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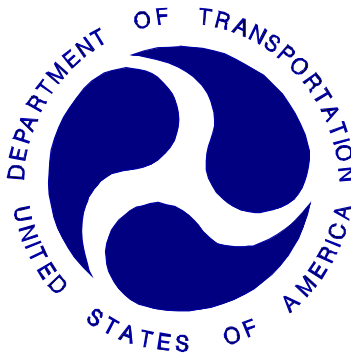
**NEW CAR ASSESSMENT PROGRAM (NCAP)  
FRONTAL BARRIER IMPACT TEST**

GENERAL MOTORS CORP.  
2003 CHEVROLET SUBURBAN  
MPV

NHTSA NUMBER: M30108

VERIDIAN TEST NUMBER: 8642-NCAP-36

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



March 26, 2003

FINAL REPORT

PREPARED FOR:

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

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FINAL REPORT ACCEPTANCE BY OCS:

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

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Date of Report Acceptance

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

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Date of Report Acceptance

**TECHNICAL REPORT STANDARD TITLE PAGE**

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				14. <i>Sponsoring Agency Code</i> NVS-111	
15. <i>Supplementary Notes</i>					
16. <i>Abstract</i>  A frontal load cell barrier test of a 2003 Chevrolet Suburban MPV was performed at Veridian Engineering crash test facility in Buffalo, New York, on March 26, 2003. The impact velocity was 56.3 kph and the temperature at the barrier face was 21.1 °C. The maximum post-test vehicle crush was 569 mm. The test vehicle was equipped with 3-point restraint systems, 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.					
<b>ATD Position</b>	<b>HIC</b>	<b>Clip (g's)</b>	<b>Chest Disp (mm)</b>	<b>Left Femur (N)</b>	<b>Right Femur (N)</b>
<b>Driver (150)</b>	632.5	48.7	30.1	5209.5	9248.4
<b>Passenger (245)</b>	902.7	52.3	27.2	5857.2	5141.8
17. <i>Key Words</i> 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)				18. <i>Distribution Statement</i> <u>Copies of this report are available from:</u> NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, DC 20590	
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## SECTION 1

### PURPOSE AND SUMMARY OF TEST

#### 1.1 PURPOSE

This 56.3 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 56.3 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

#### 1.2 TEST PROCEDURE

This 56.3 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. 150) and the right-front passenger (position 2) ATD (Serial No.245) were calibrated previous to this test. 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 139 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 Chevrolet Suburban MPV at a velocity of 56.3 kph. The test was performed at Veridian Engineering on March 26, 2003. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The occupant data is summarized below.

	<b>HIC</b>	<b>Clip (g)</b>	<b>Chest Disp. (mm)</b>	<b>Left Femur (N)</b>	<b>Right Femur (N)</b>	<b>Belt Spool (mm)</b>	<b>Belt Stretch (mm/50 mm)</b>
<b>Driver ATD</b>	632.5	48.7	30.1	5209.5	9248.4	83	0
<b>Passenger ATD</b>	902.7	52.3	27.2	5857.2	5141.8	83	0

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 569 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: Face to the upper center of the airbag, back of head to the outboard half of the head restraint, chest to the airbag, Left knee to the knee bolster left of the steering column, right knee to the knee bolster right of the steering column. The passenger's visible contact points were as follows: Face to the left half of the airbag, back of head to the outboard half of the head restraint, chest to the airbag, left knee to the left edge of the glove compartment door, right knee to the right half of the glove compartment door.

The 2003 Chevrolet Suburban MPV 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.:           M30108           Test Mode:           56.3 kph Frontal Barrier            
 Test Date:           March 26, 2003           Time:           14:39           Temperature:           21.1           °C  
 Vehicle Make/Model/Body Style:           2003 Chevrolet Suburban MPV            
 Vehicle Test Weight:           2816.5           kg  
 Vehicle/Barrier Impact Angle:           0           °  
 Impact Velocity:           56.3           kph  
 Maximum Static Crush:           569           mm  
 Vehicle Rebound:           723           mm

DUMMIES:

	<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>          139          </u>	
Number of Cameras:	<u>          1          </u> Real Time	
	<u>          16          </u> High Speed	

DOOR OPENING DATA:           Door remained closed and latched, door opened without tools           - Left Front  
          Door remained closed and latched, door opened 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>

VISIBLE DUMMY CONTACT POINTS:

	<u>DRIVER</u>	<u>PASSENGER</u>
Head:	<u>          Face to upper center of airbag; Back of head to outboard half of head restraint.          </u>	<u>          Face to left half of airbag; Back of head to outboard half of head restraint.          </u>
Abdomen:	<u>          None          </u>	<u>          None          </u>
Chest:	<u>          Airbag          </u>	<u>          Airbag          </u>
Knees:	<u>          Left knee to knee bolster left of steering column; Right knee to knee bolster right of steering column.          </u>	<u>          Left knee to left edge of glove compartment door; Right knee to right half of glove compartment door.          </u>

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 Chevrolet Suburban MPV

NHTSA No. : M30108 ; VIN: 1GNFK16Z93J118800 ; Color: Blue

Engine Data: 8 cylinders; - CID; 5.3 Liters; - cc

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

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

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

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

Safety Belt Features - Passenger - Pretensioner (Shoulder); - Load Limiter; - 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: 9/02 ; Odometer Reading 63 km

Selling Dealer: West Herr Chevrolet of Hamburg

& Address: 5025 Southwestern Blvd., Hamburg NY 14075

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: General Motors Corp.

Date of Manufacture 09/02

GVWR: 3266 kg; GAWR: 1633 kg FRONT; 1814 kg REAR

DATA FROM TIRE PLACARD:

Recommended Tire Size: P265/70 R16

\* Recommended Cold Tire Pressure: 240 kpa FRONT; 240 kpa REAR

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P265/70 R16 ; Manufacturer: Firestone

Tire Pressure with Maximum Capacity Vehicle Load: Front: 300 kPa; Rear: 300 kPa

Treadwear: 480 ; Traction: A ; Temperature: B

VEHICLE CAPACITY DATA:

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

Number of Occupants: 2 Front; 6 Rear; 8 Total

Vehicle Capacity Weight (VCW) = 729.5 kg

No. of Occupants x 68.04 kg = 544.32 kg

Rated Cargo/Luggage Weight (RCLW) = 185.18 kg\*\*

\*\* Maximum RCLW of 136.1 kg used for target weight calculation.

\* 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>648.0</u>	kg	Right Rear =	<u>573.5</u>	kg
Left Front =	<u>685.5</u>	kg	Left Rear =	<u>629.5</u>	kg
TOTAL FRONT =	<u>1333.5</u>	kg	TOTAL REAR =	<u>1203.0</u>	kg
TOTAL DELIVERED WEIGHT =	<u>2536.5</u>	kg			
% of Total Front of Vehicle Weight =	<u>52.6%</u>		% of Total Rear Weight =	<u>47.4%</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	<u>2536.5</u>	kg
Rated Cargo/Luggage Weight (RCLW) =	<u>136.1</u>	kg
Weight of 2 p.572 Dummies @ 76 each =	<u>152</u>	kg
TARGET TEST WEIGHT =	<u>2824.6</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 128.0 KG OF CARGO WEIGHT:

Right Front =	<u>730.0</u>	kg	Right Rear =	<u>689.0</u>	kg
Left Front =	<u>679.0</u>	kg	Left Rear =	<u>718.5</u>	kg
TOTAL FRONT =	<u>1409.0</u>	kg	TOTAL REAR =	<u>1407.5</u>	kg
TOTAL TEST WEIGHT =	<u>2816.5</u>	kg			
% of Total Front Weight =	<u>50.0%</u>	%	% of Total Rear Weight =	<u>50.0%</u>	%
Weight of Ballast Secured in Vehicle Trunk Area =	<u>11</u>	kg			
Vehicle Components Removed for Weight Reduction:	<u>None</u>				

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>917</u>	LF	<u>907</u>	RR	<u>939</u>	LR	<u>939</u>
FULLY LOADED:	RF	<u>908</u>	LF	<u>898</u>	RR	<u>913</u>	LR	<u>909</u>
AS TESTED:	RF	<u>911</u>	LF	<u>901</u>	RR	<u>913</u>	LR	<u>910</u>
Vehicle's Wheel Base:		<u>3310</u>	mm					
Location of Vehicle's C.G.:		<u>1654</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual =	<u>117.3</u>	liters	
Usable Capacity Figure Furnished by COTR =	<u>123</u>	liters	
Test Volume Range (92 to 94% of Usable Capacity) =	<u>113.16</u>	to <u>115.62</u>	liters
ACTUAL TEST VOLUME=	<u>113.2</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>
<u>Details of Fuel System: Fuel Tank – Located on the vehicle underbody left of centerline and forward of the rear axle; Fuel Lines -Routed along the left side of the vehicle underbody; Fuel Filler – Located on the left rear quarter panel rear of the rear wheel.</u>			

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°  
Test Date: March 26, 2003 Time: 14:39 Temperature: 21.1 °C  
Vehicle NHTSA No.: M30108  
Required Impact Velocity Range: 55.5 to 57.1 kph

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

Trap No. 1 = 56.3 kph; Trap No. 2 = 56.3 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 = <u>5491</u> ; C/L = <u>5557</u> ; Right = <u>5503</u>
Post-Test	Left = <u>4997</u> ; C/L = <u>5006</u> ; Right = <u>4944</u>
Crush	Left = <u>494</u> ; C/L = <u>551</u> ; Right = <u>559</u>
AVERAGE	= <u>535</u> mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

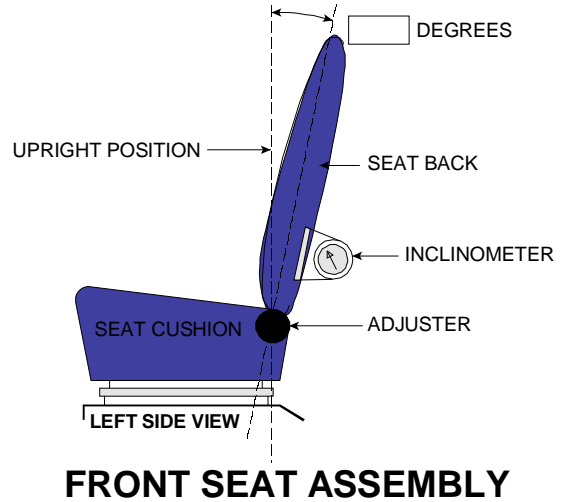
	Left = <u>695</u> ; C/L = <u>705</u> ; Right = <u>770</u>
AVERAGE	= <u>723</u> mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year :           2003    Vehicle Model:           Chevrolet Suburban    Body Style :           MPV

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



Seat back angle for driver's seat:           15.5

Measurement instructions: Measured on seat back frame

Seat back angle for passenger's seat:       15.5

Measurement instructions: Same as the driver's seat

2. Seat Fore and Aft Positioning

Positioning of the driver's seat:           Placed in mid position

Positioning of the passenger's seat:       Placed in mid position

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is                               117.3 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 =                               123 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) =       113.2 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 pump will run for 3 seconds when the ignition is turned on. The pump runs continuously while 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: The steering column is placed in the 4<sup>th</sup> detent with the uppermost stop being detent 1 (should measure 21° with respect to a level sill)

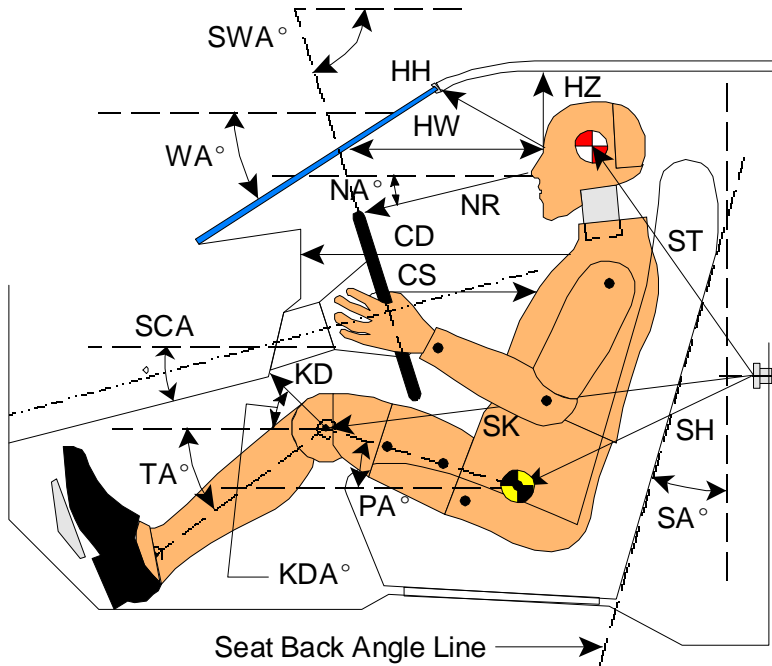
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5. SEAT BELT UPPER ANCHORAGE

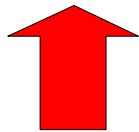
Nominal design riding position: Not applicable

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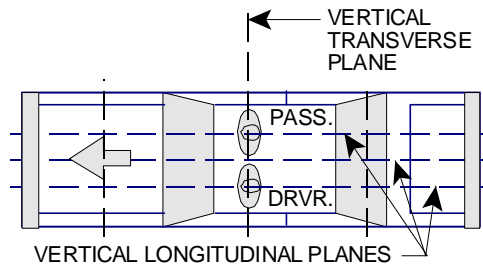
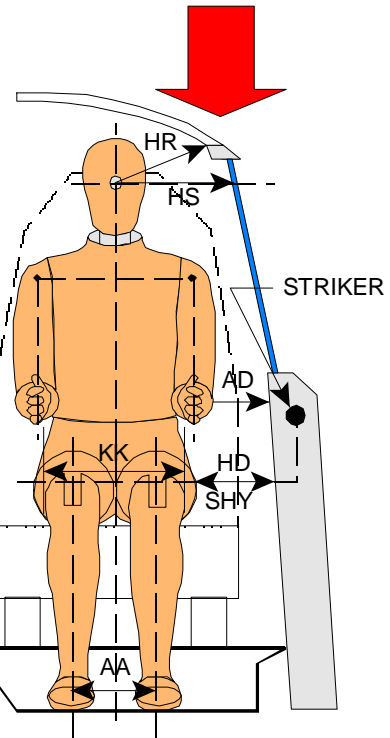
DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE  
**DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS**



- AD - Arm to Door
- HD - H-Point to Door
- HR - Head to Side Header
- HS - Head to Side Window
- KK - Knee to Knee
- AA - Ankle to Ankle
- SHY- Striker to H-Point (Y Direction)



- CD - Chest to Dash
- CS - Steering Wheel to Chest
- HH - Head to Header
- HW - Head to Windshield
- HZ - Head to Roof
- KDA - Knee to Dash Angle
- KDL- Left Knee to Dash
- KDR - Right Knee to Dash
- NA - Nose to Rim Angle
- NR - Nose to Rim
- PA - Pelvic Angle
- RA - Rim to Abdomen
- SA - Seat Back Angle
- SCA - Steering Column Angle
- SH - Striker to H-Point
- SK - Striker to Knee
- ST - Striker to Head
- SWA- Steering Wheel Angle
- TA - Tibial Angle
- WA - Windshield Angle

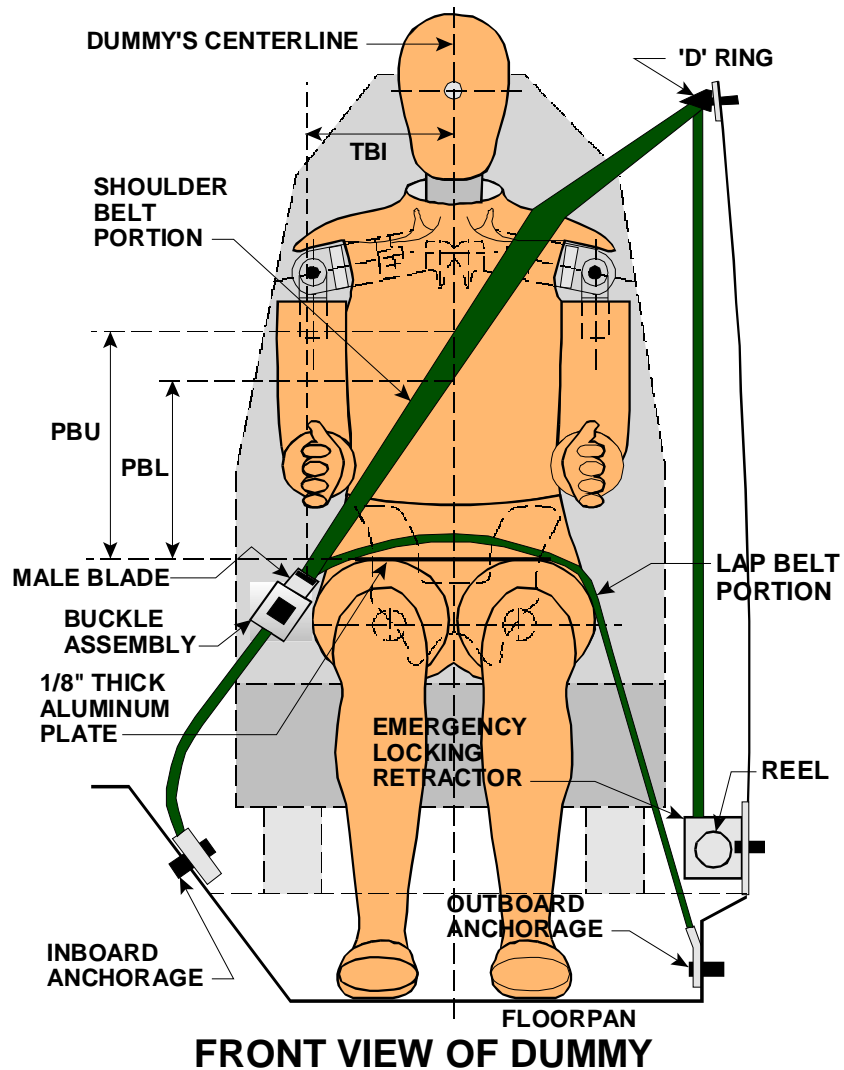


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #150)			PASS. (Serial #245)		
WA <sup>o</sup>	39.0 deg.			N/A		
SWA <sup>o</sup>	69 deg.			N/A		
SCA <sup>o</sup>	21.0 deg.			N/A		
SA <sup>o</sup>	15.8 deg.			15.8 deg.		
HZ	162			258		
HH	500			479		
HW	712			712		
HR	242			188		
NR	368	Angle	9 deg.	N/A		
CD	546			430		
CS	397			N/A		
RA	185			N/A		
KDL	174	Angle (KDA)	33 deg.	153		
KDR	168			152	Angle (KDA)	30 deg.
PA <sup>o</sup>	21.9 deg.			22.5 deg.		
TA <sup>o</sup>	40 deg.			46 deg.		
KK	310			272		
AA	272			222		
ST	644	Angle	19 deg.	628	Angle	20 deg.
SK	710	Angle	90 deg.	715	Angle	87 deg.
SH	325	Angle	99 deg.	325	Angle	99 deg.
SHY	240			227		
HS	329			327		
HD	178			159		
AD	136			130		

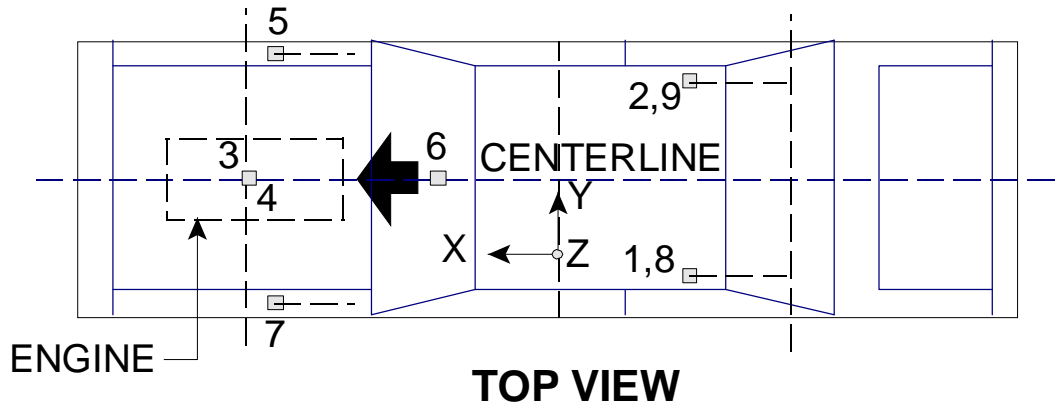
Dimensions in millimeters

**SEAT BELT POSITIONING DATA**

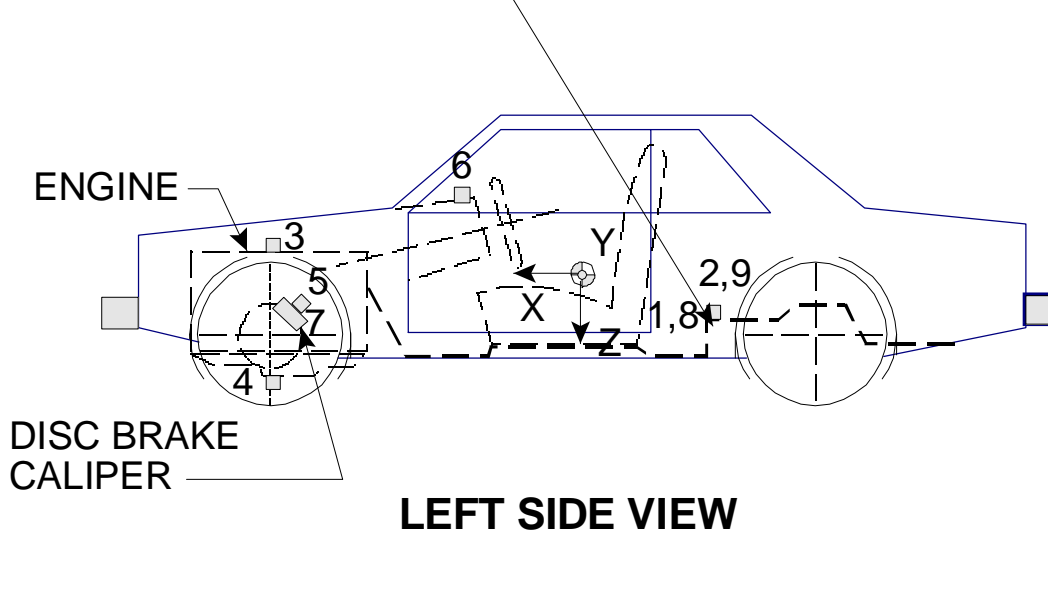


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	330	340
PBL-- Top surface of alum. plate to belt lower edge	250	250
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

## 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	2183	-729	-523
2	Right Rear Seat Cross Member X	2178	707	-547
3	Top of Engine Block	4838	-244	-965
4	Bottom of Engine	4290	31	-335
5	Disc Brake Caliper @ Right Side	4459	865	-344
6	Instrument Panel	3757	-1	-1186
7	Disc Brake Caliper @Left Side	4495	-868	-451
8	Left Rear Seat Cross Member Z	2183	-729	-523
9	Right Rear Seat Cross Member Z	2178	707	-547

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Left Rear Seat Cross Member X	2.0	156.5	-37.9	73.6
2	Right Rear Seat Cross Member X	2.1	175.9	-31.2	65.3
3	Top of Engine Block	11.8	49.8	-96.3	43.0
4†	Bottom of Engine	12.1	66.0	†	-
5††	Disc Brake Caliper @ Right Side	††	-	††	-
6††	Instrument Panel	††	-	††	-
7‡	Disc Brake Caliper @Left Side	‡	-	-98.9	23.7
8	Left Rear Seat Cross Member Z	18.3	76.9	-26.6	73.3
9	Right Rear Seat Cross Member Z	10.2	76.6	-17.9	82.1

† Channel opened: 60-62 ms

†† Cable cut: 64 ms

‡ Cable cut: 65 ms

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2003 Chevrolet Suburban MPV

NHTSA Test No.: M30108 Test Date: March 26, 2003

DESCRIPTION	Unit	MAXIMUM VALUE							
		Driver				Passenger			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head 9 Array X Arm Y	g	4.6	106.8	-30.6	79.0	8.3	83.3	-7.7	64.4
Head 9 Array X Arm Z	g	30.9	65.0	-10.0	126.0	35.8	73.4	-10.3	132.4
Head 9 Array Y Arm X	g	10.4	237.6	-68.6	77.9	9.4	237.9	-66.8	88.3
Head 9 Array Y Arm Z	g	25.1	59.8	-5.9	133.7	29.4	61.3	-12.4	132.3
Head 9 Array Z Arm X	g	17.8	234.0	-72.3	78.1	12.6	207.2	-77.9	84.7
Head 9 Array Z Arm Y	g	8.7	159.0	-30.6	87.3	10.8	85.0	-8.3	167.5
Head X	g	10.3	237.9	-60.6	78.5	10.0	240.3	-65.7	88.6
Head Y	g	5.6	153.2	-27.2	86.2	6.3	82.8	-5.5	161.0
Head Z	g	25.2	59.9	-7.5	126.9	26.4	65.0	-11.8	132.0
Head Resultant	g	66.7	77.9	-	-	67.6	88.1	-	-
Redundant Head X	g	10.8	238.4	-60.5	78.4	10.2	206.5	-64.3	88.2
Redundant Head Y	g	5.3	154.1	-29.4	86.6	6.0	242.9	-5.4	160.7
Redundant Head Z	g	25.5	59.9	-7.3	127.3	26.2	65.0	-11.8	132.0
Redundant Head Resultant	g	67.2	78.2	-	-	66.1	88.2	-	-
Upper Neck Fx	N	829.3	79.0	-532.9	152.5	544.2	82.5	-168.4	151.9
Upper Neck Fy	N	215.8	154.5	-113.9	111.1	42.0	36.1	-203.3	164.2
Upper Neck Fz	N	1914.7	73.3	-310.4	127.0	2269.7	73.4	-513.7	132.1
Upper Neck F Resultant	N	2038.8	73.5	-	-	2276.6	73.4	-	-
Upper Neck Mx	N-m	17.9	159.0	-16.3	103.2	25.7	98.3	-14.8	165.3
Upper Neck My	N-m	42.1	75.9	-29.1	272.8	26.8	82.5	-34.2	257.7
Upper Neck Mz	N-m	26.9	97.9	-13.1	150.5	13.2	262.4	-5.4	179.9
Upper Neck M Resultant	N-m	44.9	76.9	-	-	36.5	258.0	-	-
Chest X	g	2.6	270.3	-49.4	80.1	2.8	179.1	-52.3	78.1
Chest Y	g	6.5	111.8	-5.6	58.2	1.7	188.8	-7.8	84.9
Chest Z	g	20.2	71.5	-11.5	132.9	17.4	62.8	-12.2	134.7
Chest Resultant	g	51.3	79.9	-	-	53.2	73.3	-	-

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

Vehicle Year/Make/Model/Body Style: 2003 Chevrolet Suburban MPV

NHTSA Test No.: M30108 Test Date: March 26, 2003

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Redundant Chest X	g	†	-	†	-	‡	-	‡	-
Redundant Chest Y	g	6.6	111.4	-5.5	57.8	1.7	188.6	-8.4	84.8
Redundant Chest Z	g	19.7	71.4	-11.5	131.1	17.1	62.8	-12.3	134.7
Redundant Chest Resultant	g	†	-	-	-	‡	-	-	-
Chest Displacement	mm	0.0	-42.8	-30.1	69.3	0.0	20.8	-27.2	71.1
Pelvic X	g	3.6	158.3	-82.8	51.3	4.0	146.1	-65.7	48.6
Pelvic Y	g	19.6	53.7	-30.1	48.4	74.4	157.3	-9.3	76.0
Pelvic Z	g	12.7	49.4	-20.7	110.5	5.4	44.7	-17.0	118.9
Pelvic Resultant	g	83.0	51.3	-	-	74.5	157.3	-	-
Left Femur	N	123.3	263.6	-5209.5	50.9	189.2	35.3	-5857.2	48.7
Right Femur	N	364.6	41.5	-9248.4	56.2	231.2	41.8	-5141.8	52.8
Left Upper Tibia Mx	N-m	79.0	57.0	-50.3	52.5	31.2	286.4	-61.5	95.0
Left Upper Tibia My	N-m	51.3	49.7	-241.5	57.3	12.5	130.8	-130.4	78.1
Left Lower Tibia Fz	N	148.7	197.2	-4401.5	52.2	415.8	52.1	-1985.4	43.5
Left Lower Tibia Mx	N-m	76.5	55.9	-22.9	52.0	29.3	57.0	-28.0	43.1
Left Lower Tibia My	N-m	69.0	51.2	-52.4	57.7	69.5	62.7	-26.9	50.7
Right Upper Tibia Mx	N-m	89.1	52.8	-39.2	55.7	33.0	118.6	-133.8	56.9
Right Upper Tibia My	N-m	18.7	45.9	-259.4	53.9	87.3	47.3	-18.2	106.9
Right Lower Tibia Fz	N	51.9	179.4	††	-	186.3	295.3	-4361.4	55.2
Right Lower Tibia Mx	N-m	55.0	52.2	-150.7	55.8	78.0	60.2	-50.6	55.9
Right Lower Tibia My	N-m	87.2	51.5	-90.9	47.6	63.2	58.9	-24.8	294.1
Left Foot Aft Ax	g	80.6	57.7	-120.0	44.9	31.5	59.6	-167.1	43.4
Left Foot Aft Az	g	24.4	55.3	-136.2	51.6	22.2	41.4	-57.2	52.0
Left Foot Fore Az	g	90.5	57.7	-119.1	44.9	82.7	53.6	-299.4	43.4
Right Foot Aft Ax	g	52.8	53.3	-365.6	48.5	10.0	67.9	-136.2	51.2
Right Foot Aft Az	g	142.2	54.3	-233.0	48.0	8.2	291.3	-86.1	55.8
Right Foot Fore Az	g	166.1	54.6	-664.7	46.5	39.8	65.4	-158.1	55.9
Lap Belt Load	N	3002.8	53.2	-3.8	163.3	3648.8	54.4	-3.5	214.8

† P1 Redundant Chest X cable damaged at 120 ms

†† Data clipped: 48-52 ms

‡ P2 Redundant Chest X channel failed

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

Vehicle Year/Make/Model/Body Style: 2003 Chevrolet Suburban MPV

NHTSA Test No.: M30108 Test Date: March 26, 2003

HEAD INJURY CRITERIA (HIC)				
	HIC**	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	Average Acceleration t <sub>1</sub> to t <sub>2</sub>
Position #1 - Driver	632.5	63.5	97.3	51.1
Position #2 - Passenger	902.7	64.4	100.4	57.5

\*\* HIC is as defined in FMVSS 208. The maximum time interval from t<sub>1</sub> to t<sub>2</sub> is 36 milliseconds.

CLIP SUMMARY*				
	CLIP (g's)	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	CSI
Position #1 - Driver	48.7	74.2	77.2	513.6
Position #2 - Passenger	52.3	75.6	78.6	534.6

\* 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 Chevrolet Suburban MPV

NHTSA Test No.: M30108 Test Date: March 26, 2003

HEAD INJURY CRITERIA (HIC) <b>REDUNDANT</b>				
	HIC**	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	Average Acceleration t <sub>1</sub> to t <sub>2</sub>
Position #1 - Driver	637.6	63.5	97.3	51.3
Position #2 - Passenger	838.9	64.3	100.3	55.8

\*\* HIC is as defined in FMVSS 208. The maximum time interval from t<sub>1</sub> to t<sub>2</sub> is 36 milliseconds.

CLIP SUMMARY* <b>REDUNDANT</b>				
	CLIP (g's)	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	CSI
Position #1 - Driver	49.0	74.2	77.2	513.5
Position #2 - Passenger	†	-	-	†

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

† No data, Chest Redundant X accelerometer failed.

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

<u>BELT LENGTH DATA:</u>	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	1434	1490
Shoulder belt length as measured on Part 572 Dummy.	805	825
Lap belt length as measured on Part 572 Dummy.	629	665
<u>SHOULDER BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	†	†
As determined mechanically.	83	83
As determined electronically.	††	††
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	††	††
Measured mechanically.	0 mm/m	0 mm/m

\_\_\_\_\_ Dimensions in millimeters

† CRSs were installed in the second row seating positions, belt spool-off cameras were not installed.

†† Device was not installed to prevent possible interference with the seat belt system.

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

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

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

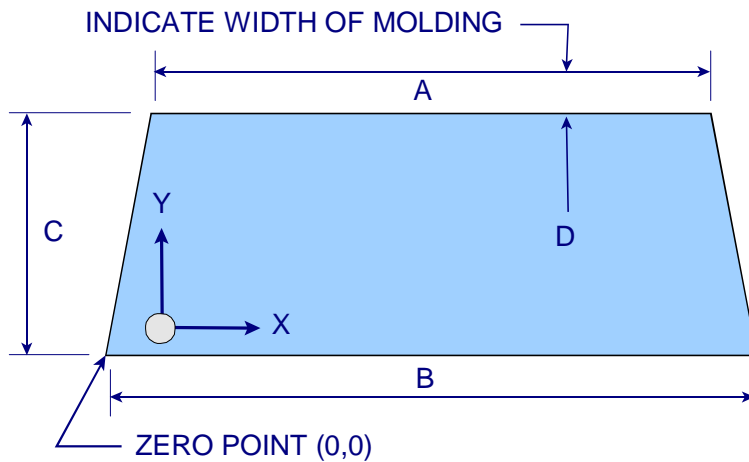
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2245	2245	100.0%
LEFT SIDE	2245	2245	100.0%
TOTAL	4490	4490	100.0%

AREA OF RETENTION FAILURE: None



DIMENSIONS (mm)	
A	1410
B	1760
C	660
D	20

**FRONT VIEW OF WINDSHIELD**

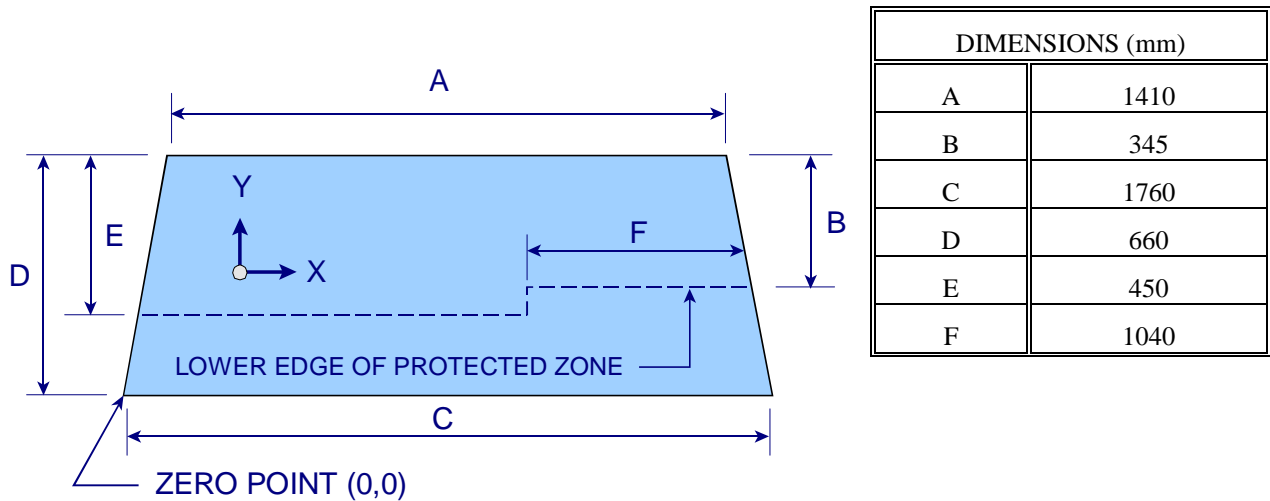
FAILURE DETAILS: None

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

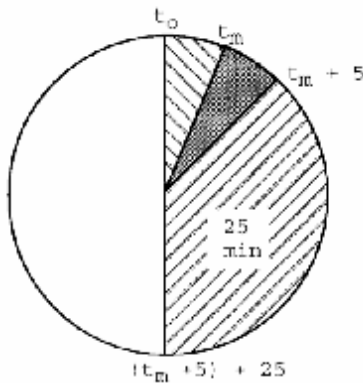
NHTSA TEST No.: M30108 TEST DATE: March 26, 2003  
VEHICLE MAKE/MODEL: 2003 Chevrolet Suburban MPV

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

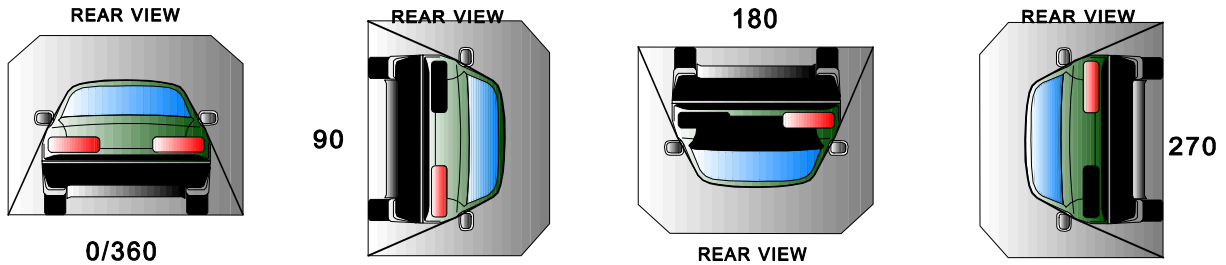
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

**DATA SHEET NO. 13 - ROLLOVER DATA**

Vehicle: 2003 Chevrolet Suburban MPV

NHTSA No.: M30108



**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	
	minutes	seconds	minutes	seconds	minutes	seconds	minutes	seconds	minutes	seconds	minutes	seconds
0° - 90°	1	8	5	6	8	7	1	5	6	8	7	1
90° - 180°	1	5	5	6	5	7	1	5	6	5	7	1
180°-270°	1	4	5	6	4	7	1	4	6	4	7	1
270°-360°	1	12	5	6	12	7	1	12	6	12	7	1

**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:**

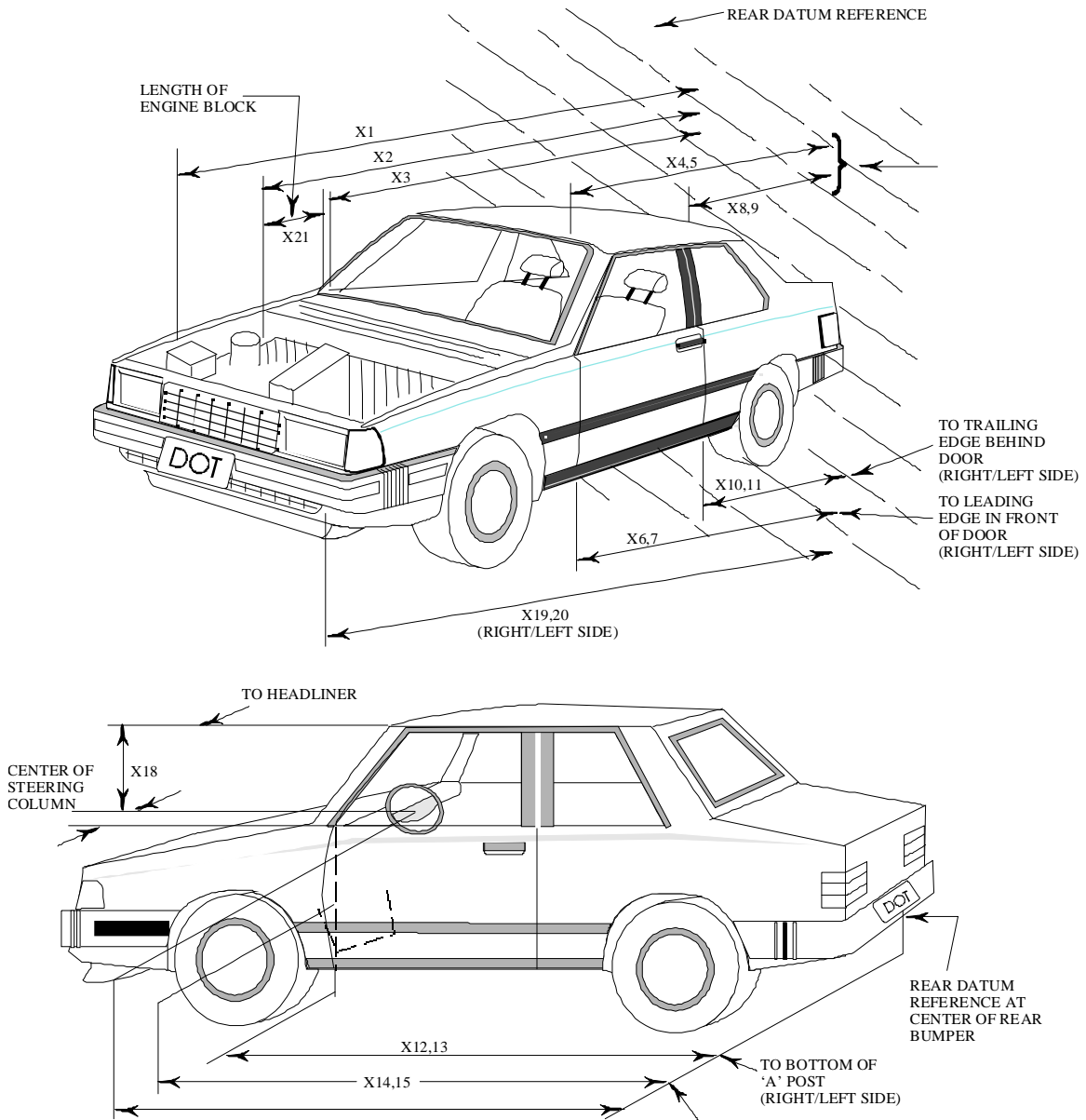
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	-
90° - 180°	0	0	0	-
180°-270°	0	0	0	-
270°-360°	0	0	0	-

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

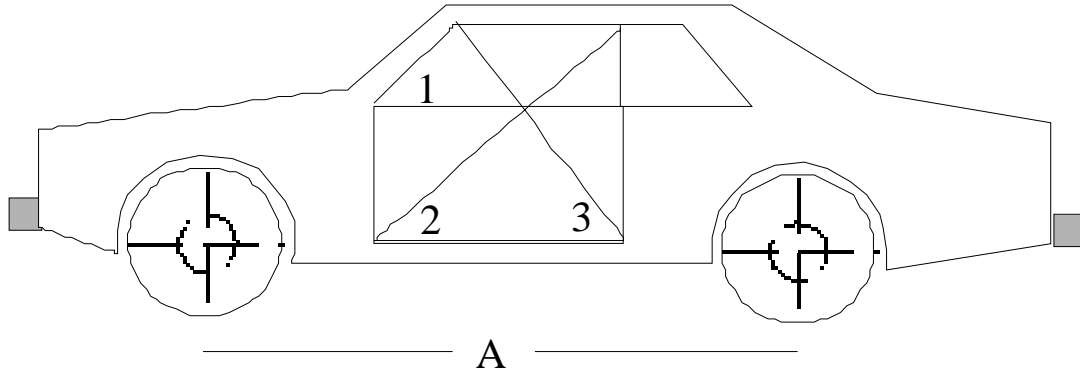


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	5557	5006	551
X2	Rear Surface of Vehicle to Front of Engine	4819	4550	269
X3	Rear Surface of Vehicle to Firewall	4386	4327	59
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	4065	4053	12
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	4066	4042	24
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	4017	4018	-1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	4020	4002	18
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2875	2866	9
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2874	2852	22
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2871	2871	0
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2866	2849	17
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	4078	4068	10
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	4079	4051	28
X14	Rear Surface of Vehicle to Firewall, Right Side	4370	4298	72
X15	Rear Surface of Vehicle to Firewall, Left Side	4363	4349	14
X16	Rear Surface of Vehicle to Steering Column	3546	3528	18
X17	Center of Steering Column to "A" Post	320	296	24
X18	Center of Steering Column to Headliner	448	378	70
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5503	4944	559
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5491	4997	494
X21	Length of Engine Block	518	510	8
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3733	3724	9
CD	Rear Surface of Vehicle to Center of Dash Panel	3756	3724	32
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3727	3679	48

All Dimensions in mm

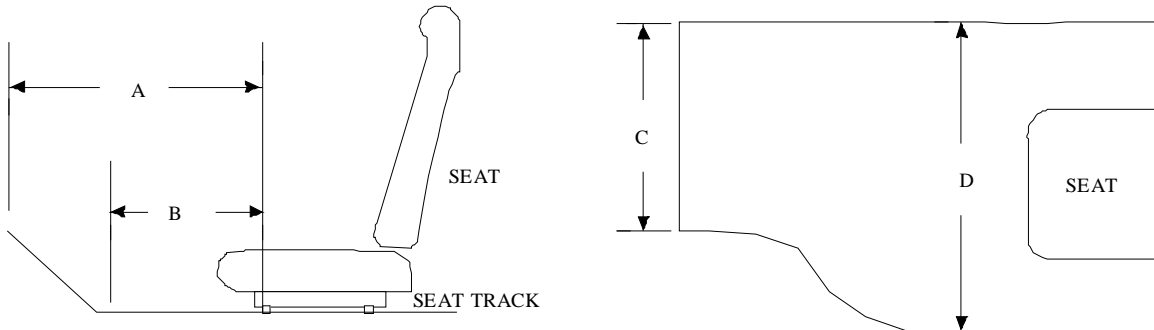
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)  
 VEHICLE INTRUSION MEASUREMENTS  
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1142	1578	1270	1143	1587	1266
AFTER TEST	1131	1571	1296	1132	1569	1299
DIFFERENCE	11	7	-26	11	18	-33

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	3310	3310
AFTER TEST	3176	3171
DIFFERENCE	134	139

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



DRIVER

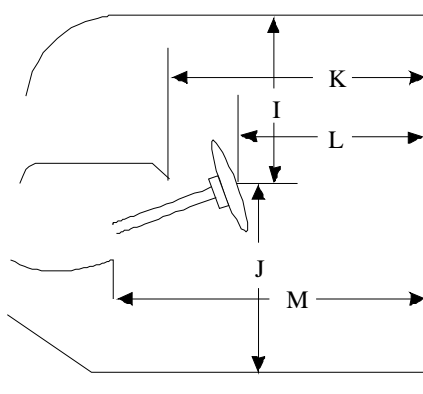
Measurement	Pre-Test	Post-Test	Difference
A	789	571	218
B	500	442	58
C	454	472	-18
D	462	485	-23

PASSENGER

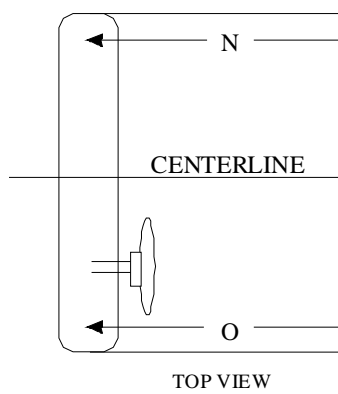
Measurement	Pre-Test	Post-Test	Difference
A	690	554	136
B	438	425	13
C	304	302	2
D	435	445	-10

Units = mm

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

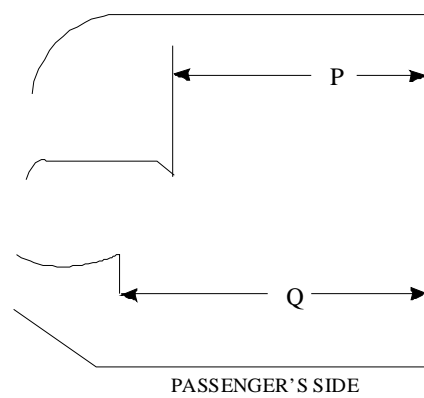


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS  
FROM C-PILLAR  
BELT ANCHORAGE

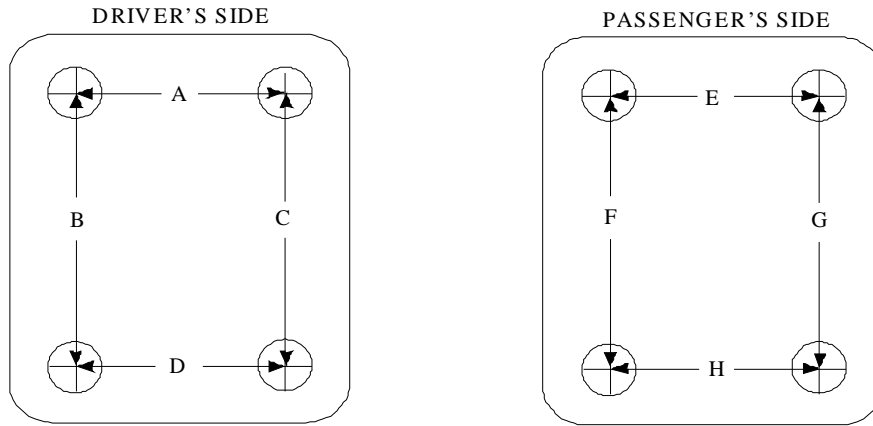


PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	448	378	70
J	708	817	-109
K	1810	1789	21
L	1603	1585	18
M	1874	1790	84
N	1796	1785	11
O	1785	1736	49
P = K (PASS.)	1781	1743	38
Q = M (PASS.)	1864	1810	54

Units = mm

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

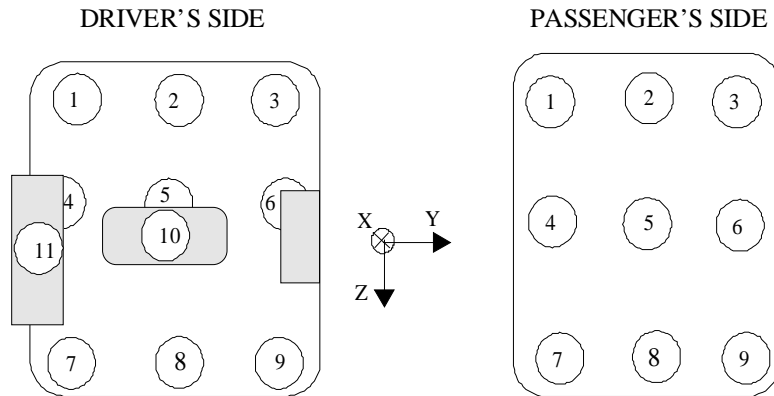


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	454	472	-18
B	429	365	64
C	357	242	115
D	462	485	-23
E	304	302	2
F	349	362	-13
G	324	286	38
H	435	445	-10

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	4201	4111	90	-709	-726	17
2	4287	4056	231	-661	-745	84
3	4228	4017	211	-684	-723	39
4	4121	4005	116	-589	-625	36
5	4138	3971	167	-588	-653	65
6	4090	3919	171	-588	-644	56
7	3982	3944	38	-532	-525	-7
8	3998	3928	70	-534	-522	-12
9	3959	3860	99	-538	-539	1
10	4015	3891	124	-700	-731	31
11	4108	4009	99	-586	-604	18

**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	4135	3973	162	-690	-781	91
2	4175	4043	132	-693	-764	71
3	4169	4104	65	-705	-757	52
4	4019	3920	99	-593	-650	57
5	4064	3951	113	-597	-655	58
6	4074	4017	57	-601	-635	34
7	3882	3847	35	-550	-542	-8
8	3923	3914	9	-530	-556	26
9	3938	3862	76	-530	-527	-3

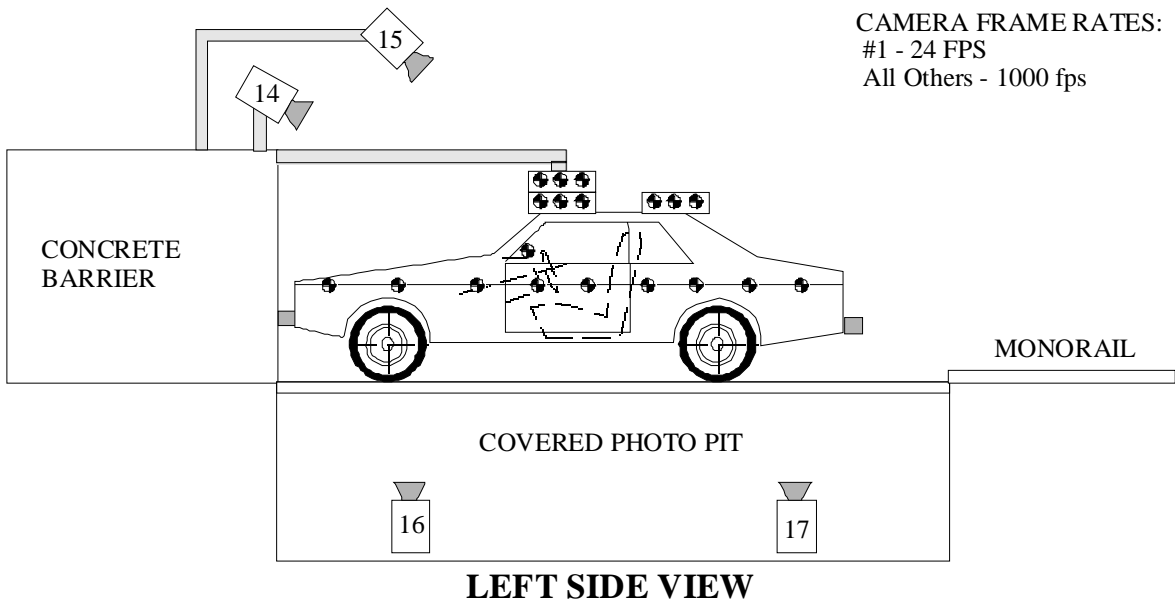
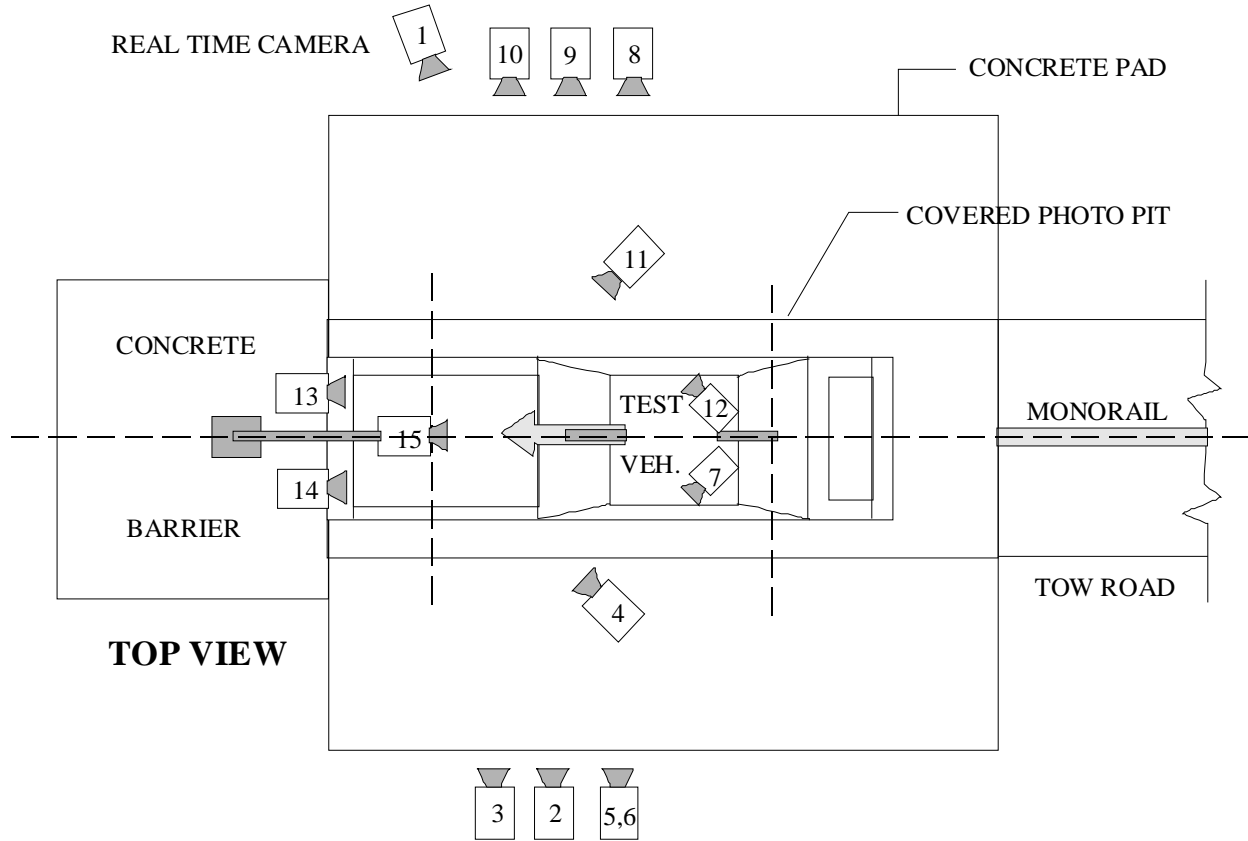
Reference: SAE: X = Rear Bumper (Positive: forward); Z = Ground (Positive: down)

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

	Elements	Pre-Test (mm)
1	Total length	5557
2	Total Width	2000
3	Bumper Top Height	703
4	Bumper Bottom Height	530
5	Longitudinal Member Top Height	615
6	Distance Between Longitudinal Members	825
7	Longitudinal Member Width	55
8	Engine top height	1185
9	Engine bottom height	315
10	Engine and gearbox width	600
11	Front bumper-engine distance	700
12	Front shock absorber fixing height	700
13	Bonnet leading edge height	1035
14	Front shock absorber fixing width	875
15	Front bumper – front axle distance	937
16	Front axle – a pillar distance	540
17	A-pillar – B pillar distance	1220
18	B-pillar – rear axle distance	1595
19	B-pillar – C Pillar distance	930
20	Roof sill bottom height	1720
21	Roof sill top height	1805
22	Floor sill bottom height	343
23	Floor sill top height	558

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.:                   M30108                   Vehicle:                   2003 Chevrolet Suburban MPV                  

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	7905	1907	1133	-2	7506	12.5	1020
3	Left Side View	8380	993	1073	-2	7981	25	1000
4	Driver and Interior View	8195	2783	2005	-5	-	25	1050
5	Steering Column (Bottom)	8628	2174	1165	-1	8229	25	1020
6	Steering Column (Top)	8628	2174	1785	-6	8229	25	1015
7	CRS View Left	3658	2693	2561	-21	-	25	1025
8	Overall Right Side	7790	2327	1126	-3	8175	12.5	1005
9	Right Side View	8520	1380	1092	-1	8905	25	1010
10	Right Passenger View	8768	2041	1376	-1	9153	35	1030
11	Passenger and Interior View	7865	2885	2005	-6	-	25	1010
12	CRS View Right	3642	2642	2537	-18	-	25	1025
13	Passenger Front View	620	-92	1987	-26	-	13	1000
14	Driver Front View	620	-92	1987	-26	-	13	1010
15	Windshield View	0	-530	3374	-46	-	13	1005
16	Pit View of Engine	0	615	-3048	90	-	13	1005
17	Pit View of Fuel Tank	0	3290	-3048	90	-	13	960

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

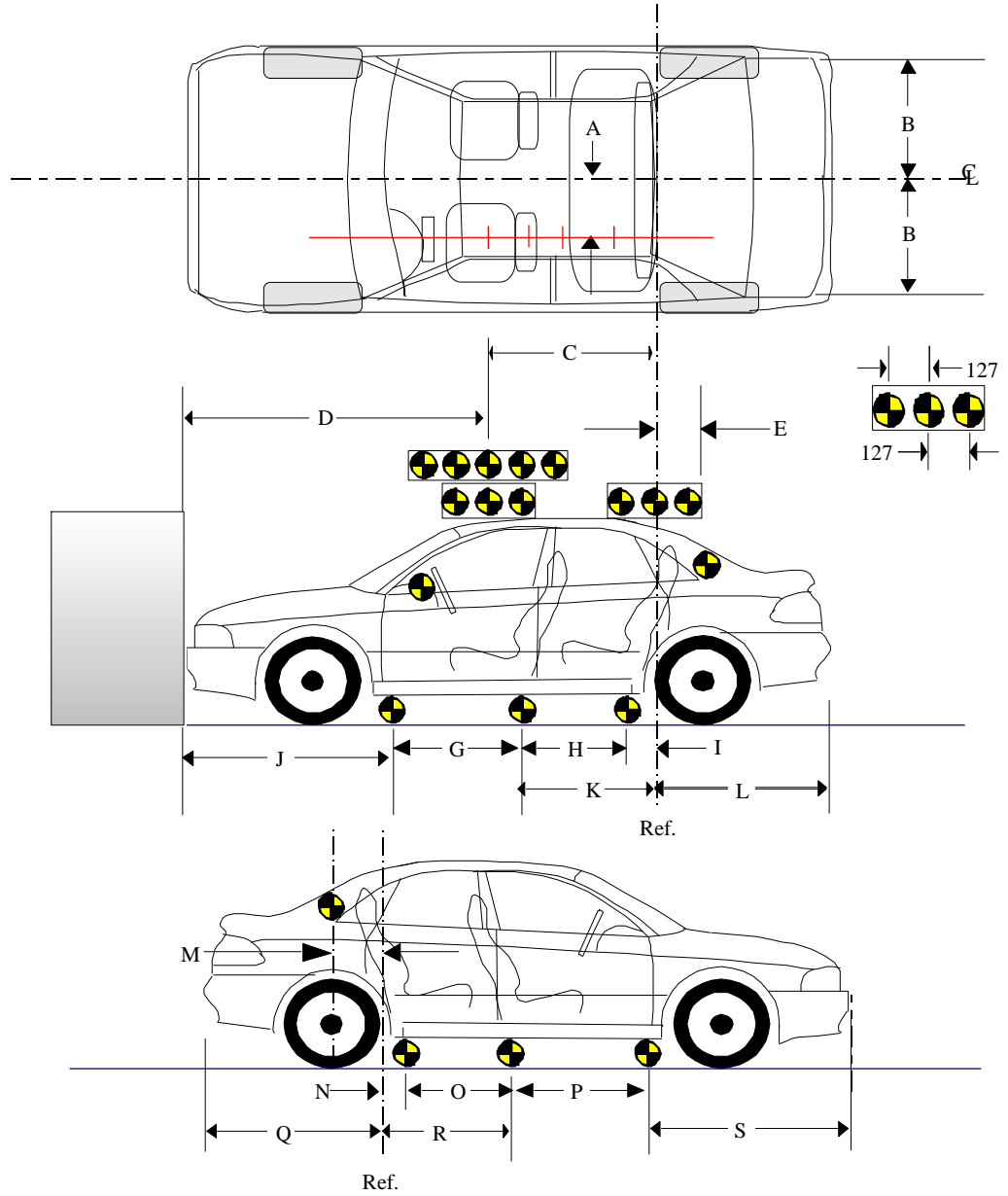
Y = film plane to impact location                      N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

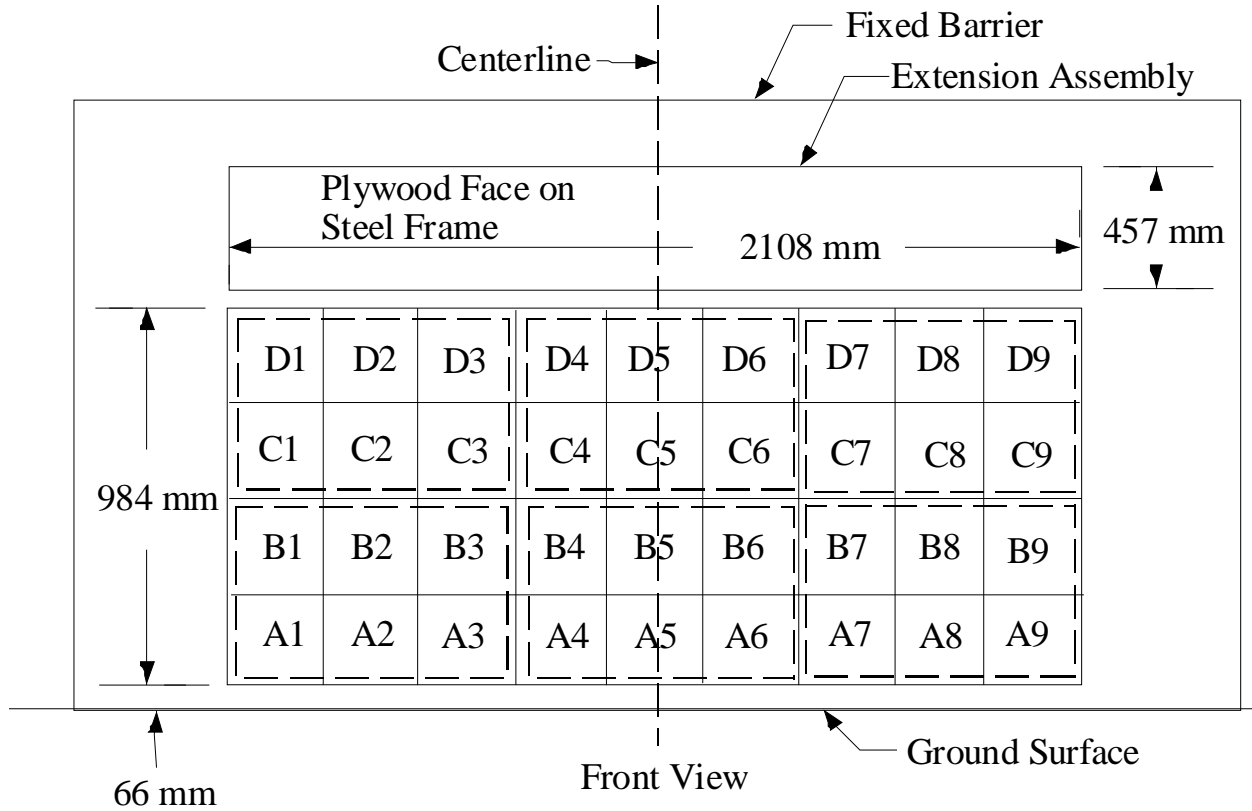
(Dimensions in millimeters)

A	461
B	784
C	1226
D	2653
E	-265
F	2005
G	1120
H	1125
I	135
J	1473
K	1260
L	1704
M	-260
N	136
O	1123
P	1121
Q	1702
R	1259
S	1474



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.:     M30108;     Test Date:     March 26, 2003;     Technician:     Lawrence Q. Valvo    

Vehicle Model Year/Make/Model:     2003 Chevrolet Suburban MPV    

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

B. Size of vent holes: (mm<sup>2</sup>)     490.9    -Driver     490.9    -Passenger

C. Total vent area: (mm<sup>2</sup>)     981.8    -Driver     981.8    -Passenger

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

Driver:     650    -Height;     500    -Width;     350    -Depth

Passenger:     550    -Height;     510    -Width;     750    -Depth

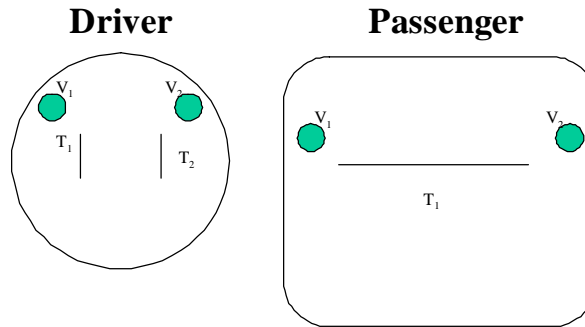
E. Is the air bag tethered?

Driver:     X    -Yes;     -    -No; If yes, record length of tether-     250    

Passenger:     X    -Yes;     -    -No; If yes, record length of tether-     500    

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<sub>n</sub> = Vent hole<sub>n</sub>, T<sub>n</sub> = Tether<sub>n</sub>).



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

Driver:     Air bag: 312273 420d GMGTD RIVER 16872189    

    Generator: -    

Passenger:     Air bag: G1ZN7802DGW 6004356008 REV.B 03    

    Generator: -

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA

FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Chevrolet Suburban MPV

NHTSA Test No.: M30108 VIN: 1GNFK16Z93J118800

Model Year: 2003 Build Date: 09/02 Test Date: March 26, 2003

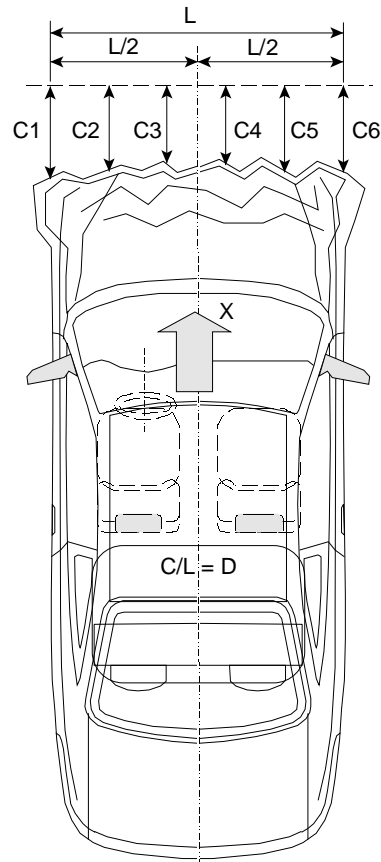
Vehicle Size Category: MPV Test Weight: 2816.5 kg

Vehicle Wheelbase: 3310 mm; Front Overhang: 937 mm; Overall Width: 2000 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	5346	4927	419
C2 =	5482	4996	486
C3 =	5543	5010	533
C4 =	5551	4982	569
C5 =	5498	4945	553
C6 =	5378	4923	455



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1751 mm

L2= 875.5 mm

L5= 350.2 mm

**APPENDIX A**  
**PHOTOGRAPHS**

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A-40	Pre-Test Driver Floor Pan View	A-43
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A-42	Post-Test Driver Head View	A-45
A-43	Post-Test Driver Contact To Airbag	A-46

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A-50	Pre-Test Passenger Feet View	A-53
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Figure A-1 LOAD CELL LOCATIONS



MFD BY GENERAL MOTORS CORP

09/02

GVWR  
3266KG(7200LB)

GAWR FRT  
1633KG(3600LB)

GAWR RR  
1814KG(4000LB)

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

1GNFK16Z93J118800

TYPE: M.P.V.

MODEL: K15906

KPDC TIRE SIZE SPEED RTG

FRT P265/70R16 S

RR P265/70R16 S

SPA P265/70R16 S

RIM

16X7J

16X7J

16X6.5J

COLD TIRE PRESSURE

240KPA(35PSI)

240KPA(35PSI)

240KPA(35PSI)

SEE OWNER'S MANUAL  FOR MORE INFORMATION.

F 245  
T 190

Figure A-2 VEHICLE CERTIFICATION PLACARD

See Figure A-2 VEHICLE CERTIFICATION PLACARD

Figure A-3 VEHICLE TIRE PLACARD



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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

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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



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



Figure A-13 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



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



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





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



Figure A-18 PRE-TEST WINDSHIELD VIEW



Figure A-19 POST-TEST WINDSHIELDVIEW



Figure A-20 PRE-TEST ENGINE COMPARTMENT VIEW



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Figure A-21 POST-TEST ENGINE COMPARTMENT VIEW

M30108



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Figure A-22 PRE-TEST FUEL CAP VIEW



Figure A-23 POST-TEST FUEL CAP VIEW

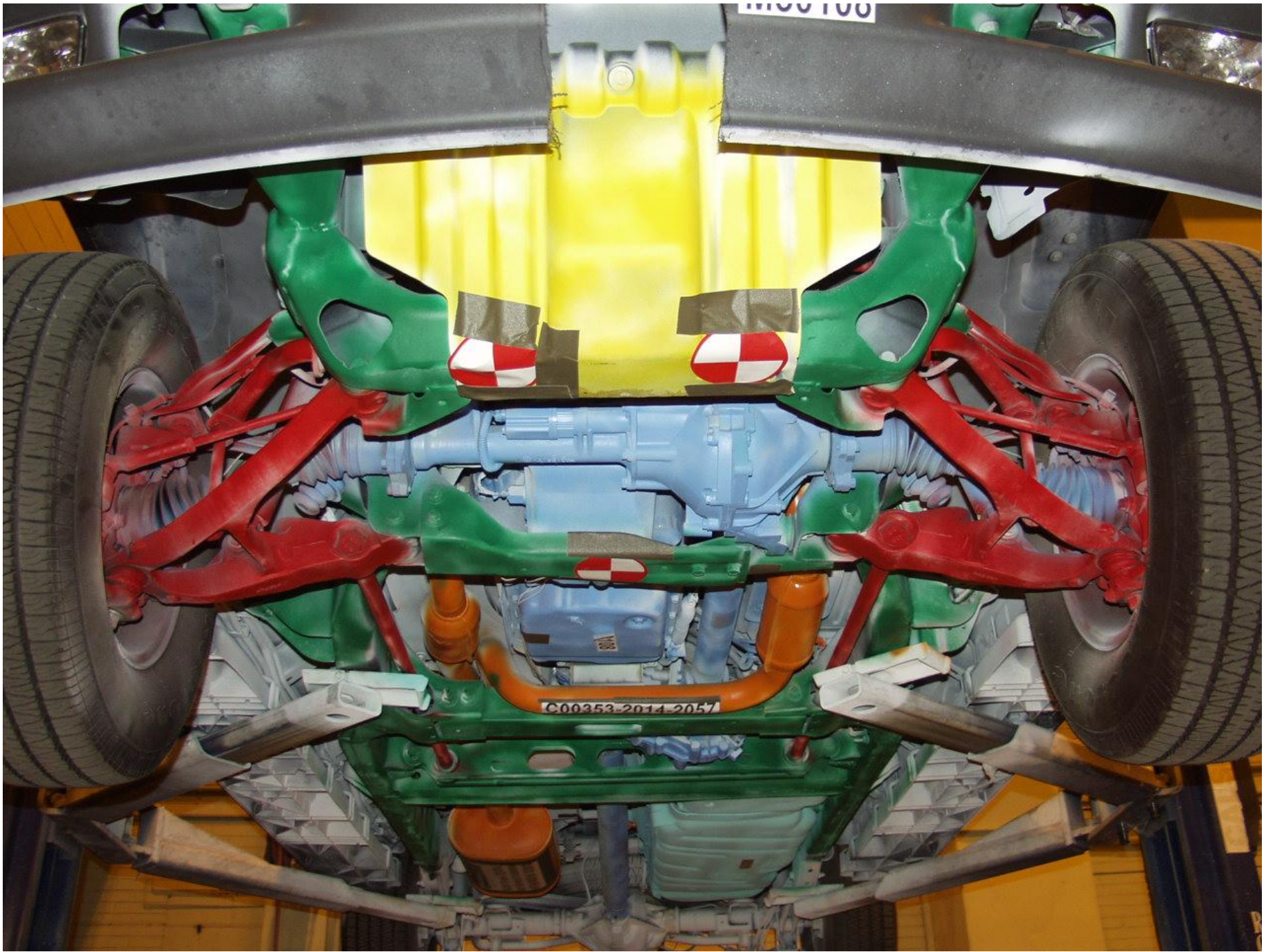


Figure A-24 PRE-TEST FRONT UNDERBODY VIEW

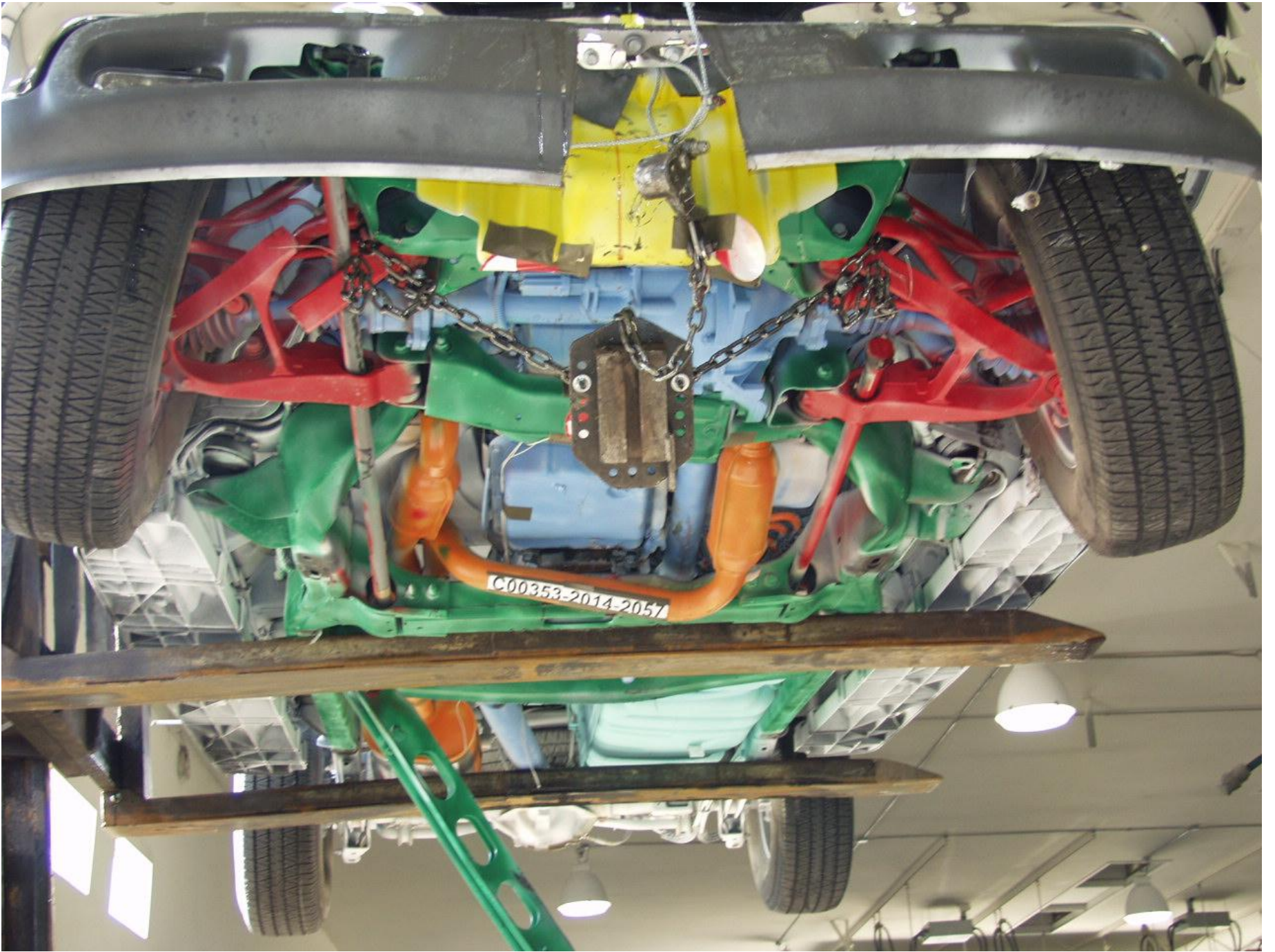


Figure A-25 POST-TEST FRONT UNDERBODY VIEW



Figure A-26 PRE-TEST MID UNDERBODY VIEW



Figure A-27 POST-TEST MID UNDERBODY VIEW



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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



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Figure A-34 PRE-TEST DRIVER AND INTERIOR VIEW



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Figure A-35 POST-TEST DRIVER AND INTERIOR VIEW



Figure A-36 PRE-TEST DRIVER FEET VIEW



Figure A-37 POST-TEST DRIVER FEET VIEW



Figure A-38 PRE-TEST DRIVER KNEE BOLSTER VIEW



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Figure A-39 POST-TEST DRIVER KNEE BOLSTER VIEW



Figure A-40 PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-41 POST-TEST DRIVER FLOOR PAN VIEW



Figure A-42 POST-TEST DRIVER HEAD VIEW



Figure A-43 POST-TEST DRIVER CONTACT TO AIRBAG



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Figure A-44 PRE-TEST PASSENGER HEAD LOCATION



Figure A-45 POST-TEST PASSENGER HEAD LOCATION



Figure A-46 PRE-TEST PASSENGER POSITION VIEW



Figure A-47 POST-TEST PASSENGER POSITION VIEW



Figure A-48 PRE-TEST PASSENGER AND INTERIOR VIEW



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Figure A-49 POST-TEST PASSENGER AND INTERIOR VIEW



Figure A-50 PRE- TEST PASSENGER FEET VIEW



Figure A-51 POST-TEST PASSENGER FEET VIEW



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Figure A-52 PRE-TEST PASSENGER KNEE BOLSTER VIEW



Figure A-53 POST-TEST PASSENGER KNEE BOLSTER VIEW



Figure A-54 PRE-TEST PASSENGER FLOOR PAN VIEW

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Figure A-55 POST-TEST PASSENGER FLOOR PAN VIEW



Figure A-56 POST-TEST PASSENGER HEAD VIEW



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Figure A-57 POST-TEST PASSENGER CONTACT TO AIRBAG



Figure A-58 ROLLOVER VIEW



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**

<b>Transducer</b>	<b>SAE Sign Convention (positive unless noted)</b>
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. M30108

<b>DATA TYPE</b>	<b>SAE FILTER CLASS (Hz)</b>
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 [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 [N, CFC_600]	B-43
37	V1P1 Right Femur [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
48	V1P1 Left Foot Aft Ax [g, CFC_600]	B-55
49	V1P1 Left Foot Aft Az [g, CFC_600]	B-56
50	V1P1 Left Foot Fore Az [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	V1P1 Lap Belt [N, CFC_60]	B-61
55	V1P2 Head 9 Array X Arm y [g, CFC_1000]	B-62
56	V1P2 Head 9 Array X Arm z [g, CFC_1000]	B-63
57	V1P2 Head 9 Array Y Arm x [g, CFC_1000]	B-64
58	V1P2 Head 9 Array Y Arm z [g, CFC_1000]	B-65
59	V1P2 Head 9 Array Z Arm x [g, CFC_1000]	B-66
60	V1P2 Head 9 Array Z Arm y [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 [mm, CFC_600]	B-92
86	V1P2 Pelvic x [g, CFC_1000]	B-93
87	V1P2 Pelvic y [g, CFC_1000]	B-94
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90	V1P2 Left Femur [N, CFC_600]	B-97
91	V1P2 Right Femur [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
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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
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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	Barrier Load Cell A1 Fx [N, CFC_60]	B-143

137	Barrier Load Cell A2 Fx [N, CFC_60]	B-144
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141	Barrier Load Cell A6 Fx [N, CFC_60]	B-148
142	Barrier Load Cell A7 Fx [N, CFC_60]	B-149
143	Barrier Load Cell A8 Fx [N, CFC_60]	B-150
144	Barrier Load Cell A9 Fx [N, CFC_60]	B-151
145	Barrier Load Cell B1 Fx [N, CFC_60]	B-152
146	Barrier Load Cell B2 Fx [N, CFC_60]	B-153
147	Barrier Load Cell B3 Fx [N, CFC_60]	B-154
148	Barrier Load Cell B4 Fx [N, CFC_60]	B-155
149	Barrier Load Cell B5 Fx [N, CFC_60]	B-156
150	Barrier Load Cell B6 Fx [N, CFC_60]	B-157
151	Barrier Load Cell B7 Fx [N, CFC_60]	B-158
152	Barrier Load Cell B8 Fx [N, CFC_60]	B-159
153	Barrier Load Cell B9 Fx [N, CFC_60]	B-160
154	Barrier Load Cell C1 Fx [N, CFC_60]	B-161
155	Barrier Load Cell C2 Fx [N, CFC_60]	B-162
156	Barrier Load Cell C3 Fx [N, CFC_60]	B-163
157	Barrier Load Cell C4 Fx [N, CFC_60]	B-164
158	Barrier Load Cell C5 Fx [N, CFC_60]	B-165
159	Barrier Load Cell C6 Fx [N, CFC_60]	B-166
160	Barrier Load Cell C7 Fx [N, CFC_60]	B-167
161	Barrier Load Cell C8 Fx [N, CFC_60]	B-168
162	Barrier Load Cell C9 Fx [N, CFC_60]	B-169
163	Barrier Load Cell D1 Fx [N, CFC_60]	B-170
164	Barrier Load Cell D2 Fx [N, CFC_60]	B-171
165	Barrier Load Cell D3 Fx [N, CFC_60]	B-172
166	Barrier Load Cell D4 Fx [N, CFC_60]	B-173
167	Barrier Load Cell D5 Fx [N, CFC_60]	B-174
168	Barrier Load Cell D6 Fx [N, CFC_60]	B-175
169	Barrier Load Cell D7 Fx [N, CFC_60]	B-176
170	Barrier Load Cell D8 Fx [N, CFC_60]	B-177
171	Barrier Load Cell D9 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

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Max: 4.6 [g] at 0.107 [s]

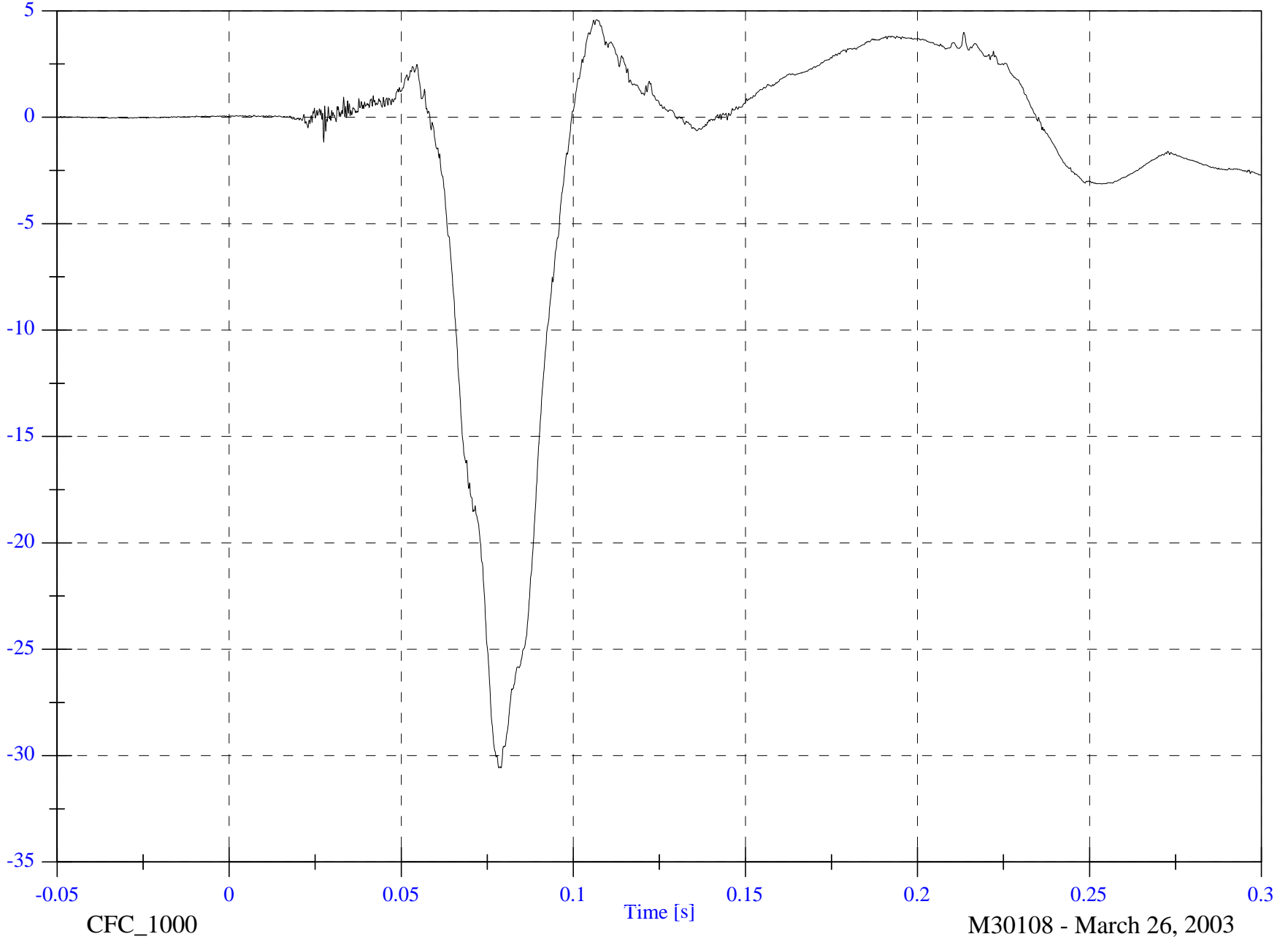
V1P1 Head 9 Array X Arm Ay

Min: -30.6 [g] at 0.079 [s]

B-8

g

8642-NCAP-36



CFC\_1000

Time [s]

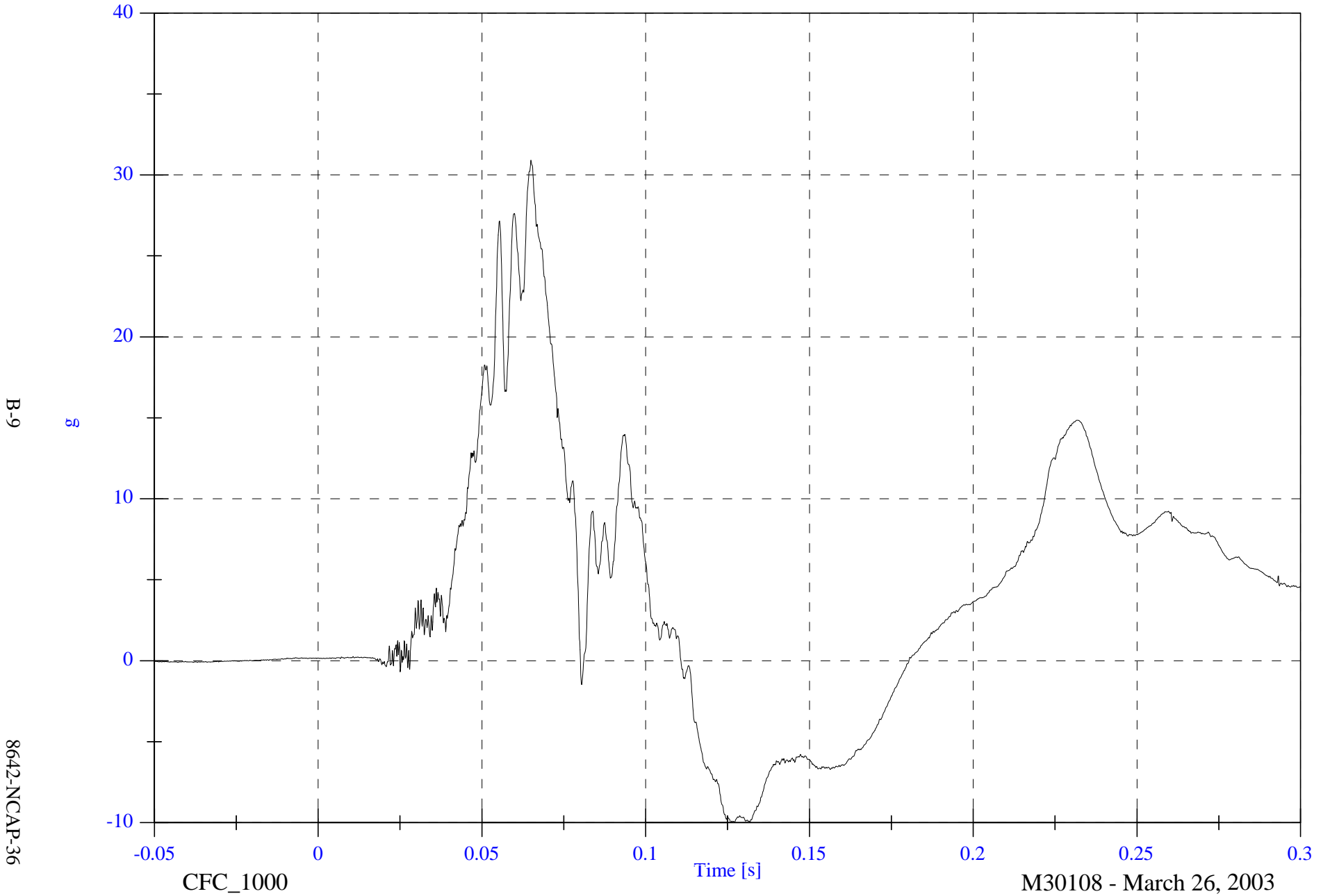
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Head 9 Array X Arm Az

Max: 30.9 [g] at 0.065 [s]

Min: -10.0 [g] at 0.126 [s]

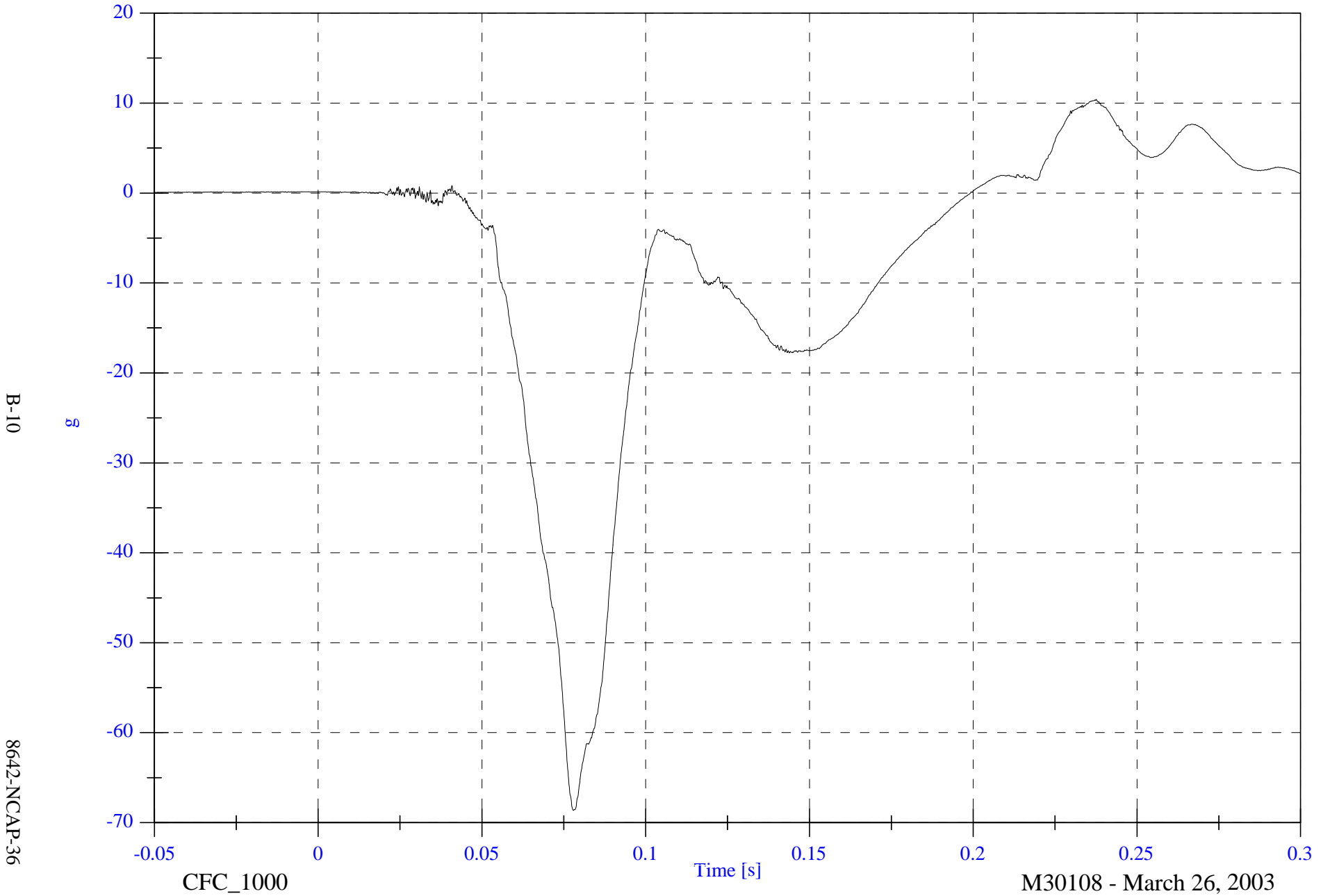


NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Head 9 Array Y Arm Ax

Max: 10.4 [g] at 0.238 [s]

Min: -68.6 [g] at 0.078 [s]



B-10

8642-NCAP-36

CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

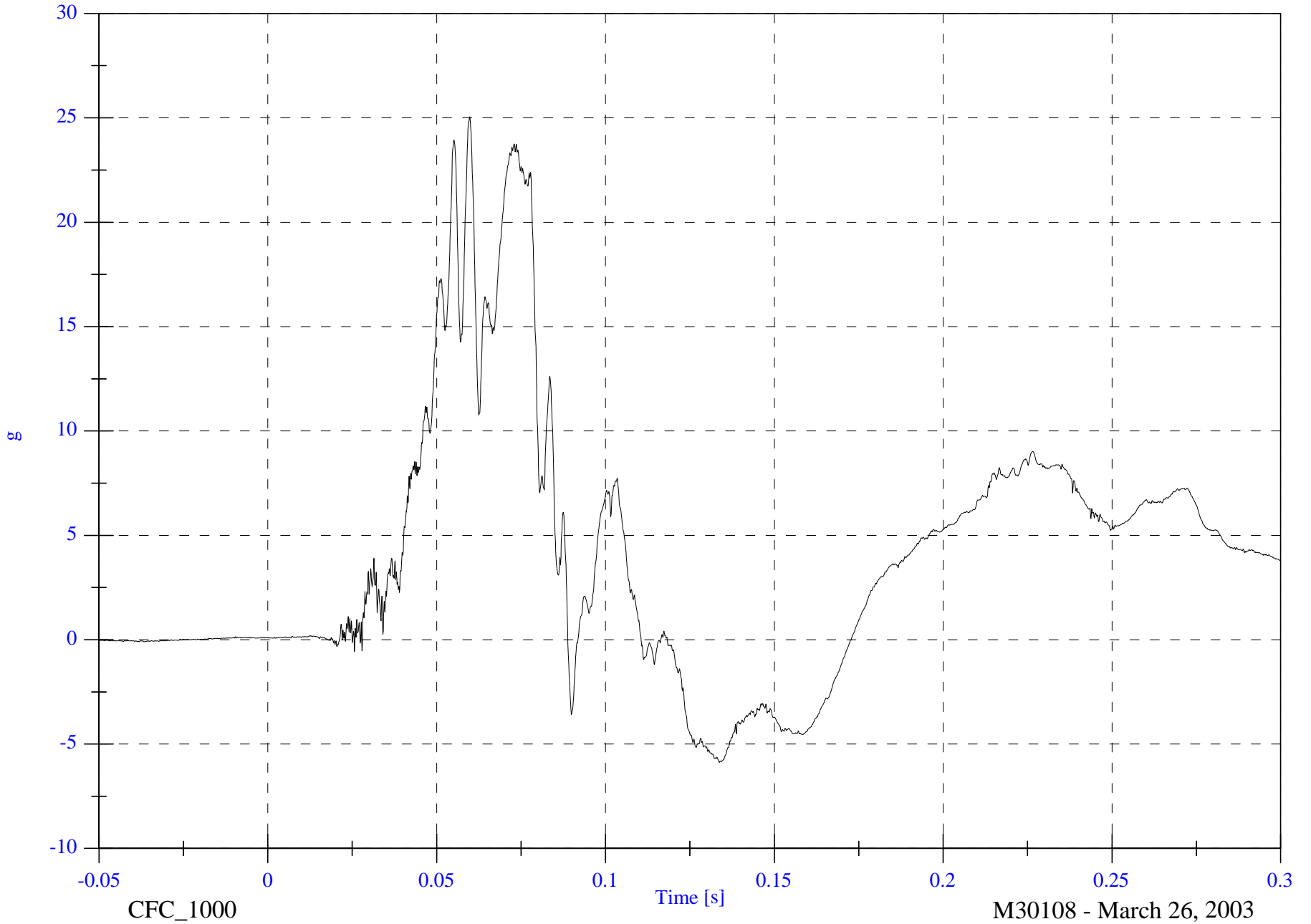
V1P1 Head 9 Array Y Arm Az

Max: 25.1 [g] at 0.060 [s]

Min: -5.9 [g] at 0.134 [s]

B-11

8642-NCAP-36



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NCAP Test #14 - 2003 Chevrolet Suburban

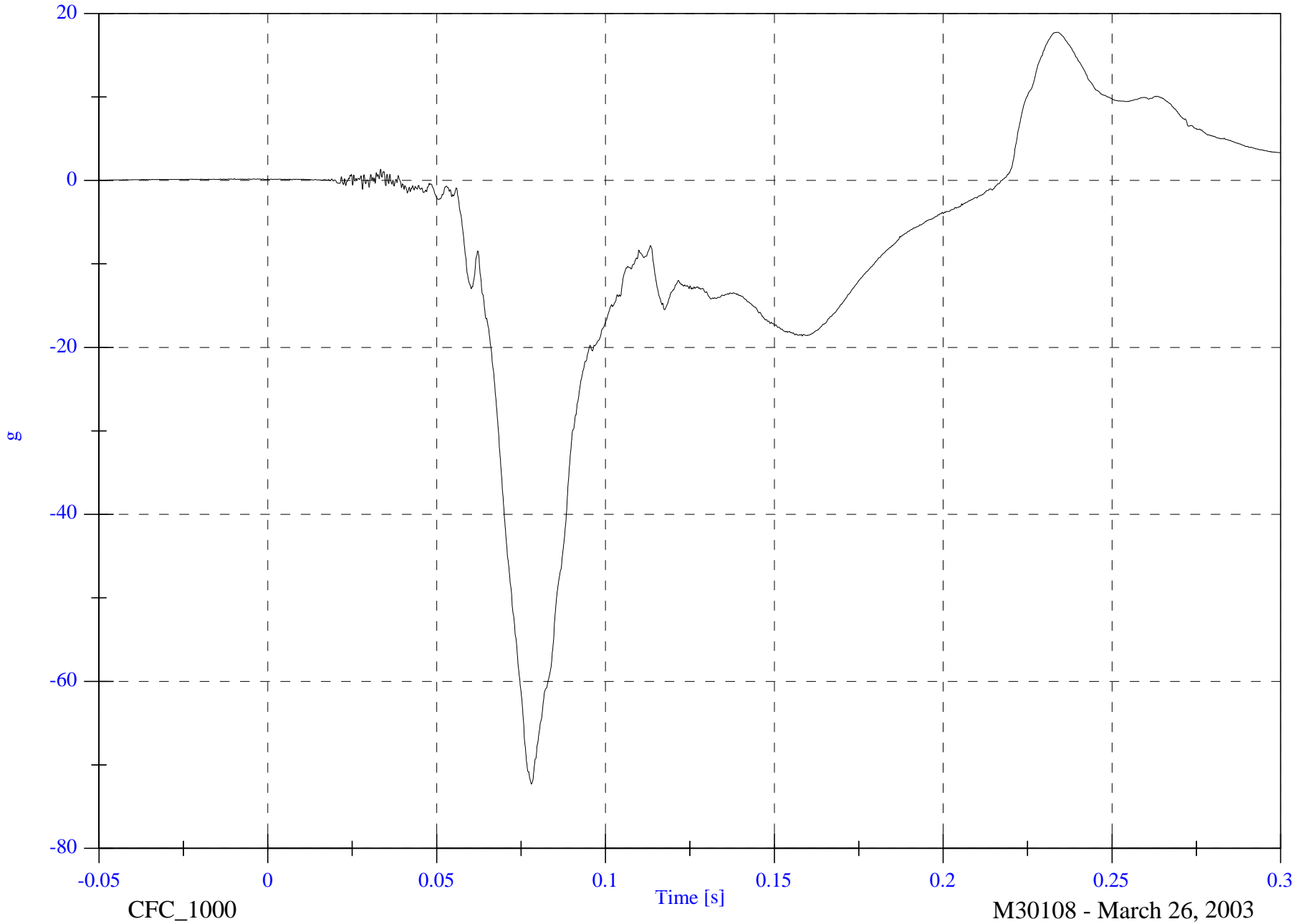
V1P1 Head 9 Array Z Arm Ax

Max: 17.8 [g] at 0.234 [s]

Min: -72.3 [g] at 0.078 [s]

B-12

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

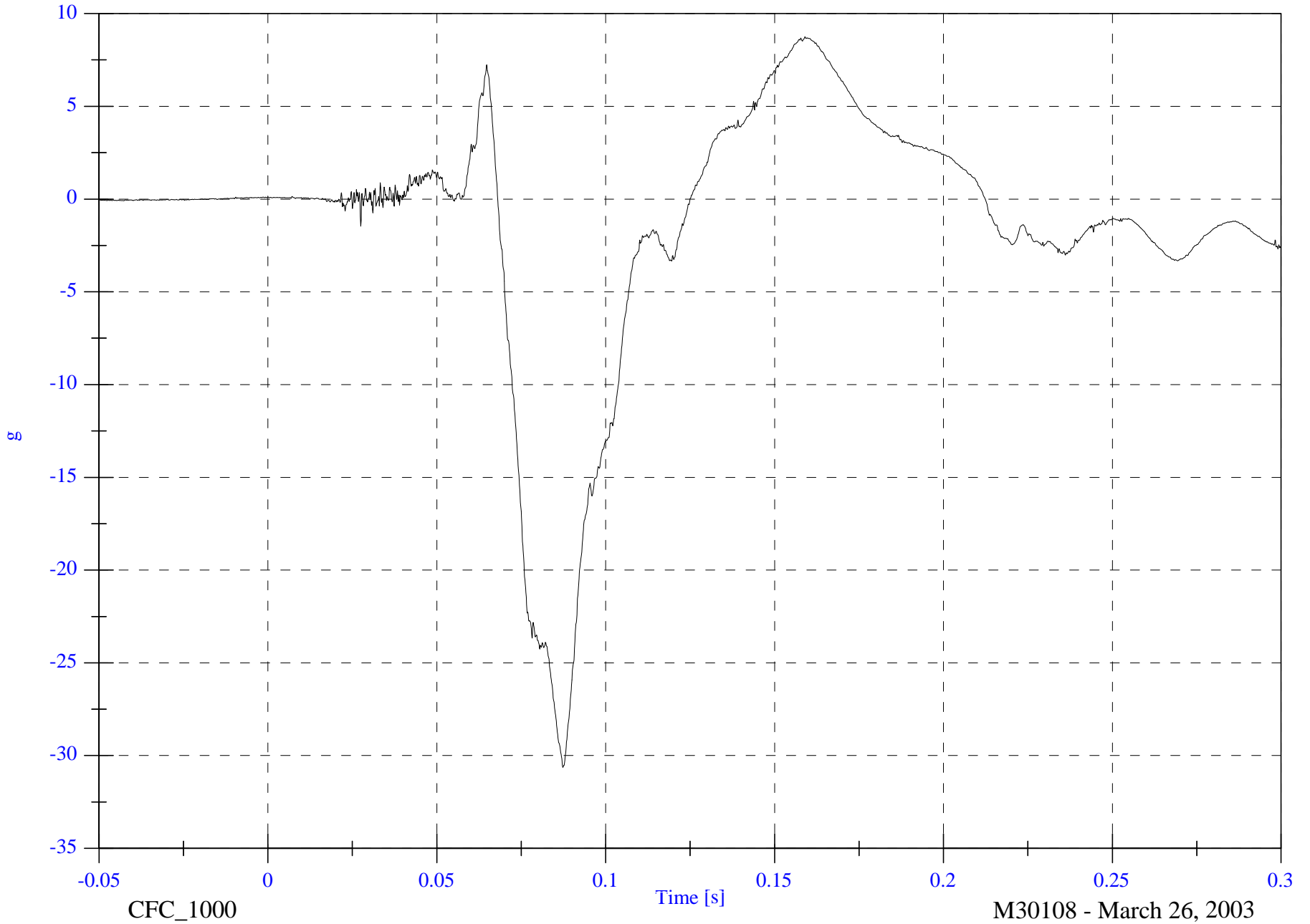
V1P1 Head 9 Array Z Arm Ay

Max: 8.7 [g] at 0.159 [s]

Min: -30.6 [g] at 0.087 [s]

B-13

8642-NCAP-36



CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

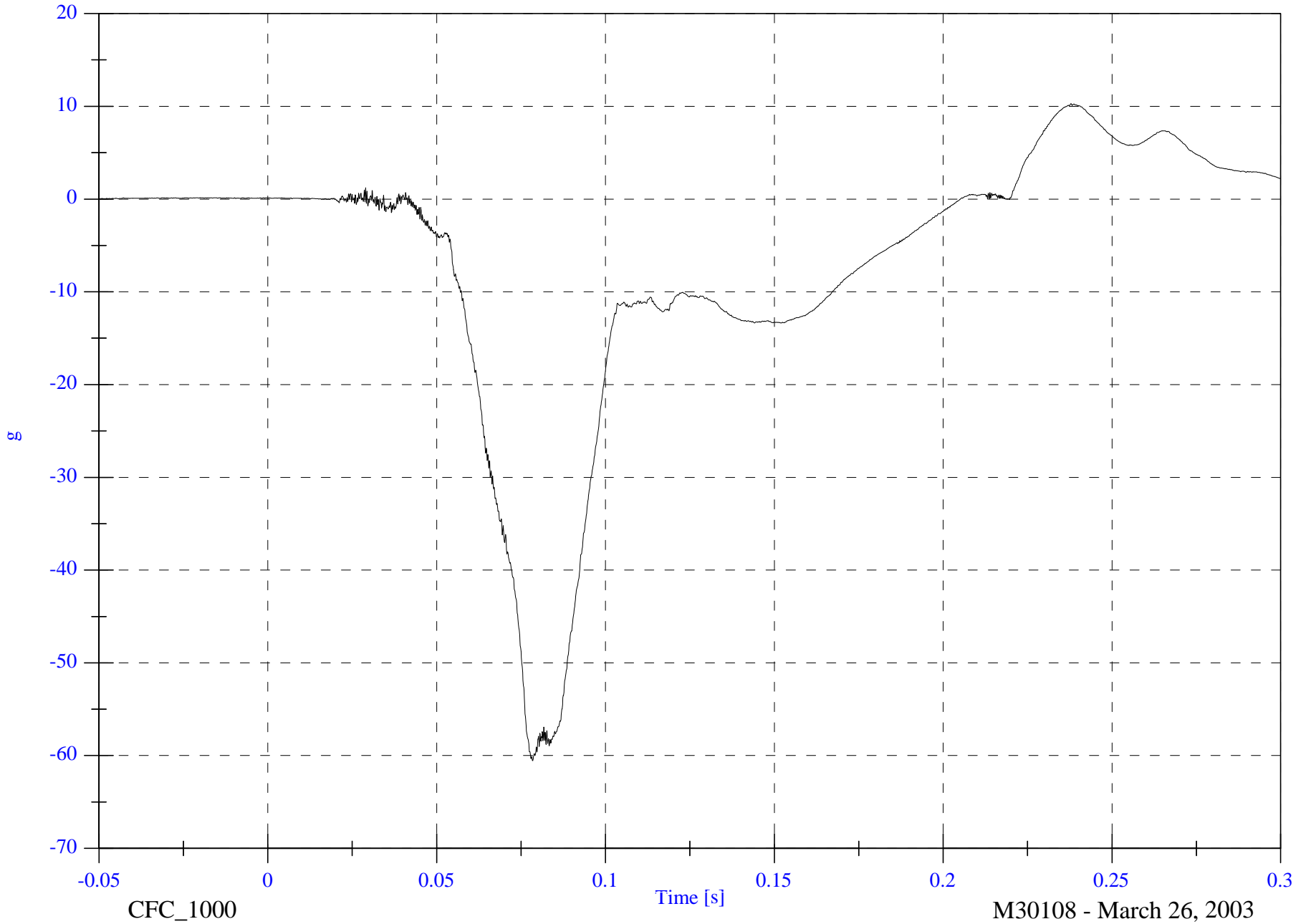
V1P1 Head CG x

Max: 10.3 [g] at 0.238 [s]

Min: -60.6 [g] at 0.078 [s]

B-14

8642-NCAP-36



CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

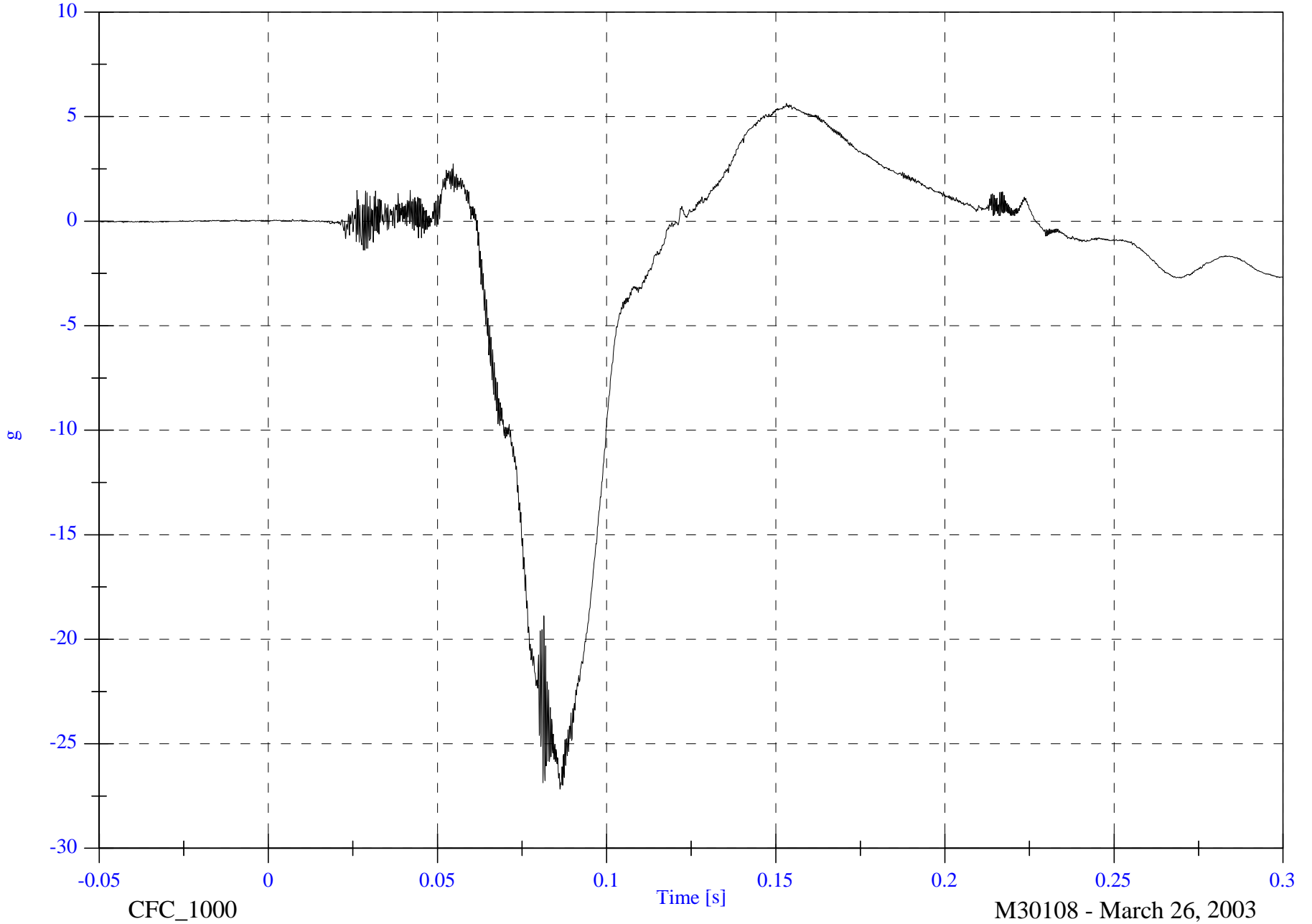
V1P1 Head CG y

Max: 5.6 [g] at 0.153 [s]

Min: -27.2 [g] at 0.086 [s]

B-15

8642-NCAP-36



CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

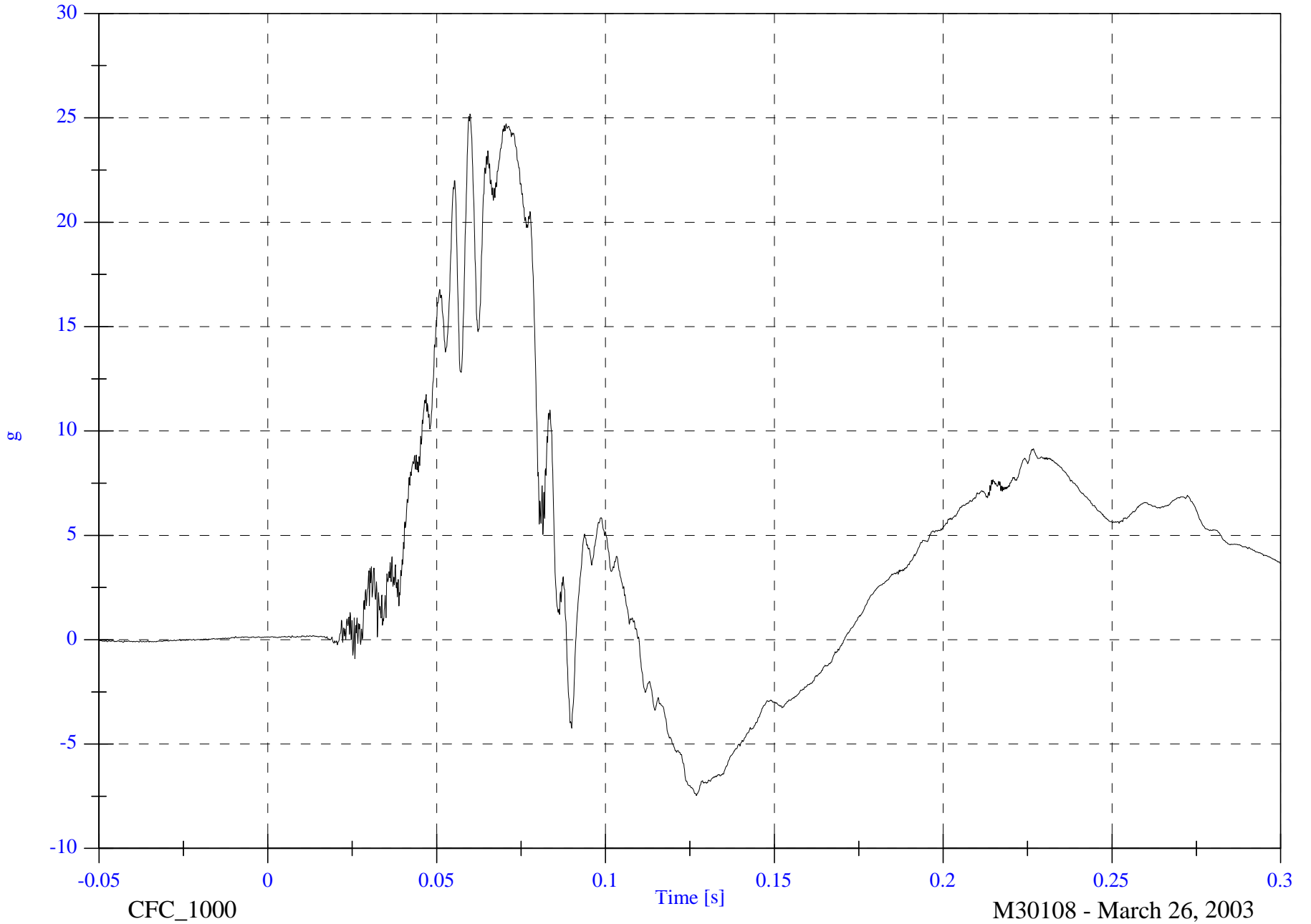
V1P1 Head CG z

Max: 25.2 [g] at 0.060 [s]

Min: -7.5 [g] at 0.127 [s]

B-16

8642-NCAP-36



M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

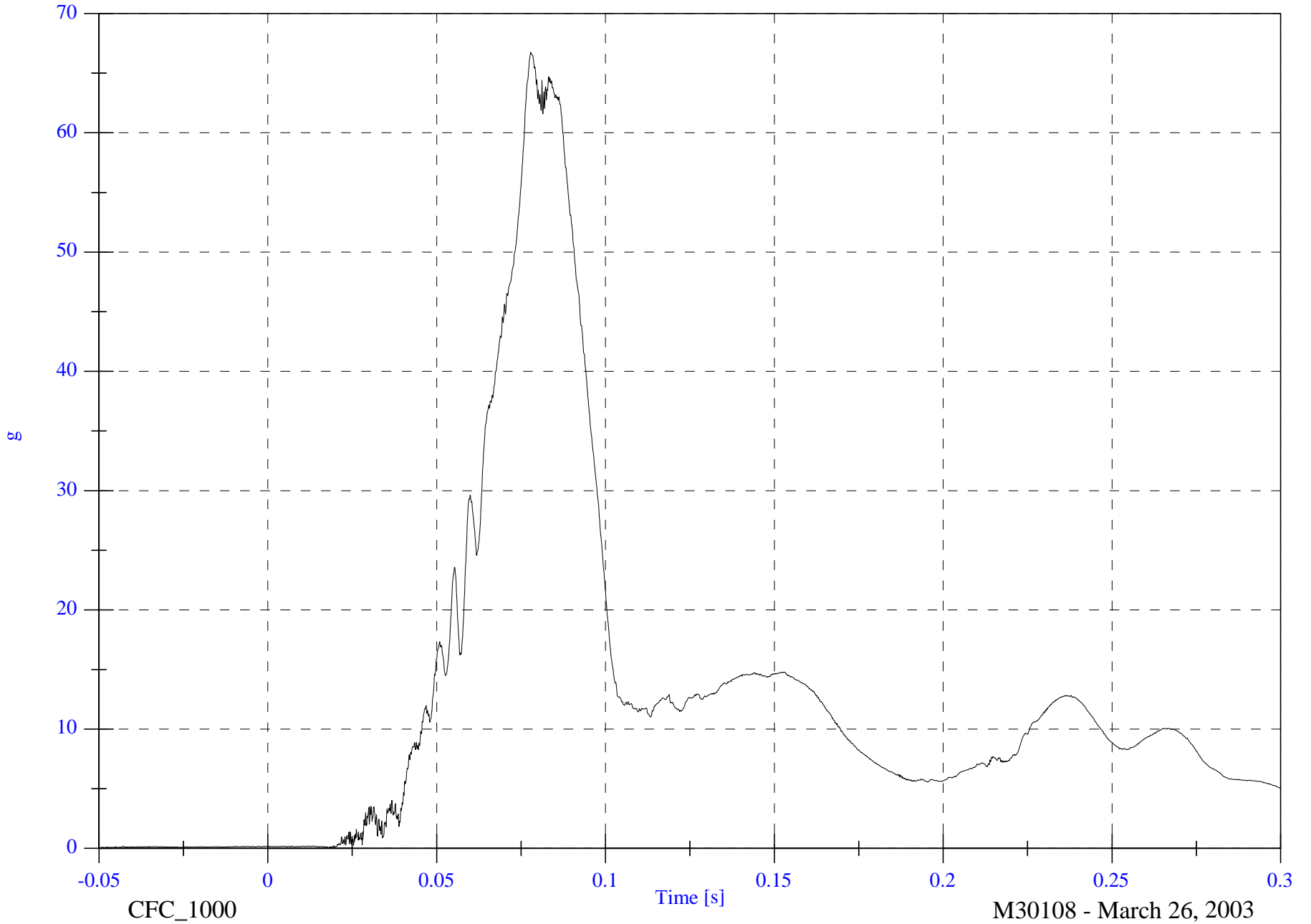
V1P1 Head CG Resultant

Max: 66.7 [g] at 0.078 [s]

Min: 0.0 [g] at 0.018 [s]

B-17

8642-NCAP-36



CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

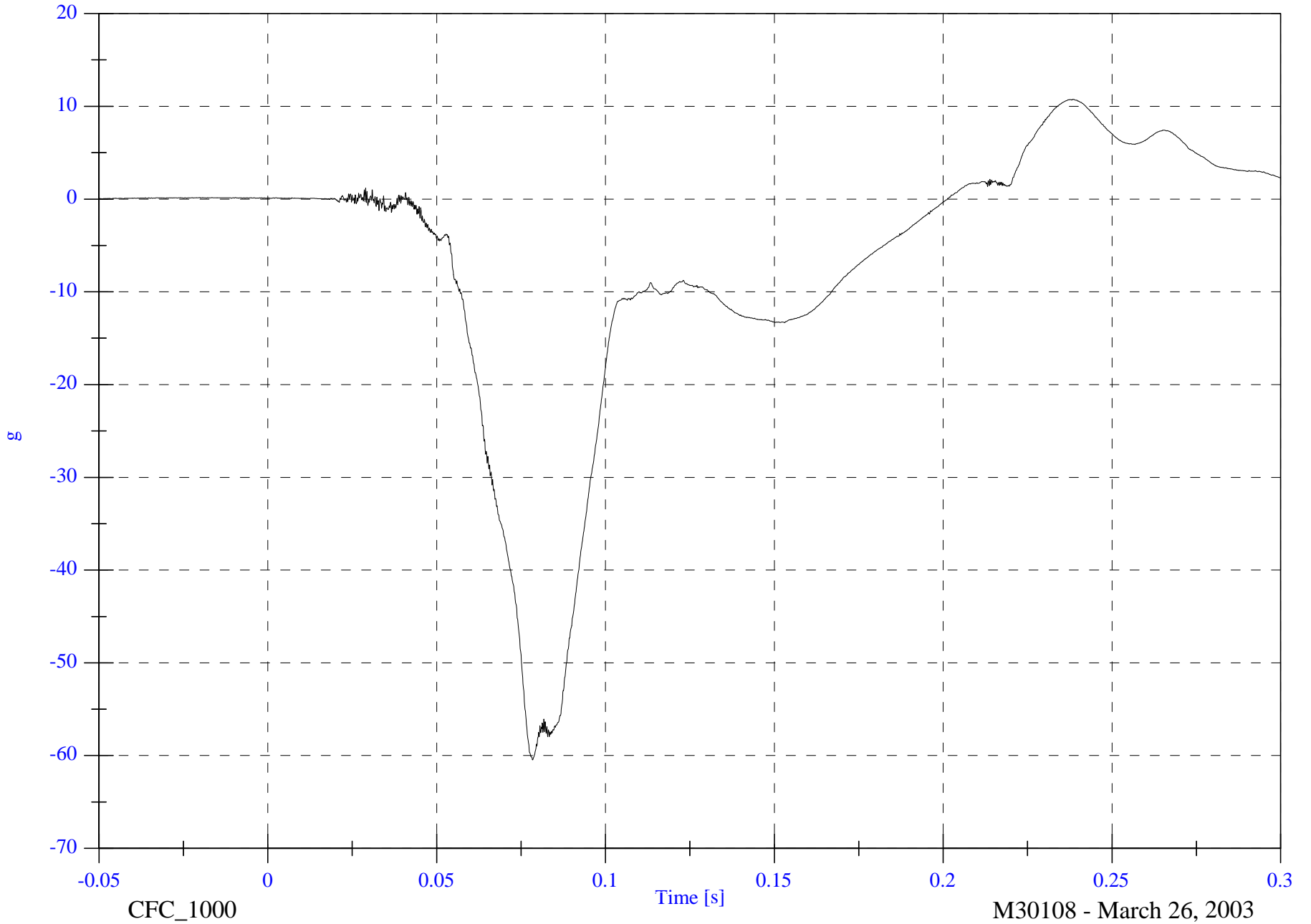
V1P1 Head CG Red x

Max: 10.8 [g] at 0.238 [s]

Min: -60.5 [g] at 0.078 [s]

B-18

8642-NCAP-36



CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

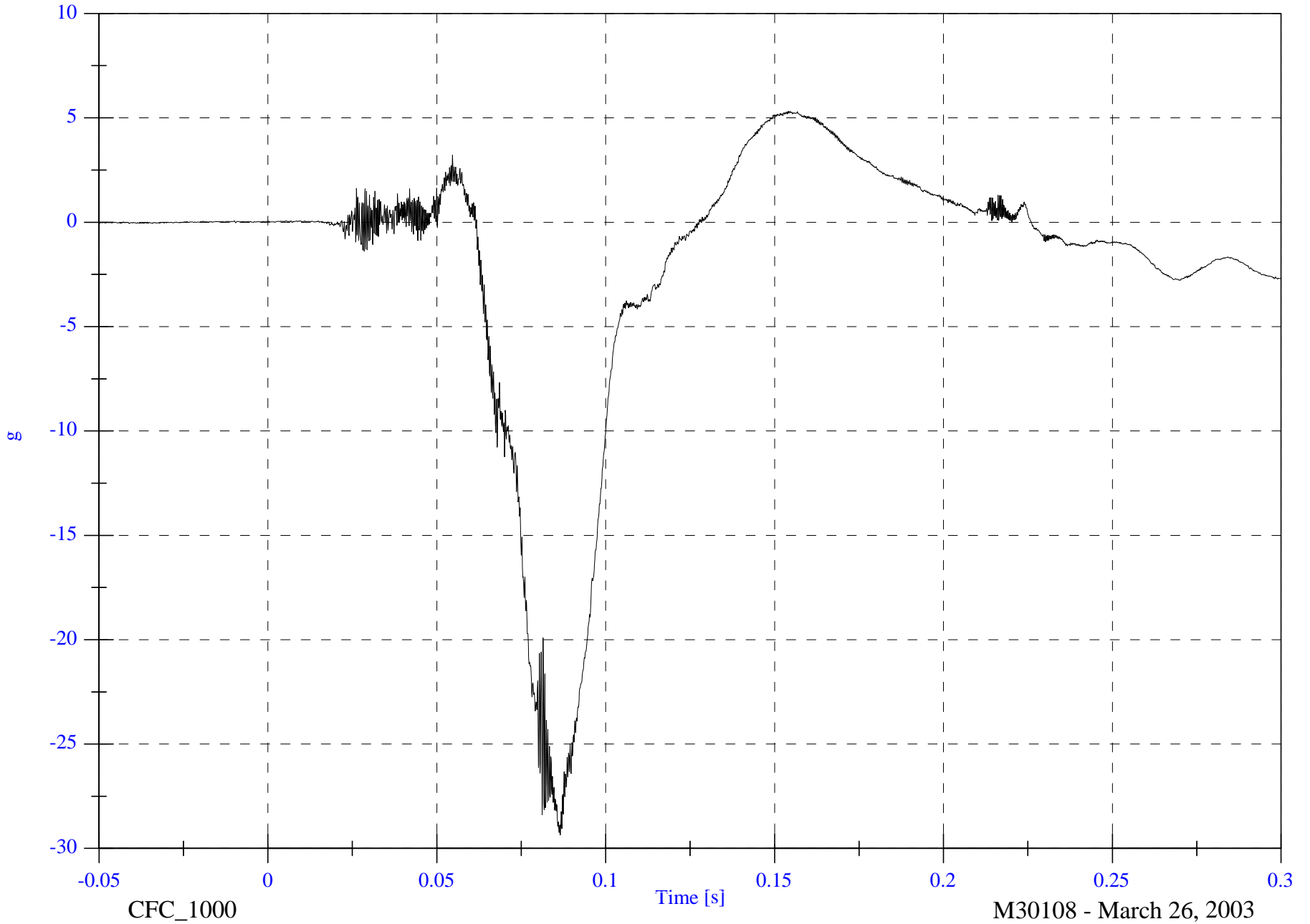
V1P1 Head CG Red y

Max: 5.3 [g] at 0.154 [s]

Min: -29.4 [g] at 0.087 [s]

B-19

8642-NCAP-36



CFC\_1000

Time [s]

