

REPORT NUMBER: CAL-00-08

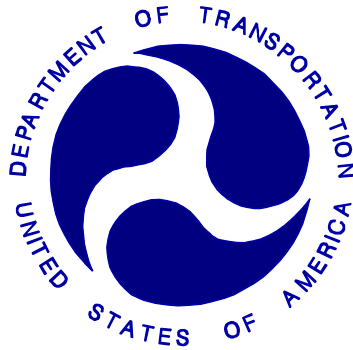
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**FORD MOTOR COMPANY
2000 MERCURY VILLAGER
SPORT WAGON**

NHTSA NUMBER: MY0213

VERIDIAN TEST NUMBER: 8413-47

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
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January 13,2000

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
Mail Code: NPS-10
400 Seventh Street, SW, Room No. 5313
Washington, DC 20590

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FINAL REPORT ACCEPTANCE BY OCS:

Manager, New Car Assessment Program (NCAP)
NHTSA, Office of Crashworthiness Standards

Date of Report Acceptance

COTR, New Car Assessment Program (NCAP)
NHTSA, Office of Crashworthiness Standards

Date of Report Acceptance

TECHNICAL REPORT STANDARD TITLE PAGE

1. <i>Report No.</i> CAL-00-08		2. <i>Government Accession No.</i>		3. <i>Recipient's Catalog No.</i>	
4. <i>Title and Subtitle</i> Final Report of NEW CAR ASSESSMENT PROGRAM (NCAP) Testing of a 2000 Mercury Villager Sport Wagon NHTSA No. MY0213				5. <i>Report Date</i> January 13,2000	
				6. <i>Performing Organization Code</i> CAL	
7. <i>Author(s)</i> David J. Travale, Program Manager James A. Czarnecki, Project Engineer				8. <i>Performing Organization Report No.</i> 8413-47	
9. <i>Performing Organization Name and Address</i> Veridian Engineering 4455 Genesee Street Buffalo, New York 14225				10. <i>Work Unit No.</i>	
				11. <i>Contract or Grant No.</i> DTNH22-96-D-02010	
12. <i>Sponsoring Agency Name and Address</i> U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NPS-10 400 Seventh , SW, Room 5313 Washington, D.C. 20590				13. <i>Type of Report and Period Covered</i> Final Report January 2000	
				14. <i>Sponsoring Agency Code</i> NPS-10	
15. <i>Supplementary Notes</i>					
16. <i>Abstract</i> A frontal load cell barrier test of a 2000 Mercury Villager Sport Wagon was performed at Veridian Engineering crash test facility in Buffalo, New York, on January 13,2000. The impact velocity was 57.0 kph and the temperature at the barrier face was 20°C. The maximum post-test vehicle crush was 456.3 mm. The test vehicle was equipped with driver and passenger 3-point active safety belts and next generation reduced force frontal airbags. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and front passenger appear to comply with the head , chest and femur requirement.					
ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (061)	657.8	49.6	43.3	5386.5	2391.2
Passenger (064)	838.5	49.5	39.3	4463.5	4784.6
17. <i>Key Words</i> 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)			18. <i>Distribution Statement</i> <u>Copies of this report are available from:</u> NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, DC 20590		
19. <i>Security Classif. (of this report)</i> UNCLASSIFIED		20. <i>Security Classif. (of this page)</i> UNCLASSIFIED		21. <i>No. of Pages</i> 280	22. <i>Price</i>

Form DOT F1700.7 (8-69)

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SECTION 1

PURPOSE AND SUMMARY OF TEST MY0213

PURPOSE

This 57.0 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-96-D-02010. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 57.0 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2000 Mercury Villager Sport Wagon at a velocity of 57.0 kph. The test was performed at Veridian Engineering on January 13, 2000. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by 1 real-time camera and 16 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head, chest, and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 064) were used previous to this test. Injury criteria for ATD Serial No. 061 and No. 064 were not exceeded in previous tests, MY5701 and MY0113. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 135 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

The driver's HIC was 657.8. The maximum chest deceleration over 3 milliseconds was 49.6 g's and maximum chest deflection was 43.3 mm. Compressive femur loads were 5386.5 Newtons on the left and 2391.2 Newtons on the right.

The right front passenger's HIC was 838.5. Maximum chest deceleration over 3 milliseconds was 49.5 g's and maximum chest deflection was 39.3 mm. Compressive femur loads were 4463.5 Newtons on the left and 4784.6 Newtons on the right.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. : MY0213 Test Mode : 56.3 kph Frontal Barrier

Test Date : January 13,2000 Time: 14:30 Temperature : 1 °C

Vehicle Make/Model/Body Style : 2000 Mercury Villager Sport Wagon

Vehicle Test Weight : 2087 kg

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 57.0 kph

Maximum Static Crush : 456.3 mm

Vehicle Rebound : 707 mm

DUMMIES:

DRIVER

PASSENGER

Type : 572E 572E

Restraint System : 3-point belt system with airbag 3-point belt system with airbag

Number of Data Channels : 135

Number of Cameras : 1 Real Time

16 High Speed

DOOR OPENING DATA : Closed/Operable - Left Front

Closed/Operable - Right Front

Front Seat(s) Data : DRIVER PASSENGER

Seat Track Failure :(mm of shift) 0 0

Seat Back Failure : none none

VISIBLE DUMMY CONTACT POINTS : DRIVER PASSENGER

Head : Airbag with back of head into headrest Airbag with back of head into headrest

Abdomen : - -

Chest Airbag Airbag

Knees Knee Bolster Knee Bolster

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 2000 Mercury Villager Sport Wagon

NHTSA No. : MY0213 ; VIN: 4M2XV12T0YDJ03950 ; Color : Red

Engine Data: 6 cylinders; - CID; 3.3 Liters; - cc

Placement : x Longitudinal or In-Line; - Transverse or Lateral

Transmission Data : 4 speeds; - Manual; x Automatic; x Overdrive

Final Drive : - Rear Wheel Drive; x Front Wheel Drive; - Four Wheel Drive

Major Options : x A/C; x Pwr.Strg.; x Pwr. Brakes

x Pwr. Windows; x Pwr. Door Locks; x Tilt Wheel

Date Received : 12/16/99 ; Odometer Reading 101 km

Selling Dealer : West-Herr Ford,Lincoln Mercury of Dansville

& Address: Dansville, N.Y. 14337

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : Ford Motor Company

Date of Manufacture 9/99

GVWR : 2469 kg; GAWR: 1231 kg FRONT; 1290 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 241 kpa FRONT

241 kpa REAR

Recommended Tire Size : P225/60R16S

* Recommended Cold Tire Pressure : 241 kpa FRONT; 241 kpa REAR

Size of Tires on Test Vehicle: P225/60R16S ; Manufacturer: Goodyear

Vehicle Capacity Data :

Type of Front Seats: - Bench; x Bucket; - Split Bench

Number of Occupants: 2 Front; 5 Rear; 7 Total

Vehicle Capacity Weight (VCW) = 585.0 kg

No. of Occupants x 68 kg = 476.3 kg

Rated Cargo/Luggage Weight (RCLW) = 108.7 kg

*Tire pressure used for test

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

Right Front	=	<u>521.5</u>	kg	Right Rear	=	<u>384.5</u>	kg
Left Front	=	<u>521</u>	kg	Left Rear	=	<u>405.5</u>	kg
TOTAL FRONT	=	<u>1042.5</u>	kg	TOTAL REAR	=	<u>790.0</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1832.5</u>	kg				
% of Total Front of Vehicle Weight	=	<u>56.9</u>	%	% of Total Rear Weight	=	<u>43.1</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight (UDW)	=	<u>1832.5</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>108.7</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152.0</u>	kg
TARGET TEST WEIGHT	=	<u>2093.2</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 103 KG OF CARGO WEIGHT:

Right Front	=	<u>565</u>	kg	Right Rear	=	<u>486</u>	kg
Left Front	=	<u>570</u>	kg	Left Rear	=	<u>466</u>	kg
TOTAL FRONT	=	<u>1135.0</u>	kg	TOTAL REAR	=	<u>952.0</u>	kg
TOTAL TEST WEIGHT	=	<u>2087.0</u>	kg				
% of Total Front Weight	=	<u>54.4</u>	%	% of Total Rear Weight	=	<u>45.6</u>	%
Weight of Ballast Secured in Vehicle Trunk Area	=	<u>156</u>	kg				
Vehicle Components Removed for Weight Reduction:		<u>none</u>					

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED :	RF	<u>779</u>	LF	<u>770</u>	RR	<u>796</u>	LR	<u>786</u>
FULLY LOADED :	RF	<u>765</u>	LF	<u>758</u>	RR	<u>762</u>	LR	<u>754</u>
AS TESTED :	RF	<u>769</u>	LF	<u>761</u>	RR	<u>762</u>	LR	<u>754</u>
Vehicle's Wheel Base :		<u>2865</u>	mm					
Location of Vehicle's C.G. :		<u>1306.9</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual	=	<u>75.7</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>75.7</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>69.66</u>	to <u>71.17</u> liters
ACTUAL TEST VOLUME	=	<u>71.17</u>	liters (with entire fuel system filled)
Test Fluid Type:	<u>Stoddard Solution</u>	;	Spec. Grav. = <u>0.764</u>
Kinematic Viscosity	=	<u>0.96</u>	centistokes; Color = <u>Orange</u>
Type of Fuel Pump:	Electric- <u>x</u>	;	Mechanical- <u>-</u>
Does Electric Pump operate with ignition switch "ON" & engine "OFF"		Yes- <u>x</u>	No- <u>-</u>
Details of Fuel System	<u>Fuel filler on left side, rear quarter panel above rear axle, fuel tank centered before rear axle and fuel lines run along left frame rail.</u>		

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°

Test Date : January 13,2000 Time: 14:30 Temperature: 1 °C

Vehicle NHTSA No. : MY0213

Required Impact Velocity Range : 55.5 to 57.1 kph

BARRIER IMPACT VELOCITY : (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 56.969 kph; Trap No. 2 = 56.969 kph

Distance from vehicle to barrier : (1) entering trap = 813 mm

(2) exiting trap = 305 mm

VEHICLE STATIC CRUSH: (mm) (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test Right = 4864.2 ; C/L = 4967.0 ; Left = 4866.2

Post-Test Right = 4412.1 ; C/L = 4510.7 ; Left = 4512.4

Crush Right = 452.1 ; C/L = 456.3 ; Left = 353.8

AVERAGE = 420.7 mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

Right = 691 ; C/L = 761 ; Left = 669

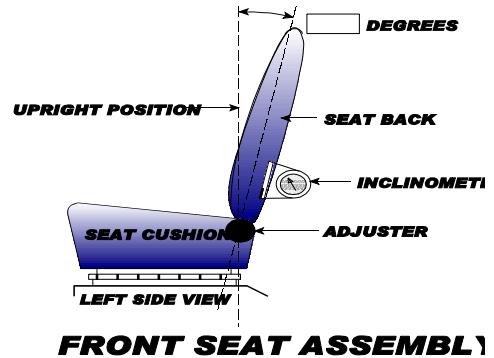
AVERAGE = 707.0 mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2000 Vehicle Model: Mercury Villager Body Style : Sport Wagon

1. Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Seat back angle for driver's seat: 10.5

Measurement instructions: Located 10.5 degrees from headrest post, electric adjustment

Seat back angle for passenger's seat: 10.5

Measurement instructions: Located 10.5 degrees from headrest post, electric adjustment

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Electric adjustment, found middle by bisecting distance from forward most and rear most position.

Positioning of the passenger's seat: Found 16 positions, placed in 9th position.

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 75.7 liters

B. "Usable Capacity" of the optional equipment fuel tank is - liters

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 75.7 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 69.66 liters

3.3 Is vehicle equipped with electric fuel pump? Yes- x ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

With ignition turned on.

DATA SHEET NO. 4 TEST VEHICLE INFORMATION (cont.)

4. STEERING COLUMN ADJUSTMENTS :

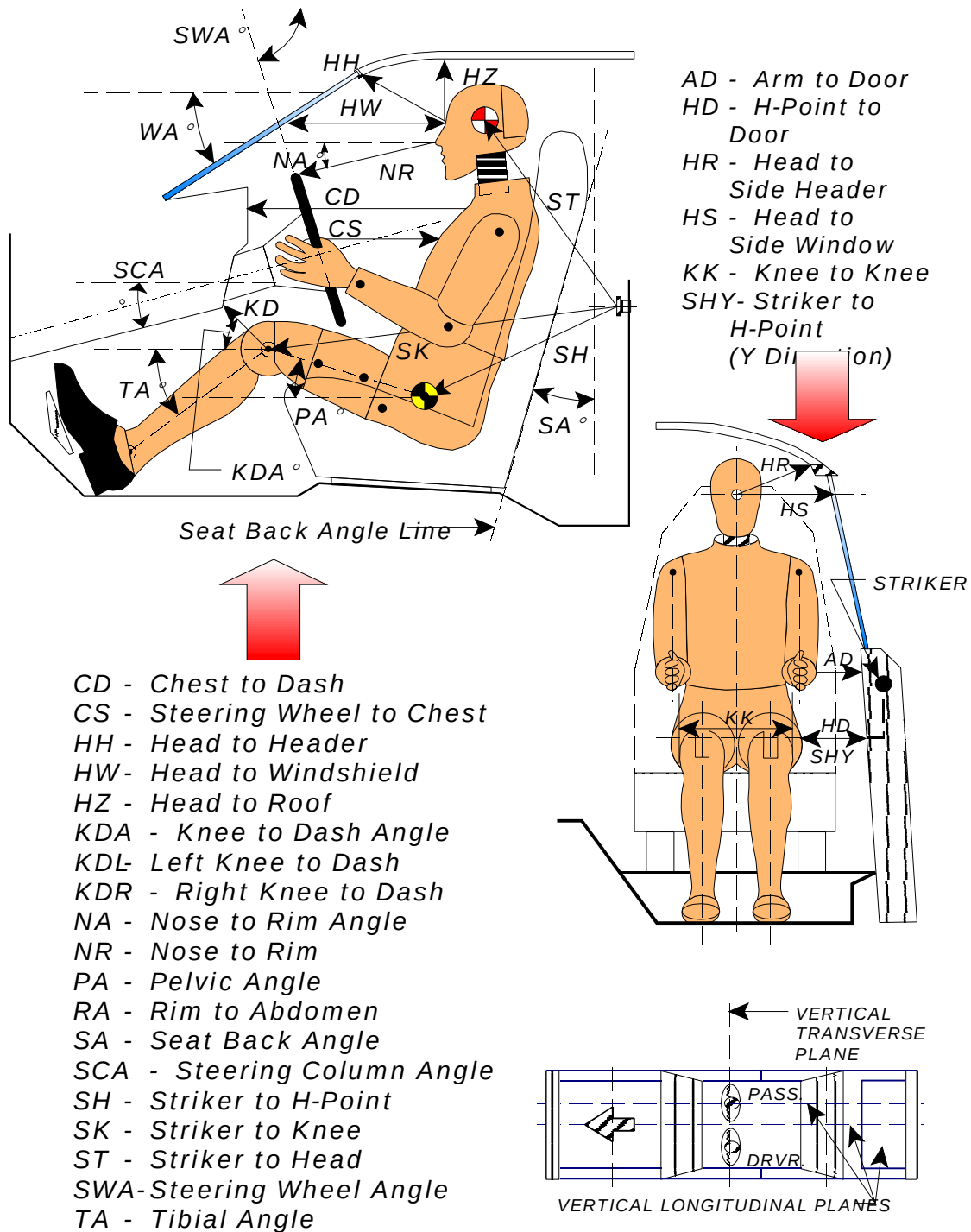
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: Found the total distance of movement, bisected distance and placed at an
angle of 27 degrees

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Located 5 positions and placed in 3rd position.

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGER

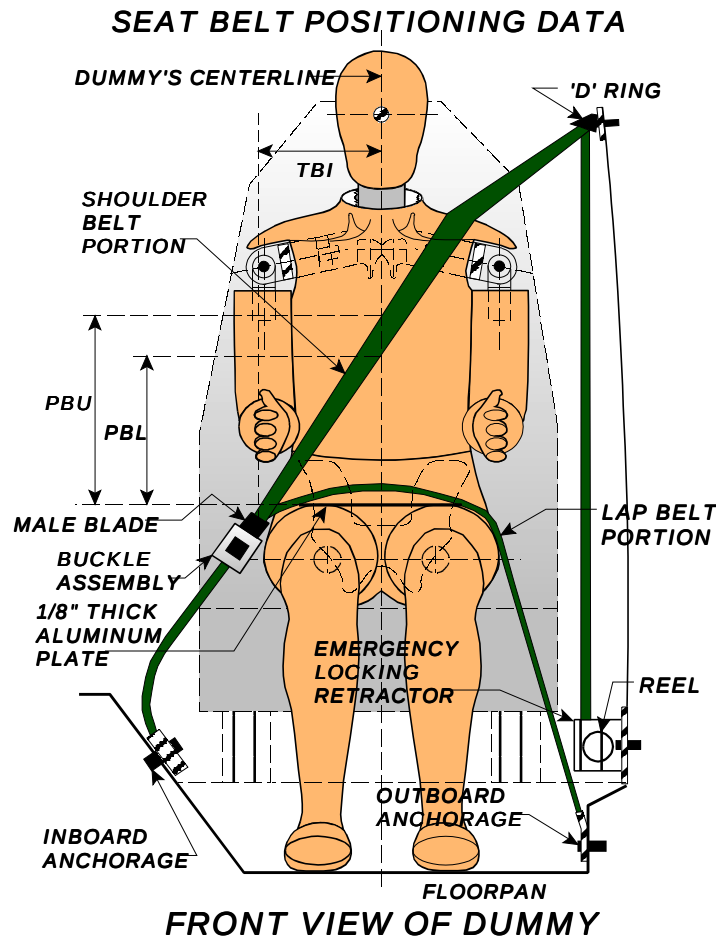


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial # 064)		
WA ^o	32 deg.			N/A		
SWA ^o	63 deg.			N/A		
SCA ^o	27 deg.			N/A		
SA ^o	20 deg.			19.2 deg.		
HZ	199			199		
HH	388			384		
HW	652			647		
HR	280			280		
NR	394	Angle	14 deg.	N/A		
CD	552			546		
CS	305			N/A		
RA	165			N/A		
KDL	136	Angle (KDA)	44 deg.	164		
KDR	121			161	Angle (KDA)	29 deg.
PA ^o	21 deg.			21 deg.		
TA ^o	57 deg.			61 deg.		
KK	270			270		
ST	625	Angle	15 deg.	624	Angle	15 deg.
SK	685	Angle	80 deg.	687	Angle	81 deg.
SH	302	Angle	105 deg.	300	Angle	105 deg.
SHY	265			264		
HS	344			346		
HD	170			165		
AD	132			124		

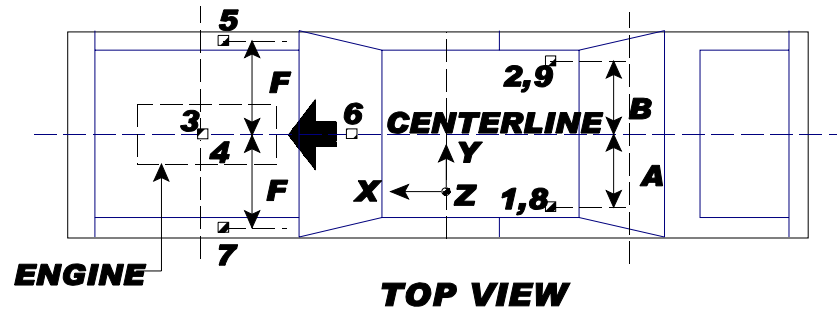
Dimensions in millimeters

DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

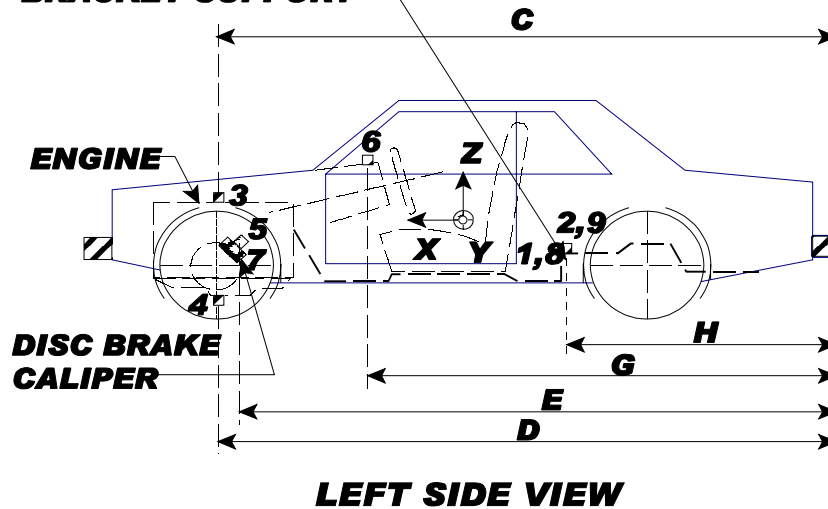


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	310	310
PBL-- Top surface of alum. plate to belt lower edge	230	230
<u>LAP BELT TENSION</u>	10 nwt	10 nwt
<u>SHOULDER BELT TENSION</u>	Retractor	Retractor

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION ASSY. FRONT ATTACHMENT BRACKET SUPPORT



Note: Vehicle accelerometer location and data summary shown in DATA SHEET NO. 7

DATA SHEET NO. 7 VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY (cont.)

DIMENSION	LENGTH (mm)
	PRE-TEST VALUES
A Left Rear Seat Crossmember Y	535
B Right Rear Seat Crossmember Y	549
C Top of Engine X	4321
D Bottom of Engine X	4053
E Disc Brake Calipers X	3885
F Disc Brake Calipers Y	555
G Instrument Panel X	3217
H Rear Seat Crossmembers X	2171

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	1.7	143.3	-51.9	40.4
2	Rear Seat X-Member @ Right Side	1.4	169.1	-48.4	40.5
3	Top of Engine Block	52.7	40.3	-160.9	28.9
4	Bottom of Engine	29.6	36.9	-157.1	29.1
5	Disc Brake Caliper @ Right Side	†	†	†	†
6	Instrument Panel	102.1	82.0	-119.4	23.7
7	Disc Brake Caliper @Left Side	21.2	60.2	-104.3	44.3
8	Rear Seat X-Member @ Left-Redundant	1.6	143.5	-54.5	39.8
9	Rear Seat X-Member @ Right-Redundant	1.3	143.0	-49.1	40.6

† - Transducer wire cut at 24 msec.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2000 Mercury Villager Sport Wagon

NHTSA Test No.: MY0213 Test Date: January 13,2000

		MAXIMUM VALE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	7.0	222.3	-61.6	76.5	8.5	234.1	-62.5	87.5
Head Y	g	3.5	222.5	-12.0	78.5	3.3	65.0	-6.3	87.2
Head Z	g	26.2	67.9	-10.1	101.8	45.5	71.7	-4.6	118.5
Head Resultant	g	65.2	75.8	0.0	-18.4	66.8	77.4	0.0	-49.3
Redundant Head X	g	7.2	222.3	-61.4	76.1	8.7	233.6	-69.3	79.3
Redundant Head Y	g	3.7	222.6	-15.7	77.8	3.7	44.3	-7.8	87.3
Redundant Head Z	g	29.9	68.4	-9.4	101.8	†	†	†	†
Redundant Head Resultant	g	66.7	70.8	0.0	-18.4	†	†	†	†
Upper Neck Fx	N	402.9	80.5	-330.3	54.2	97.3	212.5	-555.3	74.9
Upper Neck Fy	N	159.6	222.6	-190.5	76.5	383.8	63.7	-103.0	58.7
Upper Neck Fz	N	1862.7	65.0	-411.7	105.6	2302.7	73.7	-339.2	239.4
Upper Neck F Resultant	N	1863.2	65.0	2.0	-17.9	2376.5	73.7	0.9	-43.5
Upper Neck Mx	N-m	9.2	77.3	-13.0	115.3	22.7	72.8	-8.9	64.6
Upper Neck My	N-m	54.4	81.9	-22.8	221.6	41.8	84.7	-27.4	242.3
Upper Neck Mz	N-m	9.8	223.8	-4.2	149.9	11.5	74.8	-3.3	299.6
Upper Neck M Resultant	N-m	54.7	80.9	0.0	-16.7	42.6	84.7	0.0	-39.6
Chest X	g	2.2	187.6	-49.3	62.4	2.0	266.2	-49.4	67.0
Chest Y	g	2.0	112.0	-11.1	54.0	9.3	65.7	-7.9	87.4
Chest Z	g	6.4	52.2	-16.6	100.8	9.4	55.9	-11.5	109.3
Chest Resultant	g	50.4	62.1	0.1	5.2	50.3	67.0	0.1	-50.0
Redundant Chest X	g	2.1	188.1	-50.4	61.7	1.9	266.3	-48.0	60.4
Redundant Chest Y	g	2.2	112.0	-10.6	54.6	10.4	66.5	-7.4	87.5
Redundant Chest Z	g	7.3	68.2	-18.0	100.7	9.2	75.5	-11.3	108.4
Redundant Chest Resultant	g	51.6	61.6	0.1	5.6	49.4	60.3	0.0	-49.7
Chest Displacement	mm	0.0	-9.3	-43.3	70.4	0.0	-14.5	-39.3	75.0

† - P2 redundant head z transducer wire damaged

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2000 Mercury Villager Sport Wagon

NHTSA Test No.: MY0213 Test Date: January 13,2000

		MAXIMUM VALE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Pelvic X	g	1.0	272.0	-51.9	53.6	2.6	133.9	-64.2	53.2
Pelvic Y	g	9.8	95.5	-10.7	61.5	7.5	64.1	-3.3	101.5
Pelvic Z	g	3.8	254.0	-21.5	99.2	2.3	239.8	-17.0	82.1
Pelvic Resultant	g	54.1	53.6	0.0	6.2	65.0	53.2	0.0	-47.2
Left Femur	N	167.2	231.1	-5386.5	50.6	1010.2	93.4	-4463.5	58.1
Right Femur	N	210.8	40.2	-2391.2	50.2	645.8	44.8	-4784.6	54.1
Left Upper Tibia Mx	N-m	†	†	†	†	8.8	262.0	-205.0	52.4
Left Upper Tibia My	N-m	11.9	146.9	-133.4	44.0	129.1	52.5	-147.6	47.0
Left Lower Tibia Fz	N	110.7	147.0	-1819.7	44.2	271.1	158.5	-3632.8	47.5
Left Lower Tibia Mx	N-m	18.5	64.6	-8.6	80.0	13.7	56.4	-93.8	50.1
Left Lower Tibia My	N-m	14.4	29.2	-52.0	44.0	185.7	60.4	-88.4	47.5
Right Upper Tibia Mx	N-m	7.9	42.5	-23.6	70.5	26.1	50.3	-11.9	63.3
Right Upper Tibia My	N-m	19.8	183.4	-172.4	48.2	8.9	278.4	-119.4	60.9
Right Lower Tibia Fz	N	217.5	244.9	-5485.1	49.7	109.1	274.7	-2150.0	36.3
Right Lower Tibia Mx	N-m	3.8	174.0	-76.6	49.9	19.4	63.1	-4.6	37.1
Right Lower Tibia My	N-m	80.3	65.0	-39.5	41.1	8.8	106.6	-56.3	57.7
Left Foot Aft Ax	g	3.5	53.3	-72.2	41.9	63.5	62.1	-231.2	48.3
Left Foot Aft Az	g	5.2	84.8	-36.8	42.9	33.2	65.6	-40.4	60.9
Left Foot Fore Az	g	19.3	63.2	-73.9	41.8	81.6	65.2	-147.5	43.4
Right Foot Aft Ax	g	31.7	55.7	-97.2	50.2	44.8	68.8	-72.1	43.9
Right Foot Aft Az	g	17.5	62.1	-72.9	45.9	32.7	68.7	-43.6	57.9
Right Foot Fore Az	g	††	††	-123.8	35.8	129.3	68.7	-77.6	57.2
Lap Belt Load	N	6186.0	59.0	-3.3	0.8	6983.5	57.7	-2.5	-50.0
Torso Belt	N	7463.1	66.3	-36.2	222.1	8652.1	65.7	-20.6	261.6

† - Data questionable

†† - Transducer wire cut at 184 msec

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2000 Mercury Villager Sport Wagon

NHTSA Test No.: MY0213 Test Date: January 13,2000

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	657.8	54.6	90.5	50.7
Position #2 - Passenger	838.5	61.5	97.5	55.8

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

CLIP SUMMARY*				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	49.6	61.0	64.0	473.2
Position #2 - Passenger	49.5	61.7	65.0	454.8

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
REDUNDANT DATA

Vehicle Year/Make/Model/Body Style: 2000 Mercury Villager Sport Wagon

NHTSA Test No.: MY0213 Test Date: January 13,2000

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	704.6	54.0	90.0	52.1
Position #2 - Passenger	†	†	†	†

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

† - P2 head z redundant accelerometer wire damaged

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	50.3	60.1	63.1	488.7
Position #2 - Passenger	48.1	59.5	62.5	424.1

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>2173</u>	<u>2166</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>999</u>	<u>995</u>
Lap belt length as measured on Part 572 Dummy.	<u>950</u>	<u>950</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.	<u>25.4</u>	<u>38</u>
As determined mechanically.	<u>34</u>	<u>40</u>
As determined electronically.	<u>37.1</u>	<u>41.2</u>

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	<u>1.7</u>	<u>†</u>
Measured mechanically.	<u>1</u>	<u>1</u>

† - Data questionable

Dimensions in millimeters

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with a 20 mm molding.

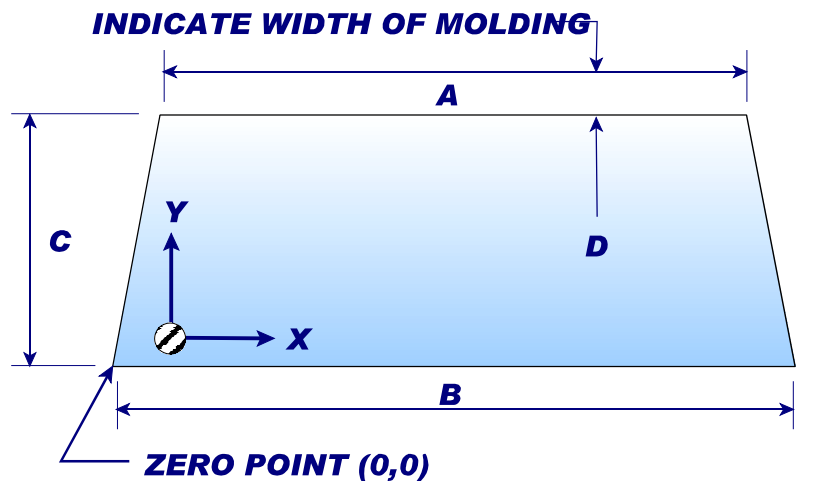
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST(mm)	
RIGHT SIDE	2240	2240	100
LEFT SIDE	2240	2240	100
TOTAL	4,480	4,480	100

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1286
B	1704
C	745
D	20

FAILURE DETAILS:

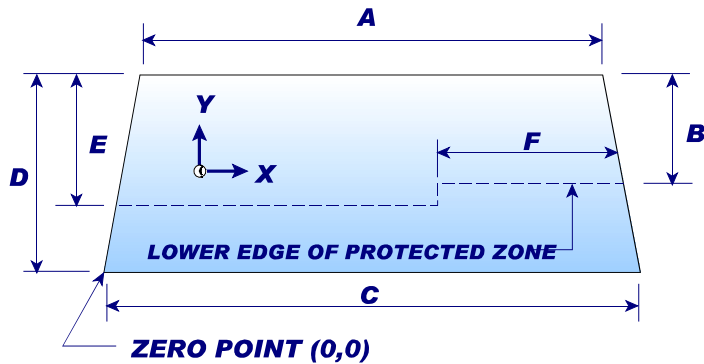
None

DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165 mm diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points extend the locus line horizontally to the edges of the windshield, then draw a line on the inner surface of the windshield below and 13 mm distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA:



DIMENSIONS (mm)	
A	1286
B	439
C	1704
D	745
E	519
F	716

FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm:

(Show location of penetration on the above sketch)

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

DATA SHEET NO. 12 FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

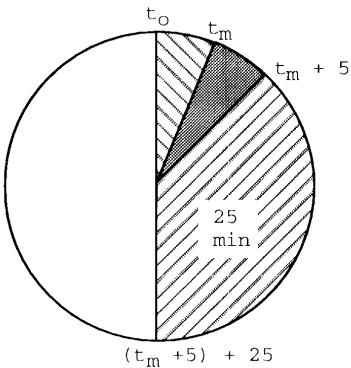
NHTSA TEST No.: MY0213 TEST DATE: January 13,2000
VEHICLE MAKE/MODEL: 2000 Mercury Villager

The test vehicle was filled from 92% to 94% of the manufacture's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 anthropomorphic test devices were located at each of the front designated seating positions.

=====

TEST VEHICLE IMPACT TYPE: X Frontal (56 kph)
- Oblique (48 kph) with _____ deg. barrier face first contacting _____ (driver/passenger) side
- Rear Moving Barrier (48 kph)
- Lateral Moving Barrier (32 kph)

FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS:

None

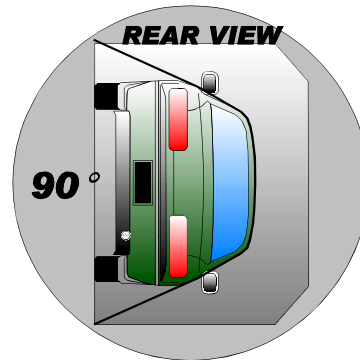
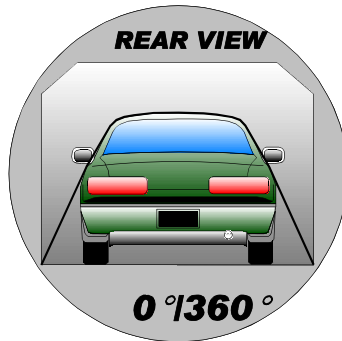
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Vehicle: 2000 Mercury Villager

NHTSA No. MY0213

0 - 90 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>16</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>16</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

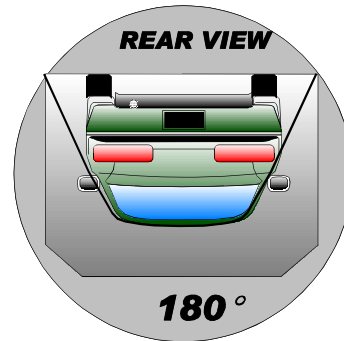
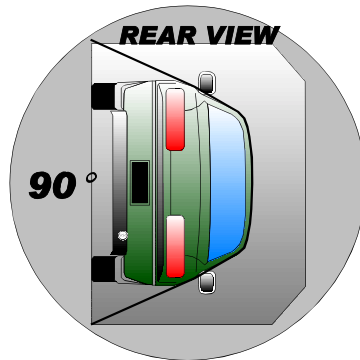
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2000 Mercury Villager

NHTSA No. MY0213

90 - 180 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>12</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>12</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

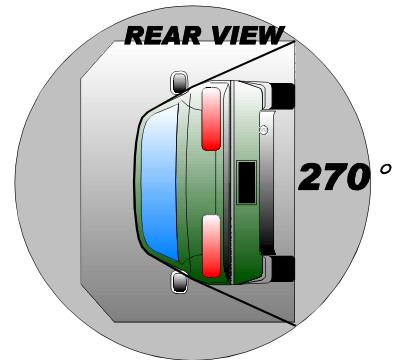
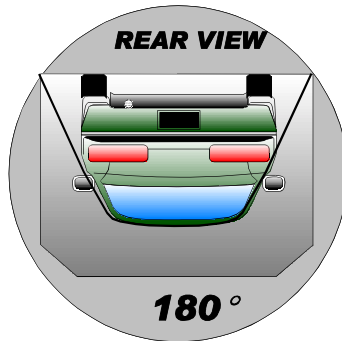
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2000 Mercury Villager

NHTSA No. MY0213

180 - 270 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>12</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>12</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

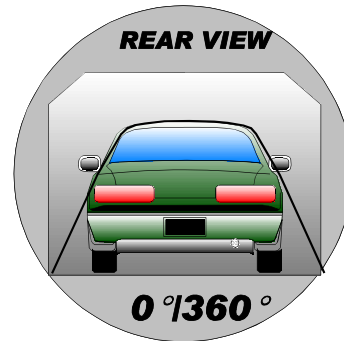
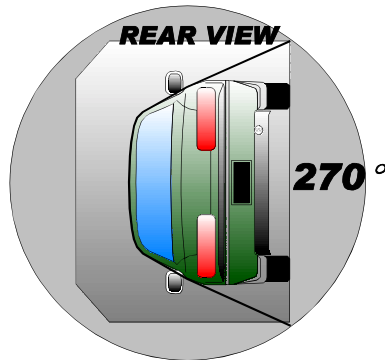
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2000 Mercury Villager

NHTSA No. MY0213

270 - 360 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>14</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>14</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

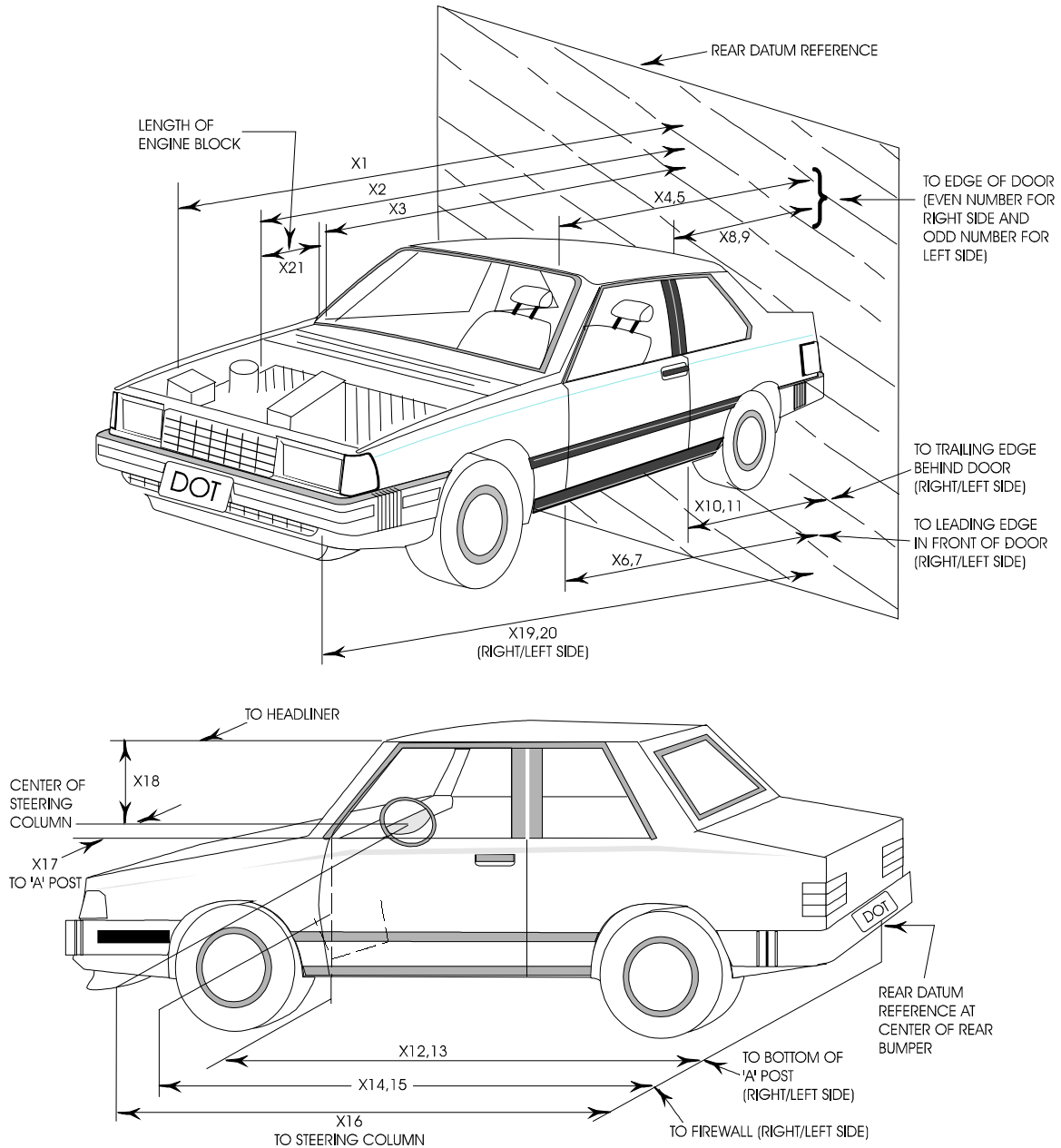
0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

DATA SHEET NO.14 VEHICLE MEASUREMENTS

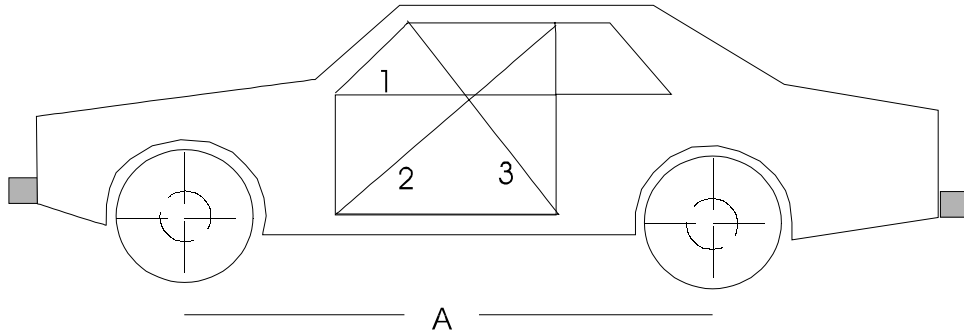


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	4967.0	4510.7	456
X2	Rear Surface of Vehicle to Front of Engine	4405.4	4367.3	38
X3	Rear Surface of Vehicle to Firewall	4012.9	3969.2	44
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3517.5	3567.2	-50
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3526.1	3560.9	-35
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3433.5	3476.9	-43
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3435.8	3429.4	6
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2360.2	2353.1	7
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2364.6	2394.6	-30
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2392.7	2385.9	7
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2394.8	2404.1	-9
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3478.2	3529.1	-51
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3483.8	3498.5	-15
X14	Rear Surface of Vehicle to Firewall, Right Side	3915.8	3790.7	125
X15	Rear Surface of Vehicle to Firewall, Left Side	3914.2	3923.1	-9
X16	Rear Surface of Vehicle to Steering Column	3022.0	3074.7	-53
X17	Center of Steering Column to "A" Post	418.9	450.6	-32
X18	Center of Steering Column to Headliner	462.9	377.6	85
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4864.2	4412.1	452
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4866.2	4512.4	354
X21	Length of Engine Block	134.4	134.4	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3260.3	3266.0	-6
CD	Rear Surface of Vehicle to Center of Dash Panel	3261.2	3298.1	-37
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3222.3	3245.8	-24

All Dimensions in mm

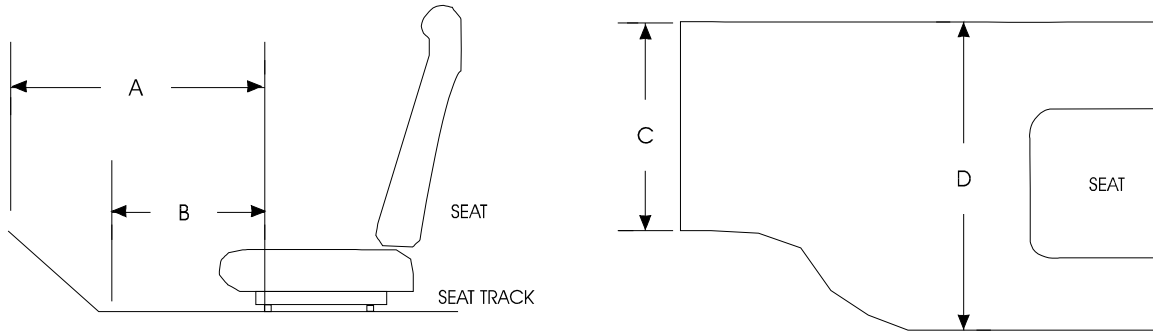
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1090.6	1556.3	1195.6	1080.2	1546.5	1182.6
AFTER TEST	1090.0	1563.7	1222.7	1079.2	1495.5	1218.8
DIFFERENCE	0.6	-7.4	-27.1	1	51	-36.2

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2866.4	2864.1
AFTER TEST	2769.5	2788.9
DIFFERENCE	96.9	75.2

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 STATIC FOOTWELL DEFORMATION



DRIVER

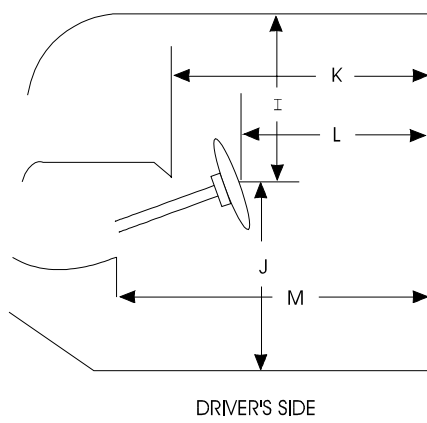
Measurement	Pre-Test	Post-Test	Difference
A	680.2	516.9	163
B	603.8	521.5	82
C	526.3	572.1	-46
D	576.1	646.2	-70

PASSENGER

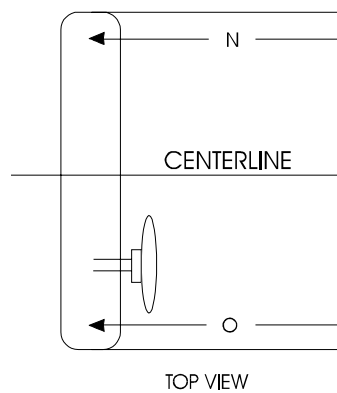
Measurement	Pre-Test	Post-Test	Difference
A	776.9	578.4	199
B	679.6	391.6	288
C	490.0	363.8	126
D	539.9	380.7	159

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
STATIC PASSENGER COMPARTMENT INTRUSION

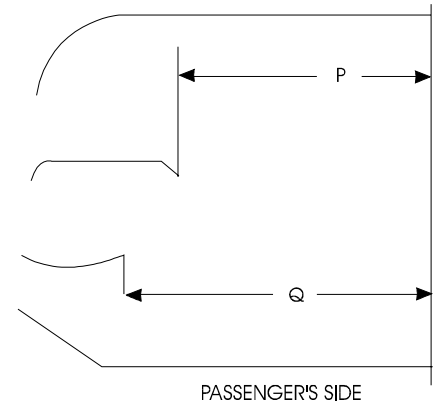


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE

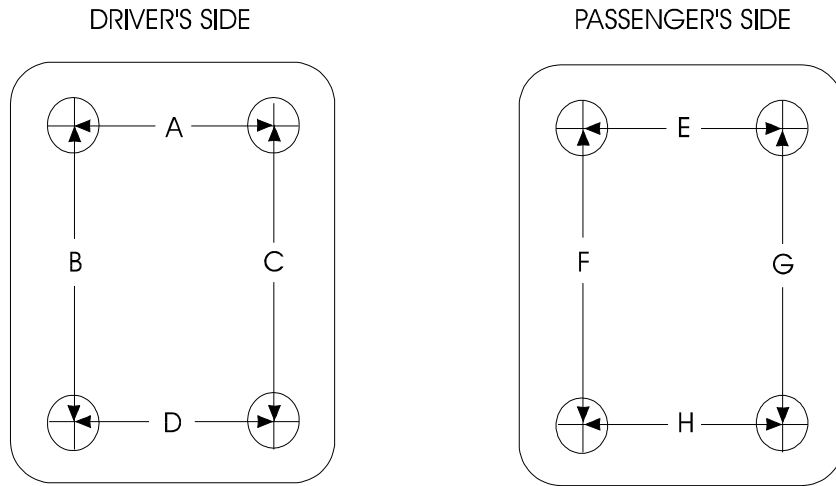


PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	462.9	377.6	85
J	698.1	832.6	-135
K	1651.9	1674.1	-22
L	1389.8	1408.7	-19
M	1591.8	1584.2	8
N	1634.4	1613.9	21
O	1590.1	1579.7	10
P = K (PASS.)	1617.3	1648.2	-31
Q = M (PASS.)	1667.8	1630.7	37

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
FLOORBOARD DEFORMATION

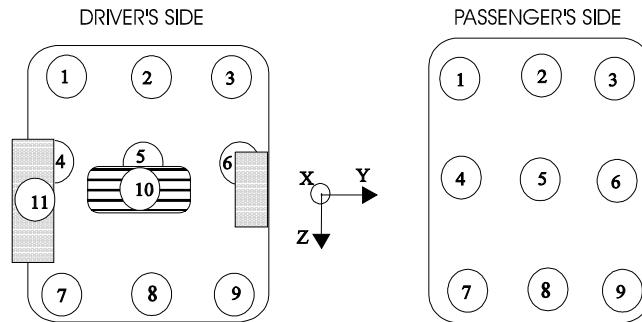


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	460	465	-5
B	715	720	-5
C	630	610	20
D	530	530	0
E	395	390	5
F	620	600	20
G	645	640	5
H	615	615	0

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
TOE-PAN INTRUSION



Driver Side Floorpan Measurements

Reference: X = Rear Bumper; Z = Ground

Floorpan Location	X Deformation			Z Deformation		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3705.9	3492.7	213	-510.9	-499.3	-12
2	3701.1	3456.5	245	-467.0	-496.8	30
3	3717.9	3509.0	209	-458.0	-449.7	-8
4	3674.1	3481.7	192	-450.5	-409.4	-41
5	3680.1	3445.0	235	-450.5	-434.7	-16
6	3668.8	3497.4	171	-419.1	-420.5	1
7	3611.7	3444.4	167	-349.3	-373.7	24
8	3624.7	3461.2	164	-382.8	-336.4	-46
9	3608.5	3438.8	170	-388.2	-352.1	-36
10	3511.0	3365.7	145	-531.1	-554.5	23
11	3592.0	3463.6	128	-499.1	-443.3	-56

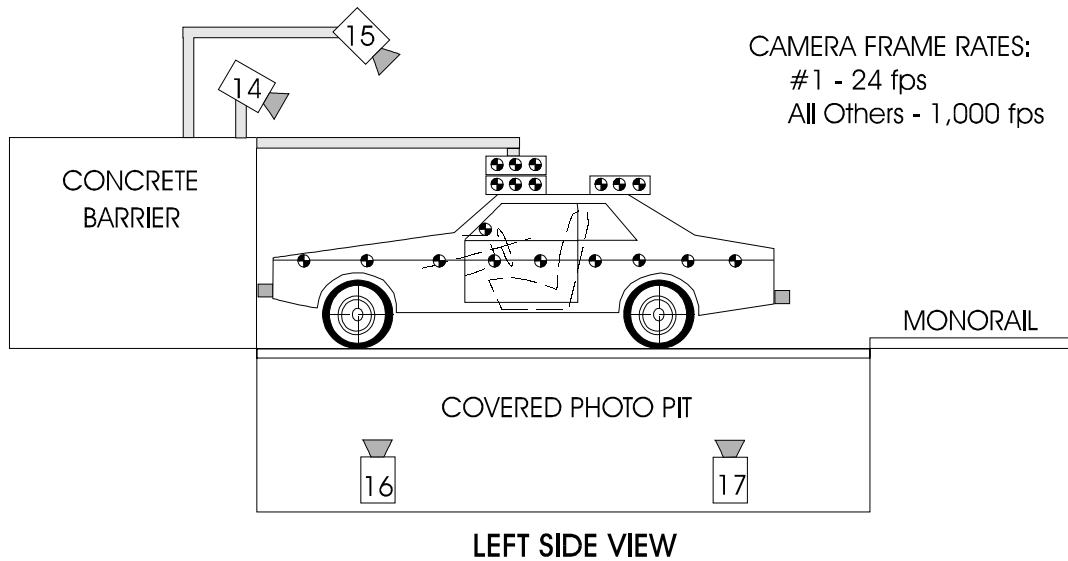
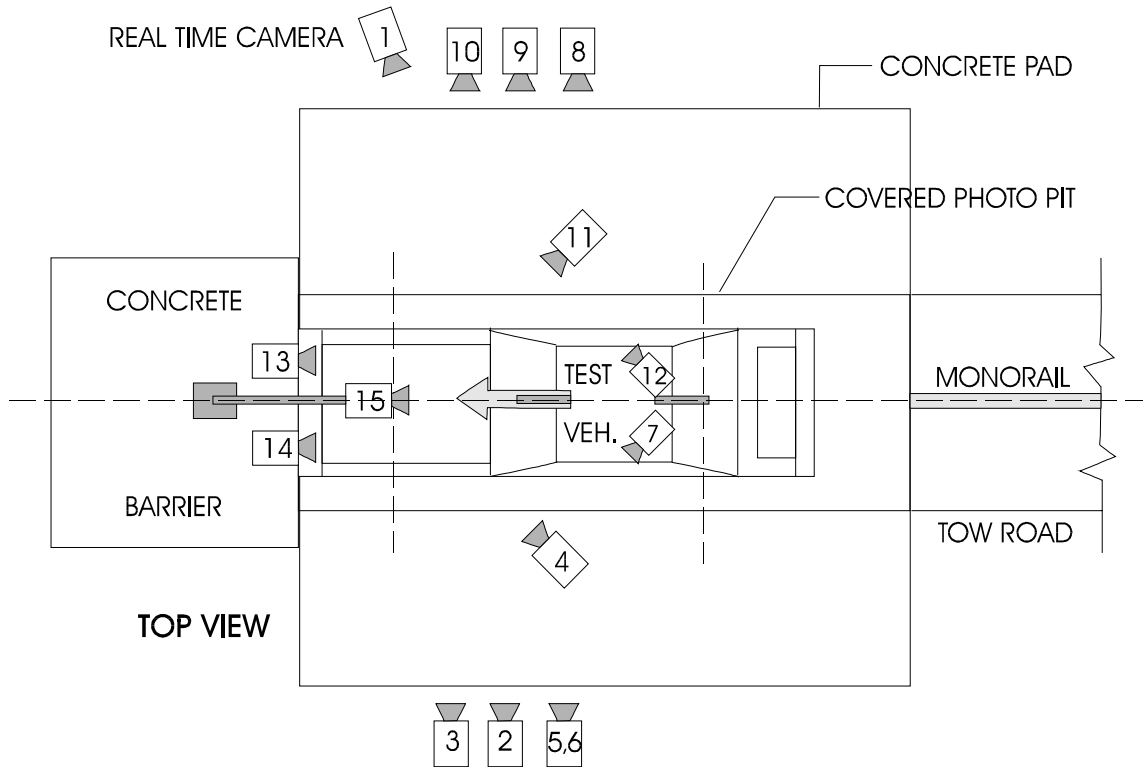
Passenger Side Floorpan Measurements

Reference: X = Rear Bumper; Z = Ground

Floorpan Location	X Deformation			Z Deformation		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3673.5	3483.3	190	-492.4	-533.2	41
2	3679.0	3444.8	234	-474.0	-471.5	-3
3	3661.8	3486.7	175	-474.6	-458.2	-16
4	3638.9	3398.2	241	-427.7	-428.3	1
5	3633.4	3382.9	251	-451.0	-390.0	-61
6	3618.5	3444.2	174	-430.0	-413.8	-16
7	3570.9	3375.5	195	-381.2	-411.2	30
8	3581.7	3258.0	324	-385.0	-451.4	66
9	3569.6	3421.8	148	-378.9	-460.9	82

Units in mm

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS



DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS (cont.)

NHTSA Test No.: MY0213 Vehicle: 2000 Mercury Villager Sport Wagon

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	6905	1657	1048	-3	6519	12.5	1010
3	Left Side View	8454	951	1094	-3	8060	25	1020
4	Driver and Interior View	6984	2971	1949	-10	-	35	1050
5	Steering Column (Bottom)	7675	1913	1166	-2	7289	25	1020
6	Steering Column (Top)	7675	1913	1780	-5	7289	25	1010
7	Left Belt	-	-	-	-	-	13	1020
8	Overall Right Side	6935	2146	1049	-3	7321	12.5	1005
9	Right Side View	8271	1242	1092	-2	8657	25	1000
10	Right Passenger View	7960	1905	1293	-3	8346	35	1020
11	Passenger and Interior View	6662	3086	1850	-9	-	35	1030
12	Right Belt	-	-	-	-	-	13	1040
13	Passenger Front View	545	-450	2000	-45	-	8	1030
14	Driver Front View	545	450	2000	-45	-	8	1015
15	Windshield View	0	0	3376	-60	-	8	1005
16	Pit View of Engine	0	930	-3048	90	-	13	1050
17	Pit View of Fuel Tank	0	2475	-3048	90	-	13	1005

*X = film plane to monorail centerline

** = referenced to horizontal plane

Y = film plane to impact location

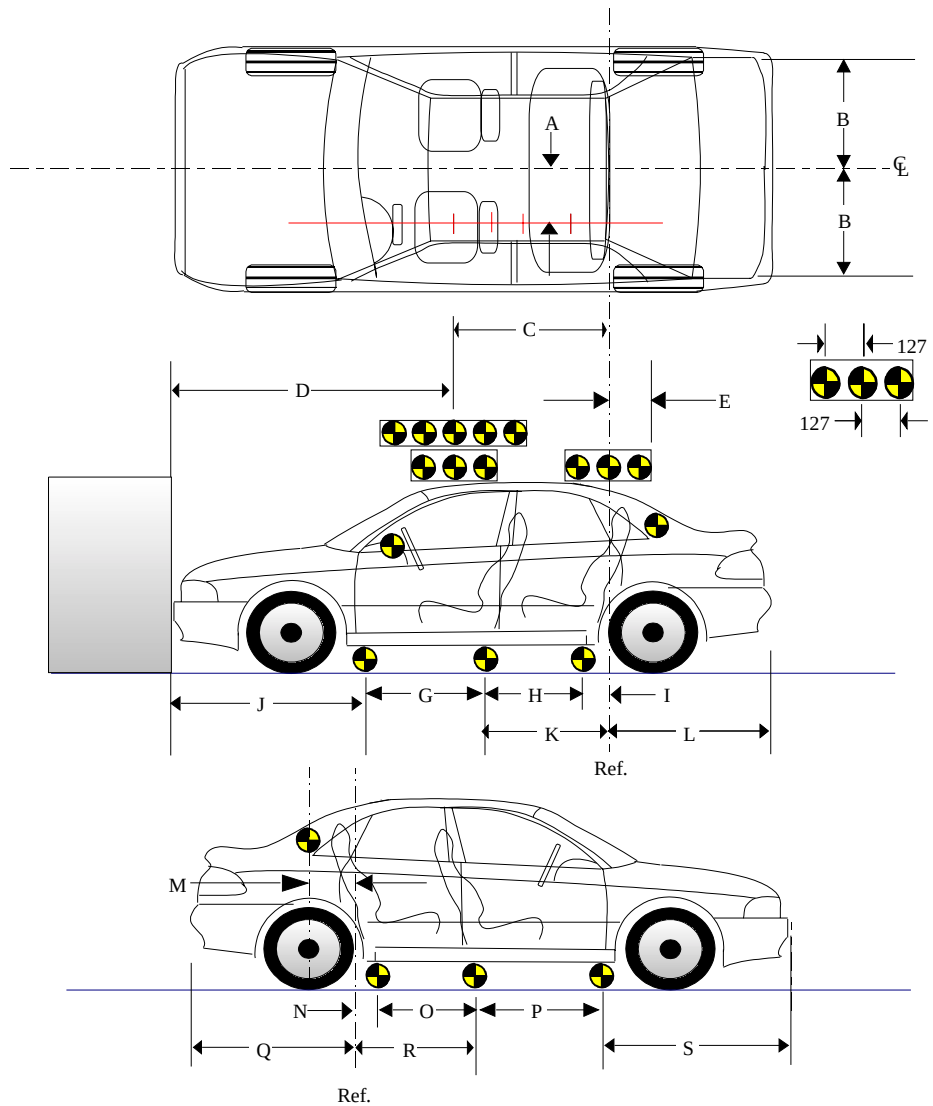
N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

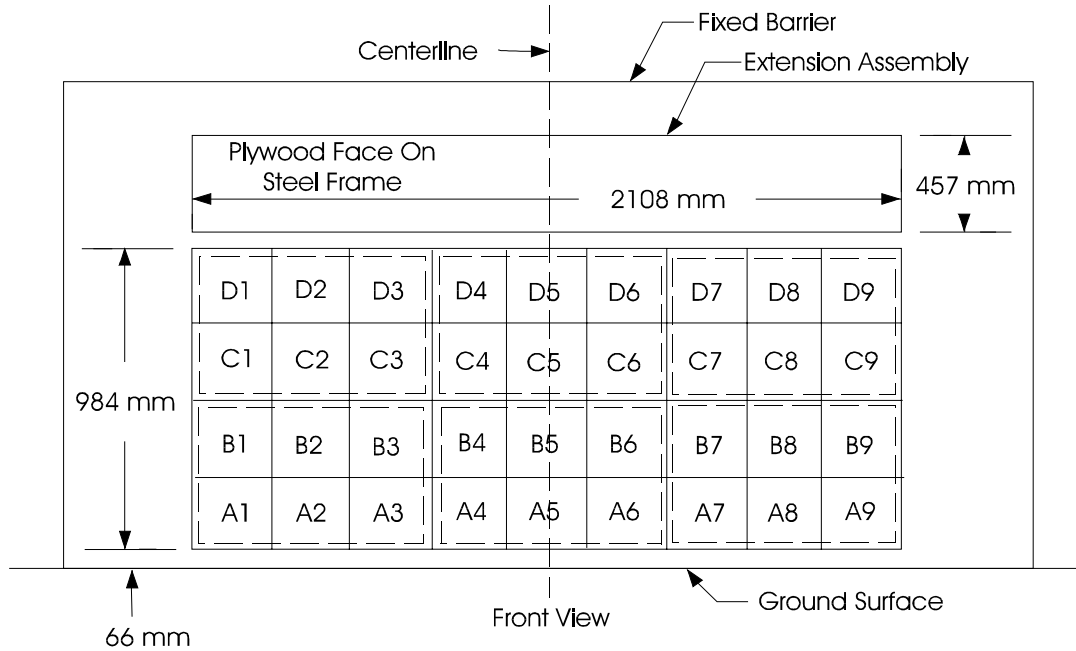
(Dimensions in millimeters)

A	385.5
B	743.3
C	1229.8
D	2269.0
E	333.2
F	1748.6
G	962.7
H	952.1
I	134.5
J	1484.3
K	1086.6
L	1433.4
M	365.0
N	138.1
O	957.7
P	959.3
Q	1418.2
R	1095.7
S	1493.8



DATA SHEET NO. 17 LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
 4 Rows
 9 Columns
 6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

The following data is presented in Appendix B:

- (1) Data from 36 individual load cells
- (2) Total or Sum of 36 individual load cells
- (3) Data from 6 Groupings shown above (6 cells/group)

DATA SHEET NO. 18 POST TEST AIR BAG DATA

NHTSA No. : MY0213; Test Date: January 13,2000; Technician: J. Czarnecki

Vehicle Model Year/Make/Model: 2000 Mercury Villager

A. No. of vent holes: 2 -Driver 2 -Passenger

B. Size of vent holes: (mm²) 30 -Driver 35 -Passenger

C. Total vent area: (mm²) 60 -Driver 70 -Passenger

D. Deflated air bag length and width dimensions or, if round, diameter. (mm)

Driver: - -Length; - -Width; 550 -Diameter

Passenger: 550 -Height; 400 -Width; 370 -Depth

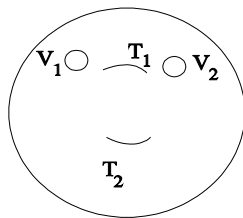
E. Is the air bag tethered?

Driver: x -Yes; - -No; If yes, record length of tether- 220

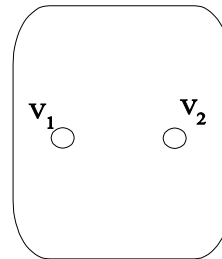
Passenger: - -Yes; x -No; If yes, record length of tether- -

Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.
(Note: Not to scale; V_n = Vent hole_n, T_n = Tether_n).

Driver



Passenger



F. Record part numbers and manufacturer name of the air bag and gas generator.

Driver: Air bag: Could not take airbag off steering wheel, tamper proof hardware

Generator: Could not take airbag off steering wheel, tamper proof hardware

Passenger: Air bag: P122459-01A TMK215830011

Generator: AP992998230401

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA
FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Mercury Villager Sport Wagon

NHTSA Test No.: MY0213 VIN: 4M2XV12T0YDJ03950

Model Year: 2000 Build Date: 9/99 Test Date: January 13,2000

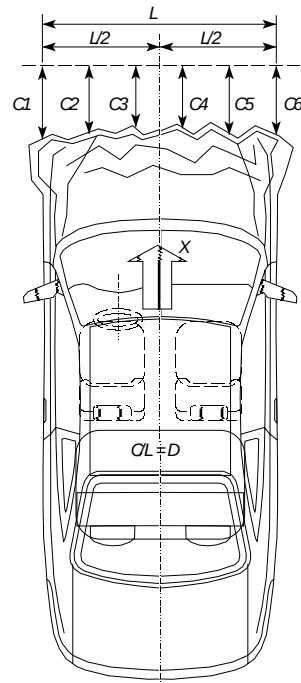
Vehicle Size Category: Minivan Test Weight: 2087 kg

Vehicle Wheelbase: 2865 mm; Front Overhang: 1484 mm; Overall Width: 1903 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

	PRE	POST	DIFF	
C1 =	4894.3	4449.9	-444.4	mm
C2 =	4931.9	4410.8	-521.1	mm
C3 =	4950.3	4356.8	-593.5	mm
C4 =	4955.6	4358.1	-597.5	mm
C5 =	4934.7	4336.3	-598.4	mm
C6 =	4896.1	4325.3	-570.8	mm



Midpoint of Damage: D = Vehicle Centerline
(Longitudinal)

Length of Damaged Region:

L1= 1903 mm
L2= - mm
L3= - mm

APPENDIX A
PHOTOGRAPHS

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Figure A-1: LOAD CELL LOCATIONS.



Figure A-2: PRE-TEST FRONT VIEW



Figure A-3: POST-TEST FRONT VIEW.



Figure A-4: PRE-TEST LEFT SIDE VIEW



Figure A-5: POST-TEST LEFT SIDE VIEW



Figure A-6: PRE-TEST RIGHT SIDE VIEW



Figure A-7: POST-TEST RIGHT SIDE VIEW



Figure A-8: PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-9: POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-10: PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-11: POST-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-12: PRE-TEST WINDSHIELD VIEW



Figure A-13: POST-TEST WINDSHIELD VIEW



Figure A-14: PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15: FUEL CAP VIEW



Figure A-16: PRE-TEST FRONT UNDERBODY VIEW



Figure A-17: POST-TEST FRONT UNDERBODY VIEW



Figure A-18: PRE-TEST FRONT SIDE UNDERBODY VIEW



Figure A-19: POST-TEST FRONT SIDE UNDERBODY VIEW



Figure A-20: PRE-TEST REAR UNDERBODY VIEW



Figure A-21: POST-TEST REAR UNDERBODY VIEW



Figure A-22: PRE-TEST DRIVER POSITION VIEW



Figure A-23: POST-TEST DRIVER POSITION VIEW



Figure A-24: PRE-TEST PASSENGER POSITION VIEW



Figure A-25: POST-TEST PASSENGER POSITION VIEW



Figure A-26: PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-27: POST-TEST DRIVER AND INTERIOR VIEW



Figure A-28: PRE-TEST PASSENGER AND INTERIOR VIEW



Figure A-29: POST-TEST PASSENGER AND INTERIOR VIEW



Figure A-30: PRE-TEST DRIVER HEAD LOCATION



Figure A-31: POST-TEST DRIVER HEAD LOCATION

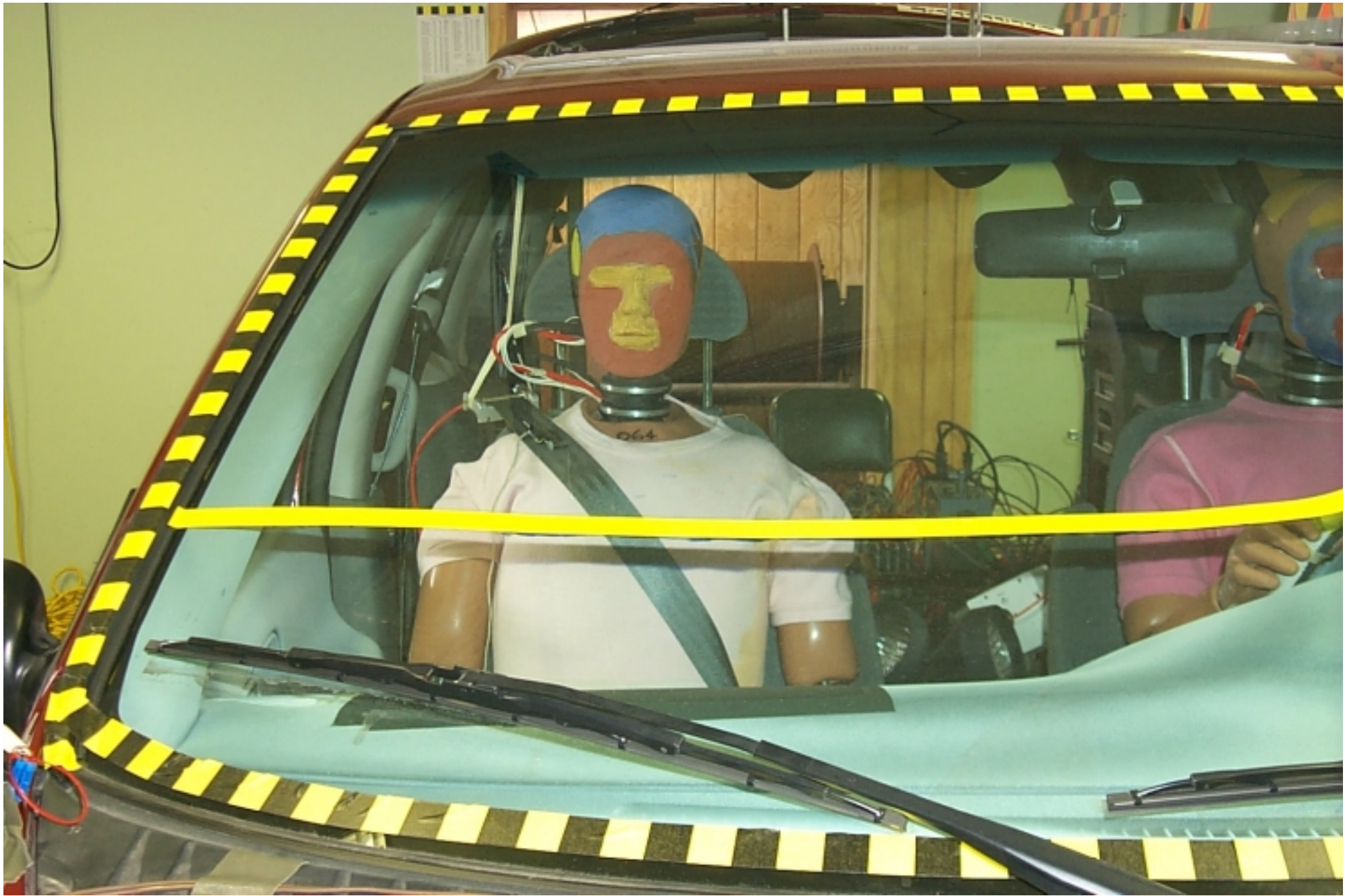


Figure A-32: PRE-TEST PASSENGER HEAD LOCATION



Figure A-33: POST-TEST PASSENGER HEAD LOCATION



Figure A-34: PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-35: POST-TEST DRIVER FLOOR PAN VIEW



Figure A-36: PRE-TEST PASSENGER FLOOR PAN VIEW



Figure A-37: POST-TEST PASSENGER FLOOR PAN VIEW



Figure A-38: ROLLOVER VIEW



Figure A-39: IMPACT VIEW

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

**Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers**

Transducer	SAE Sign Convention (positive unless noted)
Upper Neck Load Cell	Fx Head rearward Fy Head left Fz Neck in tension Mx Left ear to left shoulder My Chin to chest (flexion) Mz Chin to left shoulder (look left)
Chest Displacement Potentiometer	Compression is negative
Pelvic Load Cell (Lower Lumbar)	Fx Chest rearward Fy Chest left Fz Spine in tension
Femur Load Cell	Compression is negative
Upper Tibia Load Cell (right and left leg)	Mx Support tibia at ends, load left side center My Support tibia at ends, load front (shin) center
Lower Tibia Load Cell (right and left leg)	Fz Tibia in tension Mx Support tibia at ends, load left side center My Support tibia at ends, load front (shin) center

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO. MY0213

DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	60
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle Displacement Integrations	180
Load Cell Barrier Forces	60

NCAP Test 8 - 2000 Mercury Villager Sport

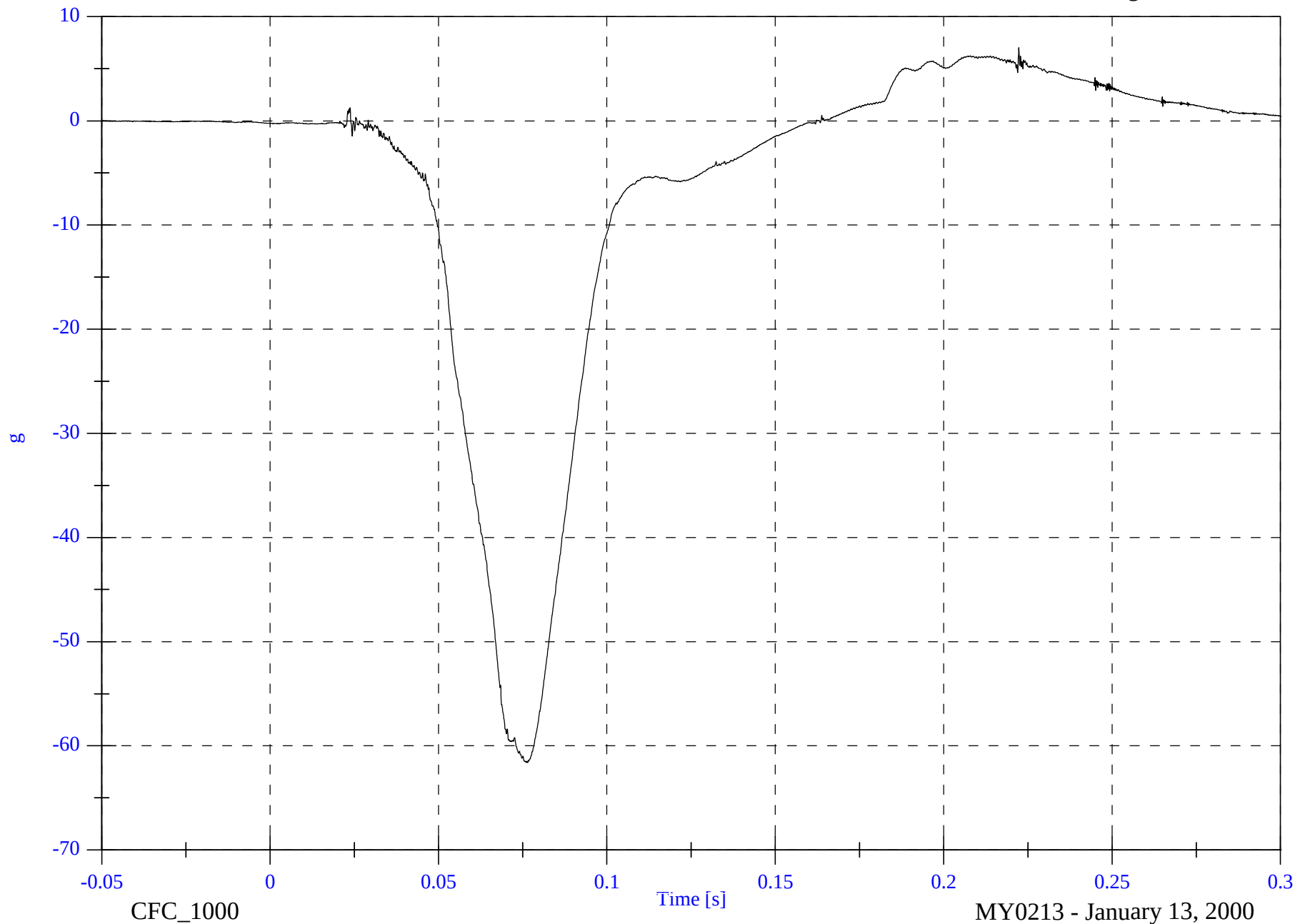
P1 Head x

Max: 7.0 [g] at 0.222 [s]

Min: -61.6 [g] at 0.076 [s]

B-4

8413-47

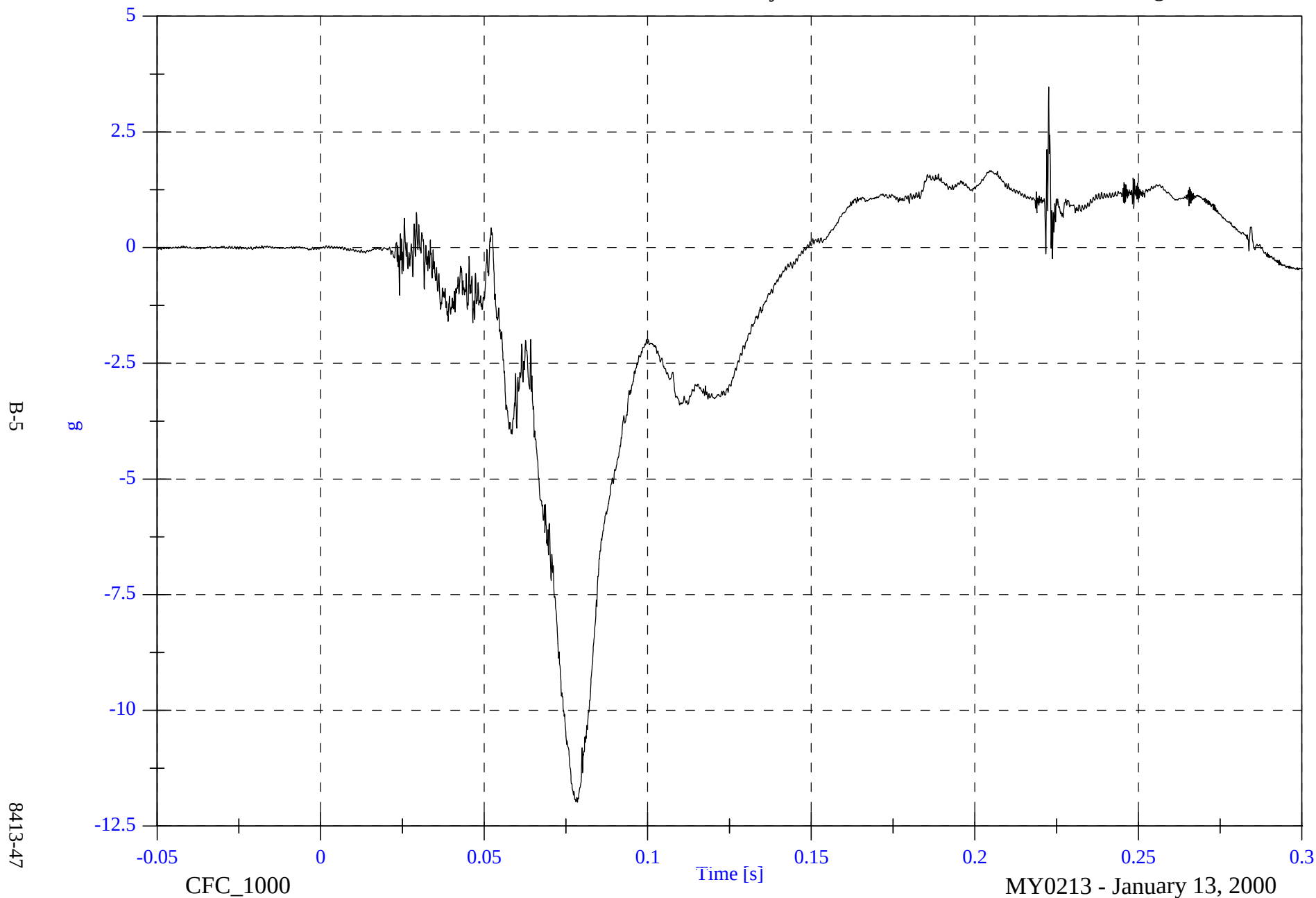


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Head y

Max: 3.5 [g] at 0.223 [s]

Min: -12.0 [g] at 0.079 [s]

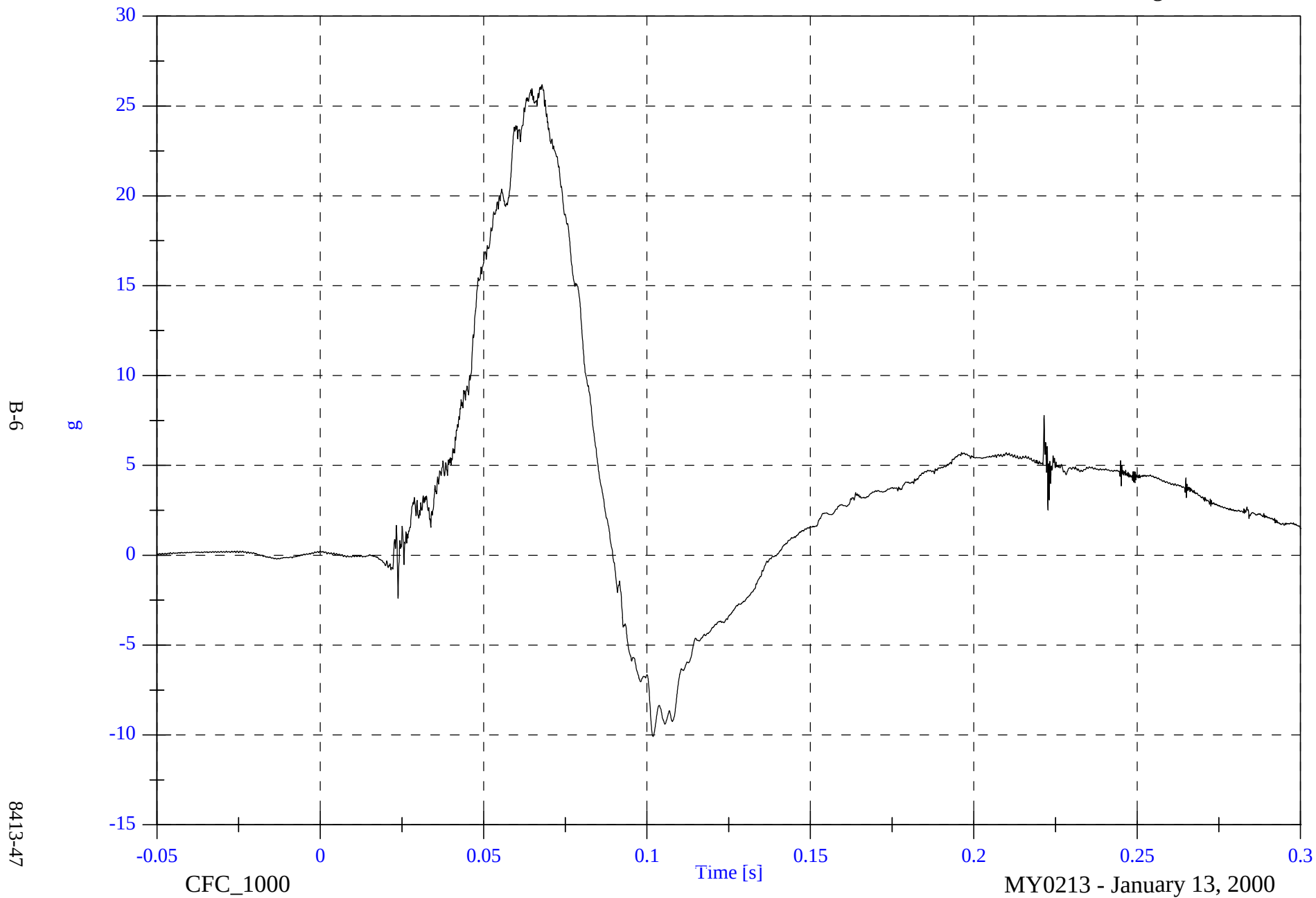


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Head z

Max: 26.2 [g] at 0.068 [s]

Min: -10.1 [g] at 0.102 [s]

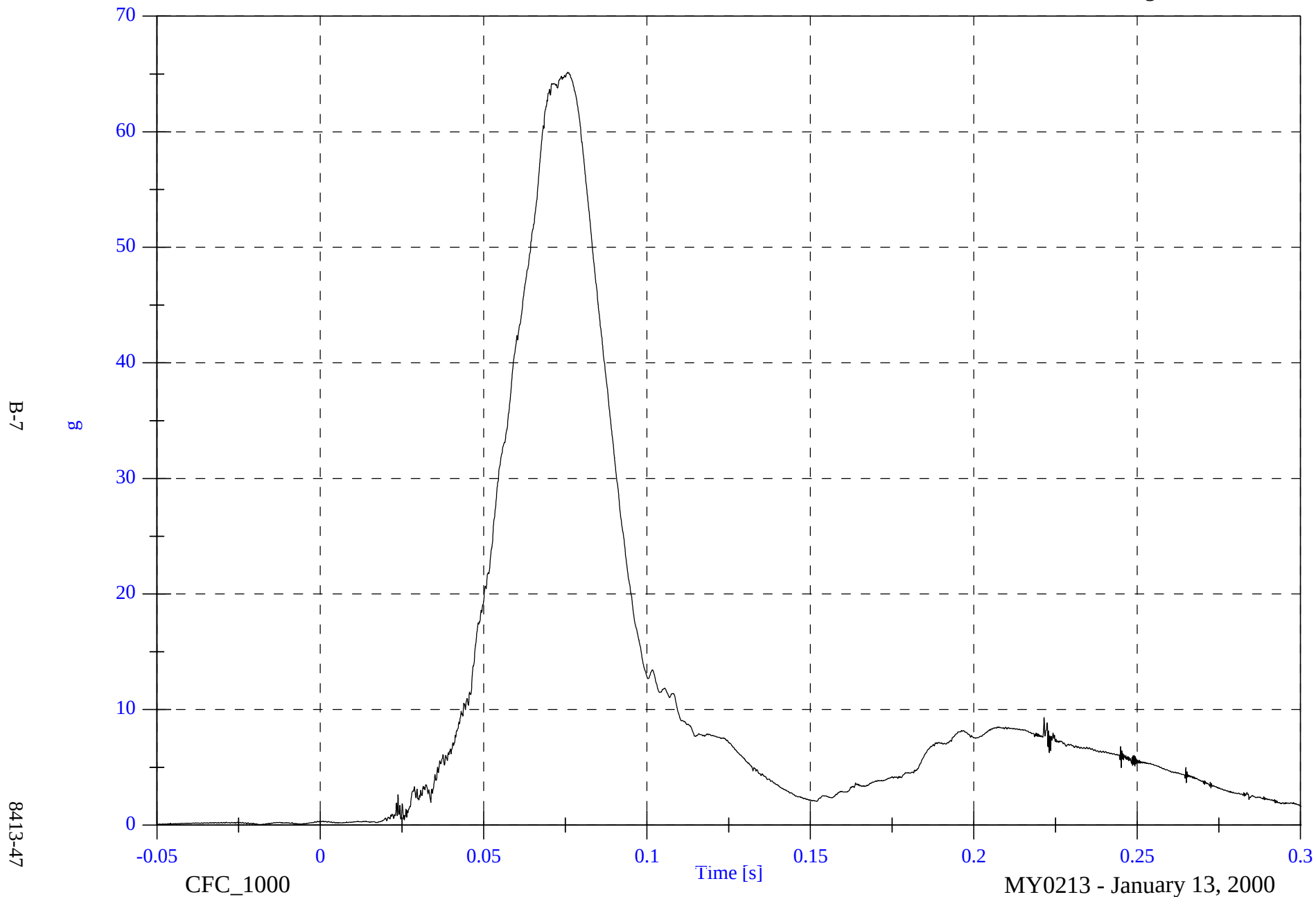


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Head Resultant

Max: 65.2 [g] at 0.076 [s]

Min: 0.0 [g] at -0.018 [s]

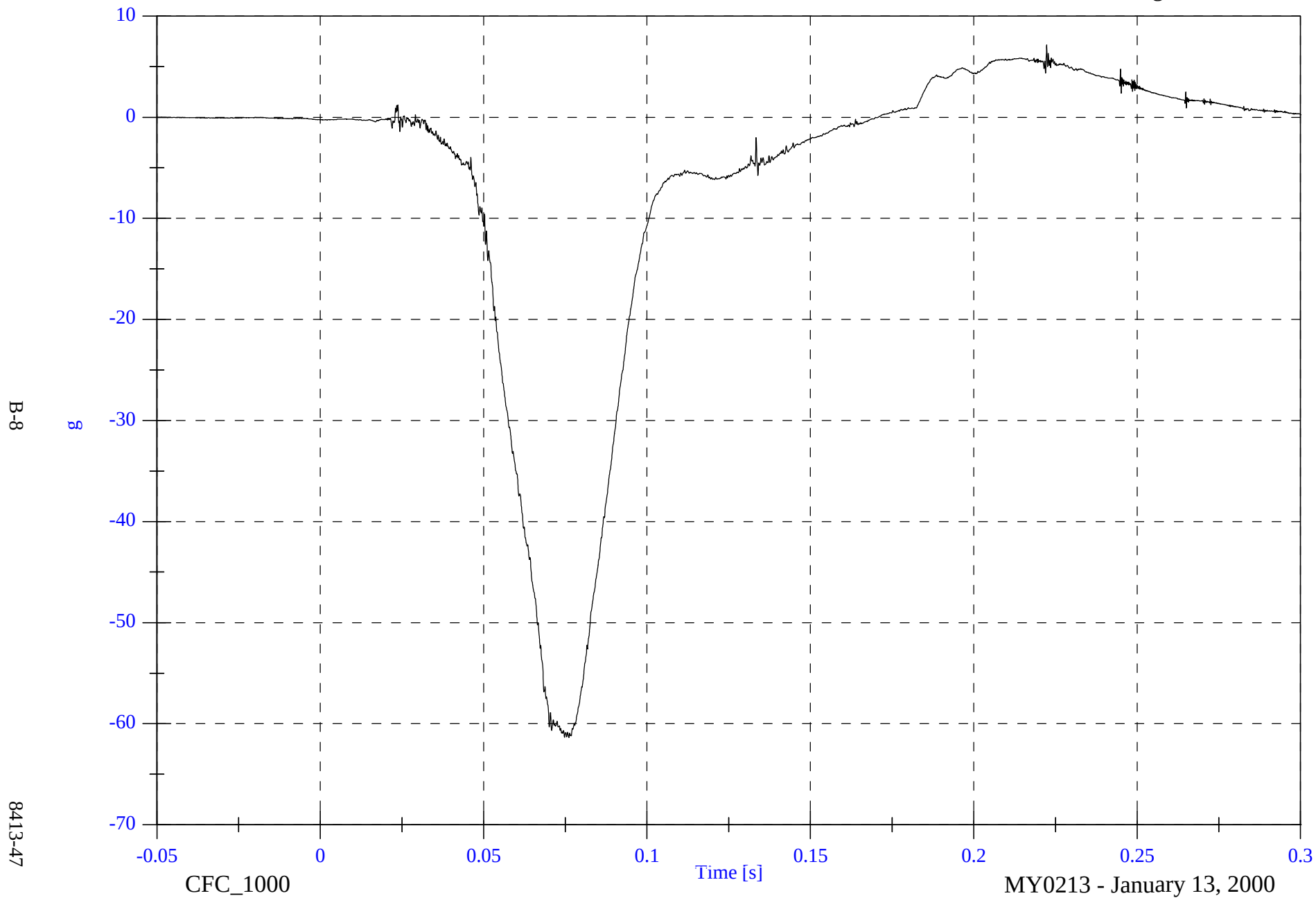


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Head Red x

Max: 7.2 [g] at 0.222 [s]

Min: -61.4 [g] at 0.076 [s]

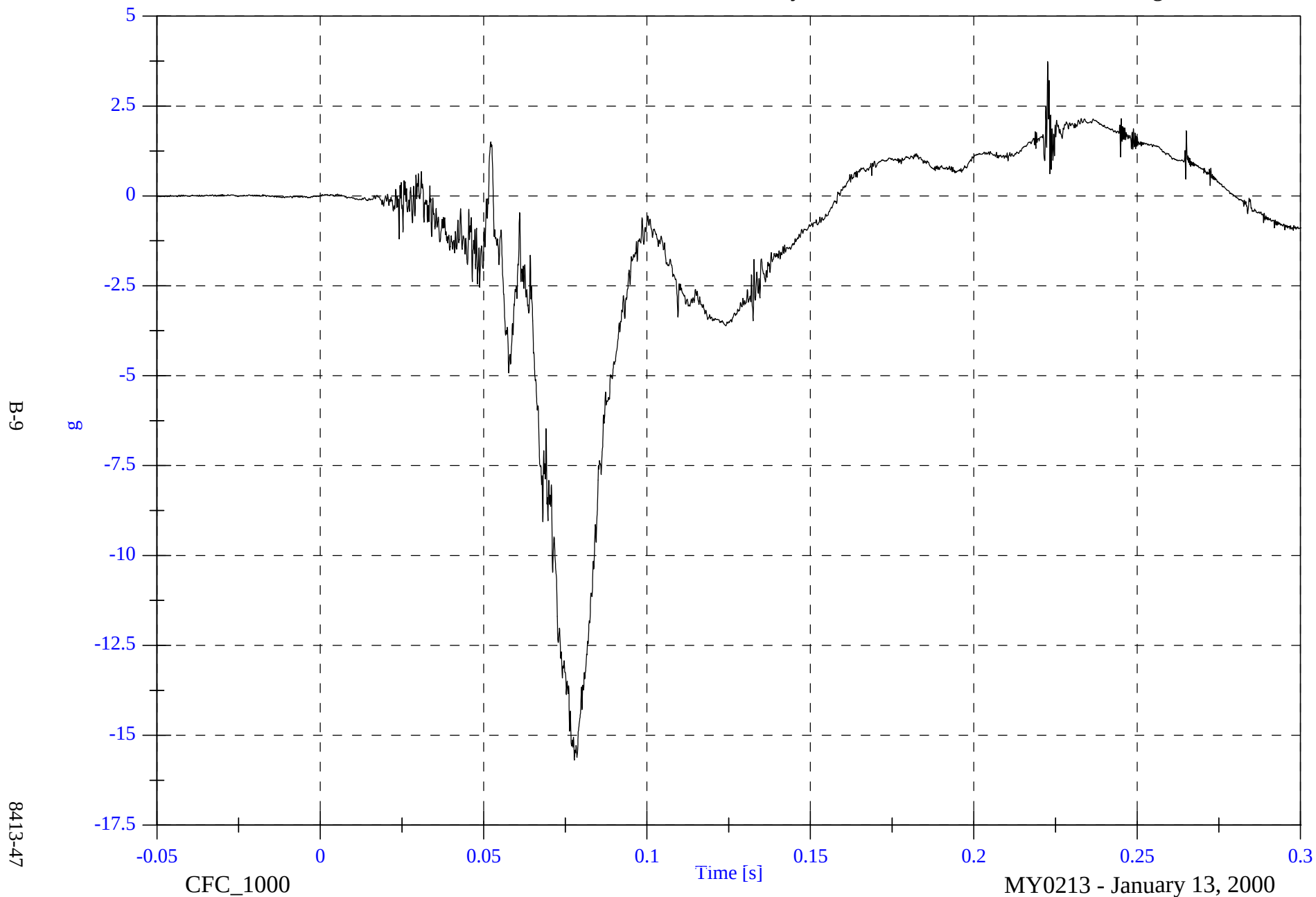


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Head Red y

Max: 3.7 [g] at 0.223 [s]

