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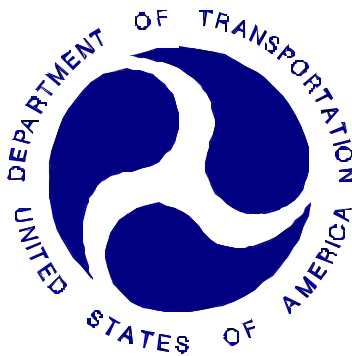
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

DAIMLERCHRYSLER AG STUTTGART
2003 MERCEDES BENZ E320
4-DOOR SEDAN

NHTSA NUMBER: M30509

VERIDIAN TEST NUMBER: 8642-NCAP-29

VERIDIAN ENGINEERING
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February 7, 2003

FINAL REPORT

PREPARED FOR:

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16. Abstract A frontal load cell barrier test of a 2003 Mercedes Benz E320 4-Door Sedan was performed at Veridian Engineering crash test facility in Buffalo, New York, on February 7, 2003. The impact velocity was 56.65 kph and the temperature at the barrier face was 20°C. The maximum post-test vehicle crush was 585 mm. The test vehicle was equipped with 3-point restraint systems with torso belt pretensioners and load limiters, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements.					
ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (061)	464.9	48.7	34.9	2367.3	3238.2
Passenger (064)	393.1	48.5	36.1	3379.1	2367.4
17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)				18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, DC 20590	
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND SUMMARY OF NCAP TEST	1-1
2	OCCUPANT AND VEHICLE INFORMATION	2-1
<u>Data Sheet</u>	<u>Description</u>	
1.	CRASH TEST SUMMARY	2-1
2.	GENERAL TEST AND VEHICLE PARAMETER DATA	2-2
3.	POST IMPACT DATA	2-4
4.	TEST VEHICLE INFORMATION	2-5
5.	DUMMY POSITIONING IN VEHICLE	2-7
6.	SEAT BELT POSITIONING DATA	2-9
7.	VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY	2-10
8.	DUMMY INJURY CRITERIA VALUES	2-12
9.	SEAT BELT PERFORMANCE DATA	2-16
10.	SUMMARY OF FMVSS 212 DATA	2-17
11.	WINDSHIELD ZONE INTRUSION FMVSS 219 DATA	2-18
12.	FMVSS 301 FUEL SYSTEM INTEGRITY DATA	2-19
13.	FMVSS 301 ROLLOVER DATA	2-20
14.	VEHICLE MEASUREMENTS	2-21
15.	CAMERA DATA	2-29
16.	REFERENCE PHOTO TARGETS	2-31
17.	LOAD CELL LOCATIONS ON FIXED BARRIER	2-32
18.	POST TEST AIR BAG DATA	2-33
19.	ACCIDENT INVESTIGATION DIVISION DATA	2-34
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA	B-1
APPENDIX C	PART 572E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION TESTS	C-1
APPENDIX D	DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION	D-1

SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.65 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. DTNH22-01-D-32005. 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 56.65 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.65 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated December 1999. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion (Partial)"; and FMVSS 301 "Fuel System Integrity" performance. Procedures for receiving, inspection testing and reporting of test results are described in the test procedures and are not repeated in this report.

One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. 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 nine accelerometer array 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 belts to measure dummy pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No.064) were used in one test previous to this test (M30507) where they did not exceed FMVSS 208 head, chest and femur requirements. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 184 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. Appendix C contains the dummy calibration data and Appendix D contains the transducer calibration dates.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 36 load cells was impacted by a 2003 Mercedes Benz E320 4-Door Sedan at a velocity of 56.65 kph. The test was performed at Veridian Engineering on February 7, 2003. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The occupant data is summarized below.

	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)	Belt Stretch (mm/50 mm)
Driver ATD	464.9	48.7	34.9	2367.3	3238.2	*	*
Passenger ATD	393.1	48.5	36.1	3379.1	2367.4	*	*

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

The maximum vehicle static crush was 585 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The face to the center of the airbag, the top of the head to the windshield header, the back of the head to the center of the head restraint, the chest to the airbag and the left and right knees to the knee bolster. The passenger's visible contact points were as follows: The face to the right of the center of the airbag, the top of the head to the windshield header, the back of the head to the right side of the center of the head restraint, the chest to the airbag and the left and right knees to the knee bolster.

The 2003 Mercedes Benz E320 4-Door Sedan did not exceed the requirements of FMVSS 208, FMVSS 212, FMVSS 219, and FMVSS 301. Data pertaining to these standards are presented in the data sheets.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No.: M30509 Test Mode: 56.3 kph Frontal Barrier
 Test Date: February 7, 2003 Time: 16:12 Temperature: 20 °C
 Vehicle Make/Model/Body Style: 2003 Mercedes Benz E320 4-Door Sedan
 Vehicle Test Weight: 1935.0 kg
 Vehicle/Barrier Impact Angle: 0 °
 Impact Velocity: 56.65 kph
 Maximum Static Crush: 585 mm
 Vehicle Rebound: 494 mm

<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Type:	<u> 572E </u>	<u> 572E </u>
Restraint System:	<u> Seatbelt, Airbag, Knee Bolster </u>	<u> Seatbelt, Airbag, Knee Bolster </u>
Number of Data Channels:	<u> 184 </u>	
Number of Cameras:	<u> 1 </u> Real Time	
	<u> 16 </u> High Speed	

DOOR OPENING DATA: Closed, Latched and Operable without Tools - Left Front
 Closed, Latched and Operable without Tools - Right Front

Front Seat(s) Data:	<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure: (mm of shift)	<u> 0 </u>	<u> 0 </u>
Seat Back Failure:	<u> None </u>	<u> None </u>

<u>VISIBLE DUMMY CONTACT POINTS:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Head:	The face to the center of the airbag, the top of the head to the windshield header, the back of the head to the center of the head restraint	The face to the right of the center of the airbag, the top of the head to the windshield header, the back of the head to the right side of the center of the head restraint
Abdomen:	<u> - </u>	<u> - </u>
Chest:	<u> Airbag </u>	<u> Airbag </u>
Knees:	<u> Knee Bolster </u>	<u> Knee Bolster </u>

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 Mercedes Benz E320 4-Door Sedan

NHTSA No. : M30509 ; VIN: WDBUF65JX3A191590 ; Color: White

Engine Data: 6 cylinders; - CID; 3.2 Liters; - cc

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

Transmission Data: 5 speeds; - Manual; X Automatic; X Overdrive

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

Safety Belt Features – Driver X Pretensioner (Shoulder); X Load Limiter; X Adj. Anchorage

Safety Belt Features - Passenger X Pretensioner (Shoulder); X Load Limiter; X Adj. Anchorage

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

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

Date Received: 2-03-2003 ; Odometer Reading 24 km

Selling Dealer: Mercedes-Benz of Buffalo

& Address: Williamsville, NY 14221

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: DaimlerChrysler AG Stuttgart

Date of Manufacture 11/02

GVWR: 2150 kg; GAWR: 975 kg FRONT; 1175 kg REAR

DATA FROM TIRE PLACARD:

Recommended Tire Size: P225/55R16

* Recommended Cold Tire Pressure: 179 kpa FRONT; 221 kpa REAR

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P225/55R16 95H ; Manufacturer: Michelin

Tire Pressure with Maximum Capacity Vehicle Load: Front: 350 kPa; Rear: 350 kPa

Treadwear: 400 ; Traction: A ; Temperature: A

VEHICLE CAPACITY DATA:

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

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 437 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 96.8 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>433.5</u>	kg	Right Rear =	<u>416.5</u>	kg
Left Front =	<u>424.5</u>	kg	Left Rear =	<u>418.0</u>	kg
TOTAL FRONT =	<u>858.0</u>	kg	TOTAL REAR =	<u>834.5</u>	kg
TOTAL DELIVERED WEIGHT =	<u>1692.5</u>	kg			
% of Total Front of Vehicle Weight =	<u>50.7%</u>		% of Total Rear Weight =	<u>49.3%</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	<u>1692.5</u>	kg
Rated Cargo/Luggage Weight (RCLW) =	<u>96.8</u>	kg
Weight of 2 p.572 Dummies @ 76 each =	<u>152</u>	kg
TARGET TEST WEIGHT =	<u>1941.3</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 90.5 KG OF CARGO WEIGHT:

Right Front =	<u>467.5</u>	kg	Right Rear =	<u>502.0</u>	kg
Left Front =	<u>451.5</u>	kg	Left Rear =	<u>514.0</u>	kg
TOTAL FRONT =	<u>919.0</u>	kg	TOTAL REAR =	<u>1016.0</u>	kg
TOTAL TEST WEIGHT =	<u>1935.0</u>	kg			
% of Total Front Weight =	<u>47.5%</u>	%	% of Total Rear Weight =	<u>52.5%</u>	%
Weight of Ballast Secured in Vehicle Trunk Area =	<u>0</u>	kg			
Vehicle Components Removed for Weight Reduction:	<u>Removed 17L of Stoddard</u>				

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>699</u>	LF	<u>700</u>	RR	<u>699</u>	LR	<u>697</u>
FULLY LOADED:	RF	<u>687</u>	LF	<u>689</u>	RR	<u>669</u>	LR	<u>668</u>
AS TESTED:	RF	<u>694</u>	LF	<u>695</u>	RR	<u>670</u>	LR	<u>670</u>
Vehicle's Wheel Base:	<u>2854</u> mm							
Location of Vehicle's C.G.:	<u>1499</u> mm rearward of front wheel center.							

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual =	<u>80</u>	liters		
Usable Capacity Figure Furnished by COTR =	<u>80</u>	liters		
Test Volume Range (92 to 94% of Usable Capacity) =	<u>73.6</u>	to	<u>75.2</u>	liters
ACTUAL TEST VOLUME=	<u>57</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: Filler neck: right side of vehicle behind rear axle; Lines – inside left frame rail				
<u>Fuel tank – centered ahead of rear axle</u>				

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: February 7, 2003 Time: 16:12 Temperature: 20 °C
Vehicle NHTSA No.: M30509
Required Impact Velocity Range: 55.5 to 57.1 kph

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

Trap No. 1 = 56.65 kph; Trap No. 2 = 56.65 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 Left = 4773 ; C/L = 4838 ; Right = 4777
Post-Test Left = 4272 ; C/L = 4253 ; Right = 4278
Crush Left = 501 ; C/L = 585 ; Right = 499
AVERAGE = 528.33 mm

VEHICLE REBOUND: (From rigid barrier only.)

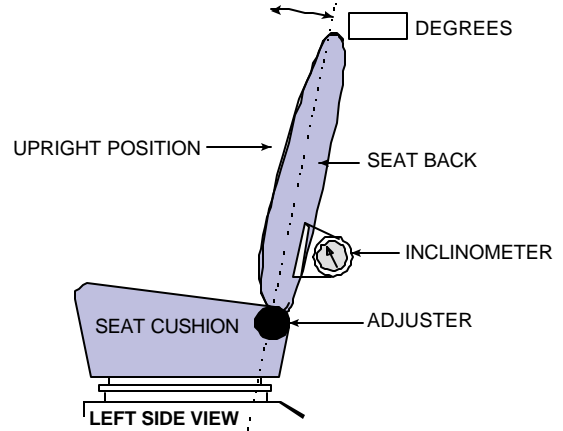
Distance from front of test vehicle to impact point:
Left = 492 ; C/L = 505 ; Right = 485
AVERAGE = 494 mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2003 Vehicle Model: Mercedes Benz E320 Body Style : 4-Door Sedan

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.



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 16.7°

Measurement instructions: Recline seat back until an angle of 16.7° is reached from the level sill. The angle is measured along the backrest at the center of the seat.

Seat back angle for passenger's seat: 16.7°

Measurement instructions: The same as the driver's seat

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Place seat in mid-position (140 mm of 280 mm). The seat track can be located by measuring 91 mm forward from the back edge of the U-rail to the seat slide on the outboard rail

Positioning of the passenger's seat: The same as the driver's seat

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 80 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 = 80 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 76 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.

The fuel pump operates when the ignition is turned to the 'ON' position. The pump then runs only when the Engine is running.

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

4. STEERING COLUMN ADJUSTMENTS:

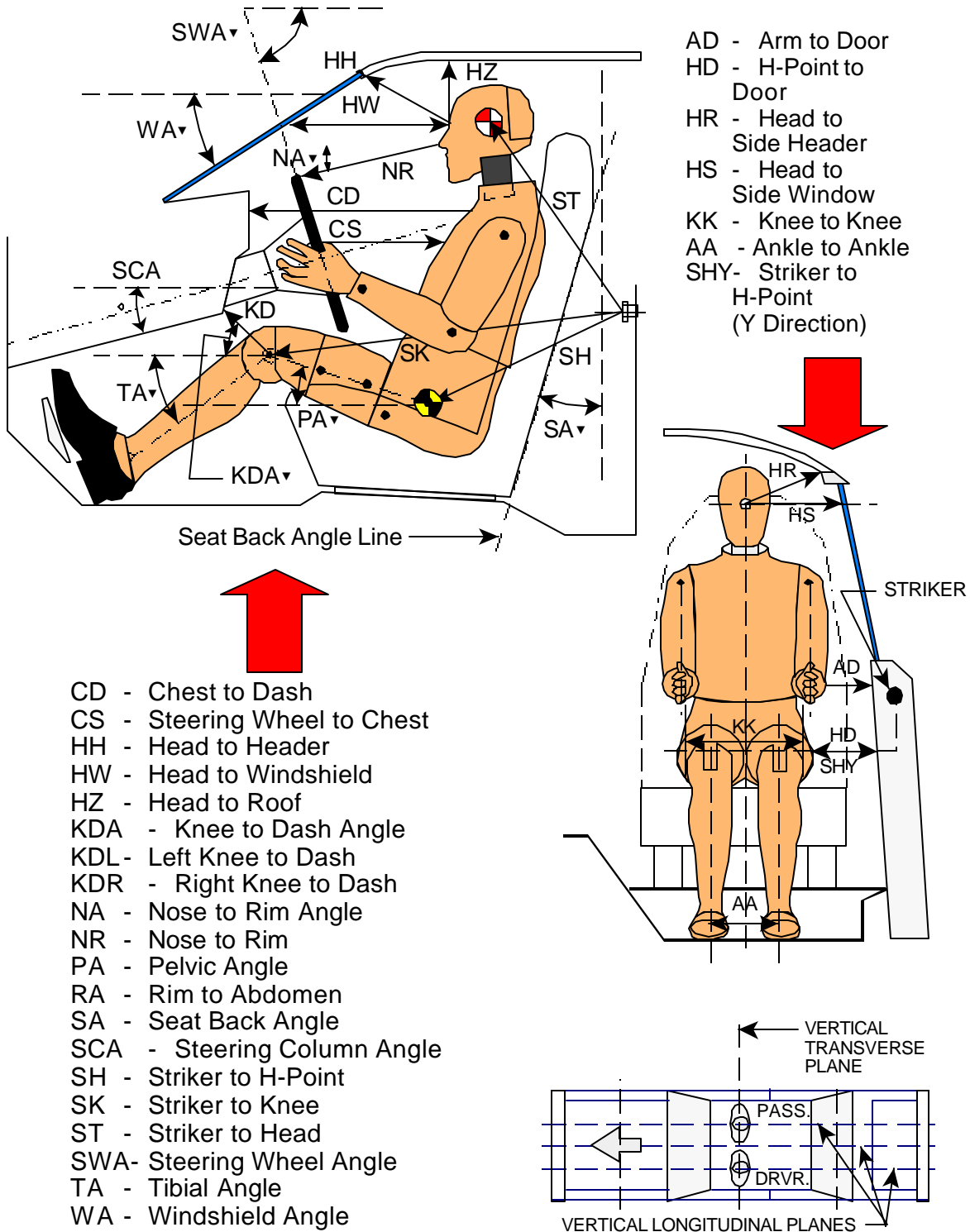
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: Mid tilt and telescopic position

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Placed in the uppermost position

DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

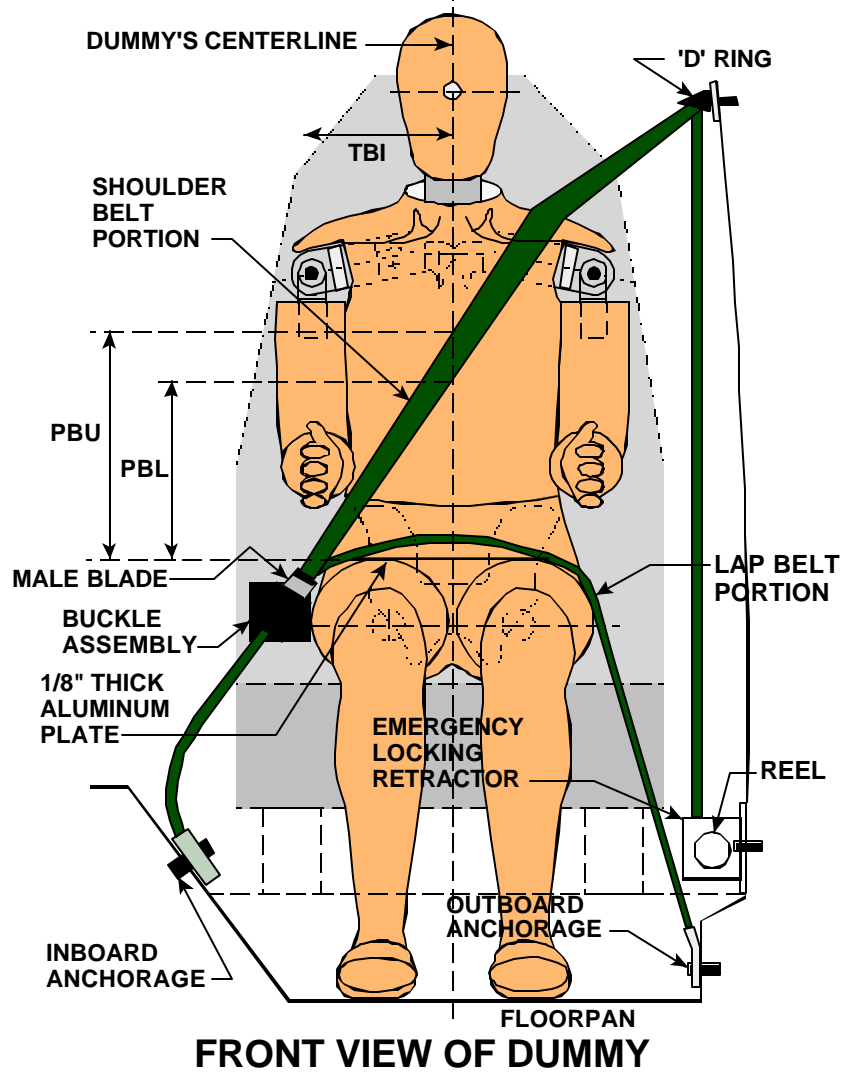


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ^o	28.9 deg.			N/A		
SWA ^o	69.0 deg.			N/A		
SCA ^o	21.0 deg.			N/A		
SA ^o	16.7 deg.			16.7 deg.		
HZ	185			169		
HH	332			340		
HW	580			595		
HR	208			218		
NR	420	Angle	-10 deg.	N/A		
CD	522			547		
CS	350			N/A		
RA	238			N/A		
KDL	183	Angle (KDA)	40 deg.	168		
KDR	165			198	Angle (KDA)	40 deg.
PA ^o	23.0 deg.			21.4 deg.		
TA ^o	36.5 deg.			37.2 deg.		
KK	290			260		
AA	330			205		
ST	415	Angle	12 deg.	420	Angle	10 deg.
SK	605	Angle	106 deg.	610	Angle	110 deg.
SH	345	Angle	150 deg.	340	Angle	140 deg.
SHY	245			245		
HS	322			330		
HD	103			115		
AD	105			95		

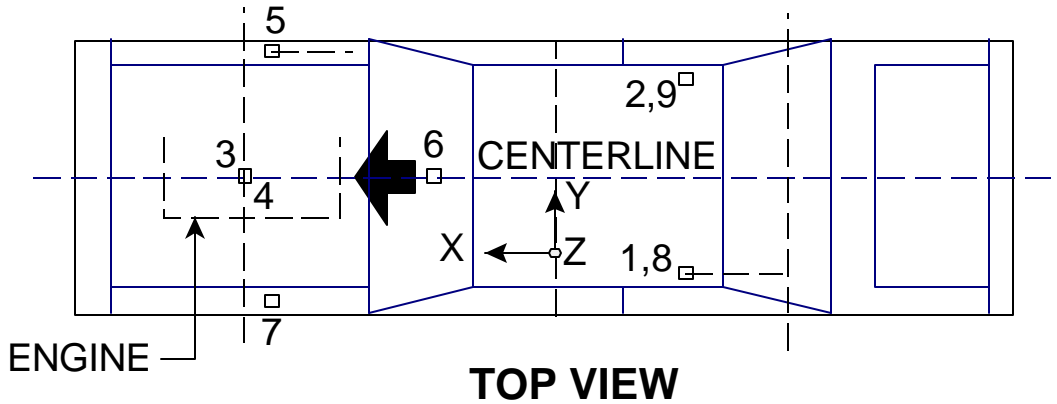
Dimensions in millimeters

SEAT BELT POSITIONING DATA

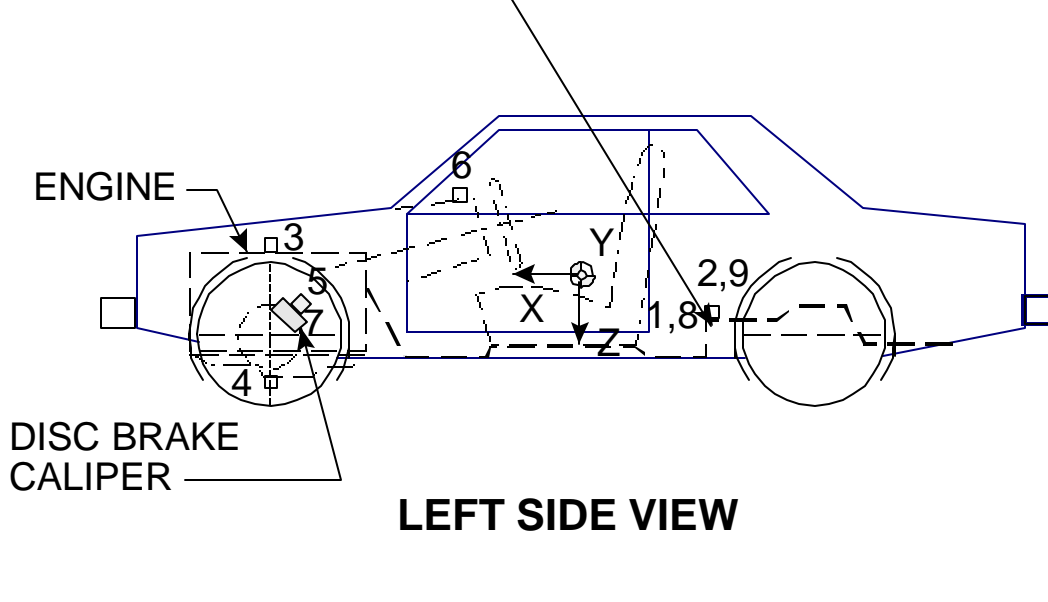


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	360	360
PBL-- Top surface of alum. plate to belt lower edge	280	285
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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.)

LOCATION		PRE-TEST LENGTH (mm)		
		X	Y	Z
1	Left Rear Seat Cross Member X	1279	-544	-559
2	Right Rear Seat Cross Member X	1245	496	-535
3	Top of Engine Block	4212	-179	-524
4	Bottom of Engine	3988	65	-14
5	Disc Brake Caliper @ Right Side	3851	838	-162
6	Instrument Panel	3006	132	-720
7	Disc Brake Caliper @Left Side	3883	-818	-349
8	Left Rear Seat Cross Member Z	1279	-544	-559
9	Right Rear Seat Cross Member Z	1245	496	-535

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Left Rear Seat Cross Member X	†	†	†	†
2	Right Rear Seat Cross Member X	3.2	113.3	-50.6	50.4
3	Top of Engine Block	†	†	†	†
4	Bottom of Engine	**	**	**	**
5	Disc Brake Caliper @ Right Side	56.2	56.9	-97.3	34.9
6	Instrument Panel	†	†	†	†
7	Disc Brake Caliper @Left Side	95.5	53.6	-127.4	38.7
8	Left Rear Seat Cross Member Z	†	†	†	†
9	Right Rear Seat Cross Member Z	8.0	80.8	-10.7	49.3

** Data not accurate – wire cut at 43 ms.

† Data is Questionable

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2003 Mercedes Benz E320 4-Door Sedan

NHTSA Test No.: M30509 Test Date: February 7, 2003

DESCRIPTION	Unit	MAXIMUM VALUE							
		Driver				Passenger			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head 9 Array X Arm Y	g	18.7	74.4	-4.7	118.4	7.8	118.6	-23.1	86.4
Head 9 Array X Arm Z	g	20.0	187.7	-14.2	80.4	26.3	53.3	-15.3	96.6
Head 9 Array Y Arm X	g	21.2	194.1	-54.0	87.9	5.7	120.4	-51.6	77.0
Head 9 Array Y Arm Z	g	19.3	62.9	-12.6	86.4	27.2	67.1	-30.2	97.3
Head 9 Array Z Arm X	g	37.3	191.3	-66.7	80.0	7.8	235.4	-59.9	84.1
Head 9 Array Z Arm Y	g	16.6	77.3	-3.1	57.1	4.7	100.9	-28.3	80.6
Head X	g	21.0	194.0	-51.8	83.9	5.0	235.8	-46.1	76.1
Head Y	g	15.1	94.6	-1.6	48.0	4.2	46.9	-19.2	90.7
Head Z	g	19.3	66.6	-17.6	90.8	42.4	73.9	-23.2	96.4
Head Resultant	g	54.7	87.0	0.0	-45.4	62.4	73.9	0.0	-48.9
Redundant Head X	g	22.3	194.0	-53.4	84.0	5.0	236.2	-48.2	73.8
Redundant Head Y	g	14.3	94.7	-1.5	30.8	4.4	46.9	-21.5	92.8
Redundant Head Z	g	19.9	66.5	-17.2	90.4	26.5	67.3	-23.2	96.9
Redundant Head Resultant	g	55.4	87.2	0.0	-46.9	50.9	73.8	0.0	-47.2
Upper Neck Fx	N	1064.6	77.9	-336.3	46.6	1030.0	80.8	-298.9	45.9
Upper Neck Fy	N	182.6	70.1	-377.5	88.2	†	†	†	†
Upper Neck Fz	N	1006.1	63.5	-350.9	187.7	719.2	45.9	-1327.8	96.8
Upper Neck F Resultant	N	1106.0	79.9	1.2	-47.1	†	†	†	†
Upper Neck Mx	N-m	13.7	136.1	-23.3	95.4	46.9	100.6	-8.6	143.4
Upper Neck My	N-m	65.0	78.6	-7.7	18.0	76.0	80.5	-15.0	105.0
Upper Neck Mz	N-m	10.6	160.1	-27.8	98.6	31.9	102.6	-13.5	168.9
Upper Neck M Resultant	N-m	66.3	78.6	0.1	4.8	76.9	80.6	0.1	-14.0
Chest X	g	4.4	254.4	-48.9	80.8	3.6	277.9	-50.7	71.4
Chest Y	g	8.1	70.6	-3.8	29.5	3.2	39.2	-7.3	72.6
Chest Z	g	8.6	50.5	-15.6	77.1	13.0	64.6	-12.6	93.7
Chest Resultant	g	50.7	80.7	0.0	-50.0	51.1	71.4	0.0	-48.3

† Data is Questionable

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

Vehicle Year/Make/Model/Body Style: 2003 Mercedes Benz E320 4-Door Sedan

NHTSA Test No.: M30509 Test Date: February 7, 2003

DESCRIPTION	Unit	MAXIMUM VALUE							
		Driver				Passenger			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Redundant Chest X	g	4.4	254.4	-49.0	80.8	3.6	277.8	-51.7	71.5
Redundant Chest Y	g	8.7	70.7	-3.8	29.5	3.4	81.2	-7.2	94.1
Redundant Chest Z	g	8.8	50.3	-15.5	74.6	12.5	64.5	-12.7	93.7
Redundant Chest Resultant	g	50.9	80.8	0.0	-47.9	52.1	71.5	0.0	-48.2
Chest Displacement	mm	0.0	-48.6	-34.9	71.3	0.0	11.6	-36.1	66.5
Pelvic X	g	6.6	194.5	-76.5	60.0	6.6	207.6	-70.9	61.9
Pelvic Y	g	15.9	77.9	-4.8	56.9	5.5	101.7	-15.9	80.3
Pelvic Z	g	*	*	*	*	3.6	216.3	-42.3	78.4
Pelvic Resultant	g	*	*	*	*	73.0	63.4	0.0	-47.5
Left Femur	N	1089.3	55.8	-2367.3	62.3	799.6	52.5	-3379.1	60.4
Right Femur	N	1024.6	51.2	-3238.2	61.5	1235.9	56.8	-2367.4	63.3
Left Upper Tibia Mx	N-m	23.9	42.2	-15.7	83.9	19.8	86.6	-26.1	43.7
Left Upper Tibia My	N-m	12.2	216.4	-137.9	62.0	17.7	225.2	-116.1	68.8
Left Lower Tibia Fz	N	213.6	118.4	-2616.9	45.5	265.7	180.1	-2429.6	71.8
Left Lower Tibia Mx	N-m	68.5	72.0	-6.0	180.1	51.1	61.5	-10.0	43.8
Left Lower Tibia My	N-m	17.6	84.7	-28.0	62.5	56.0	70.3	-28.4	45.4
Right Upper Tibia Mx	N-m	65.8	53.3	-68.0	68.3	19.7	85.1	-32.4	63.5
Right Upper Tibia My	N-m	9.3	179.3	-125.6	62.8	14.2	204.5	-102.8	58.9
Right Lower Tibia Fz	N	305.3	120.3	-3701.7	66.0	48.8	180.6	-2492.7	78.2
Right Lower Tibia Mx	N-m	32.5	50.5	-150.3	65.2	12.9	85.6	-30.9	64.2
Right Lower Tibia My	N-m	99.6	66.4	-44.0	43.6	114.3	70.9	-41.0	47.9
Left Foot Aft Ax	g	5.9	88.8	-68.3	45.1	36.4	27.0	-57.6	55.1
Left Foot Aft Az	g	6.9	197.1	-64.0	54.4	10.2	69.1	-66.5	56.4
Left Foot Fore Az	g	25.9	42.8	-83.2	47.6	65.8	27.0	-89.1	46.9
Right Foot Aft Ax	g	52.1	63.4	-86.3	48.8	8.6	87.6	-41.8	41.4
Right Foot Aft Az	g	23.8	53.9	-86.3	49.7	4.2	249.0	-47.0	51.4
Right Foot Fore Az	g	231.6	53.9	-136.0	52.0	20.1	56.2	-68.0	44.2
Lap Belt Load	N	9074.8	63.7	-117.4	193.3	9815.5	65.9	-65.8	196.7

* Data is questionable

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

Vehicle Year/Make/Model/Body Style: 2003 Mercedes Benz E320 4-Door Sedan

NHTSA Test No.: M30509 Test Date: February 7, 2003

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	464.9	62.8	98.6	44.2 g
Position #2 - Passenger	393.1	63.9	99.9	41.2 g

** 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	48.7	79.2	82.2	499.3
Position #2 - Passenger	48.5	69.8	72.8	409.9

* 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: 2003 Mercedes Benz E320 4-Door Sedan

NHTSA Test No.: M30509 Test Date: February 7, 2003

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	497.4	62.9	98.3	45.6 g
Position #2 - Passenger	384.0	64.6	100.6	40.9 g

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

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	48.5	79.3	82.3	499.2
Position #2 - Passenger	50.4	69.6	72.6	428.3

* 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:

Belt length from trim panel exit
to bolt hole anchor point for
continuous webbing systems.

Driver

Passenger

1530

1550

Shoulder belt length as measured
on Part 572 Dummy.

880

880

Lap belt length as measured
on Part 572 Dummy.

670

670

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 0.0 mm molding.

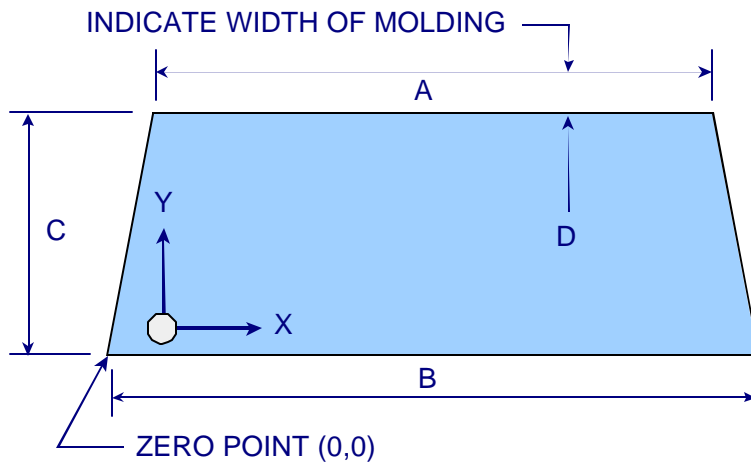
FMVSS 212 REQUIREMENTS:

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	2128.5	2128.5	100.0%
LEFT SIDE	2128.5	2128.5	100.0%
TOTAL	4257	4257	100.0%

AREA OF RETENTION FAILURE: None



DIMENSIONS (mm)	
A	1178
B	1533
C	773
D	0

FRONT VIEW OF WINDSHIELD

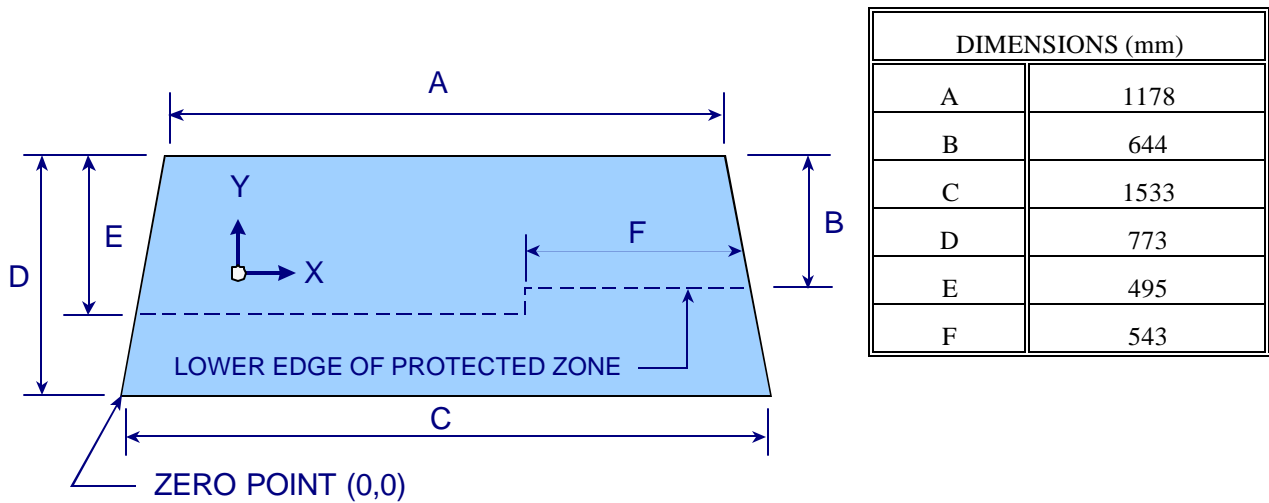
FAILURE DETAILS: None

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:



FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

(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

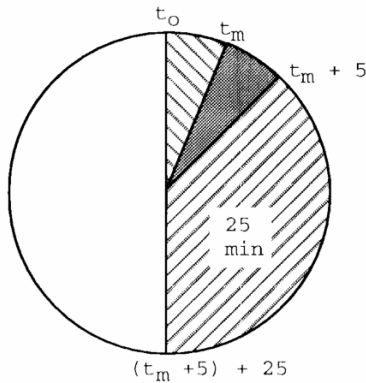
NHTSA TEST No.: M30509 TEST DATE: February 7, 2003
VEHICLE MAKE/MODEL: 2003 Mercedes Benz E320 4-Door Sedan

The test vehicle was filled from 92% to 94% of the manufacturer'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

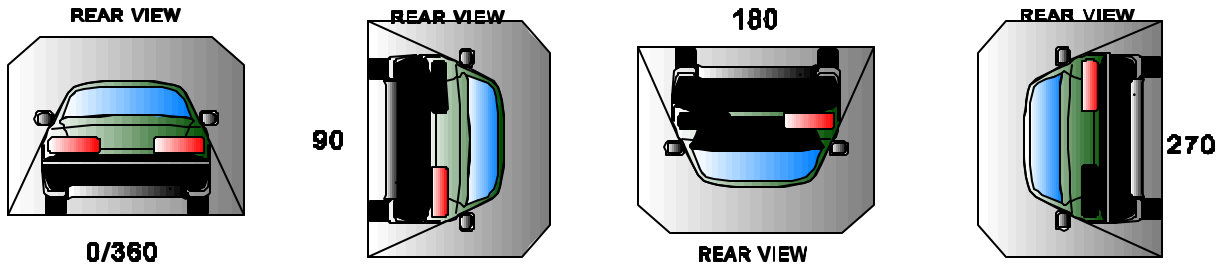
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2003 Mercedes Benz E320 4-Door Sedan

NHTSA No.: M30509



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
	1	minutes	10	seconds	5	minutes	6	minutes	10	seconds	7	minutes
0° - 90°	1	minutes	04	seconds	5	minutes	6	minutes	4	seconds	7	minutes
90° - 180°	1	minutes	01	seconds	5	minutes	6	minutes	1	seconds	7	minutes
180° -270°	1	minutes	13	seconds	5	minutes	6	minutes	13	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

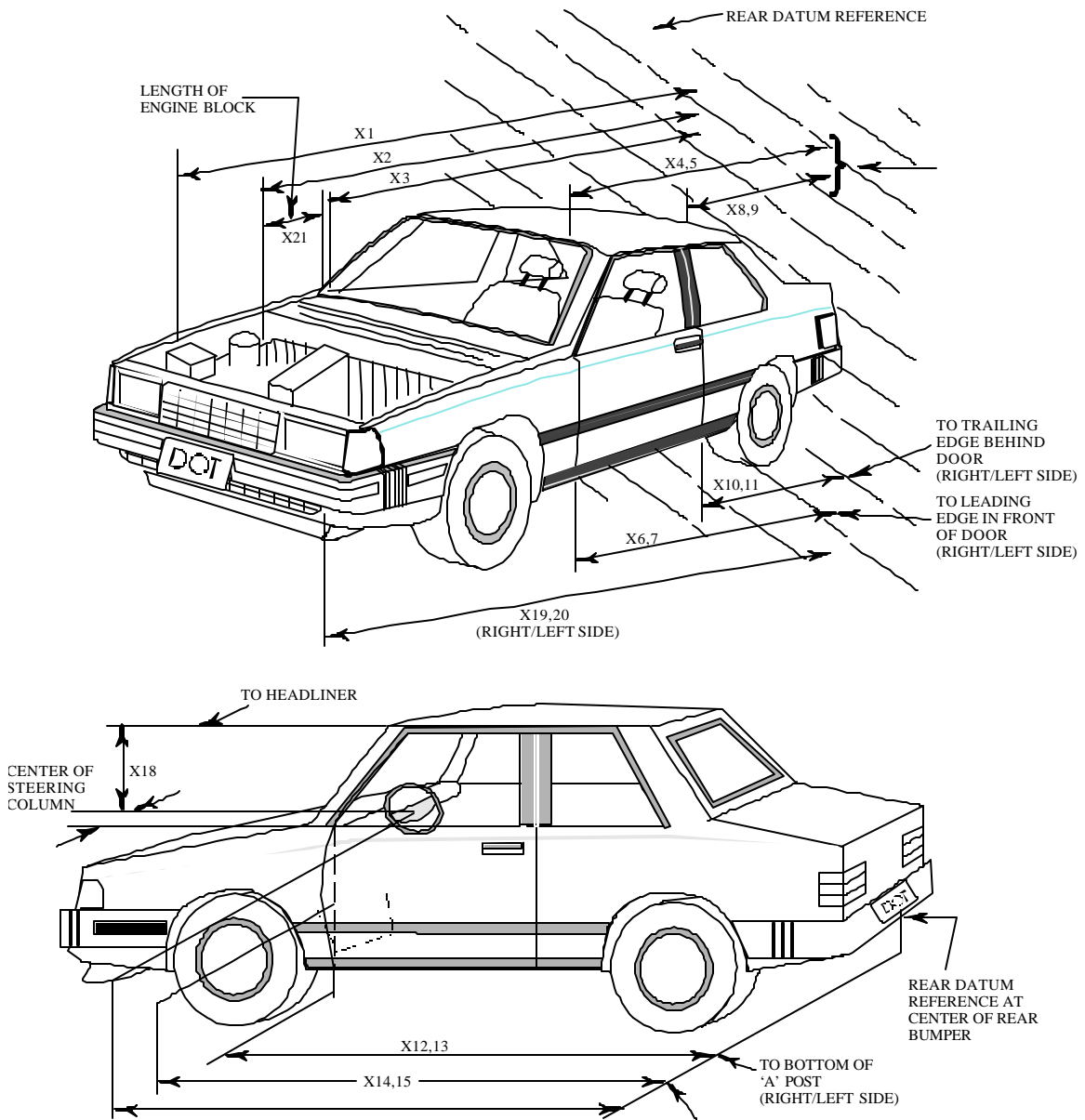
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180° -270°	0	0	0	N/A
270° -360°	0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

Rollover Stage	Spillage Location
0° - 90°	None
90° - 180°	None
180° -270°	None
270° -360°	None

DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS

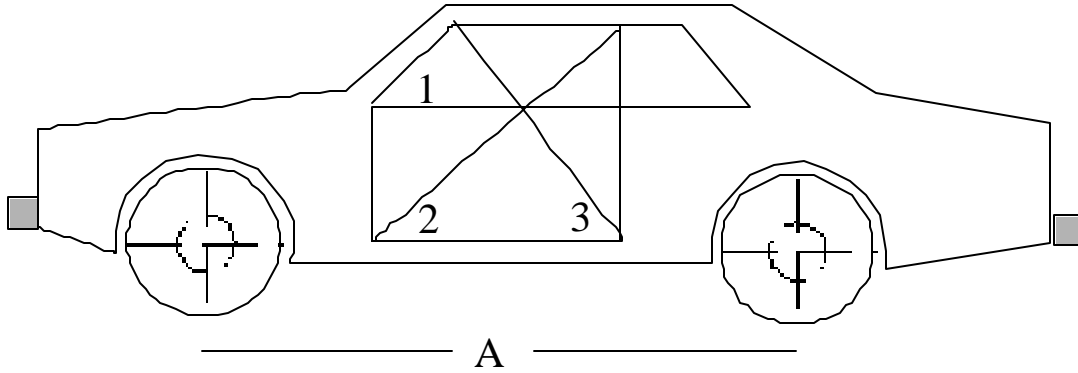


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4838	4253	585
X2	Rear Surface of Vehicle to Front of Engine	4206	4036	170
X3	Rear Surface of Vehicle to Firewall	3613	3564	49
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3304	3299	5
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3278	3283	-5
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3300	3278	22
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3310	3323	-13
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2240	2234	6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2224	2230	-6
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2220	2204	16
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2232	2243	-11
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3246	3240	6
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3247	3248	-1
X14	Rear Surface of Vehicle to Firewall, Right Side	4087	3940	147
X15	Rear Surface of Vehicle to Firewall, Left Side	4107	3978	129
X16	Rear Surface of Vehicle to Steering Column	2853	2868	-15
X17	Center of Steering Column to "A" Post	304	322	-18
X18	Center of Steering Column to Headliner	437	433	4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4777	4278	499
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4773	4272	501
X21	Length of Engine Block	406	406	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3046	3037	9
CD	Rear Surface of Vehicle to Center of Dash Panel	3051	3062	-11
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3048	3036	12

All Dimensions in mm

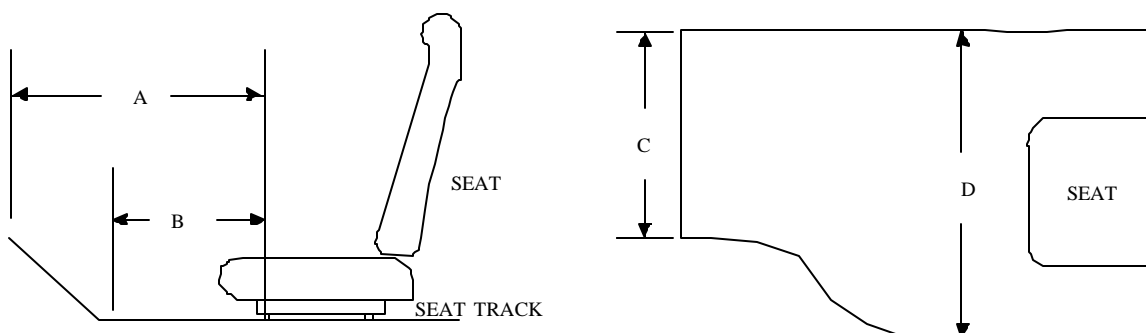
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	950	1396	966	950	1397	962
AFTER TEST	943	1392	964	943	1395	549
DIFFERENCE	7	4	2	7	2	413

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2854	2854
AFTER TEST	2720	2720
DIFFERENCE	134	134

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



DRIVER

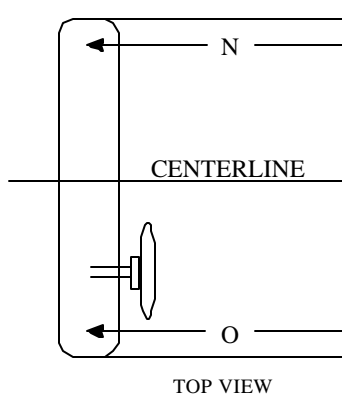
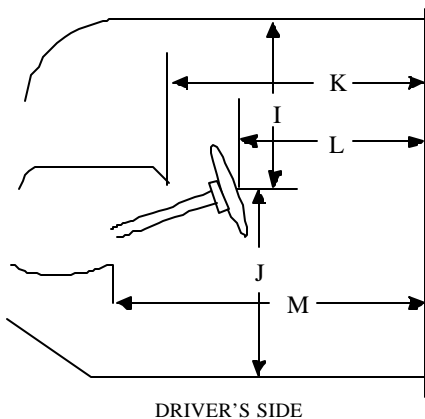
Measurement	Pre-Test	Post-Test	Difference
A	831	695	136
B	666	645	21
C	467	482	-15
D	464	455	9

PASSENGER

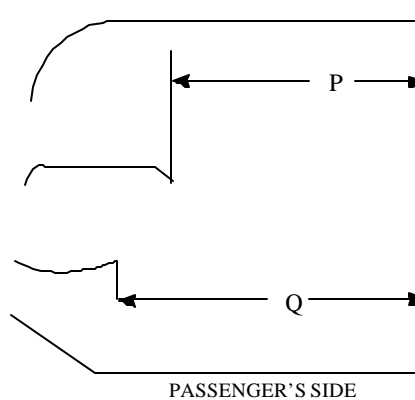
Measurement	Pre-Test	Post-Test	Difference
A	746	655	91
B	561	576	-15
C	446	424	22
D	481	3	478

Units = mm

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



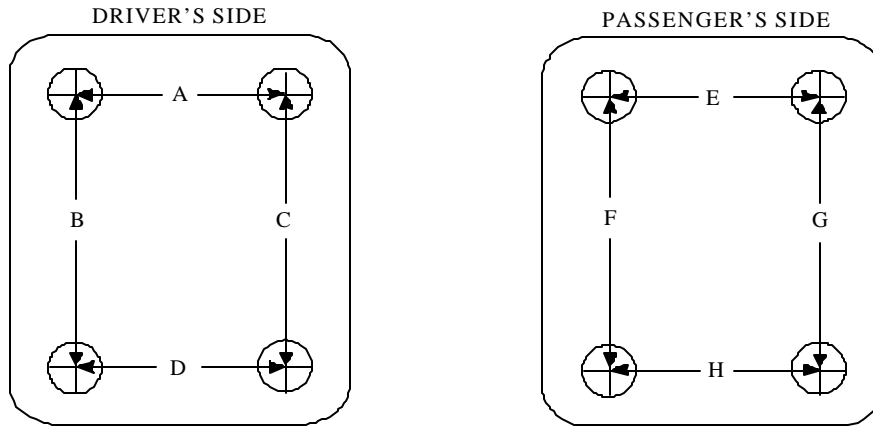
MEASUREMENTS
 FROM C-PILLAR
 BELT ANCHORAGE



Measurement	Pre-Test	Post-Test	Difference
I	437	433	4
J	624	637	-13
K	1876	1861	15
L	1703	1717	-14
M	1914	1924	-10
N	1872	1866	6
O	1888	1885	3
P = K (PASS.)	2010	2007	3
Q = M (PASS.)	1966	1956	10

Units = mm

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

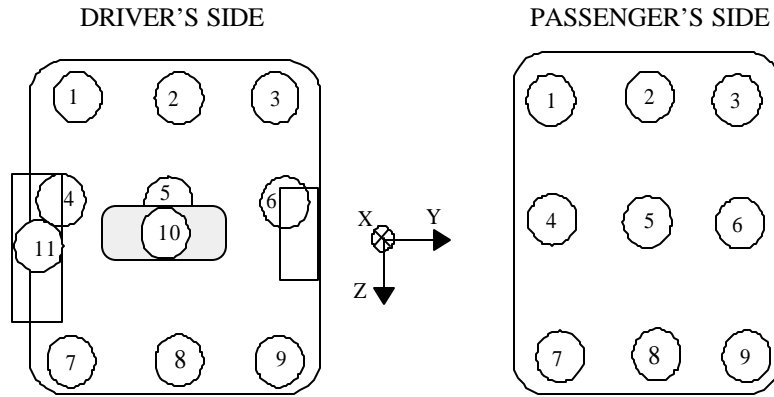


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	467	482	-15
B	397	387	10
C	362	313	48
D	464	455	9
E	446	424	22
F	443	398	45
G	438	416	22
H	481	3	478

Units = mm

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



Driver Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3597	3560	37	-460	-504	44
2	3630	3503	127	-413	-481	68
3	3614	3537	77	-455	-534	79
4	3544	3530	14	-365	-403	38
5	3541	3493	48	-367	-418	51
6	3507	3475	32	-369	-409	40
7	3466	3464	2	-304	-317	13
8	3465	3453	12	-293	-320	27
9	3469	3454	15	-290	-304	14
10	3377	3350	27	-436	-476	40
11	3459	3451	8	-406	-430	24

Passenger Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3508	3377	131	-376	-358	-18
2	3506	3411	95	-389	-373	-16
3	3485	3431	54	-377	-362	-15
4	3403	3346	57	-261	-223	-38
5	3419	3385	34	-267	-227	-40
6	3423	3405	18	-265	-221	-44
7	3304	3316	-12	-152	-90	-62
8	3322	3331	-9	-150	-87	-63
9	3328	3329	-1	-144	-80	-64

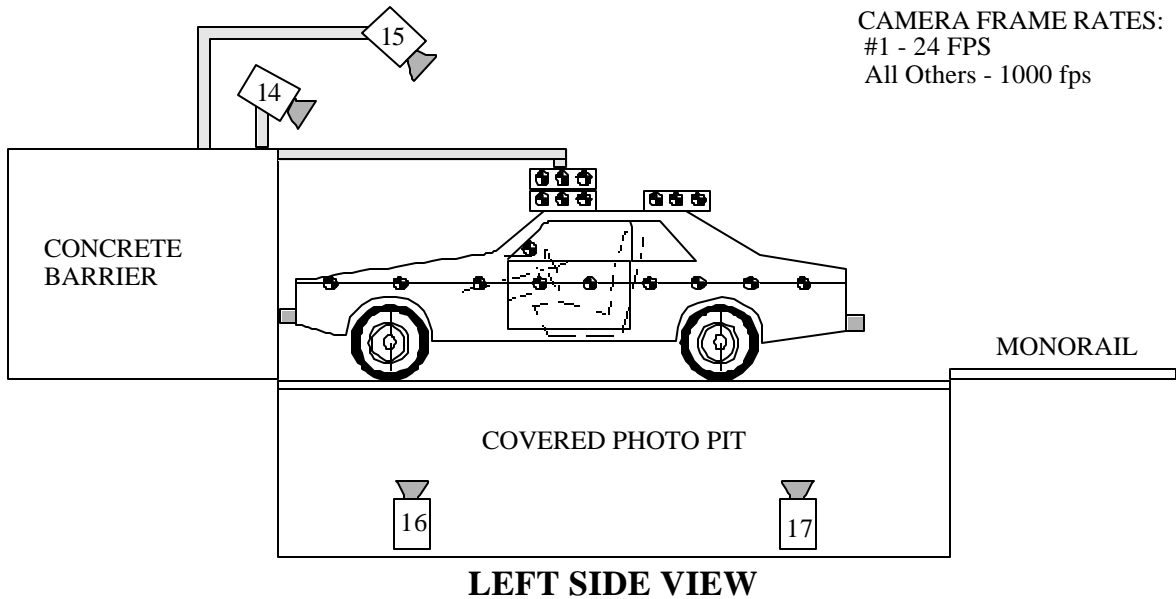
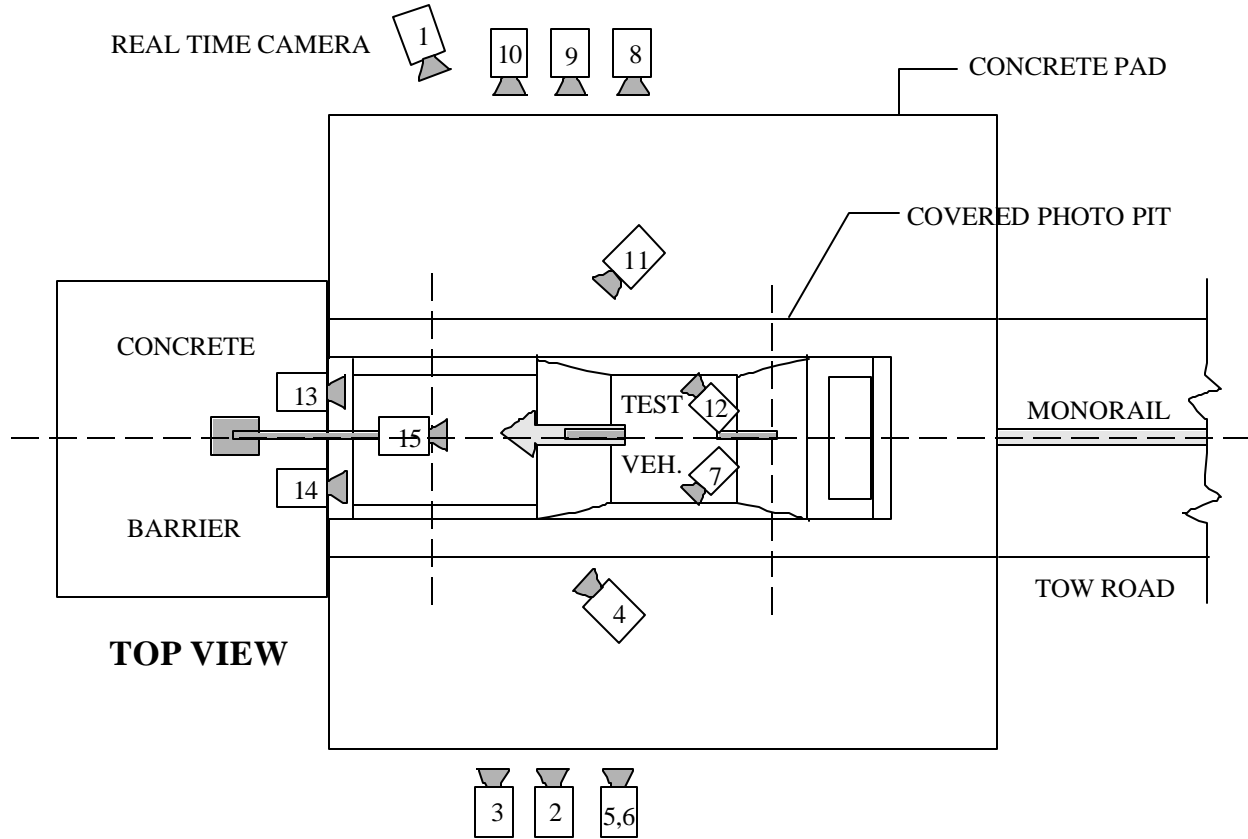
Reference: SAE: X = Rear Bumper (Positive: forward); Z = Ground (Positive: down)

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 TARGET VEHICLE STRUCTURAL MEASUREMENTS

	Elements	Pre-Test (mm)
1	Total length	4838
2	Total Width	1990
3	Bumper Top Height	550
4	Bumper Bottom Height	450
5	Longitudinal Member Top Height	550
6	Distance Between Longitudinal Members	900
7	Longitudinal Member Width	56
8	Engine top height	910
9	Engine bottom height	316
10	Engine and gearbox width	720
11	Front bumper-engine distance	613
12	Front shock absorber fixing height	850
13	Bonnet leading edge height	800
14	Front shock absorber fixing width	920
15	Front bumper – front axle distance	824
16	Front axle – a pillar distance	447
17	A-pillar – B pillar distance	950
18	B-pillar – rear axle distance	1154
19	B-pillar – C Pillar distance	716
20	Roof sill bottom height	1340
21	Roof sill top height	1440
22	Floor sill bottom height	220
23	Floor sill top height	395

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

NOTE: Camera information shown in DATA SHEET NO. 15.



CAMERA FRAME RATES:
 #1 - 24 FPS
 All Others - 1000 fps

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

NHTSA Test No.: M30509 Vehicle: 2003 Mercedes Benz E320 4-Door Sedan

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	6879	1720	1091	-1	6501	12.5	1010
3	Left Side View	8090	820	1067	-2	7712	25	1005
4	Driver and Interior View	7620	2615	1986	-9	-	25	1035
5	Steering Column (Bottom)	7620	1965	1177	-4	7242	25	1020
6	Steering Column (Top)	7620	1965	1777	-10	7242	25	1010
7	Left Side Lateral View	3658	2693	2548	-27	-	13	1010
8	Overall Right Side	8302	1347	1082	-2	8563	12.5	1010
9	Right Side View	8302	1081	1082	-5	8563	25	1025
10	Right Passenger View	7973	2036	1372	-2	8234	35	1020
11	Passenger and Interior View	7620	2893	1981	-9	-	25	1020
12	Right Side Lateral View	3642	2642	2577	-25	-	13	1010
13	Passenger Front View	620	-92	1987	-35	-	13	1000
14	Driver Front View	620	-92	1987	-35	-	13	1005
15	Windshield View	0	-530	3374	-50	-	13	1000
16	Pit View of Engine	0	615	-3048	90	-	13	1010
17	Pit View of Fuel Tank	0	2705	-3048	90	-	13	1035

*X = film plane to monorail centerline ** = referenced to horizontal plane

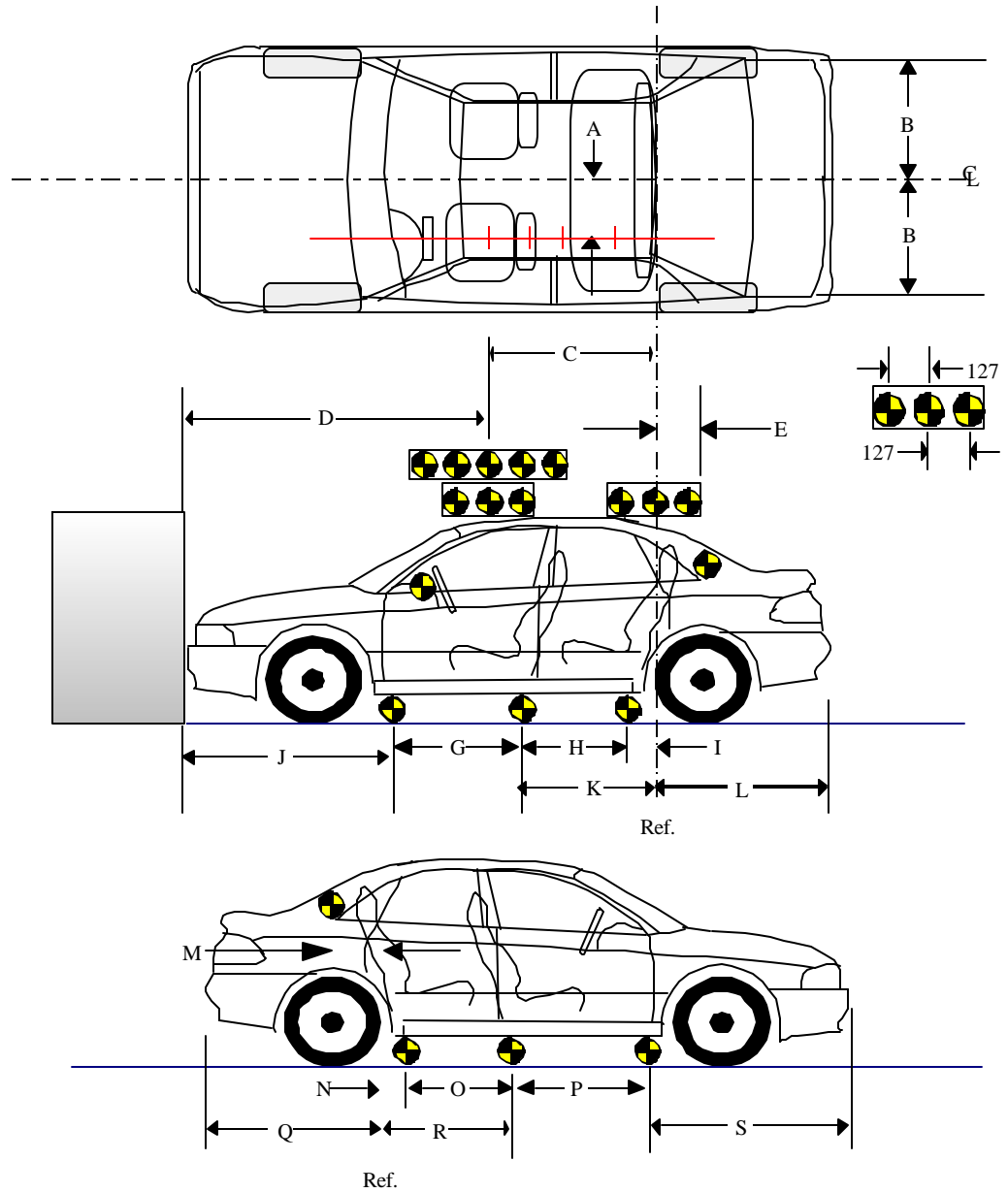
Y = film plane to impact location N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

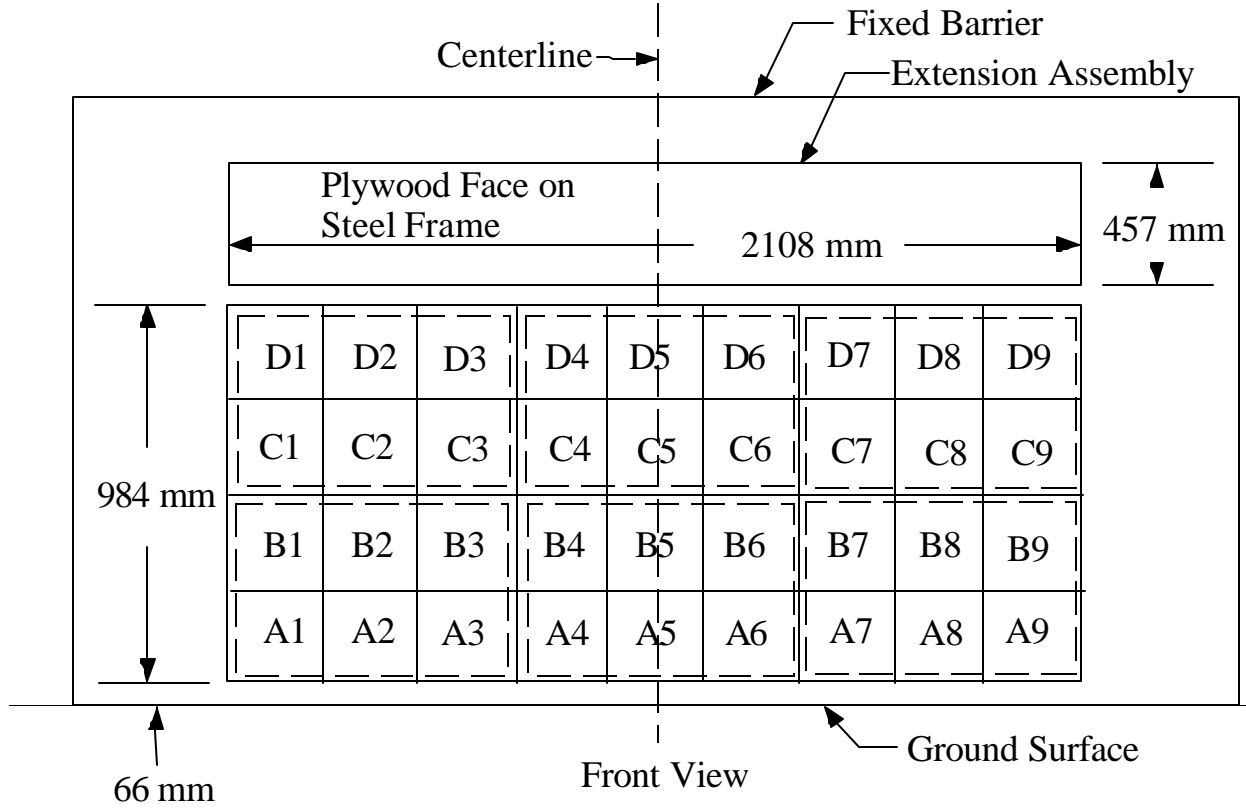
(Dimensions in millimeters)

A	337
B	639
C	914
D	2375
E	400
F	1494
G	994
H	985
I	112
J	1272
K	1097
L	1475
M	376
N	108
O	993
P	996
Q	1466
R	1101
S	1275



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.: M30509; Test Date: February 7, 2003; Technician: Patrick MacDiarmid

Vehicle Model Year/Make/Model: 2003 Mercedes Benz E320 4-Door Sedan

A. No. of vent holes: 1 -Driver 2 -Passenger

B. Size of vent holes: (mm²) 314.2 -Driver 2827.4 -Passenger

C. Total vent area: (mm²) 314.2 -Driver 5654.8 -Passenger

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

Driver: 550 -Height; 550 -Width; 265 -Depth

Passenger: 630 -Height; 380 -Width; 510 -Depth

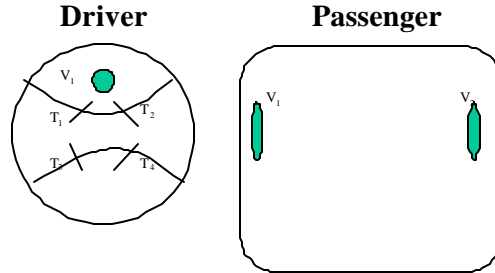
E. Is the air bag tethered?

Driver: X -Yes; - -No; If yes, record length of tether- 240

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).



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

Driver: Air bag: 0200010003441704 PA 6.6

 Generator: Not Available

Passenger: Air bag: 0029010003341103 PA 6.6 0029010003477303 PA 6.6

 Generator: Not Available

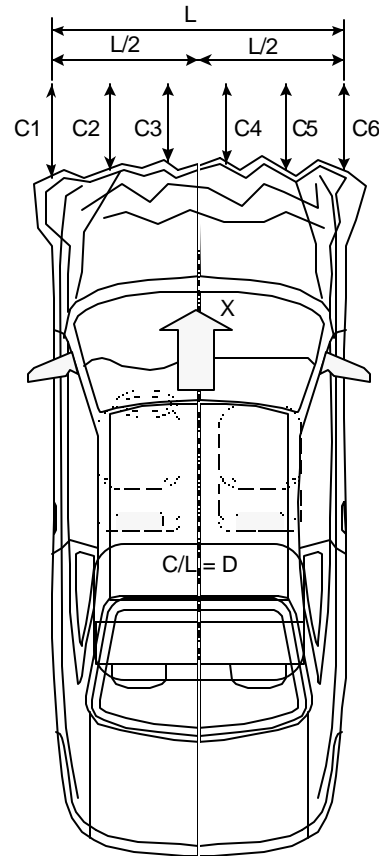
DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA

FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Mercedes Benz E320 4-Door Sedan
 NHTSA Test No.: M30509 VIN: WDBUF65JX3A191590
 Model Year: 2003 Build Date: 11/02 Test Date: February 7, 2003
 Vehicle Size Category: Mid-size Test Weight: 1935.0 kg
 Vehicle Wheelbase: 2854 mm; Front Overhang: 824 mm; Overall Width: 1990 mm
 Collision Deformation Classification (CDC) Code: 12FDEW 3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4666	4277	389
C2 =	4775	4270	505
C3 =	4831	4251	580
C4 =	4831	4255	576
C5 =	4778	4276	502
C6 =	4660	4305	355



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1565 mm
 L2= 782.5 mm
 L5= 313 mm

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>Figure</u>	<u>Title</u>	<u>Page</u>
A-1	Load Cell Locations	A-4
A-2	Vehicle Placard	A-5
A-3	Tire Placard	A-6
A-4	Right Front, As Received	A-7
A-5	Left Rear, As Received	A-8
A-6	Pre-Test Front View	A-9
A-7	Post-Test Front View	A-10
A-8	Pre-Test Left Side View	A-11
A-9	Post-Test Left Side View	A-12
A-10	Pre-Test Right Side View	A-13
A-11	Post-Test Right Side View	A-14
A-12	Pre-Test Right Front Three-Quarter View	A-15
A-13	Post-Test Right Front Three-Quarter View	A-16
A-14	Pre-Test Left Rear Three-Quarter View	A-17
A-15	Post-Test Left Rear Three-Quarter View	A-18
A-16	Left Rear Three-Quarter View Of Doors After Impact	A-19
A-17	Right Rear Three-Quarter View Of Doors After Impact	A-20
A-18	Pre-Test Windshield View	A-21
A-19	Post-Test Windshield View	A-22
A-20	Pre-Test Engine Compartment View	A-23
A-21	Post-Test Engine Compartment View	A-24
A-22	Pre-Test Fuel Cap View	A-25
A-23	Post-Test Fuel Cap View	A-26
A-24	Pre-Test Front Underbody View	A-27
A-25	Post-Test Front Underbody View	A-28
A-26	Pre-Test Mid Underbody View	A-29
A-27	Post-Test Mid Underbody View	A-30
A-28	Pre-Test Rear Underbody View	A-31
A-29	Post-Test Rear Underbody View	A-32
A-30	Pre-Test Driver Head Location	A-33
A-31	Post-Test Driver Head Location	A-34
A-32	Pre-Test Driver Position View	A-35
A-33	Post-Test Driver Position View	A-36
A-34	Pre-Test Driver And Interior View	A-37
A-35	Post-Test Driver And Interior View	A-38
A-36	Pre-Test Driver Feet View	A-39
A-37	Post-Test Driver Feet View	A-40
A-38	Pre-Test Driver Knee Bolster View	A-41
A-39	Post-Test Driver Knee Bolster View	A-42
A-40	Pre-Test Driver Floor Pan View	A-43
A-41	Post-Test Driver Floor Pan View	A-44
A-42	Post-Test Driver Head View	A-45
A-43	Post-Test Driver Contact To Airbag	A-46

TABLE OF PHOTOGRAPHS (CONTINUED)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
A-44	Pre-Test Passenger Head Location	A-47
A-45	Post-Test Passenger Head Location	A-48
A-46	Pre-Test Passenger Position View	A-49
A-47	Post-Test Passenger Position View	A-50
A-48	Pre-Test Passenger And Interior View	A-51
A-49	Post-Test Passenger And Interior View	A-52
A-50	Pre-Test Passenger Feet View	A-53
A-51	Post-Test Passenger Feet View	A-54
A-52	Pre-Test Passenger Knee Bolster View	A-55
A-53	Post-Test Passenger Knee Bolster View	A-56
A-54	Pre-Test Passenger Floor Pan View	A-57
A-55	Post-Test Passenger Floor Pan View	A-58
A-56	Post-Test Passenger Head View	A-59
A-57	Post-Test Passenger Contact To Airbag	A-60
A-58	Rollover View	A-61
A-59	Impact View	A-62



Figure A-1 LOAD CELL LOCATIONS



Figure A-2 VEHICLE CERTIFICATION PLACARD



Figure A-3 VEHICLE TIRE PLACARD



Figure A-4 RIGHT FRONT, AS RECEIVED



Figure A-5 LEFT REAR, AS RECEIVED



Figure A-6 PRE-TEST FRONT VIEW



Figure A-7 POST-TEST FRONT VIEW



Figure A-8 PRE-TEST LEFT SIDE VIEW



Figure A-9 POST-TEST LEFT SIDE VIEW



Figure A-10 PRE-TEST RIGHT SIDE VIEW



Figure A-11 POST-TEST RIGHT SIDE VIEW



Figure A-12 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-14 PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-15 POST-TEST LEFT REAR THREE-QUARTER VIEW



A-19

8642-NCAP-29

Figure A-16 LEFT REAR THREE-QUARTER VIEW OF DOORS AFTER IMPACT



Figure A-17 RIGHT REAR THREE-QUARTER VIEW OF DOORS AFTER IMPACT



Figure A-18 PRE-TEST WINDSHIELD VIEW



Figure A-19 POST-TEST WINDSHIELD VIEW



A-23

8642-NCAP-29

Figure A-20 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-21 POST-TEST ENGINE COMPARTMENT VIEW

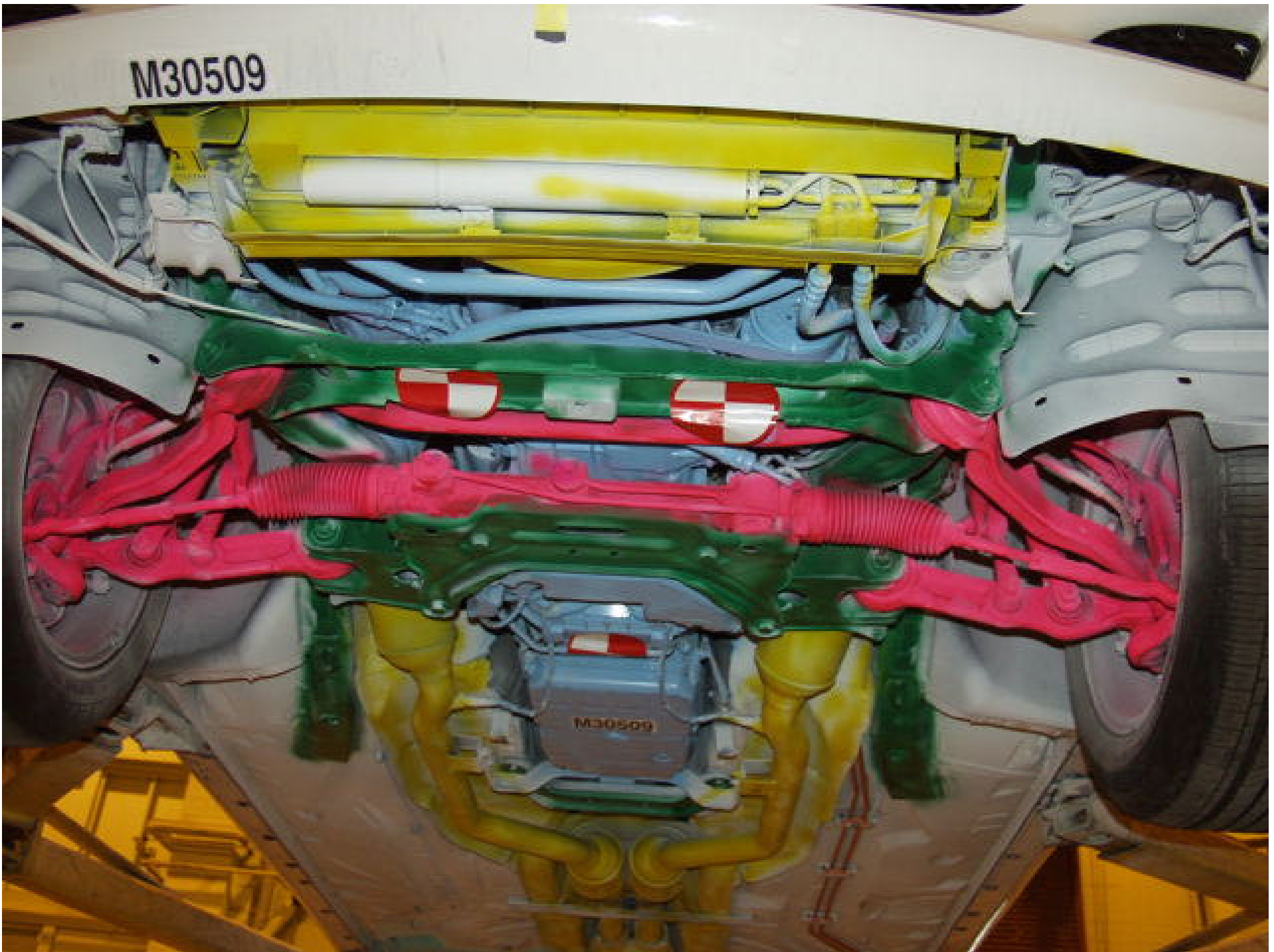
C00353-2007-2046
M30509



Figure A-22 PRE-TEST FUEL CAP VIEW



Figure A-23 POST-TEST FUEL CAP VIEW



A-27

8642-NCAP-29

Figure A-24 PRE-TEST FRONT UNDERBODY VIEW

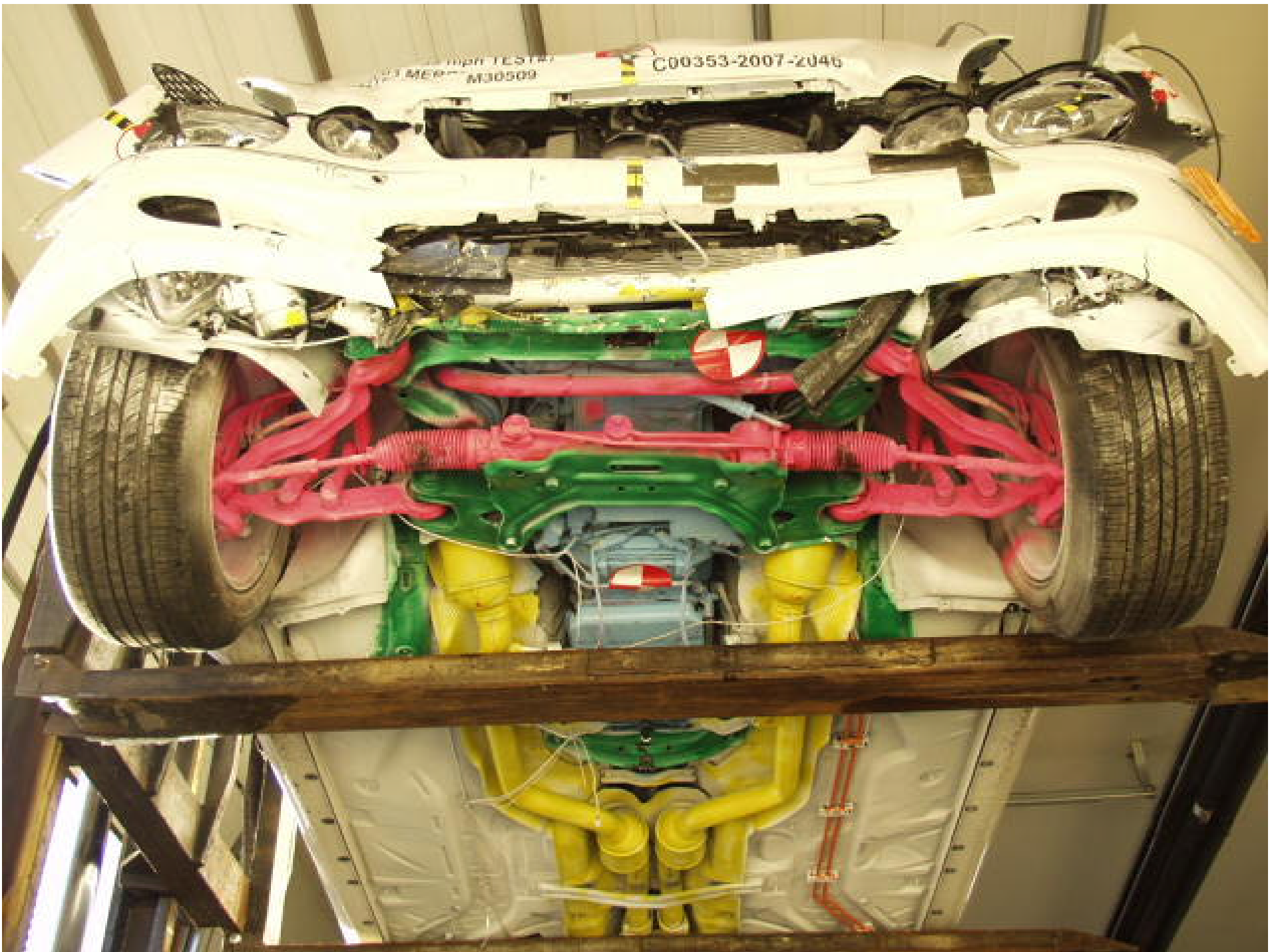


Figure A-25 POST-TEST FRONT UNDERBODY VIEW



A-29

8642-NCAP-29

Figure A-26 PRE-TEST MID UNDERBODY VIEW

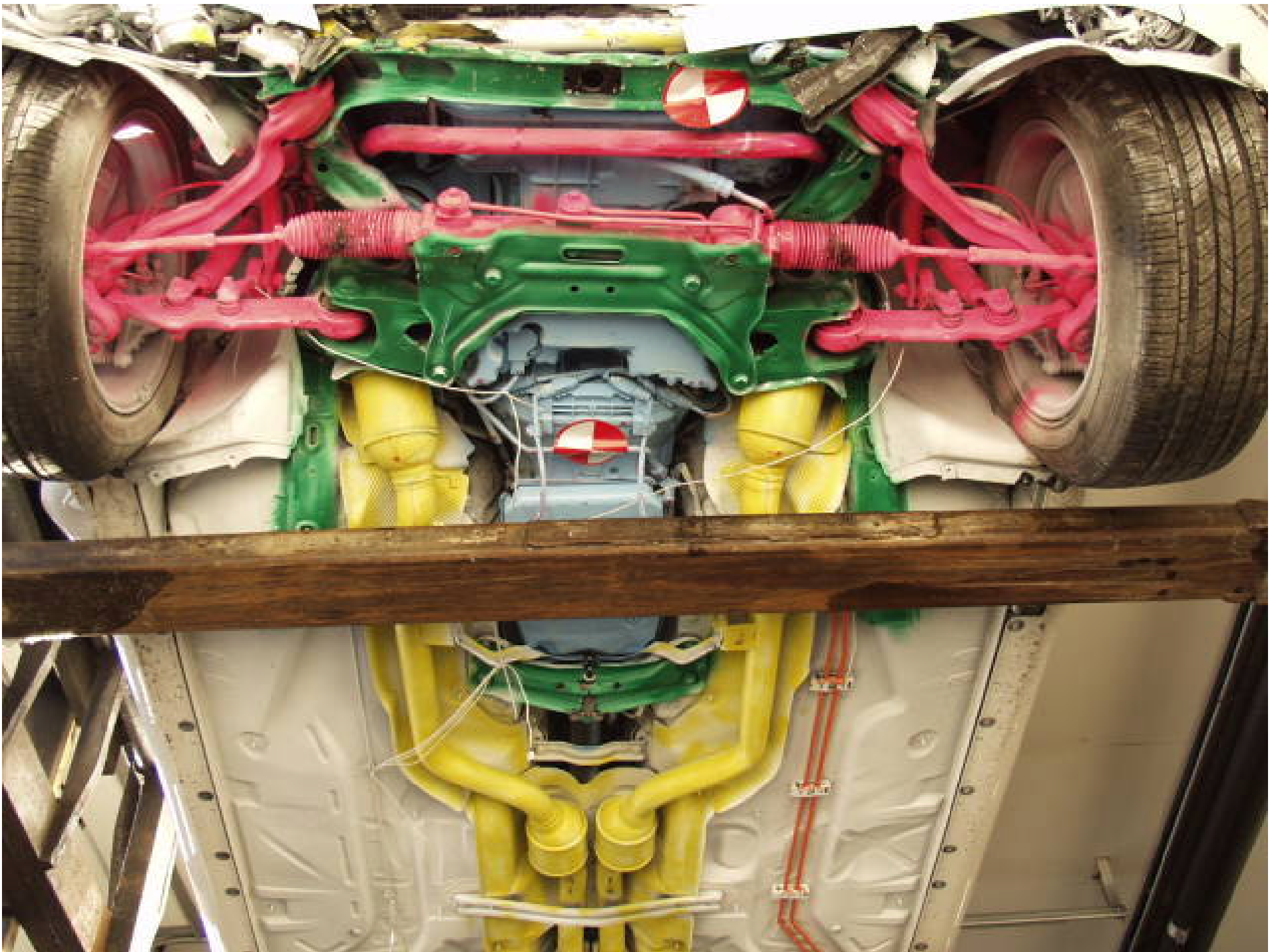


Figure A-27 POST-TEST MID UNDERBODY VIEW



C00353-2007-2046

C00353-2007-2046

VERIDIAN
NCAP 35 mph TEST#7
2003 MERCEDES E320
NHTSA M30509 02/07/03

A-31

8642-NCAP-29

Figure A-28 PRE-TEST REAR UNDERBODY VIEW

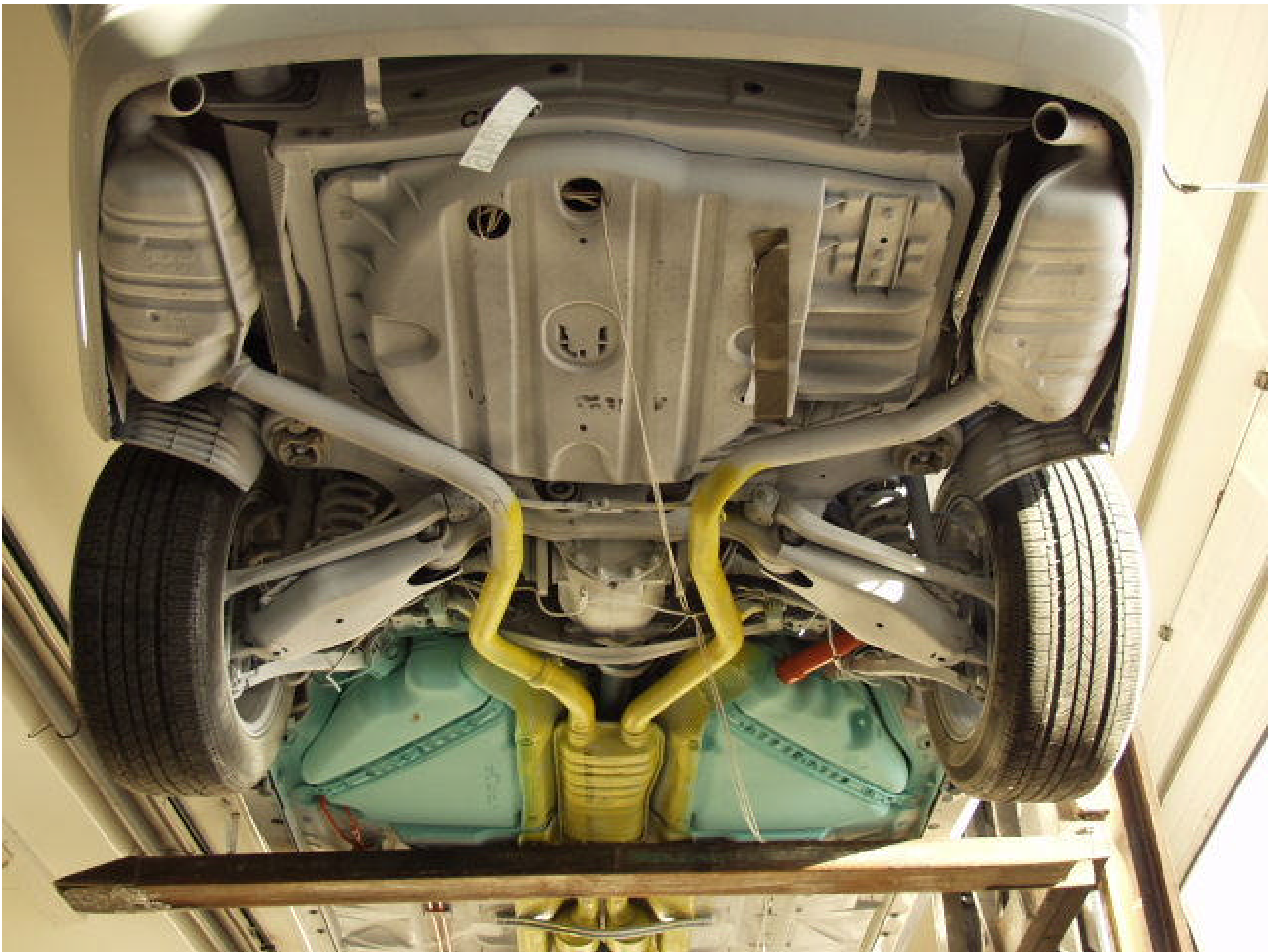


Figure A-29 POST-TEST REAR UNDERBODY VIEW



Figure A-30 PRE-TEST DRIVER HEAD LOCATION



Figure A-31 POST-TEST DRIVER HEAD LOCATION



Figure A-32 PRE-TEST DRIVER POSITION VIEW



Figure A-33 POST-TEST DRIVER POSITION VIEW



Figure A-34 PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-35 POST-TEST DRIVER AND INTERIOR VIEW

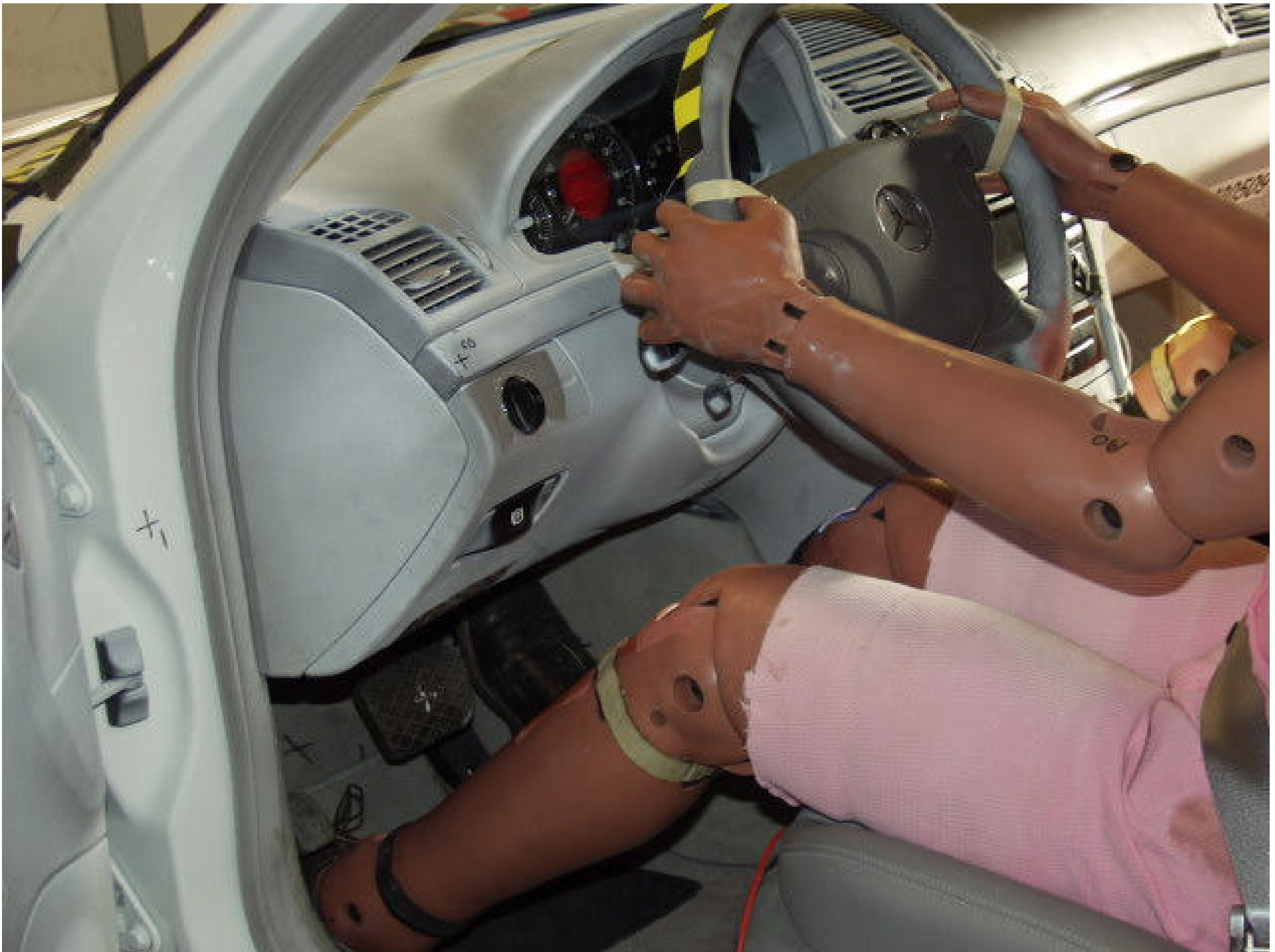


Figure A-36 PRE-TEST DRIVER FEET VIEW



A-40

8642-NCAP-29

Figure A-37 POST-TEST DRIVER FEET VIEW



A-41

8642-NCAP-29

Figure A-38 PRE-TEST DRIVER KNEE BOLSTER VIEW



Figure A-39 POST-TEST DRIVER KNEE BOLSTER VIEW



A-43

8642-NCAP-29

Figure A-40 PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-41 POST-TEST DRIVER FLOOR PAN VIEW



A-45

8642-NCAP-29

Figure A-42 POST-TEST DRIVER HEAD VIEW



A-46

8642-NCAP-29

Figure A-43 POST-TEST DRIVER CONTACT TO AIRBAG



A-47

8642-NCAP-29

Figure A-44 PRE-TEST PASSENGER HEAD LOCATION



A-48

8642-NCAP-29

Figure A-45 POST-TEST PASSENGER HEAD LOCATION



A-49

8642-NCAP-29

Figure A-46 PRE-TEST PASSENGER POSITION VIEW

A-50

8642-NCAP-29



Figure A-47 POST-TEST PASSENGER POSITION VIEW



A-51

8642-NCAP-29

Figure A-48 PRE-TEST PASSENGER AND INTERIOR VIEW



A-52

8642-NCAP-29

Figure A-49 POST-TEST PASSENGER AND INTERIOR VIEW



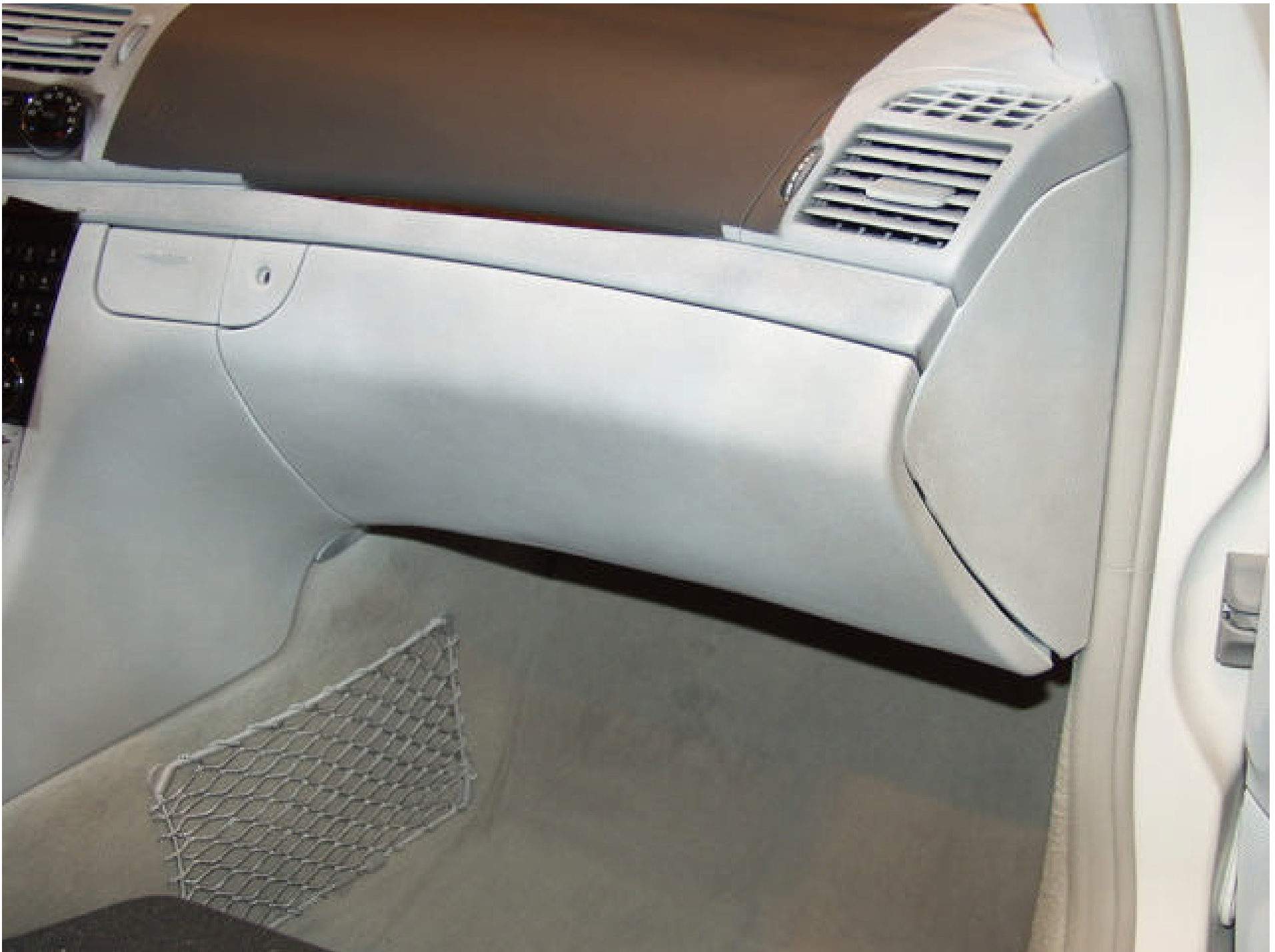
Figure A-50 PRE- TEST PASSENGER FEET VIEW



A-54

8642-NCAP-29

Figure A-51 POST-TEST PASSENGER FEET VIEW



A-55

8642-NCAP-29

Figure A-52 PRE-TEST PASSENGER KNEE BOLSTER VIEW



A-56

8642-NCAP-29

Figure A-53 POST-TEST PASSENGER KNEE BOLSTER VIEW

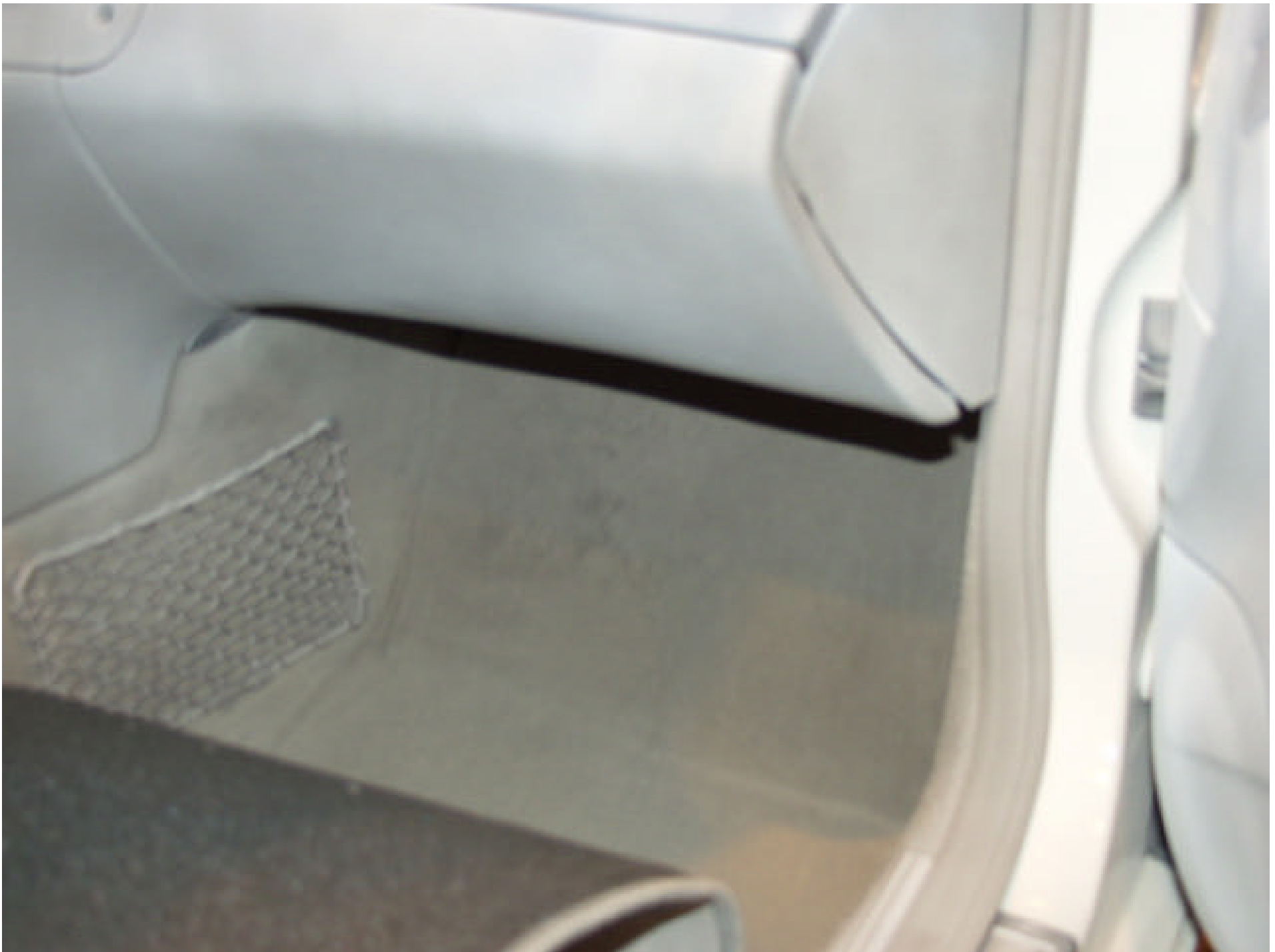


Figure A-54 PRE-TEST PASSENGER FLOOR PAN VIEW

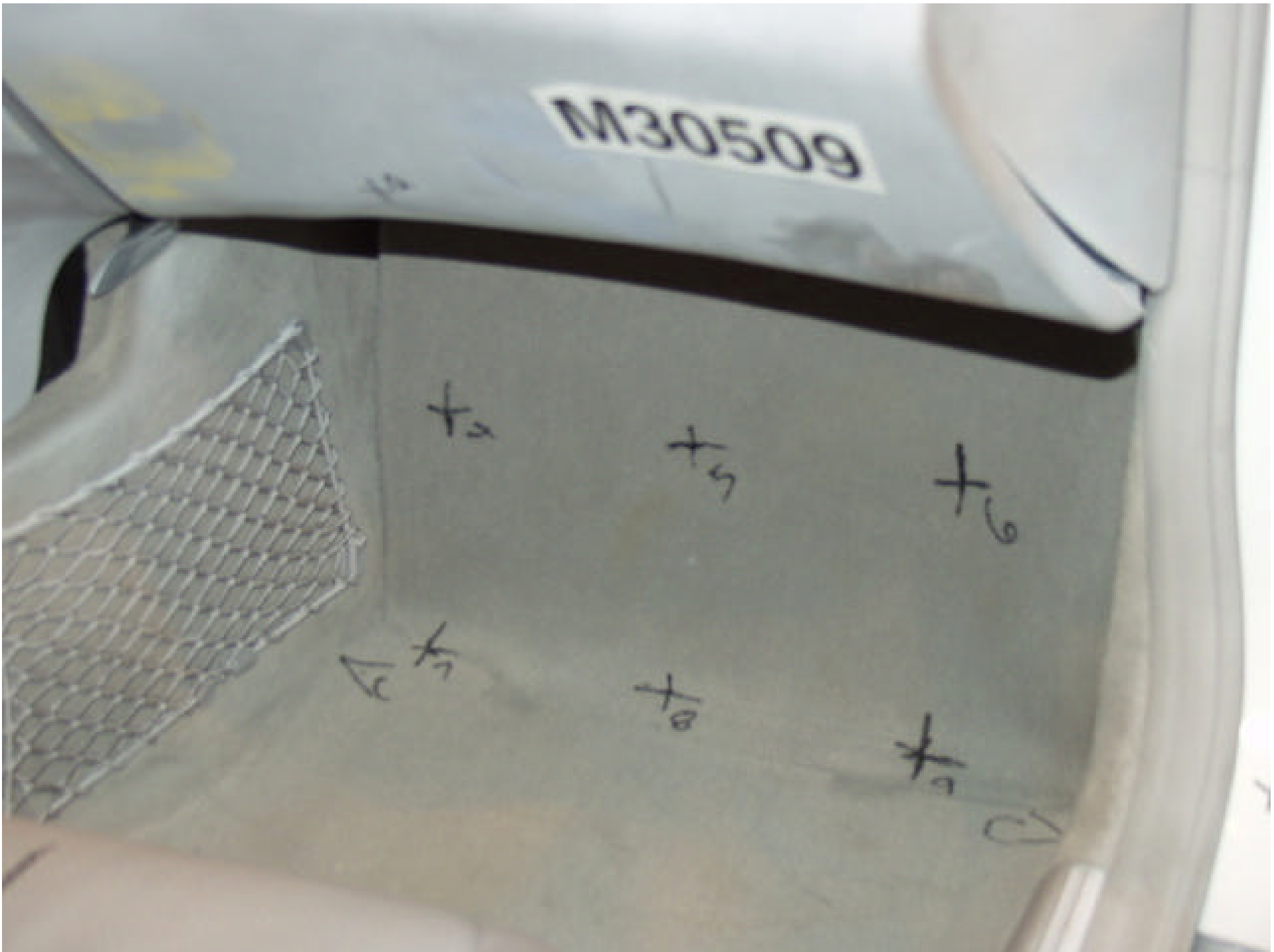


Figure A-55 POST-TEST PASSENGER FLOOR PAN VIEW

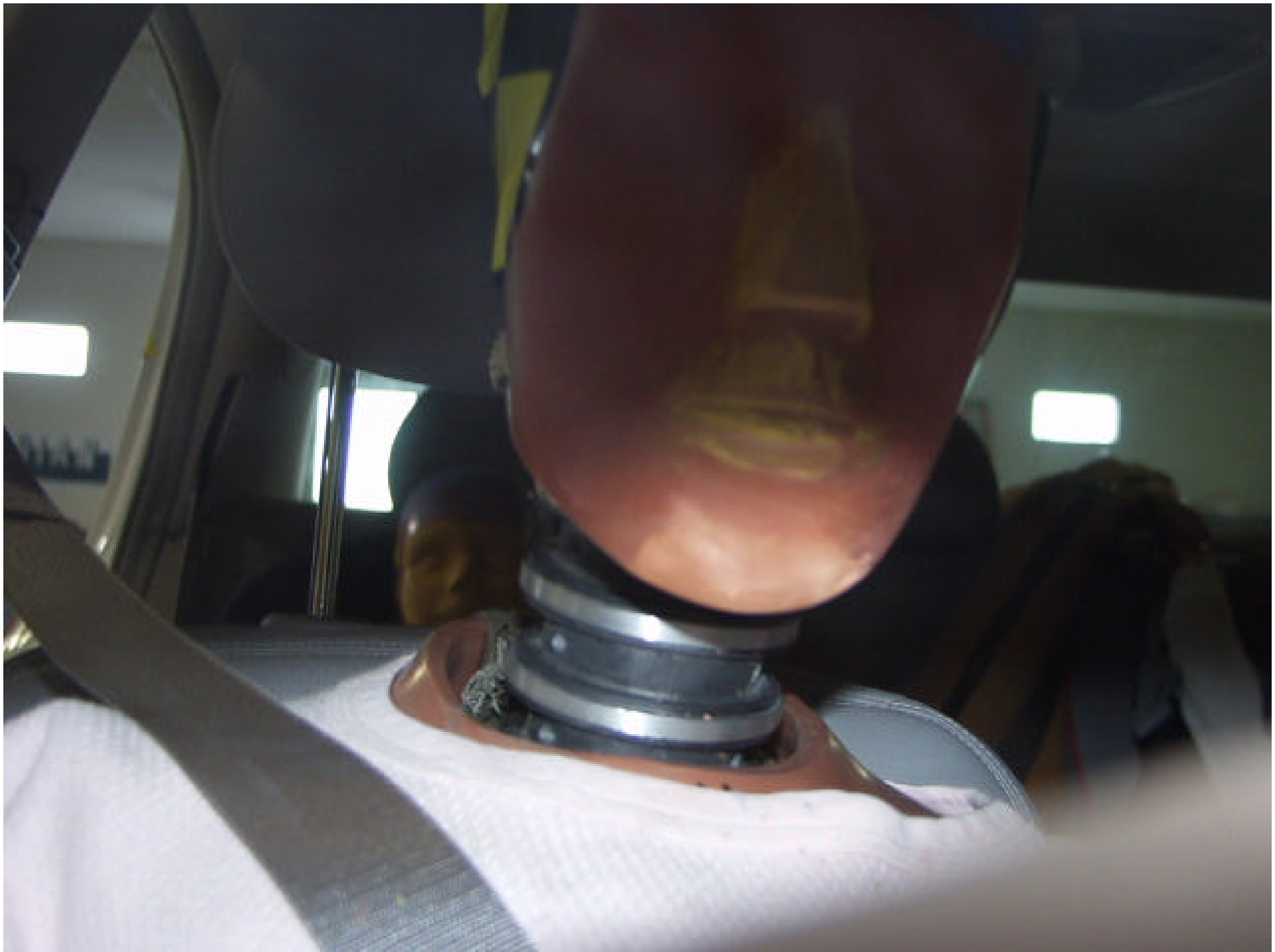


Figure A-56 POST-TEST PASSENGER HEAD VIEW



A-60

8642-NCAP-29

Figure A-57 POST-TEST PASSENGER CONTACT TO AIRBAG



Figure A-58 ROLLOVER VIEW

PHOTOGRAPH IS NOT AVAILABLE – CAMERA MALFUNCTIONED

Figure A-59 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.

DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	600
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

TABLE OF DATA PLOTS

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	V1P1 Head 9 Array X Arm Ay [g, CFC_1000]	B-8
2	V1P1 Head 9 Array X Arm Az [g, CFC_1000]	B-9
3	V1P1 Head 9 Array Y Arm Ax [g, CFC_1000]	B-10
4	V1P1 Head 9 Array Y Arm Az [g, CFC_1000]	B-11
5	V1P1 Head 9 Array Z Arm Ax [g, CFC_1000]	B-12
6	V1P1 Head 9 Array Z Arm Ay [g, CFC_1000]	B-13
7	V1P1 Head CG x [g, CFC_1000]	B-14
8	V1P1 Head CG y [g, CFC_1000]	B-15
9	V1P1 Head CG z [g, CFC_1000]	B-16
10	V1P1 Head CG Resultant [g, CFC_1000]	B-17
11	V1P1 Head CG Red x [g, CFC_1000]	B-18
12	V1P1 Head CG Red y [g, CFC_1000]	B-19
13	V1P1 Head CG Red z [g, CFC_1000]	B-20
14	V1P1 Head CG Red Resultant [g, CFC_1000]	B-21
15	V1P1 Upper Neck Fx [N, CFC_1000]	B-22
16	V1P1 Upper Neck Fy [N, CFC_1000]	B-23
17	V1P1 Upper Neck Fz [N, CFC_1000]	B-24
18	V1P1 Upper Neck F Resultant [N, CFC_1000]	B-25
19	V1P1 Upper Neck Mx [N-m, CFC_600]	B-26
20	V1P1 Upper Neck My [N-m, CFC_600]	B-27
21	V1P1 Upper Neck Mz [N-m, CFC_600]	B-28
22	V1P1 Upper Neck M Resultant [N-m, CFC_600]	B-29
23	V1P1 Chest x [g, CFC_180]	B-30
24	V1P1 Chest y [g, CFC_180]	B-31
25	V1P1 Chest z [g, CFC_180]	B-32
26	V1P1 Chest Resultant [g, CFC_180]	B-33
27	V1P1 Chest Red x [g, CFC_180]	B-34
28	V1P1 Chest Red y [g, CFC_180]	B-35
29	V1P1 Chest Red z [g, CFC_180]	B-36
30	V1P1 Chest Red Resultant [g, CFC_180]	B-37
31	V1P1 Chest Compression x [mm, CFC_600]	B-38
32	V1P1 Pelvic x [g, CFC_1000]	B-39
33	V1P1 Pelvic y [g, CFC_1000]	B-40
34	V1P1 Pelvic z [g, CFC_1000]	B-41
35	V1P1 Pelvic Resultant [g, CFC_1000]	B-42
36	V1P1 Left Femur z [N, CFC_600]	B-43
37	V1P1 Right Femur z [N, CFC_600]	B-44
38	V1P1 Left Upper Tibia Mx [N-m, CFC_600]	B-45
39	V1P1 Left Upper Tibia My [N-m, CFC_600]	B-46
40	V1P1 Left Lower Tibia Fz [N, CFC_600]	B-47
41	V1P1 Left Lower Tibia Mx [N-m, CFC_600]	B-48
42	V1P1 Left Lower Tibia My [N-m, CFC_600]	B-49
43	V1P1 Right upper Tibia Mx [N-m, CFC_600]	B-50
44	V1P1 Right upper Tibia My [N-m, CFC_600]	B-51
45	V1P1 Right Lower Tibia Fz [N, CFC_600]	B-52
46	V1P1 Right Lower Tibia Mx [N-m, CFC_600]	B-53
47	V1P1 Right Lower Tibia My [N-m, CFC_600]	B-54

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
48	V1P1 Left Foot Aft x [g, CFC_600]	B-55
49	V1P1 Left Foot Aft z [g, CFC_600]	B-56
50	V1P1 Left Foot Fore z [g, CFC_600]	B-57
51	V1P1 Right Foot Aft x [g, CFC_600]	B-58
52	V1P1 Right foot Aft z [g, CFC_600]	B-59
53	V1P1 Right Foot Fore z [g, CFC_600]	B-60
54	P1 Lap Belt [N, CFC_60]	B-61
55	V1P2 Head 9 Array X Arm Ay [g, CFC_1000]	B-62
56	V1P2 Head 9 Array X Arm Az [g, CFC_1000]	B-63
57	V1P2 Head 9 Array Y Arm Ax [g, CFC_1000]	B-64
58	V1P2 Head 9 Array Y Arm Az [g, CFC_1000]	B-65
59	V1P2 Head 9 Array Z Arm Ax [g, CFC_1000]	B-66
60	V1P2 Head 9 Array Z Arm Ay [g, CFC_1000]	B-67
61	V1P2 Head CG x [g, CFC_1000]	B-68
62	V1P2 Head CG y [g, CFC_1000]	B-69
63	V1P2 Head CG z [g, CFC_1000]	B-70
64	V1P2 Head CG Resultant [g, CFC_1000]	B-71
65	V1P2 Head CG Red x [g, CFC_1000]	B-72
66	V1P2 Head CG Red y [g, CFC_1000]	B-73
67	V1P2 Head CG Red z [g, CFC_1000]	B-74
68	V1P2 Head CG Red Resultant [g, CFC_1000]	B-75
69	V1P2 Upper Neck Fx [N, CFC_1000]	B-76
70	V1P2 Upper Neck Fy [N, CFC_1000]	B-77
71	V1P2 Upper Neck Fz [N, CFC_1000]	B-78
72	V1P2 Upper Neck F Resultant [N, CFC_1000]	B-79
73	V1P2 Upper Neck Mx [N-m, CFC_600]	B-80
74	V1P2 Upper Neck My [N-m, CFC_600]	B-81
75	V1P2 Upper Neck Mz [N-m, CFC_600]	B-82
76	V1P2 Upper Neck M Resultant [N-m, CFC_600]	B-83
77	V1P2 Chest x [g, CFC_180]	B-84
78	V1P2 Chest y [g, CFC_180]	B-85
79	V1P2 Chest z [g, CFC_180]	B-86
80	V1P2 Chest Resultant [g, CFC_180]	B-87
81	V1P2 Chest Red x [g, CFC_180]	B-88
82	V1P2 Chest Red y [g, CFC_180]	B-89
83	V1P2 Chest Red z [g, CFC_180]	B-90
84	V1P2 Chest Red Resultant [g, CFC_180]	B-91
85	V1P2 Chest Compression x [mm, CFC_600]	B-92
86	V1P2 Pelvic x [g, CFC_1000]	B-93
87	V1P2 Pelvic y [g, CFC_1000]	B-94
88	V1P2 Pelvic z [g, CFC_1000]	B-95
89	V1P2 Pelvic Resultant [g, CFC_1000]	B-96
90	V1P2 Left Femur z [N, CFC_600]	B-97
91	V1P2 Right Femur z [N, CFC_600]	B-98
92	V1P2 Left Upper Tibia Mx [N-m, CFC_600]	B-99
93	V1P2 Left Upper Tibia My [N-m, CFC_600]	B-100
94	V1P2 Left Lower Tibia Fz [N, CFC_600]	B-101
95	V1P2 Left Lower Tibia Mx [N-m, CFC_600]	B-102

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
96	V1P2 Left Lower Tibia My [N-m, CFC_600]	B-103
97	V1P2 Right Upper Tibia Mx [N-m, CFC_600]	B-104
98	V1P2 Right Upper Tibia My [N-m, CFC_600]	B-105
99	V1P2 Right Lower Tibia Fz [N, CFC_600]	B-106
100	V1P2 Right Lower Tibia Mx [N-m, CFC_600]	B-107
101	V1P2 Right Lower Tibia My [N-m, CFC_600]	B-108
102	V1P2 Left Foot Aft x [g, CFC_600]	B-109
103	V1P2 Left Foot Aft z [g, CFC_600]	B-110
104	V1P2 Left Foot Fore z [g, CFC_600]	B-111
105	V1P2 Right Foot Aft x [g, CFC_600]	B-112
106	V1P2 Right Foot Aft z [g, CFC_600]	B-113
107	V1P2 Right Foot Fore z [g, CFC_600]	B-114
108	P2 Lap Belt [N, CFC_60]	B-115
109	V1 Left Rear #1x [g, CFC_60]	B-116
110	V1 Left Rear #1x Velocity [kph, CFC_180]	B-117
111	V1 Left Rear #1x Displacement [mm, CFC_180]	B-118
112	V1 Right Rear #2x [g, CFC_60]	B-119
113	V1 Right Rear #2x Velocity [kph, CFC_180]	B-120
114	V1 Right Rear #2x Displacement [mm, CFC_180]	B-121
115	V1 Engine Top #3x [g, CFC_60]	B-122
116	V1 Engine Top #3x Velocity [kph, CFC_180]	B-123
117	V1 Engine Top #3x Displacement [mm, CFC_180]	B-124
118	V1 Engine Bottom #4x [g, CFC_60]	B-125
119	V1 Engine Bottom #4x Velocity [kph, CFC_180]	B-126
120	V1 Engine Bottom #4x Displacement [mm, CFC_180]	B-127
121	V1 Right Caliper #5x [g, CFC_60]	B-128
122	V1 Right Caliper #5x Velocity [kph, CFC_180]	B-129
123	V1 Right Caliper #5x Displacement [mm, CFC_180]	B-130
124	V1 Instrument Panel #6x [g, CFC_60]	B-131
125	V1 Instrument Panel #6x Velocity [kph, CFC_180]	B-132
126	V1 Instrument Panel #6x Displacement [mm, CFC_180]	B-133
127	V1 Left Caliper #7x [g, CFC_60]	B-134
128	V1 Left Caliper #7x Velocity [kph, CFC_180]	B-135
129	V1 Left Caliper #7x Displacement [mm, CFC_180]	B-136
130	V1 Left Rear #8z [g, CFC_60]	B-137
131	V1 Left Rear #8z Velocity [kph, CFC_180]	B-138
132	V1 Left Rear #8z Displacement [mm, CFC_180]	B-139
133	V1 Right Rear #9z [g, CFC_60]	B-140
134	V1 Right Rear #9z Velocity [kph, CFC_180]	B-141
135	V1 Right Rear #9z Displacement [mm, CFC_180]	B-142
136	B1 LCA1 Fx [N, CFC_60]	B-143
137	B1 LCA2 Fx [N, CFC_60]	B-144
138	B1 LCA3 Fx [N, CFC_60]	B-145
139	B1 LCA4 Fx [N, CFC_60]	B-146
140	B1 LCA5 Fx [N, CFC_60]	B-147
141	B1 LCA6 Fx [N, CFC_60]	B-148
142	B1 LCA7 Fx [N, CFC_60]	B-149
143	B1 LCA8 Fx [N, CFC_60]	B-150

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
144	B1 LCA9 Fx [N, CFC_60]	B-151
145	B1 LCB1 Fx [N, CFC_60]	B-152
146	B1 LCB2 Fx [N, CFC_60]	B-153
147	B1 LCB3 Fx [N, CFC_60]	B-154
148	B1 LCB4 Fx [N, CFC_60]	B-155
149	B1 LCB5 Fx [N, CFC_60]	B-156
150	B1 LCB6 Fx [N, CFC_60]	B-157
151	B1 LCB7 Fx [N, CFC_60]	B-158
152	B1 LCB8 Fx [N, CFC_60]	B-159
153	B1 LCB9 Fx [N, CFC_60]	B-160
154	B1 LCC1 Fx [N, CFC_60]	B-161
155	B1 LCC2 Fx [N, CFC_60]	B-162
156	B1 LCC3 Fx [N, CFC_60]	B-163
157	B1 LCC4 Fx [N, CFC_60]	B-164
158	B1 LCC5 Fx [N, CFC_60]	B-165
159	B1 LCC6 Fx [N, CFC_60]	B-166
160	B1 LCC7 Fx [N, CFC_60]	B-167
161	B1 LCC8 Fx [N, CFC_60]	B-168
162	B1 LCC9 Fx [N, CFC_60]	B-169
163	B1 LCD1 Fx [N, CFC_60]	B-170
164	B1 LCD2 Fx [N, CFC_60]	B-171
165	B1 LCD3 Fx [N, CFC_60]	B-172
166	B1 LCD4 Fx [N, CFC_60]	B-173
167	B1 LCD5 Fx [N, CFC_60]	B-174
168	B1 LCD6 Fx [N, CFC_60]	B-175
169	B1 LCD7 Fx [N, CFC_60]	B-176
170	B1 LCD8 Fx [N, CFC_60]	B-177
171	B1 LCD9 Fx [N, CFC_60]	B-178
172	Group 1 Load Cell Sum (A1,A2,A3,B1,B2,B3)	B-179
173	Group 2 Load Cell Sum (A4,A5,A6,B4,B5,B6)	B-180
174	Group 3 Load Cell Sum (A7,A8,A9,B7,B8,B9)	B-181
175	Group 4 Load Cell Sum (C1,C2,C3,D1,D2,D3)	B-182
176	Group 5 Load Cell Sum (C4,C5,C6,D4,D5,D6)	B-183
177	Group 6 Load Cell Sum (C7,C8,C9,D7,D8,D9)	B-184
178	Total Load Cell Sum (All 6 Groups)	B-185

NCAP Test #7 - 2003 Mercedes E320

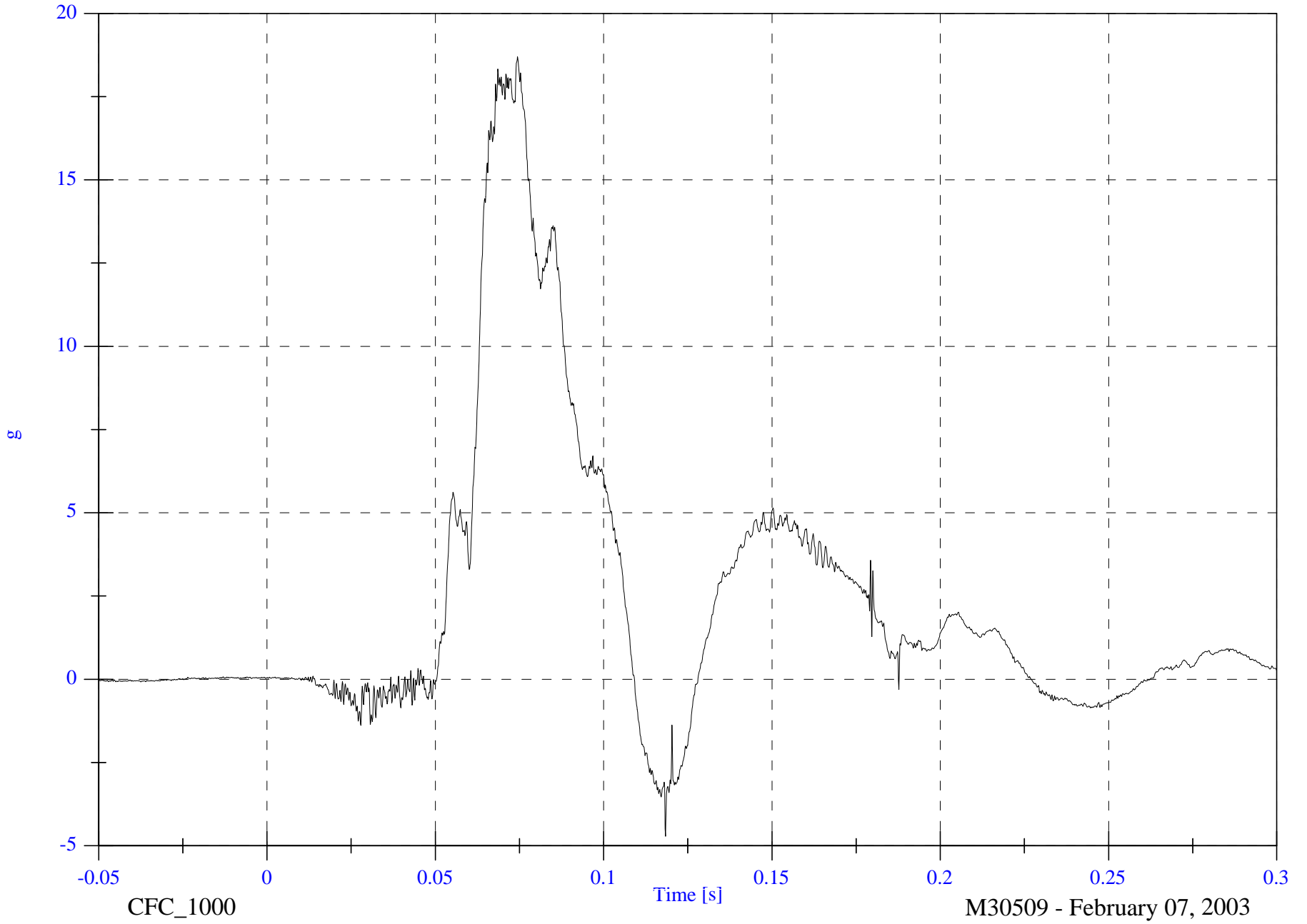
V1P1 Head 9 Array X Arm Ay

Max: 18.7 [g] at 0.074 [s]

Min: -4.7 [g] at 0.118 [s]

B-8

8642-NCAP-29

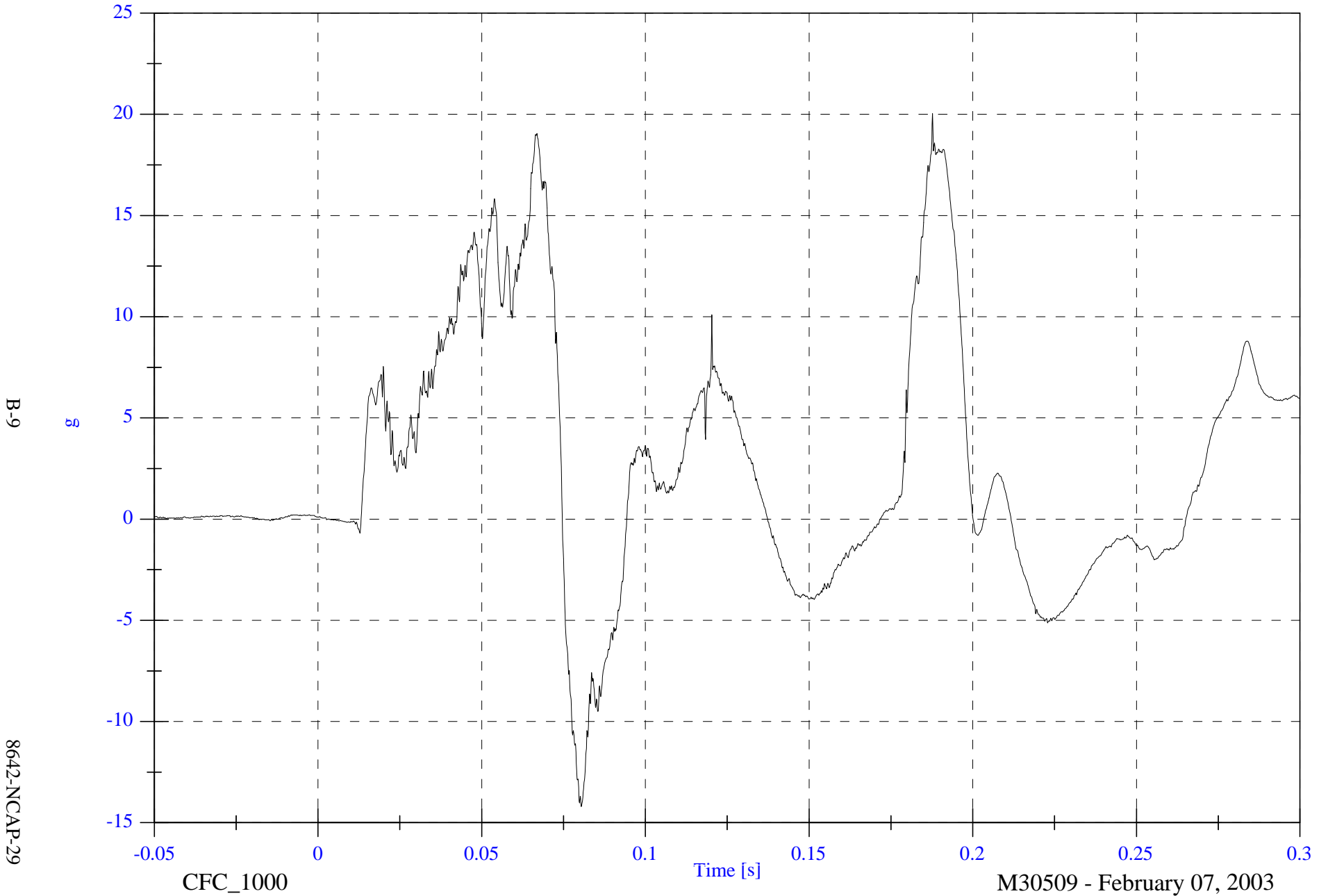


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head 9 Array X Arm Az

Max: 20.0 [g] at 0.188 [s]

Min: -14.2 [g] at 0.080 [s]

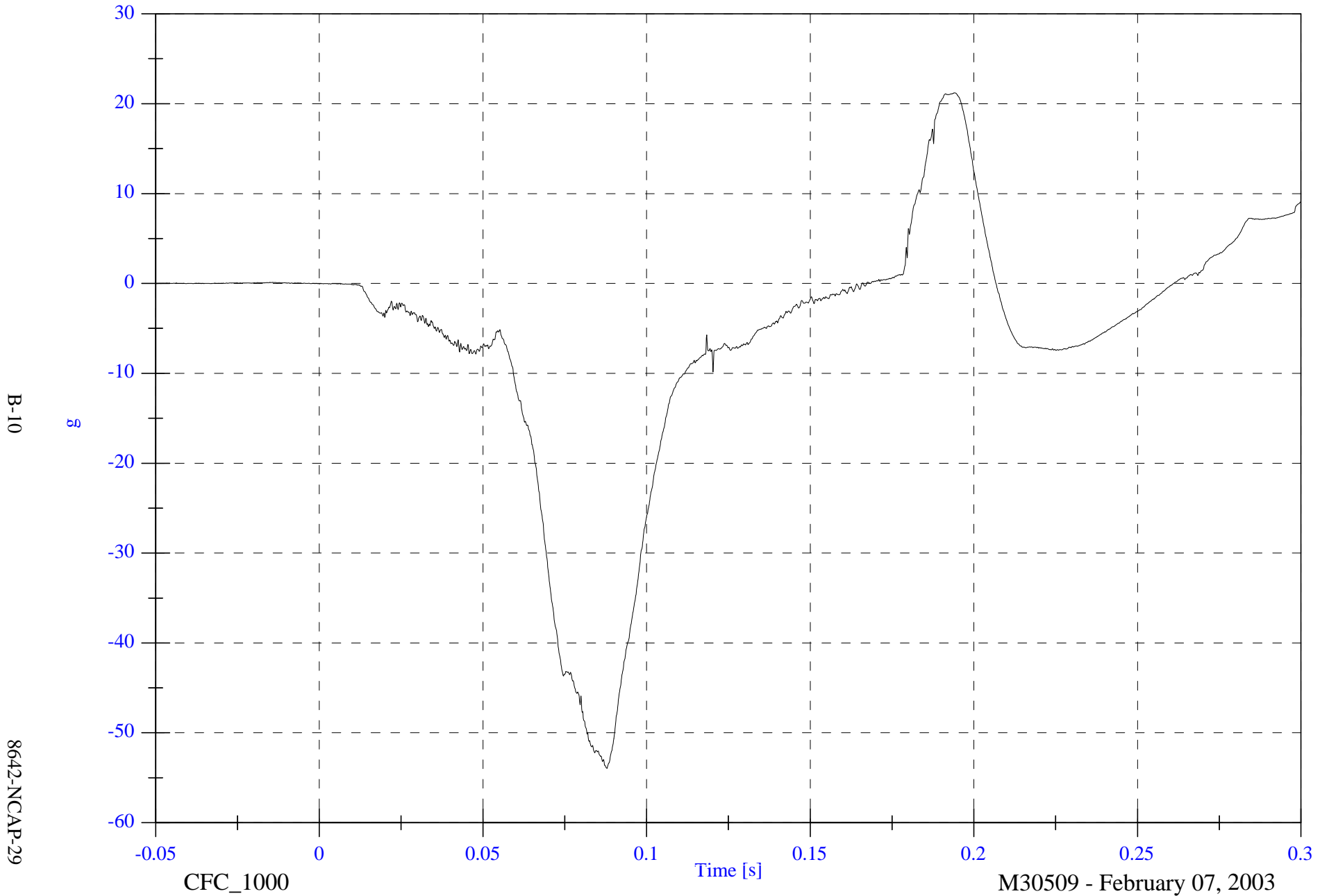


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head 9 Array Y Arm Ax

Max: 21.2 [g] at 0.194 [s]

Min: -54.0 [g] at 0.088 [s]

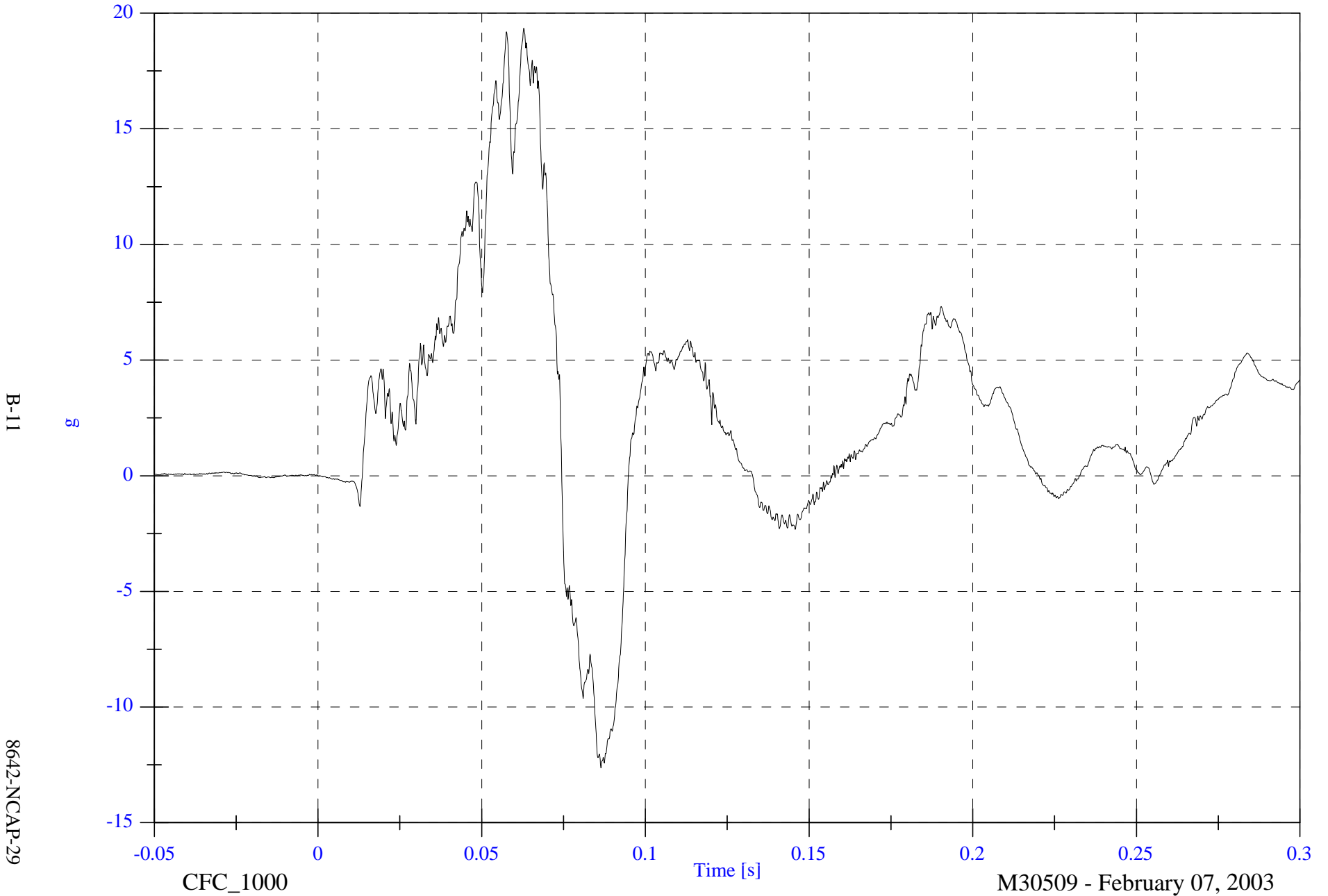


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head 9 Array Y Arm Az

Max: 19.3 [g] at 0.063 [s]

Min: -12.6 [g] at 0.086 [s]

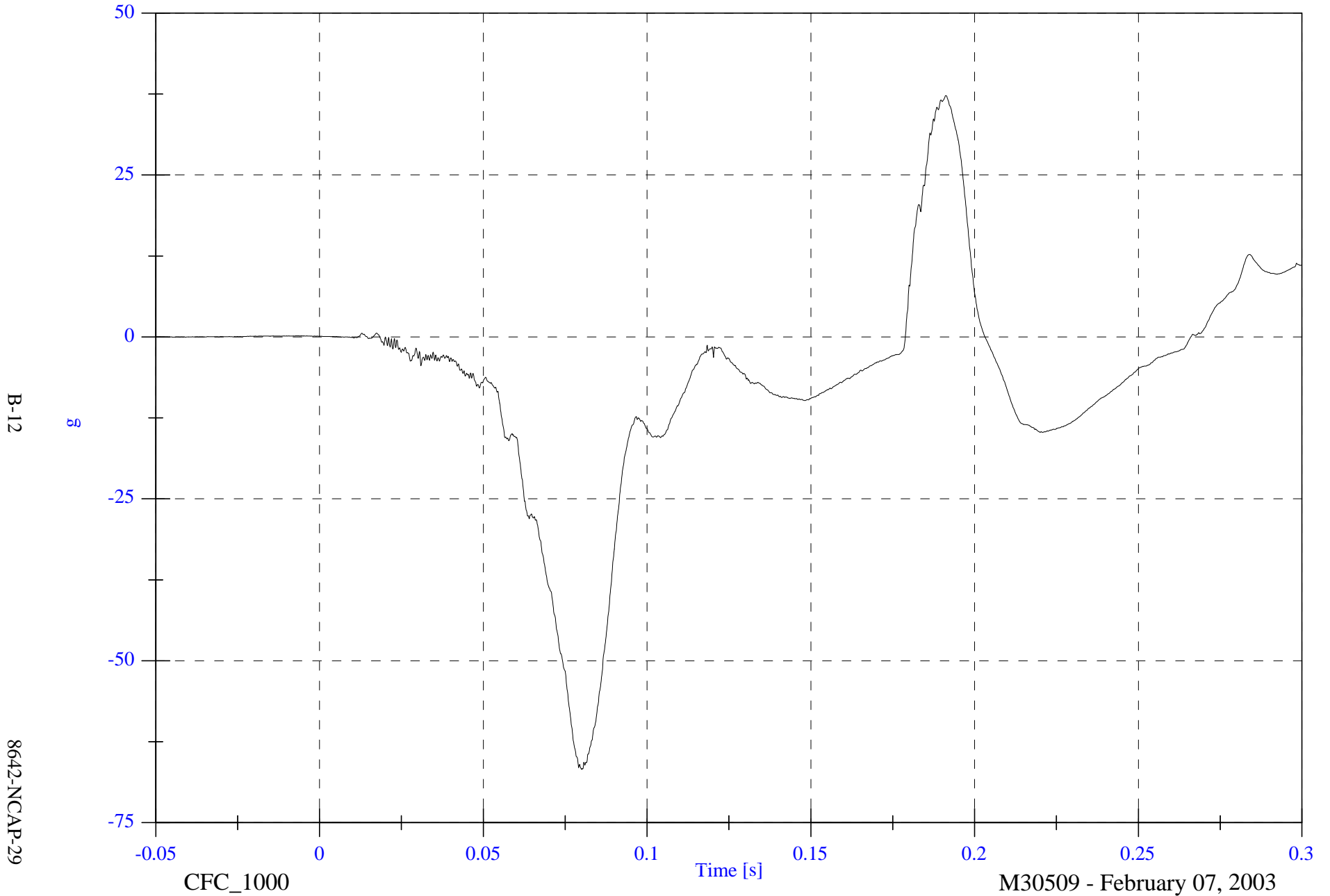


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head 9 Array Z Arm Ax

Max: 37.3 [g] at 0.191 [s]

Min: -66.7 [g] at 0.080 [s]

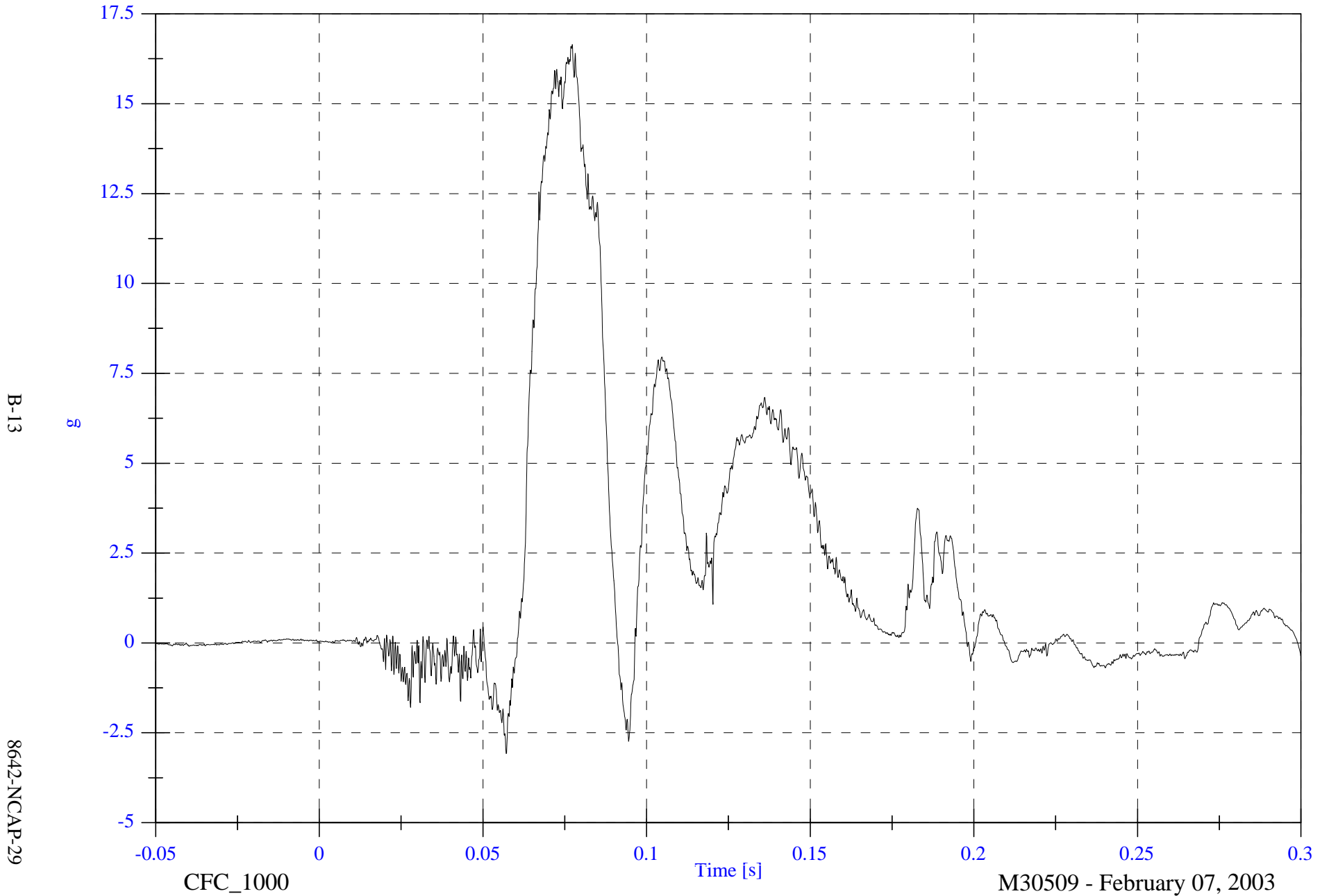


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head 9 Array Z Arm Ay

Max: 16.6 [g] at 0.077 [s]