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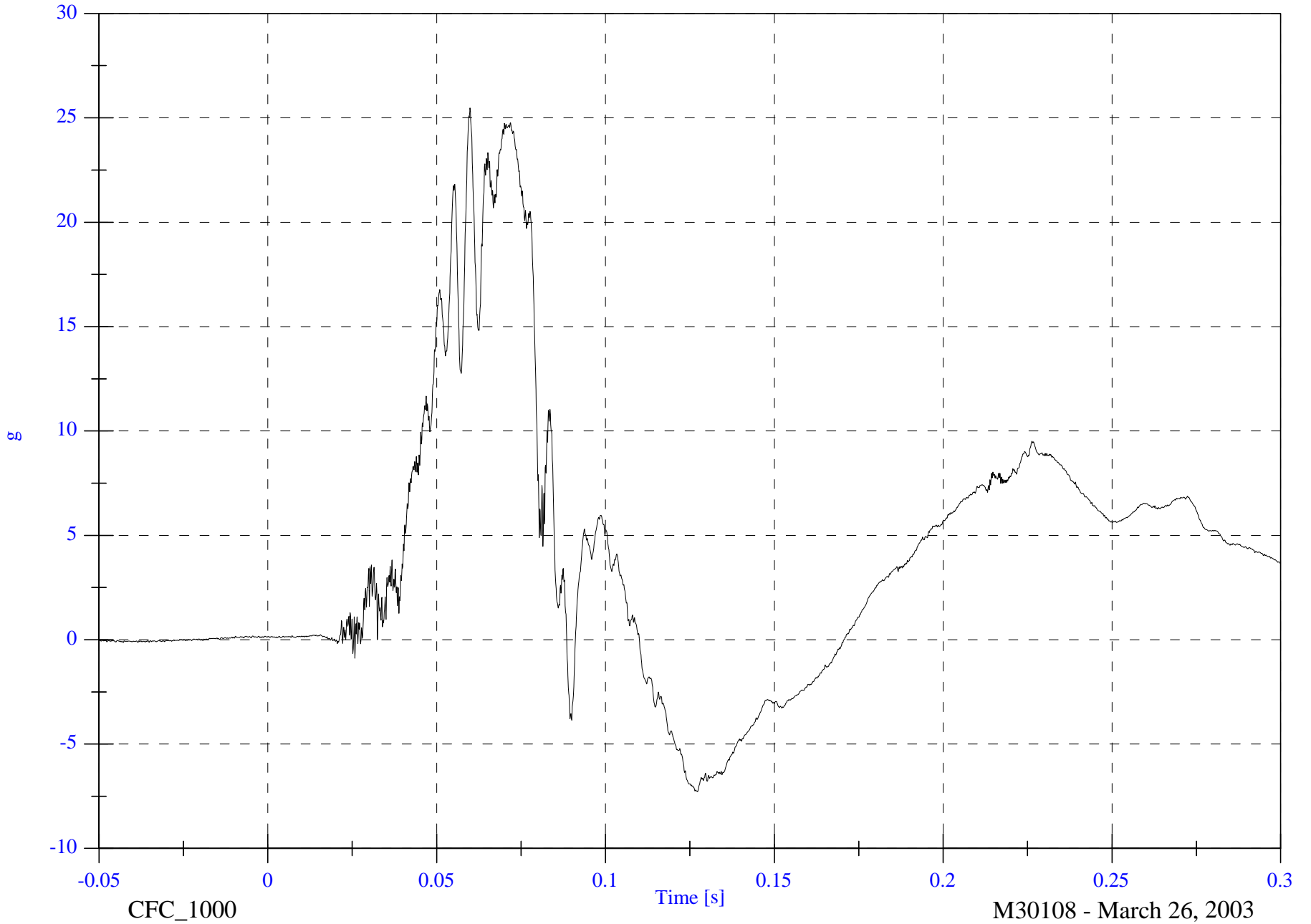
V1P1 Head CG Red z

Max: 25.5 [g] at 0.060 [s]

Min: -7.3 [g] at 0.127 [s]

B-20

8642-NCAP-36



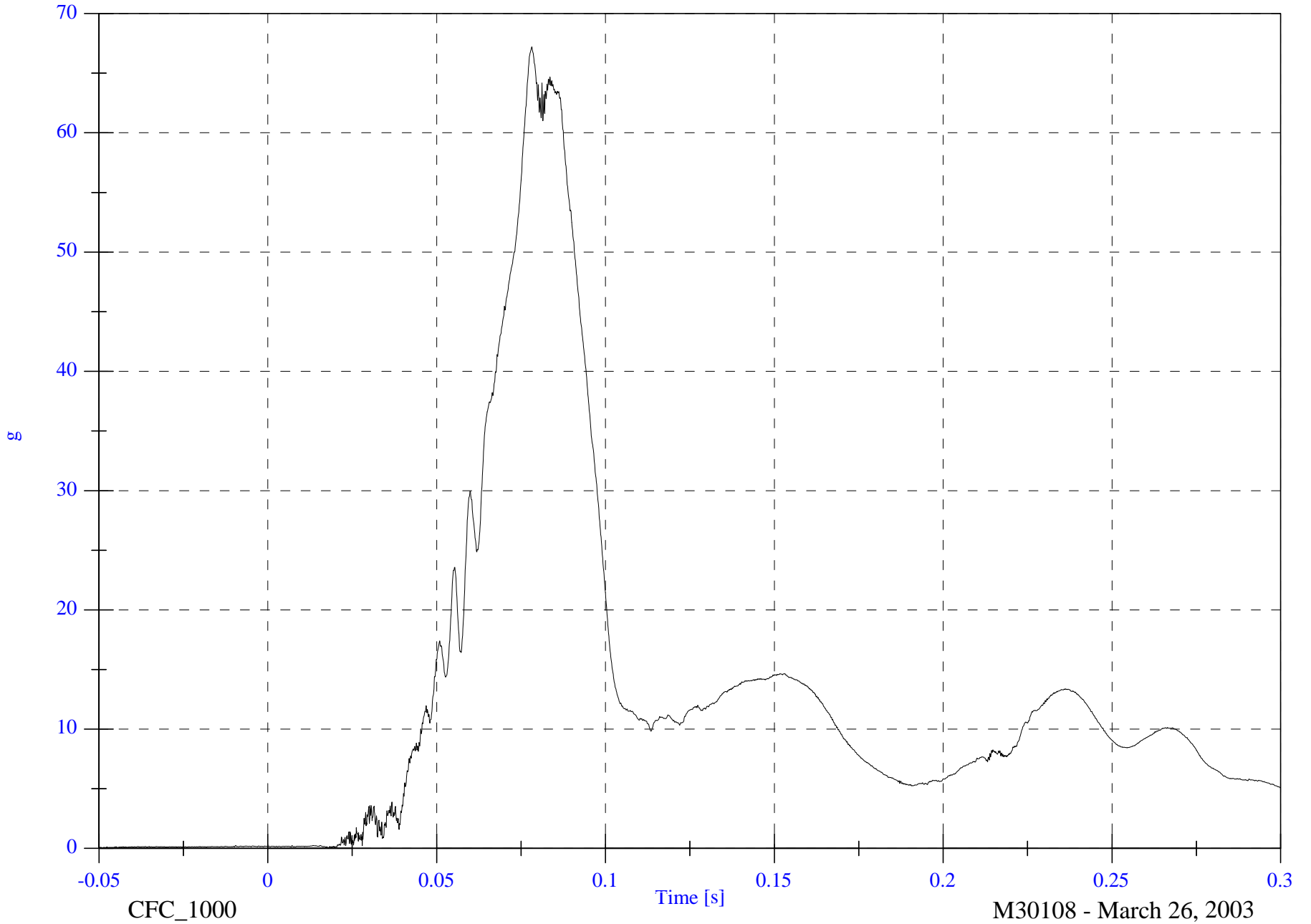
M30108 - March 26, 2003

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V1P1 Head CG Red Resultant

Max: 67.2 [g] at 0.078 [s]

Min: 0.0 [g] at 0.018 [s]



B-21

8642-NCAP-36

CFC\_1000

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

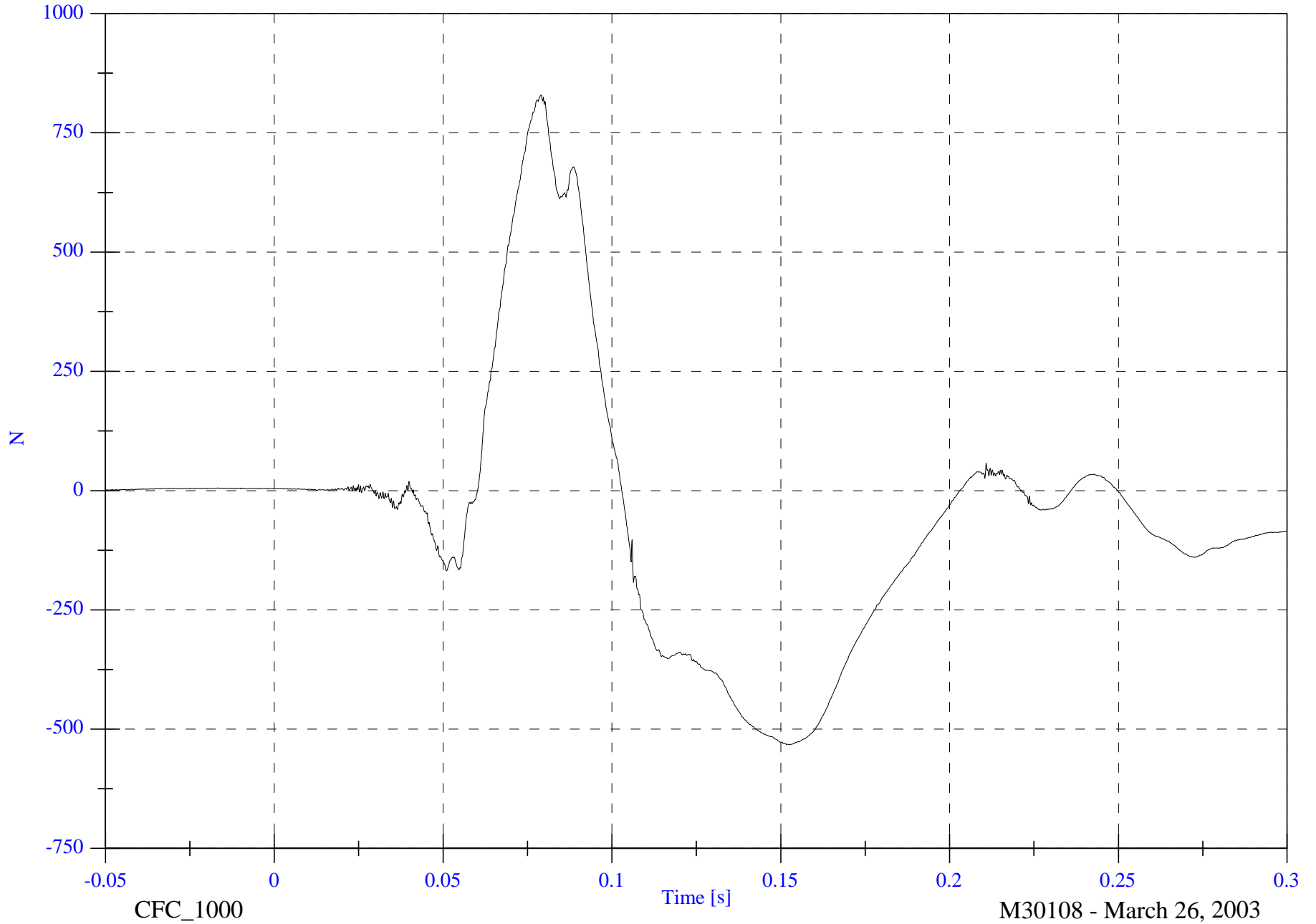
Max: 829.3 [N] at 0.079 [s]

V1P1 Upper Neck Fx

Min: -532.9 [N] at 0.152 [s]

B-22

8642-NCAP-36



CFC\_1000

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

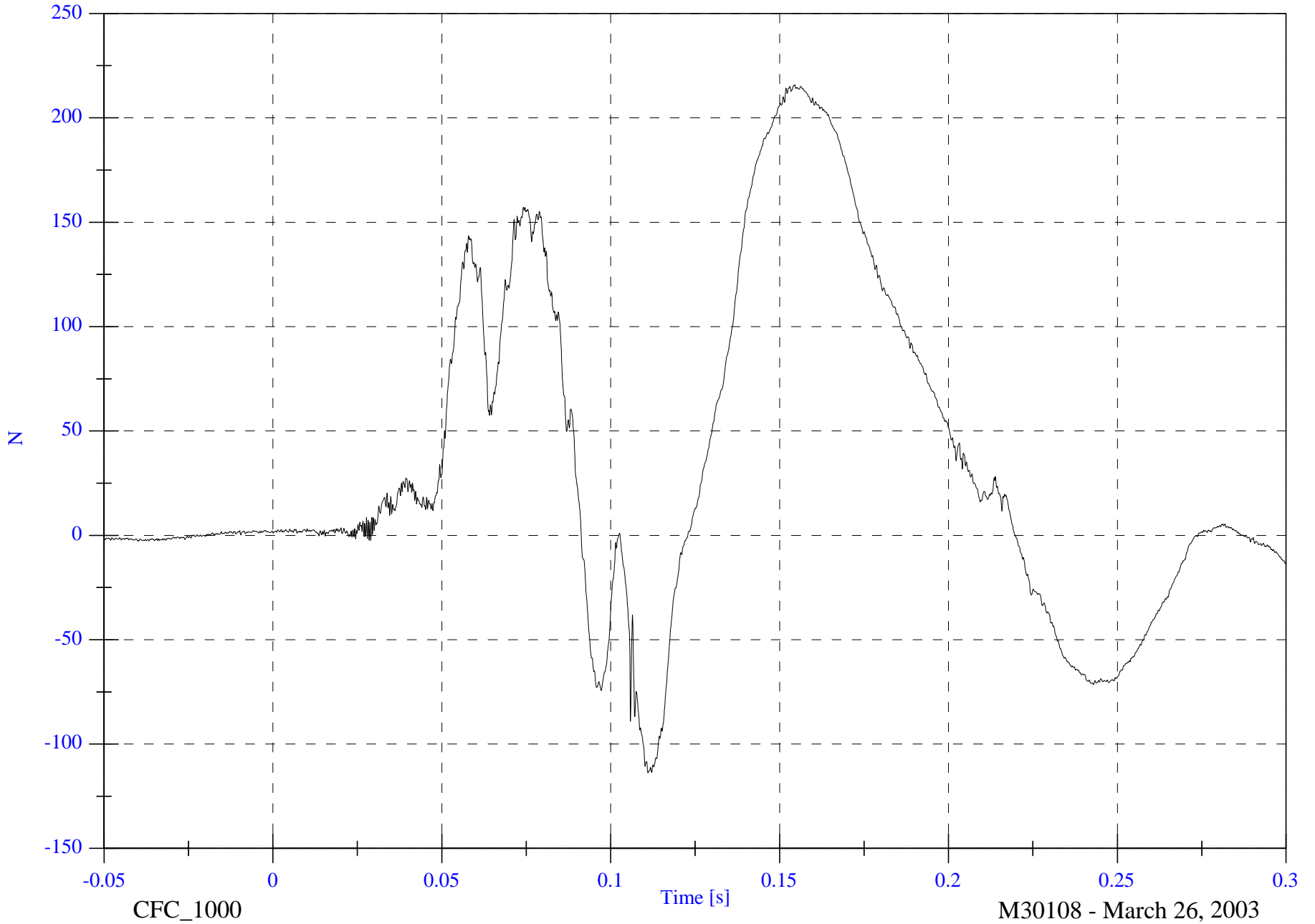
V1P1 Upper Neck Fy

Max: 215.8 [N] at 0.154 [s]

Min: -113.9 [N] at 0.111 [s]

B-23

8642-NCAP-36



CFC\_1000

Time [s]

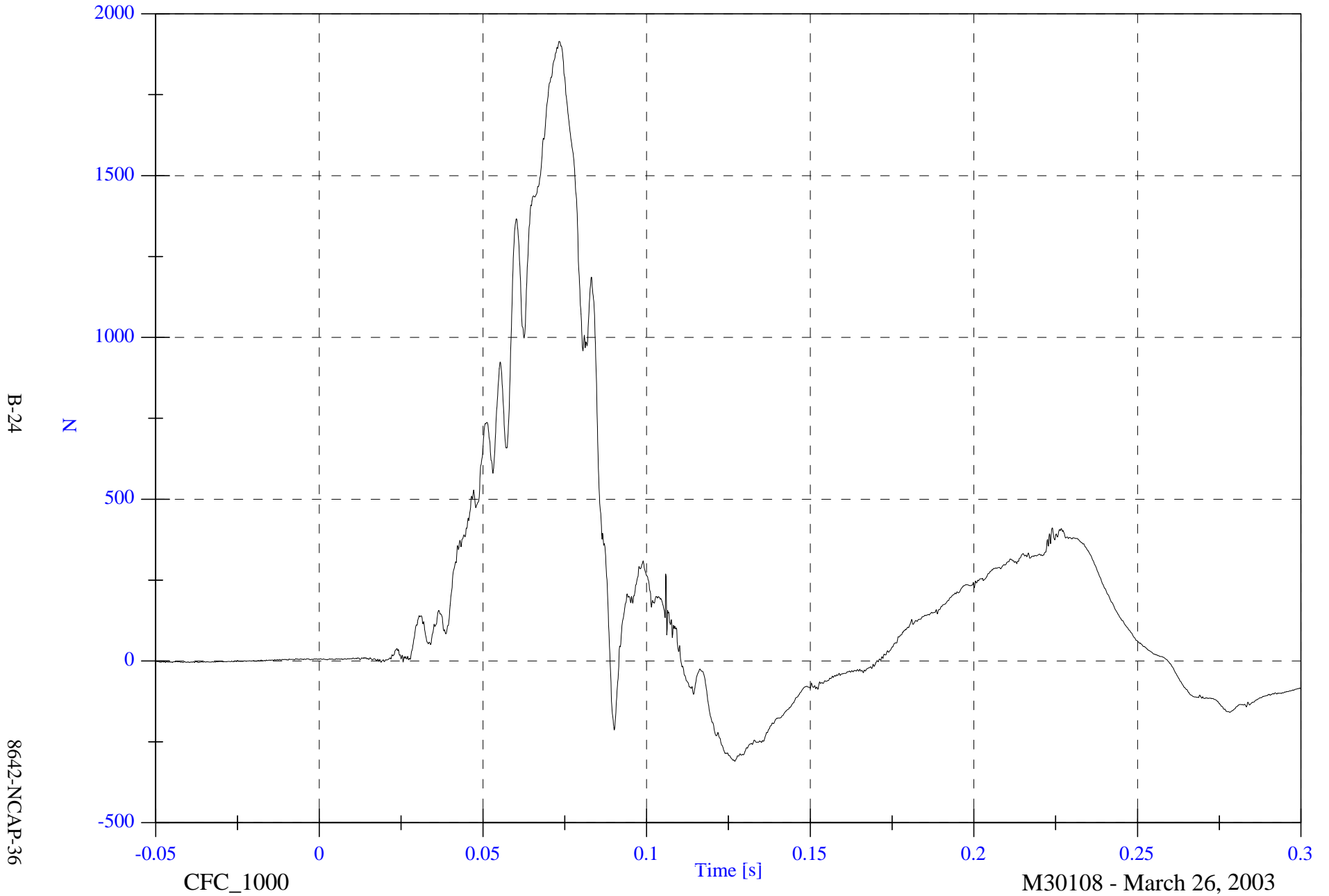
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NCAP Test #14 - 2003 Chevrolet Suburban

Max: 1914.7 [N] at 0.073 [s]

V1P1 Upper Neck Fz

Min: -310.4 [N] at 0.127 [s]

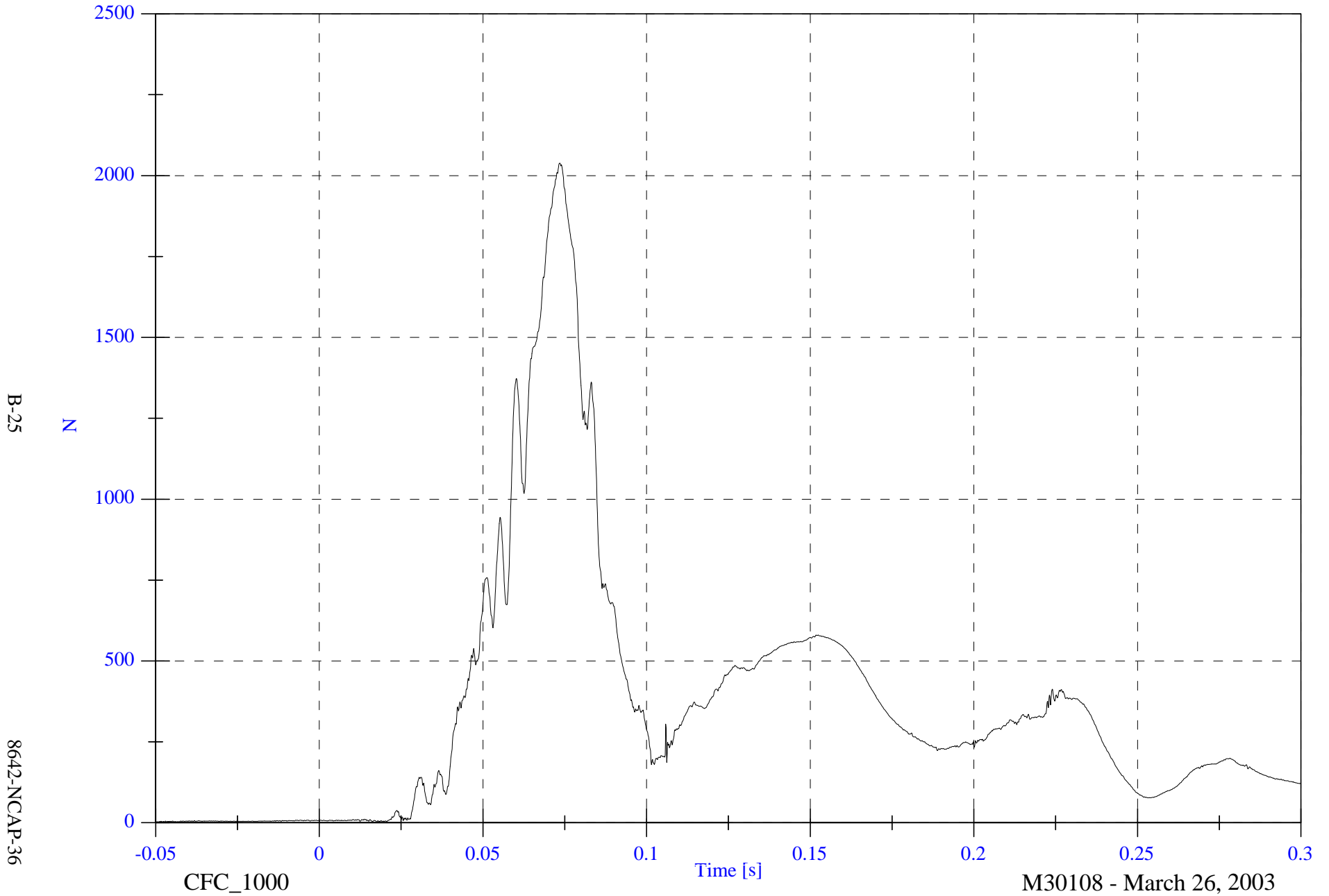


NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Upper Neck F Resultant

Max: 2038.8 [N] at 0.073 [s]

Min: 2.2 [N] at -0.050 [s]



B-25

8642-NCAP-36

CFC\_1000

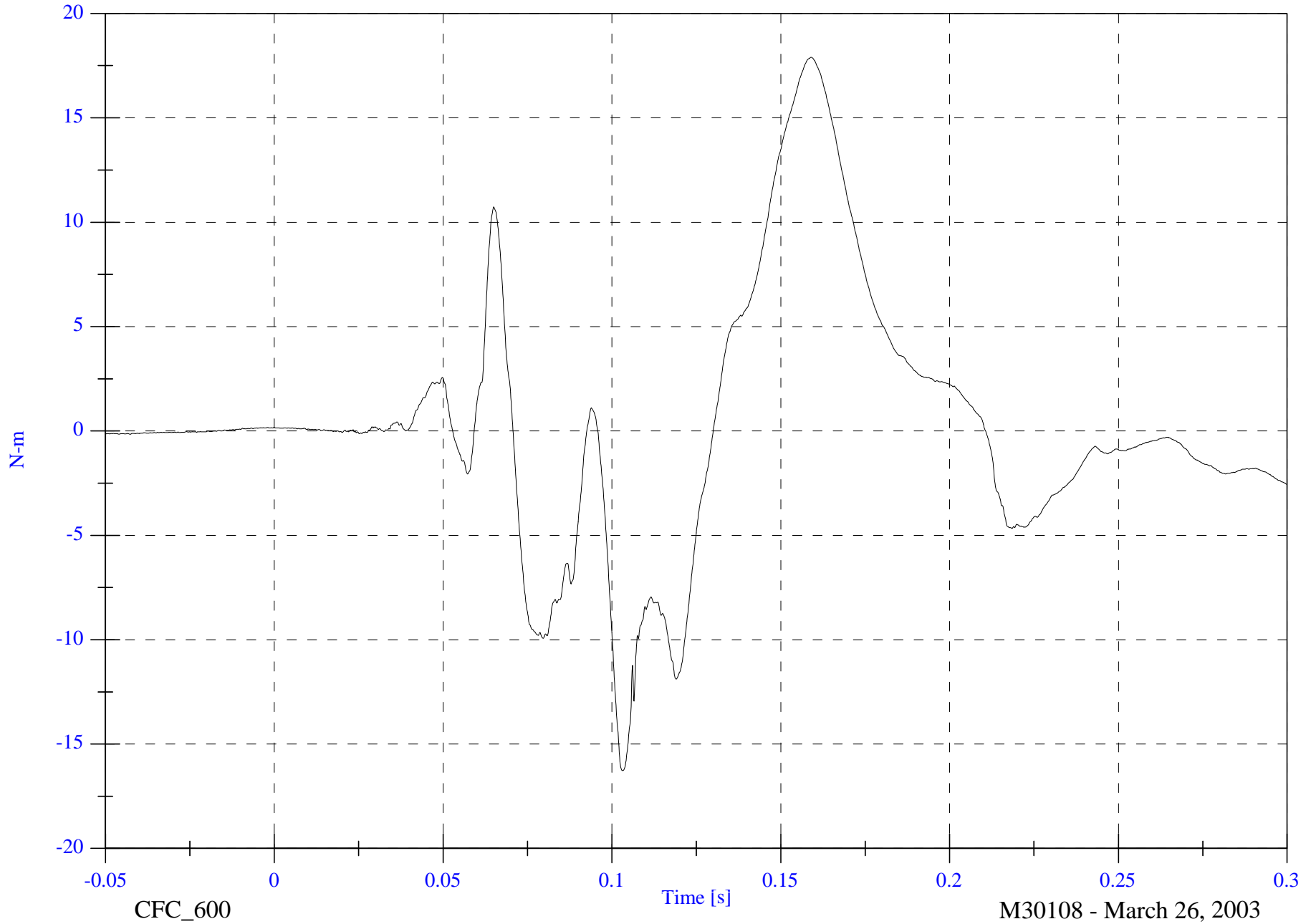
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NCAP Test #14 - 2003 Chevrolet Suburban

Max: 17.9 [N-m] at 0.159 [s]

V1P1 Upper Neck Mx

Min: -16.3 [N-m] at 0.103 [s]



B-26

8642-NCAP-36

CFC\_600

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

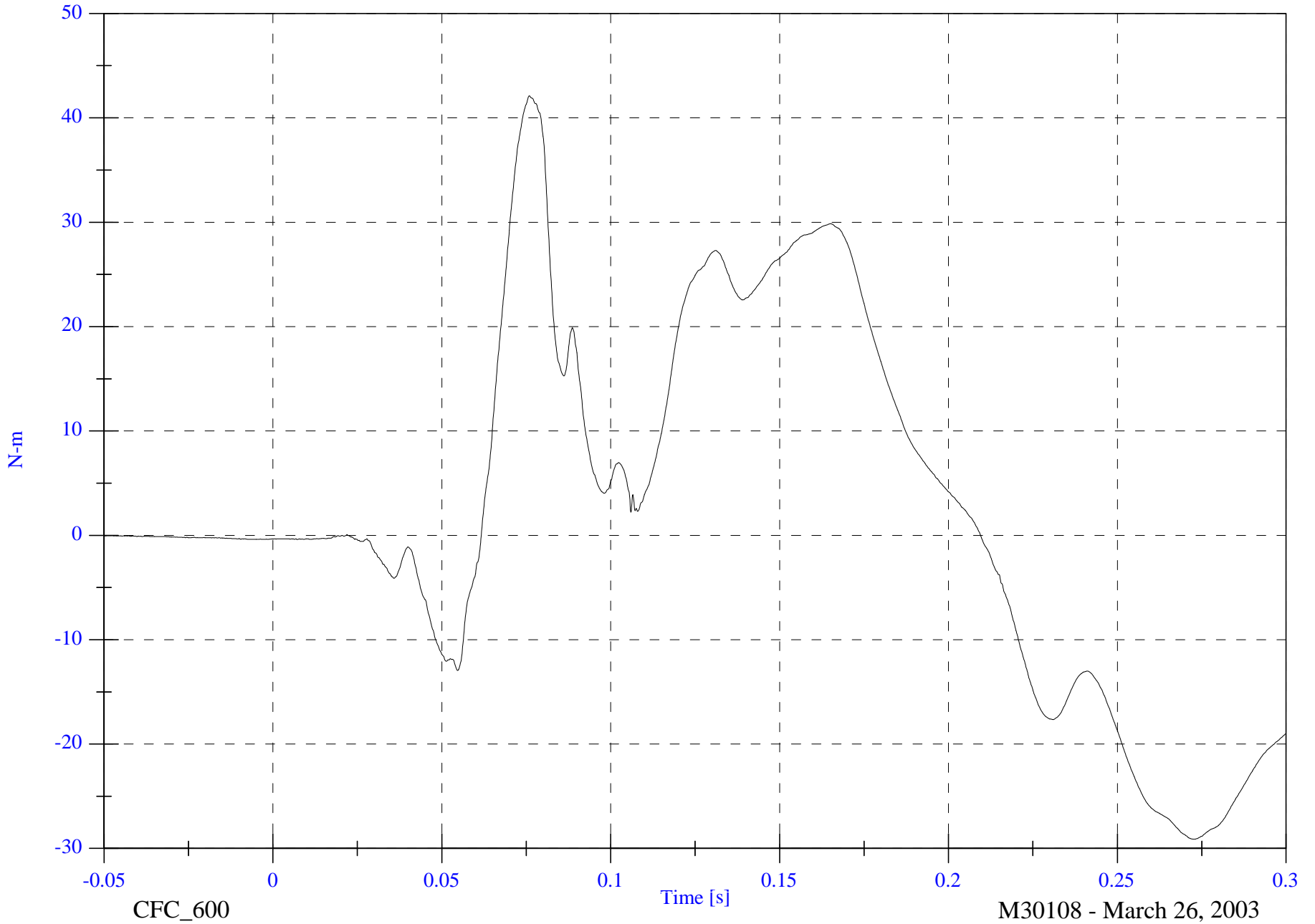
V1P1 Upper Neck My

Max: 42.1 [N-m] at 0.076 [s]

Min: -29.1 [N-m] at 0.273 [s]

B-27

8642-NCAP-36



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NCAP Test #14 - 2003 Chevrolet Suburban

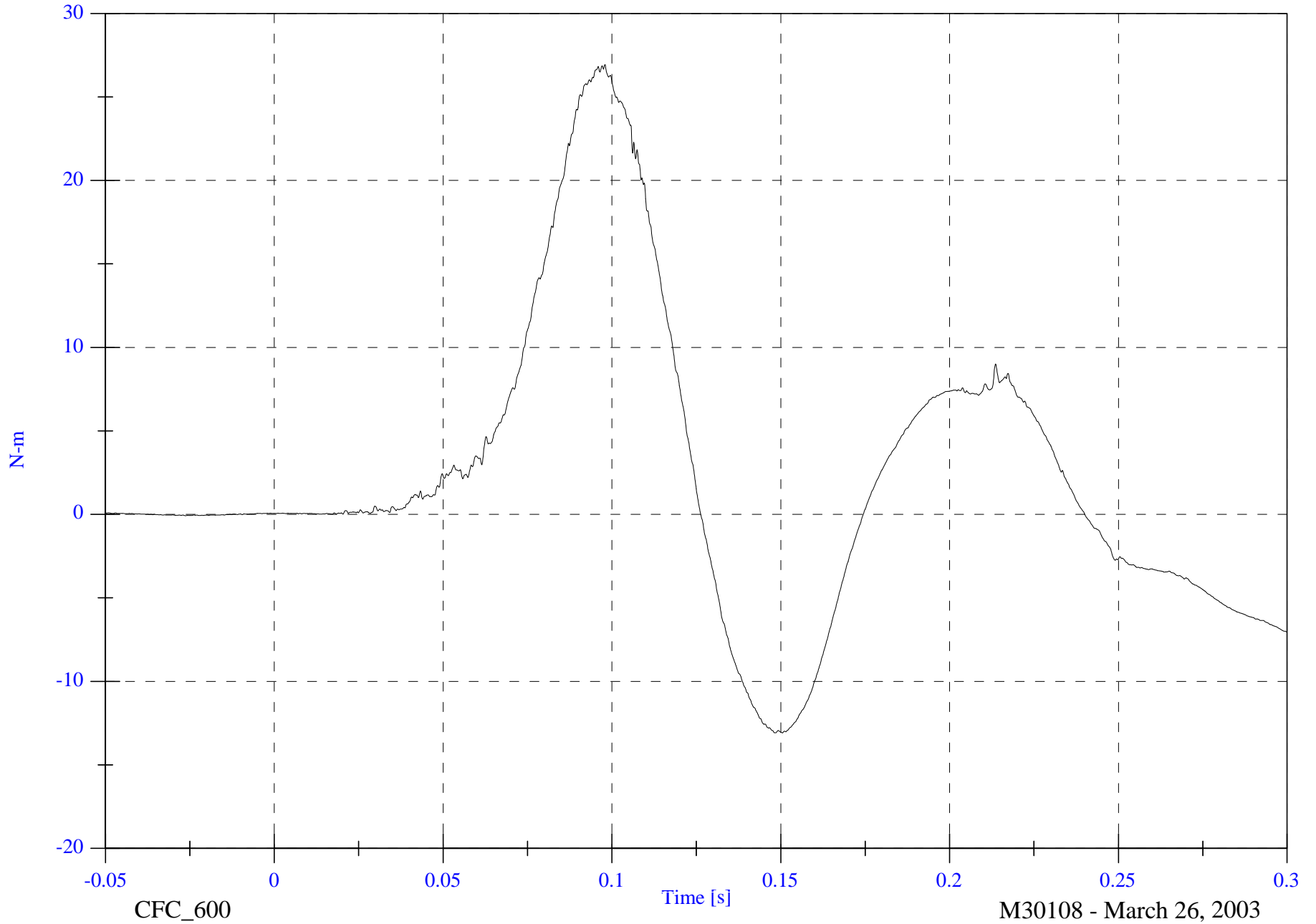
Max: 26.9 [N-m] at 0.098 [s]

V1P1 Upper Neck Mz

Min: -13.1 [N-m] at 0.150 [s]

B-28

8642-NCAP-36



CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

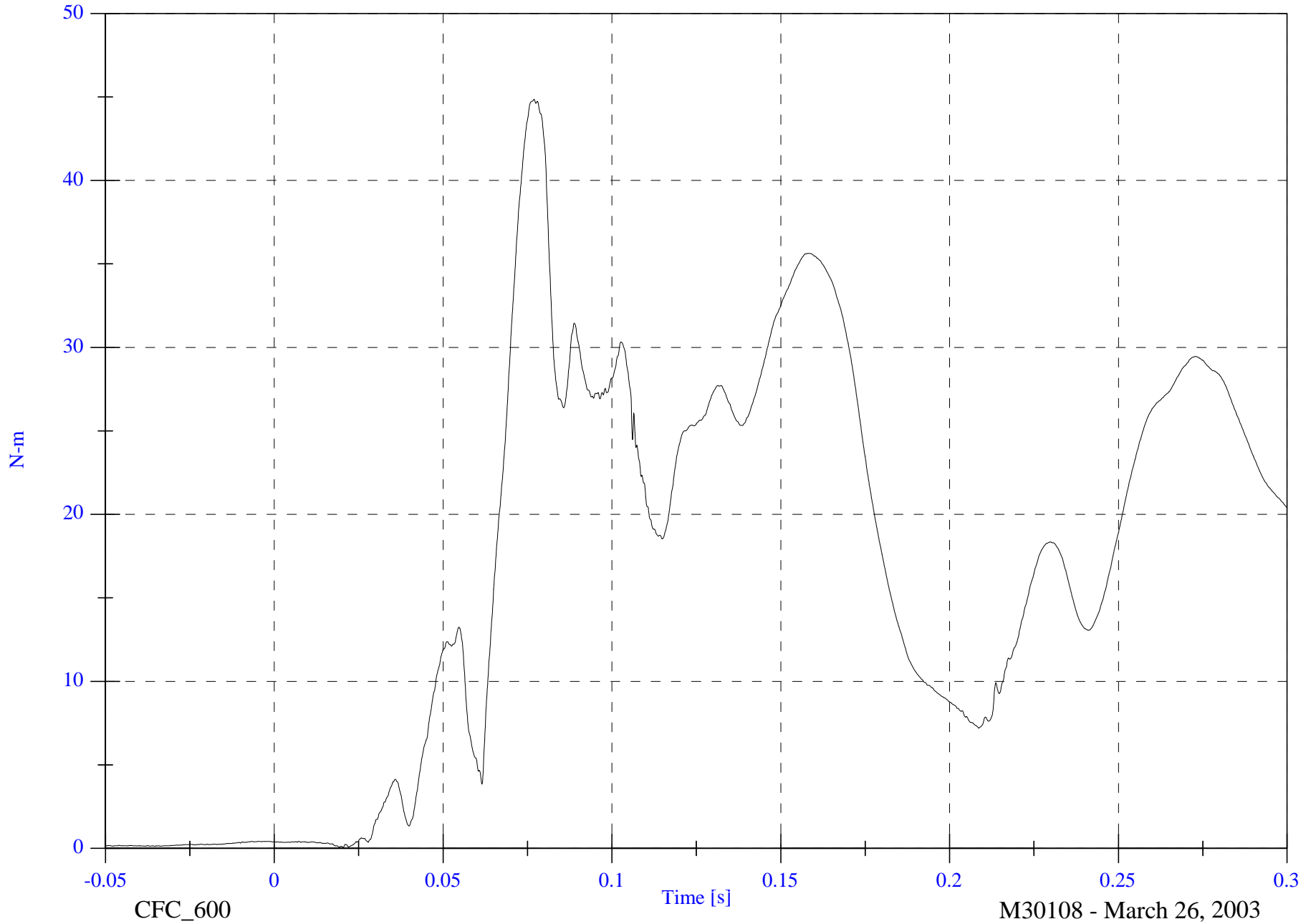
V1P1 Upper Neck M Resultant

Max: 44.9 [N-m] at 0.077 [s]

Min: 0.0 [N-m] at 0.020 [s]

B-29

8642-NCAP-36



CFC\_600

Time [s]

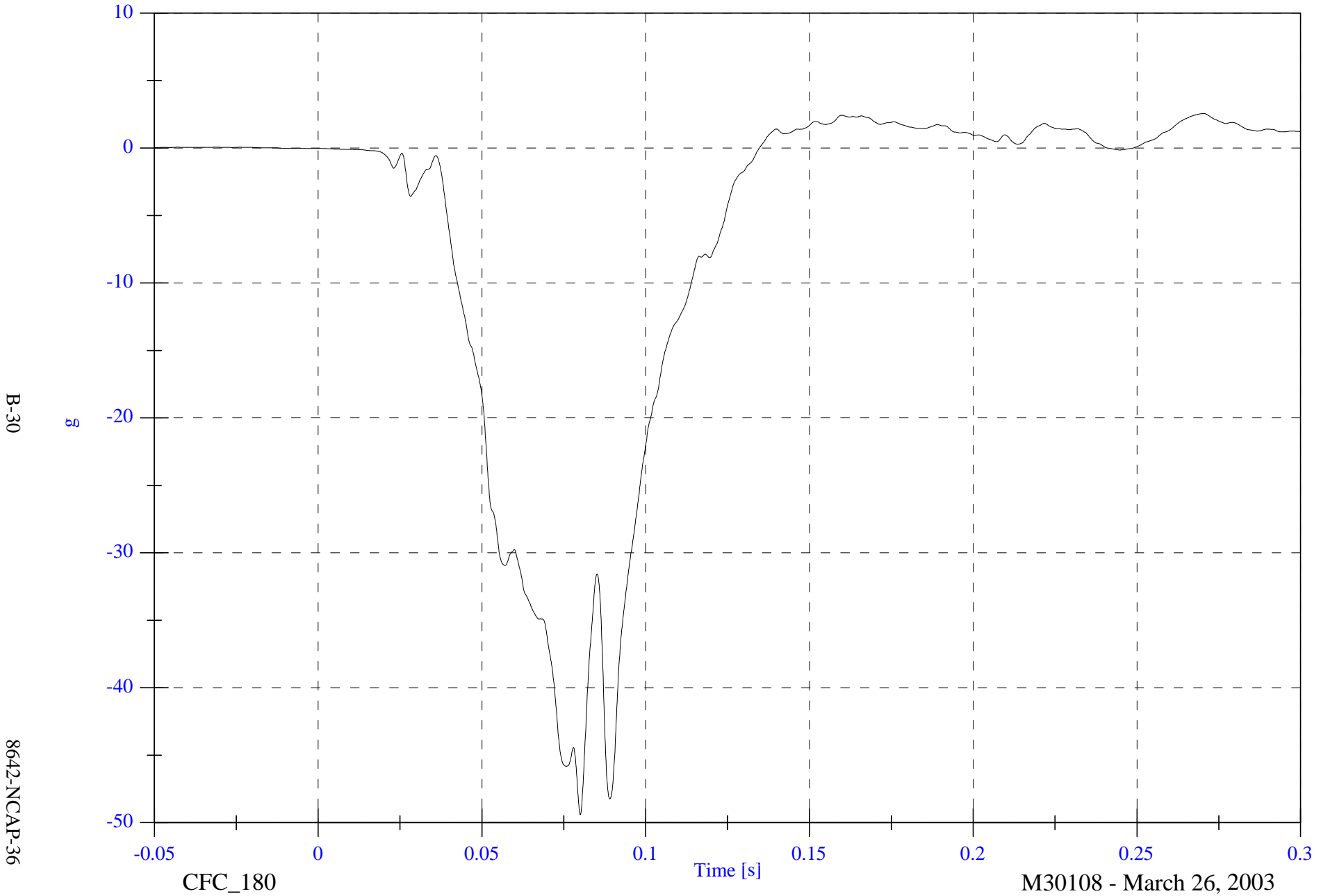
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VIP1 Chest x

Max: 2.6 [g] at 0.270 [s]

Min: -49.4 [g] at 0.080 [s]



B-30

8642-NCAP-36

CFC\_180

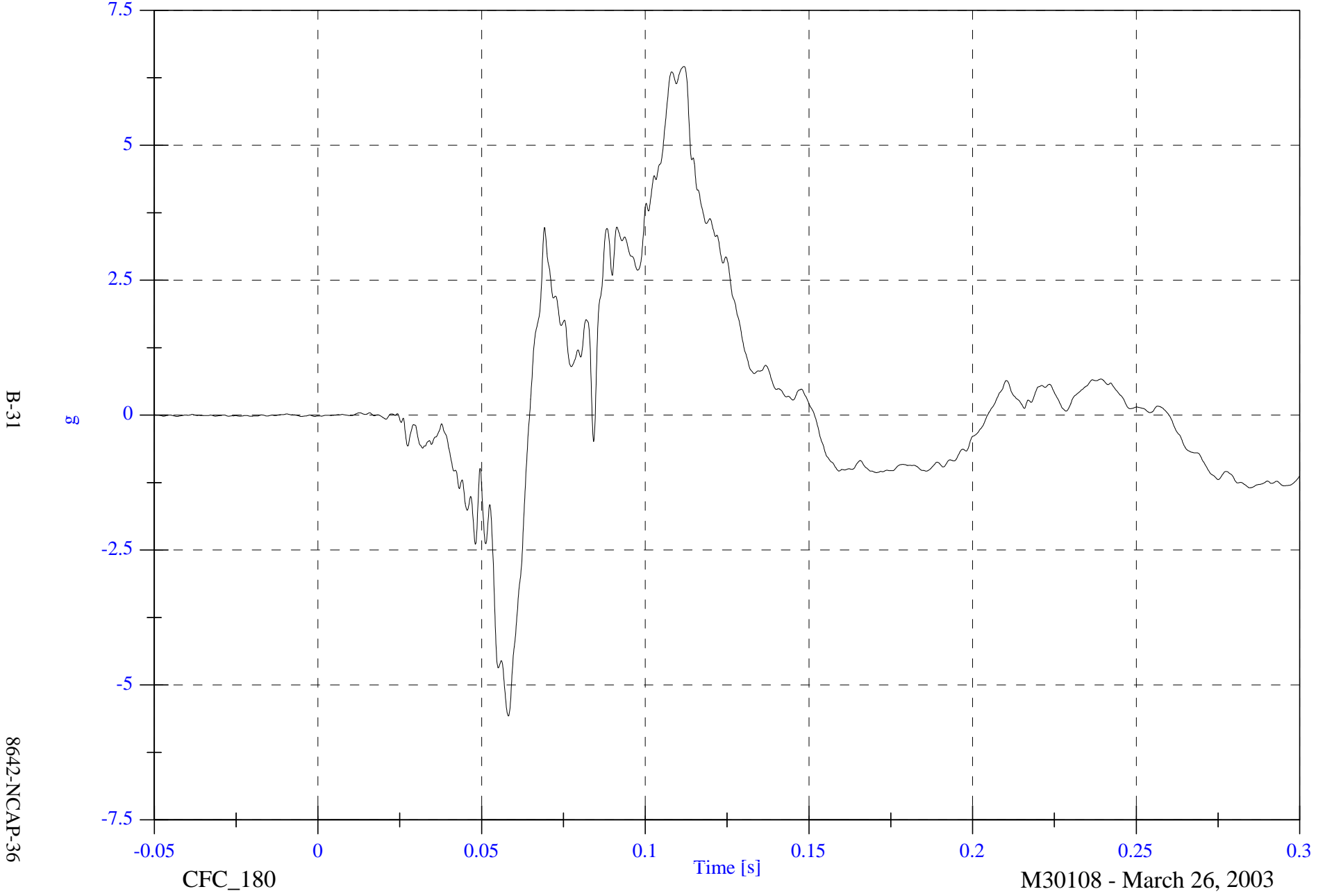
Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

Max: 6.5 [g] at 0.112 [s]  
Min: -5.6 [g] at 0.058 [s]

VIP1 Chest y



NCAP Test #14 - 2003 Chevrolet Suburban

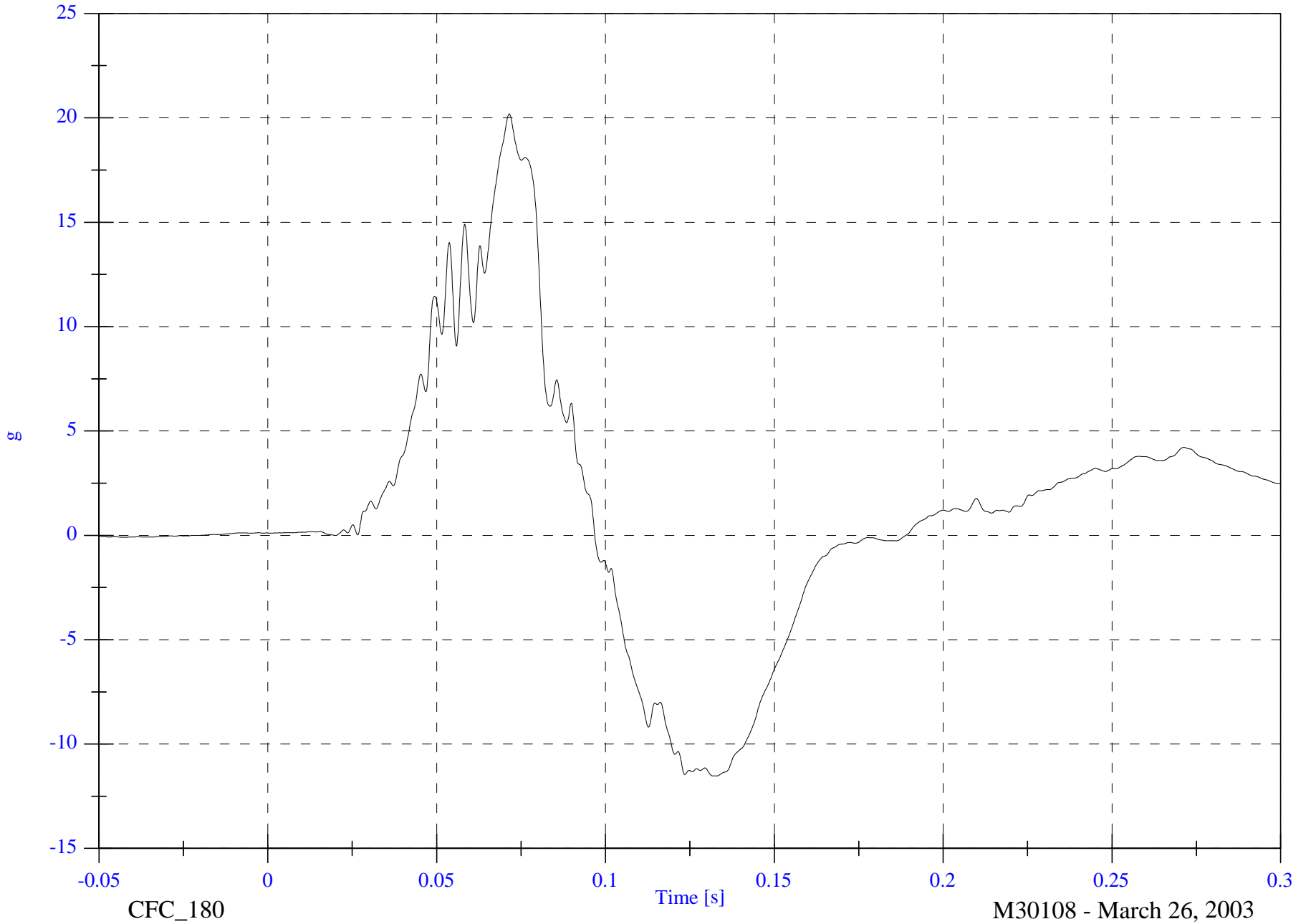
VIP1 Chest z

Max: 20.2 [g] at 0.072 [s]

Min: -11.5 [g] at 0.133 [s]

B-32

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

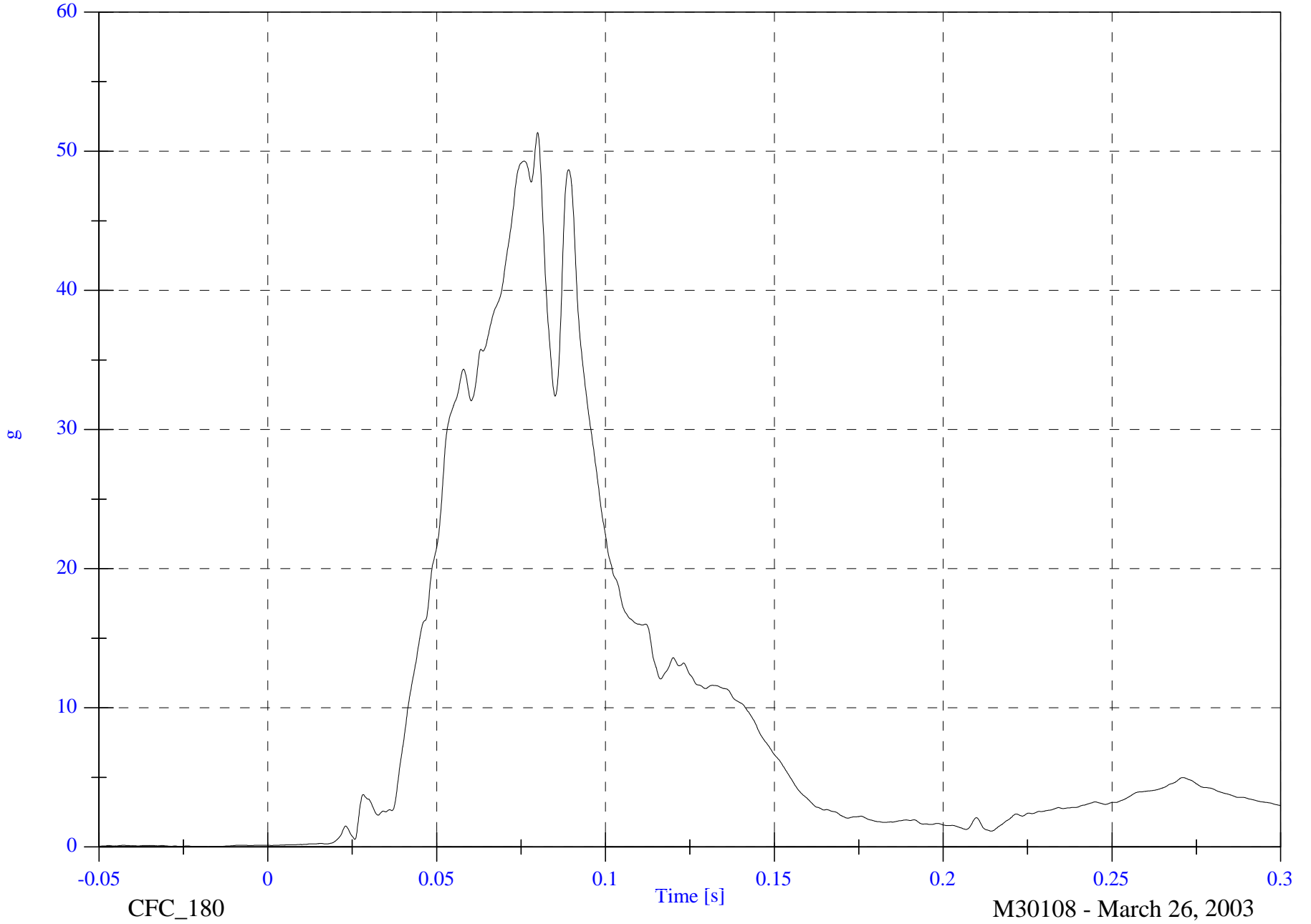
V1P1 Chest Resultant

Max: 51.3 [g] at 0.080 [s]

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

B-33

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

VIP1 Chest Red x

Max: 50.8 [g] at 0.299 [s]

Min: -290.5 [g] at 0.168 [s]

B-34

8642-NCAP-36

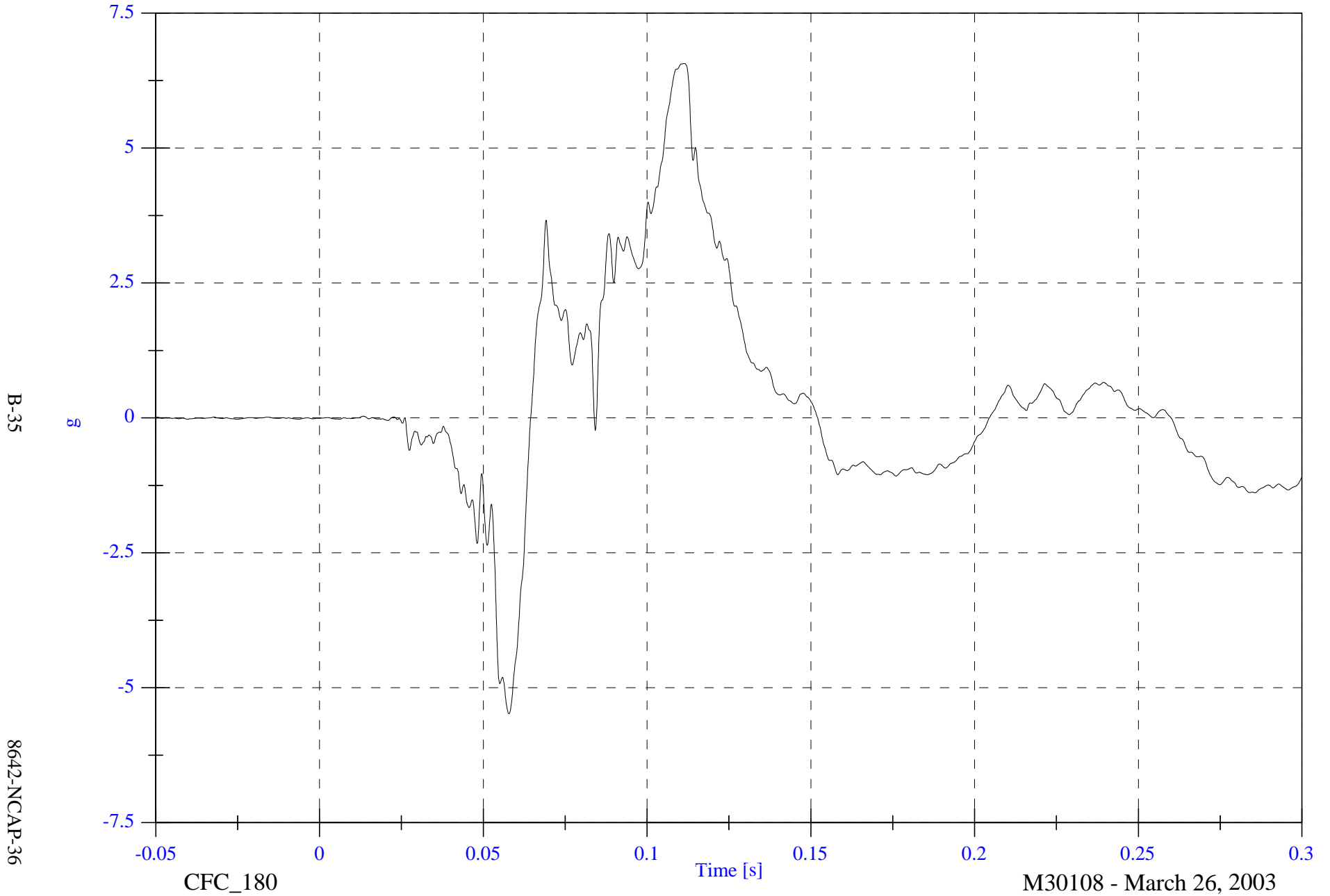


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 6.6 [g] at 0.111 [s]

VIP1 Chest Red y

Min: -5.5 [g] at 0.058 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

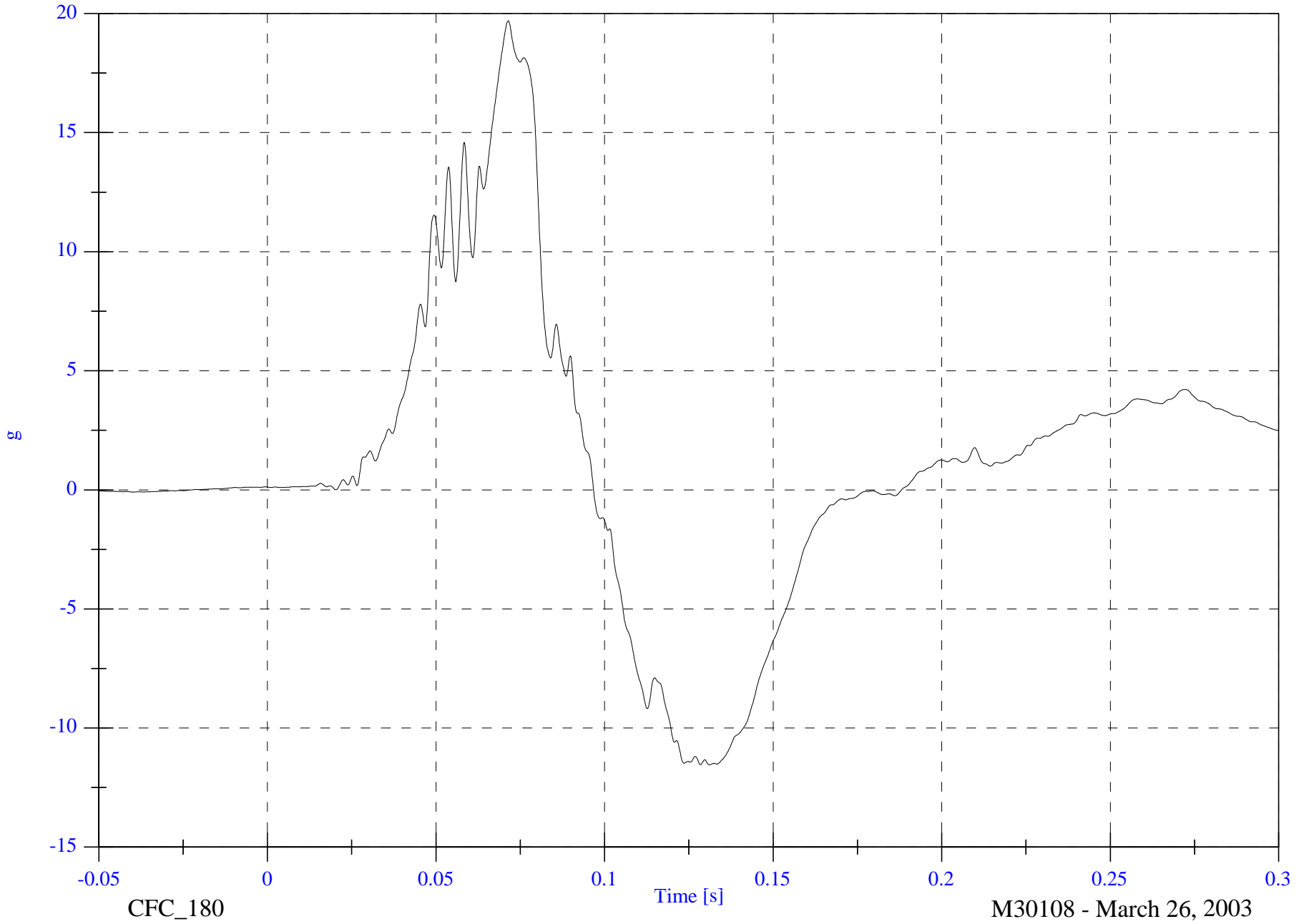
VIP1 Chest Red z

Max: 19.7 [g] at 0.071 [s]

Min: -11.5 [g] at 0.131 [s]

B-36

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

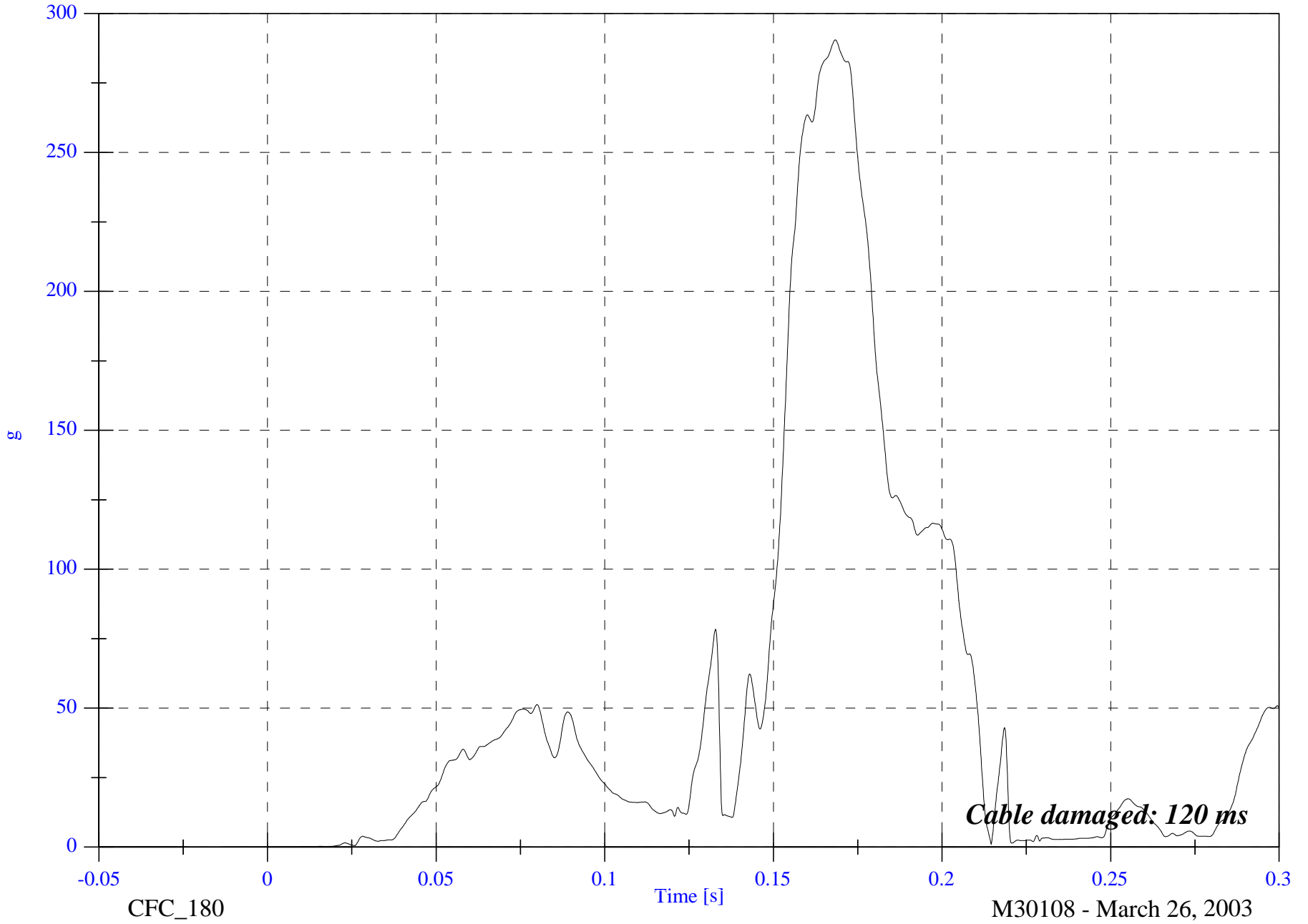
V1P1 Chest Red Resultant

Max: 290.5 [g] at 0.168 [s]

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

B-37

8642-NCAP-36



*Cable damaged: 120 ms*

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

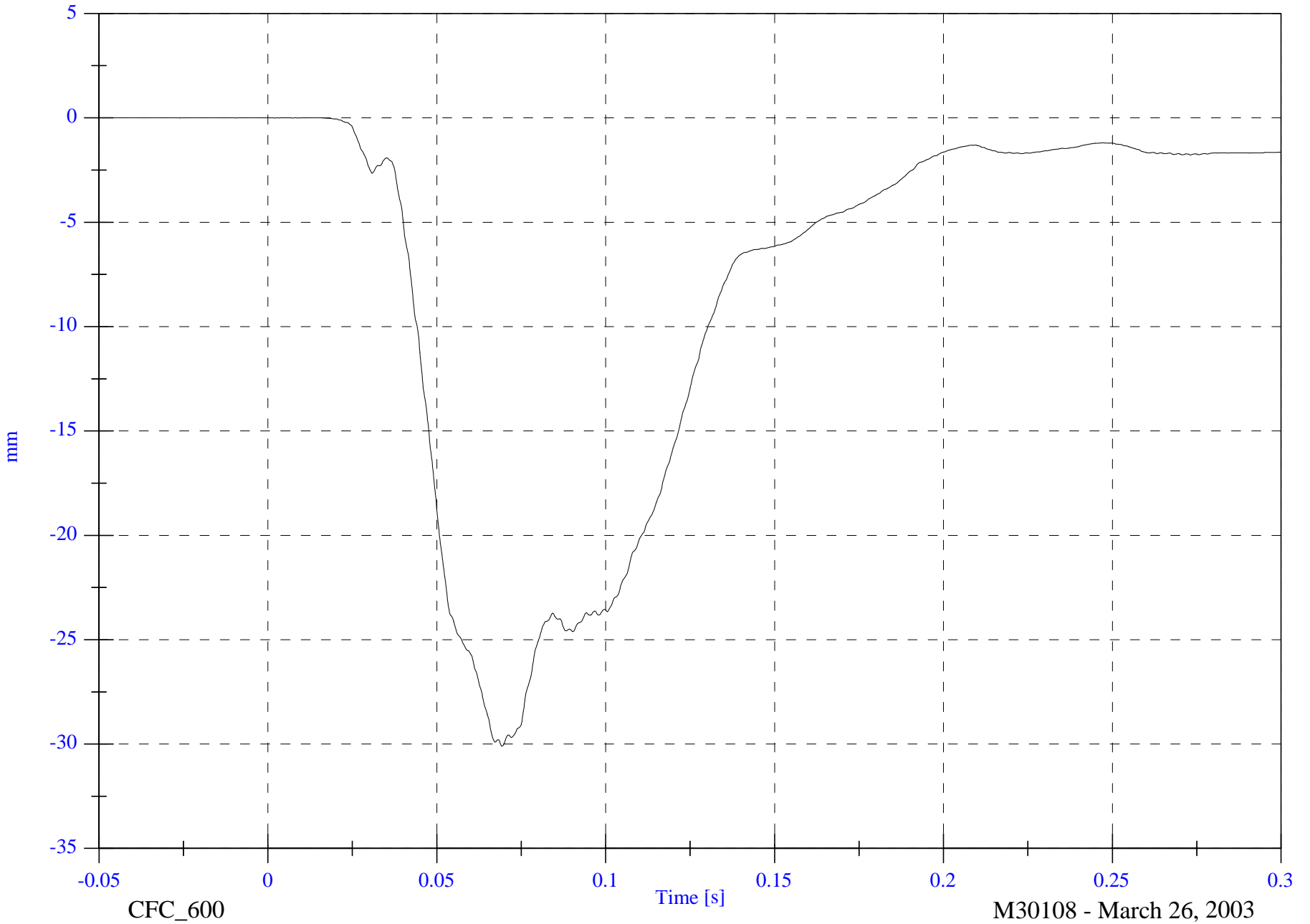
V1P1 Chest Compression

Max: 0.0 [mm] at -0.043 [s]

Min: -30.1 [mm] at 0.069 [s]

B-38

8642-NCAP-36



CFC\_600

Time [s]

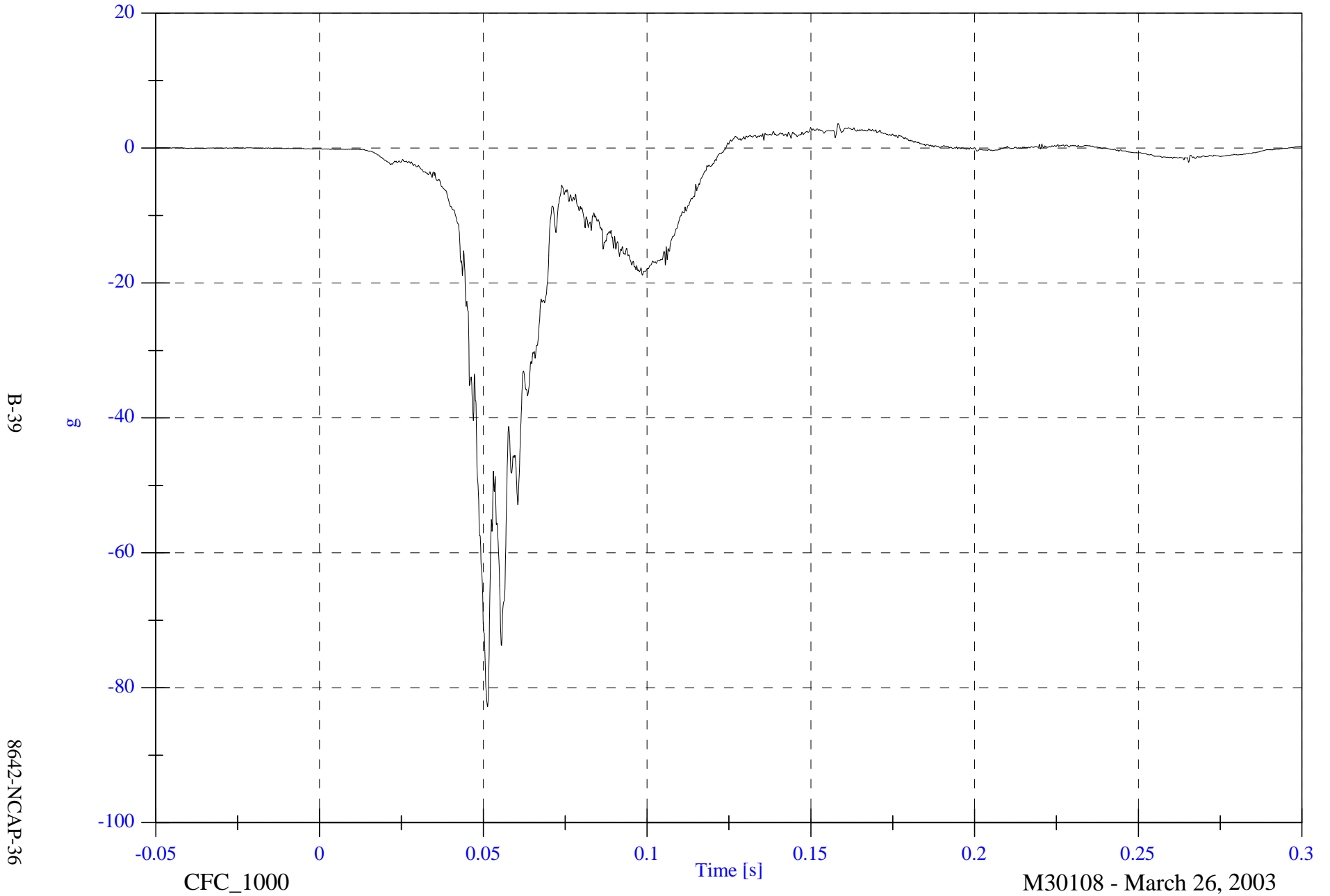
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 3.6 [g] at 0.158 [s]

Min: -82.8 [g] at 0.051 [s]

V1P1 Pelvic x

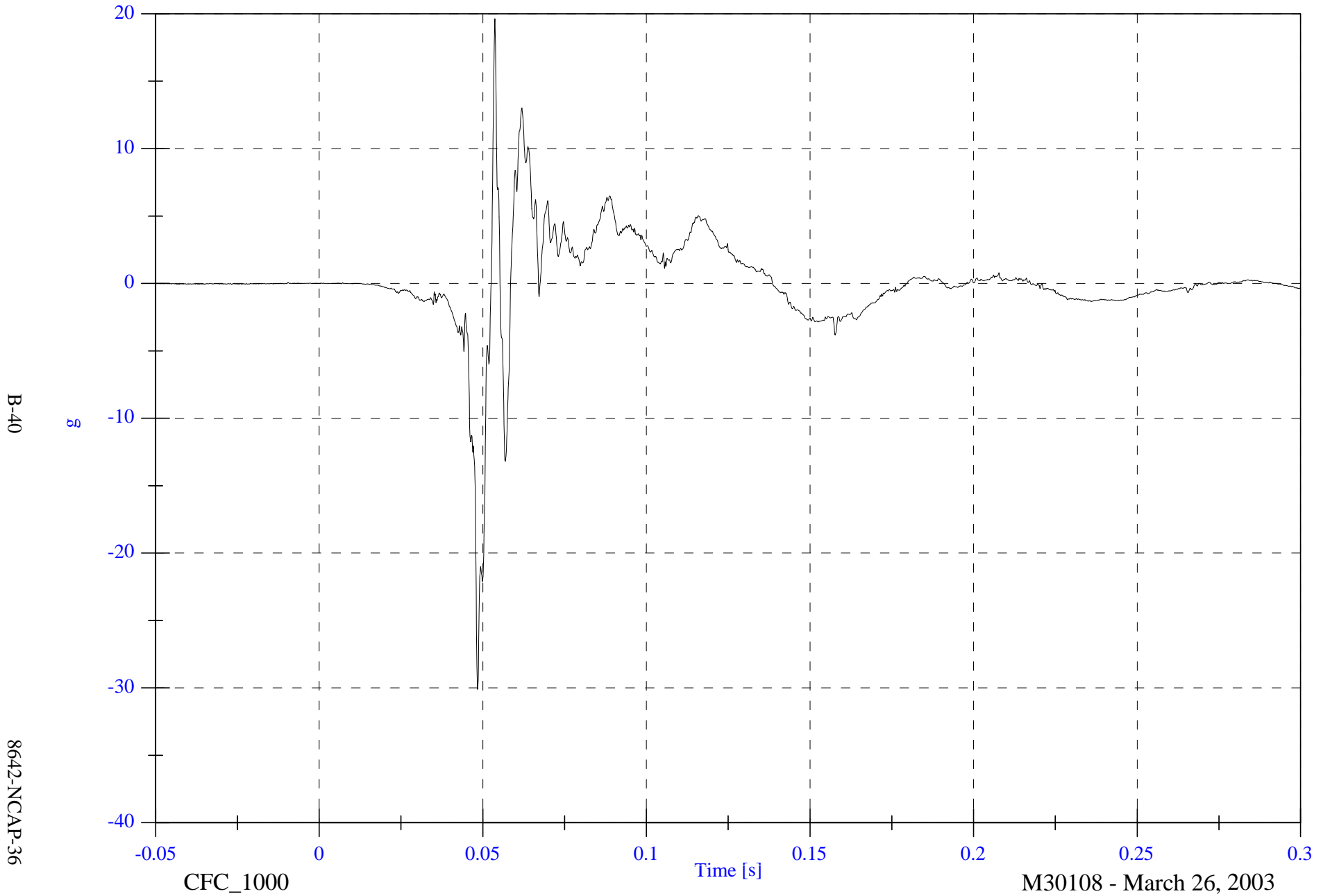


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 19.6 [g] at 0.054 [s]

Min: -30.1 [g] at 0.048 [s]

V1P1 Pelvic y



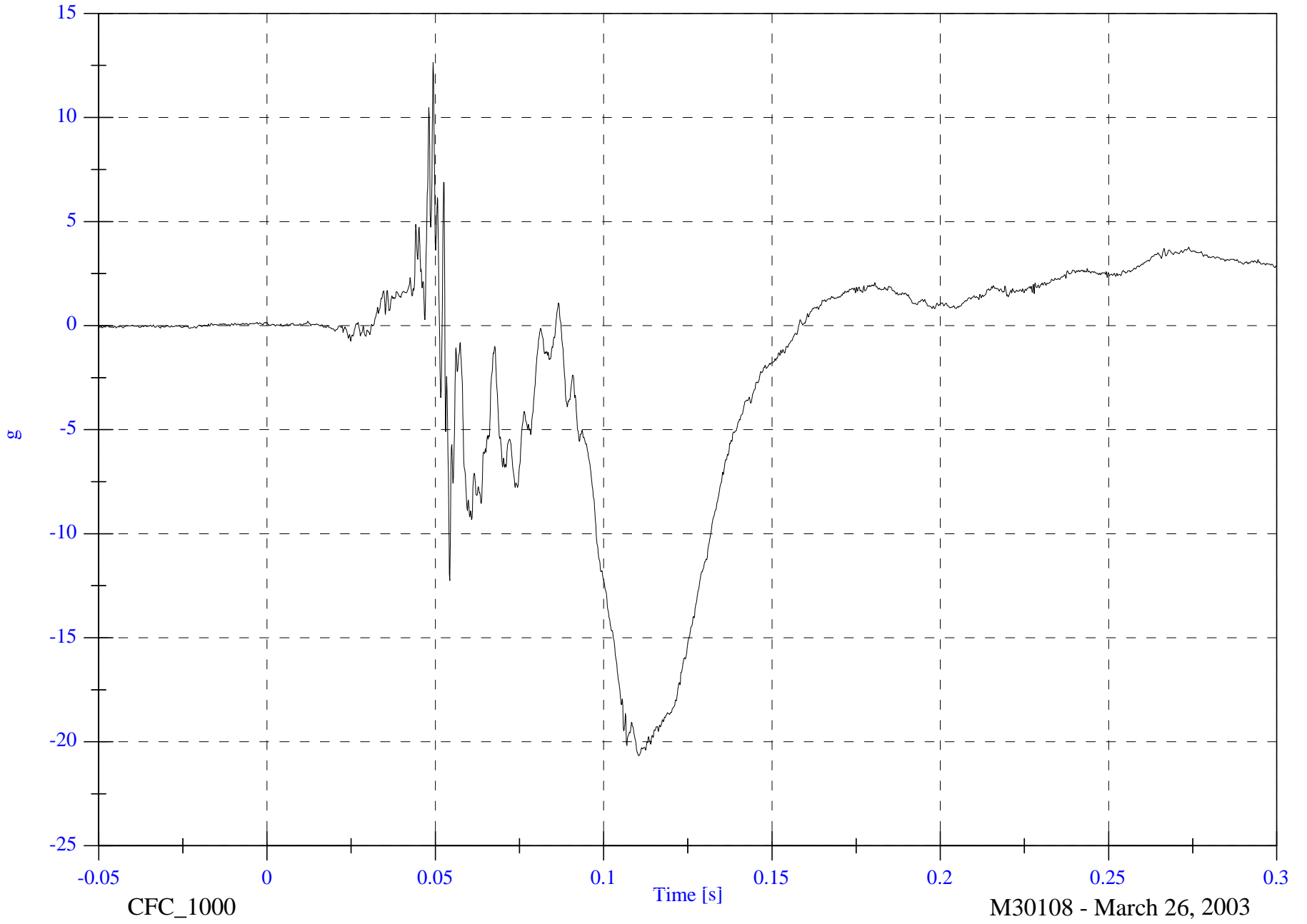
NCAP Test #14 - 2003 Chevrolet Suburban

Max: 12.7 [g] at 0.049 [s]  
Min: -20.7 [g] at 0.110 [s]

V1P1 Pelvic z

B-41

8642-NCAP-36



CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

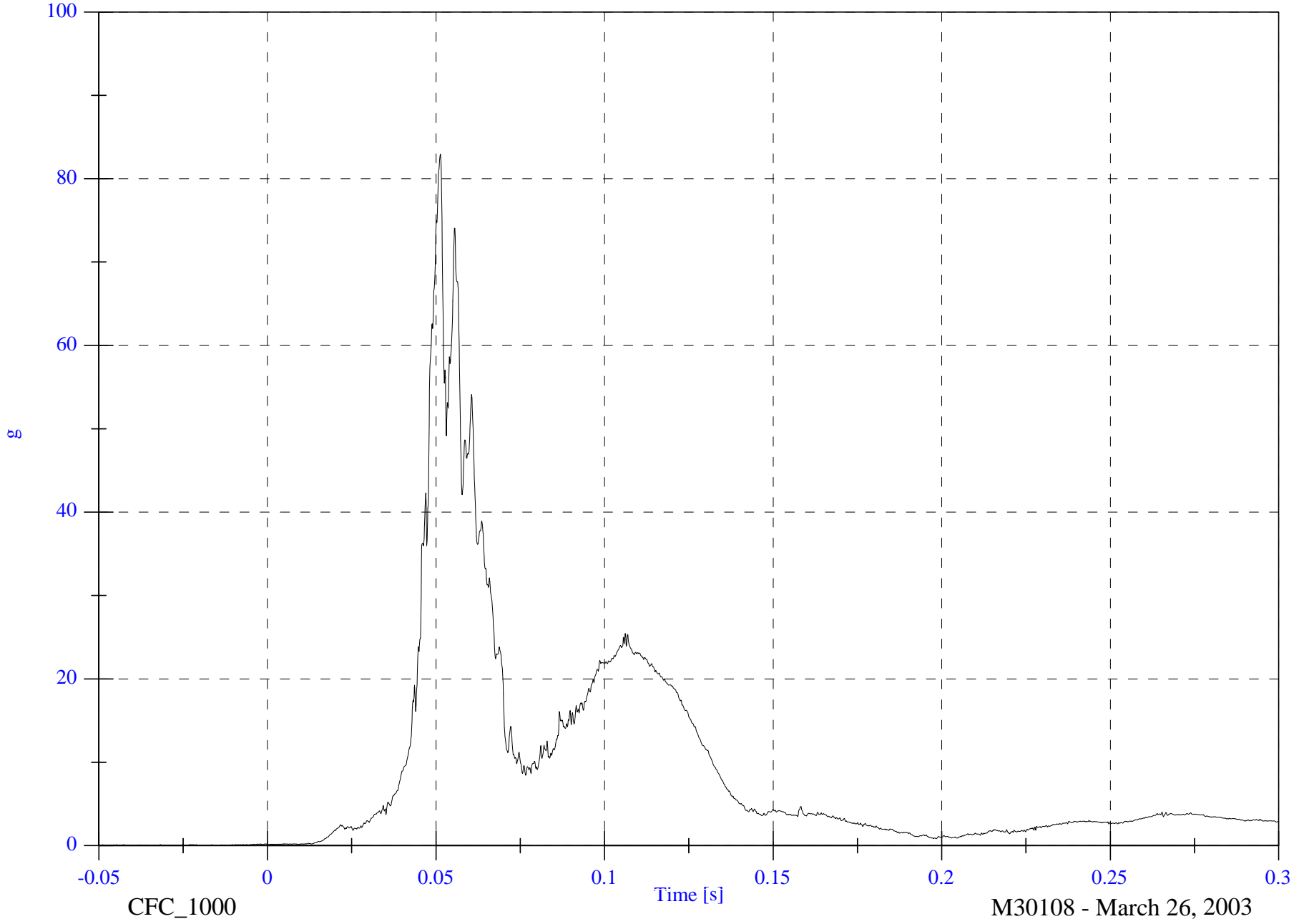
V1P1 Pelvic Resultant

Max: 83.0 [g] at 0.051 [s]

Min: 0.0 [g] at -0.019 [s]

B-42

8642-NCAP-36



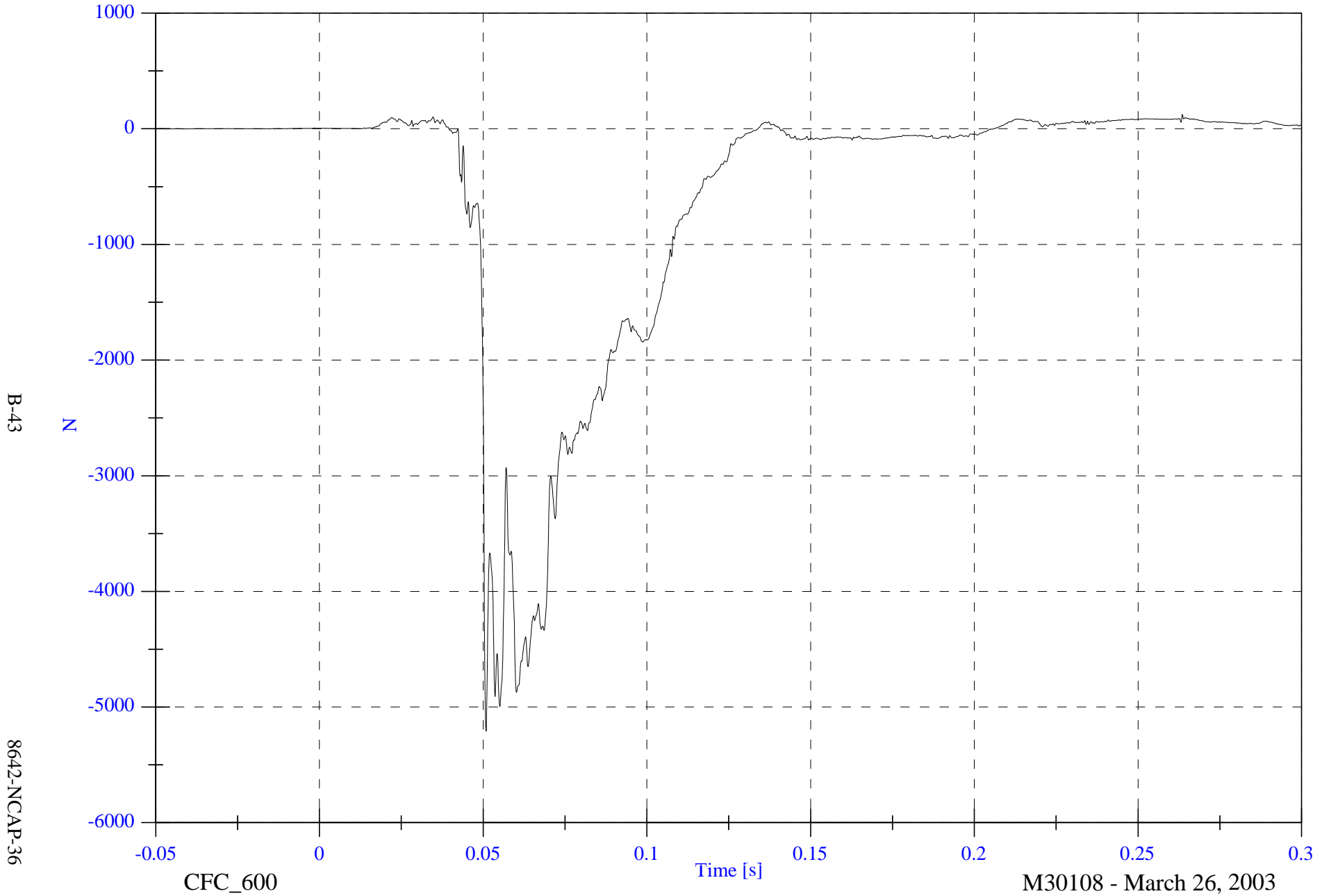
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Left Femur

Max: 123.3 [N] at 0.264 [s]

Min: -5209.5 [N] at 0.051 [s]



B-43

8642-NCAP-36

CFC\_600

Time [s]

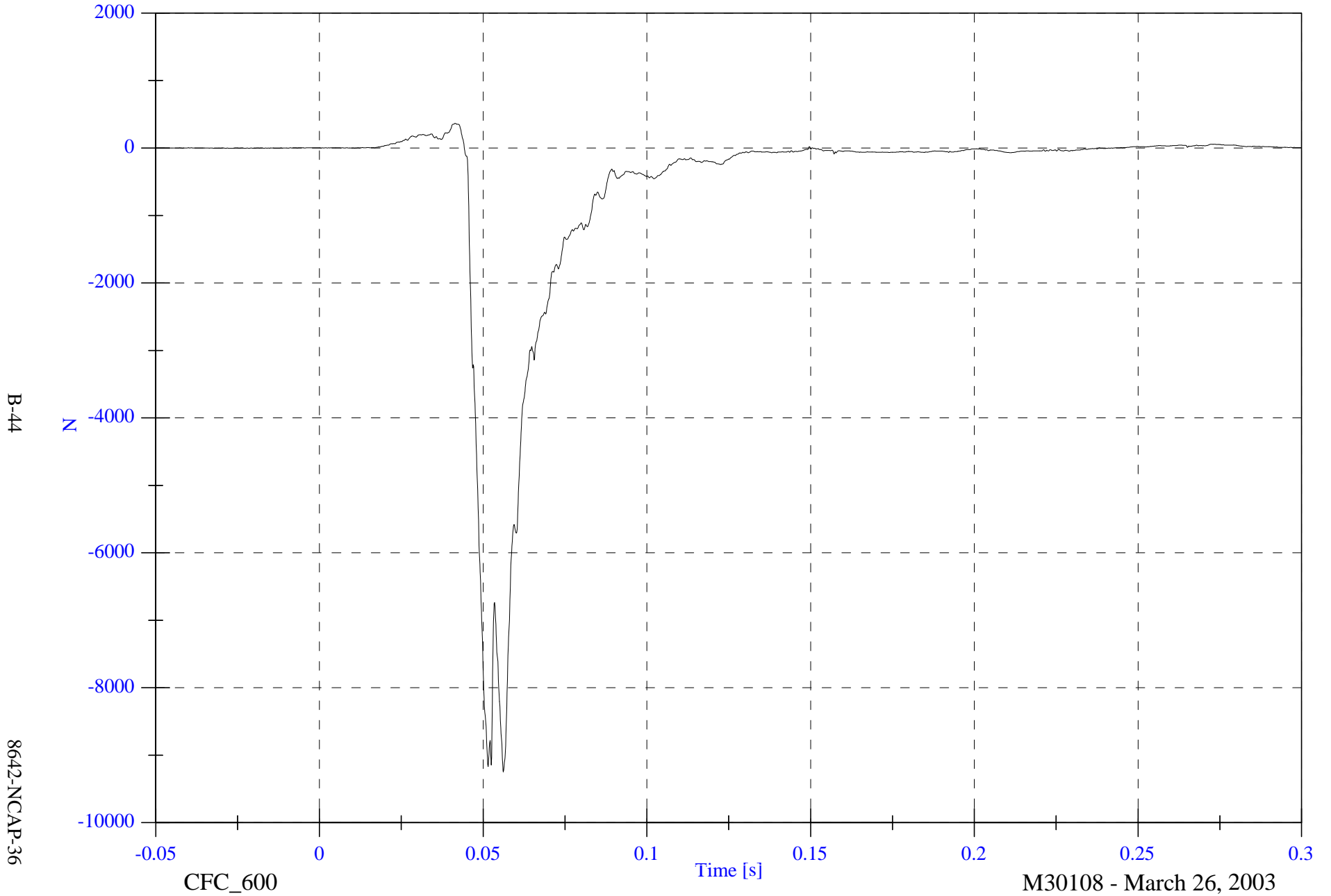
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Right Femur

Max: 364.6 [N] at 0.041 [s]

Min: -9248.4 [N] at 0.056 [s]



B-44

8642-NCAP-36

CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

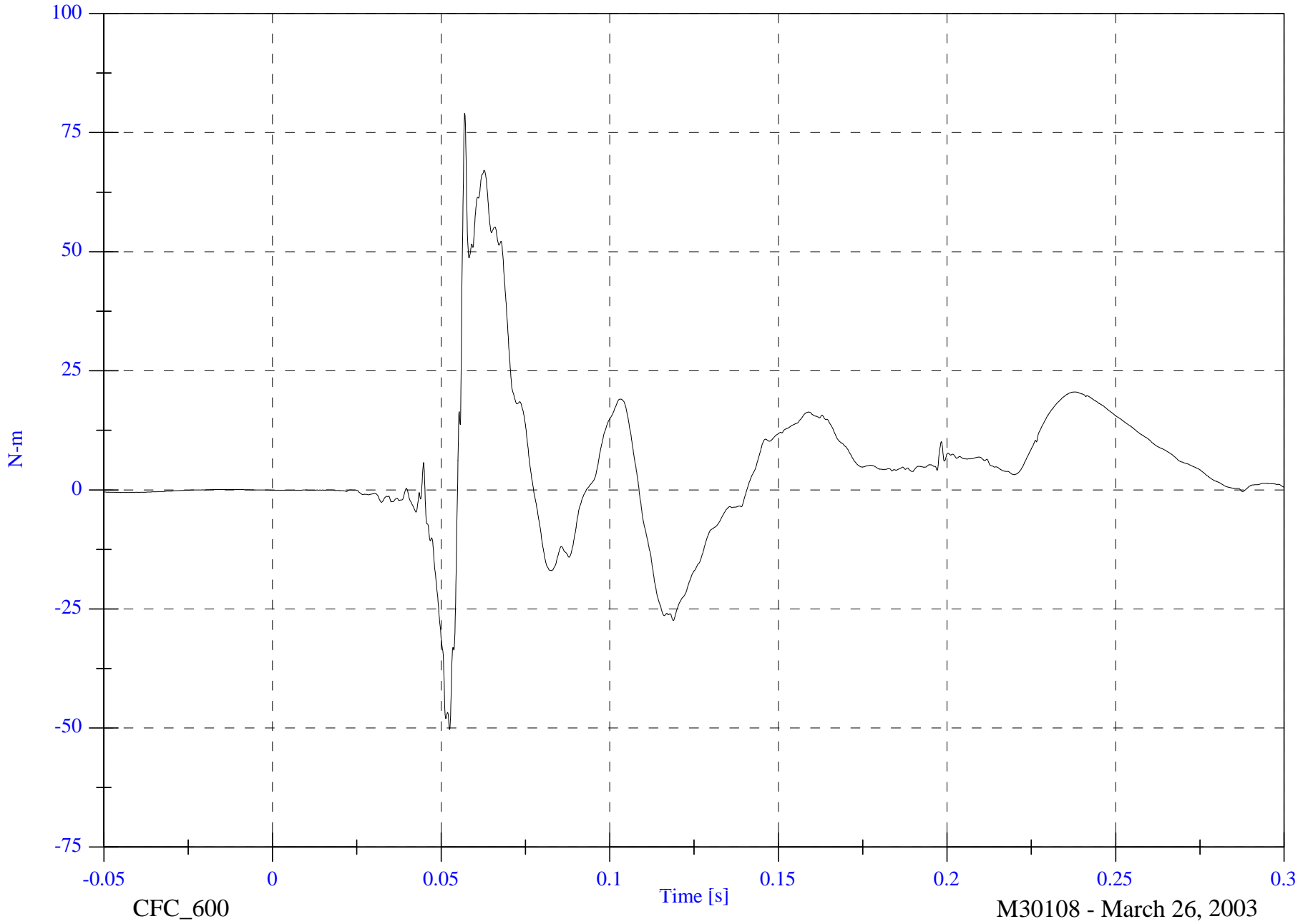
Max: 79.0 [N-m] at 0.057 [s]

V1P1 Left Upper Tibia Mx

Min: -50.3 [N-m] at 0.053 [s]

B-45

8642-NCAP-36



CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

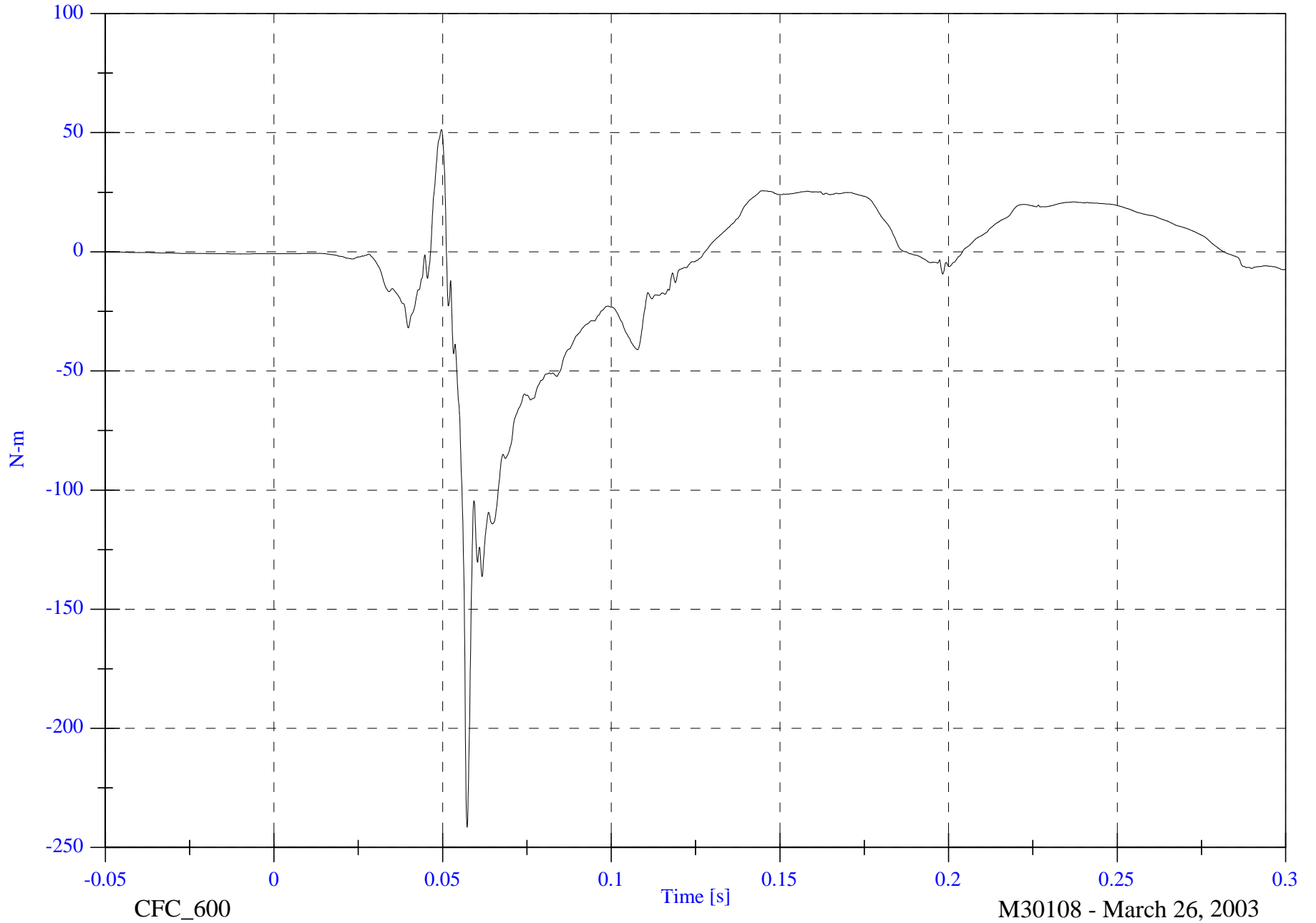
V1P1 Left Upper Tibia My

Max: 51.3 [N-m] at 0.050 [s]

Min: -241.5 [N-m] at 0.057 [s]

B-46

8642-NCAP-36



CFC\_600

Time [s]

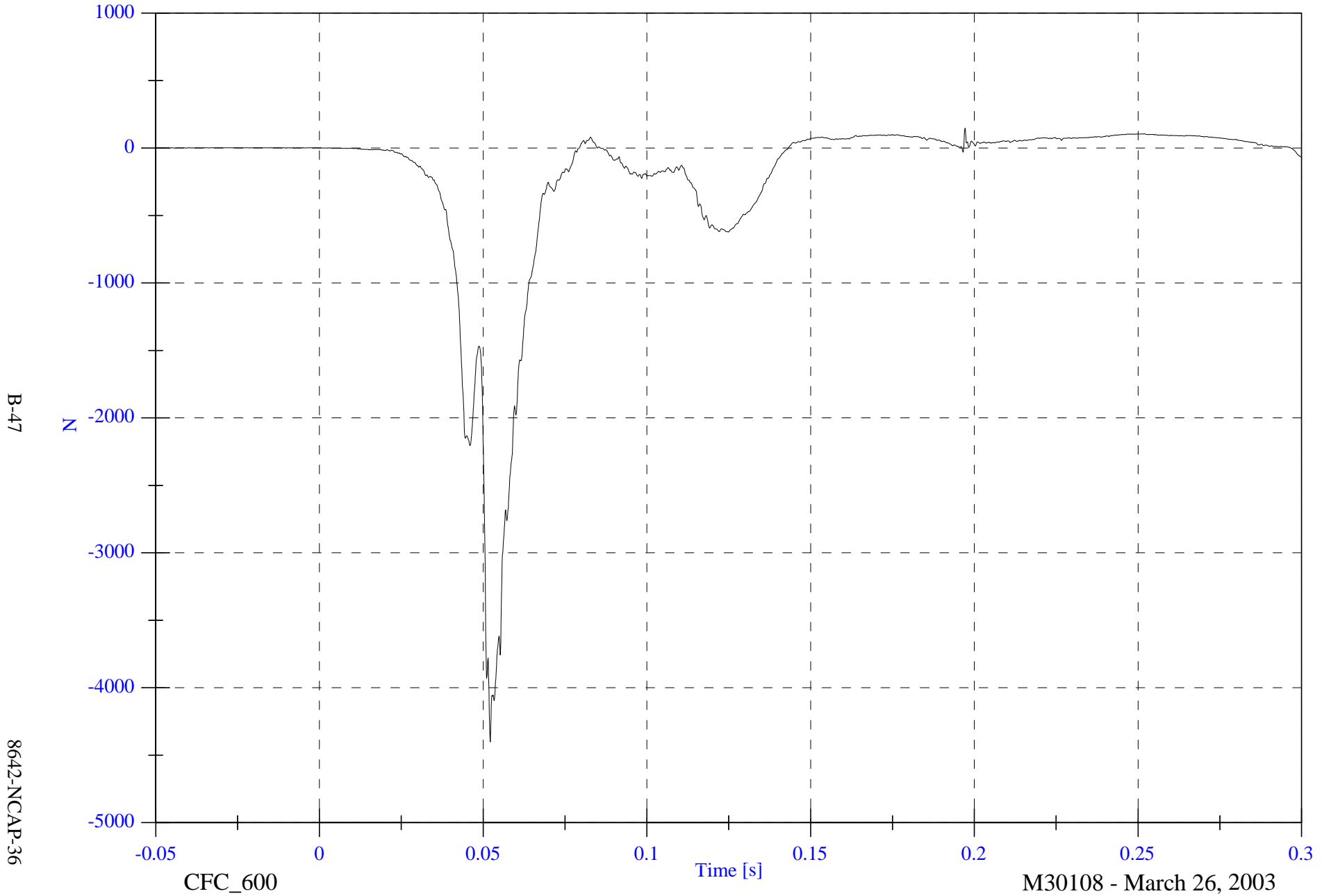
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 148.7 [N] at 0.197 [s]

V1P1 Left Lower Tibia Fz

Min: -4401.5 [N] at 0.052 [s]



B-47

8642-NCAP-36

CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

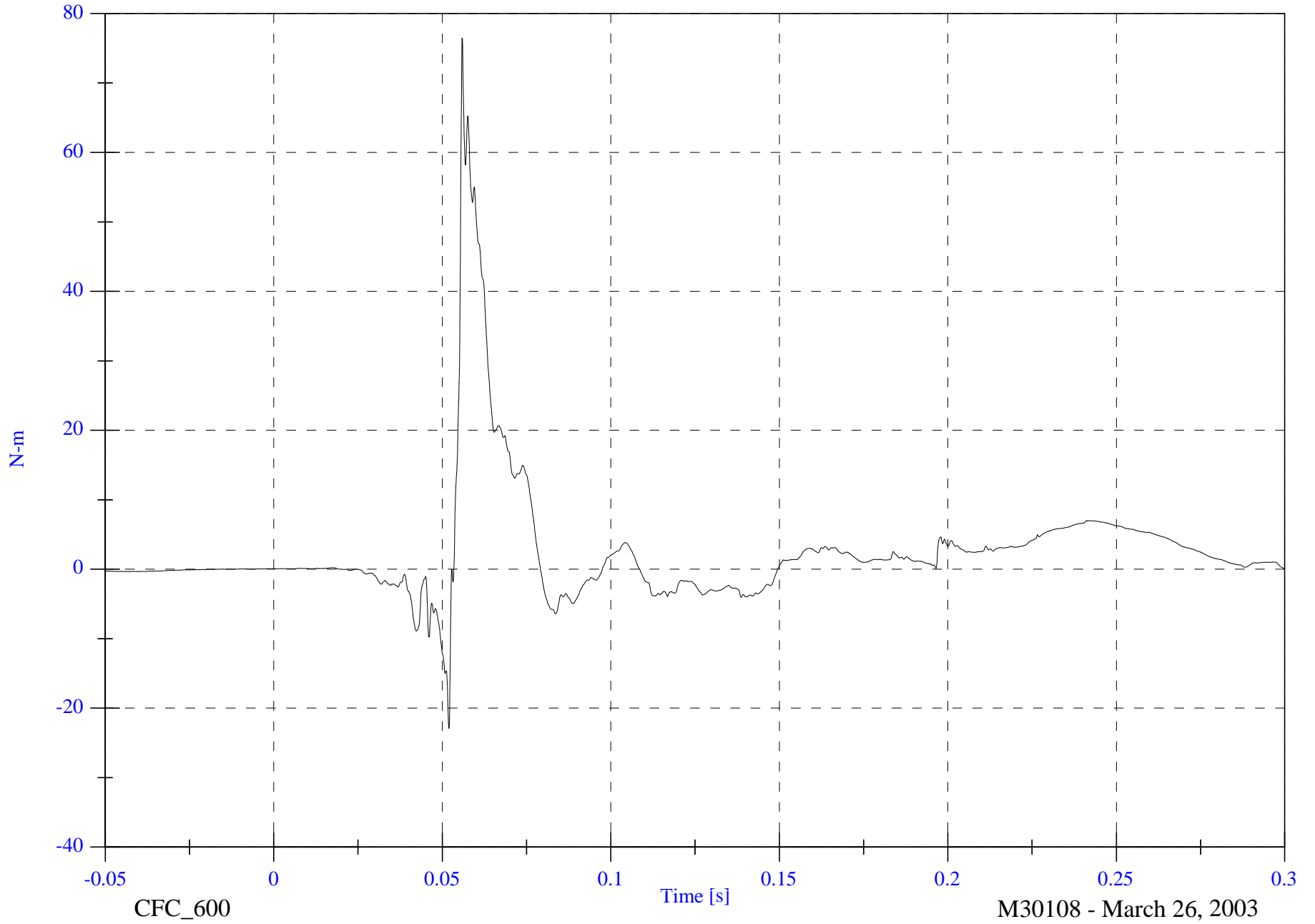
VIP1 Left Lower Tibia Mx

Max: 76.5 [N-m] at 0.056 [s]

Min: -22.9 [N-m] at 0.052 [s]

B-48

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

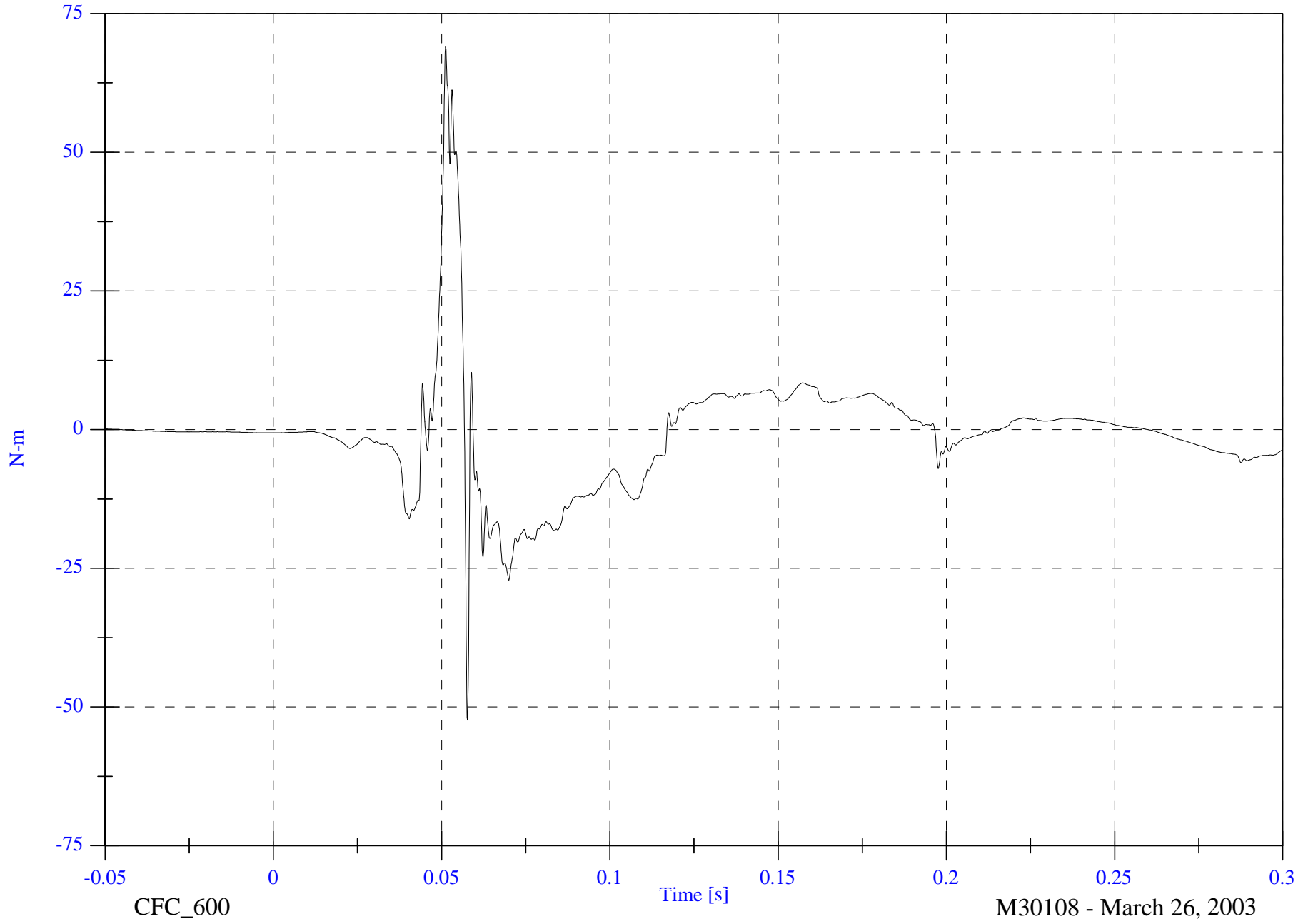
Max: 69.0 [N-m] at 0.051 [s]

VIP1 Left Lower Tibia My

Min: -52.4 [N-m] at 0.058 [s]

B-49

8642-NCAP-36



CFC\_600

Time [s]

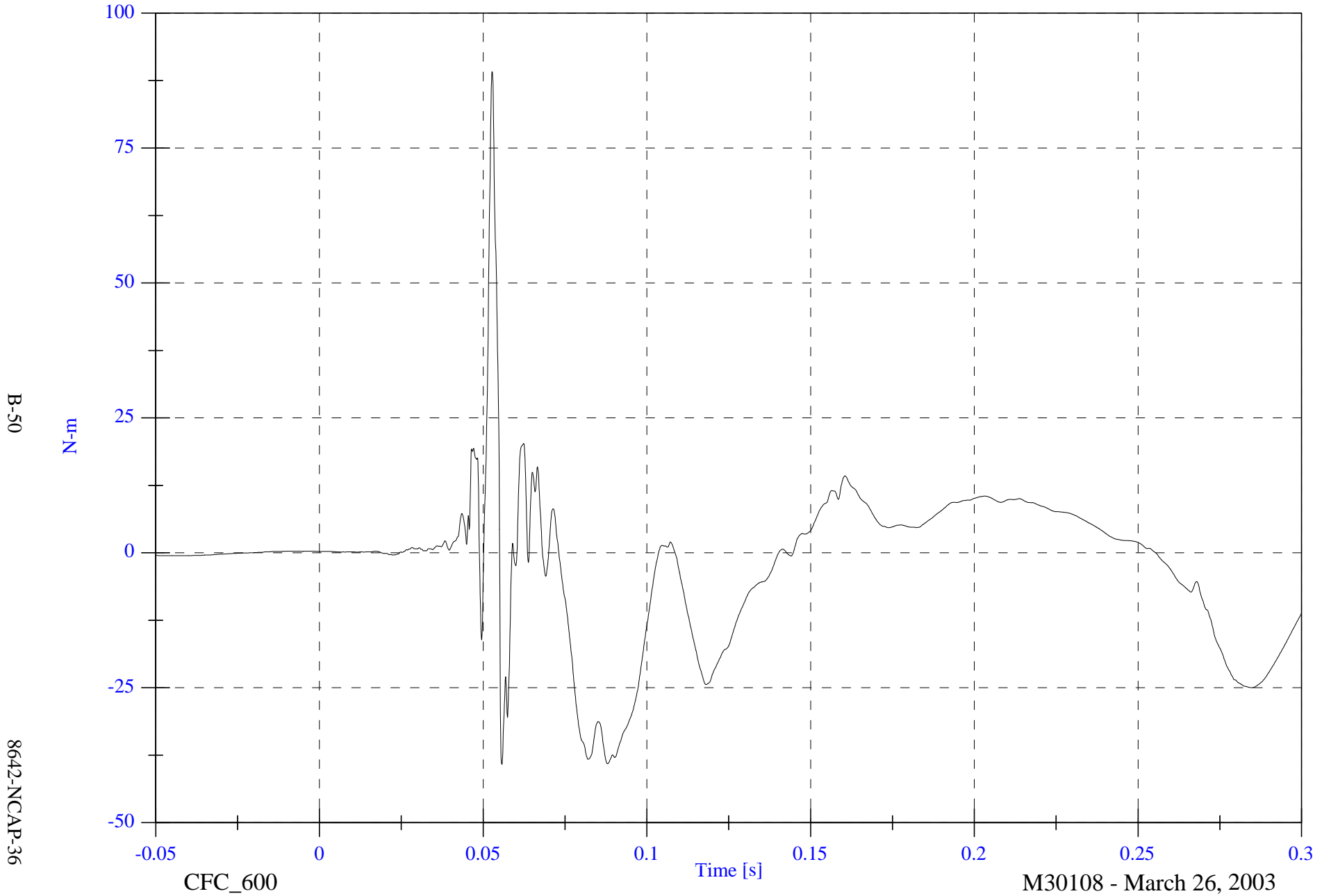
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 89.1 [N-m] at 0.053 [s]

V1P1 Right Upper Tibia Mx

Min: -39.2 [N-m] at 0.056 [s]



B-50

8642-NCAP-36

CFC\_600

Time [s]

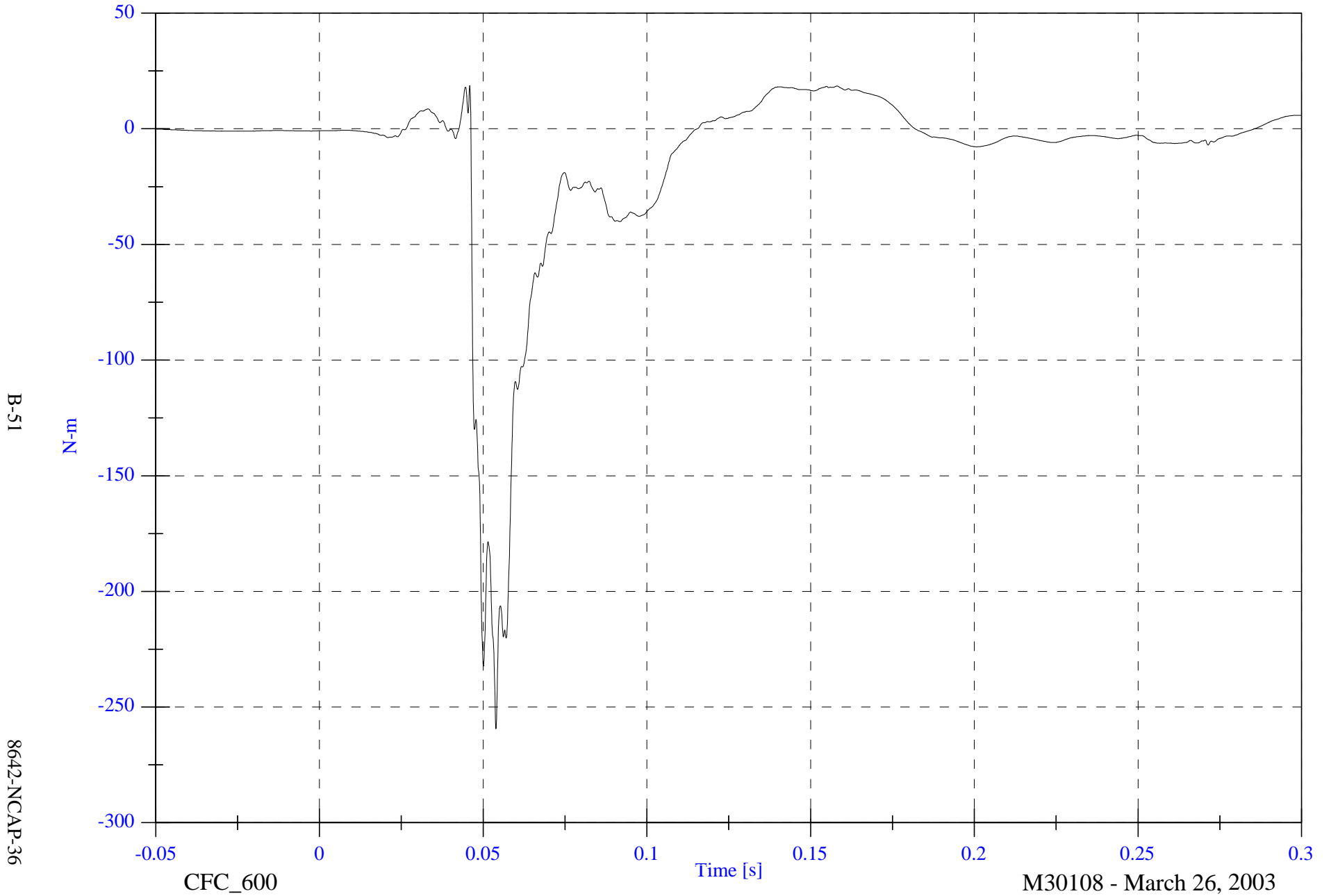
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Right Upper Tibia My

Max: 18.7 [N-m] at 0.046 [s]

Min: -259.4 [N-m] at 0.054 [s]



B-51

8642-NCAP-36

CFC\_600

Time [s]

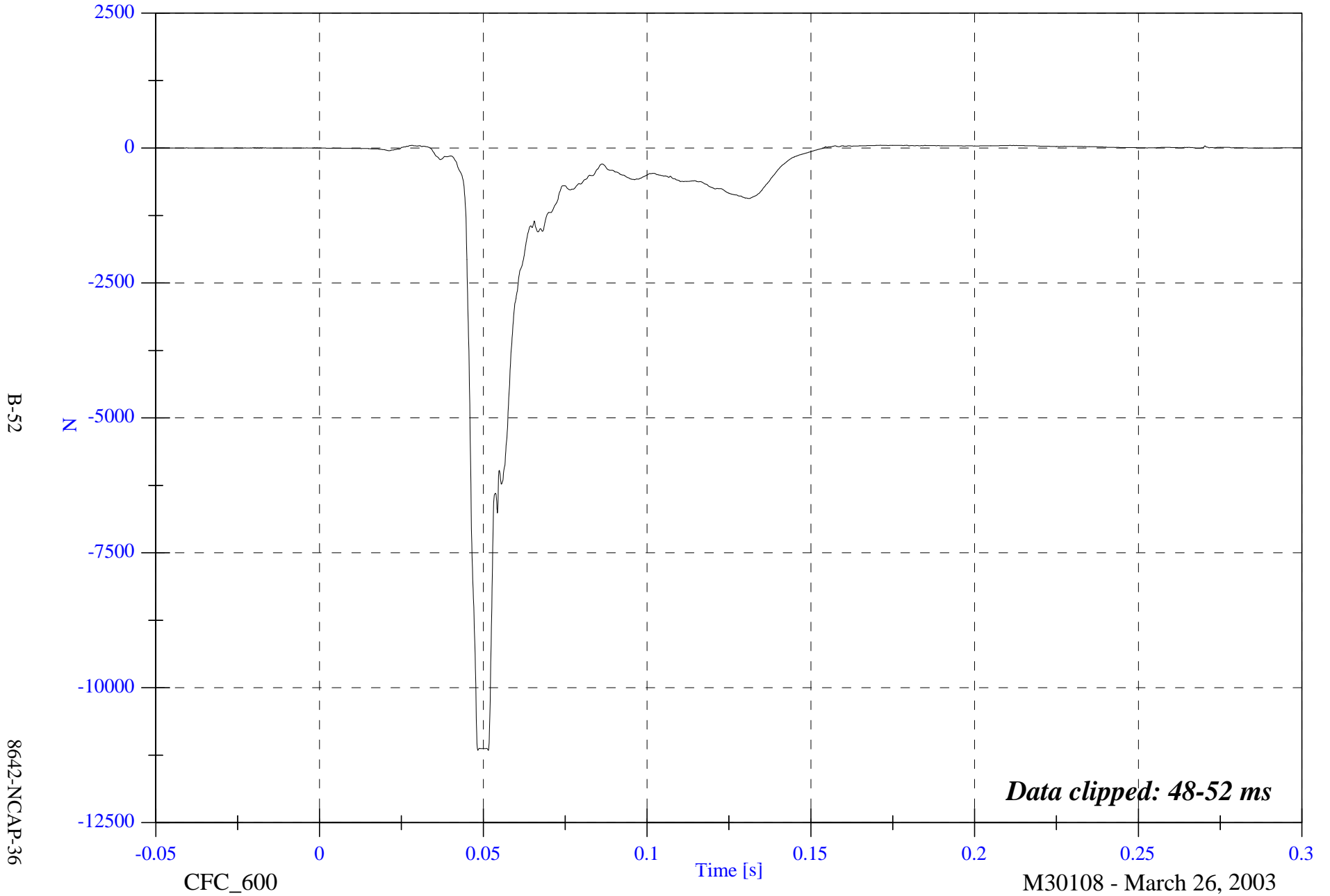
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

VIP1 Right Lower Tibia Fz

Max: 51.9 [N] at 0.179 [s]

Min: -11160.5 [N] at 0.052 [s]



B-52

8642-NCAP-36

*Data clipped: 48-52 ms*

CFC\_600

Time [s]

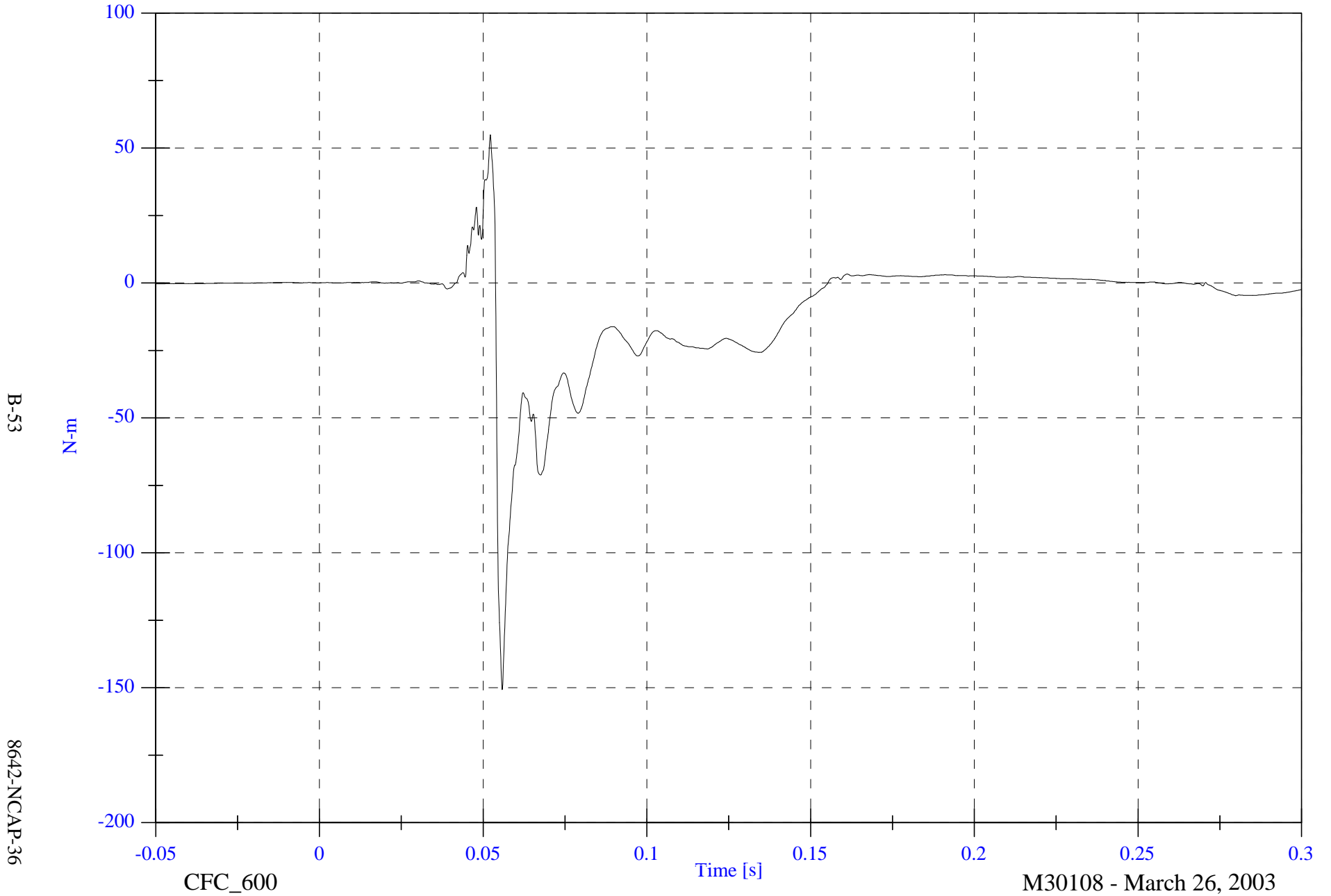
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Right Lower Tibia Mx

Max: 55.0 [N-m] at 0.052 [s]

Min: -150.7 [N-m] at 0.056 [s]



B-53

8642-NCAP-36

CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

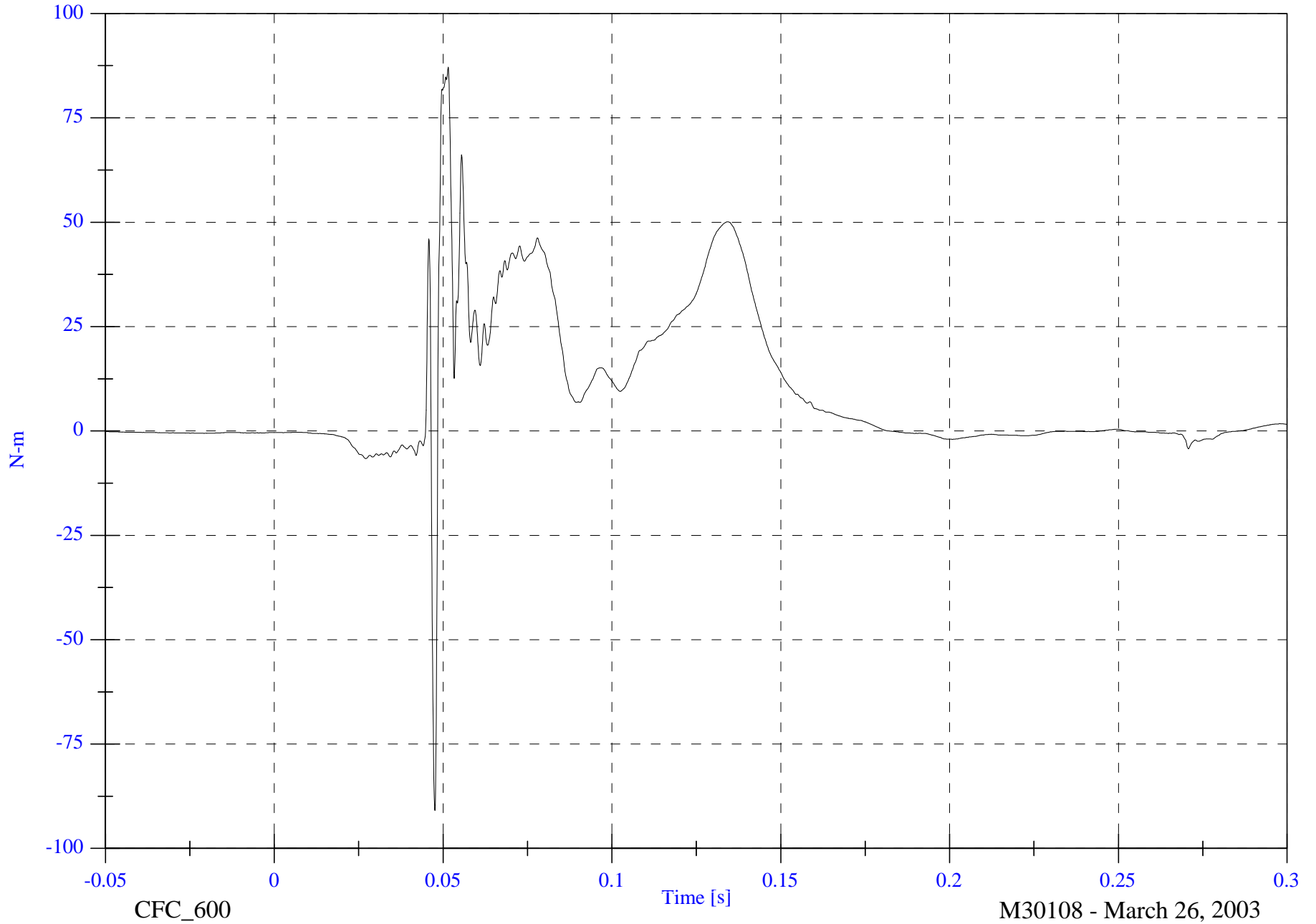
Max: 87.2 [N-m] at 0.051 [s]

V1P1 Right Lower Tibia My

Min: -90.9 [N-m] at 0.048 [s]