Min: -15.7 [g] at 0.078 [s]

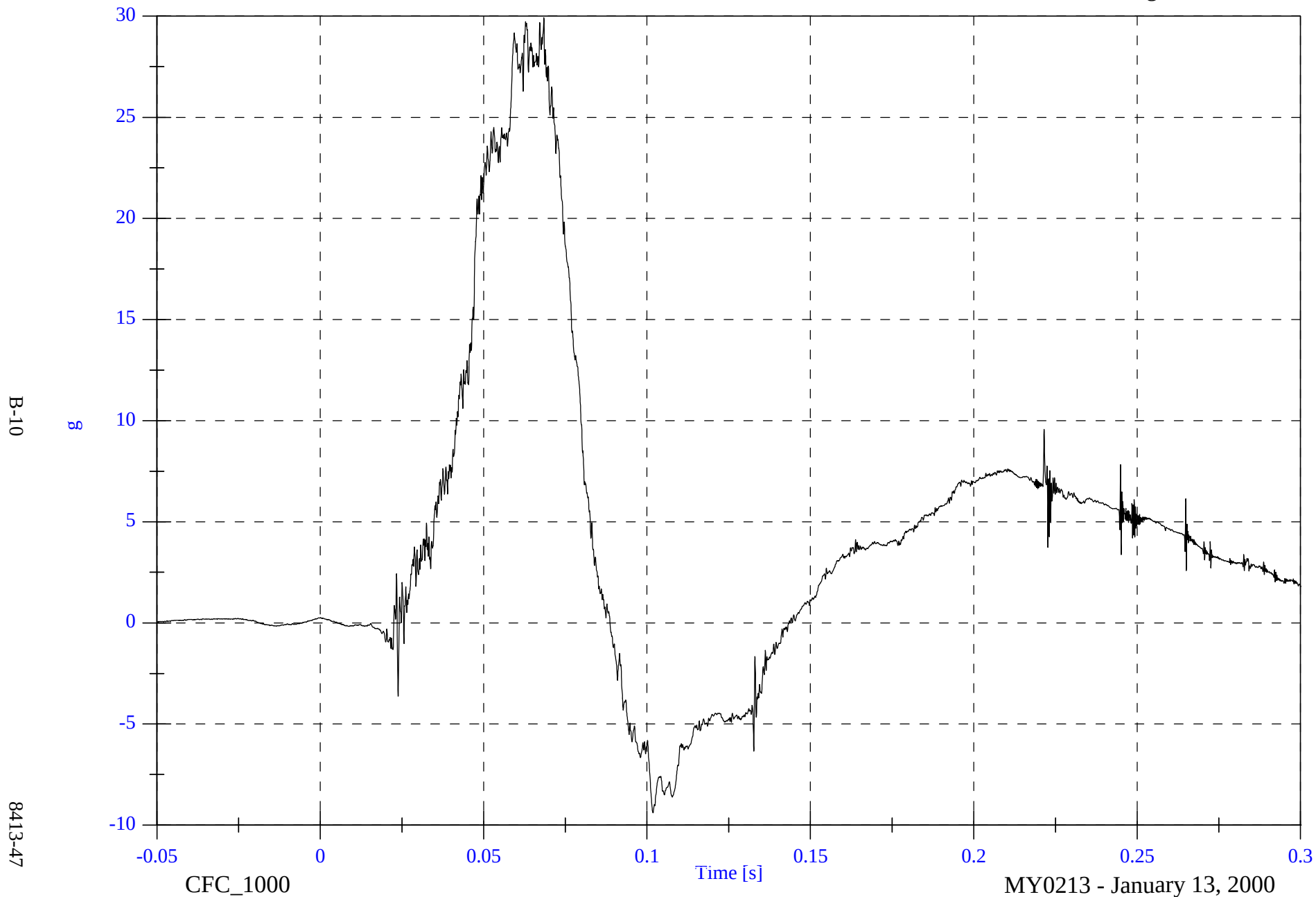


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Head Red z

Max: 29.9 [g] at 0.068 [s]

Min: -9.4 [g] at 0.102 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

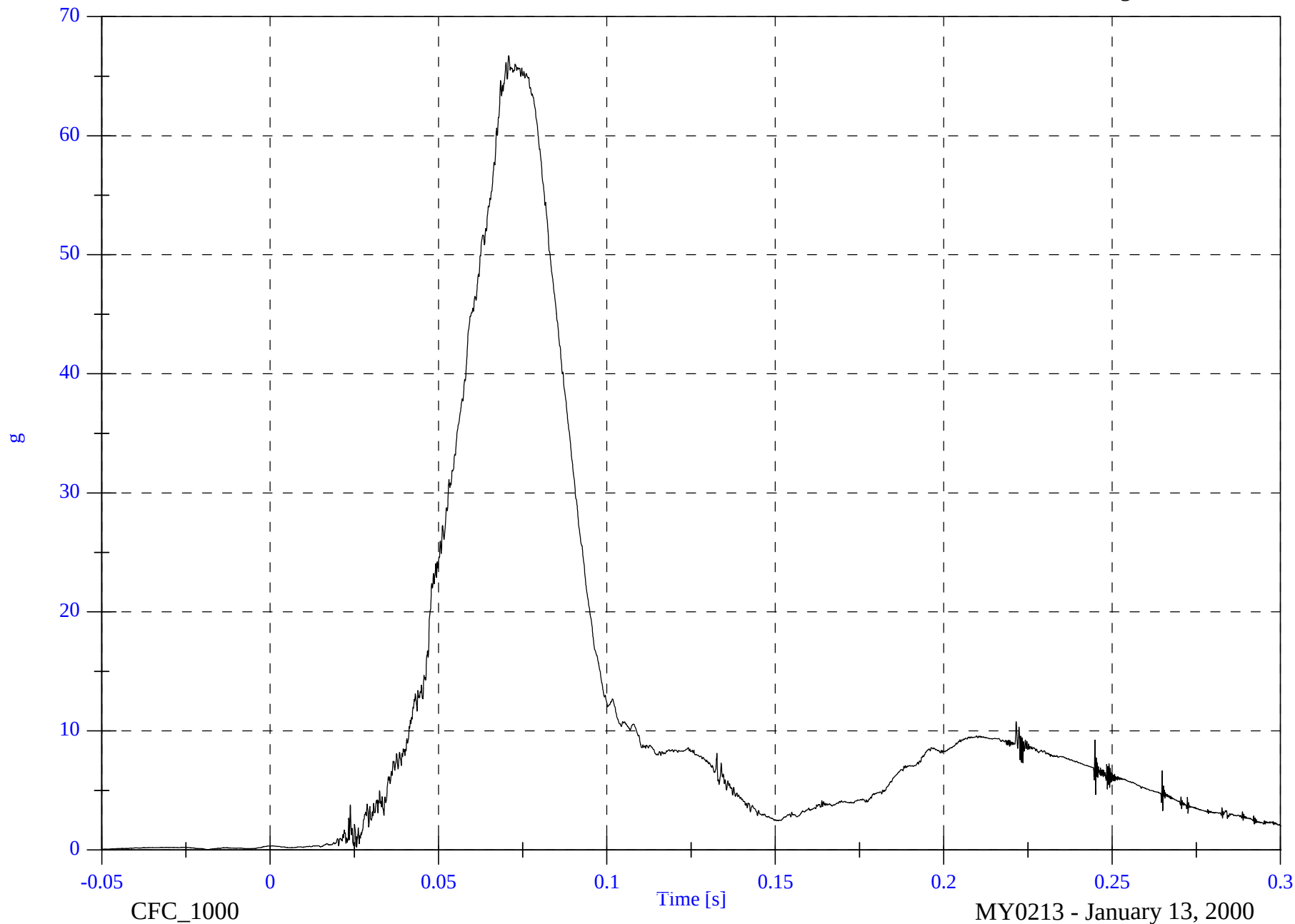
P1 Head Red Resultant

Max: 66.7 [g] at 0.071 [s]

Min: 0.0 [g] at -0.018 [s]

B-11

8413-47

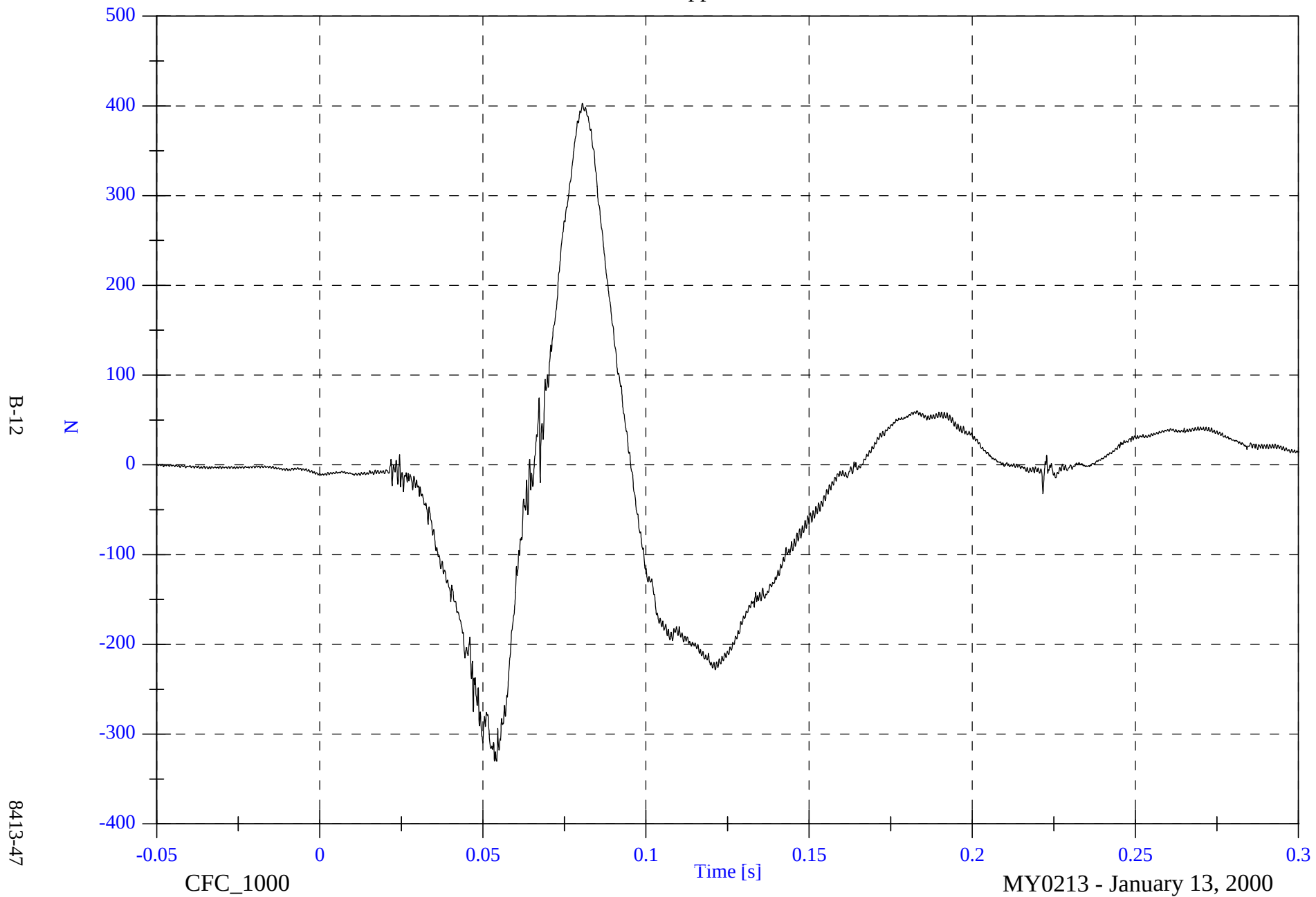


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Upper Neck Fx

Max: 402.9 [N] at 0.081 [s]

Min: -330.3 [N] at 0.054 [s]

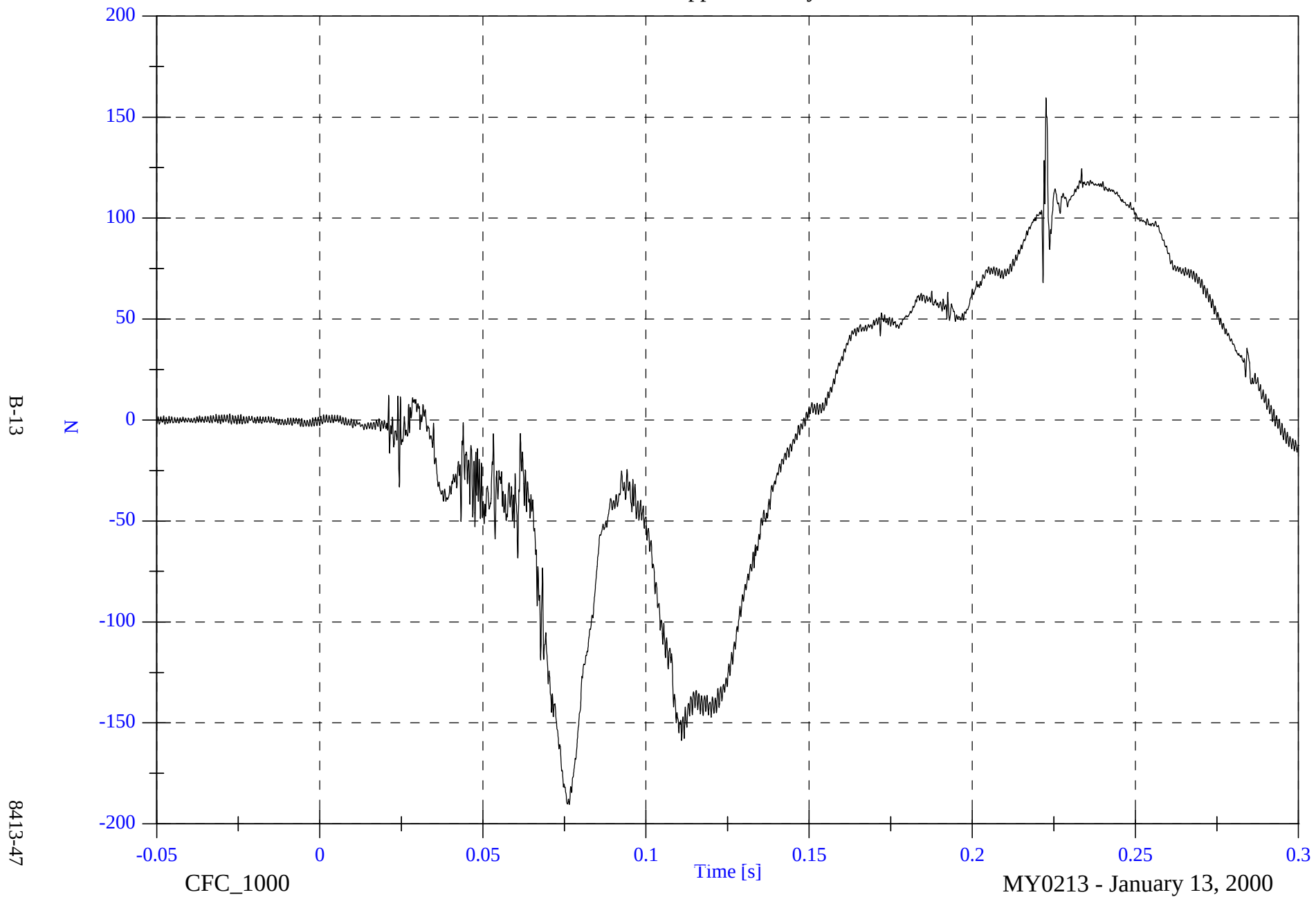


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Upper Neck Fy

Max: 159.6 [N] at 0.223 [s]

Min: -190.5 [N] at 0.076 [s]

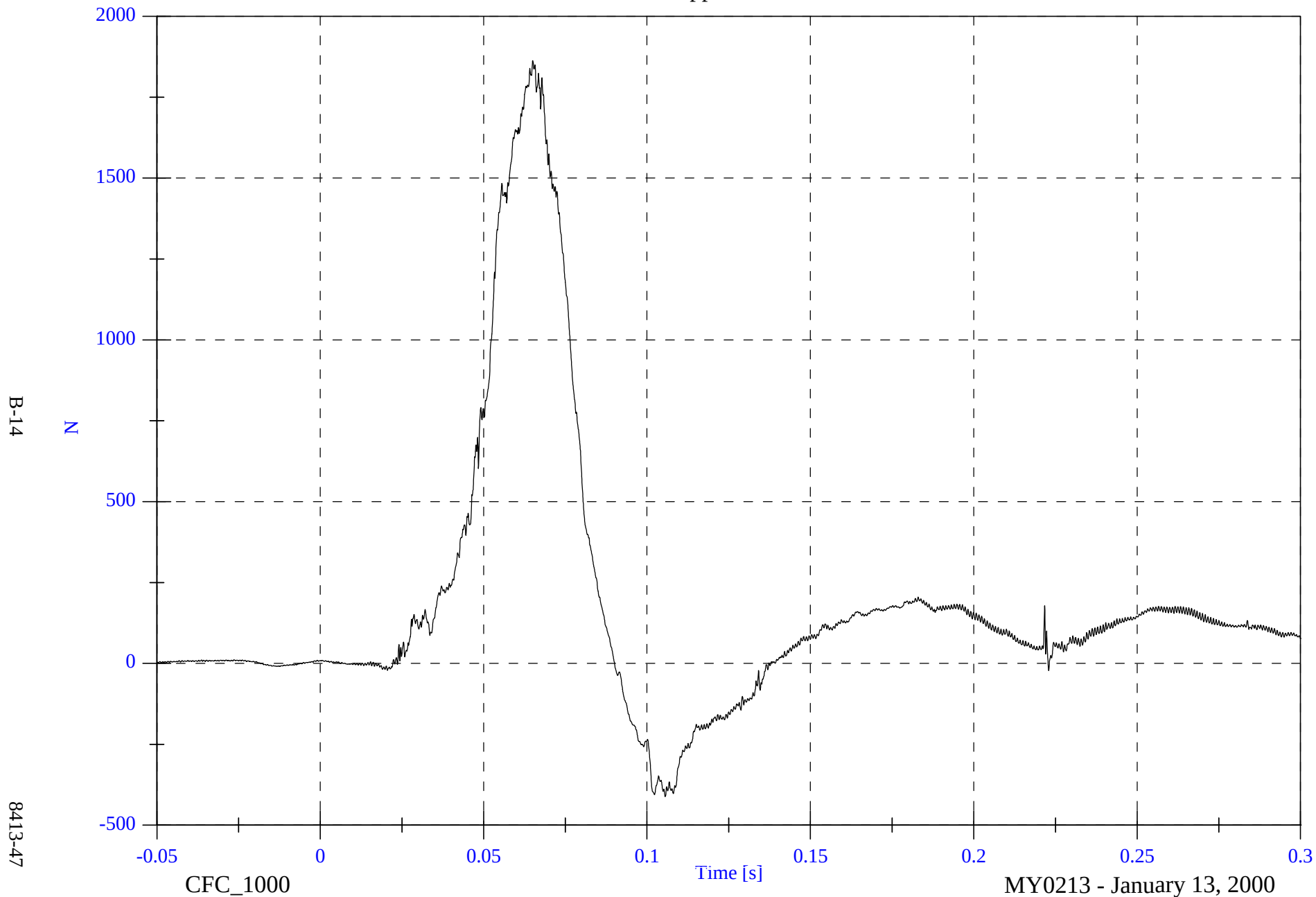


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Upper Neck Fz

Max: 1862.7 [N] at 0.065 [s]

Min: -411.7 [N] at 0.106 [s]

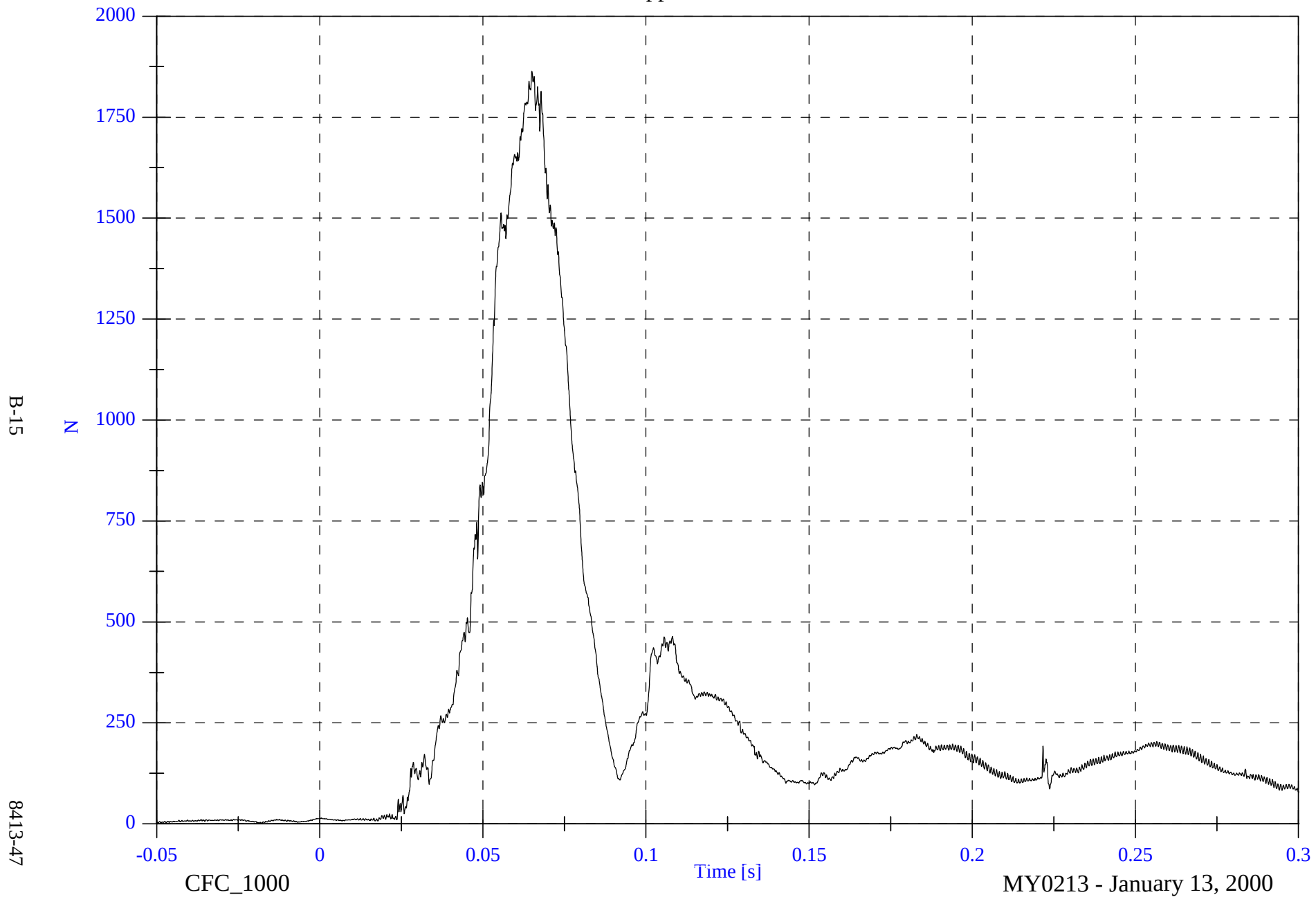


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Upper Neck F Resultant

Max: 1863.2 [N] at 0.065 [s]

Min: 2.0 [N] at -0.018 [s]

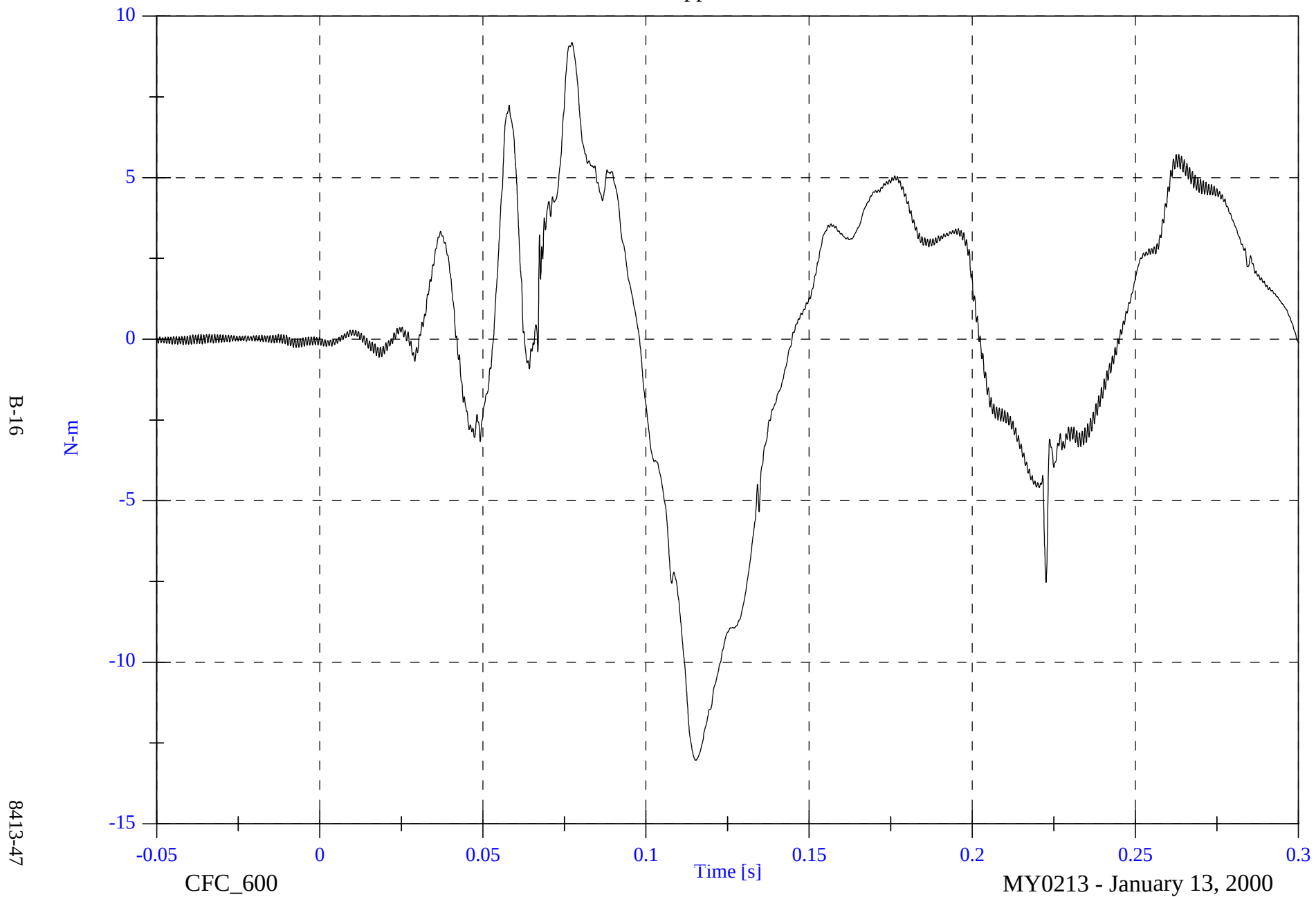


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Upper Neck Mx

Max: 9.2 [N-m] at 0.077 [s]

Min: -13.0 [N-m] at 0.115 [s]

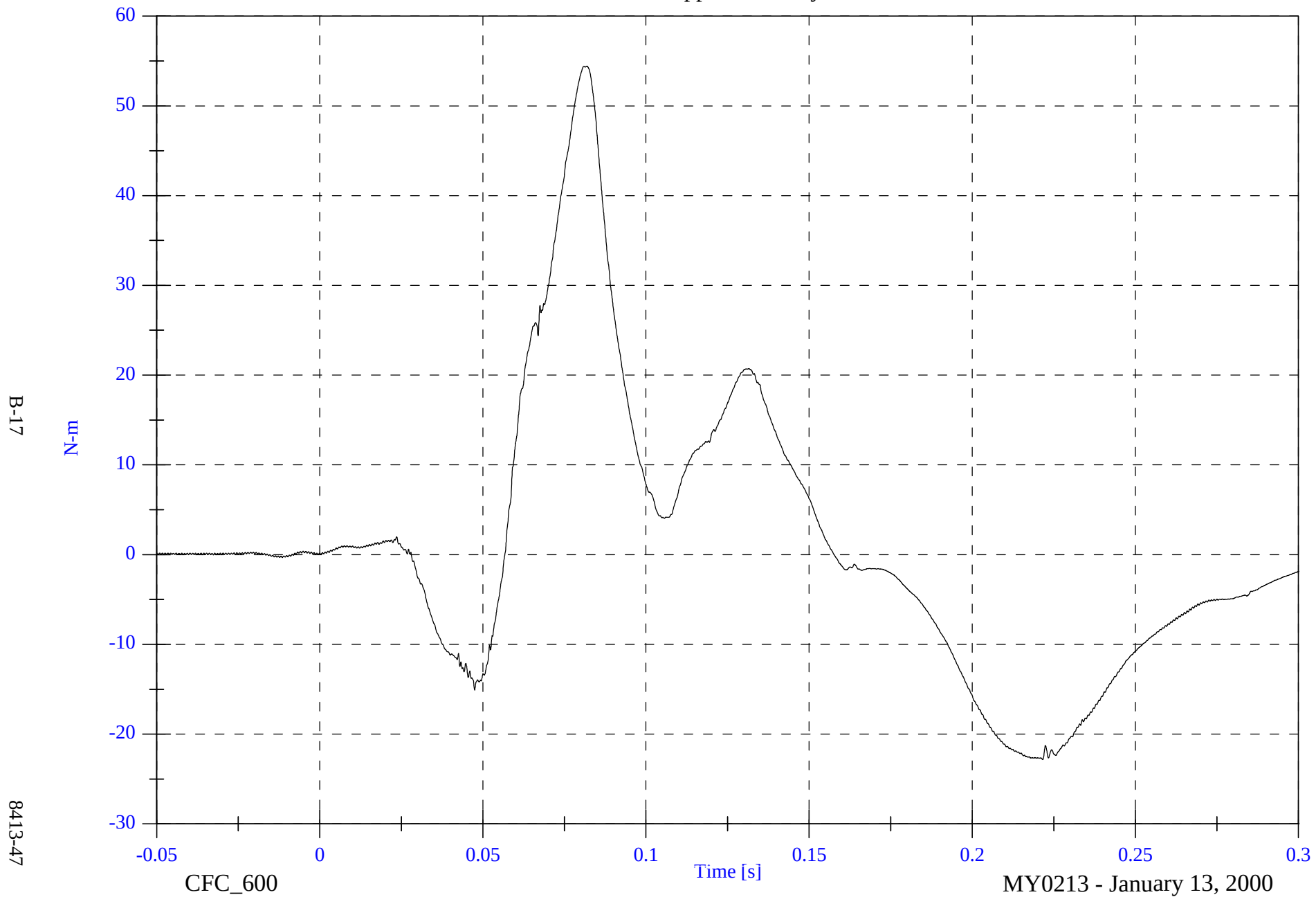


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Upper Neck My

Max: 54.4 [N-m] at 0.082 [s]

Min: -22.8 [N-m] at 0.222 [s]

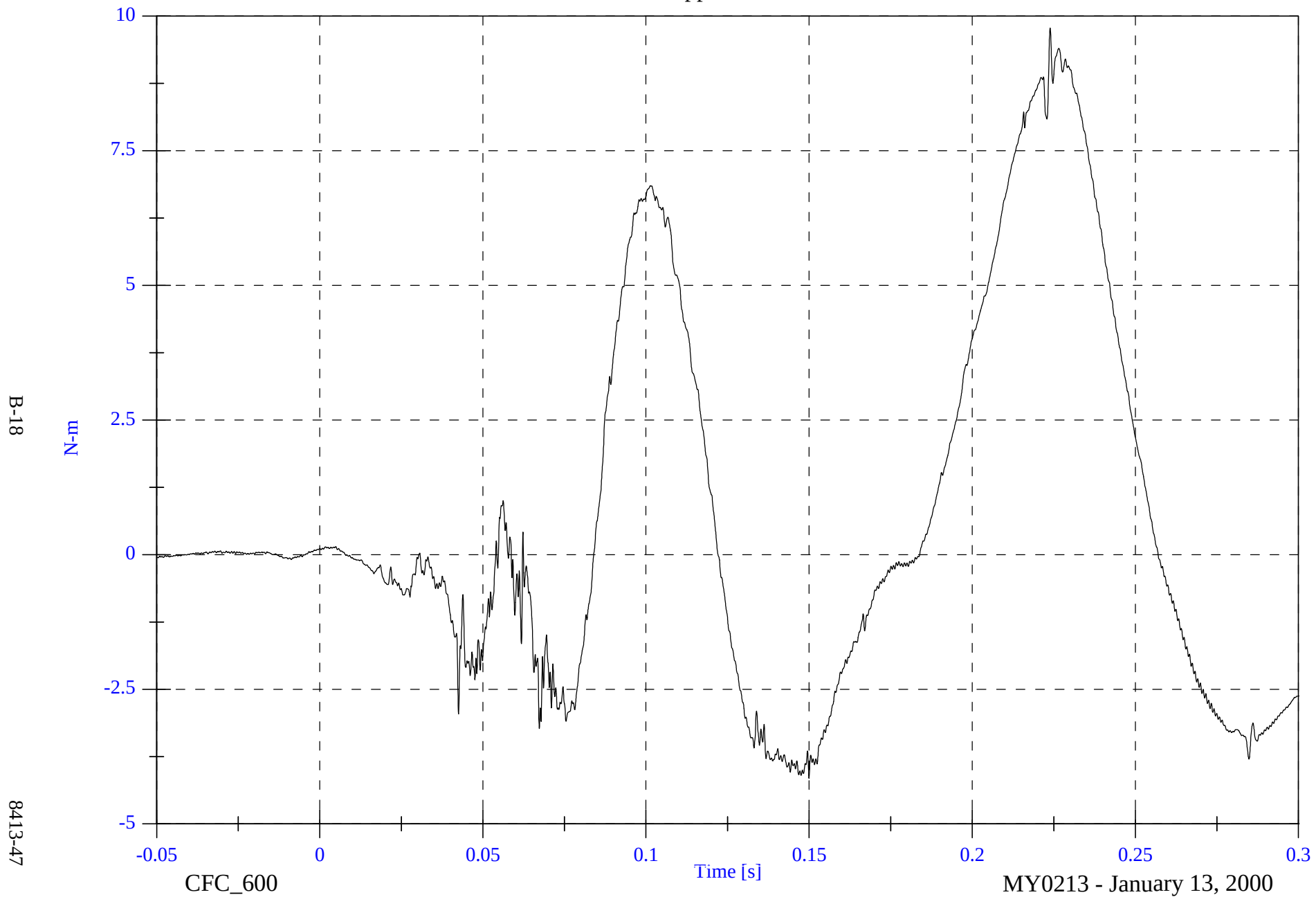


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Upper Neck Mz

Max: 9.8 [N-m] at 0.224 [s]

Min: -4.2 [N-m] at 0.150 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

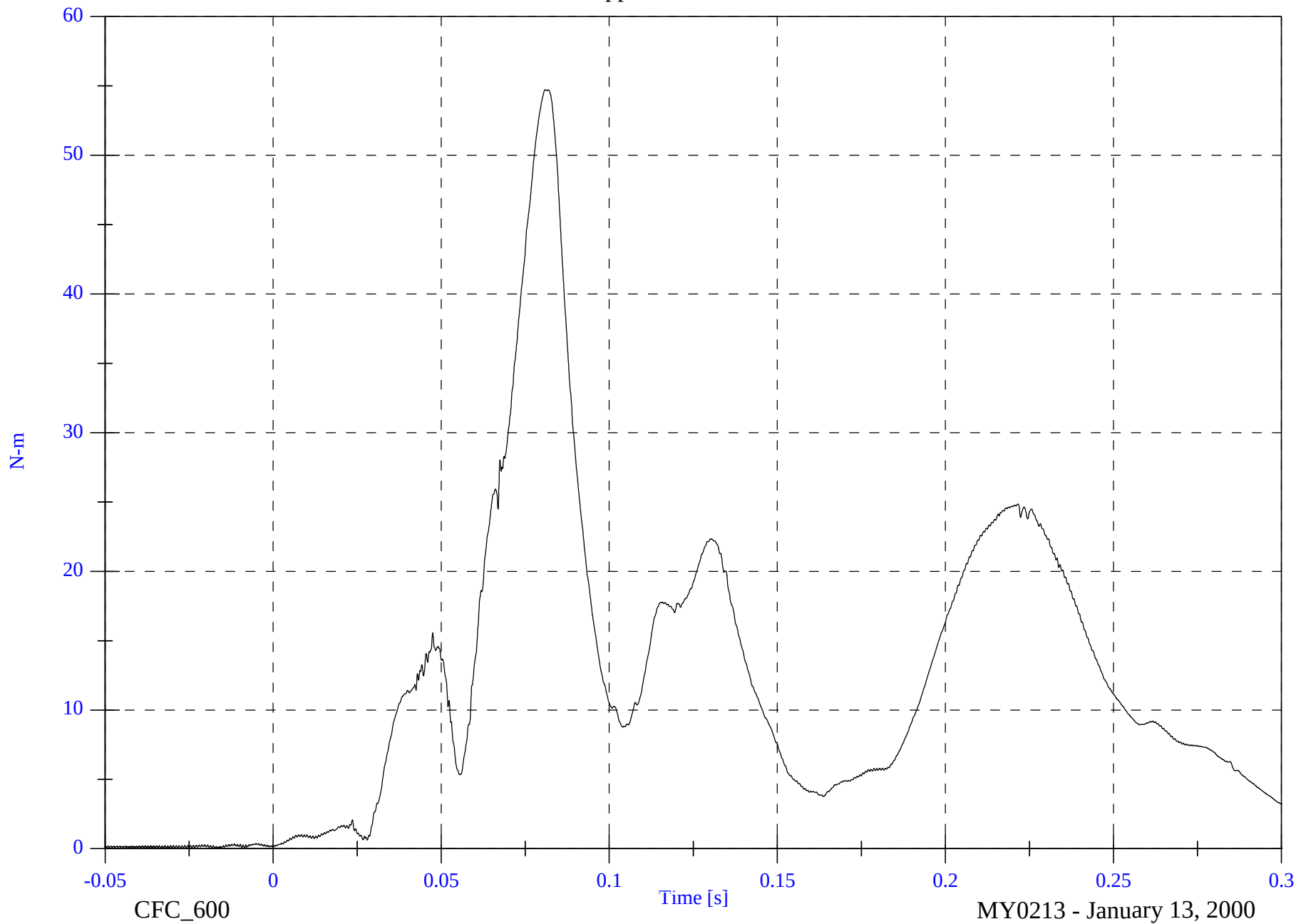
P1 Upper Neck M Resultant

Max: 54.7 [N-m] at 0.081 [s]

Min: 0.0 [N-m] at -0.017 [s]

B-19

8413-47

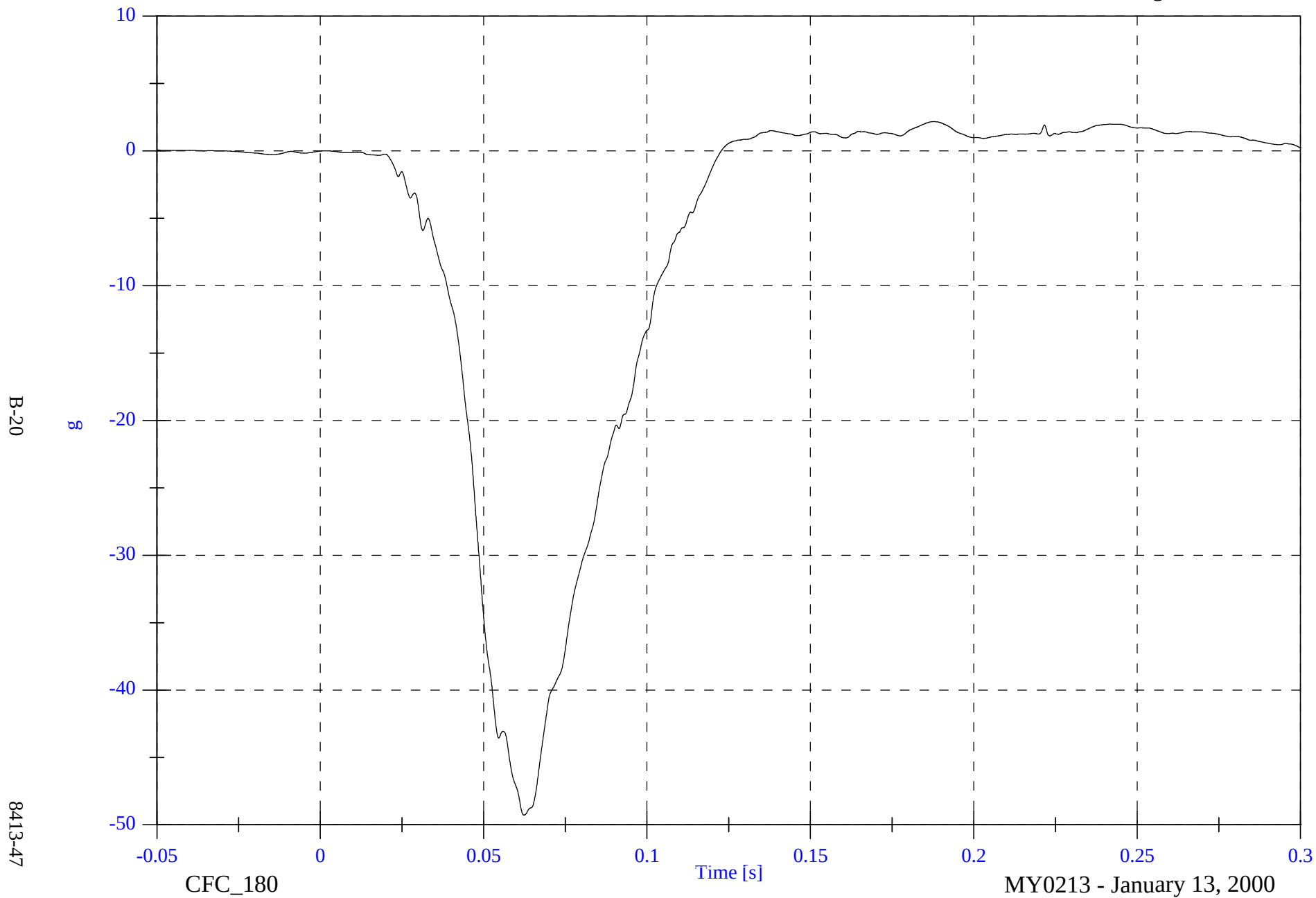


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Chest x

Max: 2.2 [g] at 0.188 [s]

Min: -49.3 [g] at 0.062 [s]

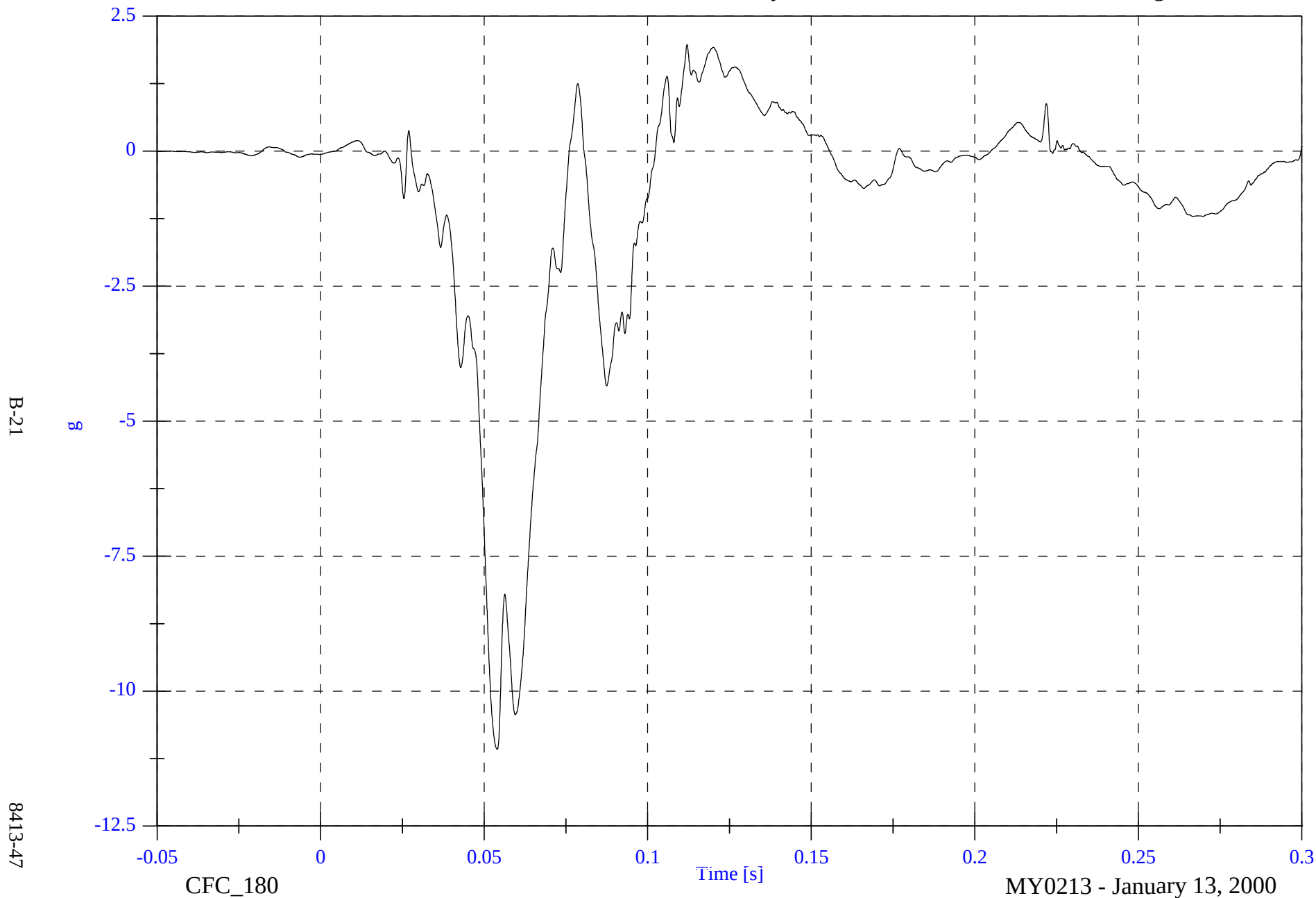


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Chest y

Max: 2.0 [g] at 0.112 [s]

Min: -11.1 [g] at 0.054 [s]

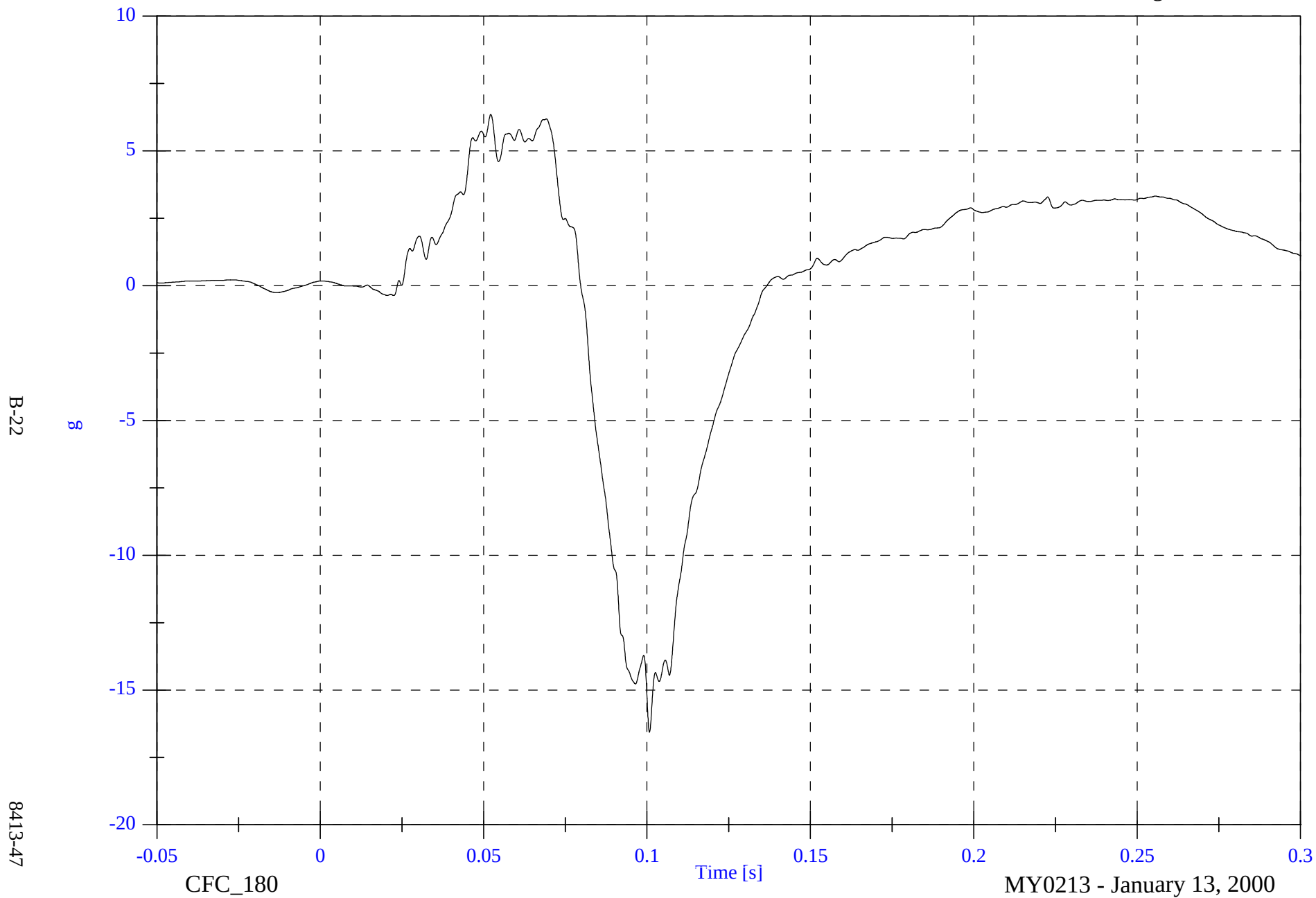


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Chest z

Max: 6.4 [g] at 0.052 [s]

Min: -16.6 [g] at 0.101 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

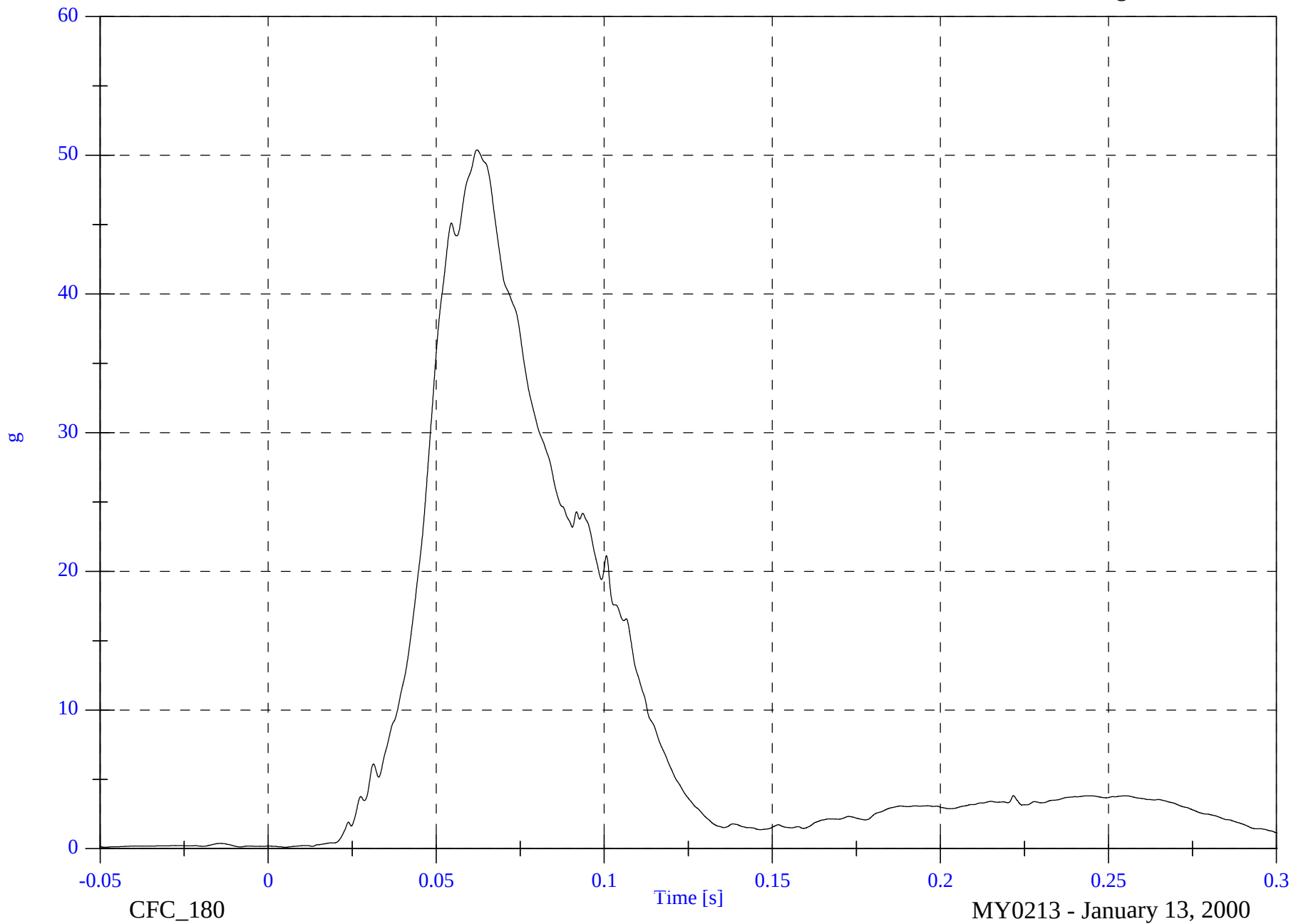
P1 Chest Resultant

Max: 50.4 [g] at 0.062 [s]

Min: 0.1 [g] at 0.005 [s]

B-23

8413-47



NCAP Test 8 - 2000 Mercury Villager Sport

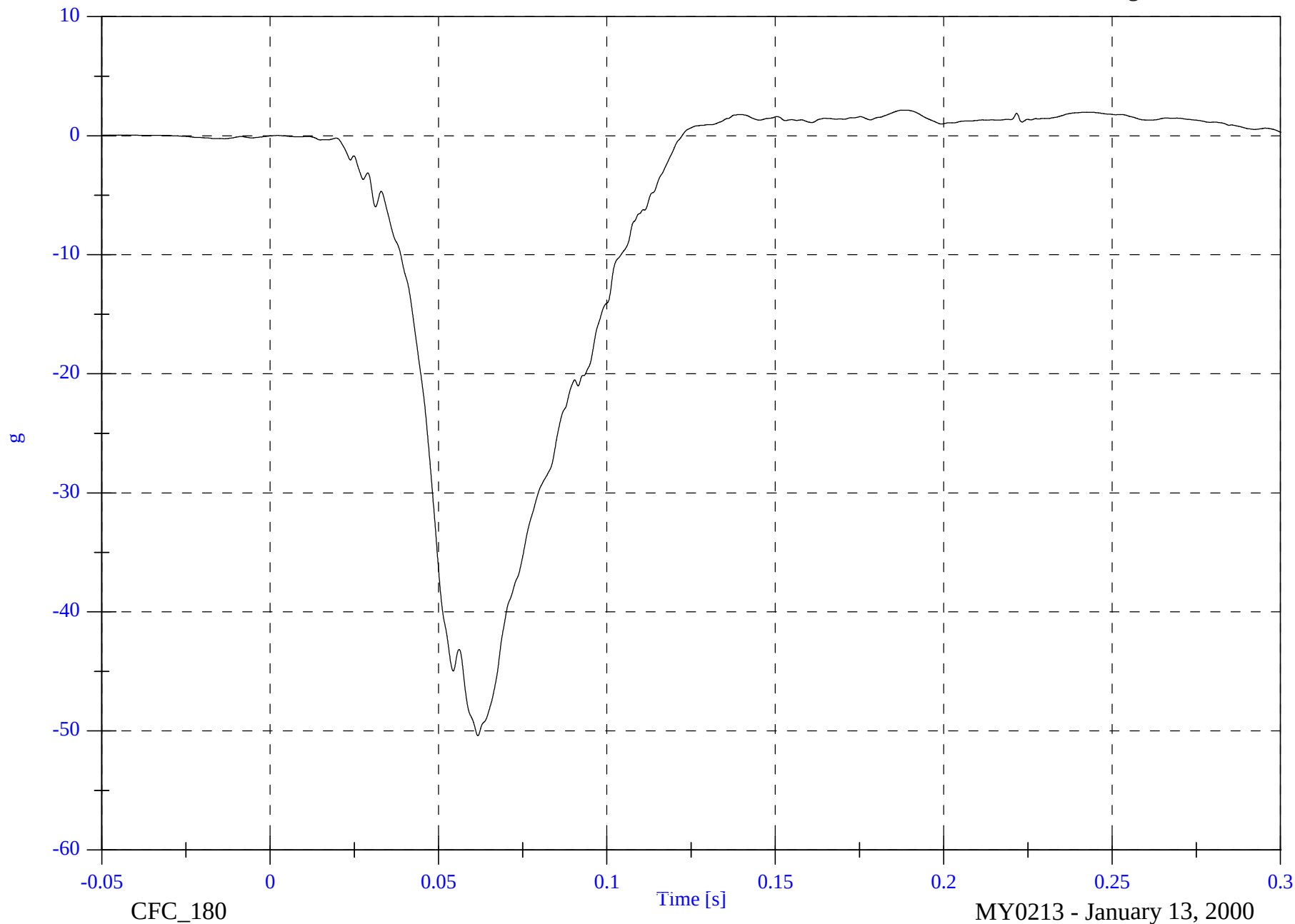
P1 Chest Red x

Max: 2.1 [g] at 0.188 [s]

Min: -50.4 [g] at 0.062 [s]

B-24

8413-47

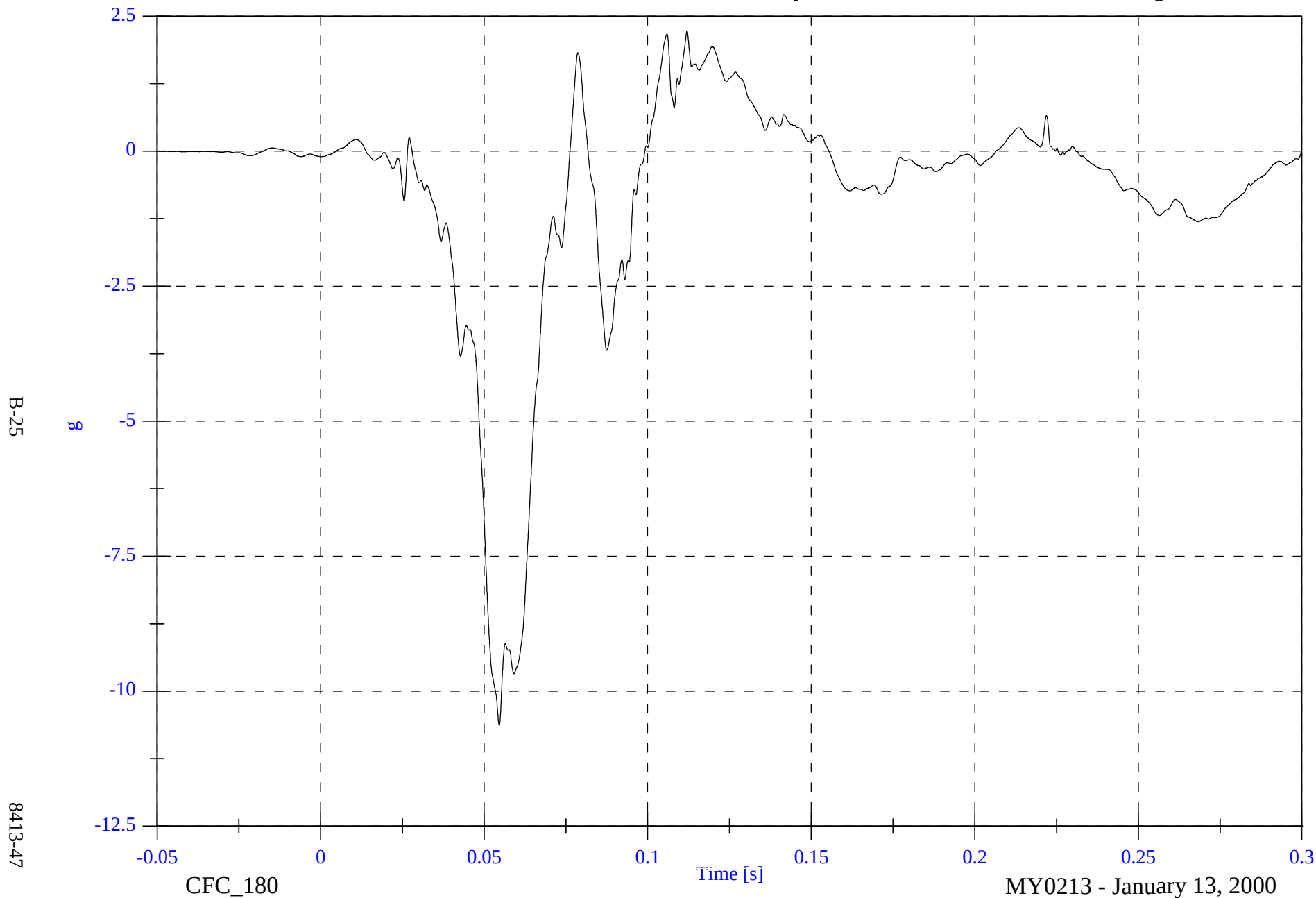


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Chest Red y

Max: 2.2 [g] at 0.112 [s]

Min: -10.6 [g] at 0.055 [s]

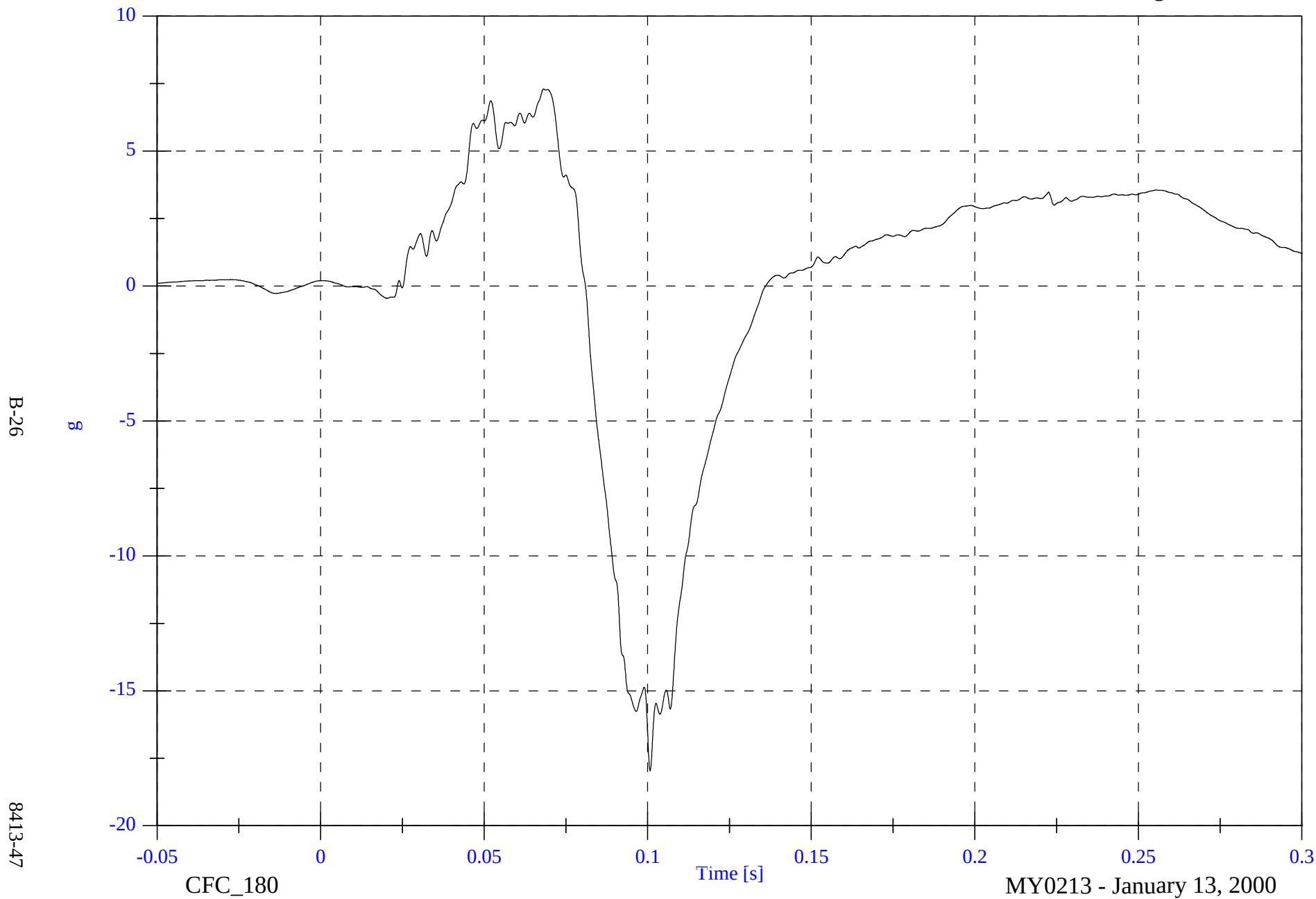


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Chest Red z

Max: 7.3 [g] at 0.068 [s]

Min: -18.0 [g] at 0.101 [s]

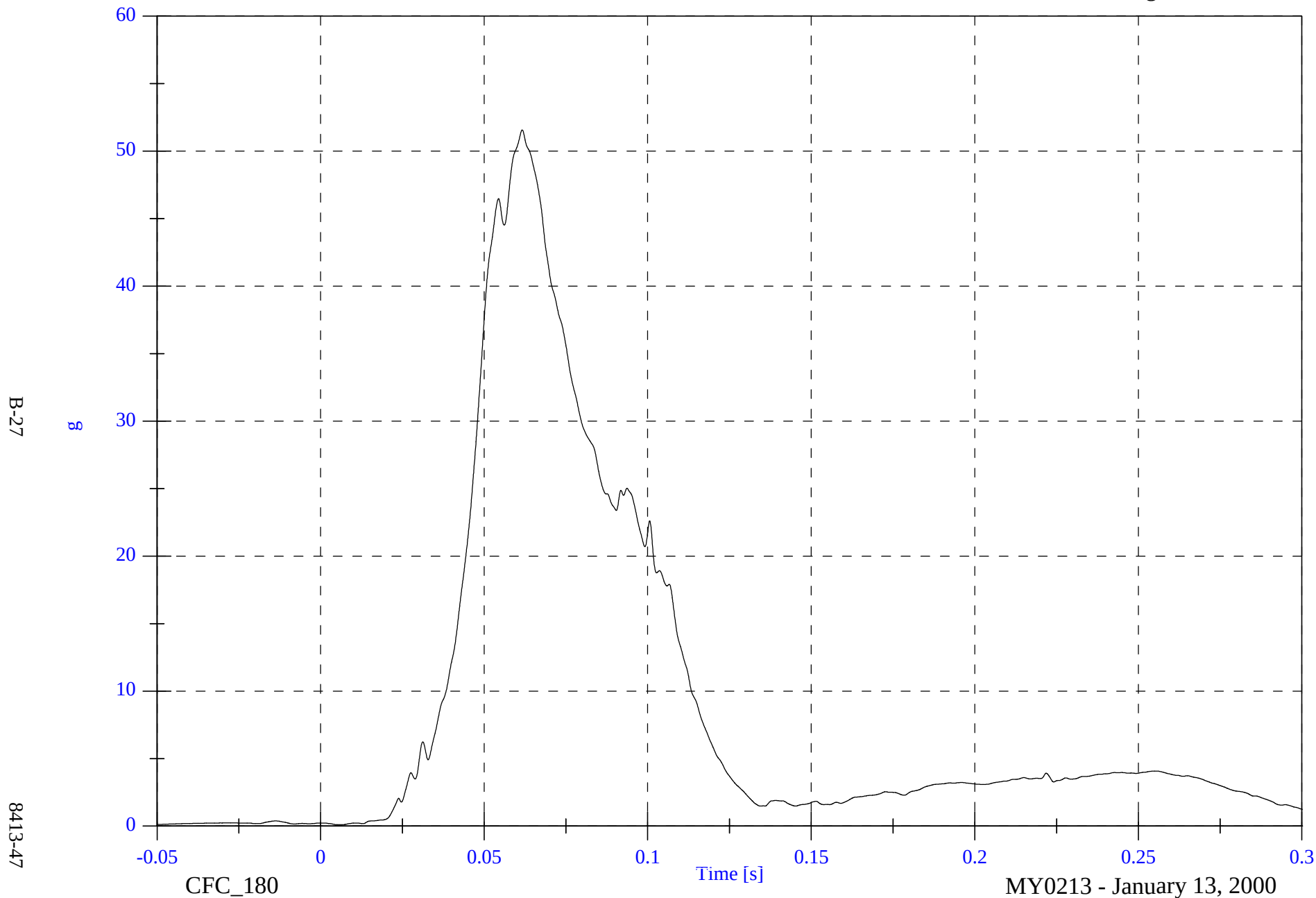


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Chest Red Resultant

Max: 51.6 [g] at 0.062 [s]

Min: 0.1 [g] at 0.006 [s]

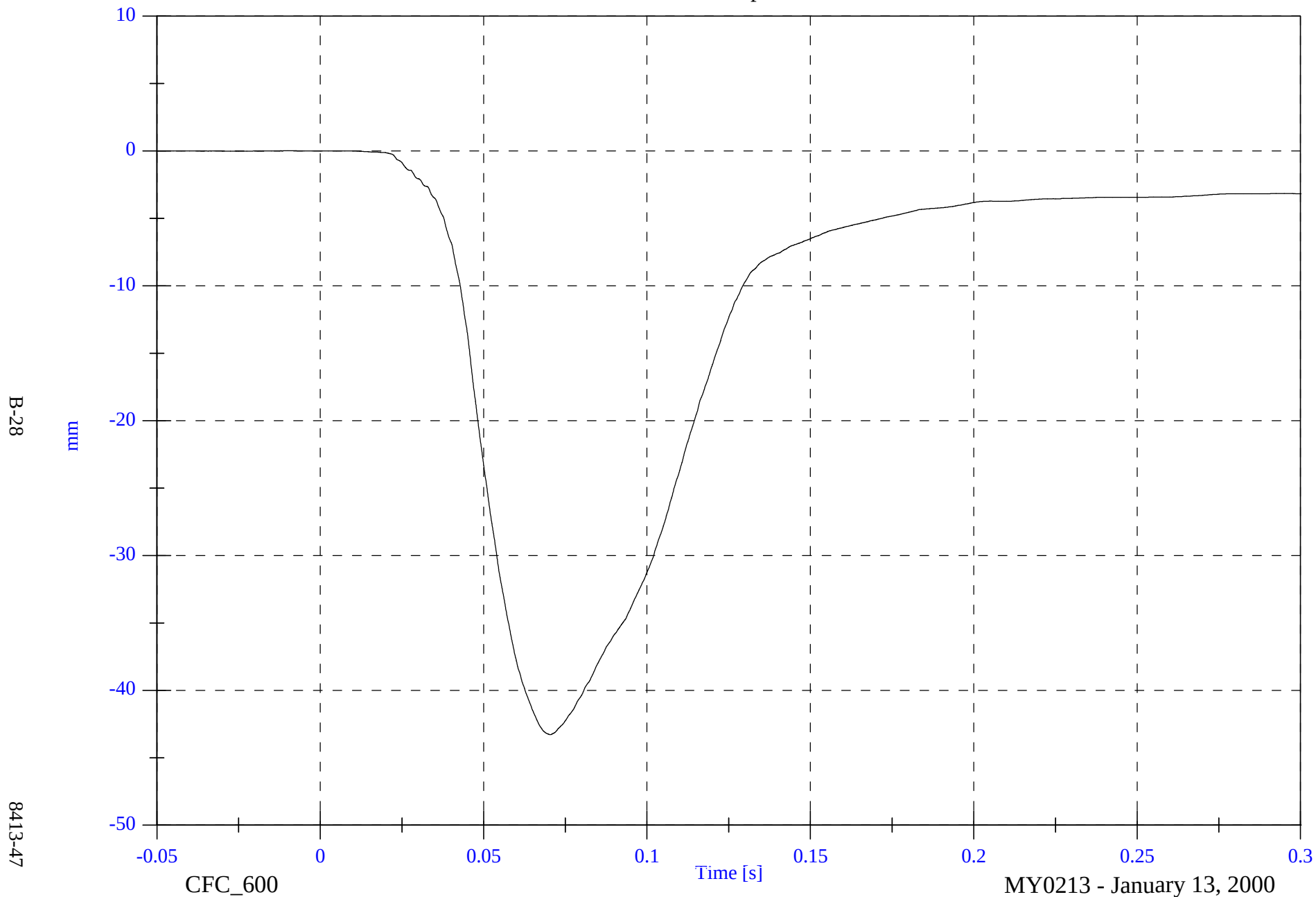


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Chest Compression x

Max: 0.0 [mm] at -0.009 [s]

Min: -43.3 [mm] at 0.070 [s]

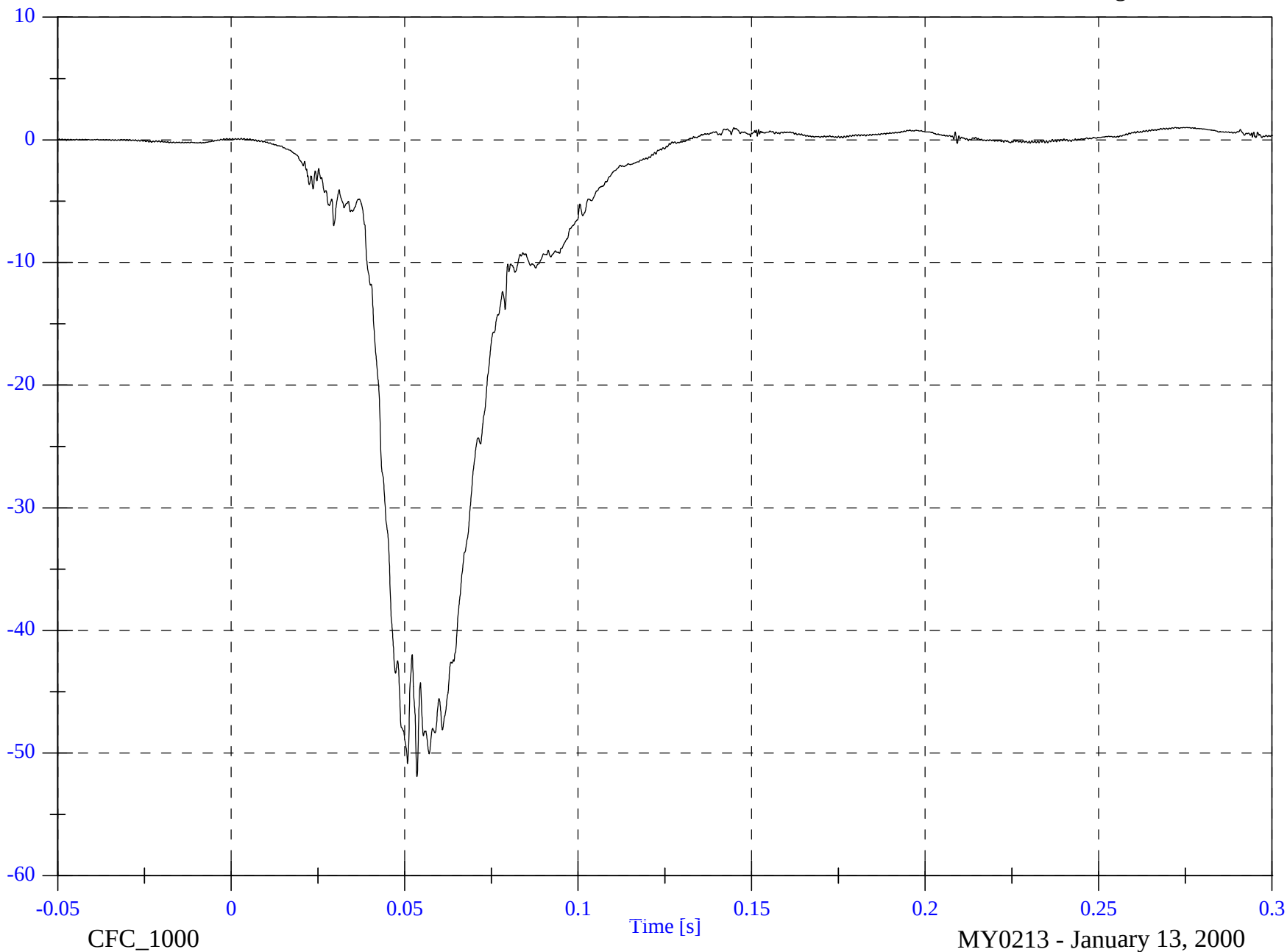


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Pelvic x

Max: 1.0 [g] at 0.272 [s]

Min: -51.9 [g] at 0.054 [s]



B-29

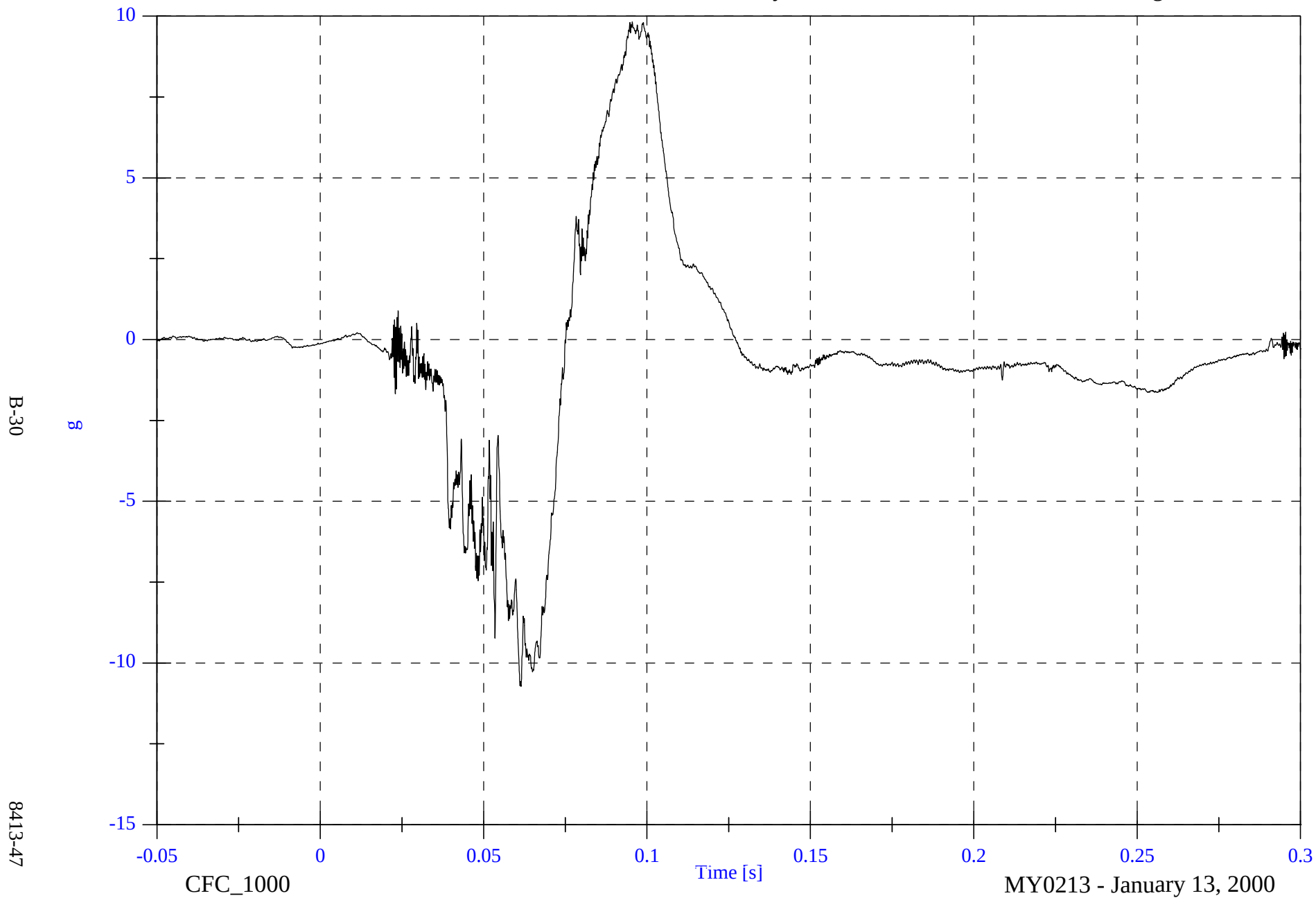
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

Max: 9.8 [g] at 0.096 [s]

Min: -10.7 [g] at 0.061 [s]

P1 Pelvic y

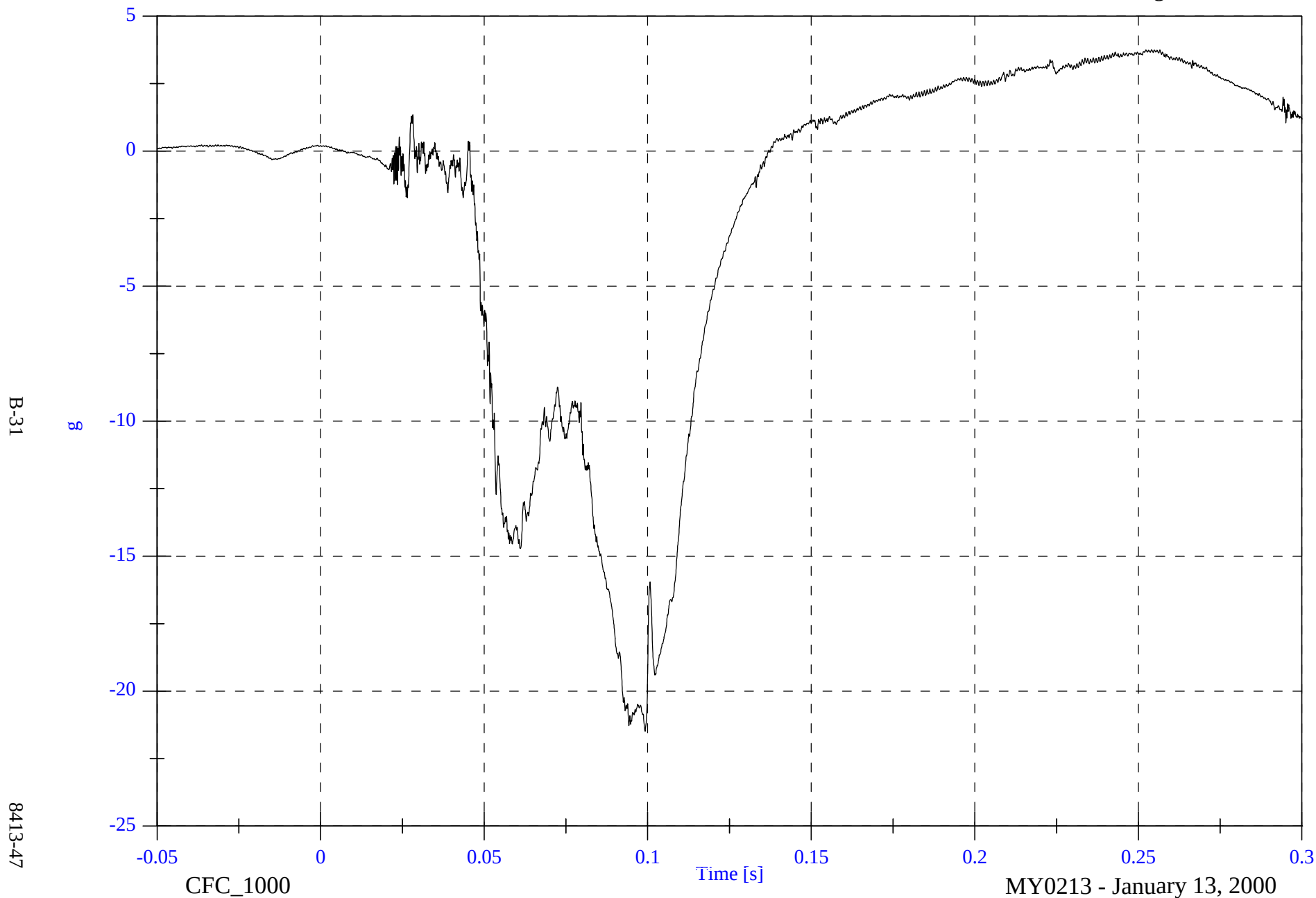


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Pelvic z

Max: 3.8 [g] at 0.254 [s]

Min: -21.5 [g] at 0.099 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

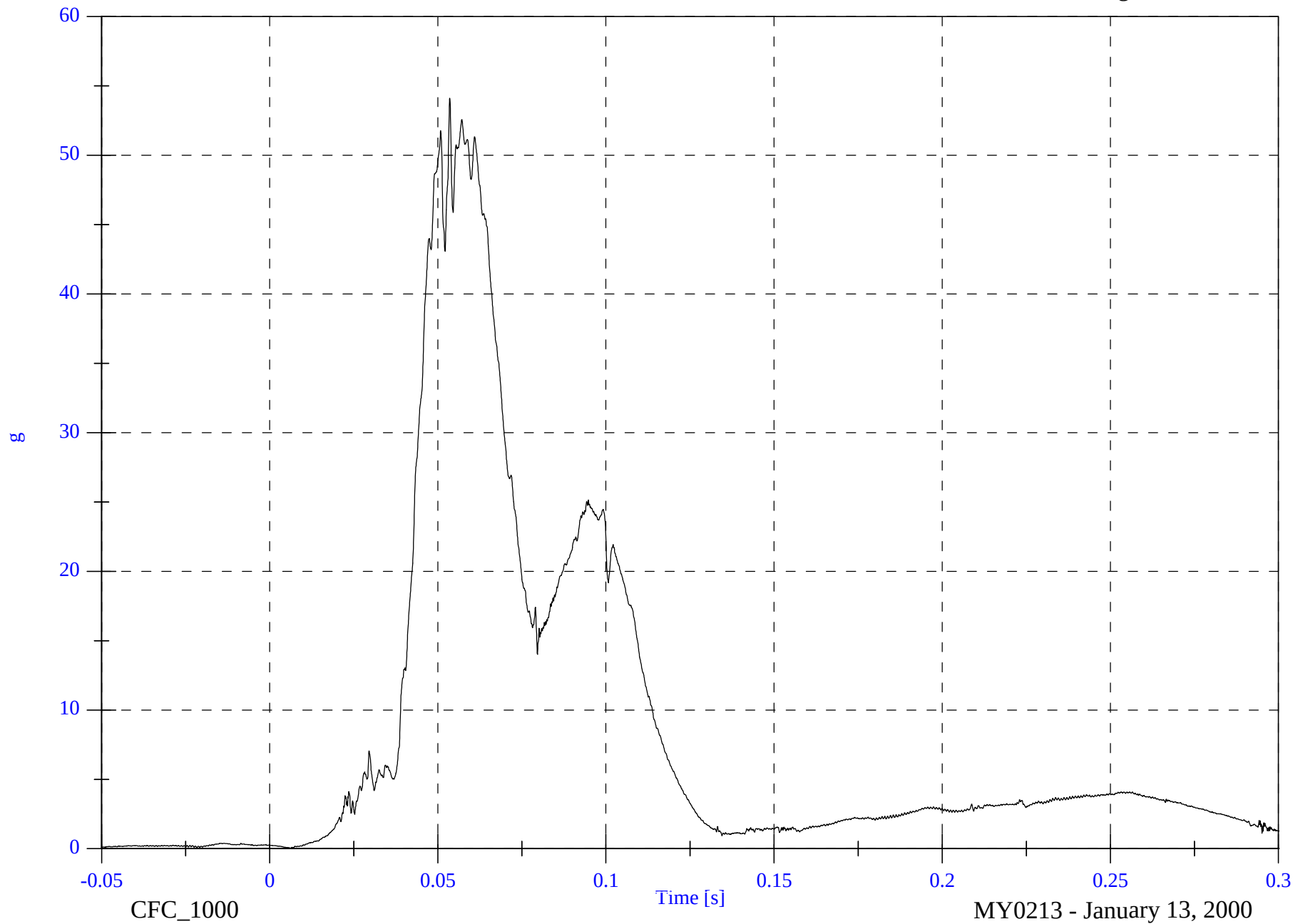
P1 Pelvic Resultant

Max: 54.1 [g] at 0.054 [s]

Min: 0.0 [g] at 0.006 [s]

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8413-47

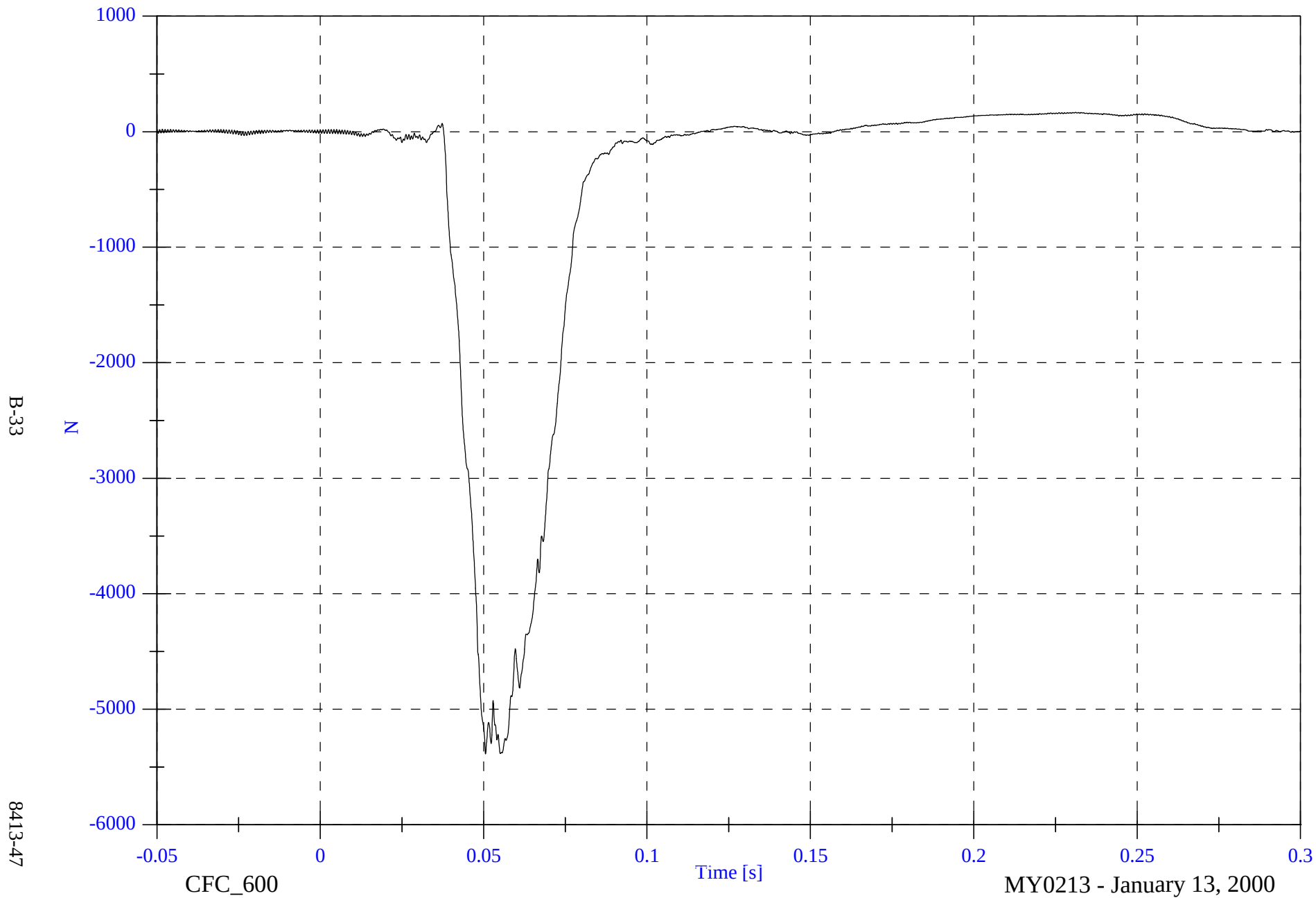


NCAP Test 8 - 2000 Mercury Villager Sport

Max: 167.2 [N] at 0.231 [s]

P1 Left Femur z

Min: -5386.5 [N] at 0.051 [s]

