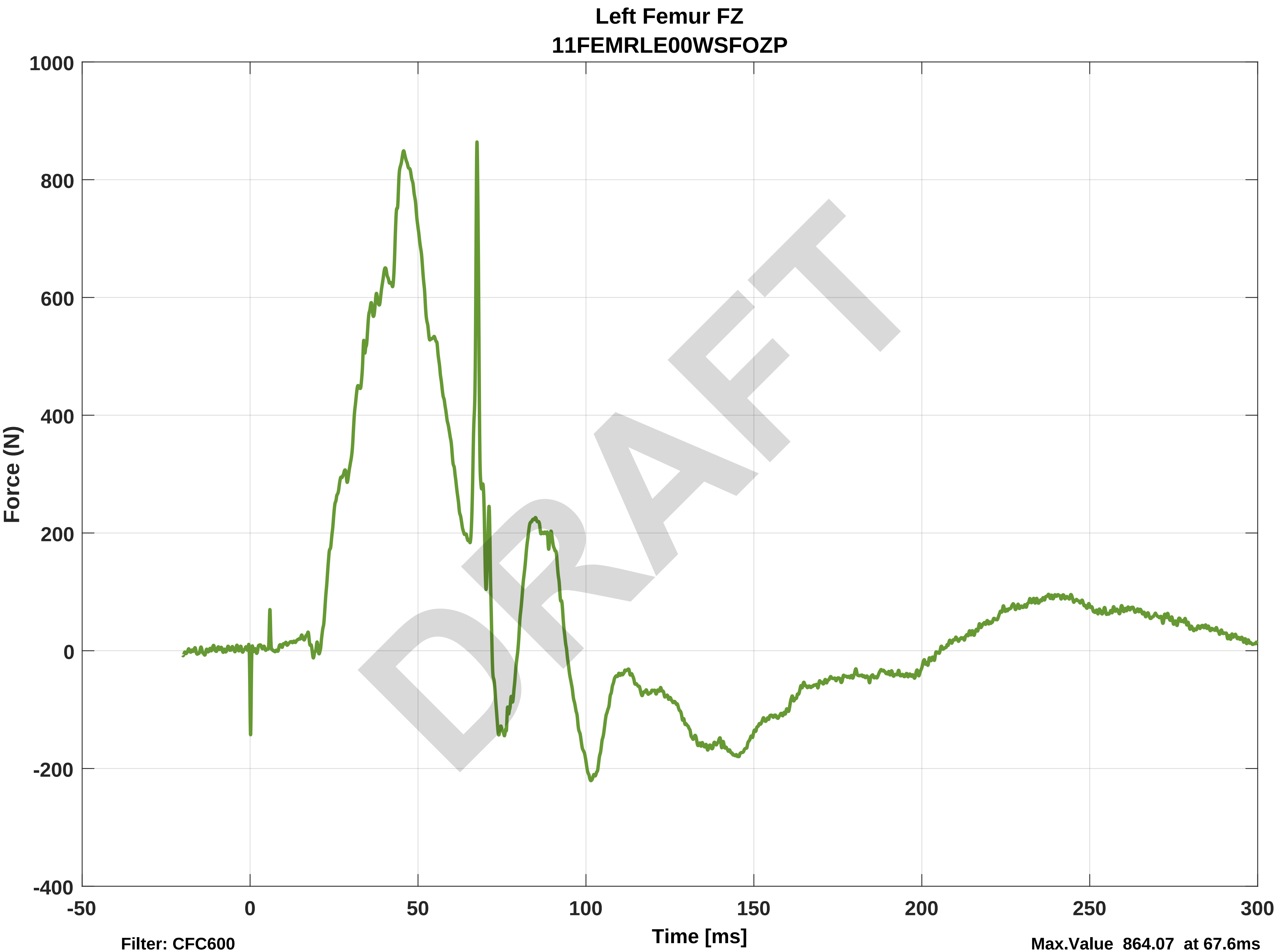
Max.Value 47.39 at 42.2ms
Min.Value 0.04 at 9.4ms



Filter: CFC600

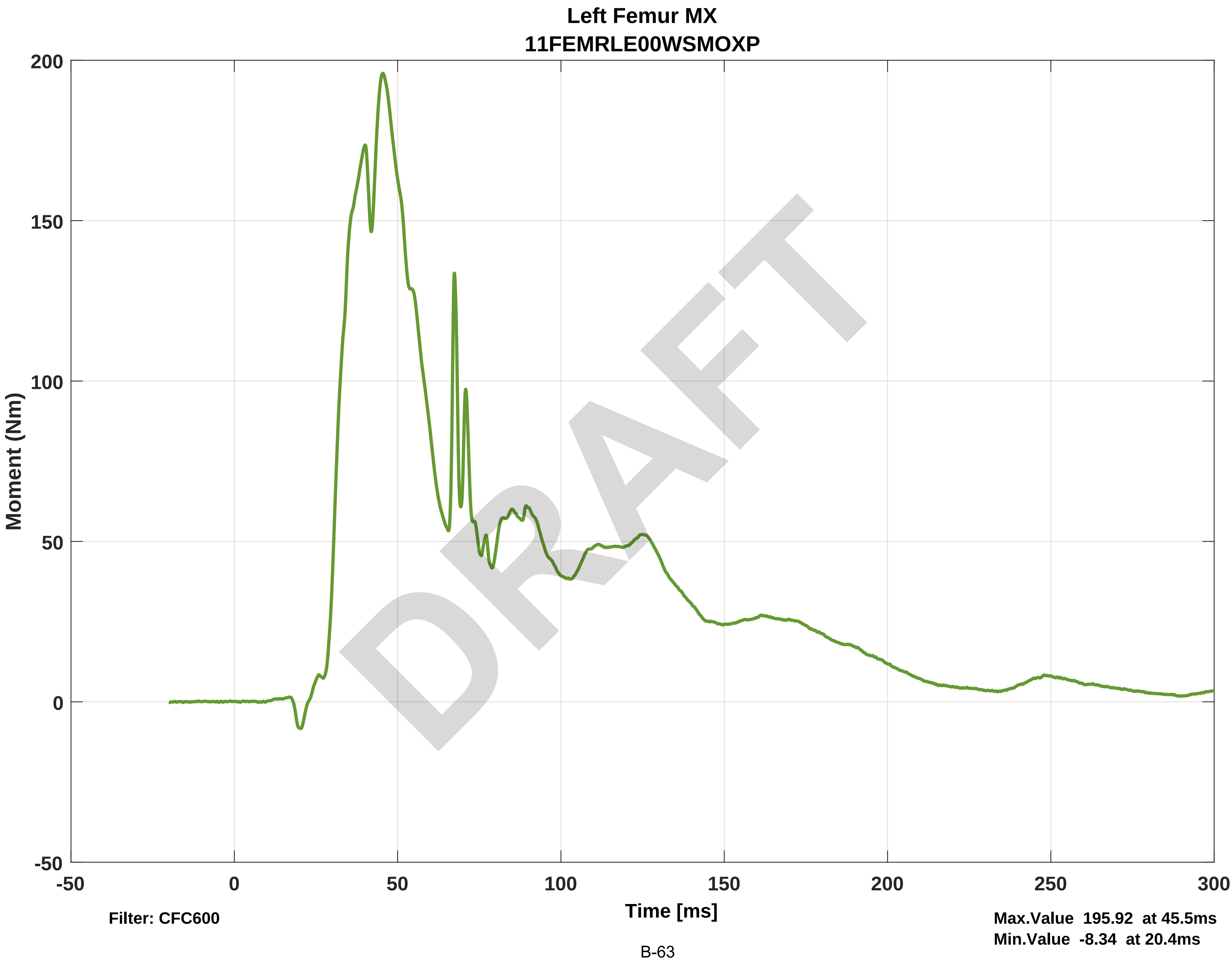
Max.Value 33.81 at 26.9ms
Min.Value -201.35 at 43.1ms


Left Femur FY
11FEMRLE00WSFOYP
100
0
-100
-200
-300
-400
-500
-50
0
50
100
150
200
250
300
Force (N)
Time [ms]
DRAFT
Filter: CFC600
Max.Value 99.94 at 102.4ms
Min.Value -446.48 at 39.4ms

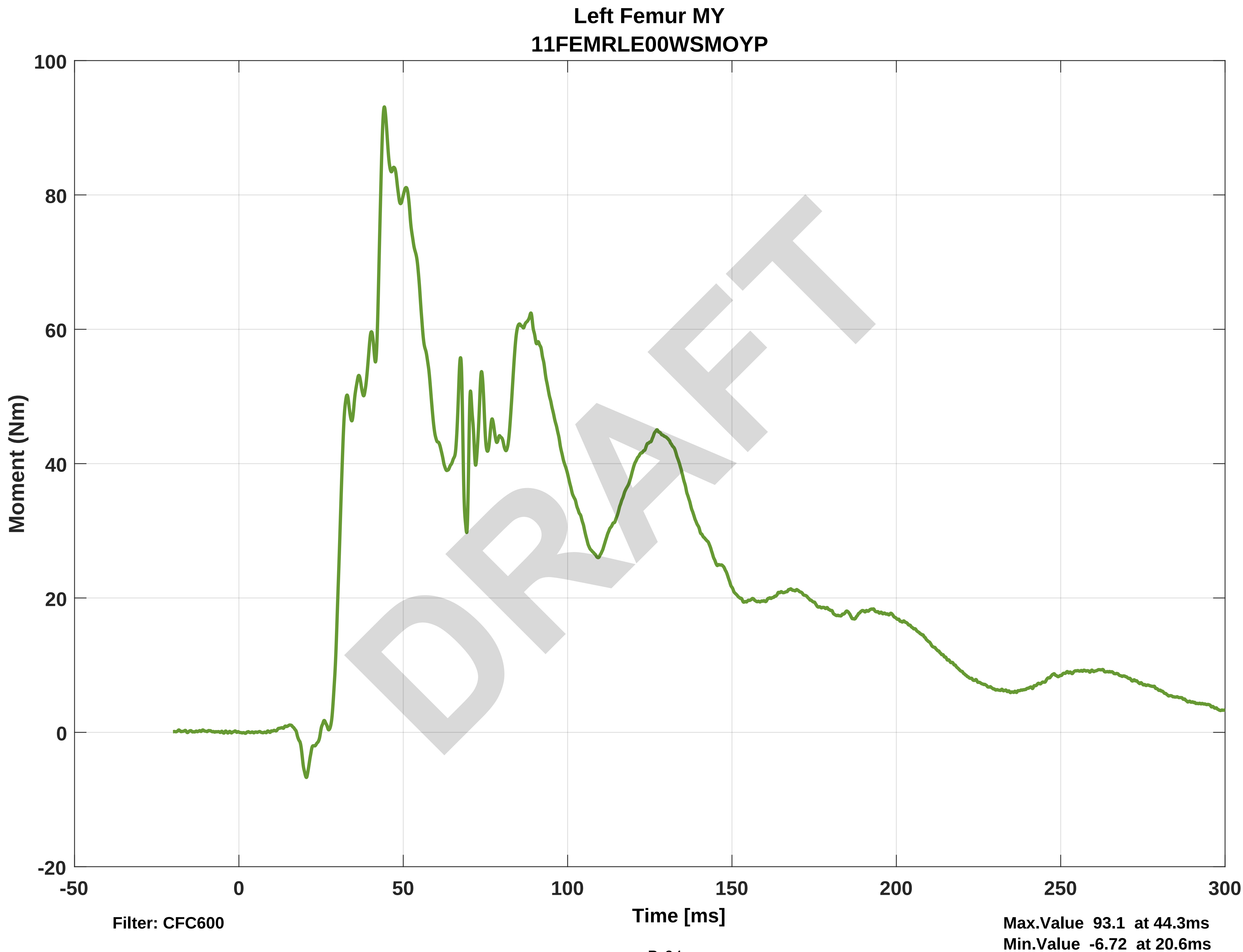


Filter: CFC600

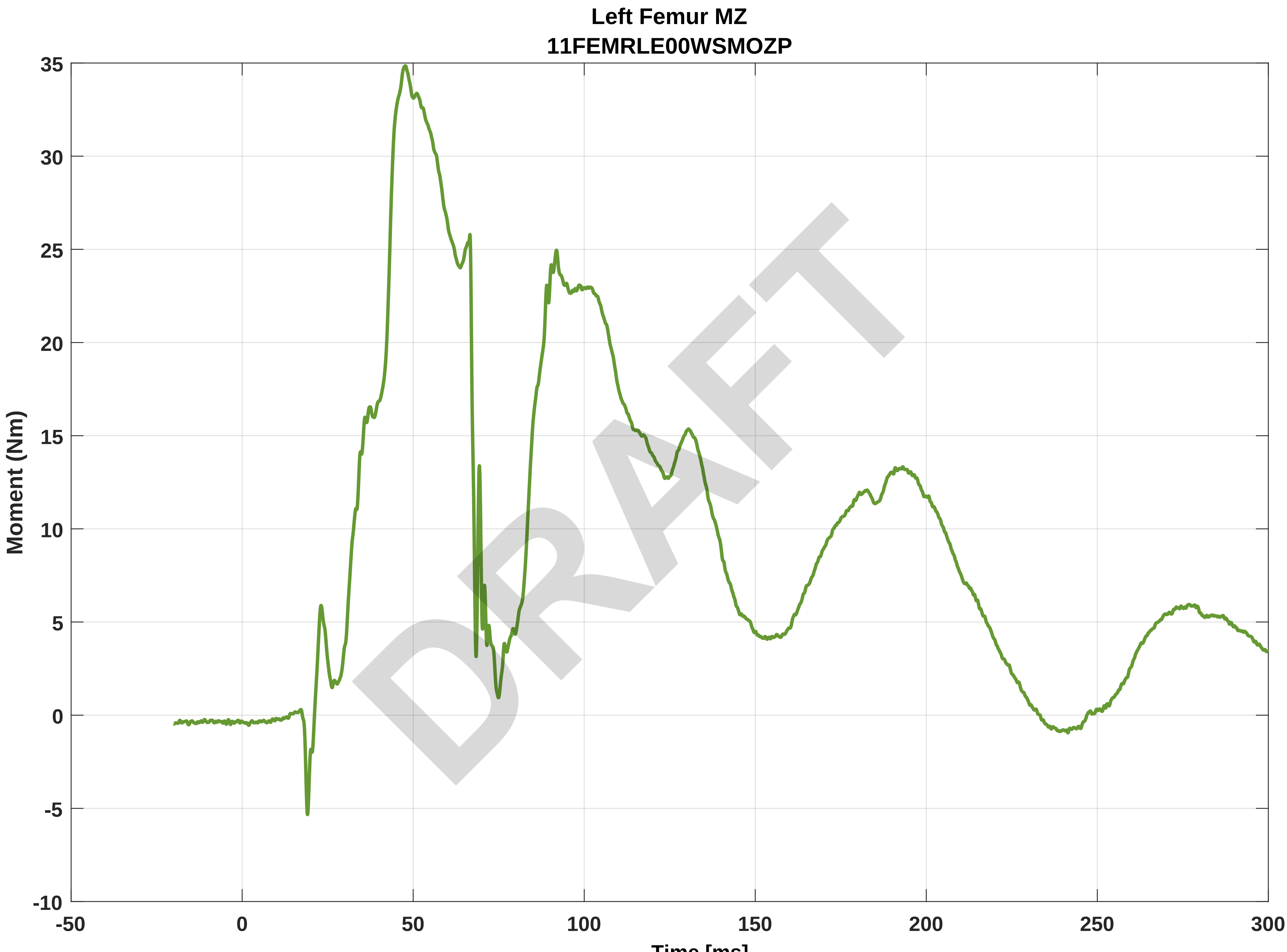
Max.Value 864.07 at 67.6ms
Min.Value -220.61 at 101.5ms



Left Femur MX
11FEMRLE00WSMOXP
Moment (Nm)
Time [ms]
200
150
100
50
0
-50
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC600
Max.Value 195.92 at 45.5ms
Min.Value -8.34 at 20.4ms

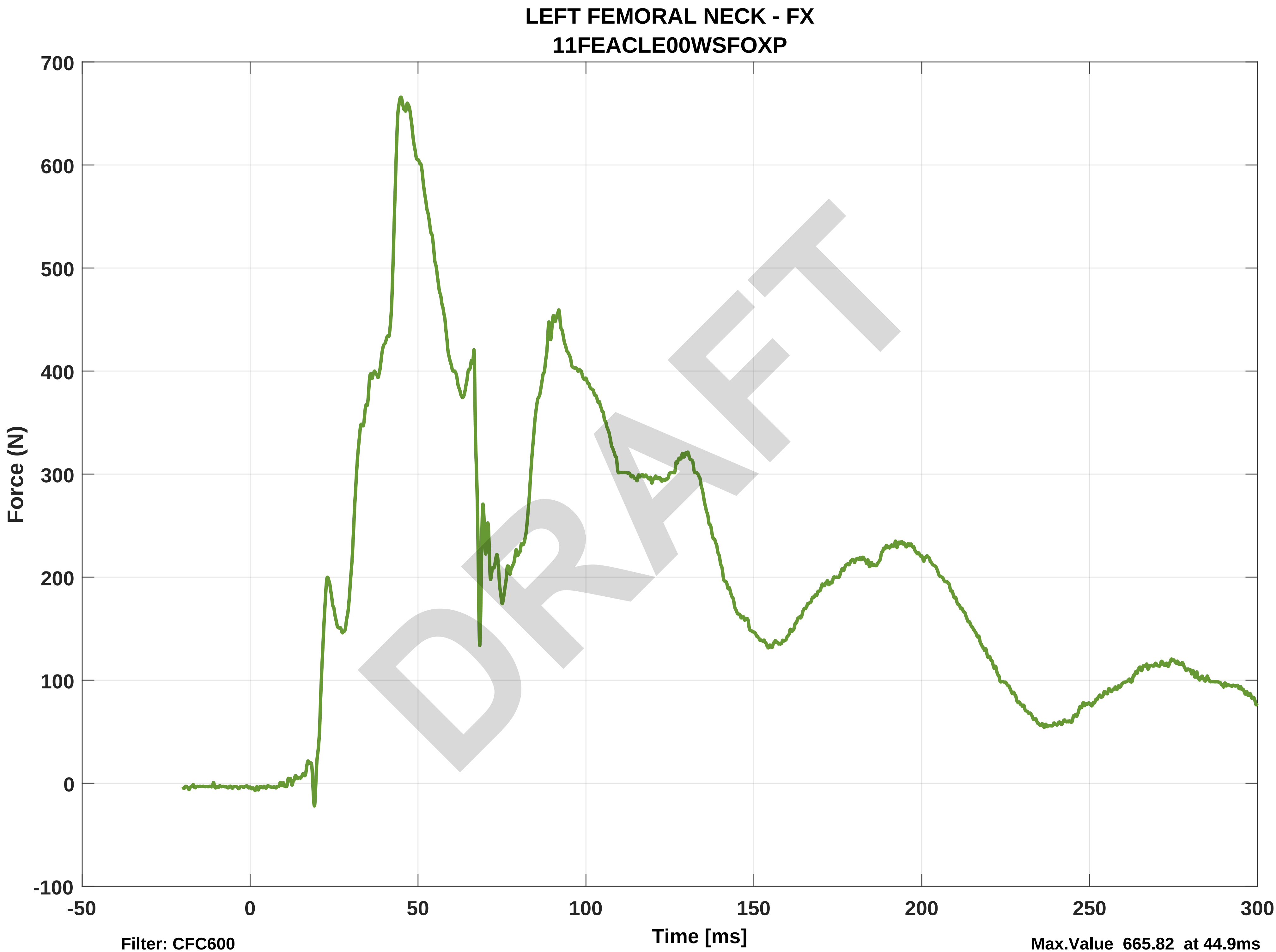


Left Femur MY
11FEMRLE00WSMOYP
Moment (Nm)
100
80
60
40
20
0
-20
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC600
Max.Value 93.1 at 44.3ms
Min.Value -6.72 at 20.6ms



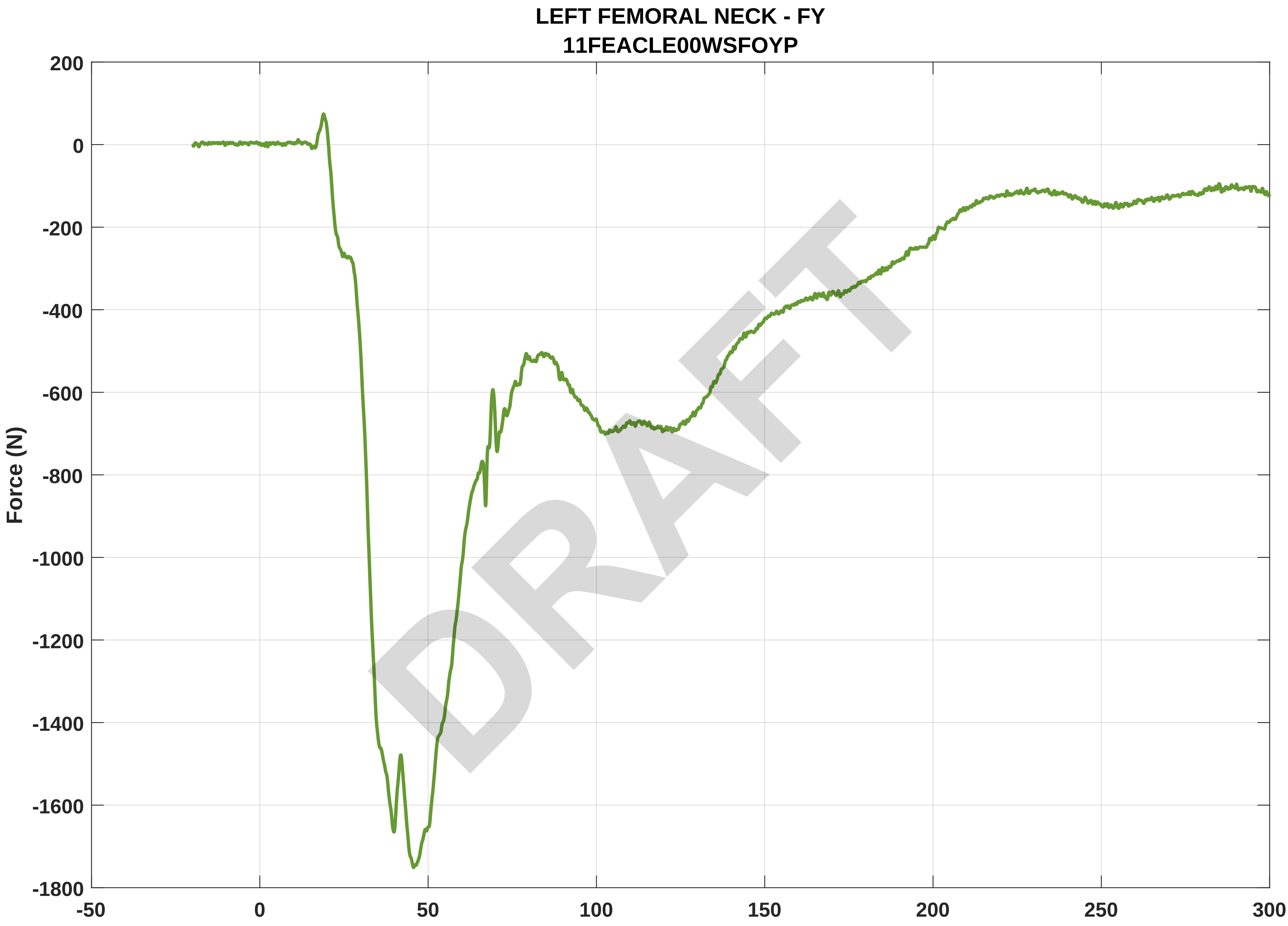
Filter: CFC600

Max.Value 34.85 at 47.7ms
Min.Value -5.33 at 19.1ms



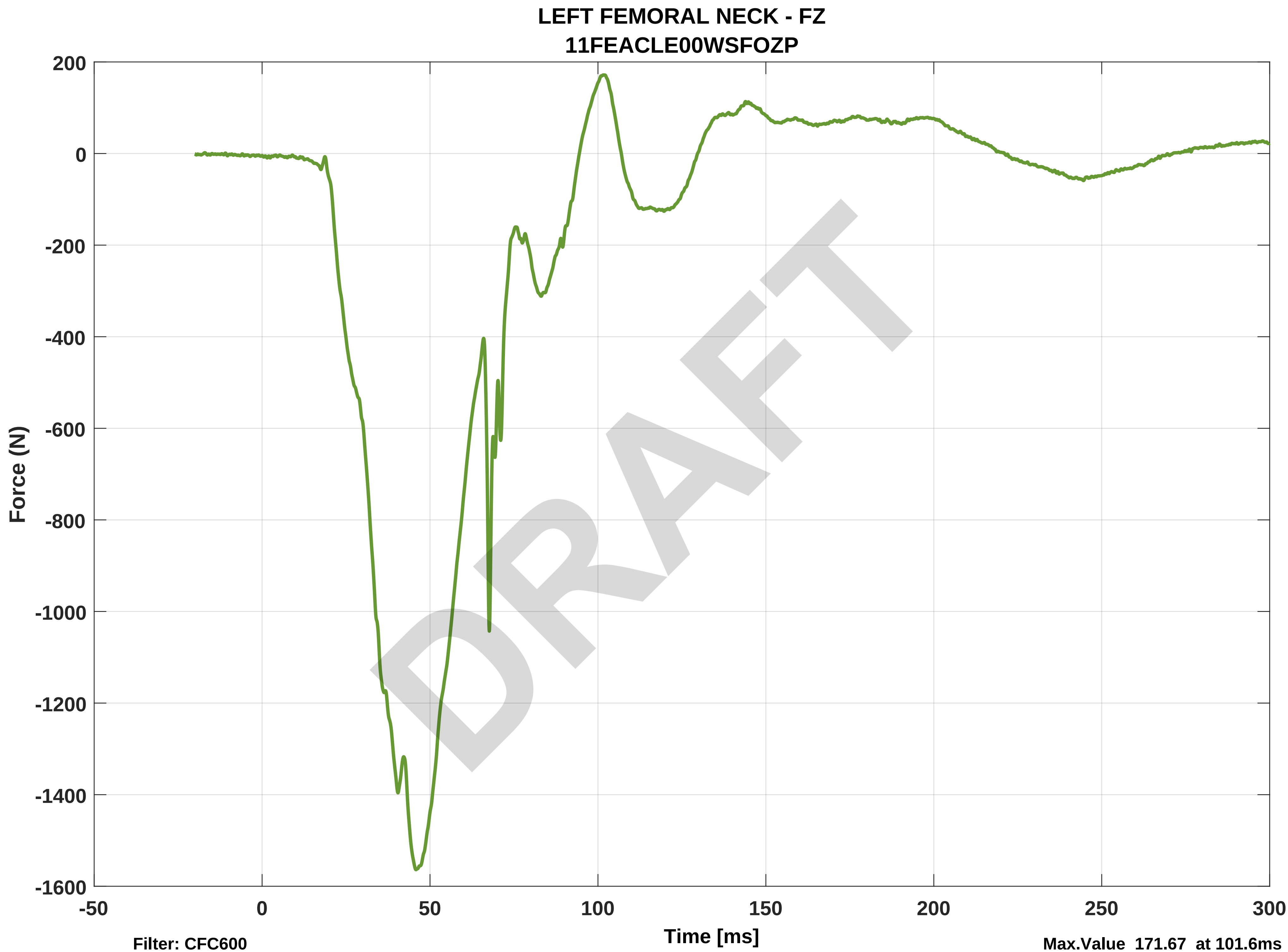
Filter: CFC600

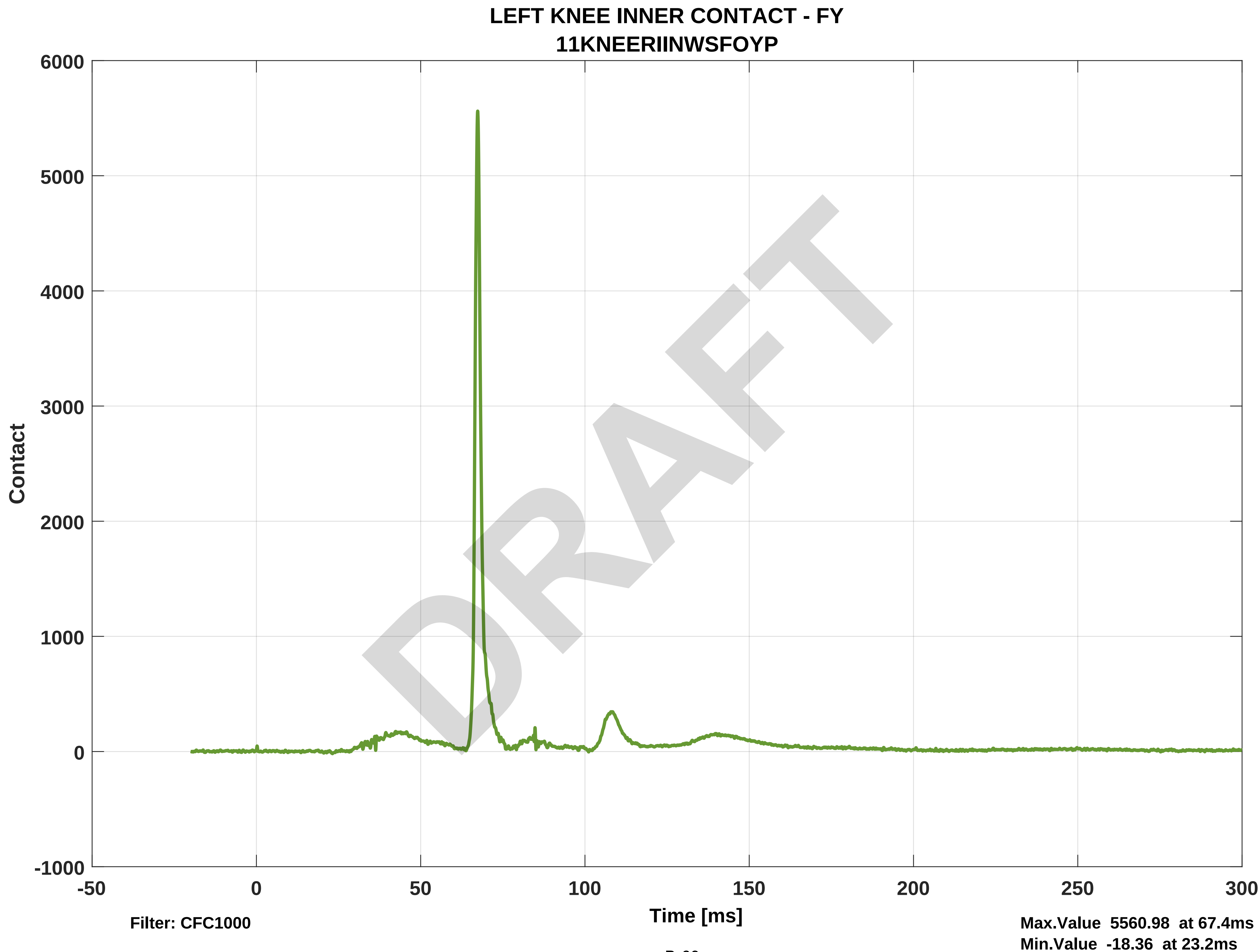
Max.Value 665.82 at 44.9ms
Min.Value -22.08 at 19.2ms

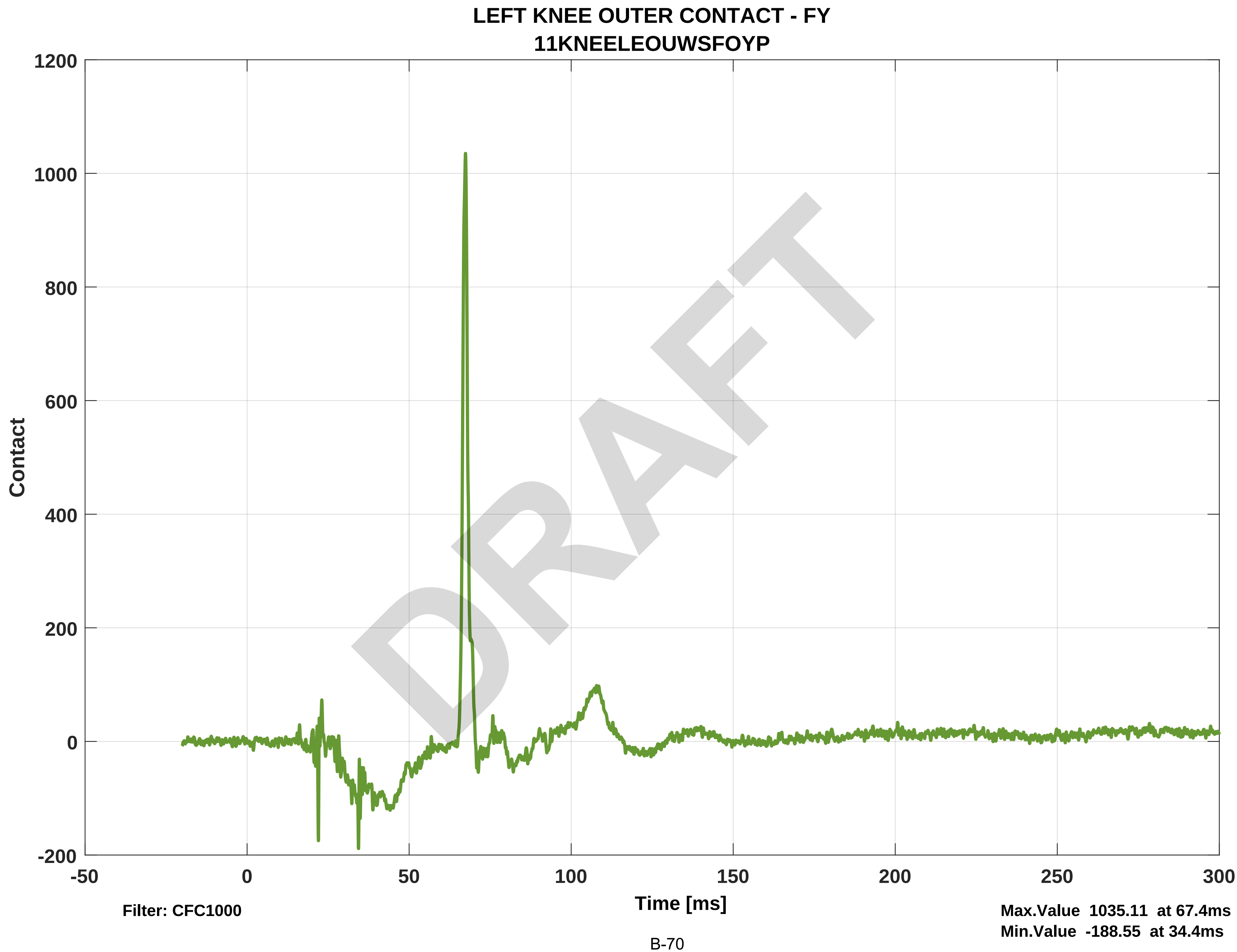


Filter: CFC600

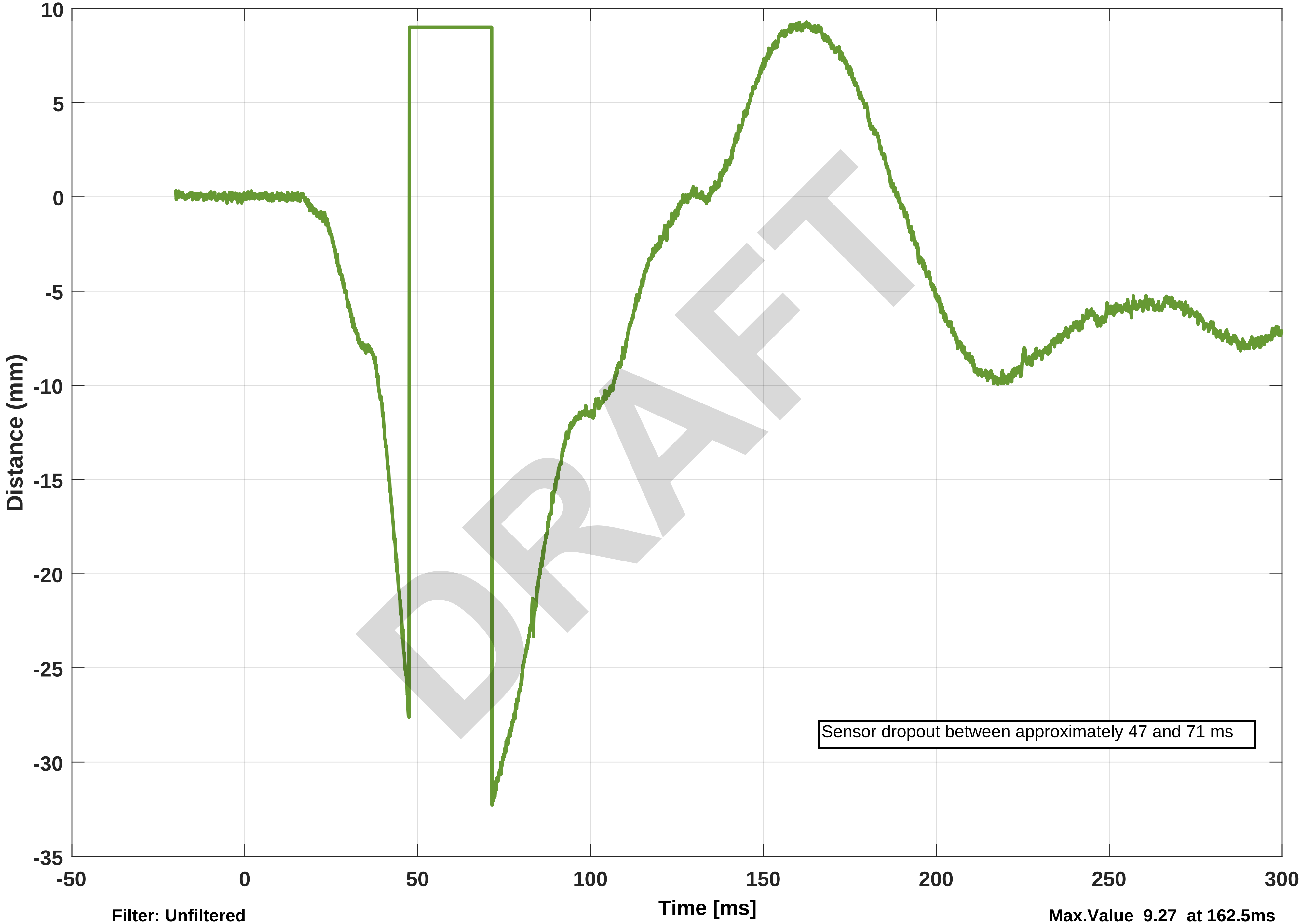
Max.Value 74.08 at 19ms
Min.Value -1751.01 at 45.7ms


LEFT FEMORAL NECK - FZ
11FEACLE00WSFOZP
Force (N)
Time [ms]
200
0
-200
-400
-600
-800
-1000
-1200
-1400
-1600
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC600
Max.Value 171.67 at 101.6ms
Min.Value -1563.76 at 45.8ms


LEFT KNEE INNER CONTACT - FY
11KNEERIINWSFOYP
Contact
6000
5000
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 5560.98 at 67.4ms
Min.Value -18.36 at 23.2ms

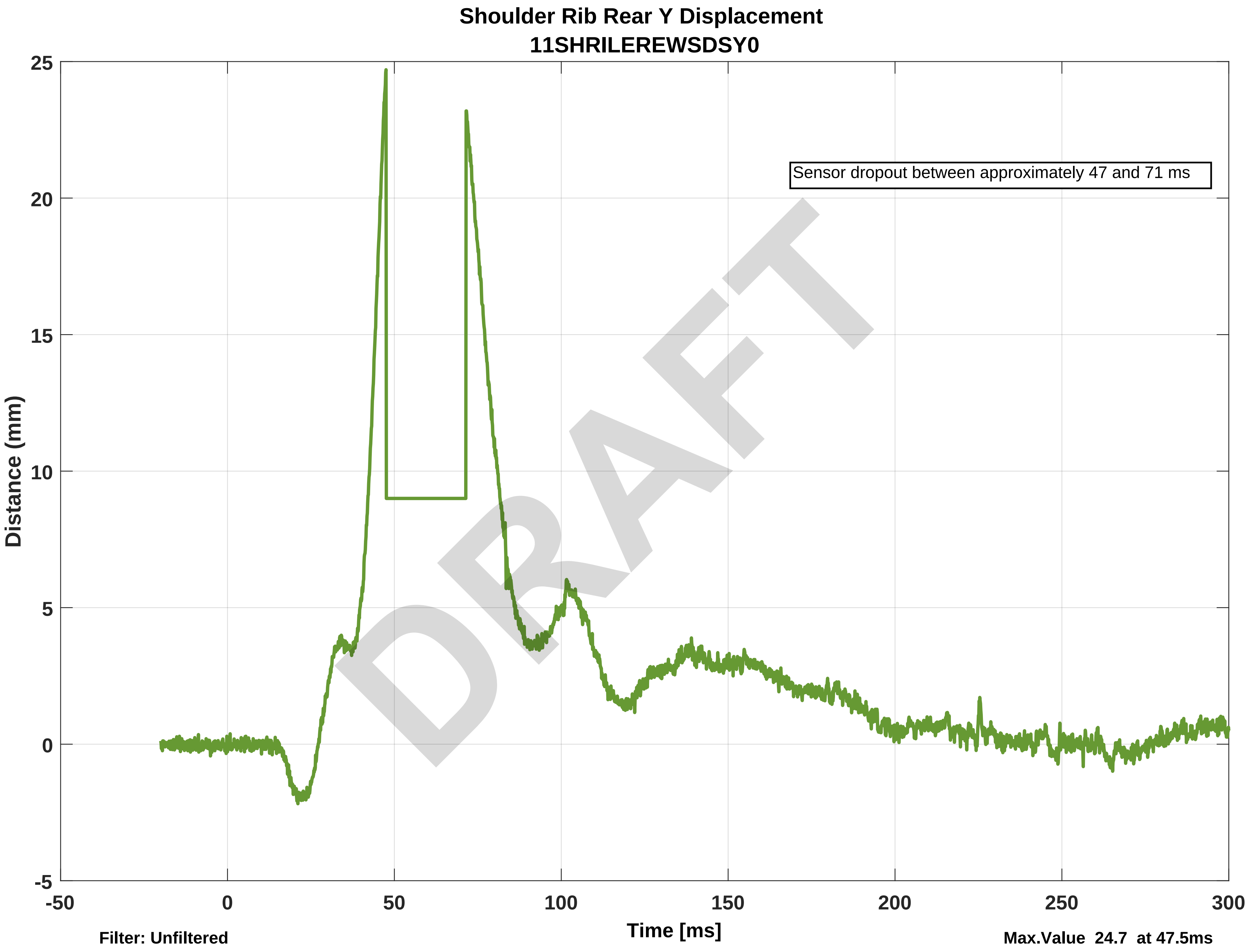

LEFT KNEE OUTER CONTACT - FY
11KNEELEOUWSFOYP
1200
1000
800
600
400
200
0
-200
-50
0
50
100
150
200
250
300
Contact
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 1035.11 at 67.4ms
Min.Value -188.55 at 34.4ms

Shoulder Rib Rear X Displacement
11SHRILEREWSDSX0

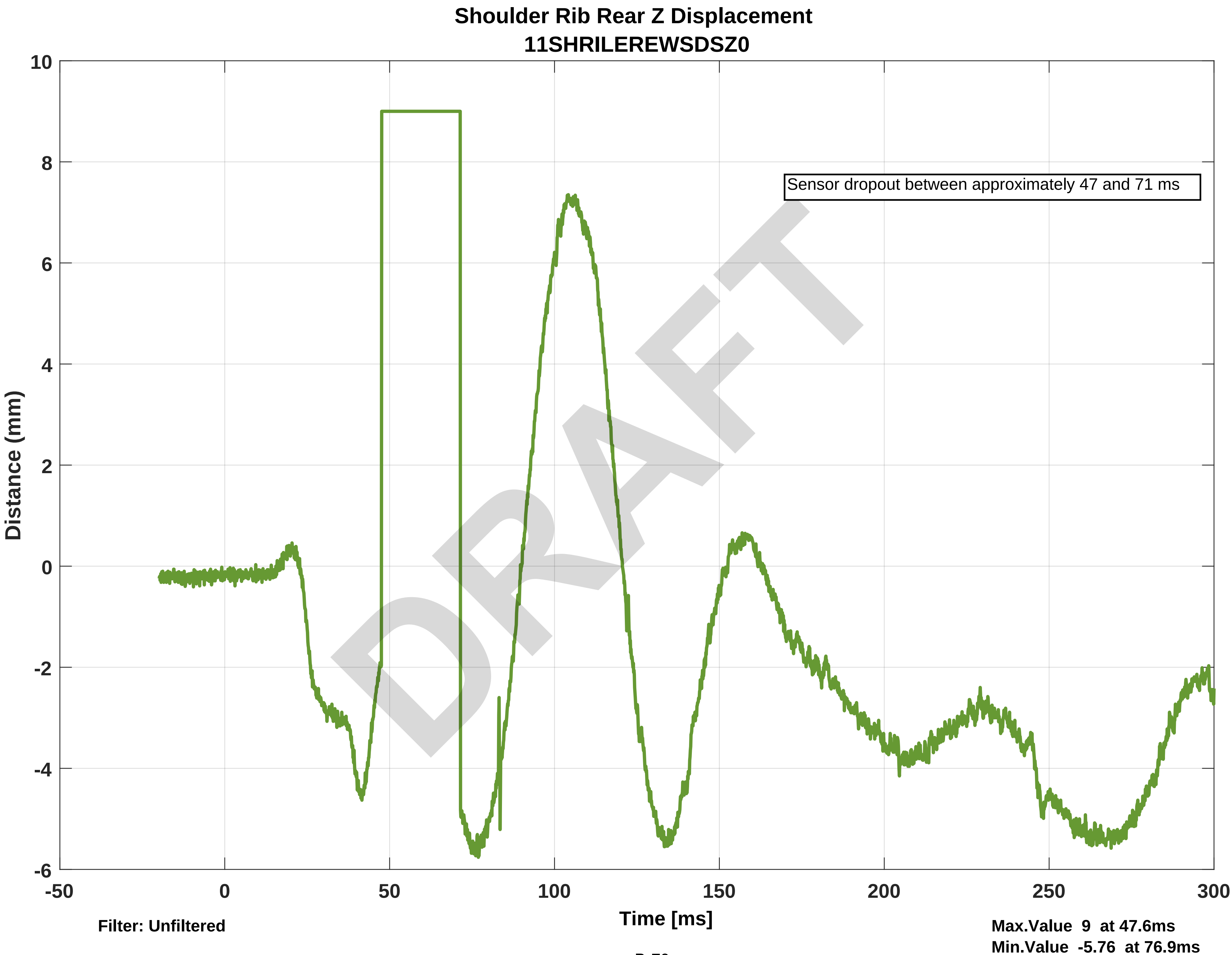


Filter: Unfiltered

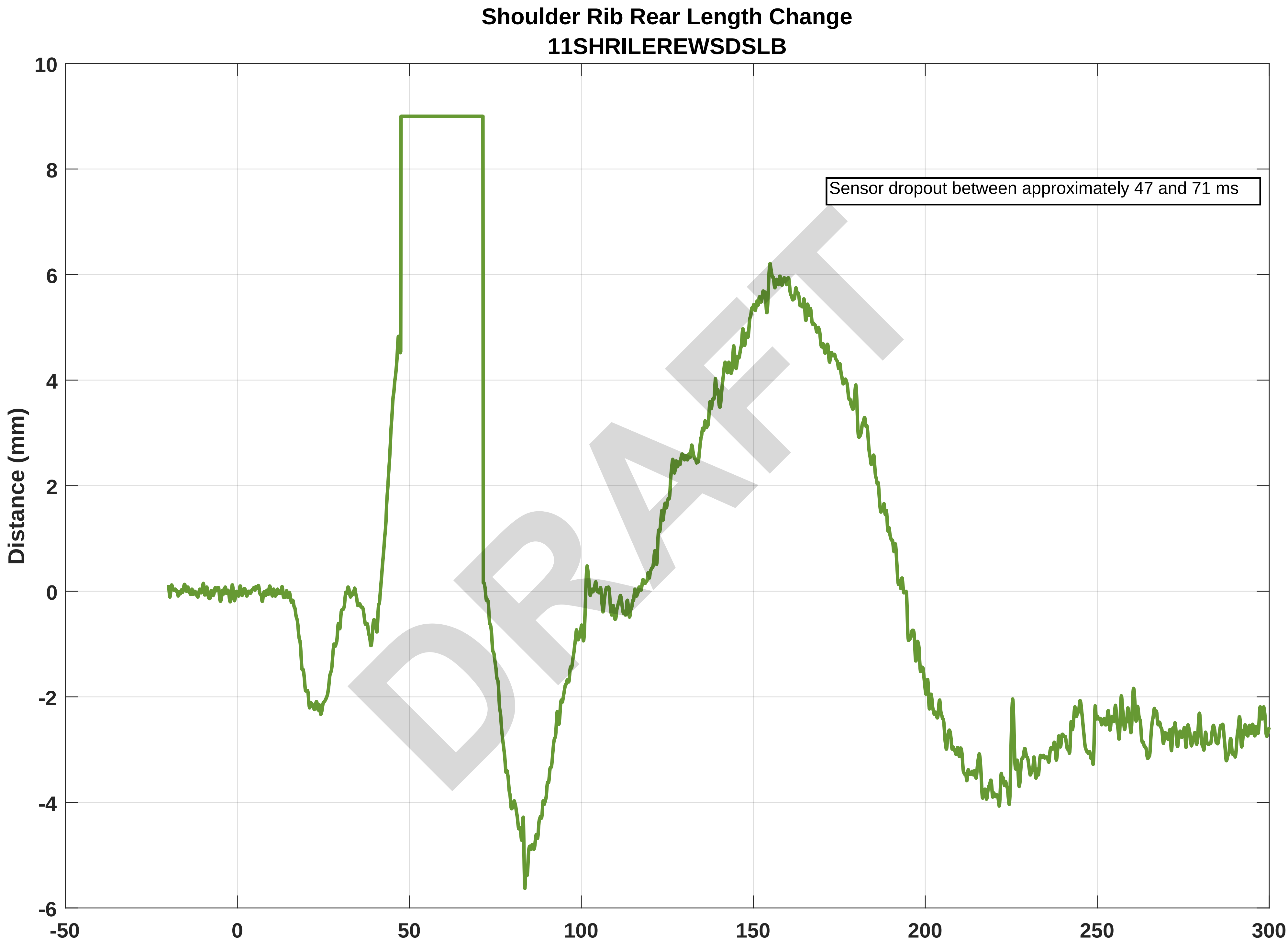
Max.Value 9.27 at 162.5ms
Min.Value -32.27 at 71.5ms



Shoulder Rib Rear Y Displacement
11SHRILEREWSDSY0
Sensor dropout between approximately 47 and 71 ms
DRAFT
Distance (mm)
25
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
Time [ms]
Filter: Unfiltered
Max.Value 24.7 at 47.5ms
Min.Value -2.18 at 21.1ms

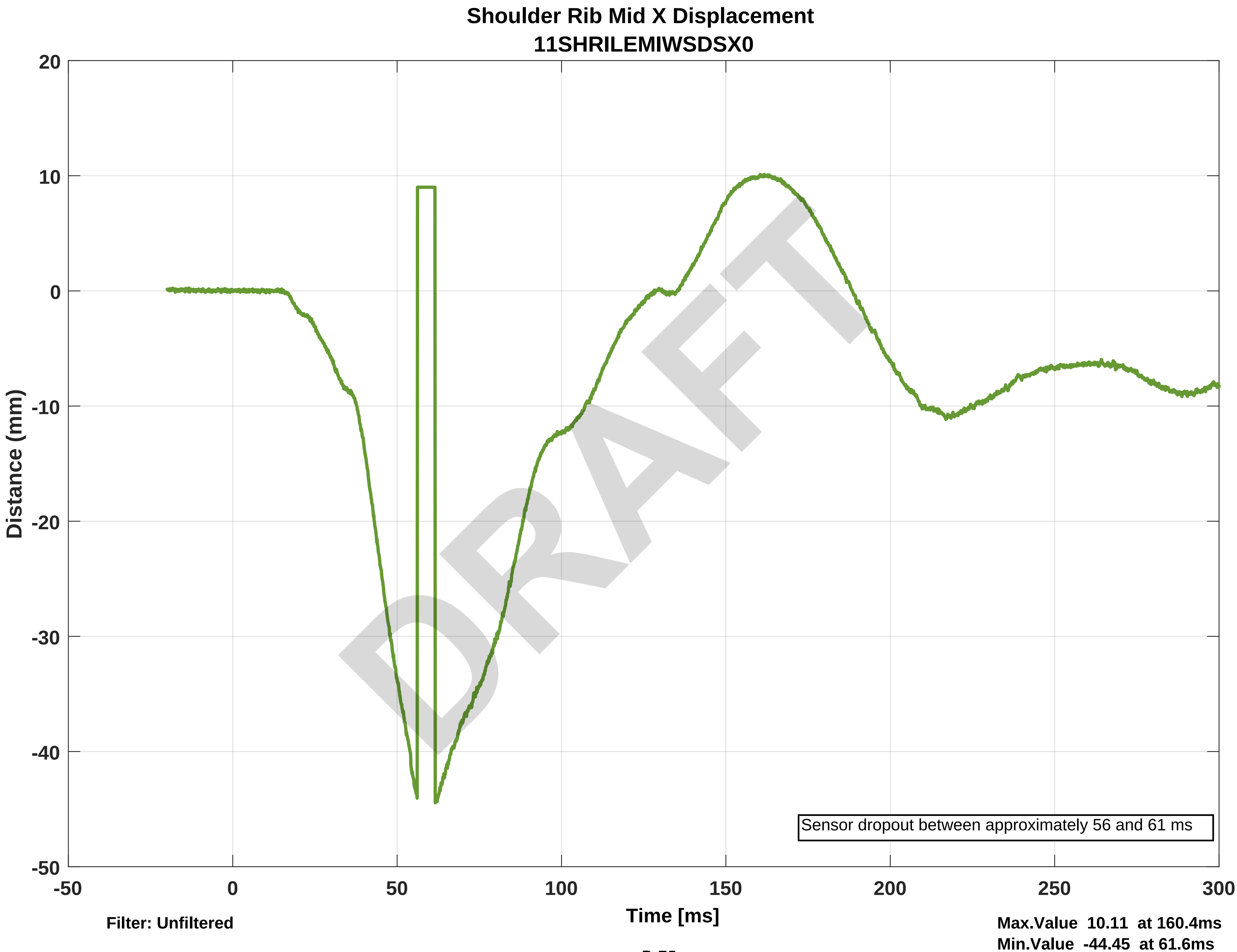


Shoulder Rib Rear Z Displacement
11SHRILEREWSDSZ0
Sensor dropout between approximately 47 and 71 ms
DRAFT
Distance (mm)
Time [ms]
10
8
6
4
2
0
-2
-4
-6
-50
0
50
100
150
200
250
300
Filter: Unfiltered
Max.Value 9 at 47.6ms
Min.Value -5.76 at 76.9ms

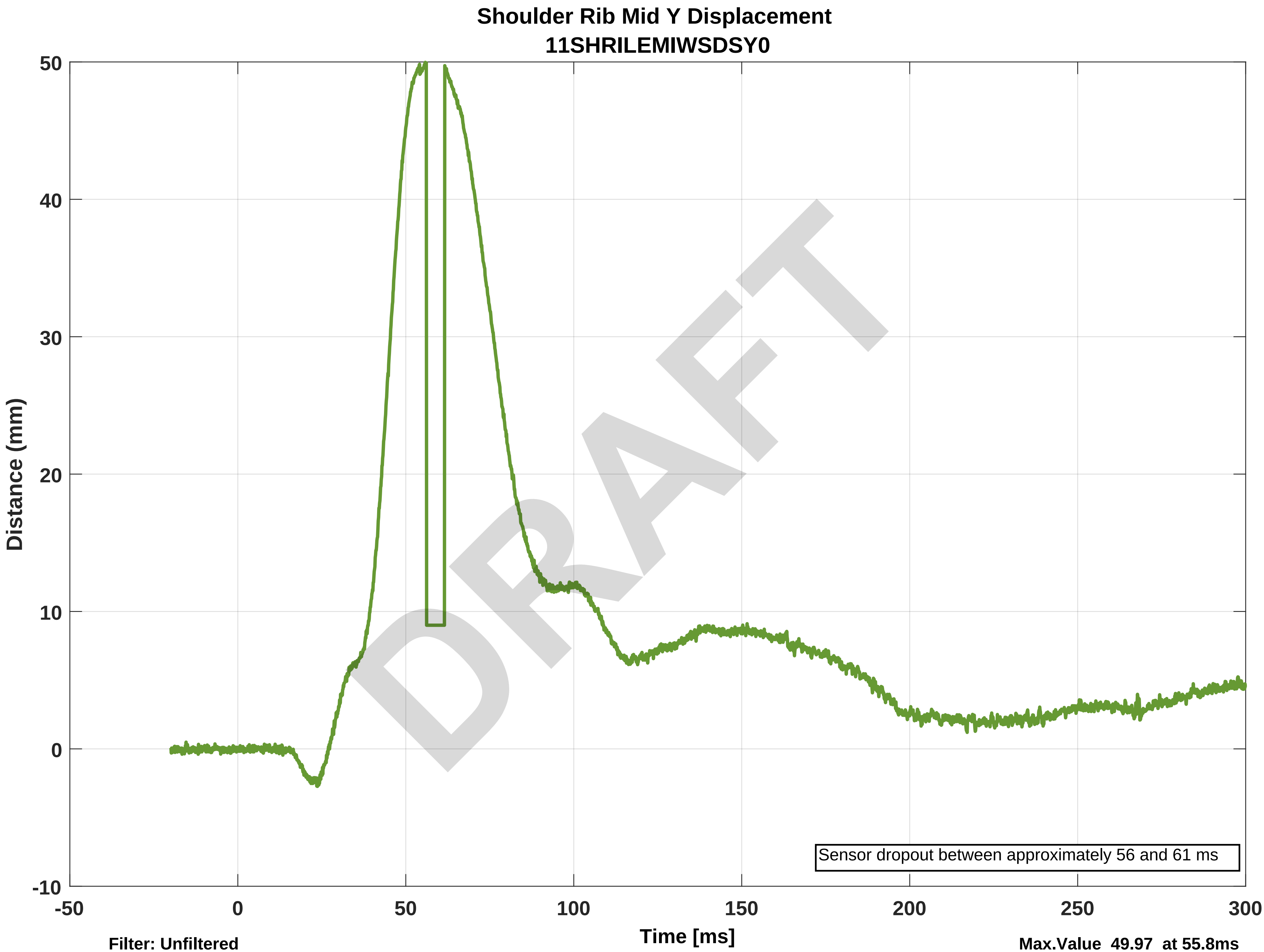


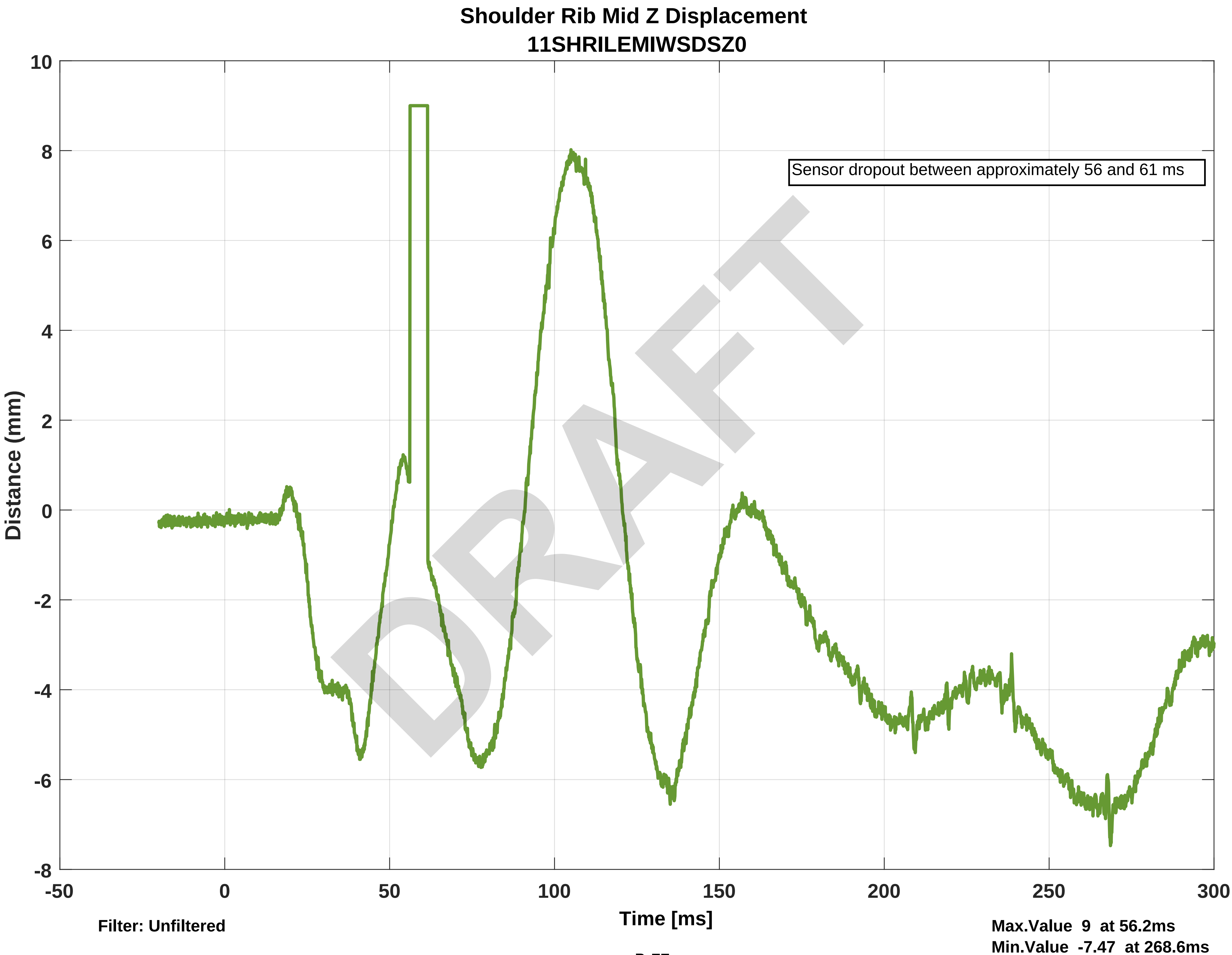
Filter: Unfiltered

Max.Value 9 at 47.6ms
Min.Value -5.63 at 83.6ms

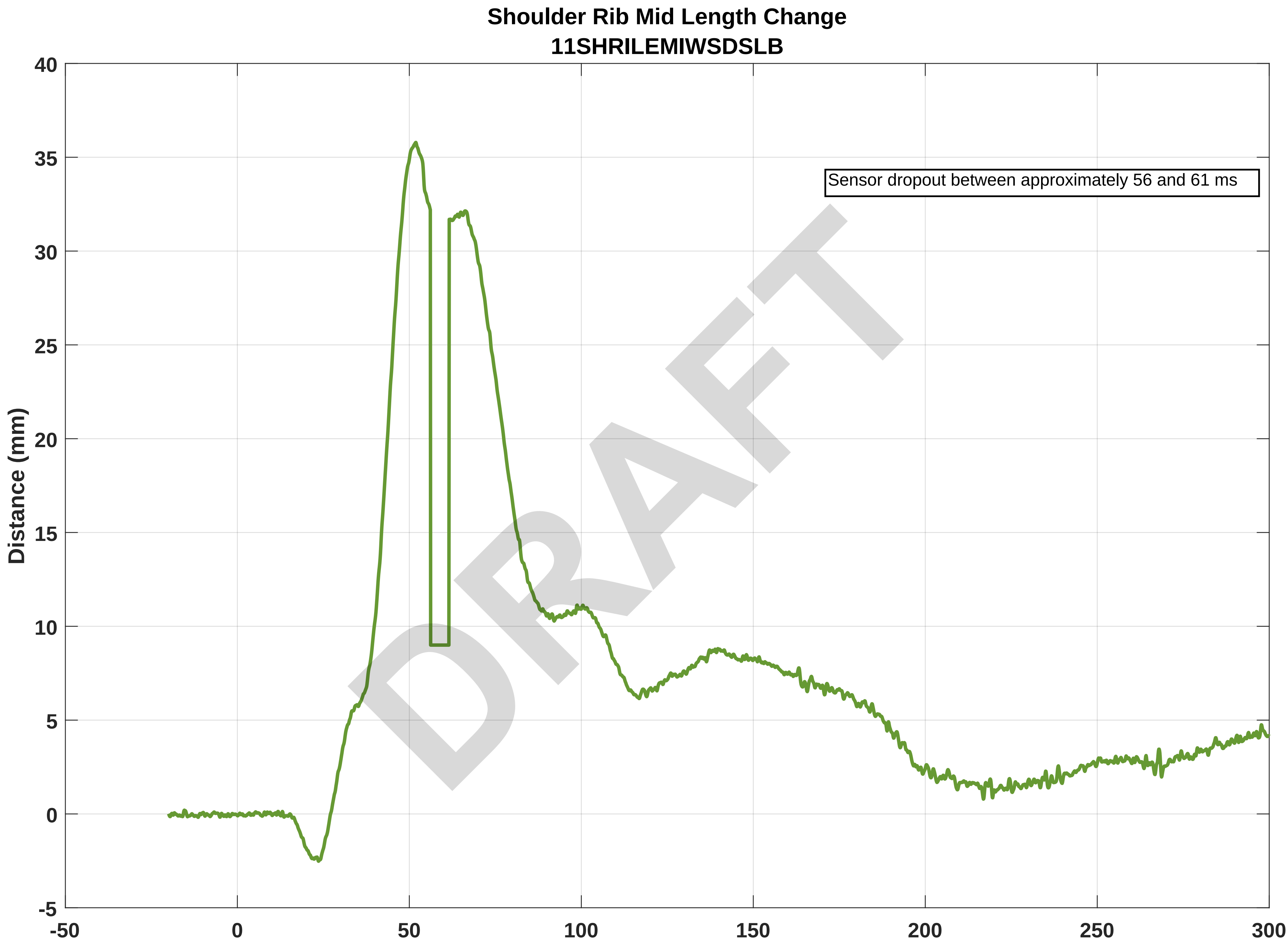


Shoulder Rib Mid X Displacement
11SHRILEMIWSDSX0
Distance (mm)
20
10
0
-10
-20
-30
-40
-50
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 56 and 61 ms
DRAFT
Filter: Unfiltered
Max.Value 10.11 at 160.4ms
Min.Value -44.45 at 61.6ms


Shoulder Rib Mid Y Displacement
11SHRILEMIWSDSY0
Distance (mm)
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 56 and 61 ms
DRAFT
Filter: Unfiltered
Max.Value 49.97 at 55.8ms
Min.Value -2.73 at 23.7ms

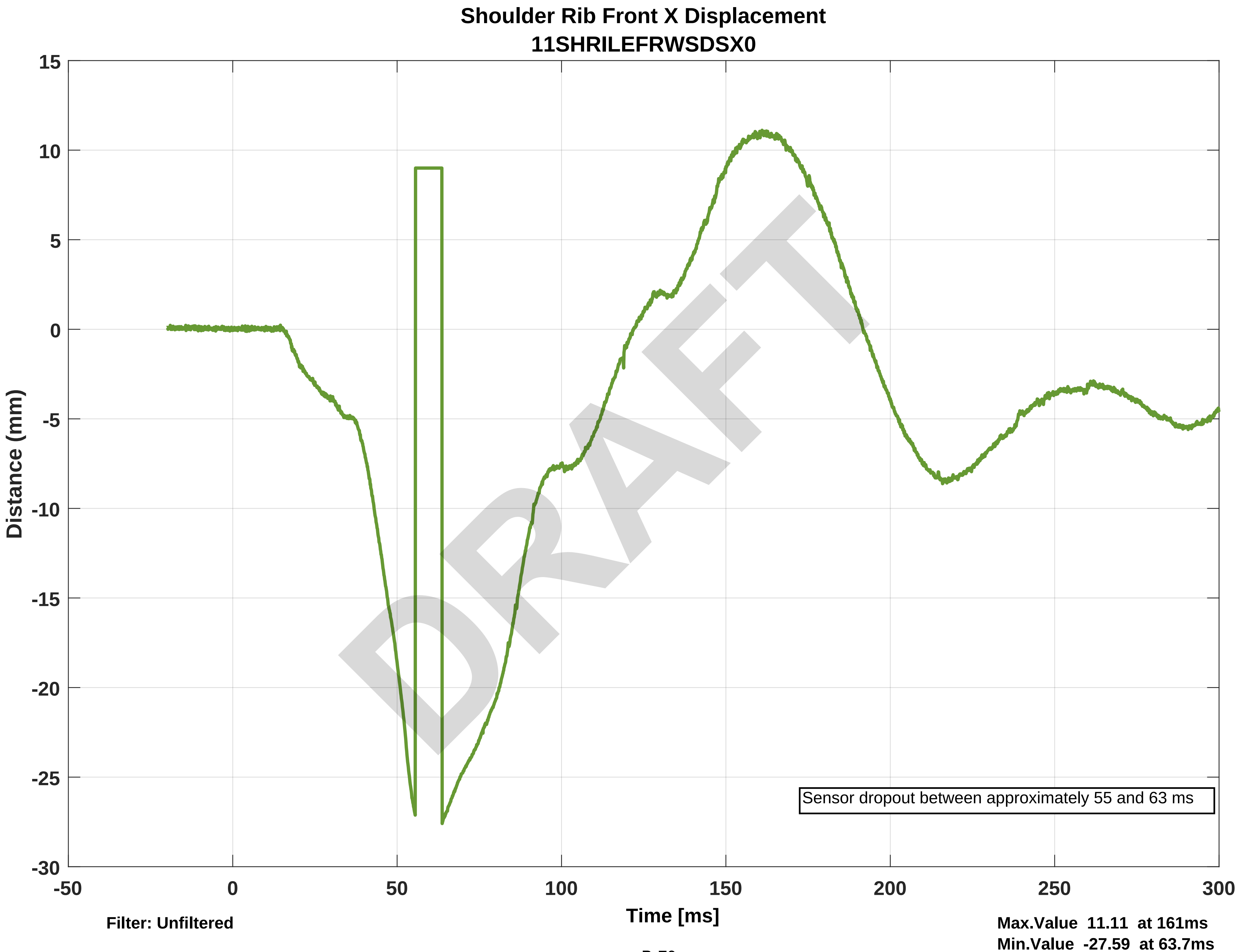


Shoulder Rib Mid Z Displacement
11SHRILEMIWSDSZ0
Sensor dropout between approximately 56 and 61 ms
DRAFT
Distance (mm)
10
8
6
4
2
0
-2
-4
-6
-8
-50
0
50
100
150
200
250
300
Time [ms]
Filter: Unfiltered
Max.Value 9 at 56.2ms
Min.Value -7.47 at 268.6ms

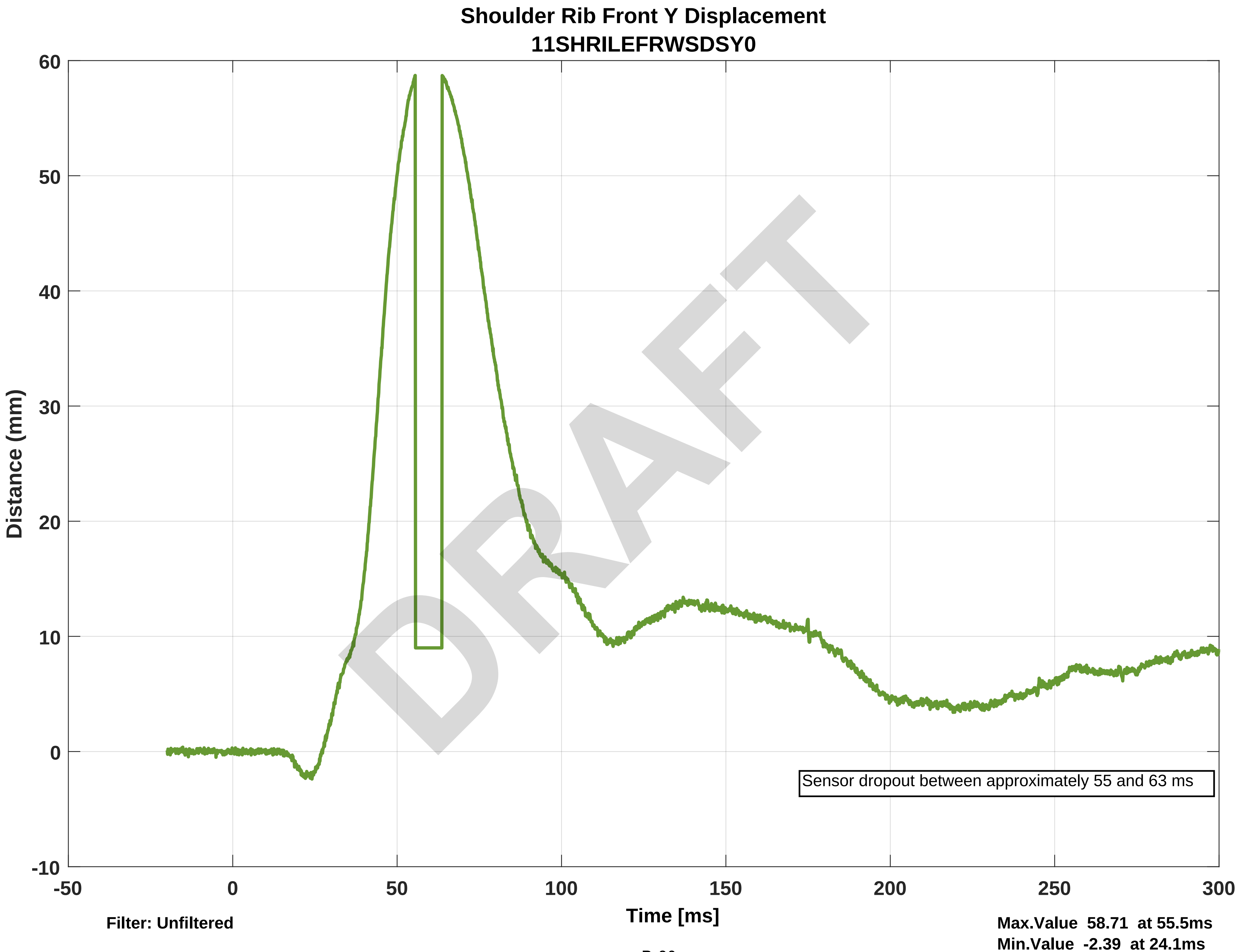


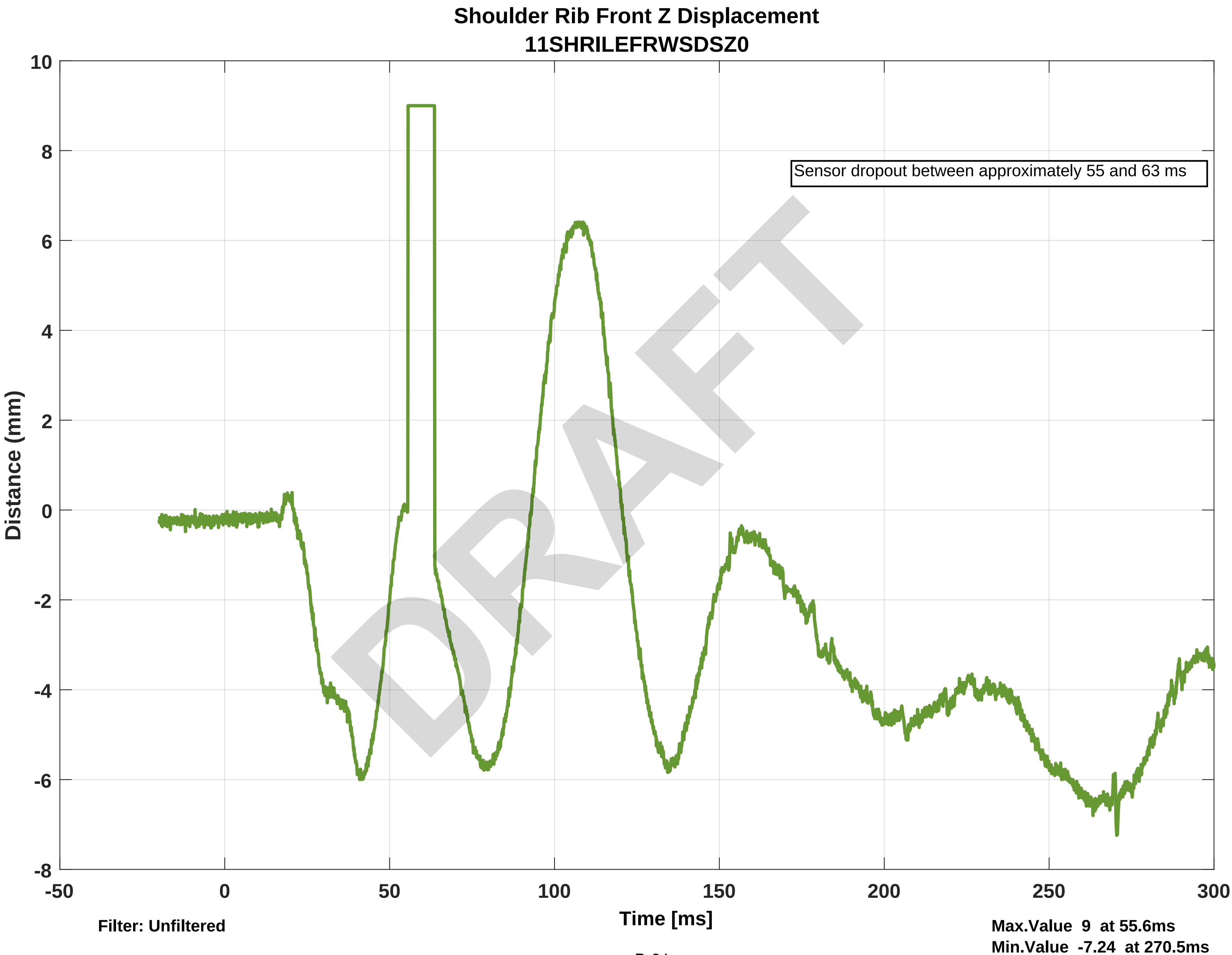
Filter: Unfiltered

Max.Value 35.79 at 51.9ms
Min.Value -2.52 at 23.6ms

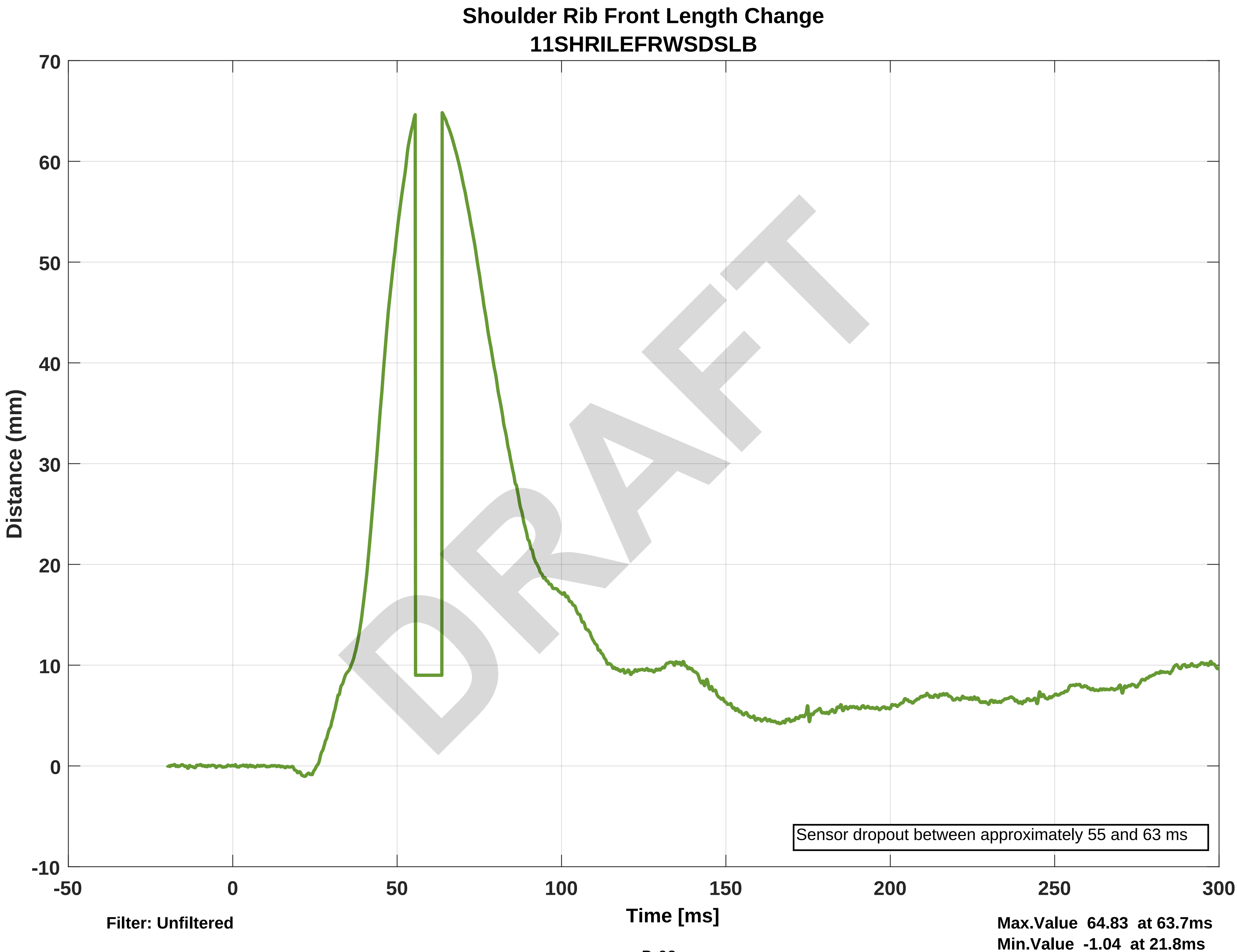


Shoulder Rib Front X Displacement
11SHRILEFRWSDSX0
Distance (mm)
15
10
5
0
-5
-10
-15
-20
-25
-30
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 55 and 63 ms
DRAFT
Filter: Unfiltered
Max.Value 11.11 at 161ms
Min.Value -27.59 at 63.7ms

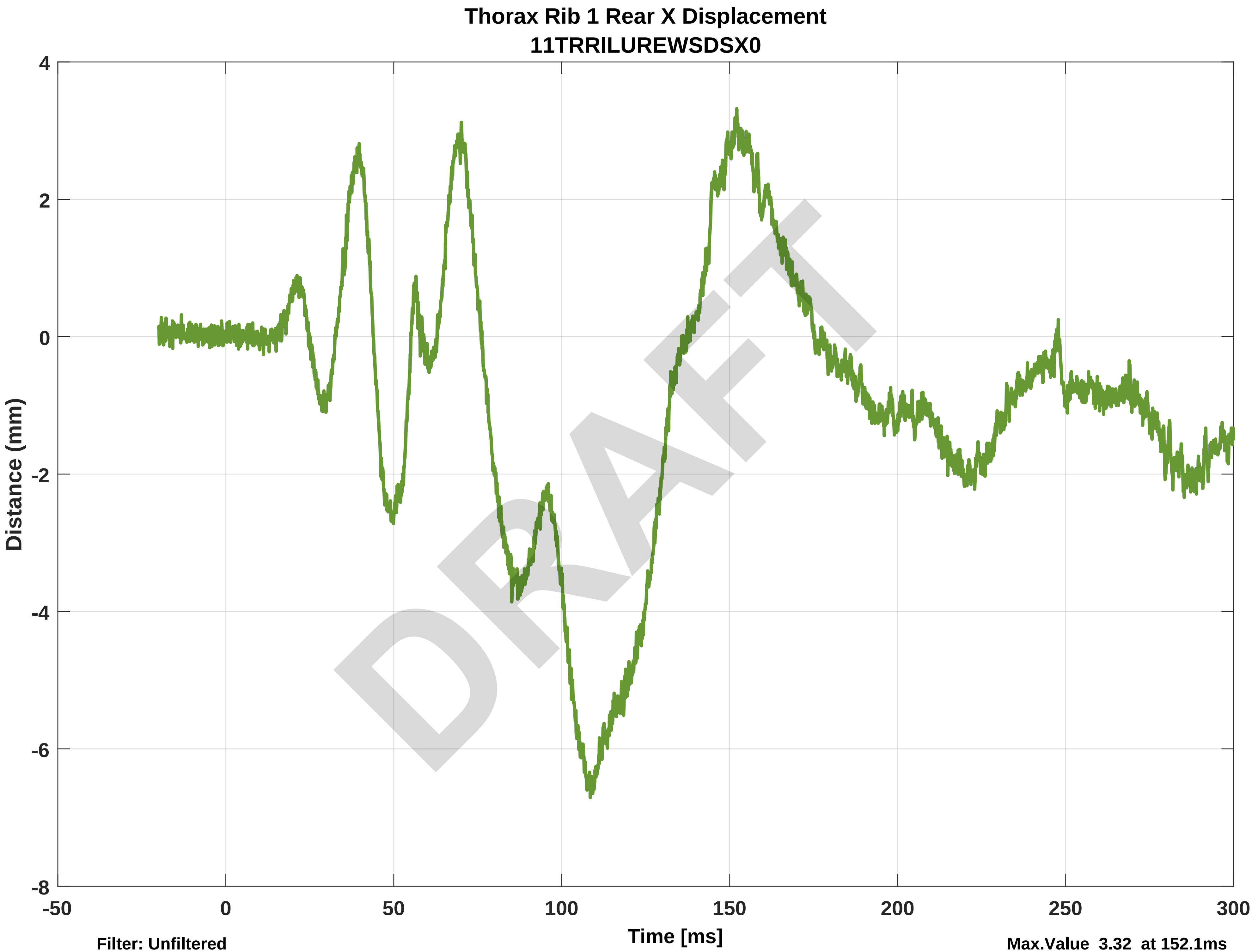

Shoulder Rib Front Y Displacement
11SHRILEFRWSDSY0
Distance (mm)
60
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 55 and 63 ms
DRAFT
Filter: Unfiltered
Max.Value 58.71 at 55.5ms
Min.Value -2.39 at 24.1ms

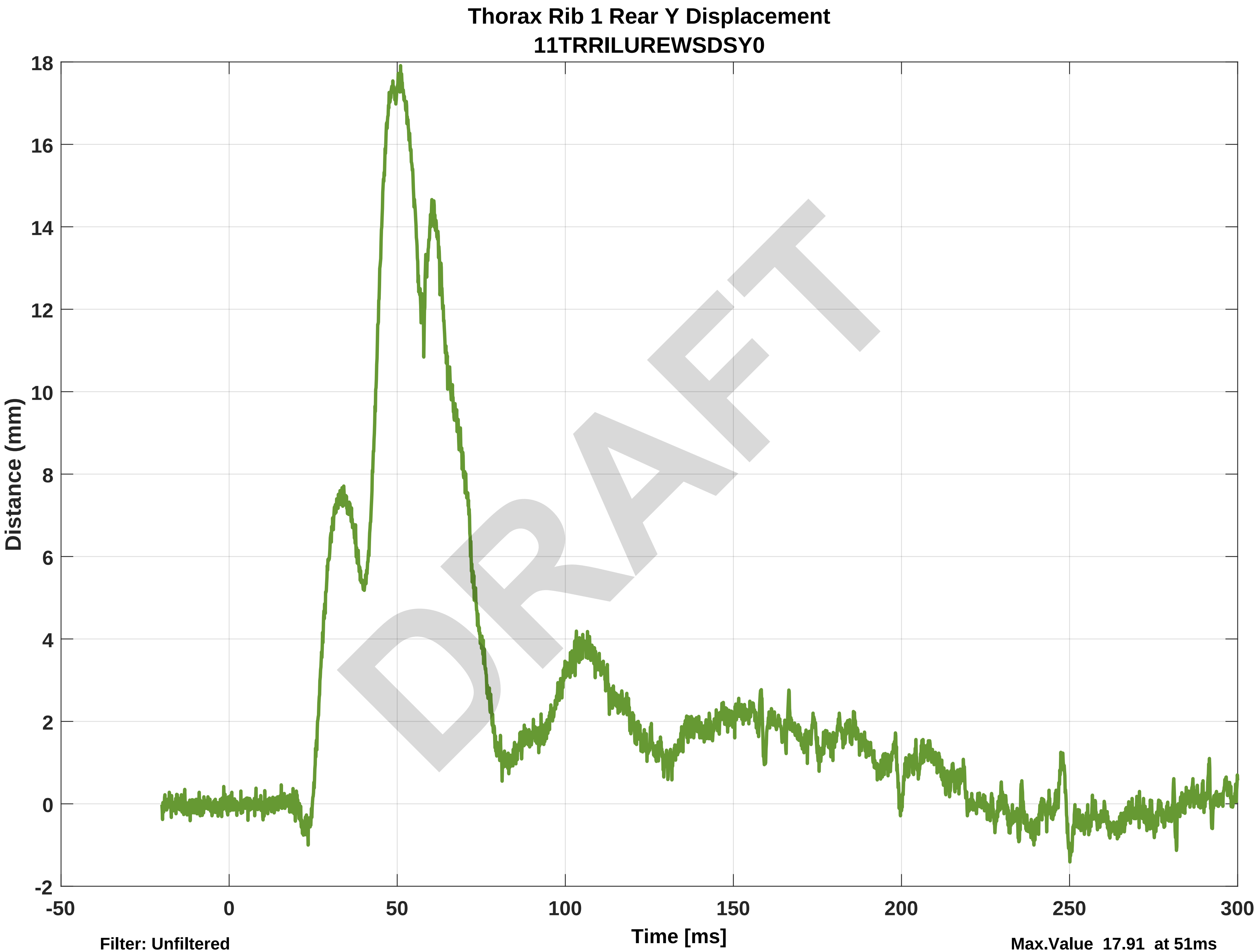


Shoulder Rib Front Z Displacement
11SHRILEFRWSDSZ0
Sensor dropout between approximately 55 and 63 ms
DRAFT
Distance (mm)
Time [ms]
10
8
6
4
2
0
-2
-4
-6
-8
-50
0
50
100
150
200
250
300
Filter: Unfiltered
Max.Value 9 at 55.6ms
Min.Value -7.24 at 270.5ms



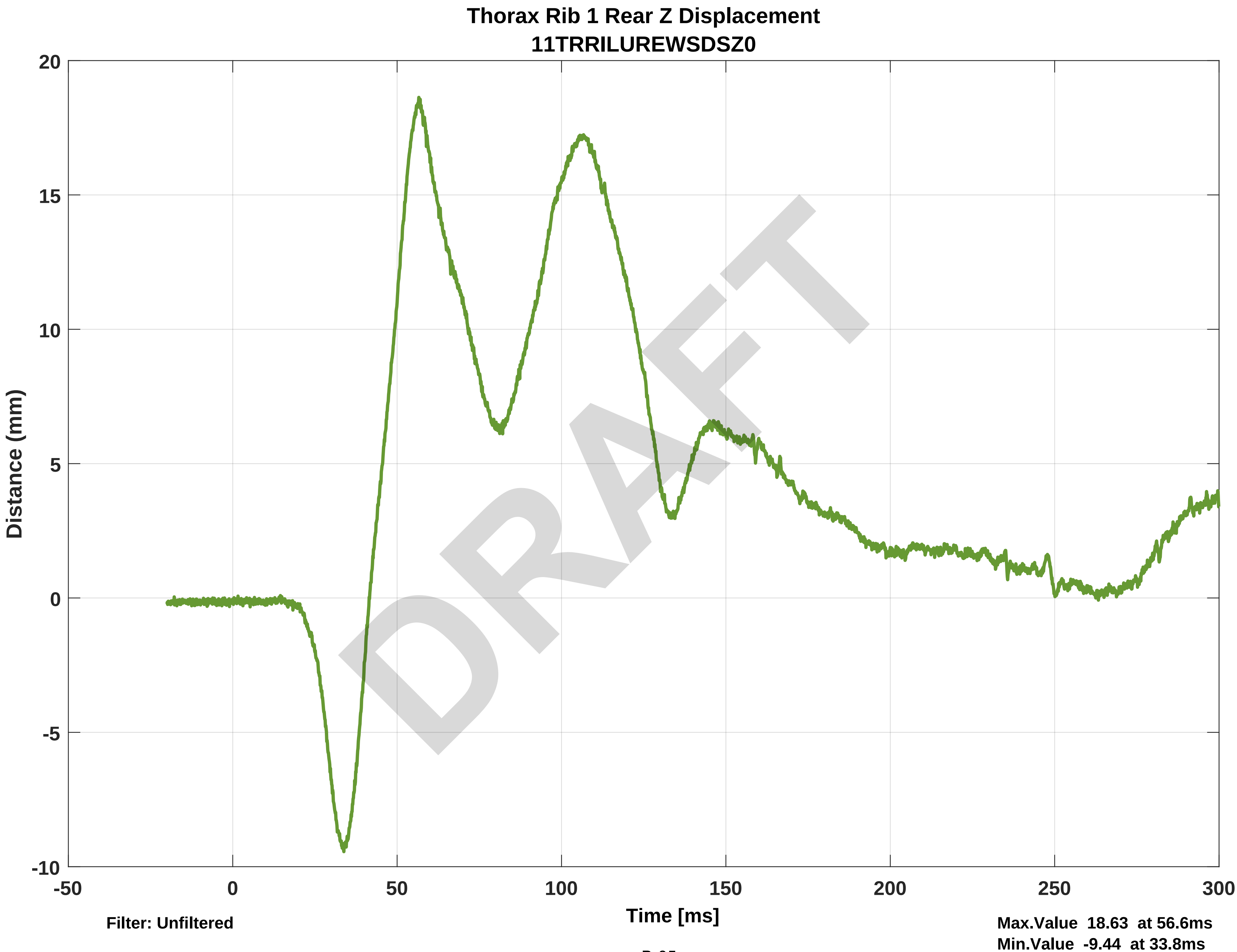
Shoulder Rib Front Length Change
11SHRILEFRWSDSLB
Distance (mm)
70
60
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 55 and 63 ms
DRAFT
Filter: Unfiltered
Max.Value 64.83 at 63.7ms
Min.Value -1.04 at 21.8ms