B-54

8642-NCAP-36



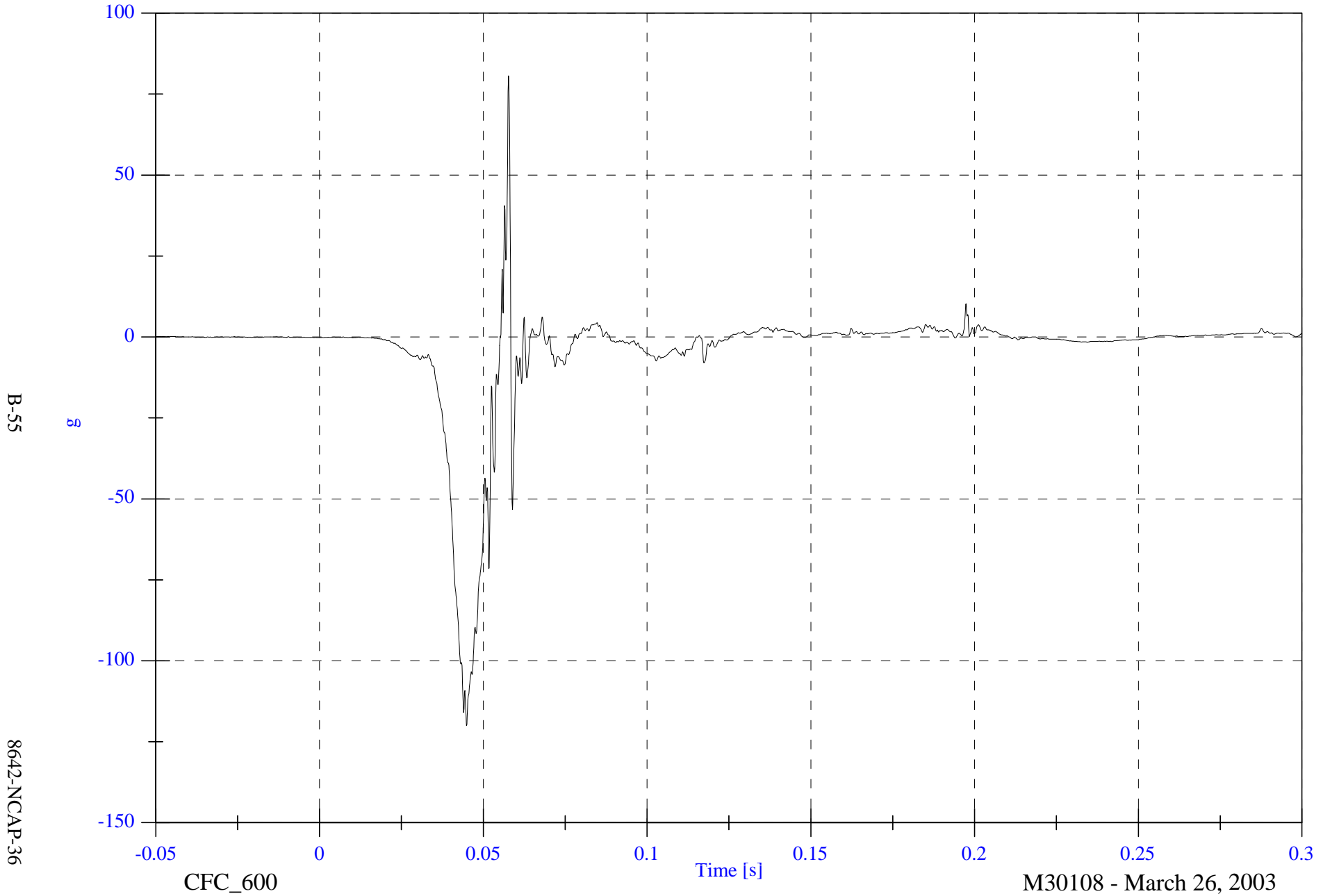
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

VIP1 Left Foot Aft Ax

Max: 80.6 [g] at 0.058 [s]

Min: -120.0 [g] at 0.045 [s]



B-55

8642-NCAP-36

CFC\_600

Time [s]

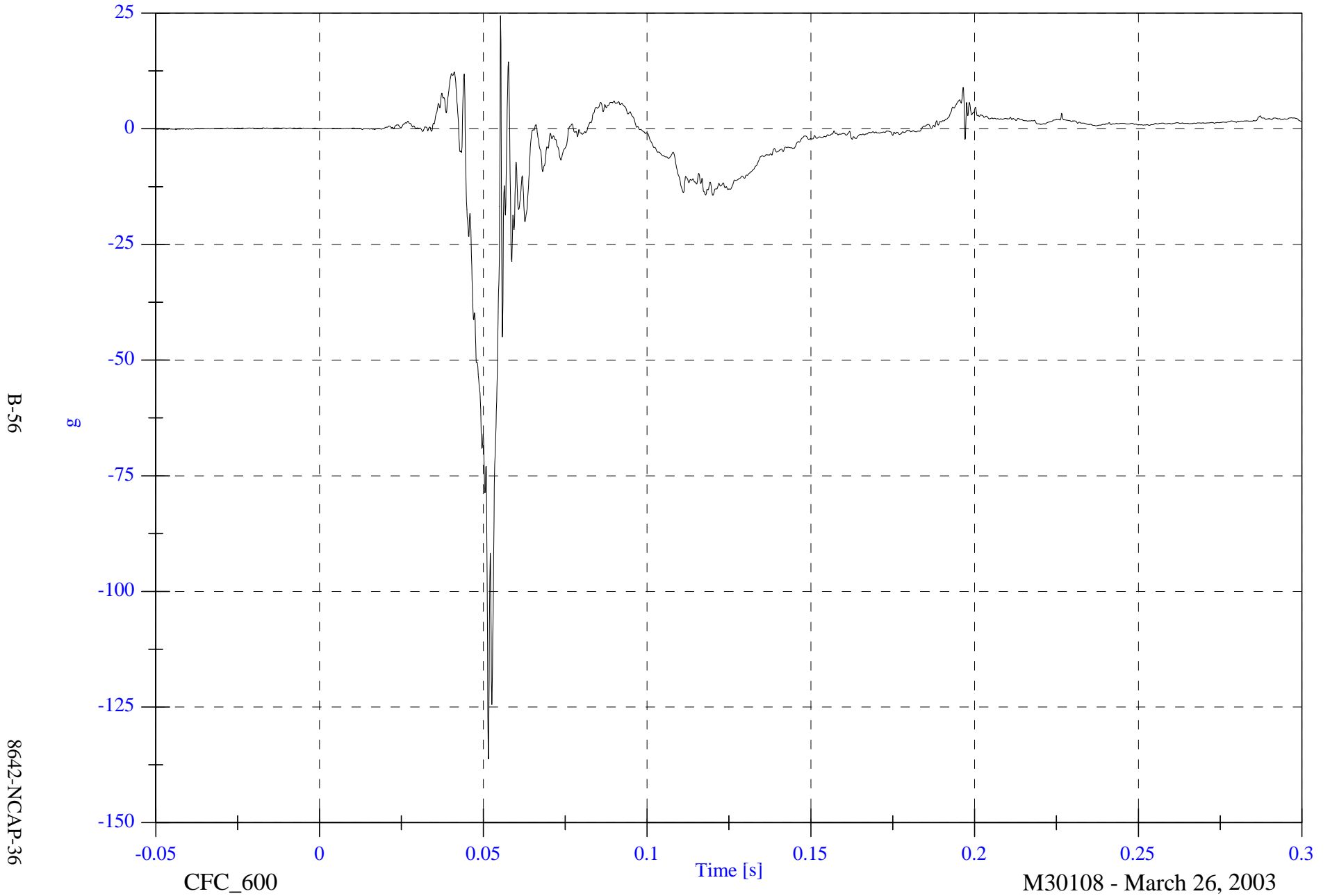
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

VIP1 Left Foot Aft Az

Max: 24.4 [g] at 0.055 [s]

Min: -136.2 [g] at 0.052 [s]

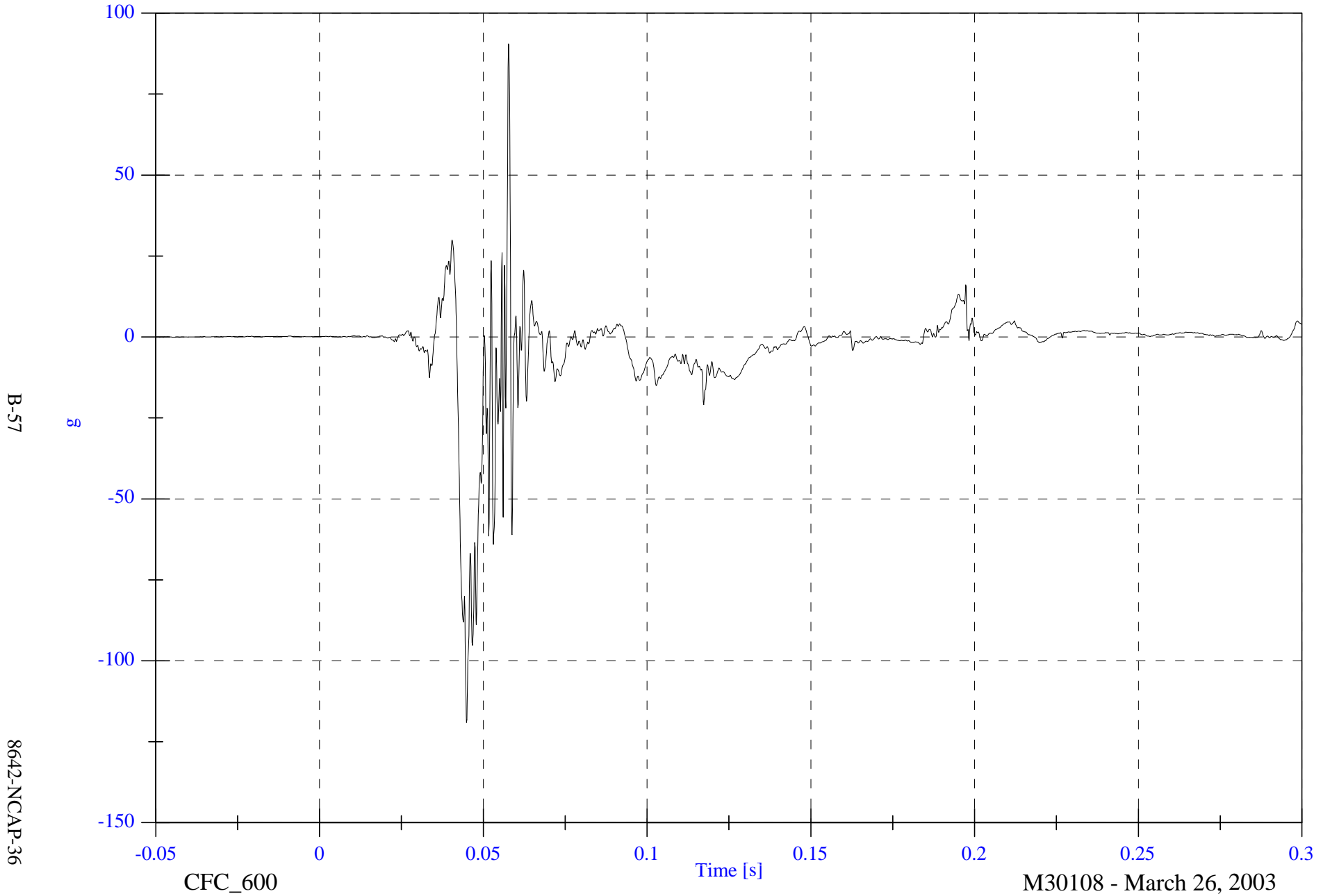


NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Left Foot Fore Az

Max: 90.5 [g] at 0.058 [s]

Min: -119.1 [g] at 0.045 [s]

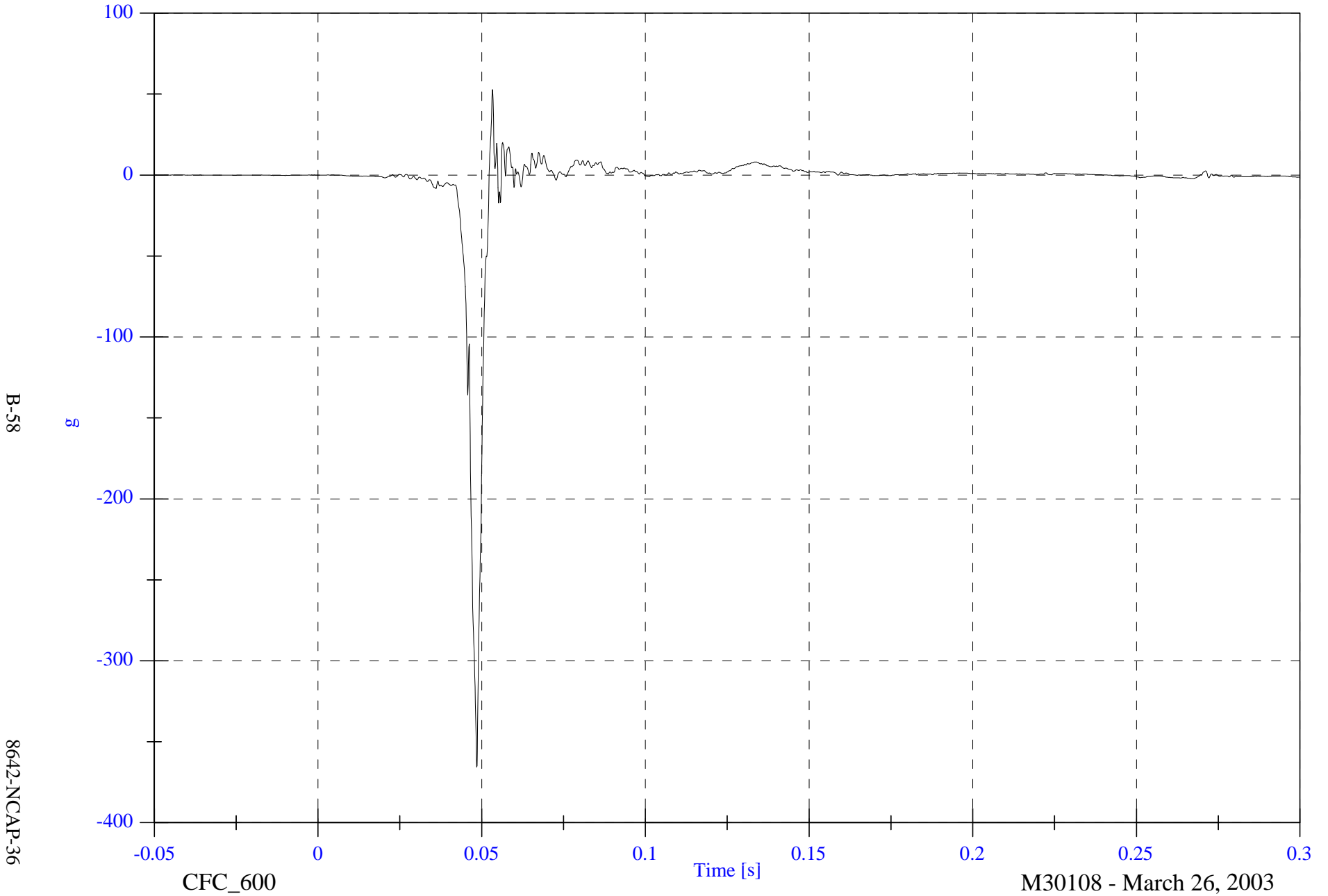


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 52.8 [g] at 0.053 [s]

Min: -365.6 [g] at 0.048 [s]

VIP1 Right Foot Aft x

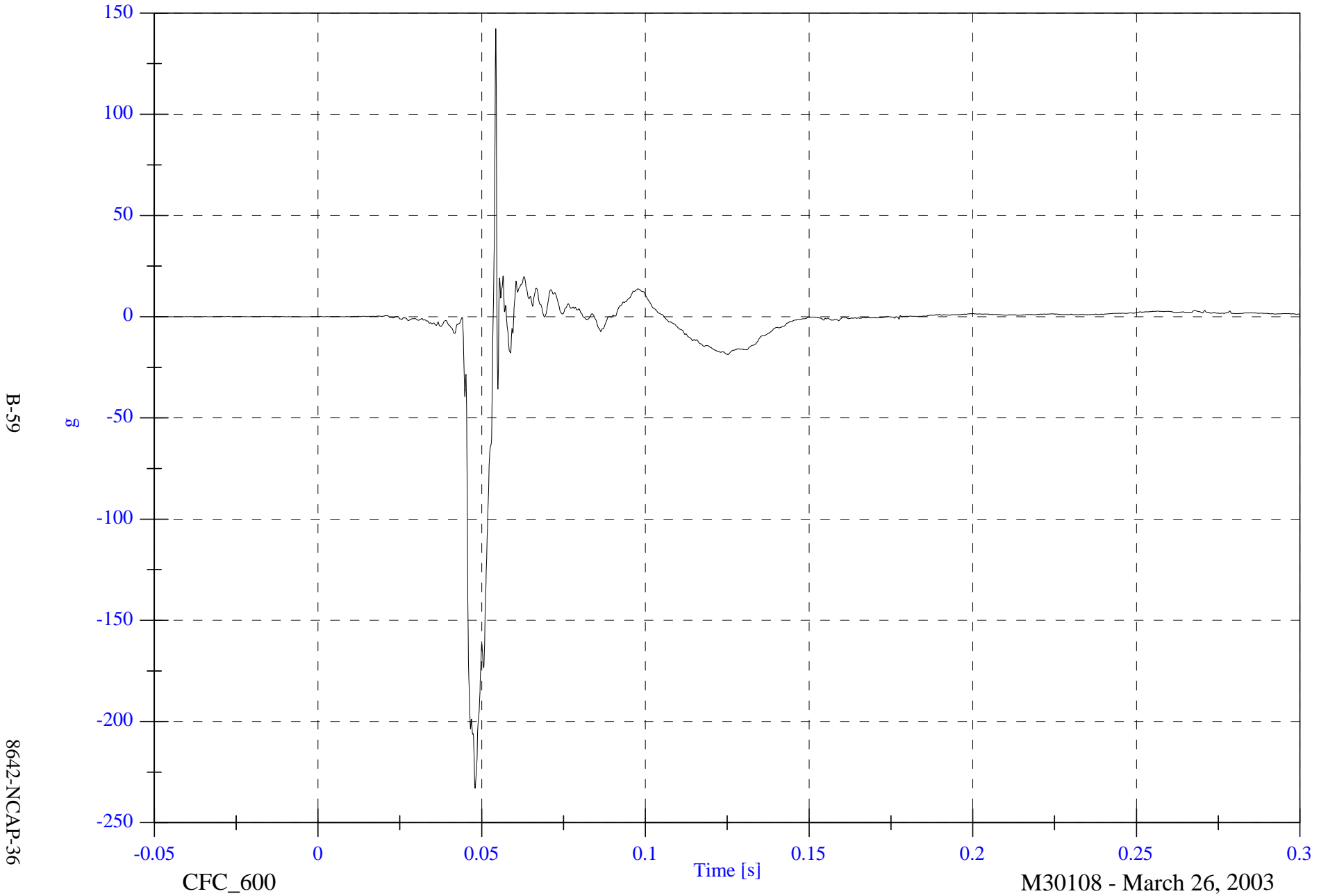


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 142.2 [g] at 0.054 [s]

V1P1 Right Foot Aft z

Min: -233.0 [g] at 0.048 [s]



B-59

8642-NCAP-36

CFC\_600

Time [s]

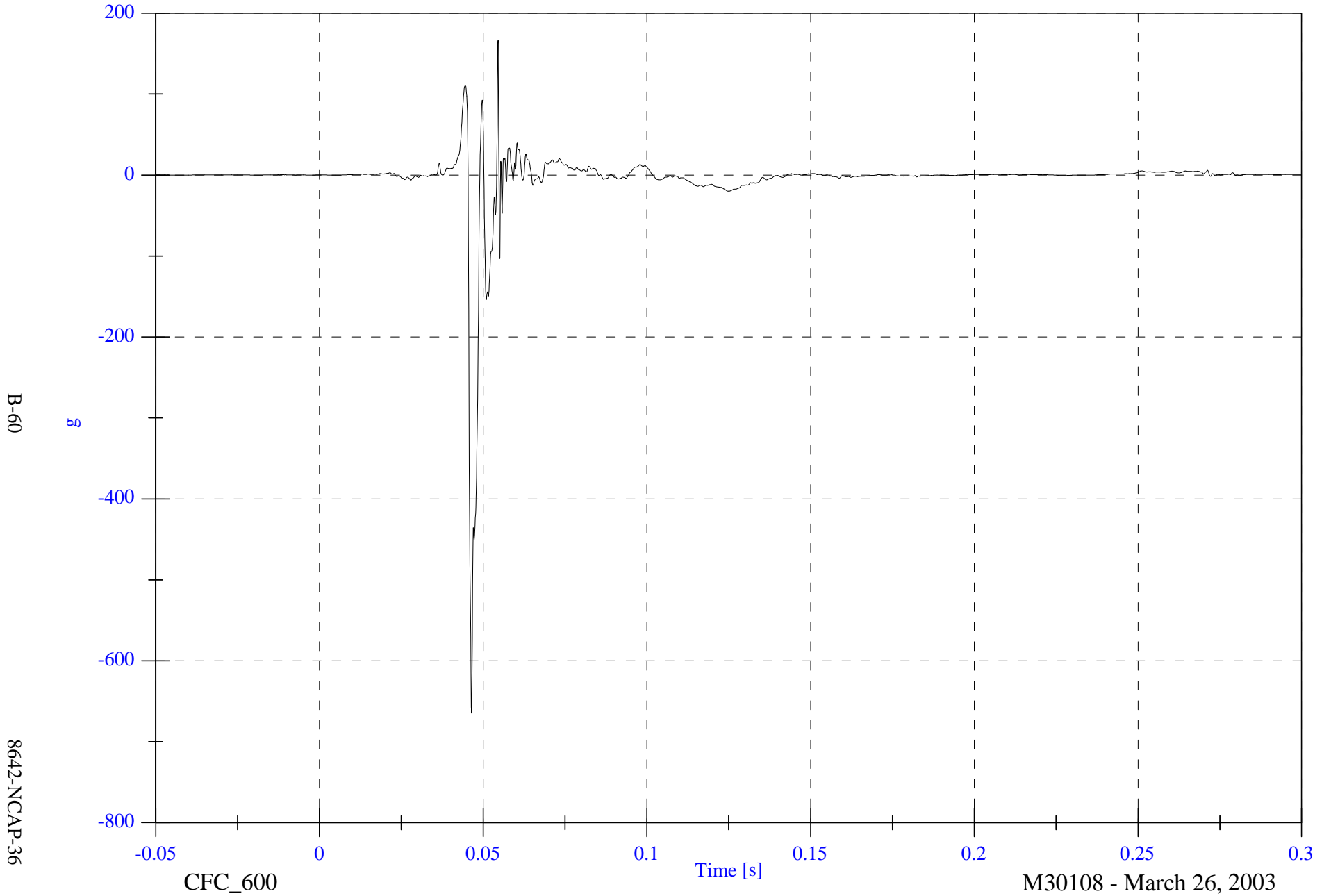
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 166.1 [g] at 0.055 [s]

Min: -664.7 [g] at 0.046 [s]

V1P1 Right Foot Fore z

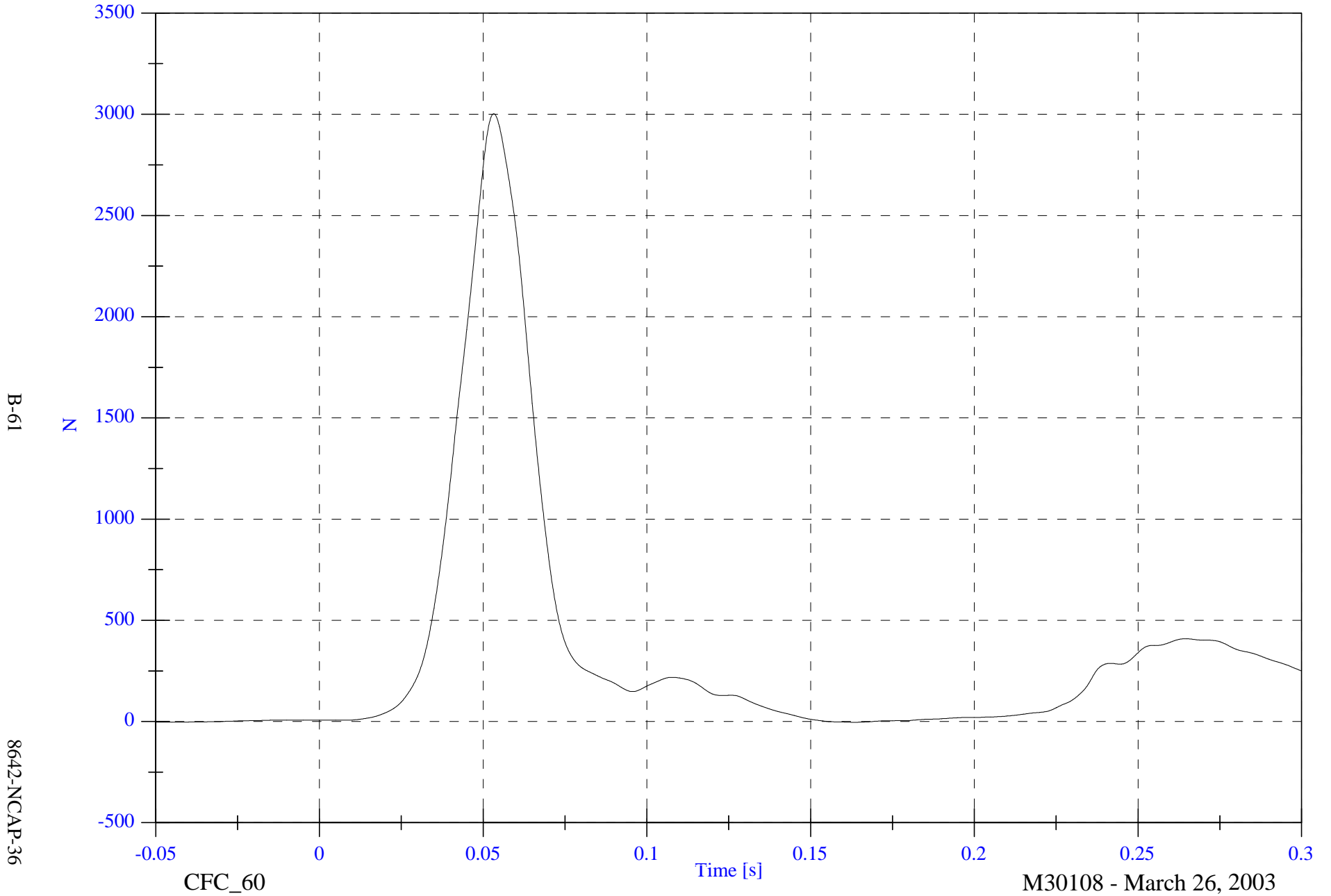


NCAP Test #14 - 2003 Chevrolet Suburban

V1P1 Lap Belt

Max: 3002.8 [N] at 0.053 [s]

Min: -3.8 [N] at 0.163 [s]



B-61

8642-NCAP-36

CFC\_60

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

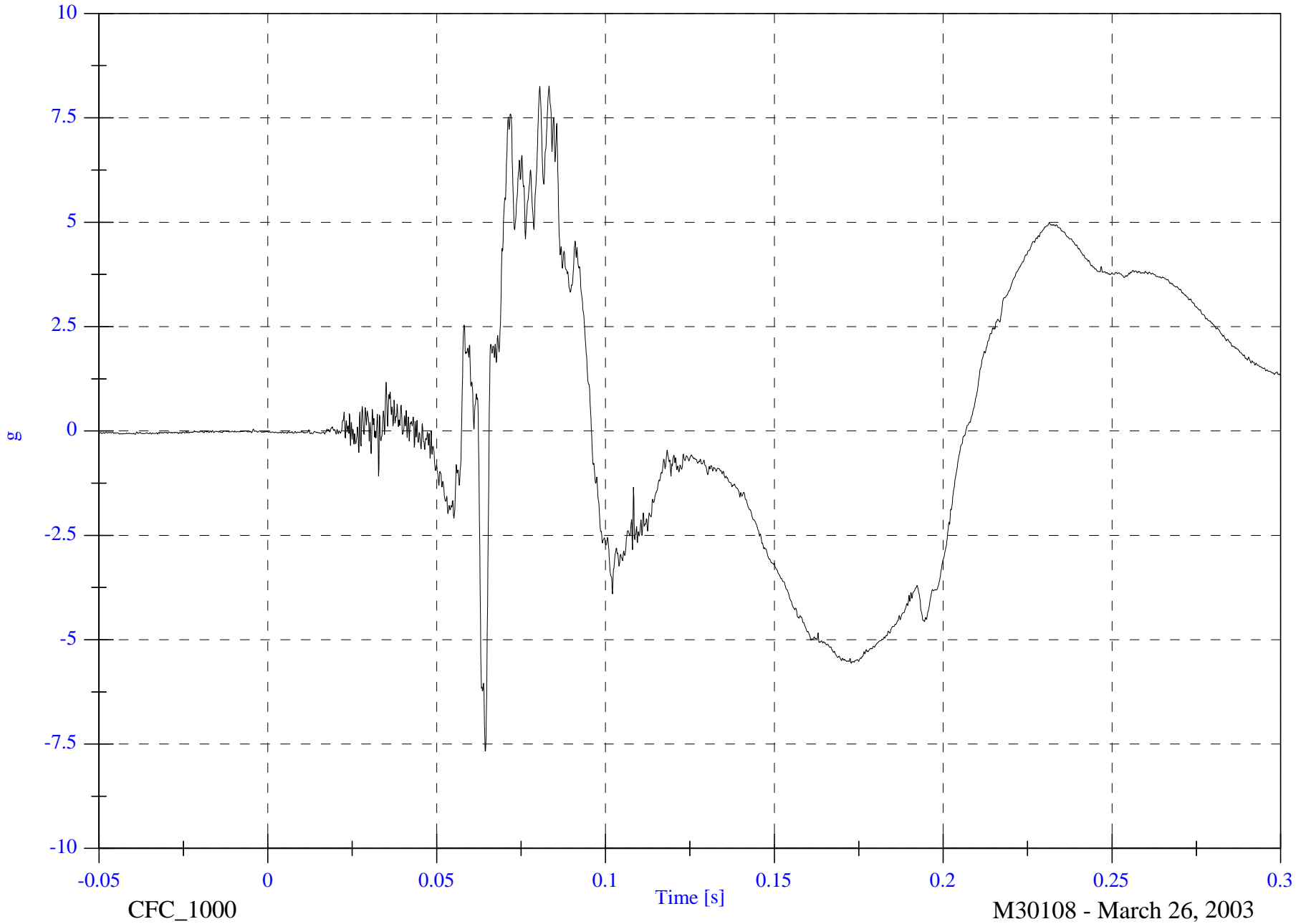
V1P2 Head 9 Array X Arm y

Max: 8.3 [g] at 0.083 [s]

Min: -7.7 [g] at 0.064 [s]

B-62

8642-NCAP-36

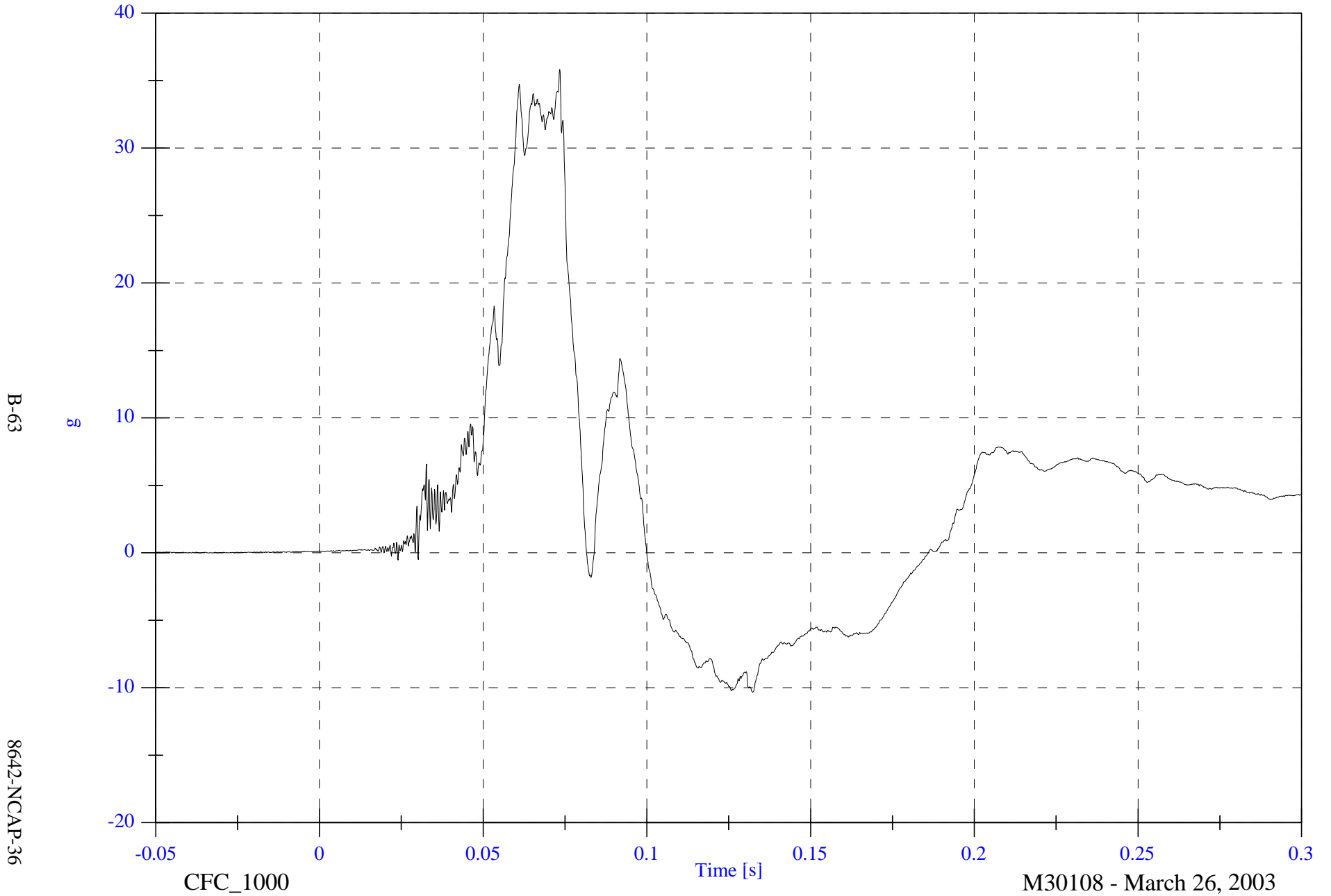


NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Head 9 Array X Arm z

Max: 35.8 [g] at 0.073 [s]

Min: -10.3 [g] at 0.132 [s]



B-63

8642-NCAP-36

CFC\_1000

Time [s]

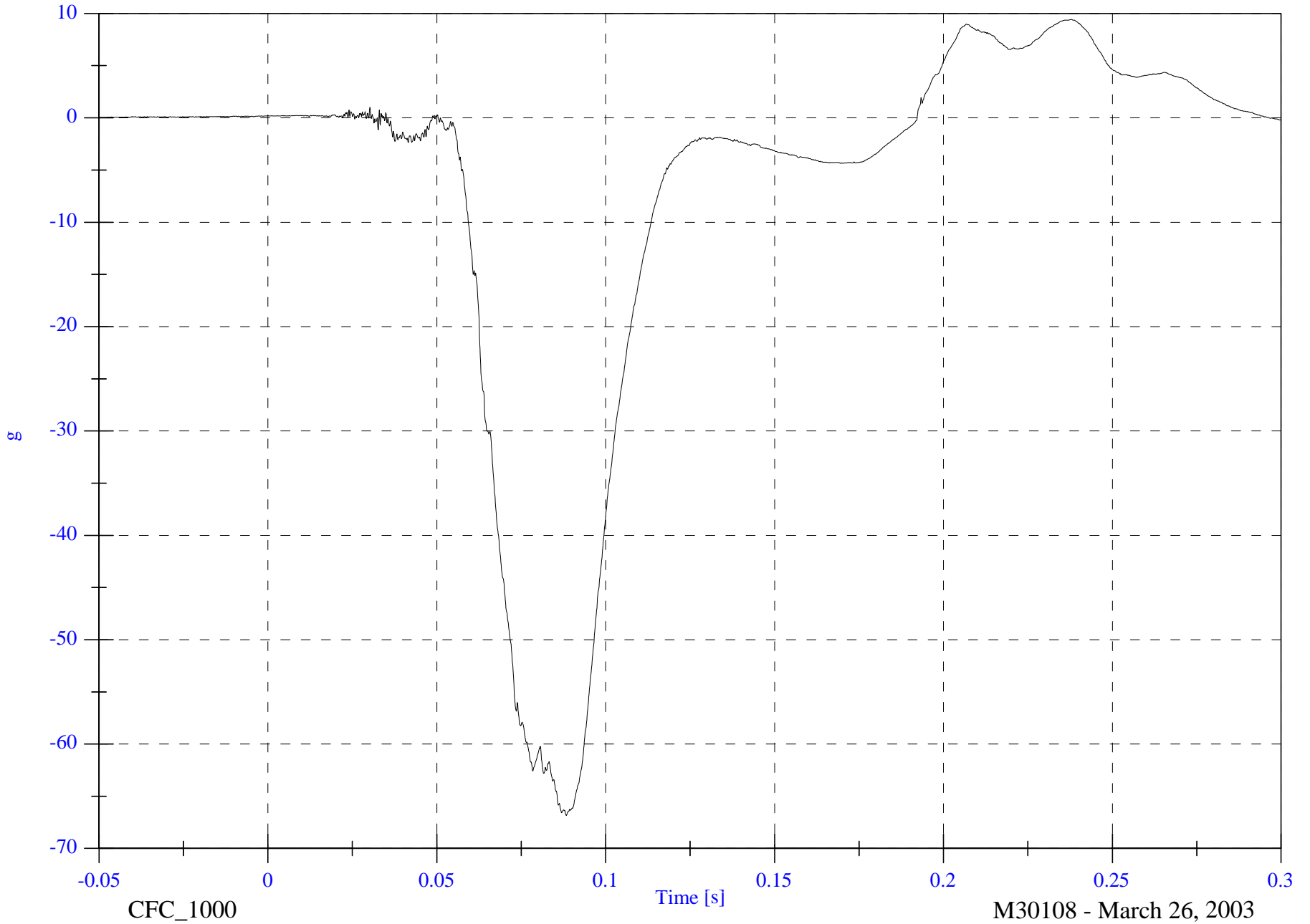
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Head 9 Array Y Arm x

Max: 9.4 [g] at 0.238 [s]

Min: -66.8 [g] at 0.088 [s]



B-64

8642-NCAP-36

CFC\_1000

Time [s]

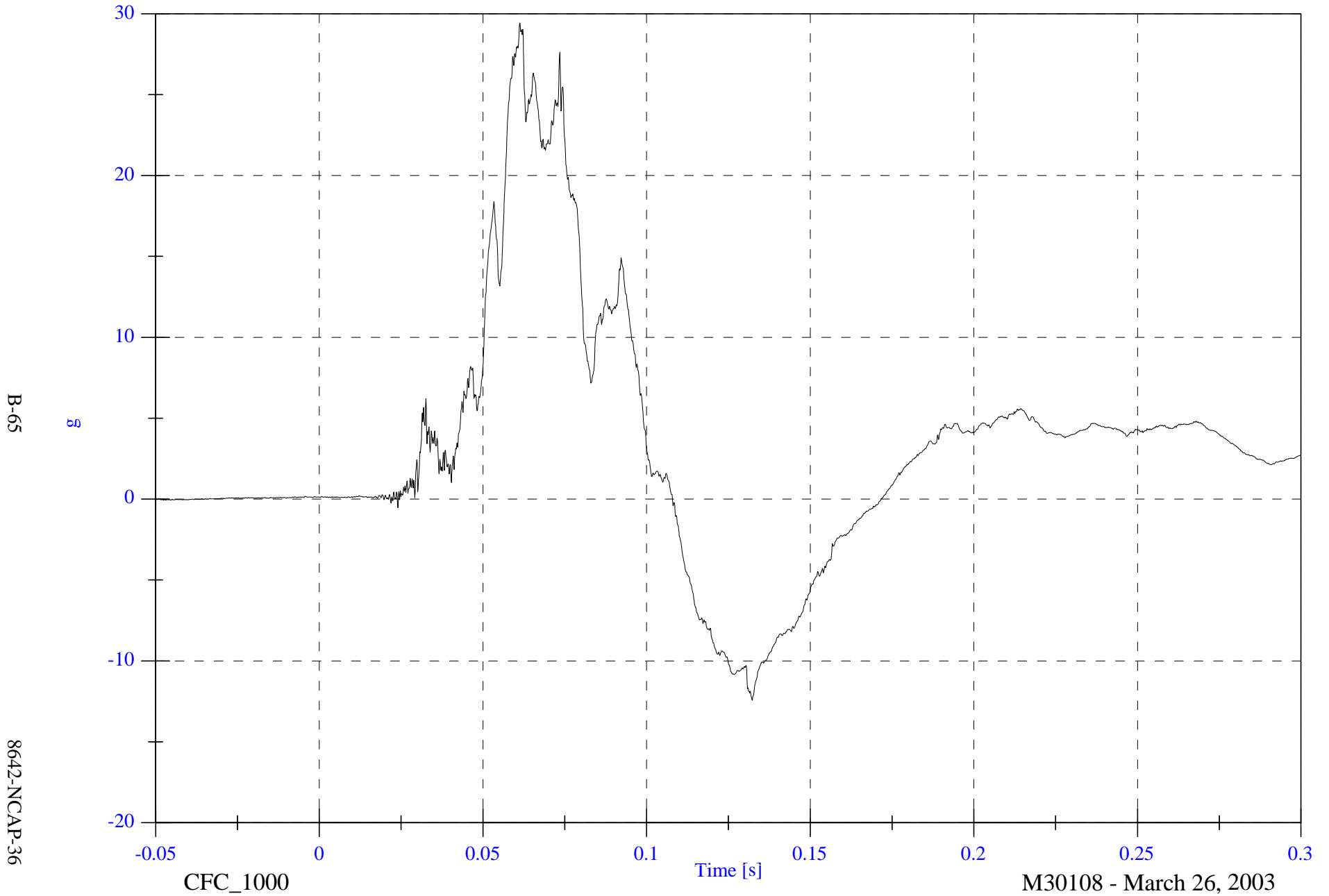
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Head 9 Array Y Arm z

Max: 29.4 [g] at 0.061 [s]

Min: -12.4 [g] at 0.132 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

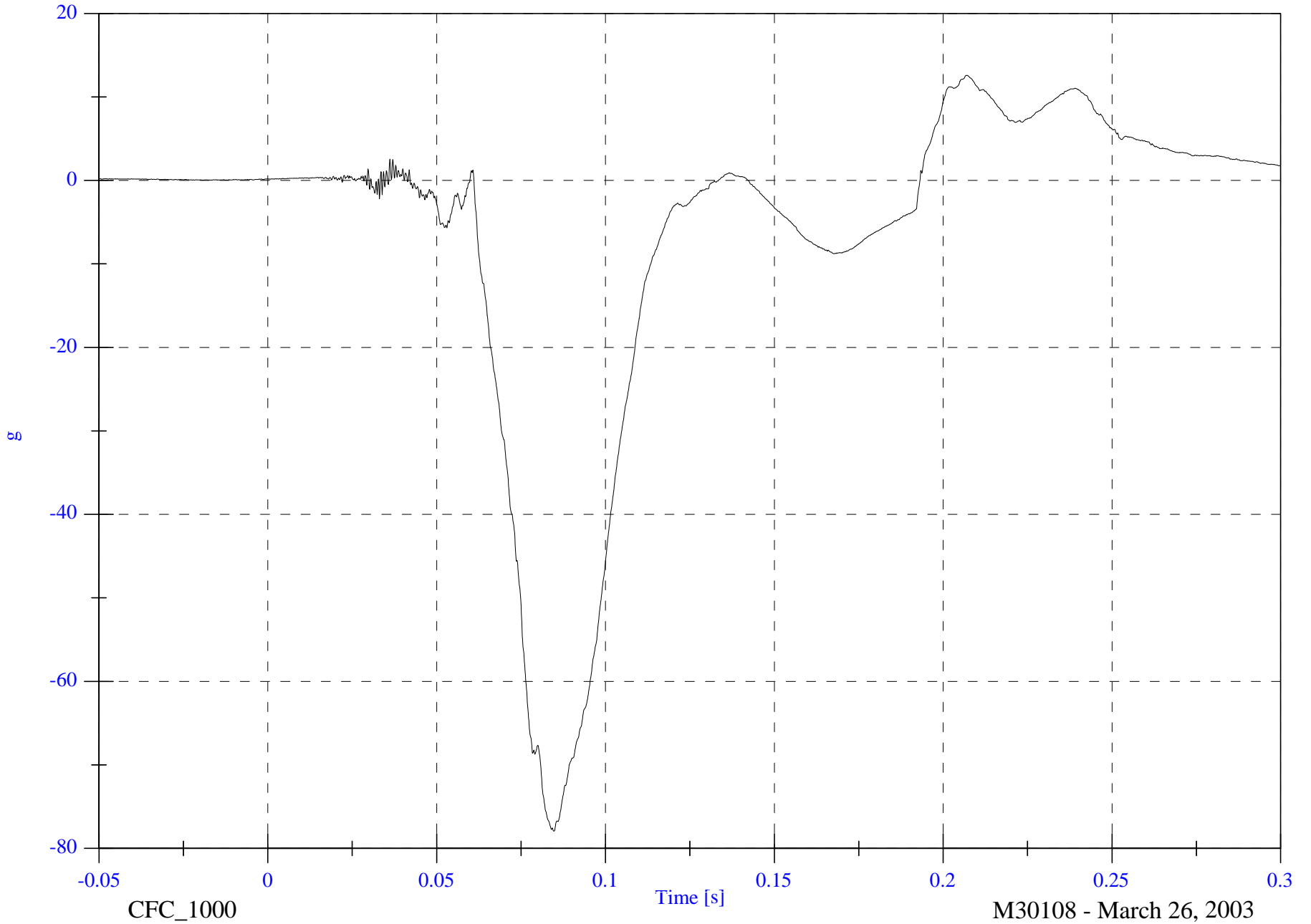
V1P2 Head 9 Array Z Arm x

Max: 12.6 [g] at 0.207 [s]

Min: -77.9 [g] at 0.085 [s]

B-66

8642-NCAP-36

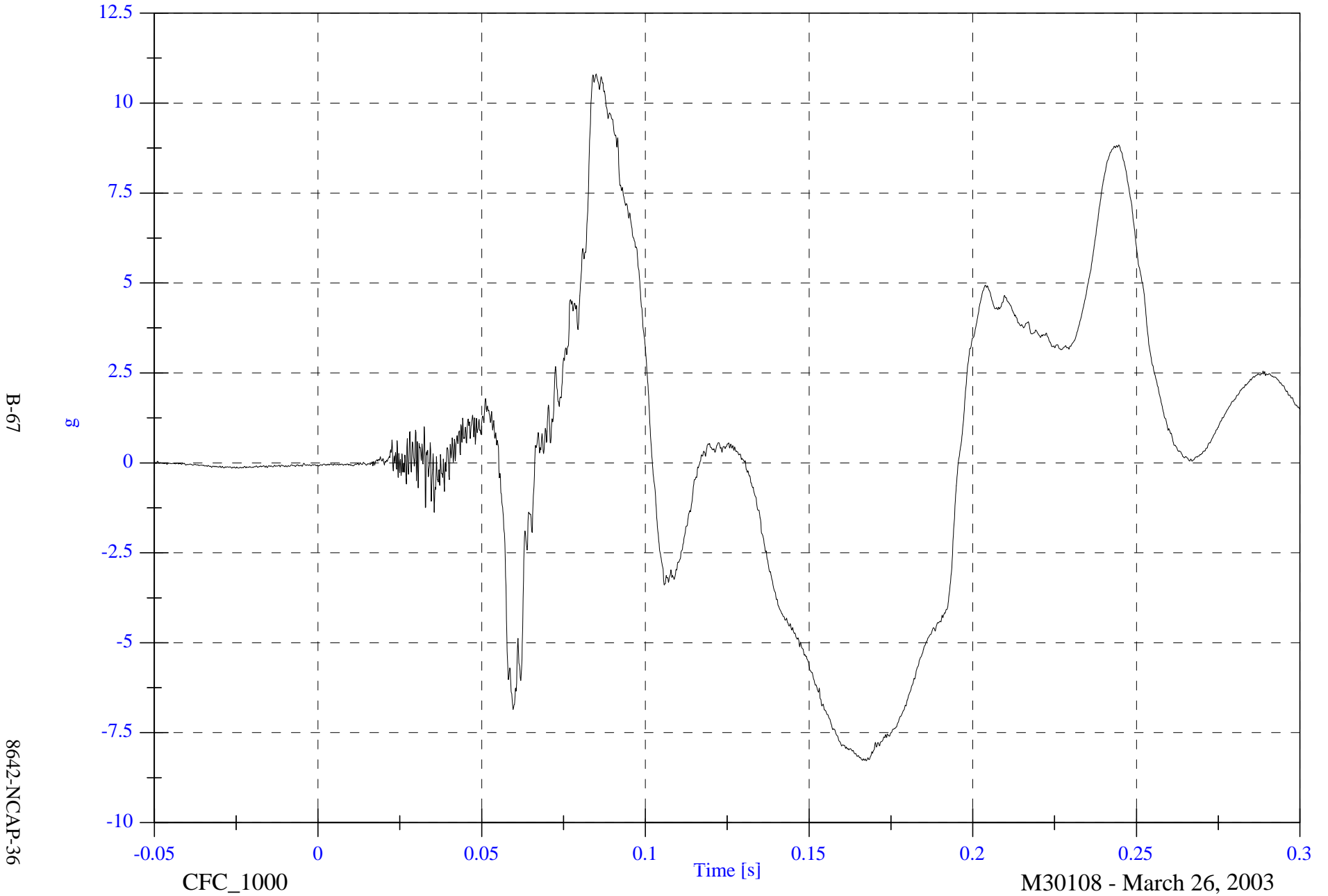


NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Head 9 Array Z Arm y

Max: 10.8 [g] at 0.085 [s]

Min: -8.3 [g] at 0.167 [s]

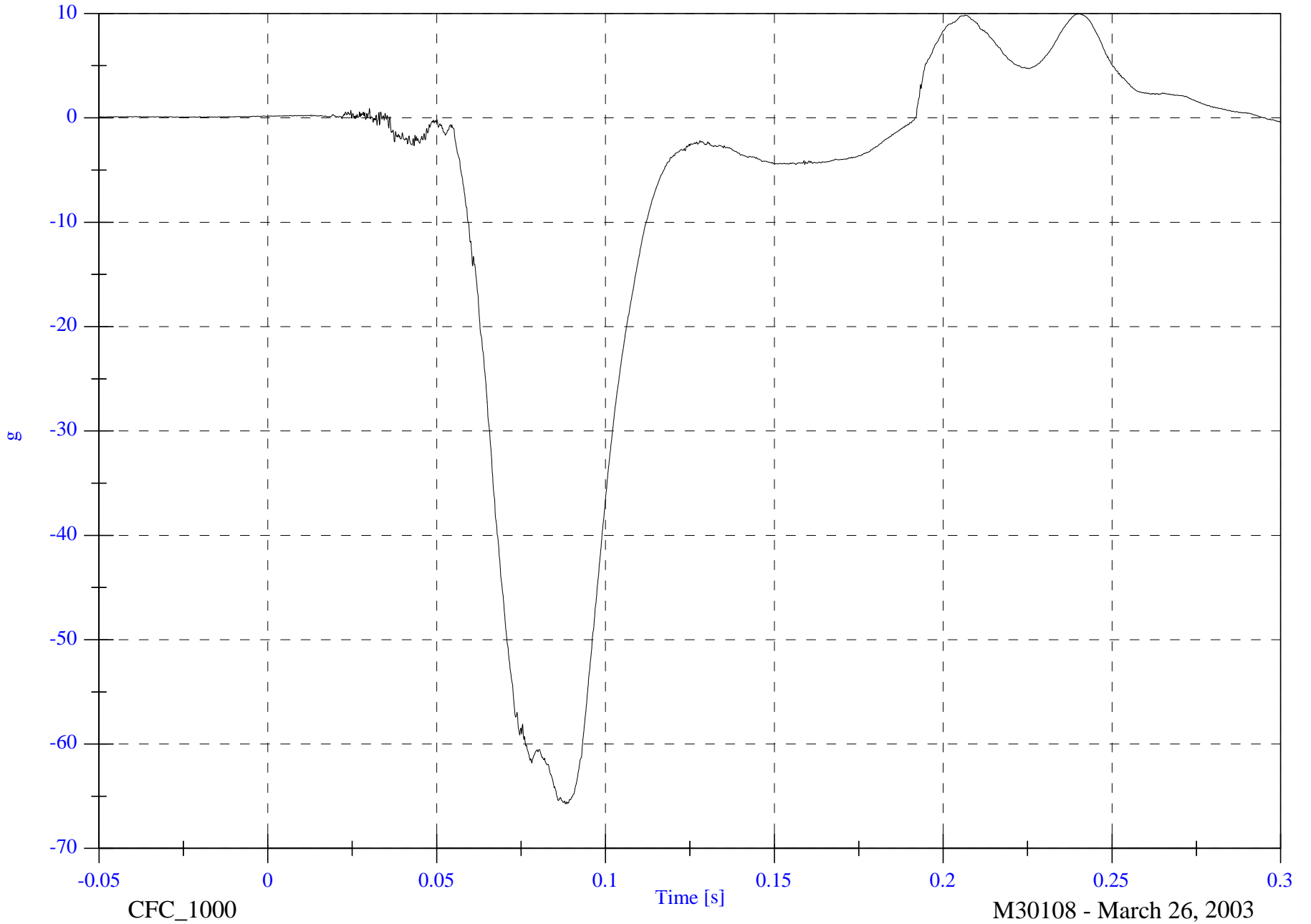


NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Head CG x

Max: 10.0 [g] at 0.240 [s]

Min: -65.7 [g] at 0.089 [s]



B-68

8642-NCAP-36

CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

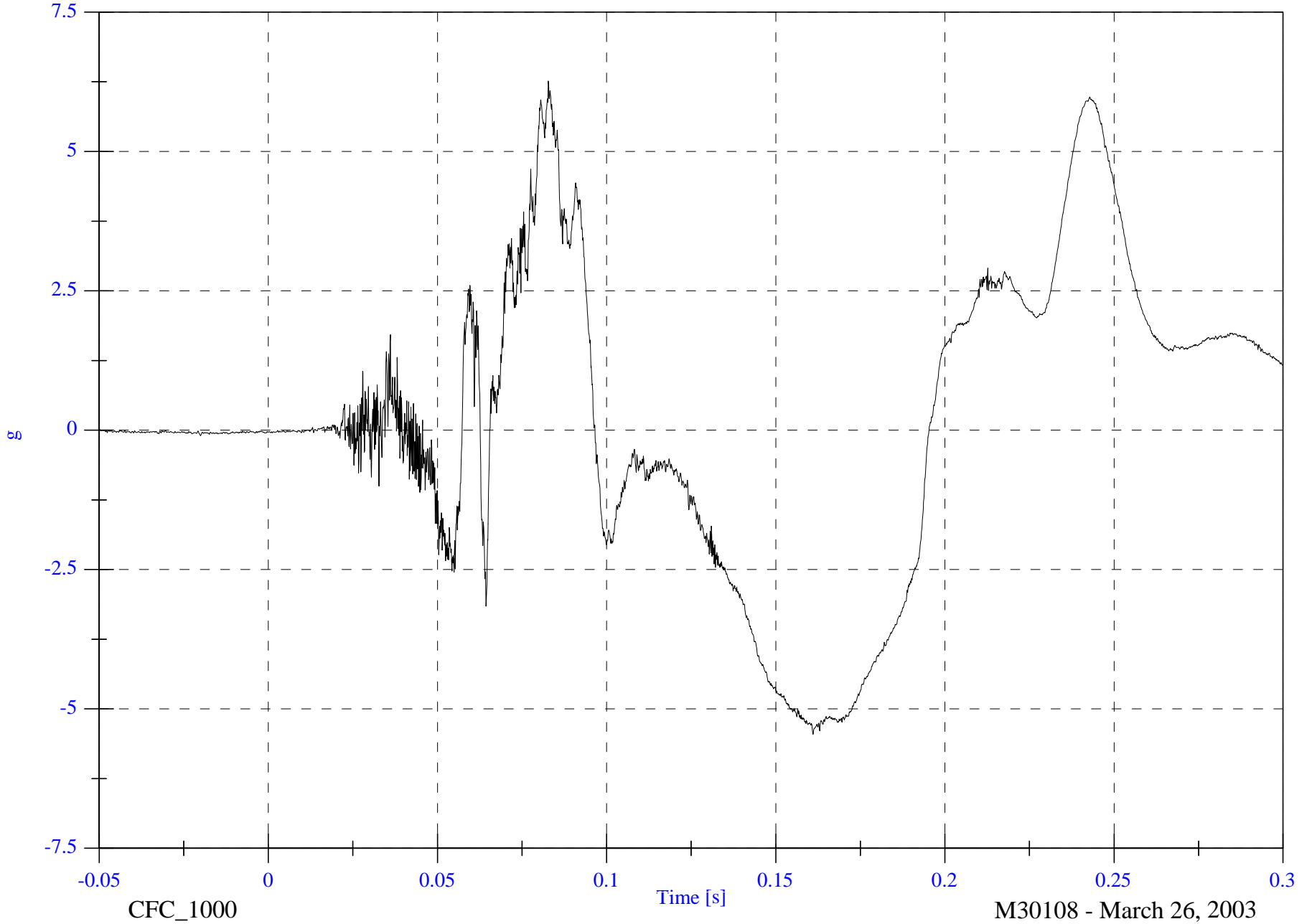
V1P2 Head CG y

Max: 6.3 [g] at 0.083 [s]

Min: -5.5 [g] at 0.161 [s]

B-69

8642-NCAP-36



M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

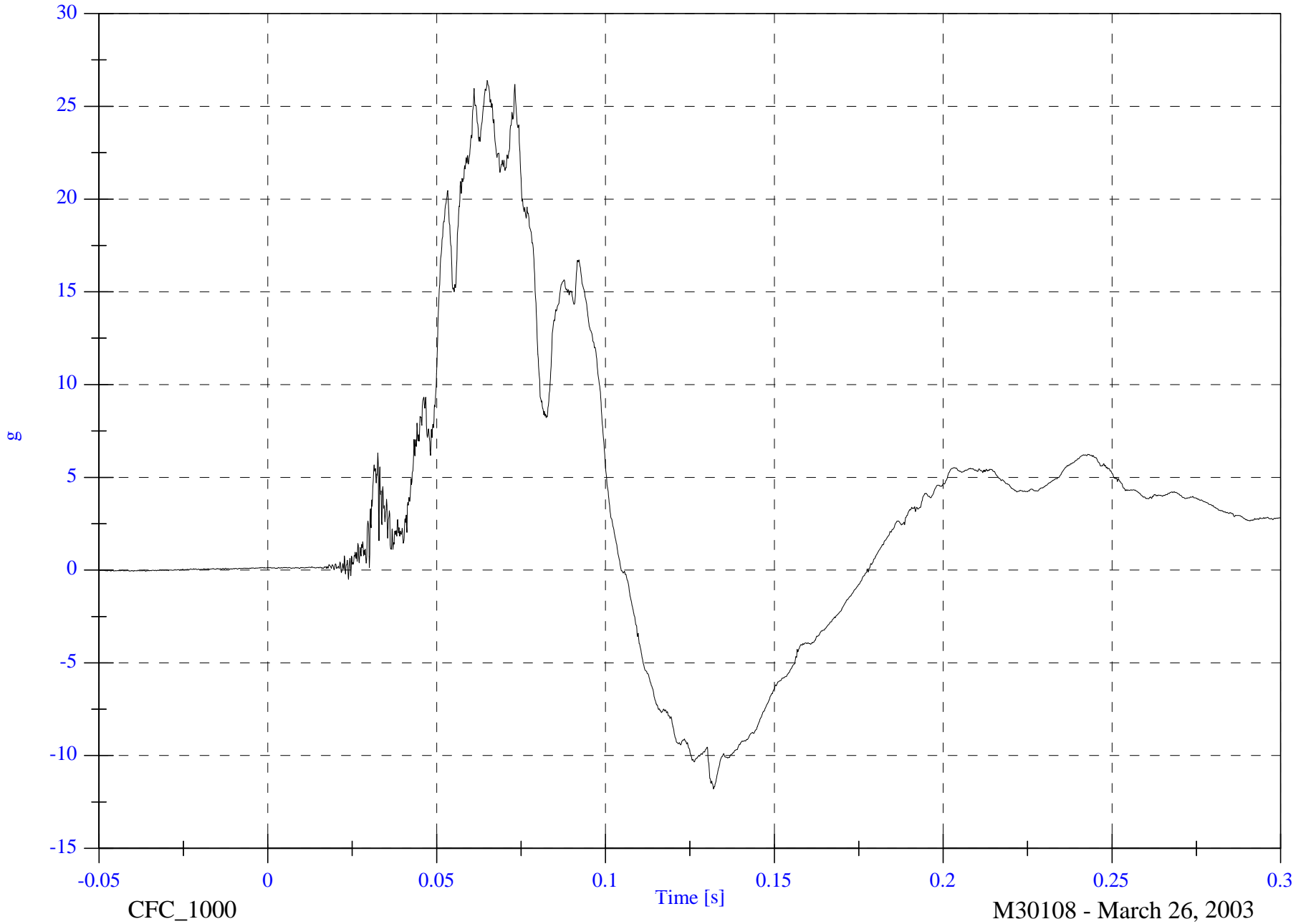
V1P2 Head CG z

Max: 26.4 [g] at 0.065 [s]

Min: -11.8 [g] at 0.132 [s]

B-70

8642-NCAP-36



CFC\_1000

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

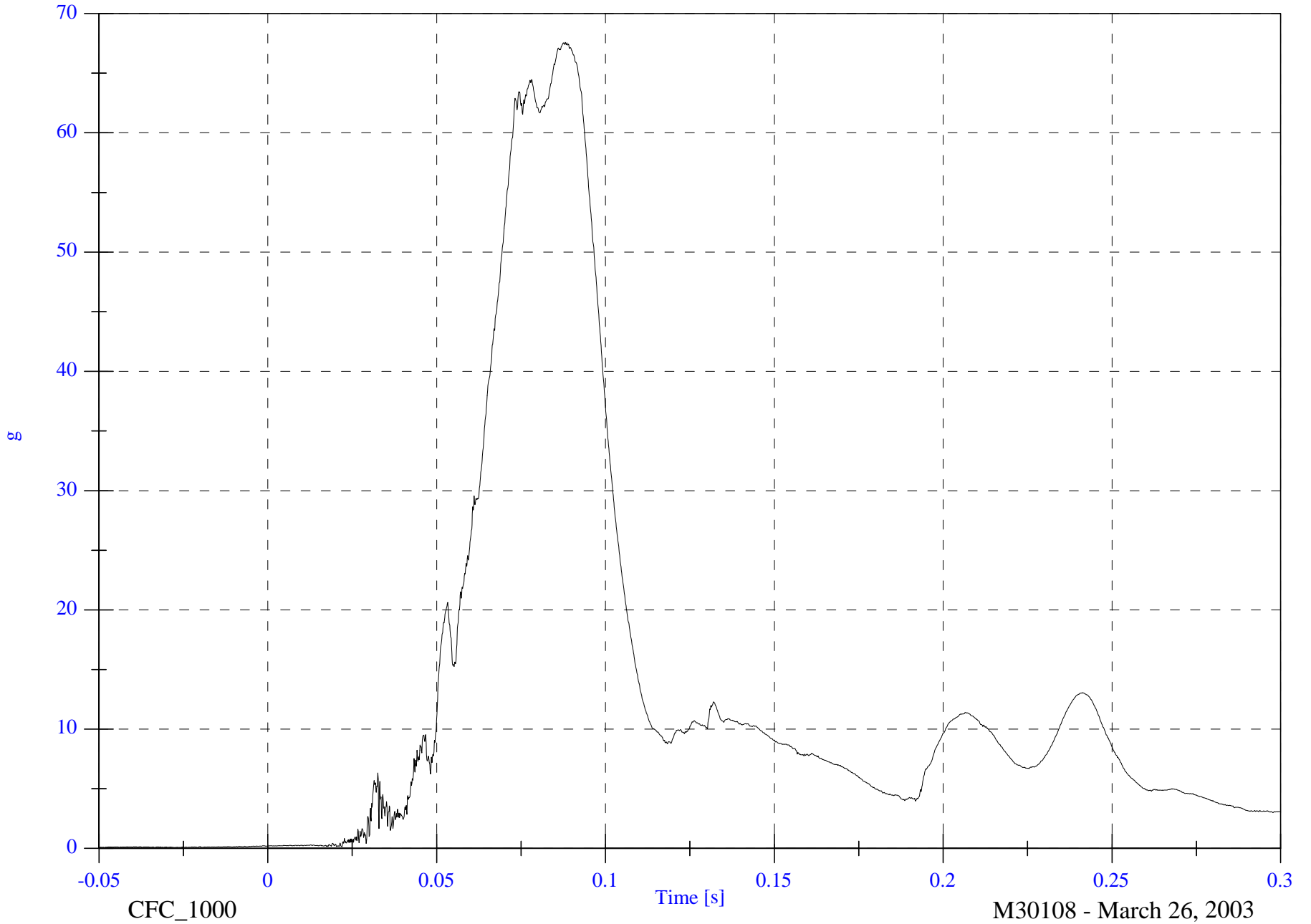
V1P2 Head CG Resultant

Max: 67.6 [g] at 0.088 [s]

Min: 0.1 [g] at -0.028 [s]

B-71

8642-NCAP-36



CFC\_1000

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

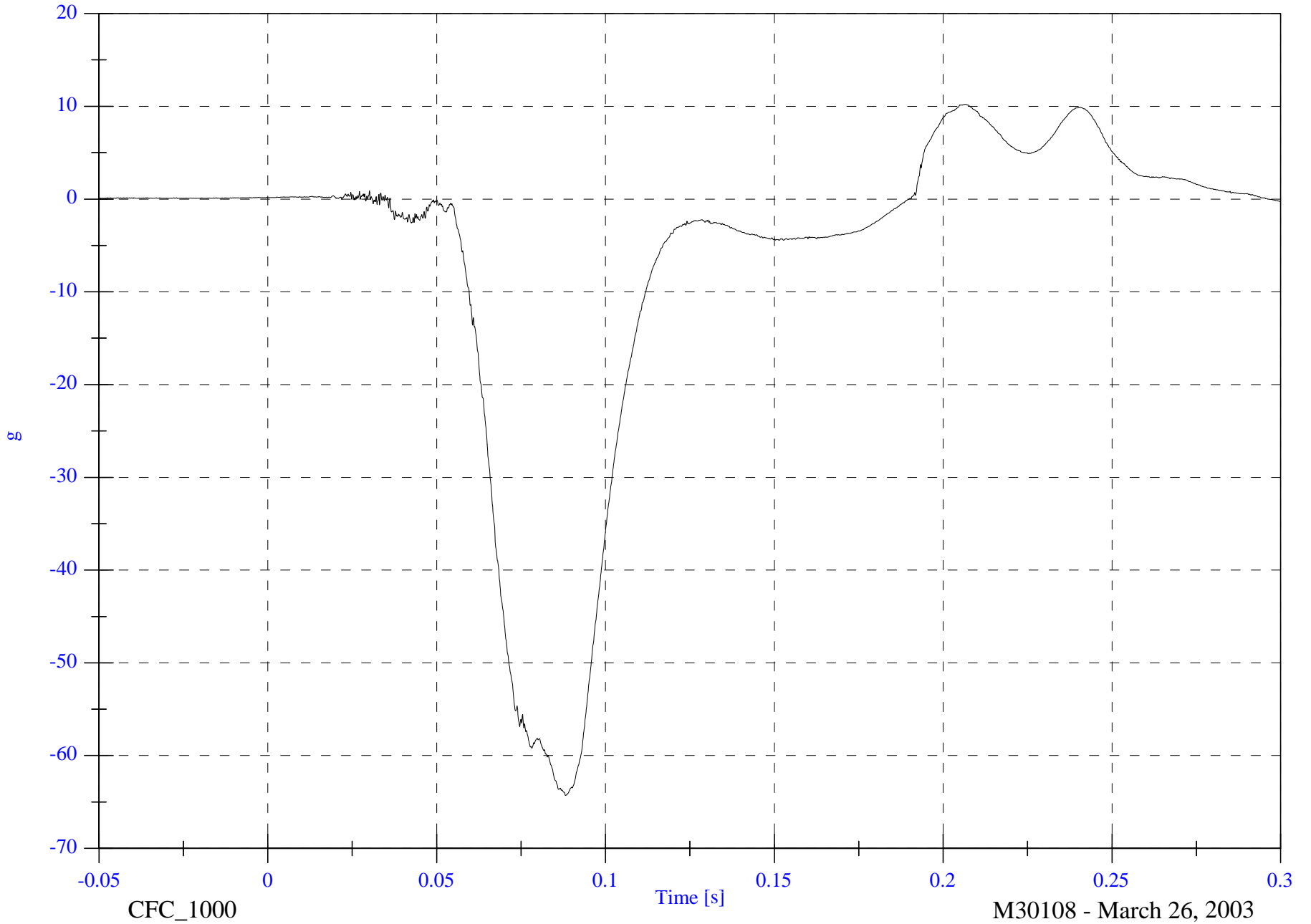
V1P2 Head CG Red x

Max: 10.2 [g] at 0.206 [s]

Min: -64.3 [g] at 0.088 [s]

B-72

8642-NCAP-36



CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

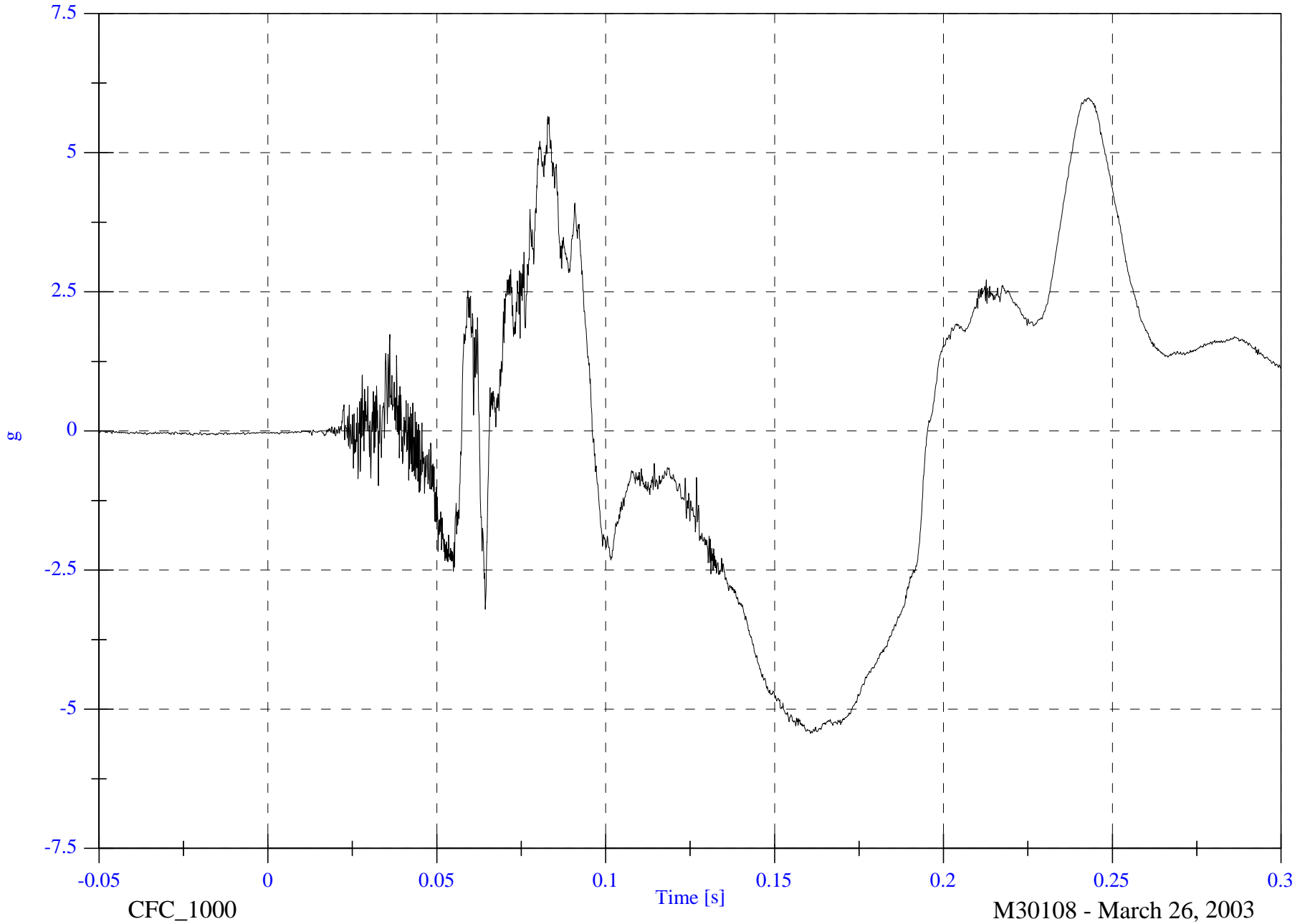
V1P2 Head CG Red y

Max: 6.0 [g] at 0.243 [s]

Min: -5.4 [g] at 0.161 [s]

B-73

8642-NCAP-36



CFC\_1000

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

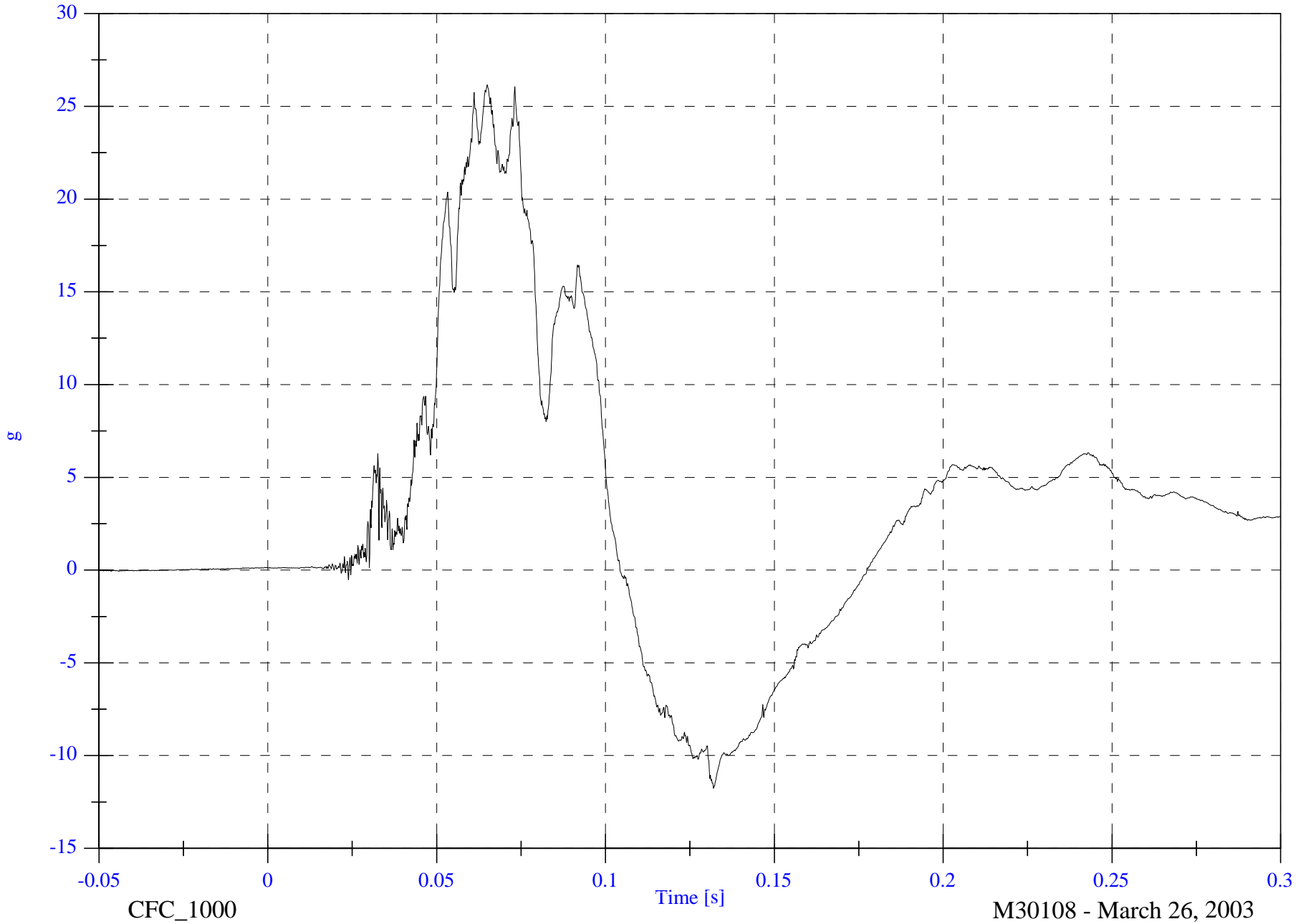
V1P2 Head CG Red z

Max: 26.2 [g] at 0.065 [s]

Min: -11.8 [g] at 0.132 [s]

B-74

8642-NCAP-36



CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

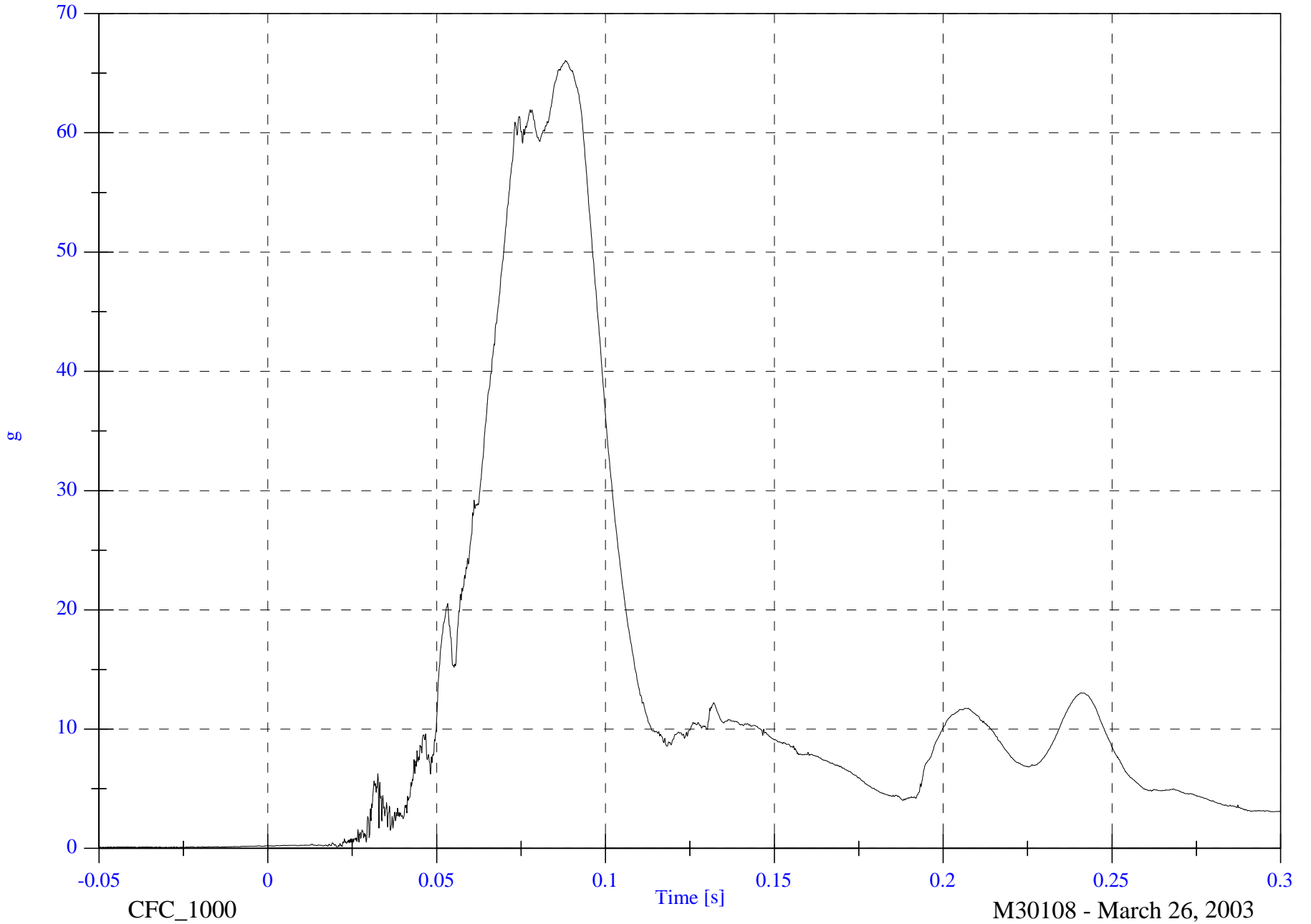
V1P2 Head CG Red Resultant

Max: 66.1 [g] at 0.088 [s]

Min: 0.1 [g] at -0.030 [s]

B-75

8642-NCAP-36



CFC\_1000

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

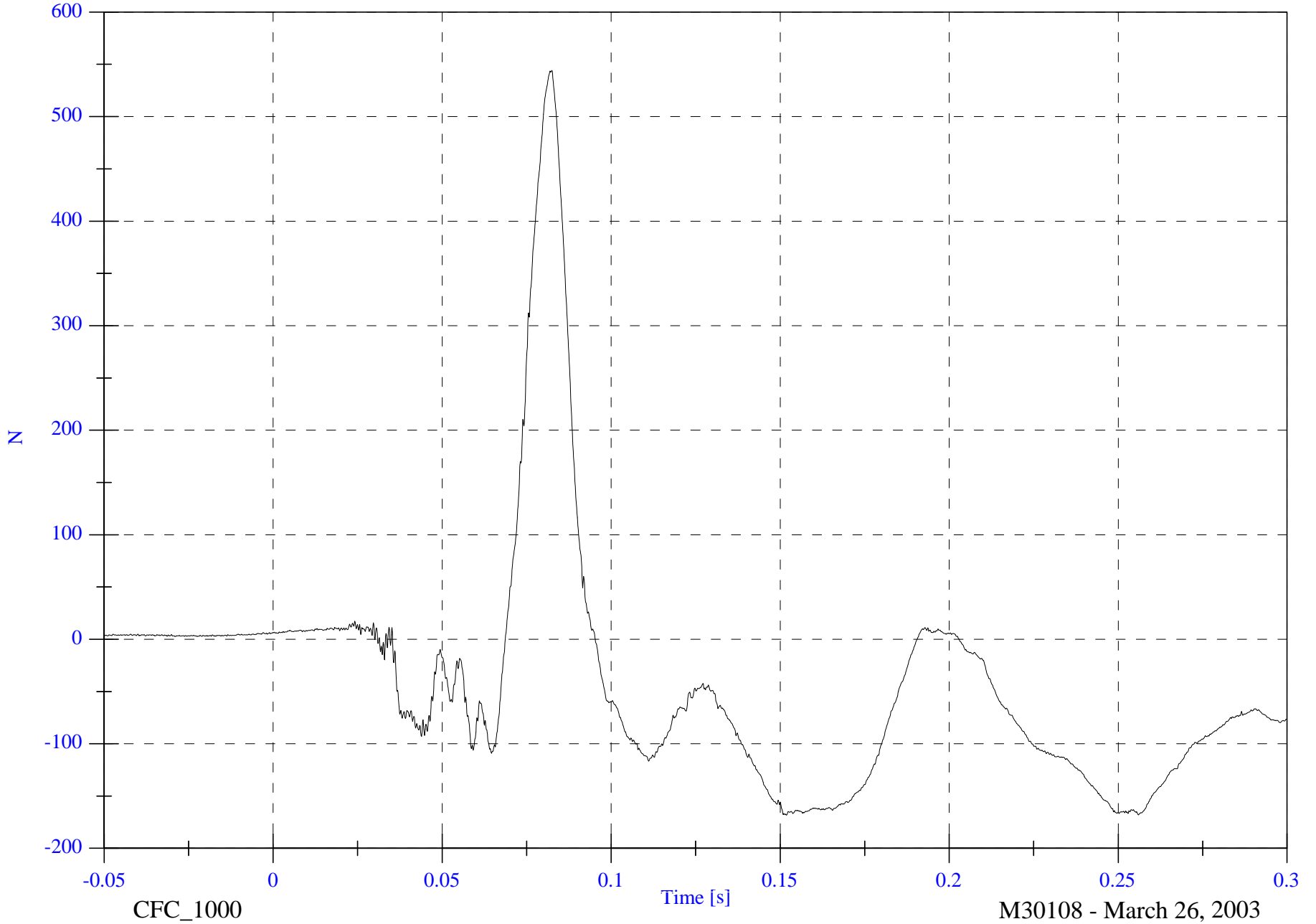
Max: 544.2 [N] at 0.082 [s]

V1P2 Upper Neck Fx

Min: -168.4 [N] at 0.152 [s]

B-76

8642-NCAP-36



CFC\_1000

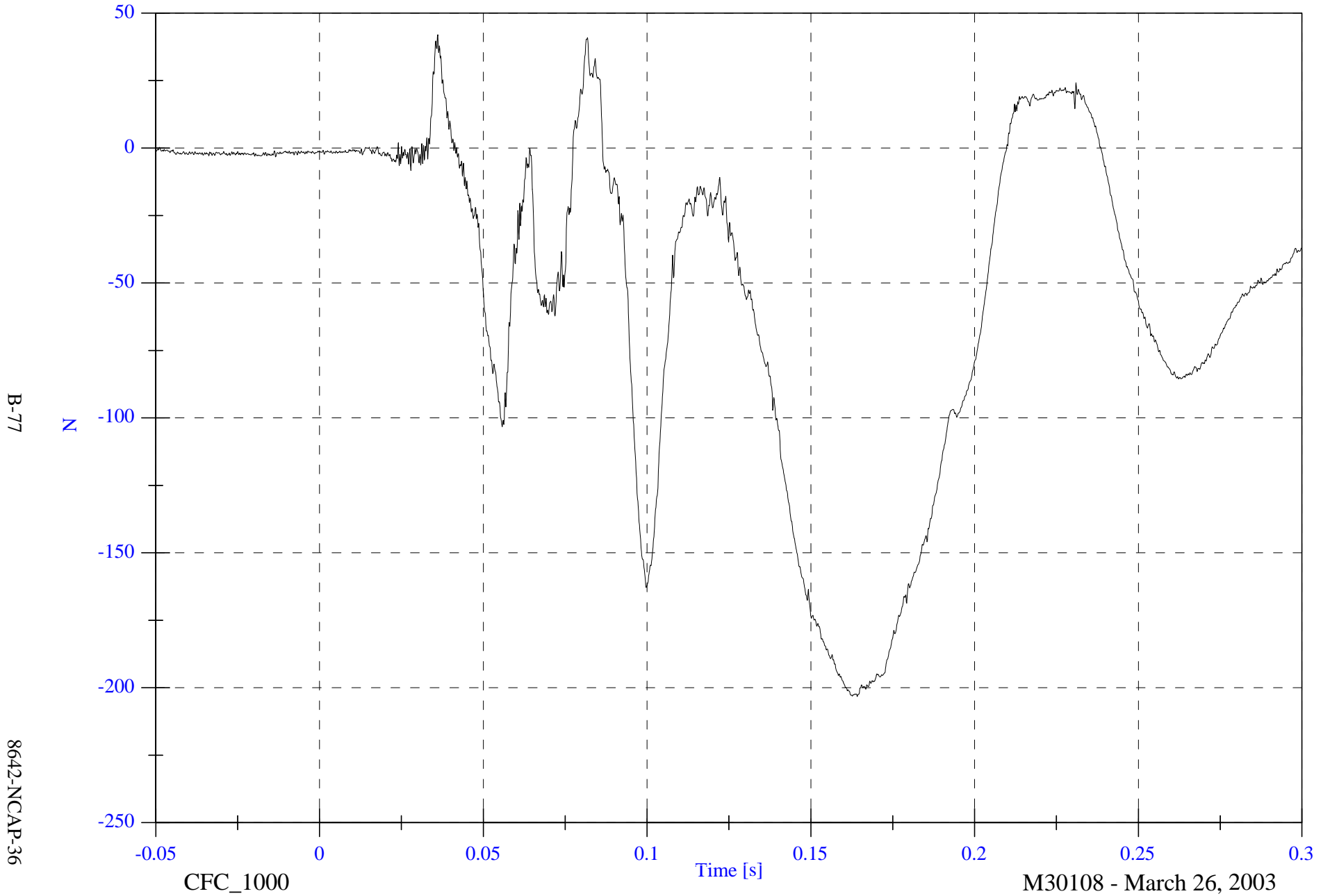
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Upper Neck Fy

Max: 42.0 [N] at 0.036 [s]

Min: -203.3 [N] at 0.164 [s]



B-77

8642-NCAP-36

CFC\_1000

Time [s]

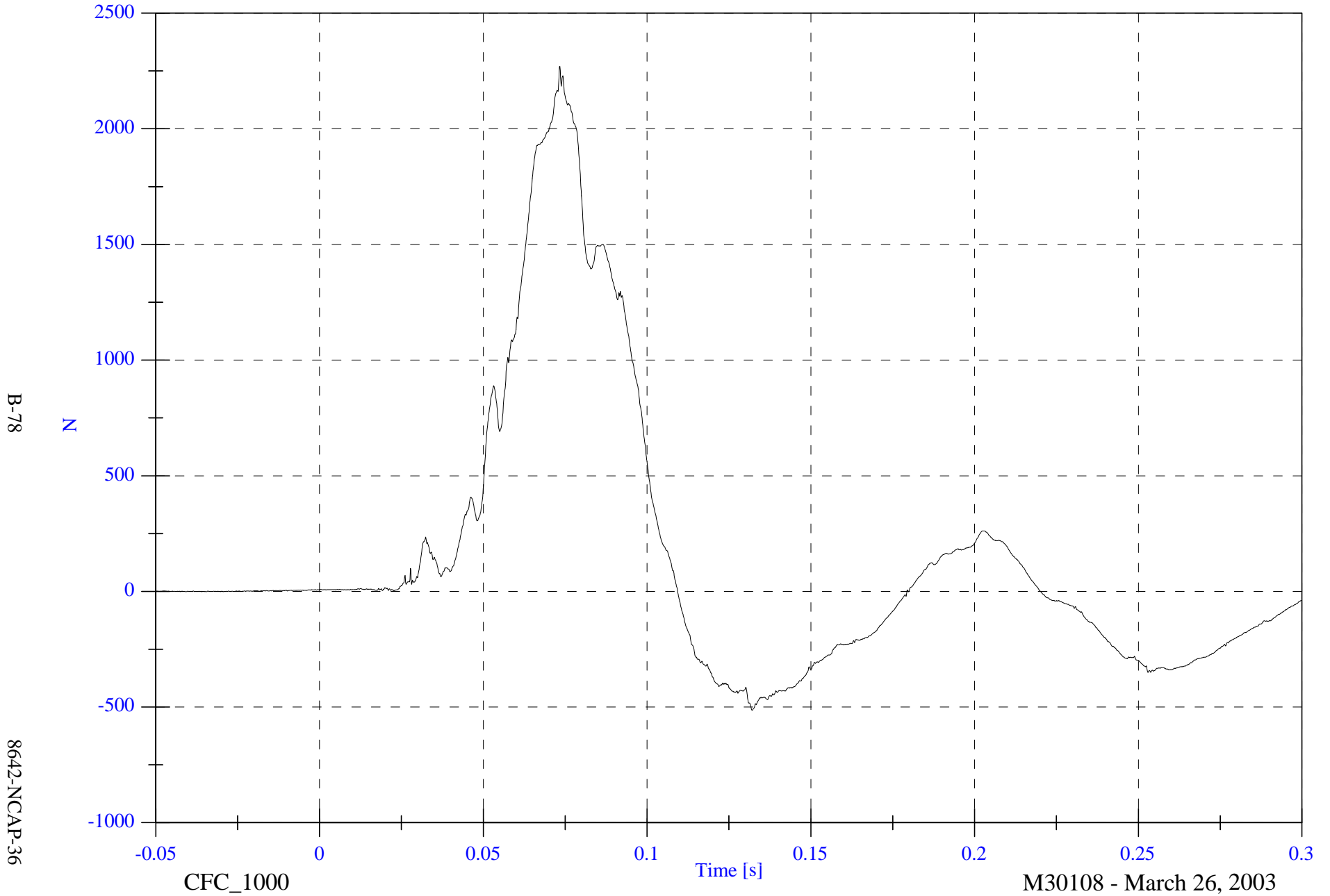
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 2269.7 [N] at 0.073 [s]

V1P2 Upper Neck Fz

Min: -513.7 [N] at 0.132 [s]

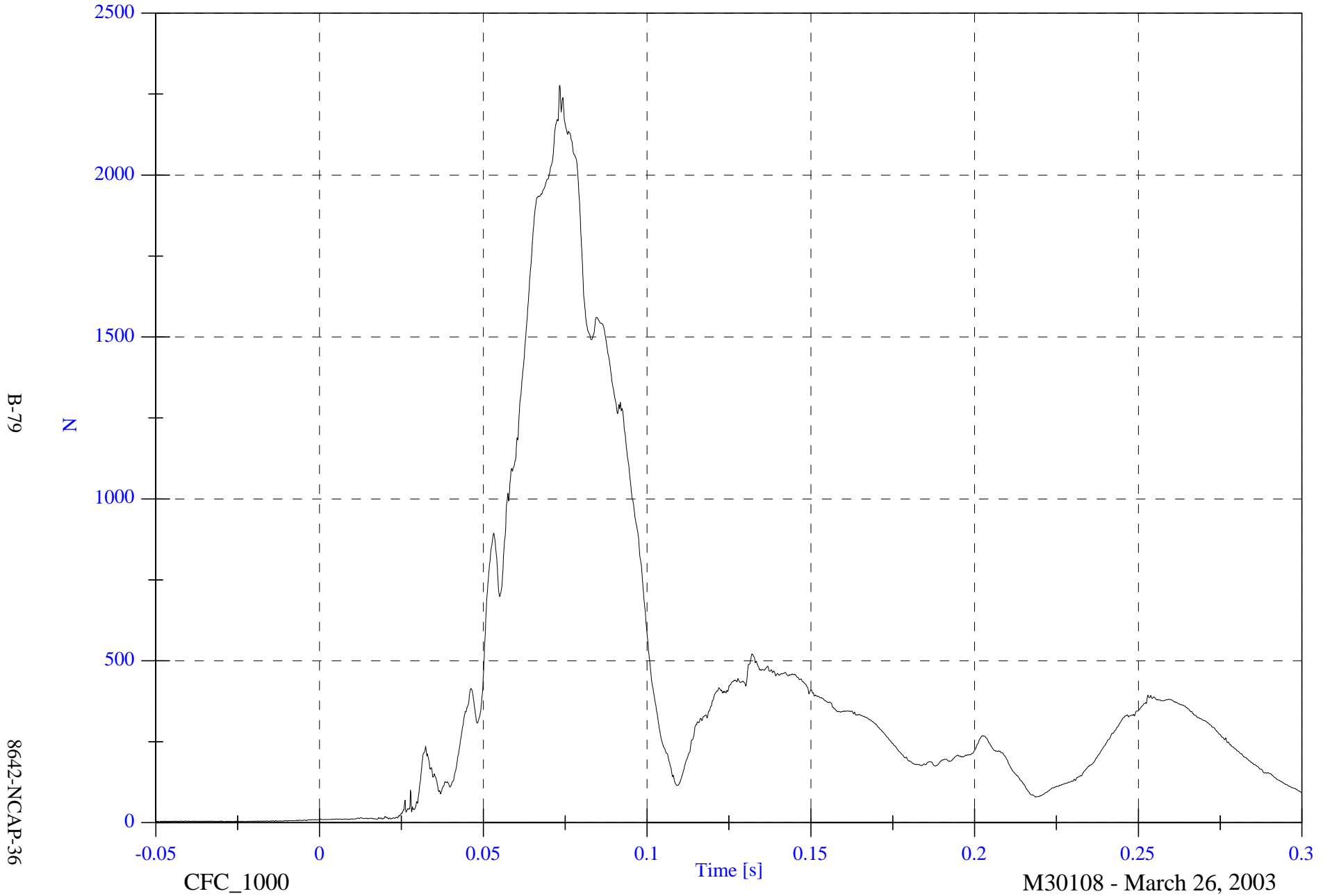


NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Upper Neck F Resultant

Max: 2276.6 [N] at 0.073 [s]

Min: 3.2 [N] at -0.029 [s]



B-79

8642-NCAP-36

CFC\_1000

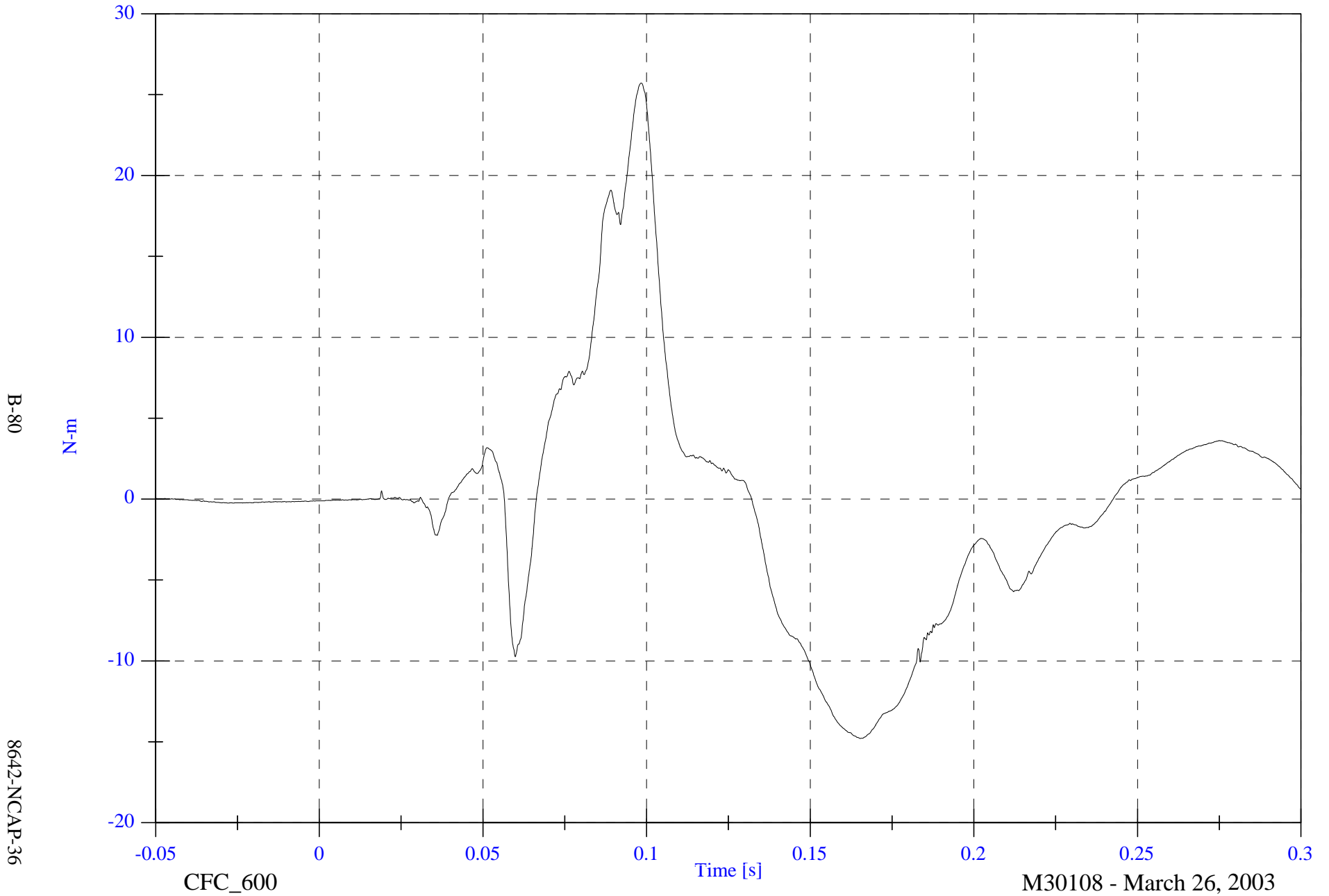
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 25.7 [N-m] at 0.098 [s]

V1P2 Upper Neck Mx

Min: -14.8 [N-m] at 0.165 [s]



B-80

8642-NCAP-36

CFC\_600

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

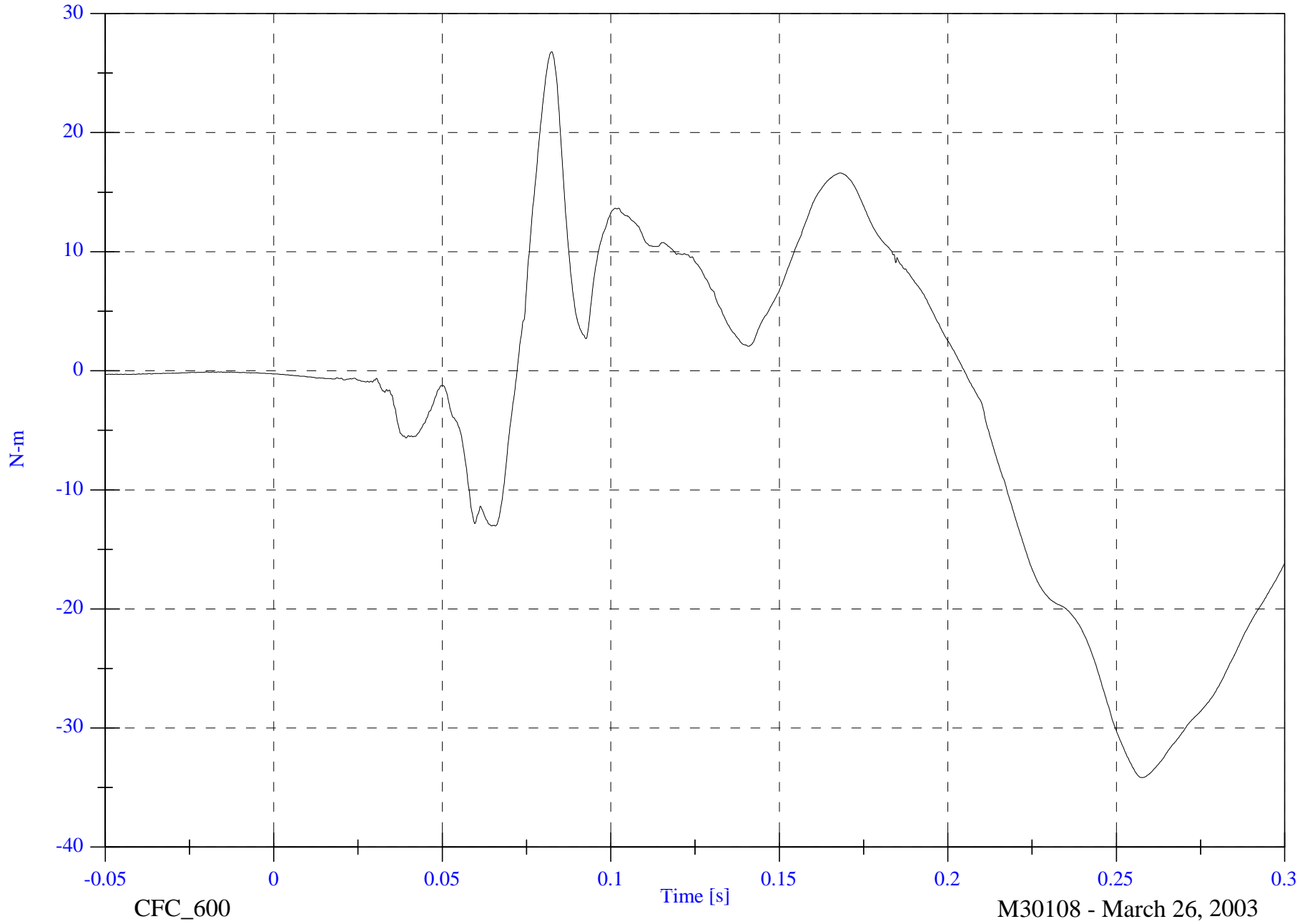
V1P2 Upper Neck My

Max: 26.8 [N-m] at 0.082 [s]

Min: -34.2 [N-m] at 0.258 [s]

B-81

8642-NCAP-36



CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

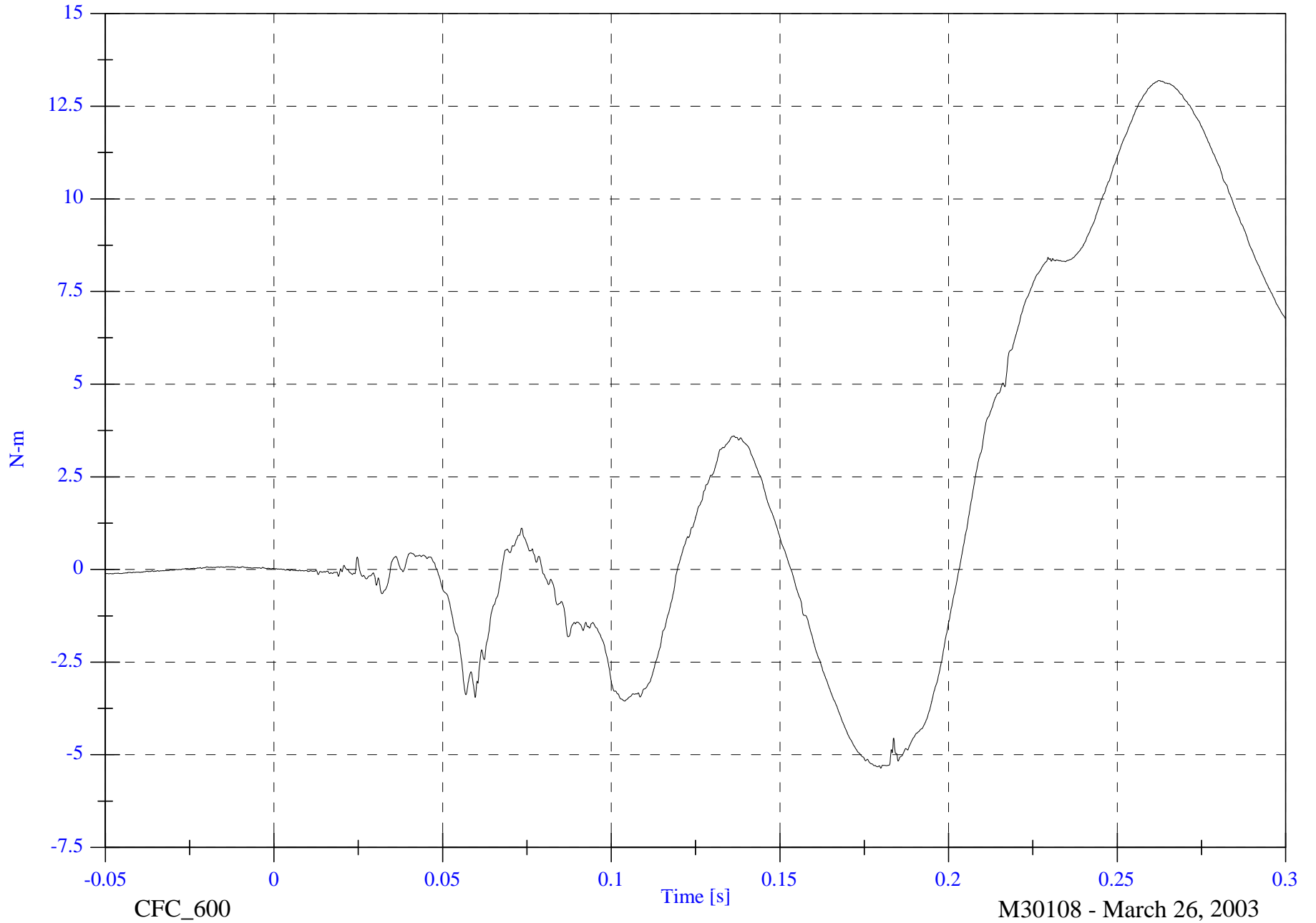
V1P2 Upper Neck Mz

Max: 13.2 [N-m] at 0.262 [s]

Min: -5.4 [N-m] at 0.180 [s]

B-82

8642-NCAP-36



CFC\_600

Time [s]

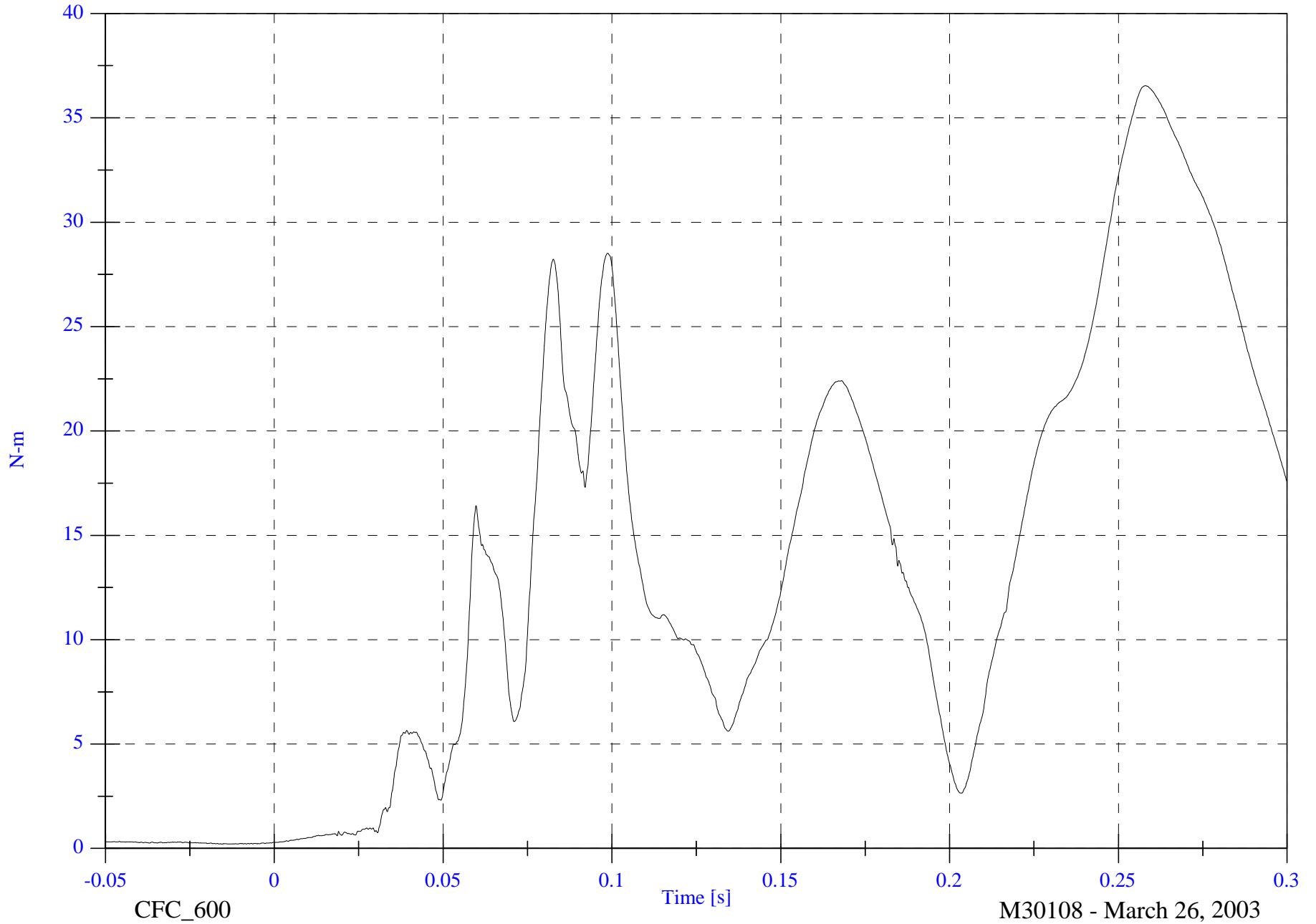
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Upper Neck M Resultant

Max: 36.5 [N-m] at 0.258 [s]

Min: 0.2 [N-m] at -0.015 [s]



B-83

8642-NCAP-36

CFC\_600

Time [s]

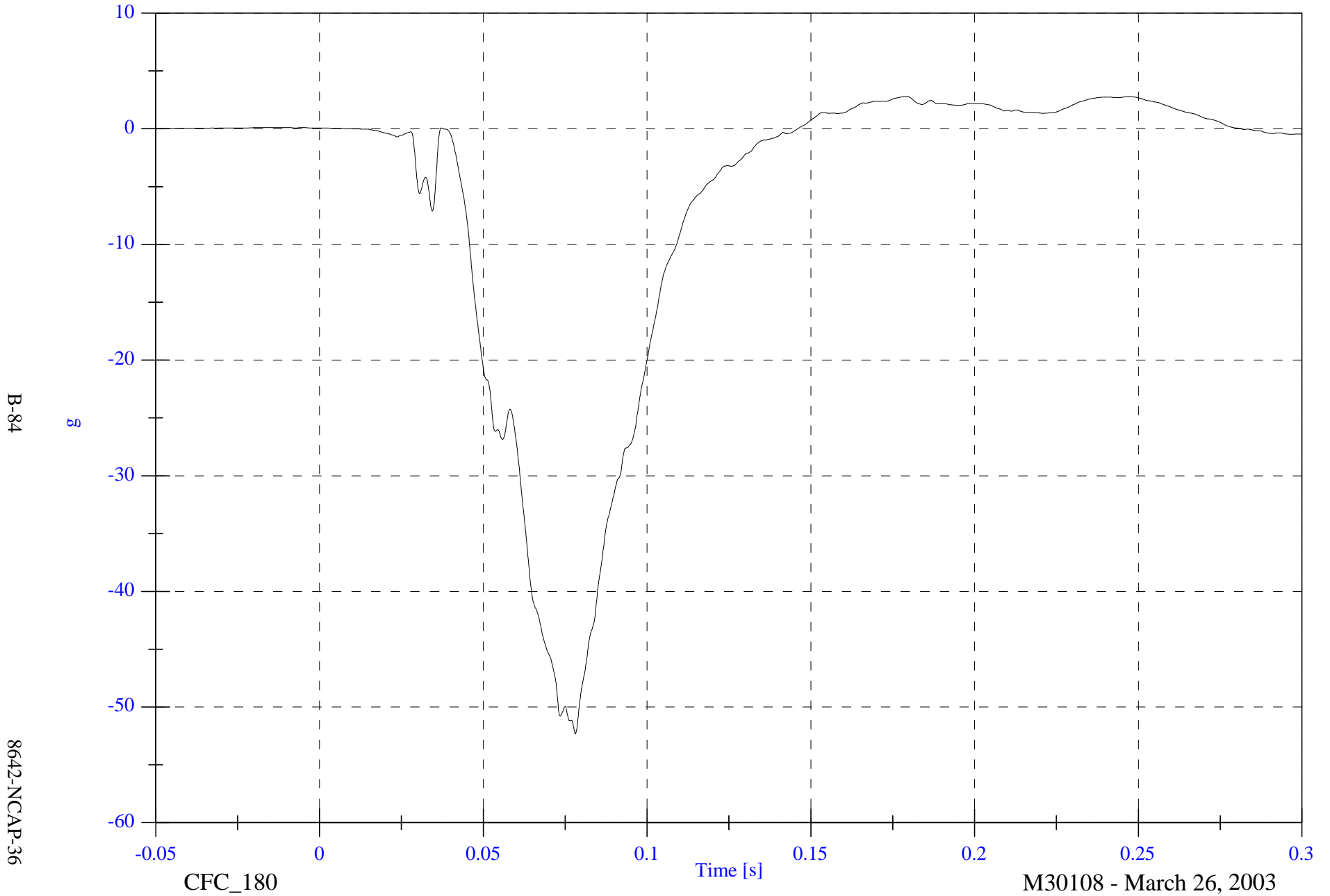
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

VIP2 Chest x

Max: 2.8 [g] at 0.179 [s]

Min: -52.3 [g] at 0.078 [s]

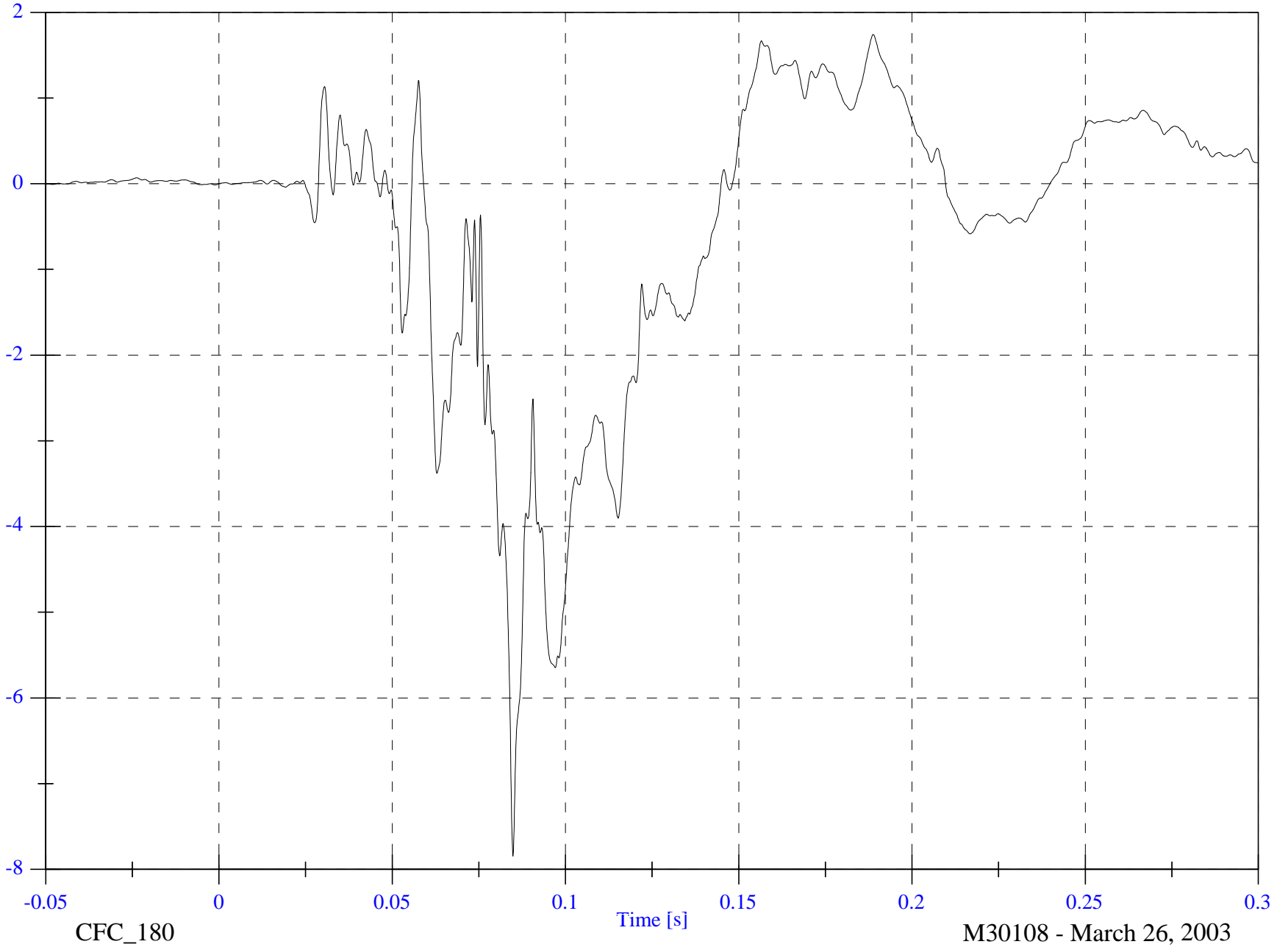


NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Chest y

Max: 1.7 [g] at 0.189 [s]

Min: -7.8 [g] at 0.085 [s]



B-85

8642-NCAP-36

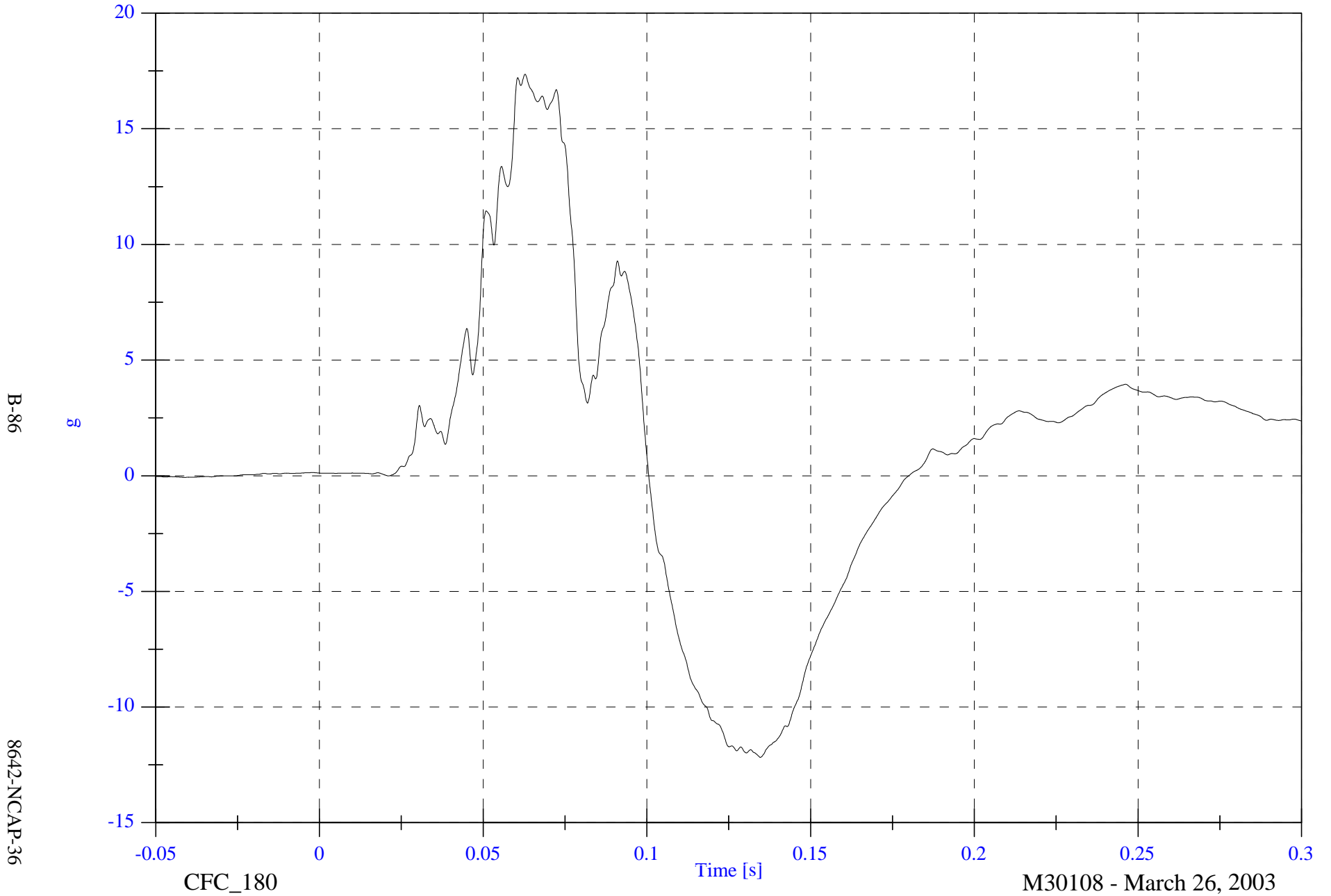
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

VIP2 Chest z

Max: 17.4 [g] at 0.063 [s]

Min: -12.2 [g] at 0.135 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

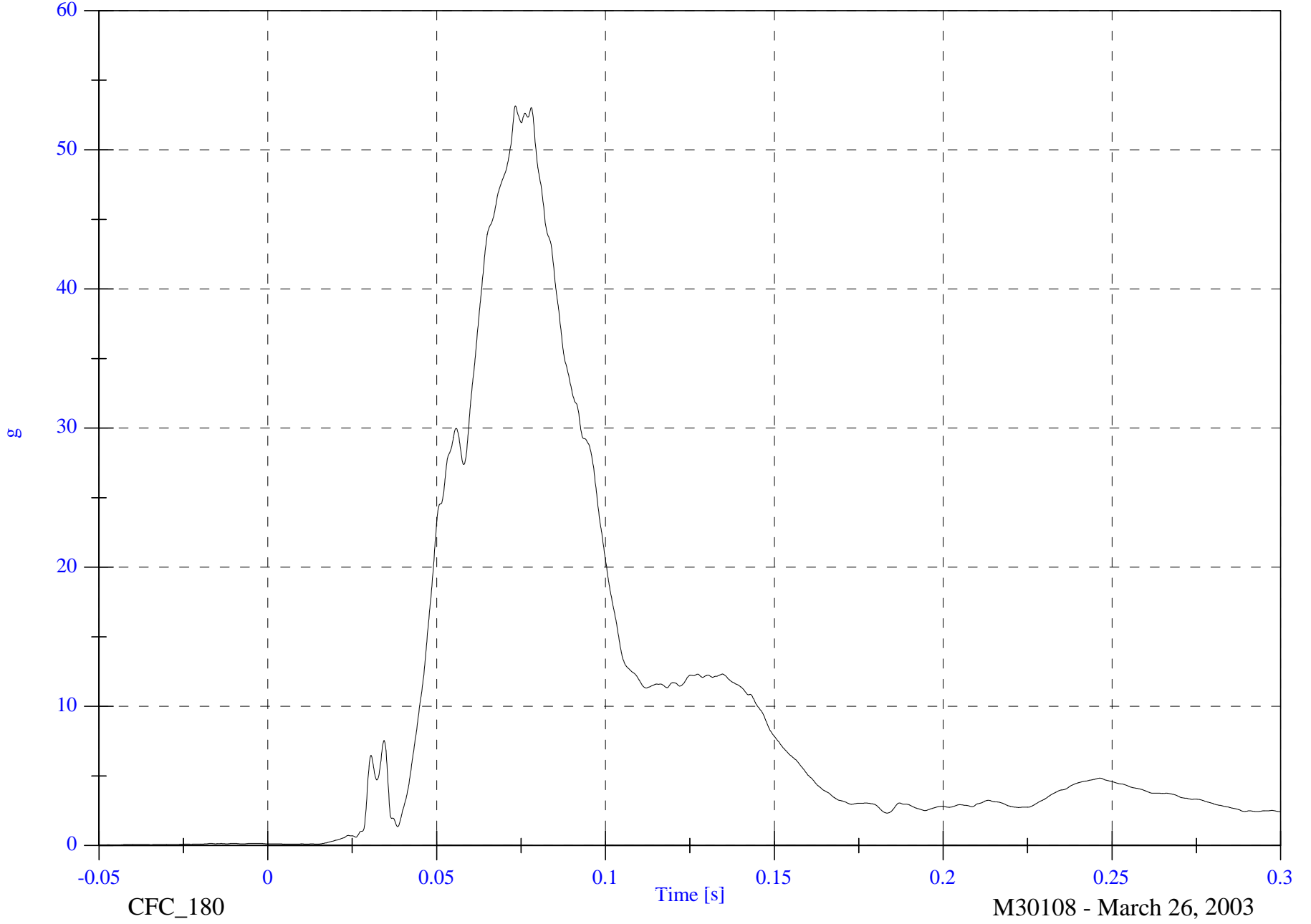
V1P2 Chest Resultant

Max: 53.2 [g] at 0.073 [s]

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

B-87

8642-NCAP-36



CFC\_180

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

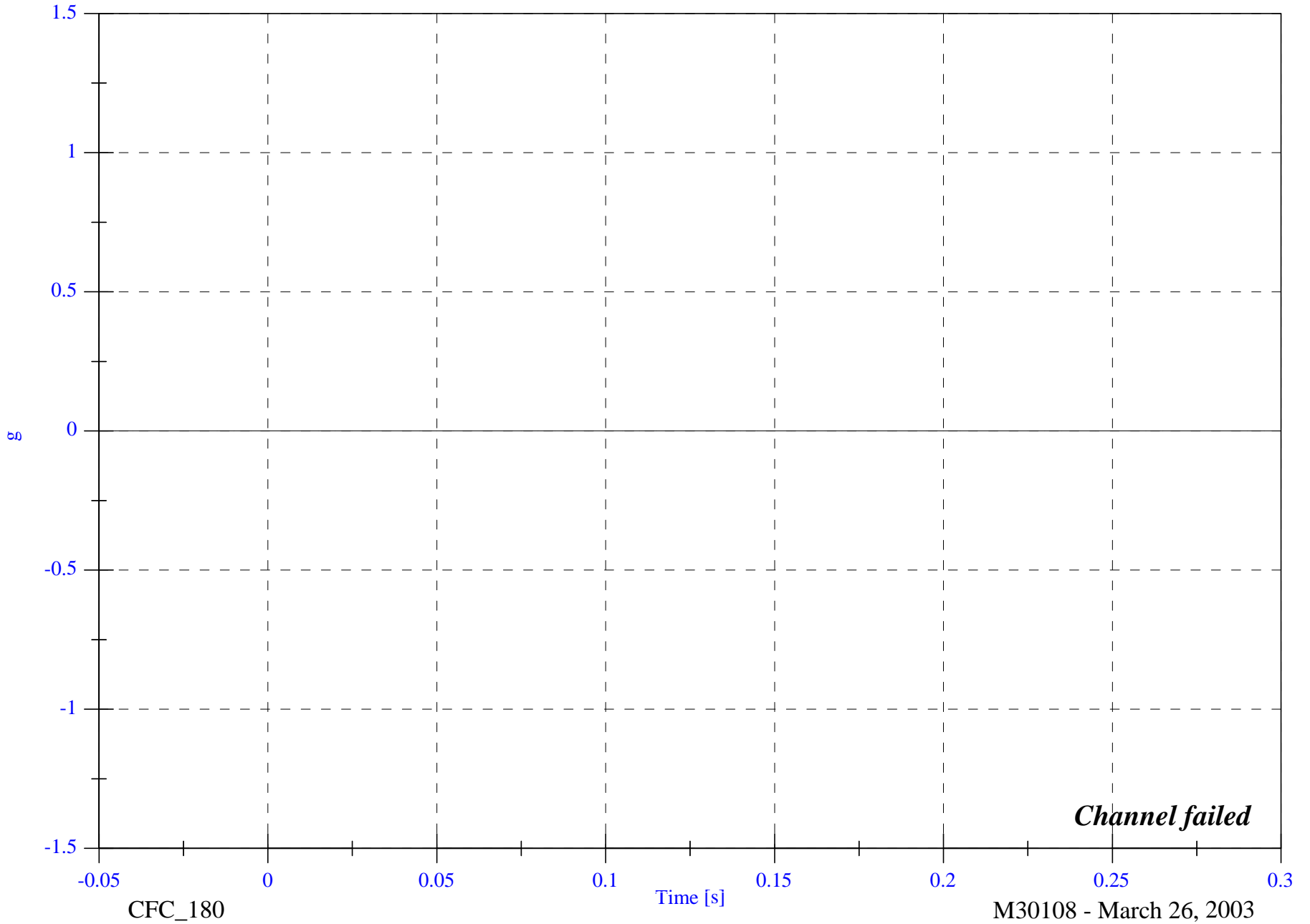
V1P2 Chest Red x

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

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

B-88

8642-NCAP-36



*Channel failed*

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

VIP2 Chest Red y

Max: 1.7 [g] at 0.189 [s]

Min: -8.4 [g] at 0.085 [s]



B-89

8642-NCAP-36

CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

VIP2 Chest Red z

Max: 17.1 [g] at 0.063 [s]

Min: -12.3 [g] at 0.135 [s]



B-90

8642-NCAP-36

CFC\_180

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

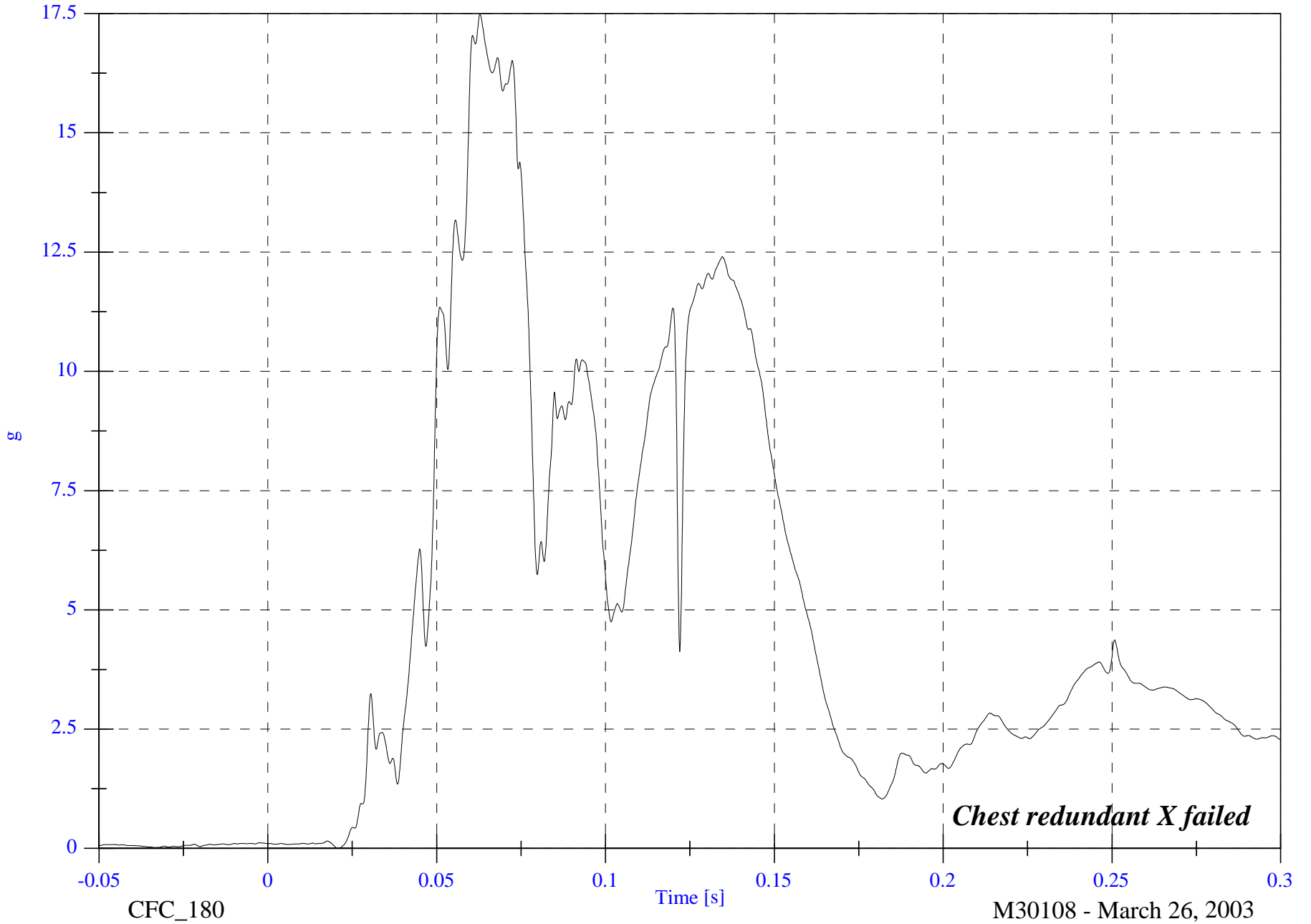
V1P2 Chest Red Resultant

Max: 17.5 [g] at 0.063 [s]