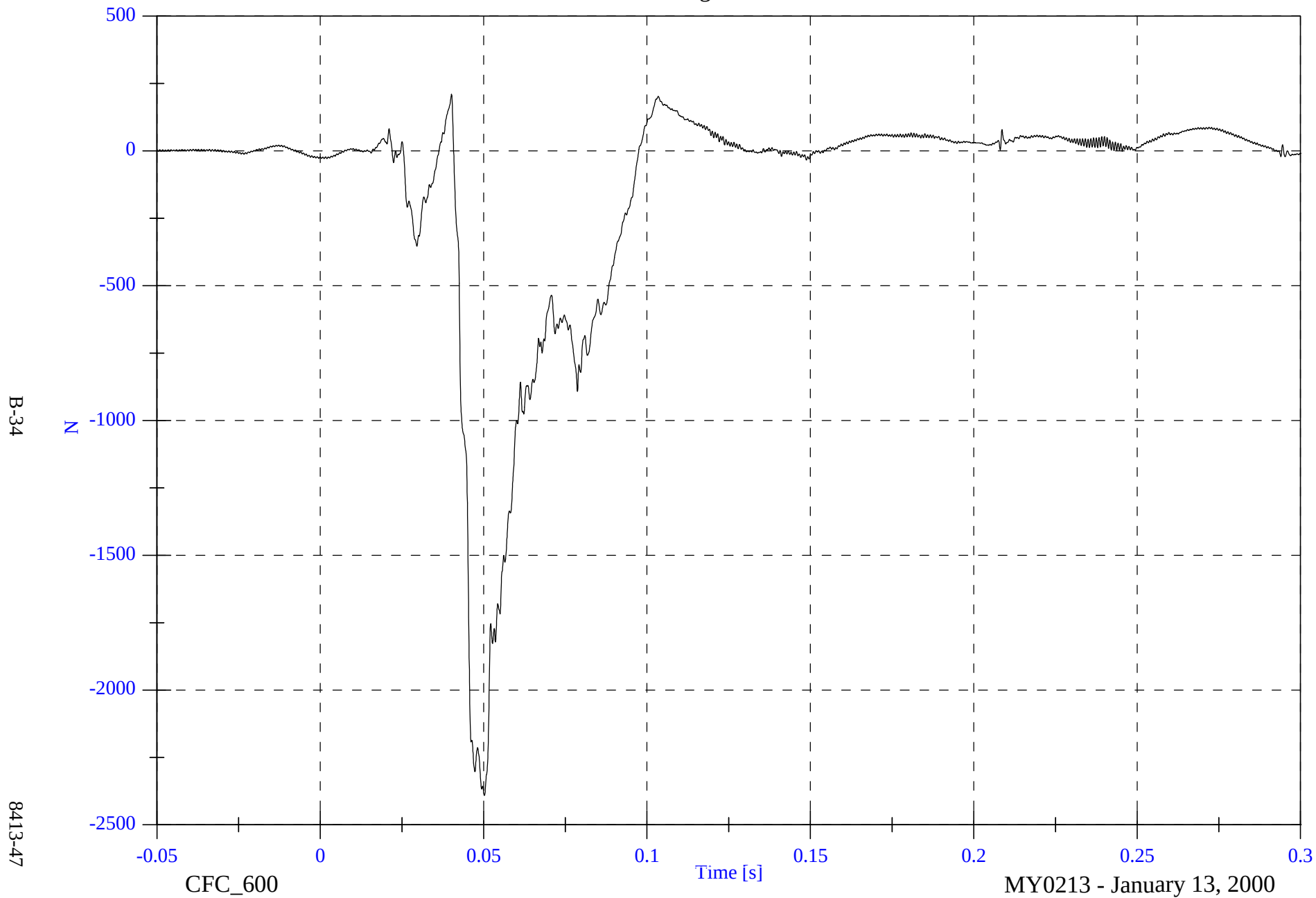


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Femur z

Max: 210.8 [N] at 0.040 [s]

Min: -2391.2 [N] at 0.050 [s]

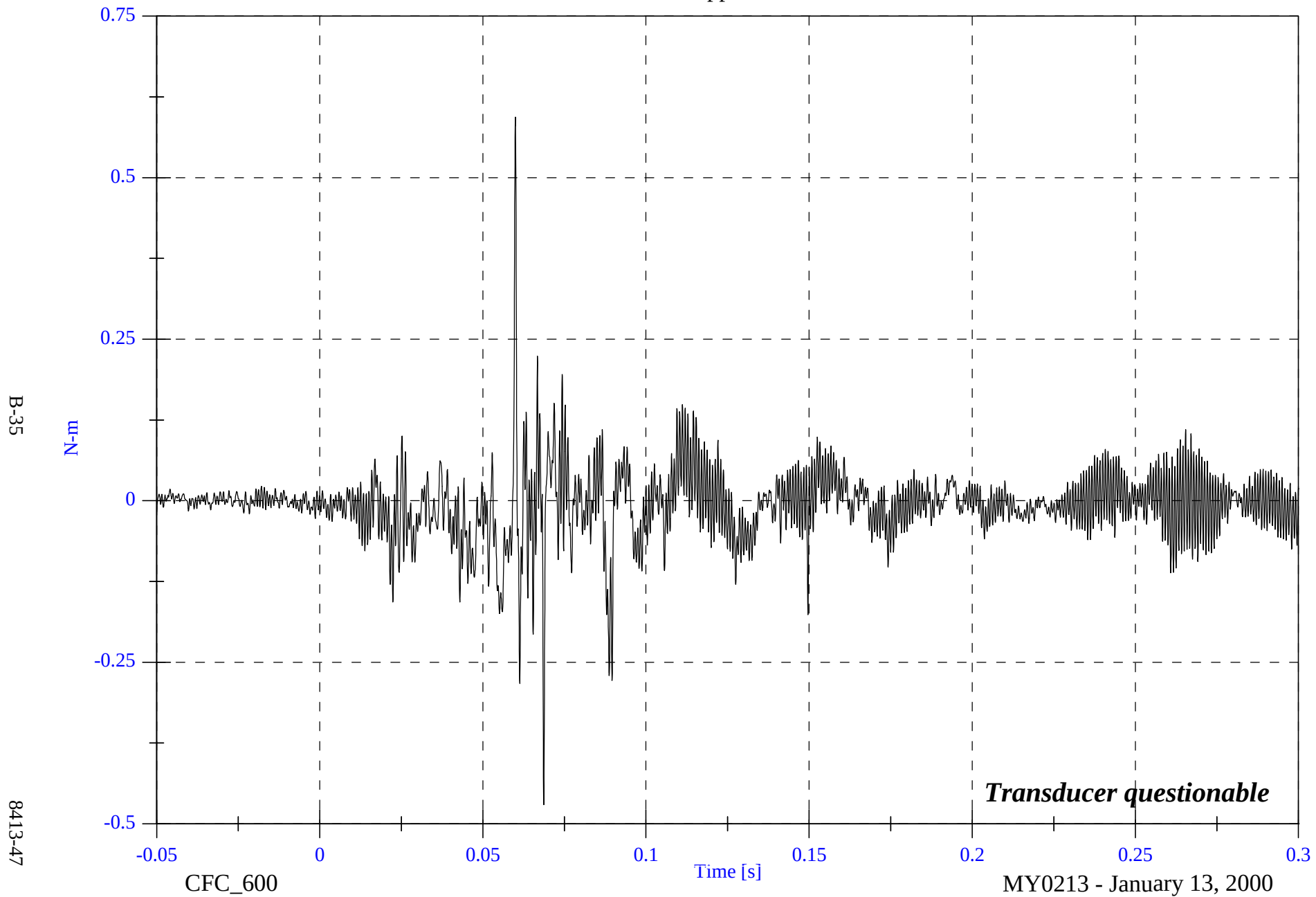


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Left Upper Tibia Mx

Max: 0.6 [N-m] at 0.060 [s]

Min: -0.5 [N-m] at 0.069 [s]

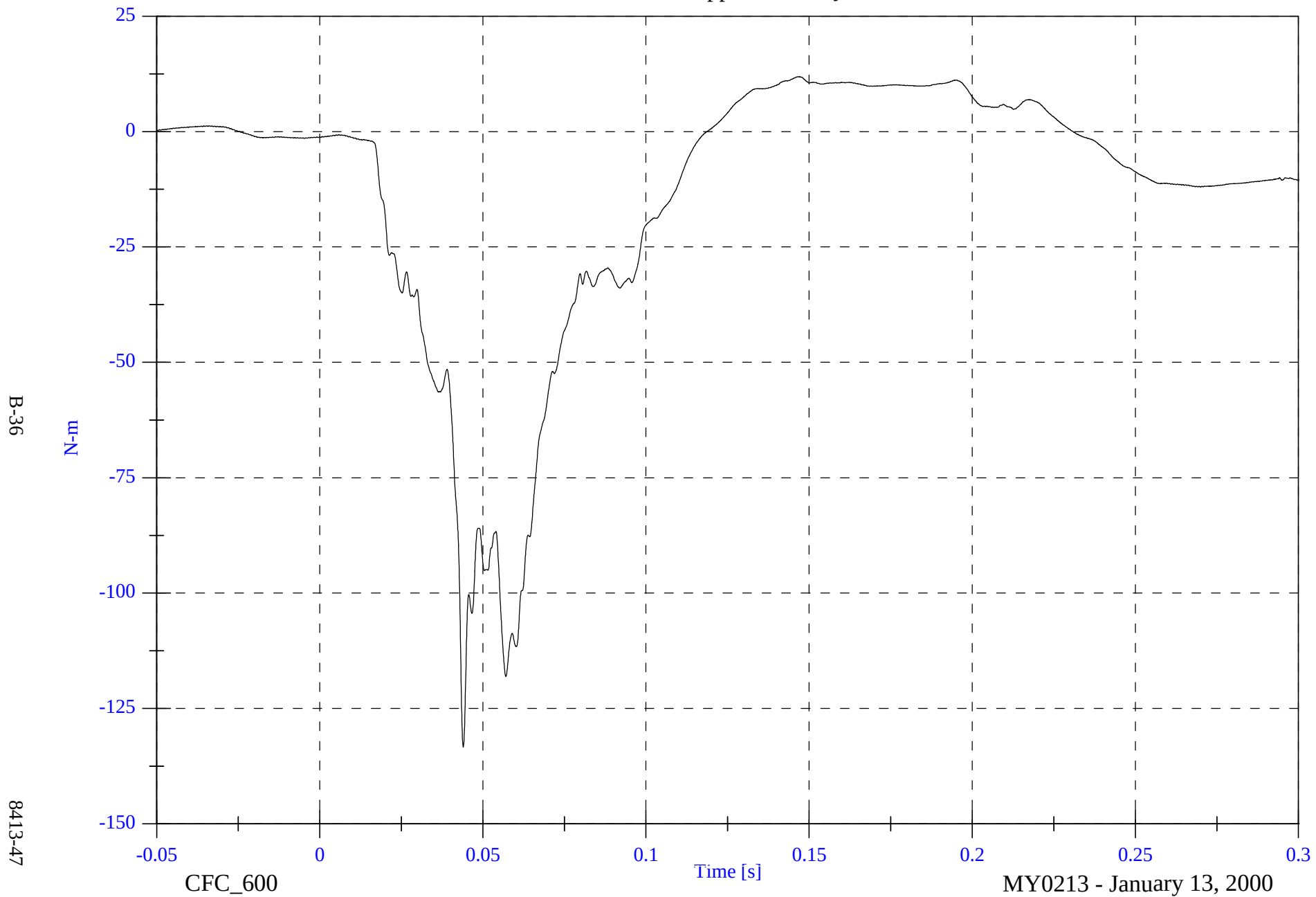


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Left Upper Tibia My

Max: 11.9 [N-m] at 0.147 [s]

Min: -133.4 [N-m] at 0.044 [s]

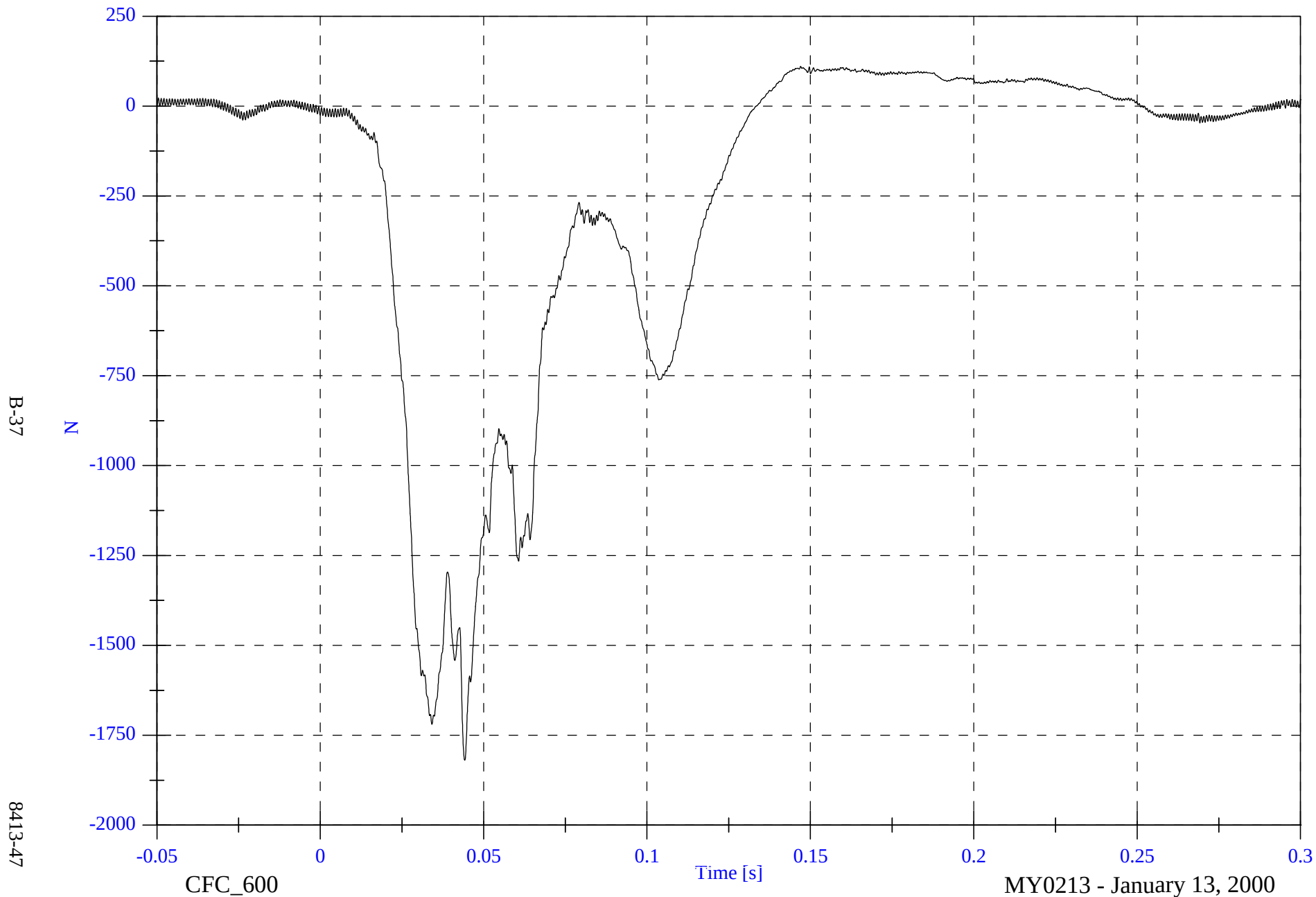


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Left Lower Tibia Fz

Max: 110.7 [N] at 0.147 [s]

Min: -1819.7 [N] at 0.044 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

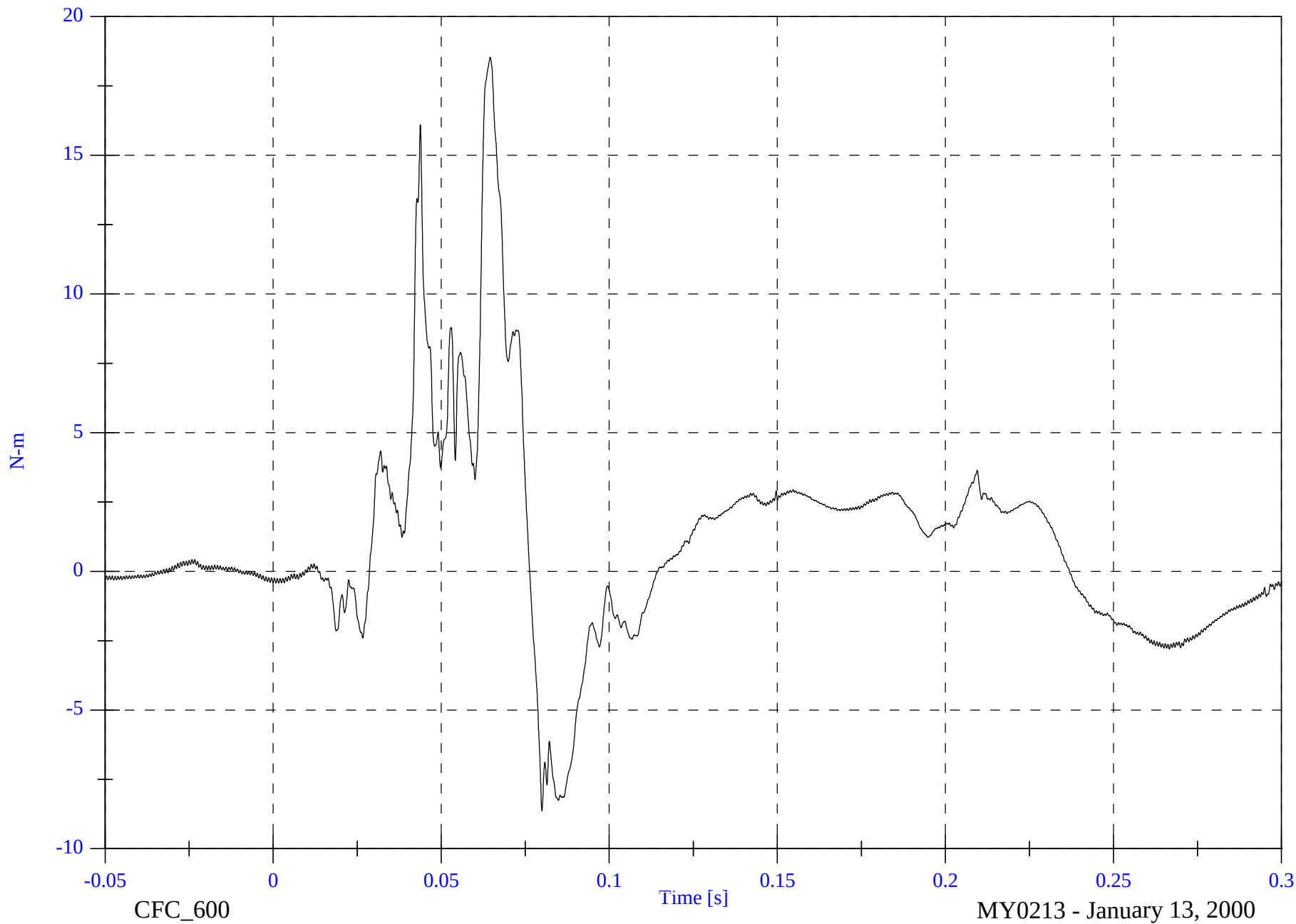
P1 Left Lower Tibia Mx

Max: 18.5 [N-m] at 0.065 [s]

Min: -8.6 [N-m] at 0.080 [s]

B-38

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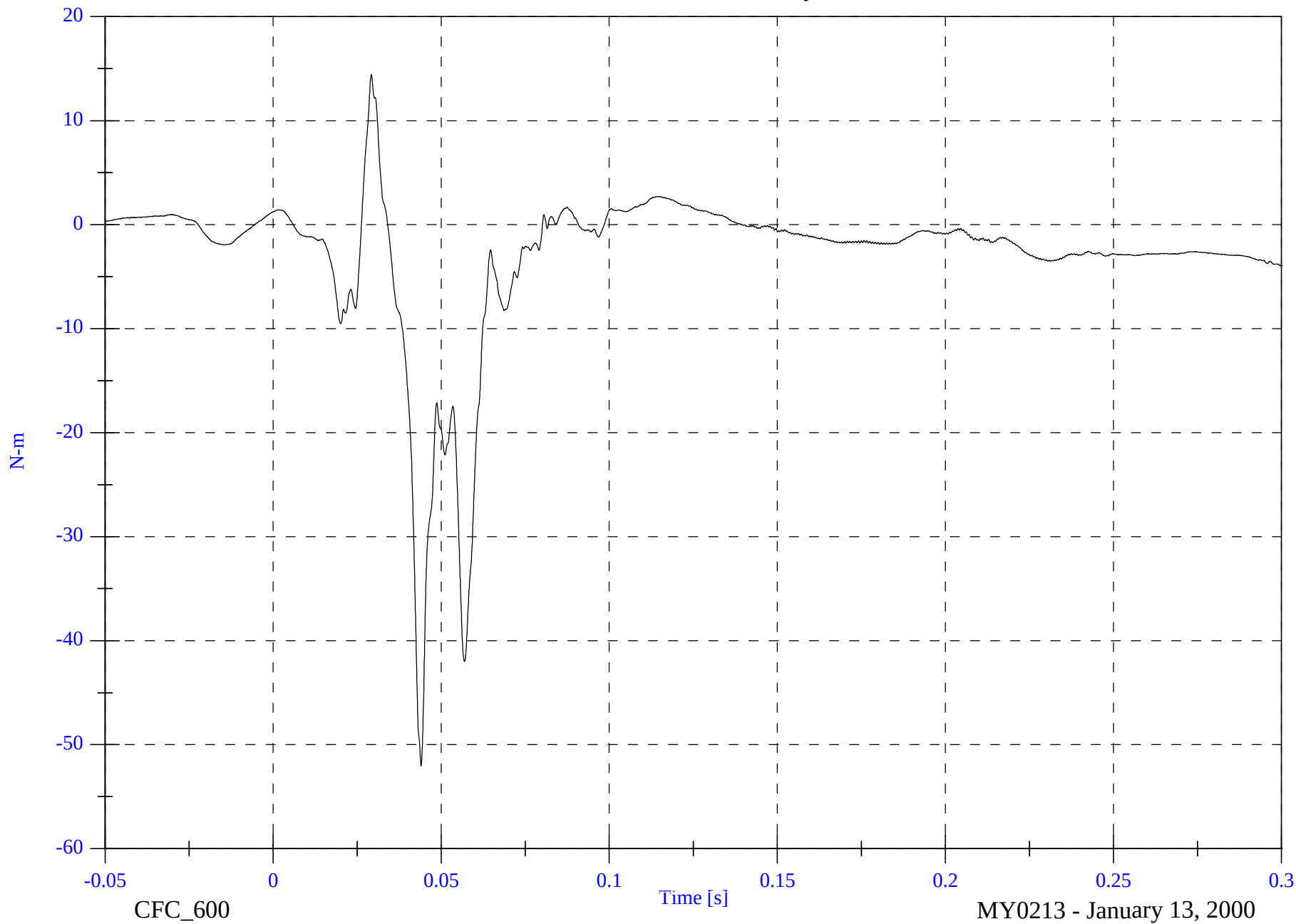


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Left Lower Tibia My

Max: 14.4 [N-m] at 0.029 [s]

Min: -52.0 [N-m] at 0.044 [s]



B-39

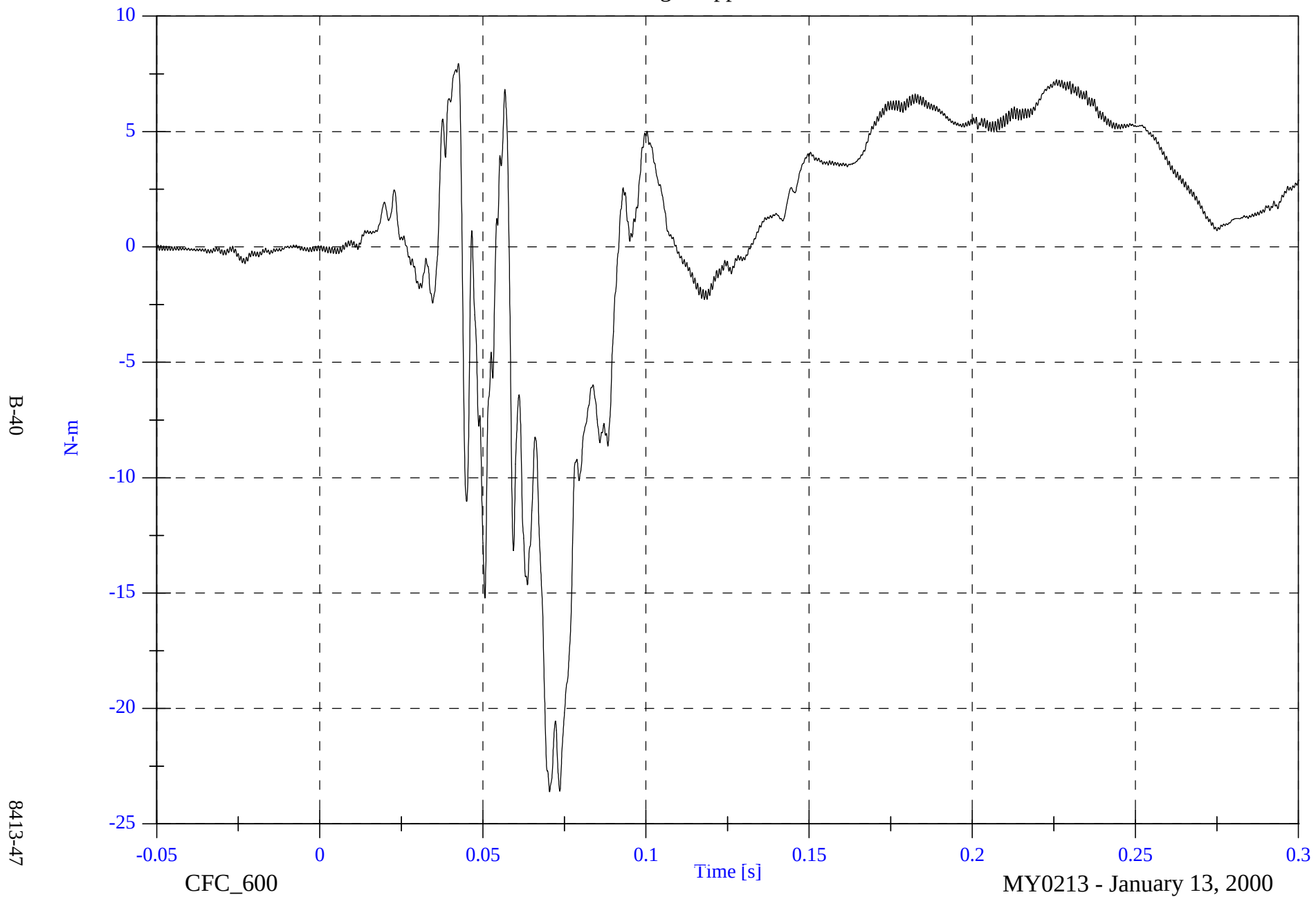
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Upper Tibia Mx

Max: 7.9 [N-m] at 0.043 [s]

Min: -23.6 [N-m] at 0.070 [s]

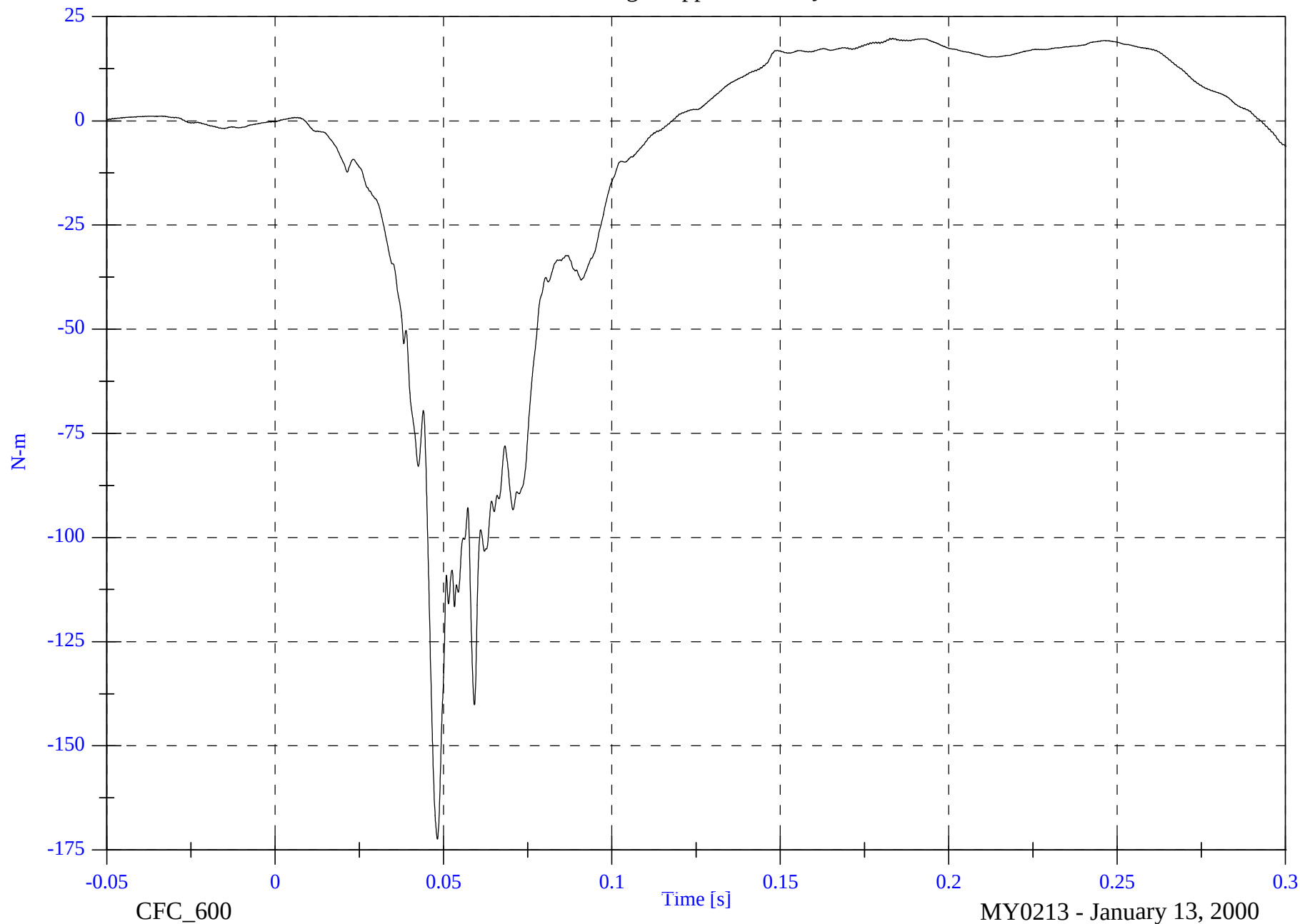


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Upper Tibia My

Max: 19.8 [N-m] at 0.183 [s]

Min: -172.4 [N-m] at 0.048 [s]



B-41

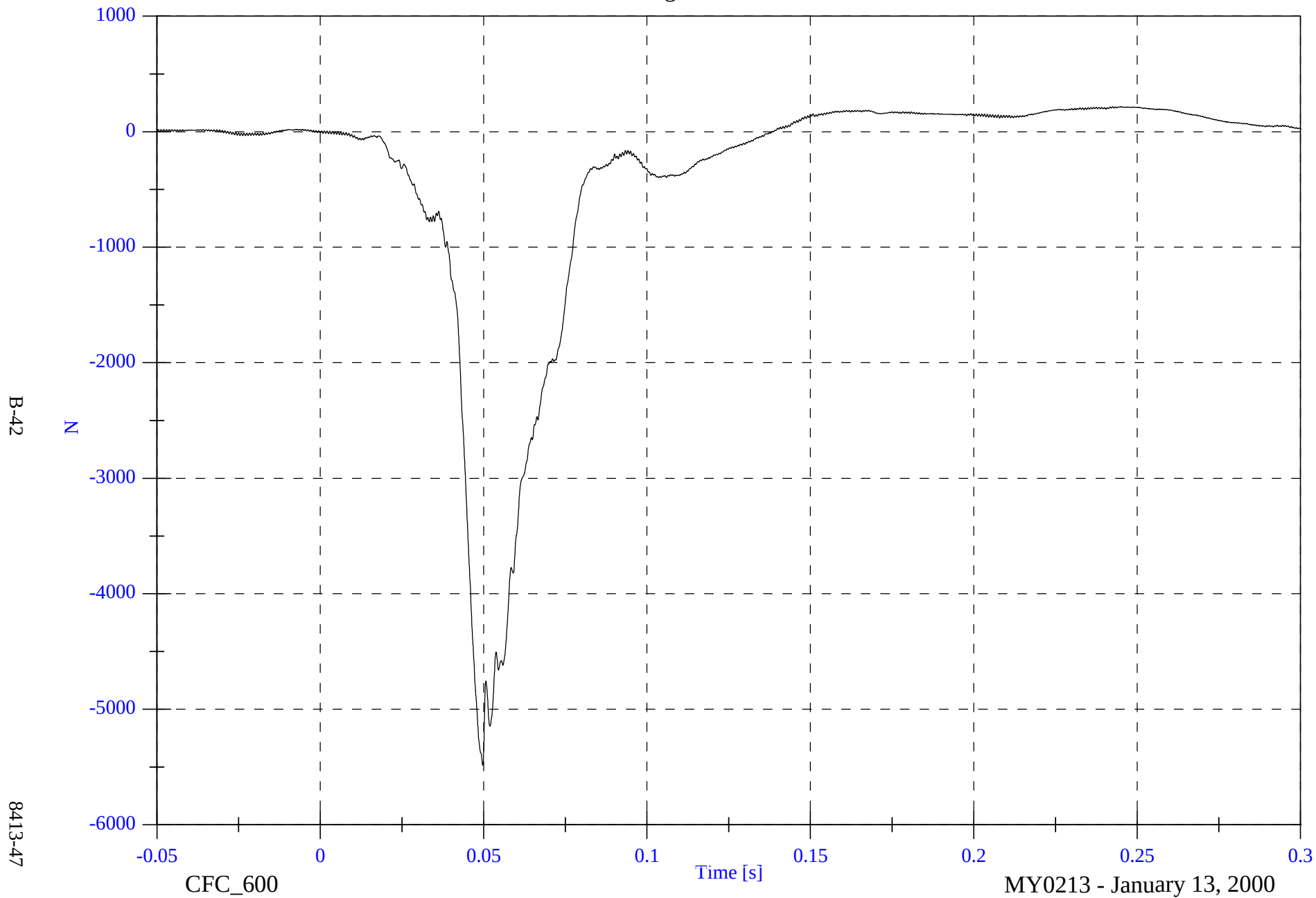
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Lower Tibia Fz

Max: 217.5 [N] at 0.245 [s]

Min: -5485.1 [N] at 0.050 [s]

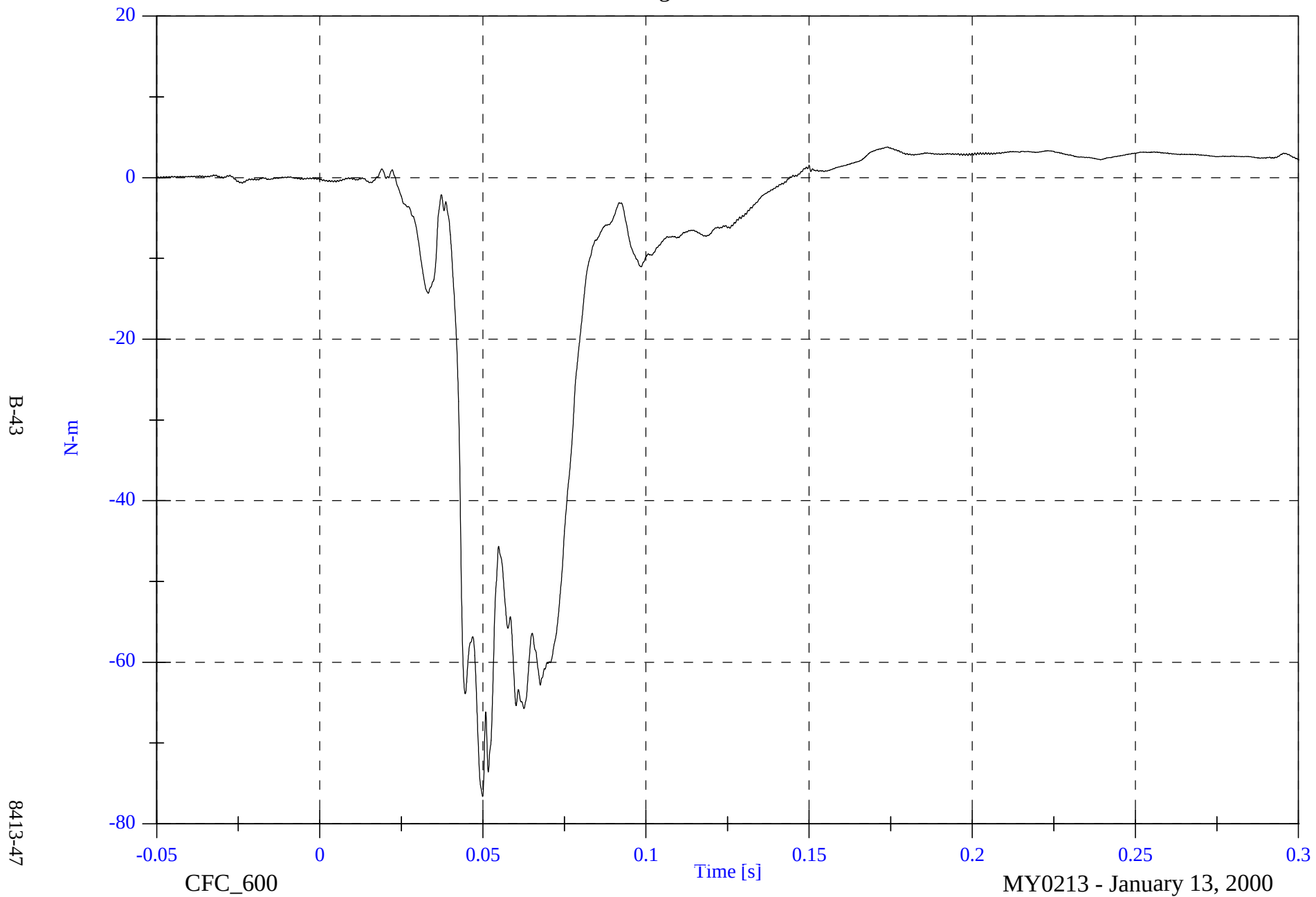


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Lower Tibia Mx

Max: 3.8 [N-m] at 0.174 [s]

Min: -76.6 [N-m] at 0.050 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

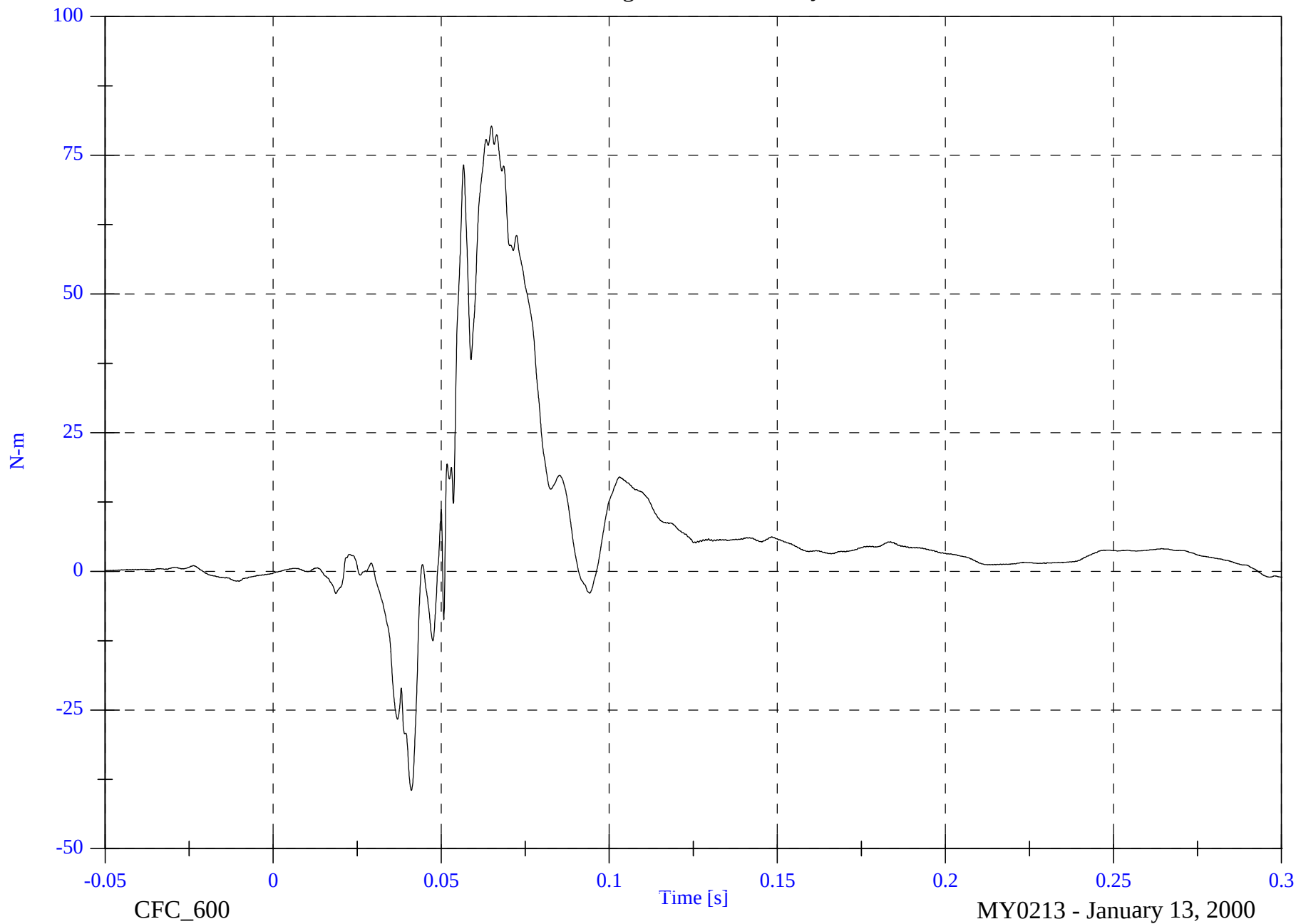
P1 Right Lower Tibia My

Max: 80.3 [N-m] at 0.065 [s]

Min: -39.5 [N-m] at 0.041 [s]

B-44

8413-47

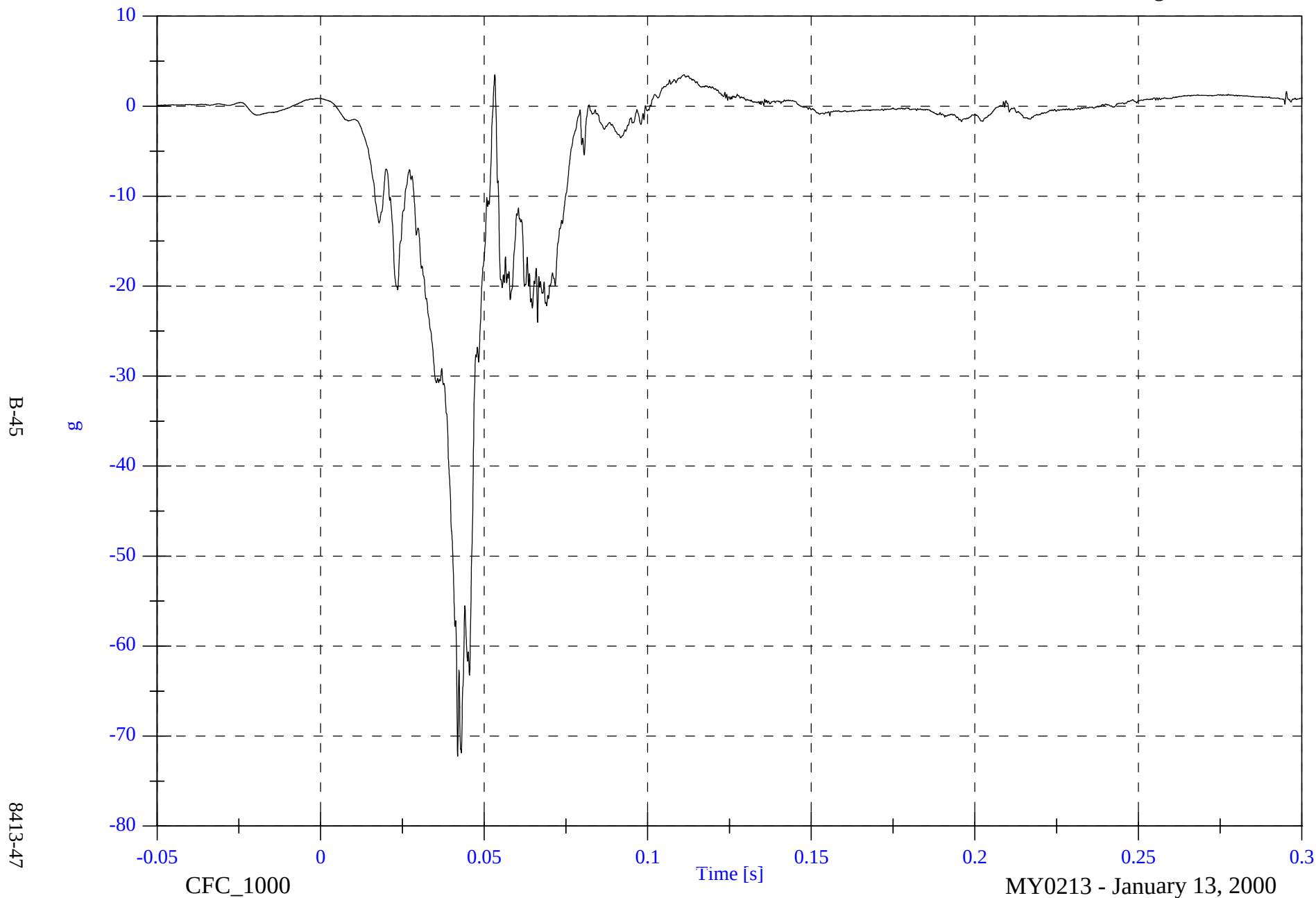


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Left Foot Aft x

Max: 3.5 [g] at 0.053 [s]

Min: -72.2 [g] at 0.042 [s]

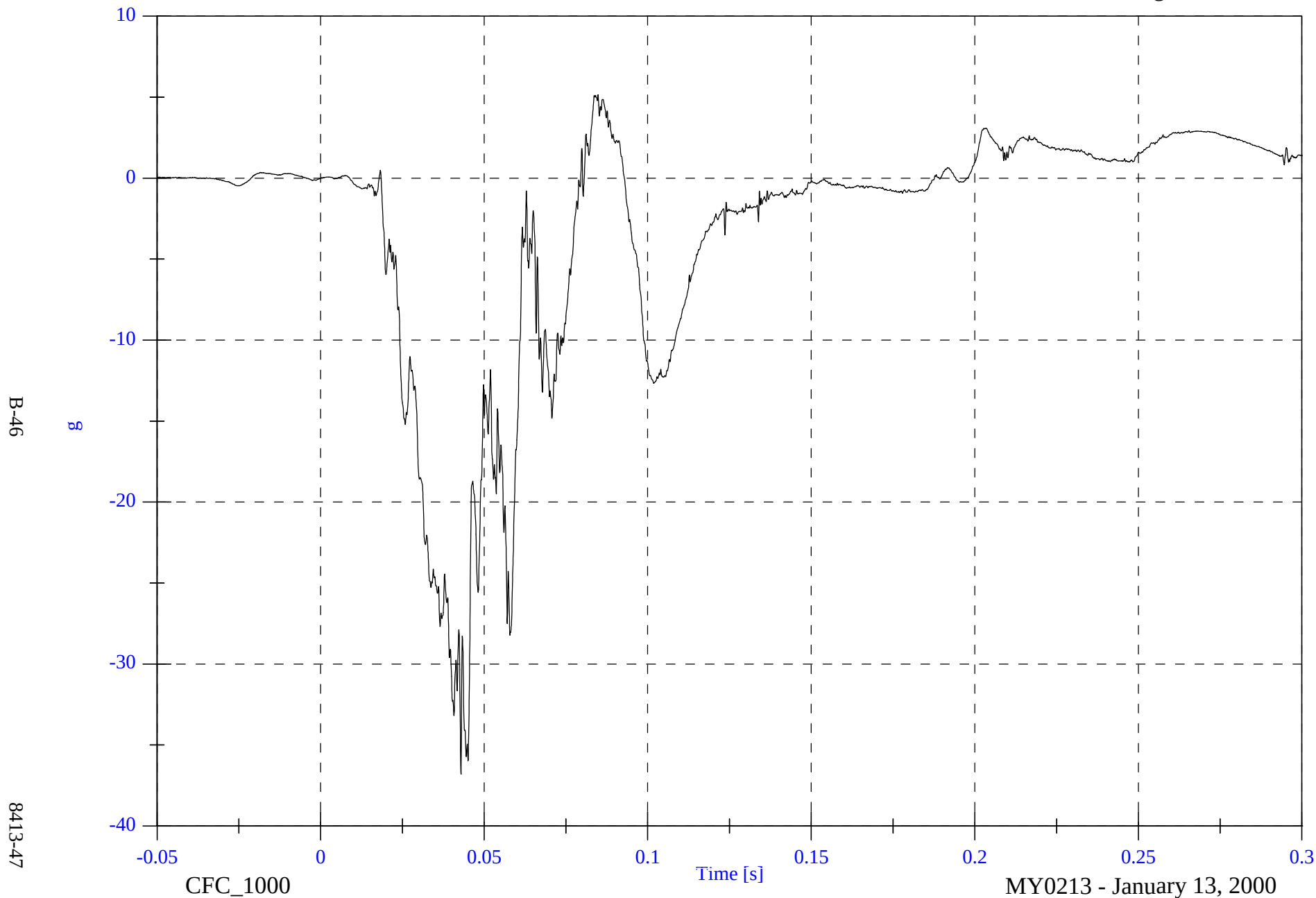


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Left Foot Aft z

Max: 5.2 [g] at 0.085 [s]

Min: -36.8 [g] at 0.043 [s]

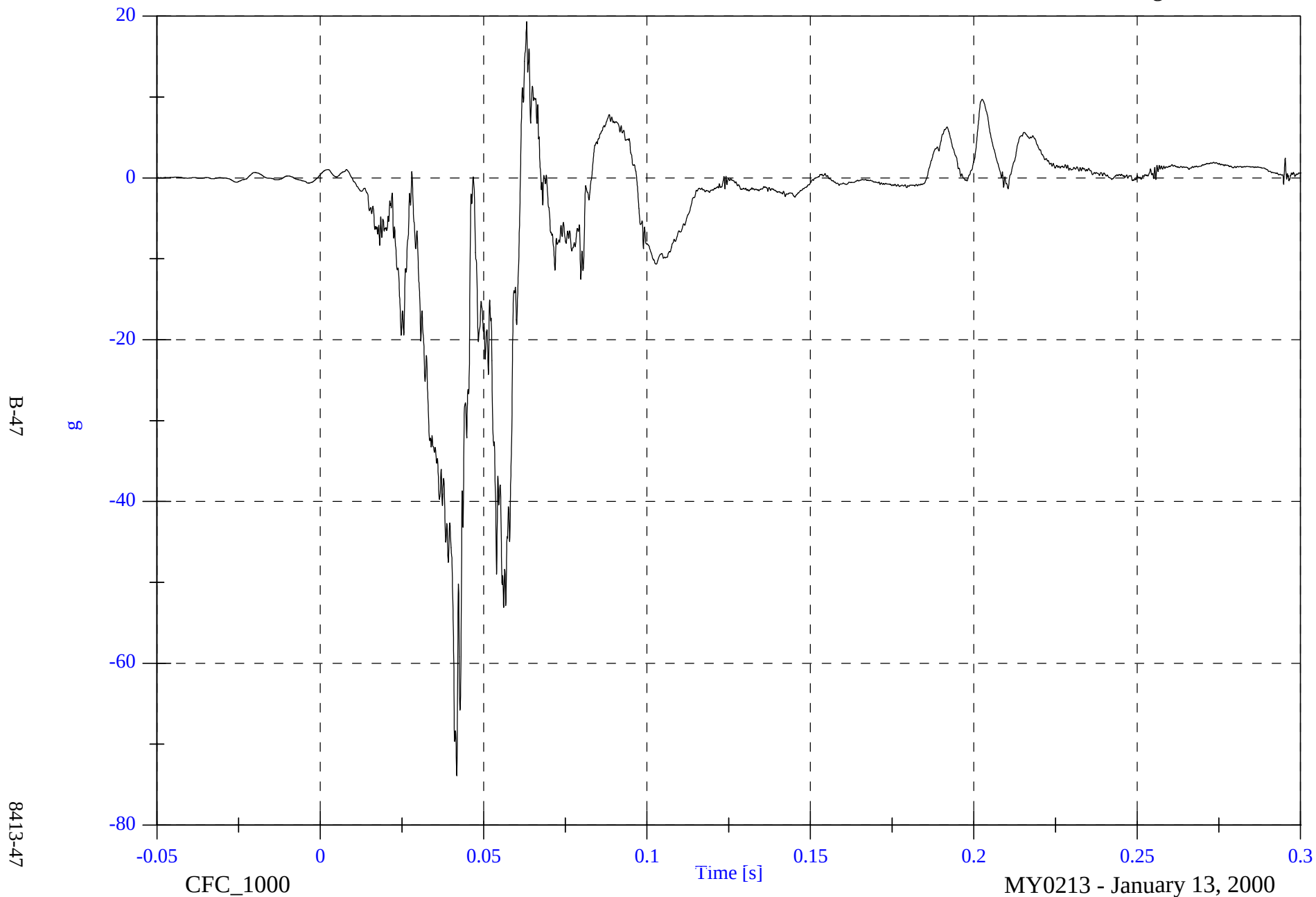


NCAP Test 8 - 2000 Mercury Villager Sport

P1 left Foot Fore z

Max: 19.3 [g] at 0.063 [s]

Min: -73.9 [g] at 0.042 [s]

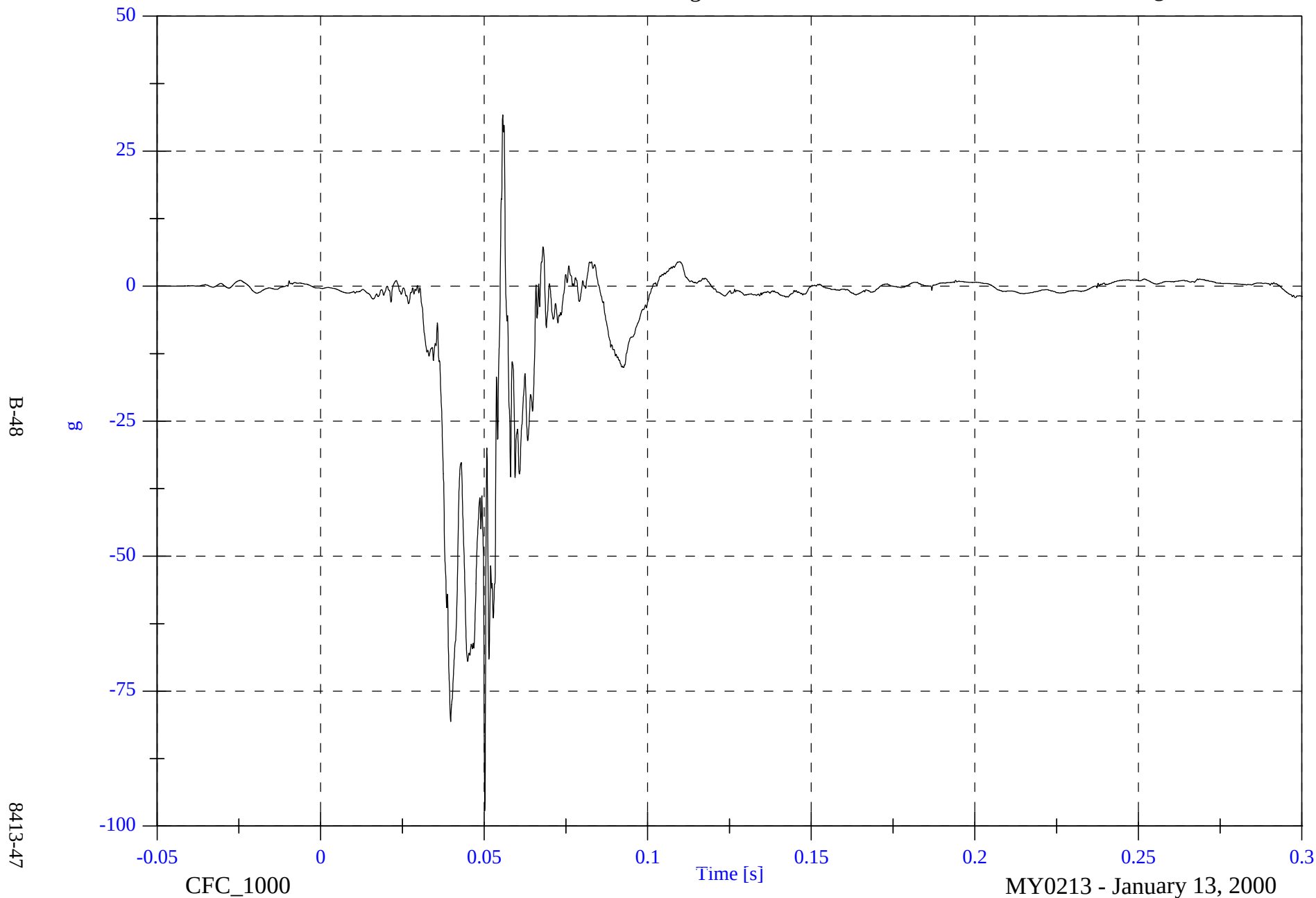


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Foot Aft x

Max: 31.7 [g] at 0.056 [s]

Min: -97.2 [g] at 0.050 [s]

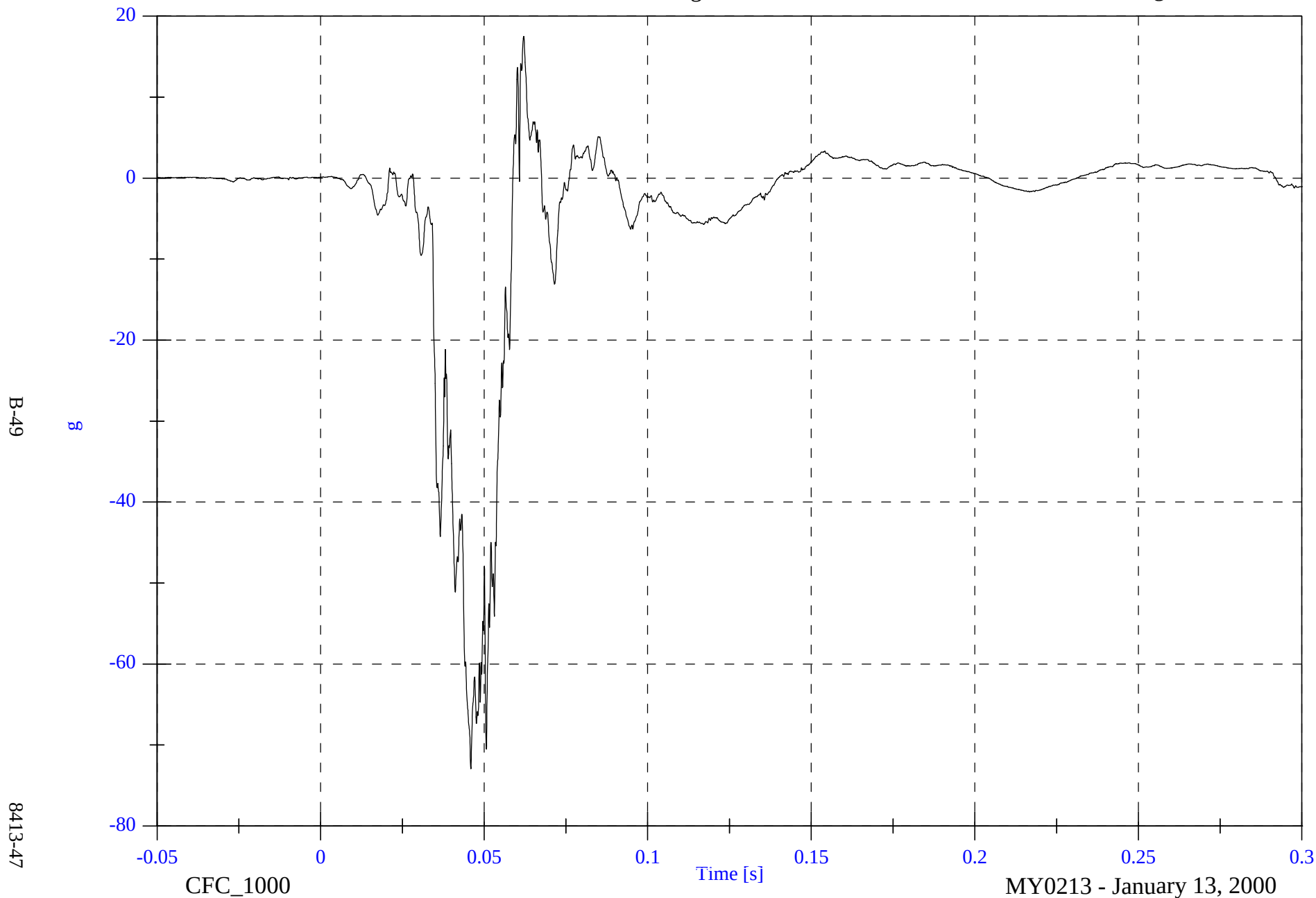


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Foot Aft z

Max: 17.5 [g] at 0.062 [s]

Min: -72.9 [g] at 0.046 [s]

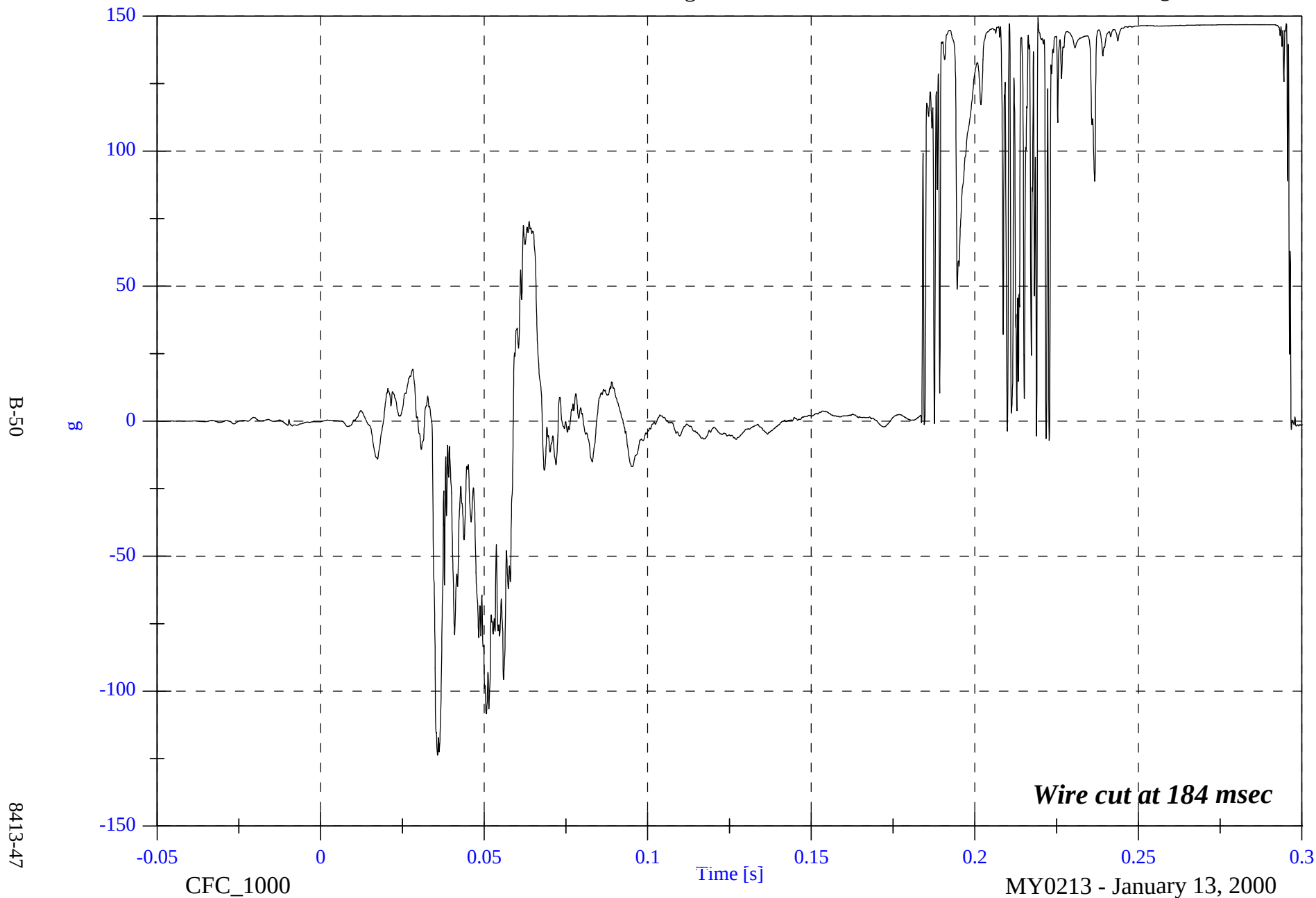


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Right Foot Fore z

Max: 149.6 [g] at 0.219 [s]

Min: -123.8 [g] at 0.036 [s]

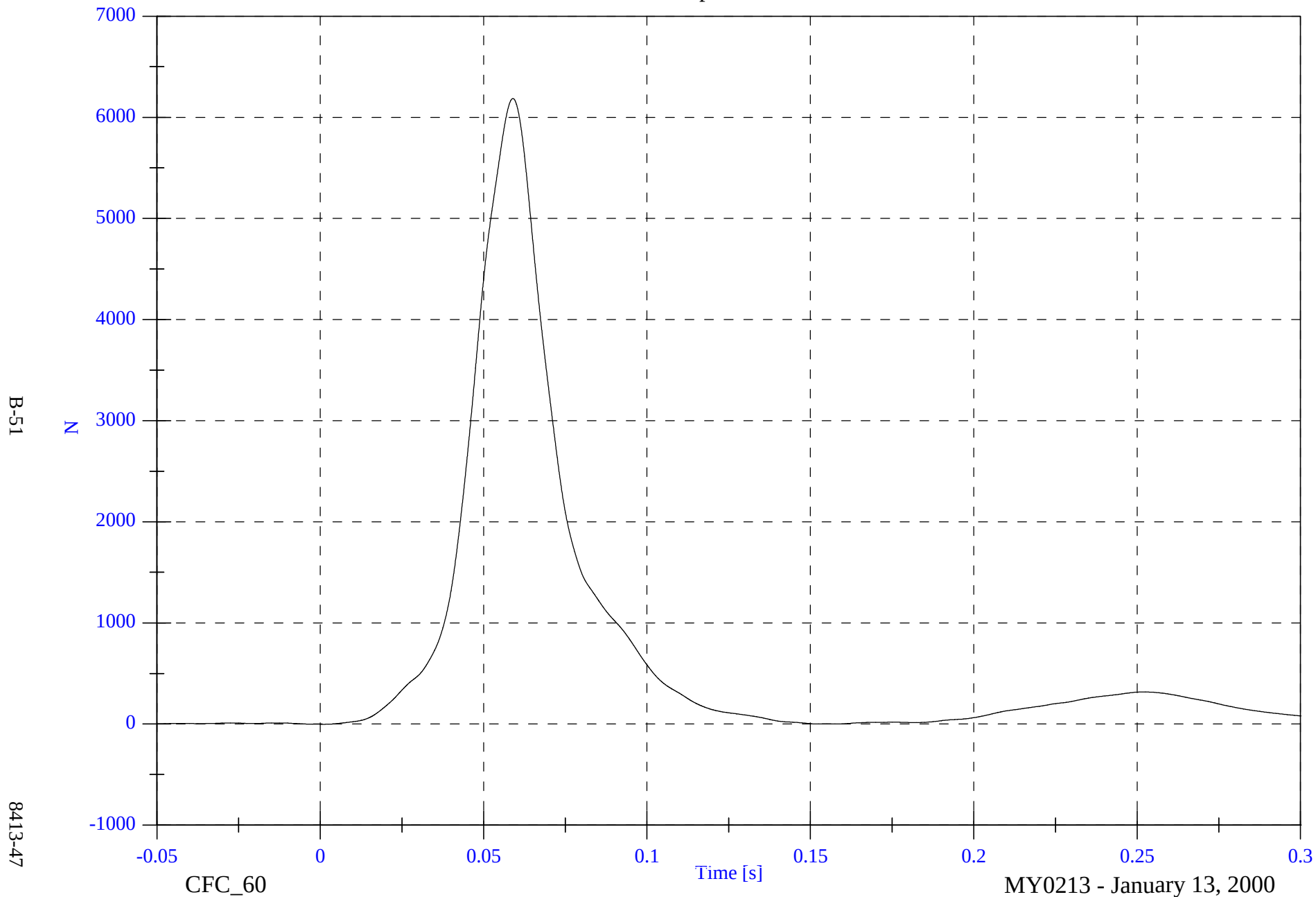


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Lap Belt Force

Max: 6186.0 [N] at 0.059 [s]

Min: -3.3 [N] at 0.001 [s]

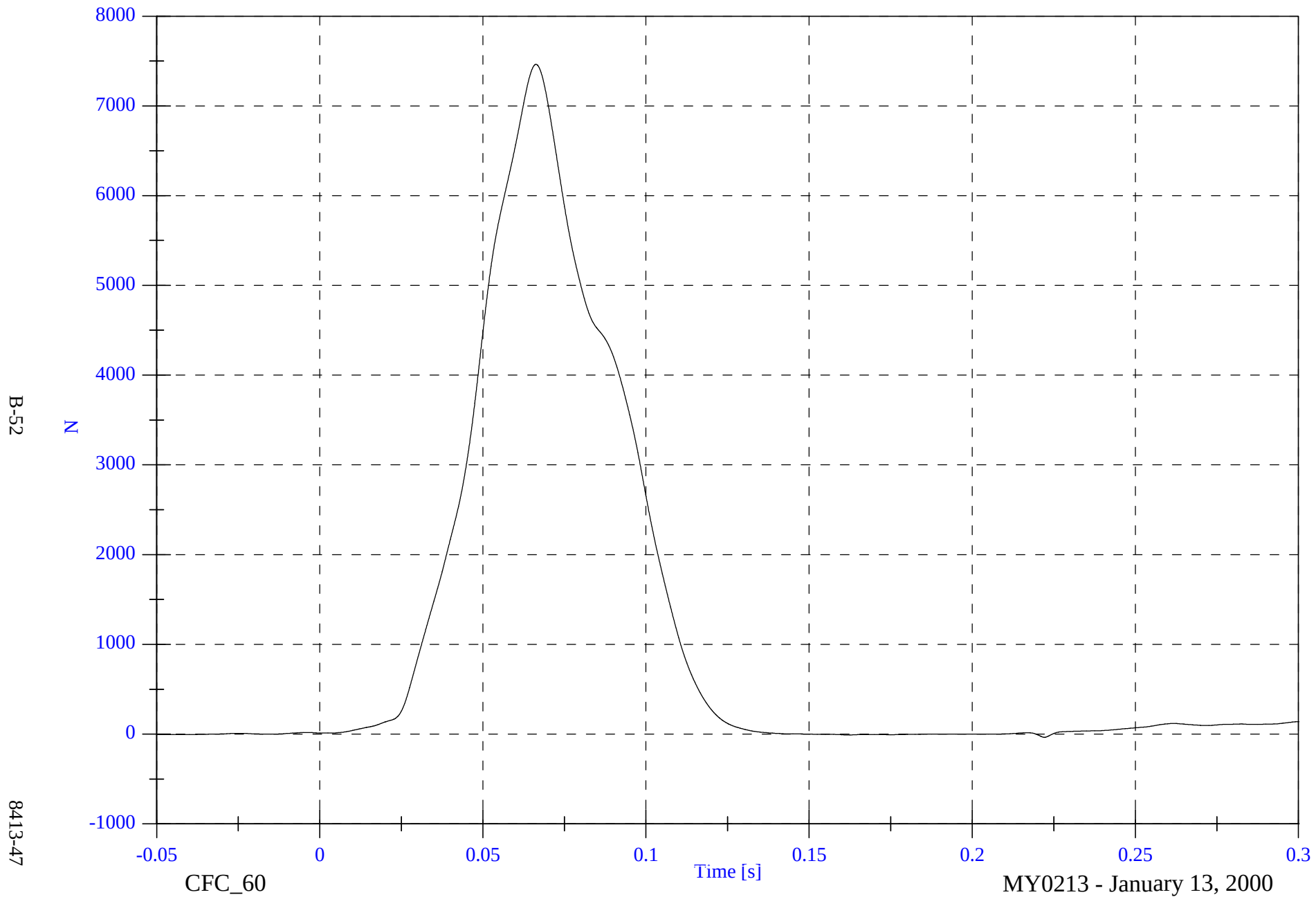


NCAP Test 8 - 2000 Mercury Villager Sport

P1 Shoulder Belt Force

Max: 7463.1 [N] at 0.066 [s]

Min: -36.2 [N] at 0.222 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

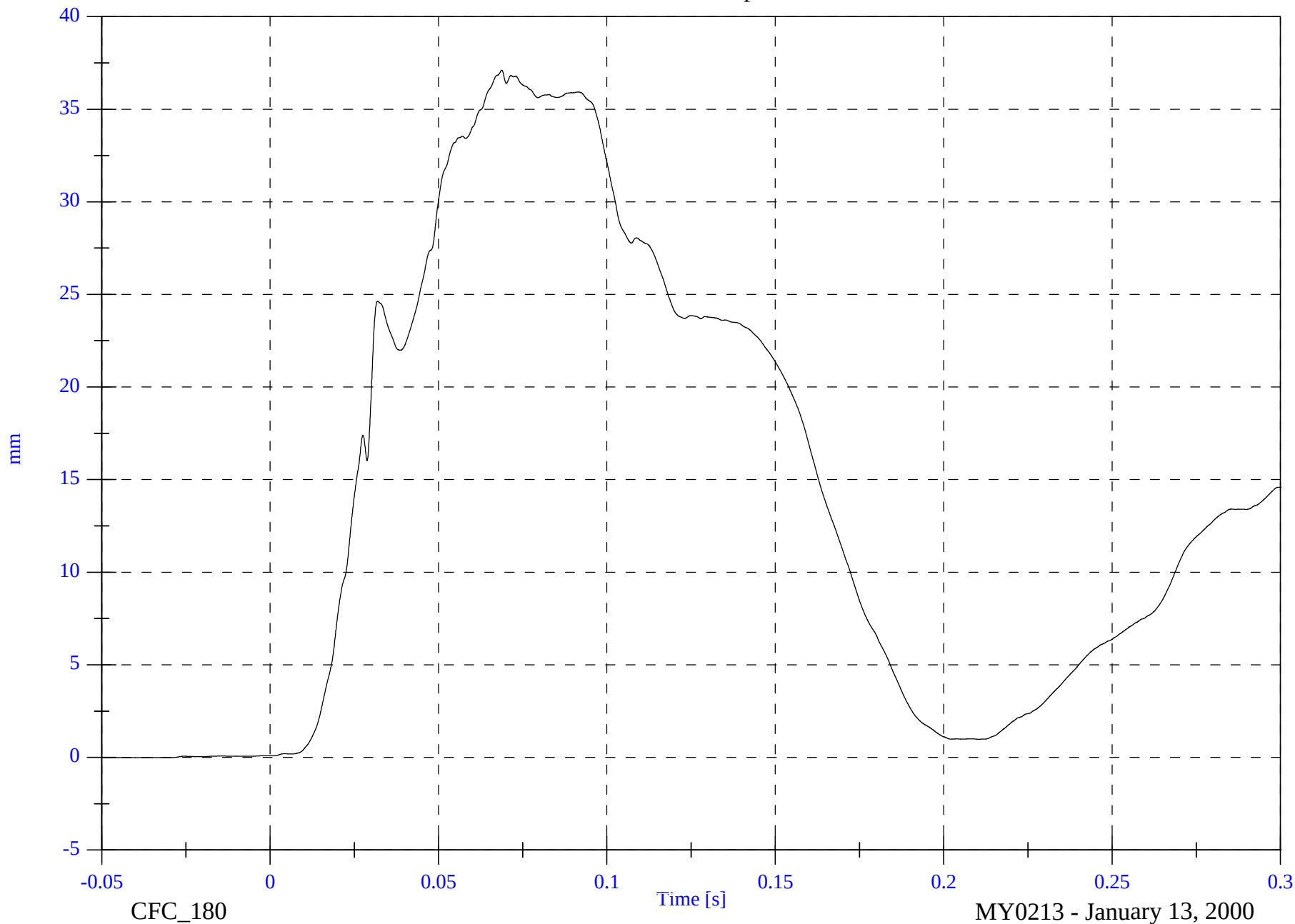
P1 Shoulder Belt Spool-Off

Max: 37.1 [mm] at 0.069 [s]

Min: -0.0 [mm] at -0.049 [s]

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8413-47



NCAP Test 8 - 2000 Mercury Villager Sport

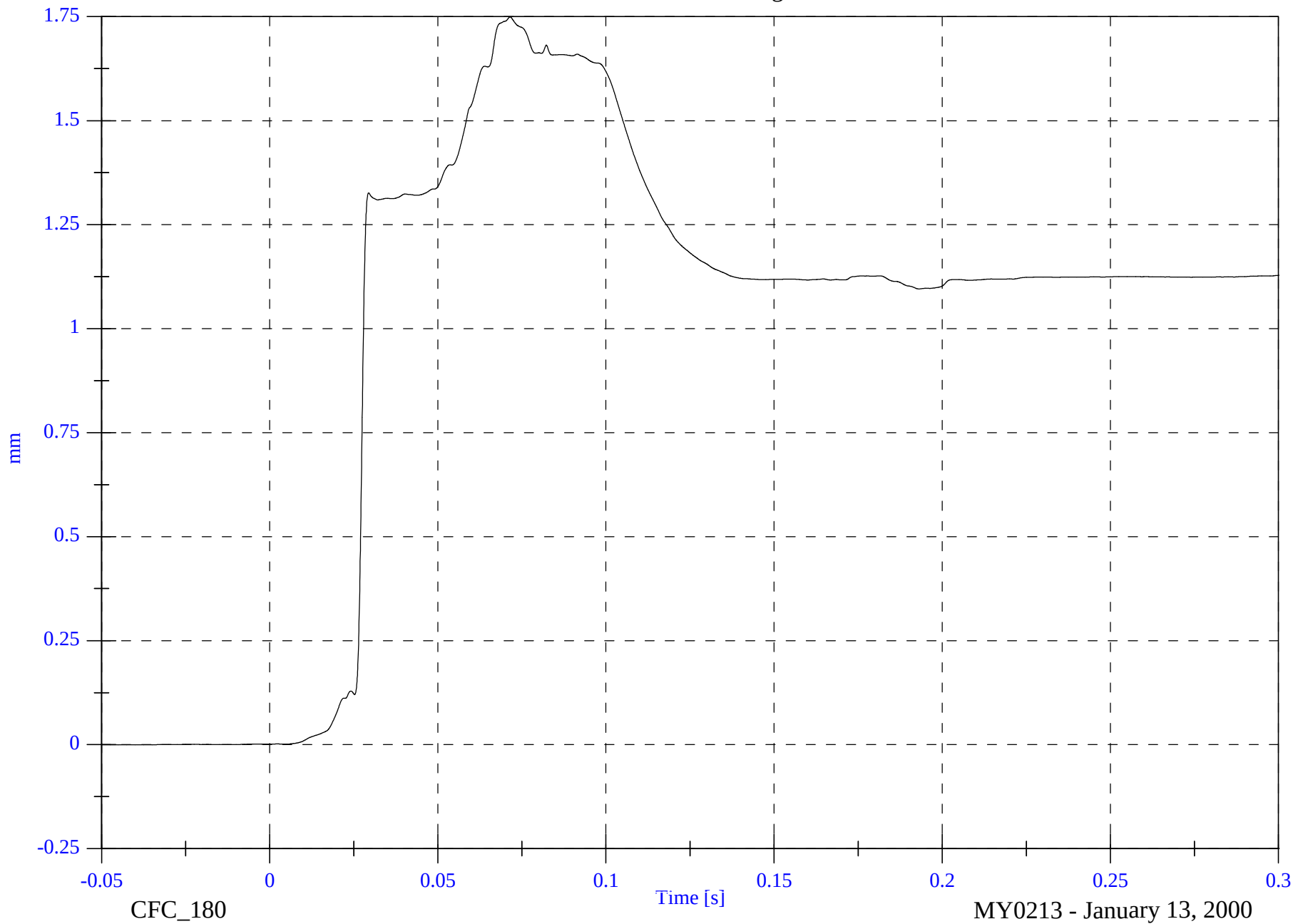
P1 Shoulder Belt Elongation

Max: 1.7 [mm] at 0.072 [s]

Min: -0.0 [mm] at -0.035 [s]

B-54

8413-47

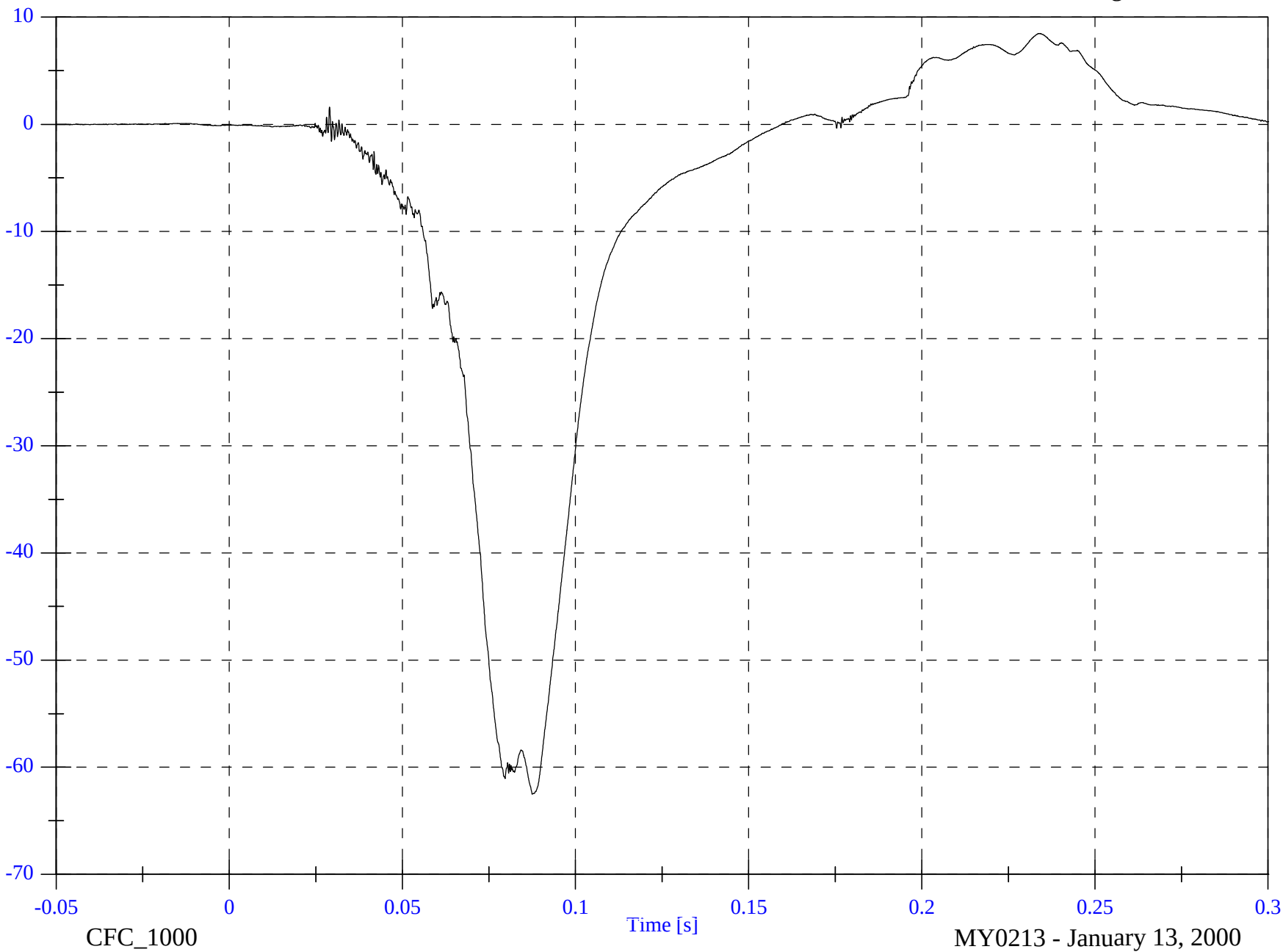


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Head x

Max: 8.5 [g] at 0.234 [s]

Min: -62.5 [g] at 0.088 [s]



B-55

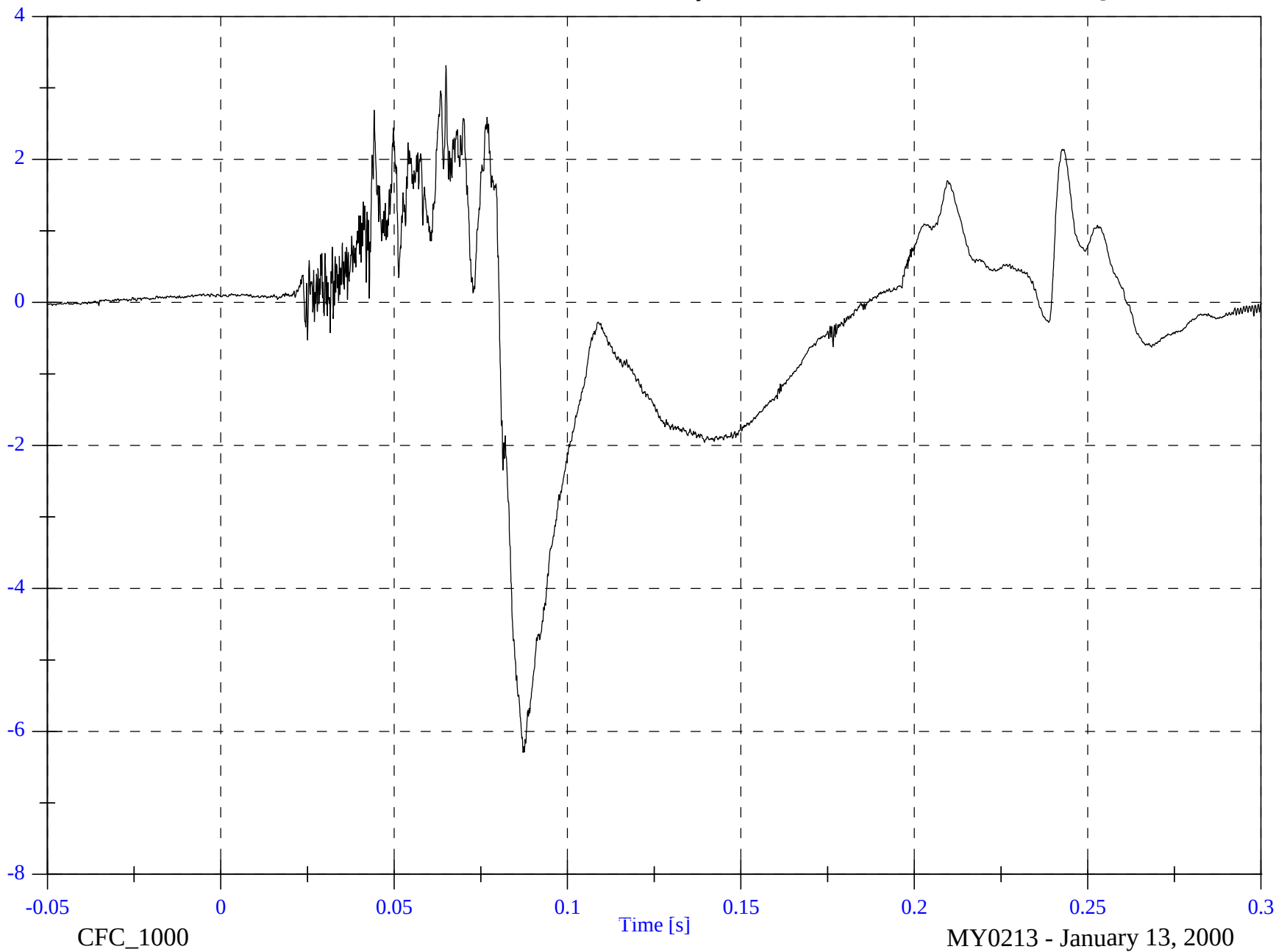
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

P2 Head y

Max: 3.3 [g] at 0.065 [s]

Min: -6.3 [g] at 0.087 [s]



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NCAP Test 8 - 2000 Mercury Villager Sport

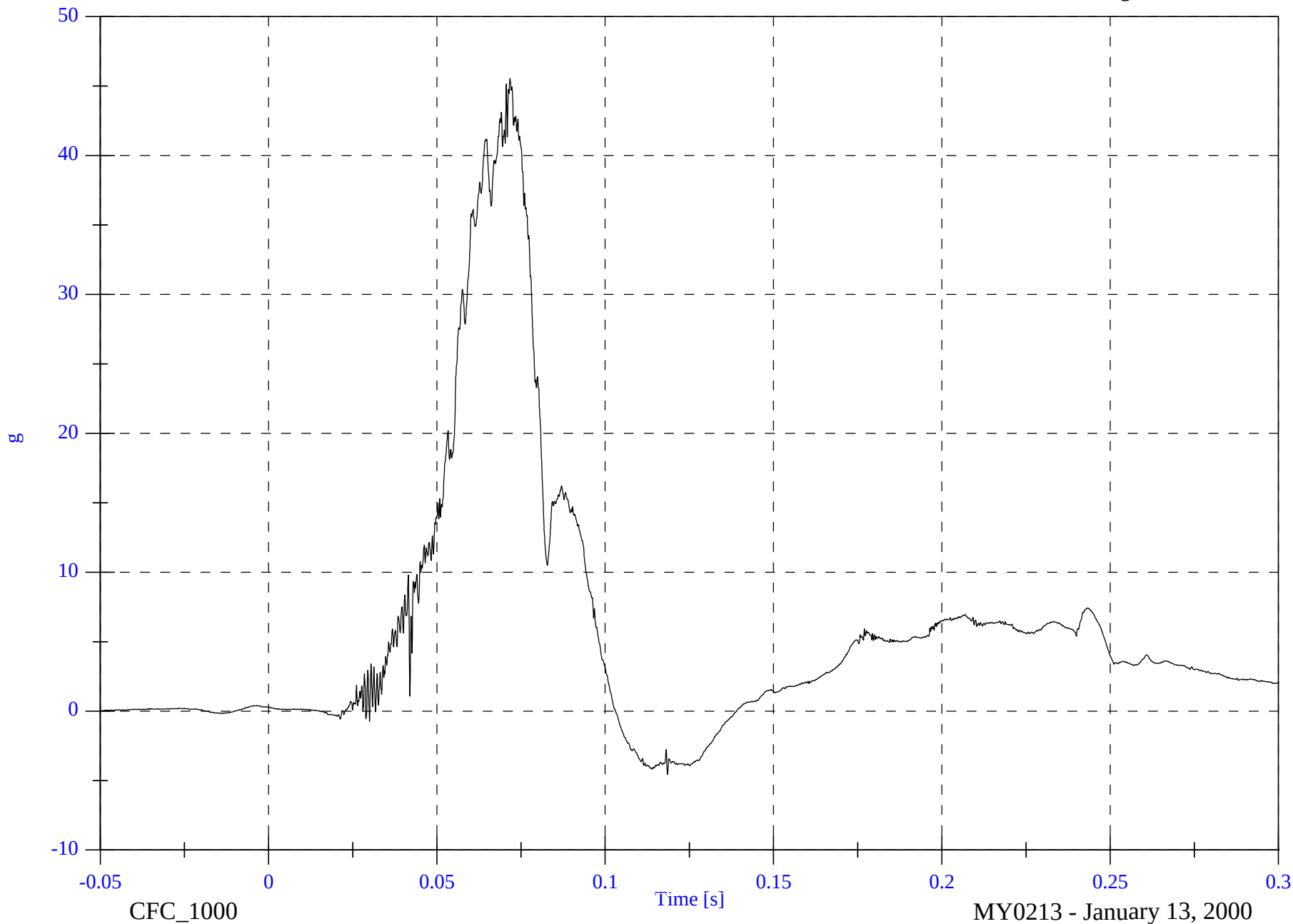
P2 Head z

Max: 45.5 [g] at 0.072 [s]

Min: -4.6 [g] at 0.119 [s]

B-57

8413-47



NCAP Test 8 - 2000 Mercury Villager Sport

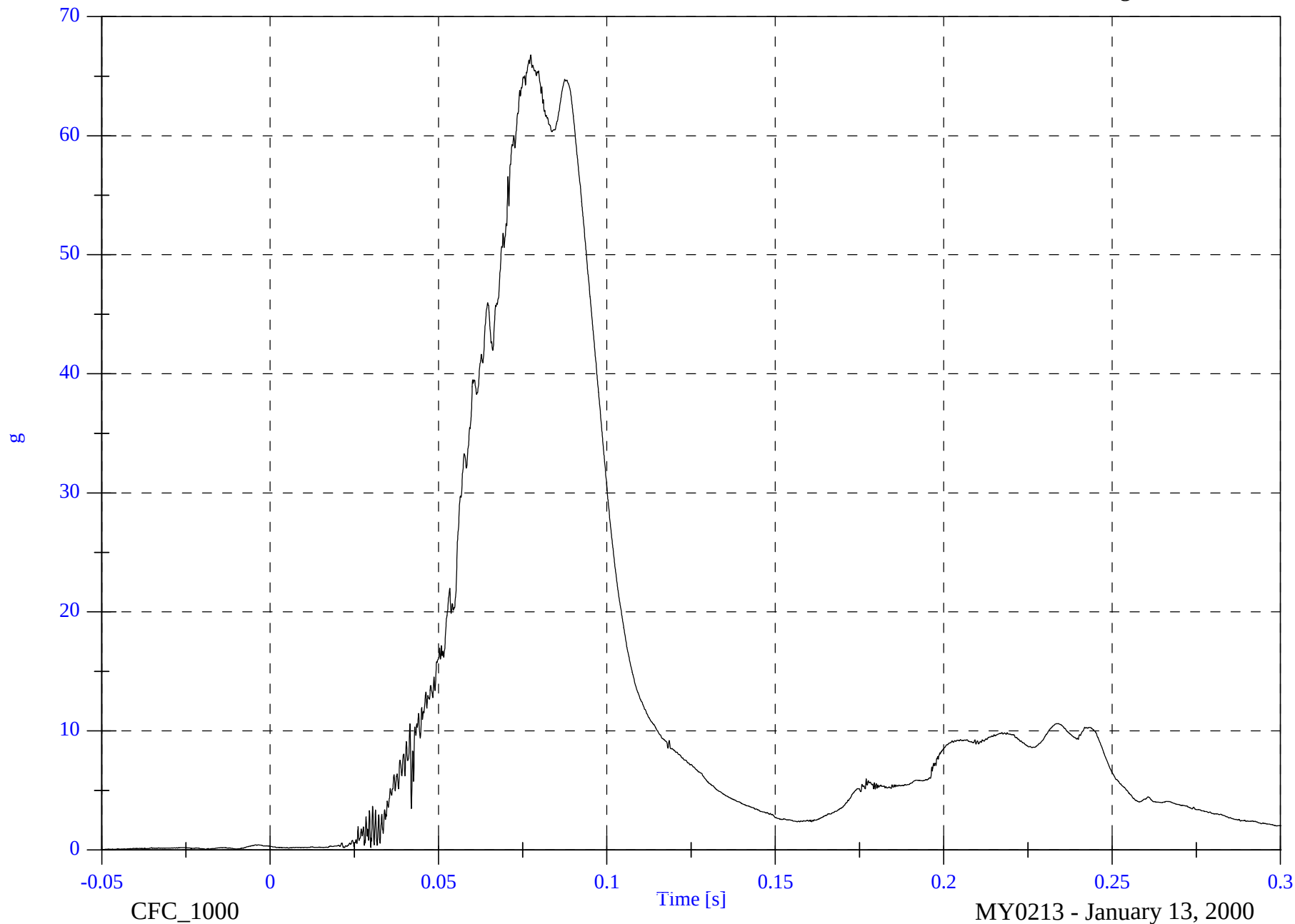
P2 Head Resultant

Max: 66.8 [g] at 0.077 [s]