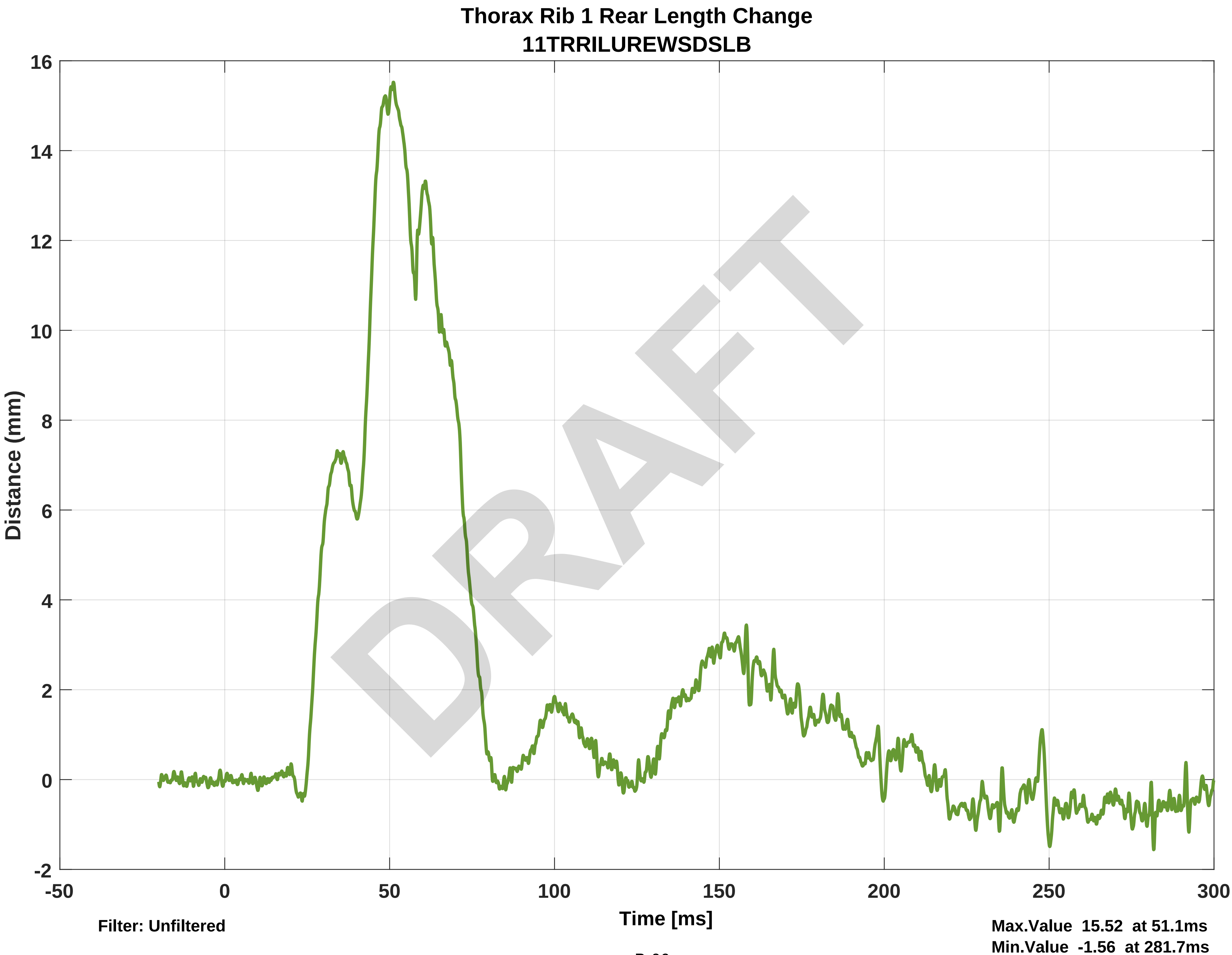

Thorax Rib 1 Rear X Displacement
11TRRILUREWSDSX0
Distance (mm)
Time [ms]
4
2
0
-2
-4
-6
-8
-50
0
50
100
150
200
250
300
DRAFT
Filter: Unfiltered
Max.Value 3.32 at 152.1ms
Min.Value -6.71 at 108.5ms

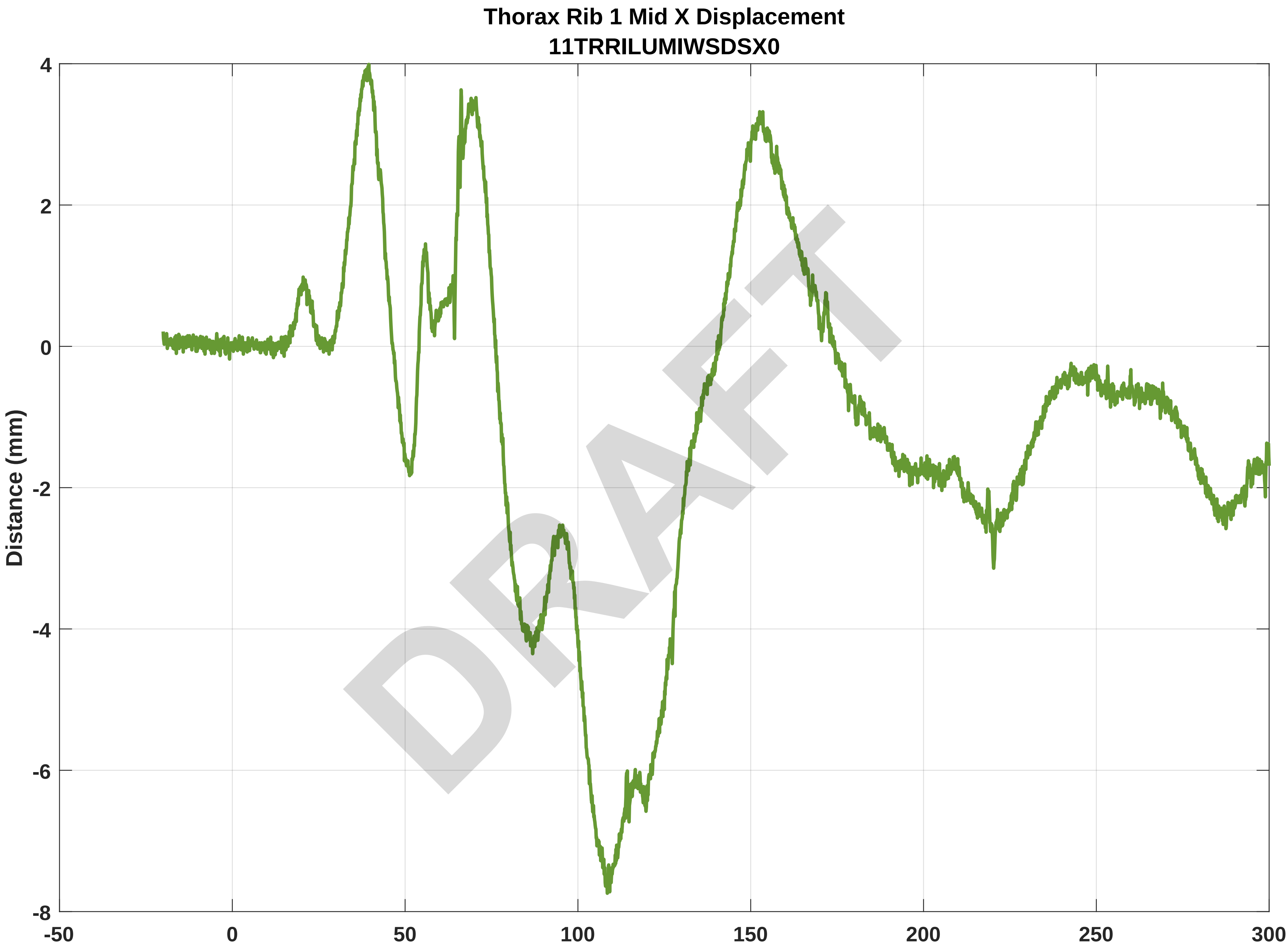


Filter: Unfiltered

Max.Value 17.91 at 51ms
Min.Value -1.41 at 250.1ms

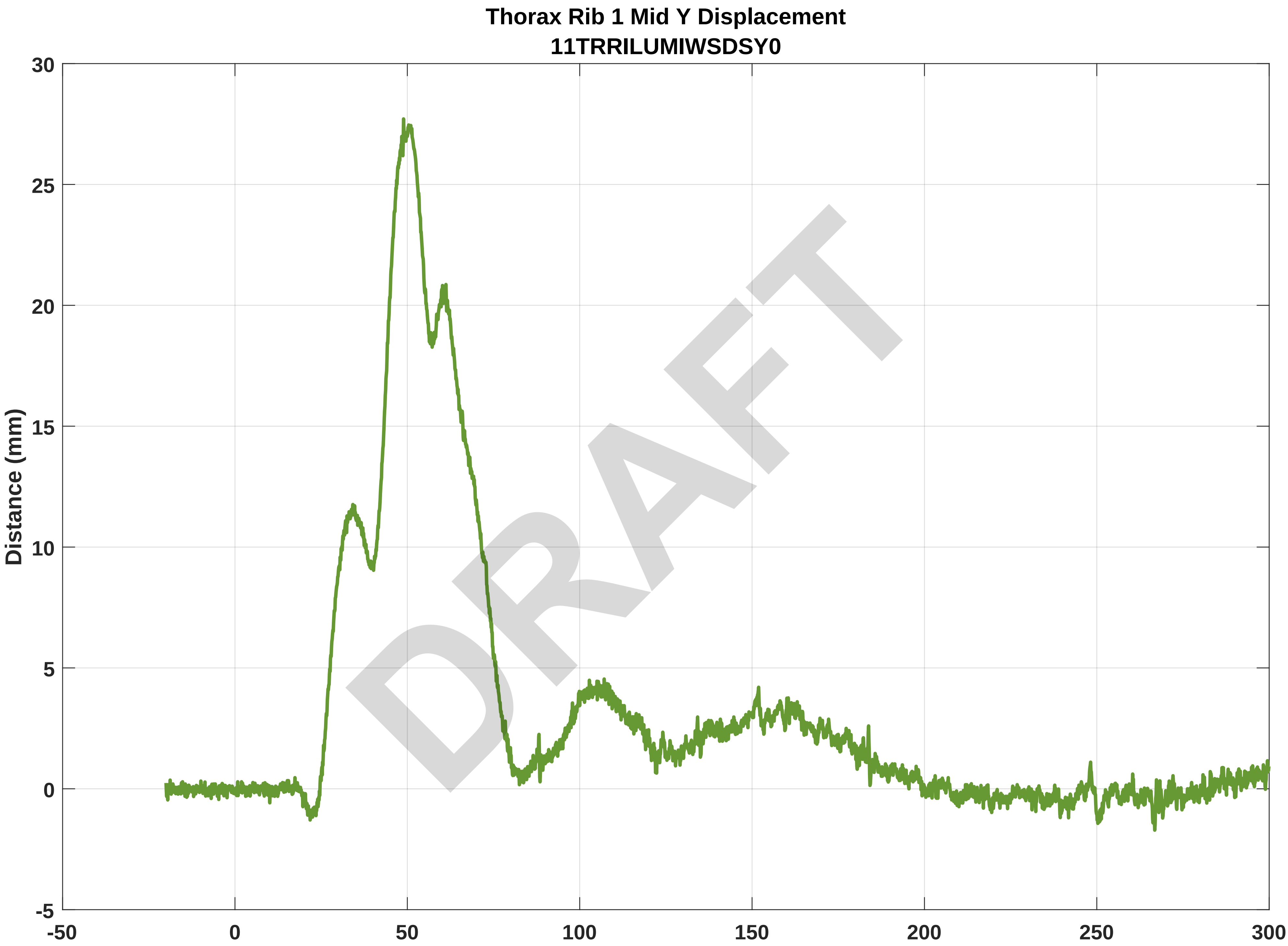

Thorax Rib 1 Rear Z Displacement
11TRRILUREWSDSZ0
Distance (mm)
Time [ms]
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
DRAFT
Filter: Unfiltered
Max.Value 18.63 at 56.6ms
Min.Value -9.44 at 33.8ms


Thorax Rib 1 Rear Length Change
11TRRILUREWSDSLB
Distance (mm)
Time [ms]
16
14
12
10
8
6
4
2
0
-2
-50
0
50
100
150
200
250
300
DRAFT
Filter: Unfiltered
Max.Value 15.52 at 51.1ms
Min.Value -1.56 at 281.7ms



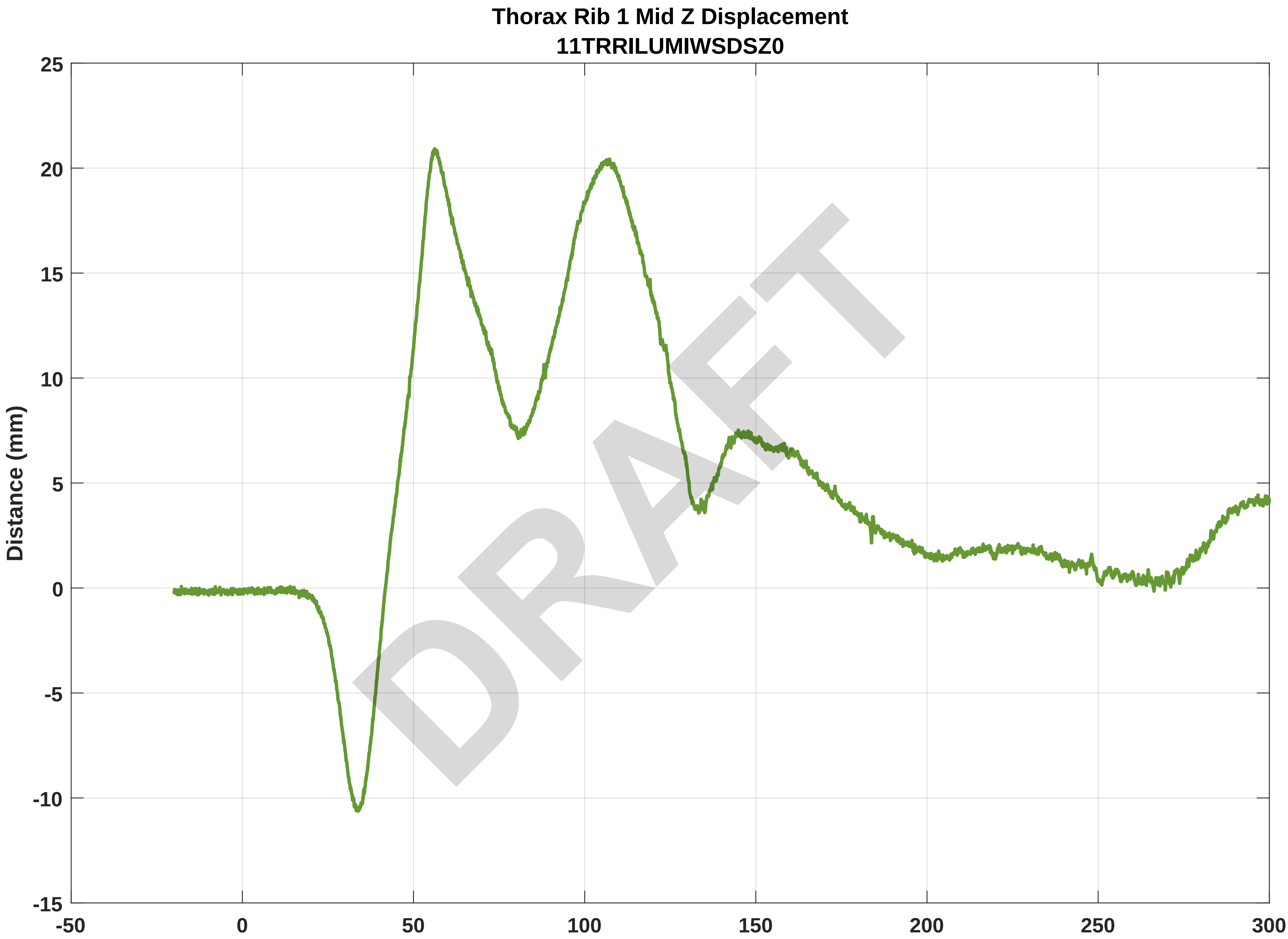
Filter: Unfiltered

Max.Value 3.99 at 39.5ms
Min.Value -7.74 at 108.5ms



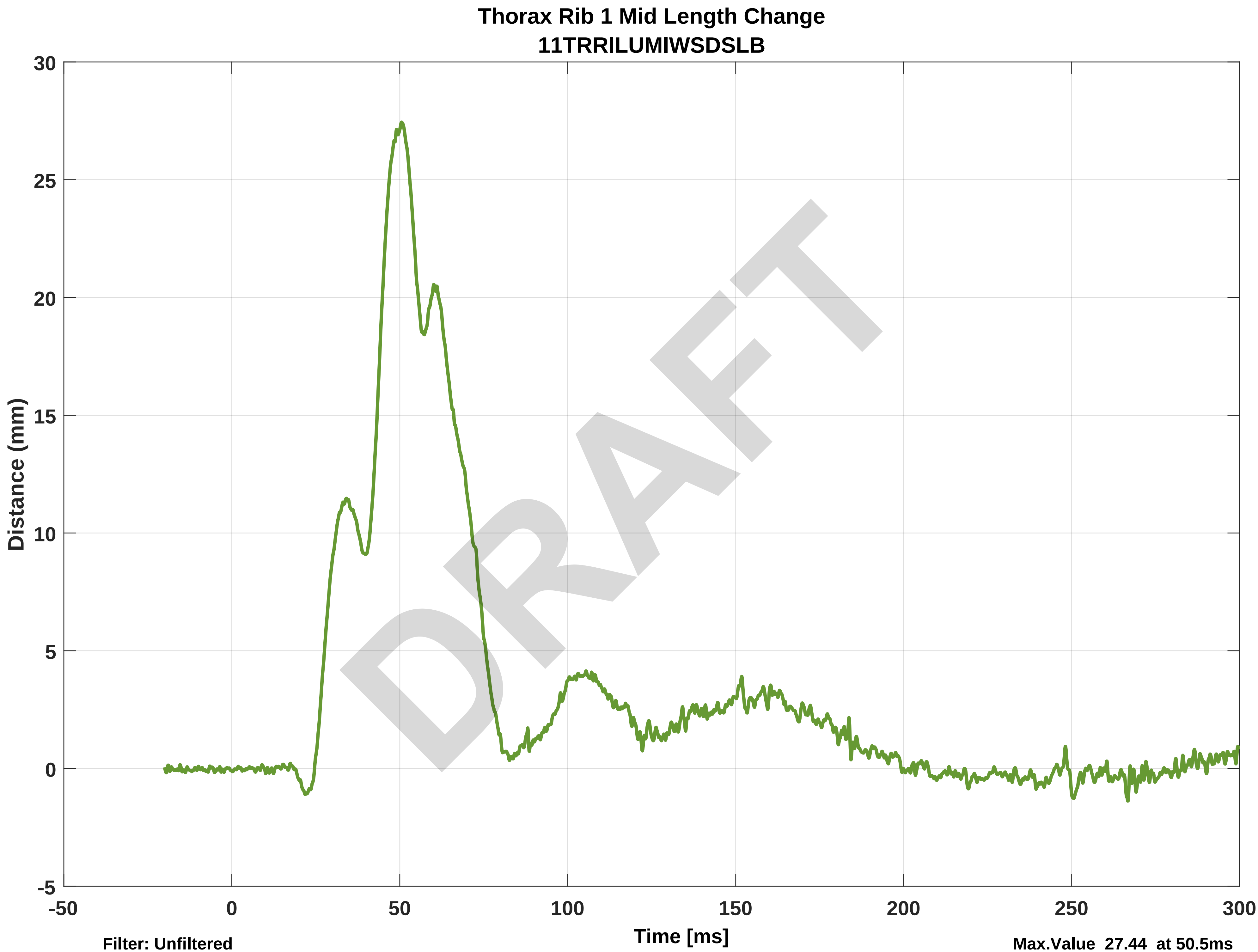
Filter: Unfiltered

Max.Value 27.71 at 48.9ms
Min.Value -1.71 at 266.8ms



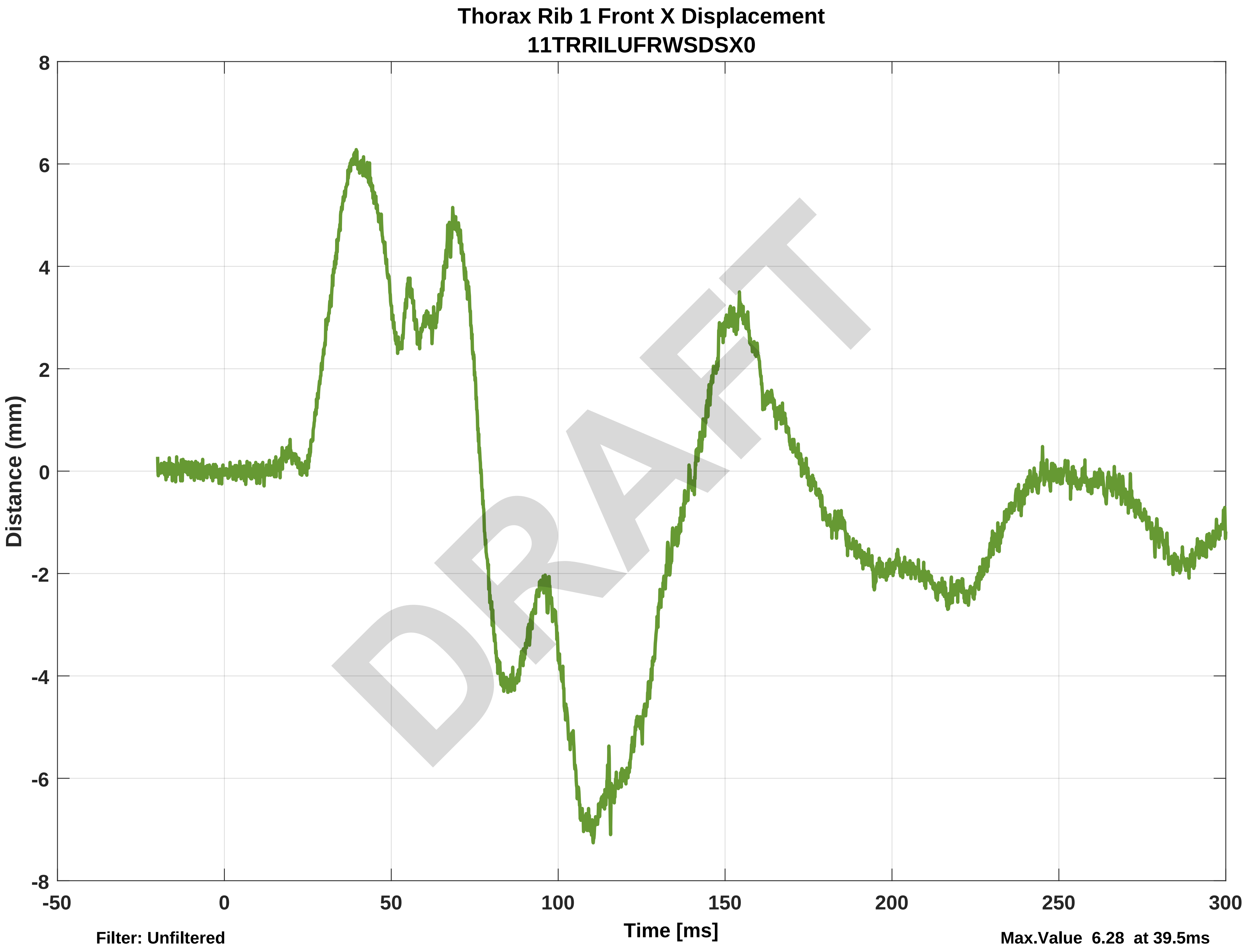
Filter: Unfiltered

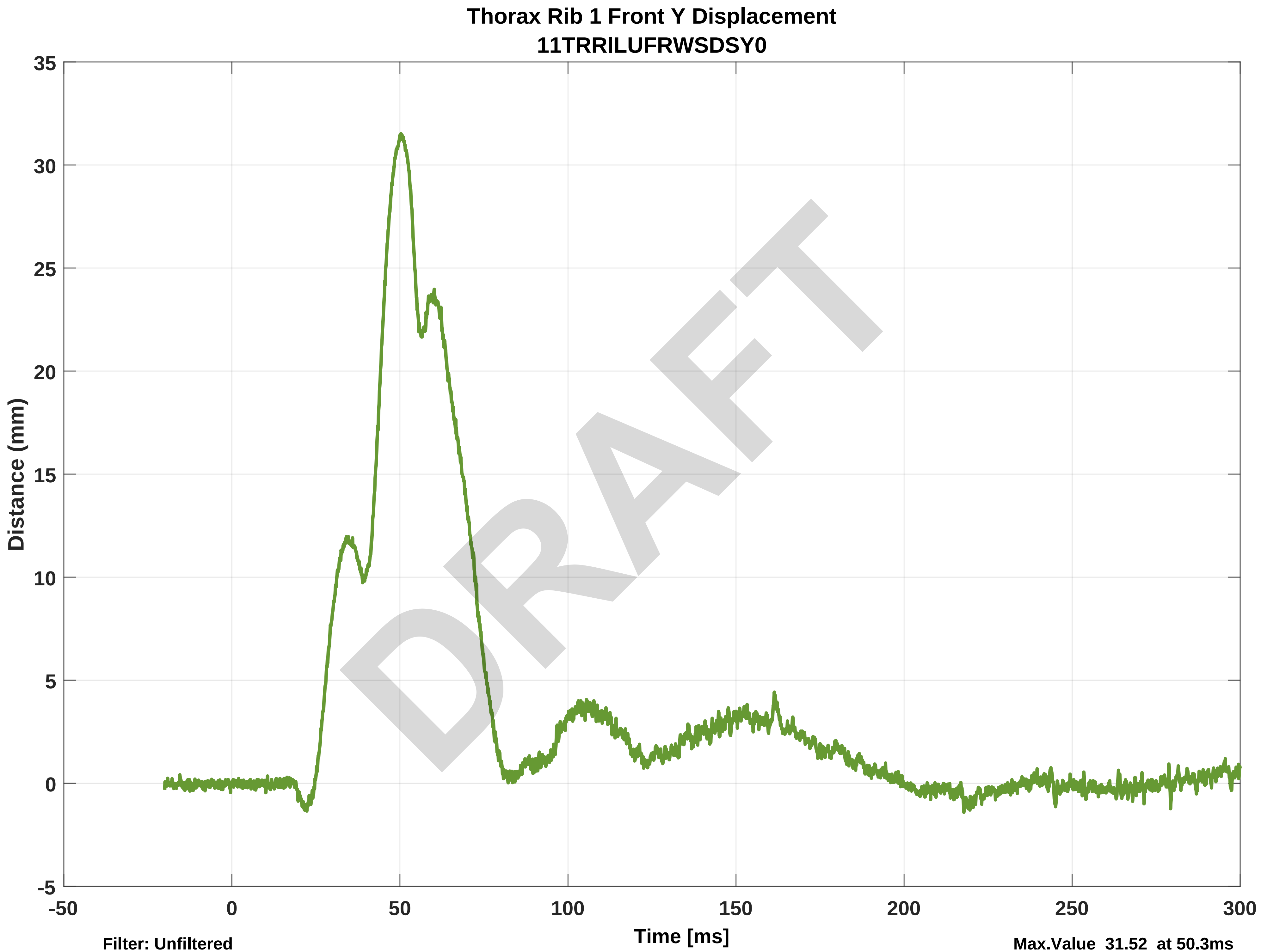
Max.Value 20.92 at 56.2ms
Min.Value -10.62 at 33.9ms



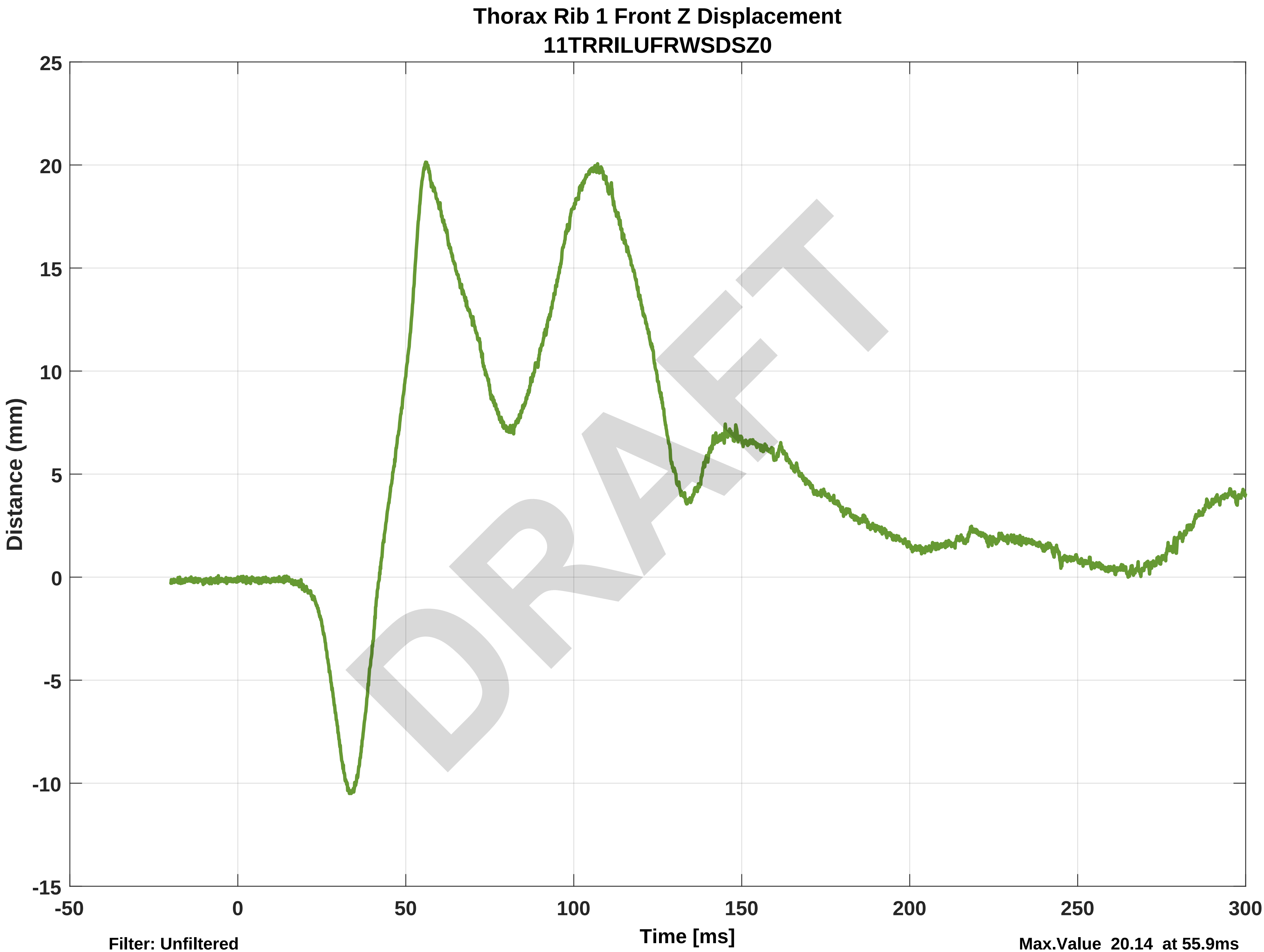
Filter: Unfiltered

Max.Value 27.44 at 50.5ms
Min.Value -1.38 at 266.7ms


Thorax Rib 1 Front X Displacement
11TRRILUFRWSDSX0
Distance (mm)
Time [ms]
8
6
4
2
0
-2
-4
-6
-8
-50
0
50
100
150
200
250
300
DRAFT
Filter: Unfiltered
Max.Value 6.28 at 39.5ms
Min.Value -7.26 at 110.5ms

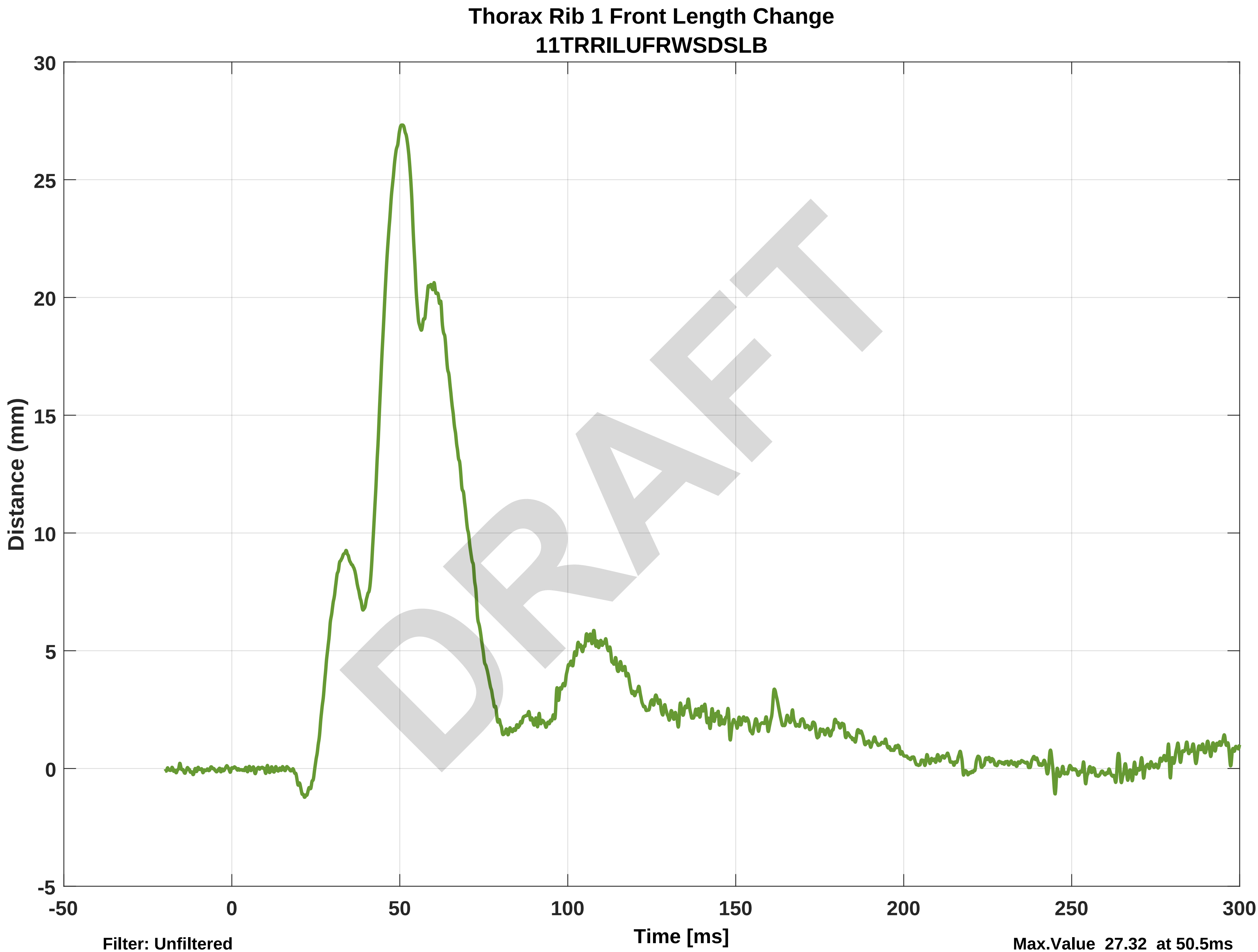


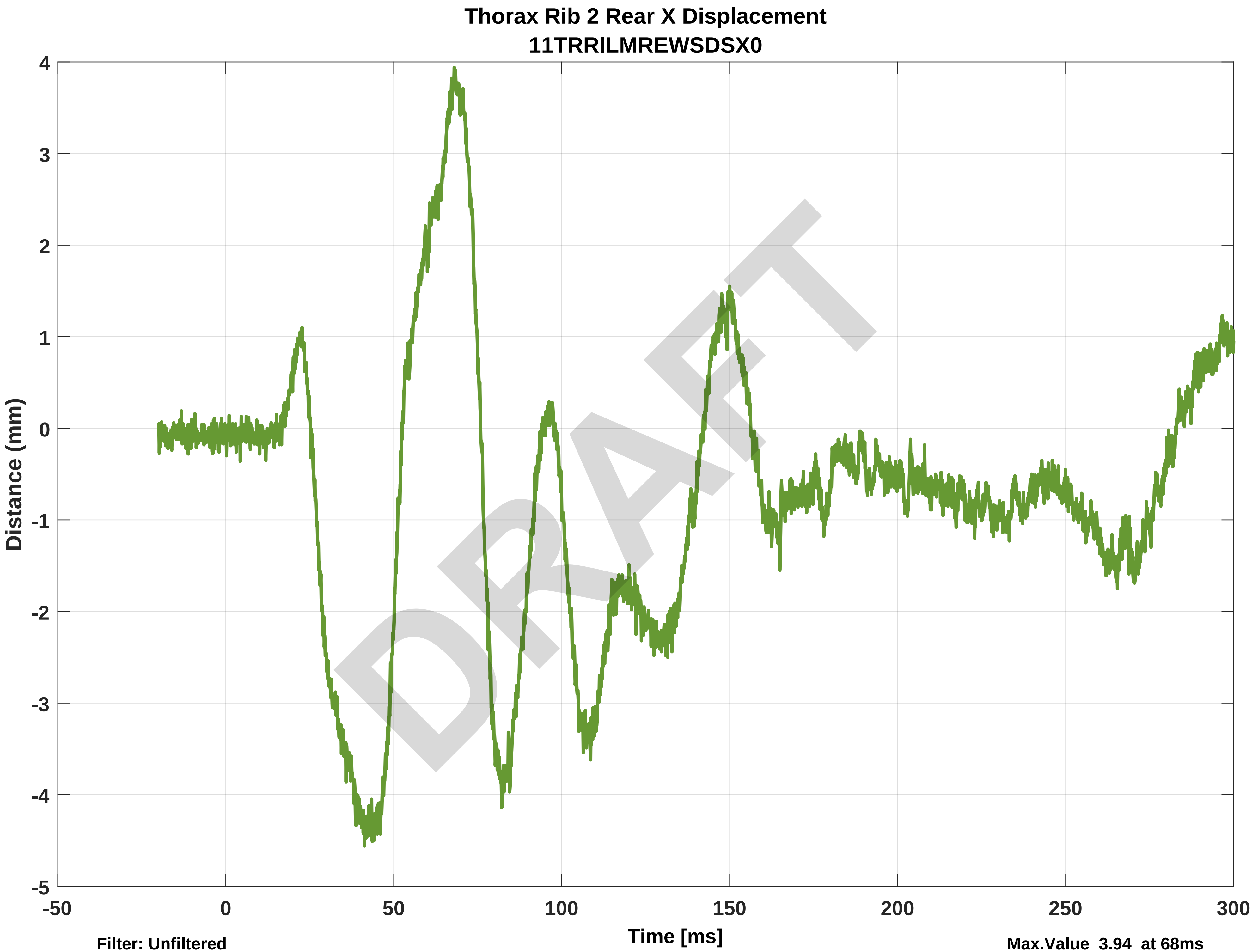
Thorax Rib 1 Front Y Displacement
11TRRILUFRWSDSY0
Distance (mm)
35
30
25
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
Time [ms]
Filter: Unfiltered
Max.Value 31.52 at 50.3ms
Min.Value -1.41 at 217.8ms
DRAFT



Filter: Unfiltered

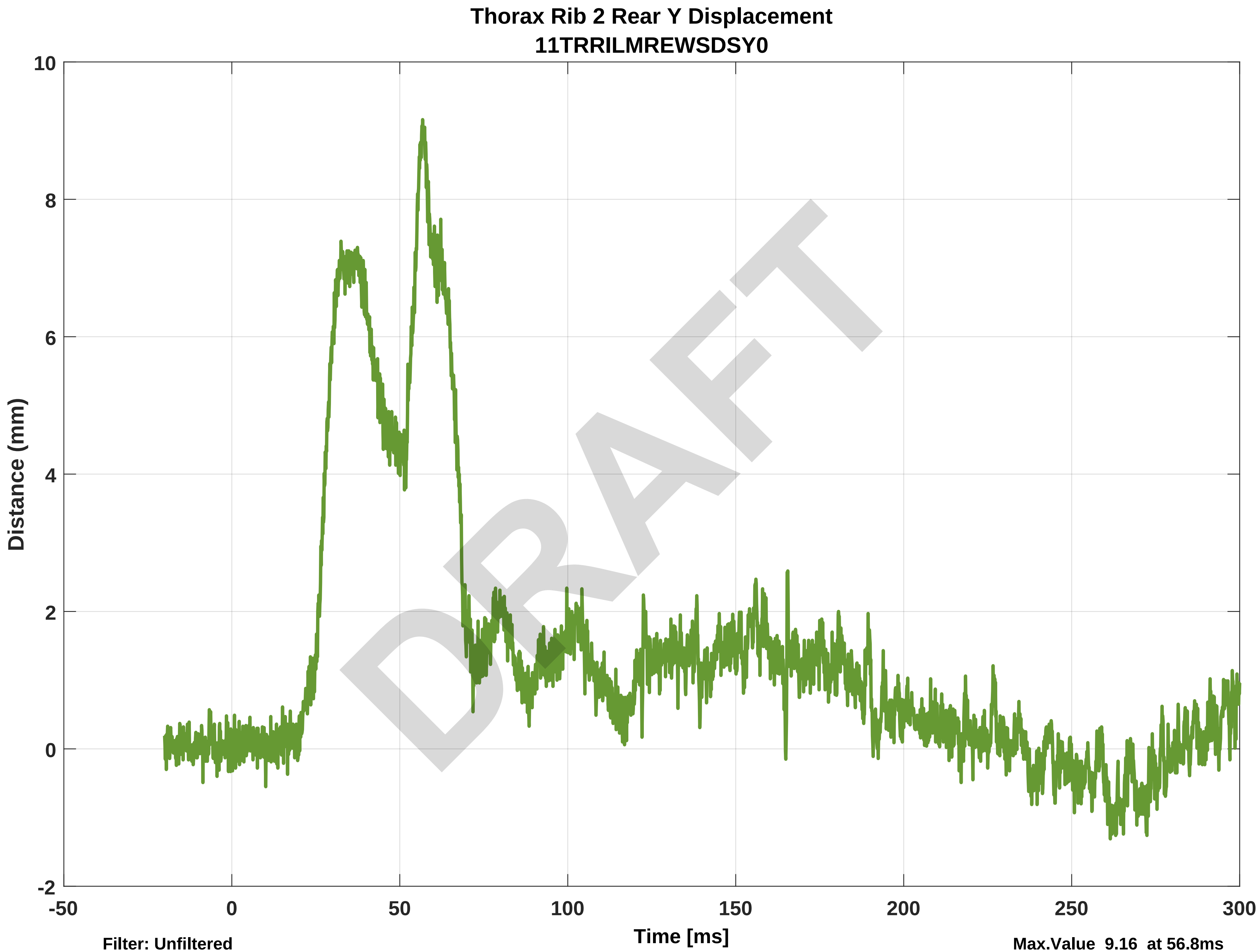
Max.Value 20.14 at 55.9ms
Min.Value -10.5 at 33.2ms


Thorax Rib 1 Front Length Change
11TRRILUFRWSDSLB
30
25
20
15
10
5
0
-5
Distance (mm)
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 27.32 at 50.5ms
Min.Value -1.22 at 21.6ms



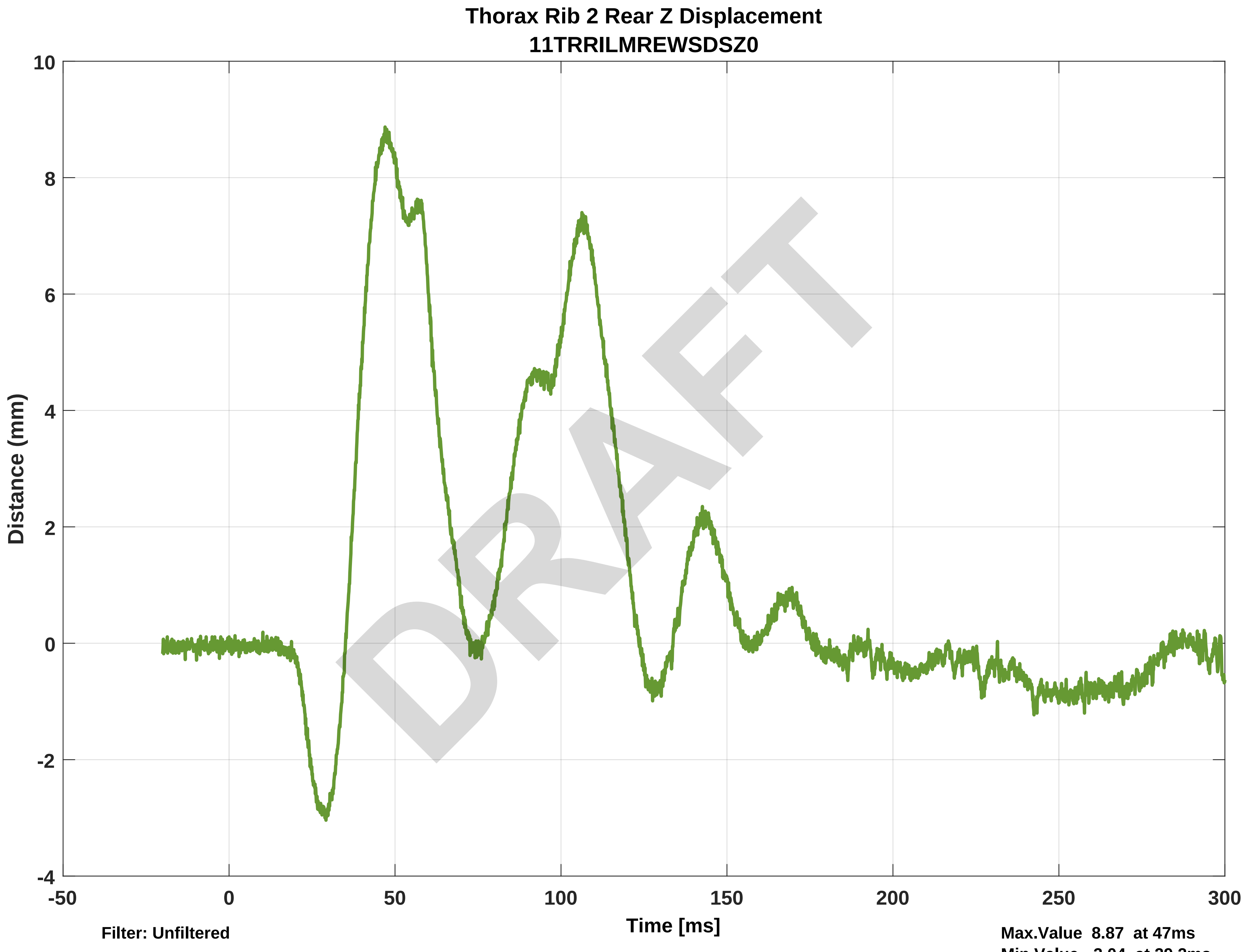
Filter: Unfiltered

Max.Value 3.94 at 68ms
Min.Value -4.56 at 41.3ms

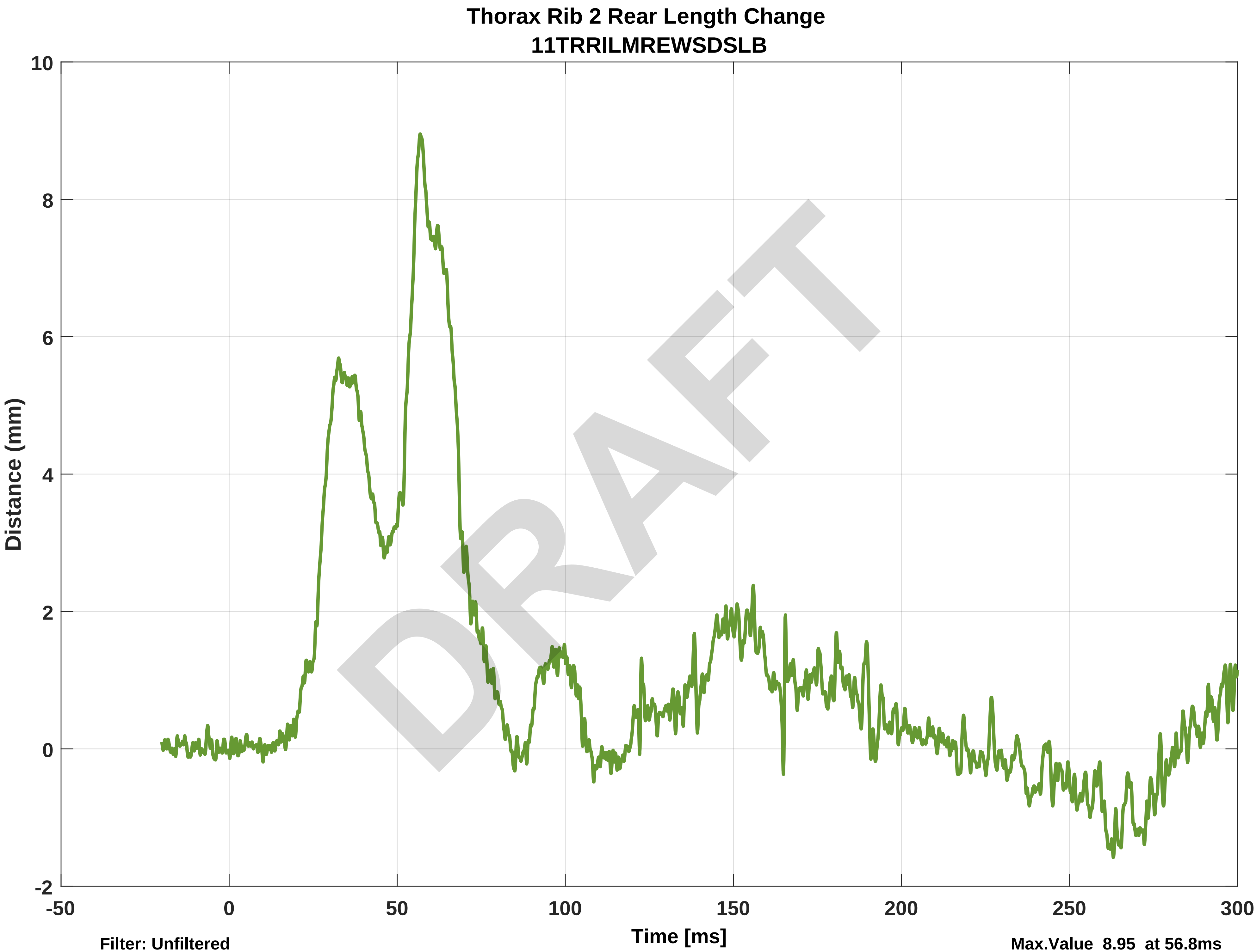


Filter: Unfiltered

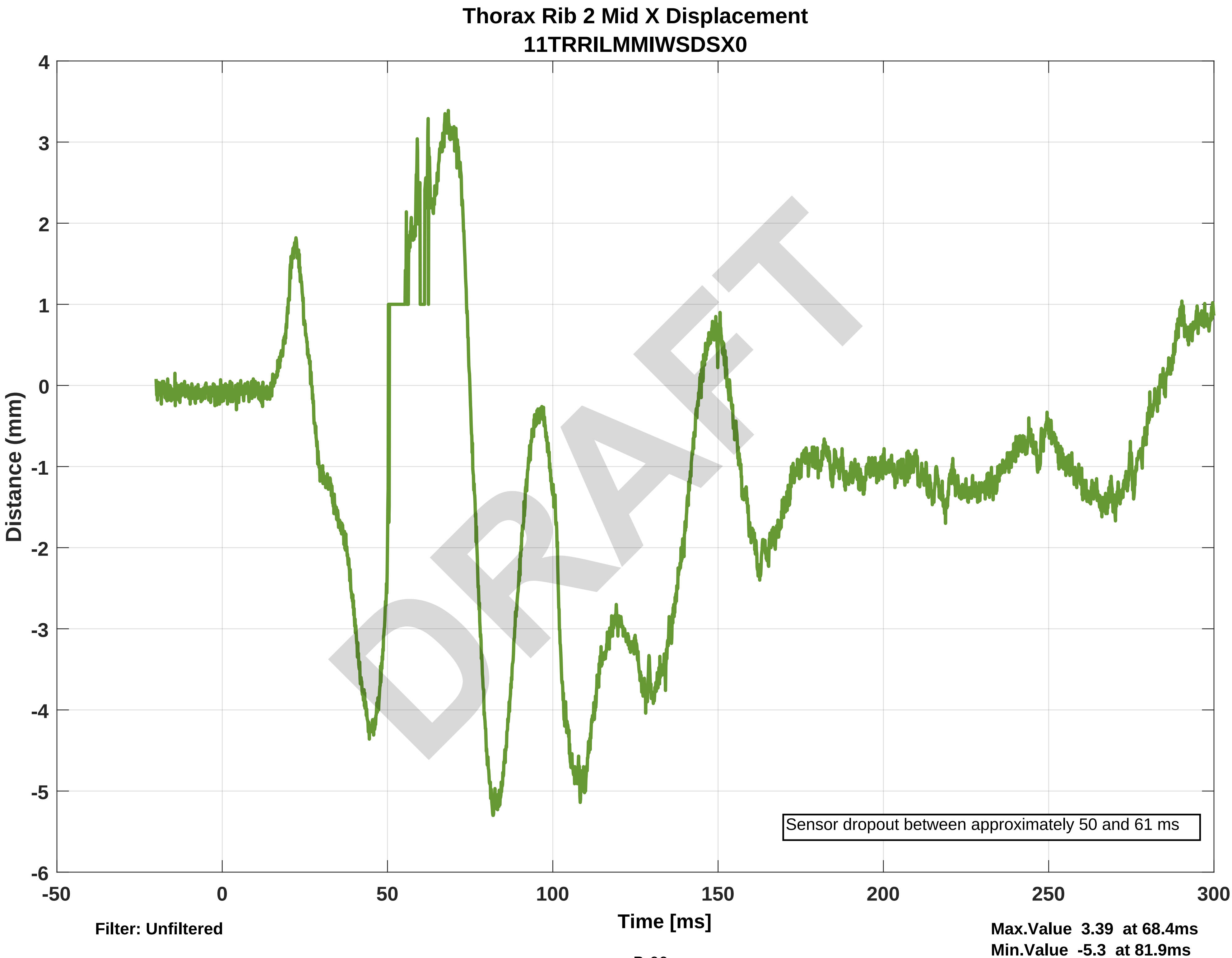
Max.Value 9.16 at 56.8ms
Min.Value -1.31 at 261.5ms



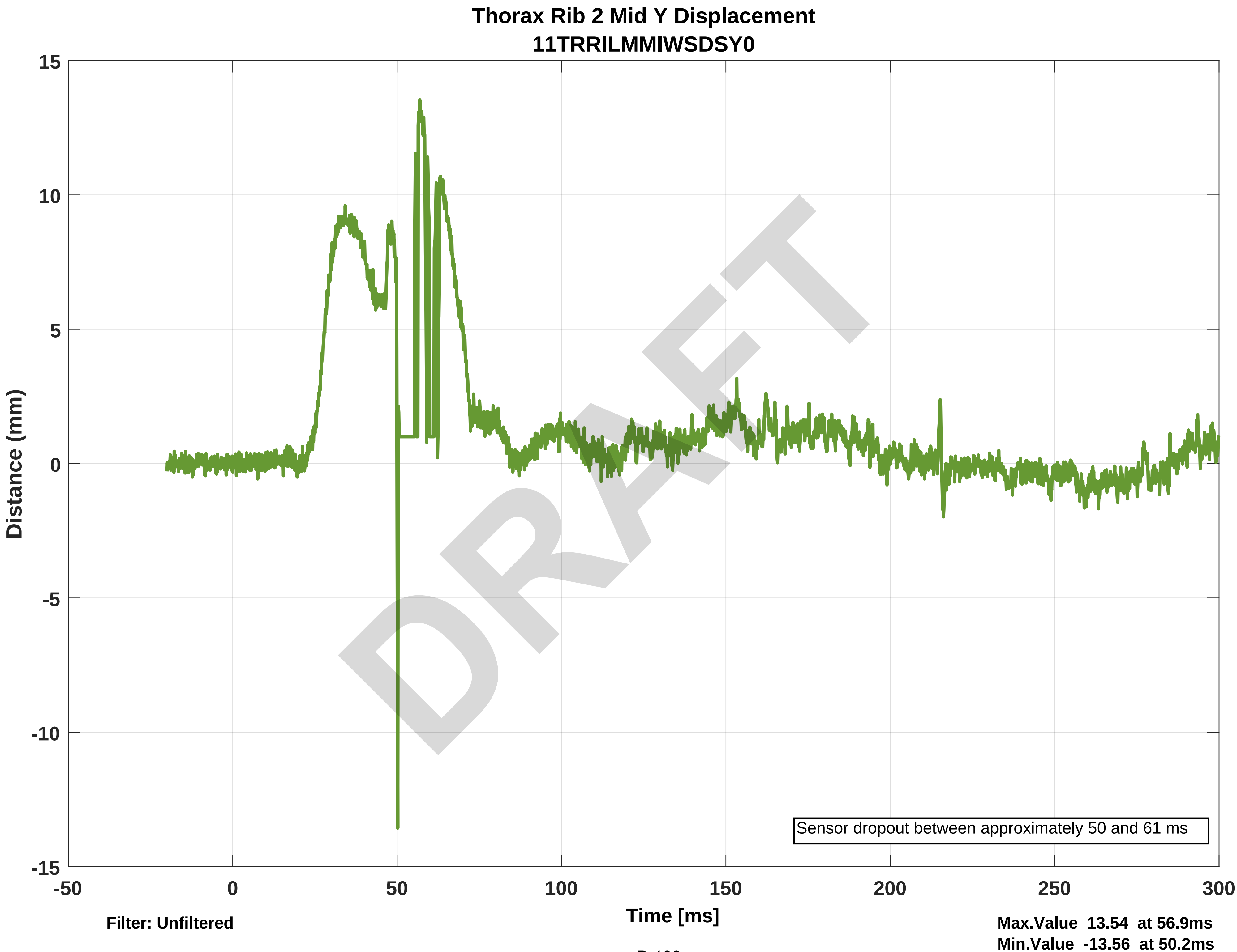
Thorax Rib 2 Rear Z Displacement
11TRRILMREWSDSZ0
Distance (mm)
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 8.87 at 47ms
Min.Value -3.04 at 29.2ms



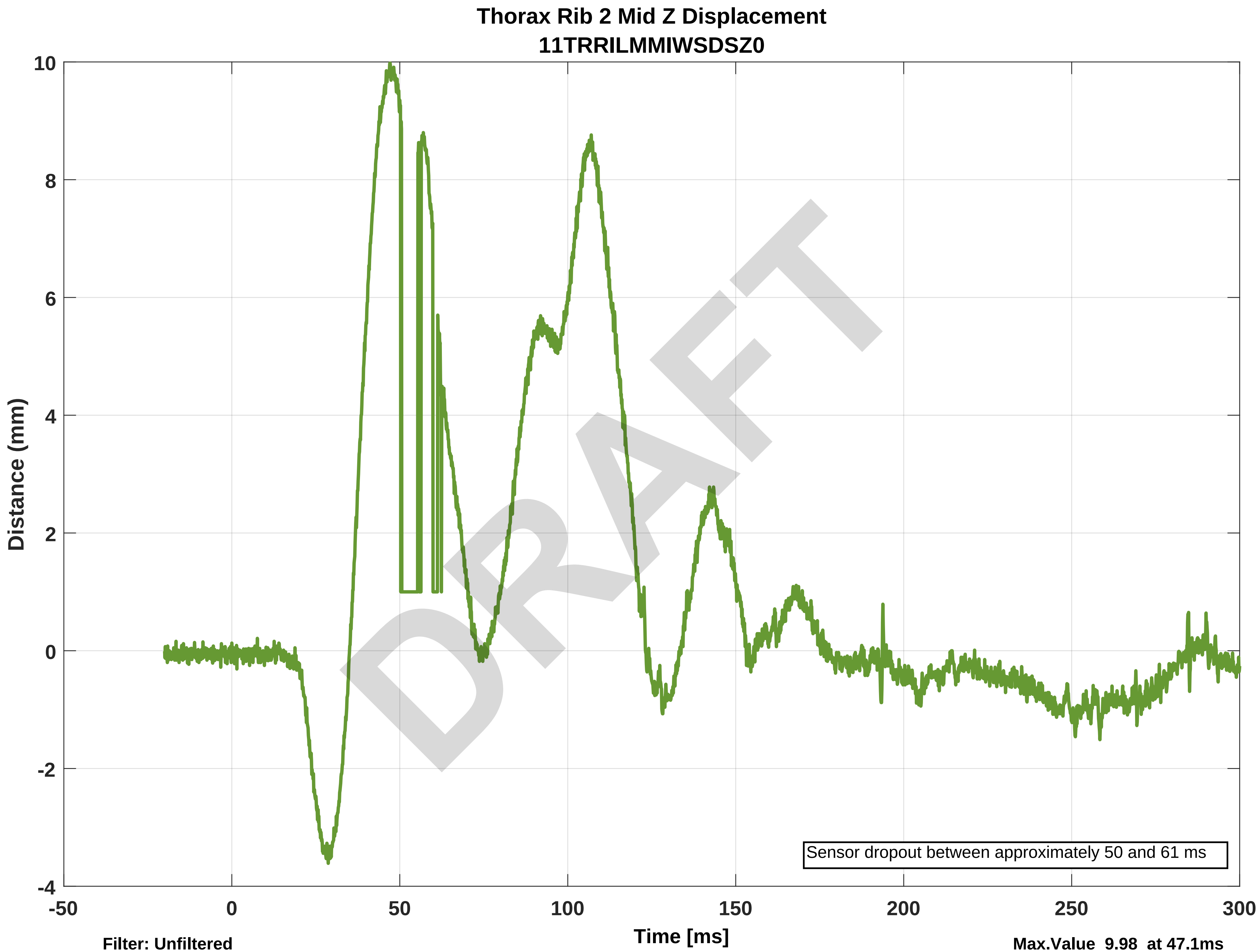
Thorax Rib 2 Rear Length Change
11TRRILMREWSDSLB
10
8
6
4
2
0
-2
Distance (mm)
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 8.95 at 56.8ms
Min.Value -1.58 at 263ms



Thorax Rib 2 Mid X Displacement
11TRRILMMIWSDSX0
Distance (mm)
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 50 and 61 ms
DRAFT
Filter: Unfiltered
Max.Value 3.39 at 68.4ms
Min.Value -5.3 at 81.9ms

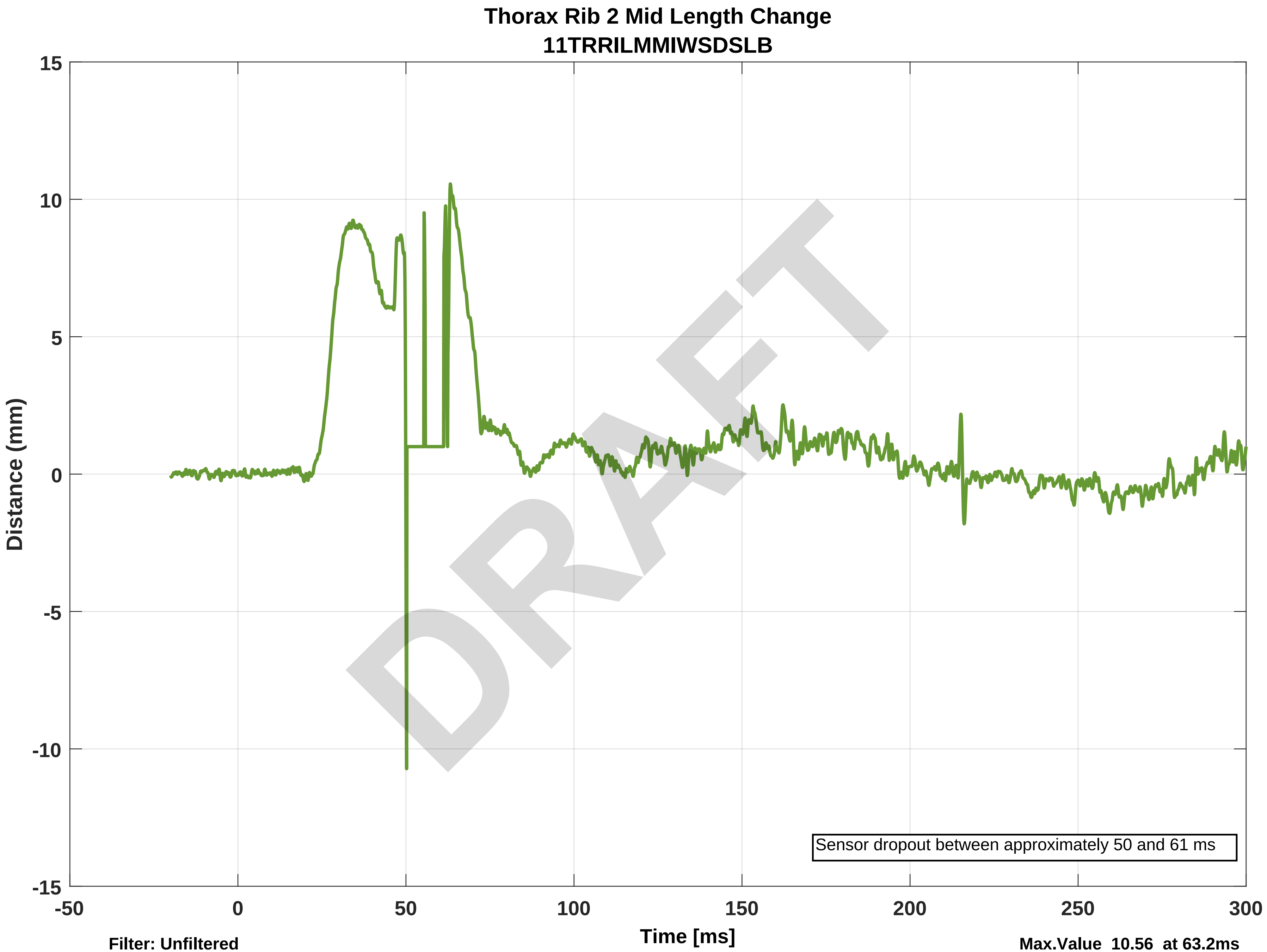


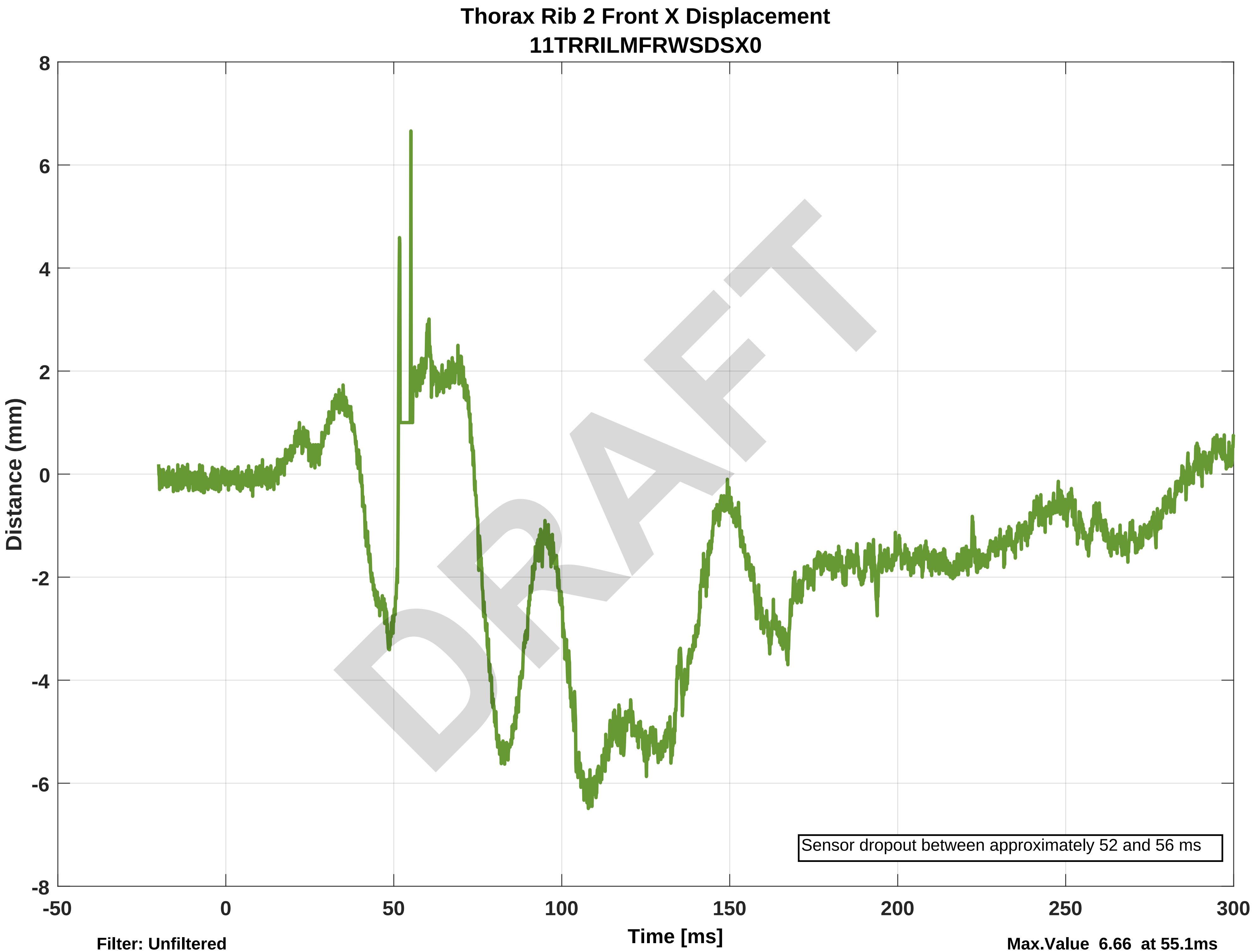
Thorax Rib 2 Mid Y Displacement
11TRRILMMIWSDSY0
Distance (mm)
15
10
5
0
-5
-10
-15
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 50 and 61 ms
DRAFT
Filter: Unfiltered
Max.Value 13.54 at 56.9ms
Min.Value -13.56 at 50.2ms

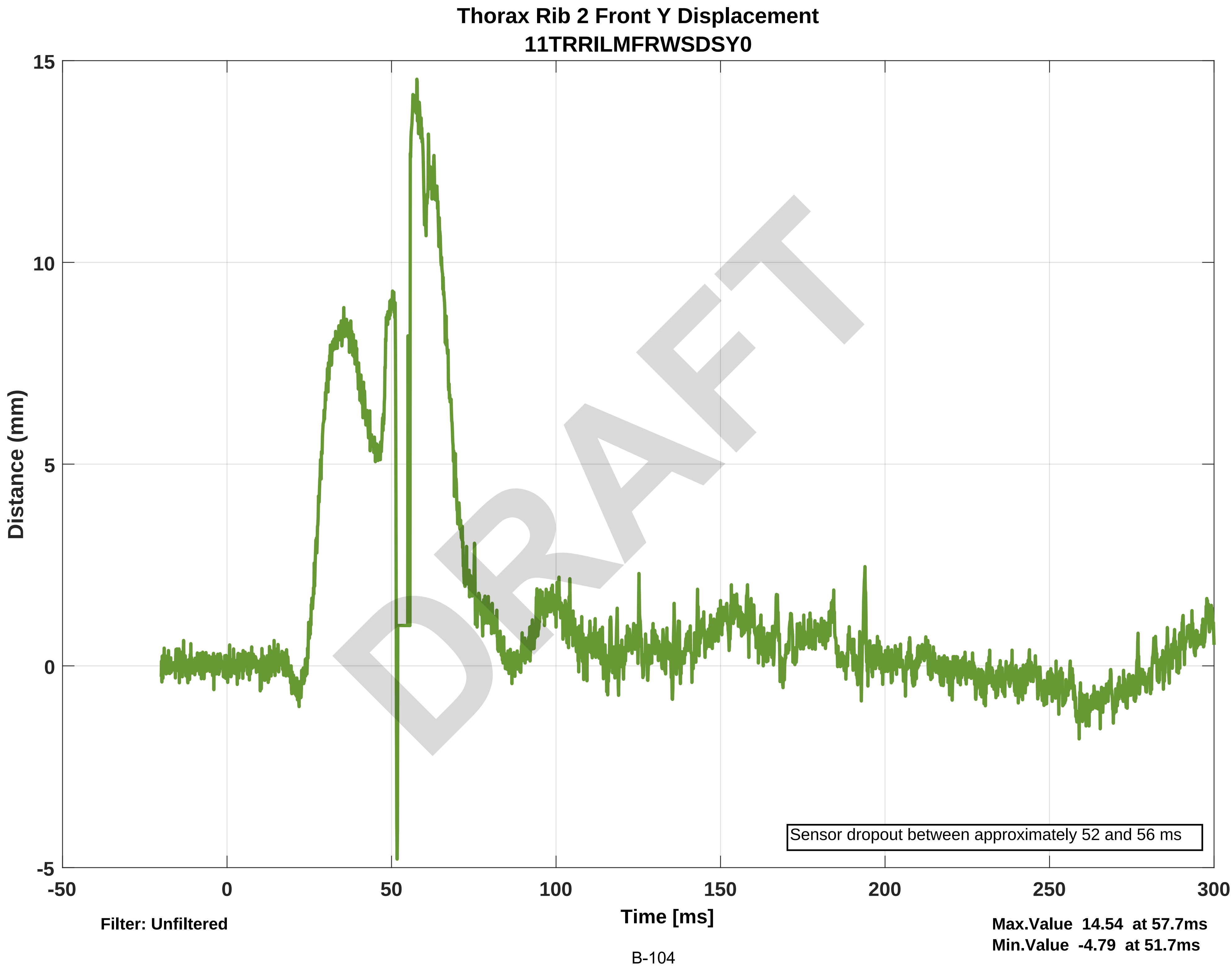


Filter: Unfiltered

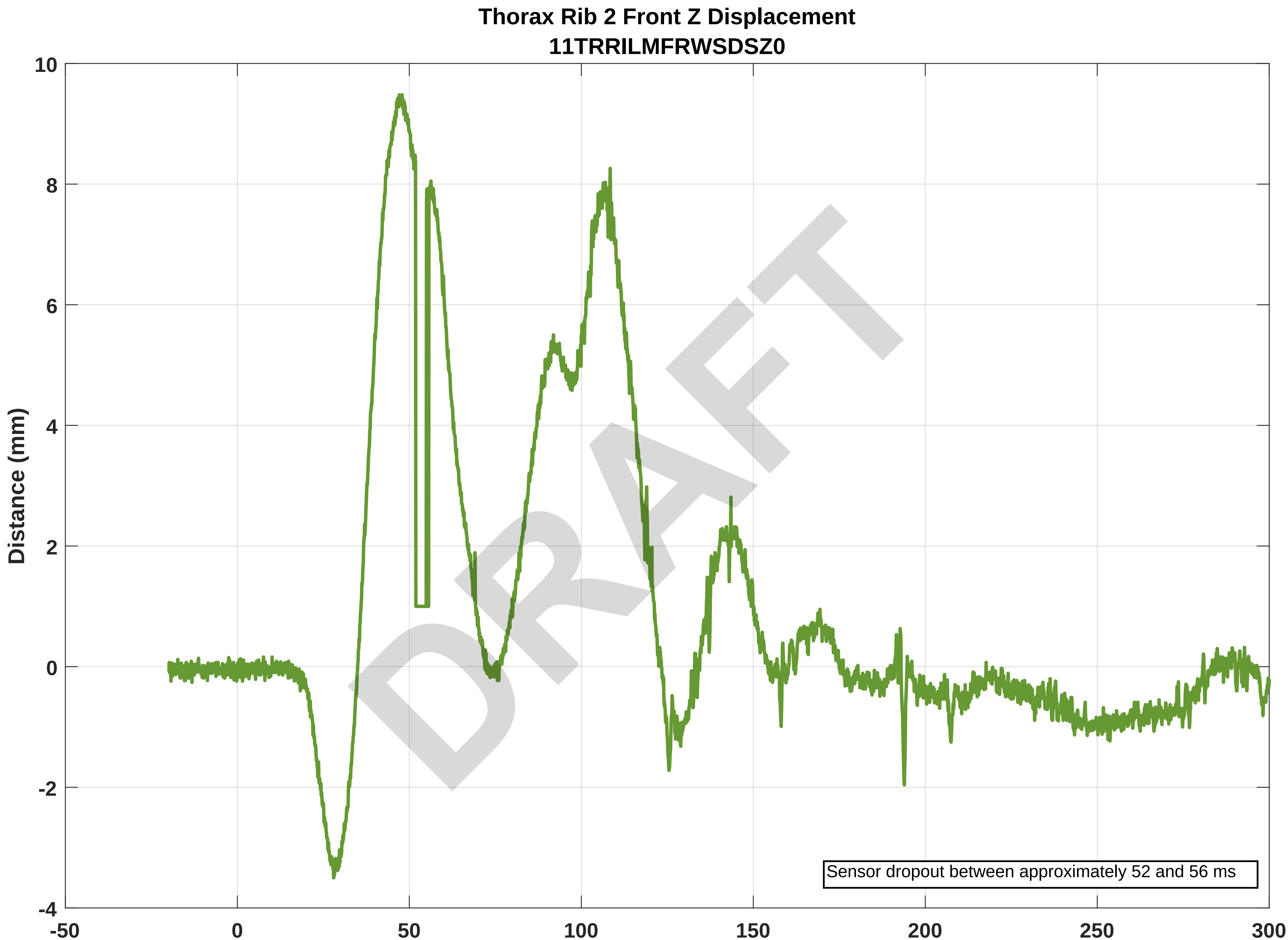
Max.Value 9.98 at 47.1ms
Min.Value -3.61 at 28.7ms


Thorax Rib 2 Mid Length Change
11TRRILMMIWSDSLB
Distance (mm)
Time [ms]
15
10
5
0
-5
-10
-15
-50
0
50
100
150
200
250
300
Sensor dropout between approximately 50 and 61 ms
DRAFT
Filter: Unfiltered
Max.Value 10.56 at 63.2ms
Min.Value -10.72 at 50.2ms


Thorax Rib 2 Front X Displacement
11TRRILMFRWSDSX0
Distance (mm)
8
6
4
2
0
-2
-4
-6
-8
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 52 and 56 ms
DRAFT
Filter: Unfiltered
Max.Value 6.66 at 55.1ms
Min.Value -6.49 at 107.9ms



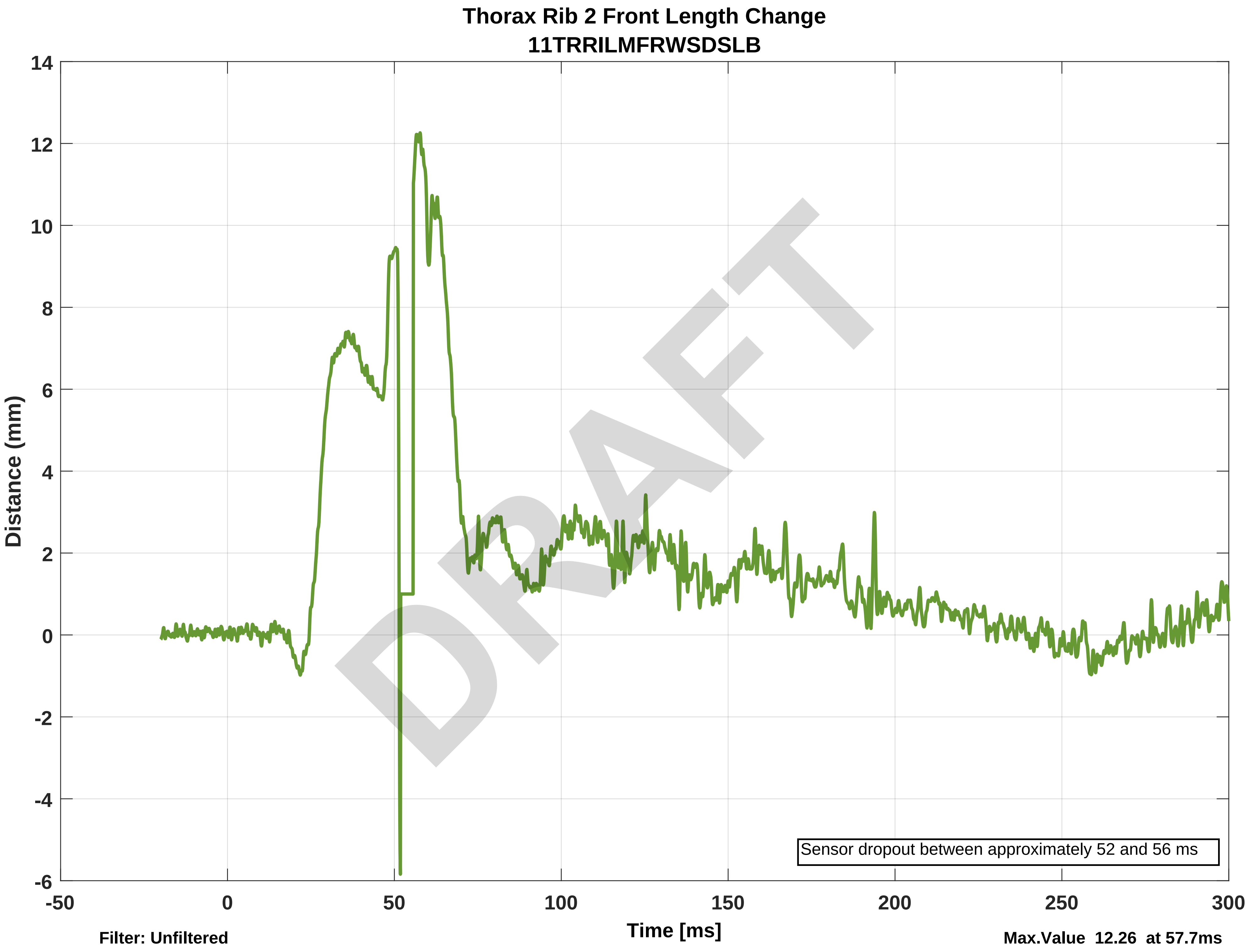
Thorax Rib 2 Front Y Displacement
11TRRILMFRWSDSY0
Distance (mm)
Time [ms]
Sensor dropout between approximately 52 and 56 ms
DRAFT
Filter: Unfiltered
Max.Value 14.54 at 57.7ms
Min.Value -4.79 at 51.7ms

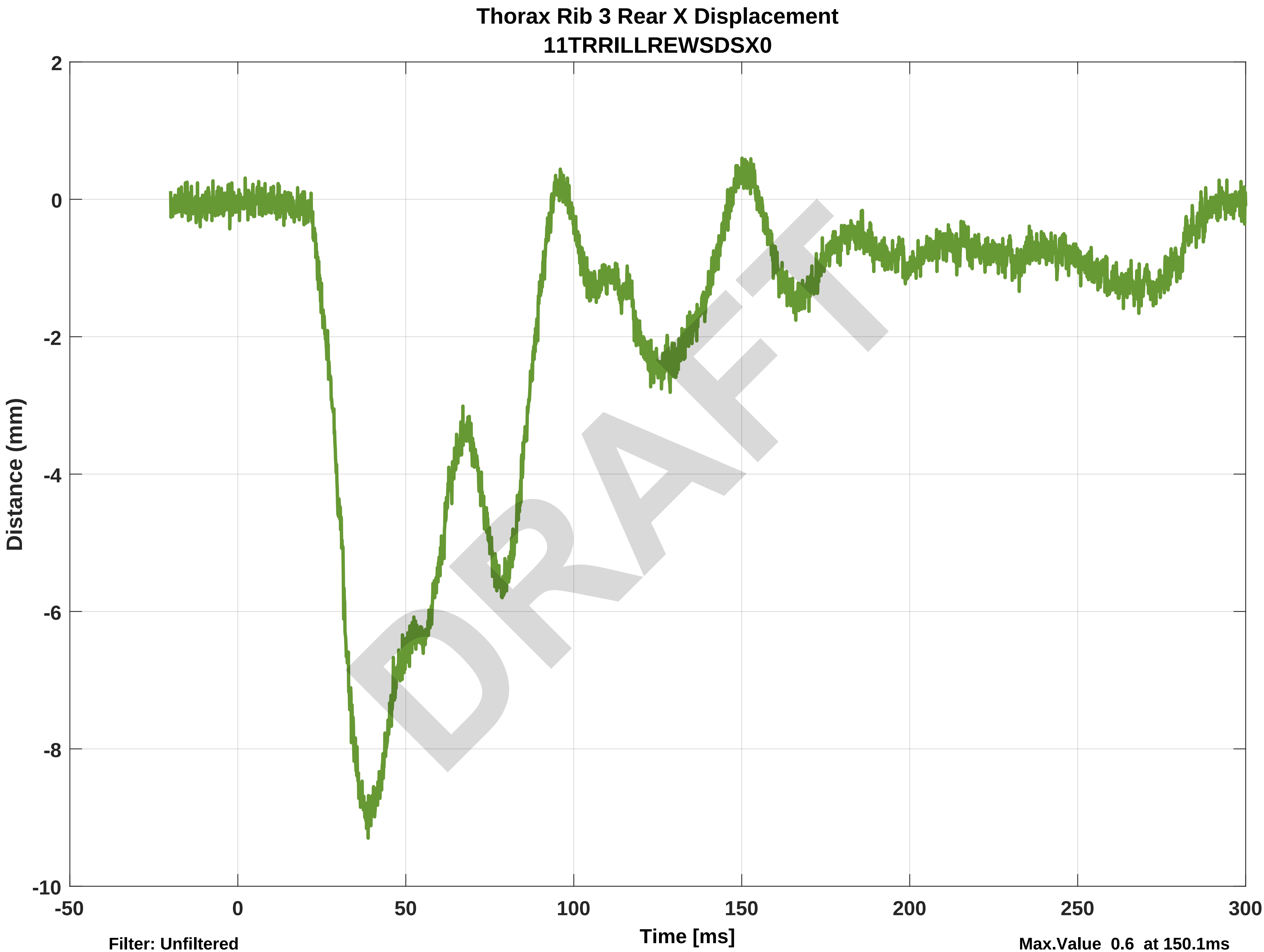


Time [ms]

Filter: Unfiltered

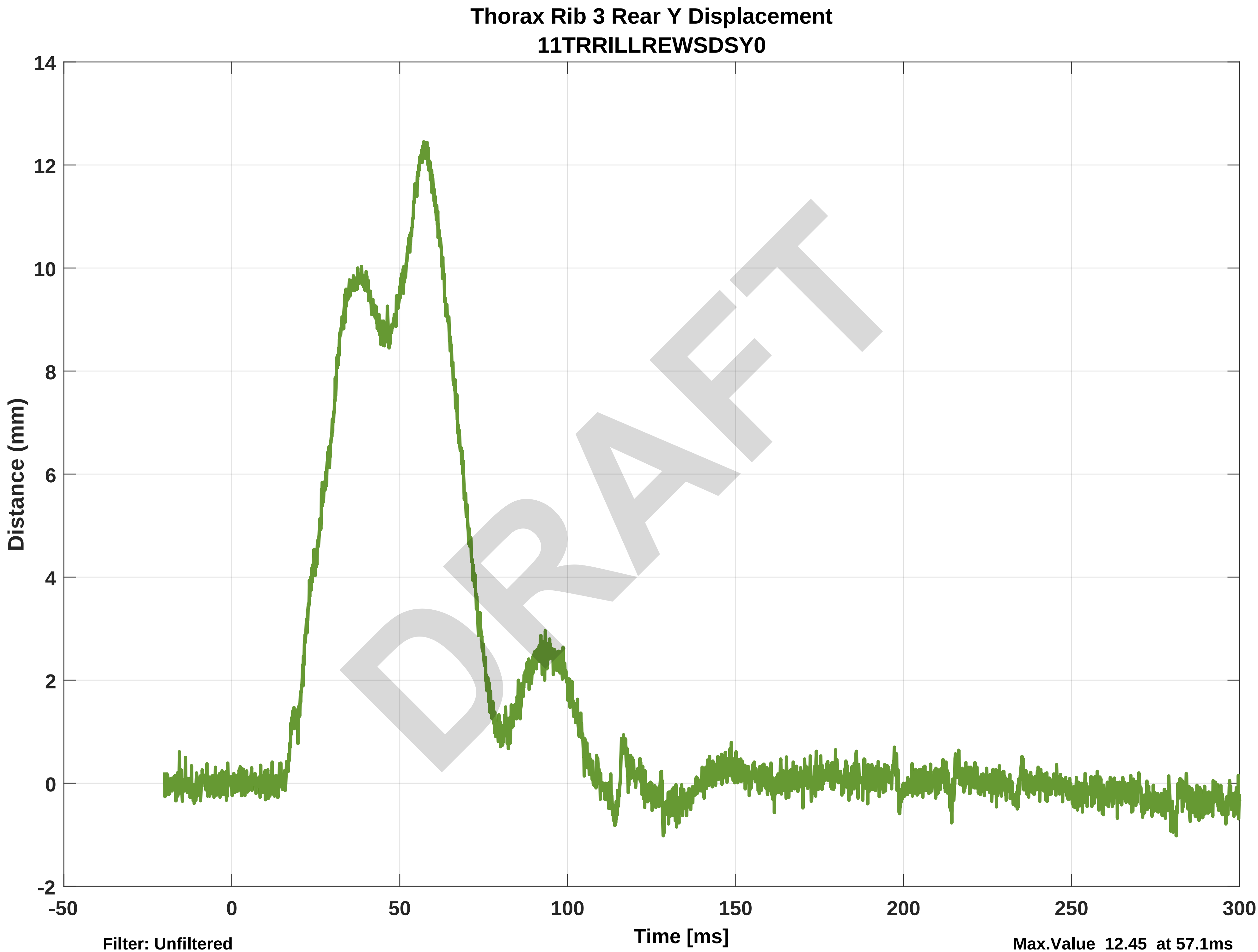
Max.Value 9.48 at 47.1ms
Min.Value -3.5 at 28ms


Thorax Rib 2 Front Length Change
11TRRILMFRWSDSLB
Distance (mm)
14
12
10
8
6
4
2
0
-2
-4
-6
-50
0
50
100
150
200
250
300
Time [ms]
Sensor dropout between approximately 52 and 56 ms
DRAFT
Filter: Unfiltered
Max.Value 12.26 at 57.7ms
Min.Value -5.84 at 51.8ms