Min: 0.0 [g] at 0.020 [s]

B-91

8642-NCAP-36



CFC\_180

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

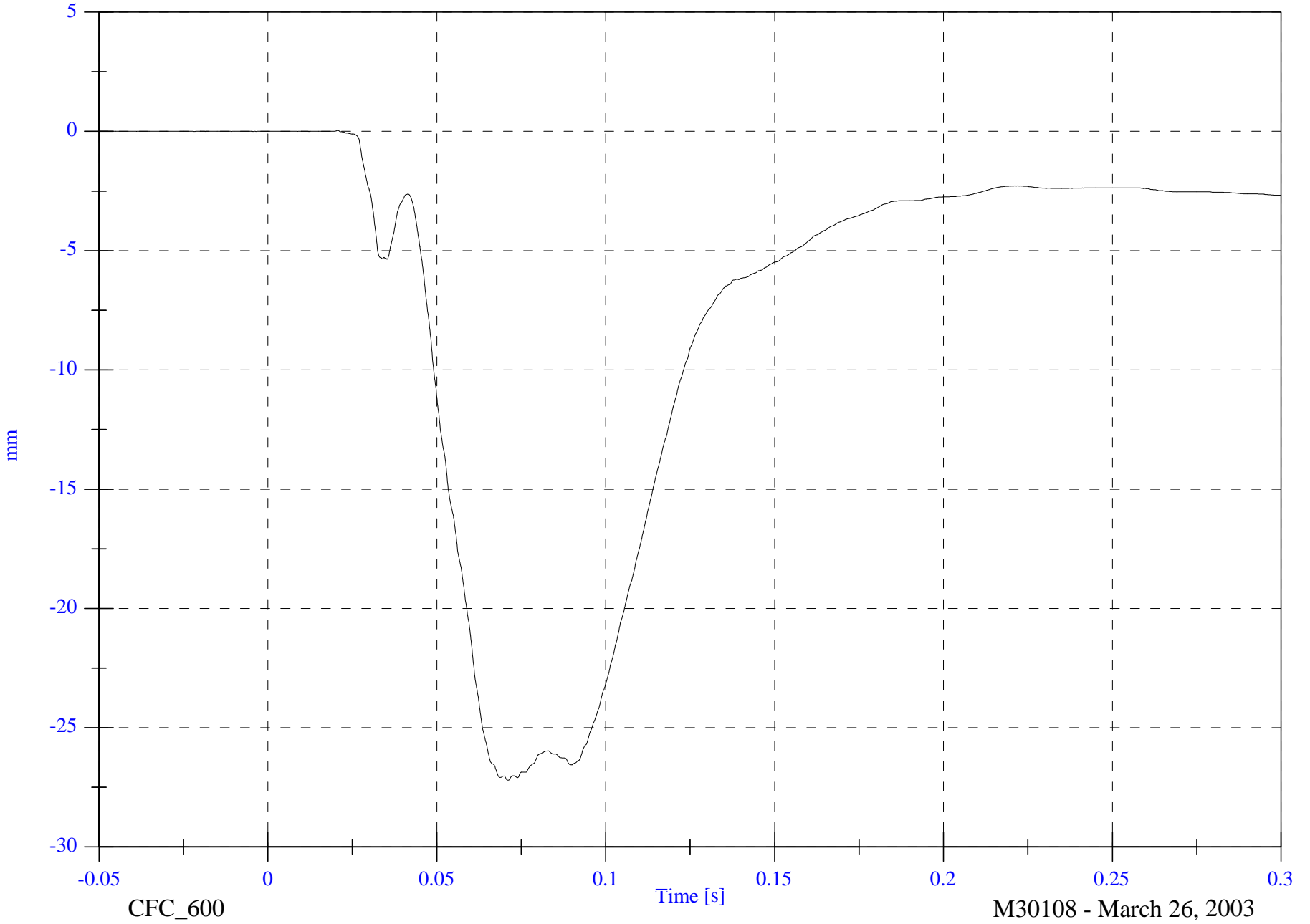
V1P2 Chest Compression

Max: 0.0 [mm] at 0.021 [s]

Min: -27.2 [mm] at 0.071 [s]

B-92

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

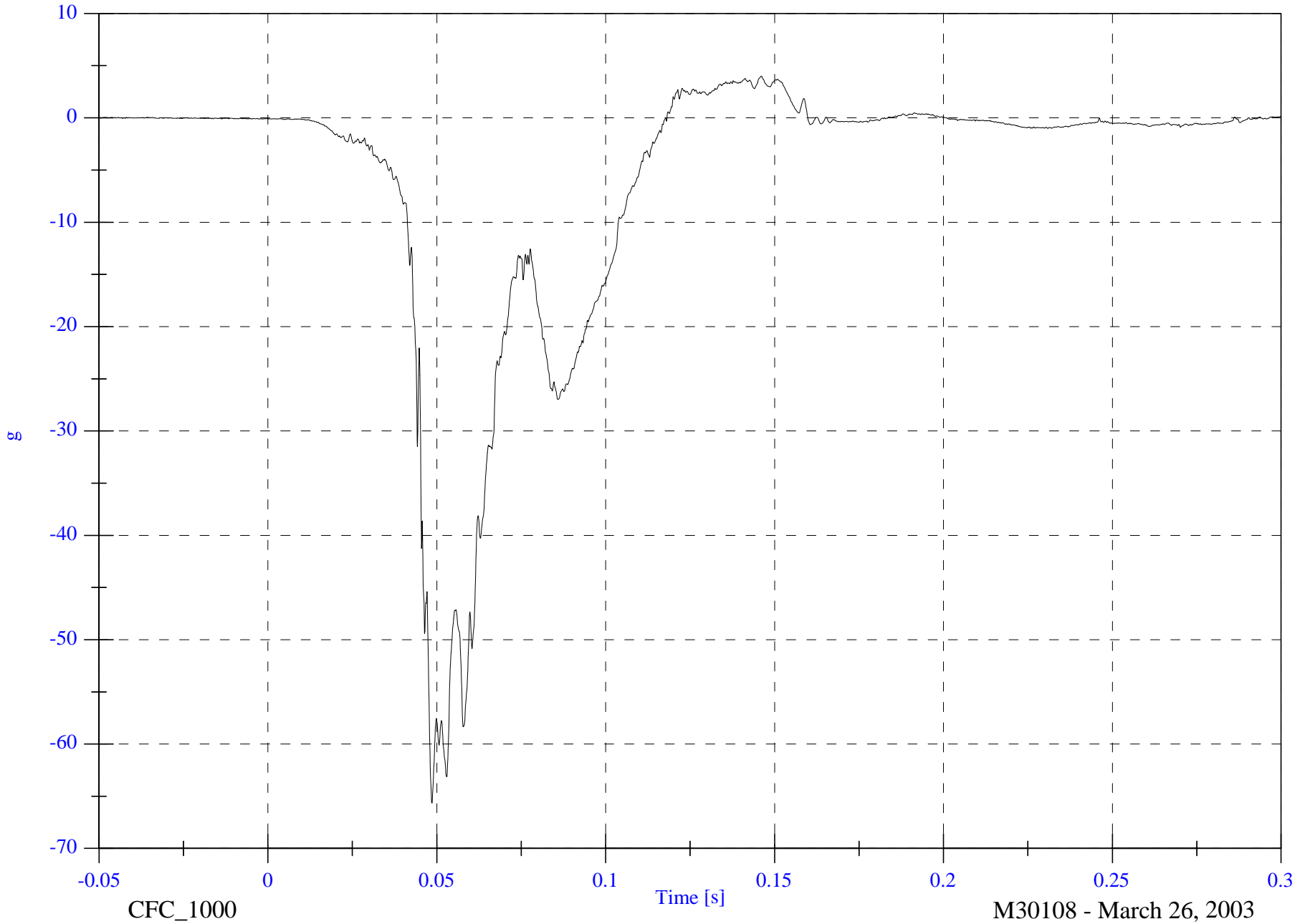
V1P2 Pelvic x

Max: 4.0 [g] at 0.146 [s]

Min: -65.7 [g] at 0.049 [s]

B-93

8642-NCAP-36



CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

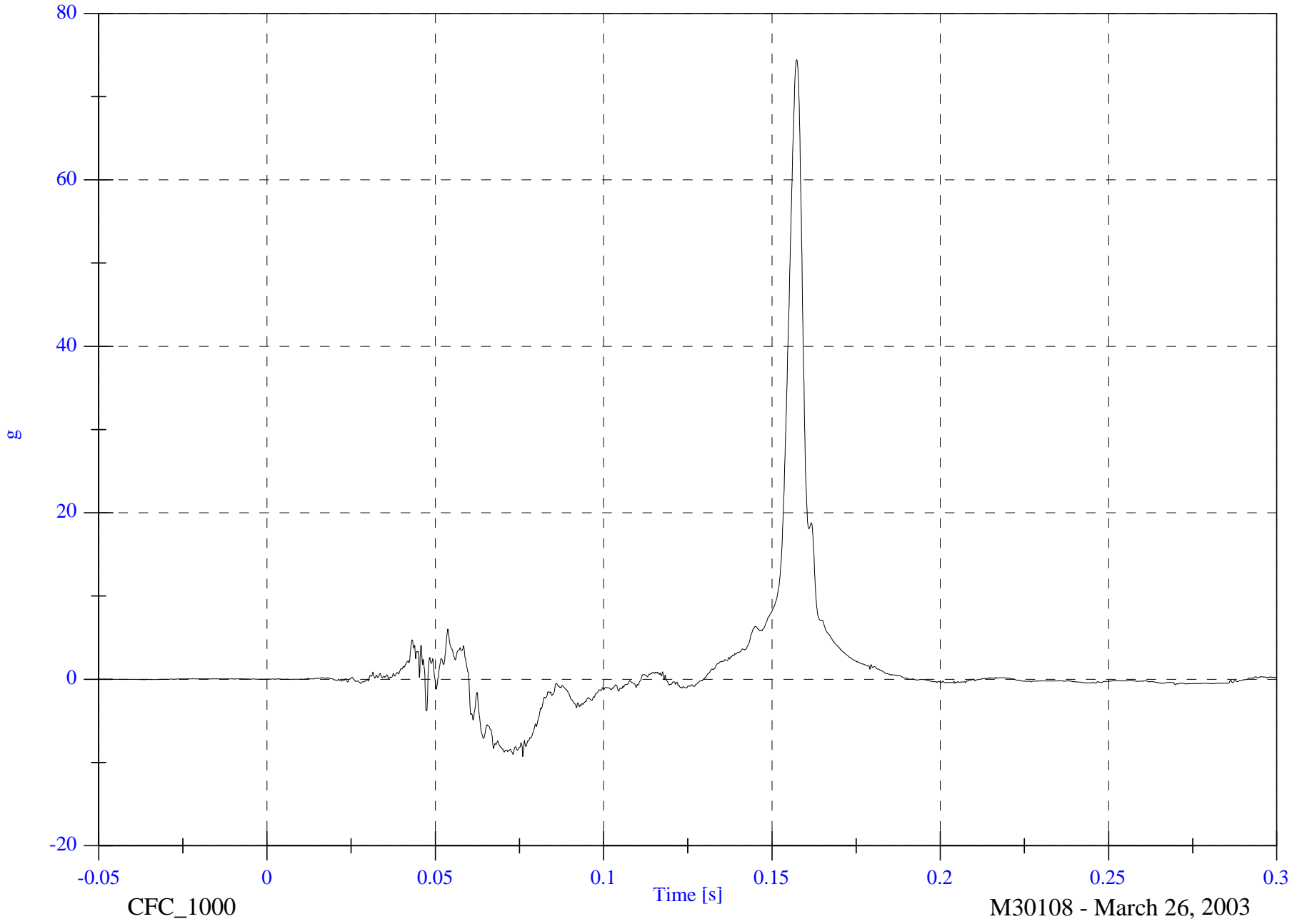
Max: 74.4 [g] at 0.157 [s]

Min: -9.3 [g] at 0.076 [s]

V1P2 Pelvic y

B-94

8642-NCAP-36



CFC\_1000

Time [s]

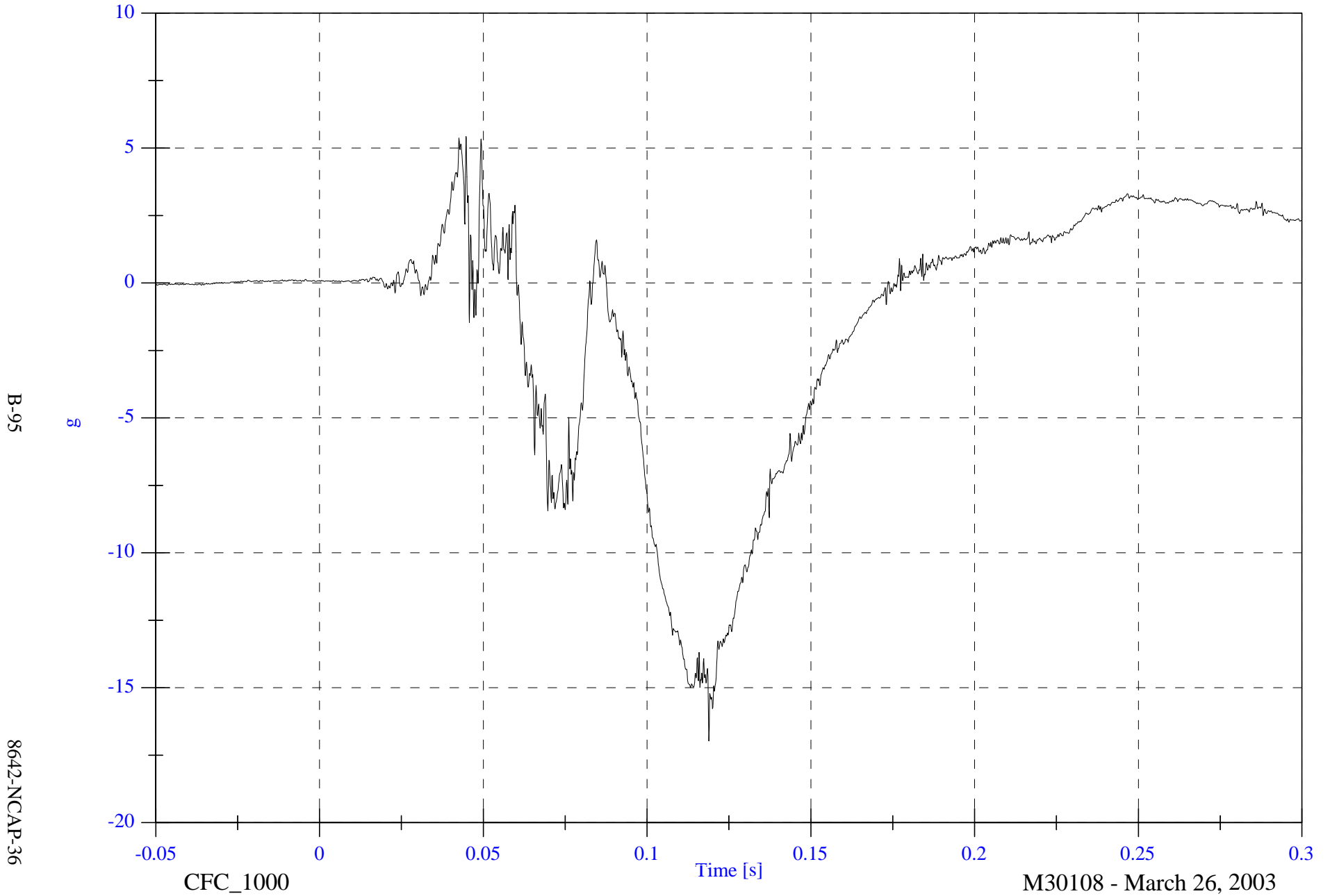
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 5.4 [g] at 0.045 [s]

Min: -17.0 [g] at 0.119 [s]

V1P2 Pelvic z



B-95

8642-NCAP-36

NCAP Test #14 - 2003 Chevrolet Suburban

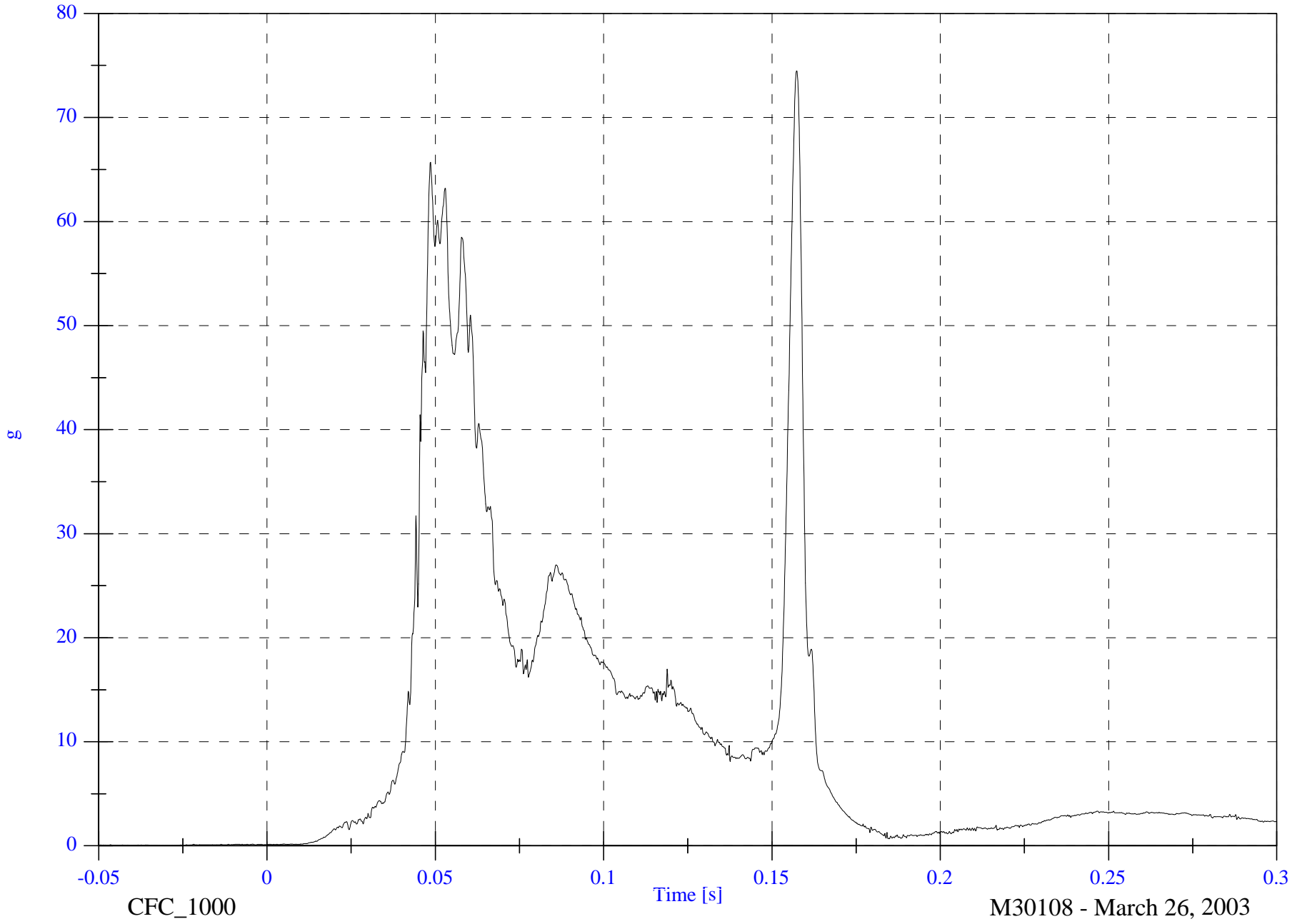
V1P2 Pelvic Resultant

Max: 74.5 [g] at 0.157 [s]

Min: 0.0 [g] at -0.032 [s]

B-96

8642-NCAP-36



CFC\_1000

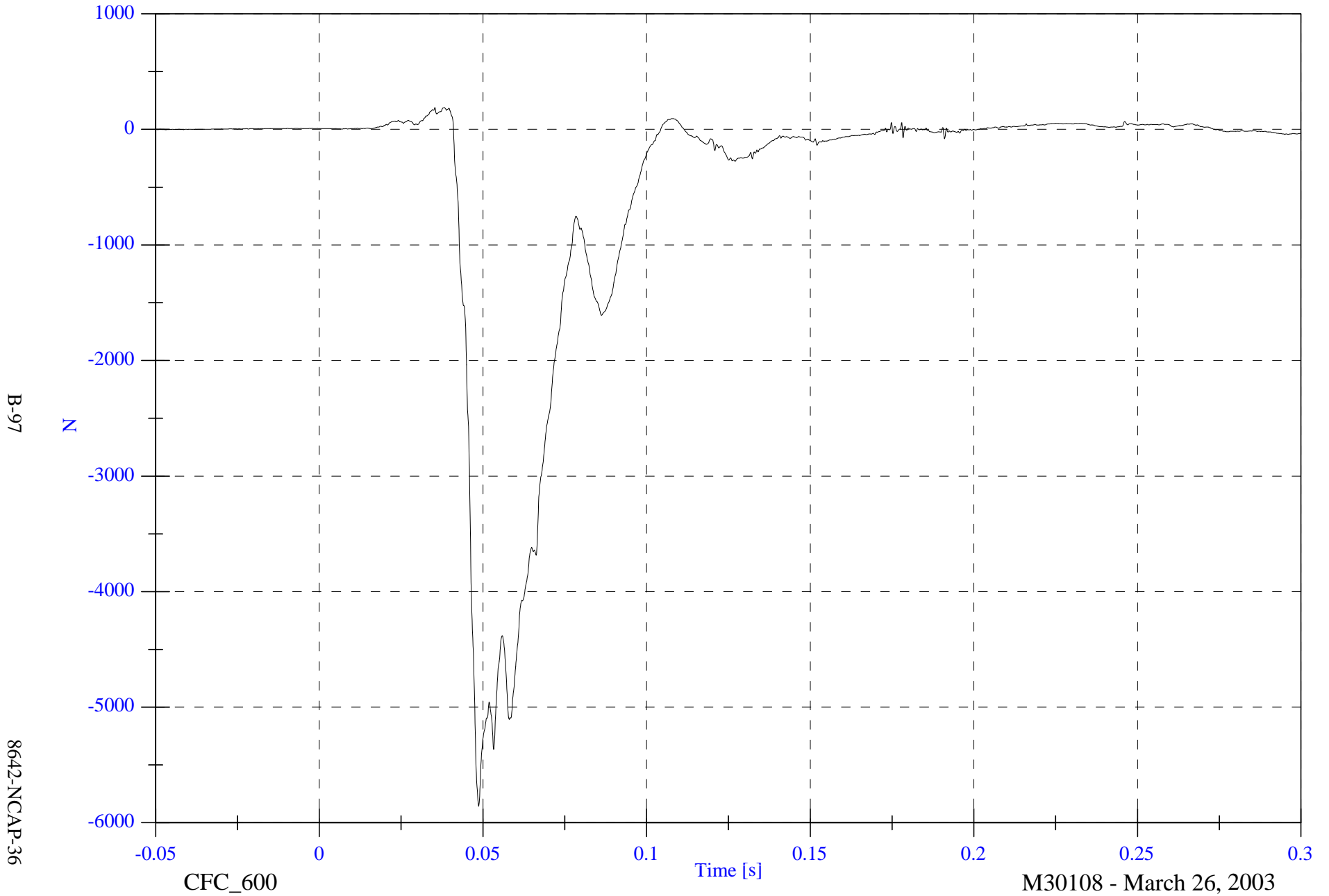
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Left Femur

Max: 189.2 [N] at 0.035 [s]

Min: -5857.2 [N] at 0.049 [s]



B-97

8642-NCAP-36

CFC\_600

Time [s]

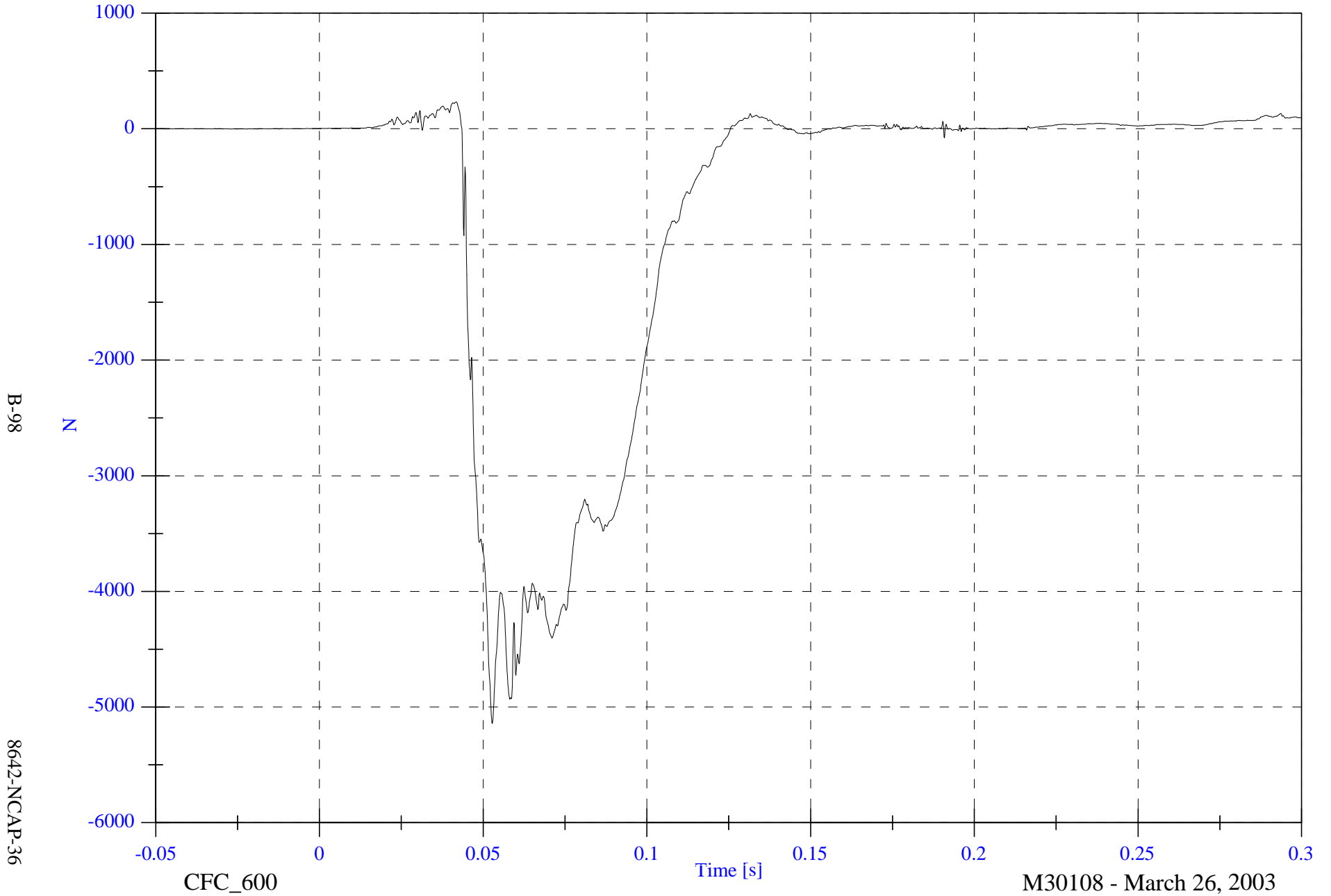
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Right Femur

Max: 231.2 [N] at 0.042 [s]

Min: -5141.8 [N] at 0.053 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

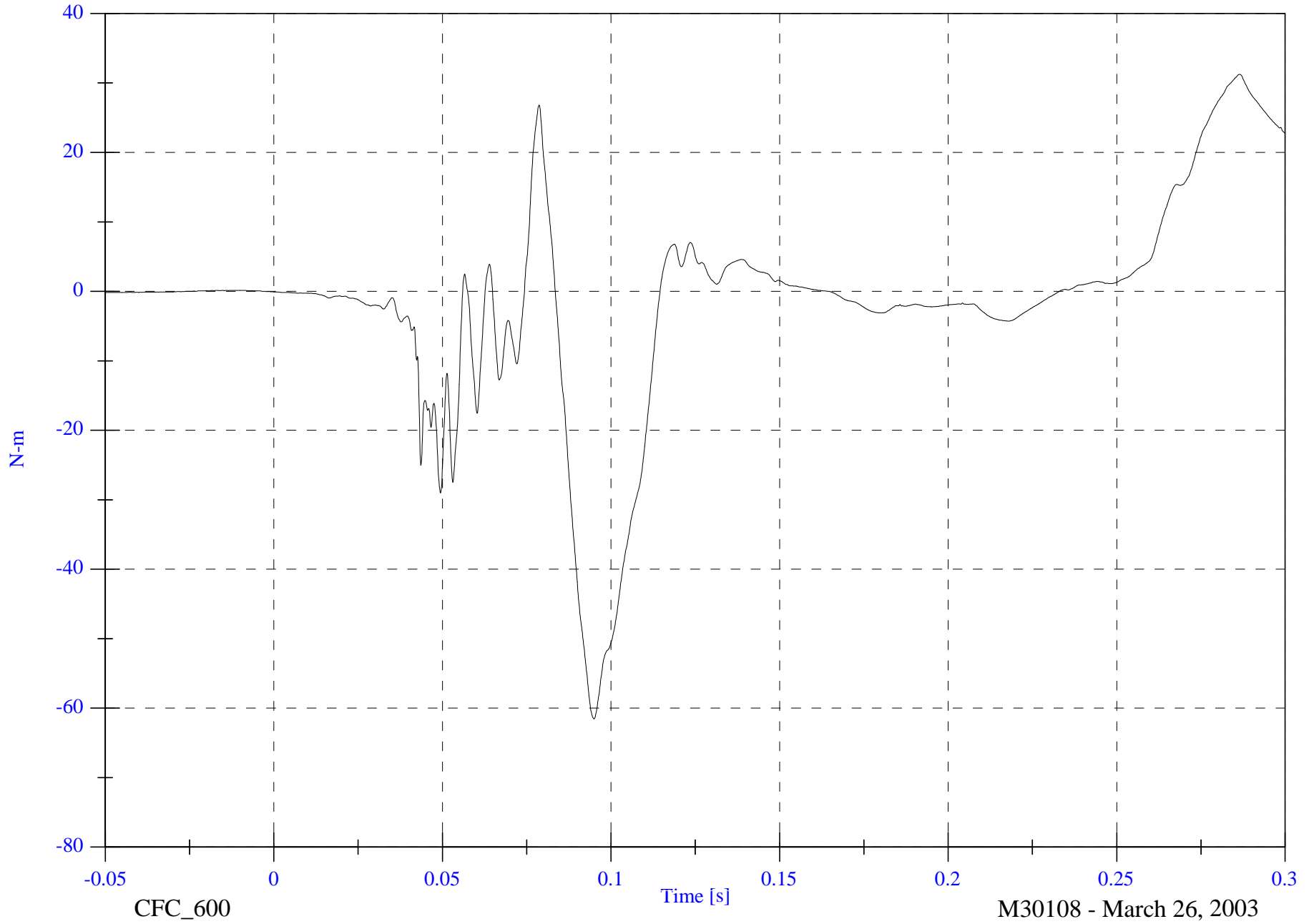
V1P2 Left Upper Tibia Mx

Max: 31.2 [N-m] at 0.286 [s]

Min: -61.5 [N-m] at 0.095 [s]

B-99

8642-NCAP-36



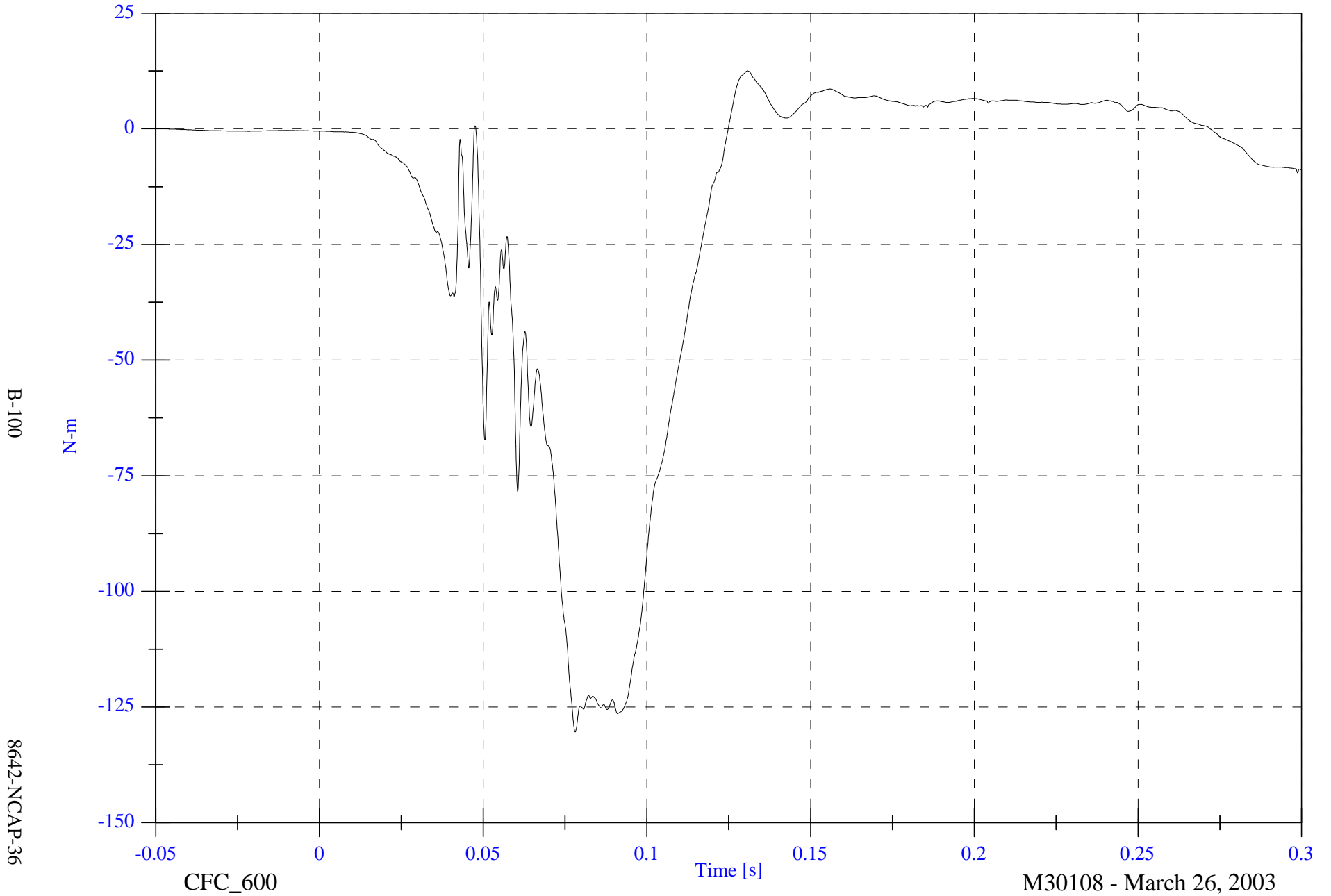
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Left Upper Tibia My

Max: 12.5 [N-m] at 0.131 [s]

Min: -130.4 [N-m] at 0.078 [s]



B-100

8642-NCAP-36

CFC\_600

Time [s]

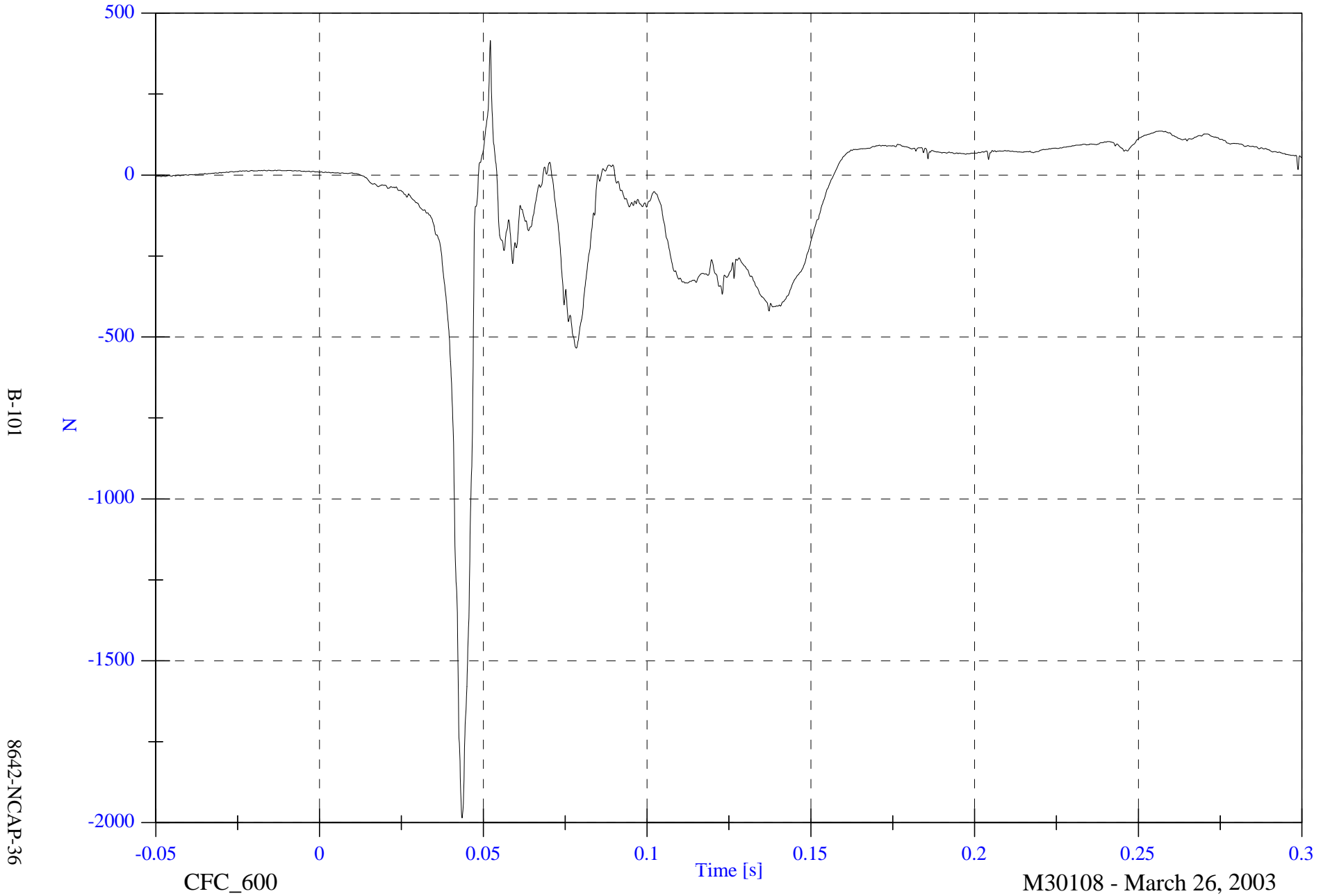
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Left Lower Tibia Fz

Max: 415.8 [N] at 0.052 [s]

Min: -1985.4 [N] at 0.043 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

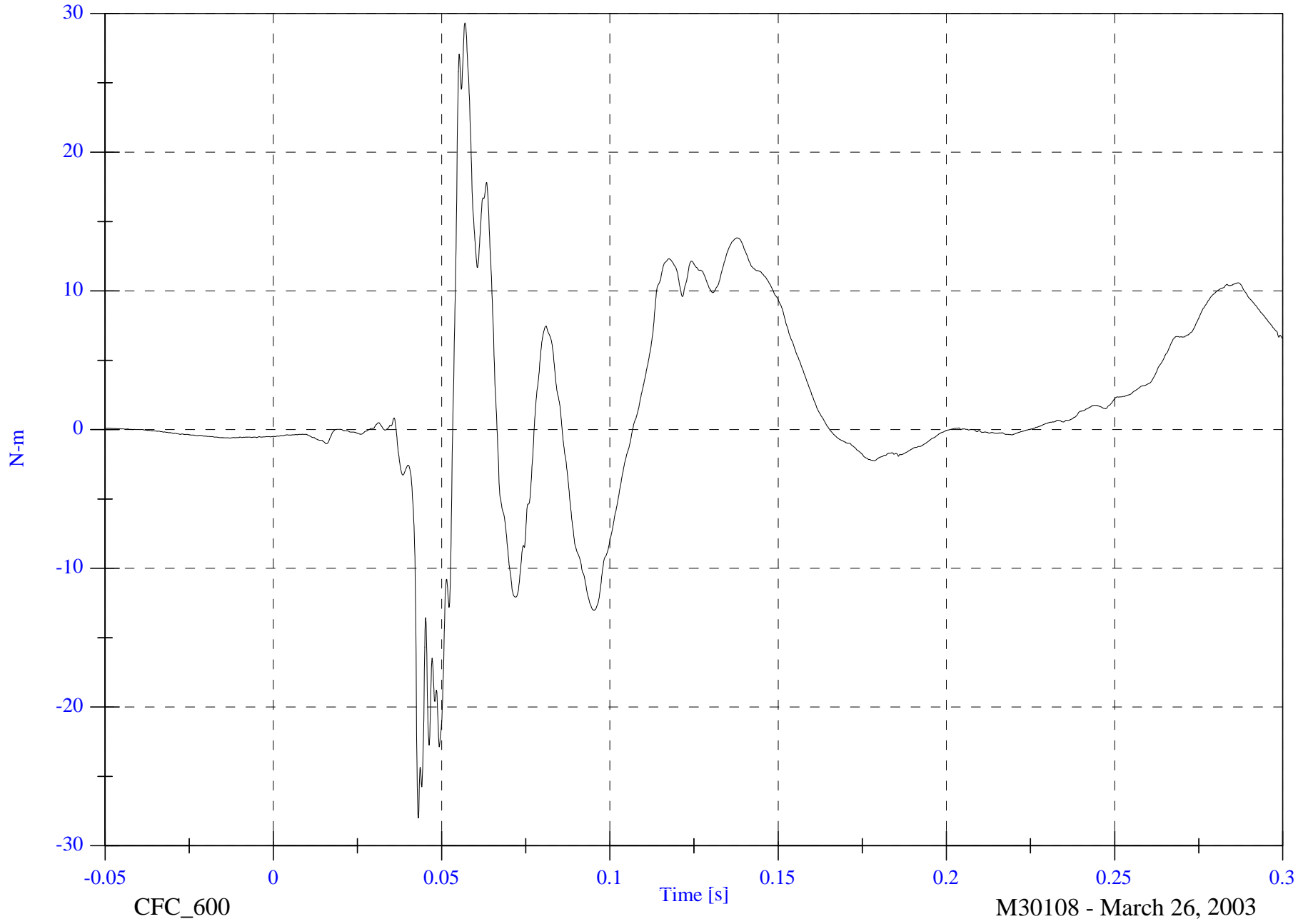
V1P2 Left Lower Tibia Mx

Max: 29.3 [N-m] at 0.057 [s]

Min: -28.0 [N-m] at 0.043 [s]

B-102

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

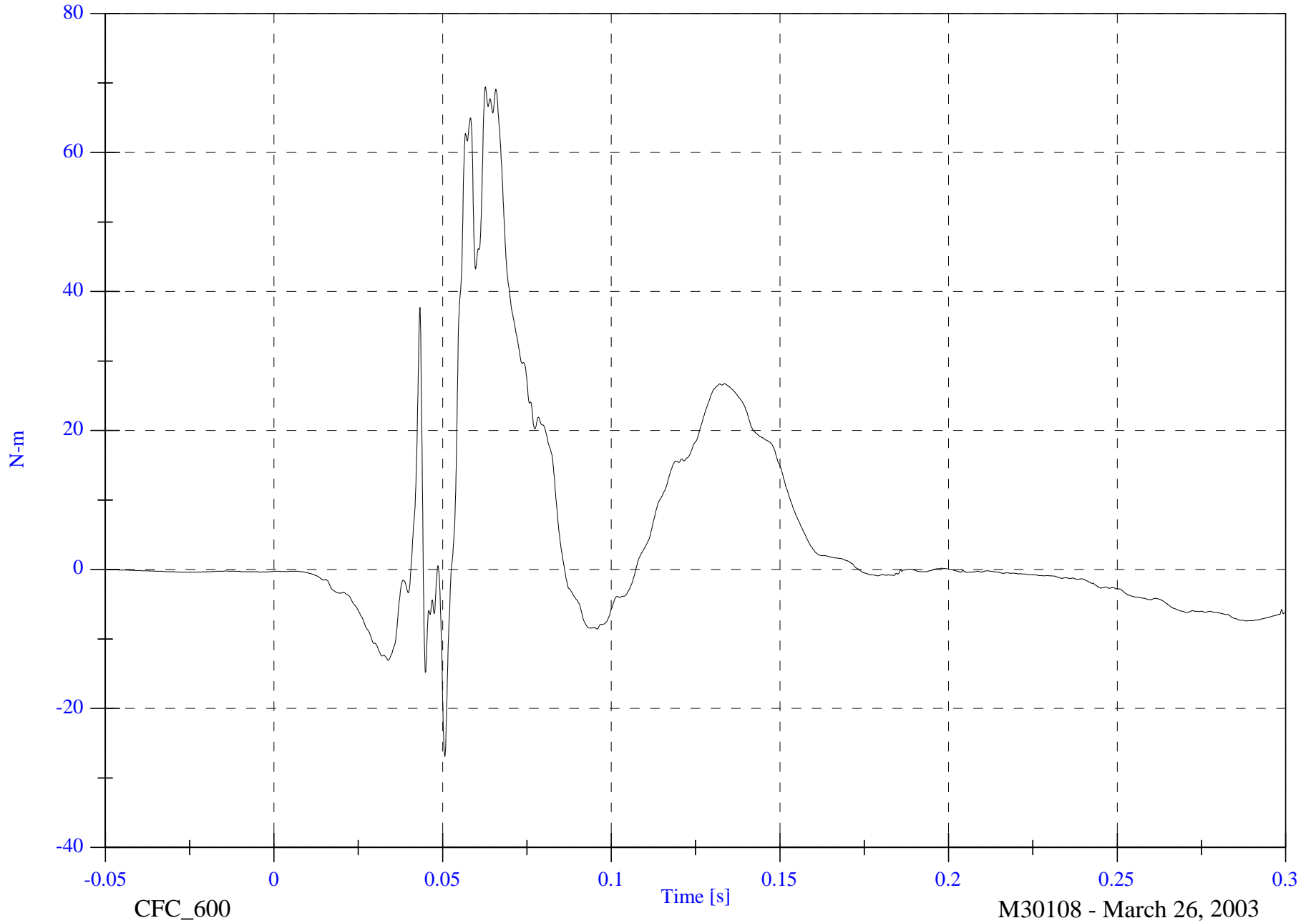
VIP2 Left Lower Tibia My

Max: 69.5 [N-m] at 0.063 [s]

Min: -26.9 [N-m] at 0.051 [s]

B-103

8642-NCAP-36



CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

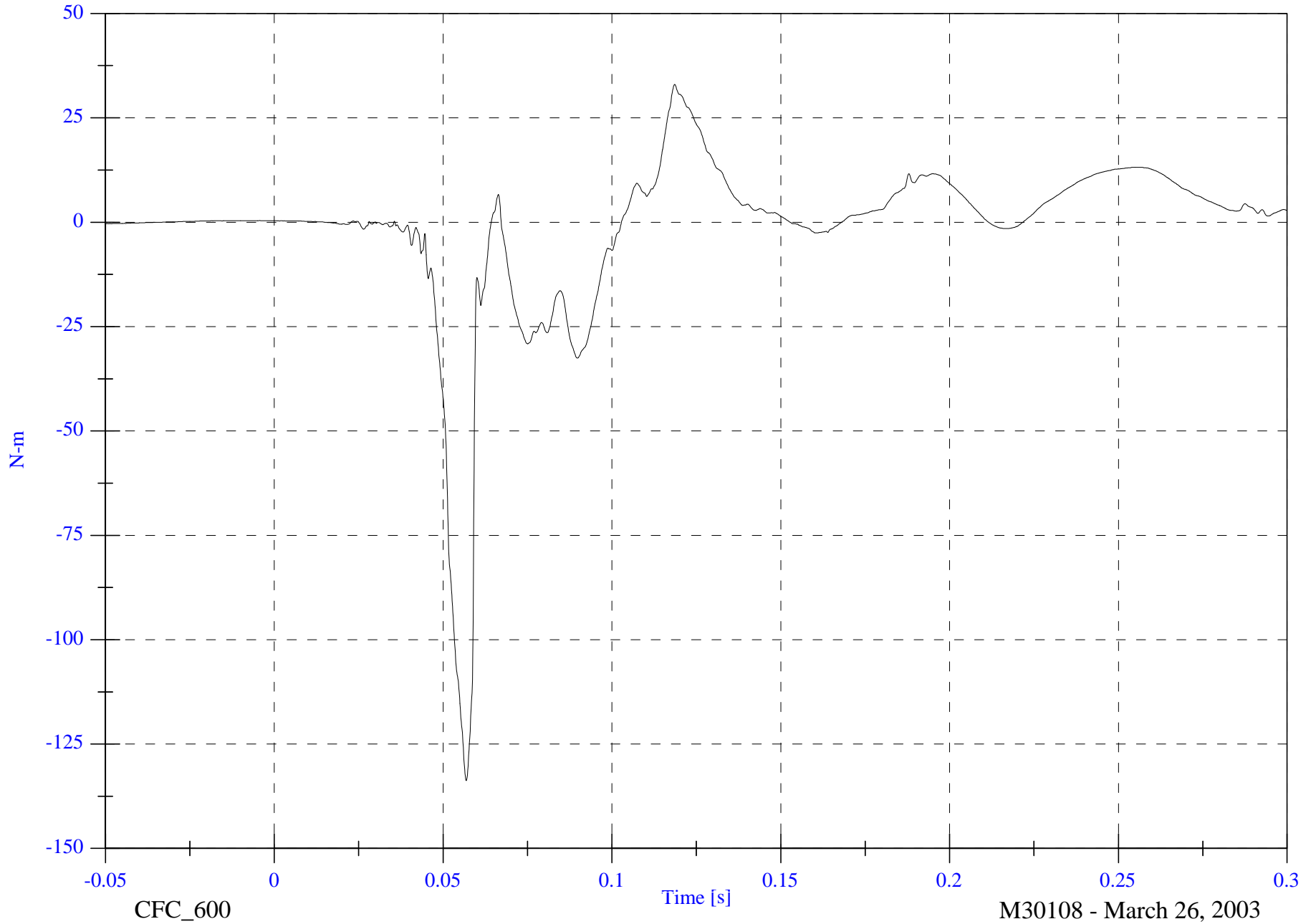
Max: 33.0 [N-m] at 0.119 [s]

V1P2 Right Upper Tibia Mx

Min: -133.8 [N-m] at 0.057 [s]

B-104

8642-NCAP-36



CFC\_600

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

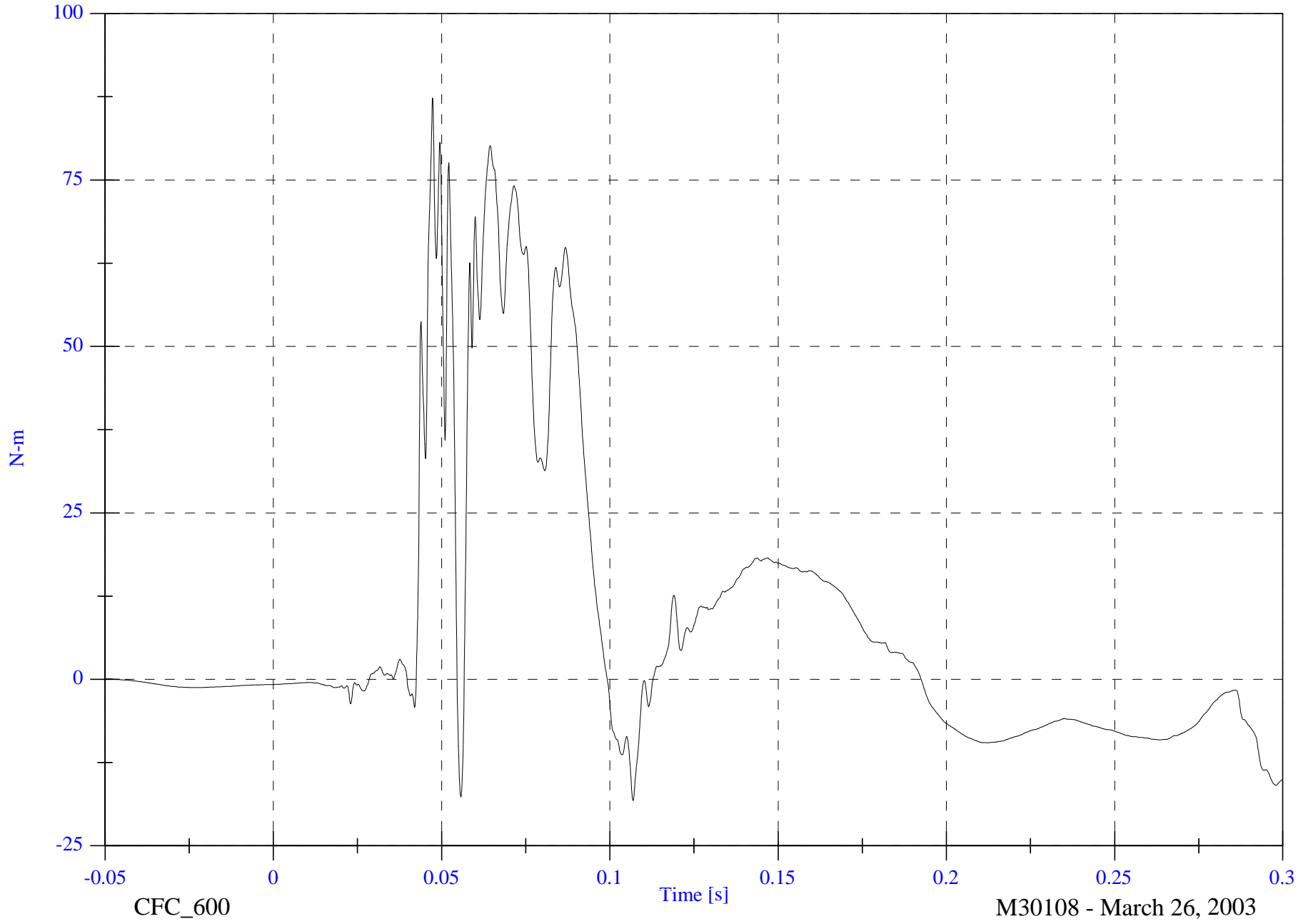
V1P2 Right Upper Tibia My

Max: 87.3 [N-m] at 0.047 [s]

Min: -18.2 [N-m] at 0.107 [s]

B-105

8642-NCAP-36



CFC\_600

Time [s]

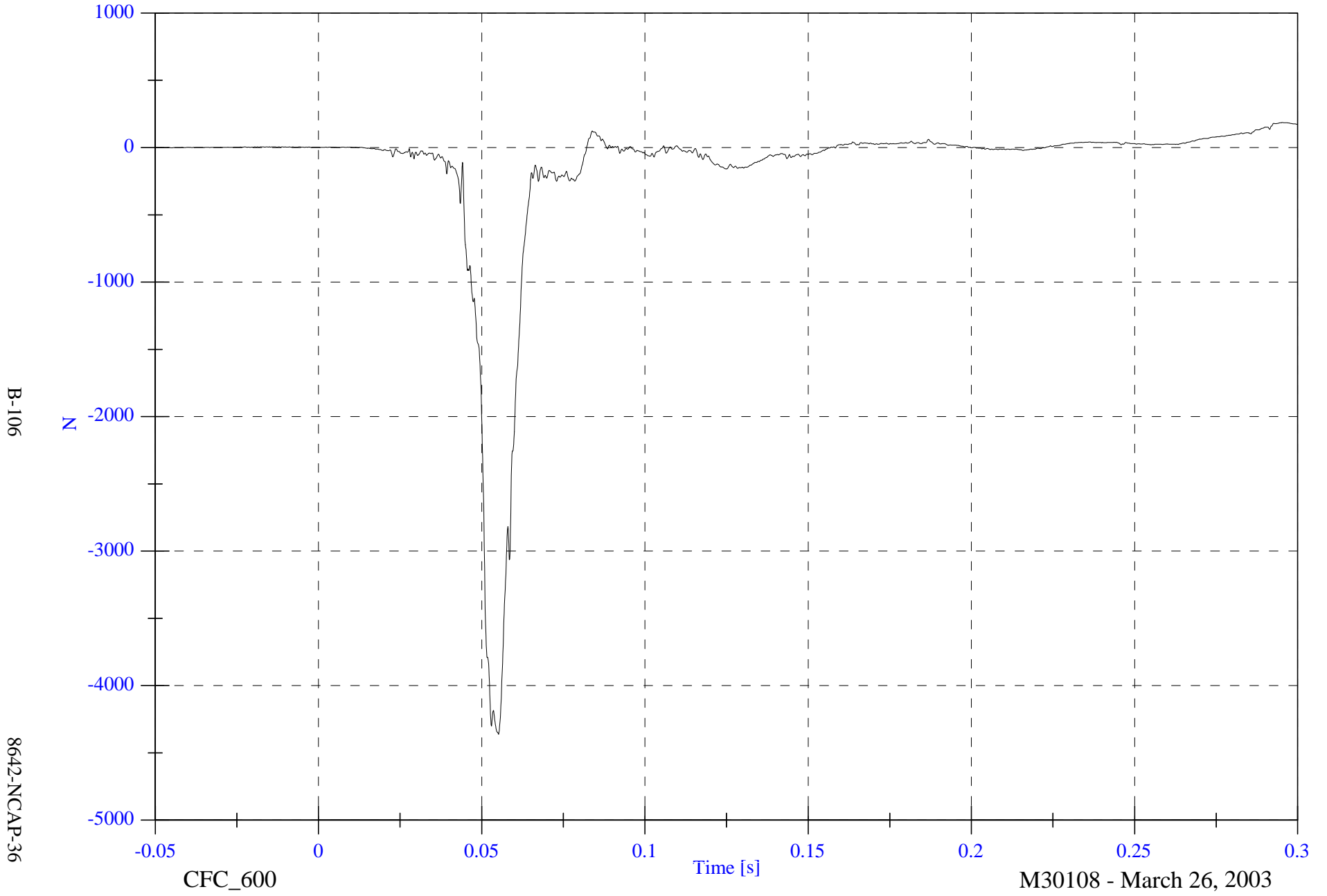
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Right Lower Tibia Fz

Max: 186.3 [N] at 0.295 [s]

Min: -4361.4 [N] at 0.055 [s]



B-106

8642-NCAP-36

CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

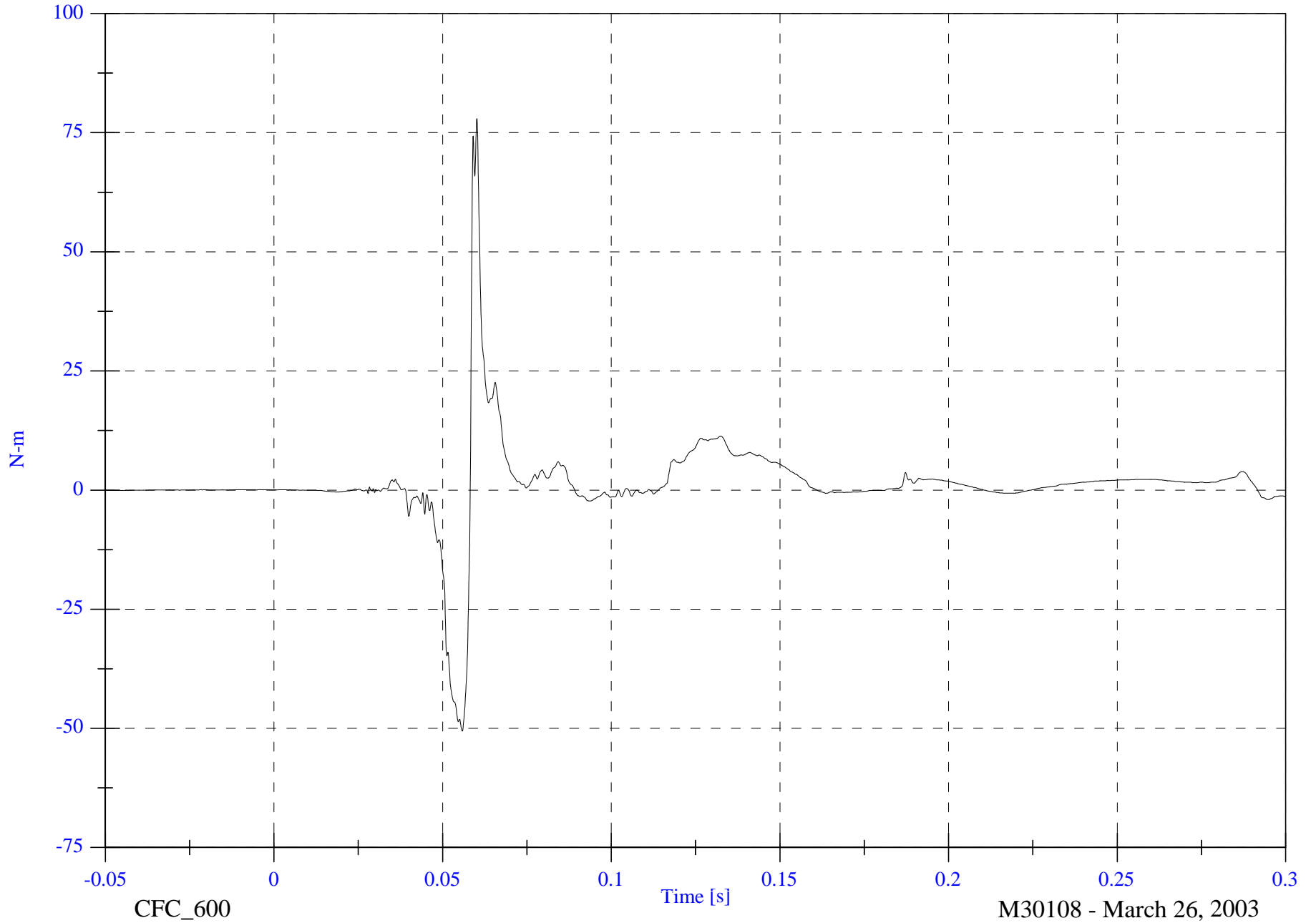
V1P2 Right Lower Tibia Mx

Max: 78.0 [N-m] at 0.060 [s]

Min: -50.6 [N-m] at 0.056 [s]

B-107

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

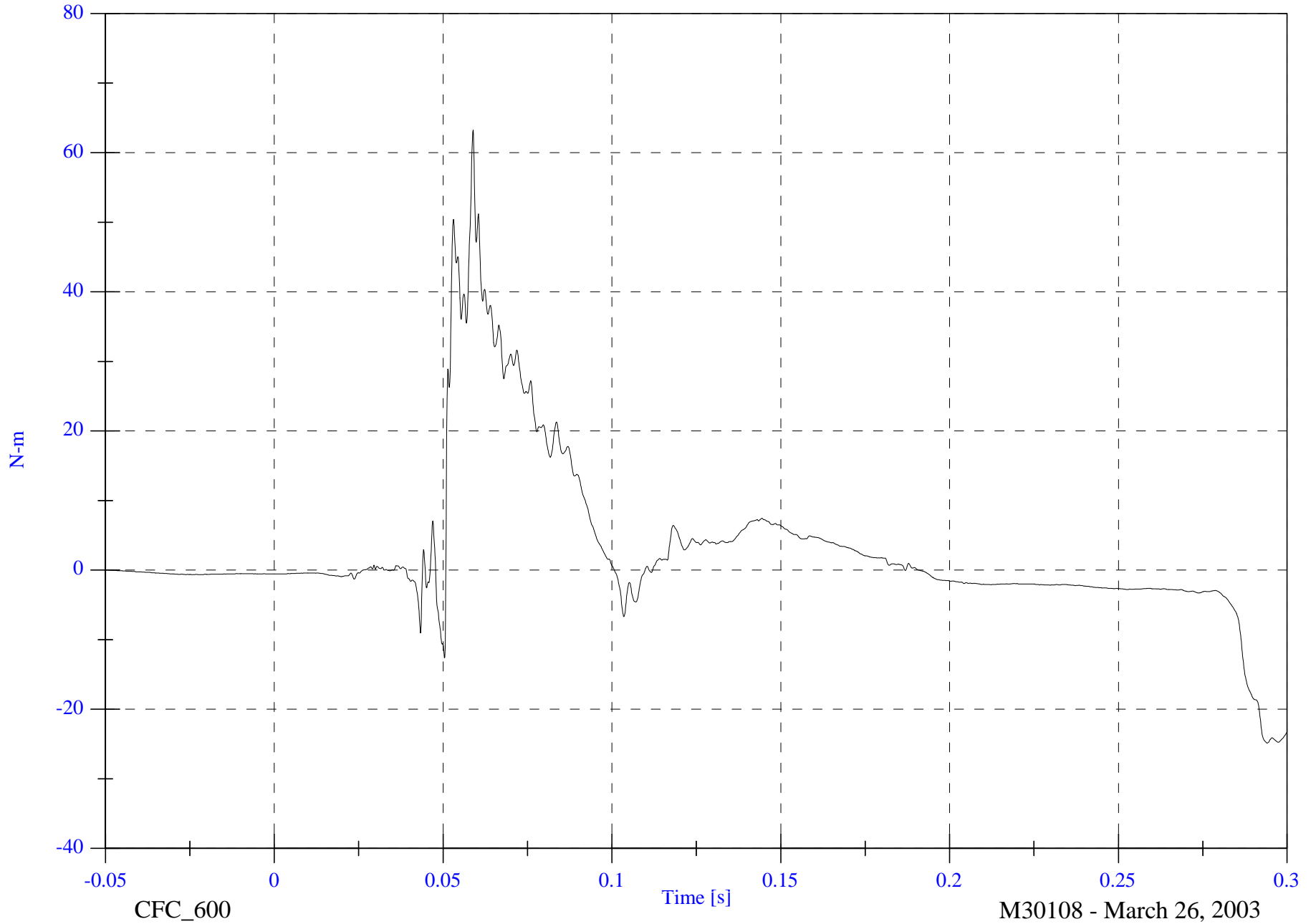
Max: 63.2 [N-m] at 0.059 [s]

V1P2 Right Lower Tibia My

Min: -24.8 [N-m] at 0.294 [s]

B-108

8642-NCAP-36



CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

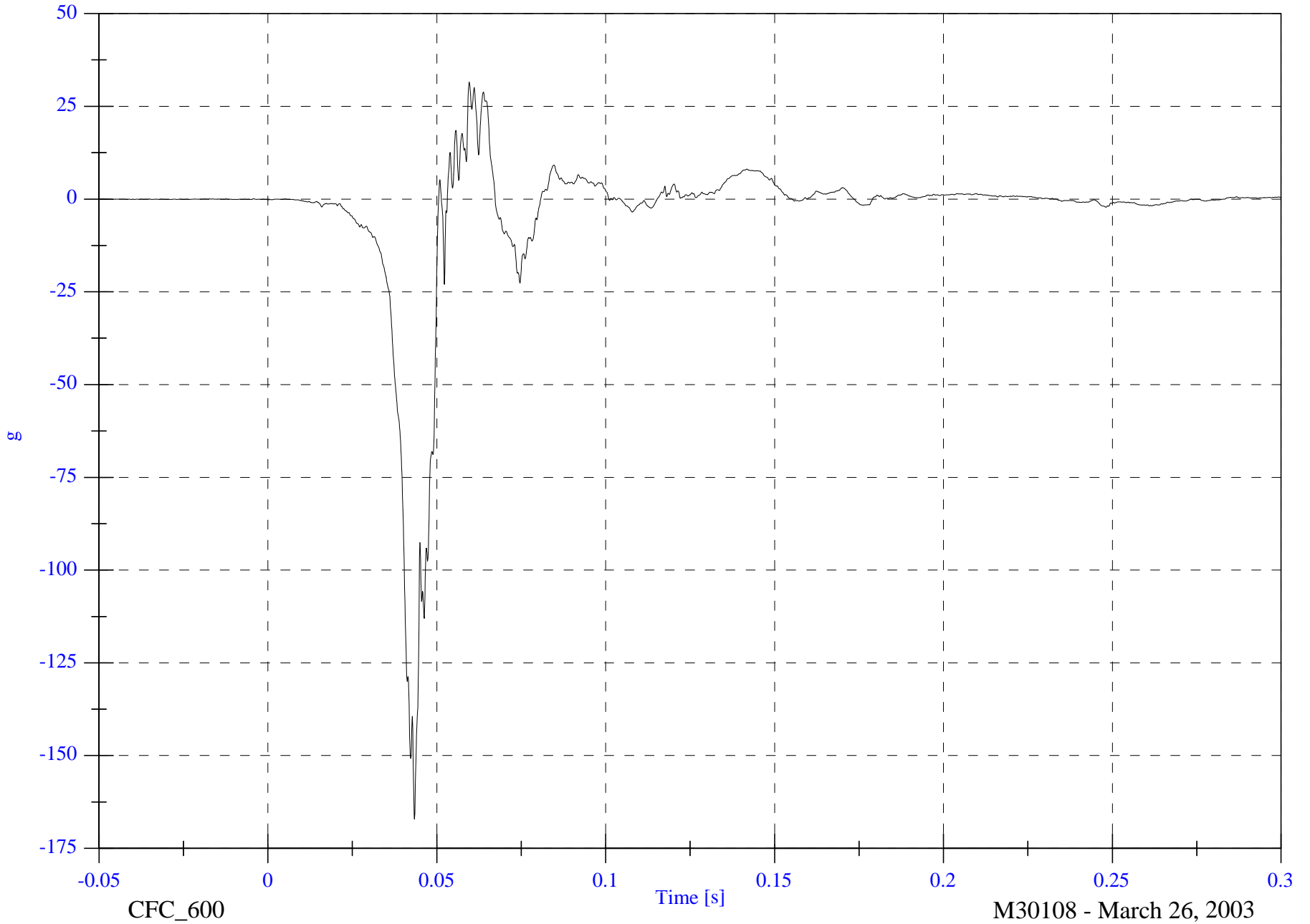
Max: 31.5 [g] at 0.060 [s]

V1P2 Left Foot Aft x

Min: -167.1 [g] at 0.043 [s]

B-109

8642-NCAP-36



CFC\_600

Time [s]

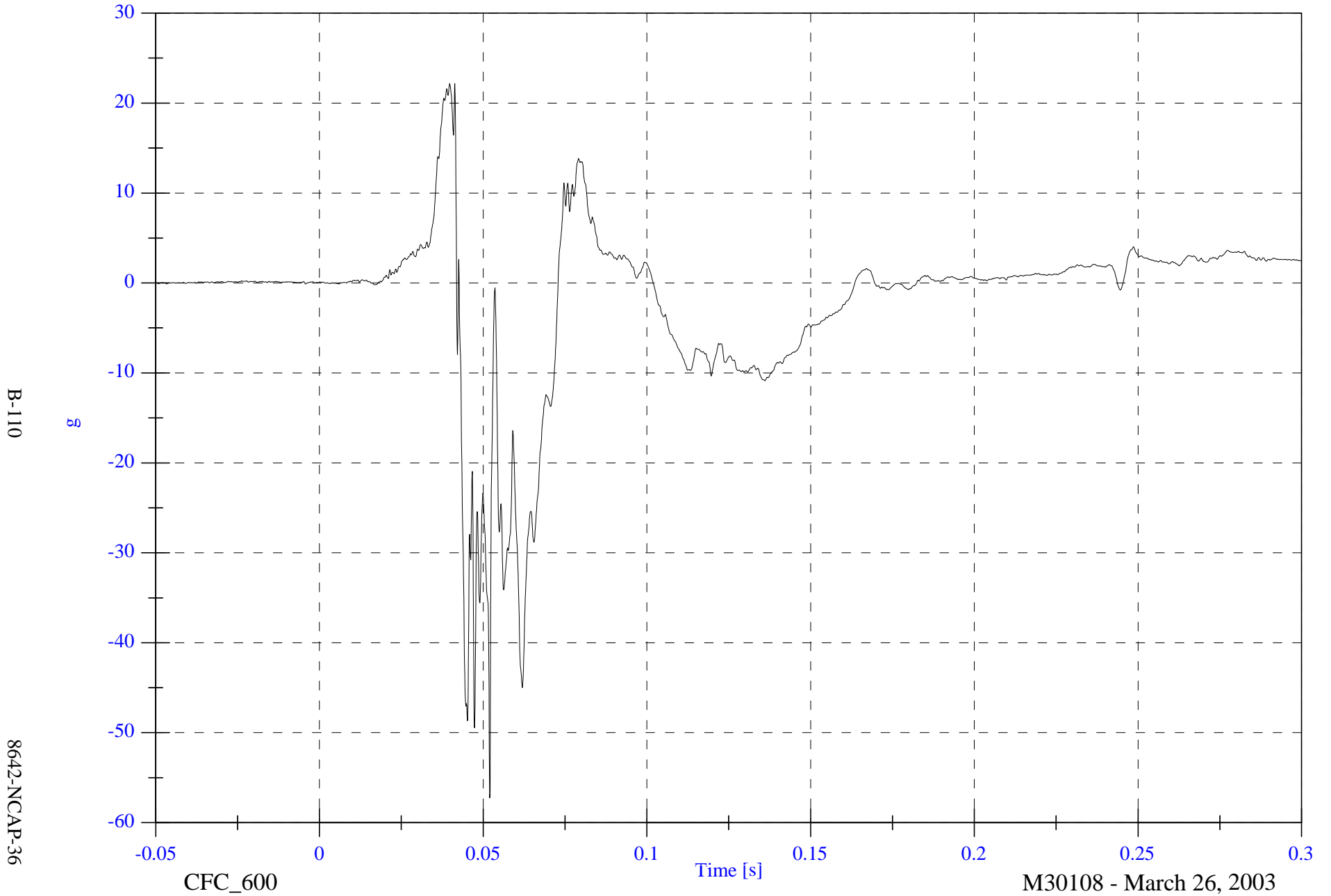
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Left Foot Aft z

Max: 22.2 [g] at 0.041 [s]

Min: -57.2 [g] at 0.052 [s]



B-110

8642-NCAP-36

NCAP Test #14 - 2003 Chevrolet Suburban

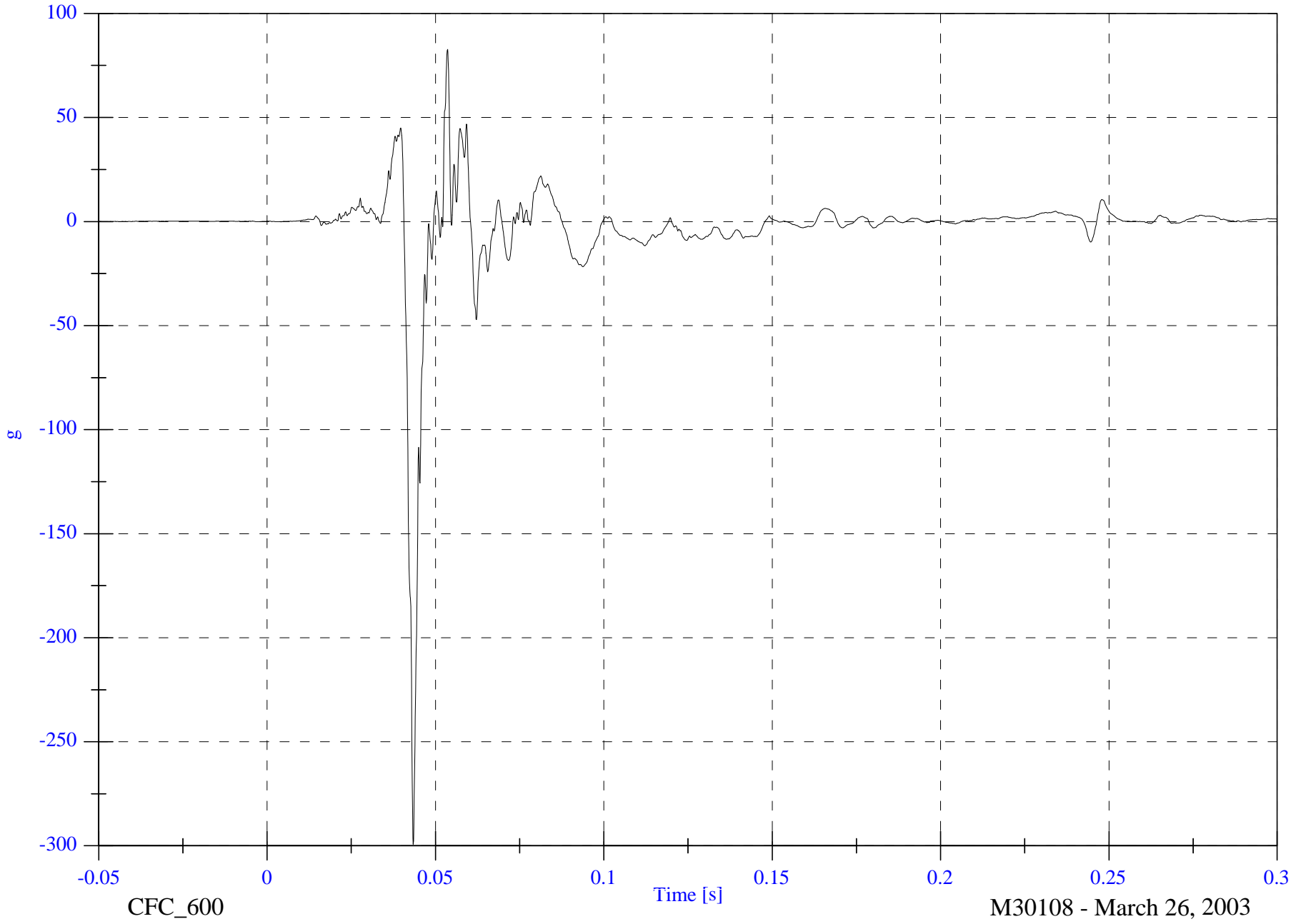
V1P2 Left Foot Fore z

Max: 82.7 [g] at 0.054 [s]

Min: -299.4 [g] at 0.043 [s]

B-111

8642-NCAP-36



CFC\_600

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

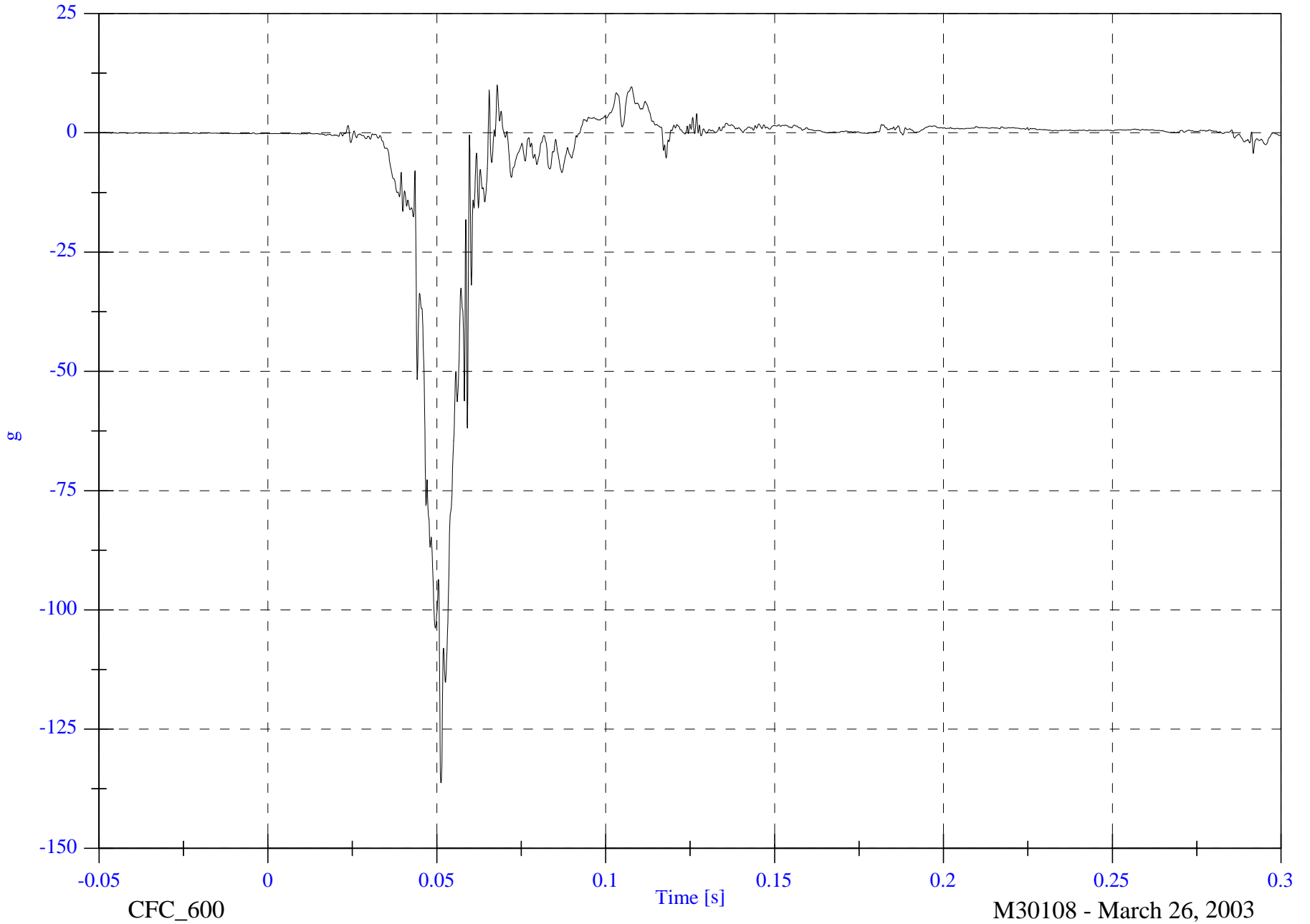
V1P2 Right Foot Aft x

Max: 10.0 [g] at 0.068 [s]

Min: -136.2 [g] at 0.051 [s]

B-112

8642-NCAP-36



CFC\_600

Time [s]

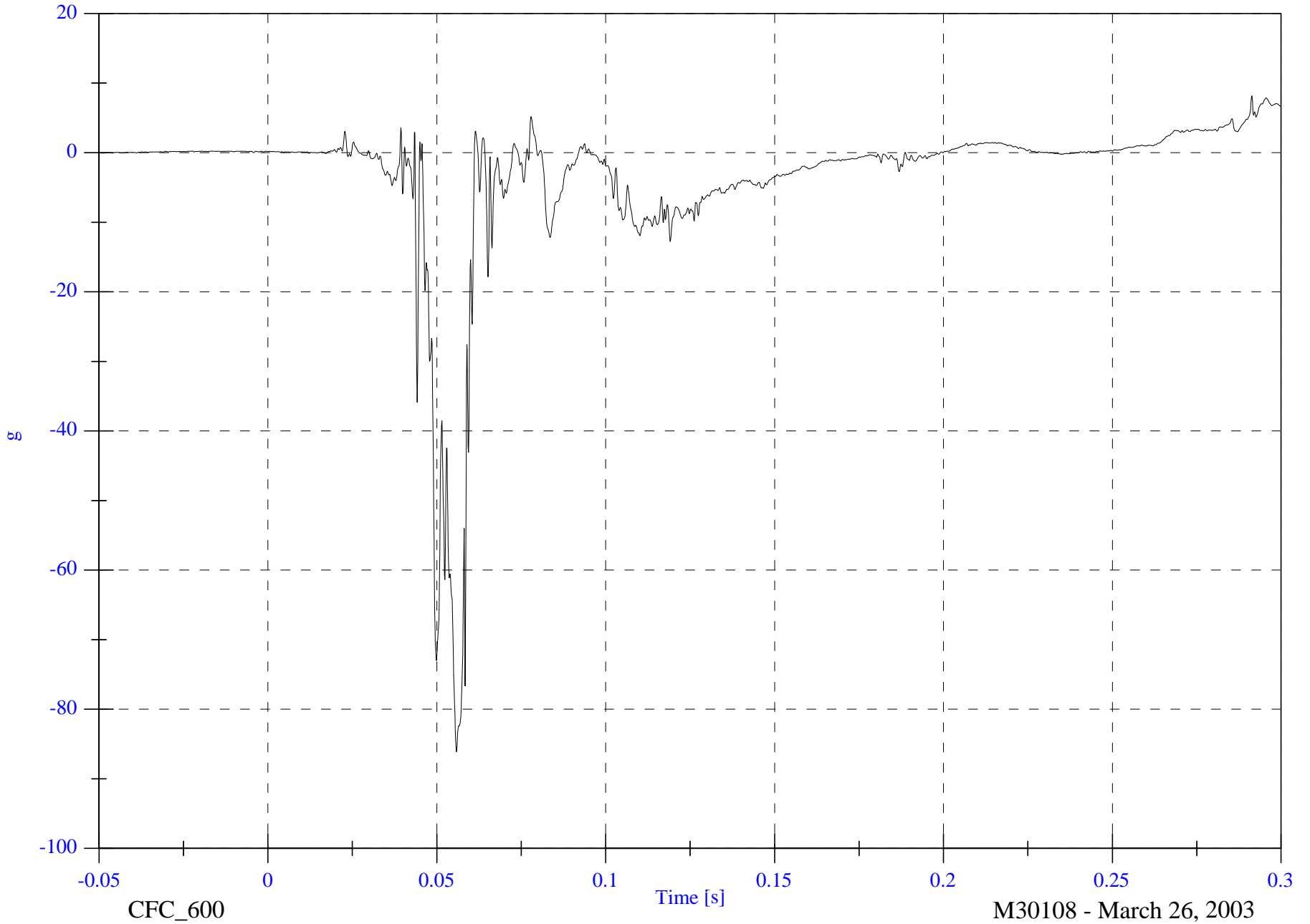
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 8.2 [g] at 0.291 [s]

V1P2 Right Foot Aft z

Min: -86.1 [g] at 0.056 [s]



B-113

8642-NCAP-36

CFC\_600

Time [s]

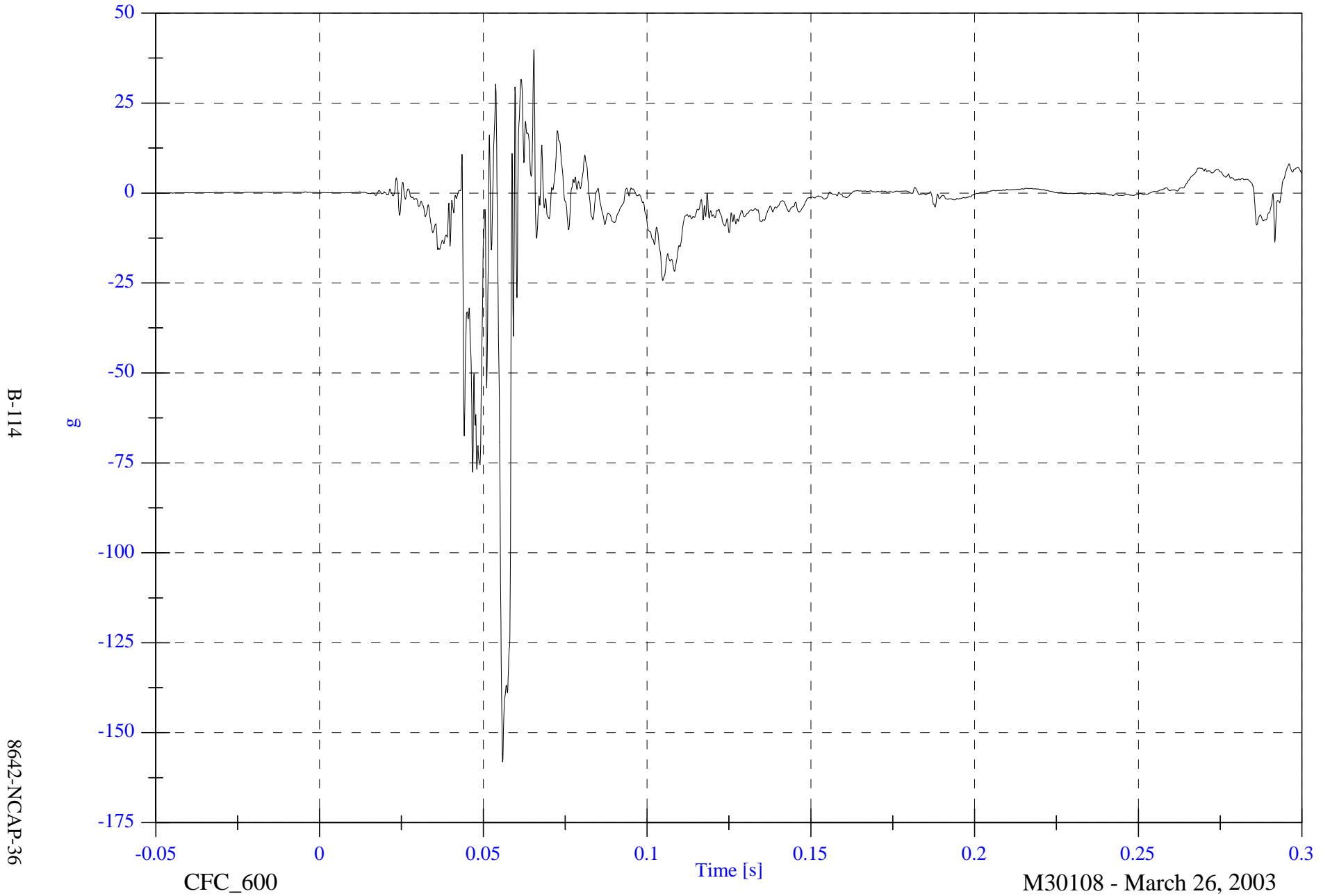
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 39.8 [g] at 0.065 [s]

V1P2 Right Foot Fore z

Min: -158.1 [g] at 0.056 [s]

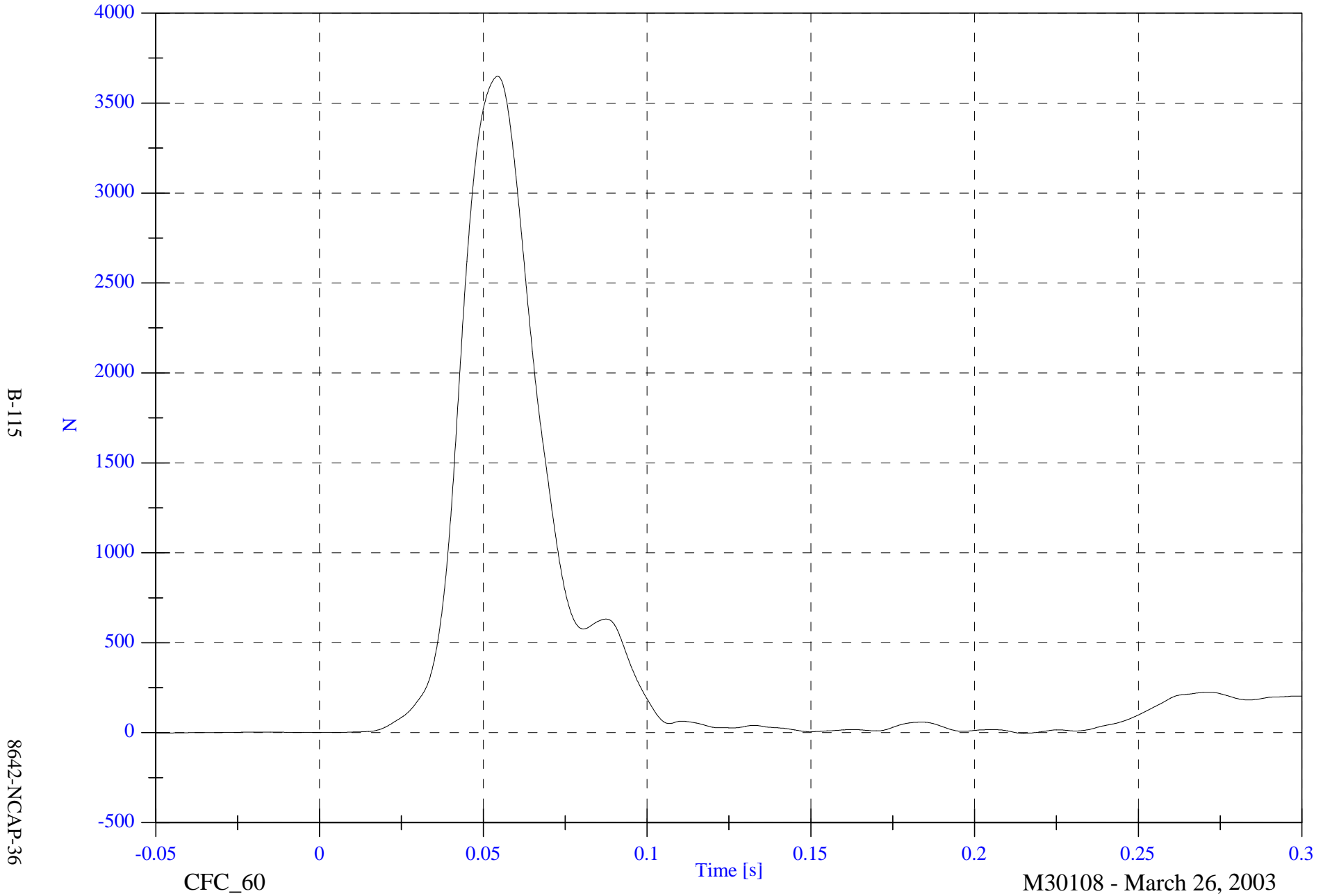


NCAP Test #14 - 2003 Chevrolet Suburban

V1P2 Lap Belt

Max: 3648.8 [N] at 0.054 [s]

Min: -3.5 [N] at 0.215 [s]



B-115

8642-NCAP-36

NCAP Test #14 - 2003 Chevrolet Suburban

V1 Left Rear #1x

Max: 2.0 [g] at 0.156 [s]

Min: -37.9 [g] at 0.074 [s]

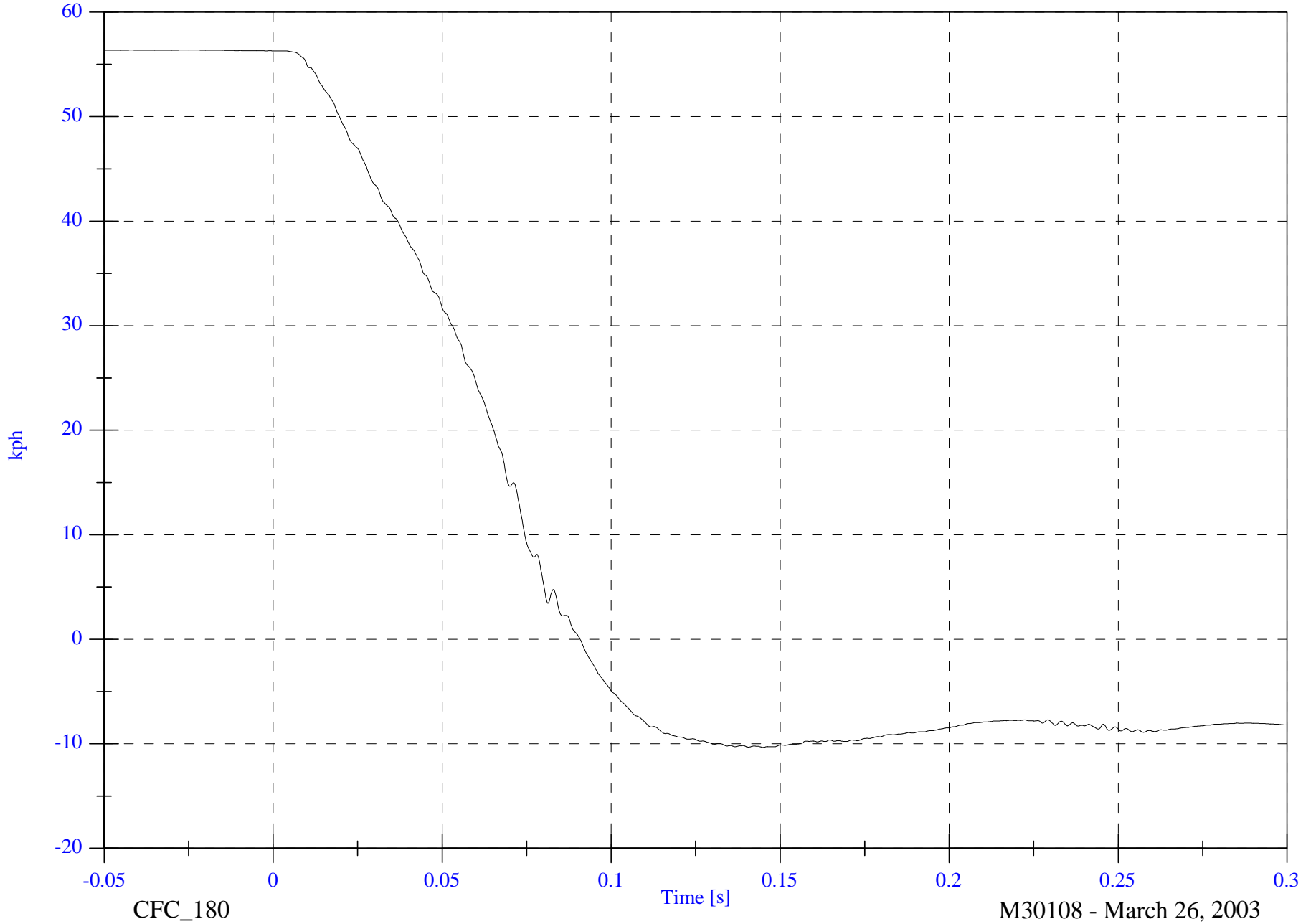


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 56.4 [kph] at -0.027 [s]

V1 Left Rear #1x Velocity

Min: -10.4 [kph] at 0.145 [s]



B-117

8642-NCAP-36

CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

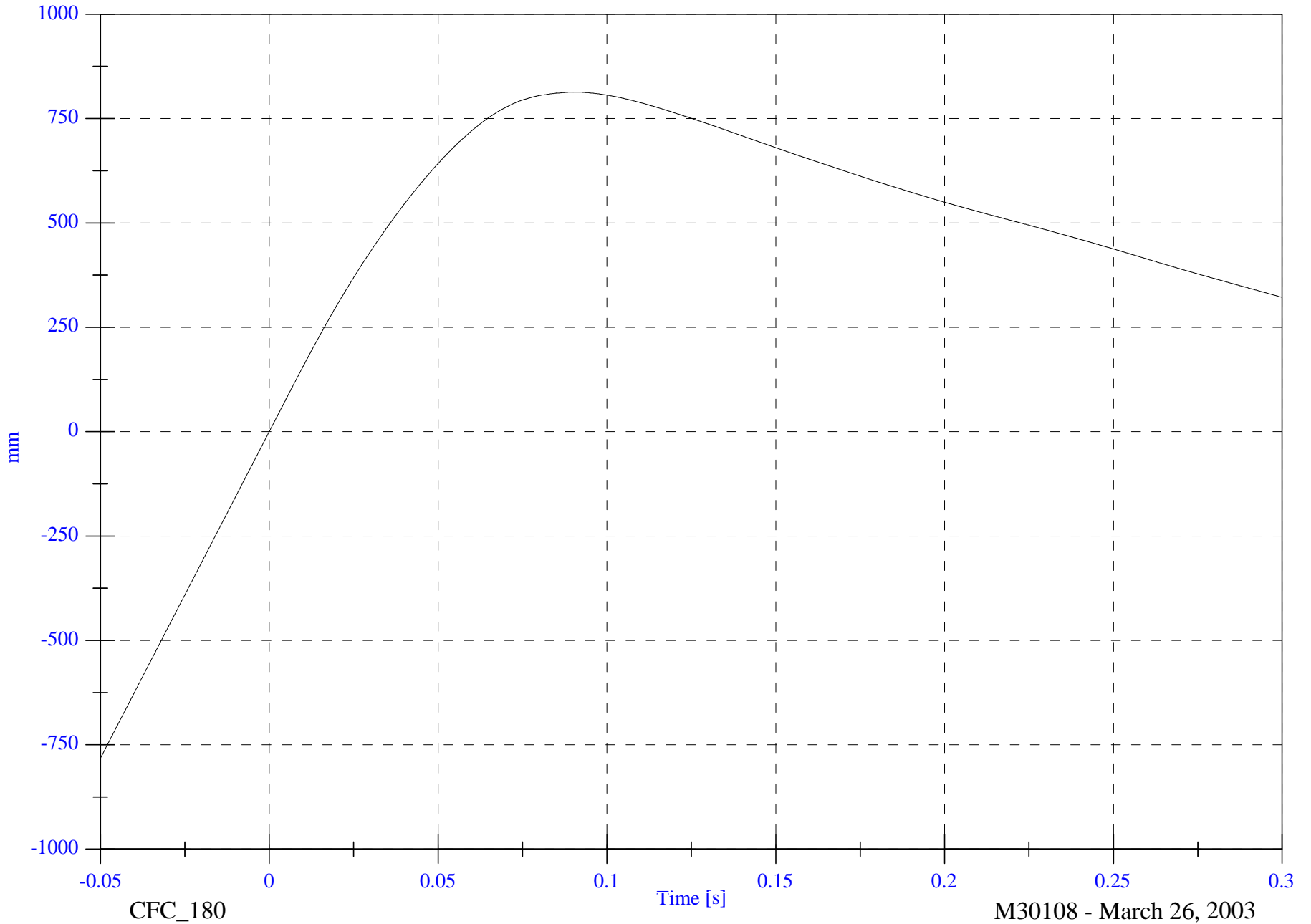
V1 Left Rear #1x Displacement

Max: 813.2 [mm] at 0.091 [s]

Min: -782.6 [mm] at -0.050 [s]

B-118

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

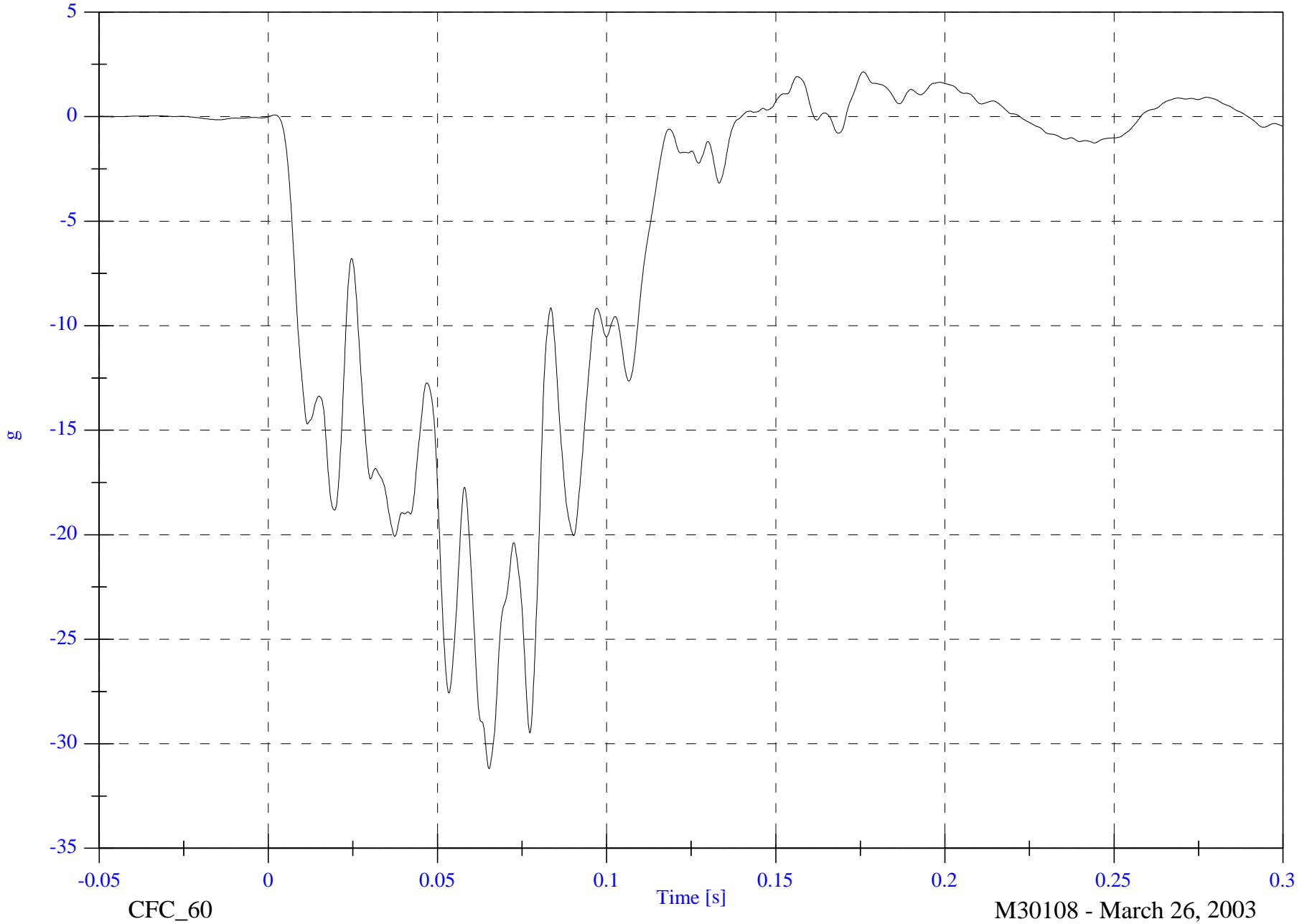
V1 Right Rear #2x

Max: 2.1 [g] at 0.176 [s]

Min: -31.2 [g] at 0.065 [s]

B-119

8642-NCAP-36



CFC\_60

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

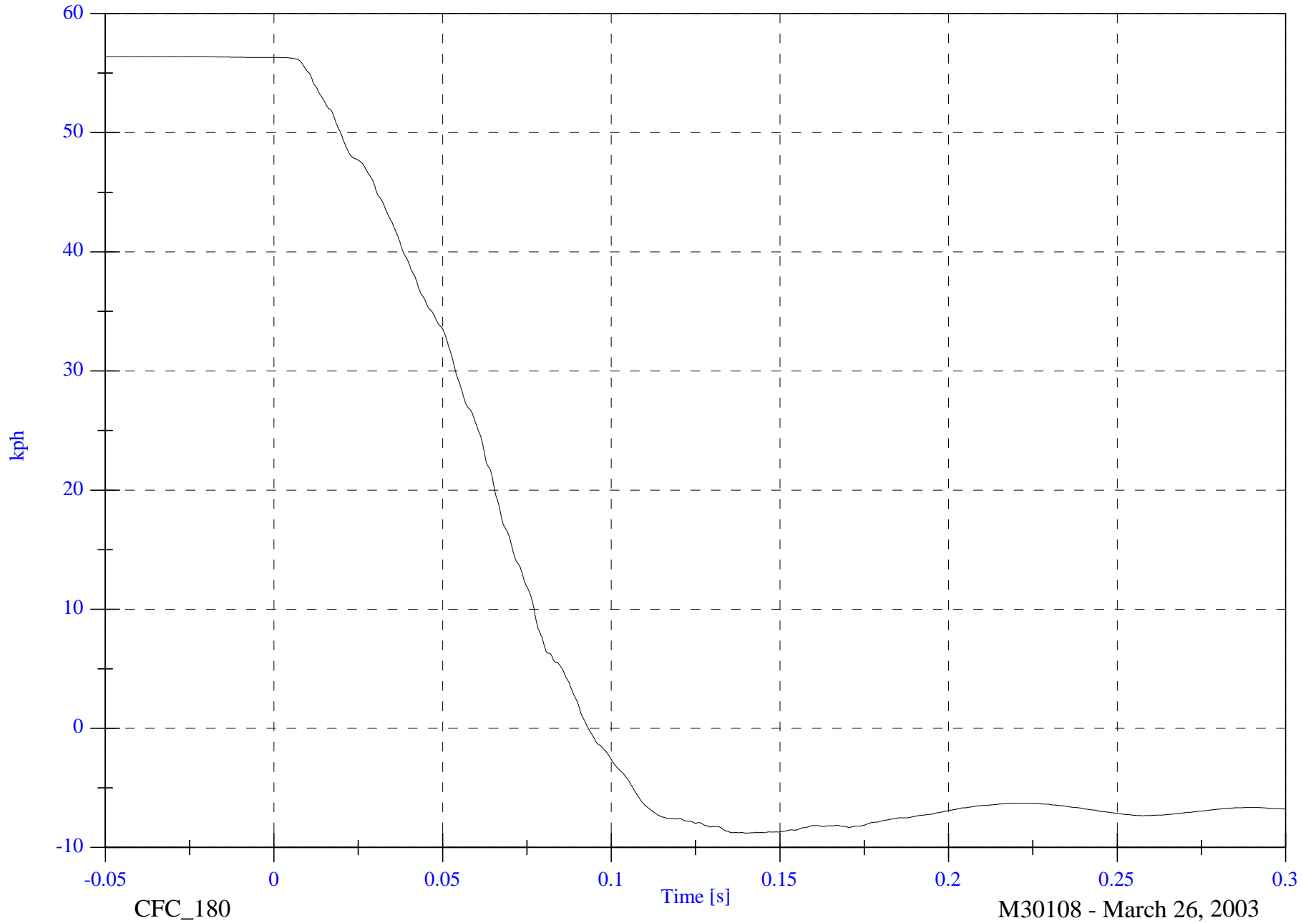
Max: 56.4 [kph] at -0.024 [s]

V1 Right Rear #2x Velocity

Min: -8.8 [kph] at 0.140 [s]

B-120

8642-NCAP-36



CFC\_180

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

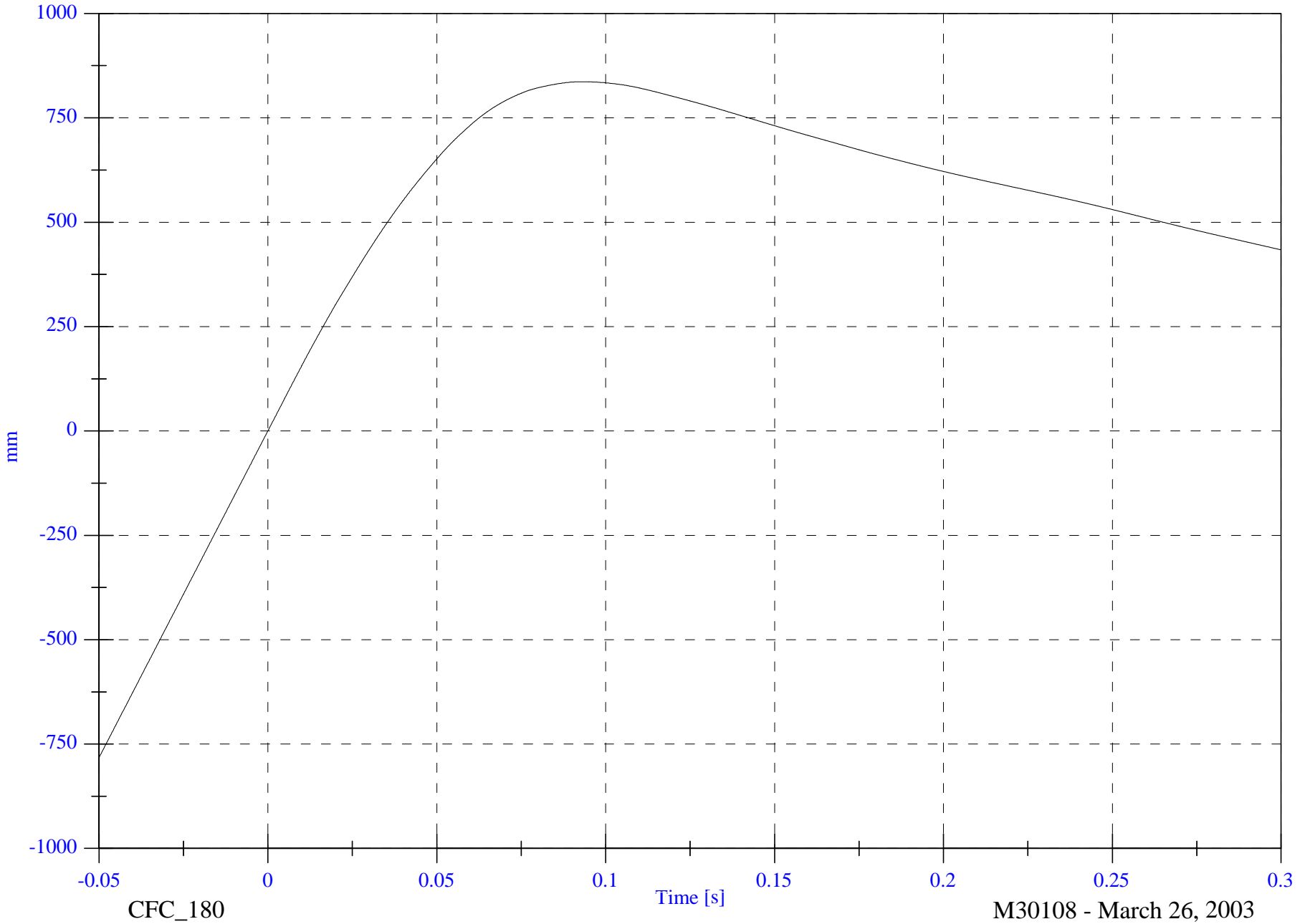
V1 Right Rear #2x Displacement

Max: 836.6 [mm] at 0.093 [s]

Min: -782.7 [mm] at -0.050 [s]

B-121

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

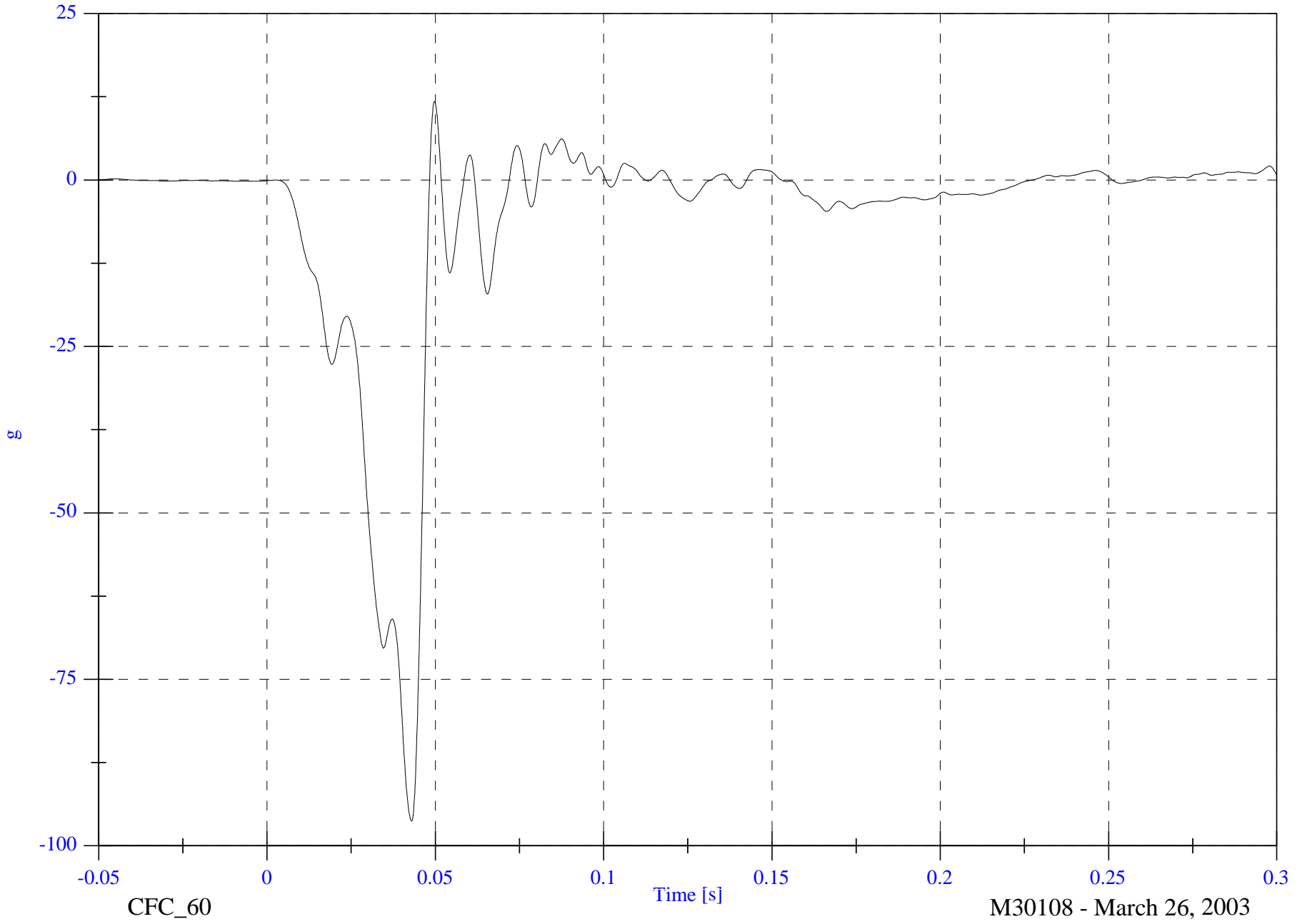
V1 Engine Top #3x

Max: 11.8 [g] at 0.050 [s]

Min: -96.3 [g] at 0.043 [s]

B-122

8642-NCAP-36



CFC\_60

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

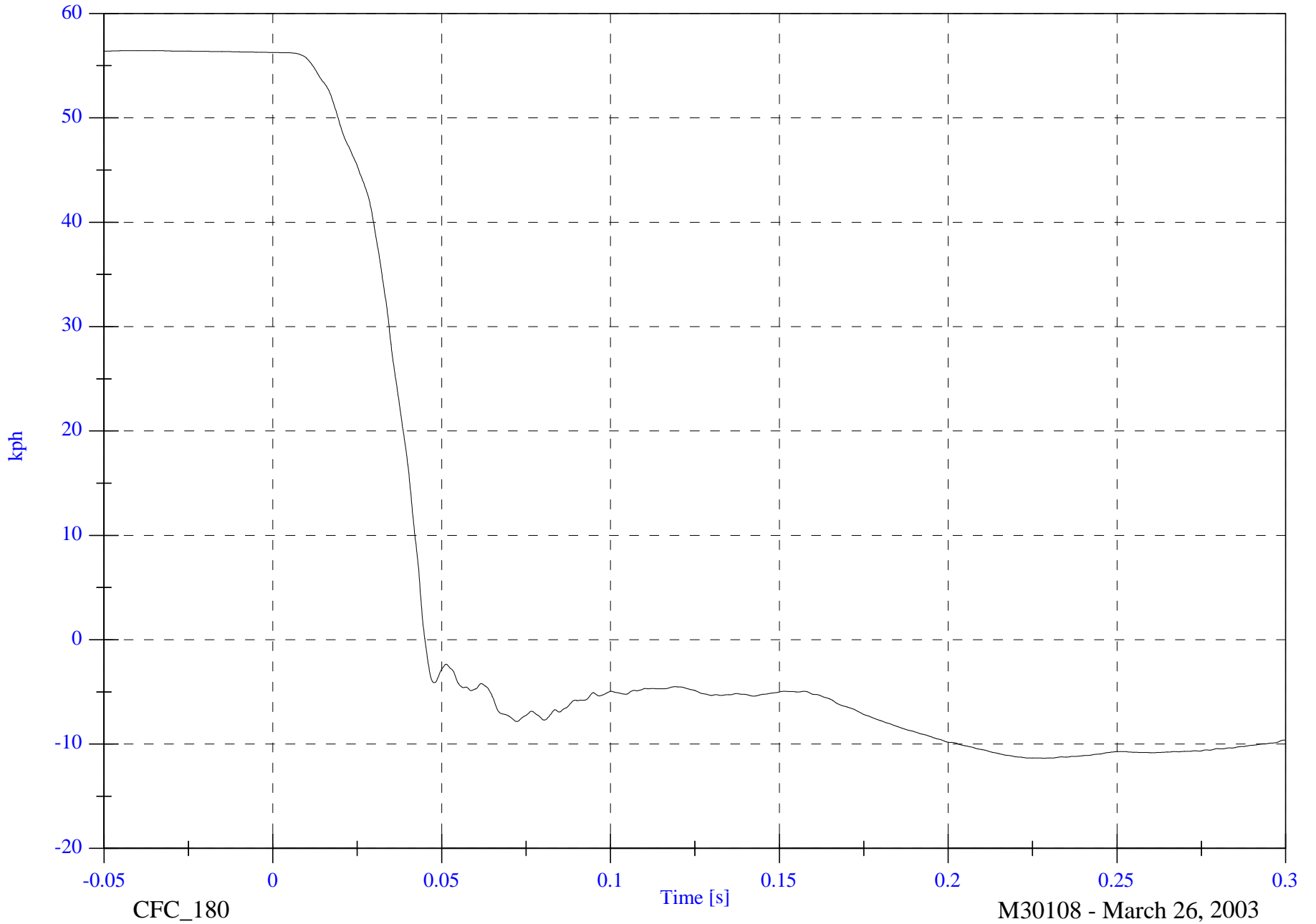
Max: 56.4 [kph] at -0.041 [s]

V1 Engine Top #3x Velocity

Min: -11.4 [kph] at 0.228 [s]

B-123

8642-NCAP-36



CFC\_180

Time [s]

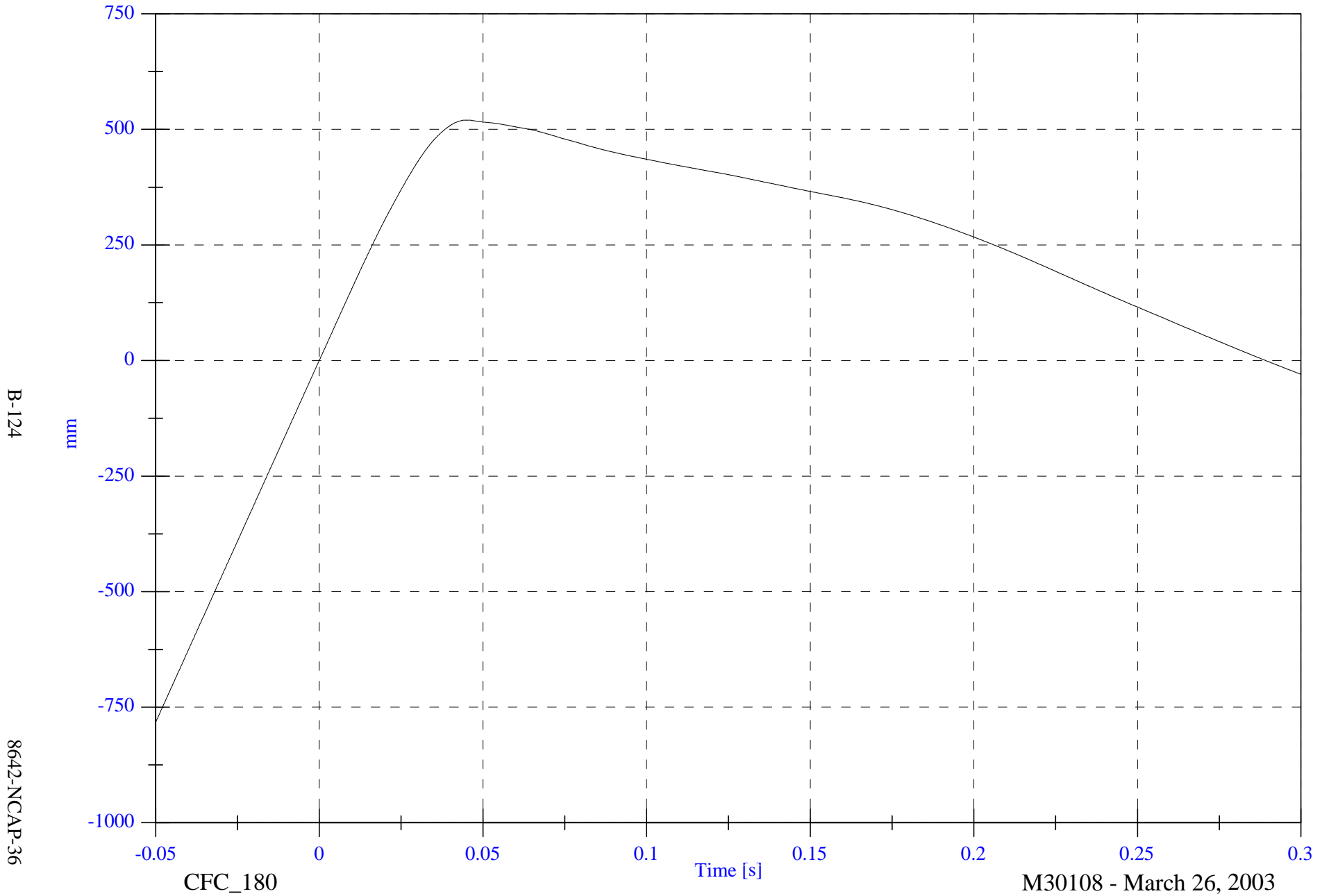
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1 Engine Top #3x Displacement

Max: 520.1 [mm] at 0.045 [s]

Min: -783.0 [mm] at -0.050 [s]



B-124

8642-NCAP-36

CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

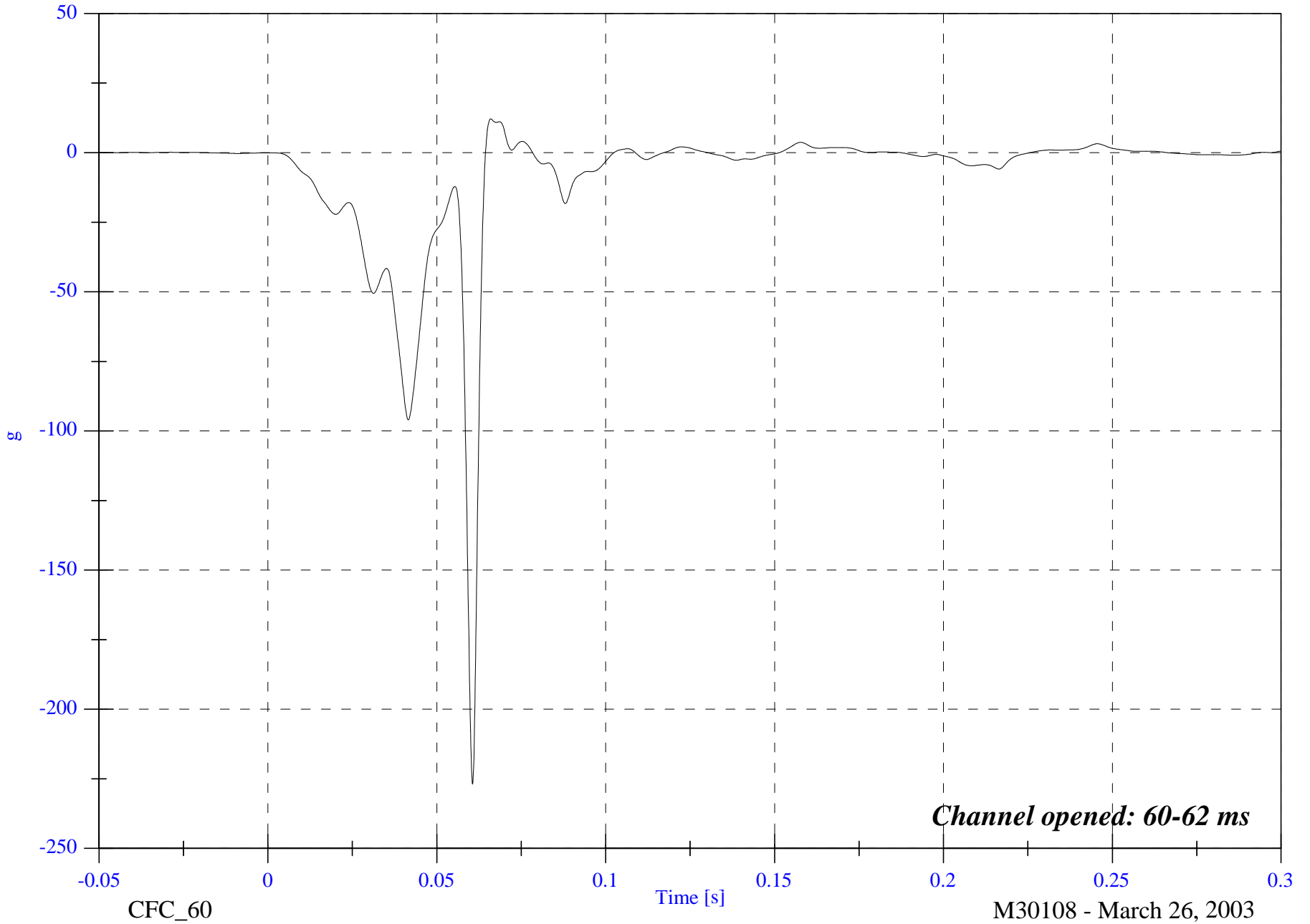
V1 Engine Bottom #4x

Max: 12.1 [g] at 0.066 [s]

Min: -226.9 [g] at 0.061 [s]

B-125

8642-NCAP-36

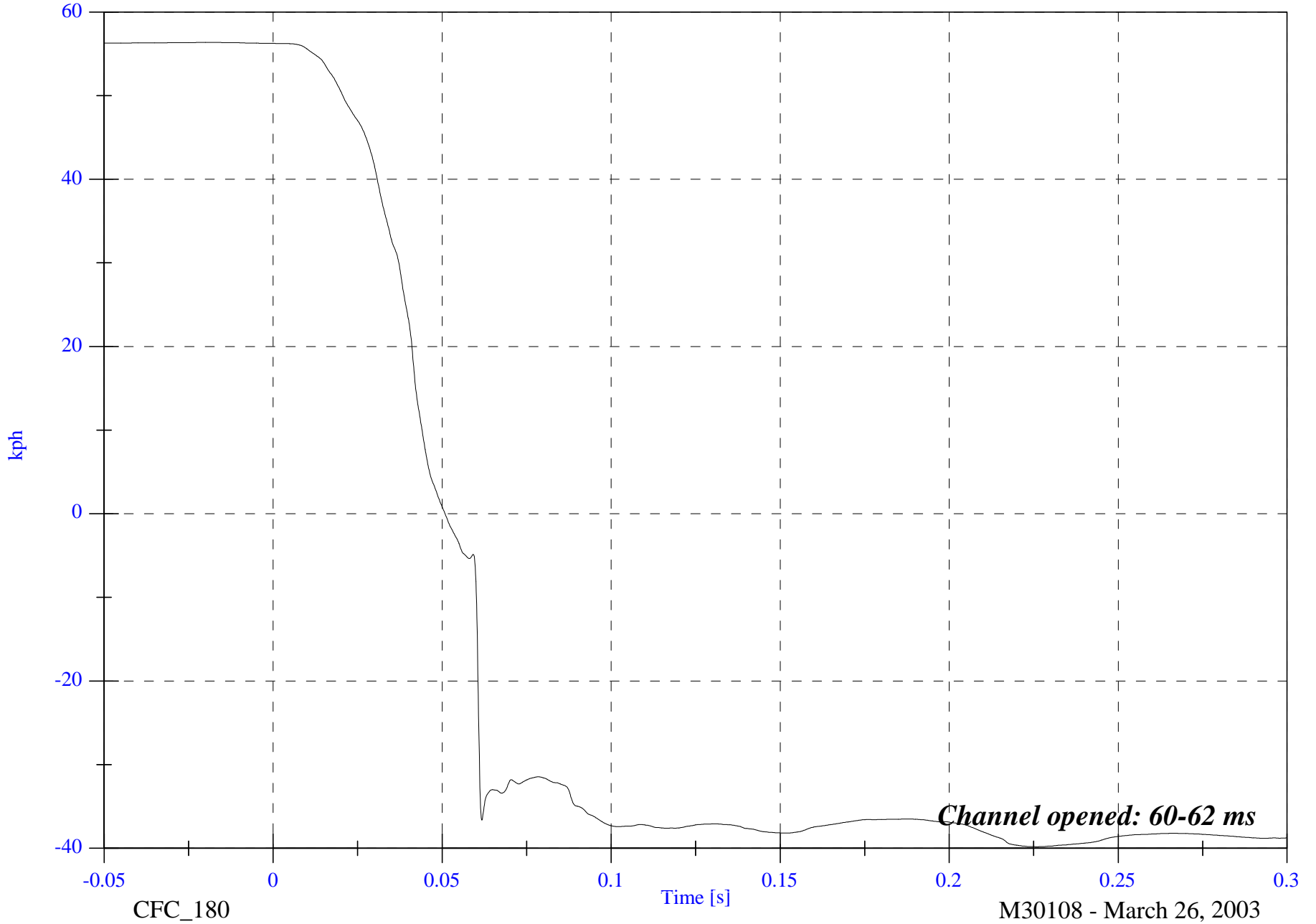


NCAP Test #14 - 2003 Chevrolet Suburban

V1 Engine Bottom #4x Velocity

Max: 56.4 [kph] at -0.018 [s]