Min: 0.0 [g] at -0.049 [s]

B-58

8413-47



NCAP Test 8 - 2000 Mercury Villager Sport

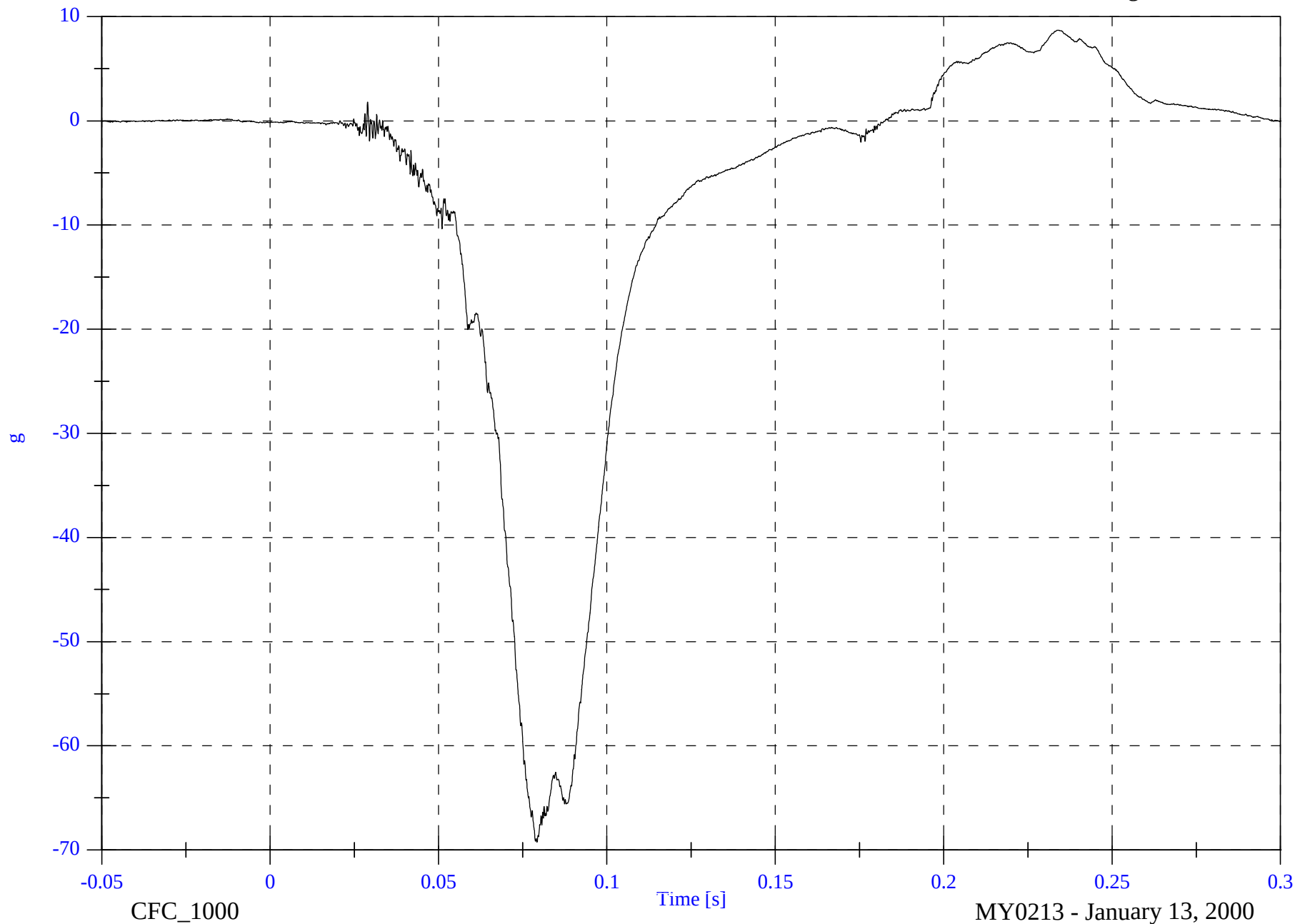
P2 Head Red x

Max: 8.7 [g] at 0.234 [s]

Min: -69.3 [g] at 0.079 [s]

B-59

8413-47

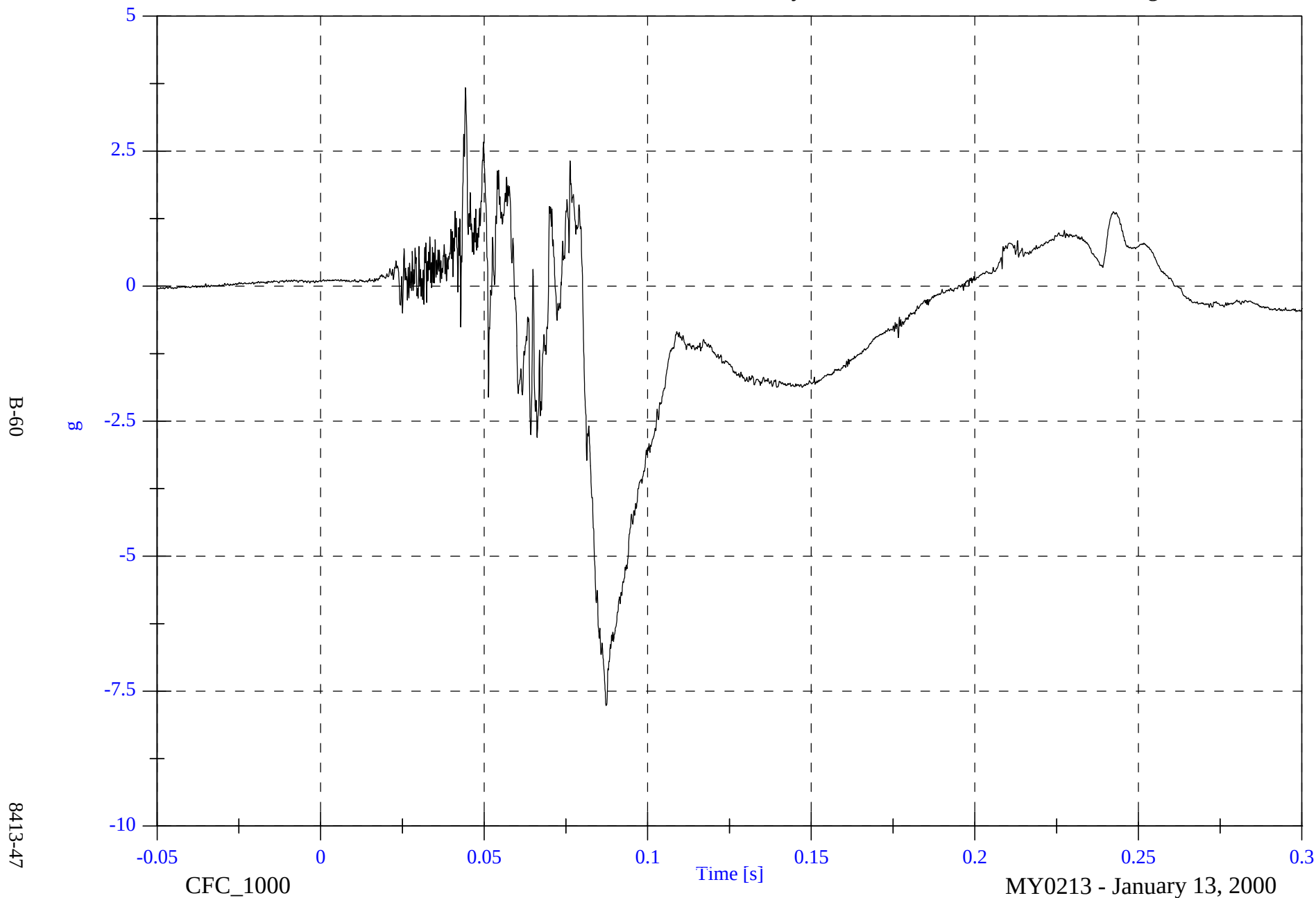


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Head Red y

Max: 3.7 [g] at 0.044 [s]

Min: -7.8 [g] at 0.087 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

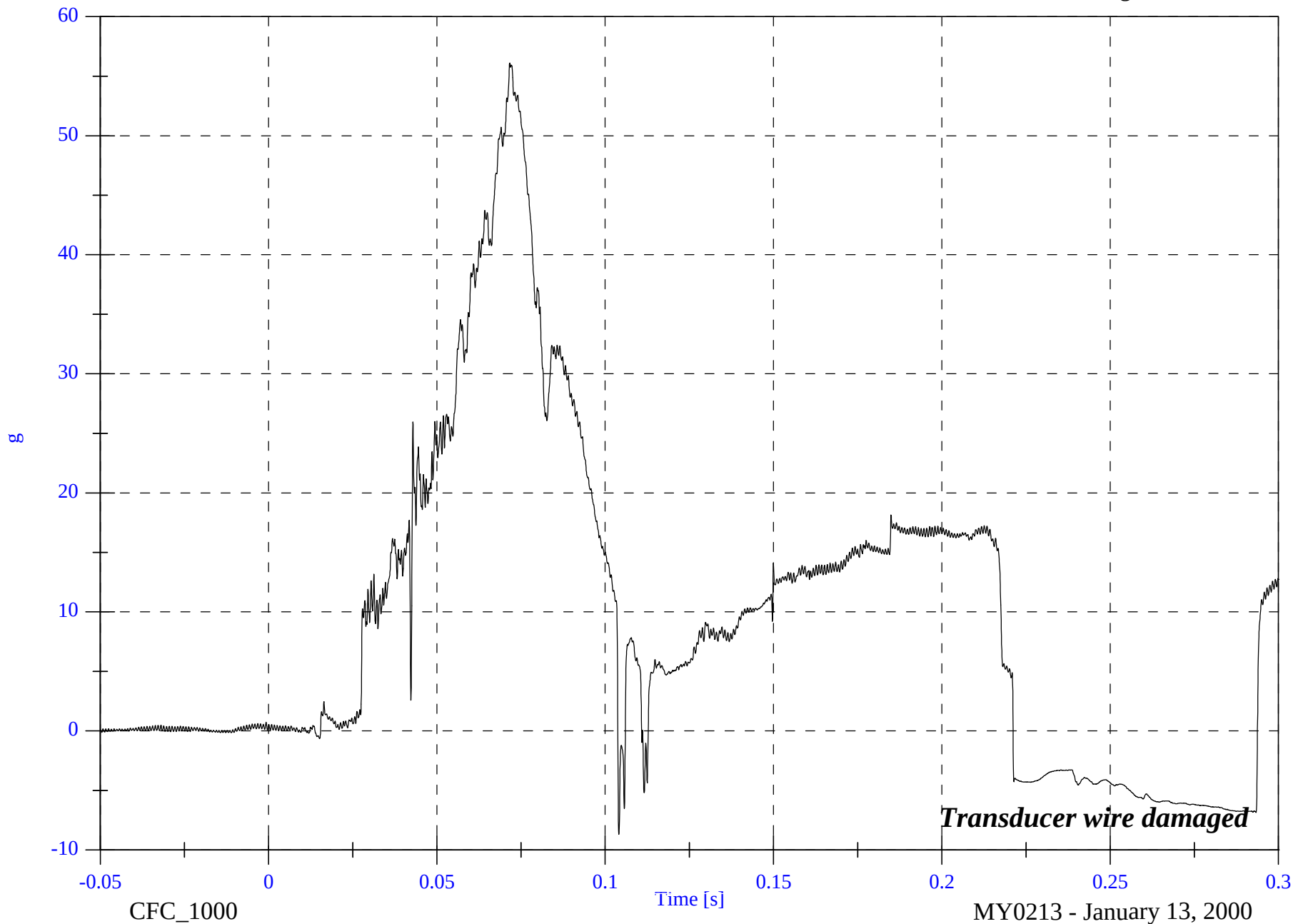
P2 Head Red z

Max: 56.1 [g] at 0.072 [s]

Min: -8.7 [g] at 0.104 [s]

B-61

8413-47

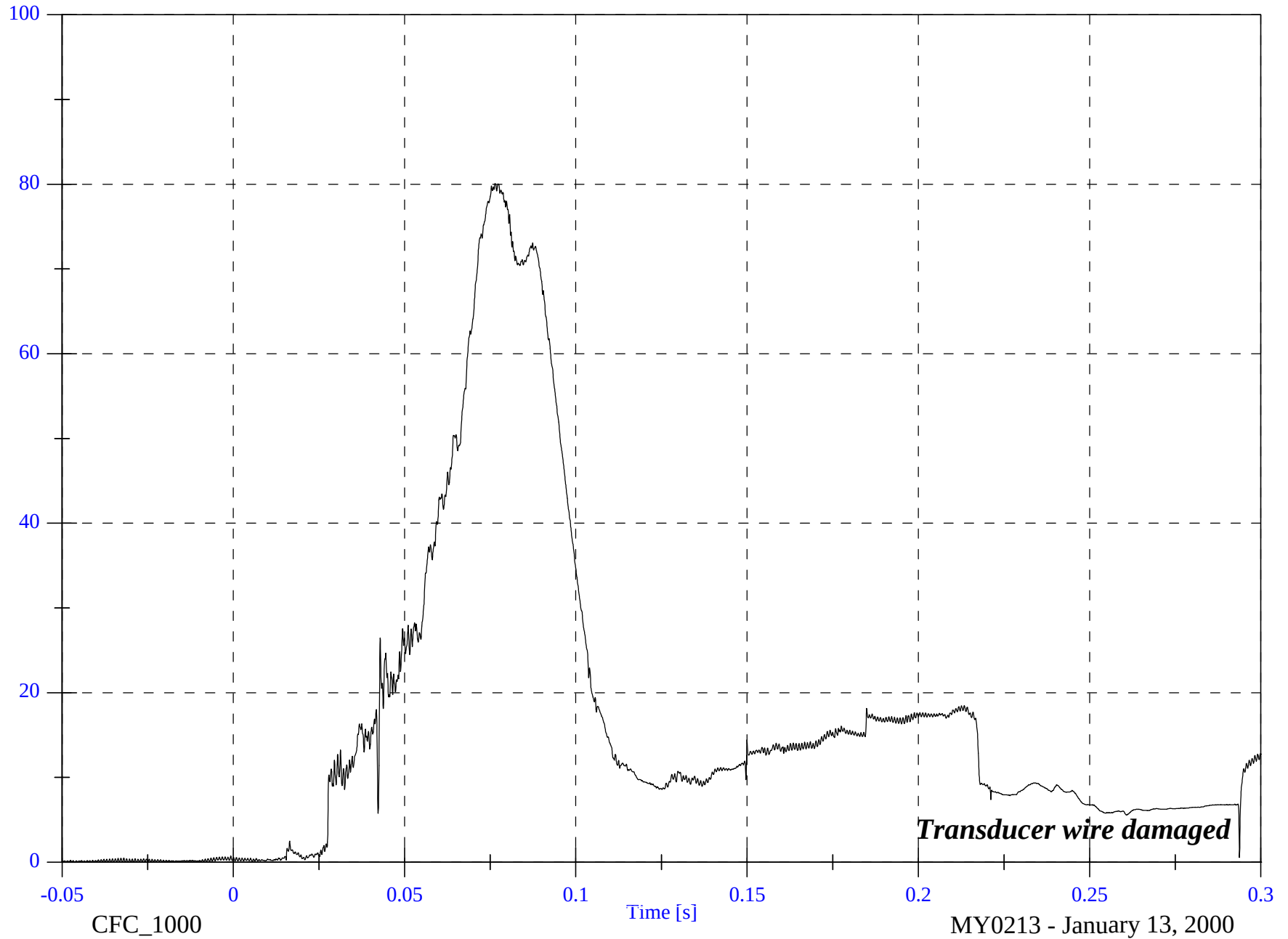


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Head Red Resultant

Max: 80.1 [g] at 0.076 [s]

Min: 0.0 [g] at -0.031 [s]



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8413-47

CFC_1000

Time [s]

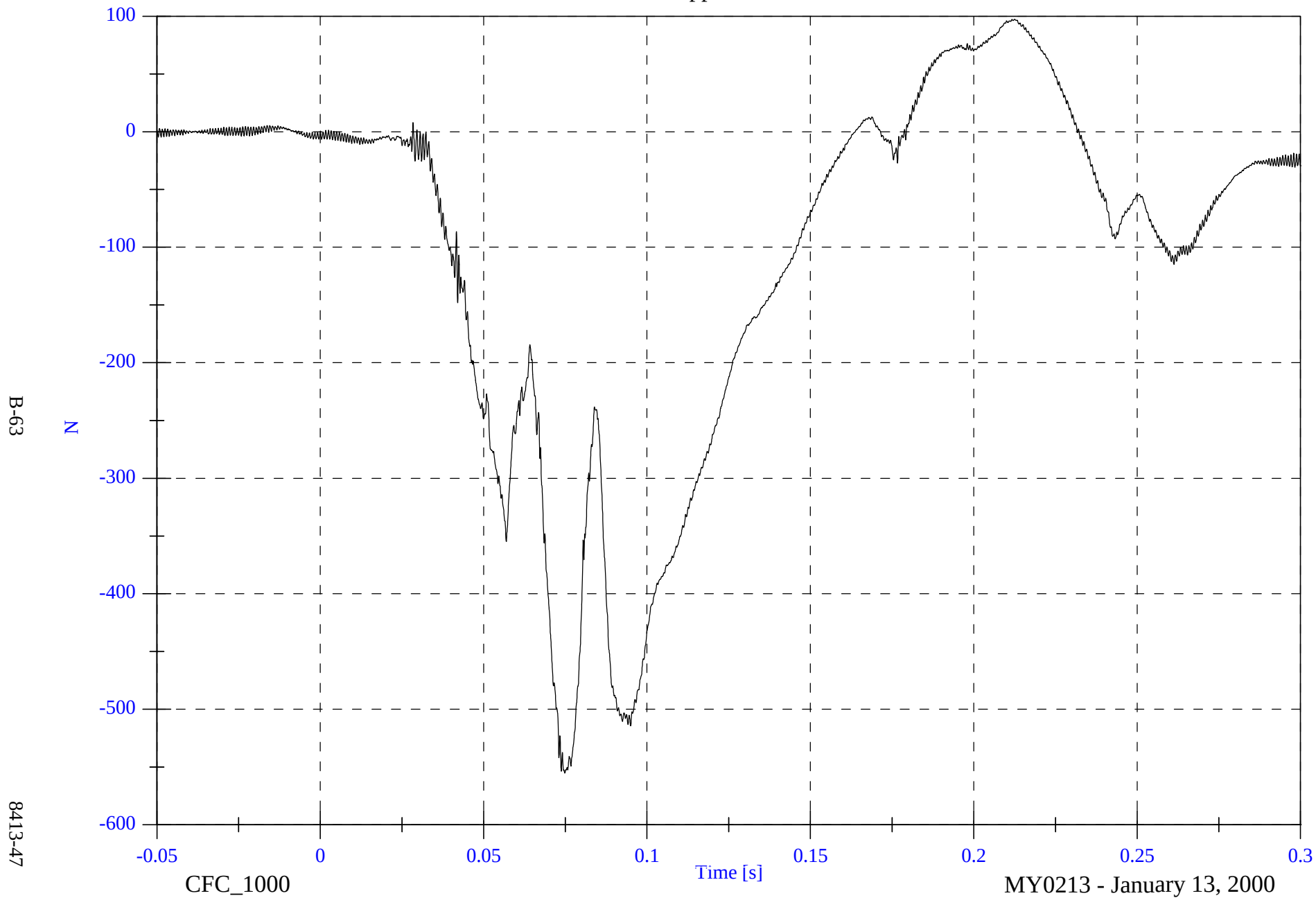
MY0213 - January 13, 2000

NCAP Test 8 - 2000 Mercury Villager Sport

P2 Upper Neck Fx

Max: 97.3 [N] at 0.212 [s]

Min: -555.3 [N] at 0.075 [s]

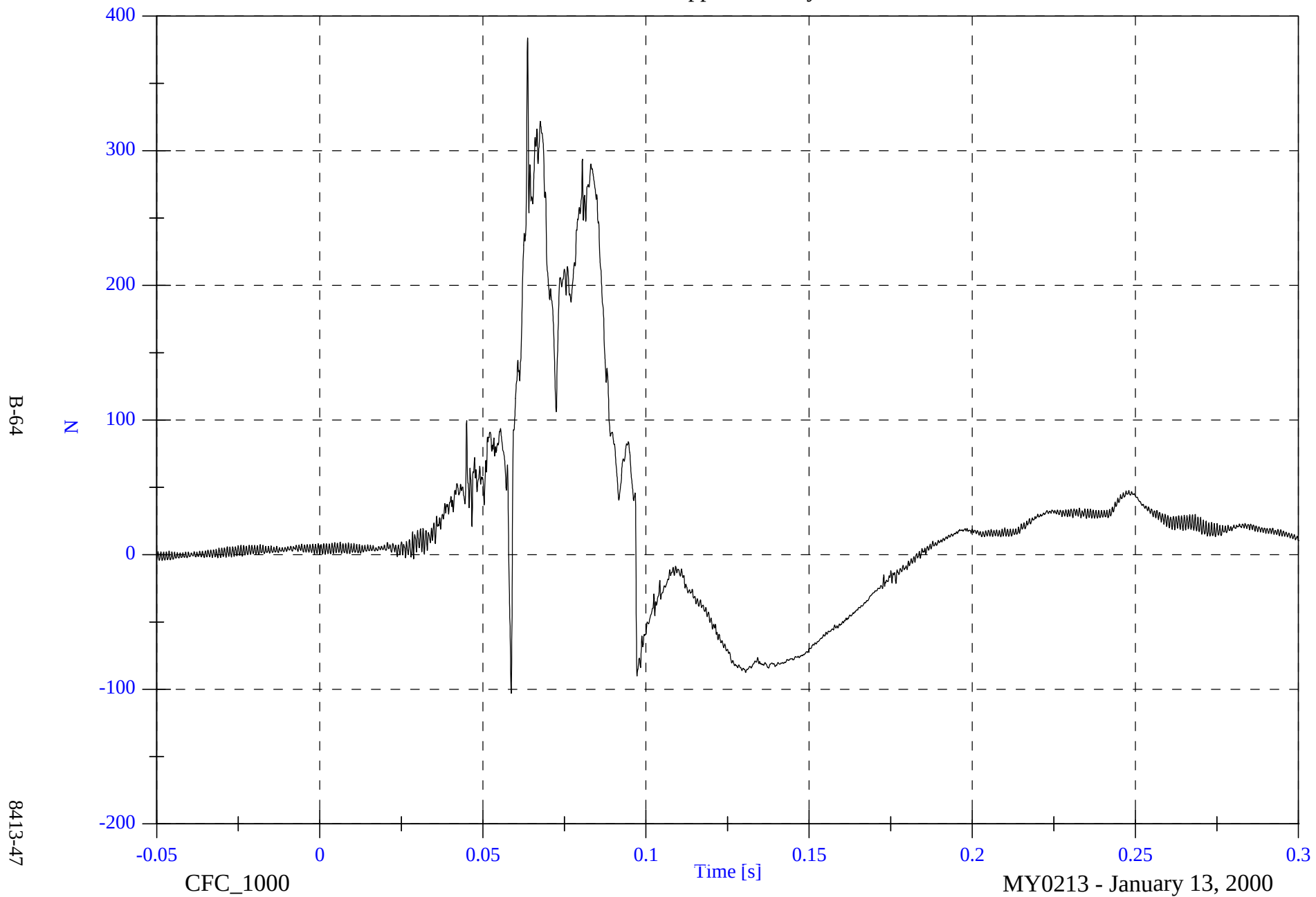


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Upper Neck Fy

Max: 383.8 [N] at 0.064 [s]

Min: -103.0 [N] at 0.059 [s]

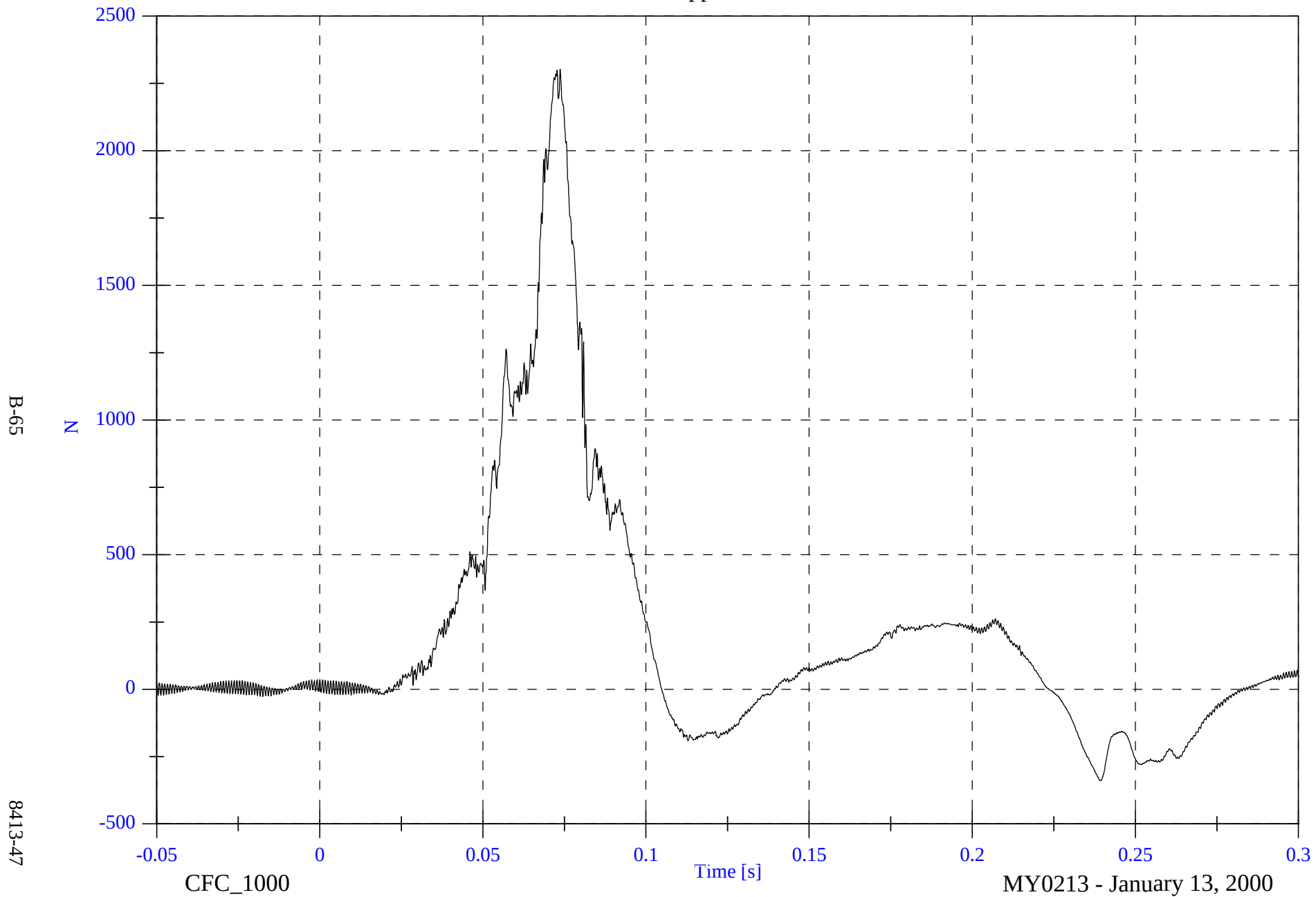


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Upper Neck Fz

Max: 2302.7 [N] at 0.074 [s]

Min: -339.2 [N] at 0.239 [s]

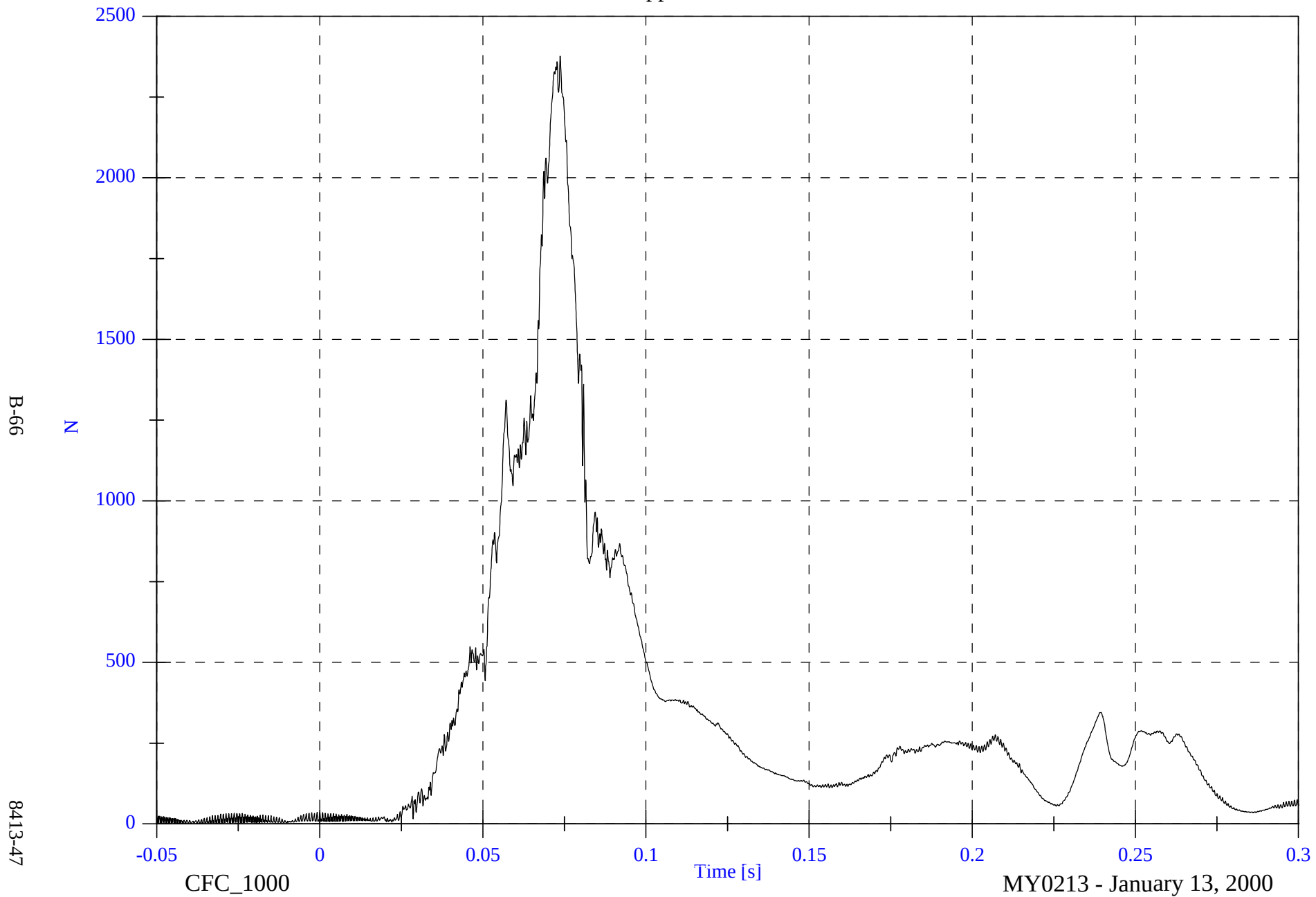


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Upper Neck F Resultant

Max: 2376.5 [N] at 0.074 [s]

Min: 0.9 [N] at -0.044 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

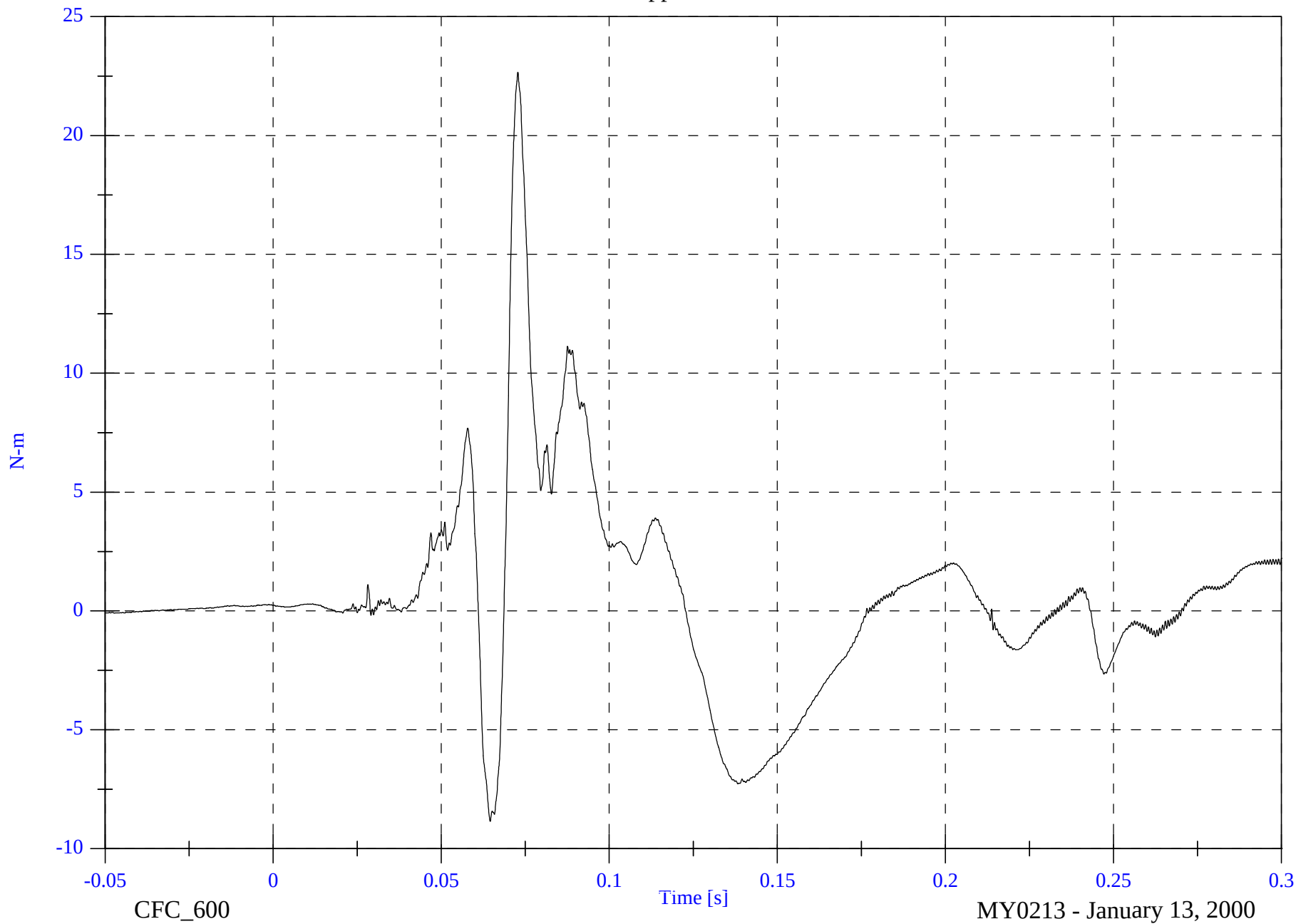
P2 Upper Neck Mx

Max: 22.7 [N-m] at 0.073 [s]

Min: -8.9 [N-m] at 0.065 [s]

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8413-47



NCAP Test 8 - 2000 Mercury Villager Sport

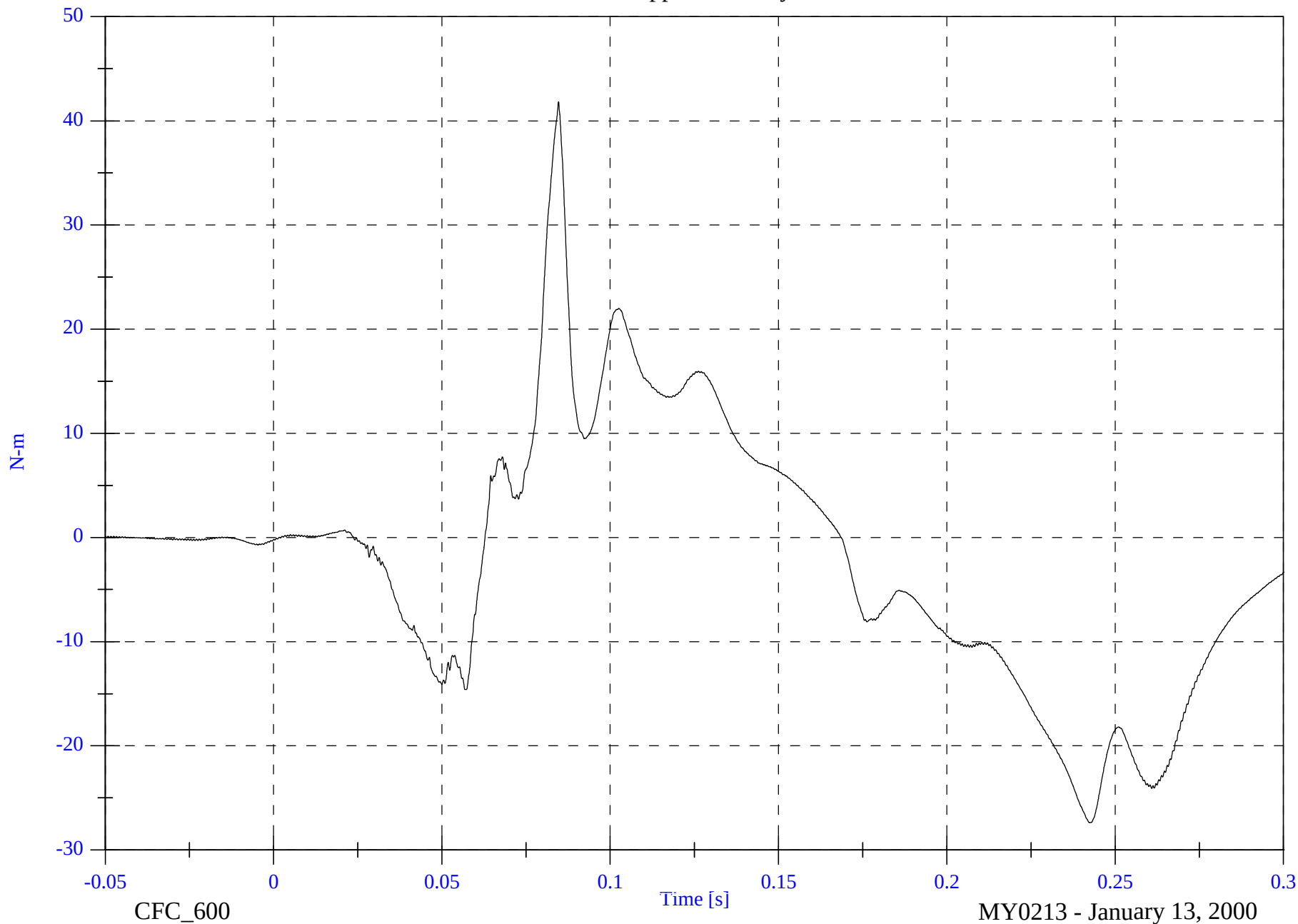
P2 Upper Neck My

Max: 41.8 [N-m] at 0.085 [s]

Min: -27.4 [N-m] at 0.242 [s]

B-68

8413-47

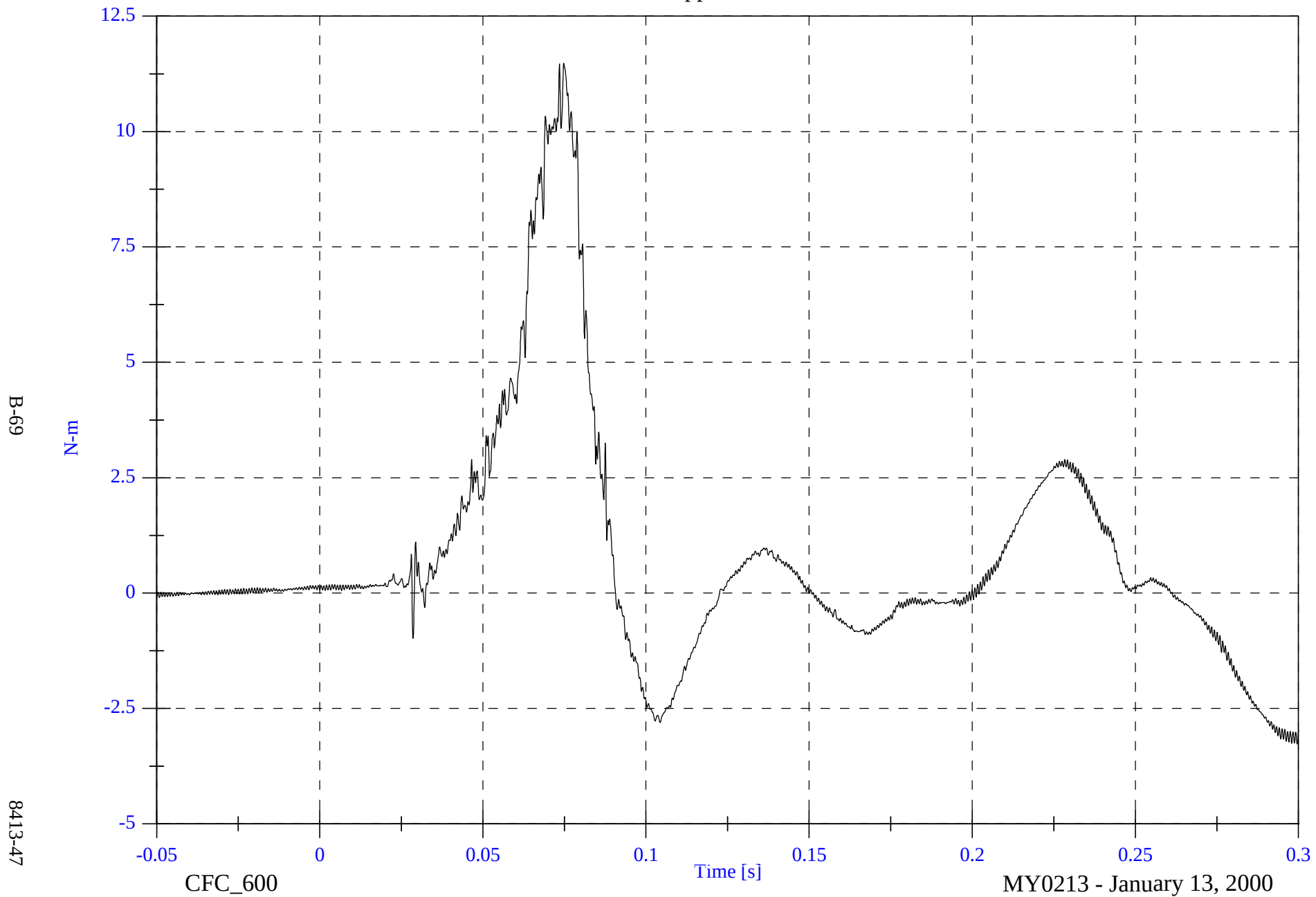


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Upper Neck Mz

Max: 11.5 [N-m] at 0.075 [s]

Min: -3.3 [N-m] at 0.300 [s]

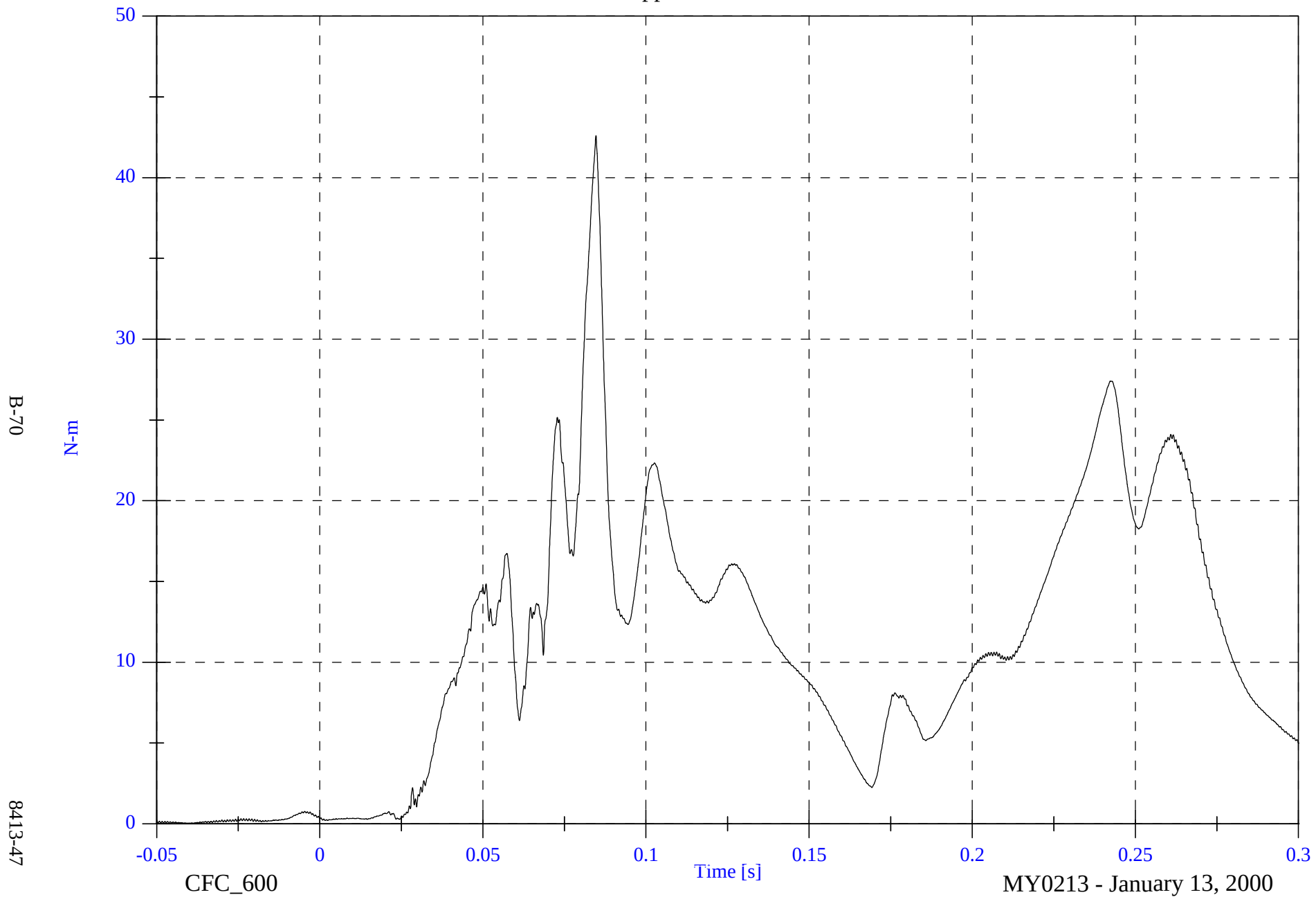


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Upper Neck M Resultant

Max: 42.6 [N-m] at 0.085 [s]

Min: 0.0 [N-m] at -0.040 [s]

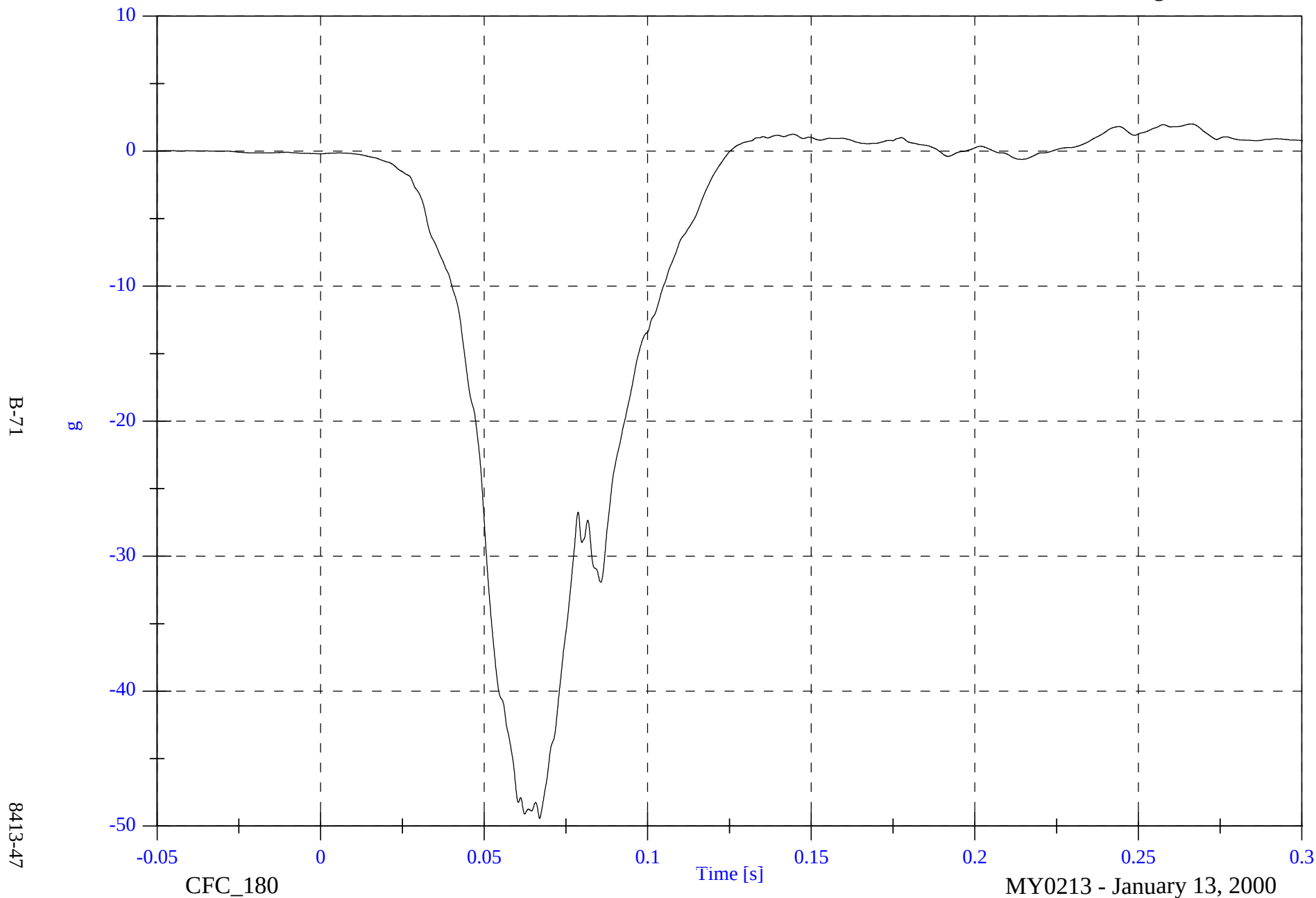


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest x

Max: 2.0 [g] at 0.266 [s]

Min: -49.4 [g] at 0.067 [s]

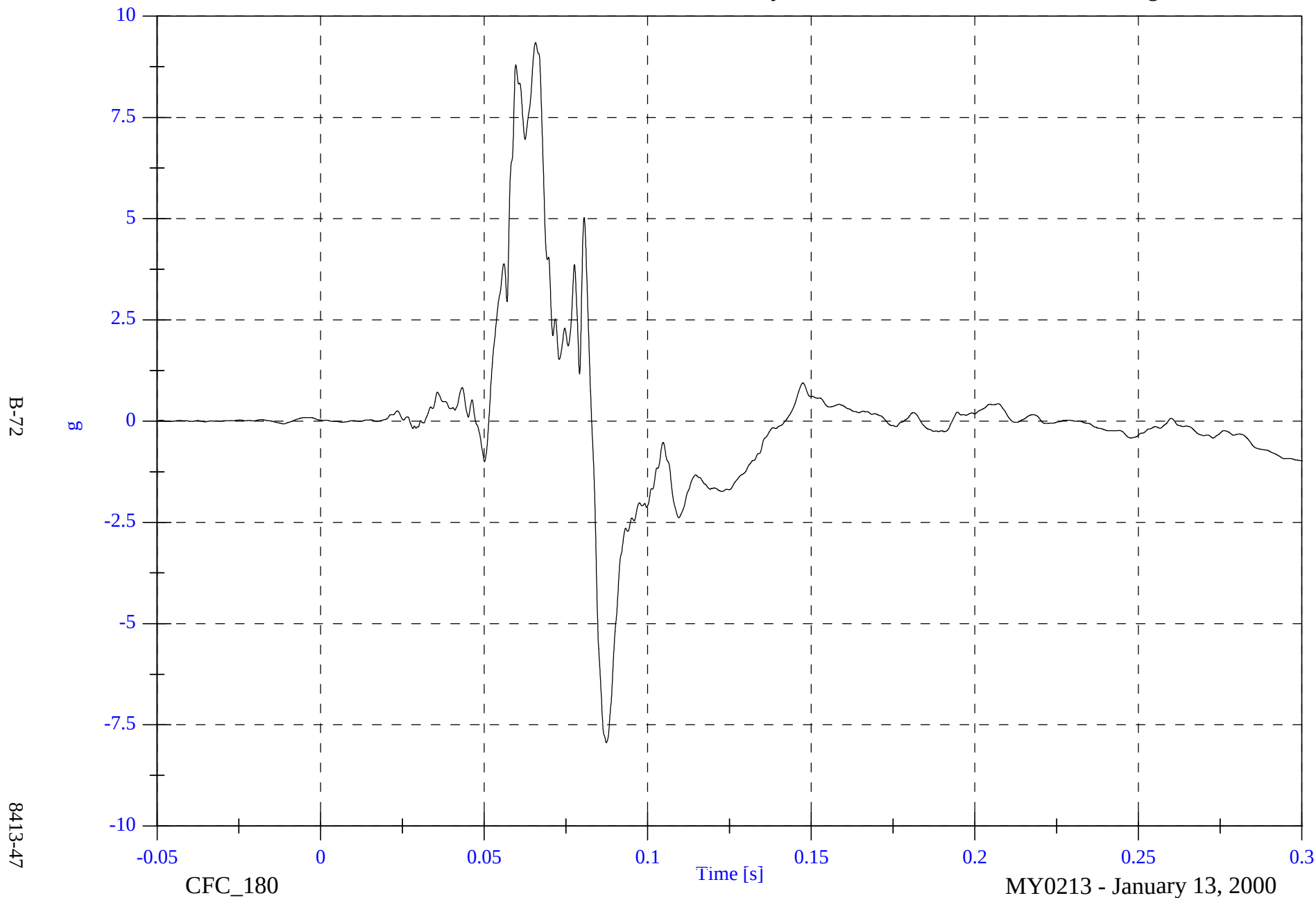


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest y

Max: 9.3 [g] at 0.066 [s]

Min: -7.9 [g] at 0.087 [s]

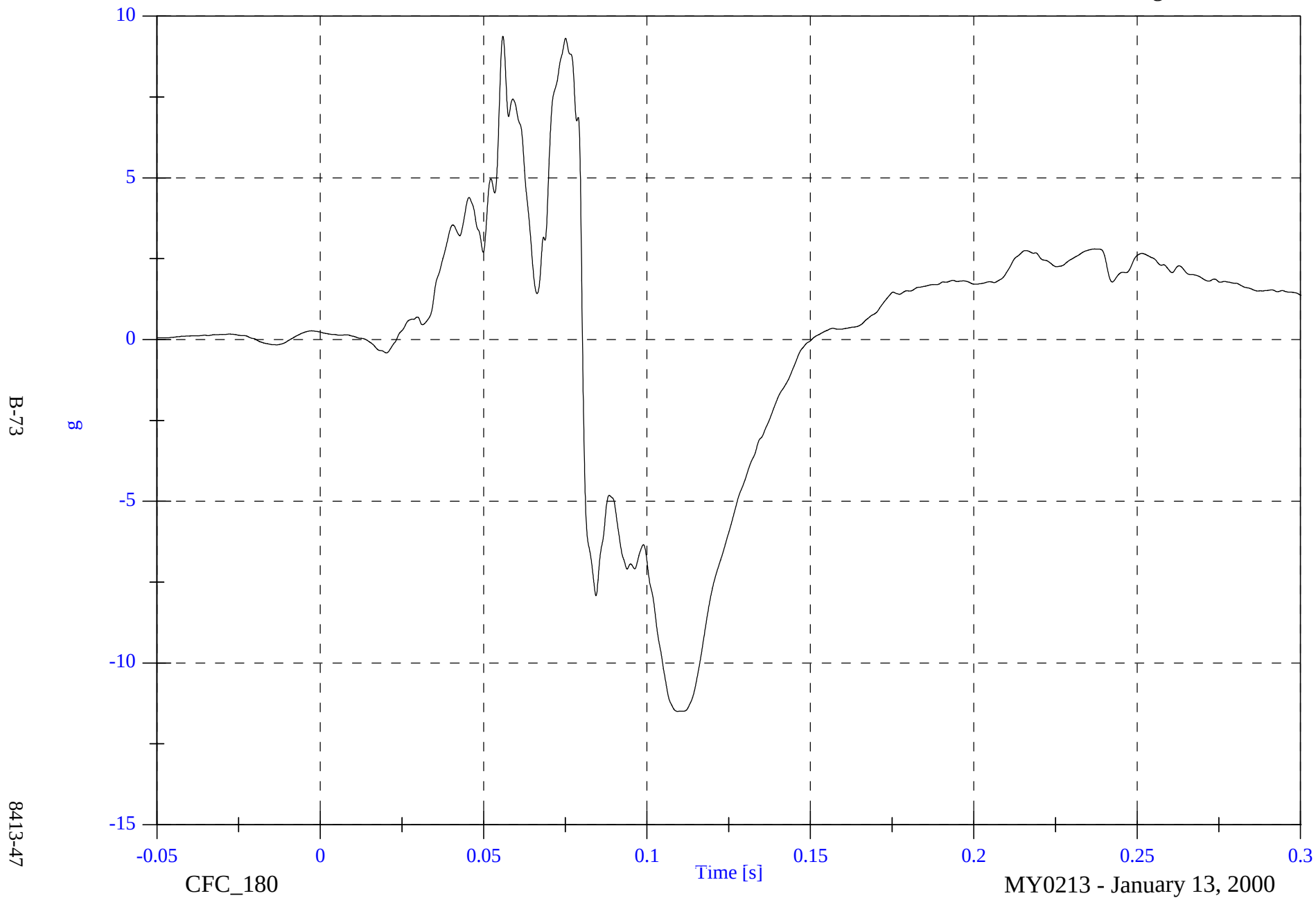


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest z

Max: 9.4 [g] at 0.056 [s]

Min: -11.5 [g] at 0.109 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

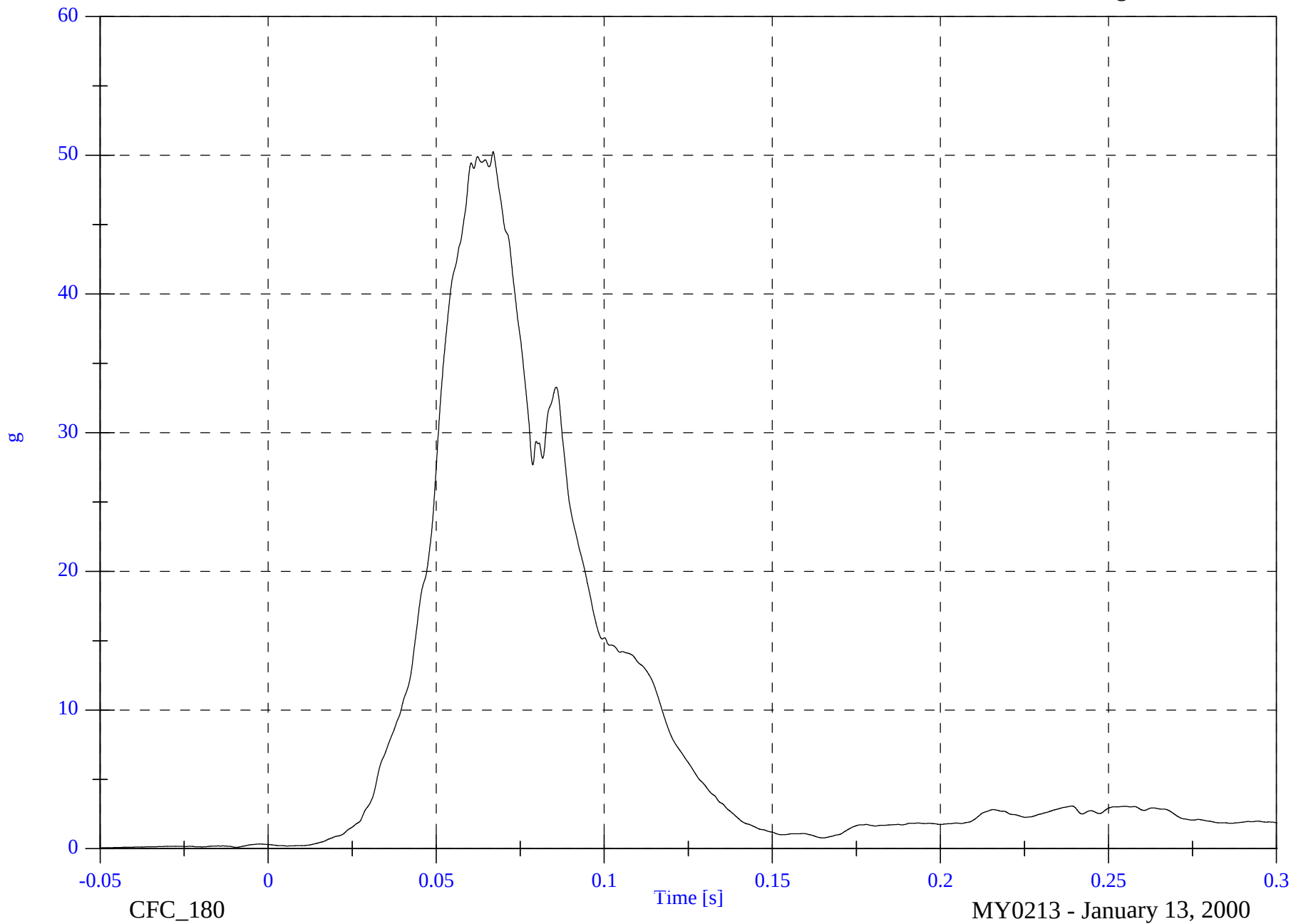
P2 Chest Resultant

Max: 50.3 [g] at 0.067 [s]

Min: 0.1 [g] at -0.050 [s]

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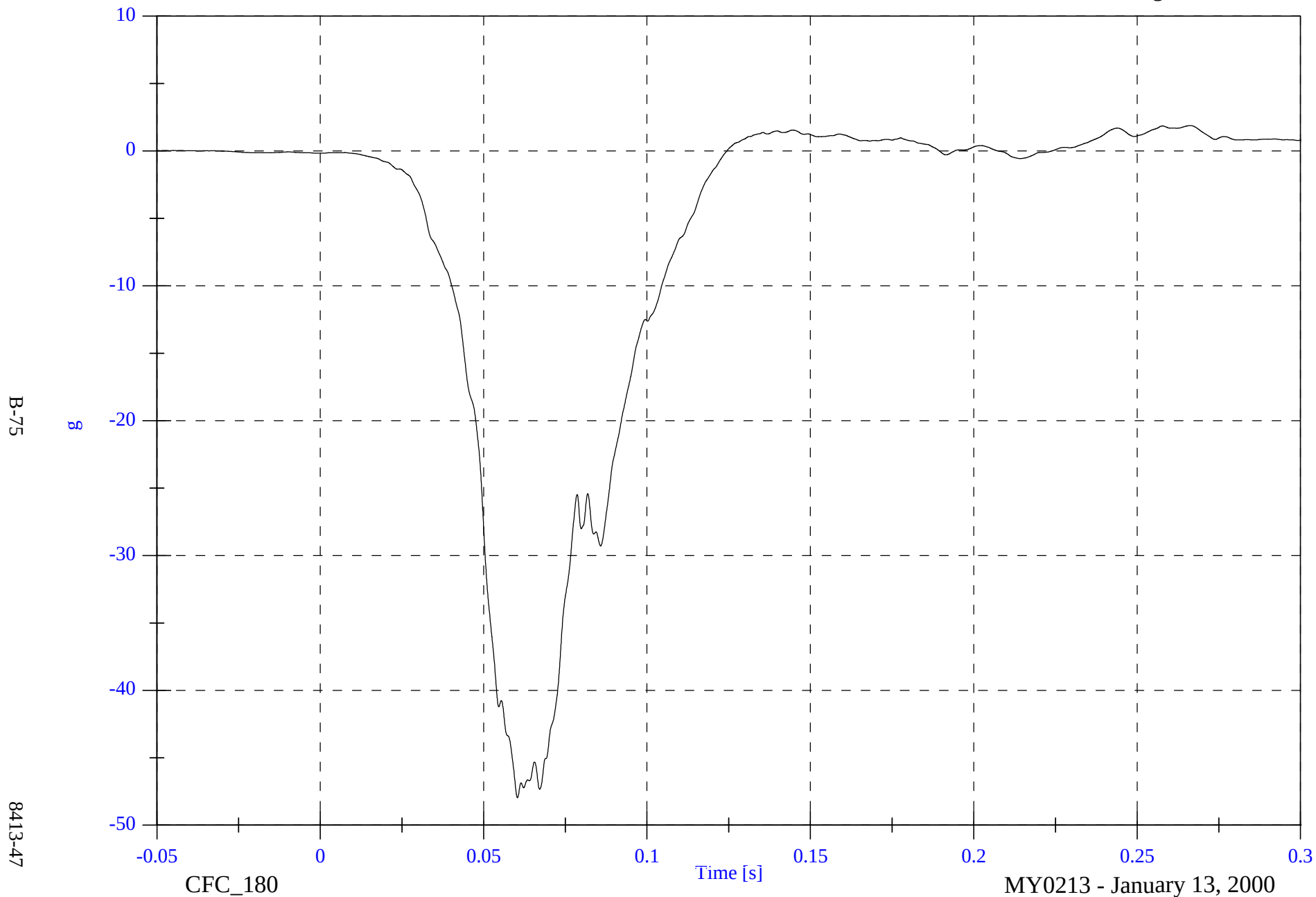


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest Red x

Max: 1.9 [g] at 0.266 [s]

Min: -48.0 [g] at 0.060 [s]

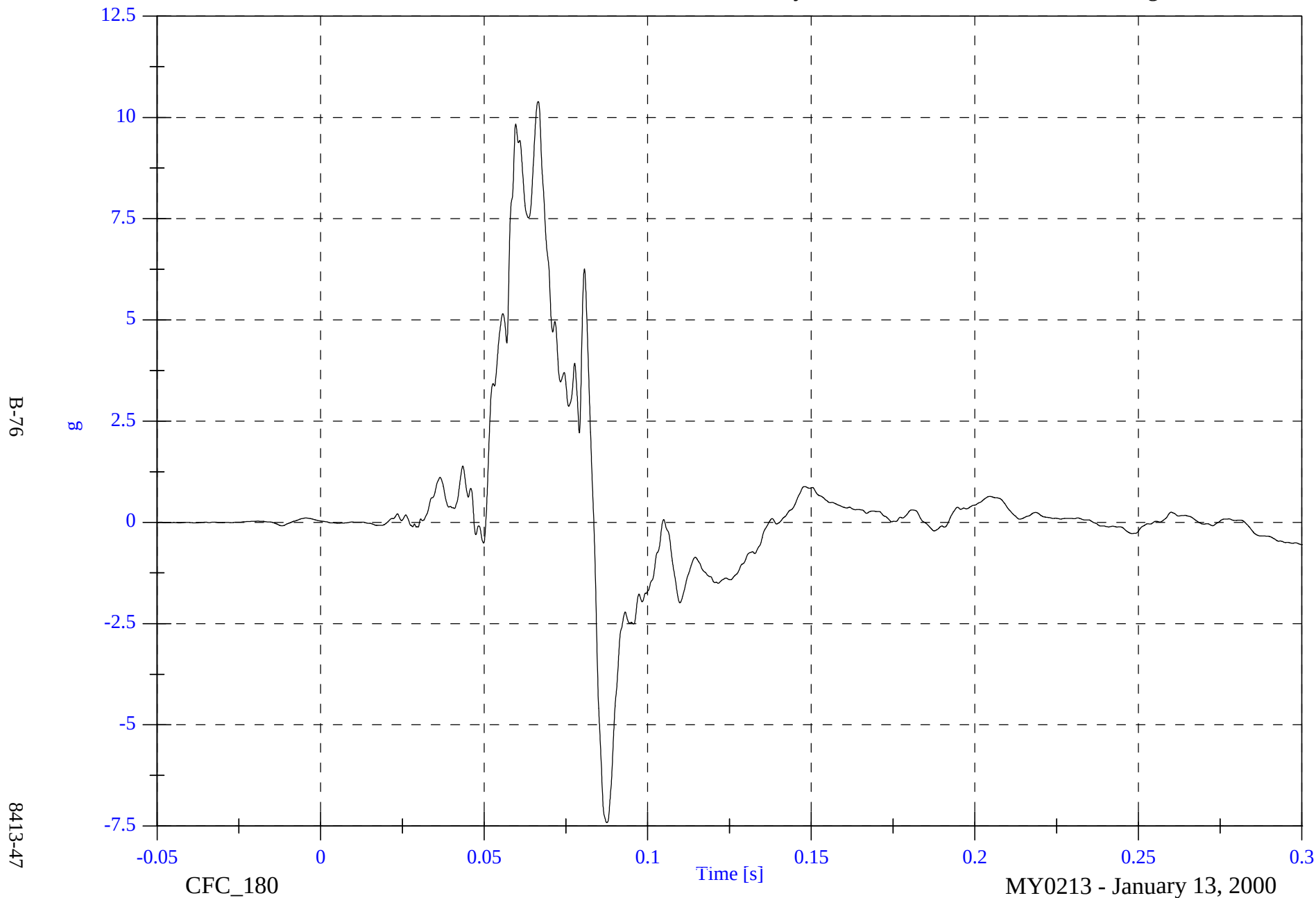


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest Red y

Max: 10.4 [g] at 0.067 [s]

Min: -7.4 [g] at 0.088 [s]

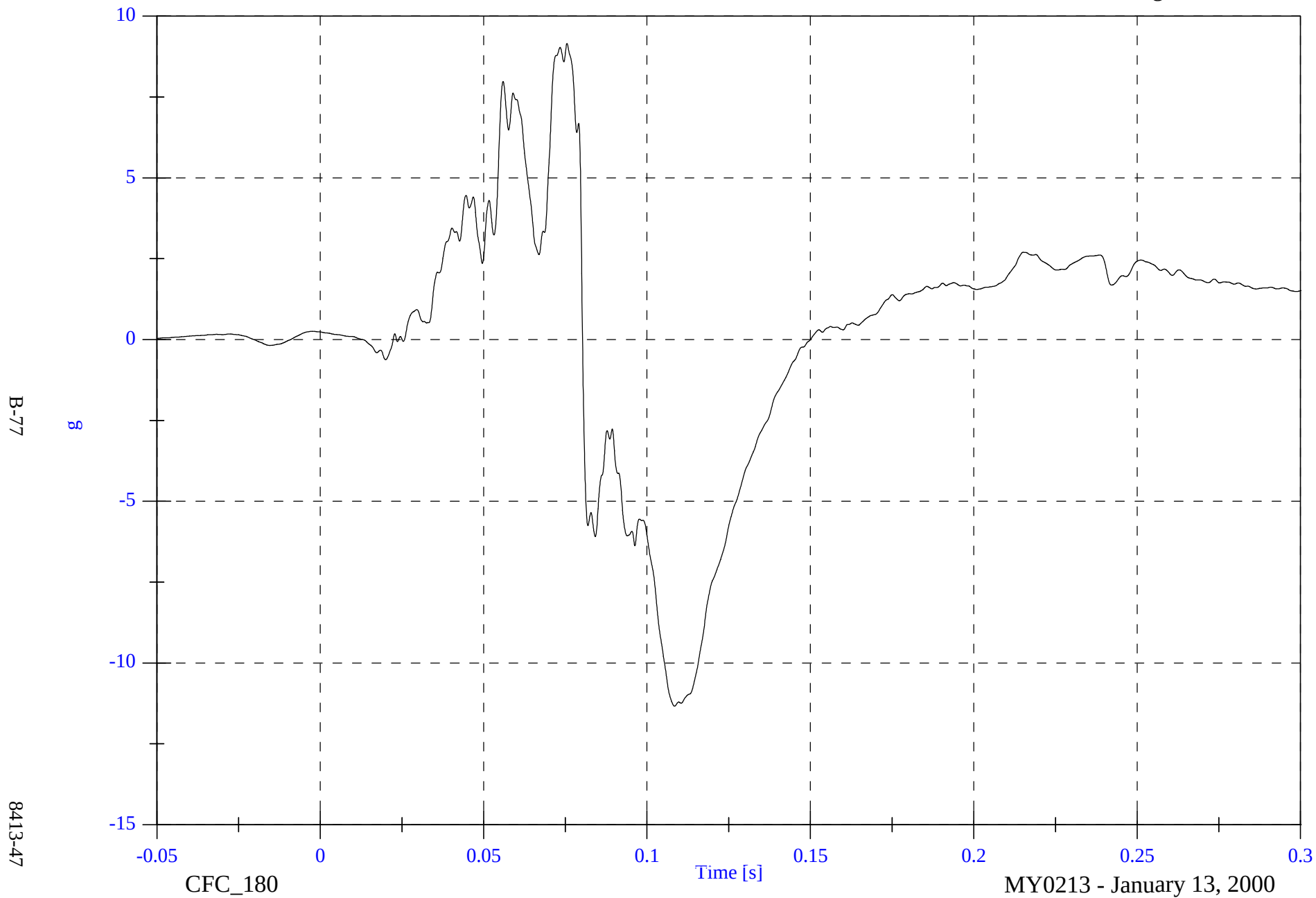


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest Red z

Max: 9.2 [g] at 0.076 [s]

Min: -11.3 [g] at 0.108 [s]

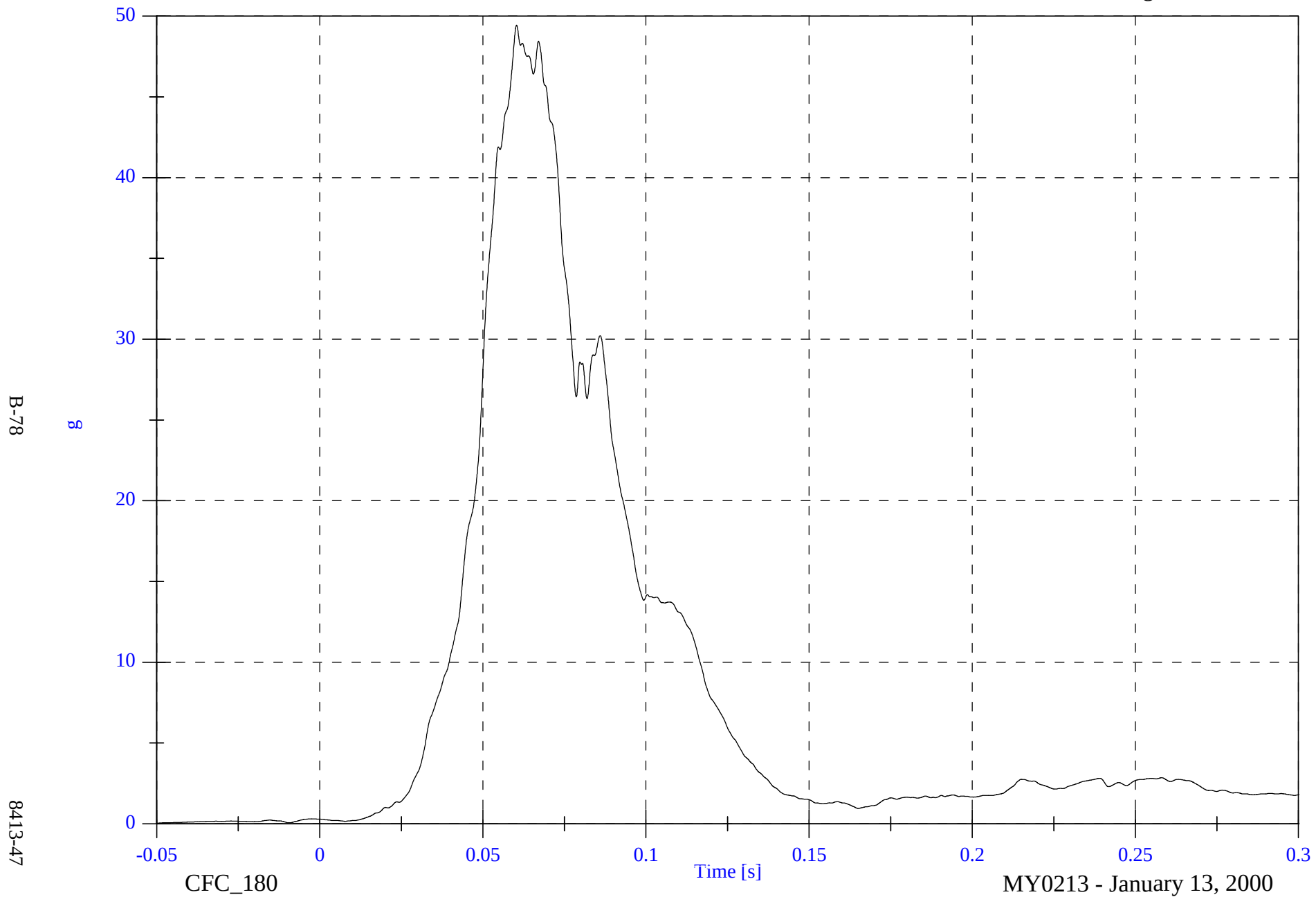


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest Red Resultant

Max: 49.4 [g] at 0.060 [s]

Min: 0.0 [g] at -0.050 [s]

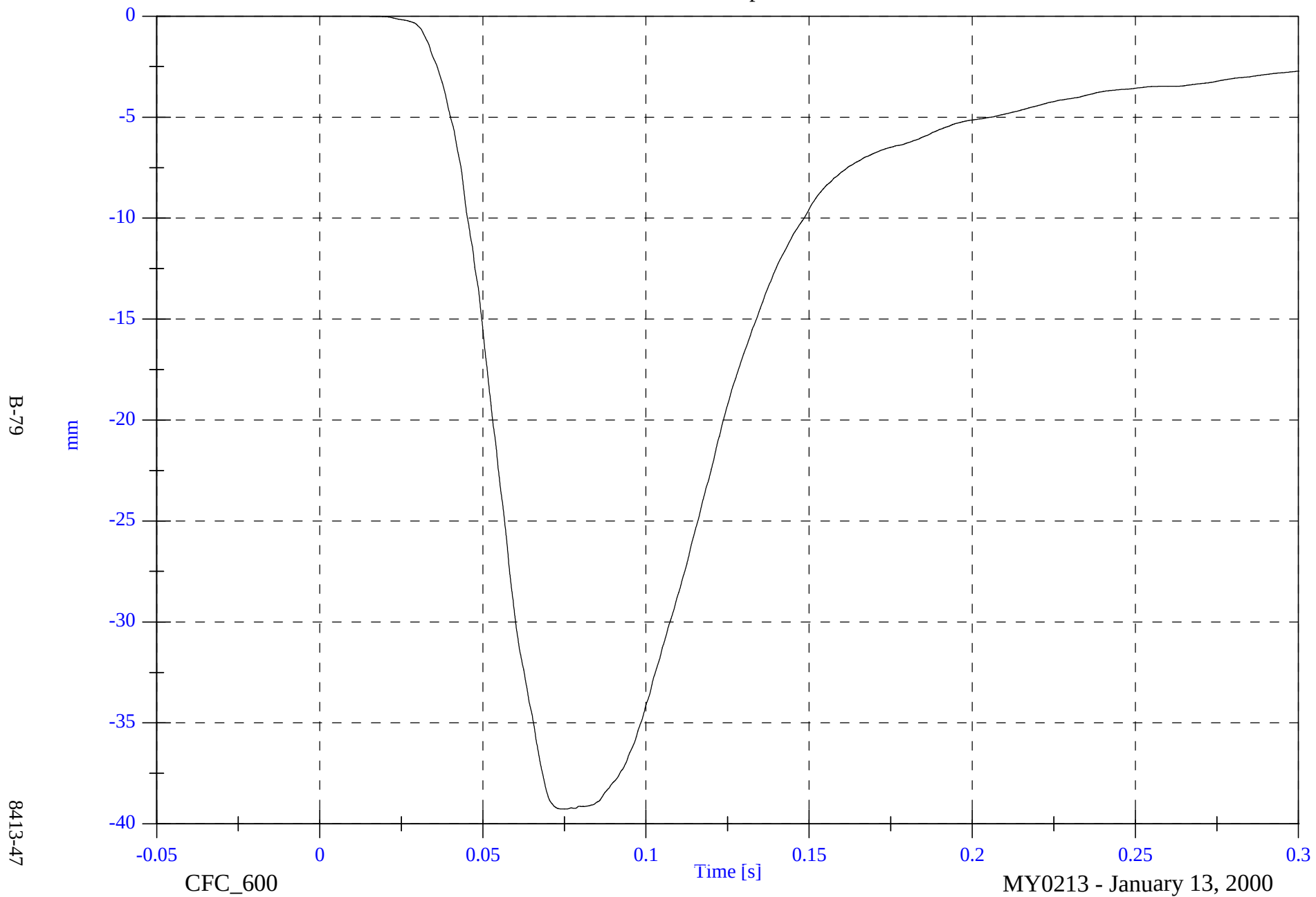


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Chest Compression x

Max: 0.0 [mm] at -0.015 [s]

Min: -39.3 [mm] at 0.075 [s]

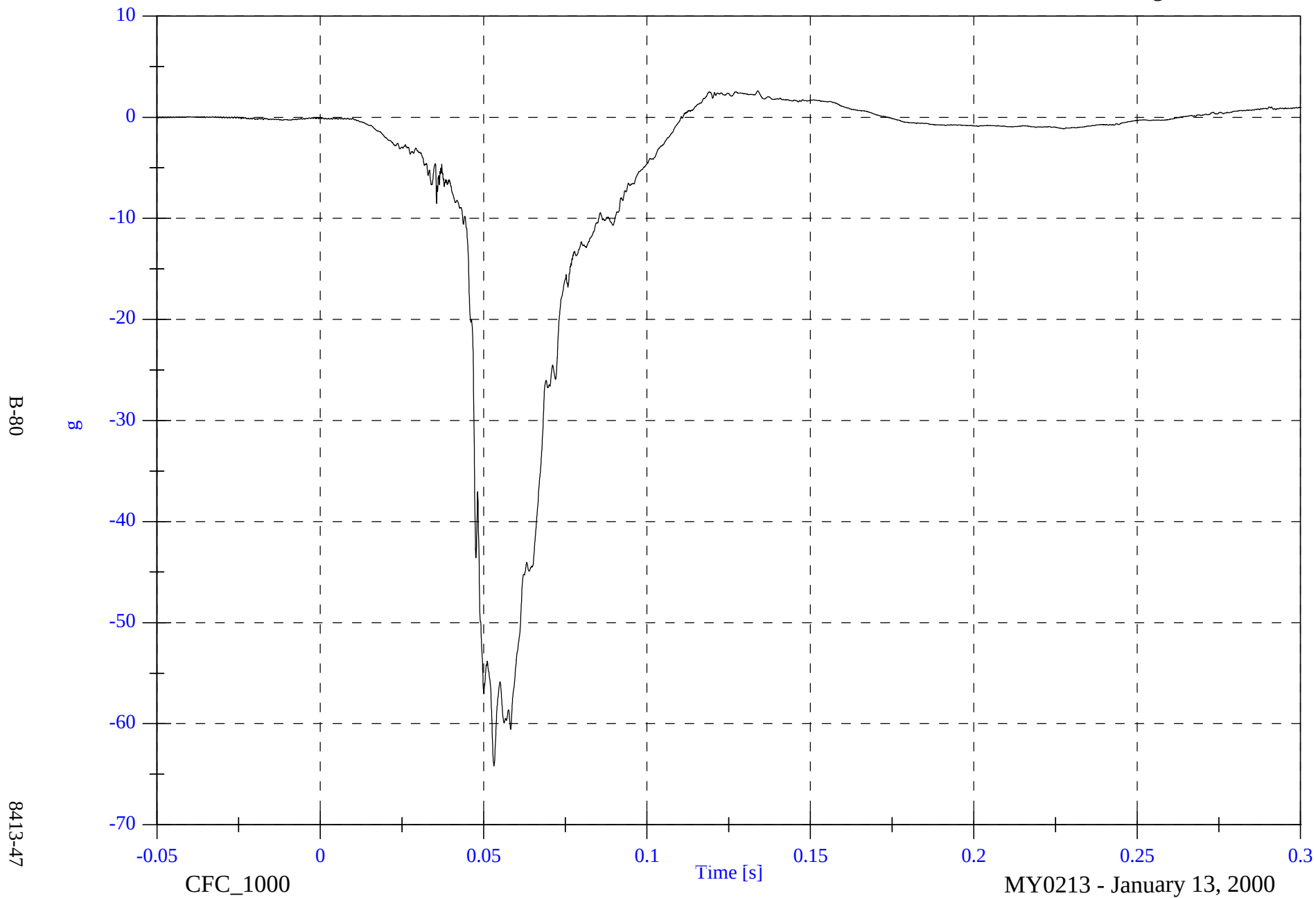


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Pelvic x

Max: 2.6 [g] at 0.134 [s]

Min: -64.2 [g] at 0.053 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

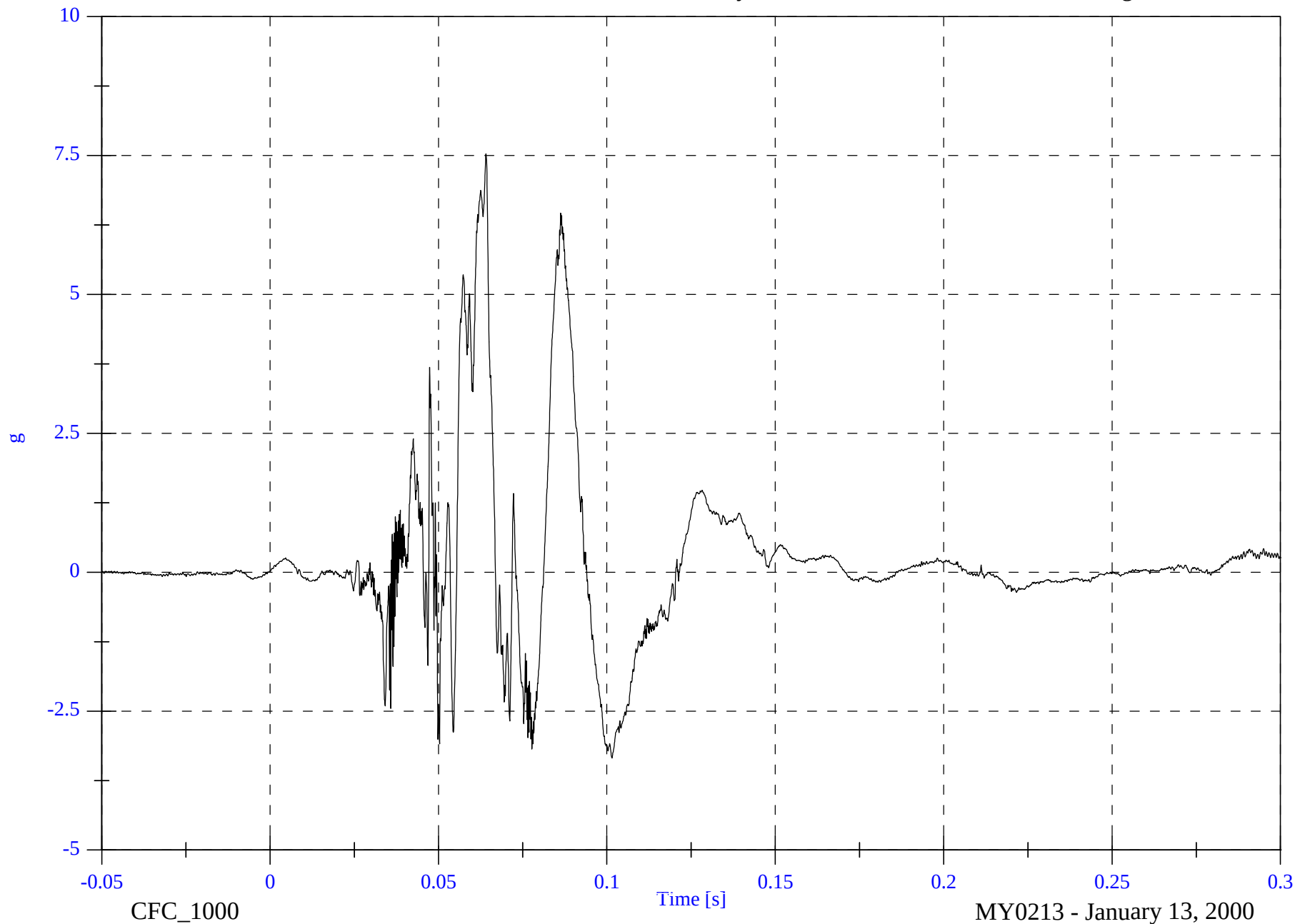
P2 Pelvic y

Max: 7.5 [g] at 0.064 [s]

Min: -3.3 [g] at 0.102 [s]

B-81

8413-47

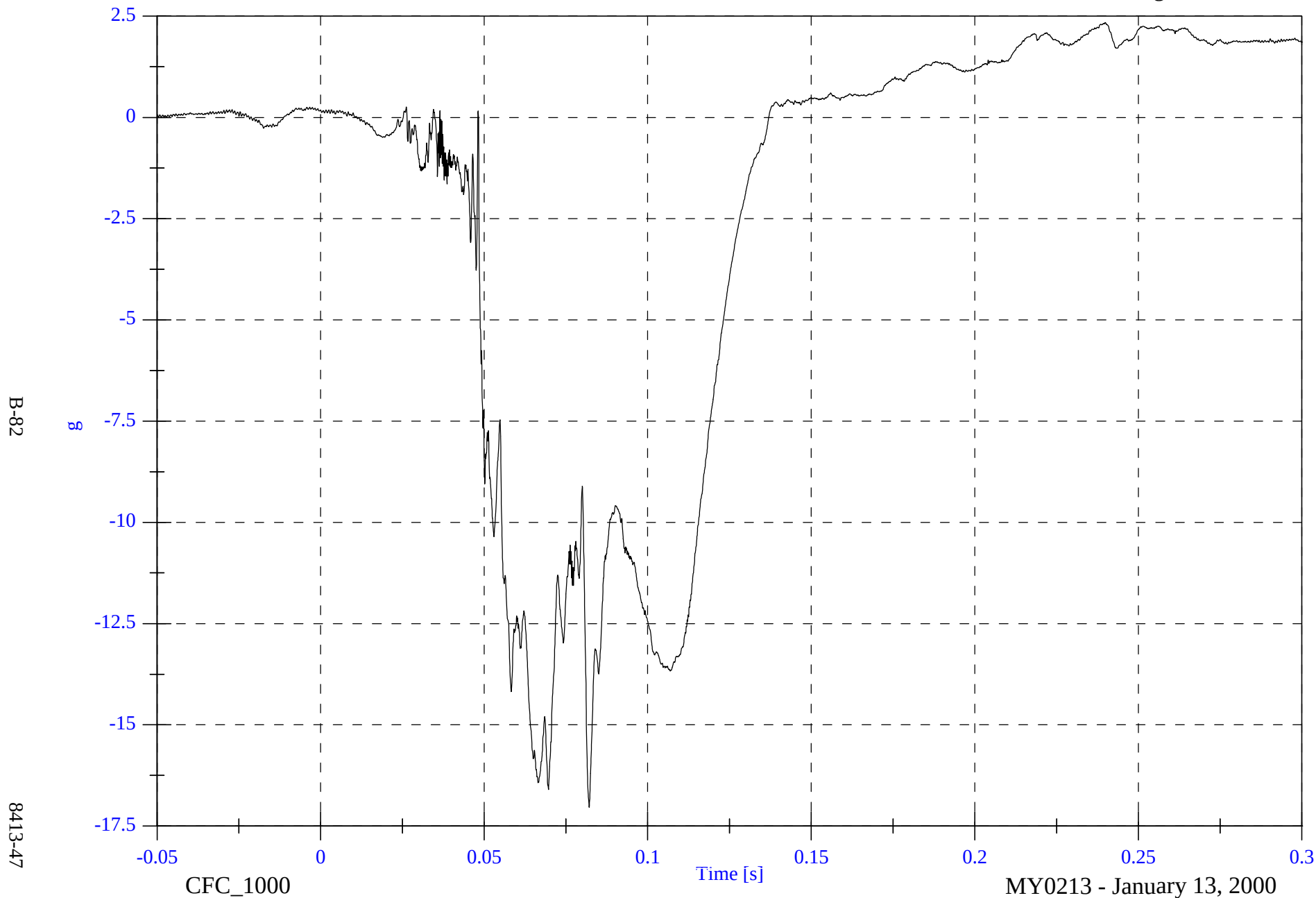


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Pelvic z

Max: 2.3 [g] at 0.240 [s]