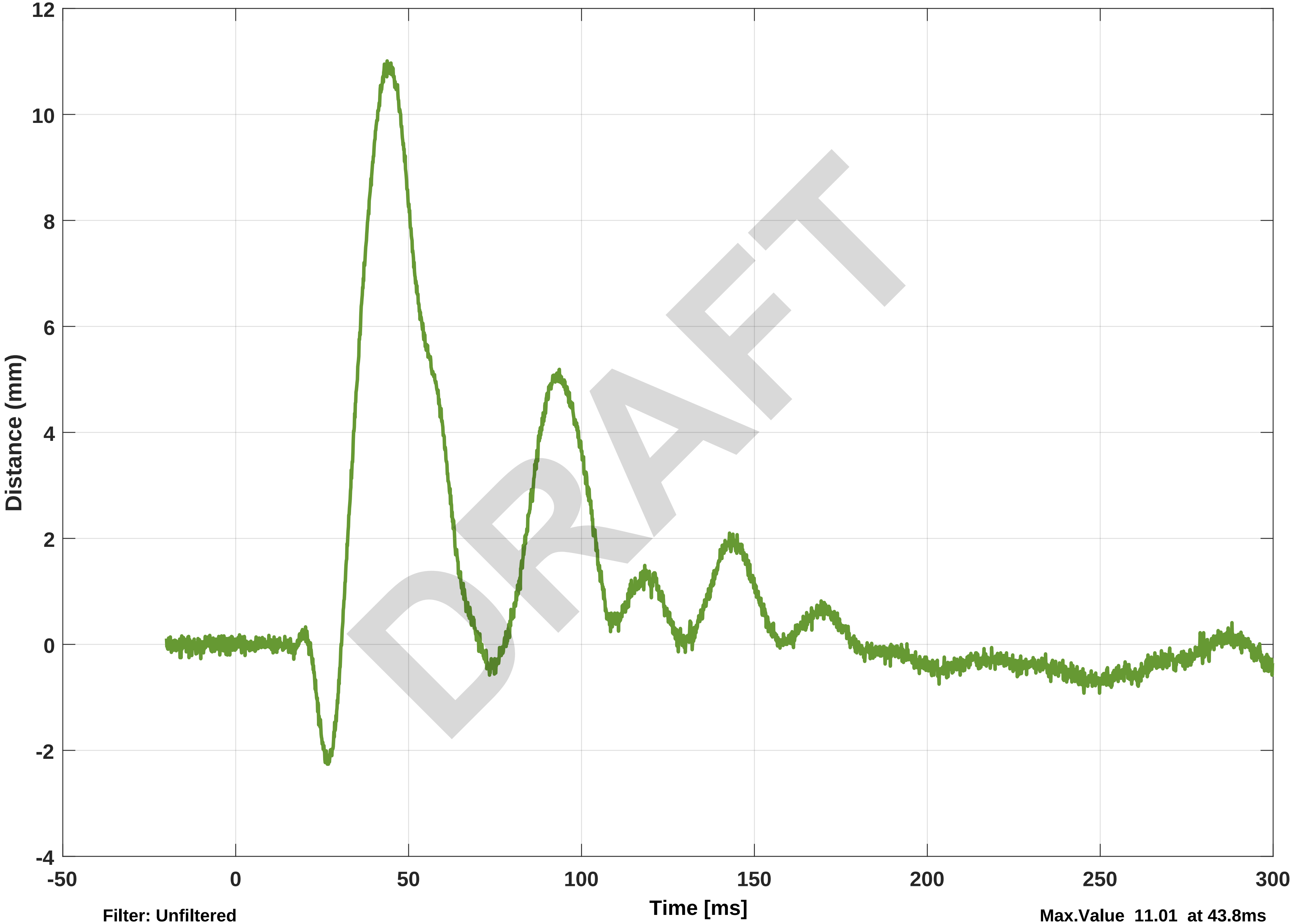


Filter: Unfiltered

Max.Value 0.6 at 150.1ms
Min.Value -9.3 at 38.8ms

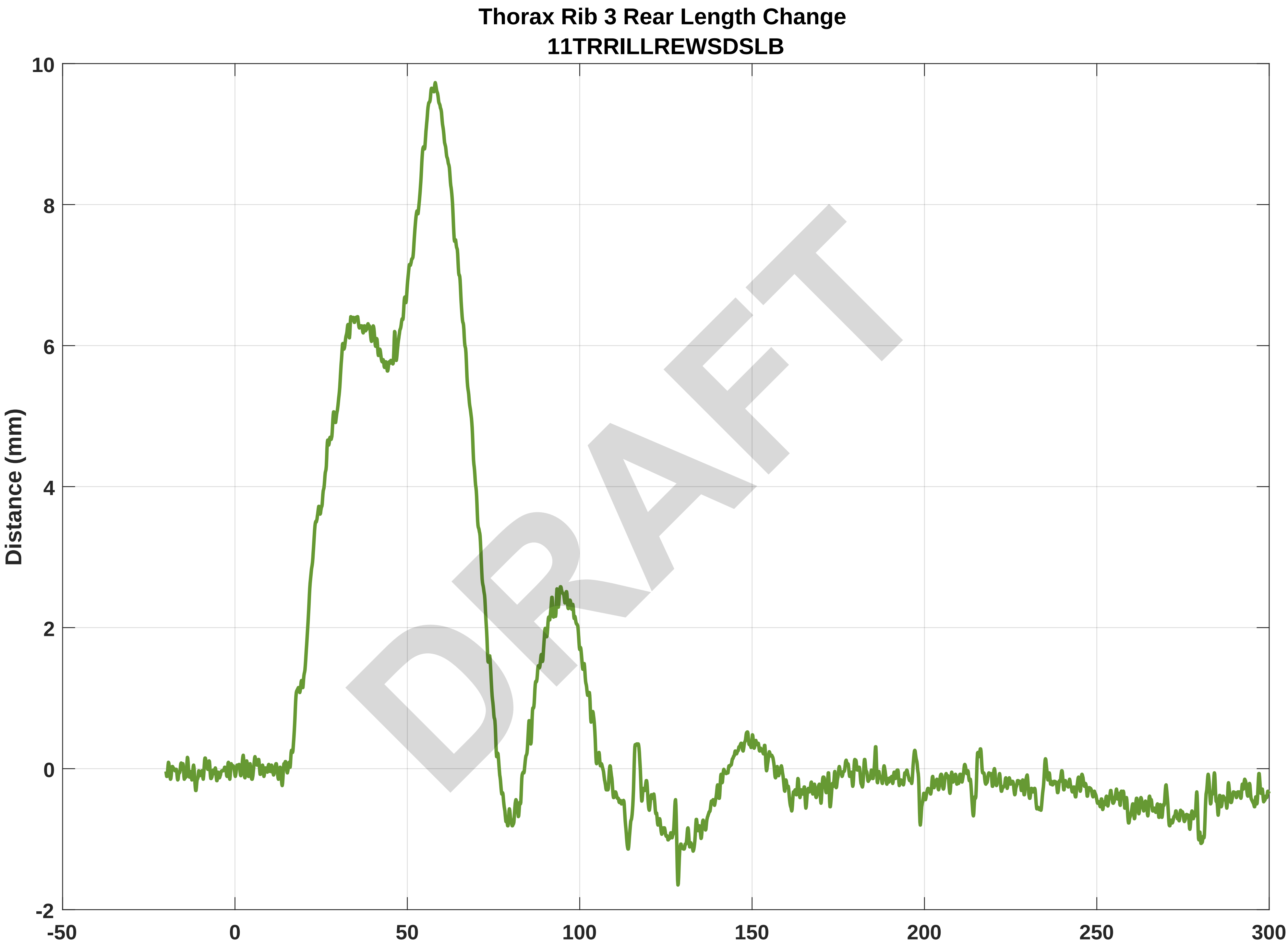

Thorax Rib 3 Rear Y Displacement
11TRRILLREWSDSY0
Distance (mm)
Time [ms]
14
12
10
8
6
4
2
0
-2
-50
0
50
100
150
200
250
300
DRAFT
Filter: Unfiltered
Max.Value 12.45 at 57.1ms
Min.Value -1.02 at 128.4ms

Thorax Rib 3 Rear Z Displacement
11TRRILLREWSDSZ0



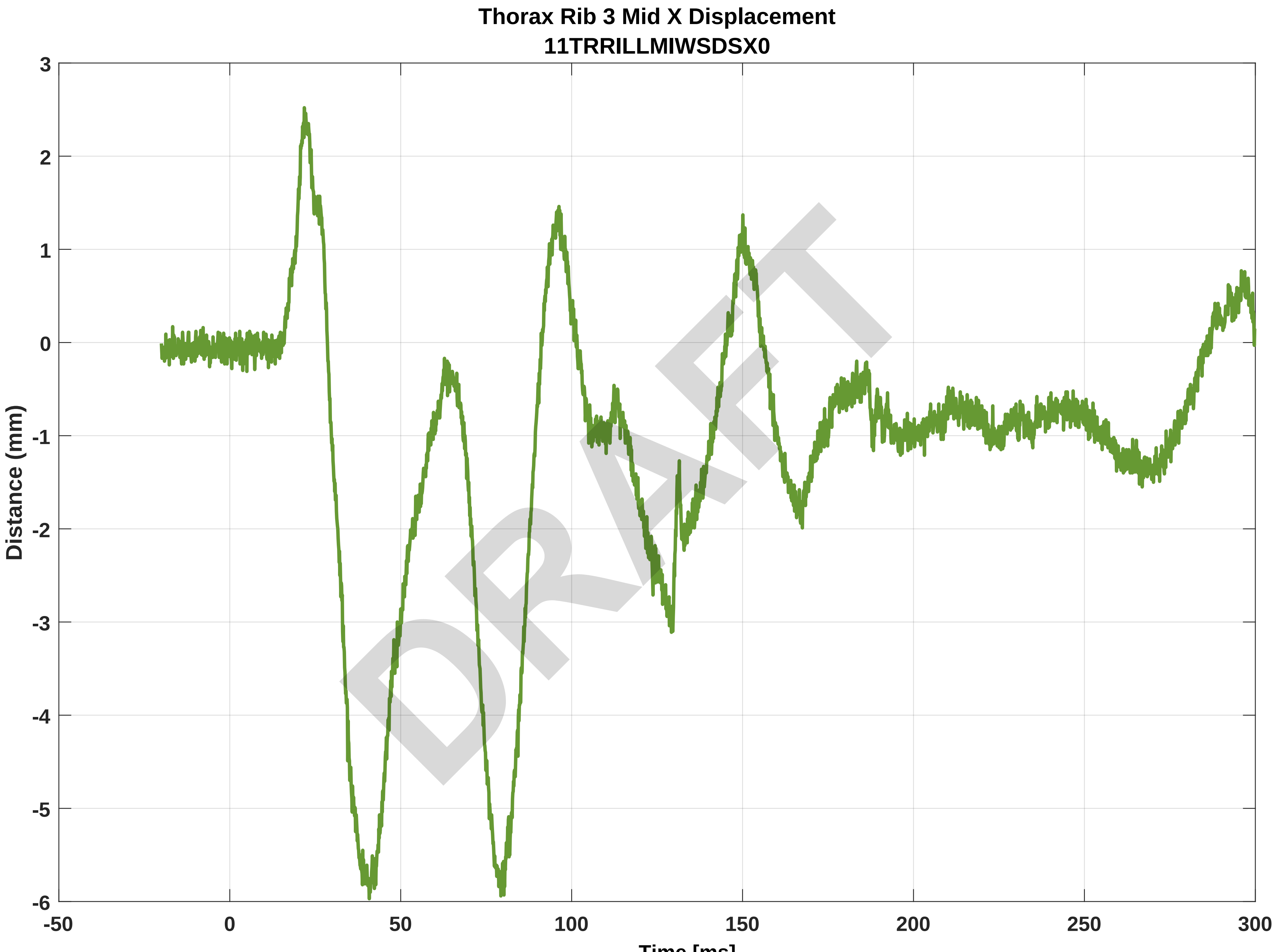
Filter: Unfiltered

Max.Value 11.01 at 43.8ms
Min.Value -2.26 at 26.5ms



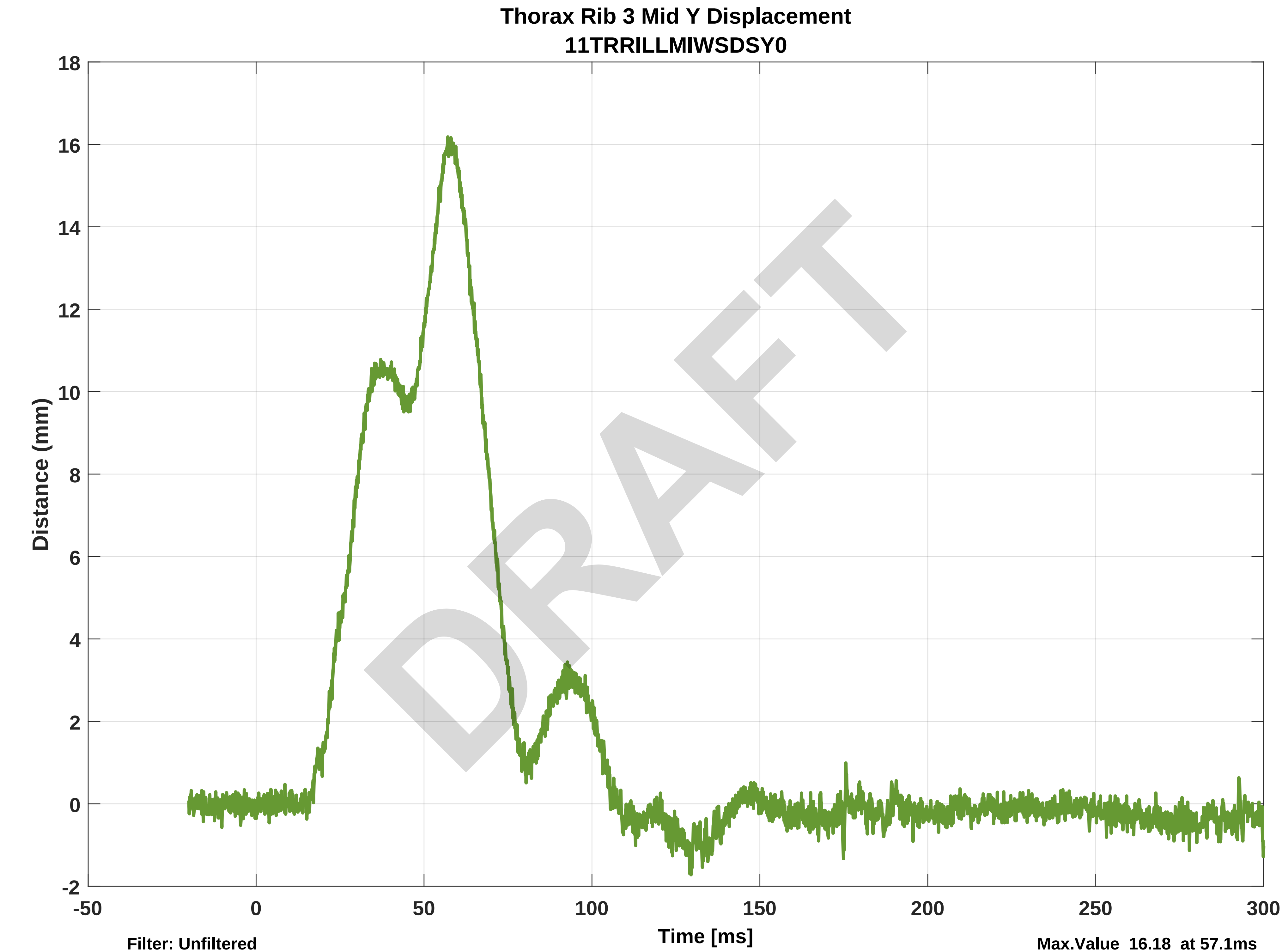
Filter: Unfiltered

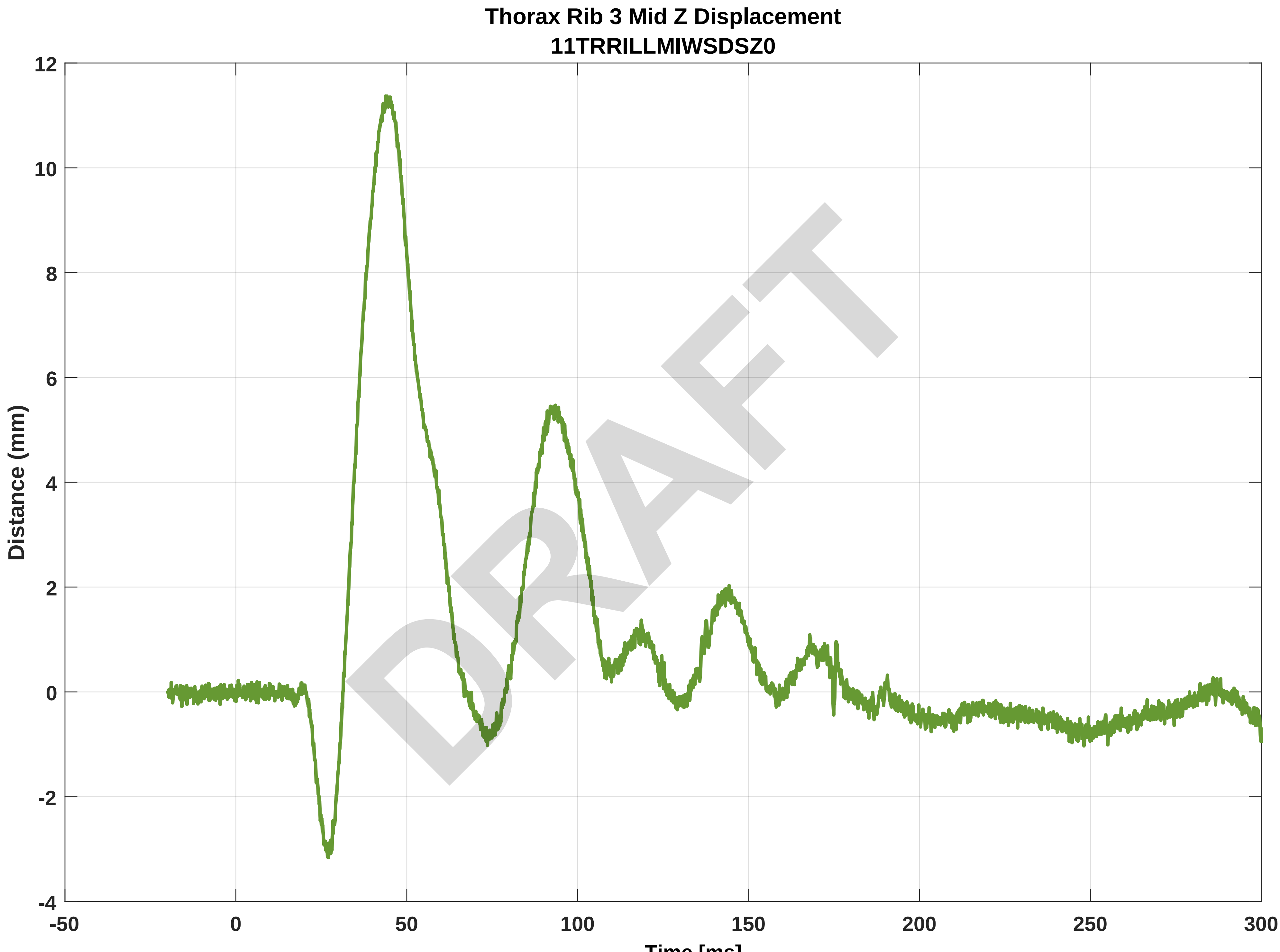
Max.Value 9.73 at 58.1ms
Min.Value -1.65 at 128.5ms



Filter: Unfiltered

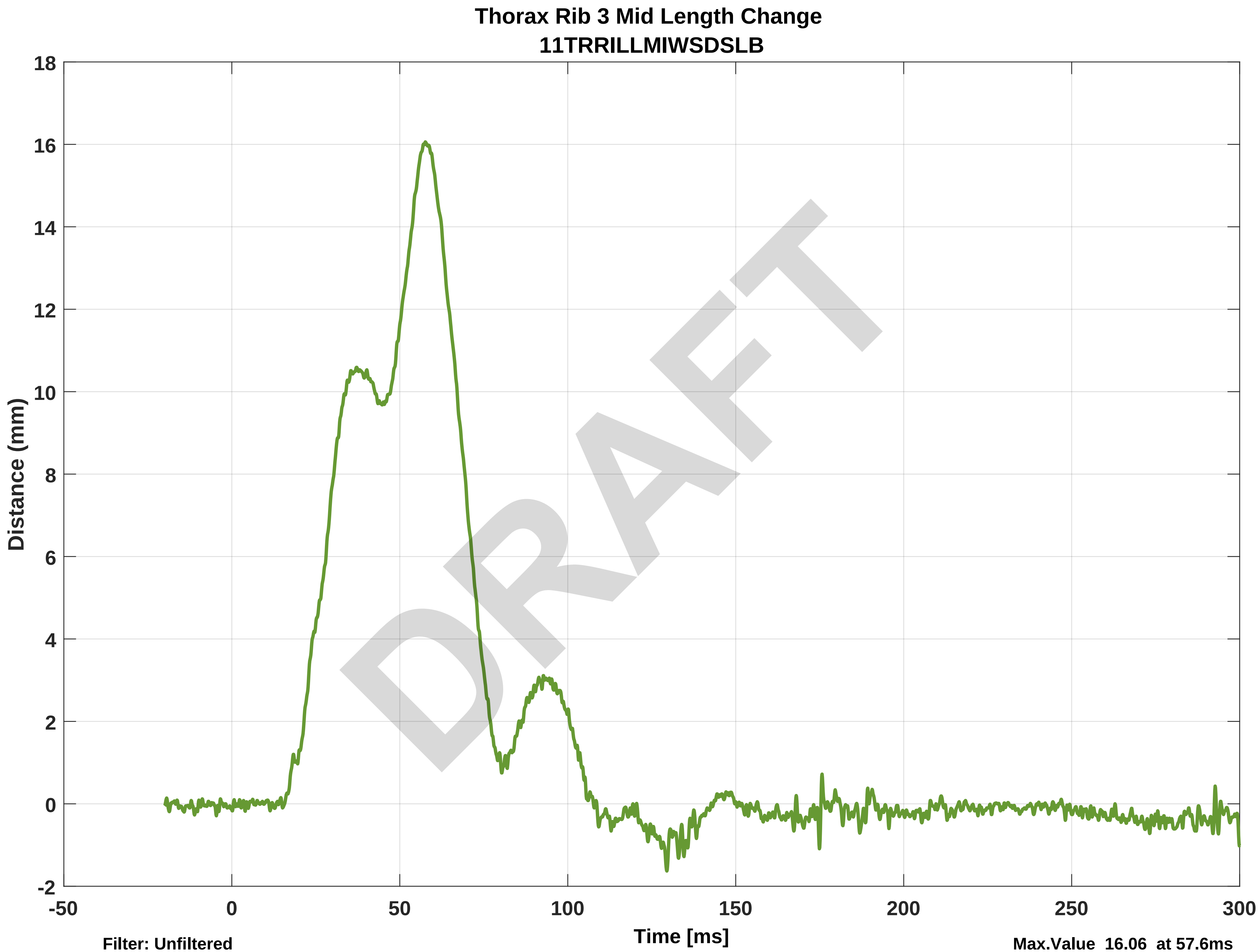
Max.Value 2.52 at 21.8ms
Min.Value -5.97 at 40.8ms


Thorax Rib 3 Mid Y Displacement
11TRRILLMIWSDSY0
Distance (mm)
18
16
14
12
10
8
6
4
2
0
-2
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 16.18 at 57.1ms
Min.Value -1.72 at 129.5ms



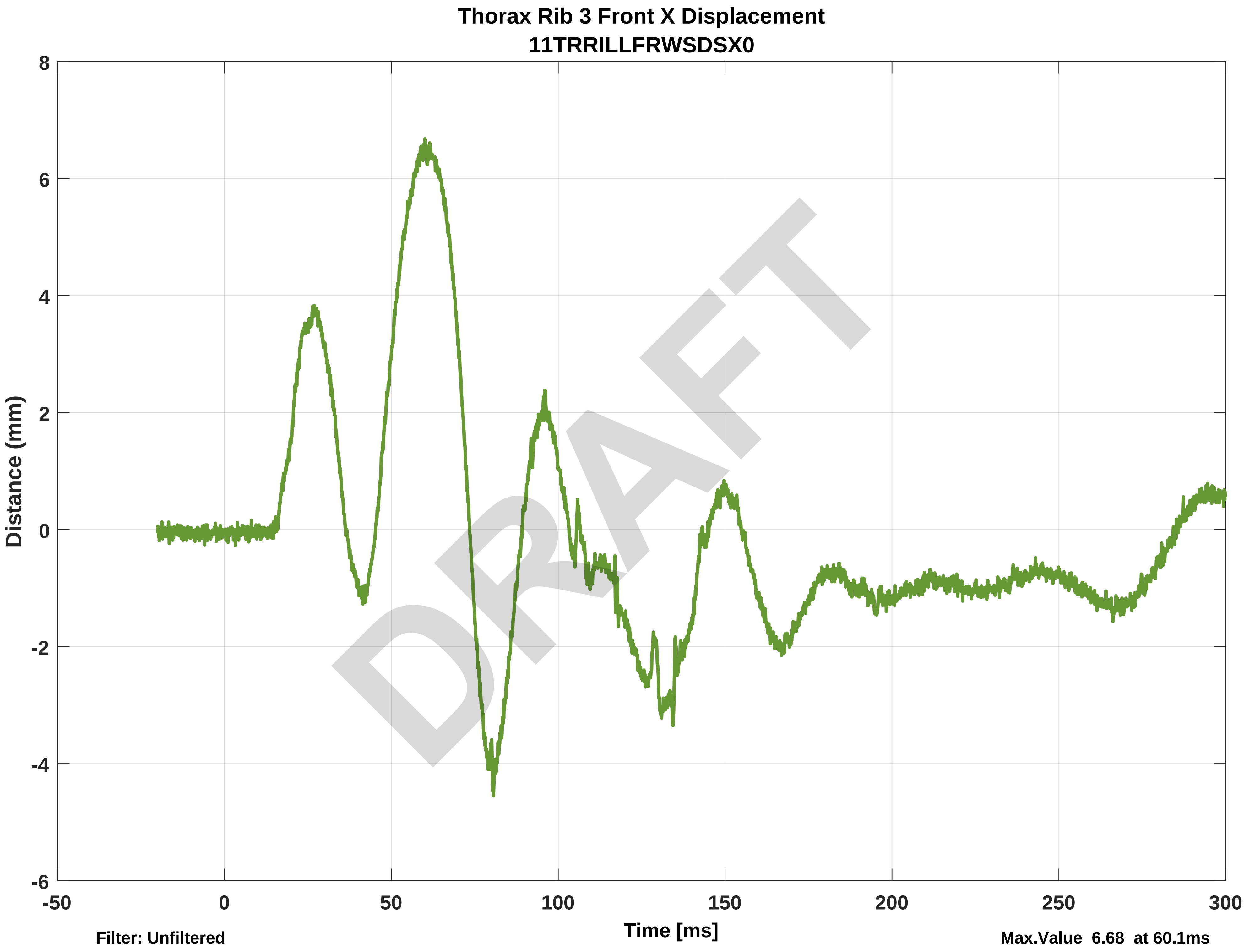
Filter: Unfiltered

Max.Value 11.37 at 43.8ms
Min.Value -3.16 at 27.1ms

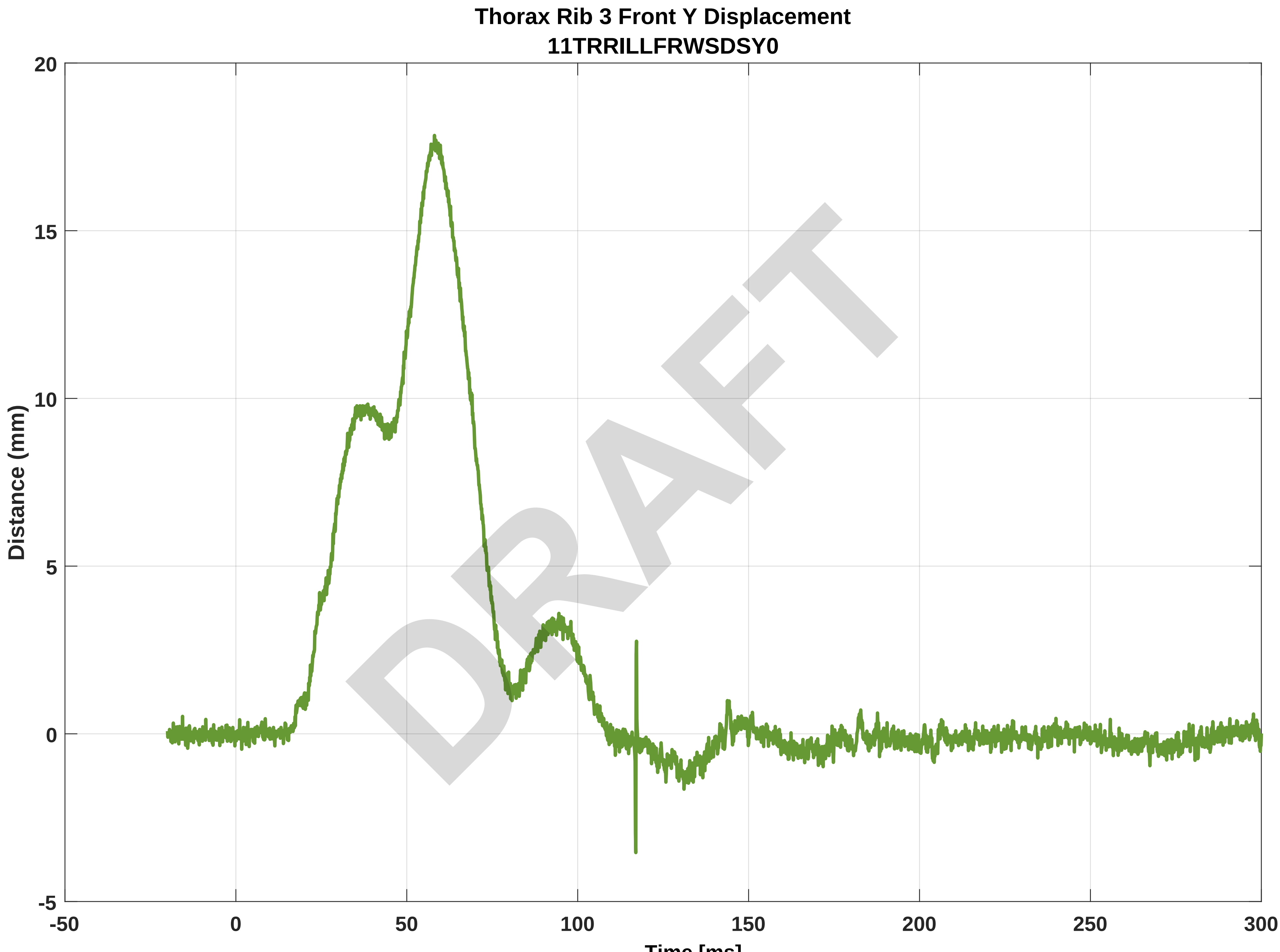


Filter: Unfiltered

Max.Value 16.06 at 57.6ms
Min.Value -1.63 at 129.5ms

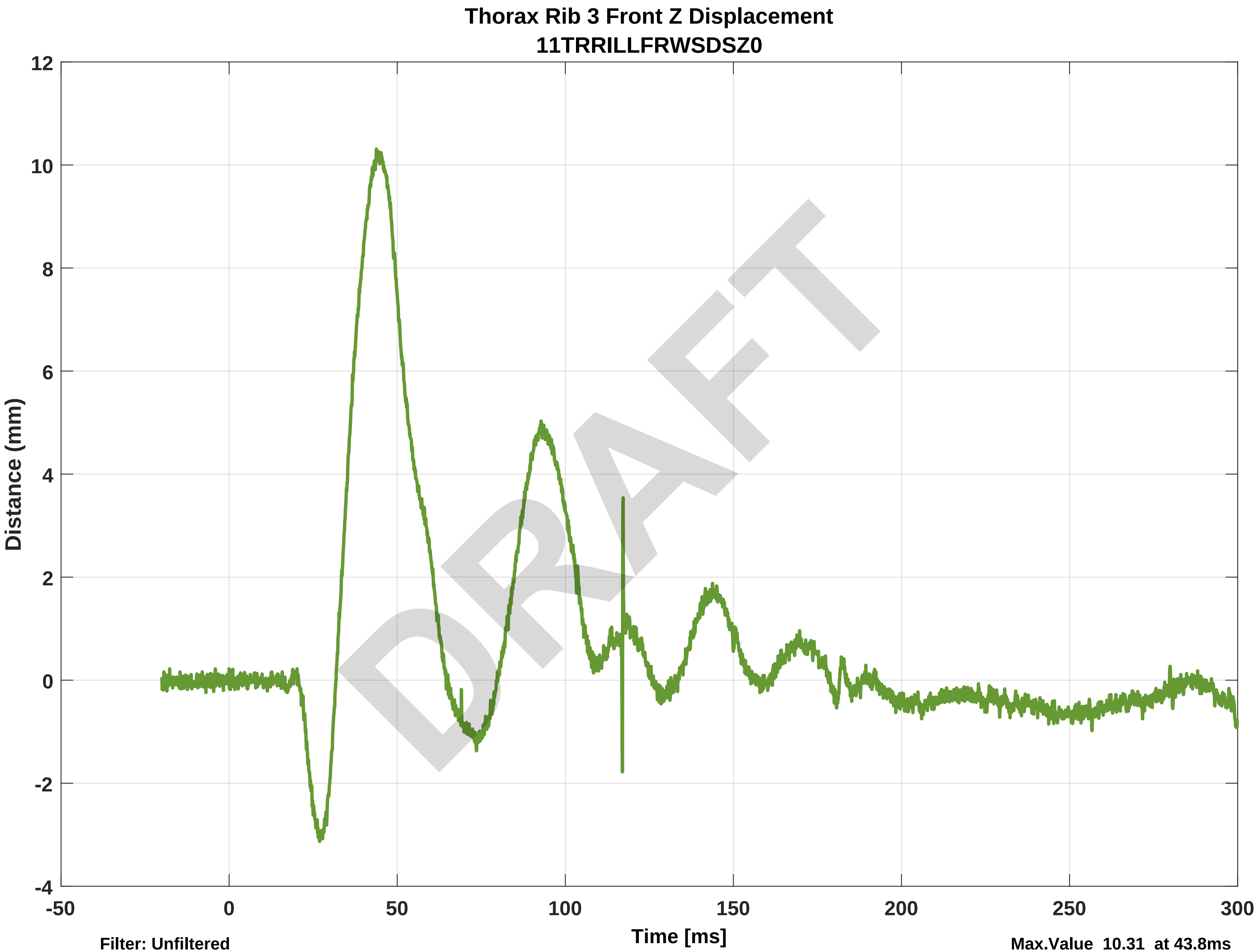


Thorax Rib 3 Front X Displacement
11TRRILLFRWSDSX0
Distance (mm)
8
6
4
2
0
-2
-4
-6
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 6.68 at 60.1ms
Min.Value -4.55 at 80.6ms



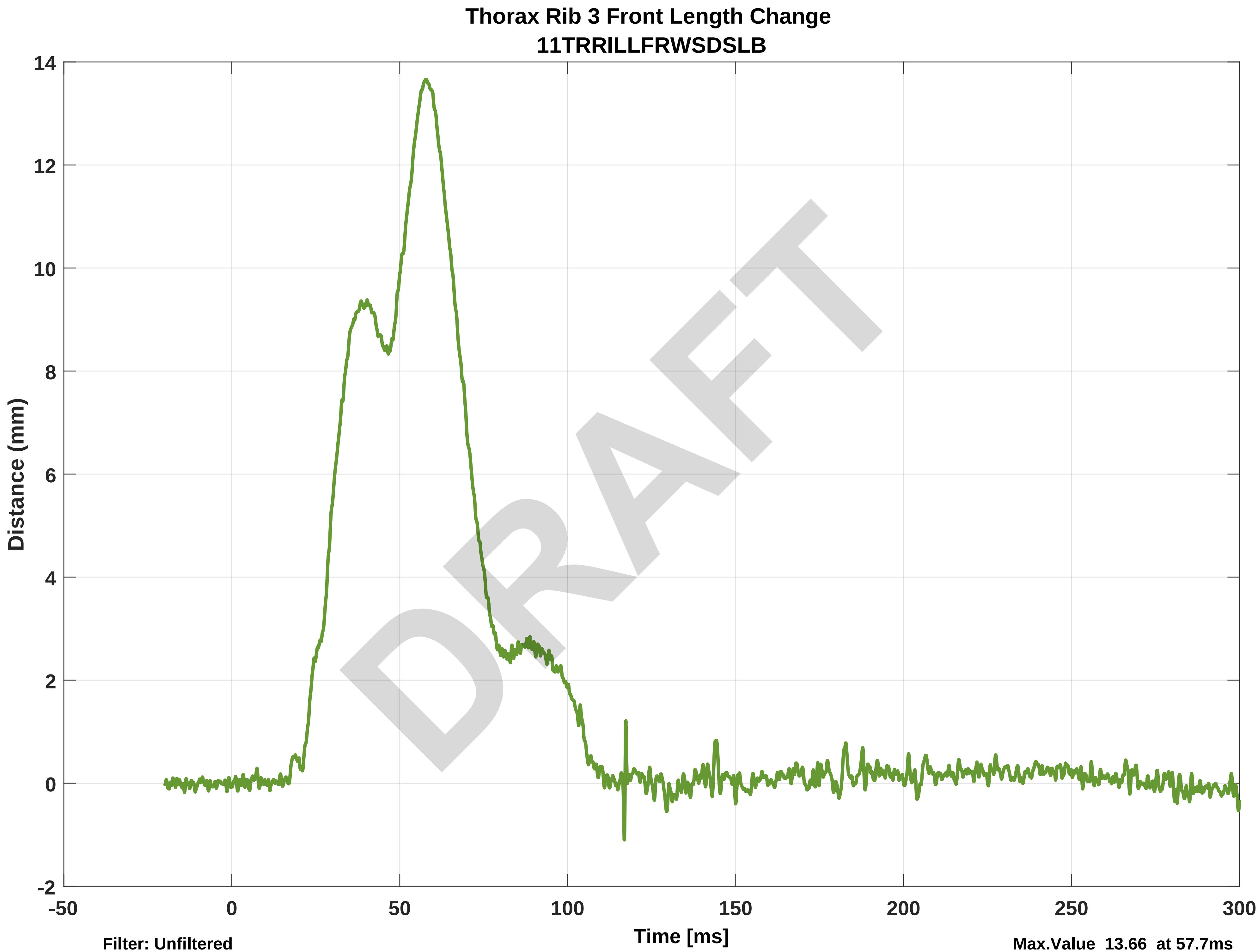
Filter: Unfiltered

Max.Value 17.84 at 58.1ms
Min.Value -3.54 at 117ms



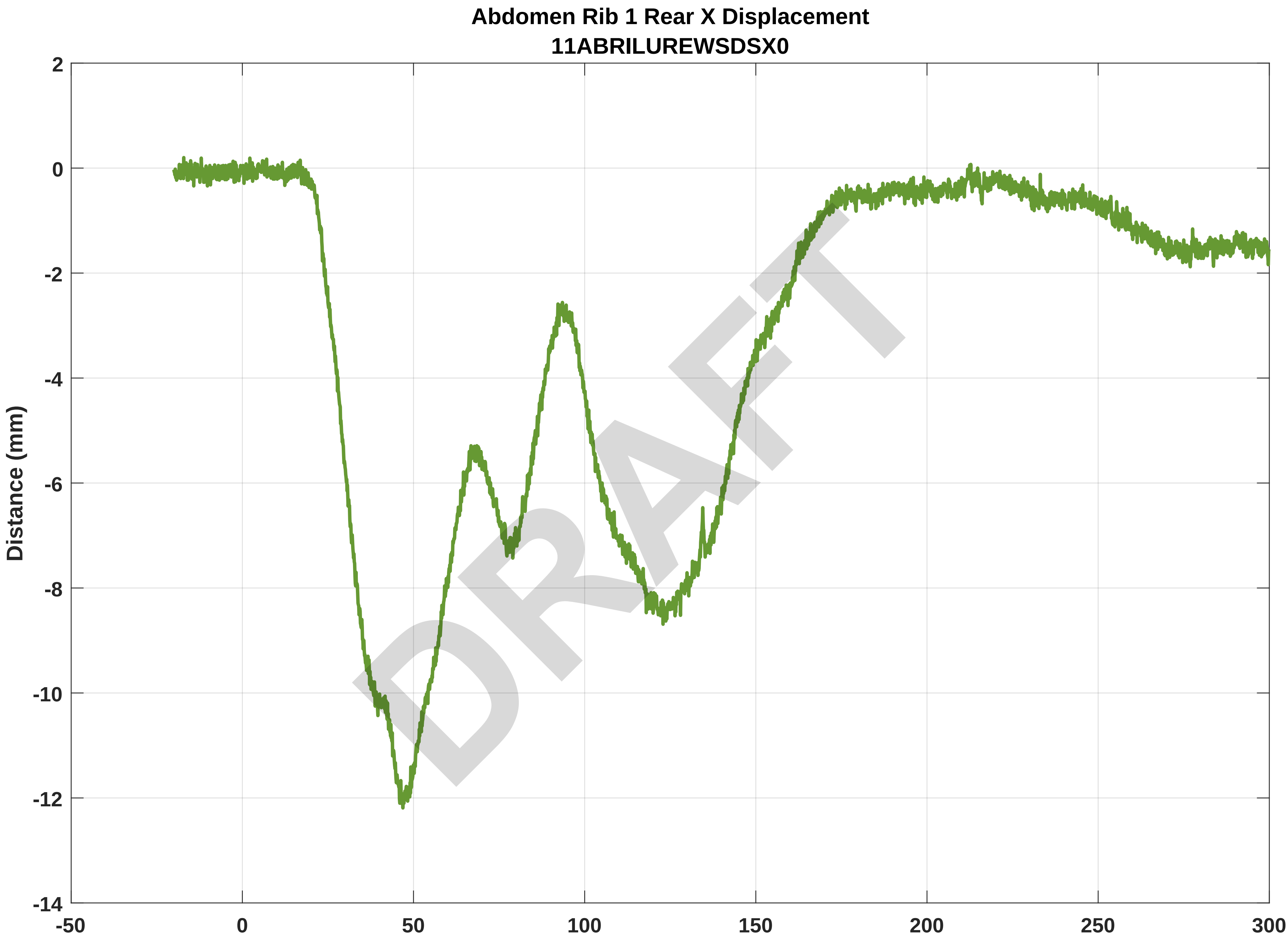
Filter: Unfiltered

Max.Value 10.31 at 43.8ms
Min.Value -3.13 at 26.9ms



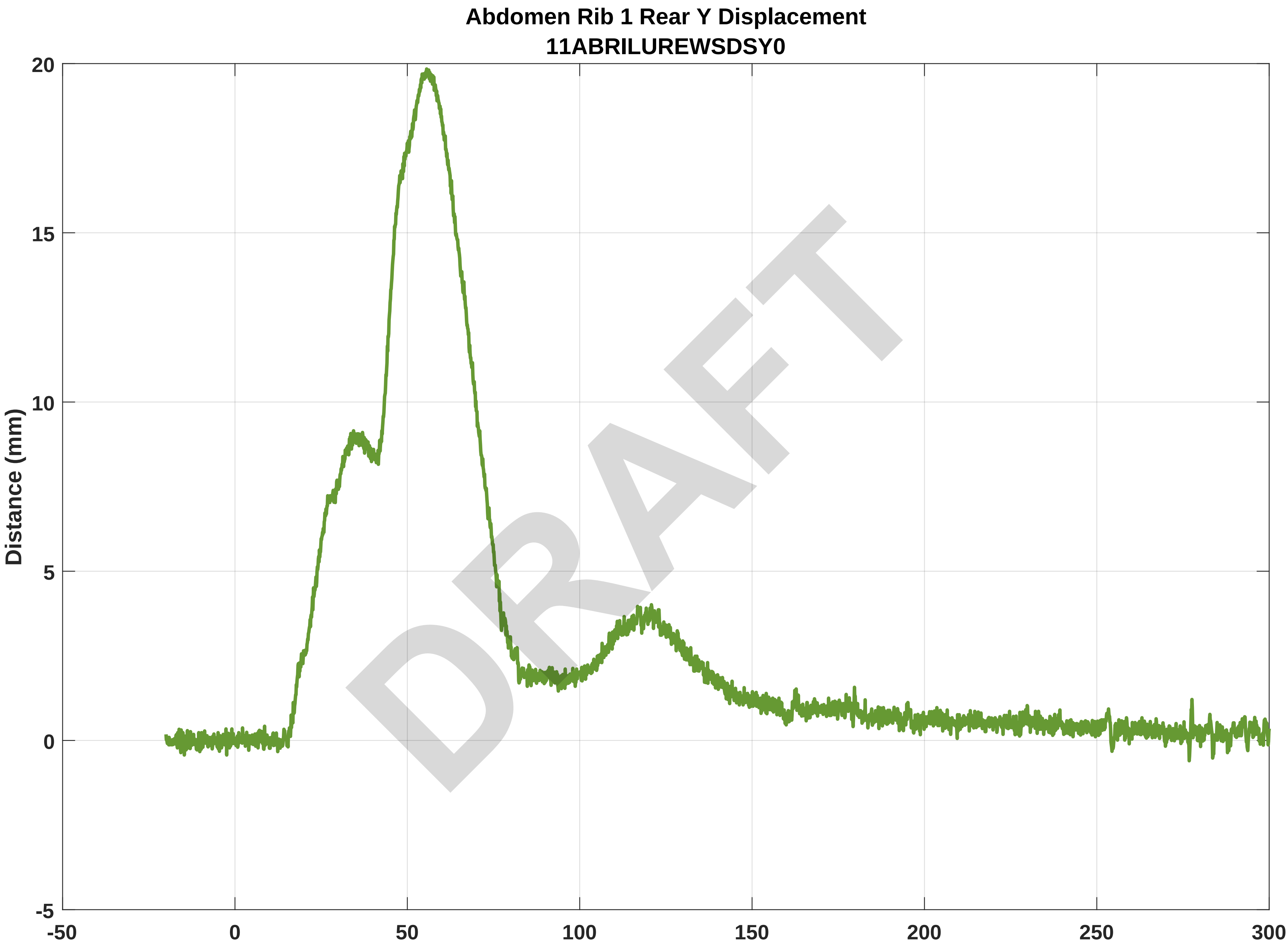
Filter: Unfiltered

Max.Value 13.66 at 57.7ms
Min.Value -1.1 at 116.8ms



Filter: Unfiltered

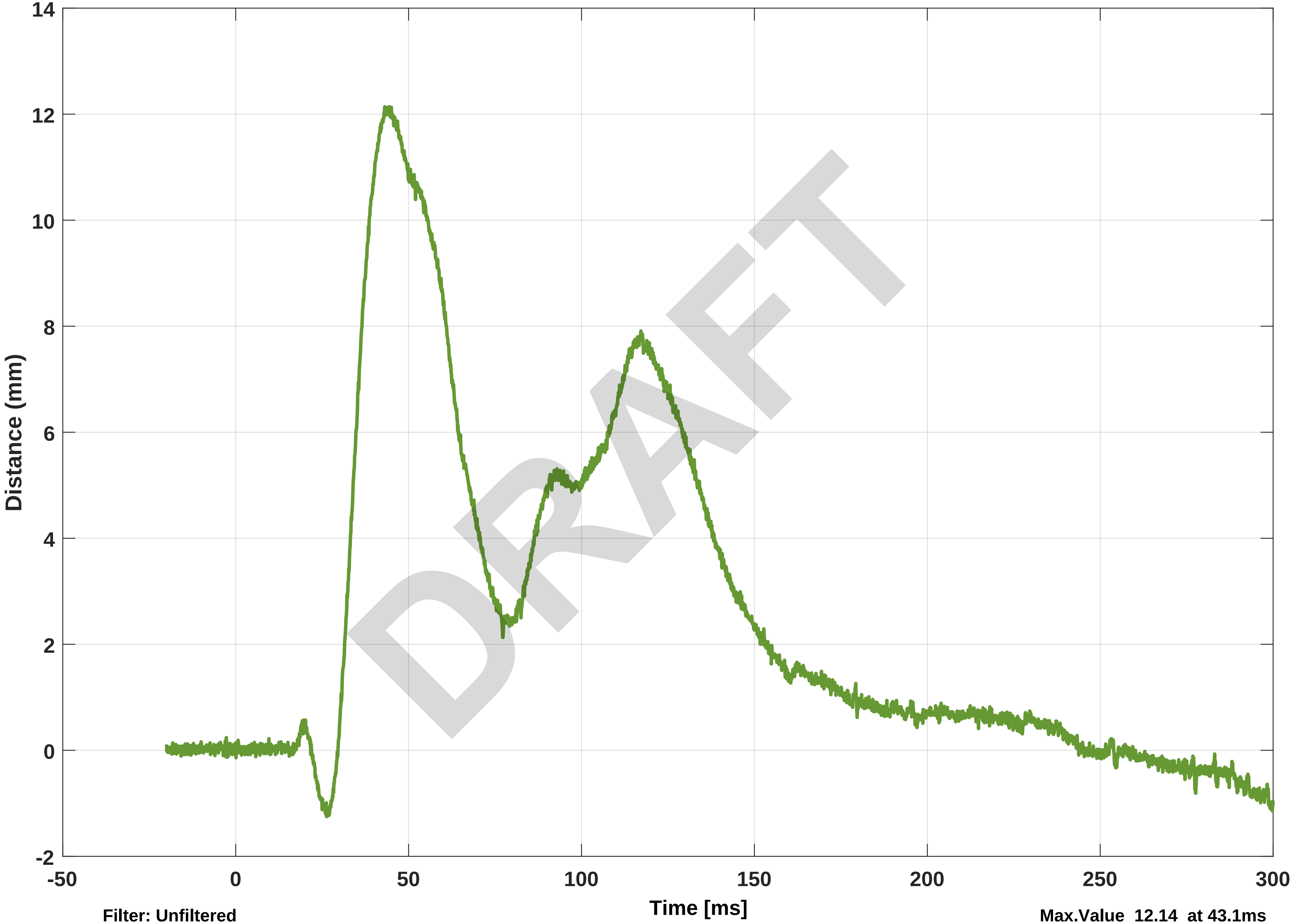
Max.Value 0.2 at -17.1ms
Min.Value -12.19 at 46.9ms



Filter: Unfiltered

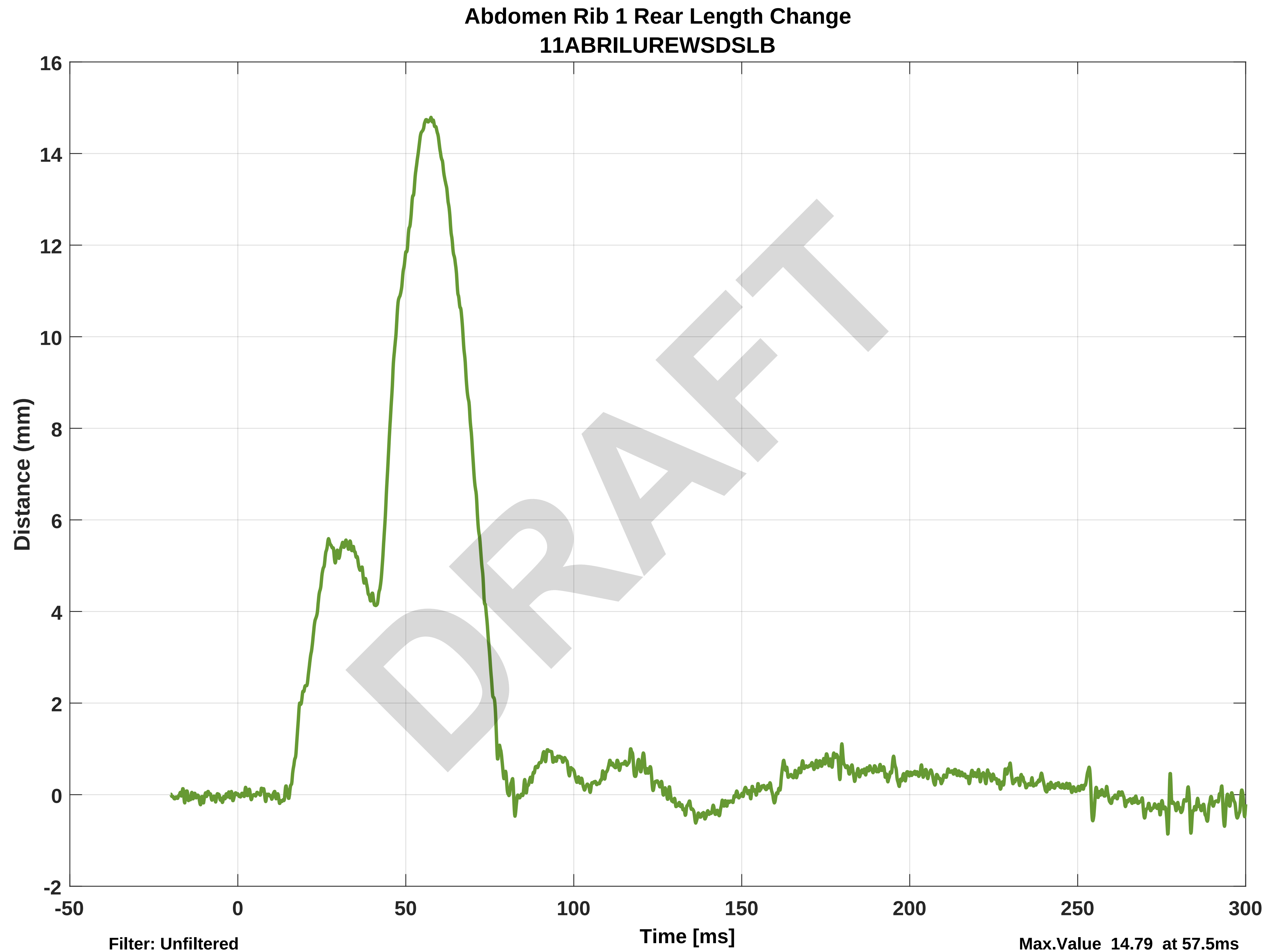
Max.Value 19.84 at 55.6ms
Min.Value -0.6 at 276.8ms

Abdomen Rib 1 Rear Z Displacement
11ABRILUREWSDSZ0



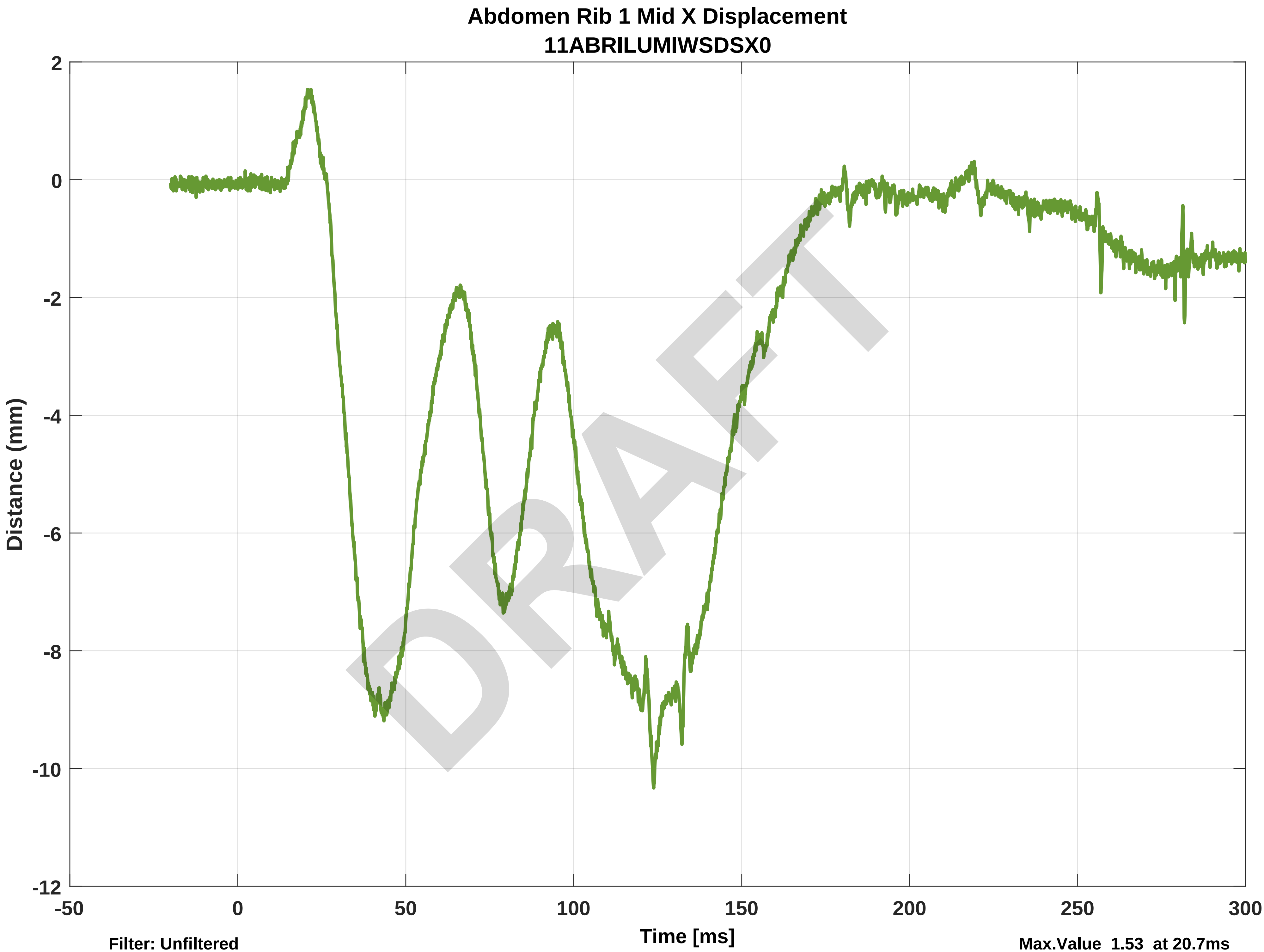
Filter: Unfiltered

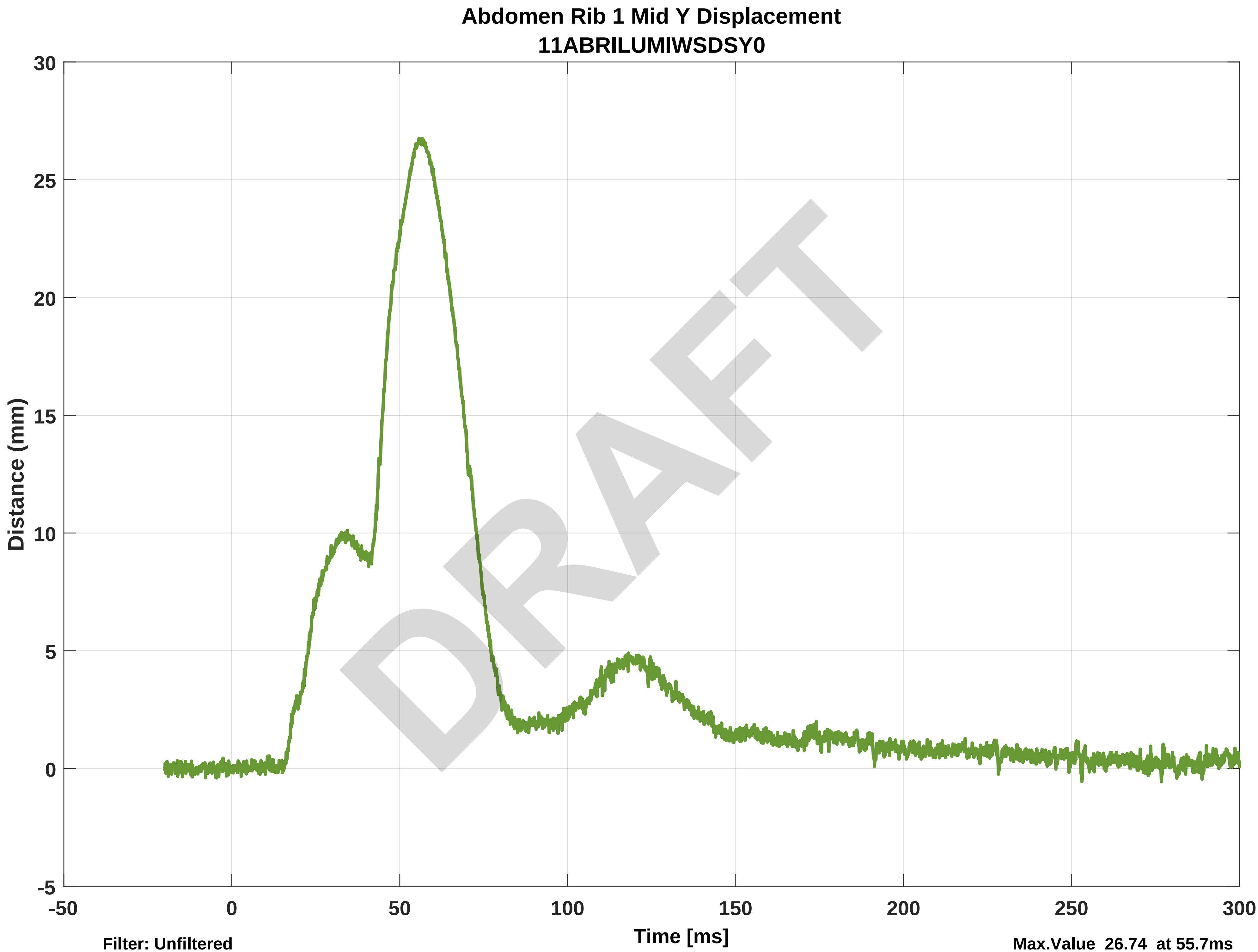
Max.Value 12.14 at 43.1ms
Min.Value -1.25 at 26.3ms



Filter: Unfiltered

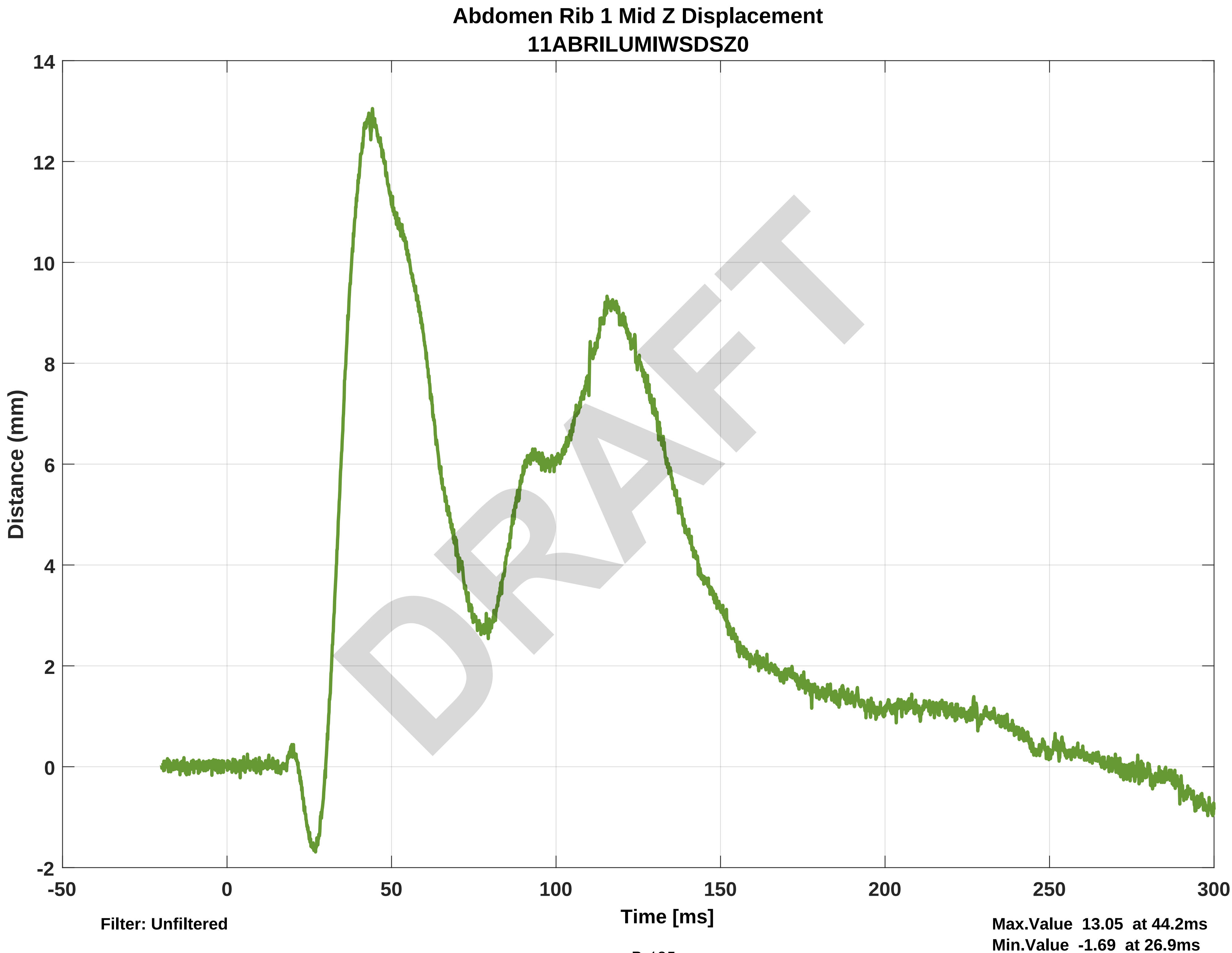
Max.Value 14.79 at 57.5ms
Min.Value -0.86 at 276.8ms


Abdomen Rib 1 Mid X Displacement
11ABRILUMIWSDSX0
Distance (mm)
2
0
-2
-4
-6
-8
-10
-12
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 1.53 at 20.7ms
Min.Value -10.33 at 123.8ms

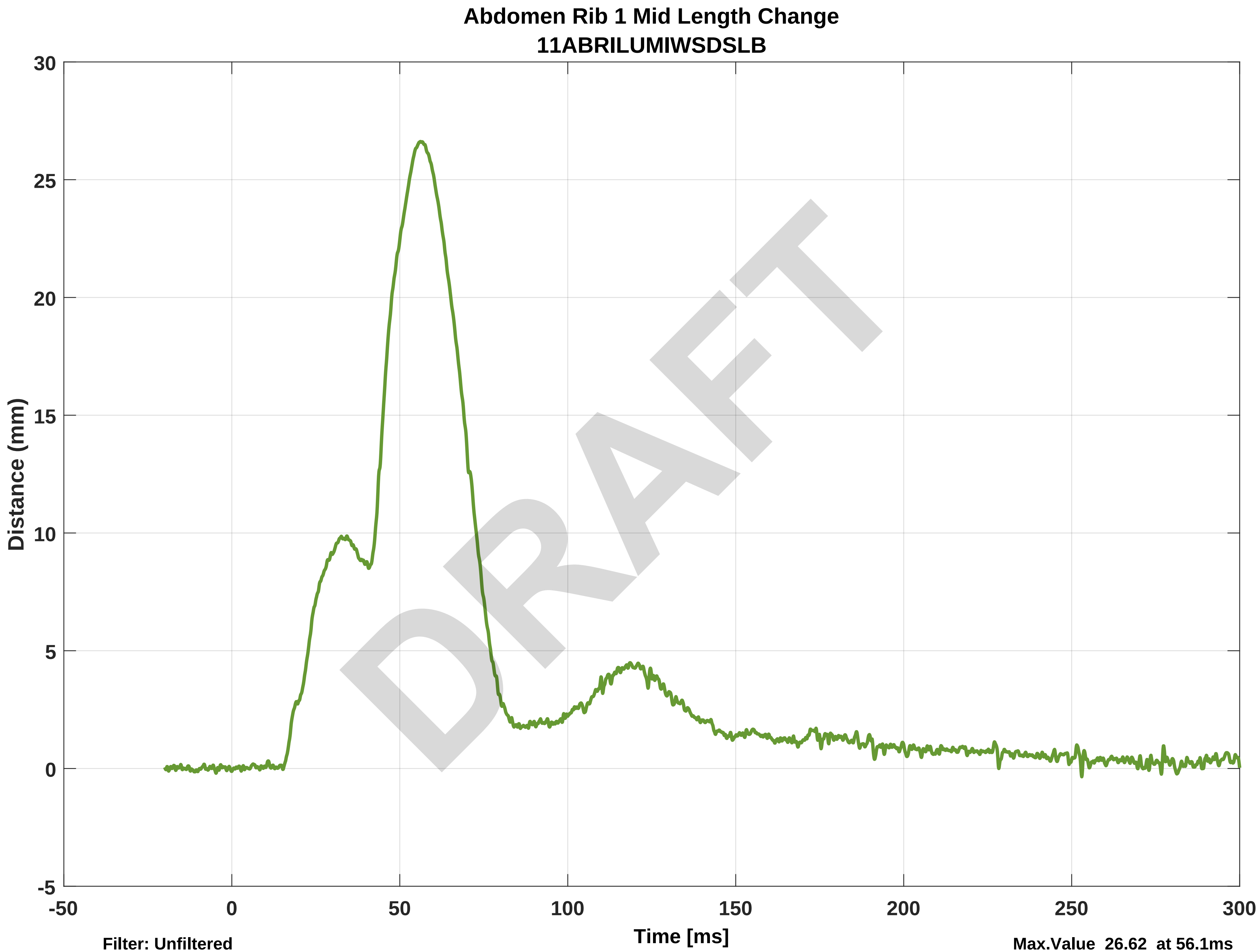


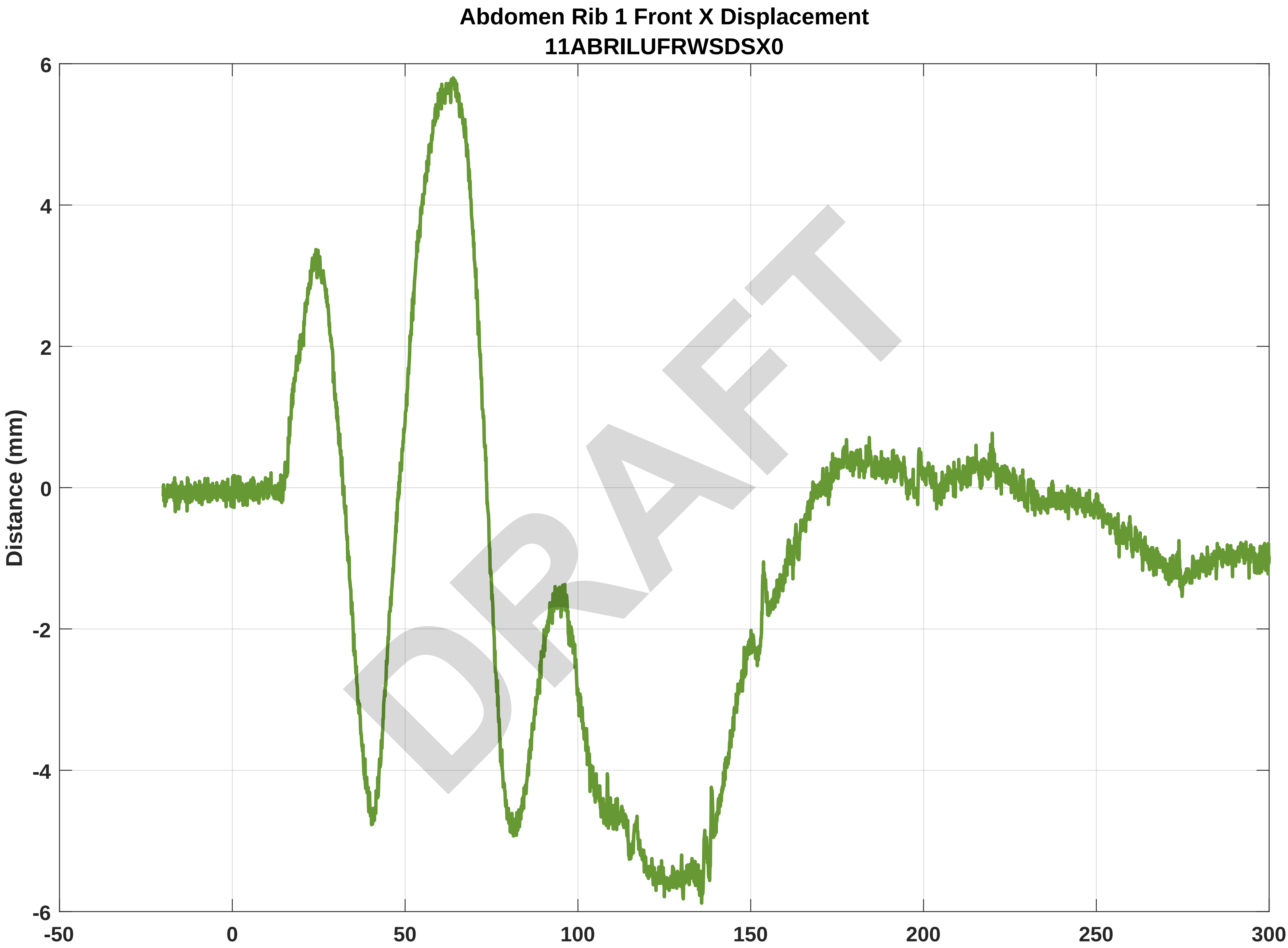
Filter: Unfiltered

Max.Value 26.74 at 55.7ms
Min.Value -0.56 at 276.7ms



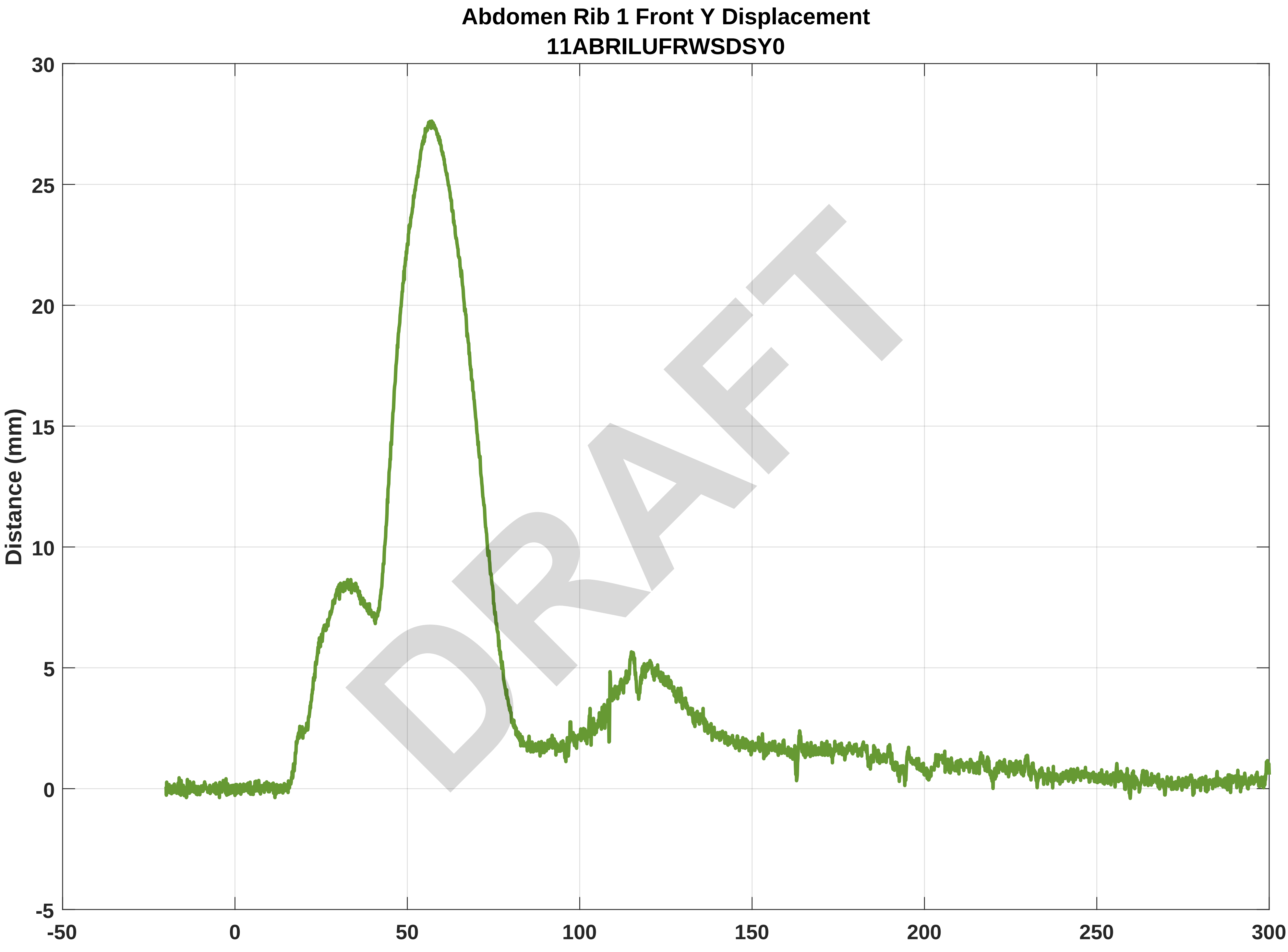
Abdomen Rib 1 Mid Z Displacement
11ABRILUMIWSDSZ0
Distance (mm)
Time [ms]
14
12
10
8
6
4
2
0
-2
-50
0
50
100
150
200
250
300
DRAFT
Filter: Unfiltered
Max.Value 13.05 at 44.2ms
Min.Value -1.69 at 26.9ms


Abdomen Rib 1 Mid Length Change
11ABRILUMIWSDSLB
Distance (mm)
30
25
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 26.62 at 56.1ms
Min.Value -0.35 at 253ms