Min: -3.1 [g] at 0.057 [s]

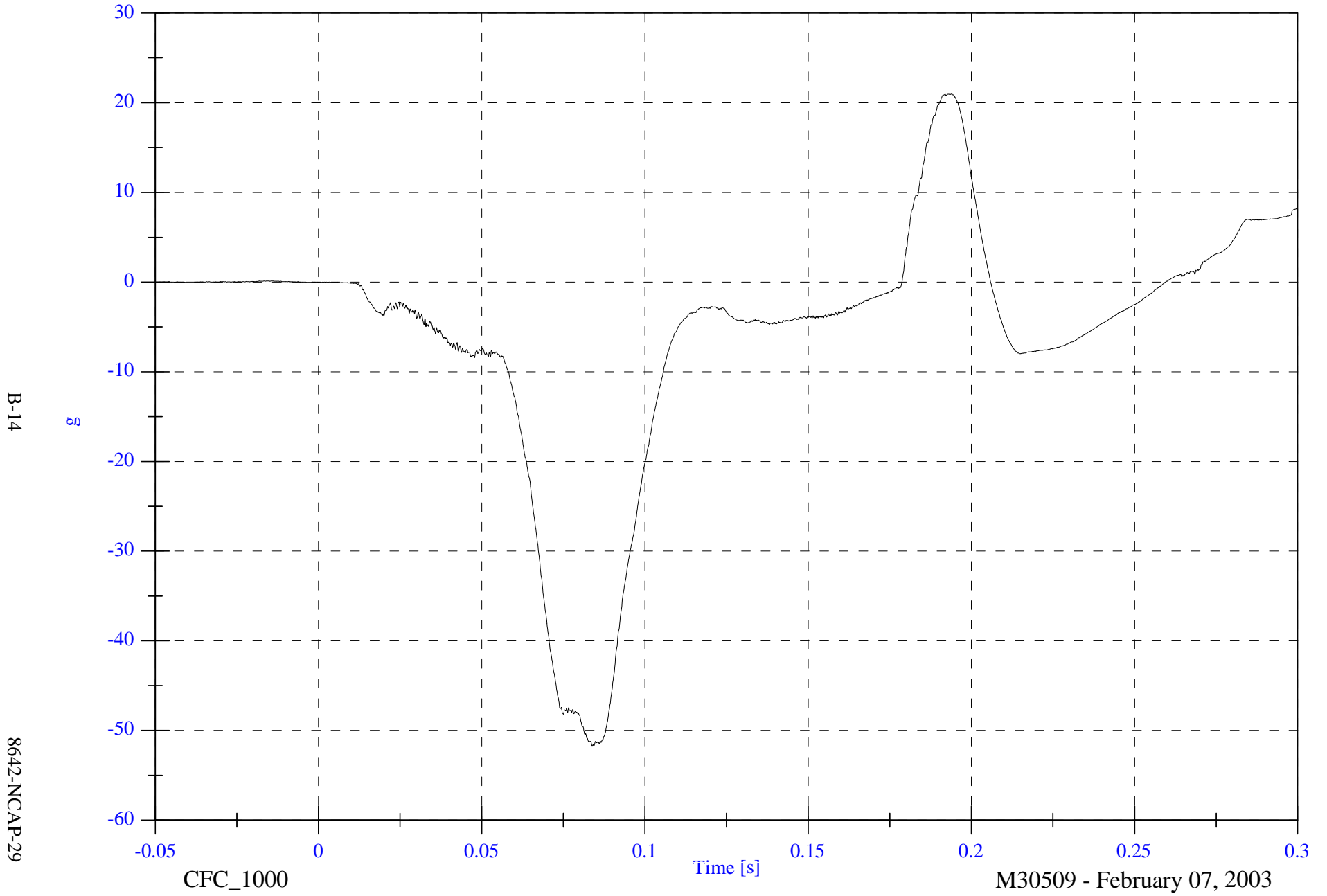


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head CG x

Max: 21.0 [g] at 0.194 [s]

Min: -51.8 [g] at 0.084 [s]



B-14

8642-NCAP-29

CFC_1000

Time [s]

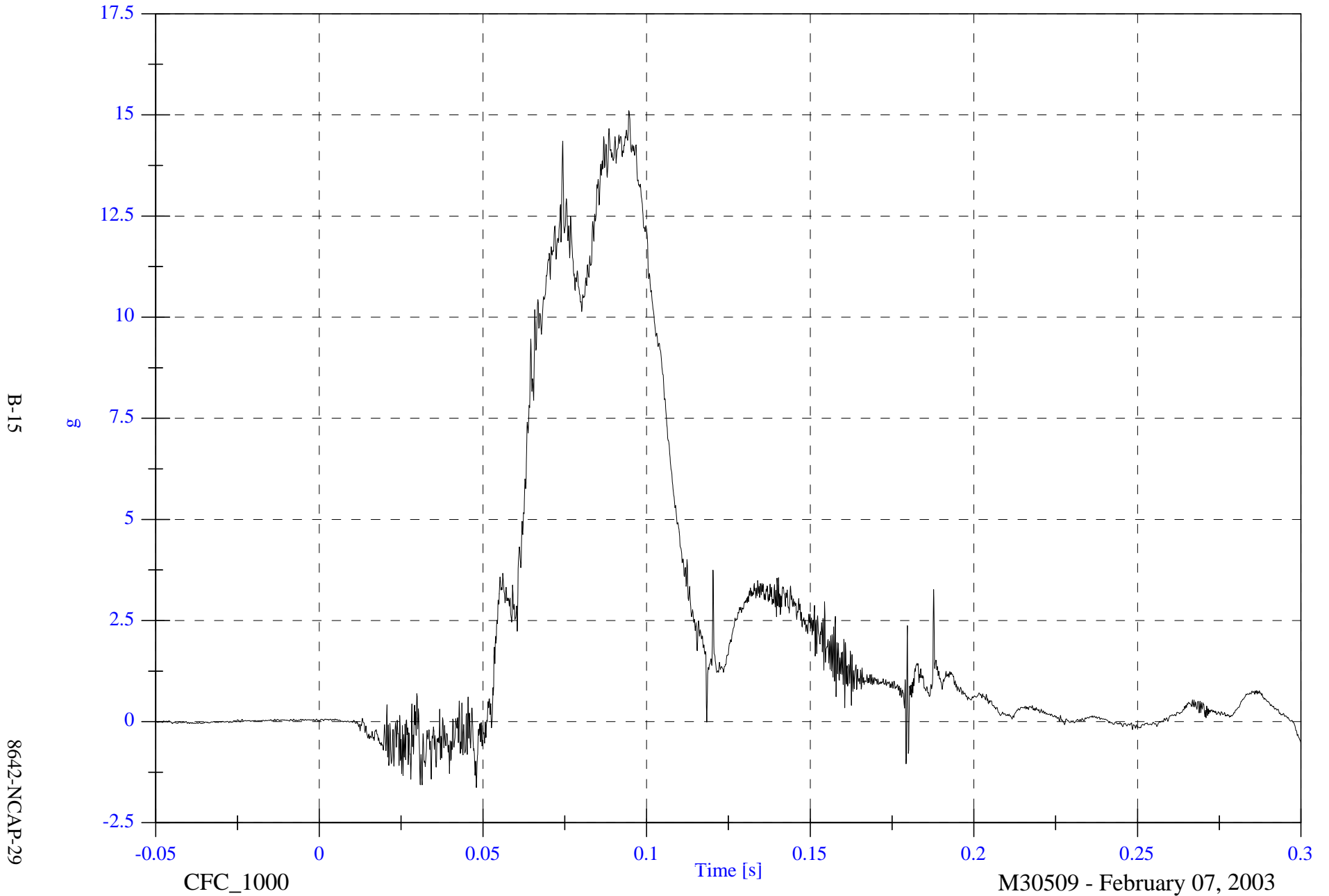
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Head CG y

Max: 15.1 [g] at 0.095 [s]

Min: -1.6 [g] at 0.048 [s]

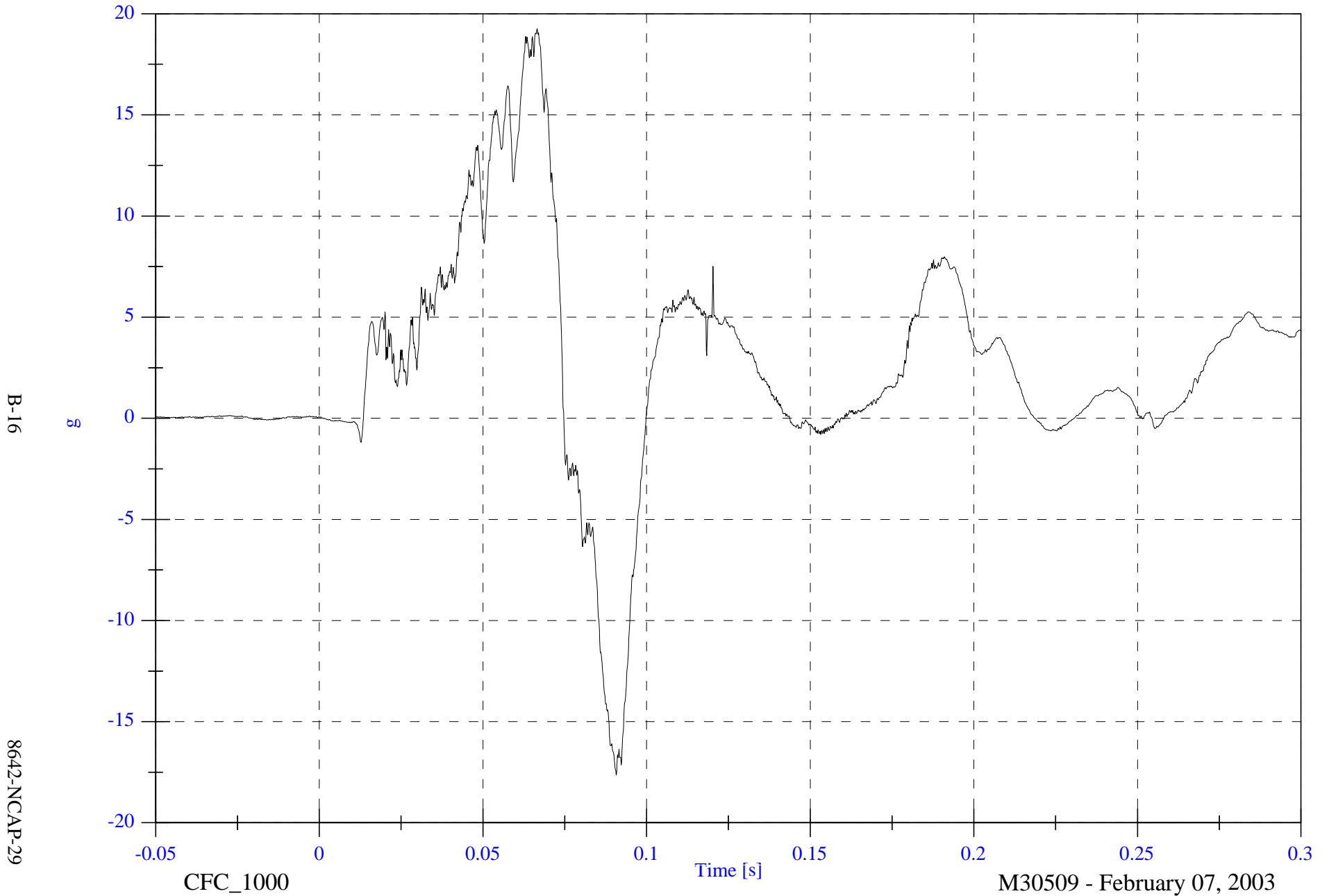


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head CG z

Max: 19.3 [g] at 0.067 [s]

Min: -17.6 [g] at 0.091 [s]



NCAP Test #7 - 2003 Mercedes E320

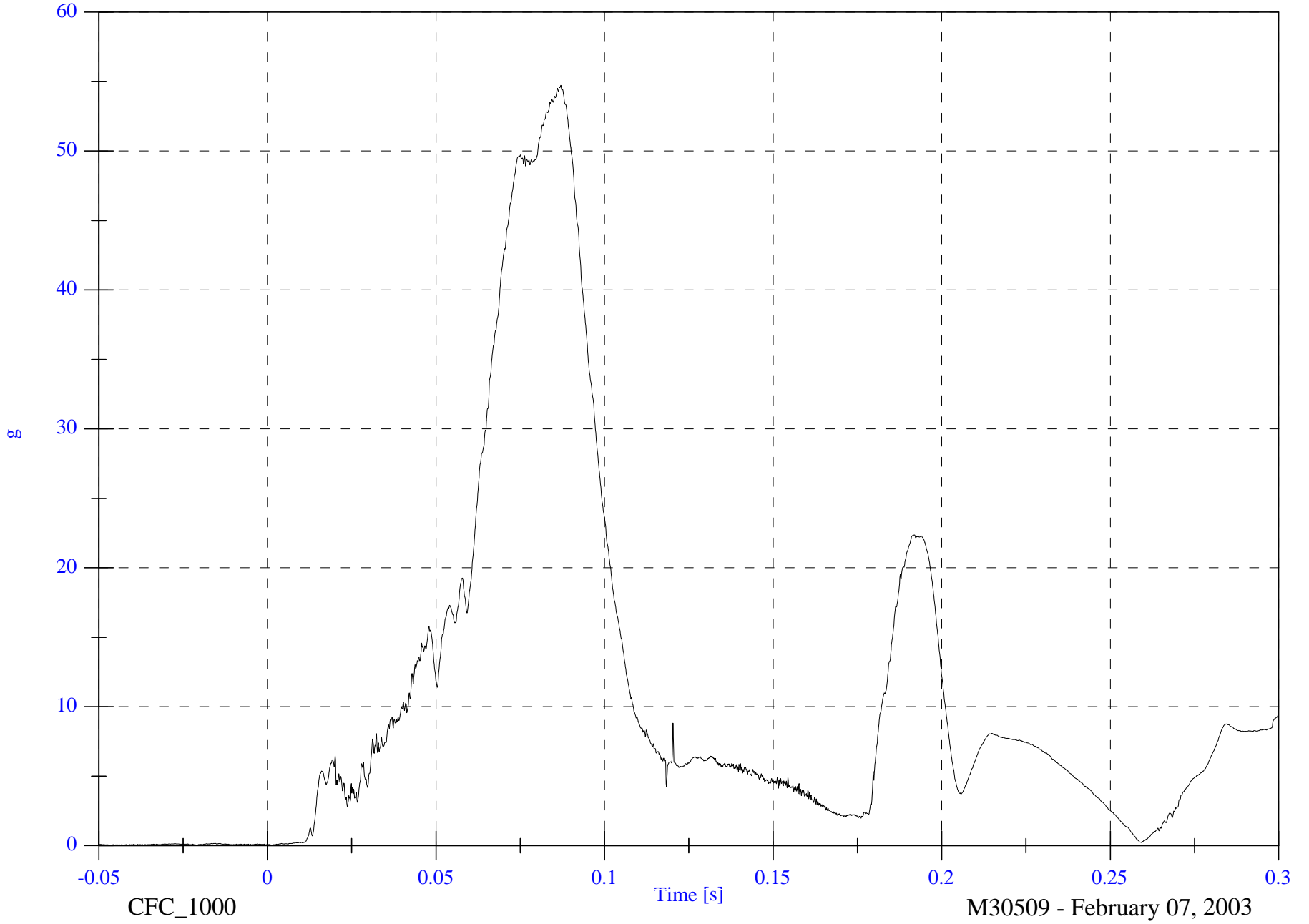
V1P1 Head CG Resultant

Max: 54.7 [g] at 0.087 [s]

Min: 0.0 [g] at -0.045 [s]

B-17

8642-NCAP-29



CFC_1000

Time [s]

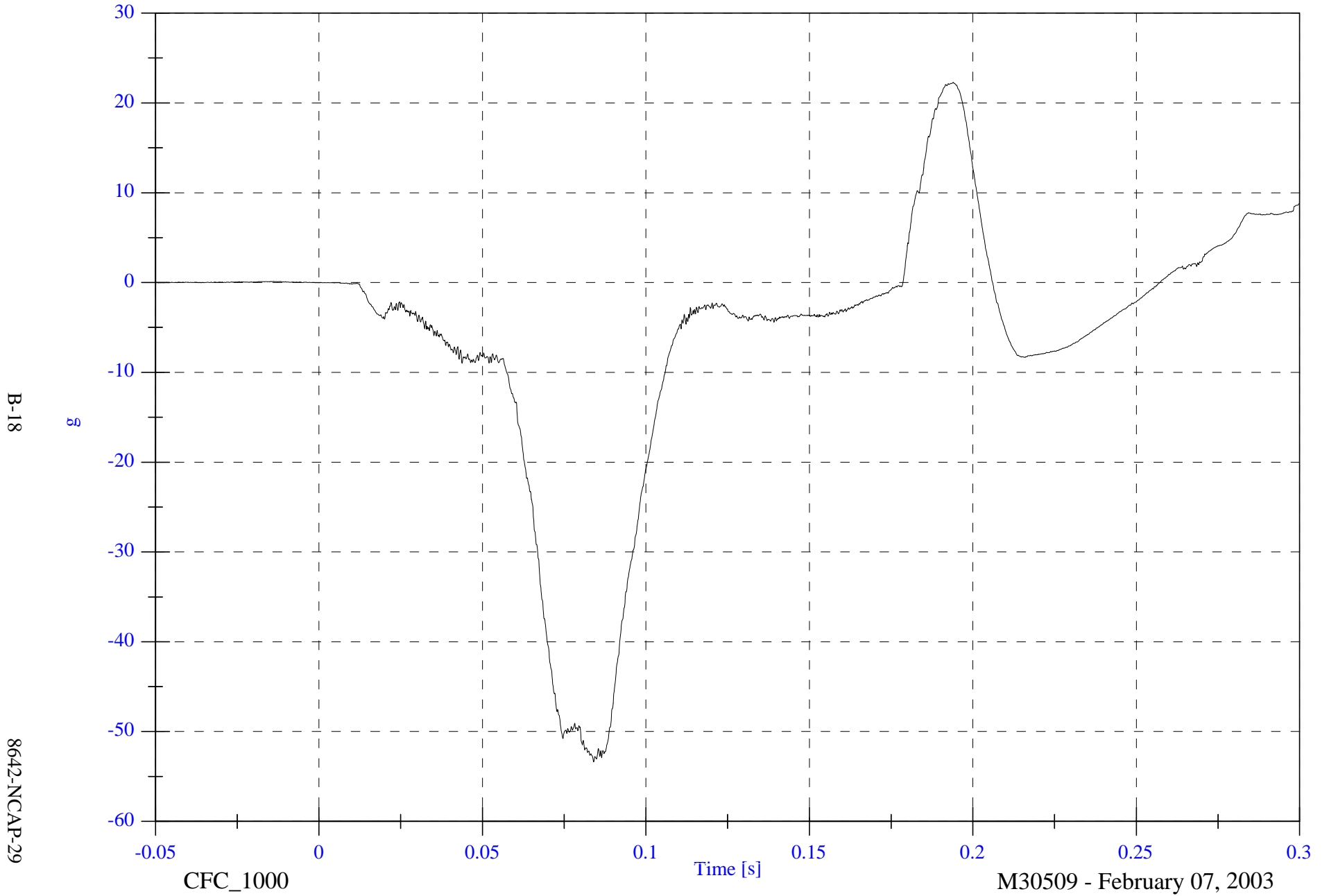
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Head CG Red x

Max: 22.3 [g] at 0.194 [s]

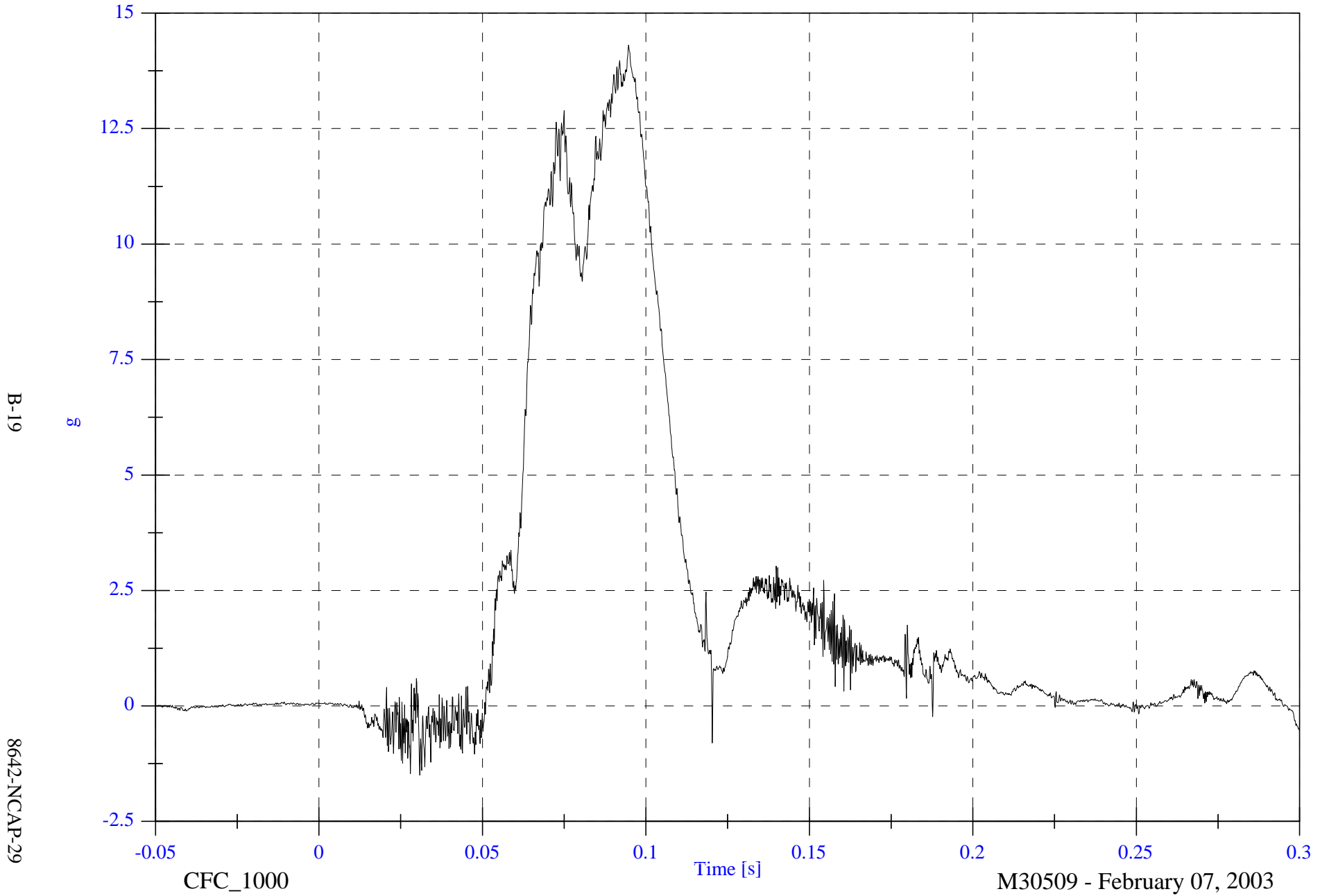
Min: -53.4 [g] at 0.084 [s]



NCAP Test #7 - 2003 Mercedes E320

Max: 14.3 [g] at 0.095 [s]
Min: -1.5 [g] at 0.031 [s]

V1P1 Head CG Red y

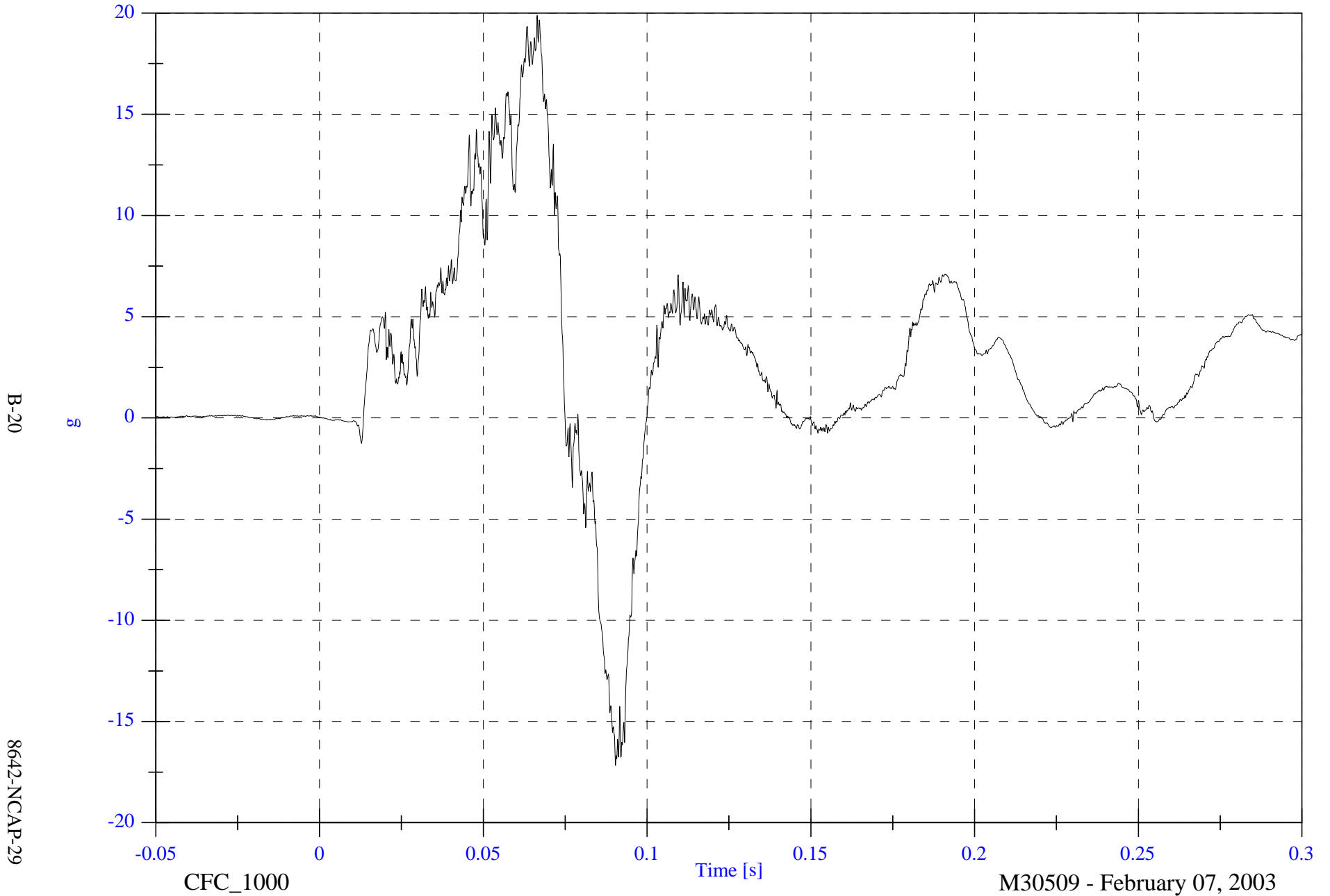


NCAP Test #7 - 2003 Mercedes E320

V1P1 Head CG Red z

Max: 19.9 [g] at 0.067 [s]

Min: -17.2 [g] at 0.090 [s]



B-20

8642-NCAP-29

CFC_1000

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

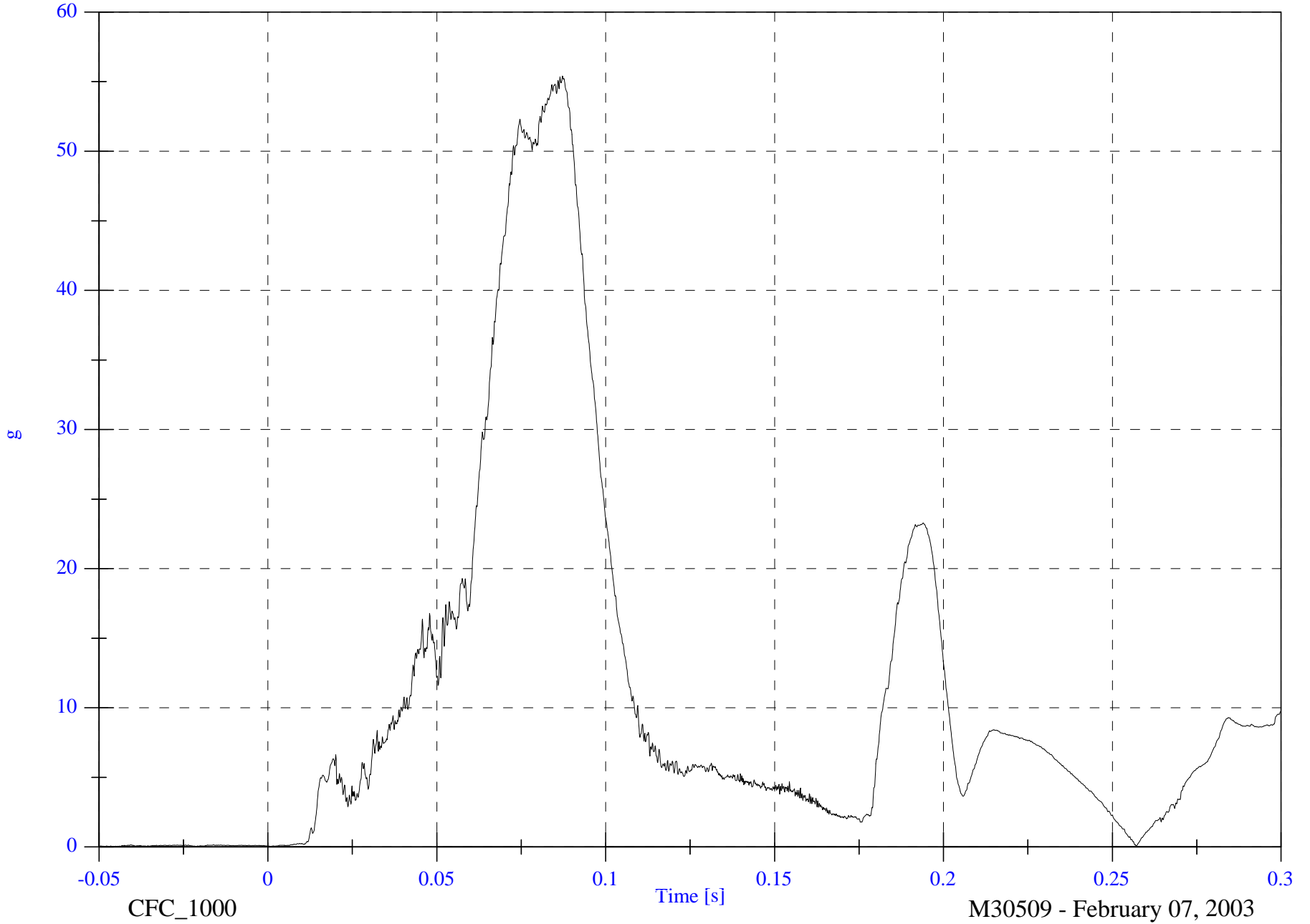
V1P1 Head CG Red Resultant

Max: 55.4 [g] at 0.087 [s]

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

B-21

8642-NCAP-29



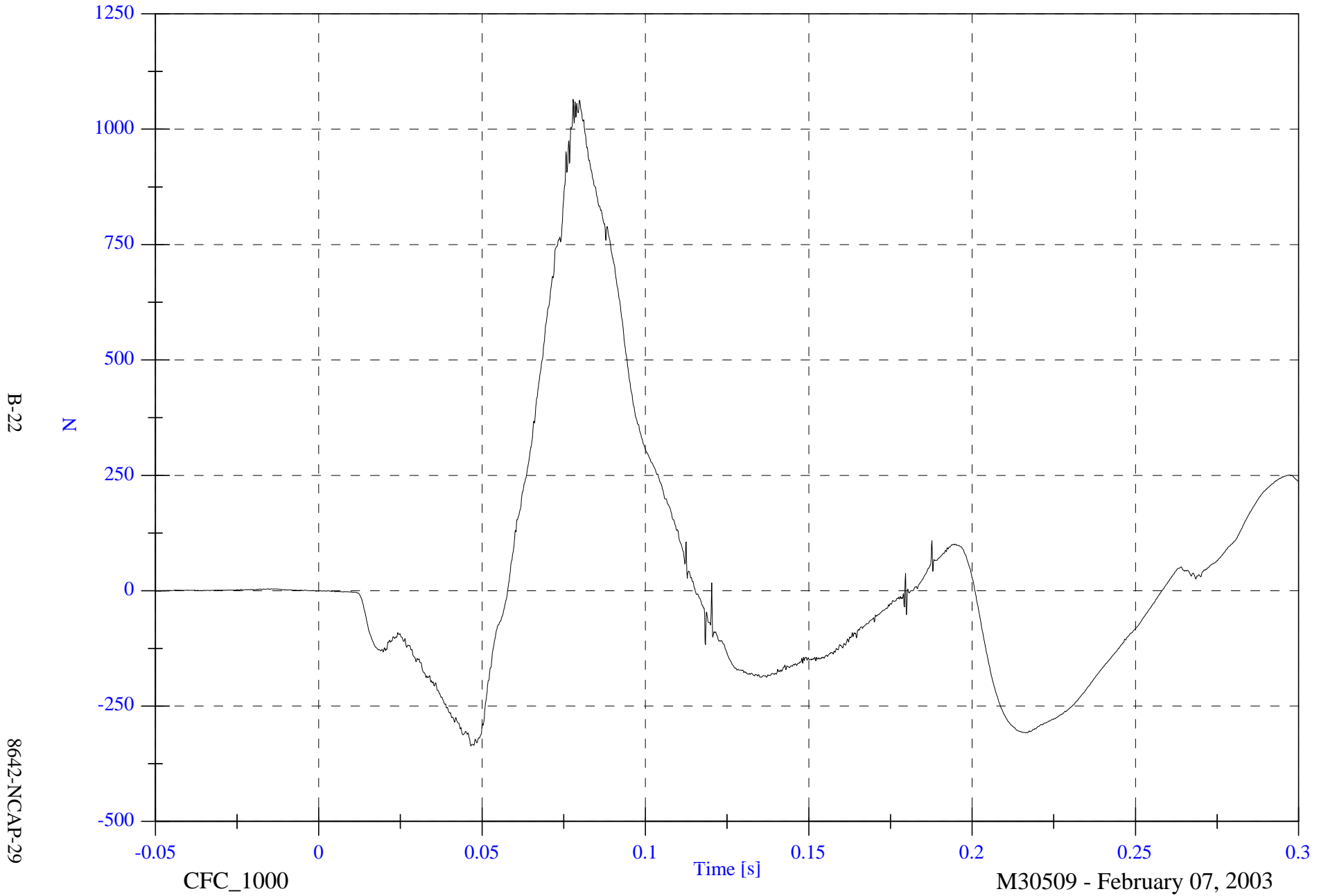
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 1064.6 [N] at 0.078 [s]

Min: -336.3 [N] at 0.047 [s]

V1P1 Upper Neck Fx



B-22

8642-NCAP-29

CFC_1000

Time [s]

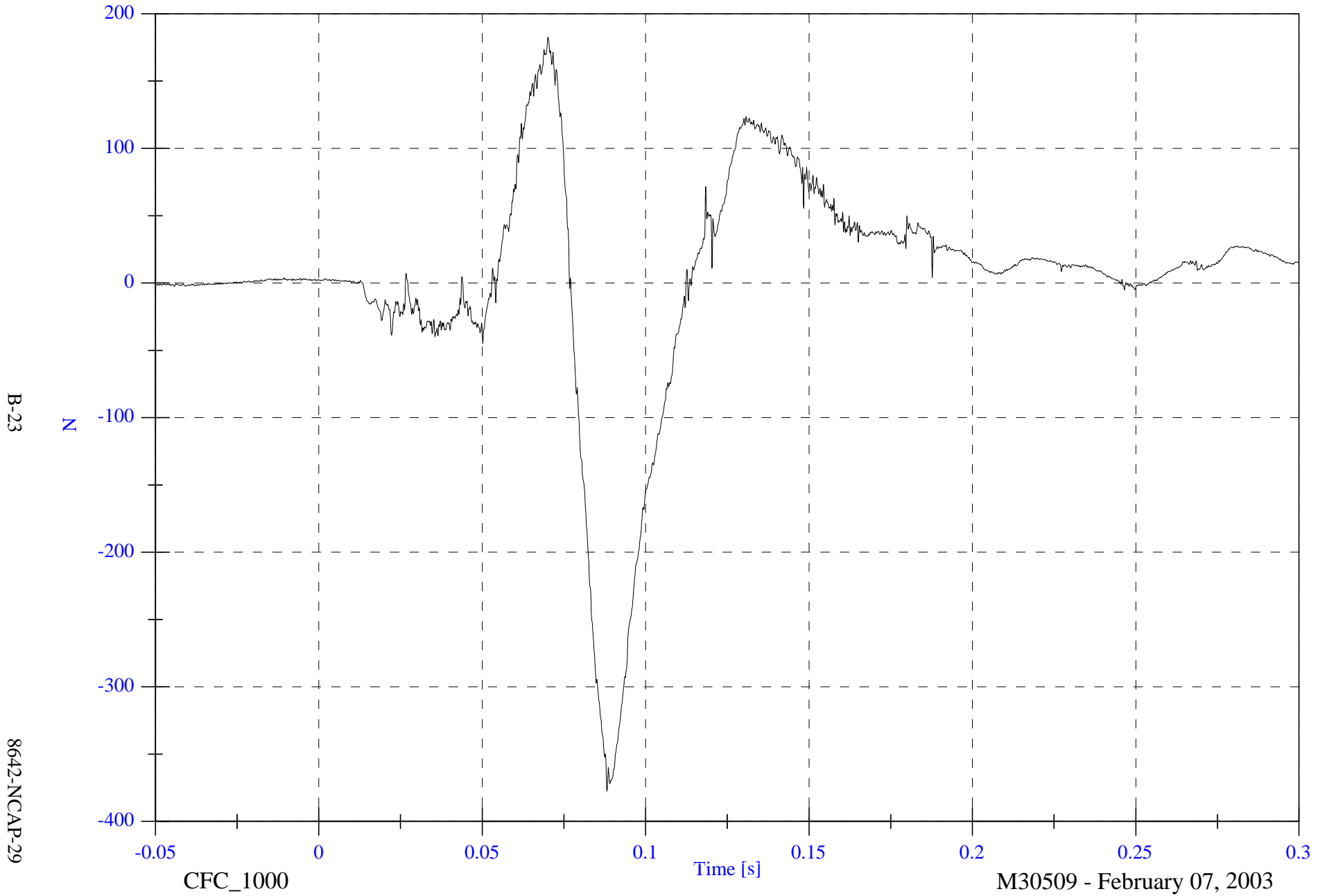
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 182.6 [N] at 0.070 [s]

Min: -377.5 [N] at 0.088 [s]

V1P1 Upper Neck Fy

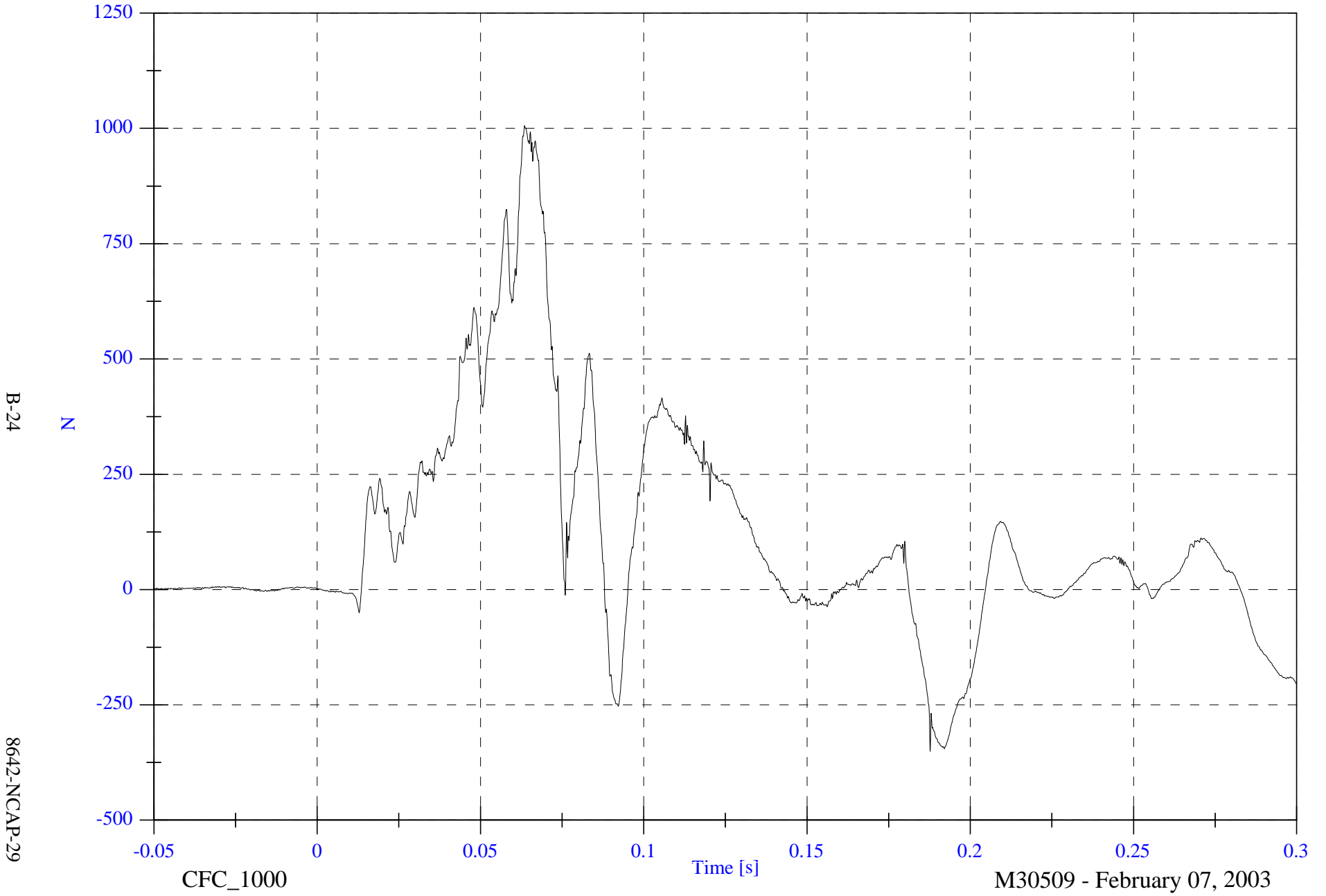


NCAP Test #7 - 2003 Mercedes E320

Max: 1006.1 [N] at 0.063 [s]

V1P1 Upper Neck Fz

Min: -350.9 [N] at 0.188 [s]

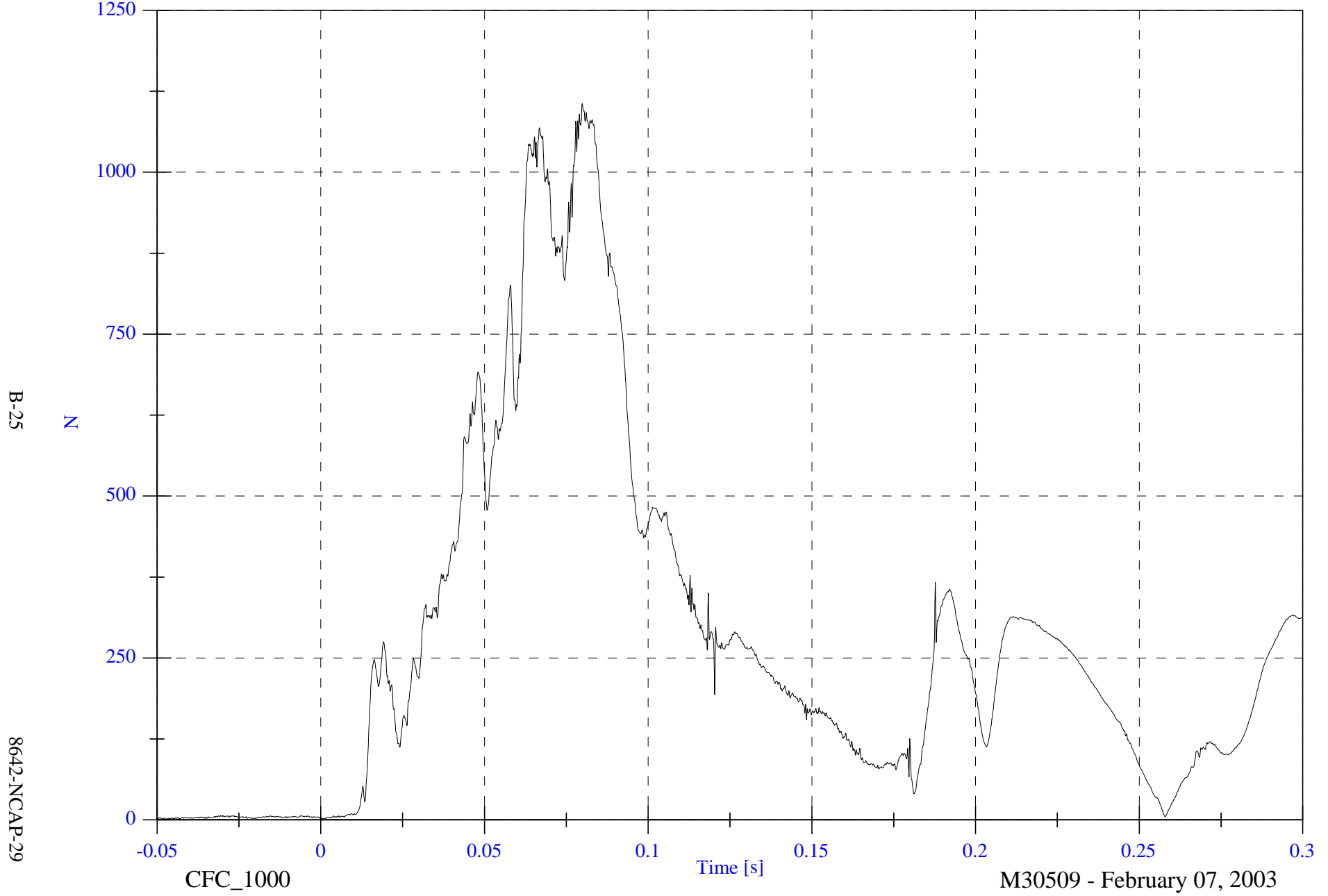


NCAP Test #7 - 2003 Mercedes E320

Max: 1106.0 [N] at 0.080 [s]

V1P1 Upper Neck F Resultant

Min: 1.2 [N] at -0.047 [s]



B-25

8642-NCAP-29

CFC_1000

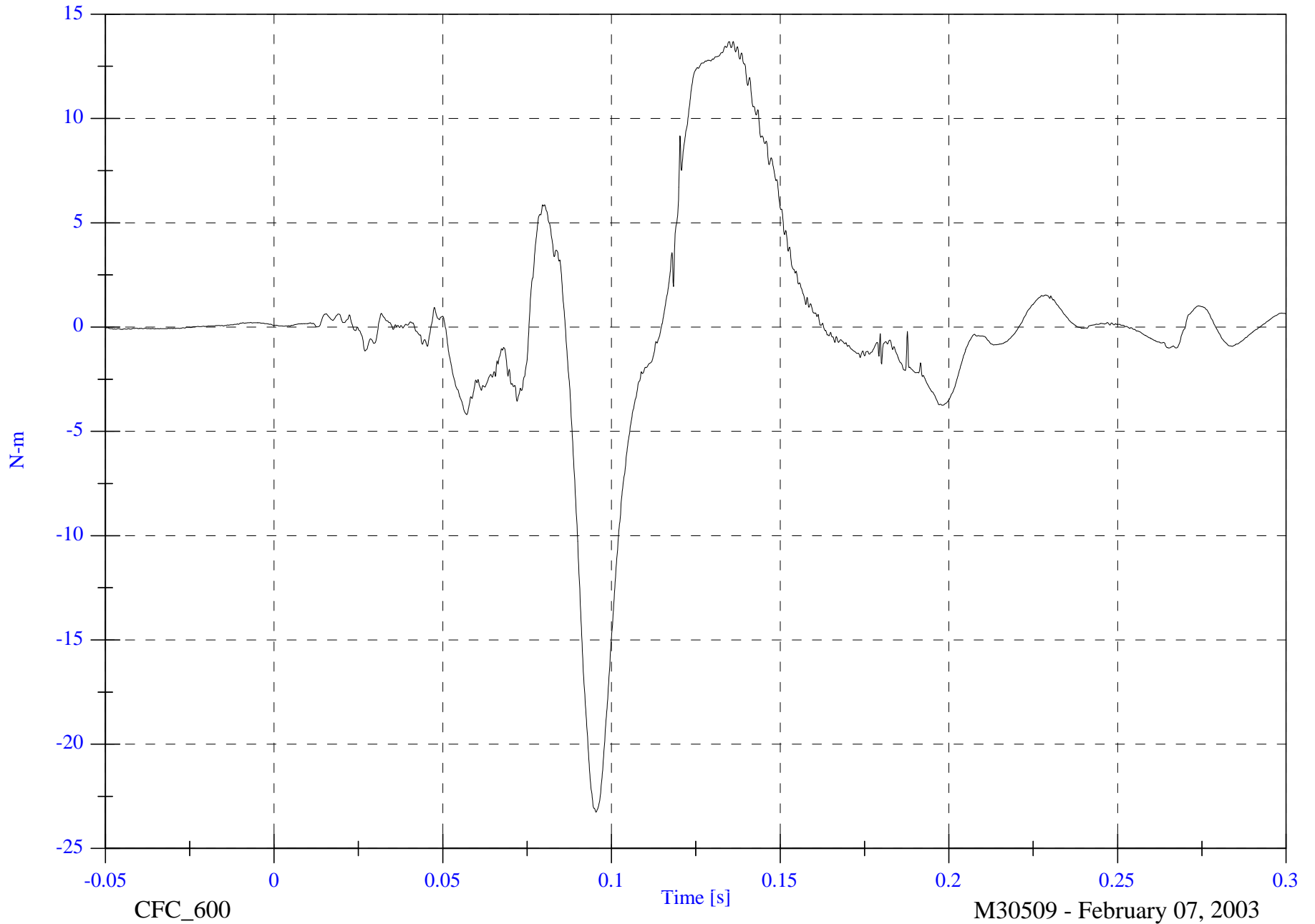
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 13.7 [N-m] at 0.136 [s]

Min: -23.3 [N-m] at 0.095 [s]

V1P1 Upper Neck Mx



B-26

8642-NCAP-29

CFC_600

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

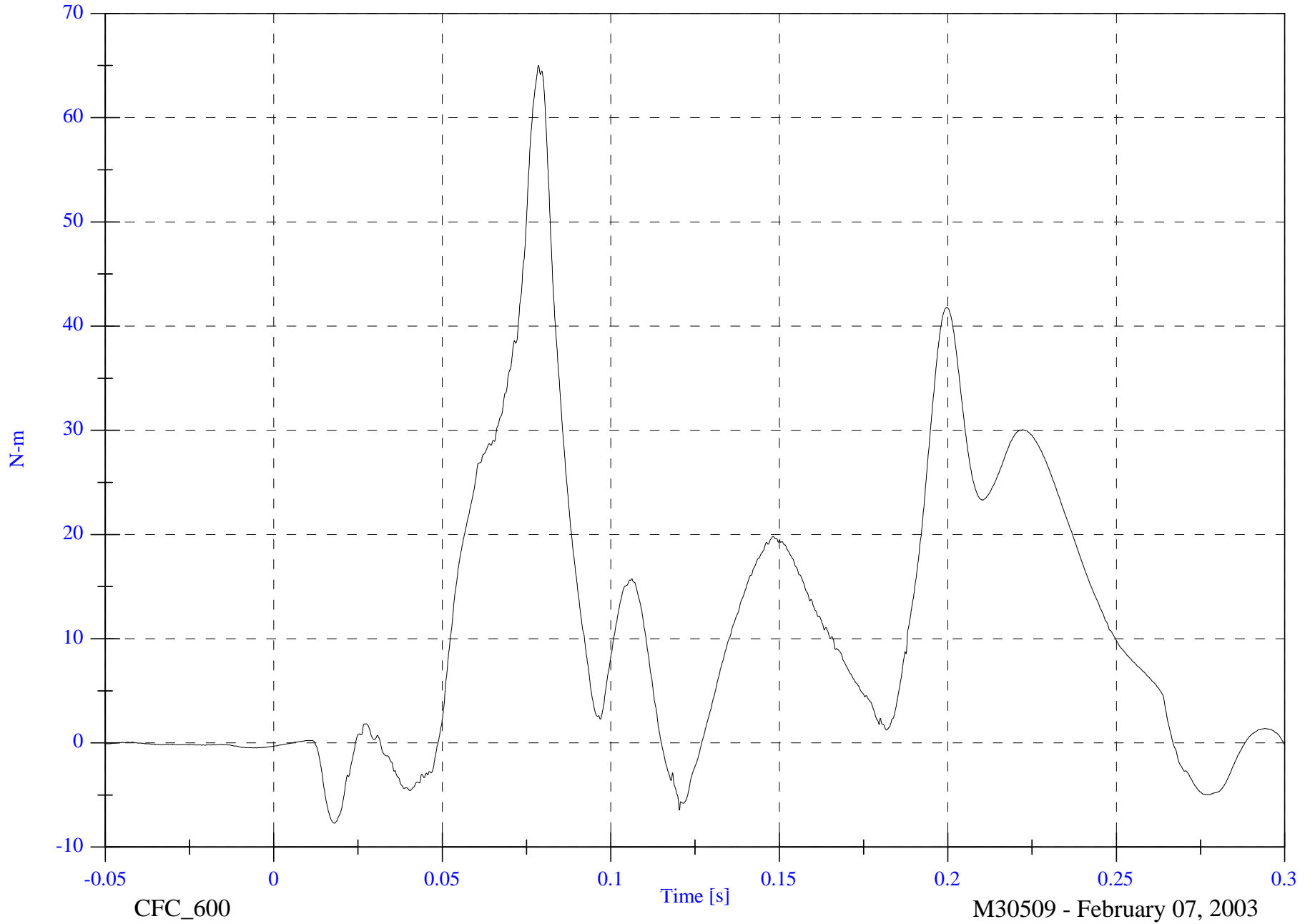
Max: 65.0 [N-m] at 0.079 [s]

Min: -7.7 [N-m] at 0.018 [s]

V1P1 Upper Neck My

B-27

8642-NCAP-29



CFC_600

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

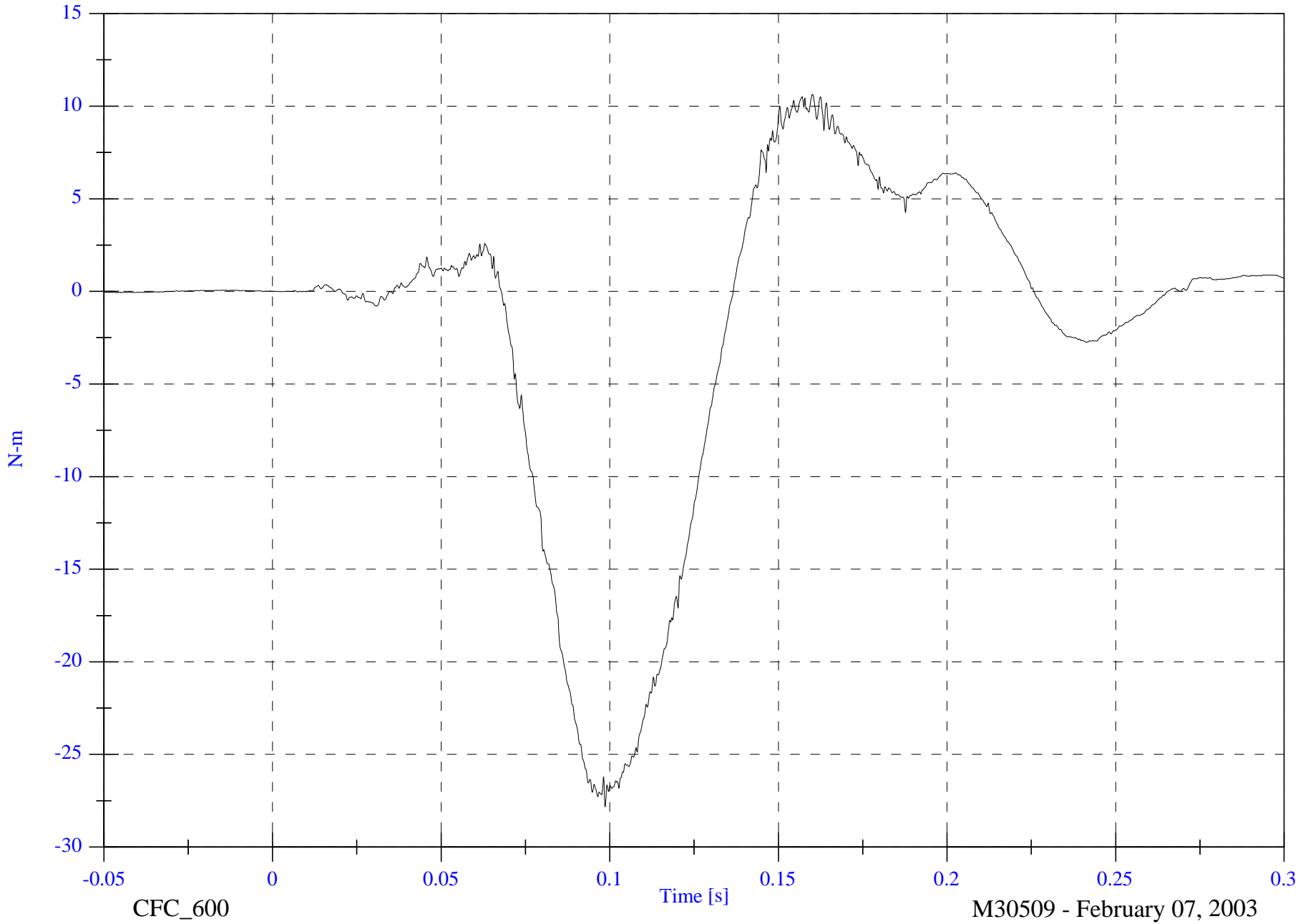
V1P1 Upper Neck Mz

Max: 10.6 [N-m] at 0.160 [s]

Min: -27.8 [N-m] at 0.099 [s]

B-28

8642-NCAP-29



CFC_600

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

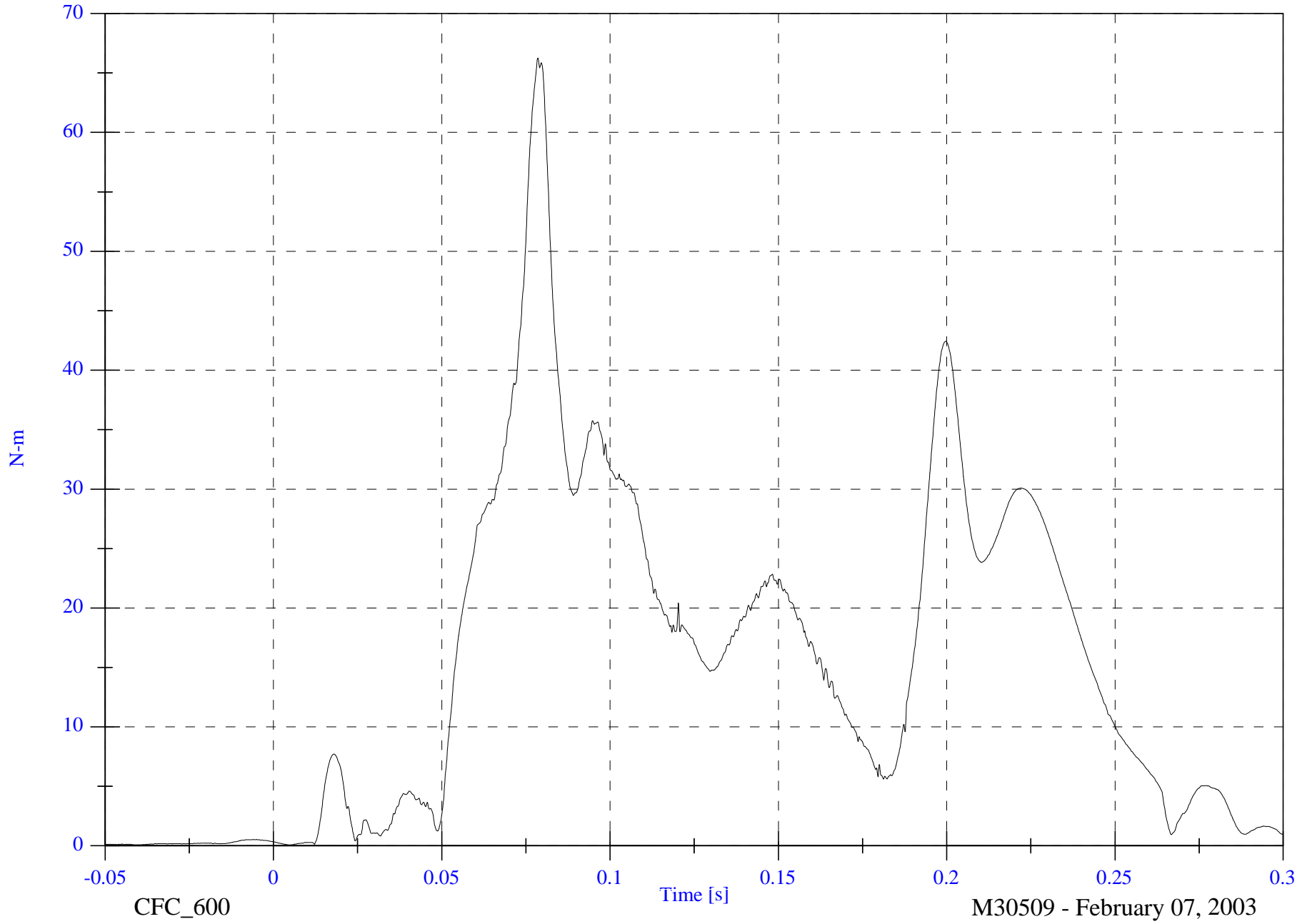
V1P1 Upper Neck M Resultant

Max: 66.3 [N-m] at 0.079 [s]

Min: 0.1 [N-m] at 0.005 [s]

B-29

8642-NCAP-29



CFC_600

Time [s]

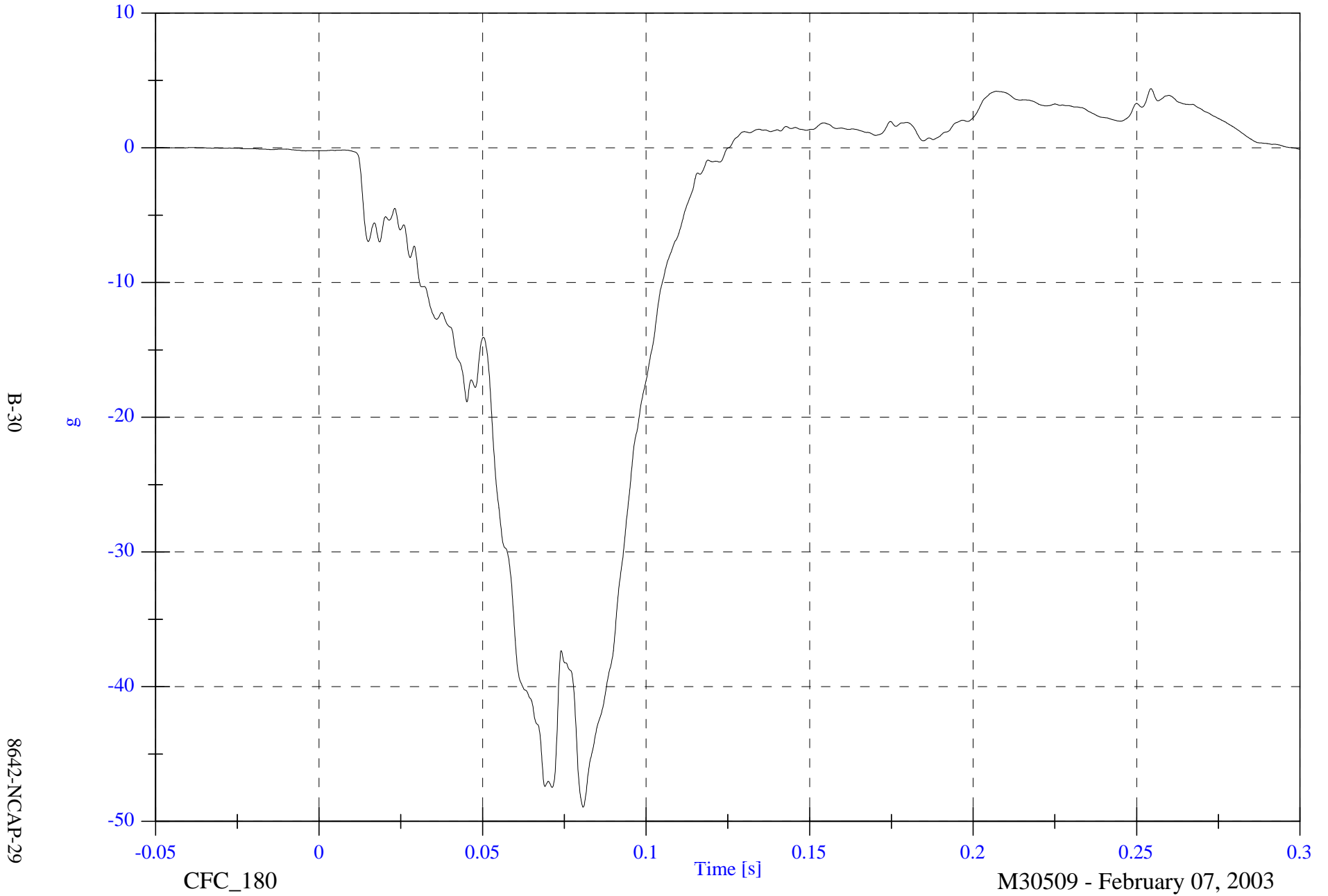
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

VIP1 Chest x

Max: 4.4 [g] at 0.254 [s]

Min: -48.9 [g] at 0.081 [s]

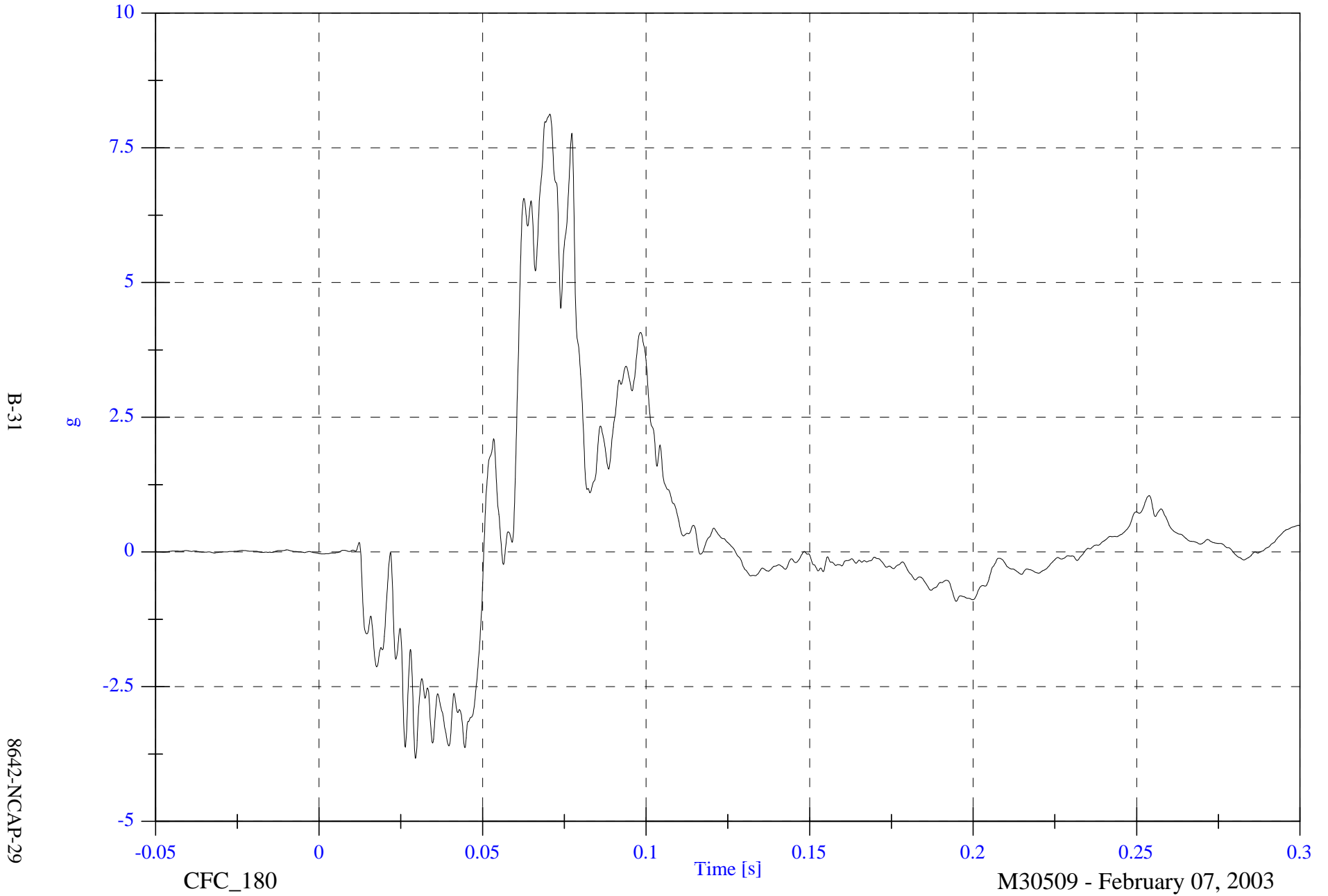


NCAP Test #7 - 2003 Mercedes E320

VIP1 Chest y

Max: 8.1 [g] at 0.071 [s]

Min: -3.8 [g] at 0.029 [s]



NCAP Test #7 - 2003 Mercedes E320

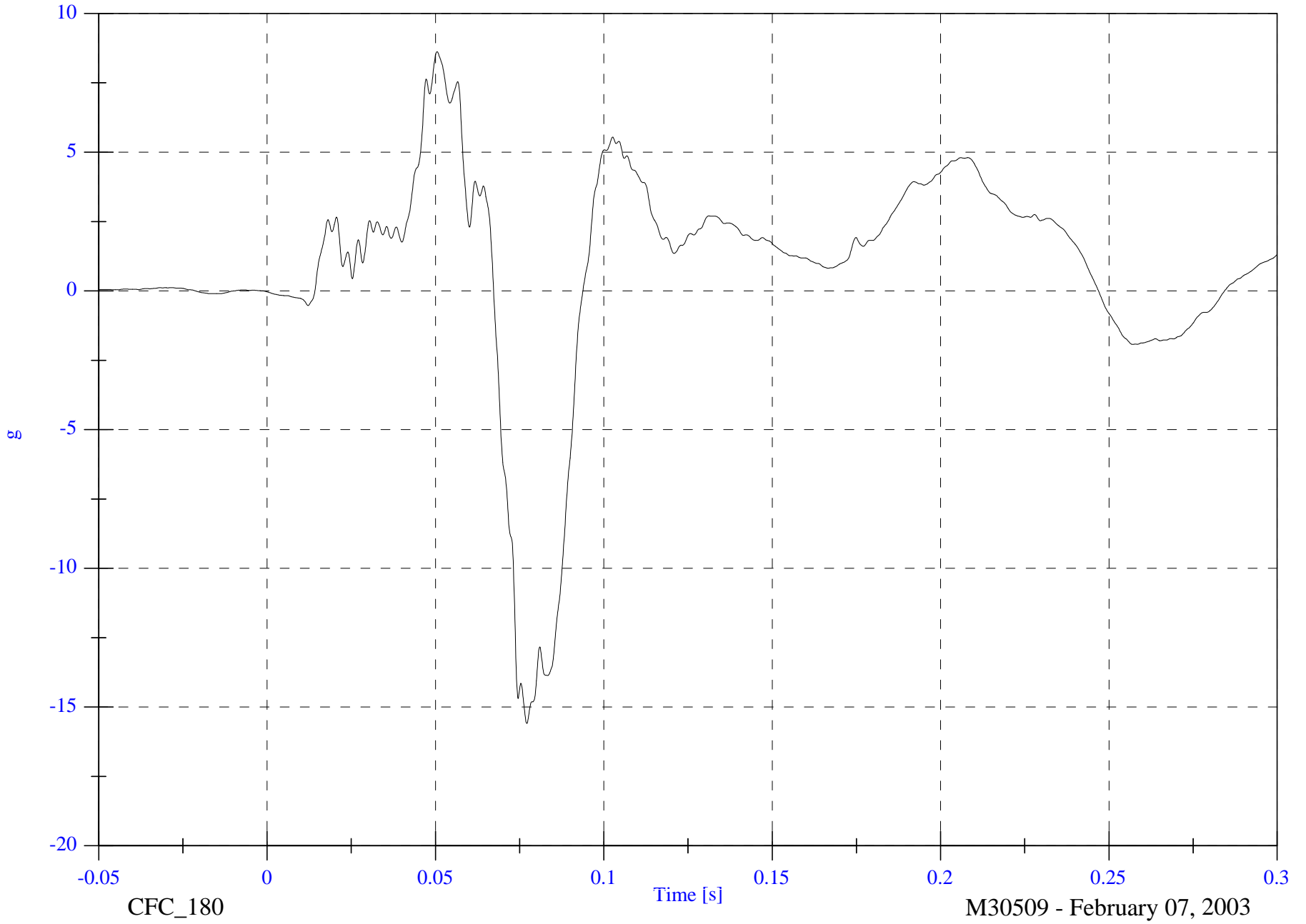
VIP1 Chest z

Max: 8.6 [g] at 0.050 [s]

Min: -15.6 [g] at 0.077 [s]

B-32

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

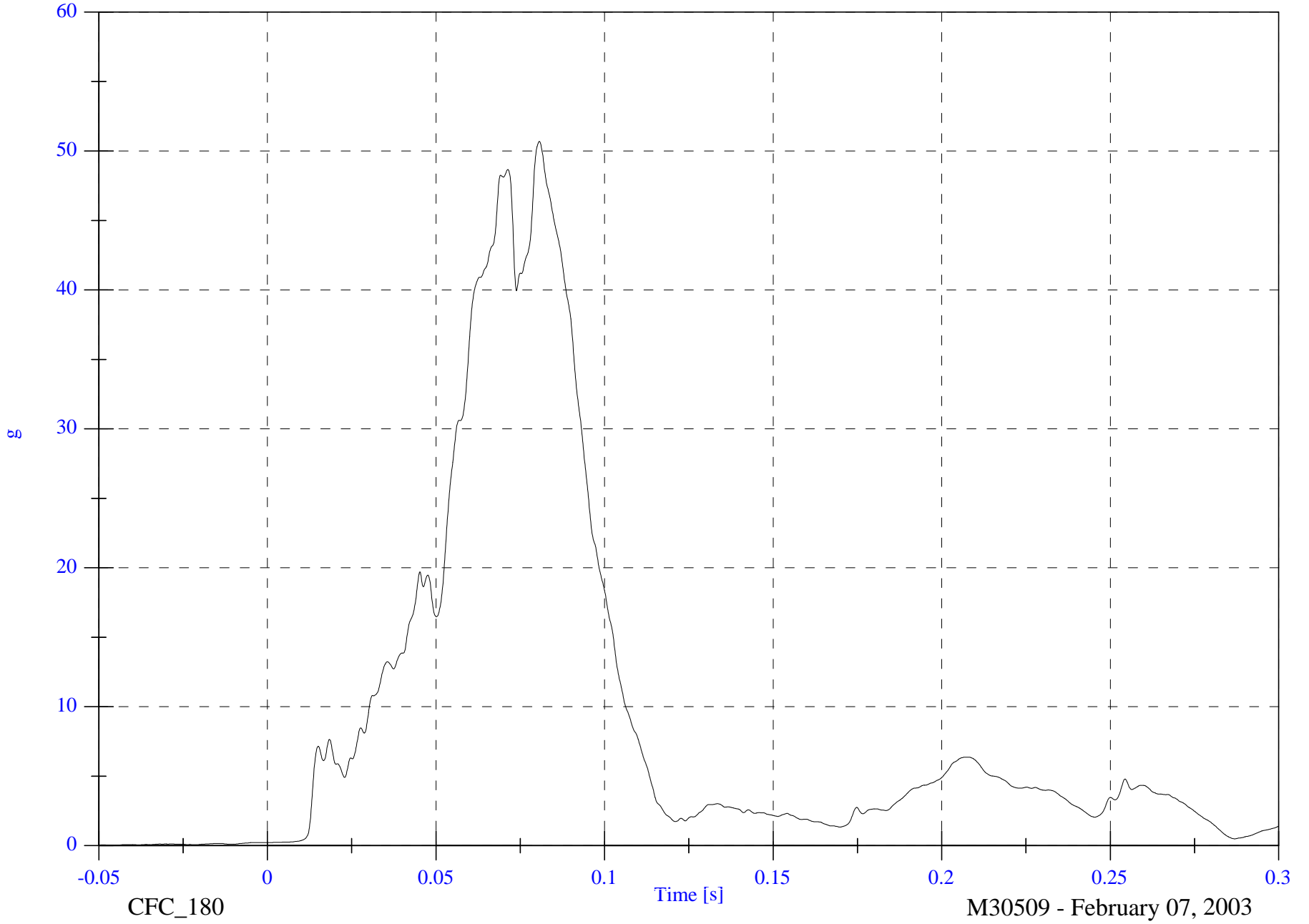
V1P1 Chest Resultant

Max: 50.7 [g] at 0.081 [s]

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

B-33

8642-NCAP-29

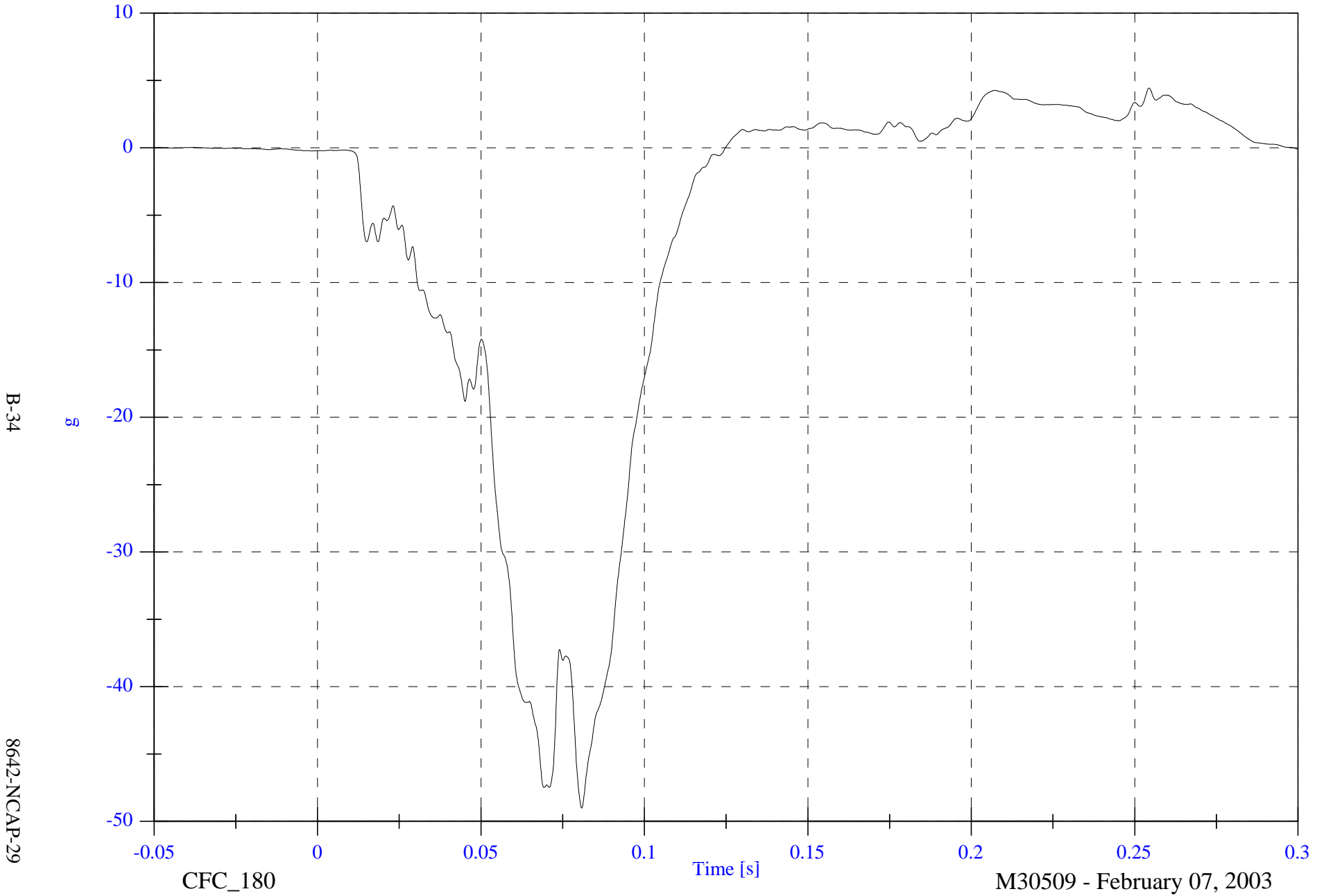


NCAP Test #7 - 2003 Mercedes E320

VIP1 Chest Red x

Max: 4.4 [g] at 0.254 [s]

Min: -49.0 [g] at 0.081 [s]

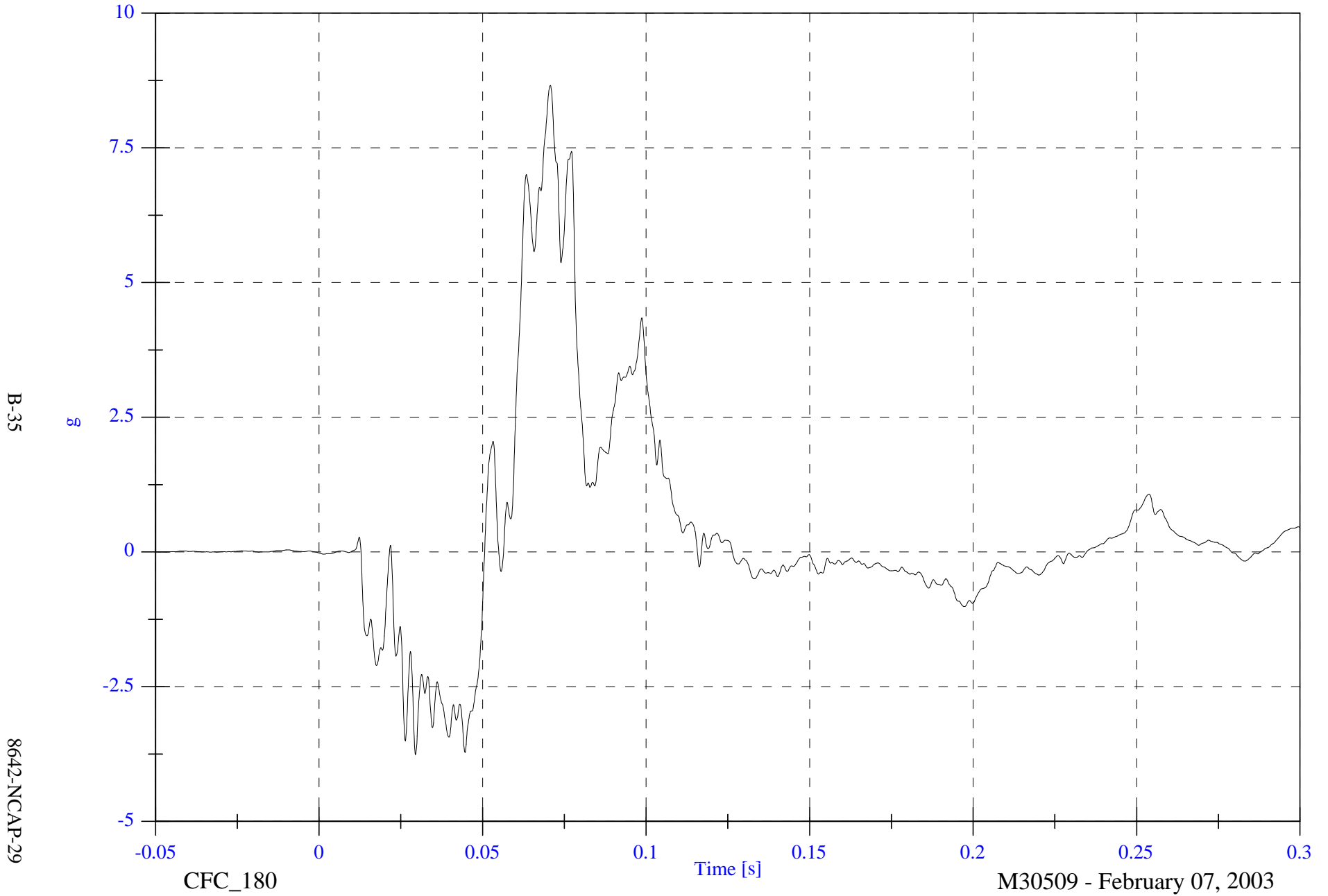


NCAP Test #7 - 2003 Mercedes E320

VIP1 Chest Red y

Max: 8.7 [g] at 0.071 [s]

Min: -3.8 [g] at 0.029 [s]

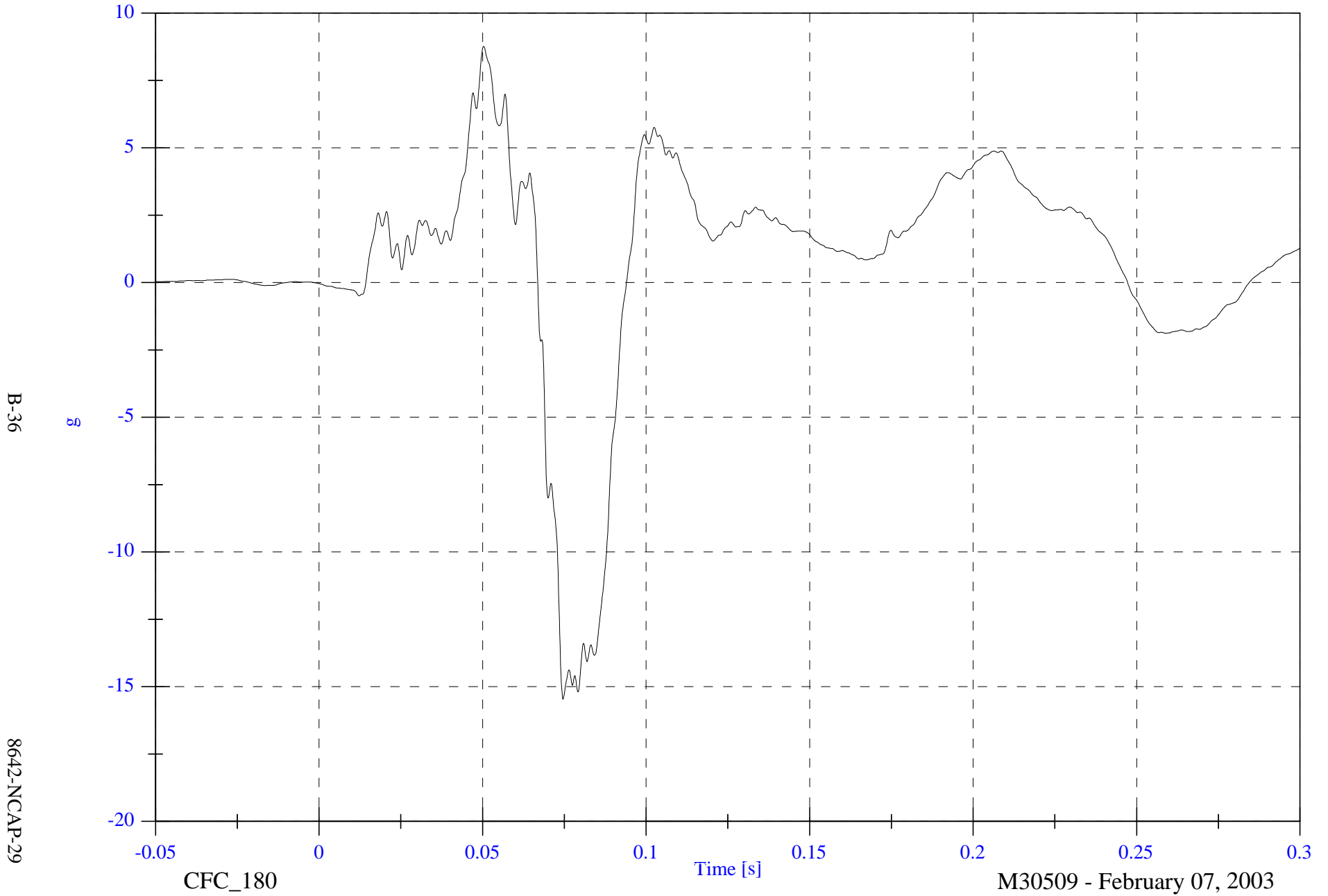


NCAP Test #7 - 2003 Mercedes E320

VIP1 Chest Red z

Max: 8.8 [g] at 0.050 [s]

Min: -15.5 [g] at 0.075 [s]



NCAP Test #7 - 2003 Mercedes E320

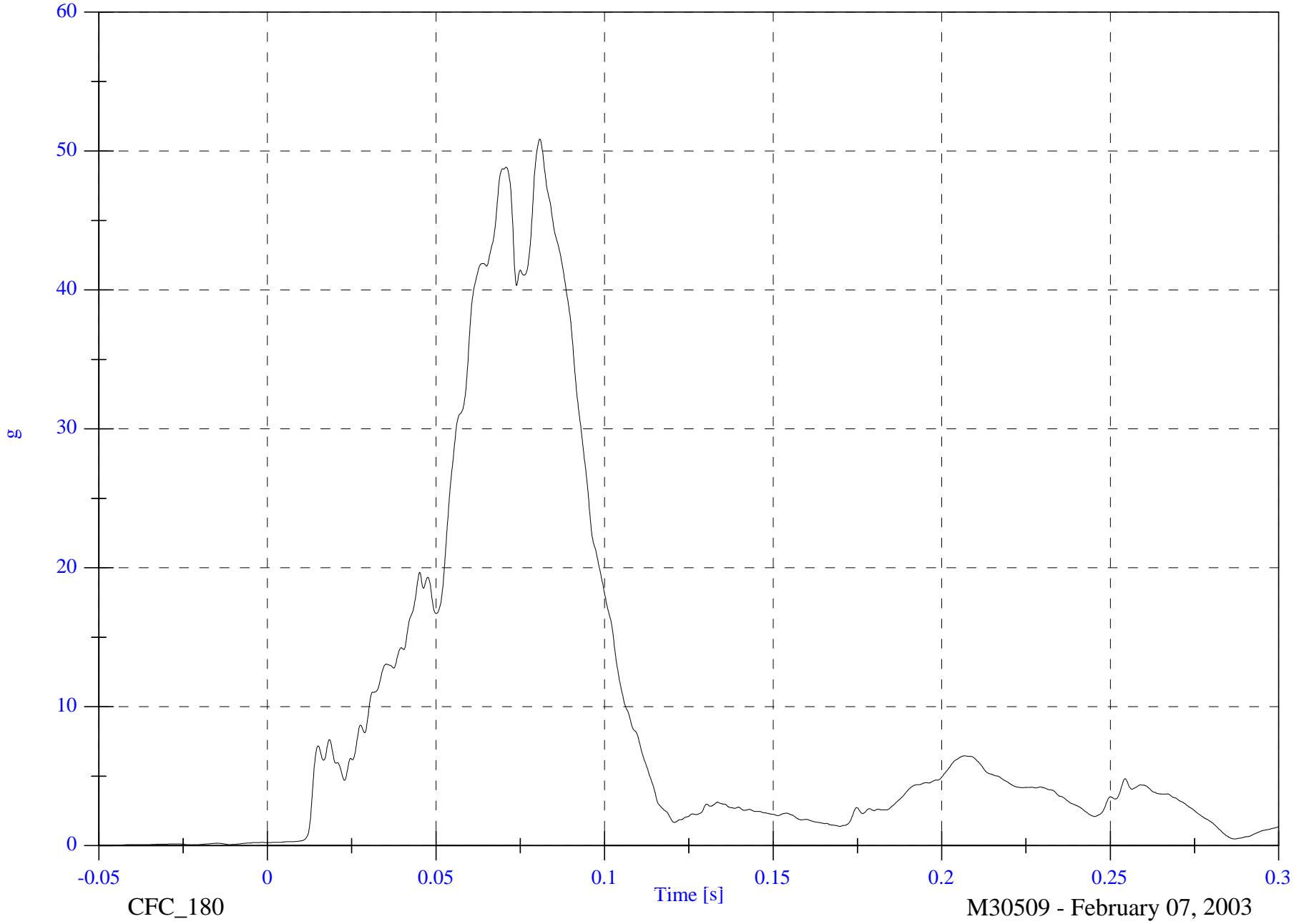
V1P1 Chest Red Resultant

Max: 50.9 [g] at 0.081 [s]

Min: 0.0 [g] at -0.048 [s]

B-37

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

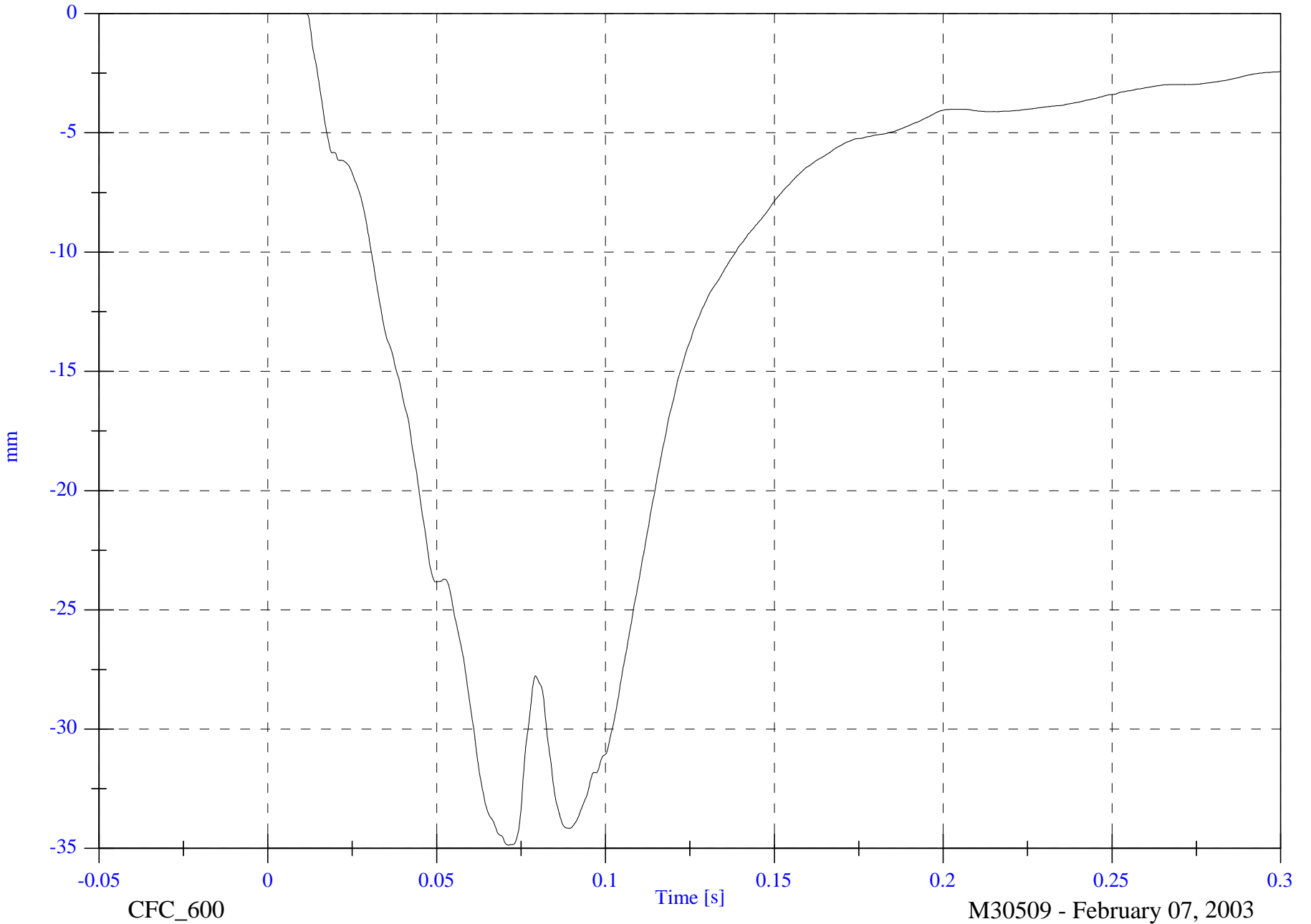
VIP1 Chest Compression x

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

Min: -34.9 [mm] at 0.071 [s]

B-38

8642-NCAP-29

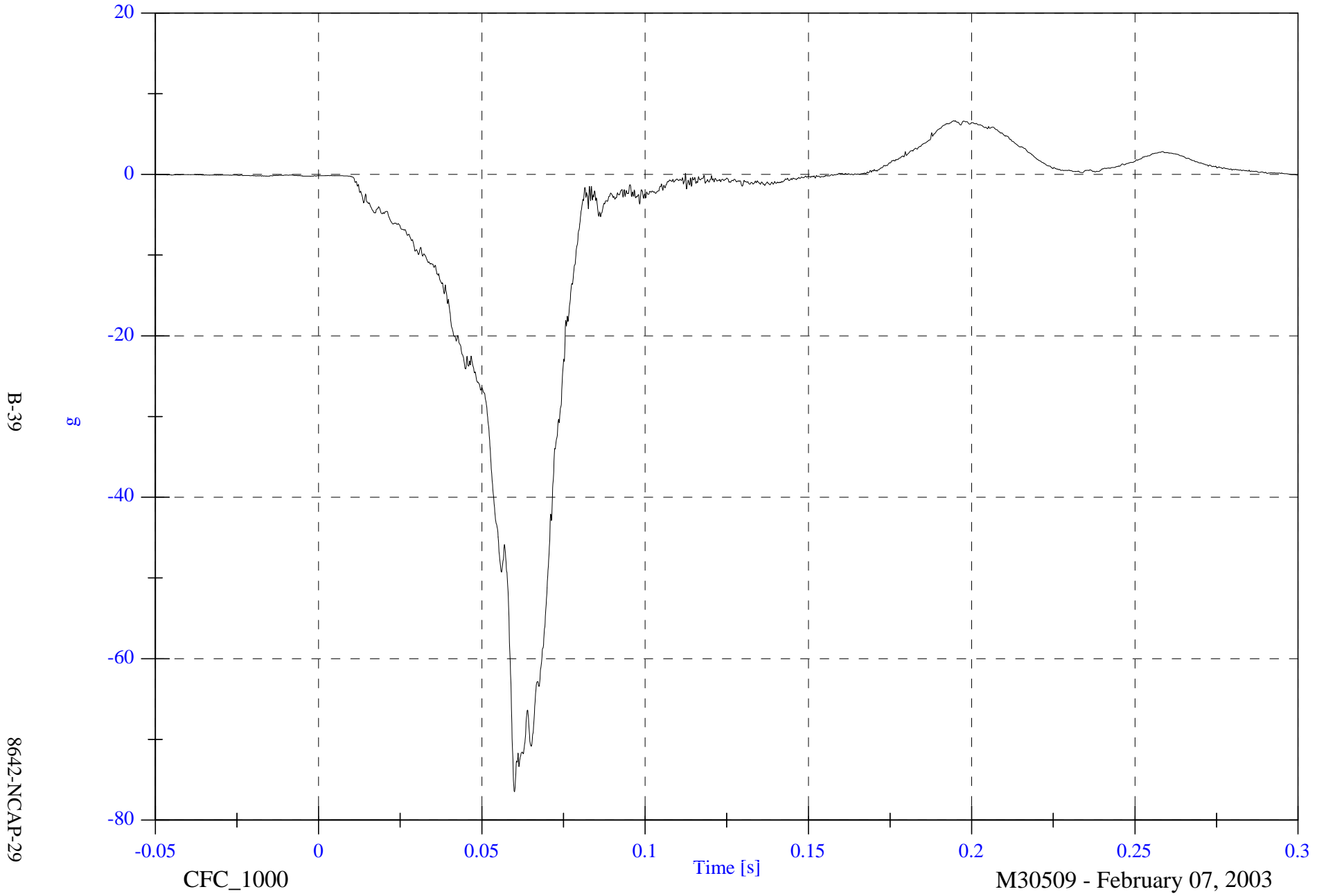


NCAP Test #7 - 2003 Mercedes E320

V1P1 Pelvic x

Max: 6.6 [g] at 0.194 [s]

Min: -76.5 [g] at 0.060 [s]

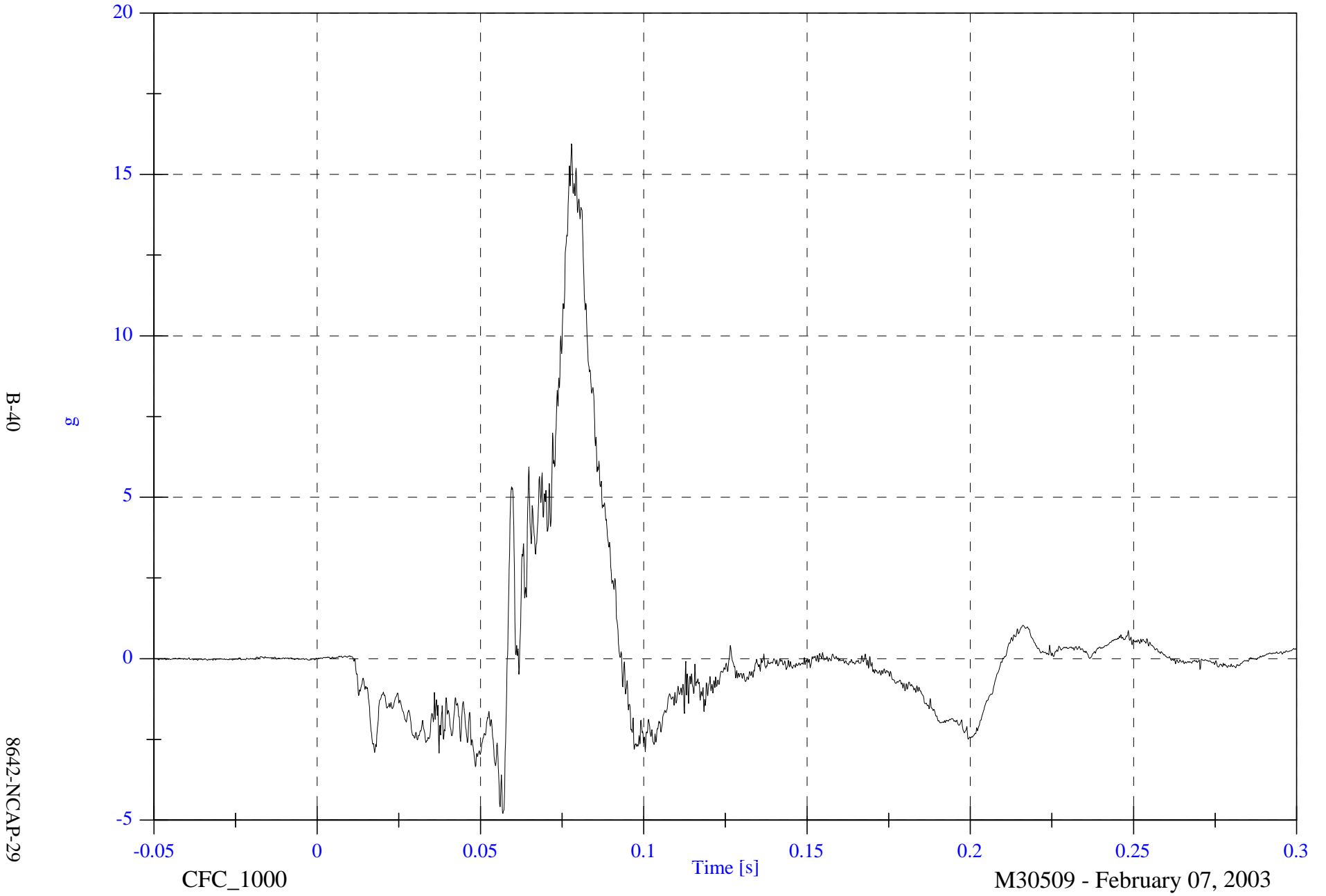


NCAP Test #7 - 2003 Mercedes E320

V1P1 Pelvic y

Max: 15.9 [g] at 0.078 [s]

Min: -4.8 [g] at 0.057 [s]

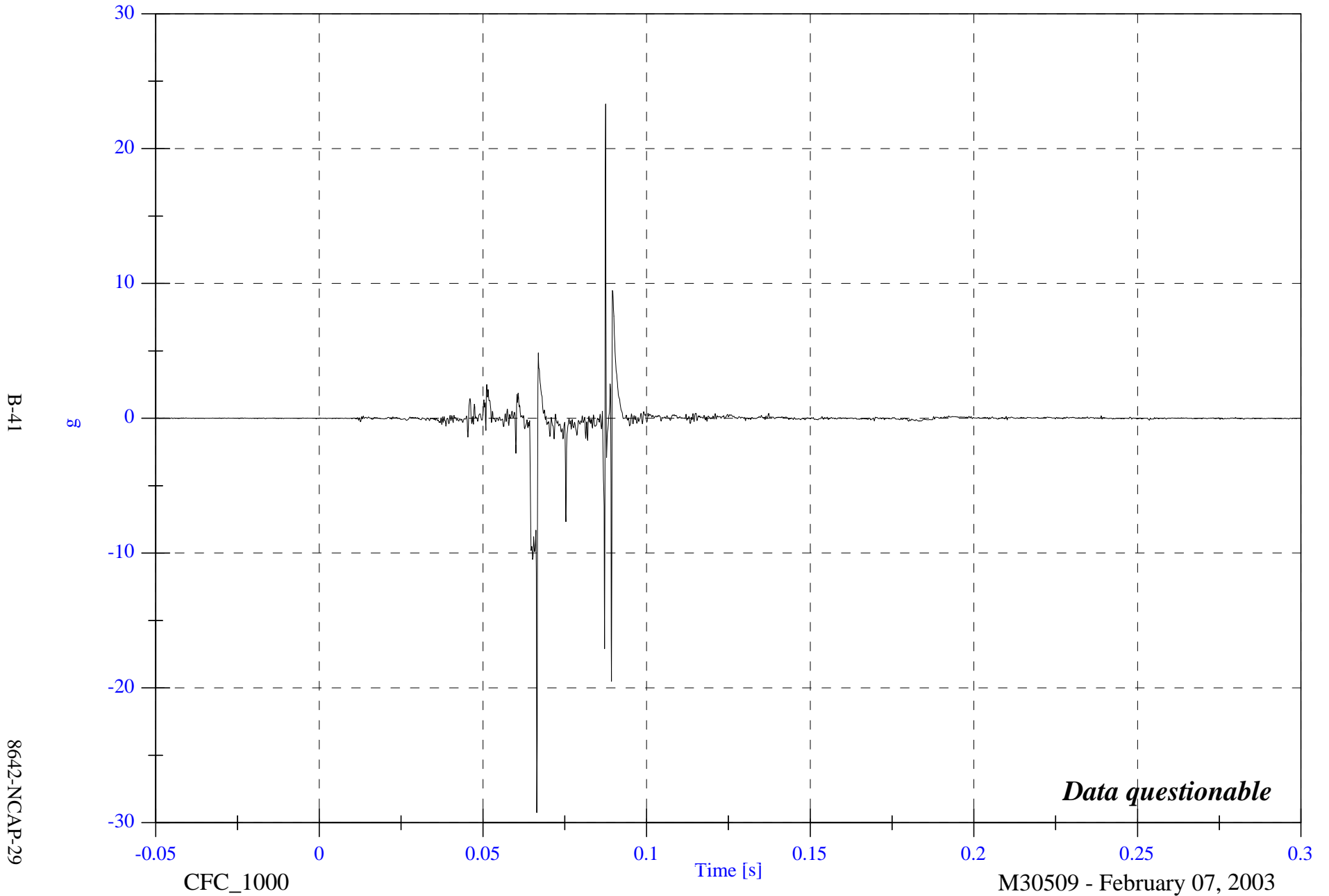


NCAP Test #7 - 2003 Mercedes E320

Max: 23.3 [g] at 0.087 [s]

Min: -29.3 [g] at 0.067 [s]

V1P1 Pelvic z



B-41

8642-NCAP-29

CFC_1000

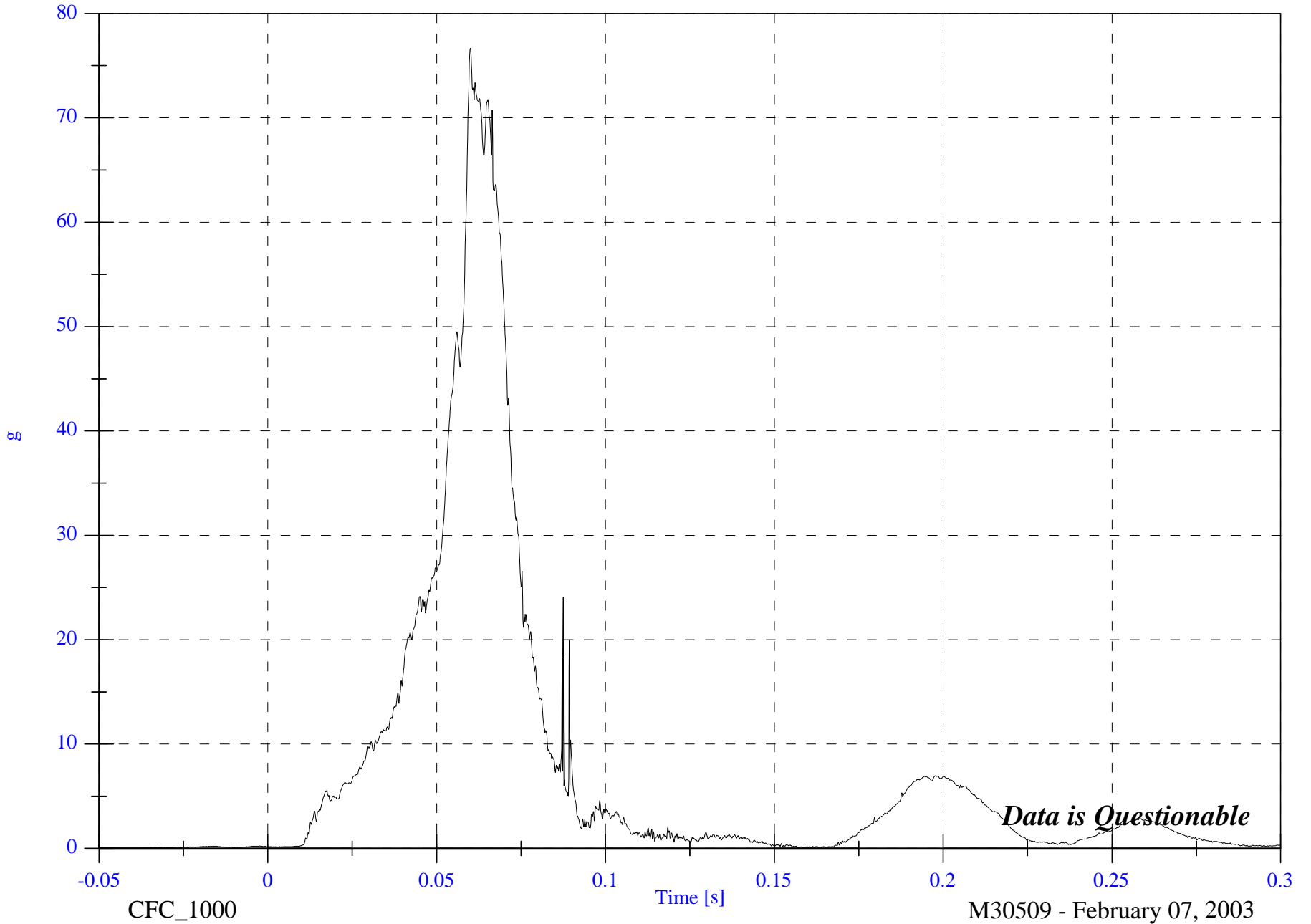
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Pelvic Resultant

Max: 76.7 [g] at 0.060 [s]

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



B-42

8642-NCAP-29

CFC_1000

Time [s]

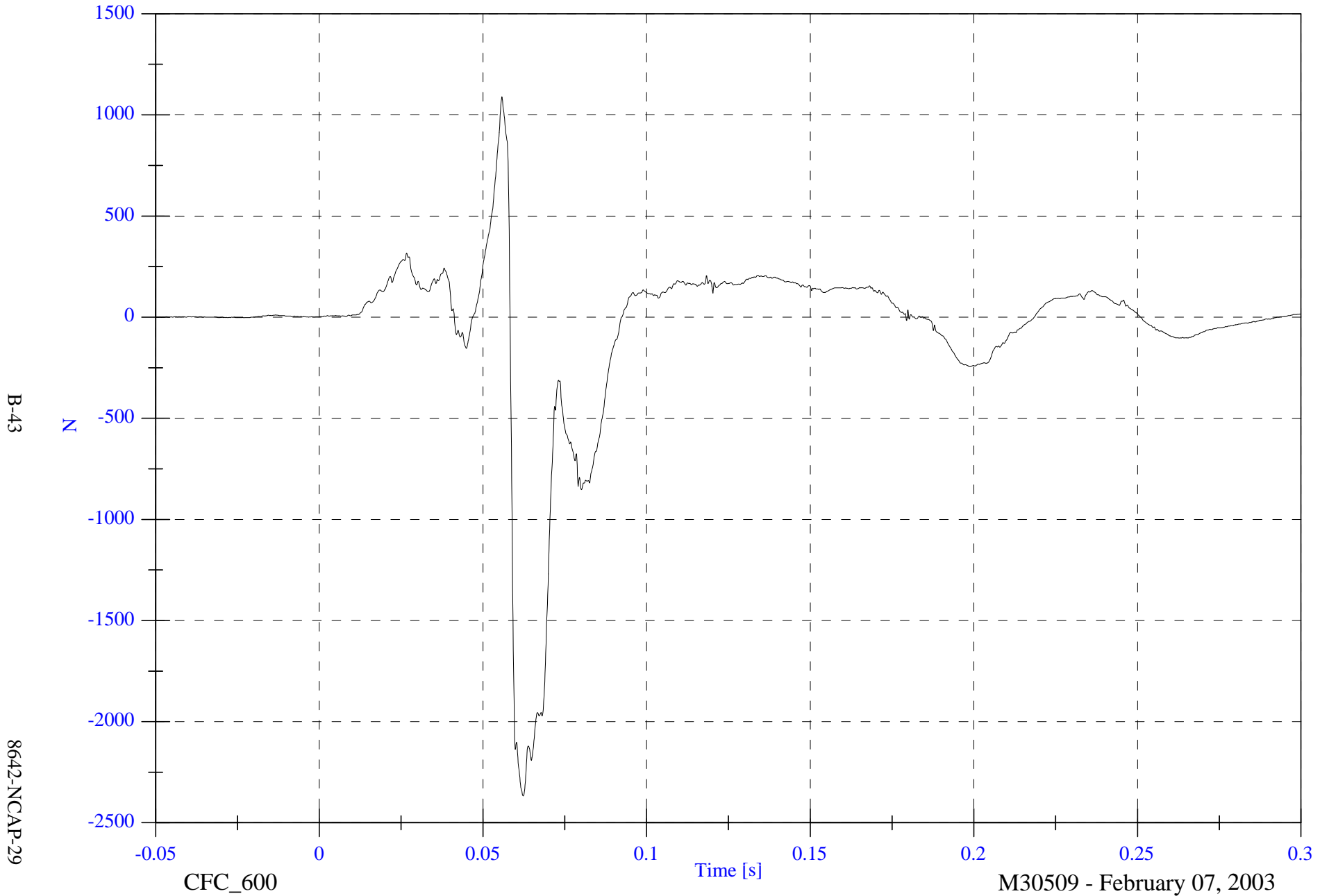
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Left Femur z

Max: 1089.3 [N] at 0.056 [s]

Min: -2367.3 [N] at 0.062 [s]

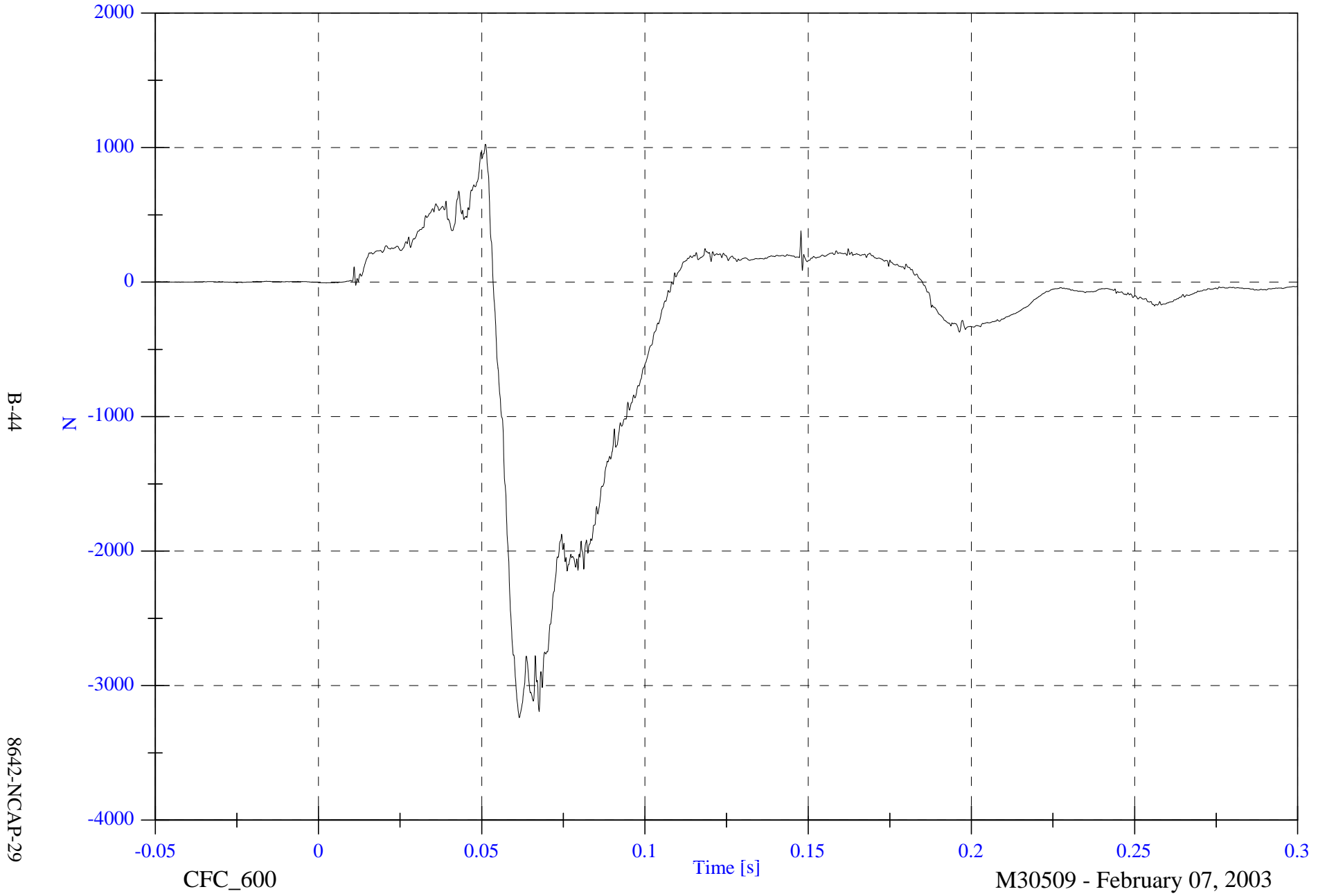


NCAP Test #7 - 2003 Mercedes E320

V1P1 Right Femur z

Max: 1024.6 [N] at 0.051 [s]

Min: -3238.2 [N] at 0.062 [s]



B-44

8642-NCAP-29

CFC_600

Time [s]

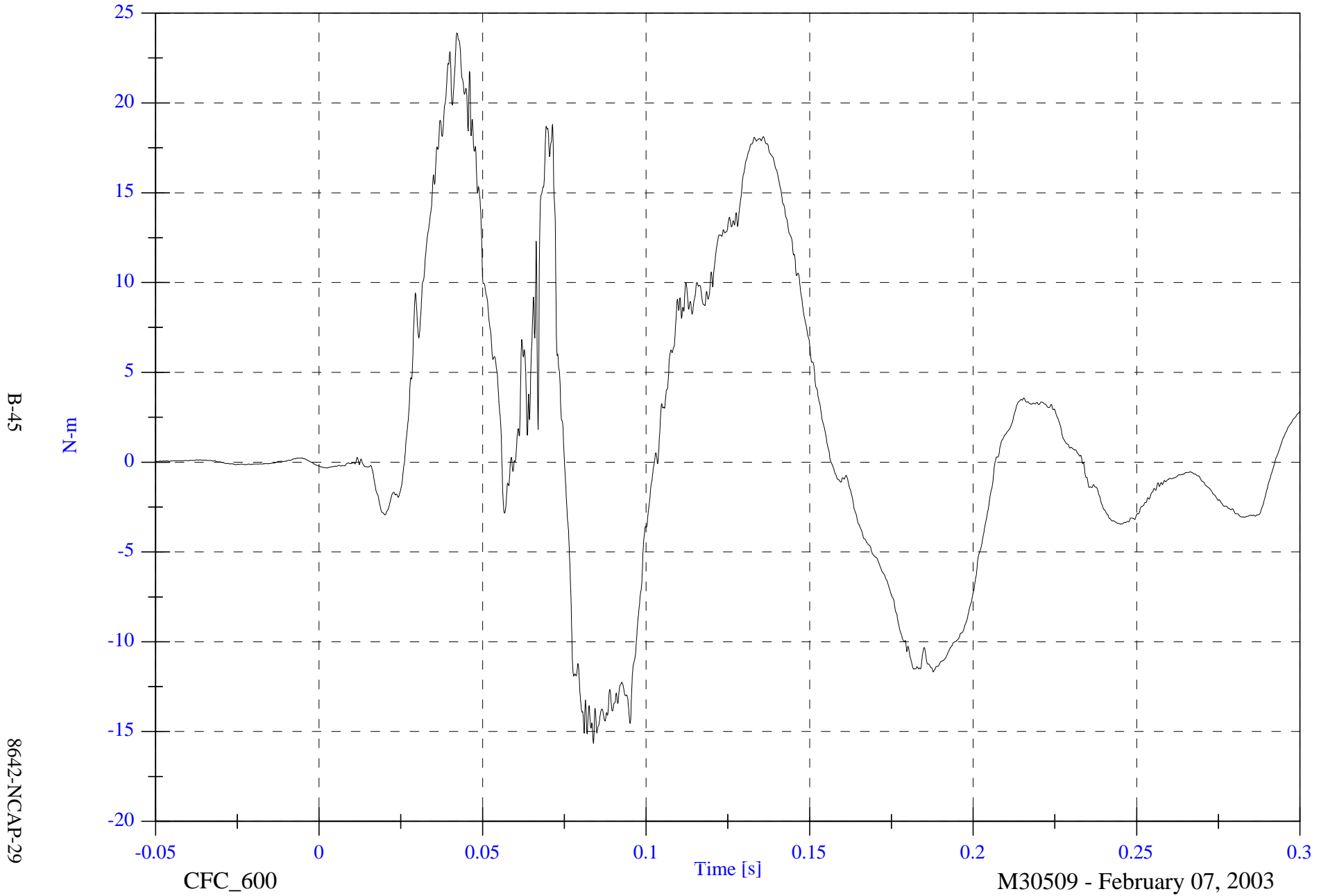
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Left Upper Tibia Mx

Max: 23.9 [N-m] at 0.042 [s]

Min: -15.7 [N-m] at 0.084 [s]

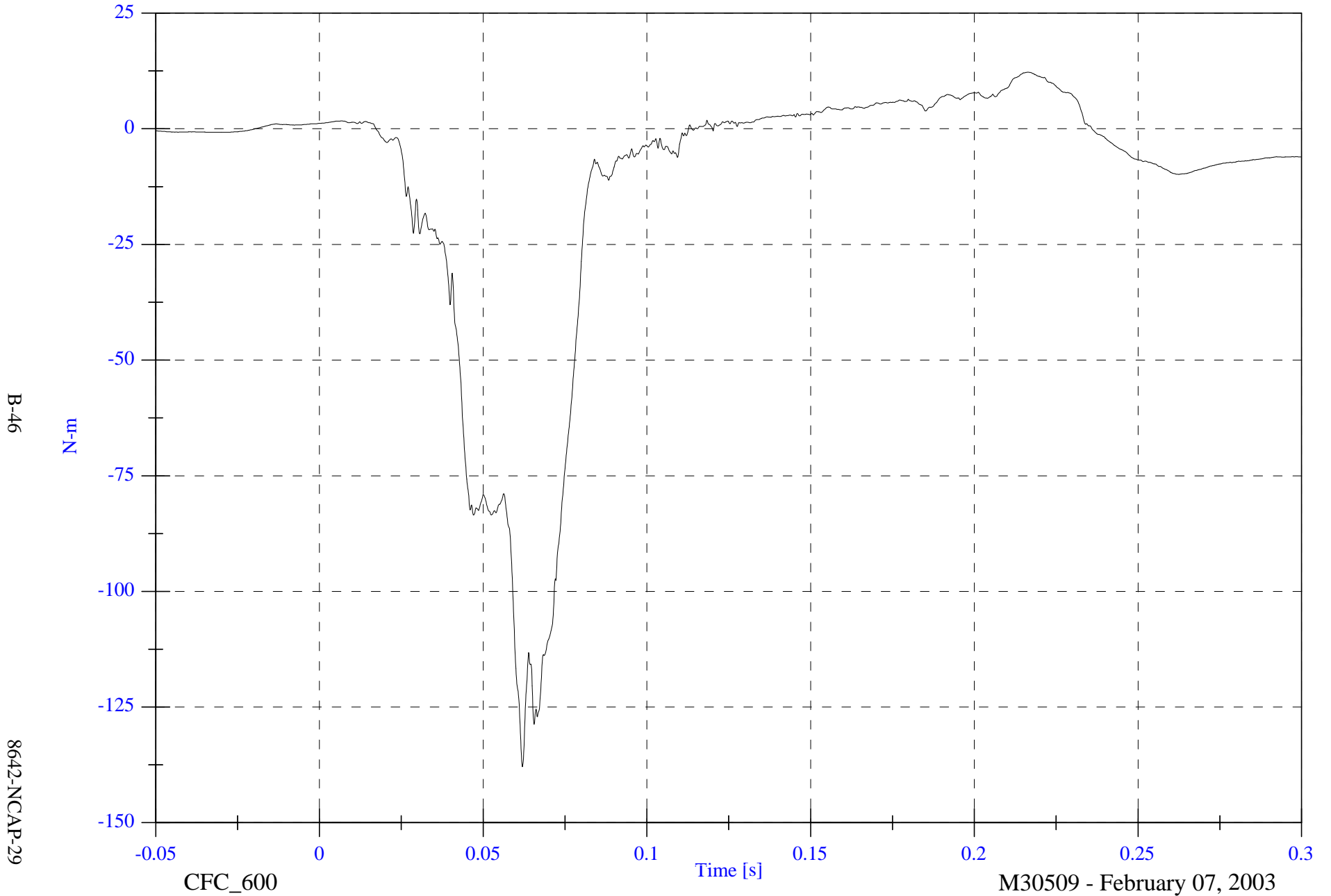


NCAP Test #7 - 2003 Mercedes E320

V1P1 Left Upper Tibia My

Max: 12.2 [N-m] at 0.216 [s]

Min: -137.9 [N-m] at 0.062 [s]



B-46

8642-NCAP-29

CFC_600

Time [s]

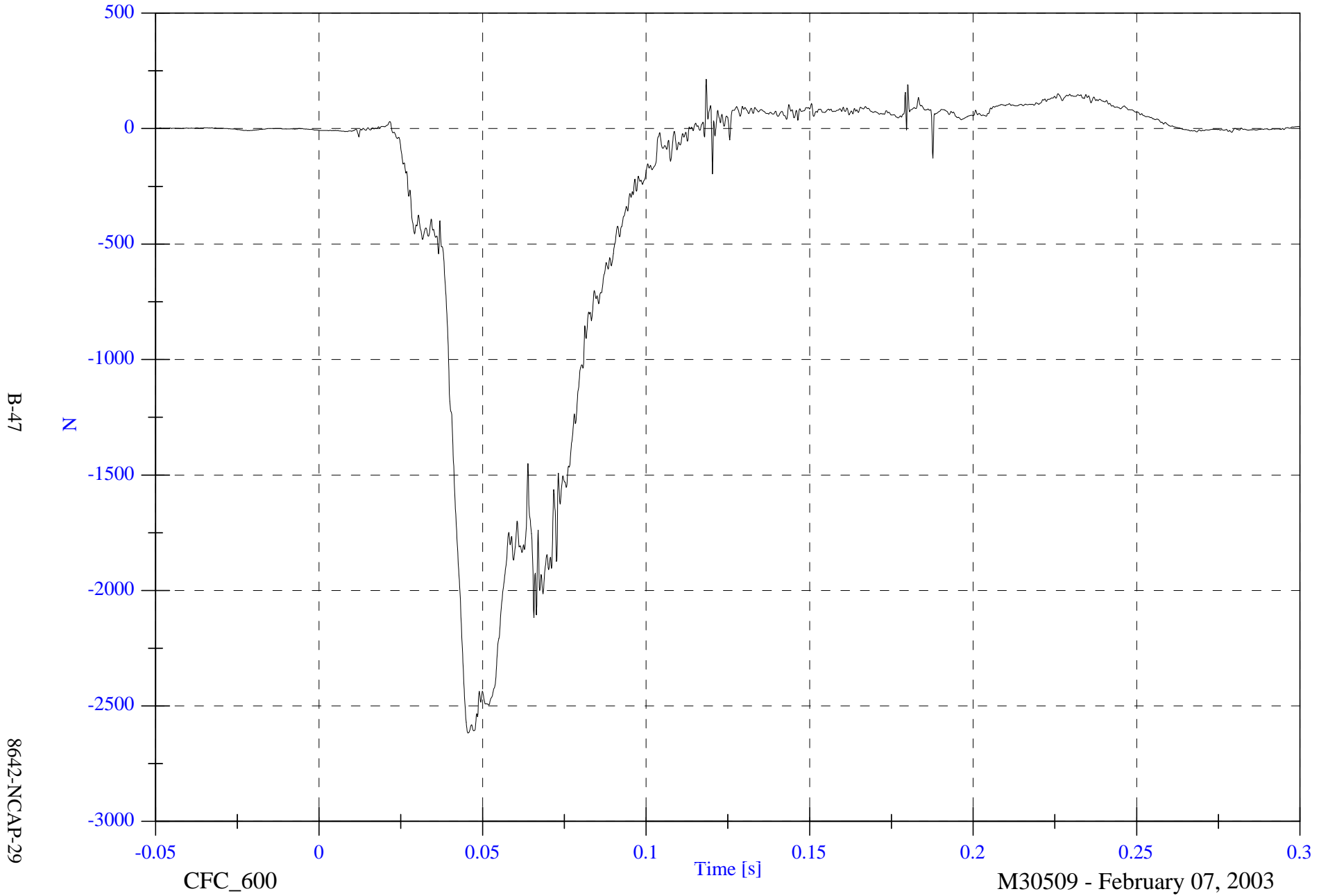
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Left Lower Tibia Fz

Max: 213.6 [N] at 0.118 [s]

Min: -2616.9 [N] at 0.045 [s]



B-47

8642-NCAP-29

CFC_600

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

VIP1 Left Lower Tibia Mx

Max: 68.5 [N-m] at 0.072 [s]

Min: -6.0 [N-m] at 0.180 [s]



B-48

8642-NCAP-29

CFC_600

Time [s]

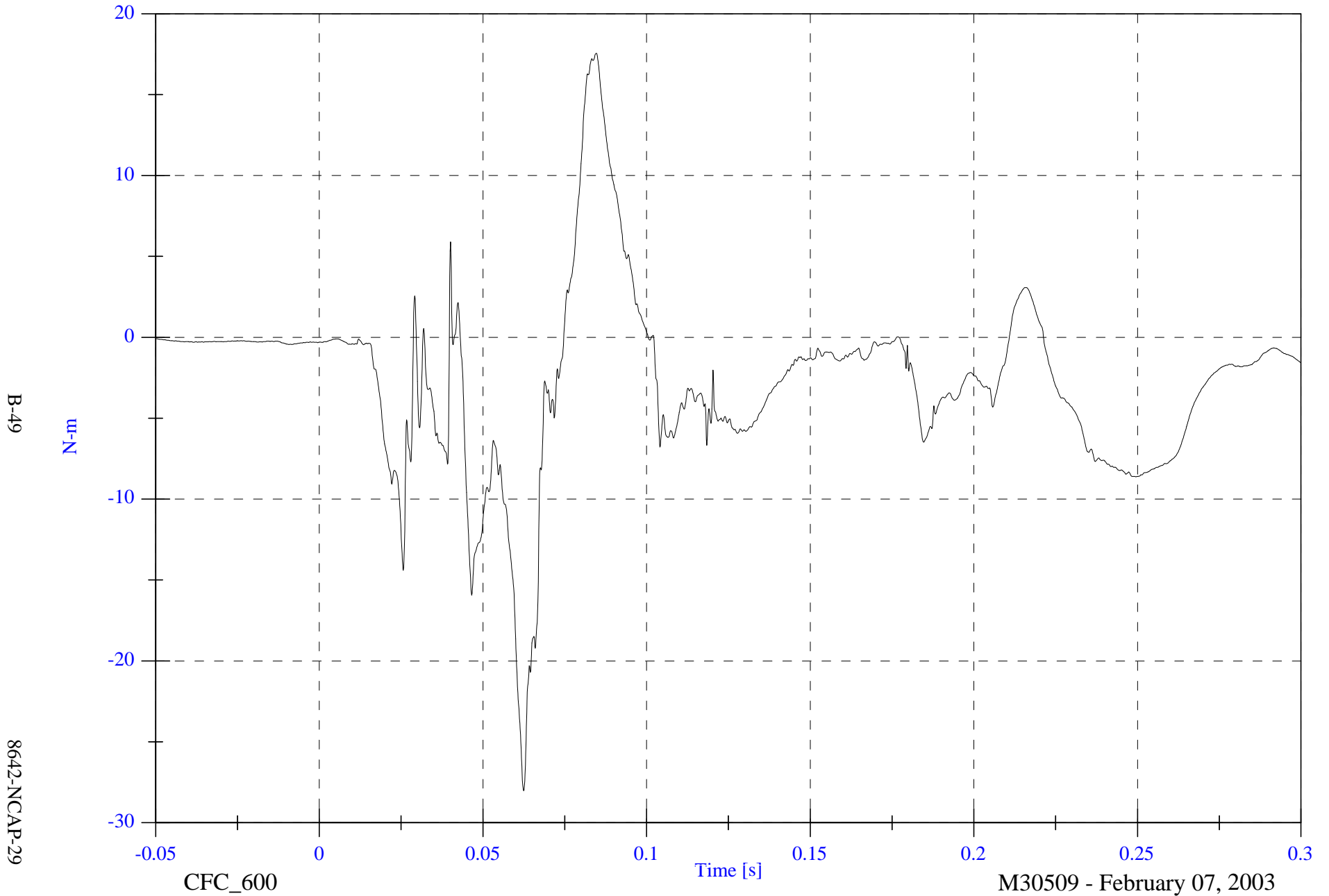
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 17.6 [N-m] at 0.085 [s]

Min: -28.0 [N-m] at 0.062 [s]

VIP1 Left Lower Tibia My



B-49

8642-NCAP-29

CFC_600

Time [s]

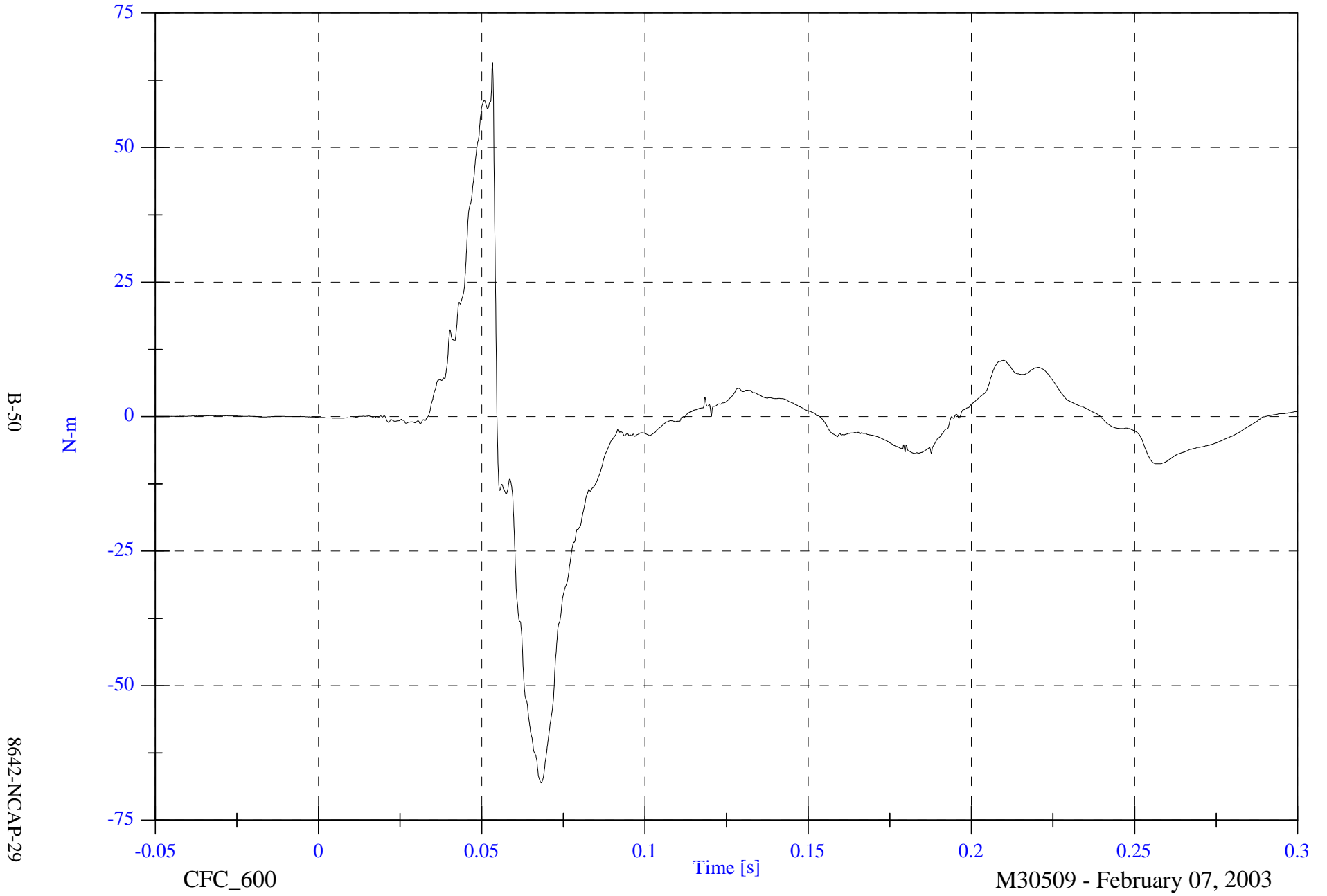
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Right upper Tibia Mx

Max: 65.8 [N-m] at 0.053 [s]

Min: -68.0 [N-m] at 0.068 [s]



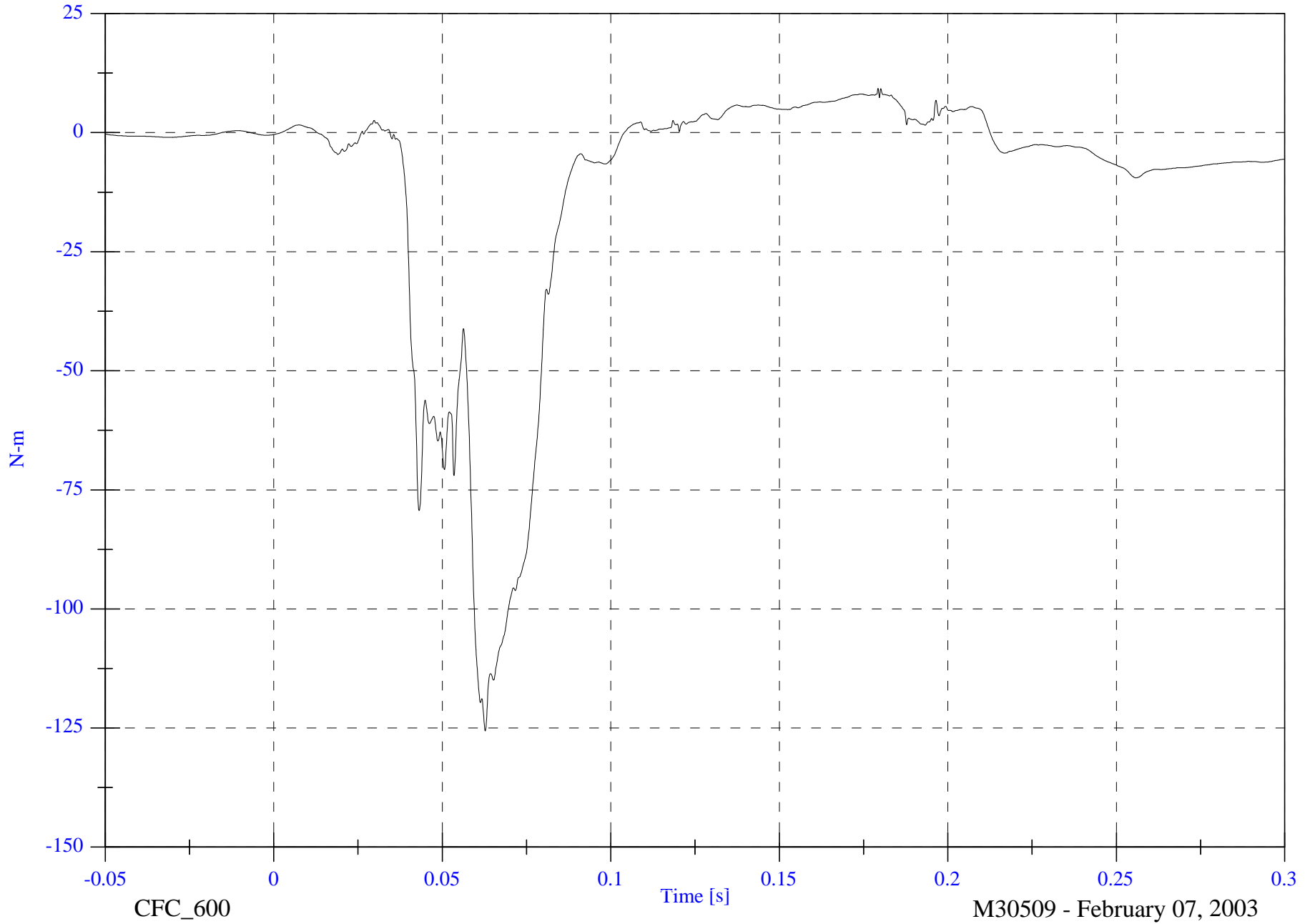
NCAP Test #7 - 2003 Mercedes E320

V1P1 Right upper Tibia My

Max: 9.3 [N-m] at 0.179 [s]
Min: -125.6 [N-m] at 0.063 [s]

B-51

8642-NCAP-29



CFC_600

Time [s]