Min: -17.0 [g] at 0.082 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

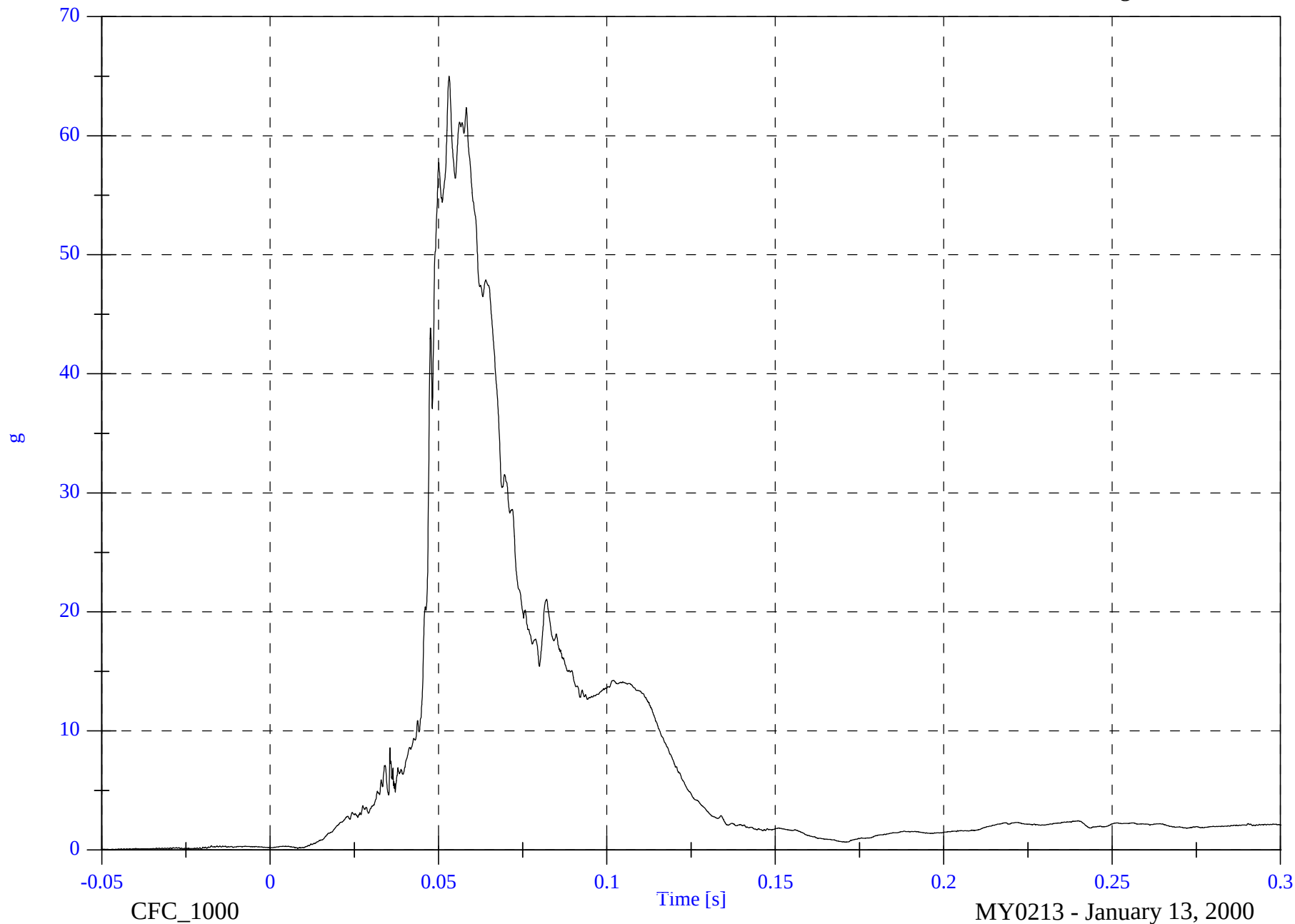
P2 Pelvic Resultant

Max: 65.0 [g] at 0.053 [s]

Min: 0.0 [g] at -0.047 [s]

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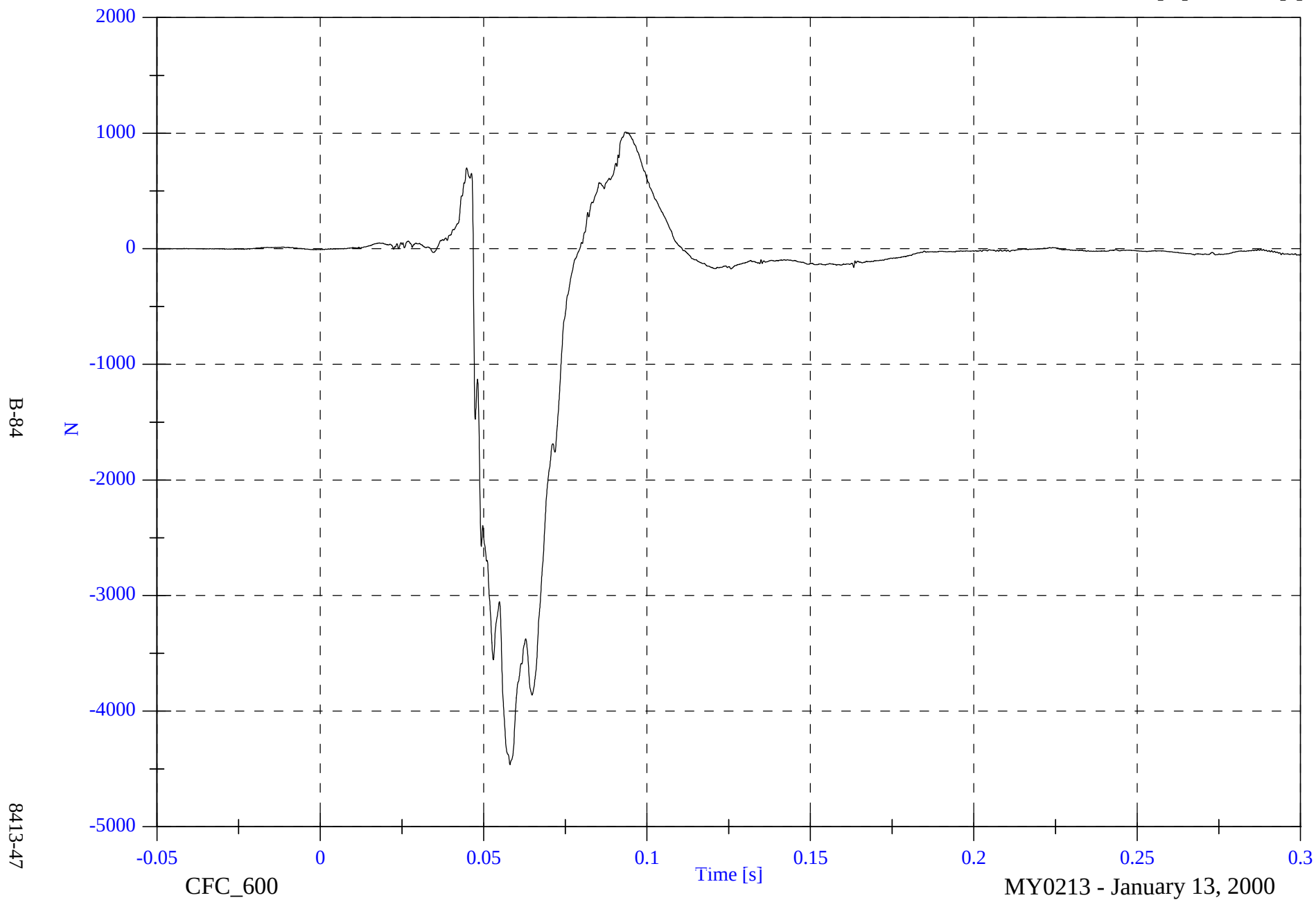


NCAP Test 8 - 2000 Mercury Villager Sport

Max: 1010.2 [N] at 0.093 [s]

Min: -4463.5 [N] at 0.058 [s]

P2 Left Femur z

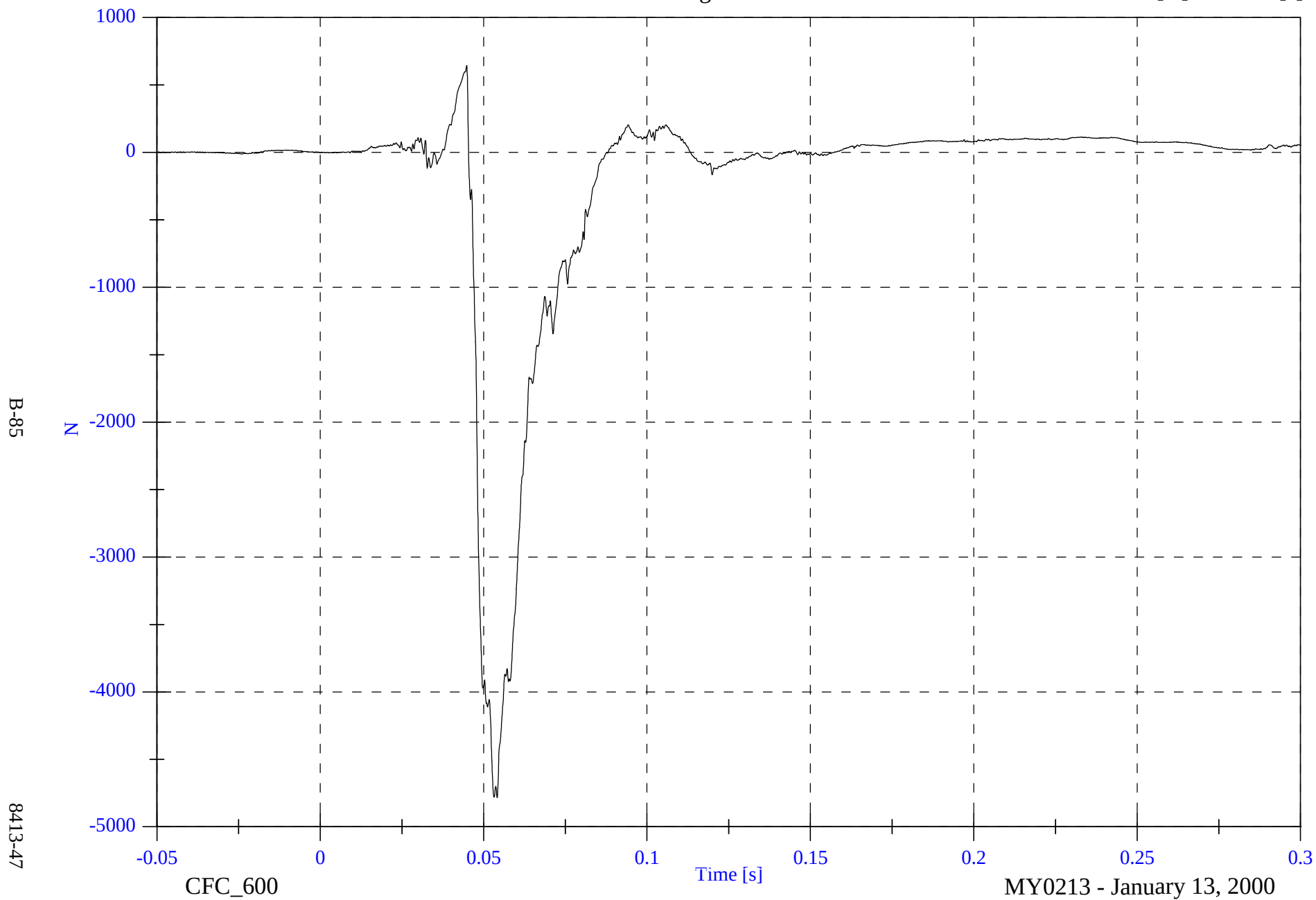


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Right Femur z

Max: 645.8 [N] at 0.045 [s]

Min: -4784.6 [N] at 0.054 [s]

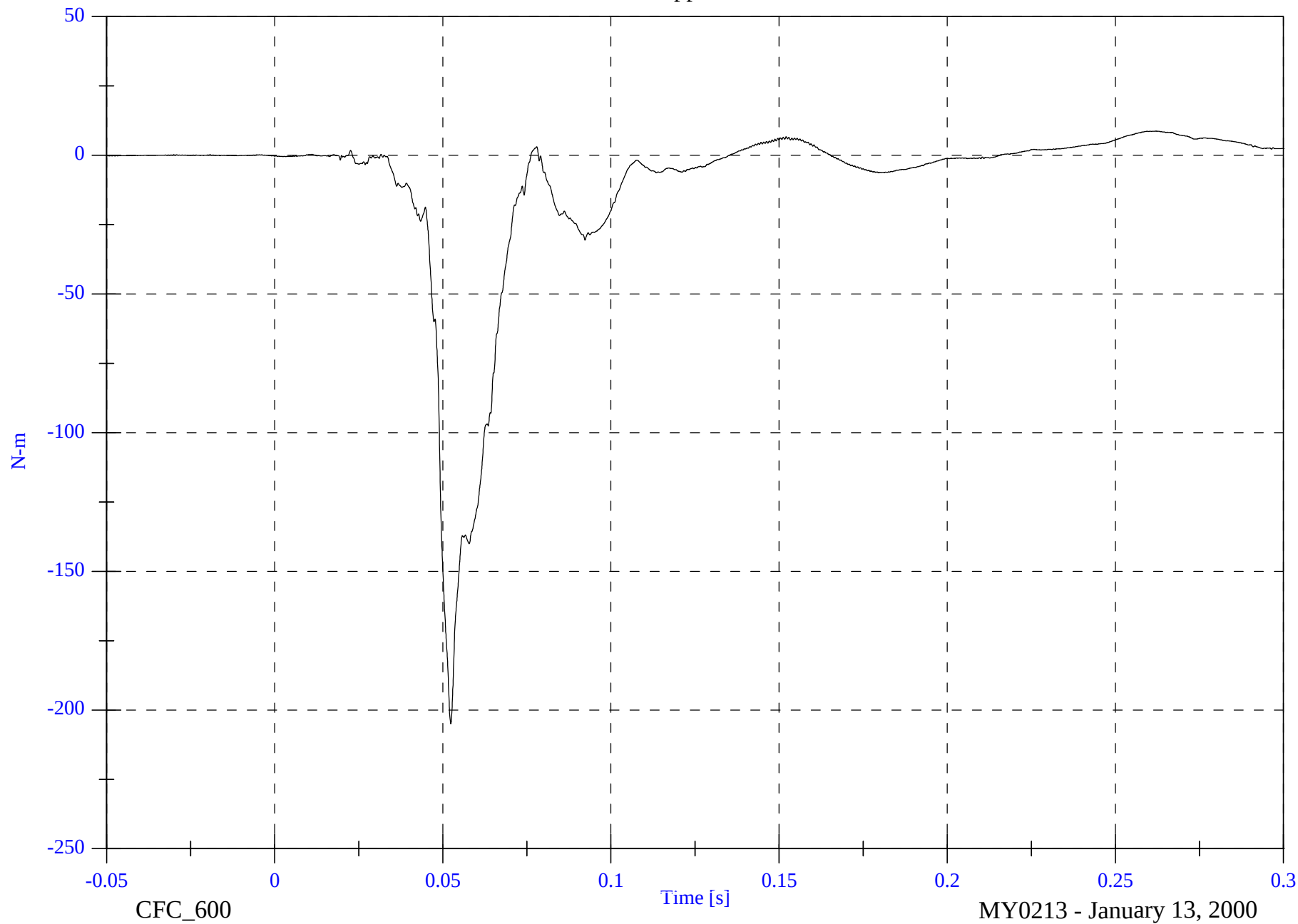


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Upper Tibia Mx

Max: 8.8 [N-m] at 0.262 [s]

Min: -205.0 [N-m] at 0.052 [s]



B-86

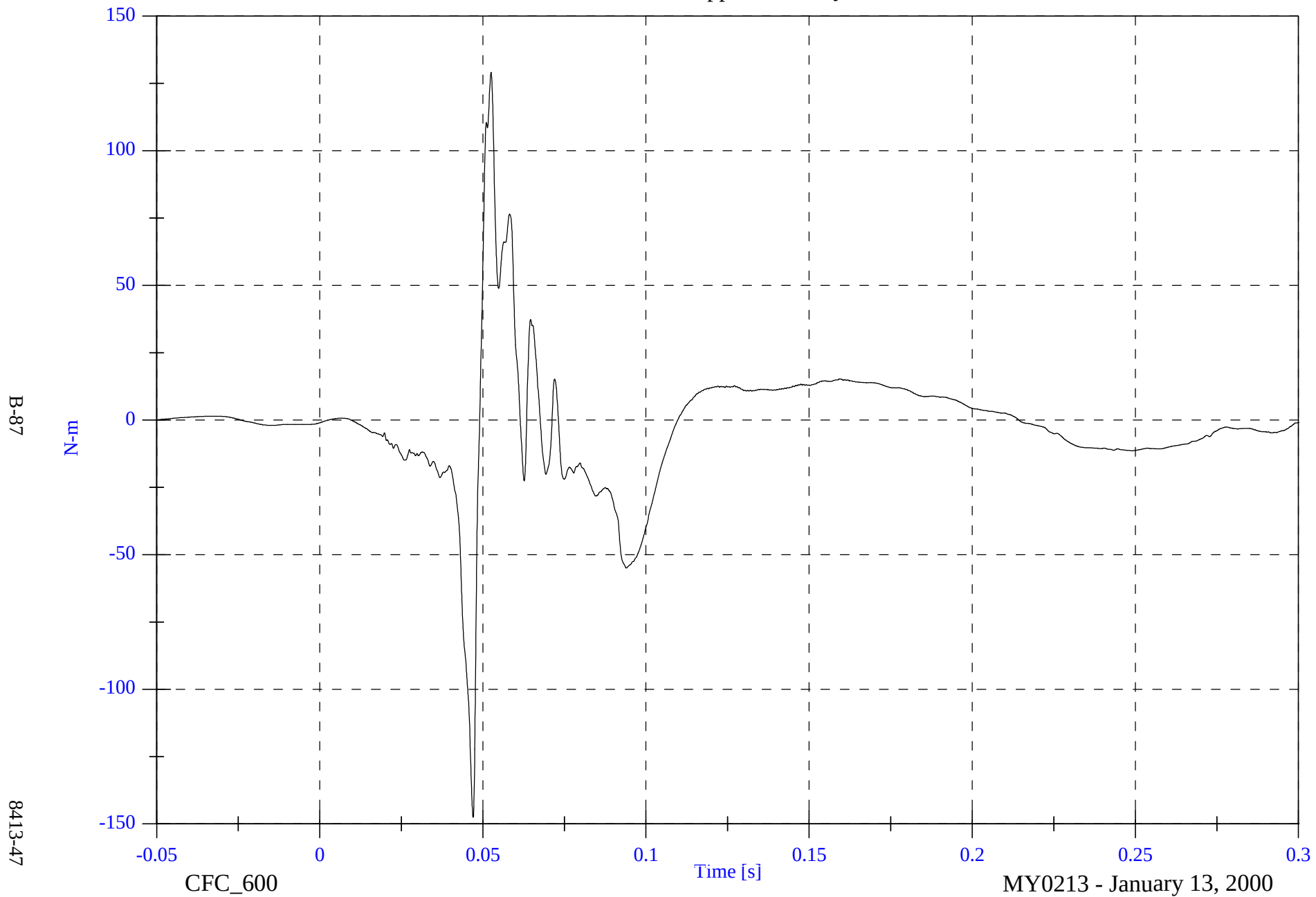
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Upper Tibia My

Max: 129.1 [N-m] at 0.053 [s]

Min: -147.6 [N-m] at 0.047 [s]

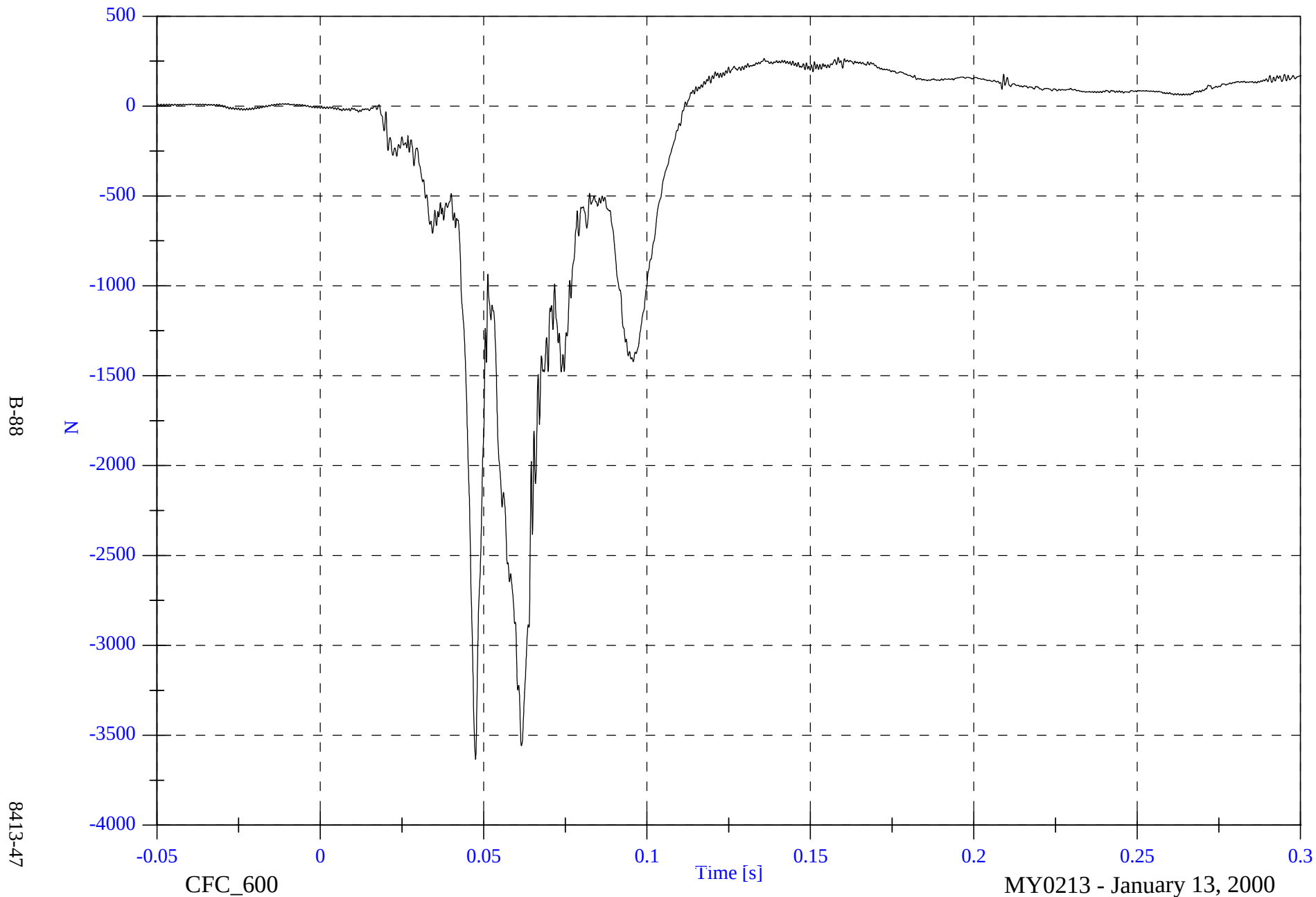


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Lower Tibia Fz

Max: 271.1 [N] at 0.159 [s]

Min: -3632.8 [N] at 0.048 [s]

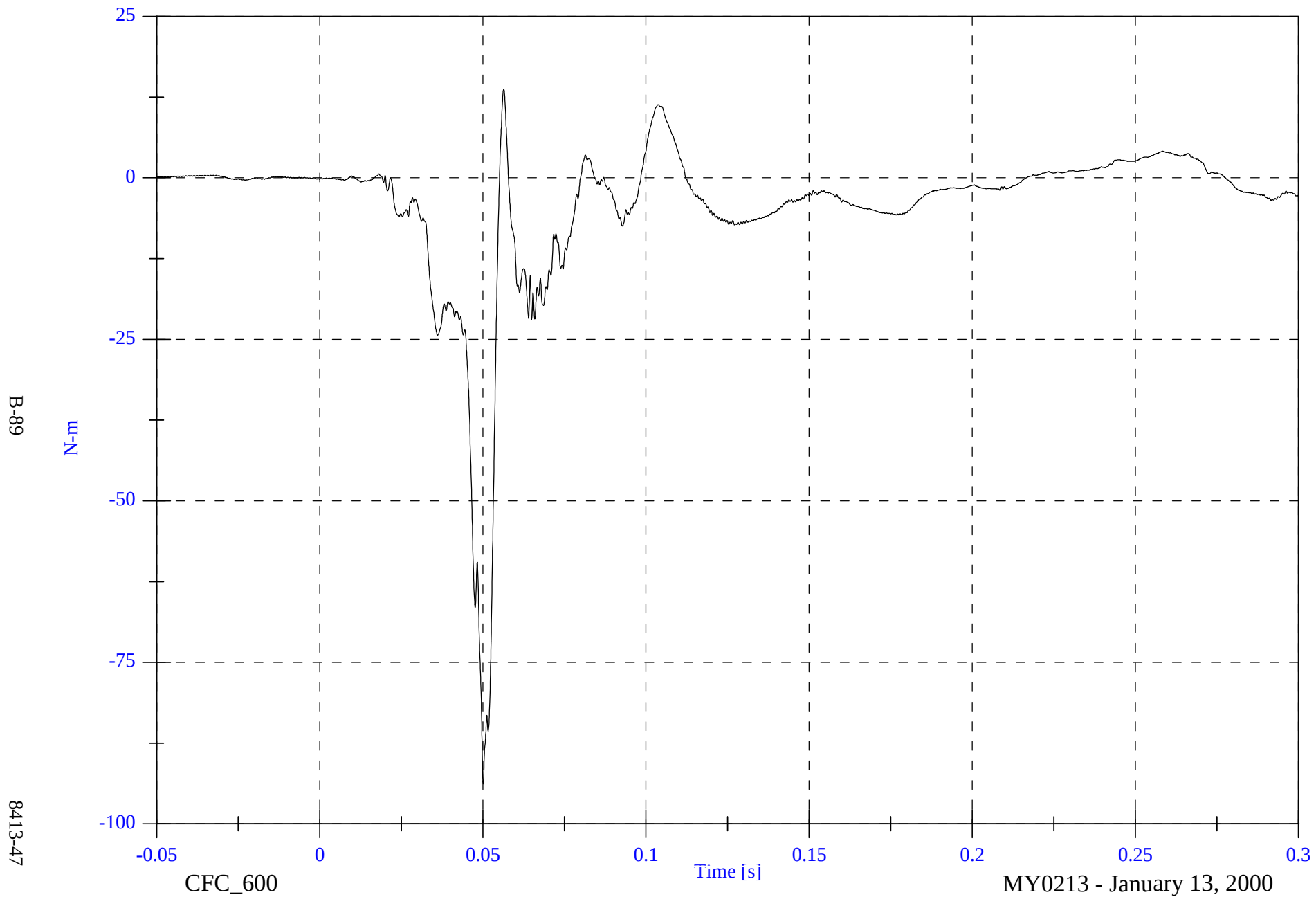


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Lower Tibia Mx

Max: 13.7 [N-m] at 0.056 [s]

Min: -93.8 [N-m] at 0.050 [s]

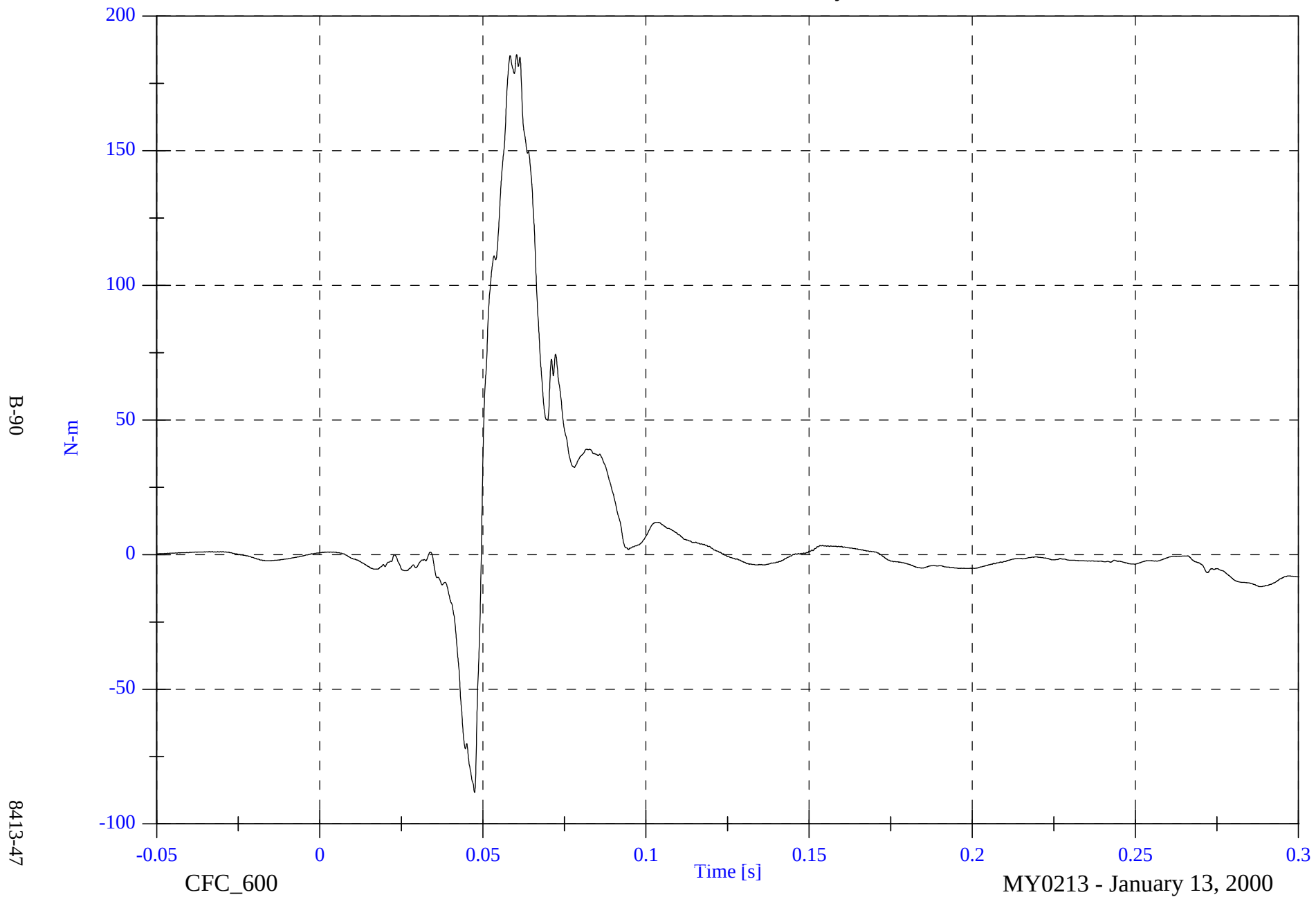


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Lower Tibia My

Max: 185.7 [N-m] at 0.060 [s]

Min: -88.4 [N-m] at 0.047 [s]

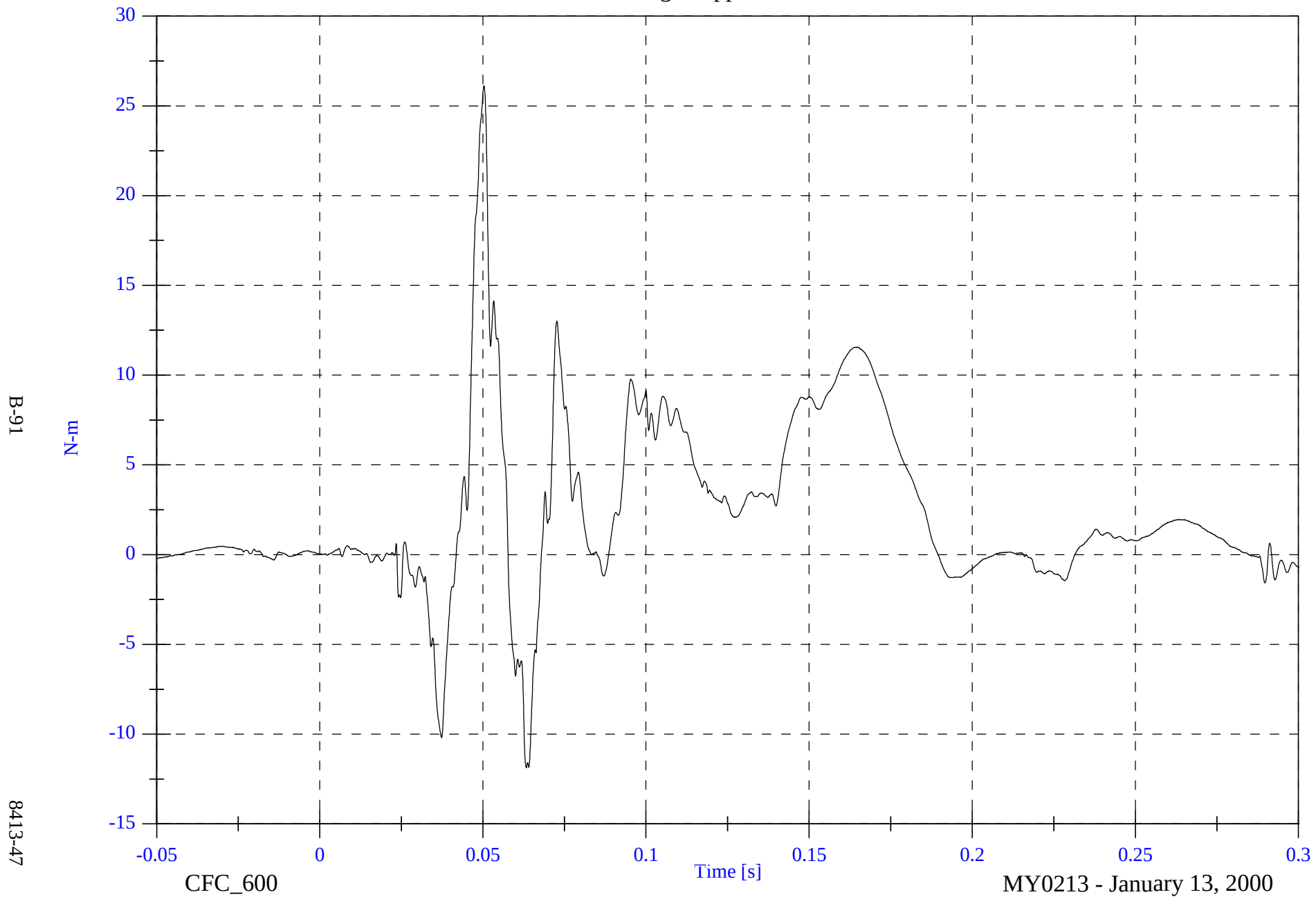


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Right Upper Tibia Mx

Max: 26.1 [N-m] at 0.050 [s]

Min: -11.9 [N-m] at 0.063 [s]

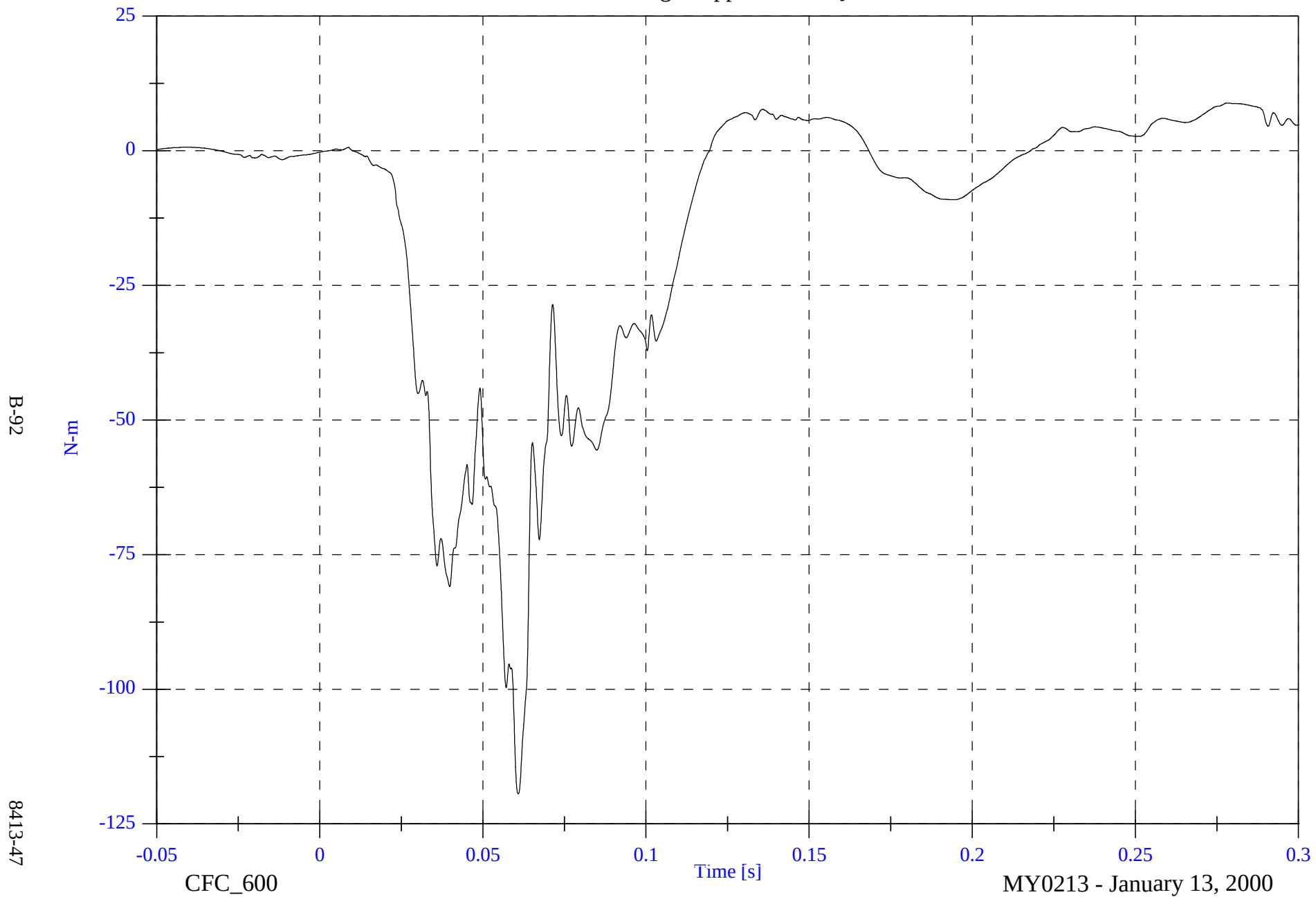


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Right Upper Tibia My

Max: 8.9 [N-m] at 0.278 [s]

Min: -119.4 [N-m] at 0.061 [s]

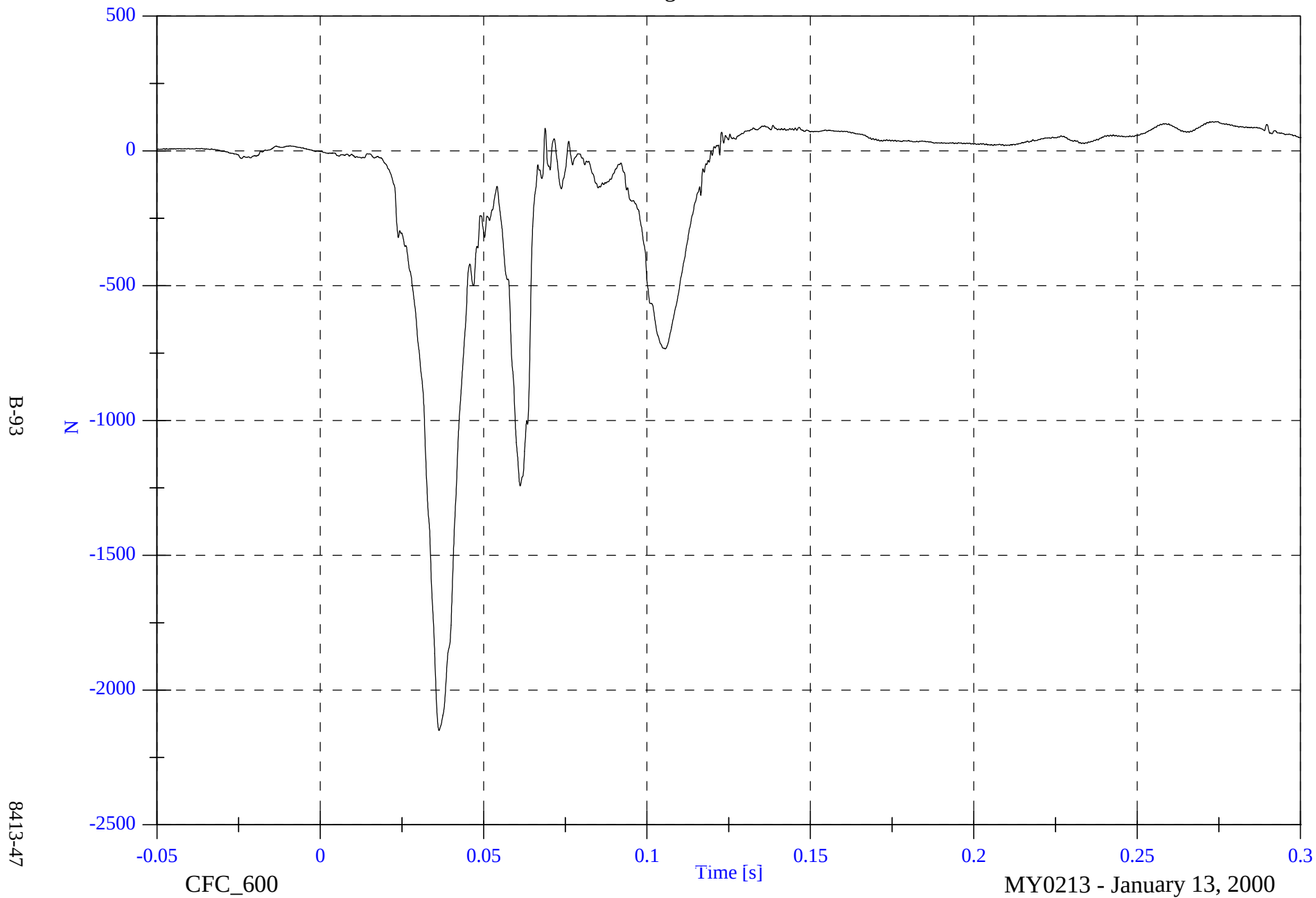


NCAP Test 8 - 2000 Mercury Villager Sport

Max: 109.1 [N] at 0.275 [s]

P2 Right Lower Tibia Fz

Min: -2150.0 [N] at 0.036 [s]

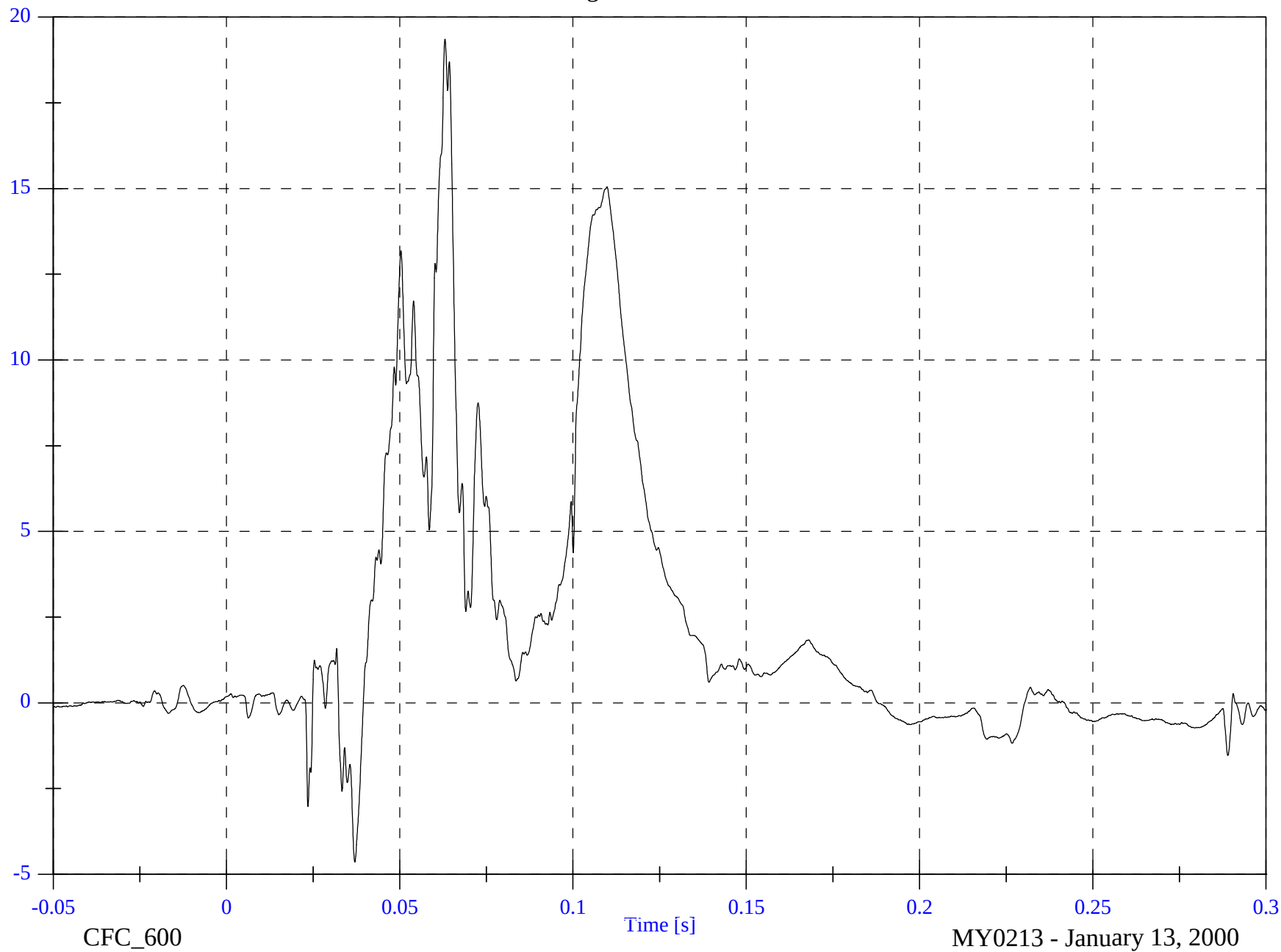


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Right Lower Tibia Mx

Max: 19.4 [N-m] at 0.063 [s]

Min: -4.6 [N-m] at 0.037 [s]



B-94

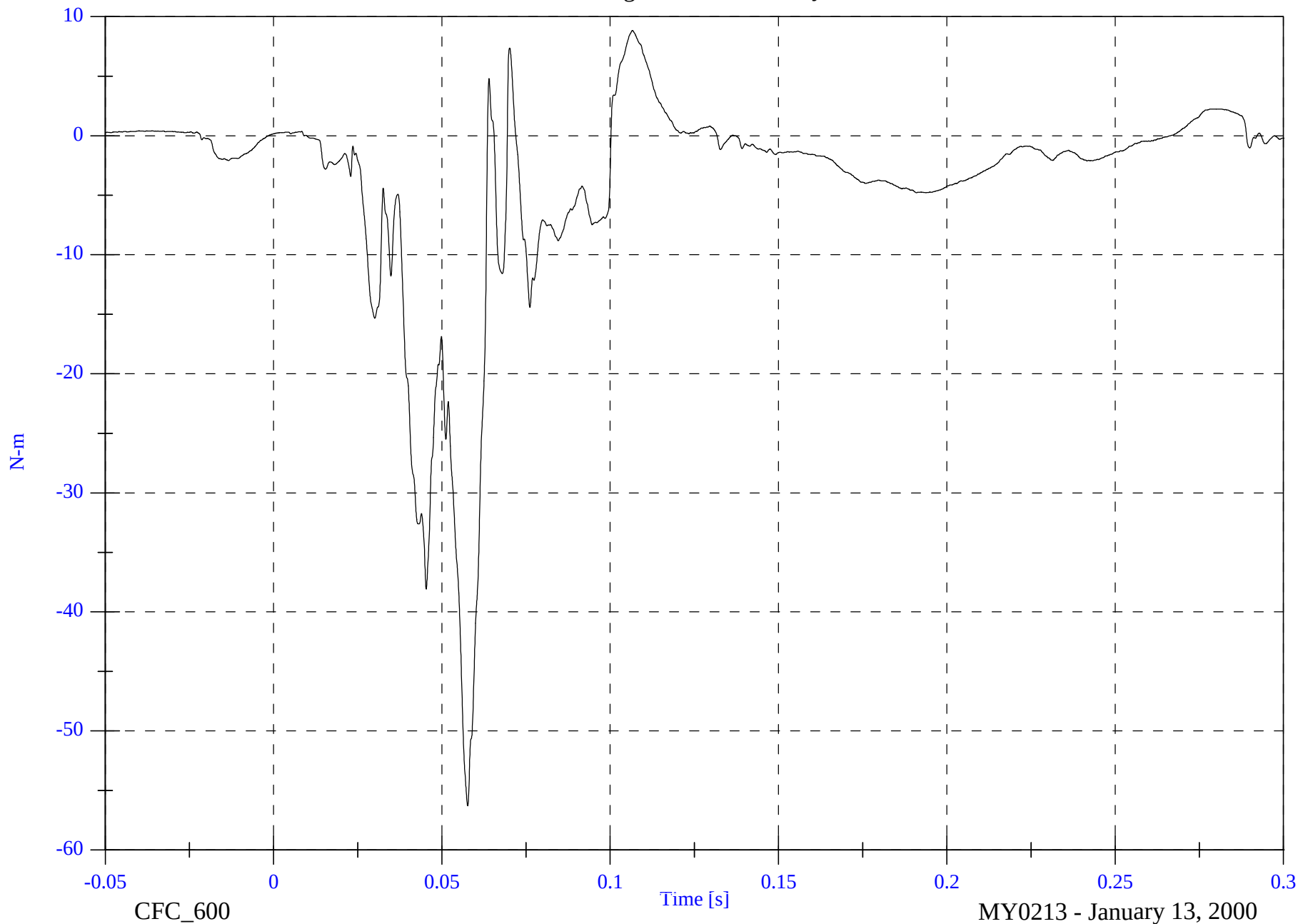
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

P2 Right Lower Tibia My

Max: 8.8 [N-m] at 0.107 [s]

Min: -56.3 [N-m] at 0.058 [s]



B-95

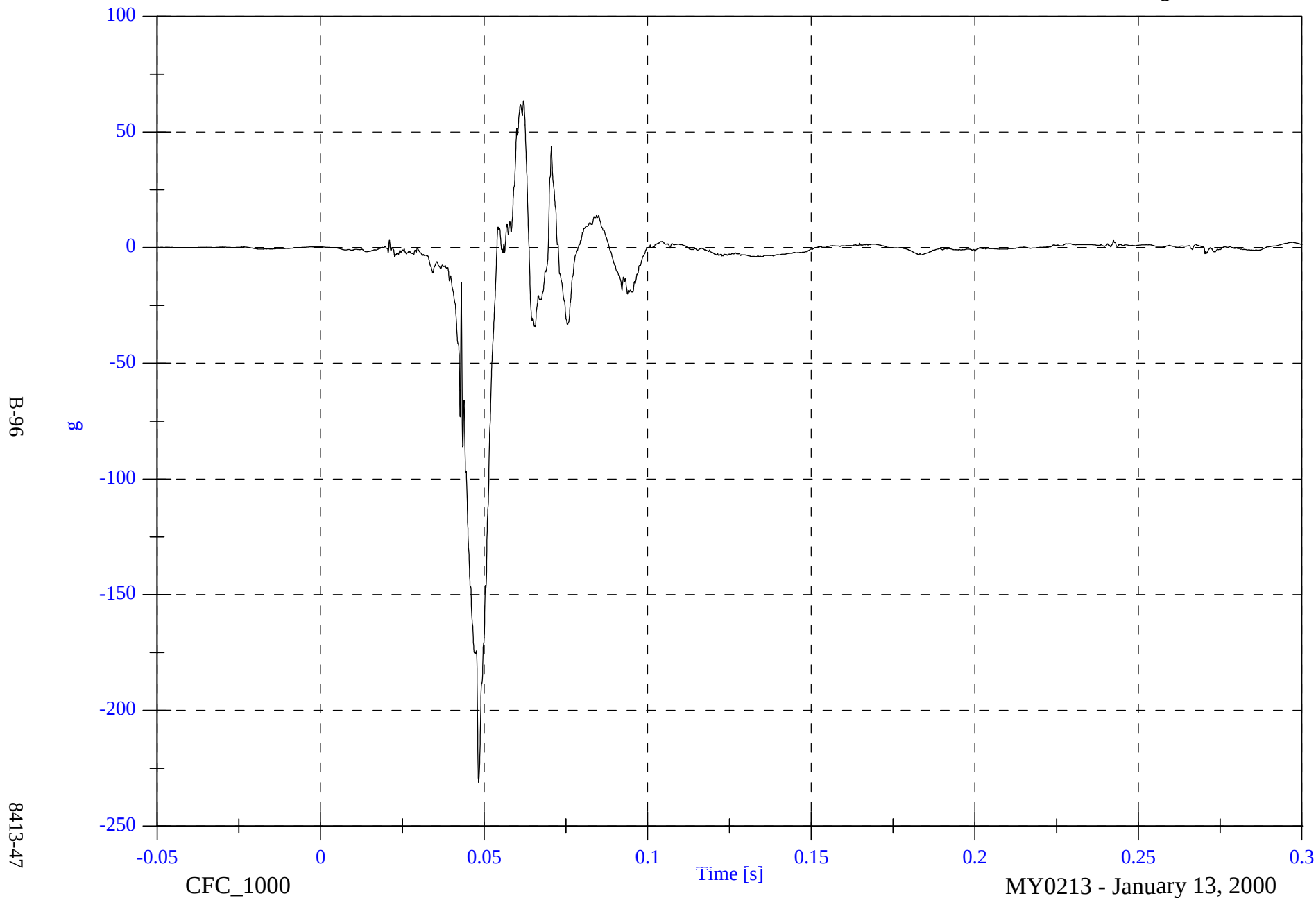
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Foot Aft x

Max: 63.5 [g] at 0.062 [s]

Min: -231.2 [g] at 0.048 [s]

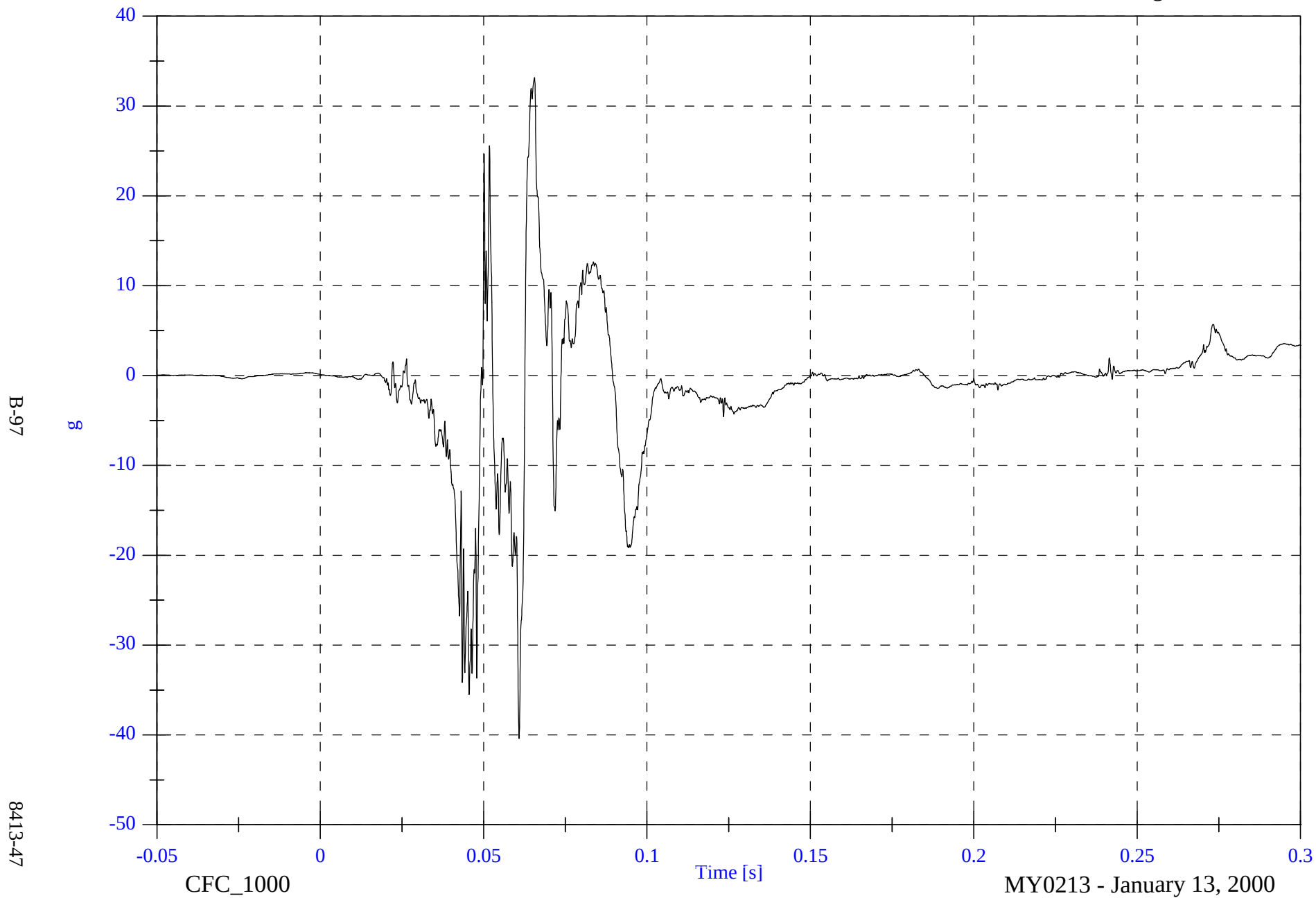


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Foot Aft z

Max: 33.2 [g] at 0.066 [s]

Min: -40.4 [g] at 0.061 [s]

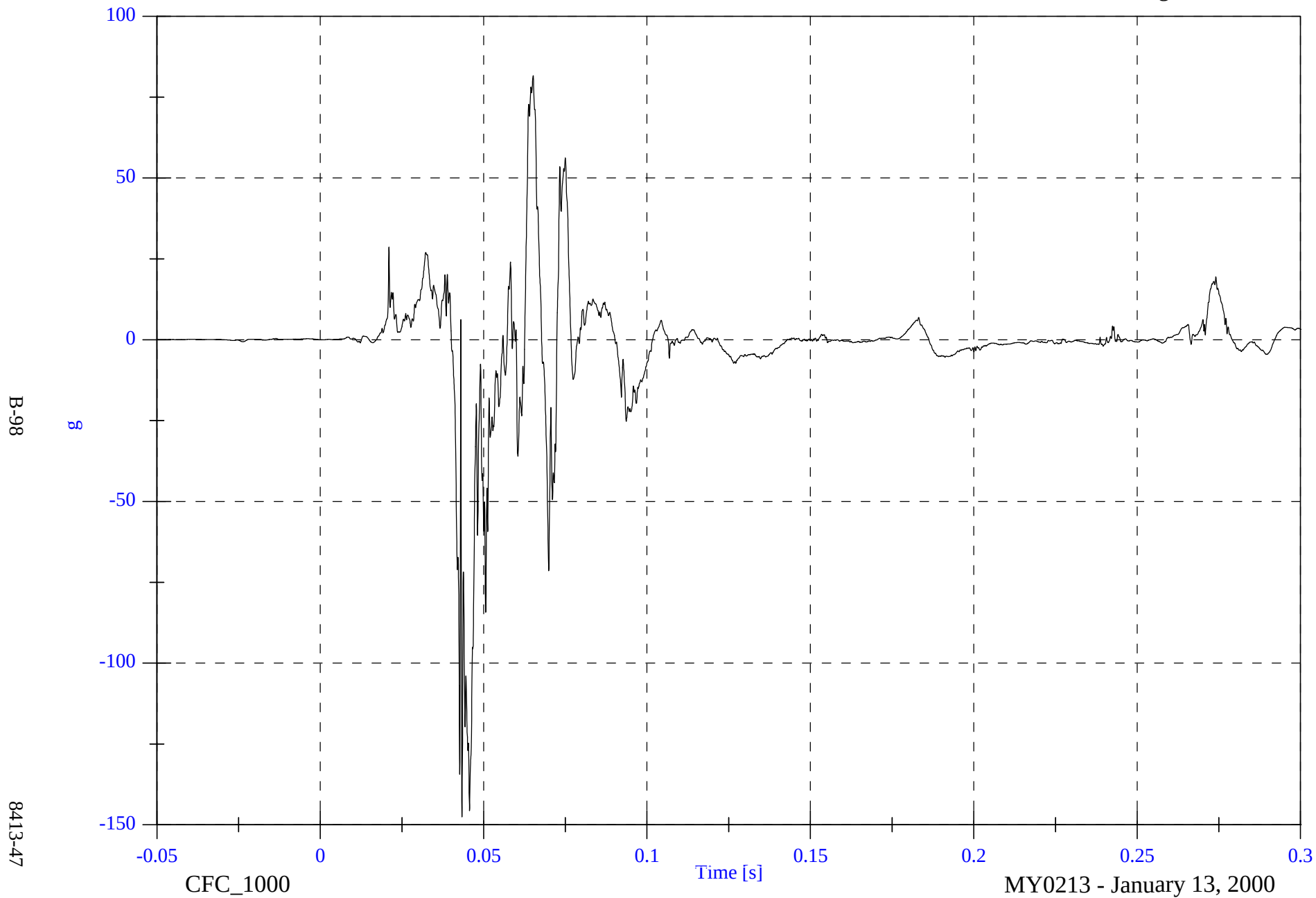


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Left Foot Fore z

Max: 81.6 [g] at 0.065 [s]

Min: -147.5 [g] at 0.043 [s]

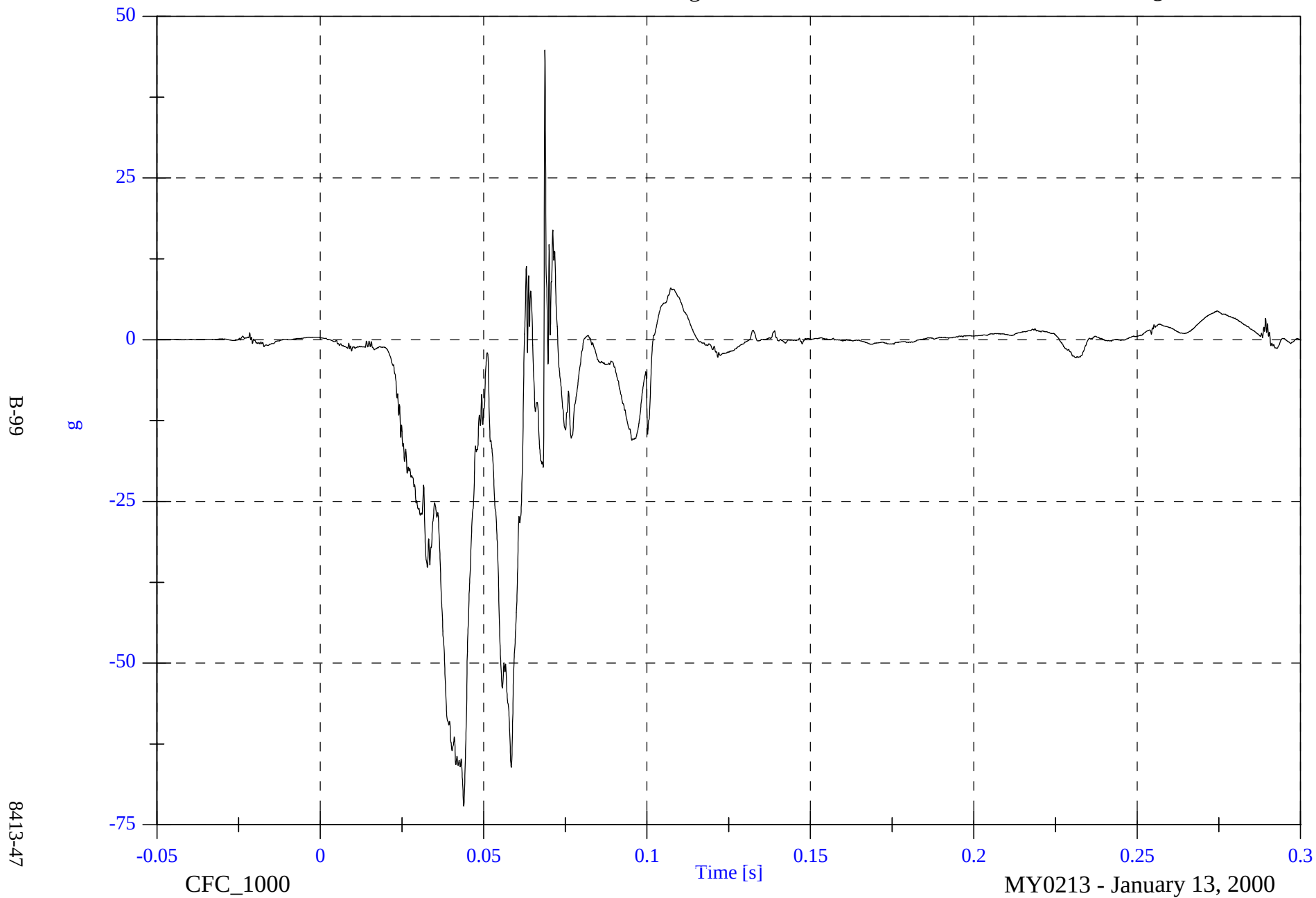


NCAP Test 8 - 2000 Mercury Villager Sport

Max: 44.8 [g] at 0.069 [s]

Min: -72.1 [g] at 0.044 [s]

P2 Right Foot Aft x

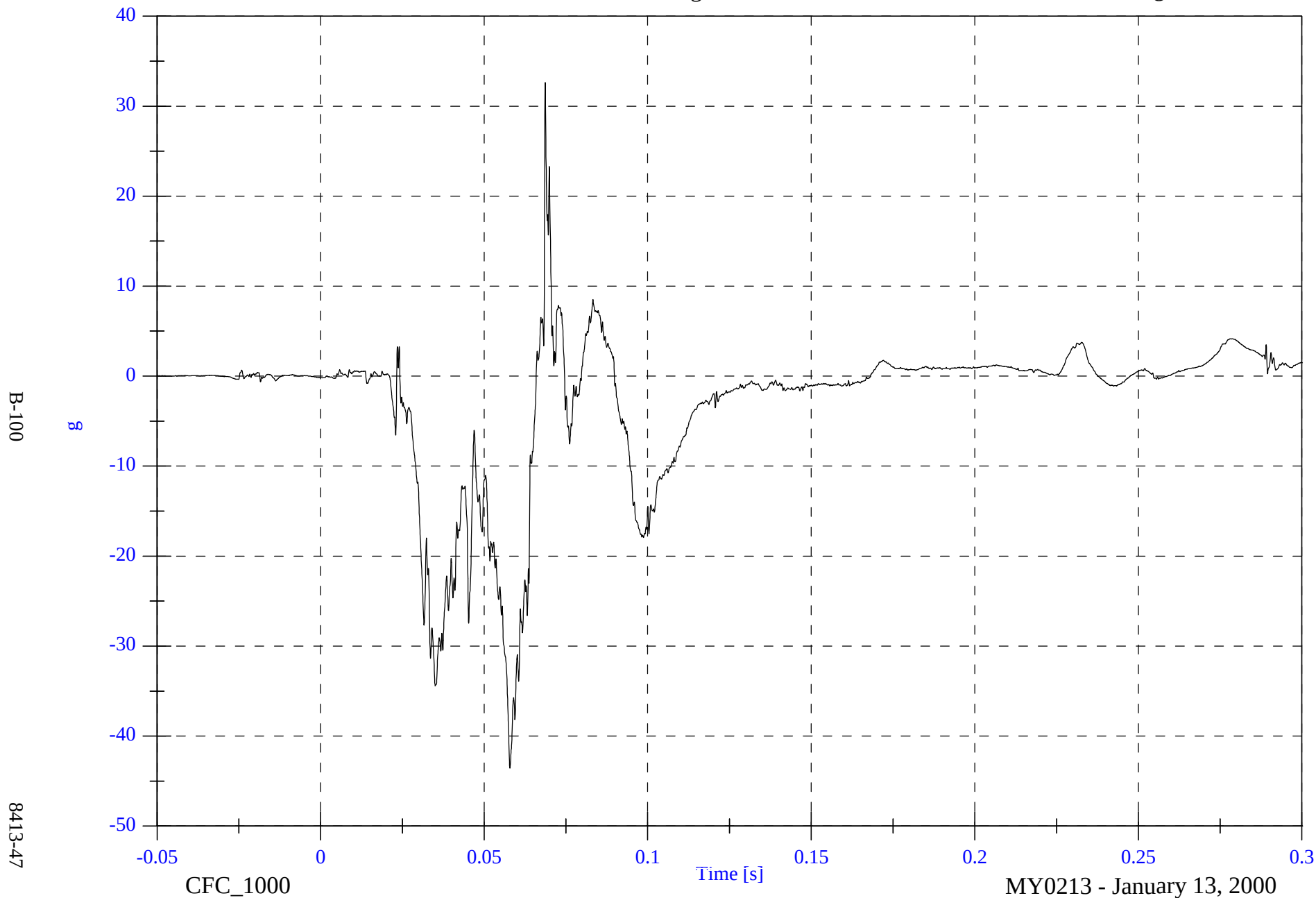


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Right Foot Aft z

Max: 32.7 [g] at 0.069 [s]

Min: -43.6 [g] at 0.058 [s]

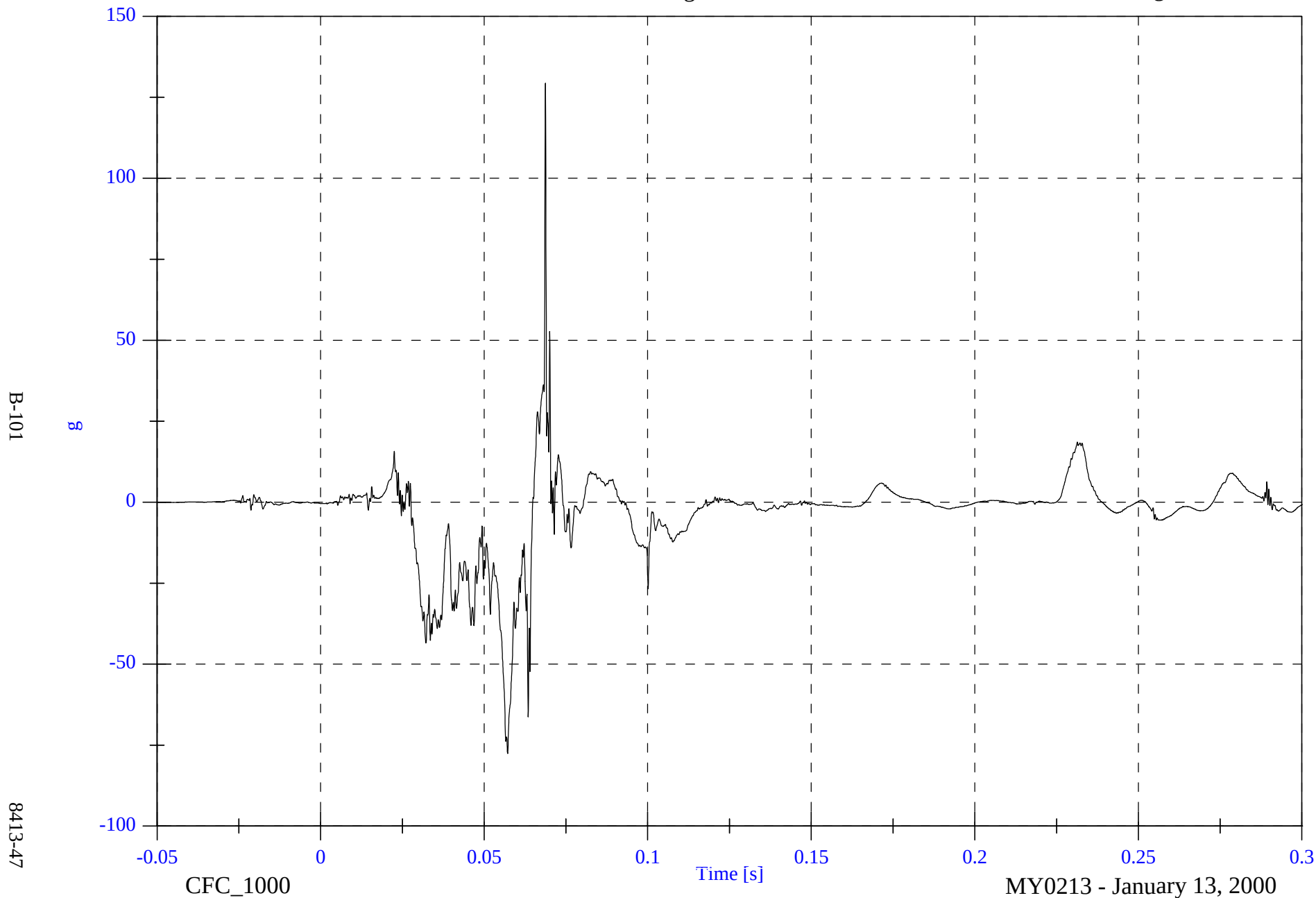


NCAP Test 8 - 2000 Mercury Villager Sport

Max: 129.3 [g] at 0.069 [s]

P2 Right Foot Fore x

Min: -77.6 [g] at 0.057 [s]

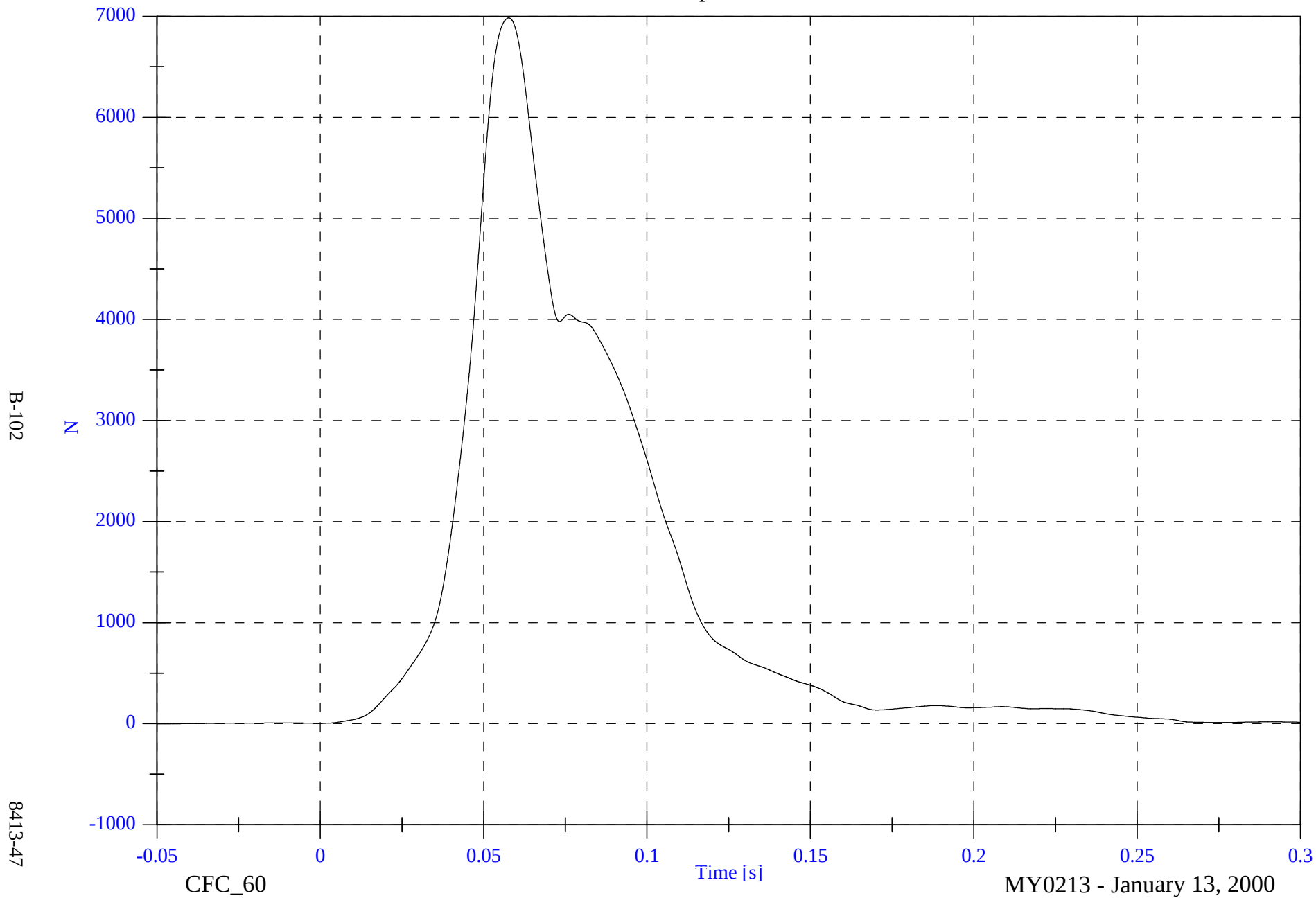


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Lap Belt Force

Max: 6983.5 [N] at 0.058 [s]

Min: -2.5 [N] at -0.050 [s]

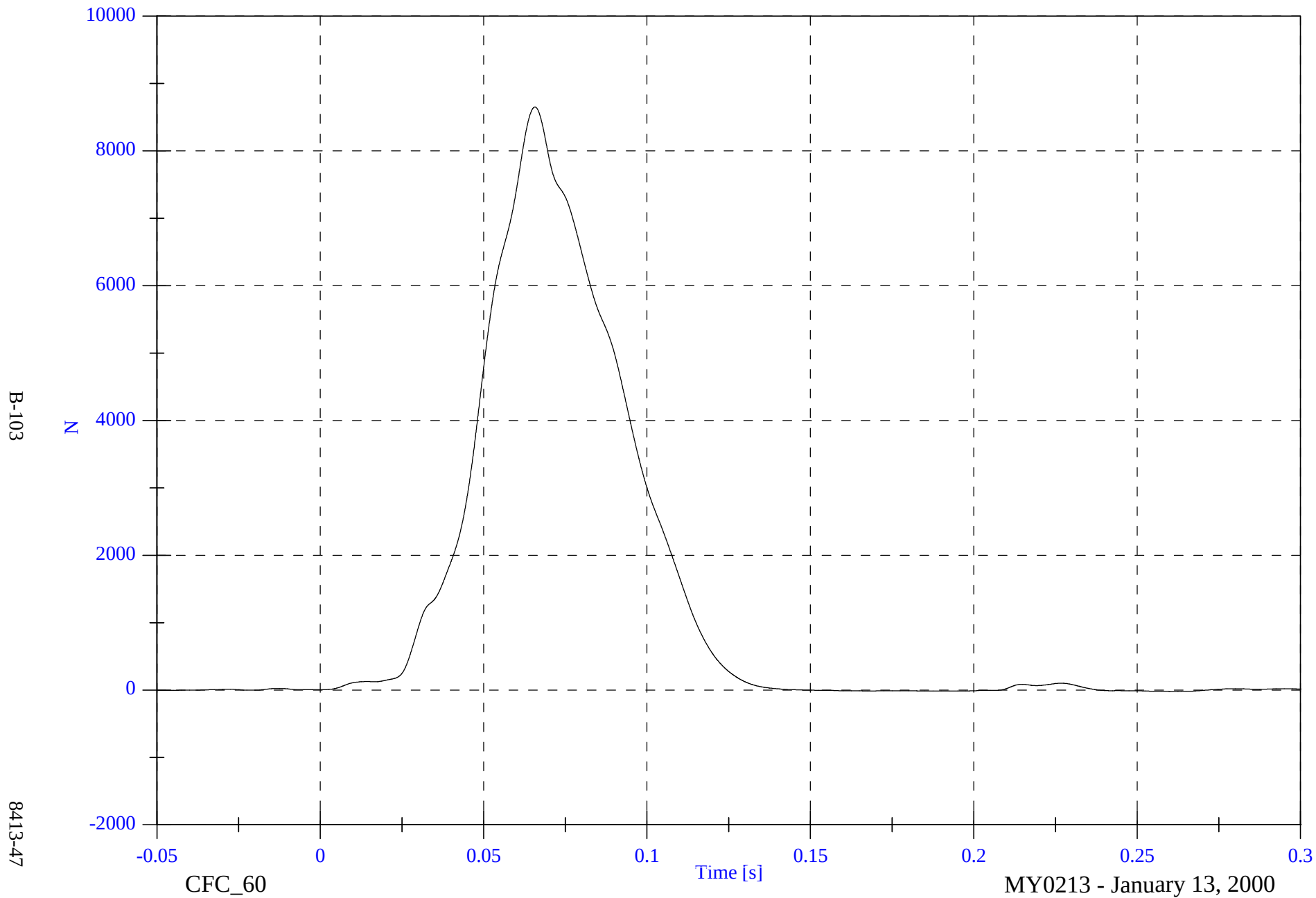


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Shoulder Belt Force

Max: 8652.1 [N] at 0.066 [s]

Min: -20.6 [N] at 0.262 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

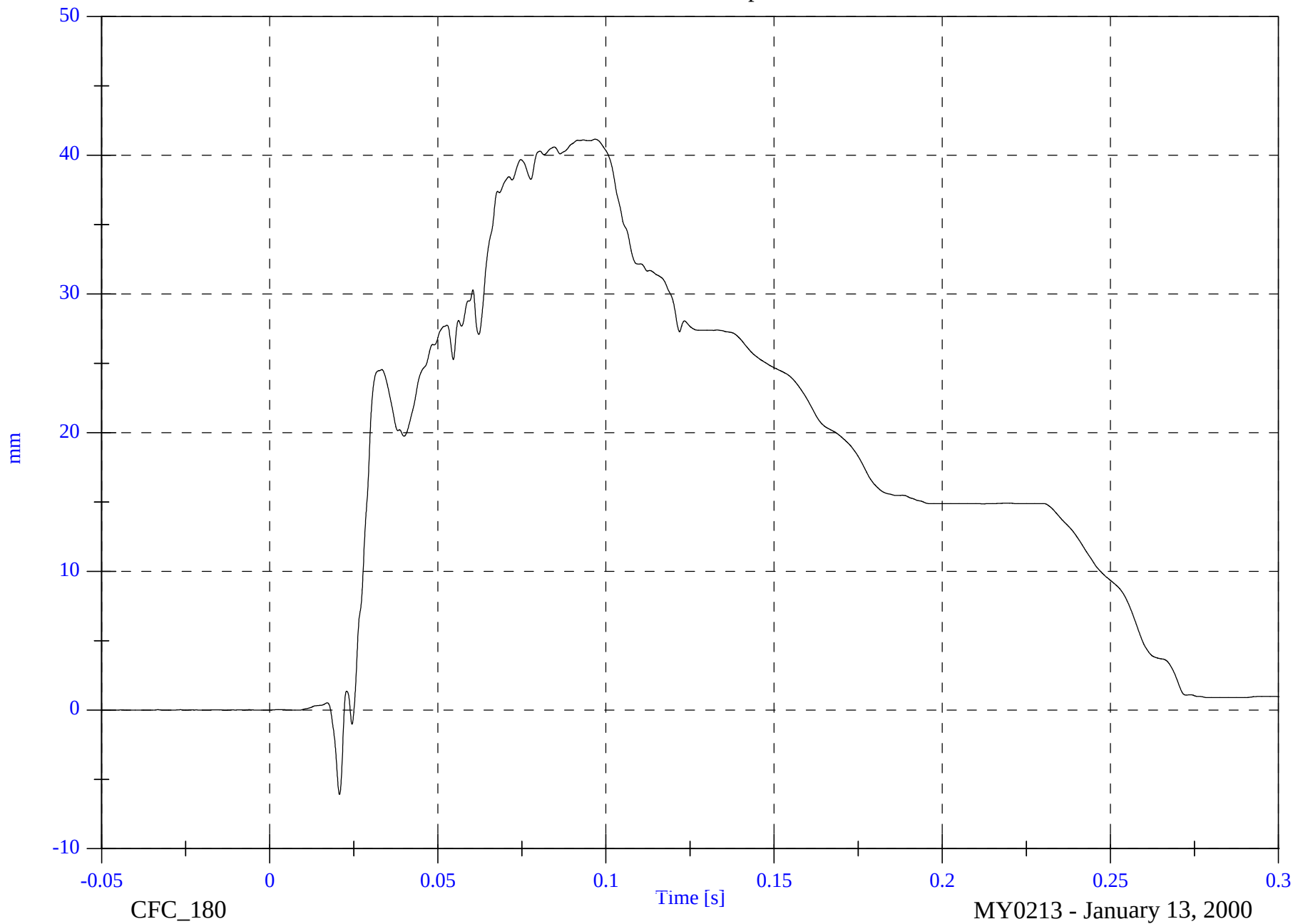
P2 Shoulder Belt Spoolout

Max: 41.2 [mm] at 0.097 [s]

Min: -6.1 [mm] at 0.021 [s]

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8413-47

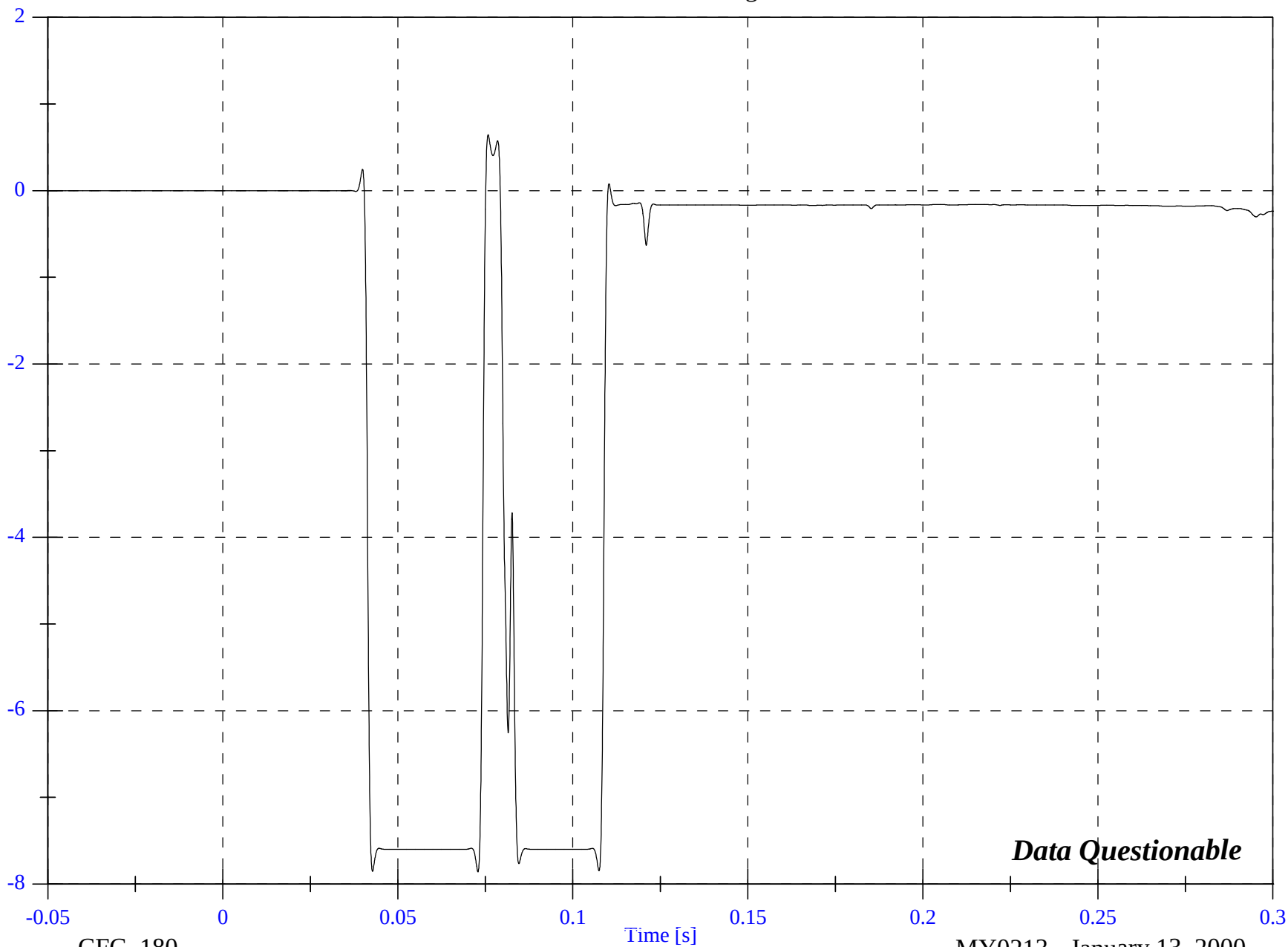


NCAP Test 8 - 2000 Mercury Villager Sport

P2 Shoulder Belt Elongation

Max: 0.6 [mm] at 0.076 [s]

Min: -7.9 [mm] at 0.073 [s]



Data Questionable

B-105

8413-47

CFC_180

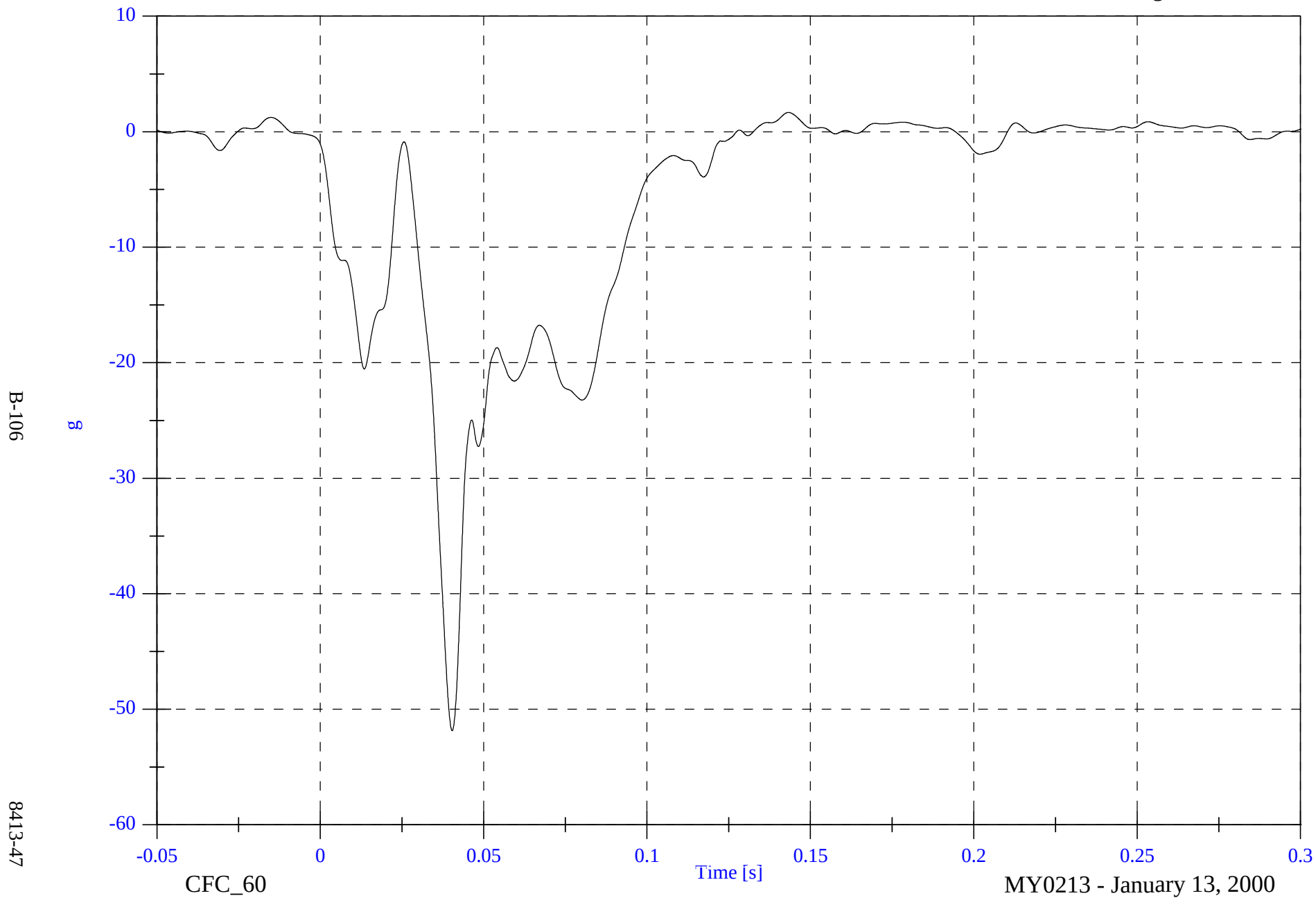
MY0213 - January 13, 2000

NCAP Test 8 - 2000 Mercury Villager Sport

Left Rear #1x

Max: 1.7 [g] at 0.143 [s]

Min: -51.9 [g] at 0.040 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

Left Rear #1x Velocity

Max: 57.0 [kph] at -0.010 [s]

Min: -9.6 [kph] at 0.132 [s]



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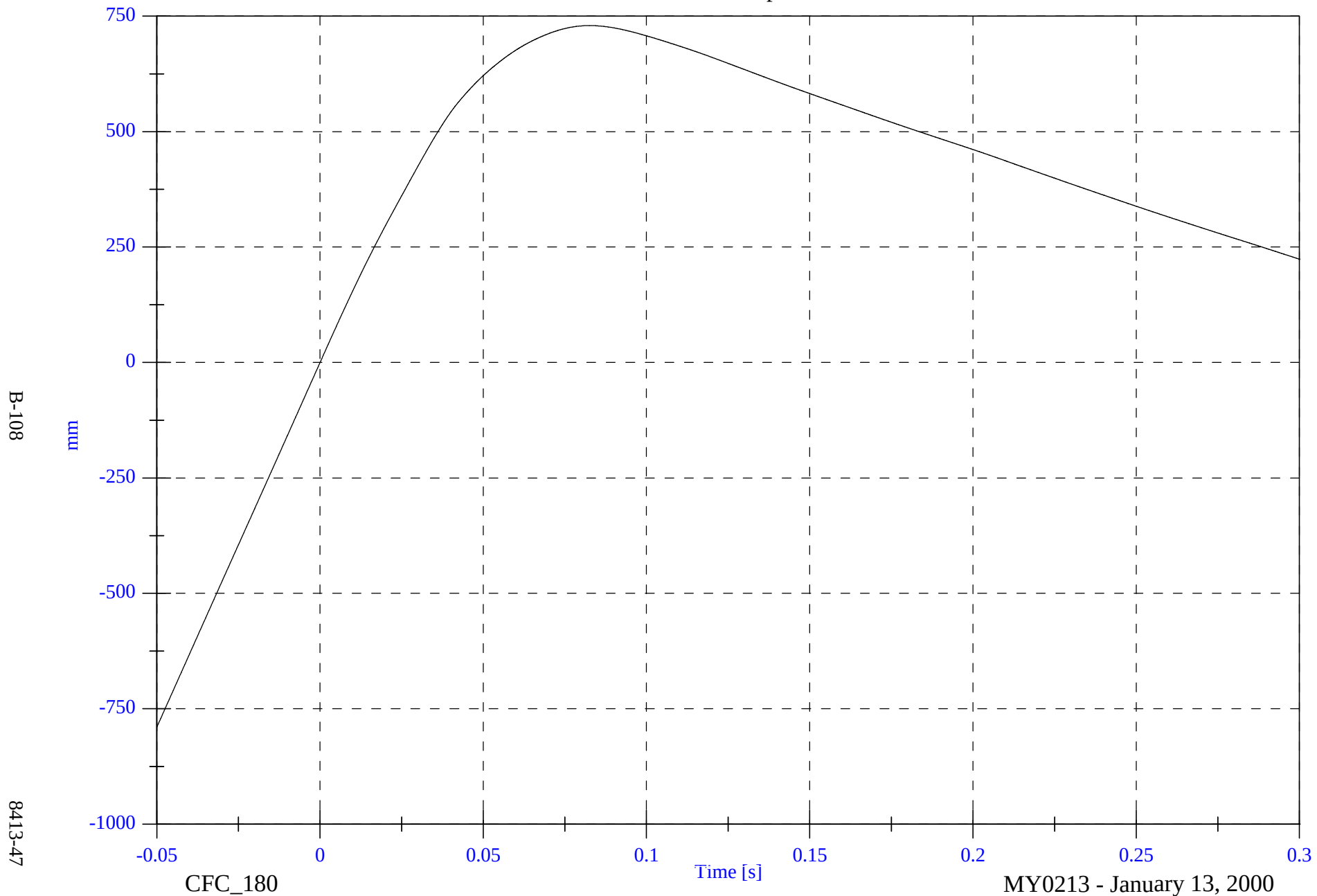
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