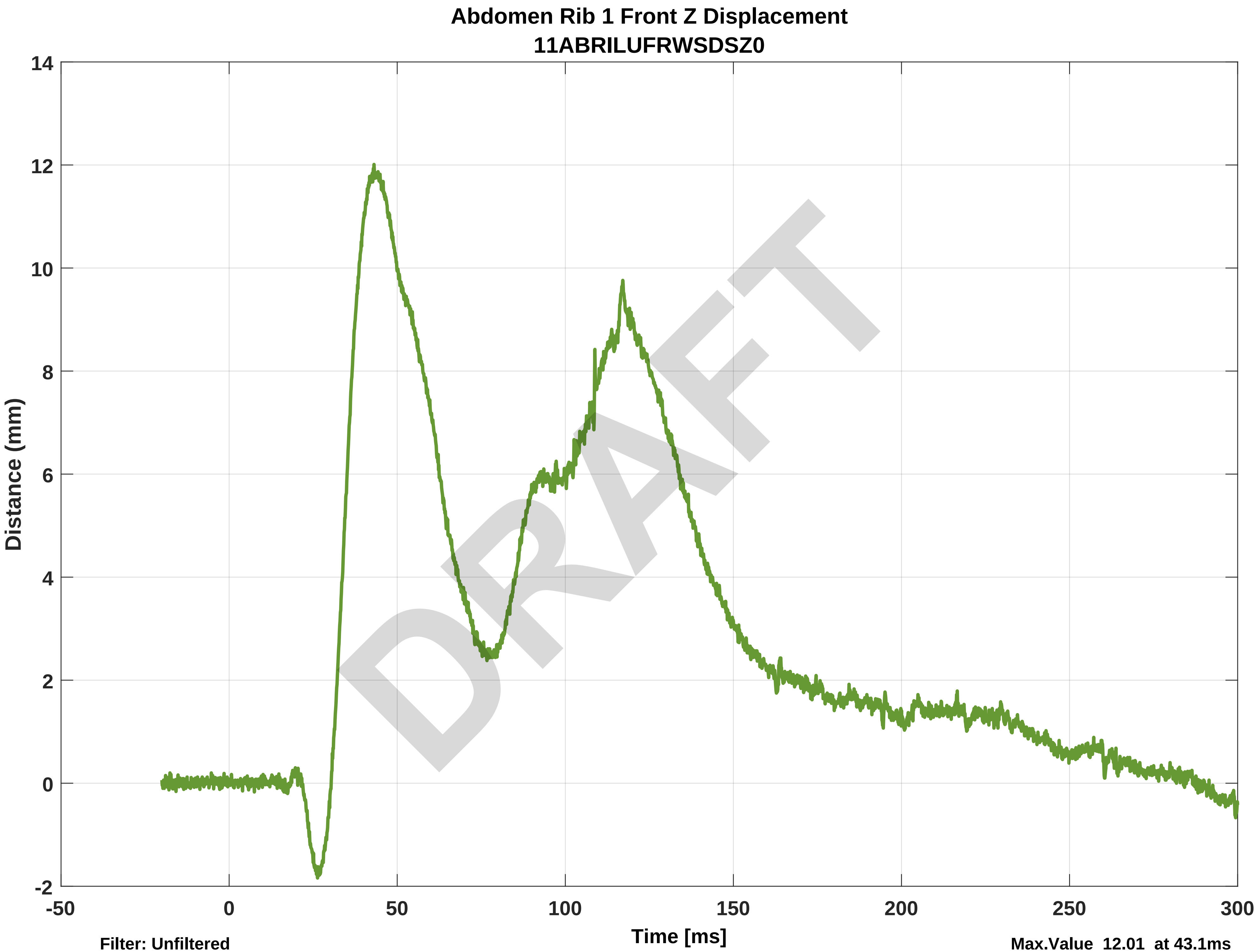
Filter: Unfiltered

Max.Value 5.8 at 63.9ms
Min.Value -5.88 at 135.8ms



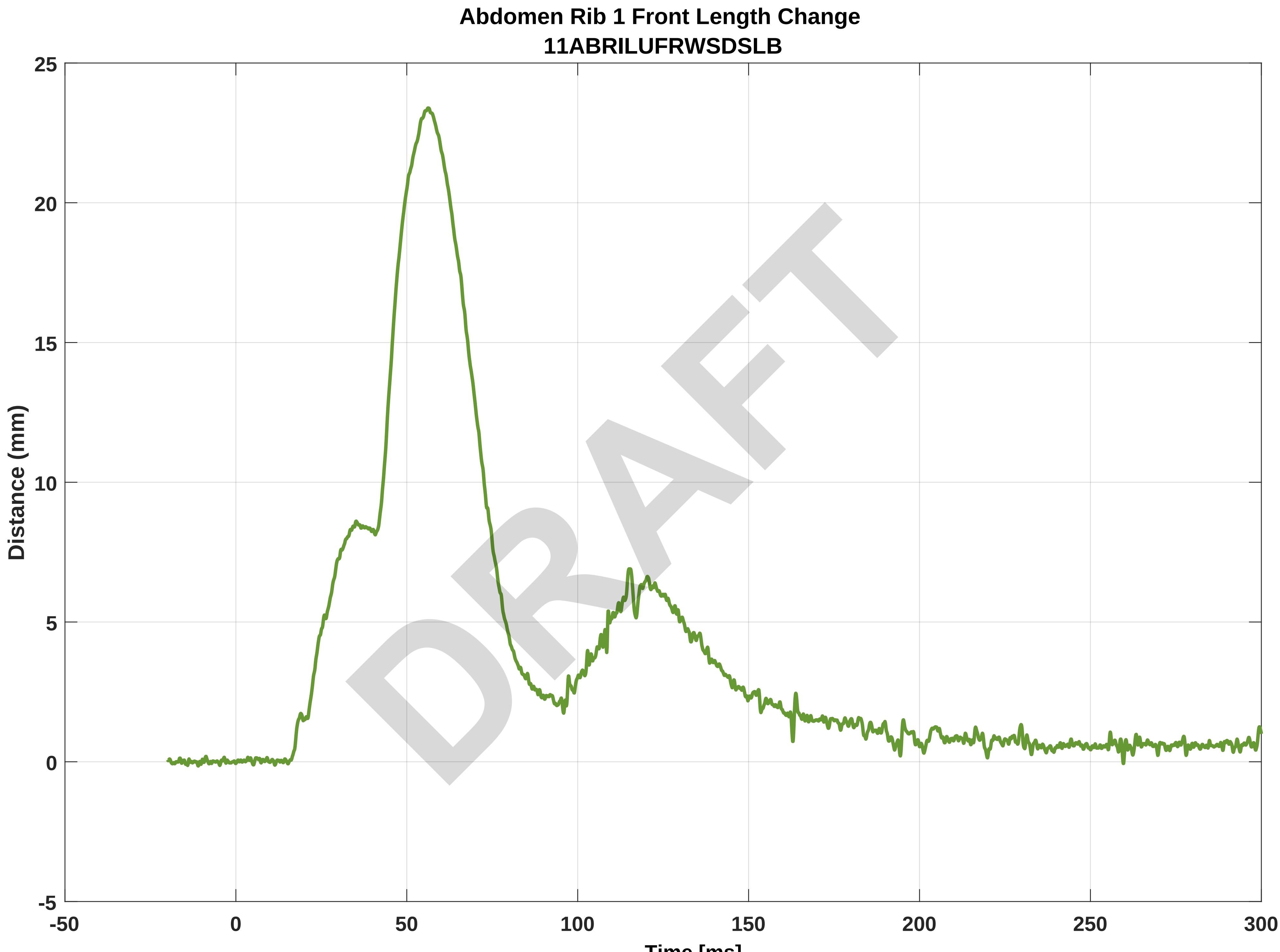
Filter: Unfiltered

Max.Value 27.62 at 57.1ms
Min.Value -0.4 at 259.7ms



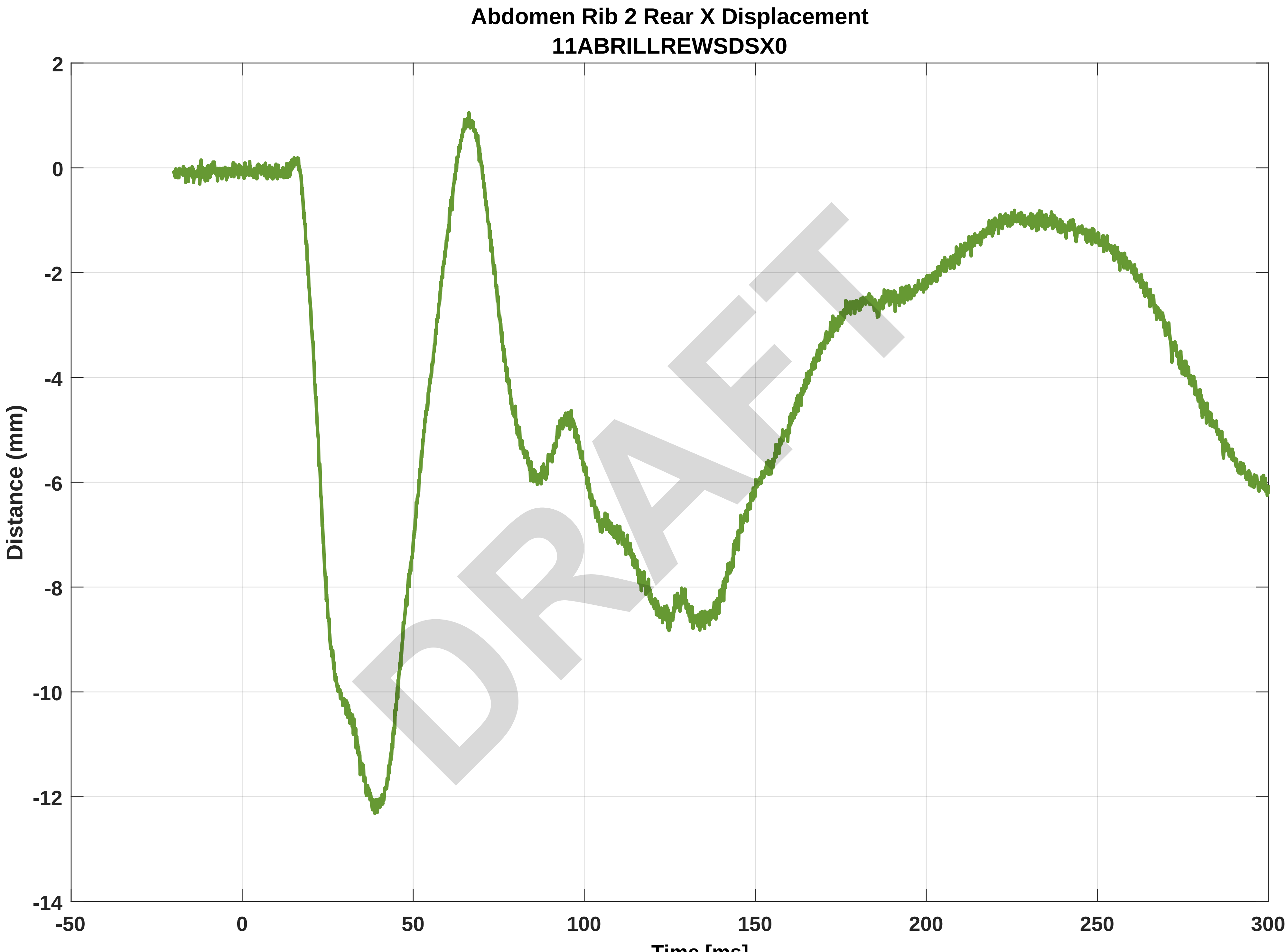
Filter: Unfiltered

Max.Value 12.01 at 43.1ms
Min.Value -1.84 at 26.3ms



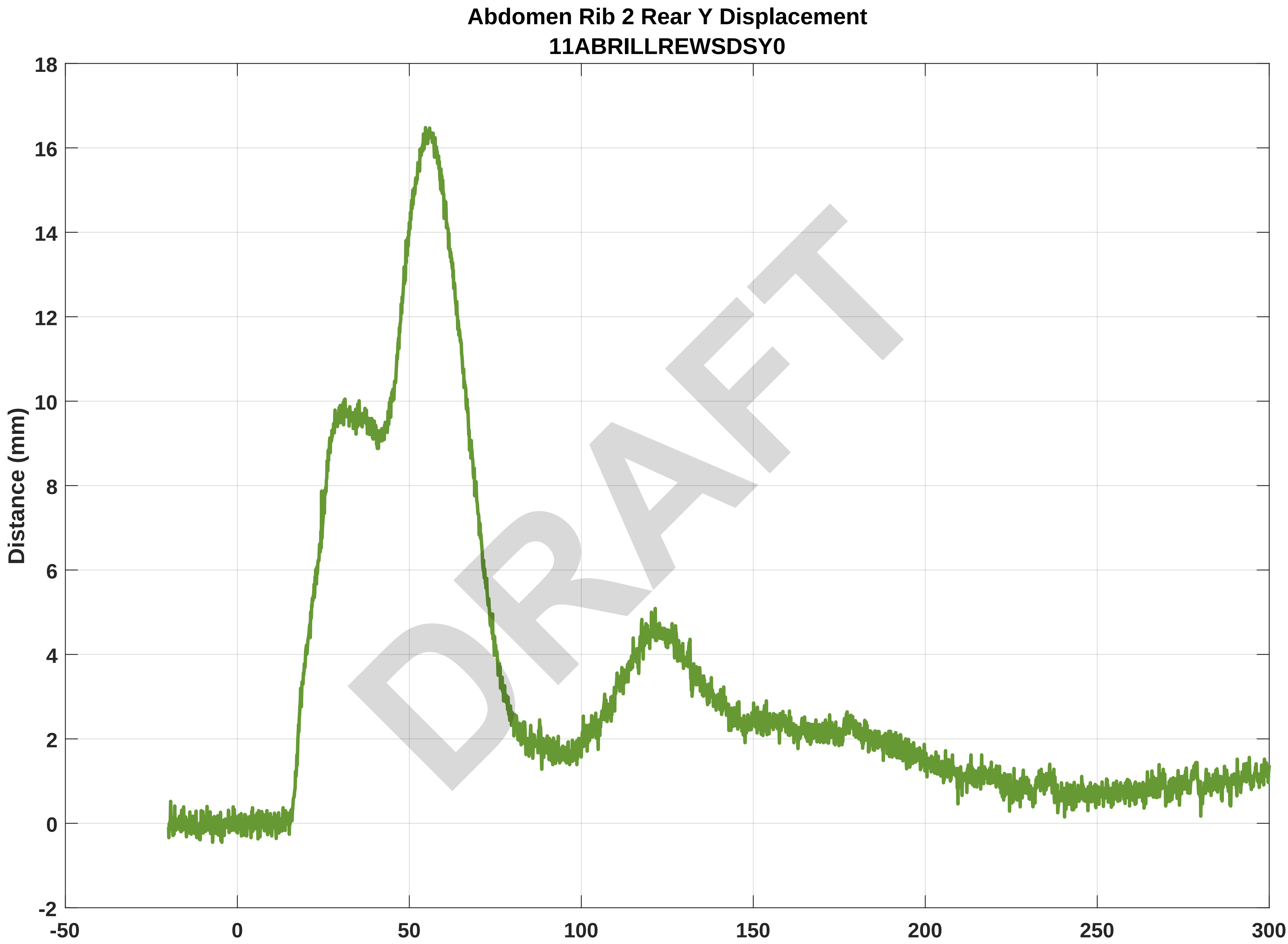
Filter: Unfiltered

Max.Value 23.39 at 56.2ms
Min.Value -0.15 at -11ms



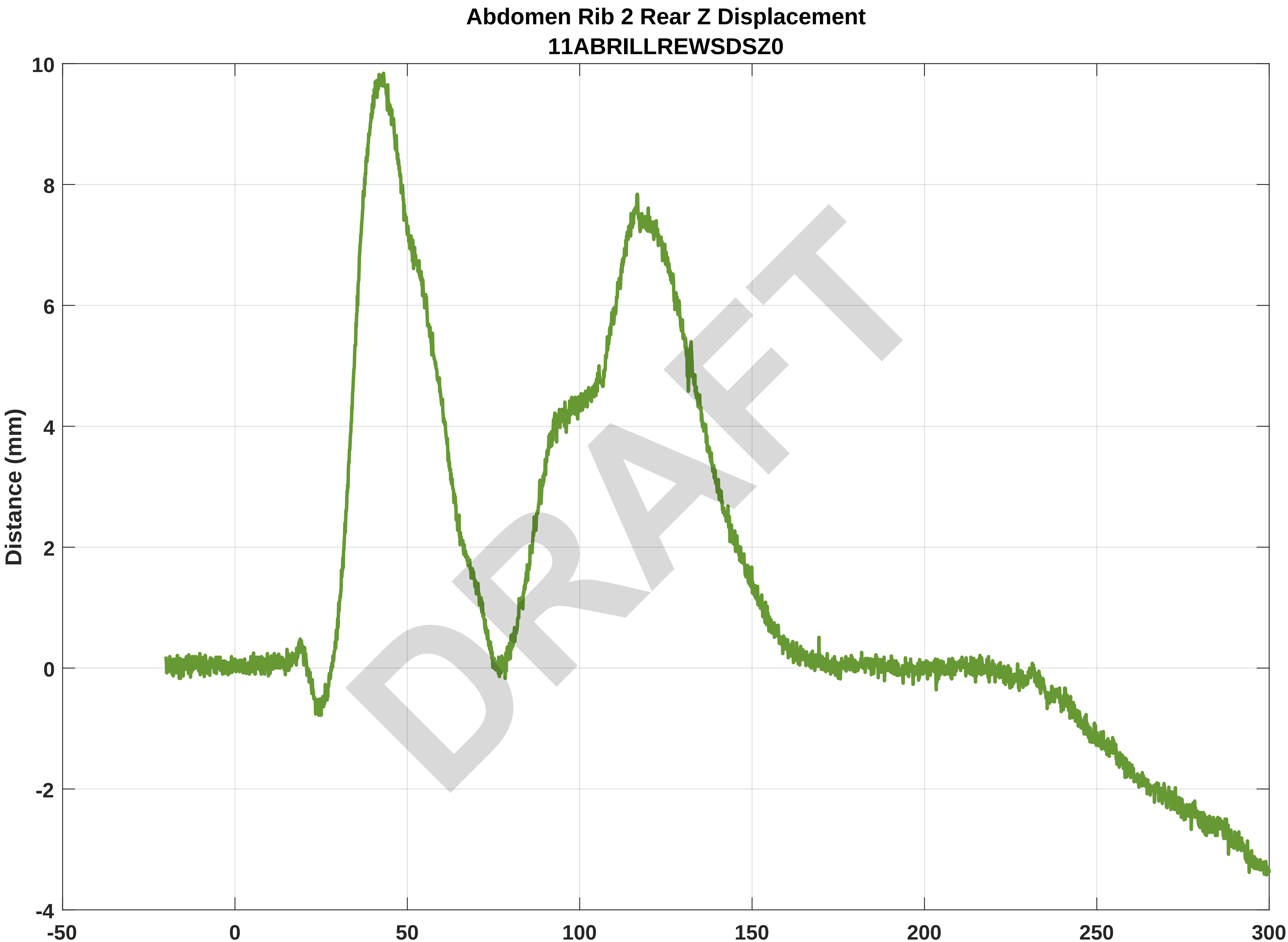
Filter: Unfiltered

Max.Value 1.05 at 66.3ms
Min.Value -12.32 at 38.8ms



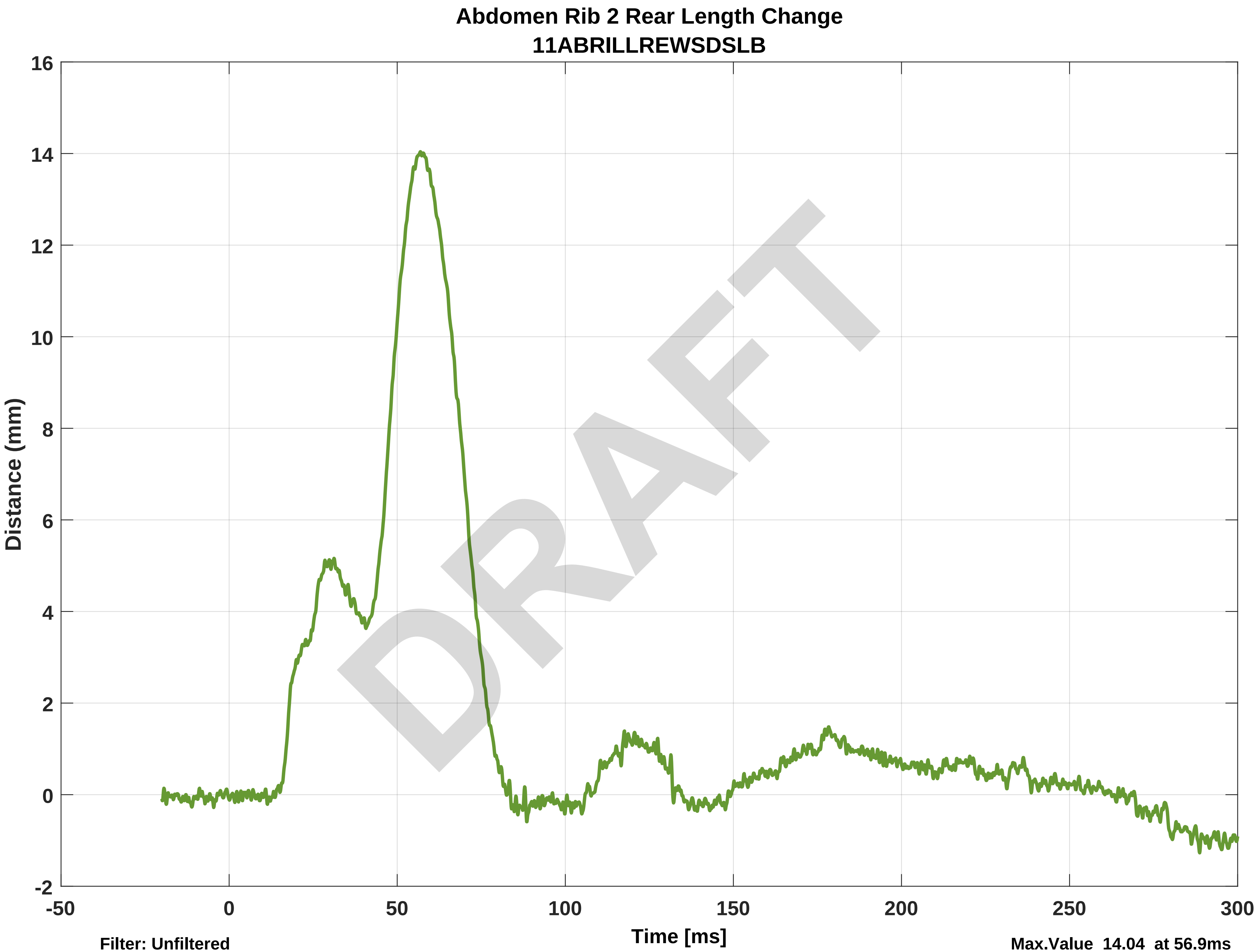
Filter: Unfiltered

Max.Value 16.48 at 54.7ms
Min.Value -0.45 at -7.2ms



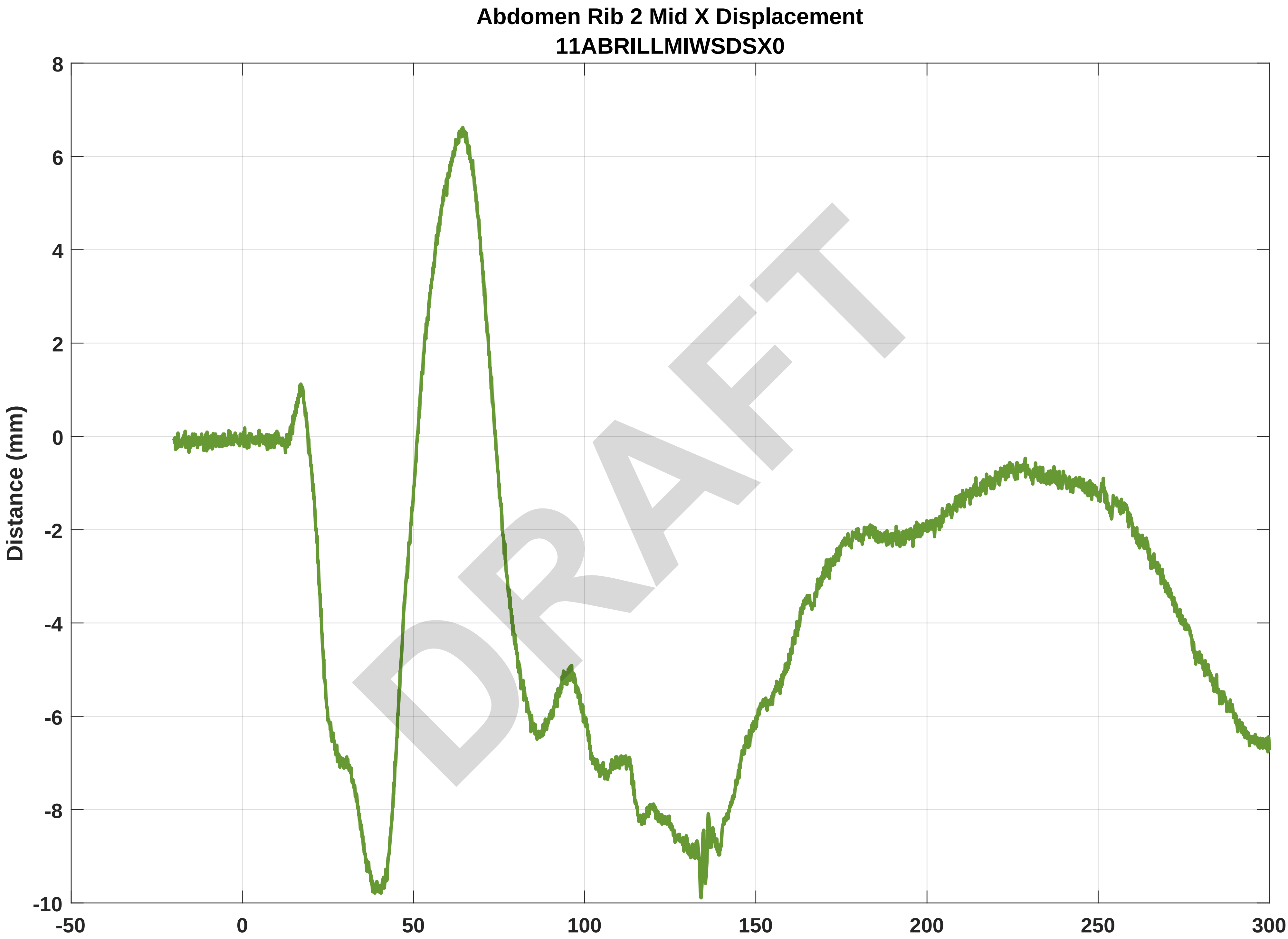
Filter: Unfiltered

Max.Value 9.84 at 43.1ms
Min.Value -3.42 at 299.2ms



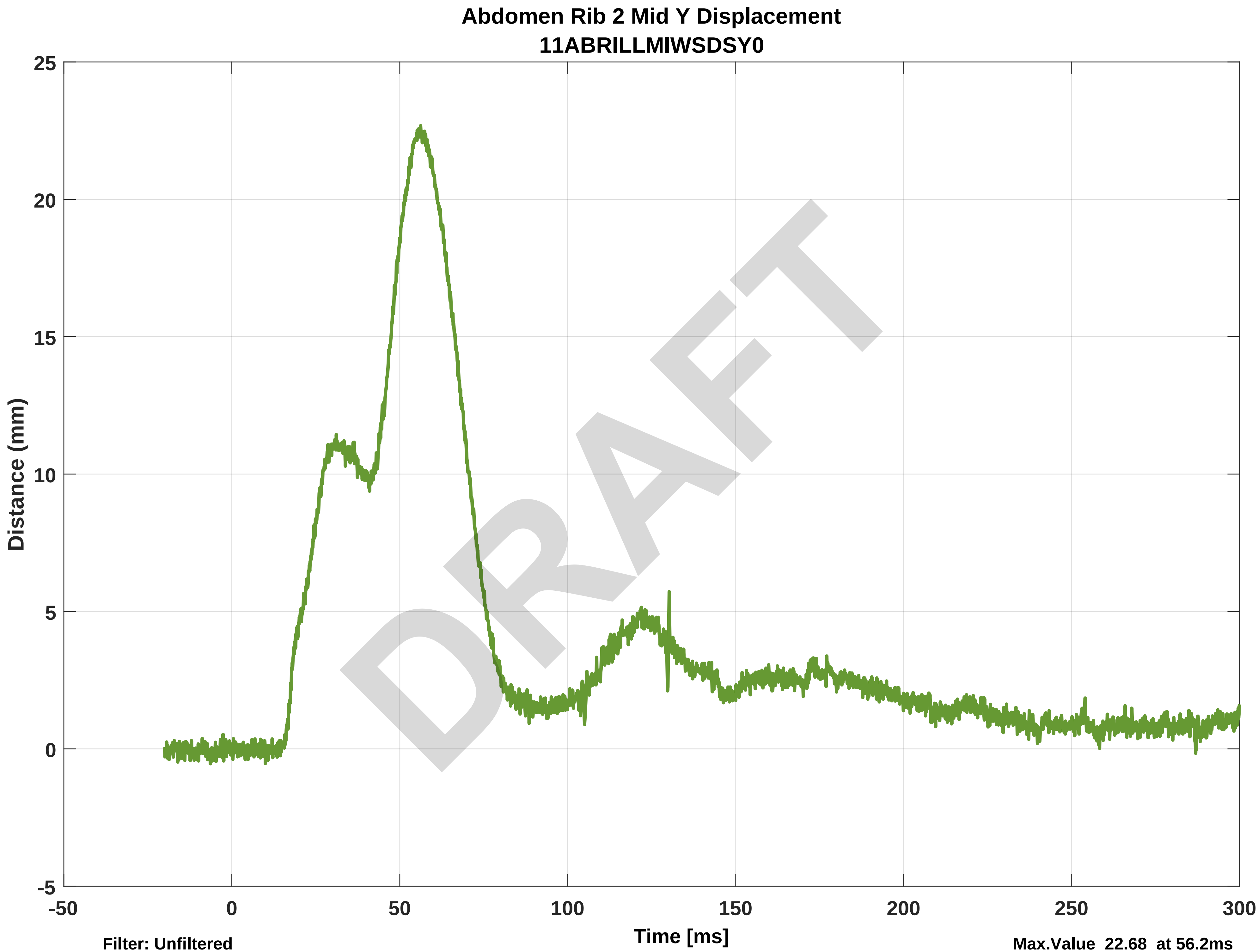
Filter: Unfiltered

Max.Value 14.04 at 56.9ms
Min.Value -1.27 at 288.7ms



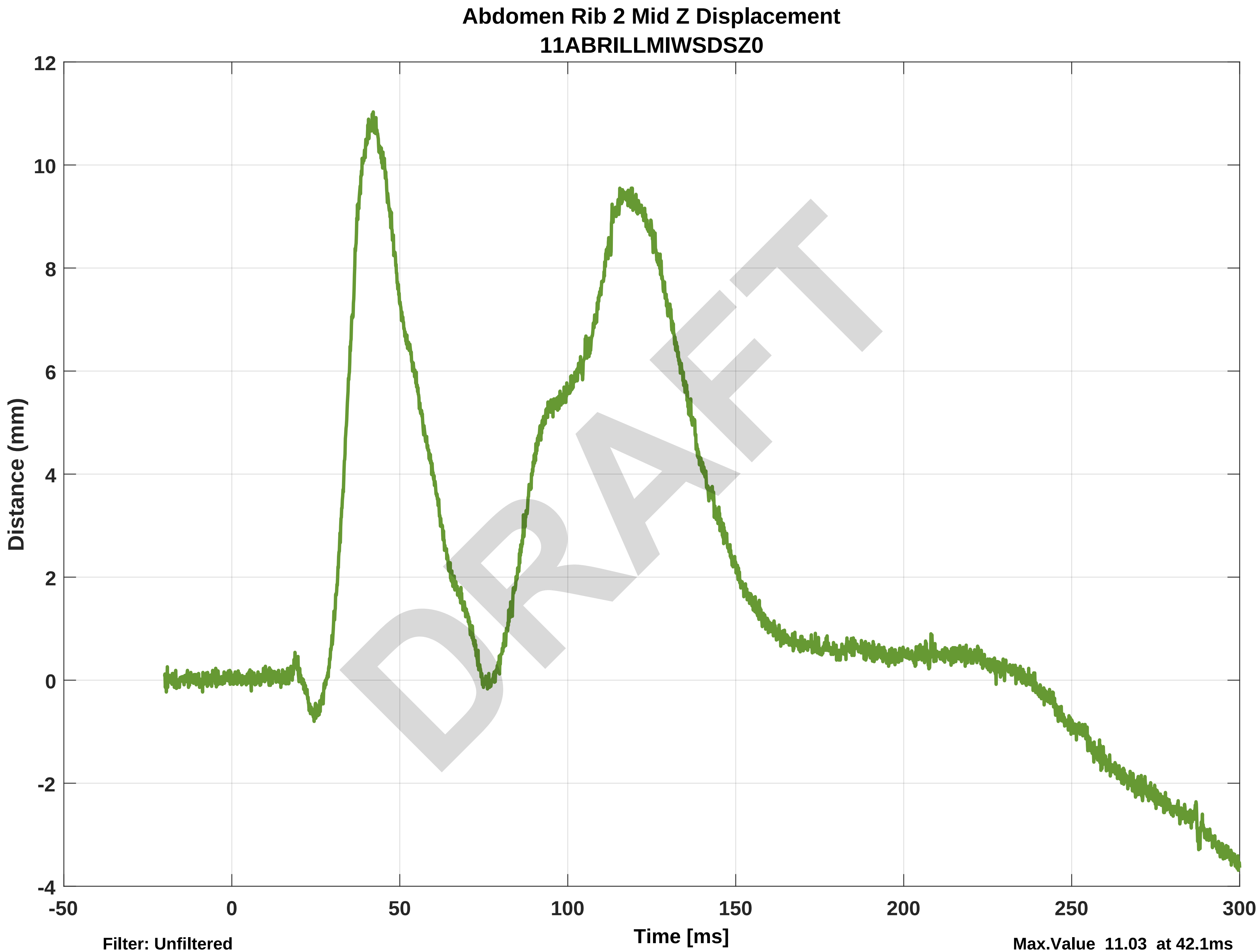
Filter: Unfiltered

Max.Value 6.62 at 64.4ms
Min.Value -9.89 at 134ms



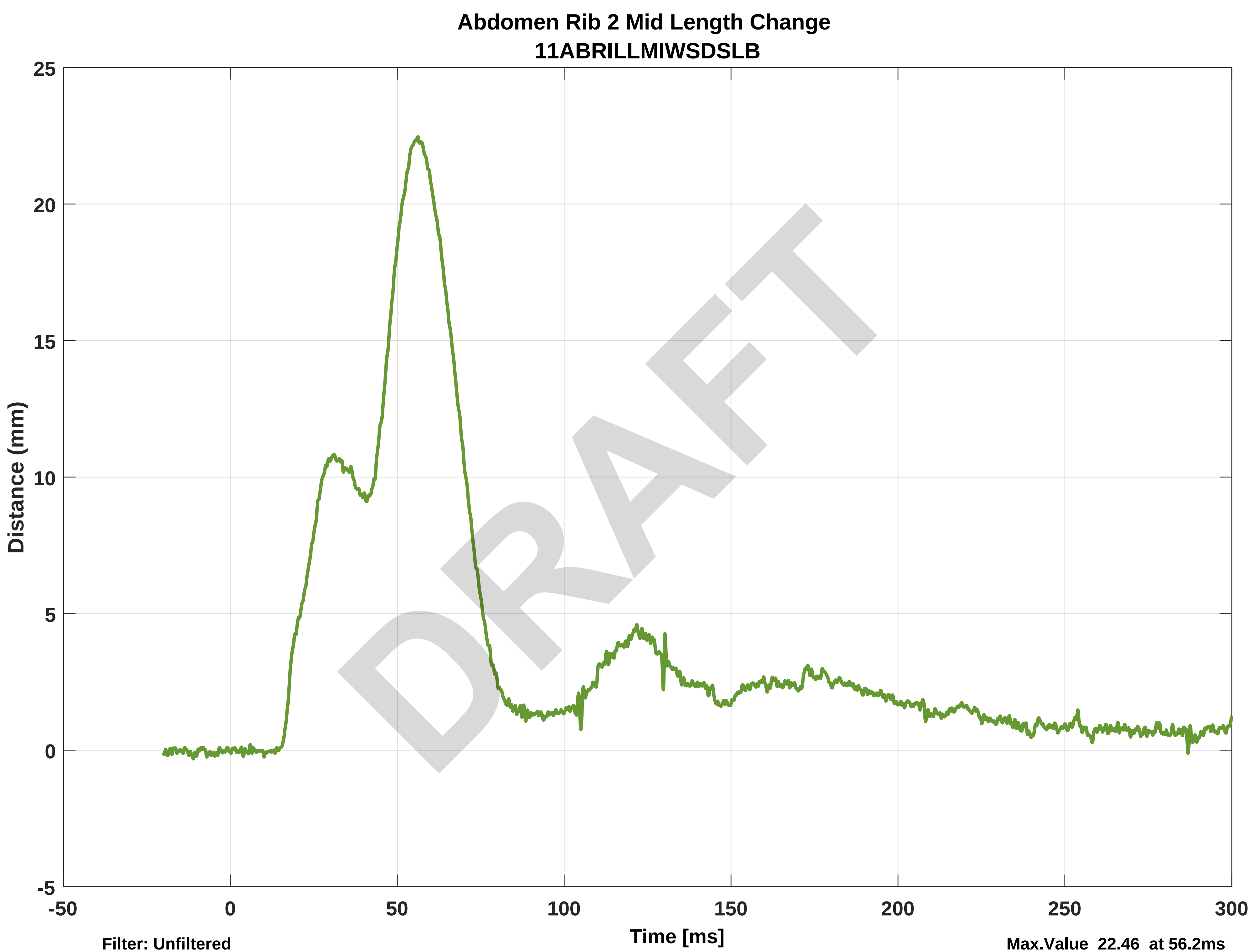
Filter: Unfiltered

Max.Value 22.68 at 56.2ms
Min.Value -0.54 at -6.4ms



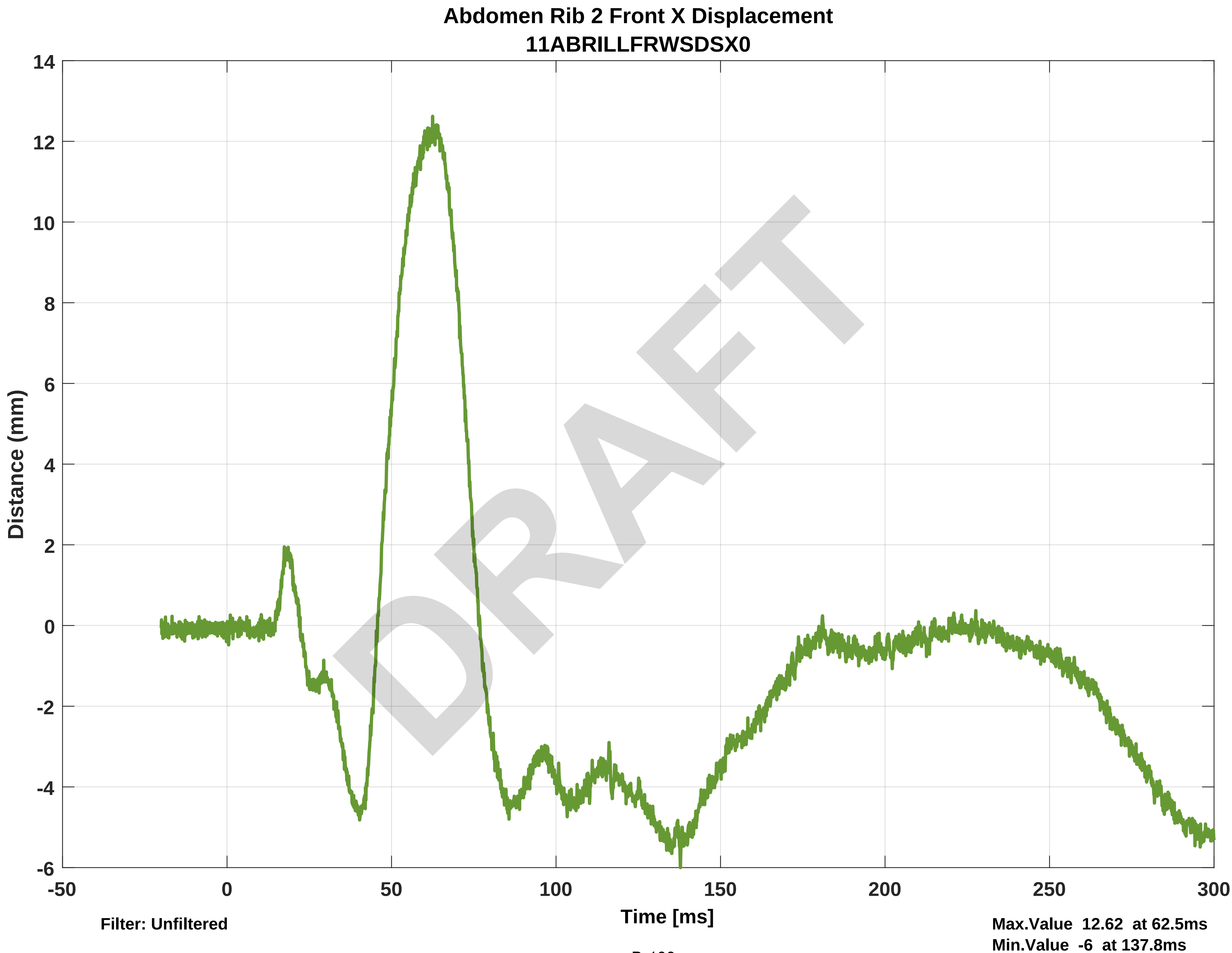
Filter: Unfiltered

Max.Value 11.03 at 42.1ms
Min.Value -3.69 at 299.6ms

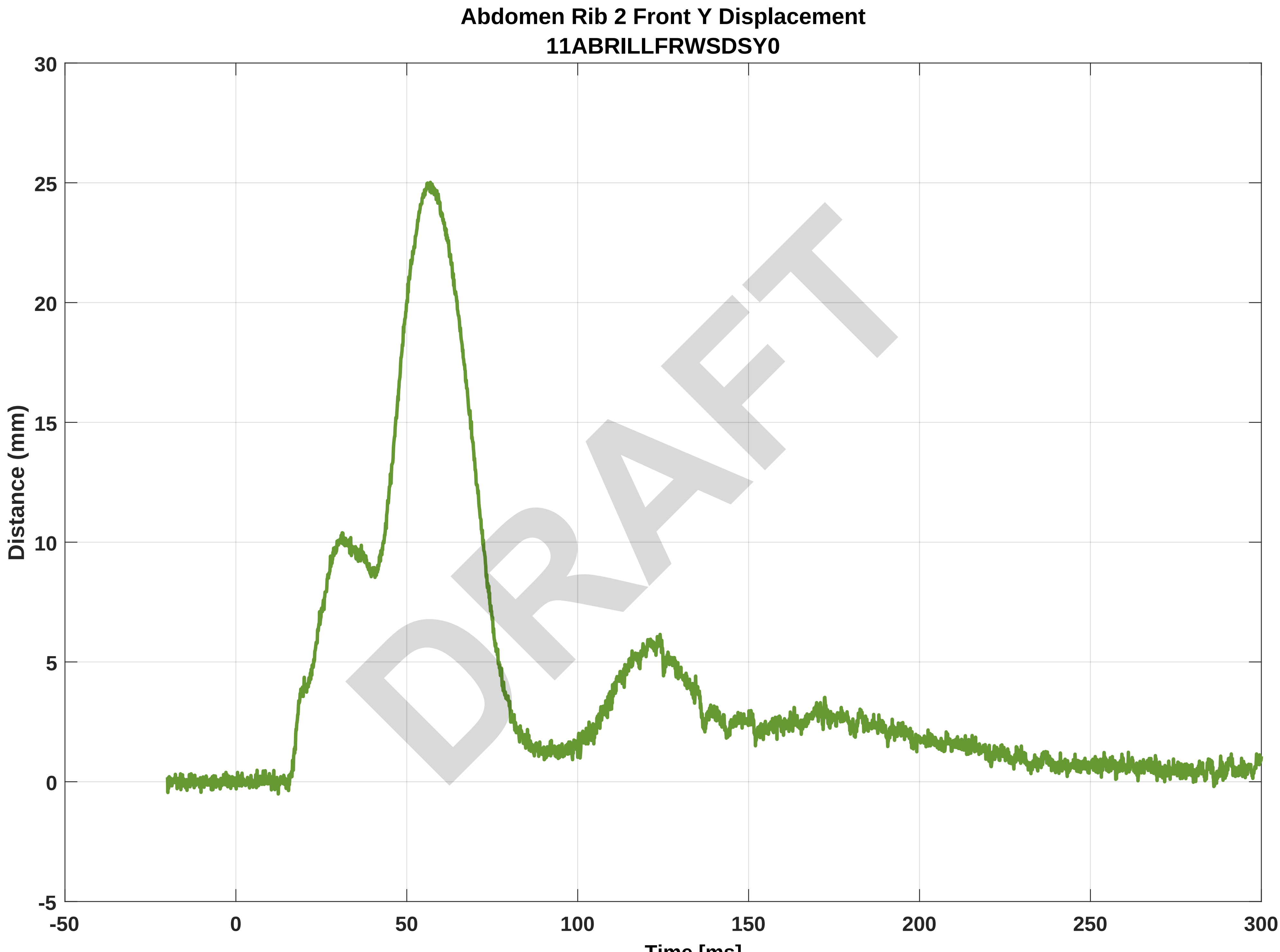


Filter: Unfiltered

Max.Value 22.46 at 56.2ms
Min.Value -0.32 at -11.1ms

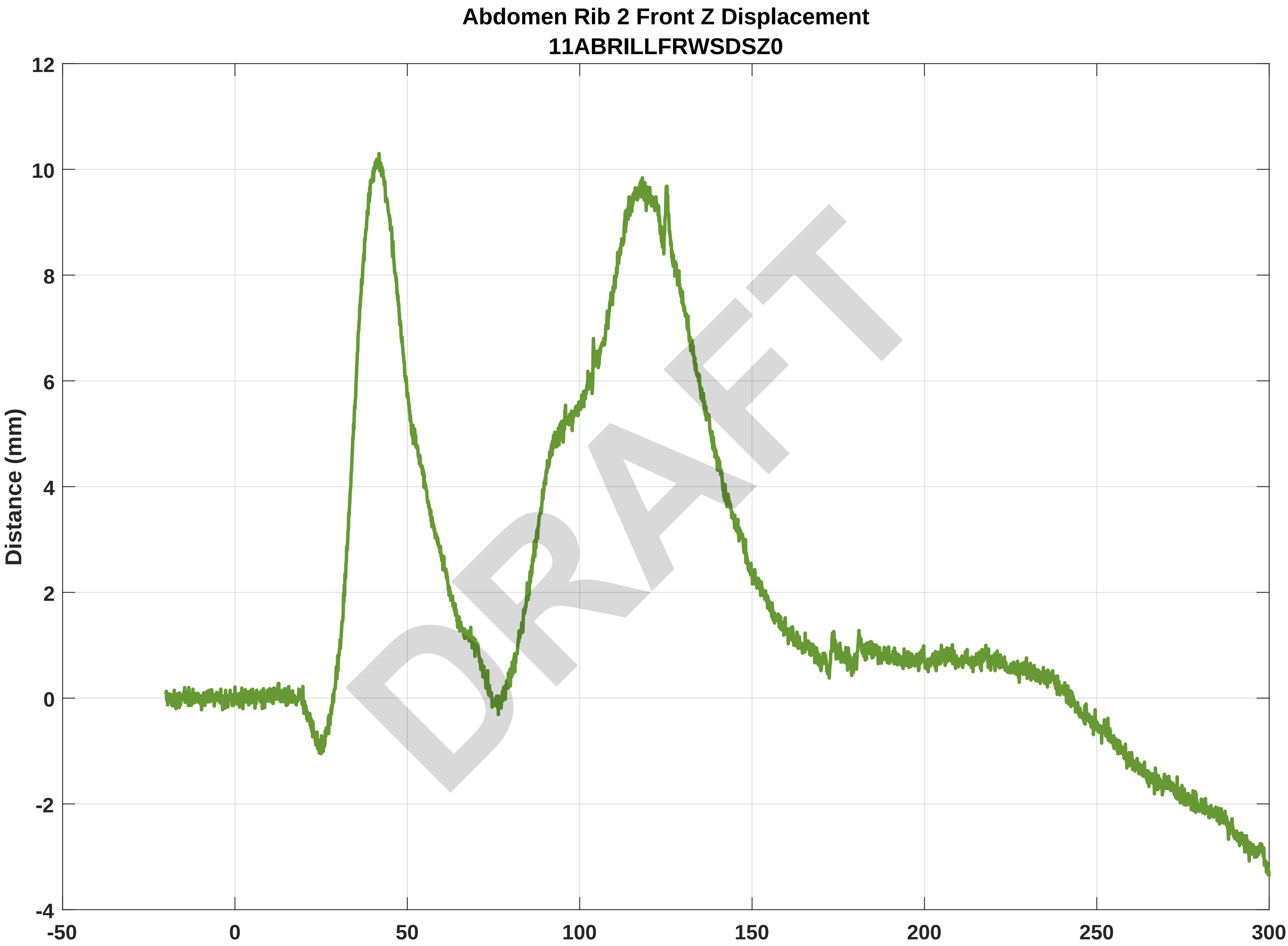


Abdomen Rib 2 Front X Displacement
11ABRILLFRWSDSX0
Distance (mm)
14
12
10
8
6
4
2
0
-2
-4
-6
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 12.62 at 62.5ms
Min.Value -6 at 137.8ms



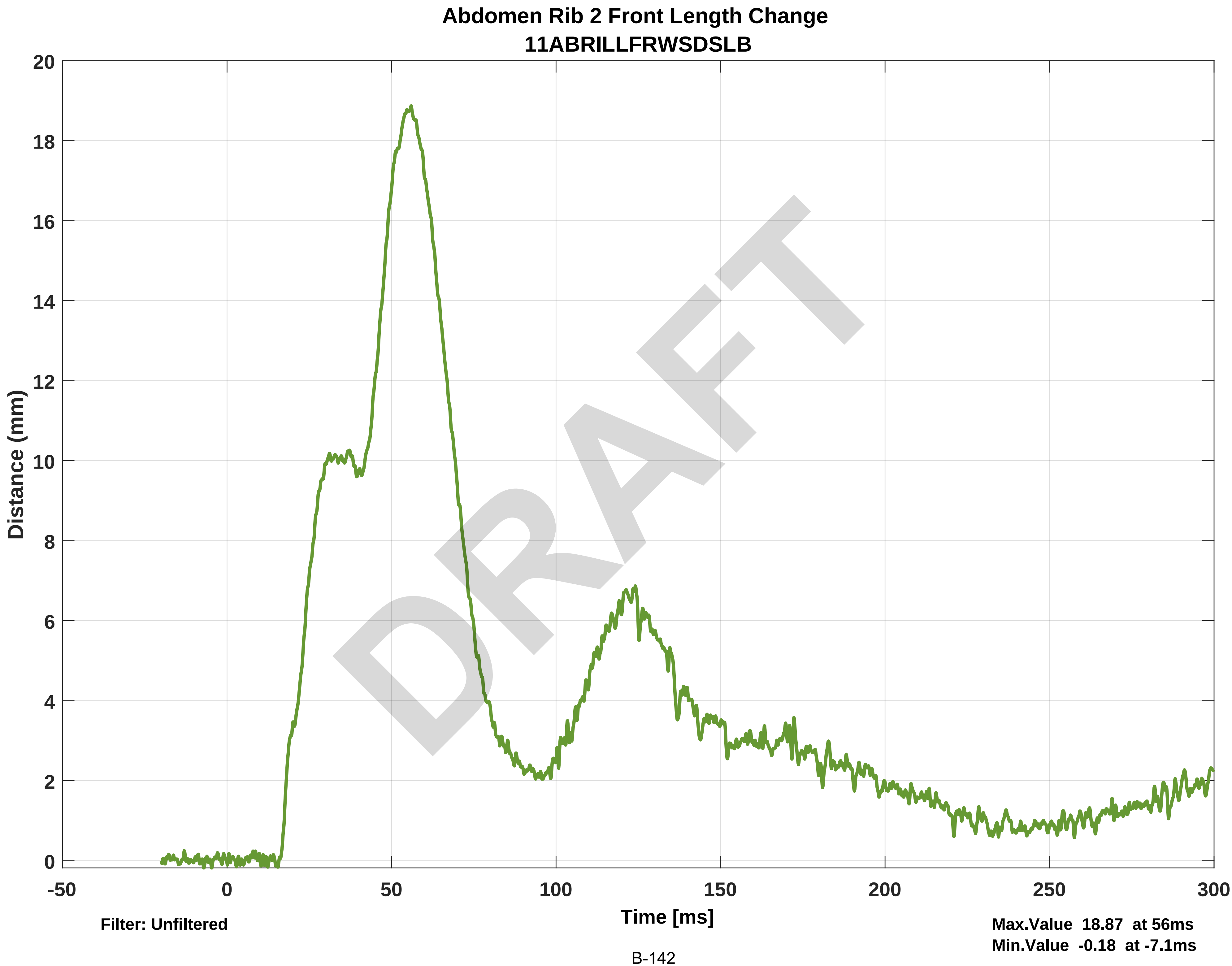
Filter: Unfiltered

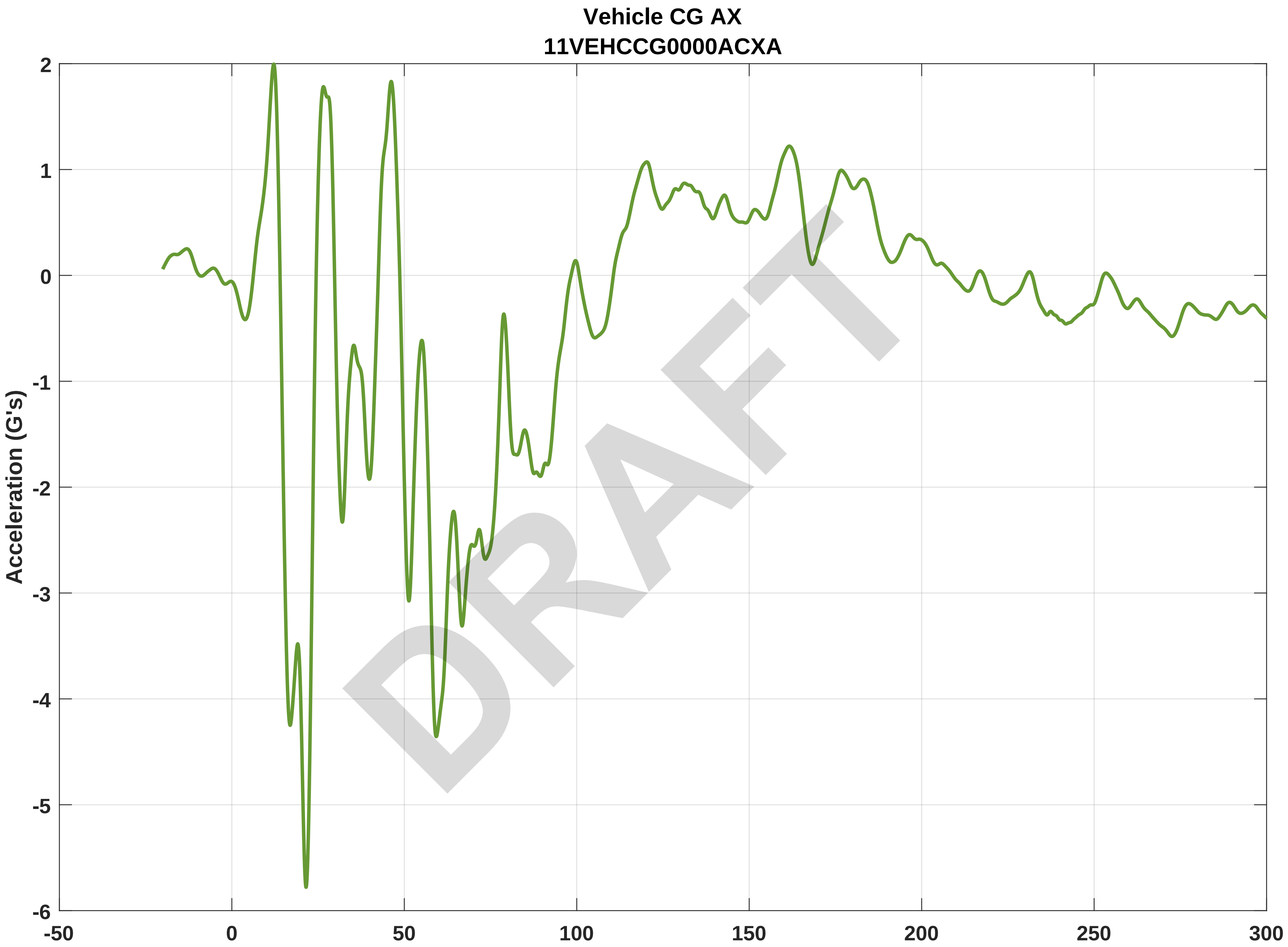
Max.Value 25.02 at 56.9ms
Min.Value -0.51 at 12.4ms



Filter: Unfiltered

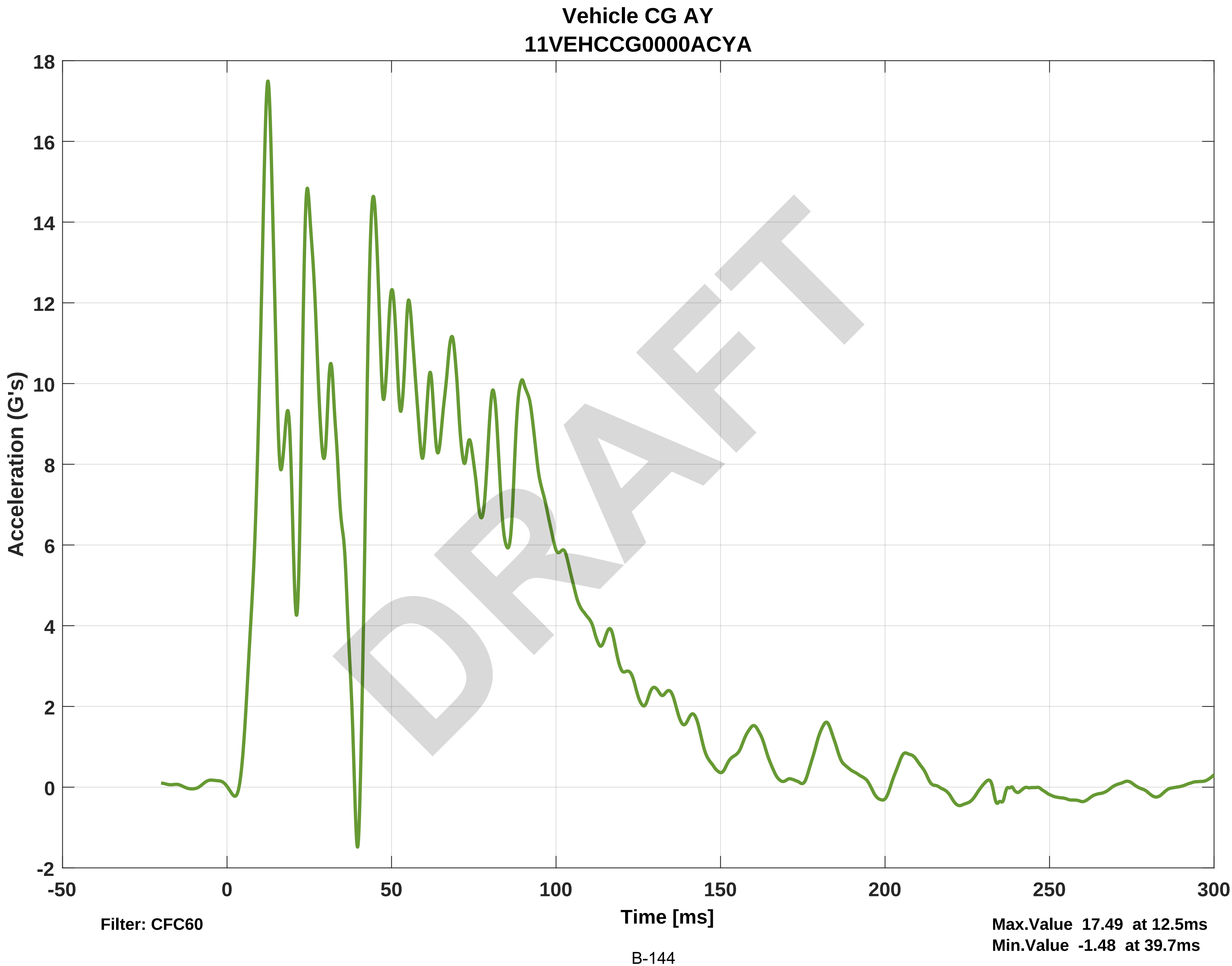
Max.Value 10.3 at 41.8ms
Min.Value -3.37 at 300ms

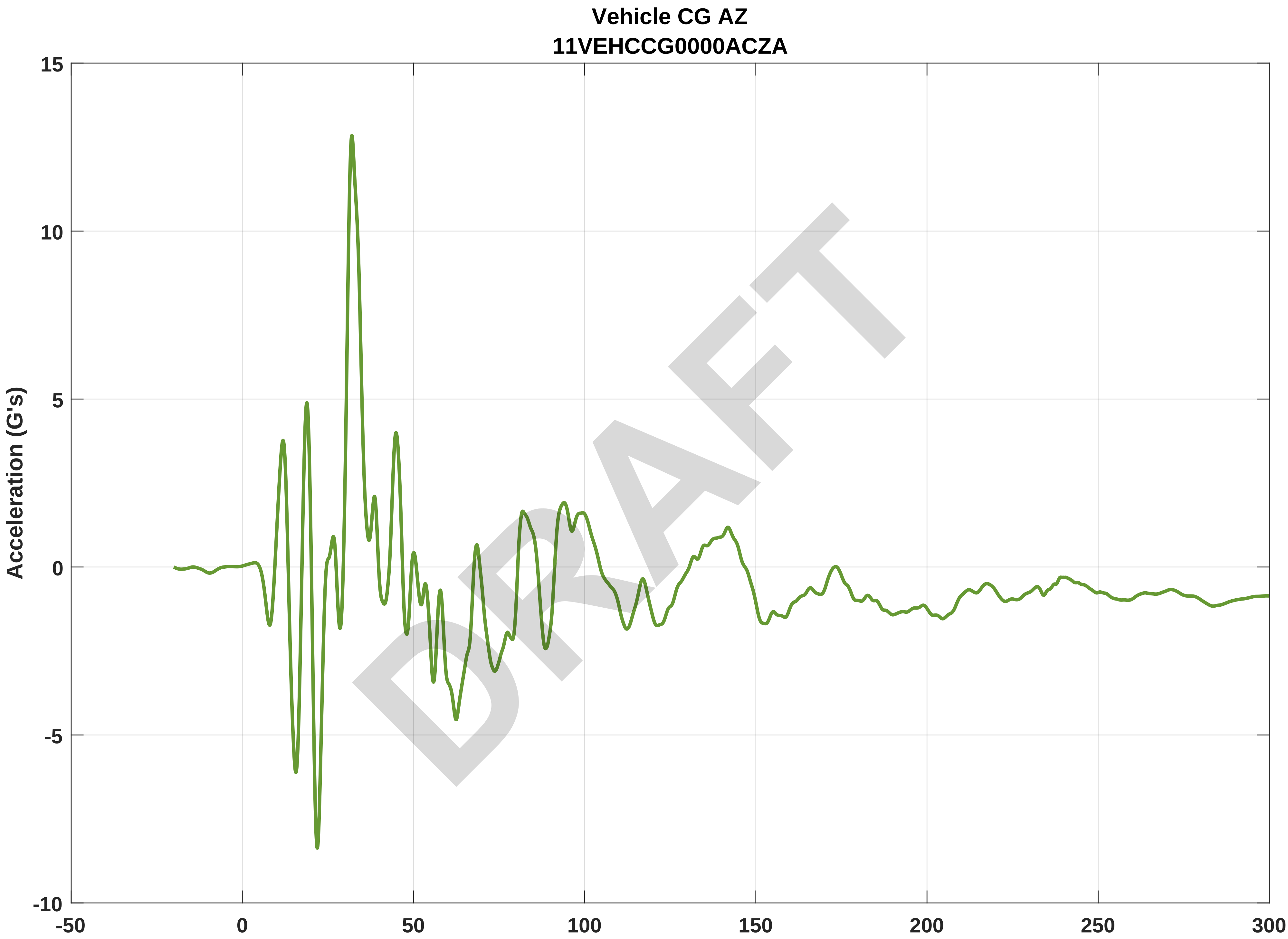

Abdomen Rib 2 Front Length Change
11ABRILLFRWSDSLB
Distance (mm)
Time [ms]
DRAFT
Filter: Unfiltered
Max.Value 18.87 at 56ms
Min.Value -0.18 at -7.1ms



Filter: CFC60

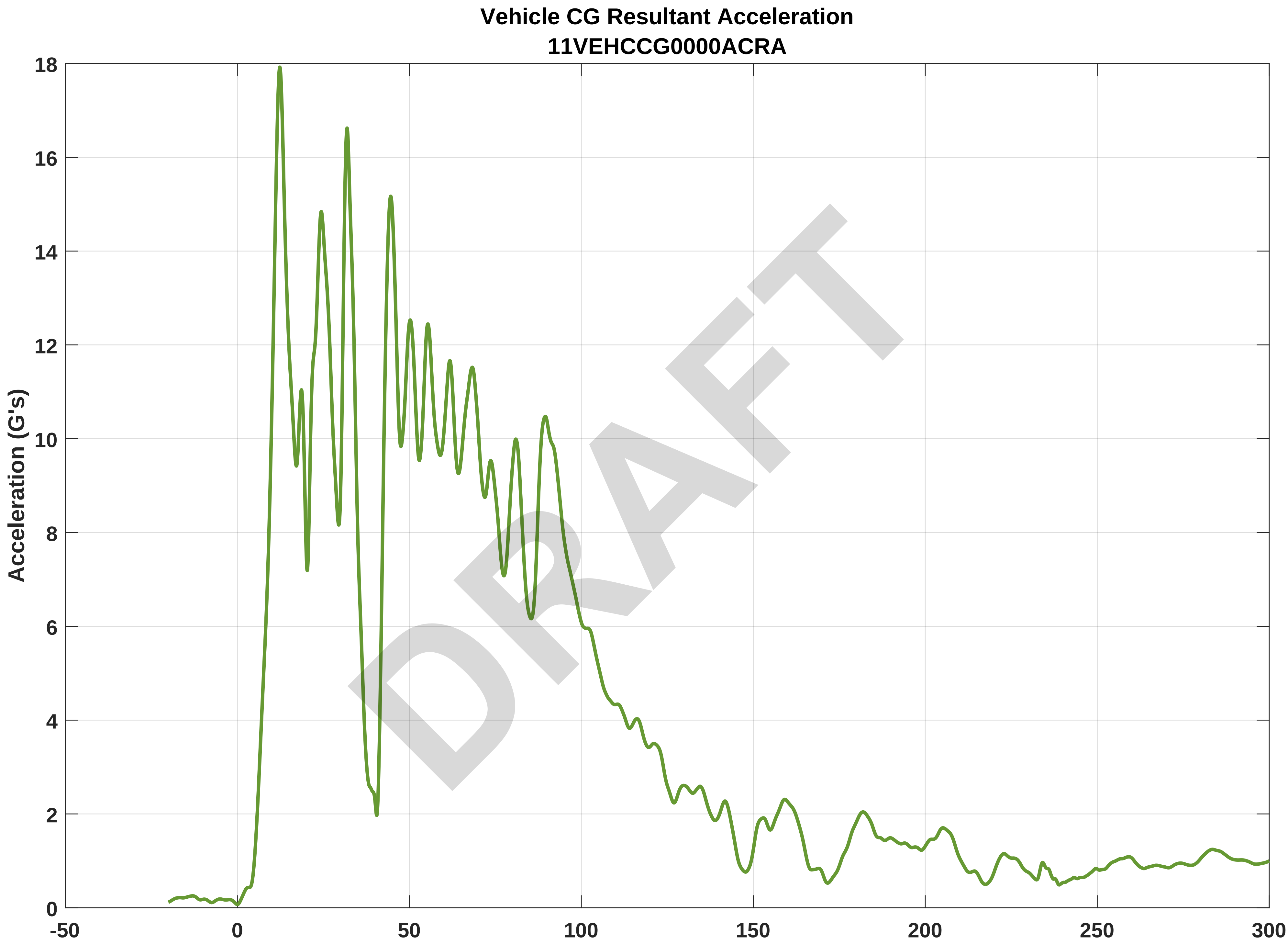
Max.Value 2 at 12.2ms
Min.Value -5.78 at 21.5ms


Vehicle CG AY
11VEHCCG0000ACYA
Acceleration (G's)
18
16
14
12
10
8
6
4
2
0
-2
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 17.49 at 12.5ms
Min.Value -1.48 at 39.7ms



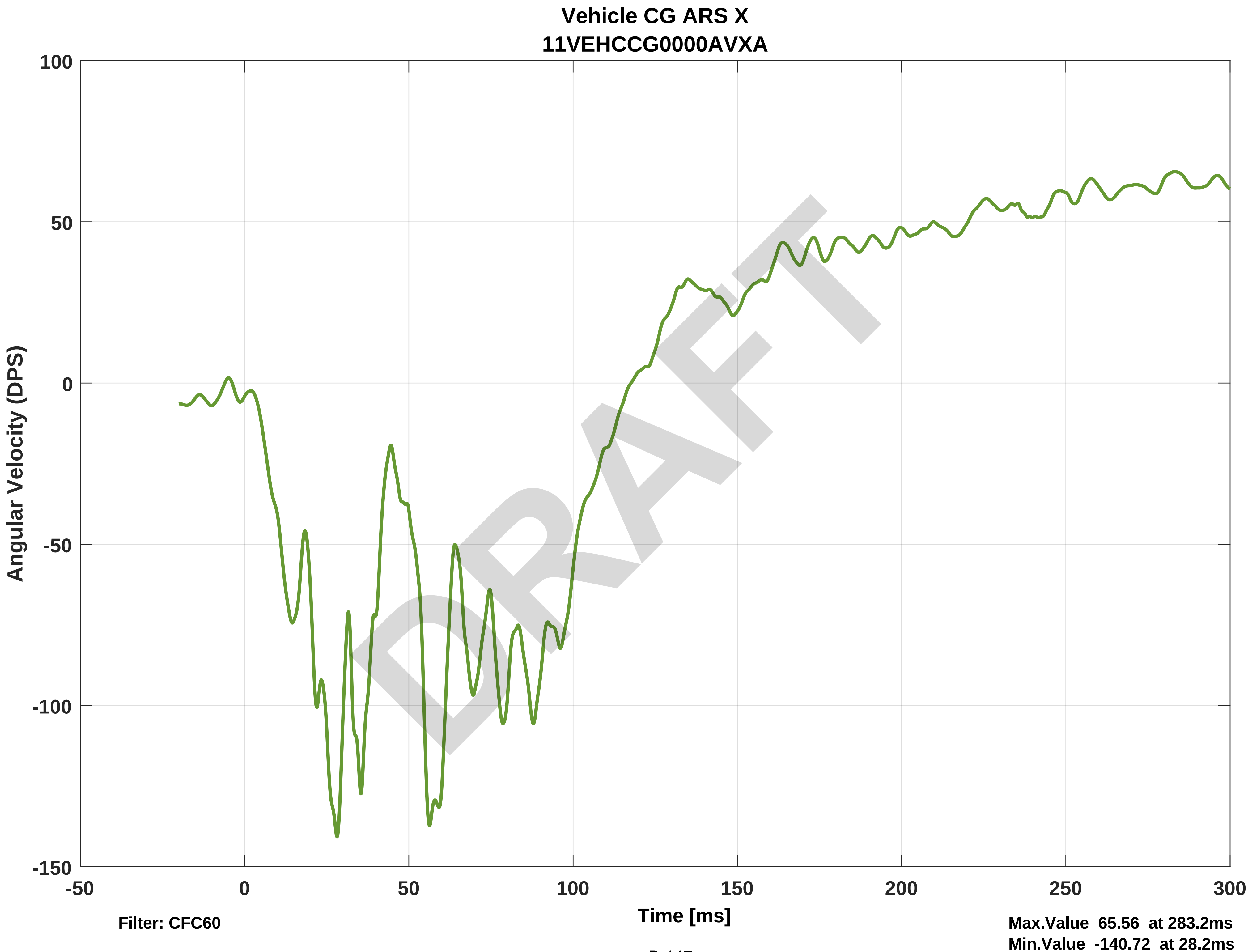
Filter: CFC60

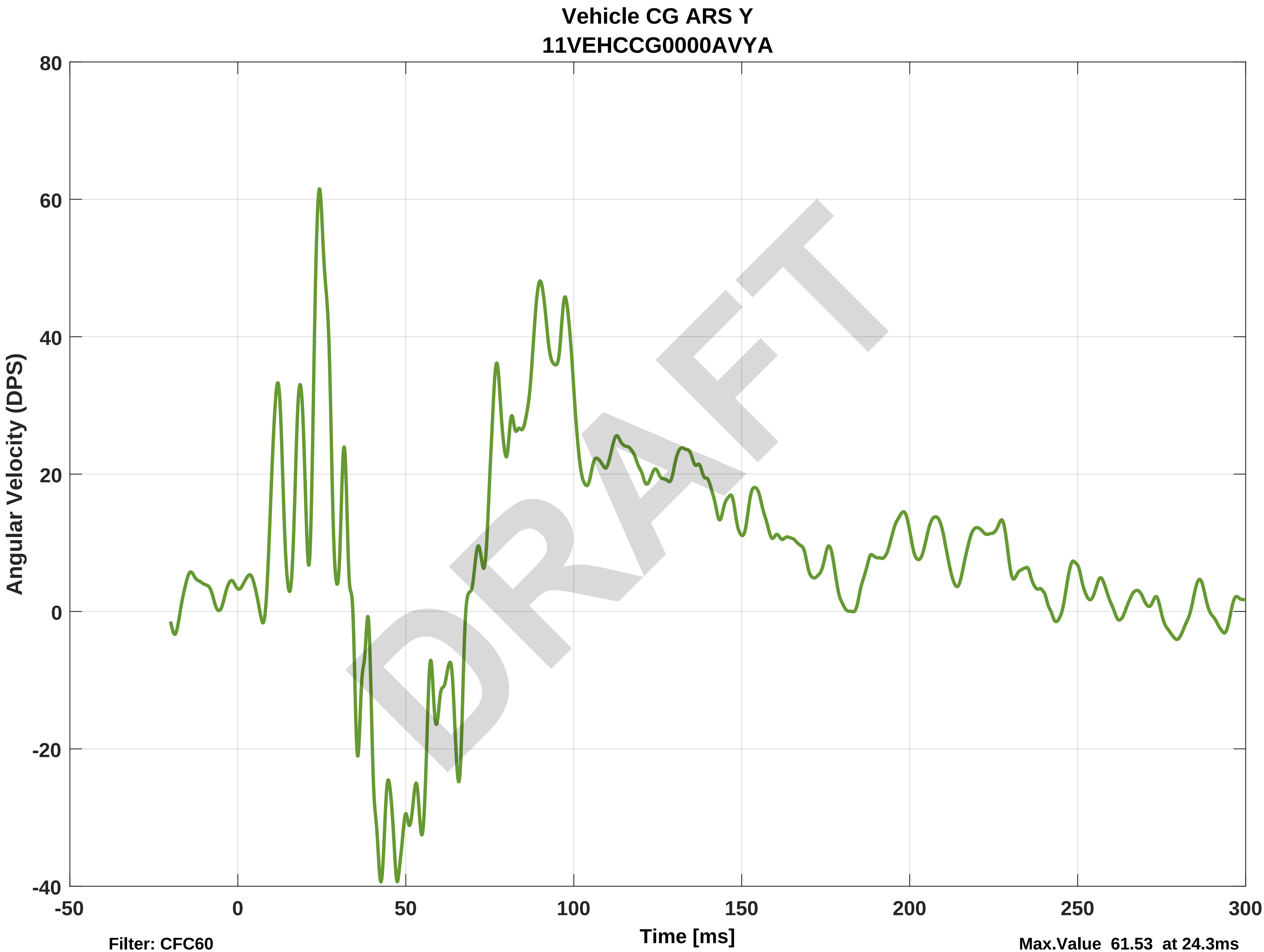
Max.Value 12.84 at 32ms
Min.Value -8.37 at 21.9ms



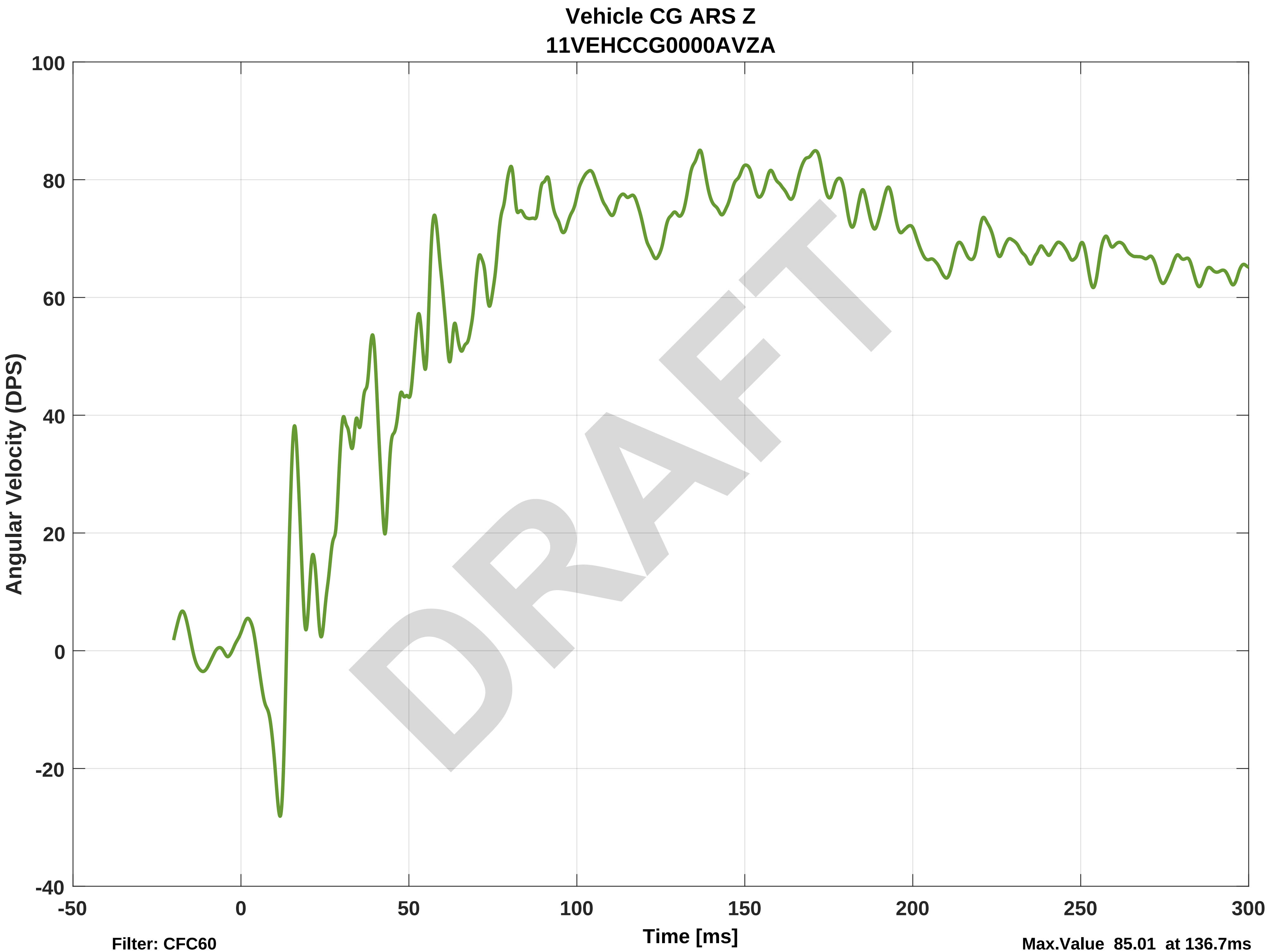
Filter: CFC60

Max.Value 17.92 at 12.4ms
Min.Value 0.07 at 0ms


Vehicle CG ARS X
11VEHCCG0000AVXA
Angular Velocity (DPS)
100
50
0
-50
-100
-150
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 65.56 at 283.2ms
Min.Value -140.72 at 28.2ms

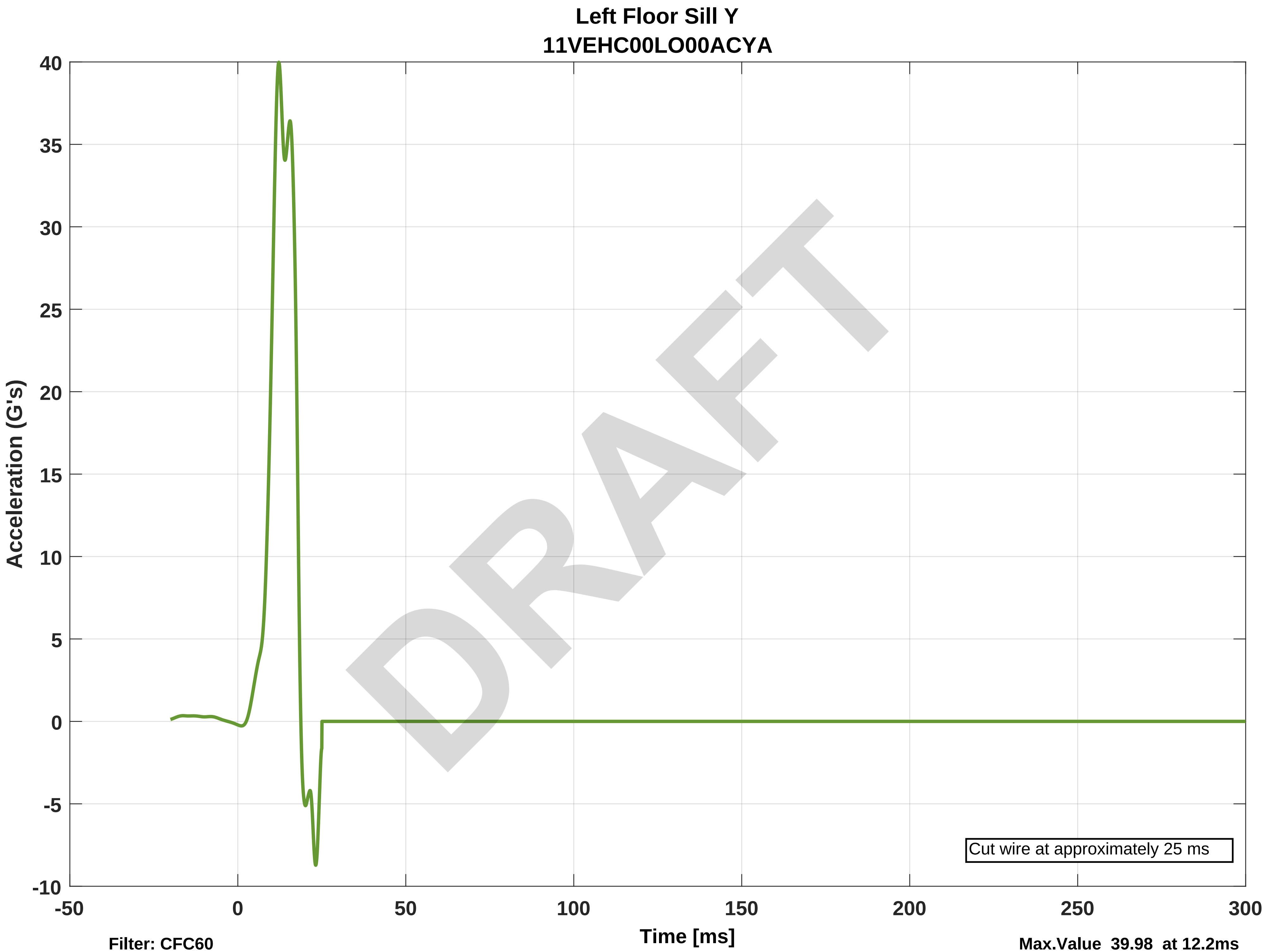


Vehicle CG ARS Y
11VEHCCG0000AVYA
80
60
40
20
0
-20
-40
Angular Velocity (DPS)
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 61.53 at 24.3ms
Min.Value -39.36 at 42.6ms



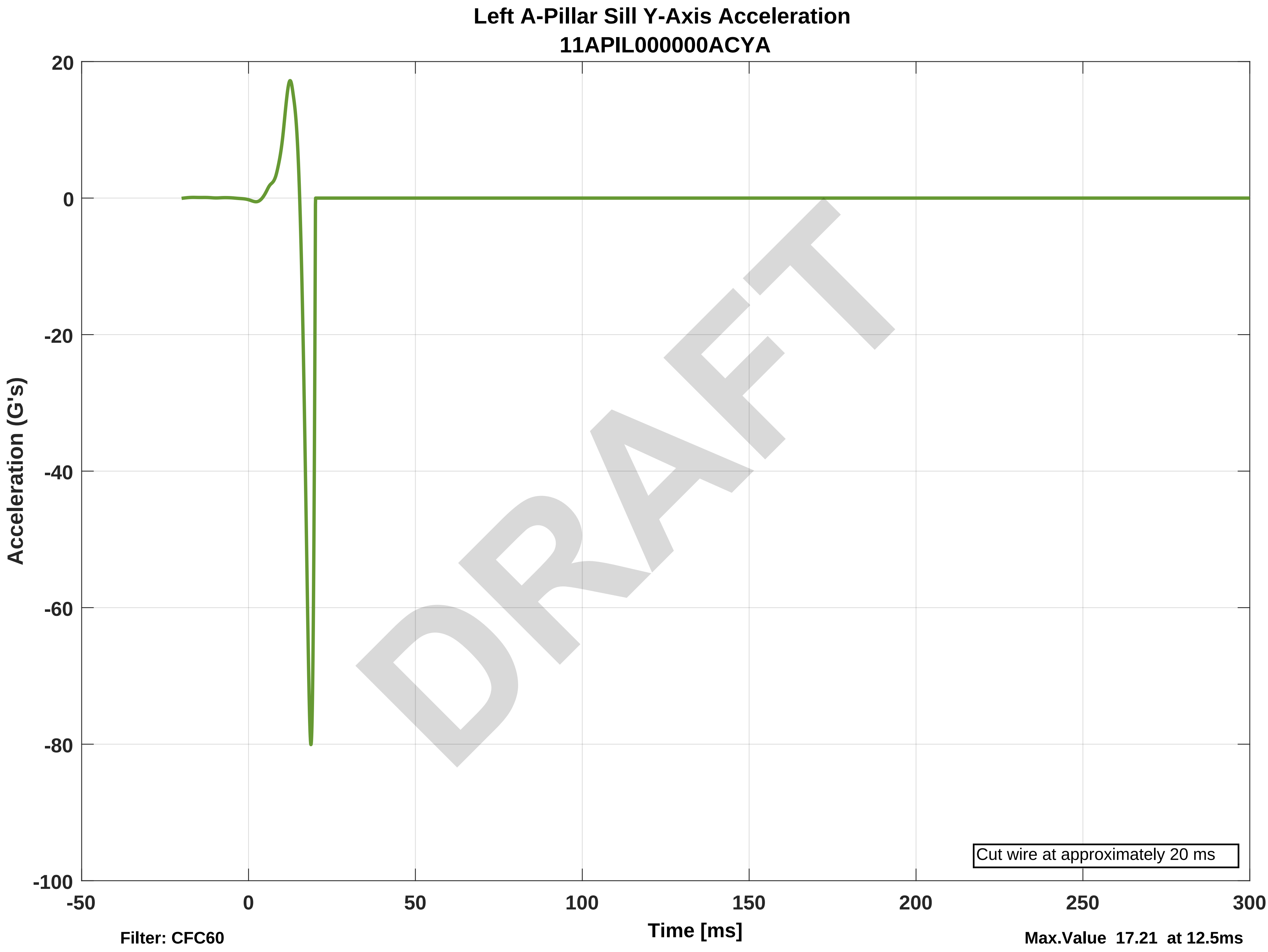
Filter: CFC60

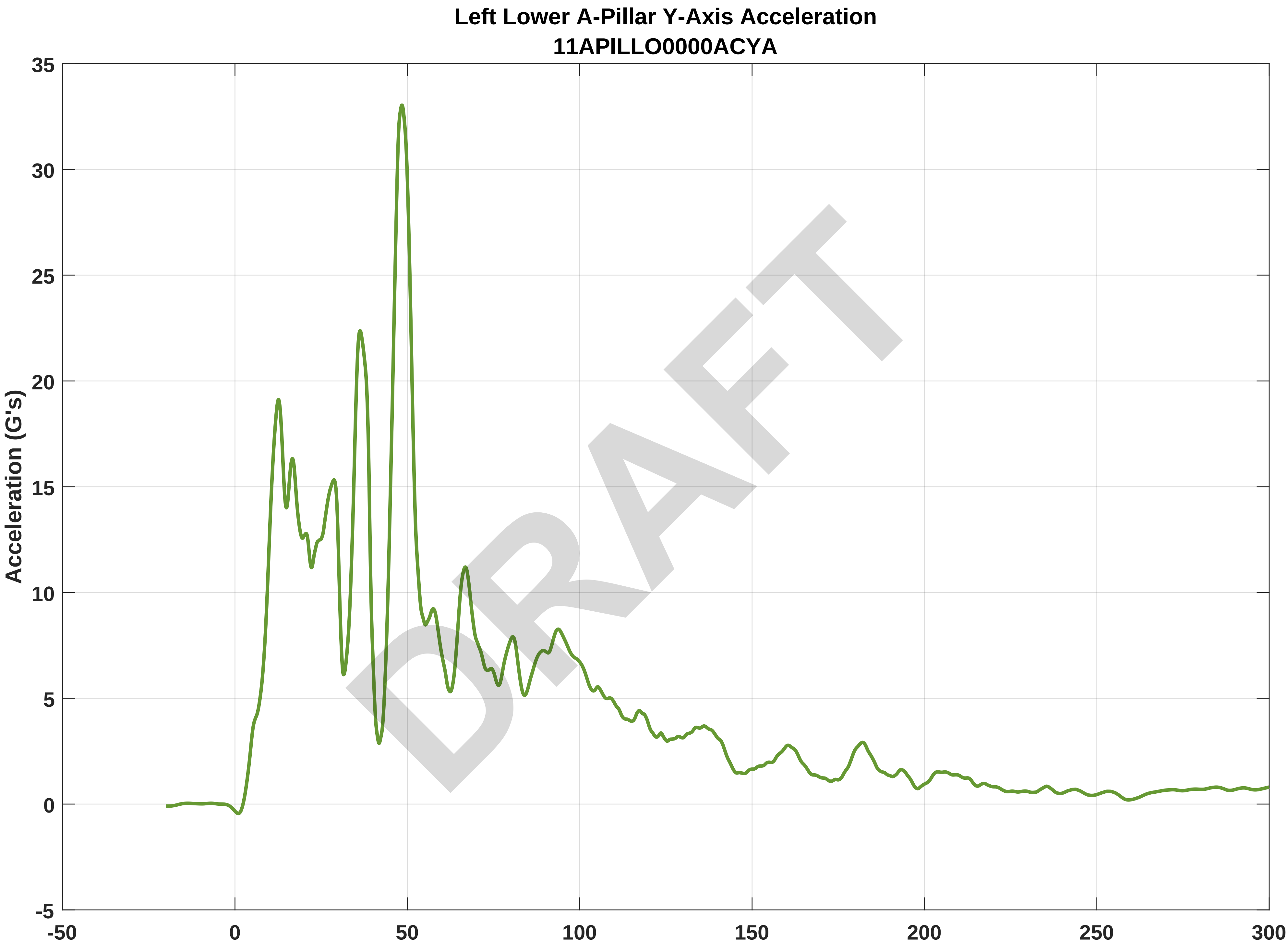
Max.Value 85.01 at 136.7ms
Min.Value -28.11 at 11.7ms



Filter: CFC60

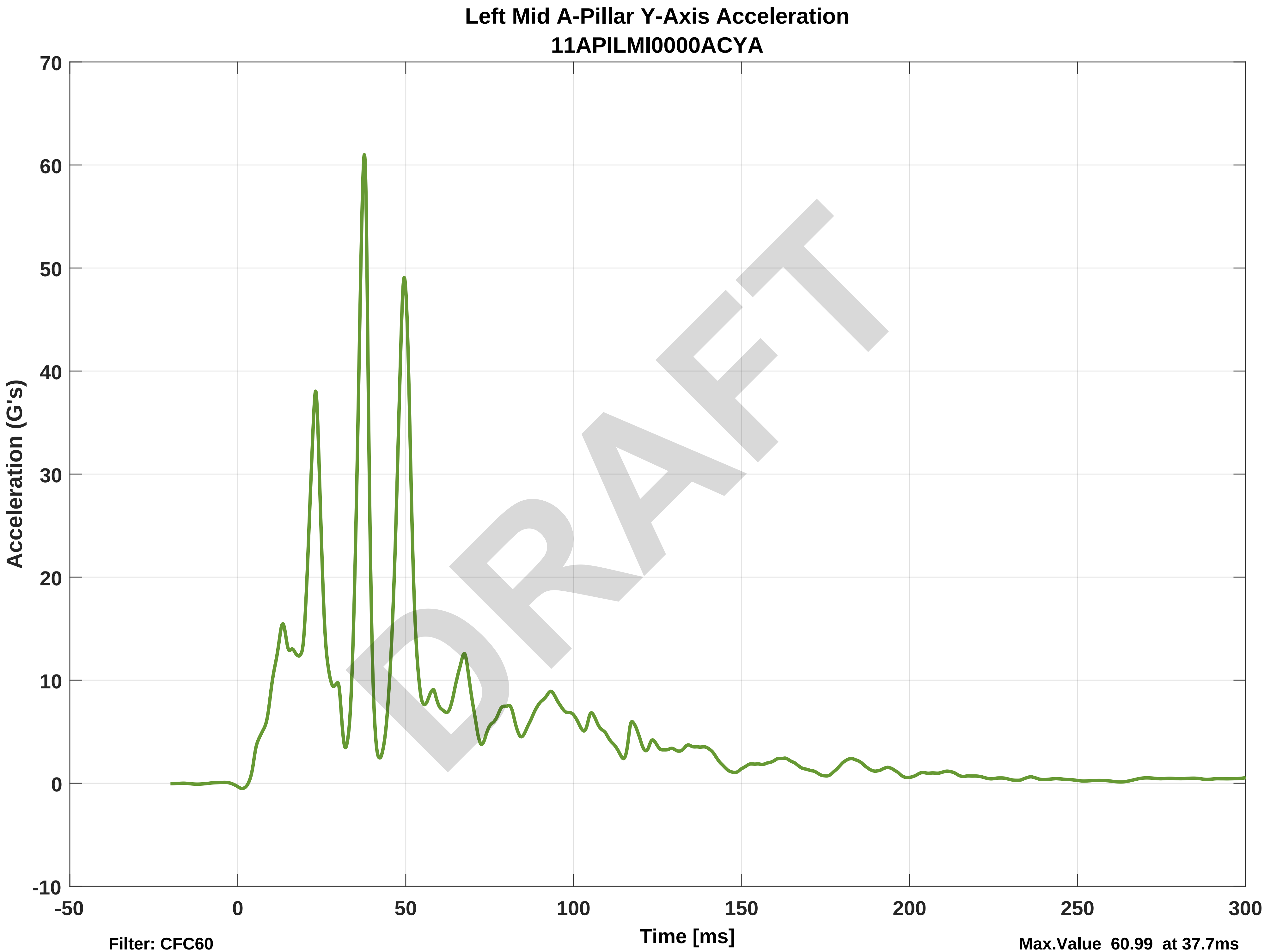
Max.Value 39.98 at 12.2ms
Min.Value -8.72 at 23.2ms


Left A-Pillar Sill Y-Axis Acceleration
11APIL000000ACYA
Acceleration (G's)
20
0
-20
-40
-60
-80
-100
-50
0
50
100
150
200
250
300
Time [ms]
Cut wire at approximately 20 ms
DRAFT
Filter: CFC60
Max.Value 17.21 at 12.5ms
Min.Value -80.06 at 18.7ms

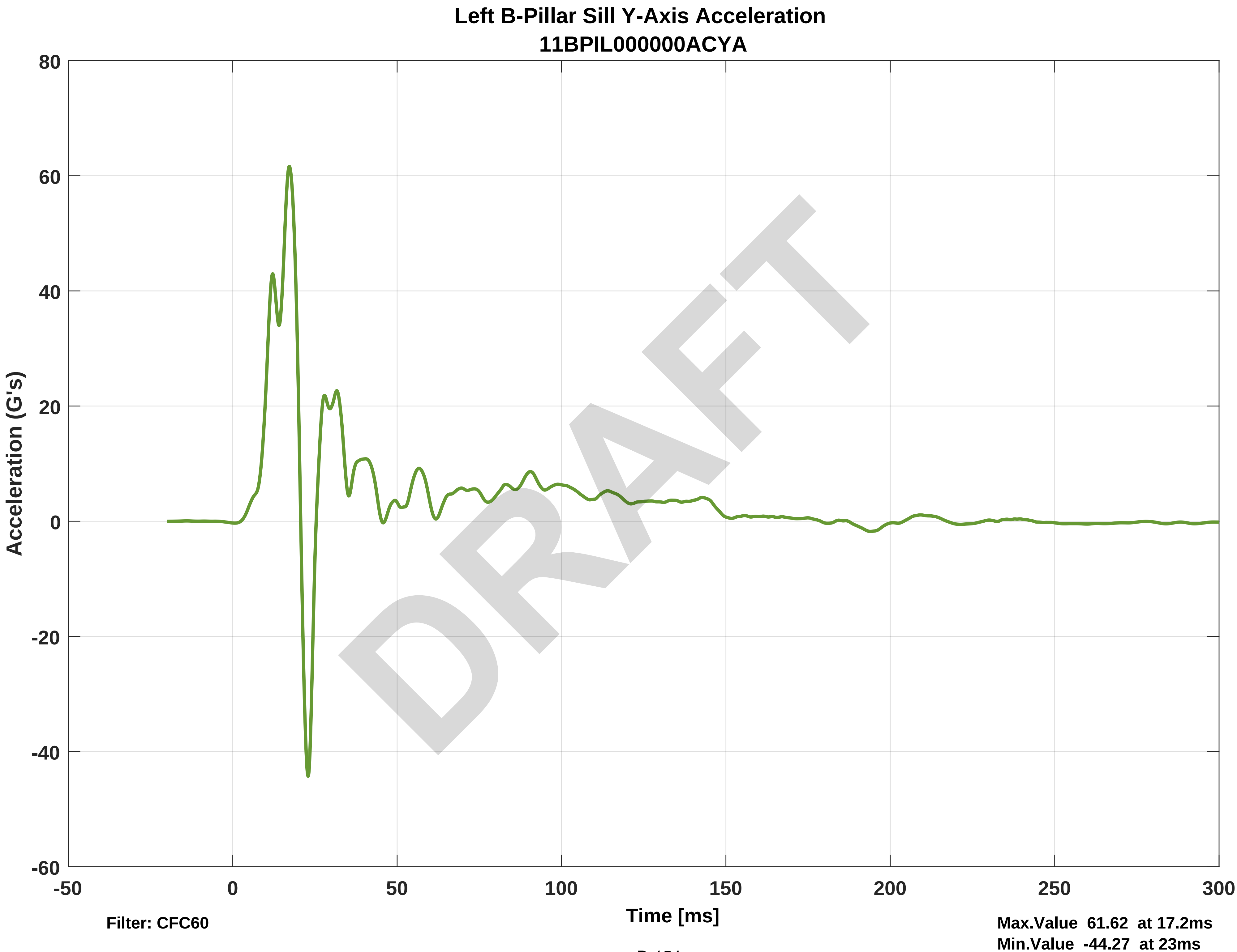


Filter: CFC60

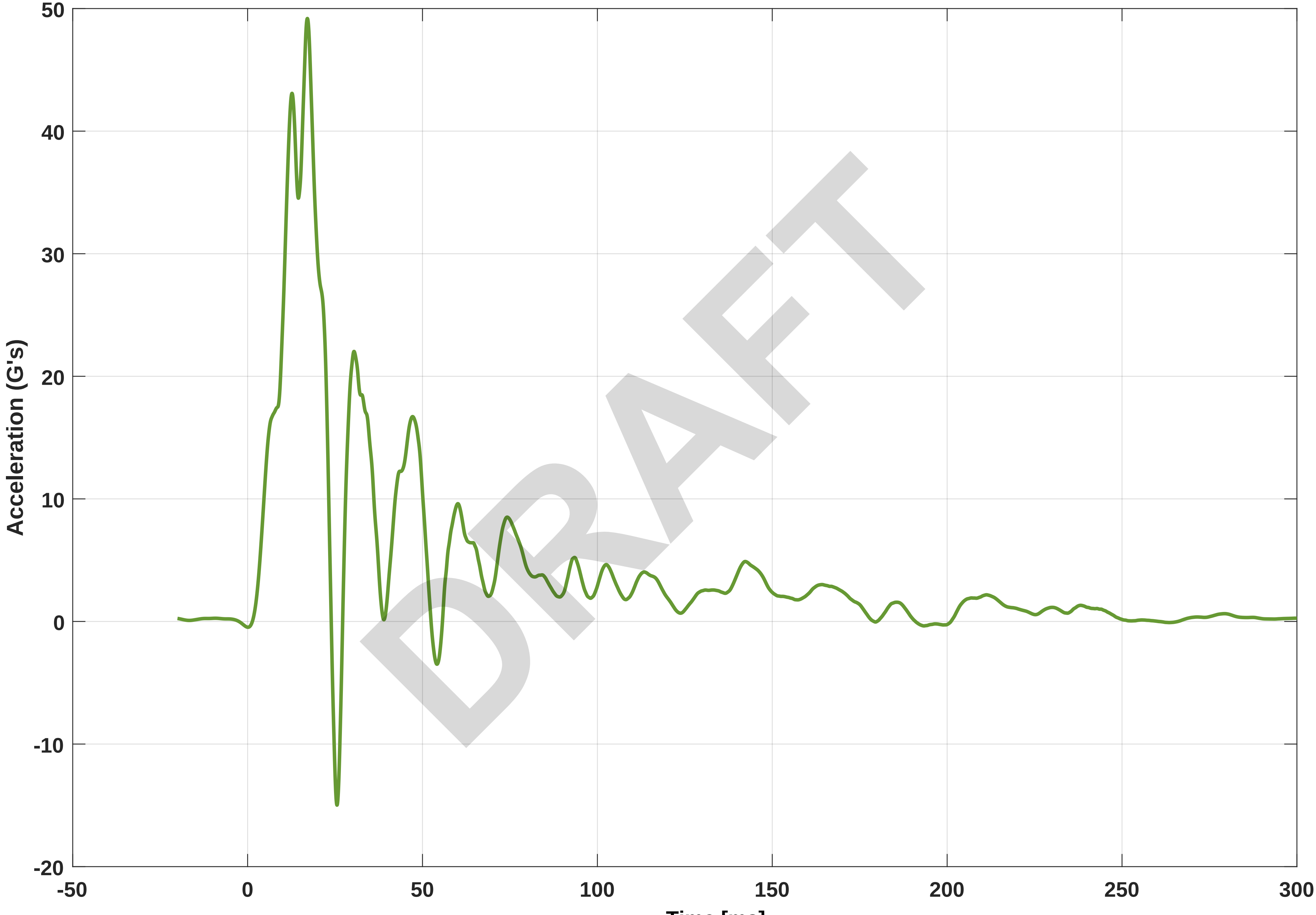
Max.Value 33.04 at 48.5ms
Min.Value -0.44 at 1ms



Left Mid A-Pillar Y-Axis Acceleration
11APILMI0000ACYA
Acceleration (G's)
Time [ms]
70
60
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC60
Max.Value 60.99 at 37.7ms
Min.Value -0.51 at 1.3ms

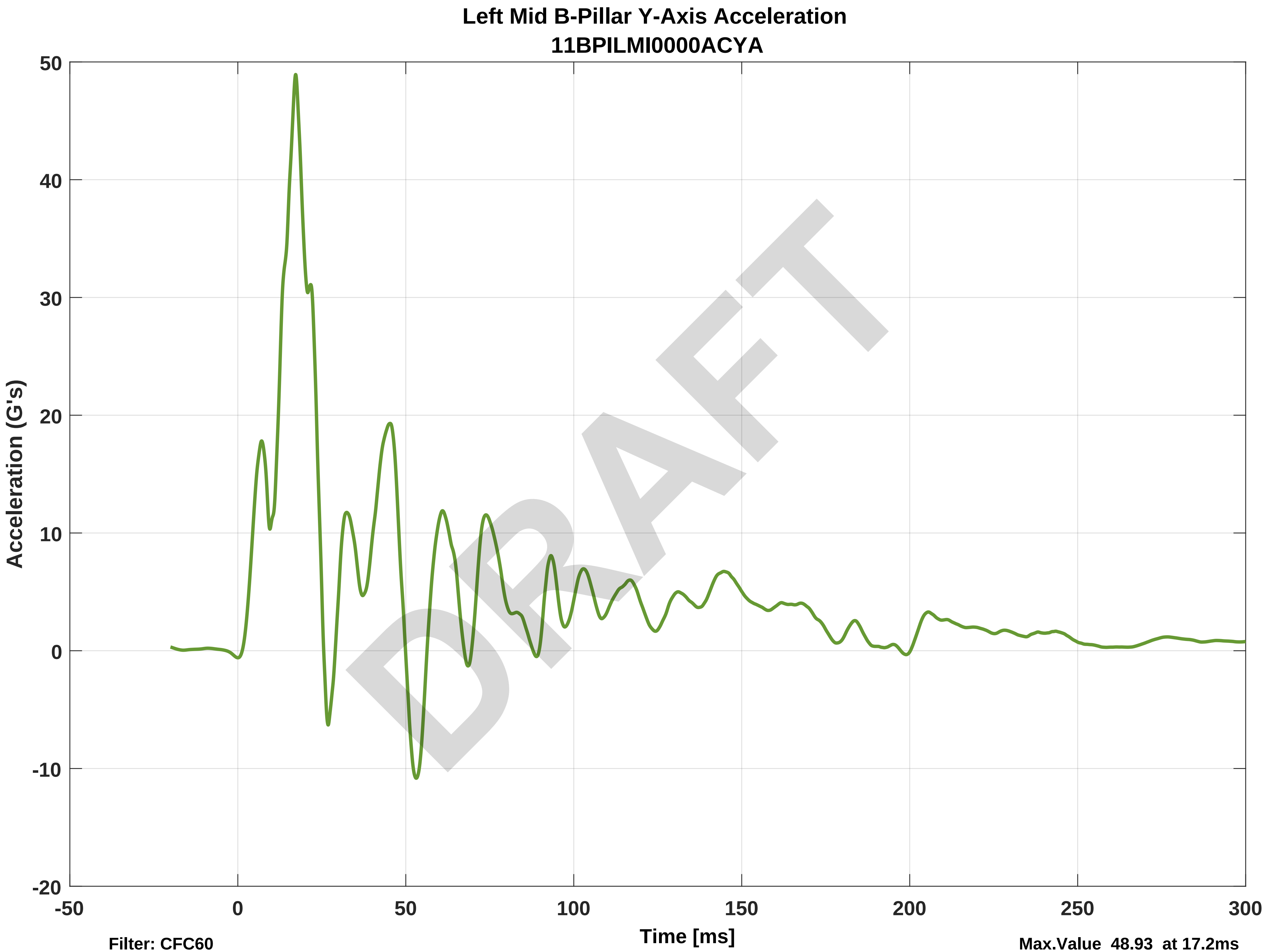

Left B-Pillar Sill Y-Axis Acceleration
11BPIL000000ACYA
Acceleration (G's)
80
60
40
20
0
-20
-40
-60
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 61.62 at 17.2ms
Min.Value -44.27 at 23ms

Left Lower B-Pillar Y-Axis Acceleration
11BPILLO0000ACYA



Filter: CFC60

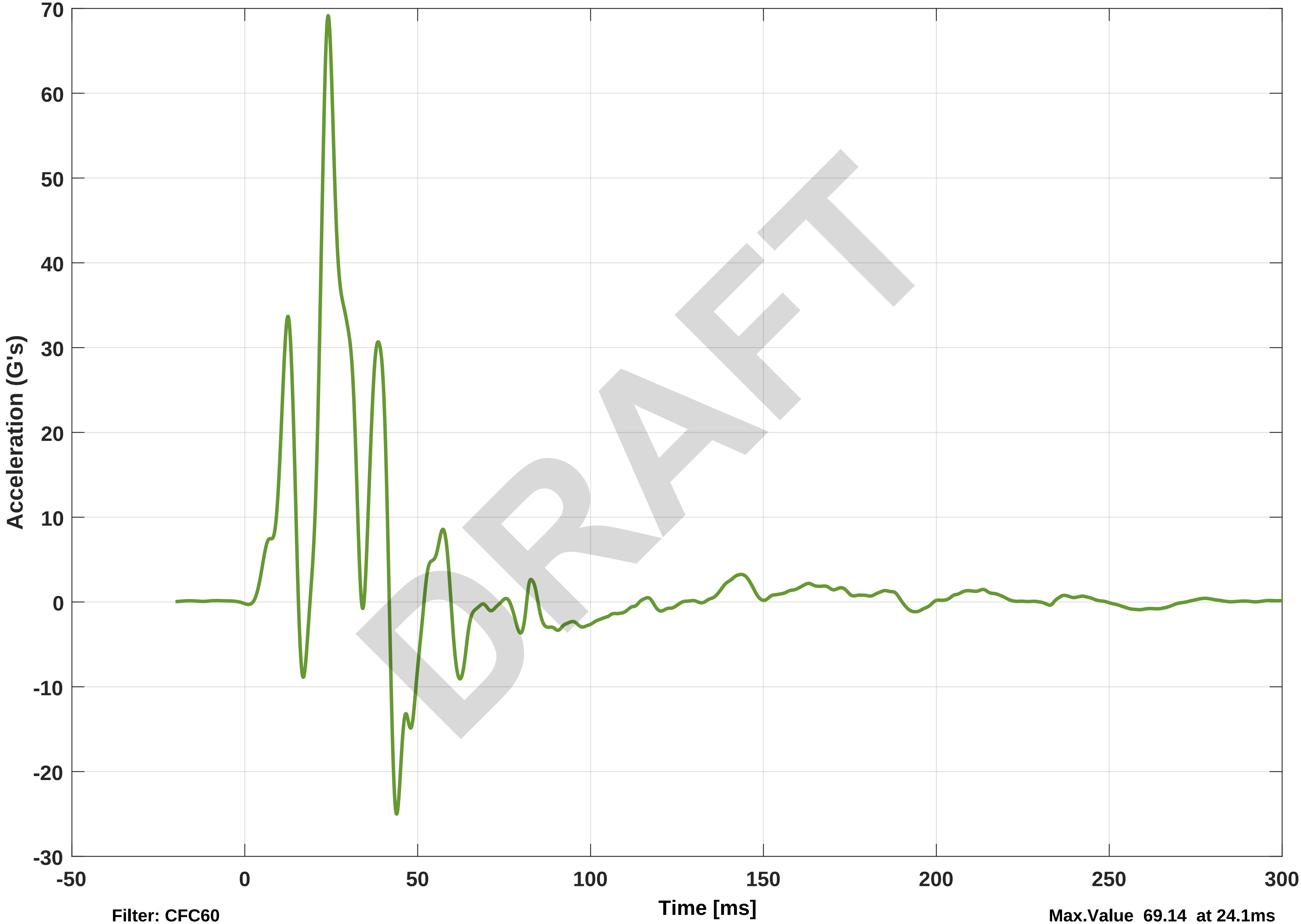
Max.Value 49.19 at 17.1ms
Min.Value -14.98 at 25.6ms