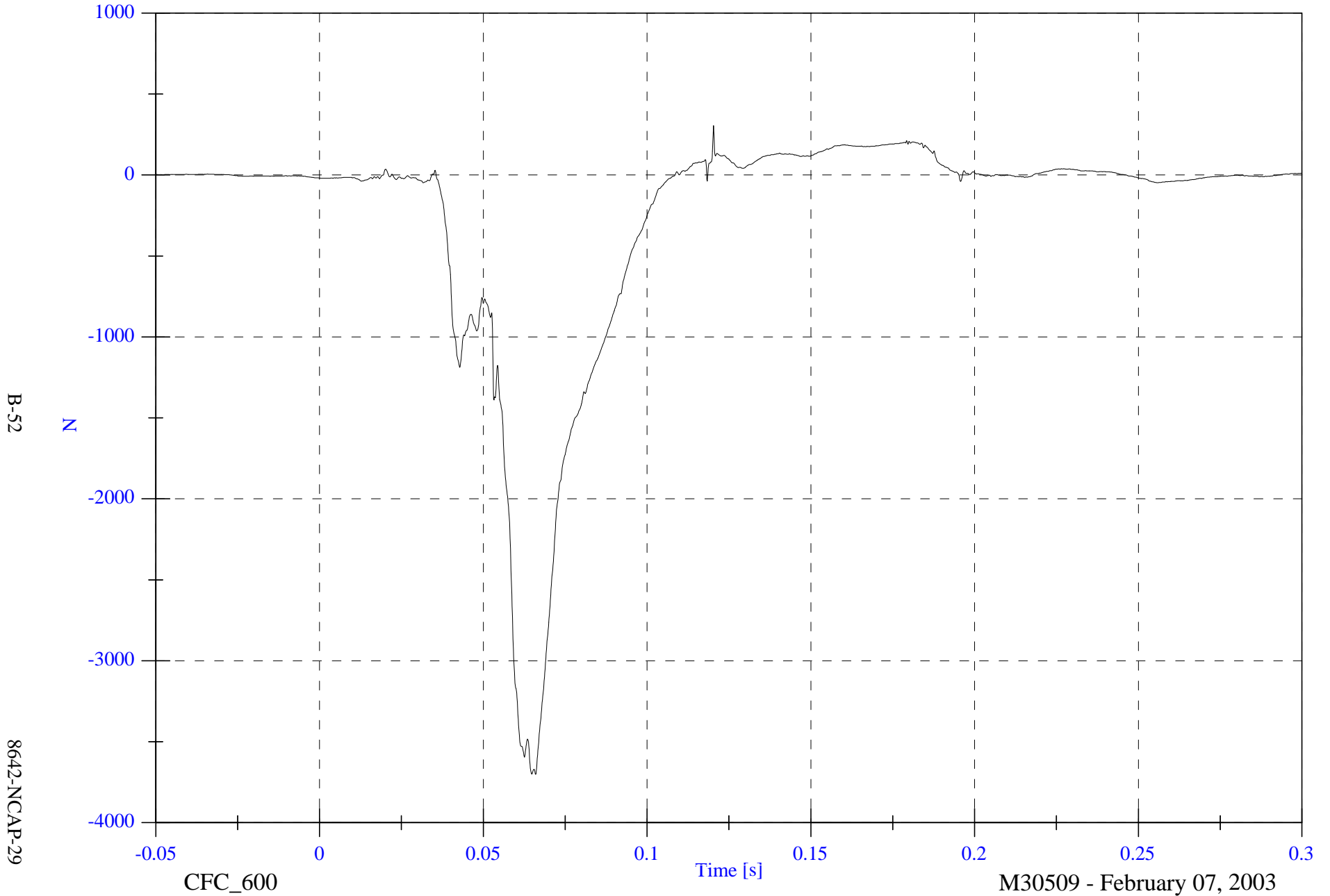
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

VIP1 Right Lower Tibia Fz

Max: 305.3 [N] at 0.120 [s]

Min: -3701.7 [N] at 0.066 [s]



B-52

8642-NCAP-29

CFC_600

Time [s]

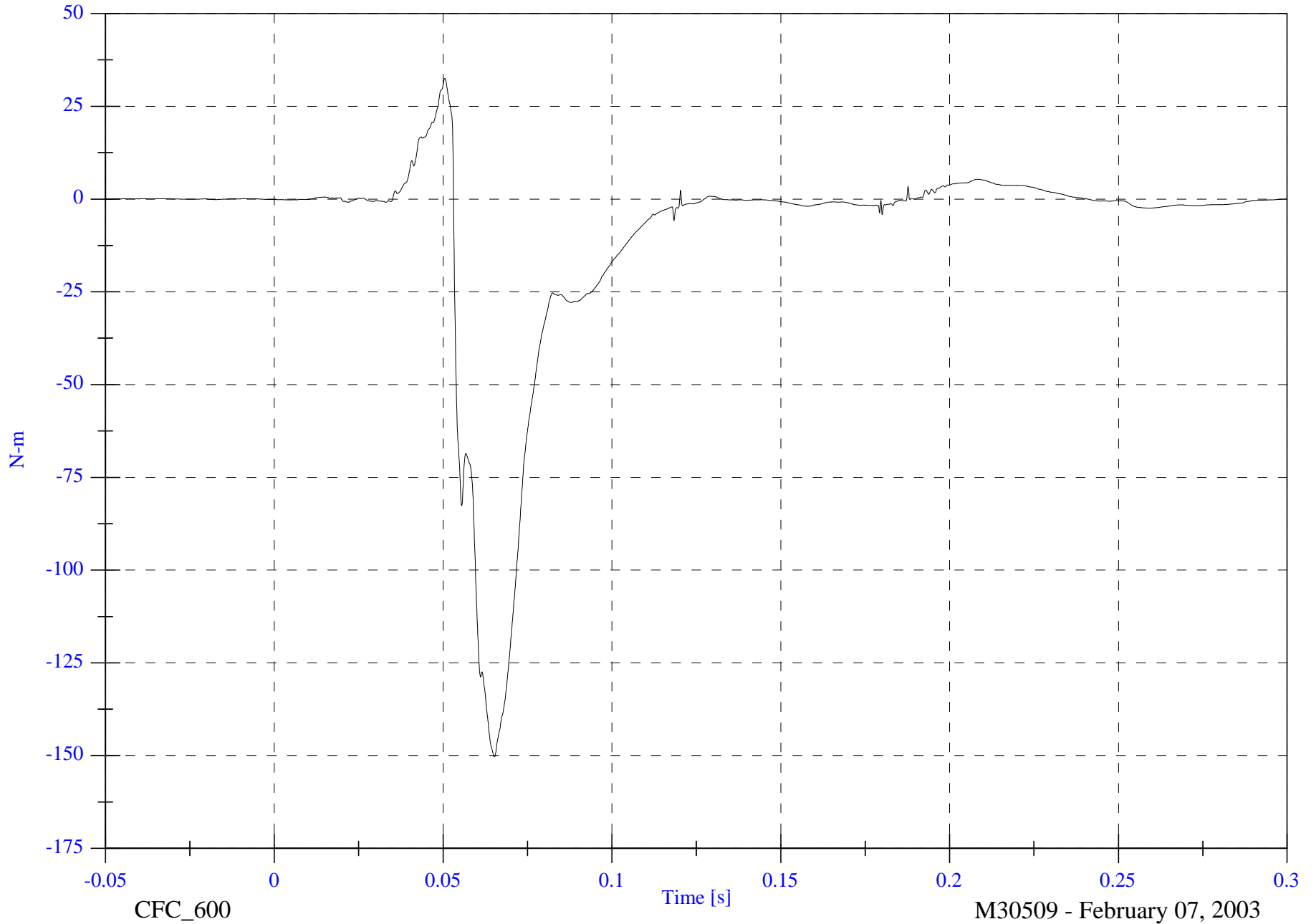
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Right Lower Tibia Mx

Max: 32.5 [N-m] at 0.050 [s]

Min: -150.3 [N-m] at 0.065 [s]



B-53

8642-NCAP-29

CFC_600

Time [s]

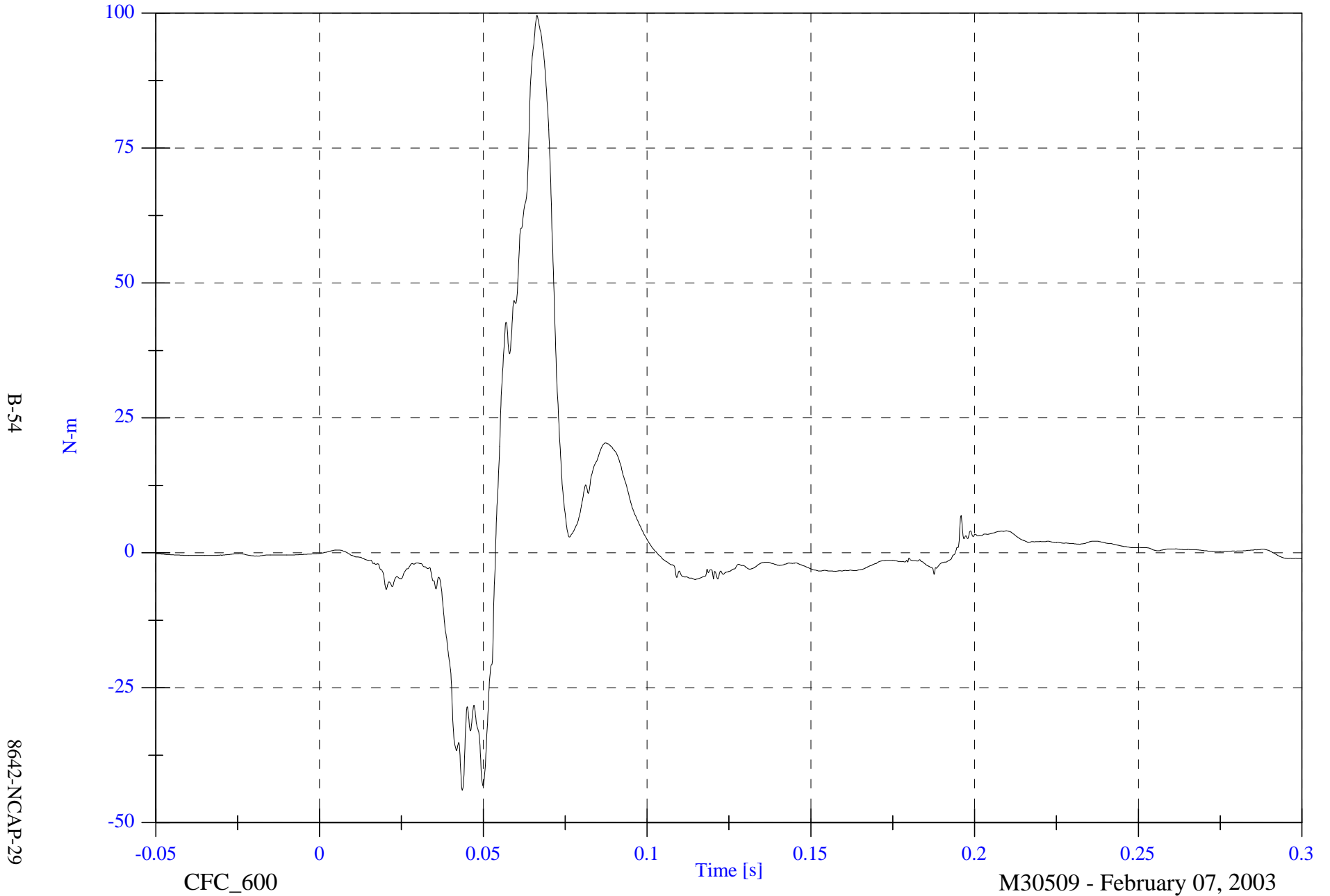
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 99.6 [N-m] at 0.066 [s]

Min: -44.0 [N-m] at 0.044 [s]

V1P1 Right Lower Tibia My

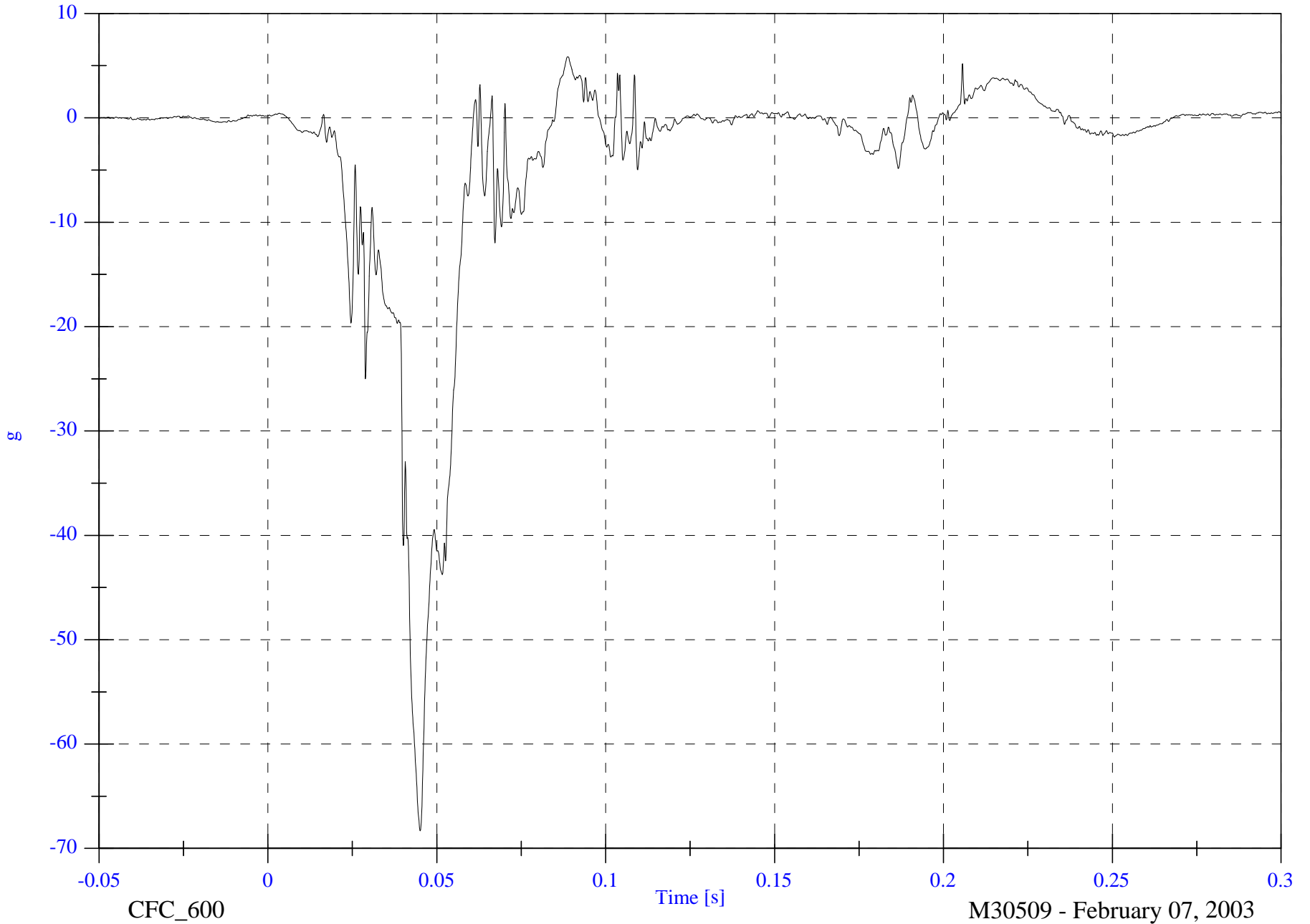


NCAP Test #7 - 2003 Mercedes E320

Max: 5.9 [g] at 0.089 [s]

Min: -68.3 [g] at 0.045 [s]

V1P1 Left Foot Aft x



B-55

8642-NCAP-29

CFC_600

Time [s]

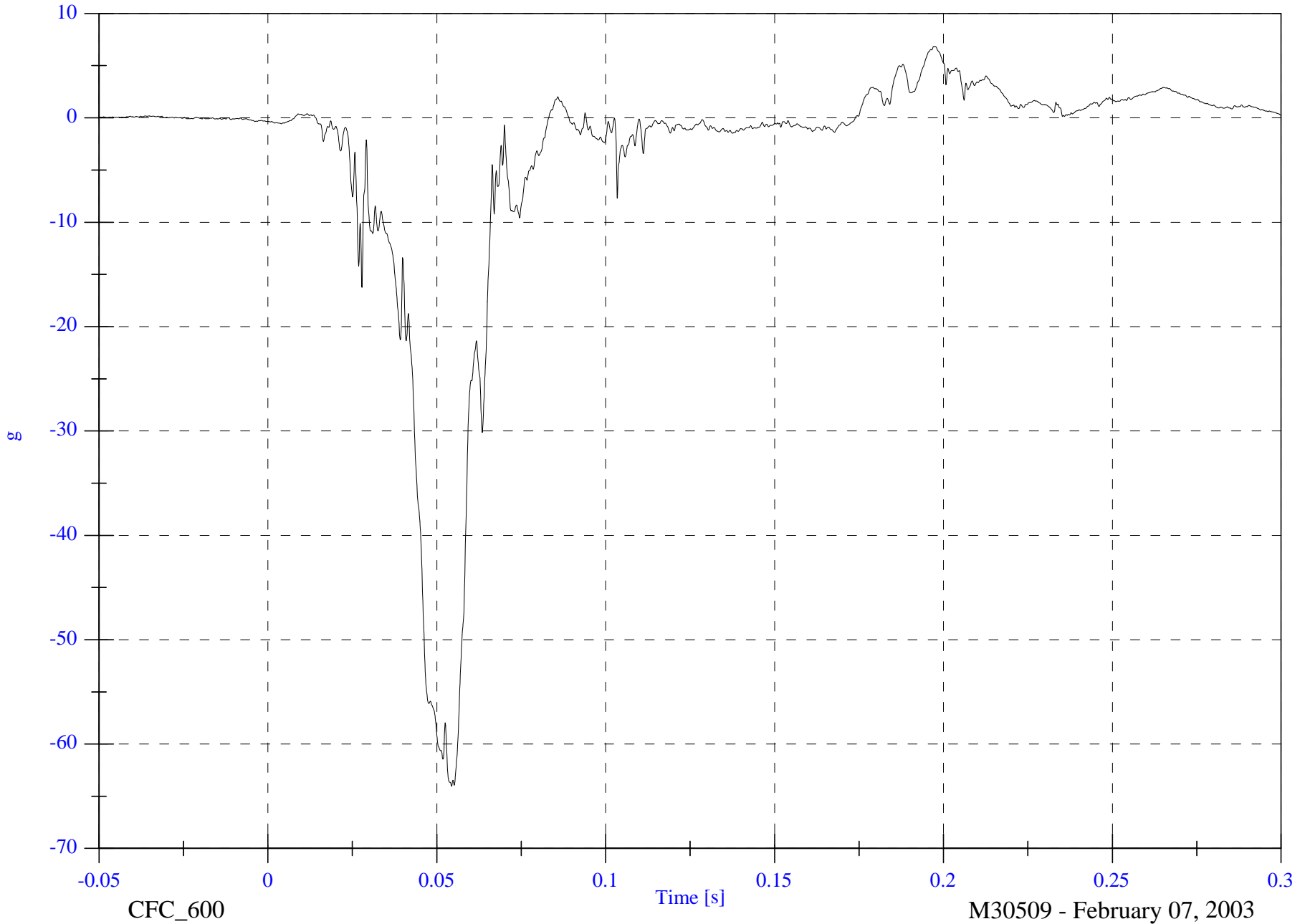
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Left Foot Aft z

Max: 6.9 [g] at 0.197 [s]

Min: -64.0 [g] at 0.054 [s]



B-56

8642-NCAP-29

CFC_600

Time [s]

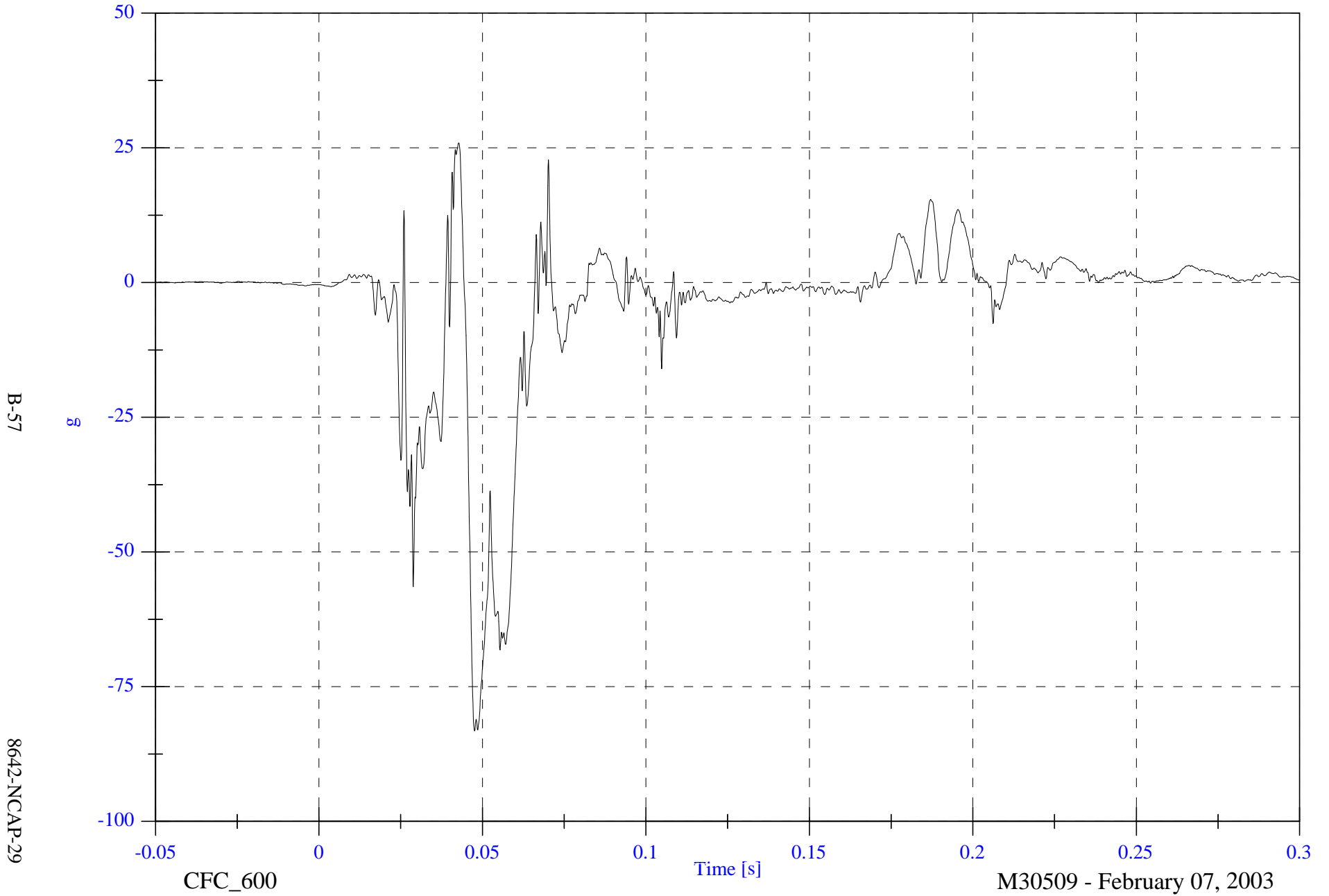
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P1 Left Foot Fore z

Max: 25.9 [g] at 0.043 [s]

Min: -83.2 [g] at 0.048 [s]



B-57

8642-NCAP-29

CFC_600

Time [s]

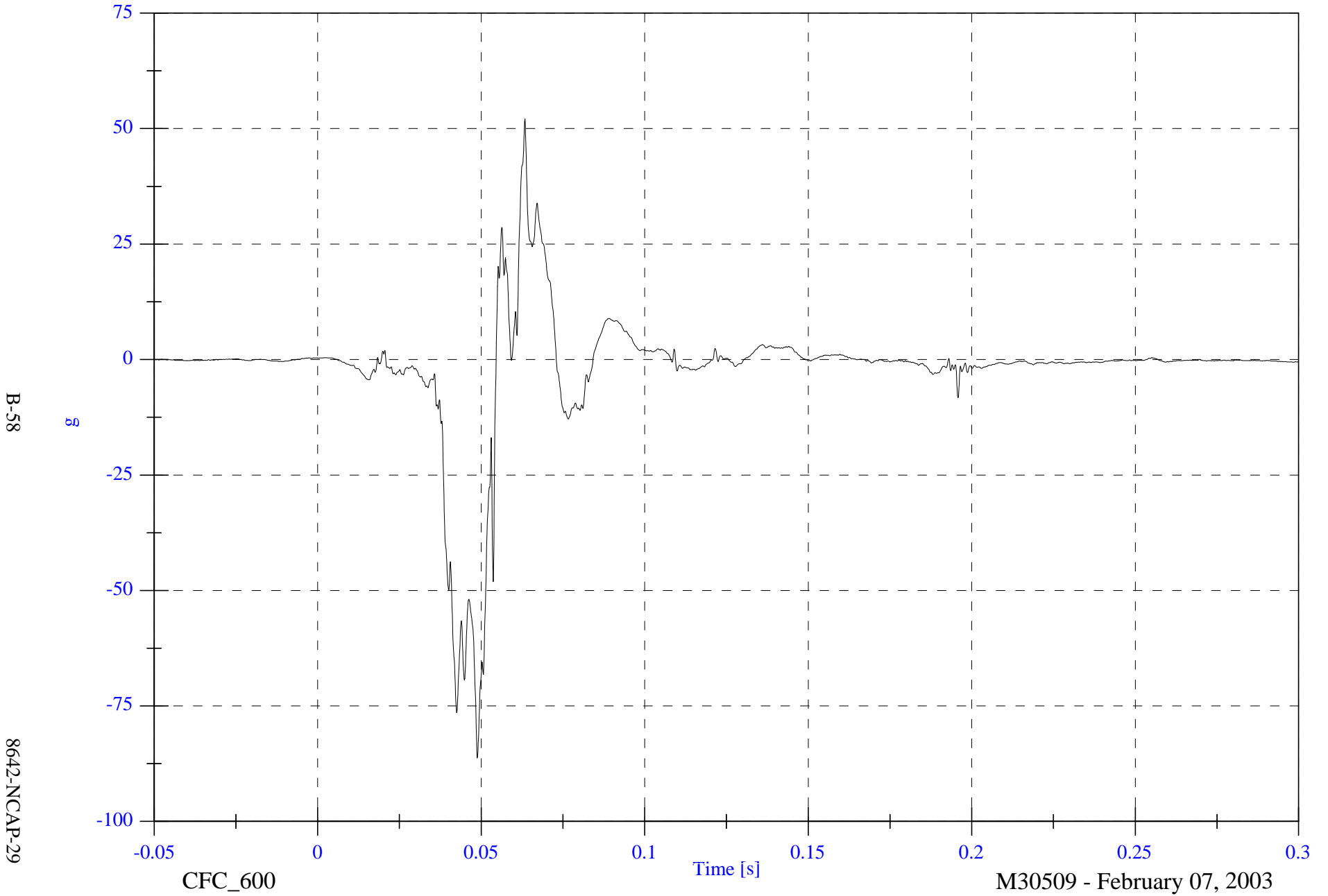
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 52.1 [g] at 0.063 [s]

Min: -86.3 [g] at 0.049 [s]

V1P1 Right Foot Aft x

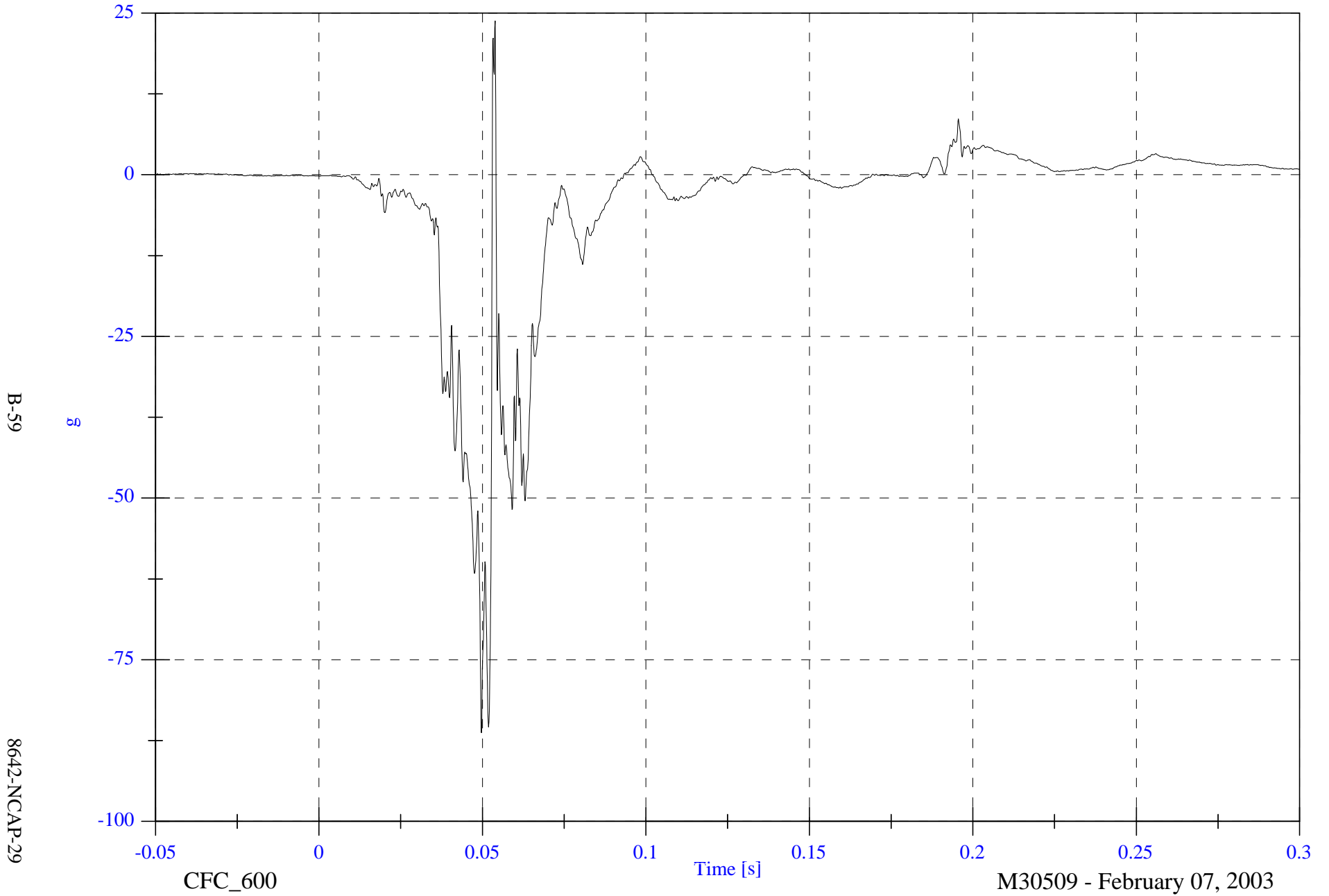


NCAP Test #7 - 2003 Mercedes E320

Max: 23.8 [g] at 0.054 [s]

Min: -86.3 [g] at 0.050 [s]

V1P1 Right foot Aft z

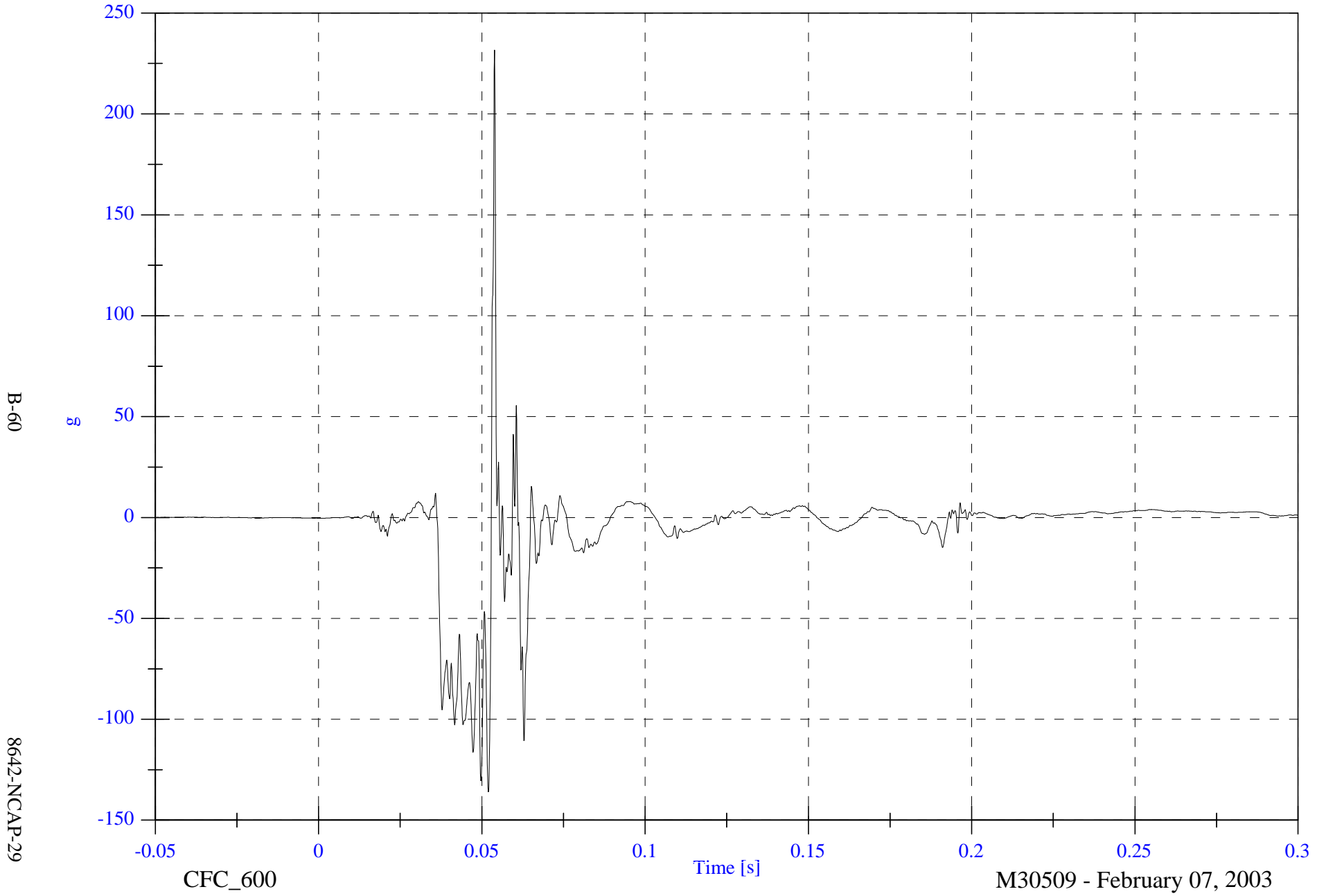


NCAP Test #7 - 2003 Mercedes E320

Max: 231.6 [g] at 0.054 [s]

Min: -136.0 [g] at 0.052 [s]

V1P1 Right Foot Fore z

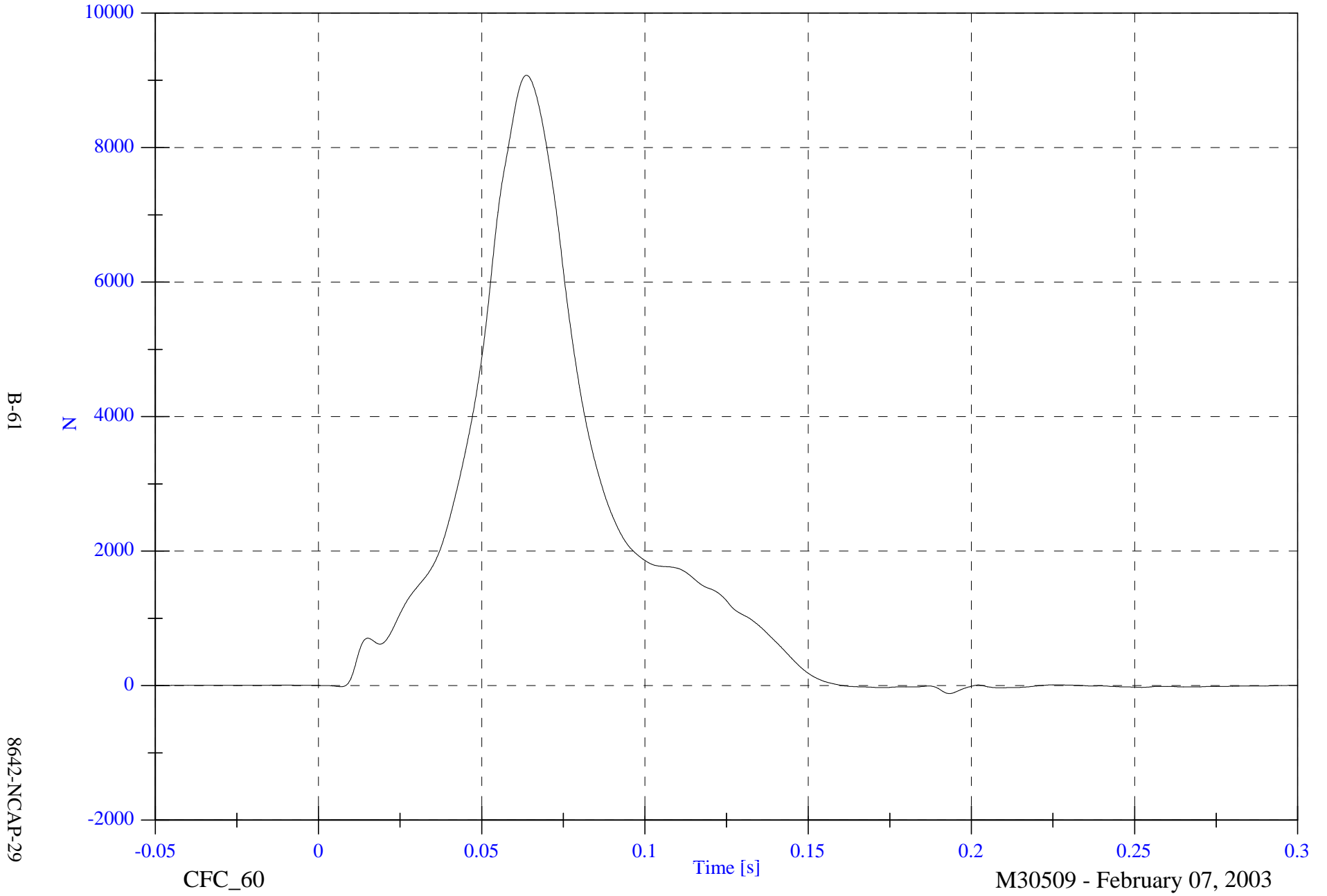


NCAP Test #7 - 2003 Mercedes E320

P1 Lap Belt

Max: 9074.8 [N] at 0.064 [s]

Min: -117.4 [N] at 0.193 [s]



B-61

8642-NCAP-29

CFC_60

Time [s]

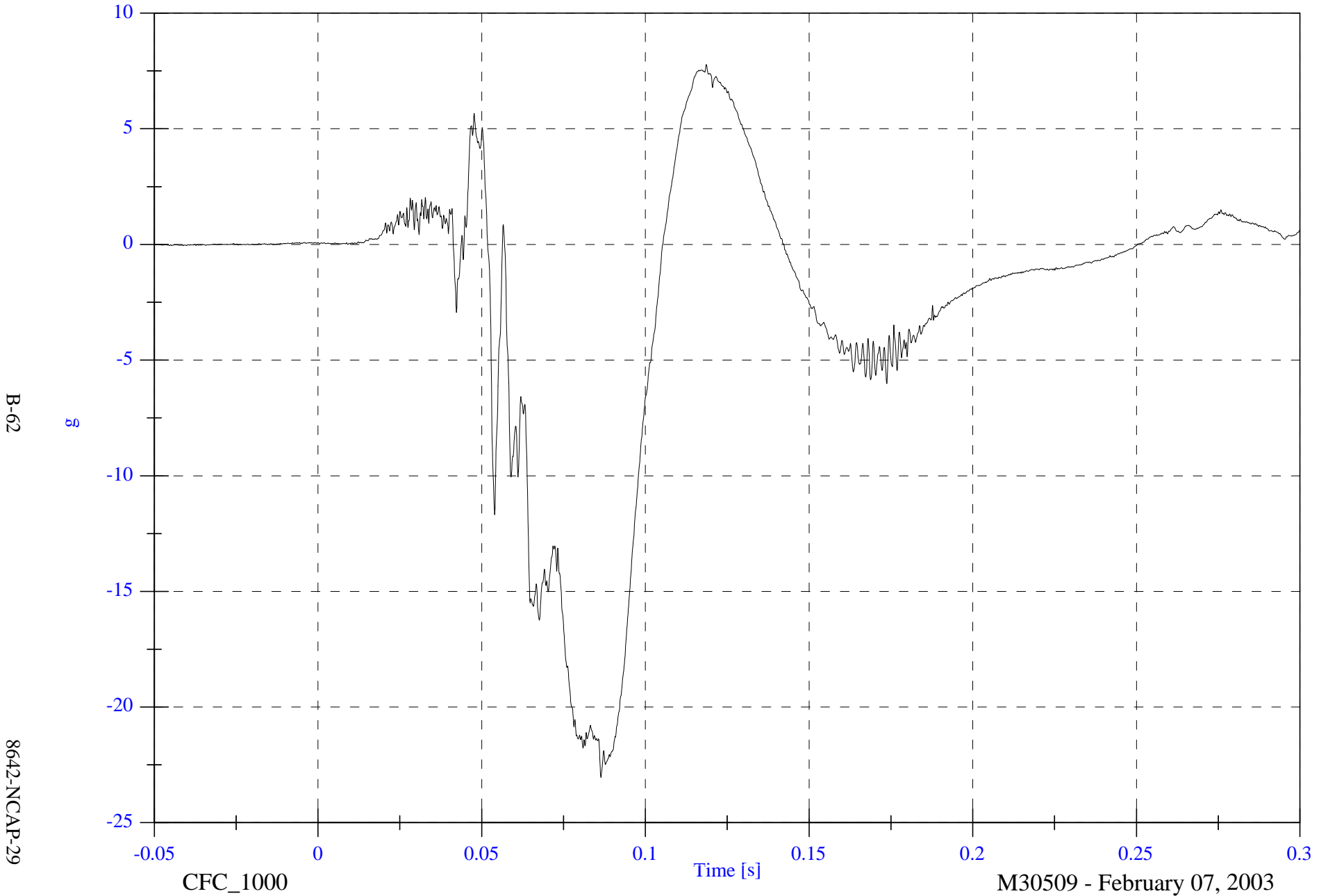
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Head 9 Array X Arm Ay

Max: 7.8 [g] at 0.119 [s]

Min: -23.1 [g] at 0.086 [s]

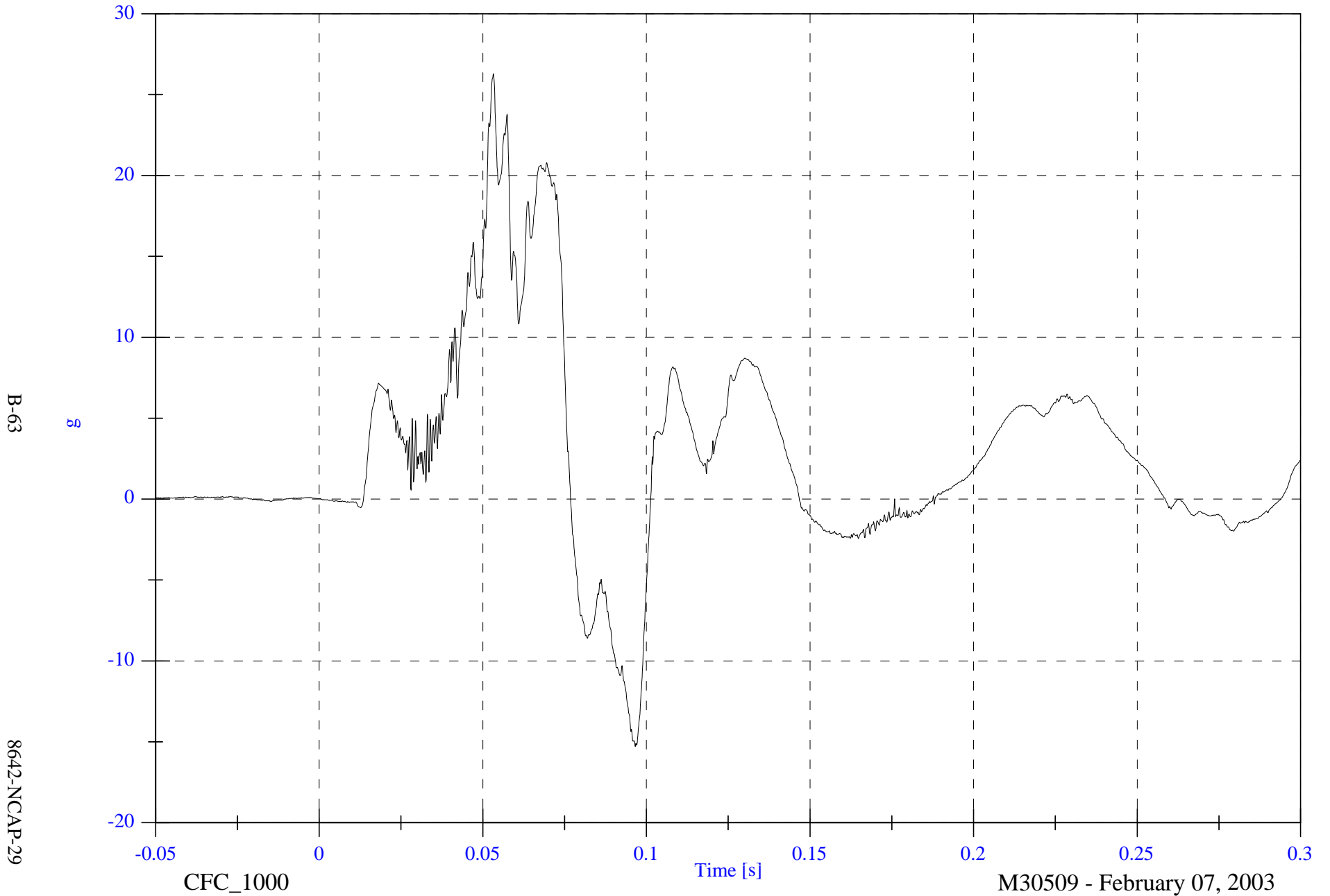


NCAP Test #7 - 2003 Mercedes E320

V1P2 Head 9 Array X Arm Az

Max: 26.3 [g] at 0.053 [s]

Min: -15.3 [g] at 0.097 [s]

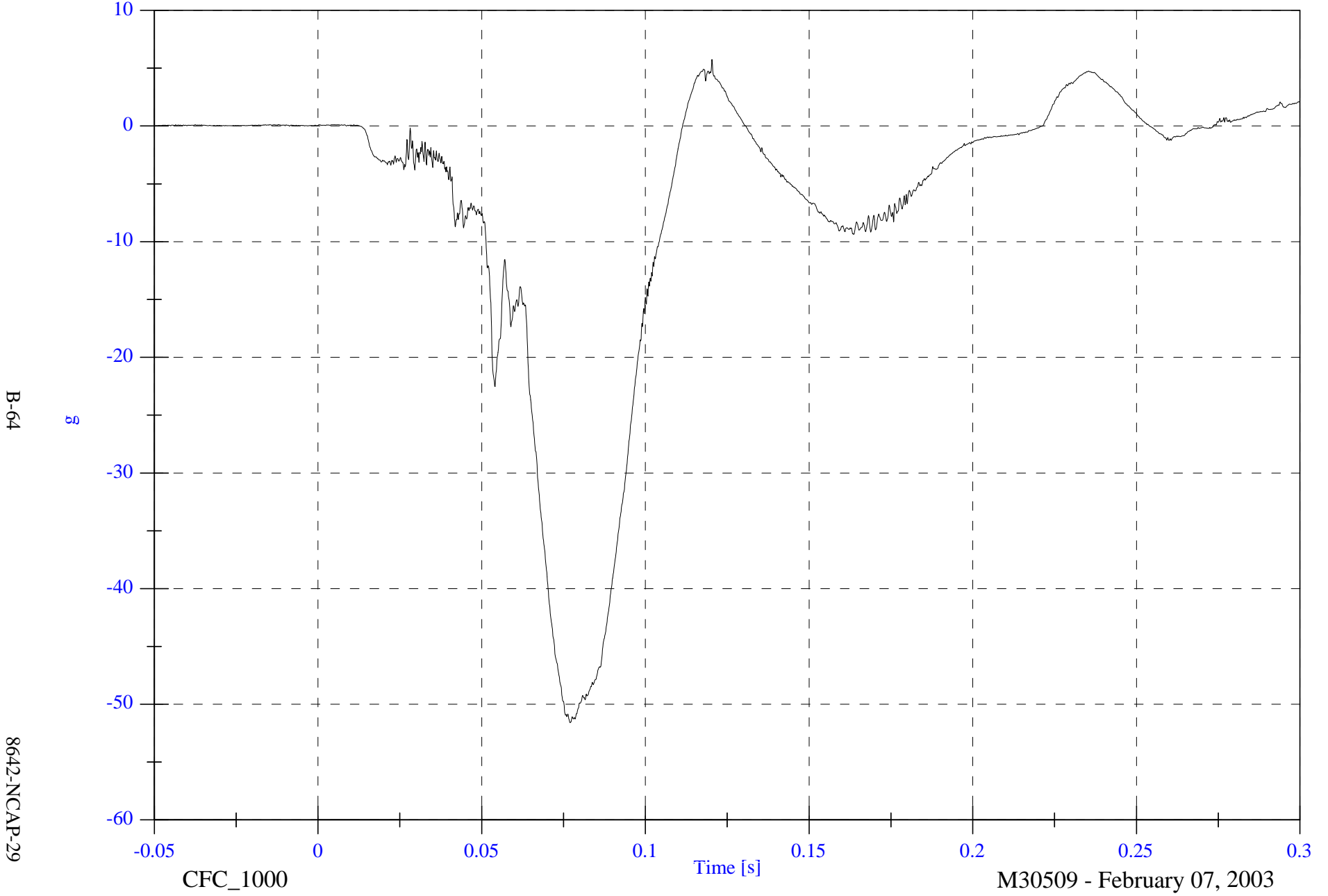


NCAP Test #7 - 2003 Mercedes E320

V1P2 Head 9 Array Y Arm Ax

Max: 5.7 [g] at 0.120 [s]

Min: -51.6 [g] at 0.077 [s]

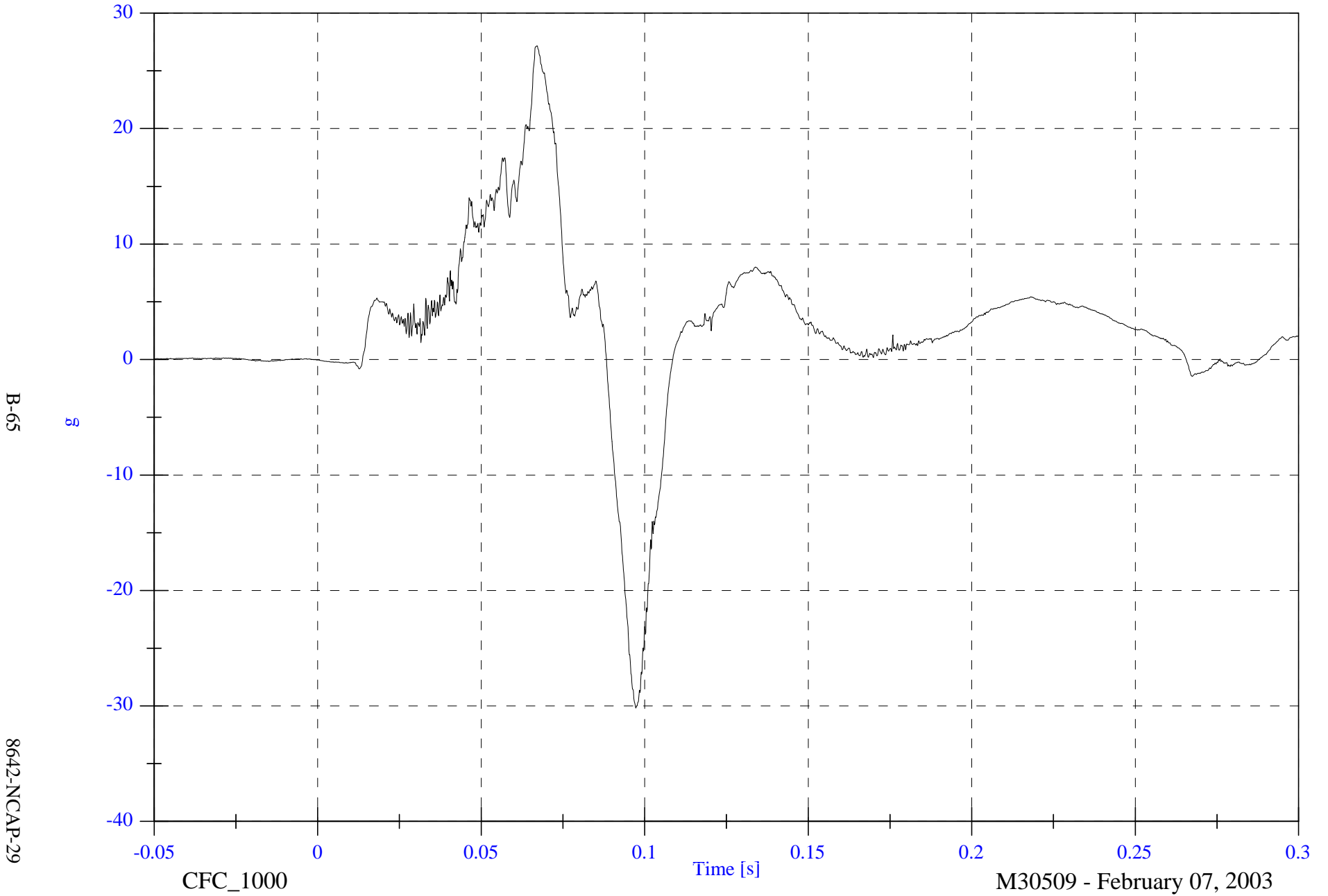


NCAP Test #7 - 2003 Mercedes E320

V1P2 Head 9 Array Y Arm Az

Max: 27.2 [g] at 0.067 [s]

Min: -30.2 [g] at 0.097 [s]



B-65

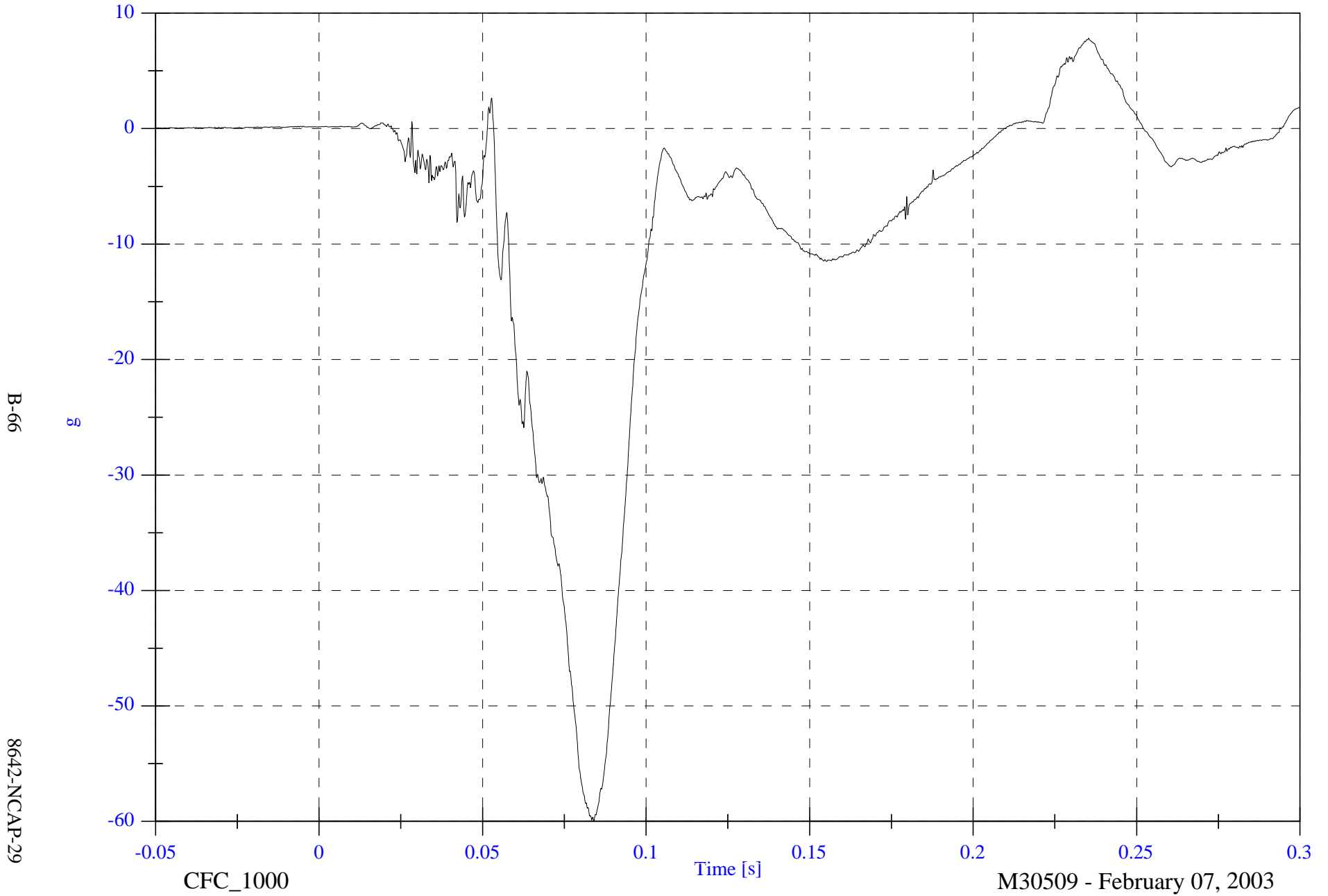
8642-NCAP-29

NCAP Test #7 - 2003 Mercedes E320

V1P2 Head 9 Array Z Arm Ax

Max: 7.8 [g] at 0.235 [s]

Min: -59.9 [g] at 0.084 [s]

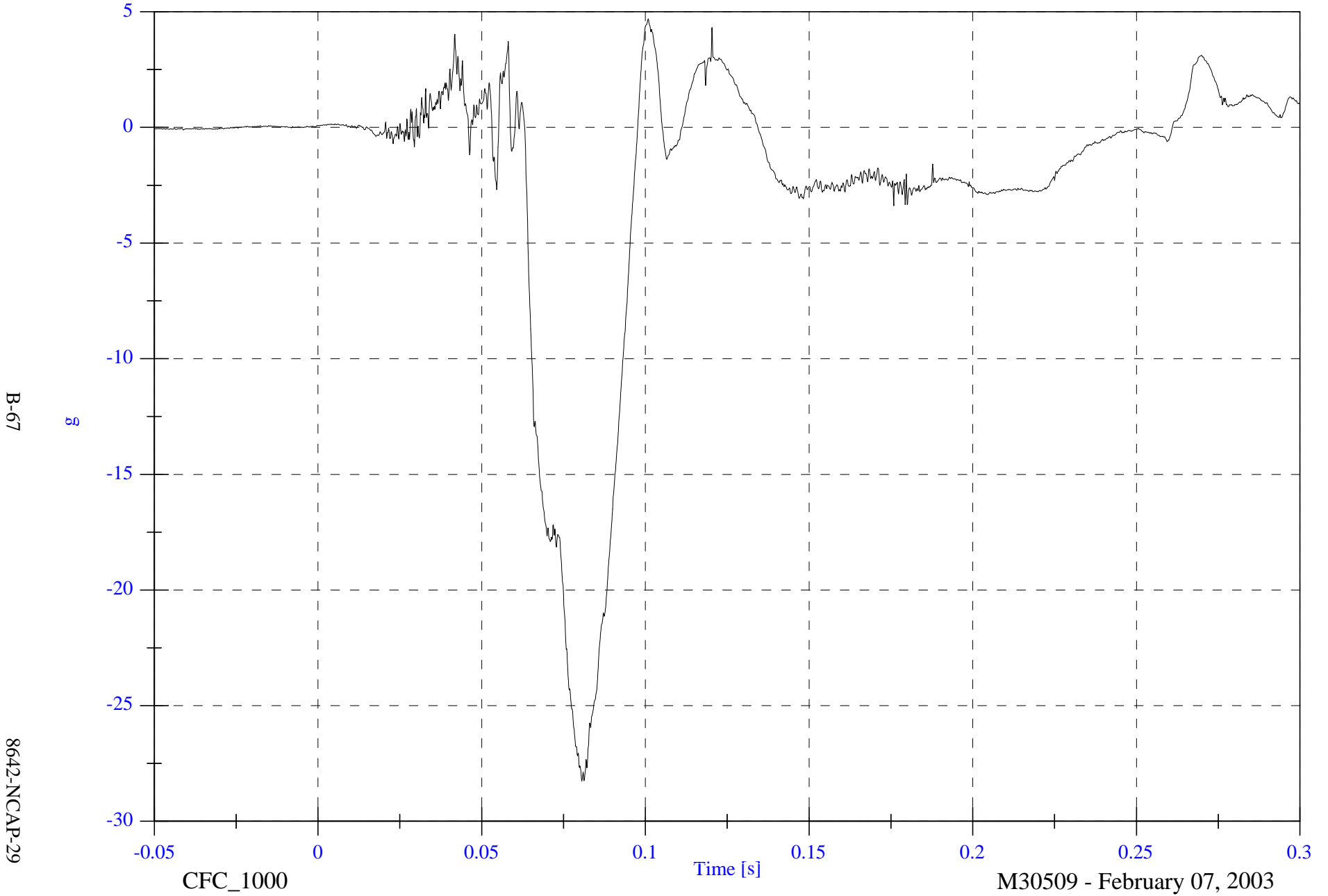


NCAP Test #7 - 2003 Mercedes E320

V1P2 Head 9 Array Z Arm Ay

Max: 4.7 [g] at 0.101 [s]

Min: -28.3 [g] at 0.081 [s]

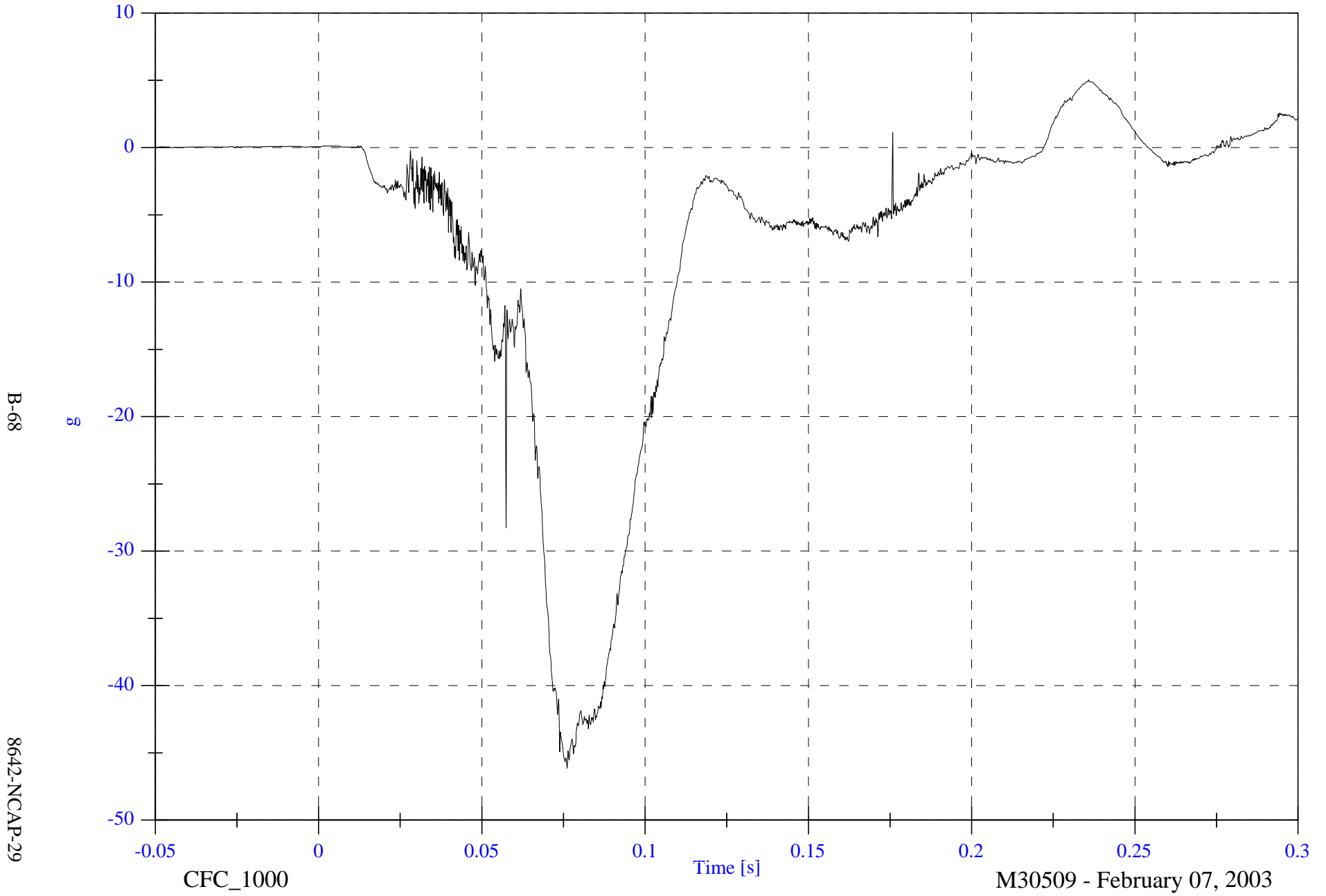


NCAP Test #7 - 2003 Mercedes E320

V1P2 Head CG x

Max: 5.0 [g] at 0.236 [s]

Min: -46.1 [g] at 0.076 [s]

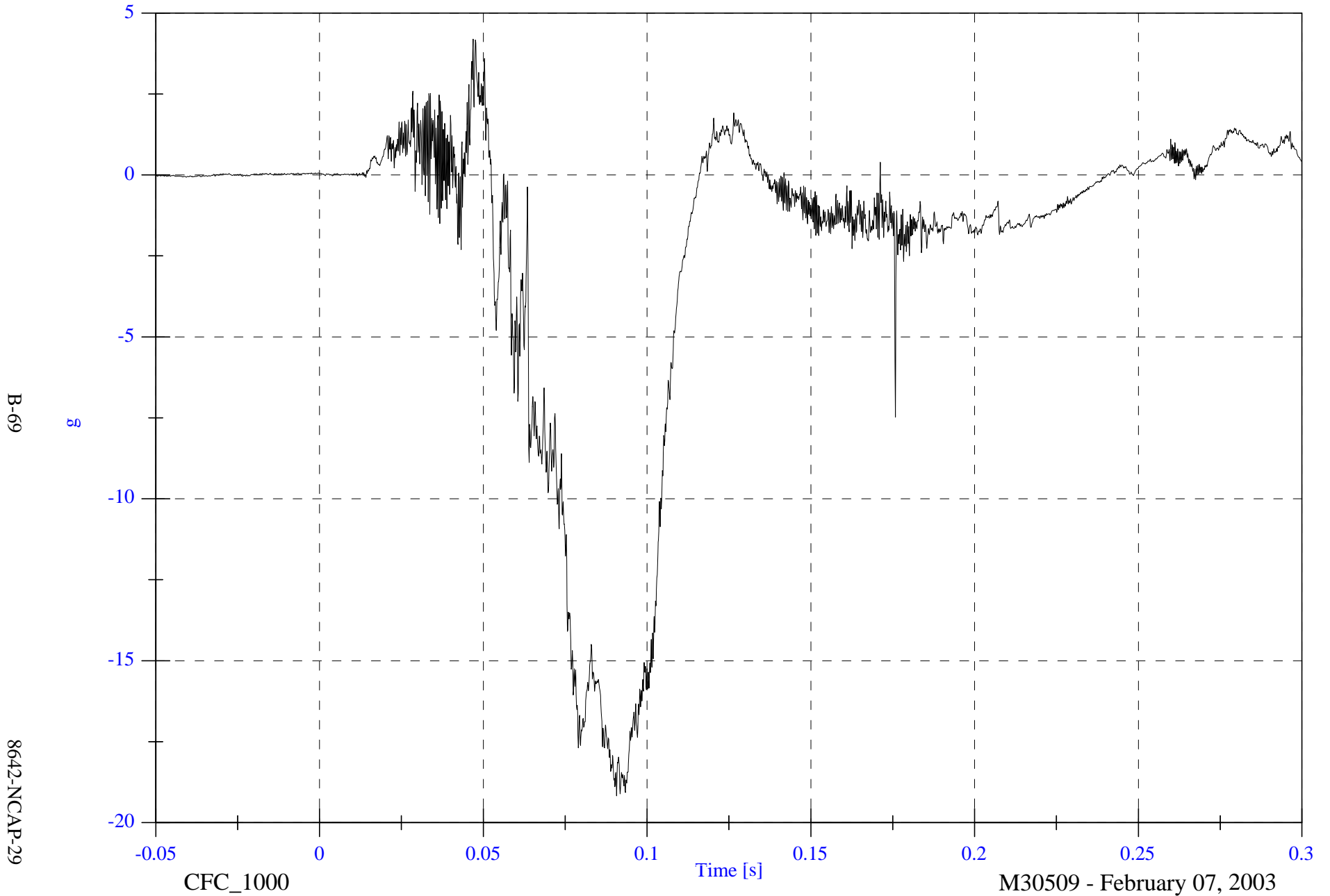


NCAP Test #7 - 2003 Mercedes E320

V1P2 Head CG y

Max: 4.2 [g] at 0.047 [s]

Min: -19.2 [g] at 0.091 [s]



B-69

8642-NCAP-29

CFC_1000

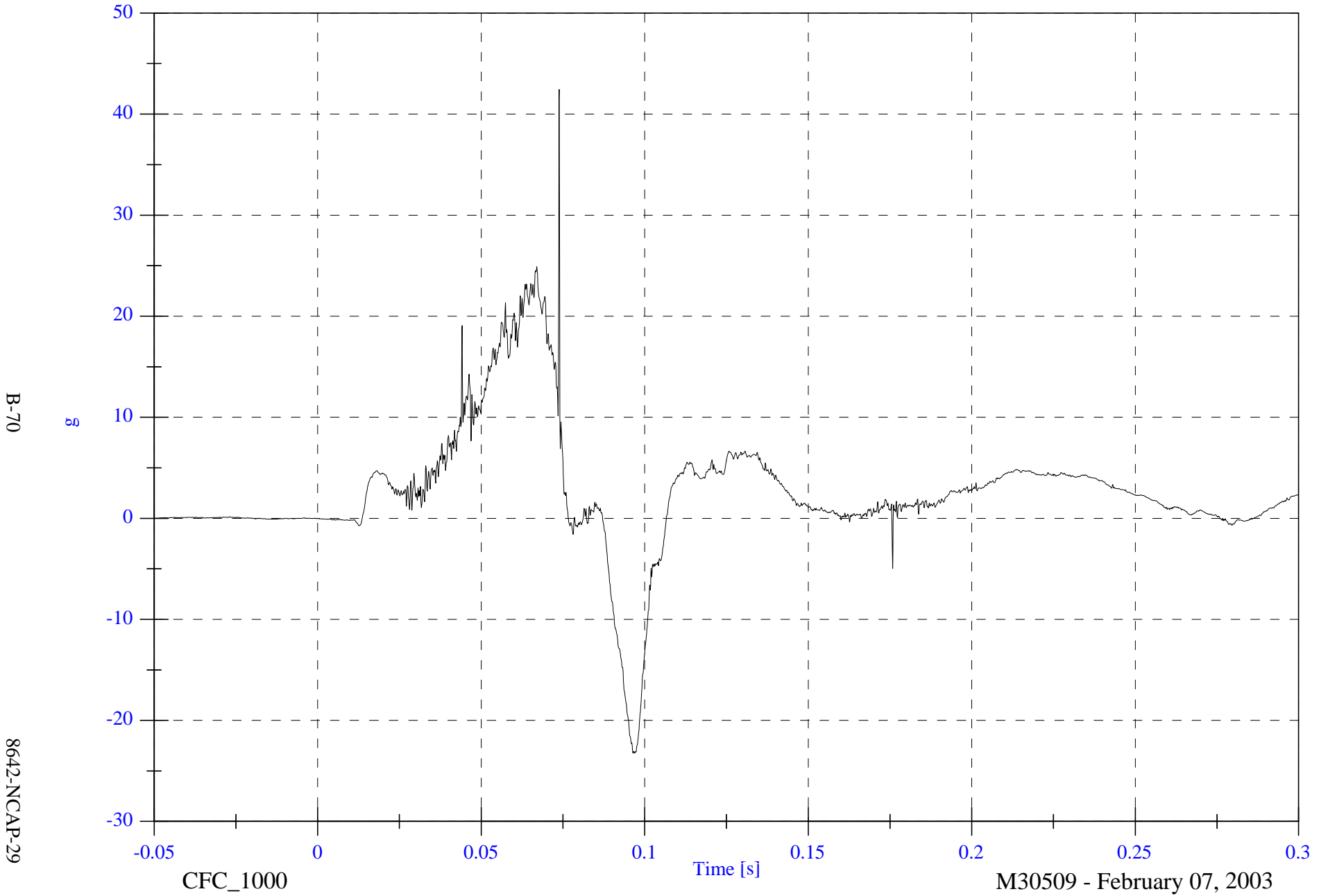
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Head CG z

Max: 42.4 [g] at 0.074 [s]

Min: -23.2 [g] at 0.096 [s]



NCAP Test #7 - 2003 Mercedes E320

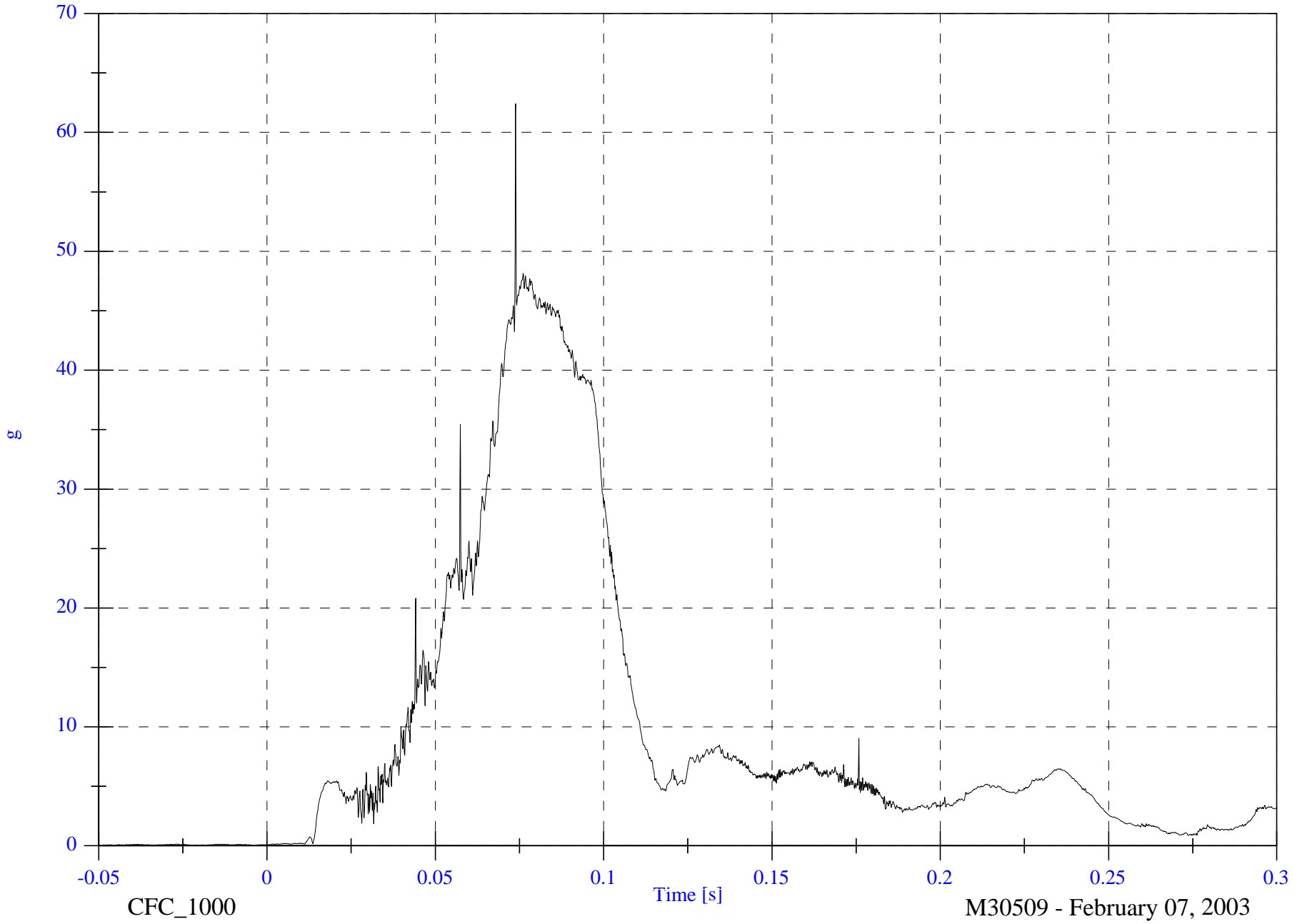
V1P2 Head CG Resultant

Max: 62.4 [g] at 0.074 [s]

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

B-71

8642-NCAP-29



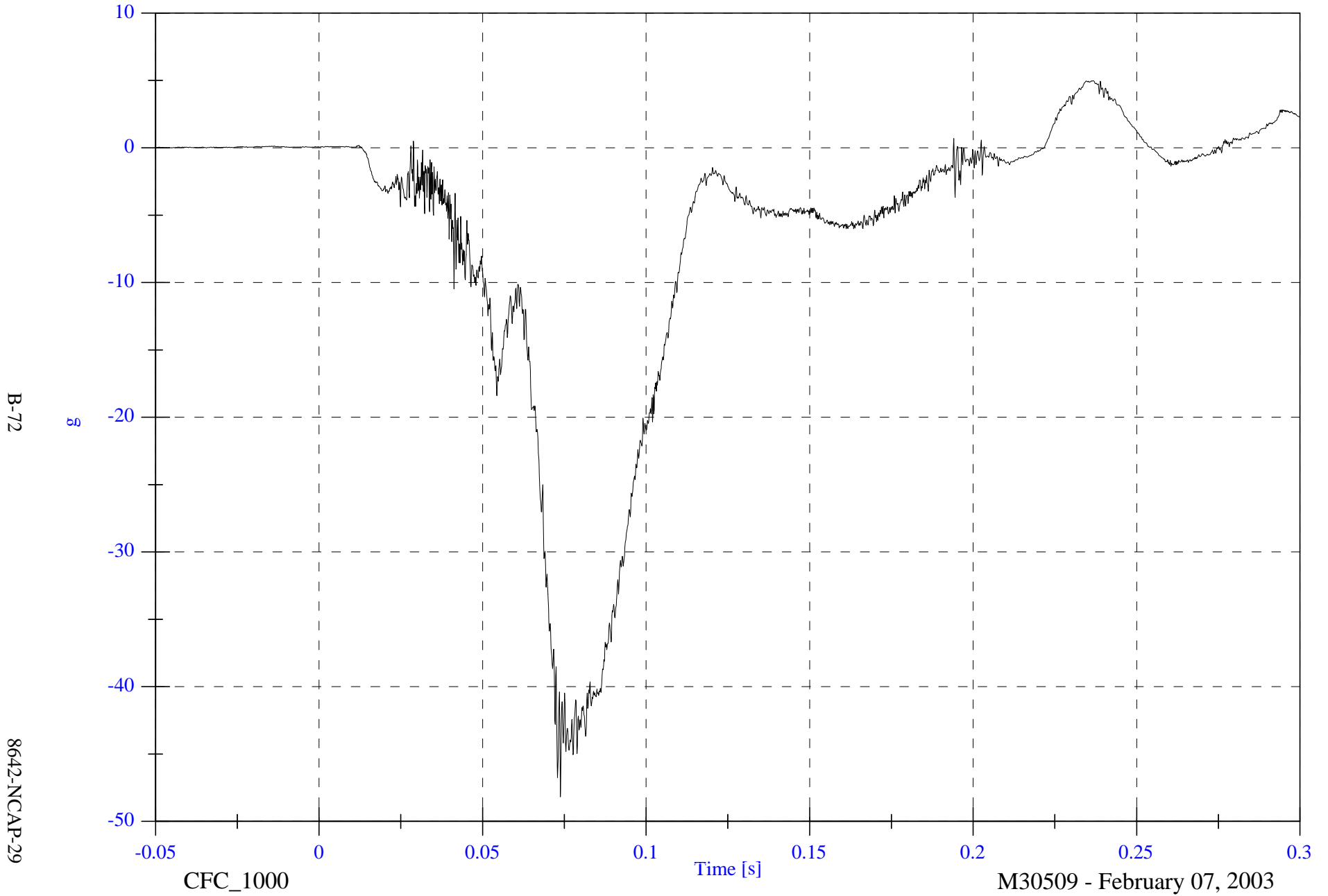
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Head CG Red x

Max: 5.0 [g] at 0.236 [s]

Min: -48.2 [g] at 0.074 [s]



B-72

8642-NCAP-29

NCAP Test #7 - 2003 Mercedes E320

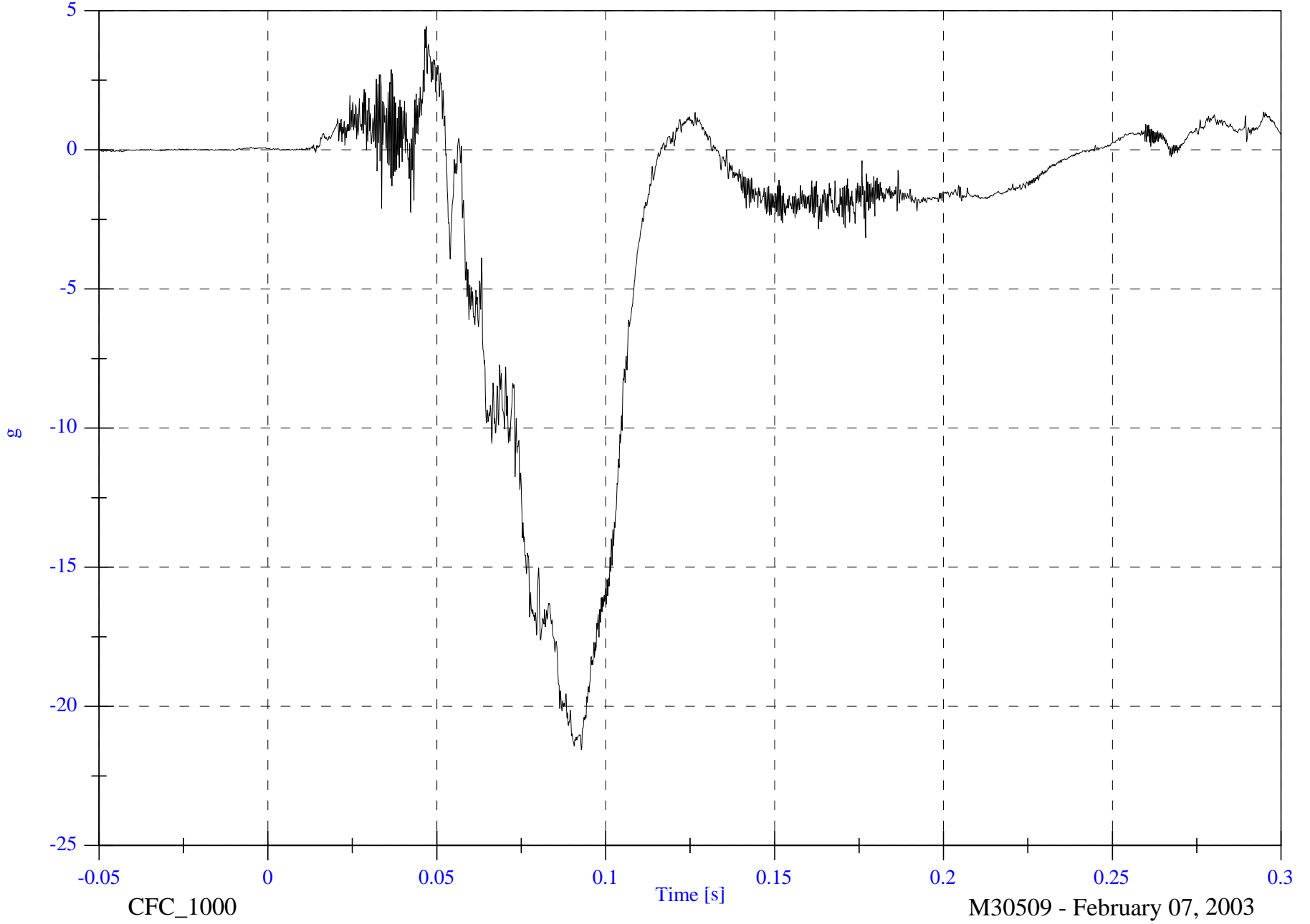
V1P2 Head CG Red y

Max: 4.4 [g] at 0.047 [s]

Min: -21.5 [g] at 0.093 [s]

B-73

8642-NCAP-29

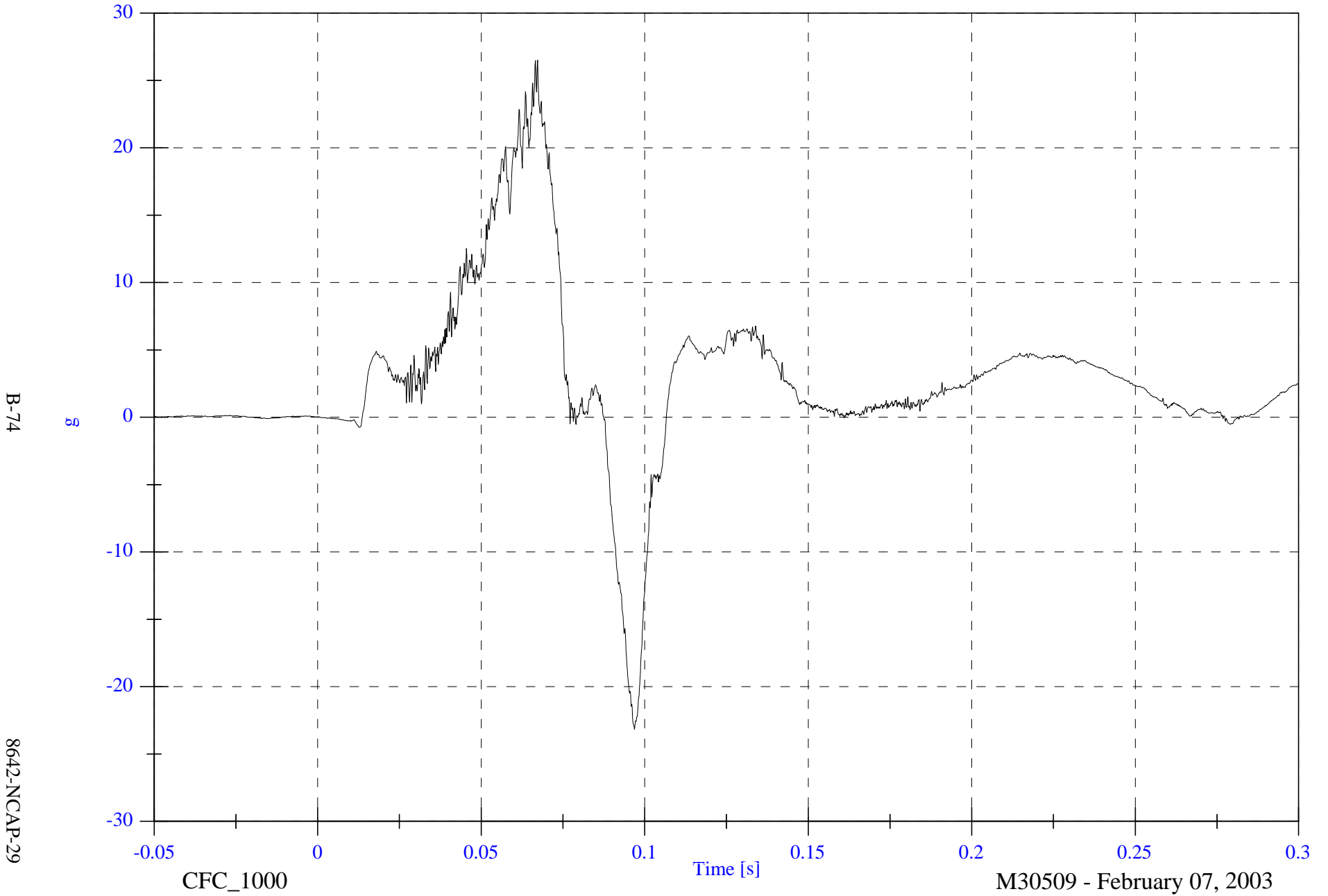


NCAP Test #7 - 2003 Mercedes E320

V1P2 Head CG Red z

Max: 26.5 [g] at 0.067 [s]

Min: -23.2 [g] at 0.097 [s]



NCAP Test #7 - 2003 Mercedes E320

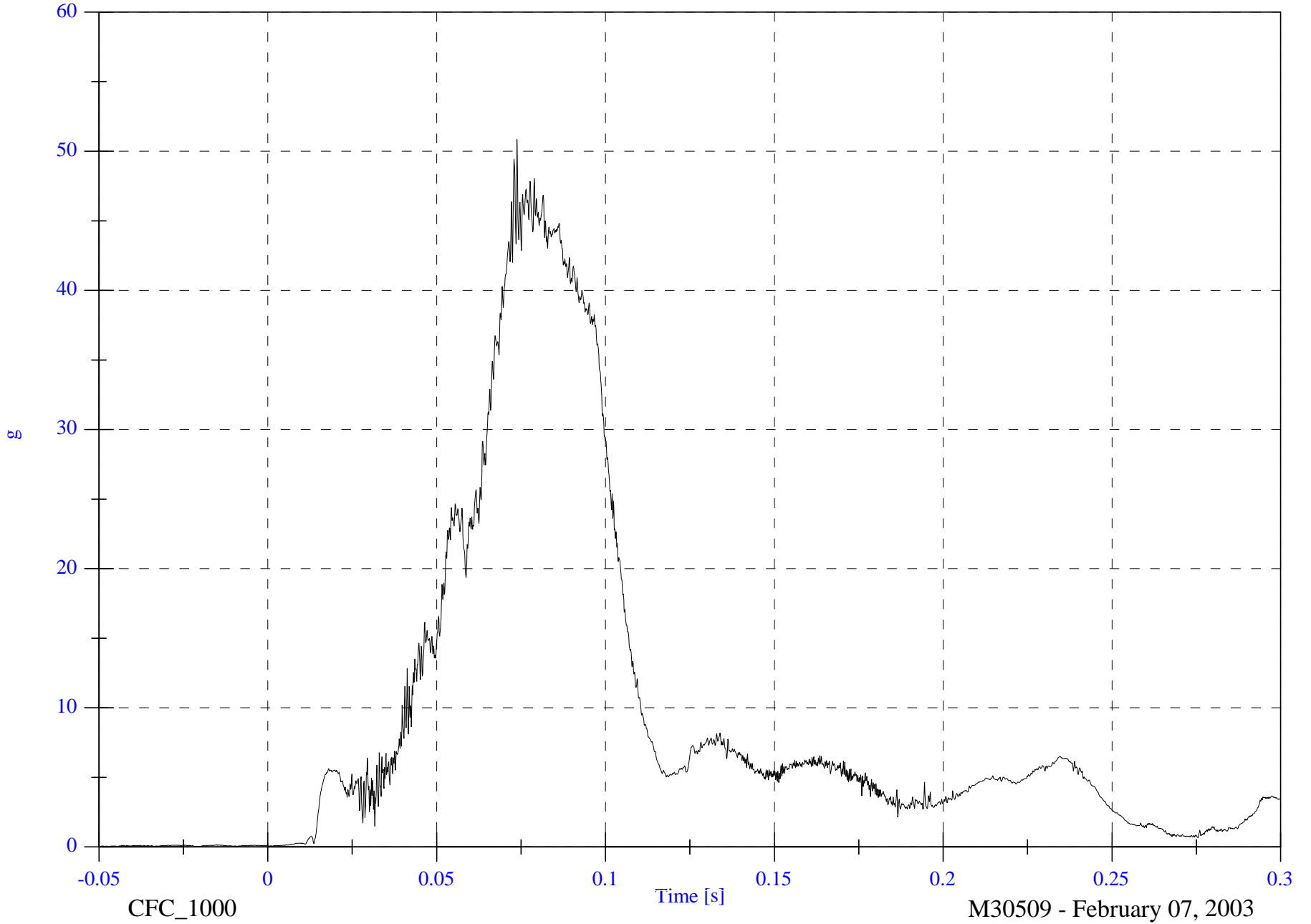
V1P2 Head CG Red Resultant

Max: 50.9 [g] at 0.074 [s]

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

B-75

8642-NCAP-29

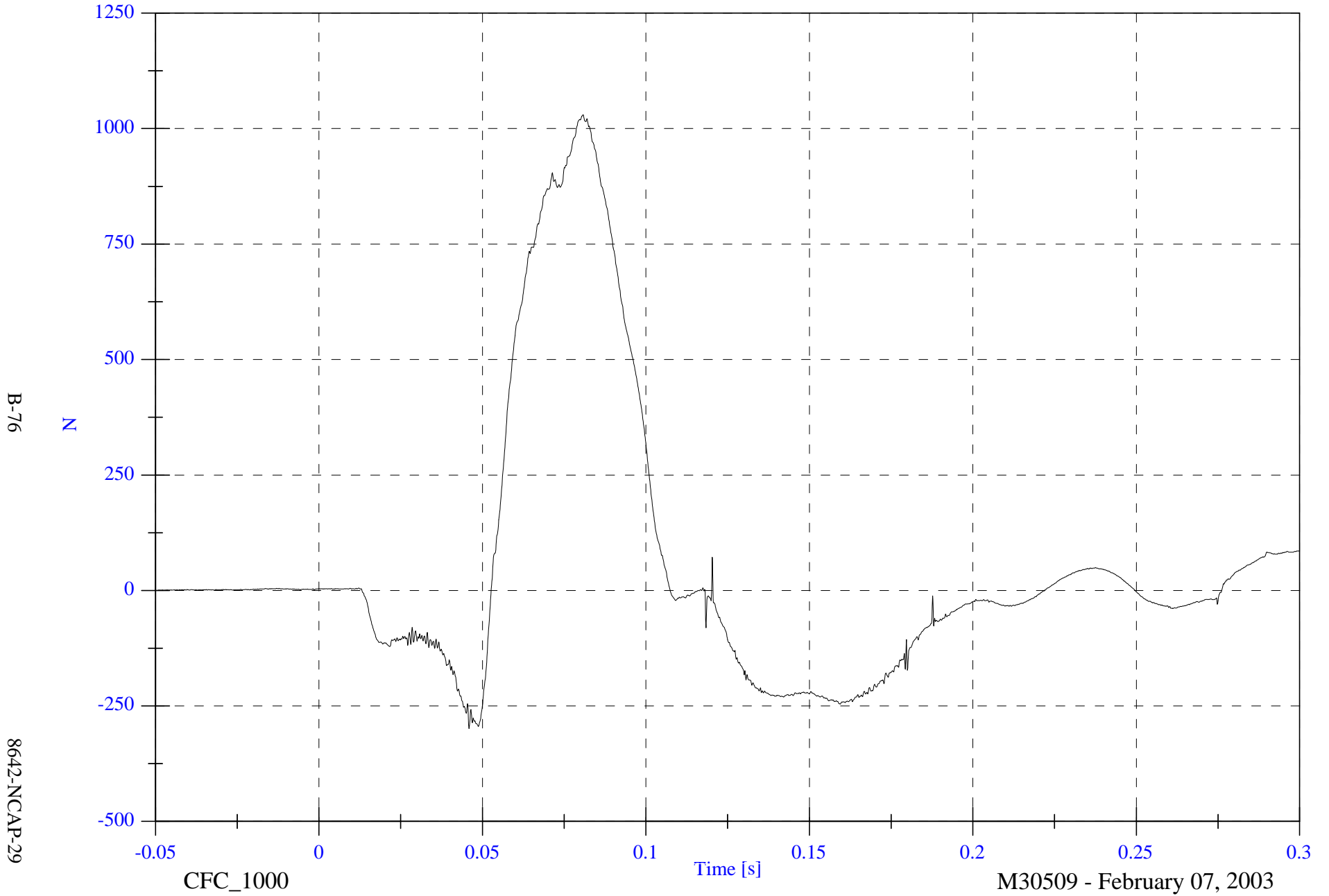


NCAP Test #7 - 2003 Mercedes E320

Max: 1030.0 [N] at 0.081 [s]

Min: -298.9 [N] at 0.046 [s]

V1P2 Upper Neck Fx

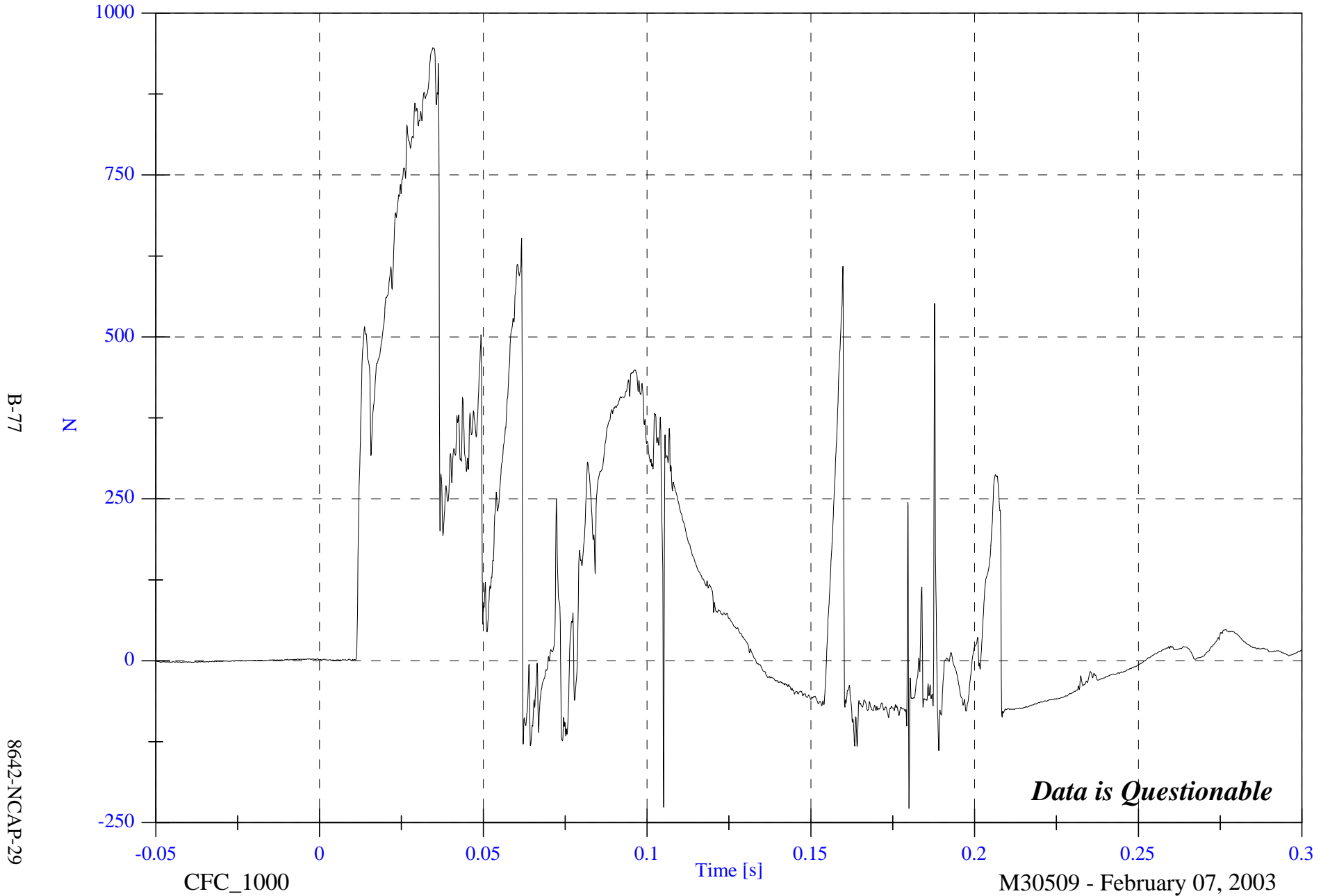


NCAP Test #7 - 2003 Mercedes E320

Max: 946.6 [N] at 0.035 [s]

Min: -227.8 [N] at 0.180 [s]

V1P2 Upper Neck Fy



B-77

8642-NCAP-29

CFC_1000

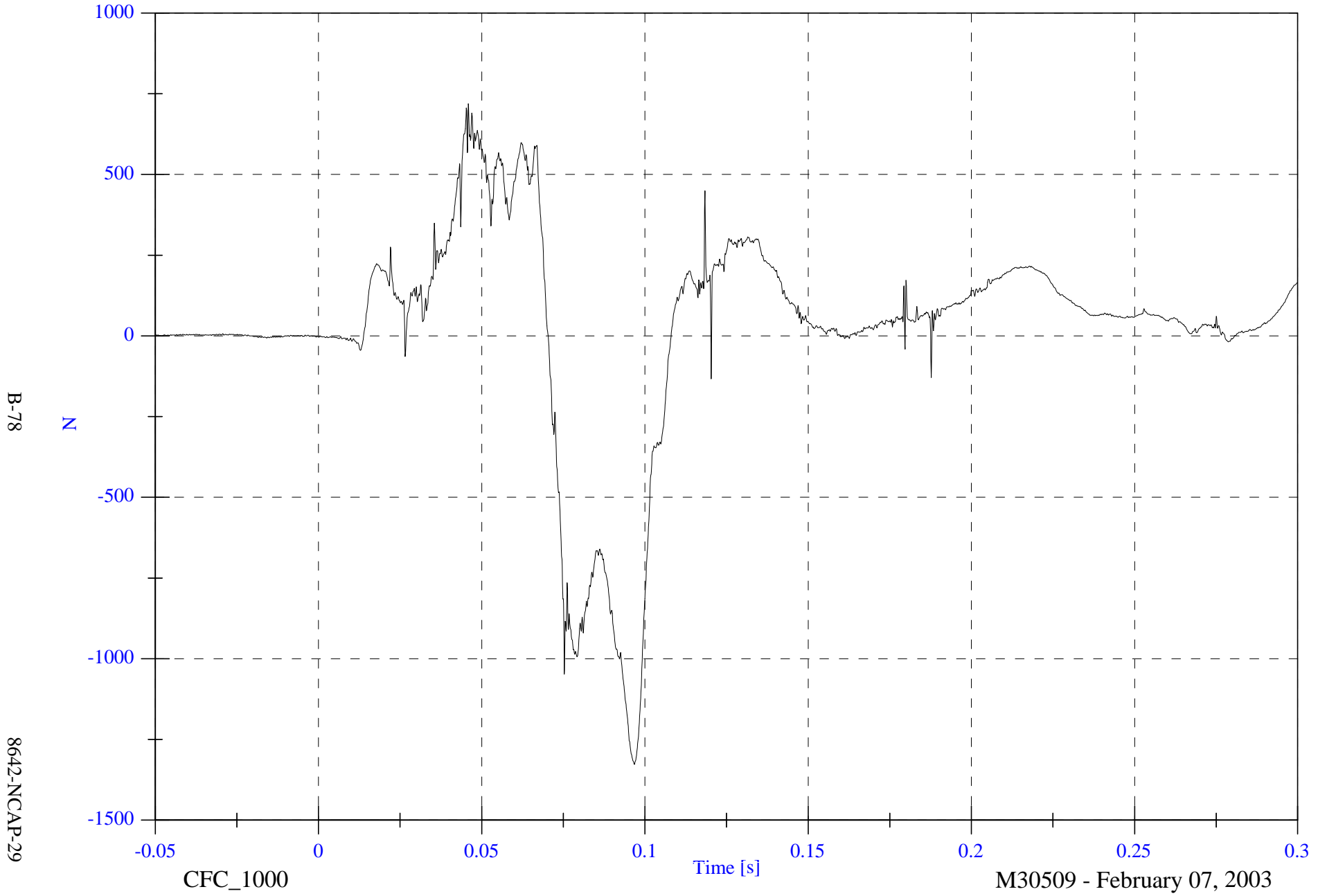
Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Upper Neck Fz

Max: 719.2 [N] at 0.046 [s]
Min: -1327.8 [N] at 0.097 [s]



B-78

8642-NCAP-29

CFC_1000

Time [s]

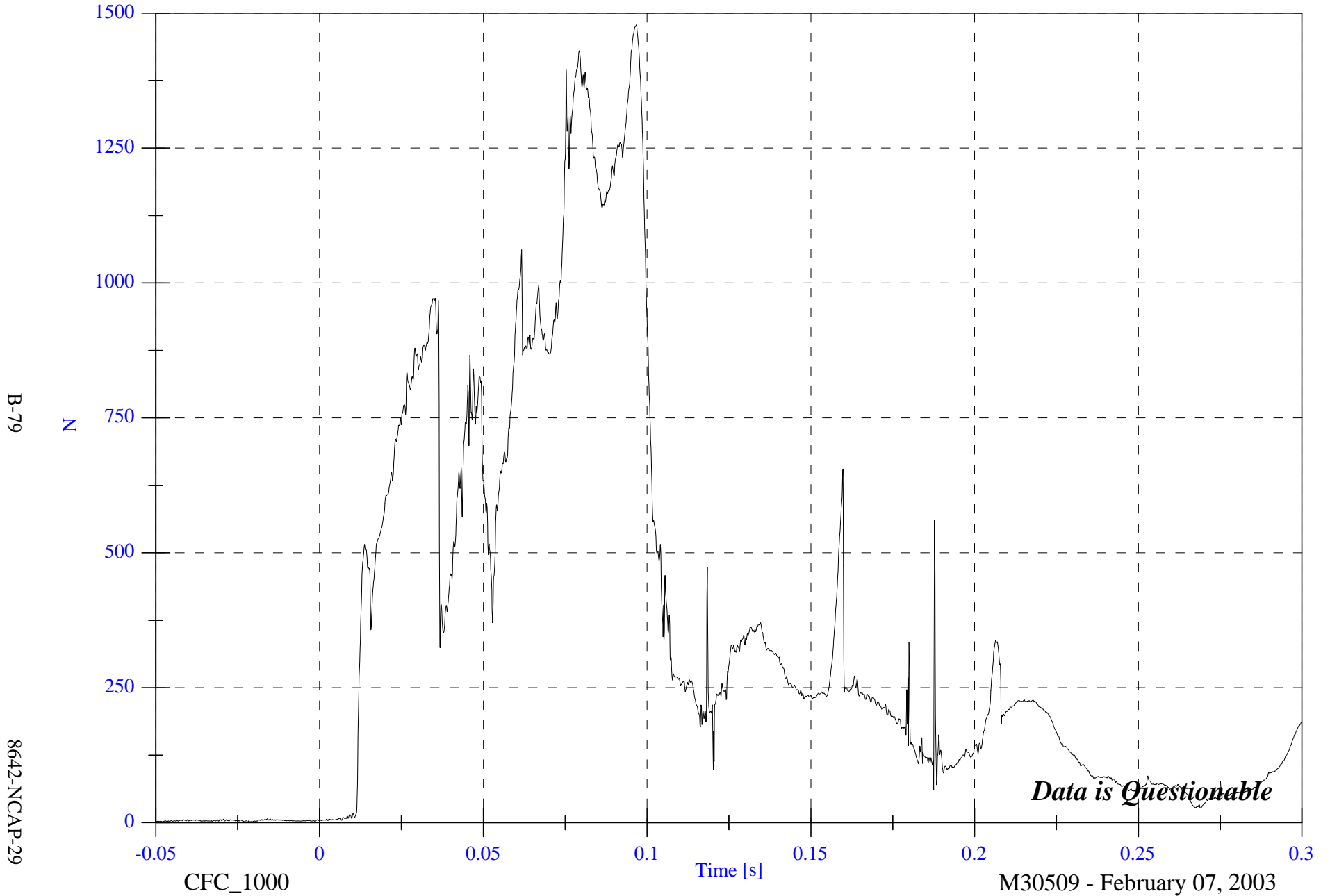
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 1478.1 [N] at 0.097 [s]

V1P2 Upper Neck F Resultant

Min: 1.3 [N] at -0.022 [s]



B-79

8642-NCAP-29

CFC_1000

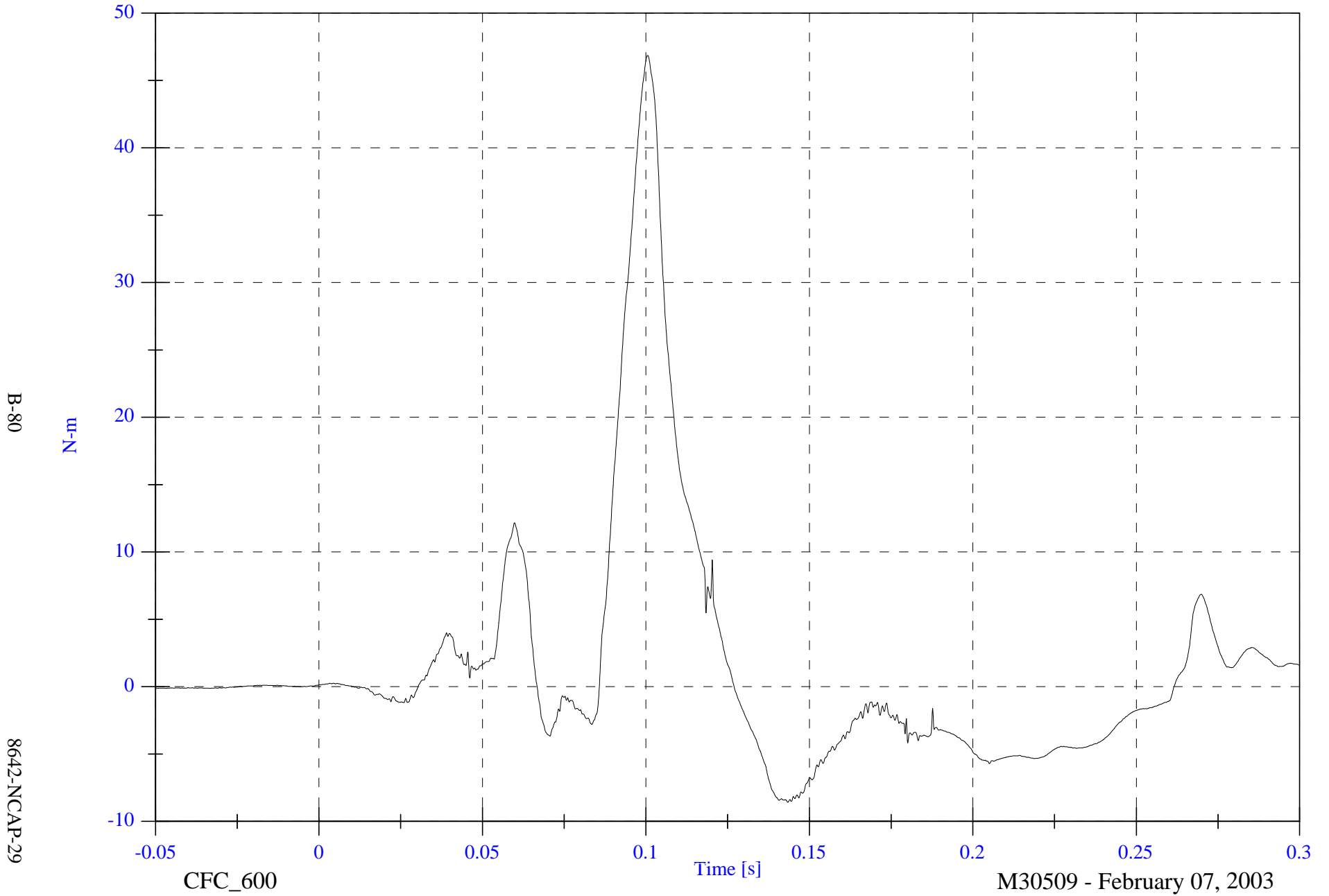
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 46.9 [N-m] at 0.101 [s]

Min: -8.6 [N-m] at 0.143 [s]

V1P2 Upper Neck Mx



B-80

8642-NCAP-29

NCAP Test #7 - 2003 Mercedes E320

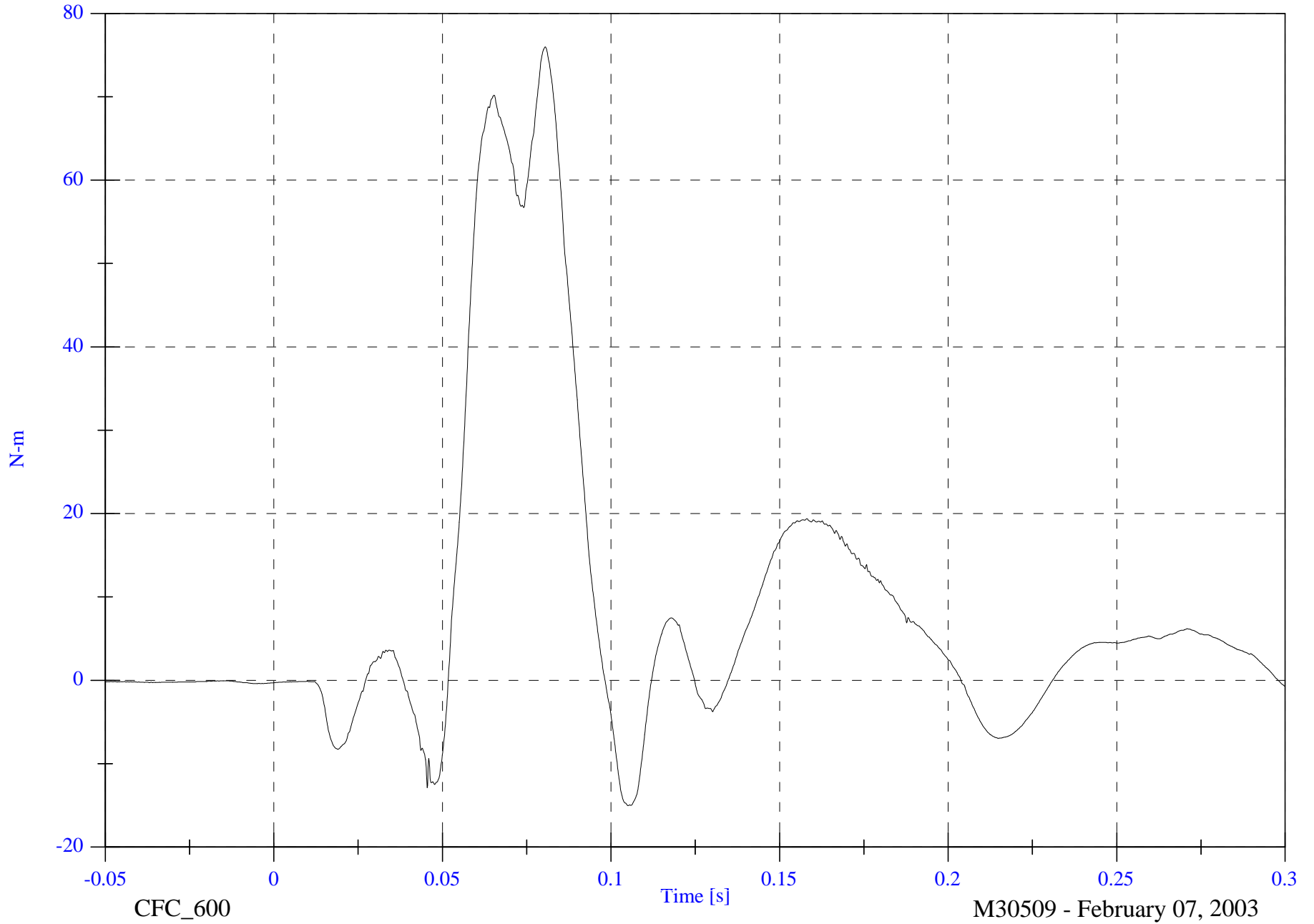
V1P2 Upper Neck My

Max: 76.0 [N-m] at 0.081 [s]

Min: -15.0 [N-m] at 0.105 [s]

B-81

8642-NCAP-29

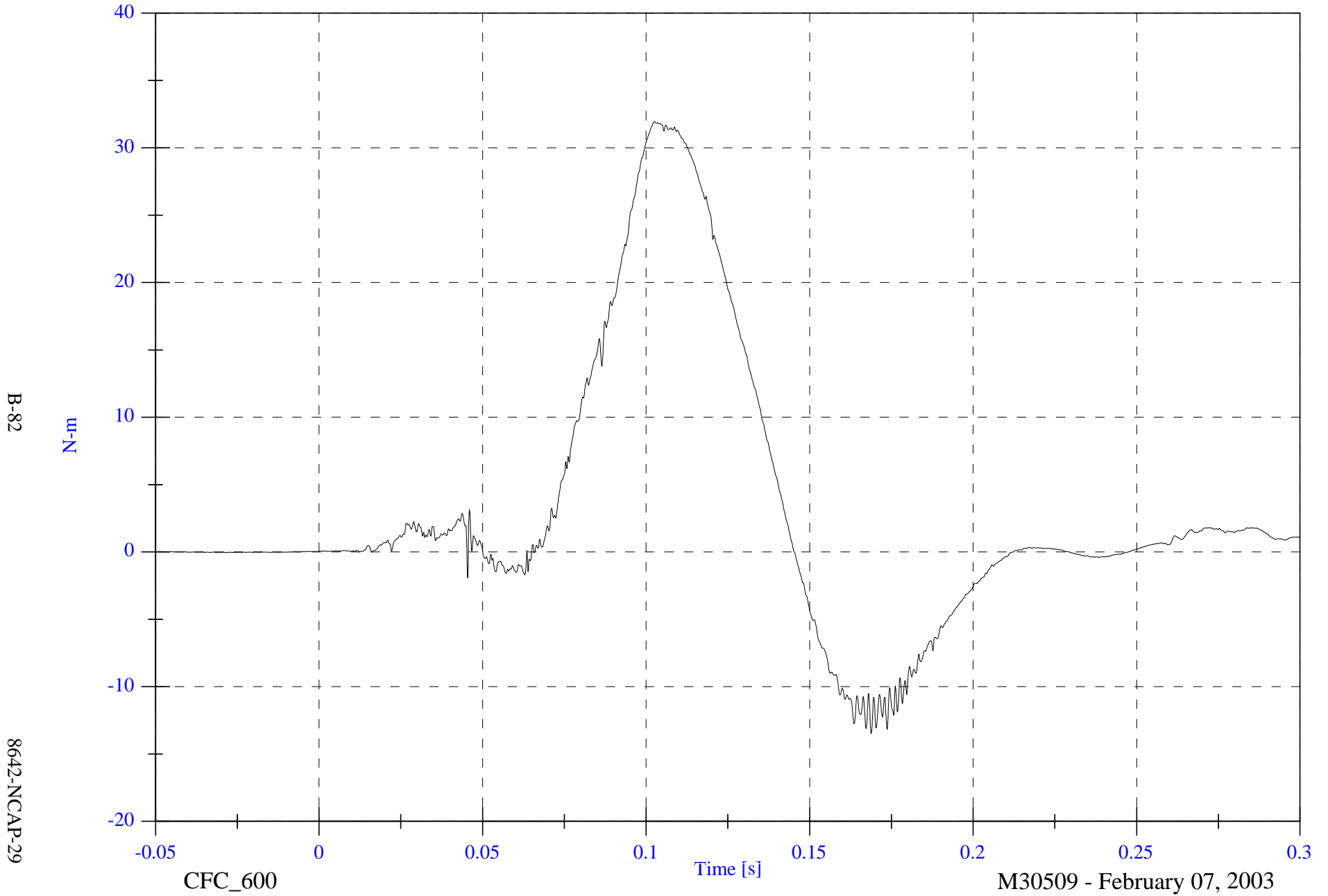


NCAP Test #7 - 2003 Mercedes E320

Max: 31.9 [N-m] at 0.103 [s]

Min: -13.5 [N-m] at 0.169 [s]

V1P2 Upper Neck Mz



B-82

8642-NCAP-29

CFC_600

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

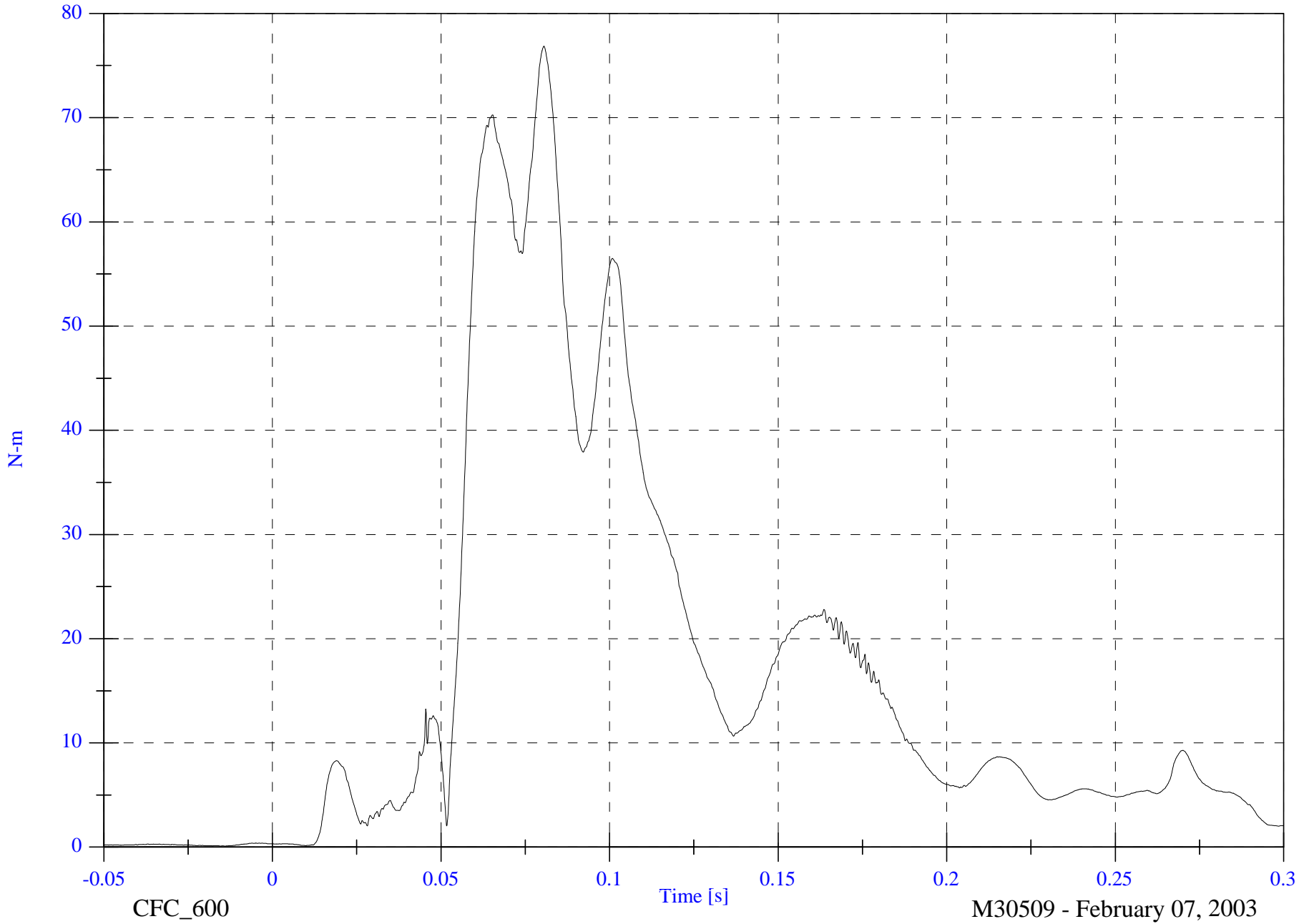
V1P2 Upper Neck M Resultant

Max: 76.9 [N-m] at 0.081 [s]

Min: 0.1 [N-m] at -0.014 [s]

B-83

8642-NCAP-29



CFC_600

Time [s]

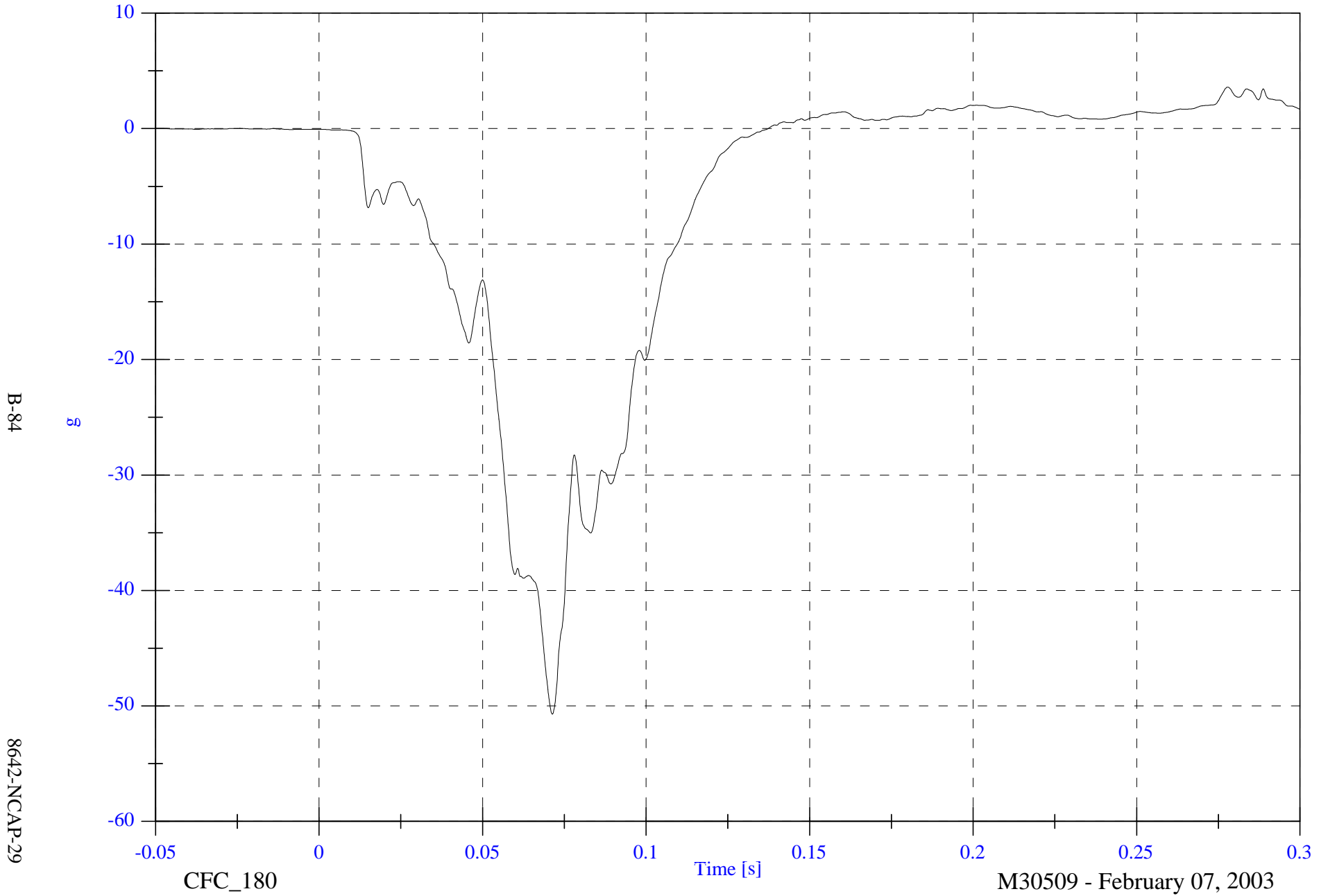
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Chest x

Max: 3.6 [g] at 0.278 [s]

Min: -50.7 [g] at 0.071 [s]

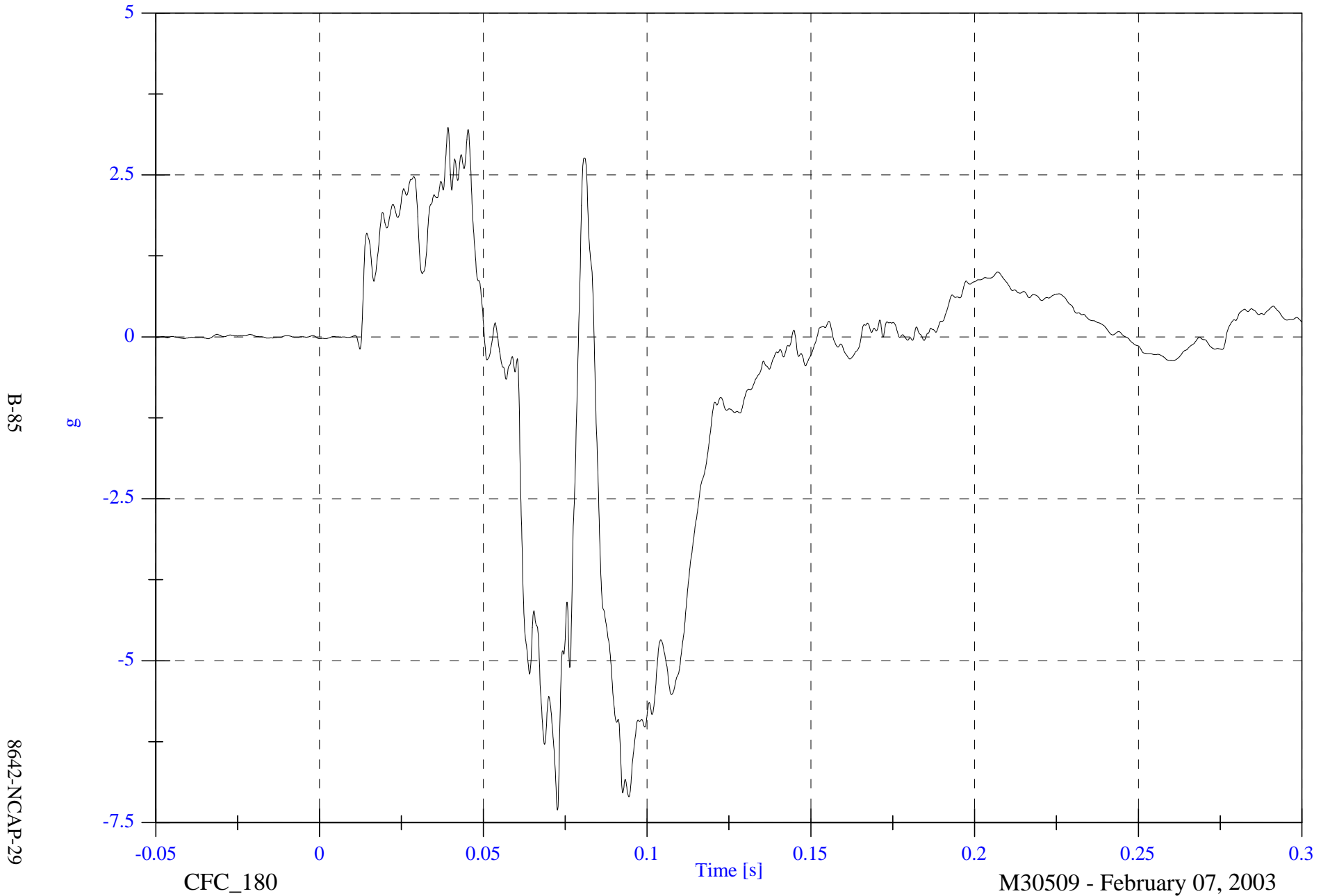


NCAP Test #7 - 2003 Mercedes E320

V1P2 Chest y

Max: 3.2 [g] at 0.039 [s]

Min: -7.3 [g] at 0.073 [s]

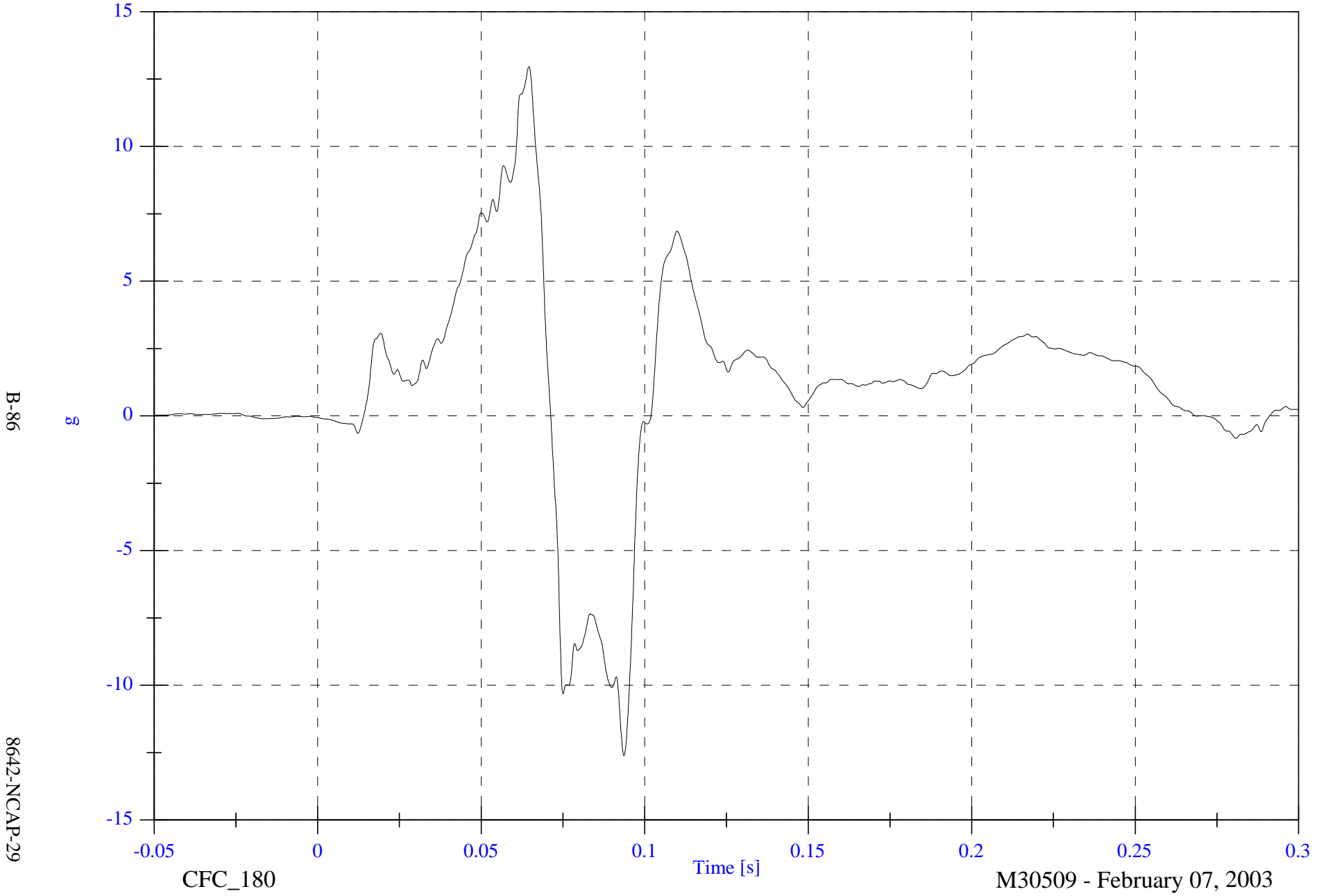


NCAP Test #7 - 2003 Mercedes E320

VIP2 Chest z

Max: 13.0 [g] at 0.065 [s]

Min: -12.6 [g] at 0.094 [s]



B-86

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

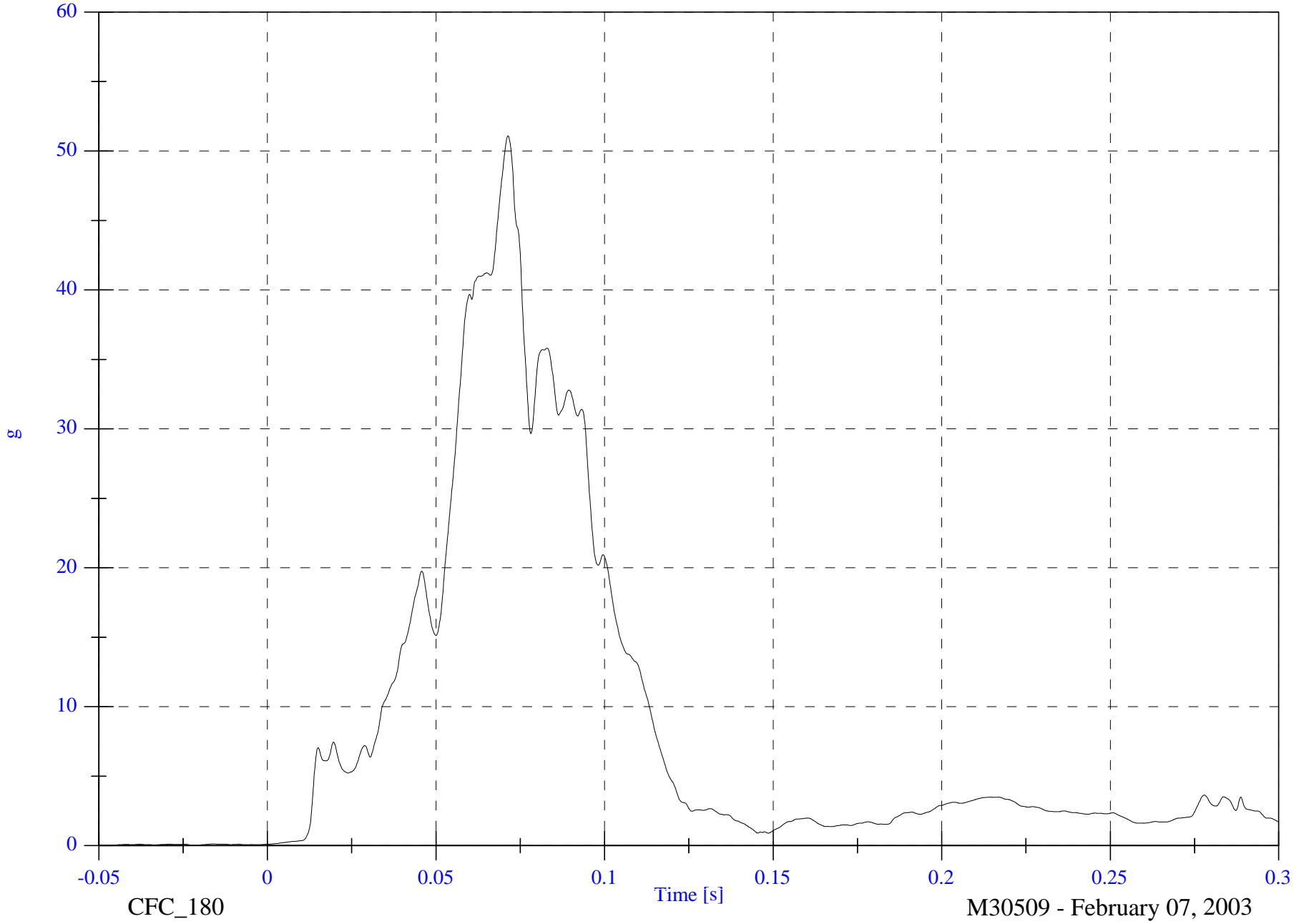
V1P2 Chest Resultant

Max: 51.1 [g] at 0.071 [s]

Min: 0.0 [g] at -0.048 [s]

B-87

8642-NCAP-29



CFC_180

Time [s]

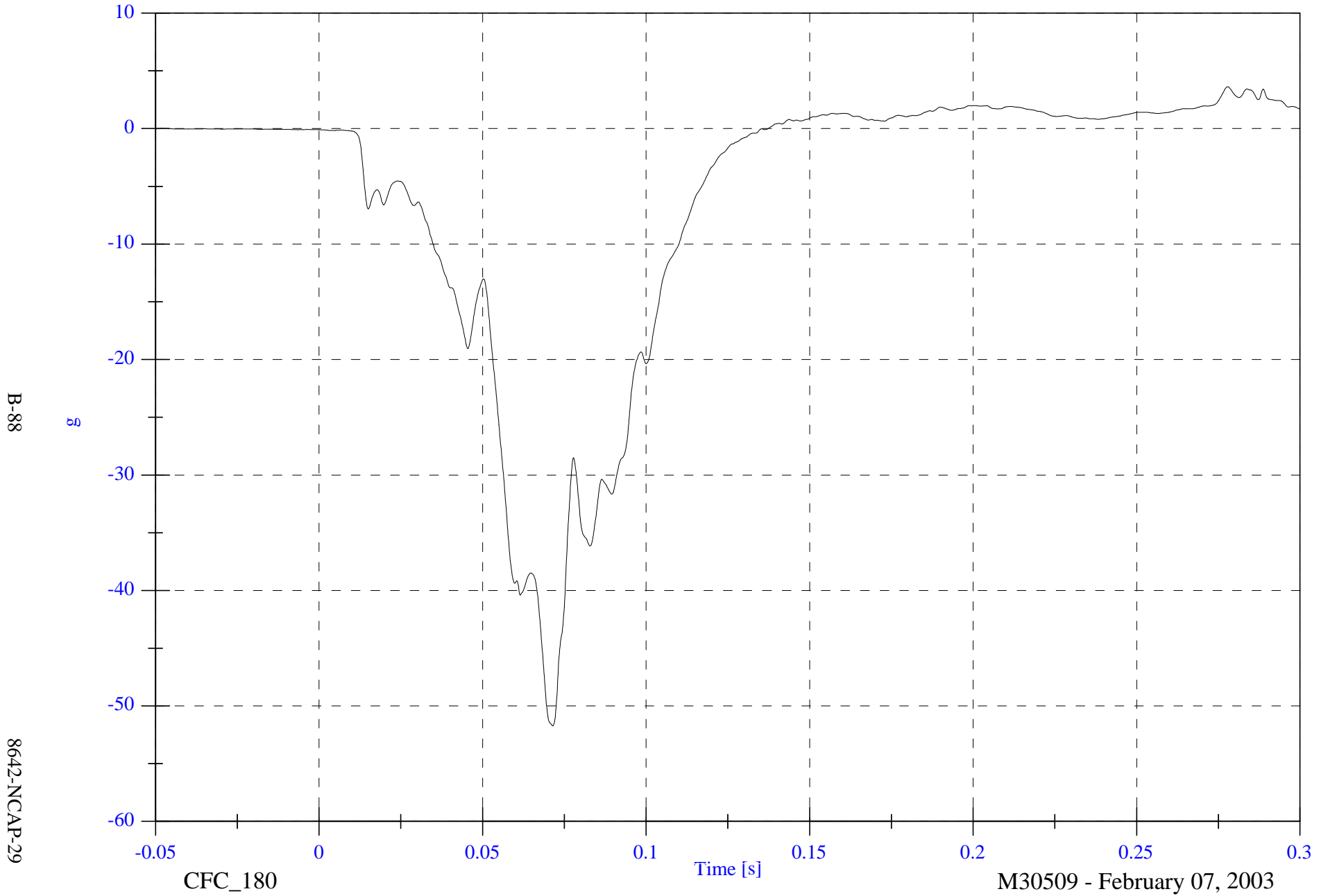
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Chest Red x

Max: 3.6 [g] at 0.278 [s]

Min: -51.7 [g] at 0.072 [s]

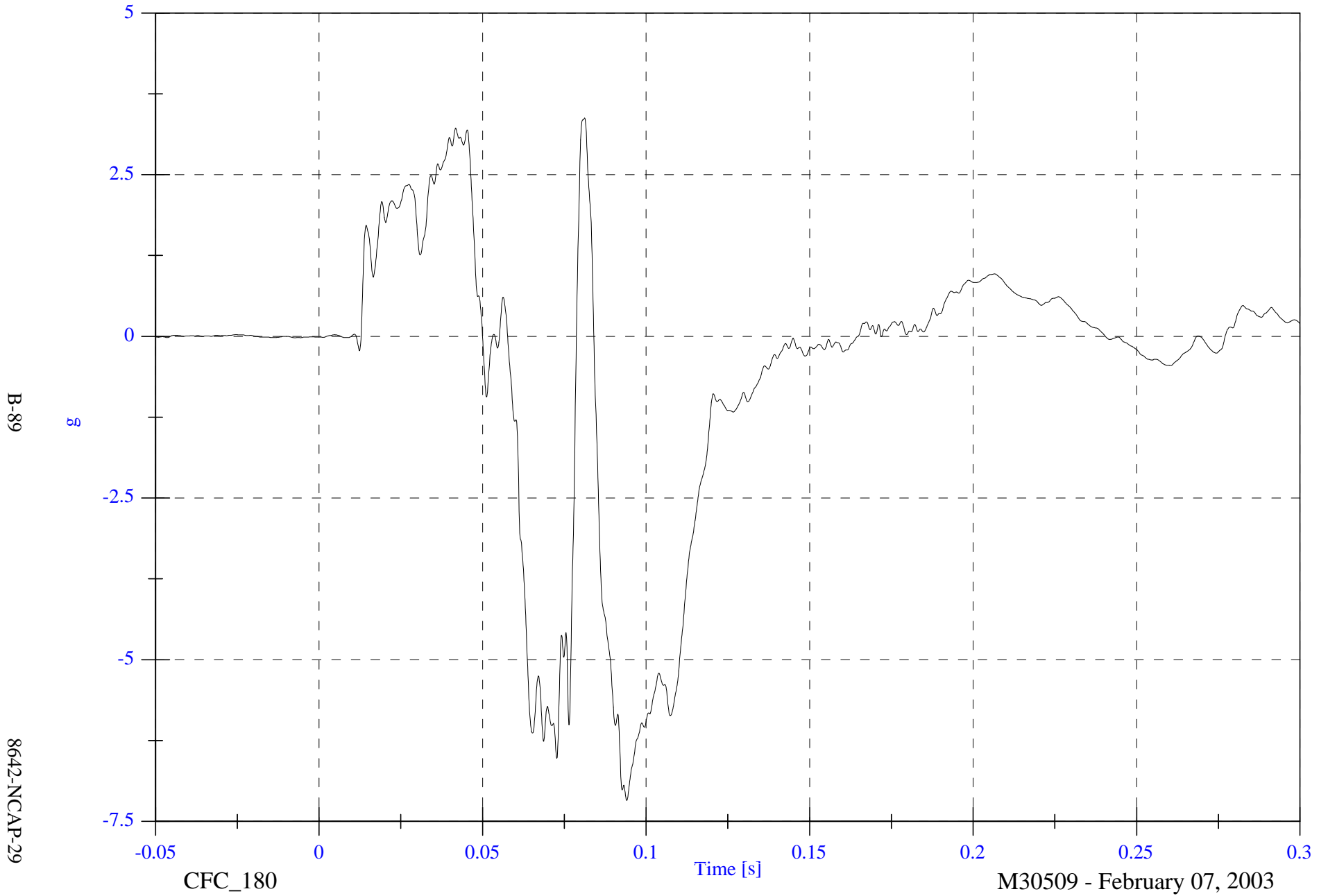


NCAP Test #7 - 2003 Mercedes E320

V1P2 Chest Red y

Max: 3.4 [g] at 0.081 [s]