Min: -39.8 [kph] at 0.226 [s]



B-126

8642-NCAP-36

CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

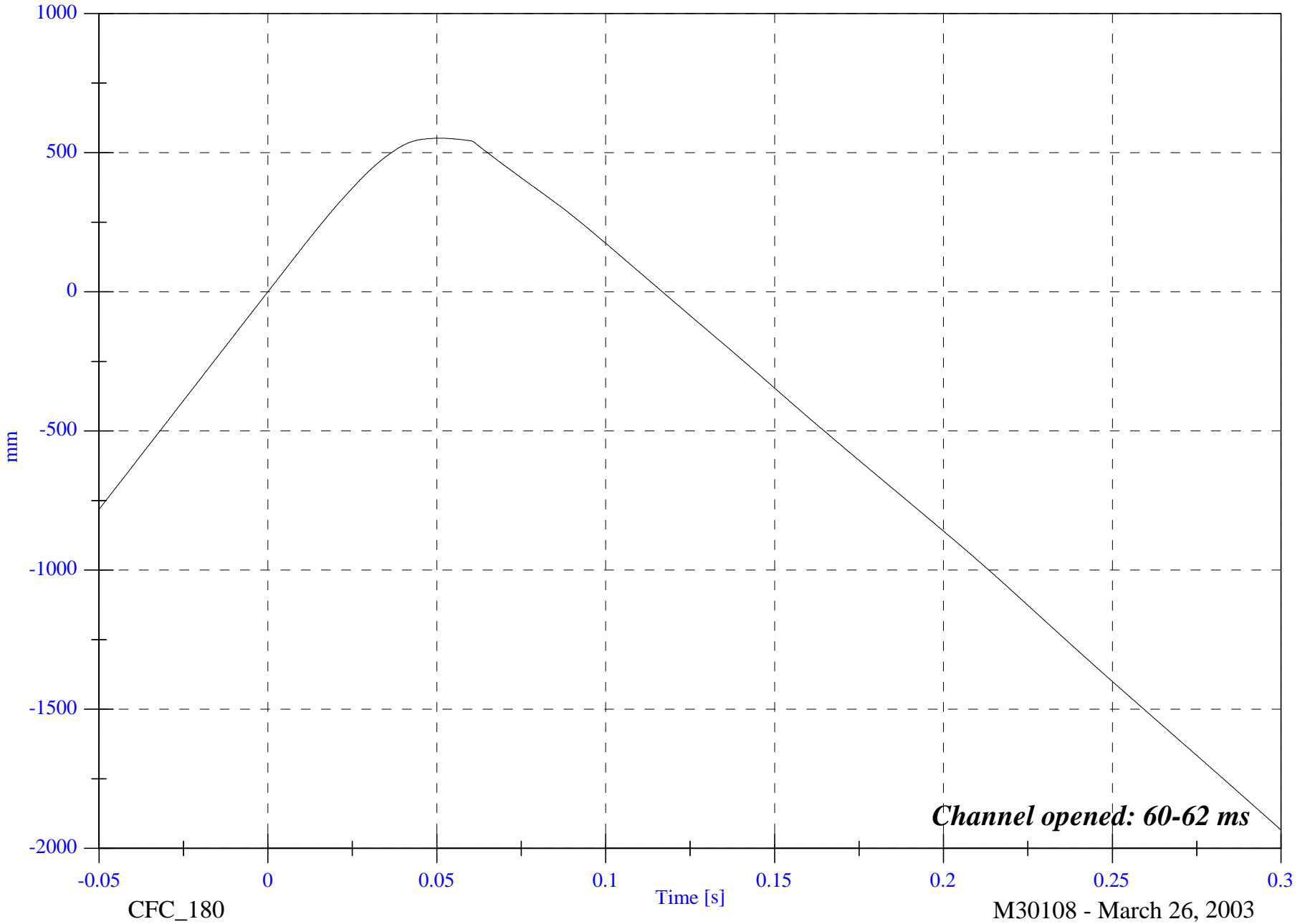
V1 Engine Bottom #4x Displacement

Max: 551.8 [mm] at 0.051 [s]

Min: -1933.2 [mm] at 0.300 [s]

B-127

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

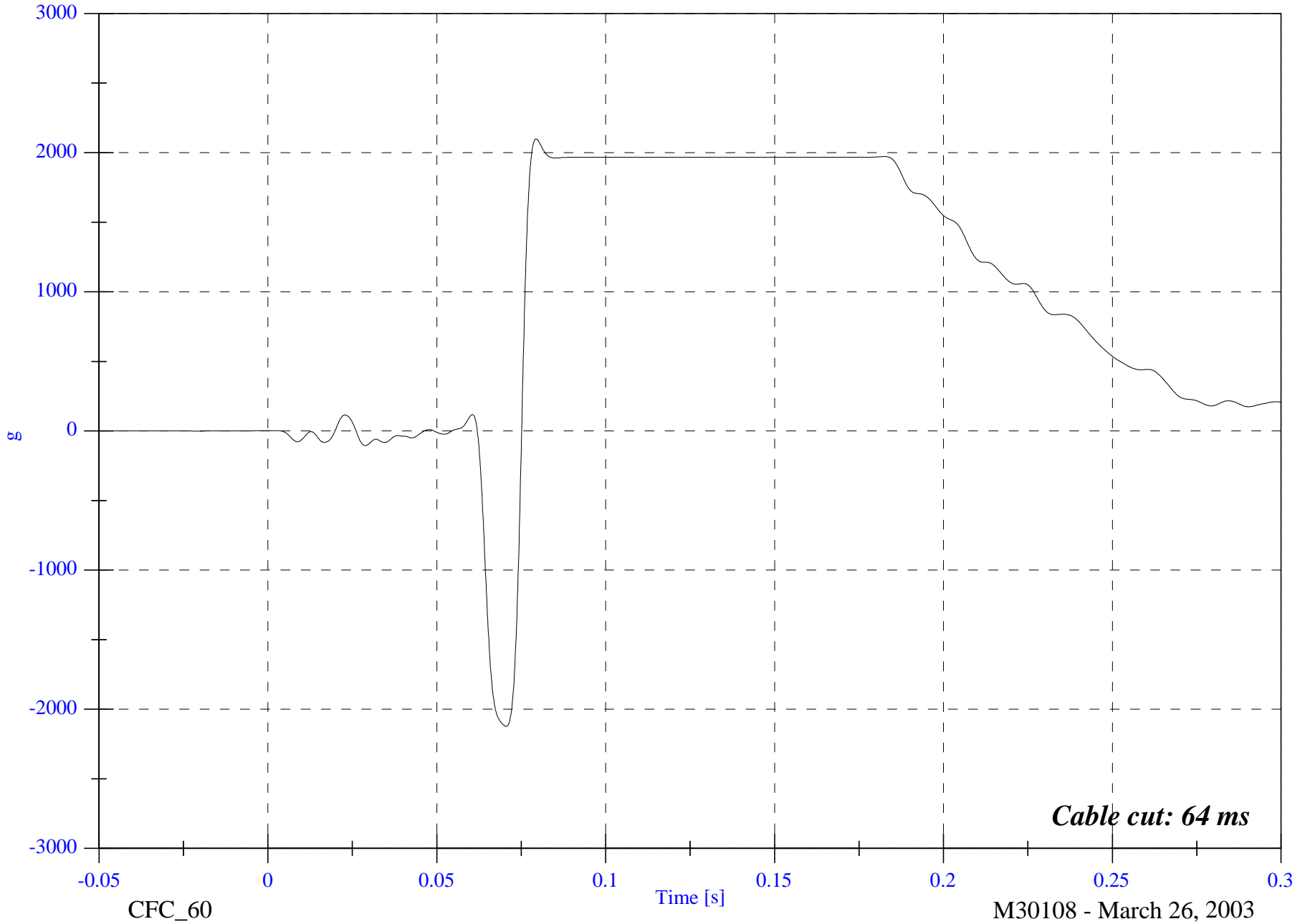
Max: 2098.8 [g] at 0.079 [s]

V1 Right Caliper #5x

Min: -2123.3 [g] at 0.071 [s]

B-128

8642-NCAP-36



*Cable cut: 64 ms*

CFC\_60

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

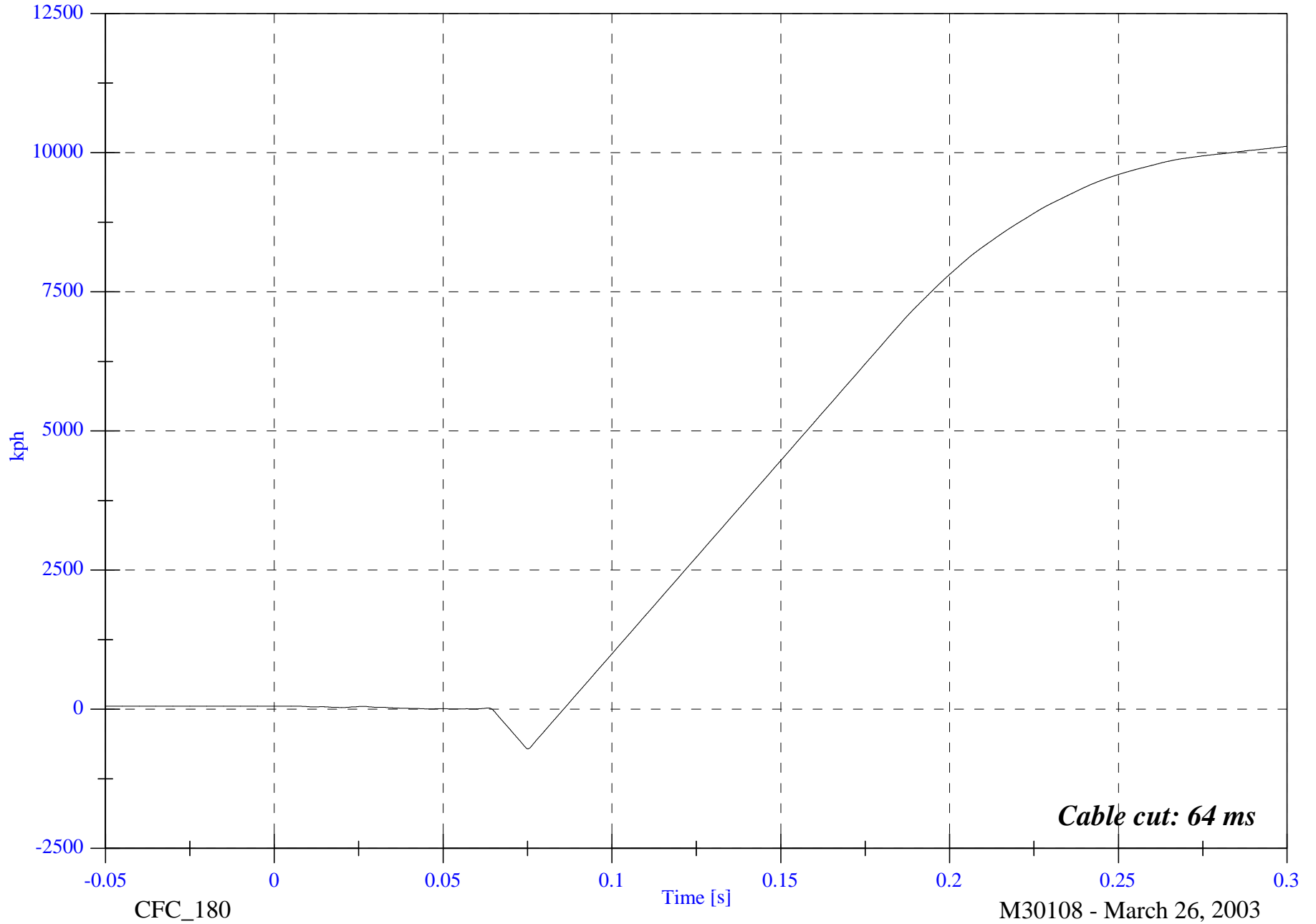
Max: 10114.4 [kph] at 0.300 [s]

V1 Right Caliper #5x Velocity

Min: -710.3 [kph] at 0.075 [s]

B-129

8642-NCAP-36



*Cable cut: 64 ms*

CFC\_180

Time [s]

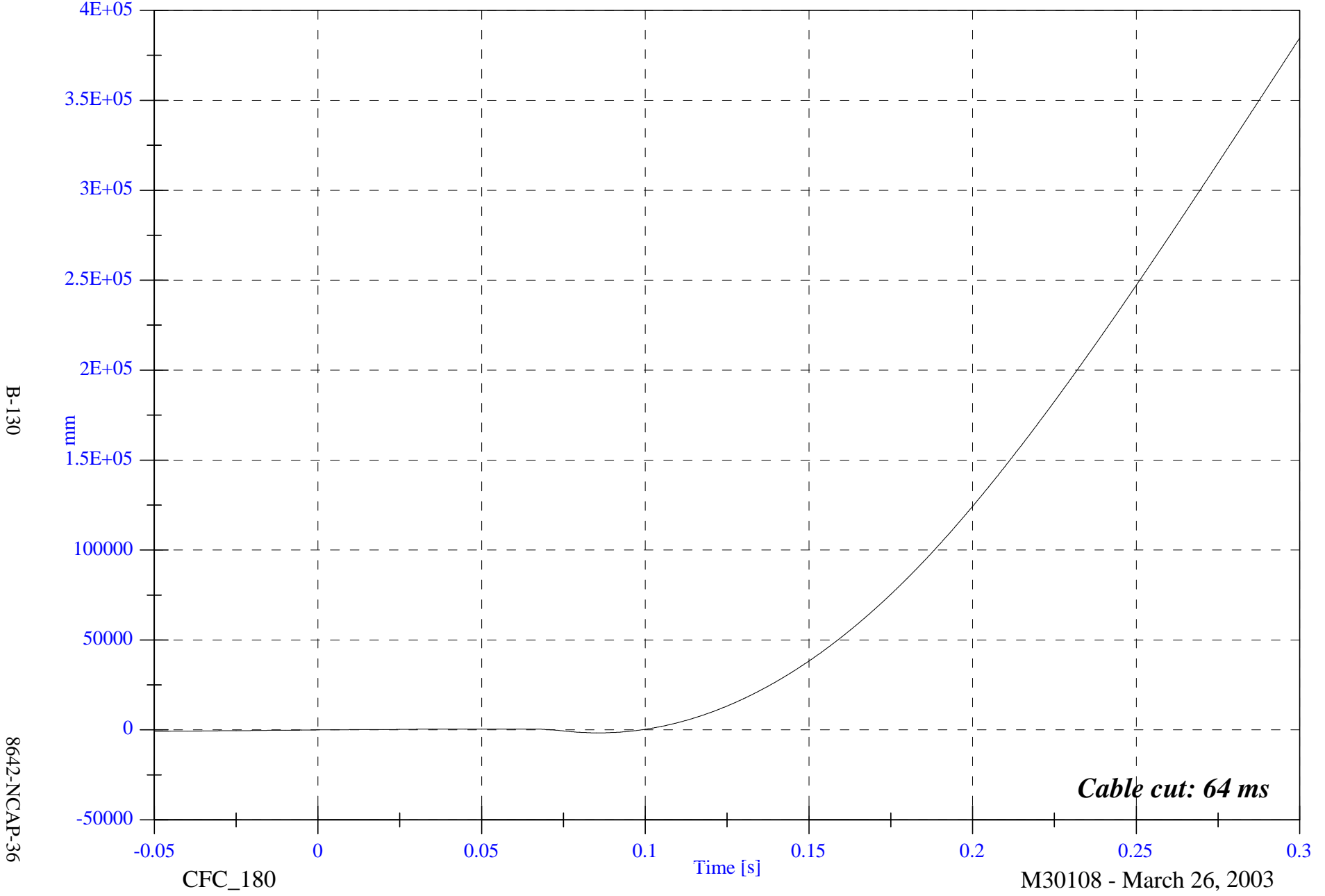
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1 Right Caliper #5x Displacement

Max: 384520.4 [mm] at 0.300 [s]

Min: -1620.2 [mm] at 0.086 [s]



B-130

8642-NCAP-36

CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

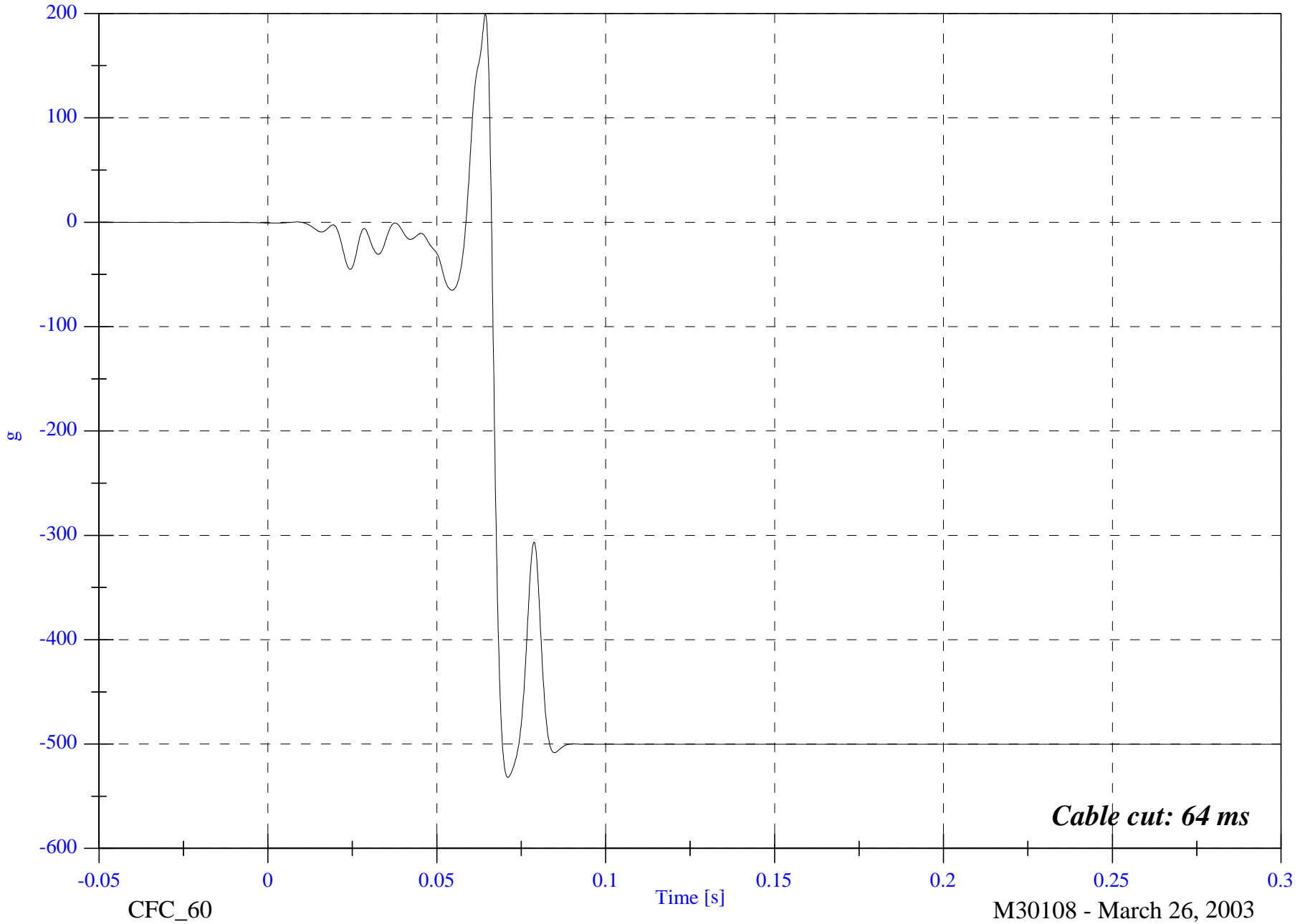
V1 Instrument Panel #6x

Max: 199.3 [g] at 0.064 [s]

Min: -531.9 [g] at 0.071 [s]

B-131

8642-NCAP-36



M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

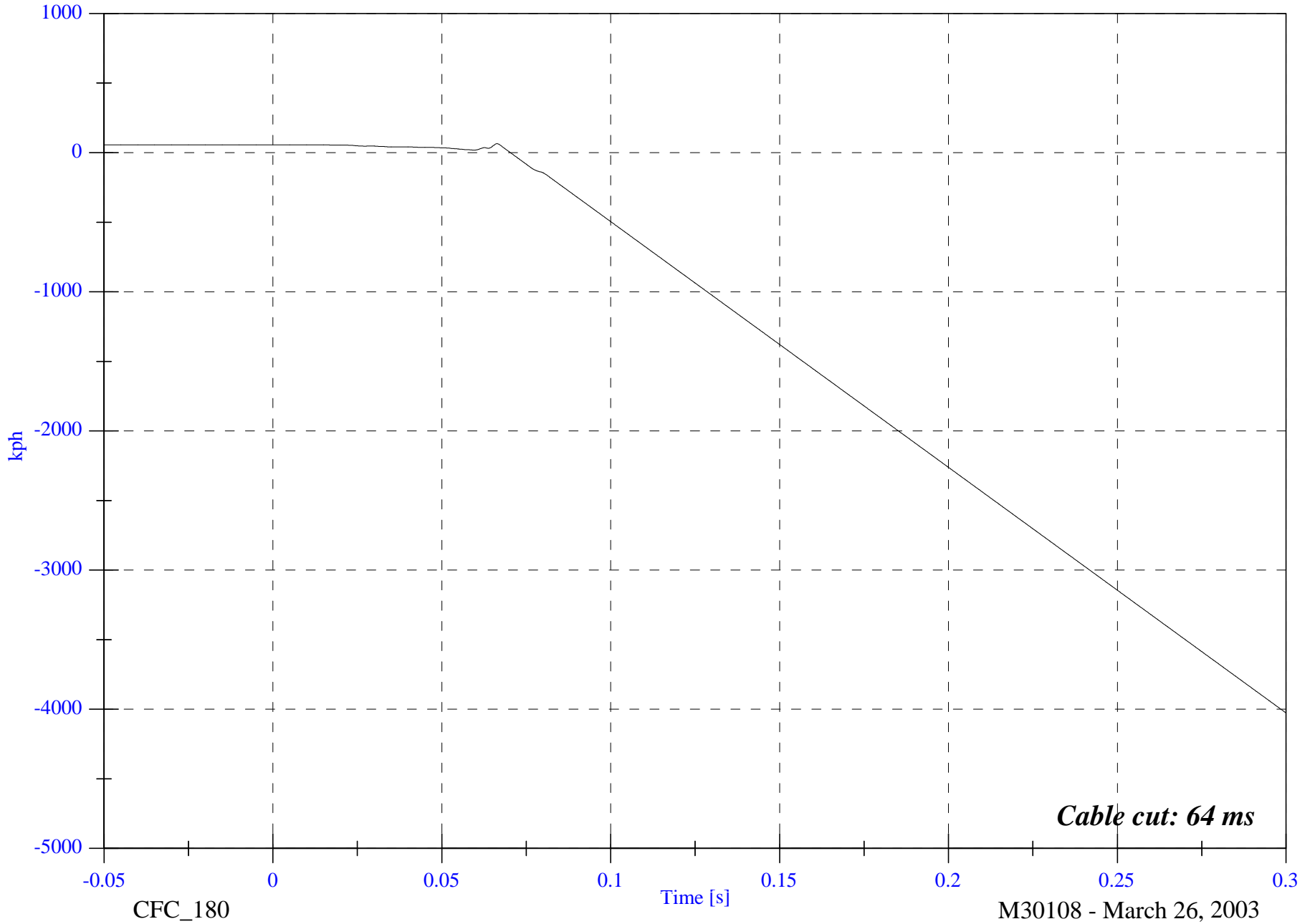
V1 Instrument Panel #6x Velocity

Max: 64.3 [kph] at 0.066 [s]

Min: -4025.6 [kph] at 0.300 [s]

B-132

8642-NCAP-36



*Cable cut: 64 ms*

CFC\_180

Time [s]

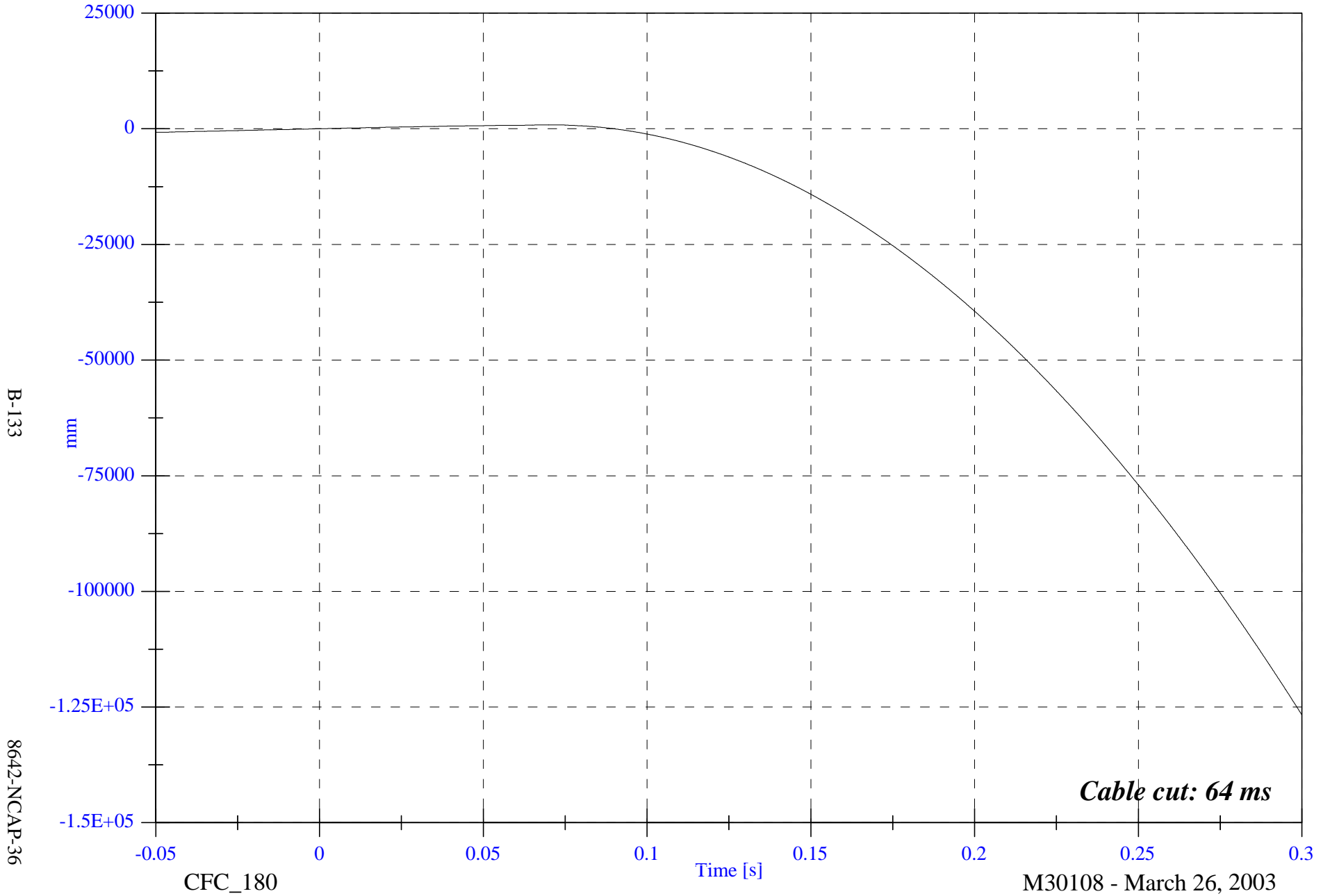
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1 Instrument Panel #6x Displacement

Max: 848.3 [mm] at 0.070 [s]

Min: -126657.7 [mm] at 0.300 [s]



B-133

8642-NCAP-36

CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

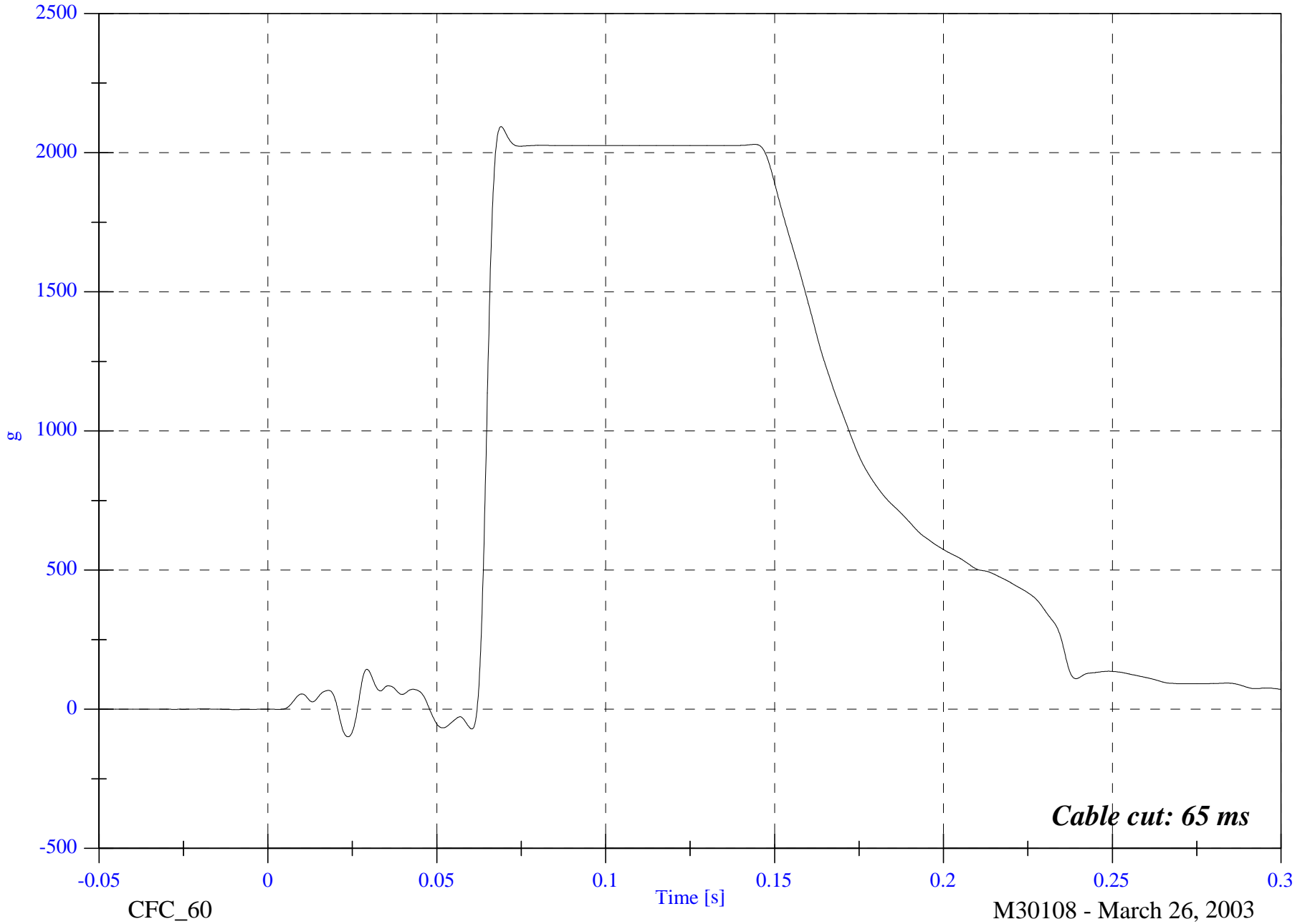
Max: 2093.5 [g] at 0.069 [s]

V1 Left Caliper #7x

Min: -98.9 [g] at 0.024 [s]

B-134

8642-NCAP-36



*Cable cut: 65 ms*

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

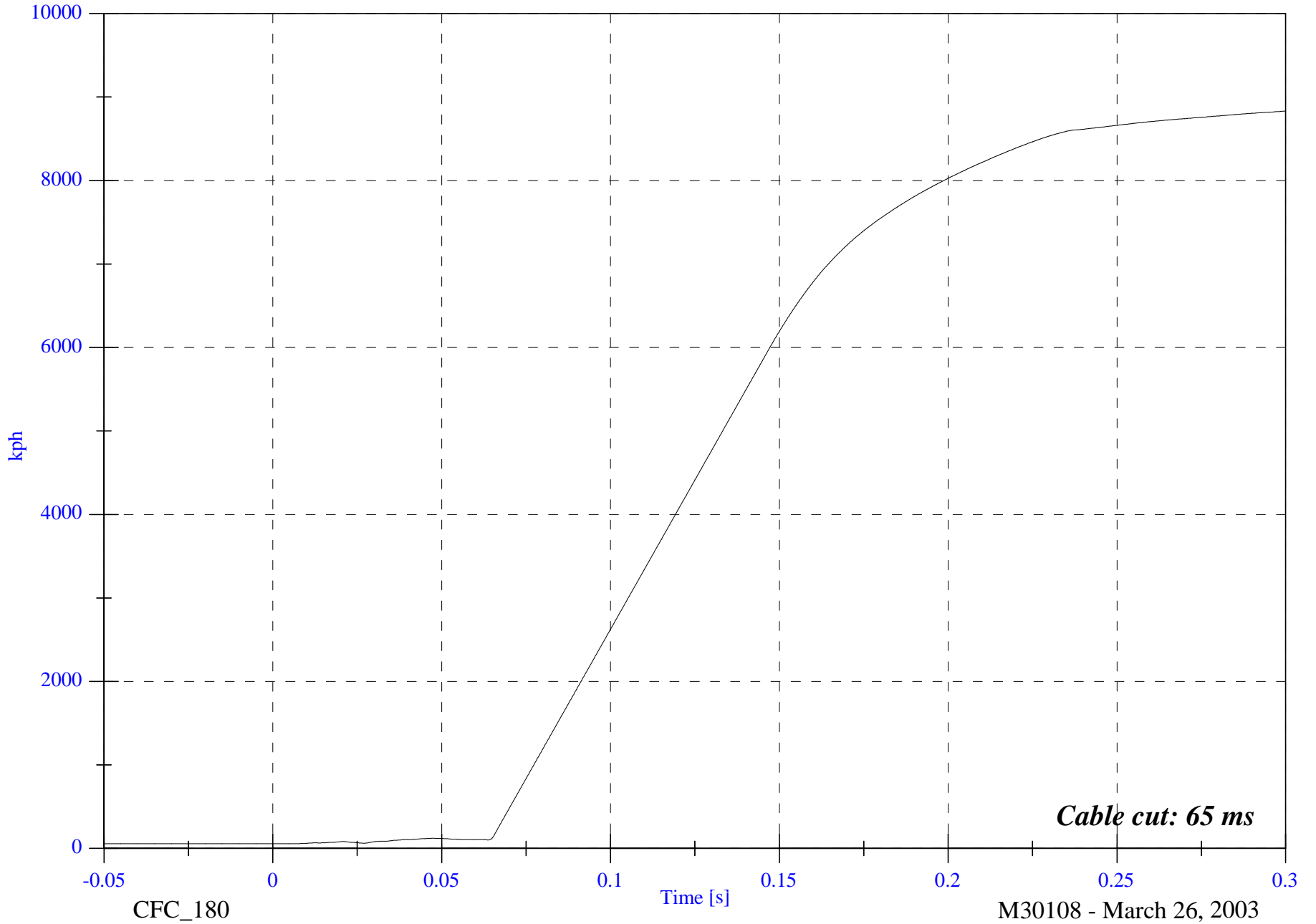
Max: 8831.0 [kph] at 0.300 [s]

V1 Left Caliper #7x Velocity

Min: 56.1 [kph] at -0.024 [s]

B-135

8642-NCAP-36

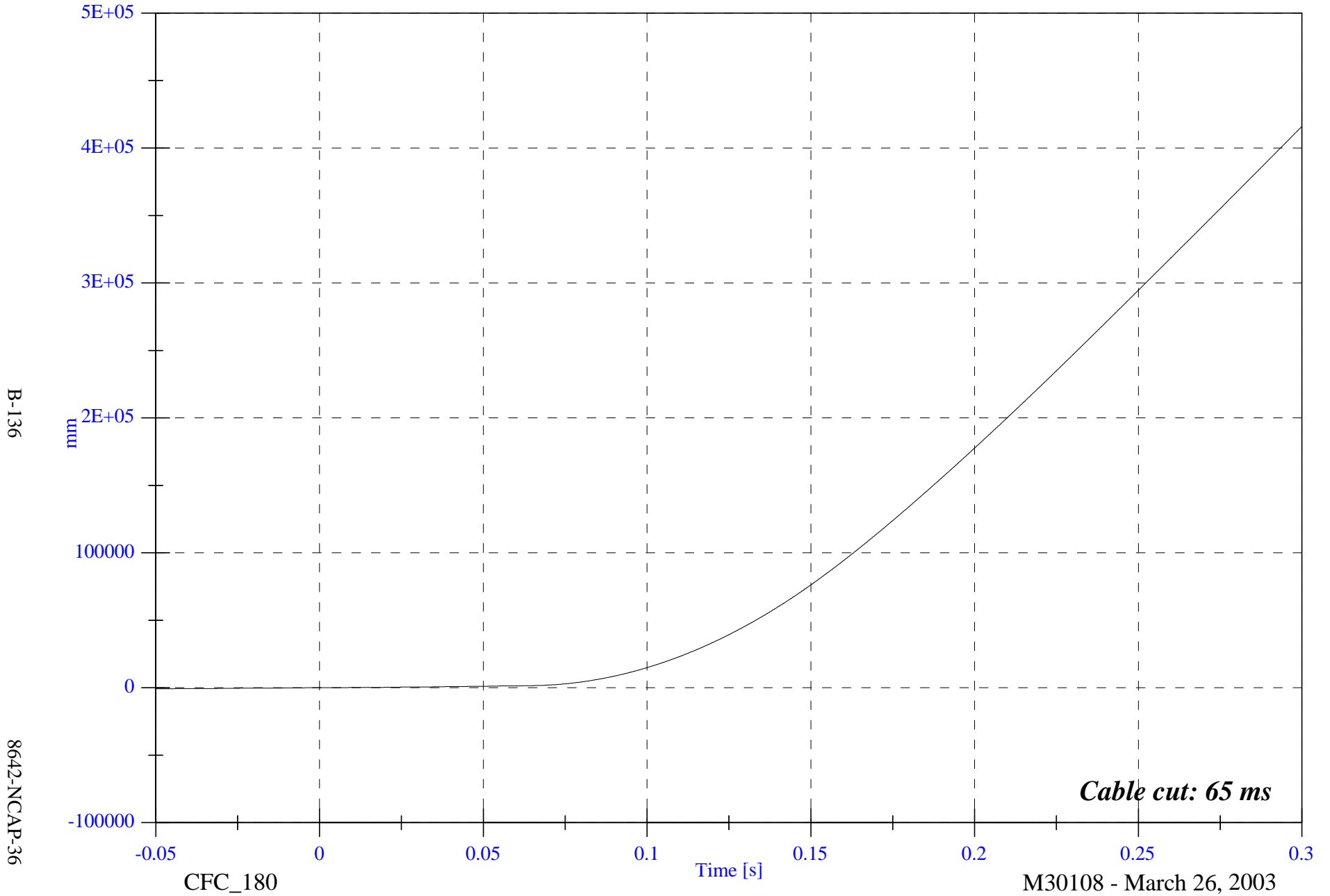


NCAP Test #14 - 2003 Chevrolet Suburban

V1 Left Caliper #7x Displacement

Max: 415897.1 [mm] at 0.300 [s]

Min: -781.3 [mm] at -0.050 [s]



B-136

8642-NCAP-36

CFC\_180

Time [s]

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*Cable cut: 65 ms*

NCAP Test #14 - 2003 Chevrolet Suburban

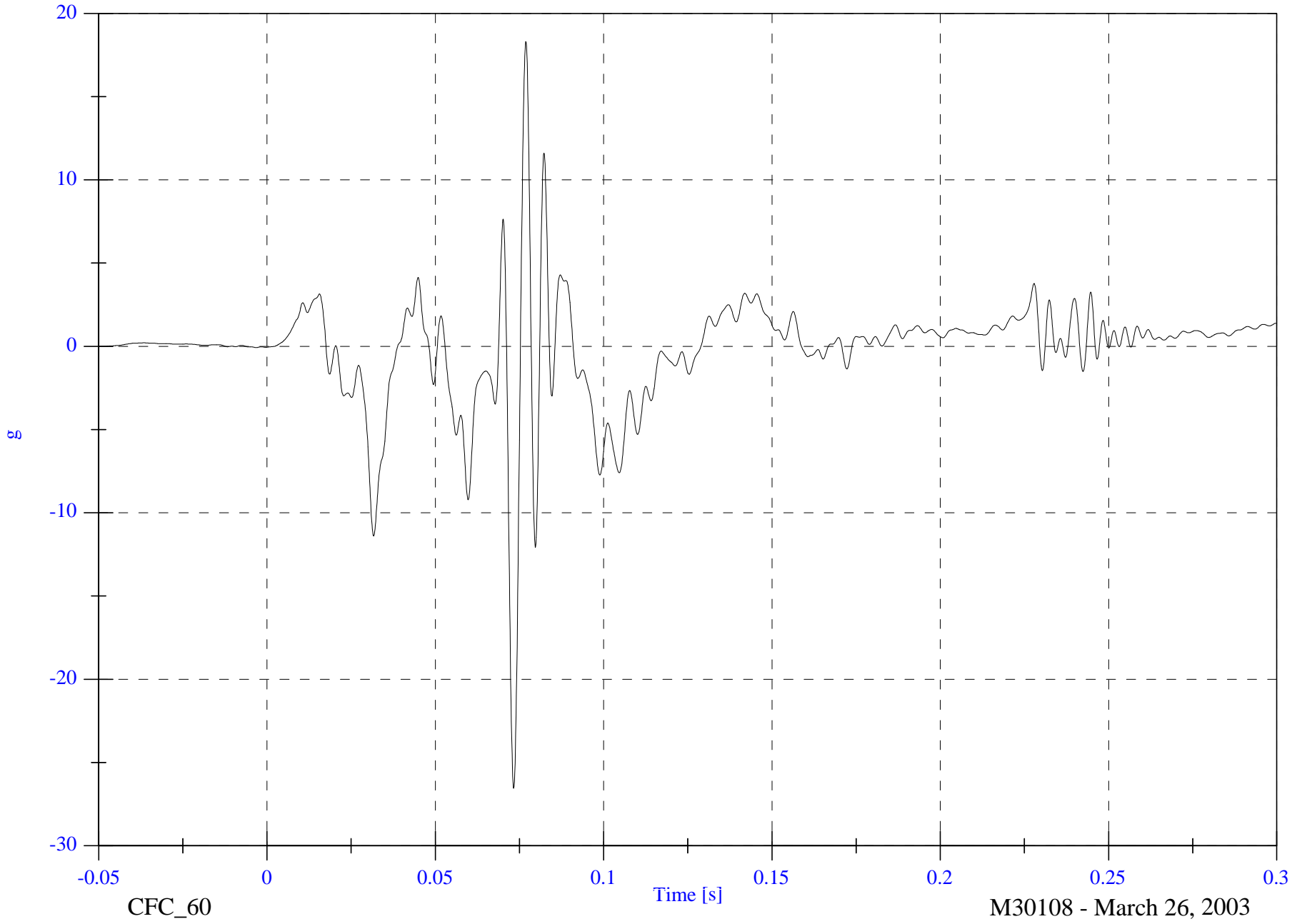
V1 Left Rear #8z

Max: 18.3 [g] at 0.077 [s]

Min: -26.6 [g] at 0.073 [s]

B-137

8642-NCAP-36

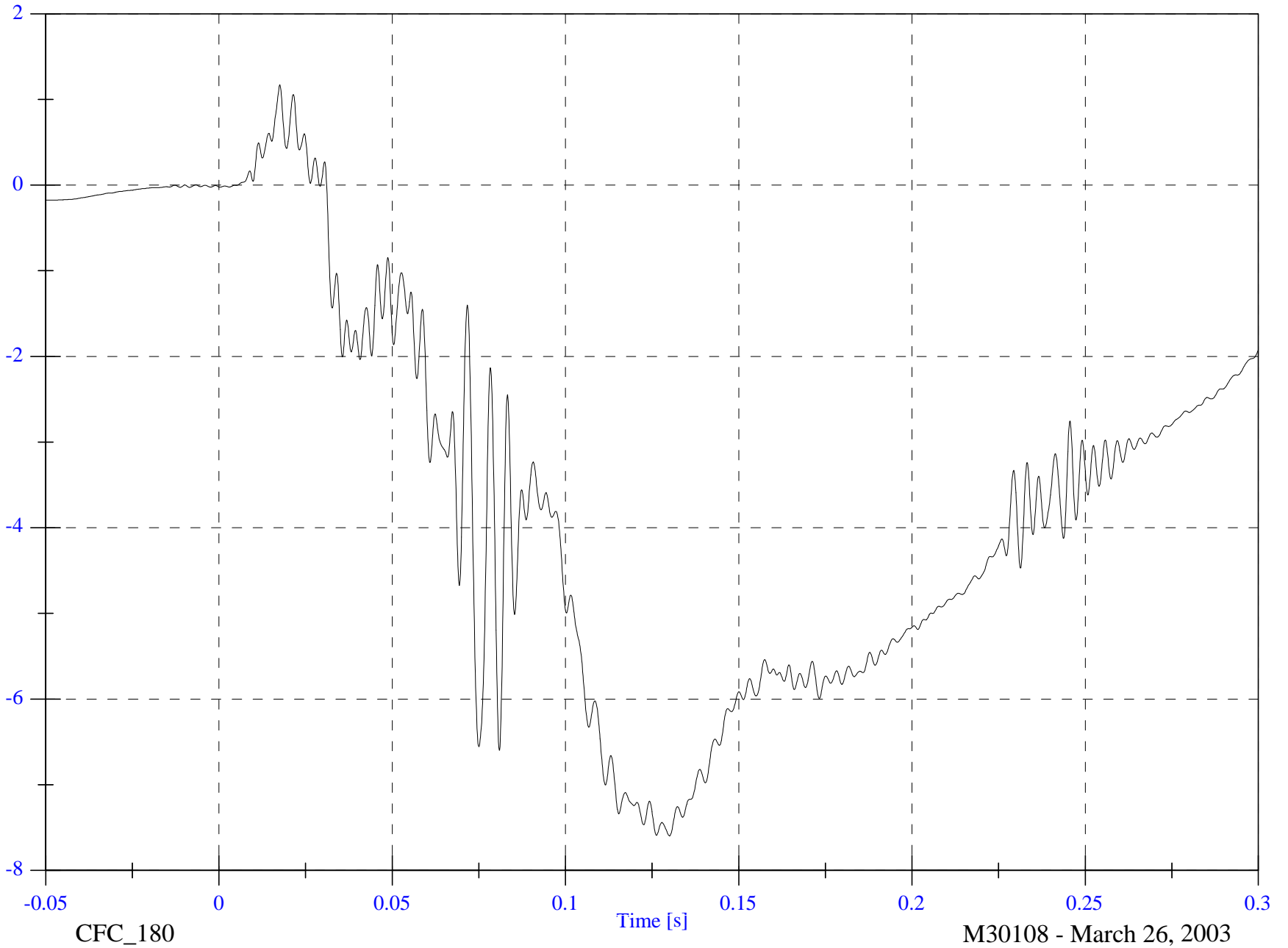


NCAP Test #14 - 2003 Chevrolet Suburban

V1 Left Rear #8z Velocity

Max: 1.2 [kph] at 0.018 [s]

Min: -7.6 [kph] at 0.130 [s]



B-138

8642-NCAP-36

CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

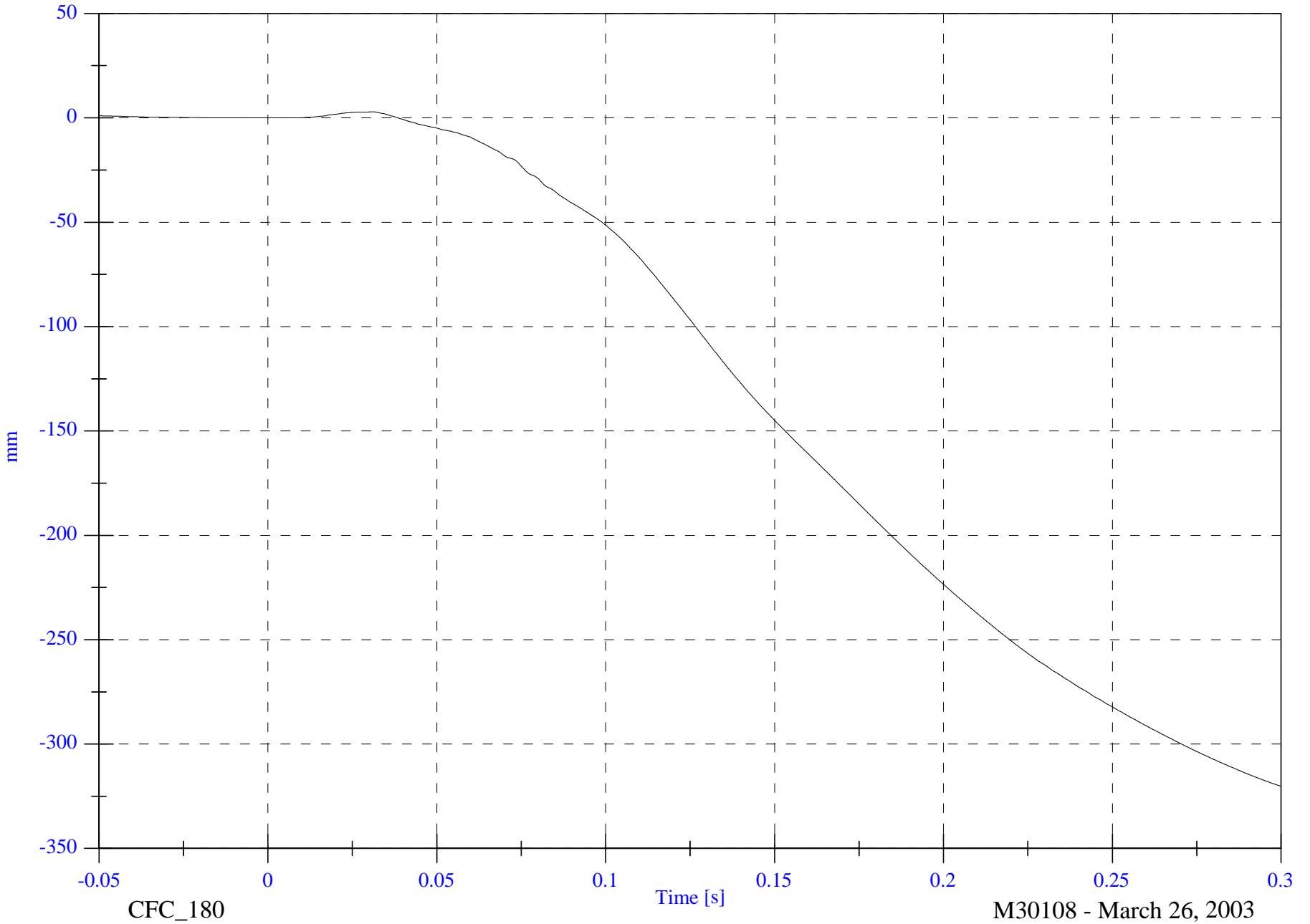
V1 Left Rear #8z Displacement

Max: 2.9 [mm] at 0.031 [s]

Min: -320.2 [mm] at 0.300 [s]

B-139

8642-NCAP-36



CFC\_180

Time [s]

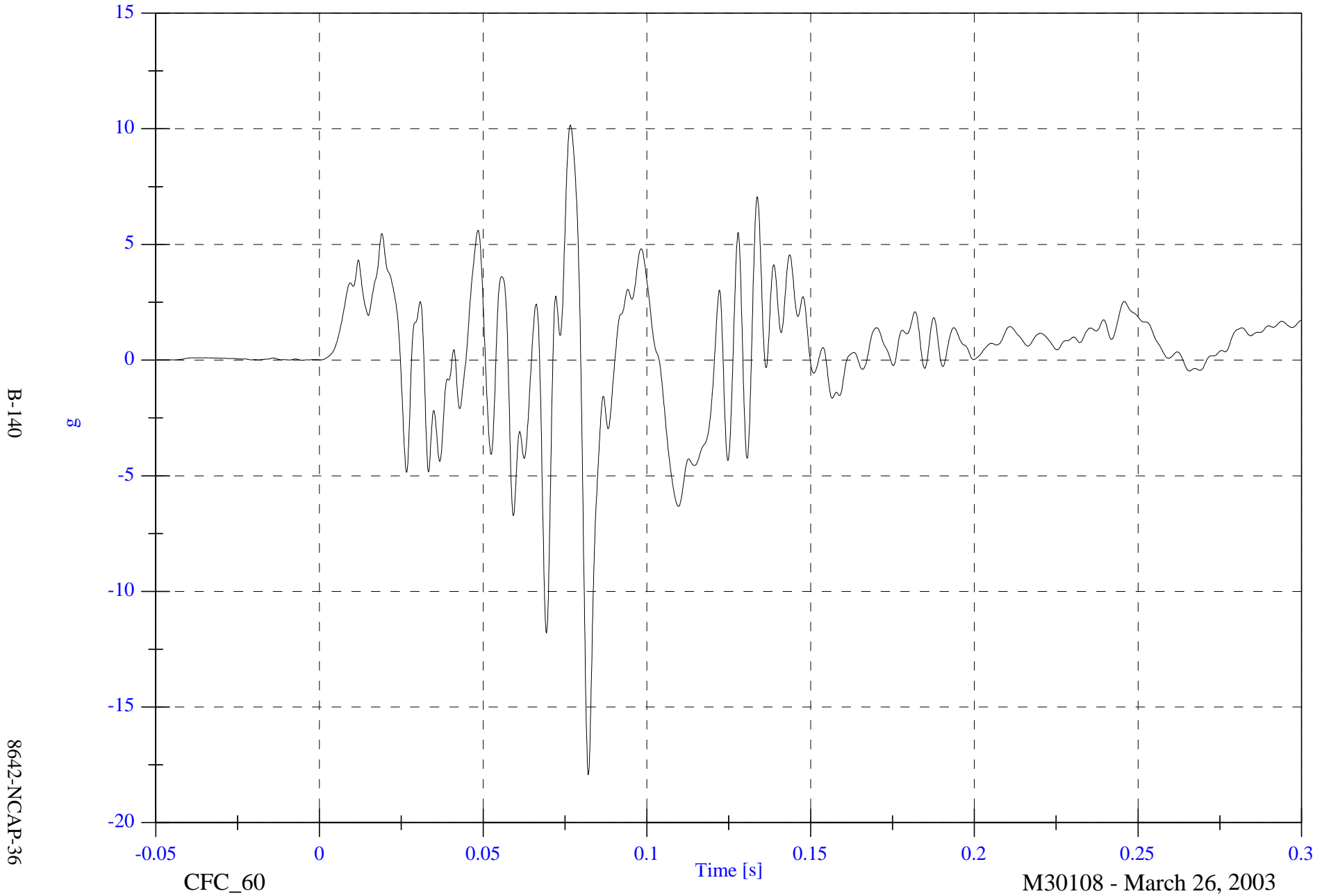
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1 Right Rear #9z

Max: 10.2 [g] at 0.077 [s]

Min: -17.9 [g] at 0.082 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

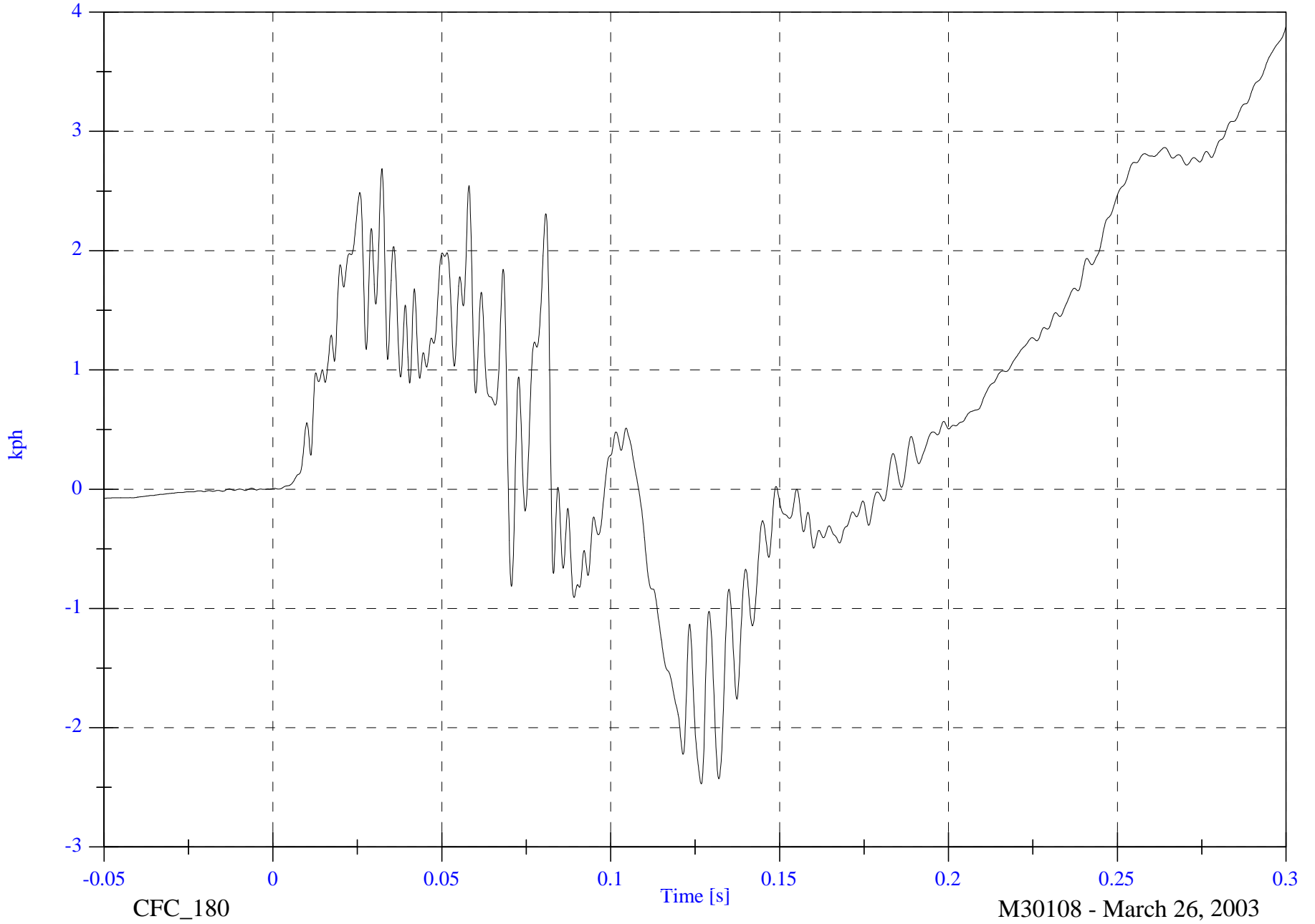
V1 Right Rear #9z Velocity

Max: 3.9 [kph] at 0.300 [s]

Min: -2.5 [kph] at 0.127 [s]

B-141

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

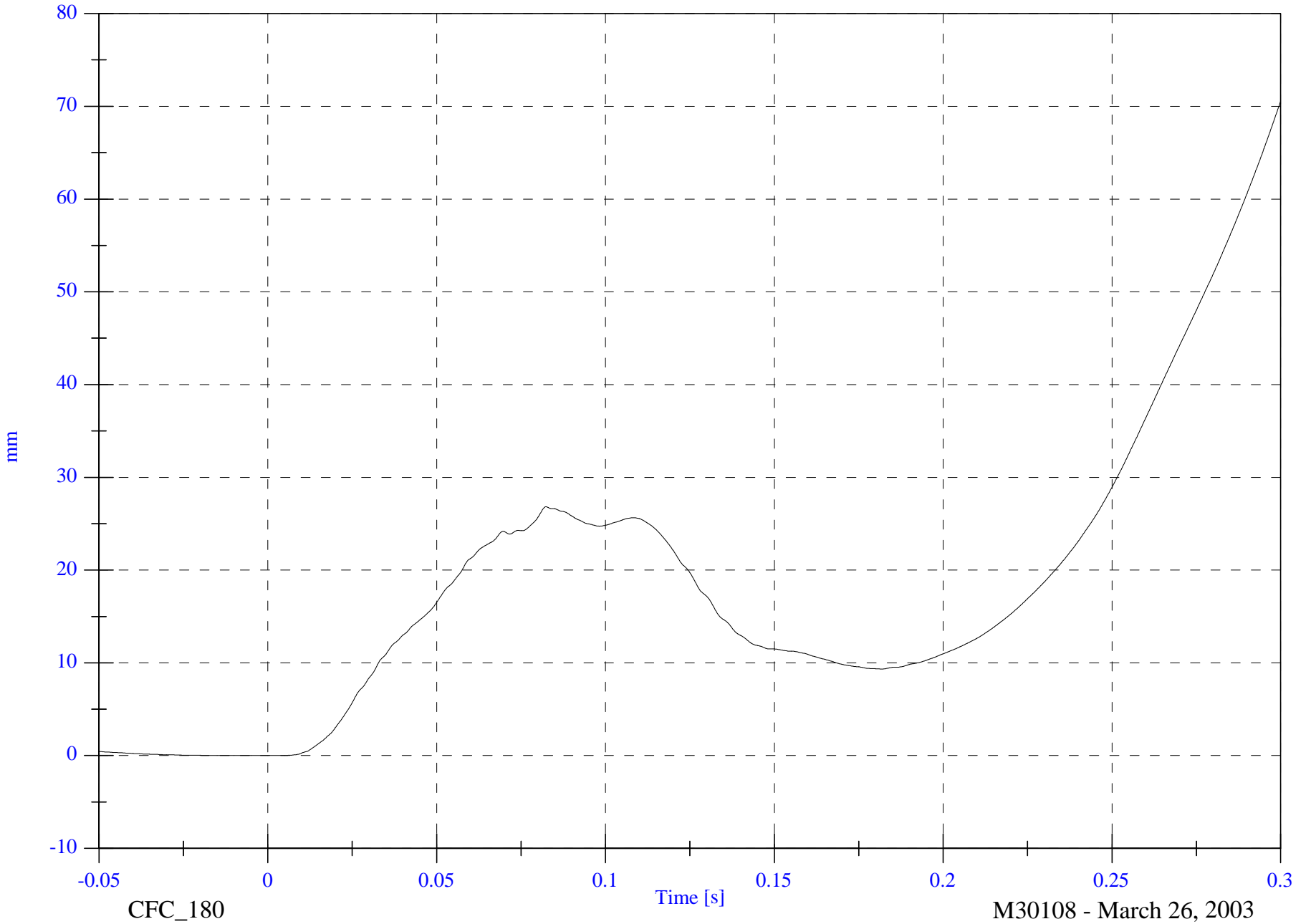
V1 Right Rear #9z Displacement

Max: 70.5 [mm] at 0.300 [s]

Min: -0.0 [mm] at -0.007 [s]

B-142

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

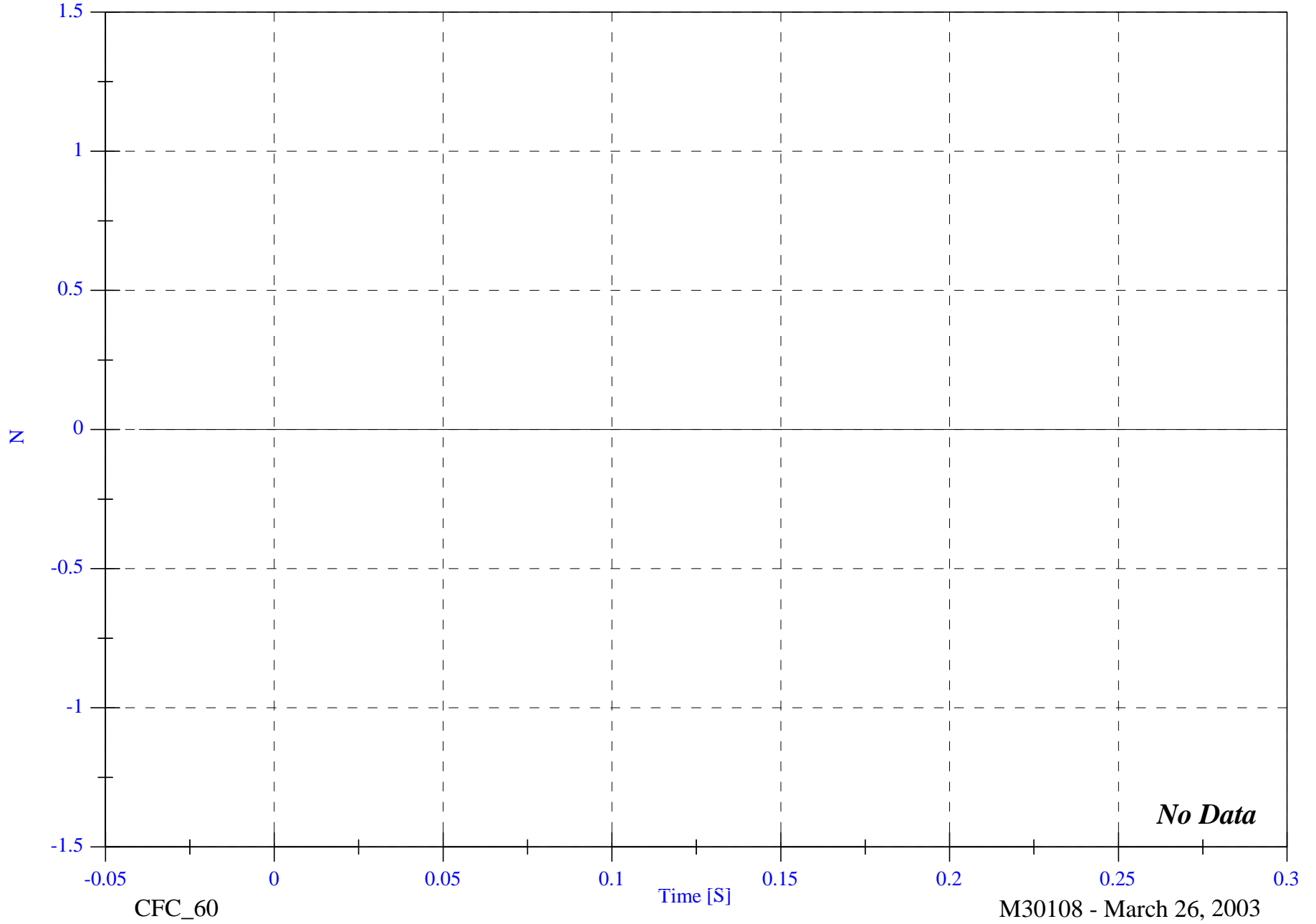
Barrier Load Cell A1 Fx

Max: 0.0 [N] at -0.040 [S]

Min: 0.0 [N] at -0.040 [S]

B-143

8642-NCAP-36

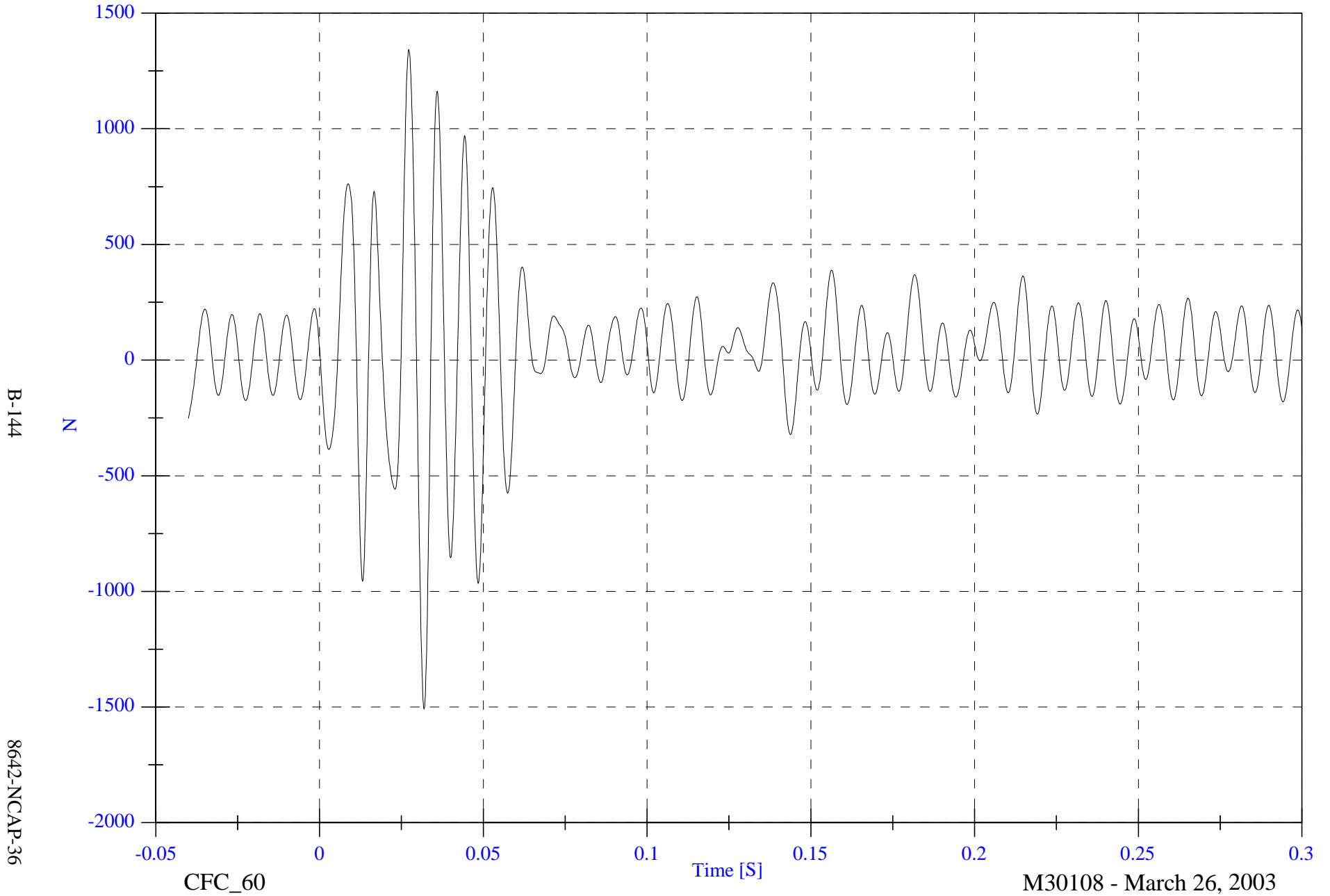


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A2 Fx

Max: 1342.1 [N] at 0.027 [S]

Min: -1509.2 [N] at 0.032 [S]

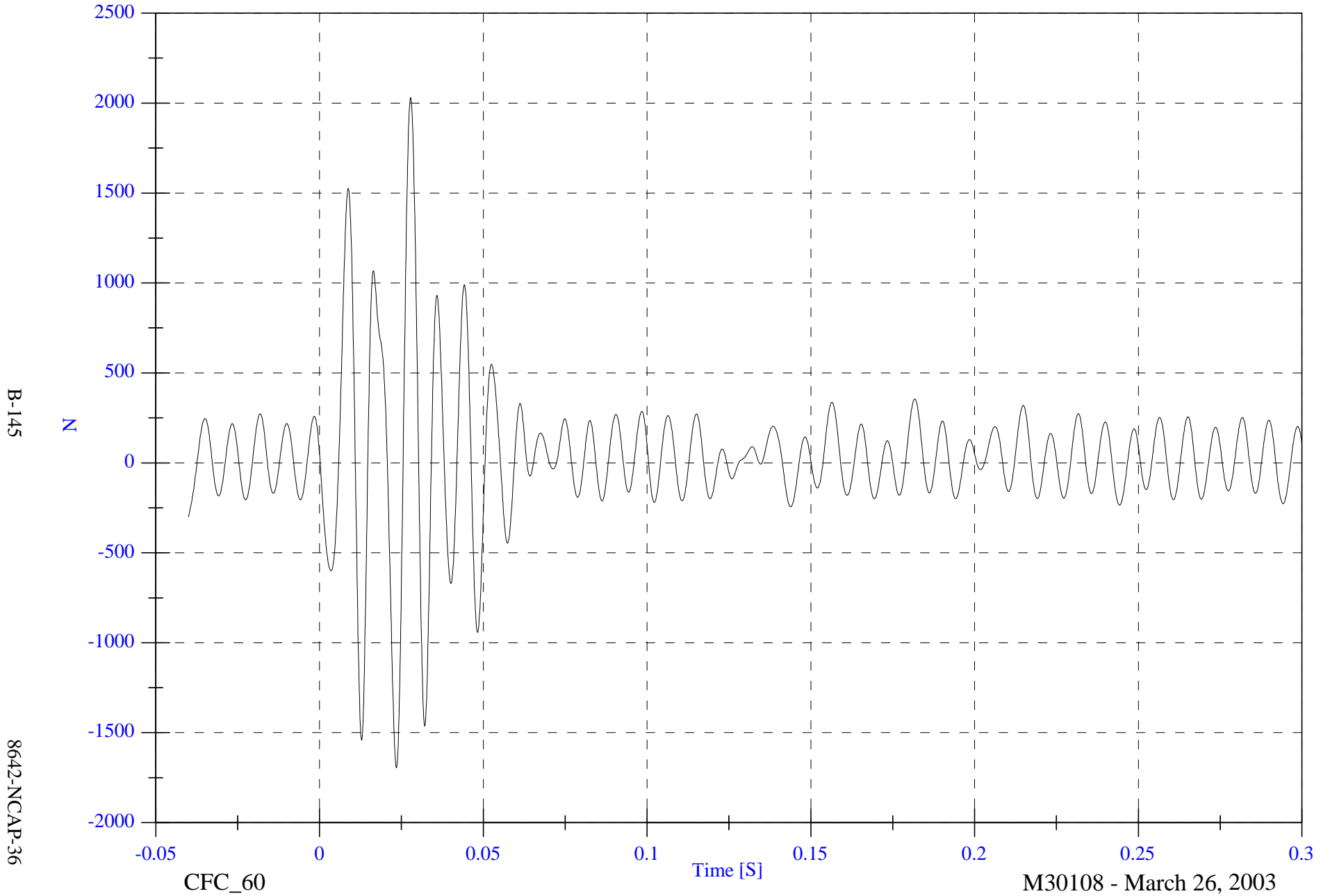


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A3 Fx

Max: 2030.6 [N] at 0.028 [S]

Min: -1695.4 [N] at 0.023 [S]



B-145

8642-NCAP-36

CFC\_60

Time [S]

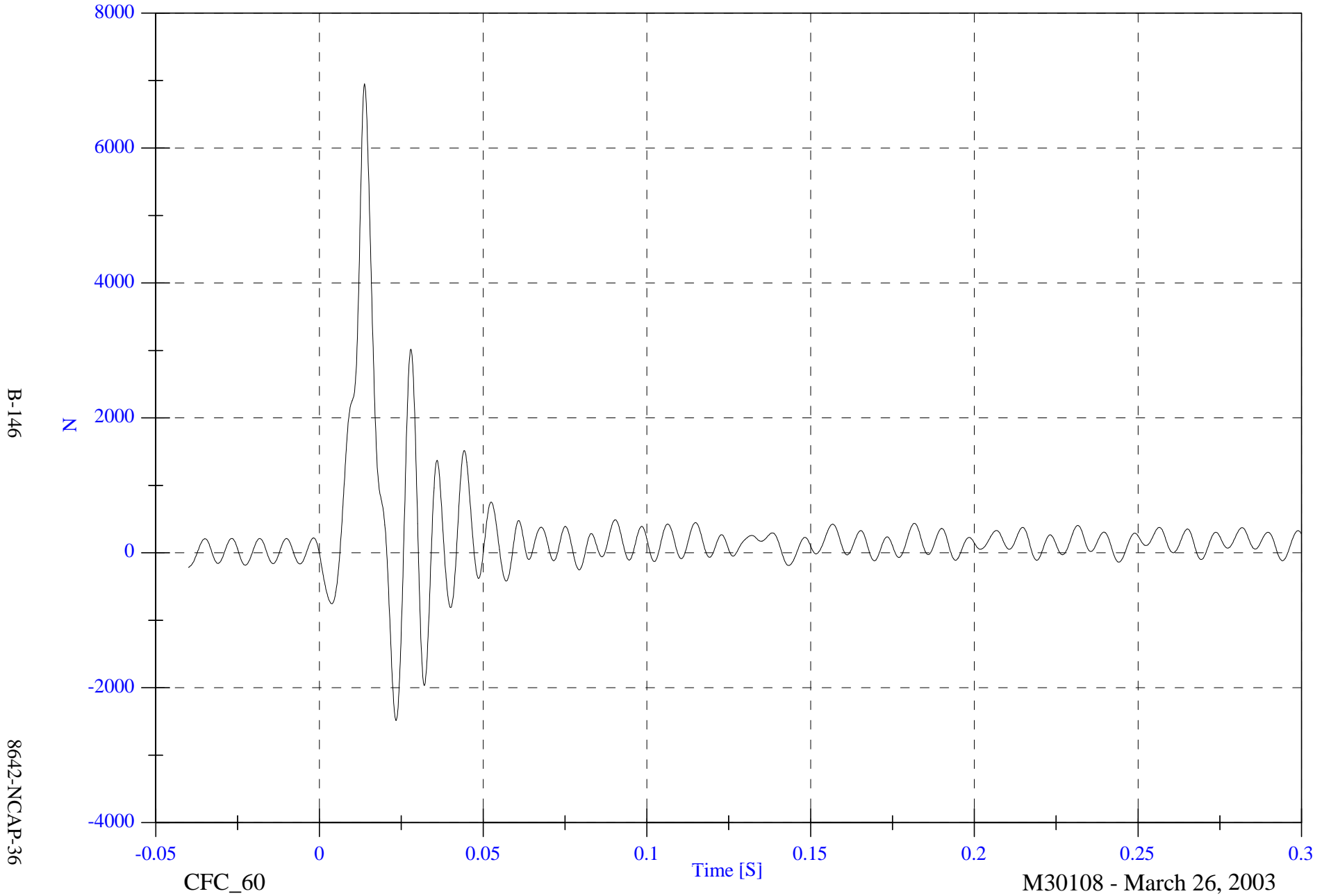
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A4 Fx

Max: 6950.8 [N] at 0.014 [S]

Min: -2484.9 [N] at 0.023 [S]

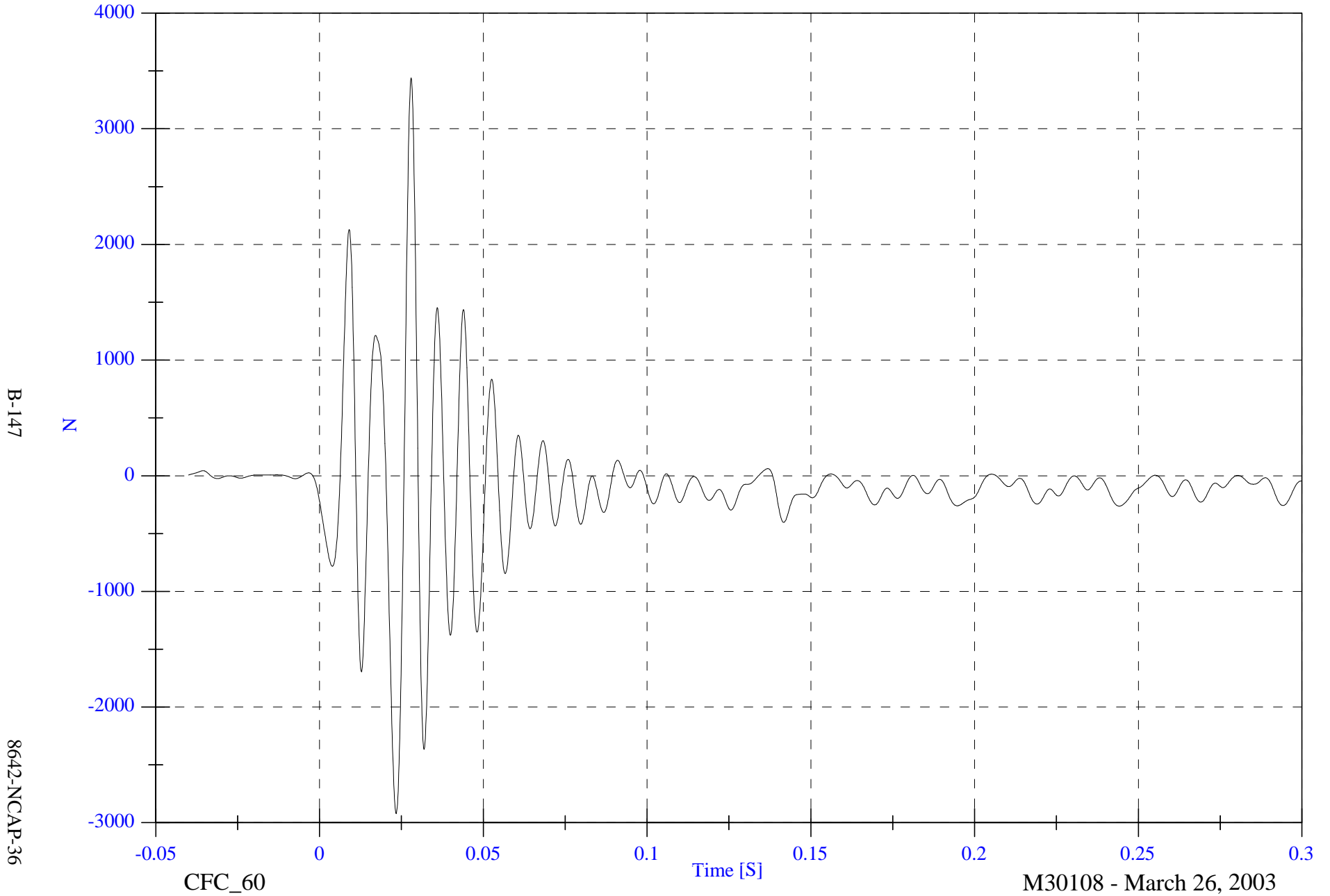


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A5 Fx

Max: 3439.6 [N] at 0.028 [S]

Min: -2921.8 [N] at 0.023 [S]



B-147

8642-NCAP-36

CFC\_60

Time [S]

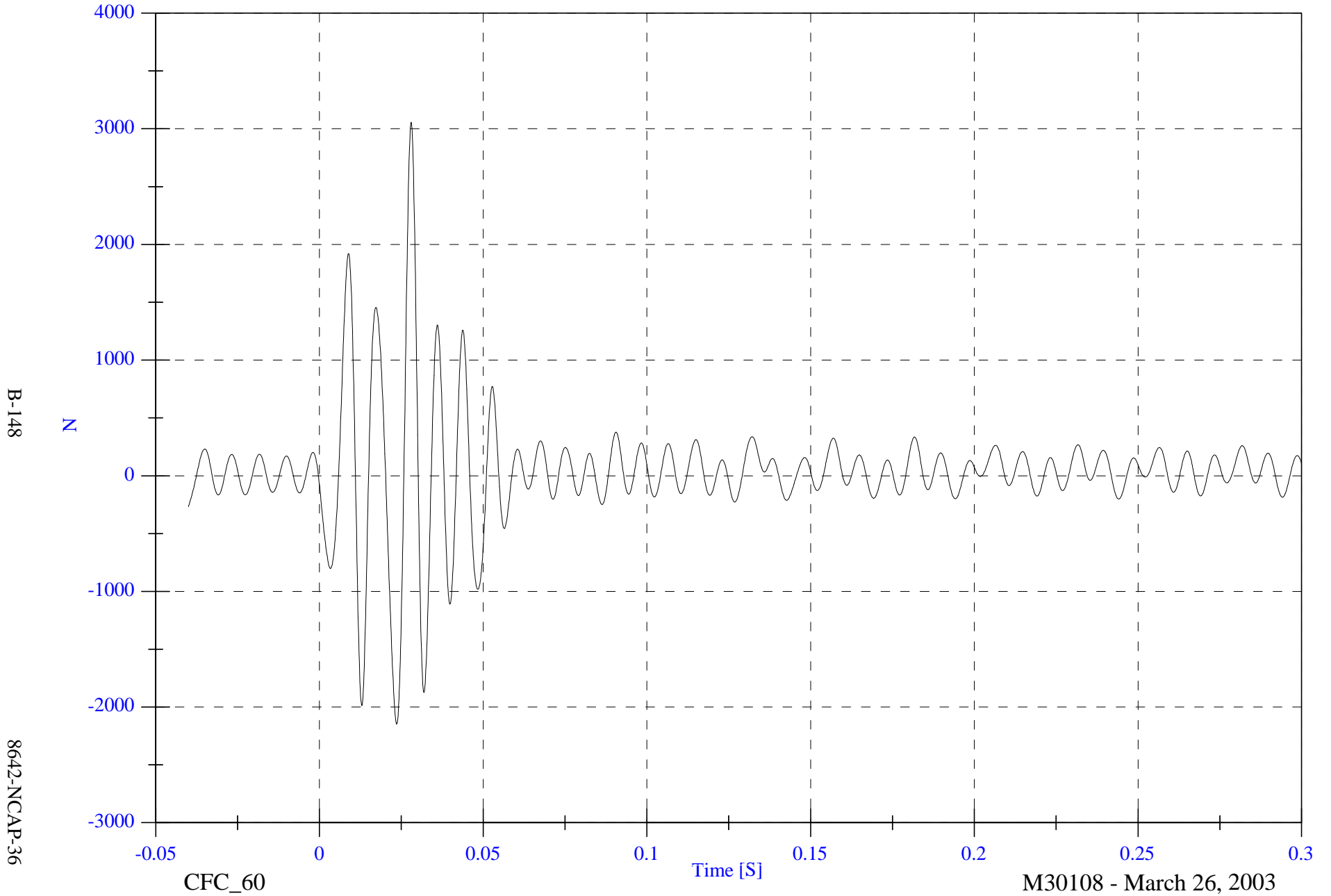
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A6 Fx

Max: 3056.1 [N] at 0.028 [S]

Min: -2148.1 [N] at 0.024 [S]



B-148

8642-NCAP-36

CFC\_60

Time [S]

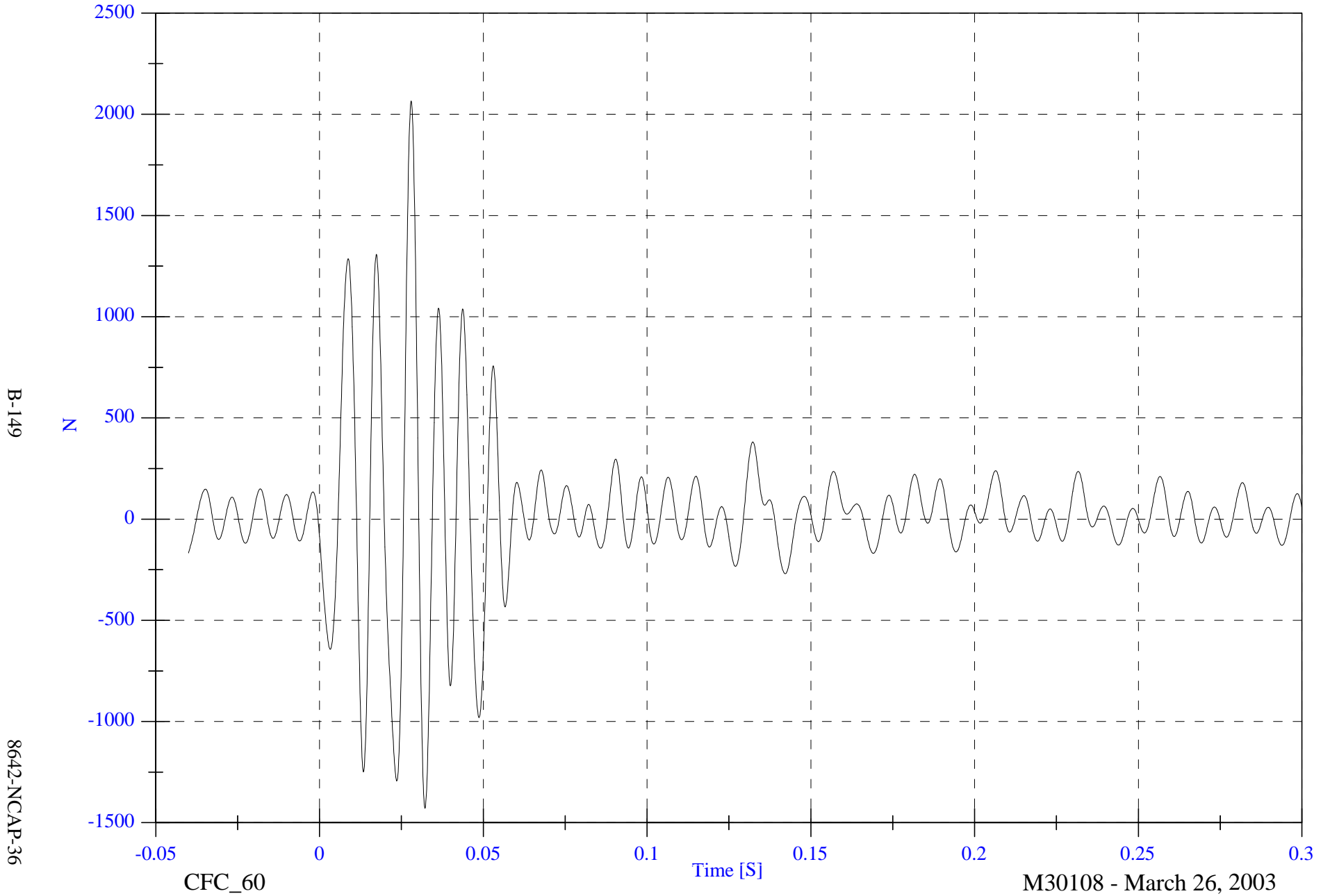
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A7 Fx

Max: 2066.1 [N] at 0.028 [S]

Min: -1429.1 [N] at 0.032 [S]



B-149

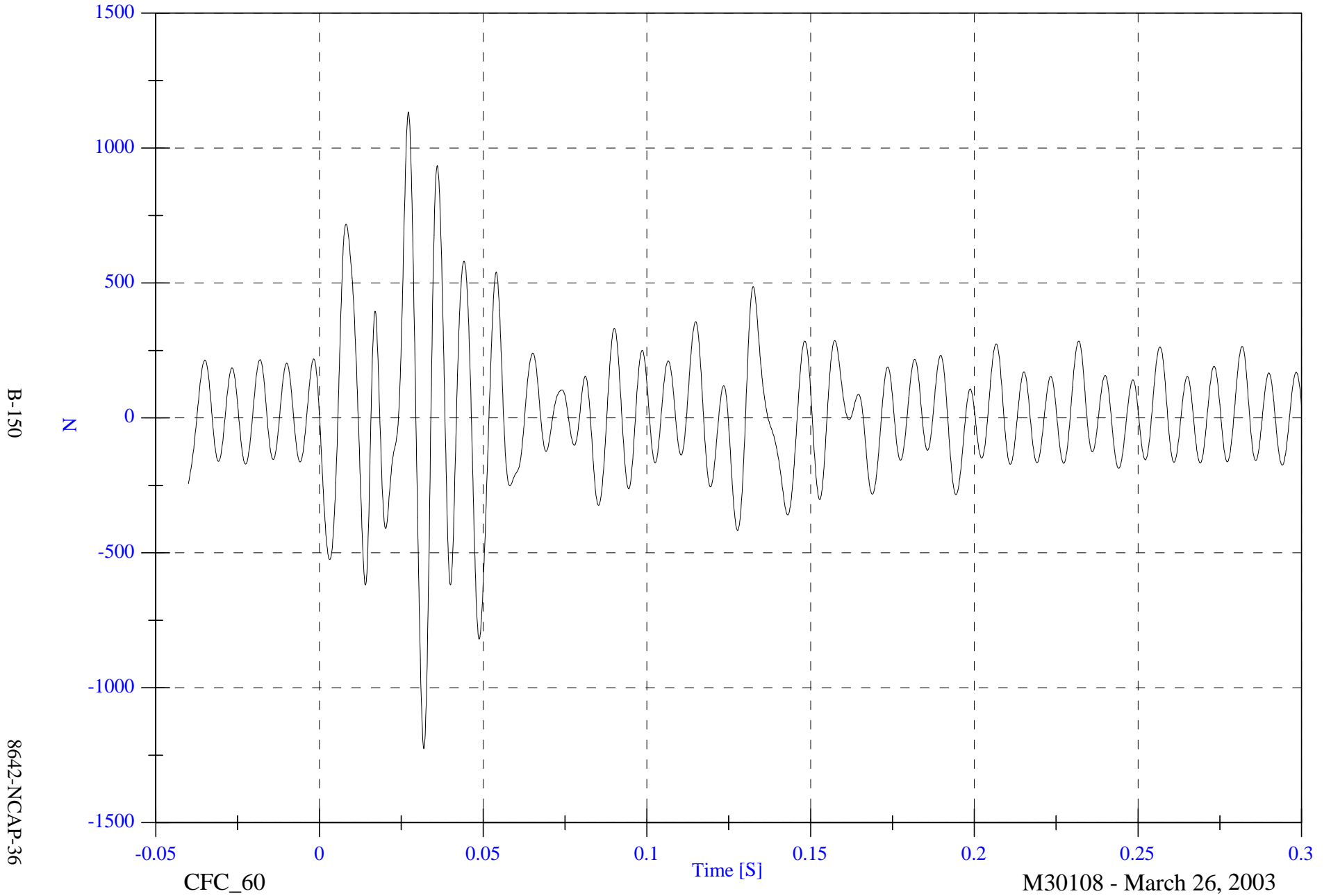
8642-NCAP-36

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A8 Fx

Max: 1134.3 [N] at 0.027 [S]

Min: -1226.3 [N] at 0.032 [S]

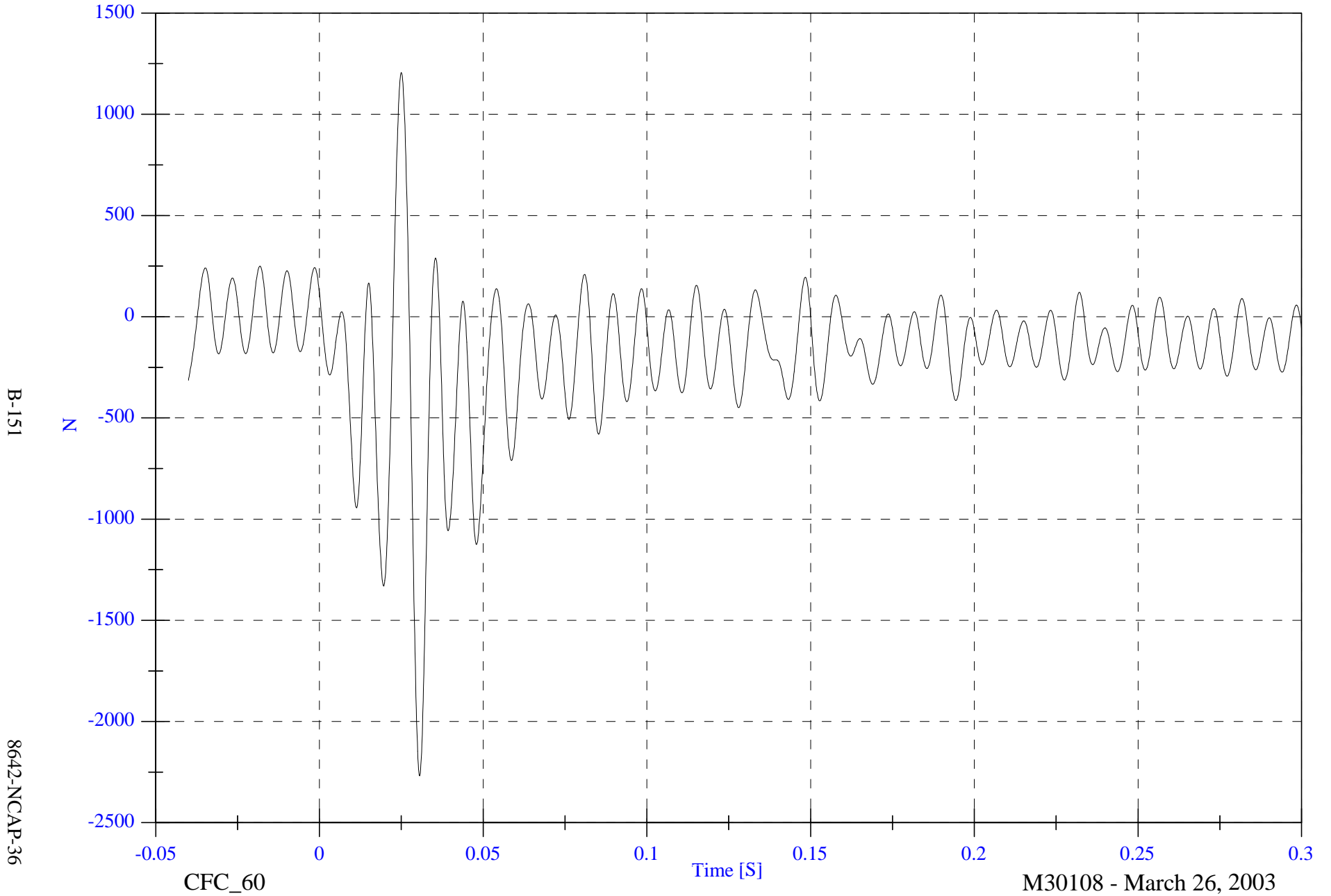


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell A9 Fx

Max: 1207.2 [N] at 0.025 [S]

Min: -2268.8 [N] at 0.031 [S]

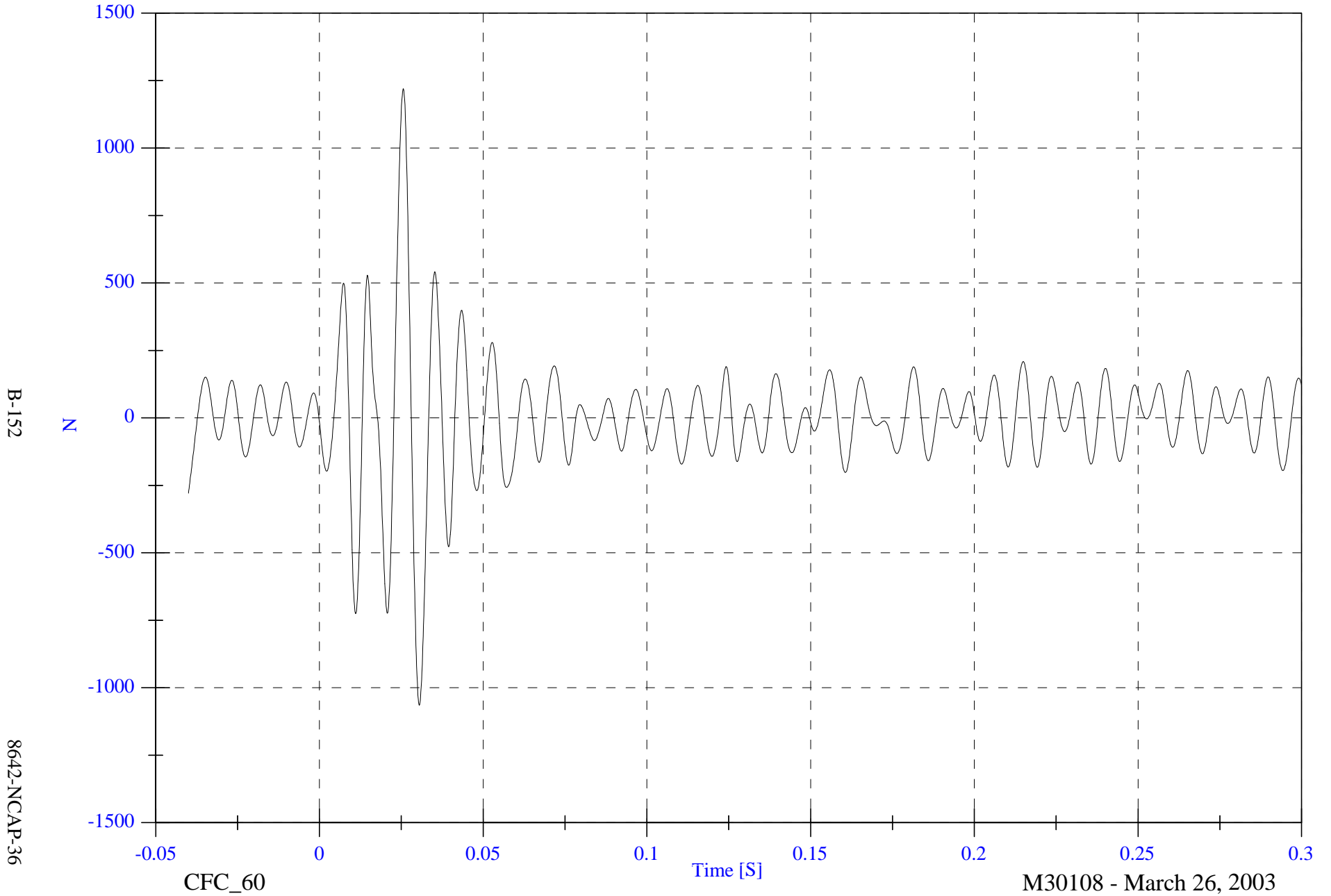


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell B1 Fx

Max: 1220.2 [N] at 0.026 [S]

Min: -1065.1 [N] at 0.030 [S]



B-152

8642-NCAP-36

CFC\_60

Time [S]

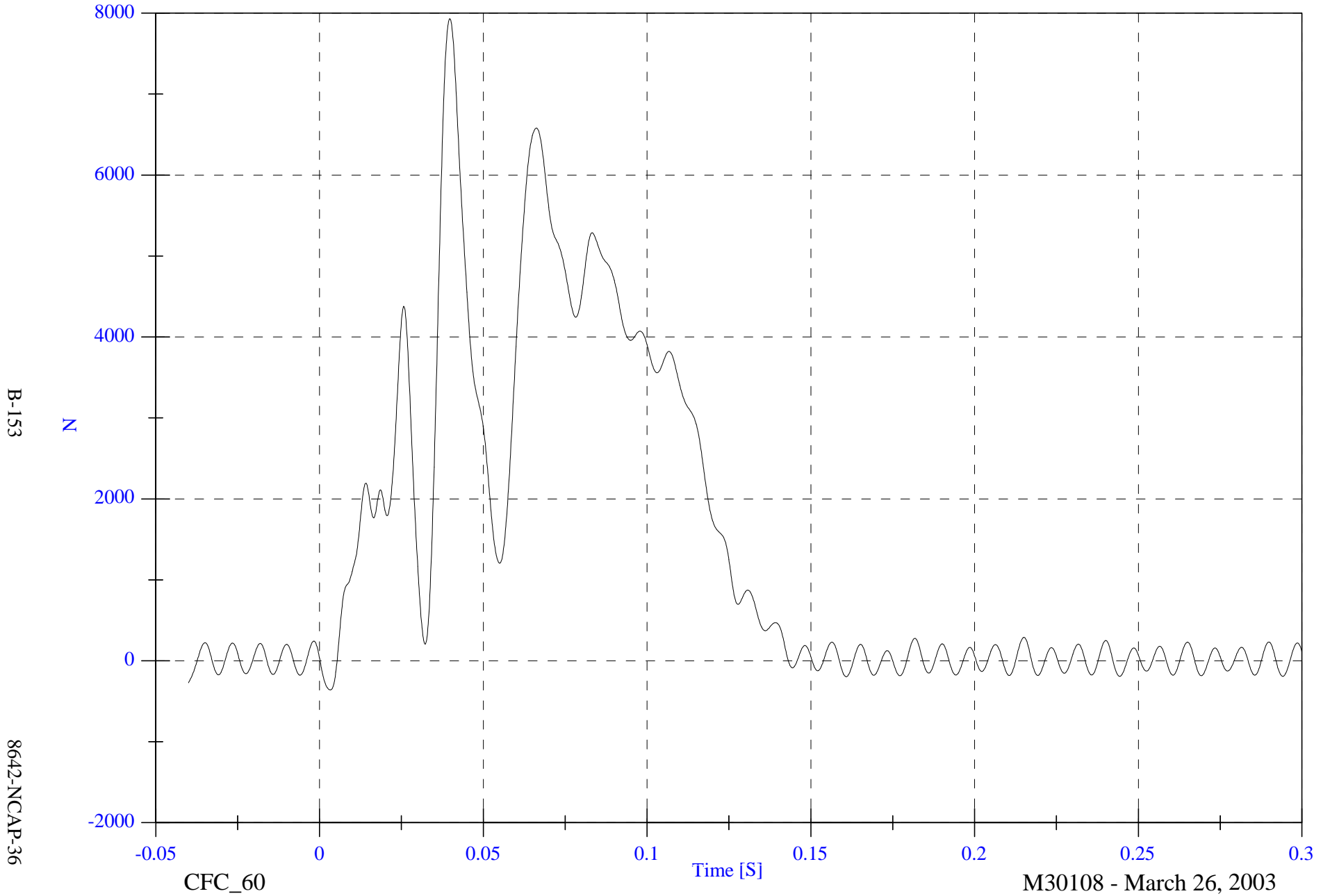
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 7931.4 [N] at 0.040 [S]

Barrier Load Cell B2 Fx

Min: -359.9 [N] at 0.003 [S]



B-153

8642-NCAP-36

CFC\_60

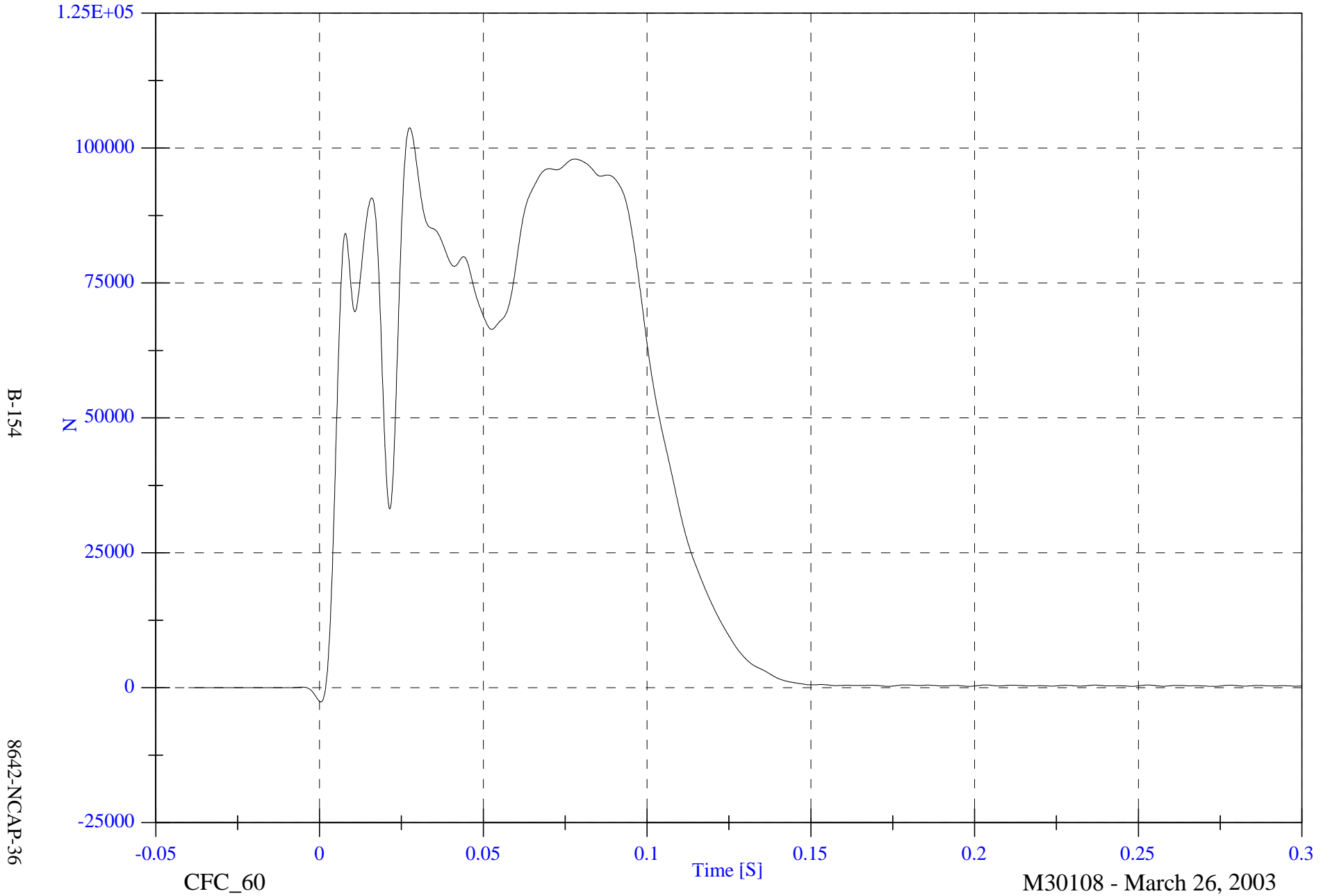
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 103751.3 [N] at 0.027 [S]

Barrier Load Cell B3 Fx

Min: -2645.0 [N] at 0.000 [S]



B-154

8642-NCAP-36

CFC\_60

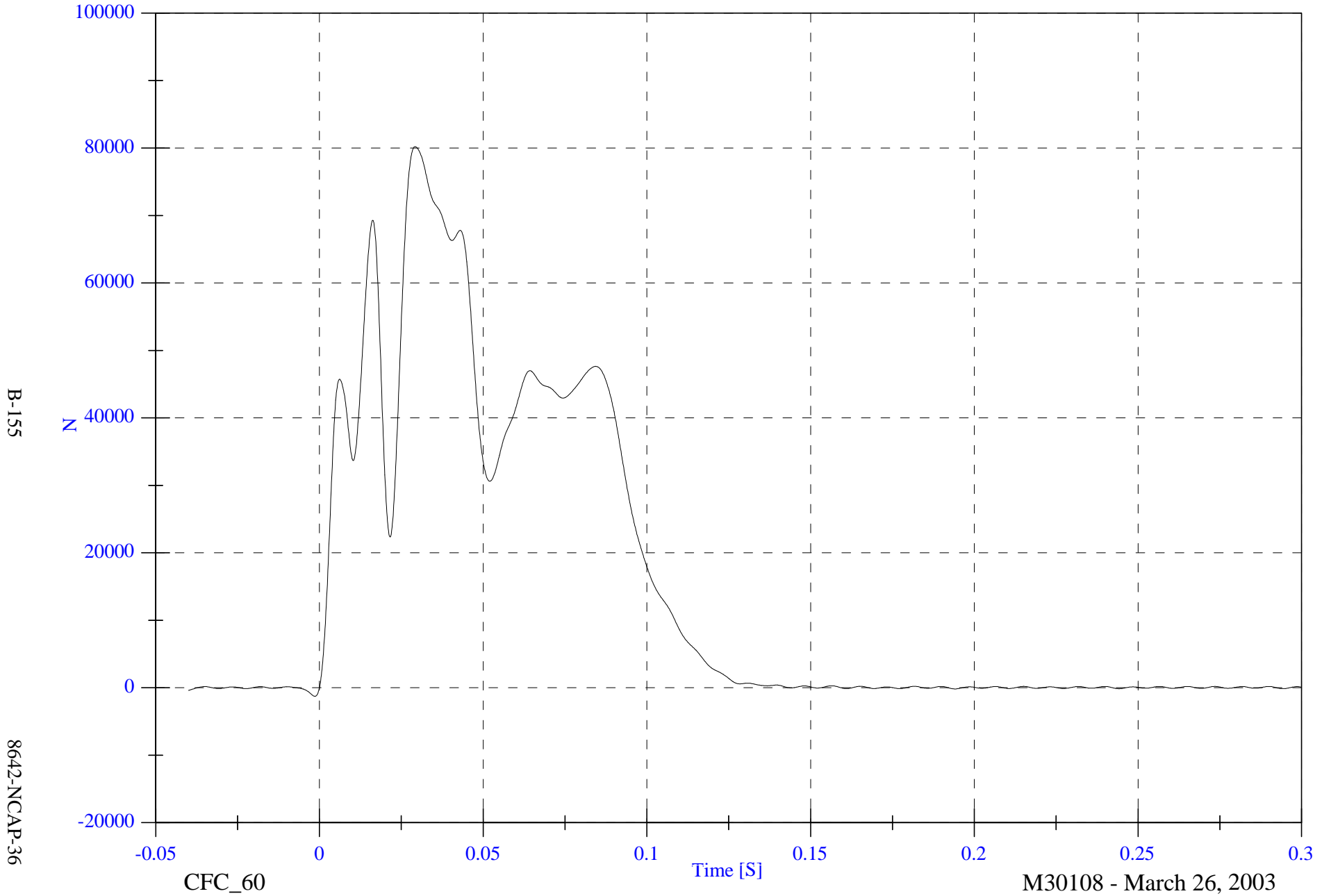
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 80207.3 [N] at 0.029 [S]

Barrier Load Cell B4 Fx

Min: -1267.5 [N] at -0.001 [S]

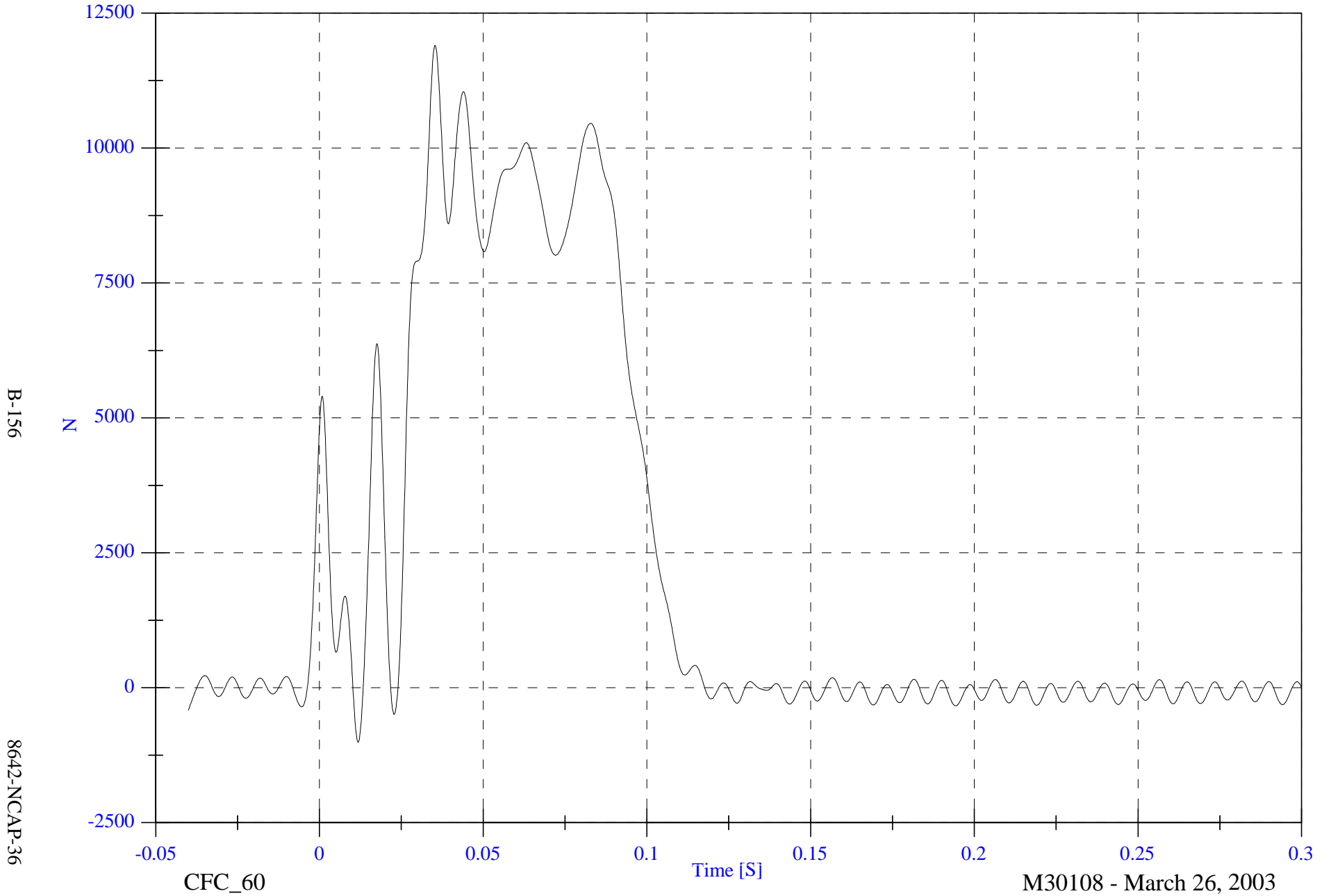


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 11904.3 [N] at 0.035 [S]

Barrier Load Cell B5 Fx

Min: -1007.4 [N] at 0.012 [S]

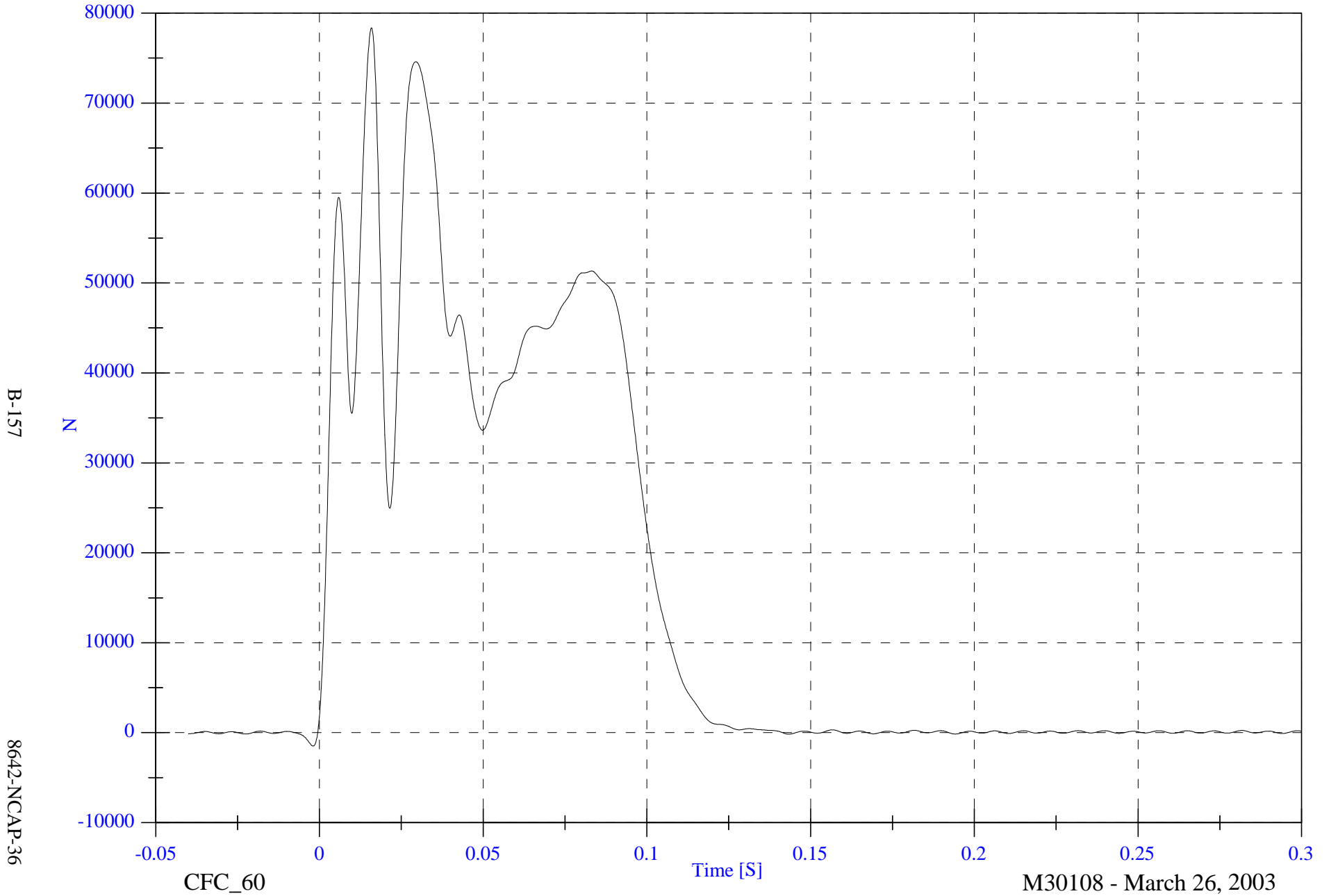


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell B6 Fx

Max: 78370.0 [N] at 0.016 [S]

Min: -1483.7 [N] at -0.002 [S]



B-157

8642-NCAP-36

CFC\_60

Time [S]

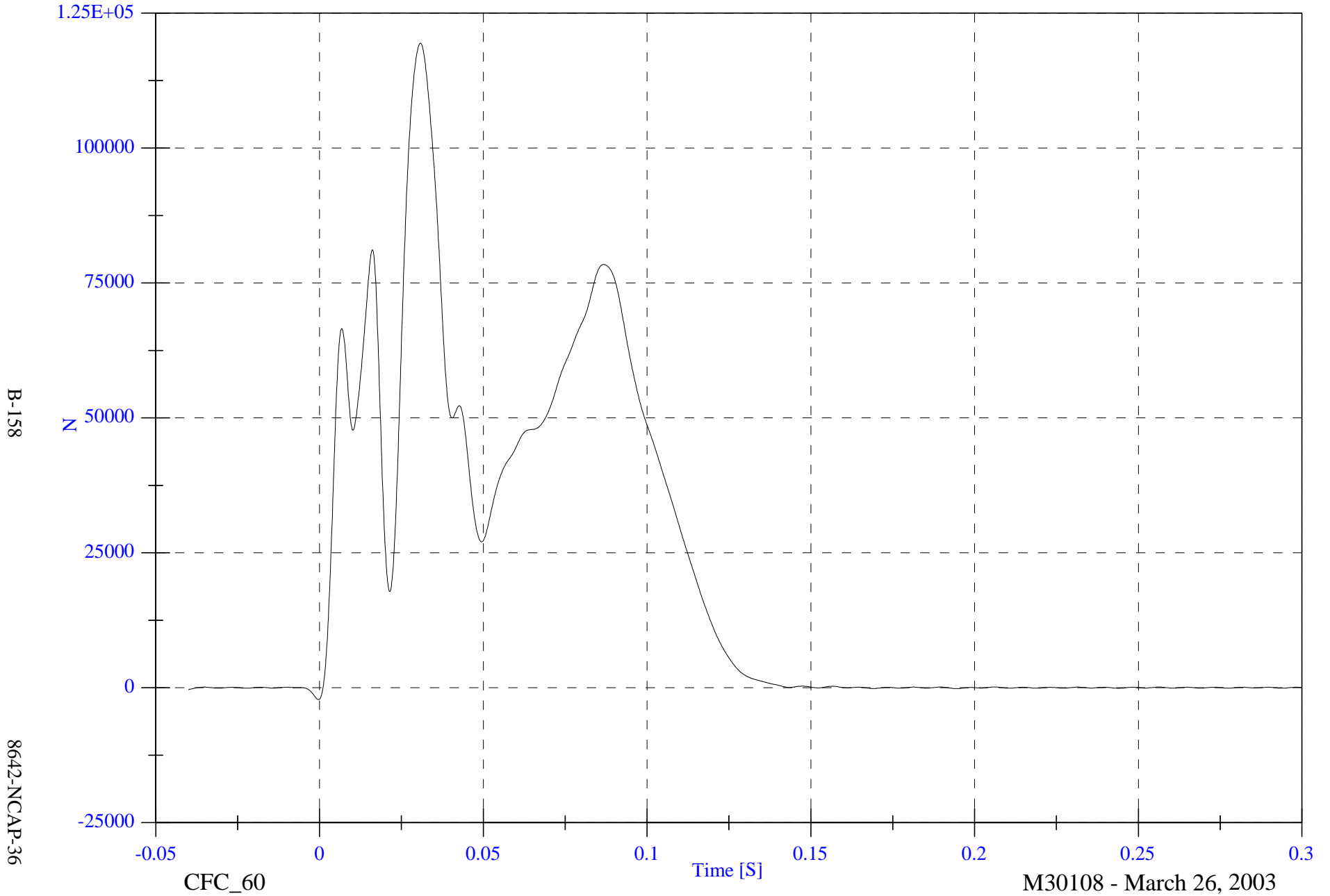
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 119427.8 [N] at 0.031 [S]

Barrier Load Cell B7 Fx

Min: -2176.6 [N] at -0.000 [S]



B-158

8642-NCAP-36

CFC\_60

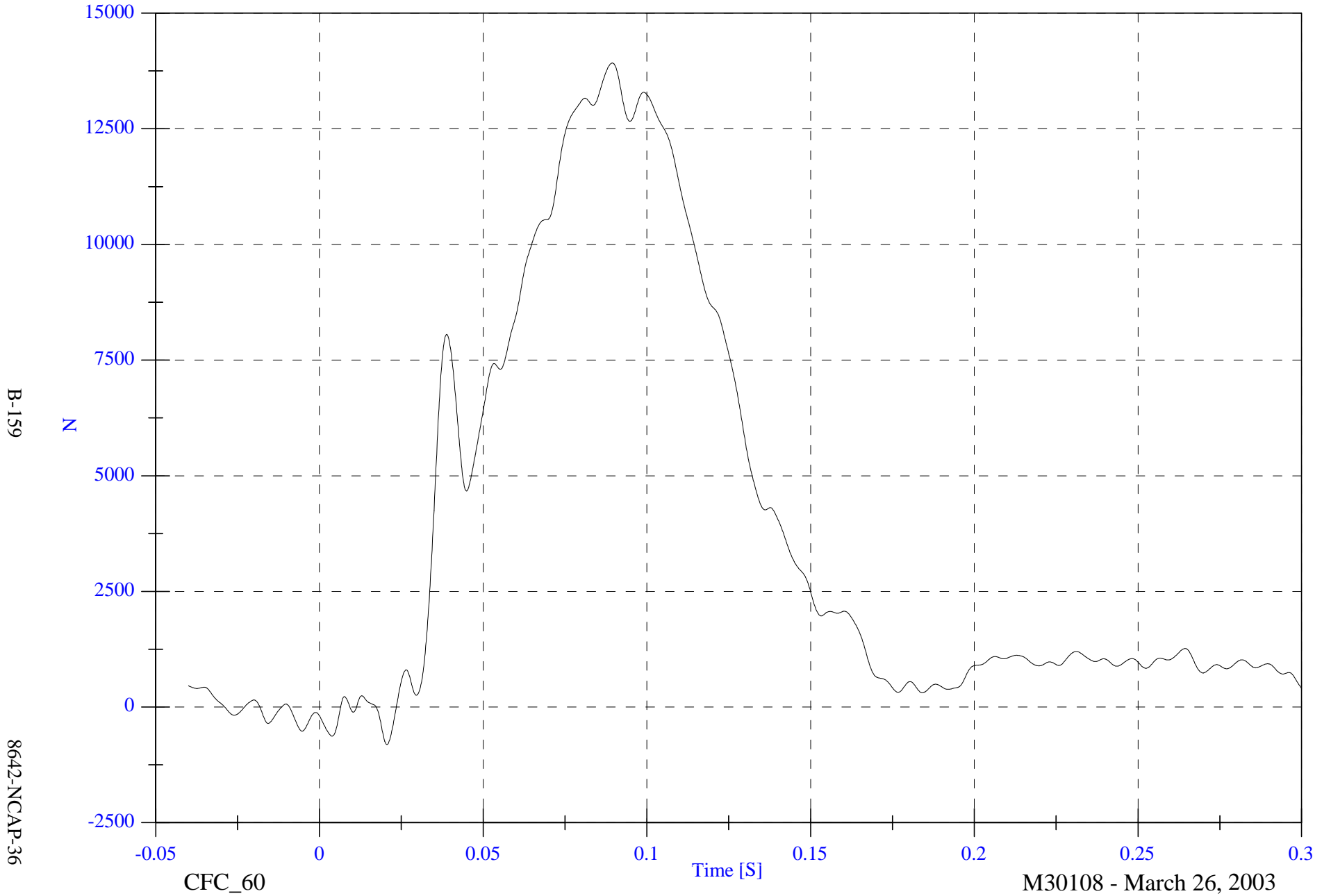
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 13920.7 [N] at 0.089 [S]

Barrier Load Cell B8 Fx

Min: -813.2 [N] at 0.021 [S]



B-159

8642-NCAP-36

CFC\_60

Time [S]

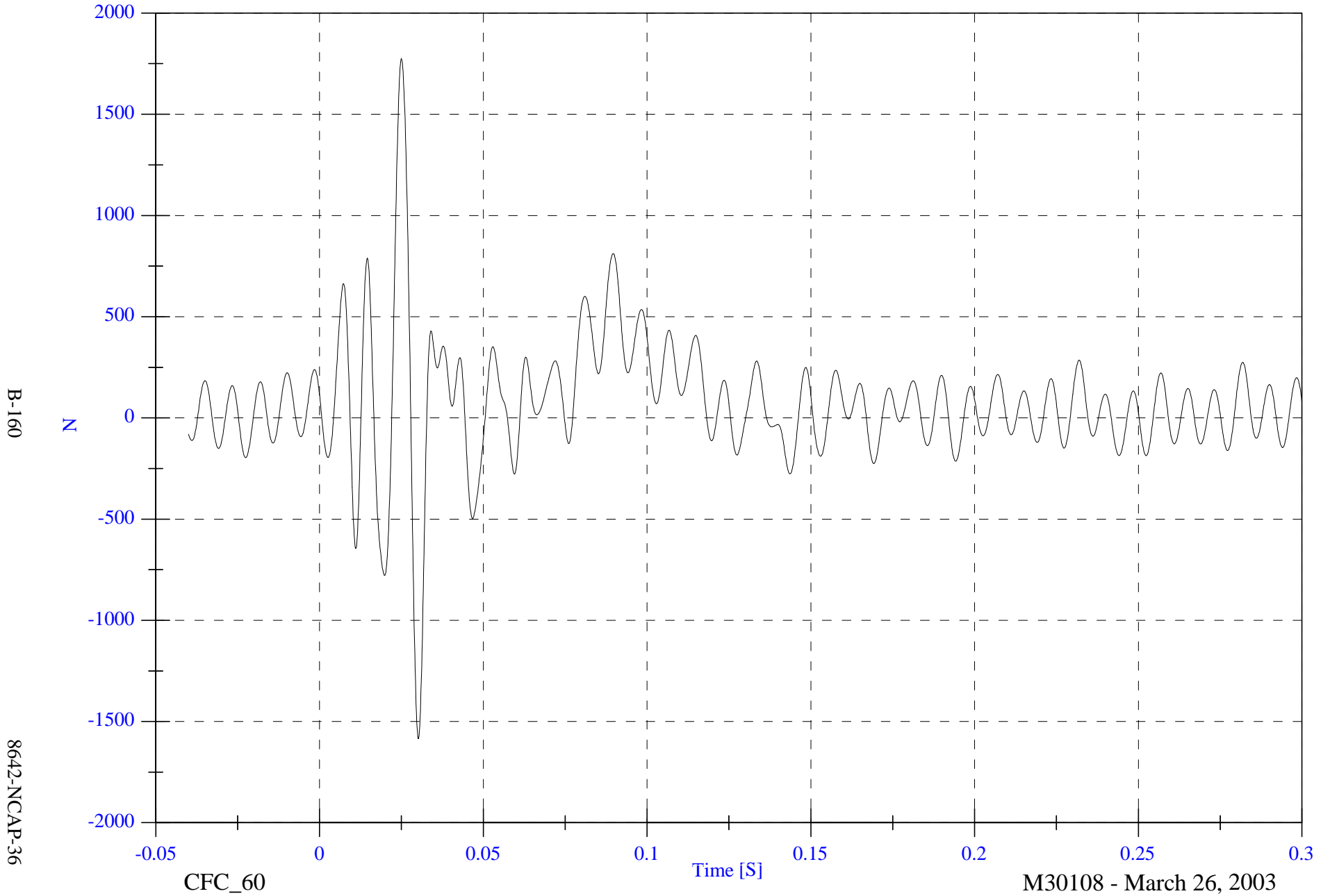
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell B9 Fx