Filter: CFC60

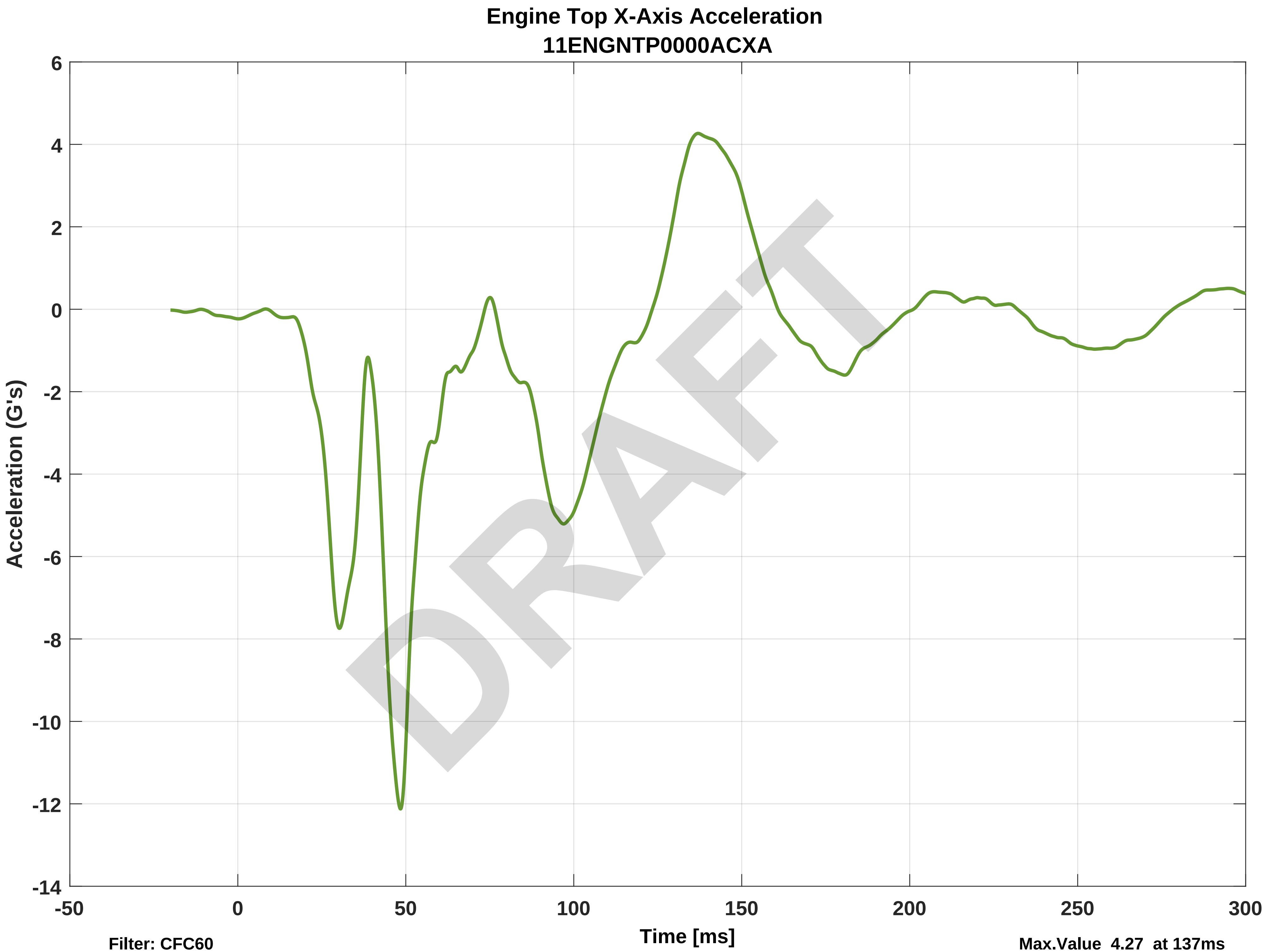
Max.Value 48.93 at 17.2ms
Min.Value -10.82 at 53.1ms

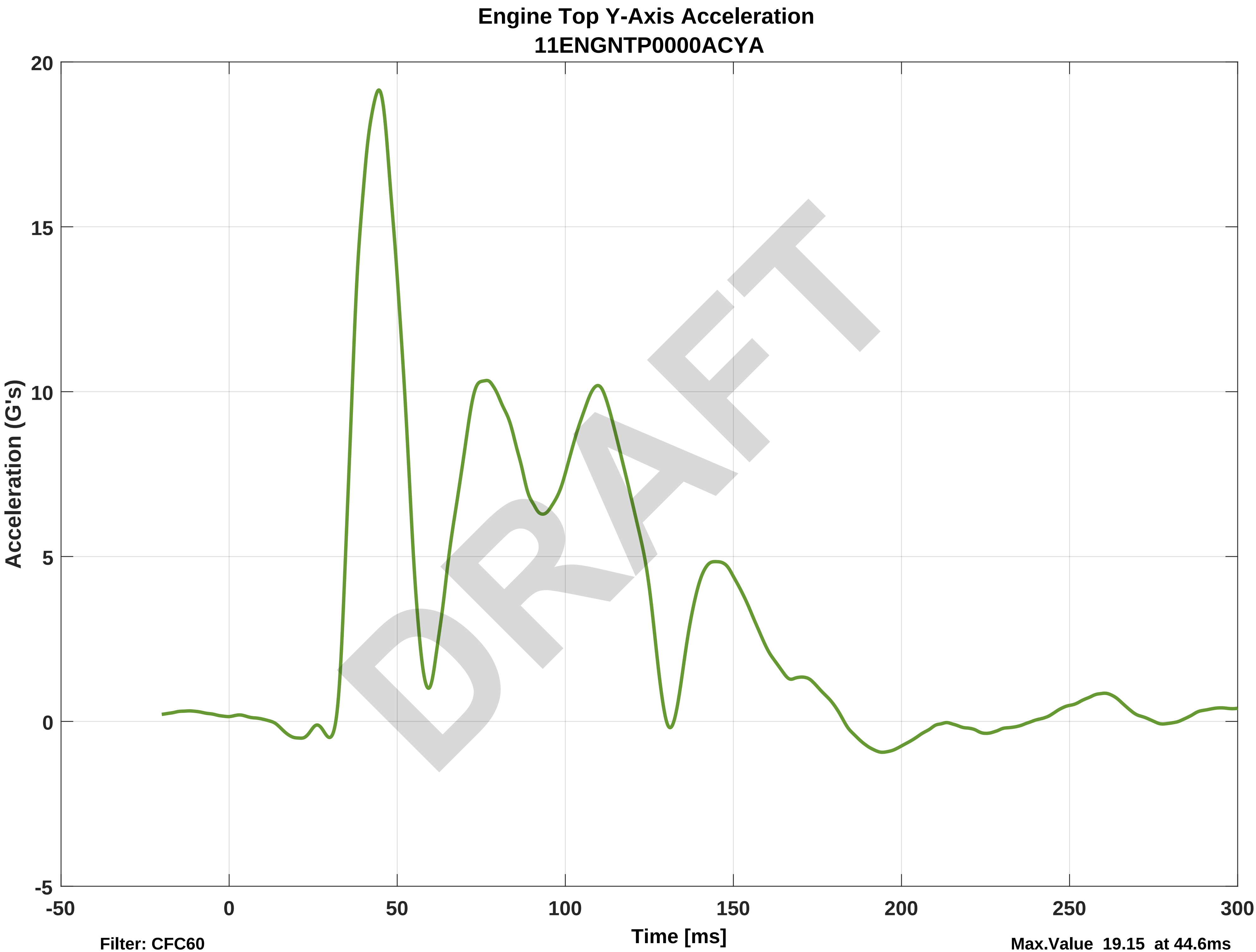
Driver Seat Track at Dummy H-Point Y-Axis Acceleration
11SETR000000ACYA



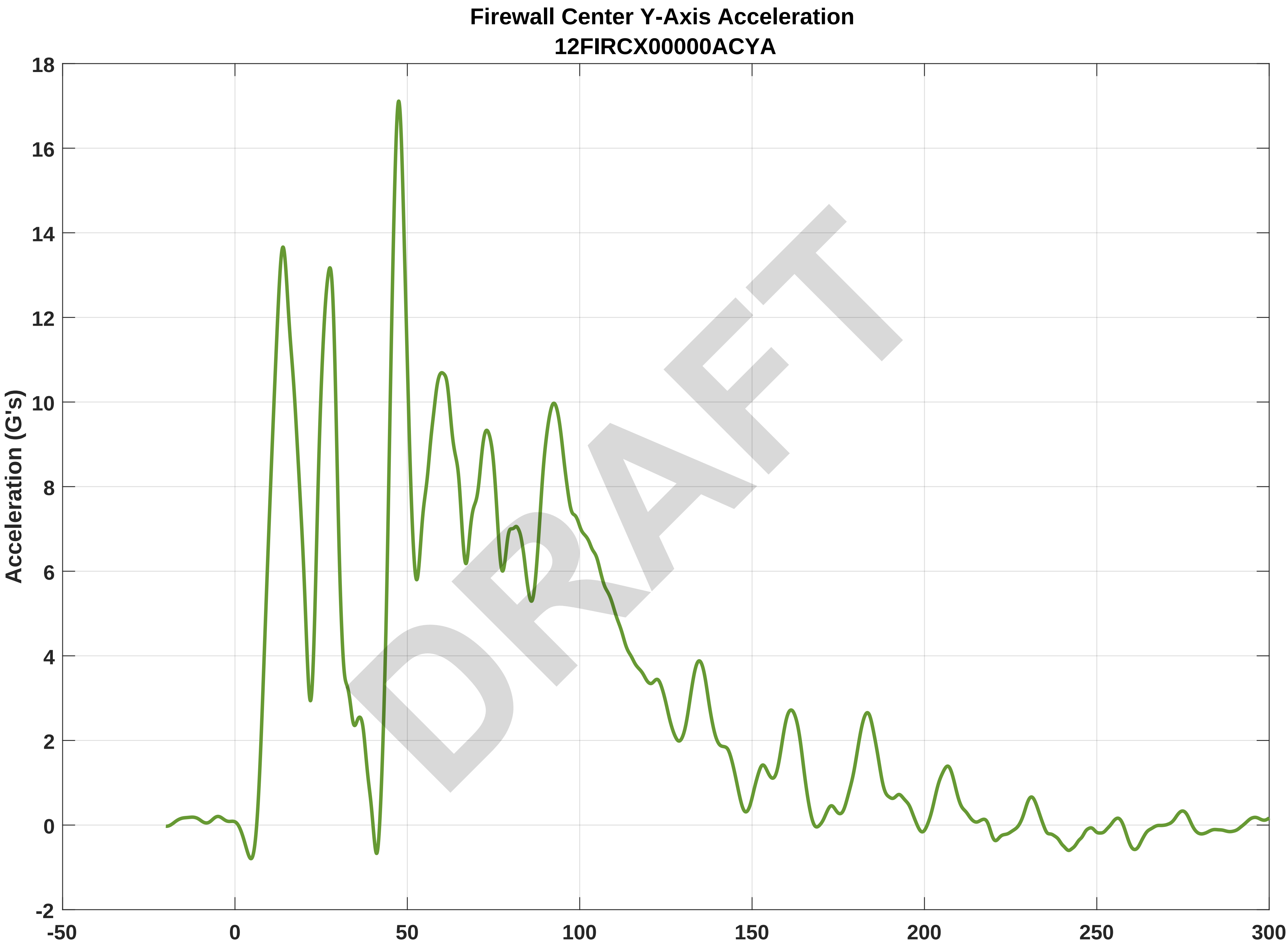
Filter: CFC60

Max.Value 69.14 at 24.1ms
Min.Value -25 at 43.9ms


Engine Top X-Axis Acceleration
11ENGNTP0000ACXA
Acceleration (G's)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 4.27 at 137ms
Min.Value -12.12 at 48.5ms

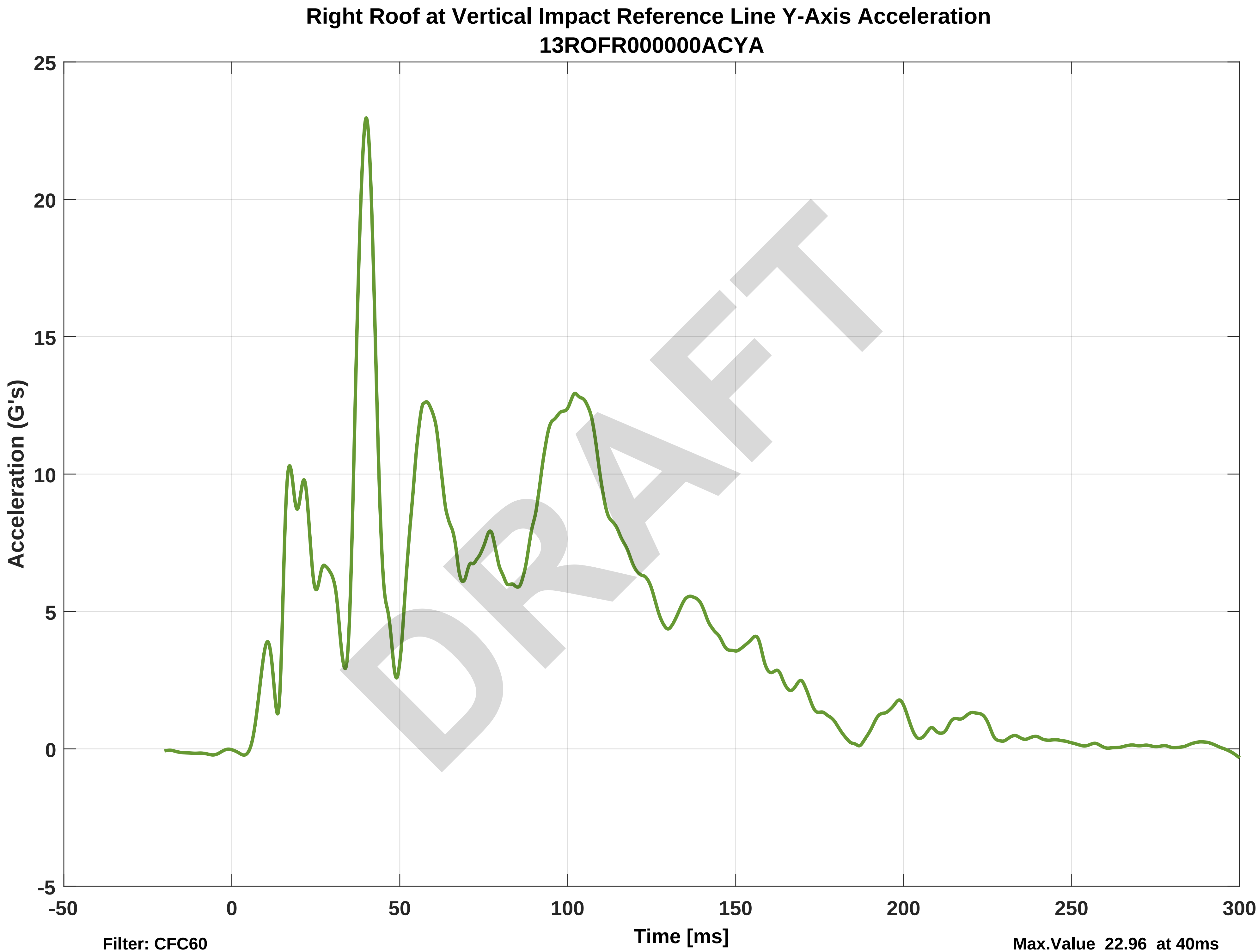


Engine Top Y-Axis Acceleration
11ENGNTP0000ACYA
Acceleration (G's)
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 19.15 at 44.6ms
Min.Value -0.94 at 194.3ms



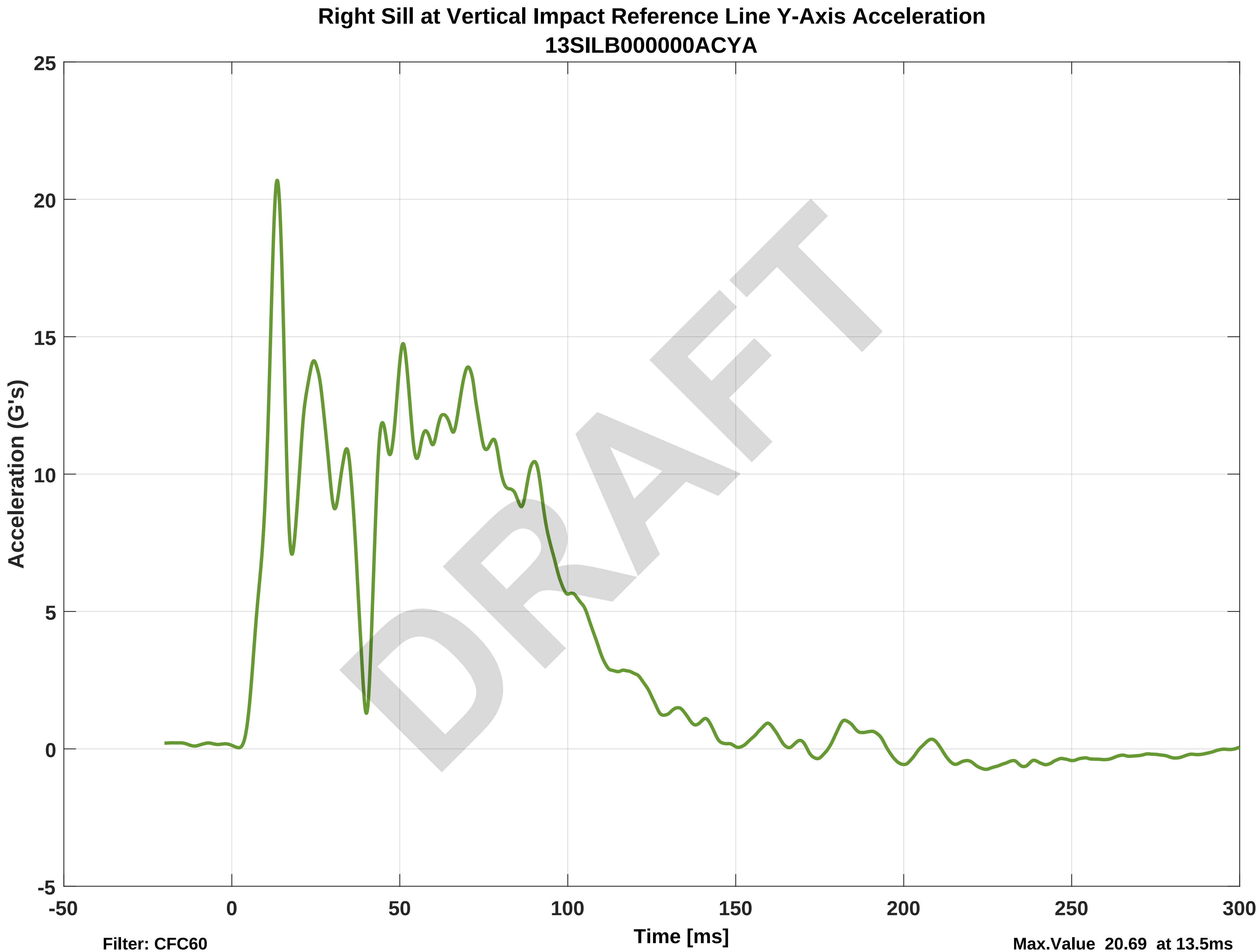
Filter: CFC60

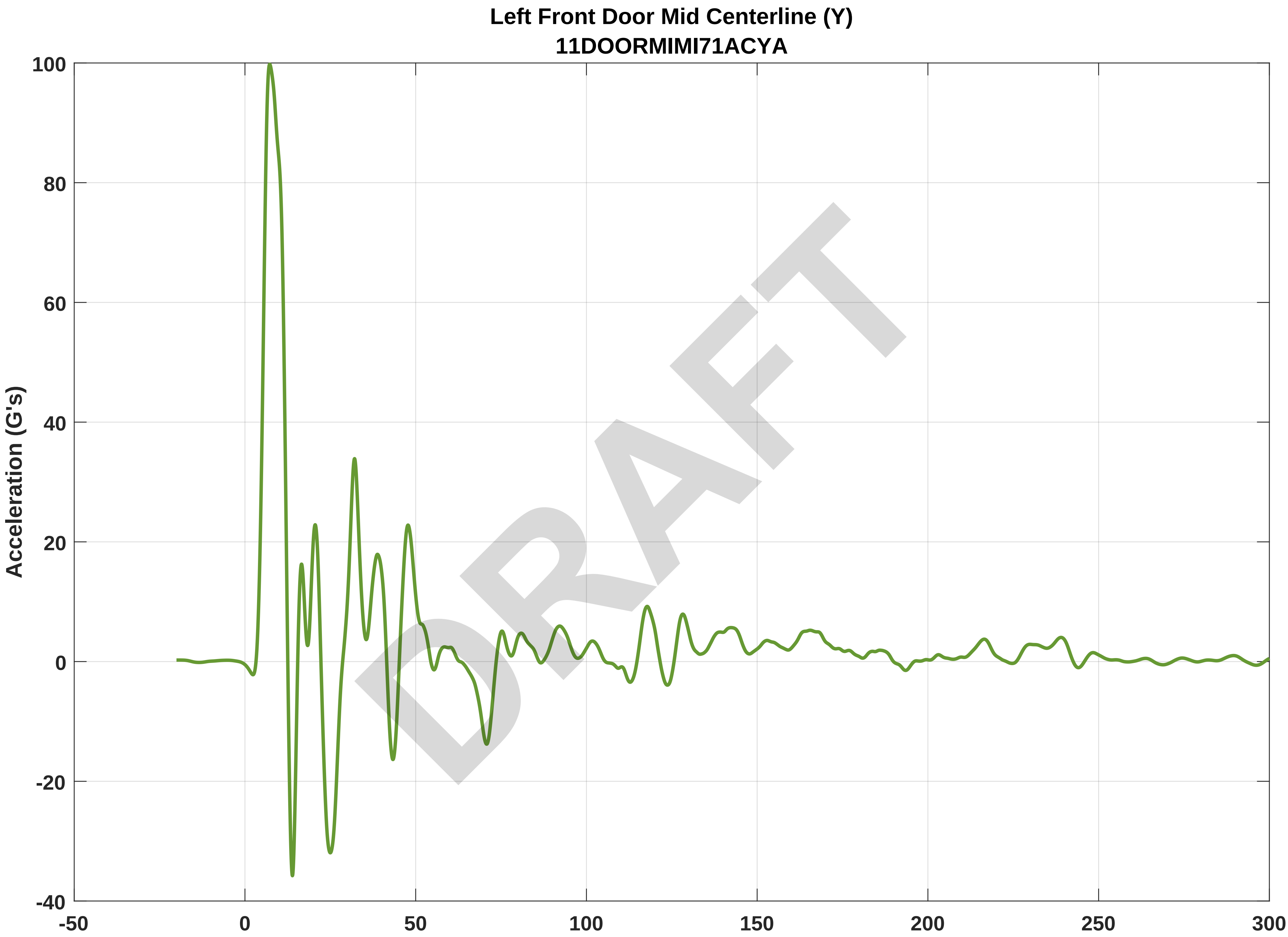
Max.Value 17.11 at 47.5ms
Min.Value -0.79 at 4.7ms

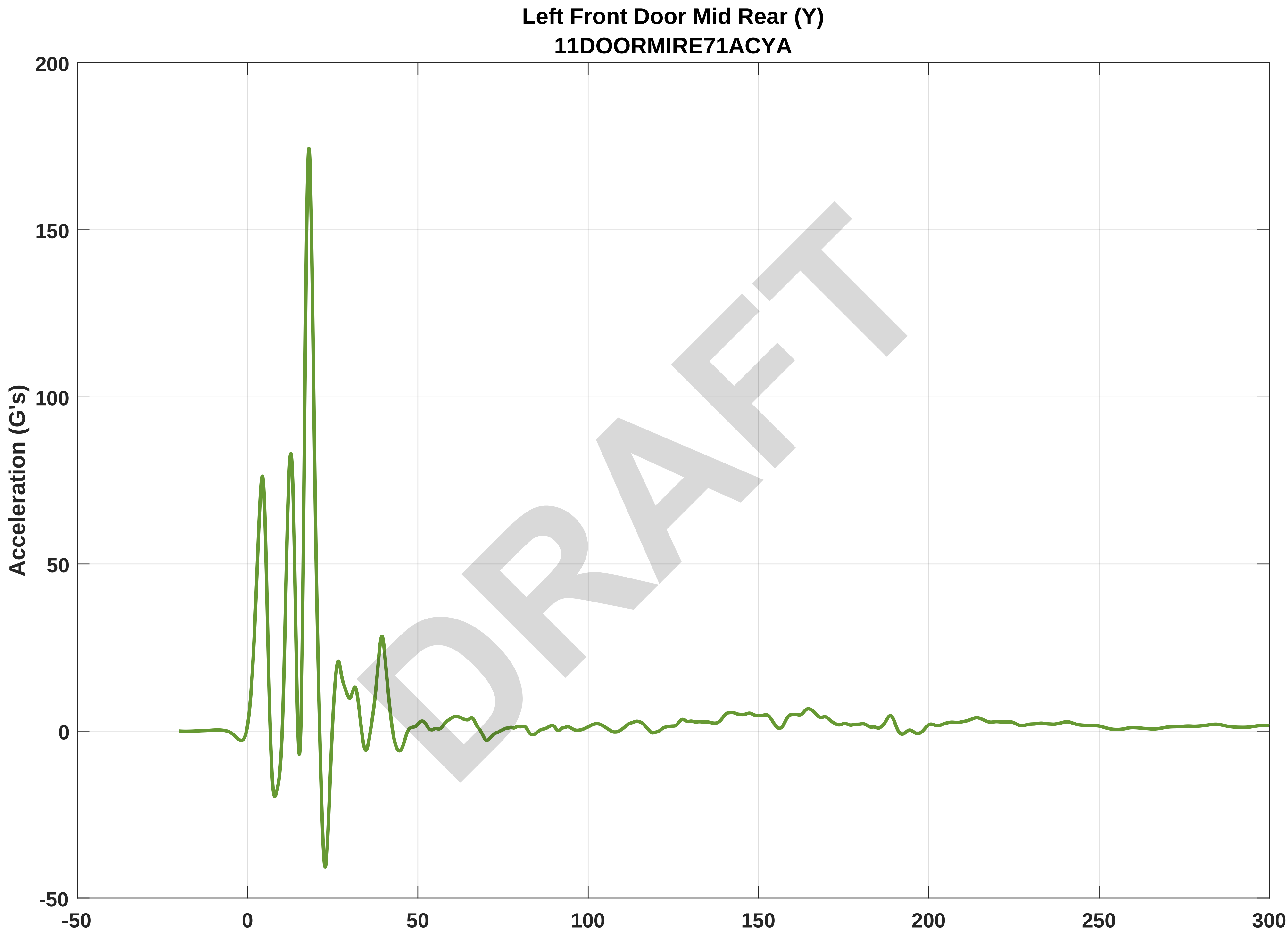


Filter: CFC60

Max.Value 22.96 at 40ms
Min.Value -0.33 at 300ms

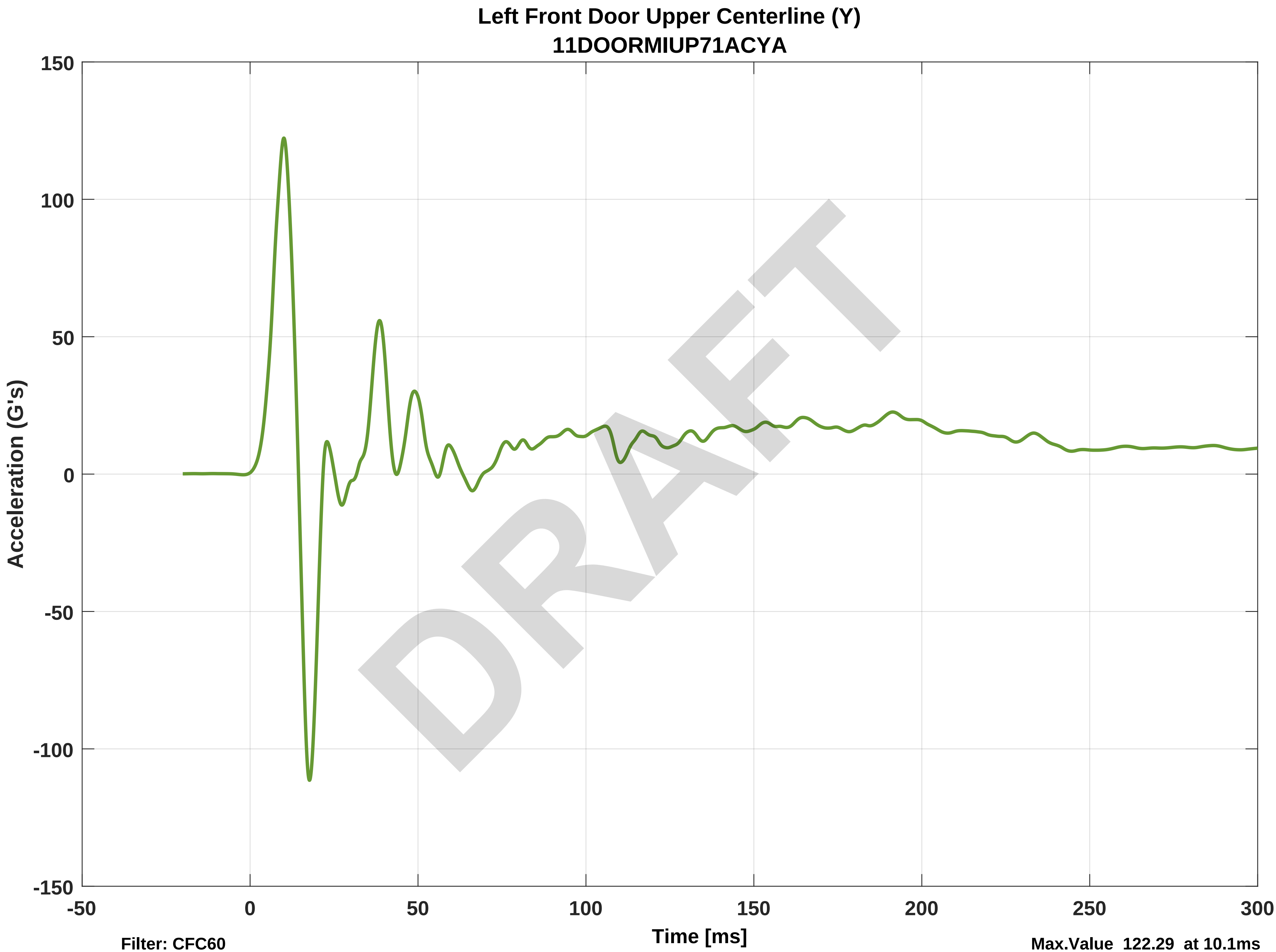

Right Sill at Vertical Impact Reference Line Y-Axis Acceleration
13SILB000000ACYA
Acceleration (G's)
Time [ms]
25
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC60
Max.Value 20.69 at 13.5ms
Min.Value -0.74 at 224.5ms


Left Front Door Mid Centerline (Y)
11DOORMIMI71ACYA
Acceleration (G's)
Time [ms]
100
80
60
40
20
0
-20
-40
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC60
Max.Value 99.78 at 7.3ms
Min.Value -35.77 at 13.9ms



Filter: CFC60

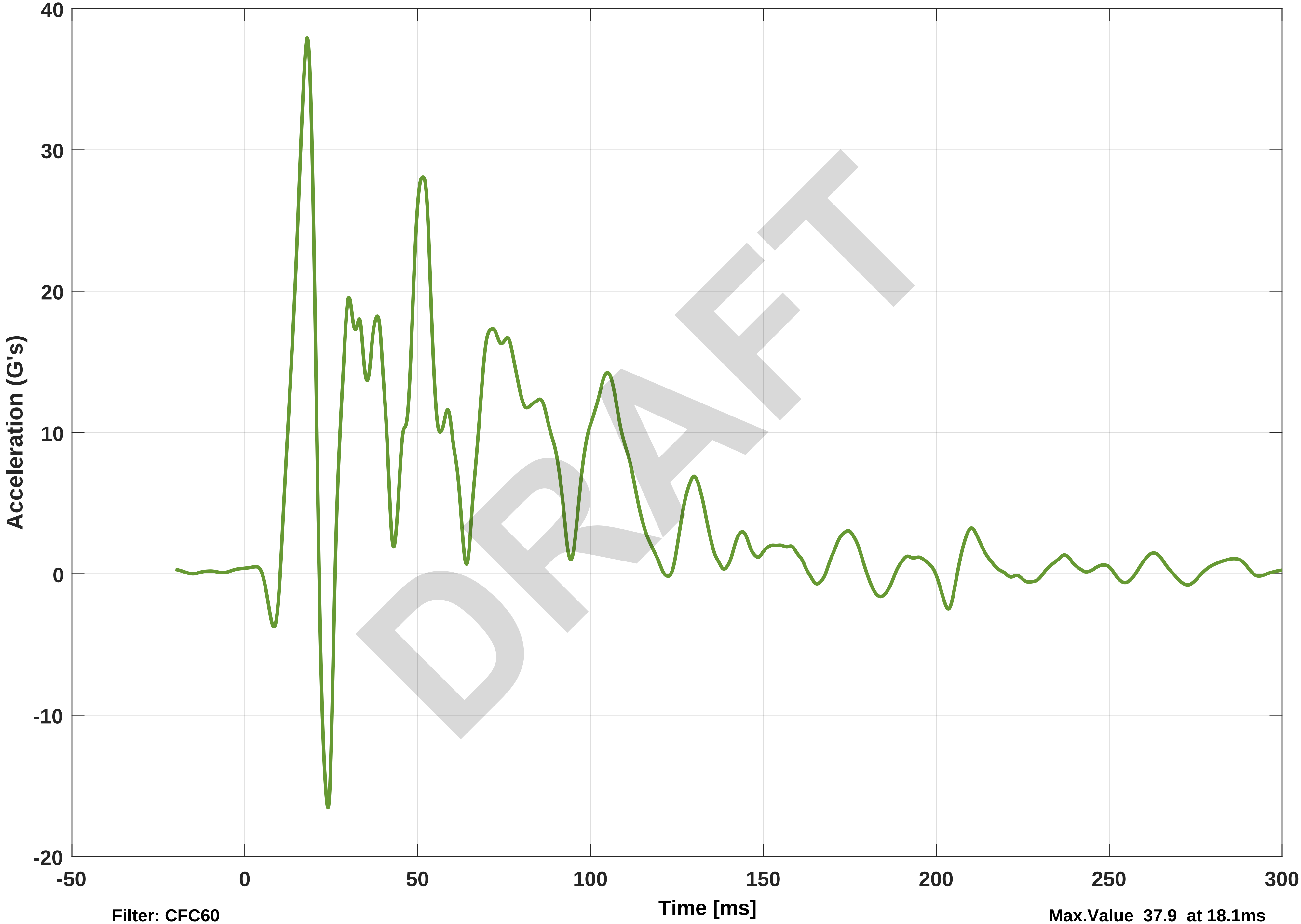
Max.Value 174.36 at 18ms
Min.Value -40.68 at 22.8ms



Filter: CFC60

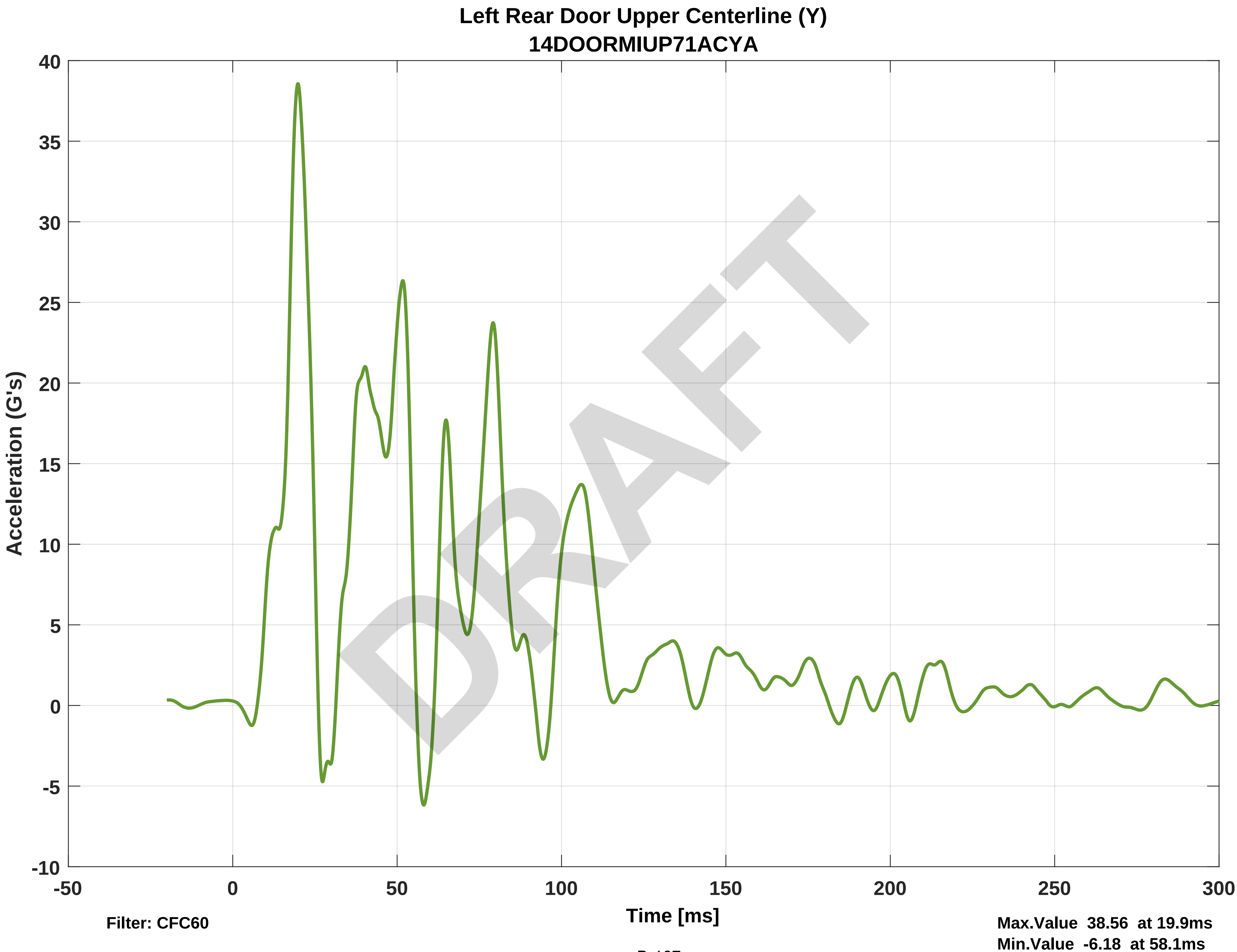
Max.Value 122.29 at 10.1ms
Min.Value -111.43 at 17.7ms

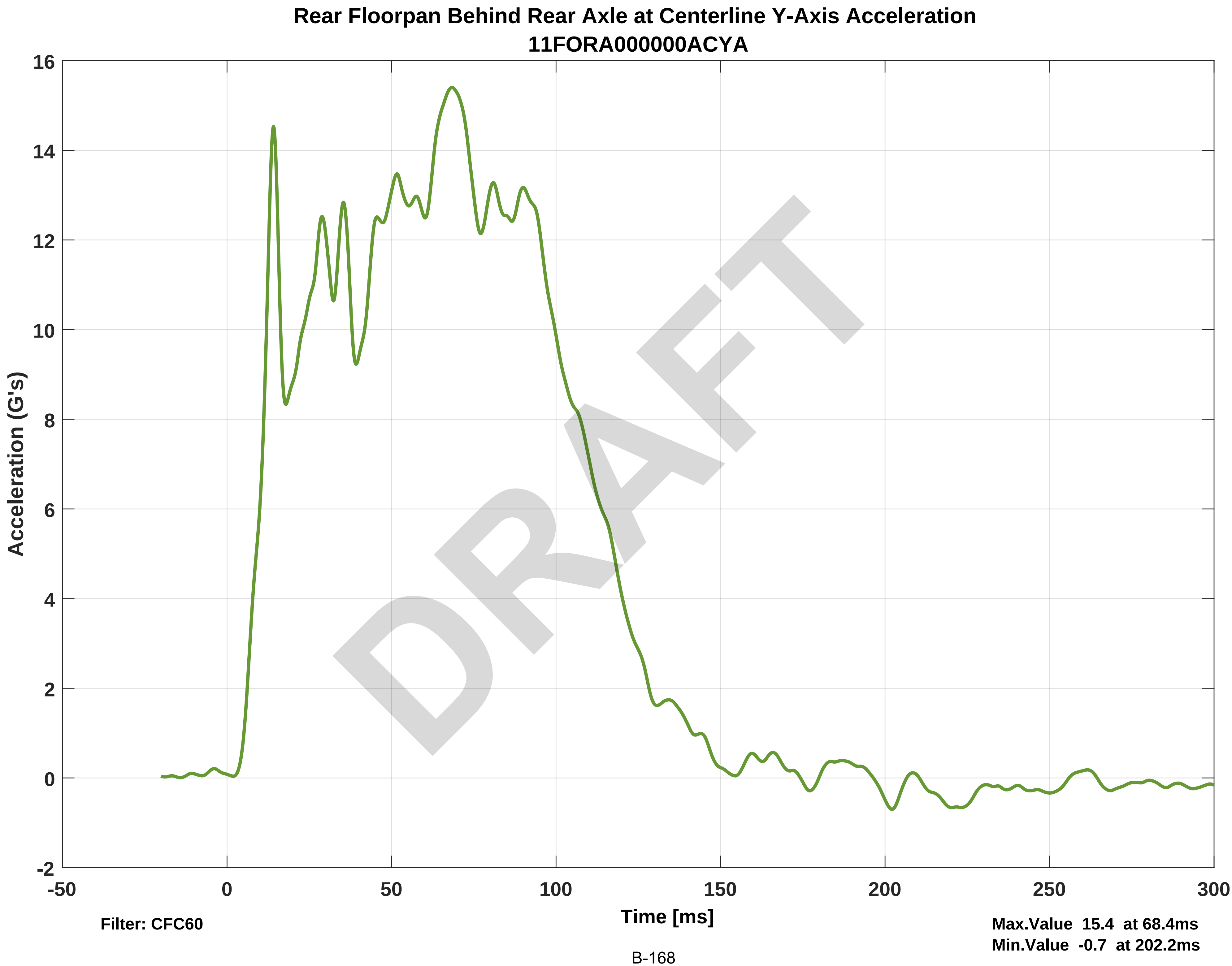
Left Rear Door Mid Rear (Y)
14DOORMIRE71ACYA

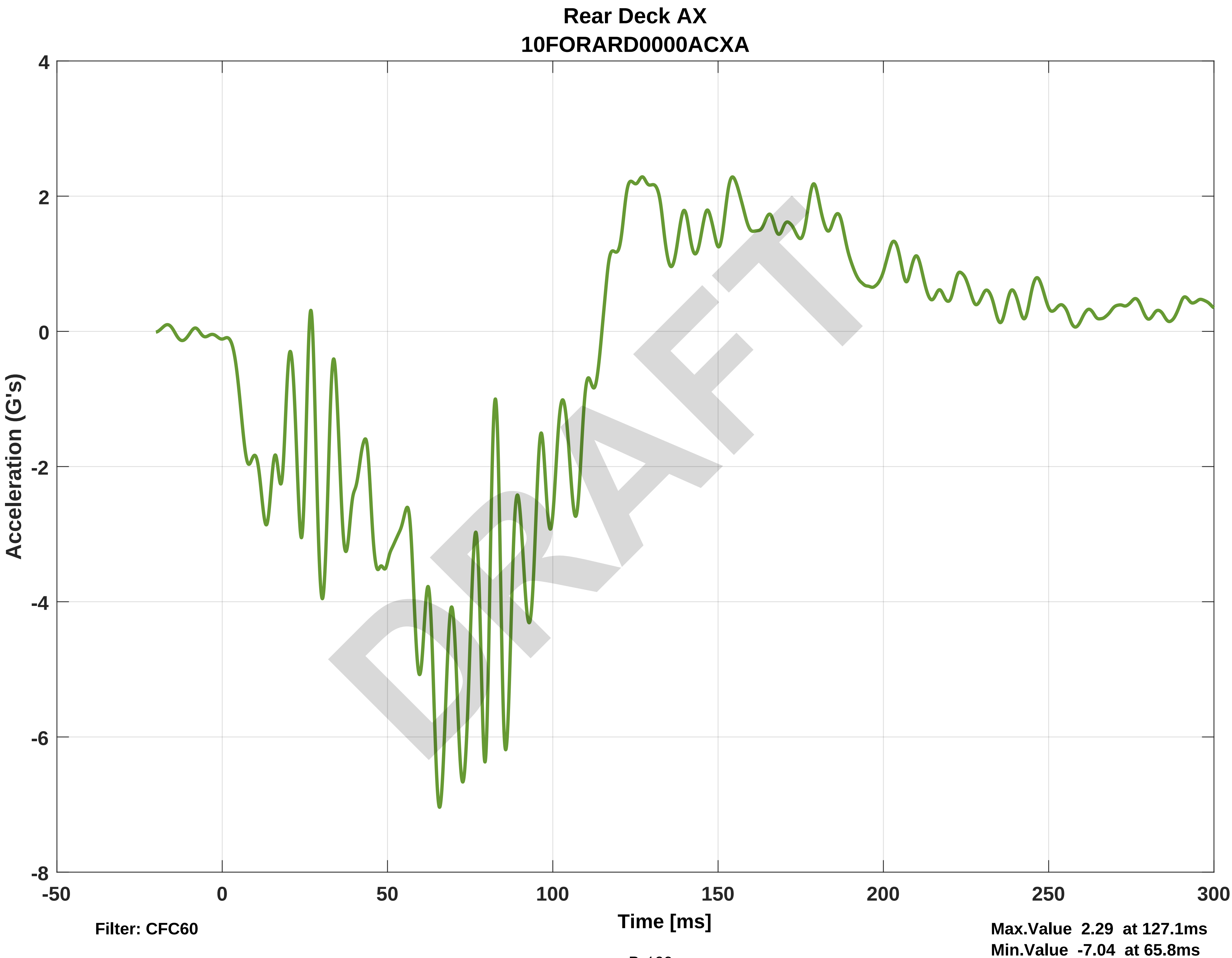


Filter: CFC60

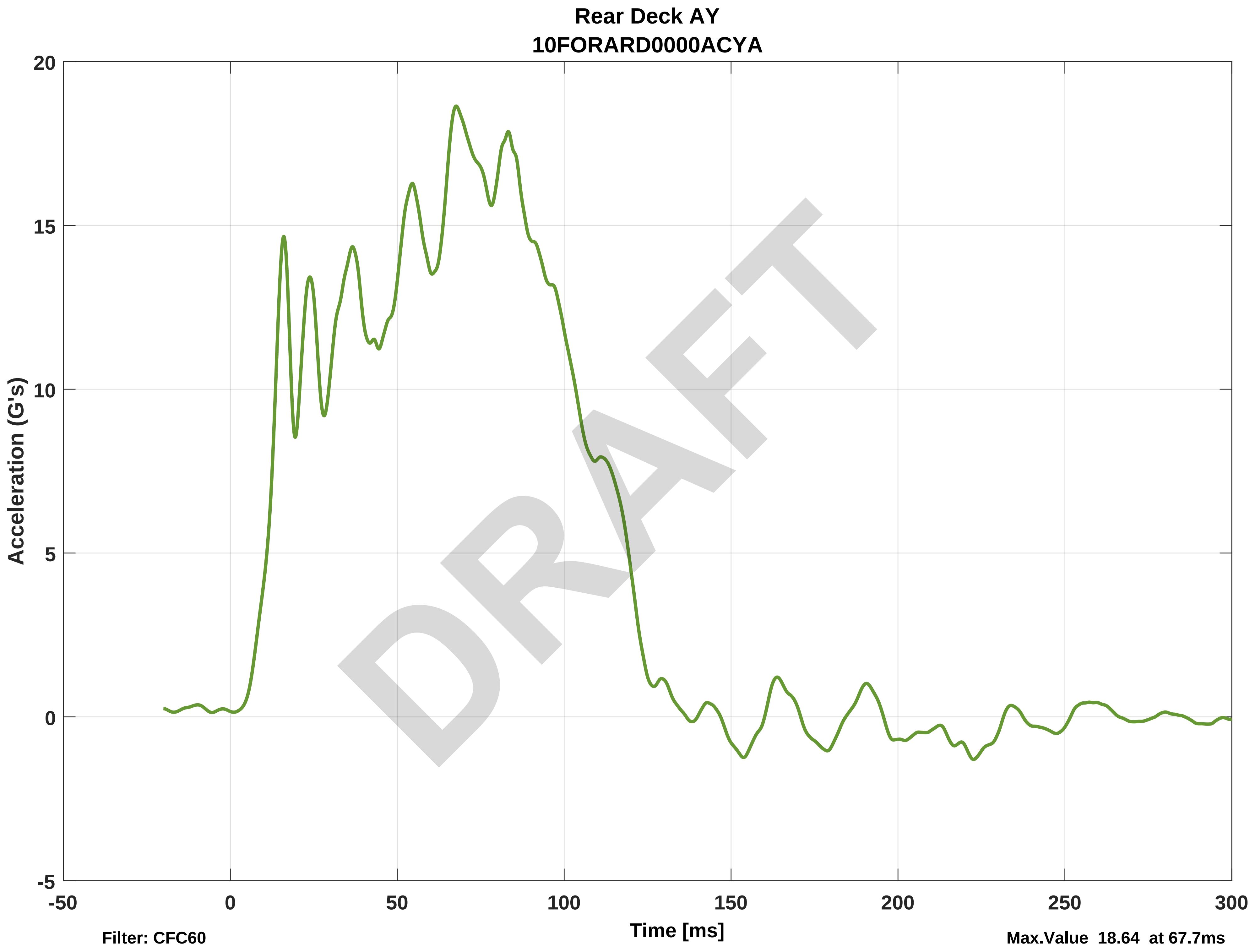
Max.Value 37.9 at 18.1ms
Min.Value -16.55 at 24.1ms


Left Rear Door Upper Centerline (Y)
14DOORMIUP71ACYA
Acceleration (G's)
Time [ms]
40
35
30
25
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC60
Max.Value 38.56 at 19.9ms
Min.Value -6.18 at 58.1ms

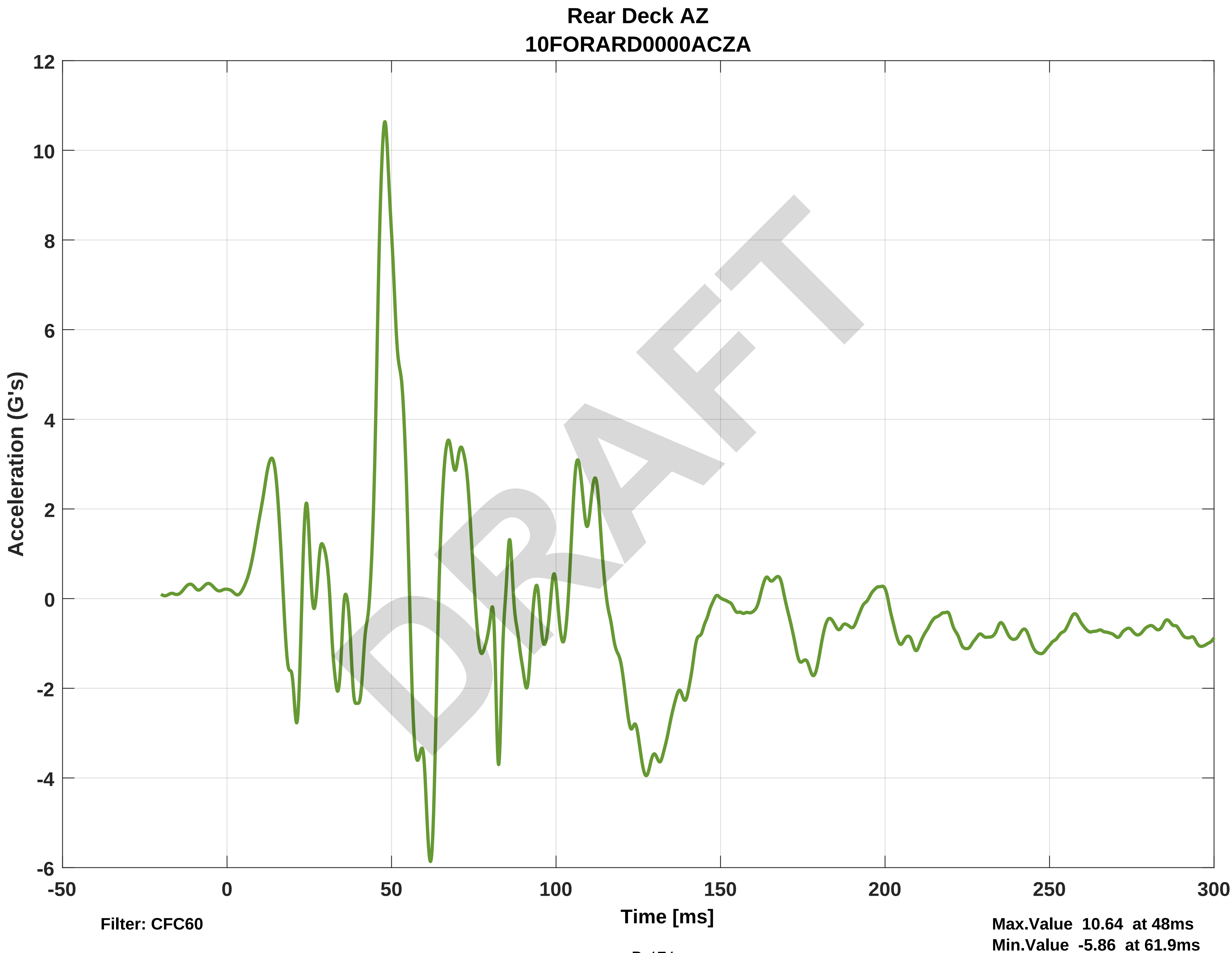

Rear Floorpan Behind Rear Axle at Centerline Y-Axis Acceleration
11FORA000000ACYA
Acceleration (G's)
16
14
12
10
8
6
4
2
0
-2
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 15.4 at 68.4ms
Min.Value -0.7 at 202.2ms

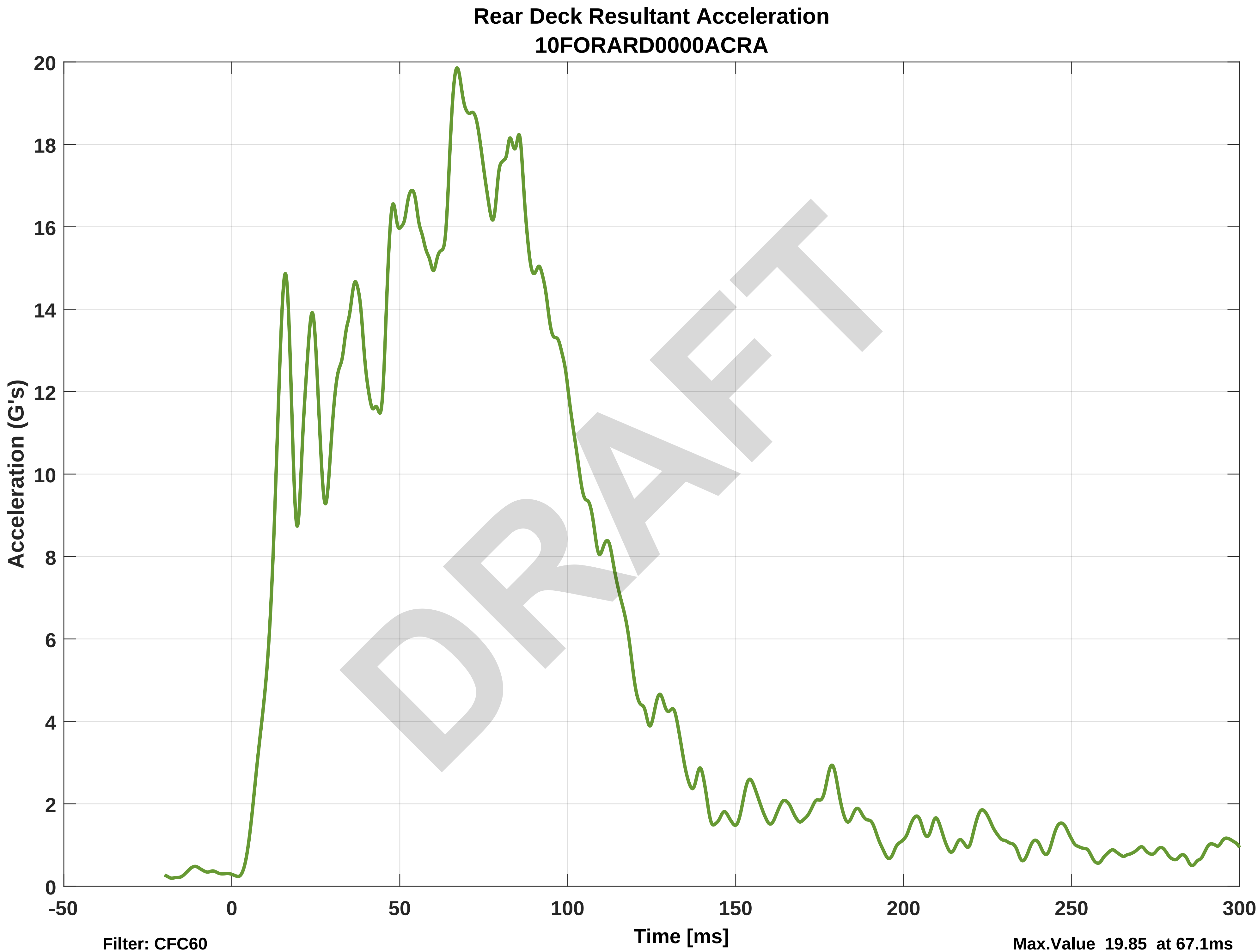


Rear Deck AX
10FORARD0000ACXA
Acceleration (G's)
Time [ms]
4
2
0
-2
-4
-6
-8
-50
0
50
100
150
200
250
300
DRAFT
Filter: CFC60
Max.Value 2.29 at 127.1ms
Min.Value -7.04 at 65.8ms



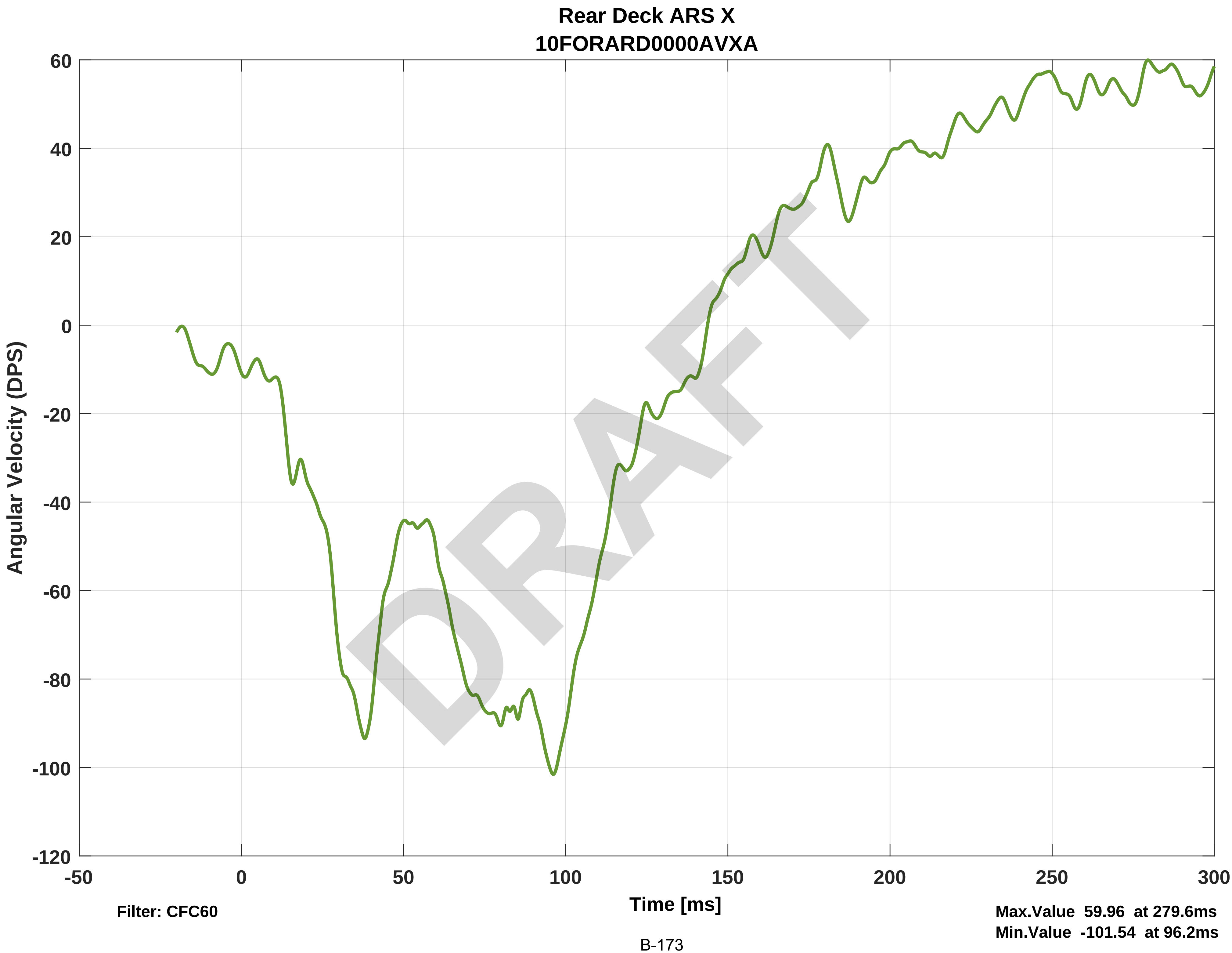
Rear Deck AY
10FORARD0000ACYA
Acceleration (G's)
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 18.64 at 67.7ms
Min.Value -1.3 at 222.7ms

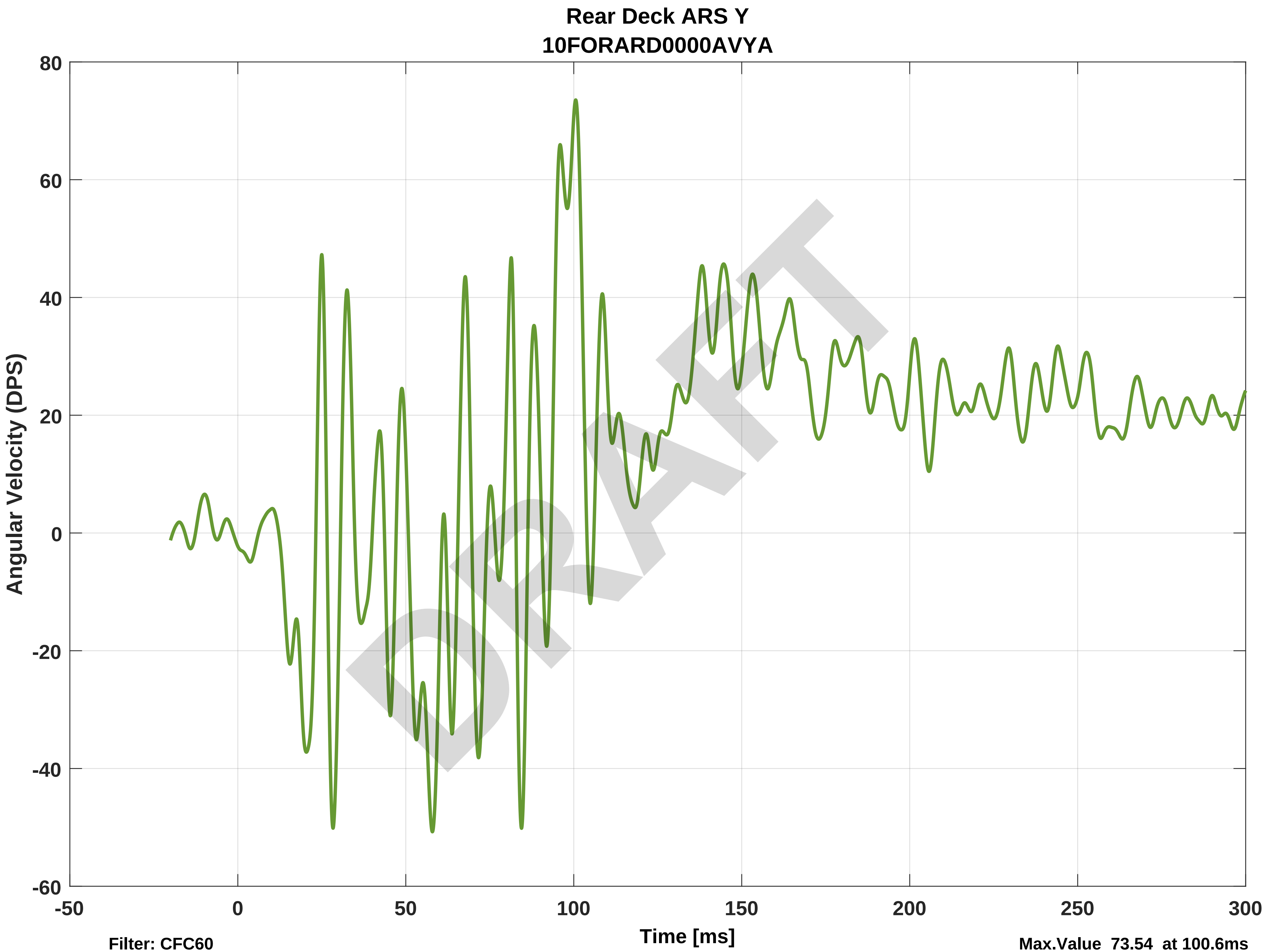

Rear Deck AZ
10FORARD0000ACZA
Acceleration (G's)
12
10
8
6
4
2
0
-2
-4
-6
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 10.64 at 48ms
Min.Value -5.86 at 61.9ms

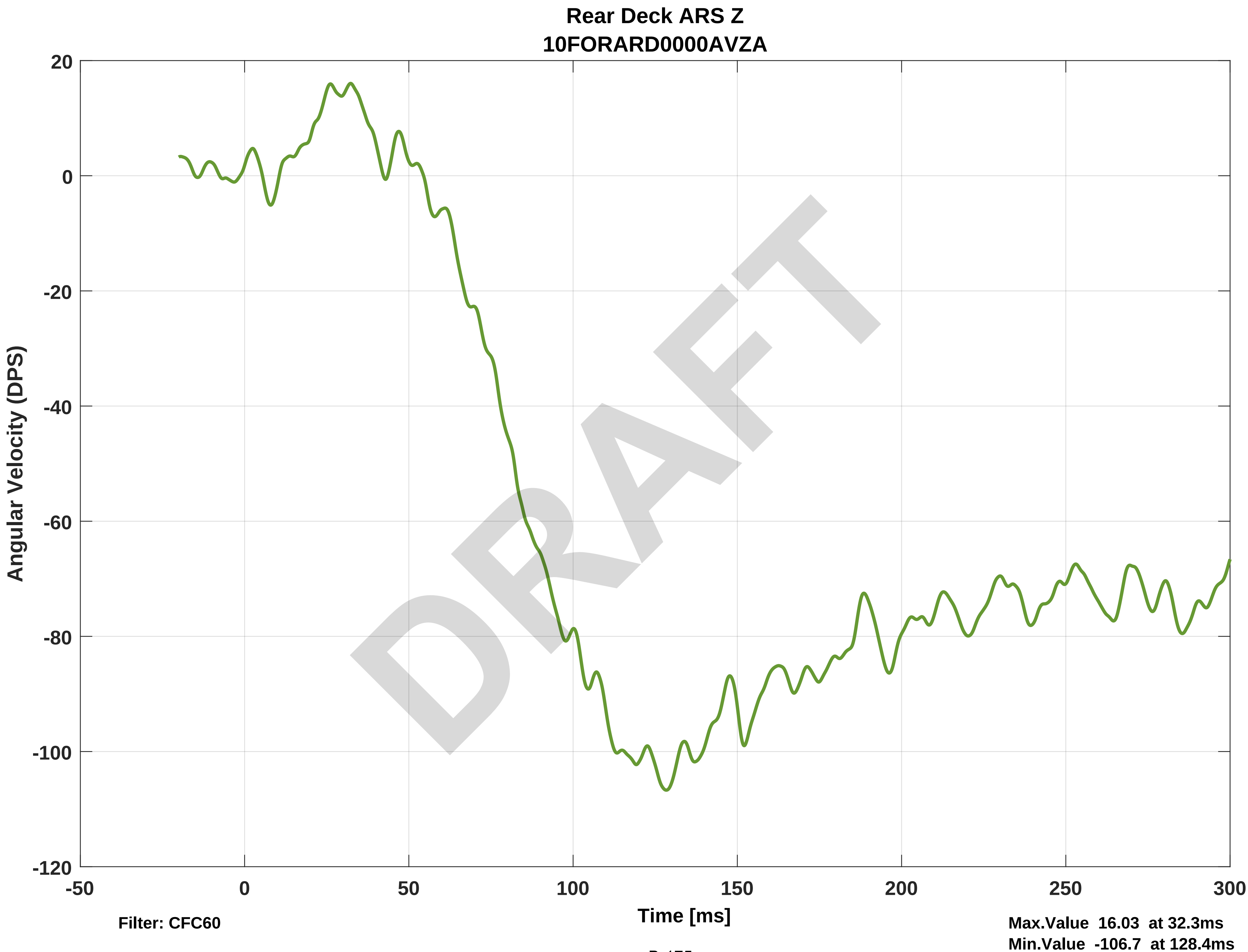


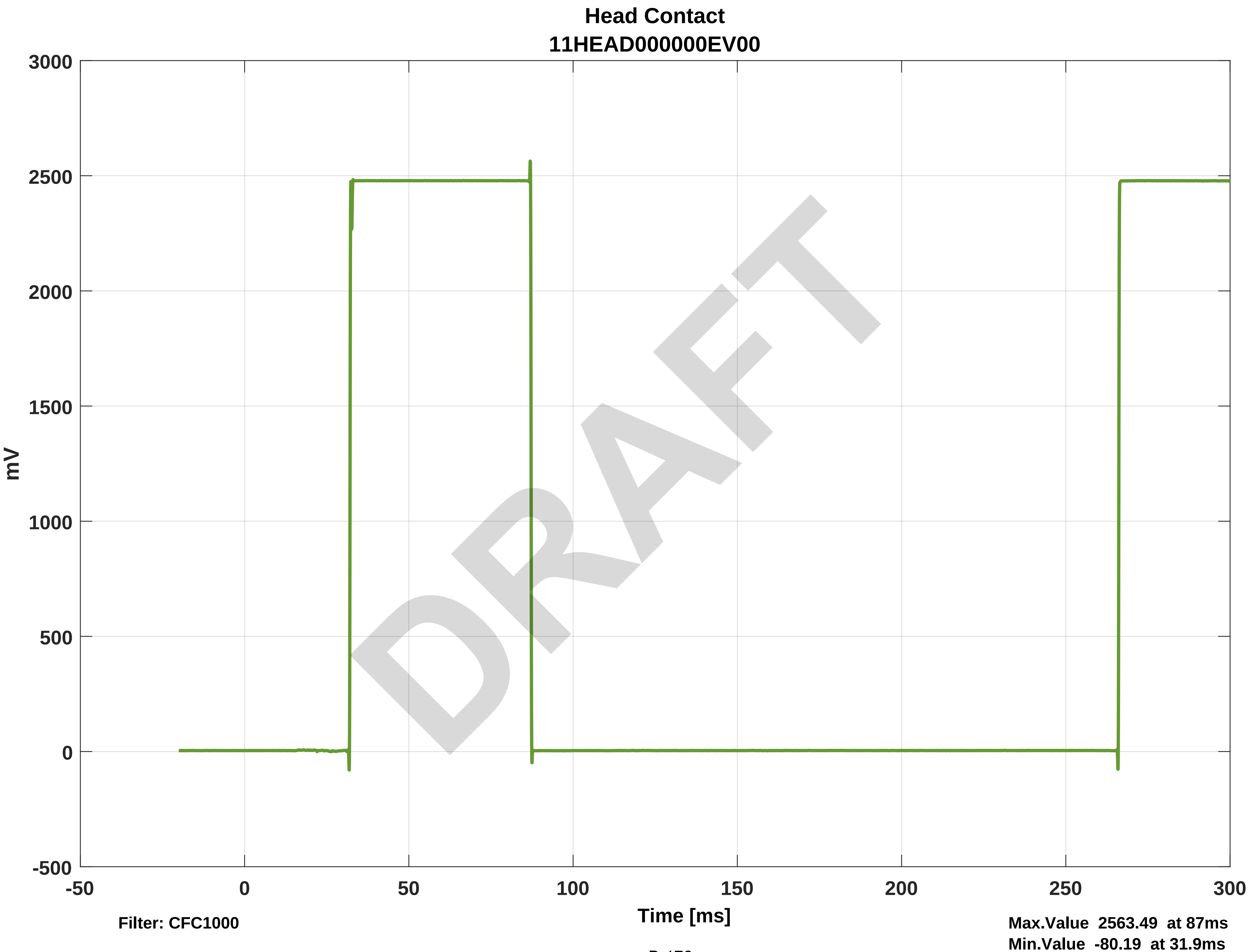
Filter: CFC60

Max.Value 19.85 at 67.1ms
Min.Value 0.2 at -17.9ms

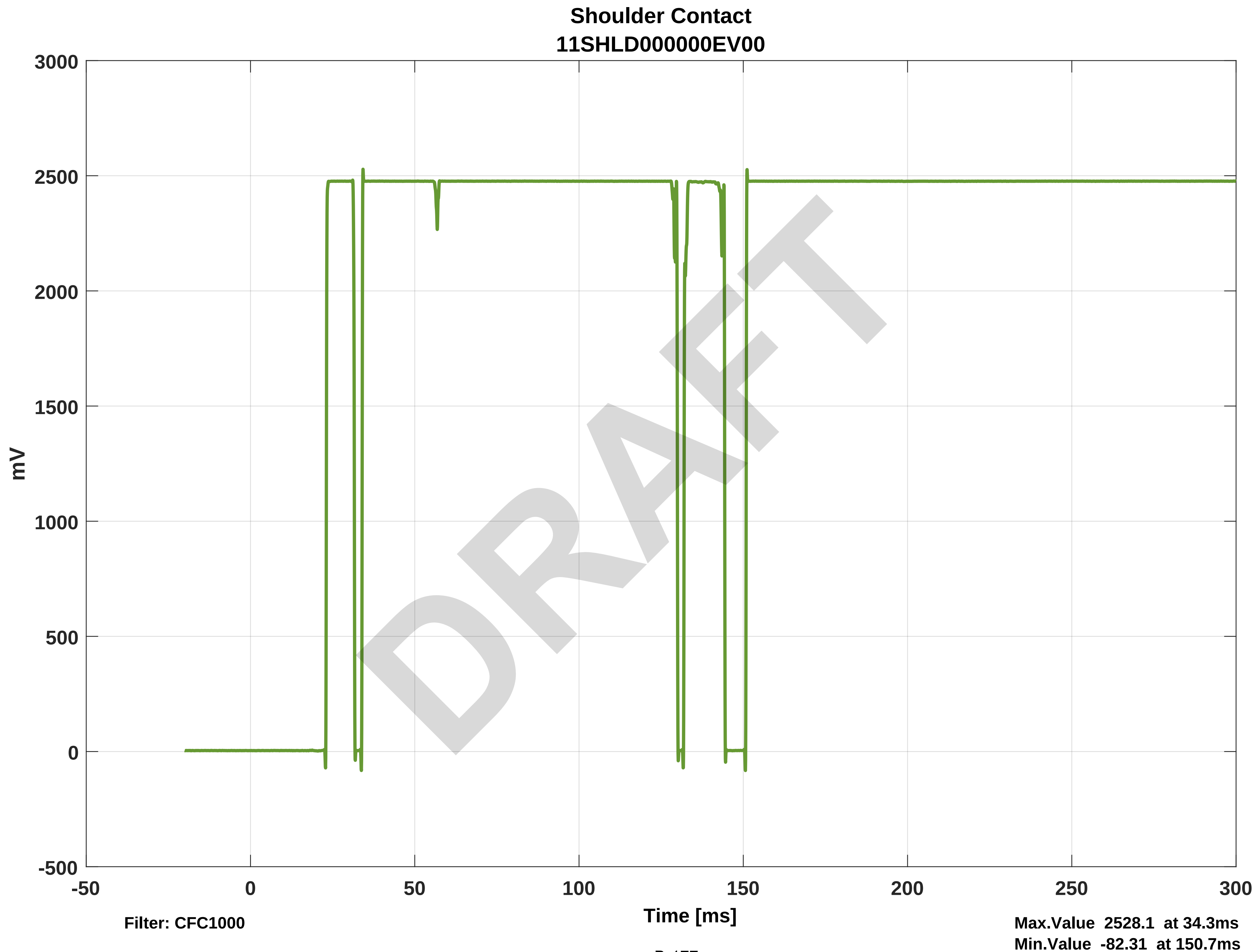

Rear Deck ARS X
10FORARD0000AVXA
60
40
20
0
-20
-40
-60
-80
-100
-120
Angular Velocity (DPS)
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 59.96 at 279.6ms
Min.Value -101.54 at 96.2ms


Rear Deck ARS Y
10FORARD0000AVYA
80
60
40
20
0
-20
-40
-60
-50
0
50
100
150
200
250
300
Angular Velocity (DPS)
Time [ms]
DRAFT
Filter: CFC60
Max.Value 73.54 at 100.6ms
Min.Value -50.75 at 57.9ms

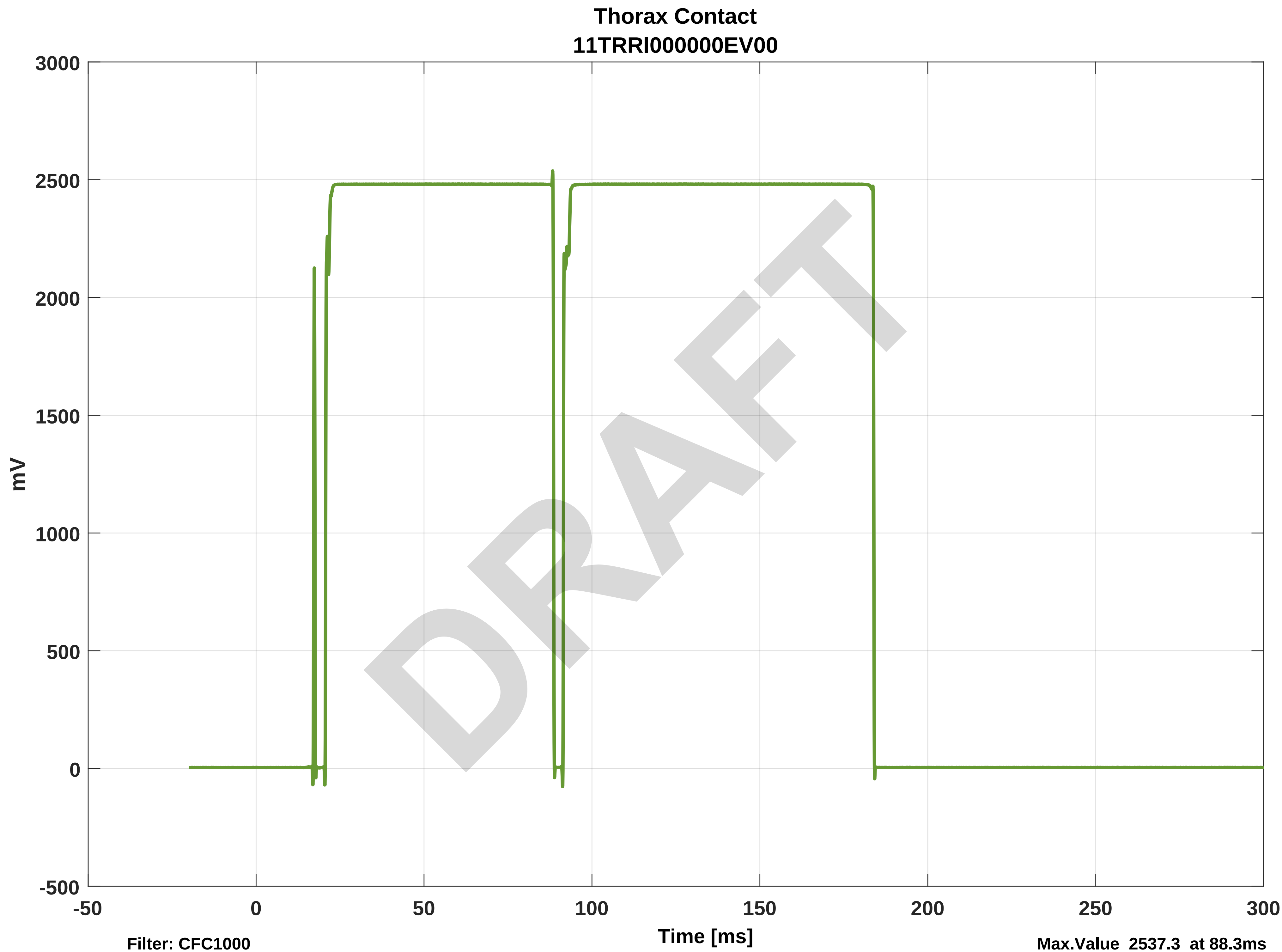

Rear Deck ARS Z
10FORARD0000AVZA
Angular Velocity (DPS)
20
0
-20
-40
-60
-80
-100
-120
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 16.03 at 32.3ms
Min.Value -106.7 at 128.4ms



Head Contact
11HEAD000000EV00
3000
2500
2000
1500
1000
500
0
-500
mV
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC1000
Max.Value 2563.49 at 87ms
Min.Value -80.19 at 31.9ms

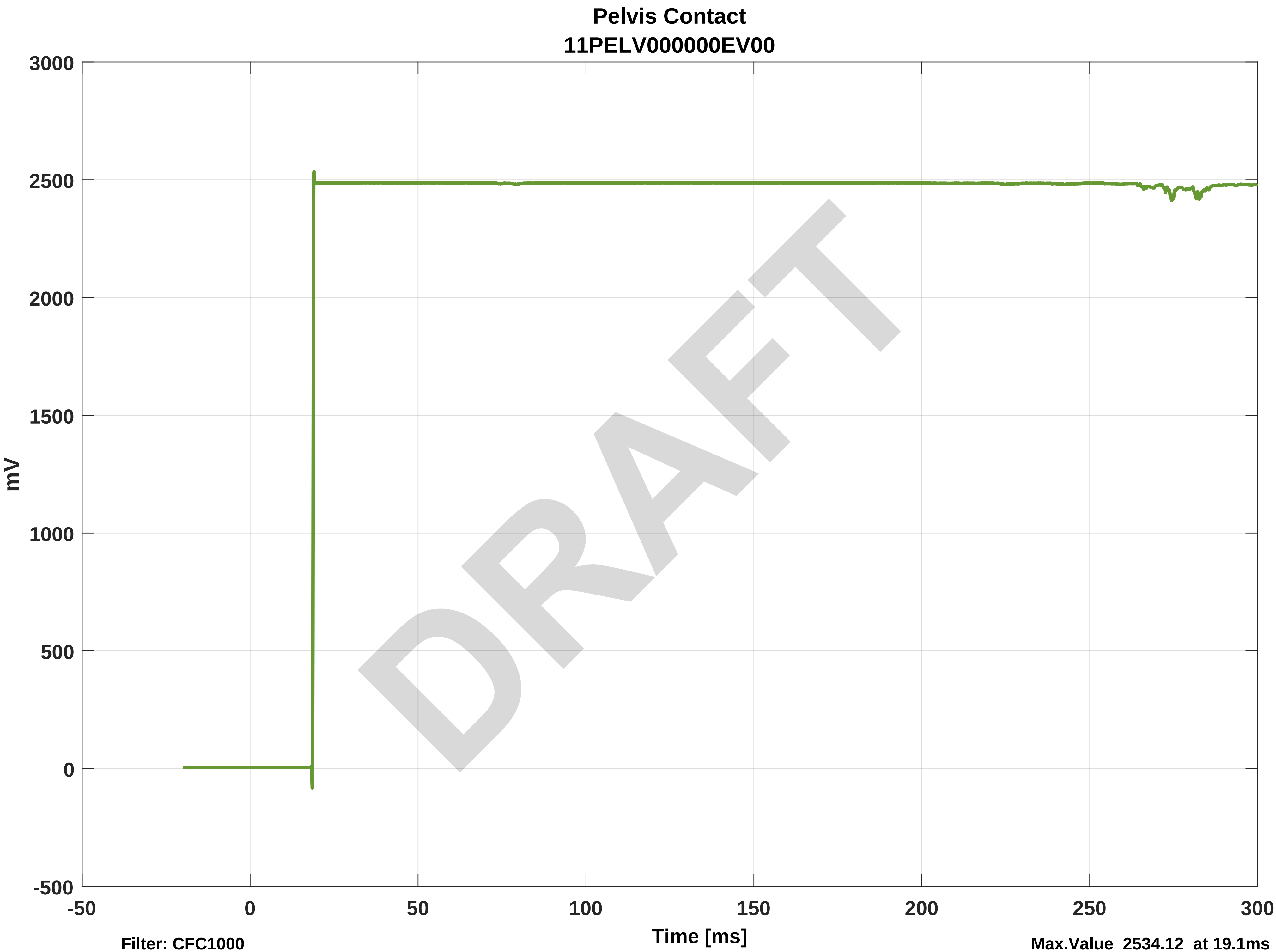


Shoulder Contact
11SHLD000000EV00
mV
3000
2500
2000
1500
1000
500
0
-500
-50
0
50
100
150
200
250
300
Time [ms]
Filter: CFC1000
Max.Value 2528.1 at 34.3ms
Min.Value -82.31 at 150.7ms
DRAFT



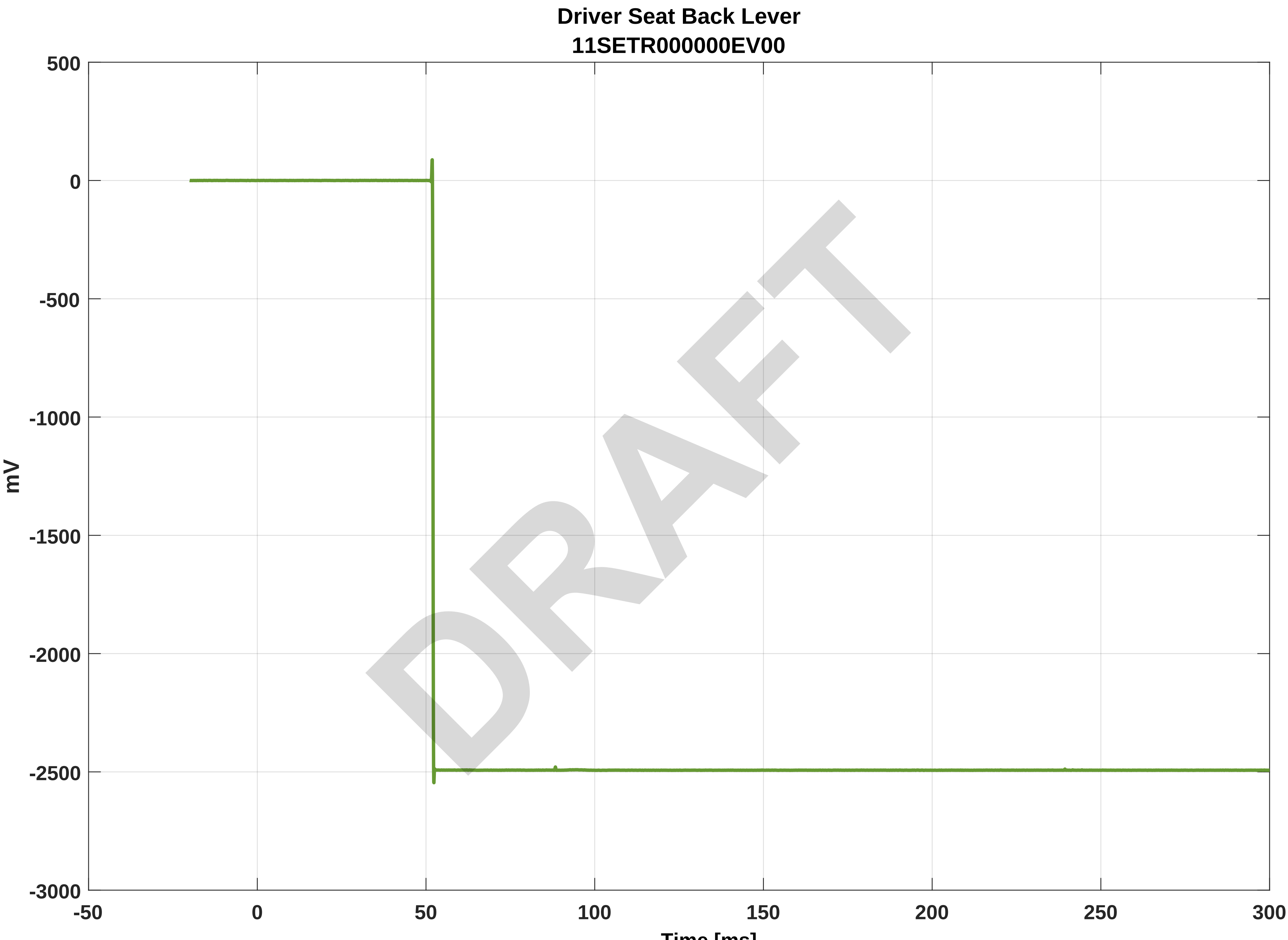
Filter: CFC1000

Max.Value 2537.3 at 88.3ms
Min.Value -76.46 at 91.3ms



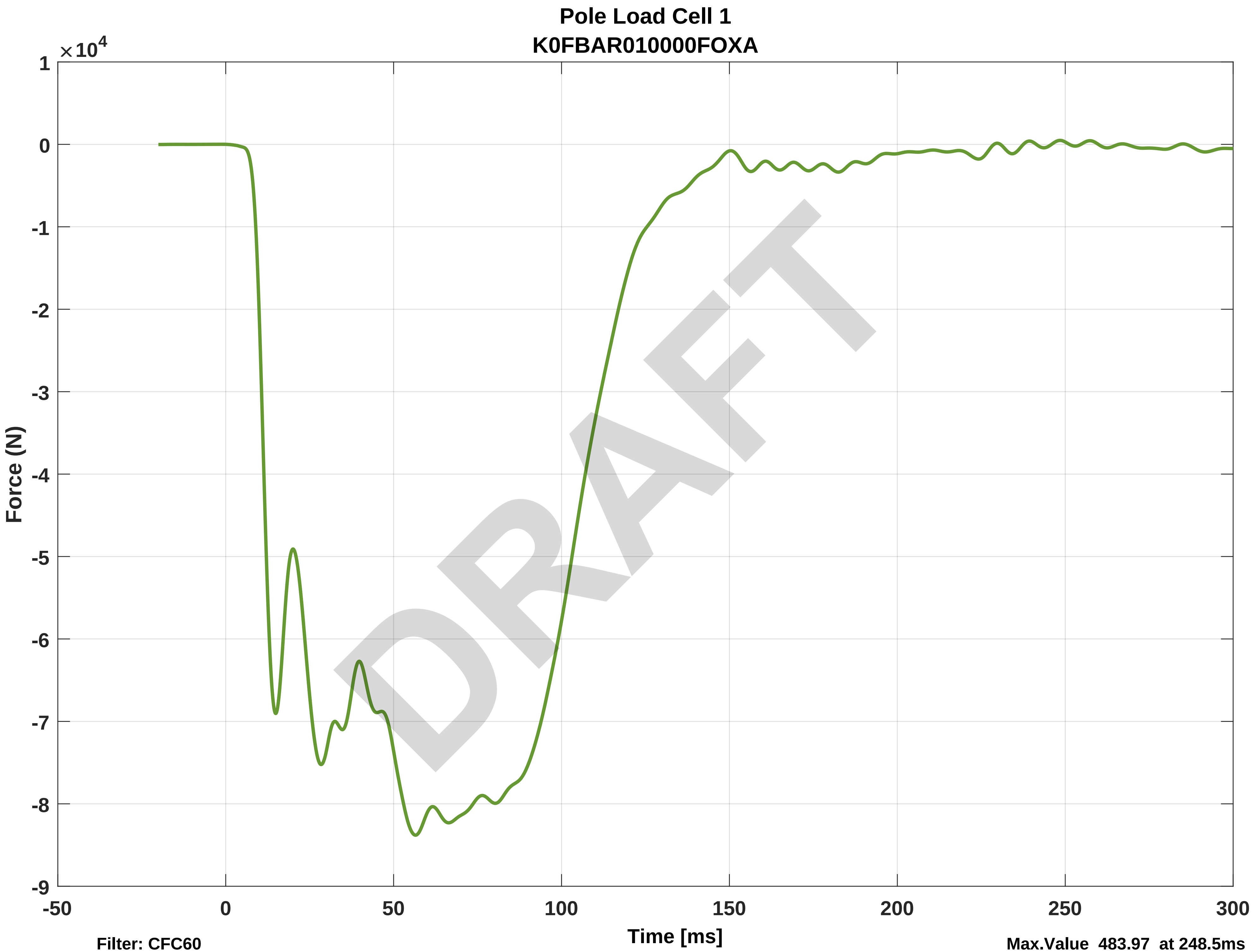
Filter: CFC1000

Max.Value 2534.12 at 19.1ms
Min.Value -82.45 at 18.5ms



Filter: CFC1000

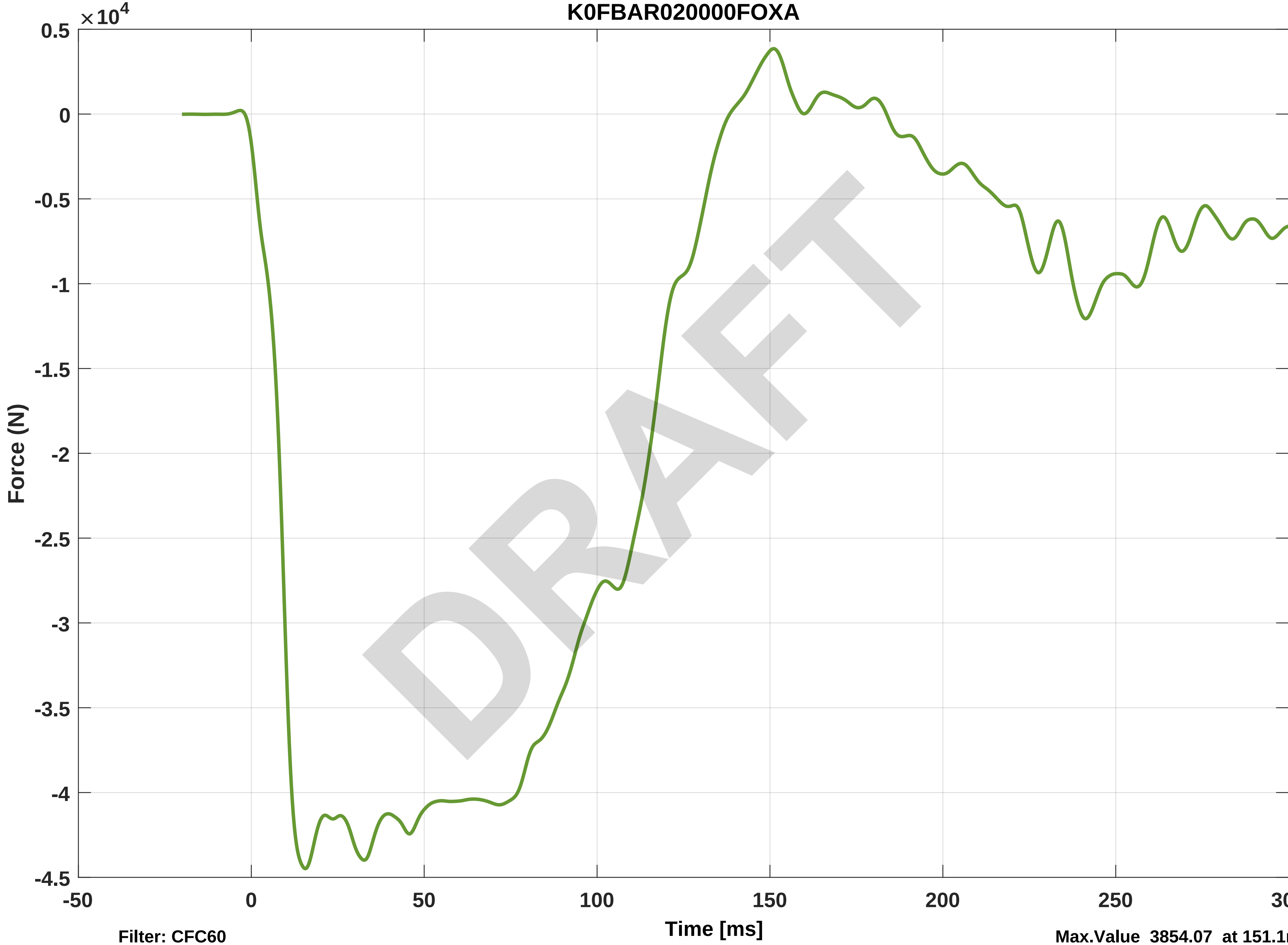
Max.Value 87.54 at 51.9ms
Min.Value -2545.68 at 52.4ms