Left Rear #1x Displacement

Max: 729.8 [mm] at 0.083 [s]

Min: -789.8 [mm] at -0.050 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

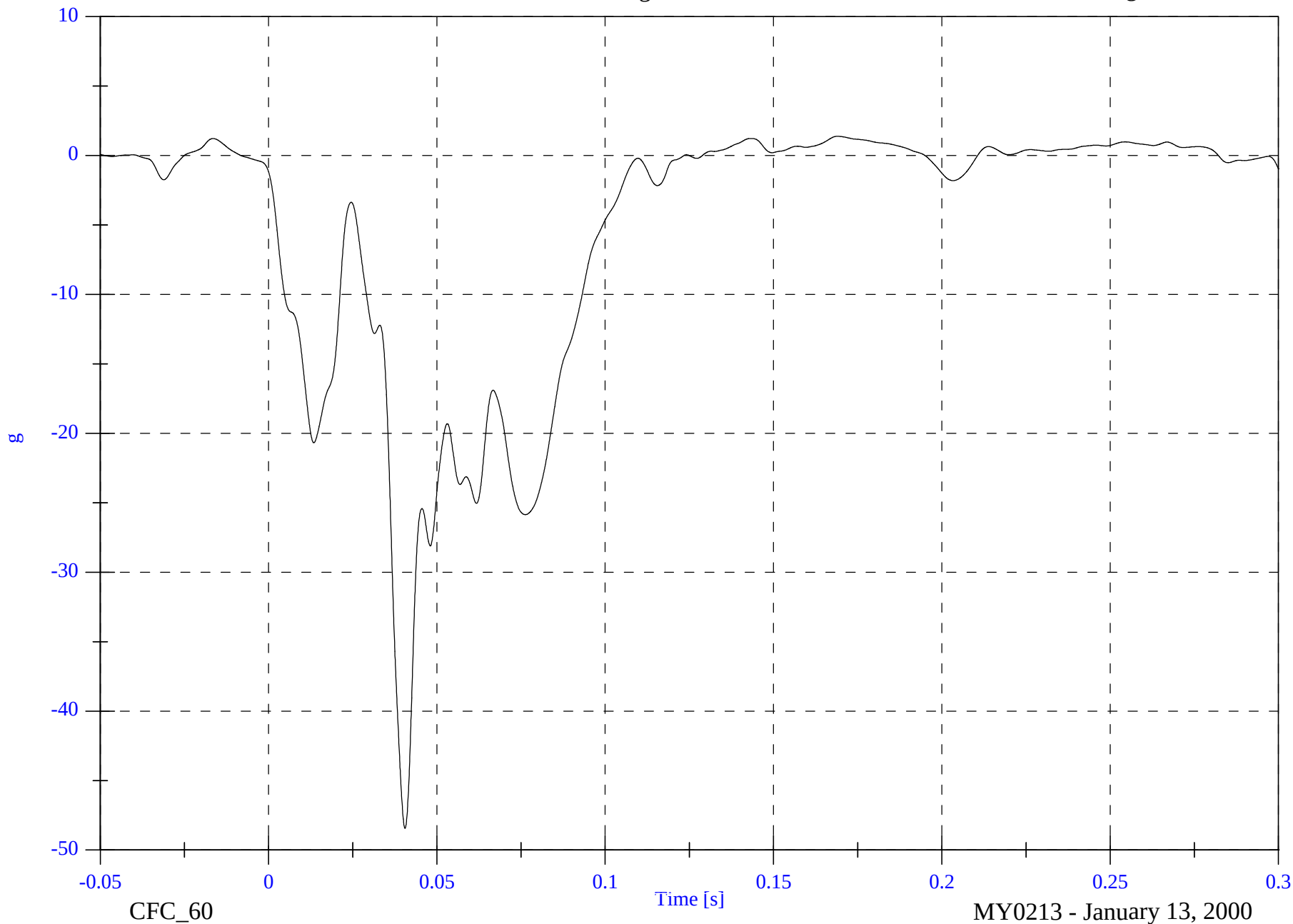
Right Rear #2x

Max: 1.4 [g] at 0.169 [s]

Min: -48.4 [g] at 0.041 [s]

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8413-47



NCAP Test 8 - 2000 Mercury Villager Sport

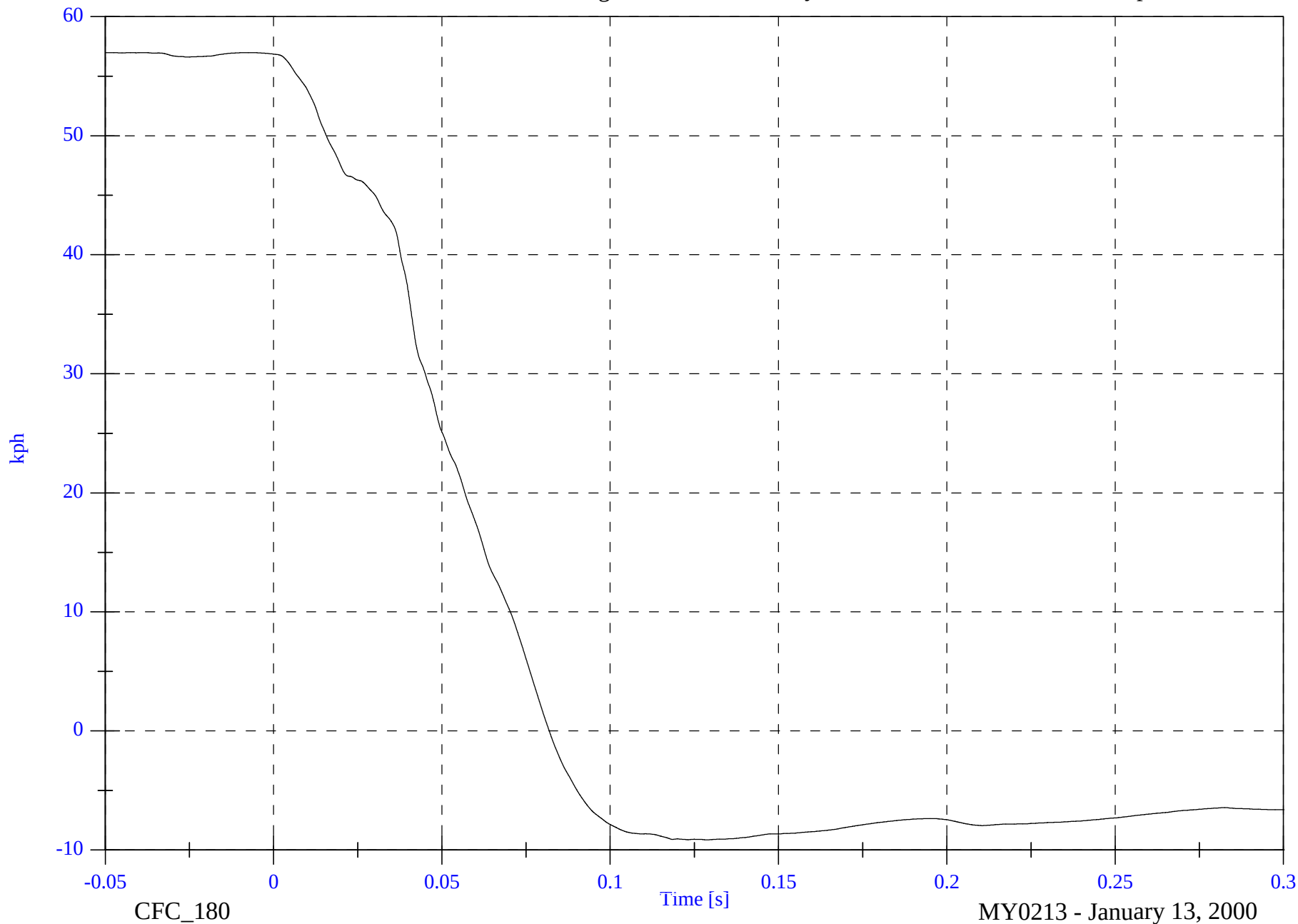
Right Rear #2x Velocity

Max: 57.0 [kph] at -0.009 [s]

Min: -9.1 [kph] at 0.129 [s]

B-110

8413-47



NCAP Test 8 - 2000 Mercury Villager Sport

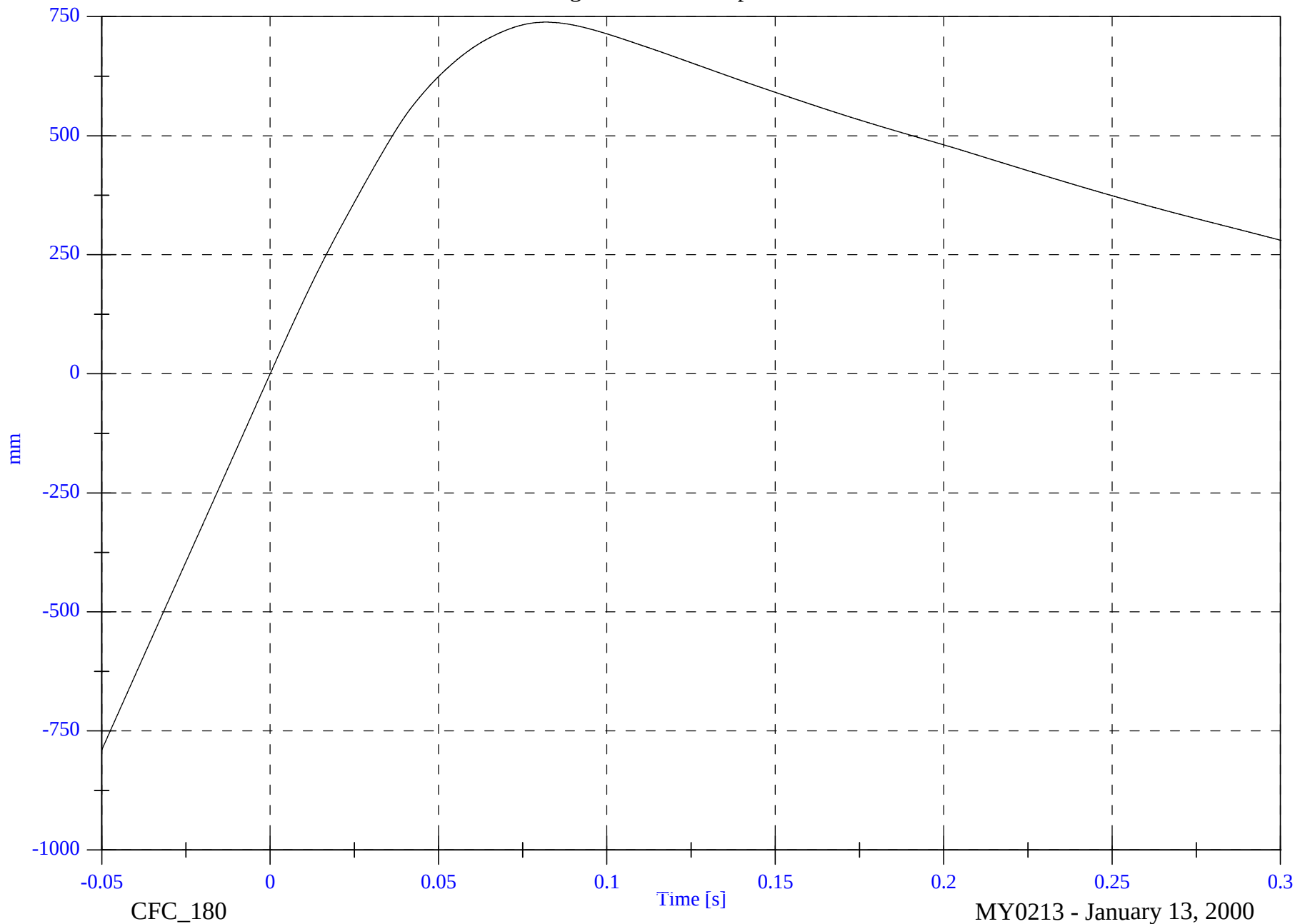
Right Rear #2x Displacement

Max: 738.6 [mm] at 0.082 [s]

Min: -789.8 [mm] at -0.050 [s]

B-111

8413-47

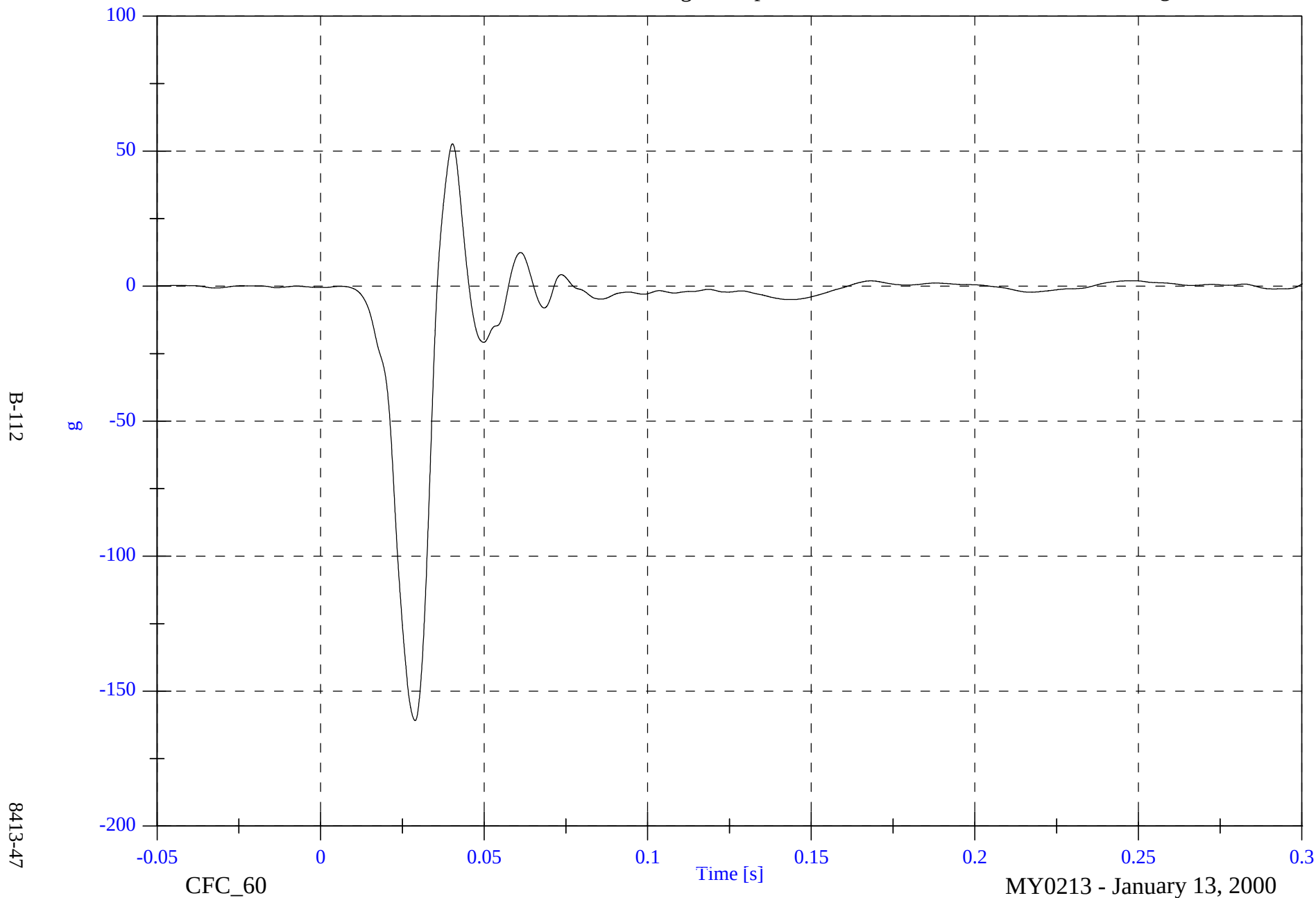


NCAP Test 8 - 2000 Mercury Villager Sport

Engine Top #3x

Max: 52.7 [g] at 0.040 [s]

Min: -160.9 [g] at 0.029 [s]

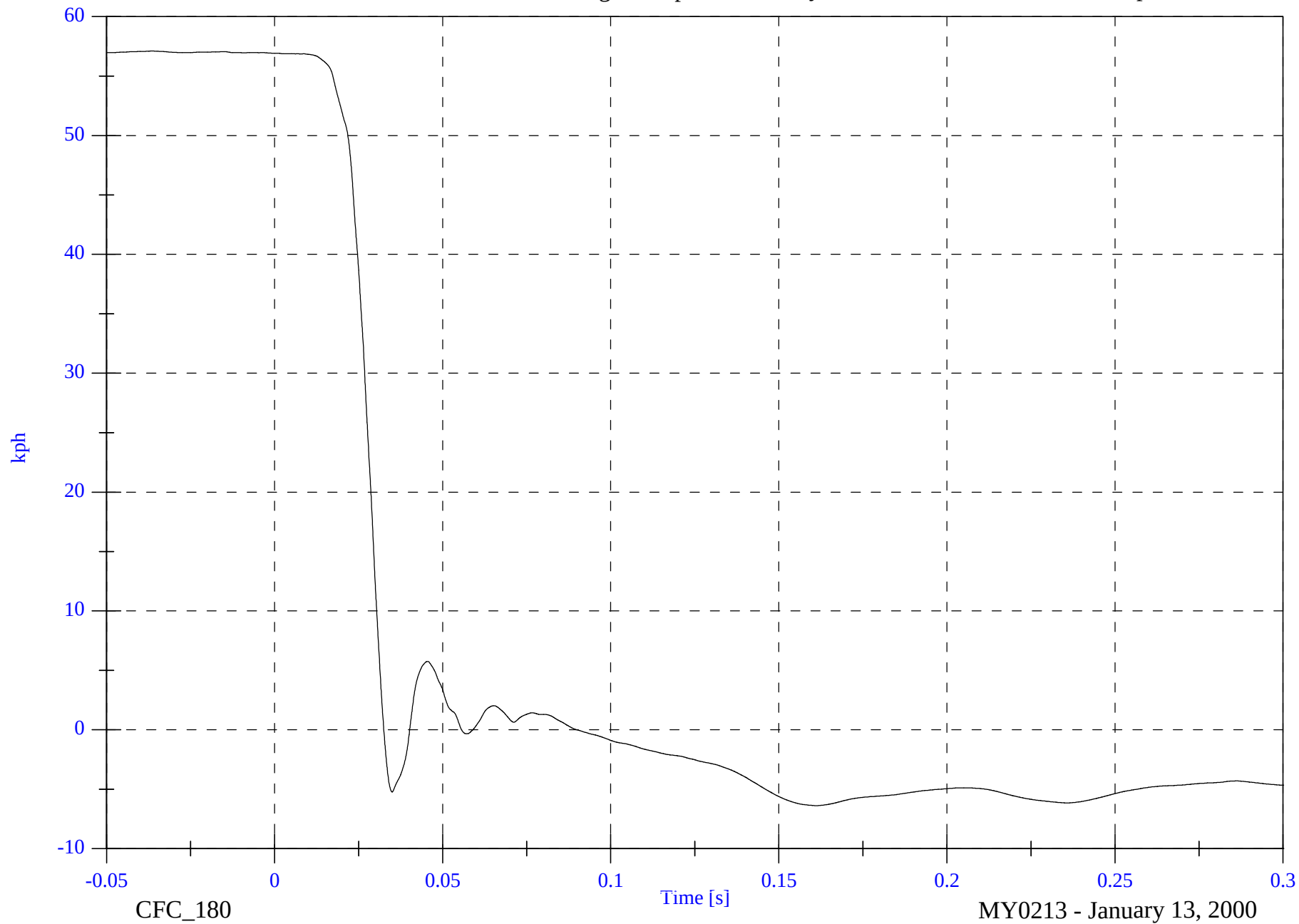


NCAP Test 8 - 2000 Mercury Villager Sport

Engine Top #3x Velocity

Max: 57.1 [kph] at -0.036 [s]

Min: -6.4 [kph] at 0.161 [s]



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8413-47

CFC_180

Time [s]

MY0213 - January 13, 2000

NCAP Test 8 - 2000 Mercury Villager Sport

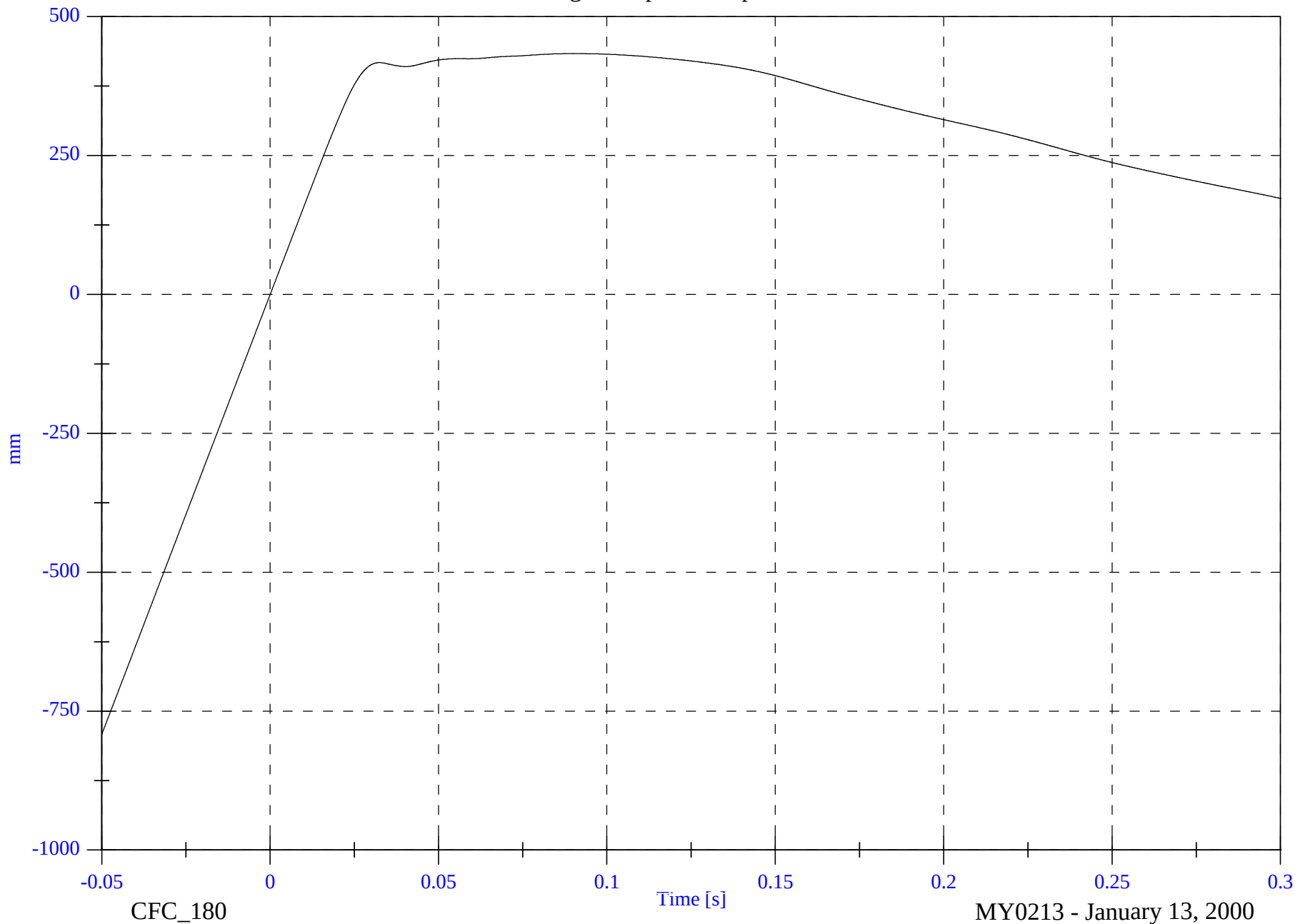
Engine Top #3x Displacement

Max: 433.6 [mm] at 0.090 [s]

Min: -791.8 [mm] at -0.050 [s]

B-114

8413-47

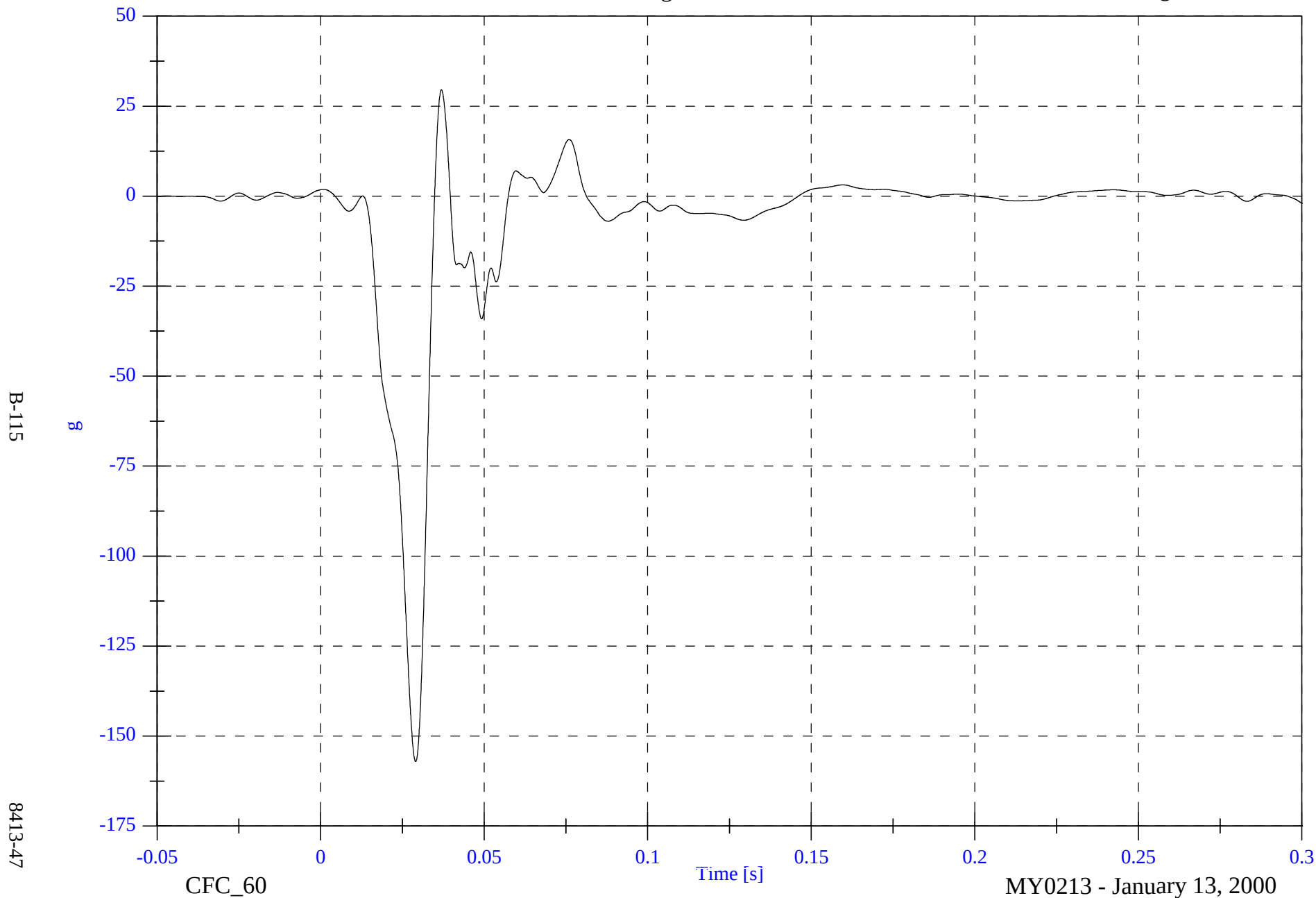


NCAP Test 8 - 2000 Mercury Villager Sport

Engine Bottom #4x

Max: 29.6 [g] at 0.037 [s]

Min: -157.1 [g] at 0.029 [s]

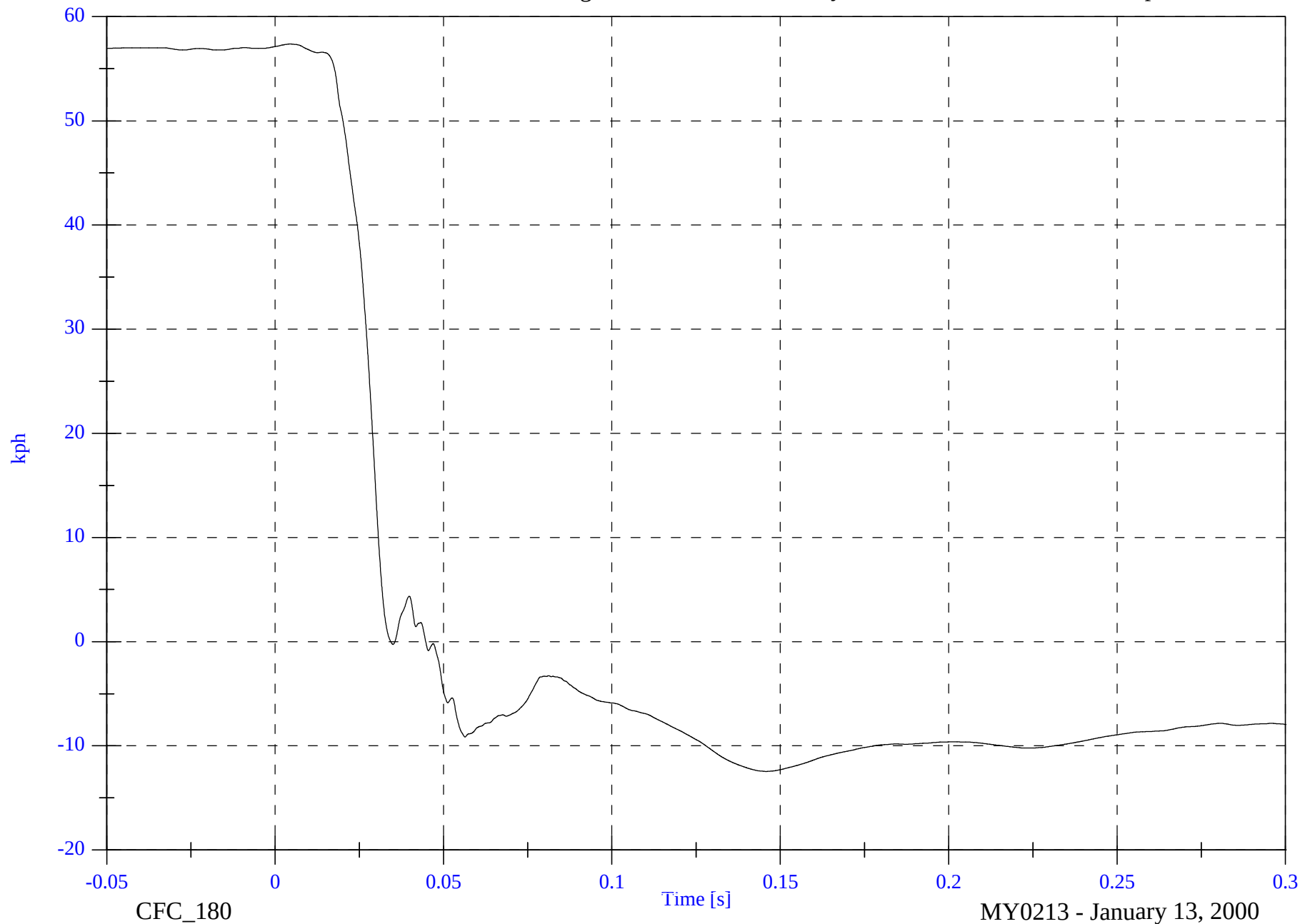


NCAP Test 8 - 2000 Mercury Villager Sport

Engine Bottom #4x Velocity

Max: 57.4 [kph] at 0.004 [s]

Min: -12.5 [kph] at 0.146 [s]



B-116

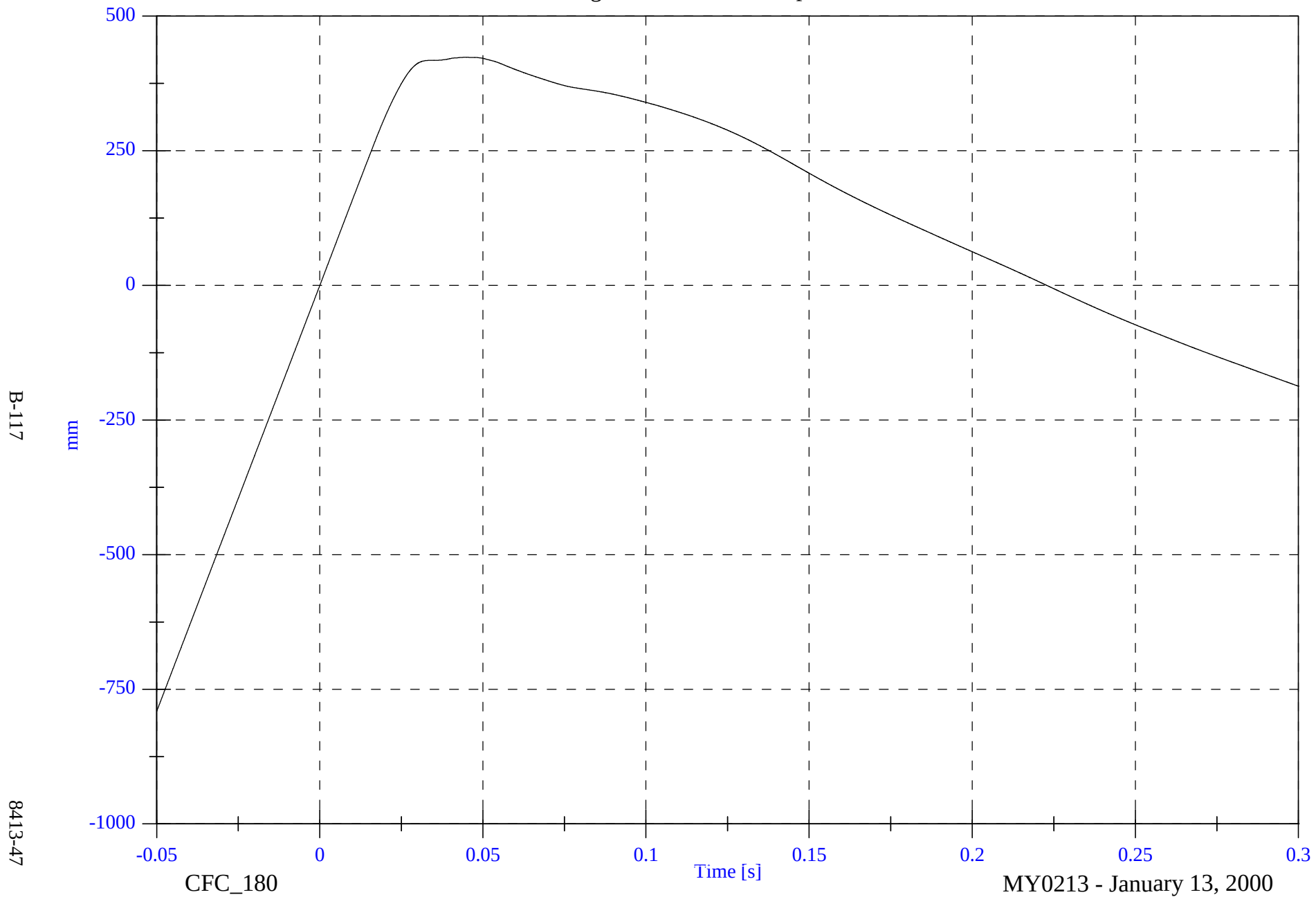
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

Engine Bottom #4x Displacement

Max: 423.7 [mm] at 0.045 [s]

Min: -790.9 [mm] at -0.050 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

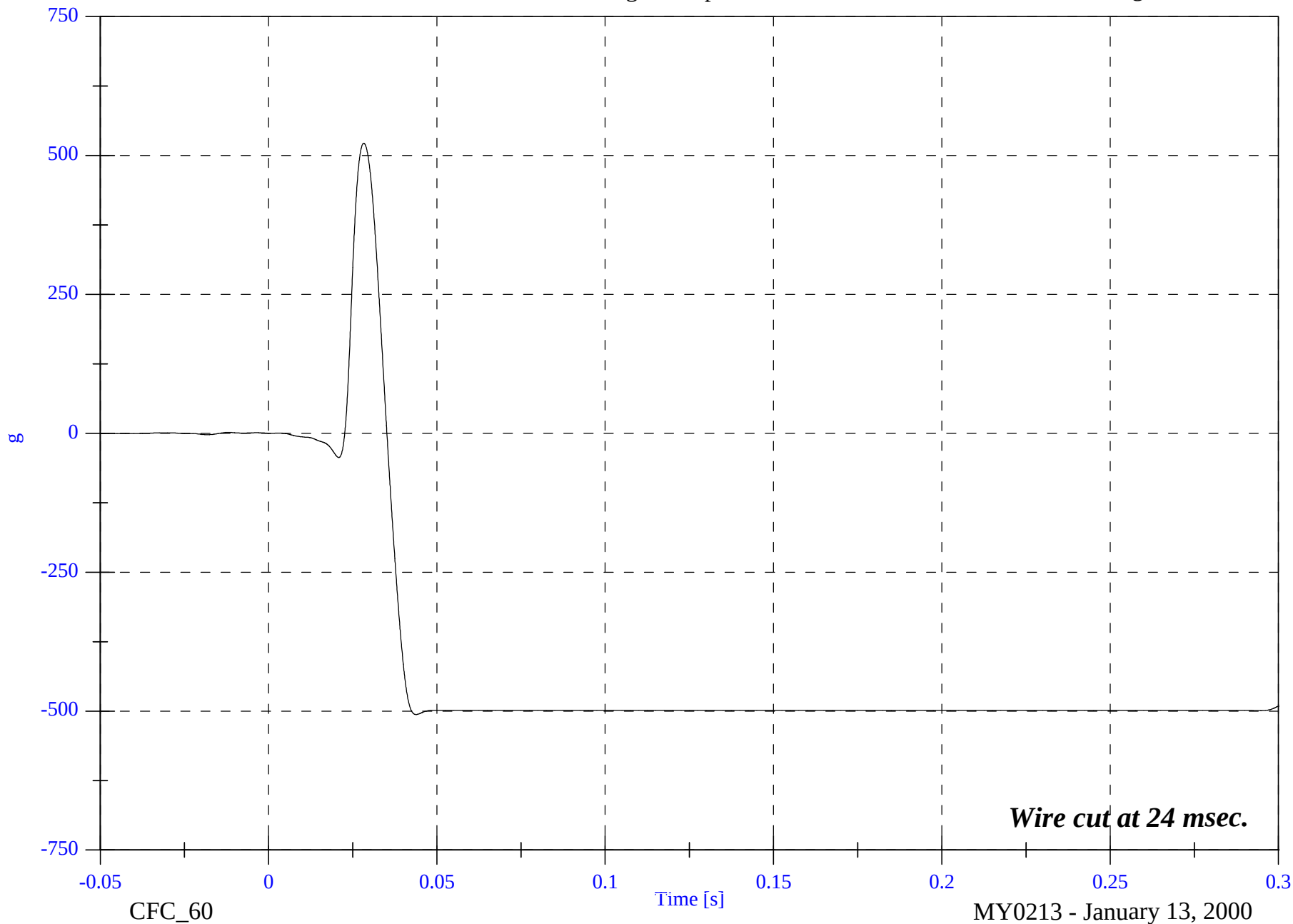
Right Caliper #5x

Max: 522.3 [g] at 0.028 [s]

Min: -506.2 [g] at 0.044 [s]

B-118

8413-47

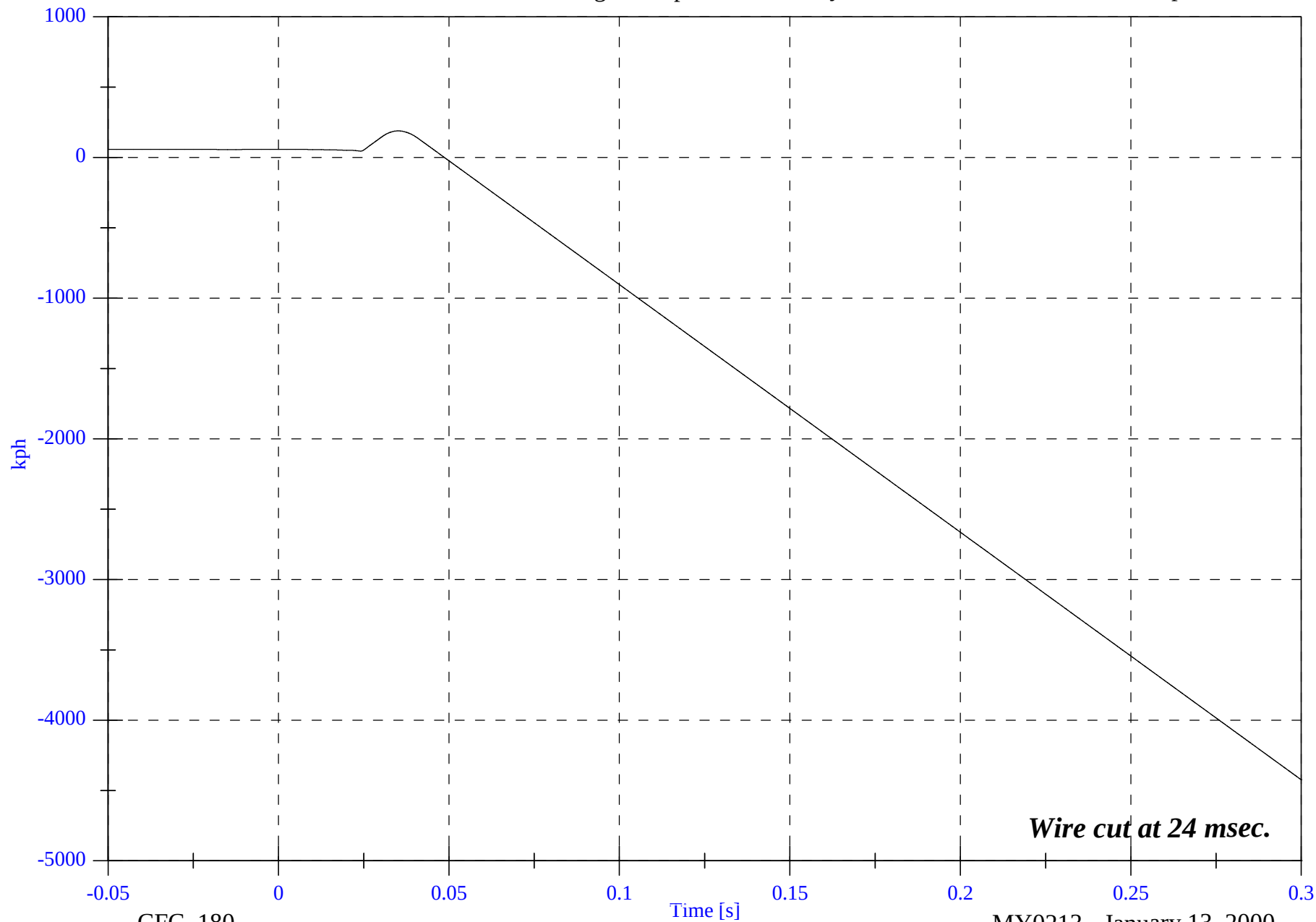


NCAP Test 8 - 2000 Mercury Villager Sport

Right Caliper #5x Velocity

Max: 189.4 [kph] at 0.035 [s]

Min: -4423.7 [kph] at 0.300 [s]



B-119

8413-47

CFC_180

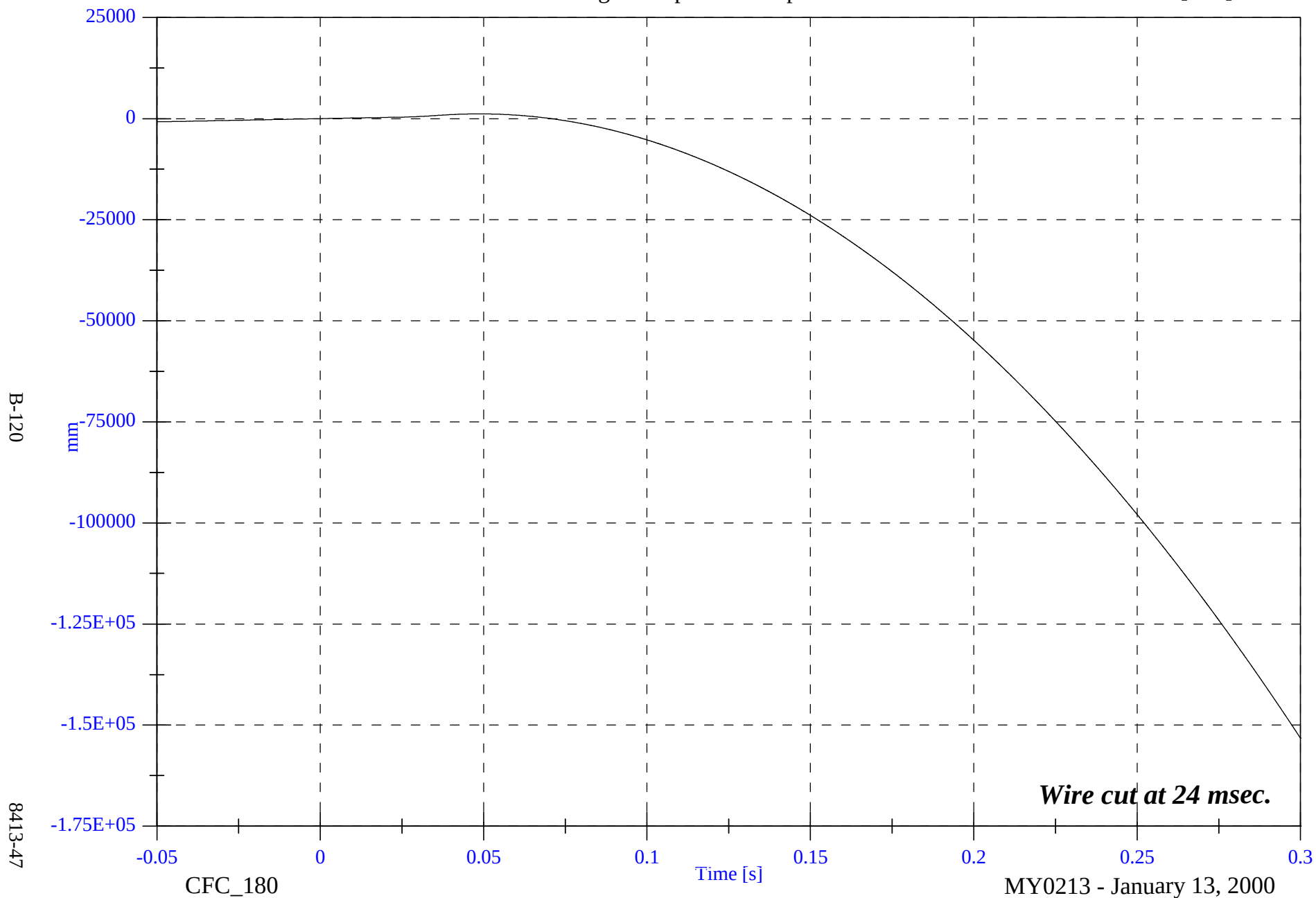
MY0213 - January 13, 2000

NCAP Test 8 - 2000 Mercury Villager Sport

Right Caliper #5x Displacement

Max: 1185.0 [mm] at 0.049 [s]

Min: -153202.8 [mm] at 0.300 [s]

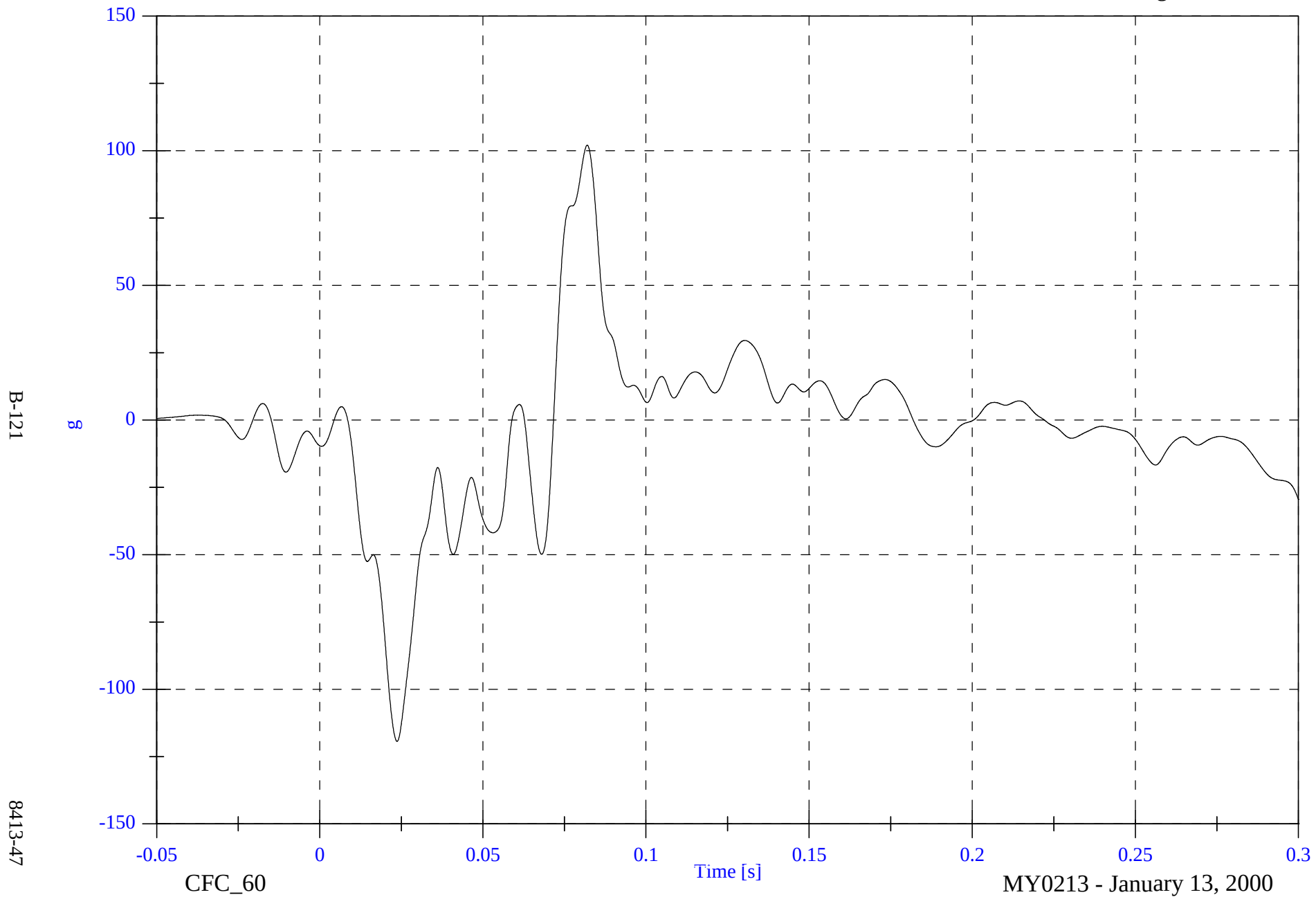


NCAP Test 8 - 2000 Mercury Villager Sport

Instrument Panel #6x

Max: 102.1 [g] at 0.082 [s]

Min: -119.4 [g] at 0.024 [s]



NCAP Test 8 - 2000 Mercury Villager Sport

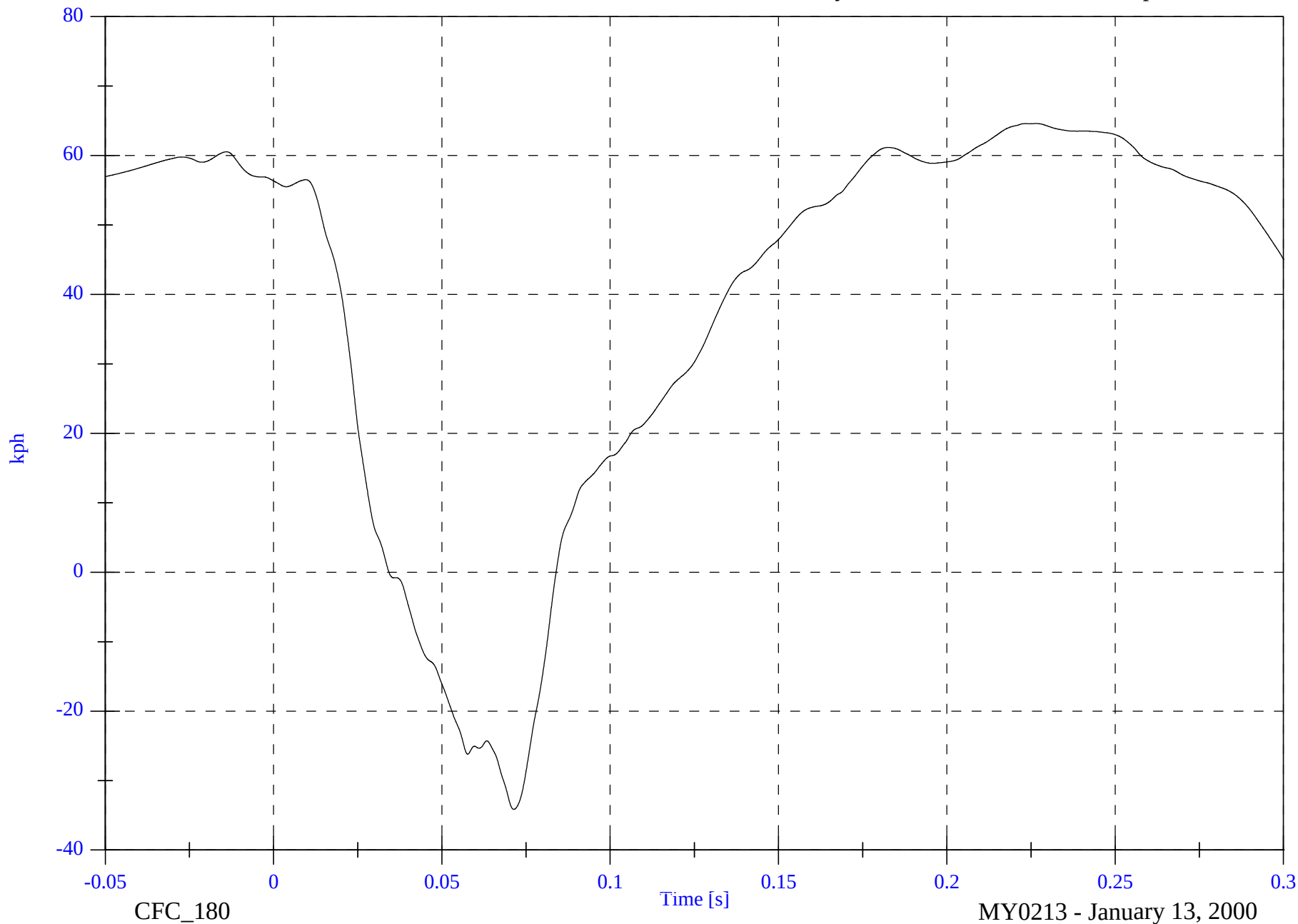
Instrument Panel #6x Velocity

Max: 64.6 [kph] at 0.227 [s]

Min: -34.2 [kph] at 0.071 [s]

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NCAP Test 8 - 2000 Mercury Villager Sport

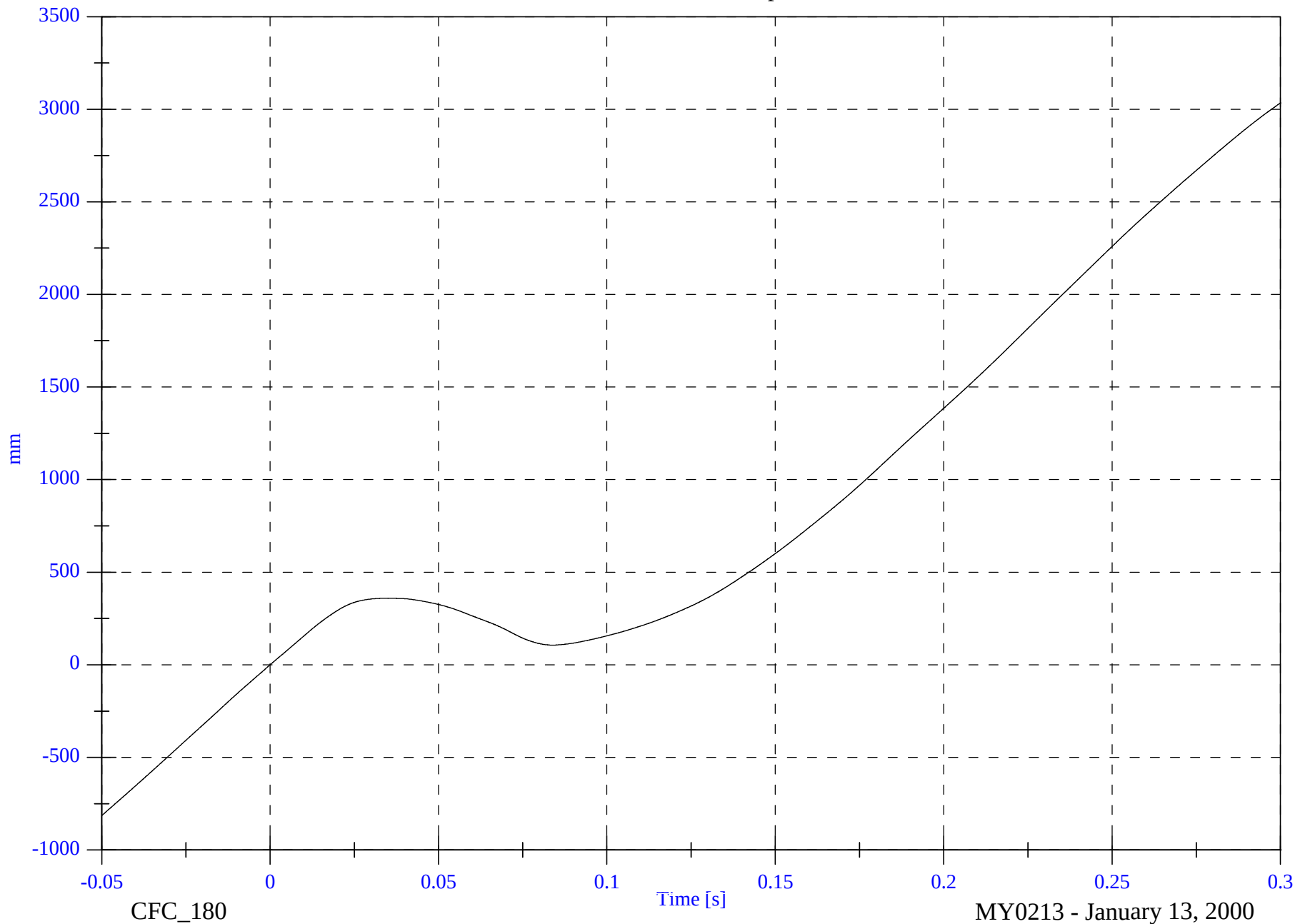
Instrument Panel #6x Displacement

Max: 3033.7 [mm] at 0.300 [s]

Min: -813.9 [mm] at -0.050 [s]

B-123

8413-47

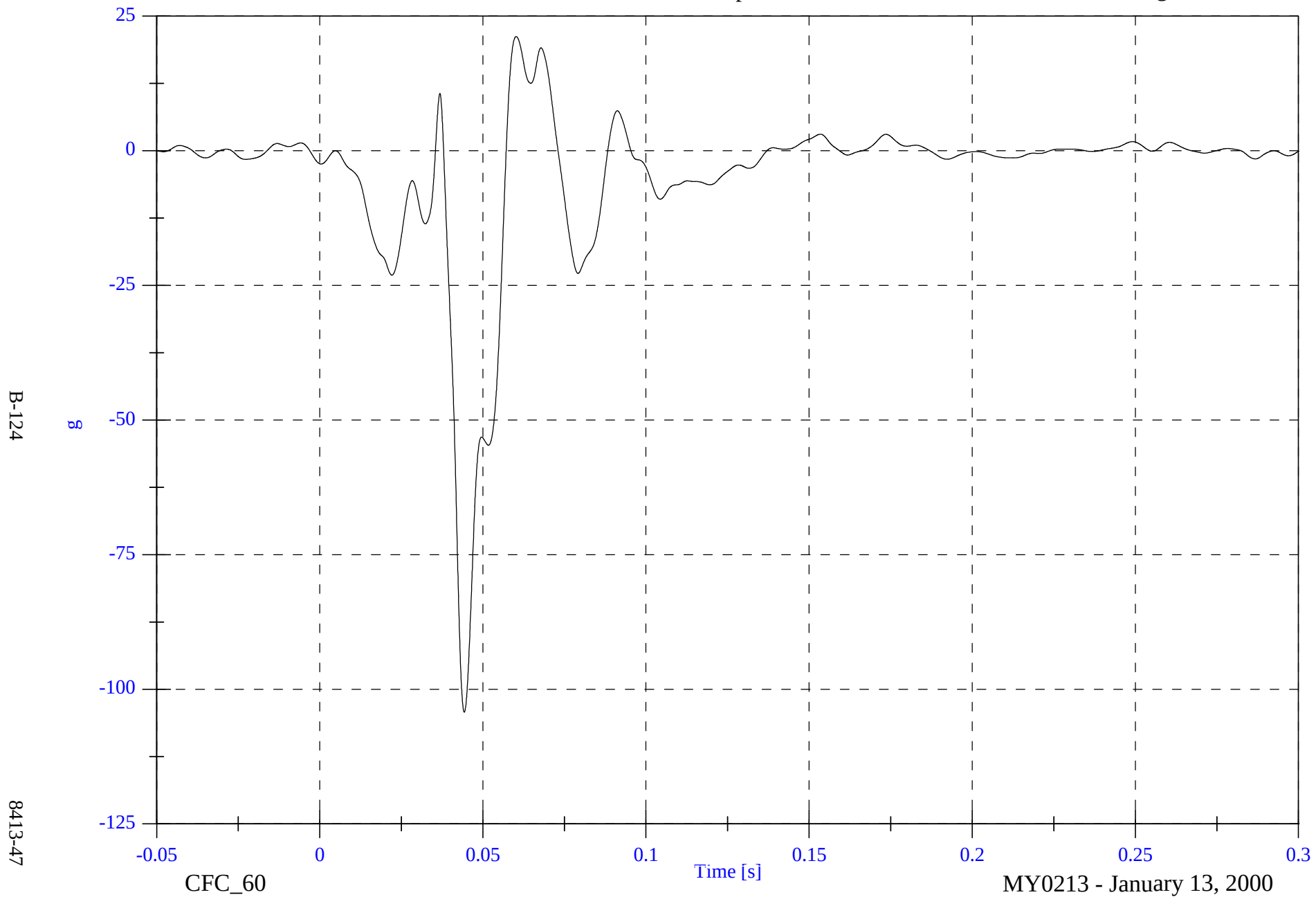


NCAP Test 8 - 2000 Mercury Villager Sport

Left Caliper #7x

Max: 21.2 [g] at 0.060 [s]

Min: -104.3 [g] at 0.044 [s]

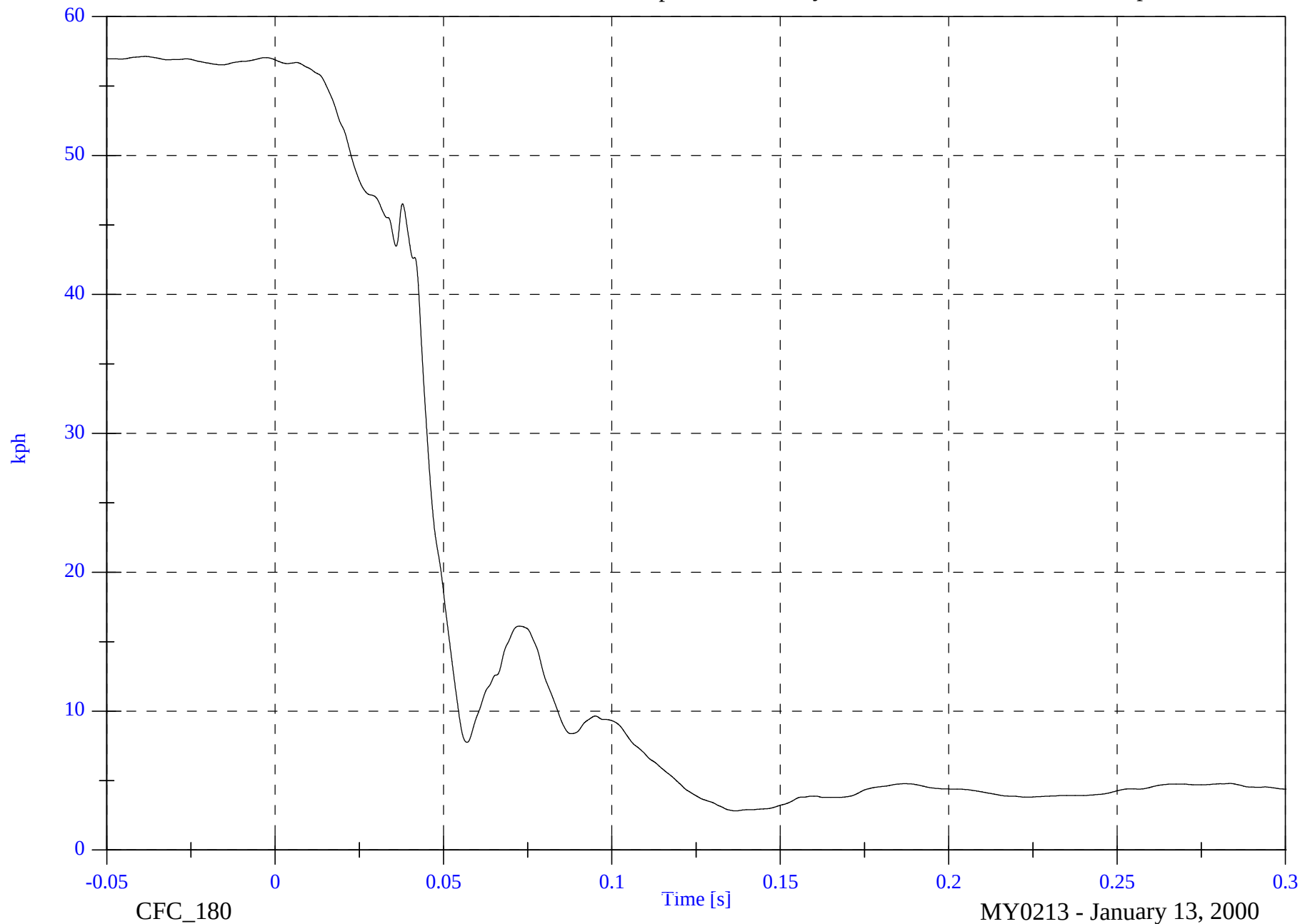


NCAP Test 8 - 2000 Mercury Villager Sport

Left Caliper #7x Velocity

Max: 57.1 [kph] at -0.039 [s]

Min: 2.8 [kph] at 0.137 [s]



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8413-47

CFC_180

Time [s]

MY0213 - January 13, 2000

NCAP Test 8 - 2000 Mercury Villager Sport

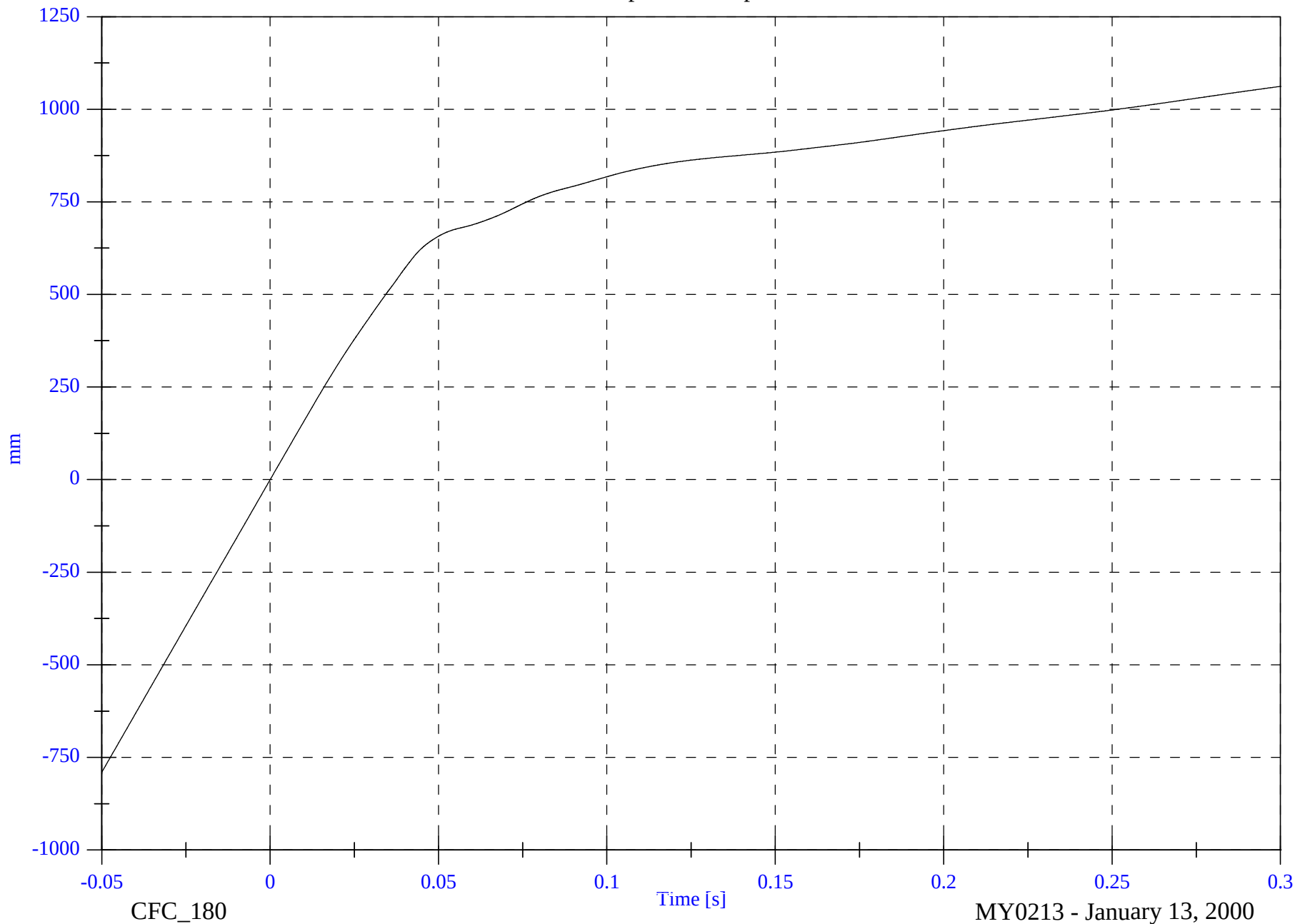
Left Caliper #7x Displacement

Max: 1061.8 [mm] at 0.300 [s]

Min: -790.1 [mm] at -0.050 [s]

B-126

8413-47

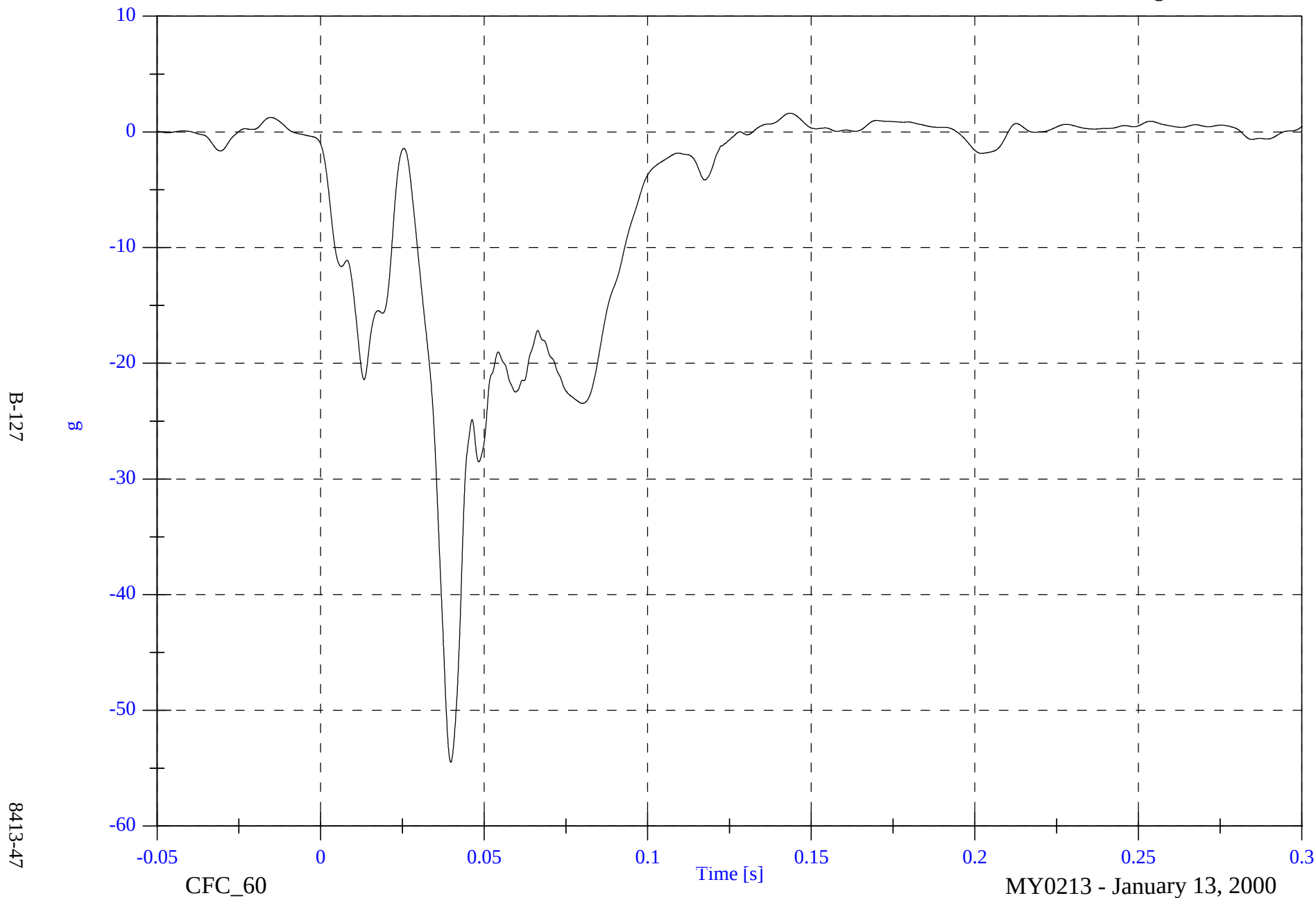


NCAP Test 8 - 2000 Mercury Villager Sport

Left Rear Red #8x

Max: 1.6 [g] at 0.144 [s]

Min: -54.5 [g] at 0.040 [s]

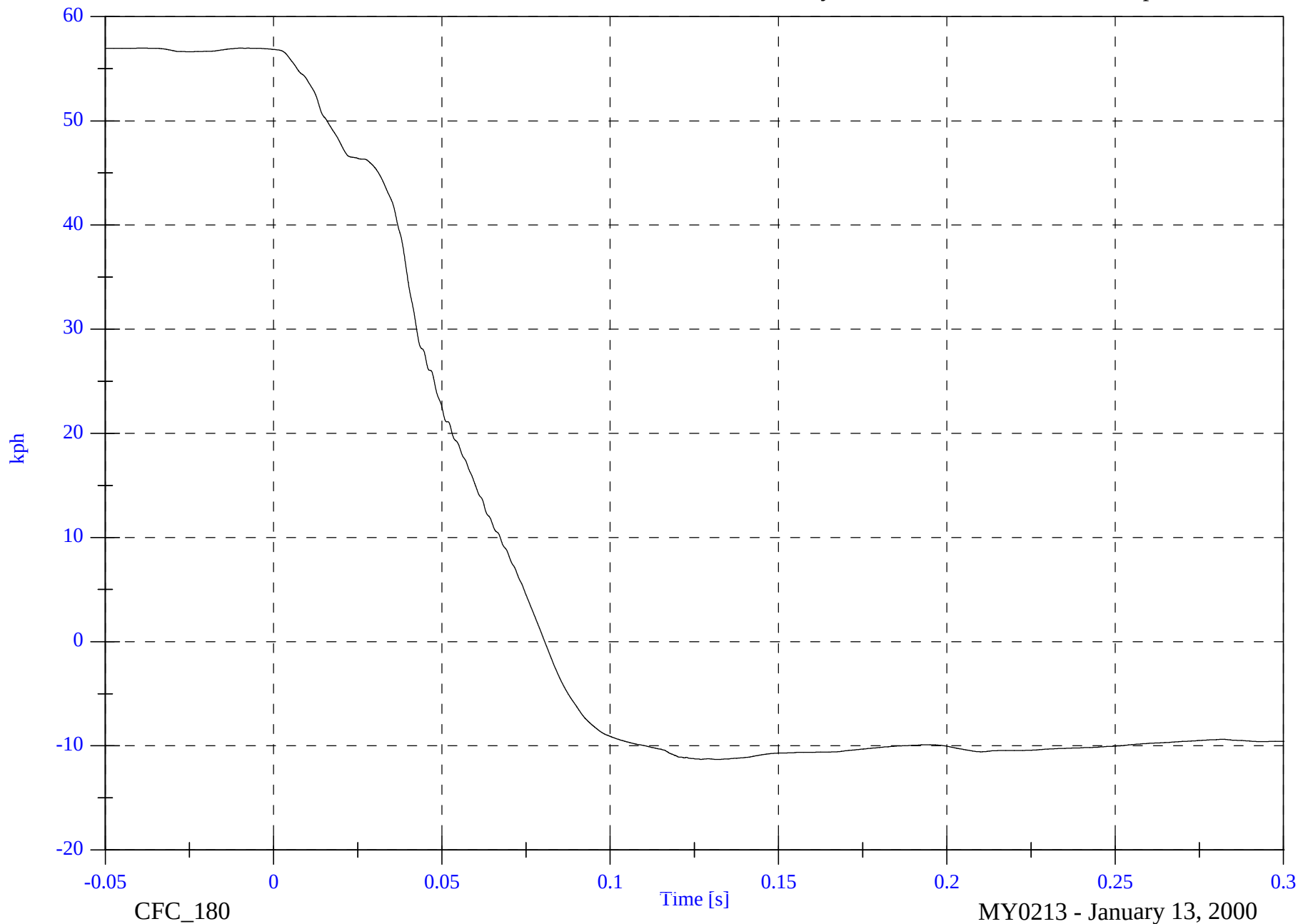


NCAP Test 8 - 2000 Mercury Villager Sport

Left Rear Red #8x Velocity

Max: 57.0 [kph] at -0.038 [s]

Min: -11.3 [kph] at 0.132 [s]



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8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

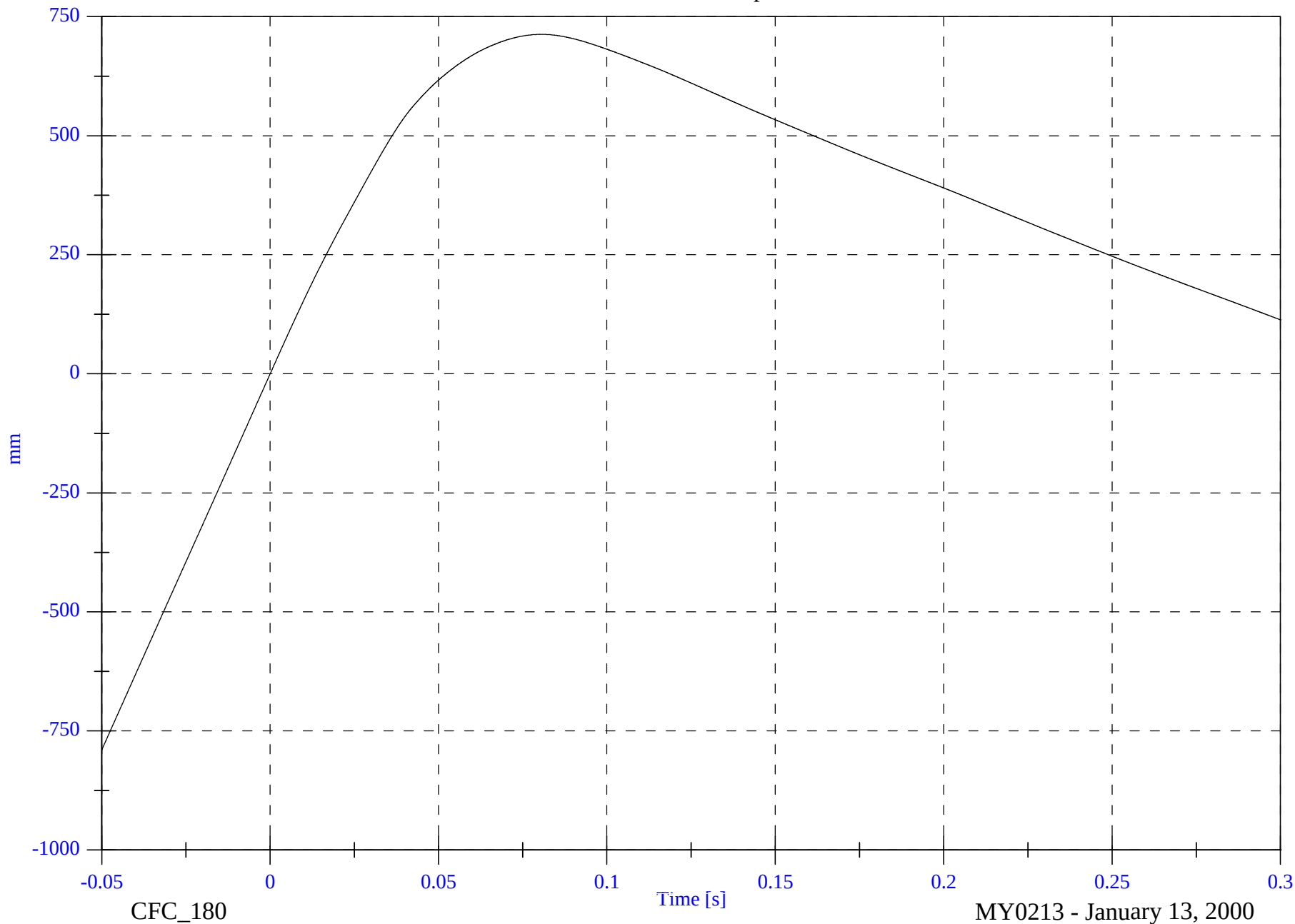
Left Rear Red #8x Displacement

Max: 712.9 [mm] at 0.081 [s]

Min: -789.8 [mm] at -0.050 [s]

B-129

8413-47

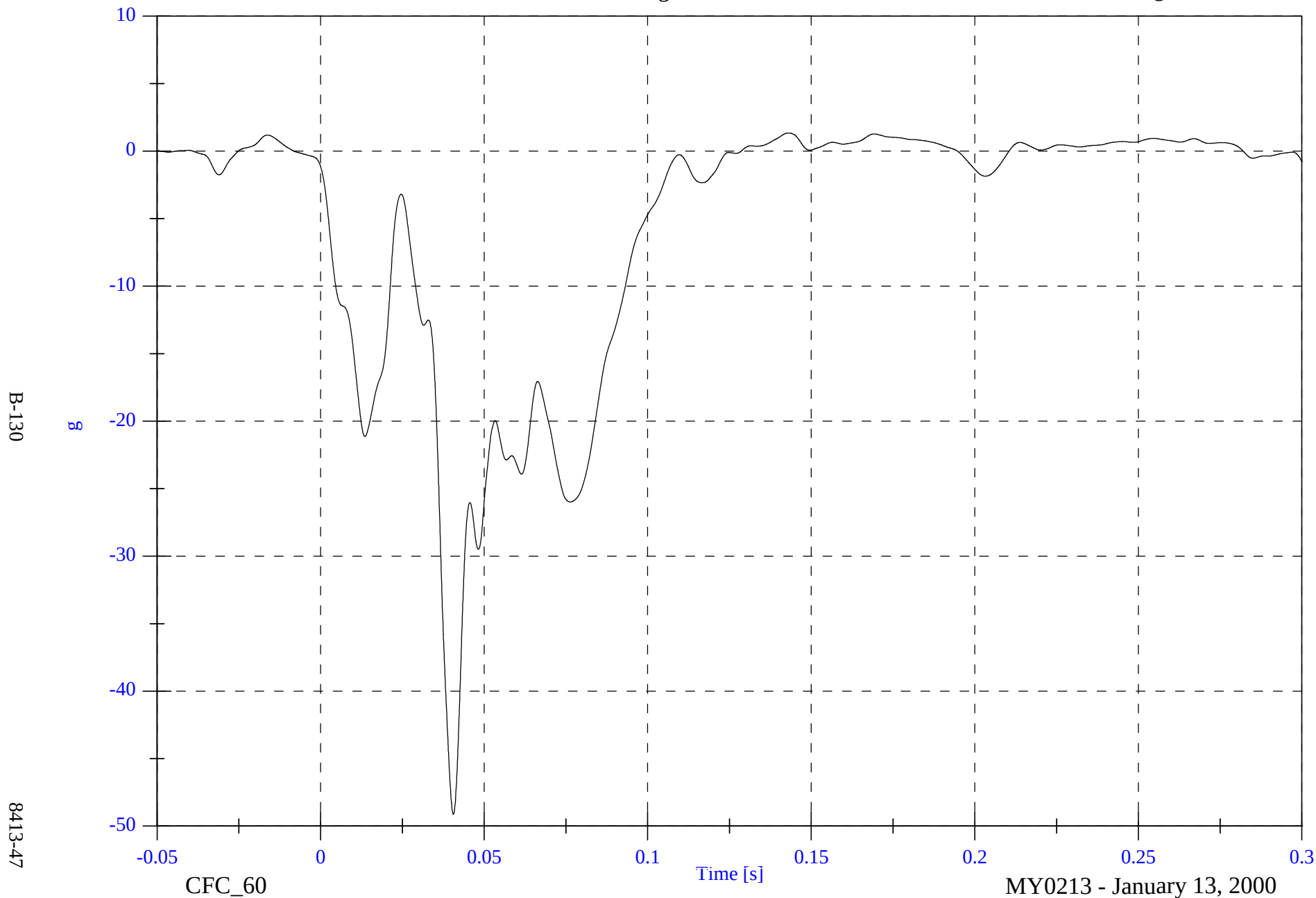


NCAP Test 8 - 2000 Mercury Villager Sport

Right Rear Red #9x

Max: 1.3 [g] at 0.143 [s]

Min: -49.1 [g] at 0.041 [s]

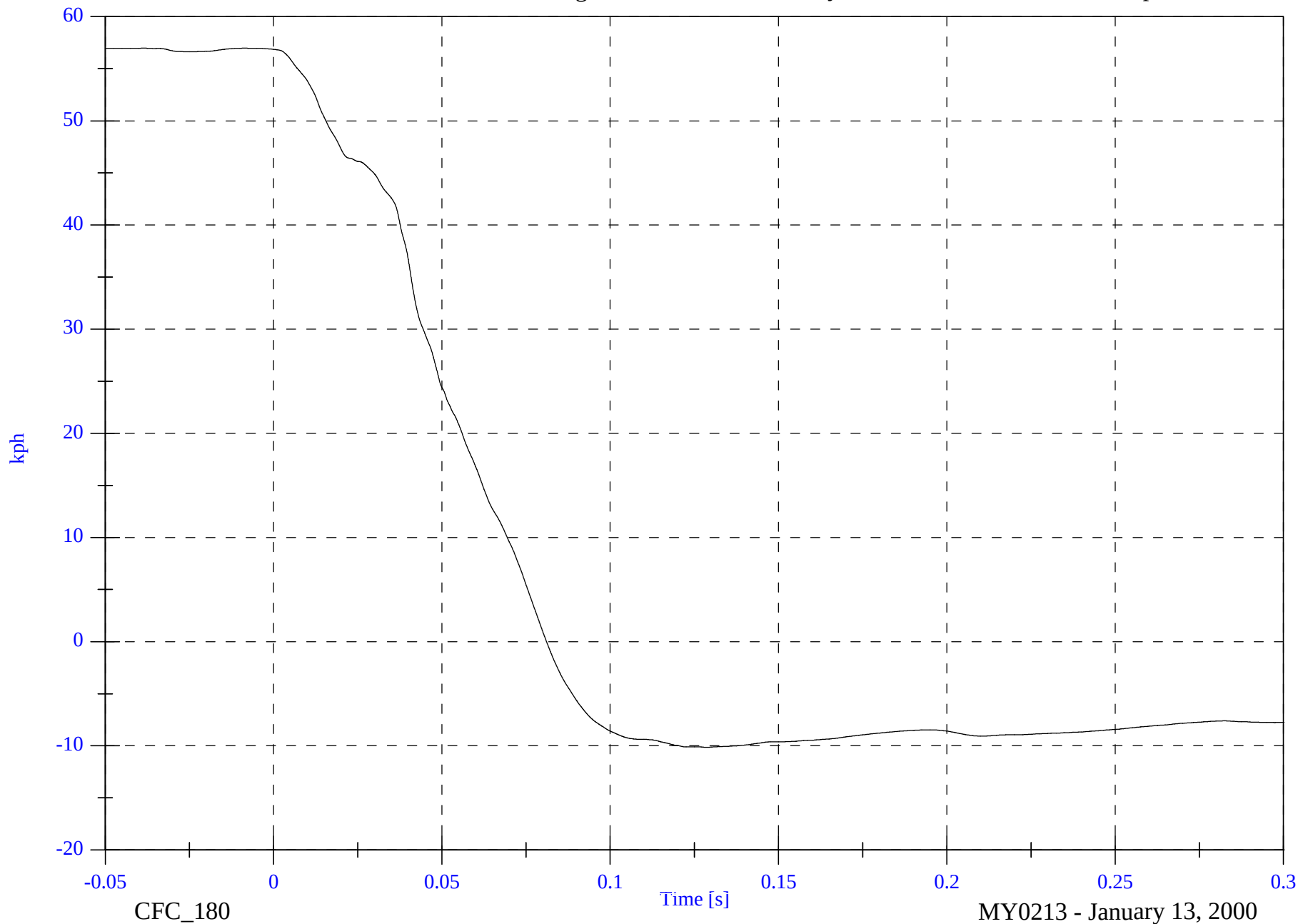


NCAP Test 8 - 2000 Mercury Villager Sport

Right Rear Red #9x Velocity

Max: 57.0 [kph] at -0.009 [s]

Min: -10.1 [kph] at 0.129 [s]