Min: -7.2 [g] at 0.094 [s]

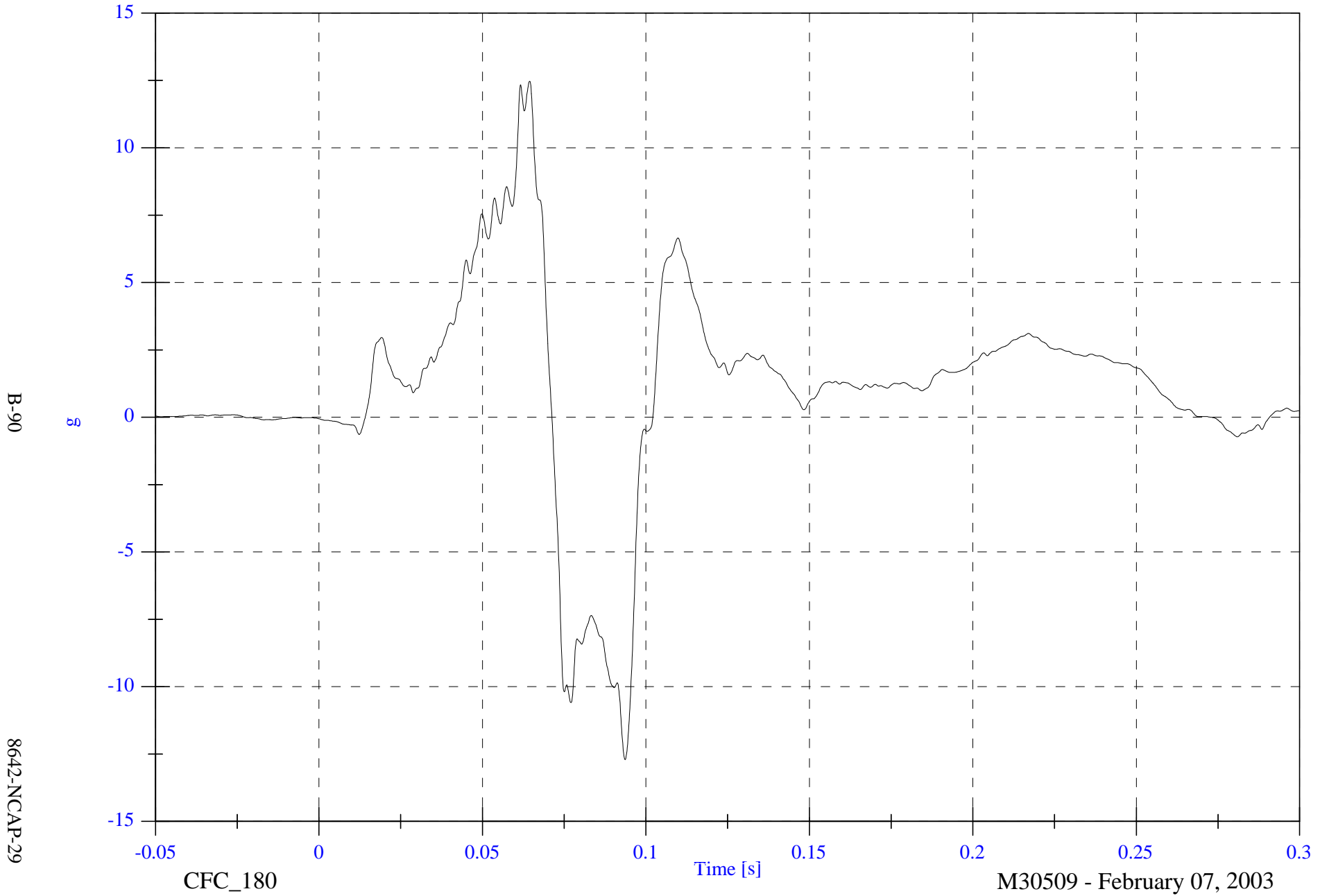


NCAP Test #7 - 2003 Mercedes E320

VIP2 Chest Red z

Max: 12.5 [g] at 0.064 [s]

Min: -12.7 [g] at 0.094 [s]



B-90

8642-NCAP-29

CFC_180

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

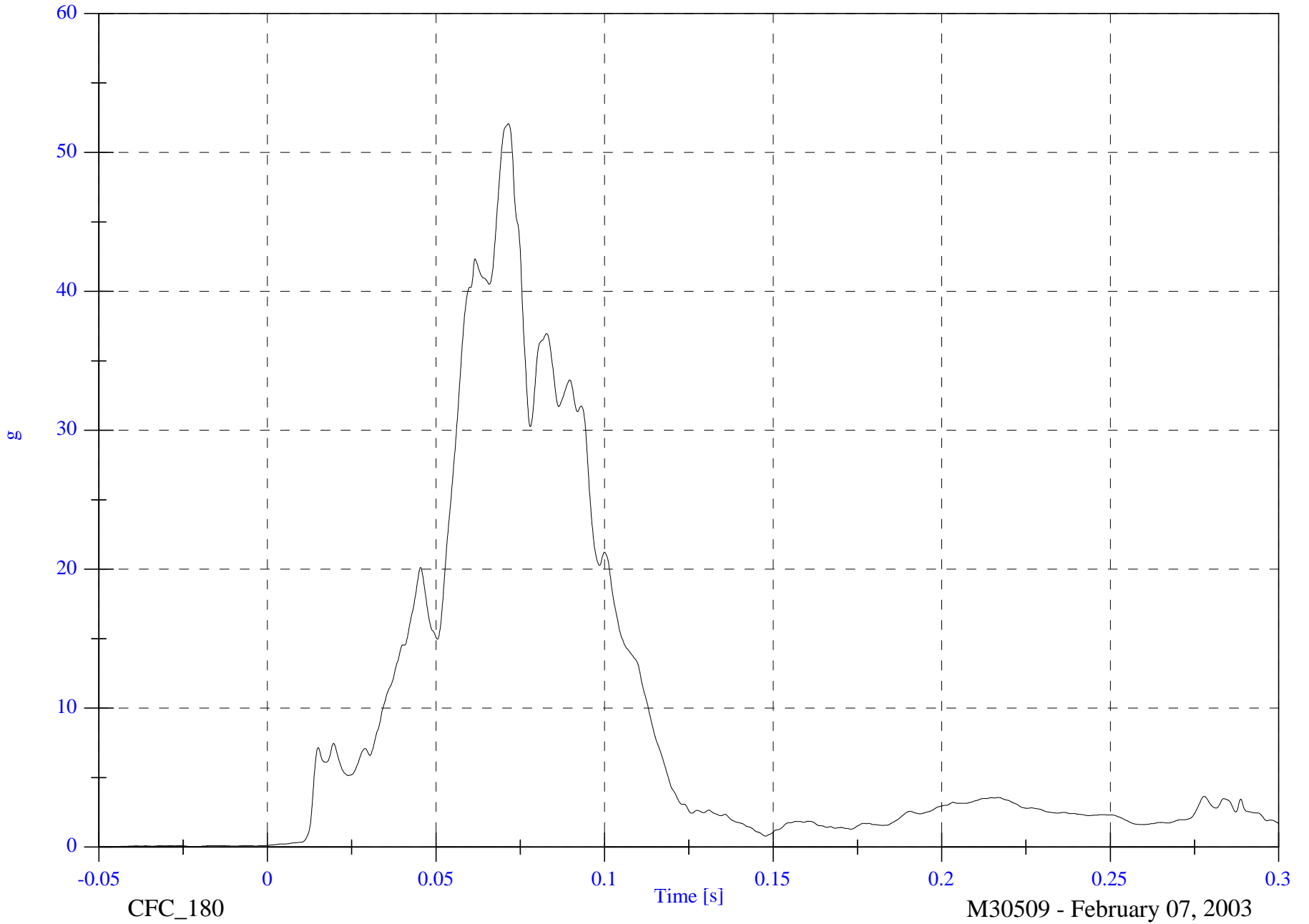
V1P2 Chest Red Resultant

Max: 52.1 [g] at 0.072 [s]

Min: 0.0 [g] at -0.048 [s]

B-91

8642-NCAP-29



CFC_180

Time [s]

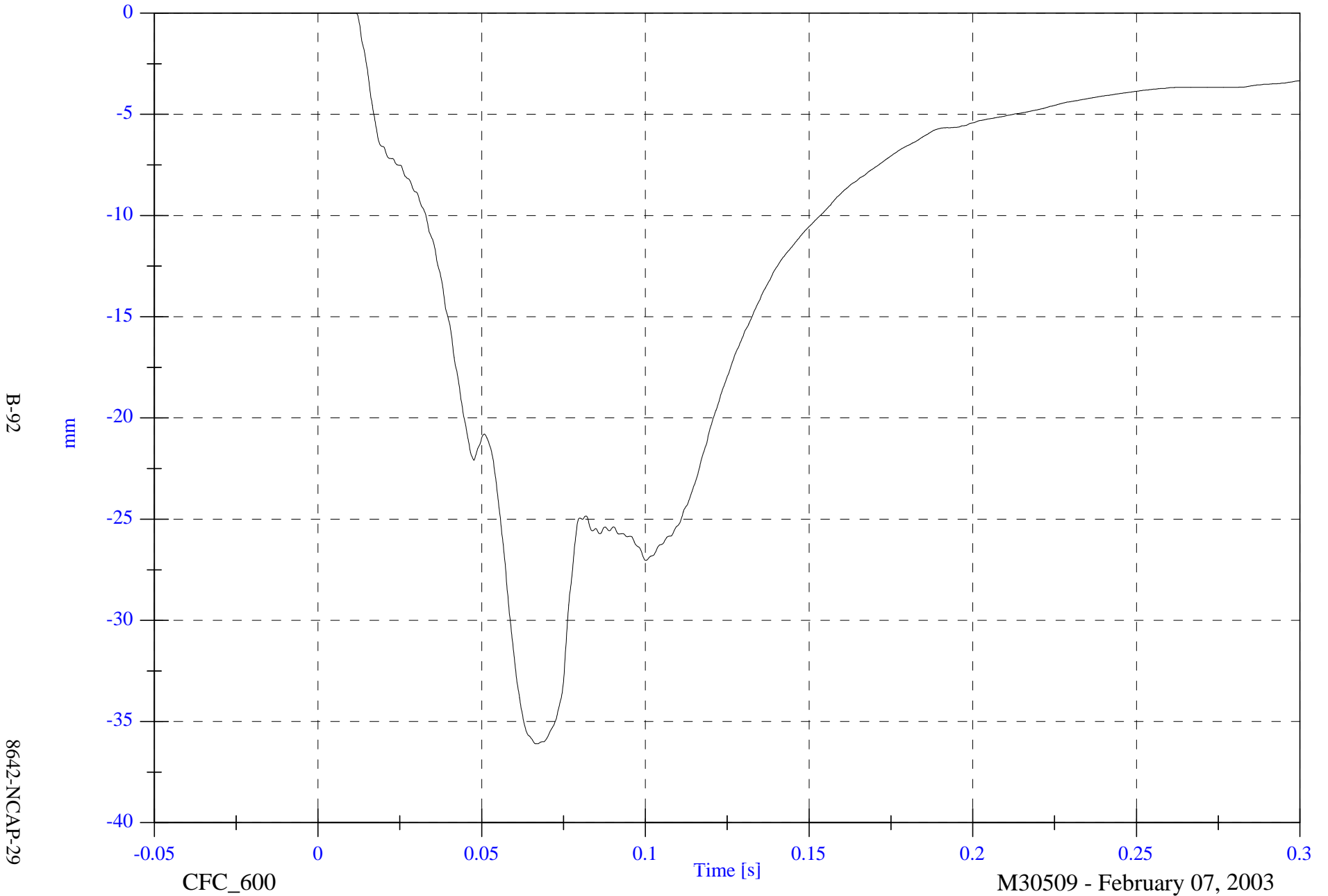
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Chest Compression x

Max: 0.0 [mm] at 0.012 [s]

Min: -36.1 [mm] at 0.067 [s]



B-92

8642-NCAP-29

CFC_600

Time [s]

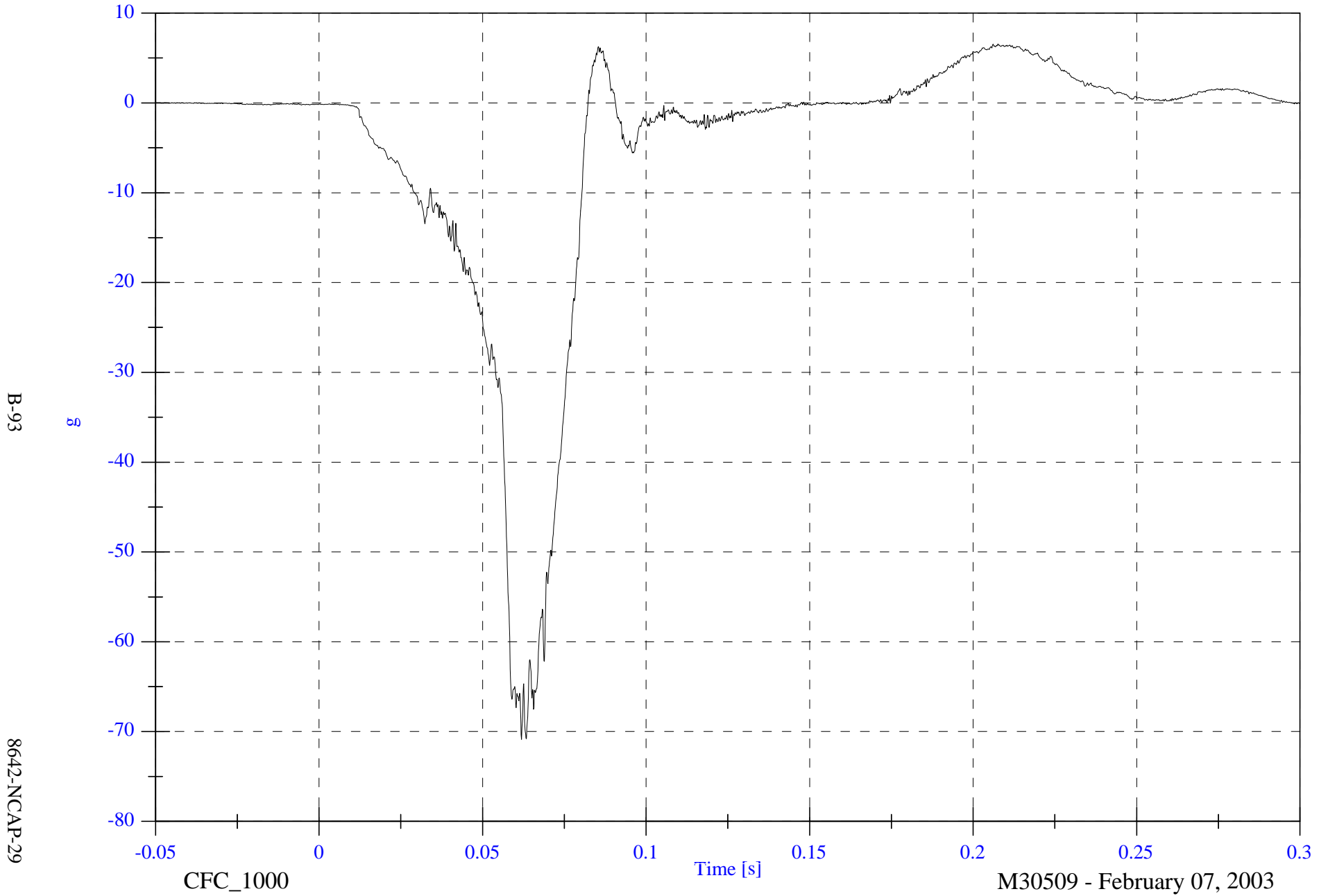
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Pelvic x

Max: 6.6 [g] at 0.208 [s]

Min: -70.9 [g] at 0.062 [s]

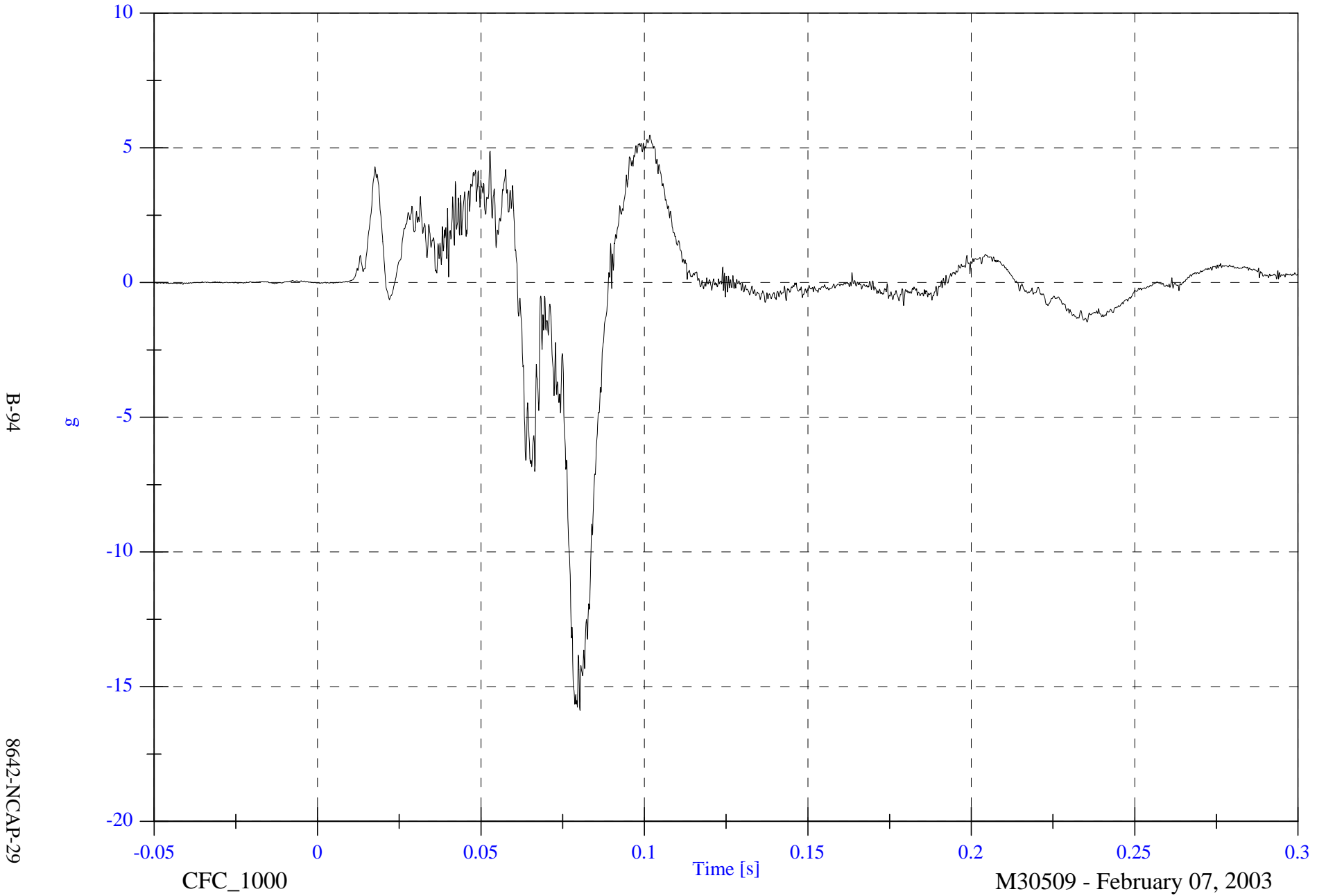


NCAP Test #7 - 2003 Mercedes E320

Max: 5.5 [g] at 0.102 [s]

Min: -15.9 [g] at 0.080 [s]

V1P2 Pelvic y



B-94

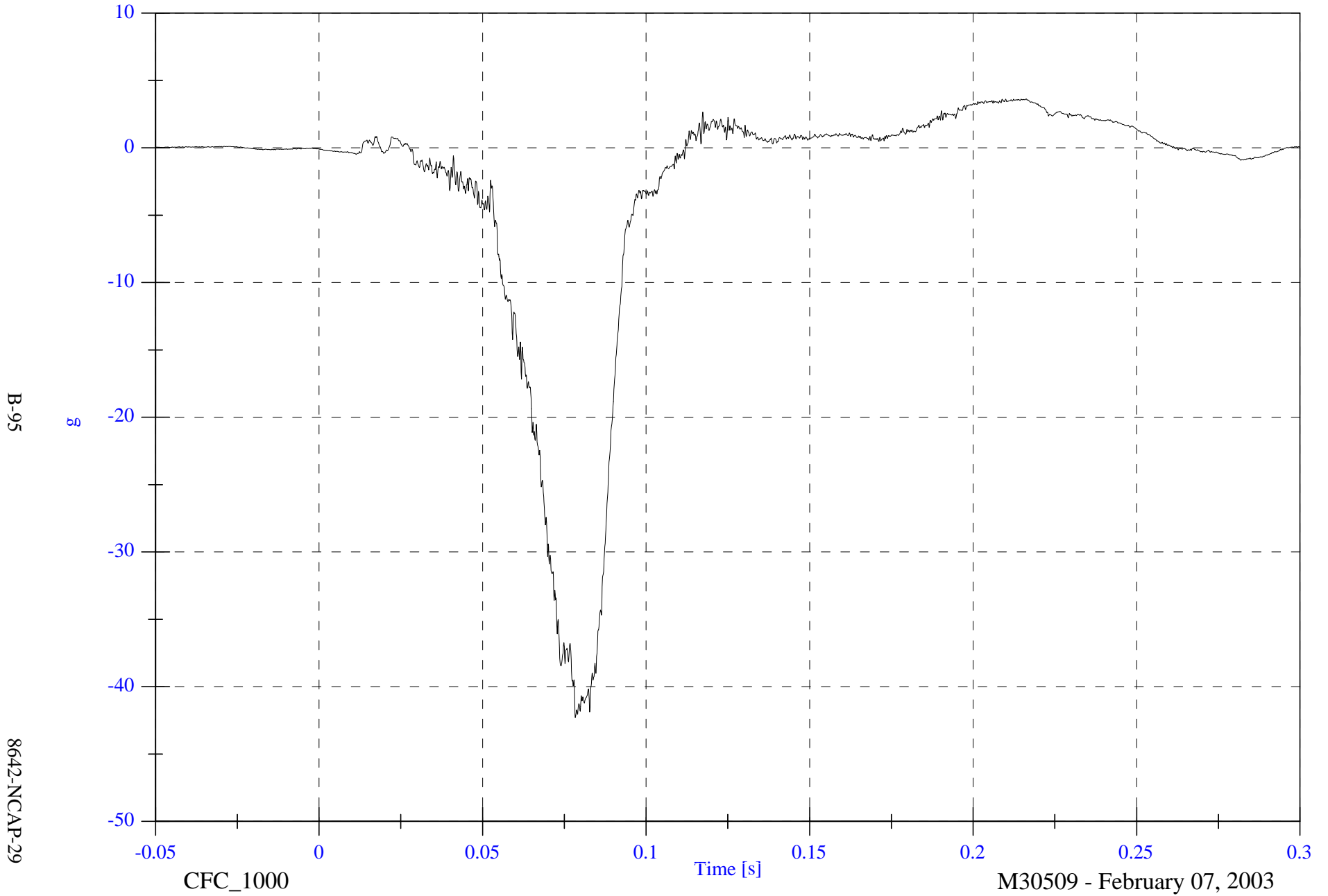
8642-NCAP-29

NCAP Test #7 - 2003 Mercedes E320

V1P2 Pelvic z

Max: 3.6 [g] at 0.216 [s]

Min: -42.3 [g] at 0.078 [s]



B-95

8642-NCAP-29

CFC_1000

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

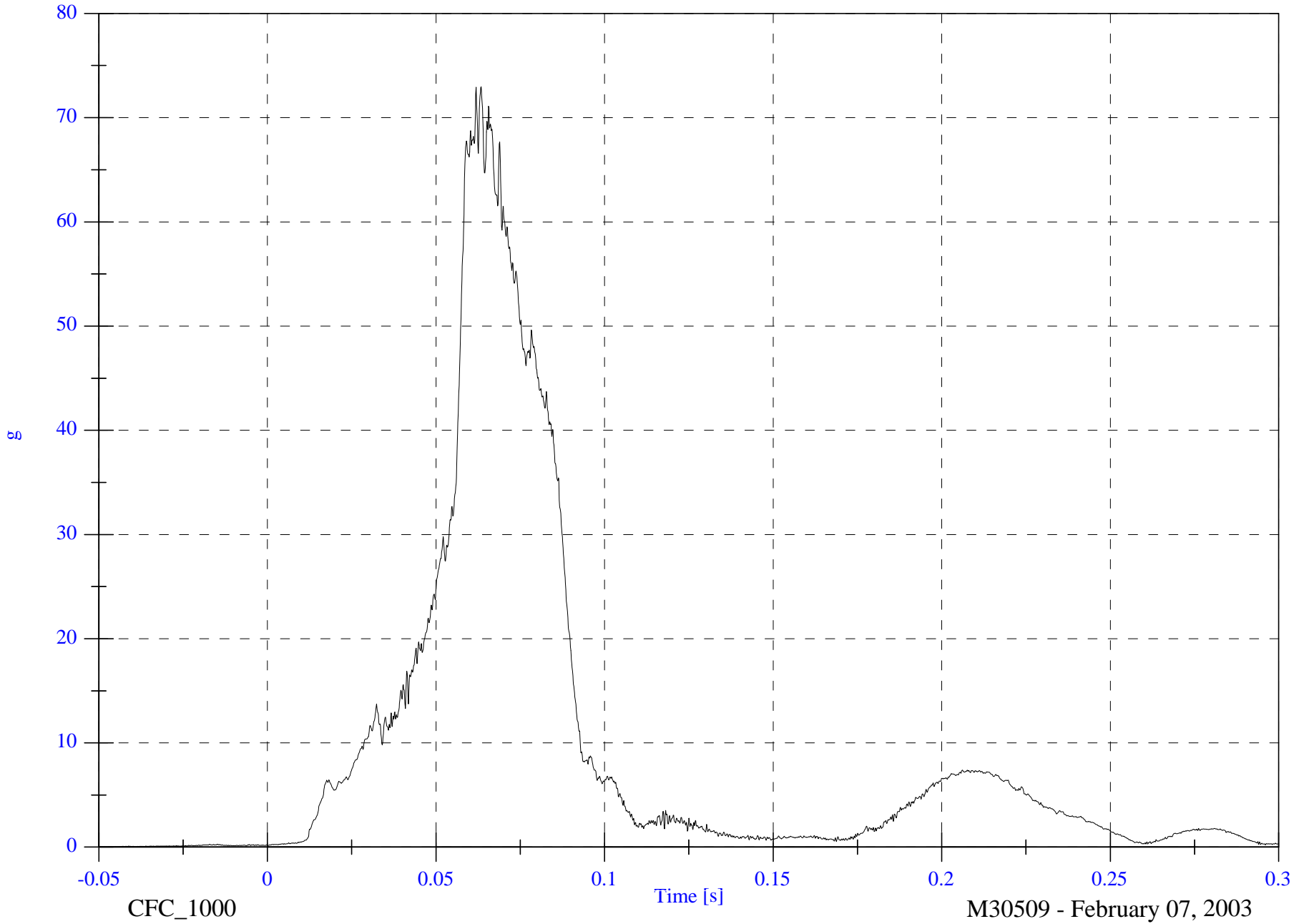
V1P2 Pelvic Resultant

Max: 73.0 [g] at 0.063 [s]

Min: 0.0 [g] at -0.048 [s]

B-96

8642-NCAP-29



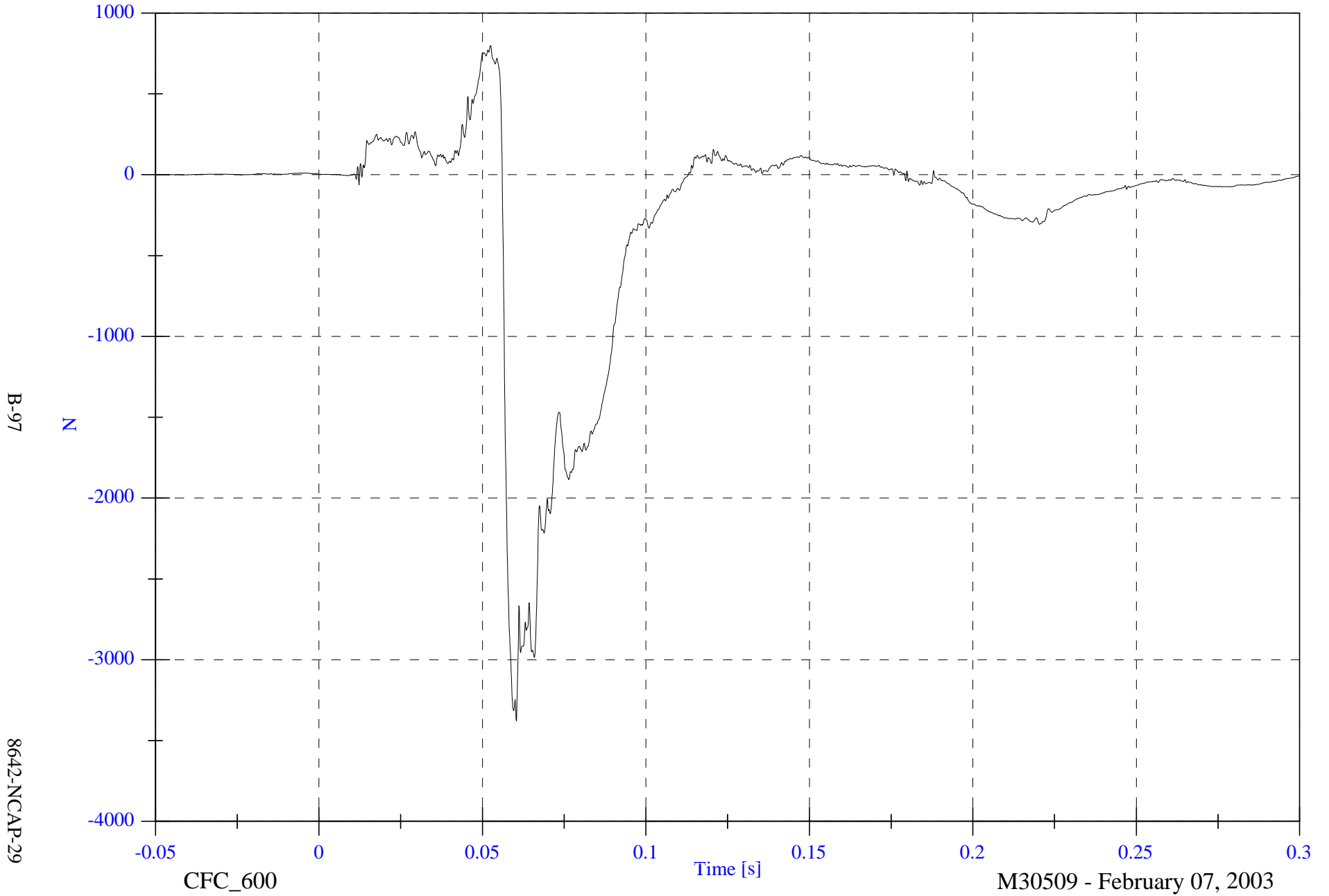
CFC_1000

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Left Femur z

Max: 799.6 [N] at 0.053 [s]
Min: -3379.1 [N] at 0.060 [s]

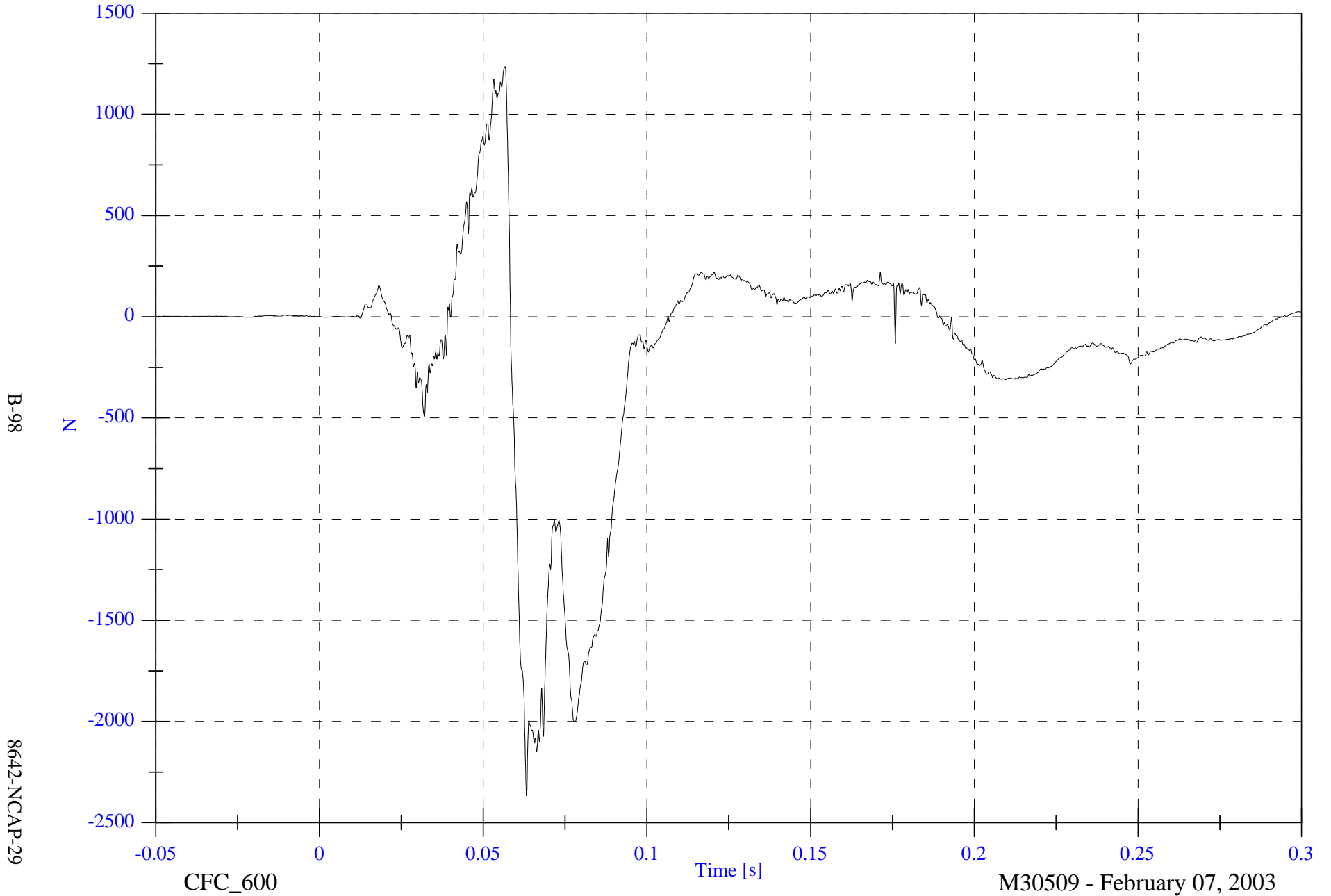


NCAP Test #7 - 2003 Mercedes E320

V1P2 Right Femur z

Max: 1235.9 [N] at 0.057 [s]

Min: -2367.4 [N] at 0.063 [s]

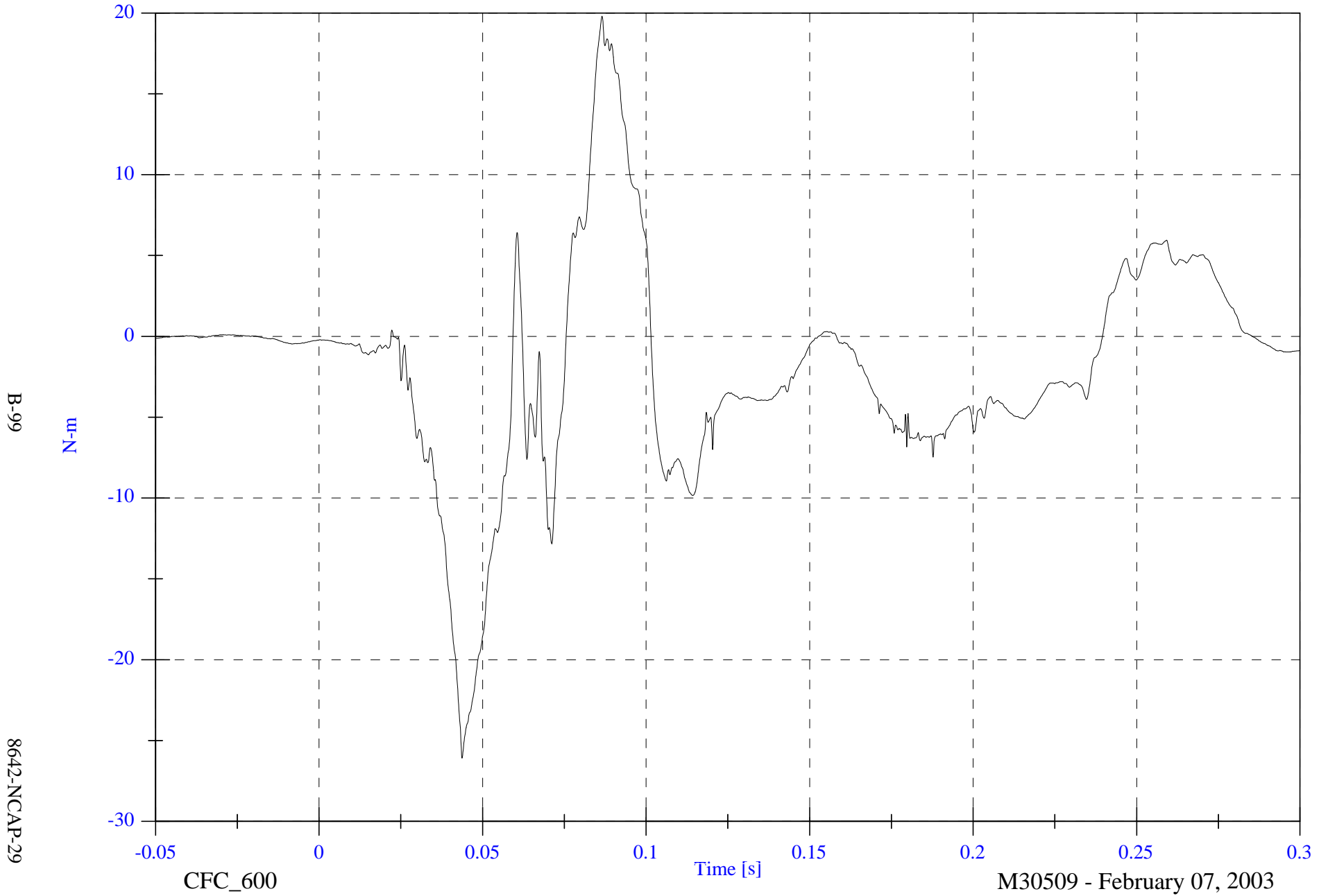


NCAP Test #7 - 2003 Mercedes E320

Max: 19.8 [N-m] at 0.087 [s]

Min: -26.1 [N-m] at 0.044 [s]

V1P2 Left Upper Tibia Mx

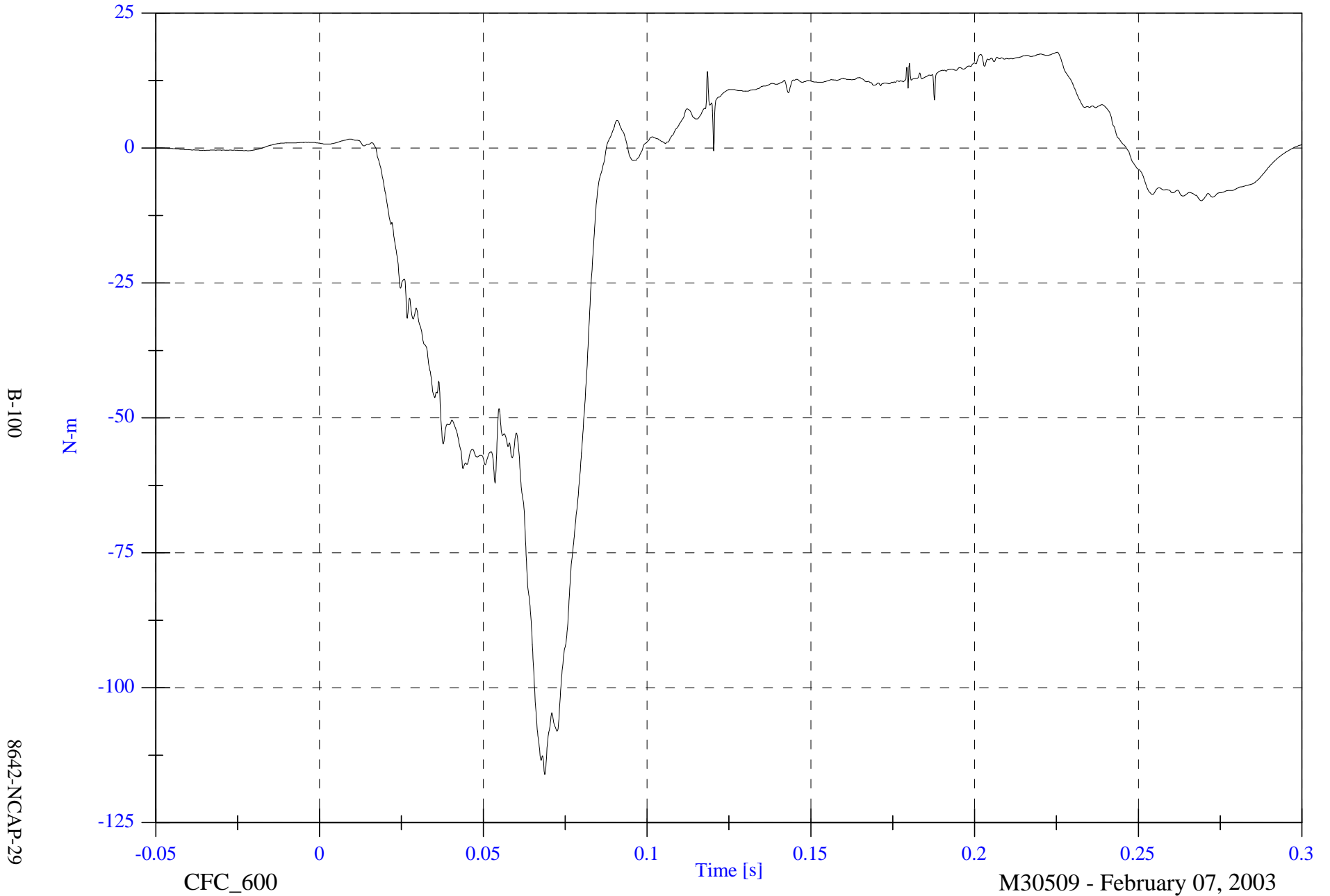


NCAP Test #7 - 2003 Mercedes E320

V1P2 Left Upper Tibia My

Max: 17.7 [N-m] at 0.225 [s]

Min: -116.1 [N-m] at 0.069 [s]

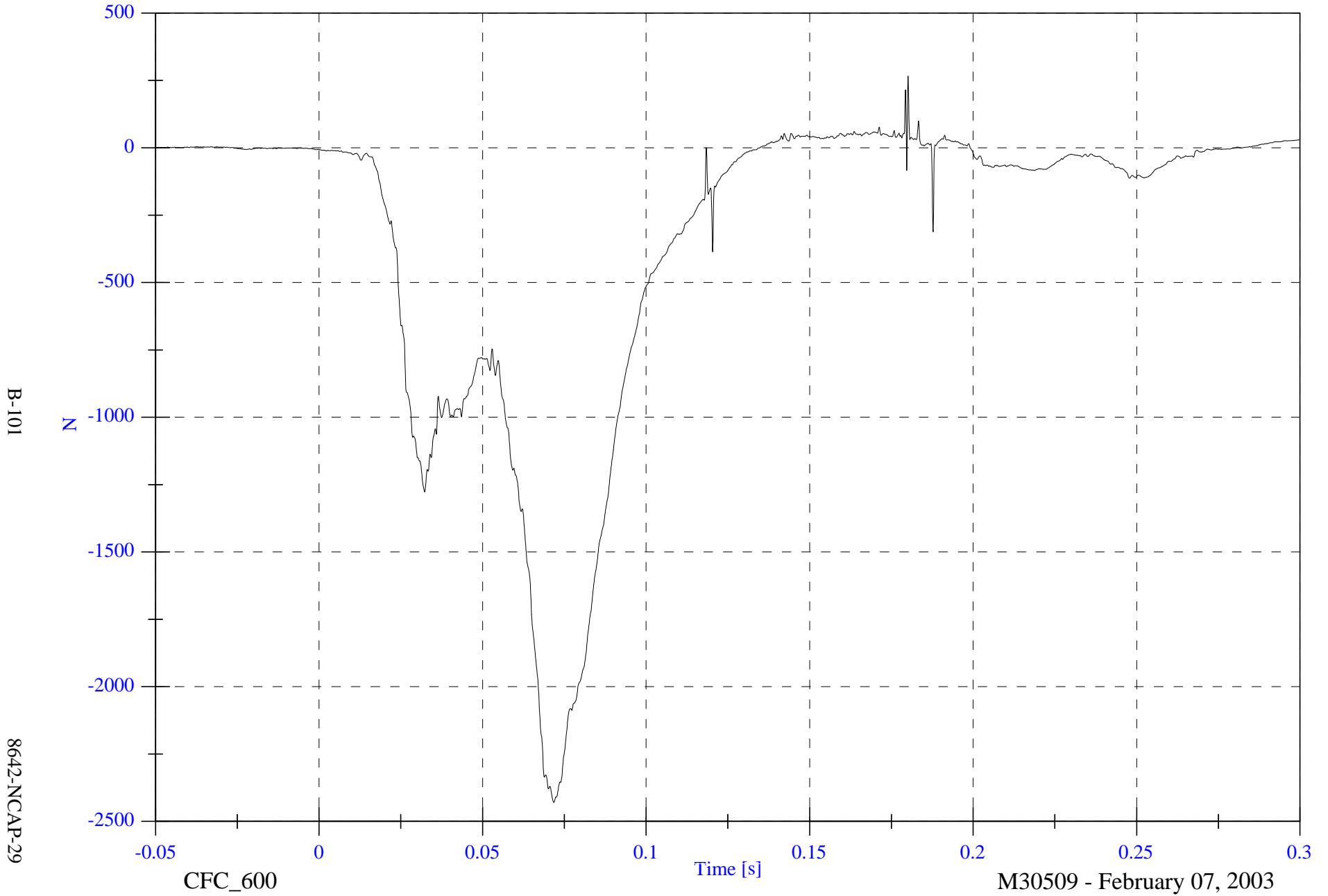


NCAP Test #7 - 2003 Mercedes E320

V1P2 Left Lower Tibia Fz

Max: 265.7 [N] at 0.180 [s]

Min: -2429.6 [N] at 0.072 [s]

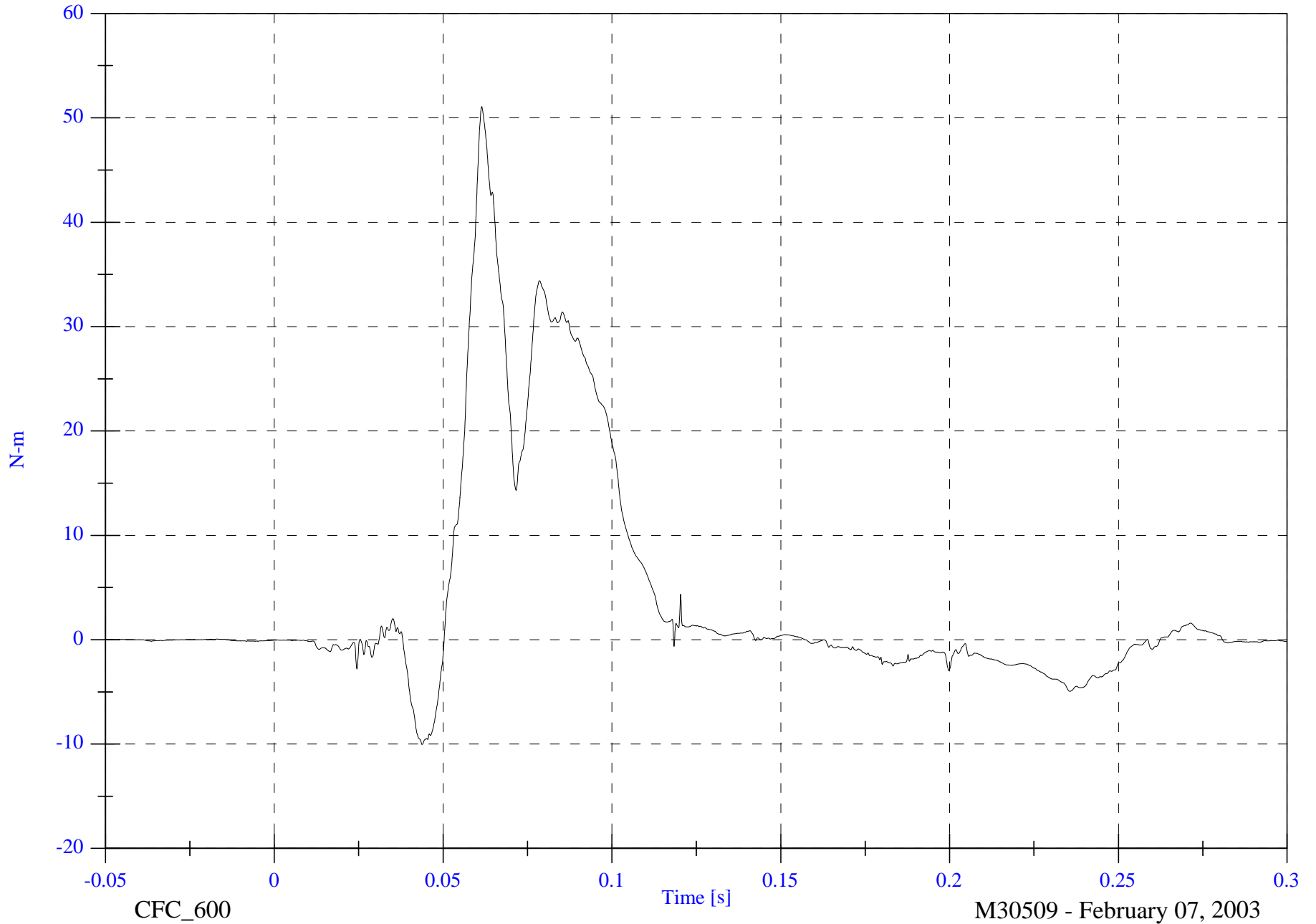


NCAP Test #7 - 2003 Mercedes E320

V1P2 Left Lower Tibia Mx

Max: 51.1 [N-m] at 0.062 [s]

Min: -10.0 [N-m] at 0.044 [s]



B-102

8642-NCAP-29

CFC_600

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

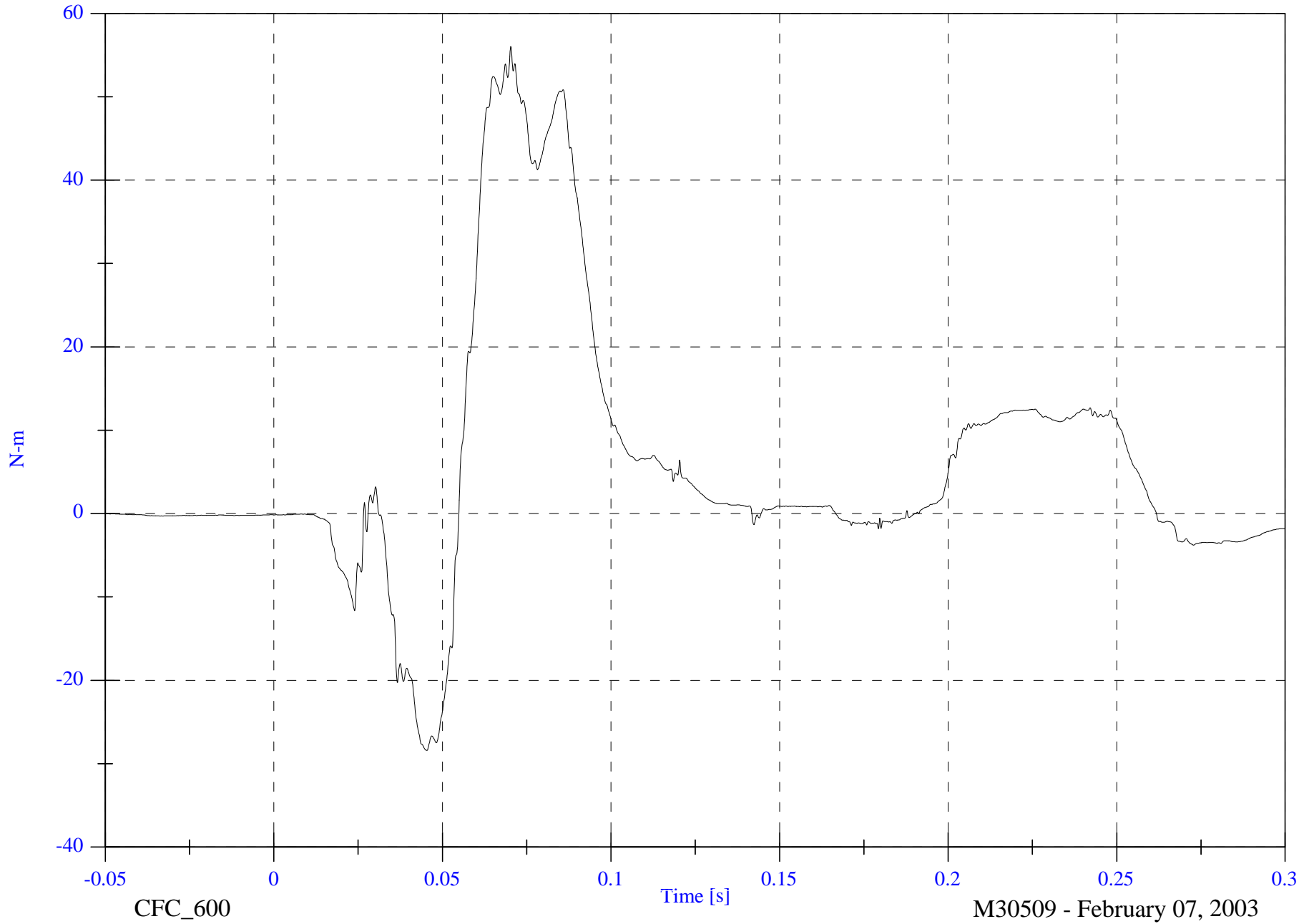
V1P2 Left Lower Tibia My

Max: 56.0 [N-m] at 0.070 [s]

Min: -28.4 [N-m] at 0.045 [s]

B-103

8642-NCAP-29



CFC_600

Time [s]

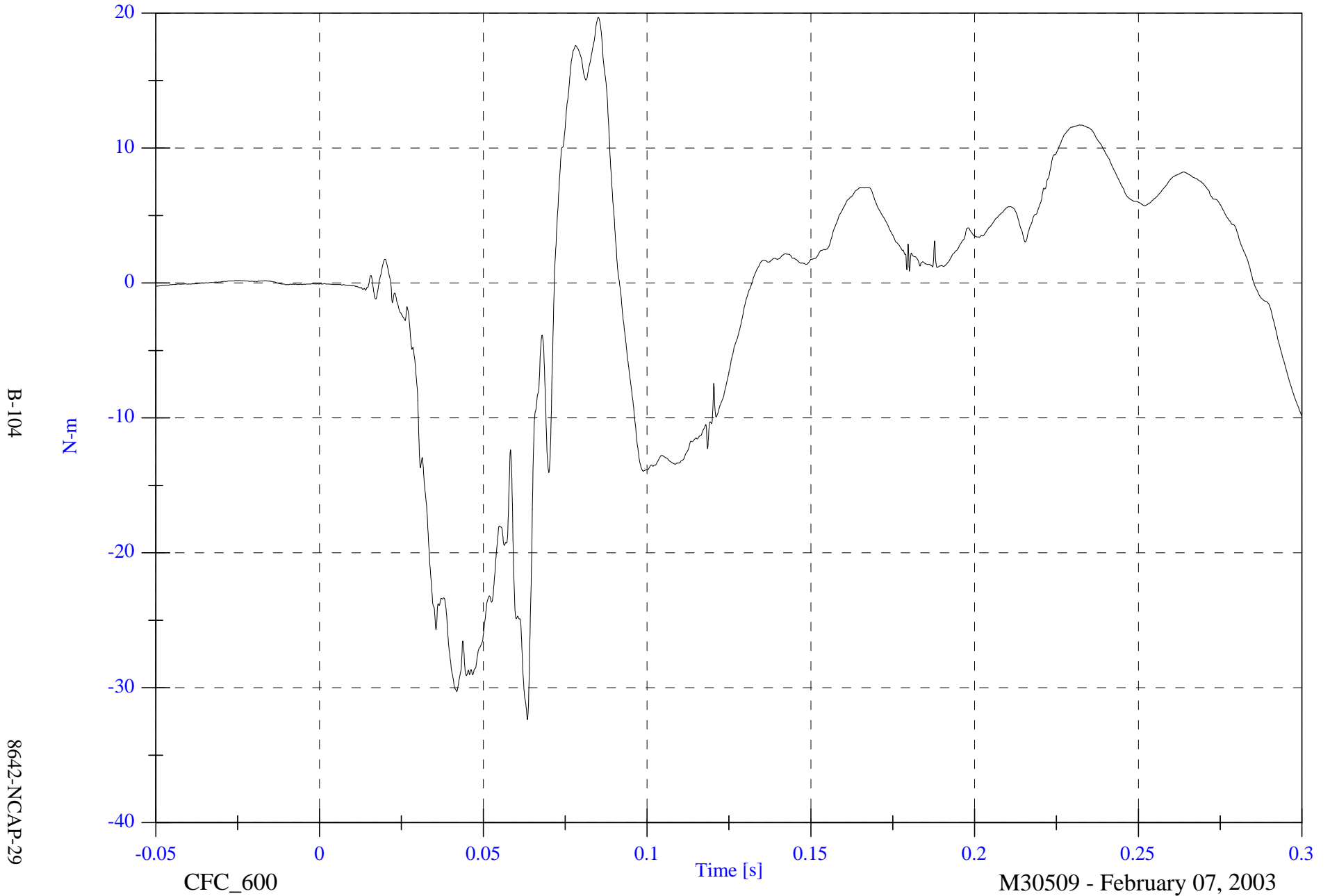
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 19.7 [N-m] at 0.085 [s]

Min: -32.4 [N-m] at 0.063 [s]

V1P2 Right Upper Tibia Mx

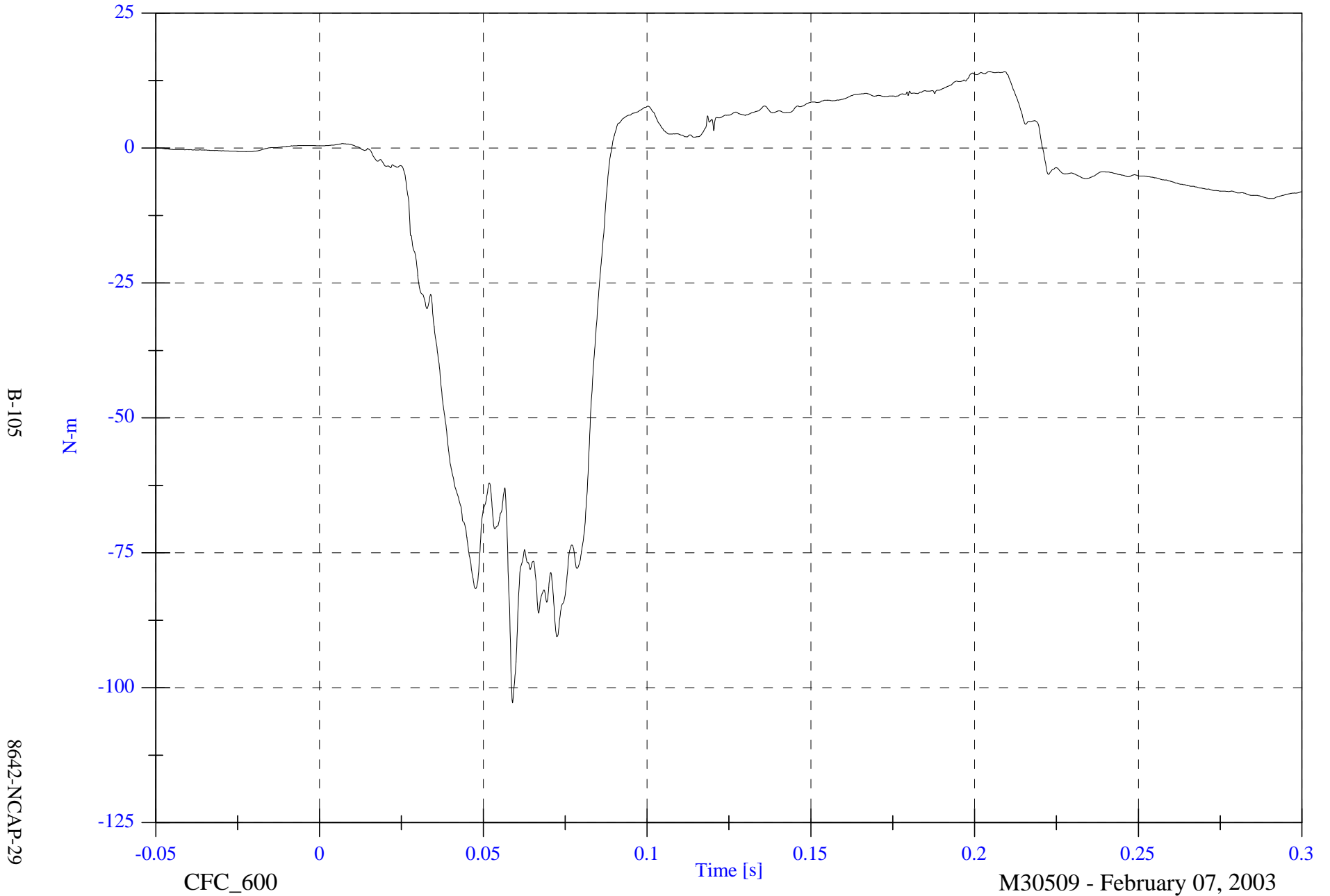


NCAP Test #7 - 2003 Mercedes E320

V1P2 Right Upper Tibia My

Max: 14.2 [N-m] at 0.204 [s]

Min: -102.8 [N-m] at 0.059 [s]



B-105

8642-NCAP-29

CFC_600

Time [s]

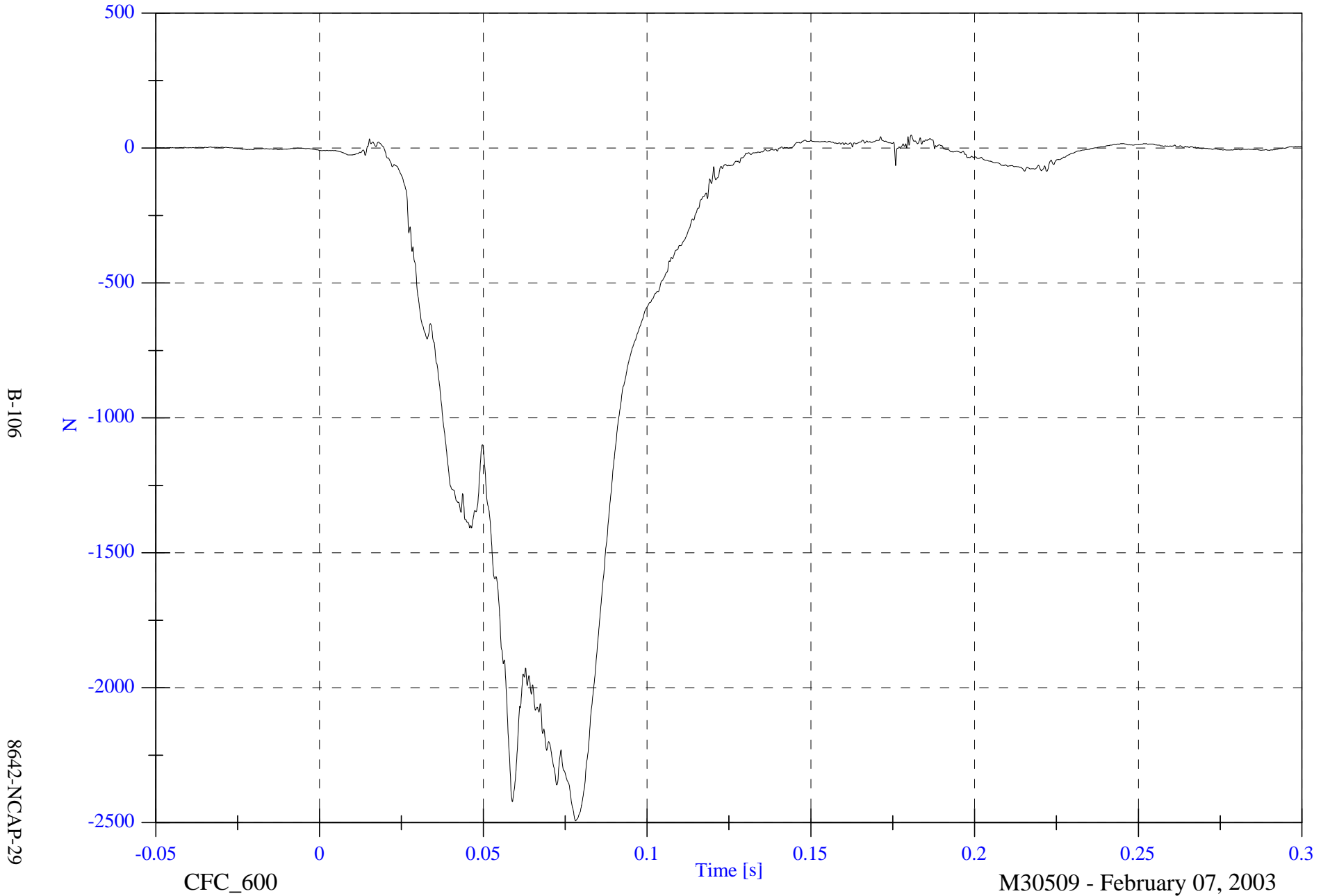
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Right Lower Tibia Fz

Max: 48.8 [N] at 0.181 [s]

Min: -2492.7 [N] at 0.078 [s]



B-106

8642-NCAP-29

CFC_600

Time [s]

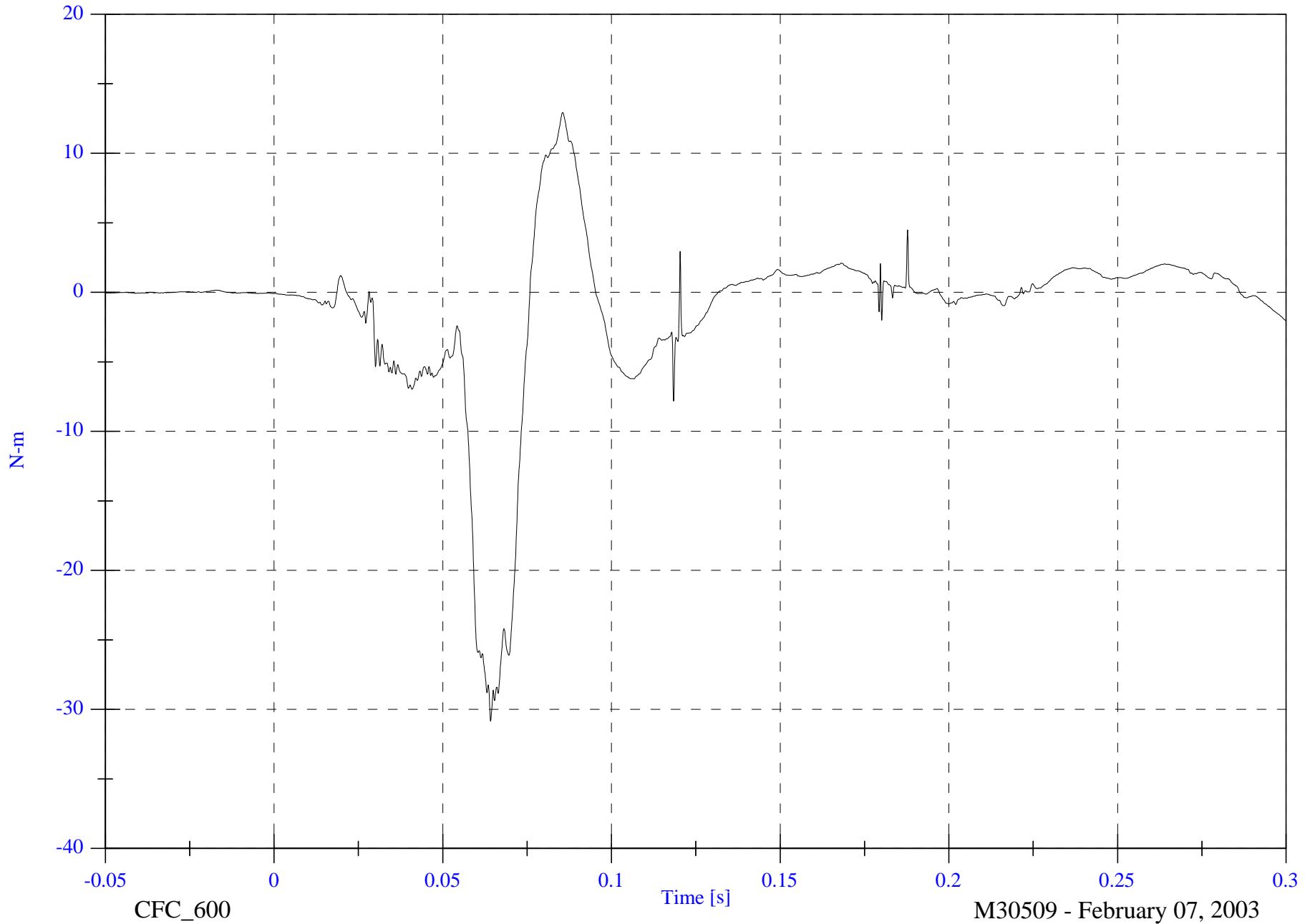
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 12.9 [N-m] at 0.086 [s]

Min: -30.9 [N-m] at 0.064 [s]

V1P2 Right Lower Tibia Mx



B-107

8642-NCAP-29

CFC_600

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

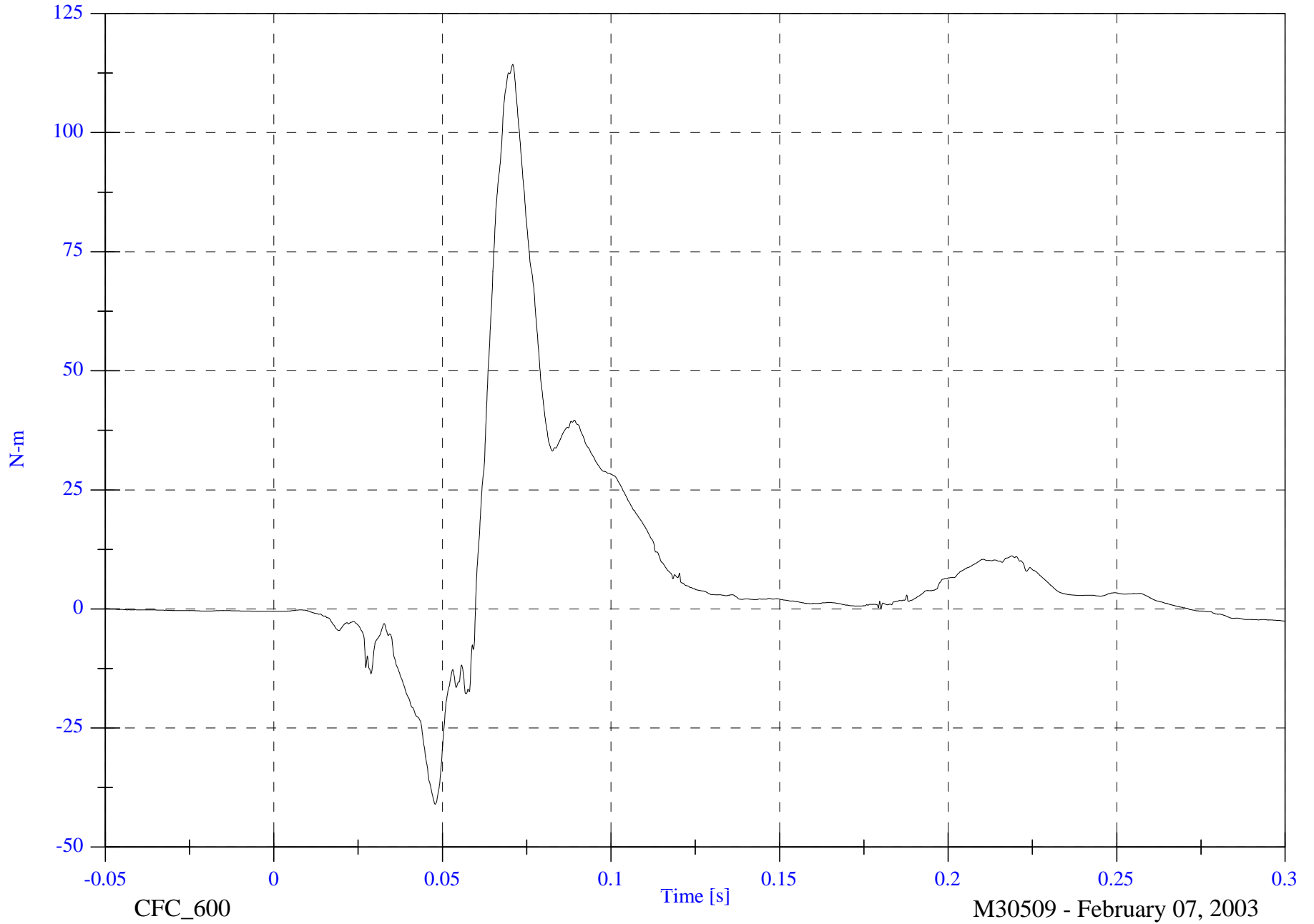
V1P2 Right Lower Tibia My

Max: 114.3 [N-m] at 0.071 [s]

Min: -41.0 [N-m] at 0.048 [s]

B-108

8642-NCAP-29



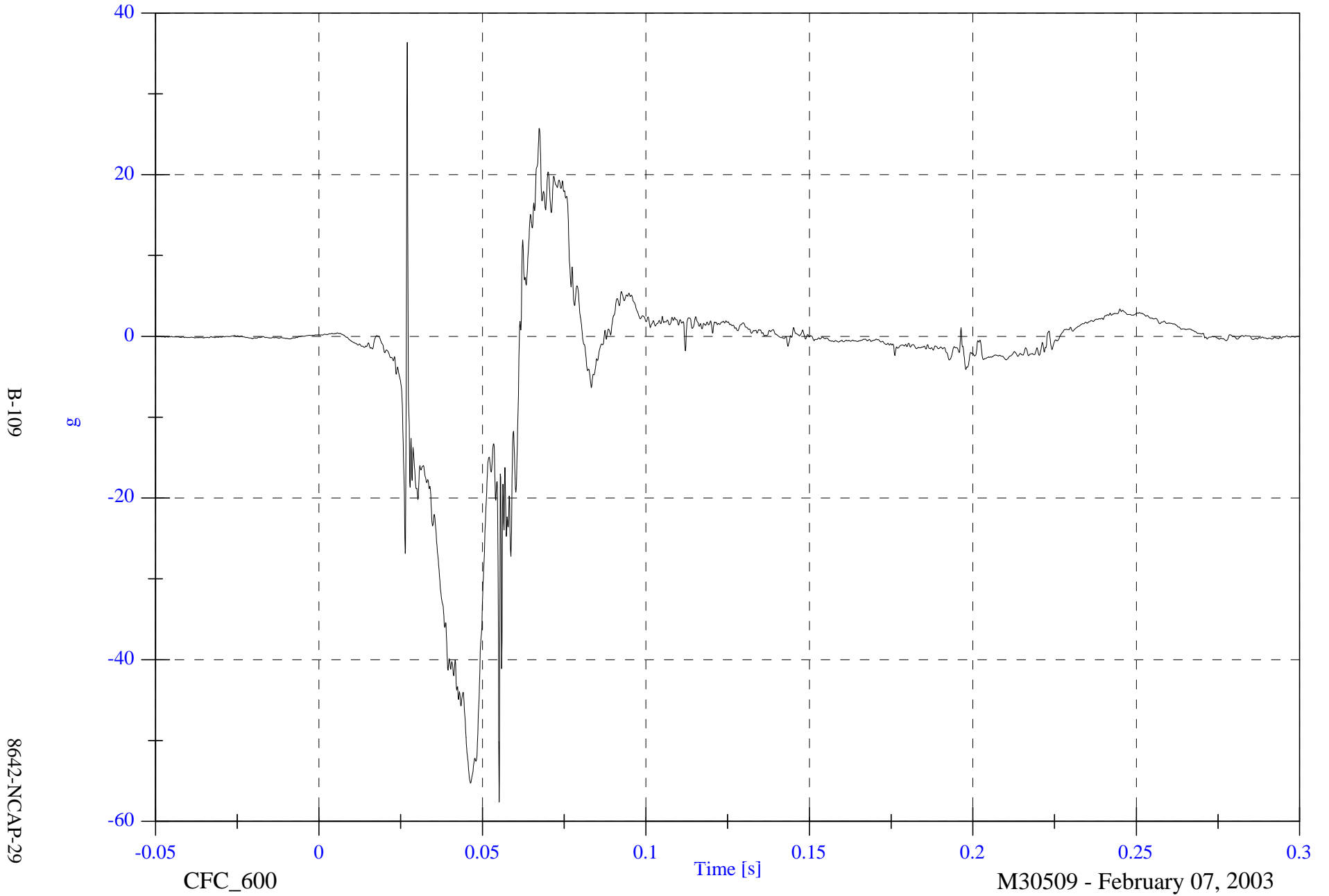
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 36.4 [g] at 0.027 [s]

Min: -57.6 [g] at 0.055 [s]

V1P2 Left Foot Aft x

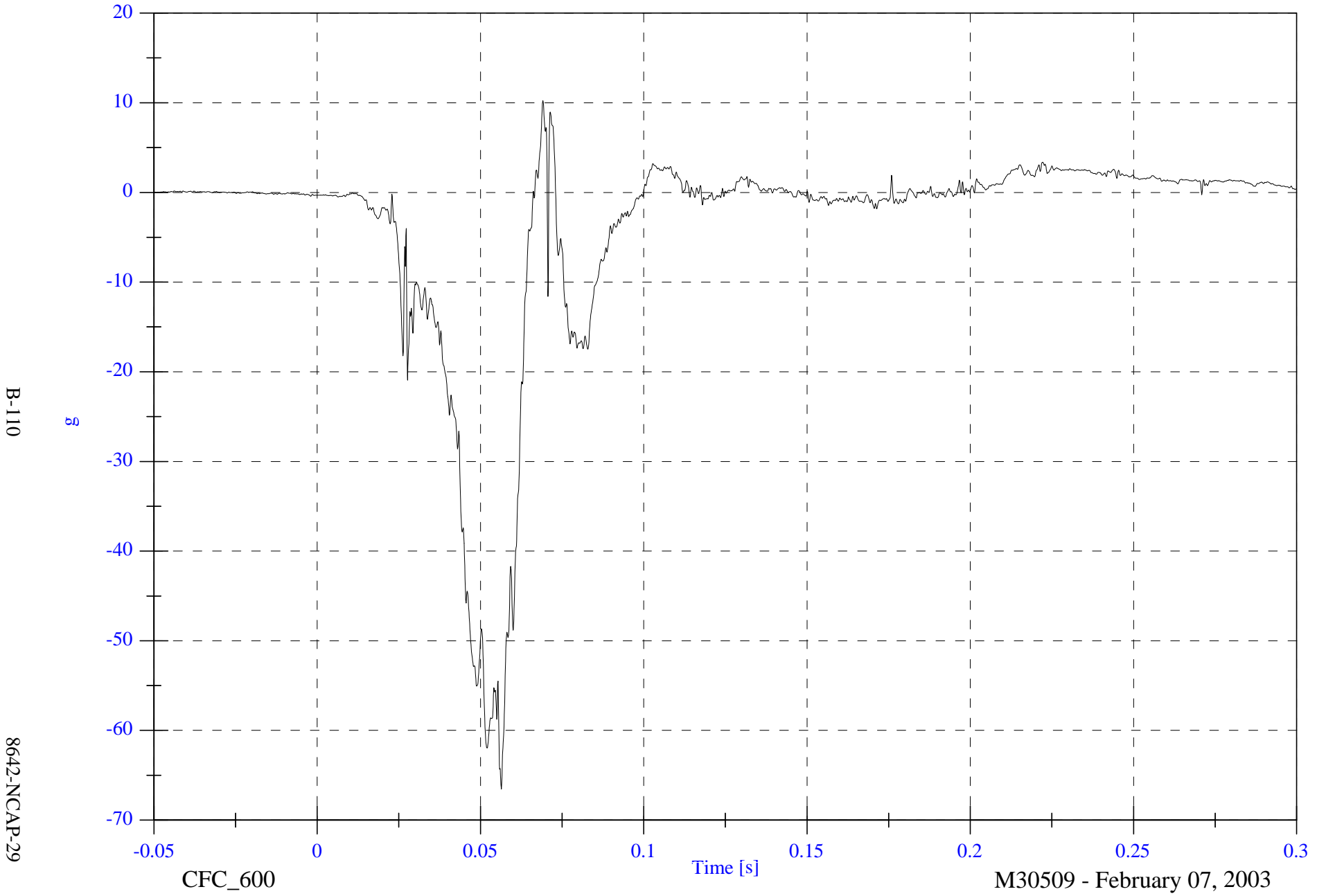


NCAP Test #7 - 2003 Mercedes E320

V1P2 Left Foot Aft z

Max: 10.2 [g] at 0.069 [s]

Min: -66.5 [g] at 0.056 [s]

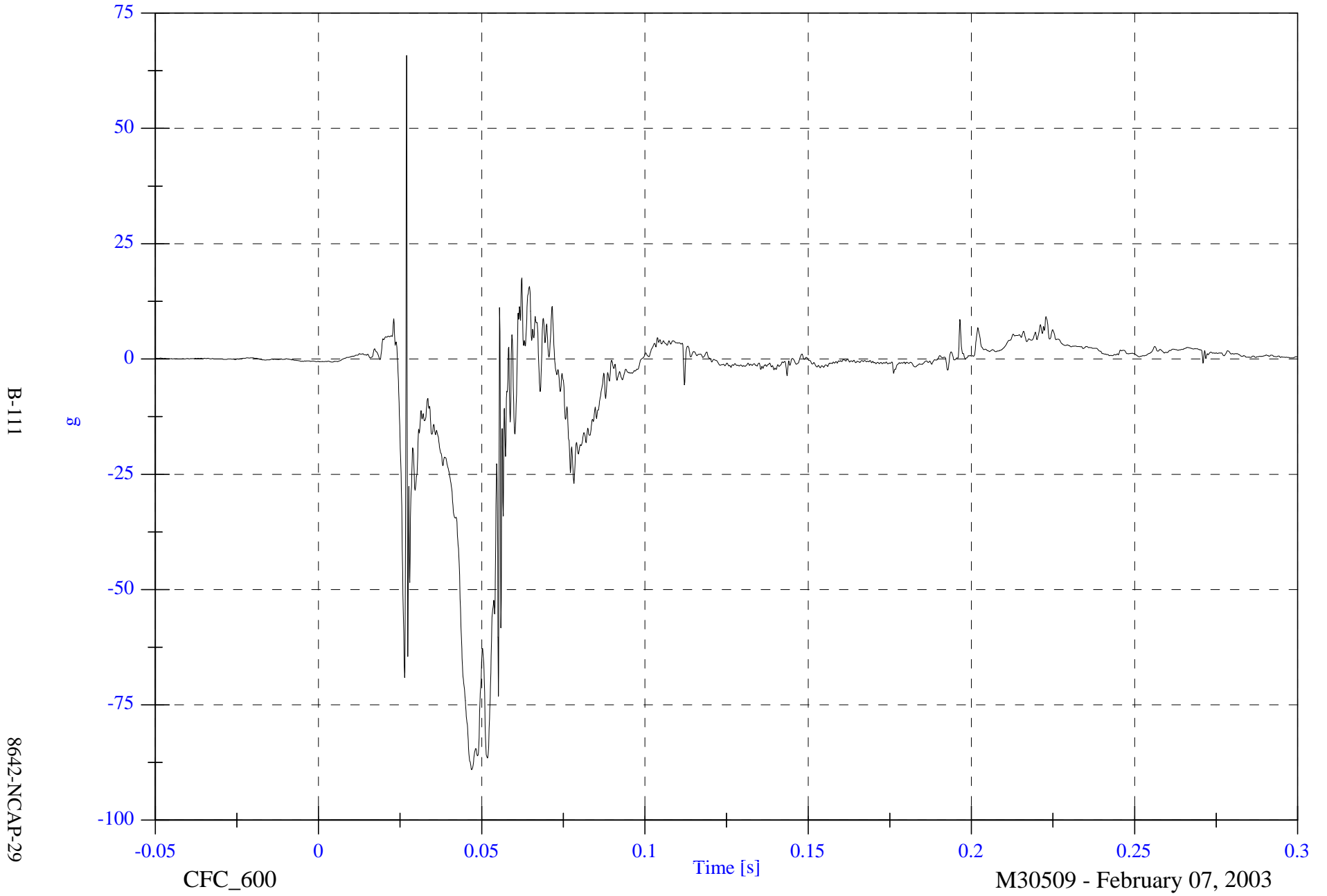


NCAP Test #7 - 2003 Mercedes E320

V1P2 Left Foot Fore z

Max: 65.8 [g] at 0.027 [s]

Min: -89.1 [g] at 0.047 [s]

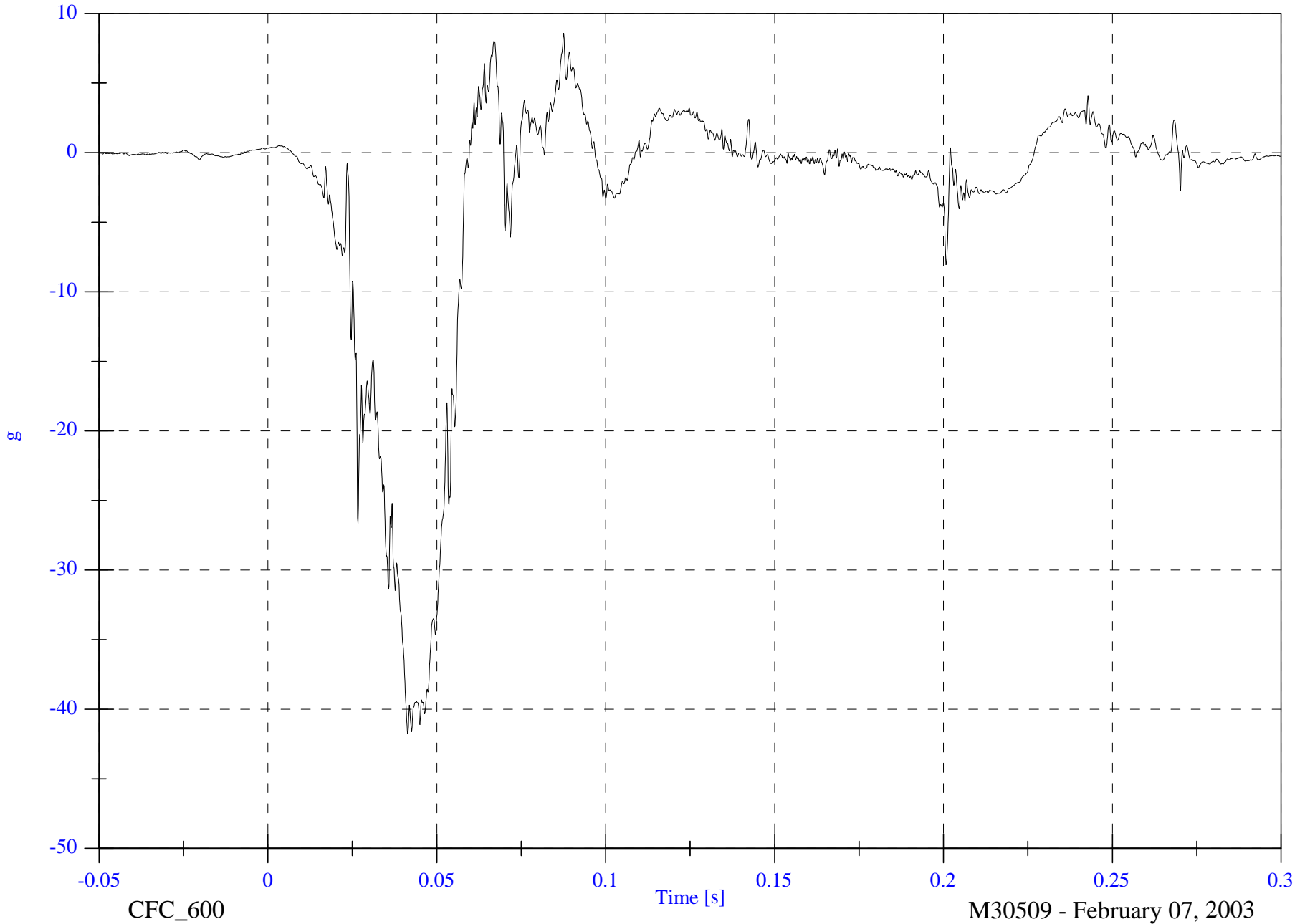


NCAP Test #7 - 2003 Mercedes E320

Max: 8.6 [g] at 0.088 [s]

Min: -41.8 [g] at 0.041 [s]

VIP2 Right Foot Aft x



B-112

8642-NCAP-29

CFC_600

Time [s]

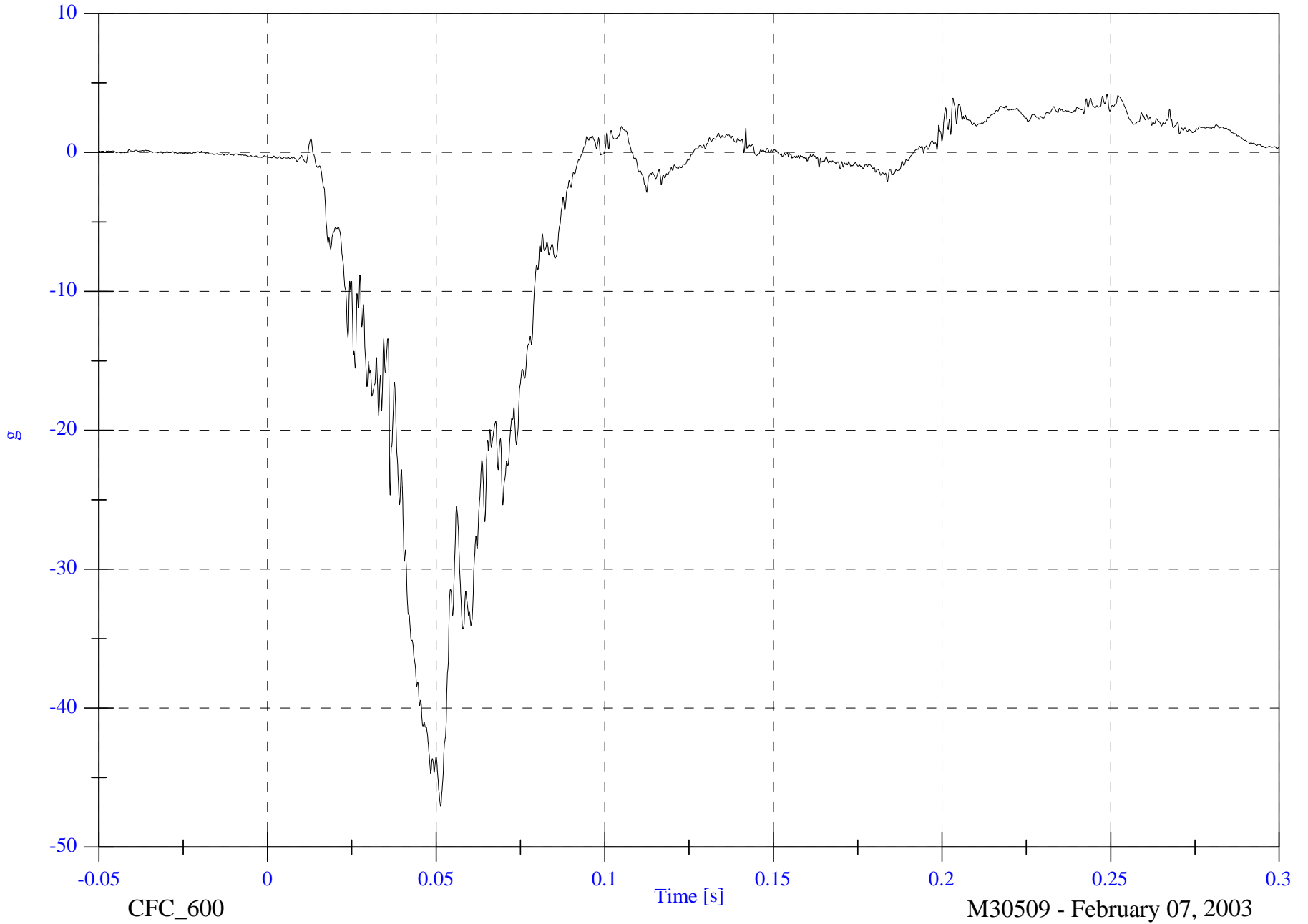
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Right Foot Aft z

Max: 4.2 [g] at 0.249 [s]

Min: -47.0 [g] at 0.051 [s]



B-113

8642-NCAP-29

CFC_600

Time [s]

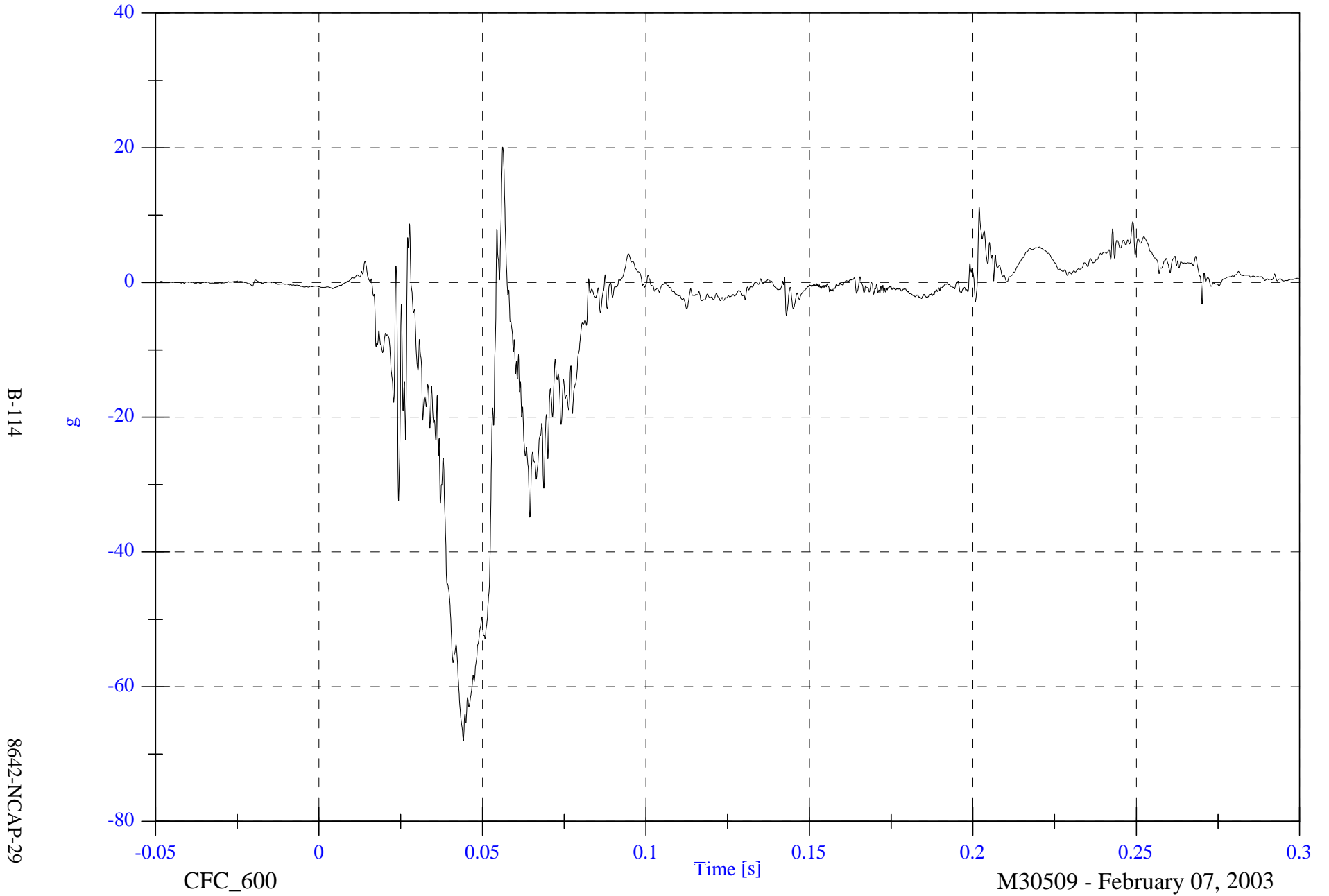
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P2 Right Foot Fore z

Max: 20.1 [g] at 0.056 [s]

Min: -68.0 [g] at 0.044 [s]



B-114

8642-NCAP-29

CFC_600

Time [s]

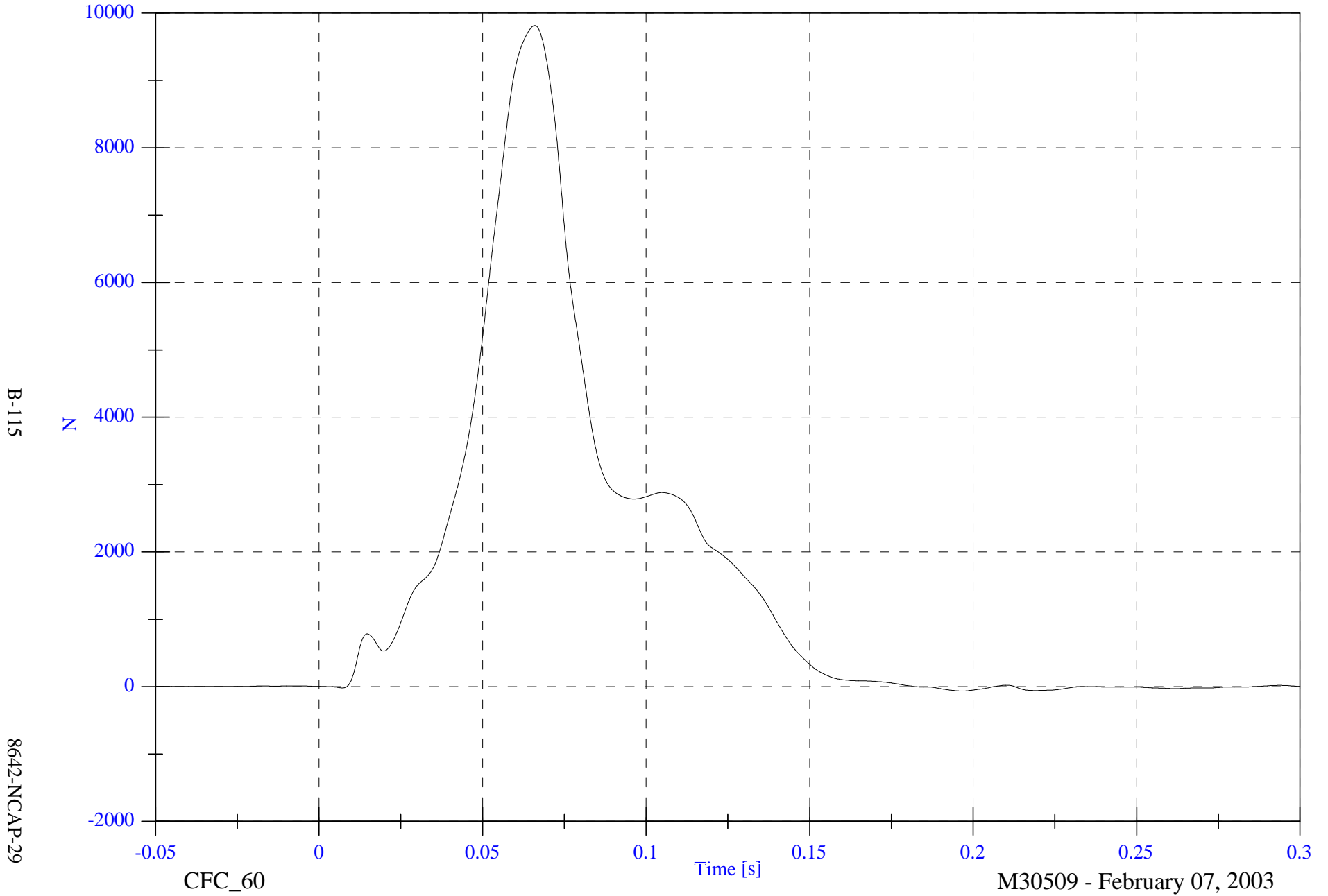
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

P2 Lap Belt

Max: 9815.5 [N] at 0.066 [s]

Min: -65.8 [N] at 0.197 [s]



B-115

8642-NCAP-29

CFC_60

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

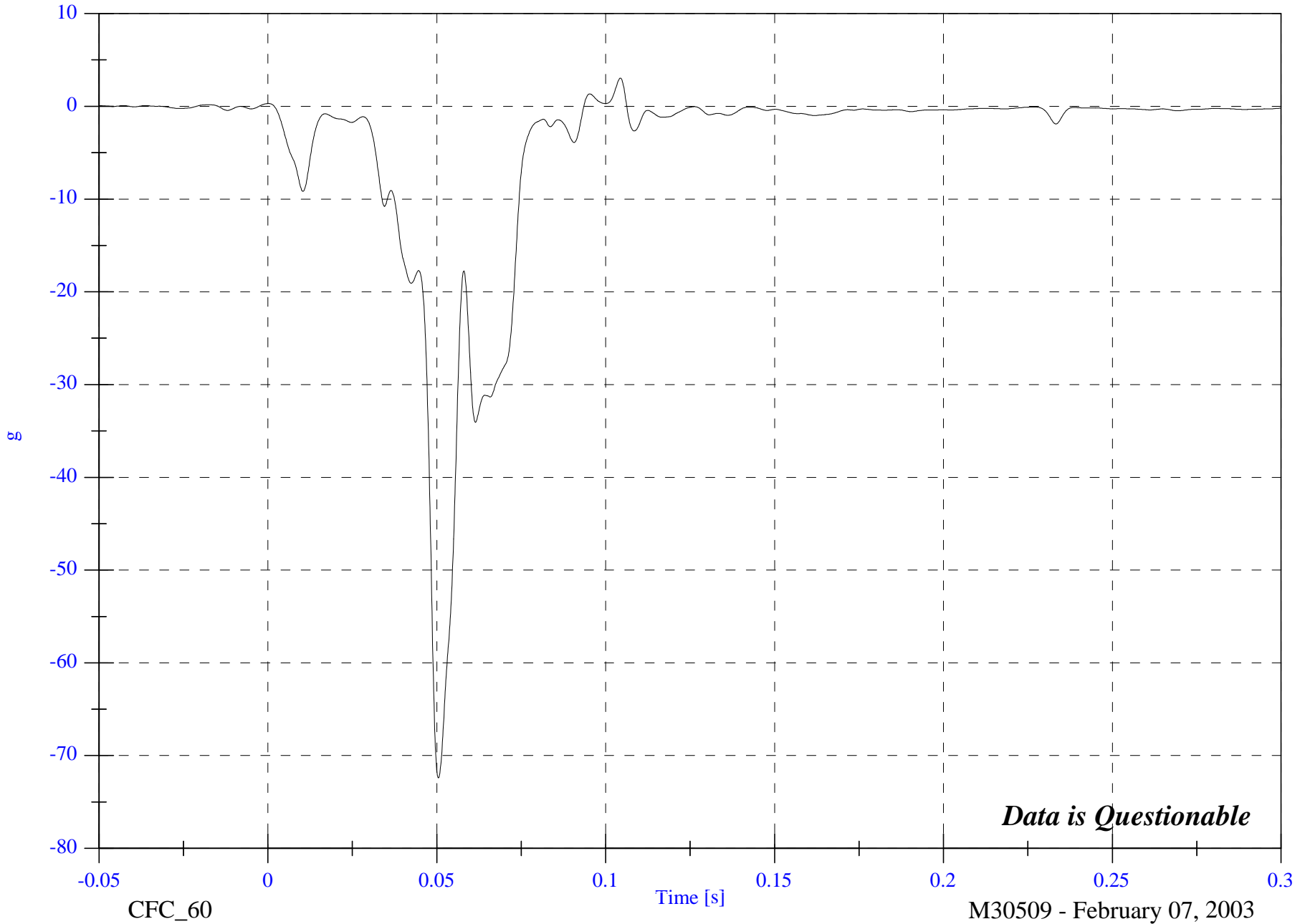
V1 Left Rear #1x

Max: 3.0 [g] at 0.104 [s]

Min: -72.4 [g] at 0.050 [s]

B-116

8642-NCAP-29



M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

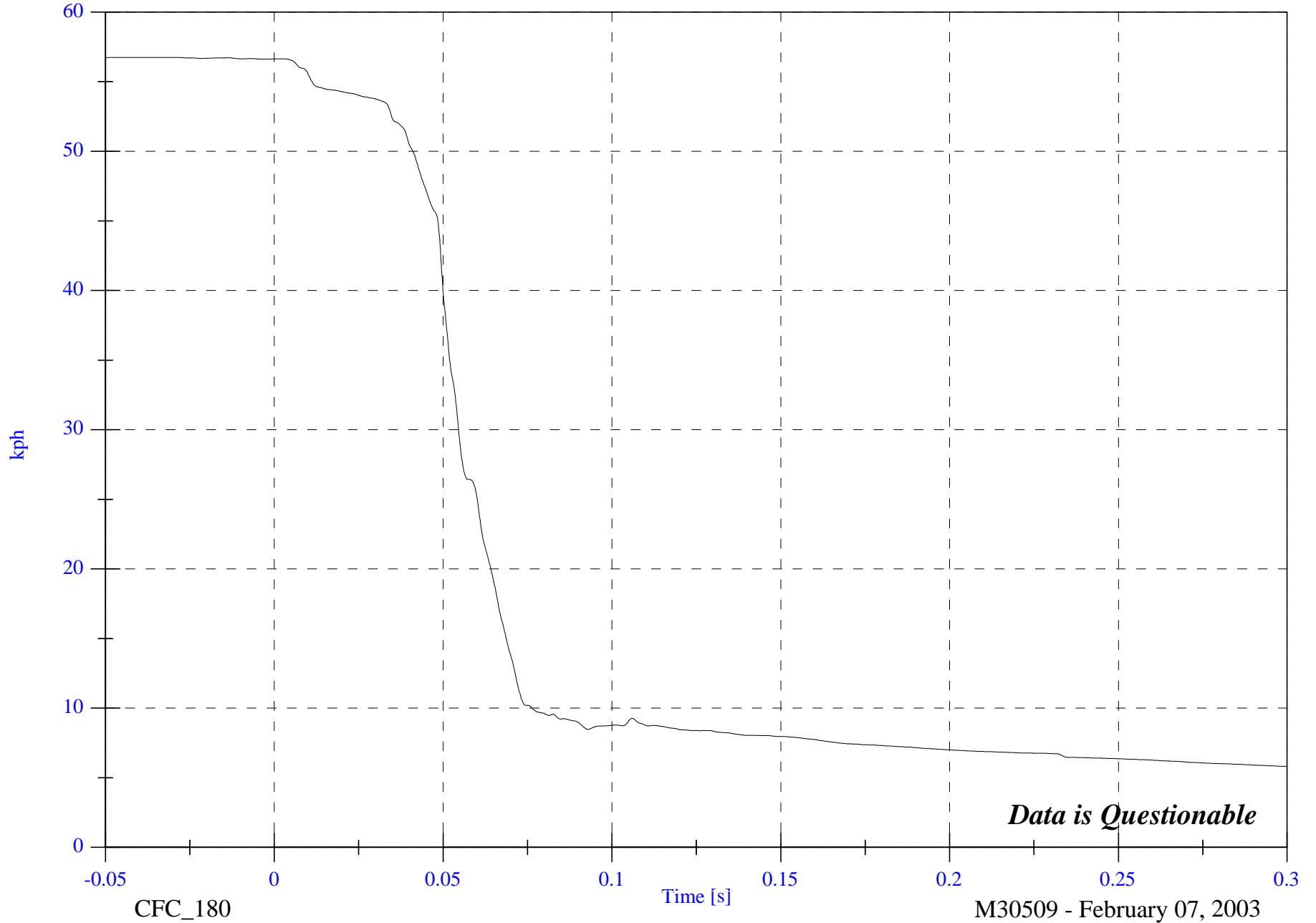
V1 Left Rear #1x Velocity

Max: 56.7 [kph] at -0.041 [s]

Min: 5.8 [kph] at 0.300 [s]

B-117

8642-NCAP-29



Data is Questionable

NCAP Test #7 - 2003 Mercedes E320

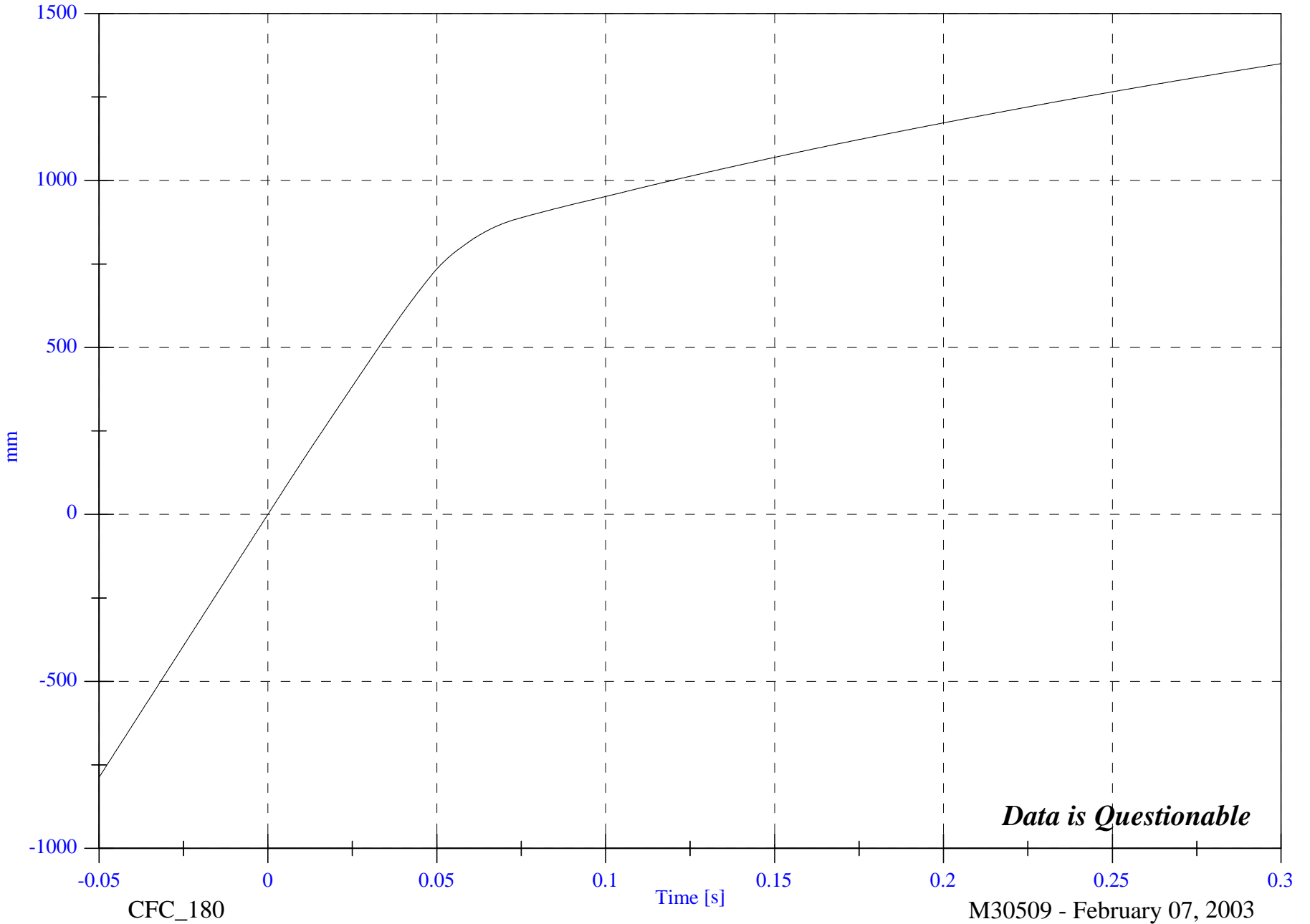
V1 Left Rear #1x Displacement

Max: 1349.8 [mm] at 0.300 [s]

Min: -787.5 [mm] at -0.050 [s]

B-118

8642-NCAP-29



CFC_180

Time [s]

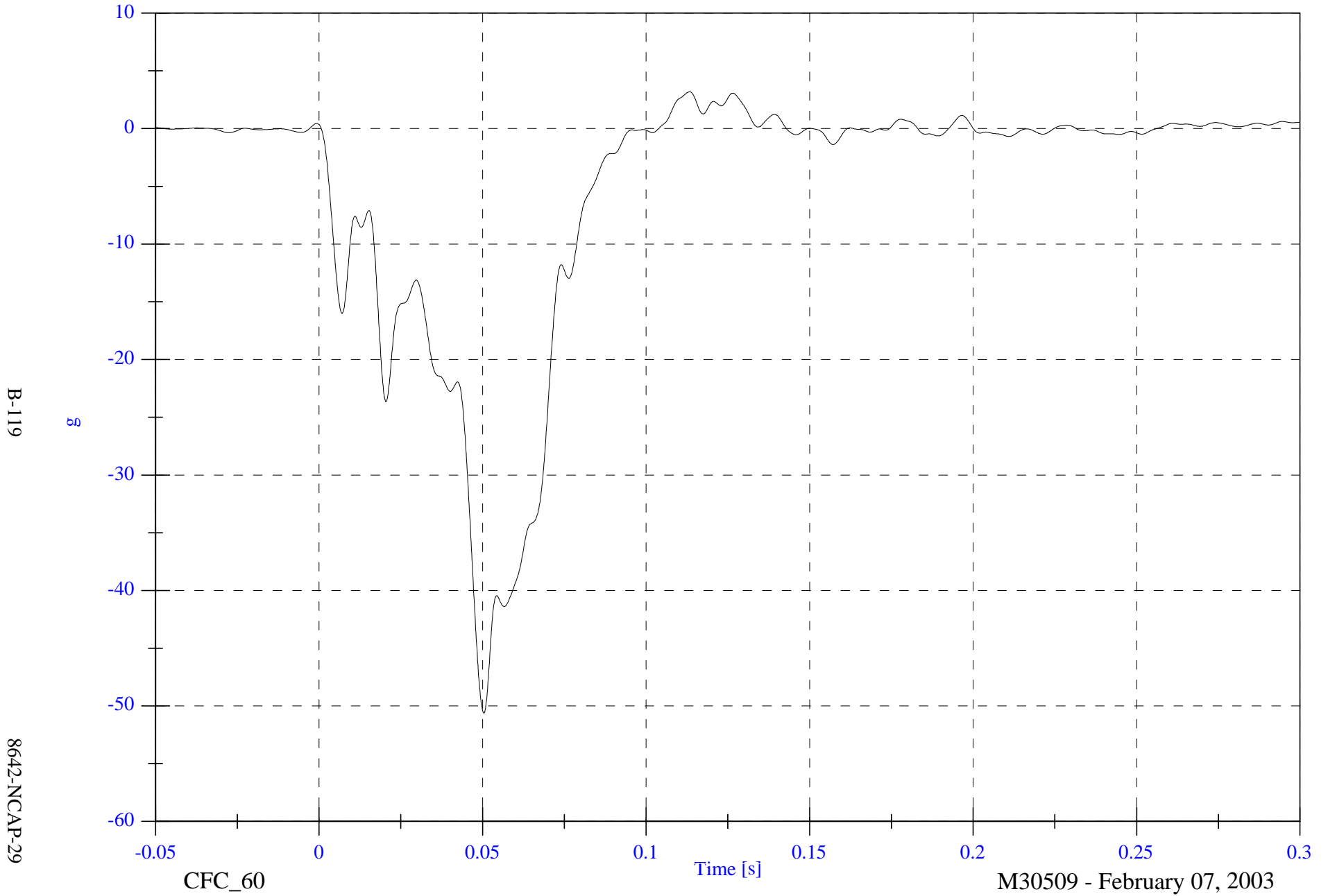
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Right Rear #2x

Max: 3.2 [g] at 0.113 [s]

Min: -50.6 [g] at 0.050 [s]



NCAP Test #7 - 2003 Mercedes E320

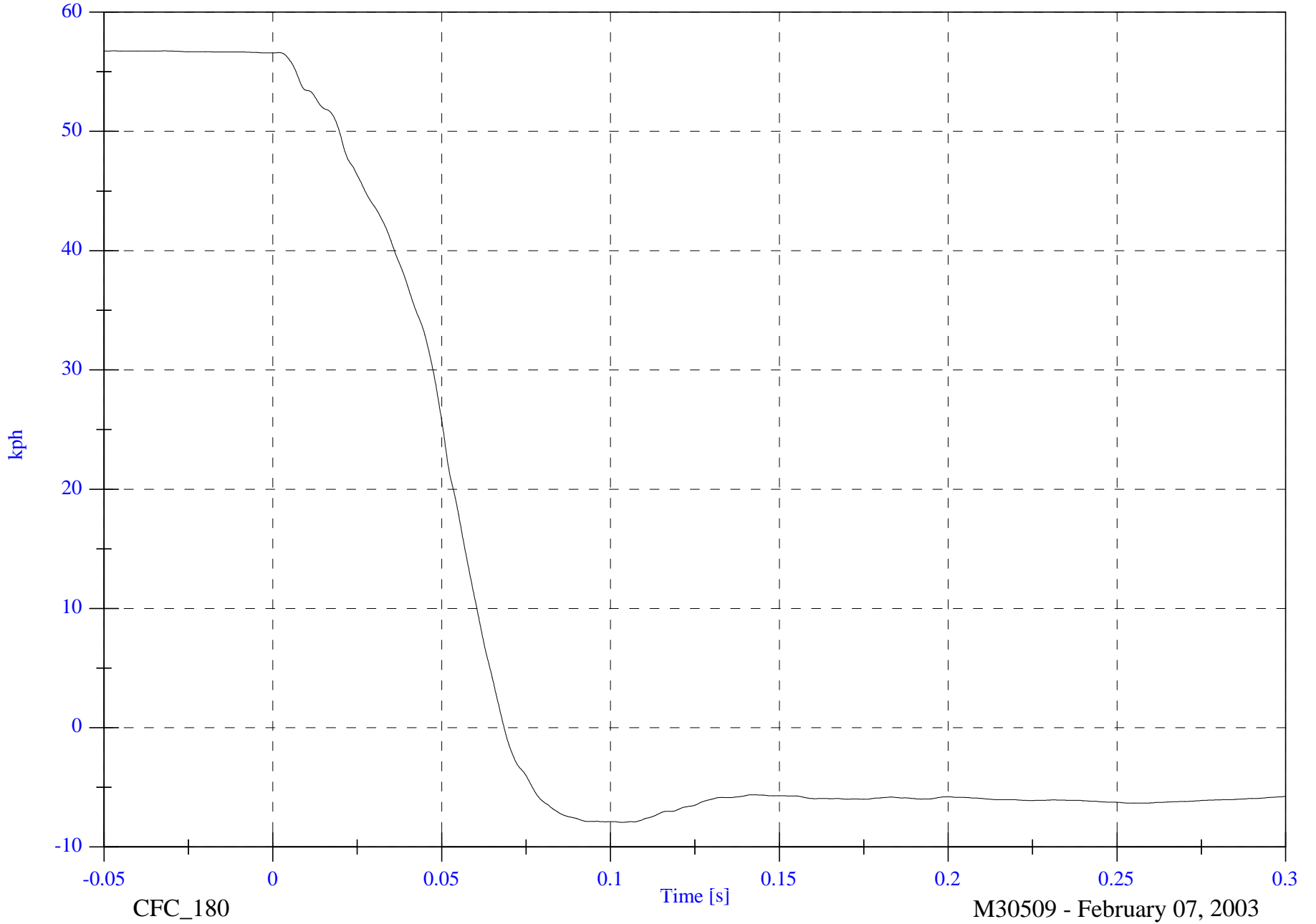
Max: 56.7 [kph] at -0.047 [s]

V1 Right Rear #2x Velocity

Min: -7.9 [kph] at 0.104 [s]

B-120

8642-NCAP-29



CFC_180

Time [s]

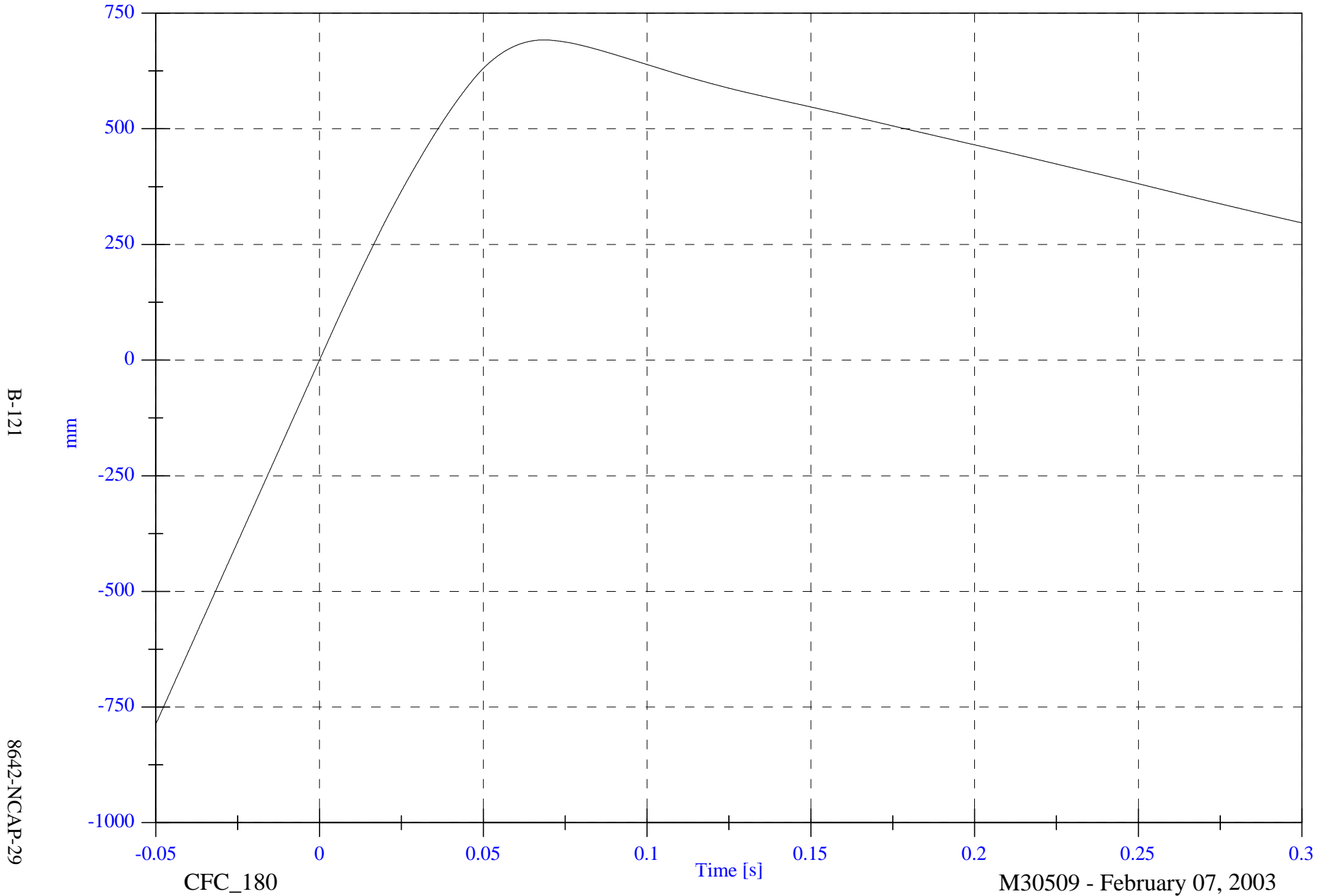
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Right Rear #2x Displacement

Max: 691.9 [mm] at 0.068 [s]

Min: -787.3 [mm] at -0.050 [s]



B-121

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

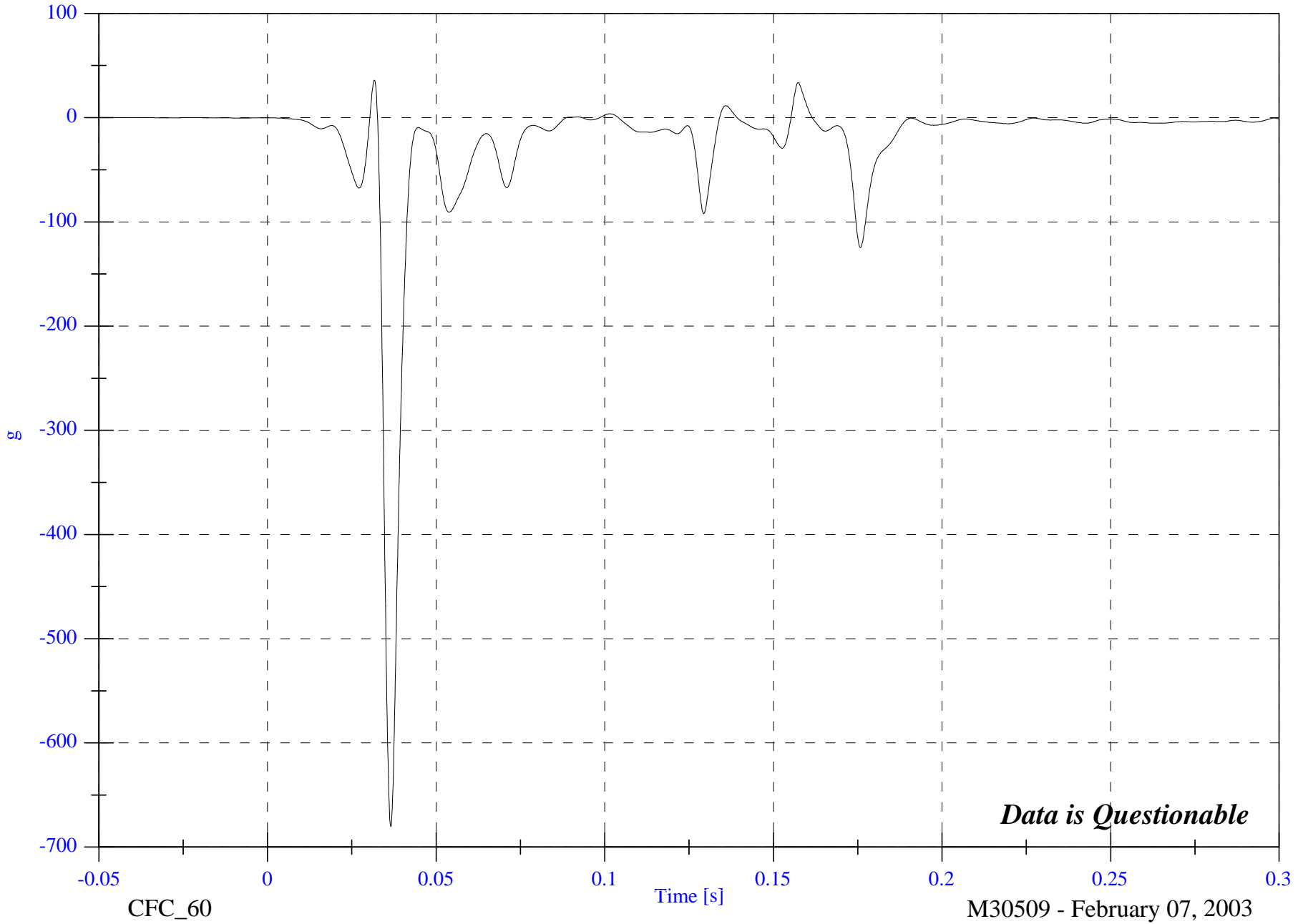
V1 Engine Top #3x

Max: 36.2 [g] at 0.032 [s]

Min: -680.4 [g] at 0.037 [s]

B-122

8642-NCAP-29



M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

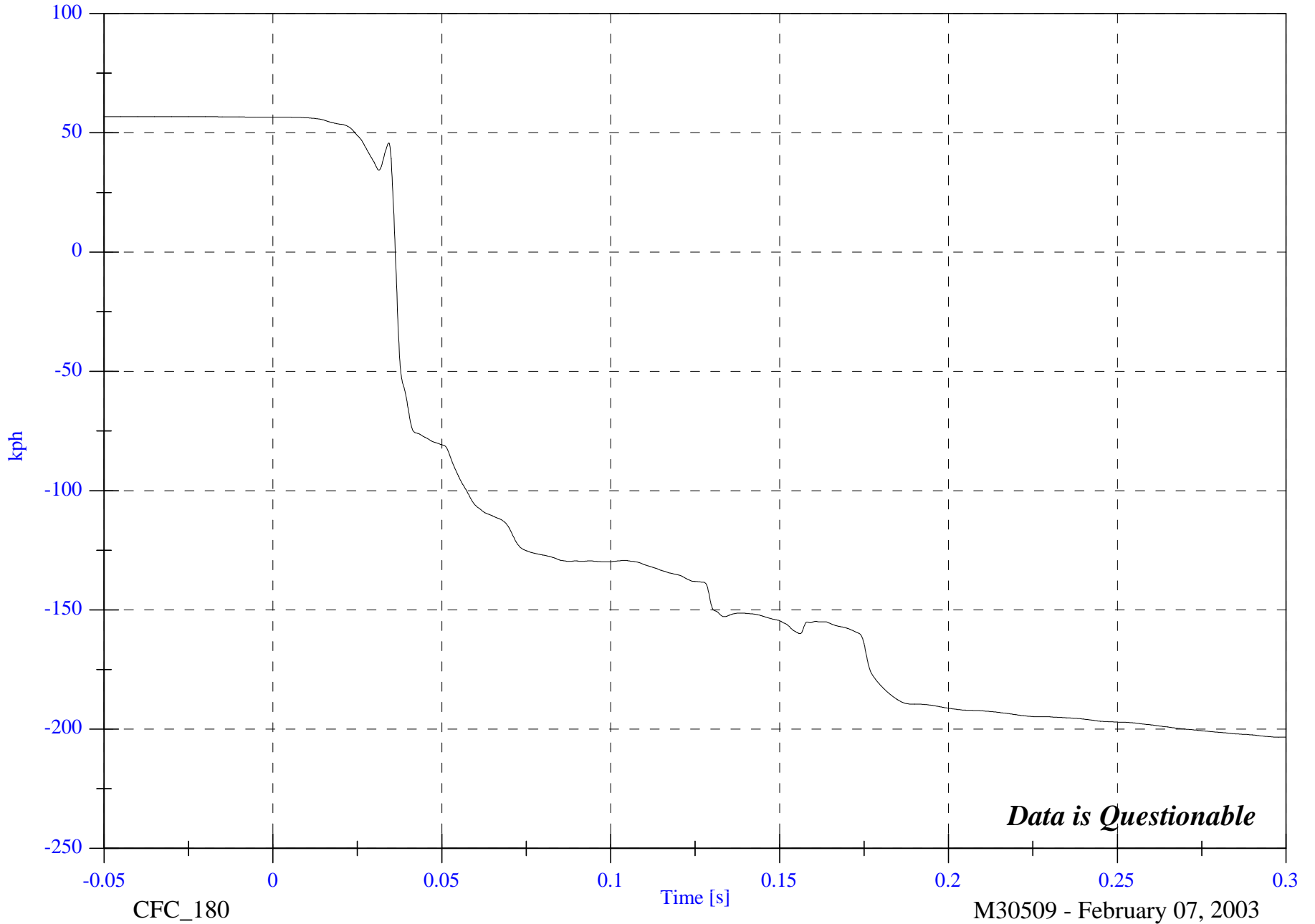
V1 Engine Top #3x Velocity

Max: 56.8 [kph] at -0.046 [s]

Min: -203.4 [kph] at 0.298 [s]

B-123

8642-NCAP-29



Data is Questionable

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

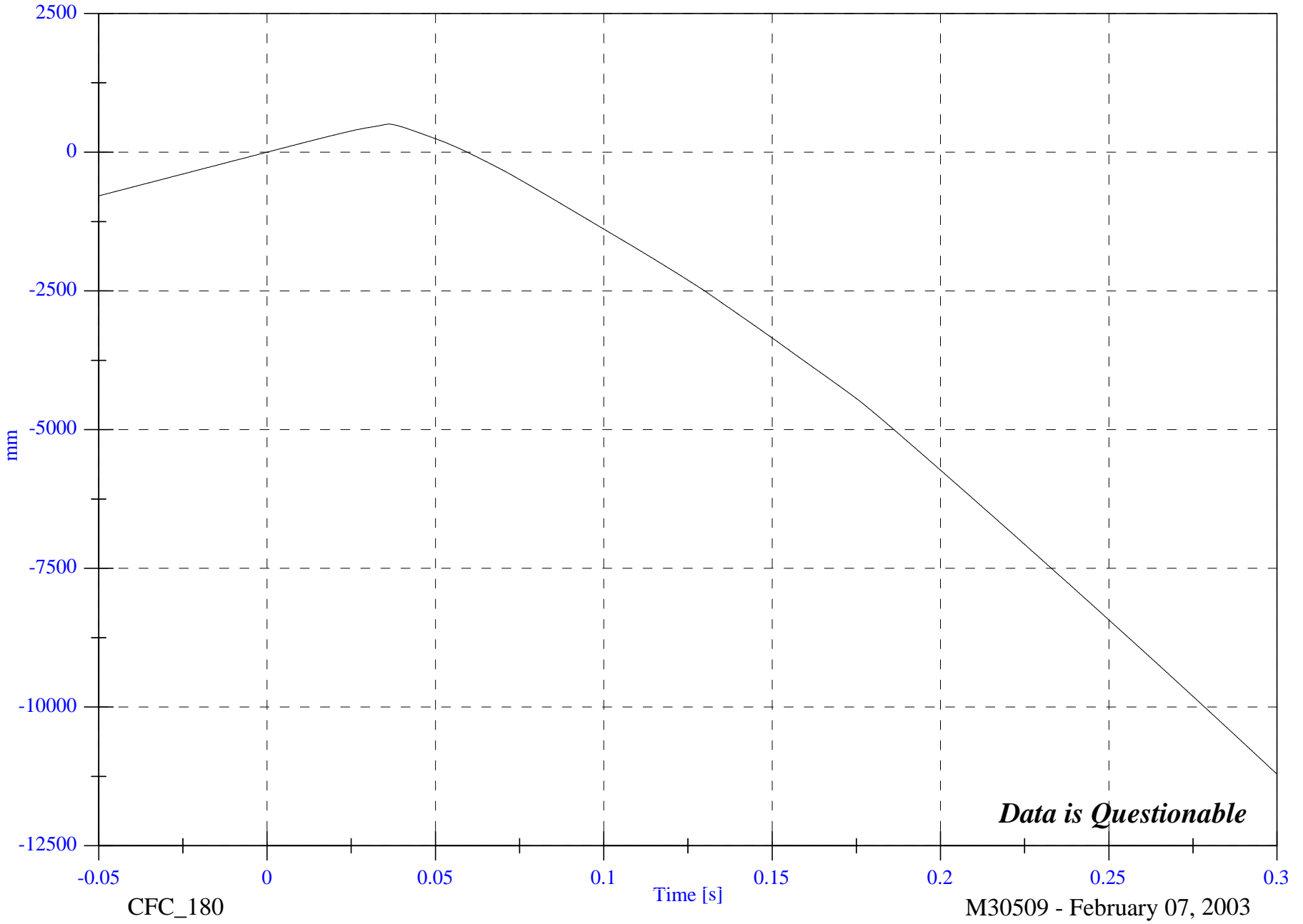
V1 Engine Top #3x Displacement

Max: 504.5 [mm] at 0.036 [s]

Min: -11205.8 [mm] at 0.300 [s]

B-124

8642-NCAP-29



Data is Questionable

CFC_180

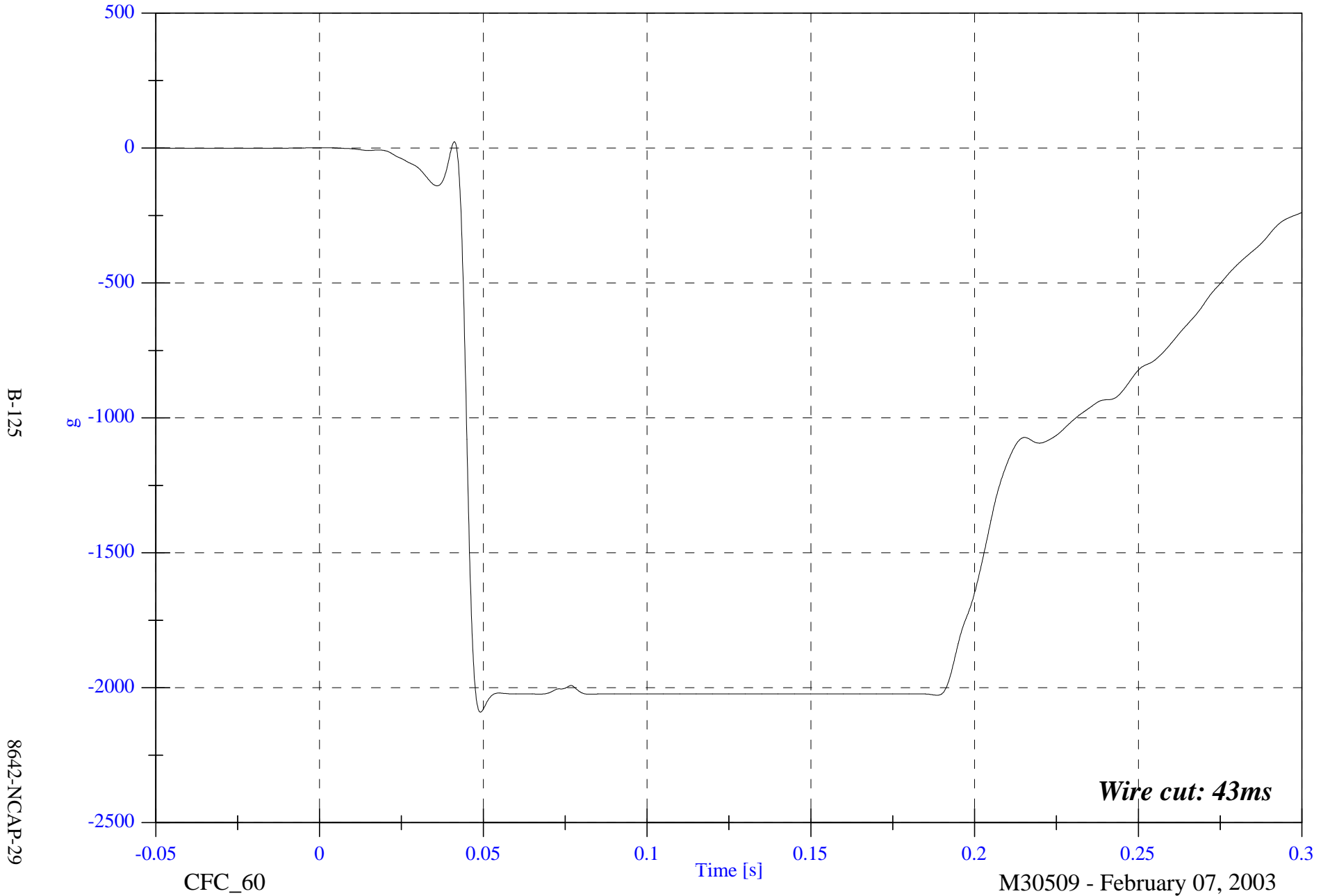
Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Engine Bottom #4x

Max: 23.4 [g] at 0.041 [s]
Min: -2090.5 [g] at 0.049 [s]



B-125

8642-NCAP-29

Wire cut: 43ms

CFC_60

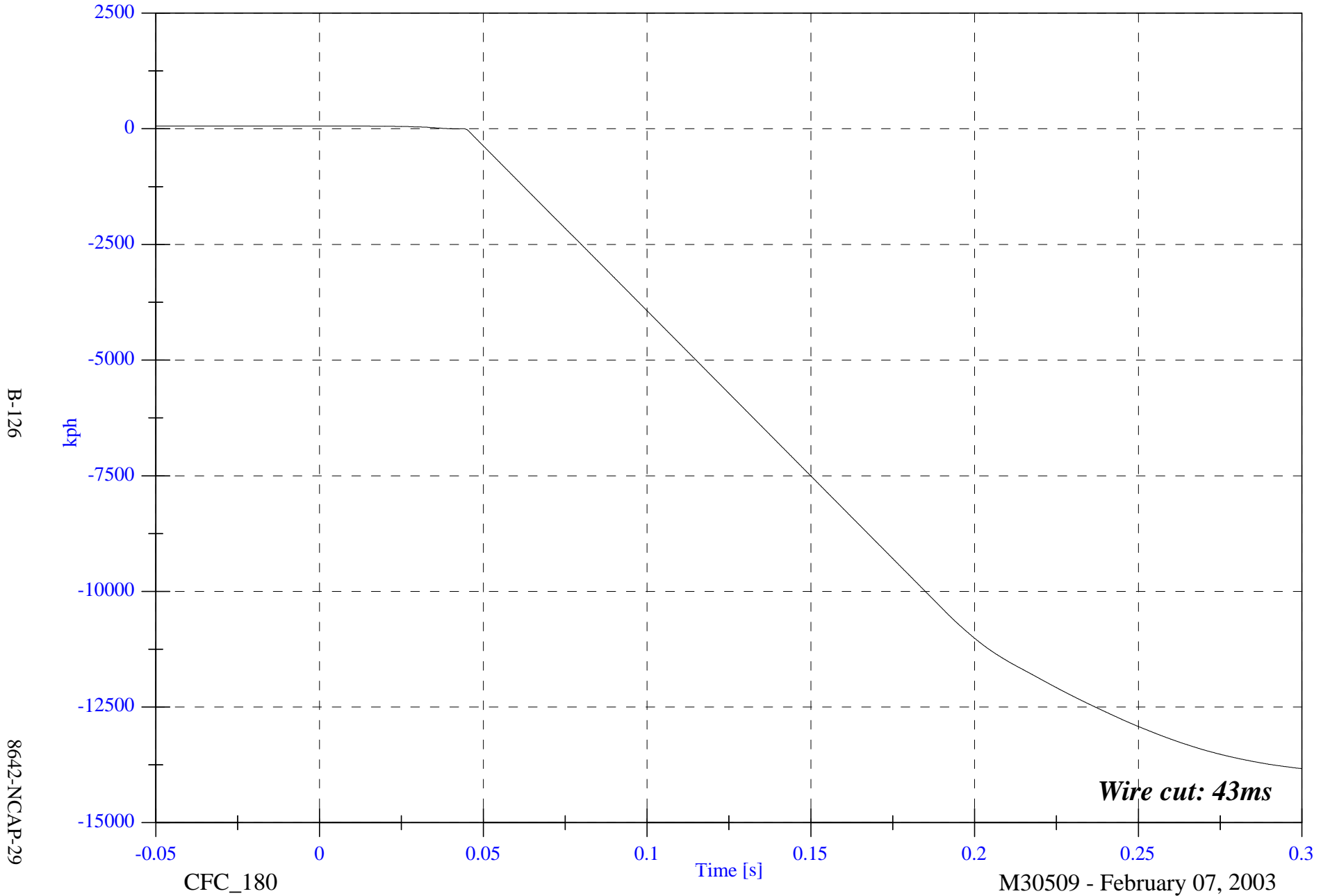
Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Engine Bottom #4x Velocity

Max: 57.3 [kph] at -0.050 [s]
Min: -13832.1 [kph] at 0.300 [s]