Filter: CFC60

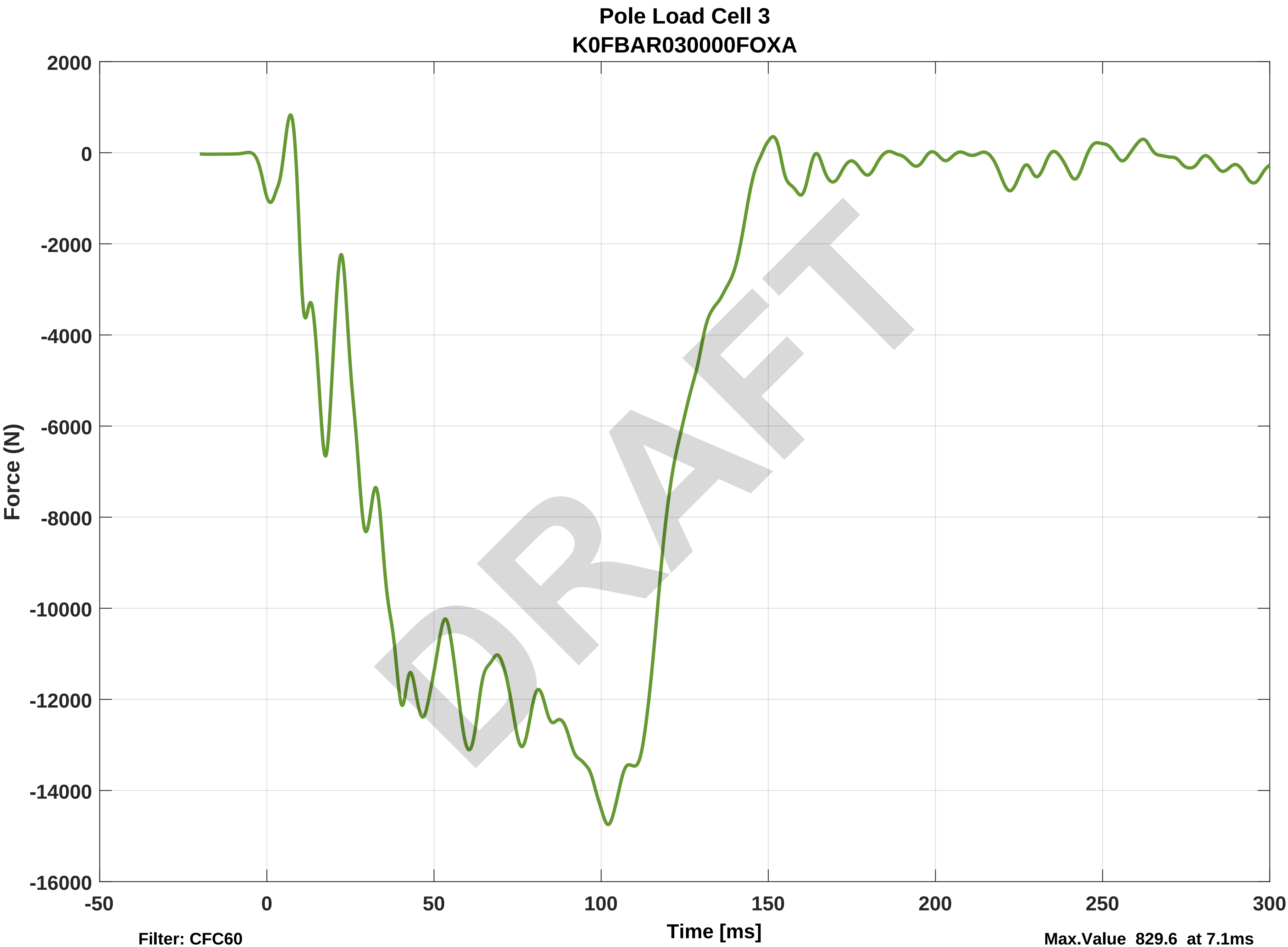
Max.Value 483.97 at 248.5ms
Min.Value -83800.53 at 56.6ms

Pole Load Cell 2
K0FBAR020000FOXA



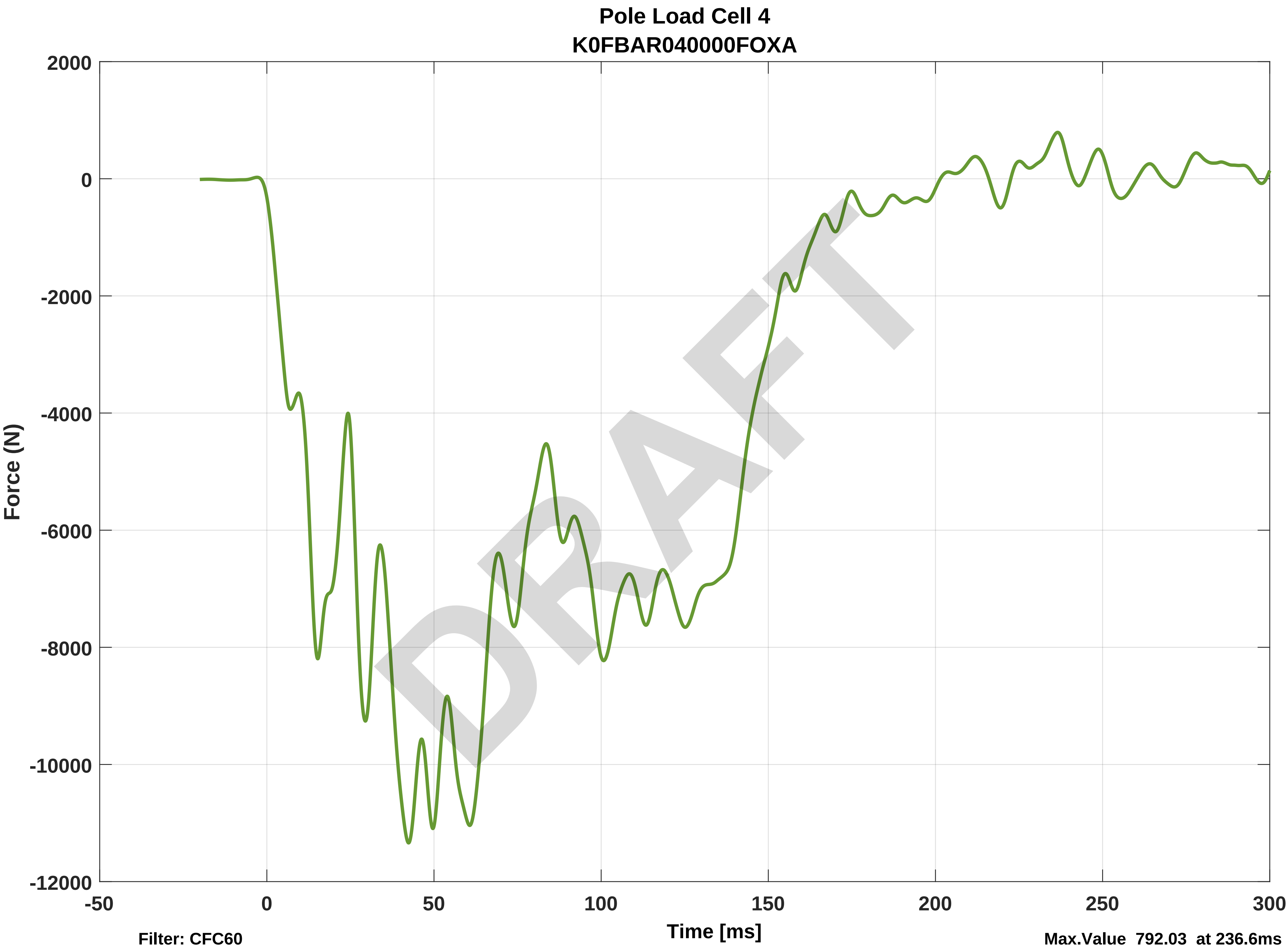
Filter: CFC60

Max.Value 3854.07 at 151.1ms
Min.Value -44482.28 at 15.7ms



Filter: CFC60

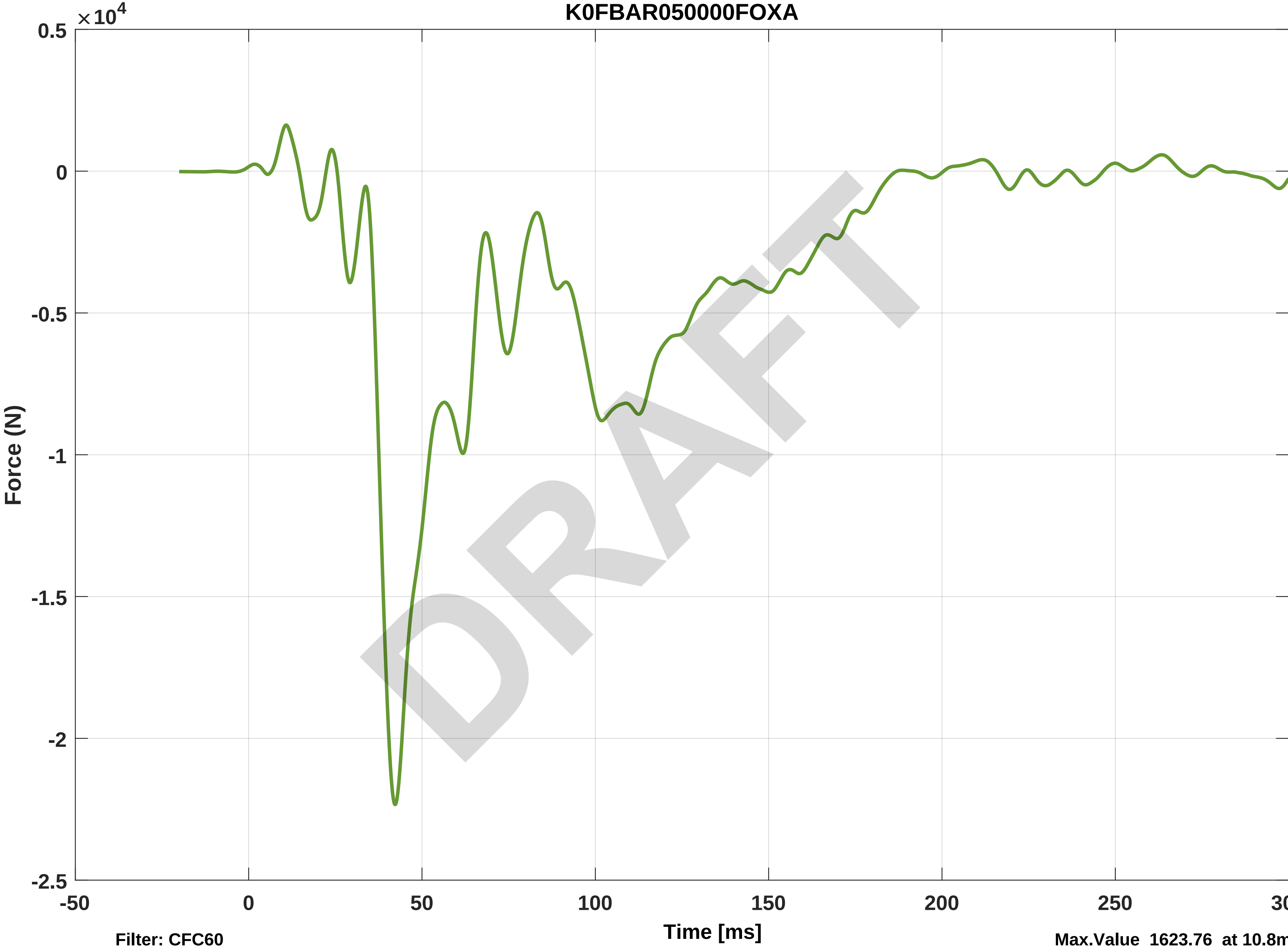
Max.Value 829.6 at 7.1ms
Min.Value -14747.53 at 102.1ms



Filter: CFC60

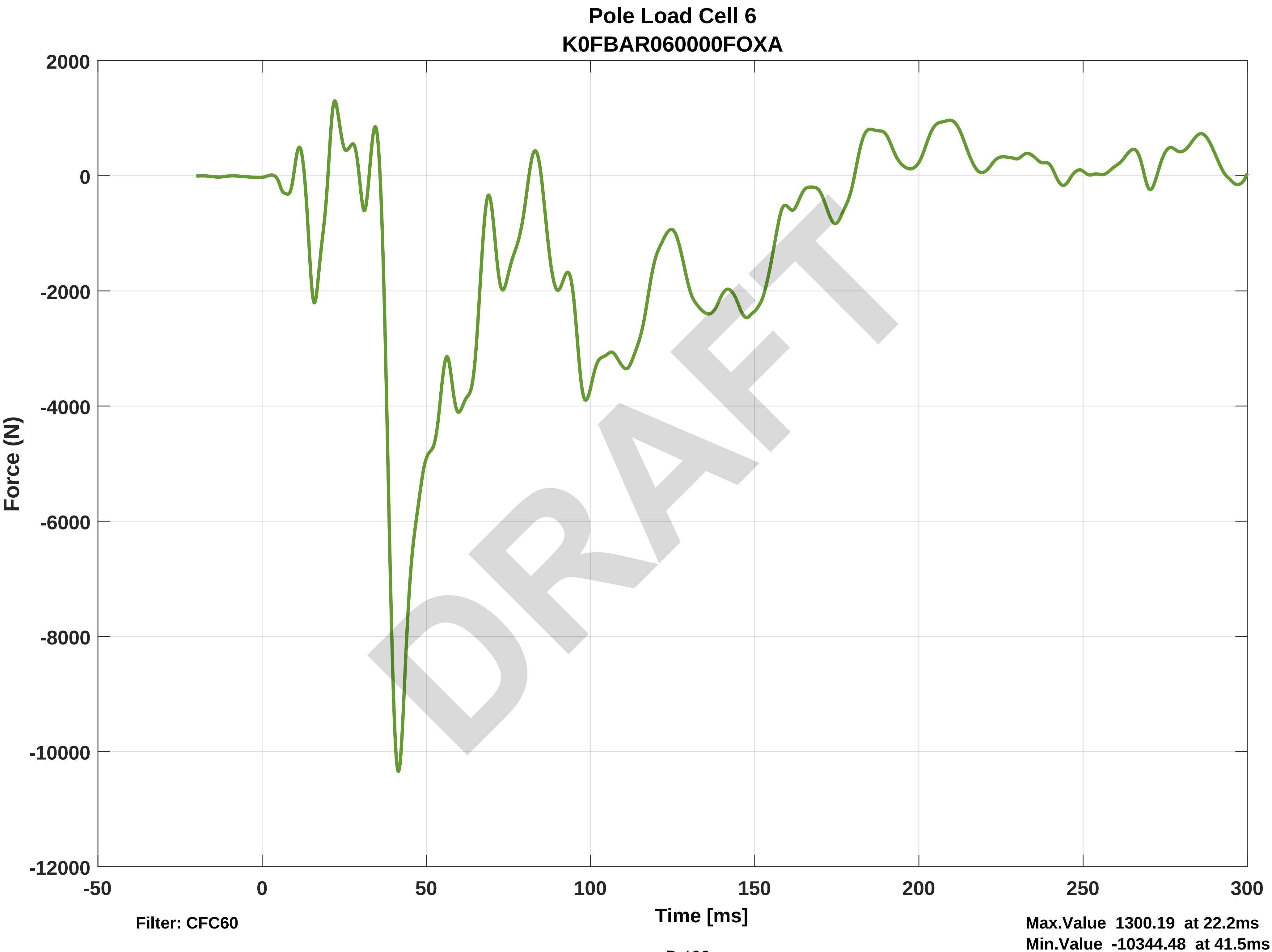
Max.Value 792.03 at 236.6ms
Min.Value -11339.22 at 42.4ms

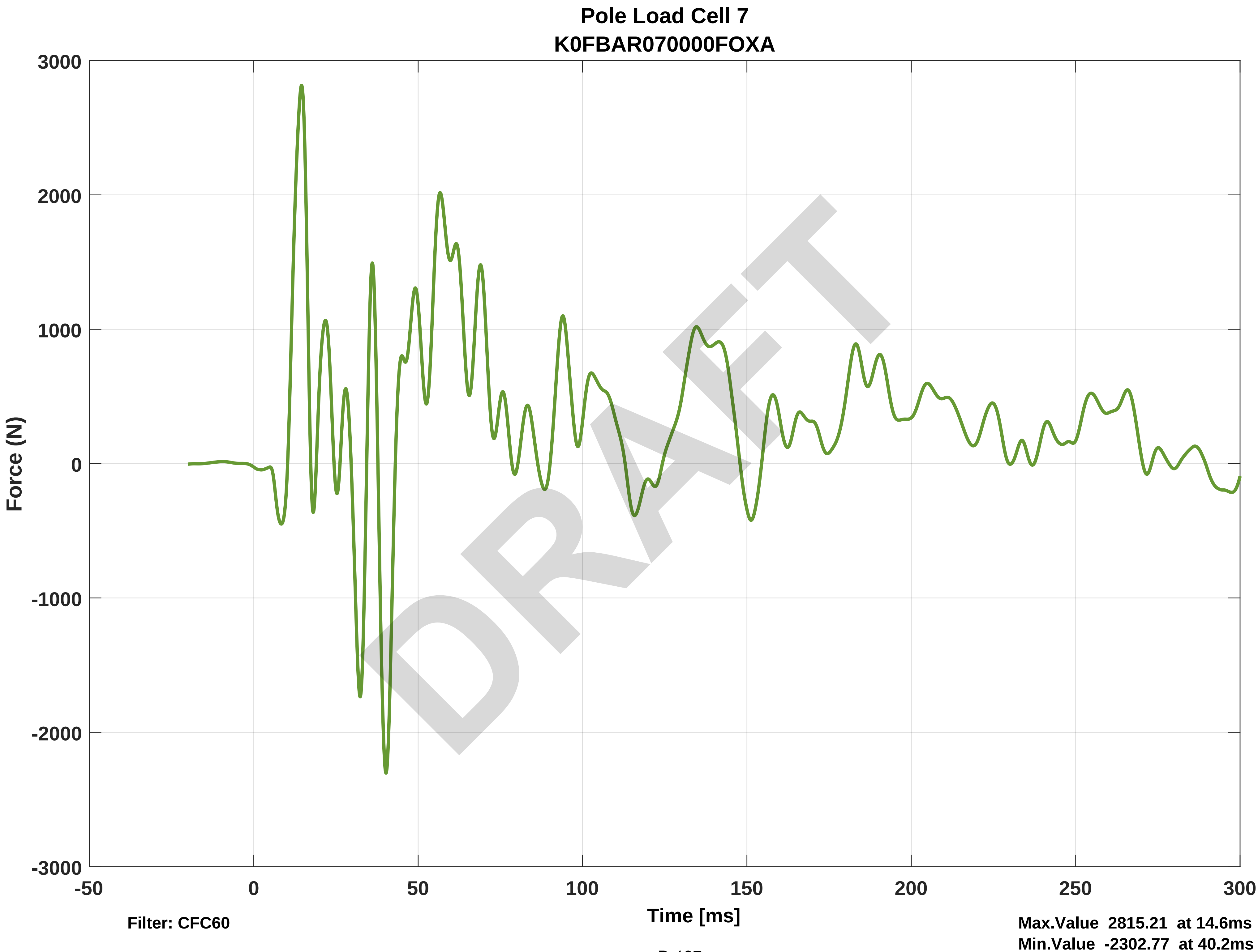
Pole Load Cell 5
K0FBAR050000FOXA



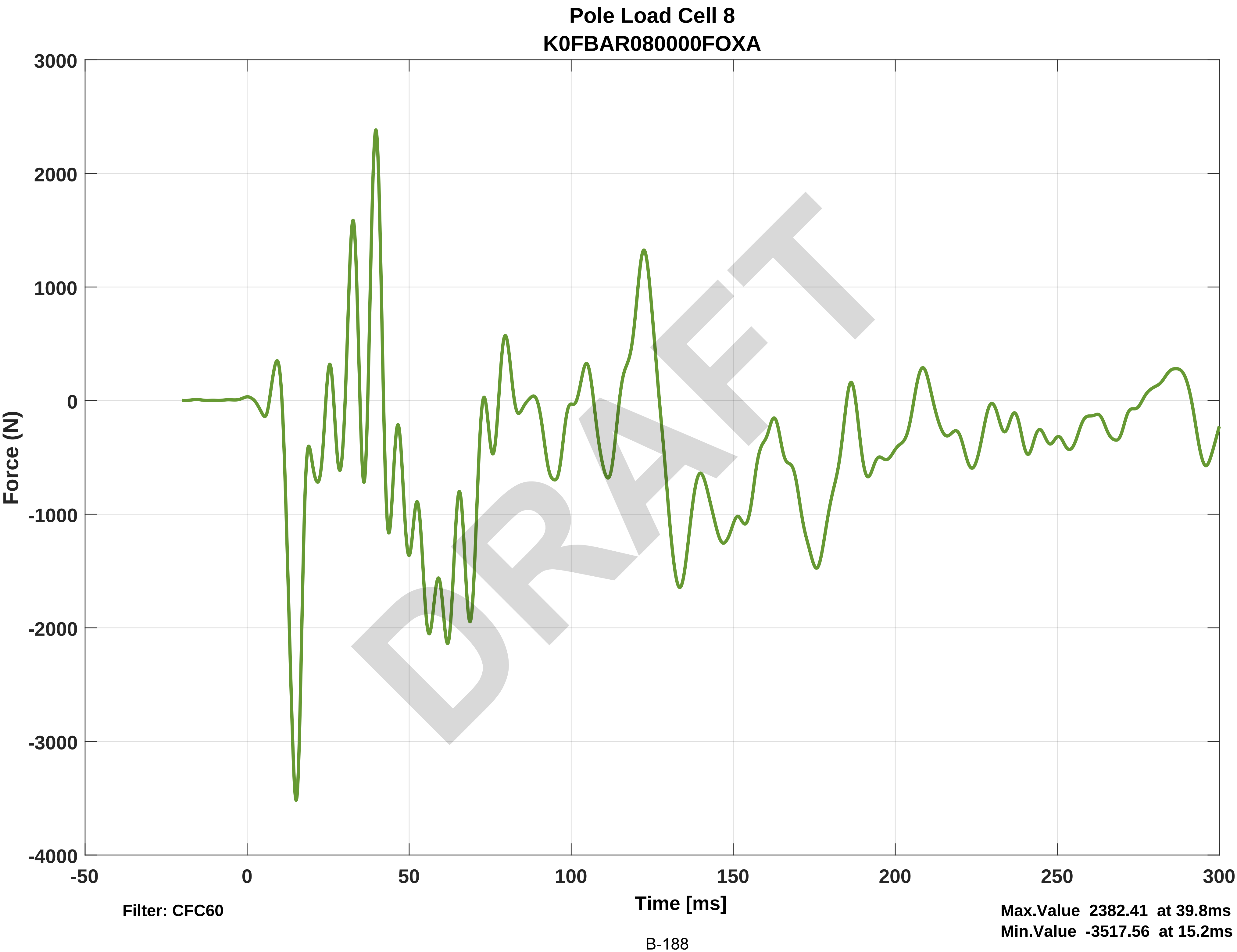
Filter: CFC60

Max.Value 1623.76 at 10.8ms
Min.Value -22332.67 at 42.3ms


Pole Load Cell 6
K0FBAR060000FOXA
2000
0
-2000
-4000
-6000
-8000
-10000
-12000
Force (N)
-50
0
50
100
150
200
250
300
Time [ms]
Filter: CFC60
Max.Value 1300.19 at 22.2ms
Min.Value -10344.48 at 41.5ms
DRAFT



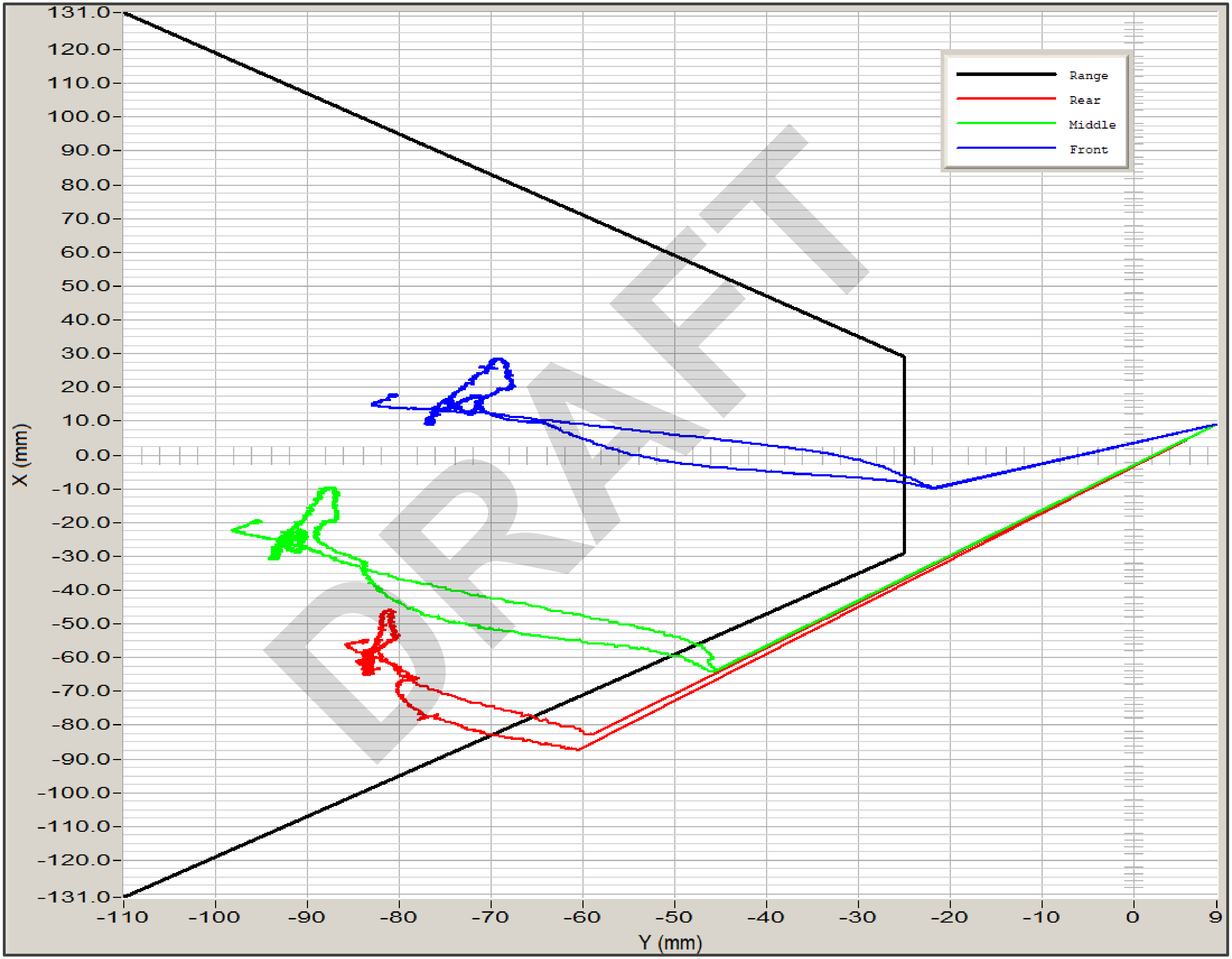
Pole Load Cell 7
K0FBAR070000FOXA
Force (N)
3000
2000
1000
0
-1000
-2000
-3000
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 2815.21 at 14.6ms
Min.Value -2302.77 at 40.2ms


Pole Load Cell 8
K0FBAR080000FOXA
Force (N)
3000
2000
1000
0
-1000
-2000
-3000
-4000
-50
0
50
100
150
200
250
300
Time [ms]
DRAFT
Filter: CFC60
Max.Value 2382.41 at 39.8ms
Min.Value -3517.56 at 15.2ms

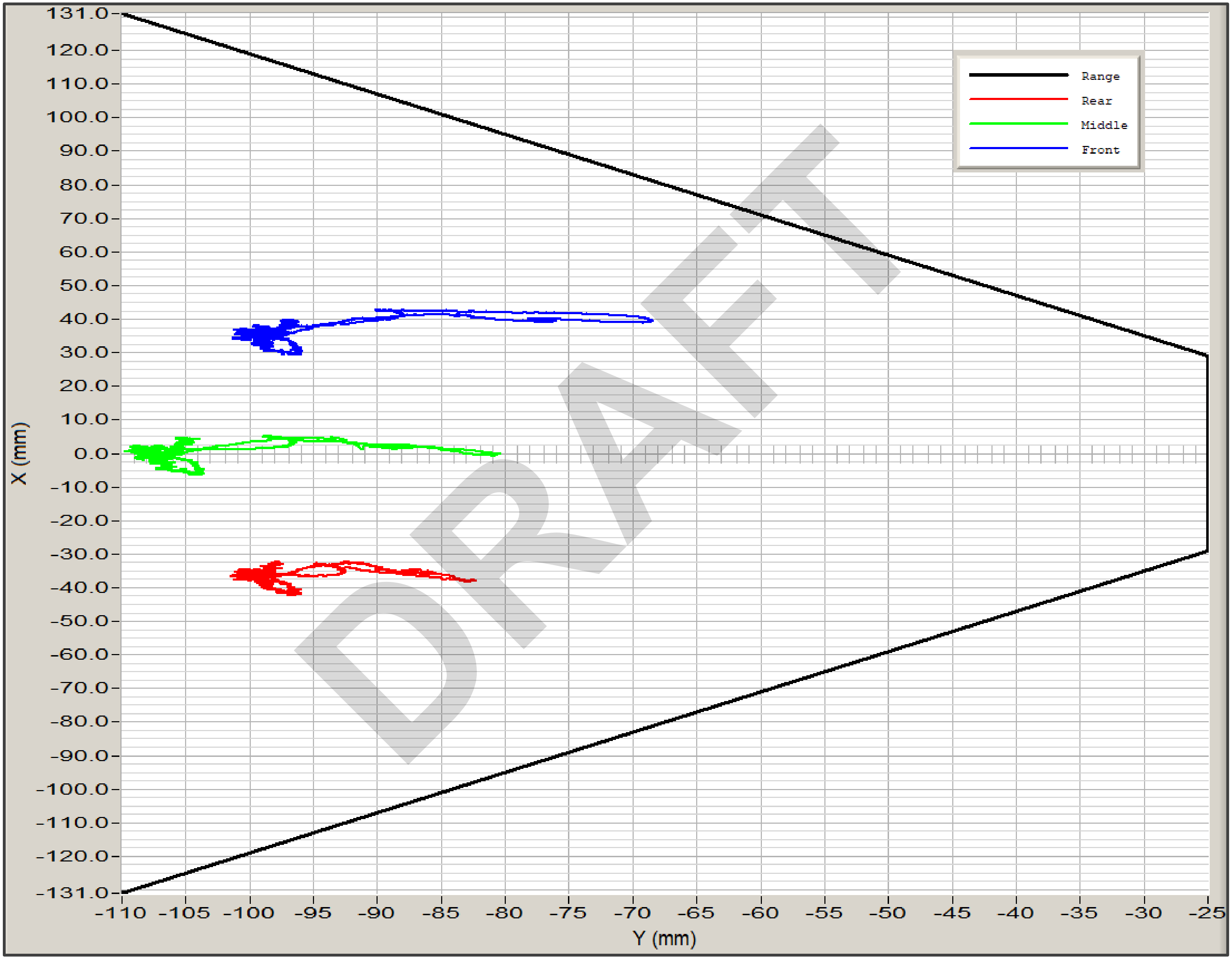
APPENDIX B.2

DUMMY RIBEYE XY DATA PLOTS

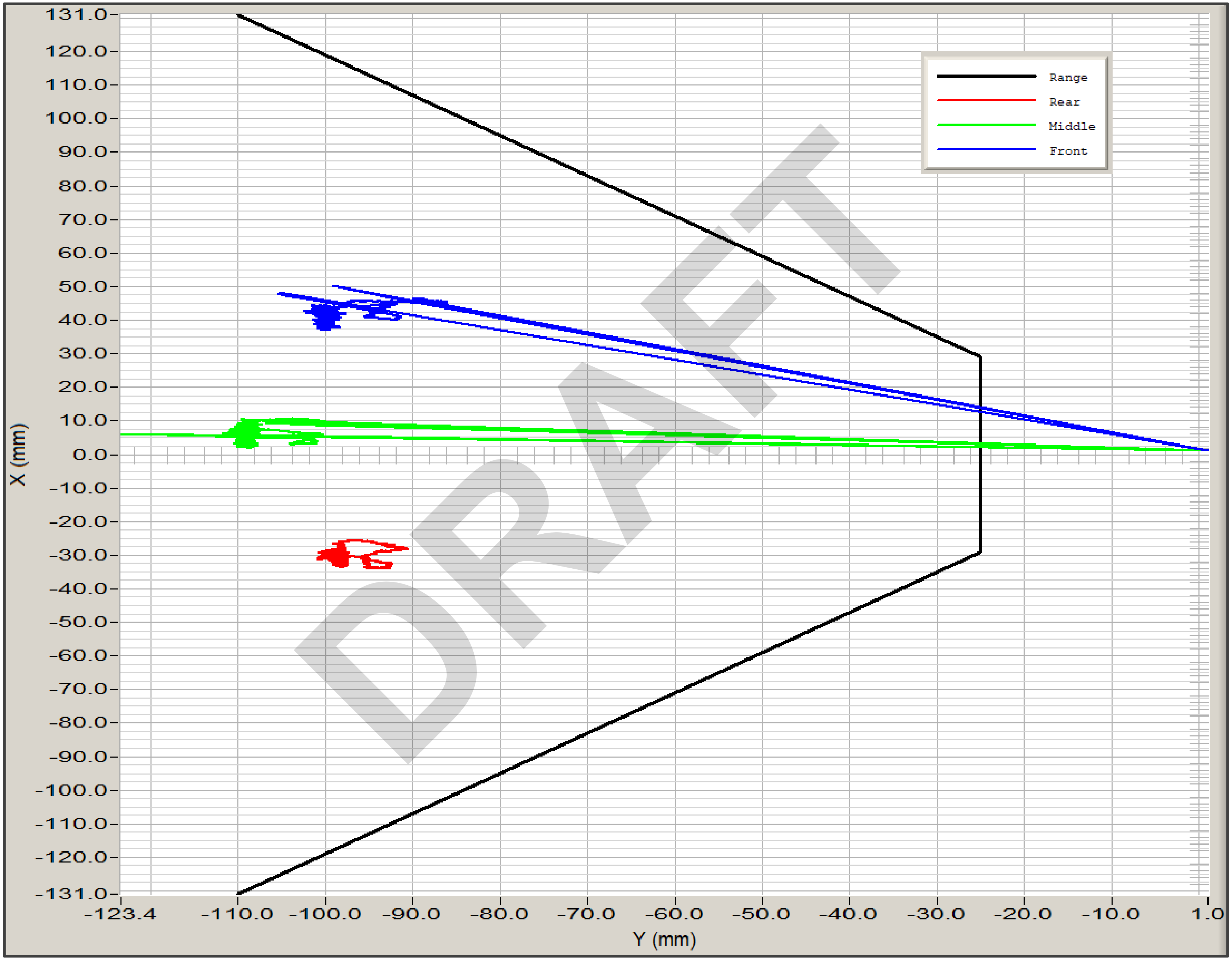
WorldSID Ribeye Shoulder XY Displacement – Side Pole



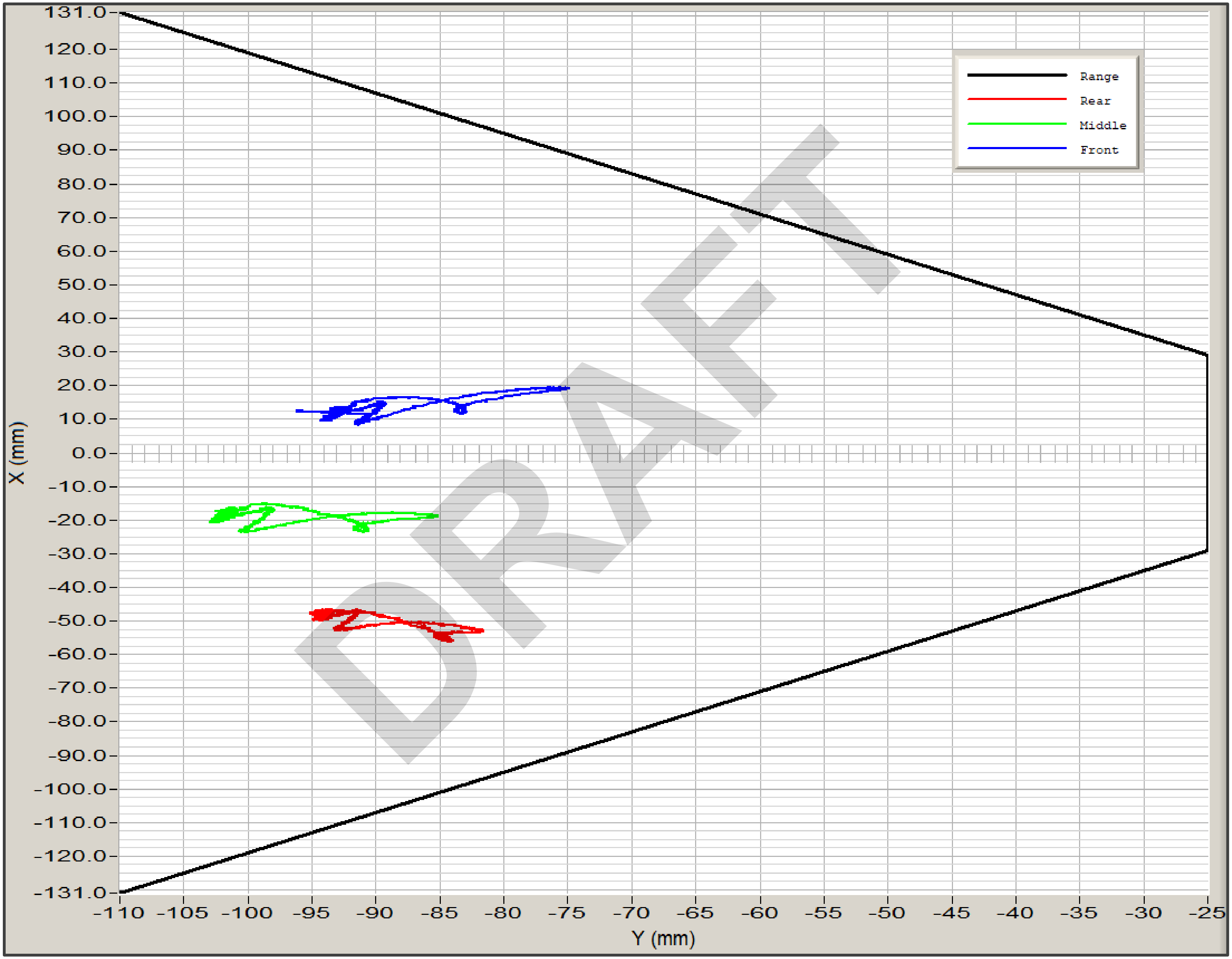
WorldSID Ribeye Thorax 1 XY Displacement – Side Pole



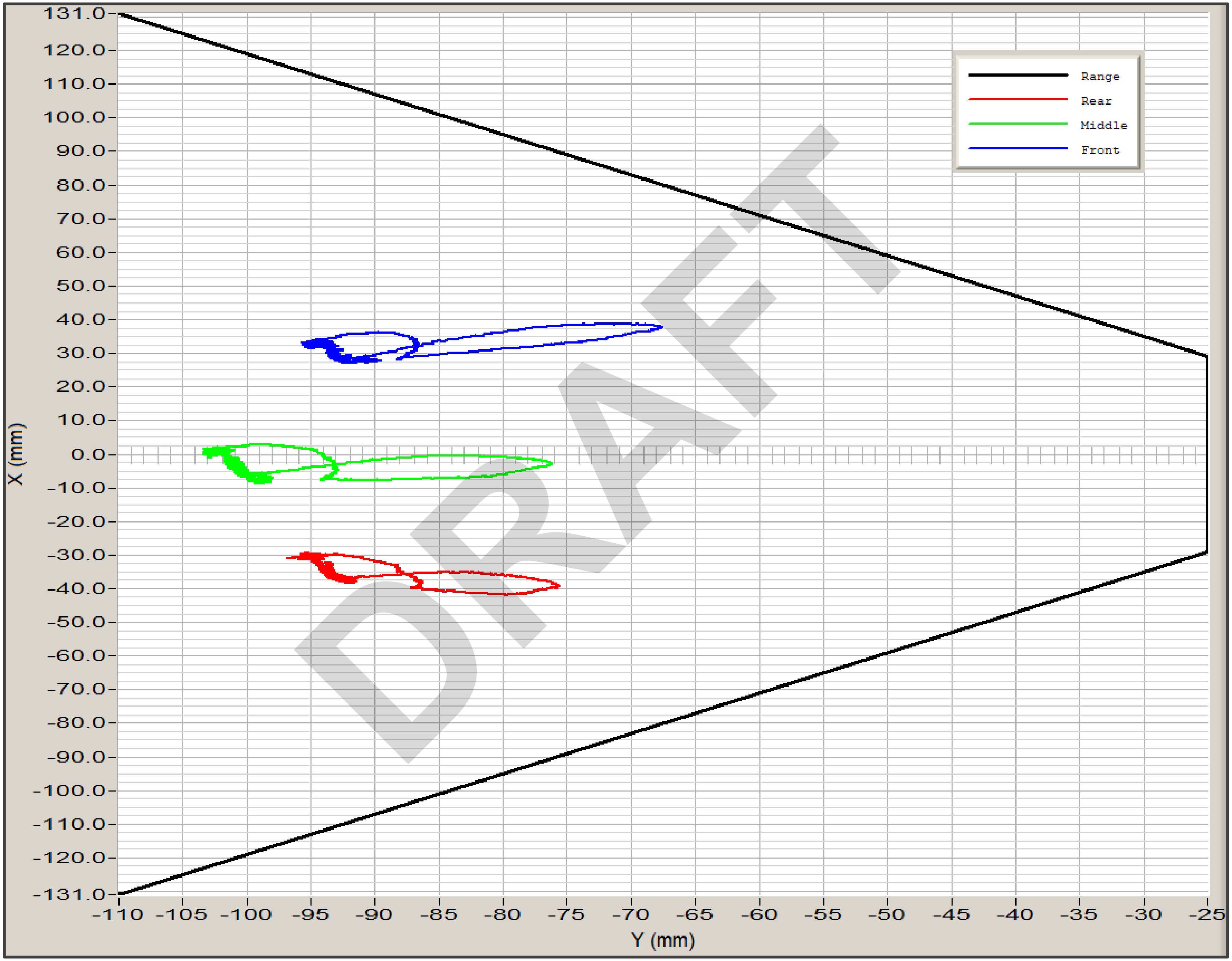
WorldSID Ribeye Thorax 2 XY Displacement – Side Pole



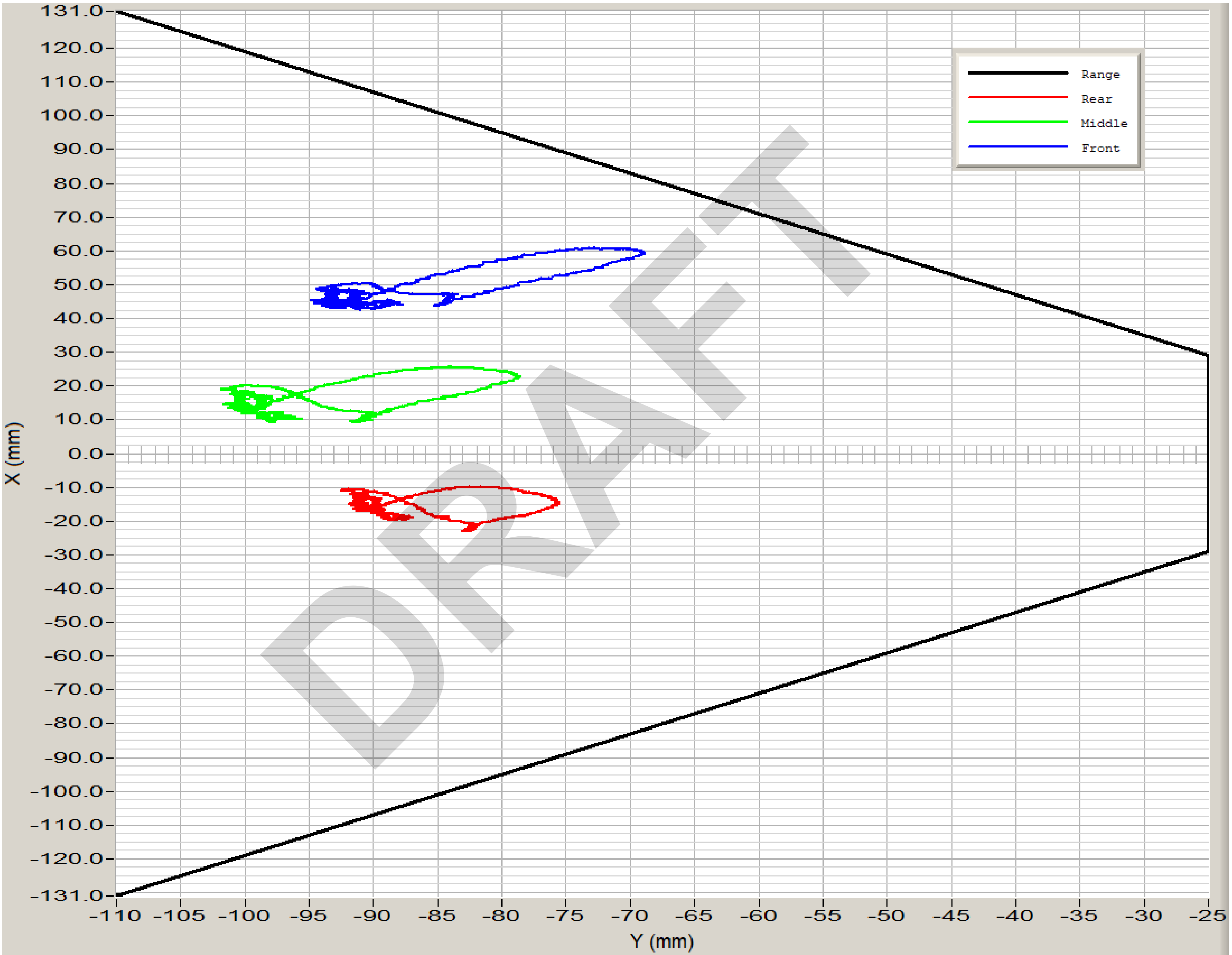
WorldSID Ribeye Thorax 3 XY Displacement – Side Pole



WorldSID Ribeye Abdomen 1 XY Displacement – Side Pole



WorldSID Ribeye Abdomen 2 XY Displacement – Side Pole



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE DATA

TABLE 1
FRONTAL HEAD DROP TEST

WSID Serial Number EB8888 Test Sequences 1 & 2

TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/27/2019		11/20/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	21.1	Pass	20.8	Pass
Humidity – During Test (%)	**10 - 70**	43.0	Pass	27.9	Pass
Peak Head Resultant Acceleration (g)	**211 - 261**	220.1	Pass	225.8	Pass
Peak Head Y Acceleration (g)	**(-15) - (+15)**	-7.57	Pass	-13.7	Pass
Unimodal (Oscillation) (%)	**(-10) - (+10)**	2.2	Pass	6.1	Pass

PLOTS 1 & 2
FRONTAL HEAD DROP TEST (CONTINUED)
PRE-TEST

Test ID	WS50 EB8888 HEAD FRONT 007	Max	1.61	g
Sampling Rate (Hz)	20000		4.05	msec
Filter	CFC1000	Min	-7.57	g
Plot number	002		1.75	msec
Units	g			

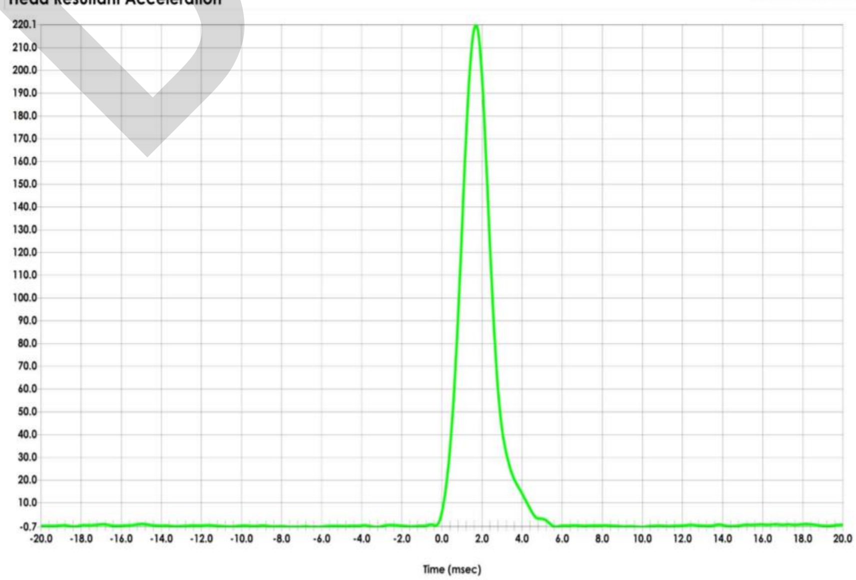
MEDICAL COLLEGE OF WISCONSIN

ENDEVCO 7268C-2000_5-2; Head Acceleration (Y)

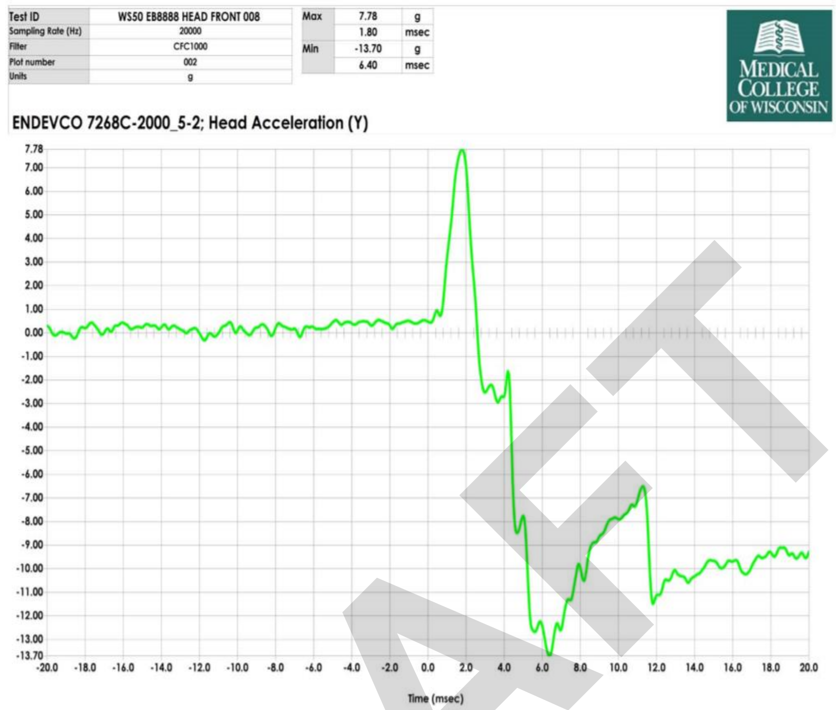
Test ID	WS50 EB8888 HEAD FRONT 007	Max	220.13	g
Sampling Rate (Hz)	20000		1.70	msec
Filter	CFC1000	Min	-0.69	g
Plot number	004		-6.35	msec
Units	g			

MEDICAL COLLEGE OF WISCONSIN

Head Resultant Acceleration



PLOTS 3 & 4
FRONTAL HEAD DROP TEST (CONTINUED)
POST-TEST



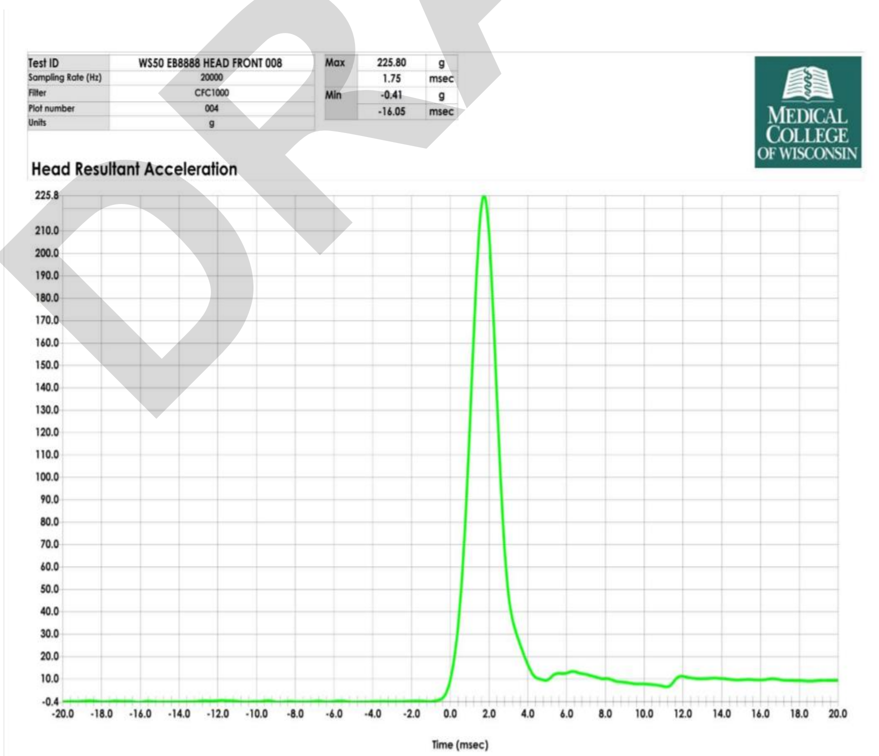


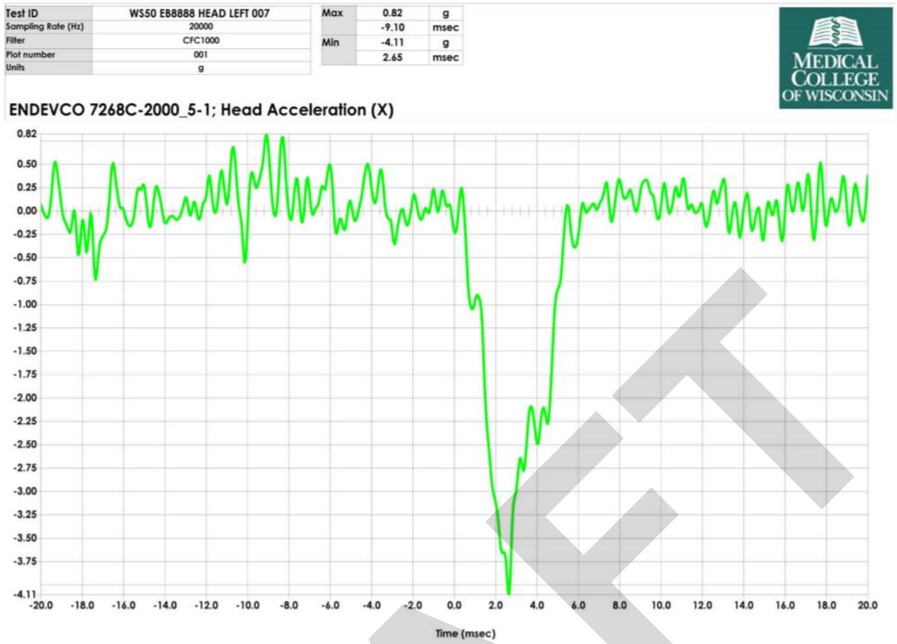
TABLE 2
LEFT LATERAL HEAD DROP TEST

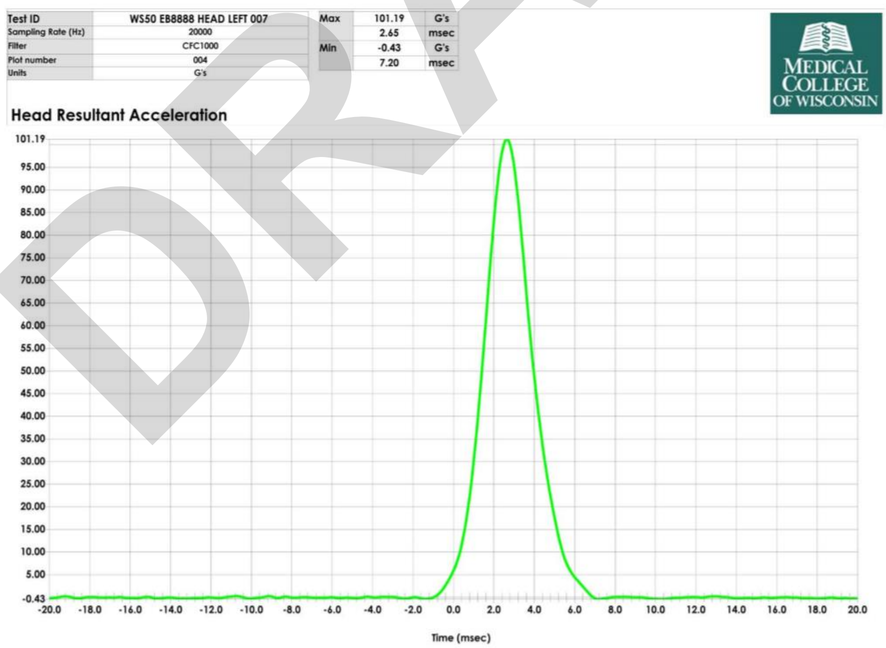
WSID Serial Number EB8888 Test Sequences 1 & 2

TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/28/2019		11/20/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	20.9	Pass	21.5	Pass
Humidity – During Test (%)	**10 - 70**	42.3	Pass	26.9	Pass
Peak Head Resultant Acceleration (g)	**107 - 126**	101.2	Fail	116.4	Pass
Peak Head X Acceleration (g)	**(-15) - (+15)**	4.1	Pass	6.94	Pass
Unimodal (Oscillation) (%)	**(-10) - (+10)**	0.4	Pass	1.2	Pass

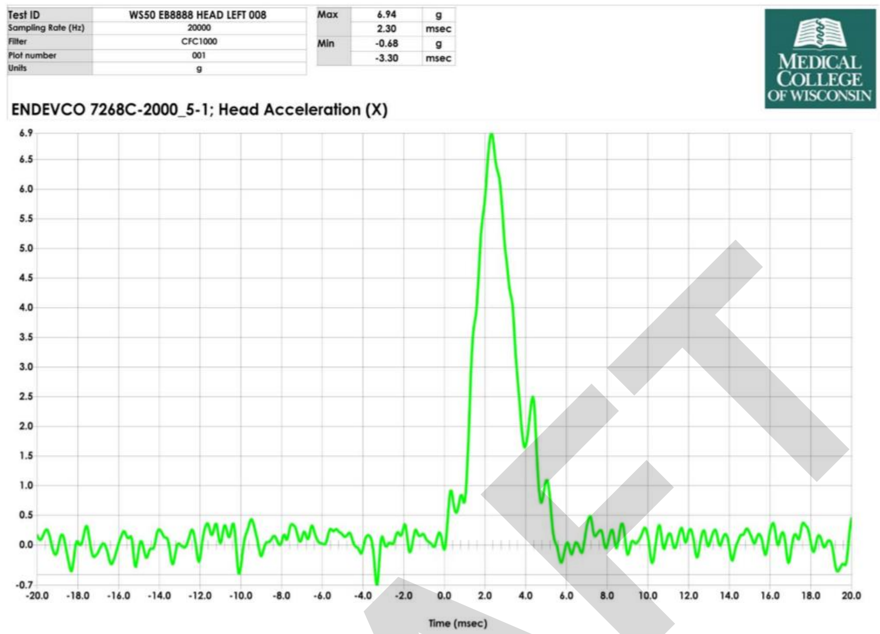
PLOTS 5 & 6

LEFT LATERAL HEAD DROP TEST (CONTINUED)
PRE-TEST





PLOTS 7 & 8
LEFT LATERAL HEAD DROP TEST (CONTINUED)
POST-TEST



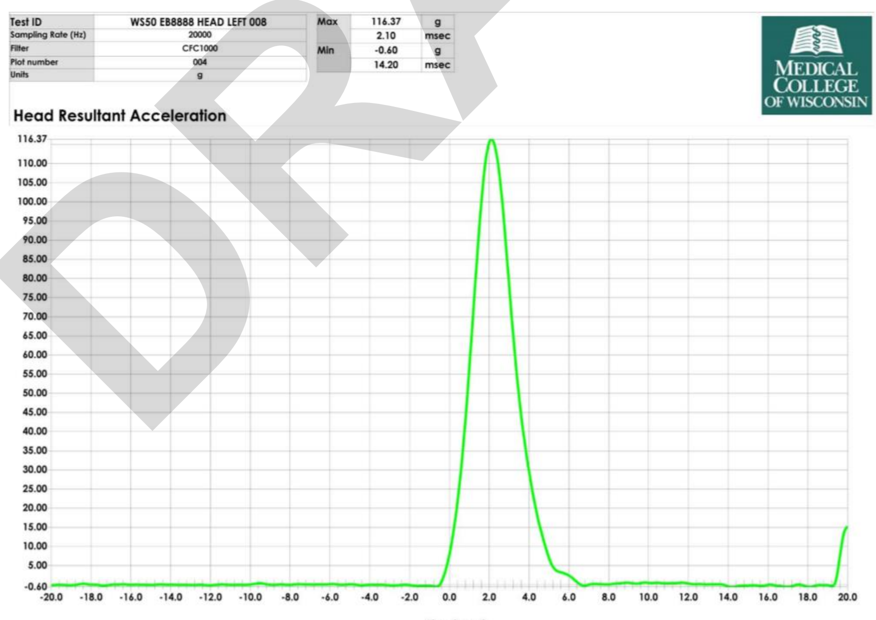


TABLE 3

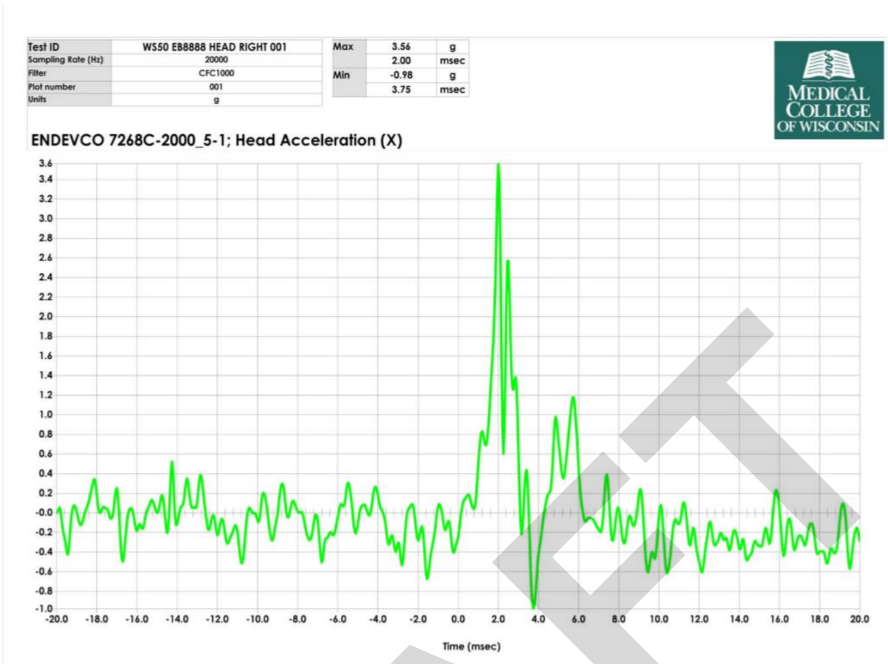
RIGHT LATERAL HEAD DROP TEST

WSID Serial Number EB8888 Test Sequences 1

TEST PARAMETER	SPEC.	POST	
Date	-	11/19/2019	
Sequential Test Number	-	1	
		Result	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	20.9	Pass
Humidity – During Test (%)	**10 - 70**	27.6	Pass
Peak Head Resultant Acceleration (g)	**107 - 126**	112.3	Pass
Peak Head X Acceleration (g)	**(-15) - (+15)**	1.2	Pass
Unimodal (Oscillation) (%)	**(-10) - (+10)**	1.6	Pass

PLOTS 8 & 9

RIGHT LATERAL HEAD DROP TEST (CONTINUED)
POST-TEST



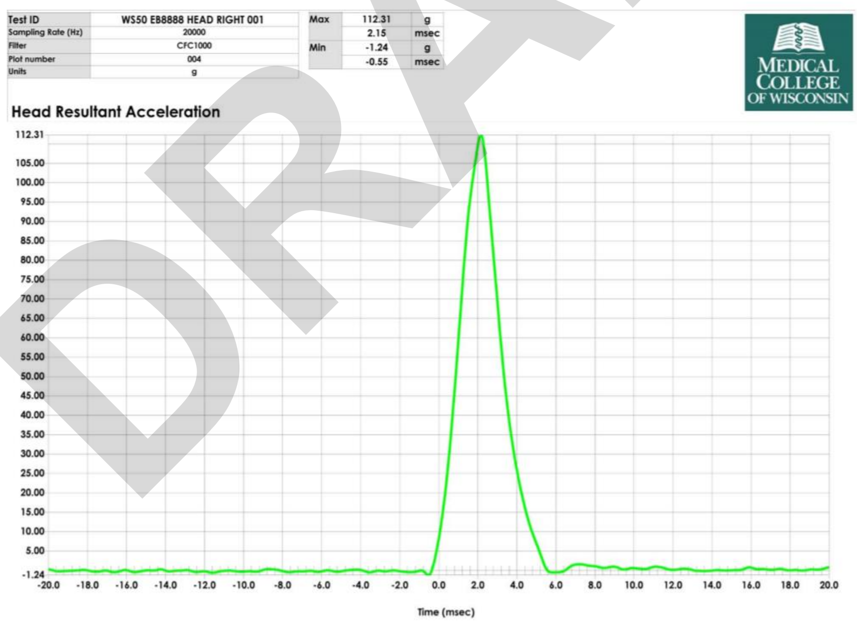


TABLE 4
LEFT LATERAL NECK PENDULUM TEST

WSID Serial Number EB8888 Test Sequences 1 & 2

TEST PARAMETER		SPEC.	PRE		POST	
Date		-	10/28/2019		11/20/2019	
Sequential Test Number		-	1		2	
			Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)		**20.6 - 22.2**	21.6	Pass	21.1	Pass
Humidity – During Test (%)		**10 - 70**	42.9	Pass	30.9	Pass
Pendulum Velocity (m/s)		**3.3 - 3.5**	3.45	Pass	3.44	Pass
Pendulum Deceleration (m/s)	4 ms	**0.77 - 1.04**	0.89	Pass	0.941	Pass
	8 ms	**1.60 - 1.90**	1.77	Pass	1.871	Pass
	12 ms	**2.43 - 3.29**	2.65	Pass	2.805	Pass
Peak Headform Rotation		**50 - 61**	53.87	Pass	54.2	Pass
Peak Headform Rotation Decay Time to 0 Degrees		**58 - 72**	60.0	Pass	60.6	Pass
Peak Moment at Occipital Condyle		**54 - 67**	64.2	Pass	64.4	Pass
Peak Moment at Occipital Condyle Decay Time to 0 Nm		**71 - 87**	75.5	Pass	76.1	Pass
Peak Headform Y Angular Rate (deg/s)		**2163 - 2393**	2292.1	Pass	2332.4	Pass

PLOTS 10 & 11
LEFT LATERAL NECK PENDULUM TEST (CONTINUED)

PRE-TEST

PLOTS 12 & 13
LEFT LATERAL NECK PENDULUM TEST (CONTINUED)

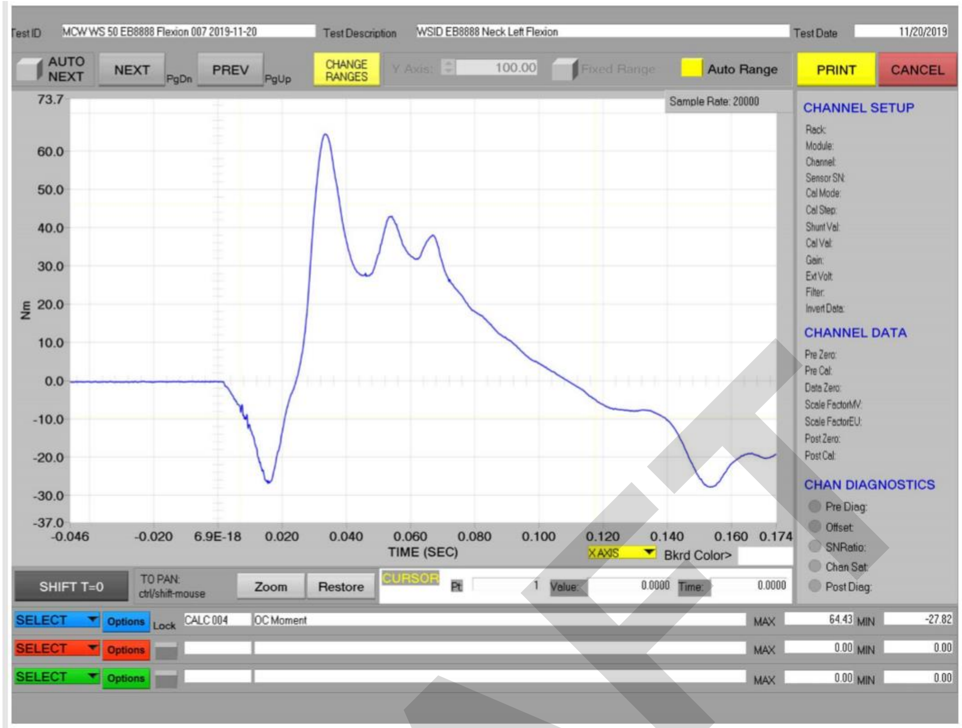
PRE-TEST

PLOTS 14 & 15
LEFT LATERAL NECK PENDULUM TEST (CONTINUED)

POST-TEST

PLOTS 16 & 17
LEFT LATERAL NECK PENDULUM TEST (CONTINUED)

POST-TEST



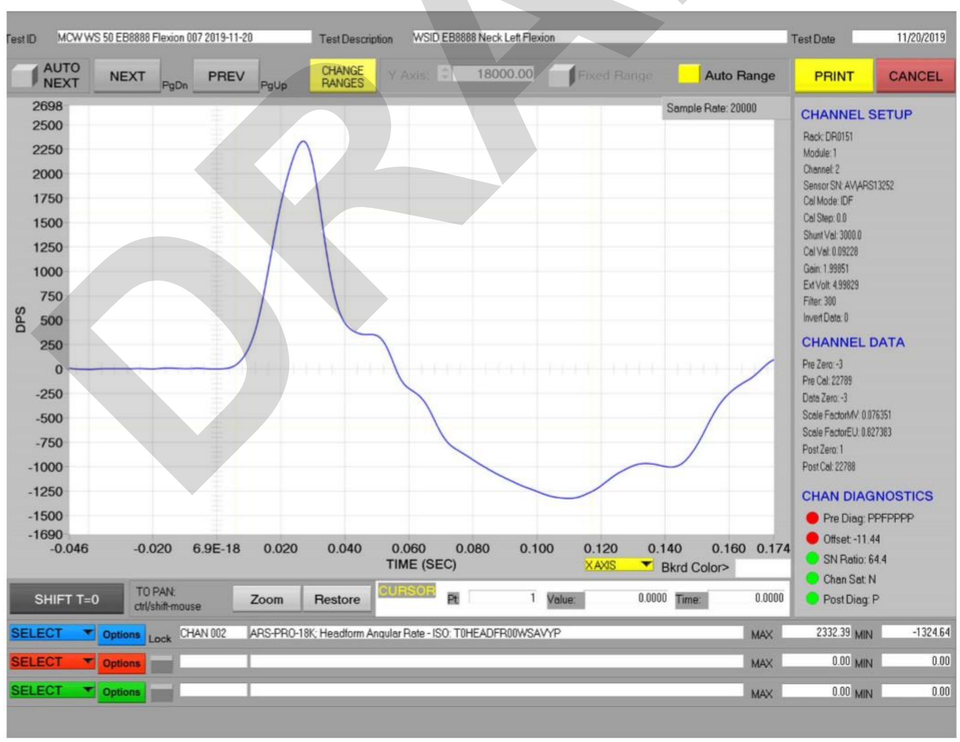


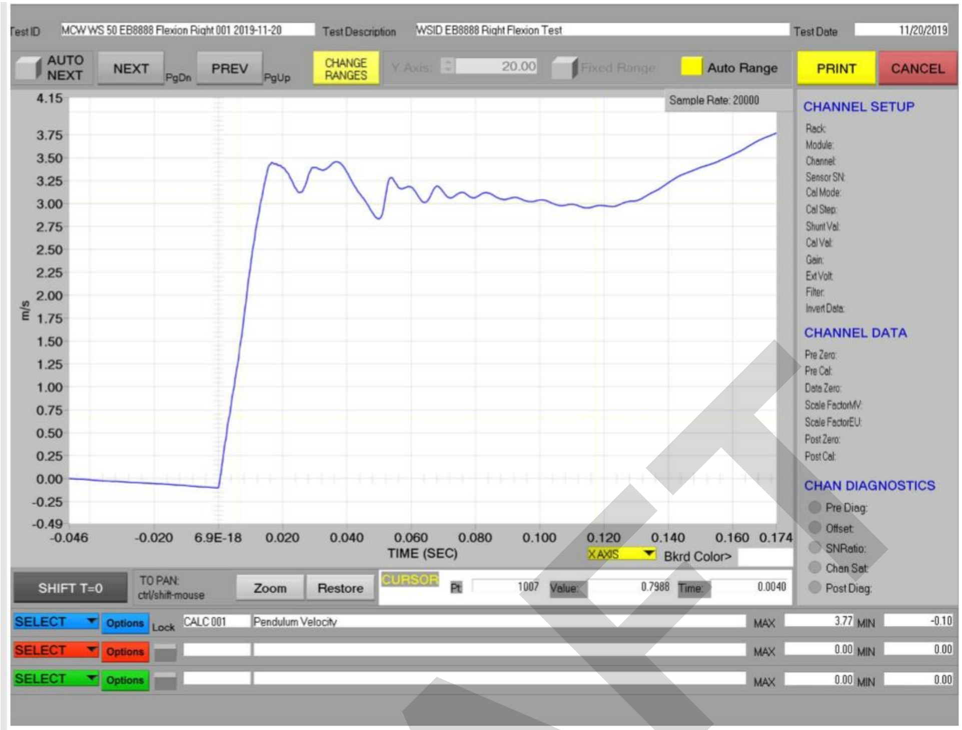
TABLE 5
RIGHT LATERAL NECK PENDULUM TEST

WSID Serial Number EB8888 Test Sequences 1

TEST PARAMETER		SPEC.	POST	
Date		-	11/20/2019	
Sequential Test Number		-	1	
			Result	**Pass/Fail**
Temperature – During Test (°C)		**20.6 - 22.2**	21.0	Pass
Humidity – During Test (%)		**10 - 70**	29.5	Pass
Pendulum Velocity (m/s)		**3.3 - 3.5**	3.45	Pass
Pendulum Deceleration (m/s)	4 ms	**0.77 - 1.04**	0.94	Pass
	8 ms	**1.60 - 1.90**	1.91	Fail
	12 ms	**2.43 - 3.29**	2.93	Pass
Peak Headform Rotation		**50 - 61**	54.0	Pass
Peak Headform Rotation Decay Time to 0 Degrees		**58 - 72**	61.2	Pass
Peak Moment at Occipital Condyle		**54 - 67**	65.9	Pass
Peak Moment at Occipital Condyle Decay Time to 0 Nm		**71 - 87**	76.5	Pass
Peak Headform Y Angular Rate (deg/s)		**2163 - 2393**	2364.1	Pass

PLOTS 18 & 19
RIGHT LATERAL NECK PENDULUM TEST (CONTINUED)

POST-TEST



PLOTS 20 & 21
RIGHT LATERAL NECK PENDULUM TEST (CONTINUED)

POST-TEST

TABLE 6
LEFT NECK TORSION PENDULUM TEST

WSID Serial Number EB8888 Test Sequences 1 & 2

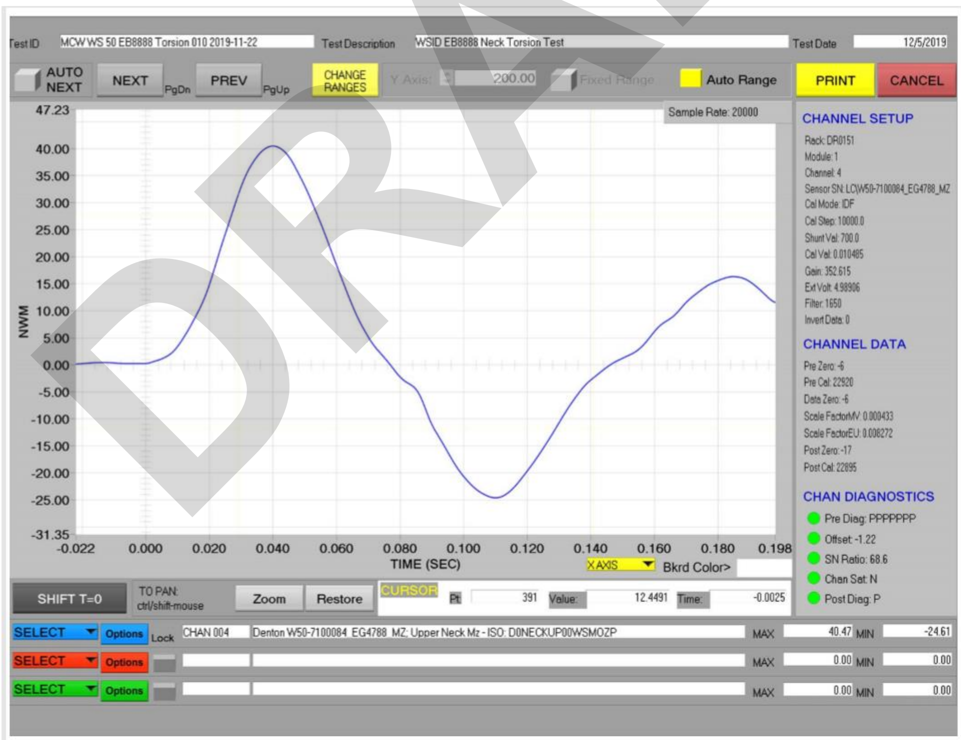
TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/28/2019		11/22/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	21.6	Pass	20.8	Pass
Humidity – During Test (%)	**10 - 70**	39.7	Pass	26.8	Pass
Pendulum Velocity (m/s)	**5.1 - 5.3**	5.21	Pass	5.22	Pass
Pendulum Deceleration (m/s) 10 ms	**2.04 - 2.28**	2.06	Pass	2.27	Pass
Pendulum Deceleration (m/s) 15 ms	**3.2 - 3.57**	3.14	Fail	3.45	Pass
Pendulum Deceleration (m/s) 20 ms	**4.32 - 4.83**	4.22	Fail	4.62	Pass
Peak Fixture Rotation (deg)	**45.0 – 48.0**	43.9	Fail	44.6	Fail
Decay Time to 0° from Peak Angle (ms)	**37.0 – 41.0**	38.1	Pass	38.2	Pass
Peak Head Angular Velocity, Z Axis (deg/s)	**1450 - 1560**	1460.7	Pass	1514.6	Pass
Peak Lower Neck Moment, Z Axis (Nm)	**36.0 – 40.0**	39.8	Pass	40.2	Fail

PLOTS 22 & 23
LEFT NECK TORSION PENDULUM TEST (CONTINUED)

PRE-TEST

PLOTS 24 & 25
LEFT NECK TORSION PENDULUM TEST (CONTINUED)
PRE-TEST

PLOTS 26 & 27
LEFT NECK TORSION PENDULUM TEST (CONTINUED)
POST-TEST



PLOTS 28 & 29
LEFT NECK TORSION PENDULUM TEST (CONTINUED)
POST-TEST

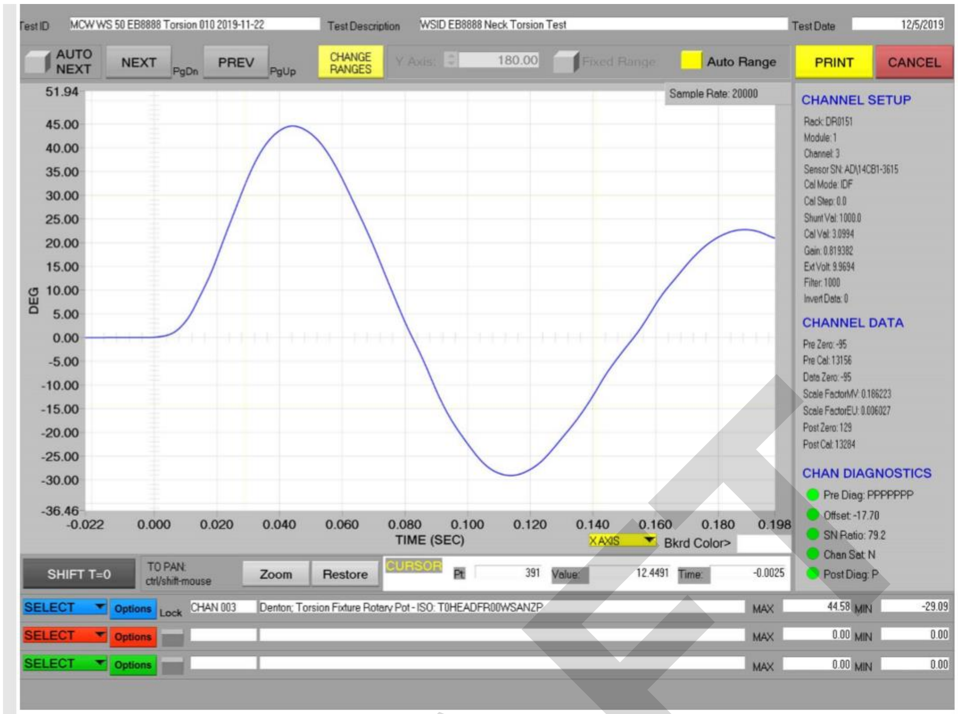


TABLE 7
RIGHT NECK TORSION PENDULUM TEST

WSID Serial Number EB8888 Test Sequences 1

TEST PARAMETER		SPEC.	POST	
Date		-	11/25/2019	
Sequential Test Number		-	1	
			Result	**Pass/Fail**
Temperature – During Test (°C)		**20.6 - 22.2**	21.4	Pass
Humidity – During Test (%)		**10 - 70**	28.7	Pass
Pendulum Velocity (m/s)		**5.1 - 5.3**	5.22	Pass
Pendulum Deceleration (m/s)	10 ms	**2.04 - 2.28**	2.24	Pass
	15 ms	**3.2 - 3.57**	3.41	Pass
	20 ms	**4.32 - 4.83**	4.56	Pass
Peak Fixture Rotation (deg)		**45.0 – 48.0**	437.	Fail
Decay Time to 0° from Peak Angle (ms)		**37.0 – 41.0**	37.7	Pass
Peak Head Angular Velocity, Z Axis (deg/s)		**1450 - 1560**	1536.3	Pass
Peak Lower Neck Moment, Z Axis (Nm)		**36.0 – 40.0**	41.0	Fail

PLOTS 30 & 31
RIGHT NECK TORSION PENDULUM TEST (CONTINUED)
POST-TEST

PLOTS 32 & 33
RIGHT NECK TORSION PENDULUM TEST (CONTINUED)
POST-TEST

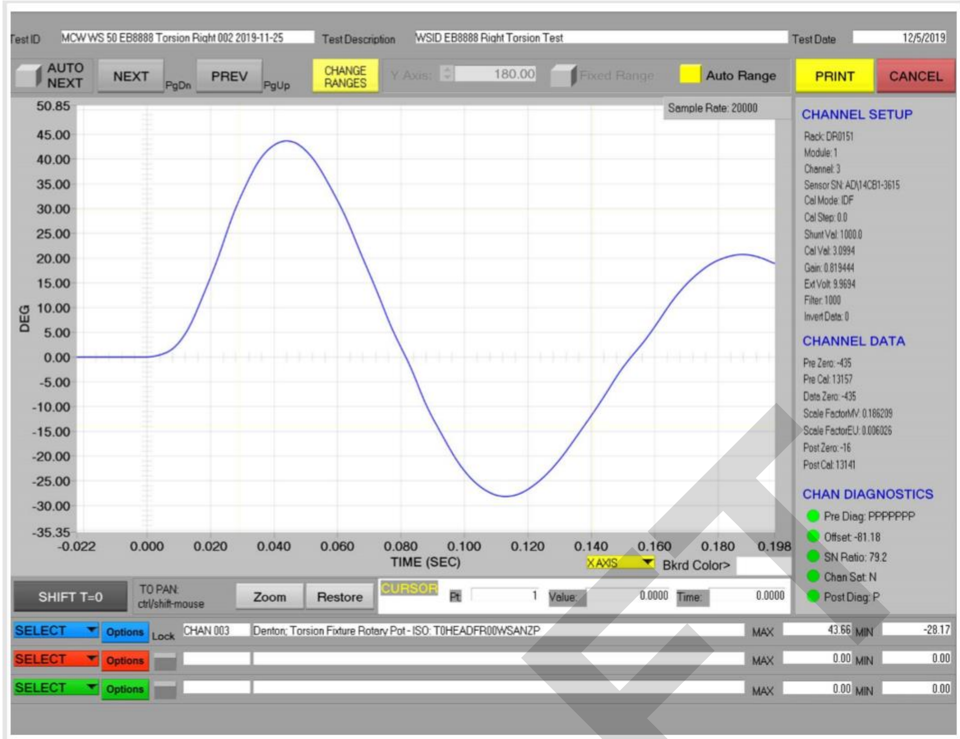
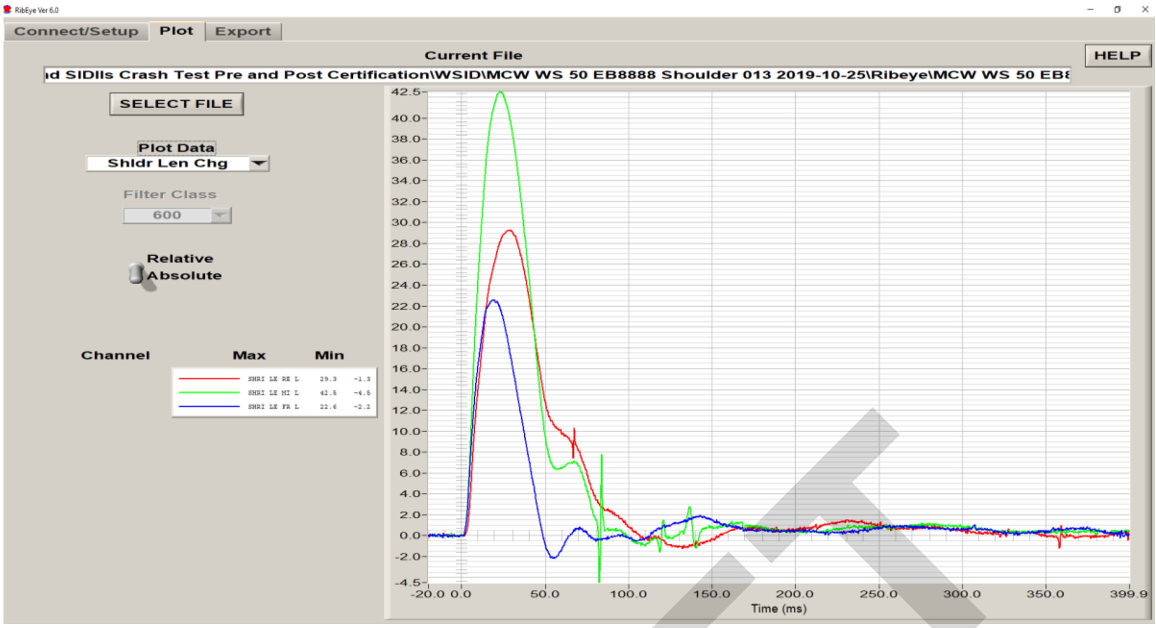


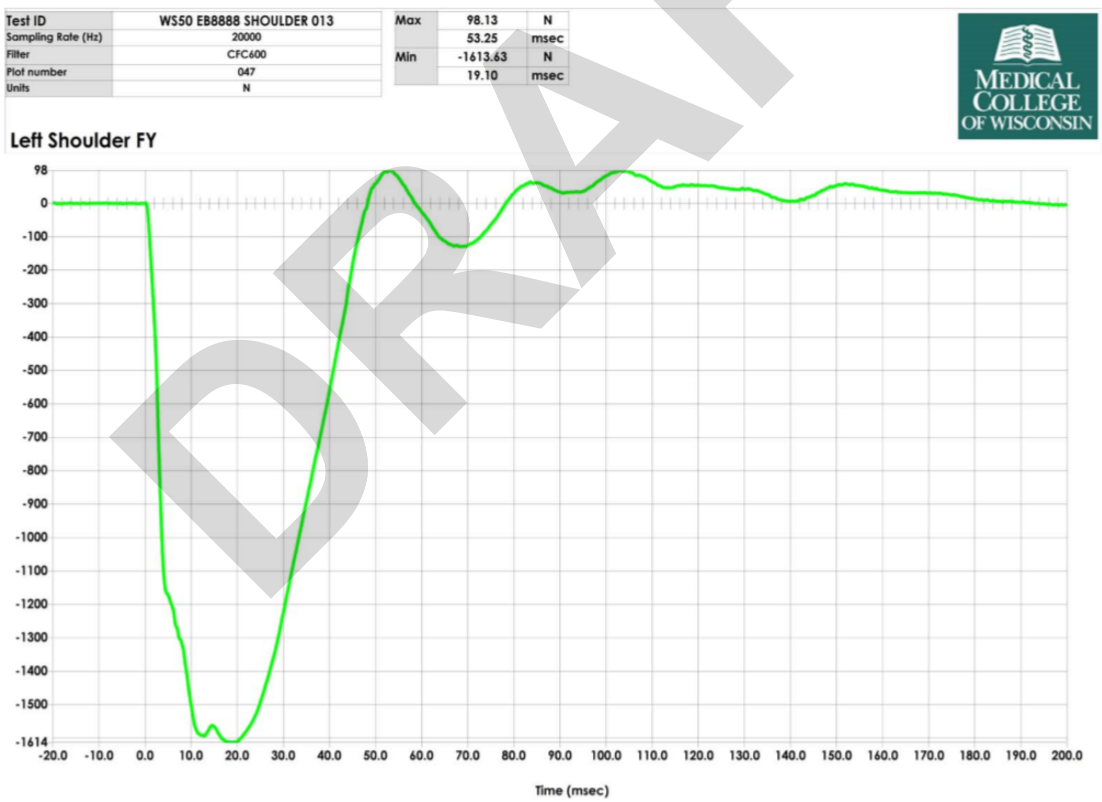
TABLE 8
SHOULDER IMPACT TEST

WSID Serial Number EB8888 Test Sequences 1 & 2

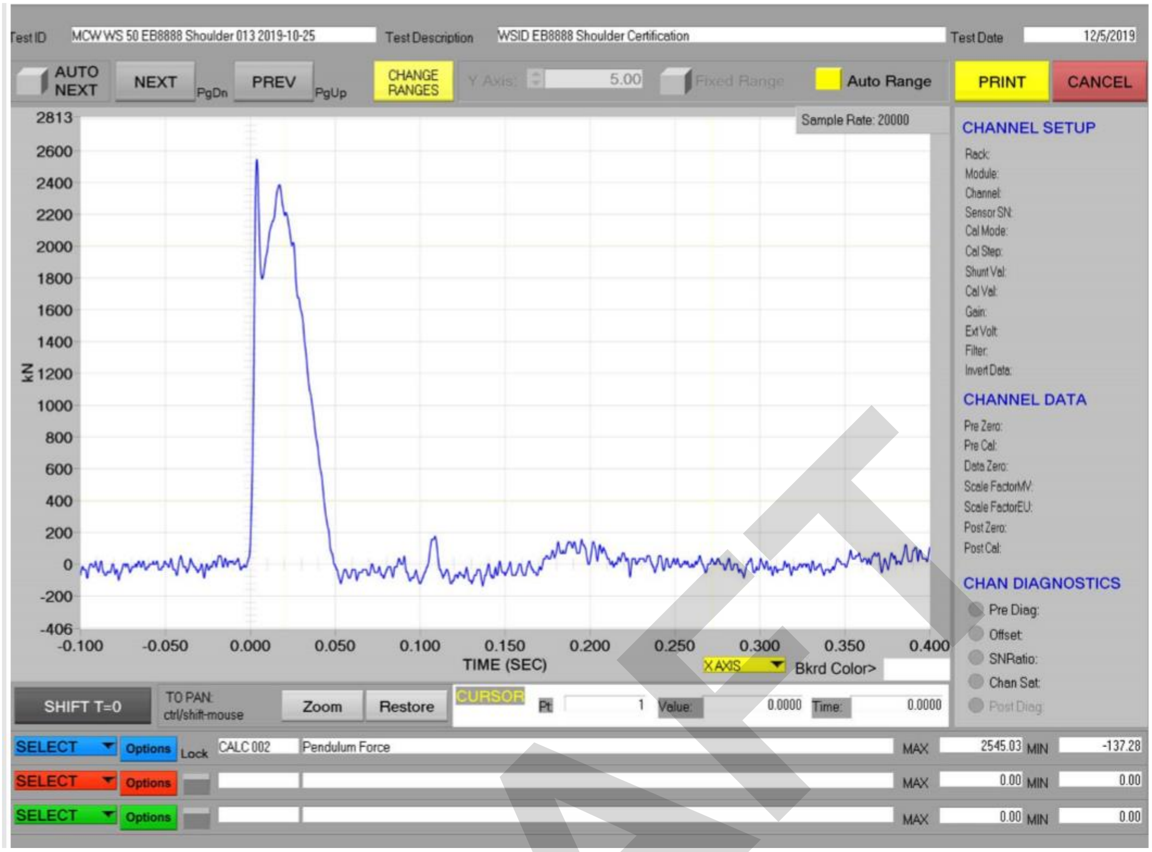
TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/25/2019		11/27/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	20.7	Pass	20.8	Pass
Relative Humidity – During Test (%)	**10 - 70**	37.4	Pass	32.6	Pass
Impactor Velocity (m/s)	**4.2 - 4.4**	4.39	Pass	4.4	Pass
Peak Shoulder Deflection (mm)	**37 - 46**	42.5	Pass	42.3	Pass
Peak Lateral Shoulder Force (kN)	**1.50 - 1.90**	1.61	Pass	1.62	Pass
Peak Pendulum Force (kN)	**2.60 - 3.30**	2.55	Fail	2.56	Fail