Max: 1775.7 [N] at 0.025 [S]

Min: -1585.9 [N] at 0.030 [S]

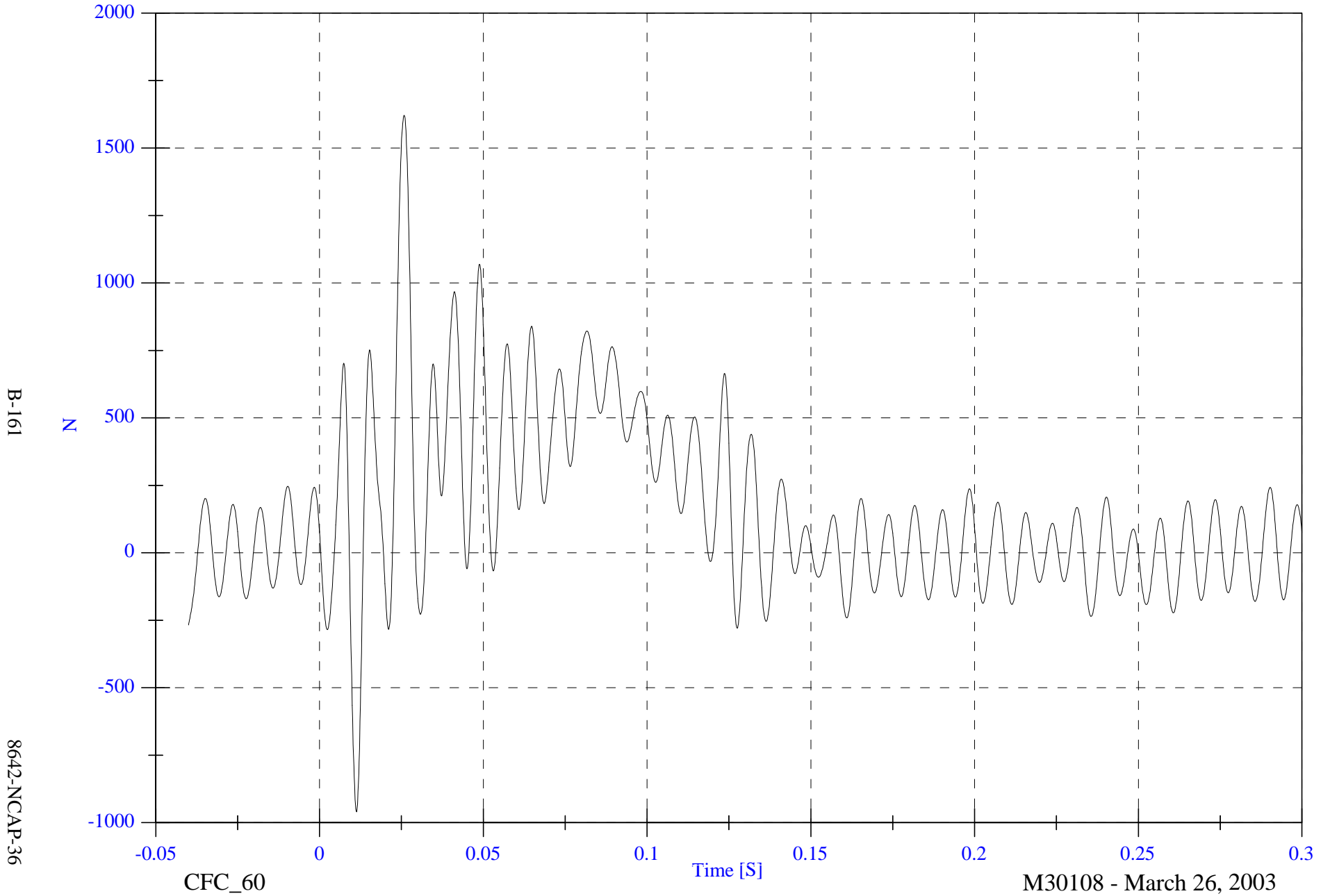


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 1620.7 [N] at 0.026 [S]

Barrier Load Cell C1 Fx

Min: -959.7 [N] at 0.011 [S]



B-161

8642-NCAP-36

CFC\_60

Time [S]

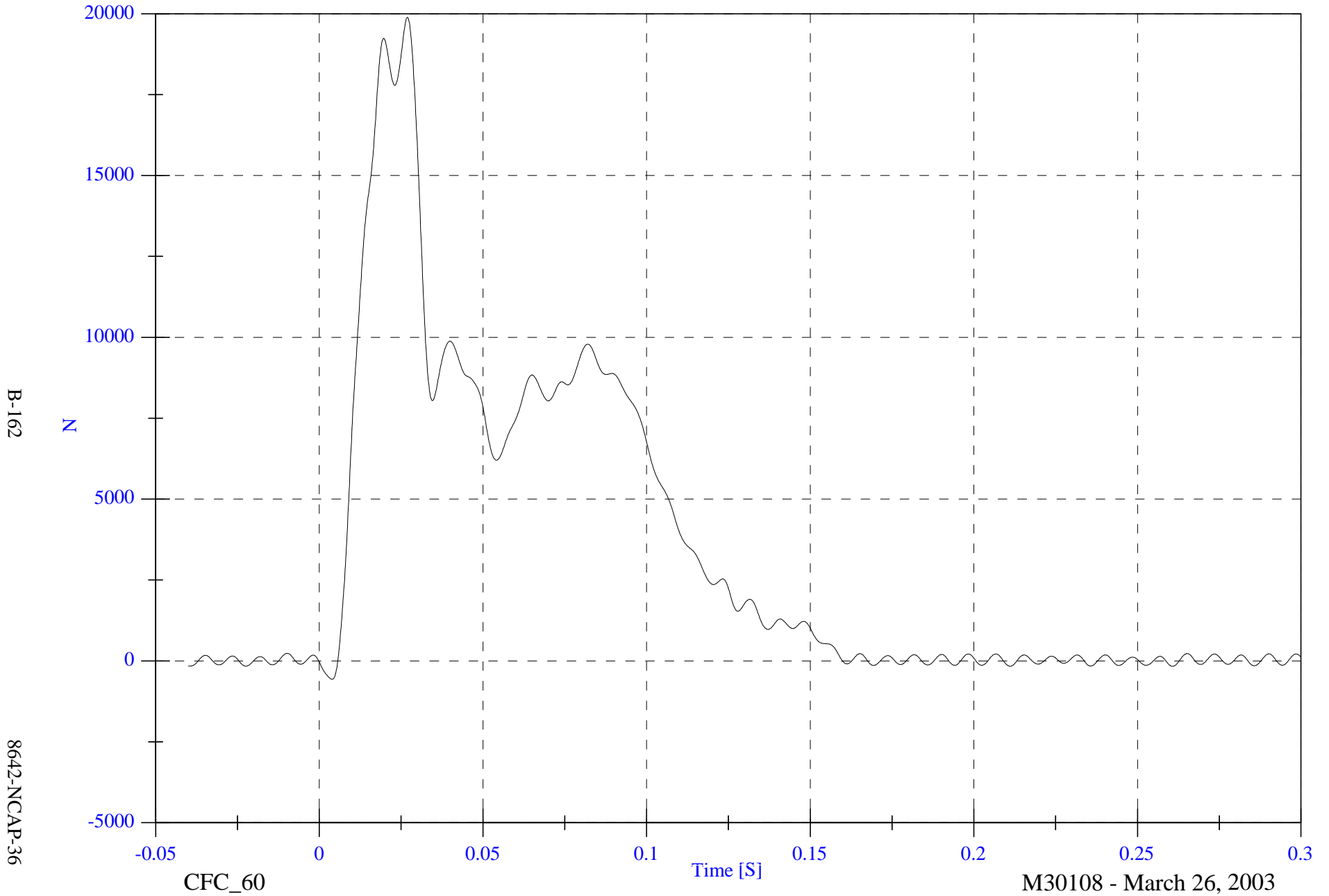
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell C2 Fx

Max: 19891.6 [N] at 0.027 [S]

Min: -565.1 [N] at 0.004 [S]



B-162

8642-NCAP-36

CFC\_60

Time [S]

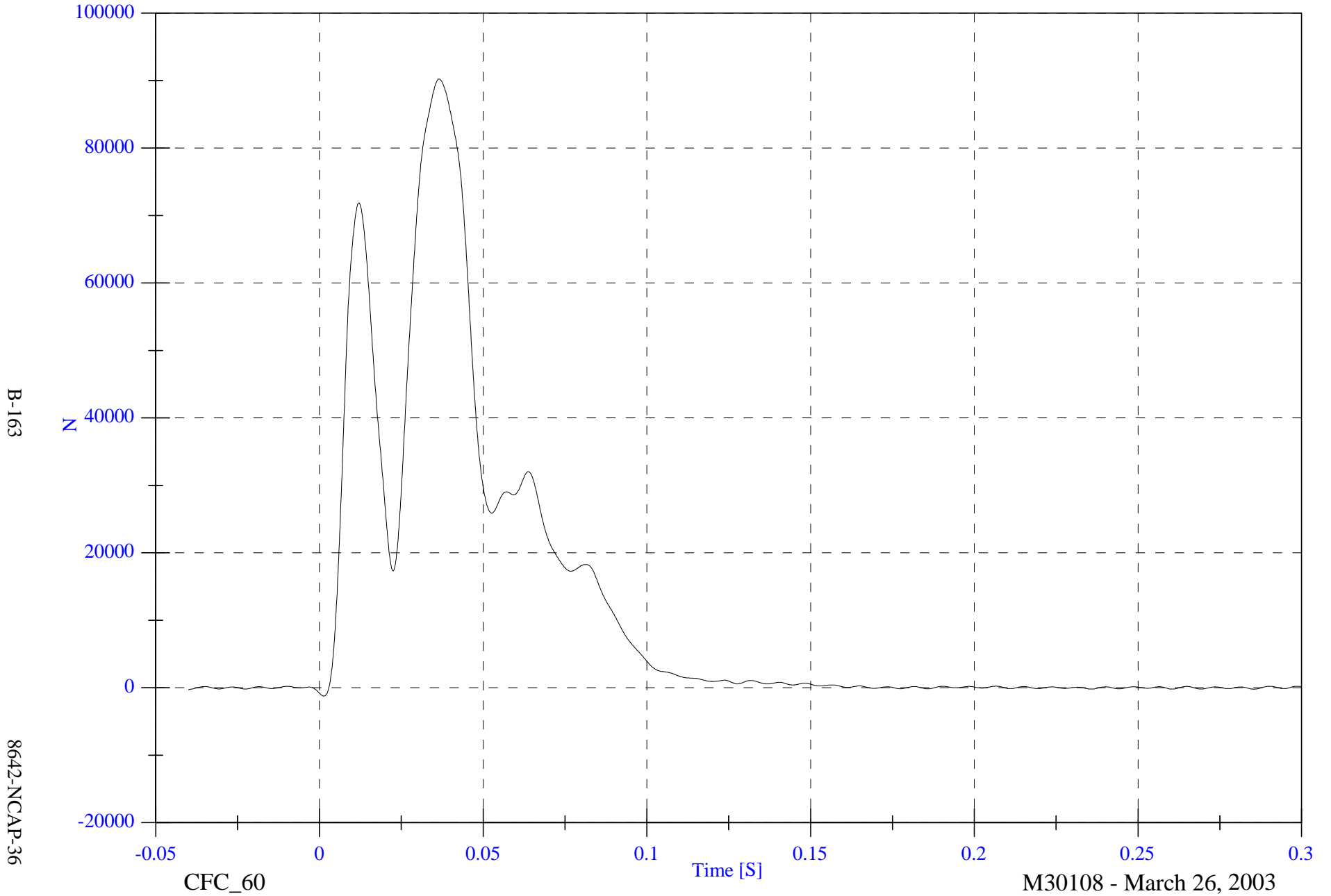
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 90221.9 [N] at 0.036 [S]

Barrier Load Cell C3 Fx

Min: -1224.8 [N] at 0.001 [S]



B-163

8642-NCAP-36

CFC\_60

Time [S]

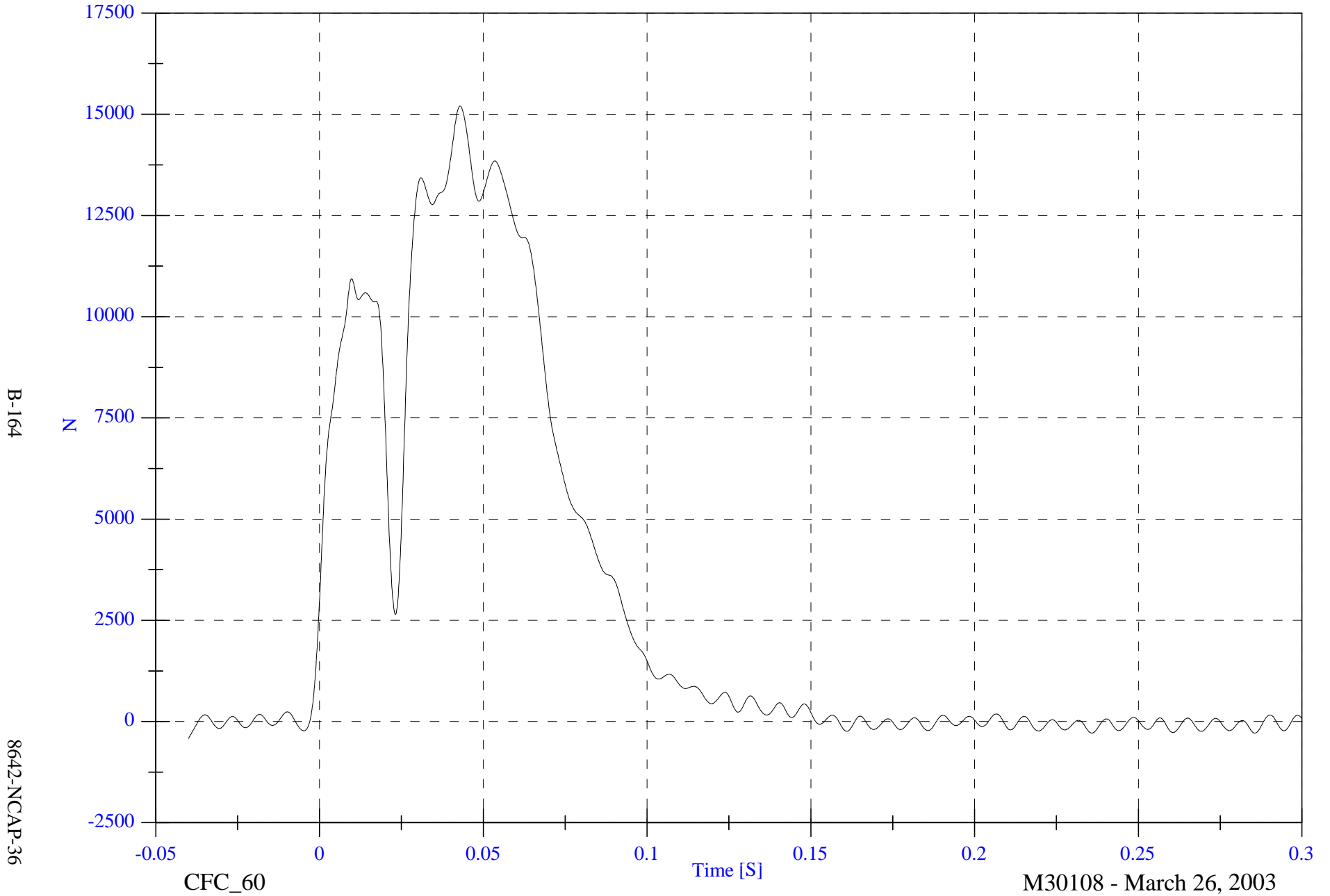
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 15204.9 [N] at 0.043 [S]

Barrier Load Cell C4 Fx

Min: -419.2 [N] at -0.040 [S]



B-164

8642-NCAP-36

CFC\_60

Time [S]

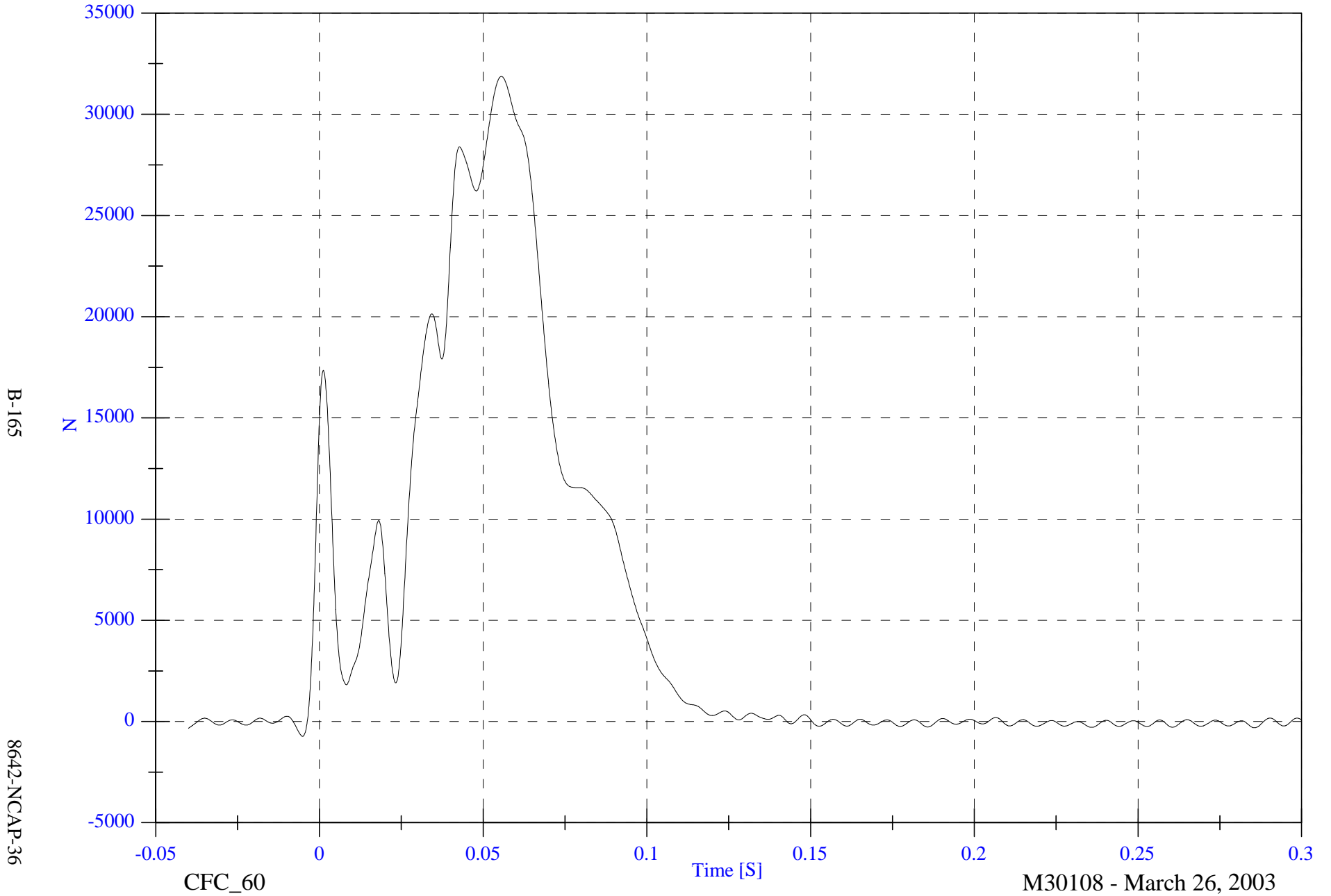
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 31869.1 [N] at 0.056 [S]

Barrier Load Cell C5 Fx

Min: -730.6 [N] at -0.005 [S]



B-165

8642-NCAP-36

CFC\_60

Time [S]

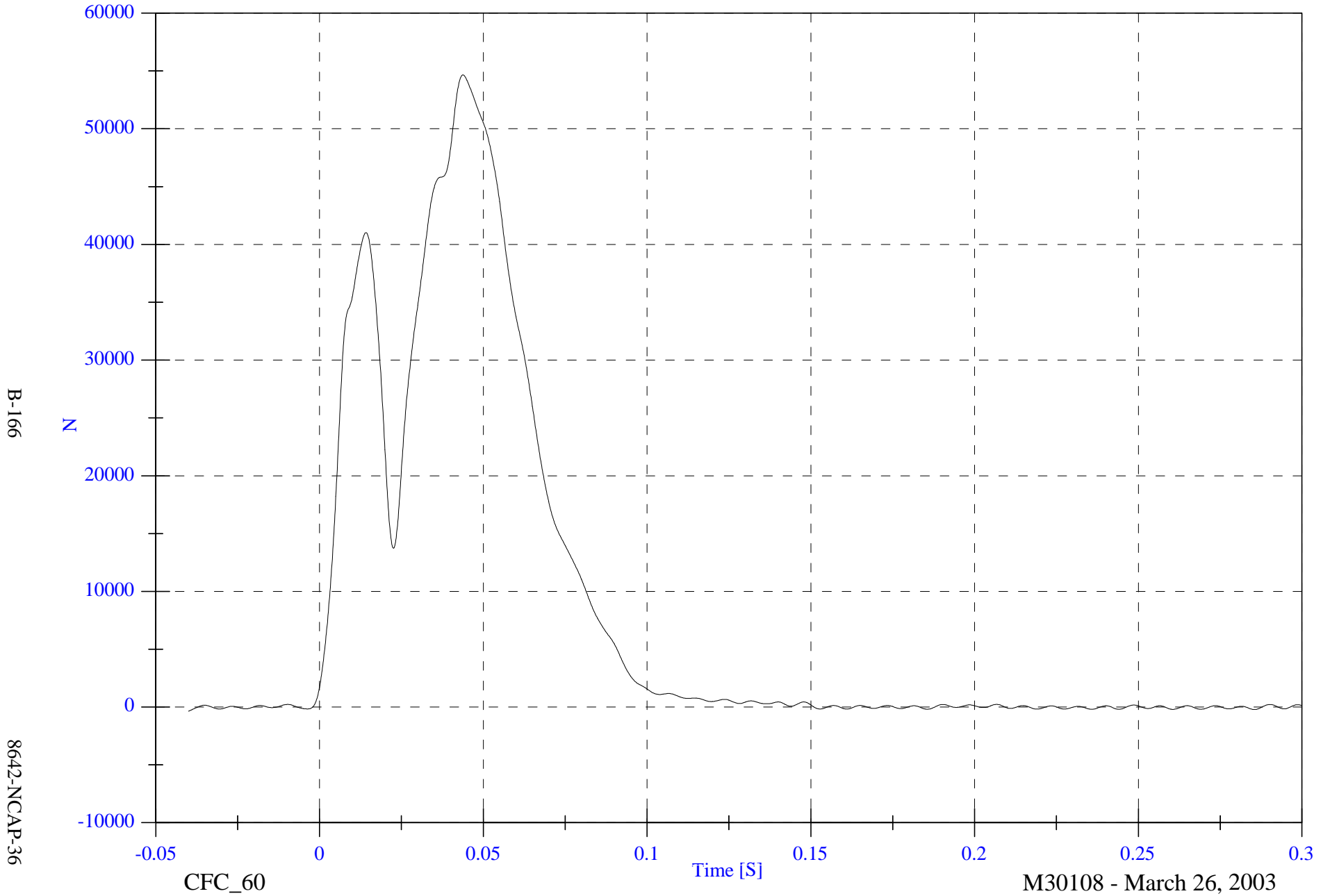
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell C6 Fx

Max: 54657.7 [N] at 0.044 [S]

Min: -365.7 [N] at -0.040 [S]



B-166

8642-NCAP-36

CFC\_60

Time [S]

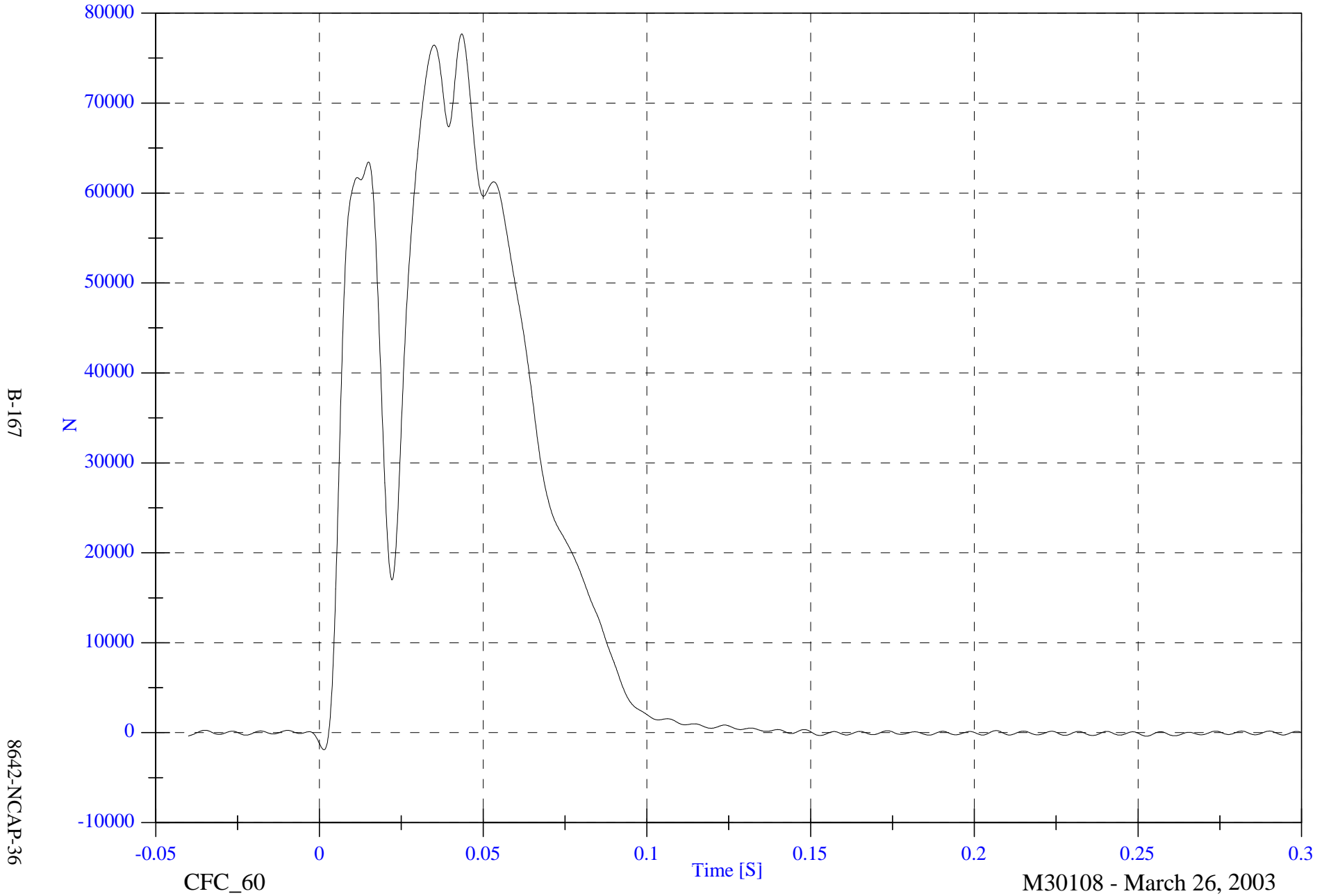
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 77696.8 [N] at 0.043 [S]

Barrier Load Cell C7 Fx

Min: -1892.2 [N] at 0.001 [S]



B-167

8642-NCAP-36

CFC\_60

Time [S]

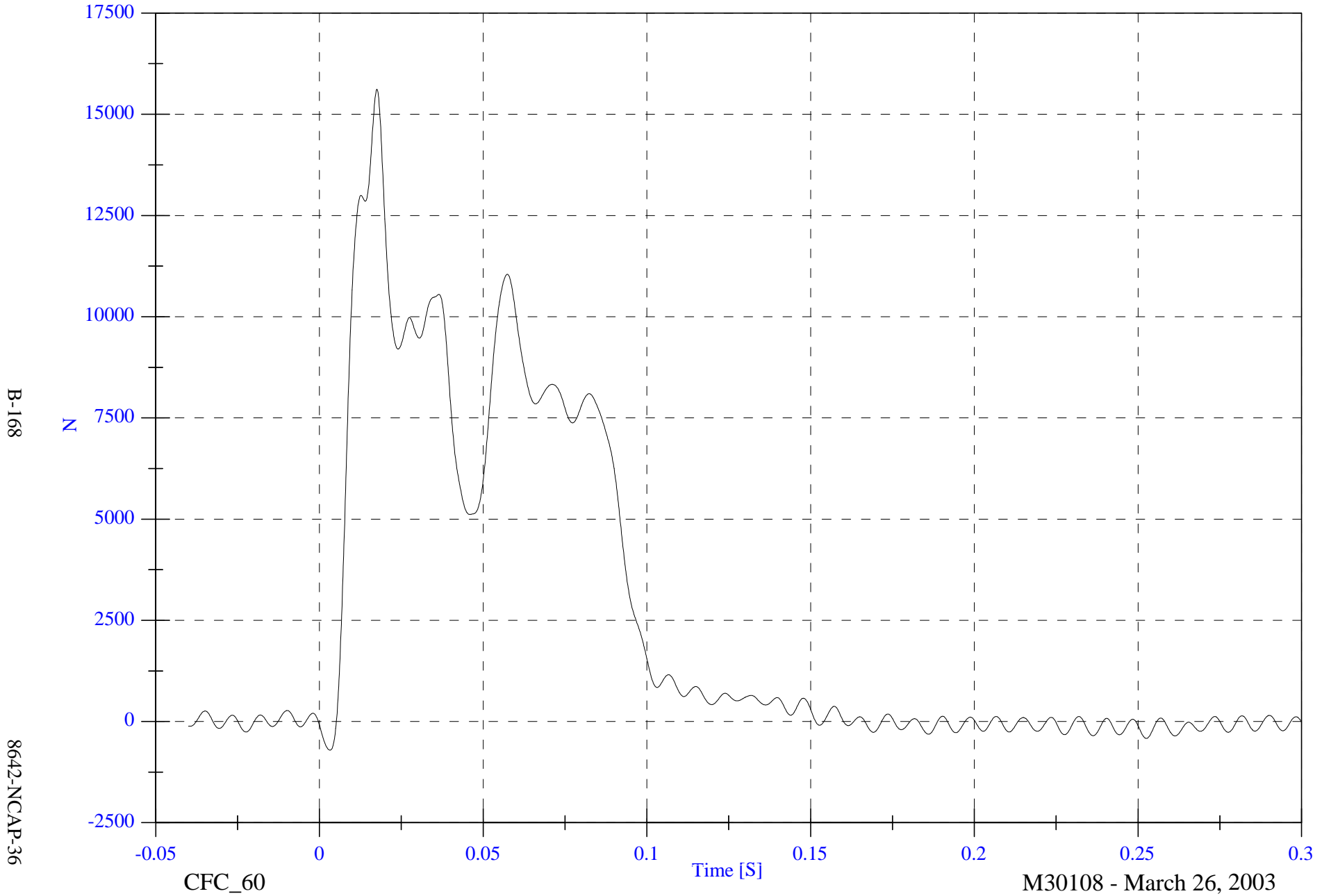
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 15619.1 [N] at 0.018 [S]

Barrier Load Cell C8 Fx

Min: -708.7 [N] at 0.003 [S]

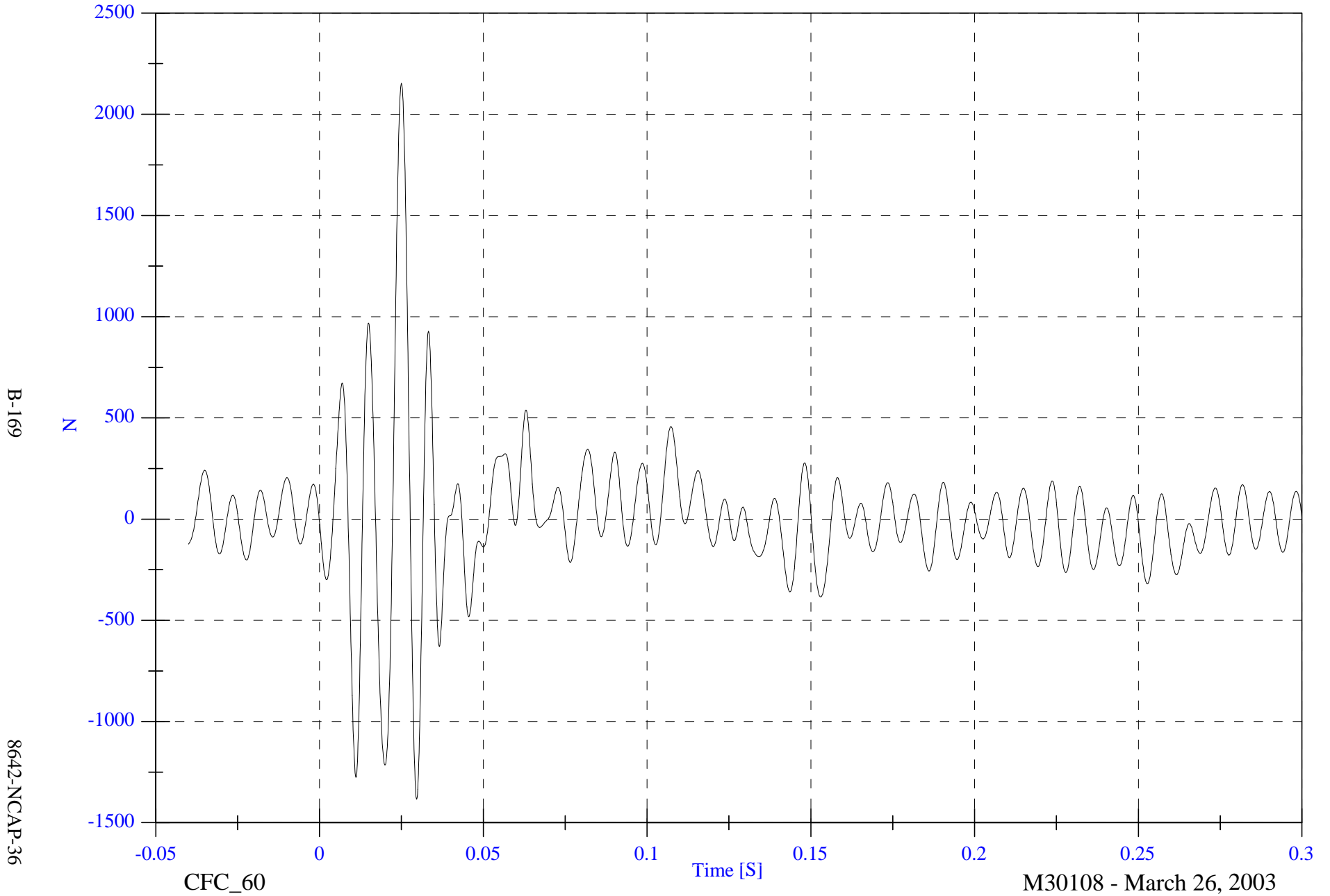


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell C9 Fx

Max: 2152.8 [N] at 0.025 [S]

Min: -1383.9 [N] at 0.030 [S]

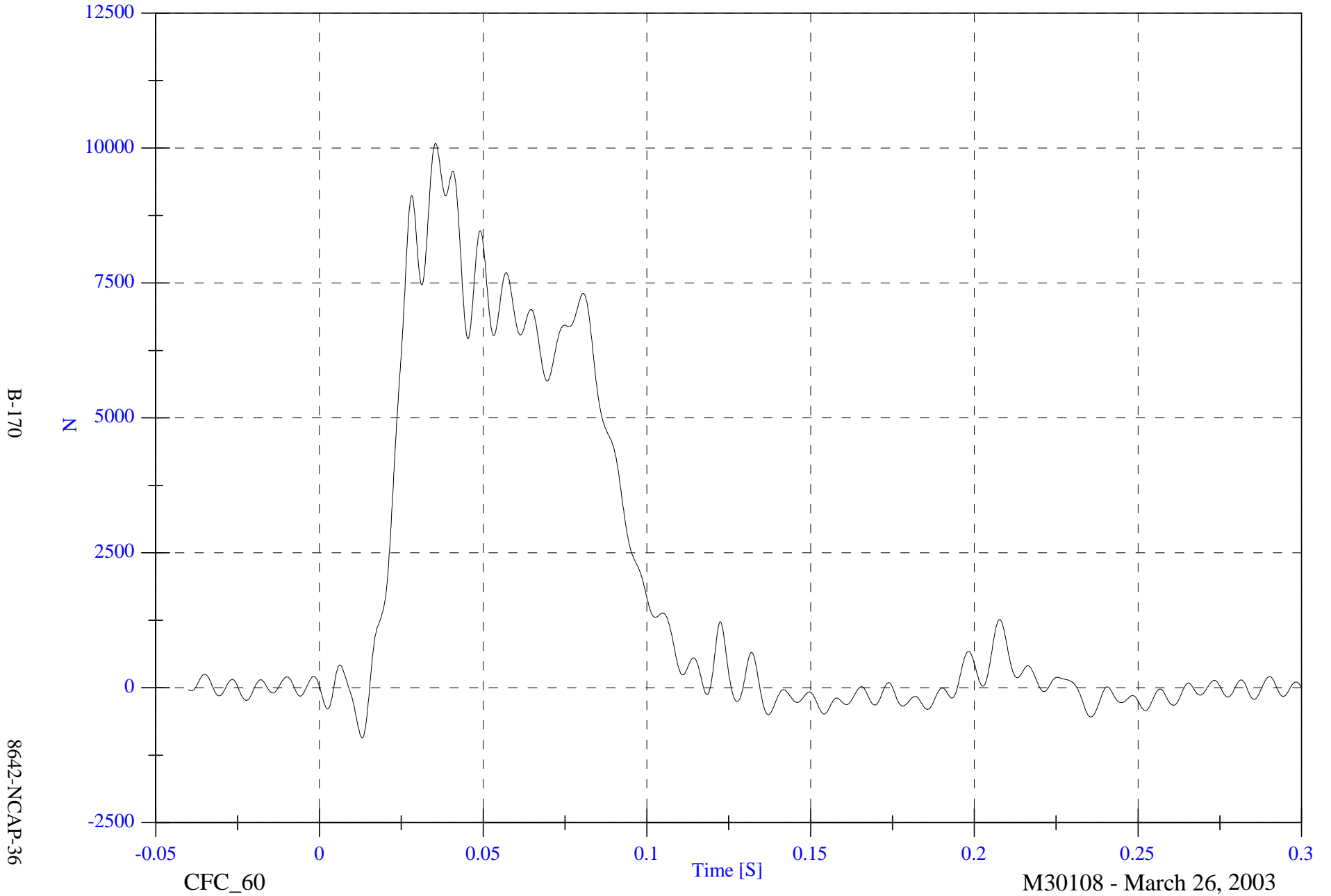


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 10085.5 [N] at 0.035 [S]

Barrier Load Cell D1 Fx

Min: -929.9 [N] at 0.013 [S]

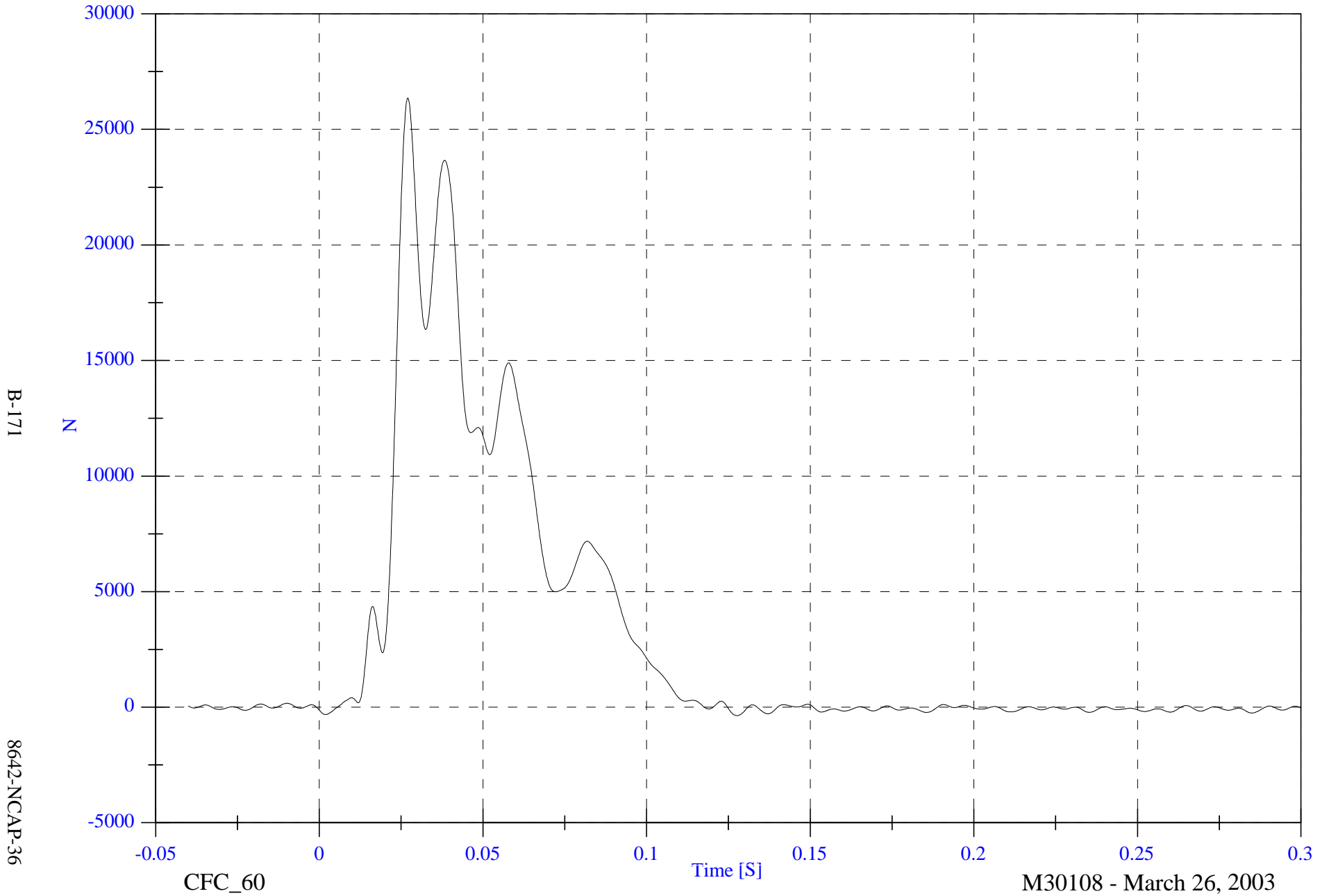


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D2 Fx

Max: 26359.9 [N] at 0.027 [S]

Min: -363.8 [N] at 0.128 [S]



B-171

8642-NCAP-36

CFC\_60

Time [S]

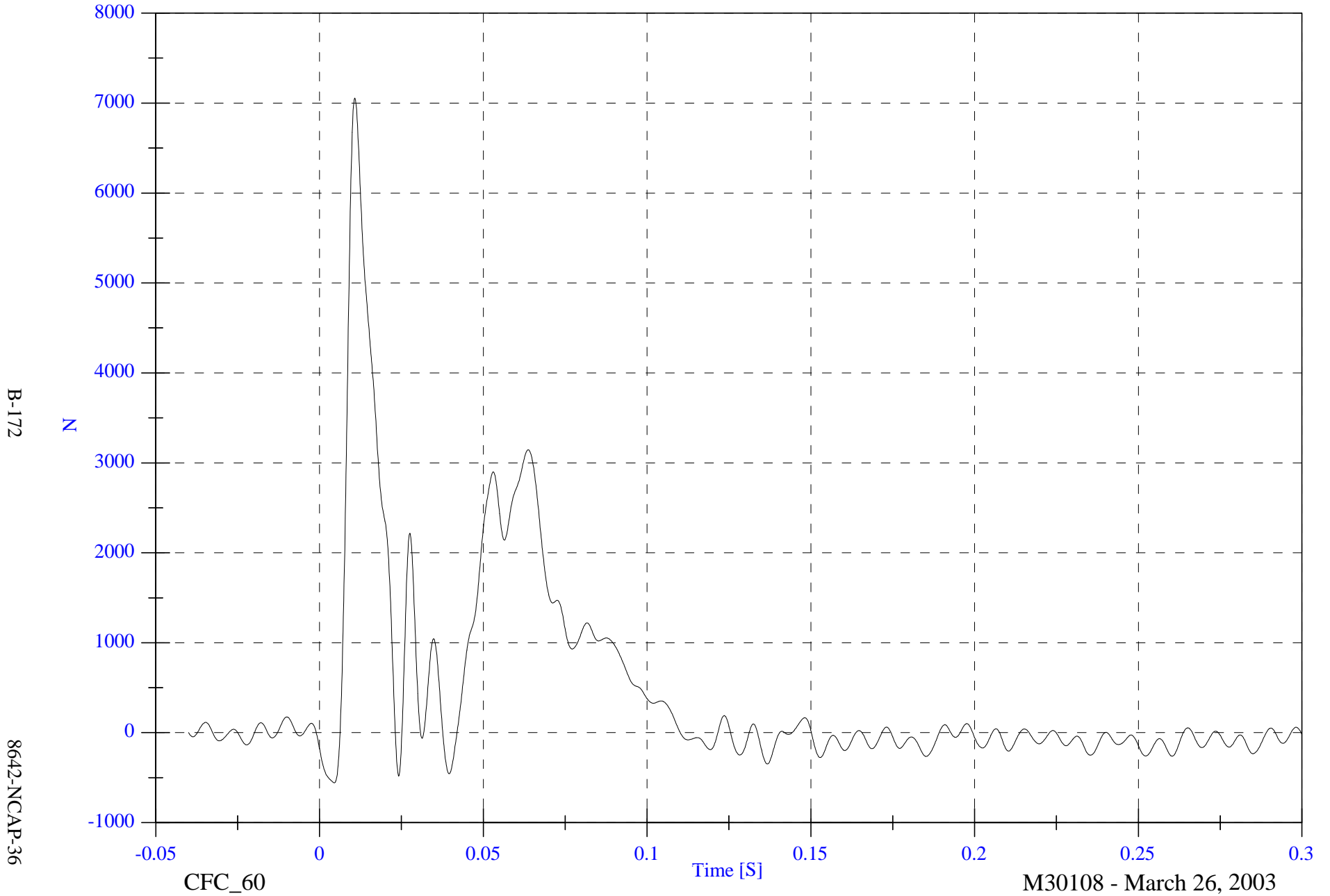
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D3 Fx

Max: 7056.5 [N] at 0.011 [S]

Min: -556.5 [N] at 0.004 [S]



B-172

8642-NCAP-36

CFC\_60

Time [S]

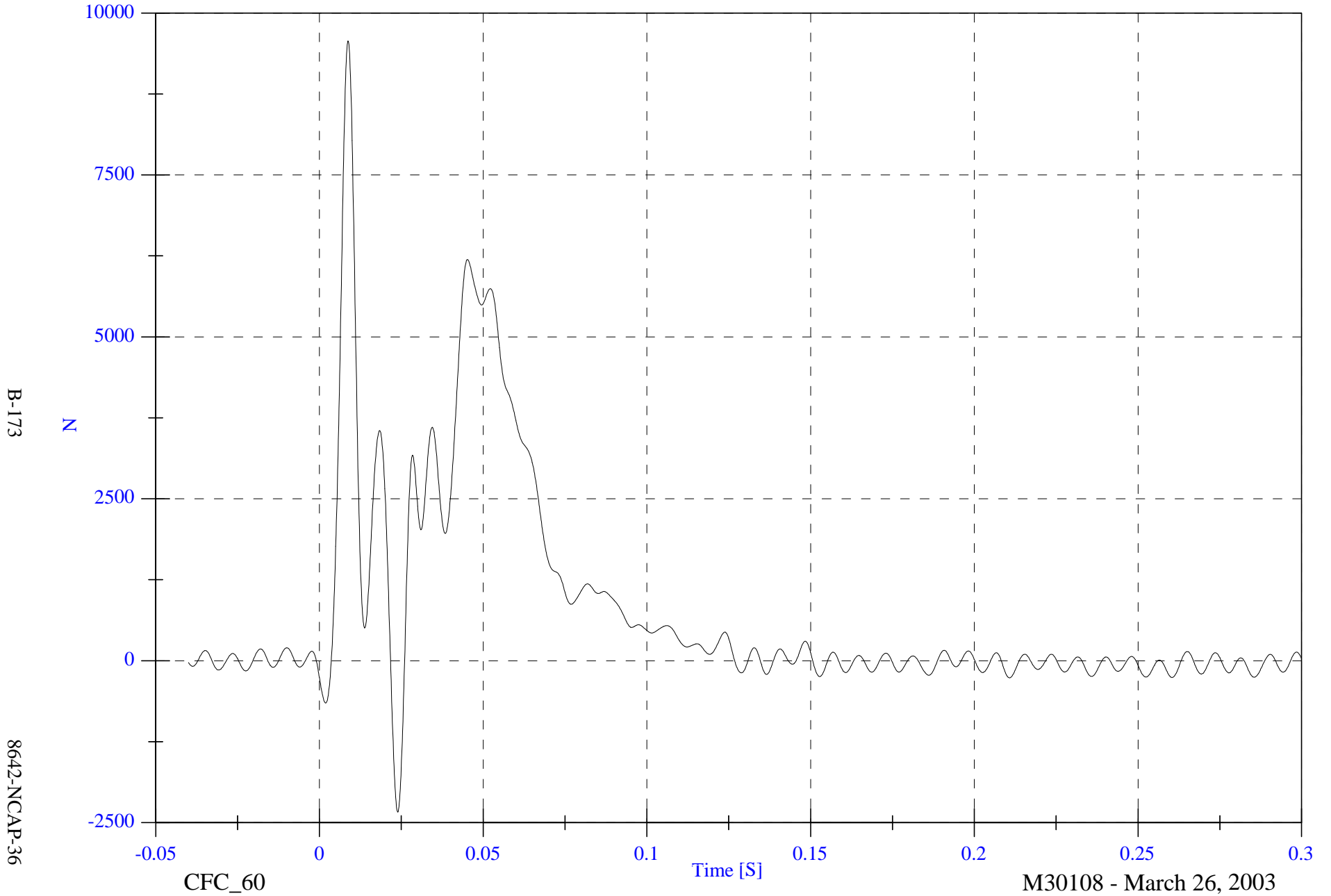
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D4 Fx

Max: 9573.0 [N] at 0.009 [S]

Min: -2337.7 [N] at 0.024 [S]



B-173

8642-NCAP-36

CFC\_60

Time [S]

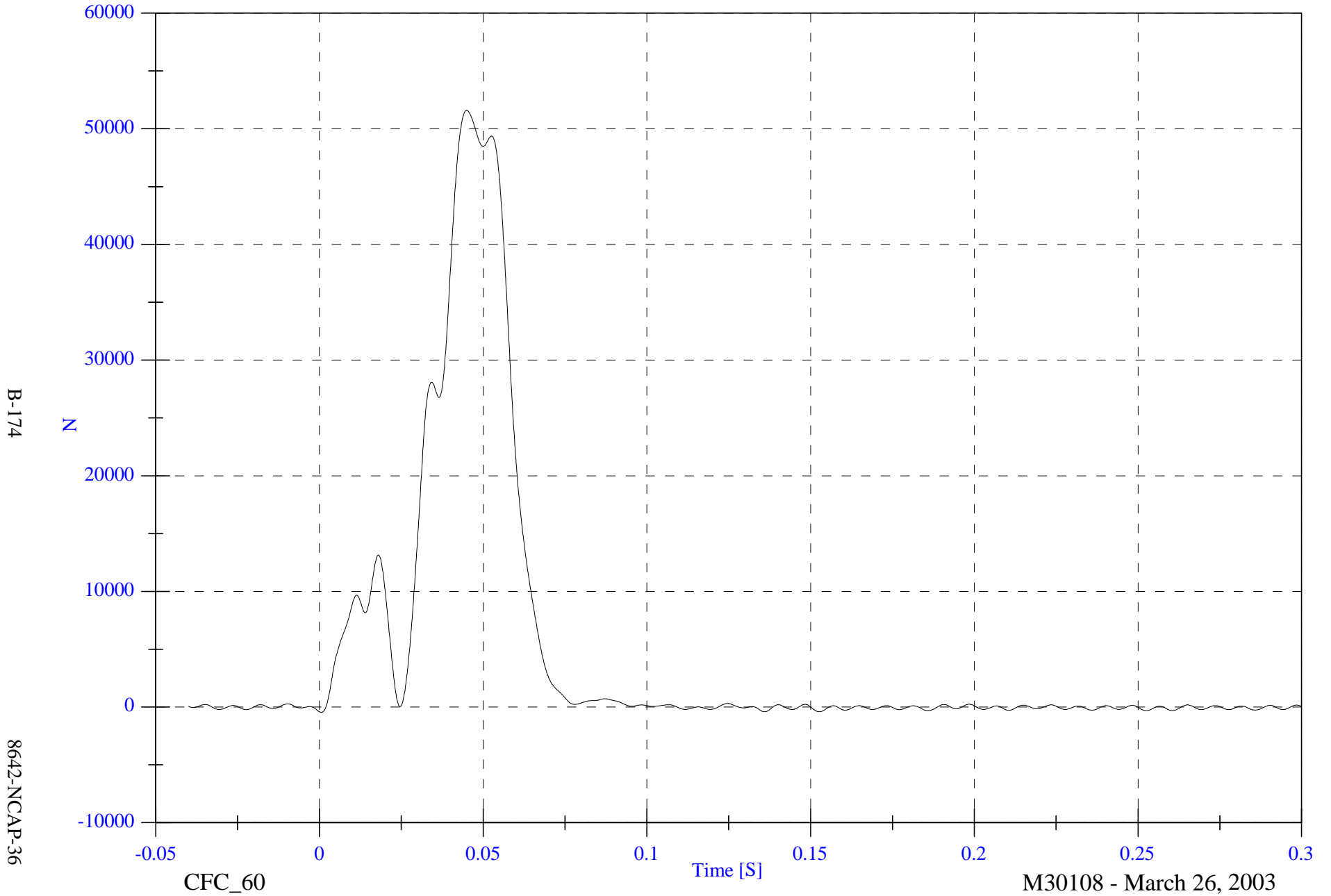
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D5 Fx

Max: 51588.2 [N] at 0.045 [S]

Min: -463.9 [N] at 0.001 [S]

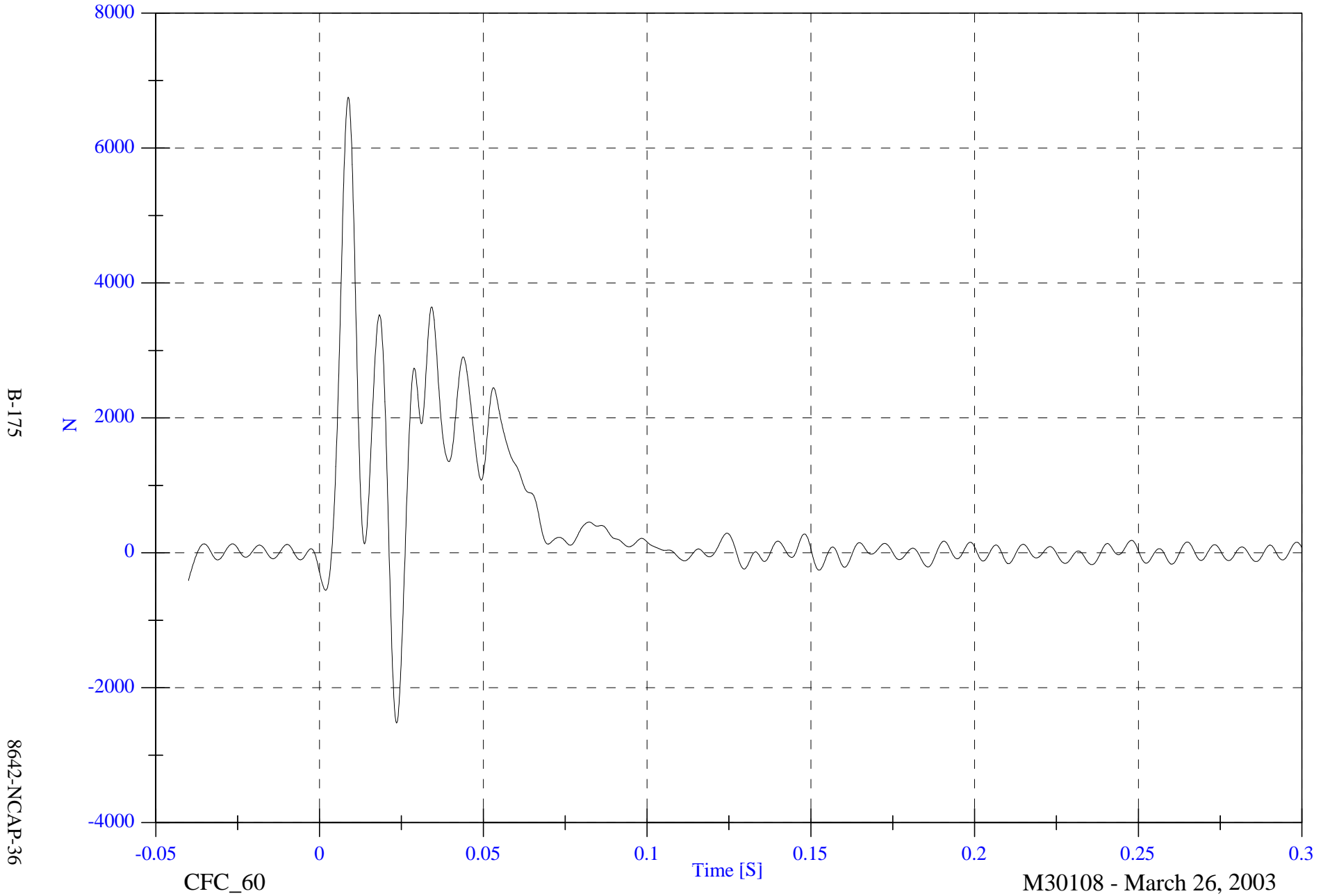


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D6 Fx

Max: 6753.2 [N] at 0.009 [S]

Min: -2523.2 [N] at 0.023 [S]

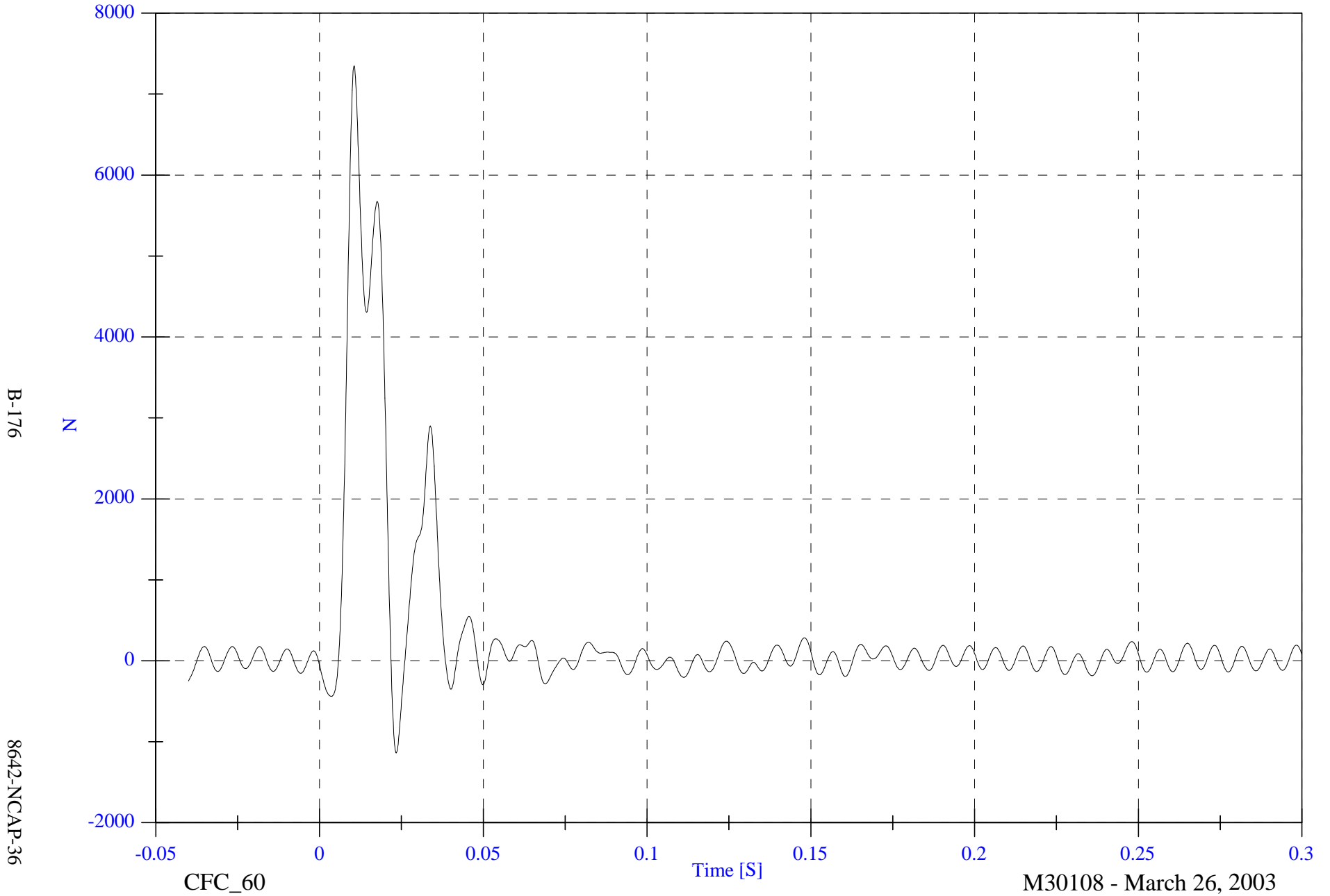


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D7 Fx

Max: 7349.9 [N] at 0.011 [S]

Min: -1140.0 [N] at 0.023 [S]

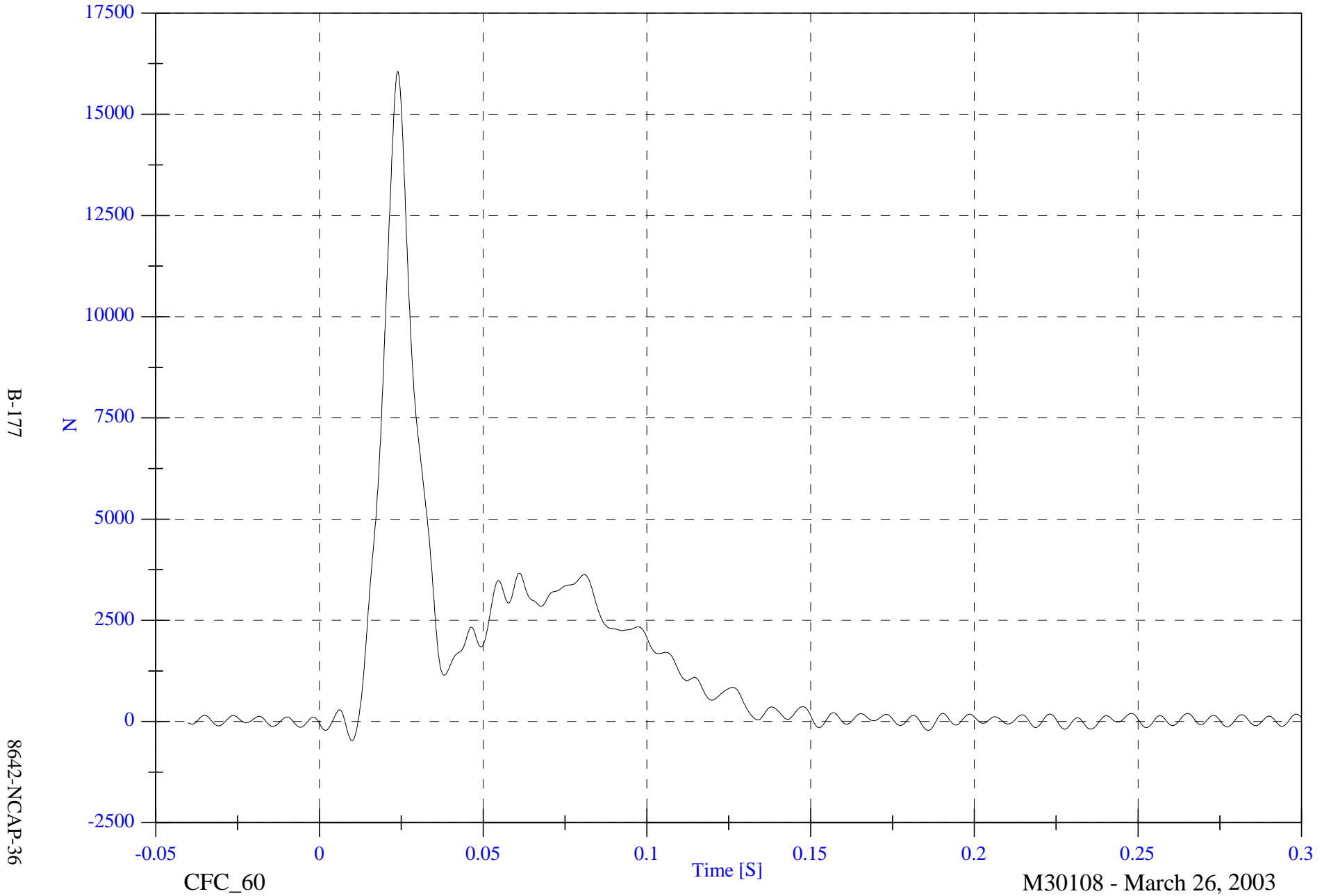


NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D8 Fx

Max: 16059.8 [N] at 0.024 [S]

Min: -475.5 [N] at 0.010 [S]



B-177

8642-NCAP-36

CFC\_60

Time [S]

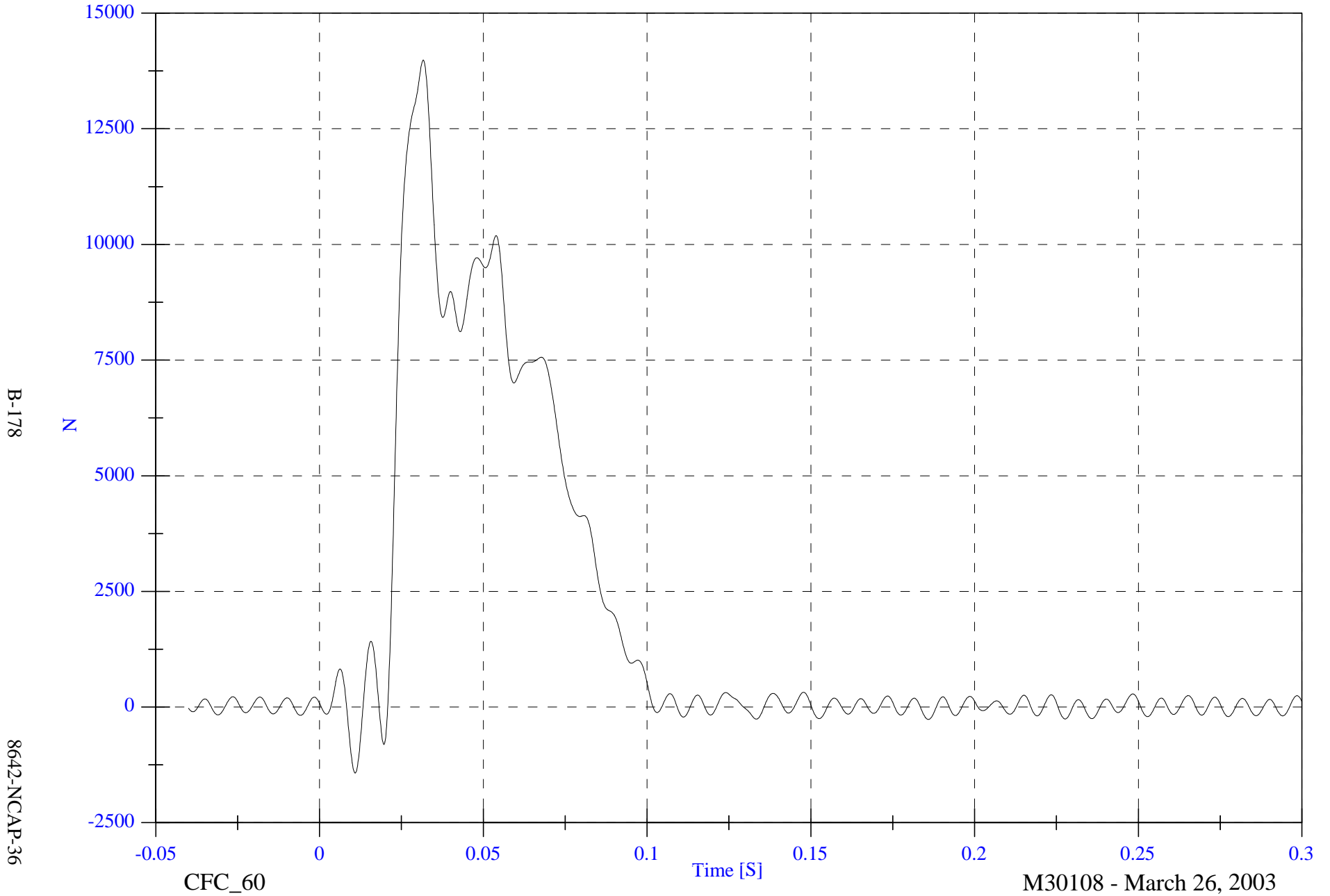
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Barrier Load Cell D9 Fx

Max: 13985.4 [N] at 0.032 [S]

Min: -1427.1 [N] at 0.011 [S]

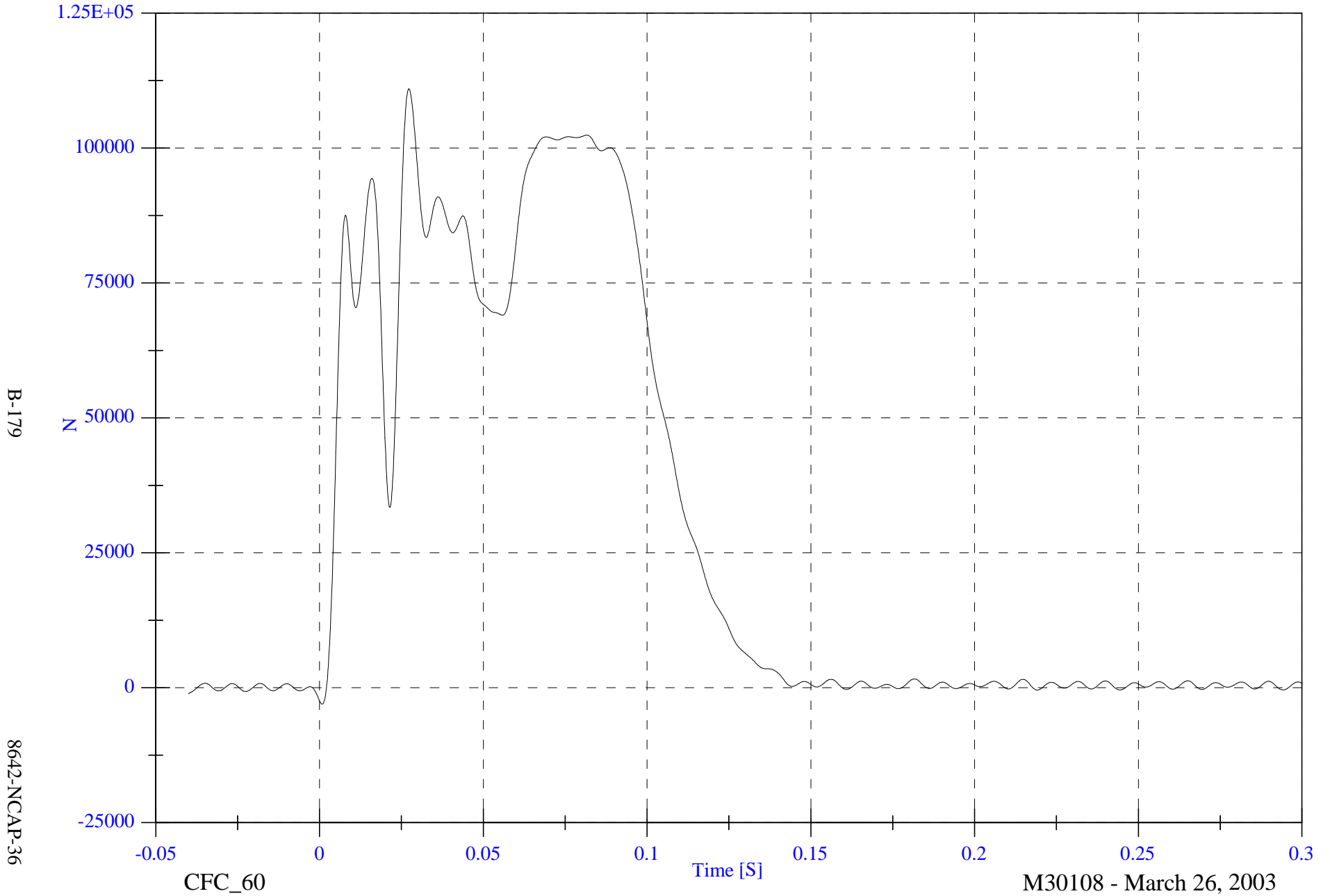


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 110969.4 [N] at 0.027 [S]

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

Min: -3040.7 [N] at 0.001 [S]



B-179

8642-NCAP-36

CFC\_60

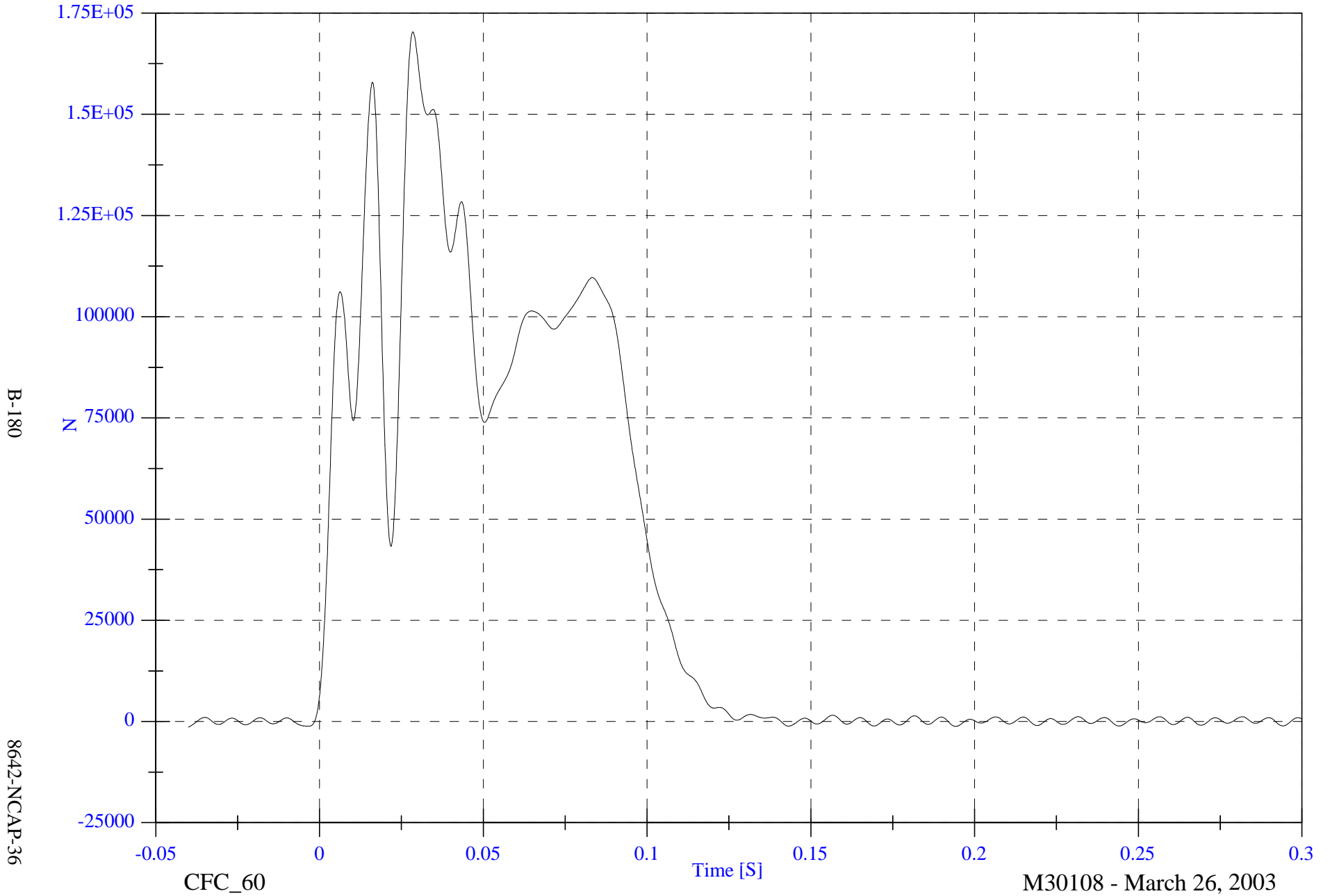
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

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

Max: 170368.0 [N] at 0.028 [S]

Min: -1413.5 [N] at -0.040 [S]



B-180

8642-NCAP-36

CFC\_60

Time [S]

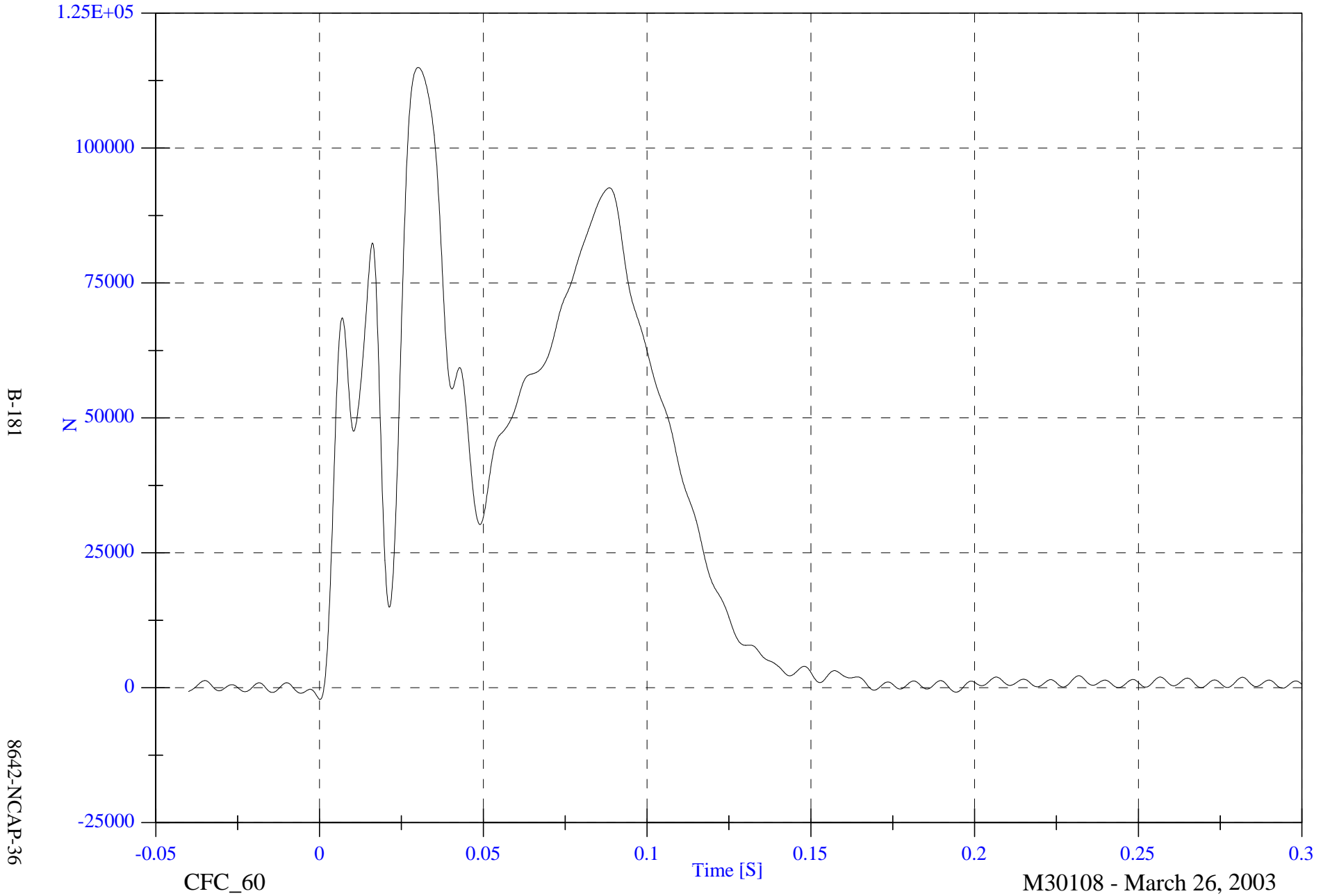
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

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

Max: 114924.1 [N] at 0.030 [S]

Min: -2160.4 [N] at 0.000 [S]

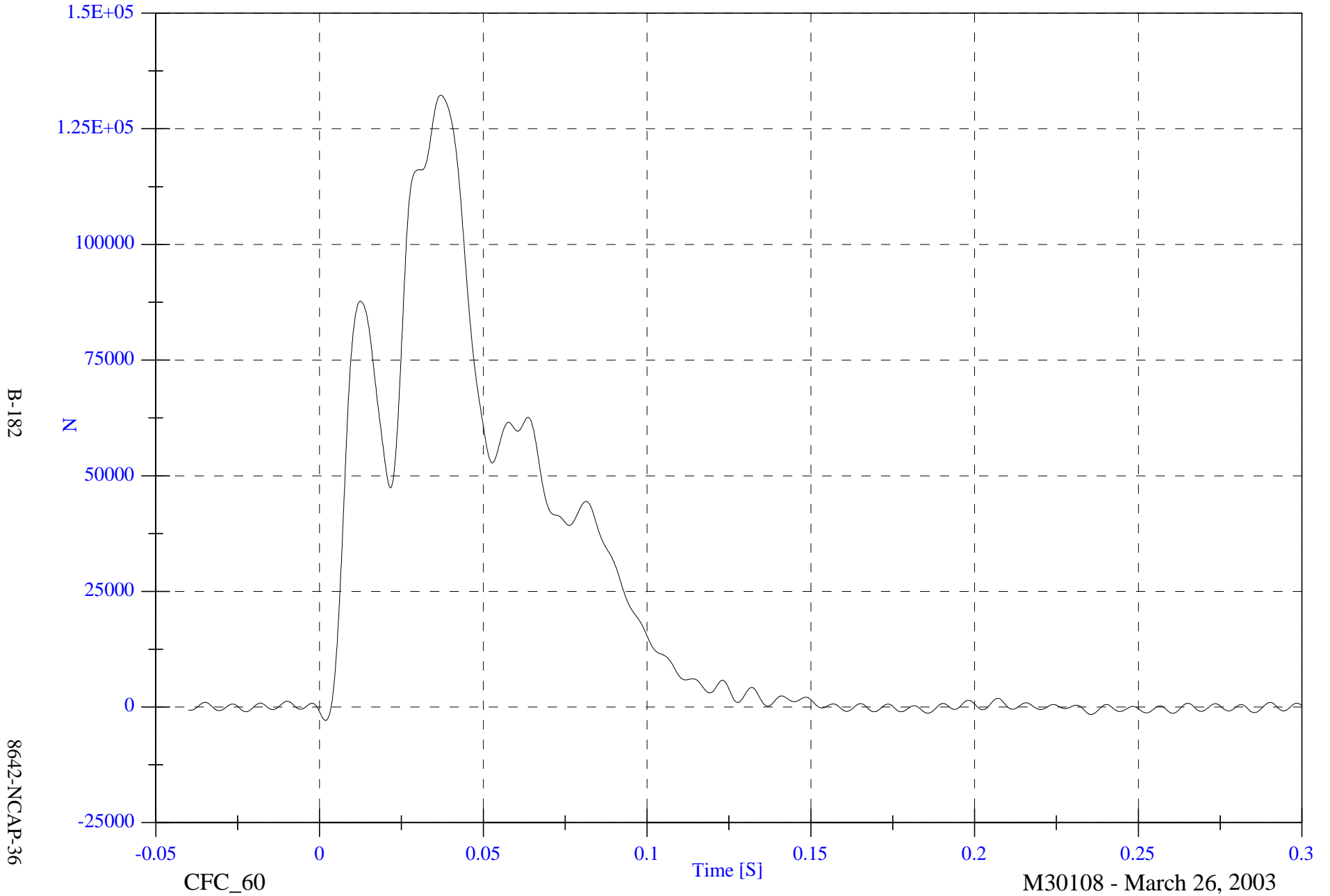


NCAP Test #14 - 2003 Chevrolet Suburban

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

Max: 132257.0 [N] at 0.037 [S]

Min: -2890.9 [N] at 0.002 [S]

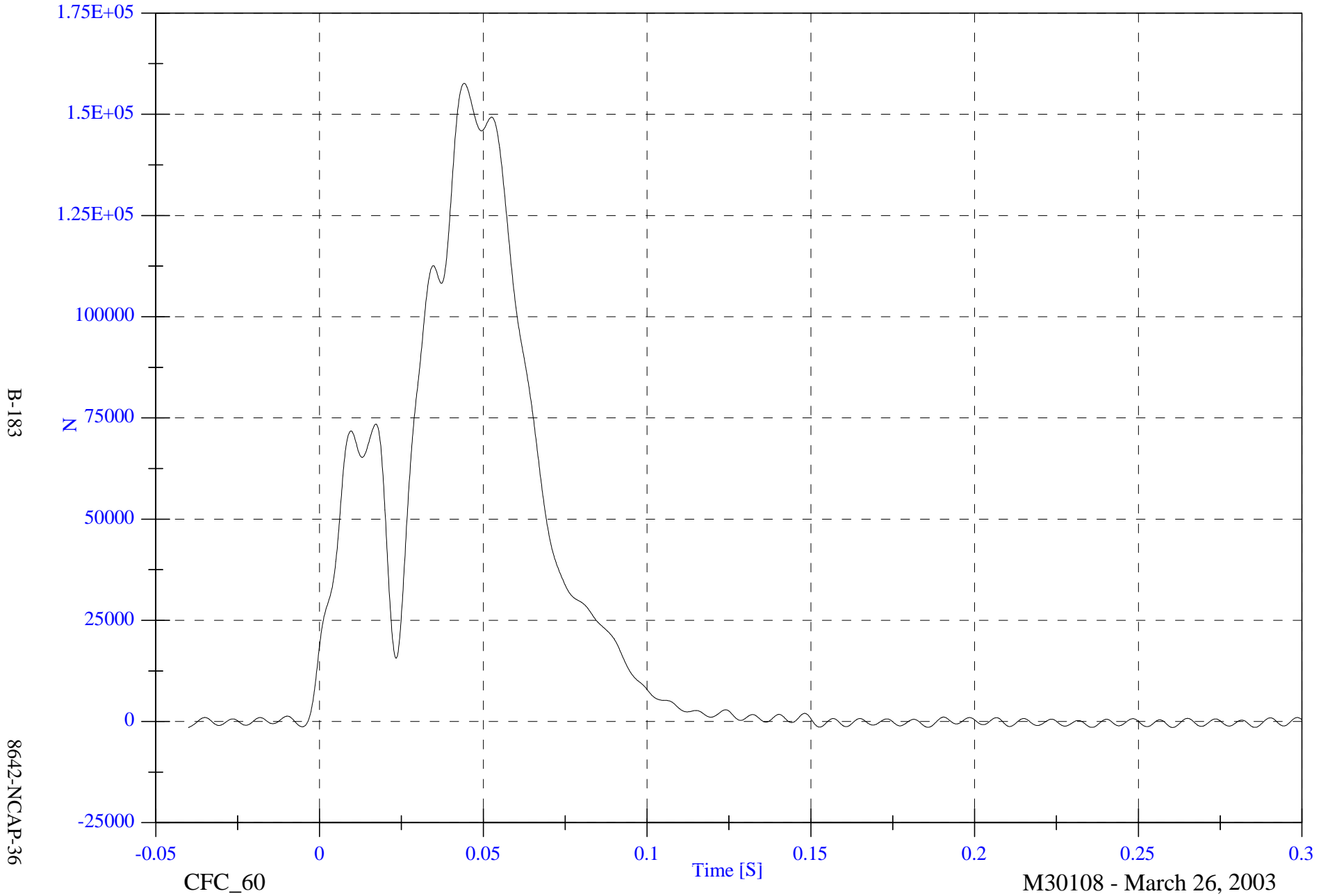


NCAP Test #14 - 2003 Chevrolet Suburban

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

Max: 157652.6 [N] at 0.044 [S]

Min: -1502.9 [N] at -0.040 [S]



B-183

8642-NCAP-36

CFC\_60

Time [S]

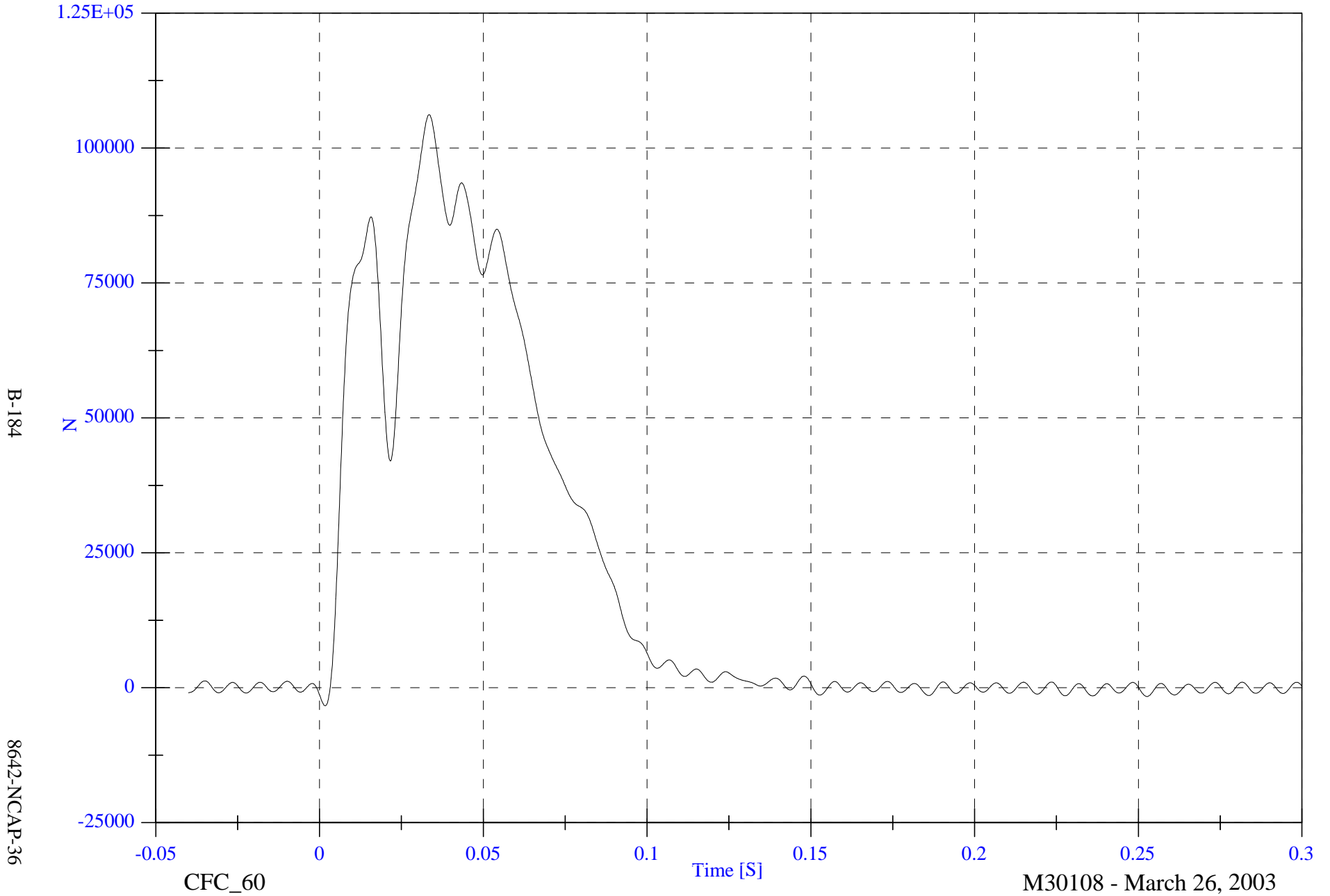
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

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

Max: 106199.7 [N] at 0.033 [S]

Min: -3339.5 [N] at 0.002 [S]



B-184

8642-NCAP-36

CFC\_60

Time [S]

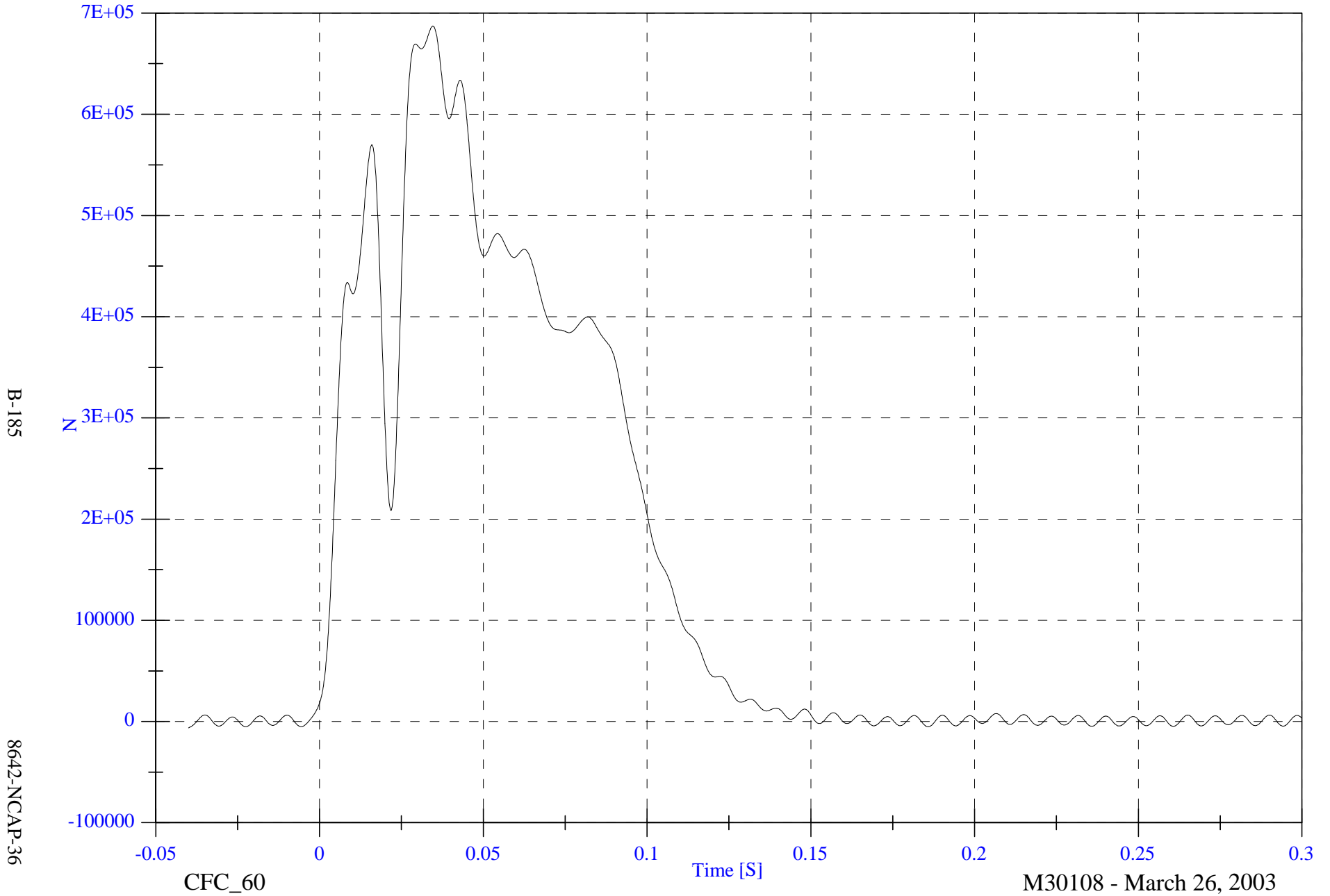
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 687138.3 [N] at 0.035 [S]

Total Load Cell Sum (All 6 Groups)

Min: -6315.7 [N] at -0.040 [S]



**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:

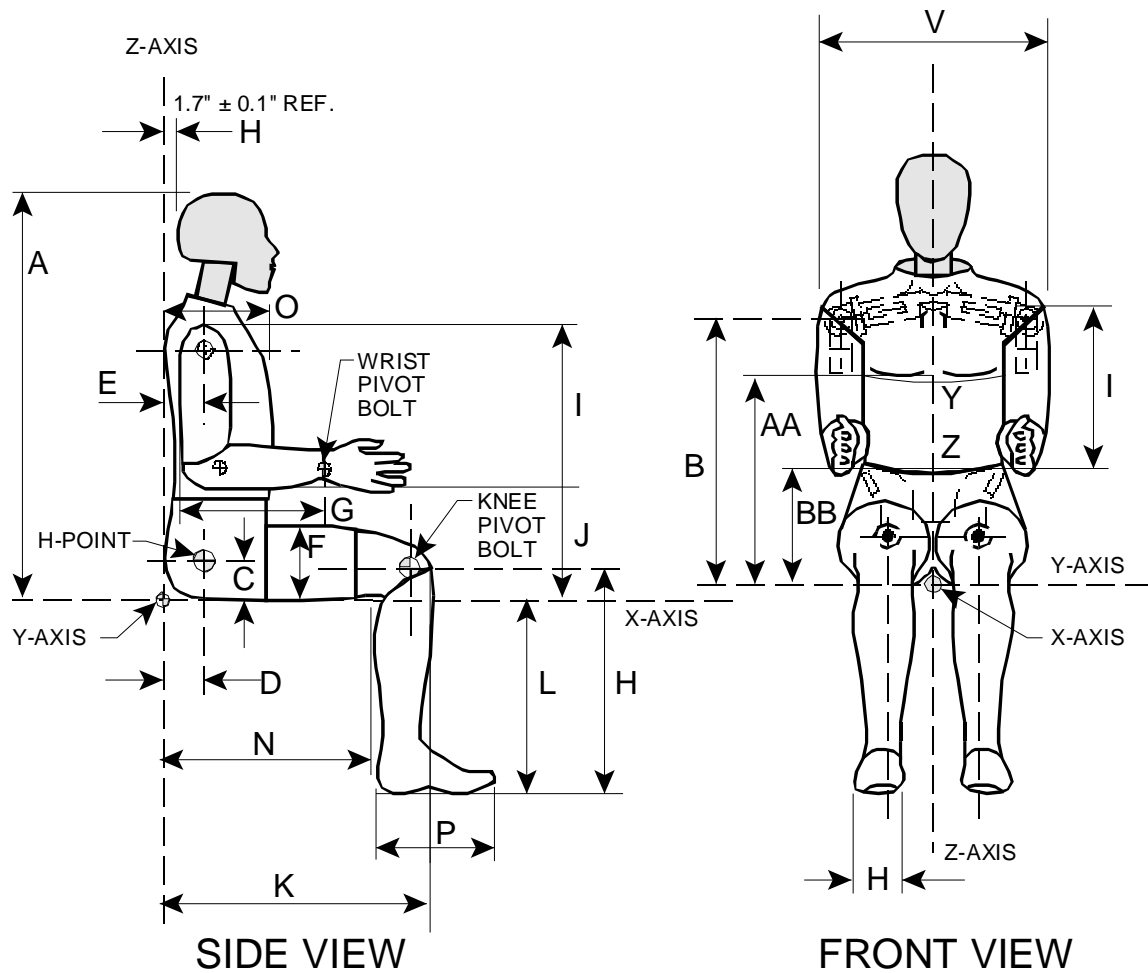
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	150	03/11/03
#2/Right Front Passenger	245	03/11/03

#### 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 150  
Sequential Test Number 1  
Date 03/05/03  
Workfile 150H 3-5-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	71.0
Relative Humidity	10% - 70%	46.0
Peak Resultant Acceleration	225-275 G's	234.91
Peak Lateral Acceleration	15 G's Max	11.97
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E  
NECK FLEXION TEST

Dummy Serial Number	150	
Sequential Test Number	1	
Date	03/06/03	6 Axis Neck Transducer
Workfile	150FLX9 03-06-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.0
Relative Humidity		10% - 70%	31.0
Impact Velocity		22.60 - 23.40 Ft/s	23.01
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.55
	20 ms	17.60 - 22.60 G's	19.42
	30 ms	12.50 - 18.50 G's	13.46
Max Pendulum G's Above 30 ms		29 G's Max	14.63
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	41.40
D Plane Rotation	Max	64 - 78 Deg	68.63
	Time	57 - 64 ms	58.80
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	77.19
	Time	47 - 58 ms	53.20
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	114.20
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	53.20

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E  
NECK EXTENSION TEST

Dummy Serial Number	150	
Sequential Test Number	1	
Date	03/06/03	6 Axis Neck Transducer
Workfile	150EXT 03-06-03	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	31.0
Impact Velocity	19.50 - 20.30 Ft/s	19.63
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	13.51
Deceleration - Time Curve Decay Time to 5 G's	38 - 46 ms	41.00
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	154.20
Positive Moment - Time Curve Decay Time to Zero	120 - 148 ms	146.00

Remarks:

Laboratory Technician:

B. Swiecicki

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PART 572E  
THORAX IMPACT TEST

Dummy Serial Number 150  
Sequential Test Number 1  
Date 03/10/03  
Workfile 150T 03-10-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	71.0
Relative Humidity	10% - 70%	38.0
Pendulum Velocity	21.6 - 22.4 Ft/s	22.07
Maximum Deflection	2.50 - 2.86 in	2.59
Maximum Resistive Force	1160 - 1325 Lbs	1288.70
Internal Hysteresis	69 - 85 %	72.69

Remarks:

Laboratory Technician:

\_\_\_\_\_ B. Swiecicki

PART 572E  
KNEE IMPACT TEST

Dummy Serial Number            150  
 Sequential Test Number        1  
 Date                                03/11/03  
 Workfile                         150LF 03-11-03; 150LR 03-11-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
<b>LEFT KNEE</b>		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	31.0
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1205.56
<b>RIGHT KNEE</b>		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	31.0
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1228.49

Remarks:

Laboratory Technician:

\_\_\_\_\_  
B. Swiecicki

PART 572E  
EXTERNAL DIMENSIONS

Dummy Serial Number            150  
 Sequential Test Number        1  
 Date                                    03/11/03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			35
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	34.0
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	34.8
Thigh Clearance	F	5.5 - 6.1 in	5.8
Buttock Knee Length	K	22.8 - 23.8 in	23.4
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	19.6
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	3.7
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.2
Elbow Rest Height	J	7.5 - 8.3 in	8.1
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.5

Remarks:

Laboratory Technician:

B. Swiecicki

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PART 572E  
HEAD DROP TEST

Dummy Serial Number 245  
Sequential Test Number 1  
Date 03/05/03  
Workfile 245H1 03-05-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	45.0
Peak Resultant Acceleration	225-275 G's	249.74
Peak Lateral Acceleration	15 G's Max	5.48
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician:

B. Swiecicki



PART 572E  
NECK EXTENSION TEST

Dummy Serial Number	245	
Sequential Test Number	1	
Date	03/07/03	6 Axis Neck Transducer
Workfile	245EXT 03-07-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.0
Relative Humidity		10% - 70%	34.0
Impact Velocity		19.50 - 20.30 Ft/s	19.55
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.16
	20 ms	14.00 - 19.00 G's	14.65
	30 ms	11.00 - 16.00 G's	11.89
Max Pendulum G's Above 30 ms		22 G's Max	12.52
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	44.20
D Plane Rotation	Max	81 - 106 Deg	89.18
	Time	72 - 82 ms	76.40
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-50.56
	Time	65 - 79 ms	72.70
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	154.50
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	141.60

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E  
THORAX IMPACT TEST

Dummy Serial Number            245  
Sequential Test Number         1  
Date                                 03/10/03  
Workfile                            245T 03-10-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	71.0
Relative Humidity	10% - 70%	38.0
Pendulum Velocity	21.6 - 22.4 Ft/s	22.33
Maximum Deflection	2.50 - 2.86 in	2.54
Maximum Resistive Force	1160 - 1325 Lbs	1294.08
Internal Hysteresis	69 - 85 %	74.38

Remarks:

Laboratory Technician:

\_\_\_\_\_ B. Swiecicki

PART 572E  
KNEE IMPACT TEST

Dummy Serial Number            245  
 Sequential Test Number         1  
 Date                                    03/11/03  
 Workfile                            245LF 03-11-03; 245RF 03-11-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
<b>LEFT KNEE</b>		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	31.0
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1182.69
<b>RIGHT KNEE</b>		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	31.0
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1198.62

Remarks:

Laboratory Technician:

\_\_\_\_\_ B. Swiecicki

PART 572E  
EXTERNAL DIMENSIONS

Dummy Serial Number            245  
 Sequential Test Number        1  
 Date                                    03/11/03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			35
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	39.4
Waist Circumference	Z	32.9 - 34.1 in	34.0
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	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.5
Knee Pivot Height	M	19.1 - 19.7 in	19.2
Foot Length	P	9.9 - 10.5 in	10.2
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	20.2
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician:

B. Swiecicki

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## **APPENDIX D**

### **DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION**

INSTRUMENT CALIBRATION FOR DRIVER DUMMY  
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 150)	Manufacturer	Serial #	Calibration		
			Last	Next	
Head 9 Array	X Arm Y	ENDEVCO	AC-P17531	22-Oct-02	22-Apr-03
	X Arm Z	ENDEVCO	AC-P14965	22-Oct-02	22-Apr-03
	Y Arm X	ENDEVCO	AC-P17563	22-Oct-02	22-Apr-03
	Y Arm Z	ENDEVCO	AC-P18551	22-Oct-02	22-Apr-03
	Z Arm X	ENDEVCO	AC-P17539	22-Oct-02	22-Apr-03
	Z Arm Y	ENDEVCO	AC-P18718	22-Oct-02	22-Apr-03
Head	X	ENDEVCO	AC-P16832	22-Oct-02	22-Apr-03
	Y	ENDEVCO	AC-P16591	22-Oct-02	22-Apr-03
	Z	ENDEVCO	AC-P16286	22-Oct-02	22-Apr-03
Head	X (R)	ENDEVCO	AC-P17141	22-Oct-02	22-Apr-03
	Y (R)	ENDEVCO	AC-P17242	22-Oct-02	22-Apr-03
	Z (R)	ENDEVCO	AC-P17152	22-Oct-02	22-Apr-03
Neck Load Cell	X	DENTON	LC-441FX	14-Oct-02	14-Apr-03
	Y	DENTON	LC-441FY	14-Oct-02	14-Apr-03
	Z	DENTON	LC-441FZ	14-Oct-02	14-Apr-03
Neck Moment	X	DENTON	LC-441MX	14-Oct-02	14-Apr-03
	Y	DENTON	LC-441MY	14-Oct-02	14-Apr-03
	Z	DENTON	LC-441MZ	14-Oct-02	14-Apr-03
Chest	X	ENDEVCO	AC-P17235	22-Oct-02	22-Apr-03
	Y	ENDEVCO	AC-P14393	22-Oct-02	22-Apr-03
	Z	ENDEVCO	AC-P17285	22-Oct-02	22-Apr-03
Chest	X (R)	ENDEVCO	AC-P16863	22-Oct-02	22-Apr-03
	Y (R)	ENDEVCO	AC-P17248	22-Oct-02	22-Apr-03
	Z (R)	ENDEVCO	AC-P17283	22-Oct-02	22-Apr-03
Chest Deflection	X	SERVO	DS-150	24-Oct-02	24-Apr-03
Pelvic	X	ENDEVCO	AC-J30041	22-Oct-02	22-Apr-03
	Y	ENDEVCO	AC-P13355	22-Oct-02	22-Apr-03
	Z	ENDEVCO	AC-P13329	22-Oct-02	22-Apr-03

INSTRUMENT CALIBRATION FOR DRIVER DUMMY  
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 150)	Manufacturer	Serial #	Calibration		
			Last	Next	
Left Femur Load Cell	Fz	GSE	LC-418	25-Oct-02	25-Apr-03
Right Femur Load Cell	Fz	GSE	LC-419	25-Oct-02	25-Apr-03
Left Upper Tibia	Mx	DENTON	LC-265MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-265MY	24-Oct-02	24-Apr-03
Left Lower Tibia	Fz	DENTON	LC-178FZ	24-Oct-02	24-Apr-03
	Mx	DENTON	LC-178MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-178MY	24-Oct-02	24-Apr-03
Right Upper Tibia	Mx	DENTON	LC-199MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-199MY	24-Oct-02	24-Apr-03
Right Lower Tibia	Fz	DENTON	LC-128FZ	24-Oct-02	24-Apr-03
	Mx	DENTON	LC-128MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-128MY	24-Oct-02	24-Apr-03
Left Foot Rear	X	ENDEVCO	AC-J19868	22-Oct-02	22-Apr-03
	Z	ENDEVCO	AC-AJ8C0	22-Oct-02	22-Apr-03
Left Foot Front	Z	ENDEVCO	AC-J34378	22-Oct-02	22-Apr-03
Right Foot Rear	X	ENDEVCO	AC-AJ7F6	22-Oct-02	22-Apr-03
	Z	ENDEVCO	AC-J27079	22-Oct-02	22-Apr-03
Right Foot Front	Z	ENDEVCO	AC-J23997	22-Oct-02	22-Apr-03
Lap Belt Load Cell	F	LEBOW	LC-706	12-Nov-02	13-May-03

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 245)	Manufacturer	Serial #	Calibration		
			Last	Next	
Head 9 Array	X Arm Y	ENDEVCO	AC-P18558	12-Mar-03	10-Sep-03
	X Arm Z	ENDEVCO	AC-P19212	12-Mar-03	10-Sep-03
	Y Arm X	ENDEVCO	AC-P19197	12-Mar-03	10-Sep-03
	Y Arm Z	ENDEVCO	AC-P18738	12-Mar-03	10-Sep-03
	Z Arm X	ENDEVCO	AC-P19217	12-Mar-03	10-Sep-03
	Z Arm Y	ENDEVCO	AC-P18739	12-Mar-03	10-Sep-03
Head	X	ENDEVCO	AC-P19216	12-Mar-03	10-Sep-03
	Y	ENDEVCO	AC-P15534	12-Mar-03	10-Sep-03
	Z	ENDEVCO	AC-P23303	12-Mar-03	10-Sep-03
Head	X (R)	ENDEVCO	AC-P16576	12-Mar-03	10-Sep-03
	Y (R)	ENDEVCO	AC-P15526	12-Mar-03	10-Sep-03
	Z (R)	ENDEVCO	AC-P19255	12-Mar-03	10-Sep-03
Neck Load Cell	X	DENTON	LC-076FX	15-Oct-02	15-Apr-03
	Y	DENTON	LC-076FY	15-Oct-02	15-Apr-03
	Z	DENTON	LC-076FZ	15-Oct-02	15-Apr-03
Neck Moment	X	DENTON	LC-076MX	15-Oct-02	15-Apr-03
	Y	DENTON	LC-076MY	15-Oct-02	15-Apr-03
	Z	DENTON	LC-076MZ	15-Oct-02	15-Apr-03
Chest	X	ENTRAN	AC-01G18-F03	18-Feb-03	19-Aug-03
	Y	ENDEVCO	AC-J27461	24-Mar-03	22-Sep-03
	Z	ENTRAN	AC-01J02-F09	18-Feb-03	19-Aug-03
Chest	X (R)	ENDEVCO	AC-P23914	10-Oct-02	10-Apr-03
	Y (R)	ENDEVCO	AC-P23957	10-Oct-02	10-Apr-03
	Z (R)	ENTRAN	AC-01G18-F09	18-Feb-03	19-Aug-03
Chest Deflection	X	SERVO	DS-245	11-Oct-02	11-Apr-03
Pelvic	X	ENDEVCO	AC-P23792	18-Feb-03	19-Aug-03
	Y	ENDEVCO	AC-P17258	18-Feb-03	19-Aug-03
	Z	ENDEVCO	AC-J31010	18-Feb-03	19-Aug-03

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 245)	Manufacturer	Serial #	Calibration		
			Last	Next	
Left Femur Load Cell	Fz	GSE	LC-551	25-Oct-02	25-Apr-03
Right Femur Load Cell	Fz	GSE	LC-951	25-Oct-02	25-Apr-03
Left Upper Tibia	Mx	DENTON	LC-200MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-200MY	24-Oct-02	24-Apr-03
Left Lower Tibia	Fz	DENTON	LC-129FZ	24-Oct-02	24-Apr-03
	Mx	DENTON	LC-129MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-129MY	24-Oct-02	24-Apr-03
Right Upper Tibia	Mx	DENTON	LC-264MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-264MY	24-Oct-02	24-Apr-03
Right Lower Tibia	Fz	DENTON	LC-177FZ	24-Oct-02	24-Apr-03
	Mx	DENTON	LC-177MX	24-Oct-02	24-Apr-03
	My	DENTON	LC-177MY	24-Oct-02	24-Apr-03
Left Foot Rear	X	ENDEVCO	AC-J18059	13-Mar-03	11-Sep-03
	Z	ENDEVCO	AC-J36176	13-Mar-03	11-Sep-03
Left Foot Front	Z	ENDEVCO	AC-J18662	13-Mar-03	11-Sep-03
Right Foot Rear	X	ENDEVCO	AC-J20084	13-Mar-03	11-Sep-03
	Z	ENDEVCO	AC-AGRP4	13-Mar-03	11-Sep-03
Right Foot Front	Z	ENDEVCO	AC-J28727	13-Mar-03	11-Sep-03
Lap Belt Load Cell	F	LEBOW	LC-707	12-Nov-02	13-May-03

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS  
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	AC-8084-041	20-Nov-02	21-May-03
Right Rear Seat Crossmember X	ICS	AC-8062-003	11-Nov-02	12-May-03
Top of Engine	ICS	AC-8084-036	20-Nov-02	21-May-03
Bottom of Engine	ICS	AC-9026-042	20-Nov-02	21-May-03
Right Disc Brake Caliper	ICS	AC-8084-045	20-Nov-02	21-May-03
Instrument Panel	ICS	AC-8084-035	11-Nov-02	12-May-03
Left Disc Brake Caliper	ICS	AC-8083-032	20-Nov-02	21-May-03
Left Seat Rear Crossmember Z	ICS	AC-8084-006	20-Nov-02	21-May-03
Right Seat Rear Crossmember Z	ICS	AC-8083-028	11-Nov-02	12-May-03

REPORT NUMBER: CAL-03-14

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

EVENFLO VANGUARD 5 COMFORT TOUCH  
FORWARD FACING CONVERTIBLE  
SECURED WITH THE LATCH SYSTEM AND THE TOP TETHER  
AND  
EVENFLO VANGUARD 5 COMFORT TOUCH  
REARWARD FACING CONVERTIBLE  
SECURED WITH THE VEHICLE SEAT BELT SYSTEM

NHTSA NUMBER: M30108

VERIDIAN ENGINEERING TEST NUMBER: 8642-NCAP-36

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



March 26, 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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Lawrence Q. Valvo, Project Engineer

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David J. Travale, Program Manager  
Transportation Sciences Center

Approval Date:

\_\_\_\_\_

FINAL REPORT ACCEPTANCE BY:

Accepted By:

\_\_\_\_\_

Acceptance Date:

\_\_\_\_\_

## TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. CAL-03-14	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of Evenflo Vanguard 5 Comfort Touch Convertible (forward facing and rearward facing configurations) NHTSA No.: M30108	5. Report Date March 26, 2003		6. Performing Organization Code CAL
	8. Performing Organization Report No. 8642-NCAP-36		
7. Author(s) Lawrence Q. Valvo, Project Engineer David J. Travale, Program Manager	10. Work Unit No.		
	11. Contract or Grant No. DTNH22-01-D-32005		
9. Performing Organization Name and Address Veridian Engineering Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225	13. Type of Report and Period Covered Final Report March 2003 – April 2003		
	14. Sponsoring Agency Code NVS-111		
15. Supplementary Notes			
16. Abstract This CRS test was performed in conjunction with a New Car Assessment Program (NCAP) load cell barrier test. An Evenflo Vanguard 5 Comfort Touch forward facing convertible was secured in Position 3 (P3) with the LATCH system and top tether. An Evenflo Vanguard 5 Comfort Touch rearward facing convertible was secured in Position 4 (P4) with the vehicle seat belt (ALR mode). This test was conducted at the Veridian Engineering Crash Test Facility in Buffalo, New York, on March 26, 2003.			
<b>ATD Position</b>	<b>HIC 15</b>	<b>HIC 36</b>	<b>Clip (3 ms)</b>
<b>P3 (Right Rear) (044)</b>	492.2	900.4	41.8
<b>P4 (Left Rear) (093)</b>	179.1	377.4	43.7
17. Key Words New Car Assessment Program (NCAP)		18. Distribution Statement <b>Copies of this report are available from:</b> 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	
19. Security Classification of Report UNCLASSIFIED	20. Security Classification of Page UNCLASSIFIED	21. No. of Pages 188	22. Price

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## SECTION 1

### PURPOSE AND SUMMARY OF TEST M30108

The purpose of this test was to obtain CRS performance data in a frontal impact NCAP condition. The 56.3 kph NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

#### SUMMARY

A forward facing convertible CRS and a 3 year old child dummy (serial no. 044) were secured in the right rear occupant position (Position 3 or P3). A rear facing convertible CRS and a 1 year old child dummy (serial no. 093) were secured in the left rear occupant position (Position 4 or P4). Both child dummies were instrumented with head, chest, and pelvic triaxial accelerometers and an upper six axis neck load cell. In addition, Position 3 was equipped with a chest displacement sensor and a lower six axis neck load cell. The dummies were calibrated prior to this test and the certification information is found in section 5.

The right rear child dummy's HIC (15ms) was 492.2, maximum chest deceleration over 3 ms was 41.8 g's. The left rear child dummy's HIC (15ms) was 179.1, maximum chest deceleration over 3 ms was 43.7 g's.

**SECTION 2**  
**DATA SHEET NO. 1**  
**CRASH TEST SUMMARY**

TEST DUMMY INFORMATION:

DESCRIPTION	Position #3 CRS	Position #4 CRS
<b>ATD Type/Serial No.</b>	HYBRID III P572P /044	CRABI P572R /093
<b>Restraint System:</b>	Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether.	Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode)

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

POST TEST DOOR OPENING

DESCRIPTION	FRONT	REAR
<b>Left Side Doors</b>	Door remained closed and latched, door opened without tools	Door remained closed and latched, door opened without tools
<b>Right Side Doors</b>	Door remained closed and latched, door opened without tools	Door remained closed and latched, door opened without tools
<b>Hatch/Other Door</b>	-	Hatch remained closed and latched, door opened without tools

POST TEST SEAT DATA

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

VISIBLE DUMMY CONTACT POINTS

	Position #3 CRS	Position #4 CRS
<b>Head Contact:</b>	Chin to chest; Back of the head to CRS seat back	Back of the head to CRS seat back
<b>Upper Torso Contact:</b>	None	None
<b>Lower Torso Contact:</b>	None	None
<b>Left Knee Contact:</b>	Left foot to P2 seat back	None
<b>Right Knee Contact:</b>	Right foot to P2 seat back	None

**DATA SHEET NO. 2**

**CRS PARAMETER DATA**

CRS: Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether and Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode). NHTSA No. M30108

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 2536.5 kg (A)

AS TESTED WEIGHT OF VEHICLE (2 P572E + 1 P572P w/ CRS + 1 P572R w/ CRS +CARGO + EQUIPMENT & INSTRUMENTATION):

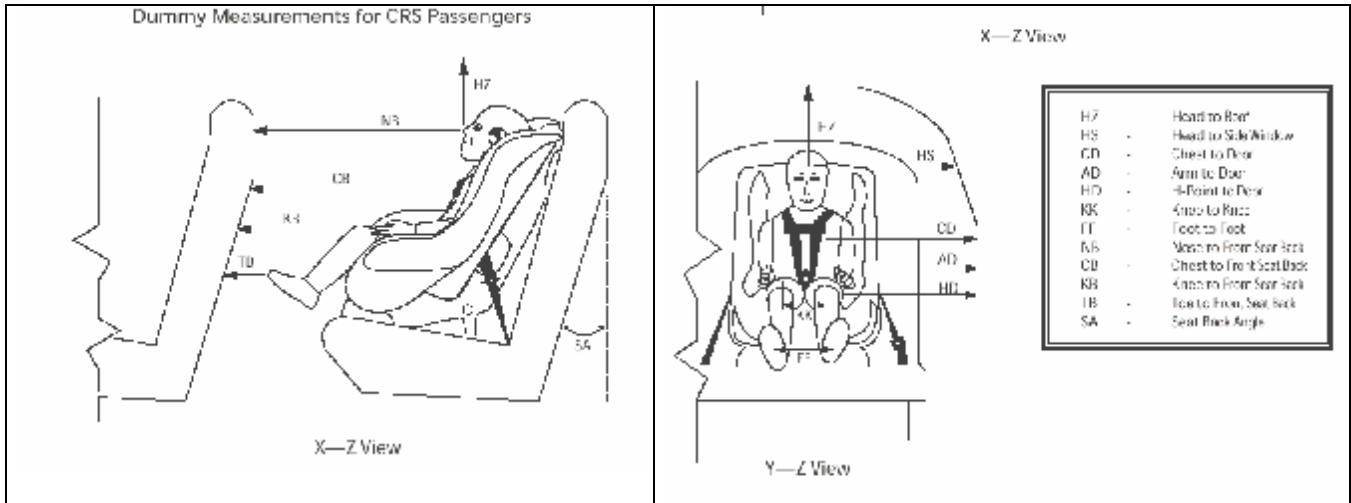
Left Front	=	<u>679.0</u>	kg	Left Rear	=	<u>718.5</u>	kg
Right Front	=	<u>730.0</u>	kg	Right Rear	=	<u>689.0</u>	kg
TOTAL FRONT	=	<u>1409.0</u>	kg	TOTAL REAR	=	<u>1407.5</u>	kg
TOTAL TEST WEIGHT	=	<u>2816.5</u>	kg				

DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE

CRS: Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether.

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Measurement	Pre-Test (mm)	Post Test (mm)
	P3 CRS ( 044)	P3 CRS ( 044)
SA	20.4°	12.7°
HS	390	331
CD	350	350
AD	223	218
HD	259	270
HZ	360	349
NB	635	590
CB	597	561
KK	152	169
FF	163	203
KB – LEFT	399	370
KB – RIGHT	395	368
TB – LEFT	112	83
TB – RIGHT	105	62

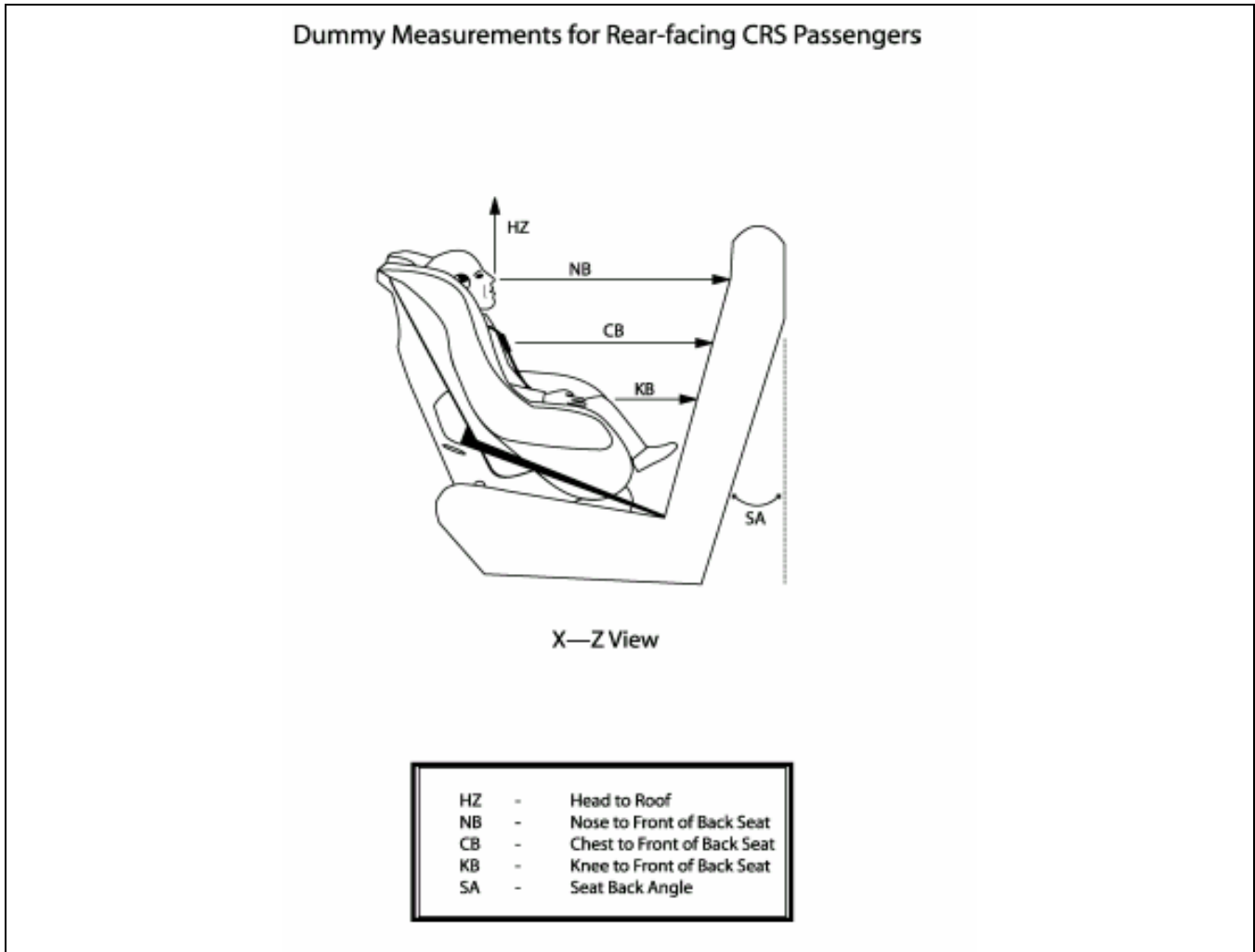
All dimensions in mm (unless noted)  
P3 – Right Rear Passenger (CRS #1)

DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE (CONTINUED)

CRS: Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode).

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Measurement	Pre-Test (mm)	Post Test (mm)
	P4 CRS (093)	P4 CRS (093)
SA	20.4°	13.4°
HZ	446	490
NB	480	509
CB	399	427
KB – LEFT	218	230
KB – RIGHT	224	250

All dimensions in mm (unless noted)  
 P4 – Left Rear Passenger (CRS #2)

**DATA SHEET 4**

**CHILD DUMMY INJURY CRITERIA VALUES**

CRS: Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether and Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode).

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DESCRIPTION	Unit	MAXIMUM VALUE							
		Position #3				Position #4			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	44.8	220.7	-39.9	110.3	35.6	91.3	-1.2	169.4
Head Y	g	20.7	110.2	-16.2	115.8	16.1	92.2	-5.1	132.9
Head Z	g	63.3	101.8	-3.8	52.2	38.9	64.6	-3.0	130.8
Head Resultant	g	71.5	110.3	-	-	48.1	64.6	-	-
Upper Neck Fx	N	15.5	28.4	-742.0	134.2	3.5	23.4	-237.5	70.3
Upper Neck Fy	N	32.9	108.2	-57.5	231.3	124.9	88.0	-104.7	132.2
Upper Neck Fz	N	1887.9	105.5	-87.4	52.9	985.3	65.6	-17.3	132.9
Upper Neck F Resultant	N	1951.1	105.5	-	-	1004.8	66.6	-	-
Upper Neck Mx	N-m	†	-	†	-	1.7	125.0	-3.5	89.2
Upper Neck My	N-m	†	-	-15.7†	232.2	1.8	148.9	-7.6	70.4
Upper Neck Mz	N-m	2.4†	262.6	†	-	1.6	92.6	-2.9	151.9
Upper Neck M Resultant	N-m	†	-	-	-	7.6	70.4	-	-
Lower Neck Fx	N	155.7	221.2	-805.1	100.8	-	-	-	-
Lower Neck Fy	N	18.6	44.9	-264.1	115.6	-	-	-	-
Lower Neck Fz	N	1352.7	102.3	-100.0	53.6	-	-	-	-
Lower Neck F Resultant	N	1578.1	102.2	-	-	-	-	-	-
Lower Neck Mx	N-m	6.0	107.6	-6.3	63.4	-	-	-	-
Lower Neck My	N-m	86.5	132.1	-11.6	218.8	-	-	-	-
Lower Neck Mz	N-m	3.1	104.8	-3.5	136.1	-	-	-	-
Lower Neck M Resultant	N-m	86.6	132.1	-	-	-	-	-	-
Chest X	g	7.9	268.0	-35.7	110.0	39.5	79.7	-1.6	297.3
Chest Y	g	3.8	115.3	-2.2	194.7	7.5	80.4	-4.1	104.4
Chest Z	g	23.2	110.2	-33.9	83.4	29.2	66.1	-5.3	128.9
Chest Resultant	g	42.8	83.7	-	-	44.4	79.6	-	-
Chest Dx	mm	0.0	-48.5	-20.0	137.1	-	-	-	-
Pelvic X	g	6.4	165.1	-41.0	81.6	27.7	76.9	-3.4	299.9
Pelvic Y	g	2.9	86.6	-7.5	74.2	5.4	79.9	-5.2	107.0
Pelvic Z	g	14.6	226.0	-28.3	91.3	33.4	65.8	-2.7	132.1
Pelvic Resultant	g	49.7	81.6	-	-	42.5	77.4	-	-

† Data questionable: 165 – 174 ms.

**DATA SHEET 4**

**CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)**

CRS: Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether and Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode).

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	HEAD INJURY CRITERIA (HIC)							
	HIC15				HIC36			
	HIC	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	Average Acceleration t <sub>1</sub> to t <sub>2</sub>	HIC	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	Average Acceleration t <sub>1</sub> to t <sub>2</sub>
Position #3 - Right	492.2	96.8	111.8	64.0	900.4	89.4	125.4	57.4
Position #4 - Left	179.1	60.1	75.1	42.7	377.4	60.2	96.2	40.6

	CLIP SUMMARY*			
	CLIP (g's)	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	CSI
Position #3 - Right	41.8	82.3	85.3	527.4
Position #4 - Left	43.7	78.2	81.2	391.0

\* 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	0.52	92.3	1220.5	-343.0	0.1
Nte	0.97	108.3	1835.9	-496.1	-5.4
Ncf	0.00	22.7	-7.1	8.4	0.0
Nce	0.49	234.6	-1.2	-224.4	-14.6

**Peak Tension (CFC1000) 1887.9 N      Peak Compression (CFC1000) -87.4 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 (CRABI 1 year old – In Position)**

Nij V10	Nij	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
Ntf	0.07	165.9	54.1	-34.1	1.3
Nte	0.99	68.4	955.5	-227.3	-5.7
Ncf	0.02	133.2	-13.4	-6.2	0.6
Nce	0.03	118.0	-6.0	1.1	-0.4

**Peak Tension (CFC1000) 985.3 N      Peak Compression (CFC1000) -17.3 N**

**Critical Values**

Nij Intercepts			Peak Limits		
Tension (CVt)	1460 N	Extension (mCVe)	17 N-m	Tension	780 N
Compression (CVc)	1460 N	Flexion (mCVf)	43 N-m	Compression	-960 N

Condyle Offset      -0.0058

**DATA SHEET NO. 5**

**CRS PERFORMANCE DATA**

CRS: Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether and Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode).