B-126

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

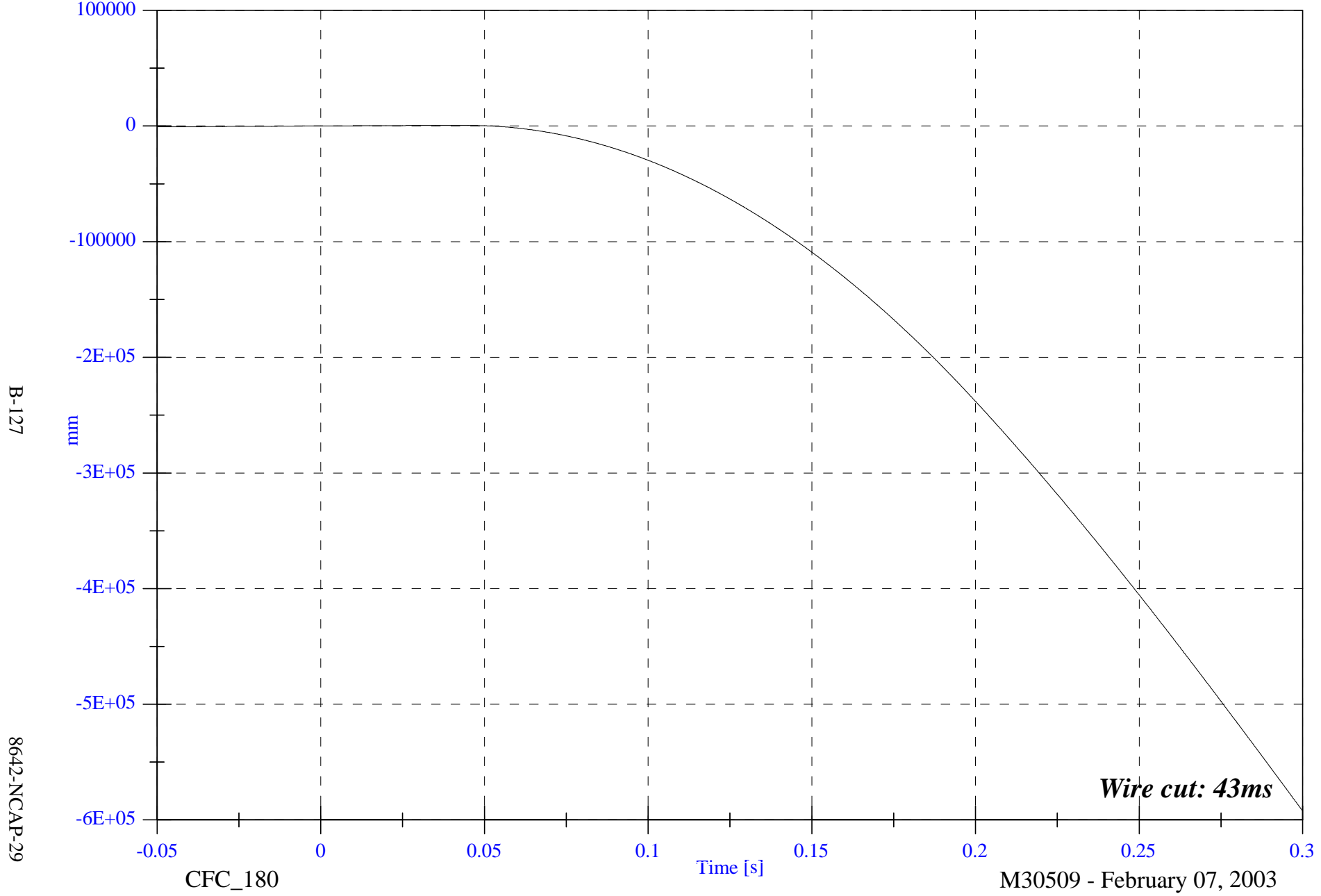
Wire cut: 43ms

NCAP Test #7 - 2003 Mercedes E320

V1 Engine Bottom #4x Displacement

Max: 507.9 [mm] at 0.040 [s]

Min: -592102.8 [mm] at 0.300 [s]



B-127

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

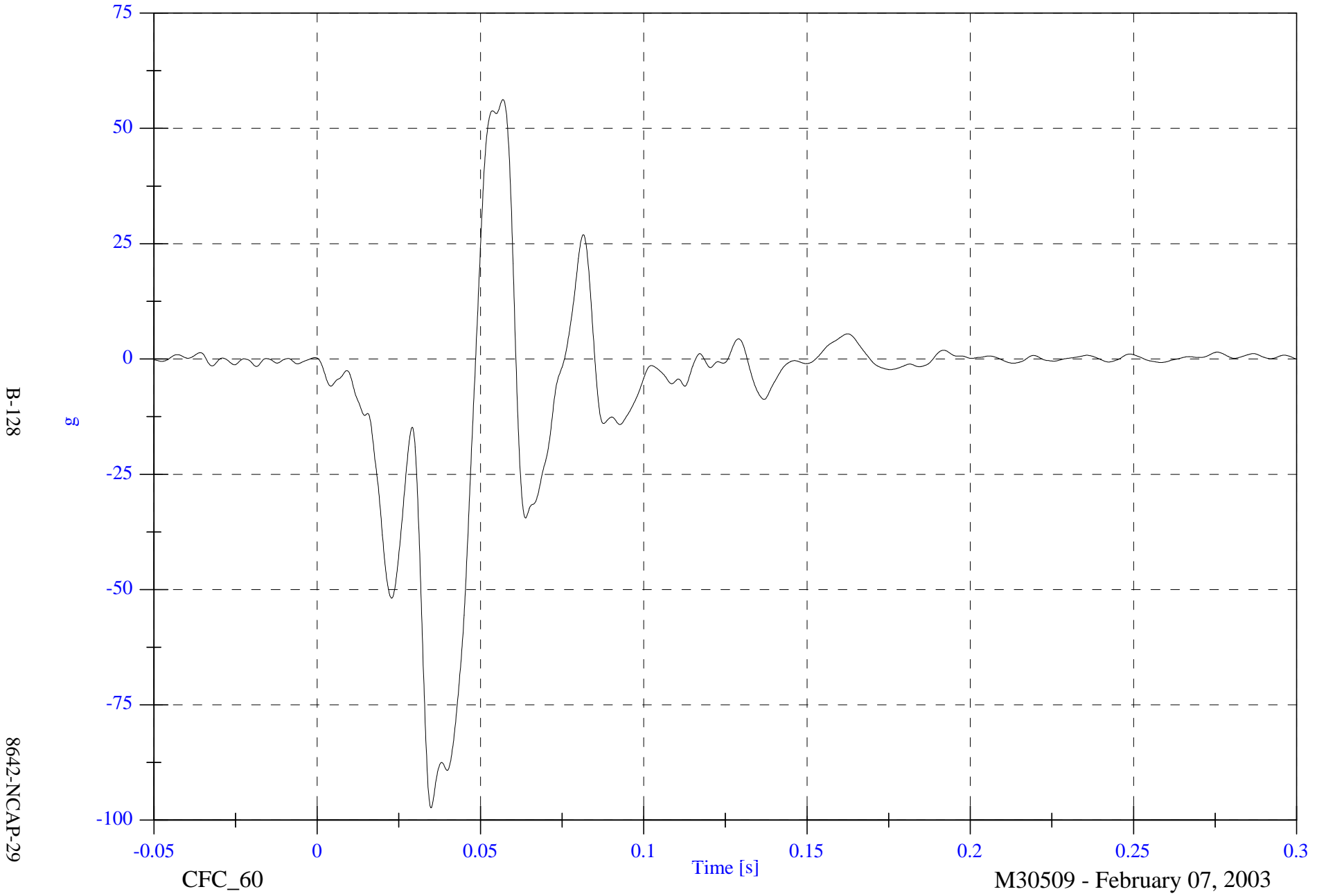
Wire cut: 43ms

NCAP Test #7 - 2003 Mercedes E320

V1 Right Caliper #5x

Max: 56.2 [g] at 0.057 [s]

Min: -97.3 [g] at 0.035 [s]



NCAP Test #7 - 2003 Mercedes E320

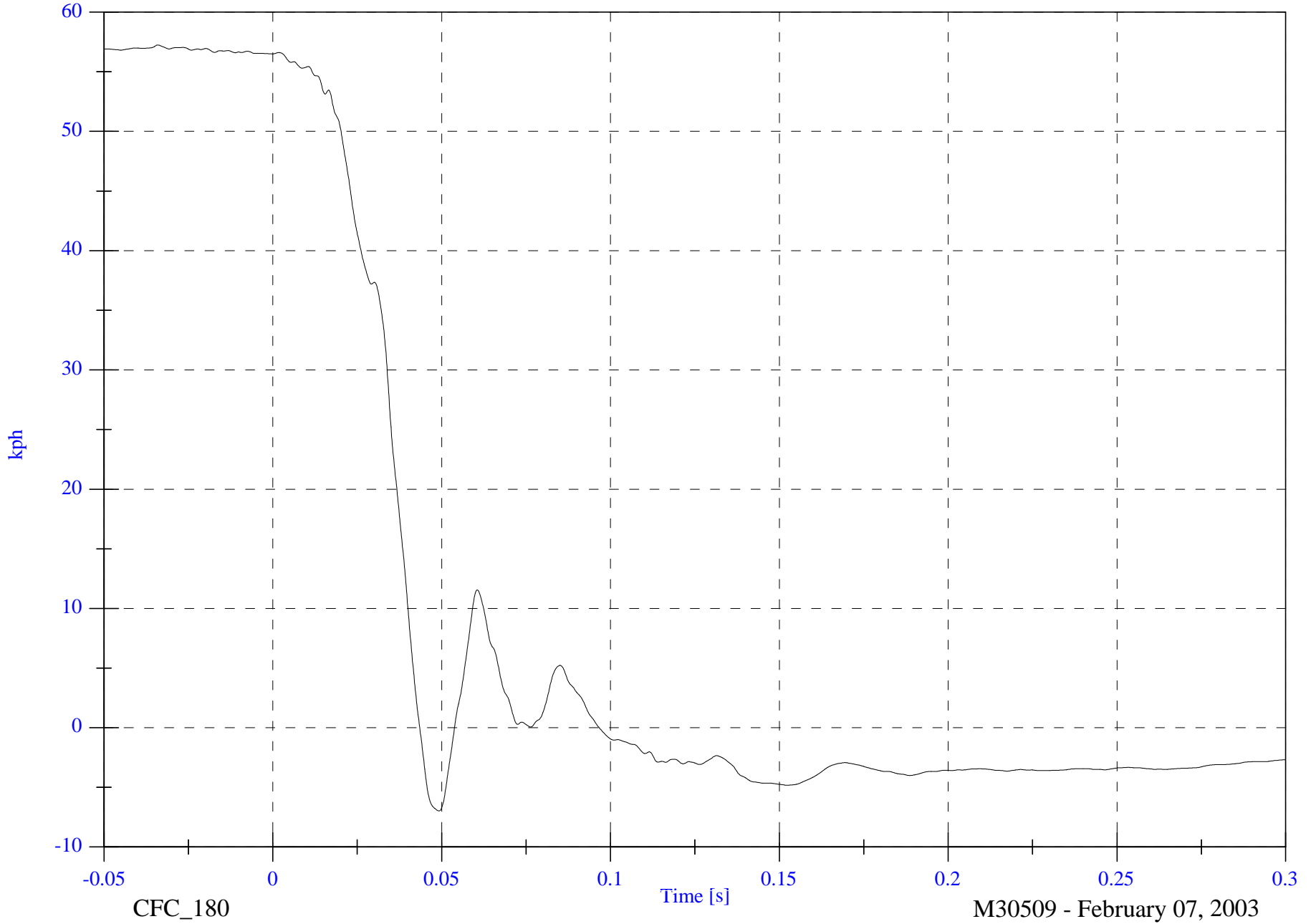
Max: 57.2 [kph] at -0.034 [s]

V1 Right Caliper #5x Velocity

Min: -7.0 [kph] at 0.049 [s]

B-129

8642-NCAP-29



CFC_180

Time [s]

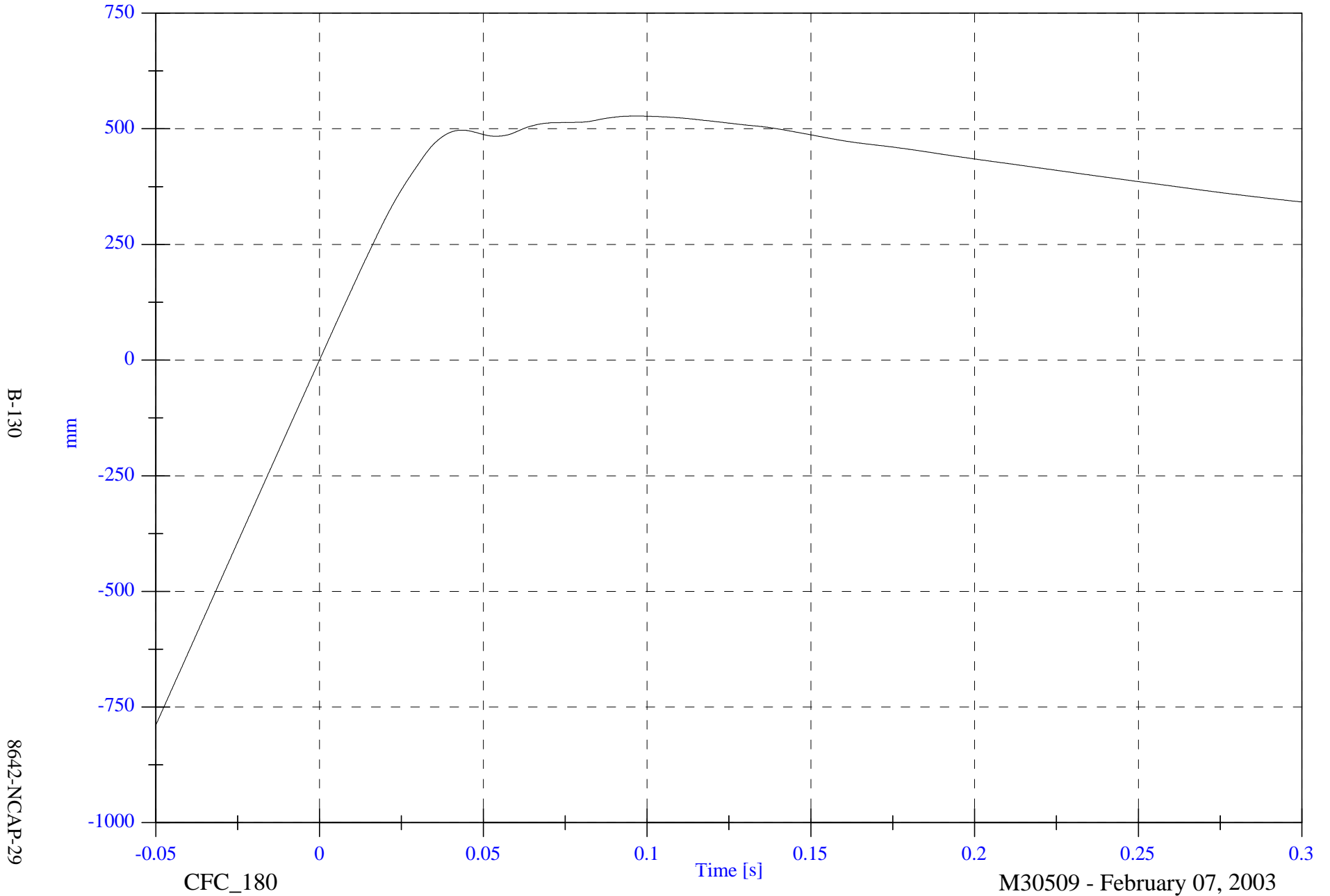
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Right Caliper #5x Displacement

Max: 527.6 [mm] at 0.097 [s]

Min: -789.3 [mm] at -0.050 [s]



B-130

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

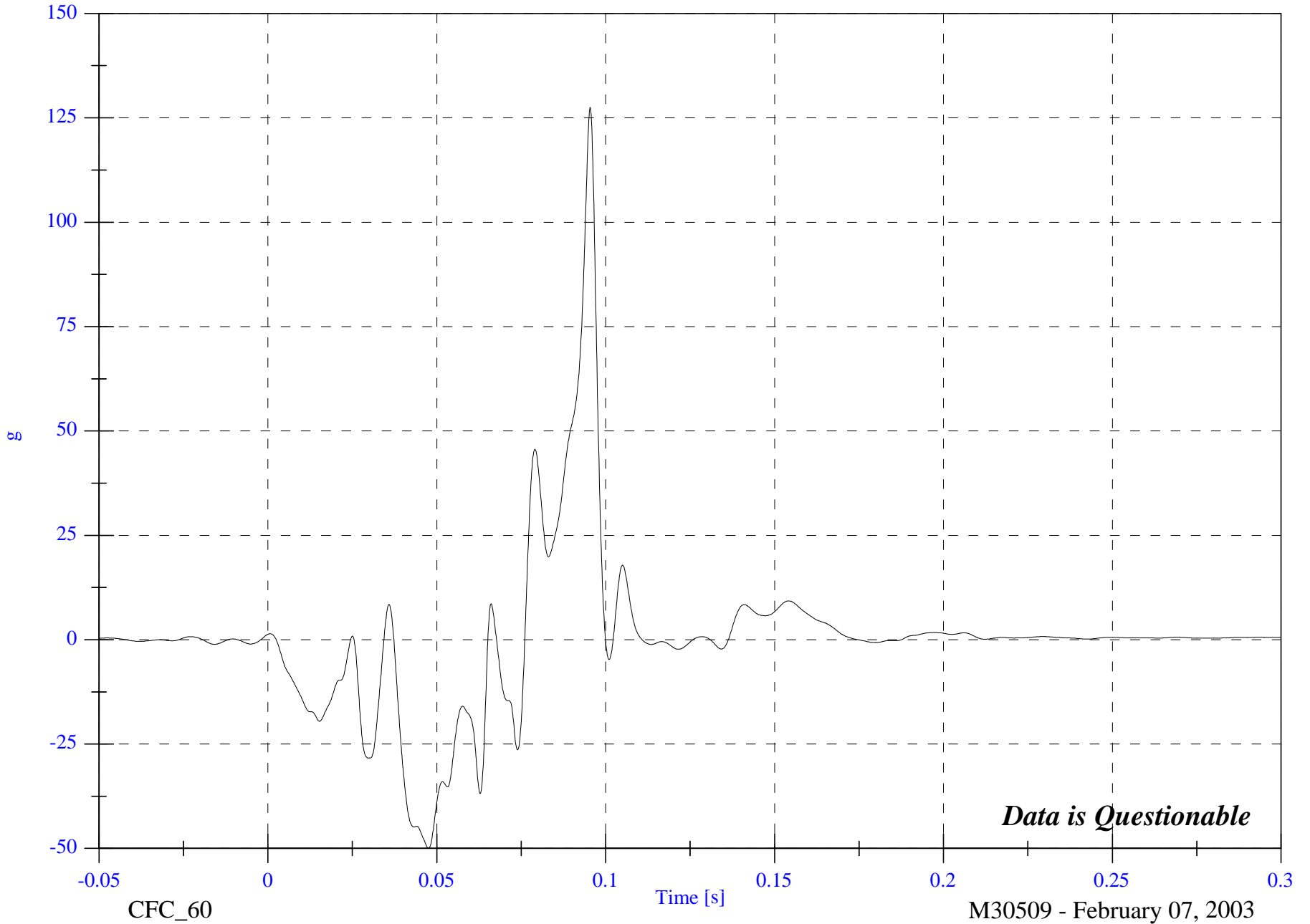
Max: 127.5 [g] at 0.095 [s]

V1 Instrument Panel #6x

Min: -50.0 [g] at 0.048 [s]

B-131

8642-NCAP-29



Data is Questionable

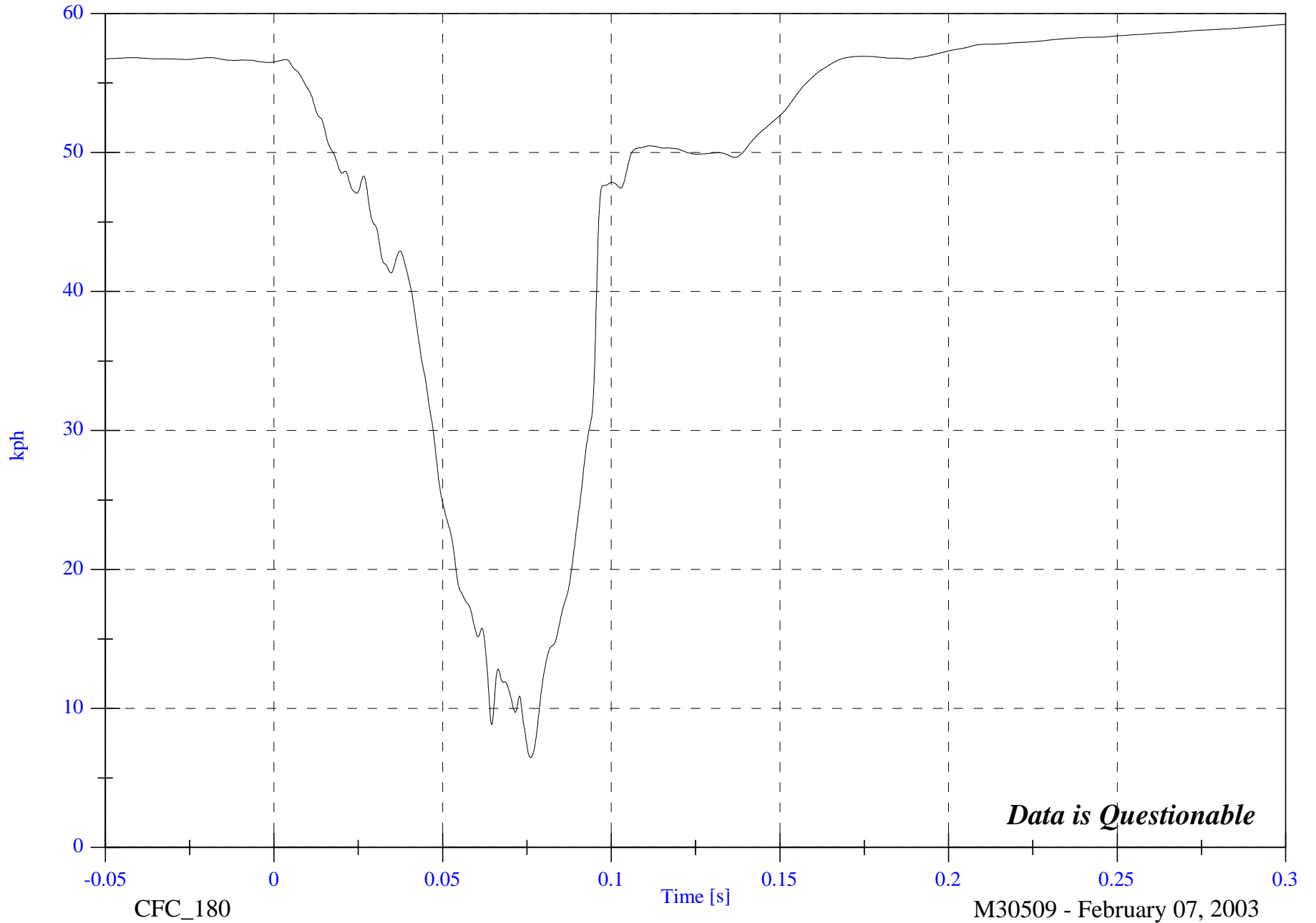
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Instrument Panel #6x Velocity

Max: 59.2 [kph] at 0.300 [s]

Min: 6.5 [kph] at 0.076 [s]



B-132

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

Data is Questionable

NCAP Test #7 - 2003 Mercedes E320

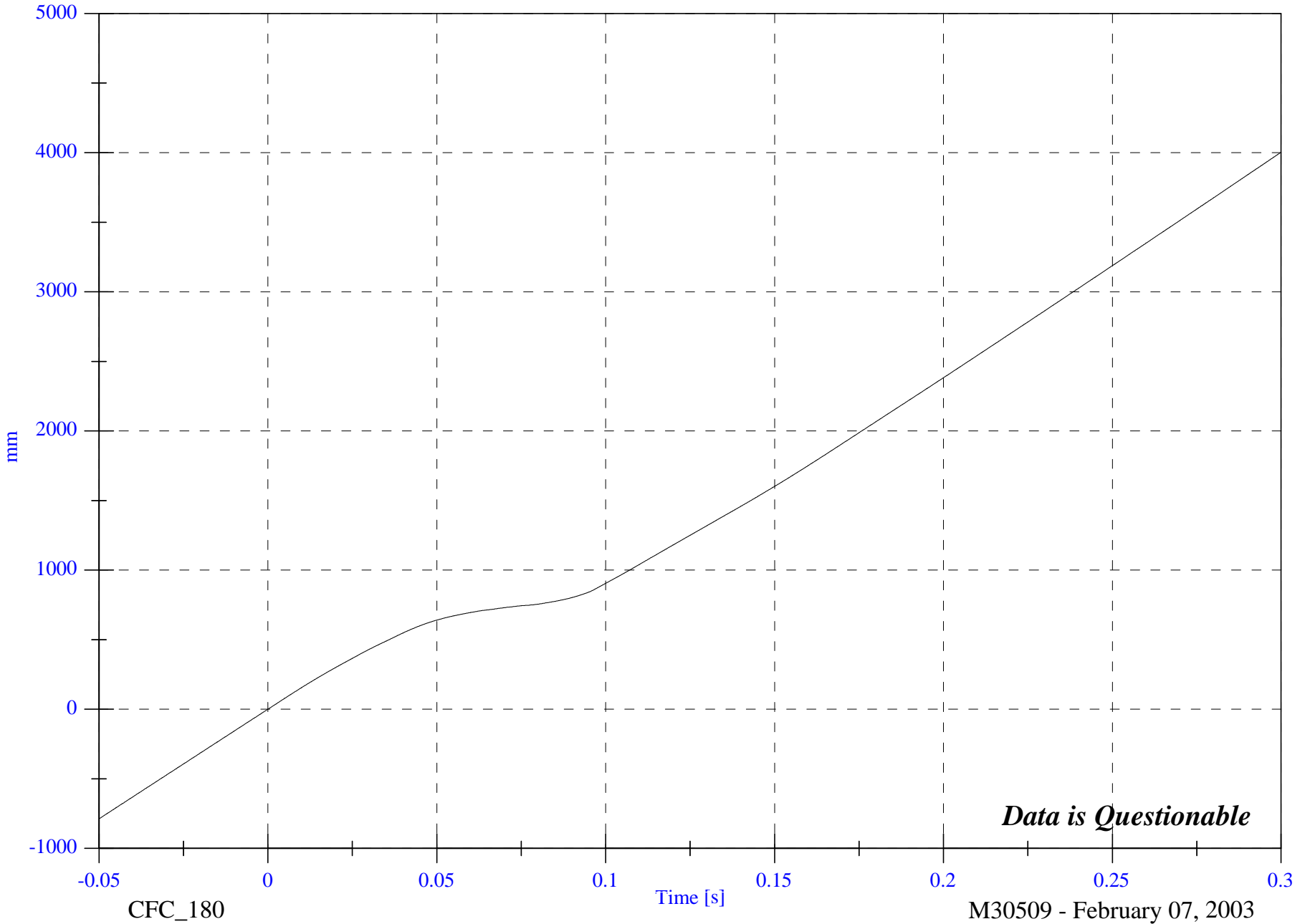
V1 Instrument Panel #6x Displacement

Max: 4002.2 [mm] at 0.300 [s]

Min: -787.6 [mm] at -0.050 [s]

B-133

8642-NCAP-29



CFC_180

Time [s]

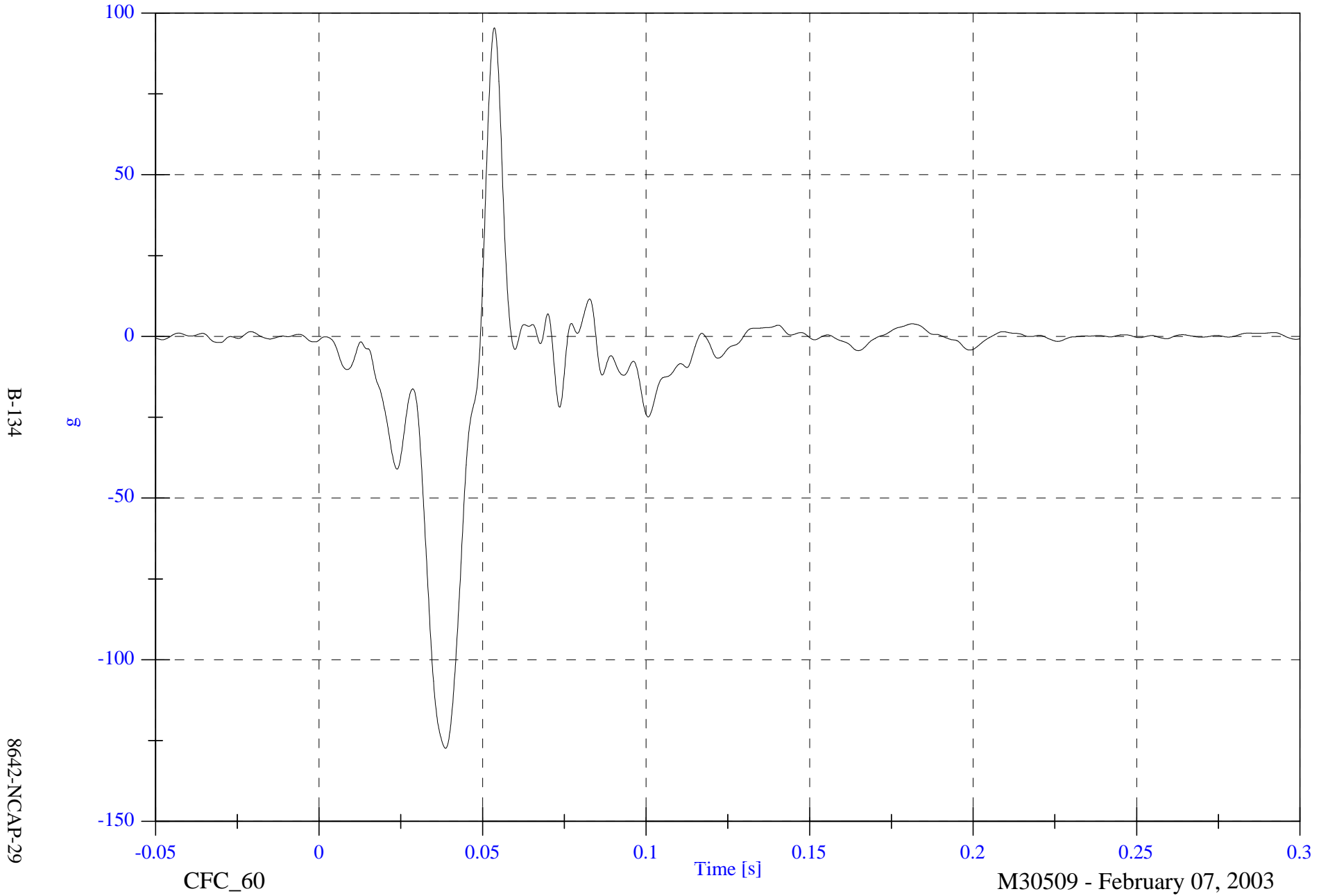
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Left Caliper #7x

Max: 95.5 [g] at 0.054 [s]

Min: -127.4 [g] at 0.039 [s]



NCAP Test #7 - 2003 Mercedes E320

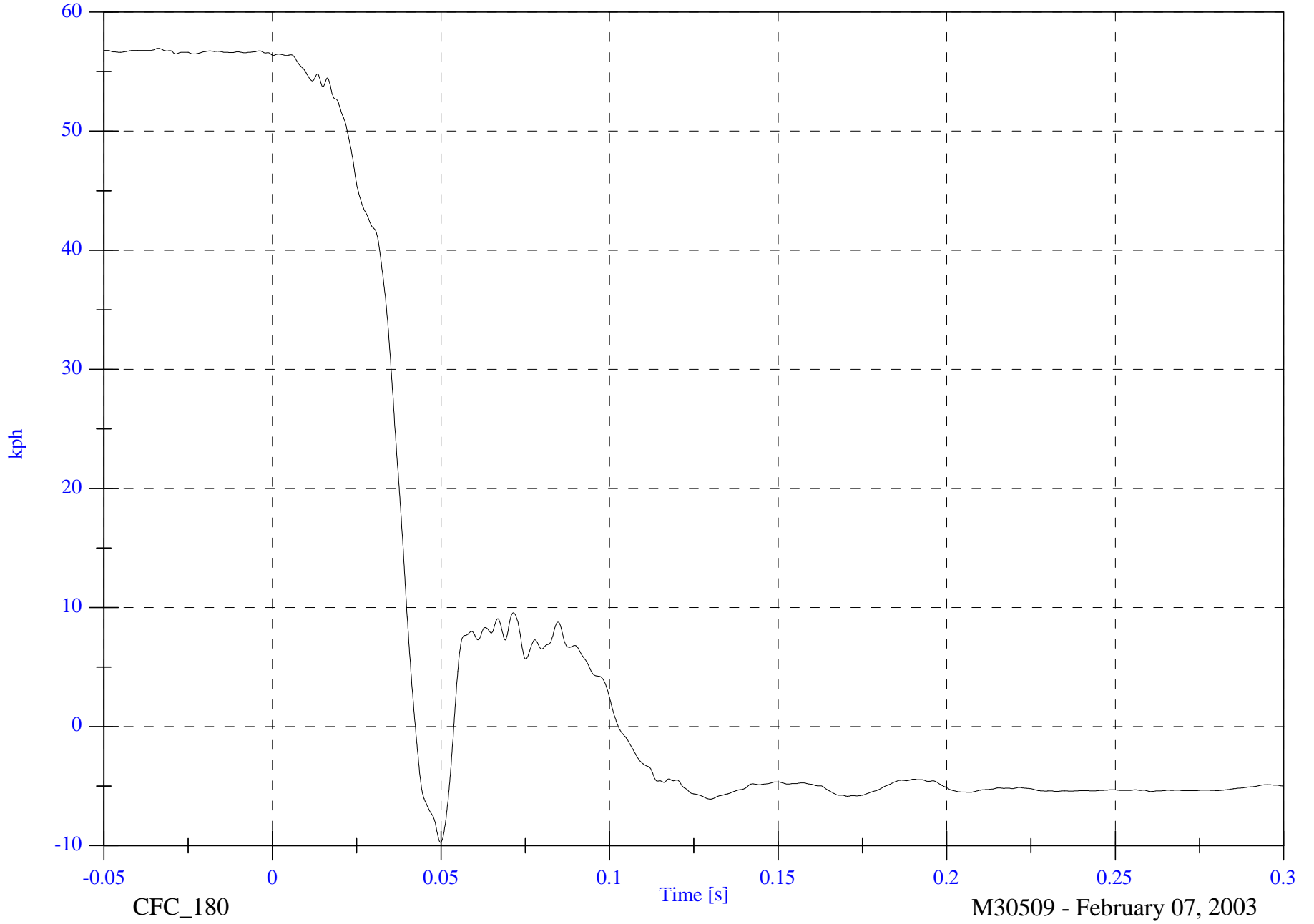
V1 Left Caliper #7x Velocity

Max: 56.9 [kph] at -0.034 [s]

Min: -9.7 [kph] at 0.050 [s]

B-135

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

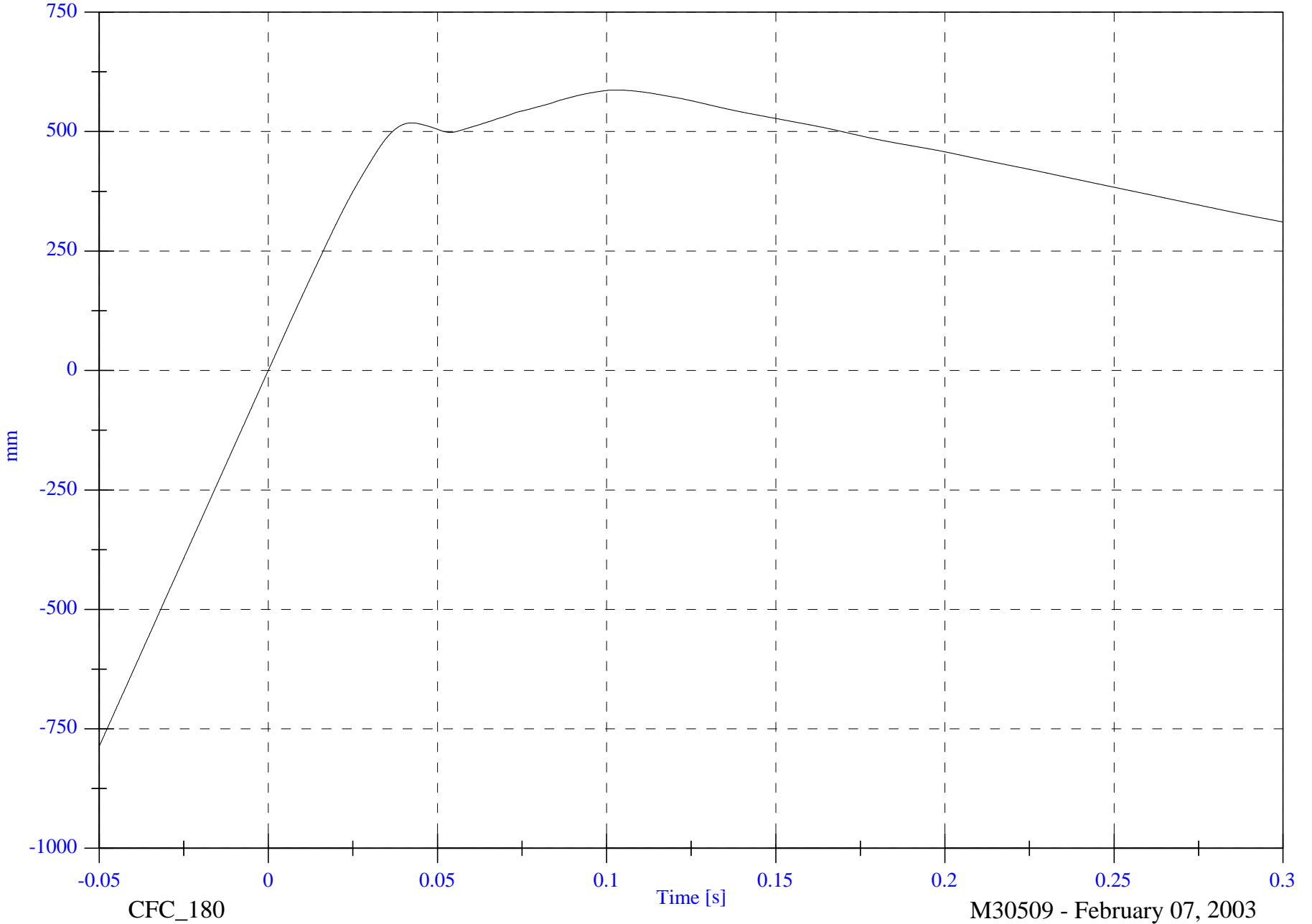
V1 Left Caliper #7x Displacement

Max: 586.7 [mm] at 0.103 [s]

Min: -787.1 [mm] at -0.050 [s]

B-136

8642-NCAP-29



CFC_180

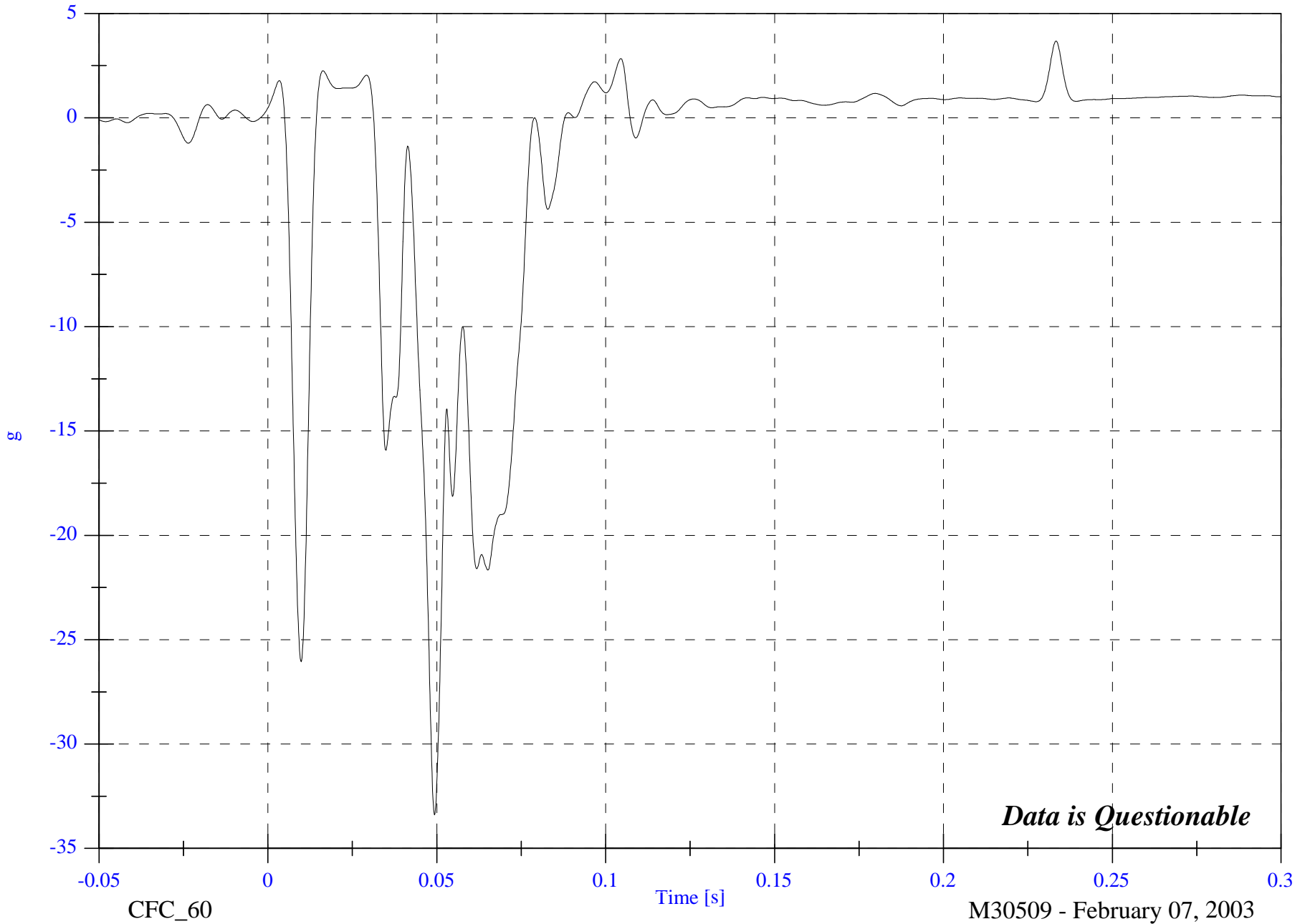
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Left Rear #8z

Max: 3.7 [g] at 0.233 [s]

Min: -33.4 [g] at 0.049 [s]



B-137

8642-NCAP-29

CFC_60

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

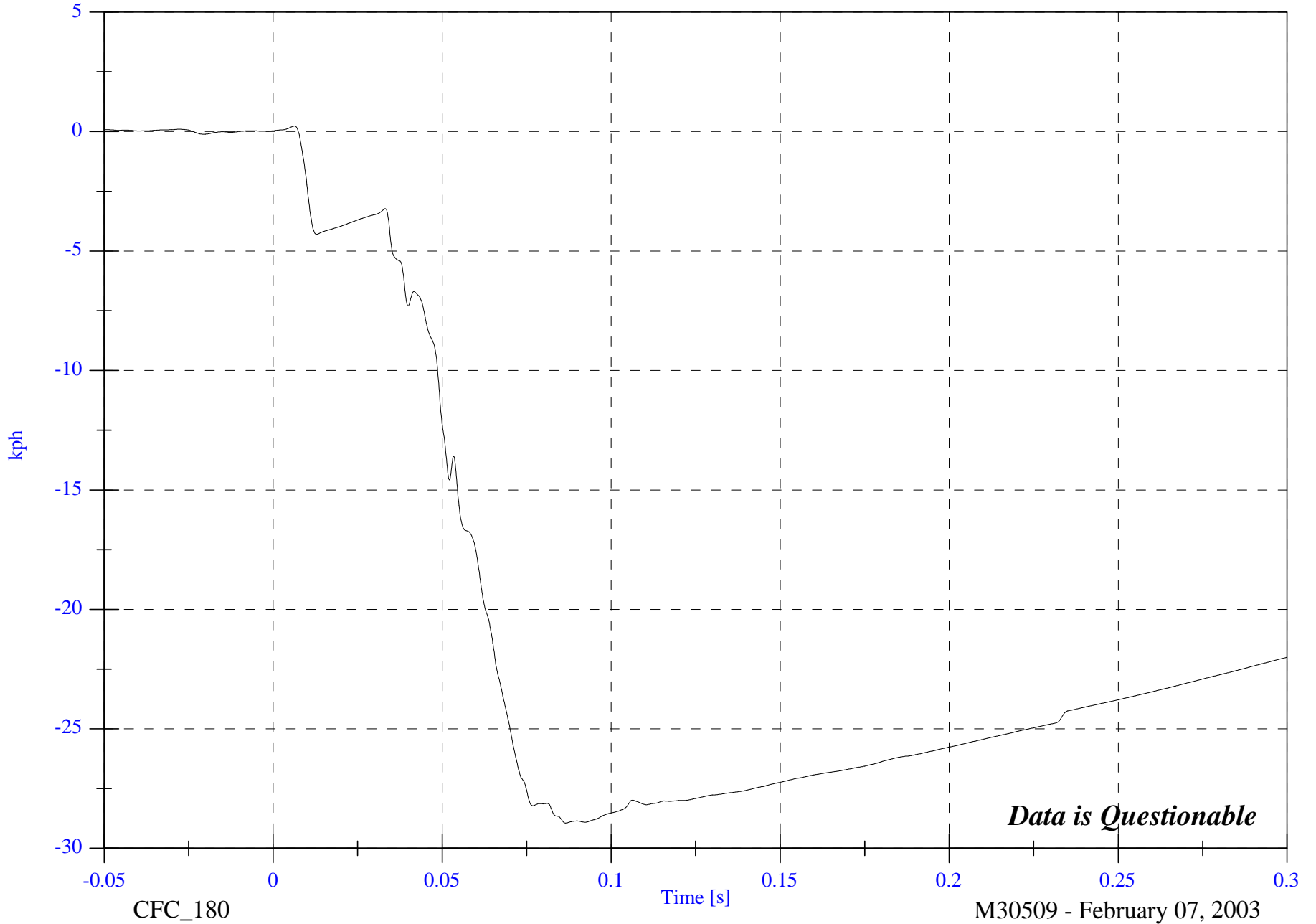
V1 Left Rear #8z Velocity

Max: 0.2 [kph] at 0.006 [s]

Min: -28.9 [kph] at 0.087 [s]

B-138

8642-NCAP-29



Data is Questionable

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

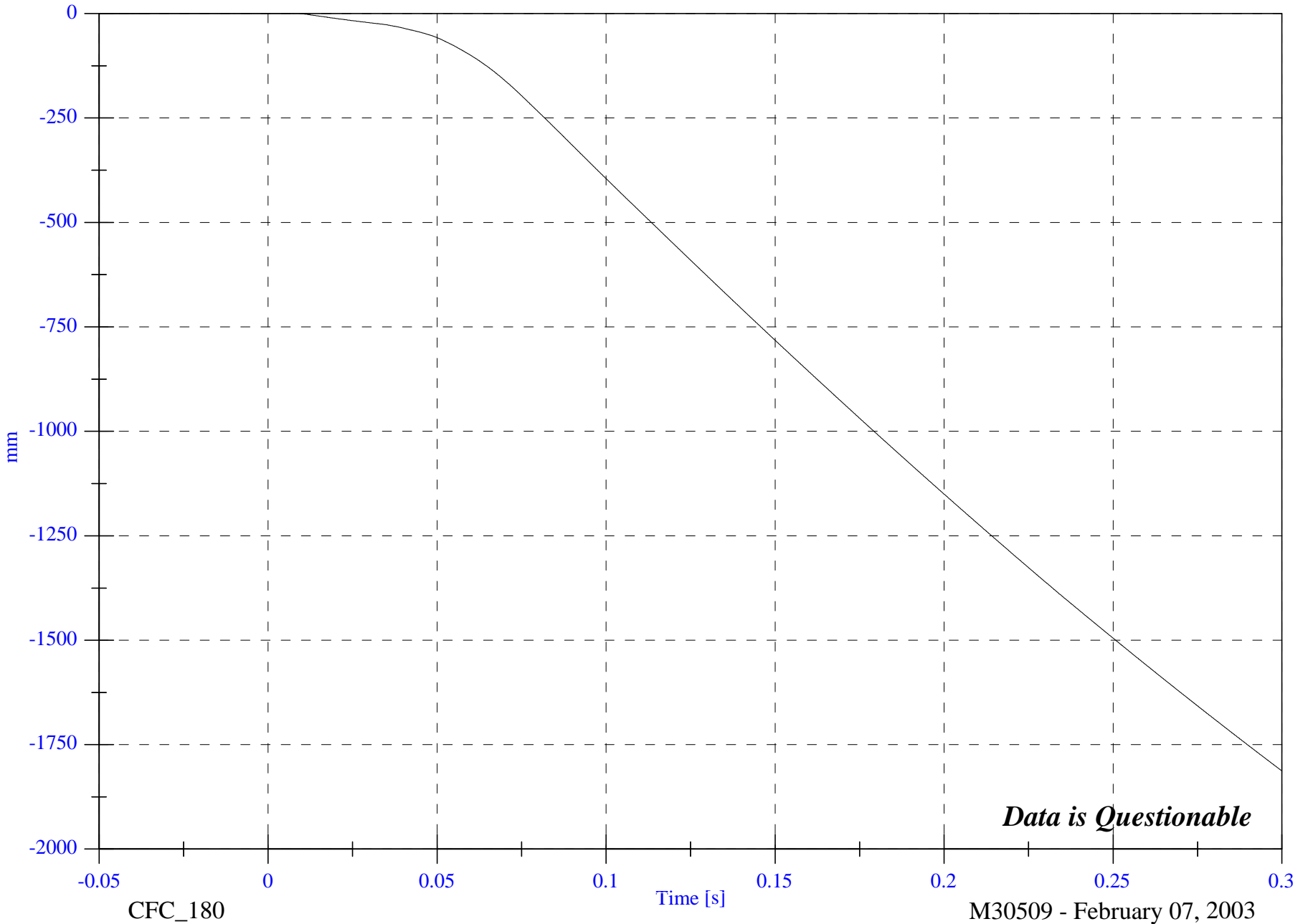
V1 Left Rear #8z Displacement

Max: 0.2 [mm] at 0.007 [s]

Min: -1812.6 [mm] at 0.300 [s]

B-139

8642-NCAP-29



Data is Questionable

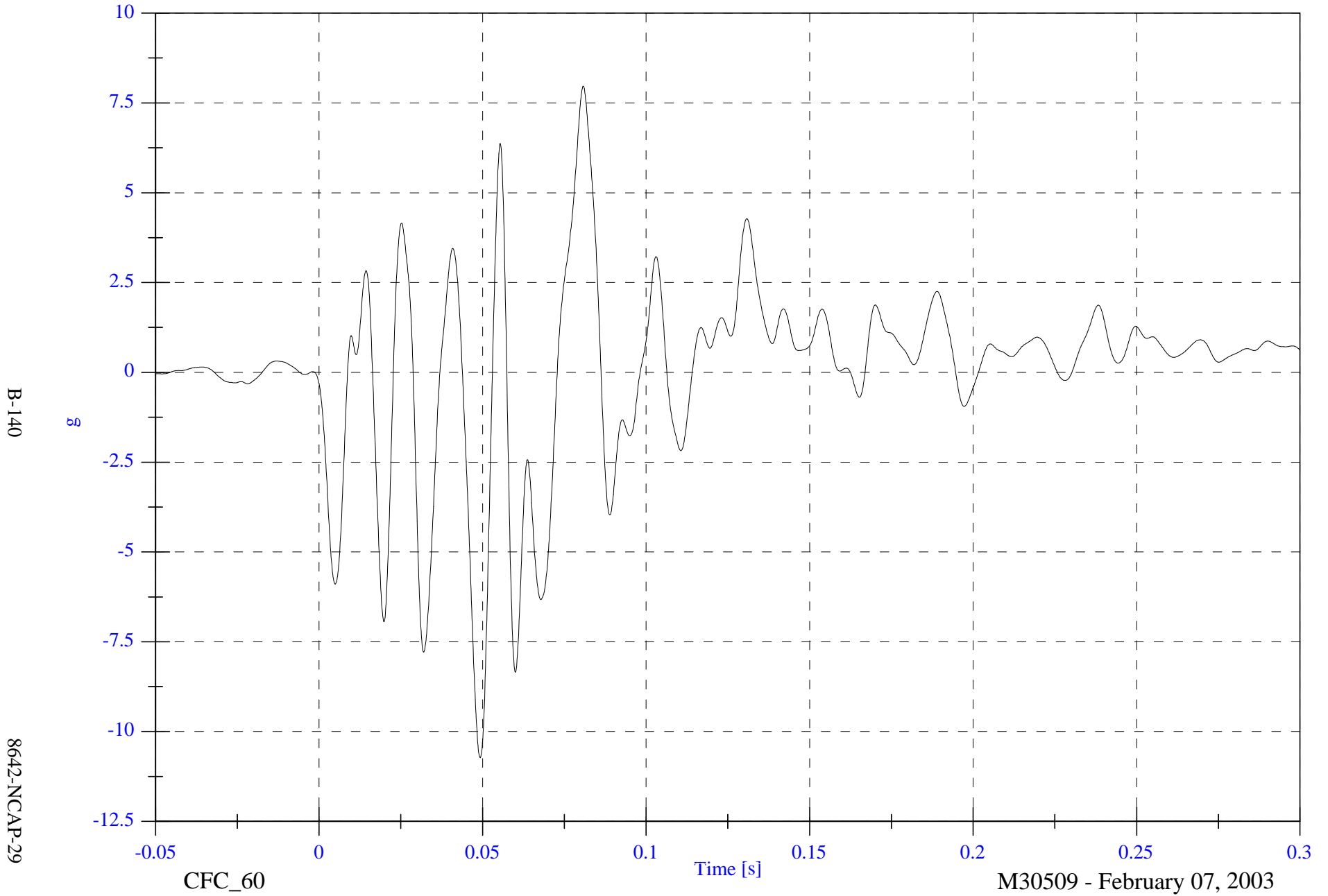
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Right Rear #9z

Max: 8.0 [g] at 0.081 [s]

Min: -10.7 [g] at 0.049 [s]



NCAP Test #7 - 2003 Mercedes E320

V1 Right Rear #9z Velocity

Max: 1.1 [kph] at 0.300 [s]

Min: -5.9 [kph] at 0.072 [s]

B-141

8642-NCAP-29



CFC_180

Time [s]

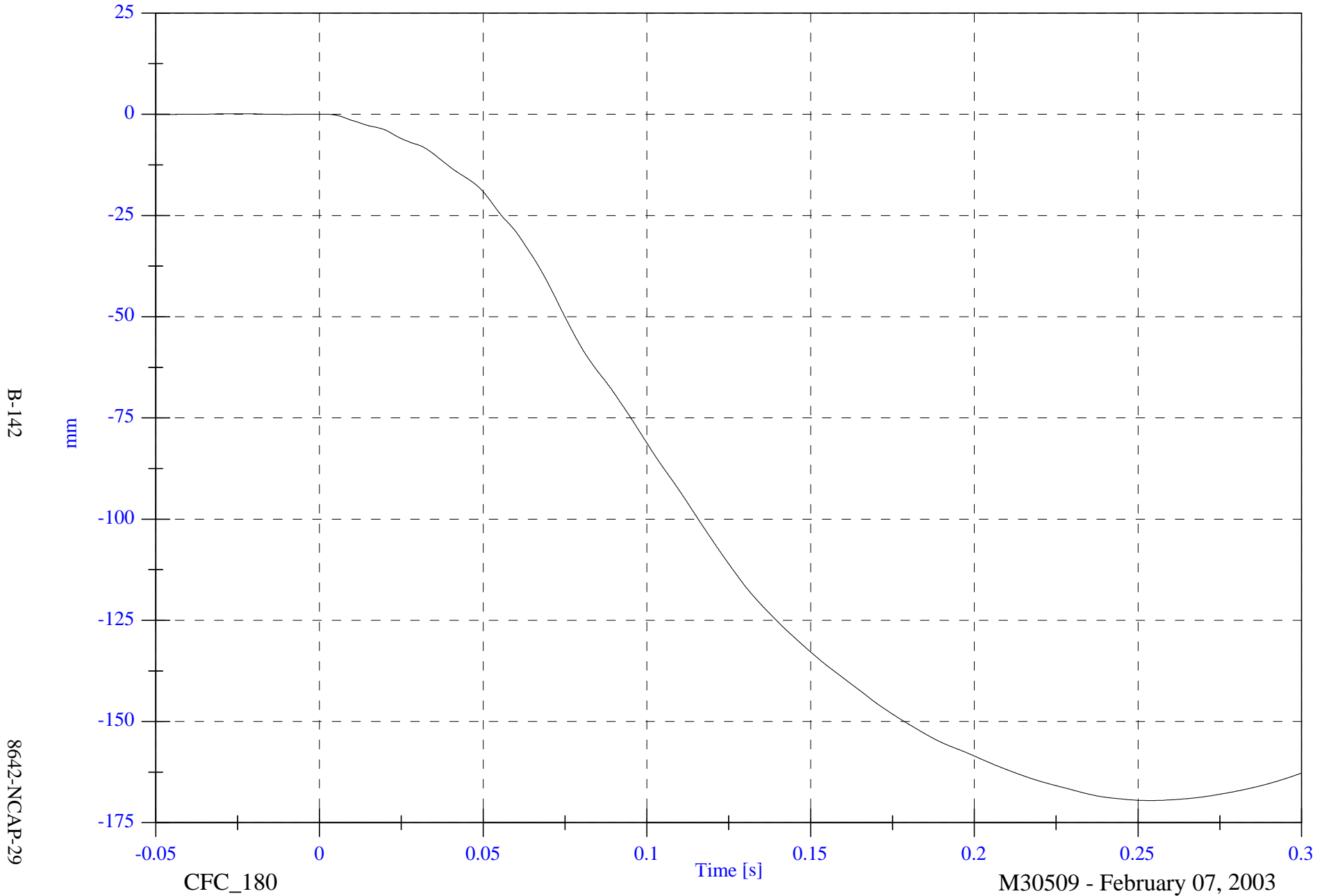
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1 Right Rear #9z Displacement

Max: 0.1 [mm] at -0.025 [s]

Min: -169.5 [mm] at 0.254 [s]



B-142

8642-NCAP-29

CFC_180

Time [s]

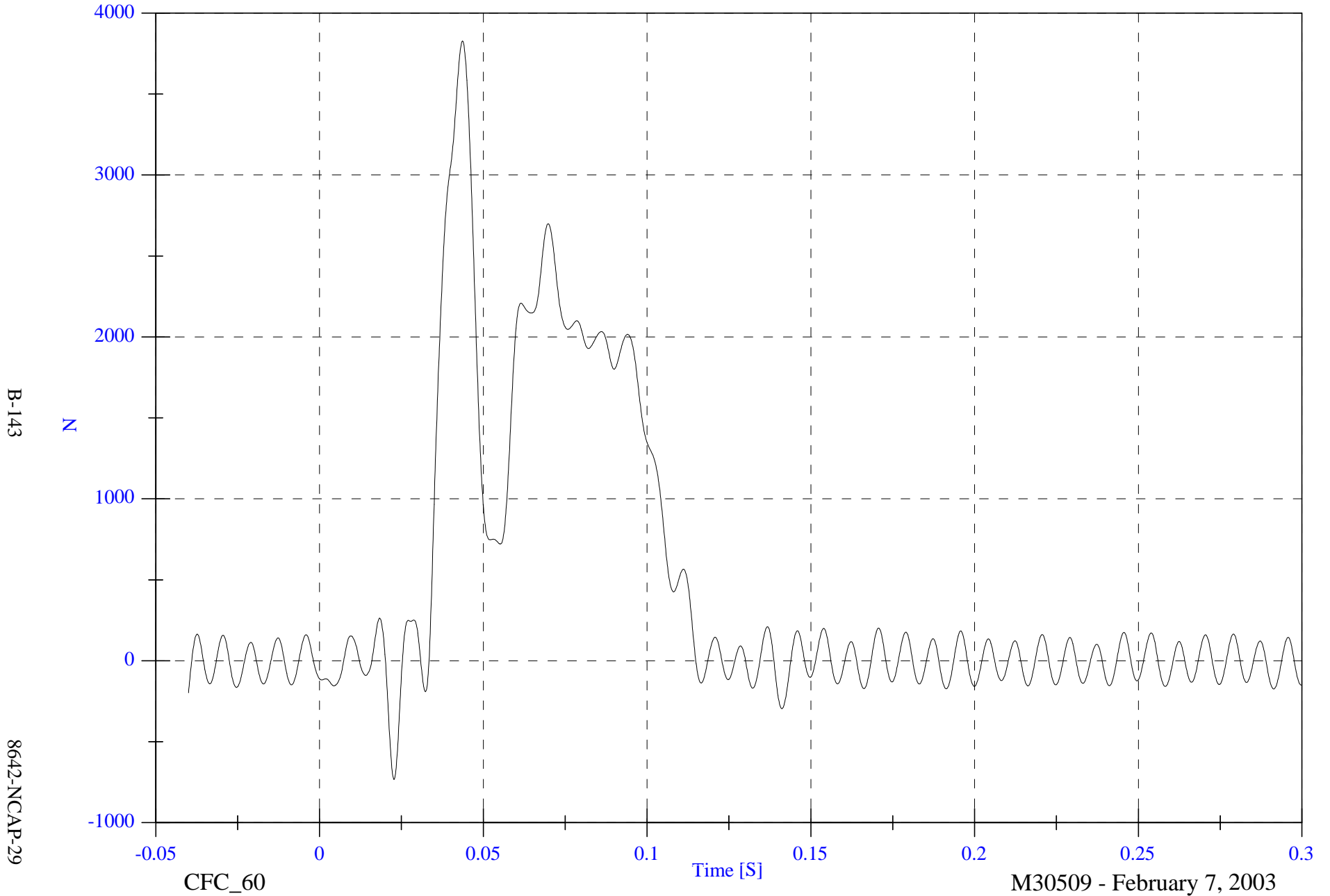
M30509 - February 07, 2003

NCAP TEST #7 2003 Mercedes E320

Max: 3827.8 [N] at 0.044 [S]

Min: -732.7 [N] at 0.023 [S]

B1 LCA1 Fx



B-143

8642-NCAP-29

CFC_60

Time [S]

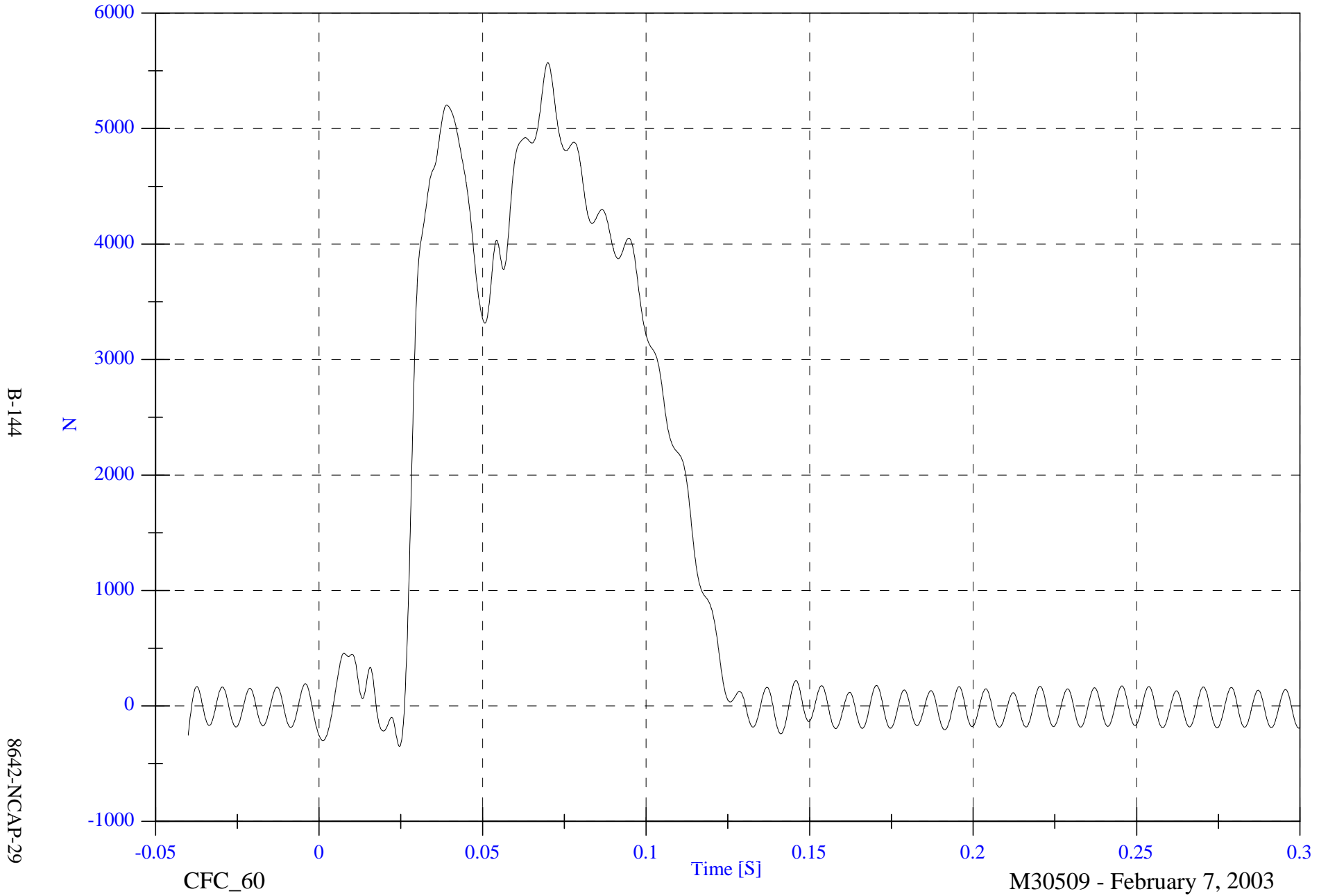
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCA2 Fx

Max: 5570.6 [N] at 0.070 [S]

Min: -351.3 [N] at 0.025 [S]

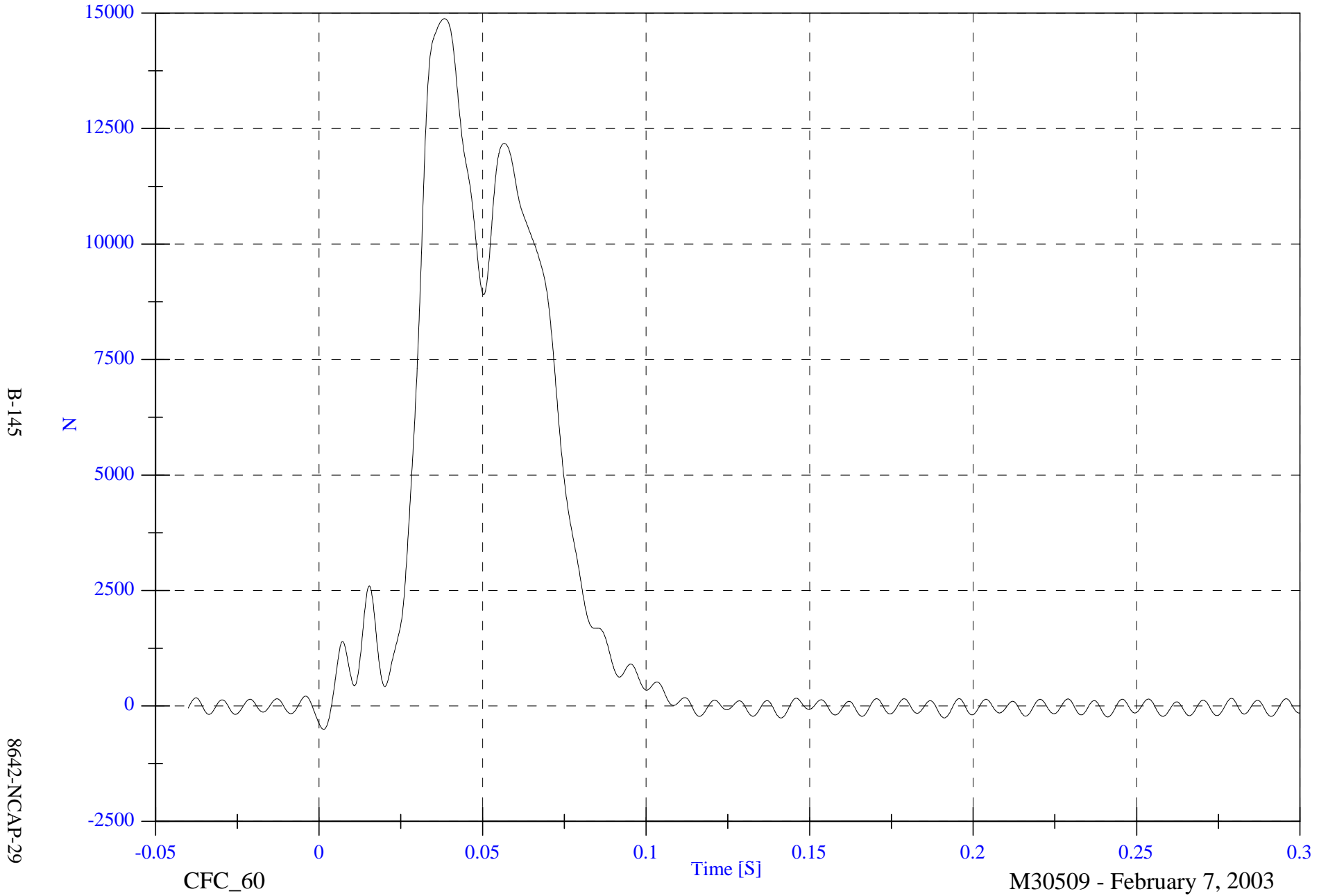


NCAP TEST #7 2003 Mercedes E320

B1 LCA3 Fx

Max: 14878.9 [N] at 0.038 [S]

Min: -505.8 [N] at 0.001 [S]



B-145

8642-NCAP-29

CFC_60

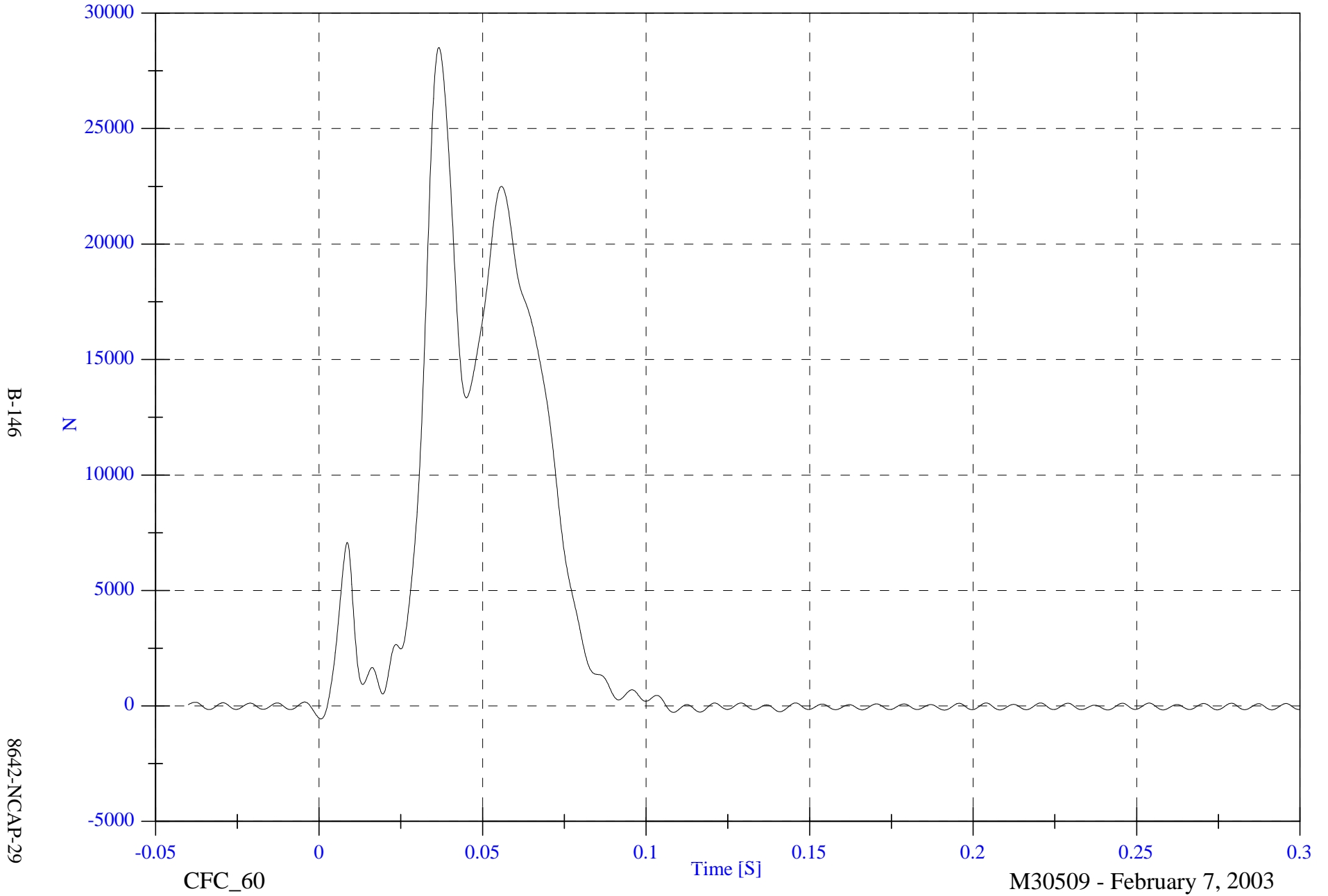
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCA4 Fx

Max: 28510.1 [N] at 0.037 [S]

Min: -561.1 [N] at 0.001 [S]

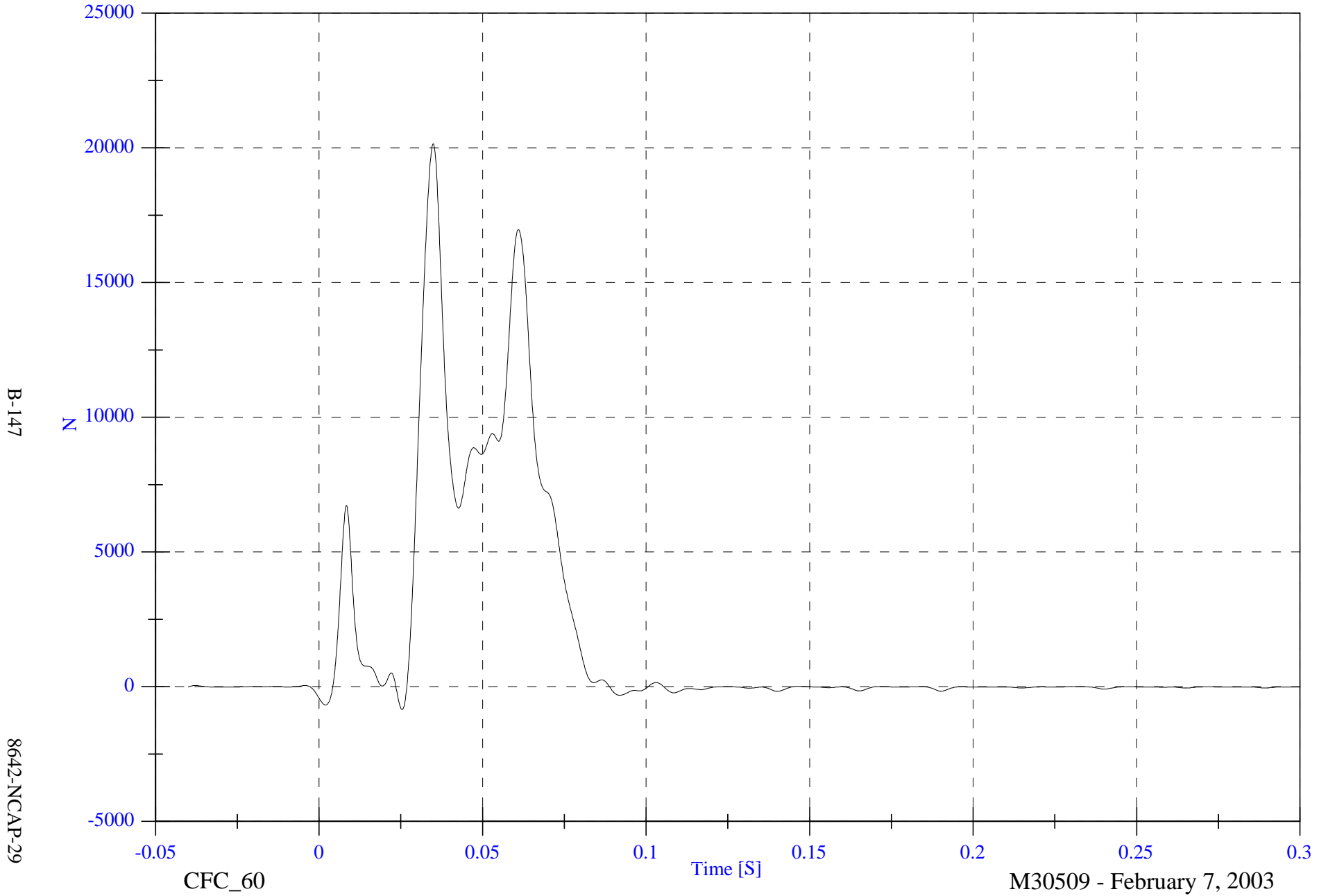


NCAP TEST #7 2003 Mercedes E320

B1 LCA5 Fx

Max: 20146.6 [N] at 0.035 [S]

Min: -846.4 [N] at 0.025 [S]

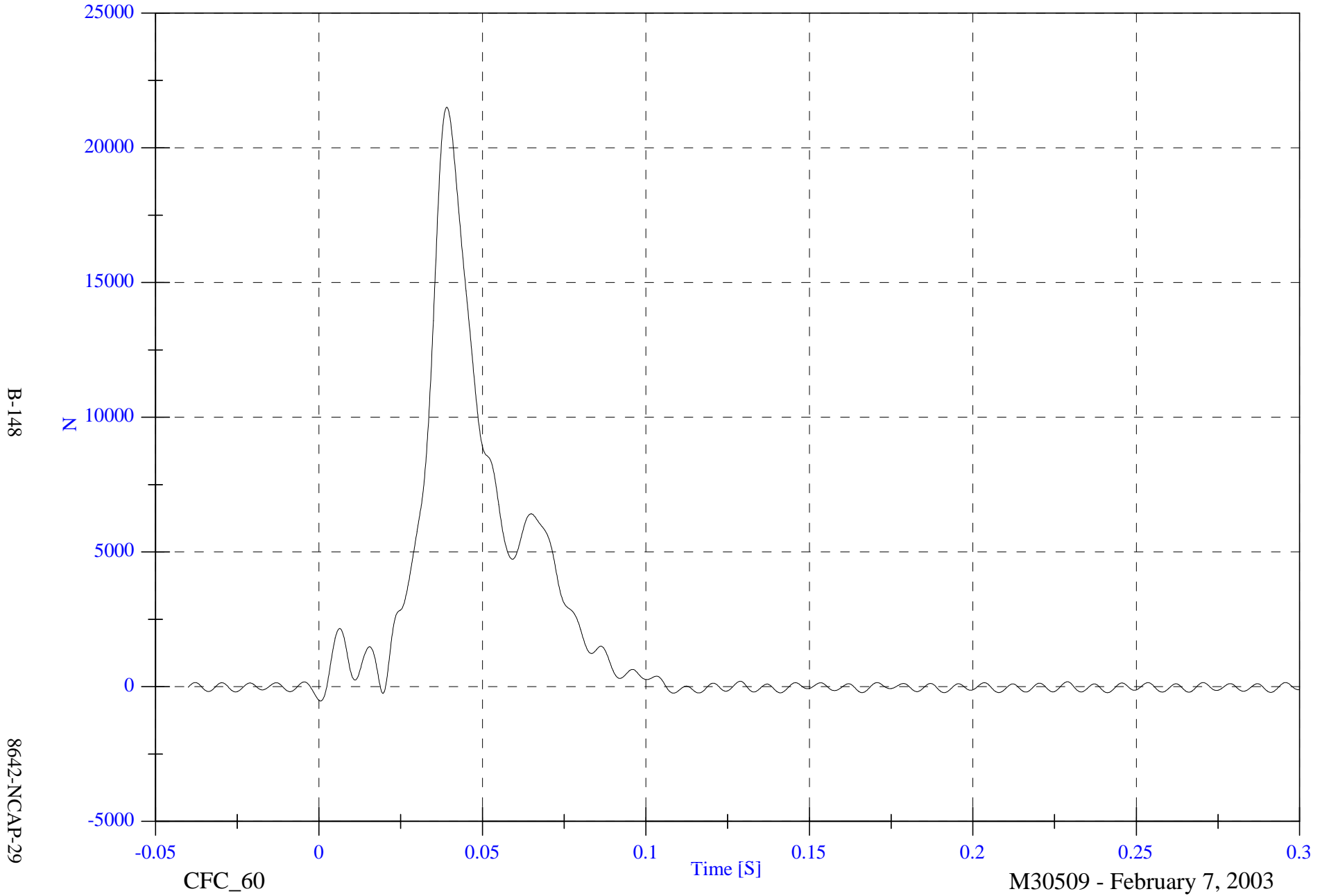


NCAP TEST #7 2003 Mercedes E320

B1 LCA6 Fx

Max: 21504.9 [N] at 0.039 [S]

Min: -531.3 [N] at 0.000 [S]

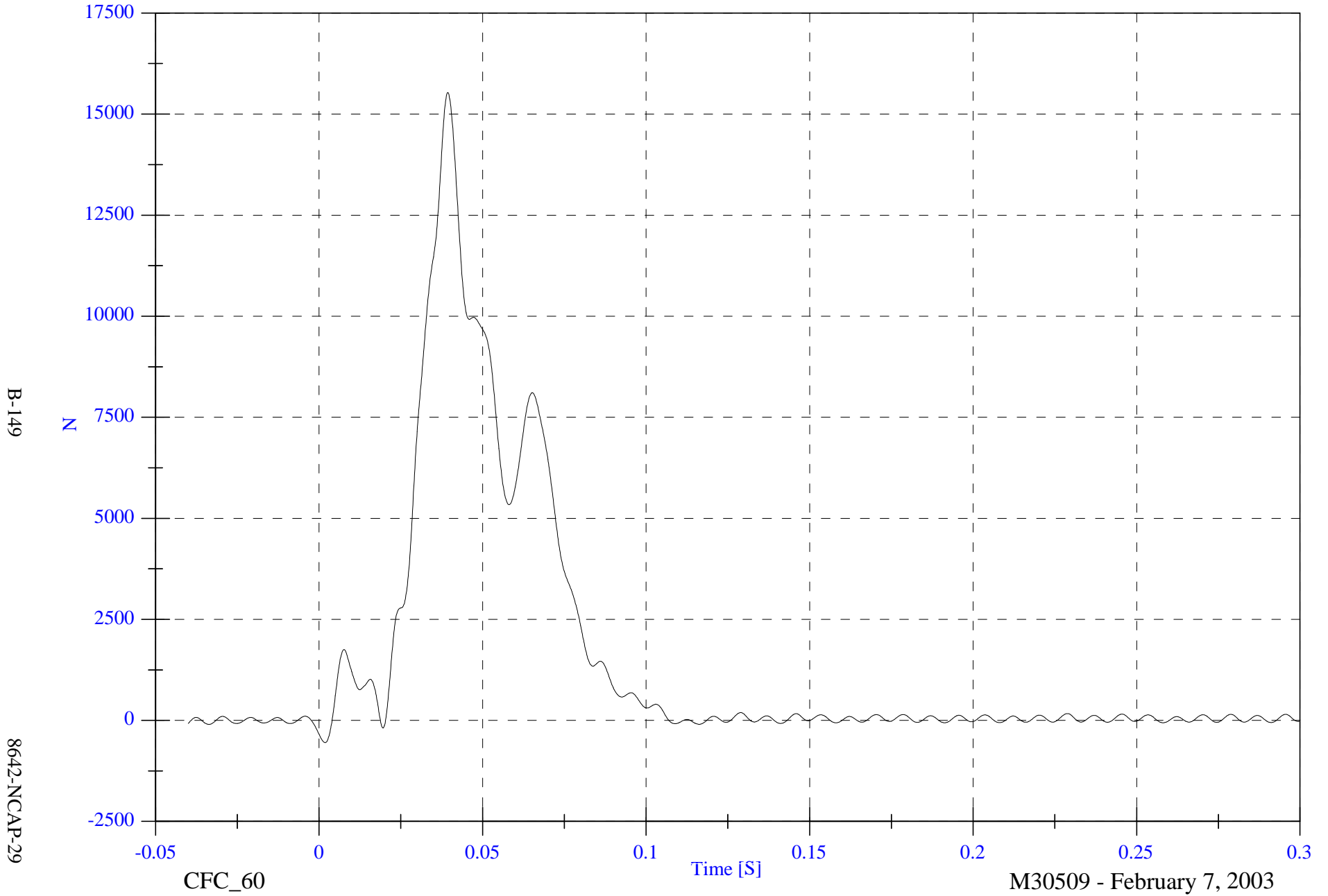


NCAP TEST #7 2003 Mercedes E320

B1 LCA7 Fx

Max: 15534.8 [N] at 0.039 [S]

Min: -551.9 [N] at 0.002 [S]



B-149

8642-NCAP-29

CFC_60

Time [S]

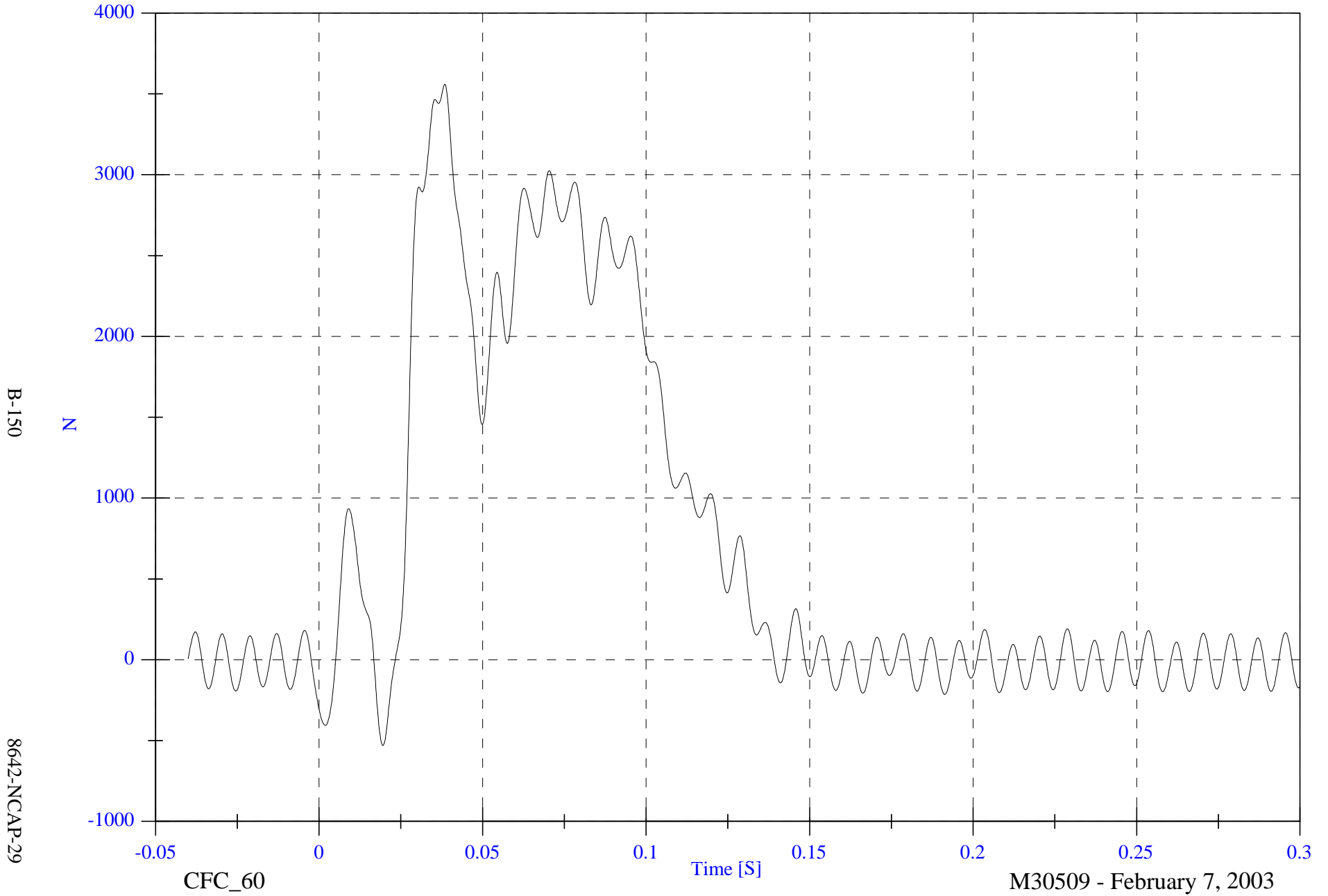
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCA8 Fx

Max: 3559.0 [N] at 0.038 [S]

Min: -529.8 [N] at 0.019 [S]



B-150

8642-NCAP-29

CFC_60

Time [S]

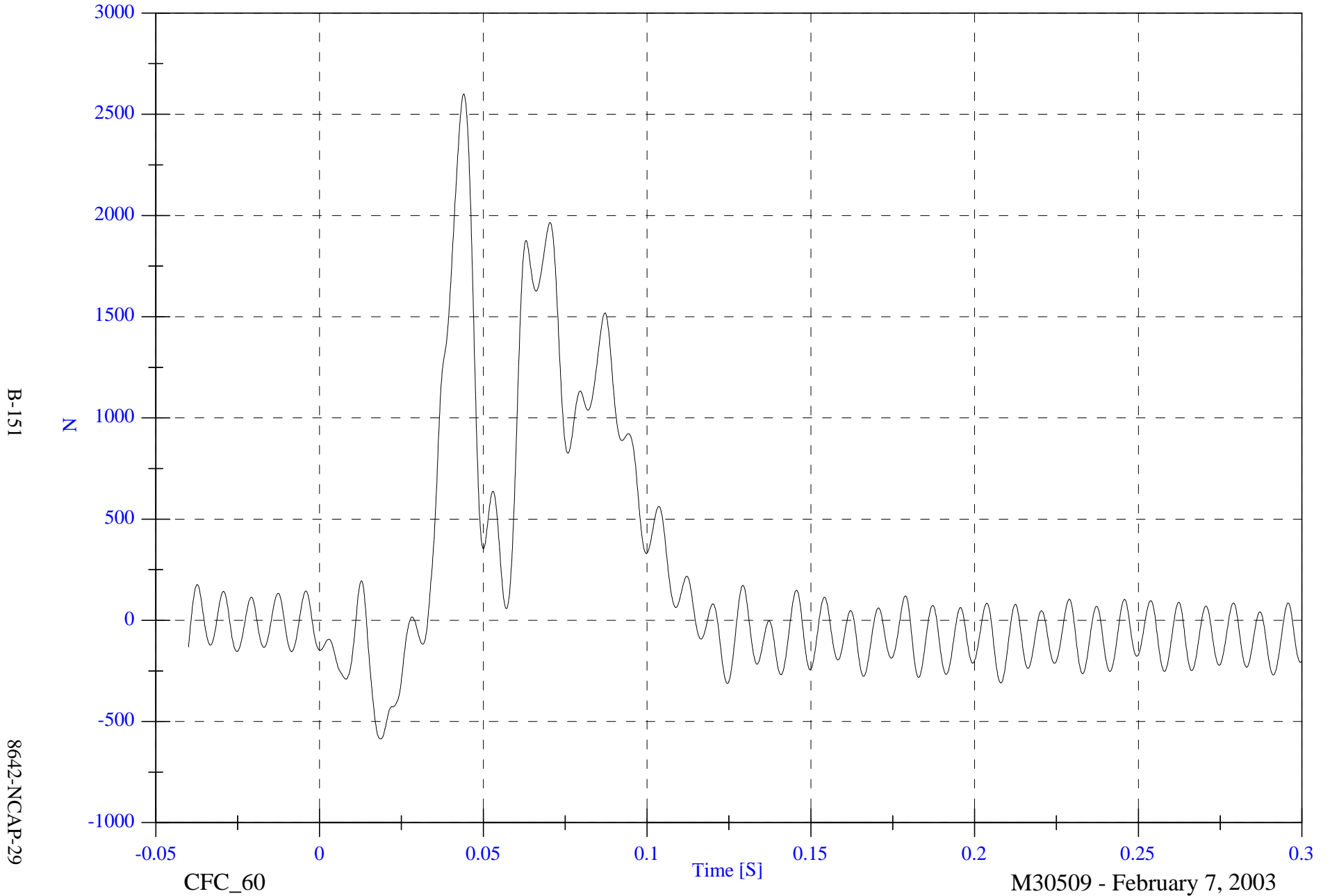
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCA9 Fx

Max: 2600.2 [N] at 0.044 [S]

Min: -585.8 [N] at 0.019 [S]

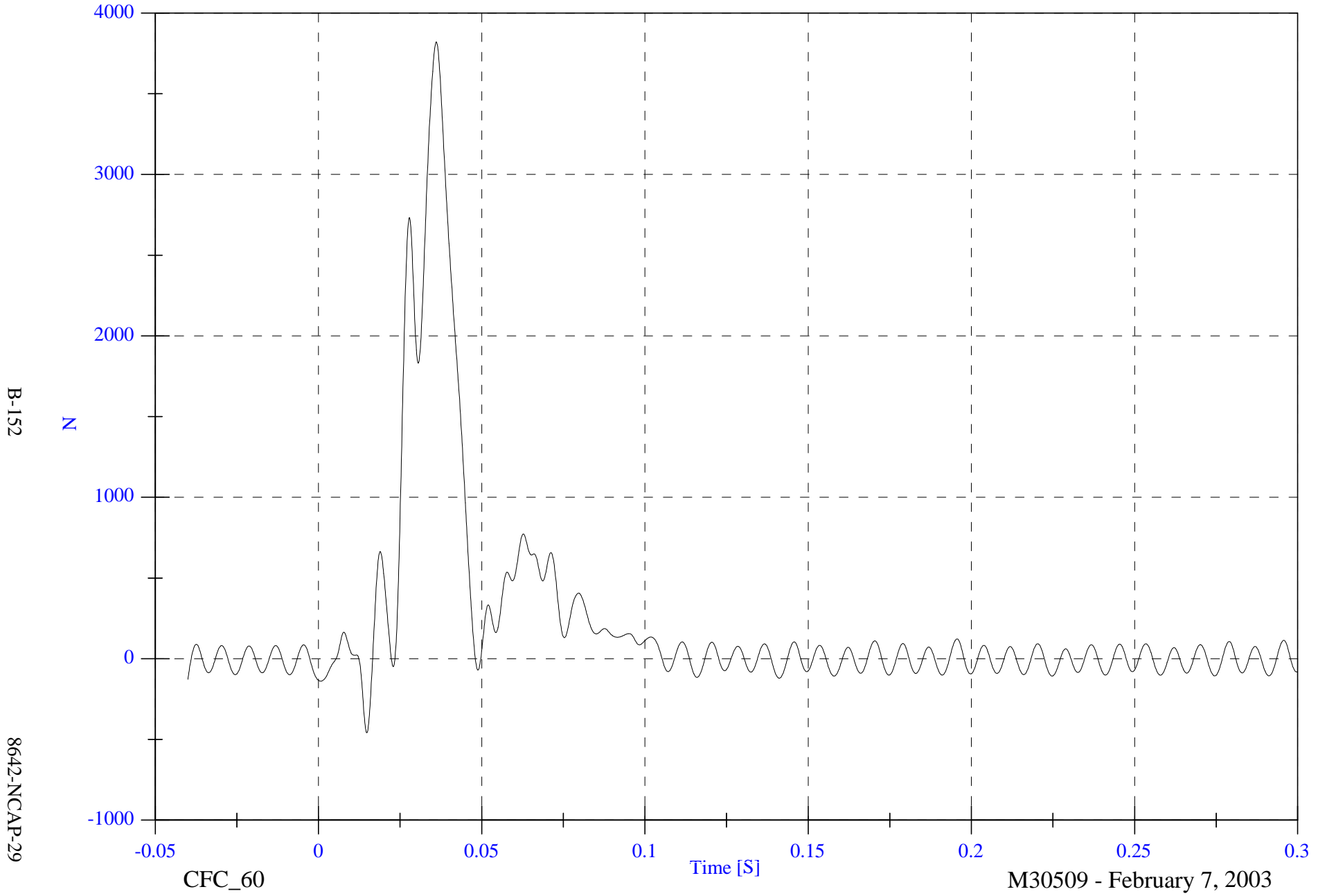


NCAP TEST #7 2003 Mercedes E320

B1 LCB1 Fx

Max: 3821.7 [N] at 0.036 [S]

Min: -459.3 [N] at 0.015 [S]



B-152

8642-NCAP-29

CFC_60

Time [S]

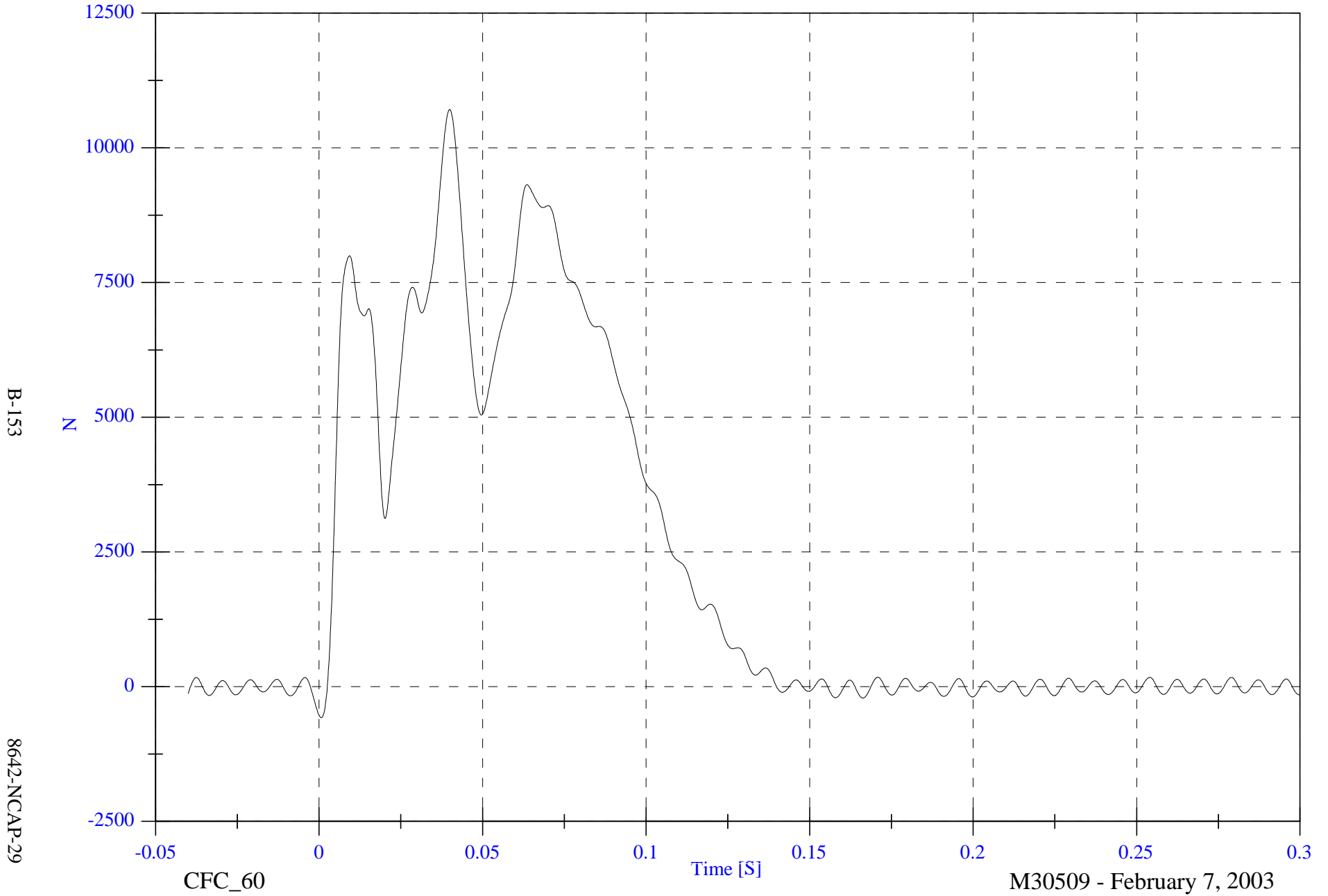
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCB2 Fx

Max: 10711.3 [N] at 0.040 [S]

Min: -576.0 [N] at 0.001 [S]

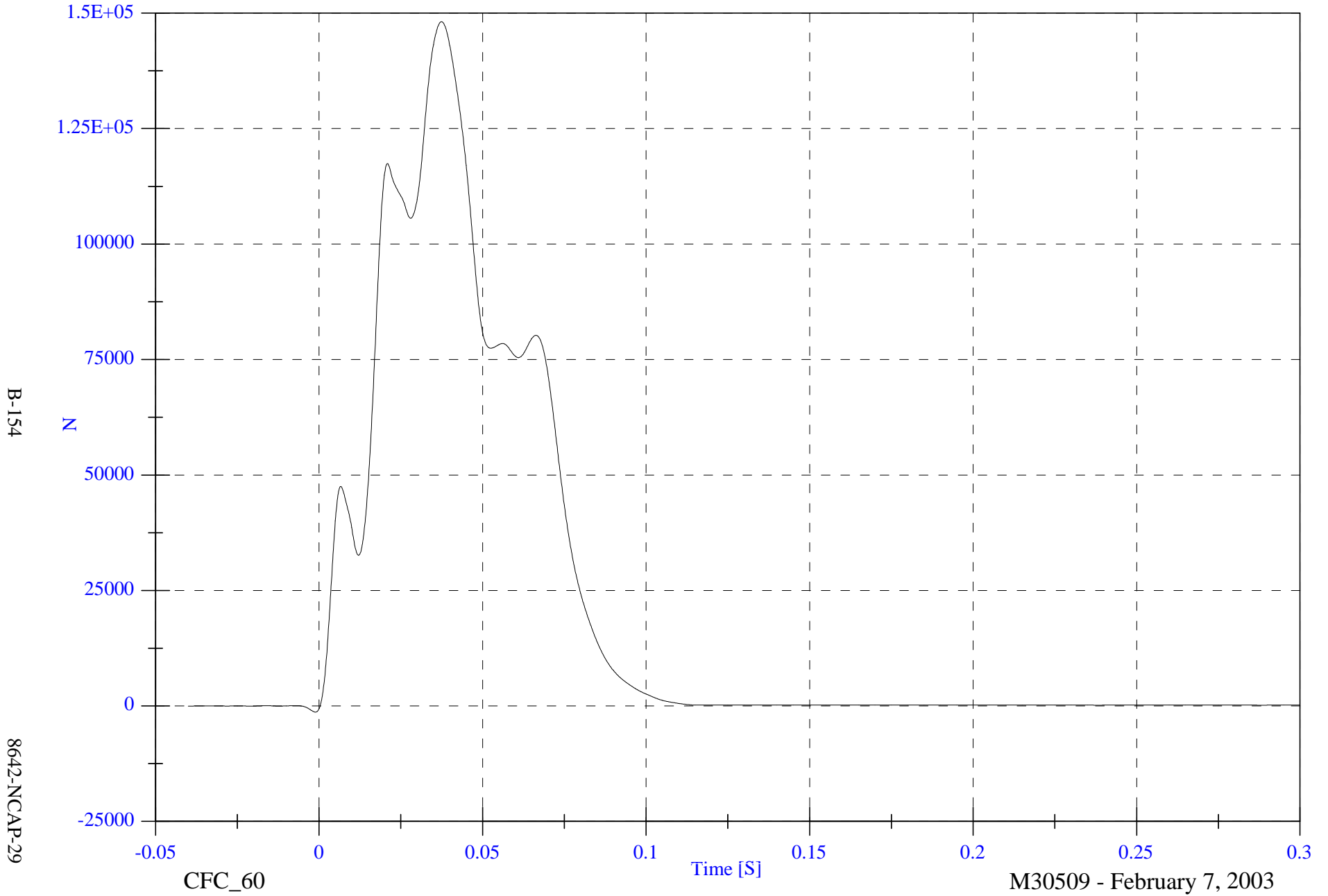


NCAP TEST #7 2003 Mercedes E320

B1 LCB3 Fx

Max: 148136.1 [N] at 0.037 [S]

Min: -1334.6 [N] at -0.001 [S]

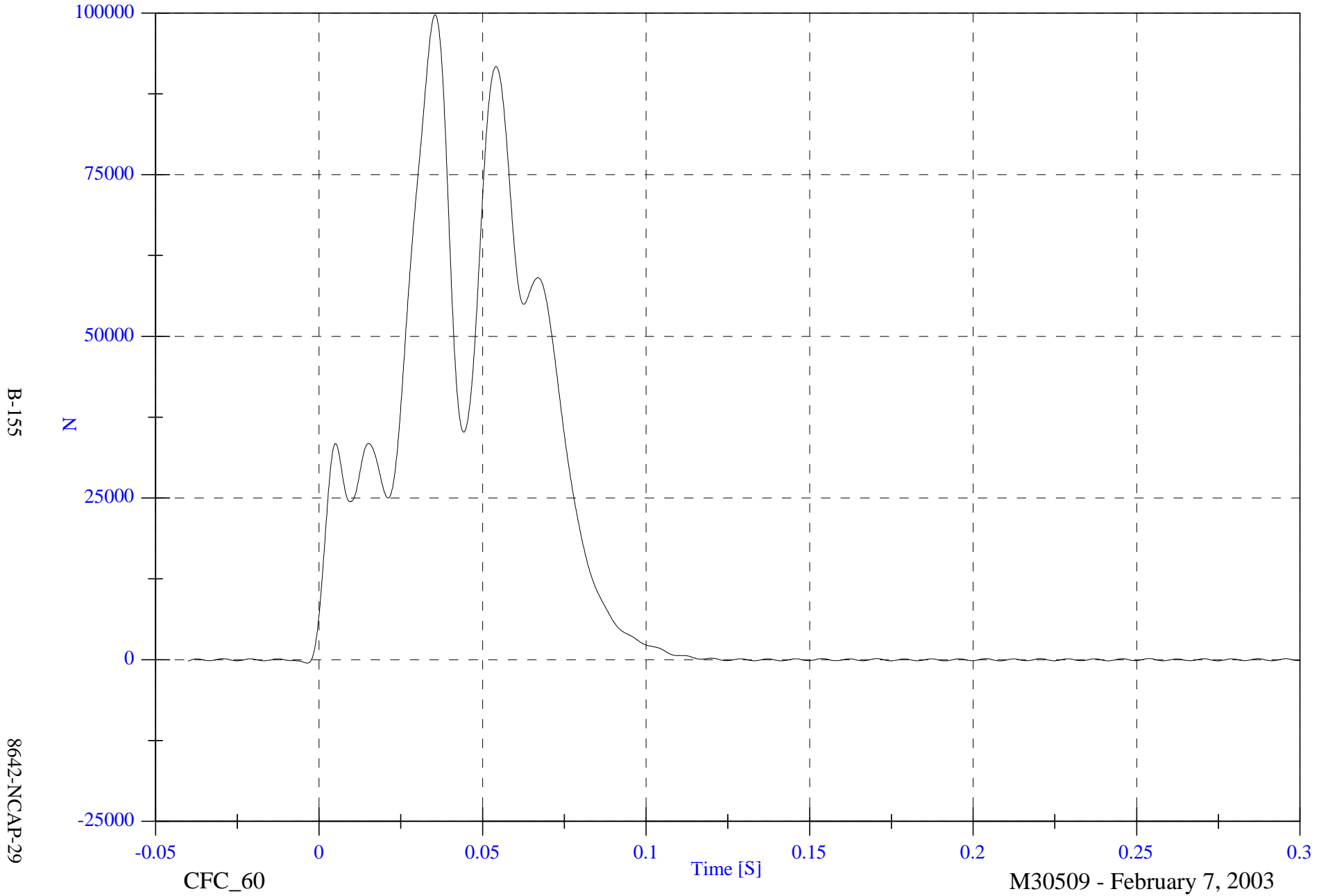


NCAP TEST #7 2003 Mercedes E320

B1 LCB4 Fx

Max: 99724.8 [N] at 0.035 [S]

Min: -513.1 [N] at -0.004 [S]

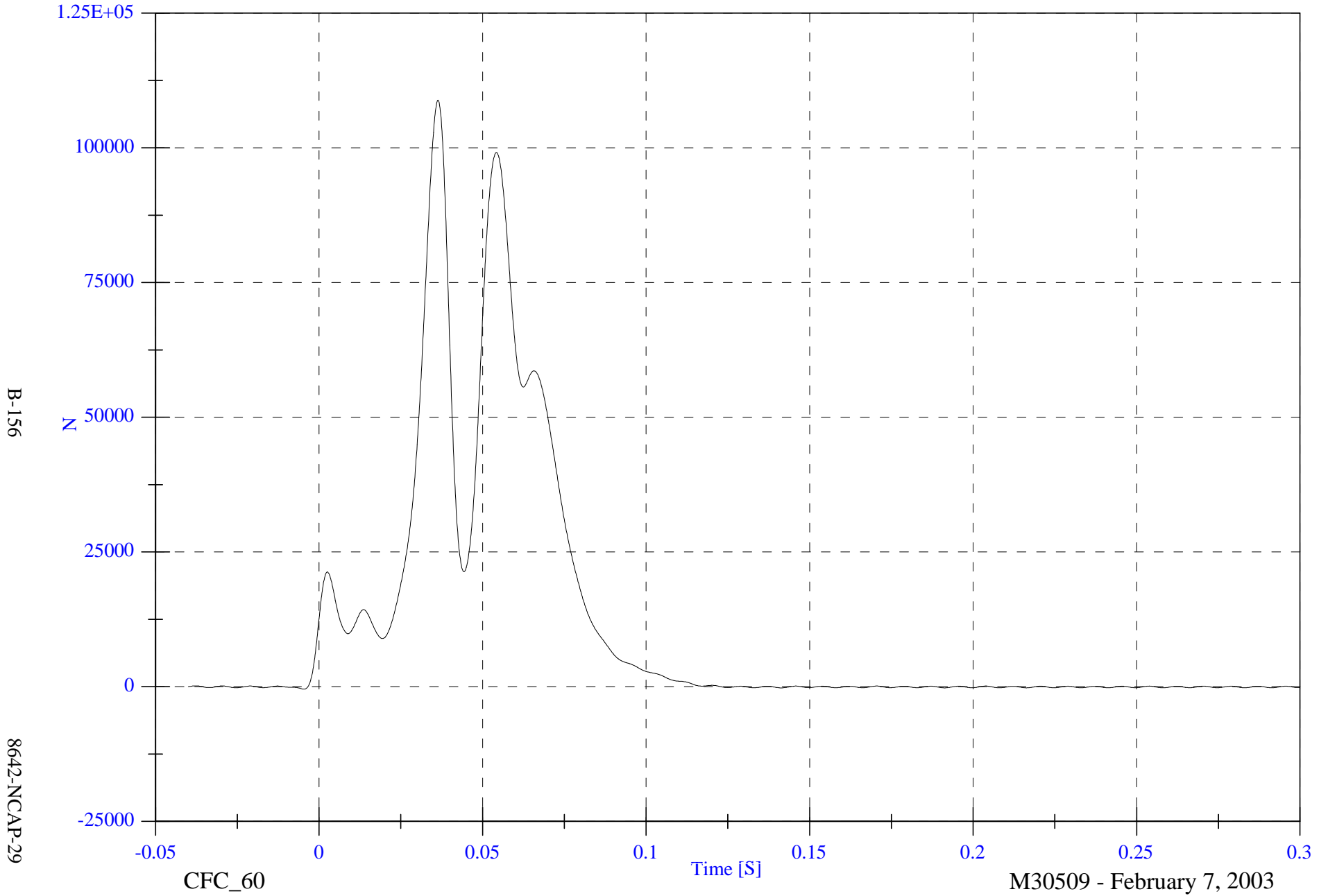


NCAP TEST #7 2003 Mercedes E320

B1 LCB5 Fx

Max: 108838.7 [N] at 0.036 [S]

Min: -446.6 [N] at -0.005 [S]

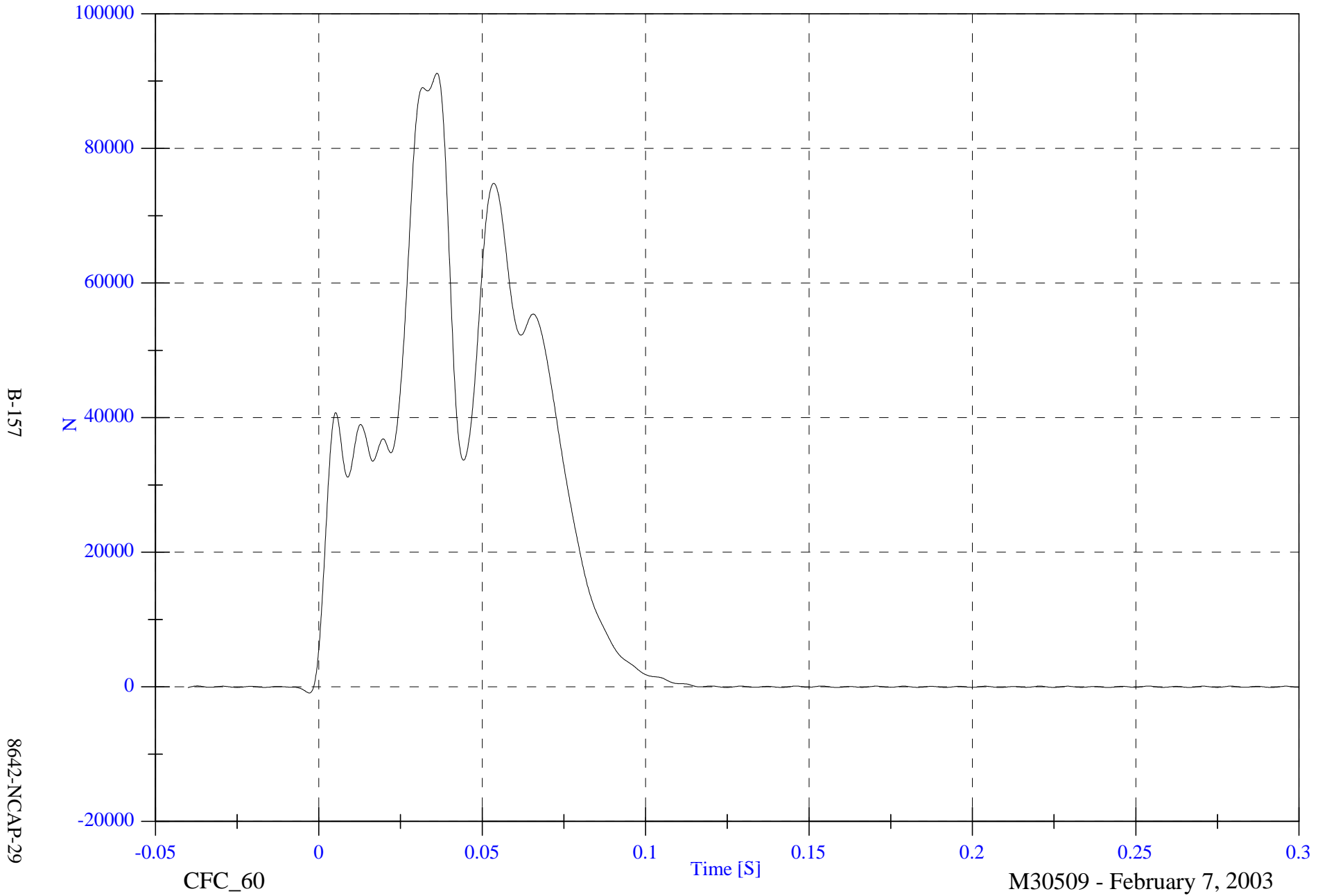


NCAP TEST #7 2003 Mercedes E320

B1 LCB6 Fx

Max: 91169.3 [N] at 0.036 [S]

Min: -906.8 [N] at -0.003 [S]

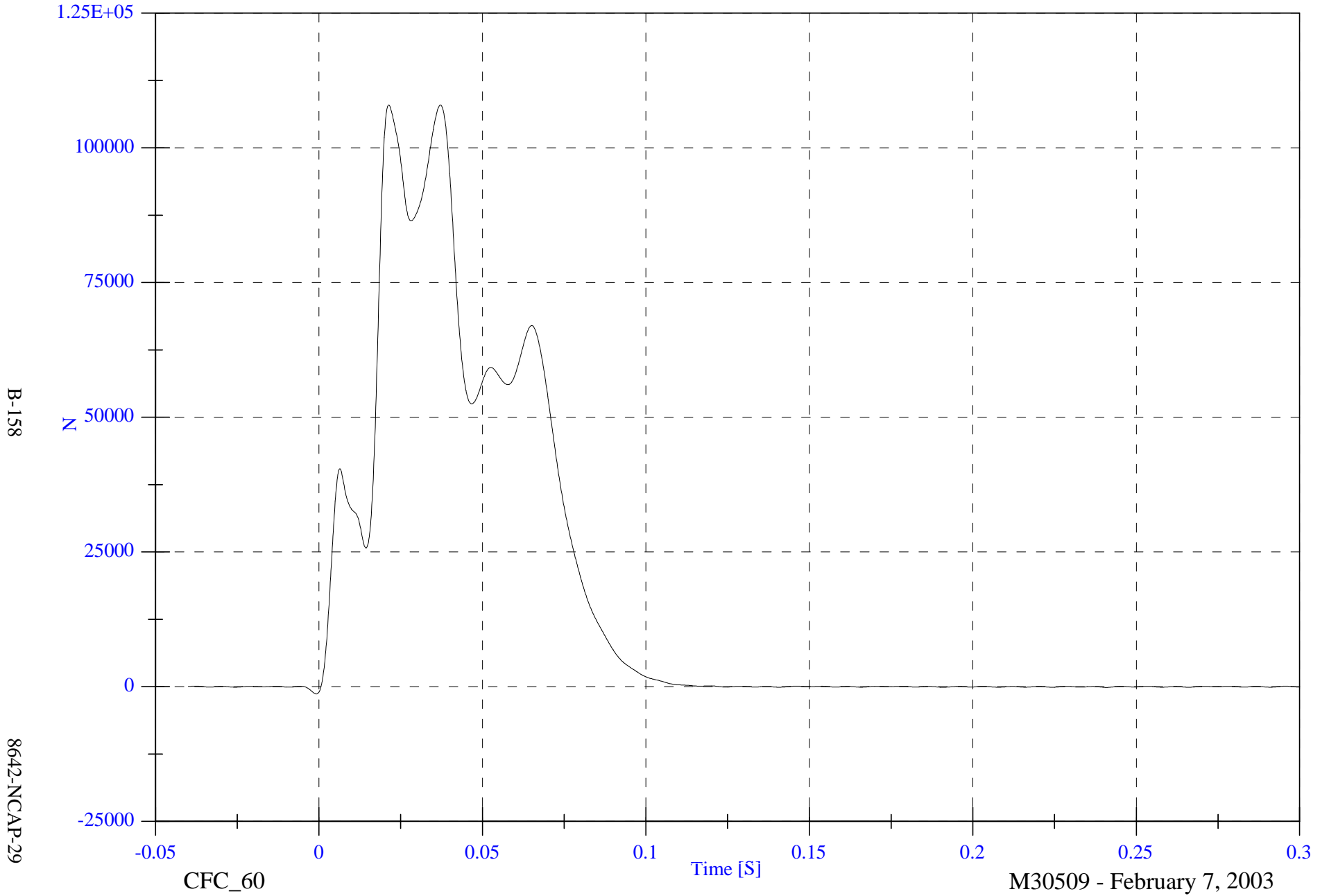


NCAP TEST #7 2003 Mercedes E320

B1 LCB7 Fx

Max: 107954.4 [N] at 0.021 [S]

Min: -1353.6 [N] at -0.001 [S]

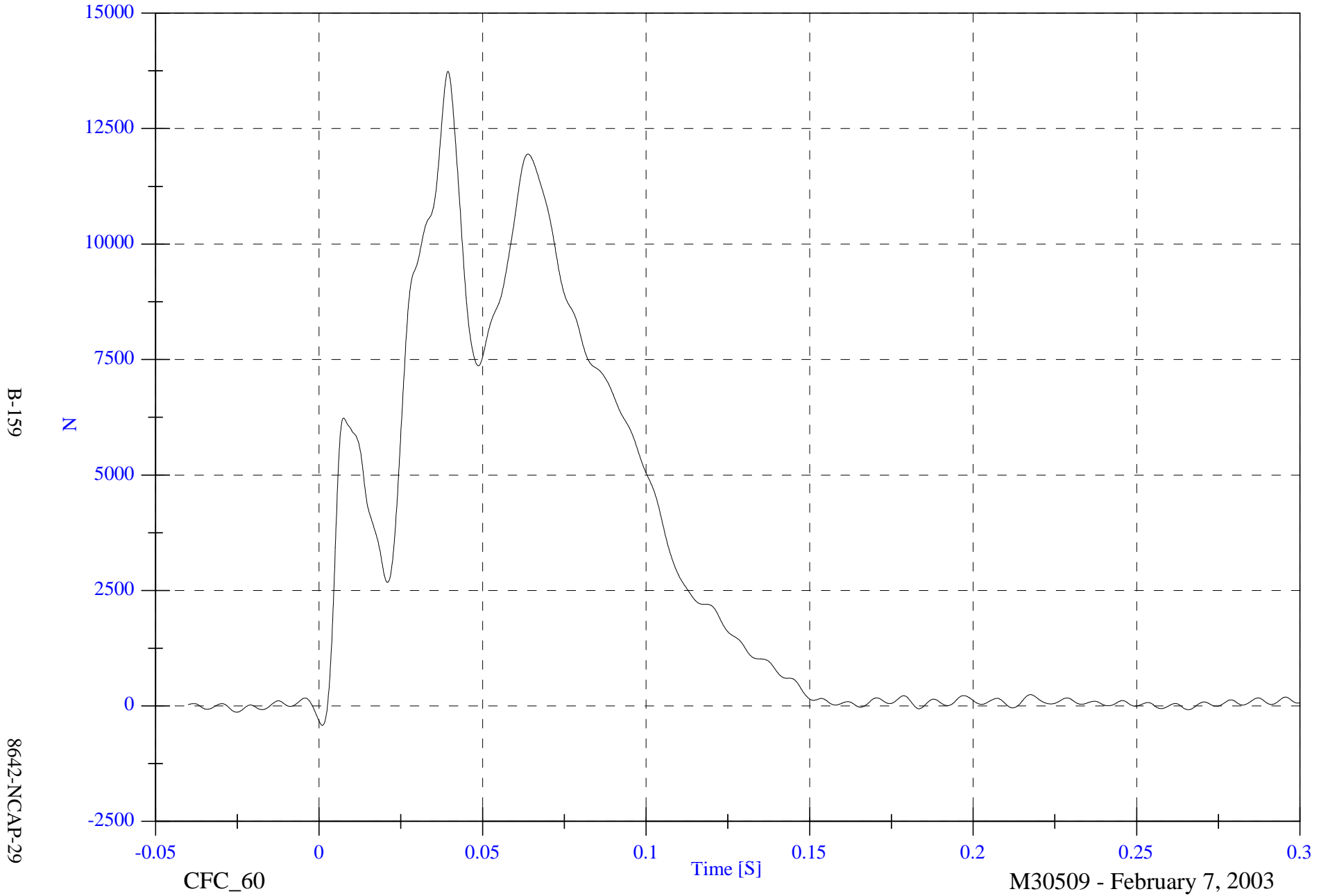


NCAP TEST #7 2003 Mercedes E320

B1 LCB8 Fx

Max: 13737.4 [N] at 0.039 [S]

Min: -420.2 [N] at 0.001 [S]

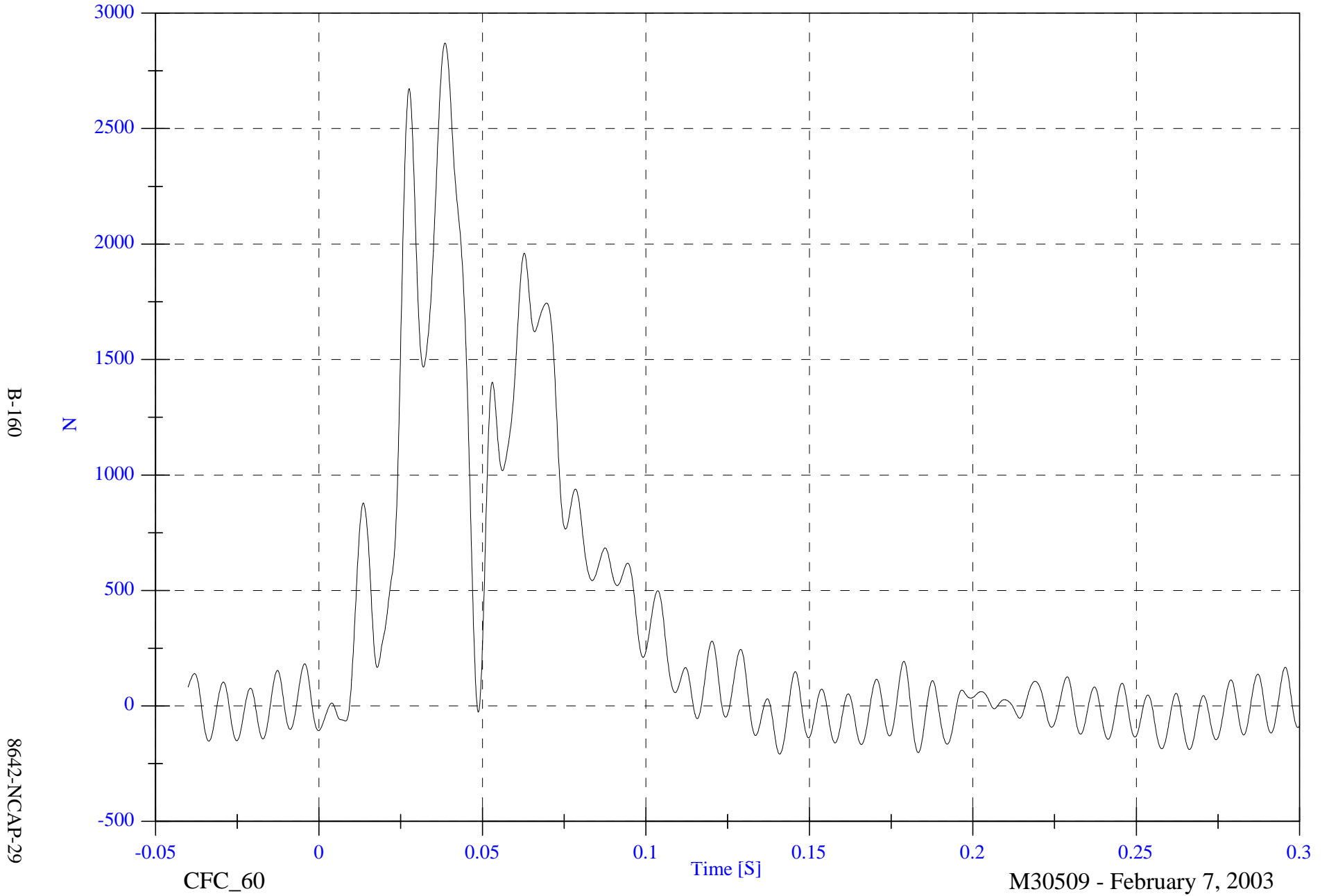


NCAP TEST #7 2003 Mercedes E320

B1 LCB9 Fx

Max: 2869.9 [N] at 0.039 [S]

Min: -208.4 [N] at 0.141 [S]

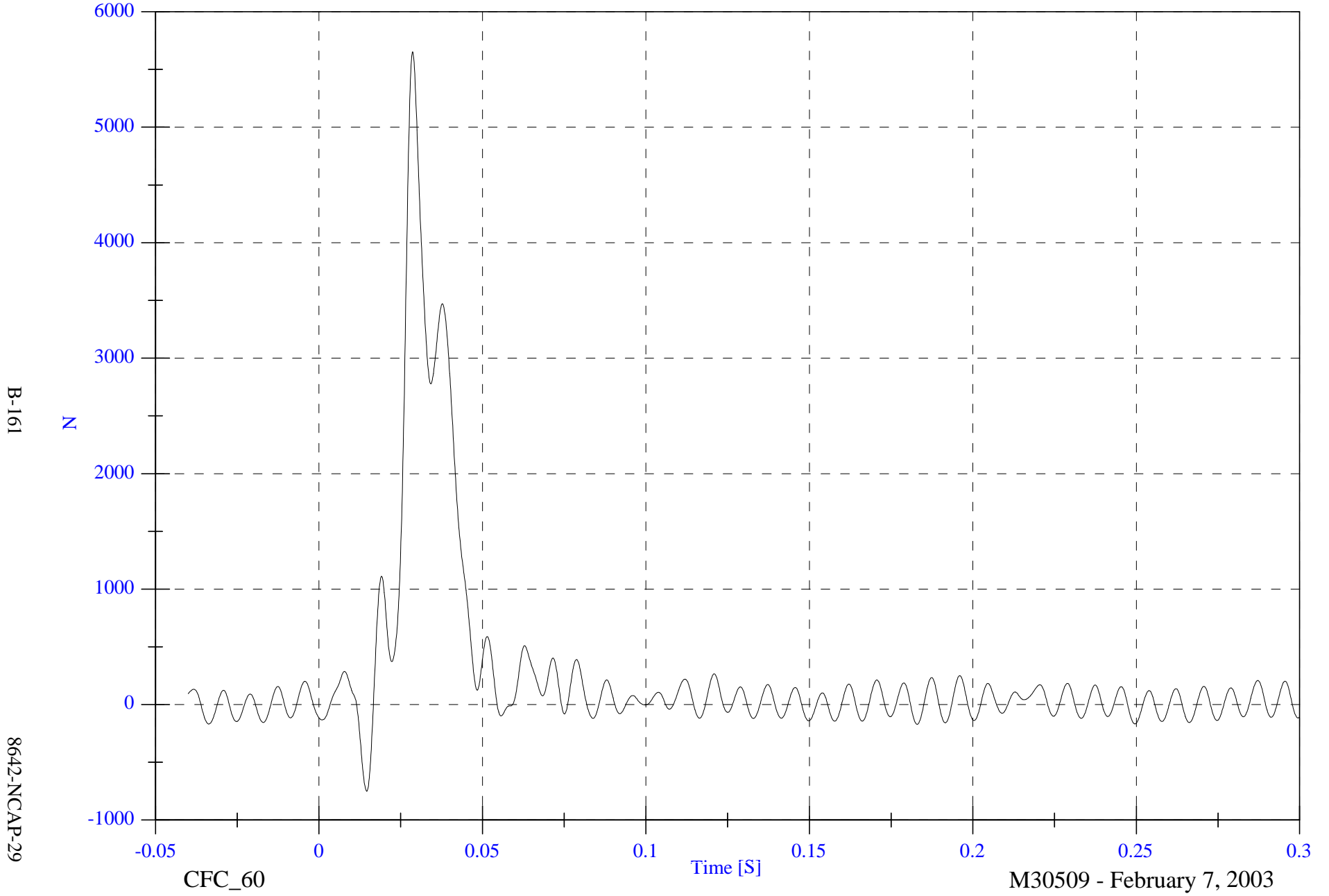


NCAP TEST #7 2003 Mercedes E320

B1 LCC1 Fx

Max: 5652.8 [N] at 0.029 [S]

Min: -750.9 [N] at 0.015 [S]



B-161

8642-NCAP-29

CFC_60

Time [S]

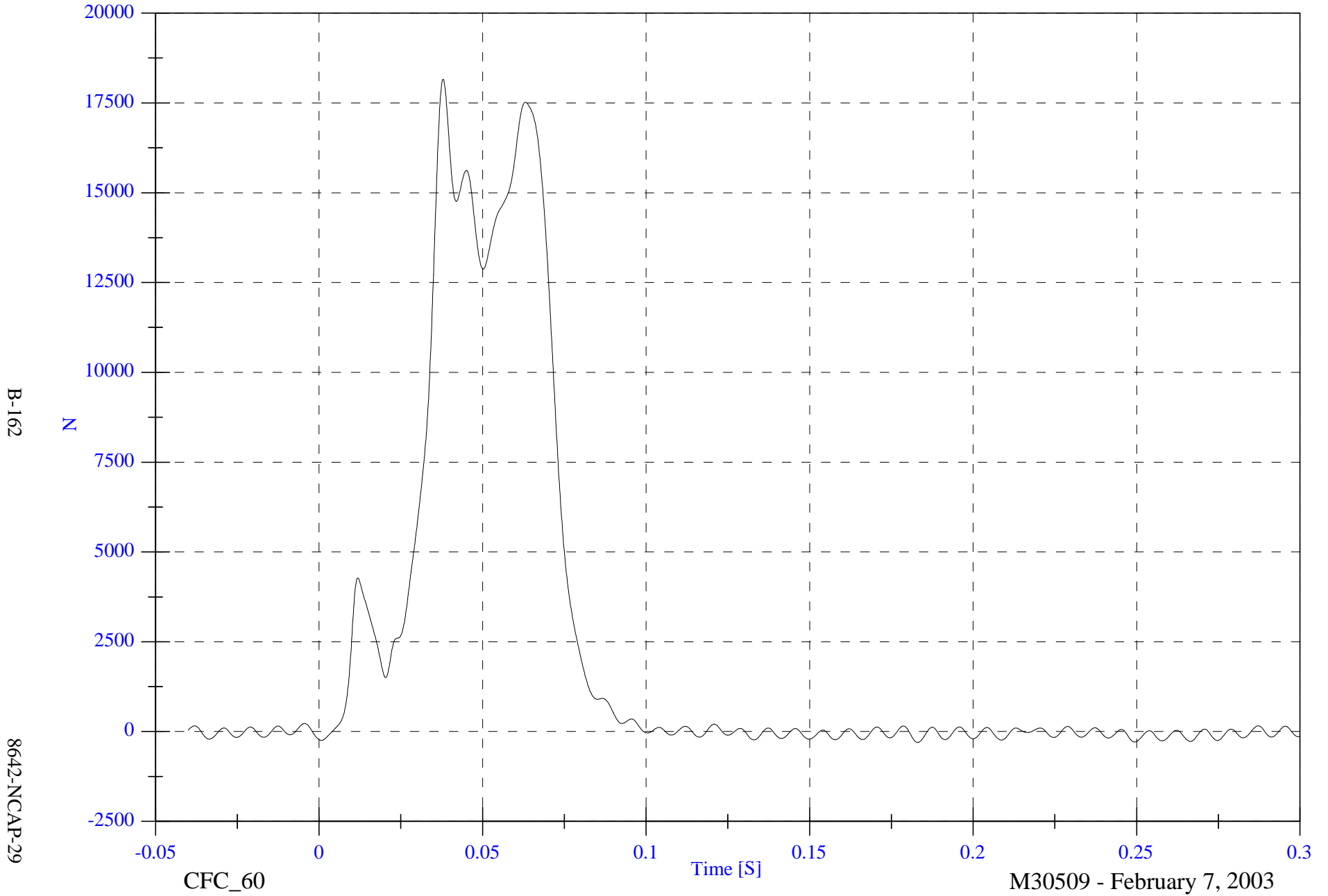
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCC2 Fx

Max: 18159.3 [N] at 0.038 [S]

Min: -301.7 [N] at 0.183 [S]

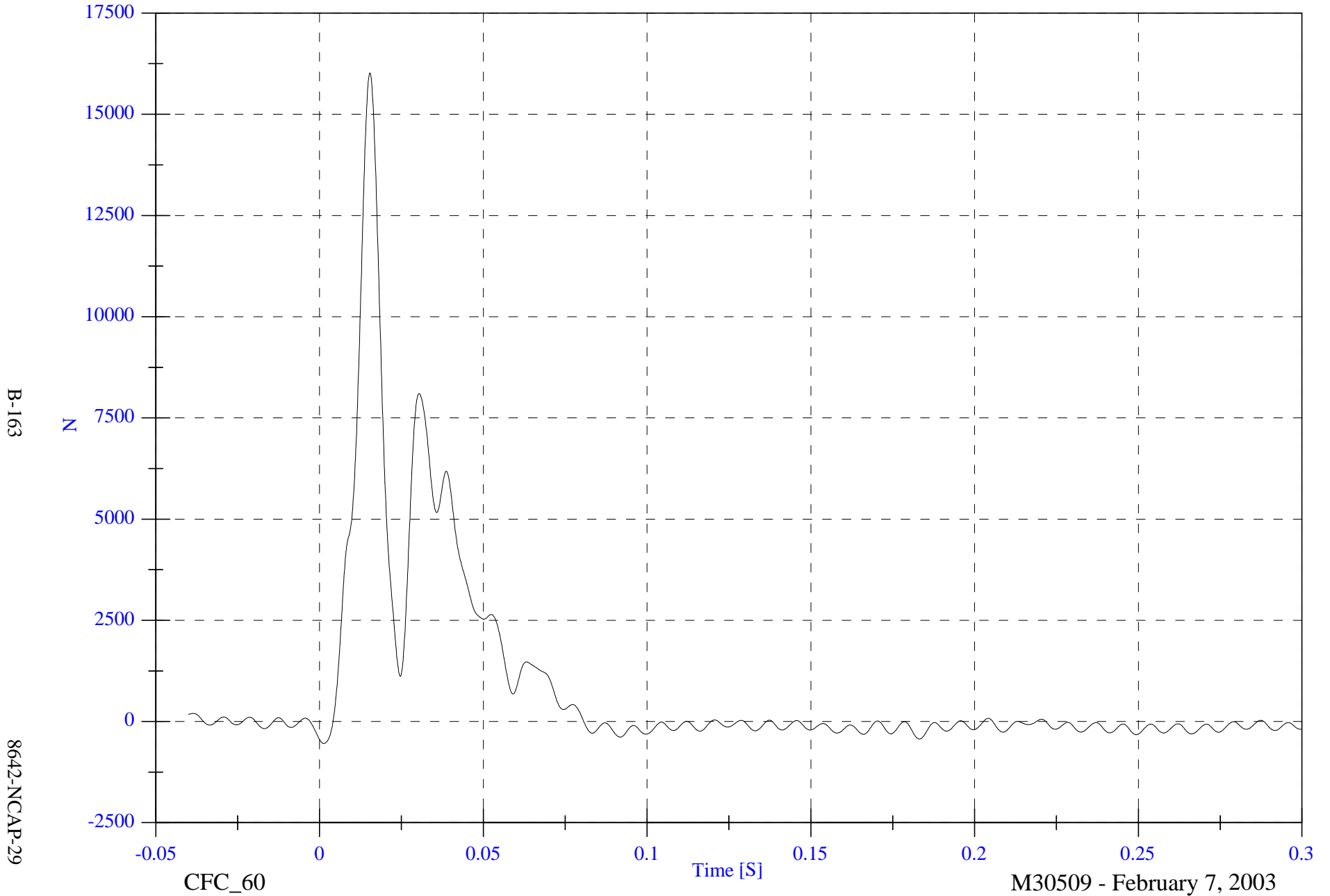


NCAP TEST #7 2003 Mercedes E320

B1 LCC3 Fx

Max: 16026.6 [N] at 0.015 [S]

Min: -544.3 [N] at 0.001 [S]

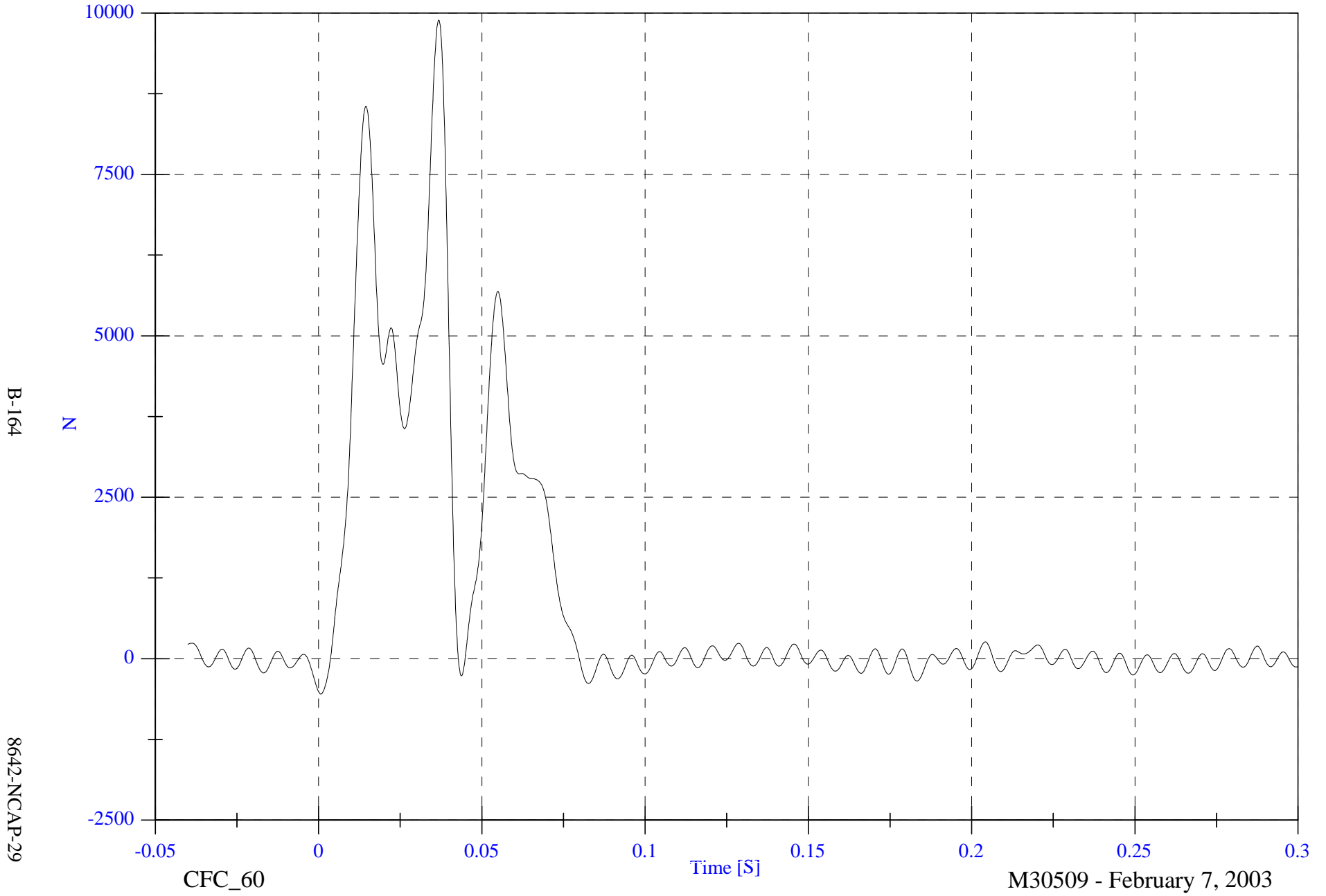


NCAP TEST #7 2003 Mercedes E320

B1 LCC4 Fx

Max: 9894.5 [N] at 0.037 [S]

Min: -545.4 [N] at 0.001 [S]

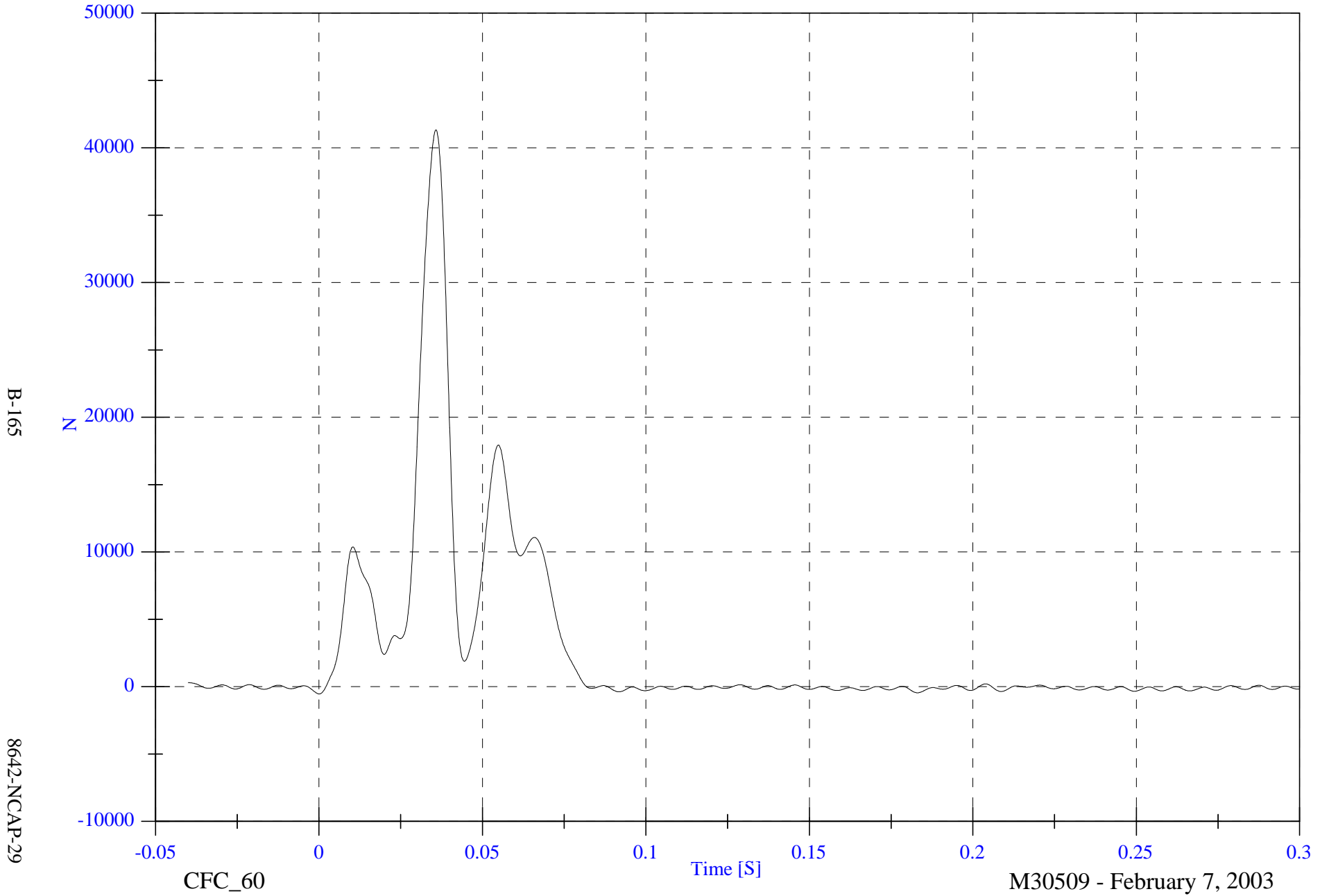


NCAP TEST #7 2003 Mercedes E320

B1 LCC5 Fx

Max: 41334.2 [N] at 0.036 [S]