PLOTS 34 & 35
SHOULDER IMPACT TEST (CONTINUED)
PRE-TEST

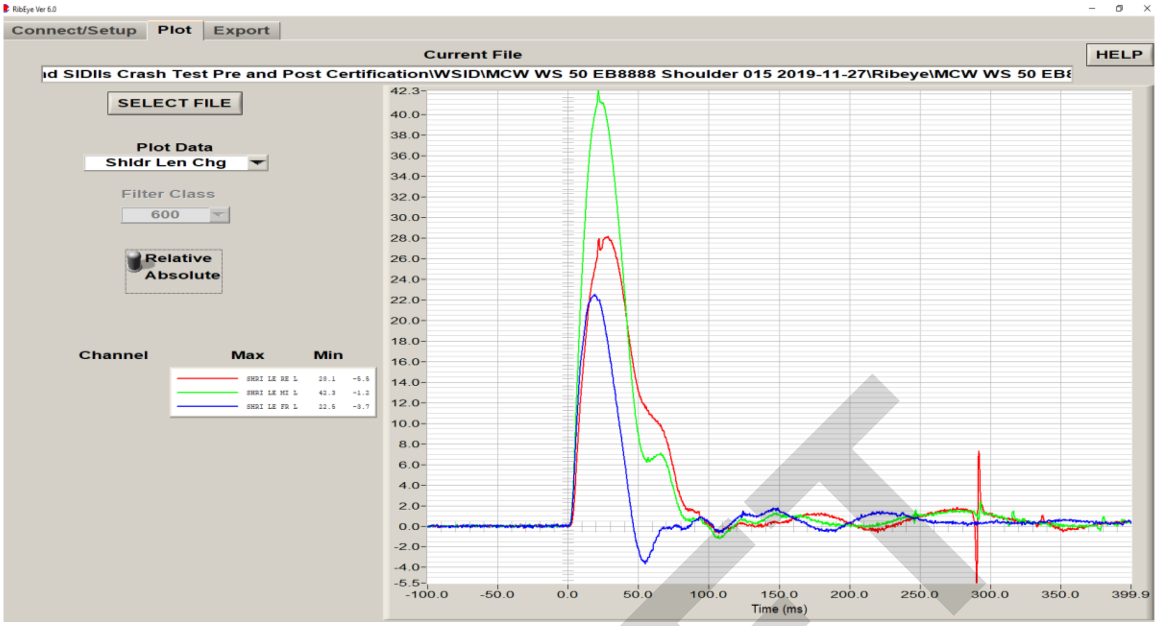




PLOT 36
SHOULDER IMPACT TEST (CONTINUED)

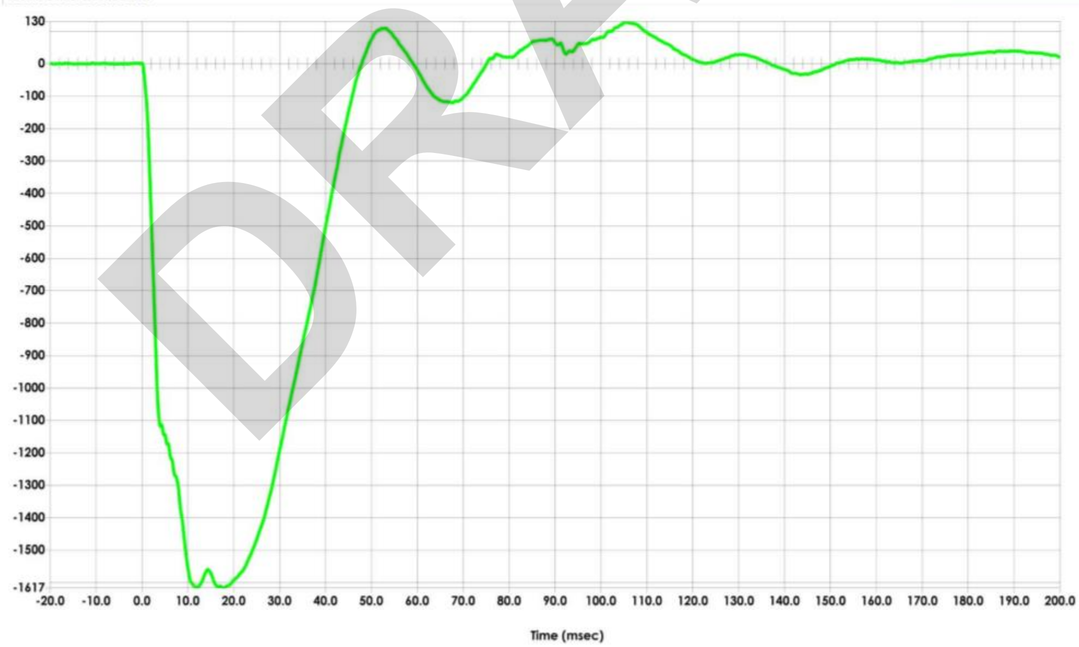


PLOTS 37 & 38
SHOULDER IMPACT TEST (CONTINUED)
POST-TEST



Test ID	WS50 EB8888 SHOULDER 015	Max	130.17	N
Sampling Rate (Hz)	20000		105.30	msec
Filter	CFC600	Min	-1616.74	N
Plot number	047		17.70	msec
Units	N			

Left Shoulder FY



PLOT 39

SHOULDER IMPACT TEST (CONTINUED)
POST-TEST

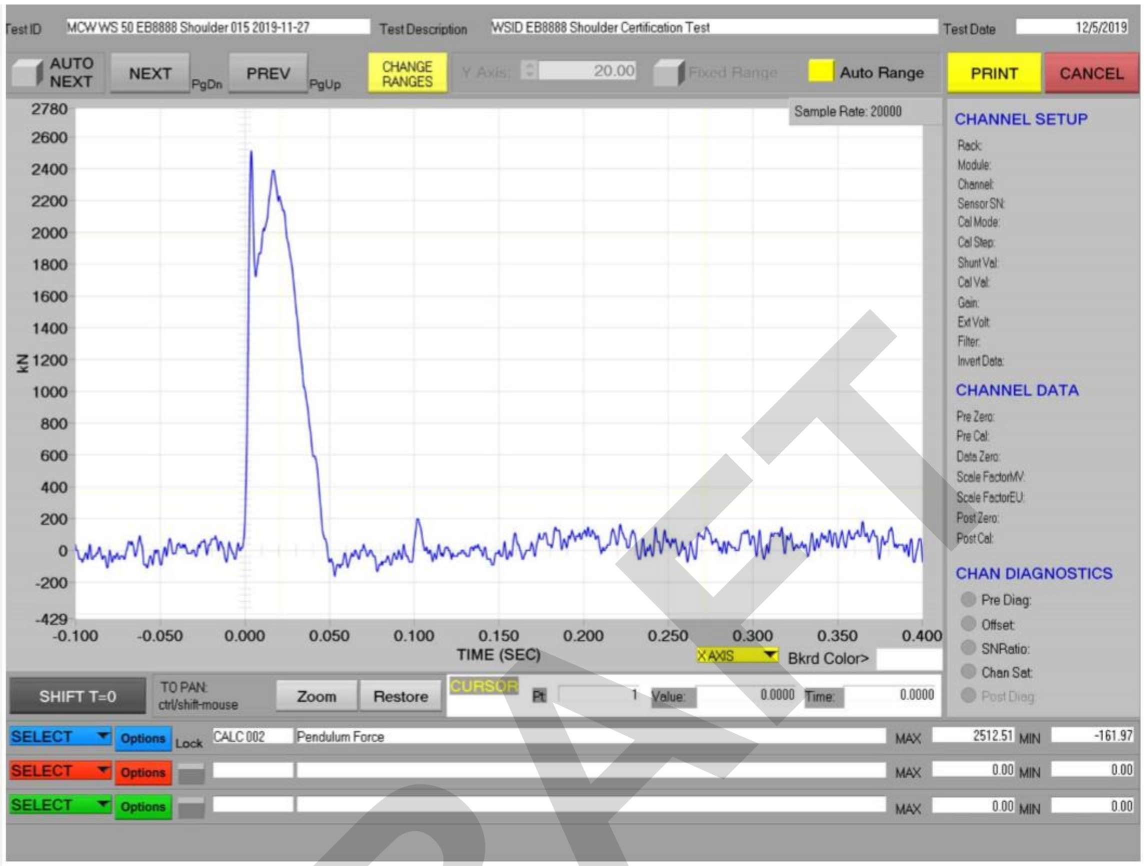


TABLE 9

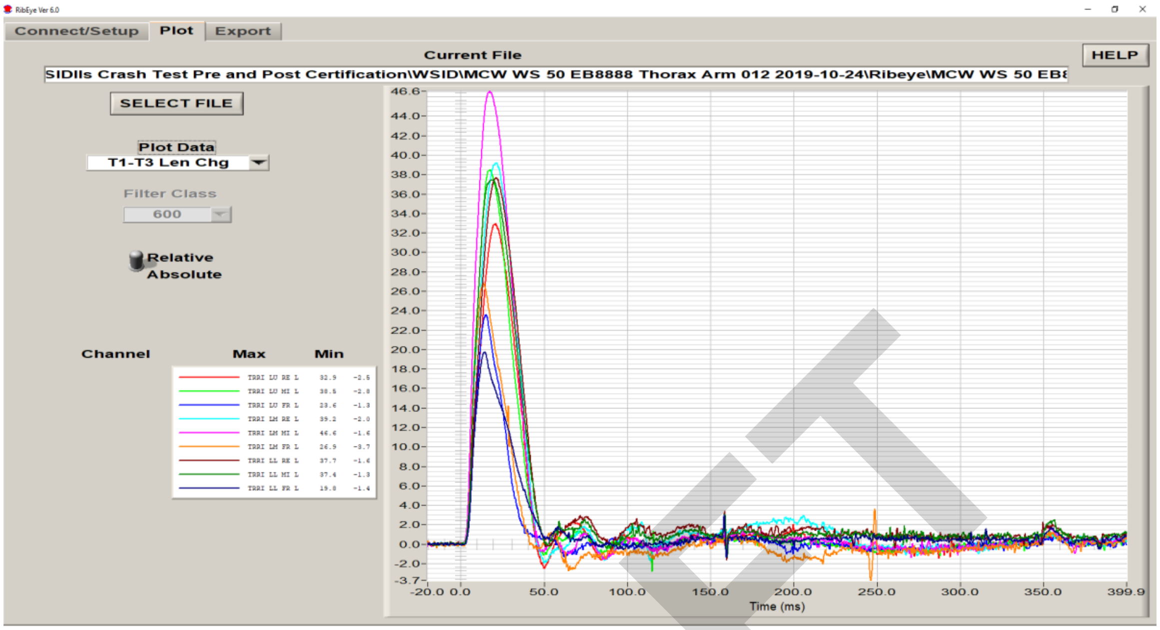
THORAX (WITH ARM) IMPACT TEST

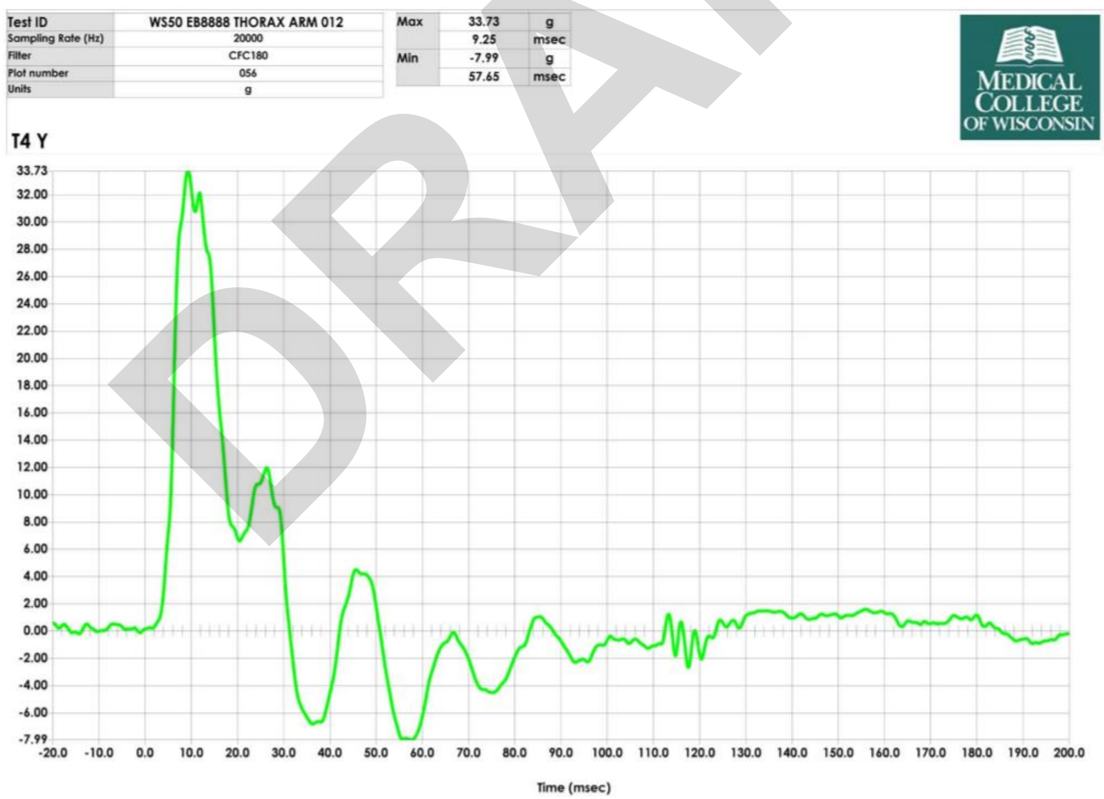
WSID Serial Number EB8888 Test Sequences 1 & 2

TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/24/2019		11/26/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	21.0	Pass	21.0	Pass
Relative Humidity – During Test (%)	**10 - 70**	41.6	Pass	29.4	Pass
Impactor Velocity (m/s)	**6.6 - 6.8**	6.74	Pass	6.73	Pass
Peak Thorax Rib 1 Deflection (mm)	**35 - 47**	38.5	Pass	40.0	Pass
Peak Thorax Rib 2 Deflection (mm)	**46 - 56**	46.6	Pass	45.4	Fail
Peak Thorax Rib 3 Deflection (mm)	**33.5 – 40.5**	37.4	Pass	36.2	Pass
Peak T4 Y Axis Acceleration (g)	**28 - 37**	33.7	Pass	32.6	Pass
Peak T12 Y Axis Acceleration (g)	**22 - 28**	23.4	Pass	23.5	Pass
Peak Pendulum Force (kN)	**5.3 – 6.2**	5.85	Pass	5.7	Pass

PLOTS 40 & 41

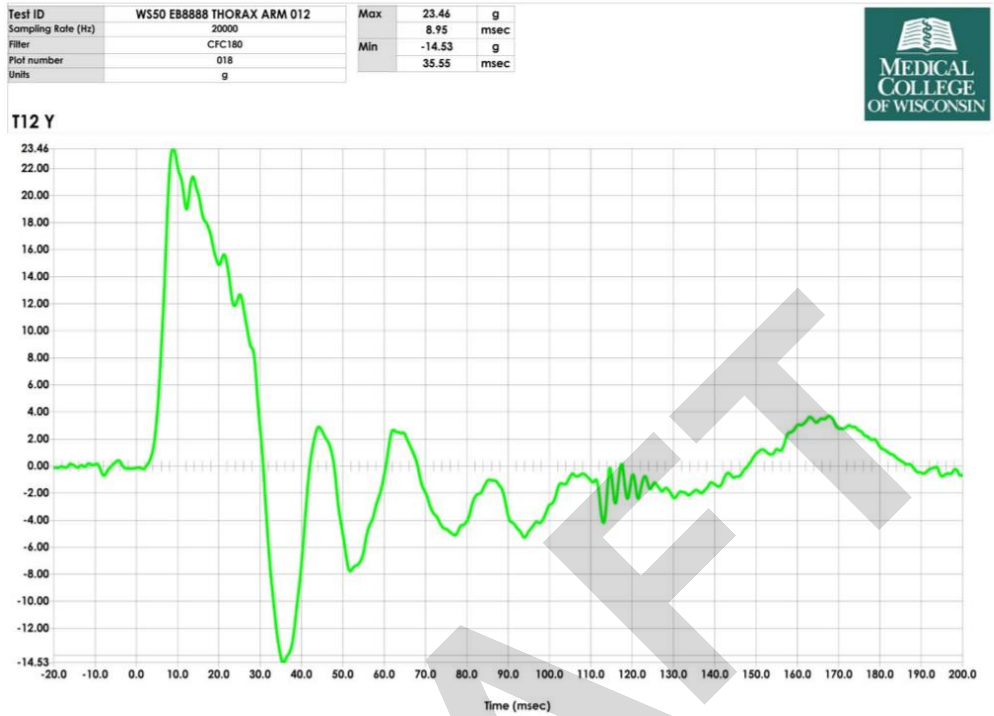
THORAX (WITH ARM) IMPACT TEST (CONTINUED)
PRE-TEST

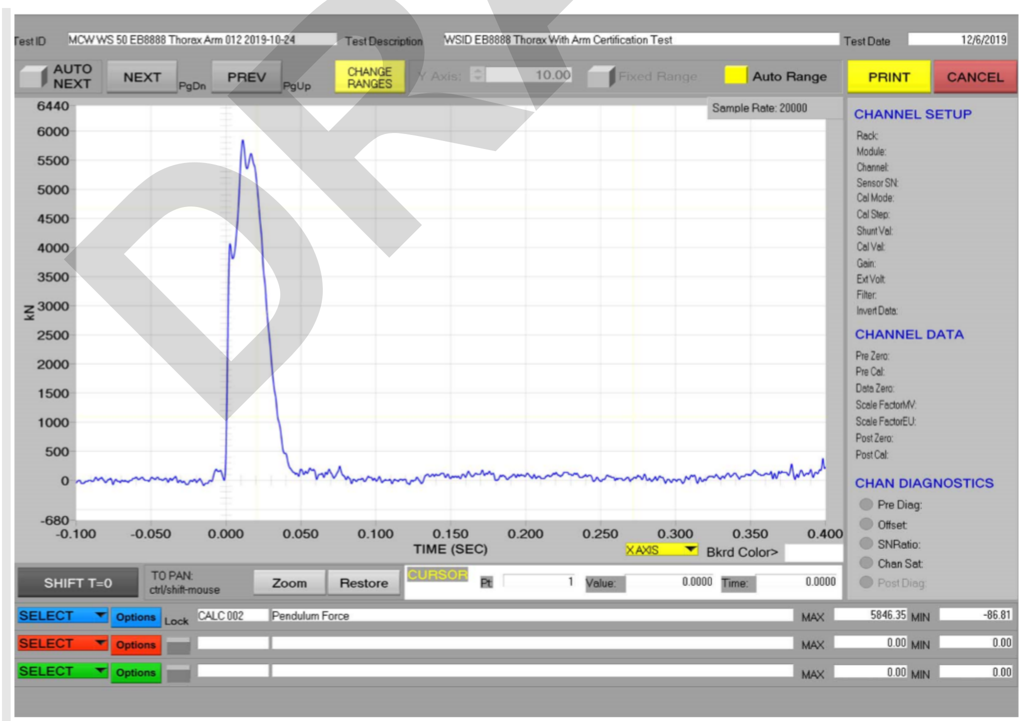




PLOTS 42 & 43

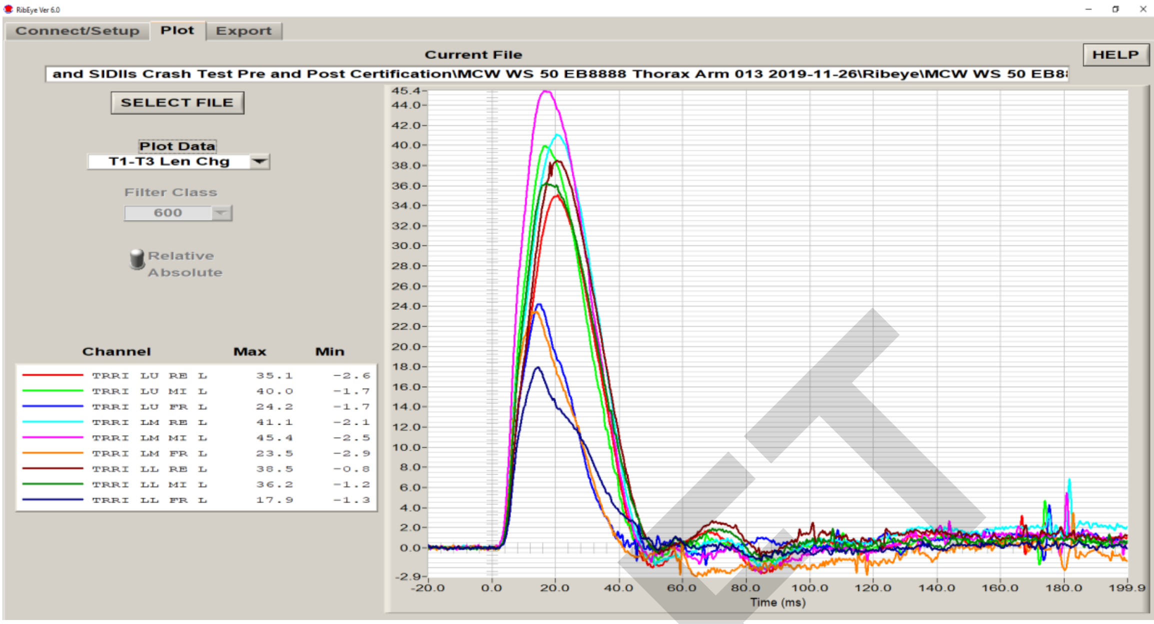
THORAX (WITH ARM) IMPACT TEST (CONTINUED)
PRE-TEST



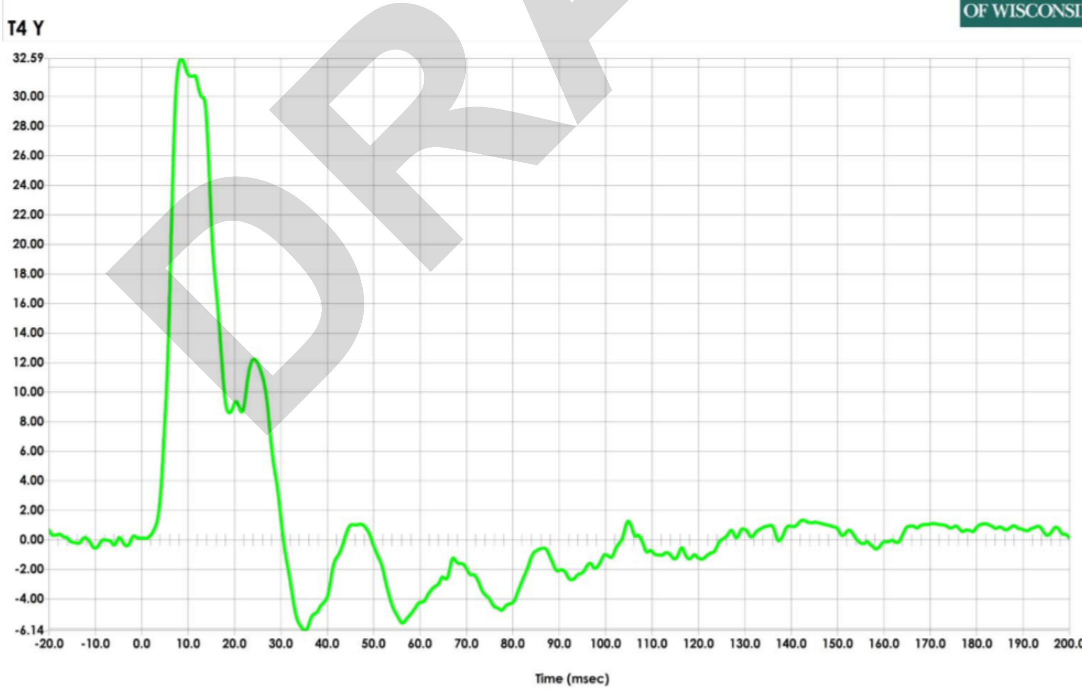


PLOTS 44 & 45

THORAX (WITH ARM) IMPACT TEST (CONTINUED)
POST-TEST



Test ID	WS50 EB8888 THORAX ARM 013	Max	32.59	g
Sampling Rate (Hz)	20000		8.55	msec
Filter	CFC180	Min	-6.14	g
Plot number	056		35.15	msec
Units	g			



PLOTS 46 & 47

THORAX (WITH ARM) IMPACT TEST (CONTINUED)
POST-TEST

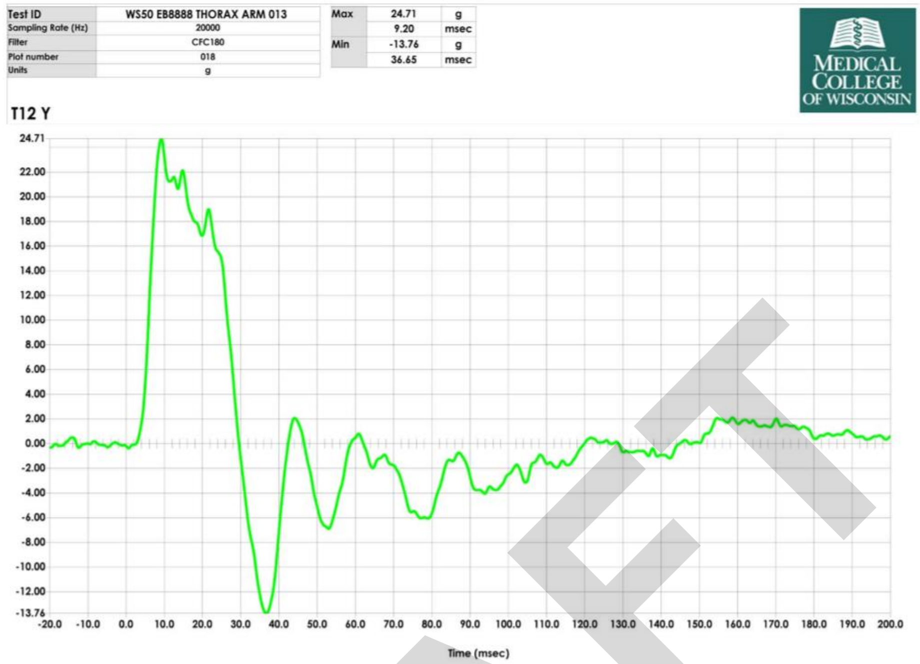


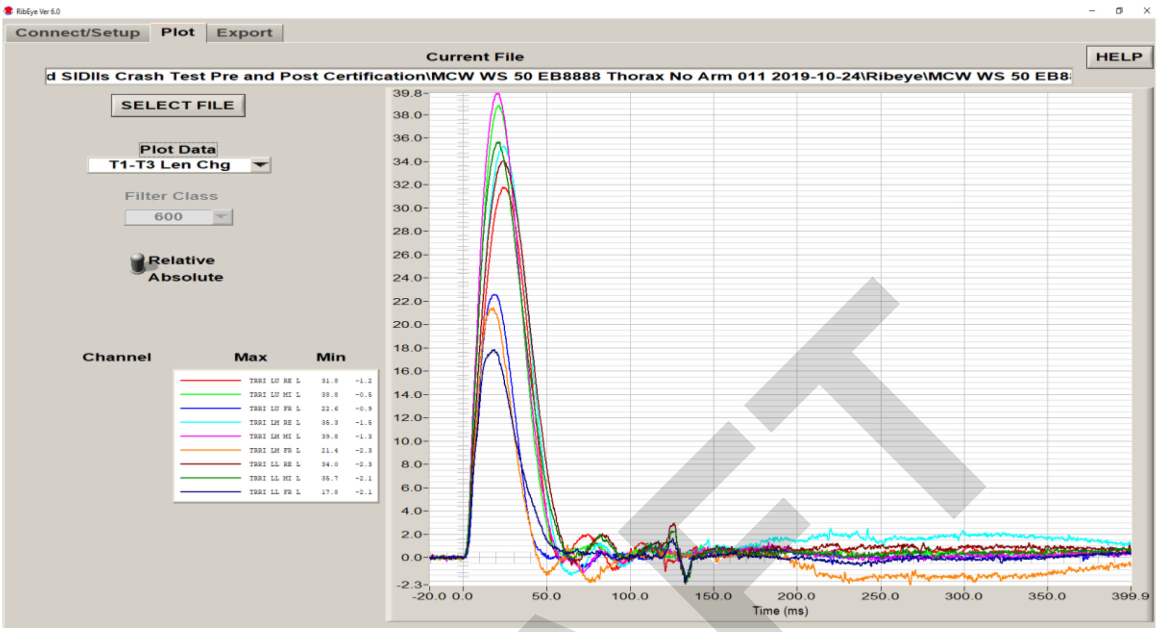
TABLE 10
THORAX (NO ARM) IMPACT TEST

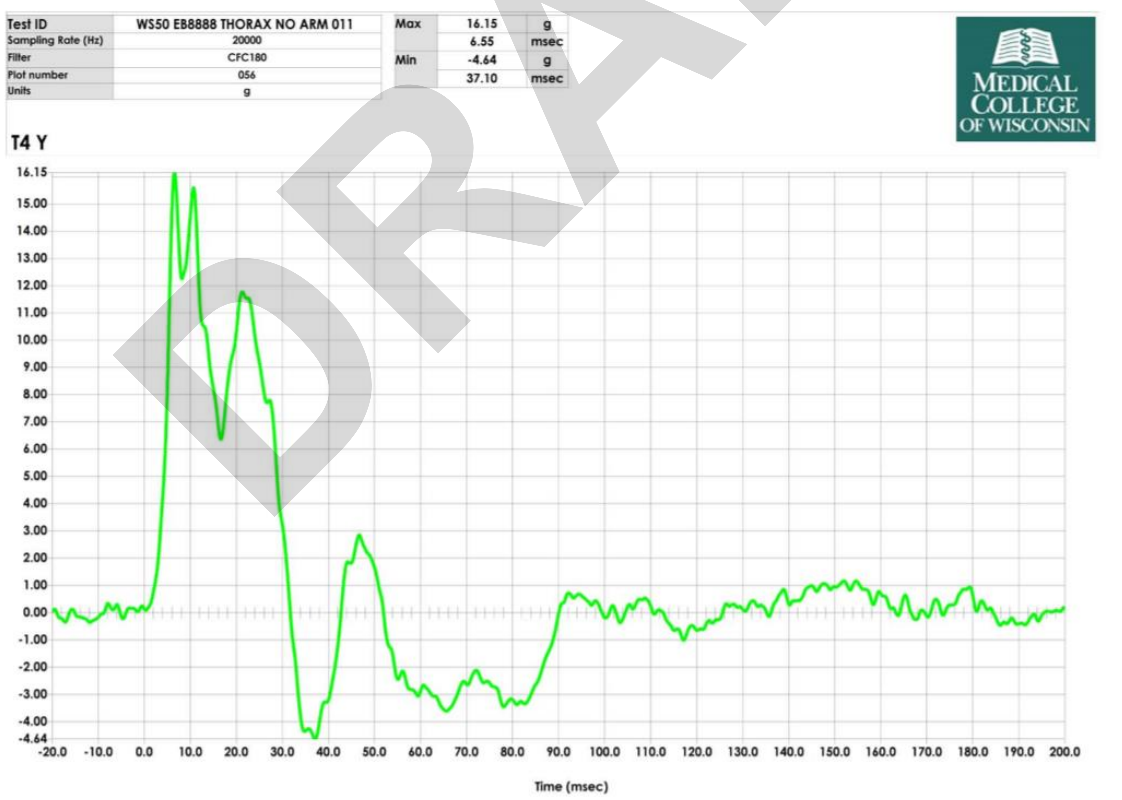
WSID Serial Number EB8888

Test Sequences 1 & 2

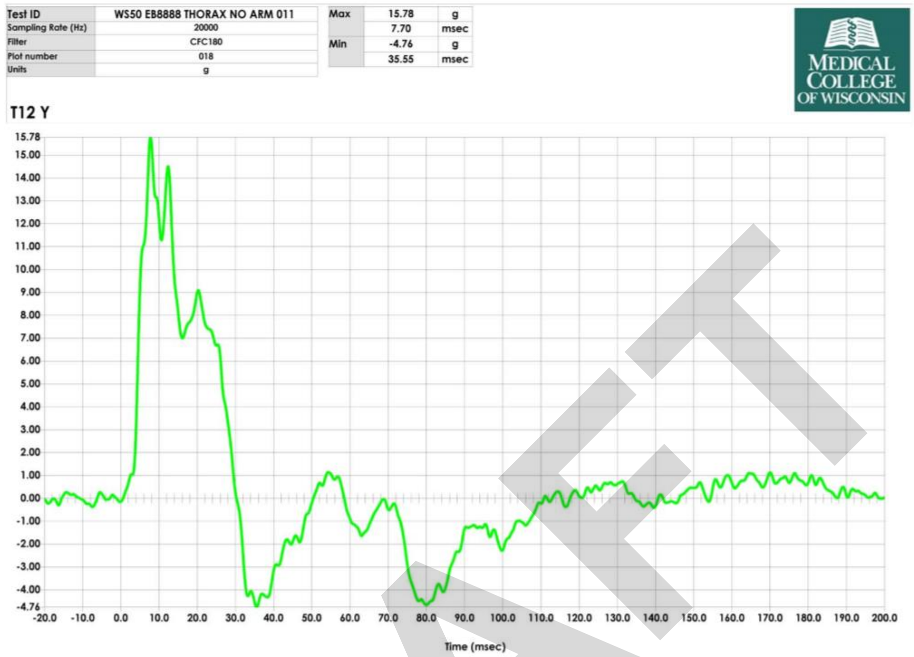
TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/24/2019		11/26/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	21.2	Pass	20.7	Pass
Relative Humidity – During Test (%)	**10 - 70**	41.3	Pass	29.9	Pass
Impactor Velocity (m/s)	**4.2 - 4.4**	4.38	Pass	4.37	Pass
Peak Thorax Rib 1 Deflection (mm)	**33 – 43**	38.8	Pass	37.1	Pass
Peak Thorax Rib 2 Deflection (mm)	**35 – 43**	39.8	Pass	39.7	Pass
Peak Thorax Rib 3 Deflection (mm)	**32 – 40**	35.7	Pass	35.7	Pass
Peak T4 Y Axis Acceleration (g)	**14 – 20**	16.2	Pass	15.5	Pass
Peak T12 Y Axis Acceleration (g)	**14 – 22**	15.8	Pass	17.3	Pass
Peak Pendulum Force (kN)	**3.20 – 3.8**	3.52	Pass	3.31	Pass

PLOTS 48 & 49
THORAX (NO ARM) IMPACT TEST (CONTINUED)
PRE-TEST

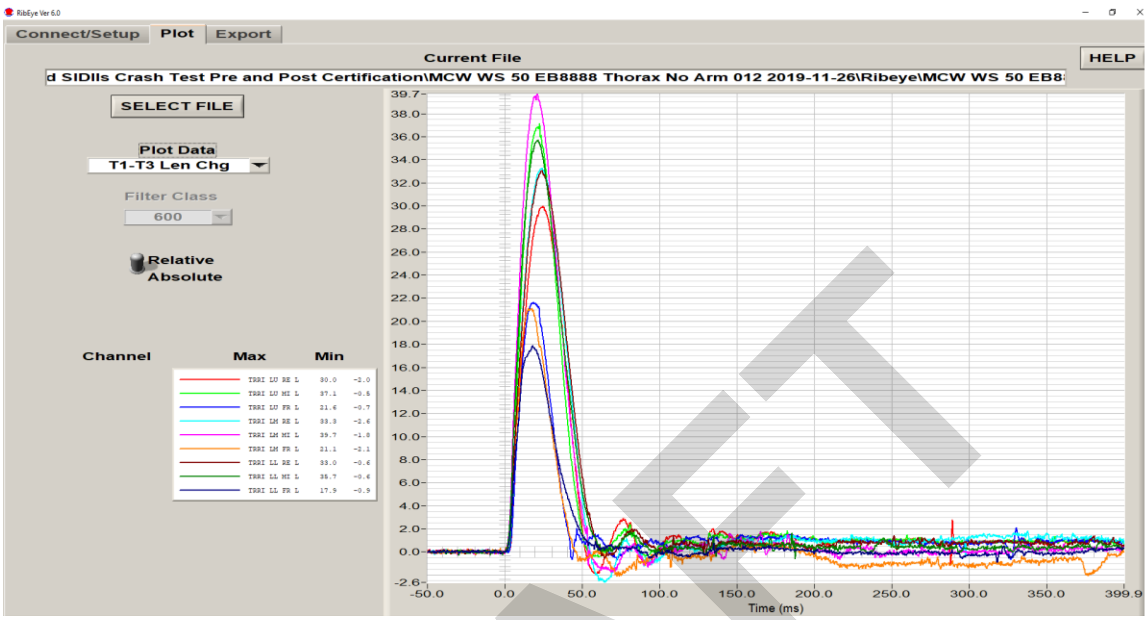


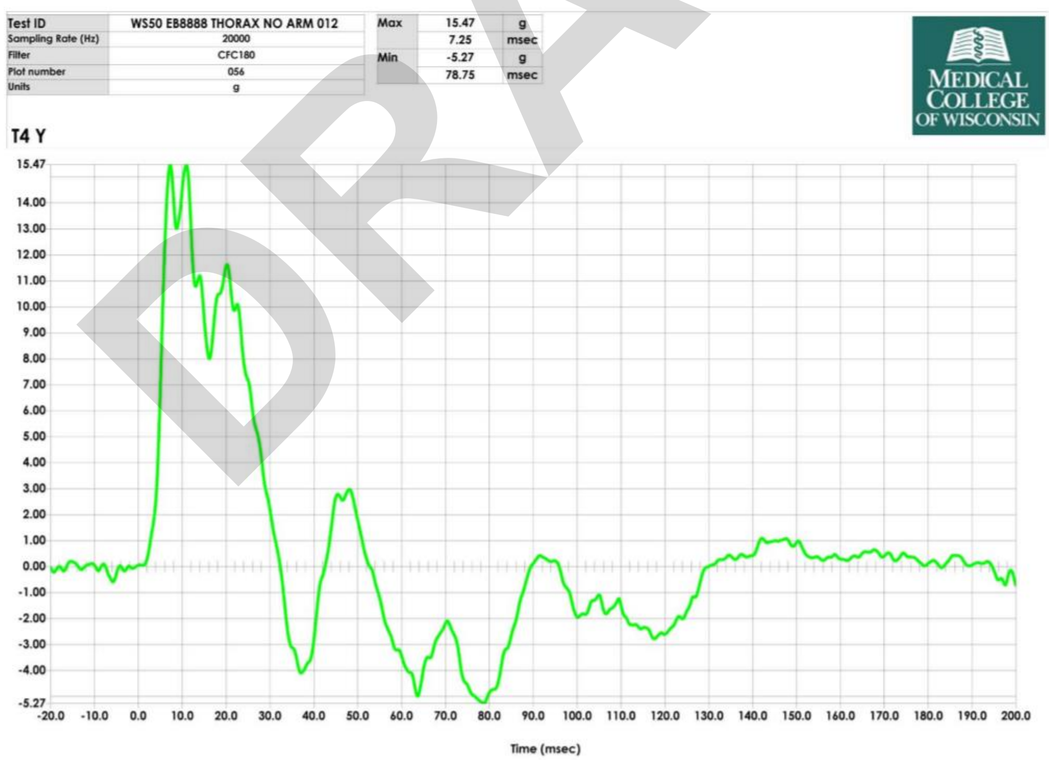


PLOTS 50 & 51
THORAX (NO ARM) IMPACT TEST (CONTINUED)
PRE-TEST

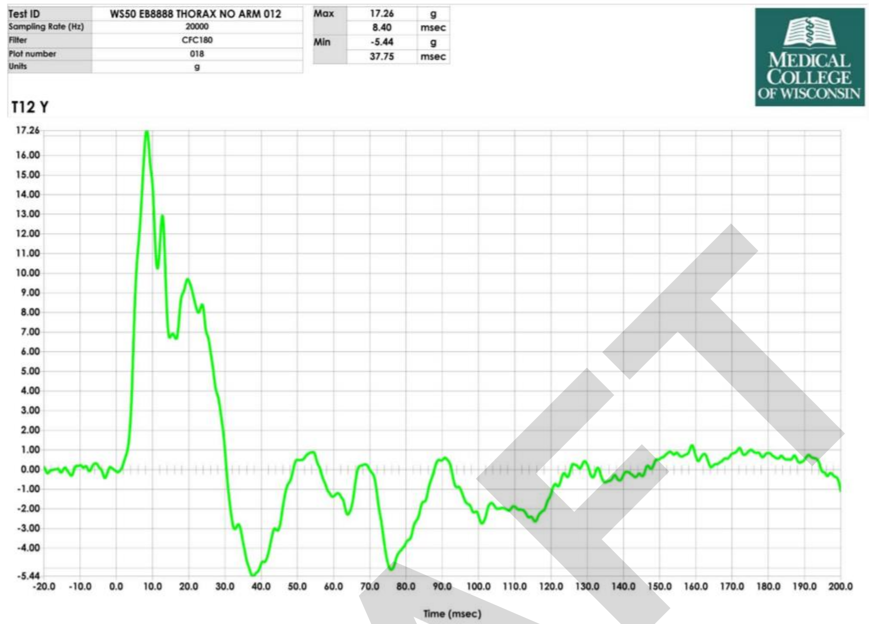


PLOTS 52 & 53
THORAX (NO ARM) IMPACT TEST (CONTINUED)
POST-TEST





PLOTS 54 & 55
THORAX (NO ARM) IMPACT TEST (CONTINUED)
POST-TEST



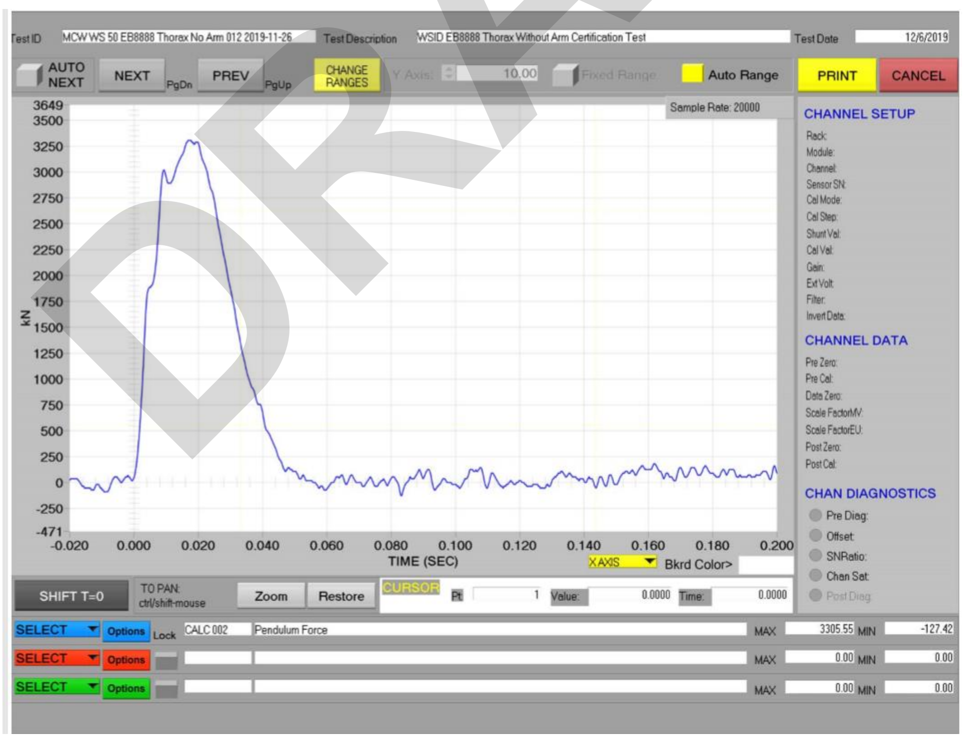
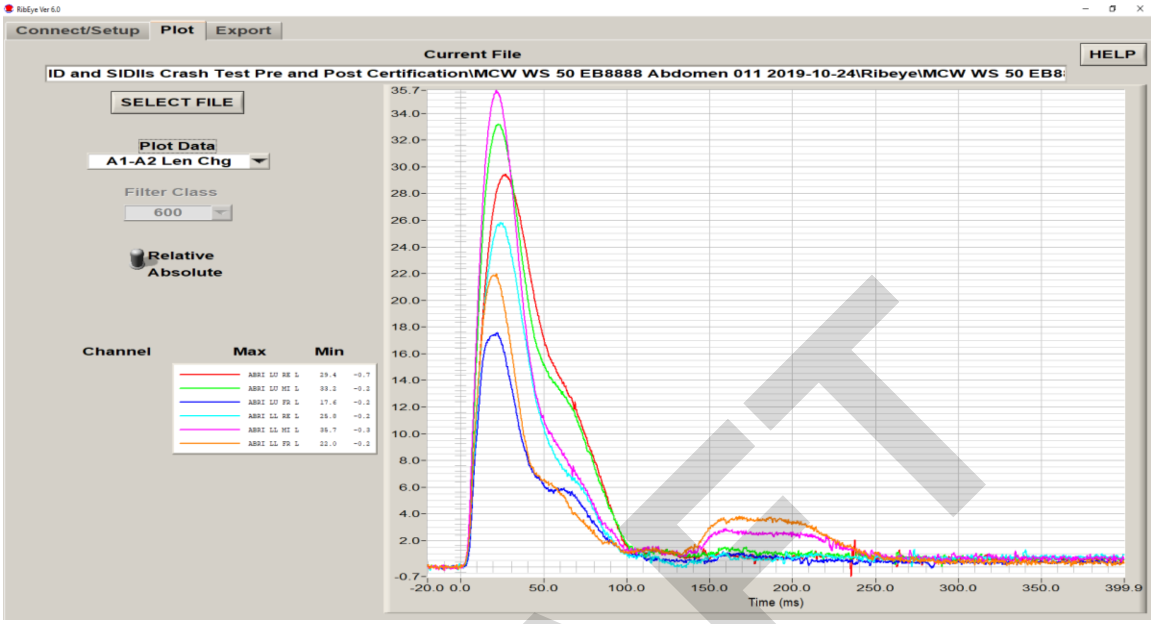


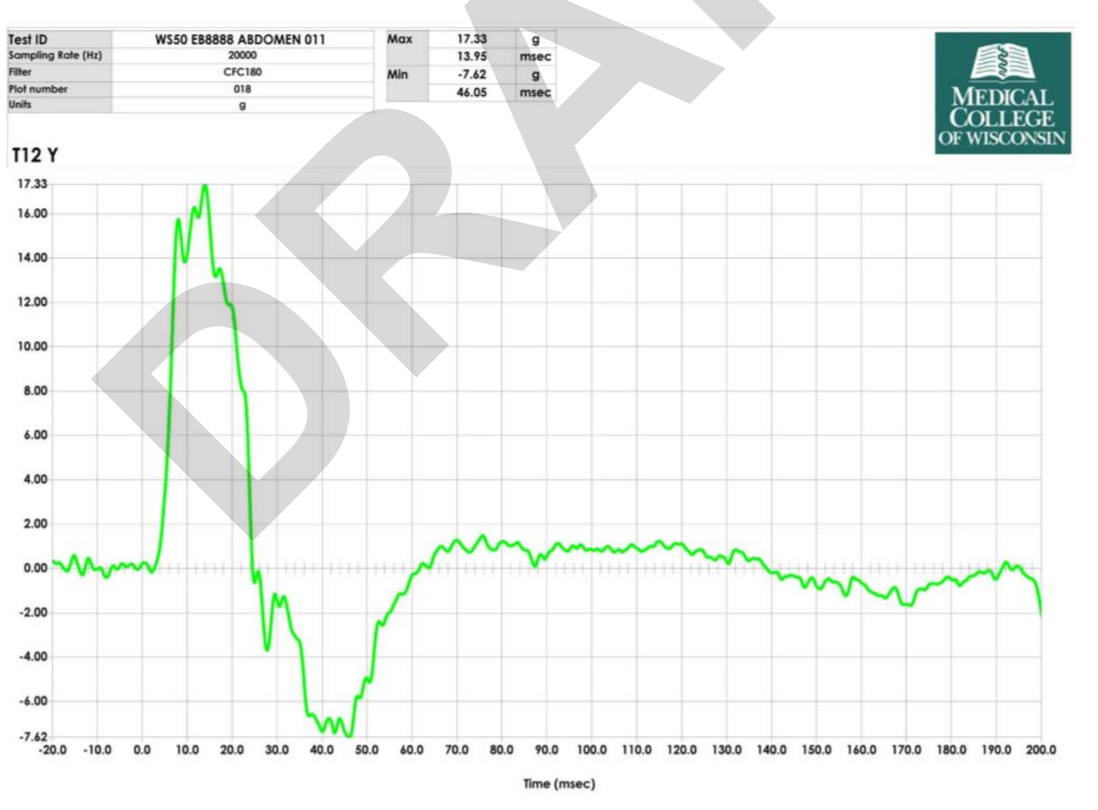
TABLE 11
ABDOMEN IMPACT TEST

WSID Serial Number EB8888 Test Sequences 1 & 2

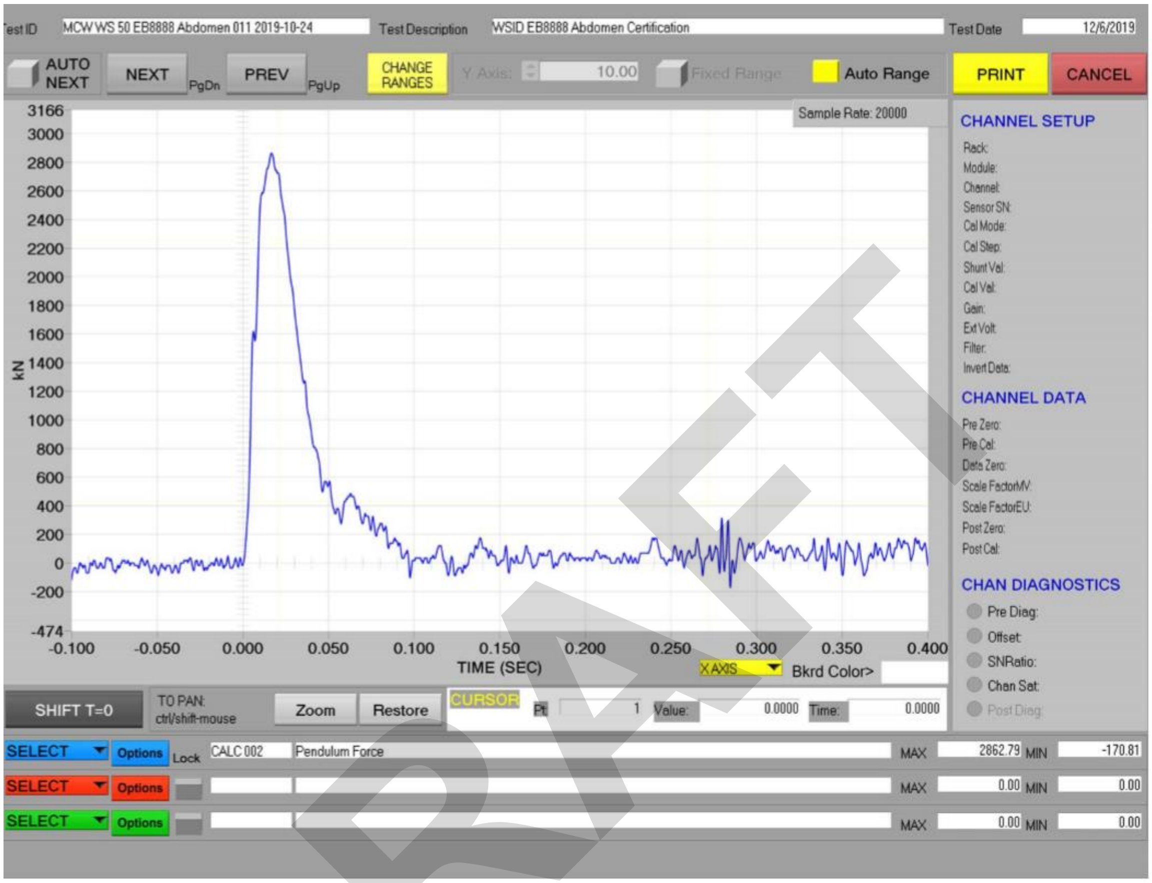
TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/24/2019		11/26/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Result**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	21.3	Pass	21.6	Pass
Relative Humidity – During Test (%)	**10 - 70**	28.5	Pass	41.2	Pass
Impactor Velocity (m/s)	**4.2 - 4.4**	4.35	Pass	4.37	Pass
Peak Abdomen Rib 1 Deflection (mm)	**33 - 40**	33.2	Pass	34.6	Pass
Peak Abdomen Rib 2 Deflection (mm)	**30 - 37**	35.7	Pass	33.0	Pass
Peak T12 Y Axis Acceleration (g)	**15 - 20**	17.3	Pass	17.0	Pass
Peak Pendulum Force (kN)	**2.70 - 3.10**	2.86	Pass	2.82	Pass

PLOTS 56 & 57
ABDOMEN IMPACT TEST (CONTINUED)
PRE-TEST

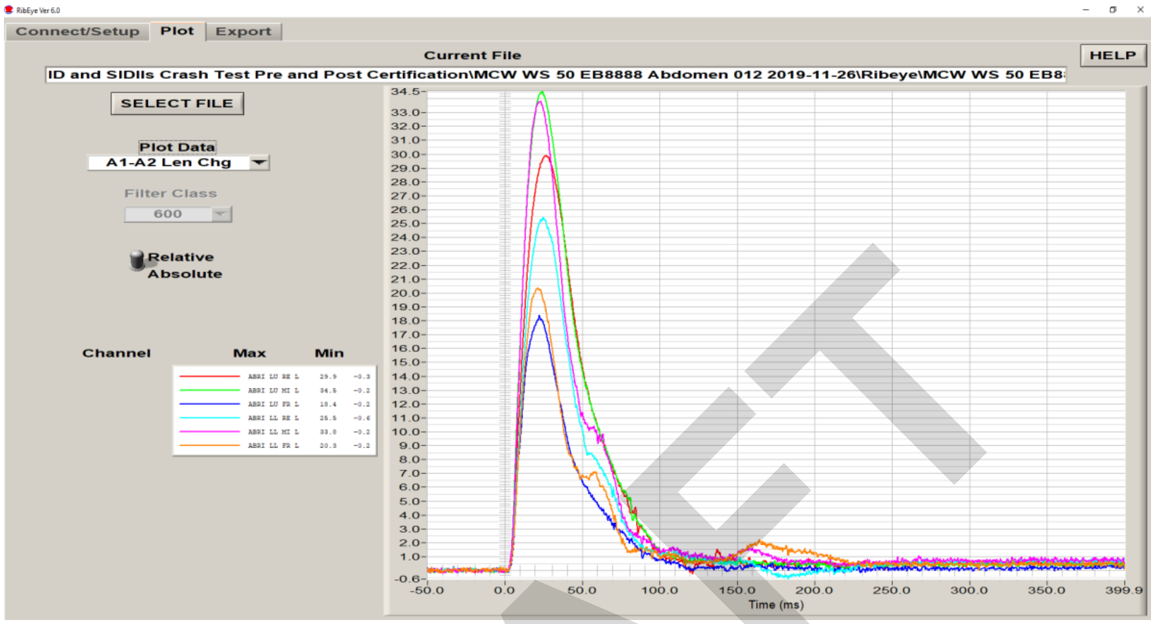


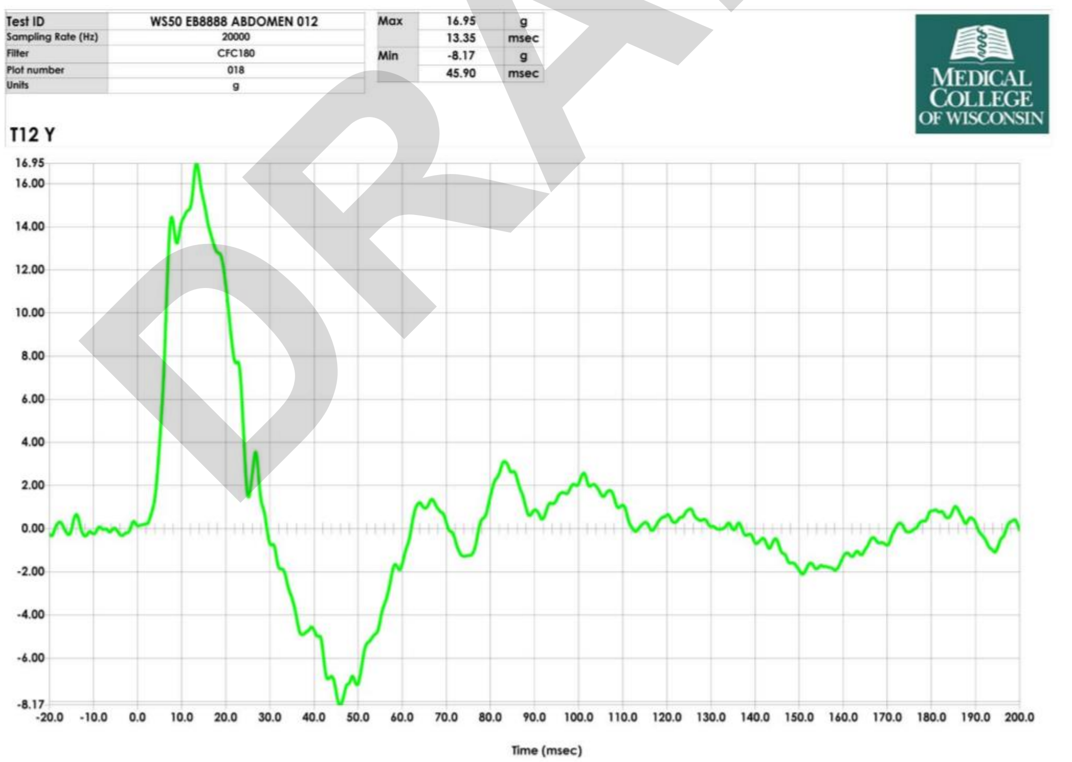


PLOT 58
ABDOMEN IMPACT TEST (CONTINUED)
PRE-TEST



PLOTS 59 & 60
ABDOMEN IMPACT TEST (CONTINUED)
POST-TEST





PLOTS 61
ABDOMEN IMPACT TEST (CONTINUED)
POST-TEST

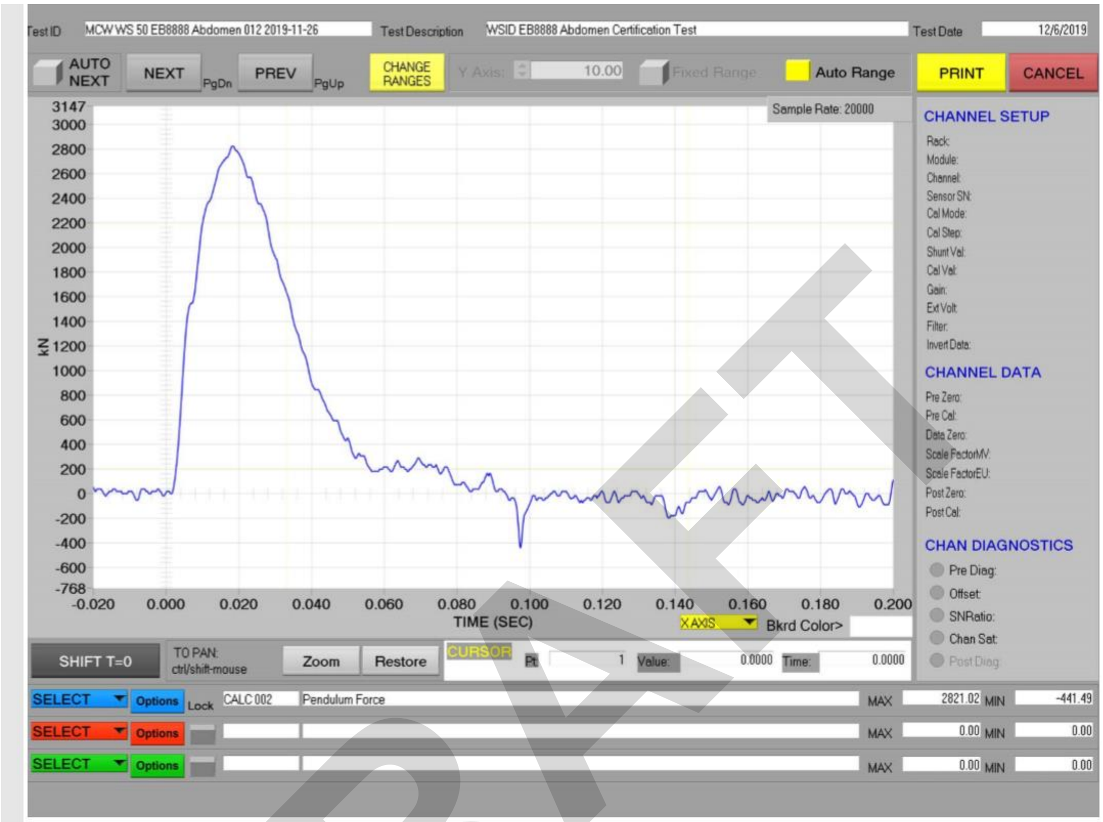
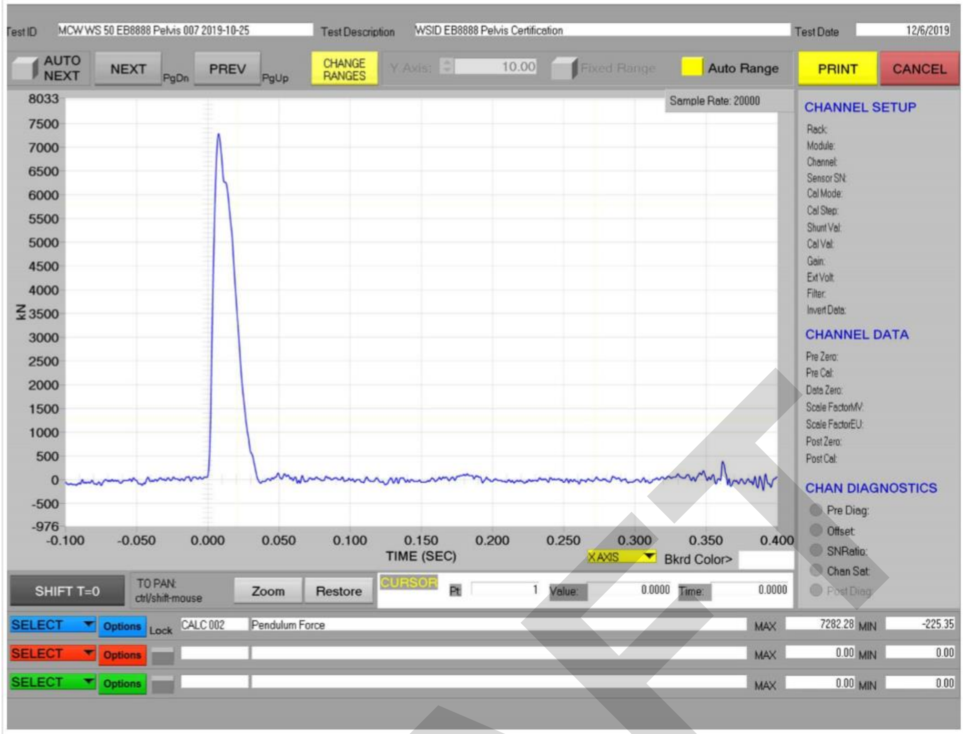


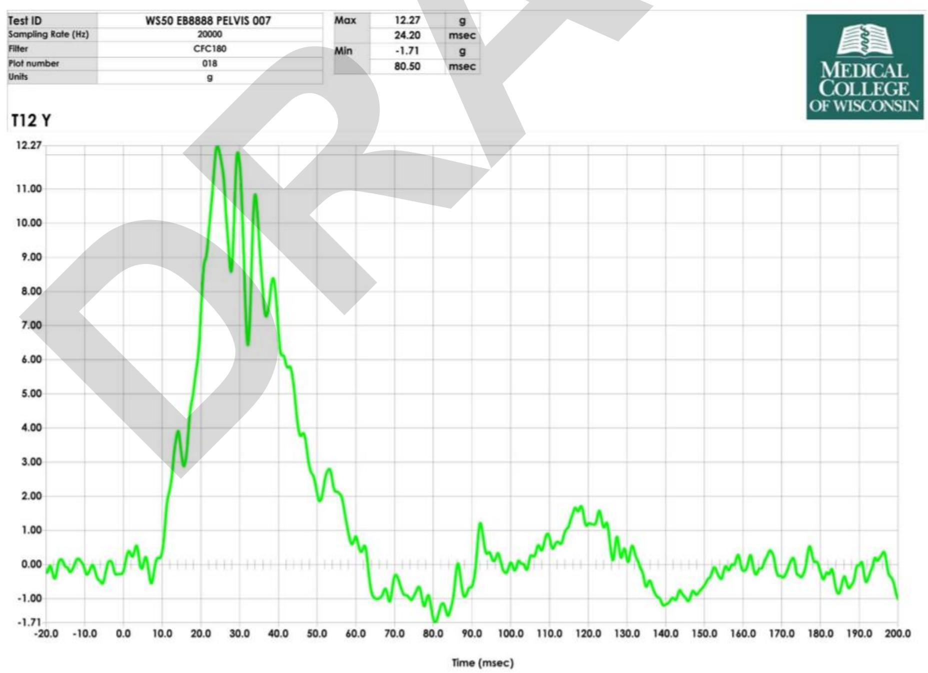
TABLE 12
PELVIS IMPACT TEST

WSID Serial Number EB8888 Test Sequences 1 & 2

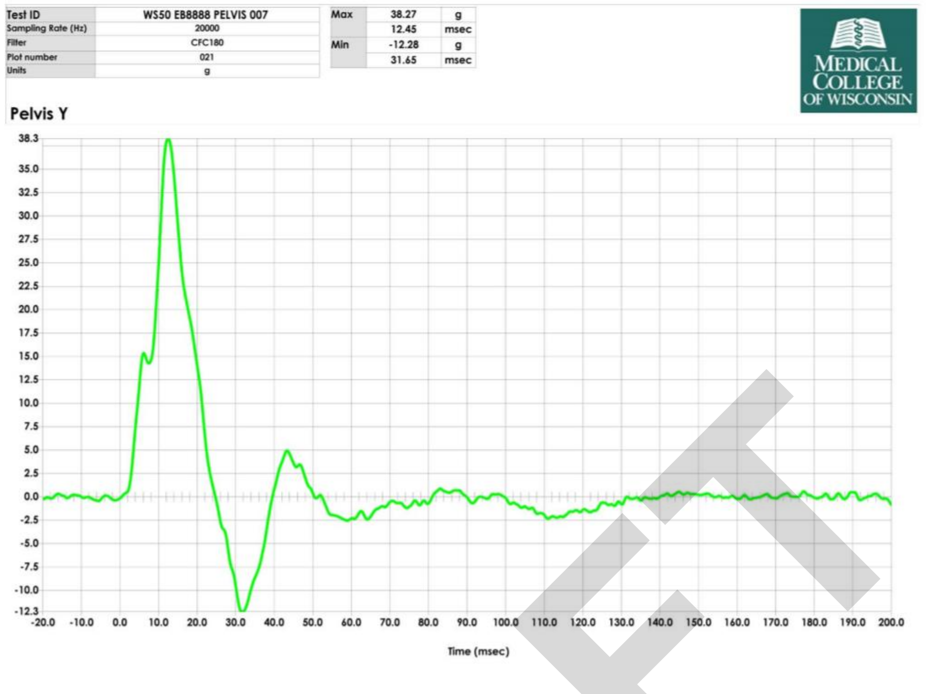
TEST PARAMETER	SPEC.	PRE		POST	
Date	-	10/25/2019		11/26/2019	
Sequential Test Number	-	1		2	
		Result	**Pass/Fail**	**Results**	**Pass/Fail**
Temperature – During Test (°C)	**20.6 - 22.2**	21.0	Pass	20.7	Pass
Humidity – During Test (%)	**10 - 70**	37.5	Pass	28.9	Pass
Impactor Velocity (m/s)	**6.6 - 6.8**	6.77	Pass	6.73	Pass
Peak Pendulum Force (kN)	**6.80 - 8.20**	7.28	Pass	7.11	Pass
Peak T12 Y Axis Acceleration (g)	**10 - 14**	12.3	Pass	10.7	Pass
Peak Pelvis Y Axis Acceleration (g)	**38.5 – 48.5**	38.3	Fail	42.5	Pass
Peak Pubic Y Axis Force (kN)	**1.30 - 1.59**	1.44	Pass	1.47	Pass
Peak Sacroiliac Y Axis Force (kN)	**1.93 - 2.21**	1.92	Fail	2.09	Pass

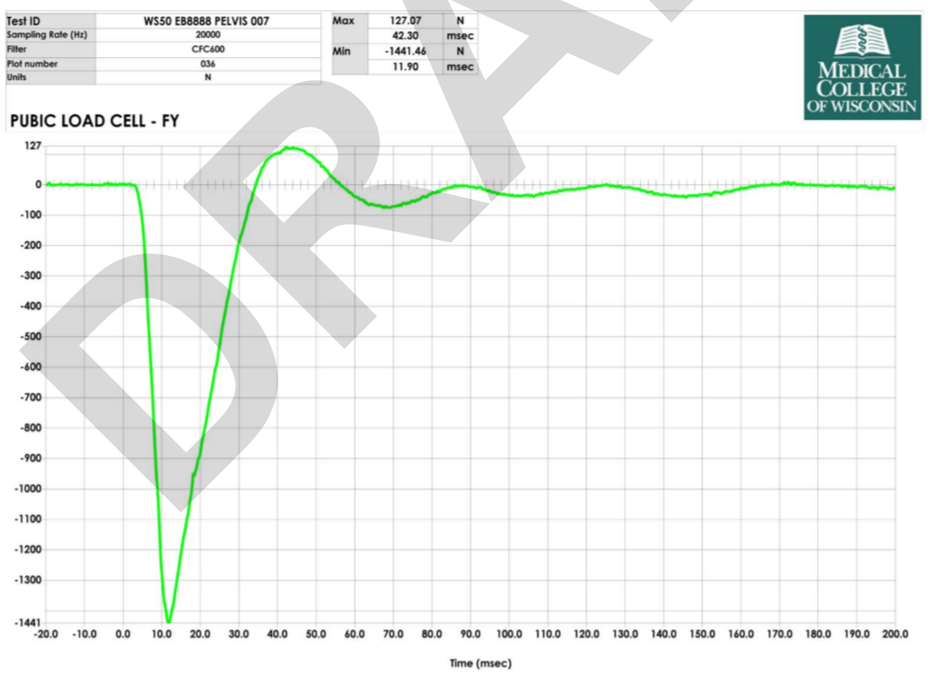
PLOTS 62 & 63
PELVIS IMPACT TEST (CONTINUED)
PRE-TEST





PLOTS 64 & 65
PELVIS IMPACT TEST (CONTINUED)
PRE-TEST



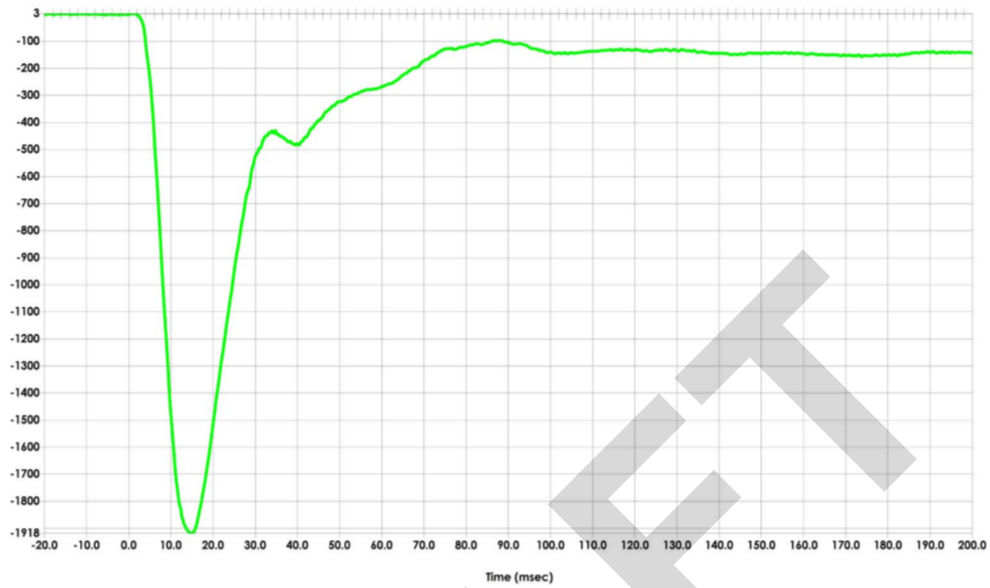


PLOTS 66
PELVIS IMPACT TEST (CONTINUED)
PRE-TEST

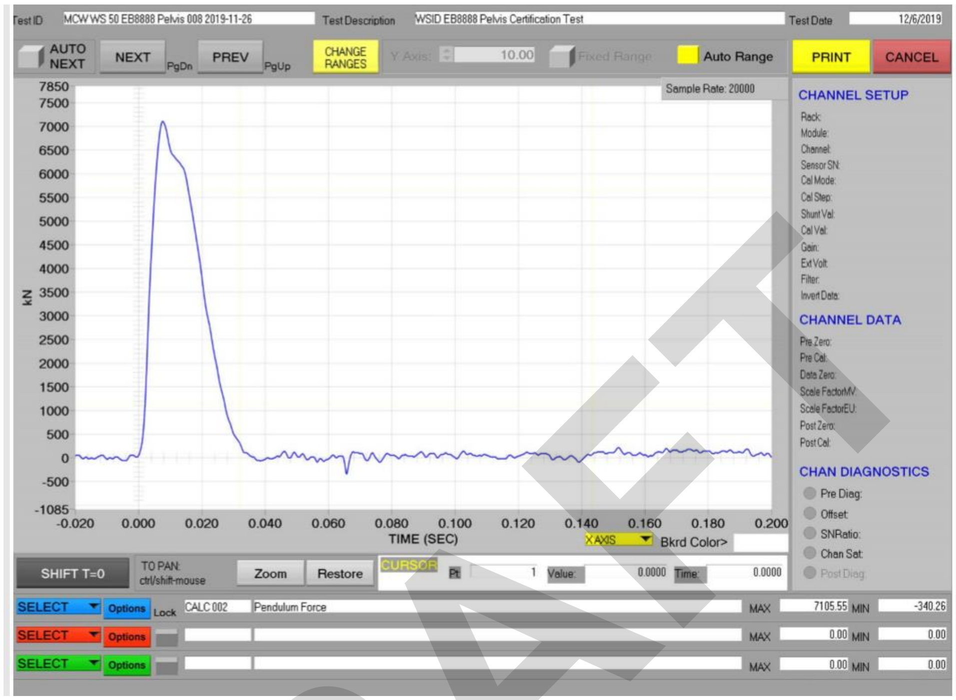
Test ID	WS50 EB8888 PELVIS 007	Max	2.55	N
Sampling Rate (Hz)	20000		-10.55	msec
Filter	CFC600	Min	-1918.44	N
Plot number	011		14.75	msec
Units	N			

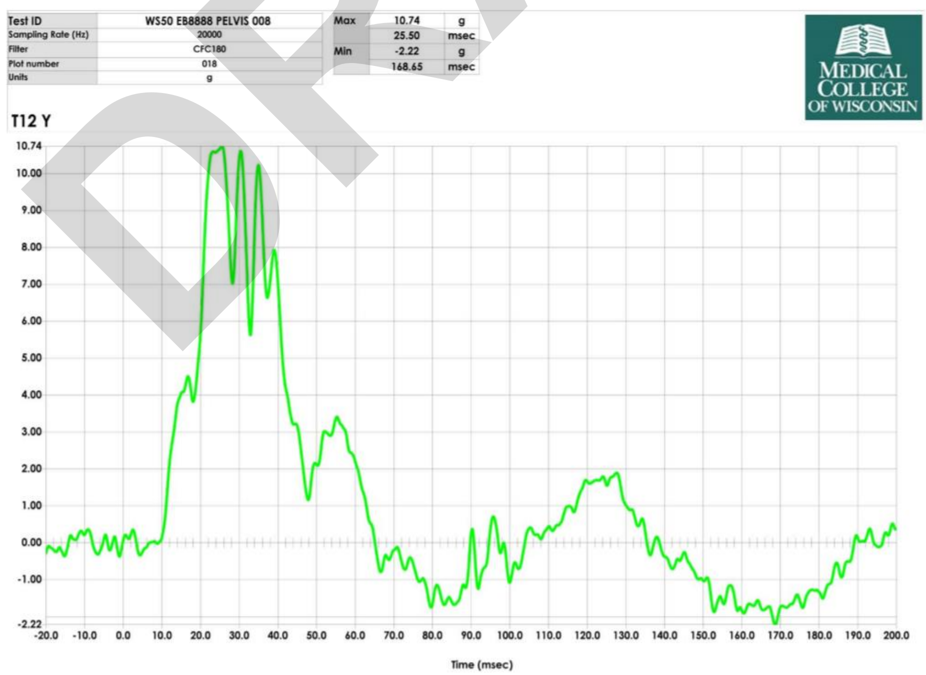
MEDICAL COLLEGE OF WISCONSIN

LEFT SACROILIAC FY

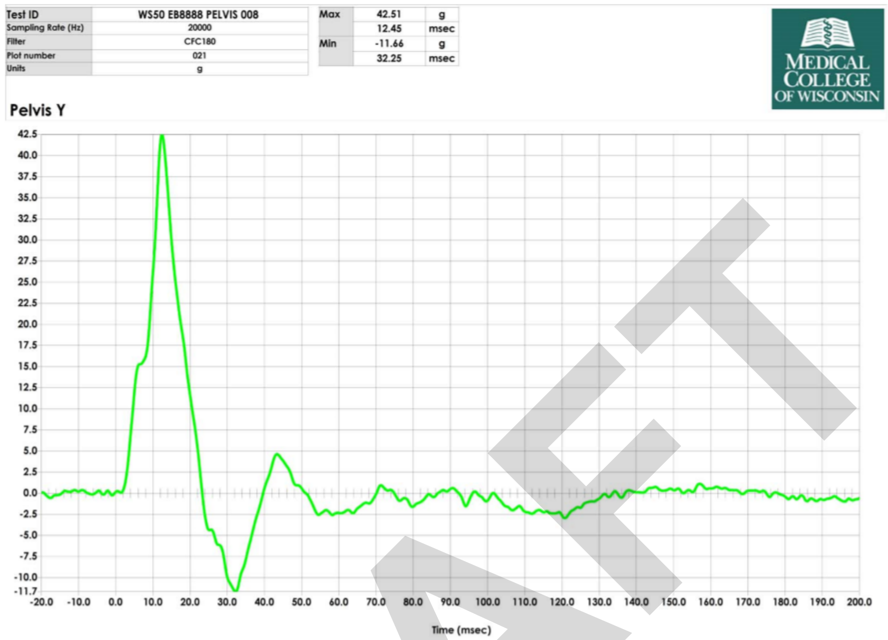


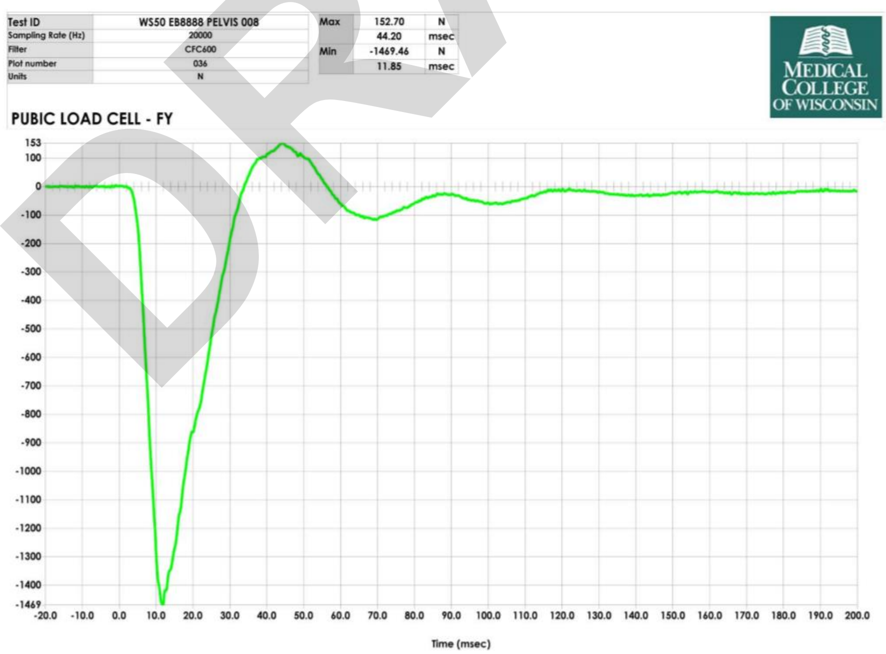
PLOTS 67 & 68
PELVIS IMPACT TEST (CONTINUED)
POST-TEST





PLOTS 69 & 70
PELVIS IMPACT TEST (CONTINUED)
POST-TEST

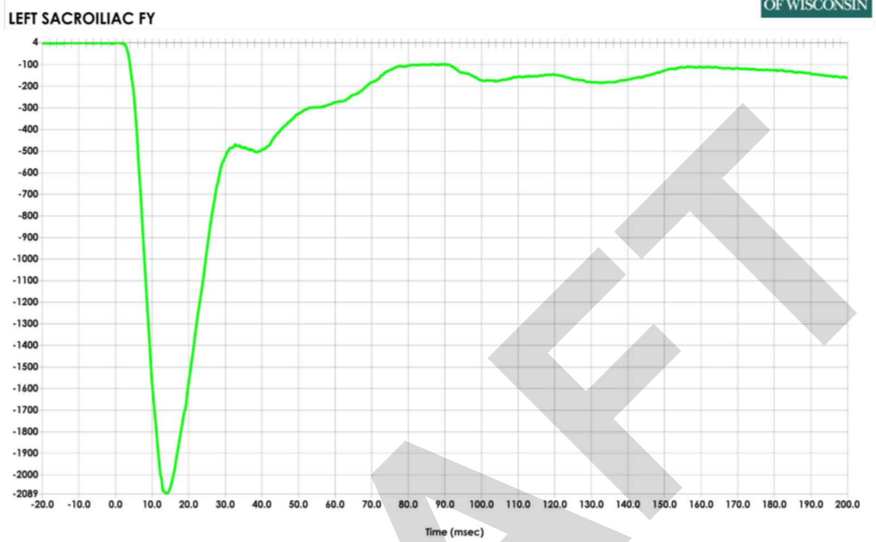




PLOT 71
PELVIS IMPACT TEST (CONTINUED)
POST-TEST

Test ID	WS50 EB8888 PELVIS 008
Sampling Rate (Hz)	20000
Filter	CFC600
Plot number	011
Units	N

Max	3.56	N
	-4.65	msec
Min	-2088.85	N
	14.00	msec



APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (WorldSID-50M)

		WorldSID-50M S/N EB8888		
		Serial Number	Manufacturer	Calibration Date
Head Accelerometers	X	10564-1	Endevco	3/12/2019
	Y	10564-2	Endevco	3/12/2019
	Z	10564-3	Endevco	3/12/2019
Head Angular Rate	X	ARS14290	DTS	8/23/2019
	Y	ARS12311	DTS	4/10/2019
	Z	ARS14276	DTS	8/23/2019
Upper Neck Force	X	EG5417	Humanetics	5/20/2019
	Y	EG5417	Humanetics	5/20/2019
	Z	EG5417	Humanetics	5/20/2019
Upper Neck Moment	X	EG5417	Humanetics	5/20/2019
	Y	EG5417	Humanetics	5/20/2019
	Z	EG5417	Humanetics	5/20/2019
Lower Neck Force	X	DW9074	Humanetics	10/4/2019
	Y	DW9074	Humanetics	10/4/2019
	Z	DW9074	Humanetics	10/4/2019
Lower Neck Moment	X	DW9074	Humanetics	10/4/2019
	Y	DW9074	Humanetics	10/4/2019
	Z	DW9074	Humanetics	10/4/2019
Upper Spine Accelerometers (T1)	X	12040-1	Endevco	10/4/2019
	Y	12040-2	Endevco	10/4/2019
	Z	12040-3	Endevco	10/4/2019
Middle Spine Accelerometers (T4)	X	12078-1	Endevco	10/4/2019
	Y	12078-2	Endevco	10/4/2019
	Z	12078-3	Endevco	10/4/2019
Lower Spine Accelerometers (T12)	X	12058-1	Endevco	10/4/2019
	Y	12058-2	Endevco	10/4/2019
	Z	12058-3	Endevco	10/4/2019
Shoulder Force	X	EC4095	Humanetics	5/23/2019
	Y	EC4095	Humanetics	5/23/2019
	Z	EC4095	Humanetics	5/23/2019
Pubic Symphysis Force	Y	EF8492	Humanetics	5/20/2019
Sacro-Iliac Left Force	X	EF6281	Humanetics	5/22/2019
	Y	EF6281	Humanetics	5/22/2019
	Z	EF6281	Humanetics	5/22/2019
Sacro-Iliac Left Moment	X	EF6281	Humanetics	5/22/2019
	Y	EF6281	Humanetics	5/22/2019
	Z	EF6281	Humanetics	5/22/2019
Lumbar Force	X	85	Humanetics	5/22/2019
	Y	85	Humanetics	5/22/2019
	Z	85	Humanetics	5/22/2019
Lumbar Moment	X	85	Humanetics	5/22/2019
	Y	85	Humanetics	5/22/2019
	Z	85	Humanetics	5/22/2019
Pelvis Acceleration	X	12300-1	Endevco	10/4/2019
	Y	12300-2	Endevco	10/4/2019
	Z	12300-3	Endevco	10/4/2019
Left Femur Force	X	DZ5708T	Denton	10/4/2019

	Y	DZ5708T	Denton	10/4/2019
	Z	DZ5708T	Denton	10/4/2019
Left Femur Moment	X	DZ5708T	Denton	10/4/2019
	Y	DZ5708T	Denton	10/4/2019
	Z	DZ5708T	Denton	10/4/2019
Left Femoral Neck Force	X	ED3147T	Humanetics	5/22/2019
	Y	ED3147T	Humanetics	5/22/2019
	Z	ED3147T	Humanetics	5/22/2019
Left Inboard Knee Force	Y	EA8973	Humanetics	2/28/2019
Left Outboard Knee Force	Y	EG2793	Humanetics	8/14/2019

			WorldSID-50M S/N EB8888		
			Serial Number	**Manufacturer**	**Calibration Date**
Shoulder RibEye	Front	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Middle	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Rear	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
Thorax Rib 1 RibEye	Front	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Middle	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Rear	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
Thorax Rib 2 RibEye	Front	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Middle	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Rear	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
Thorax Rib 3 RibEye	Front	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Middle	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Rear	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
Abdomen Rib 1 RibEye	Front	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Middle	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018

	Rear	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
Abdomen Rib 2 RibEye	Front	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Middle	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018
	Rear	X	123	Boxboro Systems	11/10/2018
		Y	123	Boxboro Systems	11/10/2018
		Z	123	Boxboro Systems	11/10/2018

TABLE 2 - VEHICLE INSTRUMENTATION

		Serial Number	Manufacturer	Calibration Date
Vehicle CG Acceleration	X	6DX0545	DTS	10/22/2019
Vehicle CG Acceleration	Y	6DX0545	DTS	10/22/2019
Vehicle CG Acceleration	Z	6DX0545	DTS	10/22/2019
Vehicle CG Angular Rate	X	6DX0545	DTS	10/22/2019
Vehicle CG Angular Rate	Y	6DX0545	DTS	10/22/2019
Vehicle CG Angular Rate	Z	6DX0545	DTS	10/22/2019
Left Floor Sill	Y	A119075	MSI	10/23/2019
Left A-Pillar Sill Y-Axis	Y	A134043	MSI	10/23/2019
Left Lower A-Pillar Y-Axis	Y	A134019	MSI	10/23/2019
Left Mid A-Pillar Y-Axis	Y	P23595	ENDEVCO	10/23/2019
Left B-Pillar Sill Y-Axis	Y	P22339	ENDEVCO	10/23/2019
Left Lower B-Pillar Y-Axis	Y	P22539	ENDEVCO	10/23/2019
Left Mid B-Pillar Y-Axis	Y	A134015	MSI	10/23/2019
Driver Seat Track at Dummy H-Point Y-Axis	Y	A086979	MSI	10/23/2019
Firewall Center Y-Axis	Y	A007267	MSI	10/23/2019
Right Roof at Vertical Impact Reference Line Y-Axis	Y	A134015	MSI	10/23/2019
Right Sill at Vertical Impact Reference Line Y-Axis	Y	A134029	MSI	10/23/2019
Rear Floorpan Above Axle	X	A010890	MSI	10/23/2019
Rear Floorpan Above Axle	Y	A011335	MSI	10/23/2019
Rear Deck Acceleration	X	6DX0537	DTS	10/22/2019
Rear Deck Acceleration	Y	6DX0537	DTS	10/22/2019
Rear Deck Acceleration	Z	6DX0537	DTS	10/22/2019
Rear Deck Angular Rate	X	6DX0537	DTS	10/22/2019
Rear Deck Angular Rate	Y	6DX0537	DTS	10/22/2019
Rear Deck Angular Rate	Z	6DX0537	DTS	10/22/2019
Left Front Door Mid Centerline	Y	A134027	MSI	10/23/2019
Left Front Door Mid Rear	Y	A086968	MSI	10/23/2019
Left Front Door Upper Centerline	Y	A134019	MSI	10/23/2019
Left Rear Door Mid Rear	Y	A134041	MSI	10/23/2019
Left Rear Door Upper Centerline	Y	A134035	MSI	10/23/2019

TABLE 3 - POLE INSTRUMENTATION

		Serial Number	Manufacturer	Calibration Date
Pole Loadcell 1	Y	330834	INTERFACE	10/7/2019
Pole Loadcell 2	Y	352865	INTERFACE	10/7/2019
Pole Loadcell 3	Y	332420	INTERFACE	10/7/2019
Pole Loadcell 4	Y	332403	INTERFACE	10/7/2019
Pole Loadcell 5	Y	334238	INTERFACE	10/7/2019
Pole Loadcell 6	Y	332400	INTERFACE	10/7/2019
Pole Loadcell 7	Y	330824	INTERFACE	10/7/2019
Pole Loadcell 8	Y	332407	INTERFACE	10/7/2019

Sign Convention
SAE J211 2014

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 food-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	
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 2014

Test Measurements	Channel Class
Vehicle Structural Accelerations	
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 acceleration (linear and angular)	1000
Integration for rotational displacement	180
Differentiation for angular acceleration	180
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	600
Lumbar	
Forces	600
Moments	600
Pelvis	
Accelerations	1000
Forces	600
Moments	600
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head Form Accelerations	1000