B-131

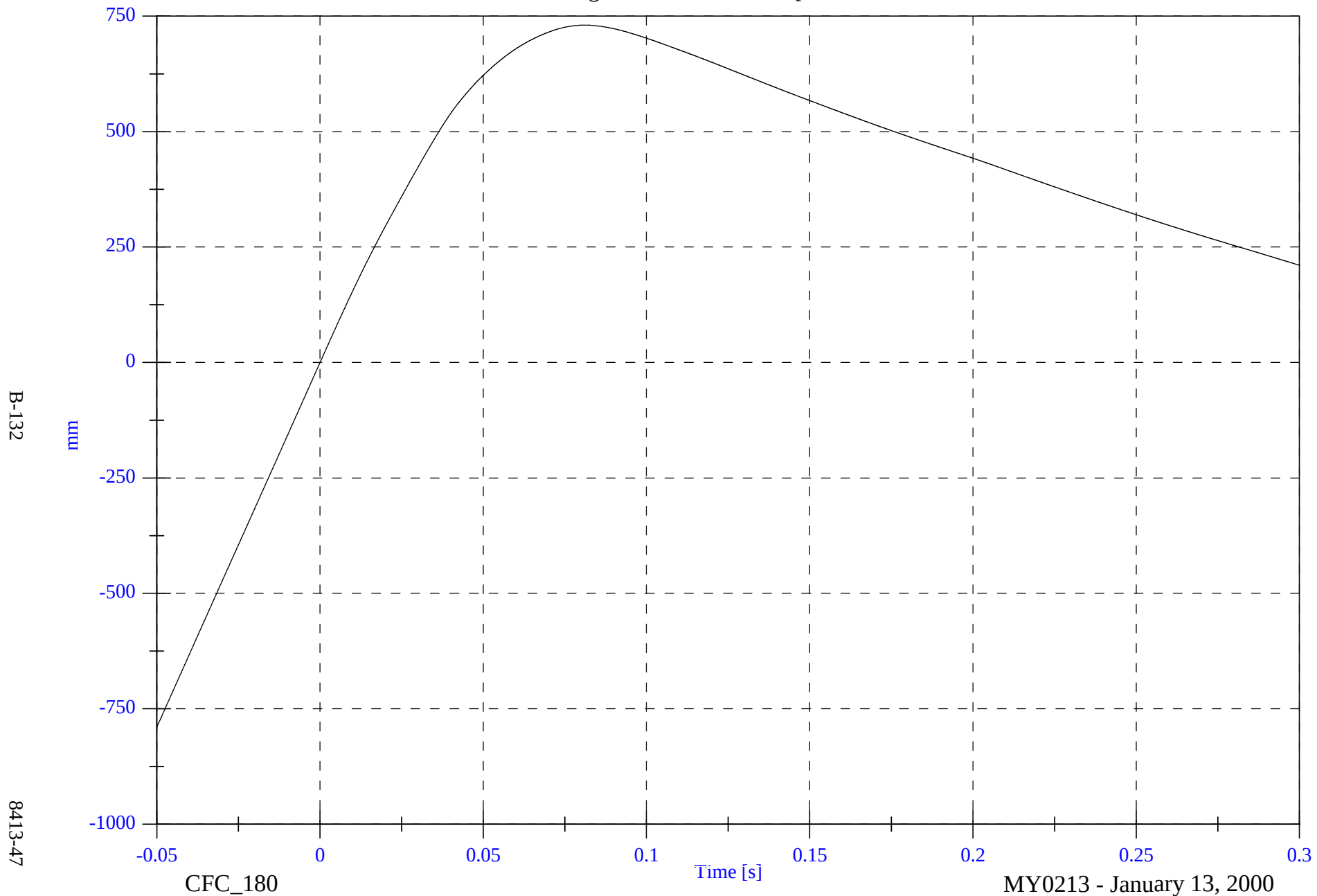
8413-47

NCAP Test 8 - 2000 Mercury Villager Sport

Right Rear Red #9x Displacement

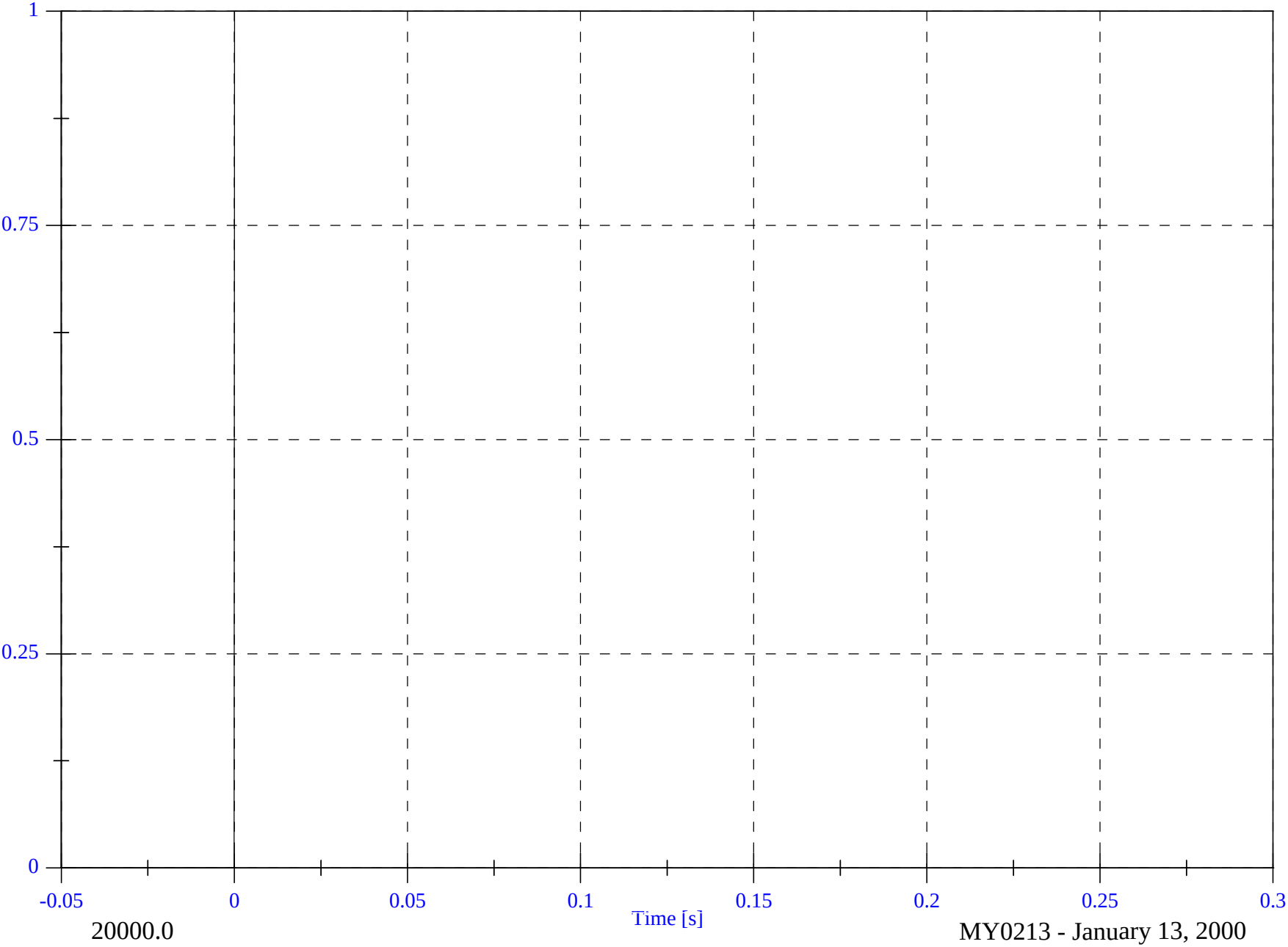
Max: 730.6 [mm] at 0.081 [s]

Min: -789.8 [mm] at -0.050 [s]



B-133

8413-47

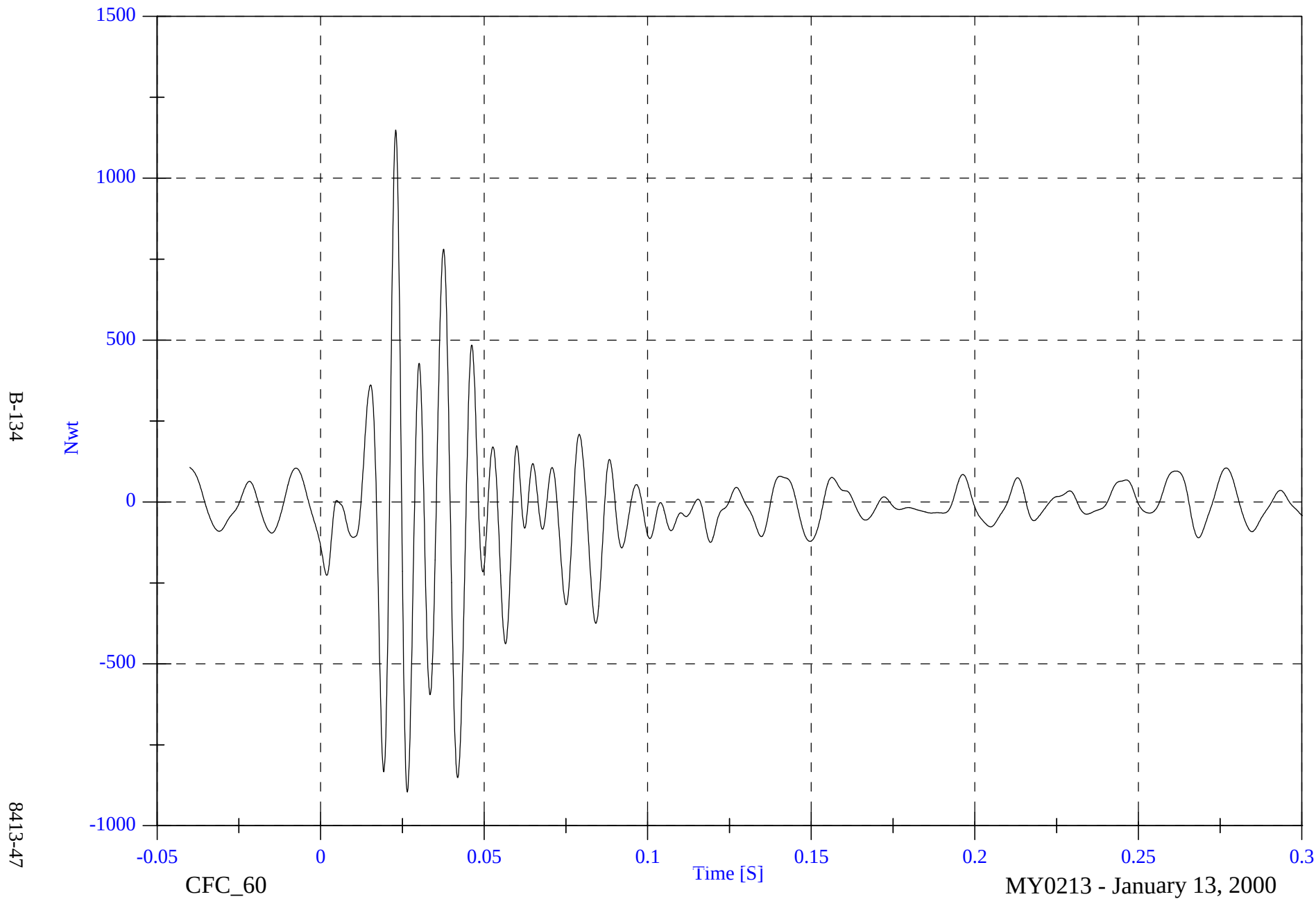


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC A1 Fx

Max: 1148.4 [Nwt] at 0.023 [S]

Min: -896.4 [Nwt] at 0.026 [S]

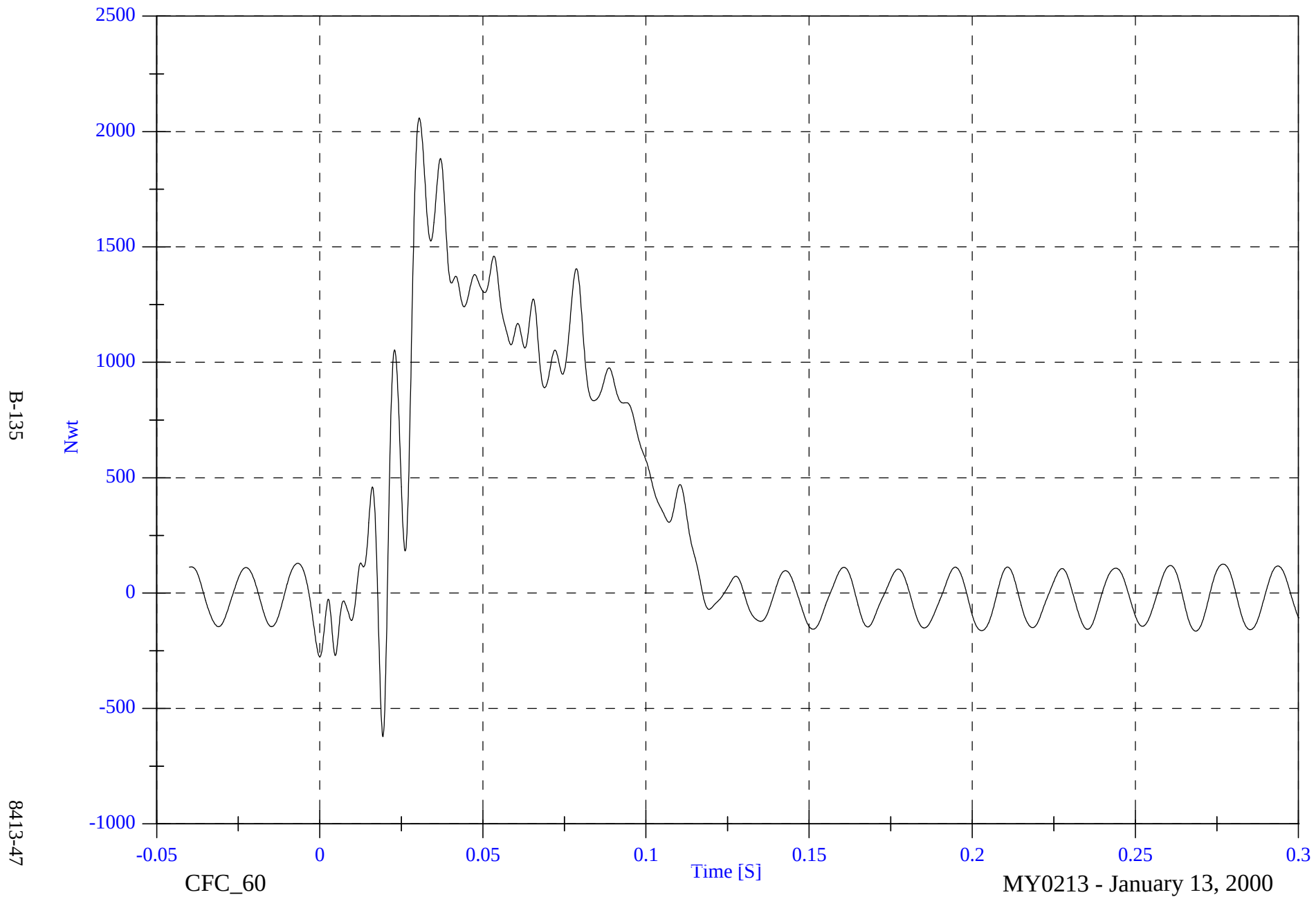


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC A2 Fx

Max: 2058.5 [Nwt] at 0.030 [S]

Min: -622.3 [Nwt] at 0.019 [S]

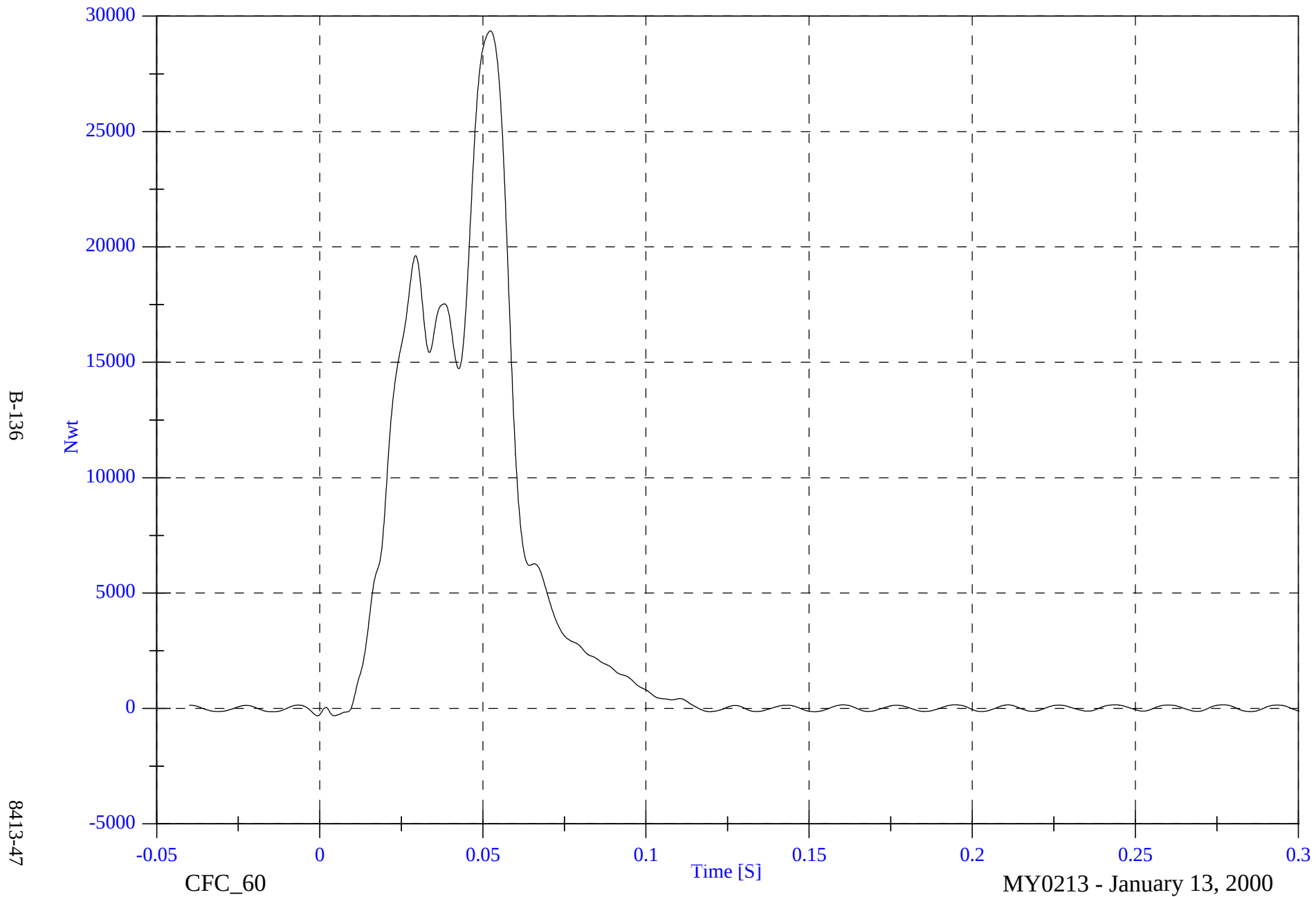


NCAP TEST #8 - 2000 Mercury Villager Sport

BLC A3 Fx

Max: 29361.8 [Nwt] at 0.052 [S]

Min: -318.5 [Nwt] at -0.001 [S]

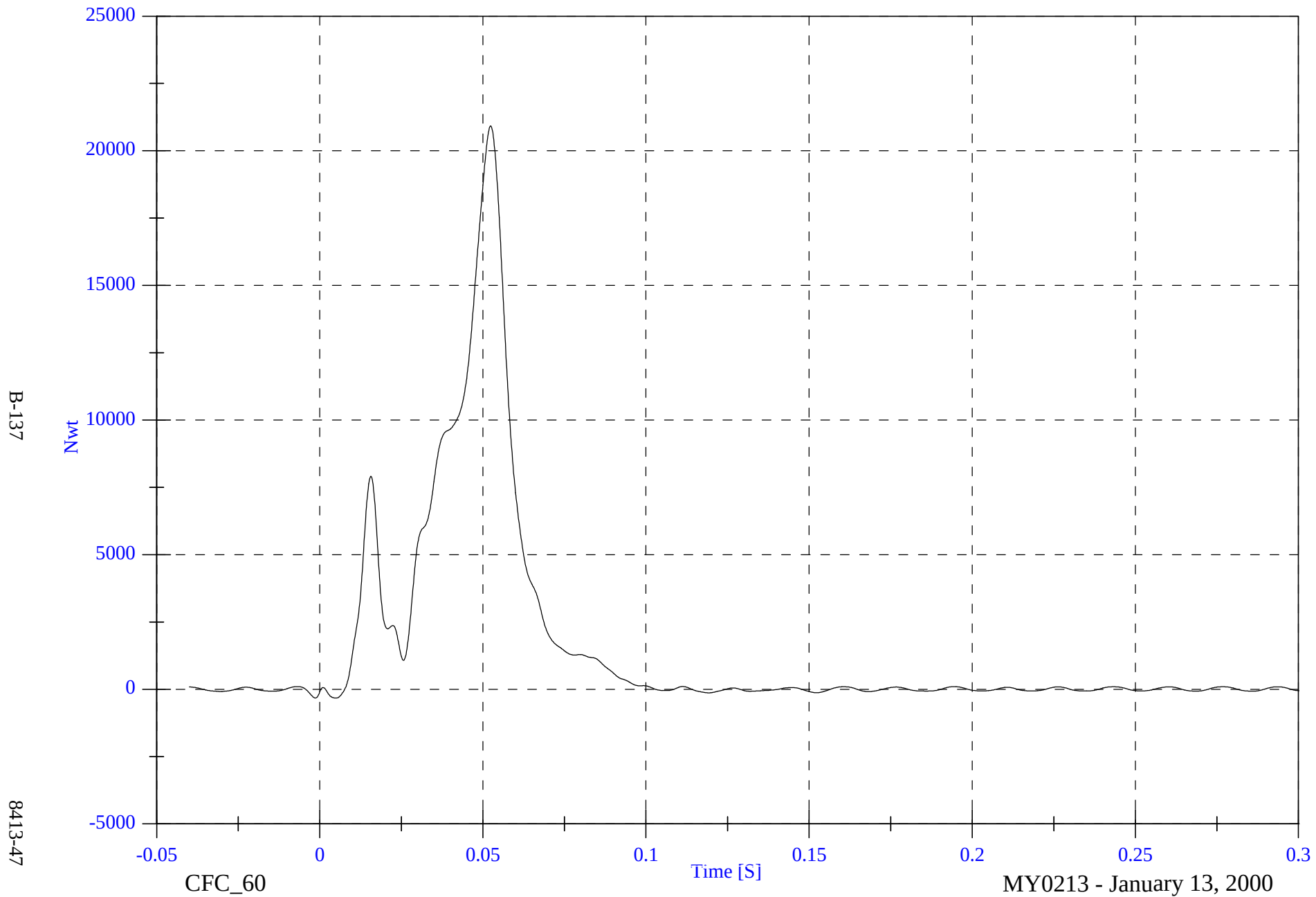


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC A4 Fx

Max: 20921.9 [Nwt] at 0.052 [S]

Min: -327.0 [Nwt] at -0.001 [S]

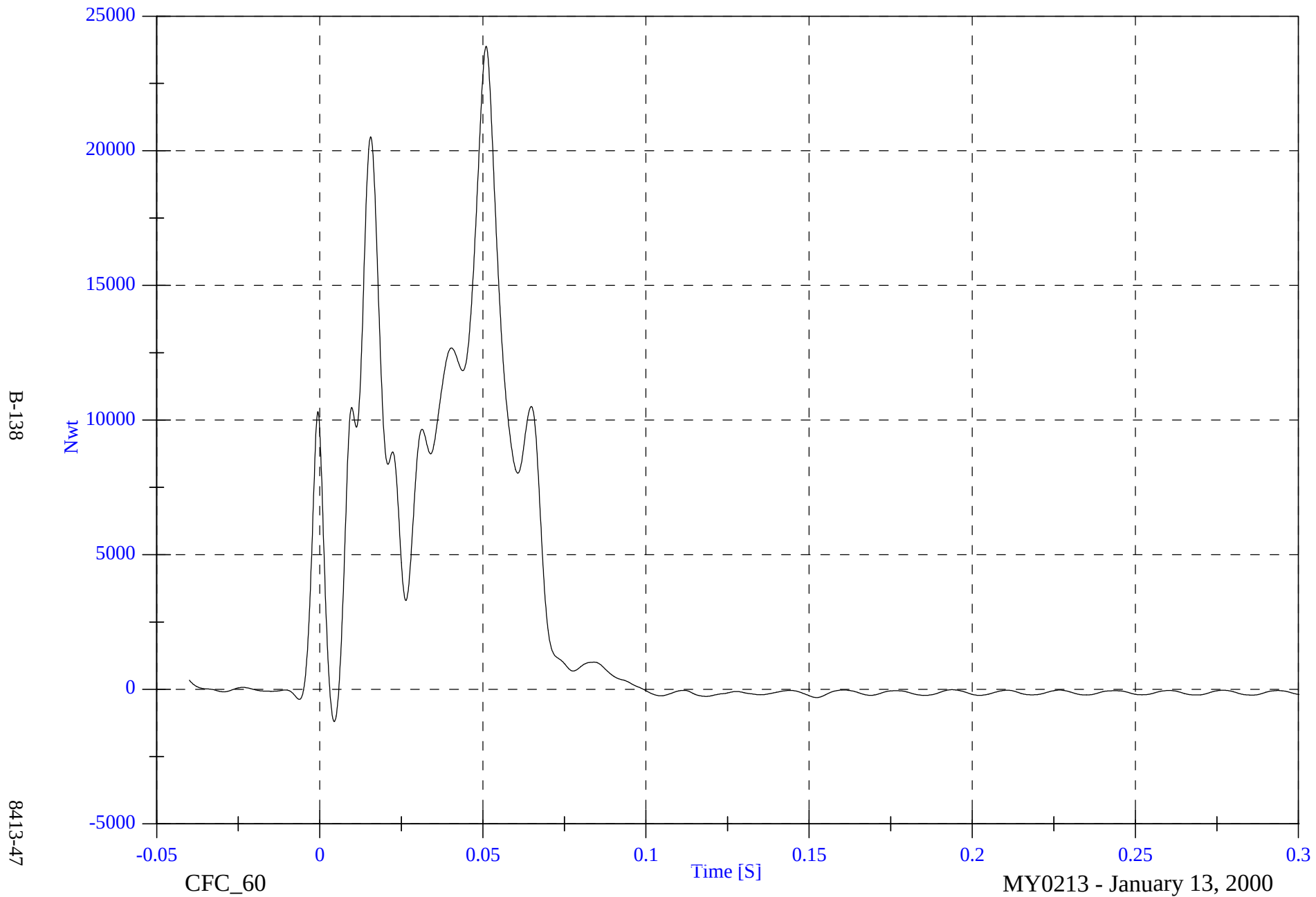


NCAP TEST #8 - 2000 Mecury Villager Sport

Max: 23886.5 [Nwt] at 0.051 [S]

BLC A5 Fx

Min: -1200.9 [Nwt] at 0.004 [S]

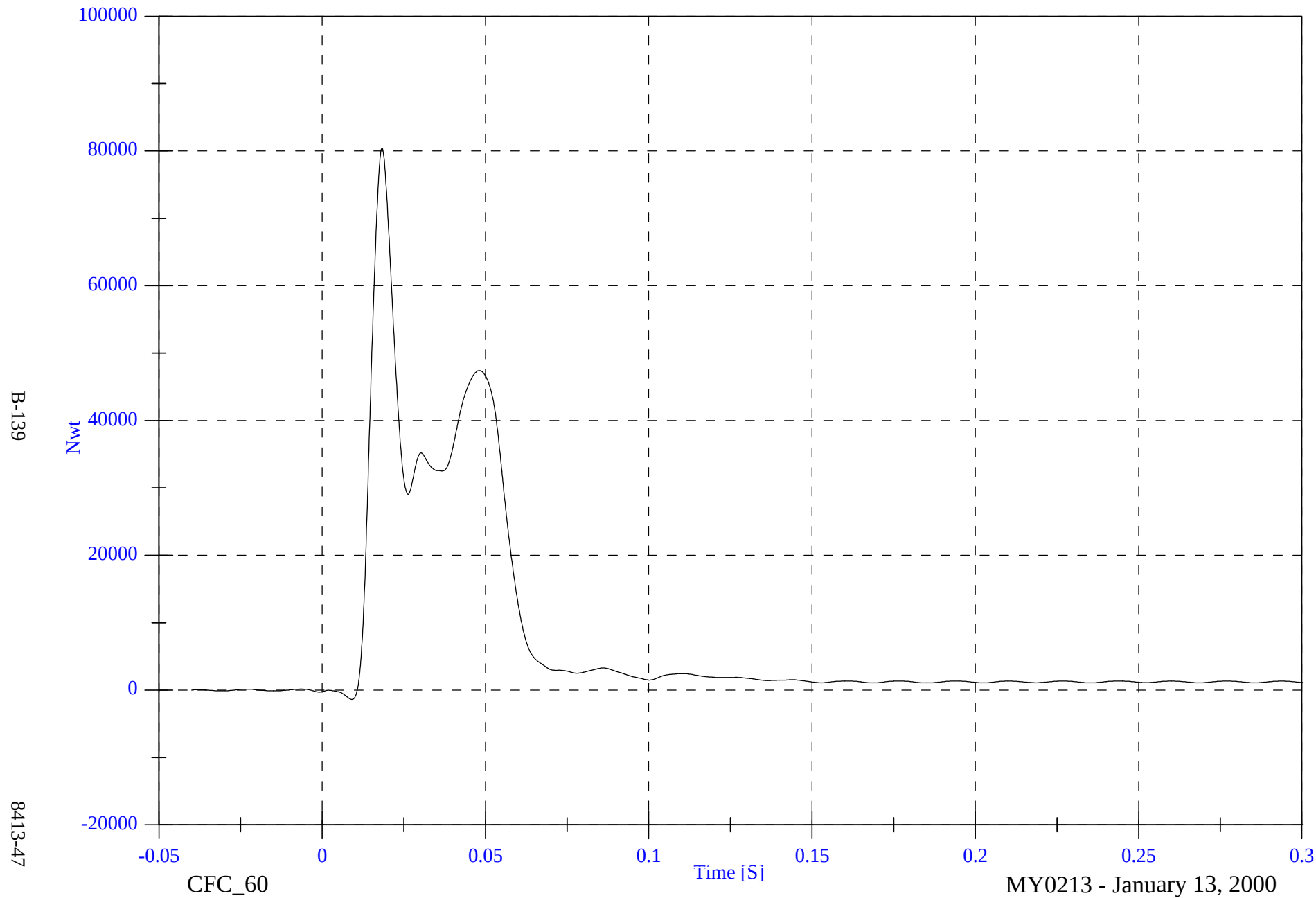


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC A6 Fx

Max: 80452.8 [Nwt] at 0.018 [S]

Min: -1399.2 [Nwt] at 0.009 [S]

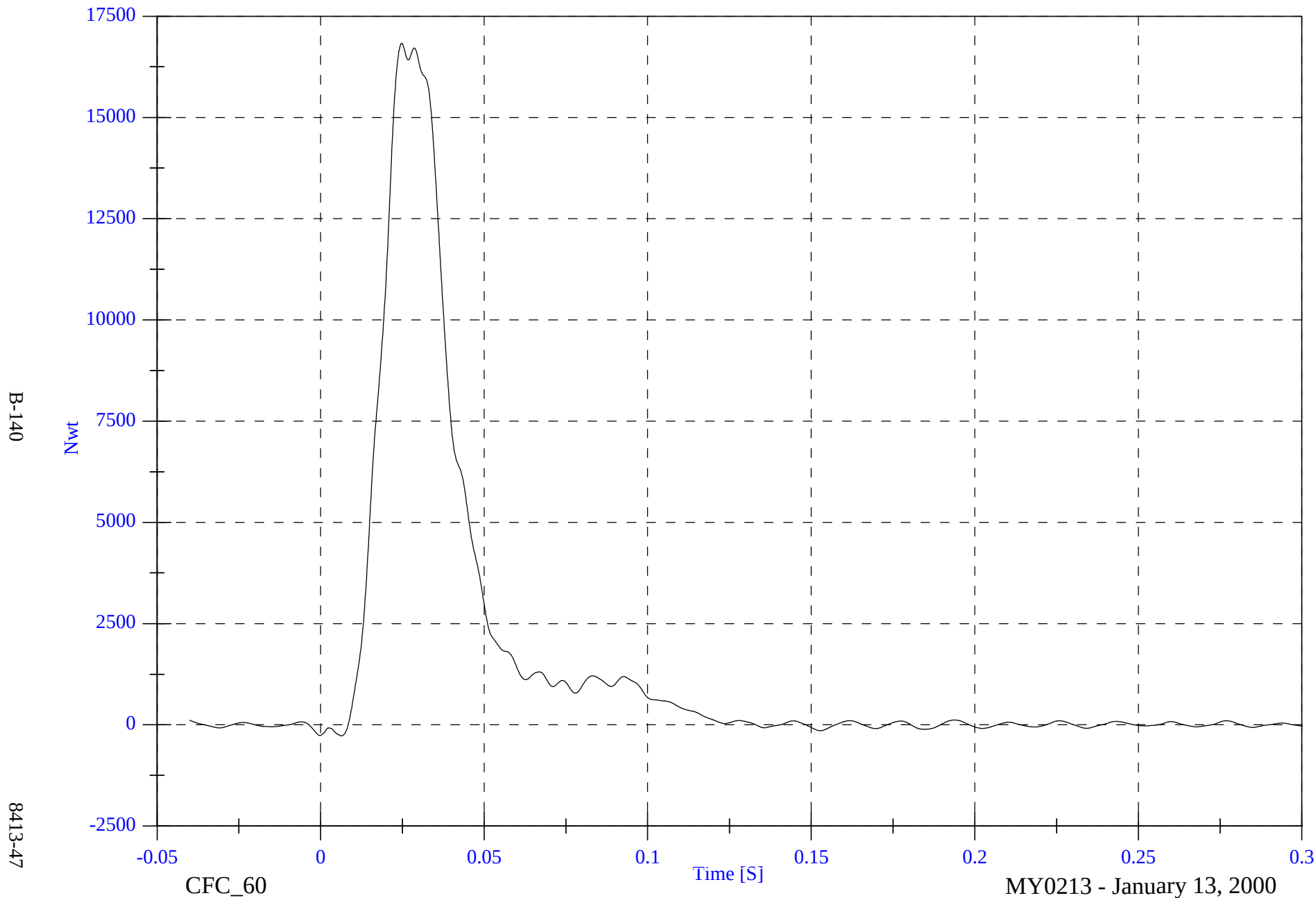


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC A7 Fx

Max: 16829.5 [Nwt] at 0.025 [S]

Min: -273.2 [Nwt] at 0.006 [S]



NCAP TEST #8 - 2000 Mecury Villager Sport

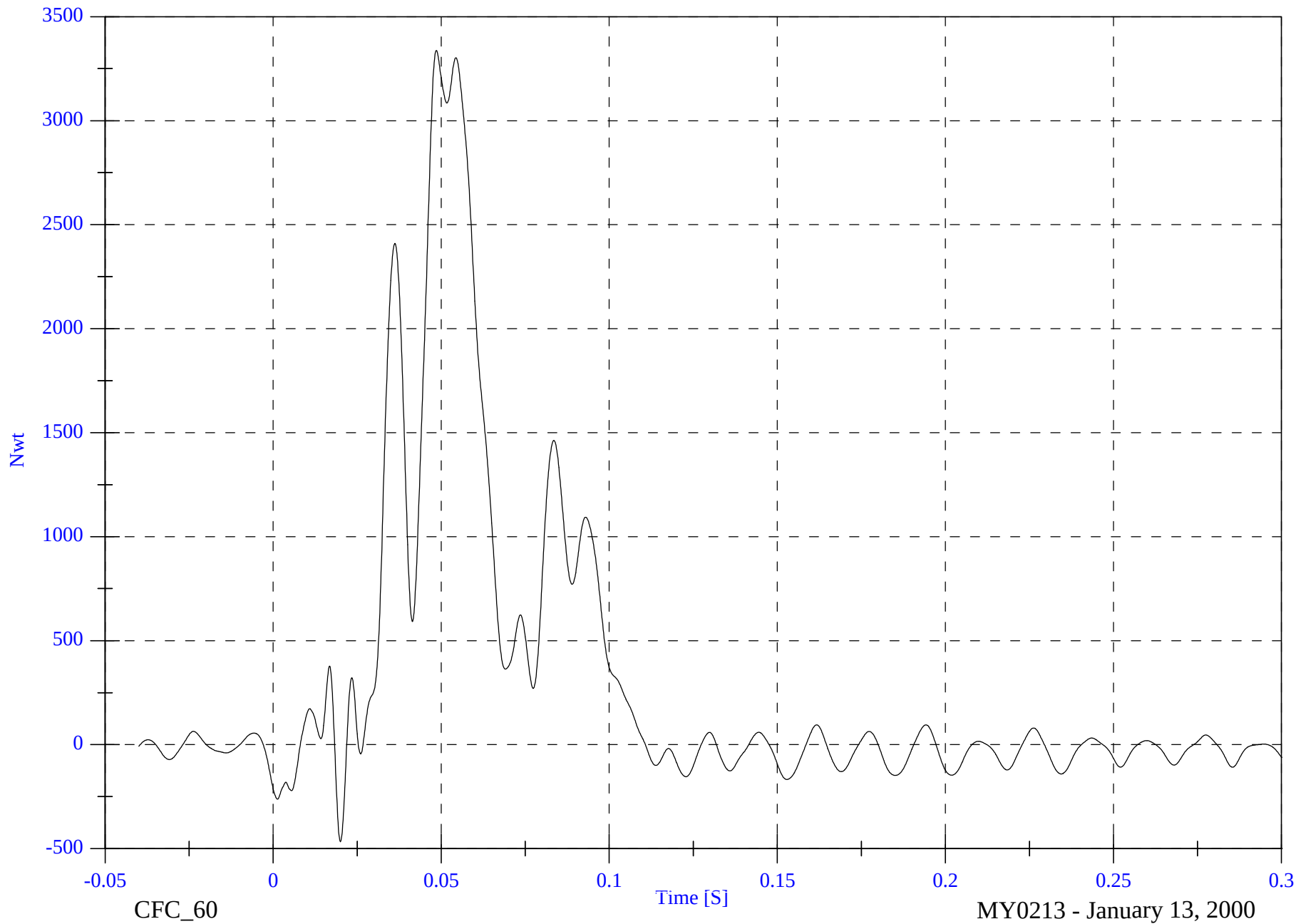
BLC A8 Fx

Max: 3337.6 [Nwt] at 0.048 [S]

Min: -466.4 [Nwt] at 0.020 [S]

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8413-47



NCAP TEST #8 - 2000 Mecury Villager Sport

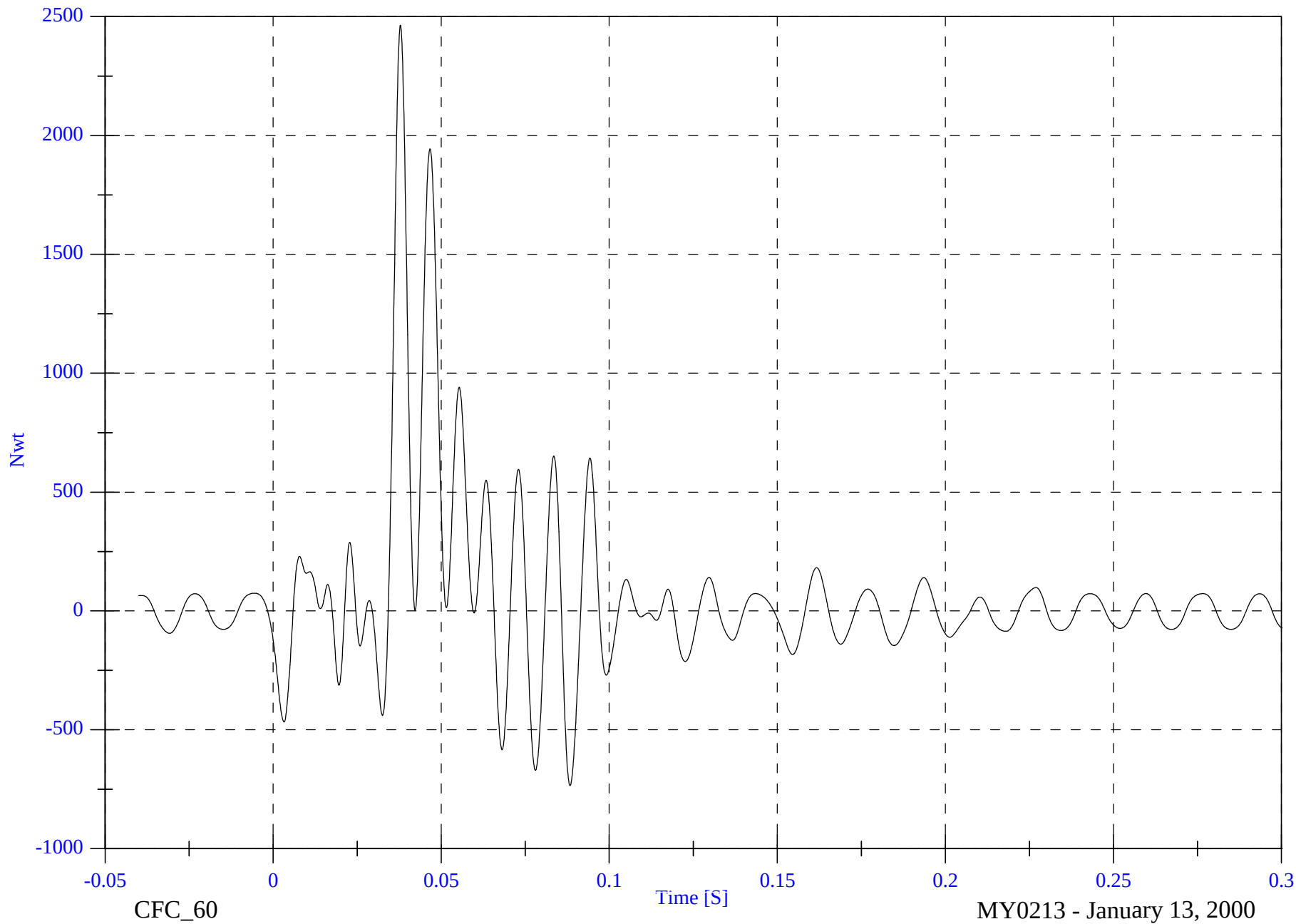
BLC A9 Fx

Max: 2464.8 [Nwt] at 0.038 [S]

Min: -734.8 [Nwt] at 0.088 [S]

B-142

8413-47

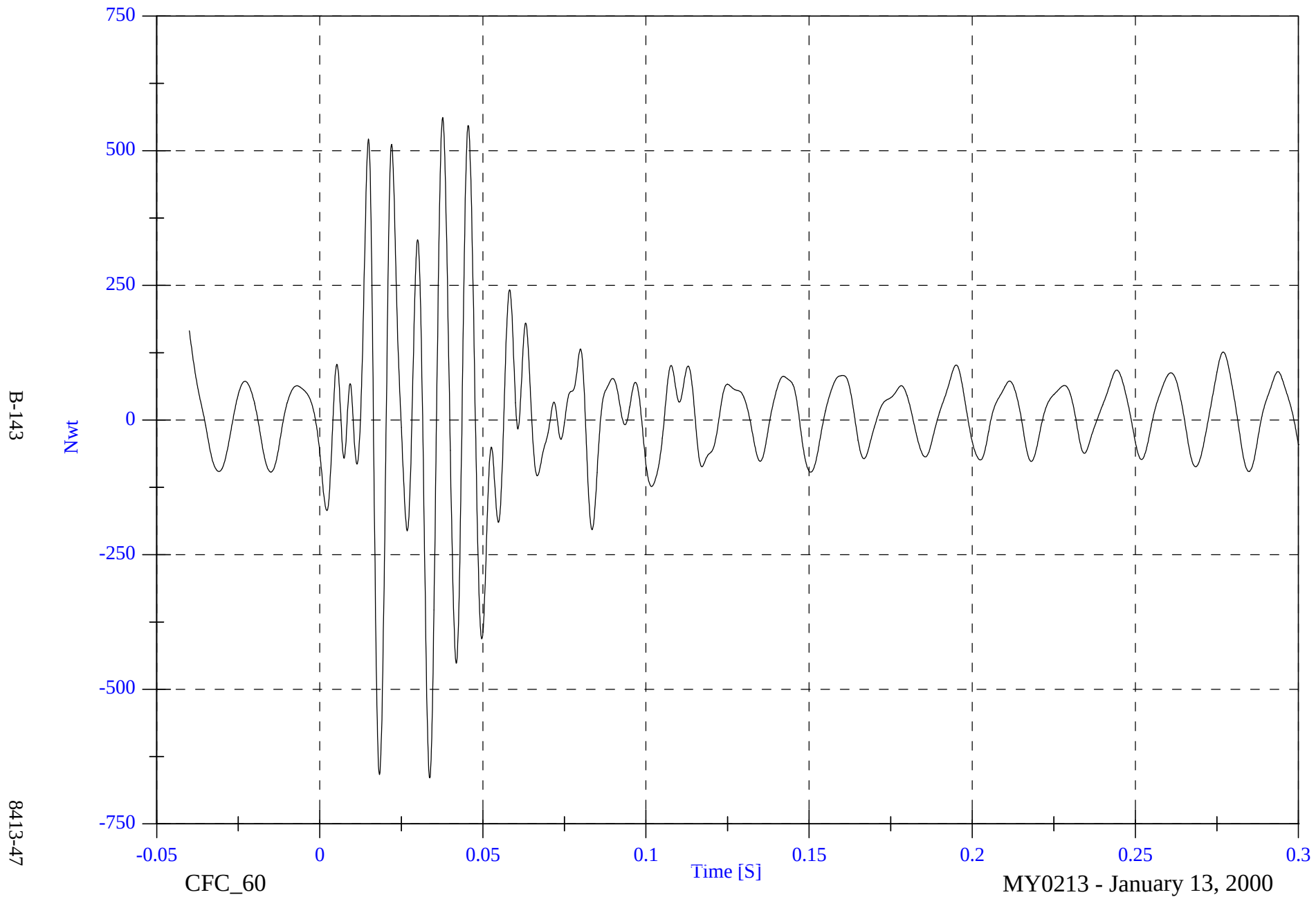


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC B1 Fx

Max: 561.7 [Nwt] at 0.038 [S]

Min: -665.0 [Nwt] at 0.034 [S]

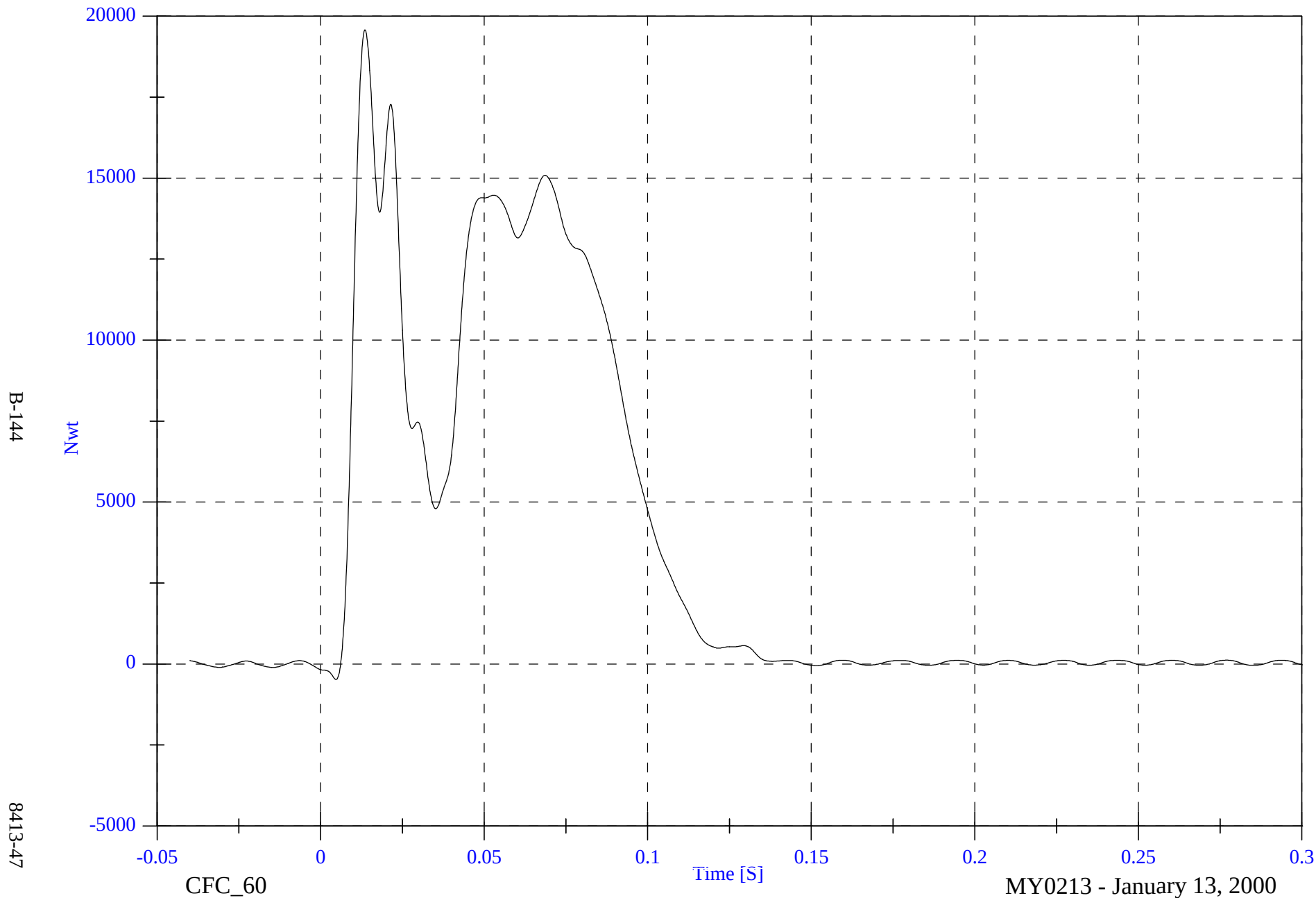


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC B2 Fx

Max: 19580.4 [Nwt] at 0.013 [S]

Min: -476.3 [Nwt] at 0.005 [S]

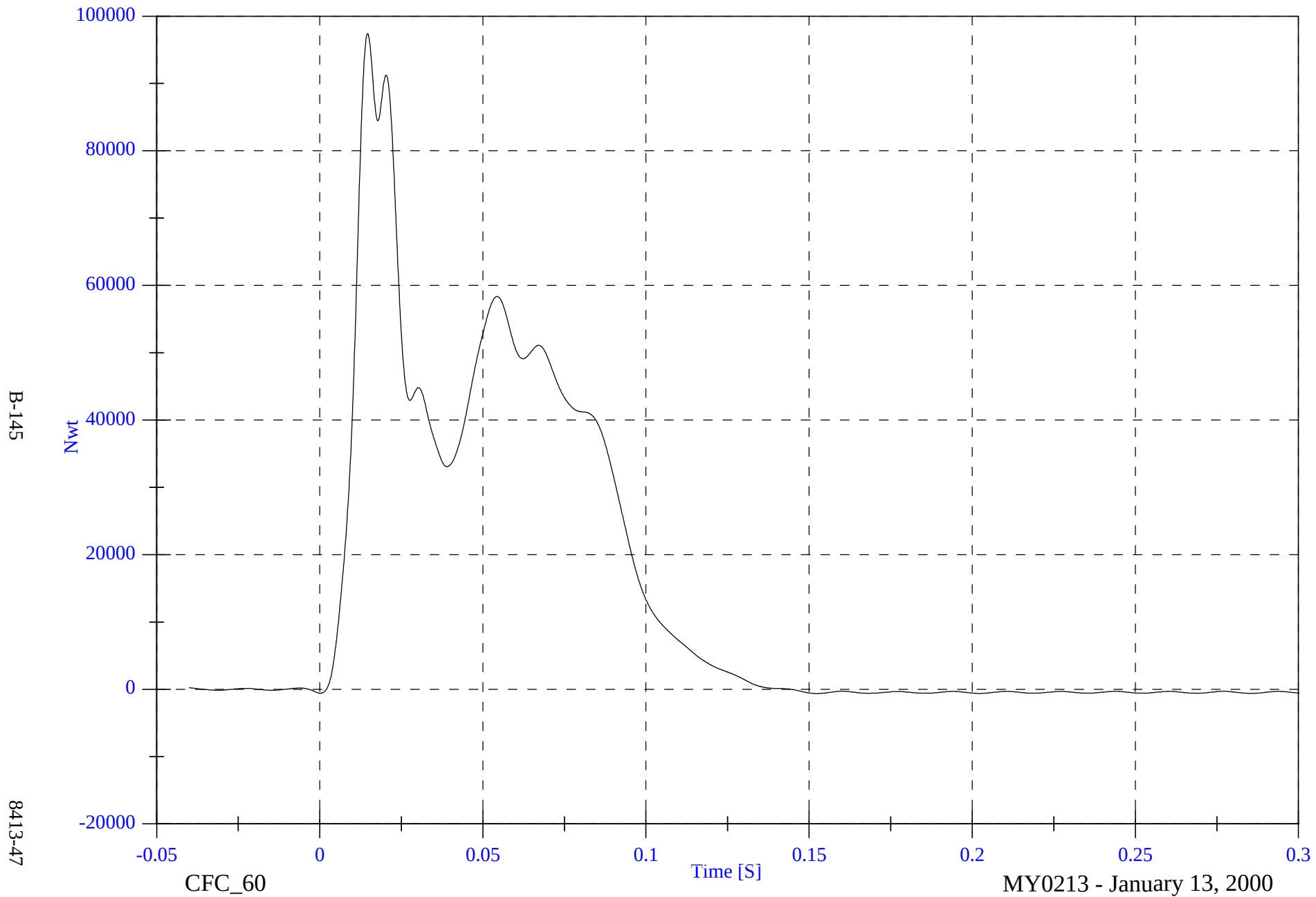


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC B3 Fx

Max: 97411.8 [Nwt] at 0.015 [S]

Min: -624.0 [Nwt] at 0.152 [S]

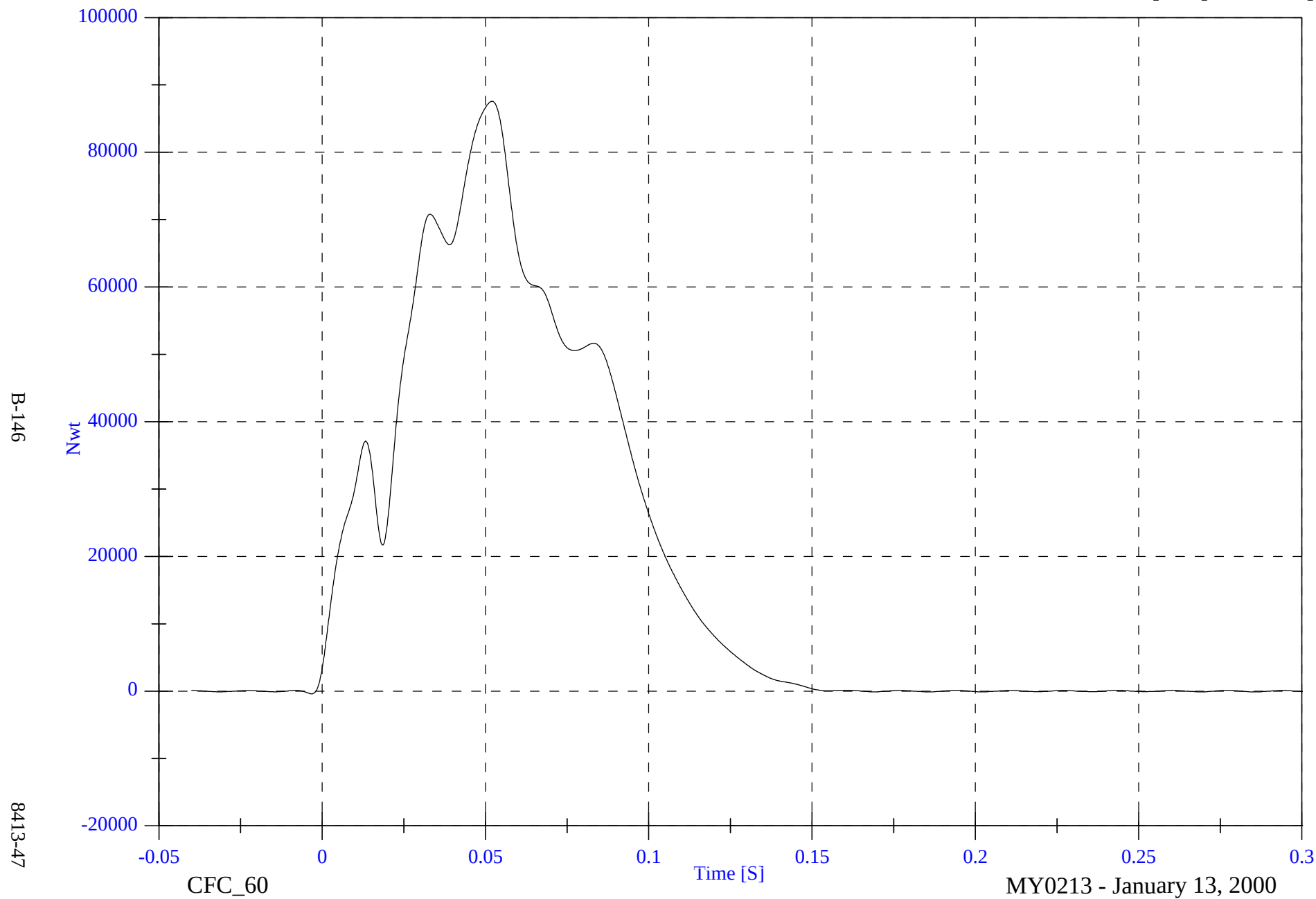


NCAP TEST #8 - 2000 Mecury Villager Sport

Max: 87572.0 [Nwt] at 0.052 [S]

Min: -399.1 [Nwt] at -0.003 [S]

BLC B4 Fx

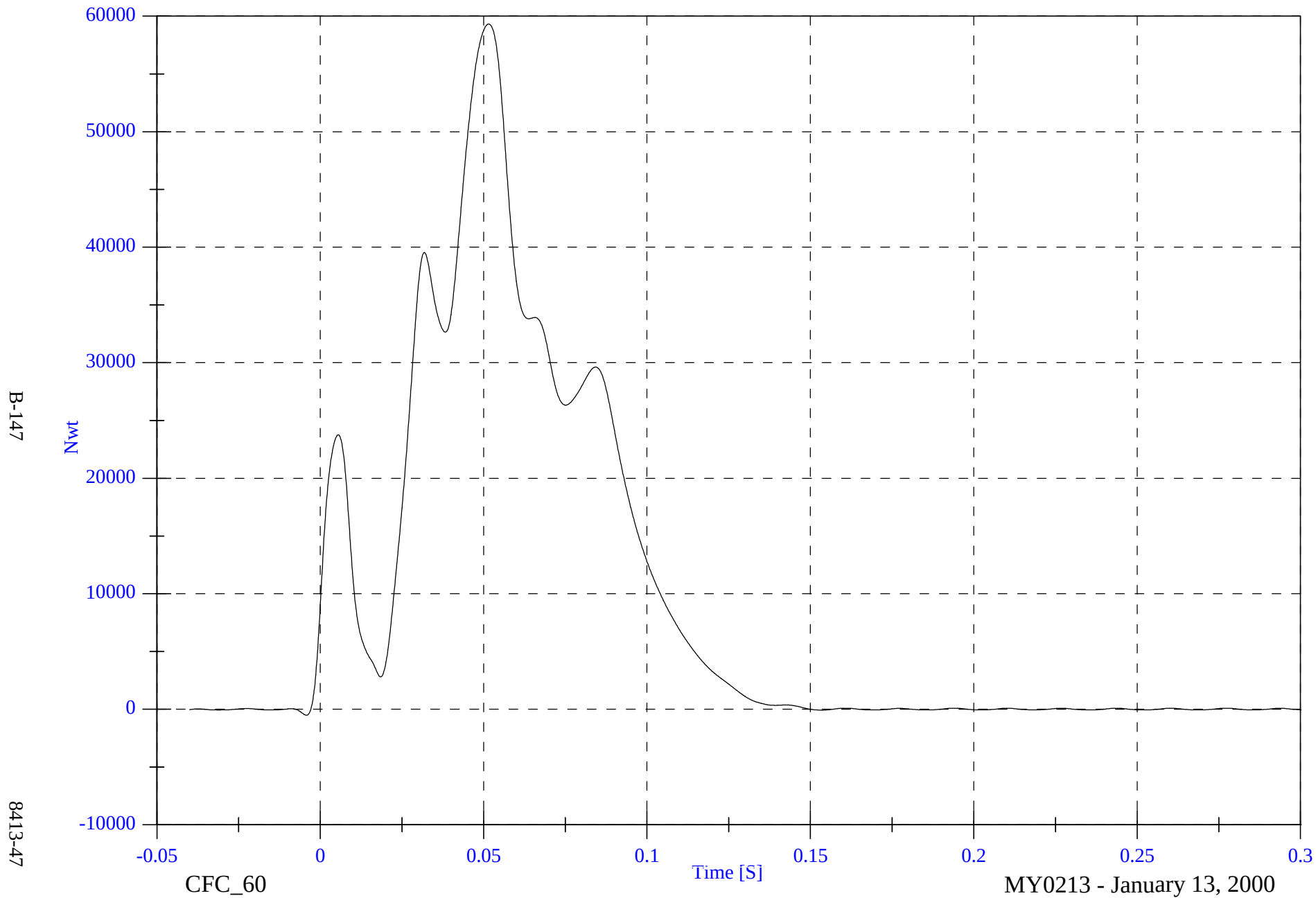


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC B5 Fx

Max: 59326.8 [Nwt] at 0.051 [S]

Min: -521.0 [Nwt] at -0.004 [S]

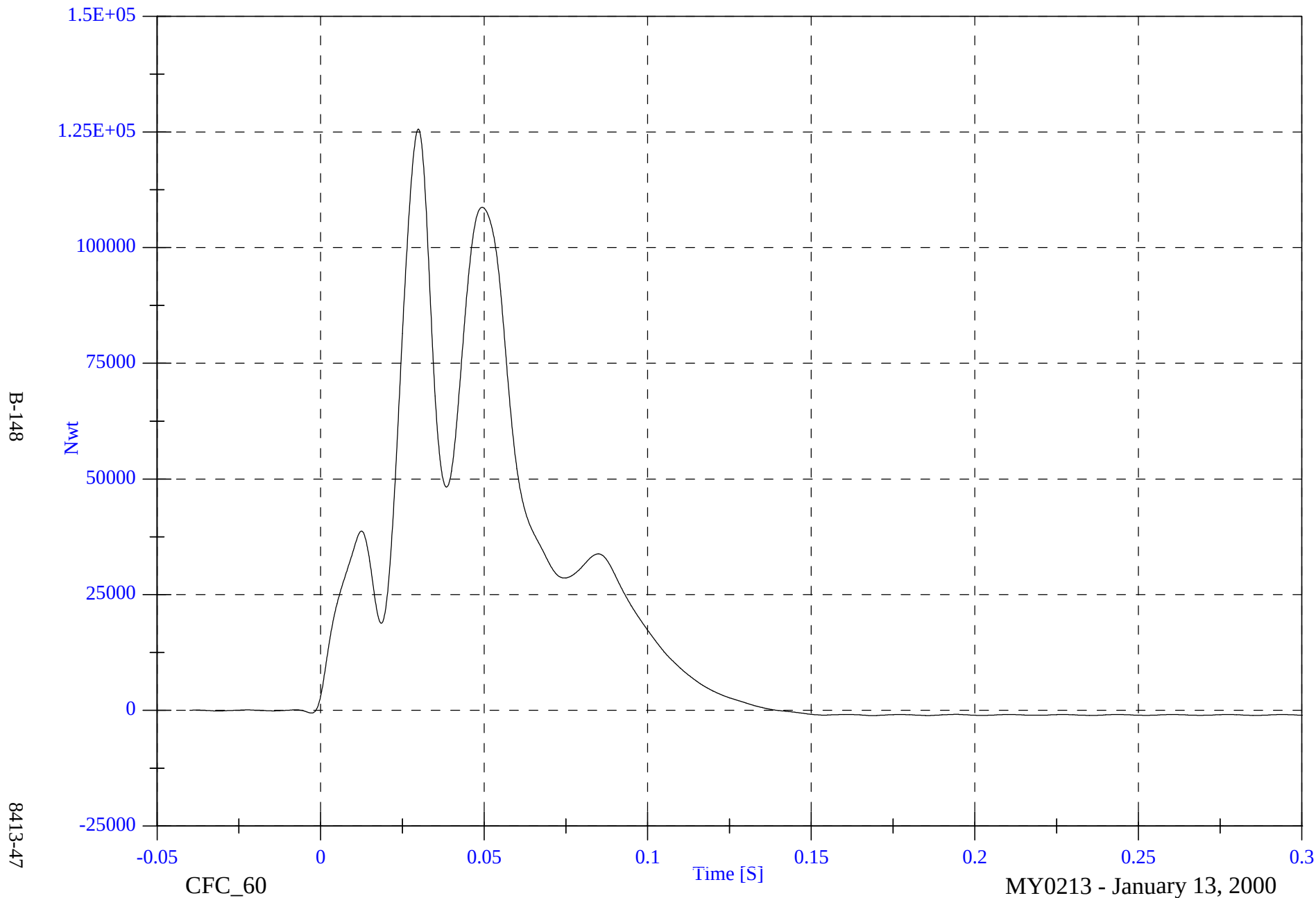


NCAP TEST #8 - 2000 Mercury Villager Sport

BLC B6 Fx

Max: 125603.9 [Nwt] at 0.030 [S]

Min: -1128.3 [Nwt] at 0.169 [S]

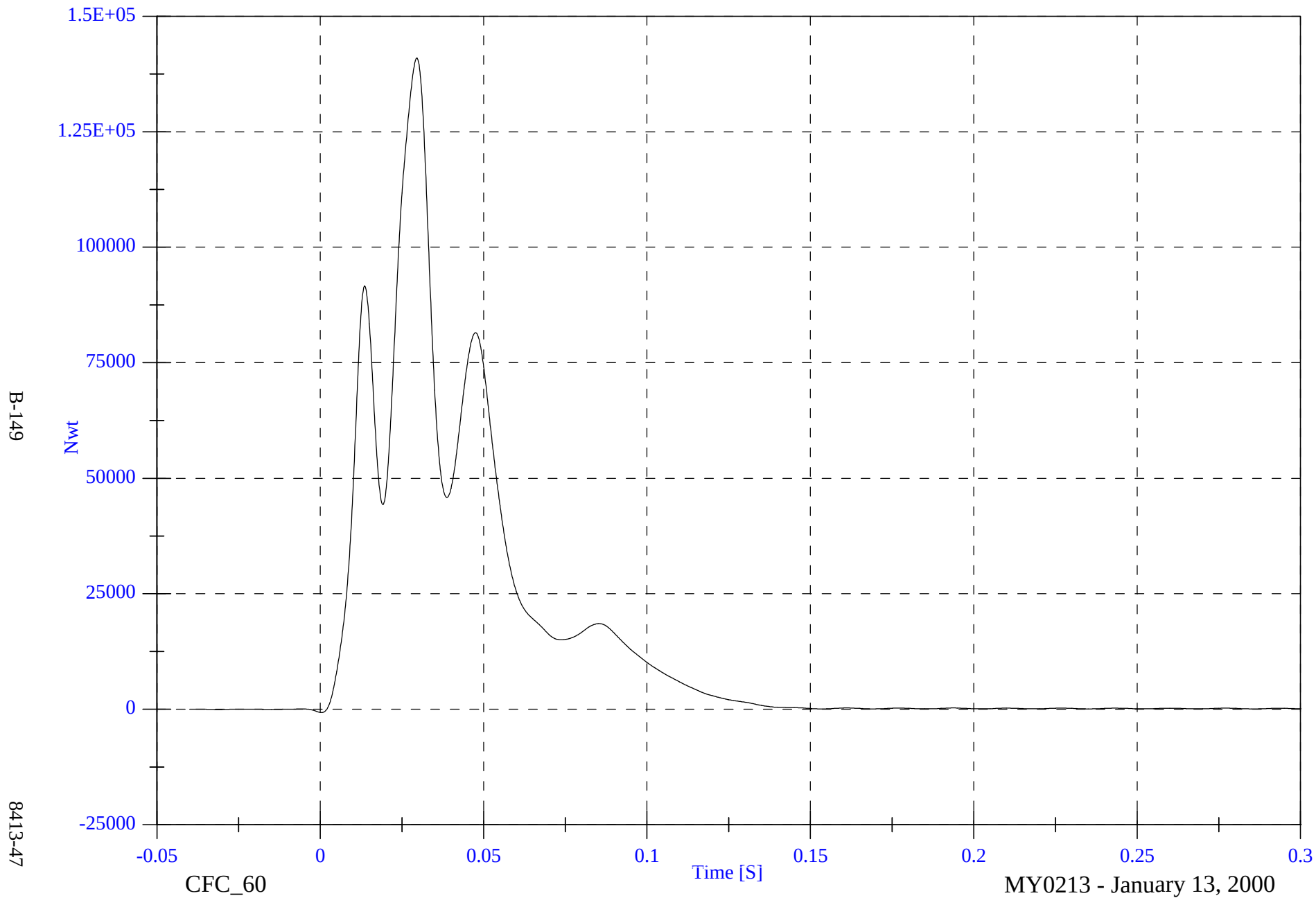


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC B7 Fx

Max: 140955.2 [Nwt] at 0.029 [S]

Min: -715.5 [Nwt] at 0.000 [S]

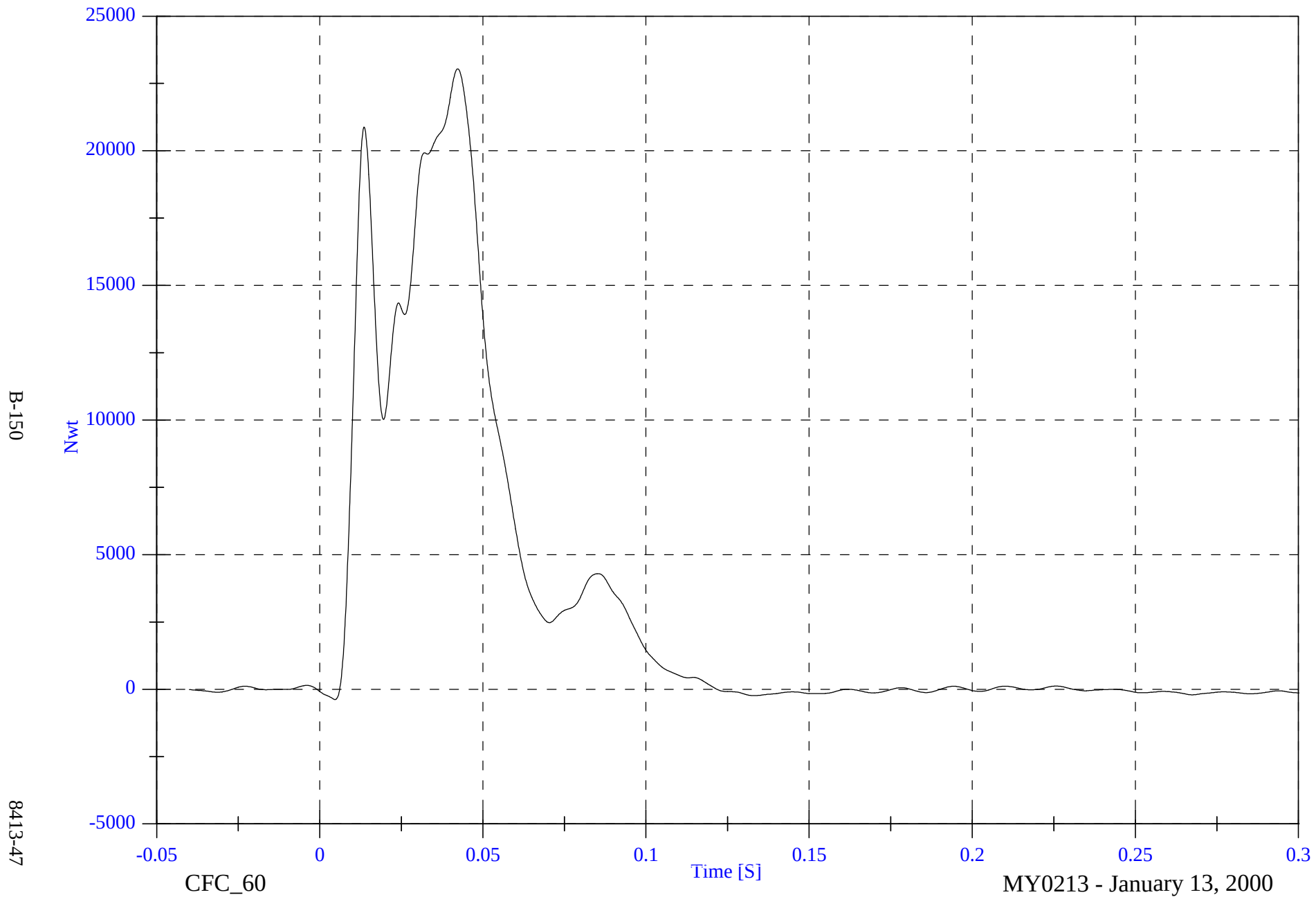


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC B8 Fx

Max: 23043.2 [Nwt] at 0.042 [S]

Min: -382.7 [Nwt] at 0.005 [S]

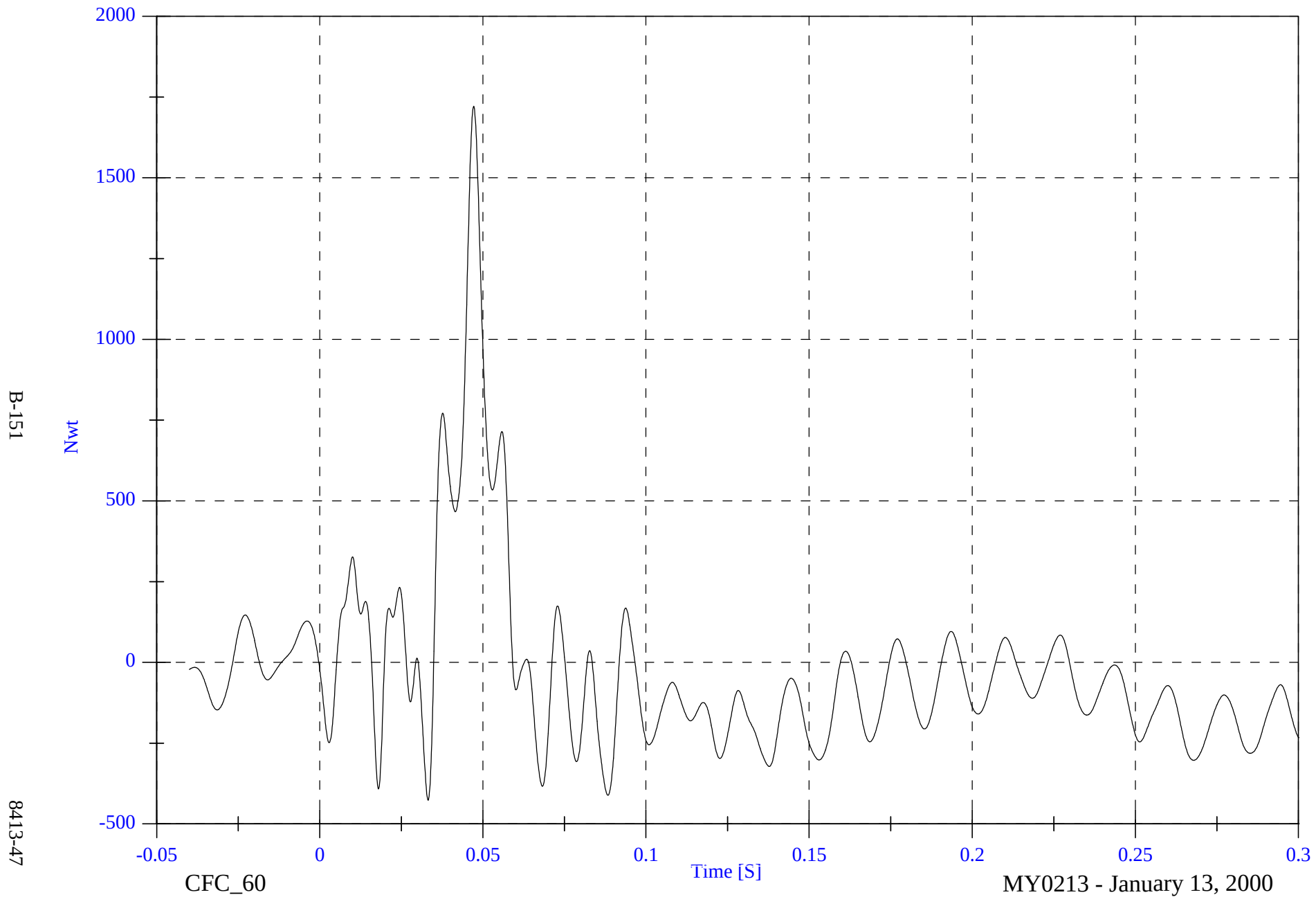


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC B9 Fx

Max: 1721.4 [Nwt] at 0.047 [S]

Min: -426.9 [Nwt] at 0.033 [S]



NCAP TEST #8 - 2000 Mecury Villager Sport

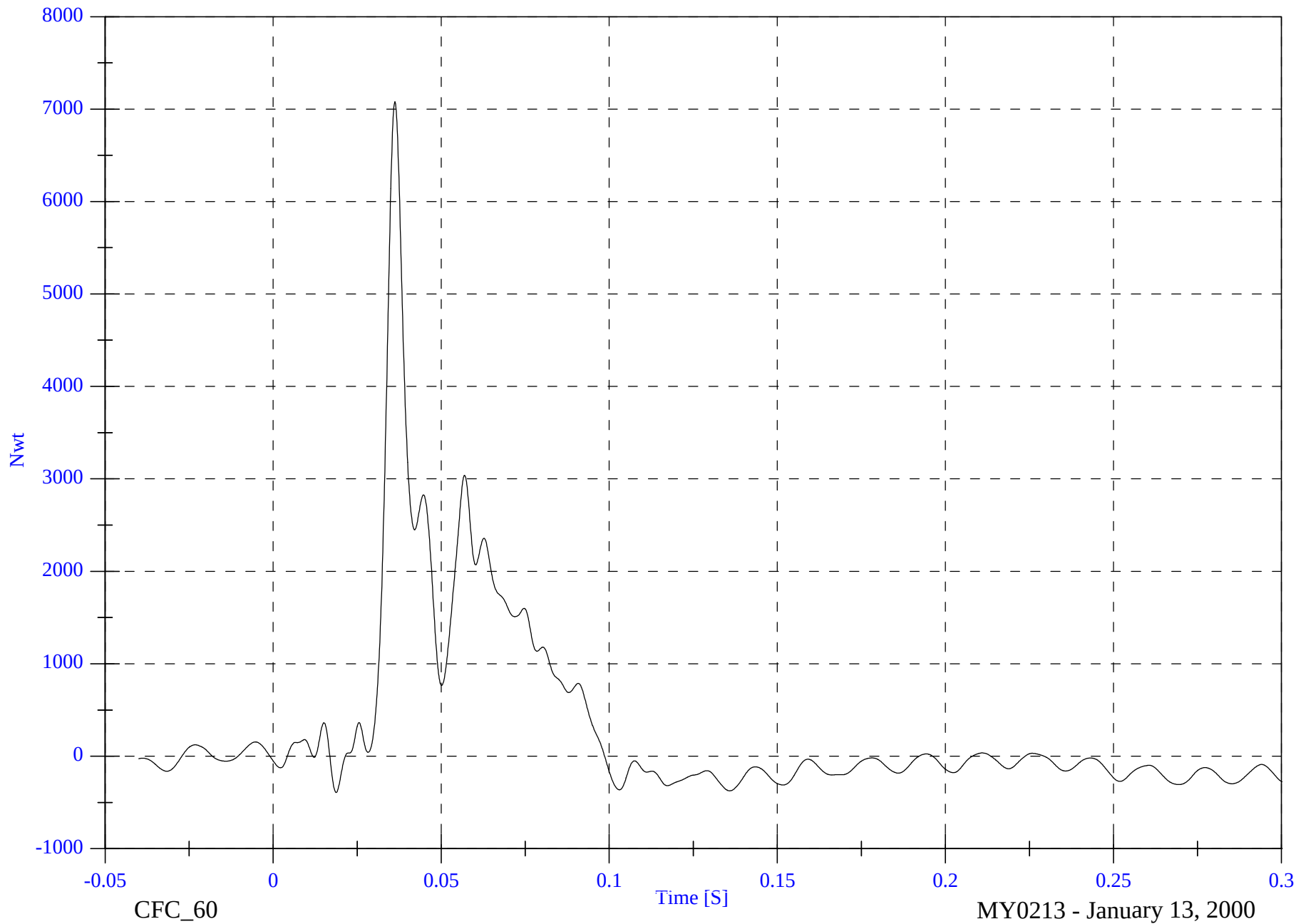
BLC C1 Fx

Max: 7081.0 [Nwt] at 0.036 [S]

Min: -392.8 [Nwt] at 0.019 [S]

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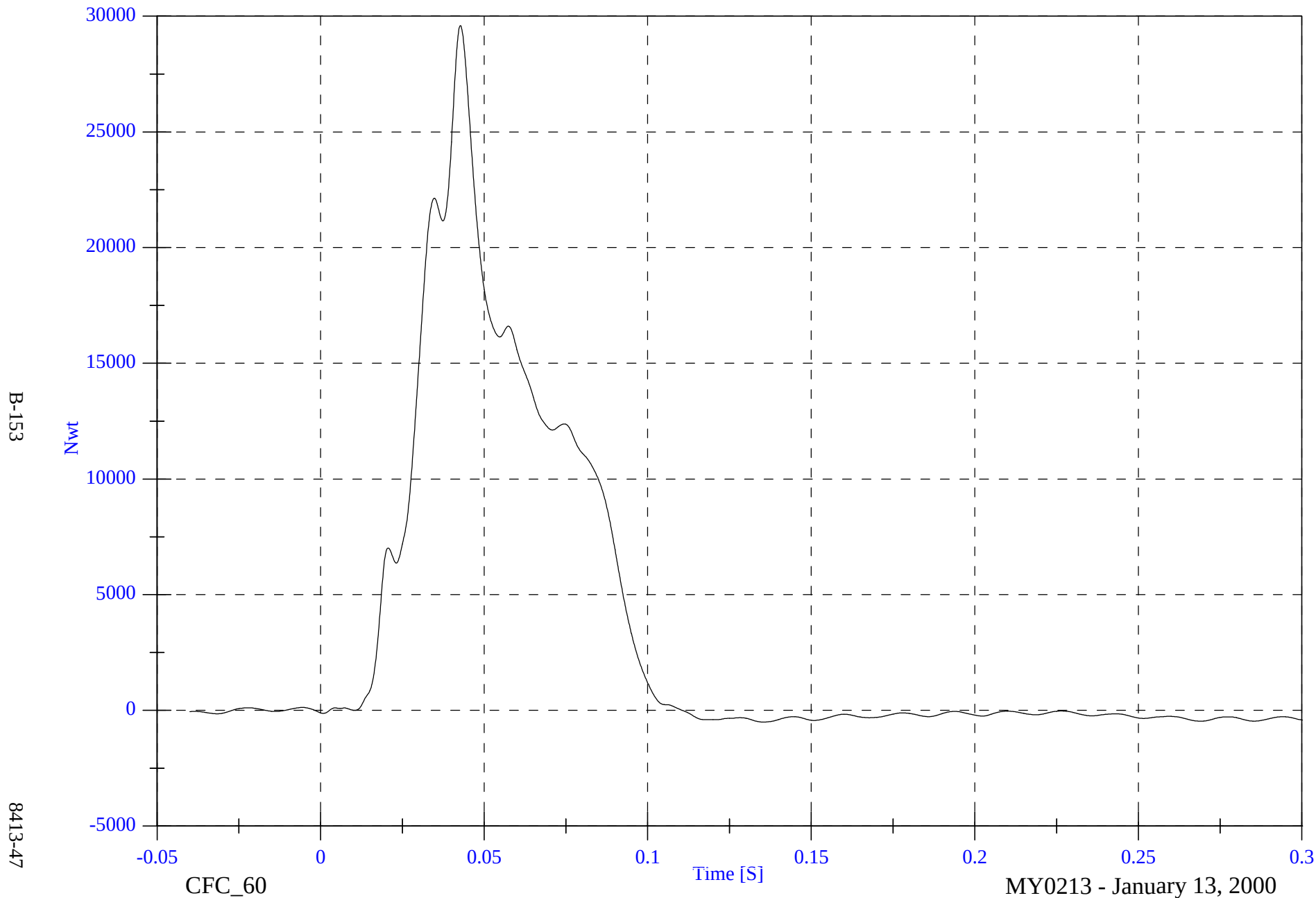


NCAP TEST #8 - 2000 Mercury Villager Sport

BLC C2 Fx

Max: 29598.9 [Nwt] at 0.043 [S]

Min: -501.3 [Nwt] at 0.135 [S]

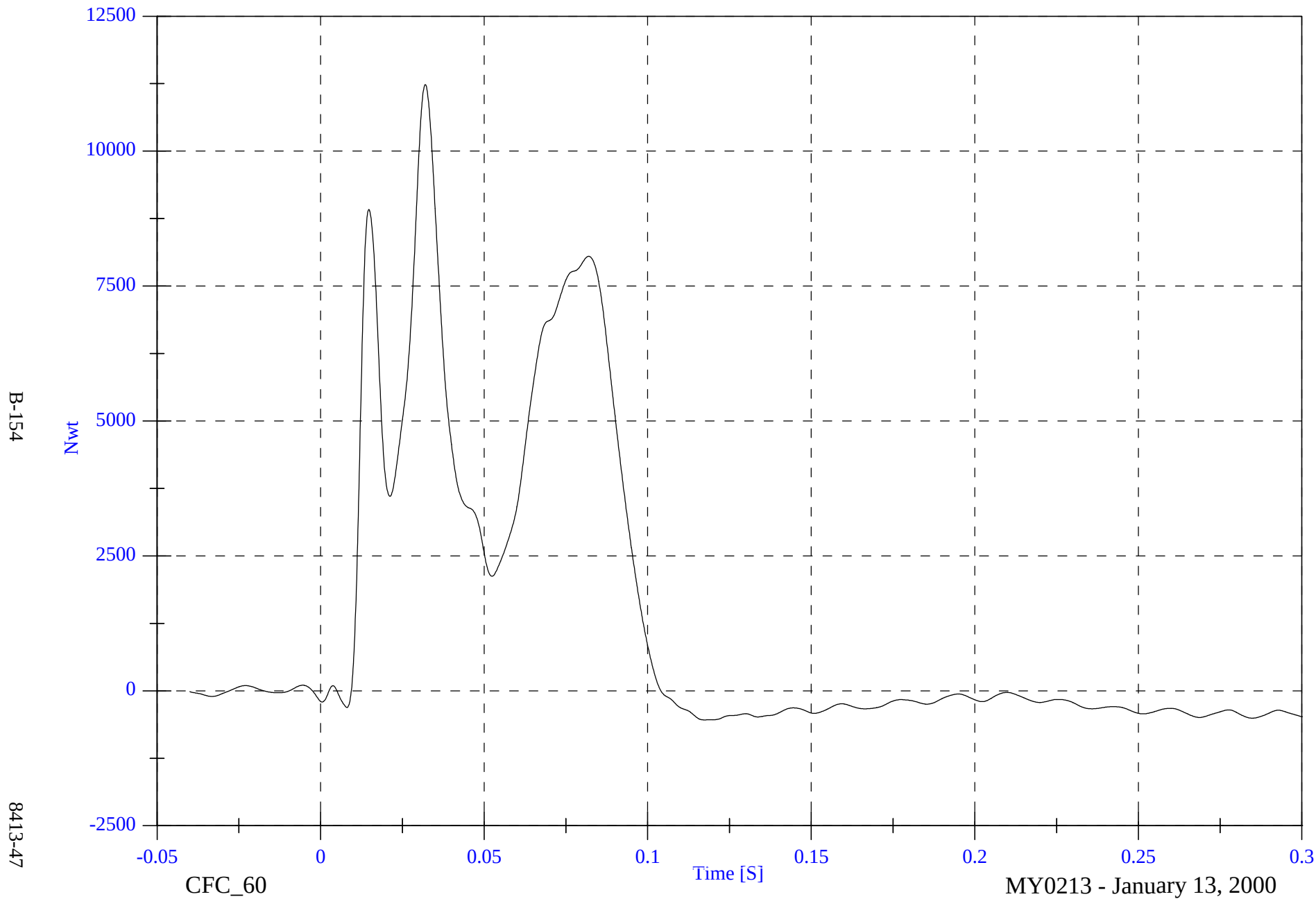


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC C3 Fx

Max: 11233.8 [Nwt] at 0.032 [S]

Min: -540.4 [Nwt] at 0.117 [S]

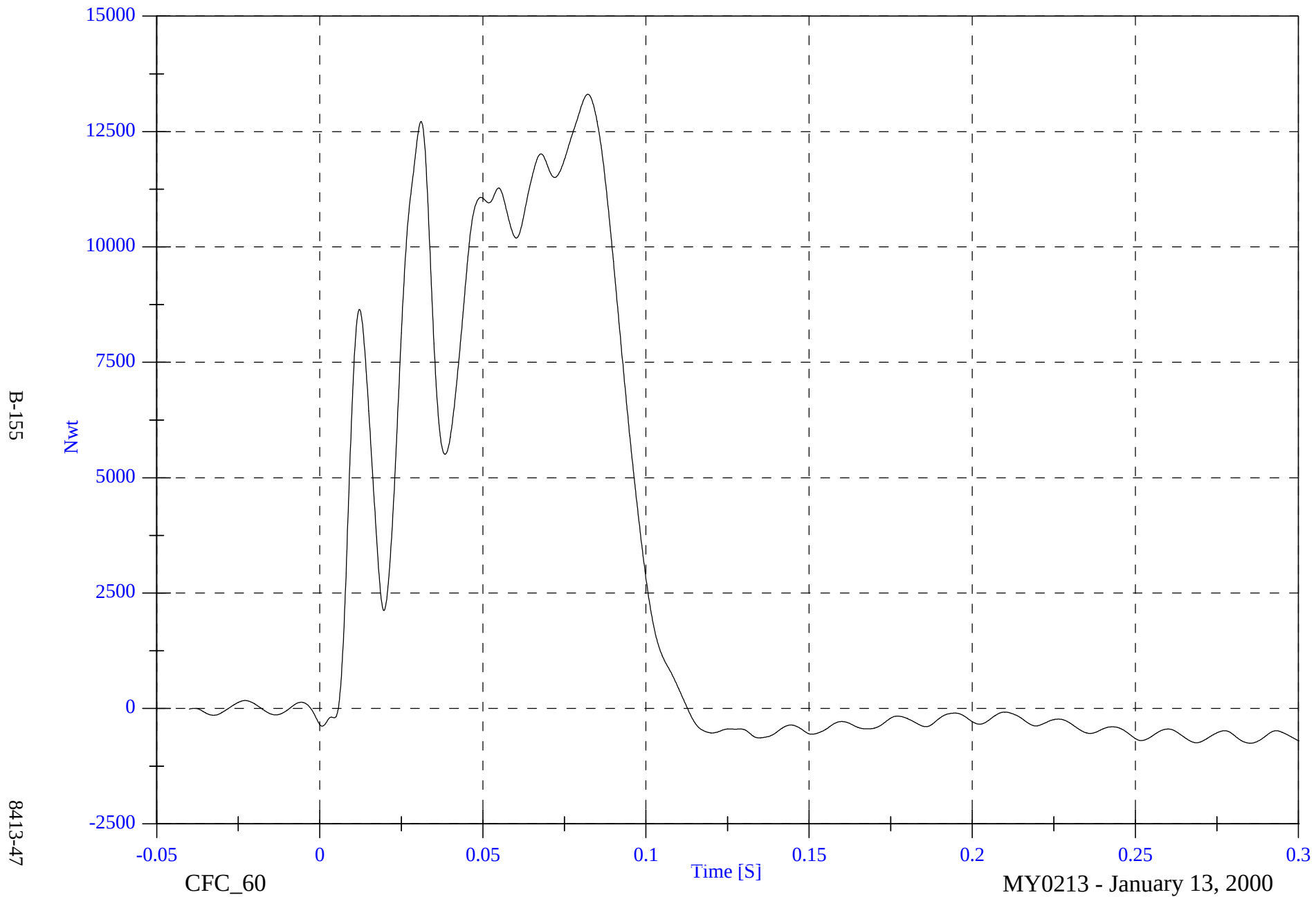


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC C4 Fx

Max: 13308.4 [Nwt] at 0.082 [S]

Min: -752.7 [Nwt] at 0.285 [S]

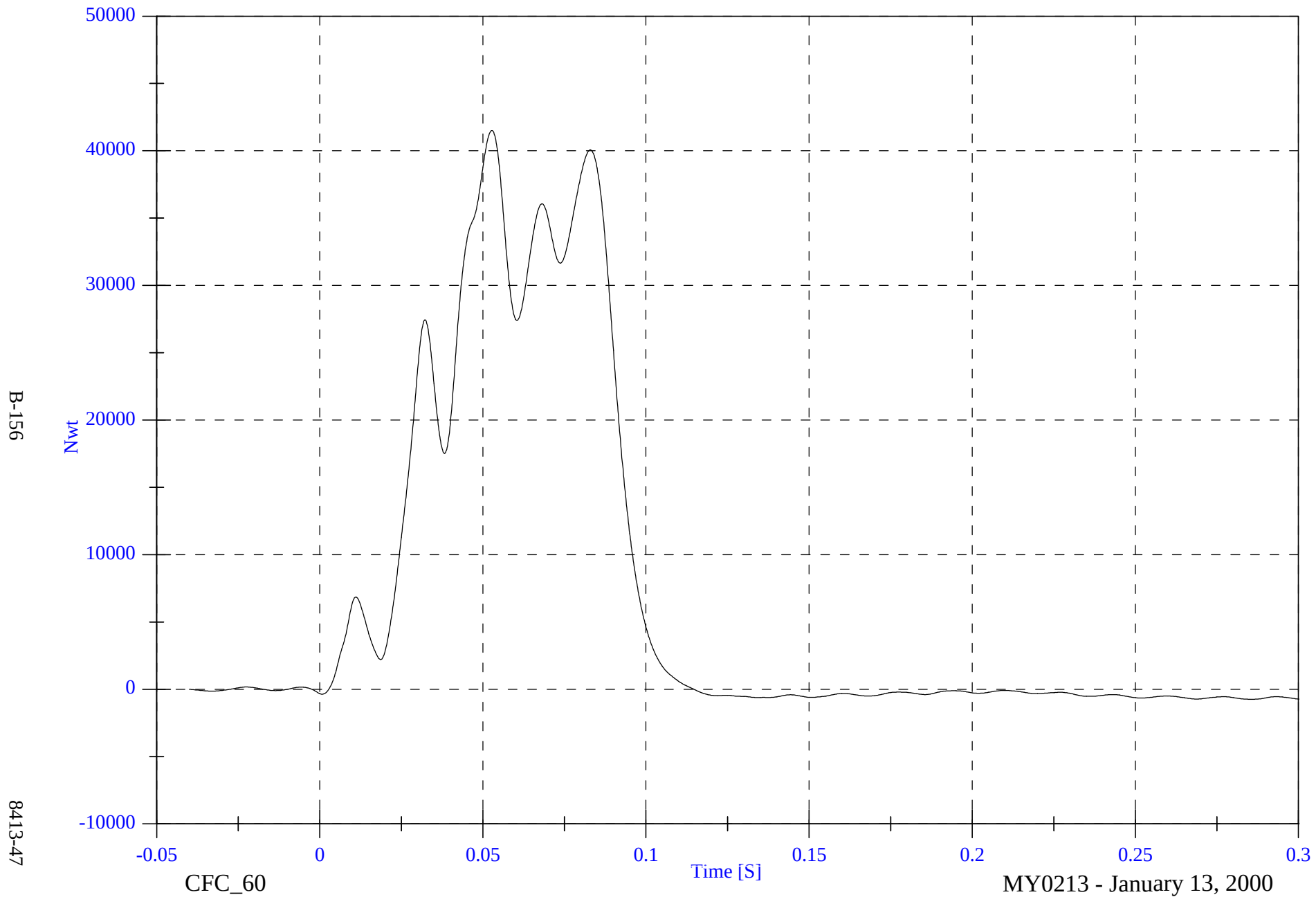


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC C5 Fx

Max: 41511.2 [Nwt] at 0.053 [S]

Min: -754.1 [Nwt] at 0.302 [S]