Min: -537.5 [N] at 0.000 [S]

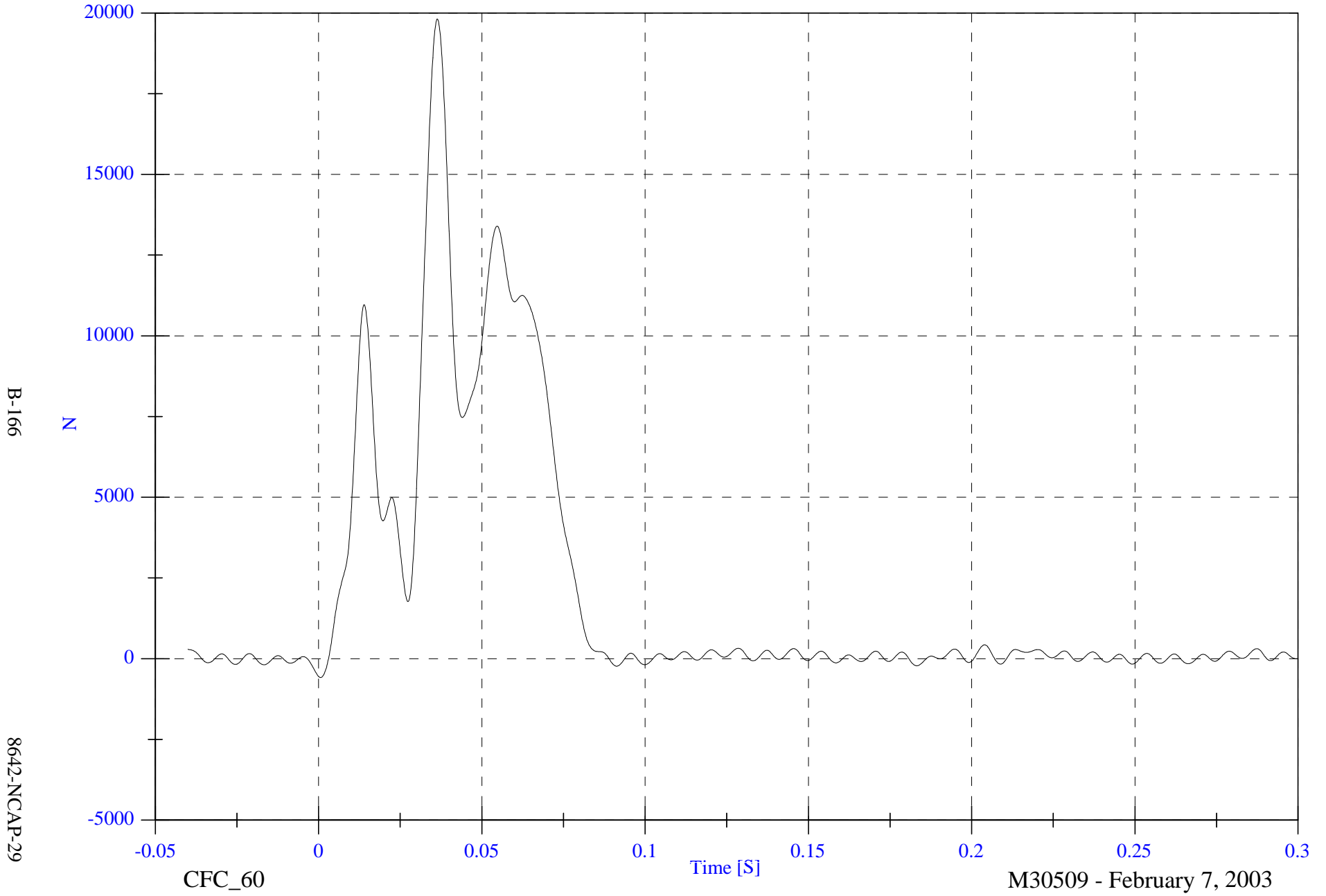


NCAP TEST #7 2003 Mercedes E320

B1 LCC6 Fx

Max: 19812.8 [N] at 0.036 [S]

Min: -582.6 [N] at 0.001 [S]

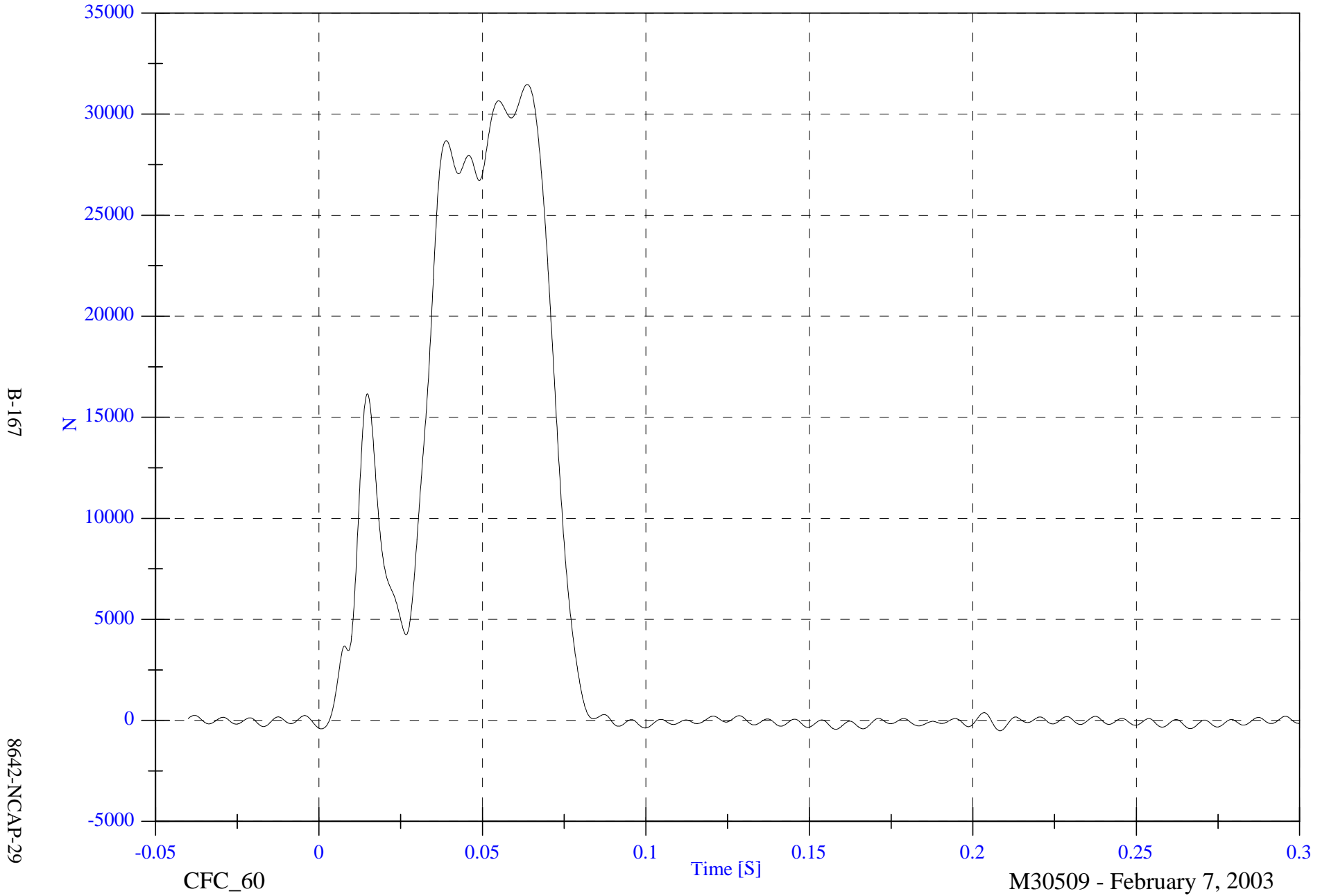


NCAP TEST #7 2003 Mercedes E320

B1 LCC7 Fx

Max: 31470.6 [N] at 0.064 [S]

Min: -512.9 [N] at 0.208 [S]



B-167

8642-NCAP-29

CFC_60

Time [S]

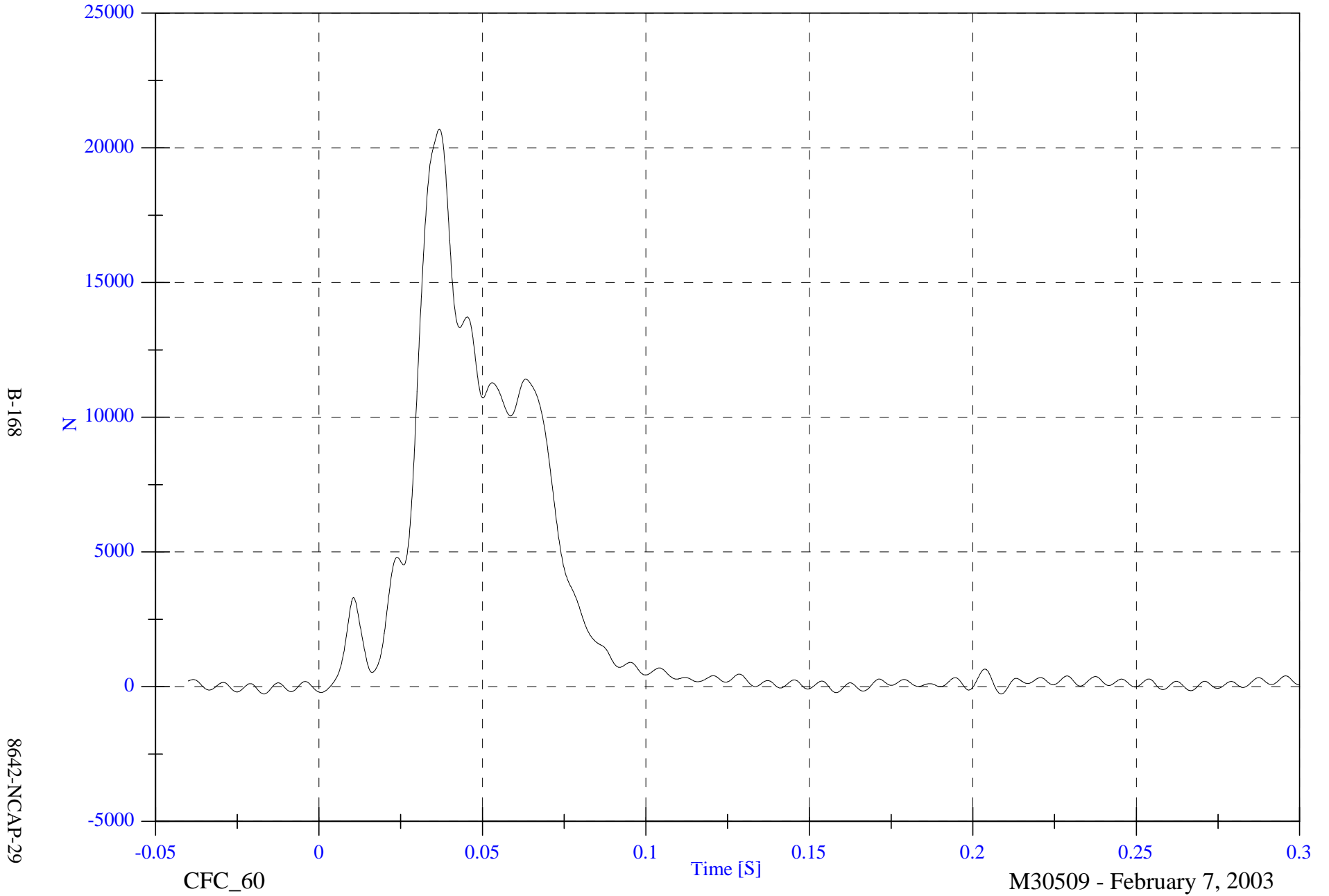
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCC8 Fx

Max: 20694.6 [N] at 0.037 [S]

Min: -270.3 [N] at -0.017 [S]

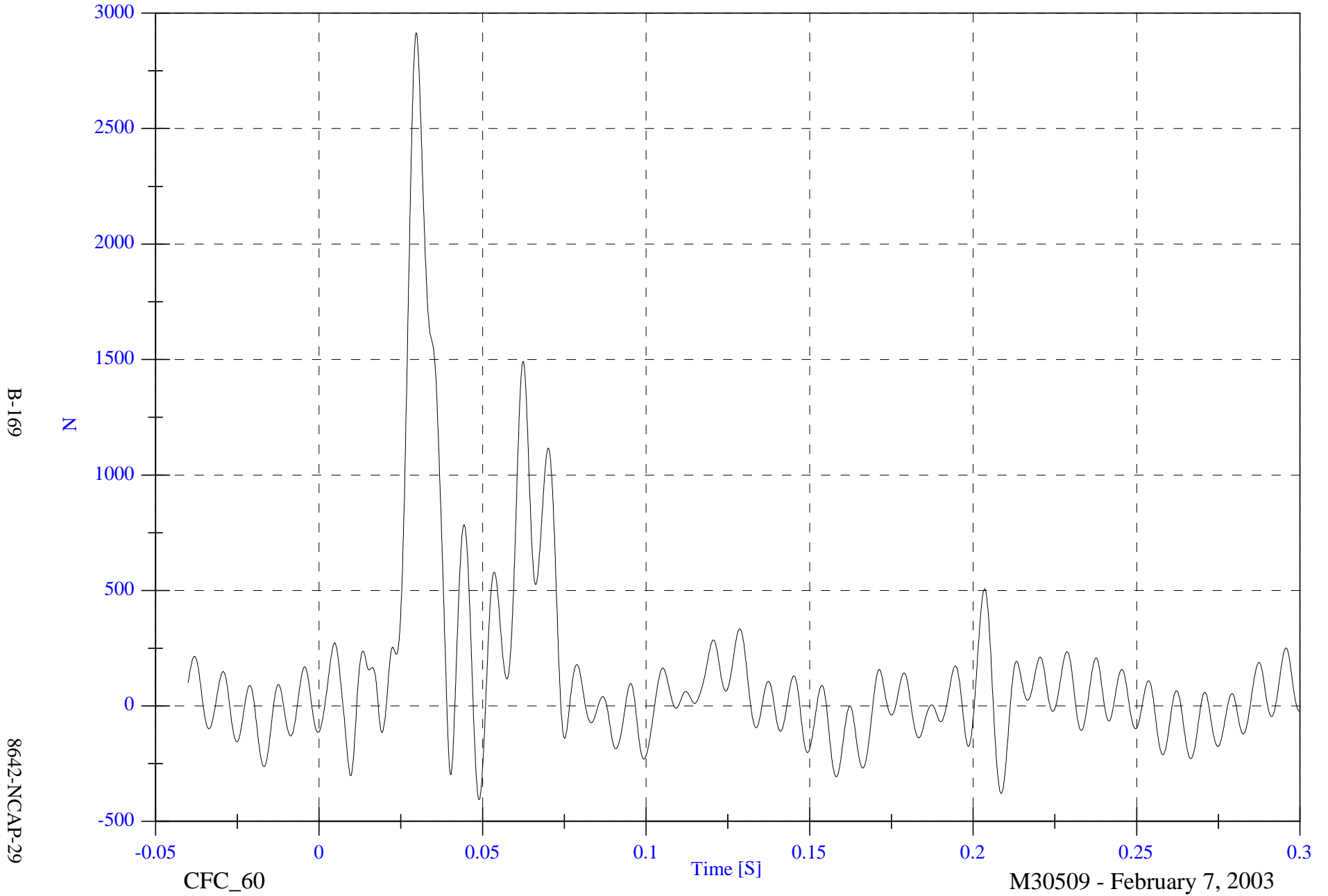


NCAP TEST #7 2003 Mercedes E320

B1 LCC9 Fx

Max: 2914.2 [N] at 0.030 [S]

Min: -405.8 [N] at 0.049 [S]

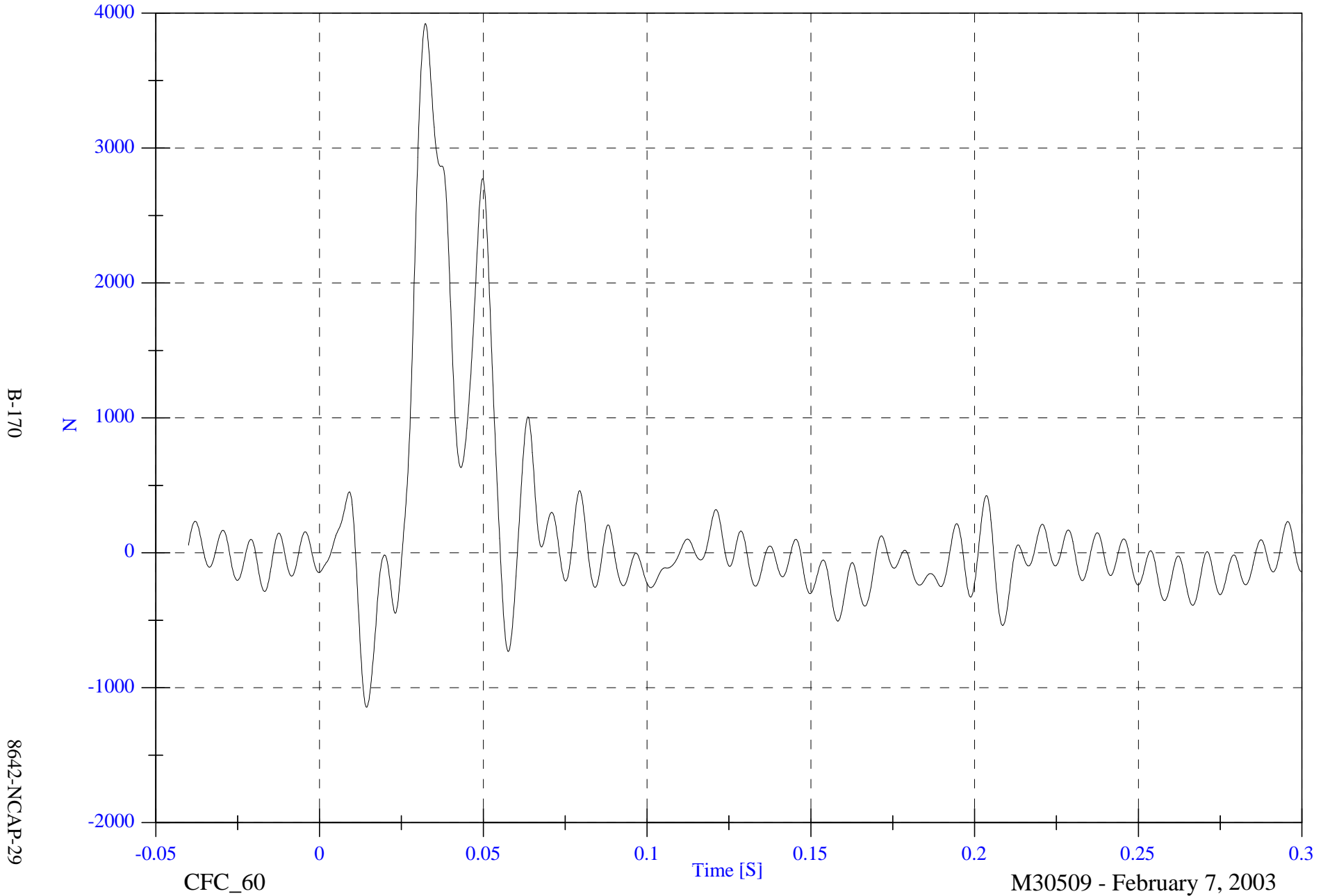


NCAP TEST #7 2003 Mercedes E320

Max: 3922.5 [N] at 0.032 [S]

B1 LCD1 Fx

Min: -1144.5 [N] at 0.014 [S]

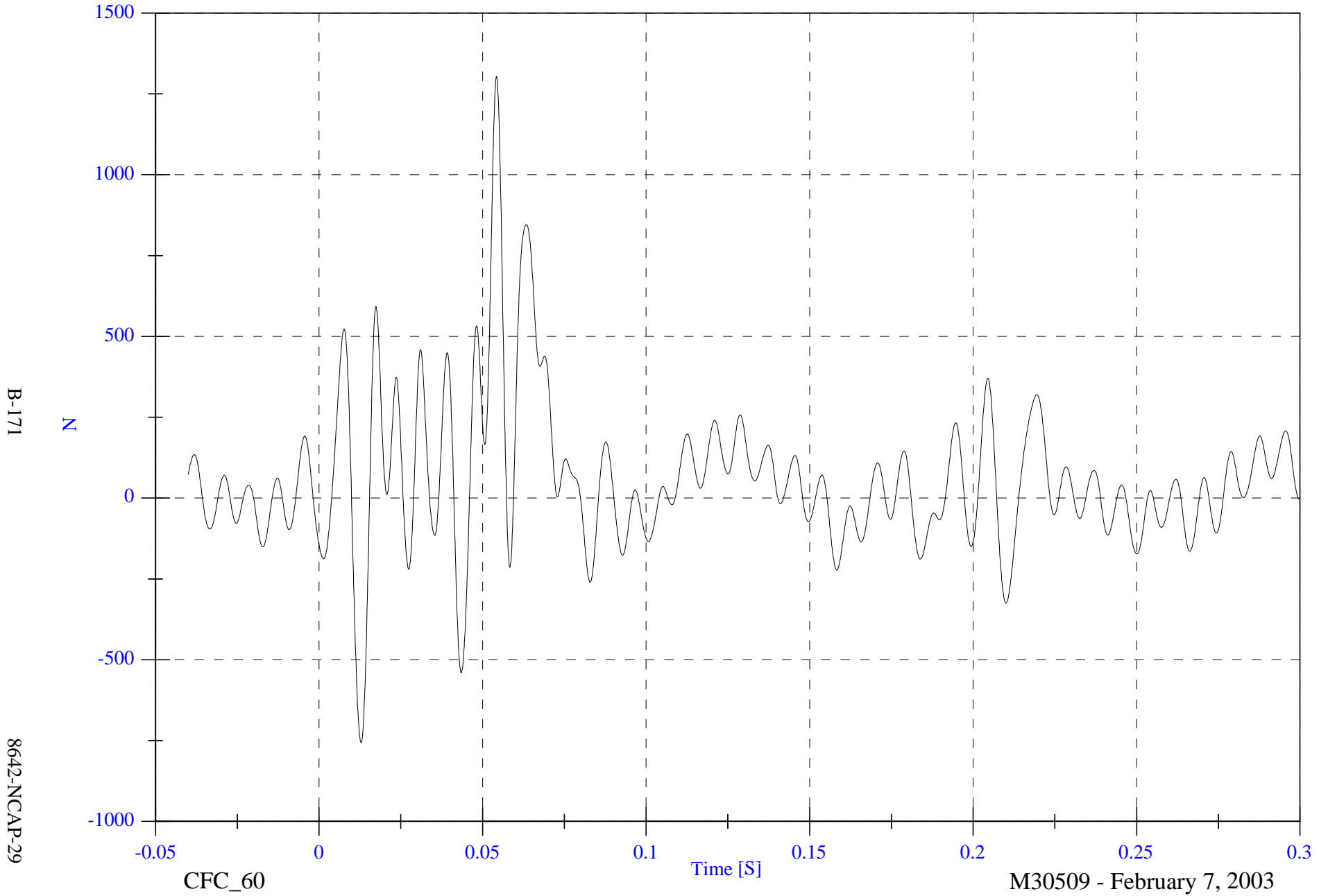


NCAP TEST #7 2003 Mercedes E320

Max: 1304.1 [N] at 0.054 [S]

B1 LCD2 Fx

Min: -756.6 [N] at 0.013 [S]

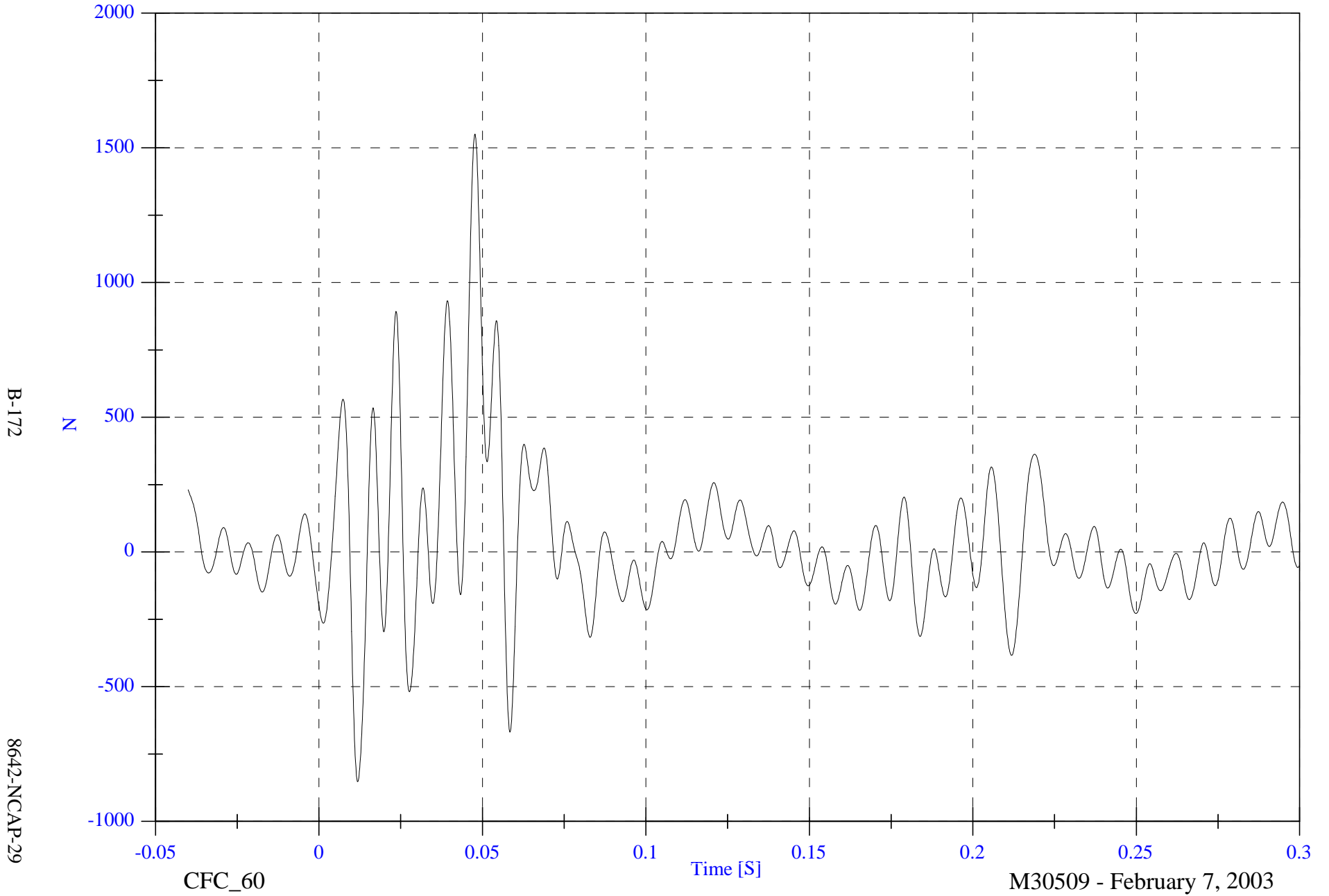


NCAP TEST #7 2003 Mercedes E320

Max: 1550.9 [N] at 0.048 [S]

B1 LCD3 Fx

Min: -852.6 [N] at 0.012 [S]

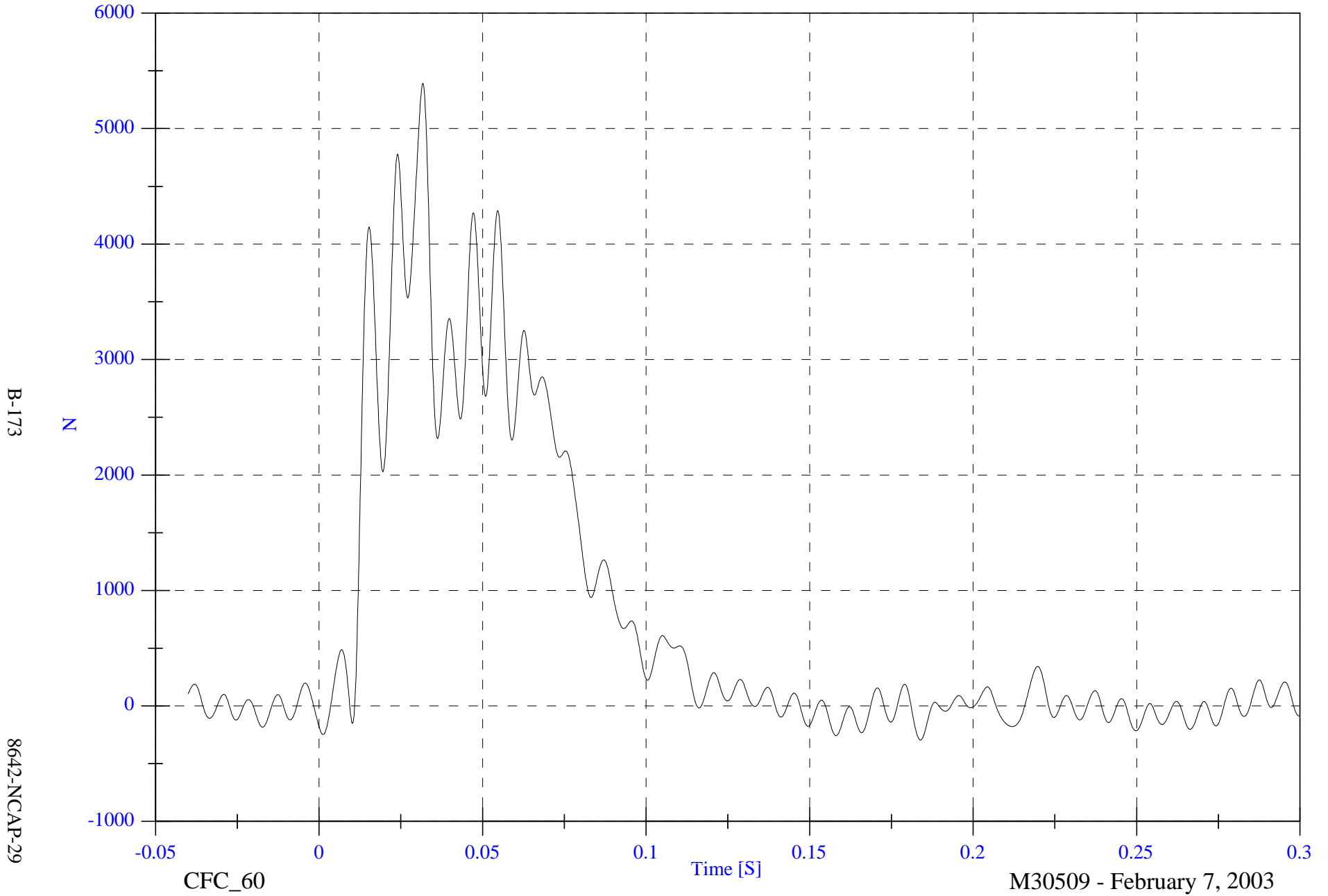


NCAP TEST #7 2003 Mercedes E320

Max: 5392.7 [N] at 0.032 [S]

B1 LCD4 Fx

Min: -295.5 [N] at 0.184 [S]

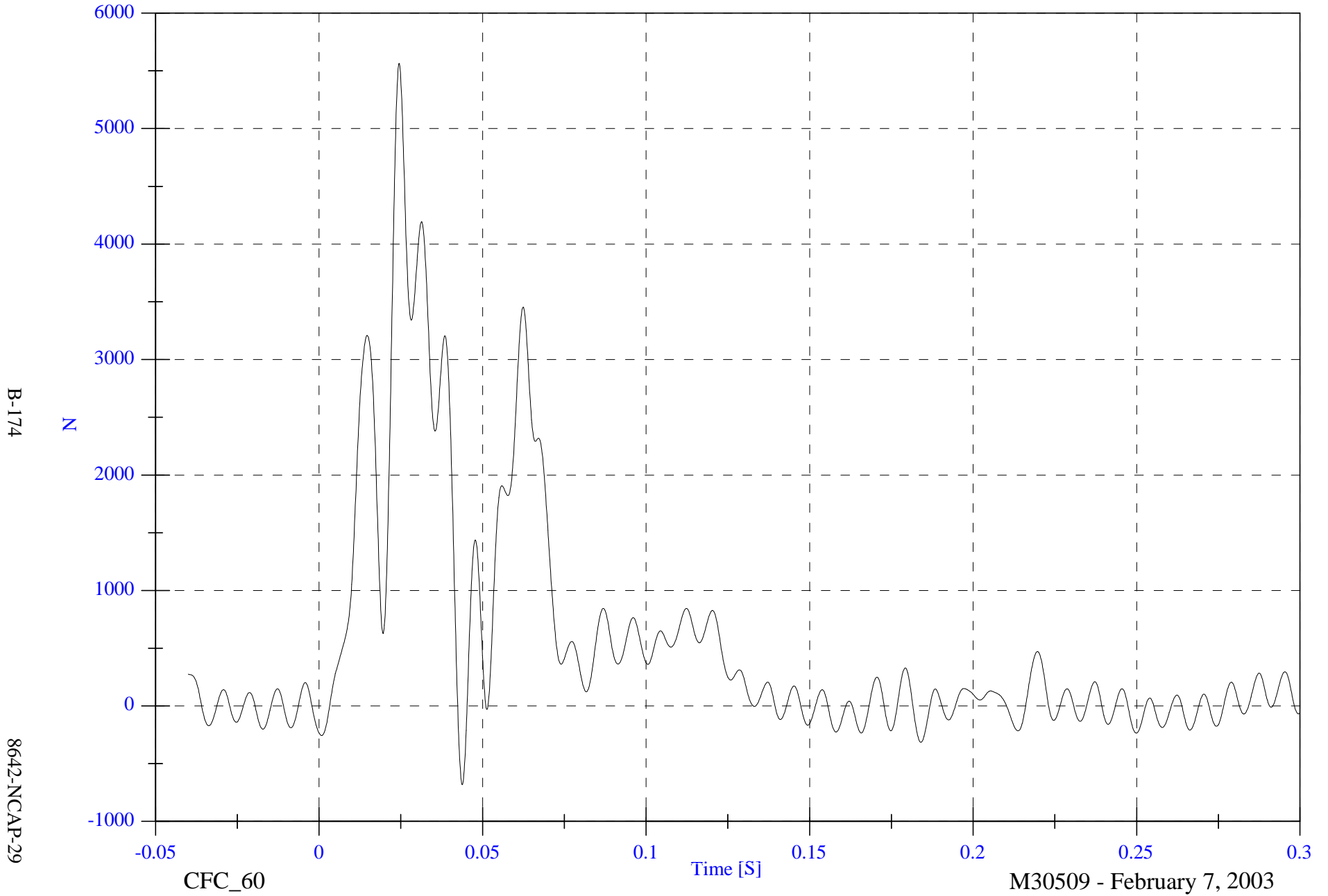


NCAP TEST #7 2003 Mercedes E320

B1 LCD5 Fx

Max: 5565.1 [N] at 0.024 [S]

Min: -681.8 [N] at 0.044 [S]



B-174

8642-NCAP-29

CFC_60

Time [S]

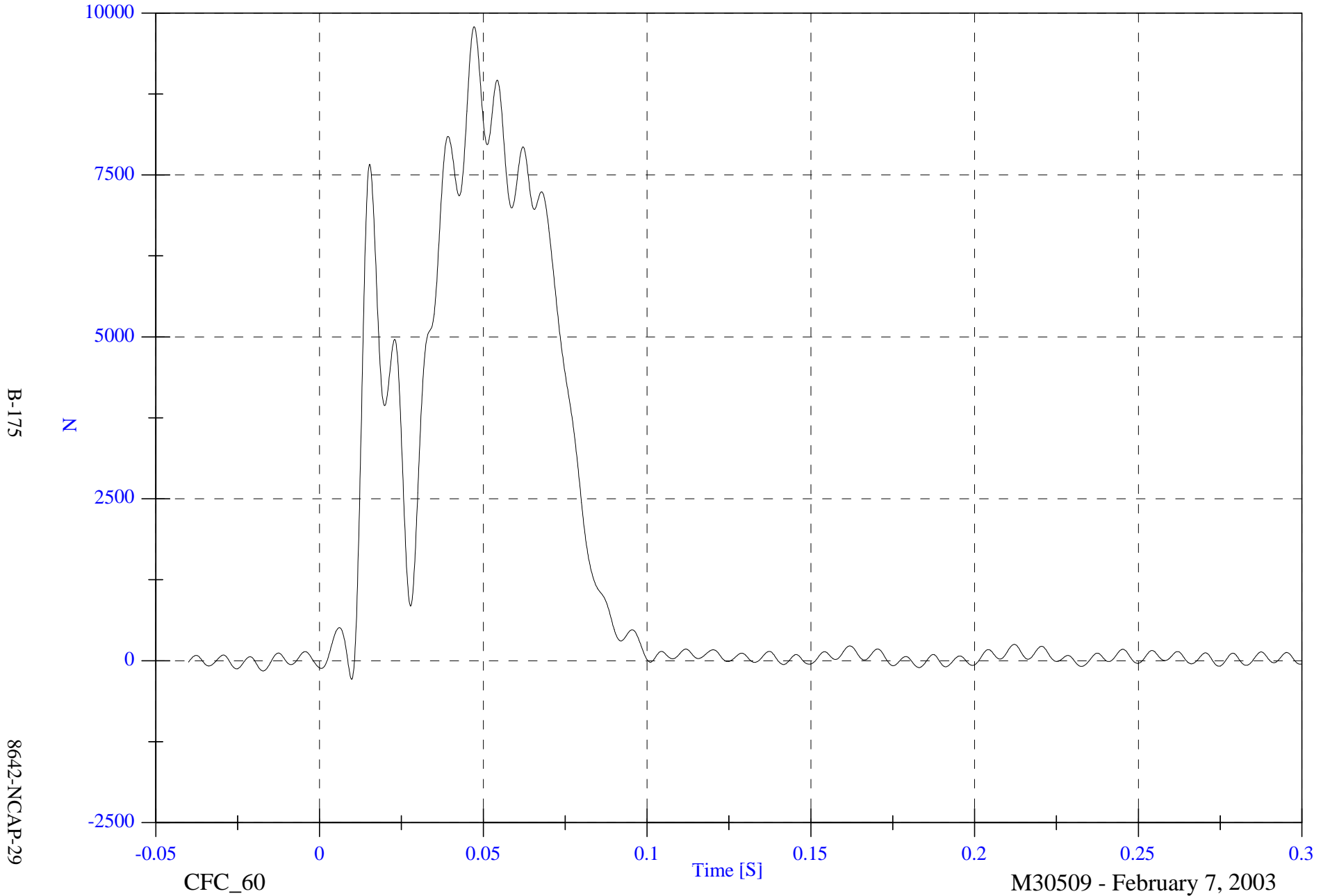
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

B1 LCD6 Fx

Max: 9790.1 [N] at 0.047 [S]

Min: -286.0 [N] at 0.010 [S]

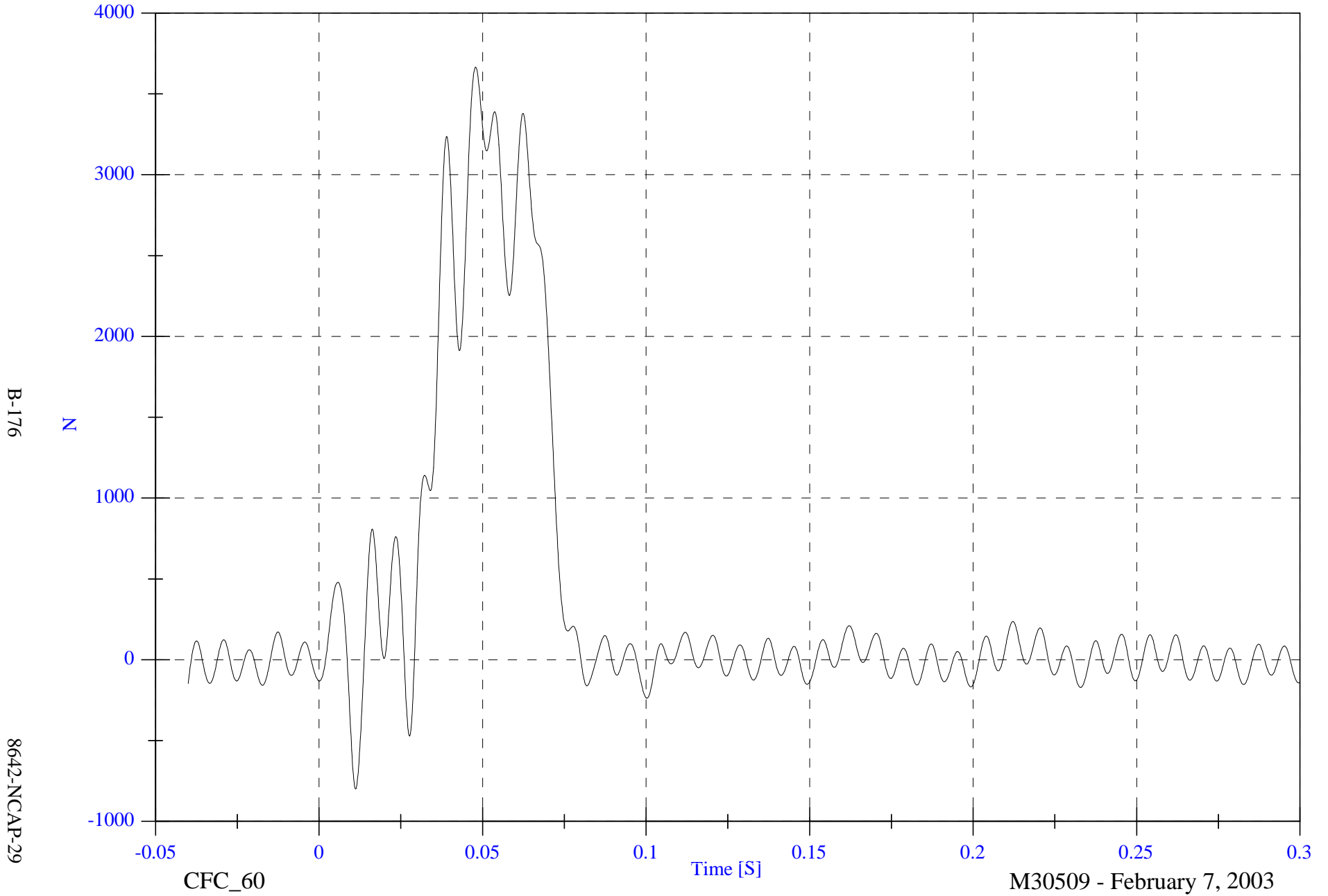


NCAP TEST #7 2003 Mercedes E320

B1 LCD7 Fx

Max: 3665.9 [N] at 0.048 [S]

Min: -799.7 [N] at 0.011 [S]

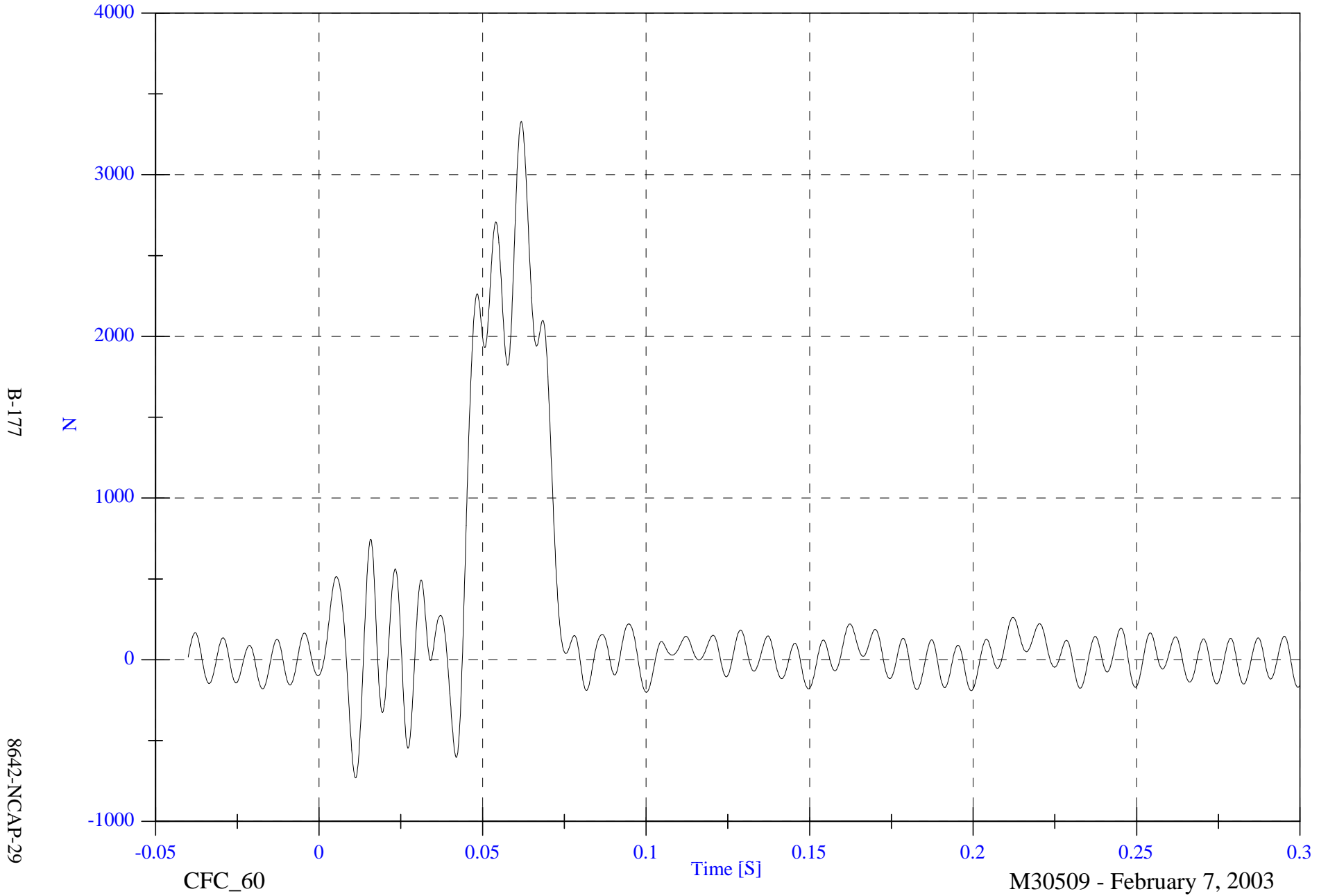


NCAP TEST #7 2003 Mercedes E320

Max: 3329.4 [N] at 0.062 [S]

B1 LCD8 Fx

Min: -731.1 [N] at 0.011 [S]

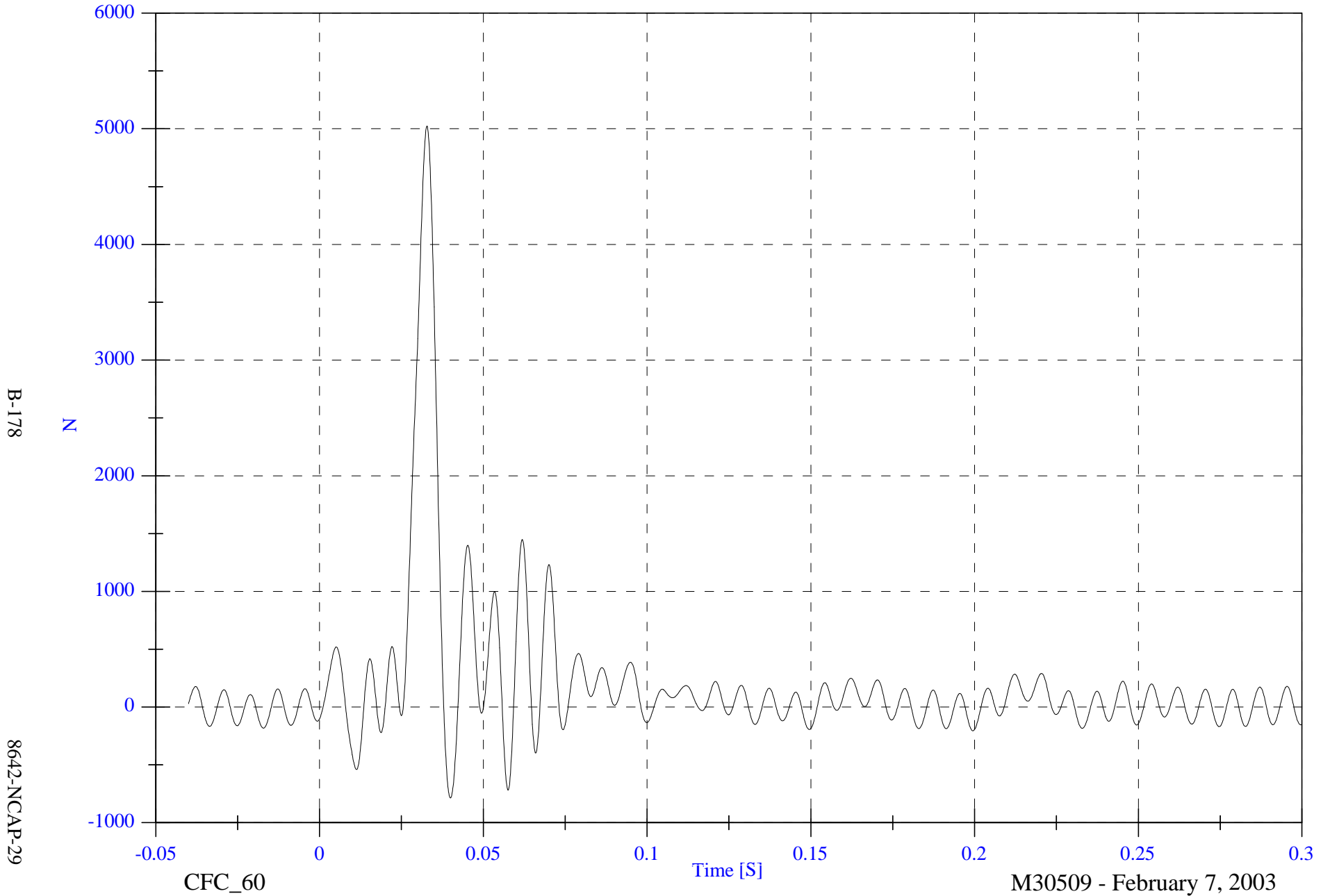


NCAP TEST #7 2003 Mercedes E320

B1 LCD9 Fx

Max: 5024.0 [N] at 0.033 [S]

Min: -785.6 [N] at 0.040 [S]

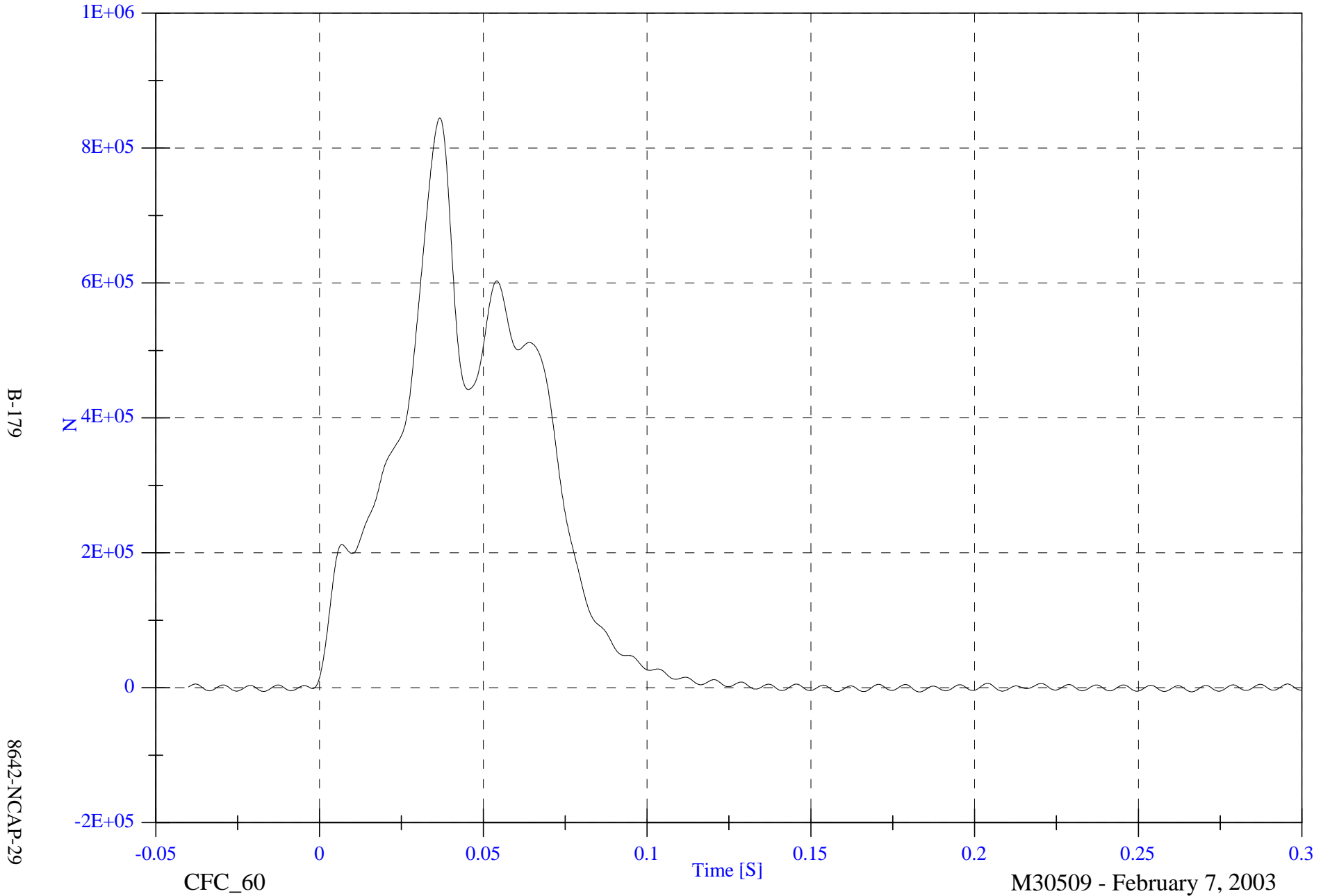


NCAP TEST #7 2003 Mercedes E320

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

Max: 844601.7 [N] at 0.037 [S]

Min: -6176.4 [N] at 0.183 [S]



B-179

8642-NCAP-29

CFC_60

Time [S]

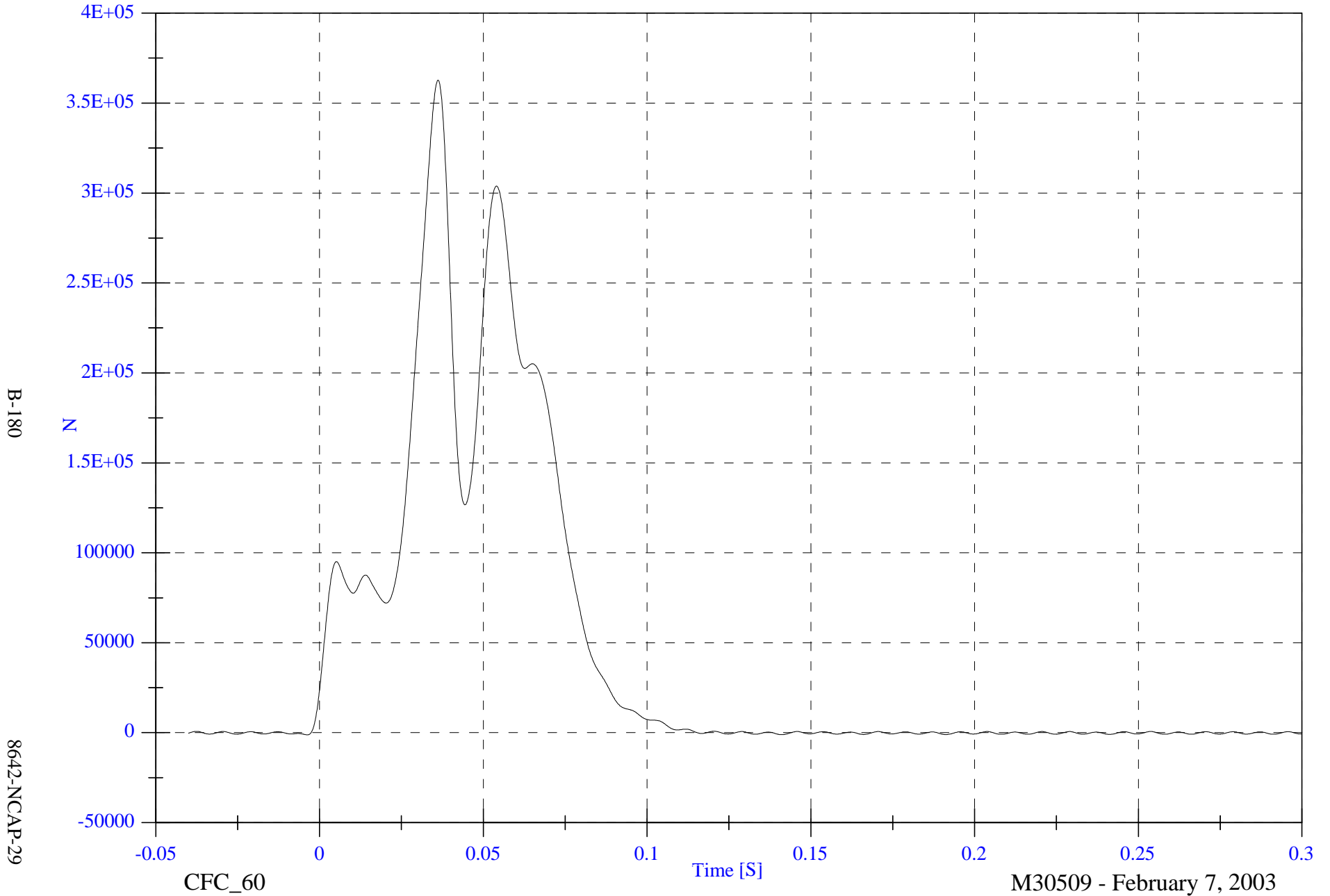
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

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

Max: 362778.6 [N] at 0.036 [S]

Min: -1173.0 [N] at -0.004 [S]



B-180

8642-NCAP-29

CFC_60

Time [S]

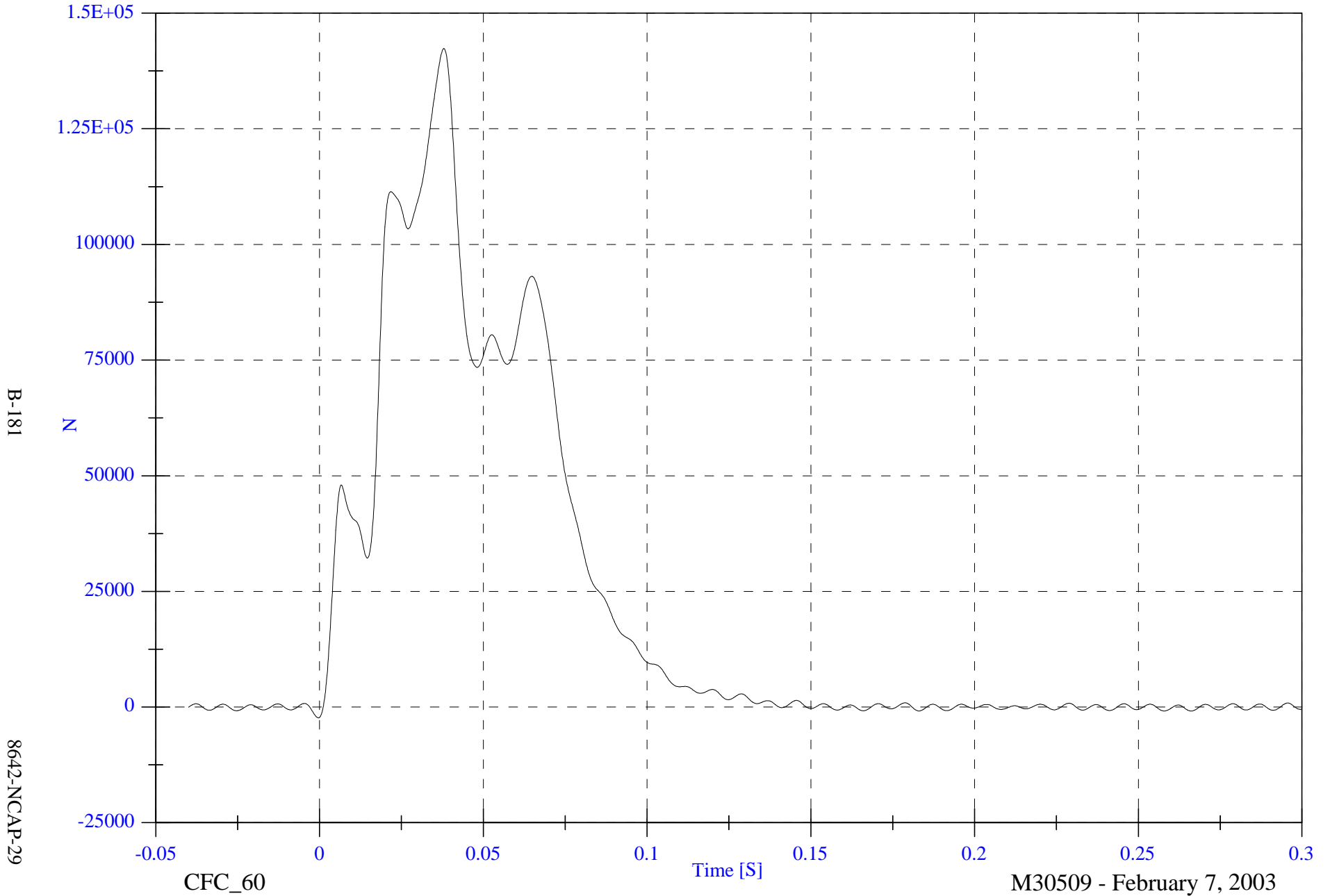
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

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

Max: 142334.4 [N] at 0.038 [S]

Min: -2328.7 [N] at -0.000 [S]



B-181

8642-NCAP-29

CFC_60

Time [S]

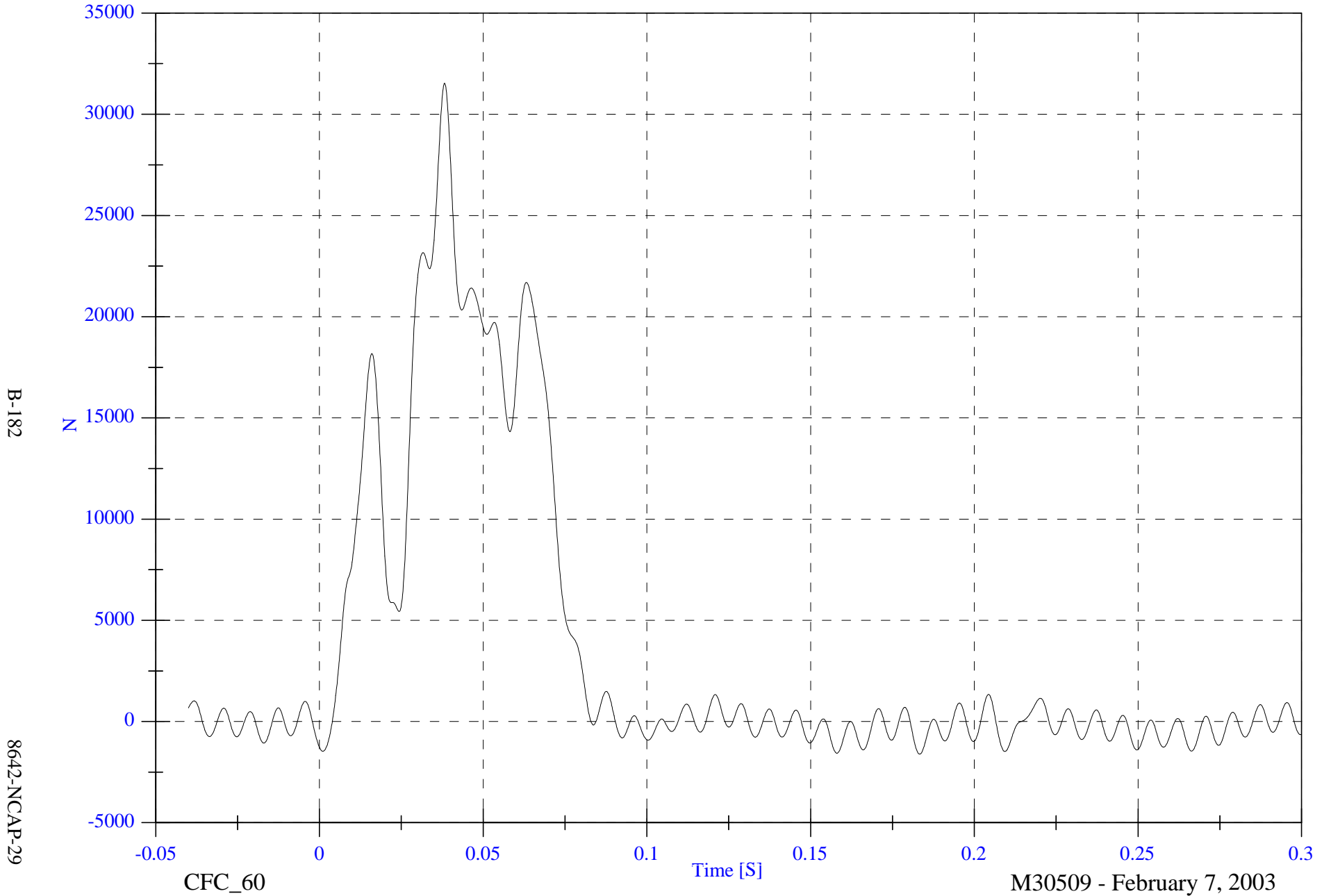
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

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

Max: 31536.8 [N] at 0.038 [S]

Min: -1613.3 [N] at 0.183 [S]



B-182

8642-NCAP-29

CFC_60

Time [S]

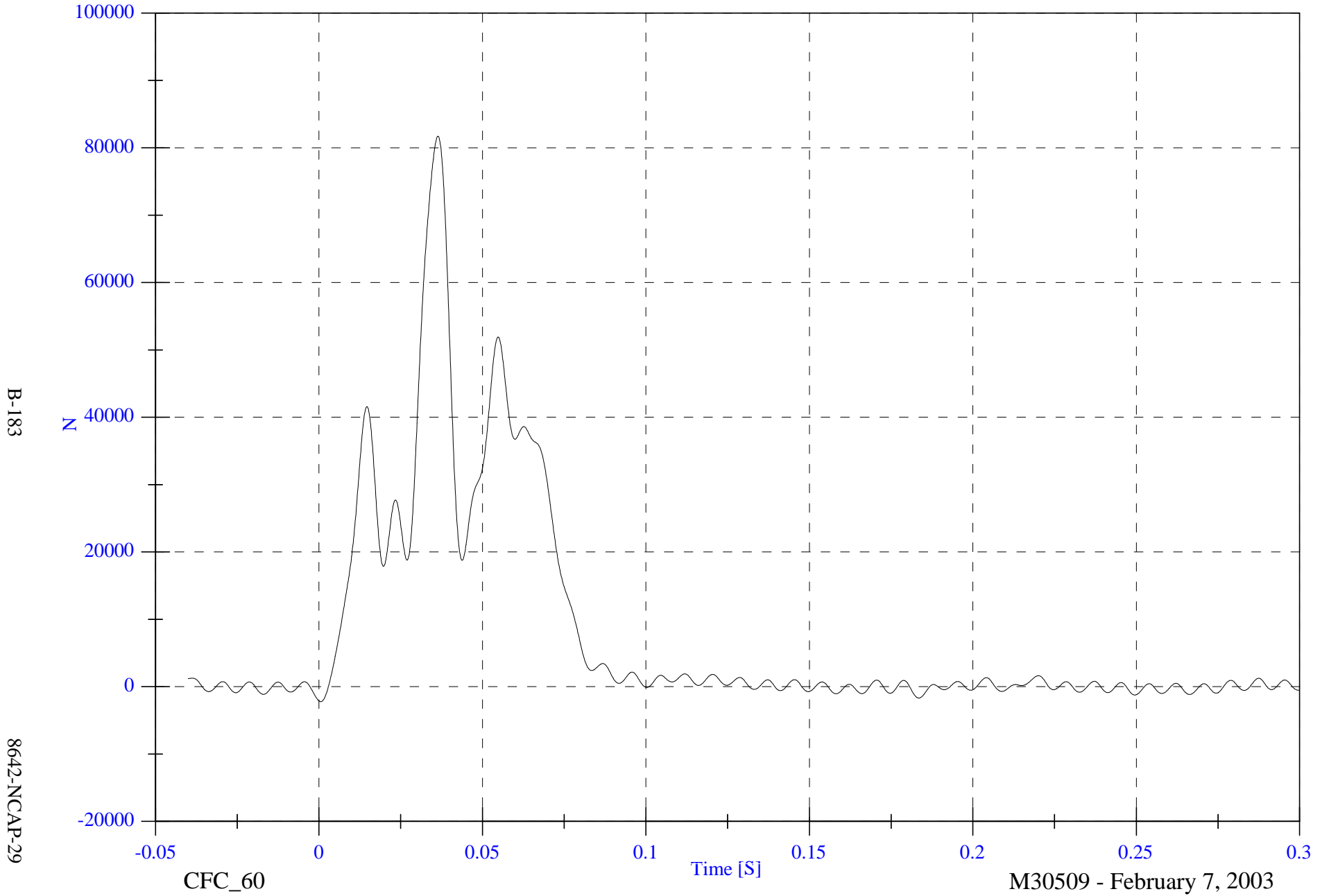
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

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

Max: 81723.3 [N] at 0.036 [S]

Min: -2232.9 [N] at 0.001 [S]



B-183

8642-NCAP-29

CFC_60

Time [S]

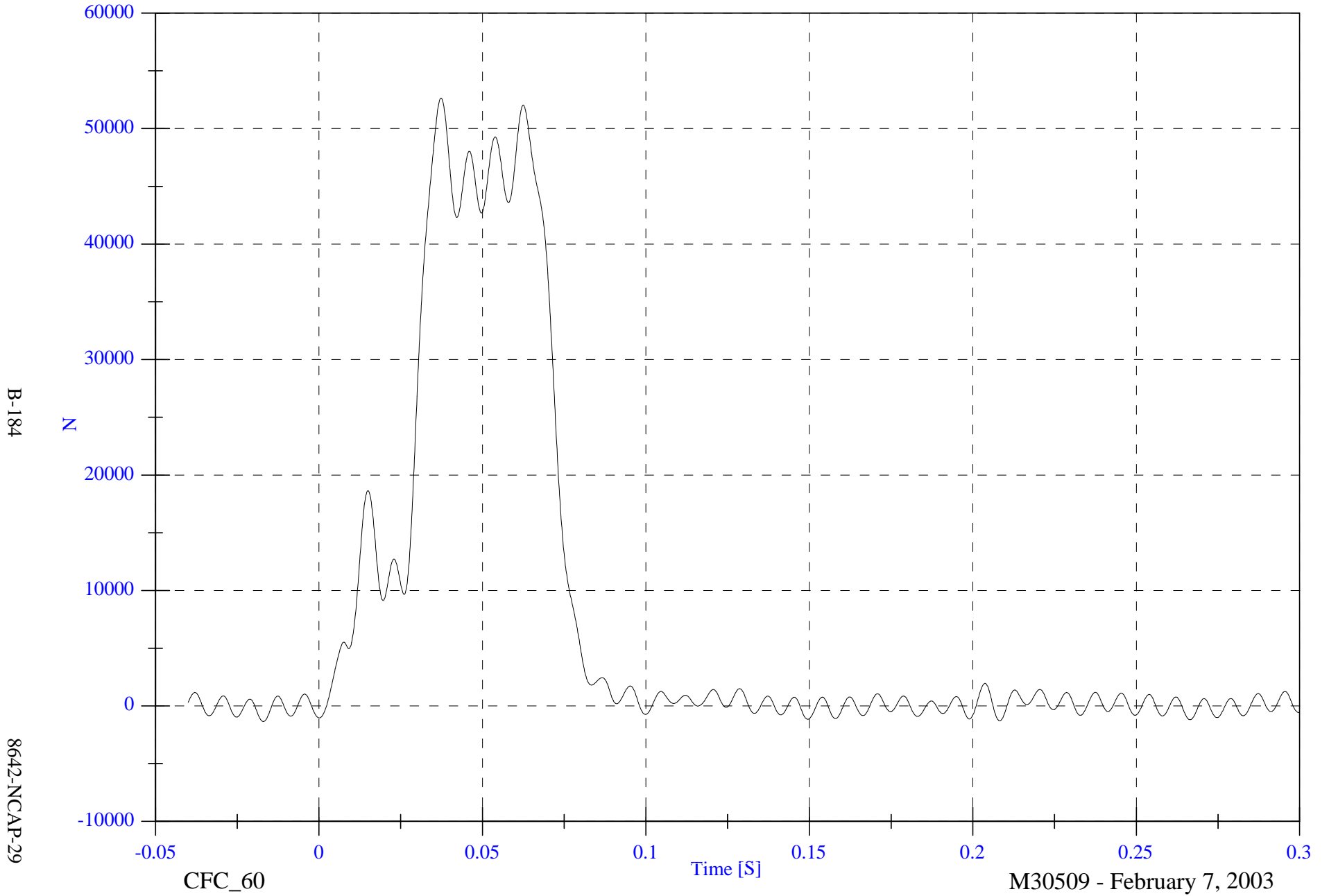
M30509 - February 7, 2003

NCAP TEST #7 2003 Mercedes E320

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

Max: 52642.1 [N] at 0.037 [S]

Min: -1350.8 [N] at -0.017 [S]

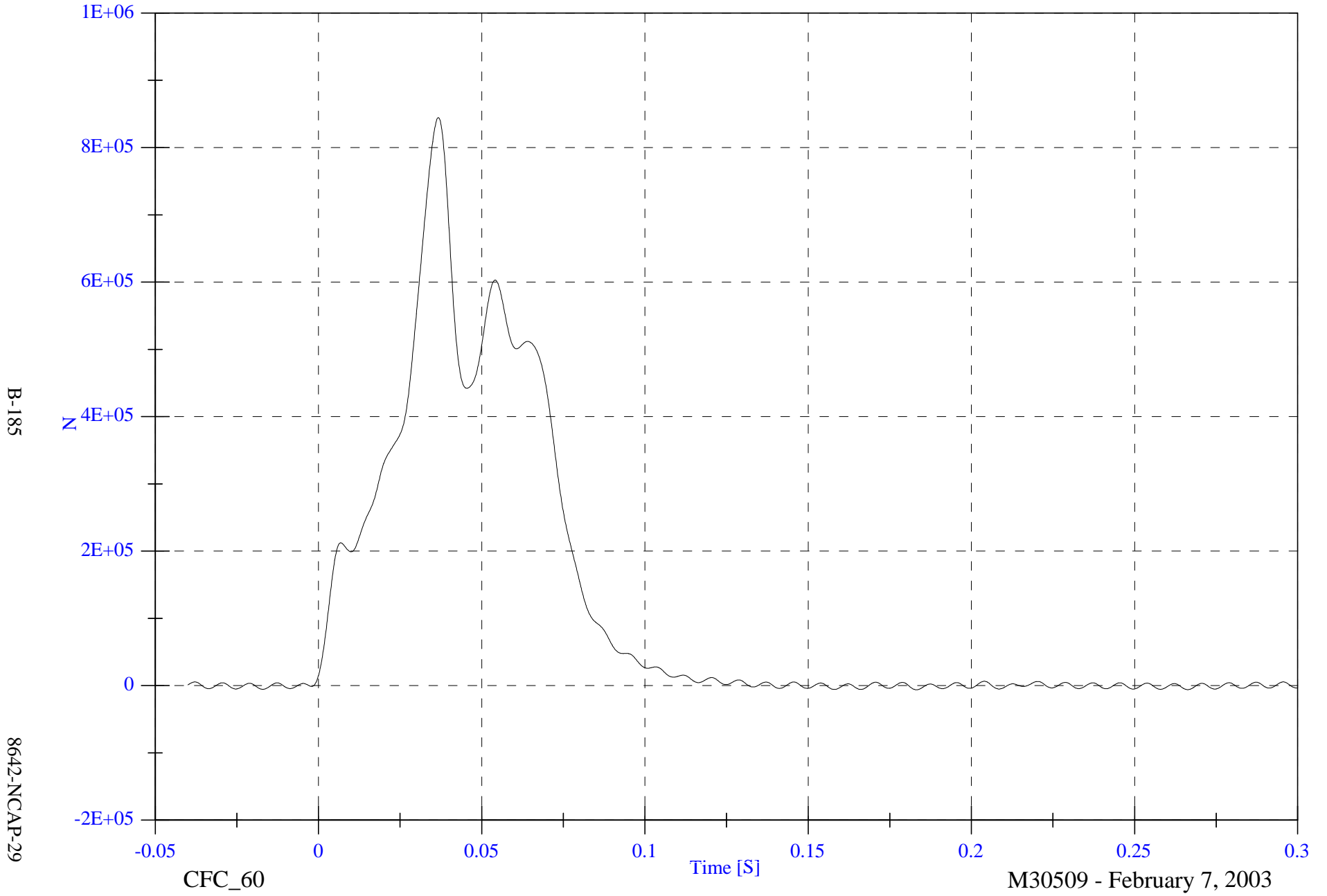


NCAP TEST #7 2003 Mercedes E320

Max: 844601.7 [N] at 0.037 [S]

Total Load Cell Sum (All 6 Groups)

Min: -6176.4 [N] at 0.183 [S]



B-185

8642-NCAP-29

CFC_60

M30509 - February 7, 2003

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:

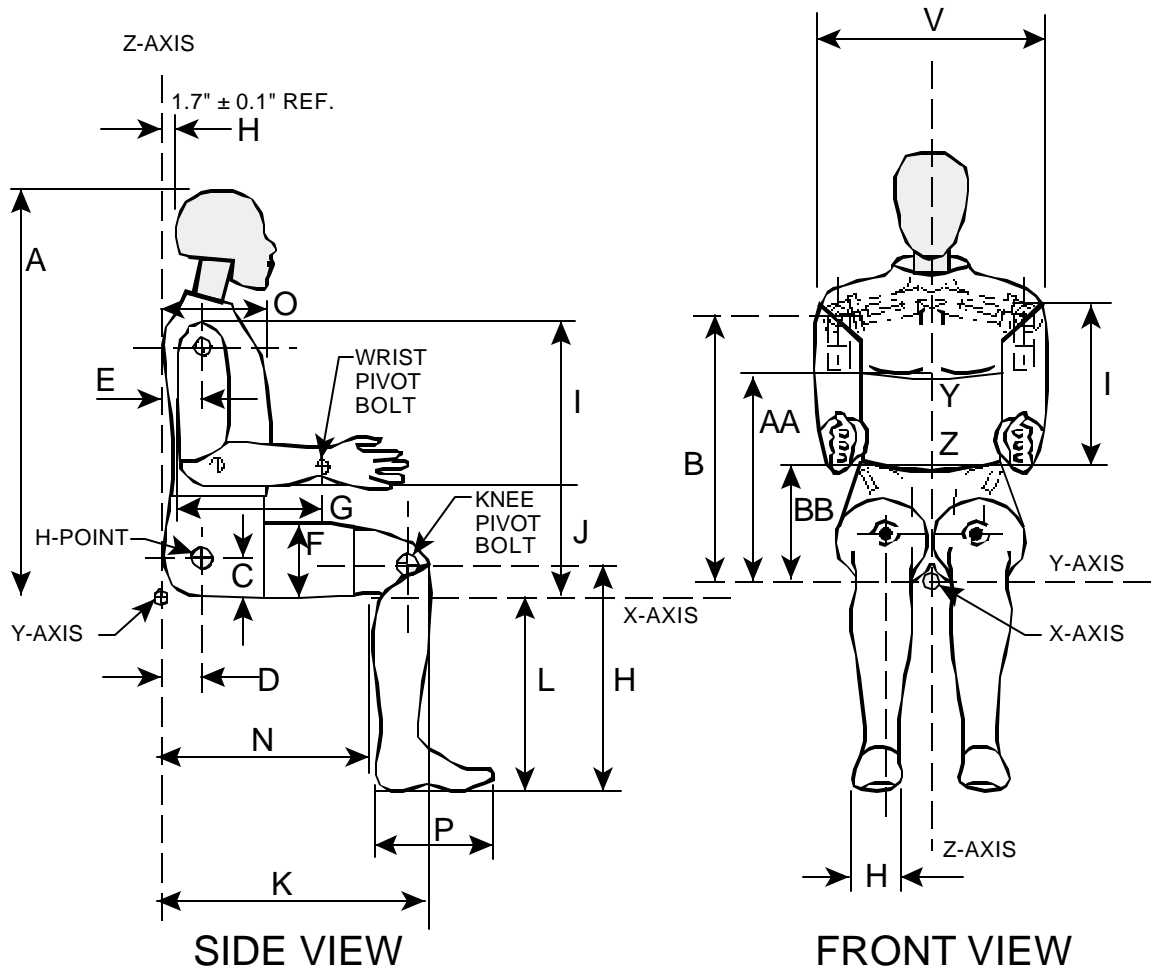
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	February 14, 2003
#2/Right Front Passenger	064	February 14, 2003

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 Indicant 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: S572.31(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 1
Date February 12, 2003
Workfile 061H 2-12-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	36.00
Peak Resultant Acceleration	225-275 G's	236.66
Peak Lateral Acceleration	15 G's Max	2.26
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	2	
Date	February 11, 2003	6 Axis Neck Transducer
Workfile	061Flx2 02-12-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	35.00
Impact Velocity		22.60 - 23.40 Ft/s	22.88
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.36
	20 ms	17.60 - 22.60 G's	20.91
	30 ms	12.50 - 18.50 G's	17.14
Max Pendulum G's Above 30 ms		29 G's Max	17.14
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	37.70
D Plane Rotation	Max	64 - 78 Deg	67.77
	Time	57 - 64 ms	58.50
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	79.22
	Time	47 - 58 ms	49.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	114.30
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.20

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	February 13, 2003	6 Axis Neck Transducer
Workfile	061Ext 02-12-03	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.00
Relative Humidity	10% - 70%	37.00
Impact Velocity	19.50 - 20.30 Ft/s	19.50
Pendulum Deceleration	10 ms	17.20 - 21.20 G's
	20 ms	14.00 - 19.00 G's
	30 ms	11.00 - 16.00 G's
Max Pendulum G's Above 30 ms	22 G's Max	13.60
Deceleration - Time Curve Decay Time to 5 G's	38 - 46 ms	40.20
D Plane Rotation	Max	81 - 106 Deg
	Time	72 - 82 ms
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs
	Time	65 - 79 ms
Rotation Angle - Time Curve Decay Time to Zero	147 - 174 ms	154.40
Positive Moment - Time Curve Decay Time to Zero	120 - 148 ms	138.30

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date February 14, 2003
Workfile 061T 02-14-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	69.0
Relative Humidity	10% - 70%	33.00
Pendulum Velocity	21.6 - 22.4 Ft/s	22.13
Maximum Deflection	2.50 - 2.86 in	2.57
Maximum Resistive Force	1160 - 1325 Lbs	1308.56
Internal Hysteresis	69 - 85 %	73.78

Remarks:

Laboratory Technician:

_____ B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
 Sequential Test Number 1
 Date February 14, 2003
 Workfile 061LF 02-14-03/ 061RF 02-14-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	38.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1234.58
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	38.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1200.90

Remarks:

Laboratory Technician:

_____ B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 1
Date February 14, 2003

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.00
Relative Humidity			38.00
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	17.8
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 1
Date February 12, 2003
Workfile 064H 02-12-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	36.00
Peak Resultant Acceleration	225-275 G's	263.01
Peak Lateral Acceleration	15 G's Max	12.86
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	5	
Date	February 13, 2003	6 Axis Neck Transducer
Workfile	064Flx5 2-13-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	37.00
Impact Velocity		22.60 - 23.40 Ft/s	22.70
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	24.00
	20 ms	17.60 - 22.60 G's	20.74
	30 ms	12.50 - 18.50 G's	14.85
Max Pendulum G's Above 30 ms		29 G's Max	14.85
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.30
D Plane Rotation	Max	64 - 78 Deg	68.73
	Time	57 - 64 ms	57.80
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	66.77
	Time	47 - 58 ms	54.20
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.20
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.20

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	February 13, 2003	6 Axis Neck Transducer
Workfile	064Ext 02-13-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	37.00
Impact Velocity		19.50 - 20.30 Ft/s	19.63
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.97
	20 ms	14.00 - 19.00 G's	16.78
	30 ms	11.00 - 16.00 G's	13.08
Max Pendulum G's Above 30 ms		22 G's Max	13.73
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	39.80
D Plane Rotation	Max	81 - 106 Deg	90.61
	Time	72 - 82 ms	75.10
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-49.00
	Time	65 - 79 ms	70.30
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	155.90
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	136.00

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date February 14, 2003
Workfile 064T 02-14-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	69.0
Relative Humidity	10% - 70%	33.00
Pendulum Velocity	21.6 - 22.4 Ft/s	22.13
Maximum Deflection	2.50 - 2.86 in	2.57
Maximum Resistive Force	1160 - 1325 Lbs	1283.69
Internal Hysteresis	69 - 85 %	74.47

Remarks:

Laboratory Technician:

_____ B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 1
Date February 14, 2003

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.0
Relative Humidity			38.0
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	33.6
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	34.9
Thigh Clearance	F	5.5 - 6.1 in	6.0
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	17.3
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
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENTRAN	AC-01G18-F06	20-Aug-02	20-Feb-03
	X Arm Z	ENTRAN	AC-00L13-F39	20-Aug-02	20-Feb-03
	Y Arm X	ENTRAN	AC-00L13-F14	21-Aug-02	21-Feb-03
	Y Arm Z	ENTRAN	AC-01G18-F16	21-Aug-02	21-Feb-03
	Z Arm X	ENTRAN	AC-00L13-F72	21-Aug-02	21-Feb-03
	Z Arm Y	ENTRAN	AC-01G18-F12	21-Aug-02	21-Feb-03
Head	X	ENTRAN	AC-00L13-F04	21-Aug-02	21-Feb-03
	Y	ENTRAN	AC-01G18-F15	21-Aug-02	21-Feb-03
	Z	ENTRAN	AC-01G18-F14	21-Aug-02	21-Feb-03
Head	X (R)	ENDEVCO	AC-P23873	10-Oct-02	10-Apr-03
	Y (R)	ENTRAN	AC-01G18-F05	21-Aug-02	21-Feb-03
	Z (R)	ENDEVCO	AC-J14668	21-Aug-02	21-Feb-03
Neck Load Cell	X	DENTON	LC-205Fx	15-Oct-02	15-Apr-03
	Y	DENTON	LC-205Fy	15-Oct-02	15-Apr-03
	Z	DENTON	LC-205Fz	15-Oct-02	15-Apr-03
Neck Moment	X	DENTON	LC-205Mx	15-Oct-02	15-Apr-03
	Y	DENTON	LC-205My	15-Oct-02	15-Apr-03
	Z	DENTON	LC-205Mz	15-Oct-02	15-Apr-03
Chest	X	ENDEVCO	AC-P21373	20-Aug-02	20-Feb-03
	Y	ENDEVCO	AC-P22639	20-Aug-02	20-Feb-03
	Z	ENDEVCO	AC-P21297	20-Aug-02	20-Feb-03
Chest	X (R)	ENDEVCO	AC-P21171	20-Aug-02	20-Feb-03
	Y (R)	ENDEVCO	AC-P23136	20-Aug-02	20-Feb-03
	Z (R)	ENDEVCO	AC-P23128	20-Aug-02	20-Feb-03
Chest Deflection	X	SERVO	DS-061	23-Sep-02	23-Mar-03
Pelvic	X	ENDEVCO	AC-P21441	20-Aug-02	20-Feb-03
	Y	ENDEVCO	AC-P19246	20-Aug-02	20-Feb-03
	Z	ENDEVCO	AC-P21516	20-Aug-02	20-Feb-03

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)	Manufacturer	Serial #	Calibration		
			Last	Next	
Left Femur Load Cell	Fz	GSE	LC-659	25-Sep-02	25-Mar-03
Right Femur Load Cell	Fz	GSE	LC-723	25-Sep-02	25-Mar-03
Left Upper Tibia	Mx	DENTON	LC-016Mx	25-Oct-02	25-Apr-03
	My	DENTON	LC-016My	25-Oct-02	25-Apr-03
Left Lower Tibia	Fz	DENTON	LC-123Fz	25-Oct-02	25-Apr-03
	Mx	DENTON	LC-123Mx	25-Oct-02	25-Apr-03
	My	DENTON	LC-123My	25-Oct-02	25-Apr-03
Right Upper Tibia	Mx	DENTON	LC-023Mx	25-Oct-02	25-Apr-03
	My	DENTON	LC-023My	25-Oct-02	25-Apr-03
Right Lower Tibia	Fz	DENTON	LC-111Fz	25-Oct-02	25-Apr-03
	Mx	DENTON	LC-111Mx	25-Oct-02	25-Apr-03
	My	DENTON	LC-111My	25-Oct-02	25-Apr-03
Left Foot Rear	X	ENDEVCO	AC-P19343	20-Aug-02	20-Feb-03
	Z	ENDEVCO	AC-P16583	20-Aug-02	20-Feb-03
Left Foot Front	Z	ENDEVCO	AC-P18525	20-Aug-02	20-Feb-03
Right Foot Rear	X	ENDEVCO	AC-P18628	20-Aug-02	20-Feb-03
	Z	ENDEVCO	AC-P18741	20-Aug-02	20-Feb-03
Right Foot Front	Z	ENDEVCO	AC-P23276	20-Aug-02	20-Feb-03
Lap Belt Load Cell		LEBOW	LC-706	12-Nov-02	12-May-03

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)	Manufacturer	Serial #	Calibration		
			Last	Next	
Head 9 Array	X Arm Y	ENTRAN	AC-01G18-F08	23-Aug-02	23-Feb-03
	X Arm Z	ENTRAN	AC-00L20-A13	23-Aug-02	23-Feb-03
	Y Arm X	ENTRAN	AC-00L20-A08	23-Aug-02	23-Feb-03
	Y Arm Z	ENTRAN	AC-01G18-F13	23-Aug-02	23-Feb-03
	Z Arm X	ENTRAN	AC-01J02-F18	23-Aug-02	23-Feb-03
	Z Arm Y	ENTRAN	AC-01G25-N11	23-Aug-02	23-Feb-03
Head	X	ENDEVCO	AC-J32184	27-Aug-02	27-Feb-03
	Y	ENDEVCO	AC-J32185	27-Aug-02	27-Feb-03
	Z	ENDEVCO	AC-J31011	27-Aug-02	27-Feb-03
Head	X (R)	ENDEVCO	AC-J31020	27-Aug-02	27-Feb-03
	Y (R)	ENDEVCO	AC-J31101	27-Aug-02	27-Feb-03
	Z (R)	ENDEVCO	AC-J31059	27-Aug-02	27-Feb-03
Neck Load Cell	X	DENTON	LC-440Fx	15-Oct-02	15-Apr-03
	Y	DENTON	LC-440Fy	15-Oct-02	15-Apr-03
	Z	DENTON	LC-440Fz	15-Oct-02	15-Apr-03
Neck Moment	X	DENTON	LC-440Mx	15-Oct-02	15-Apr-03
	Y	DENTON	LC-440My	15-Oct-02	15-Apr-03
	Z	DENTON	LC-440Mz	15-Oct-02	15-Apr-03
Chest	X	ENDEVCO	AC-J34019	28-Aug-02	27-Feb-03
	Y	ENDEVCO	AC-J33018	27-Aug-02	27-Feb-03
	Z	ENDEVCO	AC-J32783	28-Aug-02	27-Feb-03
Chest	X (R)	ENDEVCO	AC-J31066	28-Aug-02	27-Feb-03
	Y (R)	ENDEVCO	AC-P16979	27-Aug-02	27-Feb-03
	Z (R)	ENDEVCO	AC-J31022	28-Aug-02	27-Feb-03
Chest Deflection	X	SERVO	DS-064	23-Sep-02	23-Mar-03
Pelvic	X	ENDEVCO	AC-P23174	23-Aug-02	23-Feb-03
	Y	ENDEVCO	AC-P23164	23-Aug-02	23-Feb-03
	Z	ENDEVCO	AC-P23137	23-Aug-02	23-Feb-03

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)	Manufacturer	Serial #	Calibration		
			Last	Next	
Left Femur Load Cell Fz	GSE	LC-954	25-Sep-02	25-Mar-03	
Right Femur Load Cell Fz	GSE	LC-955	25-Sep-02	25-Mar-03	
Left Upper Tibia	Mx	DENTON	LC-045Mx	24-Oct-02	24-Apr-03
	My	DENTON	LC-045My	24-Oct-02	24-Apr-03
Left Lower Tibia	Fz	DENTON	LC-125Fz	24-Oct-02	24-Apr-03
	Mx	DENTON	LC-125Mx	24-Oct-02	24-Apr-03
	My	DENTON	LC-125My	24-Oct-02	24-Apr-03
Right Upper Tibia	Mx	DENTON	LC-038Mx	24-Oct-02	24-Apr-03
	My	DENTON	LC-038My	24-Oct-02	24-Apr-03
Right Lower Tibia	Fz	DENTON	LC-124Fz	24-Oct-02	24-Apr-03
	Mx	DENTON	LC-124Mx	24-Oct-02	24-Apr-03
	My	DENTON	LC-124My	24-Oct-02	24-Apr-03
Left Foot Rear	X	ENDEVCO	AC-J30491	23-Aug-02	23-Feb-03
	Z	ENDEVCO	AC-J31026	23-Aug-02	23-Feb-03
Left Foot Front	Z	ENDEVCO	AC-J32831	23-Aug-02	23-Feb-03
Right Foot Rear	X	ENDEVCO	AC-J33376	23-Aug-02	23-Feb-03
	Z	ENDEVCO	AC-J32832	23-Aug-02	23-Feb-03
Right Foot Front	Z	ENDEVCO	AC-J31095	23-Aug-02	23-Feb-03
Lap Belt Load Cell	LEBOW	LC-707	12-Nov-02	12-May-03	

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	AC-8062-003	11-Nov-02	11-May-03
Right Rear Seat Crossmember X	ICS	AC-8086-047	20-Nov-02	20-May-03
Top of Engine	ICS	AC-8084-024	11-Nov-02	11-May-03
Bottom of Engine	ICS	AC-8086-044	21-Nov-02	21-May-03
Right Disc Brake Caliper	ICS	AC-6917-024	21-Nov-02	21-May-03
Instrument Panel	ICS	AC-8083-037	21-Nov-02	21-May-03
Left Disc Brake Caliper	ICS	AC-9026-036	11-Nov-02	11-May-03
Left Seat Rear Crossmember Z	ICS	AC-8083-028	11-Nov-02	11-May-03
Right Seat Rear Crossmember Z	ICS	AC-8084-023	20-Nov-02	20-May-03

REPORT NUMBER: CAL-03-07

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

EVENFLO VANGAURD 5 LATCH
GRACO MY CARGO BOOSTER

NHTSA NUMBER: M30509

VERIDIAN ENGINEERING TEST NUMBER: 8642-NCAP-29

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



February 7, 2003

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
Mail Code: NVS-111
400 Seventh Street, SW, Room No. 5313
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-01-D-32005. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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				14. Sponsoring Agency Code NVS-111	
15. Supplementary Notes					
16. Abstract A CRS test was performed in conjunction with a New Car Assessment Program (NCAP) load cell barrier test. This test was conducted at the Veridian Engineering Crash Test Facility in Buffalo, New York, on February 7, 2003.					
ATD Position		HIC 15		HIC 36	
P3 (Right Rear) (044)		860.2		1355.4	
P4 (Left Rear) (144)		724.2		1208.4	
17. Key Words New Car Assessment Program (NCAP)				18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Technical Reference Division Room 5108 (NAD-52) 400 Seventh St., S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 ATTN: Robert Hornicle	
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND SUMMARY OF NCAP TEST	1-1
2	DATA SHEETS	2-1
	Data Sheet 1 – Crash Test Summary	2-1
	Data Sheet 2 – CRS Parameter Data	2-2
	Data Sheet 3 – CRS Dummy Positioning in Vehicle	2-3
	Data Sheet 4 – CRS Dummy Injury Criteria Values	2-4
	Data Sheet 5 – CRS Performance Data	2-7
	Data Sheet 6 – CRS Camera Data	2-9
3	PHOTOGRAPHS	3-1
4	CHILD DUMMY RESPONSE AND CRS DATA TRACES	4-1
5	CHILD DUMMY CALIBRATION INFORMATION	5-1
6	TEST EQUIPMENT LIST AND CALIBRATION INFORMATION	6-1

SECTION 1

PURPOSE AND SUMMARY OF TEST M30509

The purpose of this test was to obtain CRS performance data in a frontal impact NCAP condition. These data constitute part of the general consumer information collected by the New Car Assessment Program (NCAP).

The 56.65 kph NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

Both child dummies were instrumented with head, chest, and pelvic triaxial accelerometers, upper neck force and moment load cells and chest displacement transducers. Position 3 was equipped with lower neck force and moment load cells.

The right rear (Position 3) child dummy (serial no. 044) and left rear (Position 4) child dummy (serial no. 144) were calibrated previous to this test. Child dummy certification information is found in section 5.

The right rear child dummy's HIC was 860.2, maximum chest deceleration over 3 ms was 56.3 g's. The left rear child dummy's HIC was 724.2, maximum chest deceleration over 3 ms was 57.7 g's.

SECTION 2
DATA SHEET NO. 1
CRASH TEST SUMMARY

TEST DUMMY INFORMATION:

DESCRIPTION	Position #3 CRS	Position #4 CRS
ATD Type/Serial No.	Hybrid III 3C/044	Hybrid III 6C /144
Restraint System:	Evenflo Vangaurd 5 LATCH	Graco My CarGo Booster

Number of Data Channels _____ 45
Number of Cameras: _____ 1 _____ Real Time
_____ 2 _____ High Speed

POST TEST DOOR OPENING

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, Latched and Operable without tools	Closed, Latched and Operable without tools
Right Side Doors	Closed, Latched and Operable without tools	Closed, Latched and Operable without tools
Hatch/Other Door	N/A	N/A

POST TEST SEAT DATA

LOCATION	SEAT MOVEMENT (mm)	SEAT BACK FAILURE
P1 (Left Front)	0	None
P2 (Right Front)	0	None
P3 (Right Rear)	0	None
P4 (Left Rear)	0	None

VISIBLE DUMMY CONTACT POINTS

	Position #3 CRS	Position #4 CRS
Head Contact:	The face and chin to the chest and the back of the head to the child restraint	The face and chin to the chest and the back of the head to the child restraint
Upper Torso Contact:	None	None
Lower Torso Contact:	None	None
Left Knee Contact:	None	None
Right Knee Contact:	None	None

DATA SHEET NO. 2

CRS PARAMETER DATA

CRS: Evenflo Vangaurd 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 1692.5 kg (A)

AS TESTED WEIGHT OF VEHICLE (1 SID + 2 P572C w/ CRS +CARGO + EQUIPMENT & INSTRUMENTATION):

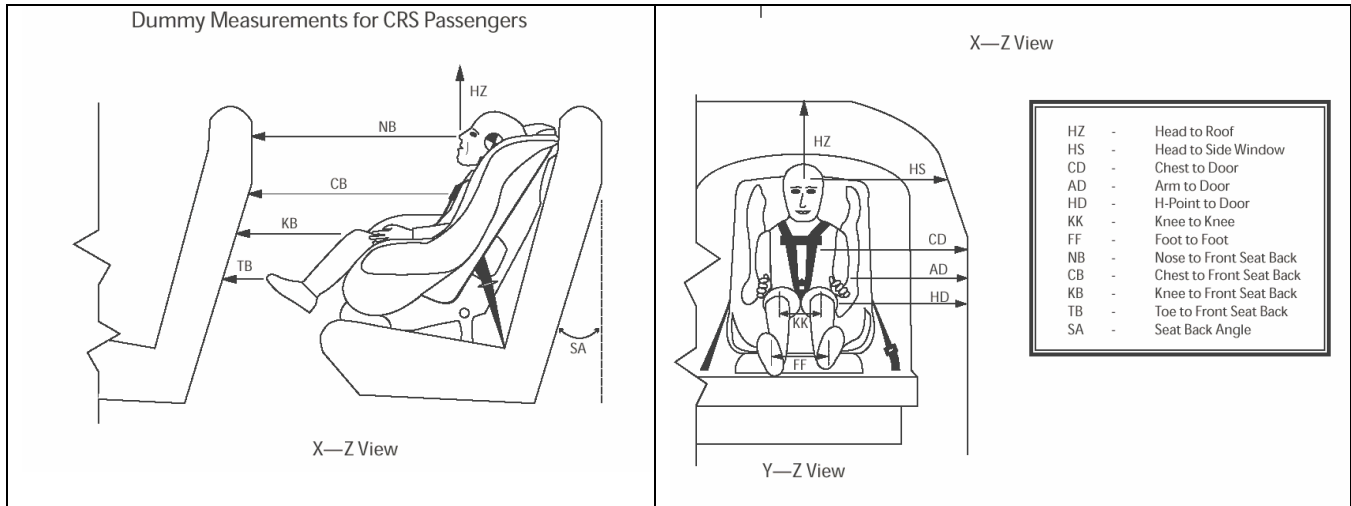
Left Front	=	<u>451.5</u>	kg	Left Rear	=	<u>514.0</u>	kg
Right Front	=	<u>467.5</u>	kg	Right Rear	=	<u>502.0</u>	kg
TOTAL FRONT	=	<u>919.0</u>	kg	TOTAL REAR	=	<u>1016.0</u>	kg
TOTAL TEST WEIGHT =		<u>1935.0</u>	kg				

DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE

CRS: Evenflo Vanguard 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509



Measurement	Pre-Test (mm)		Post Test (mm)	
	P3 CRS (044)	P4 CRS (144)	P3 CRS (044)	P4 CRS (144)
SA	24°	23.7°	25°	30°
HS	383	355	346	340
CD	353	330	342	308
AD	215	205	203	114
HD	275	210	275	177
HZ	329	313	340	305
NB	551	600	620	645
CB	526	555	608	597
KK	145	135	150	550
FF	160	150	215	210
KB – LEFT	320	265	400	230
KB – RIGHT	330	265	460	350
TB – LEFT	75	60	90	70
TB – RIGHT	65	60	175	70

All dimensions in mm (unless noted)

P3 – Right Rear Passenger (CRS #1)

P4 – Left Rear Passenger (CRS #2)

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES

CRS: Evenflo Vangaurd 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509

DESCRIPTION	Unit	MAXIMUM VALUE							
		Position #3				Position #4			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	98.4	185.0	-45.0	99.3	24.1	195.9	-44.9	95.7
Head Y	g	10.2	102.0	-11.3	99.1	27.1	63.3	-10.4	96.3
Head Z	g	82.0	84.8	-6.8	44.3	82.3	72.5	-4.3	31.0
Head Resultant	g	104.1	185.0	0.0	-33.5	91.0	72.5	0.0	-46.0
Upper Neck Fx	N	104.0	181.3	-932.4	101.0	189.7	179.7	-881.9	72.5
Upper Neck Fy	N	69.9	72.4	-115.6	120.4	115.5	71.2	-118.8	92.1
Upper Neck Fz	N	2381.6	87.3	-281.3	193.6	2626.4	74.0	-277.4	209.4
Upper Neck F Resultant	N	2448.1	87.3	1.6	-32.9	2757.5	74.0	0.3	-43.2
Upper Neck Mx	N-m	†	†	†	†	11.7	118.4	-14.2	100.8
Upper Neck My	N-m	5.9	149.6	-18.5	71.0	28.0	85.0	-29.0	62.5
Upper Neck Mz	N-m	†	†	†	†	6.2	99.7	-6.1	217.2
Upper Neck M Resultant	N-m	†	†	†	†	29.4	62.6	0.0	-28.4
Lower Neck Fx	N	338.3	184.9	-960.8	92.2	-	-	-	-
Lower Neck Fy	N	47.7	53.4	-240.4	103.4	-	-	-	-
Lower Neck Fz	N	1784.9	85.7	-202.2	45.1	-	-	-	-
Lower Neck F Resultant	N	1972.8	87.6	1.5	-21.8	-	-	-	-
Lower Neck Mx	N-m	12.2	71.3	-5.5	180.1	-	-	-	-
Lower Neck My	N-m	114.0	99.1	-17.6	184.8	-	-	-	-
Lower Neck Mz	N-m	6.4	78.2	-4.0	104.6	-	-	-	-
Lower Neck M Resultant	N-m	114.1	99.1	0.1	-41.4	-	-	-	-
Chest X	g	13.3	179.7	-49.4	69.1	4.1	129.7	-49.9	68.8
Chest Y	g	8.6	91.5	-1.8	115.8	26.2	72.6	-5.1	40.4
Chest Z	g	38.7	91.0	-30.4	70.8	5.5	87.7	-32.8	72.7
Chest Resultant	g	57.1	70.1	0.0	-23.9	63.8	72.5	0.0	-42.9
Chest Displacement	g	0.2	26.8	-29.3	104.4	0.0	9.8	-1.3	97.8

* Data is questionable

† Questionable data – data spikes present

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: Evenflo Vangaurd 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509

DESCRIPTION	Unit	MAXIMUM VALUE							
		Position #3				Position #4			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Pelvic X	g	52.1	126.3	-59.9	65.3	35.7	107.6	-86.9	76.9
Pelvic Y	g	8.4	90.0	-5.6	127.3	#	#	#	#
Pelvic Z	g	20.8	94.7	-45.4	67.6	14.5	111.7	-43.4	68.2
Pelvic Resultant	g	73.7	67.5	0.0	-30.6	**	**	**	**
Lap Belt Load	N	-	-	-	-	4650.5	70.6	-18.5	118.1

- Data is questionable – wire was cut at 72 ms.

** - Data questionable – Pelvic Y channel damaged at 72 ms.

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: Evenflo Vanguard 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509

	HEAD INJURY CRITERIA (HIC)							
	HIC15				HIC36			
	HIC	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂	HIC	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #3 - Right	860.2	77.2	92.2	80.1 g	1355.4	67.9	103.9	67.7 g
Position #4 - Left	724.2	67.1	82.1	74.7 g	1208.4	62.1	98.1	64.6 g

	CLIP SUMMARY*			
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #3 - Right	56.3	68.7	71.7	715.1
Position #4 - Left	57.7	68.1	73.4	533.6

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

Position 3 Neck Injury Summary (HIII 3 year old – In Position)

Nij V10	Nij	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
Ntf	0.49	184.8	982.7	70.1	4.5
Nte	1.31	94.9	2045.6	-804.0	-13.2
Ncf	0.08	268.2	-5.8	-18.5	5.3
Nce	0.45	198.7	-46.6	-232.2	-12.8

Peak Tension (CFC1000) 2381.6 N **Peak Compression (CFC1000)** -281.3 N

Nij Intercepts				Peak Limits	
Tension (CVt)	2340 N	Extension (mCVe)	30 N-m	Tension	1430 N
Compression (CVc)	2120 N	Flexion (mCVf)	68 N-m	Compression	-1380 N

Condyle Offset 0

Position 4 Neck Injury Summary (HIII 6 year old – In Position)

Nij V10	Nij	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
Ntf	1.16	93.5	2558.3	-339.6	30.6
Nte	0.93	70.8	2473.5	-864.6	-5.4
Ncf	0.06	35.6	-140.8	-98.4	0.5
Nce	0.69	209.4	-277.1	-144.9	-24.8

Peak Tension (CFC1000) N **Peak Compression (CFC1000)** -112.8 N

Critical Values

Nij Intercepts				Peak Limits	
Tension (CVt)	3096 N	Extension (mCVe)	42 N-m	Tension	1890 N
Compression (CVc)	2800 N	Flexion (mCVf)	93 N-m	Compression	-1820 N

Condyle Offset -0.01778

DATA SHEET NO. 5

CRS PERFORMANCE DATA

CRS: Evenflo Vanguard 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509

		MAXIMUM VALUE			
DESCRIPTION	Unit	Positive	Time (ms)	Negative	Time (ms)
P3 CRS X	g	0.5	112.1	-67.4	58.4
P3 CRS Y	g	7.8	273.4	-9.2	57.5
P3 CRS Z	g	10.3	57.2	-34.2	75.4
P3 CRS R	g	68.6	58.2	0.1	-43.4
P4 CRS X	g	19.1	117.4	-52.5	57.6
P4 CRS Y	g	13.0	71.1	-10.0	14.5
P4 CRS Z	g	12.6	126.6	-33.0	63.3
P4 CRS R	g	56.4	57.9	0.0	-34.2

DATA SHEET NO. 5

CRS PERFORMANCE DATA (CONTINUED)

CRS: Evenflo Vanguard 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509

POSITION #3 CRS POST-TEST INSPECTION (Serial No. 3691261 P1)

LOCATION	DAMAGE	REMARKS
Upper Tether Strap	No	None
Upper Tether Buckle	No	None
Upper Tether Hook	No	None
Vehicle Upper Tether Anchor	No	None
Lower Anchor Strap	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Vehicle Lower CRS Anchors	No	None
Five Point Harness Connections	No	None
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

POSITION #4 CRS POST-TEST INSPECTION (Serial No. 8481 LAN)

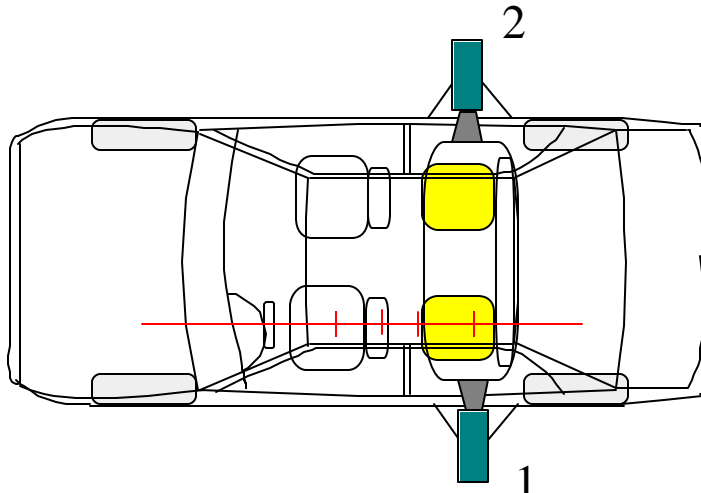
LOCATION	DAMAGE	REMARKS
Upper Tether Strap	NA	NA
Upper Tether Buckle	NA	NA
Upper Tether Hook	NA	NA
Vehicle Upper Tether Anchor	NA	NA
Lower Anchor Strap	NA	NA
Lower Anchor Buckle	NA	NA
Lower Anchor Hooks	NA	NA
Vehicle Lower CRS Anchors	NA	NA
Five Point Harness Connections	NA	NA
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	Yes	Left femur flange fractured

DATA SHEET NO. 6

CRS CAMERA DATA

CRS: Evenflo Vanguard 5 LATCH, Graco My CarGo Booster

NHTSA No. M30509



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	3658	2693	2548	-27	13	1010
2	Right side CRS lateral view	3642	2642	2577	-25	13	1010

* Reference (from point of impact); all measurements accurate to within ± 6 mm.

- X = + Forward
- Y = + To Right
- Z = + Down

SECTION 3

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page</u>
Figure 3- 1	CLOSE-UP VIEW OF POSITION 3CRS LABEL	3- 3
Figure 3- 2	PRE-TEST FRONTAL VIEW OF POSITION 3CRS	3- 4
Figure 3- 3	POST-TEST FRONTAL VIEW OF POSITION 3CRS	3- 5
Figure 3- 4	PRE-TEST REAR VIEW OF POSITION 3CRS	3- 6
Figure 3- 5	POST-TEST REAR VIEW OF POSITION 3CRS	3- 7
Figure 3- 6	PRE-TEST LEFT SIDE VIEW OF POSITION 3CRS	3- 8
Figure 3- 7	POST-TEST LEFT SIDE VIEW OF POSITION 3CRS	3- 9
Figure 3- 8	PRE-TEST RIGHT SIDE VIEW OF POSITION 3CRS	3- 10
Figure 3- 9	POST-TEST RIGHT SIDE VIEW OF POSITION 3CRS	3- 11
Figure 3- 10	CLOSE-UP VIEW OF POSITION 4CRS LABEL	3- 12
Figure 3- 11	PRE-TEST FRONTAL VIEW OF POSITION 4CRS	3- 13
Figure 3- 12	POST-TEST FRONTAL VIEW OF POSITION 4CRS	3- 14
Figure 3- 13	PRE-TEST REA R VIEW OF POSITION 4CRS	3- 15
Figure 3- 14	POST-TEST REAR VIEW OF POSITION 4CRS	3- 16
Figure 3- 15	PRE-TEST LEFT SIDE VIEW OF POSITION 4CRS	3- 17
Figure 3- 16	POST-TEST LEFT SIDE VIEW OF POSITION 4CRS	3- 18
Figure 3- 17	PRE-TEST RIGHT SIDE VIEW OF POSITION 4CRS	3- 19
Figure 3- 18	POST-TEST RIGHT SIDE VIEW OF POSITION 4CRS	3- 20
Figure 3- 19	PRE-TEST POSITION 3 LEFT SIDE VIEW	3- 21
Figure 3- 20	POST-TEST POSITION 3 LEFT SIDE VIEW	3- 22
Figure 3- 21	PRE-TEST POSITION 4 LEFT SIDE VIEW	3- 23
Figure 3- 22	POST-TEST POSITION 4 LEFT SIDE VIEW	3- 24
Figure 3- 23	PRE-TEST POSITION 3 RIGHT SIDE VIEW	3- 25
Figure 3- 24	POST-TEST POSITION 3 RIGHT SIDE VIEW	3- 26
Figure 3- 25	PRE-TEST POSITION 4 RIGHT SIDE VIEW	3- 27
Figure 3- 26	POST-TEST POSITION 4 RIGHT SIDE VIEW	3- 28
Figure 3- 27	PRE-TEST POSITION 3 FRONT VIEW	3- 29
Figure 3- 28	POST-TEST POSITION 3 FRONT VIEW	3- 30
Figure 3- 29	PRE-TEST POSITION 4 FRONT VIEW	3- 31
Figure 3- 30	POST-TEST POSITION 4 FRONT VIEW	3- 32



Figure 3-2 PRE-TEST FRONTAL VIEW OF POSITION 3 CRS



Figure 3-3 POST-TEST FRONTAL VIEW OF POSITION 3 CRS



Figure 3-4 PRE-TEST REAR VIEW OF POSITION 3 CRS



Figure 3-5 POST-TEST REAR VIEW OF POSITION 3 CRS



Figure 3-6 PRE-TEST LEFT SIDE VIEW OF POSITION 3 CRS



Figure 3-7 POST-TEST LEFT SIDE VIEW OF POSITION 3 CRS



Figure 3-8 PRE-TEST RIGHT SIDE VIEW OF POSITION 3 CRS



Figure 3-9 POST-TEST RIGHT SIDE VIEW OF POSITION 3 CRS



Figure 3-10 CLOSE-UP VIEW OF POSITION 4 CRS LABEL



Figure 3-11 PRE-TEST FRONTAL VIEW OF POSITION 4 CRS



Figure 3-12 POST-TEST FRONTAL VIEW OF POSITION 4 CRS



Figure 3-13 PRE-TEST REAR VIEW OF POSITION 4 CRS



Figure 3-14 POST-TEST REAR VIEW OF POSITION 4 CRS



Figure 3-15 PRE-TEST LEFT SIDE VIEW OF POSITION 4 CRS



Figure 3-16 POST-TEST LEFT SIDE VIEW OF POSITION 4 CRS



Figure 3-17 PRE-TEST RIGHT SIDE VIEW OF POSITION 4 CRS



Figure 3-18 POST-TEST RIGHT SIDE VIEW OF POSITION 4 CRS



Figure 3-19 PRE-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-20 POST-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-21 PRE-TEST POSITION 4 LEFT SIDE VIEW



Figure 3-22 POST-TEST POSITION 4 LEFT SIDE VIEW



3-25

8642-NCAP-29

Figure 3-23 PRE-TEST POSITION 3 RIGHT SIDE VIEW



Figure 3-24 POST-TEST POSITION 3 RIGHT SIDE VIEW



3-27

8642-NCAP-29

Figure 3-25 PRE-TEST POSITION 4 RIGHT SIDE VIEW



3-28

8642-NCAP-29

Figure 3-26 POST-TEST POSITION 4 RIGHT SIDE VIEW



3-29

8642-NCAP-29

Figure 3-27 PRE-TEST POSITION 3 FRONT VIEW



Figure 3-28 POST-TEST POSITION 3 FRONT VIEW



Figure 3-29 PRE-TEST POSITION 4 FRONT VIEW



Figure 3-30 POST-TEST POSITION 4 FRONT VIEW

SECTION 4

CHILD DUMMY RESPONSE AND CRS DATA TRACES

TABLE OF DATA PLOTS

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	V1P3 Head x [g, CFC_1000]	4-4
2	V1P3 Head y [g, CFC_1000]	4-5
3	V1P3 Head z [g, CFC_1000]	4-6
4	V1P3 Head Resultant [g, CFC_1000]	4-7
5	V1P3 Upper Neck Fx [N, CFC_1000]	4-8
6	V1P3 Upper Neck Fy [N, CFC_1000]	4-9
7	V1P3 Upper Neck Fz [N, CFC_1000]	4-10
8	V1P3 Upper Neck F Resultant [N, CFC_1000]	4-11
9	V1P3 Upper Neck Mx [N-m, CFC_600]	4-12
10	V1P3 Upper Neck My [N-m, CFC_600]	4-13
11	V1P3 Upper Neck Mz [N-m, CFC_600]	4-14
12	V1P3 Upper Neck M Resultant [N-m, CFC_600]	4-15
13	V1P3 Lower Neck Fx [N, CFC_1000]	4-16
14	V1P3 Lower Neck Fy [N, CFC_1000]	4-17
15	V1P3 Lower Neck Fz [N, CFC_1000]	4-18
16	V1P3 Lower Neck F Resultant [N, CFC_1000]	4-19
17	V1P3 Lower Neck Mx [N-m, CFC_600]	4-20
18	V1P3 Lower Neck My [N-m, CFC_600]	4-21
19	V1P3 Lower Neck Mz [N-m, CFC_600]	4-22
20	V1P3 Lower Neck M Resultant [N-m, CFC_600]	4-23
21	V1P3 Chest x [g, CFC_180]	4-24
22	V1P3 Chest y [g, CFC_180]	4-25
23	V1P3 Chest z [g, CFC_180]	4-26
24	V1P3 Chest Resultant [g, CFC_180]	4-27
25	V1P3 Chest Compression [mm, CFC_600]	4-28
26	V1P3 Pelvic x [g, CFC_1000]	4-29
27	V1P3 Pelvic y [g, CFC_1000]	4-30
28	V1P3 Pelvic z [g, CFC_1000]	4-31
29	V1P3 Pelvic Resultant [g, CFC_1000]	4-32
30	V1P4 Head x [g, CFC_1000]	4-33
31	V1P4 Head y [g, CFC_1000]	4-34
32	V1P4 Head z [g, CFC_1000]	4-35
33	V1P4 Head Resultant [g, CFC_1000]	4-36
34	V1P4 Upper Neck Fx [N, CFC_1000]	4-37
35	V1P4 Upper Neck Fy [N, CFC_1000]	4-38
36	V1P4 Upper Neck Fz [N, CFC_1000]	4-39
37	V1P4 Upper Neck F Resultant [N, CFC_1000]	4-40
38	V1P4 Upper Neck Mx [N-m, CFC_600]	4-41
39	V1P4 Upper Neck My [N-m, CFC_600]	4-42
40	V1P4 Upper Neck Mz [N-m, CFC_600]	4-43
41	V1P4 Upper Neck M Resultant [N-m, CFC_600]	4-44
42	V1P4 Chest x [g, CFC_180]	4-45
43	V1P4 Chest y [g, CFC_180]	4-46
44	V1P4 Chest z [g, CFC_180]	4-47
45	V1P4 Chest Resultant [g, CFC_180]	4-48
46	V1P4 Chest Compression [mm, CFC_600]	4-49
47	V1P4 Pelvic x [g, CFC_1000]	4-50
48	V1P4 Pelvic y [g, CFC_1000]	4-51
49	V1P4 Pelvic z [g, CFC_1000]	4-52

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
50	V1P4 Pelvic Resultant [g, CFC_1000]	4-53
51	P4 Lap Belt [N, CFC_60]	4-54
52	P3 Seat x [g, CFC_60]	4-55
53	P3 Seat x Velocity [kph, CFC_180]	4-56
54	P3 Seat x Displacement [mm, CFC_180]	4-57
55	P3 Seat y [g, CFC_60]	4-58
56	P3 Seat y Velocity [kph, CFC_180]	4-59
57	P3 Seat y Displacement [mm, CFC_180]	4-60
58	P3 Seat z [g, CFC_60]	4-61
59	P3 Seat z Velocity [kph, CFC_180]	4-62
60	P3 Seat z Displacement [mm, CFC_180]	4-63
61	P3 Seat Resultant [g, CFC_60]	4-64
62	P4 Seat x [g, CFC_60]	4-65
63	P4 Seat x Velocity [kph, CFC_180]	4-66
64	P4 Seat x Displacement [mm, CFC_180]	4-67
65	P4 Seat y [g, CFC_60]	4-68
66	P4 Seat y Velocity [kph, CFC_180]	4-69
67	P4 Seat y Displacement [mm, CFC_180]	4-70
68	P4 Seat z [g, CFC_60]	4-71
69	P4 Seat z Velocity [kph, CFC_180]	4-72
70	P4 Seat z Displacement [mm, CFC_180]	4-73
71	P4 Seat Resultant [g, CFC_60]	4-74

NCAP Test #7 - 2003 Mercedes E320

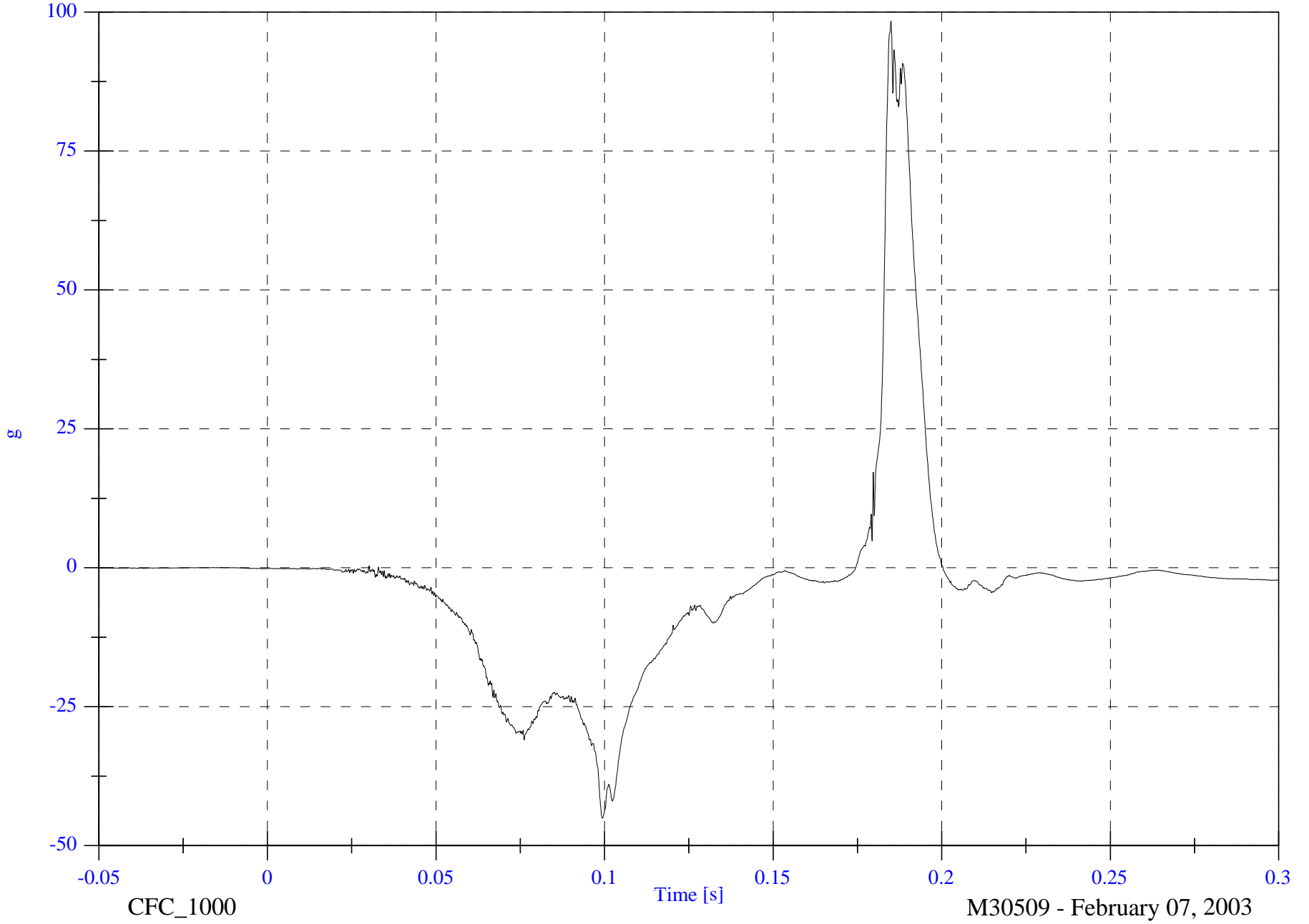
V1P3 Head x

Max: 98.4 [g] at 0.185 [s]

Min: -45.0 [g] at 0.099 [s]

4-4

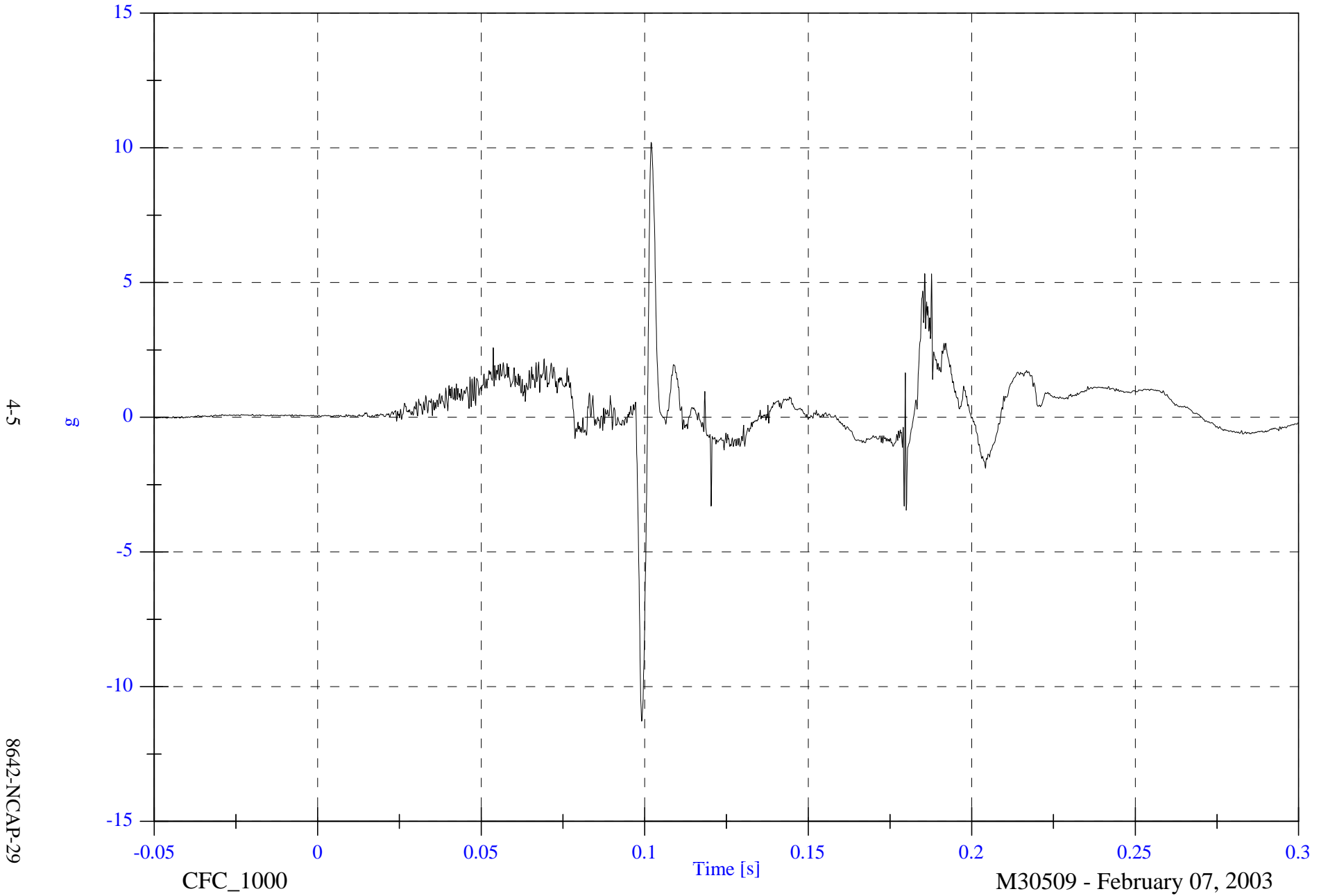
8642-NCAP-29



NCAP Test #7 - 2003 Mercedes E320

Max: 10.2 [g] at 0.102 [s]
Min: -11.3 [g] at 0.099 [s]

V1P3 Head y

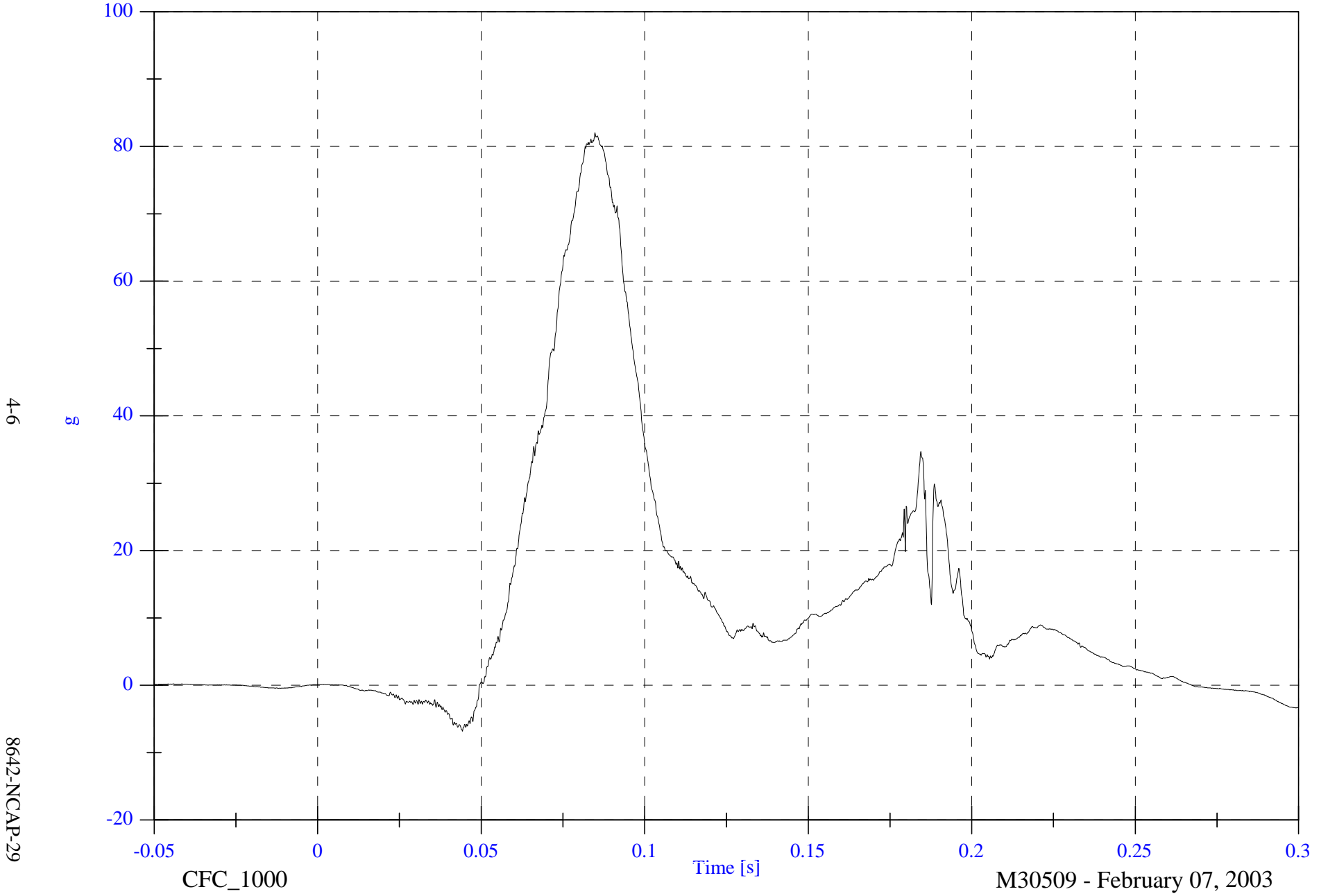


NCAP Test #7 - 2003 Mercedes E320

V1P3 Head z

Max: 82.0 [g] at 0.085 [s]

Min: -6.8 [g] at 0.044 [s]



4-6

8642-NCAP-29

CFC_1000

Time [s]

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V1P3 Head Resultant

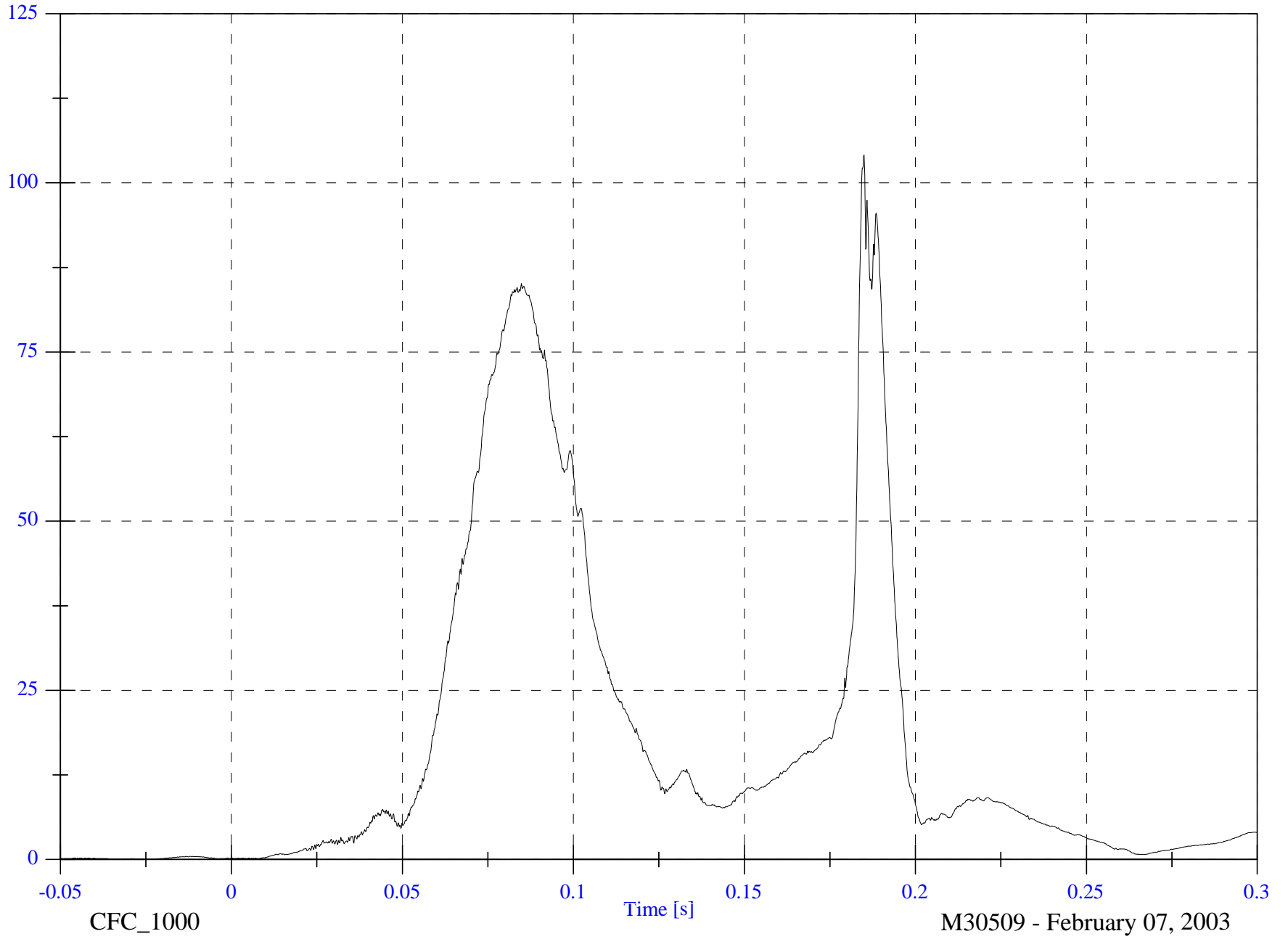
Max: 104.1 [g] at 0.185 [s]

Min: 0.0 [g] at -0.034 [s]

4-7

g

8642-NCAP-29



CFC_1000

Time [s]

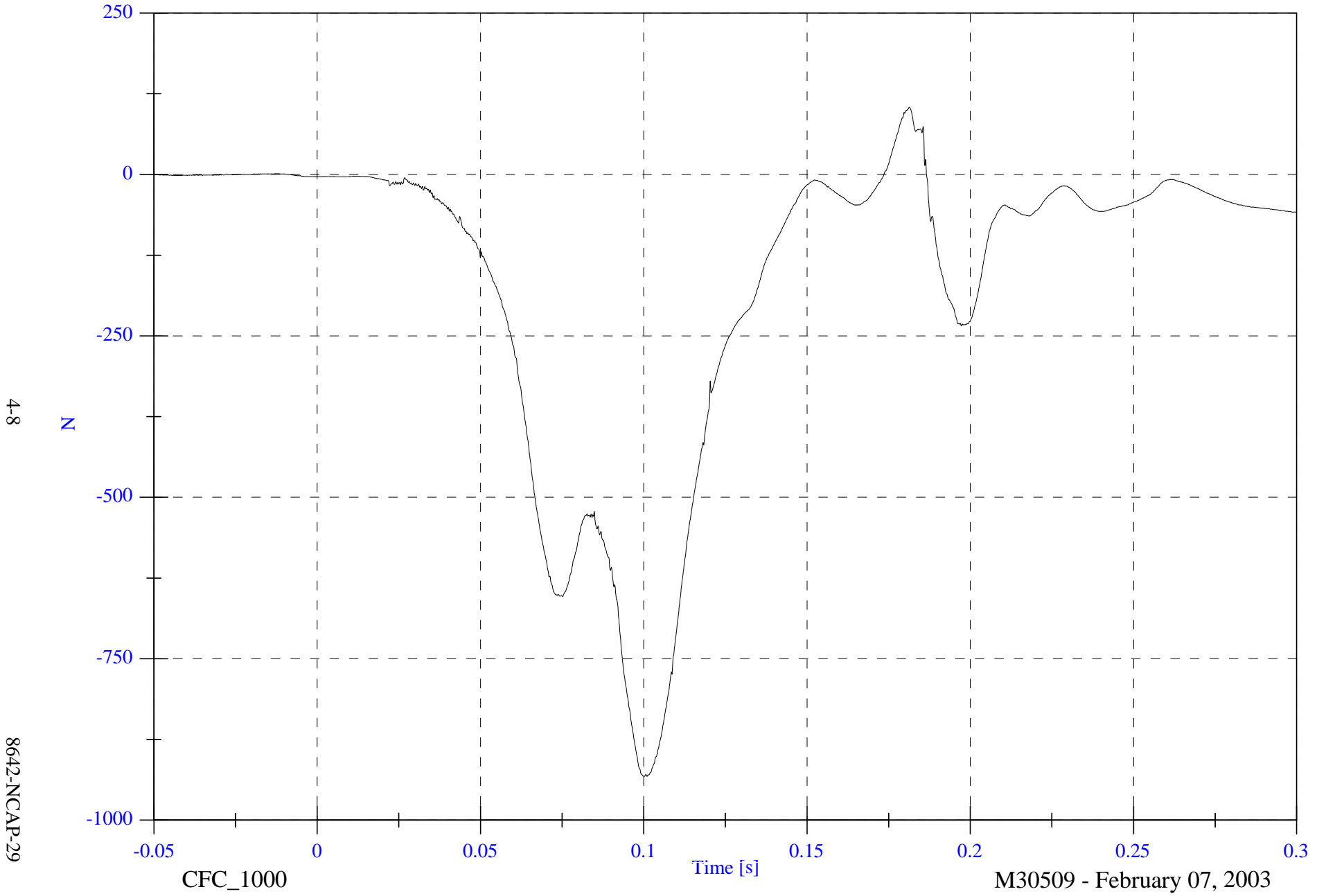
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V1P3 Upper Neck Fx

Max: 104.0 [N] at 0.181 [s]

Min: -932.4 [N] at 0.101 [s]



4-8

8642-NCAP-29

CFC_1000

Time [s]

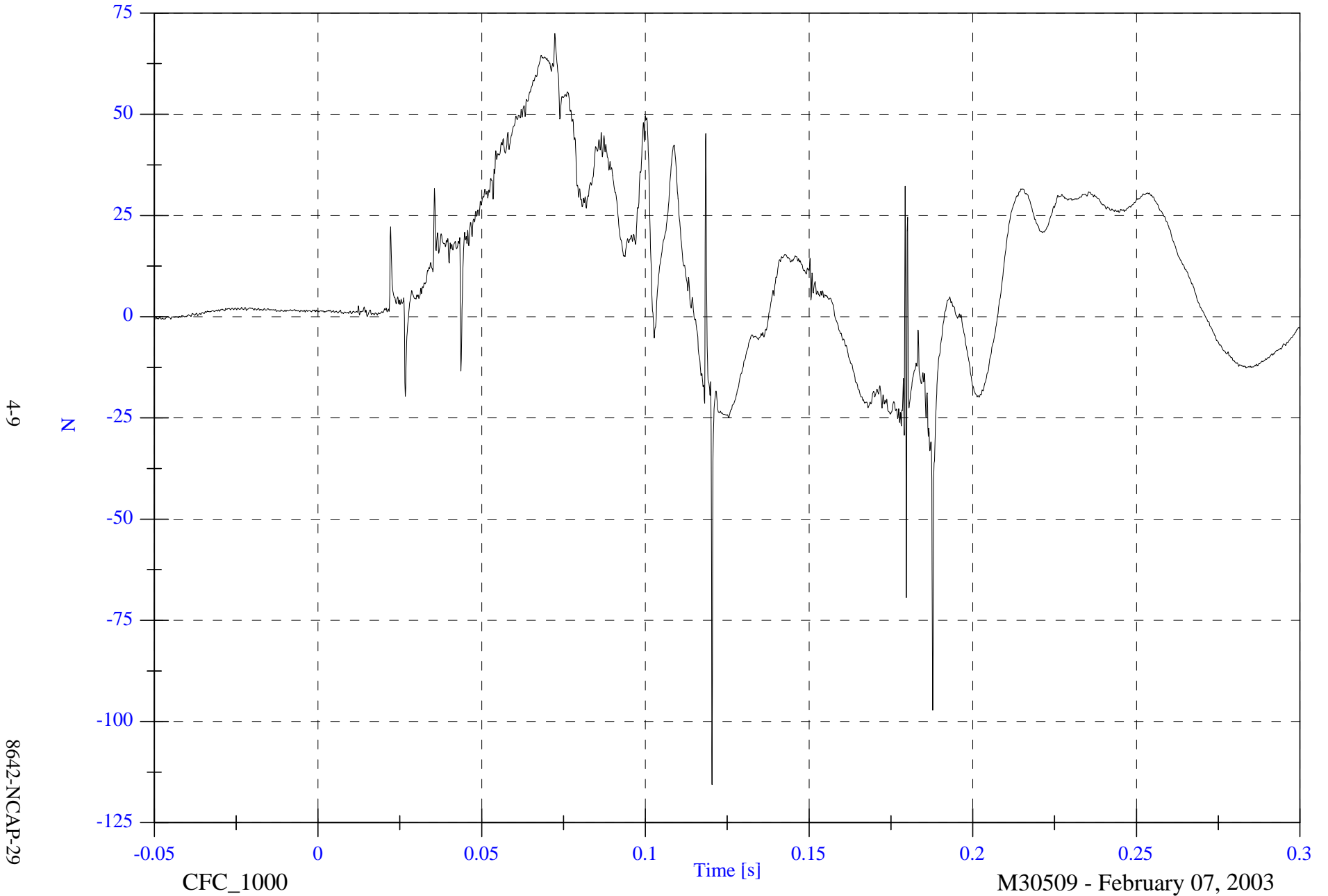
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P3 Upper Neck Fy