DUMMY INSTRUMENTATION TABLE

Channel Number	ISO CODE	Channel Title	Filter Class	Flip	Zero	Full Scale
1	11HEAD0000WSACXP	DRIVER HEAD ACCELERATION X	CFC1000	+	NO	2000
2	11HEAD0000WSACYP	DRIVER HEAD ACCELERATION Y	CFC1000	+	NO	2000
3	11HEAD0000WSACZP	DRIVER HEAD ACCELERATION Z	CFC1000	+	NO	2000
4	11HEAD0000WSAVXP	DRIVER HEAD ANGULAR RATE X	CFC1000	+	NO	8000
5	11HEAD0000WSAVYP	DRIVER HEAD ANGULAR RATE Y	CFC1000	+	NO	8000
6	11HEAD0000WSAVZP	DRIVER HEAD ANGULAR RATE Z	CFC1000	+	NO	8000
7	11NECKUP00WSFOXP	DRIVER UPPER NECK FORCE X	CFC1000	+	NO	10000
8	11NECKUP00WSFOYP	DRIVER UPPER NECK FORCE Y	CFC1000	+	NO	10000
9	11NECKUP00WSFOZP	DRIVER UPPER NECK FORCE Z	CFC1000	+	NO	12000
10	11NECKUP00WSMOXP	DRIVER UPPER NECK MOMENT X	CFC600	+	NO	300
11	11NECKUP00WSMOYP	DRIVER UPPER NECK MOMENT Y	CFC600	+	NO	300
12	11NECKUP00WSMOZP	DRIVER UPPER NECK MOMENT Z	CFC600	+	NO	200
13	11NECKLO00WSFOXP	DRIVER LOWER NECK FORCE X	CFC1000	+	NO	10000
14	11NECKLO00WSFOYP	DRIVER LOWER NECK FORCE Y	CFC1000	+	NO	10000
15	11NECKLO00WSFOZP	DRIVER LOWER NECK FORCE Z	CFC1000	+	NO	12000
16	11NECKLO00WSMOXP	DRIVER LOWER NECK MOMENT X	CFC600	+	NO	300
17	11NECKLO00WSMOYP	DRIVER LOWER NECK MOMENT Y	CFC600	+	NO	300
18	11NECKLO00WSMOZP	DRIVER LOWER NECK MOMENT Z	CFC600	+	NO	200
19	11SHLDLE00WSFOXP	DRIVER SHOULDER FORCE X	CFC600	+	NO	5000
20	11SHLDLE00WSFOYP	DRIVER SHOULDER FORCE Y	CFC600	+	NO	5000
21	11SHLDLE00WSFOZP	DRIVER SHOULDER FORCE Z	CFC600	+	NO	5000
22	11SHRILEREWSDSX0	DRIVER SHOULDER RIB REAR LED POSITION X	0	+	NO	60
23	11SHRILEREWSDSY0	DRIVER SHOULDER RIB REAR LED POSITION Y	0	+	NO	60
24	11SHRILEREWSDSZ0	DRIVER SHOULDER RIB REAR LED POSITION Z	0	+	NO	60
25	11SHRILEREWSDSLB	DRIVER SHOULDER RIB REAR LED LENGTH CHANGE	0	+	NO	60
26	11SHRILEMIWSDSX0	DRIVER SHOULDER RIB MIDDLE LED POSITION X	0	+	NO	60
27	11SHRILEMIWSDSY0	DRIVER SHOULDER RIB MIDDLE LED POSITION Y	0	+	NO	60
28	11SHRILEMIWSDSZ0	DRIVER SHOULDER RIB MIDDLE LED POSITION Z	0	+	NO	60
29	11SHRILEMIWSDSLB	DRIVER SHOULDER RIB MIDDLE LED LENGTH CHANGE	0	+	NO	60
30	11SHRILEFRWSDSX0	DRIVER SHOULDER RIB FRONT LED POSITION X	0	+	NO	60
31	11SHRILEFRWSDSY0	DRIVER SHOULDER RIB FRONT LED POSITION Y	0	+	NO	60
32	11SHRILEFRWSDSZ0	DRIVER SHOULDER RIB FRONT LED POSITION Z	0	+	NO	60
33	11SHRILEFRWSDSLB	DRIVER SHOULDER RIB FRONT LED LENGTH CHANGE	0	+	NO	60
34	11TRRILUREWSDSX0	DRIVER THORAX RIB 1 REAR LED POSITION X	0	+	NO	60
35	11TRRILUREWSDSY0	DRIVER THORAX RIB 1 REAR LED POSITION Y	0	+	NO	60
36	11TRRILUREWSDSZ0	DRIVER THORAX RIB 1 REAR LED POSITION Z	0	+	NO	60
37	11TRRILUREWSDSLB	DRIVER THORAX RIB 1 REAR LED	0	+	NO	60

		LENGTH CHANGE				
38	11TRRILUMIWSDSX0	DRIVER THORAX RIB 1 MID LED POSITION X	0	+	NO	60
39	11TRRILUMIWSDSY0	DRIVER THORAX RIB 1 MID LED POSITION Y	0	+	NO	60
40	11TRRILUMIWSDSZ0	DRIVER THORAX RIB 1 MID LED POSITION Z	0	+	NO	60
41	11TRRILUMIWSDSLB	DRIVER THORAX RIB 1 MID LED LENGTH CHANGE	0	+	NO	60
42	11TRRILUFRWSDSX0	DRIVER THORAX RIB 1 FRONT LED POSITION X	0	+	NO	60
43	11TRRILUFRWSDSY0	DRIVER THORAX RIB 1 FRONT LED POSITION Y	0	+	NO	60
44	11TRRILUFRWSDSZ0	DRIVER THORAX RIB 1 FRONT LED POSITION Z	0	+	NO	60
45	11TRRILUFRWSDSLB	DRIVER THORAX RIB 1 FRONT LED LENGTH CHANGE	0	+	NO	60
46	11TRRILMREWSDSX0	DRIVER THORAX RIB 2 REAR LED POSITION X	0	+	NO	60
47	11TRRILMREWSDSY0	DRIVER THORAX RIB 2 REAR LED POSITION Y	0	+	NO	60
48	11TRRILMREWSDSZ0	DRIVER THORAX RIB 2 REAR LED POSITION Z	0	+	NO	60
49	11TRRILMREWSDSLB	DRIVER THORAX RIB 2 REAR LED LENGTH CHANGE	0	+	NO	60
50	11TRRILMMIWSDSX0	DRIVER THORAX RIB 2 MID LED POSITION X	0	+	NO	60
51	11TRRILMMIWSDSY0	DRIVER THORAX RIB 2 MID LED POSITION Y	0	+	NO	60
52	11TRRILMMIWSDSZ0	DRIVER THORAX RIB 2 MID LED POSITION Z	0	+	NO	60
53	11TRRILMMIWSDSLB	DRIVER THORAX RIB 2 MID LED LENGTH CHANGE	0	+	NO	60
54	11TRRILMFRWSDSX0	DRIVER THORAX RIB 2 FRONT LED POSITION X	0	+	NO	60
55	11TRRILMFRWSDSY0	DRIVER THORAX RIB 2 FRONT LED POSITION Y	0	+	NO	60
56	11TRRILMFRWSDSZ0	DRIVER THORAX RIB 2 FRONT LED POSITION Z	0	+	NO	60
57	11TRRILMFRWSDSLB	DRIVER THORAX RIB 2 FRONT LED LENGTH CHANGE	0	+	NO	60
58	11TRRILLREWSDSX0	DRIVER THORAX RIB 3 REAR LED POSITION X	0	+	NO	60
59	11TRRILLREWSDSY0	DRIVER THORAX RIB 3 REAR LED POSITION Y	0	+	NO	60
60	11TRRILLREWSDSZ0	DRIVER THORAX RIB 3 REAR LED POSITION Z	0	+	NO	60
61	11TRRILLREWSDSLB	DRIVER THORAX RIB 3 REAR LED LENGTH CHANGE	0	+	NO	60
62	11TRRILLMIWSDSX0	DRIVER THORAX RIB 3 MID LED POSITION X	0	+	NO	60
63	11TRRILLMIWSDSY0	DRIVER THORAX RIB 3 MID LED POSITION Y	0	+	NO	60
64	11TRRILLMIWSDSZ0	DRIVER THORAX RIB 3 MID LED POSITION Z	0	+	NO	60
65	11TRRILLMIWSDSLB	DRIVER THORAX RIB 3 MID LED	0	+	NO	60

		LENGTH CHANGE				
66	11TRRILLFRWSDSX0	DRIVER THORAX RIB 3 FRONT LED POSITION X	0	+	NO	60
67	11TRRILLFRWSDSY0	DRIVER THORAX RIB 3 FRONT LED POSITION Y	0	+	NO	60
68	11TRRILLFRWSDSZ0	DRIVER THORAX RIB 3 FRONT LED POSITION Z	0	+	NO	60
69	11TRRILLFRWSDSLB	DRIVER THORAX RIB 3 FRONT LED LENGTH CHANGE	0	+	NO	60
70	11ABRILUREWSDSX0	DRIVER ABDOMEN RIB 1 REAR LED POSITION X	0	+	NO	60
71	11ABRILUREWSDSY0	DRIVER ABDOMEN RIB 1 REAR LED POSITION Y	0	+	NO	60
72	11ABRILUREWSDSZ0	DRIVER ABDOMEN RIB 1 REAR LED POSITION Z	0	+	NO	60
73	11ABRILUREWSDSLB	DRIVER ABDOMEN RIB 1 REAR LED LENGTH CHANGE	0	+	NO	60
74	11ABRILUMIWSDSX0	DRIVER ABDOMEN RIB 1 MID LED POSITION X	0	+	NO	60
75	11ABRILUMIWSDSY0	DRIVER ABDOMEN RIB 1 MID LED POSITION Y	0	+	NO	60
76	11ABRILUMIWSDSZ0	DRIVER ABDOMEN RIB 1 MID LED POSITION Z	0	+	NO	60
77	11ABRILUMIWSDSLB	DRIVER ABDOMEN RIB 1 MID LED LENGTH CHANGE	0	+	NO	60
78	11ABRILUFRWSDSX0	DRIVER ABDOMEN RIB 1 FRONT LED POSITION X	0	+	NO	60
79	11ABRILUFRWSDSY0	DRIVER ABDOMEN RIB 1 FRONT LED POSITION Y	0	+	NO	60
80	11ABRILUFRWSDSZ0	DRIVER ABDOMEN RIB 1 FRONT LED POSITION Z	0	+	NO	60
81	11ABRILUFRWSDSLB	DRIVER ABDOMEN RIB 1 FRONT LED LENGTH CHANGE	0	+	NO	60
82	11ABRILLREWSDSX0	DRIVER ABDOMEN RIB 2 REAR LED POSITION X	0	+	NO	60
83	11ABRILLREWSDSY0	DRIVER ABDOMEN RIB 2 REAR LED POSITION Y	0	+	NO	60
84	11ABRILLREWSDSZ0	DRIVER ABDOMEN RIB 2 REAR LED POSITION Z	0	+	NO	60
85	11ABRILLREWSDSLB	DRIVER ABDOMEN RIB 2 REAR LED LENGTH CHANGE	0	+	NO	60
86	11ABRILLMIWSDSX0	DRIVER ABDOMEN RIB 2 MID LED POSITION X	0	+	NO	60
87	11ABRILLMIWSDSY0	DRIVER ABDOMEN RIB 2 MID LED POSITION Y	0	+	NO	60
88	11ABRILLMIWSDSZ0	DRIVER ABDOMEN RIB 2 MID LED POSITION Z	0	+	NO	60
89	11ABRILLMIWSDSLB	DRIVER ABDOMEN RIB 2 MID LED LENGTH CHANGE	0	+	NO	60
90	11ABRILLFRWSDSX0	DRIVER ABDOMEN RIB 2 FRONT LED POSITION X	0	+	NO	60
91	11ABRILLFRWSDSY0	DRIVER ABDOMEN RIB 2 FRONT LED POSITION Y	0	+	NO	60
92	11ABRILLFRWSDSZ0	DRIVER ABDOMEN RIB 2 FRONT LED POSITION Z	0	+	NO	60
93	11ABRILLFRWSDSLB	DRIVER ABDOMEN RIB 2 FRONT LED	0	+	NO	60

		LENGTH CHANGE				
94	11THSP0100WSACXP	DRIVER UPPER SPINE ACCELERATION X	CFC180	+	NO	2000
95	11THSP0100WSACYP	DRIVER UPPER SPINE ACCELERATION Y	CFC180	+	NO	2000
96	11THSP0100WSACZP	DRIVER UPPER SPINE ACCELERATION Z	CFC180	+	NO	2000
97	11THSP0400WSACXP	DRIVER MIDDLE SPINE ACCELERATION X	CFC180	+	NO	2000
98	11THSP0400WSACYP	DRIVER MIDDLE SPINE ACCELERATION Y	CFC180	+	NO	2000
99	11THSP0400WSACZP	DRIVER MIDDLE SPINE ACCELERATION Z	CFC180	+	NO	2000
100	11THSP1200WSACXP	DRIVER LOWER SPINE ACCELERATION X	CFC180	+	NO	2000
101	11THSP1200WSACYP	DRIVER LOWER SPINE ACCELERATION Y	CFC180	+	NO	2000
102	11THSP1200WSACZP	DRIVER LOWER SPINE ACCELERATION Z	CFC180	+	NO	2000
103	11PUBC0000WSFOYP	DRIVER PUBIC FORCE Y	CFC600	+	NO	12000
104	11SACRLE00WSFOXP	DRIVER LEFT SACRO-ILIAC FORCE X	CFC600	+	NO	6000
105	11SACRLE00WSFOYP	DRIVER LEFT SACRO-ILIAC FORCE Y	CFC600	+	NO	12000
106	11SACRLE00WSFOZP	DRIVER LEFT SACRO-ILIAC FORCE Z	CFC600	+	NO	6000
107	11SACRLE00WSMOXP	DRIVER LEFT SACRO-ILIAC MOMENT X	CFC600	+	NO	800
108	11SACRLE00WSMOYP	DRIVER LEFT SACRO-ILIAC MOMENT Y	CFC600	+	NO	400
109	11SACRLE00WSMOZP	DRIVER LEFT SACRO-ILIAC MOMENT Z	CFC600	+	NO	400
110	11SACRRI00WSFOXP	DRIVER RIGHT SACRO-ILIAC FORCE X	CFC600	+	NO	6000
111	11SACRRI00WSFOYP	DRIVER RIGHT SACRO-ILIAC FORCE Y	CFC600	+	NO	12000
112	11SACRRI00WSFOZP	DRIVER RIGHT SACRO-ILIAC FORCE Z	CFC600	+	NO	6000
113	11SACRRI00WSMOXP	DRIVER RIGHT SACRO-ILIAC MOMENT X	CFC600	+	NO	800
114	11SACRRI00WSMOYP	DRIVER RIGHT SACRO-ILIAC MOMENT Y	CFC600	+	NO	400
115	11SACRRI00WSMOZP	DRIVER RIGHT SACRO-ILIAC MOMENT Z	CFC600	+	NO	400
116	11LUSP0000WSFOXP	DRIVER LUMBAR FORCE X	CFC600	+	NO	10000
117	11LUSP0000WSFOYP	DRIVER LUMBAR FORCE Y	CFC600	+	NO	10000
118	11LUSP0000WSFOZP	DRIVER LUMBAR FORCE Z	CFC600	+	NO	12000
119	11LUSP0000WSMOXP	DRIVER LUMBAR MOMENT X	CFC600	+	NO	300
120	11LUSP0000WSMOYP	DRIVER LUMBAR MOMENT Y	CFC600	+	NO	300
121	11LUSP0000WSMOZP	DRIVER LUMBAR MOMENT Z	CFC600	+	NO	200
122	11PELV0000WSACXP	DRIVER PELVIS ACCELERATION X	CFC180	+	NO	2000
123	11PELV0000WSACYP	DRIVER PELVIS ACCELERATION Y	CFC180	+	NO	2000
124	11PELV0000WSACZP	DRIVER PELVIS ACCELERATION Z	CFC180	+	NO	2000
125	11FEMRLE00WSFOXP	DRIVER FEMUR FORCE X	CFC600	+	NO	15000
126	11FEMRLE00WSFOYP	DRIVER FEMUR FORCE Y	CFC600	+	NO	15000
127	11FEMRLE00WSFOZP	DRIVER FEMUR FORCE Z	CFC600	+	NO	15000
128	11FEMRLE00WSMOXP	DRIVER FEMUR MOMENT X	CFC600	+	NO	350
129	11FEMRLE00WSMOYP	DRIVER FEMUR MOMENT Y	CFC600	+	NO	350
130	11FEMRLE00WSMOZP	DRIVER FEMUR MOMENT Z	CFC600	+	NO	300
131	11FEACLE00WSFOXP	DRIVER FEMORAL NECK FORCE X	CFC600	+	NO	10000
132	11FEACLE00WSFOYP	DRIVER FEMORAL NECK FORCE Y	CFC600	+	NO	25000

133	11FEACLE00WSFOZP	DRIVER FEMORAL NECK FORCE Z	CFC600	+	NO	10000
134	11KNEELEOUWSFOYP	DRIVER LEFT KNEE OUTER CONTACT FORCE Y	CFC600	+	NO	20000
135	11KNEERIINWSFOYP	DRIVER LEFT KNEE INNER CONTACT FORCE Y	CFC600	+	NO	20000
136	11VEHCCG0000ACXA	VEHICLE CENTER OF GRAVITY ACCELERATION X	CFC60	+	NO	2000
137	11VEHCCG0000ACYA	VEHICLE CENTER OF GRAVITY ACCELERATION Y	CFC60	+	NO	2000
138	11VEHCCG0000ACZA	VEHICLE CENTER OF GRAVITY ACCELERATION Z	CFC60	+	NO	2000
139	11VEHCCG0000AVXA	VEHICLE CENTER OF GRAVITY ANGULAR RATE X	CFC60	+	NO	18000
140	11VEHCCG0000AVYA	VEHICLE CENTER OF GRAVITY ANGULAR RATE Y	CFC60	+	NO	18000
141	11VEHCCG0000AVZA	VEHICLE CENTER OF GRAVITY ANGULAR RATE Z	CFC60	+	NO	18000
142	11VEHC00LO00ACYA	LEFT FLOOR SILL ACCELERATION Y	CFC60	+	NO	2000
143	11APIL000000ACYA	LEFT A-PILLAR SILL ACCELERATION Y	CFC60	+	NO	2000
144	11APILLO0000ACYA	LEFT LOWER A-PILLAR ACCELERATION Y	CFC60	+	NO	2000
145	11APILMI0000ACYA	LEFT MID A-PILLAR ACCELERATION Y	CFC60	+	NO	2000
146	11BPIL000000ACYA	LEFT B-PILLAR SILL ACCELERATION Y	CFC60	+	NO	2000
147	11BPILLO0000ACYA	LEFT LOWER B-PILLAR ACCELERATION Y	CFC60	+	NO	2000
148	11BPILMI0000ACYA	LEFT MID B-PILLAR ACCELERATION Y	CFC60	+	NO	2000
149	11SETR000000ACYA	DRIVER SEAT TRACK AT DUMMY H-POINT ACCELERATION Y	CFC60	+	NO	2000
150	11ENGNTP0000ACXA	ENGINE TOP ACCELERATION X	CFC60	+	NO	2000
151	11ENGNTP0000ACYA	ENGINE TOP ACCELERATION Y	CFC60	+	NO	2000
152	12FIRCX00000ACYA	FIREWALL CENTER ACCELERATION Y	CFC60	+	NO	2000
153	13ROFR000000ACYA	RIGHT ROOF AT VERTICAL IMPACT REFERENCE LINE ACCELERATION Y	CFC60	+	NO	2000
154	13SILB000000ACYA	RIGHT SILL AT VERTICAL IMPACT REFERENCE LINE ACCELERATION Y	CFC60	+	NO	2000
155	11FORA000000ACXA	REAR FLOORPAN BEHIND REAR AXLE AT CENTERLINE ACCELERATION X	CFC60	+	NO	2000
156	11FORA000000ACYA	REAR FLOORPAN BEHIND REAR AXLE AT CENTERLINE ACCELERATION Y	CFC60	+	NO	2000
157	11DOORMIMI71ACYA	LEFT FRONT DOOR MID CENTERLINE ACCELERATION Y	CFC60	+	NO	2000
158	11DOORMIRE71ACYA	LEFT FRONT DOOR MID REAR ACCELERATION Y	CFC60	+	NO	2000
159	11DOORMIUP71ACYA	LEFT FRONT DOOR UPPER CENTERLINE ACCELERATION Y	CFC60	+	NO	2000
160	14DOORMIRE71ACYA	LEFT REAR DOOR MID REAR ACCELERATION Y	CFC60	+	NO	2000
161	14DOORMIUP71ACYA	LEFT REAR DOOR UPPER CENTERLINE ACCELERATION Y	CFC60	+	NO	2000
162	10FORARD0000ACXA	REAR DECK ACCELERATION X	CFC60	+	NO	2000
163	10FORARD0000ACYA	REAR DECK ACCELERATION Y	CFC60	+	NO	2000

164	10FORARD0000ACZA	REAR DECK ACCELERATION Z	CFC60	+	NO	2000
165	10FORARD0000AVXA	REAR DECK ANGULAR RATE X	CFC60	+	NO	18000
166	10FORARD0000AVYA	REAR DECK ANGULAR RATE Y	CFC60	+	NO	18000
167	10FORARD0000AVZA	REAR DECK ANGULAR RATE Z	CFC60	+	NO	18000
168	11HEAD000000EV00	DRIVER HEAD CONTACT SWITCH	0	+	NO	1
169	11SHLD000000EV00	DRIVER SHOULDER CONTACT SWITCH	0	+	NO	1
170	11TRRI000000EV00	DRIVER TORSO CONTACT SWITCH	0	+	NO	1
171	11PELV000000EV00	DRIVER PELVIS CONTACT SWITCH	0	+	NO	1
172	11SETR000000EV00	DRIVER SEAT BACK LEVER CONTACT SWITCH	0	+	NO	1
173	K0FBAR010000FOXA	LOAD CELL POLE #1 FX	CFC60	+	NO	22400
174	K0FBAR020000FOXA	LOAD CELL POLE #2 FX	CFC60	+	NO	22400
175	K0FBAR030000FOXA	LOAD CELL POLE #3 FX	CFC60	+	NO	22400
176	K0FBAR040000FOXA	LOAD CELL POLE #4 FX	CFC60	+	NO	22400
177	K0FBAR050000FOXA	LOAD CELL POLE #5 FX	CFC60	+	NO	22400
178	K0FBAR060000FOXA	LOAD CELL POLE #6 FX	CFC60	+	NO	22400
179	K0FBAR070000FOXA	LOAD CELL POLE #7 FX	CFC60	+	NO	22400
180	K0FBAR080000FOXA	LOAD CELL POLE #8 FX	CFC60	+	NO	22400

APPENDIX E

WORLD SID 50M DRAFT SEATING PROCEDURE

APPENDIX A: NHTSA WSID-50M_Rev2 Seating Procedure

Seating and Positioning Procedures for the WorldSID 50th Percentile Male Dummy (WSID-50M) – Driver Position

1 Determine the seat type

Visually inspect the seats to determine type (i.e., bucket or bench).
_Bench
_Bucket

2 Position lumbar supports

Position the seat's adjustable lumbar supports to the lowest, retracted, or deflated adjustment positions.
_*N/A* No lumbar adjustment

3 Position additional supports

Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position.
_*N/A* No additional support adjustment

4 Position leg supports

Position an adjustable leg support system in its rearmost position.
_*N/A* No adjustable leg support system

5 Mark the centerline of the seat using a vehicle longitudinal, vertical (XZ) plane (complete ONLY the one that is applicable to seat being marked)

5.1 Bucket Seat: For future reference, locate and mark the line on the seat cushion that is the intersection of the XZ plane which passes through the centerline of the seat and the seat cushion upper surface.

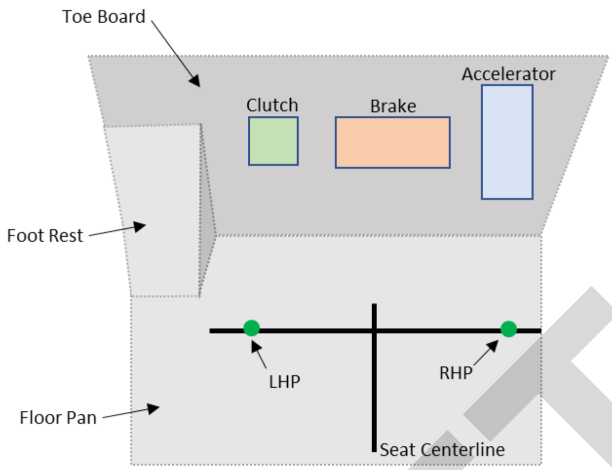
5.2 Bench Seat: For future reference, locate and mark the line on the seat cushion that is the intersection of the XZ plane which passes through the centerline of the steering wheel and the seat cushion upper surface.

6 Determine the type of accelerator pedal in the vehicle in order to mark the Right Heel Point (RHP). It is suggested to do the measurements using a Coordinate-Measuring Machine (CMM).

6.1 Is it a suspended accelerator pedal? If so, use the procedures detailed in step 7, and then go to step 9.

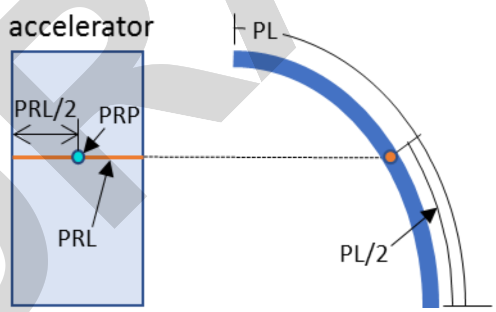
6.2 Is it a floor-mounted accelerator pedal? If so, skip step 7 and use the procedures detailed in step 8, and then go to step 9.

7 Locate and mark the Heel Points (RHP and LHP) on the floor pan with a <u>suspended accelerator pedal</u>. (For a floor-mounted pedal, proceed to step 8.)



7.1 Place adjustable pedals in the full forward position (towards the front of the vehicle).
_N/A the pedals are not adjustable.

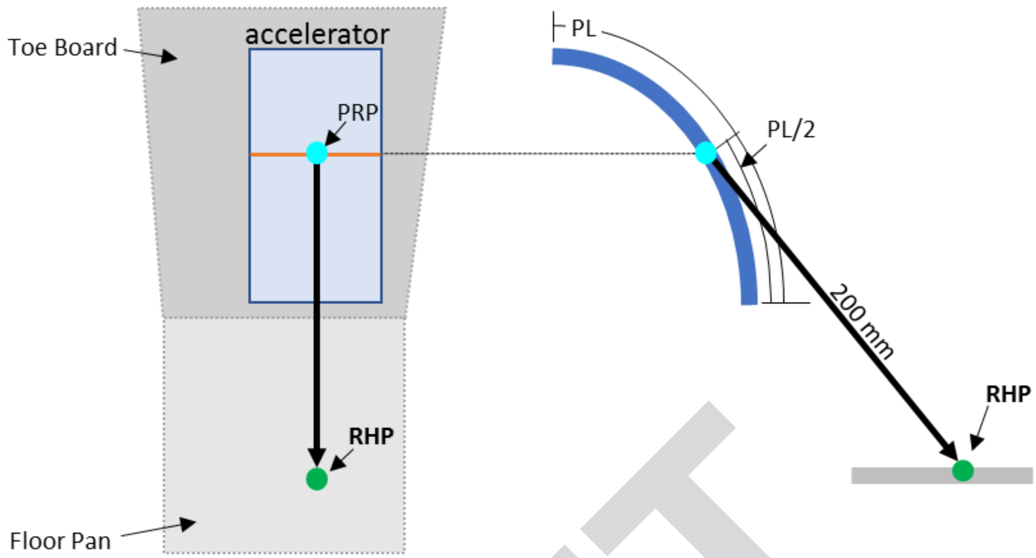
7.2 Using the diagram and steps below, locate the Pedal Reference Point (PRP) on the accelerator pedal (using a measurement device such as a flexible tape measure, CMM, and/or calipers).



7.2.1 Measure the accelerator pedal length (PL) along the surface of the pedal from the top most edge/point to the bottom most edge/point. Record the length:__________. Calculate 50% of this length (0.5PL). Establish the pedal reference line (PRL) by marking a line in the y-direction on the pedal surface at the mid-point of the PL.

7.2.2 Measure the accelerator pedal width along the PRL. Establish the pedal reference point (PRP) by marking the midpoint of the PRL.

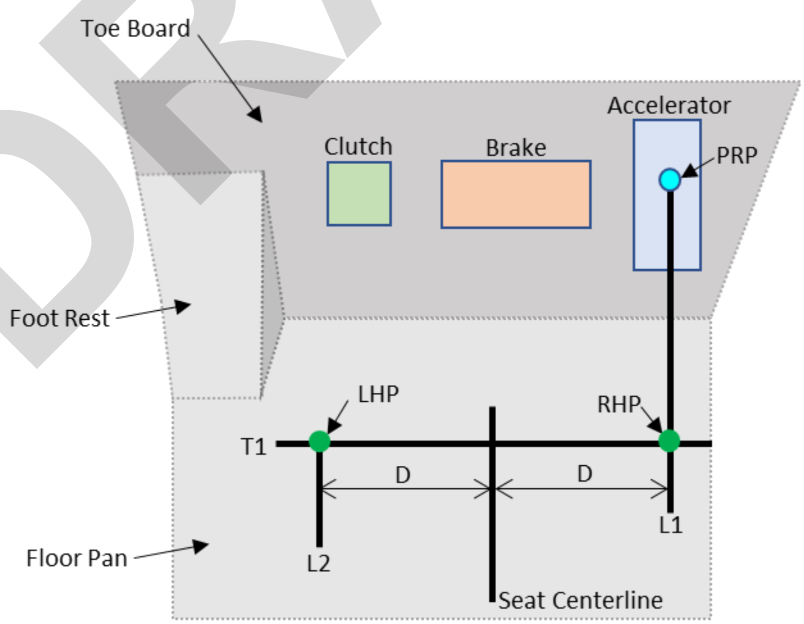
7.3 Using a measurement device (e.g., CMM, 200 mm bar, calipers), locate a point on the floor pan that is 200 mm from PRP and is in the vehicle's longitudinal, vertical (XZ) plane passing through PRP. This is the right heel point (RHP).



7.4 Mark a line (L1) along the surface of the pedal and the floor pan that passes through PRP, RHP and is in the vehicle longitudinal, vertical (XZ) plane.

7.5 Translate and mark the seat centerline on the floor pan. The lines on the seat and floor pan should be in the same vehicle XZ plane.

7.6 Measure the distance in the y-direction (D) from the seat centerline to L1. Record the value:__________.



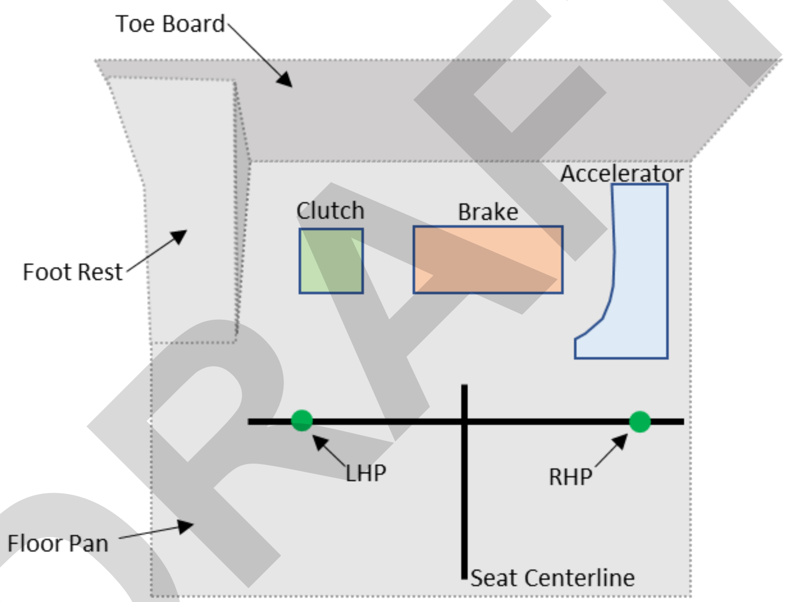
7.6.1 Measure and mark a point on the floor pan to the left of the seat centerline (looking toward the front of the vehicle) that is the same distance (D) from the seat centerline and is in the same vehicle lateral, vertical (YZ) plane. This is the left heel point (LHP).

7.6.2 Mark a line (T1) on the floor pan through RHP and LHP.

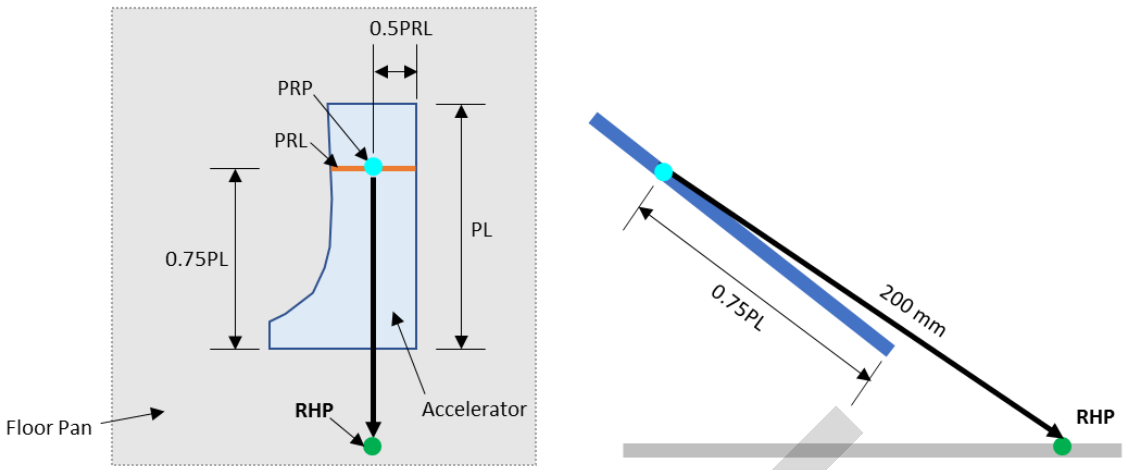
7.6.3 Mark a line (L2) on the floor pan that is in a vehicle XZ plane and that passes through LHP.

7.7 Mark two lines on the floor pan parallel to line T1; the first 10 mm forward and the second 10 mm rearward of T1. The zone between these two lines will be used for placement of both the left and right heels and will be referred to as the heel point zone.

8 Locate and mark the Heel Points (RHP and LHP) on the floor pan with a floor-mounted accelerator pedal. (Use step 7 for a suspended pedal.)



8.1 Using the diagram below, locate the Pedal Reference Point (PRP) and the Right Heel Point (RHP) using a measurement device such as a tape measure, CMM, 200 mm bar, and/or calipers. Use the active part of the pedal, which is defined as the moveable part of the floor-mounted pedal.



8.1.1 Determine the overall pedal length (PL) on the active pedal, as measured along the surface of the moveable pedal from the top most edge/point to the bottom most edge/point. Record the length:__________. Calculate 75% of this length (0.75PL). Establish the pedal reference line (PRL) by marking a line in the y-direction on the pedal surface at 0.75PL from the bottom edge of the pedal.

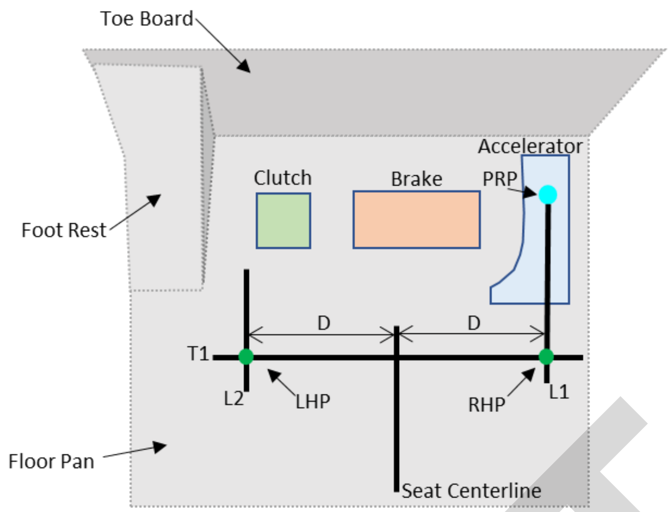
8.1.2 Measure the length of the PRL in the y-direction and mark the center point of the PRL. This is the PRP.

8.2 Using a measurement device (e.g., CMM, 200mm bar, calipers), locate a point on the floor pan that is 200 mm from PRP and is in the vehicle's longitudinal, vertical (XZ) plane which passes through PRP. This is the right heel point (RHP).

8.3 Mark a line (L1) along the surface of the pedal and the floor pan that passes through PRP, and RHP and is in the vehicle's longitudinal, vertical (XZ) plane.

8.4 Translate and mark the seat centerline on the floor pan. The lines on the seat and floor pan should be in the same vehicle XZ plane.

8.5 Measure the distance in the y-direction (D) from the seat centerline to L1. Record the value:___________.



8.5.1 Measure and mark a point on the floor pan to the left of the seat centerline (looking toward the front of the vehicle) that is the same distance (D) from the seat centerline as RHP and is in the same vehicle lateral, vertical (YZ) plane. This is the left heel point (LHP).

8.5.2 Mark a line on the floor pan through RHP and LHP; call it T1.

8.5.3 Mark a line on the floor pan that is in a vehicle XZ plane and that passes through LHP. This line shall be referred to as L2.

8.6 Mark two lines on the floor pan parallel to line T1; the first 10 mm forward and the second 10 mm rearward of T1. This zone between these two lines will be used for placement of both the left and right heels and will be referred to as the heel point zone.

9 Mark the range of seat travel

Prior to marking the seat for fore/aft travel, move the seat through its full range of motion using all available controls. Separately, operate each control to determine whether it moves the seat and/or seat cushion primarily in the fore-aft or up-down directions.

9.1 Mark a point (seat cushion reference point - SCRP) on the side of the seat cushion that is between 150 mm and 250 mm from the front edge of the seat cushion. For seat cushions that move up and down independently from the seat housing, mark the point on the side of the cushion in an area that will not be obscured by the seat housing when the seat cushion is at its lowest height position.

9.2 Draw a horizontal line (seat cushion reference line - SCRL) through the SCRP.

9.3 Using only the controls that primarily move the seat in the fore-aft direction, move the SCRP to the rearmost position.

9.4 If the seat cushion adjusts fore-aft, independent of the seat back, using only the controls that primarily move the seat cushion in the fore-aft direction, move the SCRP to the rearmost position.

_ *N/A* No independent fore-aft seat cushion adjustment

9.5 Using any part of any control, other than the parts just used for fore-aft positioning, determine the range of angles of the SCRL and set the SCRL at mid-angle. Start with the seat in the lowest most position. Record the maximum, minimum, and mid-angles in the table below.

SCRL (deg)	Max	Min	Mid
Driver			

9.6 If the seat and/or seat cushion height is adjustable, using any part of any control other than the parts which primarily move the seat or seat cushion fore-aft, put the SCRP in its lowest position with the SCRL angle at the mid-angle found in 9.5.

_ *N/A* No seat height adjustment

9.7 Using only the controls that primarily move the seat in the fore-aft direction, verify the seat is in the rearmost position.

9.8 Using only the controls that primarily move the seat in the fore-aft direction, mark each detent possible from rearward to full forward. Mark each position so that there is a visual indication when the seat is at a particular position as follows below.

- For manual seats, move the seat forward one detent at a time and mark each detent.
- For power seats, mark only the rearmost, middle, and foremost positions.
- Label three of the positions with the following: F for foremost, M for mid-track (if there is no mid-track, label the closest adjustment position to the rear of mid-track), and R for rearmost.

Measure the SCRP fore-aft location for each seat position on the table below.

	SCRL Mid-Angle (deg)	**Rearmost**		**Mid-track**		**Foremost**		**SCRP Height (mm)** Spacing measurement between detents (if applicable)
		X	**Z**	**X**	**Z**	**X**	**Z**	**X**
Driver								

9.8.1 While at mid-track, also mark a position that is 25 mm rearward of mid-track.

10 Position the head restraint

10.1 Using any adjustment of the head restraint, position it to its highest setting.

10.2 Using any adjustment of the head restraint, position it to the full rearward setting.

_*N/A* The test vehicle is equipped with automatically adjusting head restraints or there is no head restraint adjustment.

11 Set the seat for a test dummy

Using the reference marks on the seat from section 9, set the seat in the mid-track, lowest height, and mid seat cushion angle positions by using the following steps to adjust the seat:

11.1 If the seat or seat cushion height is adjustable, using other than the controls that primarily move the seat or seat cushion fore and aft, set the height of the SCRP to the minimum height, with the SCRL set as closely as possible to the mid-angle determined in step 9.5.

11.2 Using the control that primarily moves the seat fore and aft, move the SCRP to the mid-track position determined in 9.8.

11.3 Set the seat back angle at the manufacturer's <u>nominal design riding position</u> for a 50th percentile male adult occupant.

If the position is not specified, set the seat back in the position that produces a torso (back) angle of 25° from vertical when measured with the SAE J826 H-point machine (Society of Automotive Engineers (SAE) Surface Vehicle Standard J826, revised July 1995). For seat backs with discrete positions, if a torso (back) angle of 25° from vertical cannot be achieved, set the seat back in the detent that yields a torso (back) angle as close as possible to 25° from vertical. Describe the method used to achieve the nominal design riding position and record the seat back angle.

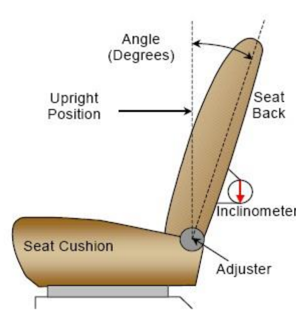
____

____

____

Seat Back Angle_____°

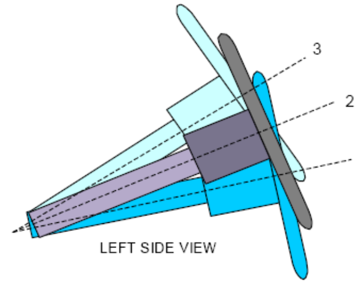
_*N/A* The seat back does not adjust.



FRONT SEAT ASSEMBLY

12 Set the steering wheel to the mid-position

Use the markings to position the steering wheel hub at the geometric center of full range of driving positions including any telescoping positions. For steering columns with discrete positions and no detent at the mid-angle, position the column in the next lowest detent from the mid-angle.



STEERING COLUMN ASSEMBLY

Complete the following table:

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1		
Geometric Center – Position 2		
Uppermost – Position 3		
Telescoping Steering Wheel Travel		
Test Position		

_*N/A* The steering wheel does not adjust.

13 Set adjustable seat belt upper anchorages

Use the markings to position an adjustable seat belt upper anchorage at the manufacturer's nominal design position for a 50th percentile male adult occupant or highest position if not provided. Fill in the following table:

Seat	Total # of Positions	Placed in Position #
Driver		

_*N/A* The seat belt upper anchorage does not adjust.

14 Retract the armrest

Retract any folding armrest
_*N/A* No armrest or armrest is fixed, not retractable.

15 Determine the H-point location with the H-Point machine;

Position the three-dimensional H-point manikin (i.e., H-point machine) specified in Society of Automotive Engineers (SAE) Surface Vehicle Standard J826, revised July 1995, Devices for Use in Defining and Measuring Vehicle Seating Accommodation in the seat as follows:

15.1 Place a 910 mm^2 piece of muslin cotton cloth over the seat area (the muslin cloth shall be comparable to 48 threads/in^2 and density of 2.85 lb/yd). Tuck the muslin cloth a sufficient amount to prevent hammocking of the material.

15.2 Place the seat and back assembly of the H-Point machine such that its plane of symmetry is coincident with the centerline marking on the seat.

15.3 Install the lower leg and foot segments.

15.4 Set the length of the lower leg segments at 414 mm (16.3 in) and the length of the thigh bar at 401 mm (15.8 in).

15.5 Leg and foot placement

15.5.1 Insert the pin so that the right foot angle is not less than 87°.

15.5.2 Place the right foot on the un-depressed accelerator pedal with the sole of the foot on the pedal and the heel as far forward as allowable. Do not place the heel on the toe board.

15.5.3 Adjust the left leg to be the same distance from H-point machine centerline as the right leg.

15.5.4 With the T-bar level, place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheel well projection. If the foot cannot be positioned on the toe board, set it on the floor pan.

_Foot on toe board

_Foot on floor pan

15.6 Apply the lower leg weights.

15.7 Apply the thigh weights.

15.8 Tilt the back pan forward against the forward stop and draw the H-point machine away from the seatback using the T-bar.

15.9 Re-positioning the H-point machine.

15.9.1 Allow the H-point machine to slide rearward until a forward horizontal restraining load on the T-bar is no longer required due to the seat pan contacting the seat back.
_The seat pan does not slide rearward. Go to step 15.9.2.

15.9.2 Slide the H-point machine rearward by a horizontal rearward load applied at the T-bar until the seat pan contacts the seat back.

15.10 Apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.

15.11 Again apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.

15.12 Carefully return the back pan to the seat back.

15.13 Install the right and left buttock weights.

15.14 Install the eight torso weights, alternating the installation between right and left.

15.15 Tilt the back pan forward until the stop is contacted.

15.16 Rock the H-point machine from side to side over a 10° arc (5° to each side of the vertical centerline) for three complete cycles. Restrain the T-bar during rocking so that the seat pan does not change position. Minimize any inadvertent exterior loads applied in a vertical or fore-aft direction. The feet are free to move during this rocking motion.

15.17 Without applying a forward or lateral load, lift the right foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

15.18 Lower the right foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor, toe board, or undepressed accelerator pedal.

15.19 Without applying a forward or lateral load, lift the left foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

15.20 Lower the left foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor or toe board.

15.21 Is the seat pan level?

_Yes. Go to step 15.23.

_No. Go to step 15.22.

15.22 Apply a sufficient lateral load to the top of the seatback pan to level the H-point machine seat pan on the seat.

15.23 Holding the T-bar to prevent the H-point machine from sliding forward on the seat cushion, return the seatback pan to the seatback.

15.24 Holding the T-bar to prevent the H-point machine from sliding forward on the seat cushion, apply a rearward force perpendicular to the back angle bar just above the torso weights until either 66 N (15 lb) of force is reached or the hip angle is increased by 3°, whichever occurs first. Minimize the exterior downward or side forces applied to the H-point machine. Release the force. Repeat this step until the resulting hip angle is identical. Complete as many force applications as necessary and record the results in the following table:

Force App.	Hip Angle
1	
2	
3	
4	
5	

15.25 Is the H-point machine level?

_Yes. Go to step 15.26.
_No. Go back to step 15.15 and repeat steps to re-level H-point machine.

15.26 Record the H-point location in the table below:

H-point Machine H-point Location and Torso Angle	
Torso Angle	°
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)

Reference: X-axis is positive forward of striker
Y-axis is positive right of striker
Z-axis is positive below striker

15.27 Create a Seat Tracking Point (STP): Place a target point 20 mm forward of the H-point machine H-point on a rigid part of the seat and record its location in the table below. This reference point will be used to locate the dummy H-point relative to the seat if the seat cannot be set to the mid-track position.

Seat Tracking Point (STP) Location at Mid-track	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)

15.28 Remove the H-point machine.

16 Calculate the WSID-50M H-point target at seat mid-track

16.1 The WSID-50M H-point is offset 20 mm forward and 20 mm above the H-point machine H-point as determined in the table below:

WSID-50M Target H-point at Mid-track		
H-point machine H-point (from step15.26) +/- 20 mm = WSID-50M H-point at mid-track		
X (positive (+) forward of striker)	( ) + 20 mm	mm
Z (positive (+) below striker)	( ) - 20 mm	mm

If steps 1-16 were completed prior to seating, verify that measurements have been recorded prior to placing dummy in seat.

17 Once the H-point has been determined and the following items are verified, position a WSID-50M in the driver seat of the test vehicle.

17.1 Follow the procedures in the WSID-50M Qualification Manual for setting the joint torques. Adjust the dummy's neck bracket to align the zero-degree index mark as specified in the user's manual.

17.2 Verify the head and pelvis tilt sensors installed in the dummy are reading correctly about the X and Y axes.

17.3 Verify the seat back and base angles, the steering wheel location, and the seat belt height adjustment are in the correct locations.

18 Positioning the test dummy in the seat

18.1 Move the seat to the full rearward position (as defined in Section 11) and place the test dummy in the seat with the thighs resting on the seat cushion.

18.2 Position the test dummy in the seat such that its plane of symmetry (i.e., mid-sagittal plane) is coincident with the centerline marking on the seat cushion, seat back, and head restraint and its H-point is approximately above the STP.

18.3 Bend the upper torso forward and then lay it back against the seat back. Push the shoulders of the dummy fully rearward. Using the installed tilt sensors, position the dummy so that it sits squarely and level in both the X- and Y-axes in the seat.

18.4 To the extent practicable keep the left and right thighs and legs in vertical planes and align the centerline of the right foot with the centerline of the accelerator pedal. Initially set the feet perpendicular to the legs and then place the right foot as far forward as possible in the direction of the pedal centerline (as defined in steps 8 or 9).

18.4.1 Does this vehicle have a footrest?

___Yes. Starting with the left foot and leg inboard of the footrest, rotate the leg about the hip the minimal amount needed to maximize coverage of the sole of the shoe over the footrest (when viewed longitudinally), while keeping the centerline of the foot in a vertical plane and the leg as vertical as practicable. Ignore the LHP.

___No. Adjust the left leg so the knees are an equal distance from the seat centerline, as measured from the centerline of the knee, while keeping the leg as vertical as practical. Align the heel with the LHP (± 10 mm).

18.5 Lift the feet and slide the seat forward to 25 mm rearward of mid-track or the detent closest to this position that is not greater than 25 mm rearward of mid-track. Adjust the feet if necessary. If there is knee/leg contact with the steering wheel, steering column, or instrument panel, adjust the knee/leg making contact inboard or outboard the minimal amount required to create clearance (not more than 10 mm).

Is there still interference between the dummy's knees/legs and the knee bolster/instrument panel?

__No. Go to step 18.6.

__Yes. Lift the feet and slide the seat to 50 mm rearward of mid-track or the detent closest to this position that is not greater than 50 mm rearward of mid-track. If there is still interference (within 5 mm), continue to move the seat rearward in 25 mm increments until there is no longer interference.

18.6 Verify the seat location by measuring the SCRP, then measure the location of the STP and record it under Trial 1 in the table below (subsequent trials may be needed, depending on the outcome of step 18.13):

Seat Tracking Point Location Trial 1	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)
Seat Tracking Point Location Trial 2 (if applicable)	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)
Seat Tracking Point Location Trial 3 (if applicable)	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)

18.6.1 Calculate and record the Seat Tracking Point Difference (STPD)

STPD = Location of STP from step 18.6 – location of STP from step15.27

Record in table below:

Trial 1		
	Results from 18.6 - Results from 15.27 =	STPD
X (positive (+) forward of striker)	( ) - ( )	mm
Z (positive (+) below striker)	( ) - ( )	mm

Trial 2 (if applicable)		
	Results from 18.6 - Results from 15.27 =	STPD
X (positive (+) forward of striker)	( ) - ( )	mm
Z (positive (+) below striker)	( ) - ( )	mm

Trial 3 (if applicable)		
	Results from 18.6 - Results from 15.27 =	STPD
X (positive (+) forward of striker)	( ) - ( )	mm
Z (positive (+) below striker)	( ) - ( )	mm

18.6.2 Calculate and record the WSID-50M target H-point for each seat position as the seat is moved forward (per step 18.5), following the corresponding steps.

X: WSID-50M Target H-point for 18.6.2 = (WSID-50M Target H-point from 16.1) + (STPD from 18.6.1)

Z: WSID-50M Target H-point for 18.6.2 = (WSID-50M Target H-point from 16.1) + (STPD from 18.6.1)

Trial 1			
	Results from 16.1 -	Results from 18.6.1 =	Current Target H-point
X (positive (+) forward of striker)	( ) +	( )	mm
Z (positive (+) below striker)	( ) +	( )	mm

Trial 2 (if applicable)			
	Results from 16.1 -	Results from 18.6.1 =	Current Target H-point
X (positive (+) forward of striker)	( )	( )	mm
Z (positive (+) below striker)	( ) +	( )	mm

Trial 3(if applicable)			
	Results from 16.1 -	Results from 18.6.1 =	Current Target H-point
X (positive (+) forward of striker)	( ) +	( )	mm
Z (positive (+) below striker)	( ) +	( )	mm

18.7 Confirm, using the tilt sensors, that the dummy is positioned such that the plane of symmetry (i.e., mid-sagittal plane) coincides with the longitudinal, vertical centerline of the seat– adjust the dummy if necessary.

18.8 Verify/Measure the pelvis angles using the tilt angle sensors installed in the test dummy. Verify that the pelvis angles are 0°± 2.5° (about the X-axis) and 0° ± 2.5° (about the Y-axis).

18.9 Confirm that the H-point is within ± 10 mm of the target location in the horizontal (X) and the vertical (Z) directions – adjust the dummy if necessary.

18.10 Are the pelvis angles within specification (described in step 18.8)?

_Yes. Go to step 18.11.

_No. Go back to step 18.7 and repeat steps to re-adjust pelvis angles while maintaining the H-point position within specification.

18.11 Verify/Measure the head angles using the tilt angle sensors installed in the test dummy. Verify that the head angles are 0°± 2.5° (about the X axis) and 0°± 2.5° (about the Y-axis).
18.11.1 Are the head angles within specification?

_Yes. Go to step 18.12 (foot placement).

__No and the head is not touching the head restraint and the pelvis has not yet been re-adjusted. Go back to step 18.7; adjust the pelvis while maintaining the H-point target position within specification.

__No and the head is not touching the head restraint and the pelvis has already been re-adjusted. Go to step 18.11.2.

_No and the head is touching the head restraint and the seatback has not yet been re-adjusted. Go to step 18.11.2.

_No and the head is touching the head restraint and the seatback has already been re-adjusted.

Record final head angles X:____°
Y:____°

18.11.2 Can the dummy's head/neck be adjusted to obtain the head tilt sensor specifications of 0°± 2.5° (X) and 0° ± 2.5° (Y) without interacting with the head restraint?

___Yes. Neck can be adjusted to achieve head angles within the tolerances.
Record the neck adjustment: ____ notches FWD/RWD
Go to Step 18.12.

___ No. Neck was adjusted, but the head is still not within the specifications. Go to Step 18.11.3.

___No. Neck cannot be adjusted because of interference with the head restraint. Go to Step 18.11.3.

18.11.3 Has seatback angle been adjusted?

___No. Adjust the seatback a maximum of 1 detent for manual seats and not more than 2° from the manufacturer's recommended angle found in step 11.3, to bring the head angles within/or as close as possible to specification. Return to step 18.7.

Record original seatback angle before adjustment: ____ °
Record the new seatback angle: _____°

___Yes. Make no further adjustment.
Record final head angles X: _____°
Y: _____°

Go to step 18.12.

18.12 Foot Placement

18.12.1 Right Foot Placement

Without inducing pelvis or torso movement, position the right foot in contact with the accelerator pedal such that the midline of the foot is in the same vertical plane as L1 (longitudinal line parallel with vehicle centerline which passes through PRP) and the heel is resting on RHP or within the heel point zone (as determined in step 7).

To the extent practicable, keep the right thigh and the leg in a vertical plane. Rotate the toe towards the shin of the ATD to minimize the compression of the accelerator pedal while maintaining contact with the pedal.

The heel shall remain as close as practicable to RHP but always within the heel point zone (RHP ± 10 mm fore-aft).

18.12.2 Left Foot Placement – Does the vehicle have a footrest?

_Yes. The LHP created in step 7 is not used. Place the foot on the footrest. Go to steps 18.12.3 and 18.12.4.

_No. Go to step 18.12.5.

18.12.3 Place the heel on the floor pan at the intersection of the foot rest and the floor pan. To the extent practicable, keep the left thigh and leg in a vertical plane, rotate the leg about the hip the minimal amount needed to maximize contact with the sole of the shoe and the footrest while keeping the midline of the foot in a vertical plane as L2.

If the foot sole of the foot cannot rest on the footrest due to the footrest angle, rotate the ankle as far forward as possible, while maintaining the heel location at the intersection of the floor pan and the footrest.

18.12.4 When the foot is placed on the footrest, does the footrest elevate the left heel more than 20 mm above (vertical axis) the right heel?
_No. Go to step 18.13.

_Yes. Position the foot off the footrest using step 18.12.5.

18.12.5 If there is not a footrest or the foot cannot be placed due to Step 18.12.4;

To the extent practicable keep the left thigh and the leg in a vertical plane throughout the procedure. With the midline of the foot in the same vertical plane as L2, place the heel on LHP or as close as possible within the heel point zone. If the left heel cannot be placed within the heel point zone, place the heel as near to LHP as practicable while keeping the midline of the foot in the same vertical plane as L2. Rotate the foot towards the toe board (plantar flexion) to the maximum extent practicable while maintaining the heel position. Check which of the following that applies (ONLY check one):

__The left foot reaches the toe board without adjusting the foot or leg. Record final knee spacing below and go to step 18.13.

__The foot does not reach the toe board and does not contact the brake or clutch pedal with foot rotated forward as far as possible (plantar flexion). Record final knee spacing below and go to step 18.13.

_The left foot contacts the brake or clutch pedal.

__Rotate the foot about the leg (abduction) the minimal amount needed to avoid pedal contact. If the heel is not in the heel point zone, move the heel forward to the middle of the heel point zone and LHP to the extent practicable. Rotate the foot towards the toe board (plantar flexion) to the maximum extent practicable while maintaining the heel position. If the foot still contacts the brake or clutch pedal, continue to the next step; otherwise, record final knee spacing below and go to step18.13.

___Rotate the leg outboard about the hip the minimum distance necessary to avoid pedal contact. If the heel is not in the heel point zone, move the heel forward to the middle of the heel point zone to the extent practicable. Rotate the foot towards the toe board (plantar flexion) to the maximum extent practicable while maintain the heel position. Record final knee spacing below and go to step18.13.

Final Knee Spacing: ___mm

18.13 Verify that the head and pelvis angles and the H-point location are within the specifications (steps 18.8, 18.9, and 18.11). For a seat that is not in mid-track, if the dummy leg/knee to knee bolster/instrument panel clearance is greater than 5 mm, the seat should be moved forward. If there is leg/knee contact with the steering wheel, steering column, knee bolster, or instrument panel, adjust the leg/knee making contact inboard or outboard the minimal amount required to create clearance (not to exceed 10 mm).

____Seat is already at mid-track and dummy is within specified head/pelvis angles and H-point location. Go to step 18.14.

____Dummy leg/knee to knee bolster/instrument panel clearance is greater than 5 mm. Adjust the seat forward, without going forward of mid-track, until a clearance of 5 mm or less is achieved.

Record seat position: ______mm rearward of mid-track.

Return to step 18.6 and repeat the steps to go through the trials.

___ Dummy leg/knee to knee bolster/instrument panel clearance is not greater than 5 mm. No adjustments required.

Record seat position: _____mm rearward of mid-track.

Go to step 18.14.

18.14 Arm and belt placement. Verify the shoulders of the dummy are rotated fully rearward.

18.14.1 Place both upper arms at the first detent downward of the horizontal arm position detent.
Is the seat belt used for this test?
_Yes. Go to step 18.14.2.
_No. Stop, seating completed.

18.14.2 Fasten the seat belt around the dummy.

18.14.3 Remove all slack from the lap belt portion.

18.14.4 Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times.

18.14.5 Apply a 2 to 4-pound tension load to the lap belt.
__pounds of load applied

18.14.6 Is the belt system equipped with a tension-relieving device?
_Yes. Go to step 18.14.7.
_No. Stop, seating completed.

18.14.7 Introduce the maximum amount of slack into the upper torso belt that is recommended by the vehicle manufacturer in the vehicle owner's manual.

Driver WS_50th Seating Worksheet

Vehicle ____________ **Technician** ____________
VIN # ____________ **Position** ____________
ATD ____________ **Date** ____________
SEATING # ____________

SCRL Angle
Max ______
Min - ______
Difference ______
/2 ______
Min + ______
Mid Angle ______

VSID Tilt Sensors		**X**	**Y**
Head	0±2		
T1	0±2		
T6	0±2		
T12	0±2		
Pelvis	0±2		

Seat Back Angle W/Level ______ **HEAD REST POST** ______ **FINAL HEAD REST** ______
Seat Pan Angle W/Level ______

Pelvis Angle WSID 0° +/-2.5° Manual Inclinometer ______ Tilt Sensor ______

	Measurements From Driver Striker				
Name	**Meas X**	**Meas Y**	**Meas Z**	**3D Distance**	**Deg**
SBU					
SBL					
STRIKER					
FOSB					
ROSB					
DRIVER OSCAR H-POINT					
DRIVER RIGHT HEAD CG					
DRIVER LEFT HEAD CG					
DRIVER NS					
DRIVER TN					
DRIVER TC					
DRIVER C1					
DRIVER SHT 1					
DRIVER E1					
DRIVER P1					
DRIVER H-POINT					
DRIVER OK					
DRIVER IK					
DRIVER OA					
DRIVER IA					
DRIVER OH					
DRIVER IH					
DRIVER OP					
DRIVER R					
DRIVER H					
DRIVER H-POINT TOOL AN					
DRIVER W1					
DRIVER W2					
DRIVER WS ANGLE					
DRIVER D1					
DRIVER C2					
DRIVER C3					
DRIVER D2					
DRIVER D3					
DRIVER HR					
DRIVER HS					
DRIVER AD					
DRIVER HD					
DRIVER TS					
DRIVER HH					
DRIVER KK					
DRVER SH					
DRIVER TORSO ANGLE					
DRIVER HRA					

Neck was adjusted ?

15.26

Oscar H-point location		
Torso Angle		°
X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

15.27

Seat Tracking Point (STP) location at mid-position		
X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

16.1

WSID Target H-point at Mid-position					
	Oscar H-point (15.26)	+/-	20mm	=	WSID H-Point at Mid-position
X (Positive (+) forward of striker)	0	+	20	=	mm
Z (Positive (+) below striker)	0	-	20	=	mm

18.6

Seat Tracking Point location		
X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm
Seat Tracking Point location Trial 2 (if applicable)		
X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm
Seat Tracking Point location Trial 3 (if applicable)		
X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

DRIVER

Fill in cells to calculate H-point Location

WSID H-point Target

WSID H-point Target at midtrack

18.6.1

Trial 1					
	Results from (18.6)	-	Results from (15.27)	=	STPD
X (Positive (+) forward of striker)	0	-	0	=	0 mm
Z (Positive (+) below striker)	0	-	0	=	0 mm

Trial 2					
	Results from (18.6)	-	Results from (15.27)	=	STPD
X (Positive (+) forward of striker)	0	-	0	=	0 mm
Z (Positive (+) below striker)	0	-	0	=	0 mm

Trial 2					
	Results from (18.6)	-	Results from (15.27)	=	STPD
X (Positive (+) forward of striker)	0	-	0	=	0 mm
Z (Positive (+) below striker)	0	-	0	=	0 mm

18.6.2

Trial 1					
	Results from (16.1)	+	Results from (18.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	0	+	0	=	0 mm
Z (Positive (+) below striker)	0	+	0	=	0 mm

Trial 2					
	Results from (16.1)	+	Results from (18.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	0	+	0	=	0 mm
Z (Positive (+) below striker)	0	+	0	=	0 mm

Trial 3					
	Results from (16.1)	+	Results from (18.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	0	+	0	=	0 mm
Z (Positive (+) below striker)	0	+	0	=	0 mm

Seating and Positioning Procedures for the WorldSID 50TH Percentile Male Dummy (WSID-50M) – Right Front Passenger Position

1 Determine the seat type

Visually inspect the seats to determine type (i.e., bucket or bench).
_Bench
_Bucket

2 Position lumbar supports

Position the seat's adjustable lumbar supports to the lowest, retracted, or deflated adjustment positions.
_*N/A* No lumbar adjustment

3 Position additional supports

Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position.
_*N/A* No additional support adjustment

4 Position leg supports

Position an adjustable leg support system in its rearmost position.
_*N/A* No adjustable leg support system

5 Position the head restraint

5.1 Using any adjustment of the head restraint, position it to its highest position.

5.2 Using any adjustment of the head restraint, position it to the full rearward position. If it rotates, rotate it such that the head restraint extends as far rearward as possible.

_*N/A* The test vehicle is equipped with automatically adjusting head restraints or there is no head restraint adjustment,

6 Mark the centerline of the seat using a vehicle longitudinal, vertical (XZ) plane (complete ONLY the one that is applicable to seat being marked)

6.1 Bucket Seat: For future reference, locate and mark the line on the seat cushion that is the intersection of the XZ plane which passes through the centerline of the seat and the seat cushion upper surface.

6.2 Bench Seat: For future reference, locate and mark the line on the seat cushion that is the intersection of the XZ plane which passes through the seat cushion upper surface and is the same lateral distance from the vehicle centerline as the steering wheel center.

7 Mark the range of seat travel

Prior to marking the seat for fore/aft travel, move the seat through its full range of motion using all available controls. Separately, operate each control to determine whether it moves the seat and/or seat cushion primarily in the fore-aft or up-down directions.

7.1 Mark a point (seat cushion reference point - SCRP) on the side of the seat cushion that is between 150 mm and 250 mm from the front edge of the seat cushion. For seat cushions that move up and down independently from the seat housing, mark the point on the side of the cushion in an area that will not be obscured by the seat housing when the seat cushion is at its lowest height position.

7.2 Draw a horizontal line (seat cushion reference line - SCRL) through the SCRP.

7.3 Using only the controls that primarily move the seat in the fore-aft direction, move the SCRP to the rearmost position.

7.4 If the seat cushion adjusts fore-aft, independent of the seat back, using only the controls that primarily move the seat cushion in the fore-aft direction, move the SCRP to the rearmost position.

_ *N/A* No independent fore-aft seat cushion adjustment

7.5 Using any part of any control, other than the parts just used for fore-aft positioning, determine the range of angles of the SCRL and set the SCRL at mid-angle. Start with the seat position in the lowest position. Record the maximum, minimum, and mid-angles in the table below.

SCRL (deg)	Max	Min	Mid
Passenger			

7.6 If the seat and/or seat cushion height is adjustable, using any part of any control other than the parts which primarily move the seat or seat cushion fore-aft, put the SCRP in its lowest position with the SCRL angle at the mid-angle found in 7.5.

__*N/A* No seat height adjustment

7.7 Using only the controls that primarily move the seat in the fore-aft direction, verify the seat is in the rearmost position

7.8 Using only the controls that primarily move the seat in the fore-aft direction, mark each detent possible from rearward to full forward. Mark each position so that there is a visual indication when the seat is at a particular position as follows below.

- For manual seats, move the seat forward one detent at a time and mark each detent.
- For power seats, mark only the rearmost, middle, and foremost positions.
- Label three of the positions with the following: F for foremost, M for

mid-track (if there is no mid-track, label the closest adjustment position to the rear of mid-track), and R for rearmost.

Measure and record the SCRP fore-aft location for each seat position on the table below.

	SCRL Mid-Angle (deg)	Rearmost		Mid-track		Full forward		SCRP Height (mm) Spacing measurement between detents (if applicable)
		X	Z	X	Z	X	Z	X
Passenger								

7.8.1 While at mid-track, also mark a position that is 25 mm rearward of mid-track.

8 Set the seat for a test dummy

Using the reference marks on the seat from section 7, set the seat in the mid-track, lowest height, and mid seat cushion angle positions by using the following steps to adjust the seat:

8.1 If the seat or seat cushion height is adjustable, using other than the controls that primarily move the seat or seat cushion fore and aft, set the height of the SCRP to the minimum height, with the SCRL set as closely as possible to the mid-angle determined in previous steps.

8.2 Using the control that primarily moves the seat fore and aft, move the SCRP to the mid-track position.

8.3 Set the seat back angle at the manufacturer's nominal design riding position for a 50thpercentile male adult occupant.

If the position is not specified, set the seat back in the position that produces a torso (back) angle of 25° from vertical when measured with the SAE J826 H-point machine (specified in Society of Automotive Engineers (SAE) Surface Vehicle Standard J826, revised July 1995). For seat backs with discrete positions, if a torso (back) angle of 25° from vertical cannot be achieved, set the seat back in the detent that yields a torso (back) angle as close as possible to 25° from vertical. Describe the method used to achieve the nominal design riding position and record the seat back angle.

____

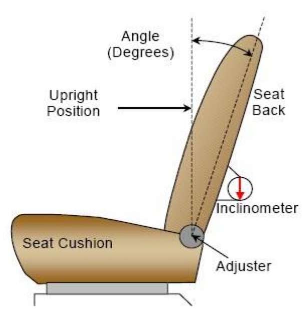
____

____

____

Seat Back Angle_____°

_*N/A* The seat back does not adjust.



FRONT SEAT ASSEMBLY

9 Set adjustable seat belt upper anchorages

Use the markings to position an adjustable seat belt upper anchorage at the manufacturer's nominal design position for a 50th percentile male adult occupant or highest position if not provided. Fill in the following table:

Seat	Total # of Positions	Placed in Position #
Front Passenger		

_*N/A* The seat belt upper anchorage does not adjust.

10 Retract the armrest

Retract any folding armrest

_*N/A* No armrest or armrest is fixed, not retractable.

11 Determine the H-point location with the H-Point machine

Position the three-dimensional H-point manikin (i.e., H-point machine) specified in Society of Automotive Engineers (SAE) Surface Vehicle Standard J826, revised July 1995, Devices for Use in Defining and Measuring Vehicle Seating Accommodation in the seat as follows:

11.1 Place a 910 mm^2 piece of muslin cotton cloth over the seat area (the muslin cloth shall be comparable to 48 threads/in^2 and density of 2.85 lb/yd). Tuck the muslin cloth a sufficient amount to prevent hammocking of the material.

11.2 Place the seat and back assembly of the H-Point machine such that its plane of symmetry is coincident with the centerline marking on the seat.

11.3 Install the lower leg and foot segments.

11.4 Set the length of the lower leg segment at 414 mm (16.3 in) and the length of the thigh bar at 401 mm (15.8 in).

11.5 Leg and foot placement

11.5.1 Tighten the pins so that the foot angle is not more than 130°.

11.5.2 With the T-bar level, place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheel well projection. If the foot cannot be positioned on the toe board, set it on the floor pan.
__Foot on toe board
__Foot on floor pan

11.5.3 With the T-bar level, place the right foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheel well projection. If the foot cannot be positioned on the toe board, set it on the floor pan.
__Foot on toe board
__Foot on floor pan

11.5.4 Space the lower legs 270 mm (10.6 in) apart, equally spaced about the centerline of the H-point machine.

11.6 Apply the lower leg weights.

11.7 Apply the thigh weights.

11.8 Tilt the back pan forward against the forward stop and draw the H-point machine away from the seatback using the T-bar.

11.9 Re-positioning the H-point machine.

11.9.1 Allow the H-point machine to slide rearward until a forward horizontal restraining load on the T-bar is no longer required due to the seat pan contacting the seat back.
___The set pan does not slide rearward. Go to step 11.9.2.

11.9.2 Slide the H-point machine rearward by a horizontal rearward load applied at the T-bar until the seat pan contacts the seat back.

11.10 Apply a 10-kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.

11.11 Again apply a 10-kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.

11.12 Carefully return the back pan to the seat back.

11.13 Install the right and left buttock weights.

11.14 Install the eight torso weights, alternating the installation between right and left.

11.15 Tilt the back pan forward until the stop is contacted.

11.16 Rock the H-point machine from side to side over a 10° arc (5° to each side of the vertical centerline) for three complete cycles. Restrain the T-bar during rocking so that the seat pan does not change position. Minimize any inadvertent exterior loads applied in a vertical or fore-aft direction. The feet are free to move during this rocking motion.

11.17 Without applying a forward or lateral load, lift the right foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

11.18 Lower the right foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor or toe board.

11.19 Without applying a forward or lateral load, lift the left foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

11.20 Lower the left foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor or toe board.

11.21 Is the seat pan level?
_Yes. Go to step 11.23.
_No. Go to step 11.22.

11.22 Apply a sufficient lateral load to the top of the seatback pan to level the H-point machine seat pan on the seat.

11.23 Holding the T-bar to prevent the H-point from sliding forward on the seat cushion, return the seatback pan to the seatback.

11.24 Holding the T-bar to prevent the H-point machine from sliding forward on the seat cushion, apply a rearward force perpendicular to the back angle bar just above the torso weights until either 66 N (15 lb) of force is reached or the hip angle is increased by 3°, whichever occurs first. Minimize the exterior downward or side forces applied to the H-point machine. Release the force. Repeat this step until the resulting hip angle is identical. Complete as many force applications as necessary and record the results in the following table:

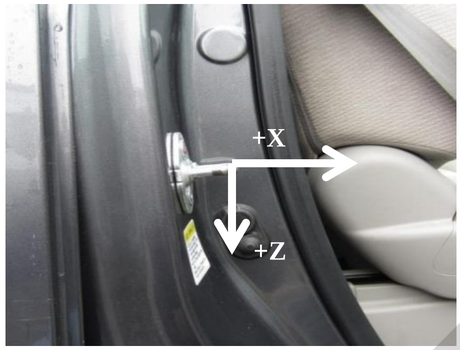
Force App.	Hip Angle
1	
2	
3	
4	
5	

11.25 Is the H-point machine level?
_Yes. Go to step 11.26.
_No. Go back to step 11.15 and repeat steps to re-level H-point machine.

11.26 Record the H-point location and torso angle in the table below:

H-point Machine H-point Location and Torso Angle	
Torso Angle	°
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)

Reference: X-axis is positive forward of striker
Y-axis is positive right of striker
Z-axis is positive below striker



11.27 Create a Seat Tracking Point (STP): Place a target point 20 mm forward of the H-point machine H-point on a rigid part of the seat and record its location in the table below. This reference point will be used to locate the dummy H-point relative to the seat if the seat cannot be set to the mid-track position.

Seat Tracking Point (STP) Location at Mid-track	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)

11.28 Remove the H-point machine.

12 Calculate the WSID-50M H-point Target at Mid-track

12.1 The WSID-50M H-point is offset 20 mm forward and 20 mm above the H-point machine H-point as determined in the table below:

WSID-50M Target H-point at Mid-track				
H-point machine H-point (11.26) +/- 20 mm = WSID-50M H-point at mid-track				
X (positive (+) forward of striker)	( )	+	20 mm	mm
Z (positive (+) below striker)	( )	-	20 mm	mm

If steps 1-12 were completed prior to seating, verify that measurements have been recorded prior to placing dummy in seat.

13 Once the H-point has been determined and the following items are verified, position a qualified WSID-50M in the right front seat of the test vehicle.

13.1 Follow the procedures in the WSID-50M Qualification Manual for setting the joint torques. Adjust the dummy's neck bracket to align the zero-degree index mark as specified in the user's manual.

13.2 Verify the head and pelvis tilt sensors installed in the dummy are reading correctly about the X and Y axes.

13.3 Verify the seat back and base angles and the seat belt height adjustment are in the correct locations.

14 Positioning the test dummy in the seat

14.1 Move the seat to the full rearward, lowest mid angle position (as defined in Section 8) and place the test dummy in the seat with the thighs resting on the seat.

14.2 Position the test dummy in the seat such that its plane of symmetry (i.e. mid-sagittal plane) is coincident with the centerline marking on the seat cushion, seat back, and head restraint and such that it's H-point is approximately above the STP.

14.3 Bend the upper torso forward and then lay it back against the seat back. Push the shoulders of the dummy fully rearward. Using the installed tilt sensors, position the dummy so that it sits squarely and level in the both the X and Y axes in the seat.

14.4 Foot and leg alignment:

Align the legs such that the following occurs:

To the extent practicable keep the left and right thigh and the leg in a vertical plane; adjust the knees such that they are 225 mm apart (centerline to centerline) and equidistant from the seat centerline. Initially set the feet perpendicular to the legs and equidistant from the seat centerline.

14.5 Lift the feet and slide the seat forward to 25 mm rearward of mid-track or the detent closest to this position that is not greater than 25 mm rearward of mid-track. Adjust the feet as necessary. If there is knee/leg contact with the knee bolster or instrument panel, adjust only the knee/leg that is interacting with the knee bolster/instrument panel inboard or outboard the minimum amount required to create clearance (not to exceed 10 mm), without the inner thigh crossing the centerline of the seat.

Is there still interference between the dummy's knees/legs and the knee bolster/instrument panel?

__No. Go to step 14.6.

__Yes. Lift the feet and slide the seat to 50 mm rearward of mid-track or the detent closest to this position that is not greater than 50 mm rearward of mid-track. If there is still interference (within 5 mm), continue to move the seat rearward in 25 mm increments until there is no longer interference.

14.6 Verify the seat location by measuring the SCRP, then measure the location of the STP and record it under Trial 1 in table below (subsequent trials may be needed, depending on the outcome of step 14.13):

Seat Tracking Point Location Trial 1	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)
Seat Tracking Point Location Trial 2 (if applicable)	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)
Seat Tracking Point Location Trial 3 (if applicable)	
X (positive (+) forward of striker)	(mm)
Z (positive (+) below striker)	(mm)

14.6.1 Calculate and record the Seat Tracking Point Difference (STPD)

STPD = Location of STP from step 14.6 – location of STP from step 11.27

Record in table below:

Trial 1				
	Results from 14.6 -	Results from 11.27 =		STPD
X (positive (+) forward of striker)	( )	-	( )	mm
Z (positive (+) below striker)	( )	-	( )	mm

Trial 2 (if applicable)				
	Results from 14.6 -	Results from 11.27 =		STPD
X (positive (+) forward of striker)	( )	-	( )	mm
Z (positive (+) below striker)	( )	-	( )	mm

Trial 3 (if applicable)				
	Results from 14.6 -	Results from 11.27 =		STPD
X (positive (+) forward of striker)	( )	-	( )	mm
Z (positive (+) below striker)	( )	-	( )	mm

14.6.2 Calculate and record the WS-50M target H-point for each seat position as the seat is moved forward (per step 14.5), following the corresponding steps.

X: WSID-50M Target H-point for 14.6.2 = (WSID-50M Target H-point *from 12.1) + (STPD from 14.6.1)*

Z: WSID-50M Target H-point for 14.6.2 = (WSID-50M Target H-point from 12.1) + (STPD from 14.6.1)

Trial 1				
	Results from 12.1	-	Results from 14.6.1 =	Current Target H-point
X (positive (+) forward of	( )	+	( )	mm
Z (positive (+) below striker)	( )	+	( )	mm

Trial 2 (if applicable)				
	Results from 12.1	-	Results from 14.6.1 =	Current Target H-point
X (positive (+) forward of	( )		( )	mm
Z (positive (+) below striker)	( )	+	( )	mm

Trial 3 (if applicable)				
	Results from 12.1	-	Results from 14.6.1 =	Current Target H-point
X (positive (+) forward of	( )	+	( )	mm
Z (positive (+) below striker)	( )	+	( )	mm

14.7 Confirm, using the tilt sensors, that the dummy is positioned such that the plane of symmetry (i.e., mid-sagittal plane) coincides with the longitudinal, vertical centerline of the seat– adjust the dummy if necessary.

14.8 Verify/measure the pelvis angles using the tilt angle sensors installed in the test dummy. Verify that the pelvis angles are 0°± 2.5° (about the X-axis) and 0° ± 2.5° (about the Y-axis).

14.9 Confirm that the H-point is within ± 10 mm of the target location in the horizontal (X) and the vertical (Z) directions – adjust the dummy if necessary.

14.10 Are the pelvis angles within specification (described in step 14.8)?

_Yes. Go to step 14.11.

__No. Go back to step 14.7 and repeat steps to re-adjust the pelvis angles while maintaining the H-point position within specification.

14.11 Verify/Measure the head angles using the tilt angle sensors installed in the test dummy. Verify that the head angles are 0°± 2.5° (about the X axis) and 0°± 2.5° (about the Y-axis).

14.11.1 Are the head angles within specification?

__Yes. Go to step 14.12 (foot placement).

__No and the head is not touching head restraint and the pelvis has not yet been re-adjusted. Go back to step 14.7; adjust the pelvis while maintaining the H-point target position within specification.

__No and the head is not touching the head restraint, but the pelvis has already been re-adjusted. Go to step 14.11.2.

__No and the head is touching head rest and the seatback has not yet been re-adjusted. Go to step 14.11.2.

_No and the head is touching the head restraint and the seatback has already been re-adjusted.

Record final head angles X:____°
Y:____°

14.11.2 Can the dummy's head/neck be adjusted to obtain the head tilt sensor specifications of 0°± 2.5° (X) and 0° ± 2.5° (Y) without interacting with the head restraint?

___Yes. Neck can be adjusted to achieve head angles within the tolerances.
Record the neck adjustment: _____ notches FWD/RWD
Go to Step 14.12.

___No. Neck was adjusted, but the head is still not within the specifications. Go to Step 14.11.3.

___No. Neck cannot be adjusted because of interference with the head restraint. Go to Step 14.11.3.

14.11.2 Has the seatback angle been adjusted?

__No. Adjust the seatback a maximum of 1 detent for manual seats and not more than 2° from the manufacturer's recommended angle found in step 8.3, to bring the head angles within/or as close as possible to specification. Return to step 14.7.

Record original seatback angle before adjustment: ____ °
Record the new seatback angle: _____°

__Yes. Make no further adjustment.
Record final head angles X:____°
Y:____°

Go to step 14.12.

14.12 Foot Placement

14.12.1 To the extent practicable without inducing pelvis or torso movement, keep the thighs and the legs in vertical planes throughout the procedure. If possible, maintain a knee spacing of 225 mm, as measured between the centerline of the knees, with the knees being equidistant from the seat centerline. Also, if possible, position and maintain the feet equidistant from the centerline of the seat.

14.12.2 For each foot, check which of the following that applies (ONLY check one):

__The foot can be placed flat on the toe board with the heel resting on the floor pan as close as possible to the intersection of the floor pan and toe board.

__The foot cannot be placed flat on the toe board. Set the foot perpendicular to the leg and place it as far forward as possible with the heel resting on the floor pan and the foot perpendicular to leg.

__The vehicle has a wheelhouse projection and the foot cannot be placed on the toe board. Do not set the foot on the wheelhouse projection. Set the foot perpendicular to the leg and move the leg laterally the minimum amount needed to avoid the wheelhouse projection, while maintaining the dummy's head and pelvis angle and H-point location specifications. Make sure the foot and leg are still in same vertical plane. Place the foot as far forward as possible with the heel resting on the floor pan.

14.12.3 If either of the dummy's legs contact the vehicle's interior, shift only the knee with clearance issues inboard or outboard the minimum required to avoid contact (not to exceed 10 mm), without the inner thigh crossing the centerline of the seat. Maintain the dummy's head and pelvis angle and H-point location specifications, and try to maintain the leg and foot in the same vertical plane.

__N/A- there was no leg contact.

__Knees were shifted for clearance.

Final Knee Spacing: ______ mm

14.13 Verify that the head and pelvis angles and the H-point location are within the specifications (steps 14.8, 14.9, and 14.11). For a seat that is not in mid-track, if the dummy leg/knee to knee bolster/instrument panel clearance is greater than 5 mm, the seat should be moved forward. If there is leg/knee contact with the knee bolster/instrument panel, adjust the leg/knee making contact inboard or outboard the minimal amount required to create clearance (not to exceed 10 mm).

___Seat is already at mid-track and dummy is within specified head/pelvis angles and H-point location. Go to step 14.14.

_ Dummy leg/knee to knee bolster/instrument panel clearance is greater than 5 mm. Adjust the seat forward, without going forward of mid-track, until a clearance of 5 mm or less is achieved.

Record seat position: ___ mm rearward of mid-track.

Return to step 14.6 and repeat the steps to go through the trials.

__Dummy leg/knee to knee bolster/instrument panel clearance is not greater than 5 mm. No adjustments required.

Record seat position: ____mm rearward of mid-track.

Go to step 14.14.

14.14 Arm and belt placement. Verify the shoulders of the dummy are rotated fully rearward.

14.14.1 Place the both of the upper arms adjacent to the torso with the centerline as close to a vertical plane as possible;

Is the seat belt used for this test?

_Yes. Go to step 14.14.2.

_No. Stop, seating is completed.

14.14.2 Fasten the seat belt around the dummy.

14.14.3 Remove all slack from the lap belt portion.

14.14.4 Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times.

14.14.5 Apply a 2 to 4-pound tension load to the lap belt.

__pounds of load applied

14.14.6 Is the belt system equipped with a tension-relieving device?

_Yes. Go to step 14.14.7.

_No. Stop, seating is completed.

14.14.7 Introduce the maximum amount of slack into the upper torso bet that is recommended by the vehicle manufacturer in the vehicle owner’s manual.

Passenger WS_50th Seating Worksheet

Vehicle		**Technician**	
VIN #		**Position**	
ATD		**Date**	
SEATING #			

					X	Y
SCRL Angle	Max		**THOR Tilt Sensors**			
	Min -		Head	0°±2		
	Difference		T1	0°±2		
	/2		T6	0°±2		
	Min +		T12	0°±2		
	Mid Angle		Pelvis	0°±2		

Seat Back Angle	W/Level°		**POST ANGLE**		**REST POST ANGLE**	
Seat Pan Angle	W/Level°					
Pelvis Angle	WSID 0° +/-2.5°		Manual Inclinometer			

	Measurements From Passenger Striker				
Name	Meas X	Meas Y	Meas Z	3D Distance	Deg
SBU					
SBL					
STRIKER					
FOSB					
ROSB					
PASSENGER OSCAR H-POINT					
PASSENGER RIGHT HEAD CG					
PASSENGER LEFT HEAD CG					
PASSENGER NS					
PASSENGER TN					
PASSENGER TC					
PASSENGER C1					
PASSENGER SHT1					
PASSENGER E1					
PASSENGER P1					
PASSENGER H-POINT					
PASSENGER OK					
PASSENGER IK					
PASSENGER OA					
PASSENGER IA					
PASSENGER OH					
PASSENGER IH					
PASSENGER OP					
PASSENGER R					
PASSENGER H					
PASSENGER W1					
PASSENGER W2					
PASSENGER WINDSHIELD ANGLE					
PASSENGER D1					
PASSENGER D2					
PASSENGER D3					
PASSENGER H-POINT TOOL ANGLE					
PASSENGER HR					
PASSENGER HS					
PASSENGER AD					
PASSENGER HD					
PASSENGER HH					
PASSENGER KK					
PASSENGER SH					
PASSENGER TORSO ANGLE					
DRIVER HRA					

Neck was adjusted ?

11.26

Oscar H-point location

Torso Angle		°
X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

11.27

Seat Tracking Point (STP) location at mid-position

X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

12.1

WS Target H-point at Mid-position

	Oscar H-point (11.26)	+/-	20mm	=	WS H-Point at Mid-position
X (Positive (+) forward of striker)	0	+	20	=	20 mm
Z (Positive (+) below striker)	0	-	20	=	-20 mm

14.6

Seat Tracking Point location

X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

Seat Tracking Point location Trial 2 (if applicable)

X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

Seat Tracking Point location Trial 3 (if applicable)

X (Positive (+) forward of striker)		mm
Z (Positive (+) below striker)		mm

PASSENGER

Fill in cells to calculate H-point Location

WS H-point Target

WS H-point Target at Mid-position

14.6.1

Trial 1

	Results from (14.6)	-	Results from (11.27)	=	STPD
X (Positive (+) forward of striker)	0	-	0	=	0 mm
Z (Positive (+) below striker)	0	-	0	=	0 mm

Trial 2

	Results from (14.6)	-	Results from (11.27)	=	STPD
X (Positive (+) forward of striker)	0	-	0	=	0 mm
Z (Positive (+) below striker)	0	-	0	=	0 mm

Trial 2

	Results from (14.6)	-	Results from (11.27)	=	STPD
X (Positive (+) forward of striker)	0	-	0	=	0 mm
Z (Positive (+) below striker)	0	-	0	=	0 mm

14.6.2

Trial 1

	Results from (12.1)	+	Results from (14.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	20	+	0	=	20 mm
Z (Positive (+) below striker)	-20	+	0	=	-20 mm

Trial 2

	Results from (12.1)	+	Results from (14.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	20	+	0	=	20 mm
Z (Positive (+) below striker)	-20	+	0	=	-20 mm

Trial 3

	Results from (12.1)	+	Results from (14.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	20	+	0	=	20 mm
Z (Positive (+) below striker)	-20	+	0	=	-20 mm

APPENDIX F

WORLD SID 50M SEATING WORKSHEET

15.26

Oscar H-point location	
Torso Angle	20 °
X (Positive (+) forward of striker)	243 mm
Z (Positive (+) below striker)	278 mm

15.27

Seat Tracking Point (STP) location at mid-position	
X (Positive (+) forward of striker)	263 mm
Z (Positive (+) below striker)	346 mm

16.1

WSID Target H-point at Mid-position

	Oscar H-point (15.26)	+/-	20mm	=	WSID H-Point at Mid-position
X (Positive (+) forward of striker)	243	+	20	=	263 mm
Z (Positive (+) below striker)	278	-	20	=	258 mm

18.6

Seat Tracking Point location	
X (Positive (+) forward of striker)	243 mm
Z (Positive (+) below striker)	349 mm
Seat Tracking Point location Trial 2 (if applicable)	
X (Positive (+) forward of striker)	263 mm
Z (Positive (+) below striker)	347 mm
Seat Tracking Point location Trial 3 (if applicable)	
X (Positive (+) forward of striker)	mm
Z (Positive (+) below striker)	mm

DRIVER

Fill in cells to calculate H-point Location

WSID H-point Target

WSID H-point Target at midtrack

18.6.1

Trial 1

	Results from (18.6)	-	Results from (15.27)	=	STPD
X (Positive (+) forward of striker)	243	-	263	=	-20 mm
Z (Positive (+) below striker)	349	-	346	=	3 mm

Trial 2

	Results from (18.6)	-	Results from (15.27)	=	STPD
X (Positive (+) forward of striker)	263	-	263	=	0 mm
Z (Positive (+) below striker)	347	-	346	=	1 mm

Trial 2

	Results from (18.6)	-	Results from (15.27)	=	STPD
X (Positive (+) forward of striker)	0	-	263	=	-263 mm
Z (Positive (+) below striker)	0	-	346	=	-346 mm

18.6.2

Trial 1

	Results from (16.1)	+	Results from (18.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	263	+	-20	=	243 mm
Z (Positive (+) below striker)	258	+	3	=	261 mm

Trial 2

	Results from (16.1)	+	Results from (18.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	263	+	0	=	263 mm
Z (Positive (+) below striker)	258	+	1	=	259 mm

Trial 3

	Results from (16.1)	+	Results from (18.6.1)	=	Current H-point Target
X (Positive (+) forward of striker)	263	+	-263	=	0 mm
Z (Positive (+) below striker)	258	+	-346	=	-88 mm

Driver WSID 50th Seating Worksheet

Vehicle	2018 Honda Accord 4-door Seadan	**Technician**	Steve T
VIN #	1HGCV1FI8JA079564	**Position**	Driver
ATD	WorldSID	**Date**	Oct 31 2019
Test #	R20185385		

SCRL Angle	Max	10.1	**WSID 50th Tilt Sensors**		**X**	**Y**
	Min -	5	Head	0°±2	0.6	-1.8
	Difference	5.1	[redacted]			
	/2	2.55	T6	0°±2	1.5	-1.2
	Min +	2.55	[redacted]			
	Mid Angle	7.55	Pelvis	0°±2	0.5	-1.6

Seat Back Angle	W/Level °		**HEAD REST POST ANGLE**	2.4		**FINAL HEAD REST POST ANGLE**	Full Up
Seat Pan Angle	W/Level °						
Pelvis Angle	WSID 50th 0° +/-2.5°		Manual Inclinometer	n/a	Tilt Sensor		

Collected Points

Name	Meas X	Meas Y	Meas Z
SBU -	-36	2	-13
SBL -	-32	1	23
STRIKER -	0	0	0
FOSB -	493	203	501
FISB -			
ROSB -			
RISB -			
PCP-(Pedal Center Point)			
RHP - (Right Heel Point)			
LHP -(Left Heel Point)	997	243	539
S0 -	569	435	-101
TS -	628	435	-261
BS -	510	435	57
SC1 -			
OSCAR H-POINT -	244	247	277
DR PROJECTED WSID H-POINT AT MID-POSITION -			
DRIVER STP 15.27 MID-POSITION -			
DRIVER STP STEP 18.6 TRIAL 1 -	244	185	348
DR PROJECTED WSID H-POINT STEP 18.6.2 TRIAL 1 -	256	220	258
DRIVER STP STEP 18.6 TRIAL 2 -	264	185	346
DR PROJECTED WSID H-POINT STEP 18.6.2 TRIAL 2 -	272	221	262
DRIVER STP STEP 18.6 TRIAL 3 -			
DR PROJECTED WSID H-POINT STEP 18.6.2 TRIAL 3 -			
RHDCG-	122	531	-404
3DLHCG-	136	380	-406
LHDCG -	115	378	-405
BON -	210	451	-386
TN -	210	452	-356
TC -	195	451	-281
SHLD R1 -	167	450	-176
THX R1 -	203	448	-99
THX R2 -	237	445	-33
THX R3 -	254	443	14
ABD R1 -	275	447	70
ABD R2 -	293	445	118
TPS	326	441	143
C1 -	174	448	-157
C2 -	209	436	-100
C3 -	282	435	58
SHT -	77	237	-142
E1 -	271	205	-13
P1 -	221	223	212
H-POINT -	273	220	263
OK -	660	206	132
IK -	696	542	129
OA -	964	215	415
IA -	973	541	424
OH -	1003	226	537
IH -	1012	577	532
OP -	-122	367	-274
R -	201	457	-572
H -	536	450	-512

W1	823	451	-387				
W1 - Outside	823	450	-392				
W2 - Outside	951	450	-319				
D1 -	769	448	-235				
D2 -	848	206	133				
D3 -	848	542	133				
HRP -	210	218	-506				
HSP -	211	80	-387				
ADP -	270	45	-11				
HDP -	276	104	262				
Calculated Measurements							
Name	**Cal X**	**Cal Y**	**Cal Z**	**Cal 3D Distance**	**Deg**		
HZ -			186				
HH -				349			
HW -	612						
NR -				429			
CD -				600			
CS -	360						
IKD -				153			-153
OKD -				188			
HR -				261			
HS -		370					
AD -		160					
HD -		117					
HLHL -				351			
KK -				338			
SH -				438			
HRA -							
H-POINT TOOL ANGLE -					44.4		
TORSO ANGLE -					13.3		
WINDSHIELD ANGLE -					60.4		