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		MAXIMUM VALUE			
DESCRIPTION	Unit	Positive	Time (ms)	Negative	Time (ms)
P3 Tether Load	N	751.3	93.9	-52.0	171.0
P3 CRS X	g	9.7	249.2	-50.1	68.2
P3 CRS Y	g	4.9	173.7	-5.9	53.9
P3 CRS Z	g	20.6	56.8	-14.6	87.4
P3 CRS Resultant	g	50.2	68.2	-	-
P4 Lap Belt Load	N	2939.3	72.9	-16.7	4.2
P4 CRS X	g	3.8	150.1	-37.4	73.3
P4 CRS Y	g	5.8	104.8	-2.8	52.6
P4 CRS Z	g	5.3	30.7	-11.1	81.8
P4 CRS Resultant	g	38.6	73.2	-	-

**DATA SHEET NO. 5**

**CRS PERFORMANCE DATA (CONTINUED)**

CRS: Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether and Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode). NHTSA No. M30108

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

<b>LOCATION</b>	<b>DAMAGE</b>	<b>REMARKS</b>
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 (Model No. 3691261 P1)**

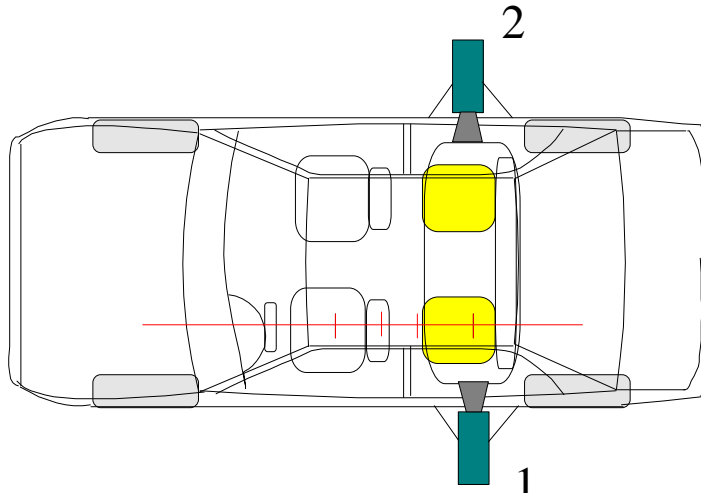
<b>LOCATION</b>	<b>DAMAGE</b>	<b>REMARKS</b>
Vehicle Seat Belt	No	None
Vehicle Seat Belt Buckle	No	None
Vehicle Seat Belt Anchors	No	None
Five Point Harness Connections	No	None
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

**DATA SHEET NO. 6**

**CRS CAMERA DATA**

CRS: Evenflo Vanguard 5 Comfort Touch forward facing convertible secured with the LATCH system and top tether and Evenflo Vanguard 5 Comfort Touch rearward facing convertible secured with the vehicle belt system (ALR mode).

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Camera No.	View	Coordinates (millimeters)			Angle** (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	3658	2693	2561	-21	25	1025
2	Right side CRS lateral view	3642	2642	2537	-18	25	1025

\* Reference (from point of impact); all measurements accurate to within  $\pm 6$  mm

\*\* = referenced to horizontal plane

X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

**SECTION 3**

**PHOTOGRAPHS**

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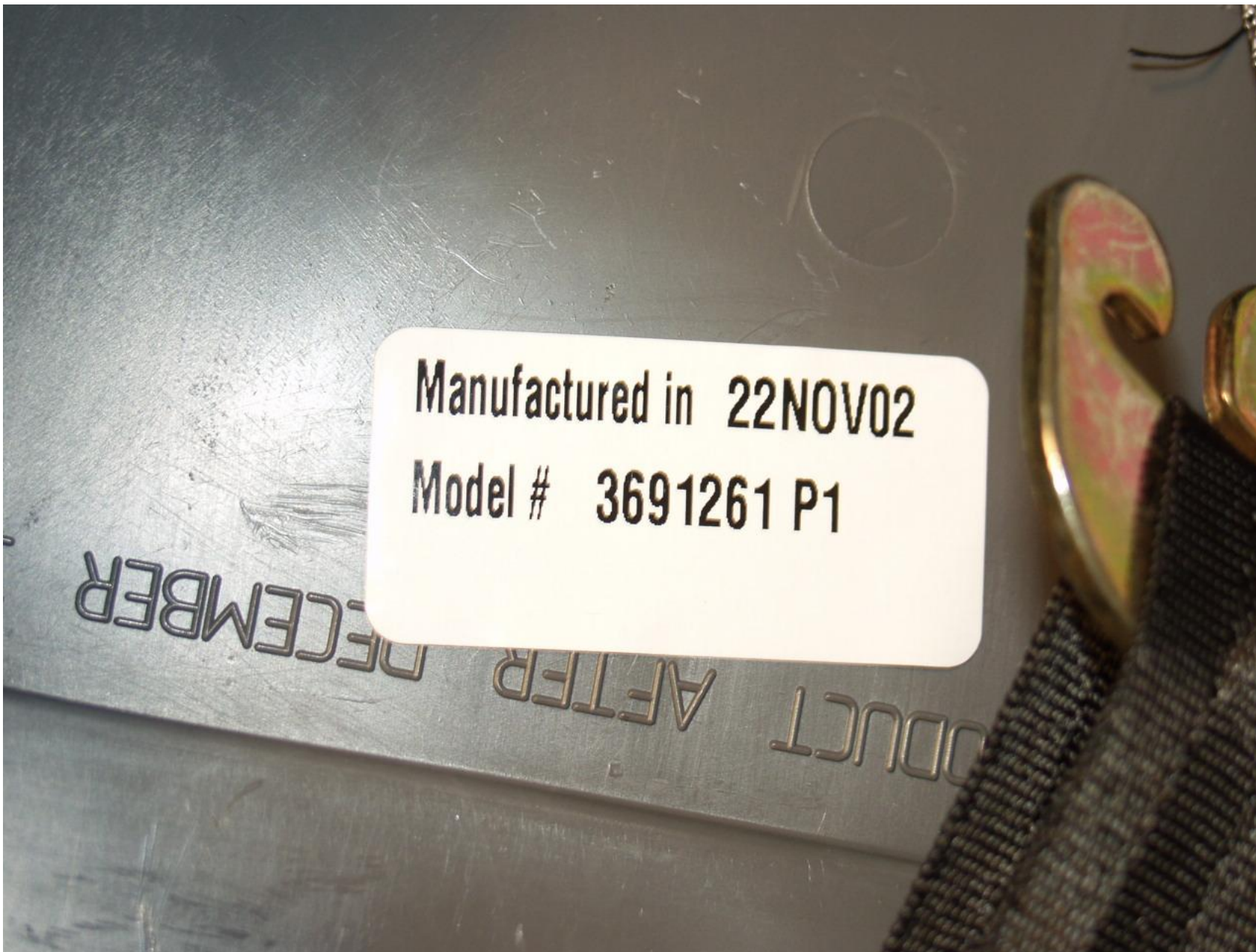


Figure 3-1: CLOSE-UP VIEW OF POSITION 3 CRS LABEL



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

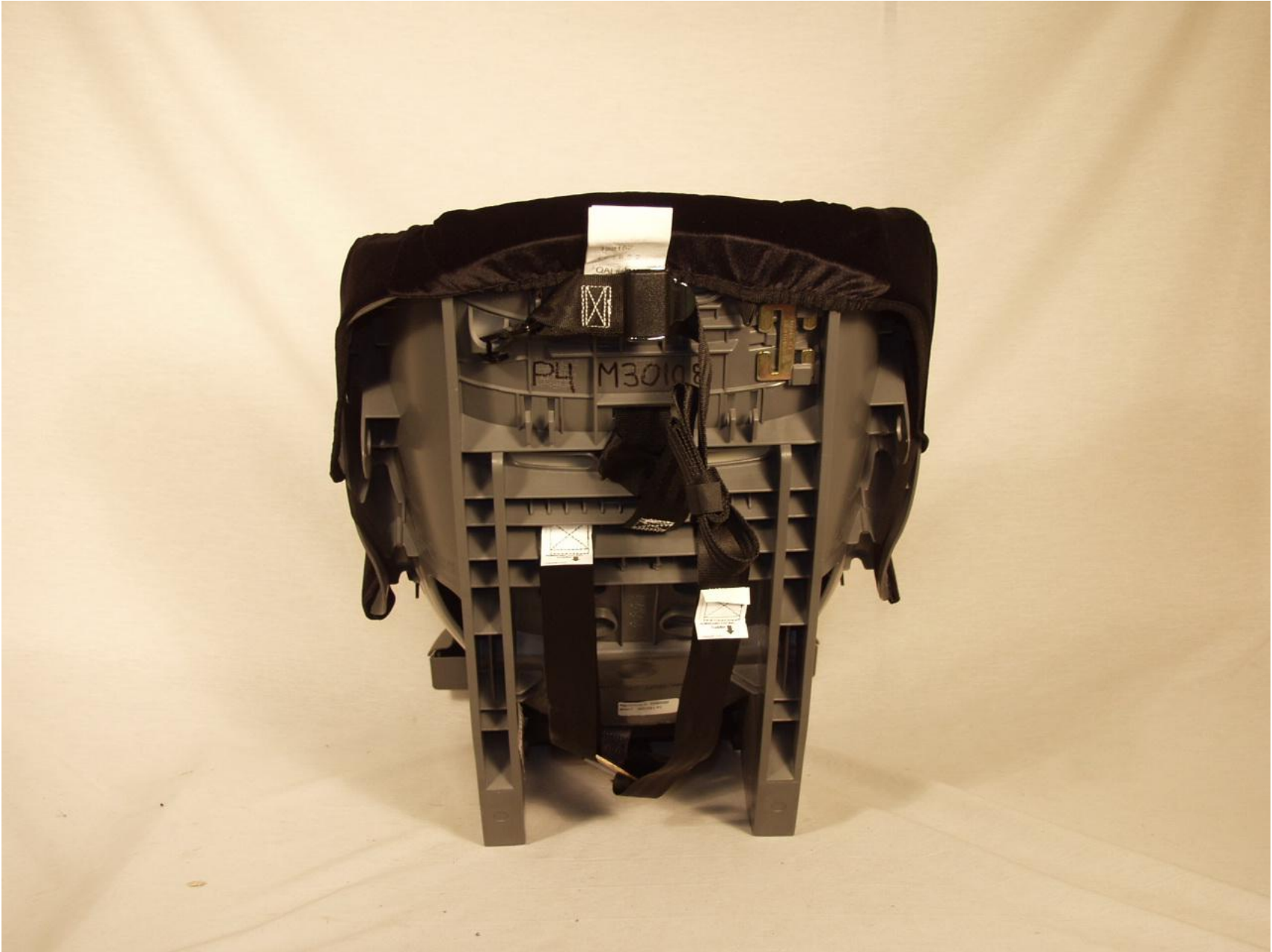


Figure 3-11: PRE-TEST FRONTAL VIEW OF POSITION 4 CRS



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

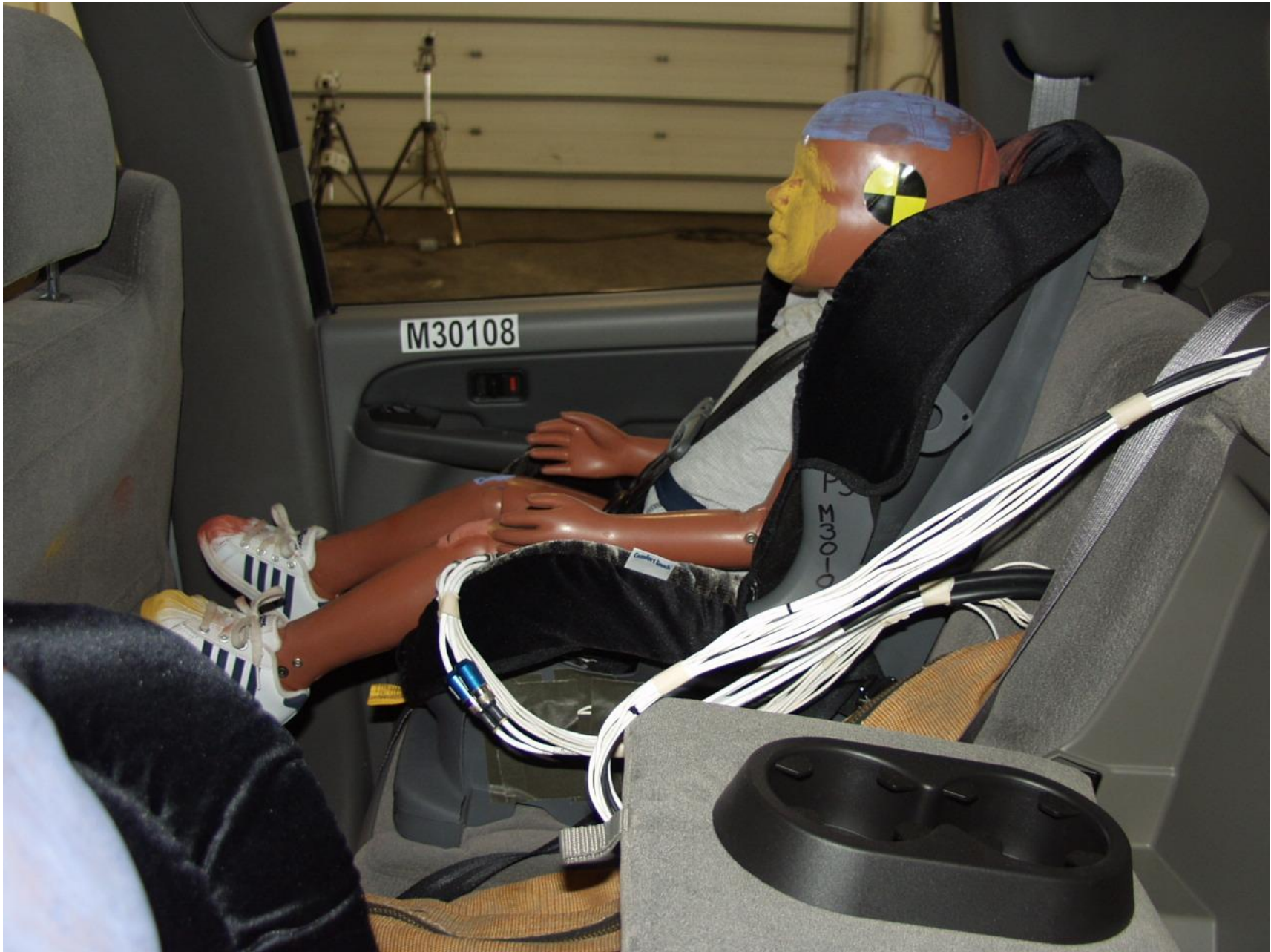


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Figure 3-21: PRE-TEST POSITION 4 LEFT SIDE VIEW



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



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



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



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



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



Figure 3-27: PRE-TEST POSITION 3 FRONT VIEW



Figure 3-28: POST-TEST POSITION 3 REAR VIEW



Figure 3-29: PRE-TEST POSITION 4 REAR VIEW



Figure 3-30: POST-TEST POSITION 4 REAR VIEW

**SECTION 4**

**CHILD DUMMY RESPONSE AND CRS DATA TRACES**

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50	V1P4 Upper Neck My [N-m, CFC_600]	4-53
51	V1P4 Upper Neck Mz [N-m, CFC_600]	4-54
52	V1P4 Upper Neck M Resultant [N-m, CFC_600]	4-55
53	V1P4 Chest x [g, CFC_180]	4-56
54	V1P4 Chest y [g, CFC_180]	4-57
55	V1P4 Chest z [g, CFC_180]	4-58
56	V1P4 Chest Resultant [g, CFC_180]	4-59
57	V1P4 Pelvic x [g, CFC_1000]	4-60
58	V1P4 Pelvic y [g, CFC_1000]	4-61
59	V1P4 Pelvic z [g, CFC_1000]	4-62
60	V1P4 Pelvic Resultant [g, CFC_1000]	4-63
61	V1P4 Lap Belt [N, CFC_60]	4-64
62	V1P4 CRS x [g, CFC_60]	4-65
63	V1P4 CRS x Velocity [kph, CFC_180]	4-66
64	V1P4 CRS x Displacement [mm, CFC_180]	4-67
65	V1P4 CRS y [g, CFC_60]	4-68
66	V1P4 CRS y Velocity [kph, CFC_180]	4-69
67	V1P4 CRS y Displacement [mm, CFC_180]	4-70
68	V1P4 CRS z [g, CFC_60]	4-71
69	V1P4 CRS z Velocity [kph, CFC_180]	4-72
70	V1P4 CRS z Displacement [mm, CFC_180]	4-73
71	V1P4 CRS Resultant [g, CFC_60]	4-74

NCAP Test #14 - 2003 Chevrolet Suburban

V1P3 Head x

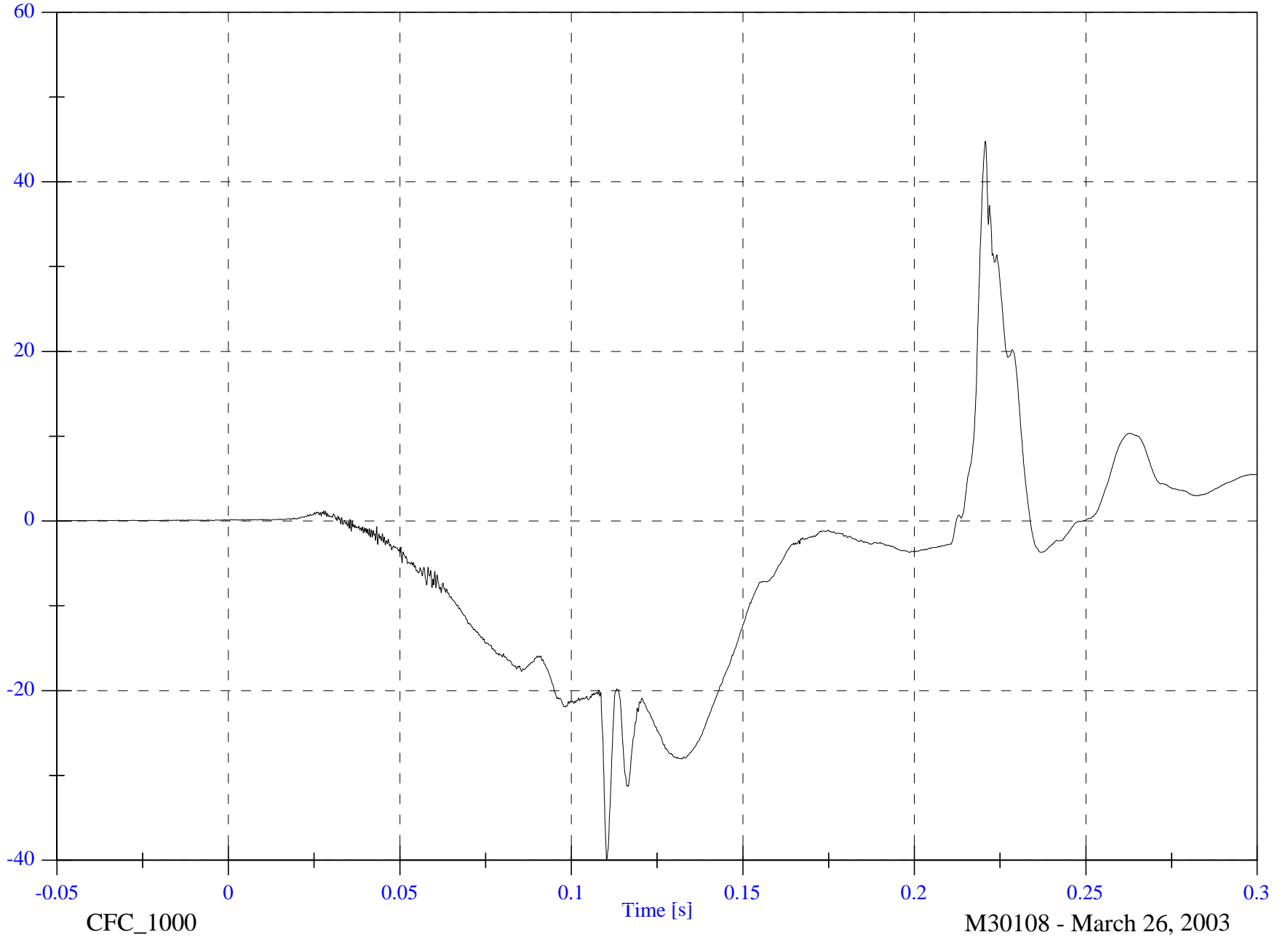
Max: 44.8 [g] at 0.221 [s]

Min: -39.9 [g] at 0.110 [s]

4-4

g

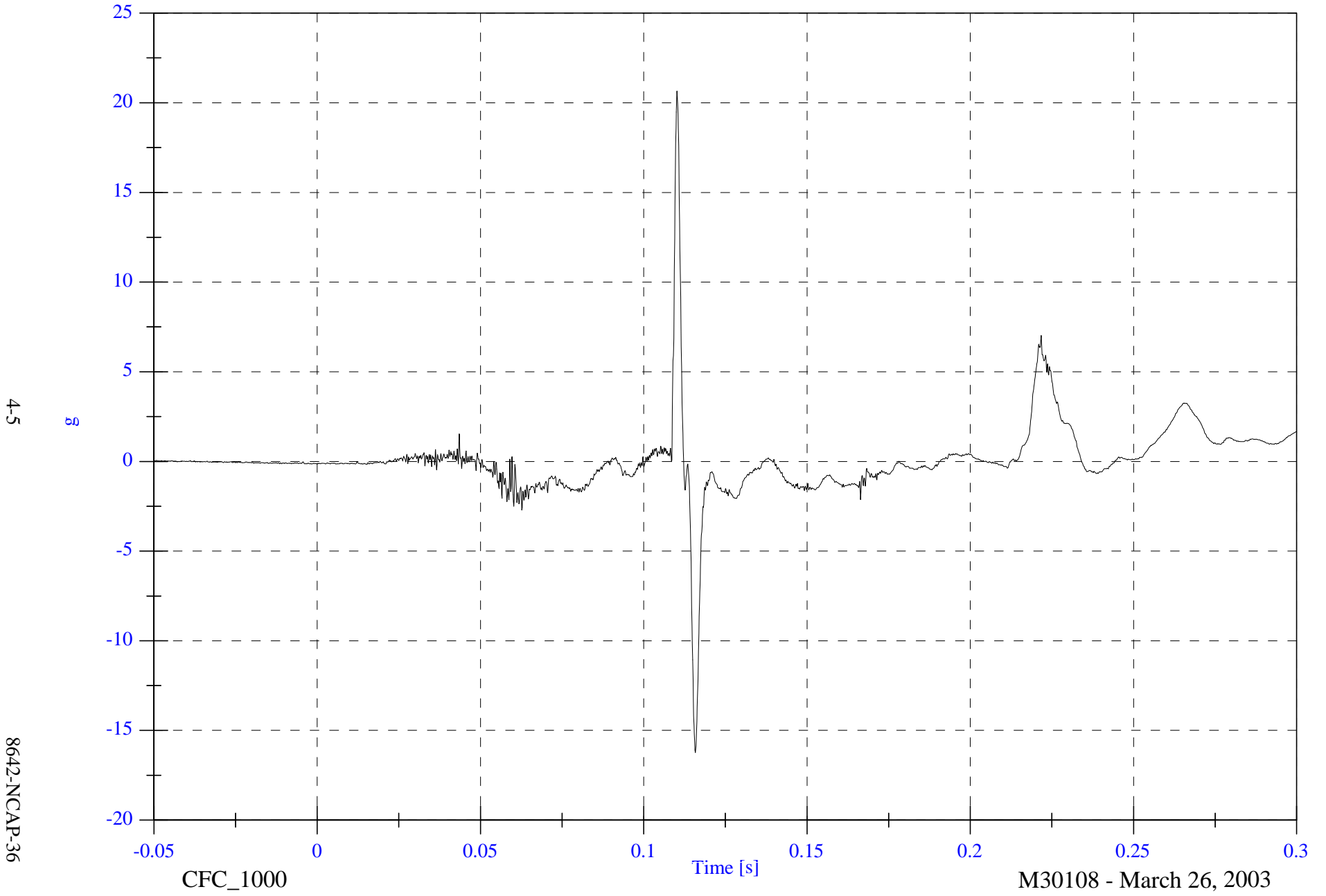
8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

Max: 20.7 [g] at 0.110 [s]  
Min: -16.2 [g] at 0.116 [s]

V1P3 Head y



NCAP Test #14 - 2003 Chevrolet Suburban

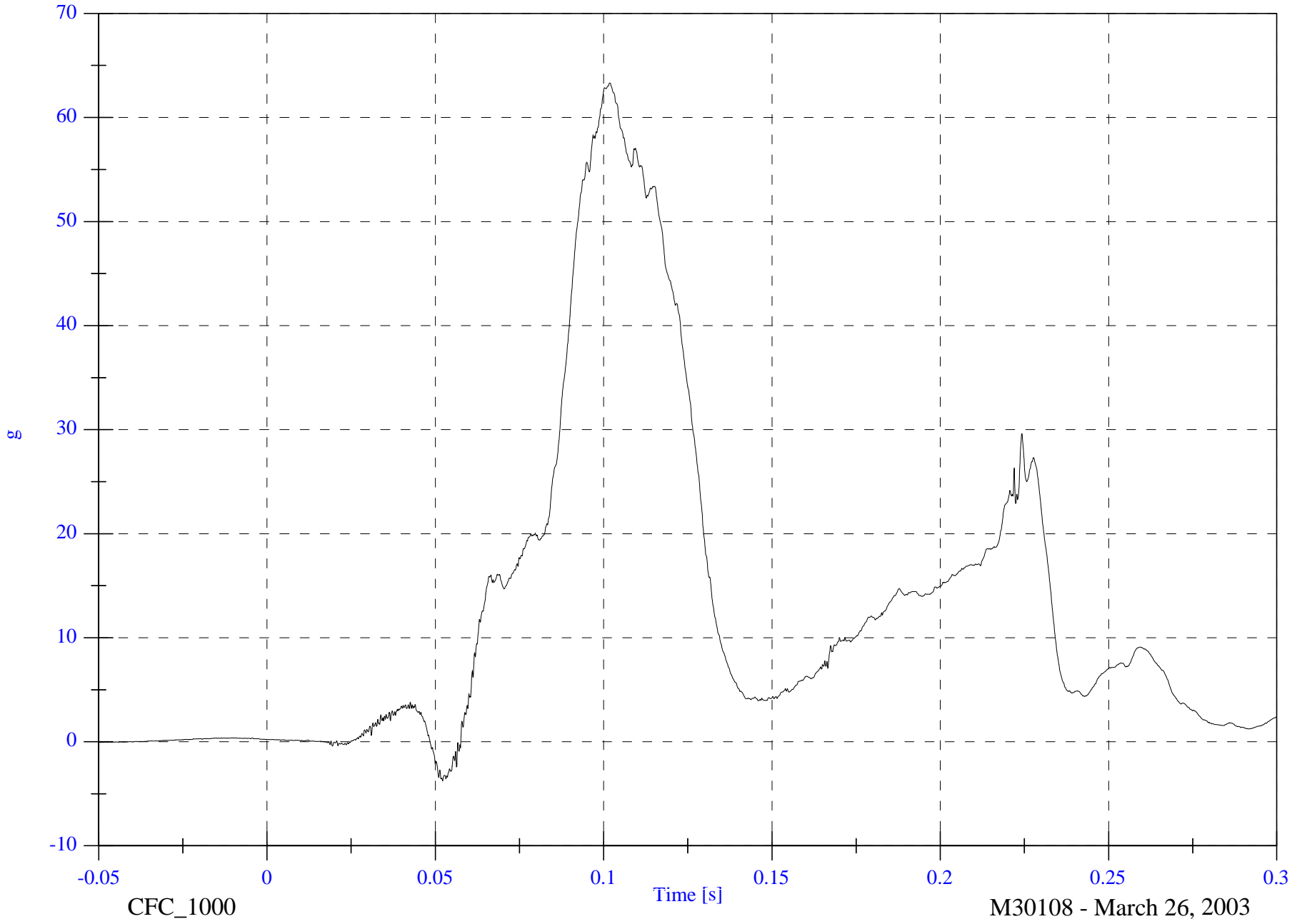
V1P3 Head z

Max: 63.3 [g] at 0.102 [s]

Min: -3.8 [g] at 0.052 [s]

4-6

8642-NCAP-36



CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

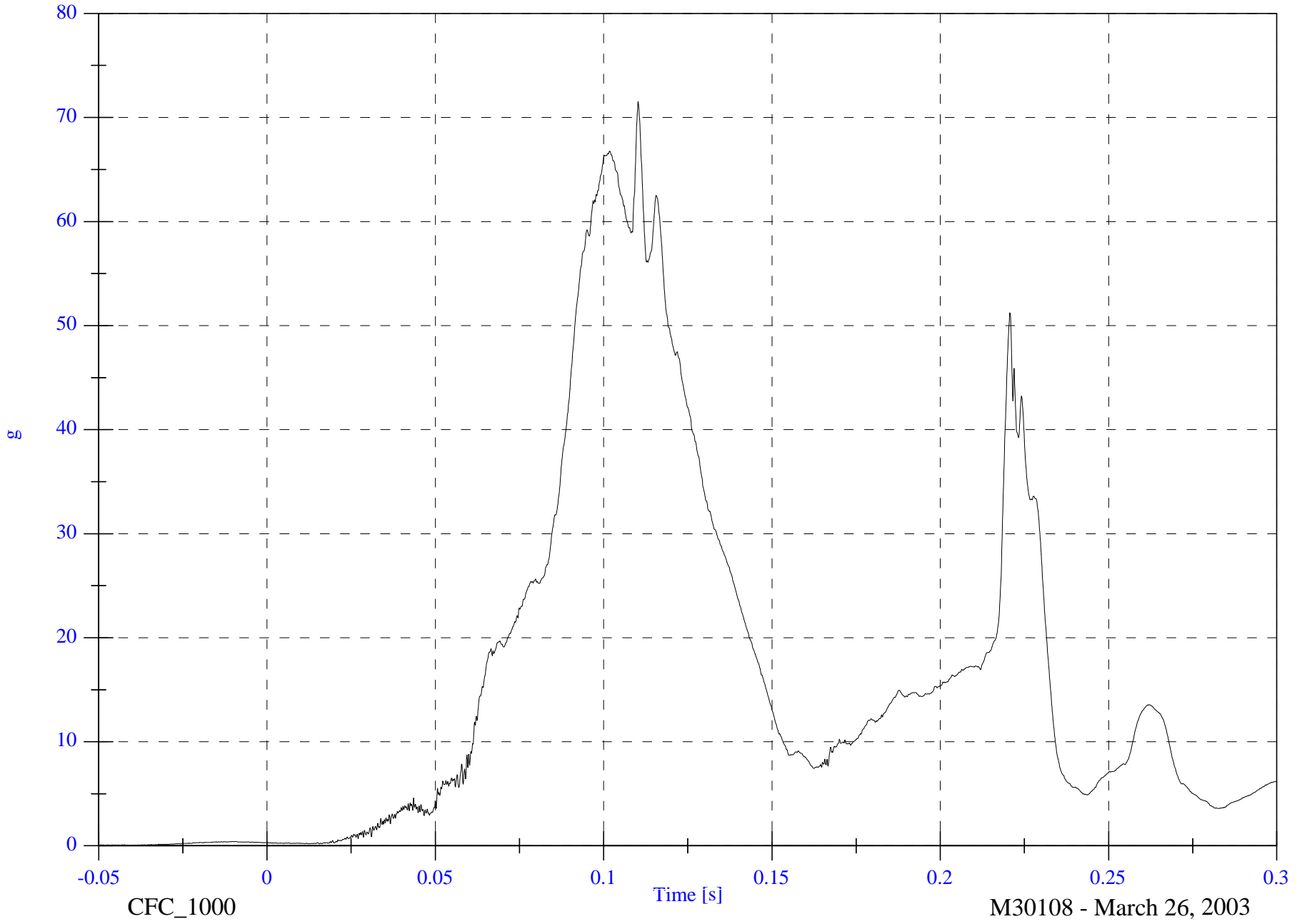
V1P3 Head Resultant

Max: 71.5 [g] at 0.110 [s]

Min: 0.0 [g] at -0.041 [s]

4-7

8642-NCAP-36

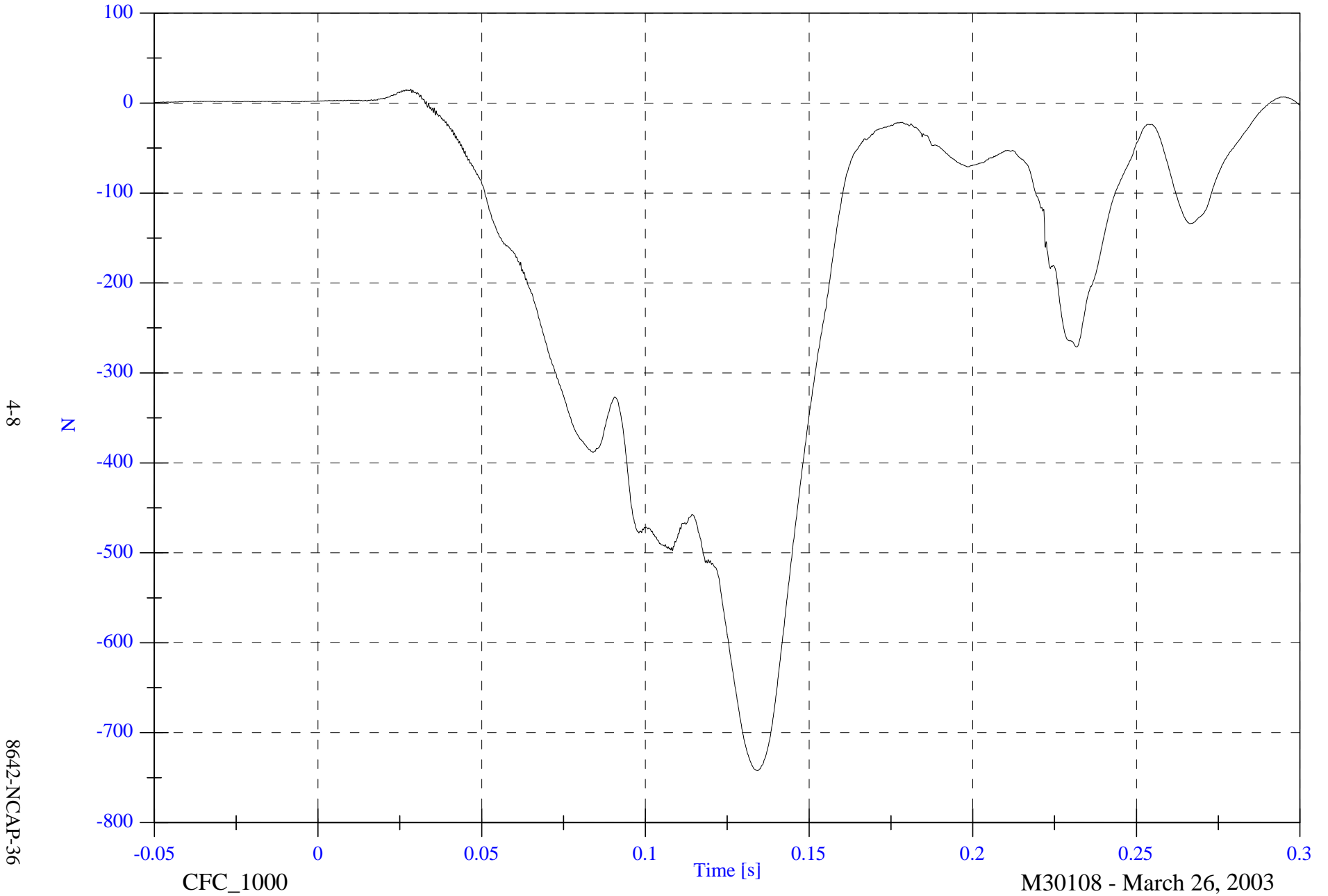


NCAP Test #14 - 2003 Chevrolet Suburban

V1P3 Upper Neck Fx

Max: 15.5 [N] at 0.028 [s]

Min: -742.0 [N] at 0.134 [s]



4-8

8642-NCAP-36

CFC\_1000

Time [s]

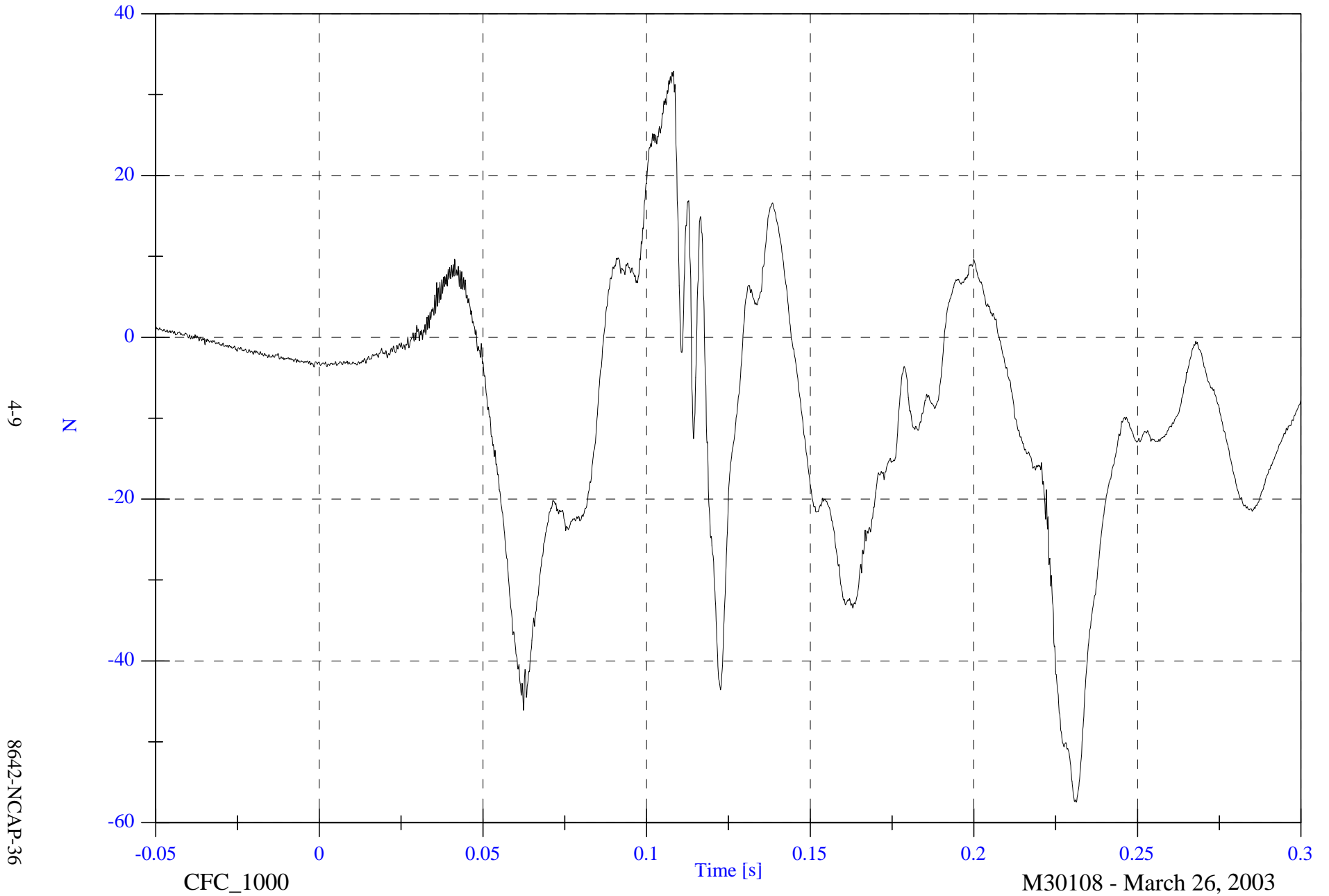
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 32.9 [N] at 0.108 [s]

Min: -57.5 [N] at 0.231 [s]

V1P3 Upper Neck Fy



4-9

N

Time [s]

CFC\_1000

M30108 - March 26, 2003

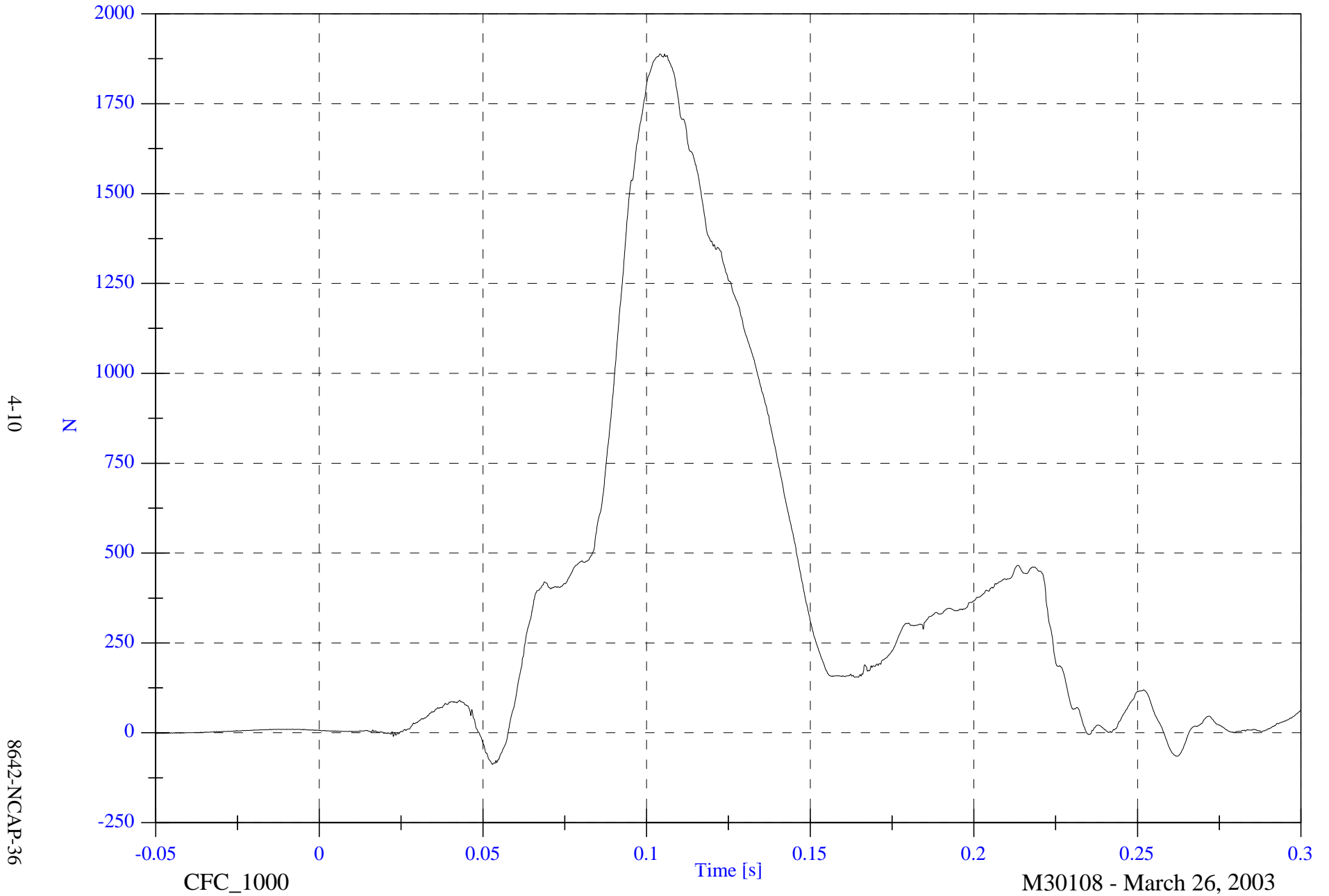
8642-NCAP-36

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 1887.9 [N] at 0.105 [s]

Min: -87.4 [N] at 0.053 [s]

V1P3 Upper Neck Fz



4-10

8642-NCAP-36

CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

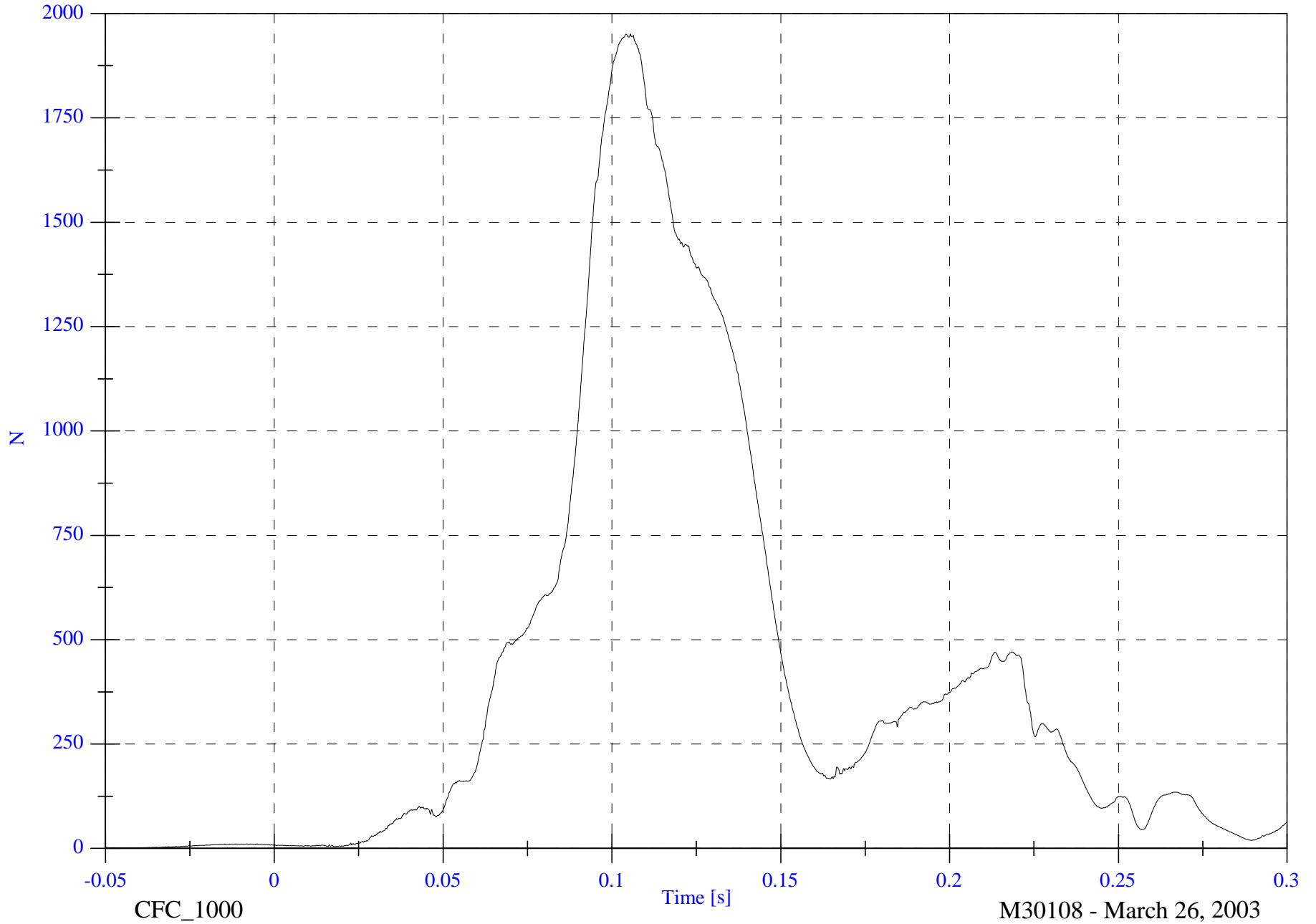
V1P3 Upper Neck F Resultant

Max: 1951.1 [N] at 0.105 [s]

Min: 1.1 [N] at -0.045 [s]

4-11

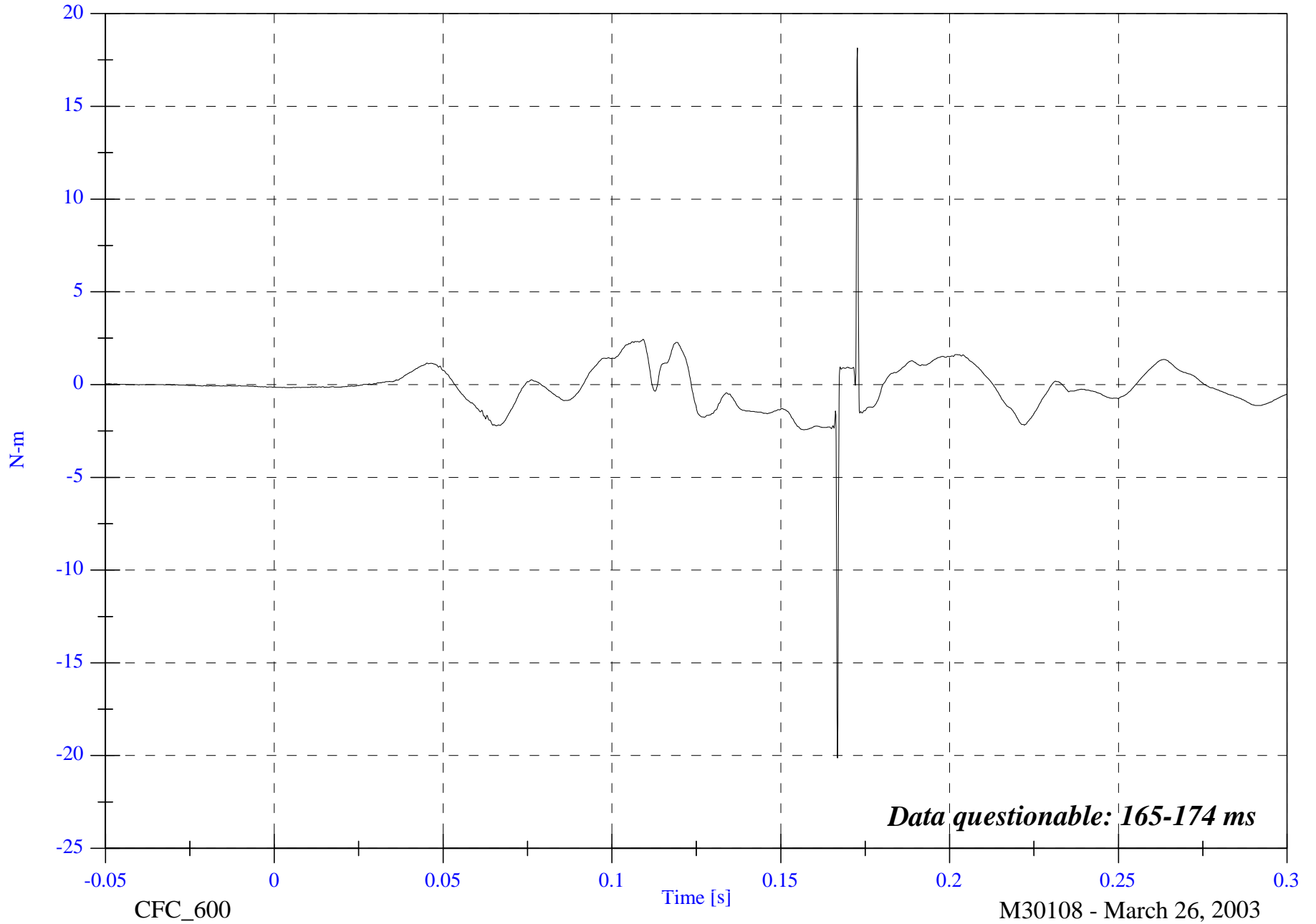
8642-NCAP-36



CFC\_1000

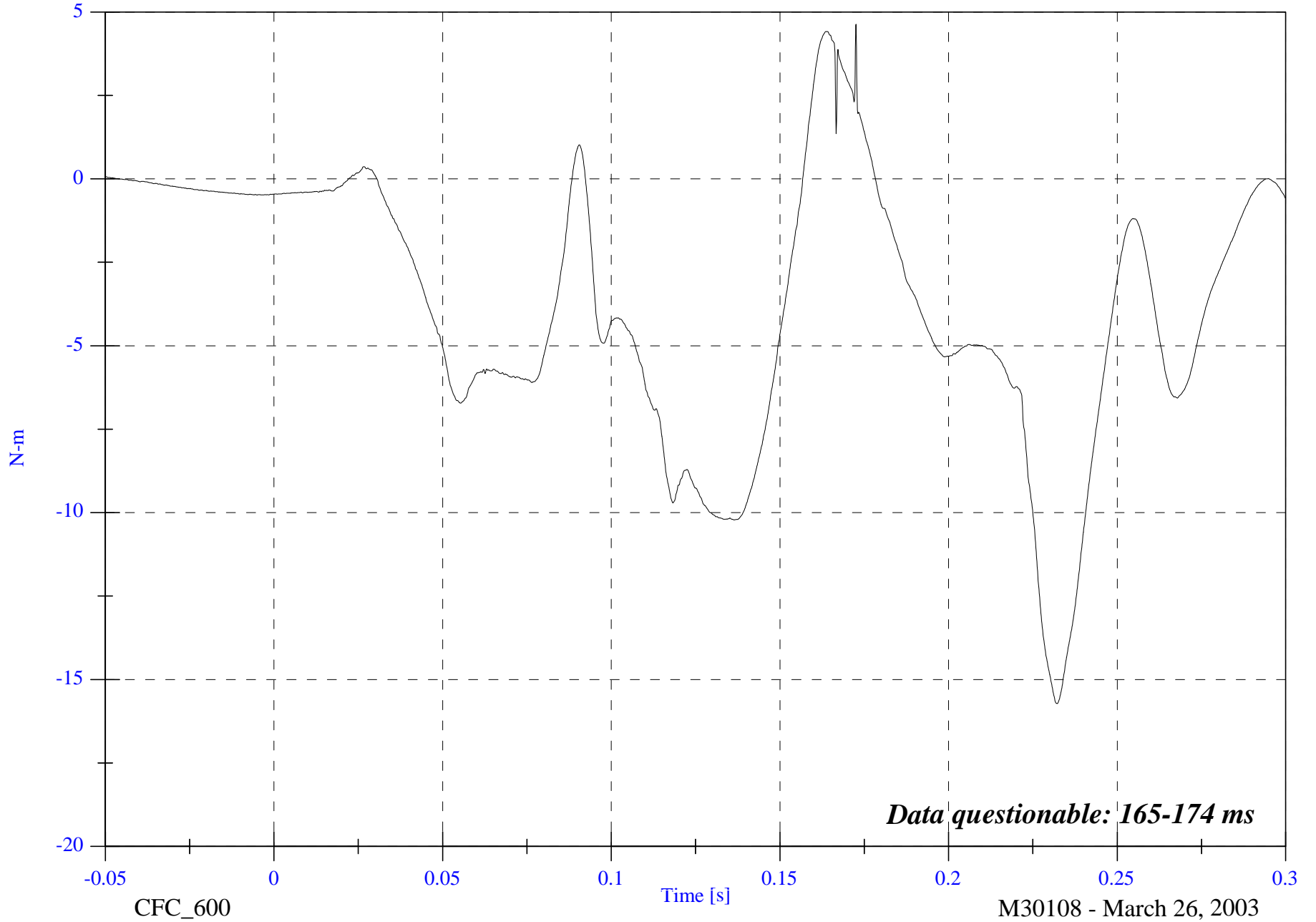
M30108 - March 26, 2003

V1P3 Upper Neck Mx



4-13

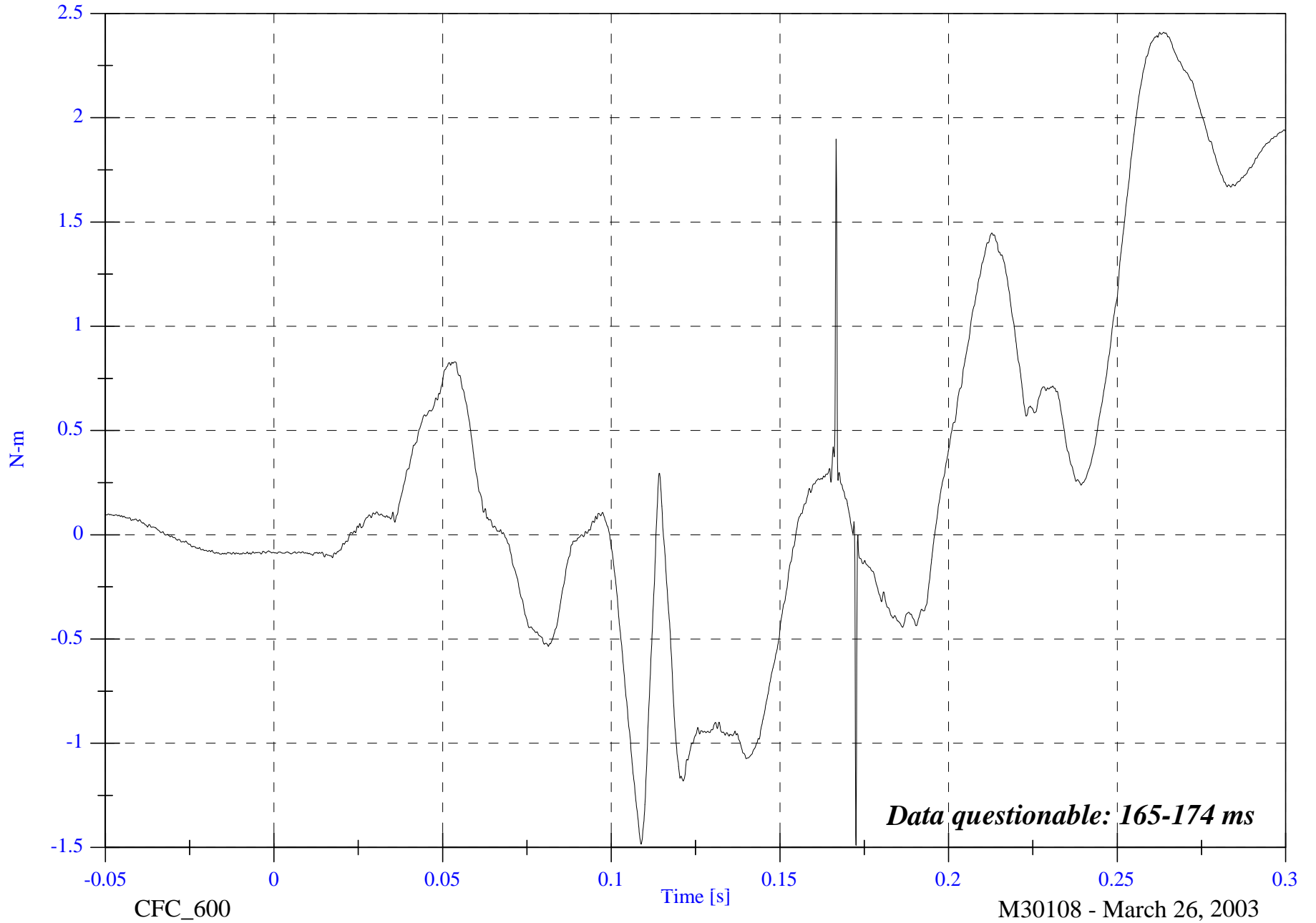
8642-NCAP-36



*Data questionable: 165-174 ms*

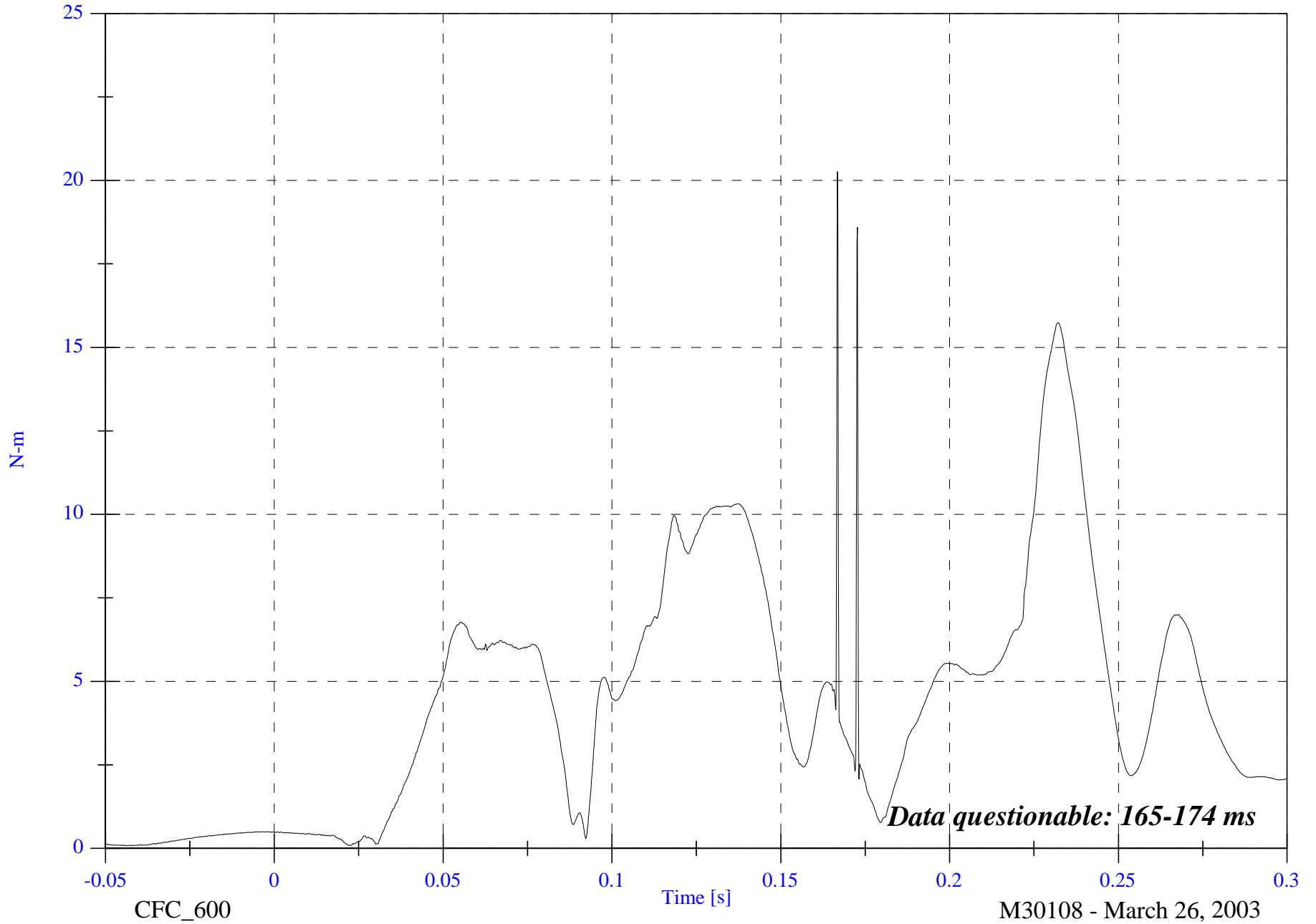
4-14

8642-NCAP-36



4-15

8642-NCAP-36



*Data questionable: 165-174 ms*

NCAP Test #14 - 2003 Chevrolet Suburban

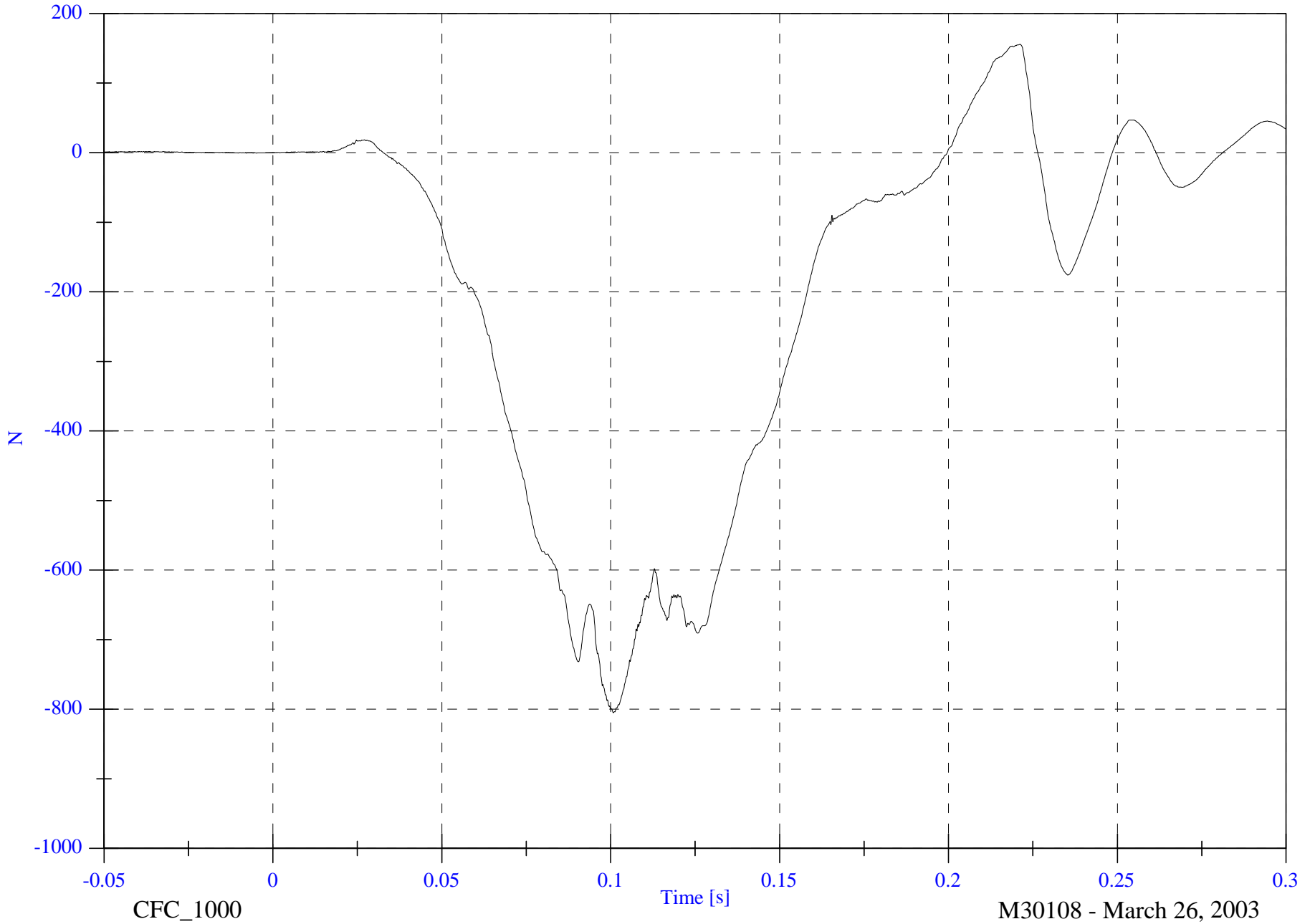
V1P3 Lower Neck Fx

Max: 155.7 [N] at 0.221 [s]

Min: -805.1 [N] at 0.101 [s]

4-16

8642-NCAP-36



CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

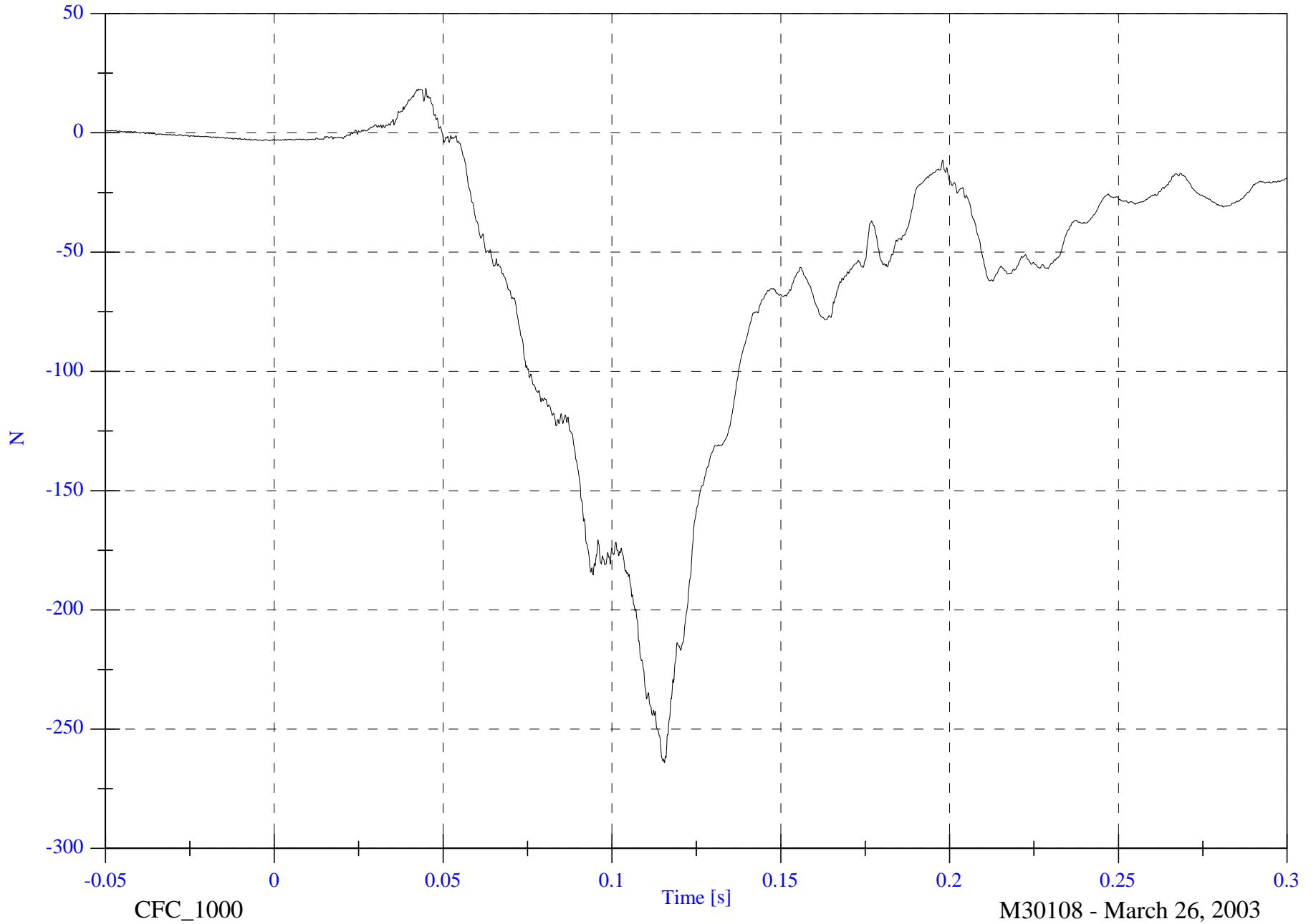
V1P3 Lower Neck Fy

Max: 18.6 [N] at 0.045 [s]

Min: -264.1 [N] at 0.116 [s]

4-17

8642-NCAP-36



CFC\_1000

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NCAP Test #14 - 2003 Chevrolet Suburban

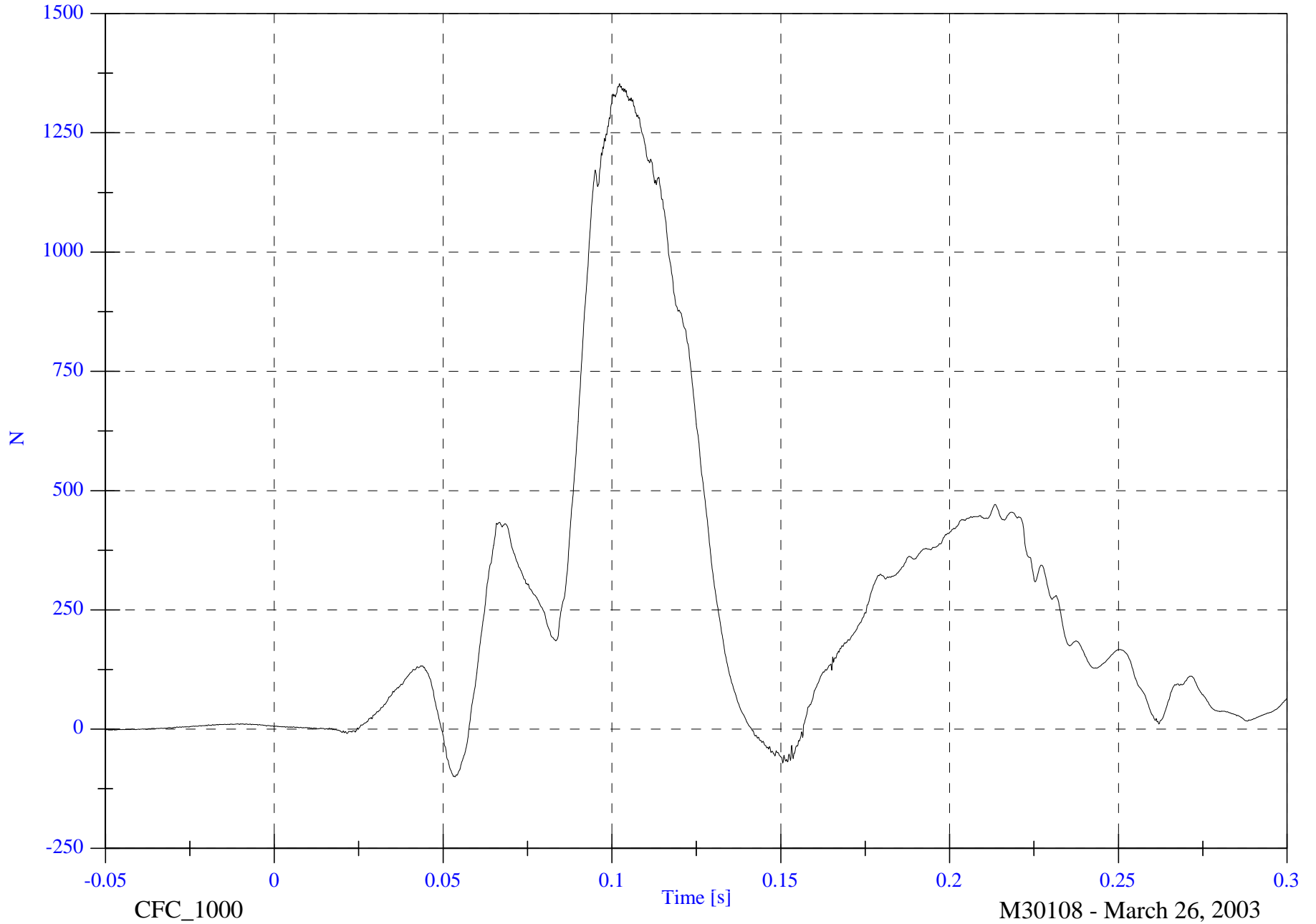
Max: 1352.7 [N] at 0.102 [s]

V1P3 Lower Neck Fz

Min: -100.0 [N] at 0.054 [s]

4-18

8642-NCAP-36



CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

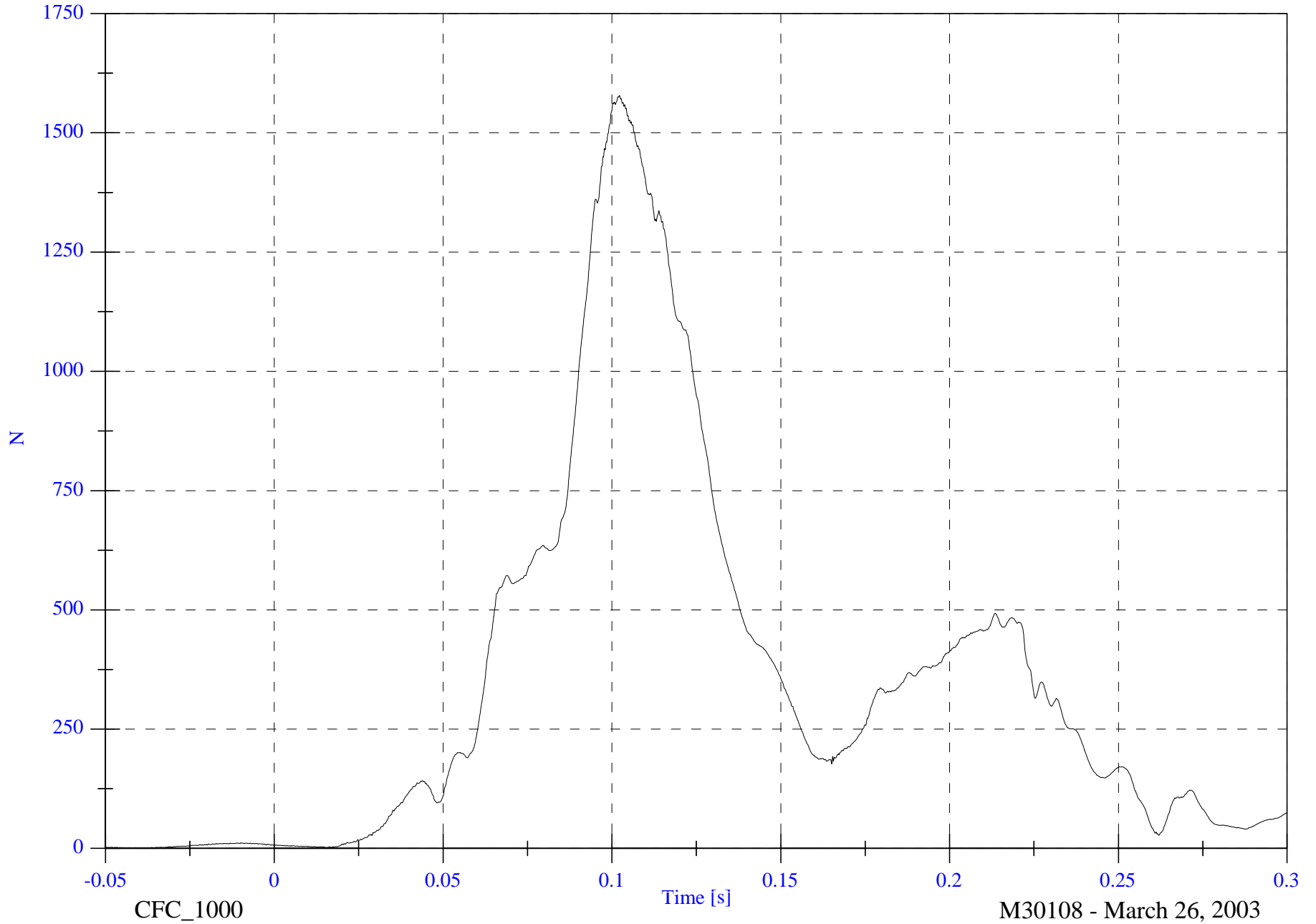
V1P3 Lower Neck F Resultant

Max: 1578.1 [N] at 0.102 [s]

Min: 1.1 [N] at -0.040 [s]

4-19

8642-NCAP-36



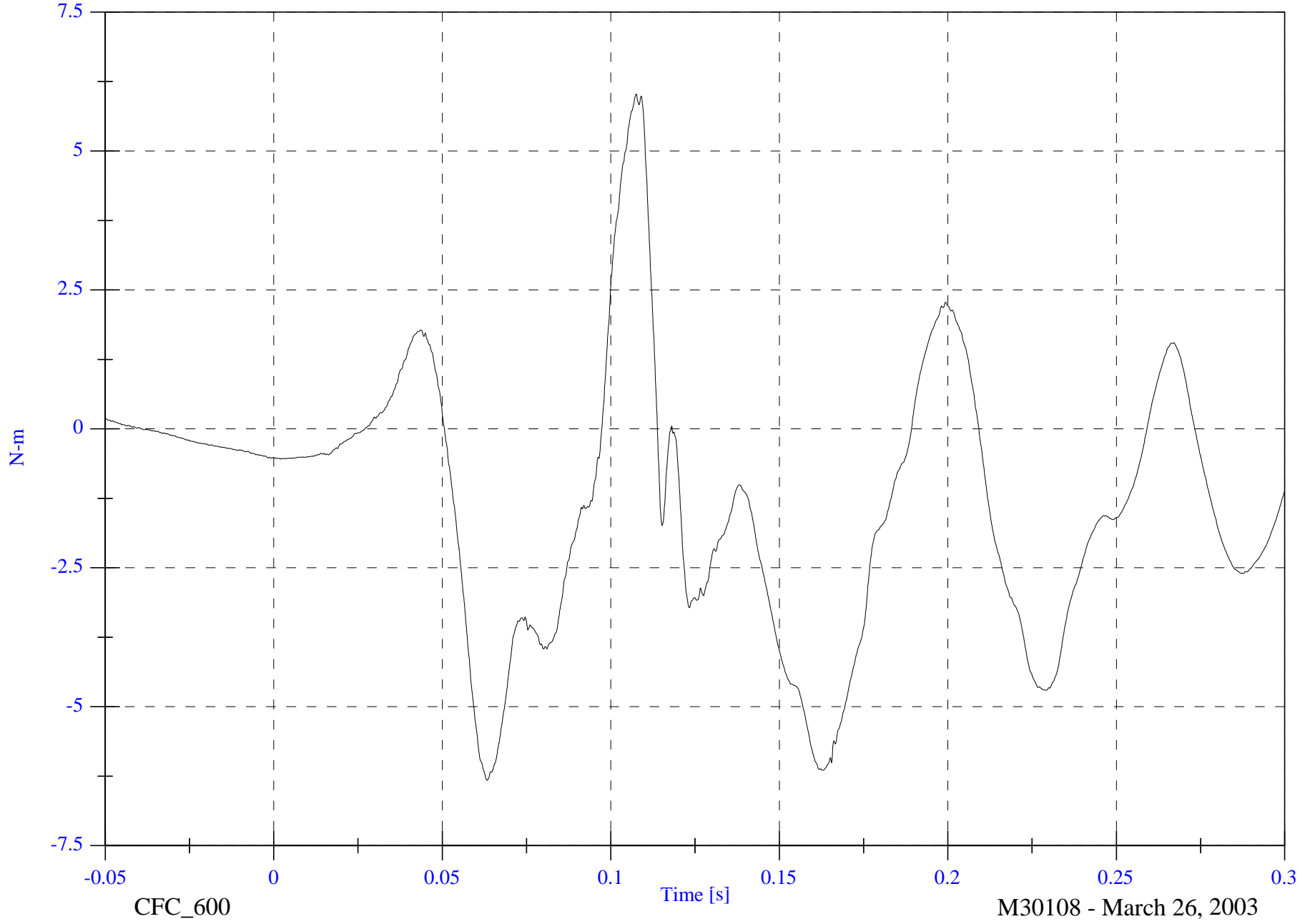
CFC\_1000

Time [s]

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4-20

8642-NCAP-36

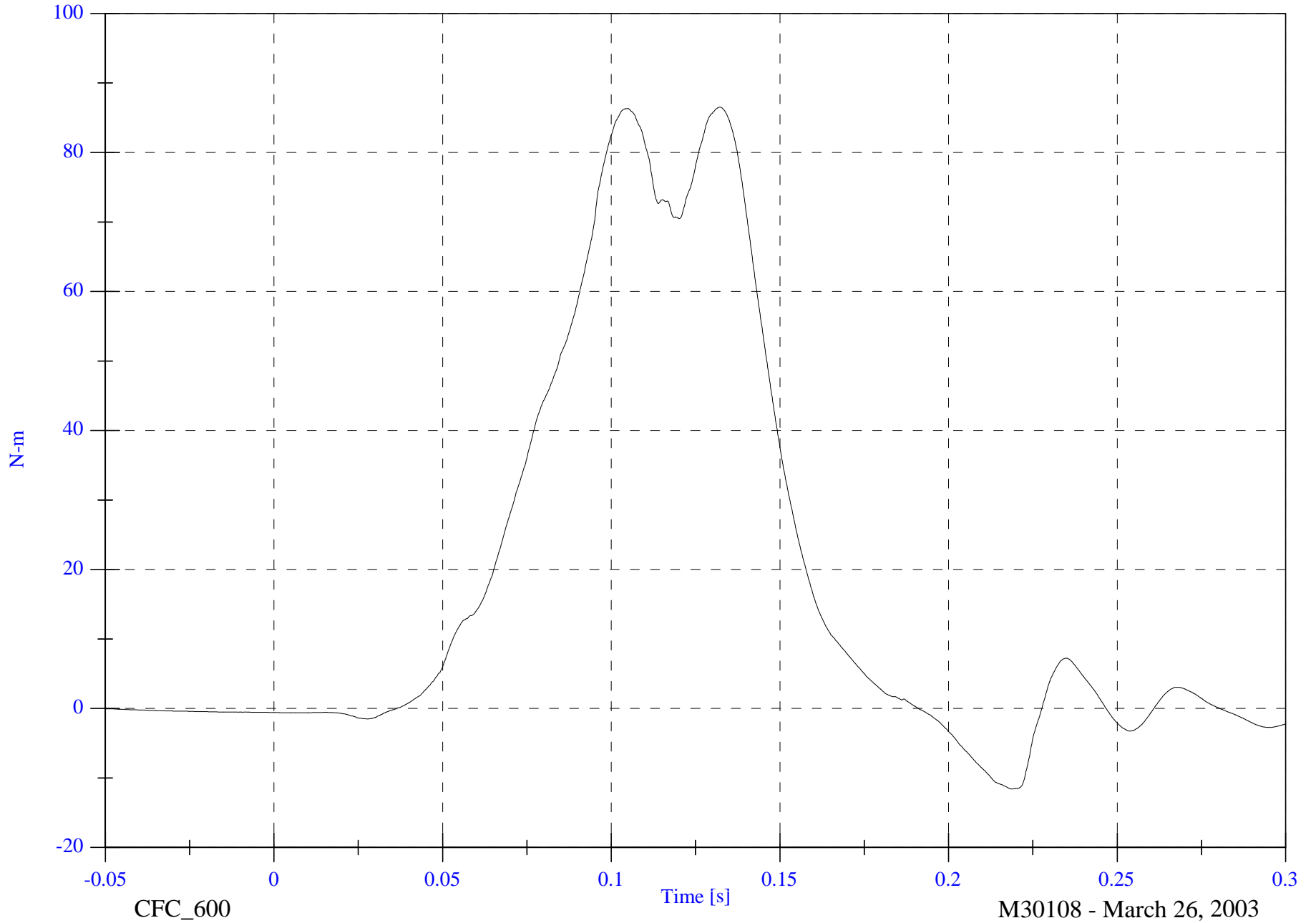


CFC\_600

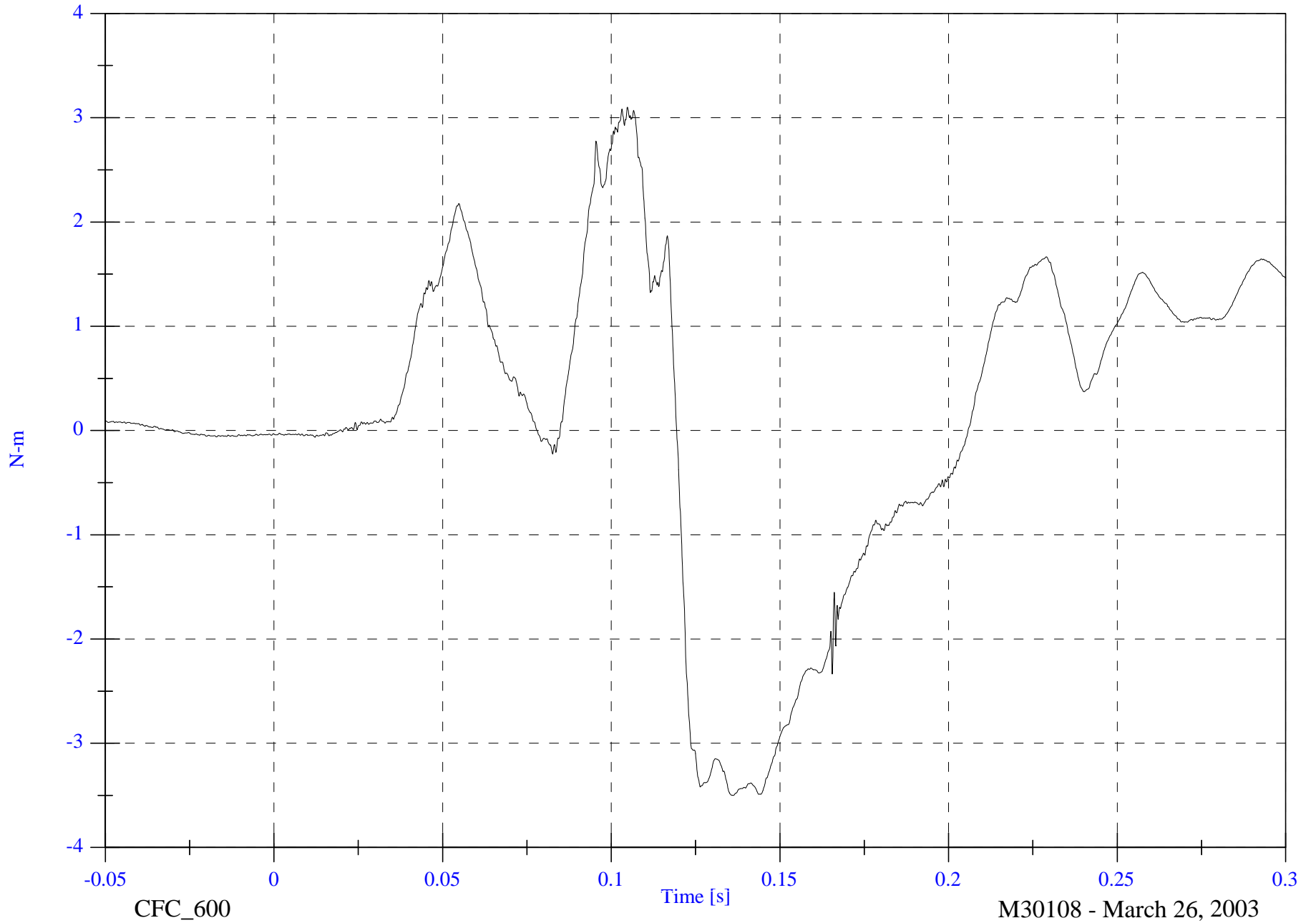
Time [s]

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V1P3 Lower Neck My



V1P3 Lower Neck Mz



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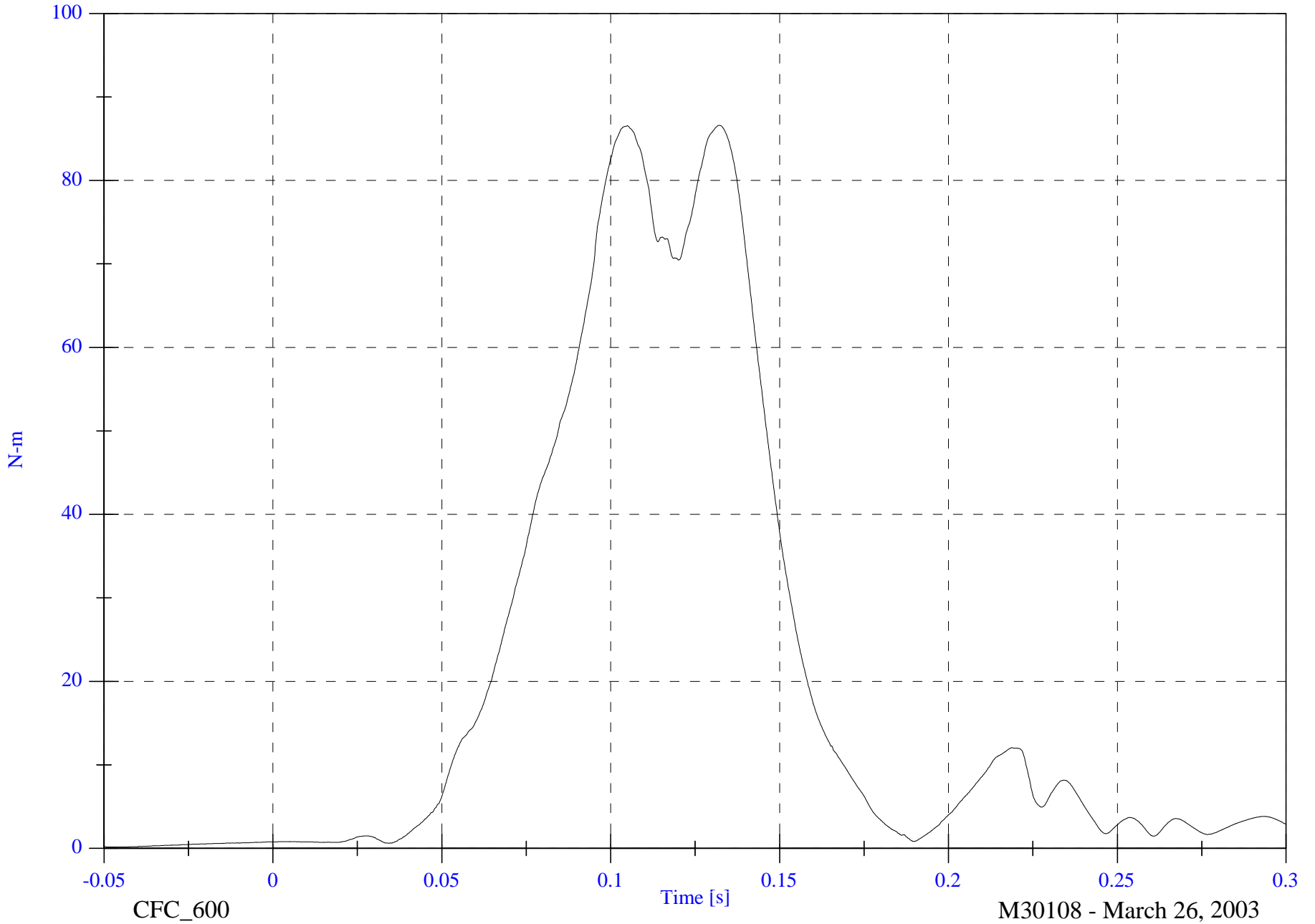
V1P3 Lower Neck M Resultant

Max: 86.6 [N-m] at 0.132 [s]

Min: 0.2 [N-m] at -0.045 [s]

4-23

8642-NCAP-36



CFC\_600

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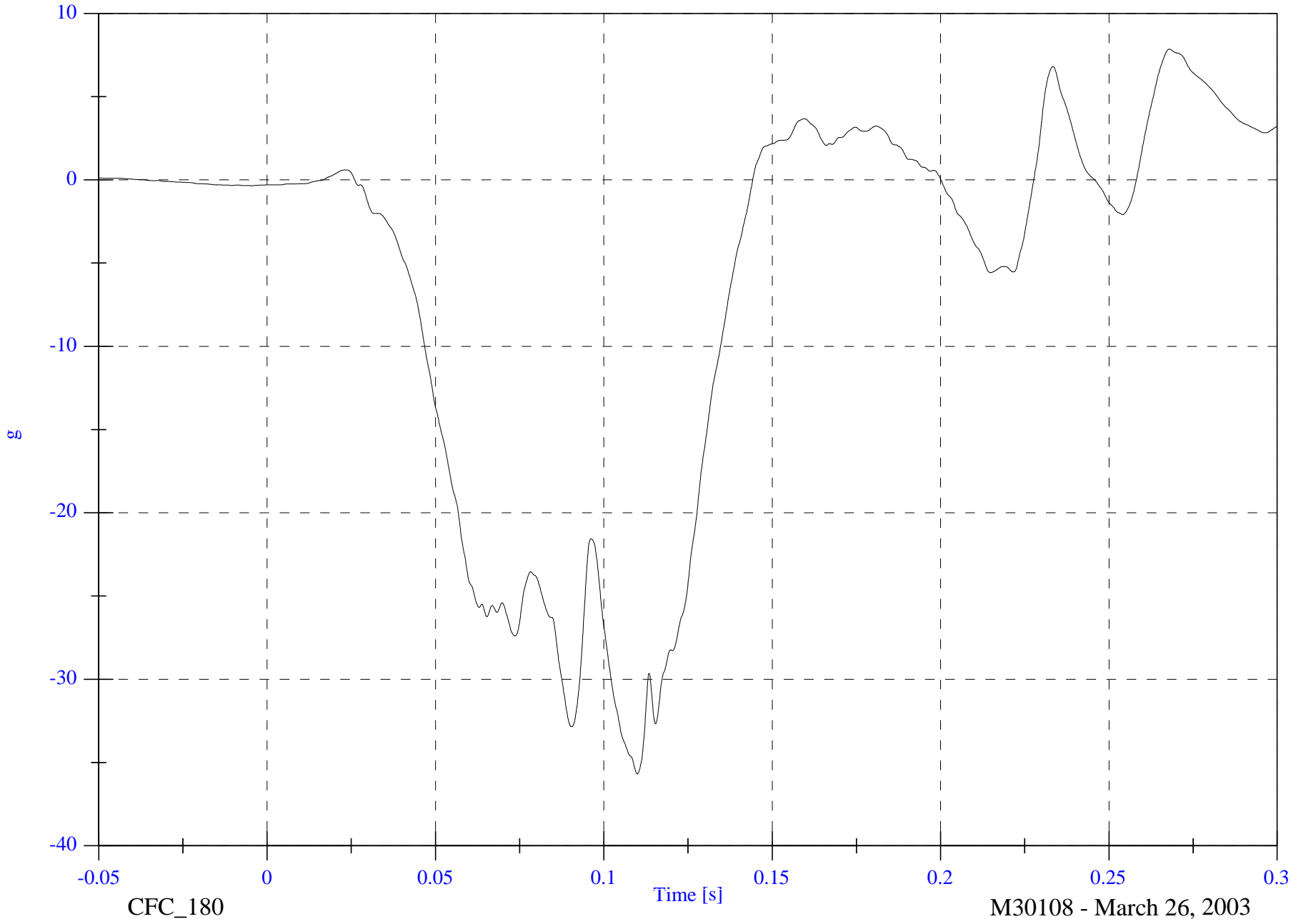
VIP3 Chest x

Max: 7.9 [g] at 0.268 [s]

Min: -35.7 [g] at 0.110 [s]

4-24

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

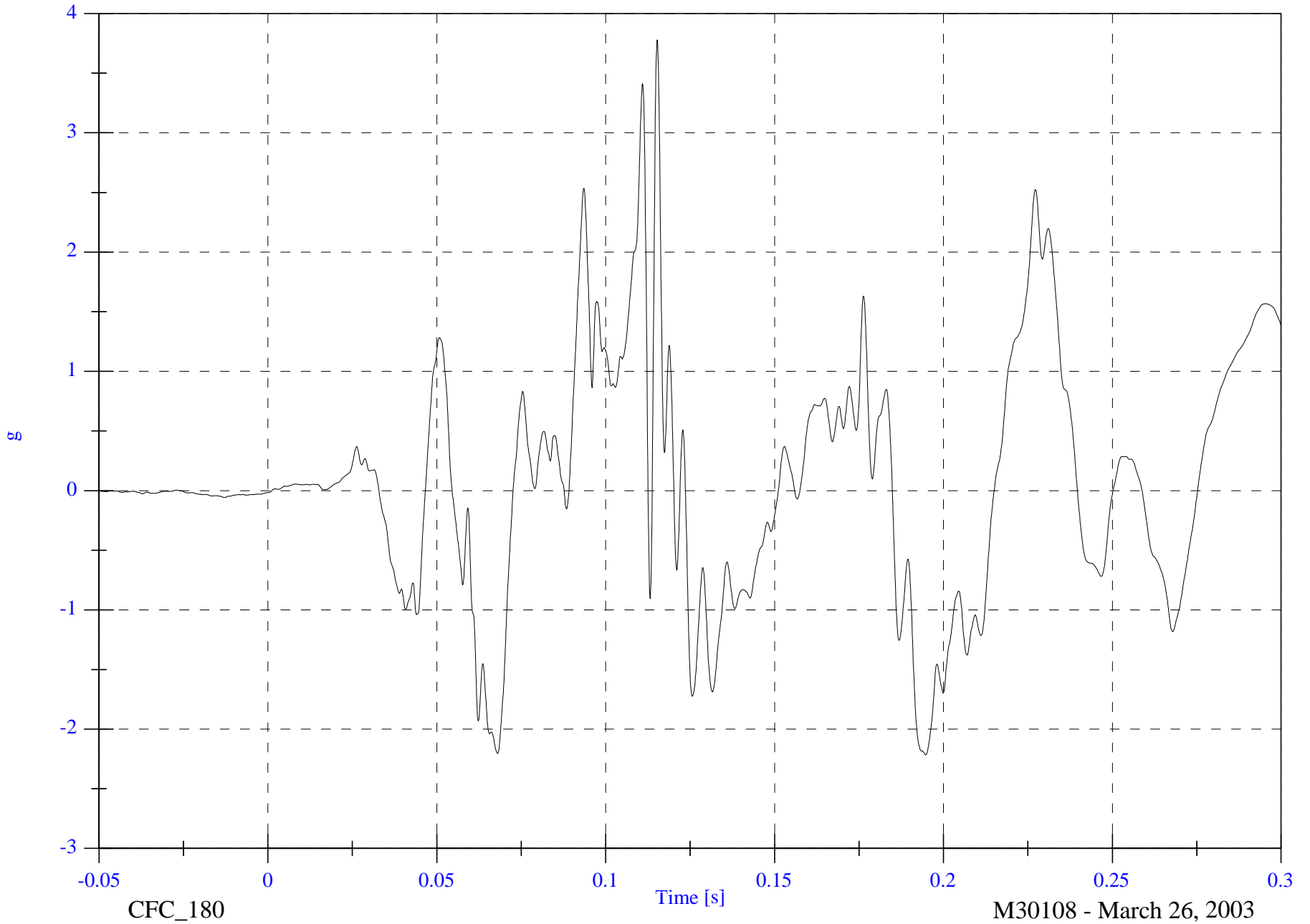
Max: 3.8 [g] at 0.115 [s]

Min: -2.2 [g] at 0.195 [s]

VIP3 Chest y

4-25

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

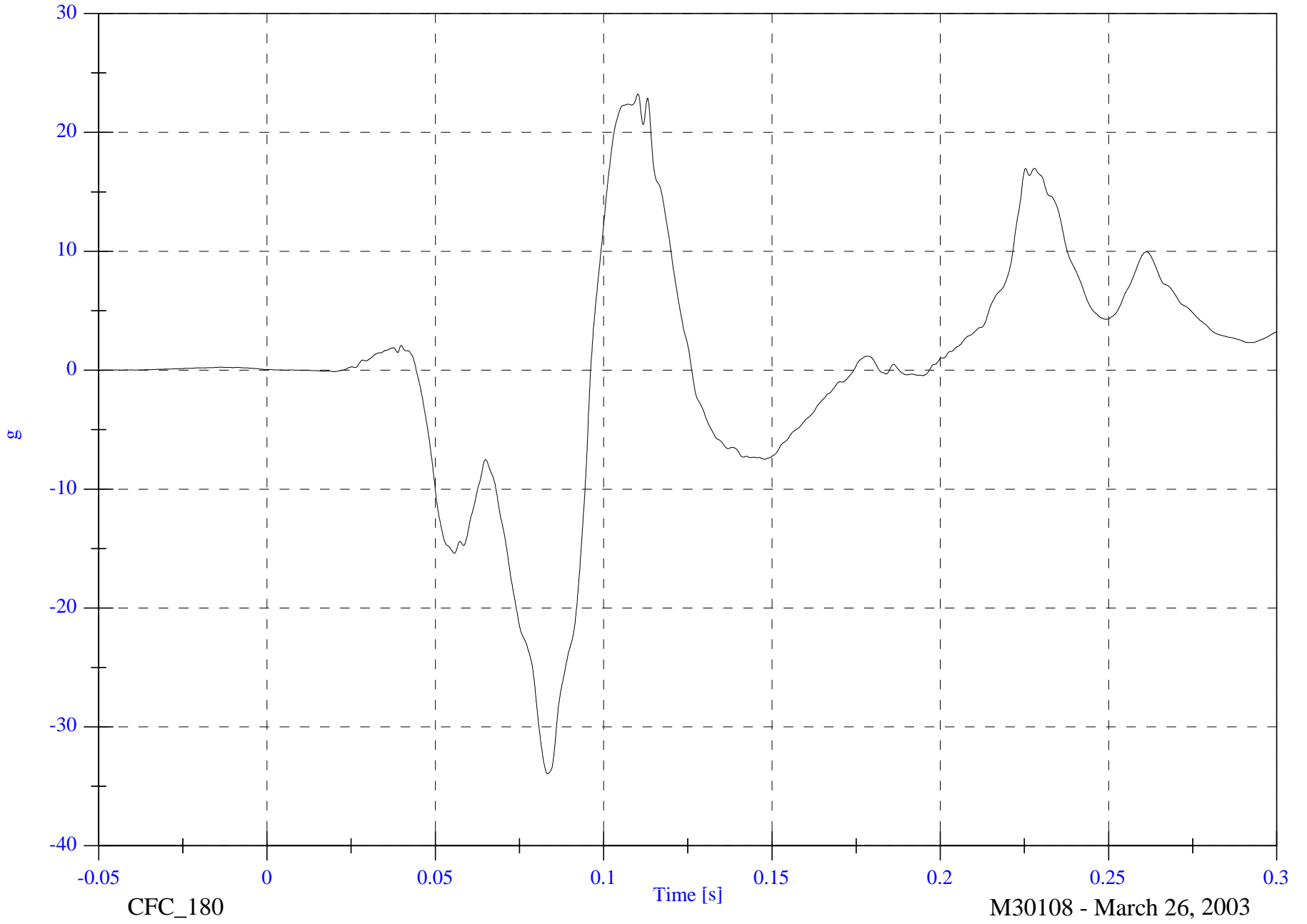
VIP3 Chest z

Max: 23.2 [g] at 0.110 [s]

Min: -33.9 [g] at 0.083 [s]

4-26

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

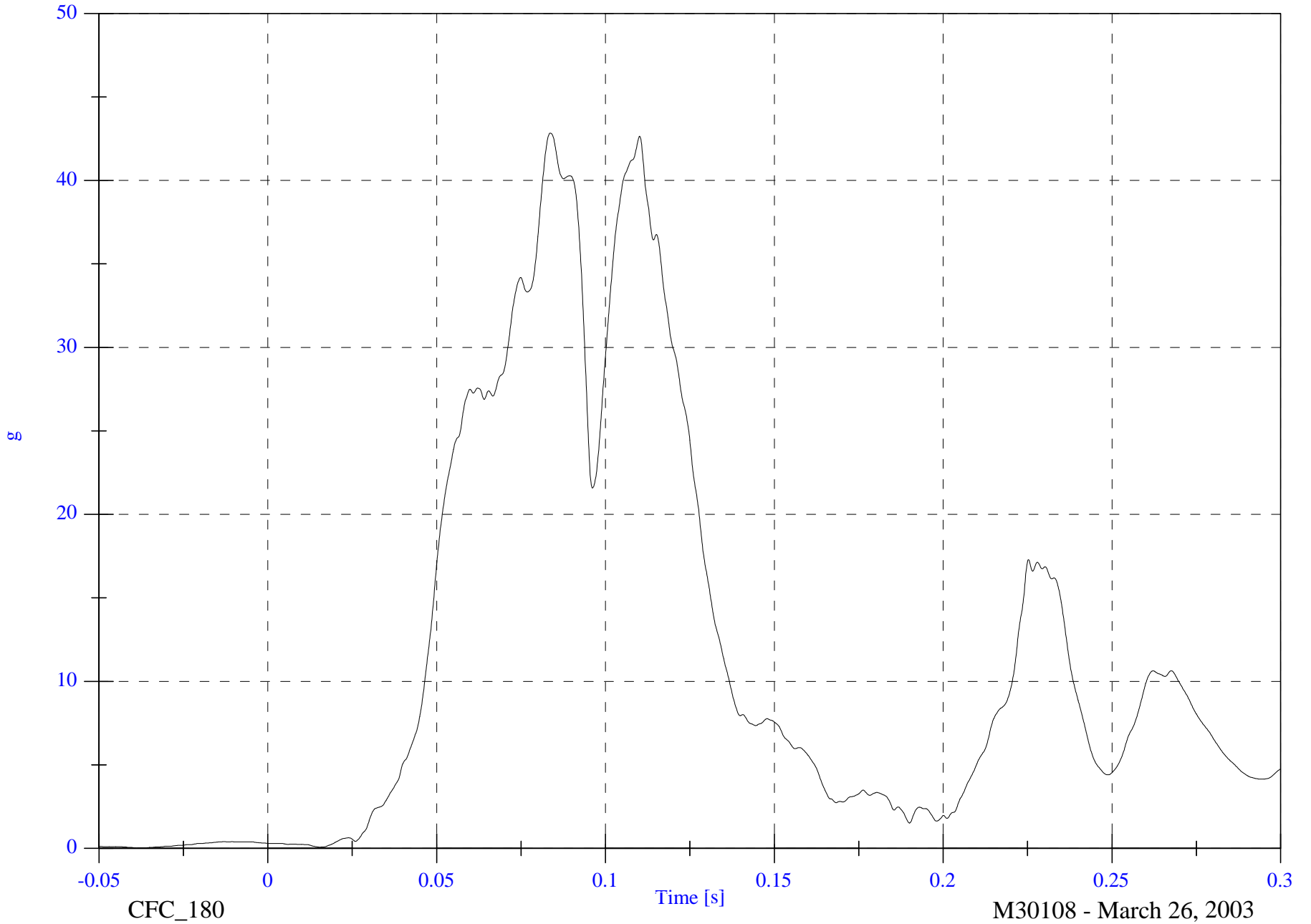
V1P3 Chest Resultant

Max: 42.8 [g] at 0.084 [s]

Min: 0.0 [g] at -0.039 [s]

4-27

8642-NCAP-36

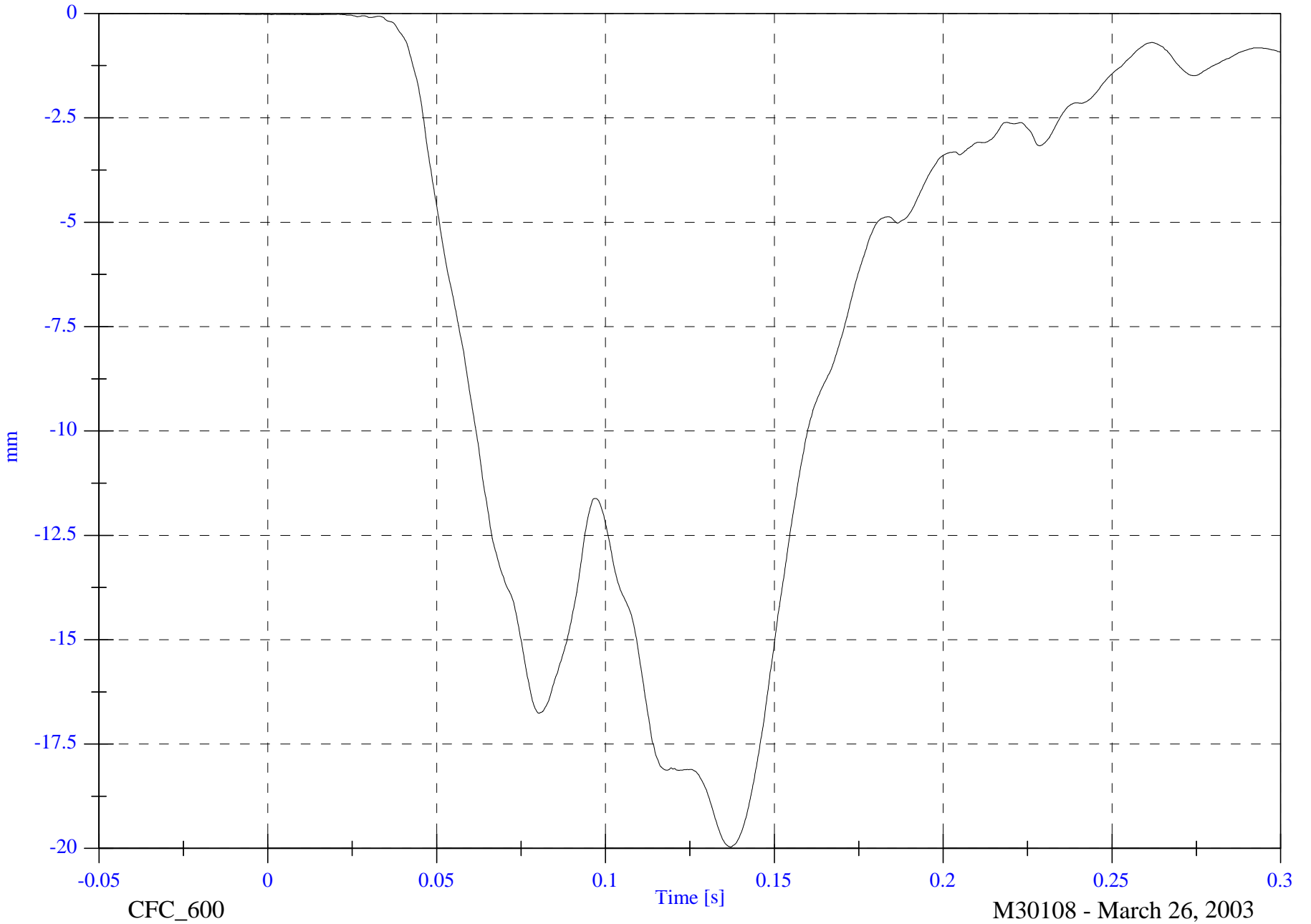


CFC\_180

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4-28

8642-NCAP-36

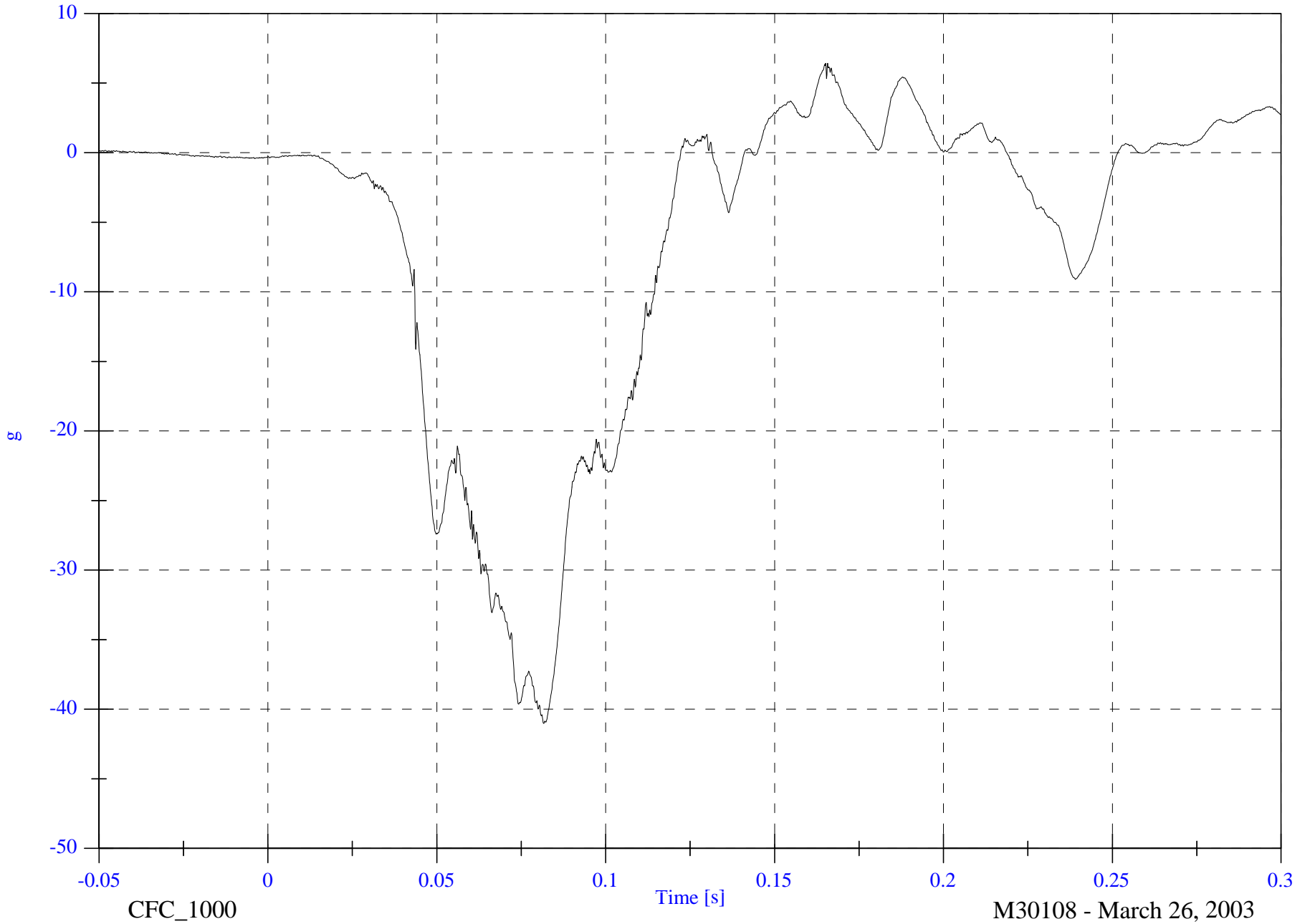


NCAP Test #14 - 2003 Chevrolet Suburban

V1P3 Pelvic x

Max: 6.4 [g] at 0.165 [s]

Min: -41.0 [g] at 0.082 [s]



4-29

8642-NCAP-36

CFC\_1000

Time [s]

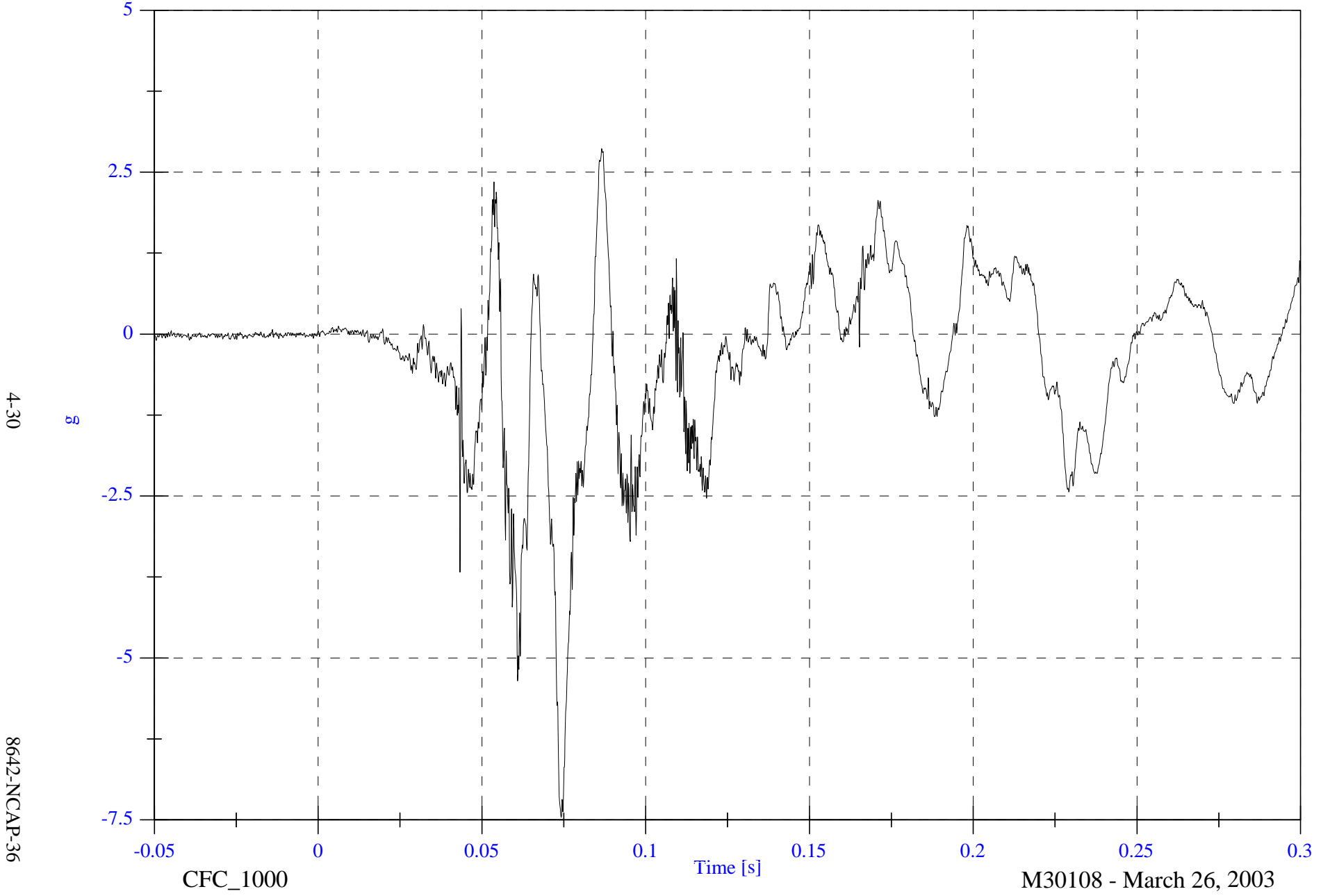
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Max: 2.9 [g] at 0.087 [s]

Min: -7.5 [g] at 0.074 [s]

V1P3 Pelvic y



4-30

8642-NCAP-36

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NCAP Test #14 - 2003 Chevrolet Suburban

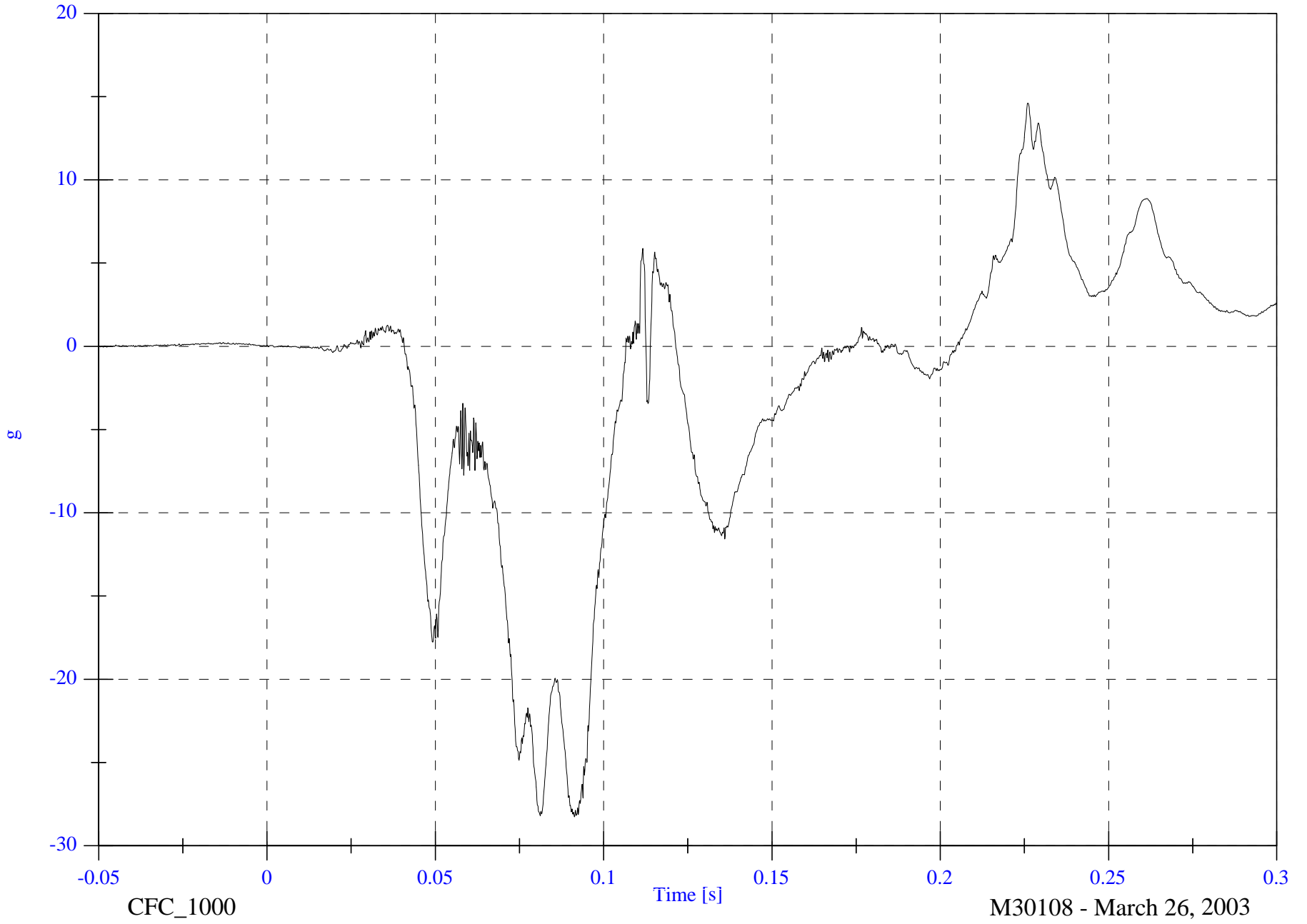
V1P3 Pelvic z

Max: 14.6 [g] at 0.226 [s]

Min: -28.3 [g] at 0.091 [s]

4-31

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

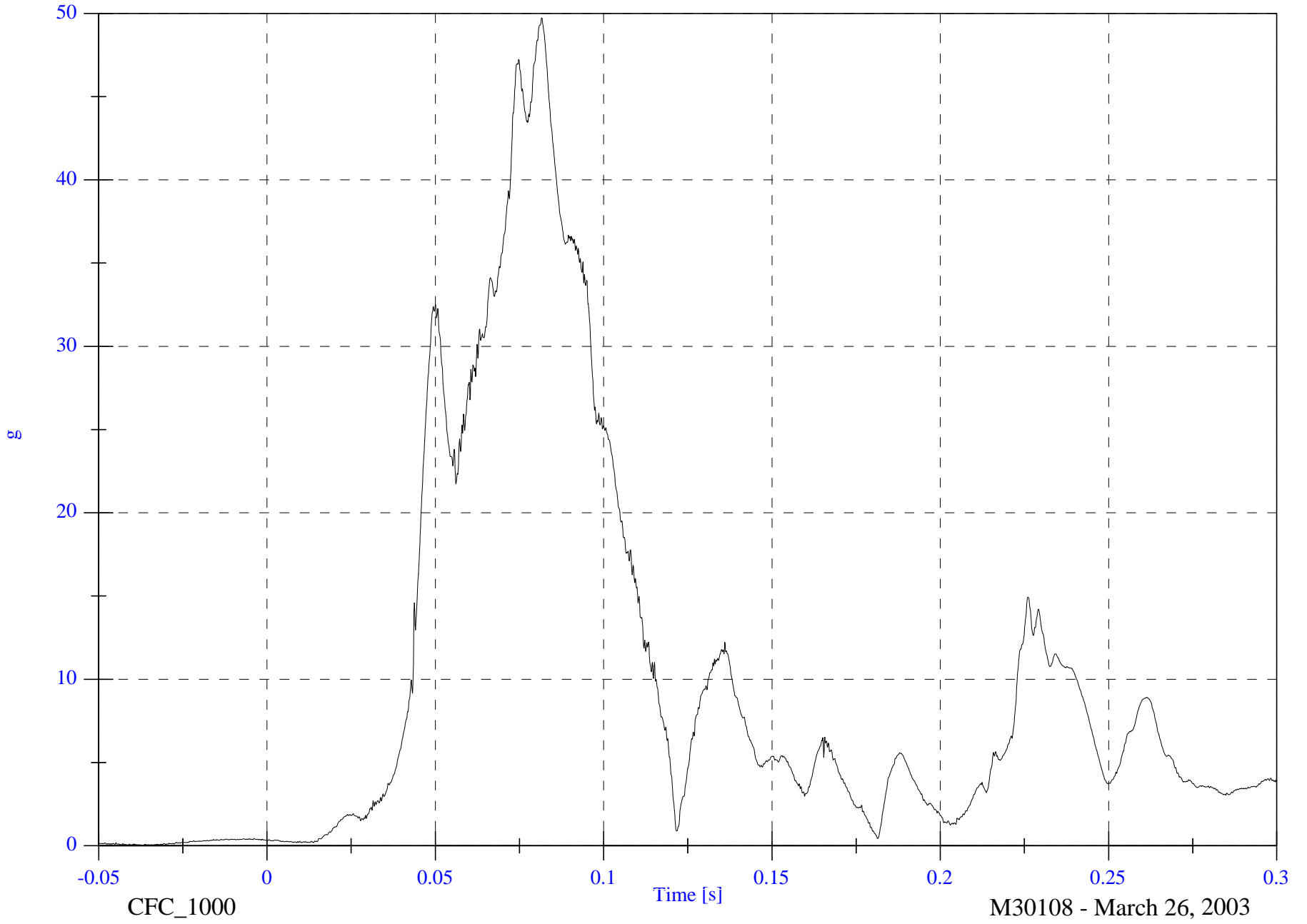
V1P3 Pelvic Resultant

Max: 49.7 [g] at 0.082 [s]

Min: 0.0 [g] at -0.037 [s]

4-32

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

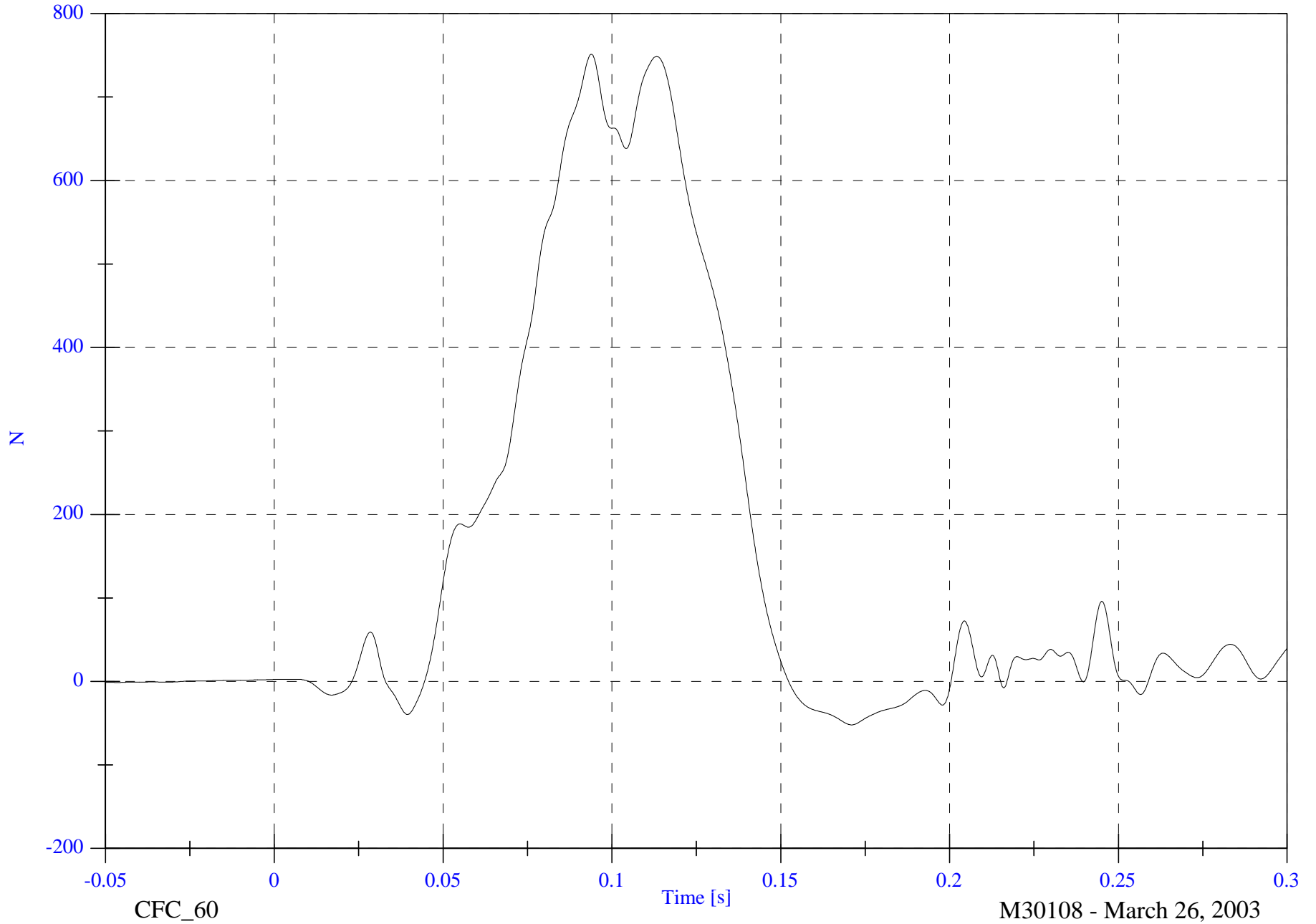
Max: 751.3 [N] at 0.094 [s]