Max: 69.9 [N] at 0.072 [s]

Min: -115.6 [N] at 0.120 [s]



4-9

8642-NCAP-29

CFC_1000

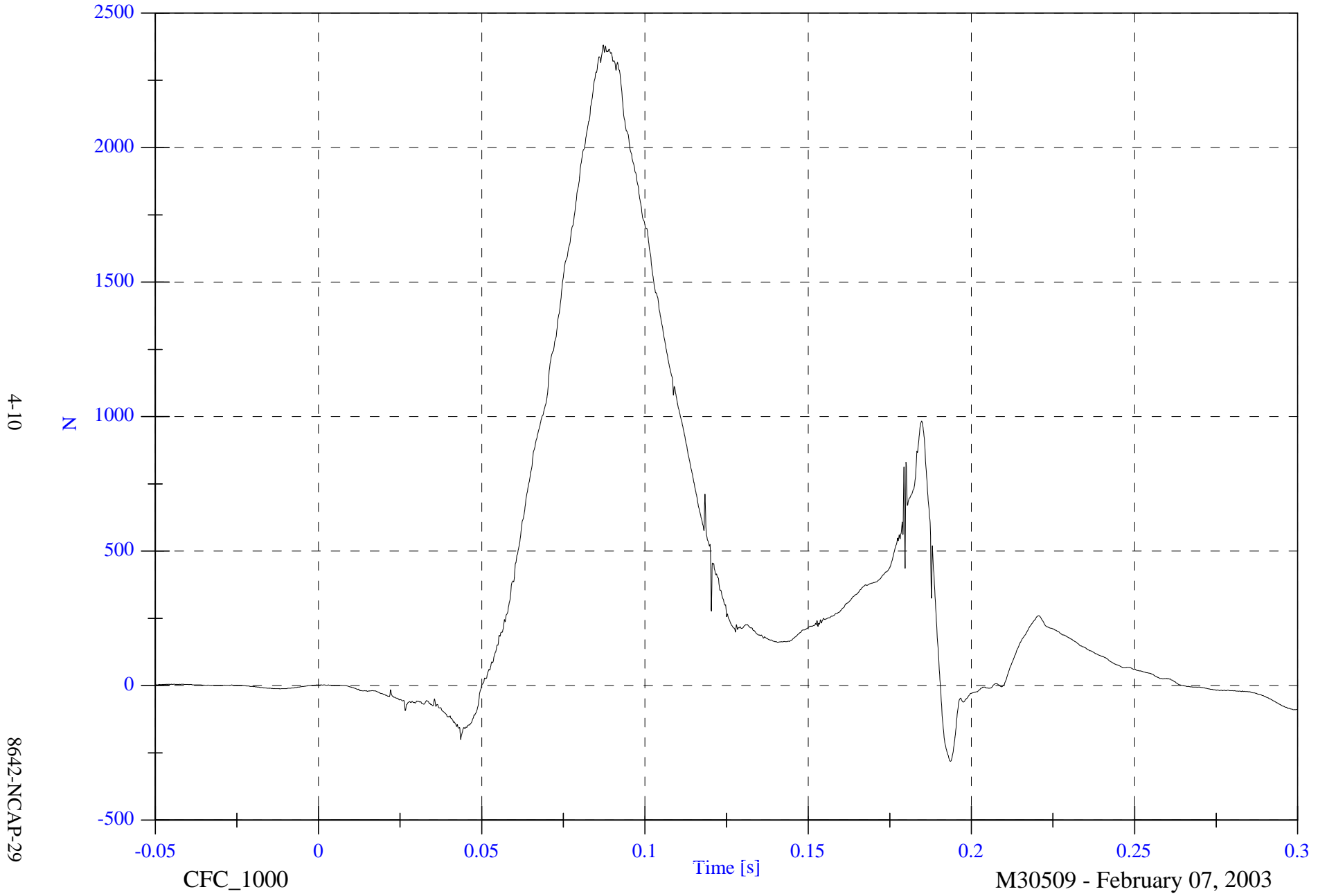
M30509 - February 07, 2003

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Max: 2381.6 [N] at 0.087 [s]

V1P3 Upper Neck Fz

Min: -281.3 [N] at 0.194 [s]



4-10

8642-NCAP-29

CFC_1000

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

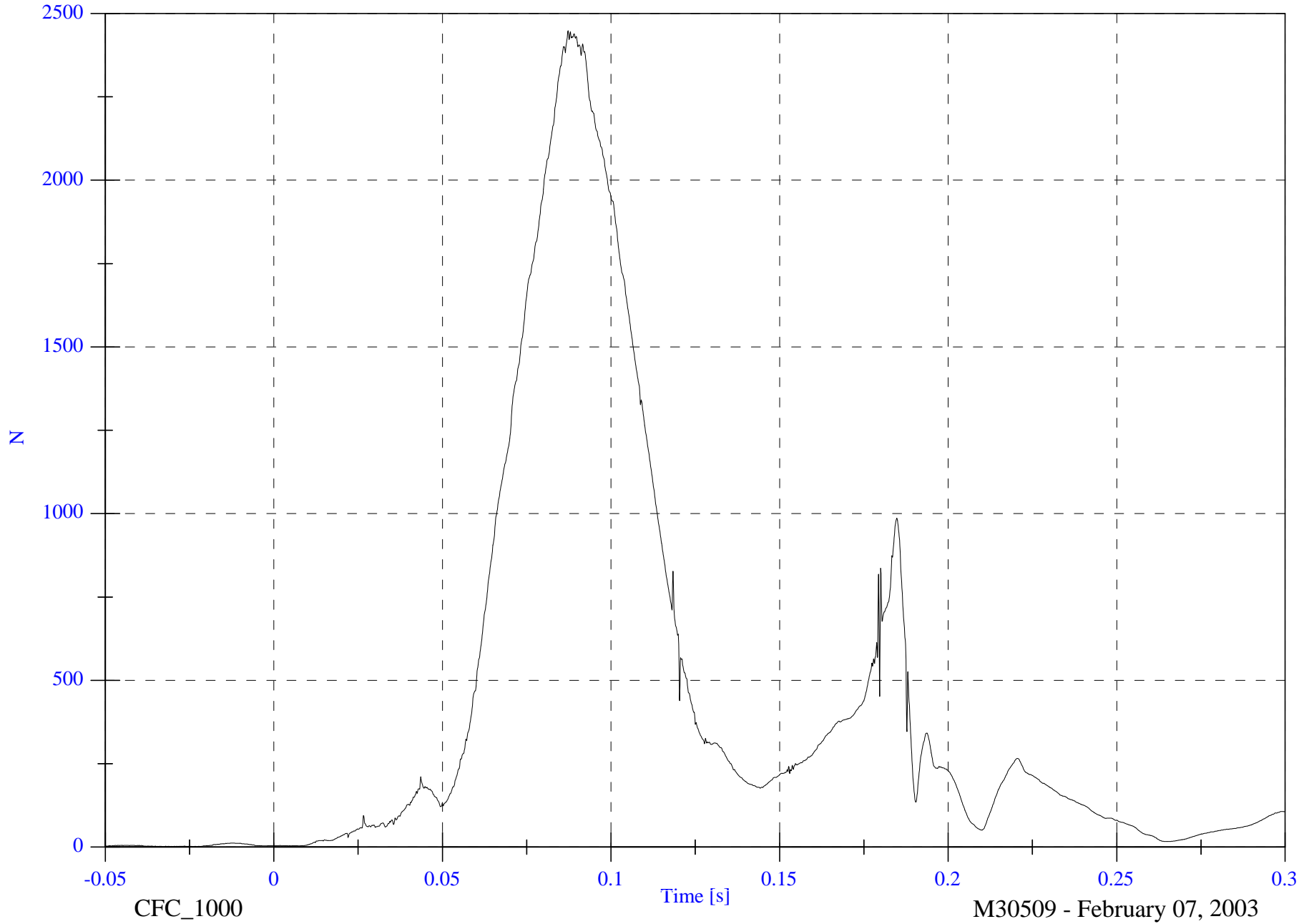
Max: 2448.1 [N] at 0.087 [s]

V1P3 Upper Neck F Resultant

Min: 1.6 [N] at -0.033 [s]

4-11

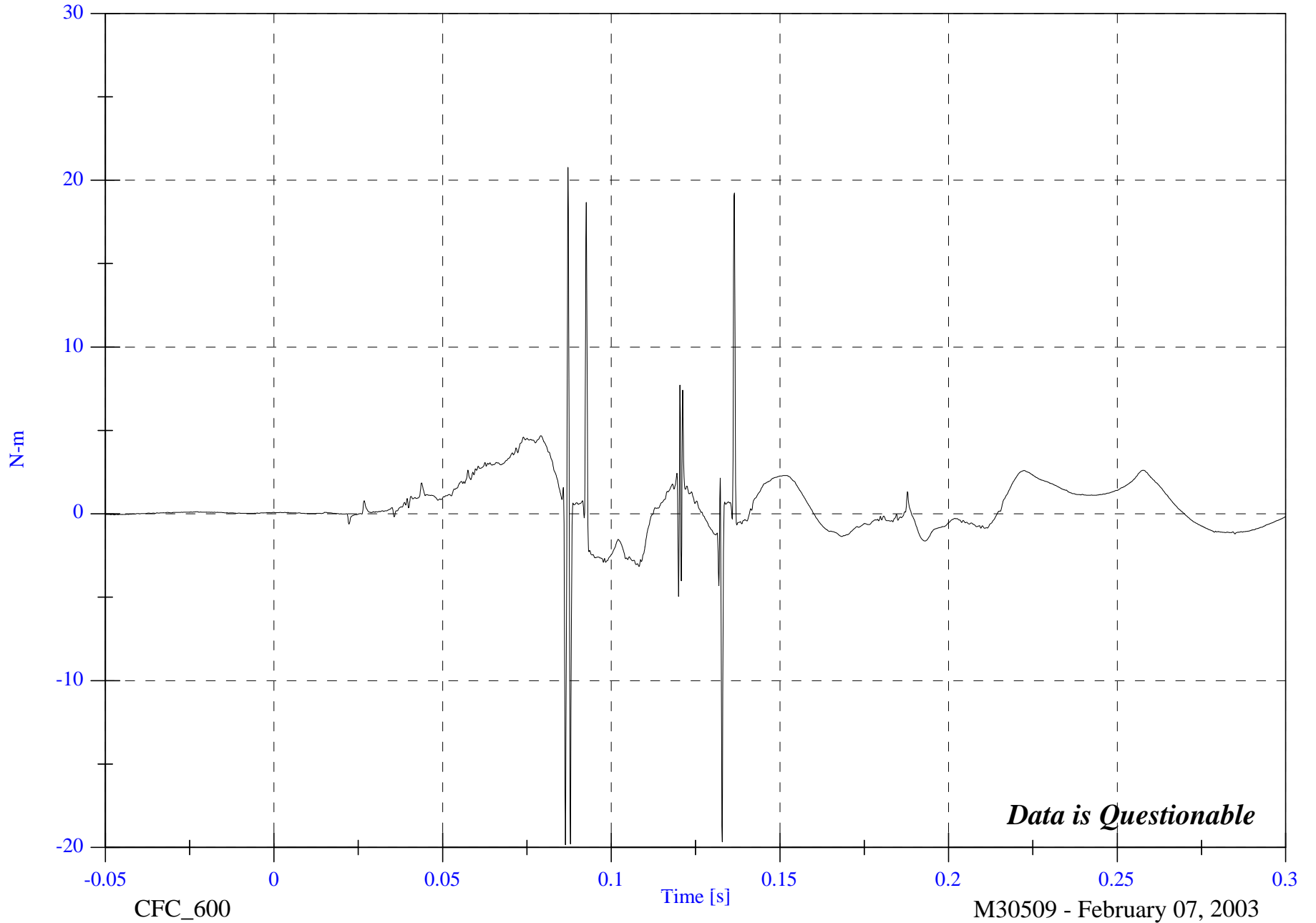
8642-NCAP-29



CFC_1000

M30509 - February 07, 2003

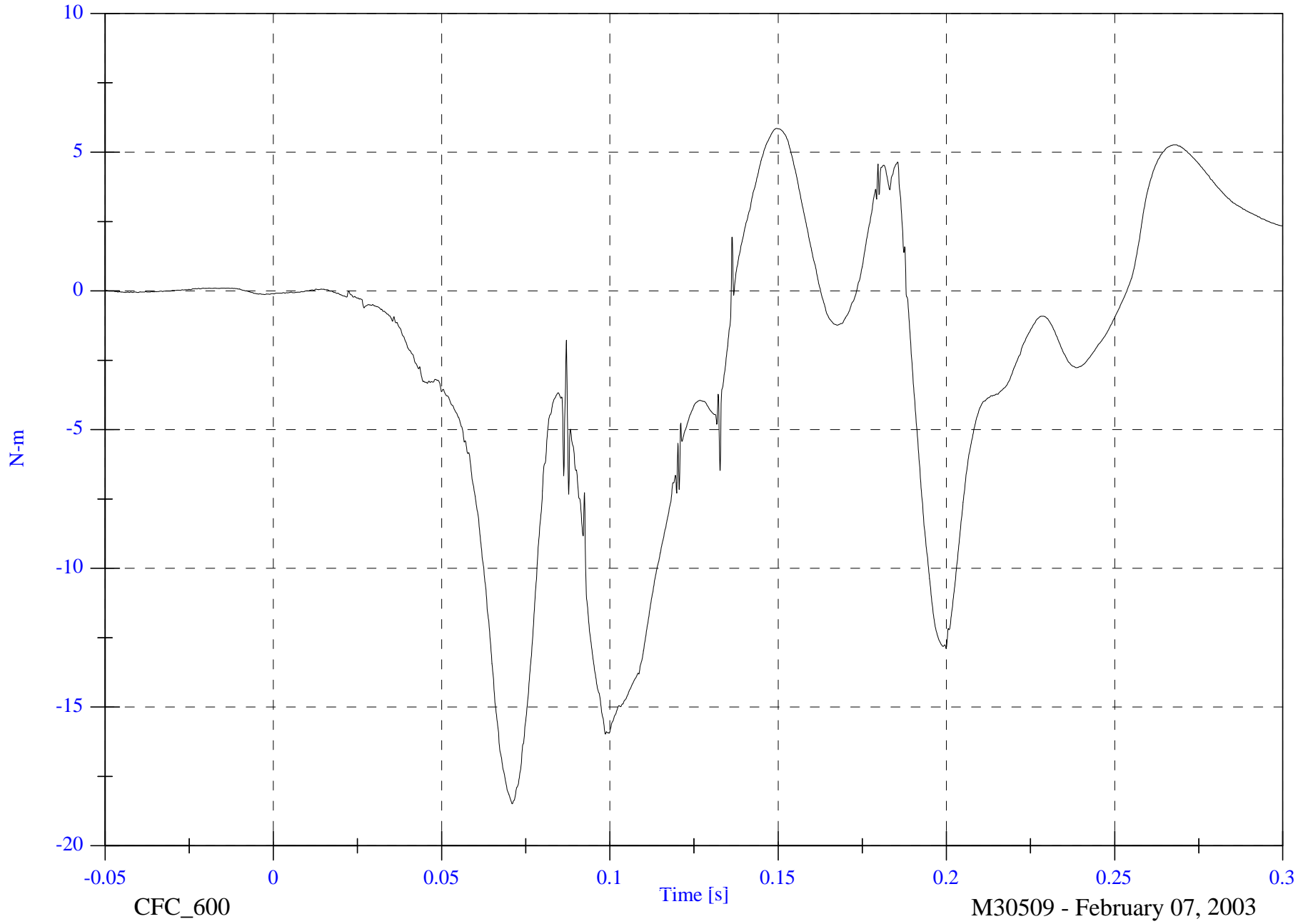
V1P3 Upper Neck Mx



NCAP Test #7 - 2003 Mercedes E320

V1P3 Upper Neck My

Max: 5.9 [N-m] at 0.150 [s]
Min: -18.5 [N-m] at 0.071 [s]



4-13

8642-NCAP-29

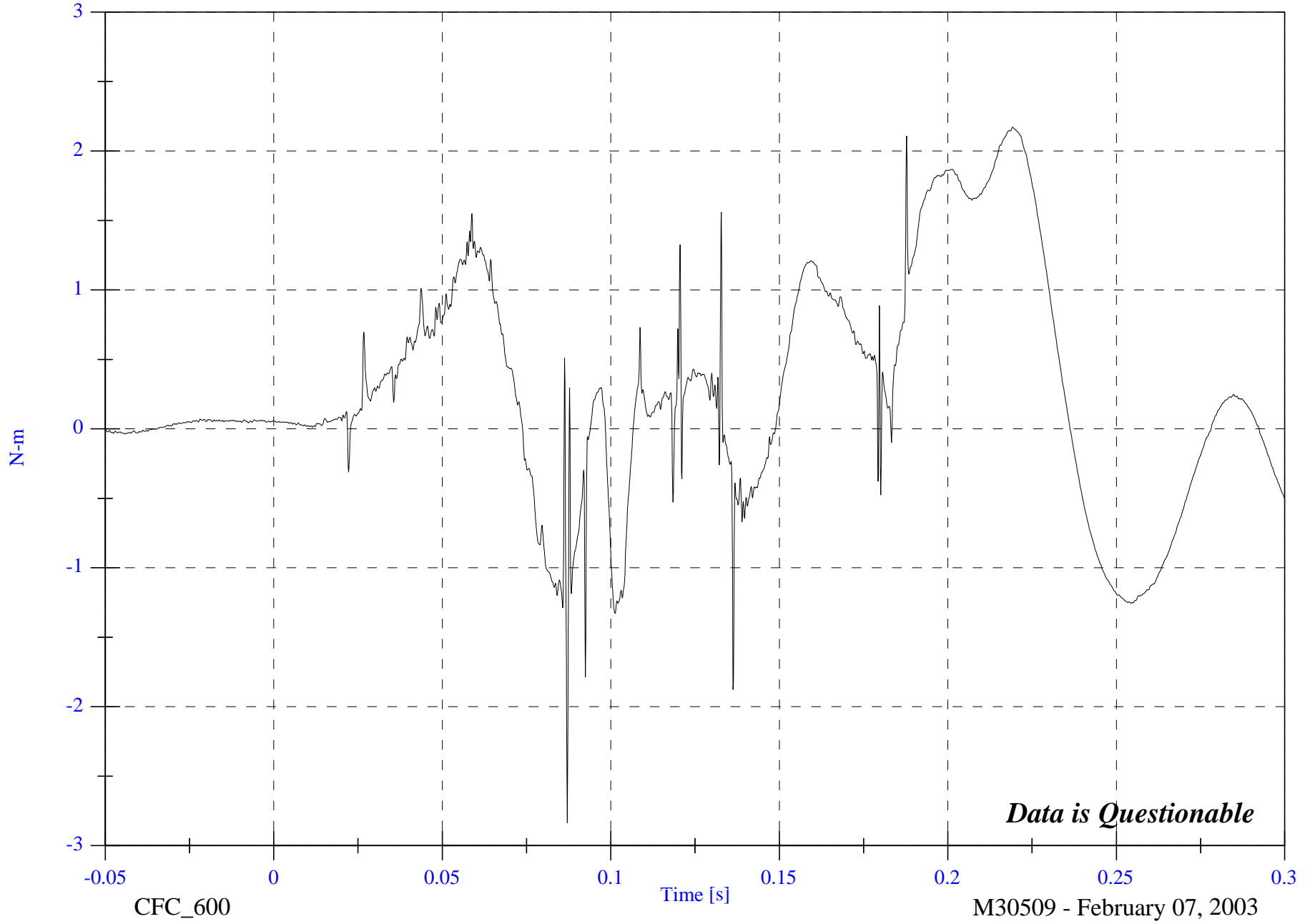
CFC_600

Time [s]

M30509 - February 07, 2003

4-14

8642-NCAP-29



Data is Questionable

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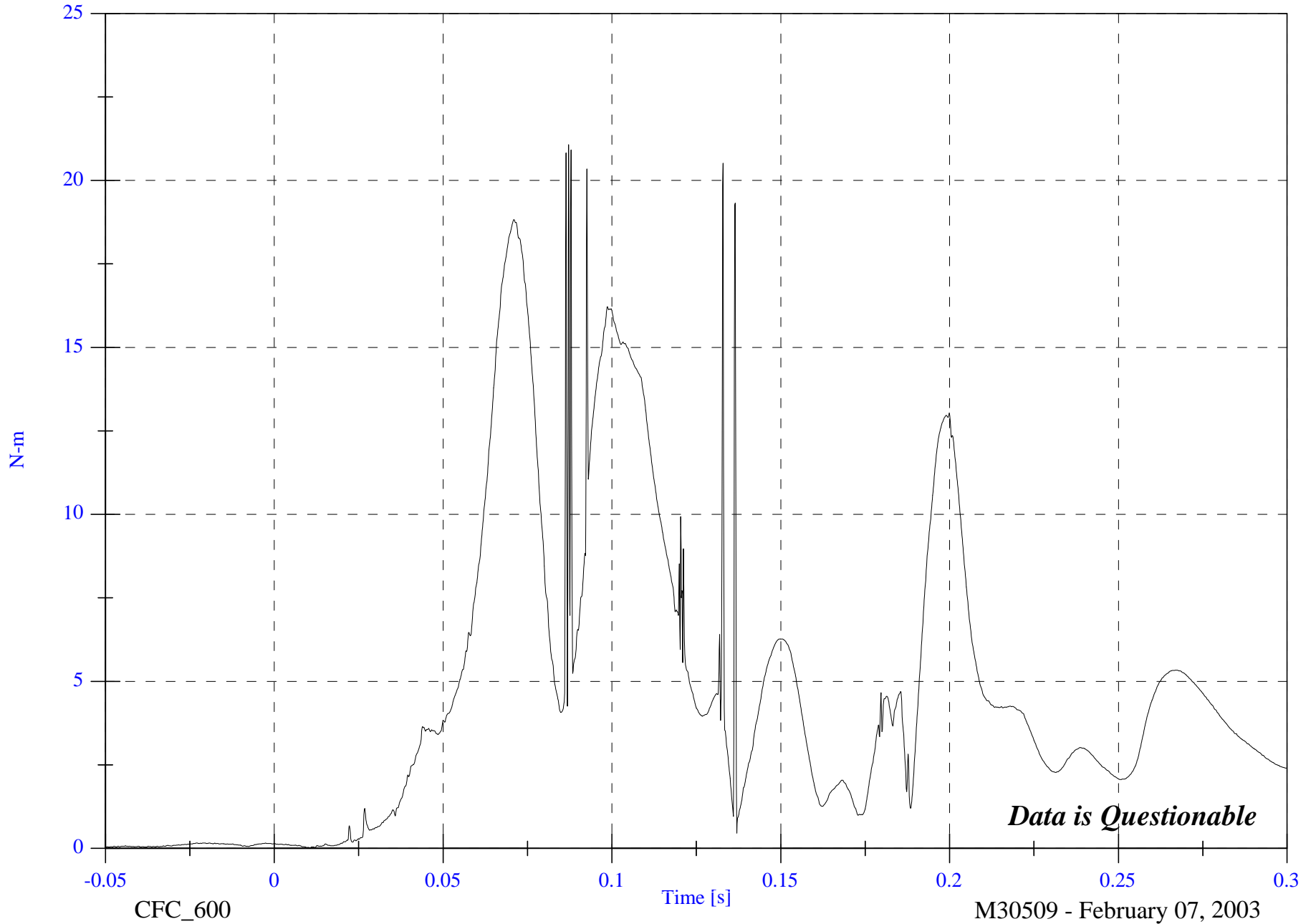
V1P3 Upper Neck M Resultant

Max: 21.1 [N-m] at 0.087 [s]

Min: 0.0 [N-m] at 0.011 [s]

4-15

8642-NCAP-29



Data is Questionable

M30509 - February 07, 2003

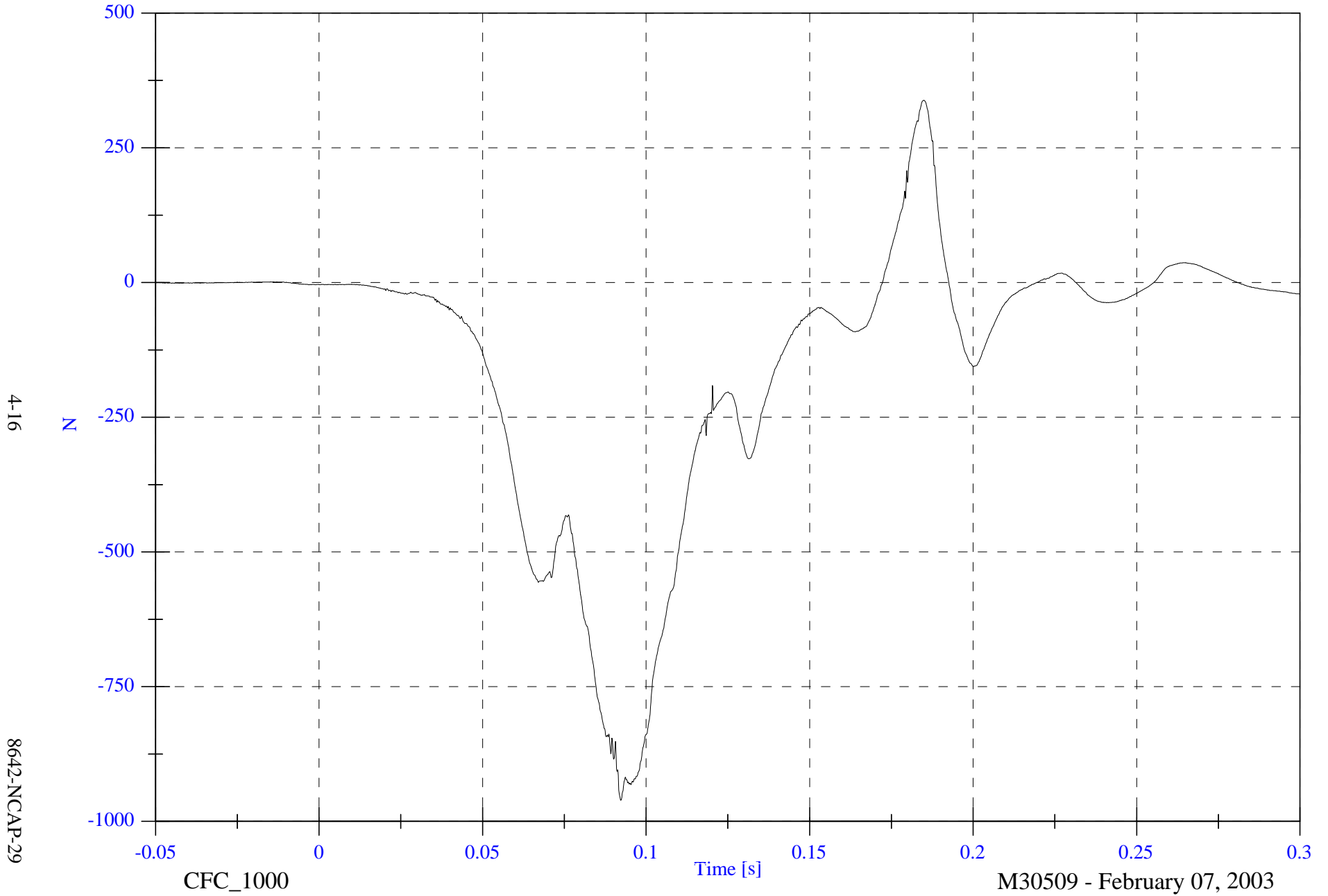
CFC_600

NCAP Test #7 - 2003 Mercedes E320

V1P3 Lower Neck Fx

Max: 338.3 [N] at 0.185 [s]

Min: -960.8 [N] at 0.092 [s]



4-16

8642-NCAP-29

CFC_1000

Time [s]

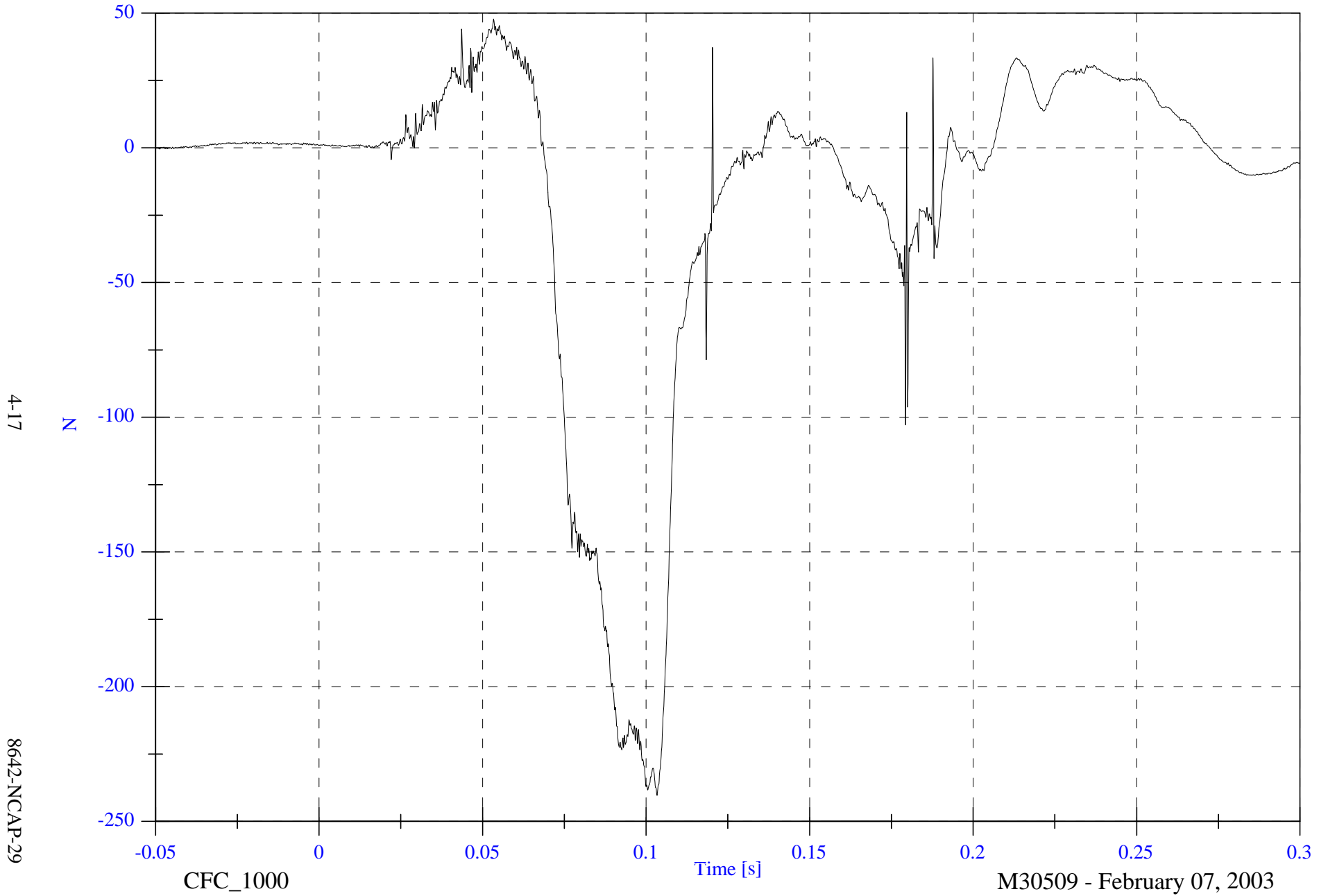
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P3 Lower Neck Fy

Max: 47.7 [N] at 0.053 [s]

Min: -240.4 [N] at 0.103 [s]

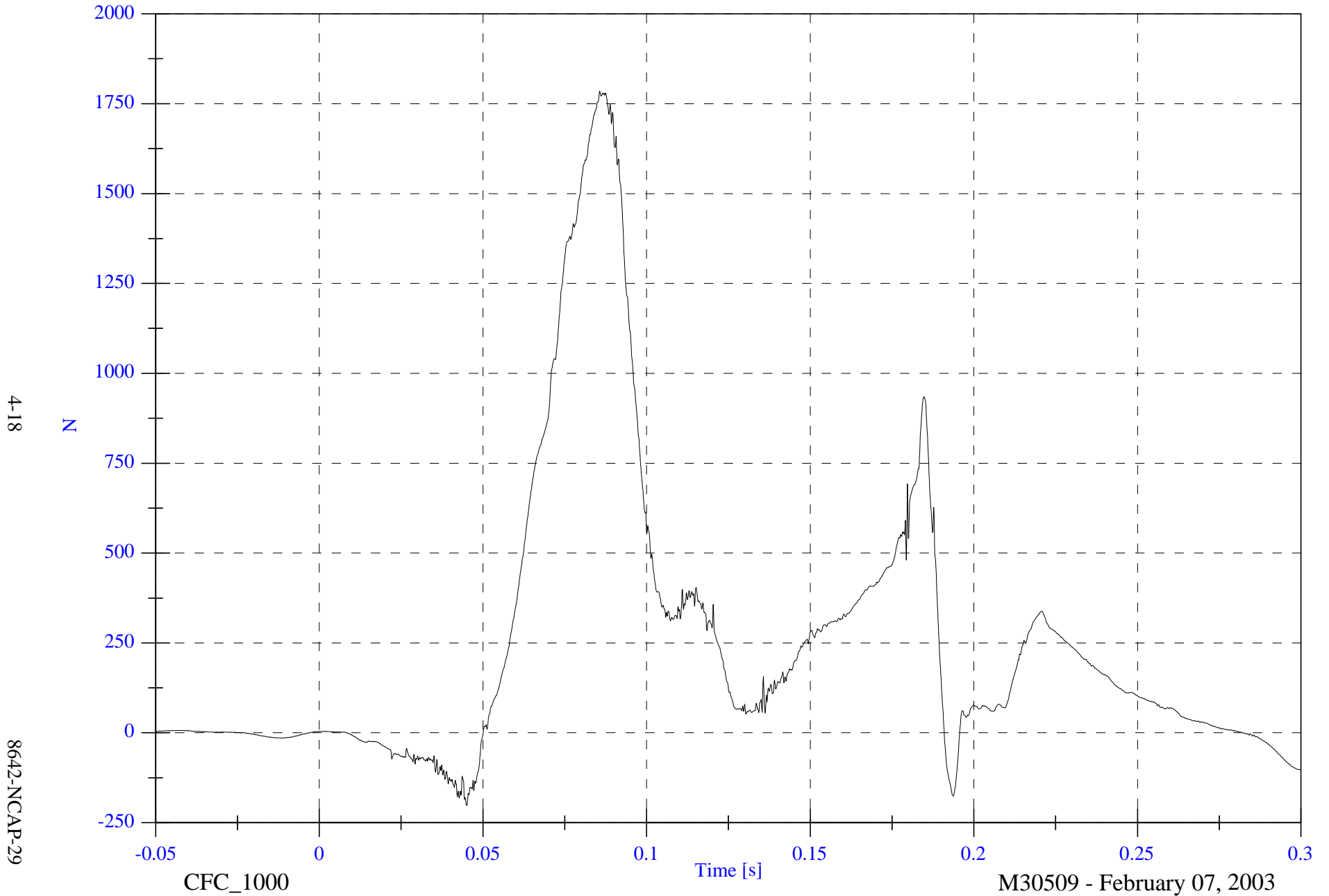


NCAP Test #7 - 2003 Mercedes E320

Max: 1784.9 [N] at 0.086 [s]

V1P3 Lower Neck Fz

Min: -202.2 [N] at 0.045 [s]



4-18

8642-NCAP-29

CFC_1000

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

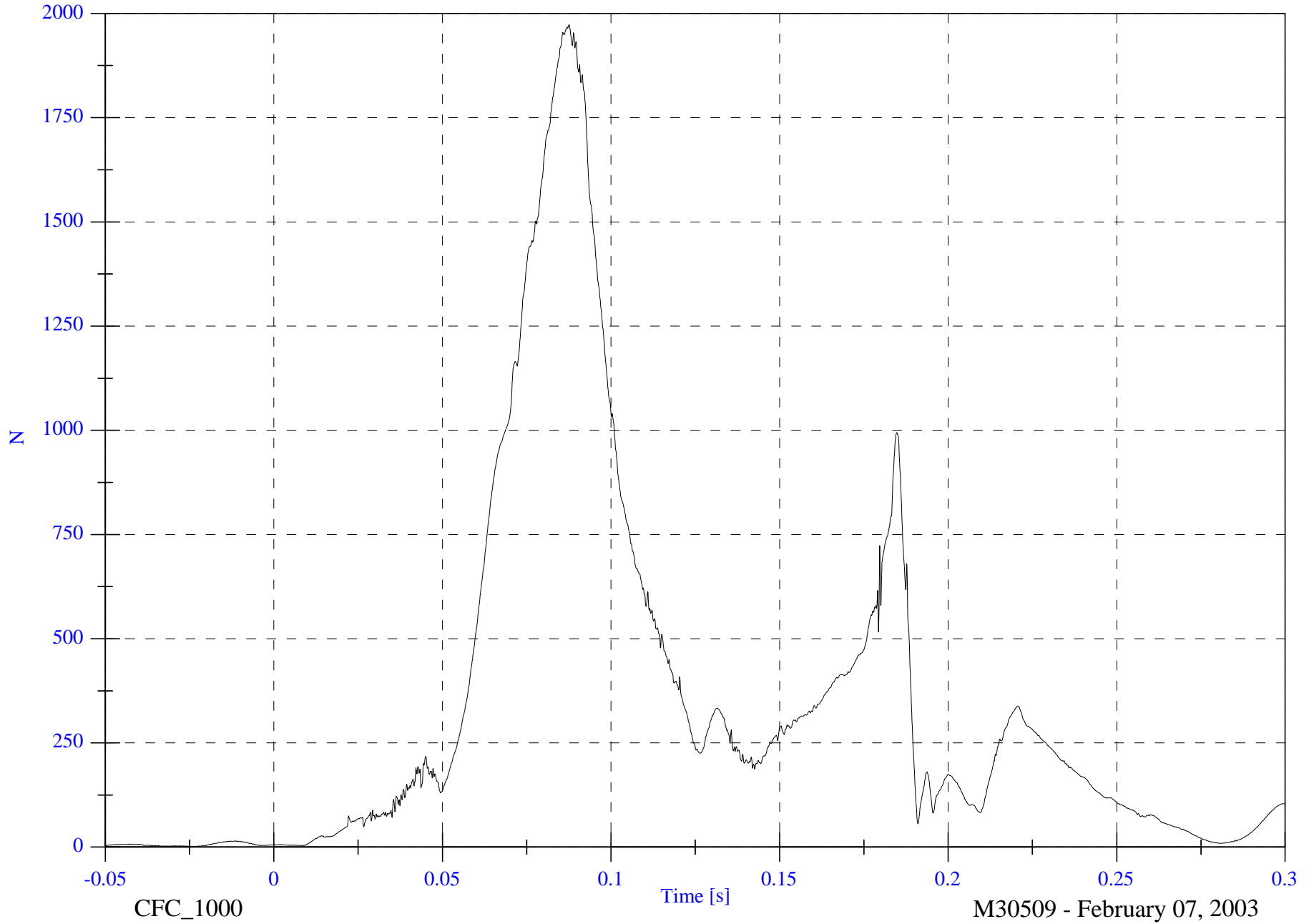
Max: 1972.8 [N] at 0.088 [s]

V1P3 Lower Neck F Resultant

Min: 1.5 [N] at -0.022 [s]

4-19

8642-NCAP-29



CFC_1000

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

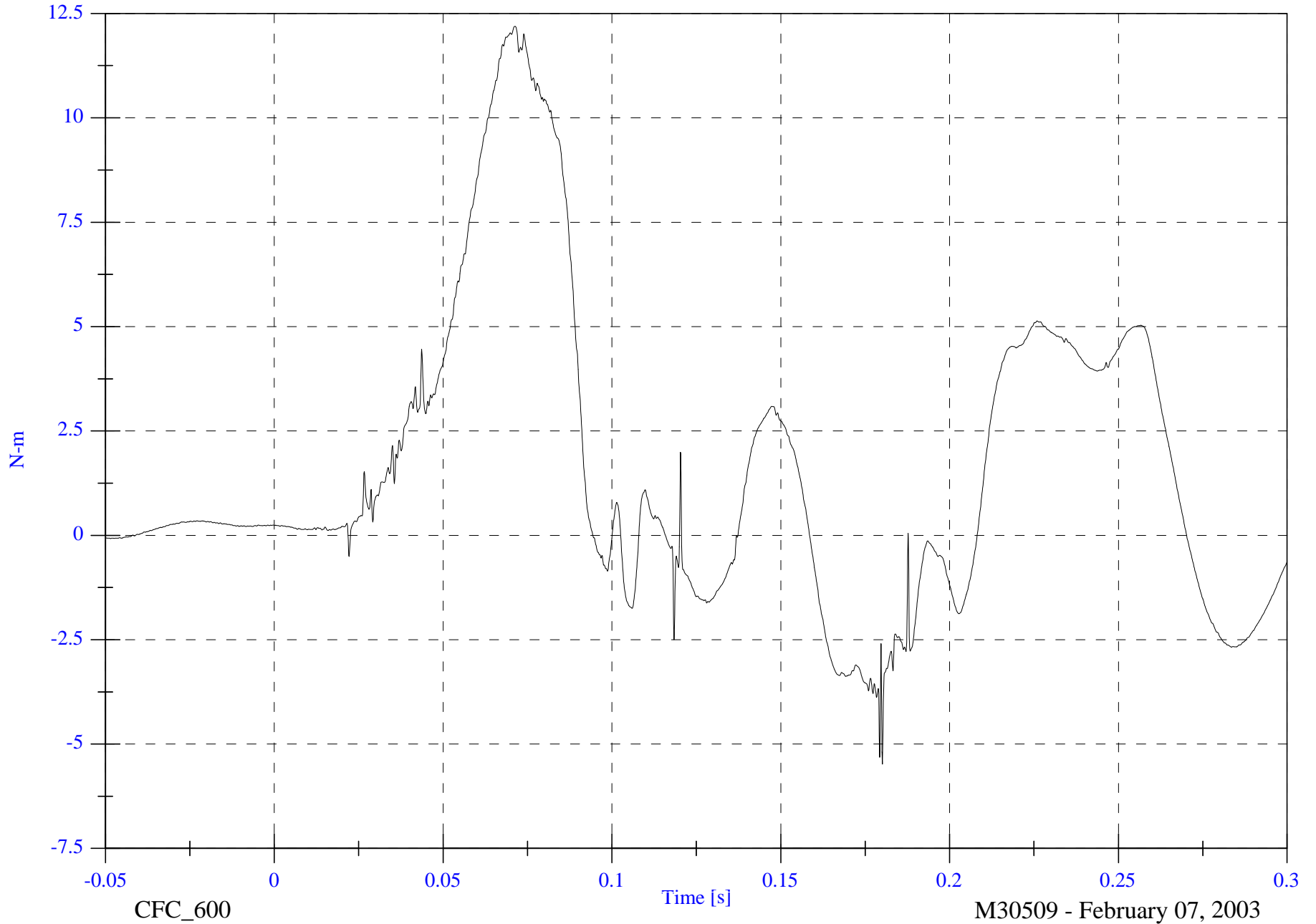
V1P3 Lower Neck Mx

Max: 12.2 [N-m] at 0.071 [s]

Min: -5.5 [N-m] at 0.180 [s]

4-20

8642-NCAP-29

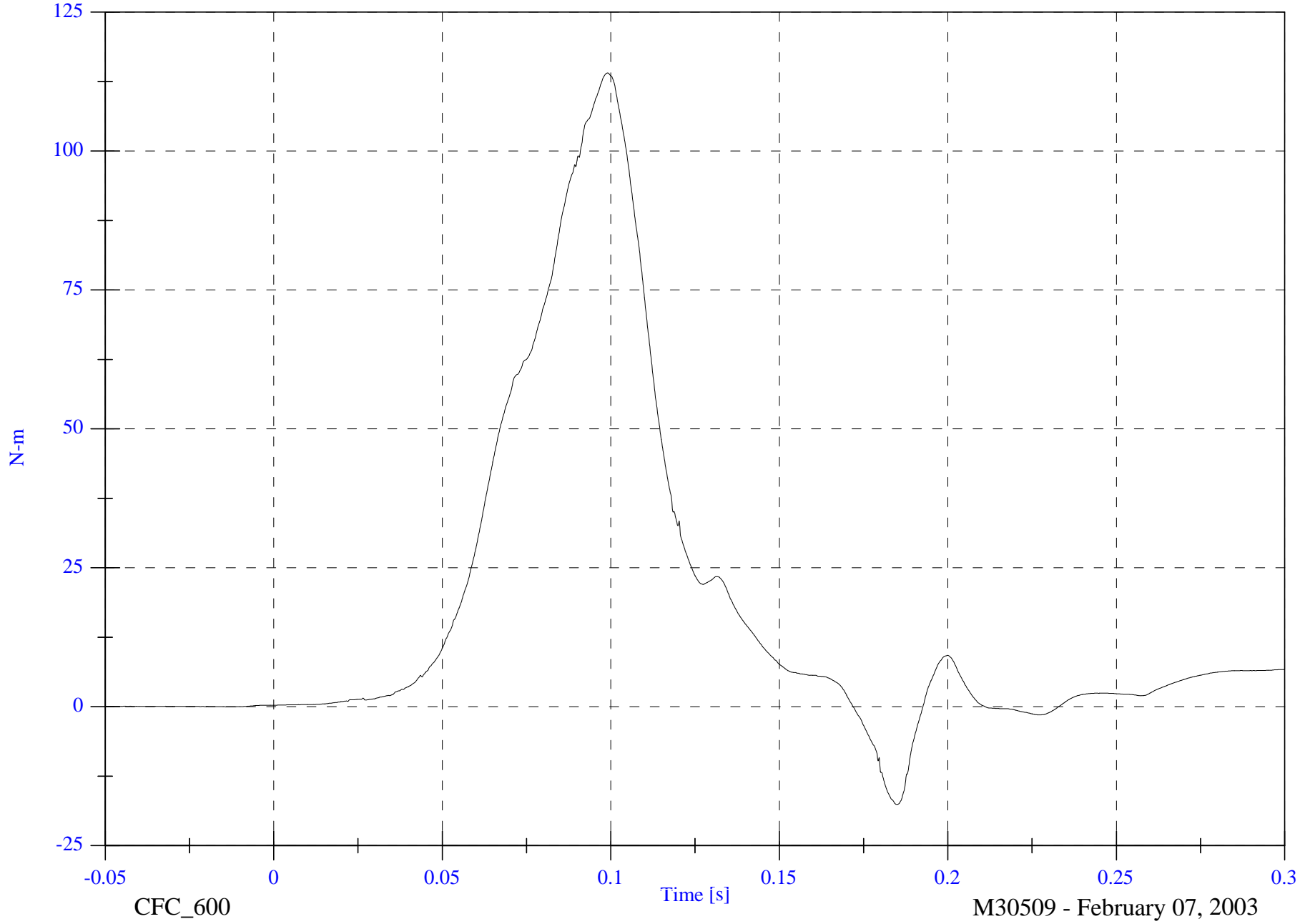


CFC_600

Time [s]

M30509 - February 07, 2003

V1P3 Lower Neck My



NCAP Test #7 - 2003 Mercedes E320

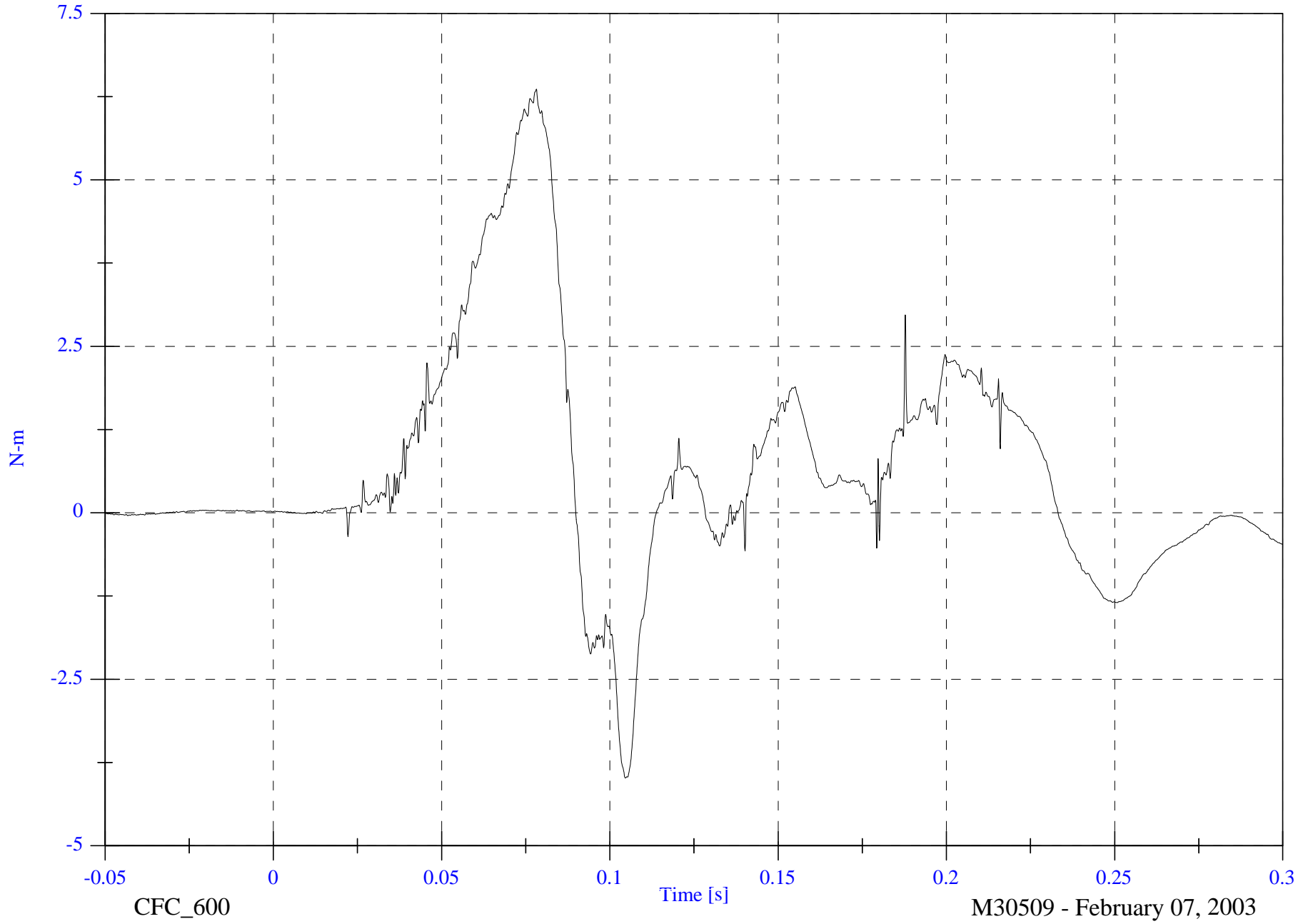
V1P3 Lower Neck Mz

Max: 6.4 [N-m] at 0.078 [s]

Min: -4.0 [N-m] at 0.105 [s]

4-22

8642-NCAP-29



CFC_600

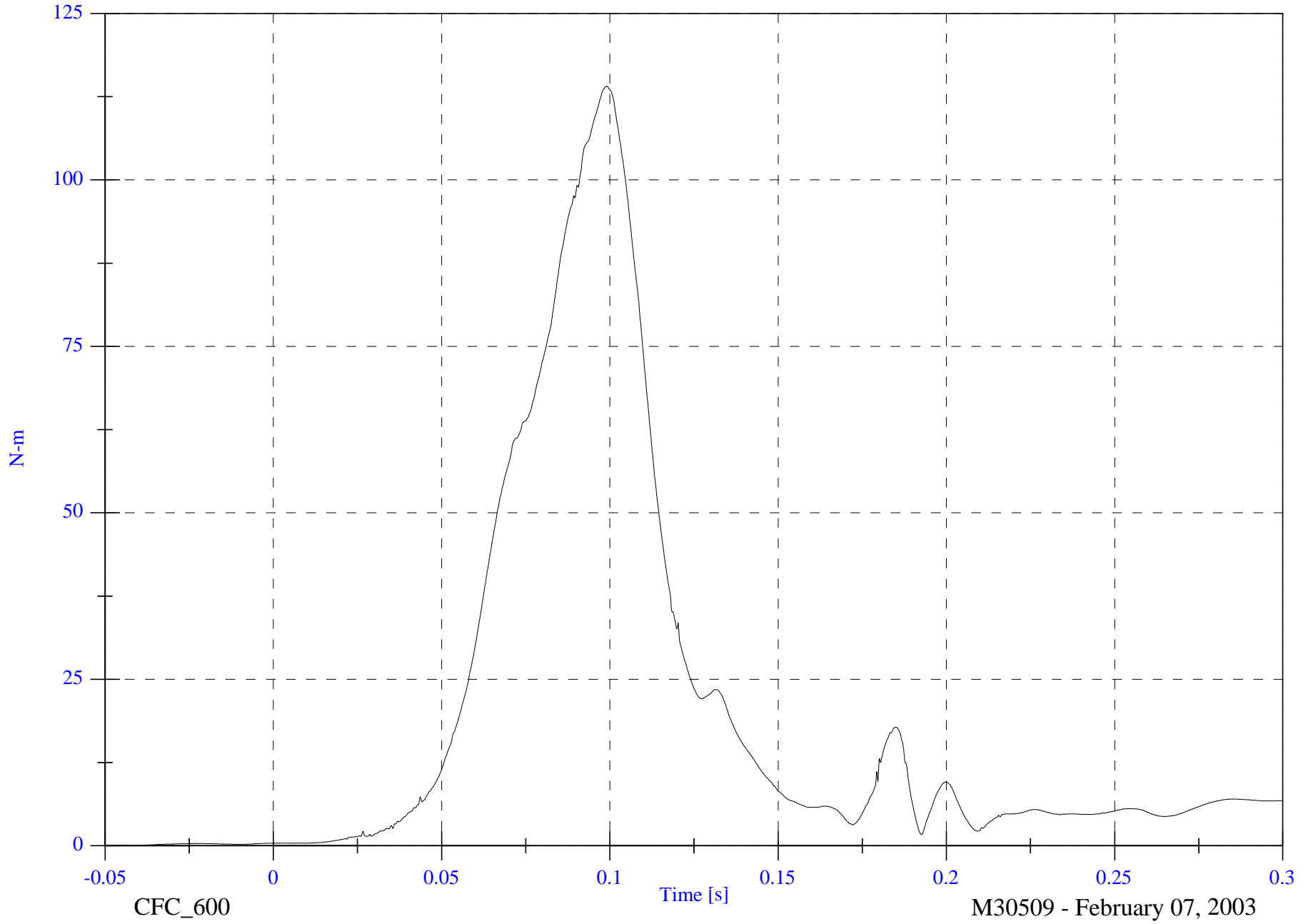
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P3 Lower Neck M Resultant

Max: 114.1 [N-m] at 0.099 [s]

Min: 0.1 [N-m] at -0.041 [s]



4-23

8642-NCAP-29

CFC_600

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

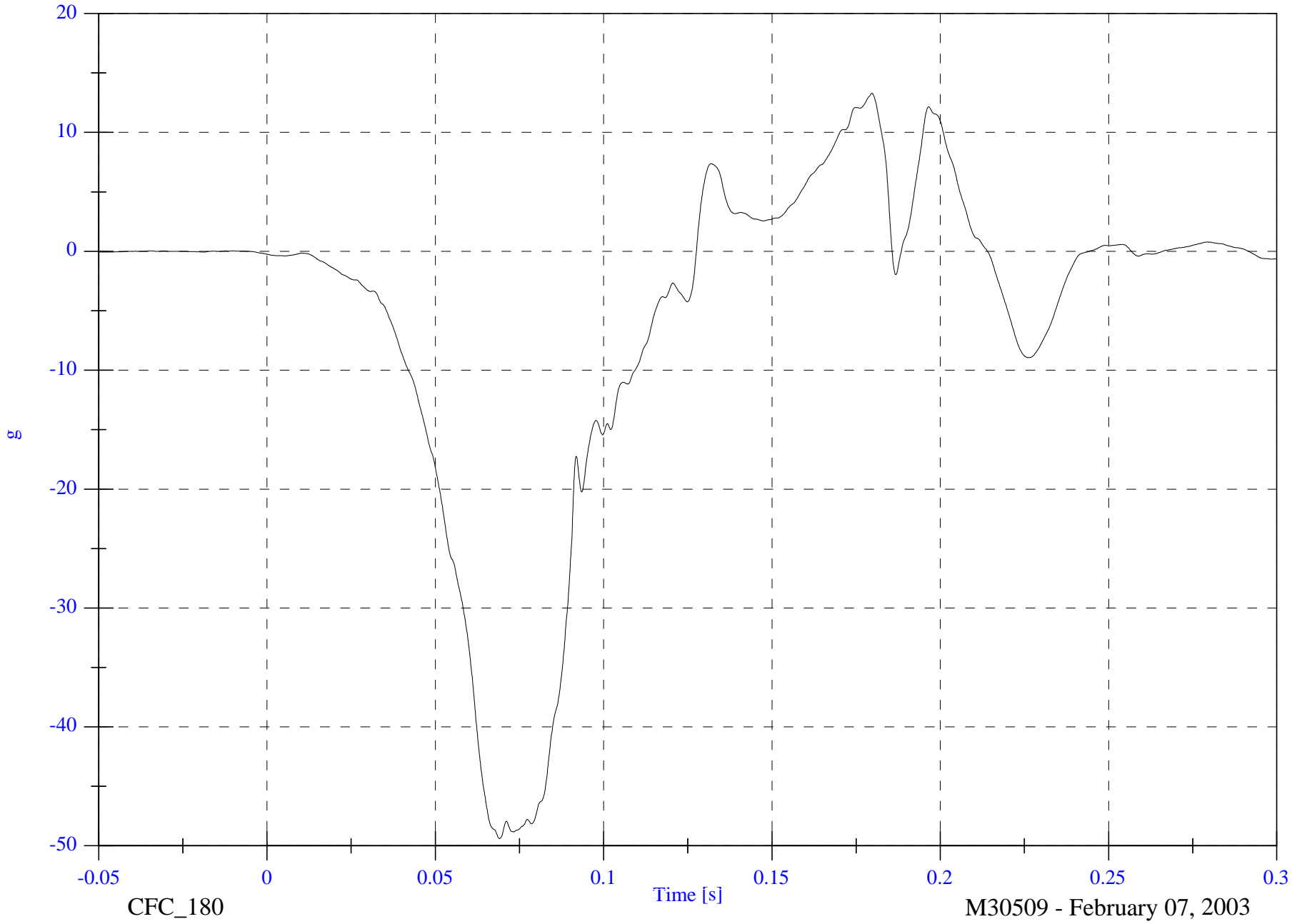
VIP3 Chest x

Max: 13.3 [g] at 0.180 [s]

Min: -49.4 [g] at 0.069 [s]

4-24

8642-NCAP-29

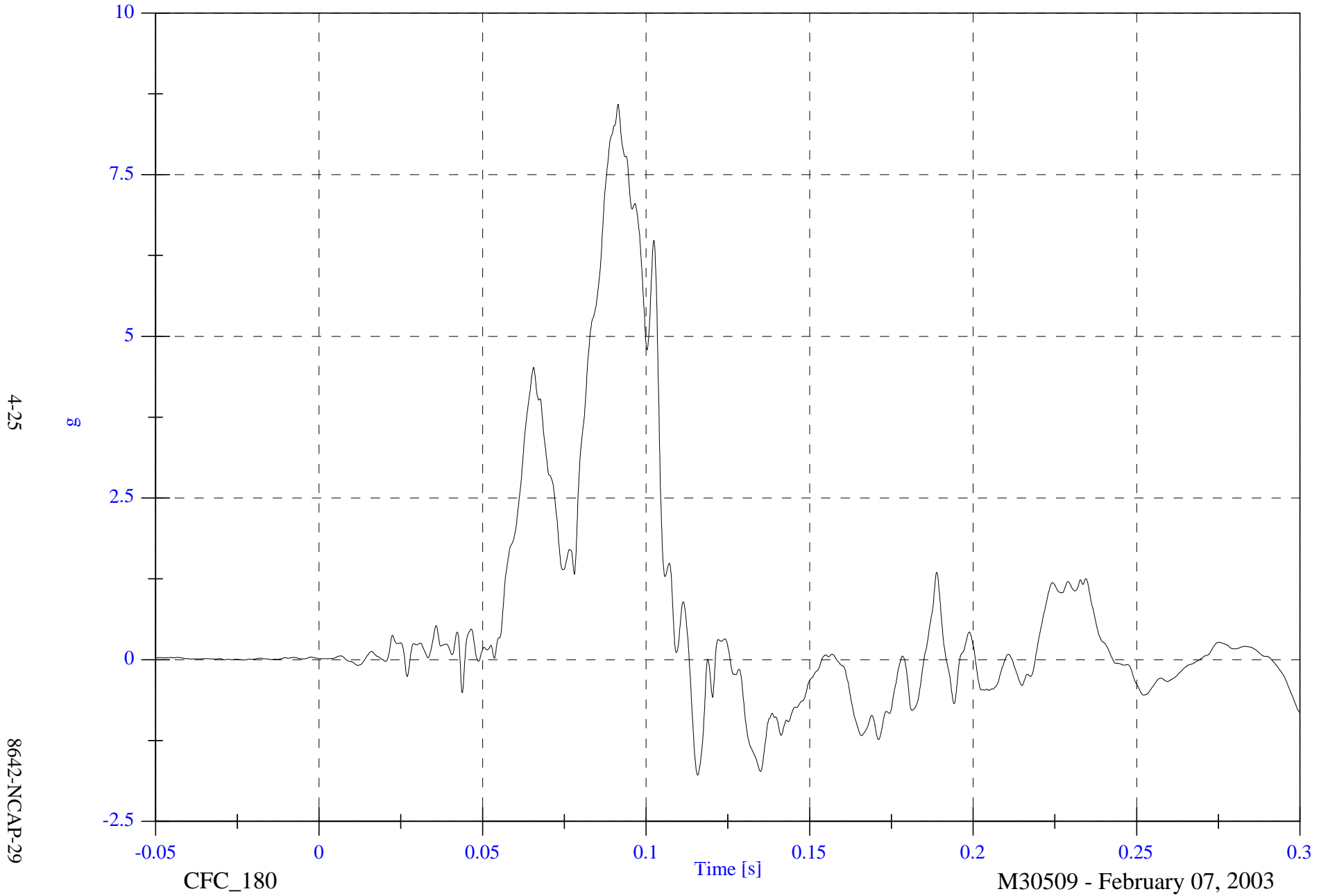


NCAP Test #7 - 2003 Mercedes E320

VIP3 Chest y

Max: 8.6 [g] at 0.091 [s]

Min: -1.8 [g] at 0.116 [s]

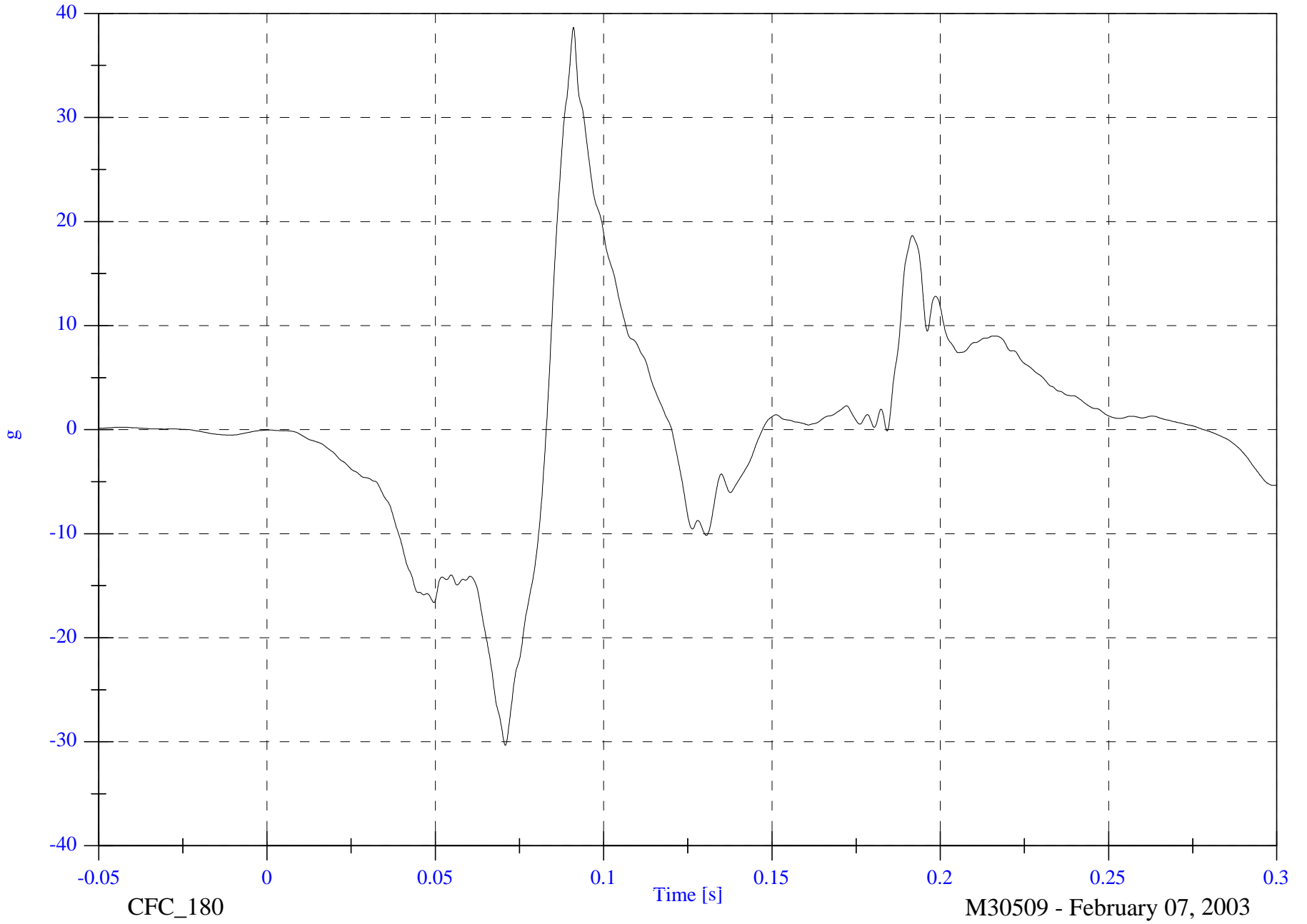


NCAP Test #7 - 2003 Mercedes E320

VIP3 Chest z

Max: 38.7 [g] at 0.091 [s]

Min: -30.4 [g] at 0.071 [s]



4-26

8642-NCAP-29

CFC_180

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

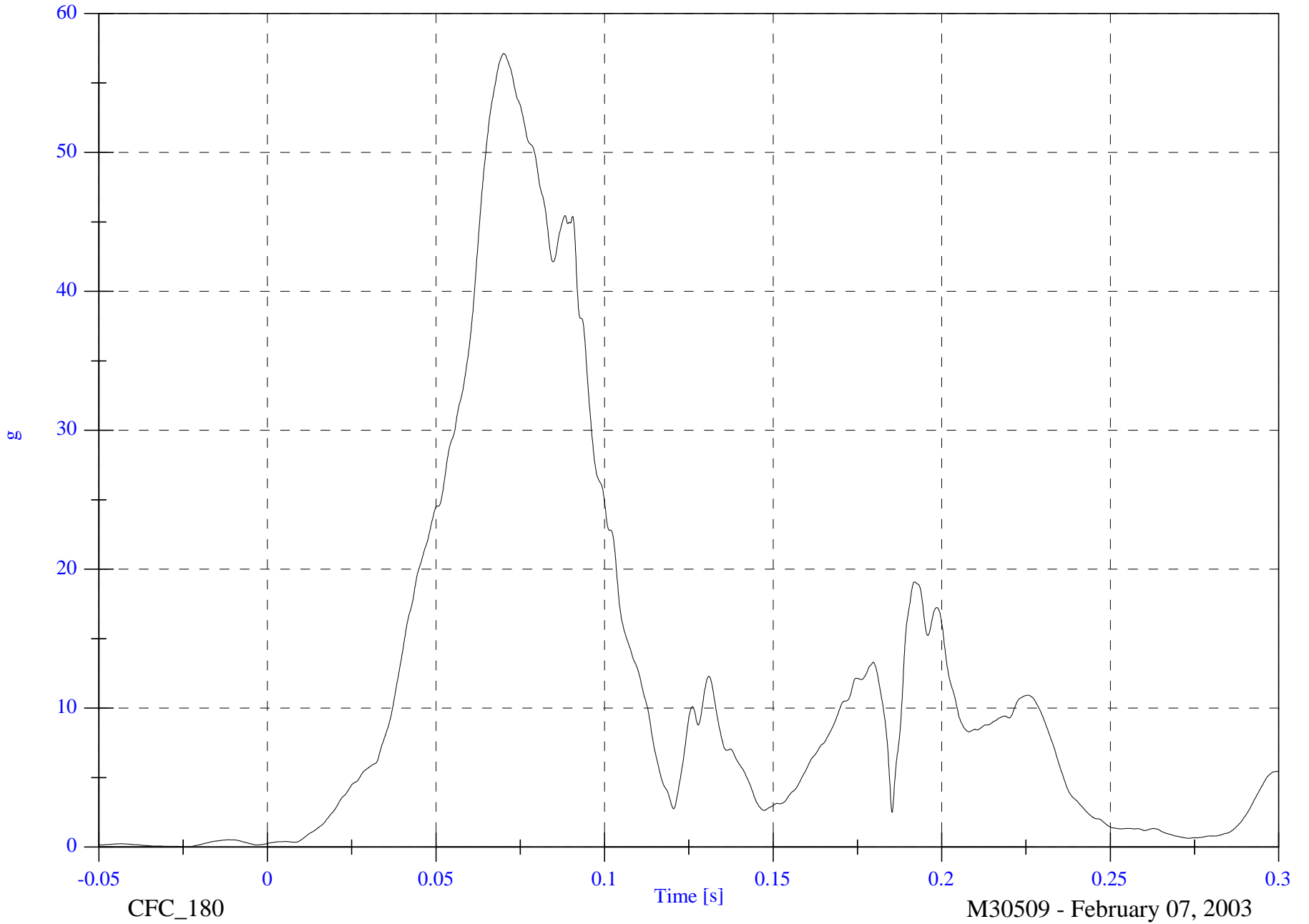
V1P3 Chest Resultant

Max: 57.1 [g] at 0.070 [s]

Min: 0.0 [g] at -0.024 [s]

4-27

8642-NCAP-29



CFC_180

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

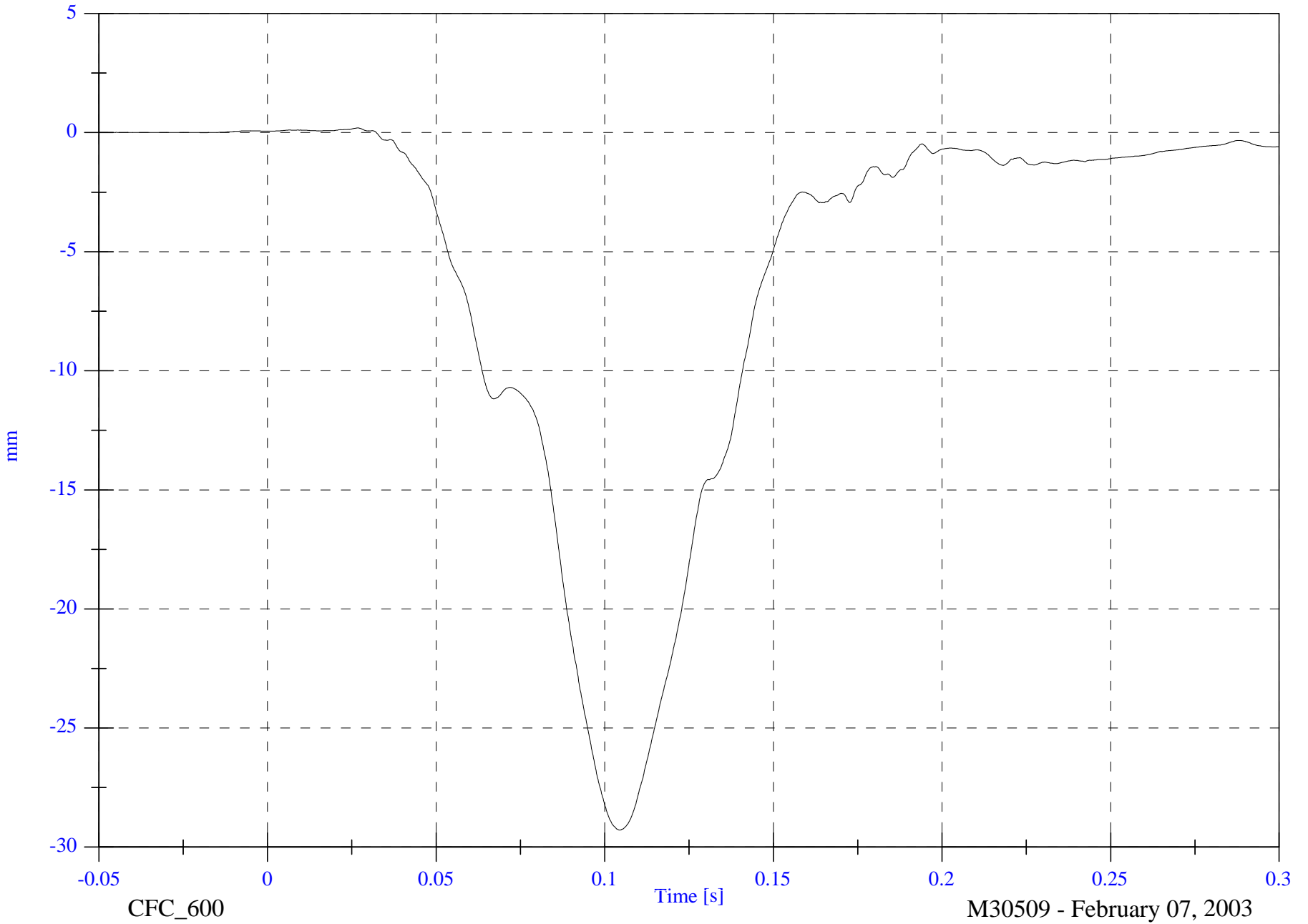
V1P3 Chest Compression

Max: 0.2 [mm] at 0.027 [s]

Min: -29.3 [mm] at 0.104 [s]

4-28

8642-NCAP-29



CFC_600

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

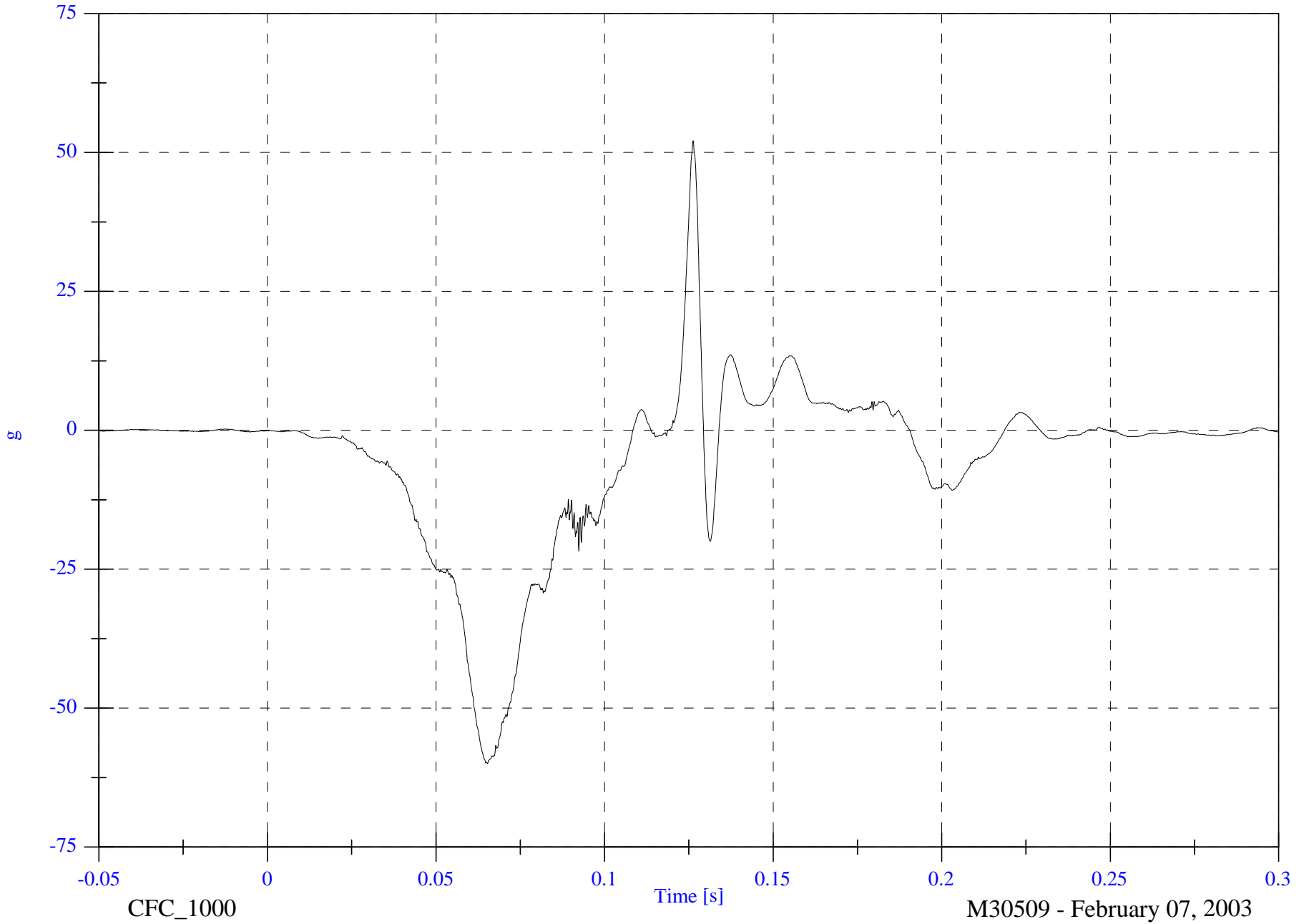
V1P3 Pelvic x

Max: 52.1 [g] at 0.126 [s]

Min: -59.9 [g] at 0.065 [s]

4-29

8642-NCAP-29

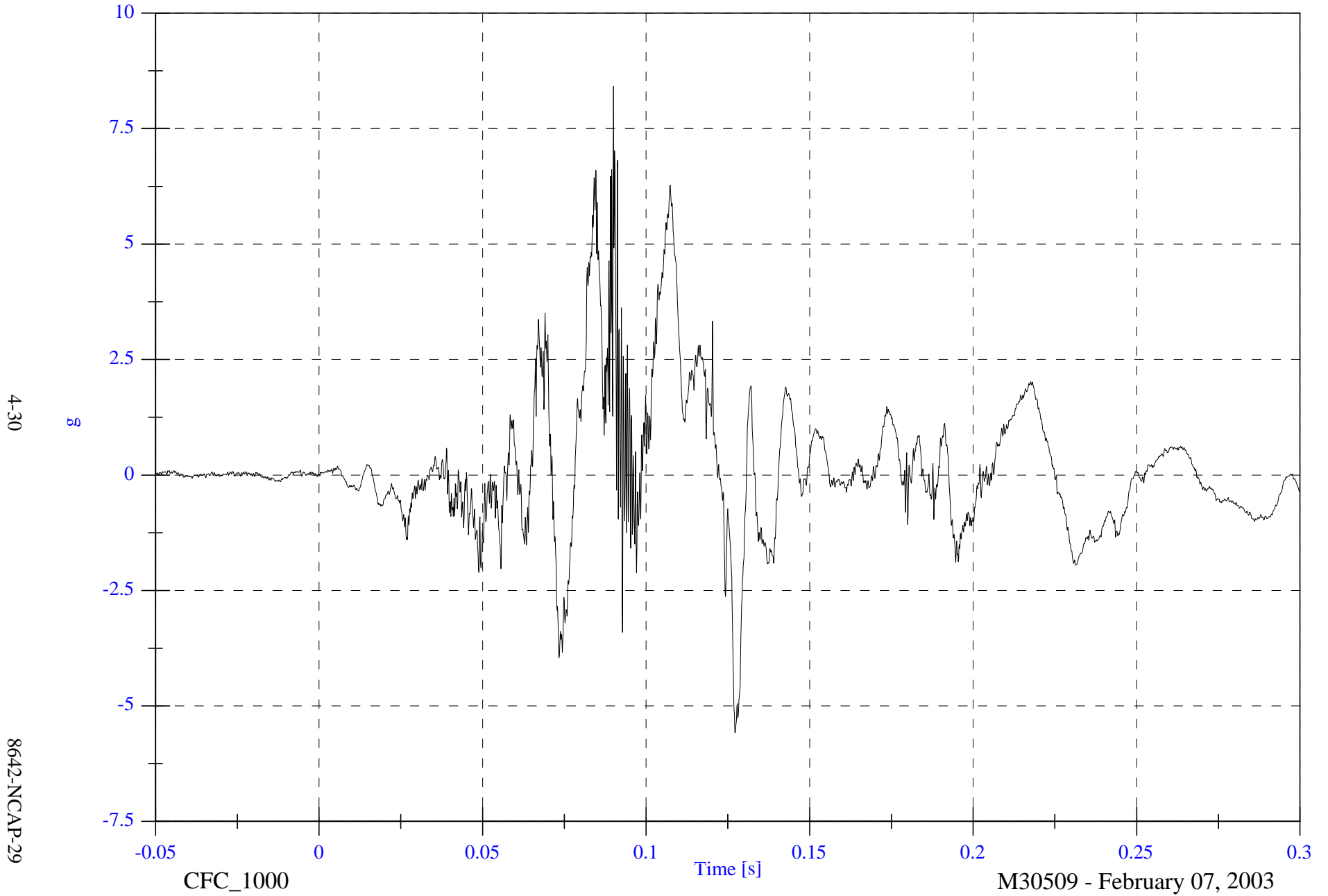


NCAP Test #7 - 2003 Mercedes E320

V1P3 Pelvic y

Max: 8.4 [g] at 0.090 [s]

Min: -5.6 [g] at 0.127 [s]

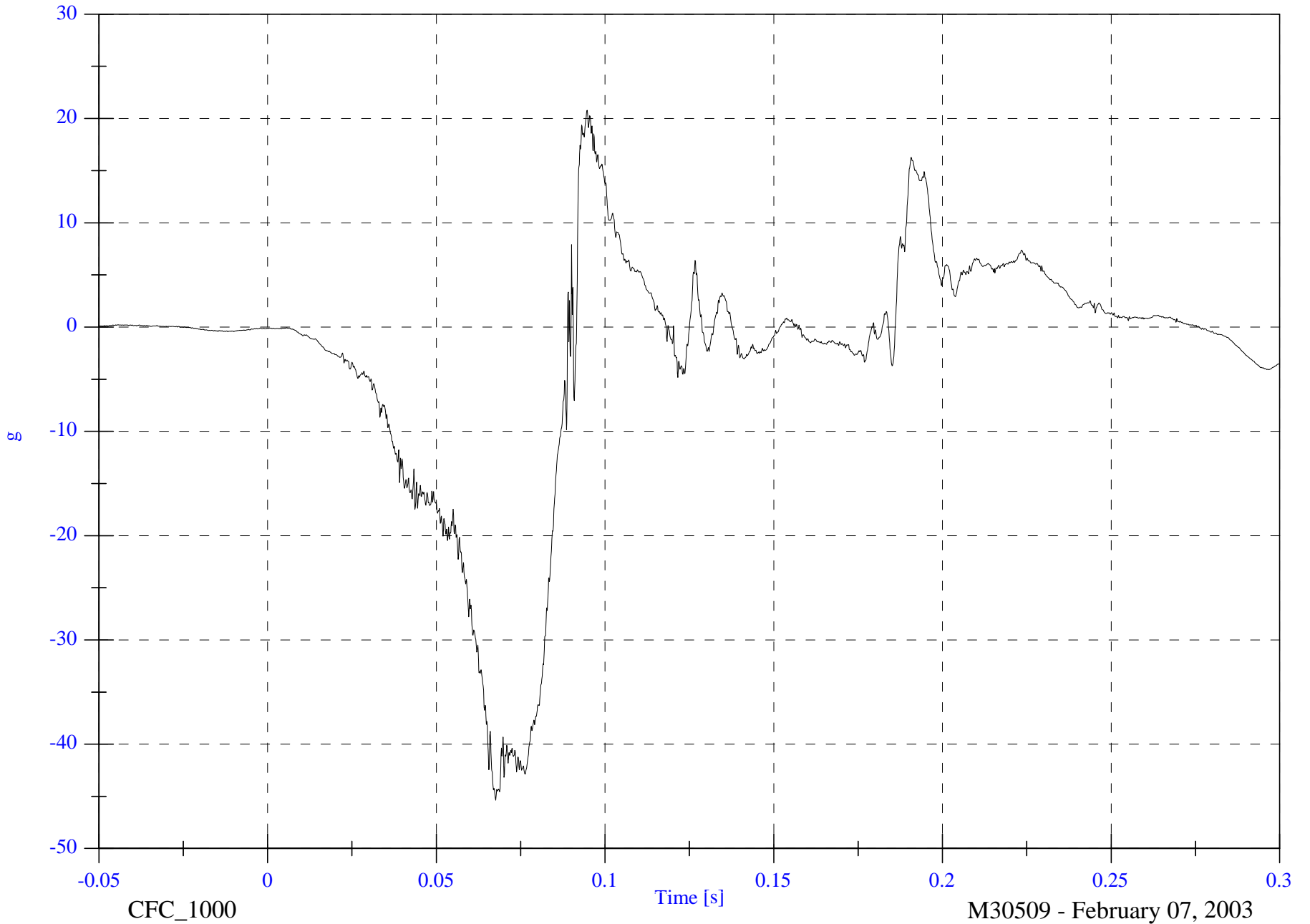


NCAP Test #7 - 2003 Mercedes E320

Max: 20.8 [g] at 0.095 [s]

Min: -45.4 [g] at 0.068 [s]

V1P3 Pelvic z



4-31

8642-NCAP-29

CFC_1000

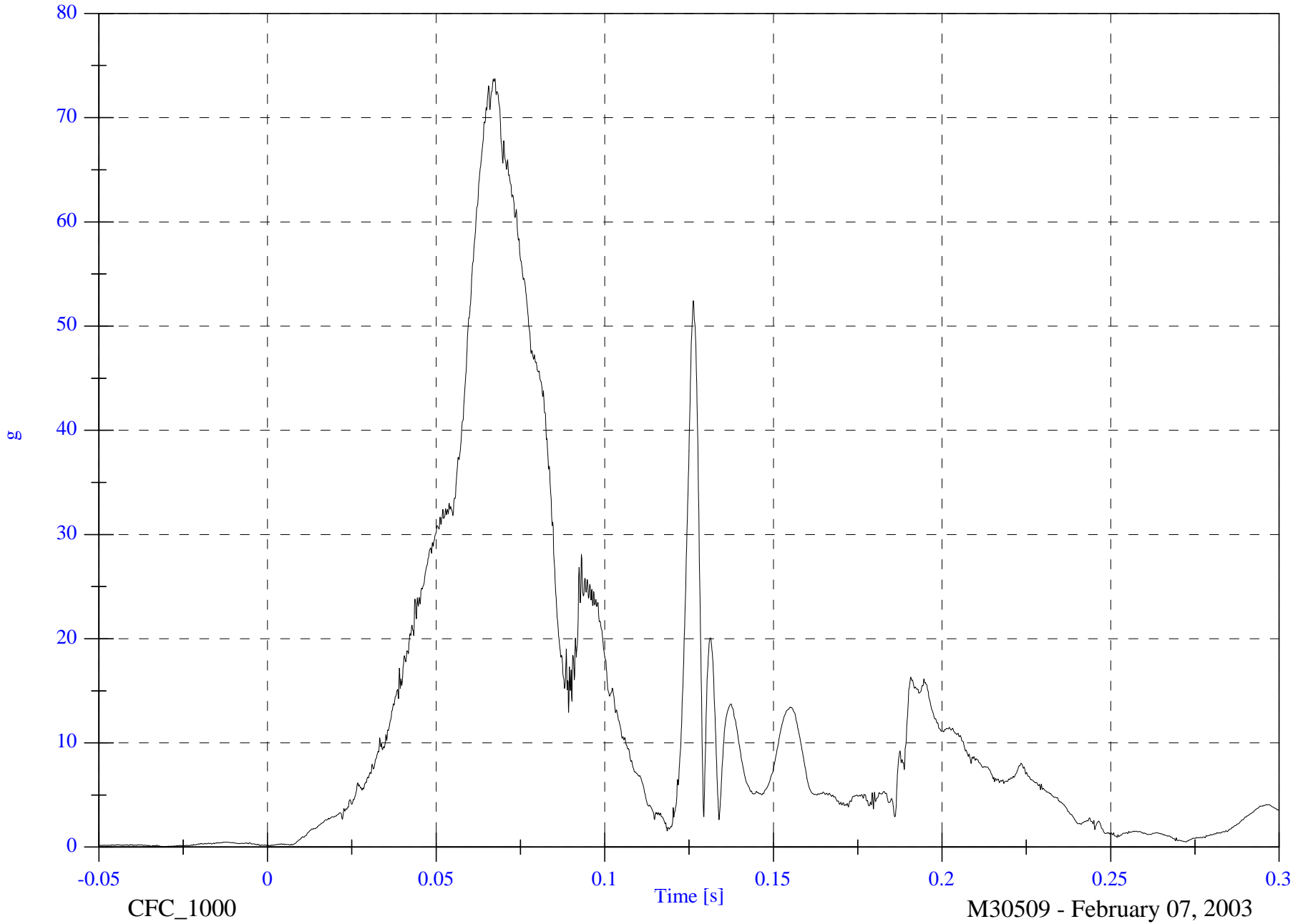
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P3 Pelvic Resultant

Max: 73.7 [g] at 0.067 [s]

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



4-32

8642-NCAP-29

CFC_1000

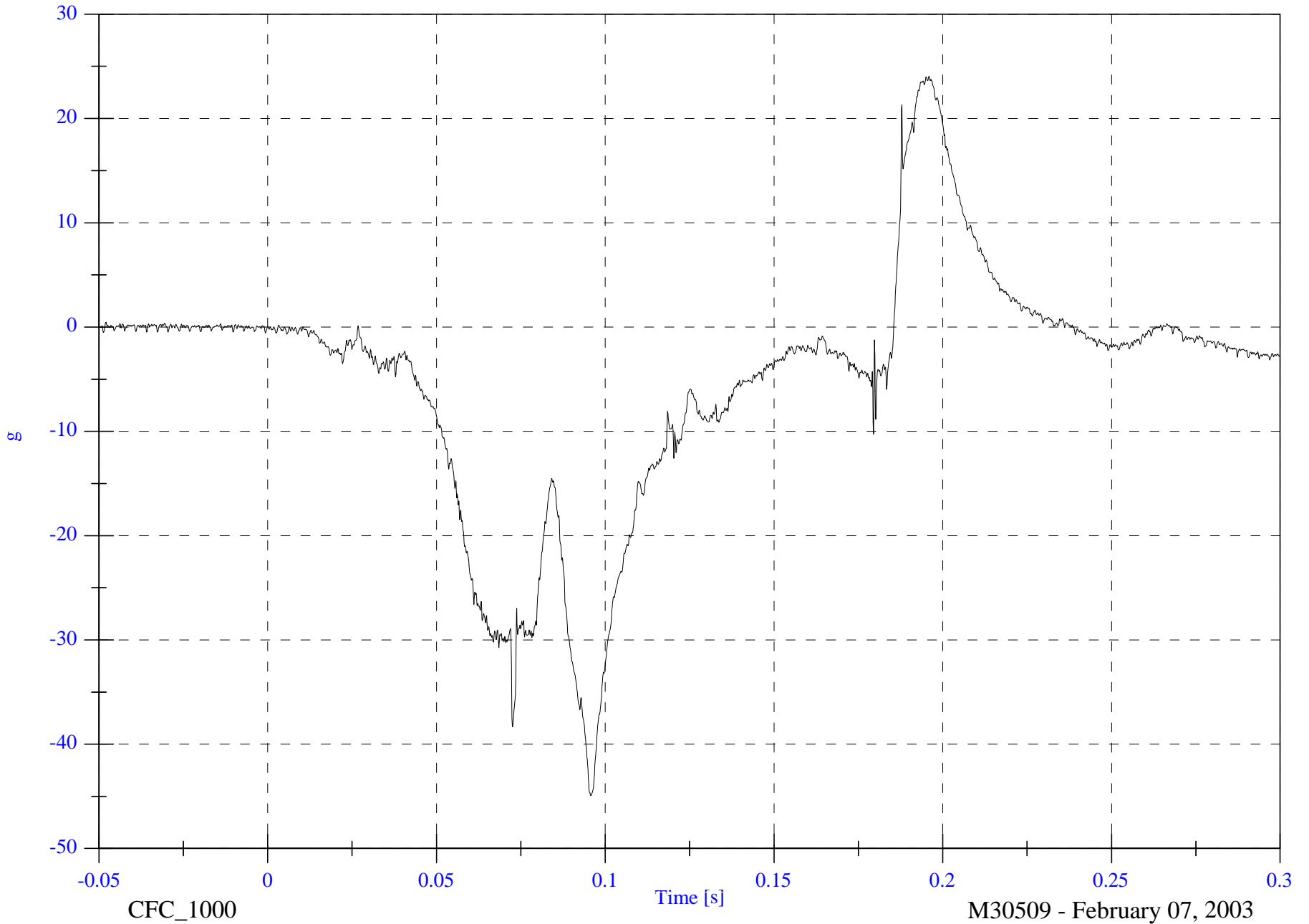
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P4 Head x

Max: 24.1 [g] at 0.196 [s]

Min: -44.9 [g] at 0.096 [s]



4-33

8642-NCAP-29

NCAP Test #7 - 2003 Mercedes E320

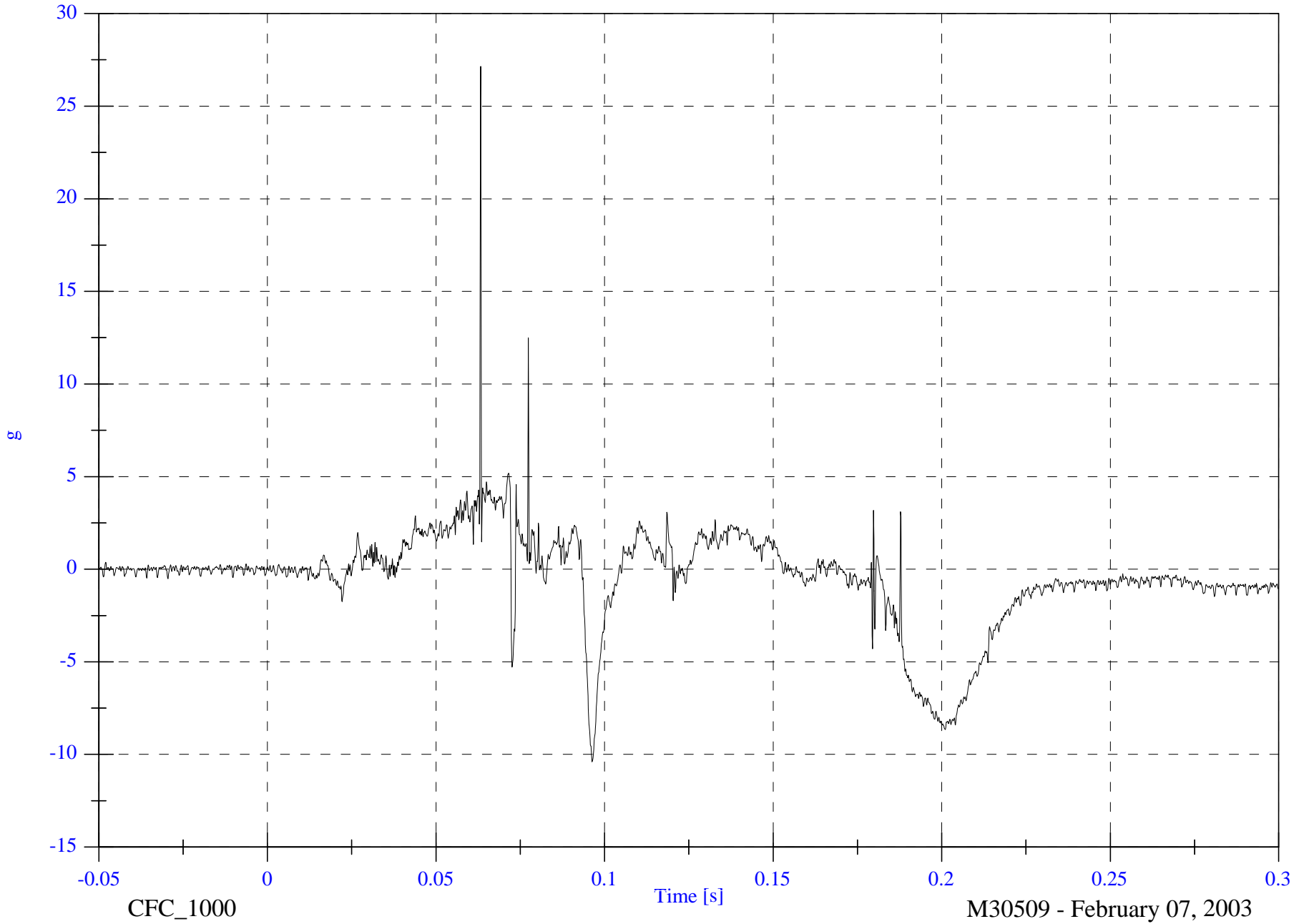
V1P4 Head y

Max: 27.1 [g] at 0.063 [s]

Min: -10.4 [g] at 0.096 [s]

4-34

8642-NCAP-29



CFC_1000

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

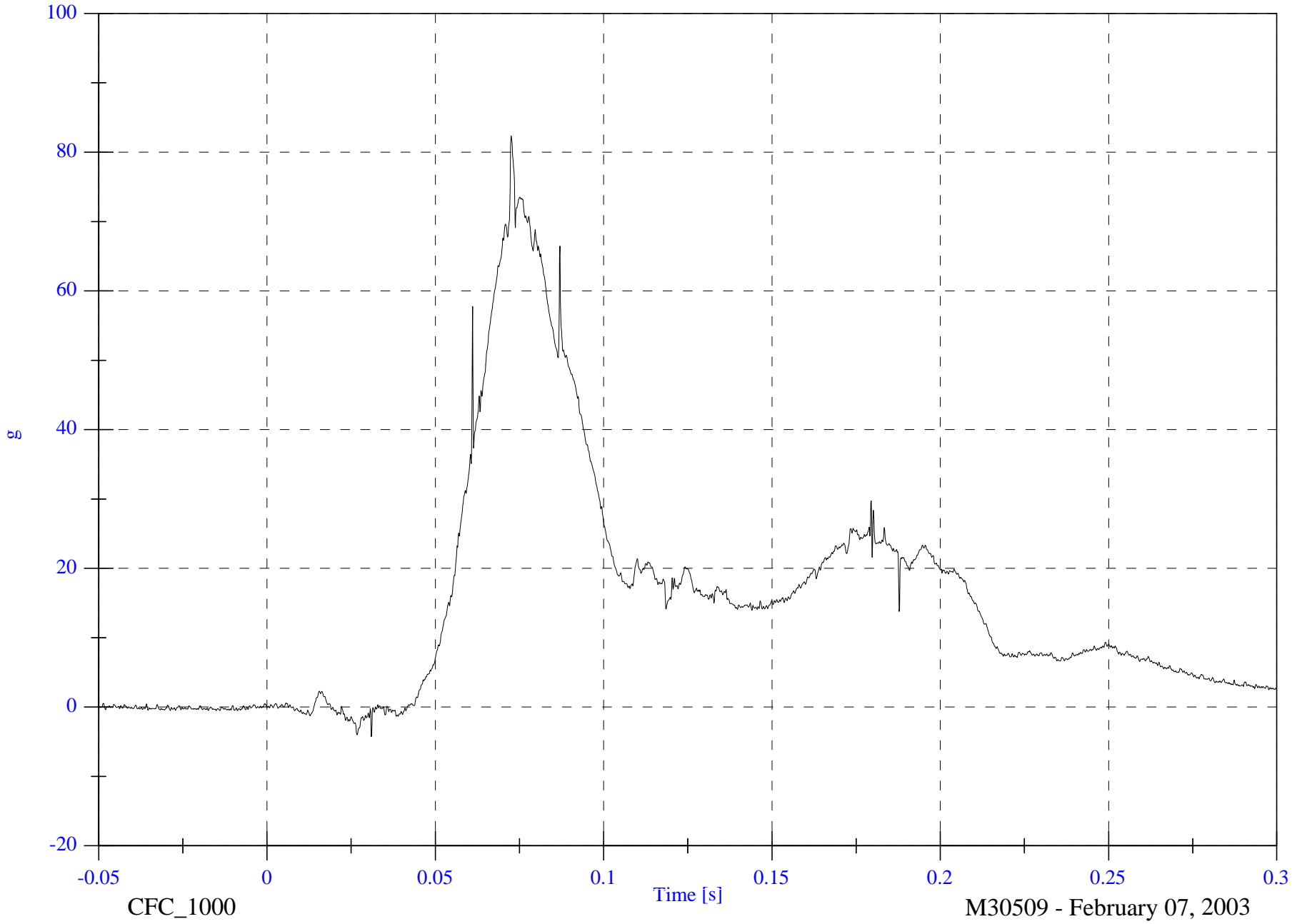
V1P4 Head z

Max: 82.3 [g] at 0.072 [s]

Min: -4.3 [g] at 0.031 [s]

4-35

8642-NCAP-29



CFC_1000

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

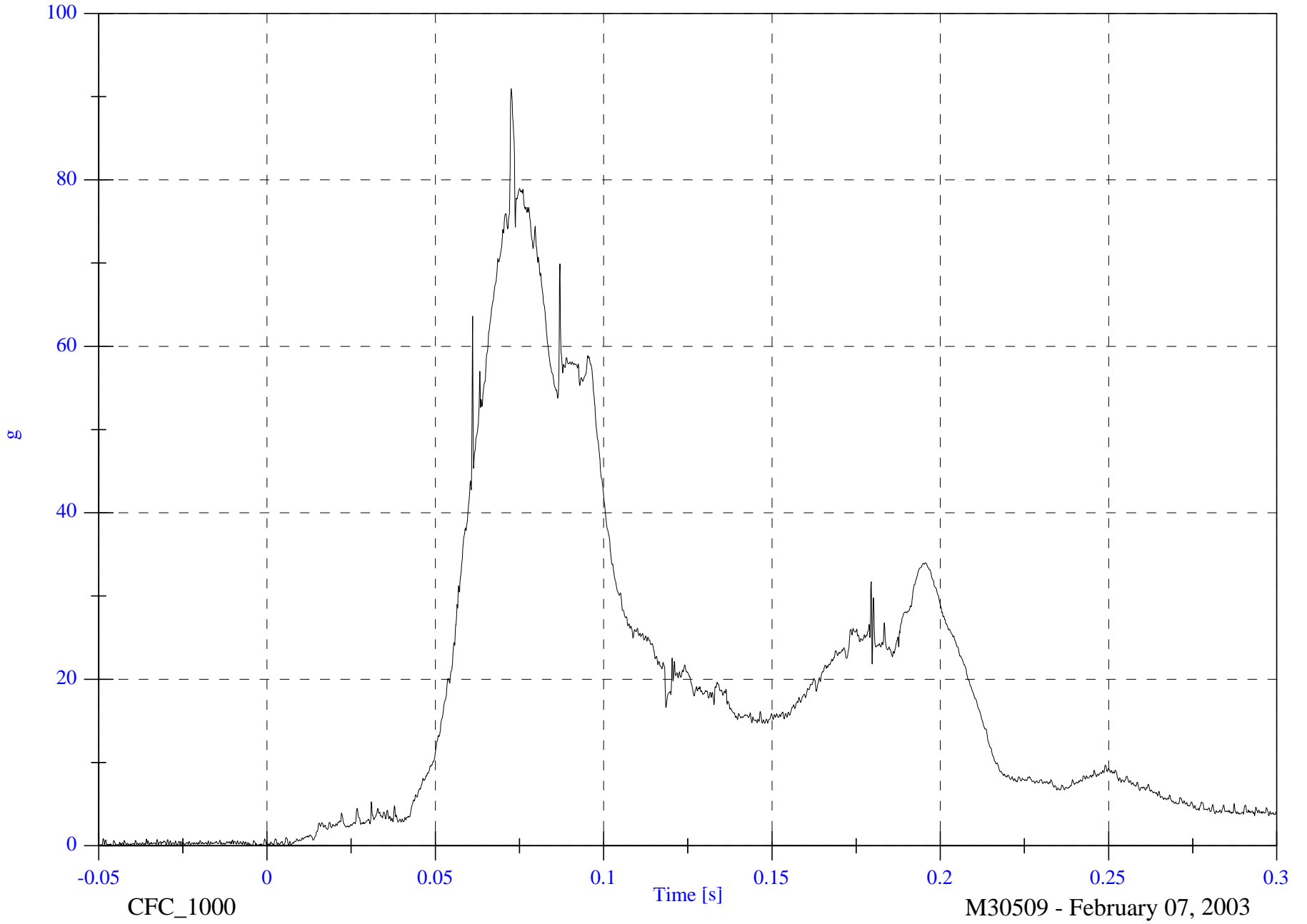
V1P4 Head Resultant

Max: 91.0 [g] at 0.072 [s]

Min: 0.0 [g] at -0.046 [s]

4-36

8642-NCAP-29

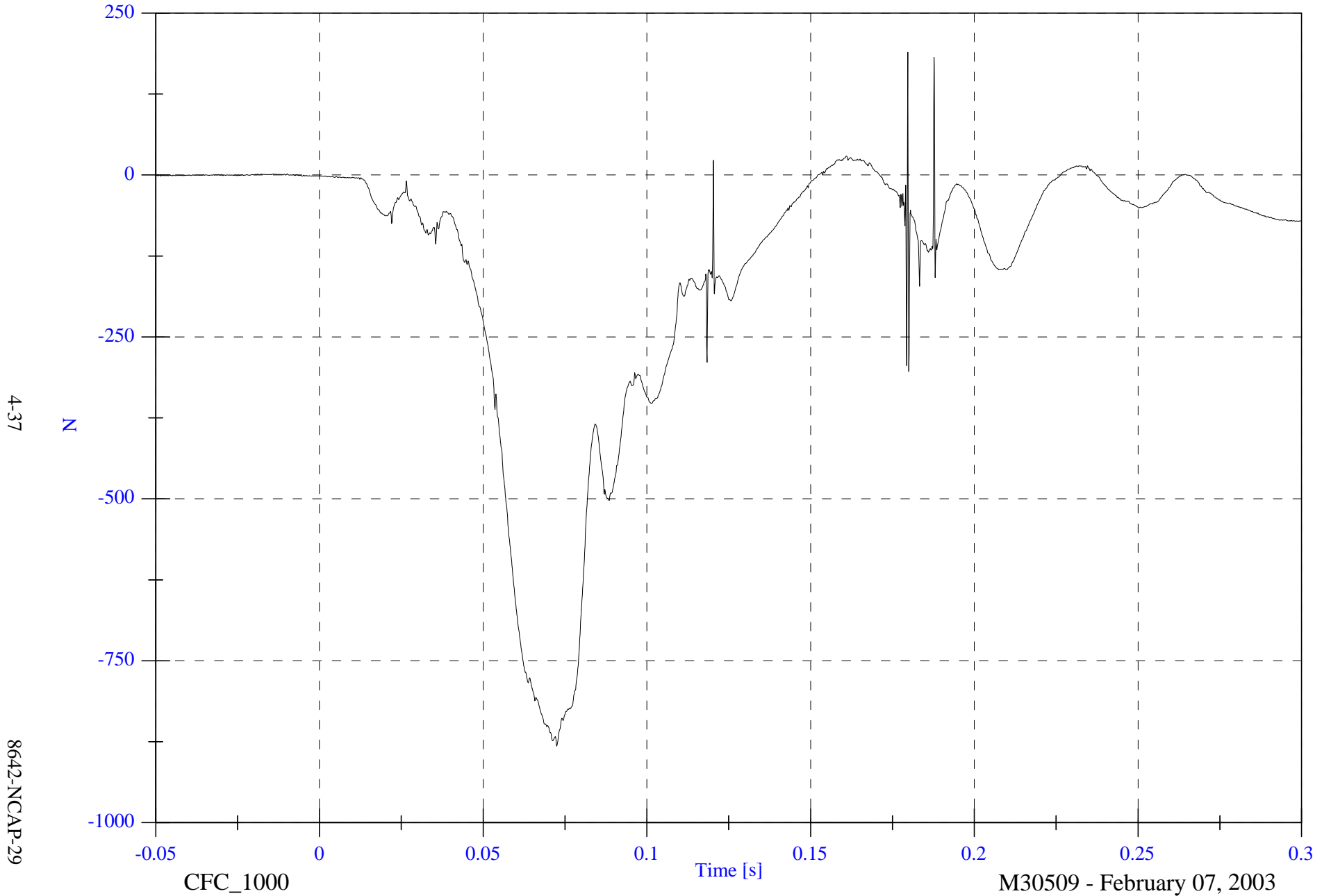


NCAP Test #7 - 2003 Mercedes E320

Max: 189.7 [N] at 0.180 [s]

Min: -881.9 [N] at 0.072 [s]

V1P4 Upper Neck Fx

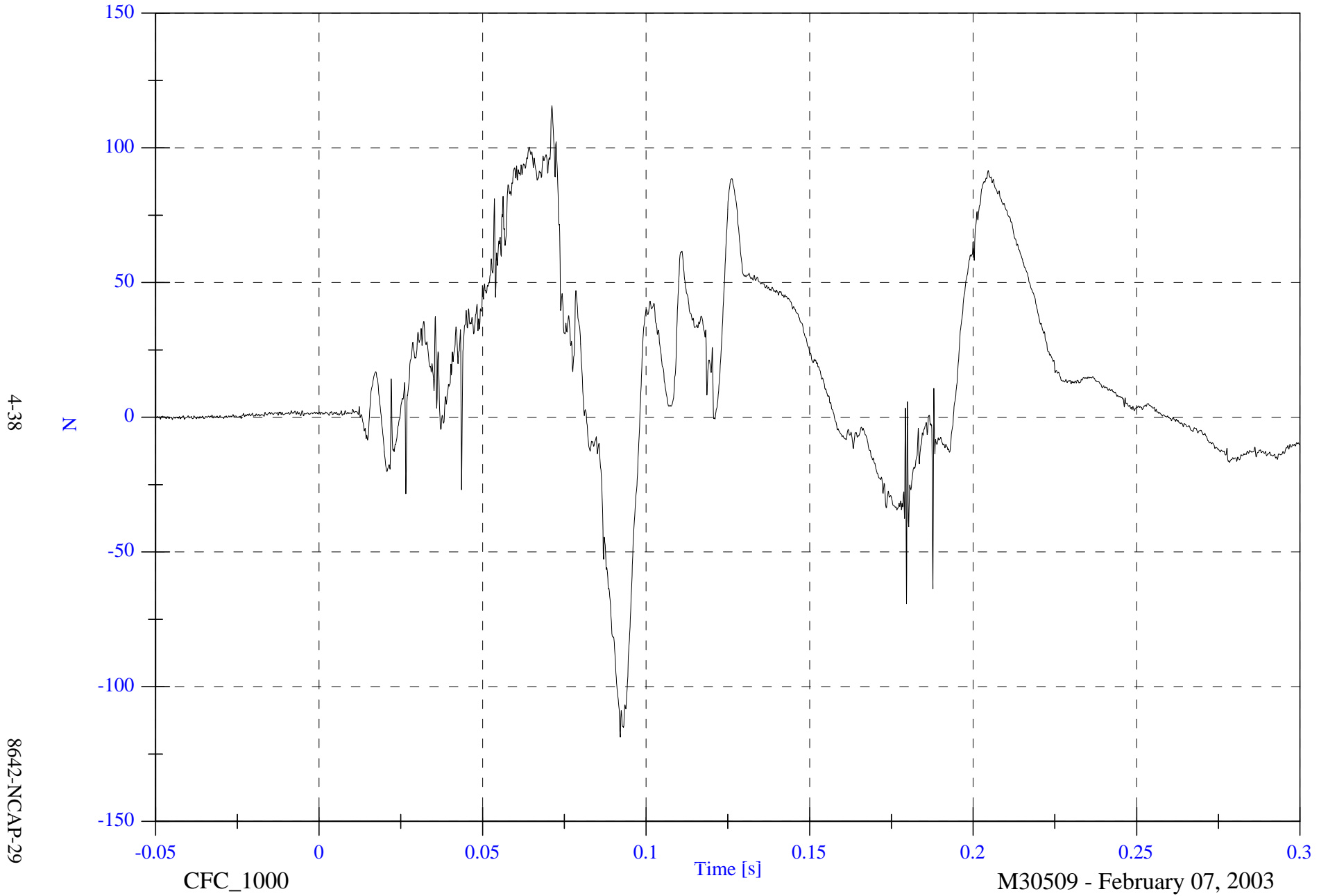


NCAP Test #7 - 2003 Mercedes E320

Max: 115.5 [N] at 0.071 [s]

Min: -118.8 [N] at 0.092 [s]

V1P4 Upper Neck Fy



4-38

8642-NCAP-29

CFC_1000

Time [s]

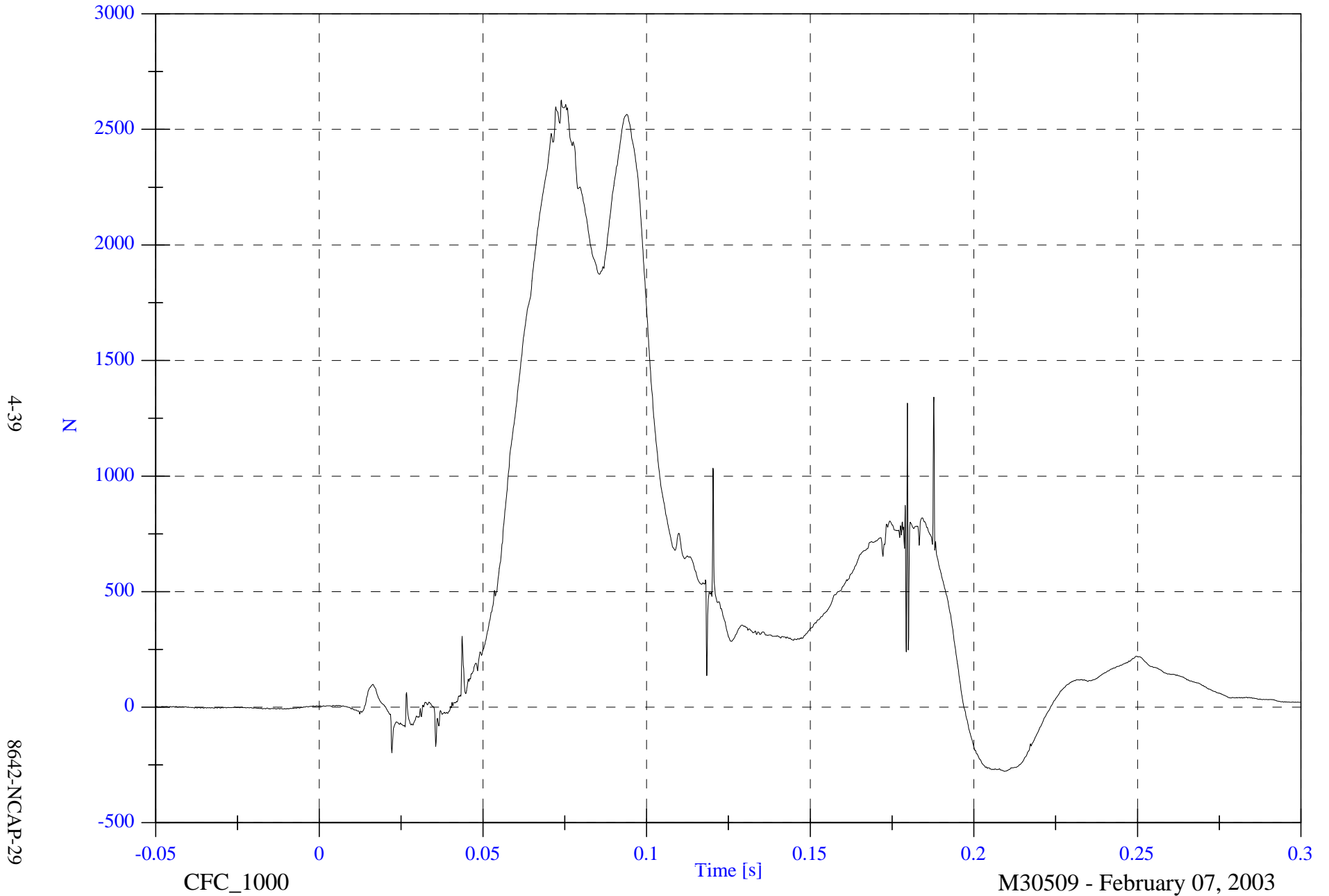
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 2626.4 [N] at 0.074 [s]

Min: -277.4 [N] at 0.209 [s]

V1P4 Upper Neck Fz



4-39

8642-NCAP-29

CFC_1000

Time [s]

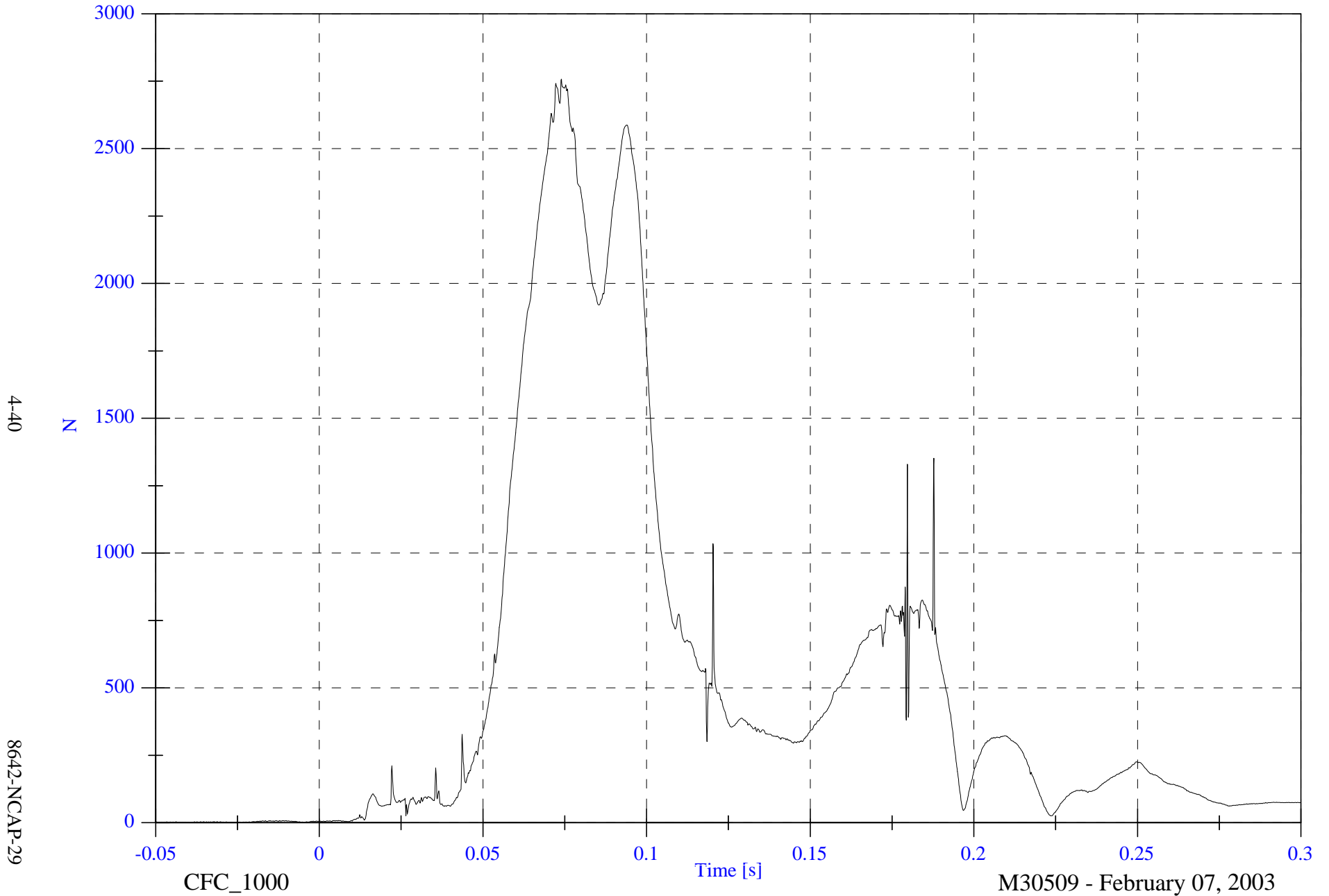
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 2757.5 [N] at 0.074 [s]

V1P4 Upper Neck F Resultant

Min: 0.3 [N] at -0.043 [s]



4-40

8642-NCAP-29

CFC_1000

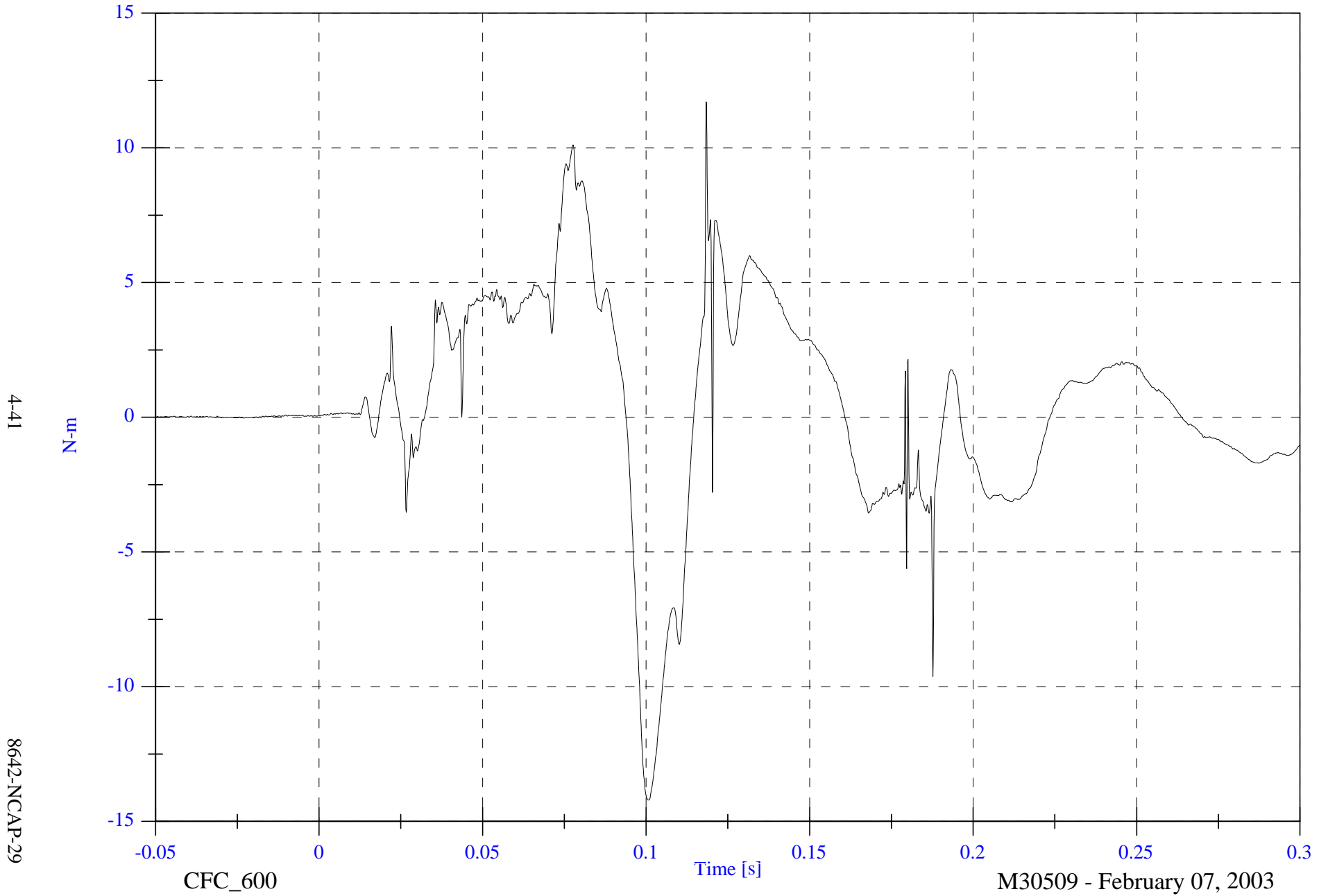
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 11.7 [N-m] at 0.118 [s]

Min: -14.2 [N-m] at 0.101 [s]

V1P4 Upper Neck Mx



4-41

8642-NCAP-29

CFC_600

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

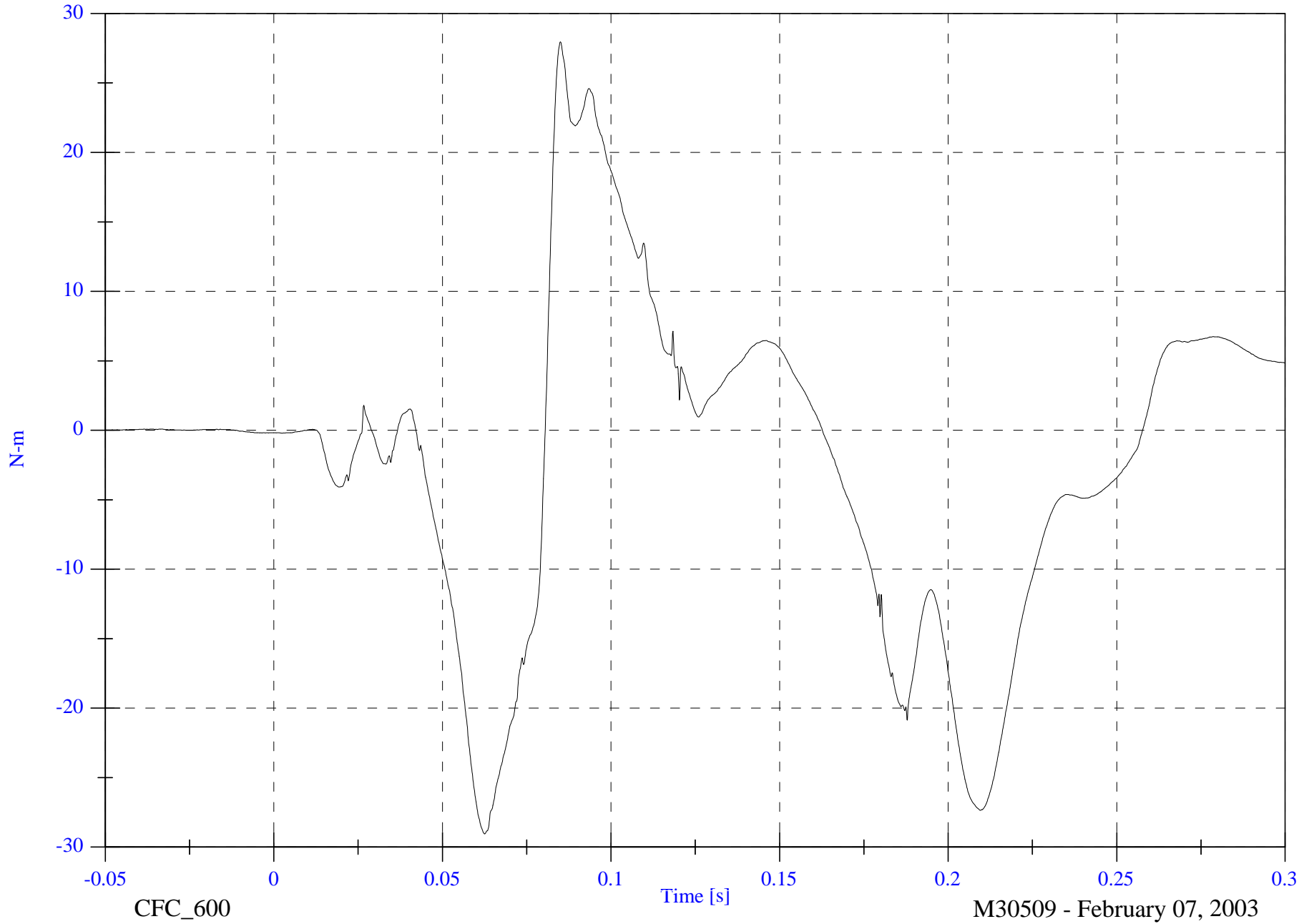
Max: 28.0 [N-m] at 0.085 [s]

Min: -29.0 [N-m] at 0.062 [s]

V1P4 Upper Neck My

4-42

8642-NCAP-29

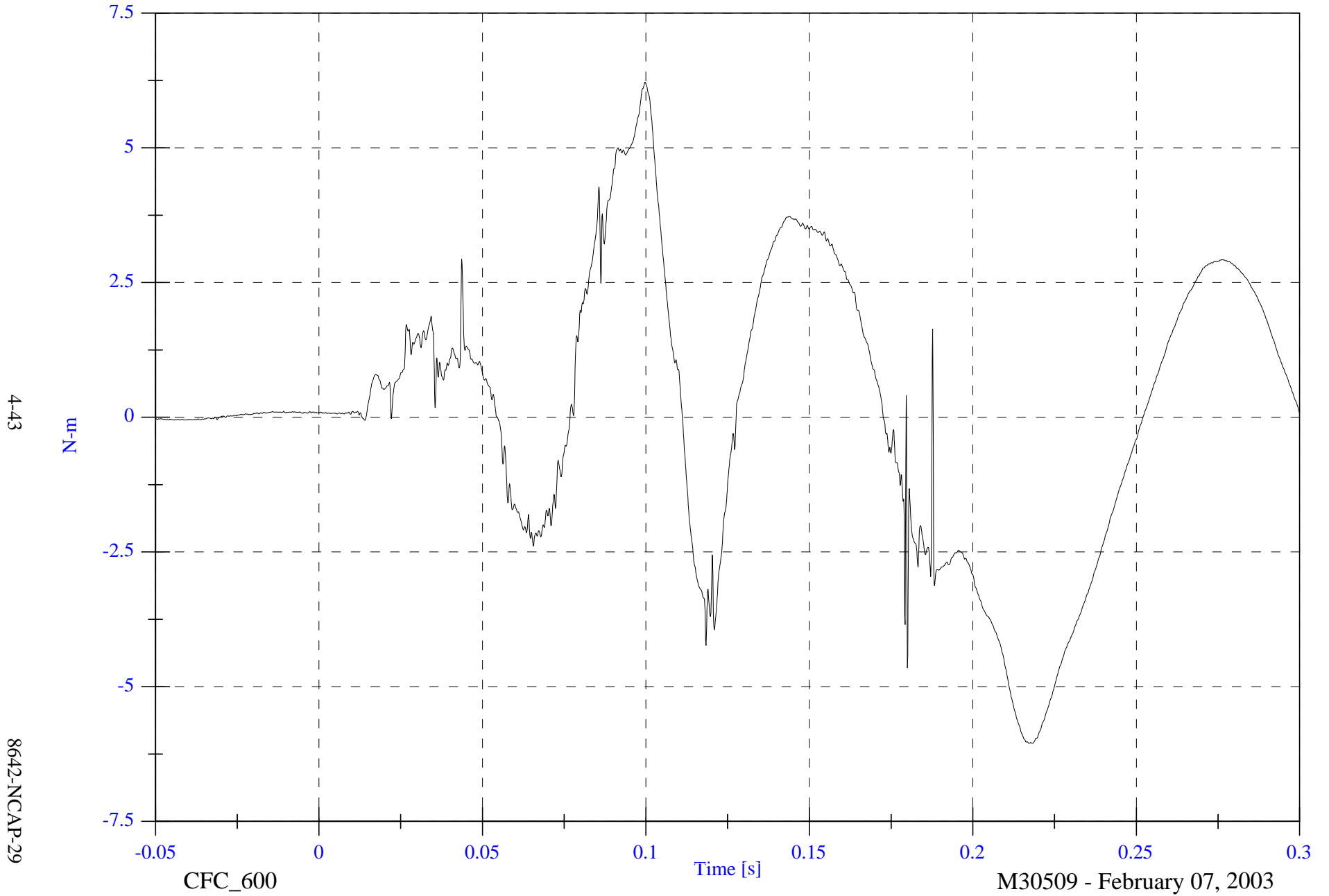


NCAP Test #7 - 2003 Mercedes E320

Max: 6.2 [N-m] at 0.100 [s]

Min: -6.1 [N-m] at 0.217 [s]

V1P4 Upper Neck Mz



4-43

8642-NCAP-29

CFC_600

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

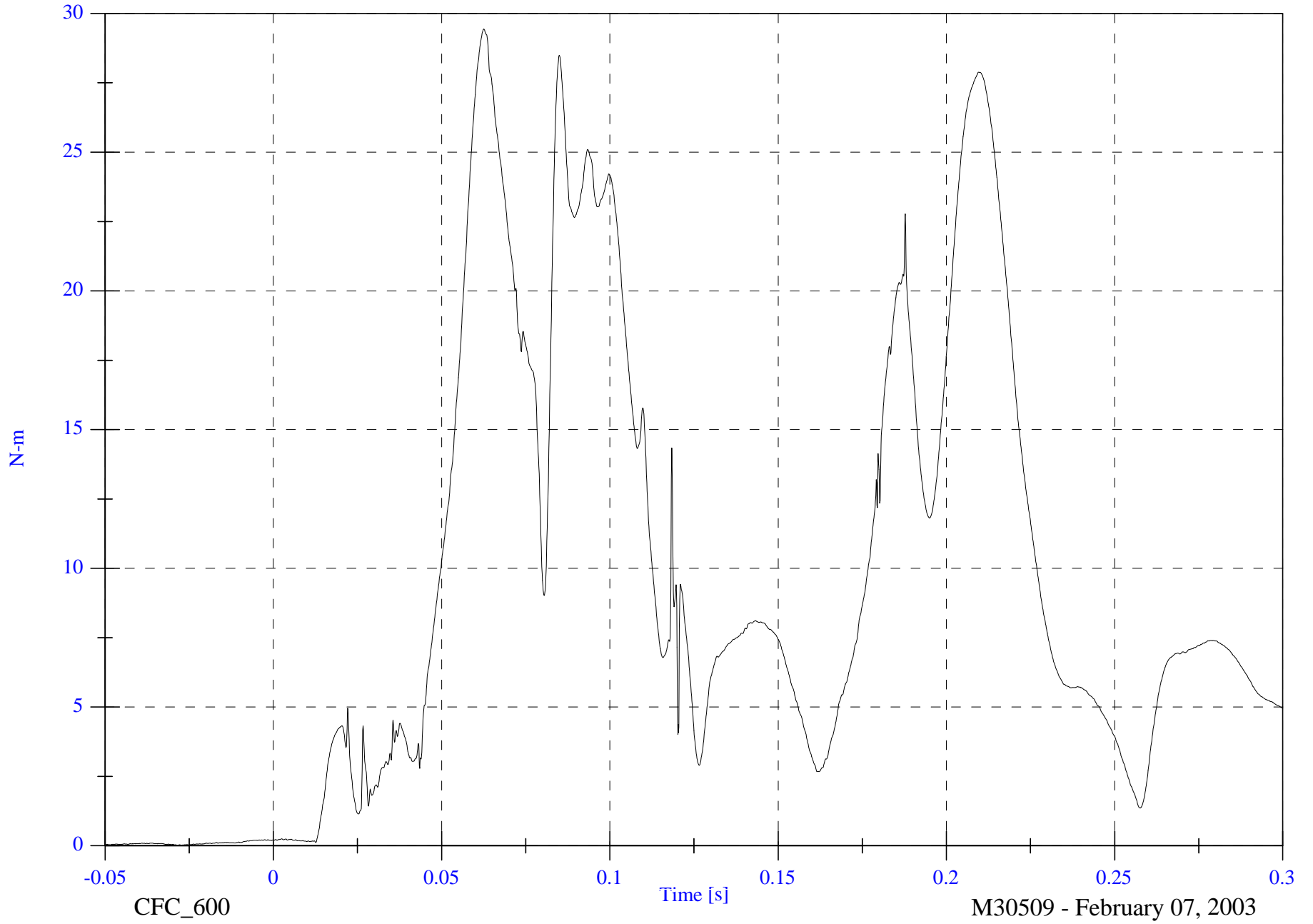
V1P4 Upper Neck M Resultant

Max: 29.4 [N-m] at 0.063 [s]

Min: 0.0 [N-m] at -0.028 [s]

4-44

8642-NCAP-29



CFC_600

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

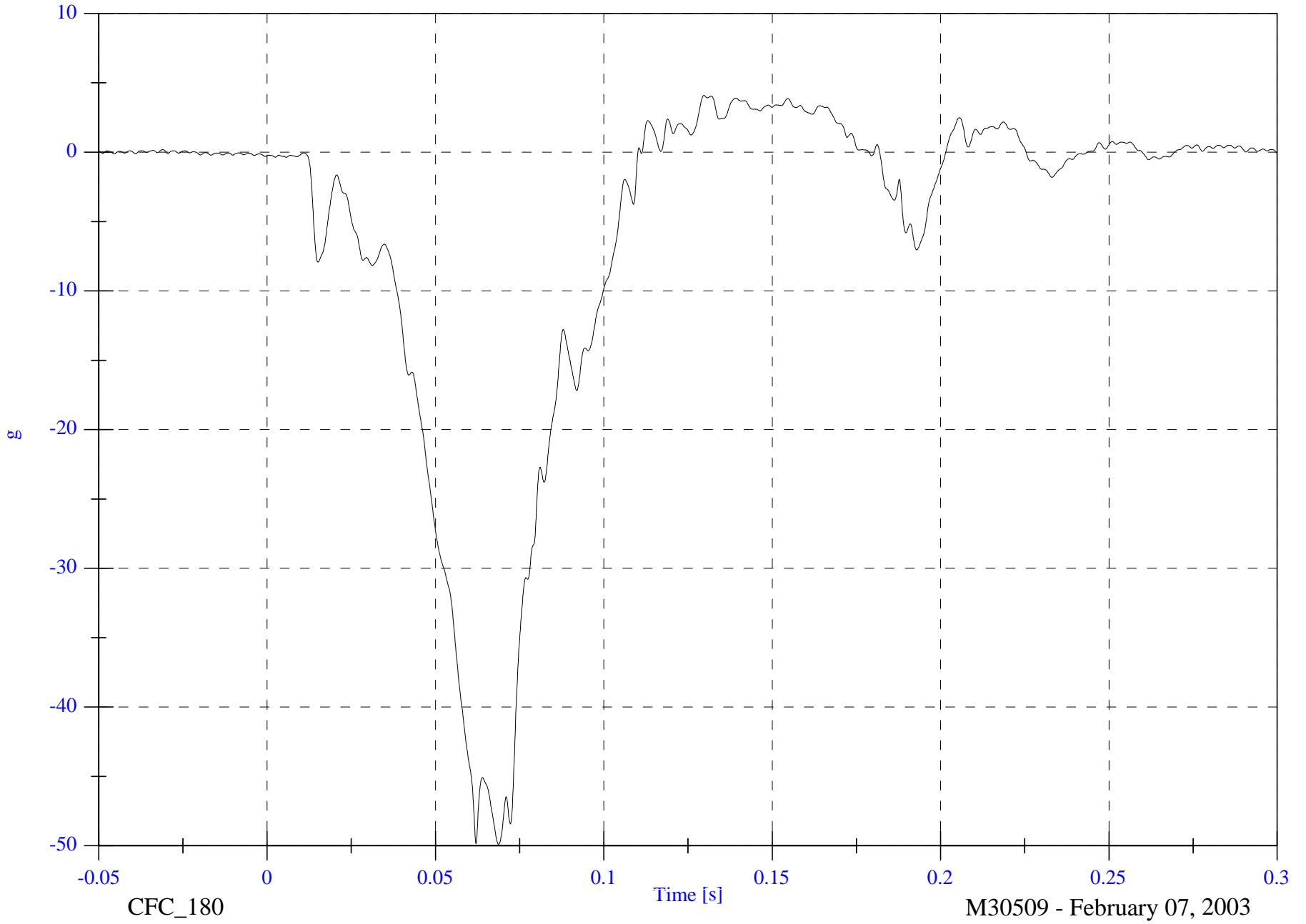
VIP4 Chest x

Max: 4.1 [g] at 0.130 [s]

Min: -49.9 [g] at 0.069 [s]

4-45

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

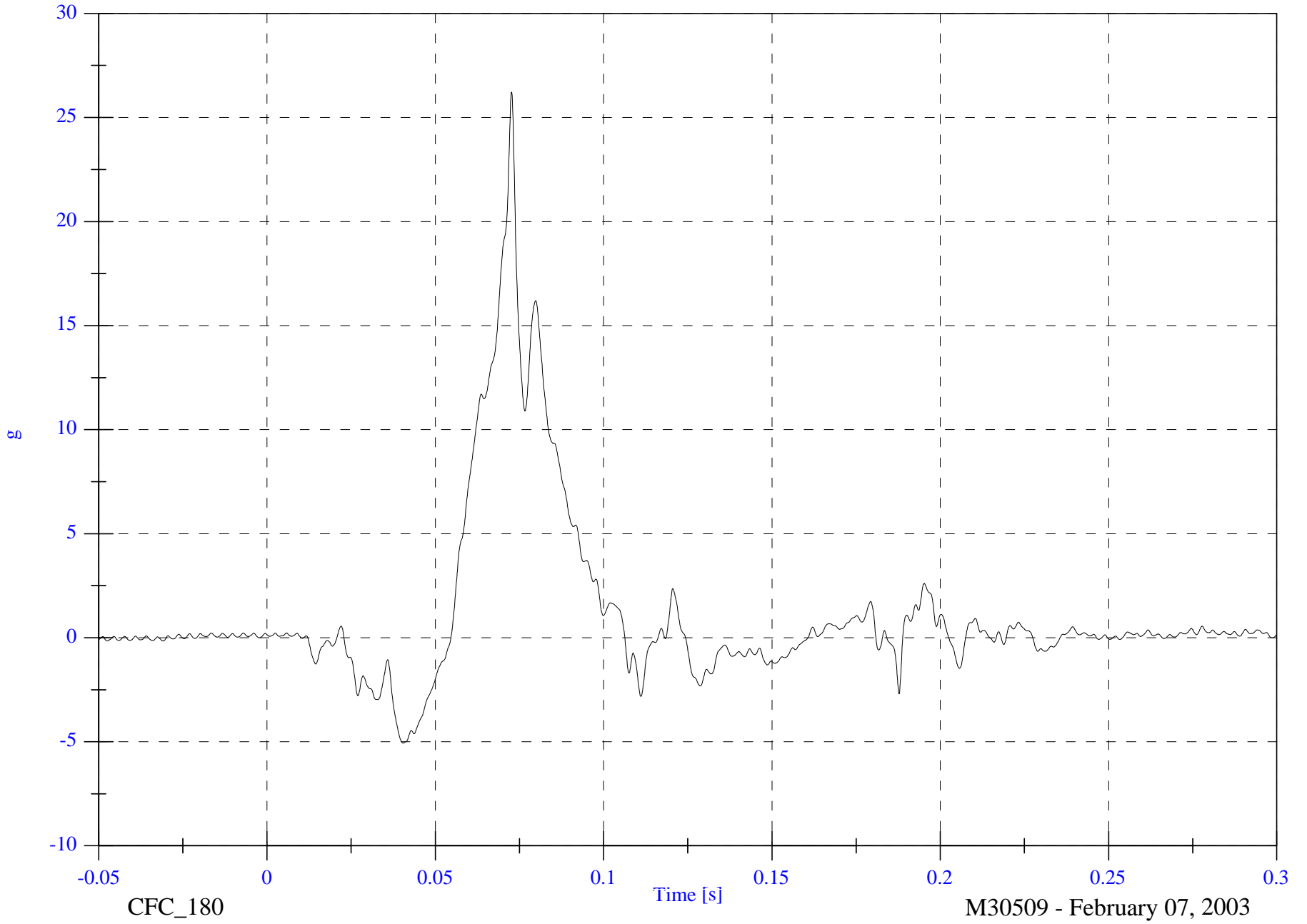
VIP4 Chest y

Max: 26.2 [g] at 0.073 [s]

Min: -5.1 [g] at 0.040 [s]