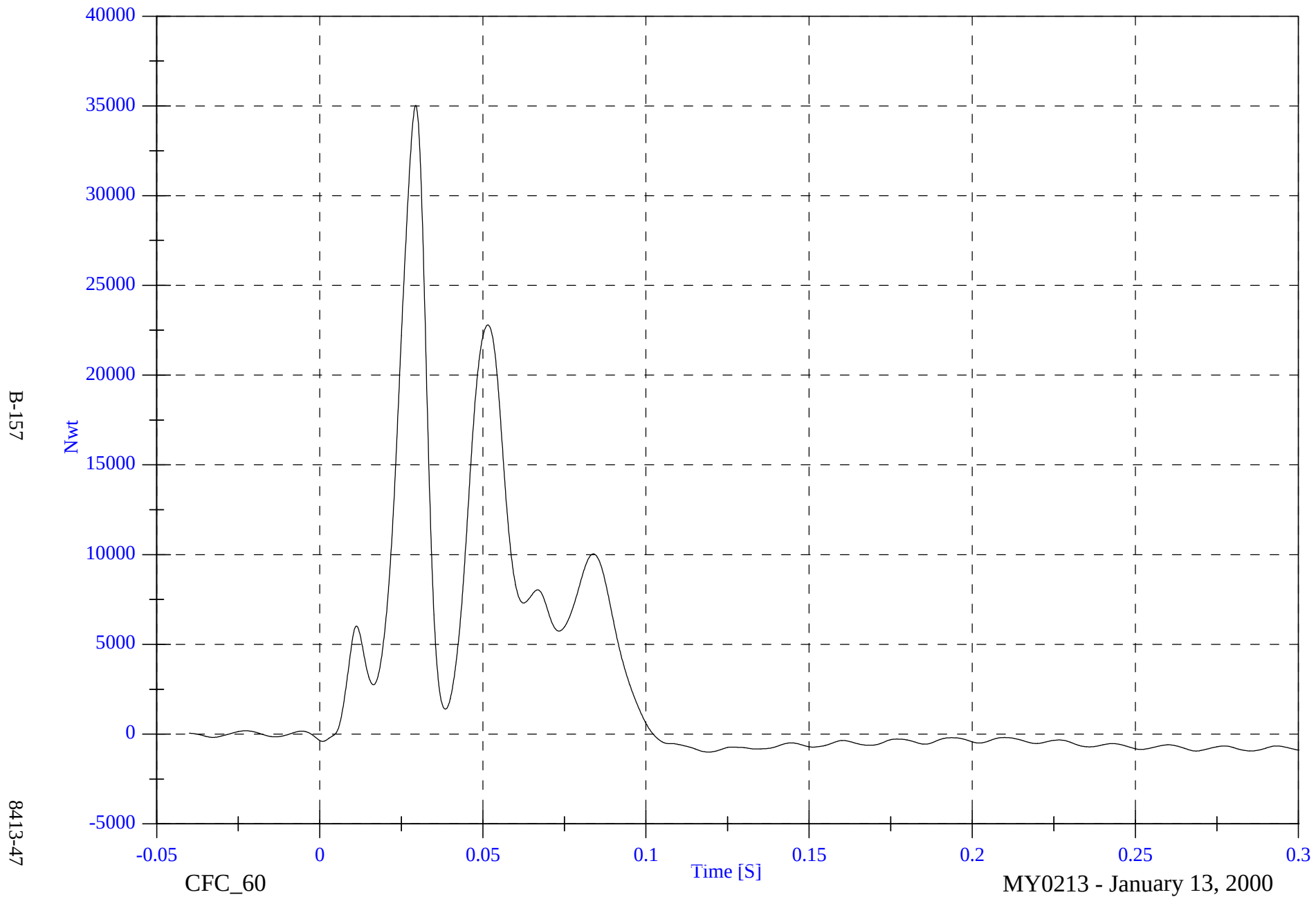


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC C6 Fx

Max: 35024.4 [Nwt] at 0.029 [S]

Min: -998.5 [Nwt] at 0.119 [S]

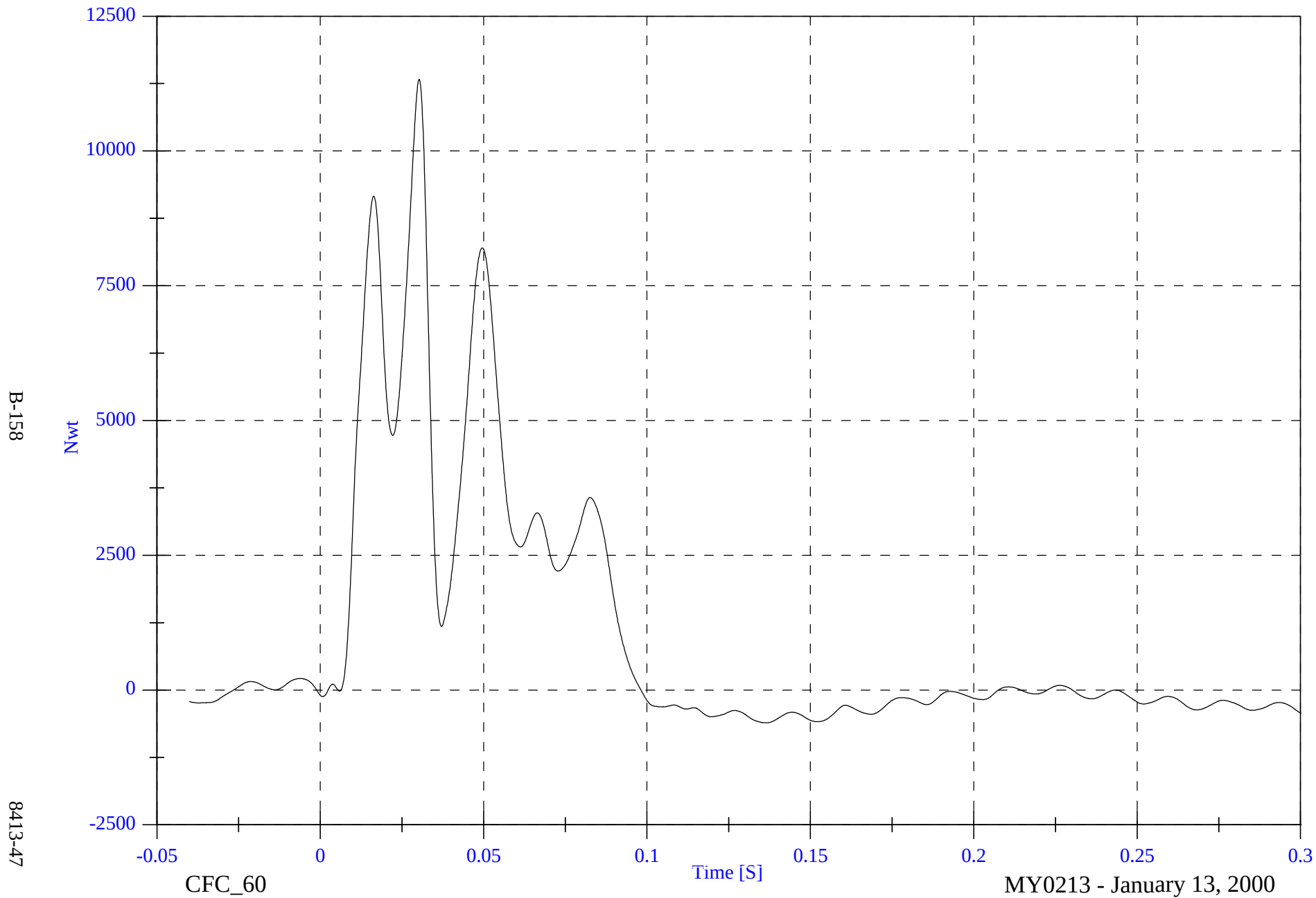


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC C7 Fx

Max: 11328.5 [Nwt] at 0.030 [S]

Min: -609.8 [Nwt] at 0.136 [S]

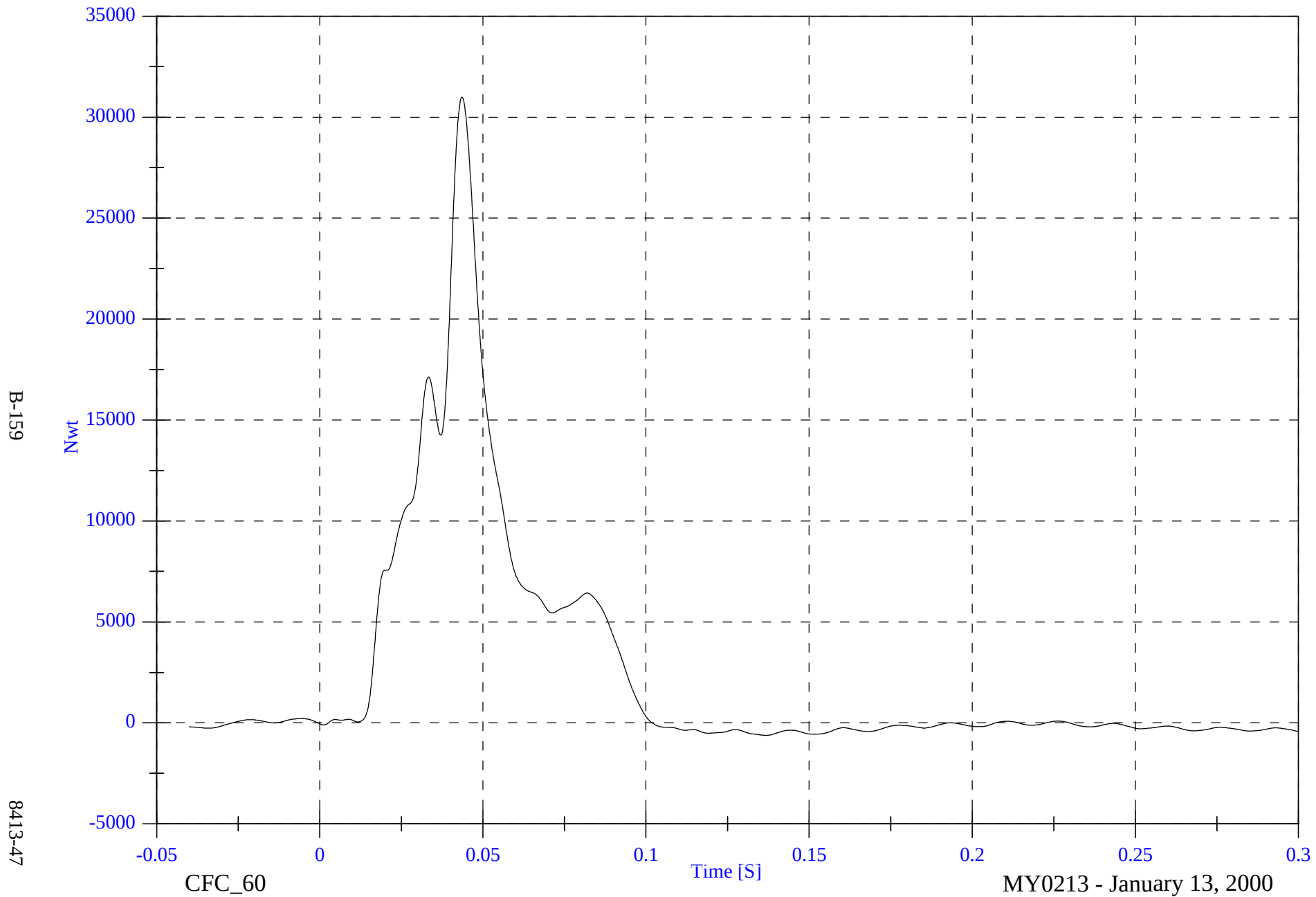


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC C8 Fx

Max: 30999.9 [Nwt] at 0.044 [S]

Min: -620.8 [Nwt] at 0.137 [S]

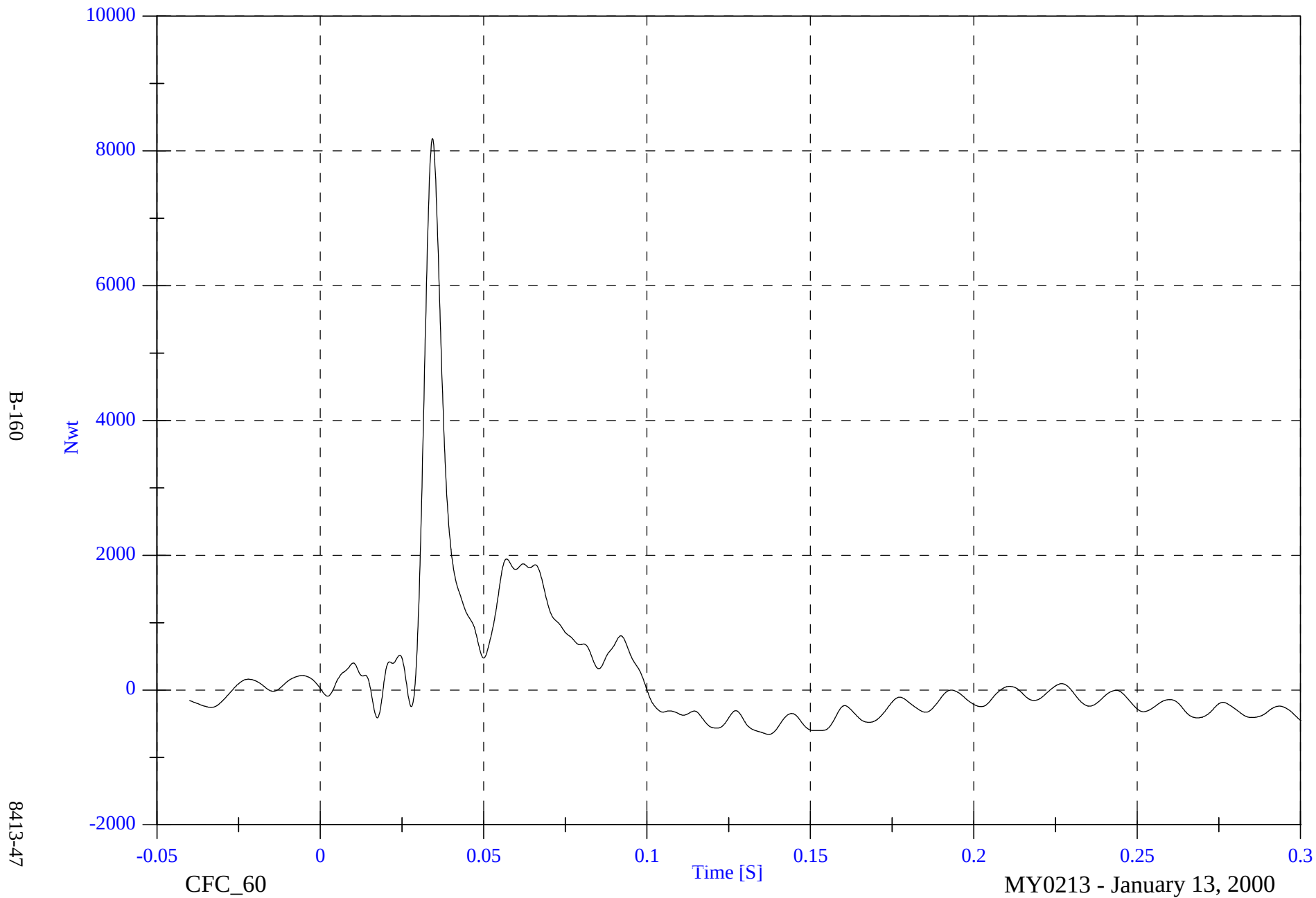


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC C9 Fx

Max: 8185.5 [Nwt] at 0.034 [S]

Min: -659.1 [Nwt] at 0.137 [S]

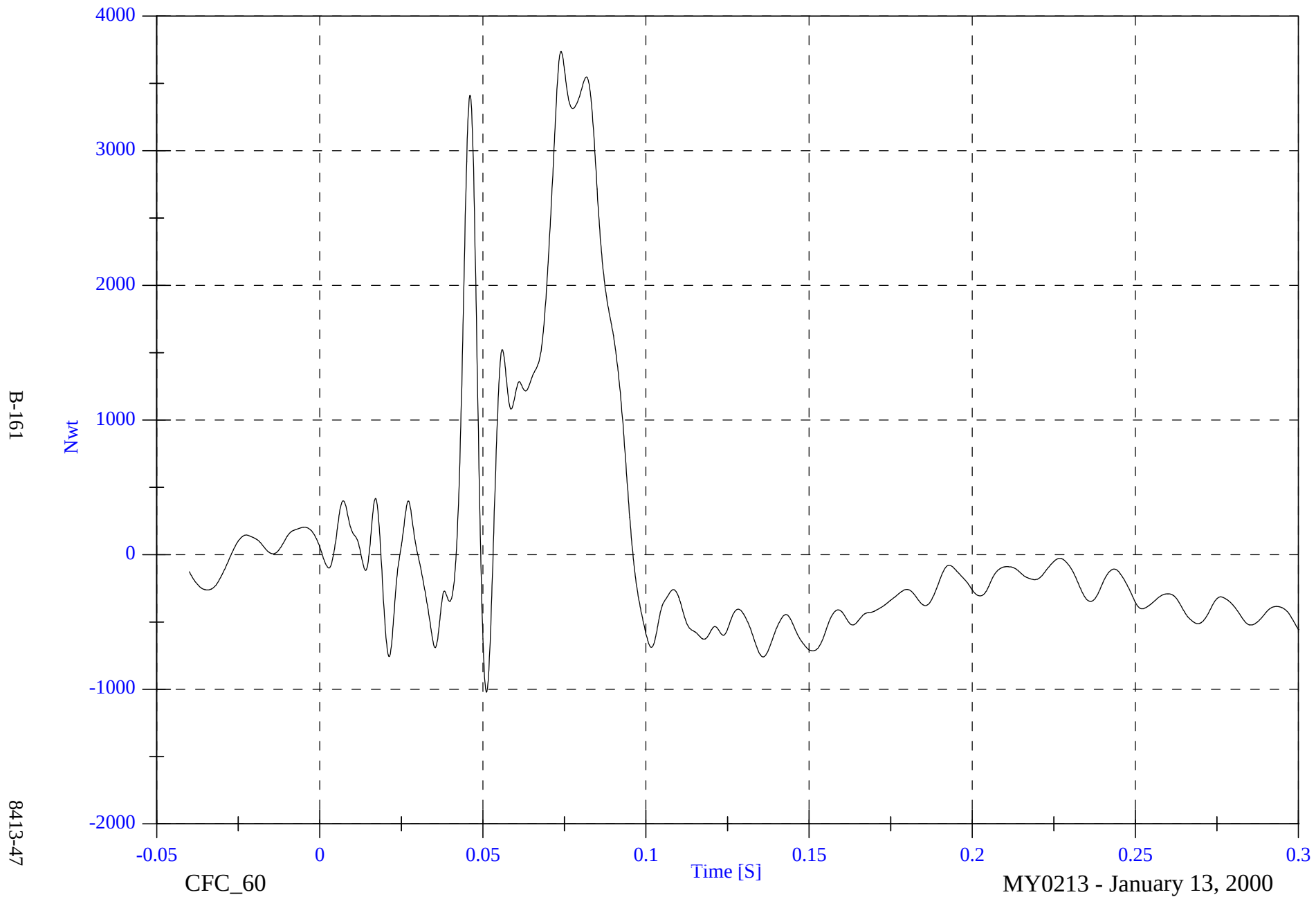


NCAP TEST #8 - 2000 Mercury Villager Sport

BLC D1 Fx

Max: 3738.5 [Nwt] at 0.074 [S]

Min: -1021.9 [Nwt] at 0.051 [S]

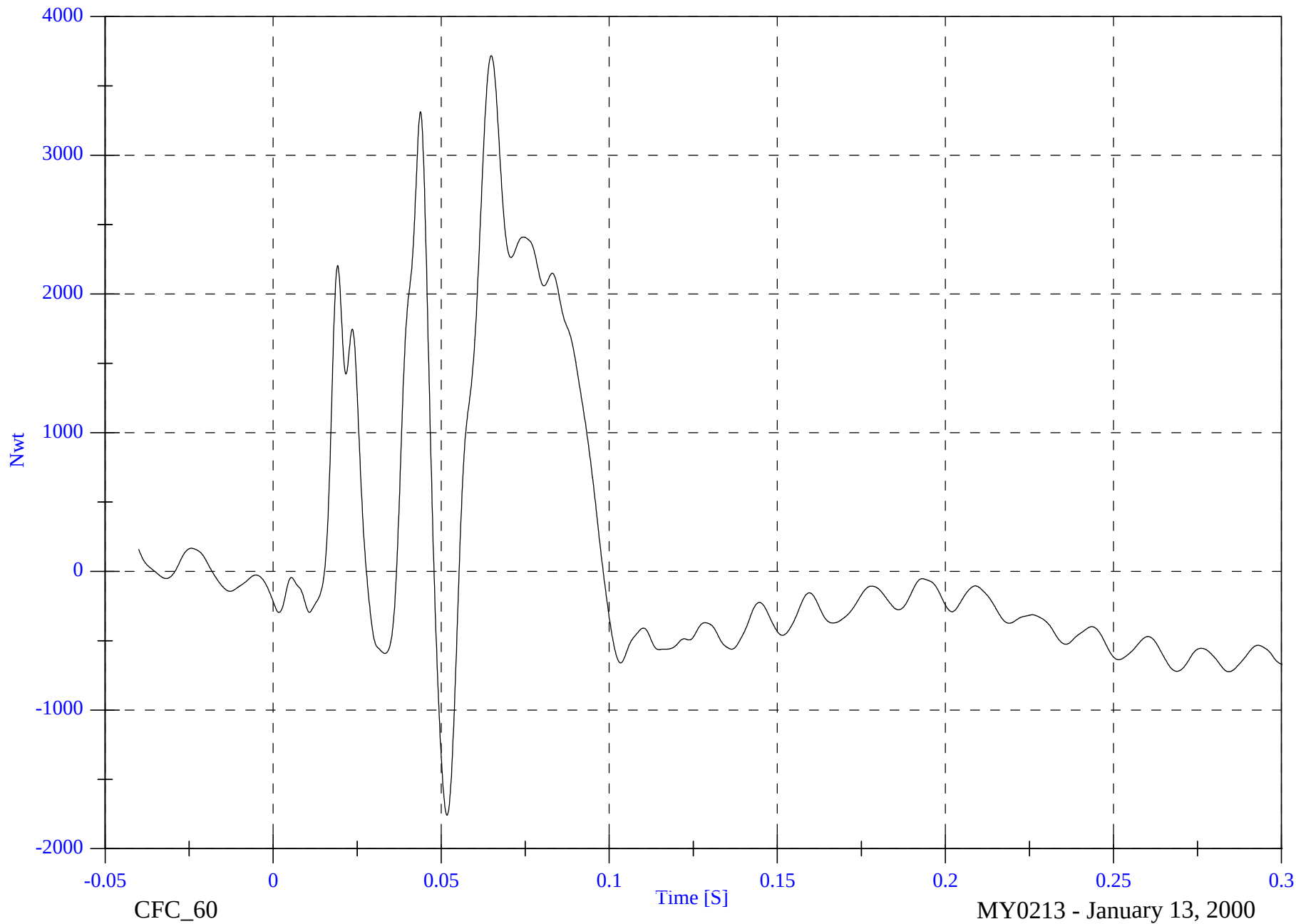


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC D2 Fx

Max: 3719.0 [Nwt] at 0.065 [S]

Min: -1759.7 [Nwt] at 0.052 [S]



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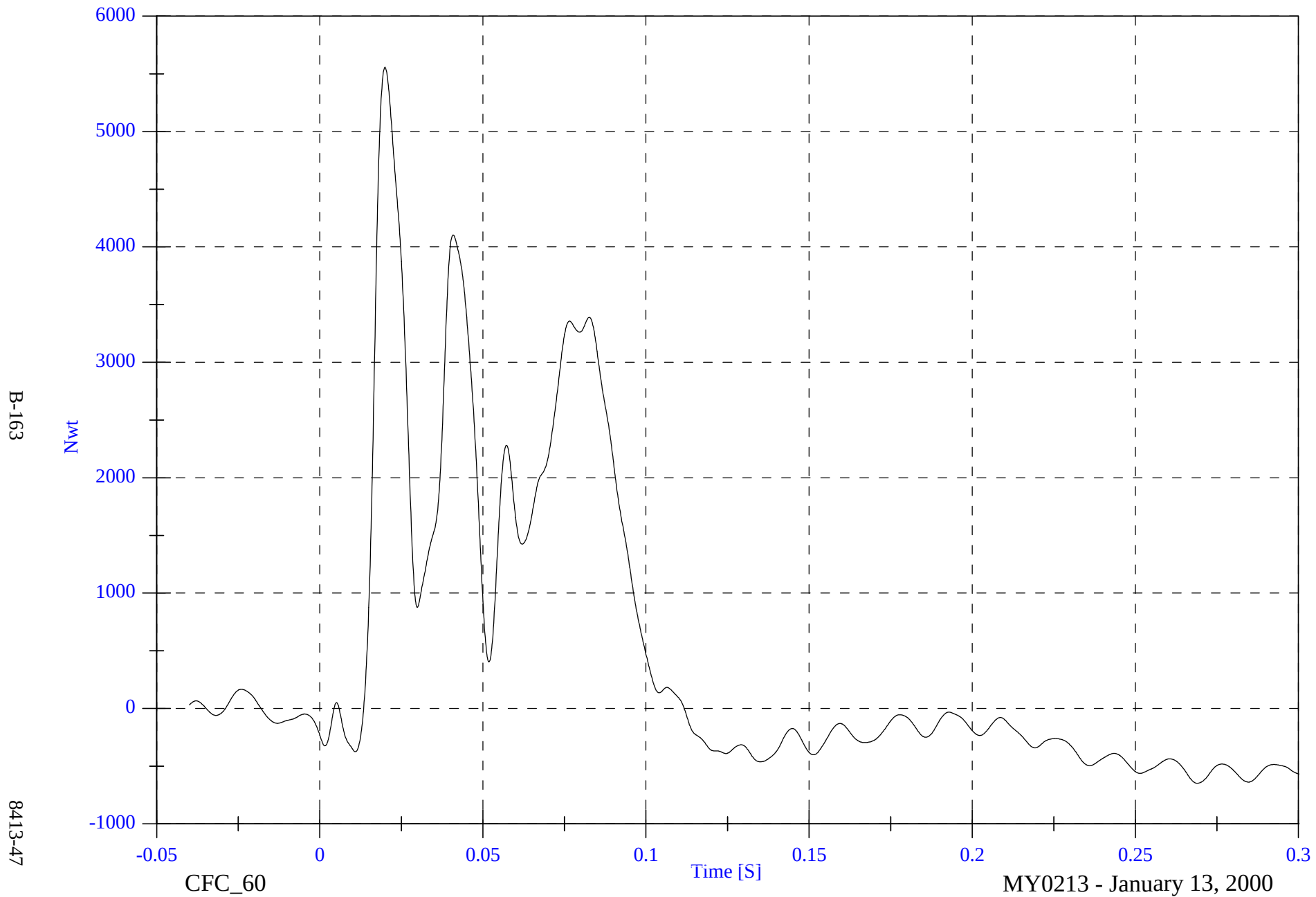
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NCAP TEST #8 - 2000 Mecury Villager Sport

BLC D3 Fx

Max: 5557.4 [Nwt] at 0.020 [S]

Min: -648.2 [Nwt] at 0.269 [S]



NCAP TEST #8 - 2000 Mecury Villager Sport

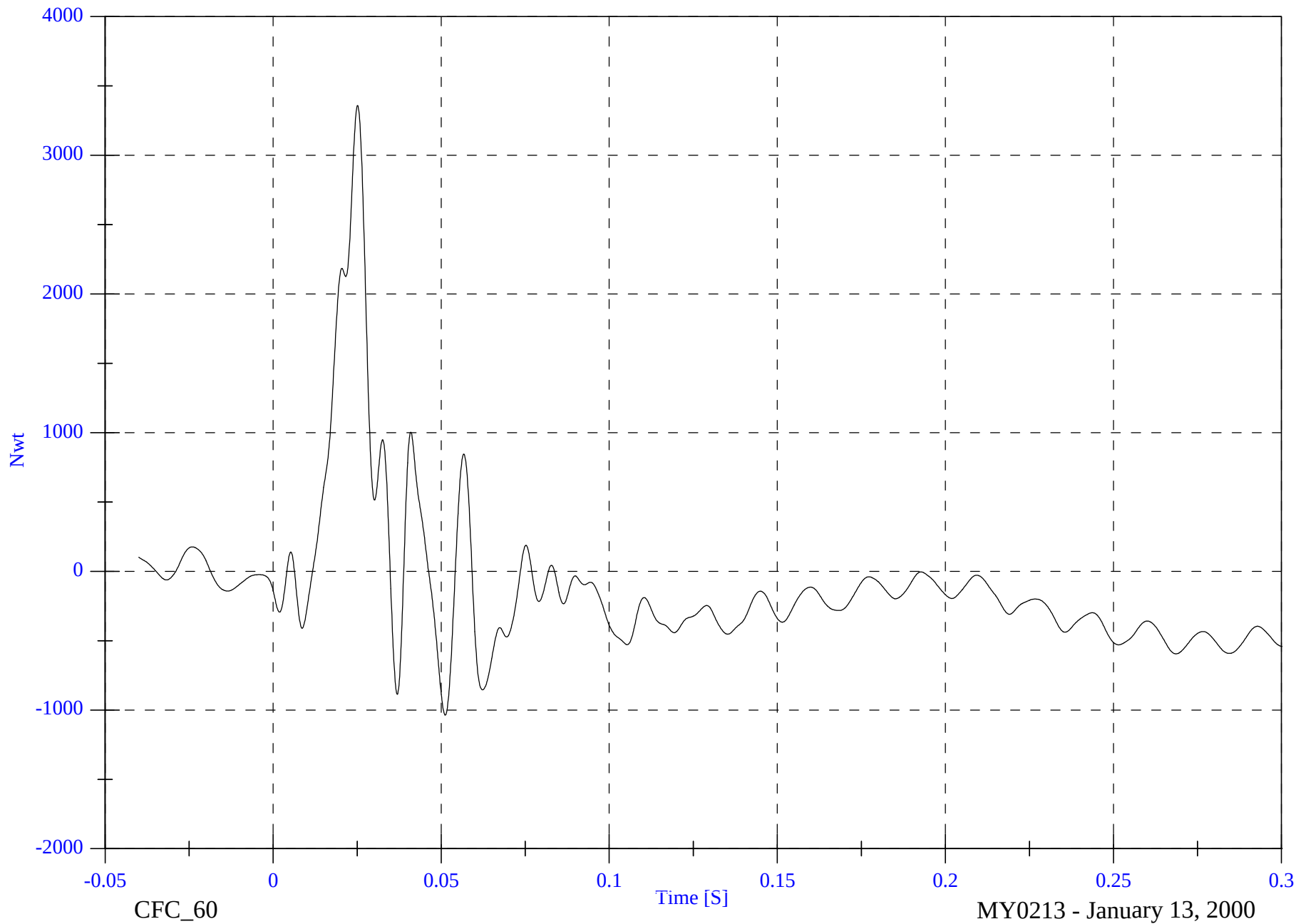
BLC D4 Fx

Max: 3359.9 [Nwt] at 0.025 [S]

Min: -1037.3 [Nwt] at 0.051 [S]

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NCAP TEST #8 - 2000 Mecury Villager Sport

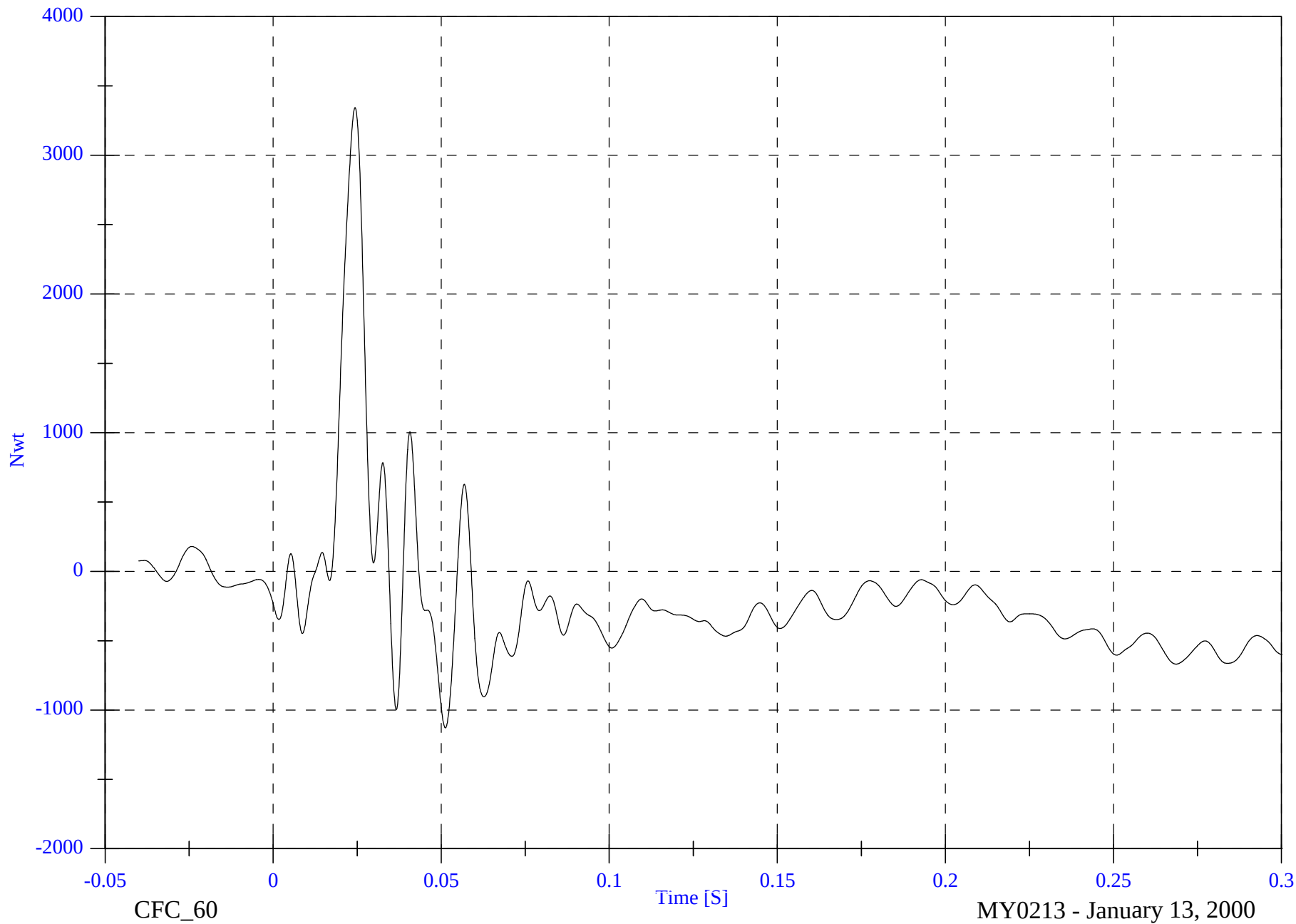
BLC D5 Fx

Max: 3344.7 [Nwt] at 0.024 [S]

Min: -1129.5 [Nwt] at 0.051 [S]

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NCAP TEST #8 - 2000 Mercury Villager Sport

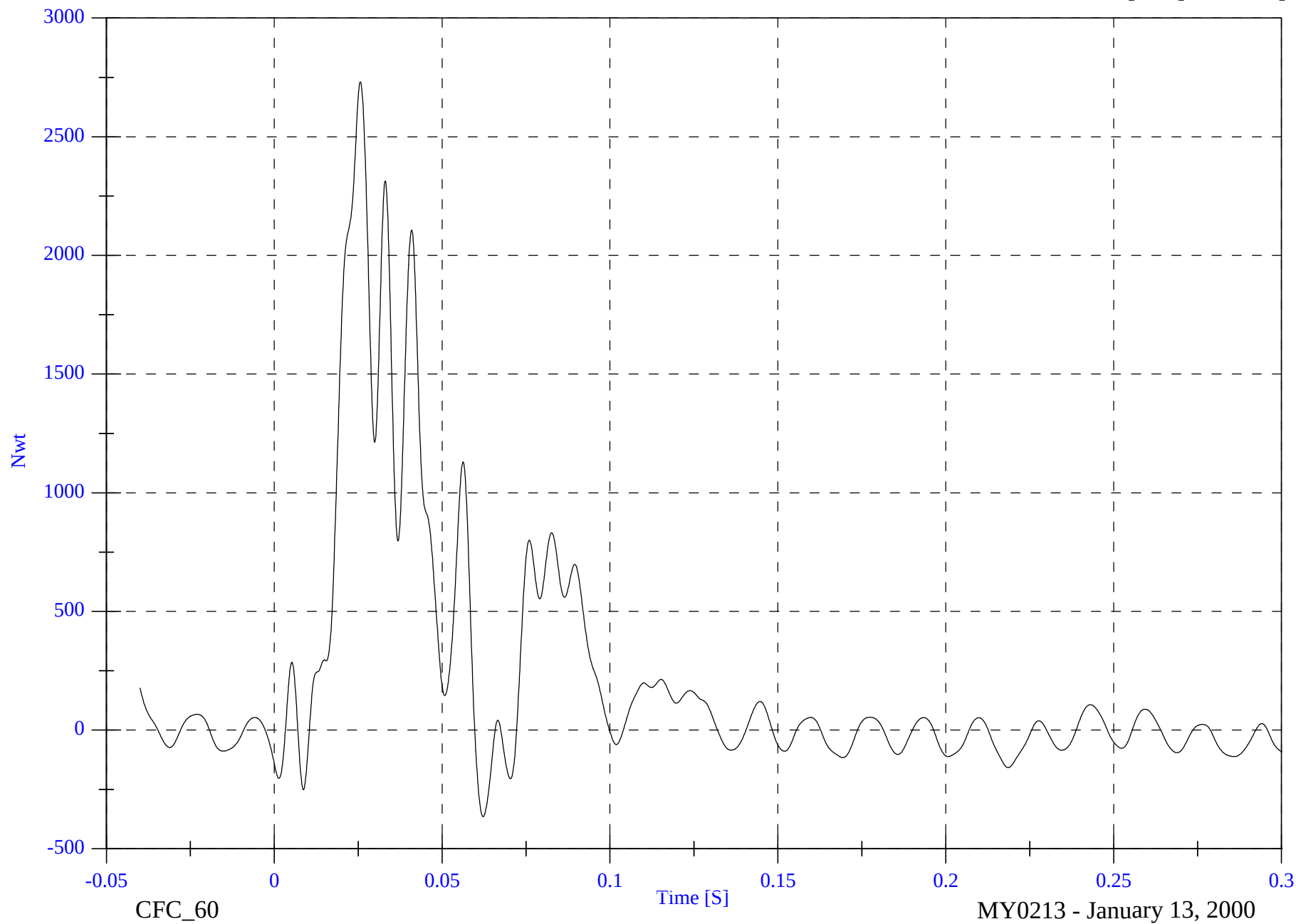
BLC D6 Fx

Max: 2731.0 [Nwt] at 0.026 [S]

Min: -364.9 [Nwt] at 0.062 [S]

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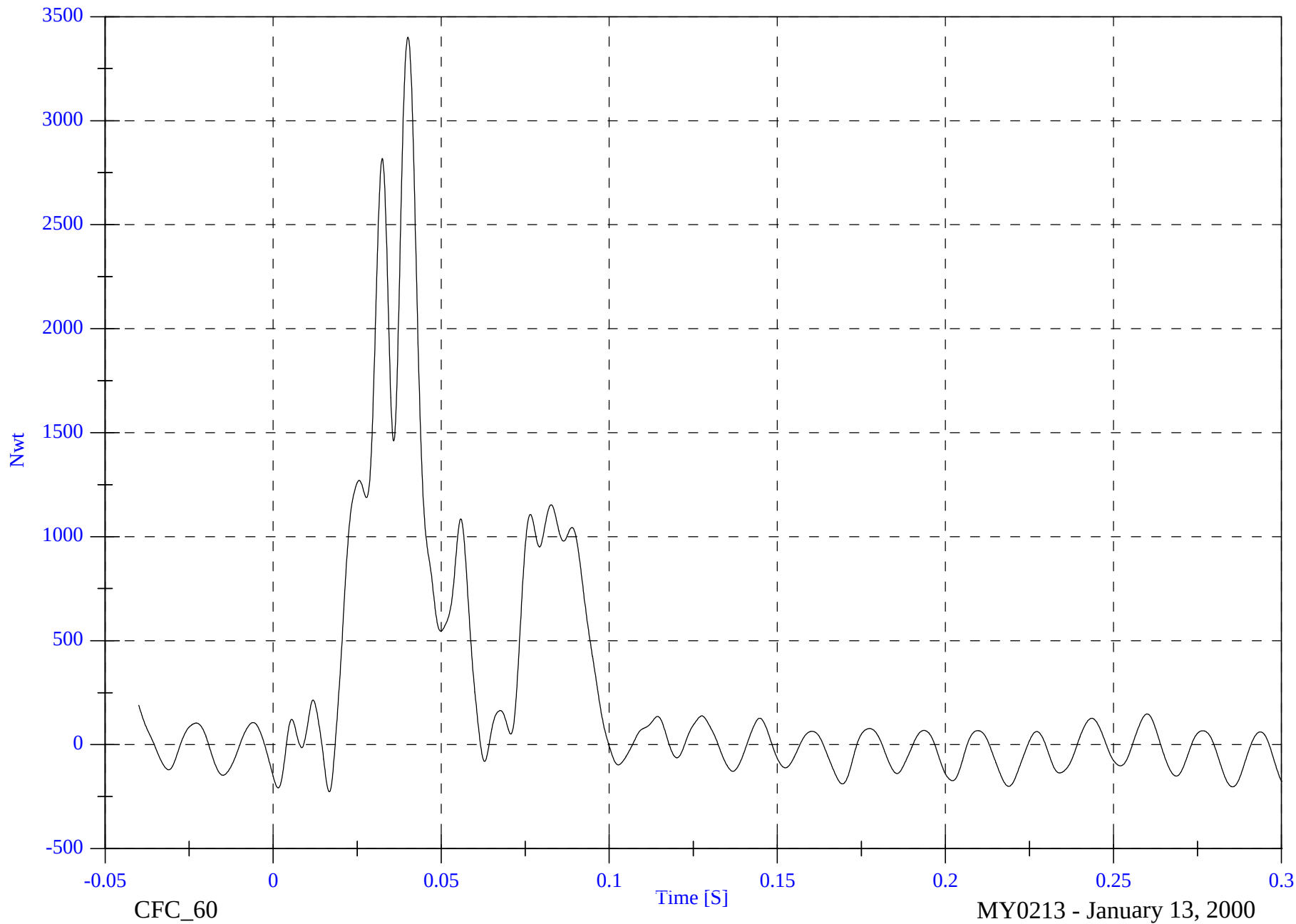


NCAP TEST #8 - 2000 Mercury Villager Sport

BLC D7 Fx

Max: 3401.6 [Nwt] at 0.040 [S]

Min: -226.5 [Nwt] at 0.017 [S]



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CFC_60

MY0213 - January 13, 2000

NCAP TEST #8 - 2000 Mercury Villager Sport

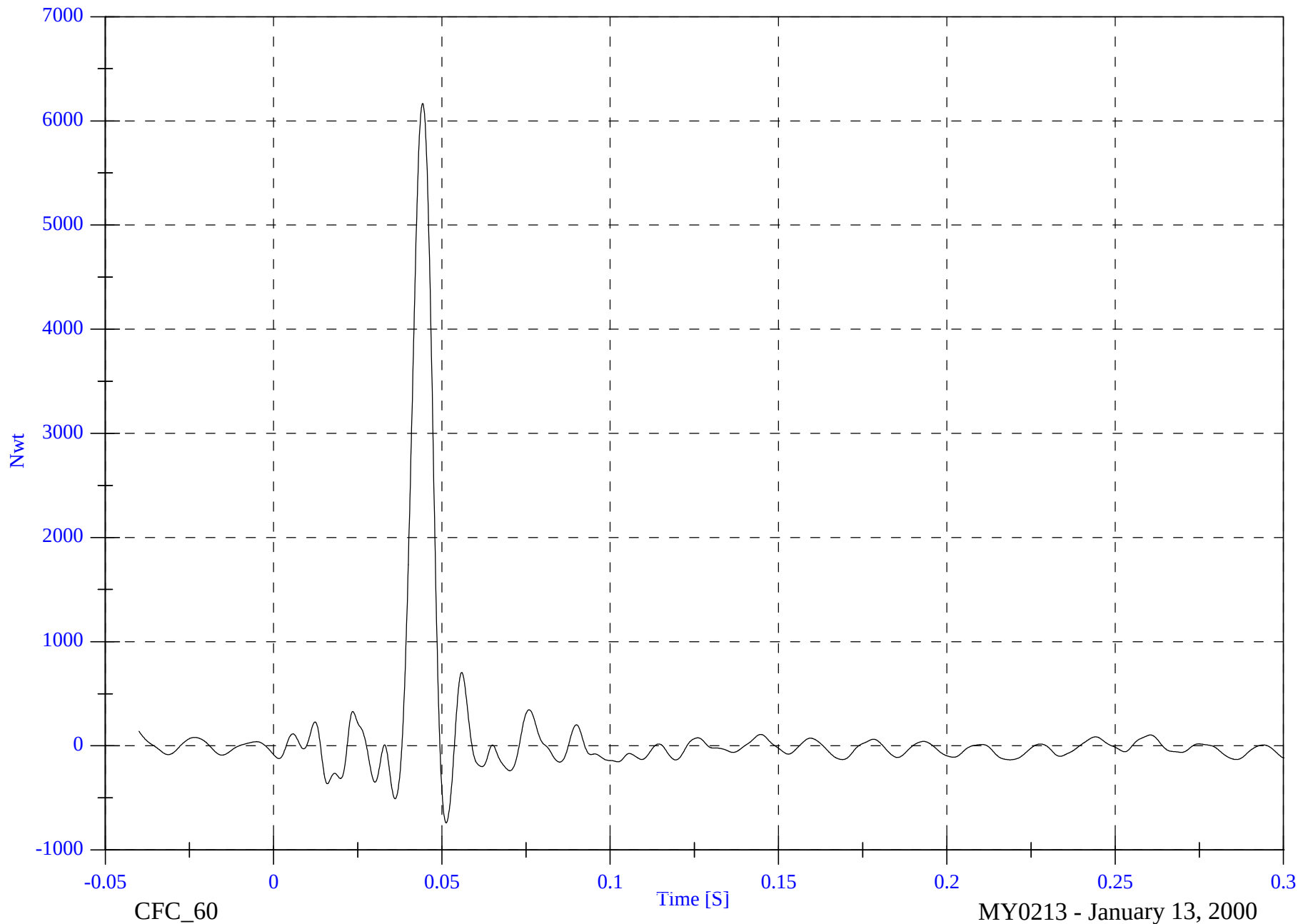
BLC D8 Fx

Max: 6167.5 [Nwt] at 0.044 [S]

Min: -739.6 [Nwt] at 0.051 [S]

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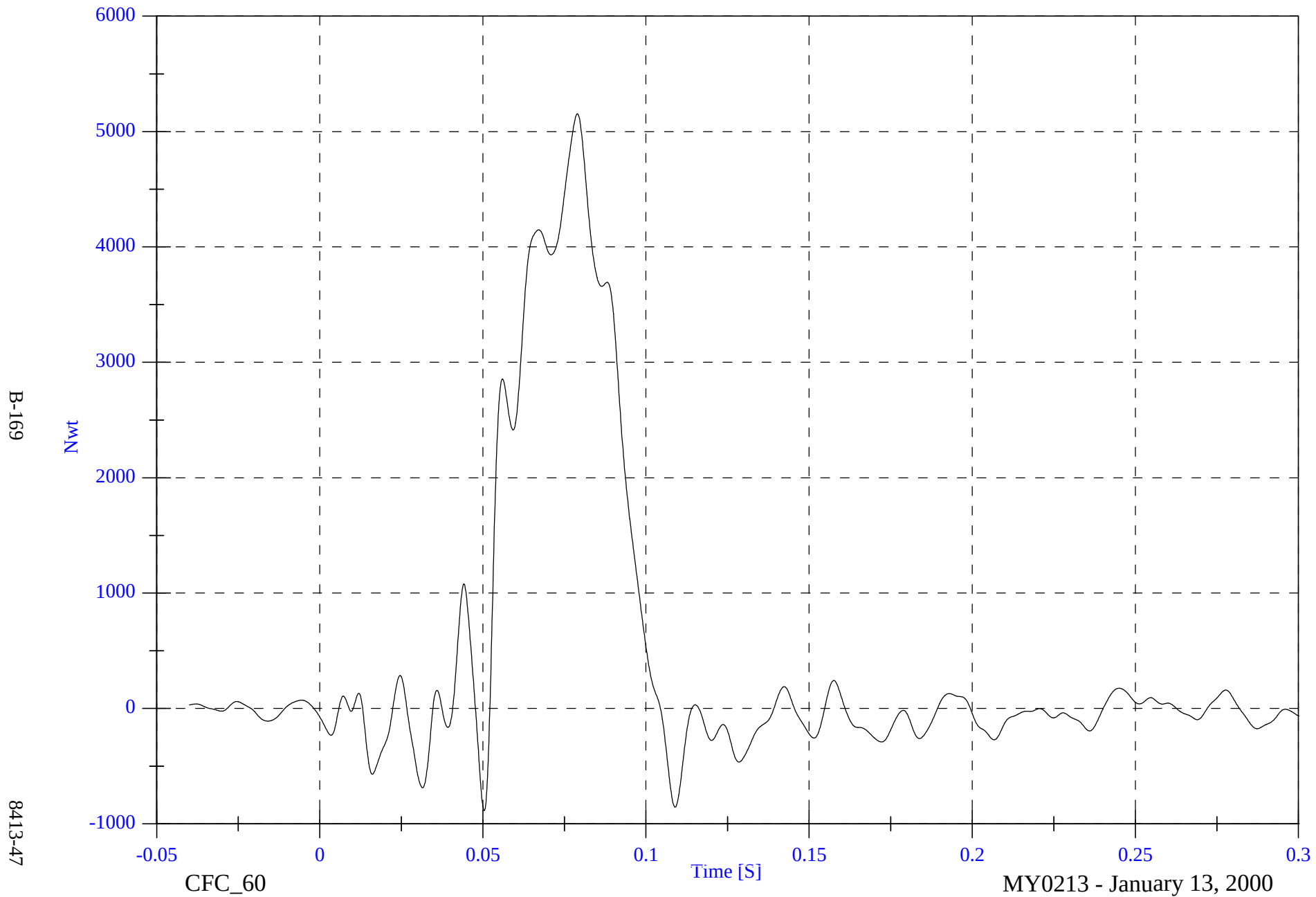


NCAP TEST #8 - 2000 Mecury Villager Sport

BLC D9 Fx

Max: 5153.7 [Nwt] at 0.079 [S]

Min: -886.6 [Nwt] at 0.050 [S]

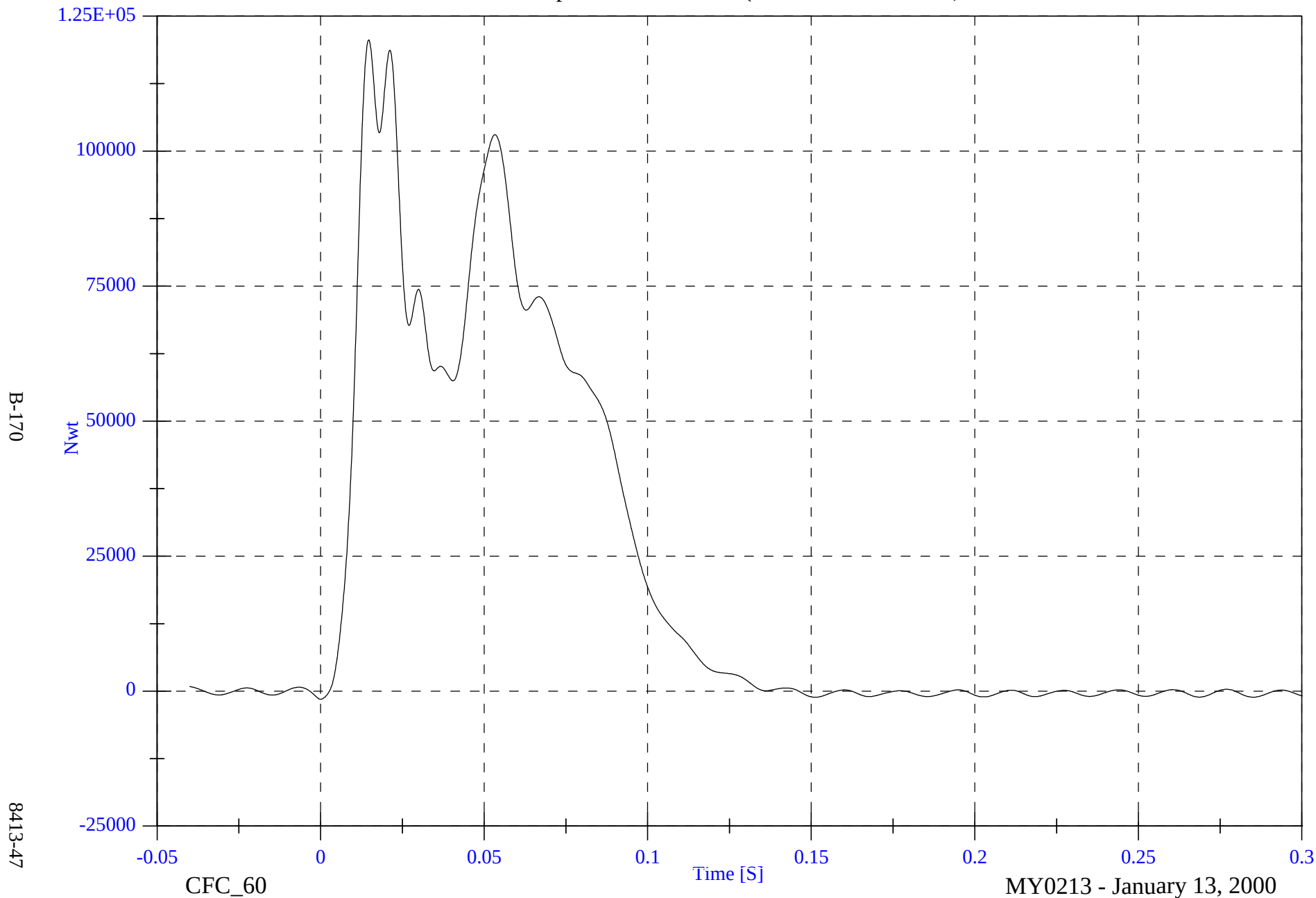


NCAP TEST #8 - 2000 Mecury Villager Sport

Group 1 Load Cell Sum (A1,A2,A3,B1,B2,B3)

Max: 120623.2 [Nwt] at 0.015 [S]

Min: -1514.9 [Nwt] at -0.000 [S]

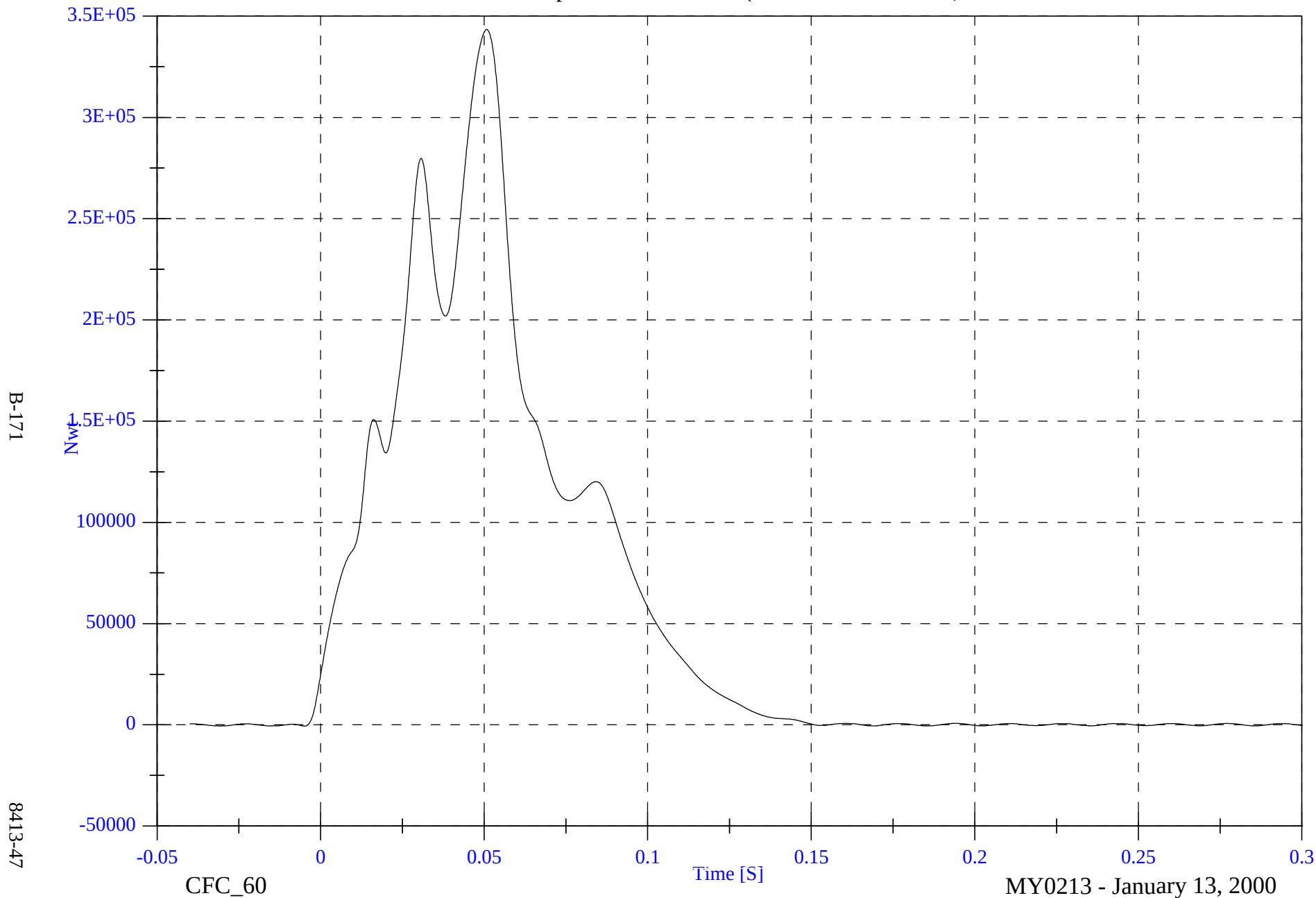


NCAP TEST #8 - 2000 Mecury Villager Sport

Group 2 Load Cell Sum (A4,A5,A6,B4,B5,B6)

Max: 343463.5 [Nwt] at 0.051 [S]

Min: -632.4 [Nwt] at -0.005 [S]

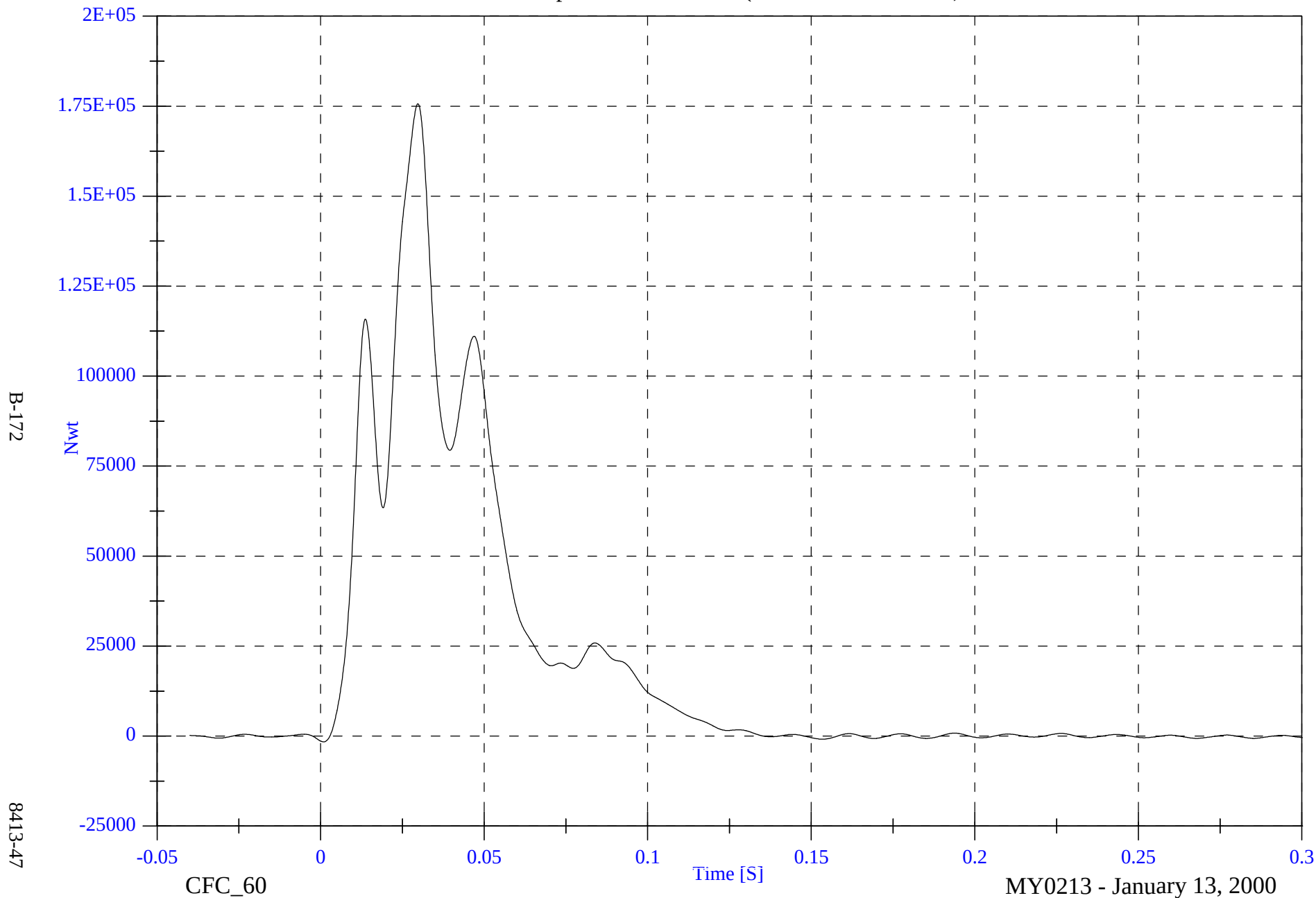


NCAP TEST #8 - 2000 Mecury Villager Sport

Group 3 Load Cell Sum (A7,A8,A9,B7,B8,B9)

Max: 175696.5 [Nwt] at 0.030 [S]

Min: -1612.2 [Nwt] at 0.001 [S]

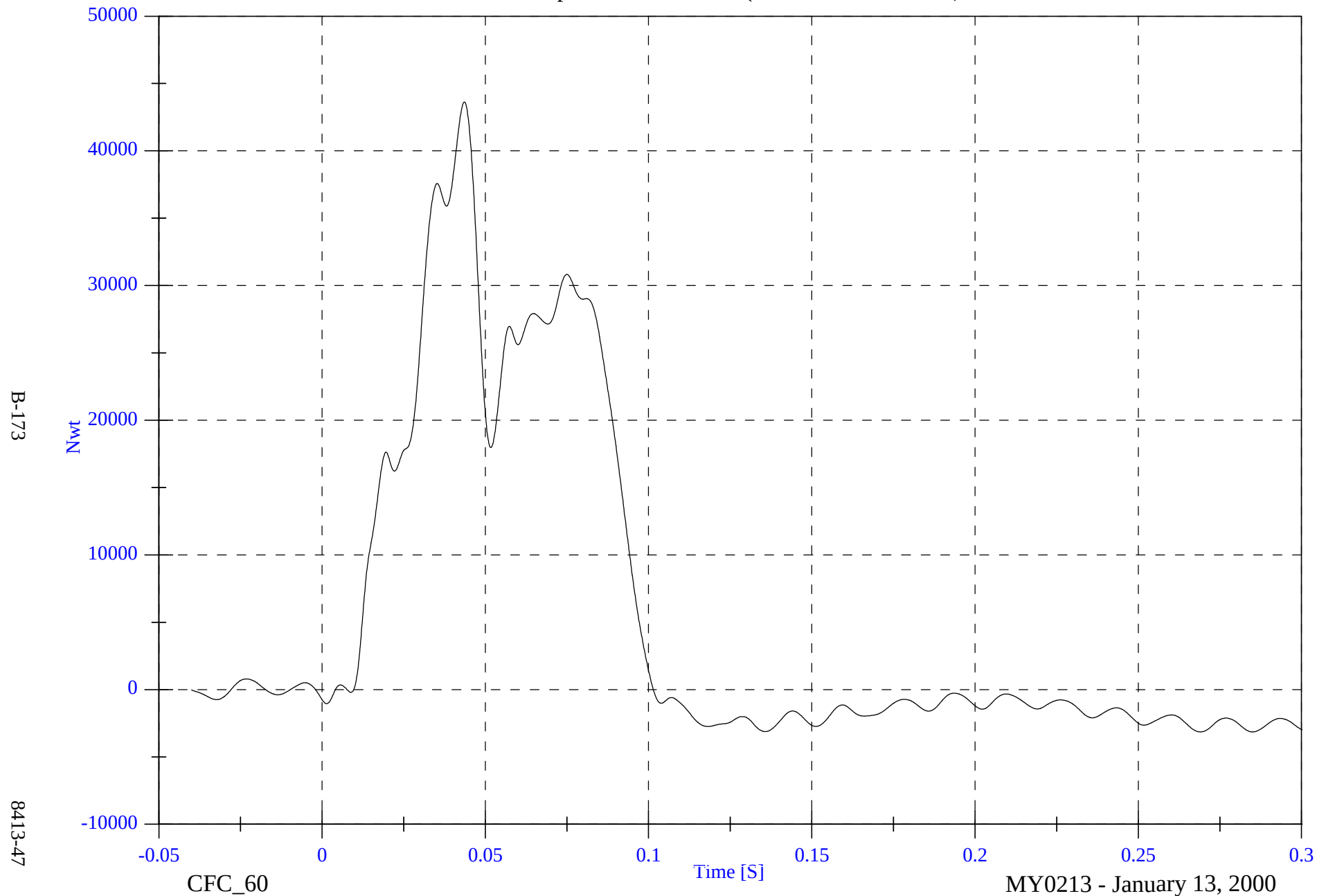


NCAP TEST #8 - 2000 Mecury Villager Sport

Group 4 Load Cell Sum (C1,C2,C3,D1,D2,D3)

Max: 43633.9 [Nwt] at 0.044 [S]

Min: -3148.5 [Nwt] at 0.285 [S]

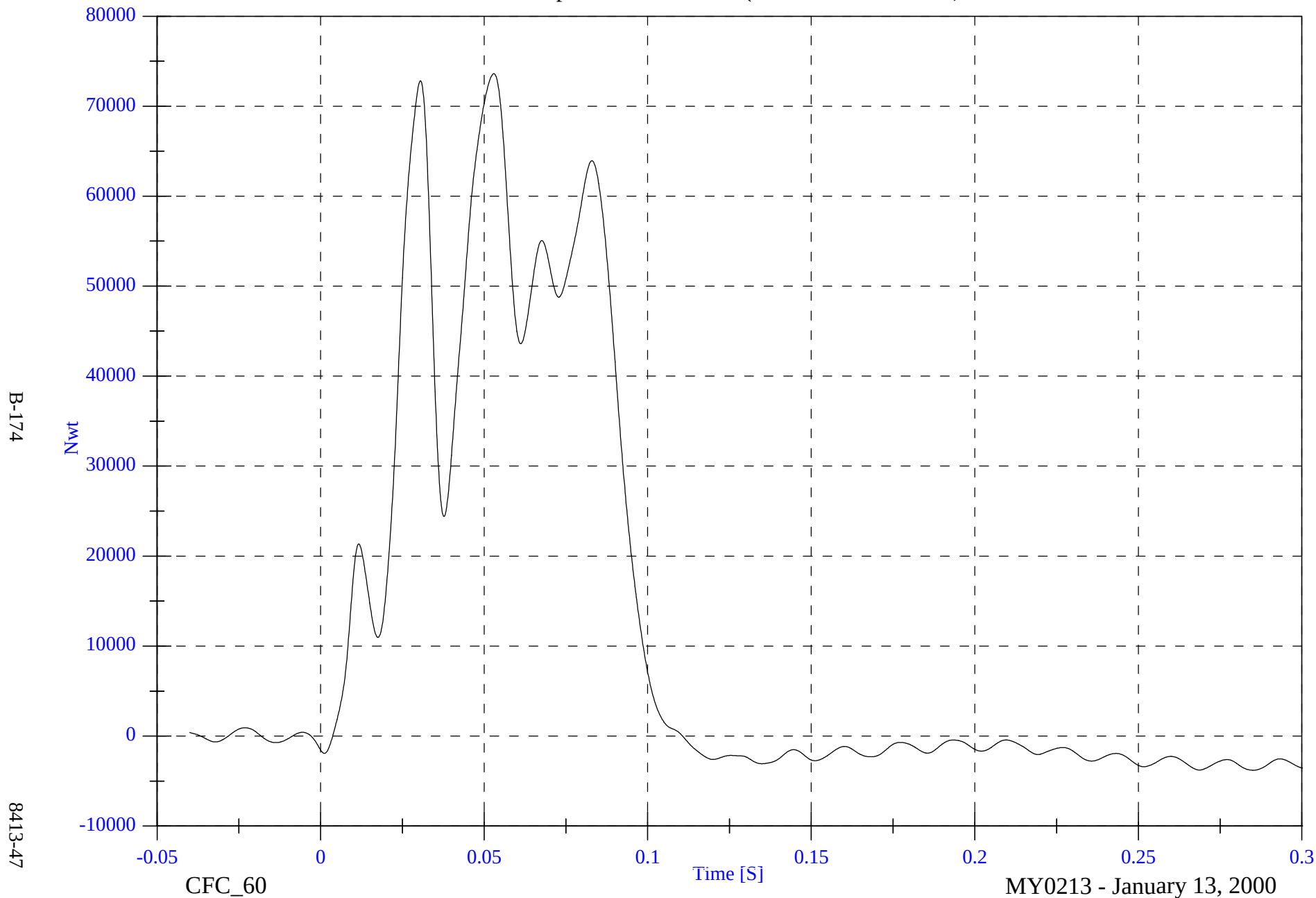


NCAP TEST #8 - 2000 Mecury Villager Sport

Group 5 Load Cell Sum (C4,C5,C6,D4,D5,D6)

Max: 73615.6 [Nwt] at 0.053 [S]

Min: -3800.4 [Nwt] at 0.285 [S]

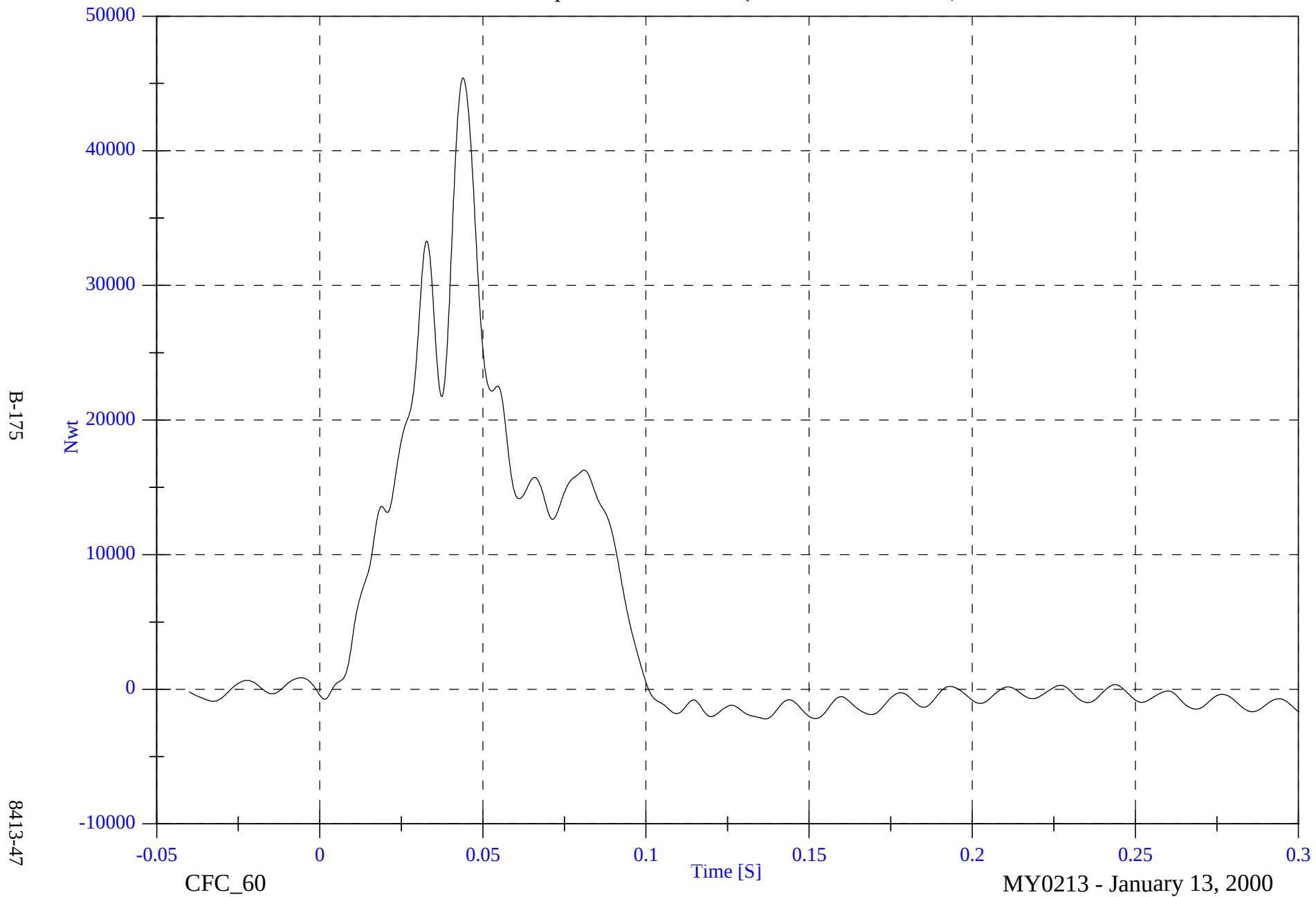


NCAP TEST #8 - 2000 Mecury Villager Sport

Group 6 Load Cell Sum (C7,C8,C9,D7,D8,D9)

Max: 45415.0 [Nwt] at 0.044 [S]

Min: -2201.3 [Nwt] at 0.137 [S]

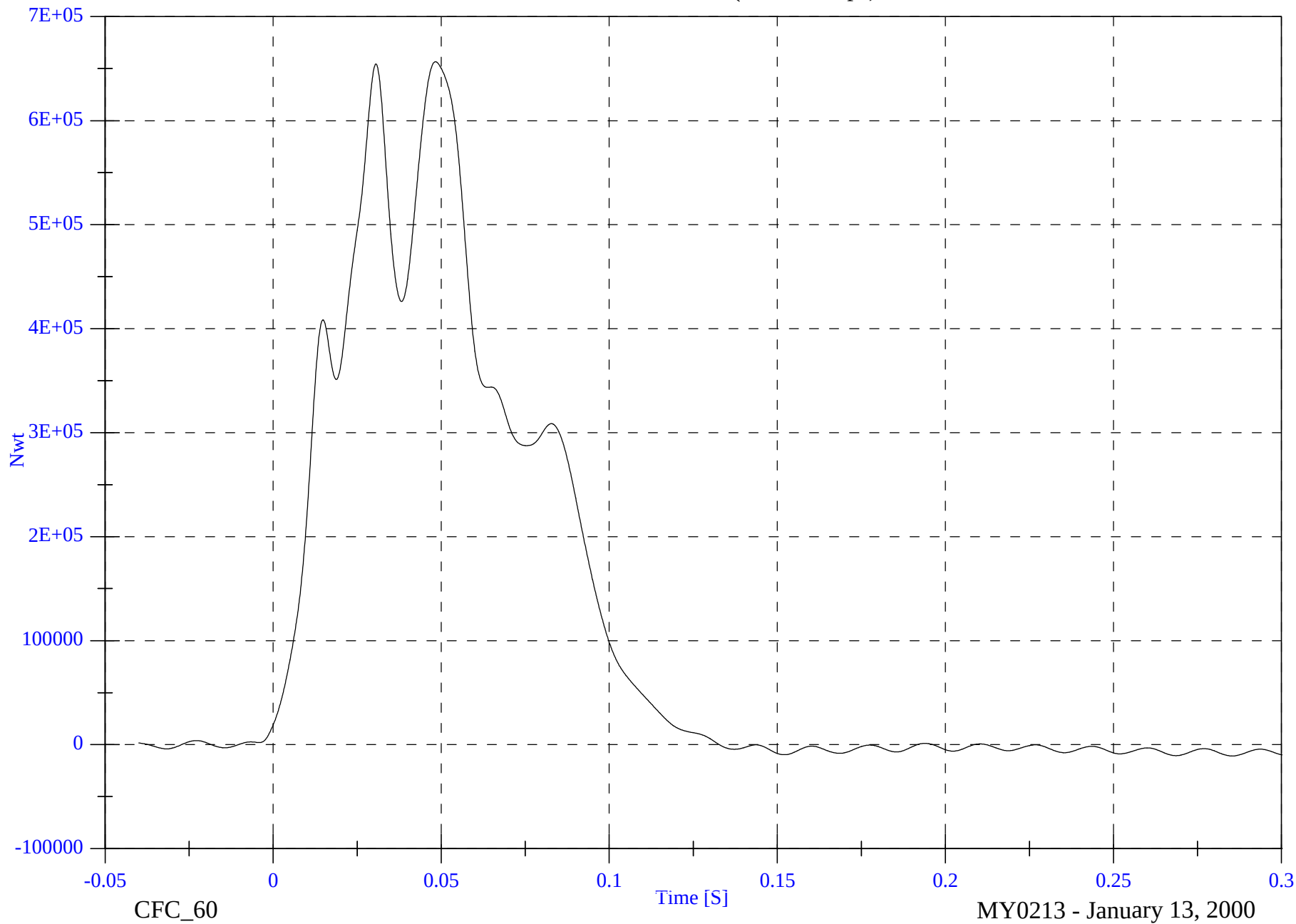


NCAP TEST #8 - 2000 Mercury Villager Sport

Total Load Cell Sum (All 6 Groups)

Max: 656674.1 [Nwt] at 0.048 [S]

Min: -10855.1 [Nwt] at 0.285 [S]



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CFC_60

Time [S]

MY0213 - January 13, 2000

APPENDIX C

PART 572B/E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA SHEETS

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Veridian Engineering. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

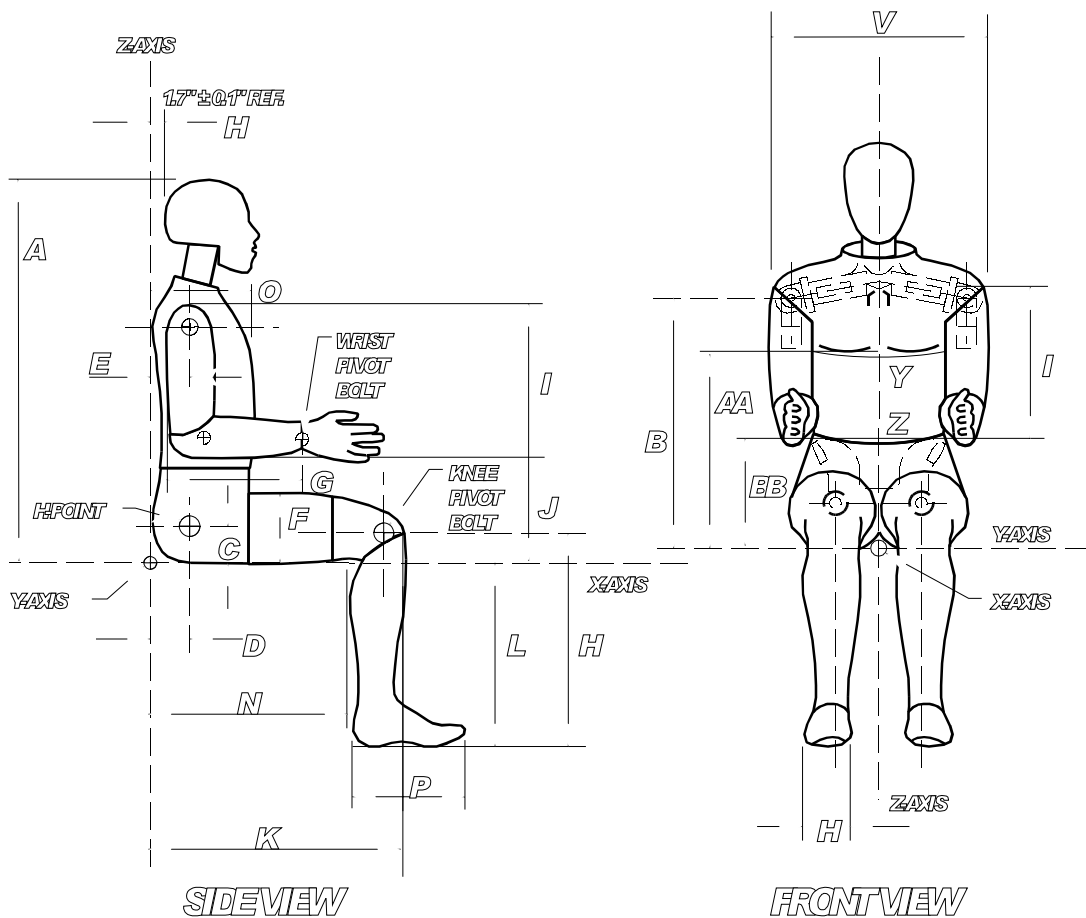
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	12/10/99
#2/Right Front Passenger	064	12/10/99

Electronic Test Equipment

The complement of signal conditioning, recording and display equipment, in conjunction with dummy certification testing, can be found in New Car Assessment and Standards Inducant Testing Final Report No. 6525-V-1.

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE Figure is referenced to the erect/seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude. (REF: S57231(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 6
Date December 6, 1999
Workfile 061699.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	71
Relative Humidity	10% - 70%	32
Peak Resultant Acceleration	225-275 G's	237.2
Peak Lateral Acceleration	15 G's Max	10.0
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	6	
Date	December 6, 1999	6 Axis Neck Transducer
Workfile	061699.nfl	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71
Relative Humidity		10% - 70%	32
Impact Velocity		22.60 - 23.40 Ft/s	22.70
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	24.58
	20 ms	17.60 - 22.60 G's	20.41
	30 ms	12.50 - 18.50 G's	14.35
Max Pendulum G's Above 30 ms		29 G's Max	14.35
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.63
D Plane Rotation	Max	64 - 78 Deg	76.03
	Time	57 - 64 ms	63.25
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	76.29
	Time	47 - 58 ms	54.63
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	119.00
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	100.88

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	6	
Date	December 6, 1999	6 Axis Neck Transducer
Workfile	061699.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	31
Impact Velocity		19.50 - 20.30 Ft/s	19.77
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.35
	20 ms	14.00 - 19.00 G's	18.69
	30 ms	11.00 - 16.00 G's	15.04
Max Pendulum G's Above 30 ms		22 G's Max	15.04
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	39.00
D Plane Rotation	Max	81 - 106 Deg	96.52
	Time	72 - 82 ms	74.25
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-50.42
	Time	65 - 79 ms	70.00
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	155.25
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	129.63

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 6
Date December 6, 1999
Workfile 061699.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	31
Pendulum Velocity	21.6 - 22.4 Ft/s	22.65
Maximum Deflection	2.50 - 2.86 in	2.52
Maximum Resistive Force	1160 - 1325 Lbs	1243.47
Internal Hysteresis	69 - 85 %	74.03

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 6
Date December 6, 1999
Workfile 061699.lf/061699.rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	30
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1265.0
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	30
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1246.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 6
Date December 10, 1999

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			32
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.5
Chest Depth	O	8.4 - 9.0 in	8.4
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.9
Thigh Clearance	F	5.5 - 6.1 in	6.1
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.5
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.1
Elbow Rest Height	J	7.5 - 8.3 in	7.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.4
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 064
Sequential Test Number 6
Date December 6, 1999
Workfile 064699.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	71
Relative Humidity	10% - 70%	32
Peak Resultant Acceleration	225-275 G's	239.5
Peak Lateral Acceleration	15 G's Max	12.0
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	6	
Date	December 6, 1999	6 Axis Neck Transducer
Workfile	064699.nfl	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	31
Impact Velocity		22.60 - 23.40 Ft/s	22.64
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.65
	20 ms	17.60 - 22.60 G's	19.38
	30 ms	12.50 - 18.50 G's	15.62
Max Pendulum G's Above 30 ms		29 G's Max	15.62
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.75
D Plane Rotation	Max	64 - 78 Deg	72.67
	Time	57 - 64 ms	58.13
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	78.61
	Time	47 - 58 ms	53.88
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	121.00
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	101.63

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	6	
Date	December 6, 1999	6 Axis Neck Transducer
Workfile	064699.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	31
Impact Velocity		19.50 - 20.30 Ft/s	19.67
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	20.00
	20 ms	14.00 - 19.00 G's	18.38
	30 ms	11.00 - 16.00 G's	15.32
Max Pendulum G's Above 30 ms		22 G's Max	15.32
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	39.13
D Plane Rotation	Max	81 - 106 Deg	97.84
	Time	72 - 82 ms	73.38
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-55.90
	Time	65 - 79 ms	69.13
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	147.75
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	135.50

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 6
Date December 6, 1999
Workfile 064699.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	30
Pendulum Velocity	21.6 - 22.4 Ft/s	21.68
Maximum Deflection	2.50 - 2.86 in	2.50
Maximum Resistive Force	1160 - 1325 Lbs	1300.05
Internal Hysteresis	69 - 85 %	76.8

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 6
Date December 6, 1999
Workfile 064699.lf/064699.rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	30
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1134.0
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	30
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1135.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 6
Date December 10, 1999

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			30
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	38.8
Waist Circumference	Z	32.9 - 34.1 in	33.4
Chest Depth	O	8.4 - 9.0 in	8.6
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.5
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.3
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.4
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.3
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician: B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-AL553	08-Nov-99	08-May-00
	Y	ENDEVCO	AC-A83G	08-Nov-99	08-May-00
	Z	ENDEVCO	AC-C14901	08-Nov-99	08-May-00
Head	X (R)	ENDEVCO	AC-A13939	08-Nov-99	08-May-00
	Y (R)	ENDEVCO	AC-A14181	08-Nov-99	08-May-00
	Z (R)	ENDEVCO	AC-A14124	08-Nov-99	08-May-00
Neck Load Cell	X	DENTON	LC-205Fx	06-Aug-99	06-Feb-00
	Y	DENTON	LC-205Fy	06-Aug-99	06-Feb-00
	Z	DENTON	LC-205Fz	06-Aug-99	06-Feb-00
Neck Moment	X	DENTON	LC-205Mx	06-Aug-99	06-Feb-00
	Y	DENTON	LC-205My	06-Aug-99	06-Feb-00
	Z	DENTON	LC-205Mz	06-Aug-99	06-Feb-00
Chest	X	ENDEVCO	AC-FP90	08-Nov-99	08-May-00
	Y	ENDEVCO	AC-A26A	08-Nov-99	08-May-00
	Z	ENDEVCO	AC-AL6H7	08-Nov-99	08-May-00
Chest	X (R)	ENDEVCO	AC-B11407	08-Nov-99	08-May-00
	Y (R)	ENDEVCO	AC-B11408	08-Nov-99	08-May-00
	Z (R)	ENDEVCO	AC-B10827	08-Nov-99	08-May-00
Chest Deflection Gauge Hybrid III Use Only		SERVO	DS-061	06-Aug-99	06-Feb-00
Pelvic	X	ENDEVCO	AC-ADMB8	08-Nov-99	08-May-00
	Y	ENDEVCO	AC-ADL44	08-Nov-99	08-May-00
	Z	ENDEVCO	AC-ACT12	08-Nov-99	08-May-00

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-418	20-Oct-99	20-Apr-00
Right Femur Load Cell		GSE	LC-420	19-Oct-99	19-Apr-00
Left Upper Tibia	Mx	DENTON	LC-045Mx	16-Sep-99	16-Mar-00
	My	DENTON	LC-045My	16-Sep-99	16-Mar-00
Left Lower Tibia	Fz	DENTON	LC-125Fz	16-Sep-99	16-Mar-00
	Mx	DENTON	LC-125Mx	16-Sep-99	16-Mar-00
	My	DENTON	LC-125My	16-Sep-99	16-Mar-00
Right Upper Tibia	Mx	DENTON	LC-038Mx	16-Sep-99	16-Mar-00
	My	DENTON	LC-038My	16-Sep-99	16-Mar-00
Right Lower Tibia	Fz	DENTON	LC-124Fz	16-Sep-99	16-Mar-00
	Mx	DENTON	LC-124Mx	16-Sep-99	16-Mar-00
	My	DENTON	LC-124My	16-Sep-99	16-Mar-00
Left Foot Rear	X	ENDEVCO	AC-J31009	11-Oct-99	11-Apr-00
	Z	ENDEVCO	AC-J32176	11-Oct-99	11-Apr-00
Left Foot Front	Z	ENDEVCO	AC-J31042	11-Oct-99	11-Apr-00
Right Foot Rear	X	ENDEVCO	AC-J32143	11-Oct-99	11-Apr-00
	Z	ENDEVCO	AC-J31050	11-Oct-99	11-Apr-00
Right Foot Front	Z	ENDEVCO	AC-J31060	11-Oct-99	11-Apr-00
Lap Belt Load Cells		LEBOW	LC-706	19-Oct-99	19-Apr-00
Shoulder Belt Load Cells		LEBOW	LC-707	19-Oct-99	19-Apr-00
Spool-Out Potentiometer		-	-	-	-
Belt Stretch Transducer		CAL	DS-E5	24-Aug-99	24-Feb-00

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-AD4A9	17-Dec-99	17-Jun-00
	Y	ENDEVCO	AC-AE8T7	17-Dec-99	17-Jun-00
	Z	ENDEVCO	AC-AF5R1	17-Nov-99	17-May-00
Head	X (R)	ENDEVCO	AC-P13329	05-Oct-99	05-Apr-00
	Y (R)	ENDEVCO	AC-P13355	05-Oct-99	05-Apr-00
	Z (R)	ENDEVCO	AC-J31026	17-Nov-99	17-May-00
Neck Load Cell	X	DENTON	LC-440Fx	06-Aug-99	06-Feb-00
	Y	DENTON	LC-440Fy	06-Aug-99	06-Feb-00
	Z	DENTON	LC-440Fz	06-Aug-99	06-Feb-00
Neck Moment	X	DENTON	LC-440Mx	06-Aug-99	06-Feb-00
	Y	DENTON	LC-440My	06-Aug-99	06-Feb-00
	Z	DENTON	LC-440Mz	06-Aug-99	06-Feb-00
Chest	X	ENDEVCO	AC-A08A	17-Dec-99	17-Jun-00
	Y	ENDEVCO	AC-ADL42	17-Dec-99	17-Jun-00
	Z	ENDEVCO	AC-A28F	17-Dec-99	17-Jun-00
Chest	X (R)	ENDEVCO	AC-A14077	17-Dec-99	17-Jun-00
	Y (R)	ENDEVCO	AC-A13882	17-Dec-99	17-Jun-00
	Z (R)	ENDEVCO	AC-ACCW0	17-Dec-99	17-Jun-00
Chest Deflection Gauge		SERVO	DS-064	06-Aug-99	06-Feb-00
Hybrid III Use Only					
Pelvic	X	ENDEVCO	AC-AF480	17-Dec-99	17-Jun-00
	Y	ENDEVCO	AC-AC2M6	17-Dec-99	17-Jun-00
	Z	ENDEVCO	AC-AF5C1	17-Dec-99	17-Jun-00

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-954	20-Oct-99	20-Apr-00
Right Femur Load Cell		GSE	LC-955	19-Oct-99	19-Apr-00
Left Upper Tibia	Mx	DENTON	LC-016Mx	16-Sep-99	16-Mar-00
	My	DENTON	LC-016My	16-Sep-99	16-Mar-00
Left Lower Tibia	Fz	DENTON	LC-123Fz	16-Sep-99	16-Mar-00
	Mx	DENTON	LC-123Mx	16-Sep-99	16-Mar-00
	My	DENTON	LC-123My	16-Sep-99	16-Mar-00
Right Upper Tibia	Mx	DENTON	LC-023Mx	12-Oct-99	12-Apr-00
	My	DENTON	LC-023My	12-Oct-99	12-Apr-00
Right Lower Tibia	Fz	DENTON	LC-111Fz	12-Oct-99	12-Apr-00
	Mx	DENTON	LC-111Mx	12-Oct-99	12-Apr-00
	My	DENTON	LC-111My	12-Oct-99	12-Apr-00
Left Foot Rear	X	ENDEVCO	AC-J32185	11-Oct-99	11-Apr-00
	Z	ENDEVCO	AC-J32184	11-Oct-99	11-Apr-00
Left Foot Front	Z	ENDEVCO	AC-J31011	11-Oct-99	11-Apr-00
Right Foot Rear	X	ENDEVCO	AC-J31059	11-Oct-99	11-Apr-00
	Z	ENDEVCO	AC-J31101	11-Oct-99	11-Apr-00
Right Foot Front	Z	ENDEVCO	AC-J31020	11-Oct-99	11-Apr-00
Lap Belt Load Cells		LEBOW	LC-711	19-Oct-99	19-Apr-00
Shoulder Belt Load Cells		LEBOW	LC-712	19-Oct-99	19-Apr-00
Spool-Out Potentiometer		-	-	-	-
Belt Stretch Transducer		CAL	DS-E6	24-Aug-99	24-Feb-00

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember	ICS	AC-X26	01-Sep-99	01-Mar-00
Right Rear Seat Crossmember	ICS	AC-D85	08-Dec-99	08-Jun-00
Top of Engine	ICS	AC-D80	07-Dec-99	07-Jun-00
Bottom of Engine	ENDEVCO	AC-J18570	06-Dec-99	06-Jun-00
Right Disc Brake Caliper	ENDEVCO	AC-AC7W8	06-Dec-99	06-Jun-00
Instrument Panel	ICS	AC-D78	23-Nov-99	23-May-00
Left Disc Brake Caliper	ENTRAN	AC-D03	03-Sep-99	03-Mar-00
Left Seat Rear Crossmember (R)	ICS	AC-D69	01-Sep-99	01-Mar-00
Right Seat Rear Crossmember (R)	ICS	AC-D61	02-Sep-99	02-Mar-00