4-46

8642-NCAP-29



CFC_180

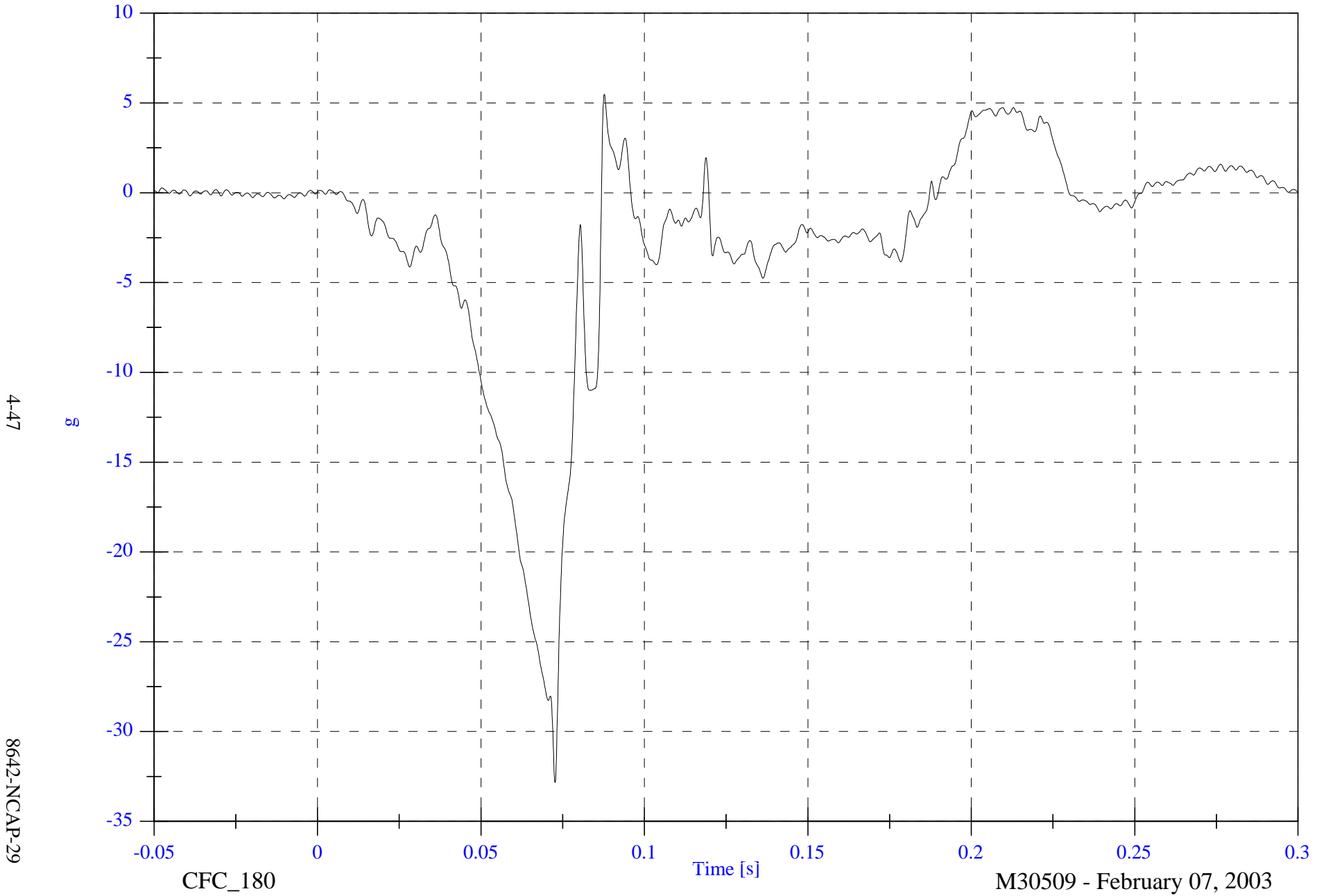
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

VIP4 Chest z

Max: 5.5 [g] at 0.088 [s]

Min: -32.8 [g] at 0.073 [s]



NCAP Test #7 - 2003 Mercedes E320

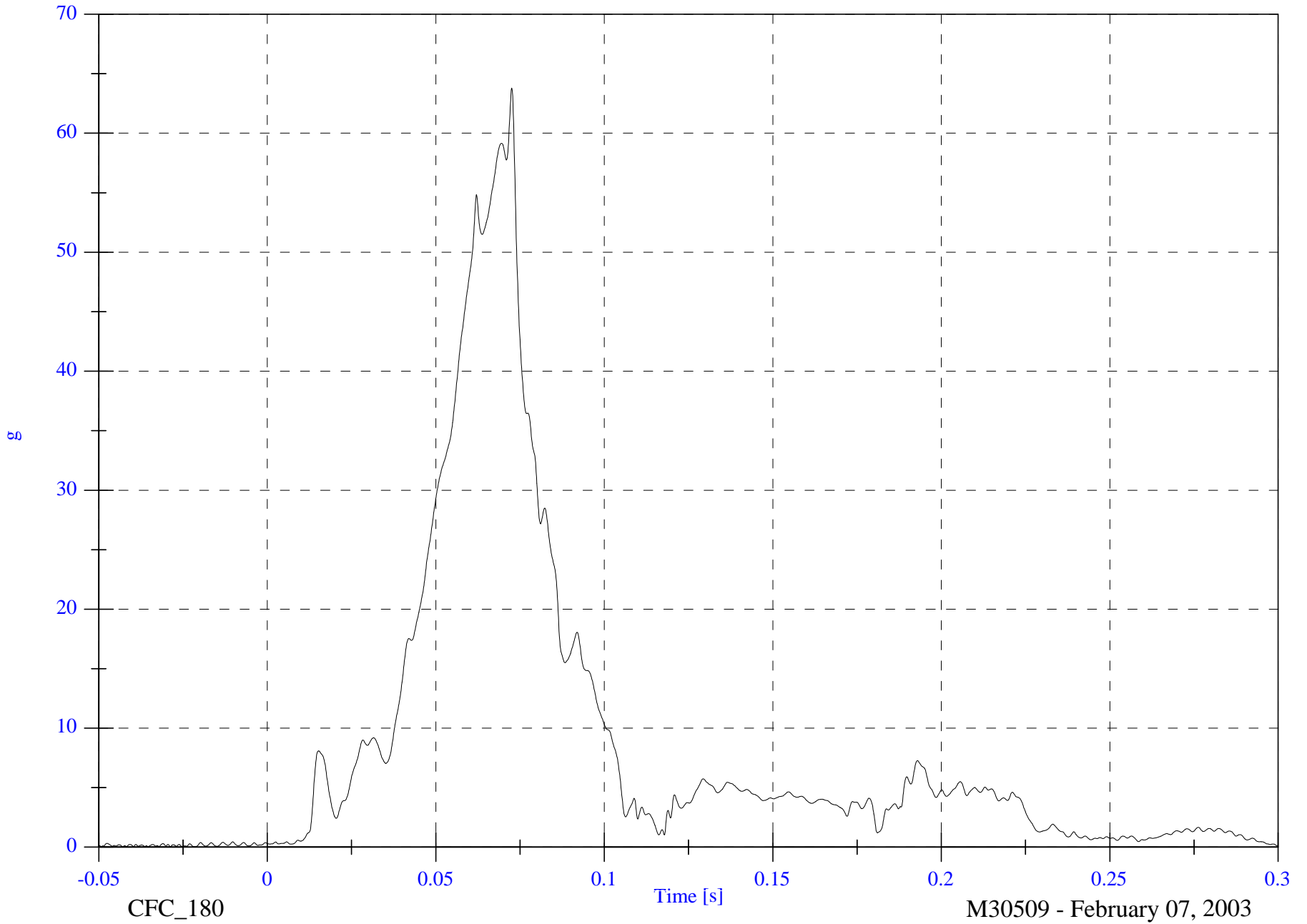
V1P4 Chest Resultant

Max: 63.8 [g] at 0.072 [s]

Min: 0.0 [g] at -0.043 [s]

4-48

8642-NCAP-29



NCAP Test #7 - 2003 Mercedes E320

V1P4 Chest Compression

Max: 0.0 [mm] at 0.010 [s]

Min: -1.3 [mm] at 0.098 [s]



4-49

8642-NCAP-29

CFC_600

Time [s]

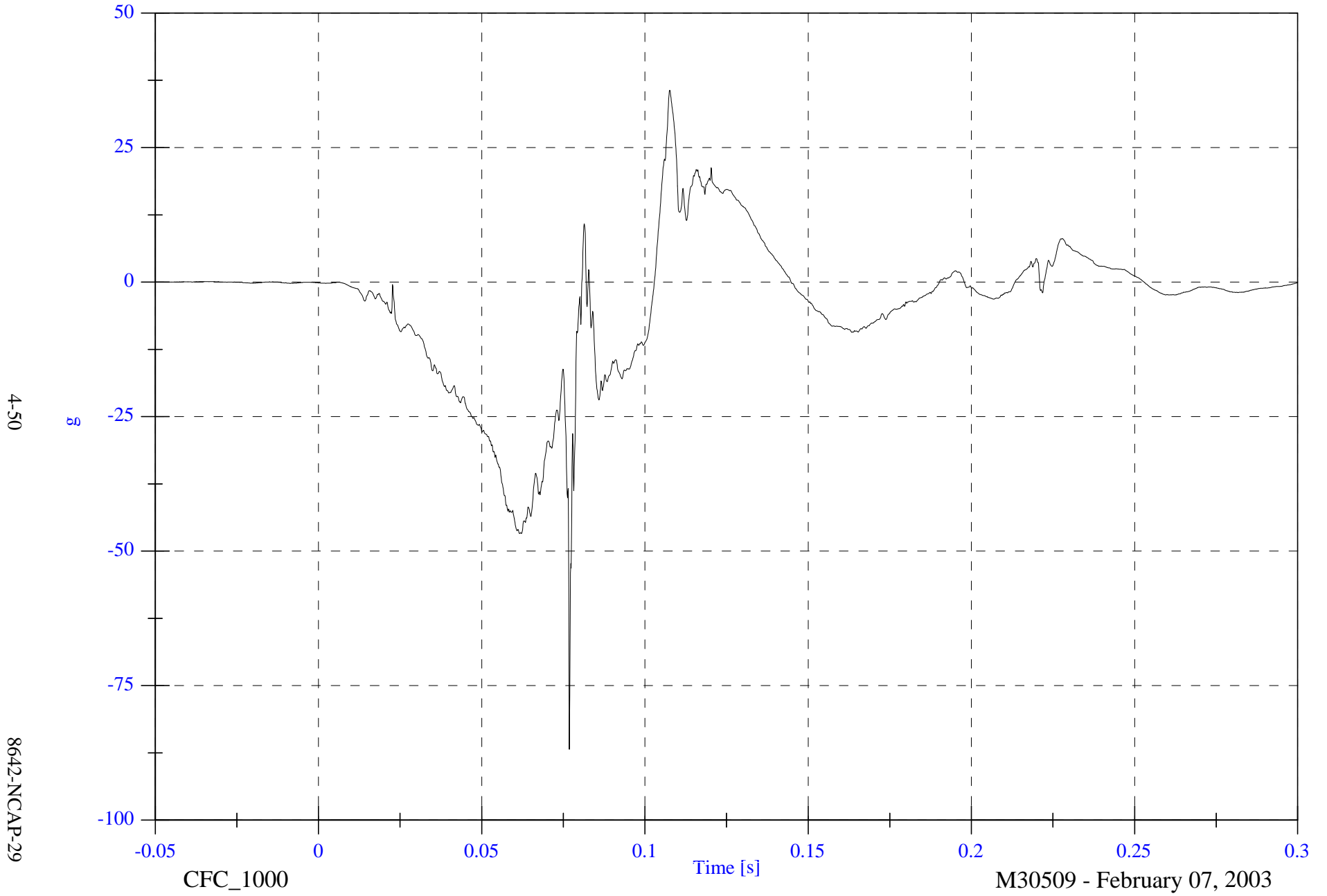
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 35.7 [g] at 0.108 [s]

Min: -86.9 [g] at 0.077 [s]

V1P4 Pelvic x



NCAP Test #7 - 2003 Mercedes E320

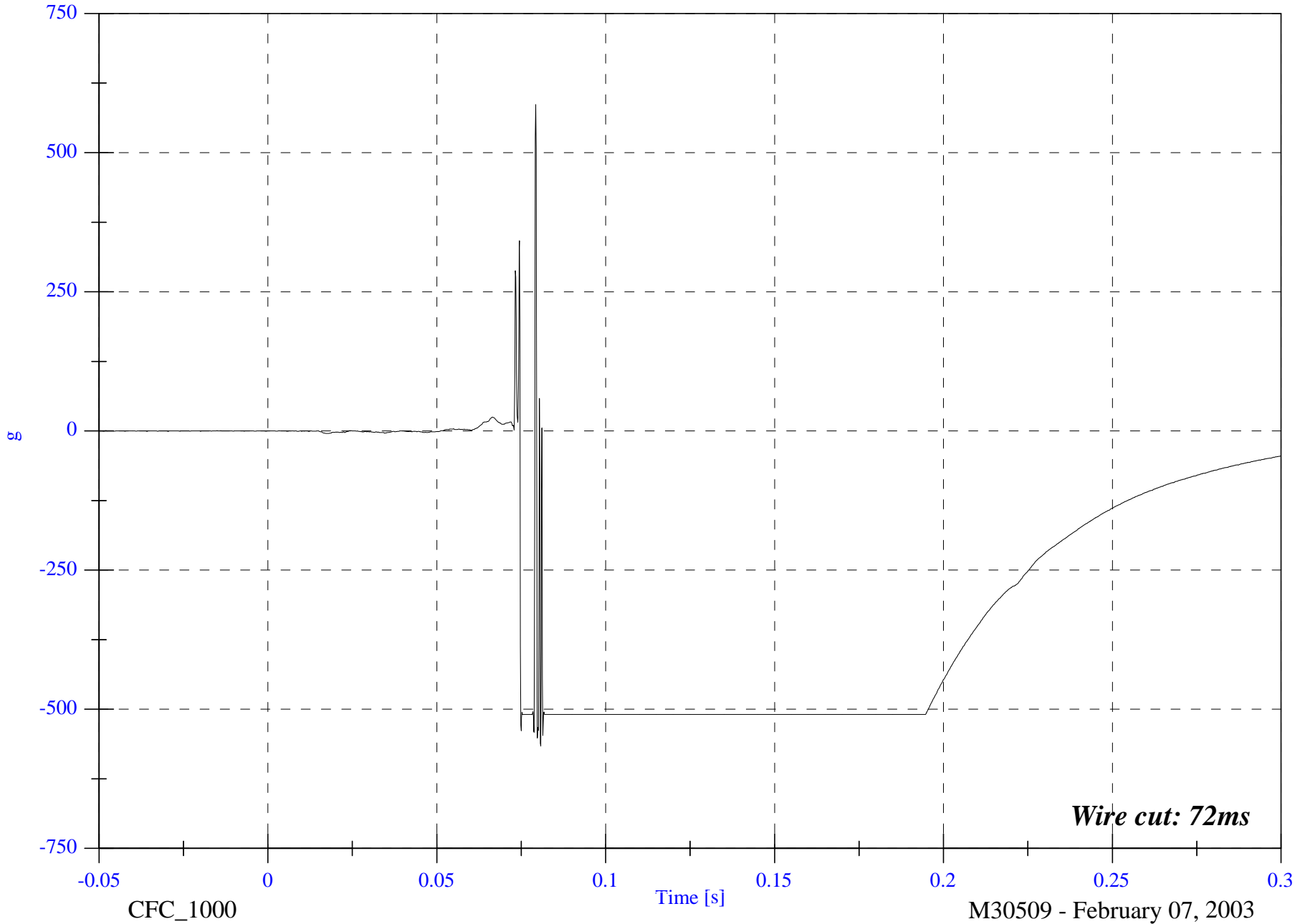
Max: 586.7 [g] at 0.079 [s]

Min: -566.3 [g] at 0.081 [s]

V1P4 Pelvic y

4-51

8642-NCAP-29



Wire cut: 72ms

CFC_1000

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

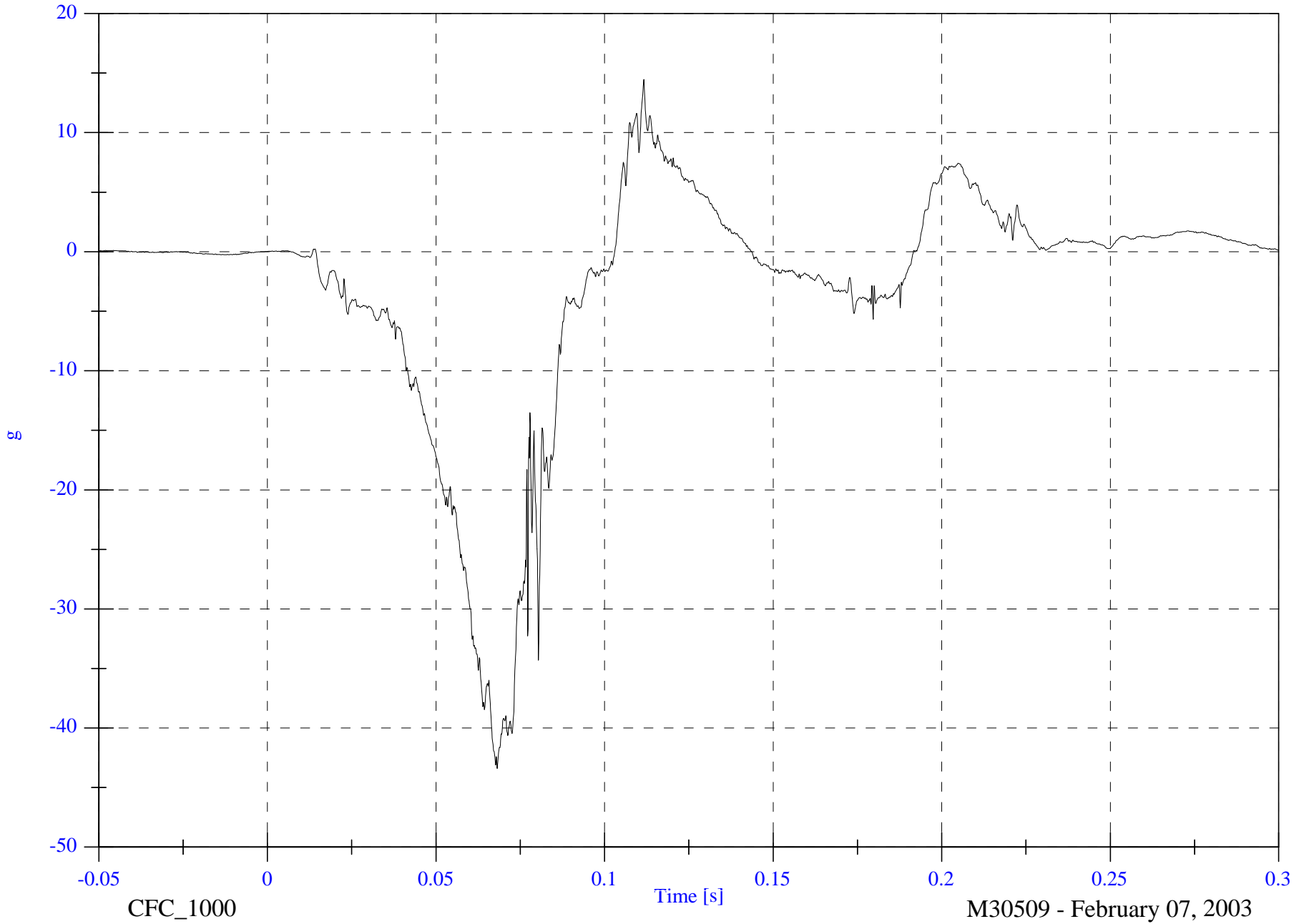
V1P4 Pelvic z

Max: 14.5 [g] at 0.112 [s]

Min: -43.4 [g] at 0.068 [s]

4-52

8642-NCAP-29



CFC_1000

Time [s]

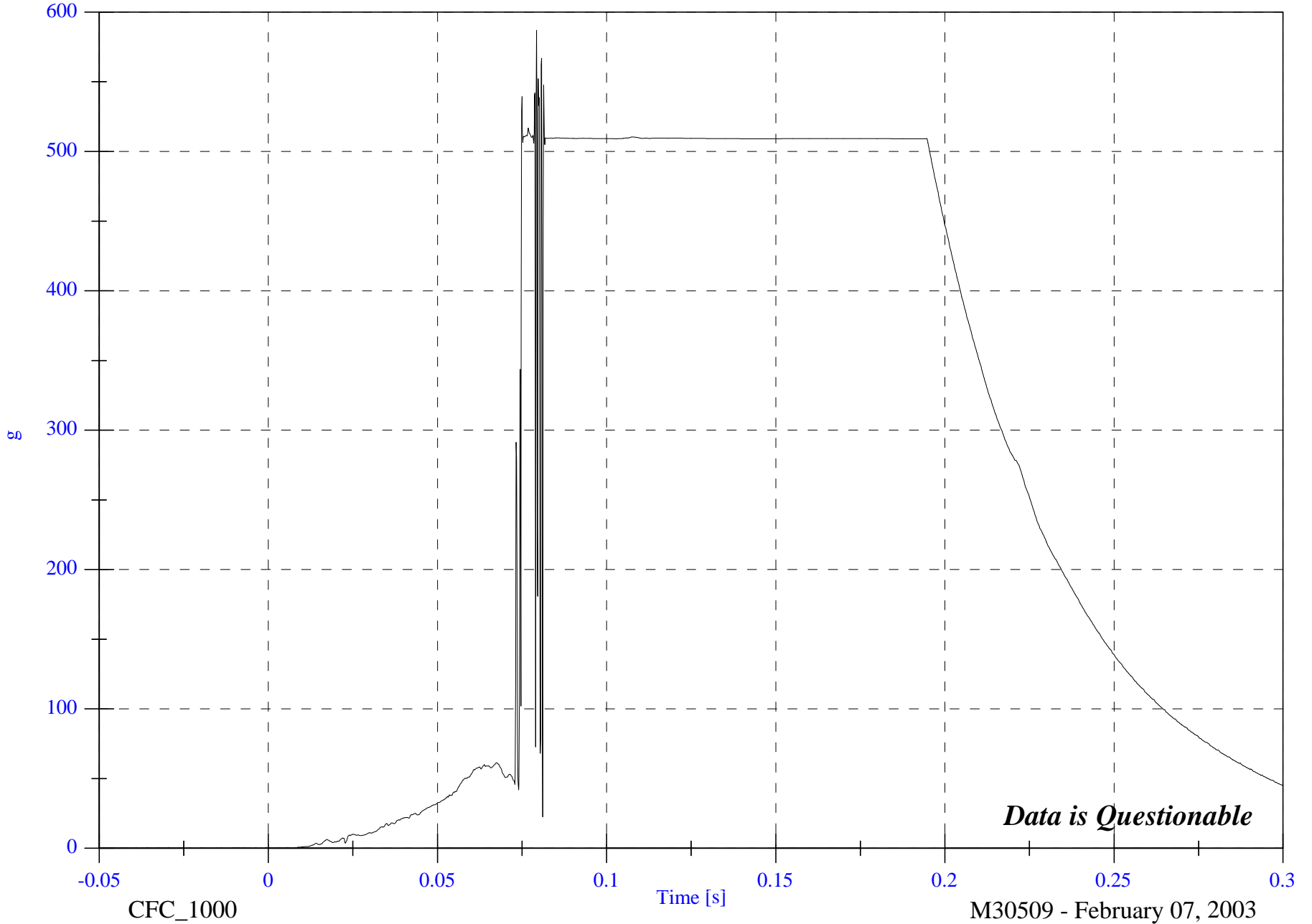
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

V1P4 Pelvic Resultant

Max: 587.1 [g] at 0.079 [s]

Min: 0.0 [g] at -0.028 [s]



4-53

8642-NCAP-29

CFC_1000

Time [s]

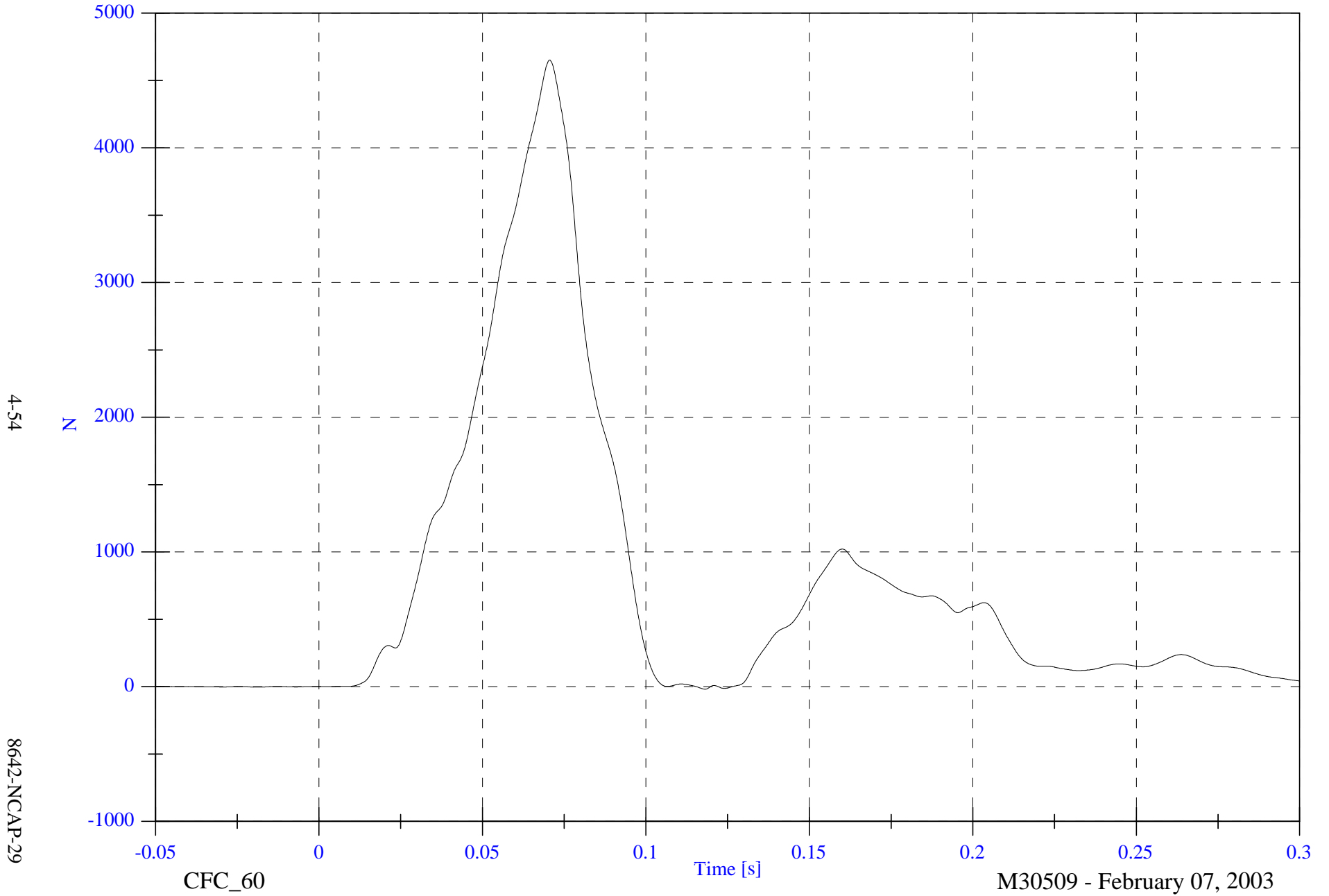
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

P4 Lap Belt

Max: 4650.5 [N] at 0.071 [s]

Min: -18.5 [N] at 0.118 [s]



4-54

8642-NCAP-29

CFC_60

Time [s]

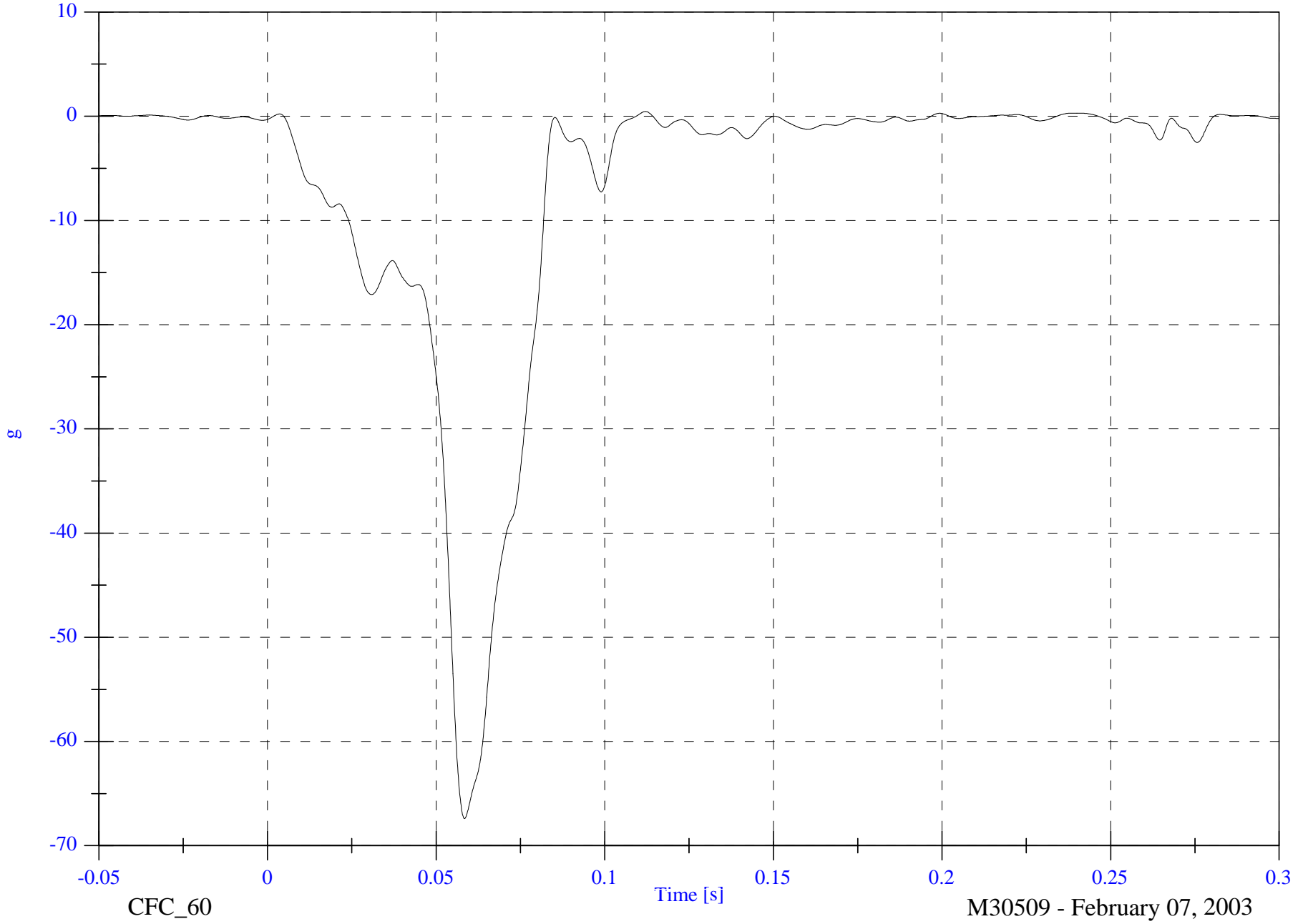
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

P3 Seat x

Max: 0.5 [g] at 0.112 [s]

Min: -67.4 [g] at 0.058 [s]



4-55

8642-NCAP-29

CFC_60

Time [s]

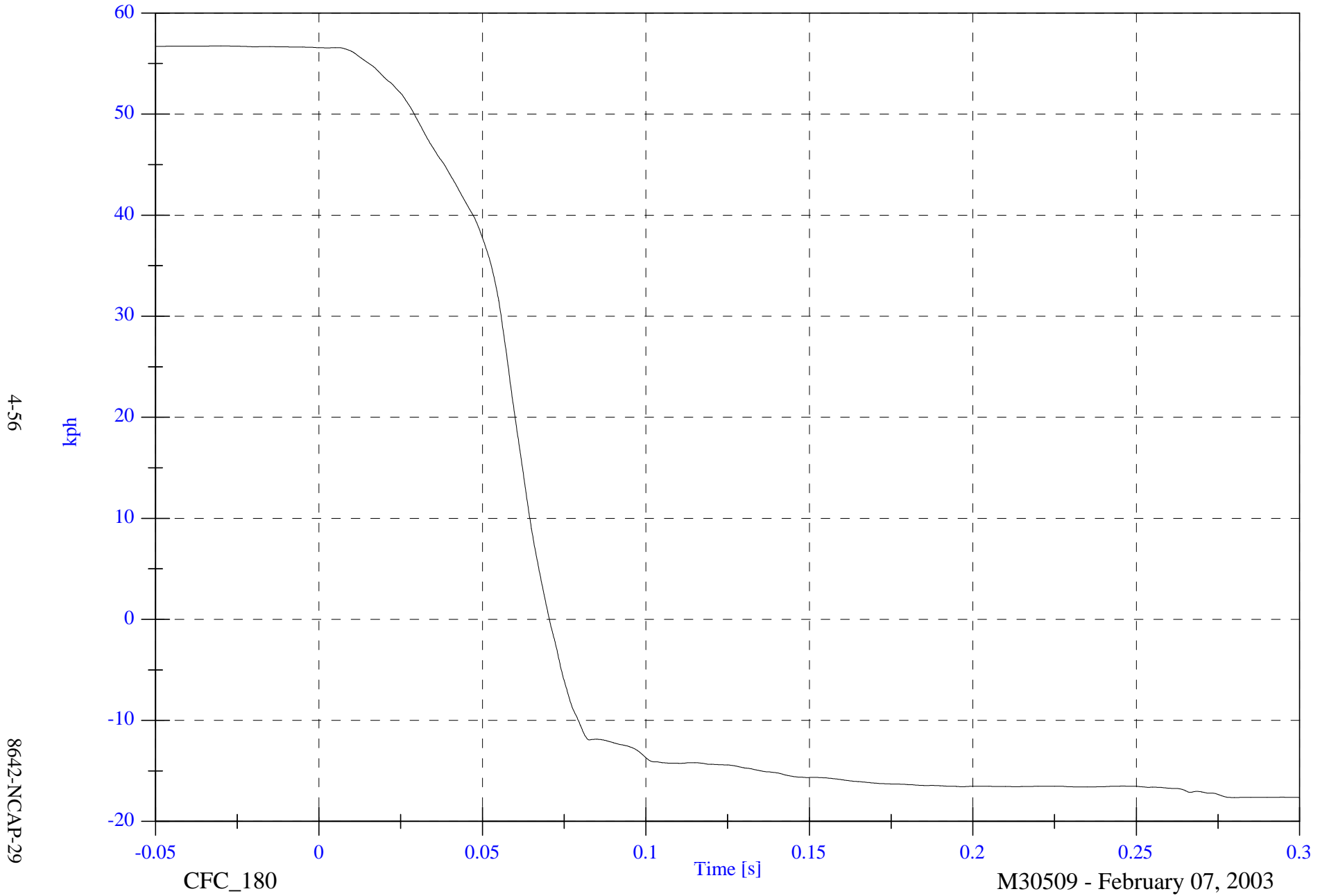
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 56.7 [kph] at -0.029 [s]

Min: -17.6 [kph] at 0.280 [s]

P3 Seat x Velocity



4-56

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

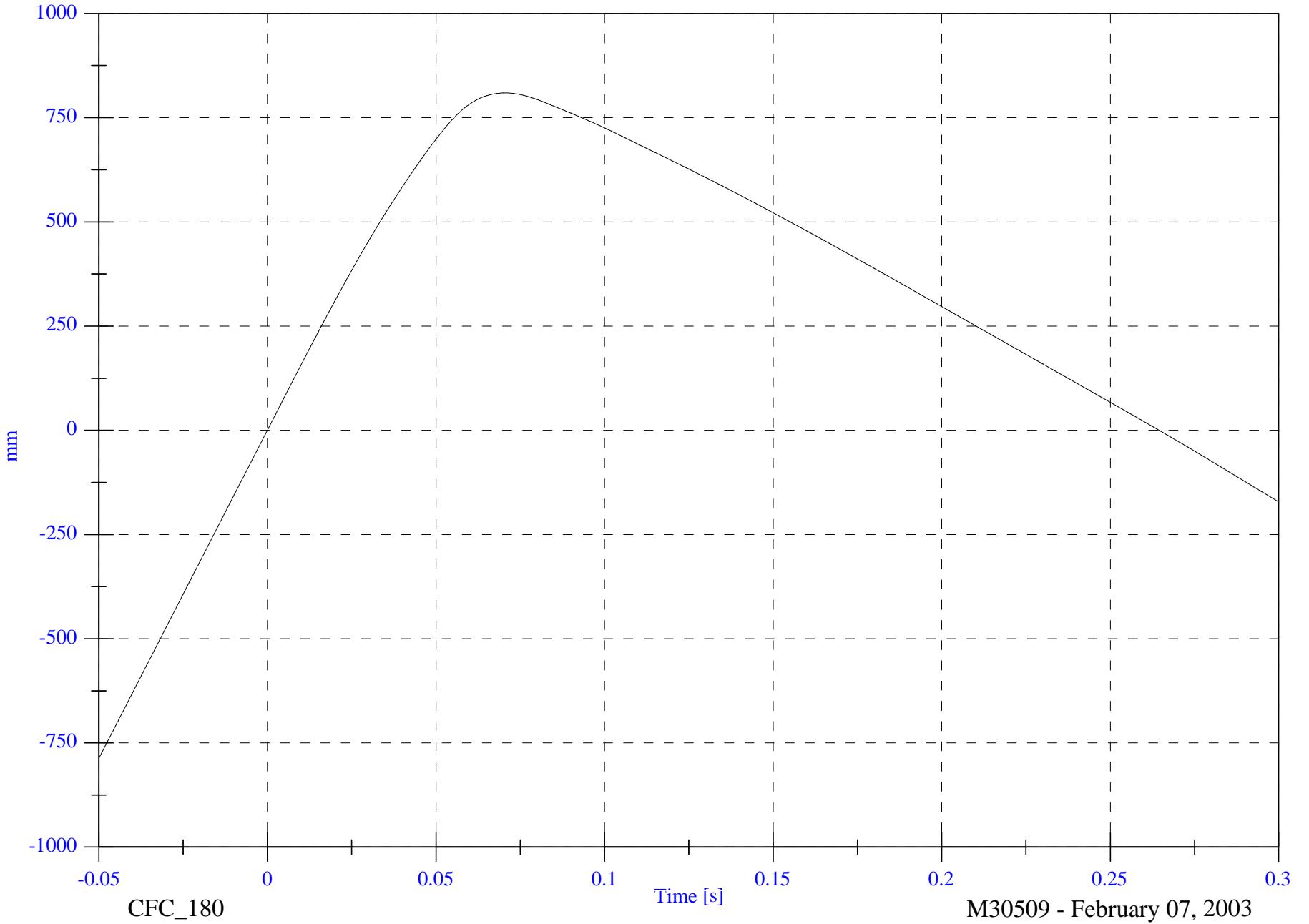
P3 Seat x Displacement

Max: 809.3 [mm] at 0.070 [s]

Min: -787.4 [mm] at -0.050 [s]

4-57

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

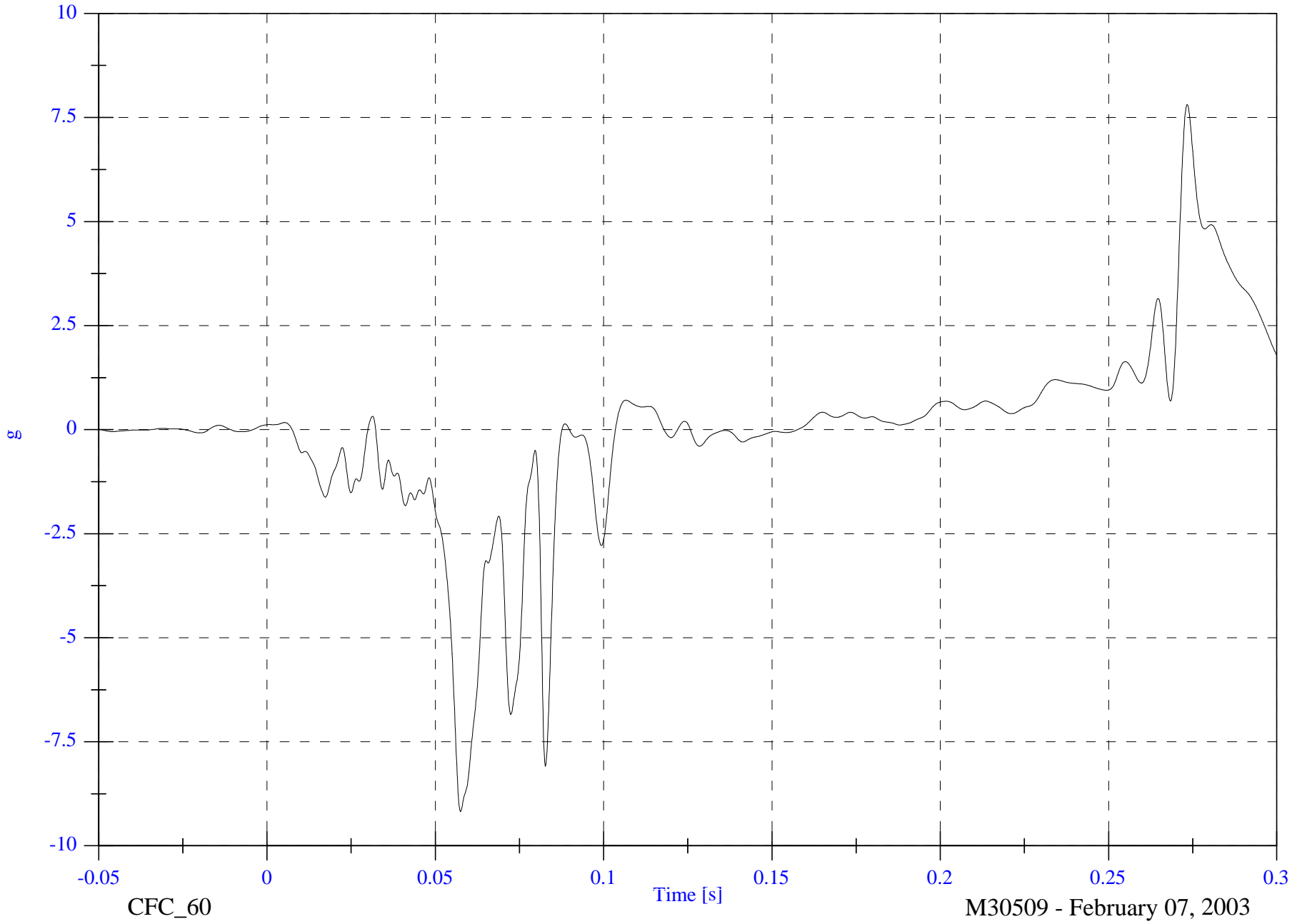
NCAP Test #7 - 2003 Mercedes E320

P3 Seat y

Max: 7.8 [g] at 0.273 [s]
Min: -9.2 [g] at 0.057 [s]

4-58

8642-NCAP-29



CFC_60

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

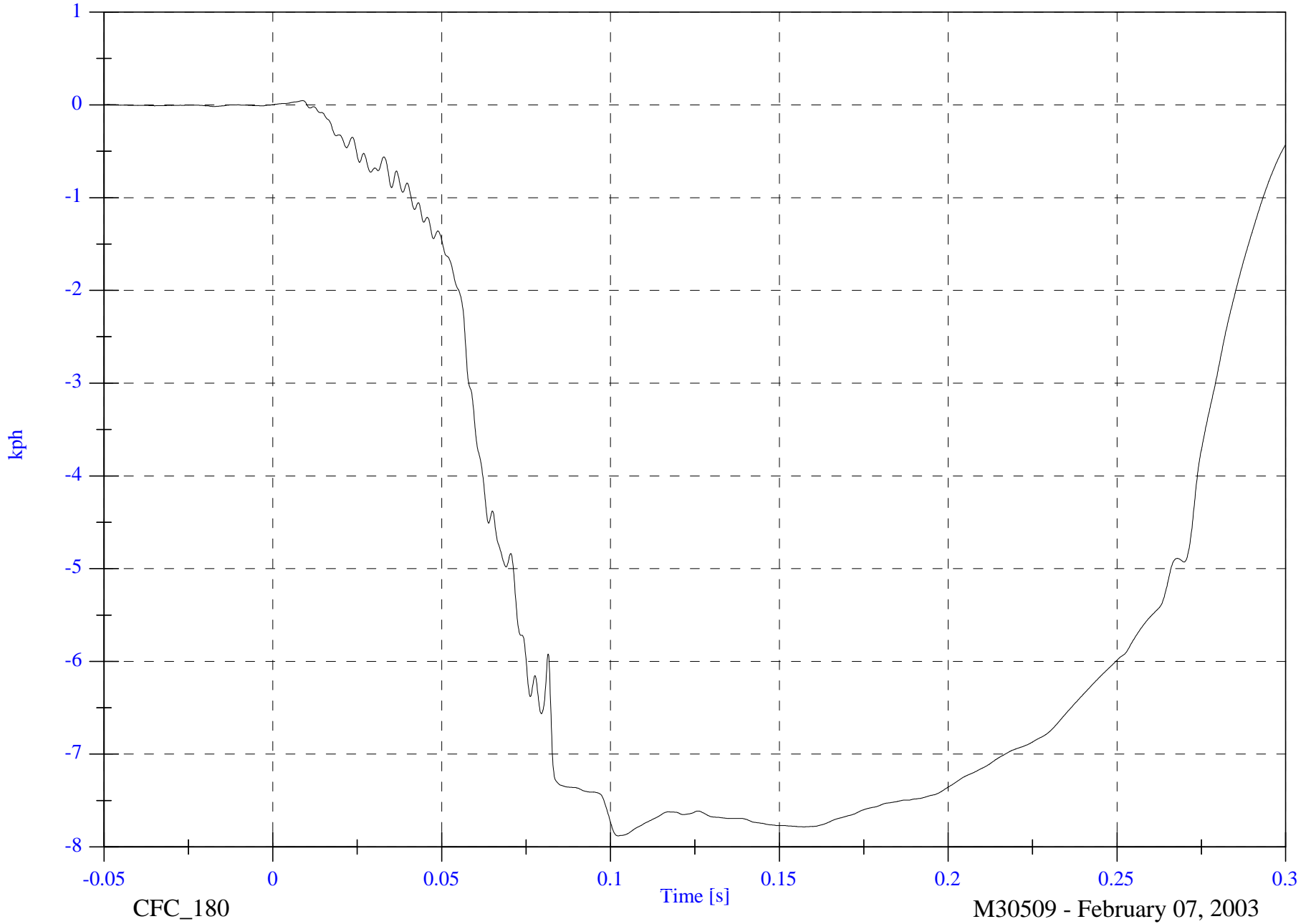
P3 Seat y Velocity

Max: 0.0 [kph] at 0.009 [s]

Min: -7.9 [kph] at 0.102 [s]

4-59

8642-NCAP-29



CFC_180

Time [s]

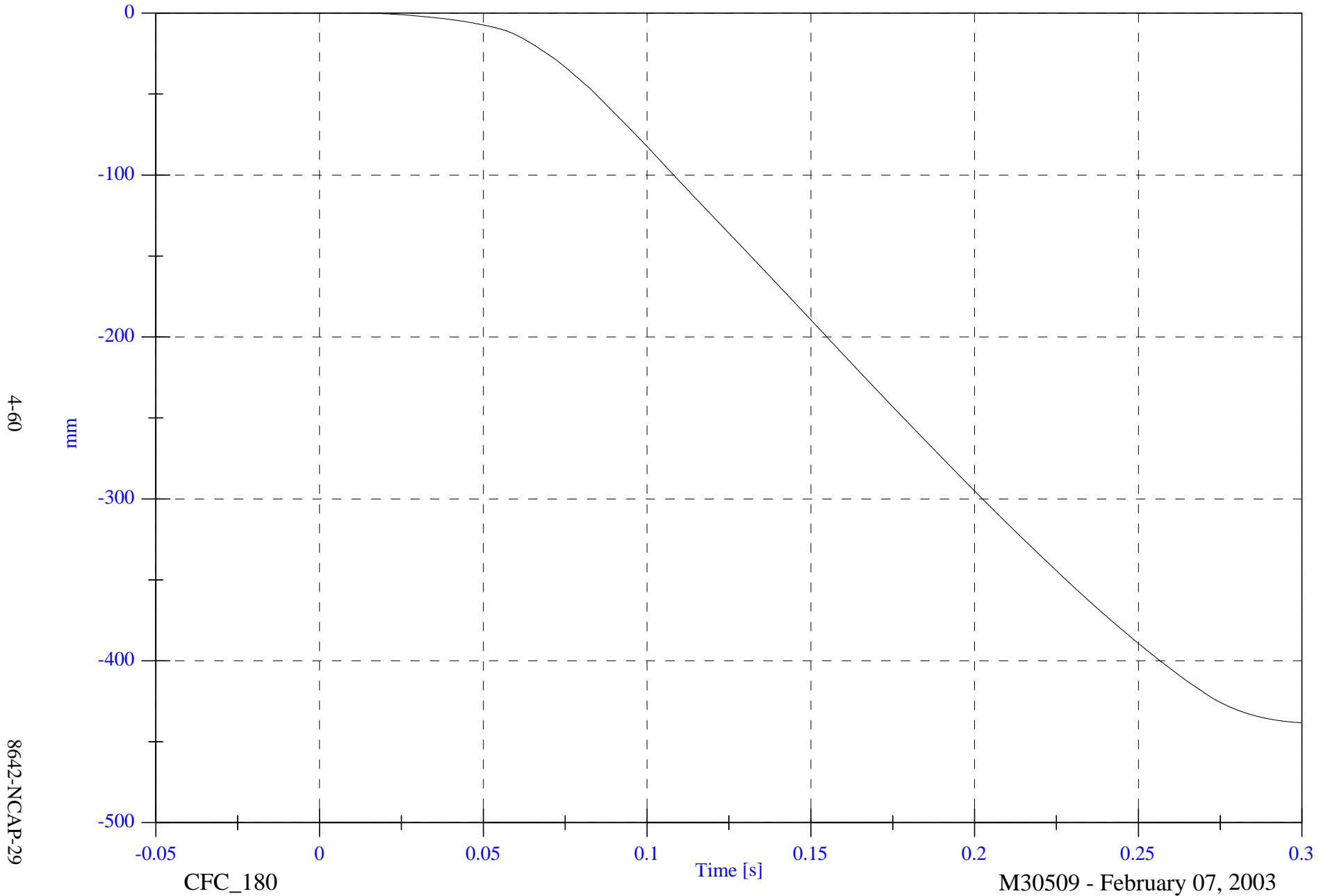
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 0.1 [mm] at -0.046 [s]

Min: -438.3 [mm] at 0.300 [s]

P3 Seat y Displacement



4-60

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

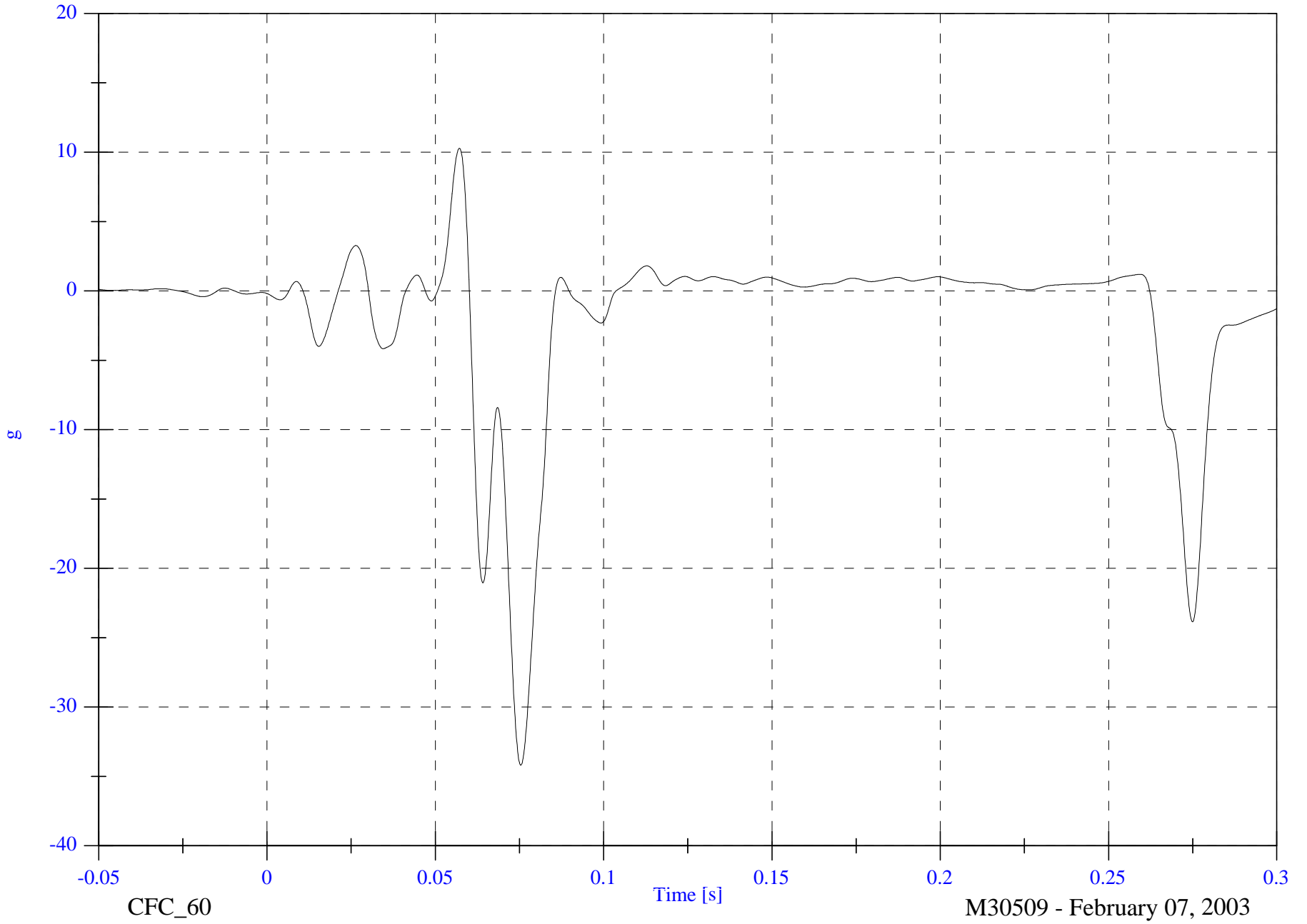
P3 Seat z

Max: 10.3 [g] at 0.057 [s]

Min: -34.2 [g] at 0.075 [s]

4-61

8642-NCAP-29



CFC_60

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

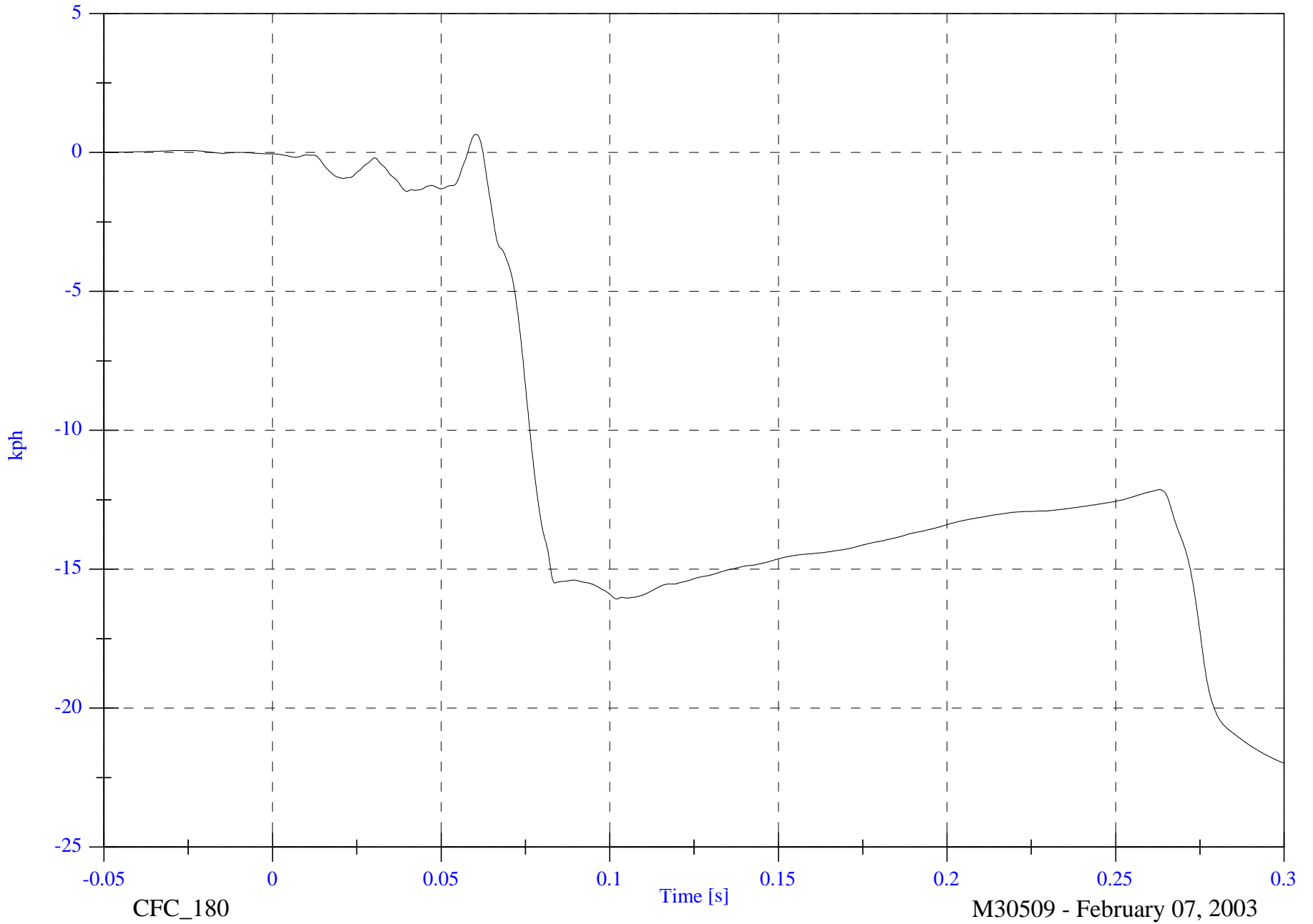
P3 Seat z Velocity

Max: 0.6 [kph] at 0.060 [s]

Min: -22.0 [kph] at 0.300 [s]

4-62

8642-NCAP-29

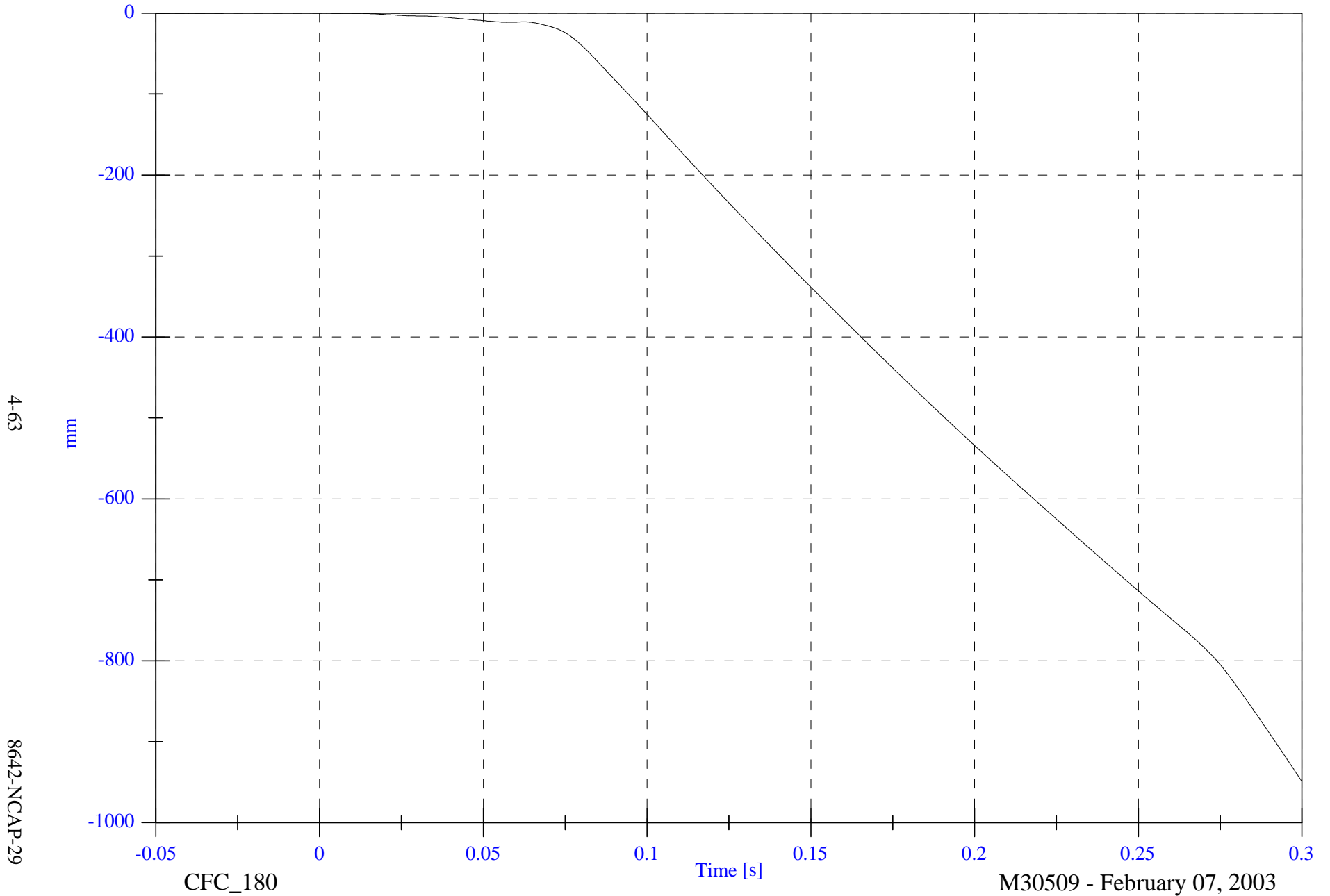


NCAP Test #7 - 2003 Mercedes E320

Max: 0.1 [mm] at -0.018 [s]

Min: -948.8 [mm] at 0.300 [s]

P3 Seat z Displacement



4-63

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

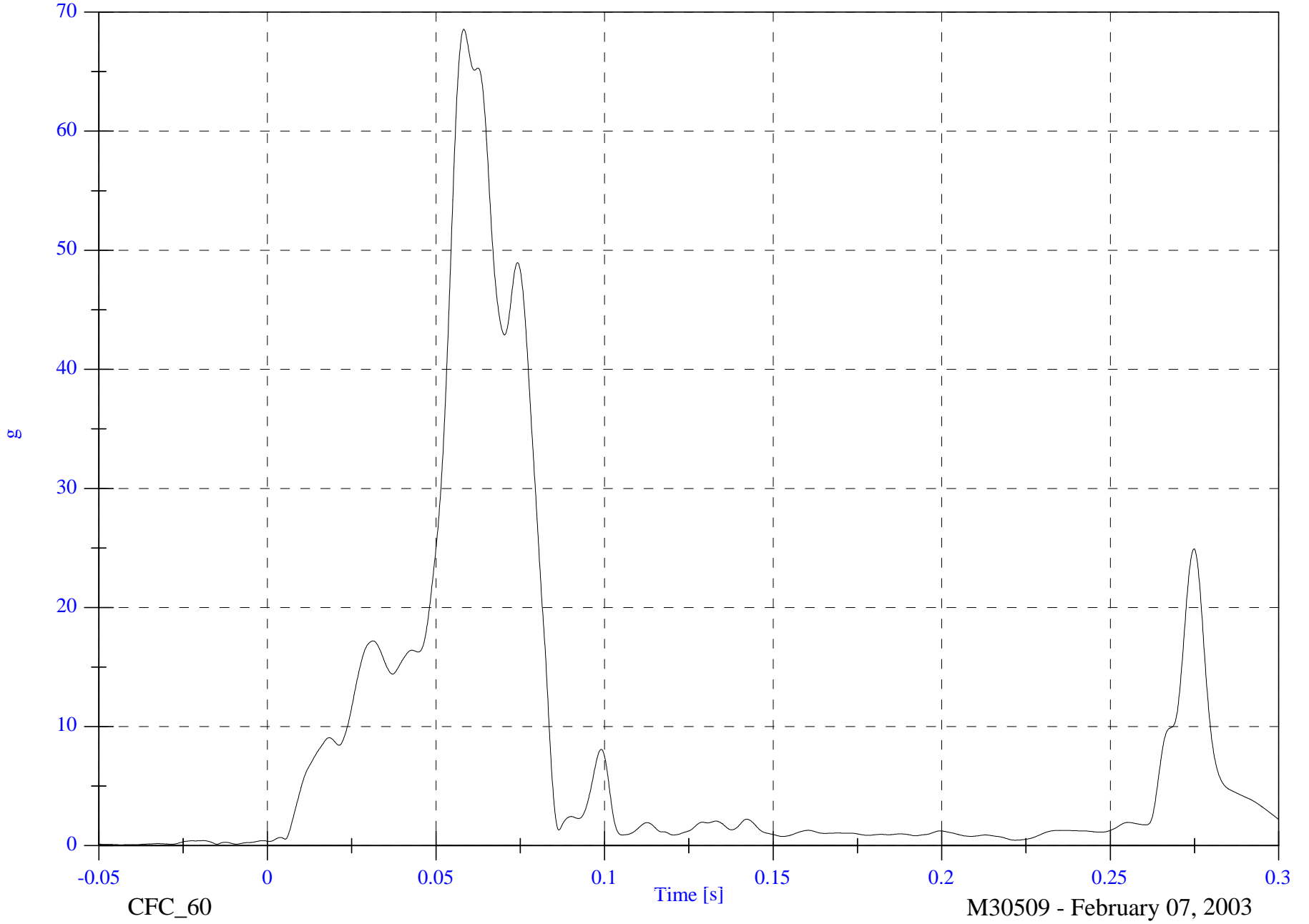
P3 Seat Resultant

Max: 68.6 [g] at 0.058 [s]

Min: 0.1 [g] at -0.043 [s]

4-64

8642-NCAP-29



CFC_60

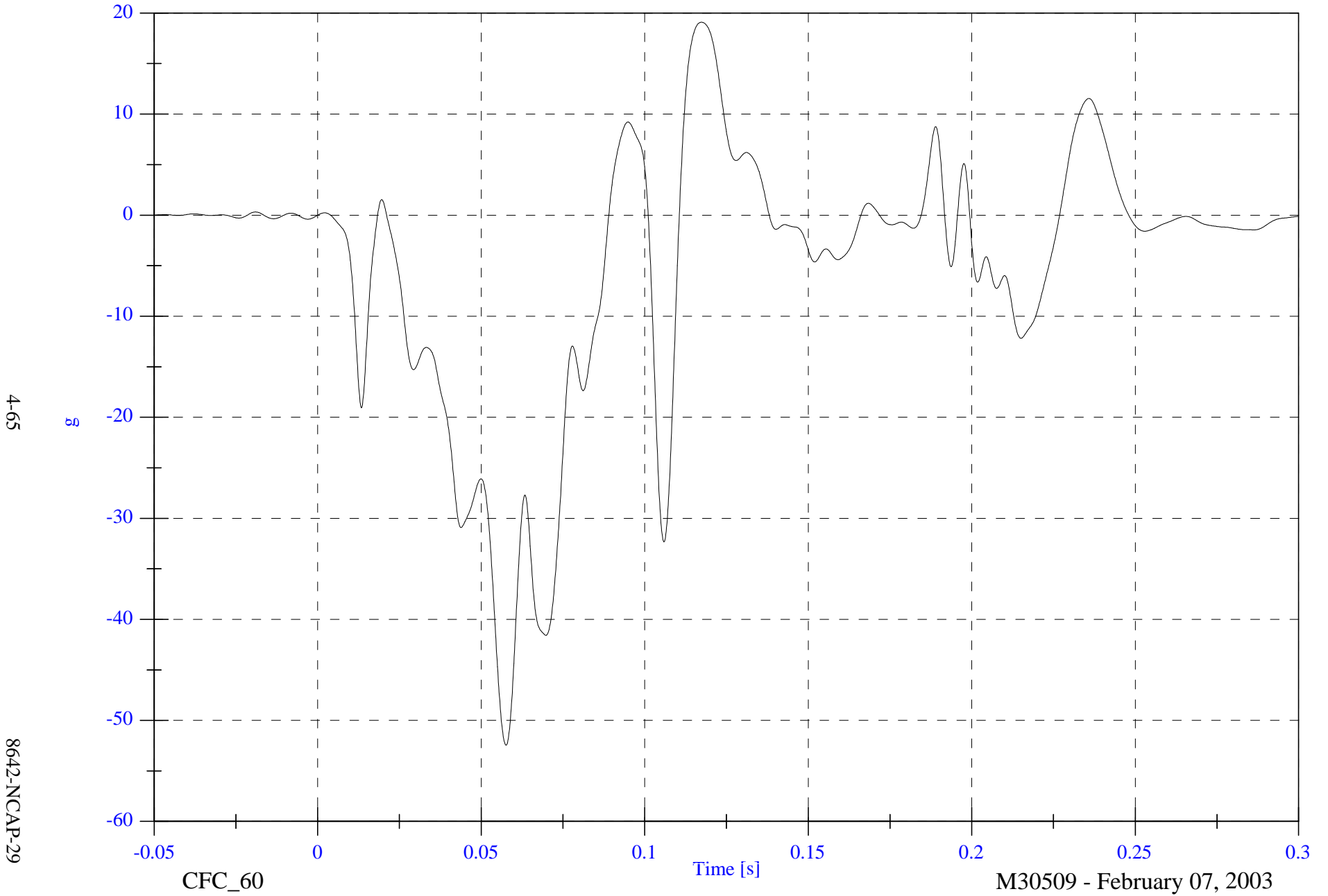
Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 19.1 [g] at 0.117 [s]
Min: -52.5 [g] at 0.058 [s]

P4 Seat x



NCAP Test #7 - 2003 Mercedes E320

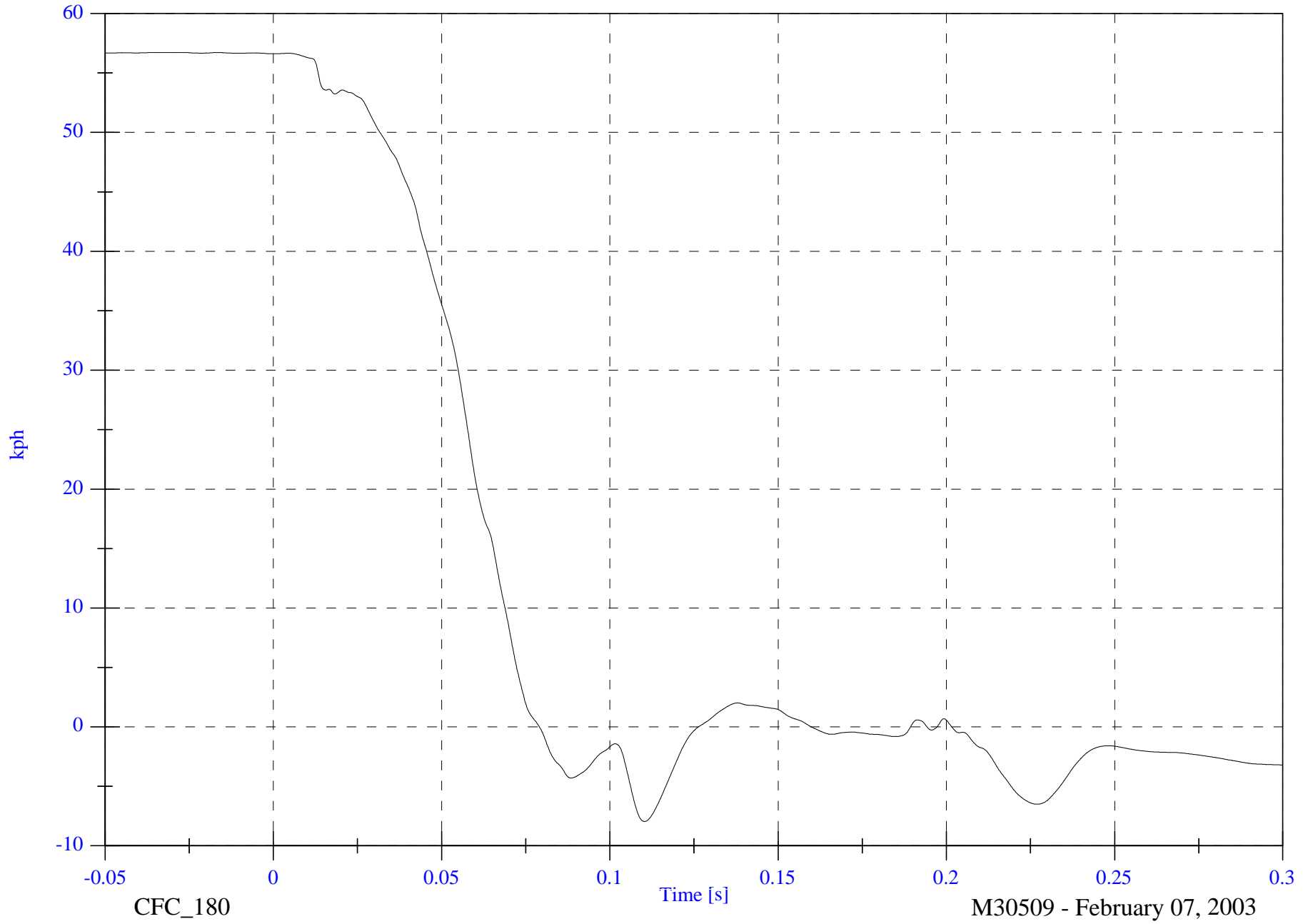
P4 Seat x Velocity

Max: 56.7 [kph] at -0.017 [s]

Min: -8.0 [kph] at 0.110 [s]

4-66

8642-NCAP-29



CFC_180

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

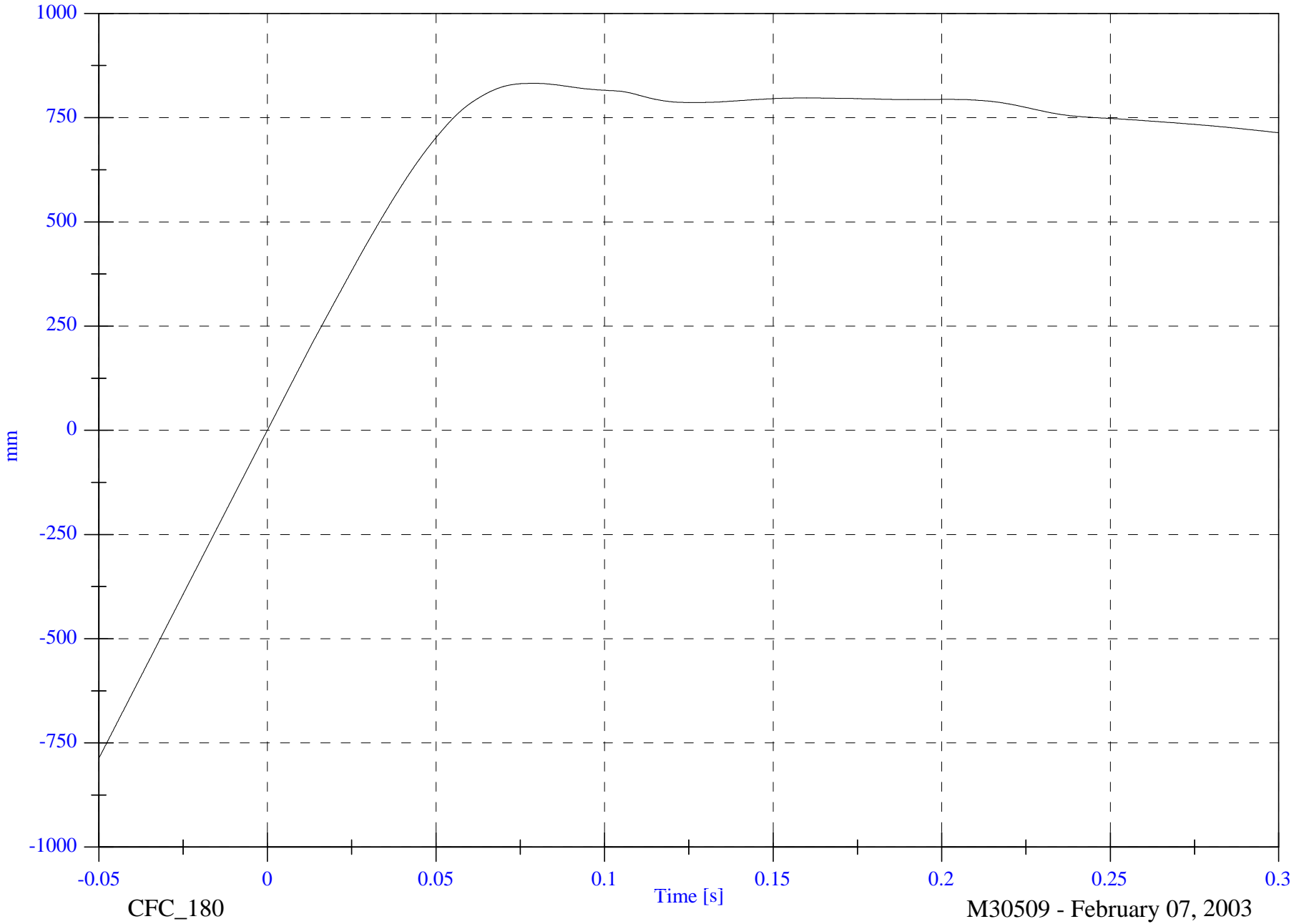
P4 Seat x Displacement

Max: 832.4 [mm] at 0.079 [s]

Min: -787.3 [mm] at -0.050 [s]

4-67

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

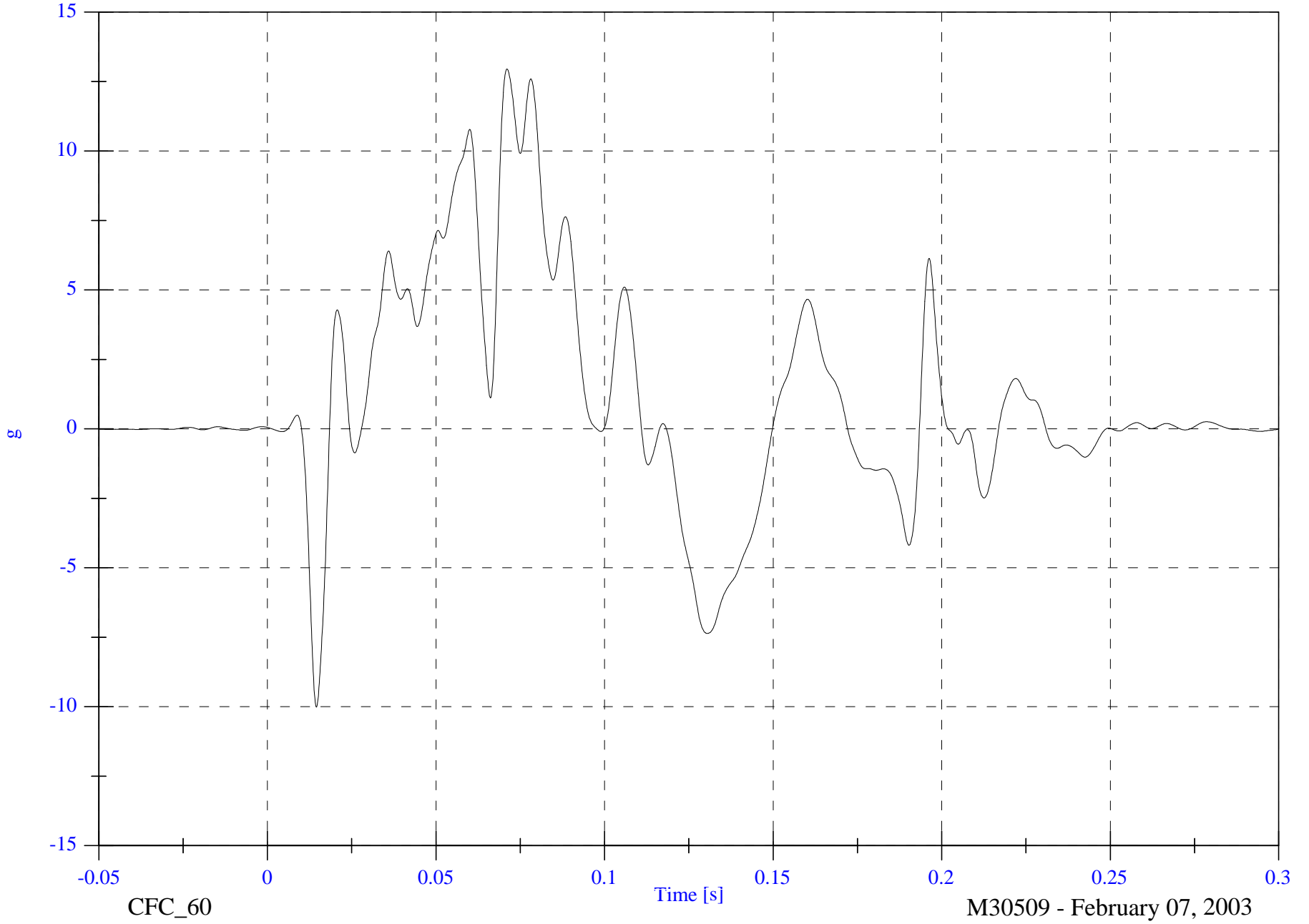
P4 Seat y

Max: 13.0 [g] at 0.071 [s]

Min: -10.0 [g] at 0.015 [s]

4-68

8642-NCAP-29



NCAP Test #7 - 2003 Mercedes E320

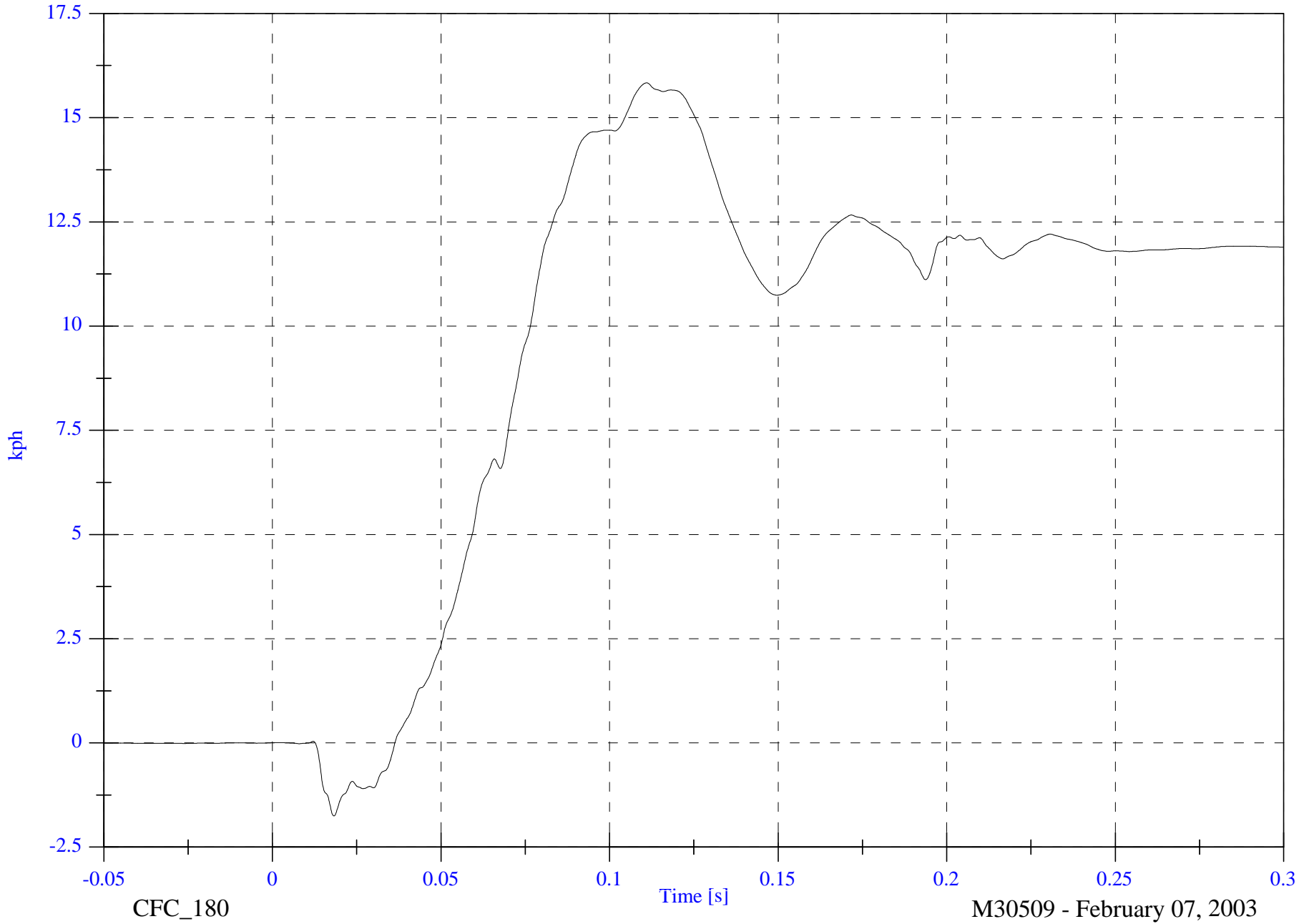
P4 Seat y Velocity

Max: 15.8 [kph] at 0.111 [s]

Min: -1.8 [kph] at 0.018 [s]

4-69

8642-NCAP-29



CFC_180

Time [s]

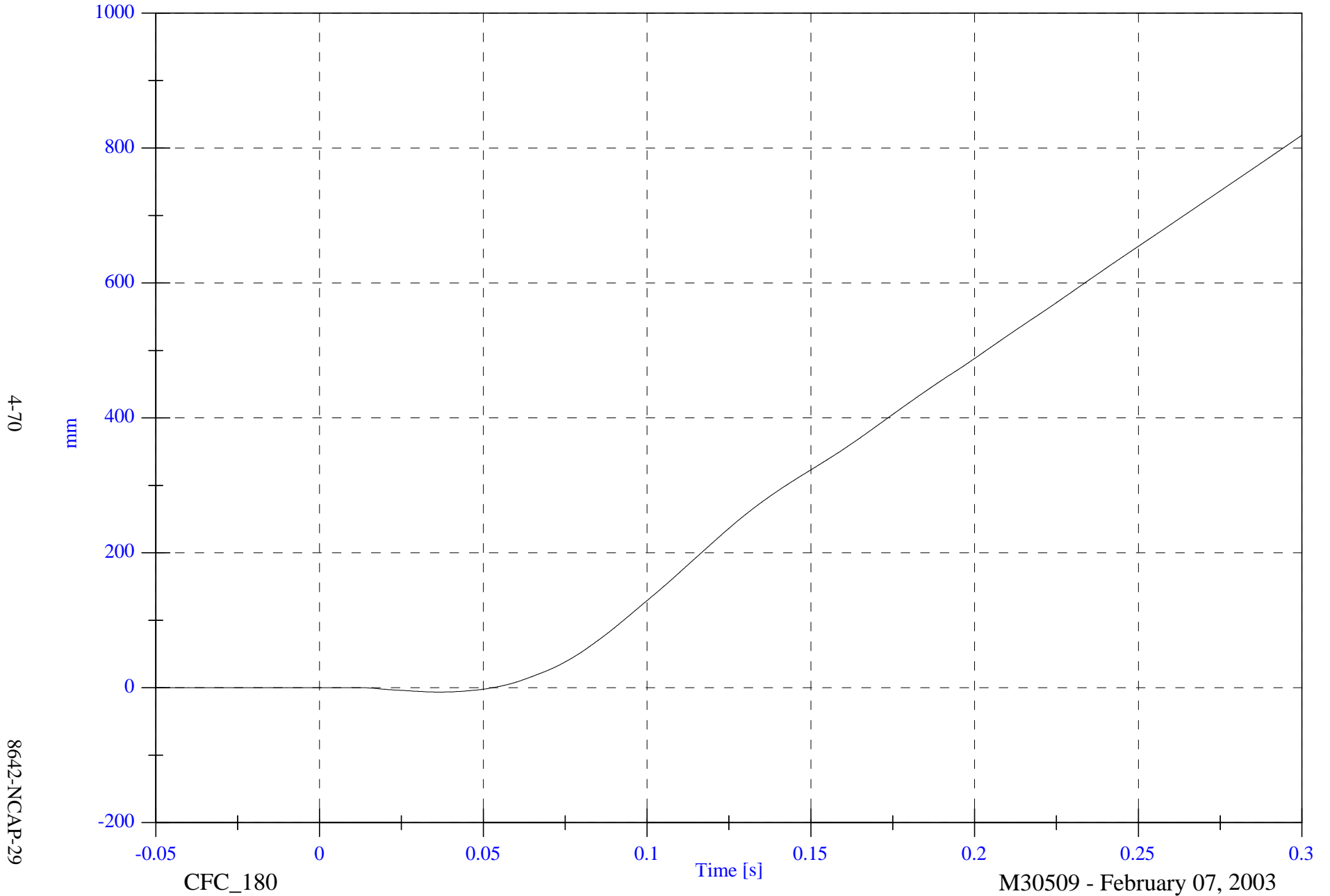
M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

Max: 818.7 [mm] at 0.300 [s]

P4 Seat y Displacement

Min: -6.5 [mm] at 0.036 [s]



4-70

8642-NCAP-29

CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

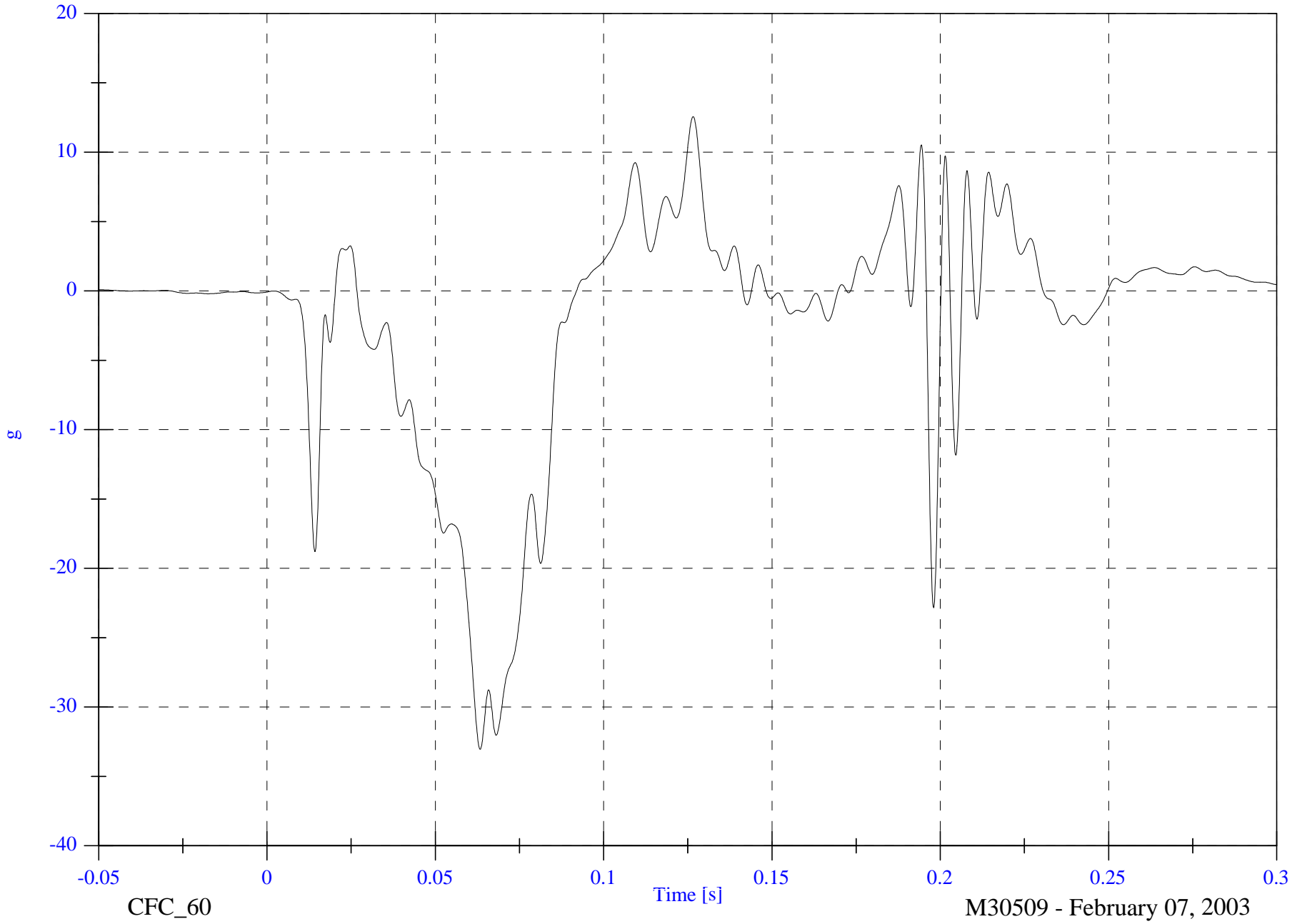
P4 Seat z

Max: 12.6 [g] at 0.127 [s]

Min: -33.0 [g] at 0.063 [s]

4-71

8642-NCAP-29



CFC_60

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

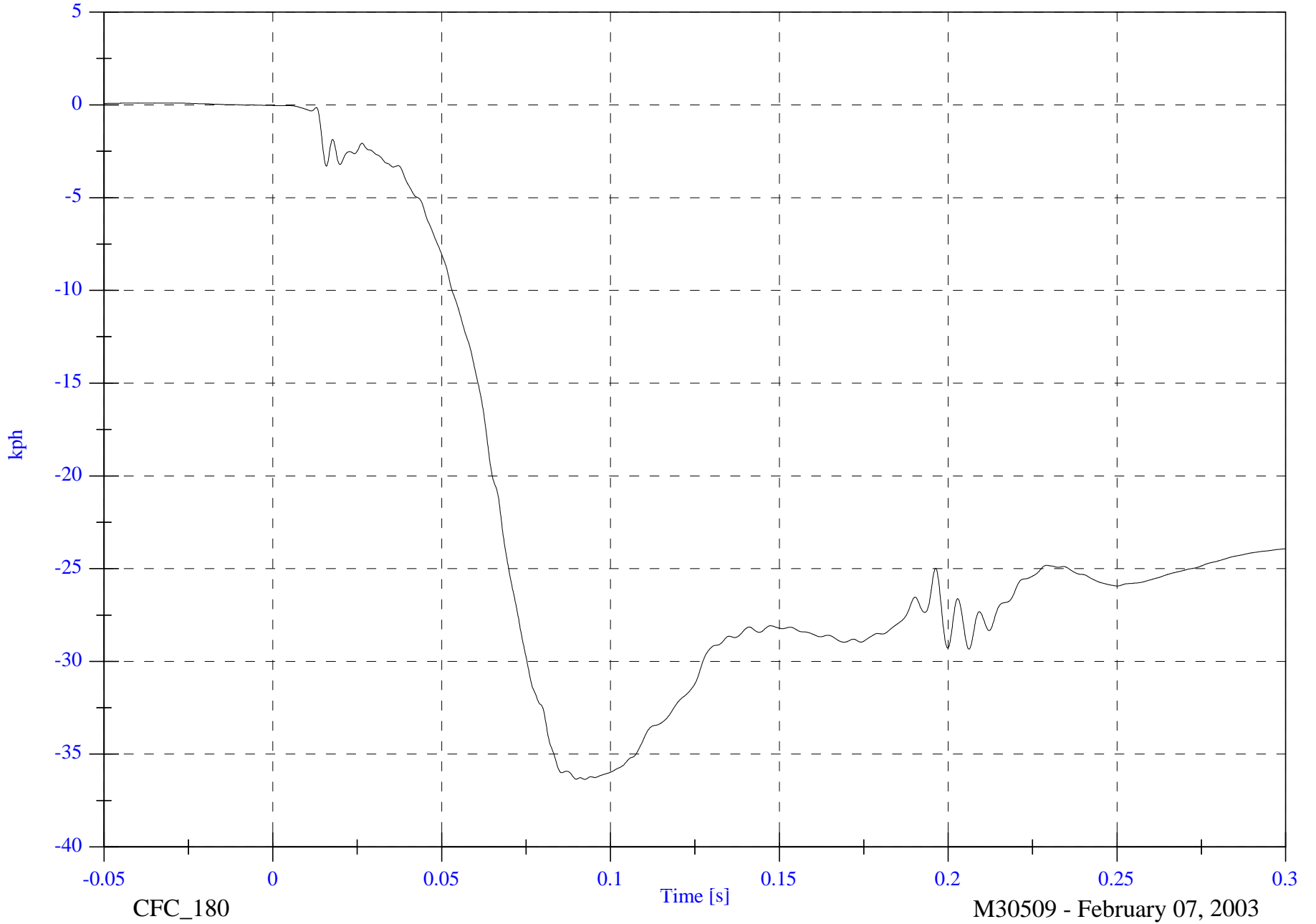
P4 Seat z Velocity

Max: 0.1 [kph] at -0.028 [s]

Min: -36.4 [kph] at 0.092 [s]

4-72

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

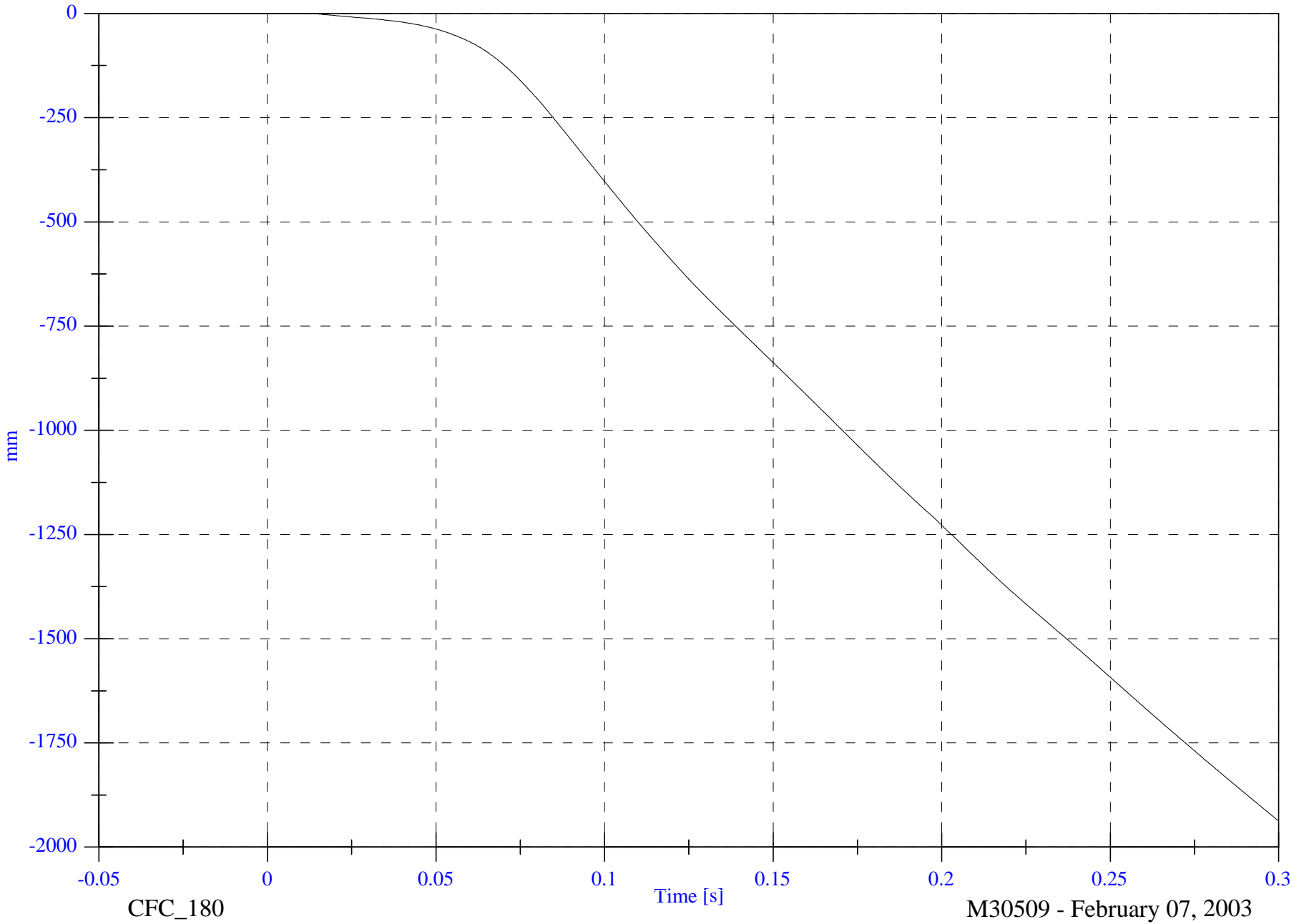
NCAP Test #7 - 2003 Mercedes E320

P4 Seat z Displacement

Max: 0.0 [mm] at -0.010 [s]
Min: -1937.1 [mm] at 0.300 [s]

4-73

8642-NCAP-29



CFC_180

Time [s]

M30509 - February 07, 2003

NCAP Test #7 - 2003 Mercedes E320

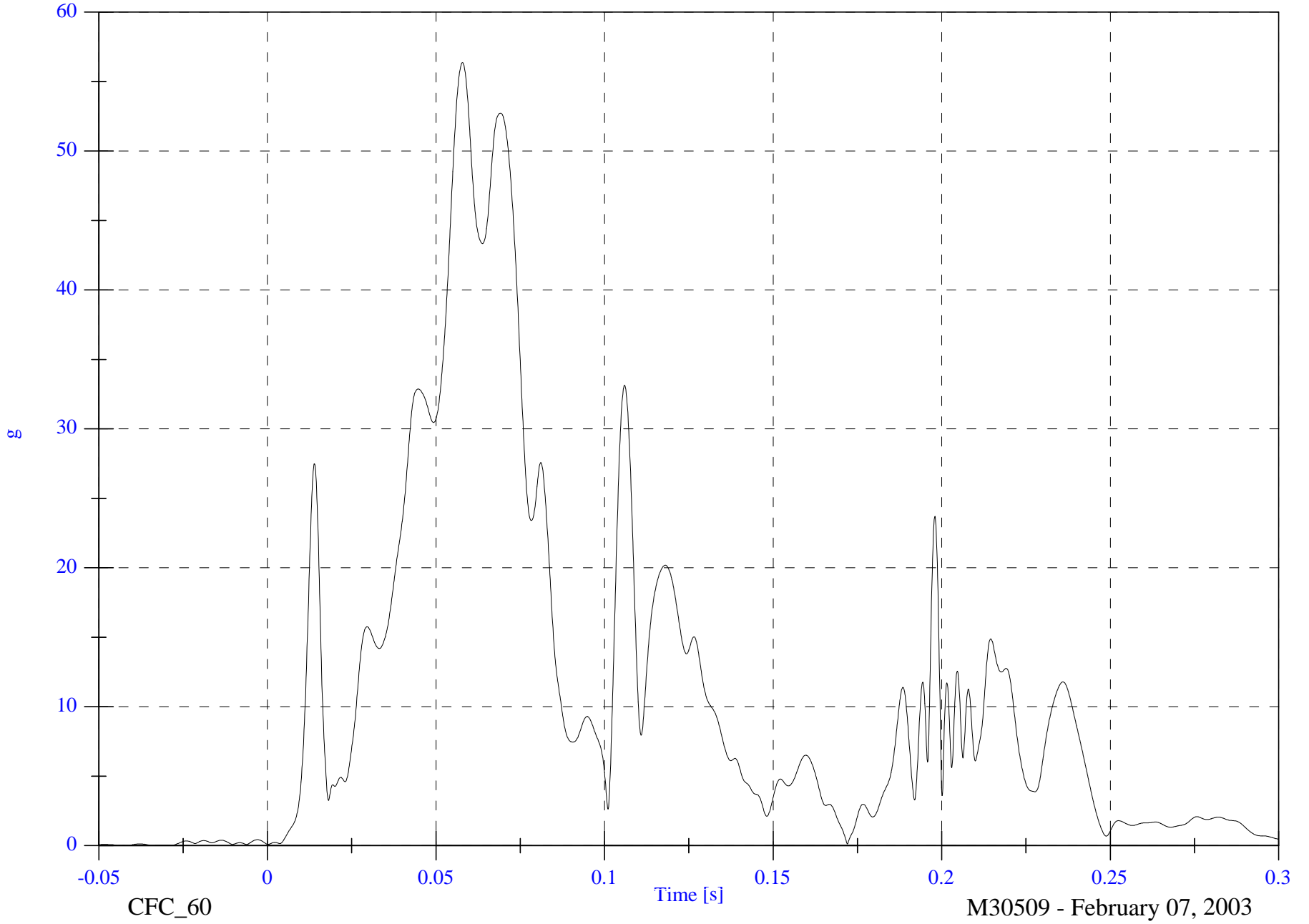
P4 Seat Resultant

Max: 56.4 [g] at 0.058 [s]

Min: 0.0 [g] at -0.034 [s]

4-74

8642-NCAP-29



SECTION 5

CHILD DUMMY CALIBRATION INFORMATION

ATD 144 was certified by VRTC prior to the test program. The certification results are not available electronically.

044 Head Drop

Part 572P Head Drop

Calibration Date: 01-27-03

Serial No: 044

Work File: 044H 01-27-03

-----TEST RESULTS-----

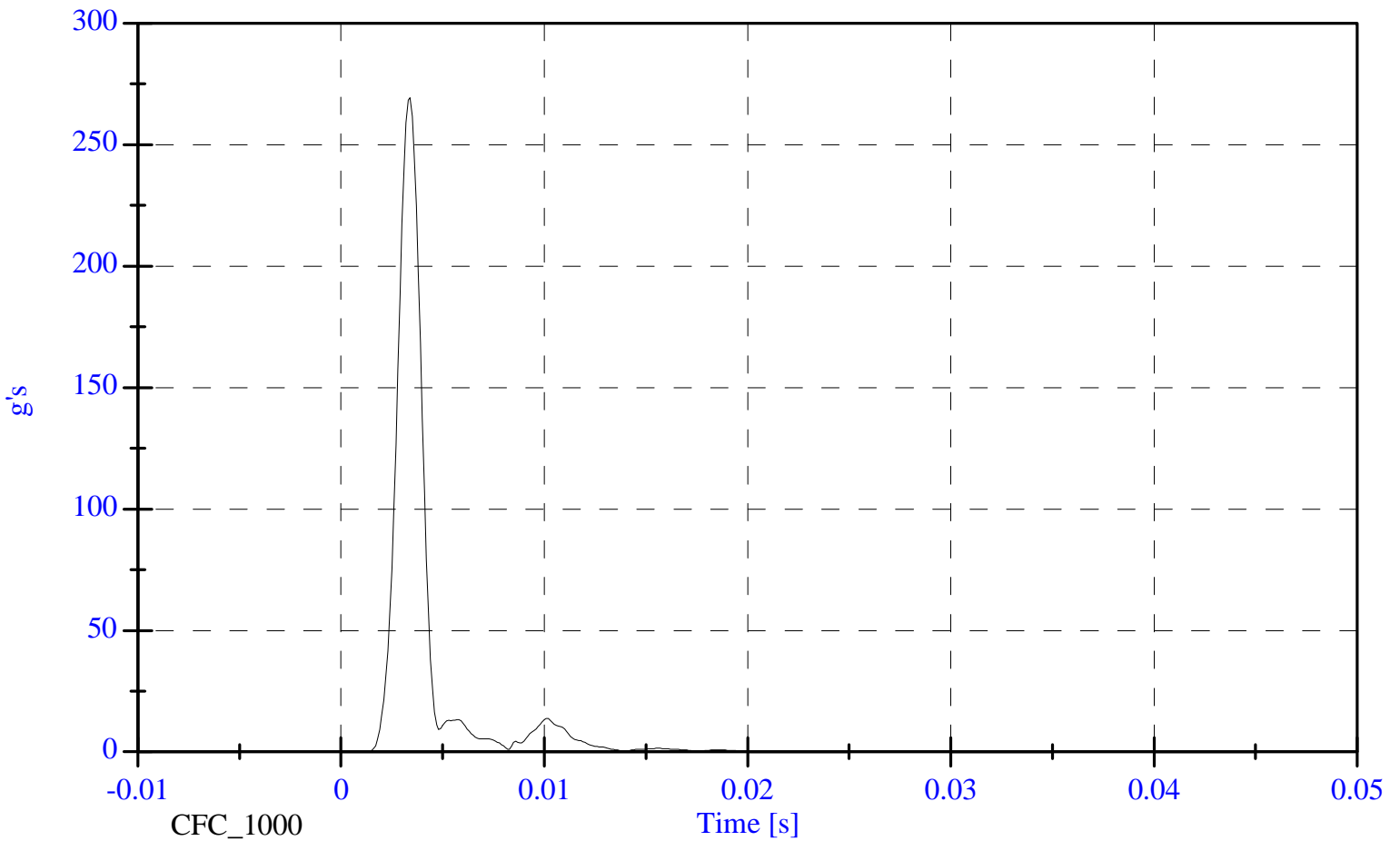
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	66.0-78.0 F	70.0 F	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Peak Resultant Accel.:	250-280 Gs	269.30 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	3.21 Gs	Passed
Curve PerCent NonModal:	< 10%	5.12 %	Passed

044 Head Drop

Head Resultant

Max: 269.3 [g's] at 0.003 [s]

Min: 0.0 [g's] at -0.009 [s]



044 Neck Flexion

Part 572P Neck Flexion Test Calibration Date: 01-27-03
Serial No: 044 Work File: 044N 01-27-03

-----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.11 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Test Pendulum Speed:	5.40- 5.60 m/s	5.43 m/s	Passed

-----PENDULUM PULSE-----

Pulse at 10 ms:	2.00- 2.70 m/s	2.04 m/s	Passed
Pulse at 15 ms:	3.00- 4.00 m/s	3.05 m/s	Passed
Pulse at 20 ms:	4.00- 5.10 m/s	4.25 m/s	Passed

-----D PLANE ROTATION-----

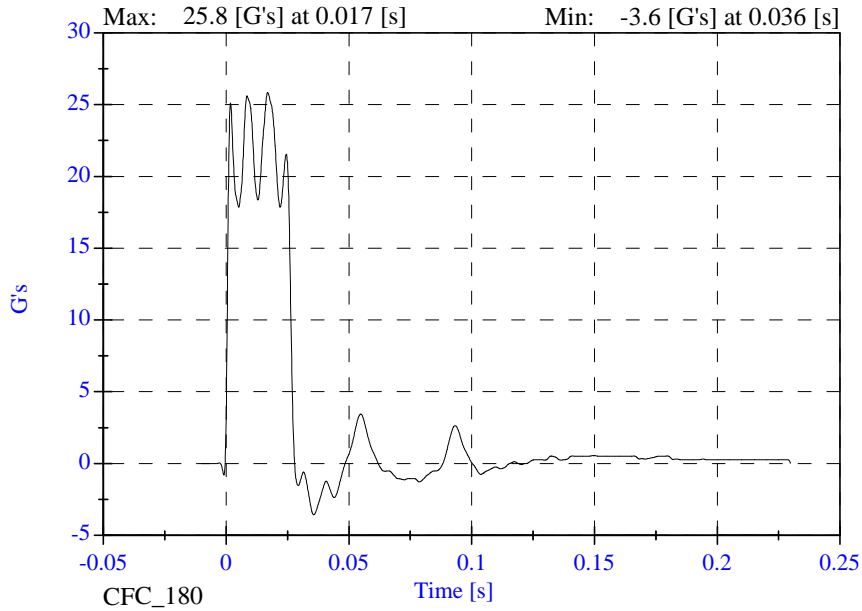
Maximum Rotation:	70.0-82.0 Deg	75.22 Deg	Passed
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-----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	42.00- 53.00 N-m	45.09 N-m	Passed
Occipital Moment Decay:	60.0-80.0 ms	76.10 ms	Passed

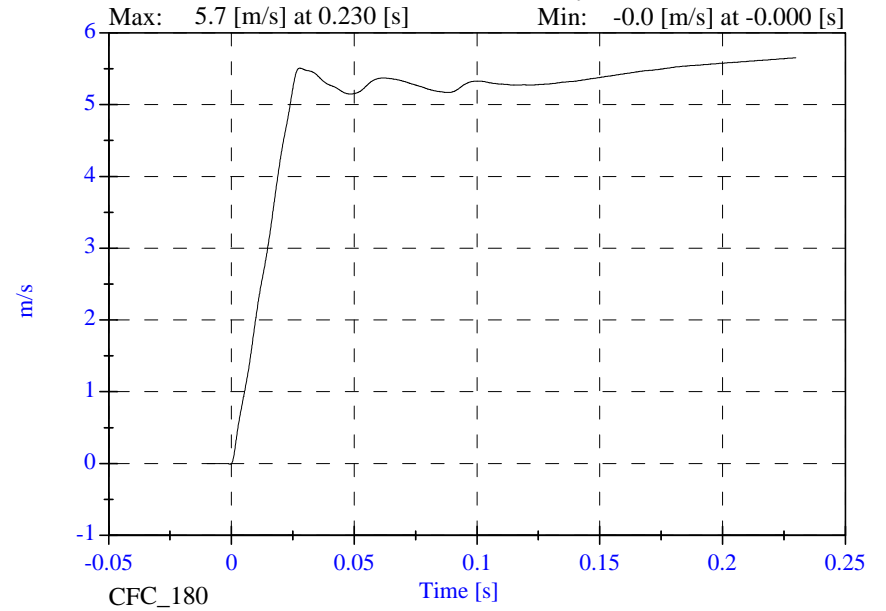
044 Neck Flexion

Pendulum Acceleration

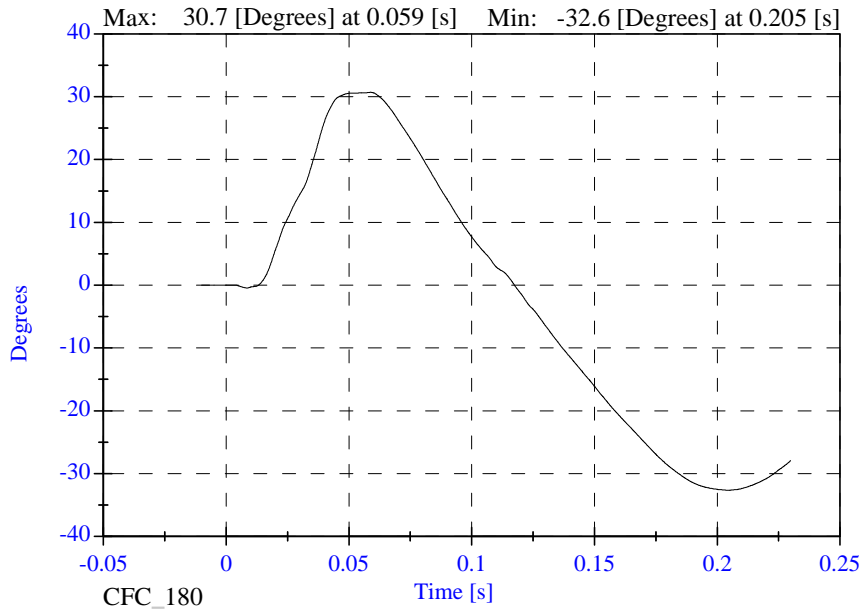


70 - 01-27-03

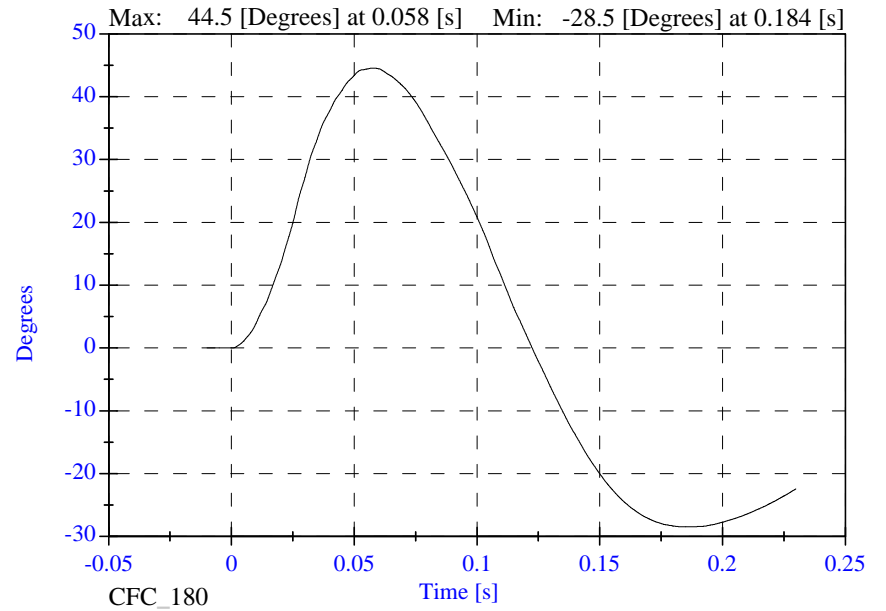
Pendulum Velocity



Head Rotation

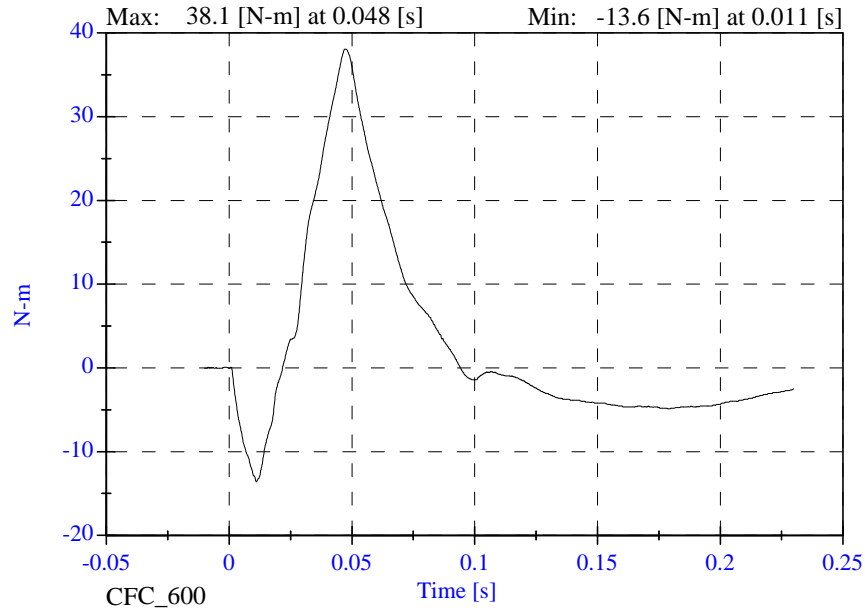


Arm Rotation



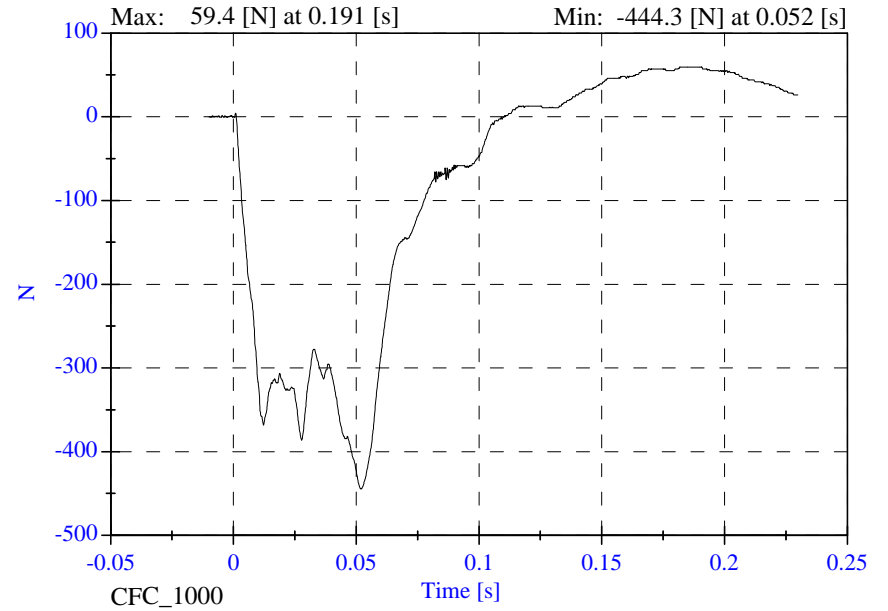
044 Neck Flexion

Neck Moment Y

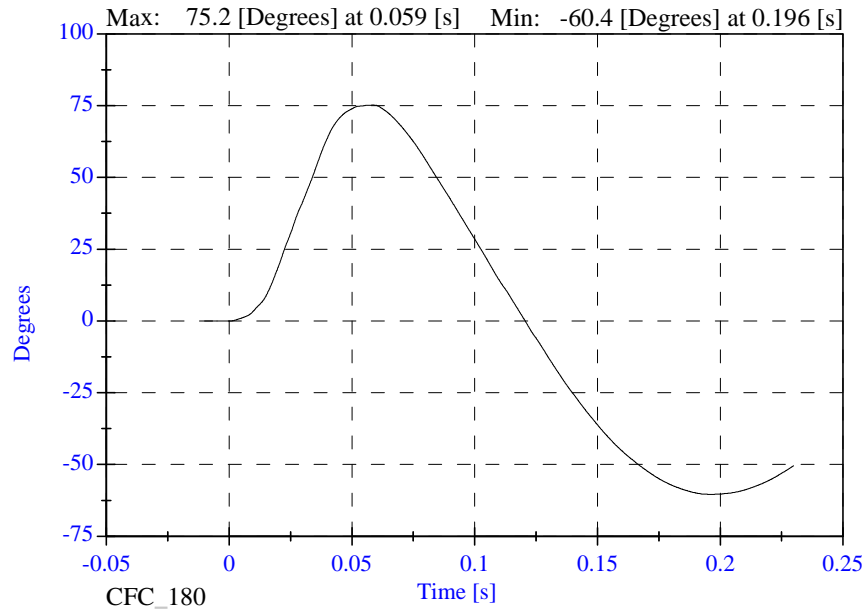


70 - 01-27-03

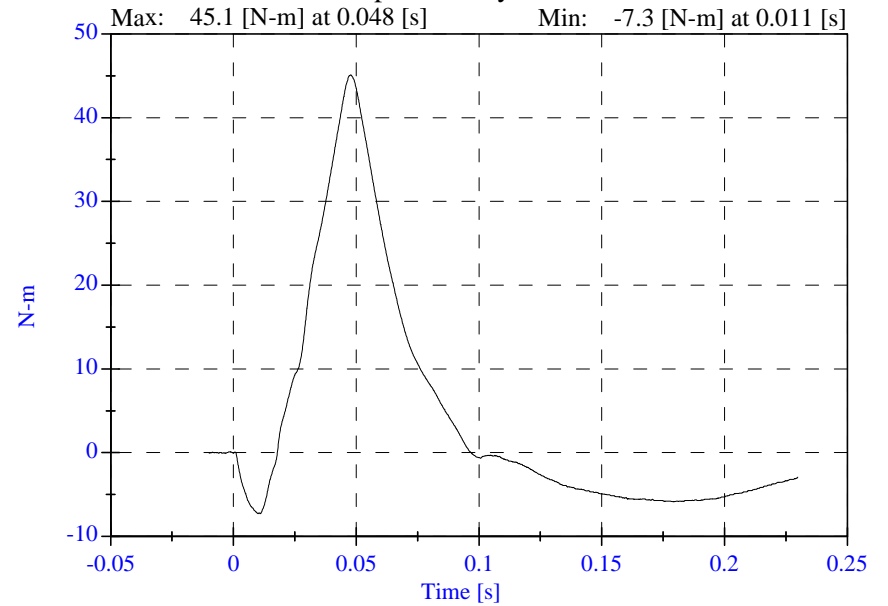
Neck Force X



Total Rotation



Occipital Condyle Moment



044 Neck Extension

Part 572P Neck Extension Test Calibration Date: 01-28-03
Serial No: 044 Work File: 044Ext3 01-28-03

-----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	69.0-72.0 F	71.00 F	Passed
Lab Humidity:	10-70 %	31.00 %	Passed
Test Pendulum Speed:	11.58-12.38 ft/s	12.05 ft/s	Passed

-----PENDULUM PULSE-----

Pulse at 6 ms:	3.30- 4.60 ft/s	3.69 ft/s	Passed
Pulse at 10 ms:	6.20- 8.20 ft/s	6.62 ft/s	Passed
Pulse at 14 ms:	9.20-11.50 ft/s	9.32 ft/s	Passed

-----D PLANE ROTATION-----

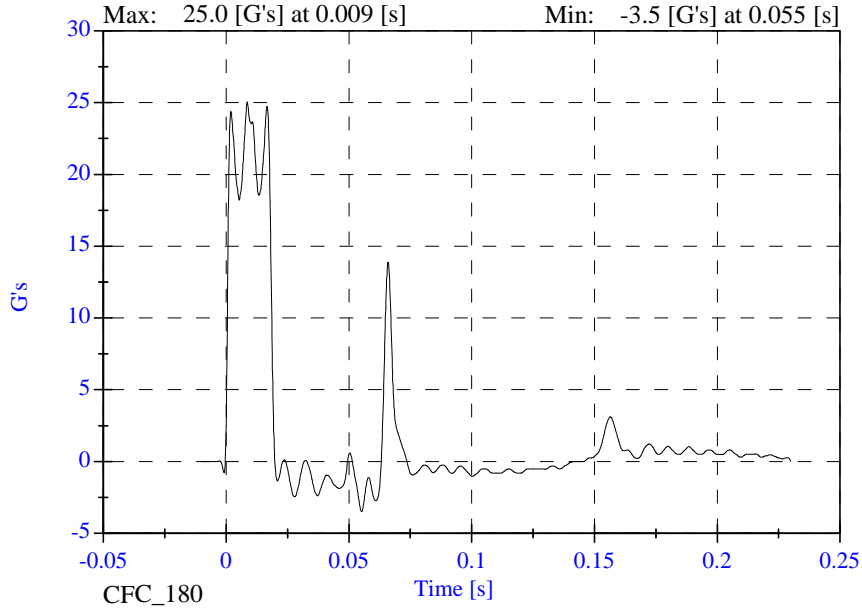
Maximum Rotation:	83.0-93.0 Deg	83.96 Deg	Passed
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-----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	-53.30--43.70 N-m	-51.96 N-m	Passed
Occipital Moment Decay:	60.0-80.0 ms	74.40 ms	Passed

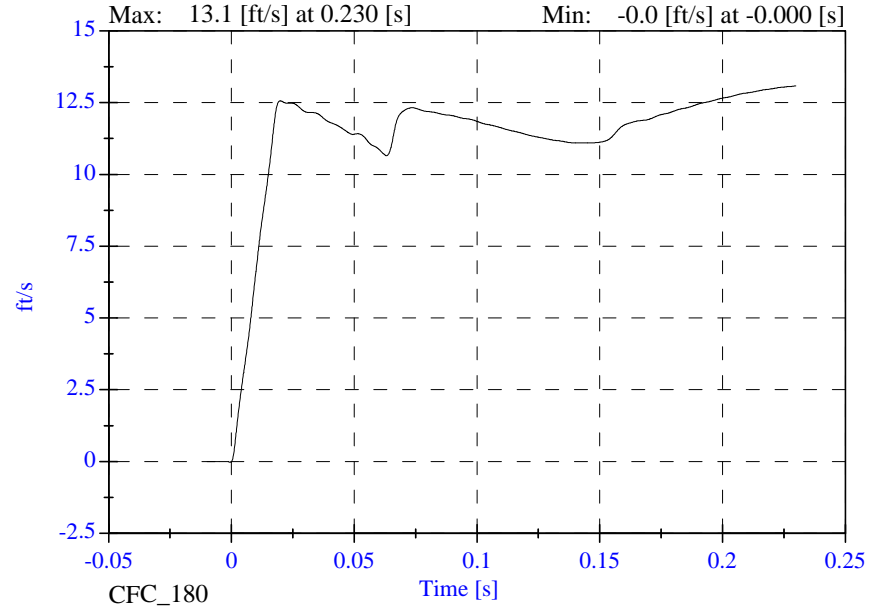
044 Neck Extension

Pendulum Acceleration

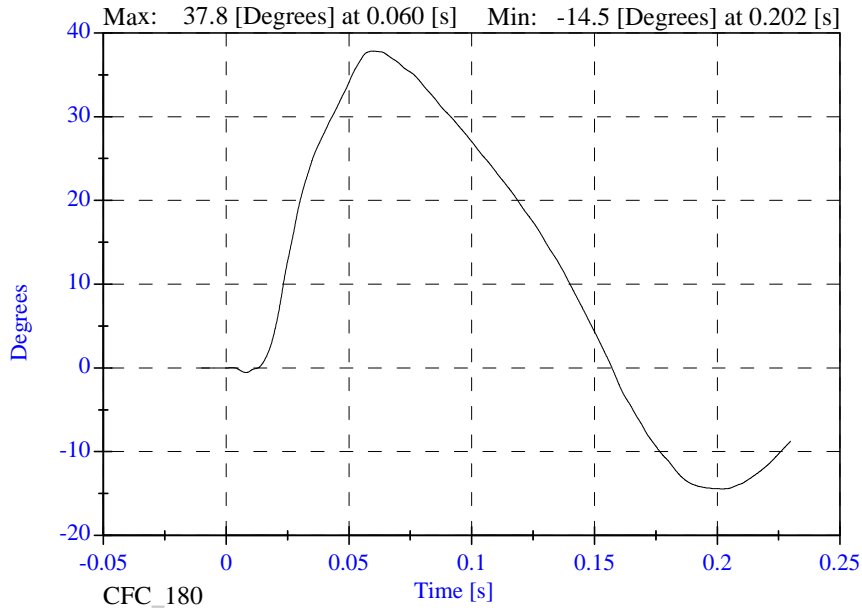


71 - 01-28-03

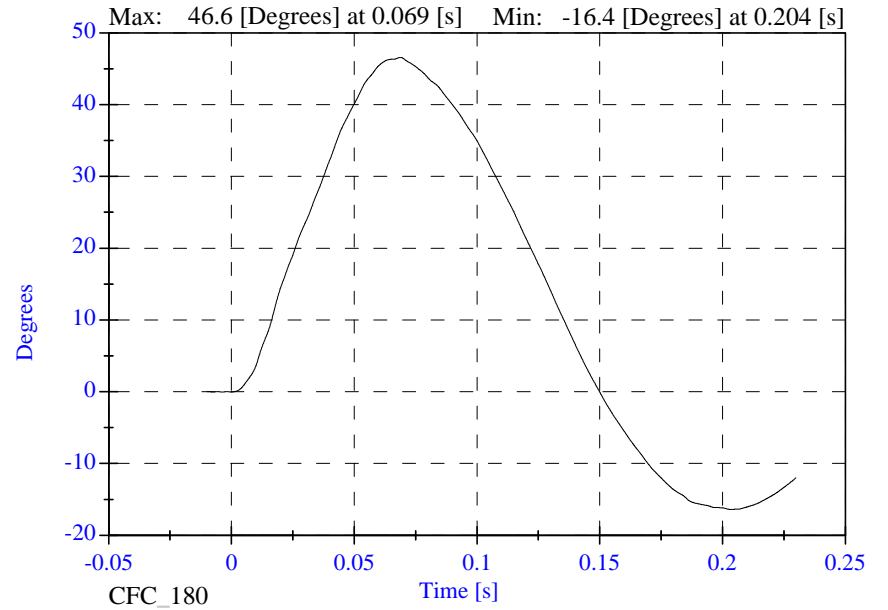
Pendulum Velocity



Head Rotation

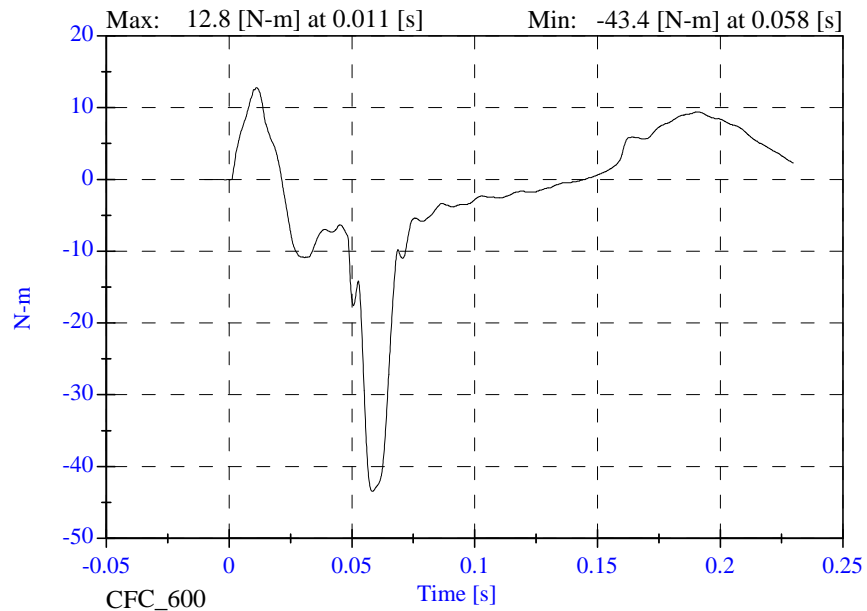


Arm Rotation



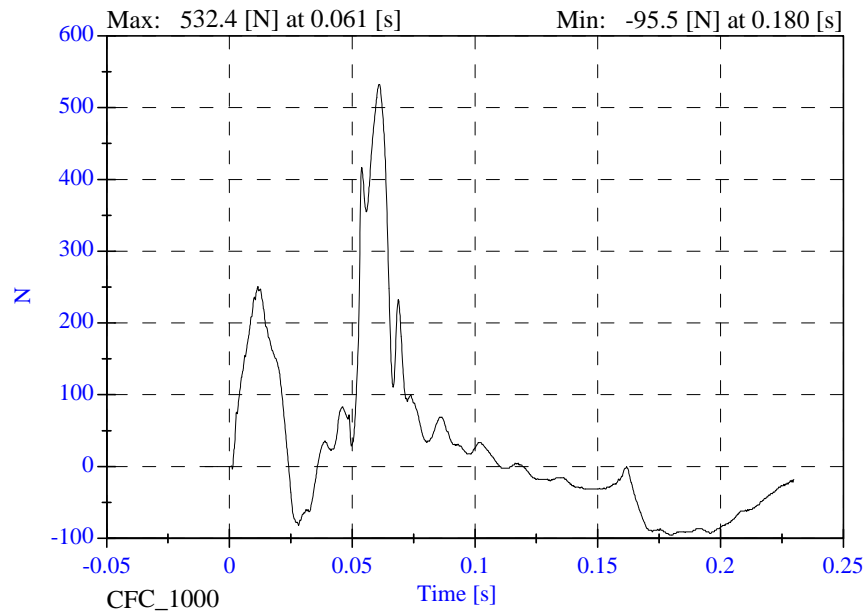
044 Neck Extension

Neck Moment Y

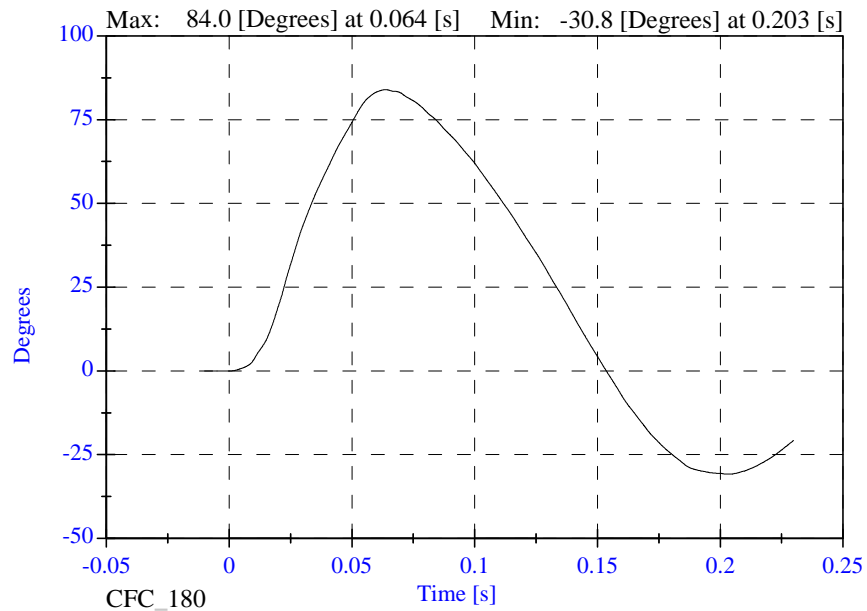


71 - 01-28-03

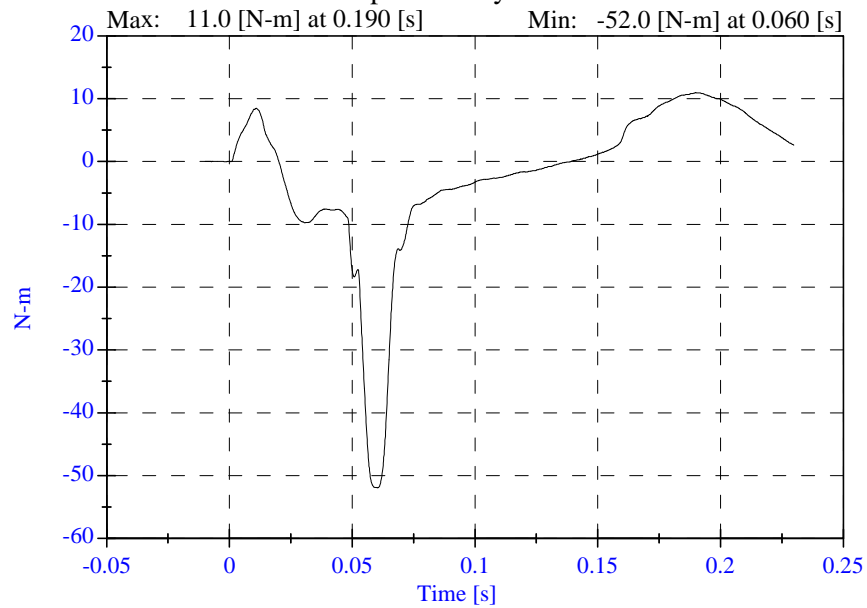
Neck Force X



Total Rotation



Occipital Condyle Moment



044 Chest Impact

Part 572P Thorax Impact

Calibration Date: 01-28-03

Serial No: 044

Work File: 044T1 01-28-03

-----TEST RESULTS-----

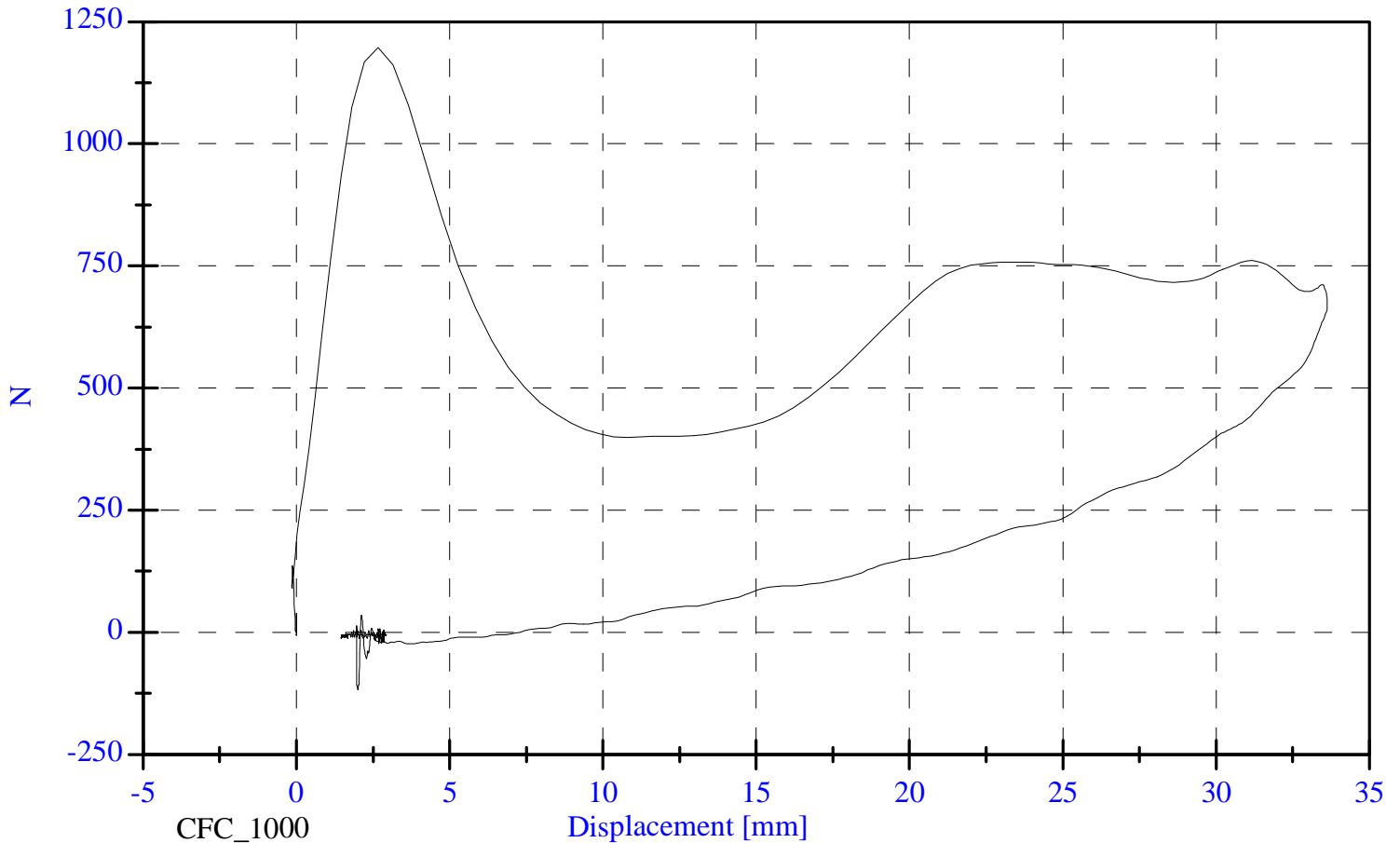
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Pendulum Velocity:	5.90- 6.10 m/s	5.94 m/s	Passed
Maximum Deflection:	32.00-38.00 mm	33.62 mm	Passed
Maximum Res. Force:	680.00- 810.00 N	740.30 N	Passed
Internal Hysteresis:	65-85 %	76.47 %	Passed
Pass Sternum Force Criteria?:	860.00 N	760.89	Passed

044 Chest Impact

Probe Force vs. Displacement

Max: 1196.8 [N] at 2.669 [mm]

Min: -117.8 [N] at 2.005 [mm]



044 Lumbar Spi ne Fl exi on Spi ne_Fl exi on_test. txt

Date: 1-28-03

Result: 45 degrees - 38.8 lbf

Certified By: B. Swi eci cki Date: 01-28-03

SECTION 6

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

P572 HYBRID III 3C INSTRUMENTATION

	POSITION #3 (RIGHT) SERIAL NO.: 044		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	ENDEVCO	AC-P17912	11-Nov-02
HEAD AY	ENDEVCO	AC-P17743	11-Nov-02
HEAD AZ	ENDEVCO	AC-P15319	11-Nov-02
UPPER NECK FX	DENTON	LC-248-FX	15-Oct-02
UPPER NECK FY	DENTON	LC-248-FY	15-Oct-02
UPPER NECK FZ	DENTON	LC-248-FZ	15-Oct-02
UPPER NECK MX	DENTON	LC-248-MX	15-Oct-02
UPPER NECK MY	DENTON	LC-248-MY	15-Oct-02
UPPER NECK MZ	DENTON	LC-248-MZ	15-Oct-02
LOWER NECK FX	DENTON	LC-249-FX	15-Oct-02
LOWER NECK FY	DENTON	LC-249-FY	15-Oct-02
LOWER NECK FZ	DENTON	LC-249-FZ	15-Oct-02
LOWER NECK MX	DENTON	LC-249-MX	15-Oct-02
LOWER NECK MY	DENTON	LC-249-MY	15-Oct-02
LOWER NECK MZ	DENTON	LC-249-MZ	15-Oct-02
CHEST AX	ENDEVCO	AC-P15334	11-Nov-02
CHEST AY	ENDEVCO	AC-P15321	11-Nov-02
CHEST AZ	ENDEVCO	AC-P17758	11-Nov-02
CHEST DISPLACEMENT X	SERVO	DS-044	12-Nov-02
PELVIS AX	ENDEVCO	AC-P16755	11-Nov-02
PELVIS AY	ENDEVCO	AC-P15591	11-Nov-02
PELVIS AZ	ENDEVCO	AC-P16155	11-Nov-02

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

P572 HYBRID III 6C INSTRUMENTATION

POSITION #4 (LEFT) SERIAL NO.: 144			
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	ENTRAN	AC-02I02I10-N25	13-Nov-02
HEAD AY	ENTRAN	AC-02I02I10-N09	13-Nov-02
HEAD AZ	ENTRAN	AC-02I02I10-N17	13-Nov-02
UPPER NECK FX	DENTON	LC-1037Fx	05-Dec-02
UPPER NECK FY	DENTON	LC-1037Fy	05-Dec-02
UPPER NECK FZ	DENTON	LC-1037Fz	05-Dec-02
UPPER NECK MX	DENTON	LC-1037Mx	05-Dec-02
UPPER NECK MY	DENTON	LC-1037My	05-Dec-02
UPPER NECK MZ	DENTON	LC-1037Mz	05-Dec-02
CHEST AX	ENTRAN	AC-02I02I10-N04	14-Nov-02
CHEST AY	ENTRAN	AC-02I02I10-N15	14-Nov-02
CHEST AZ	ENTRAN	AC-02I02I24-N07	14-Nov-02
CHEST DISPLACEMENT X	SERVO	DS-144	22-Jan-03
PELVIS AX	ENTRAN	AC-02I02I10-N01	13-Nov-02
PELVIS AY	ENTRAN	AC-02I02I10-N02	13-Nov-02
PELVIS AZ	ENTRAN	AC-02A16-A28	12-Dec-02
LAP BELT LOAD	LEBOW	LC-712	12-Nov-02

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE AND MDB INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
P3 CRS (X)	ENDEVCO	AC-P17255	19-Aug-02
P3 CRS (Y)	ENDEVCO	AC-P17145	19-Aug-02
P3 CRS (Z)	ENDEVCO	AC-P16813	19-Aug-02
P4 CRS (X)	ENDEVCO	AC-J32383	21-Jan-03
P4 CRS (Y)	ENDEVCO	AC-J29805	21-Jan-03
P4 CRS (Z)	ENDEVCO	AC-J25745	21-Jan-03

REMARKS: None