V1P3 Tether Belt

Min: -52.0 [N] at 0.171 [s]

4-33

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

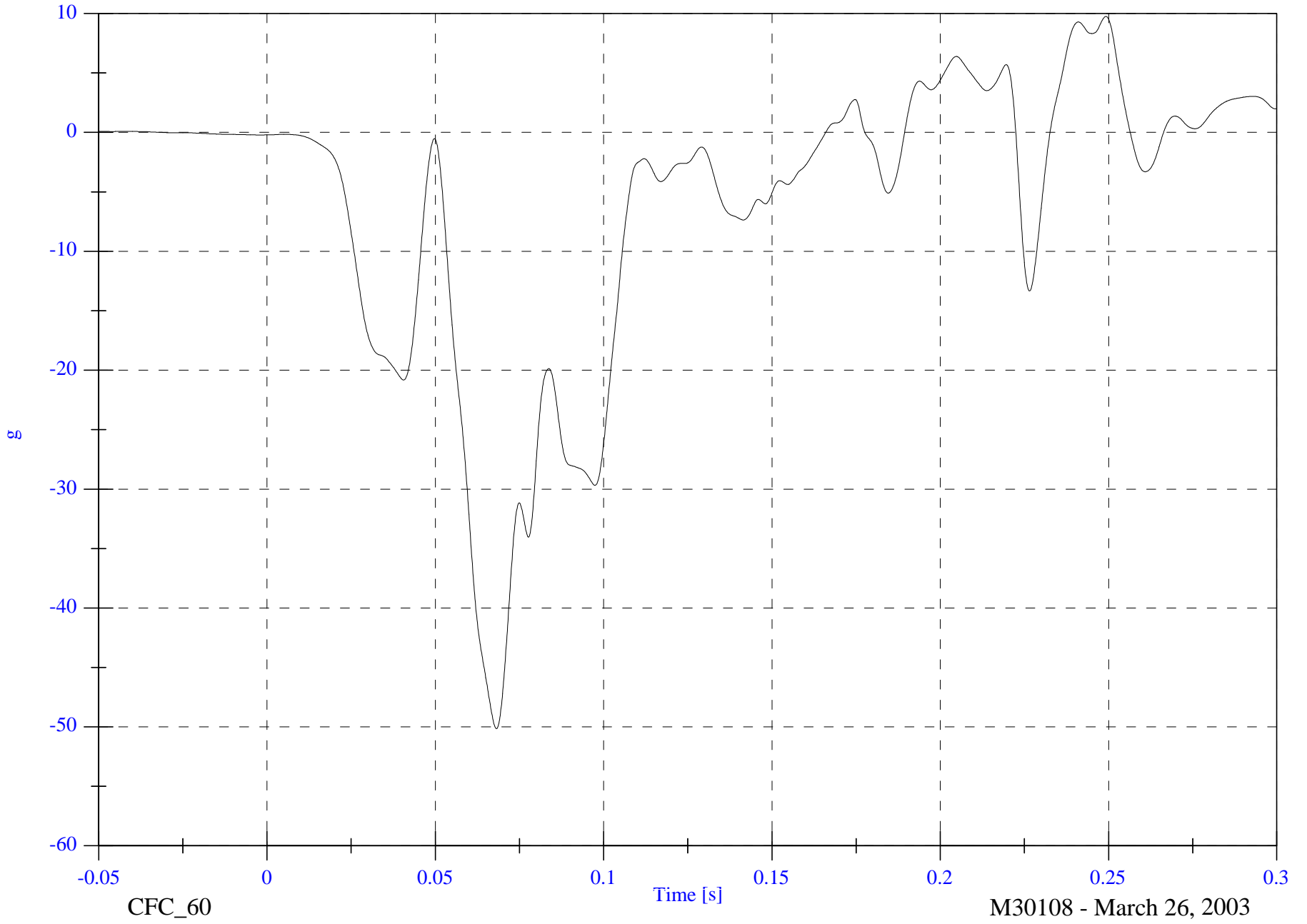
V1P3 CRS x

Max: 9.7 [g] at 0.249 [s]

Min: -50.1 [g] at 0.068 [s]

4-34

8642-NCAP-36



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V1P3 CRS x Velocity

Max: 56.4 [kph] at -0.032 [s]

Min: -22.7 [kph] at 0.189 [s]

4-35

8642-NCAP-36



CFC\_180

Time [s]

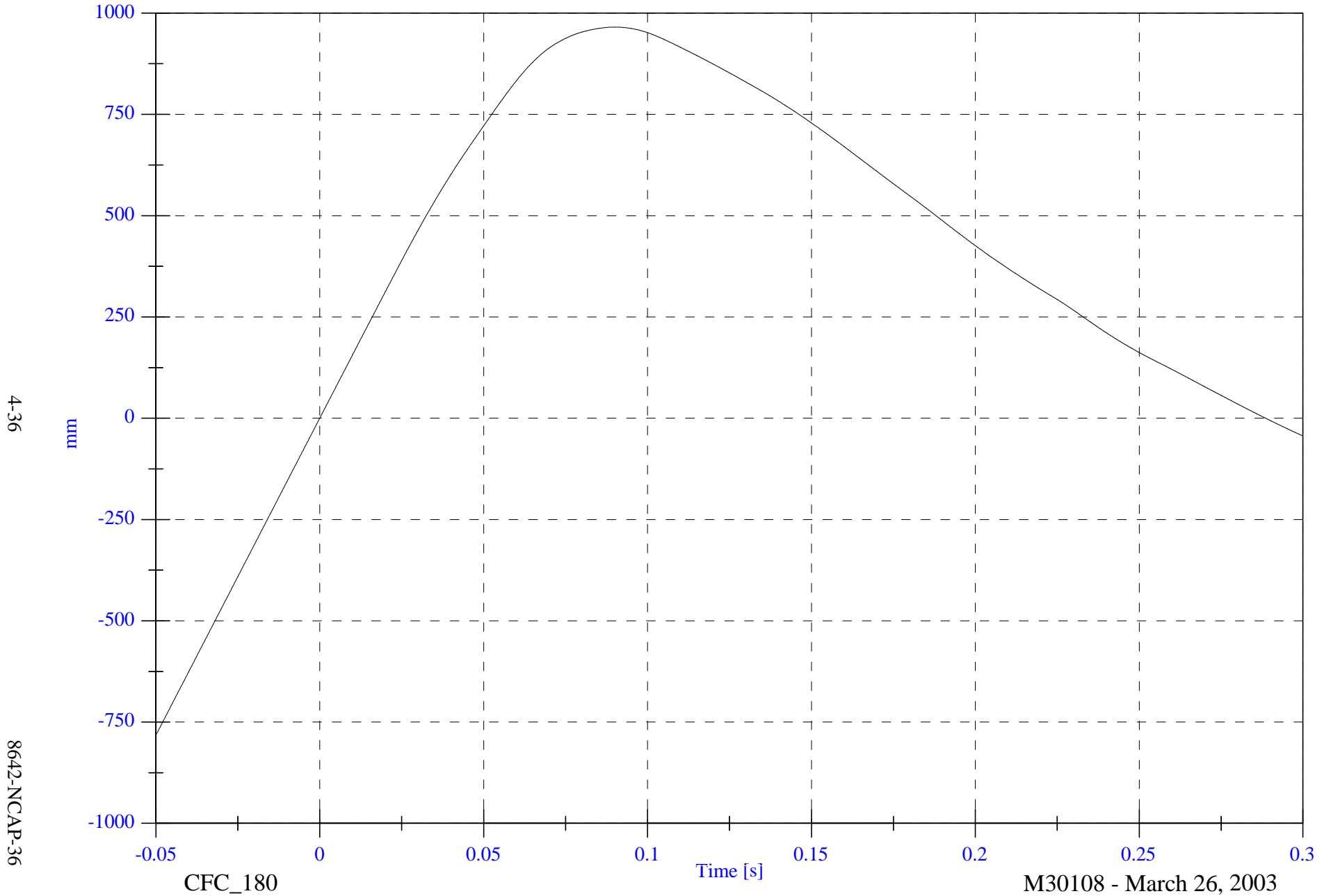
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

Max: 965.5 [mm] at 0.090 [s]

Min: -782.7 [mm] at -0.050 [s]

V1P3 CRS x Displacement



4-36

8642-NCAP-36

CFC\_180

Time [s]

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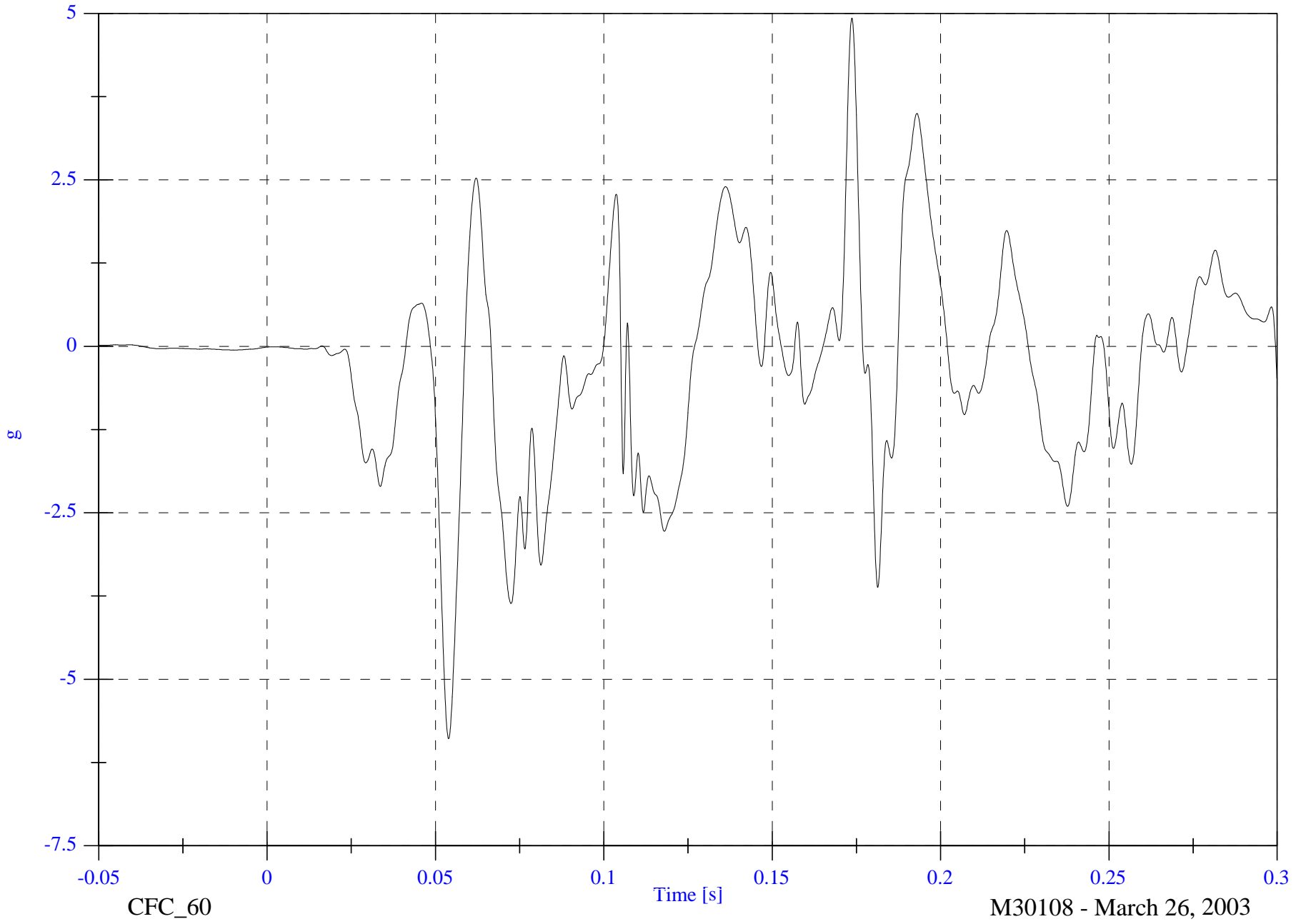
NCAP Test #14 - 2003 Chevrolet Suburban

Max: 4.9 [g] at 0.174 [s]  
Min: -5.9 [g] at 0.054 [s]

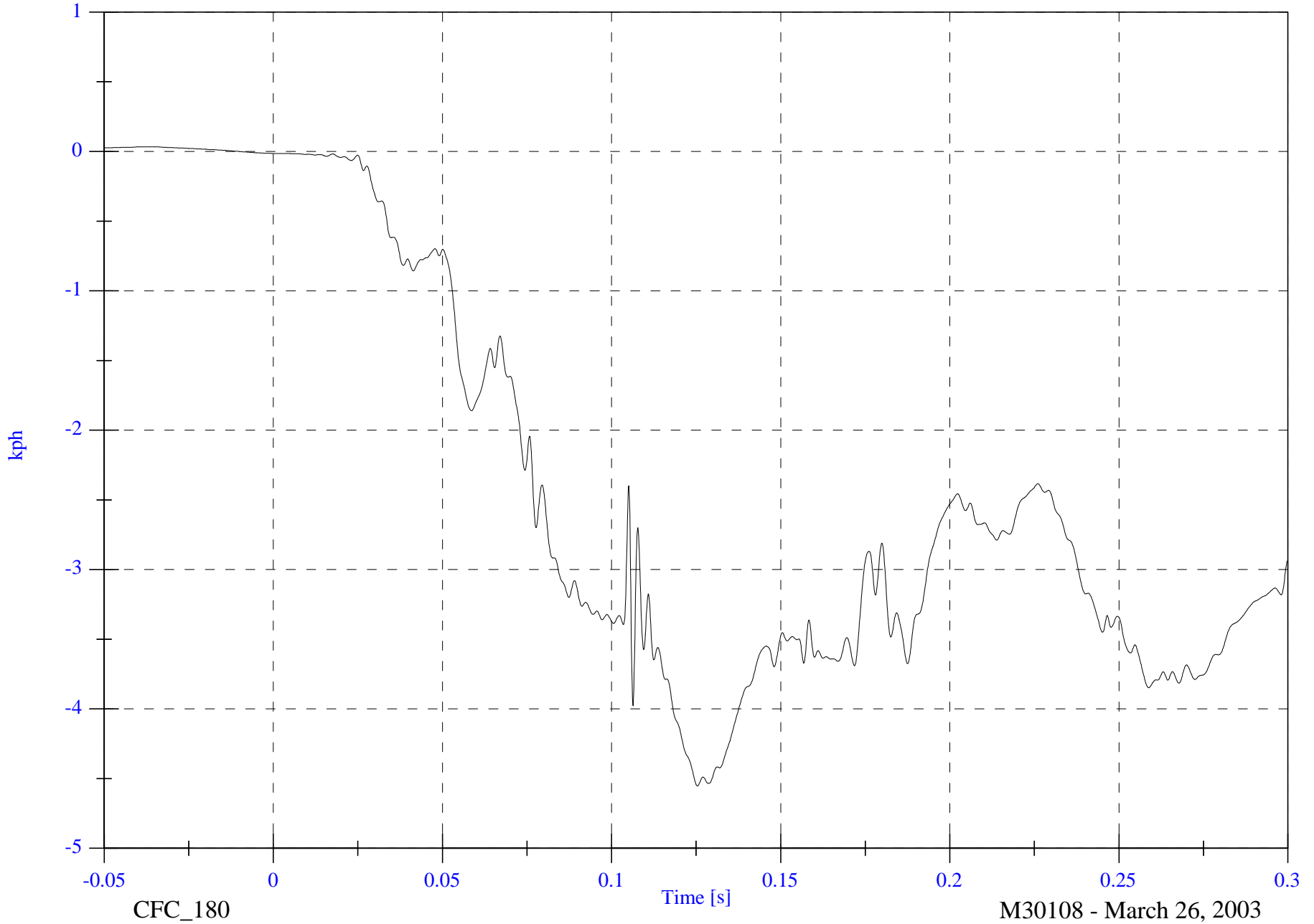
V1P3 CRS y

4-37

8642-NCAP-36



V1P3 CRS y Velocity



NCAP Test #14 - 2003 Chevrolet Suburban

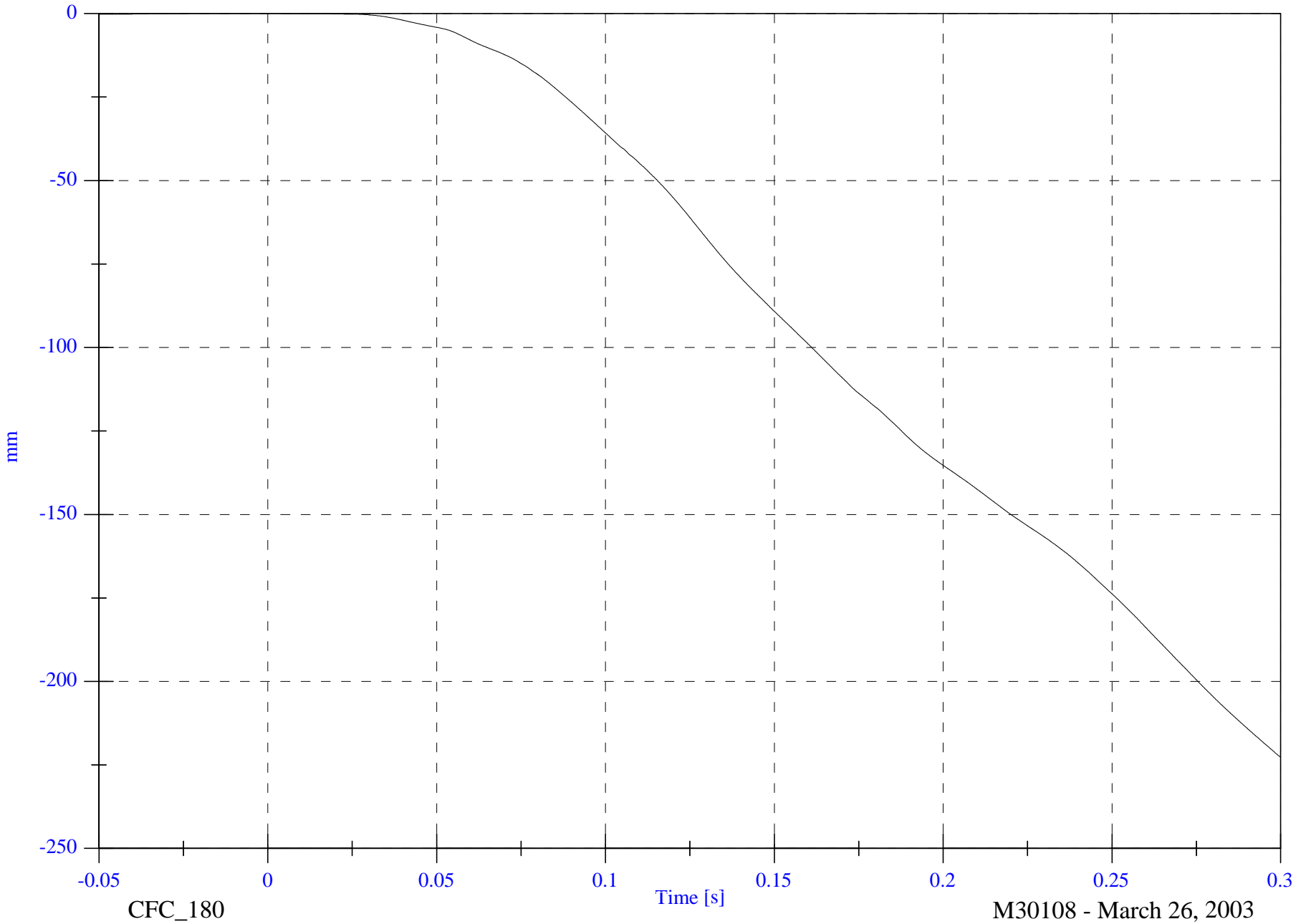
V1P3 CRS y Displacement

Max: 0.0 [mm] at -0.010 [s]

Min: -222.7 [mm] at 0.300 [s]

4-39

8642-NCAP-36



CFC\_180

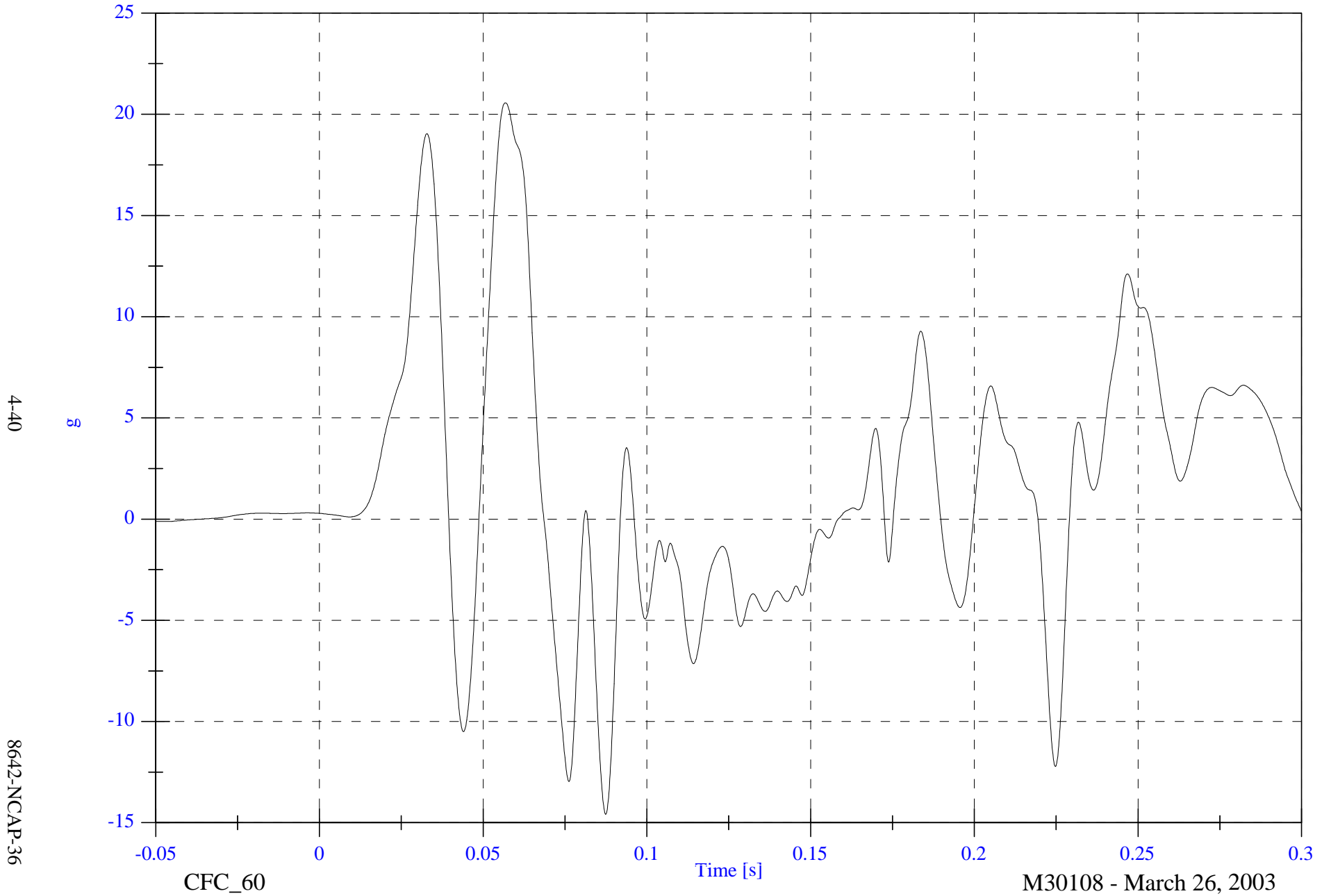
M30108 - March 26, 2003

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V1P3 CRS z

Max: 20.6 [g] at 0.057 [s]

Min: -14.6 [g] at 0.087 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

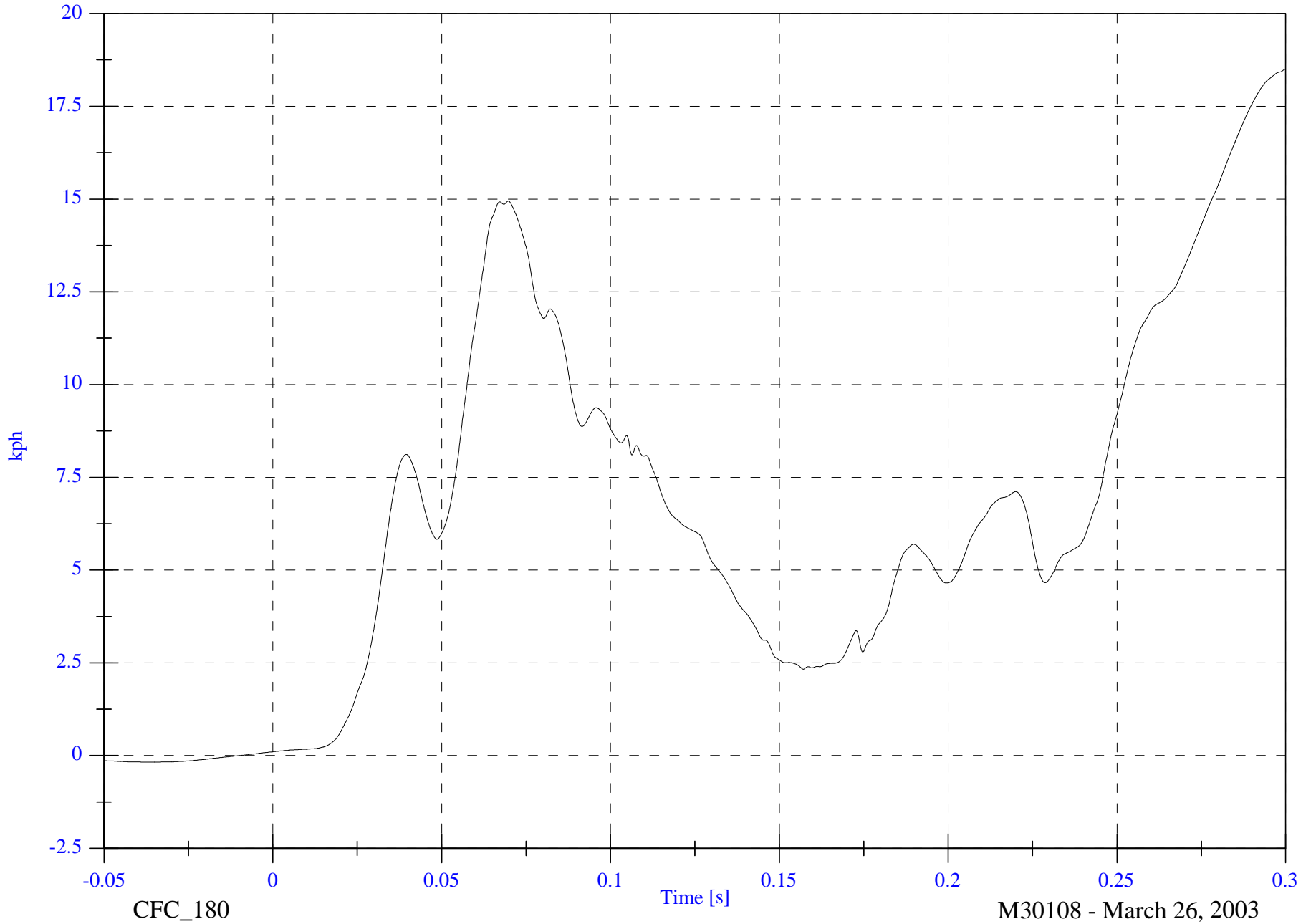
V1P3 CRS z Velocity

Max: 18.5 [kph] at 0.300 [s]

Min: -0.2 [kph] at -0.036 [s]

4-41

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

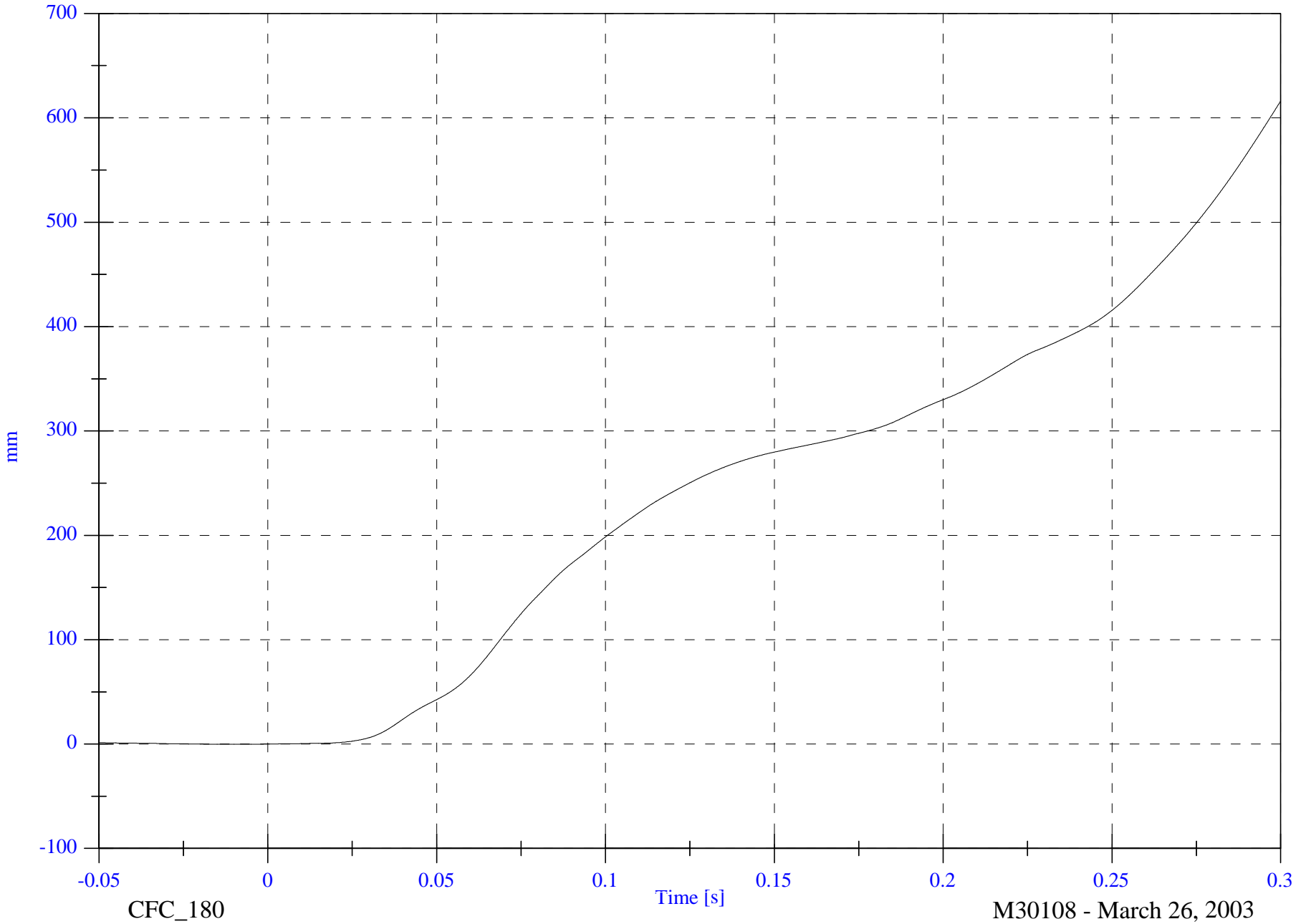
Max: 615.8 [mm] at 0.300 [s]

V1P3 CRS z Displacement

Min: -0.1 [mm] at -0.010 [s]

4-42

8642-NCAP-36



CFC\_180

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NCAP Test #14 - 2003 Chevrolet Suburban

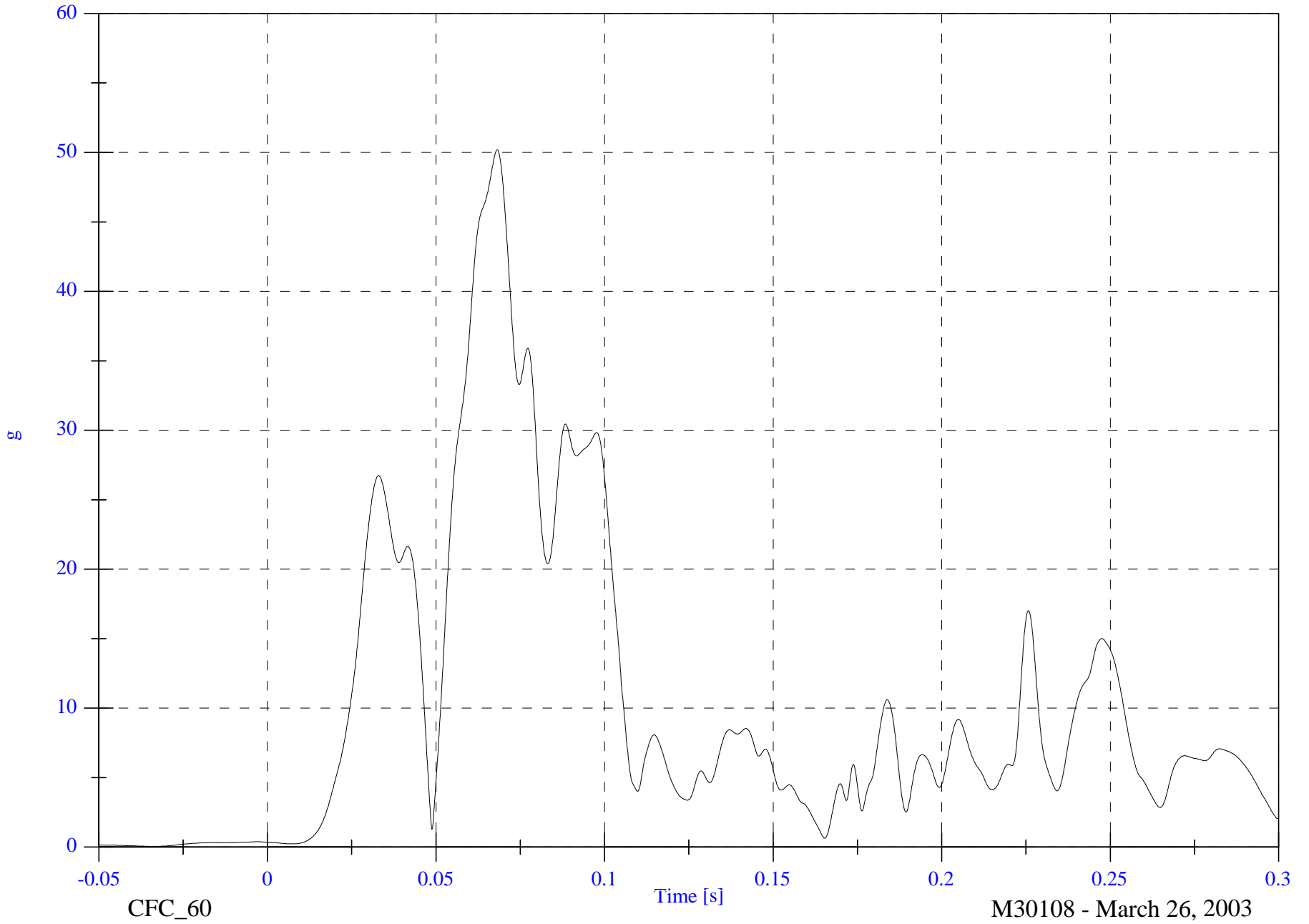
V1P3 CRS Resultant

Max: 50.2 [g] at 0.068 [s]

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

4-43

8642-NCAP-36



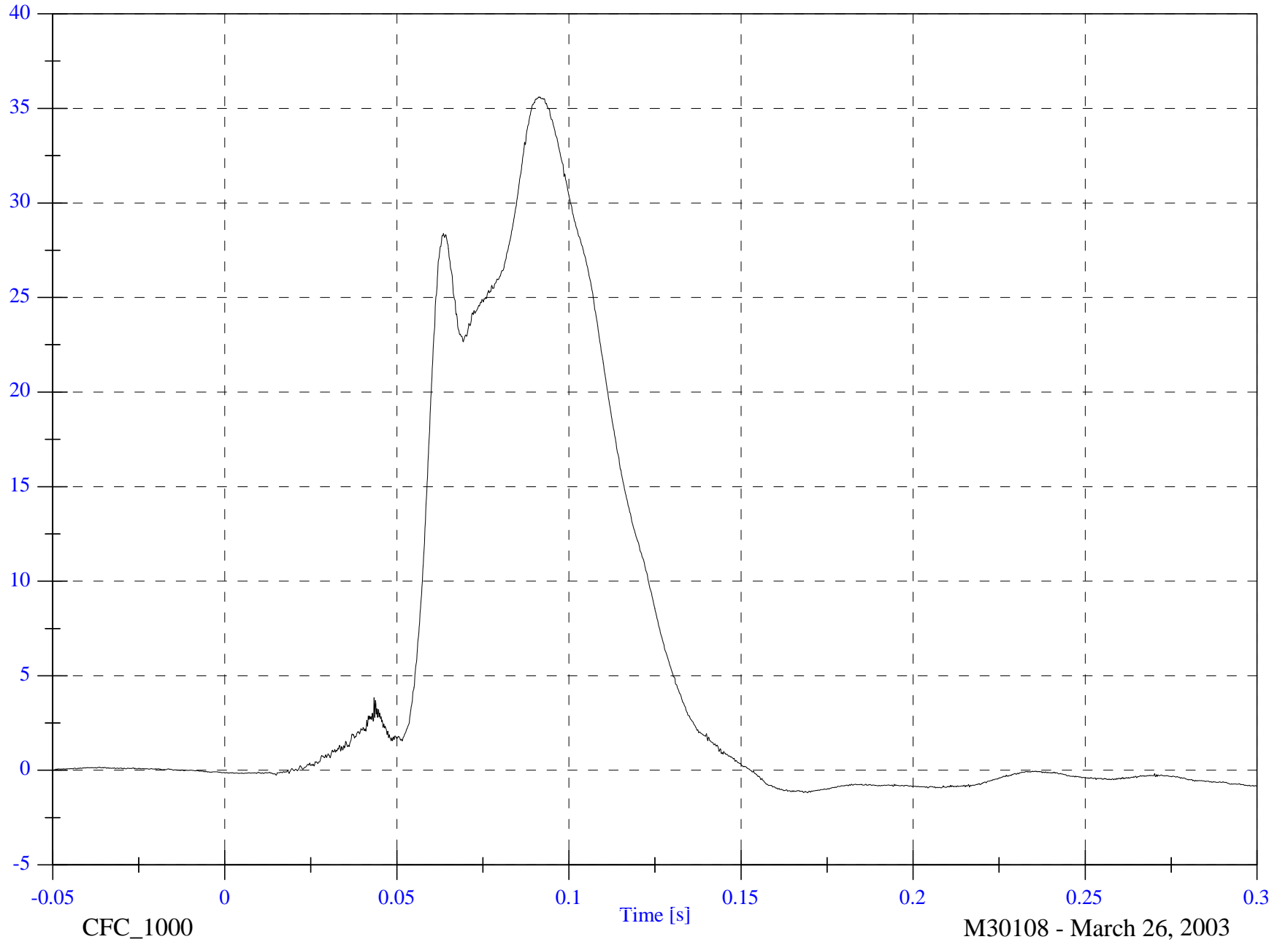
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V1P4 Head x

Max: 35.6 [g] at 0.091 [s]

Min: -1.2 [g] at 0.169 [s]



4-44

8642-NCAP-36

CFC\_1000

M30108 - March 26, 2003

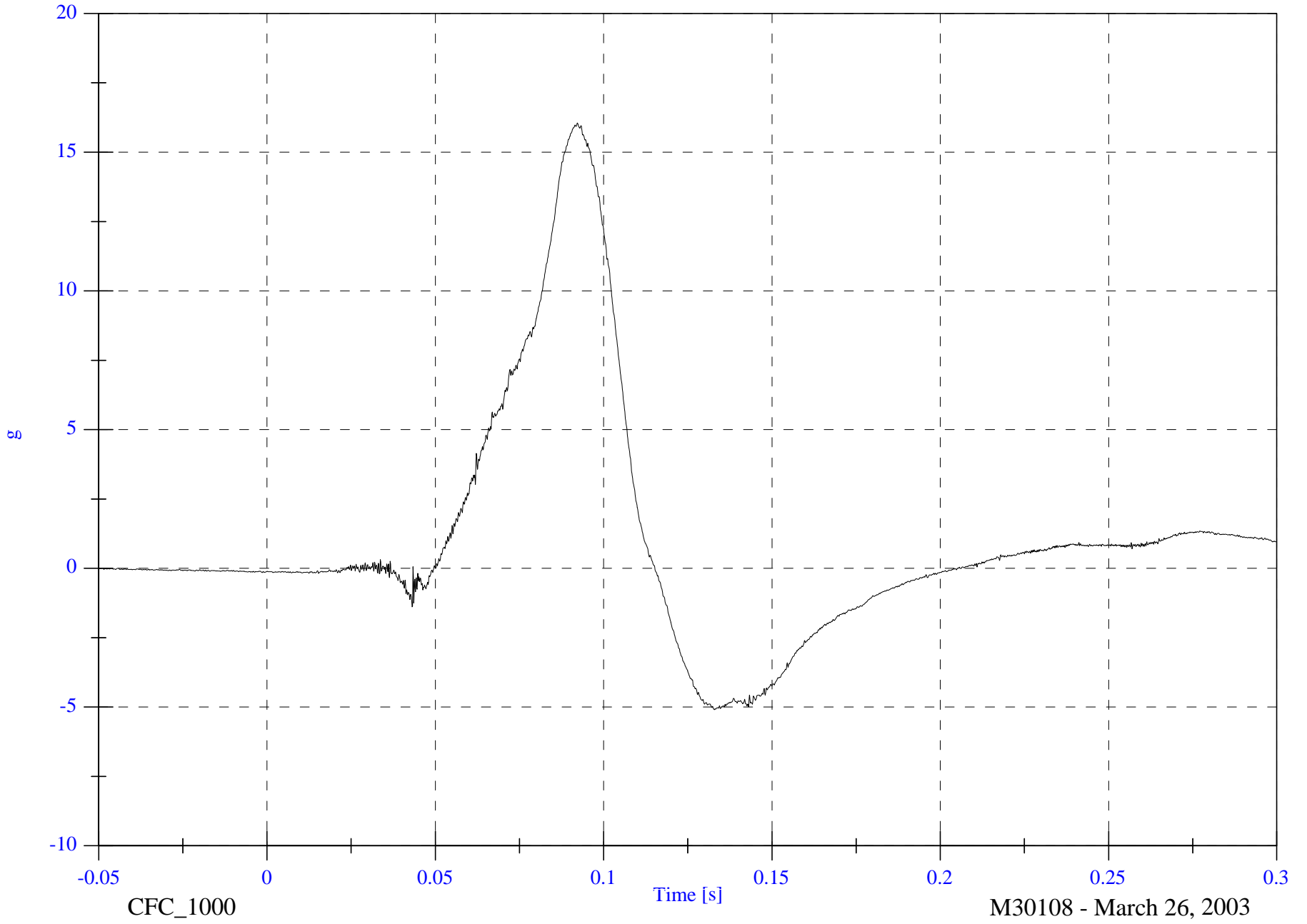
NCAP Test #14 - 2003 Chevrolet Suburban

Max: 16.1 [g] at 0.092 [s]  
Min: -5.1 [g] at 0.133 [s]

V1P4 Head y

4-45

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

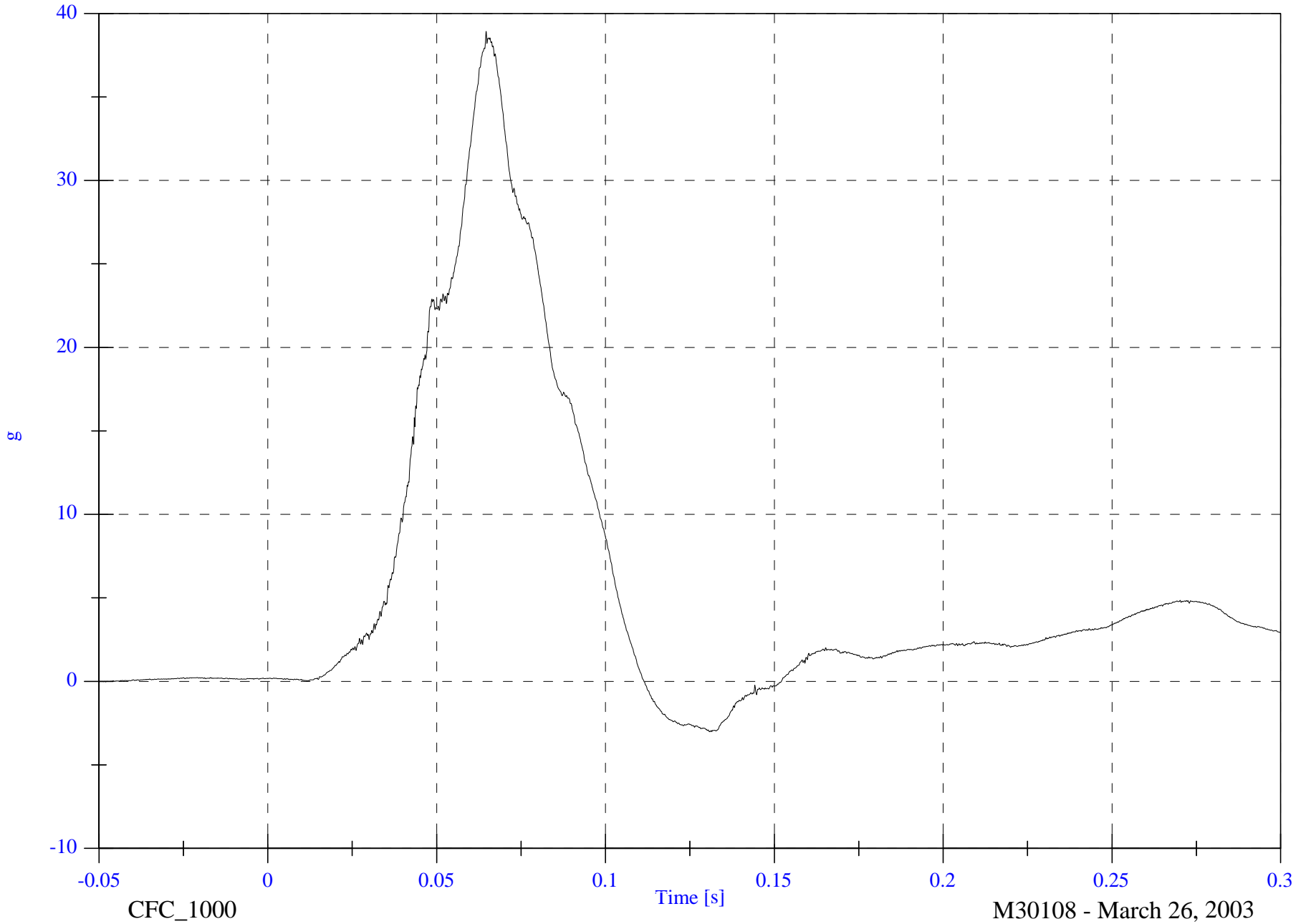
V1P4 Head z

Max: 38.9 [g] at 0.065 [s]

Min: -3.0 [g] at 0.131 [s]

4-46

8642-NCAP-36



CFC\_1000

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

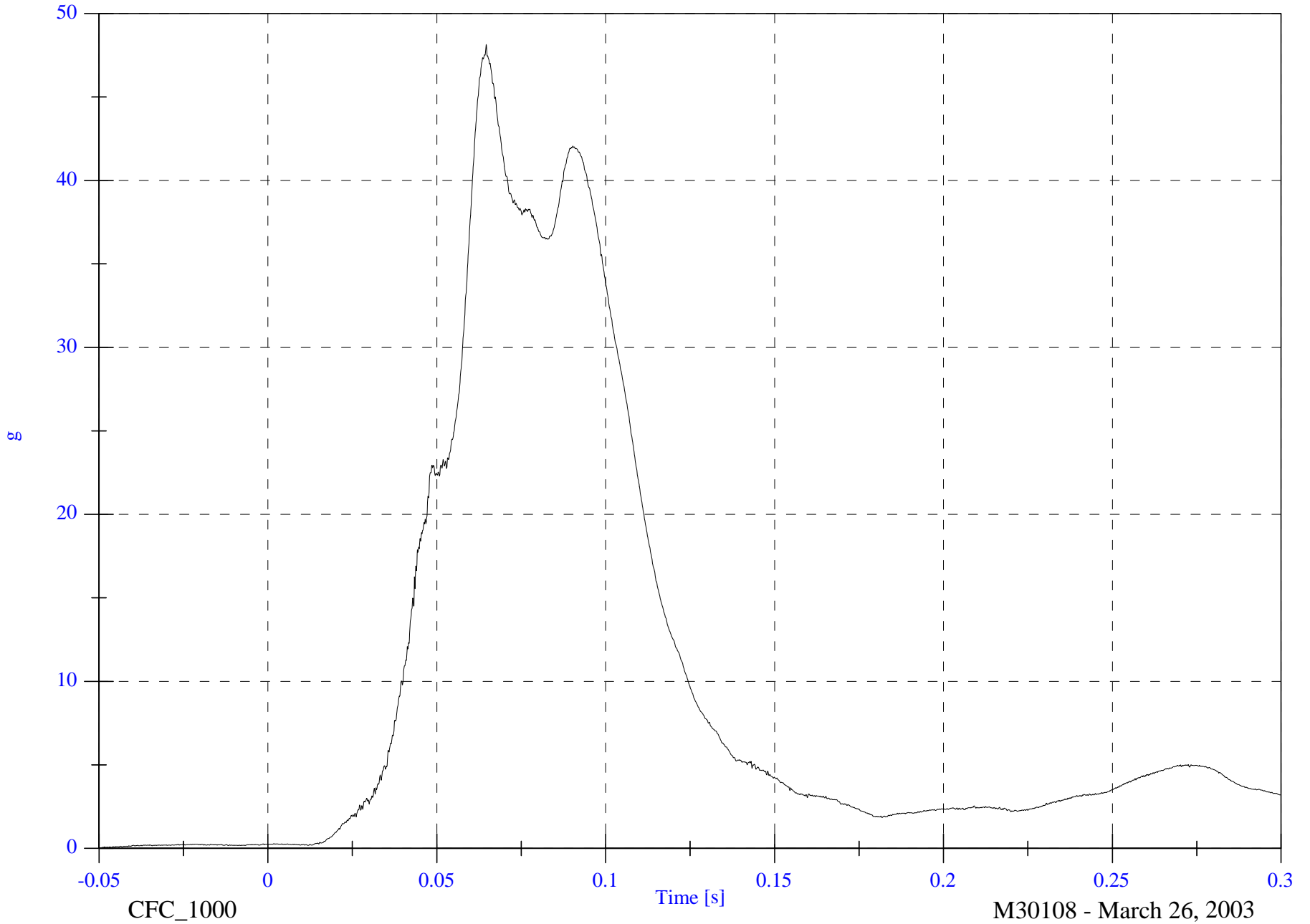
V1P4 Head Resultant

Max: 48.1 [g] at 0.065 [s]

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

4-47

8642-NCAP-36



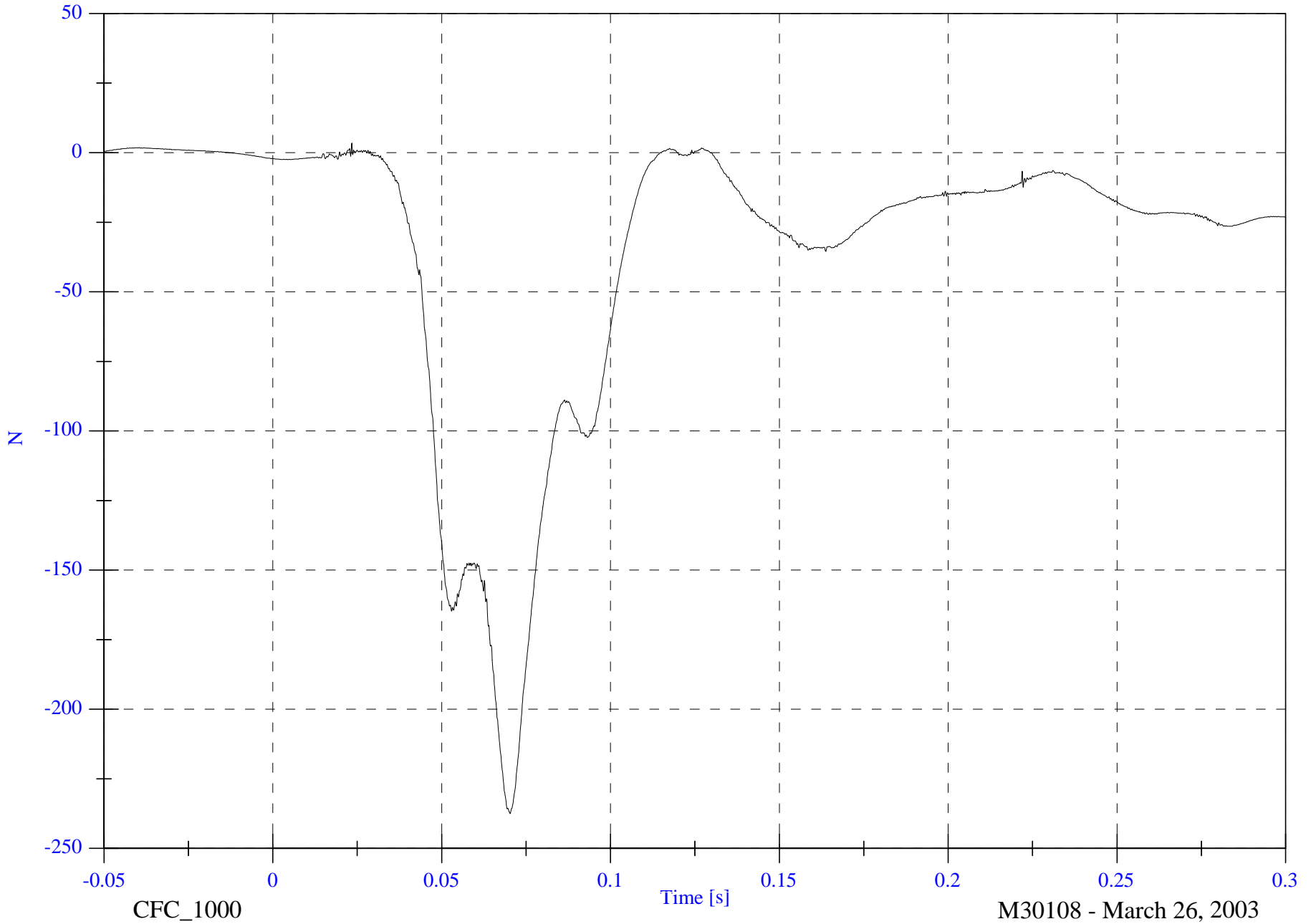
NCAP Test #14 - 2003 Chevrolet Suburban

V1P4 Upper Neck Fx

Max: 3.5 [N] at 0.023 [s]  
Min: -237.5 [N] at 0.070 [s]

4-48

8642-NCAP-36



CFC\_1000

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

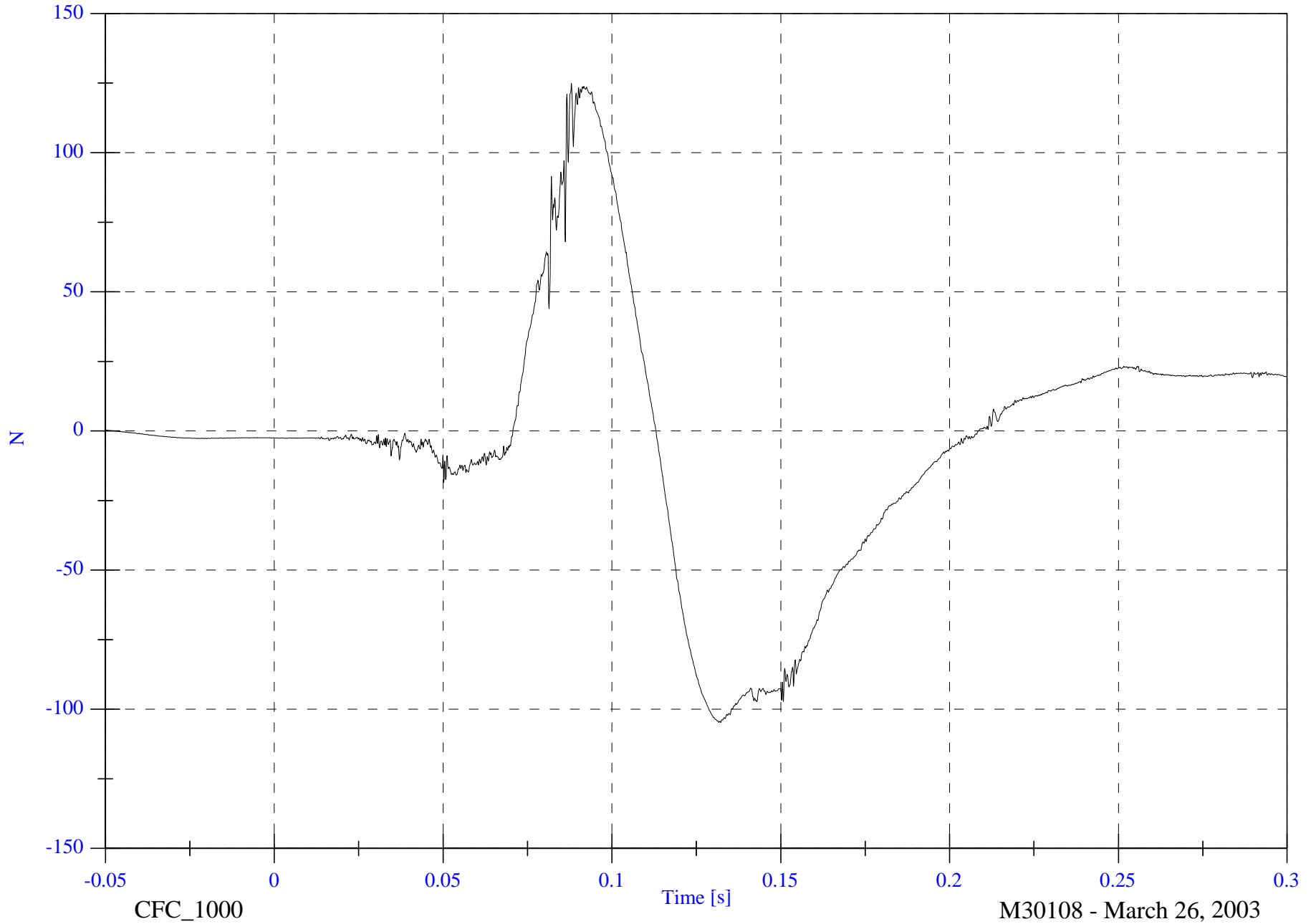
Max: 124.9 [N] at 0.088 [s]

V1P4 Upper Neck Fy

Min: -104.7 [N] at 0.132 [s]

4-49

8642-NCAP-36

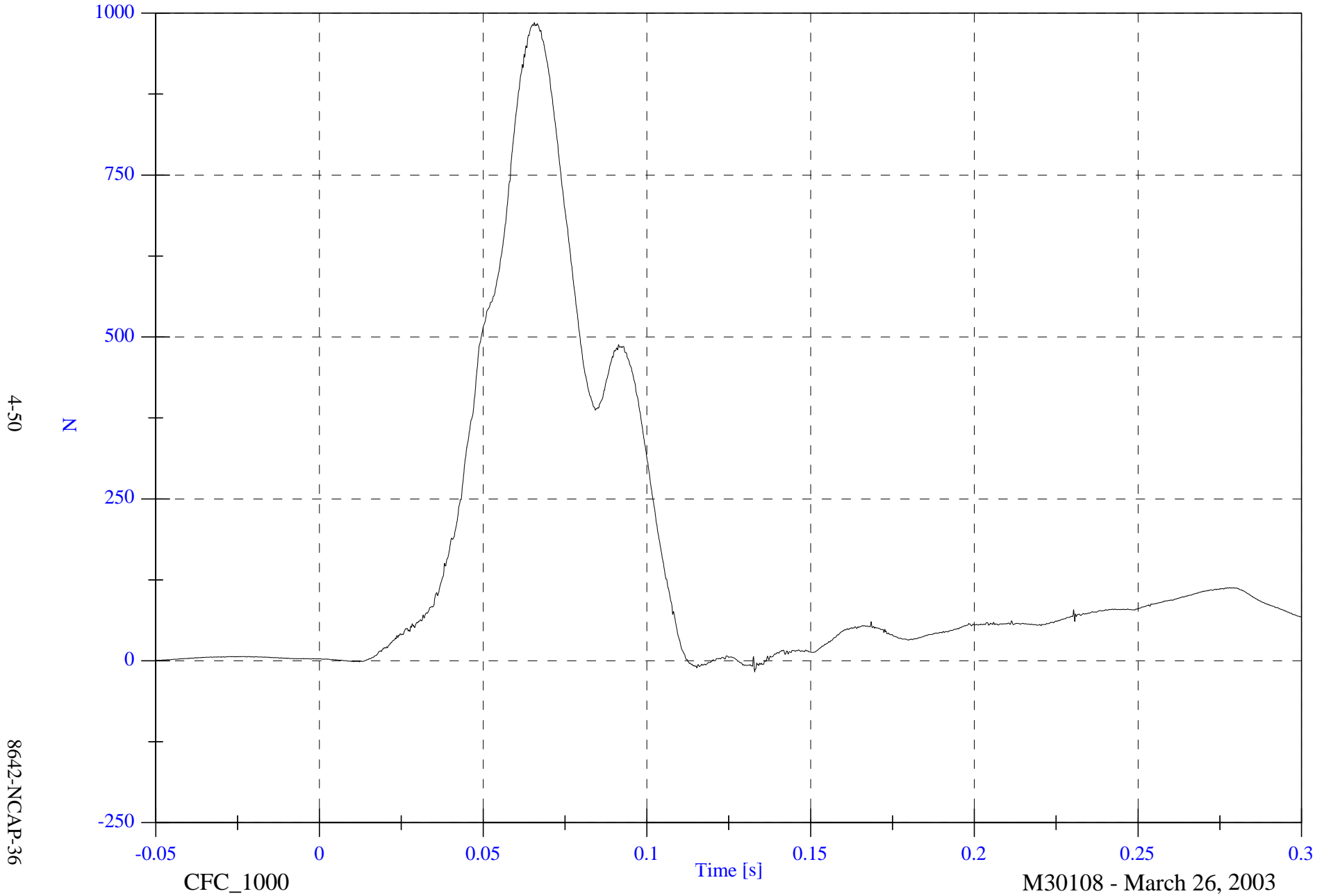


NCAP Test #14 - 2003 Chevrolet Suburban

Max: 985.3 [N] at 0.066 [s]

V1P4 Upper Neck Fz

Min: -17.3 [N] at 0.133 [s]



4-50

8642-NCAP-36

CFC\_1000

Time [s]

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NCAP Test #14 - 2003 Chevrolet Suburban

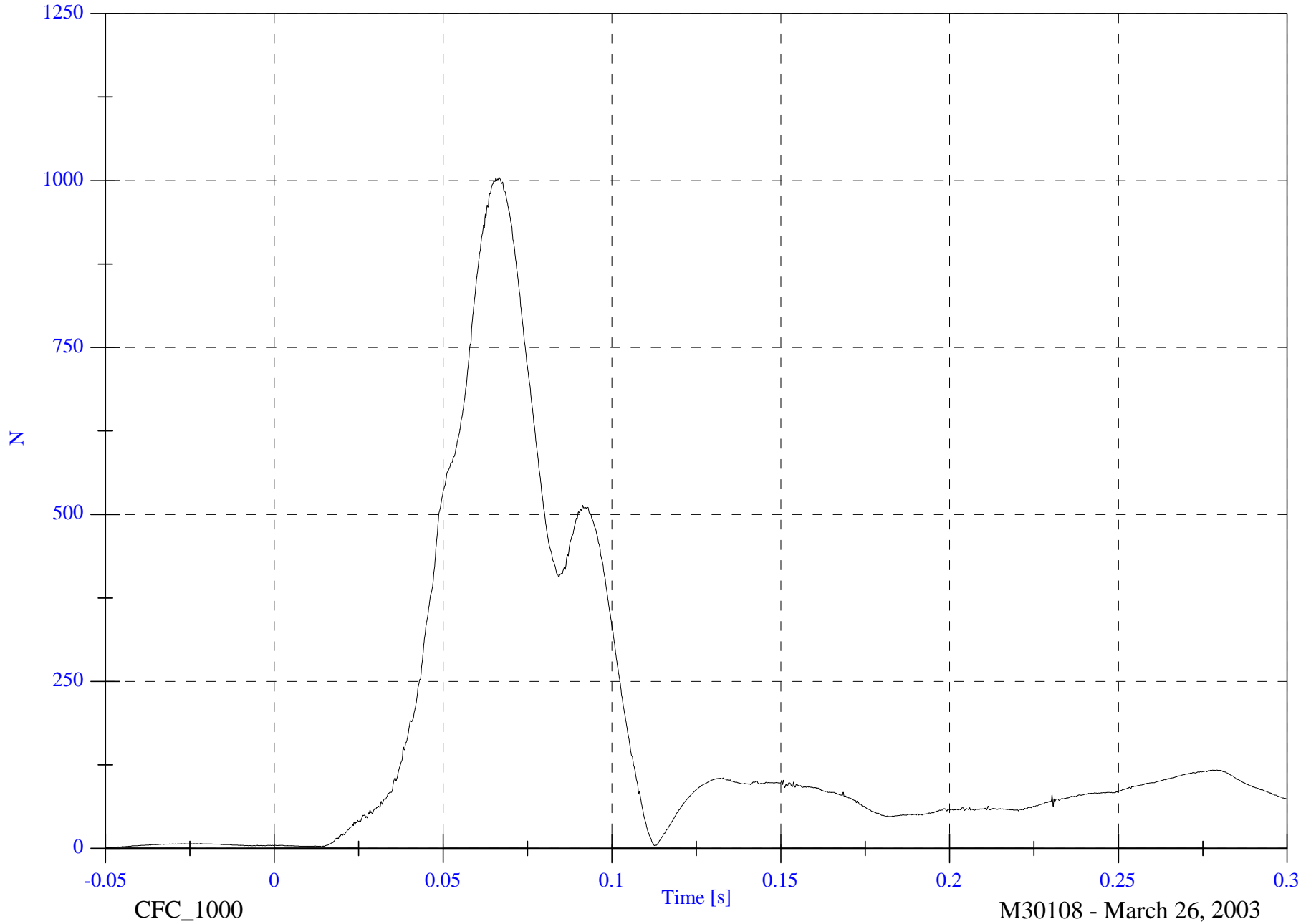
V1P4 Upper Neck F Resultant

Max: 1004.8 [N] at 0.067 [s]

Min: 0.8 [N] at -0.050 [s]

4-51

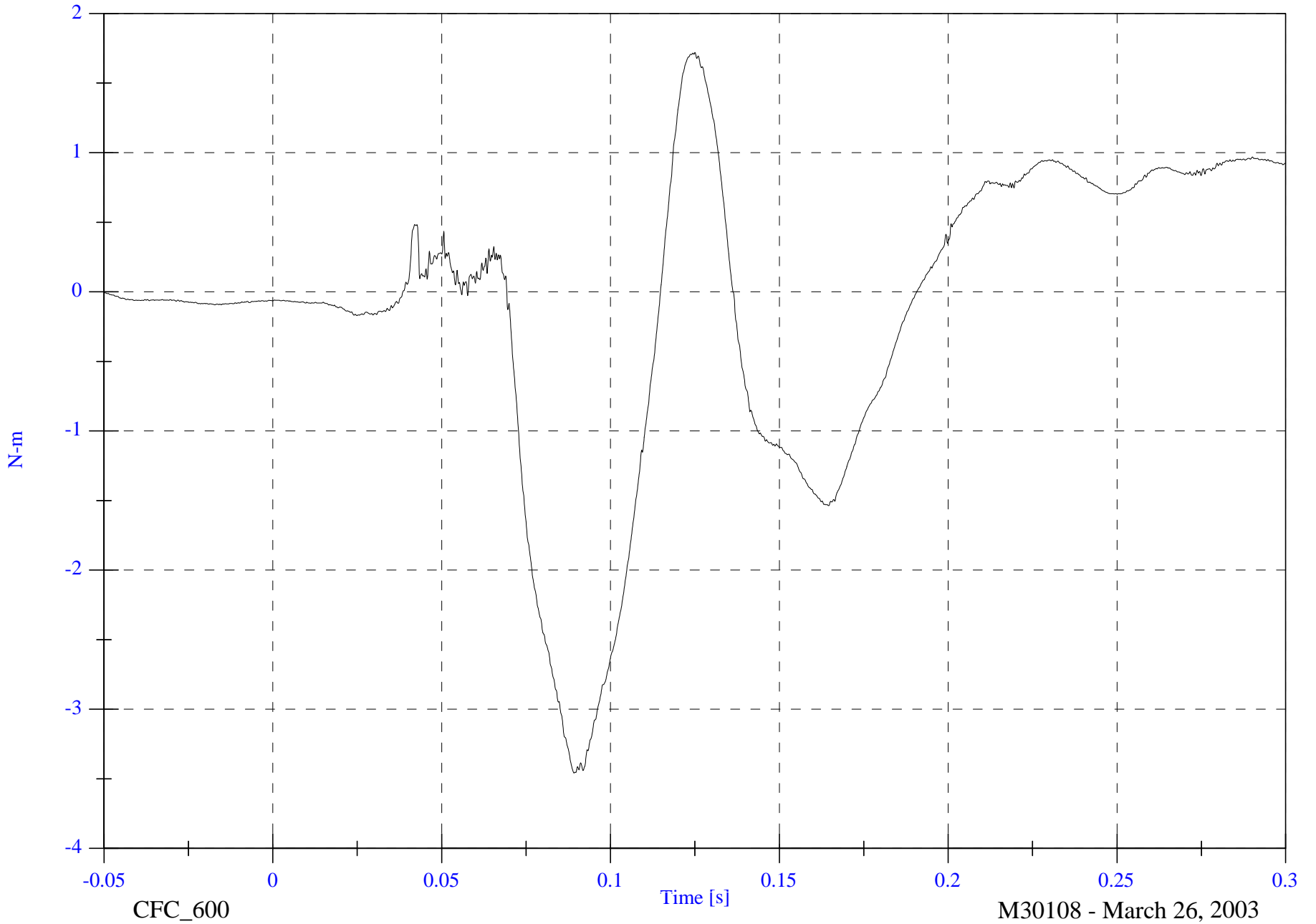
8642-NCAP-36

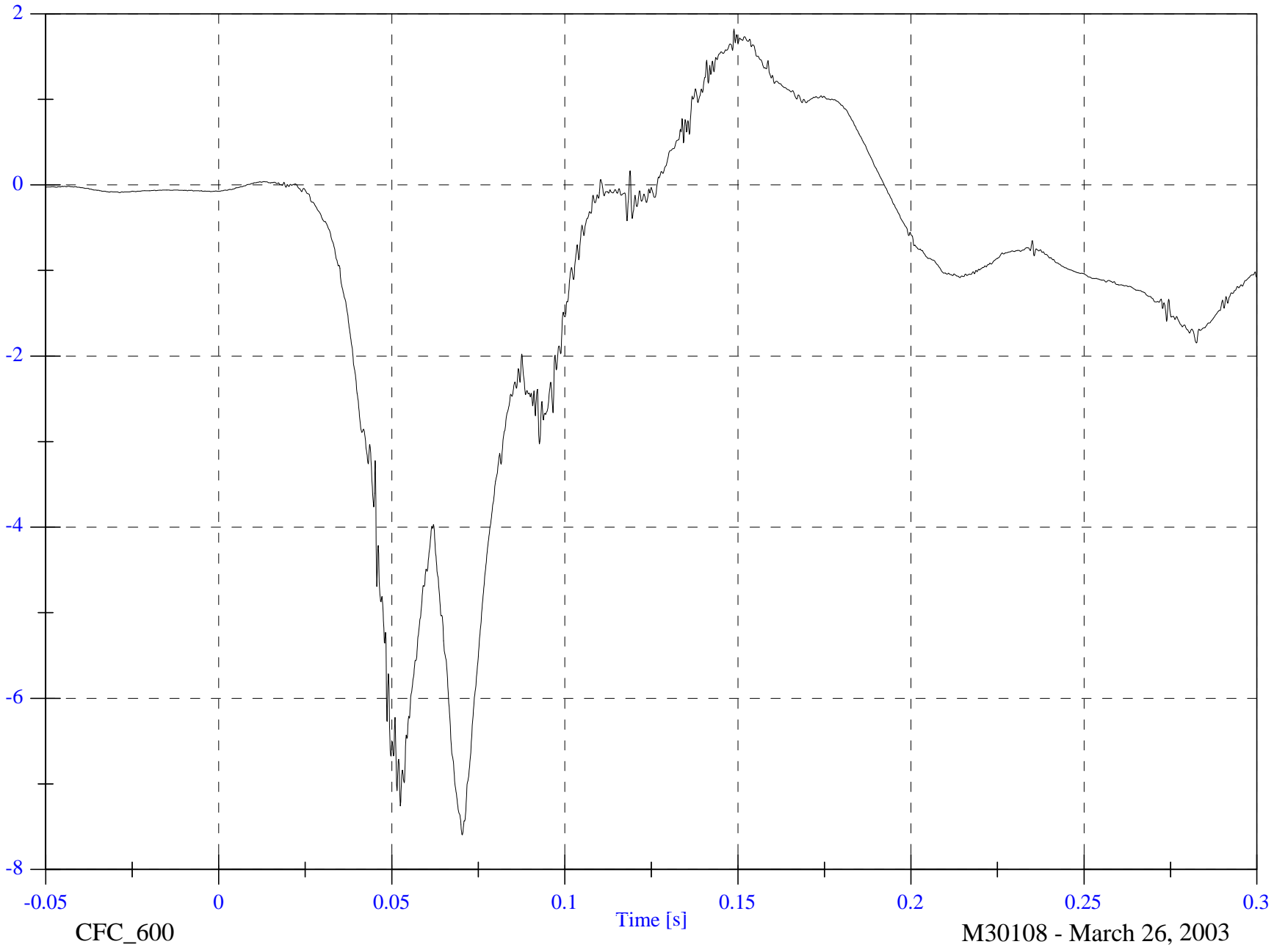


CFC\_1000

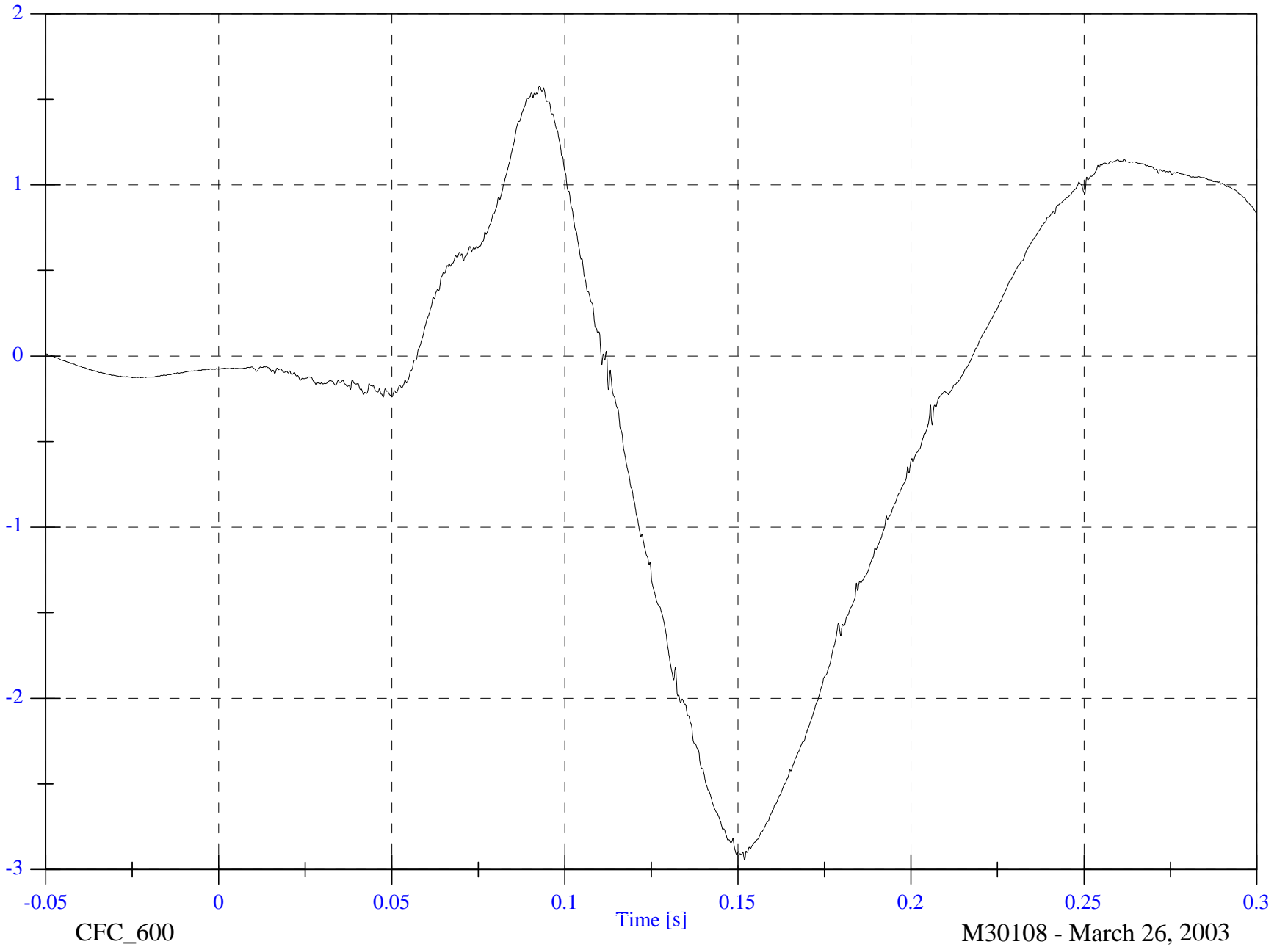
Time [s]

M30108 - March 26, 2003





V1P4 Upper Neck Mz

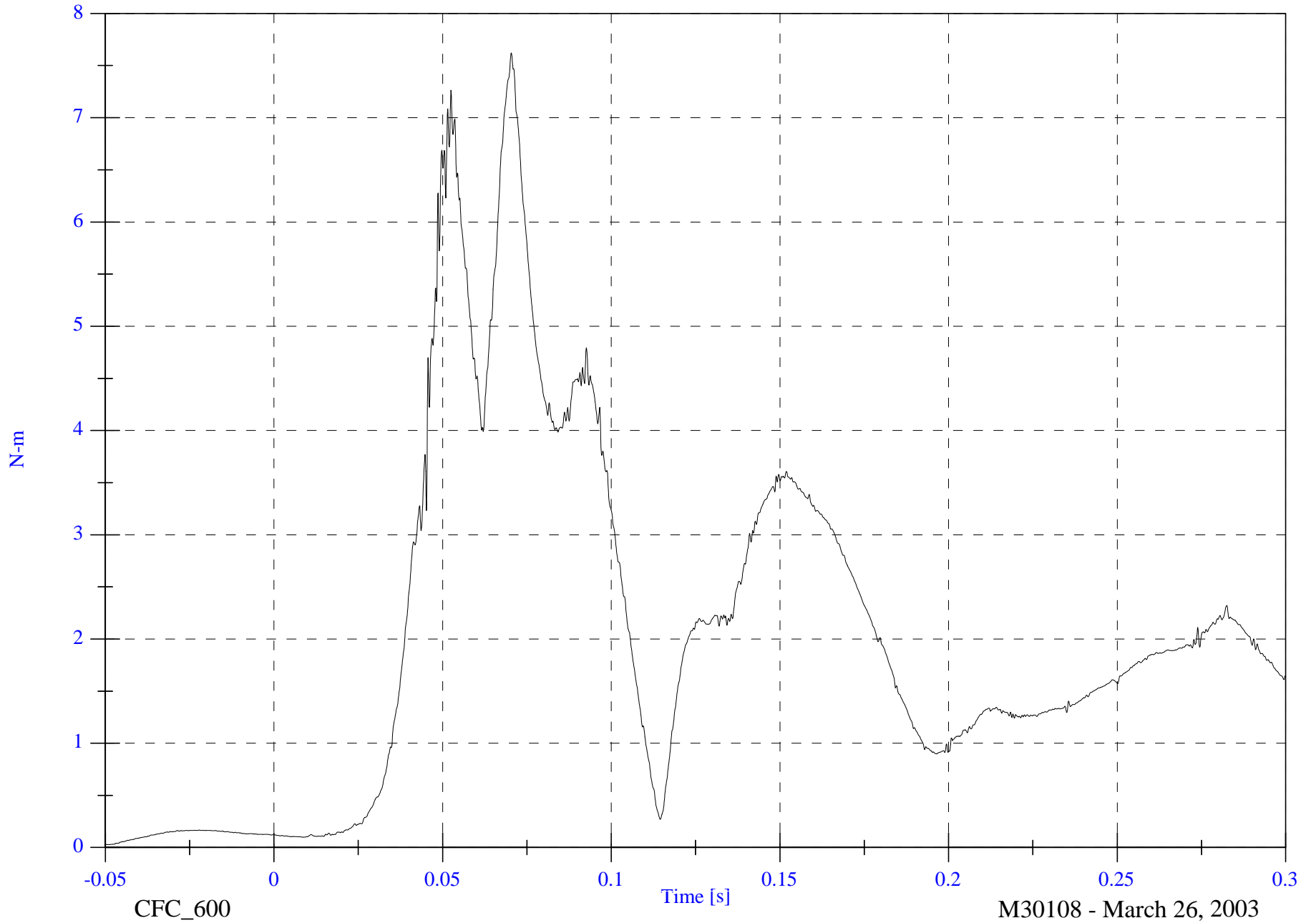


NCAP Test #14 - 2003 Chevrolet Suburban

V1P4 Upper Neck M Resultant

Max: 7.6 [N-m] at 0.070 [s]

Min: 0.0 [N-m] at -0.049 [s]



4-55

8642-NCAP-36

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

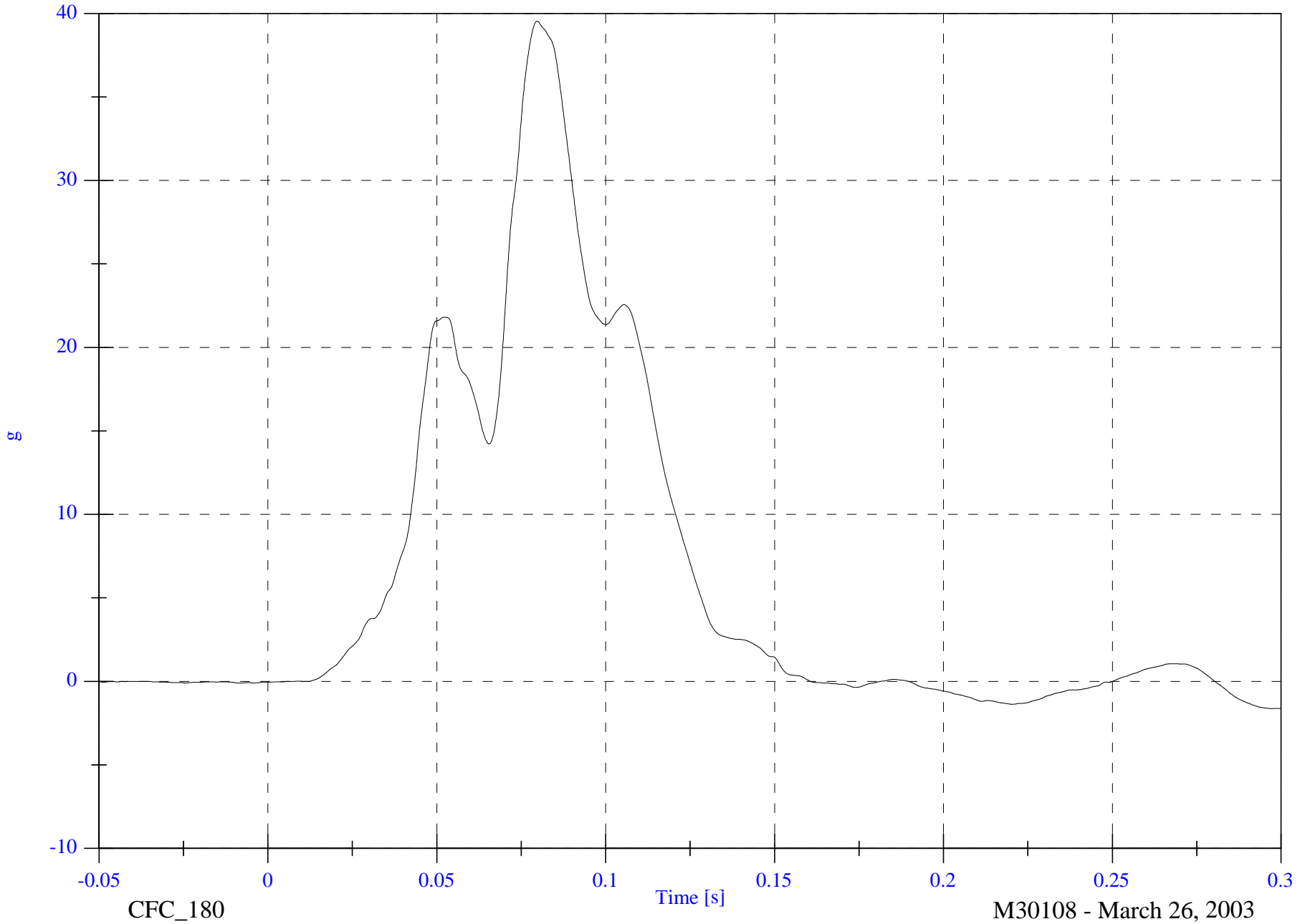
VIP4 Chest x

Max: 39.5 [g] at 0.080 [s]

Min: -1.6 [g] at 0.297 [s]

4-56

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

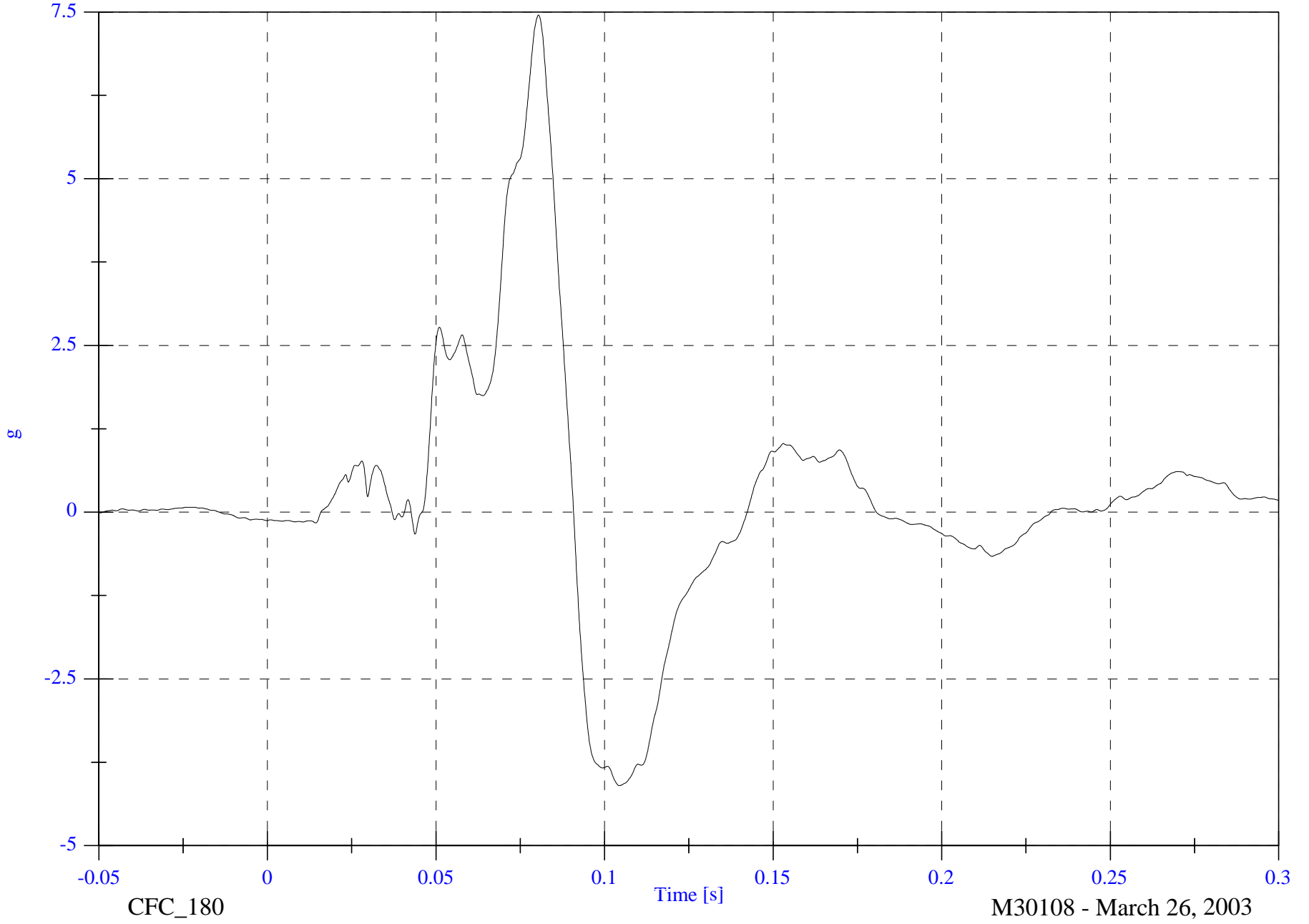
VIP4 Chest y

Max: 7.5 [g] at 0.080 [s]

Min: -4.1 [g] at 0.104 [s]

4-57

8642-NCAP-36



CFC\_180

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

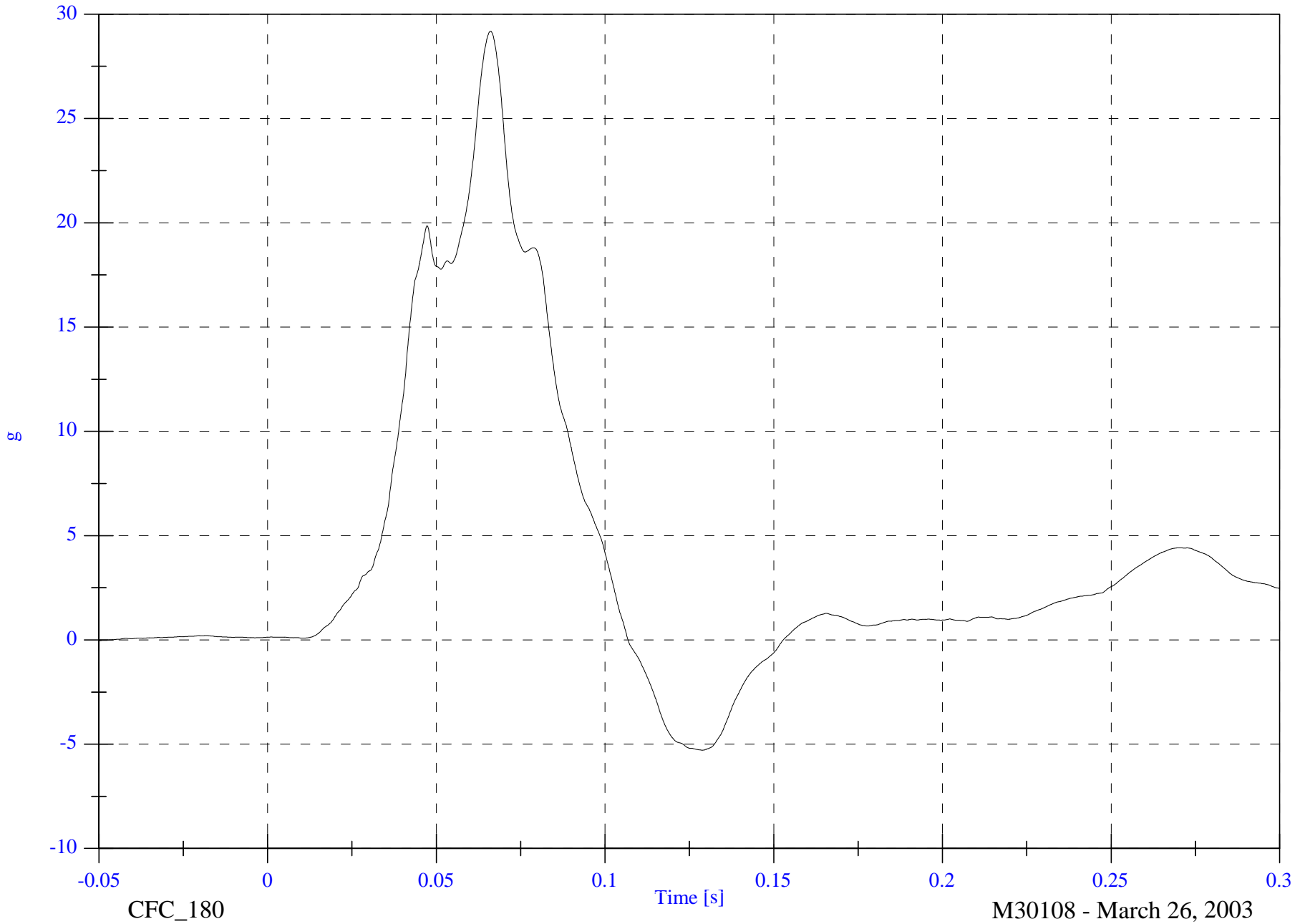
VIP4 Chest z

Max: 29.2 [g] at 0.066 [s]

Min: -5.3 [g] at 0.129 [s]

4-58

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

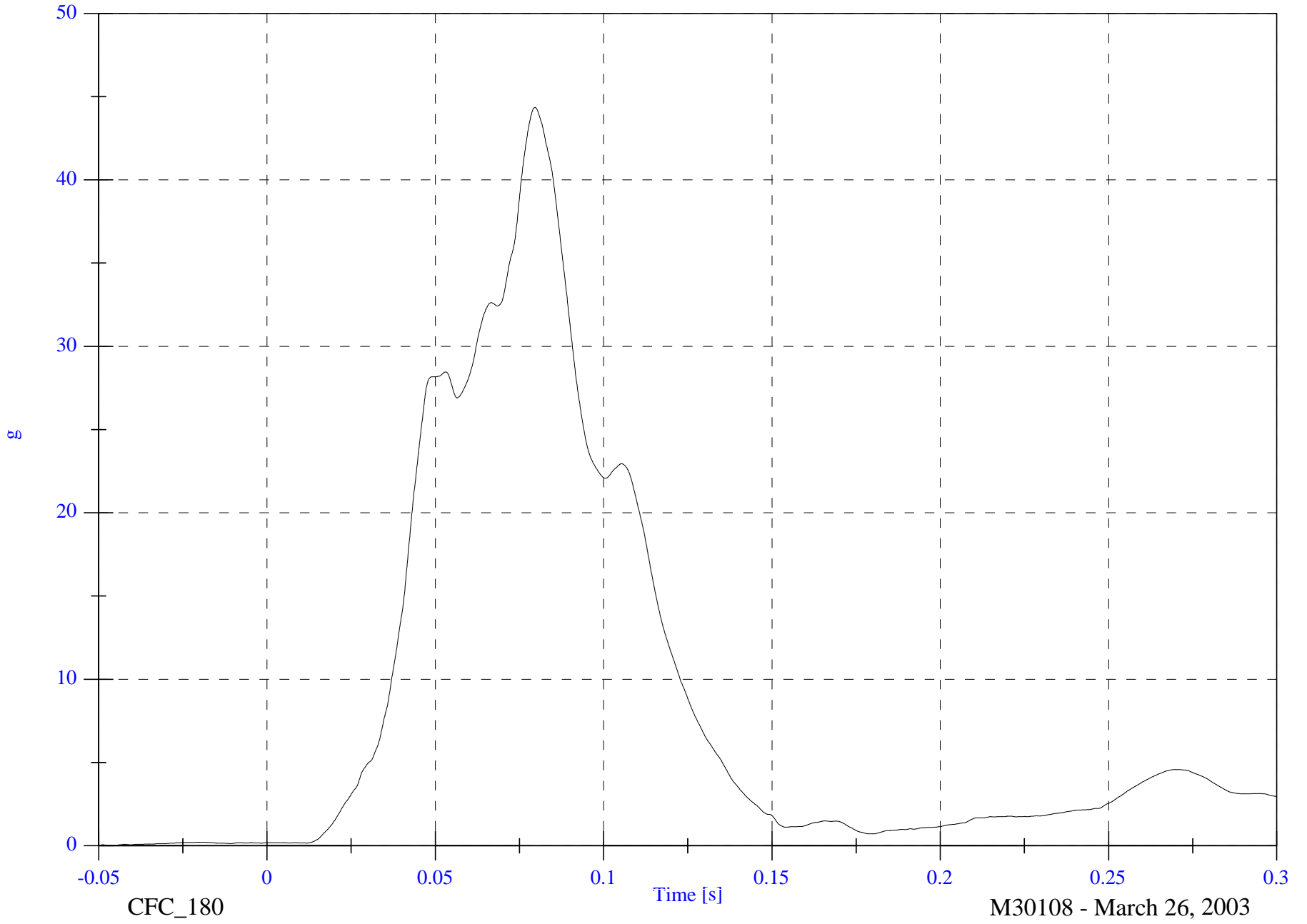
V1P4 Chest Resultant

Max: 44.4 [g] at 0.080 [s]

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

4-59

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

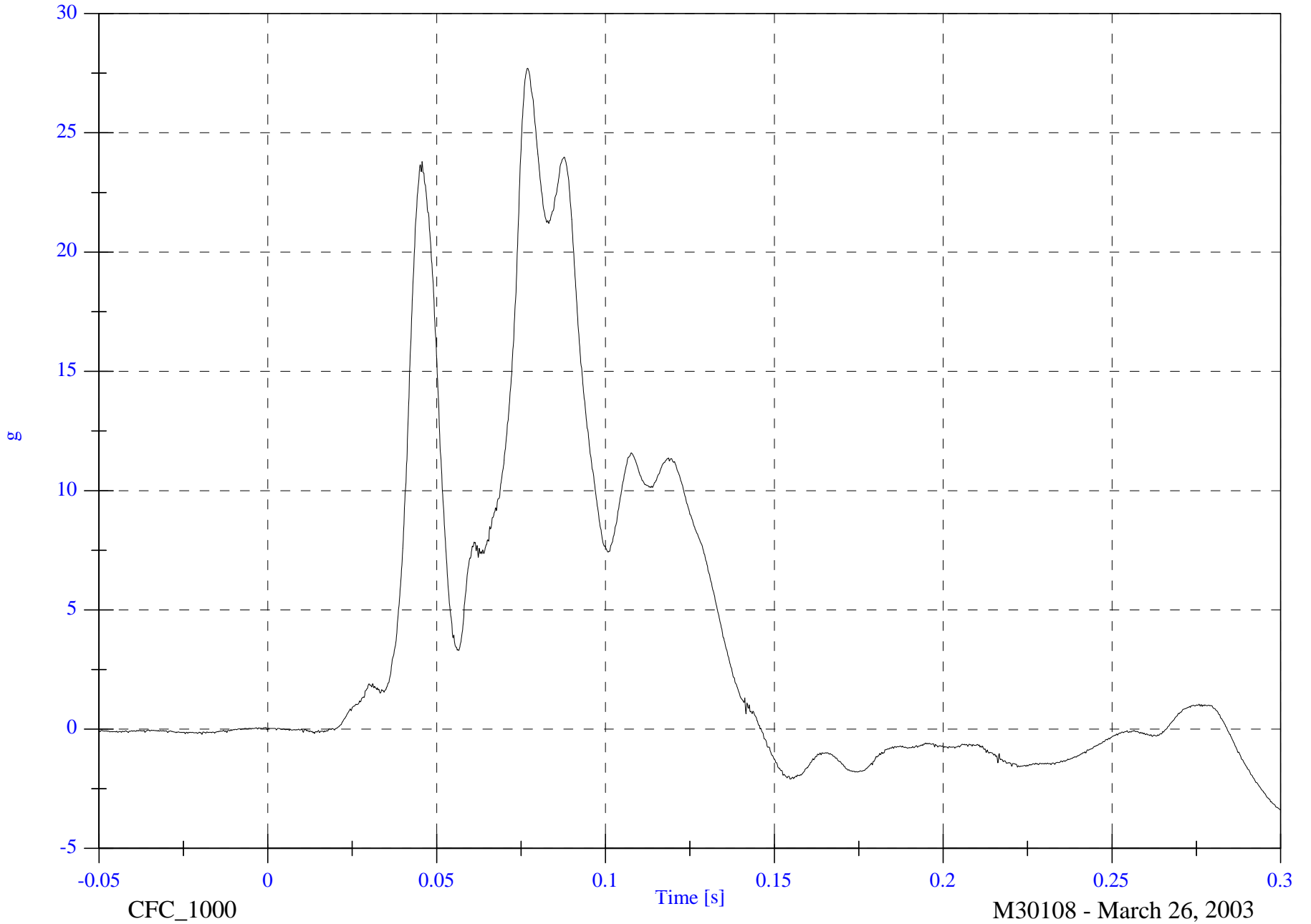
V1P4 Pelvic x

Max: 27.7 [g] at 0.077 [s]

Min: -3.4 [g] at 0.300 [s]

4-60

8642-NCAP-36



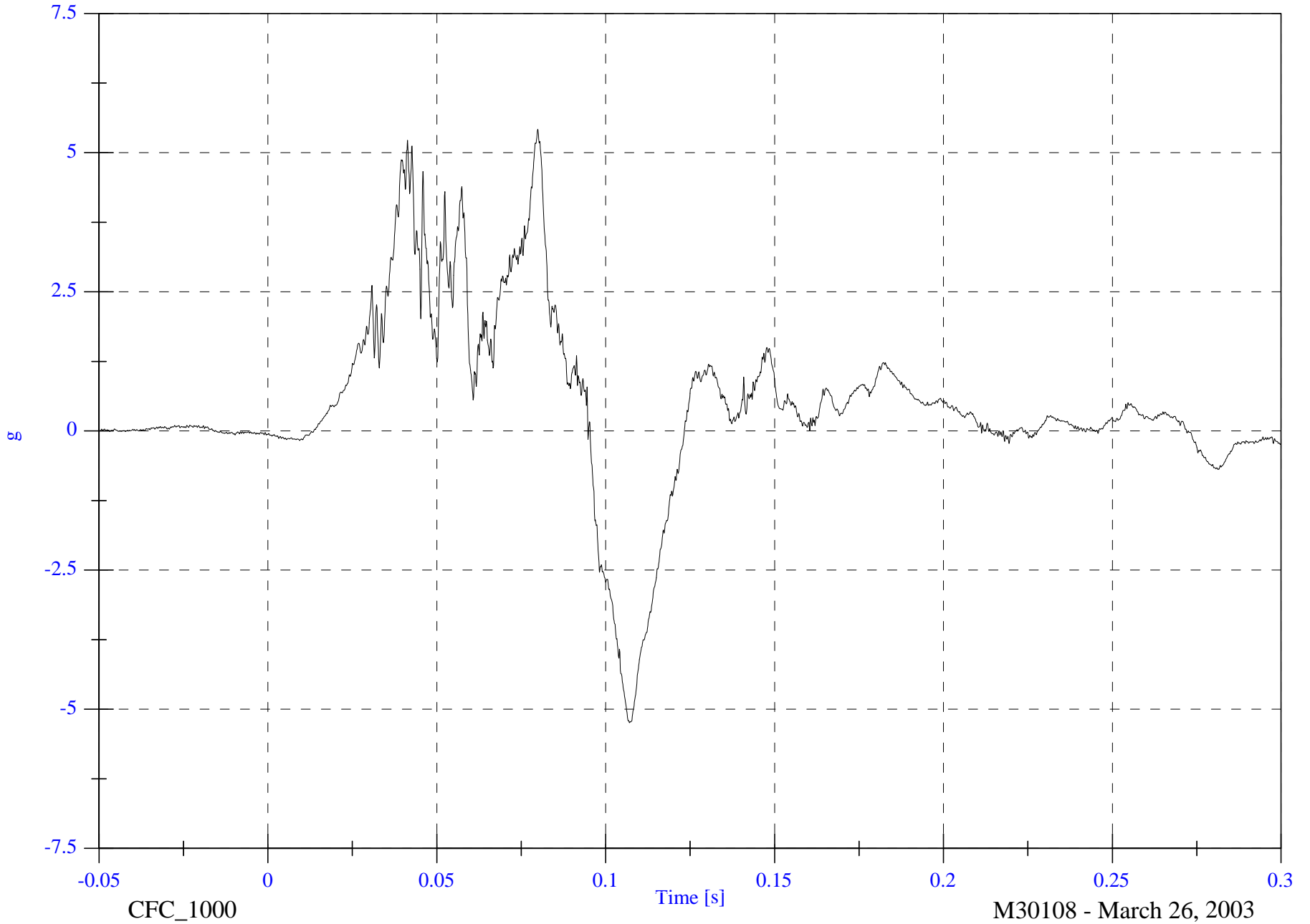
NCAP Test #14 - 2003 Chevrolet Suburban

Max: 5.4 [g] at 0.080 [s]  
Min: -5.2 [g] at 0.107 [s]

V1P4 Pelvic y

4-61

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

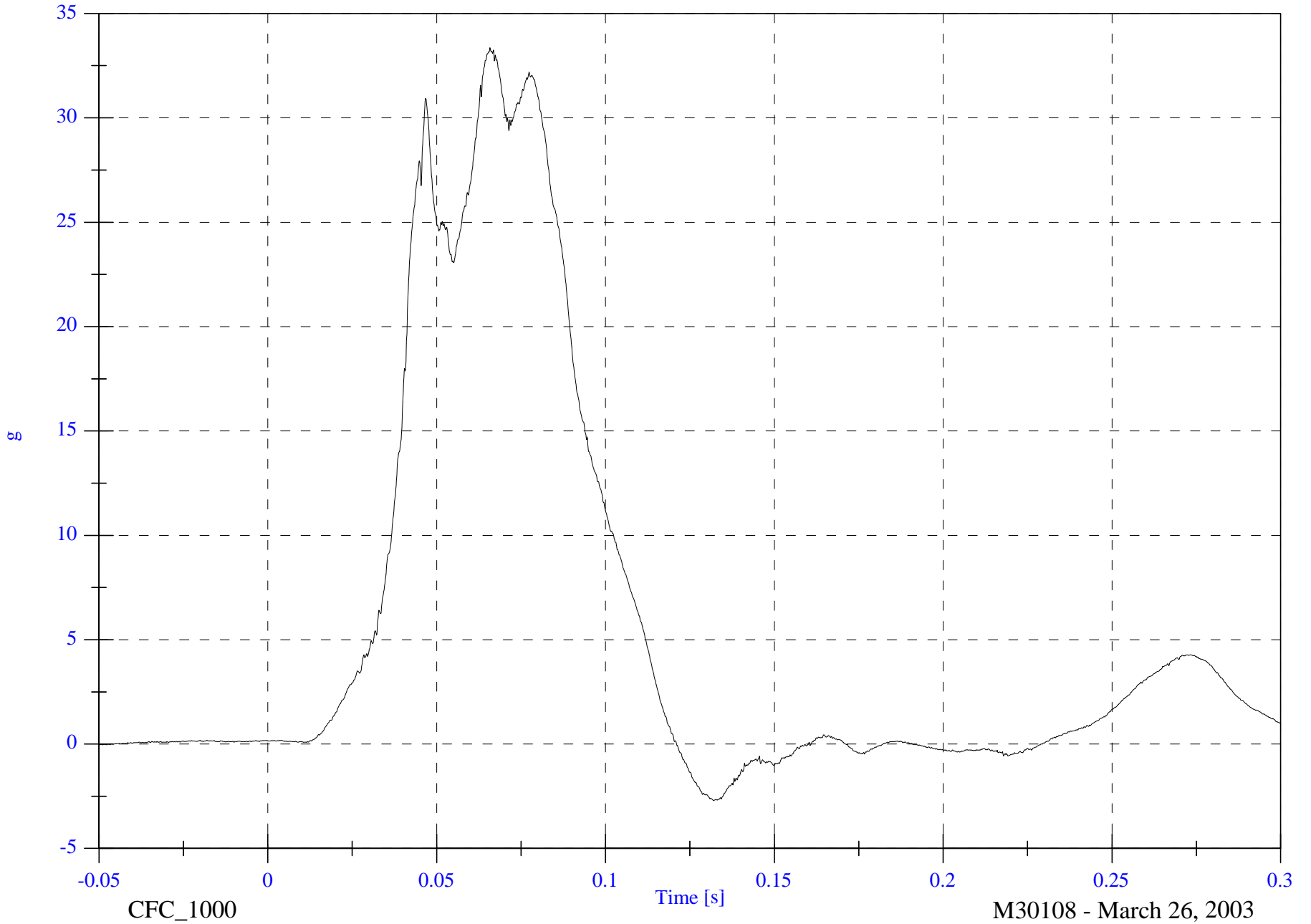
Max: 33.4 [g] at 0.066 [s]

V1P4 Pelvic z

Min: -2.7 [g] at 0.132 [s]

4-62

8642-NCAP-36



M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

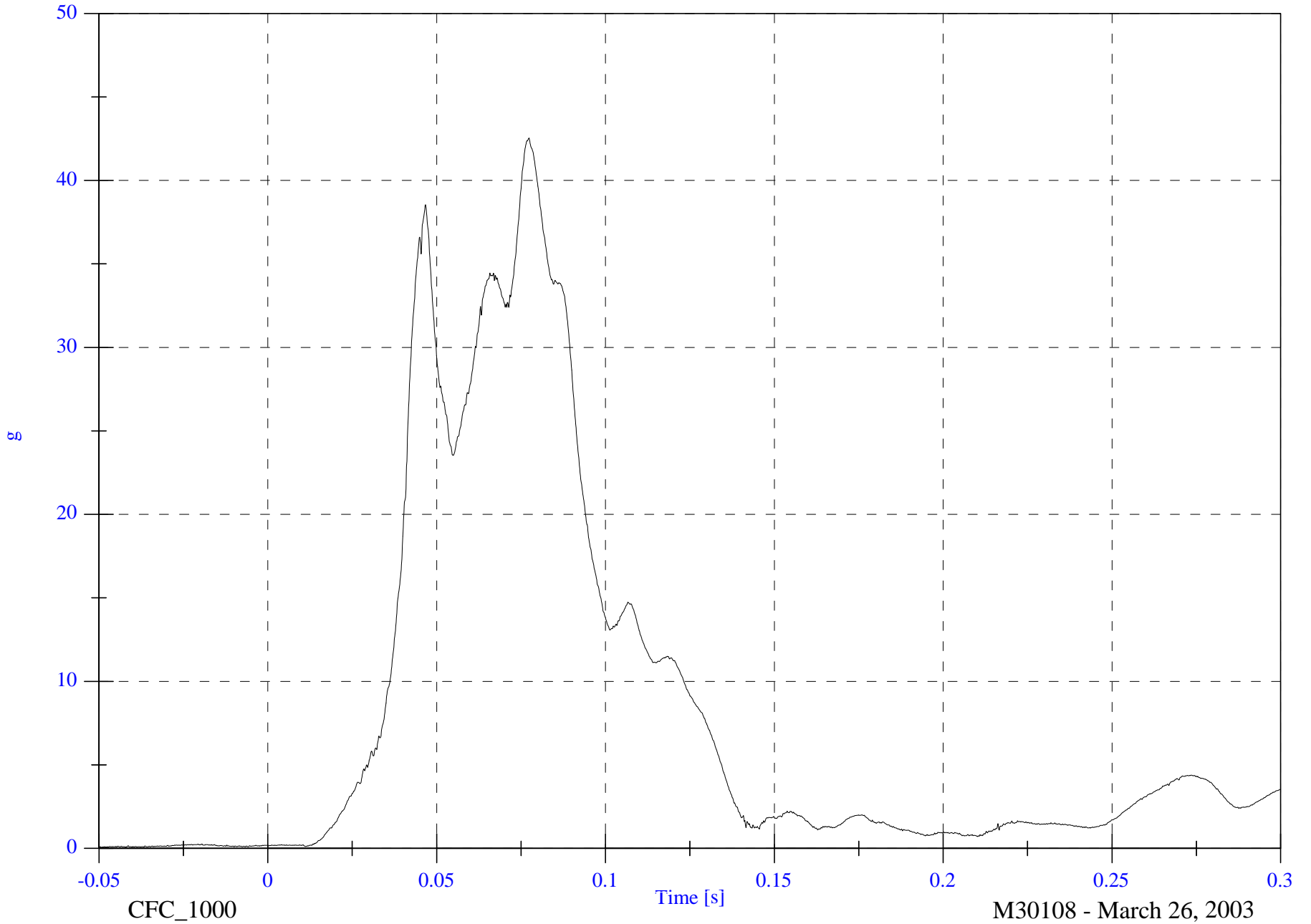
V1P4 Pelvic Resultant

Max: 42.5 [g] at 0.077 [s]

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

4-63

8642-NCAP-36



CFC\_1000

Time [s]

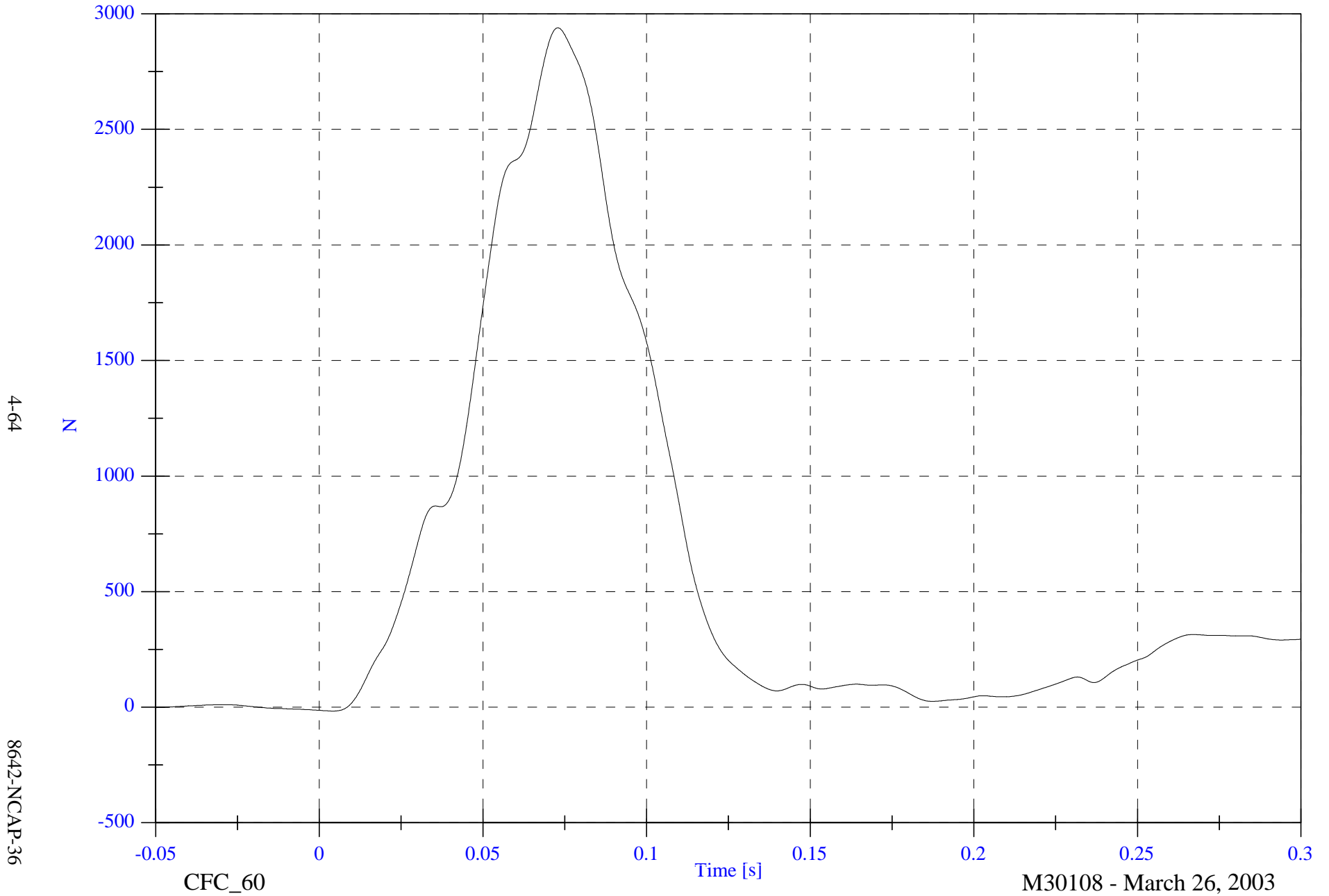
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P4 Lap Belt

Max: 2939.3 [N] at 0.073 [s]

Min: -16.7 [N] at 0.004 [s]



4-64

8642-NCAP-36

CFC\_60

Time [s]

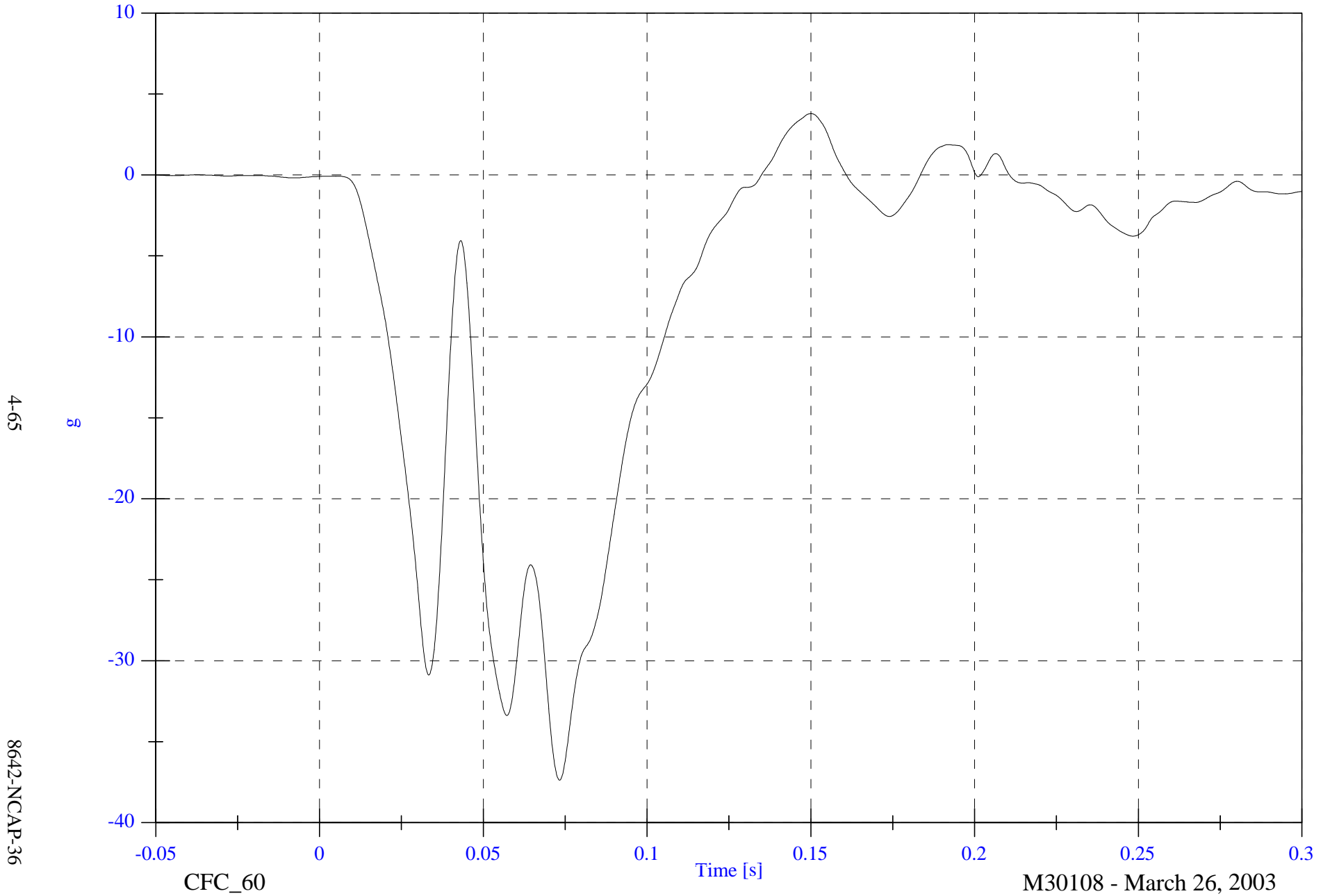
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P4 CRS x

Max: 3.8 [g] at 0.150 [s]

Min: -37.4 [g] at 0.073 [s]



4-65

8642-NCAP-36

CFC\_60

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

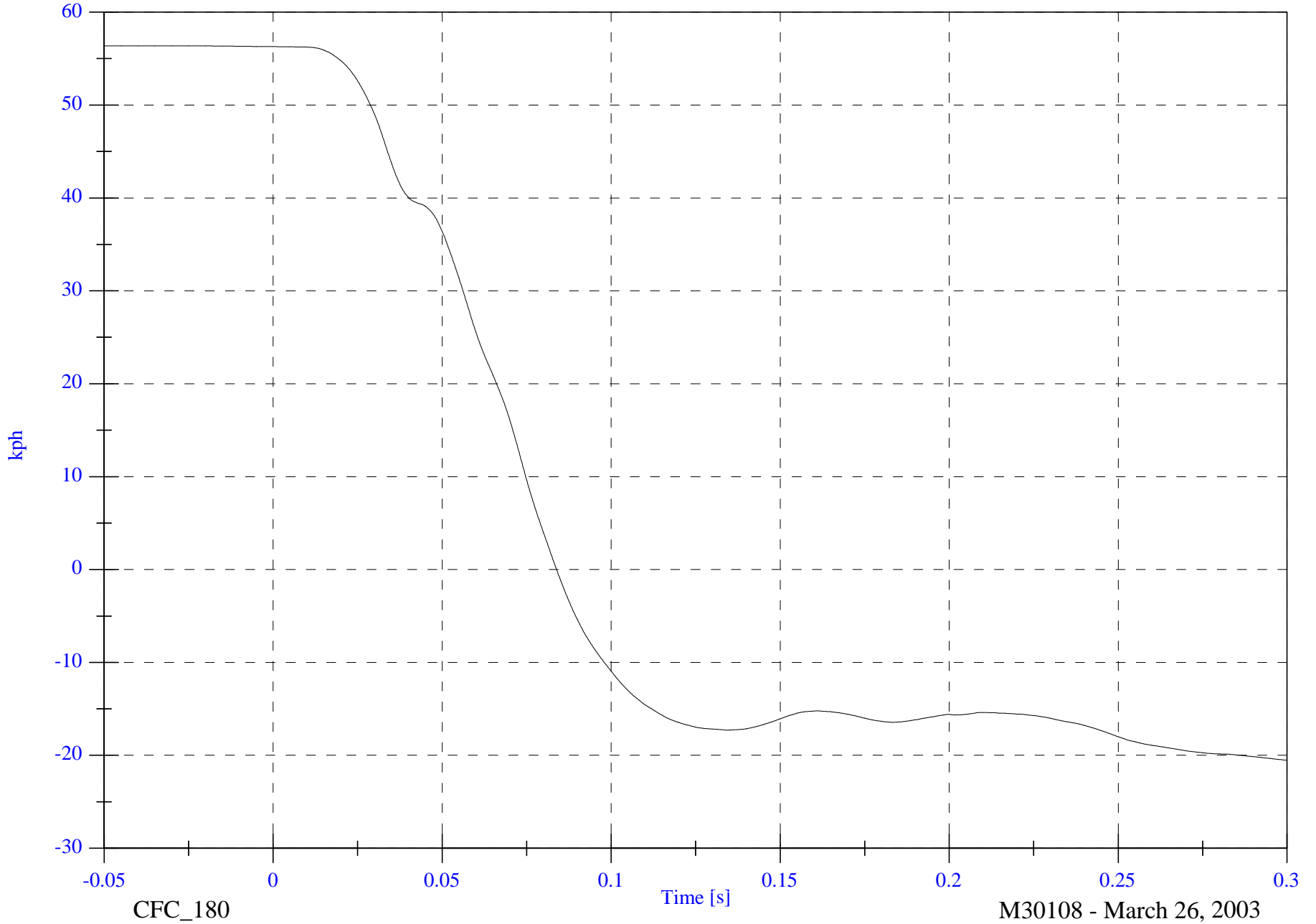
V1P4 CRS x Velocity

Max: 56.4 [kph] at -0.048 [s]

Min: -20.5 [kph] at 0.300 [s]

4-66

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

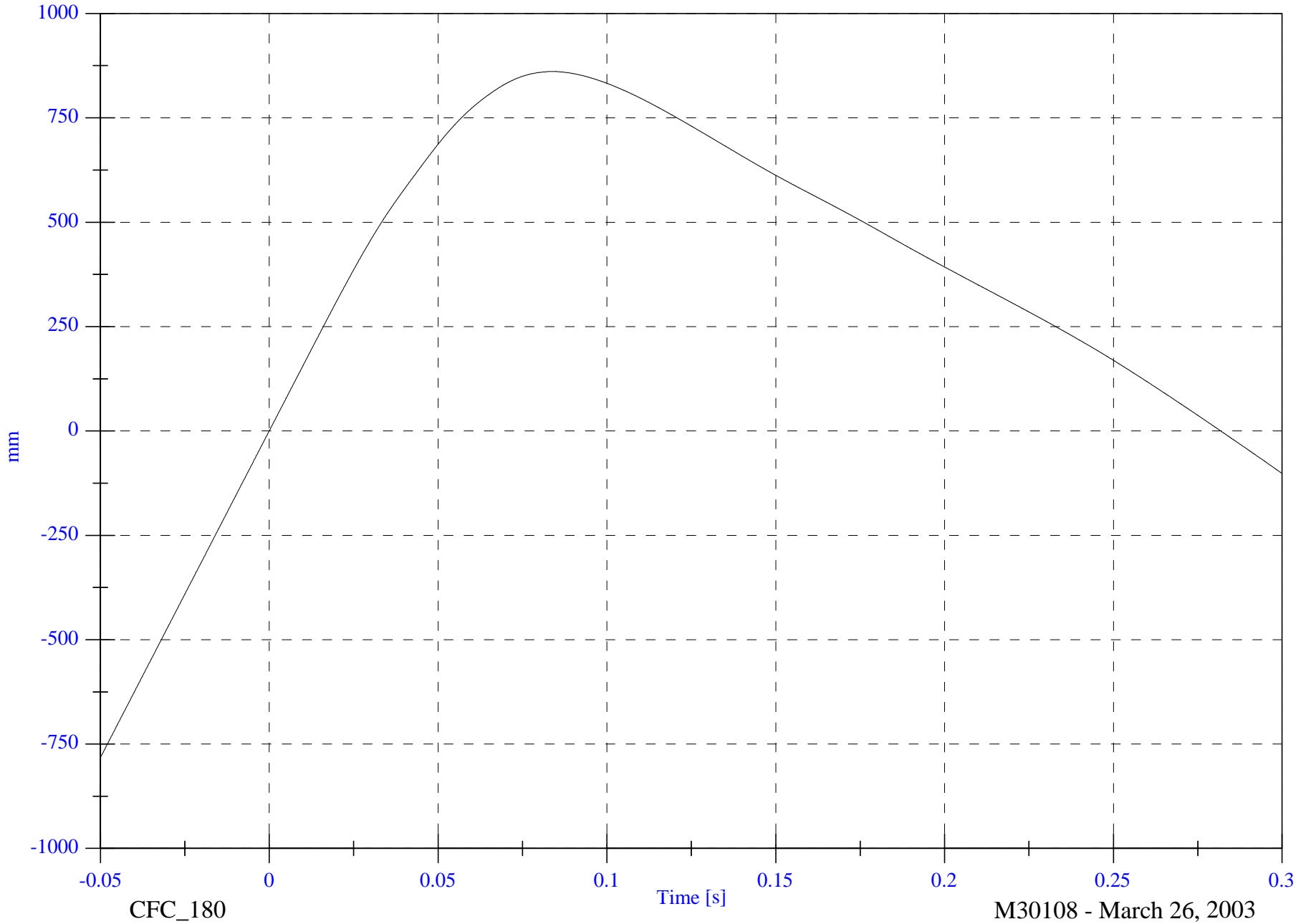
Max: 860.9 [mm] at 0.084 [s]

V1P4 CRS x Displacement

Min: -782.6 [mm] at -0.050 [s]

4-67

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

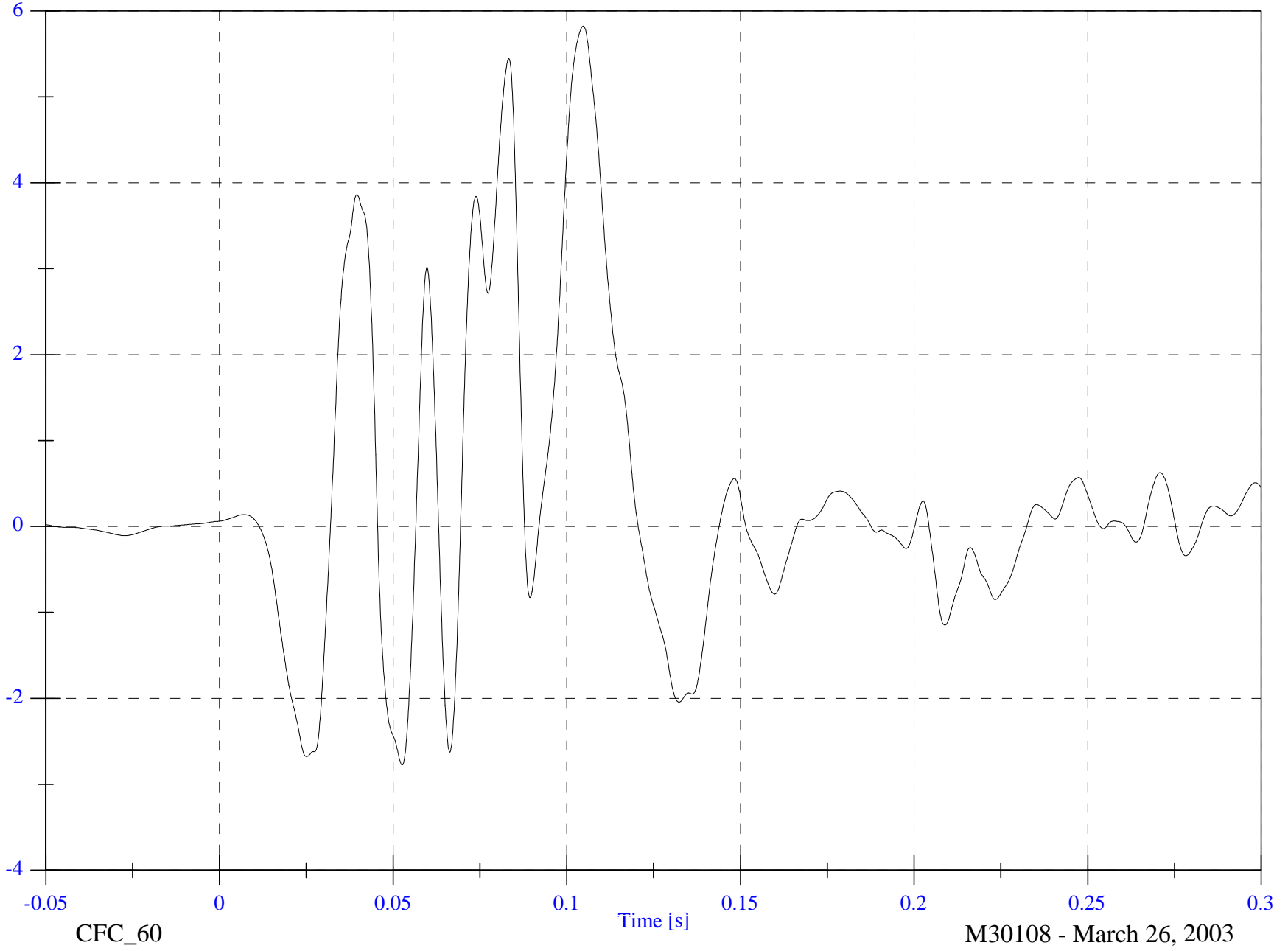
Max: 5.8 [g] at 0.105 [s]  
Min: -2.8 [g] at 0.053 [s]

V1P4 CRS y

4-68

g

8642-NCAP-36



CFC\_60

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

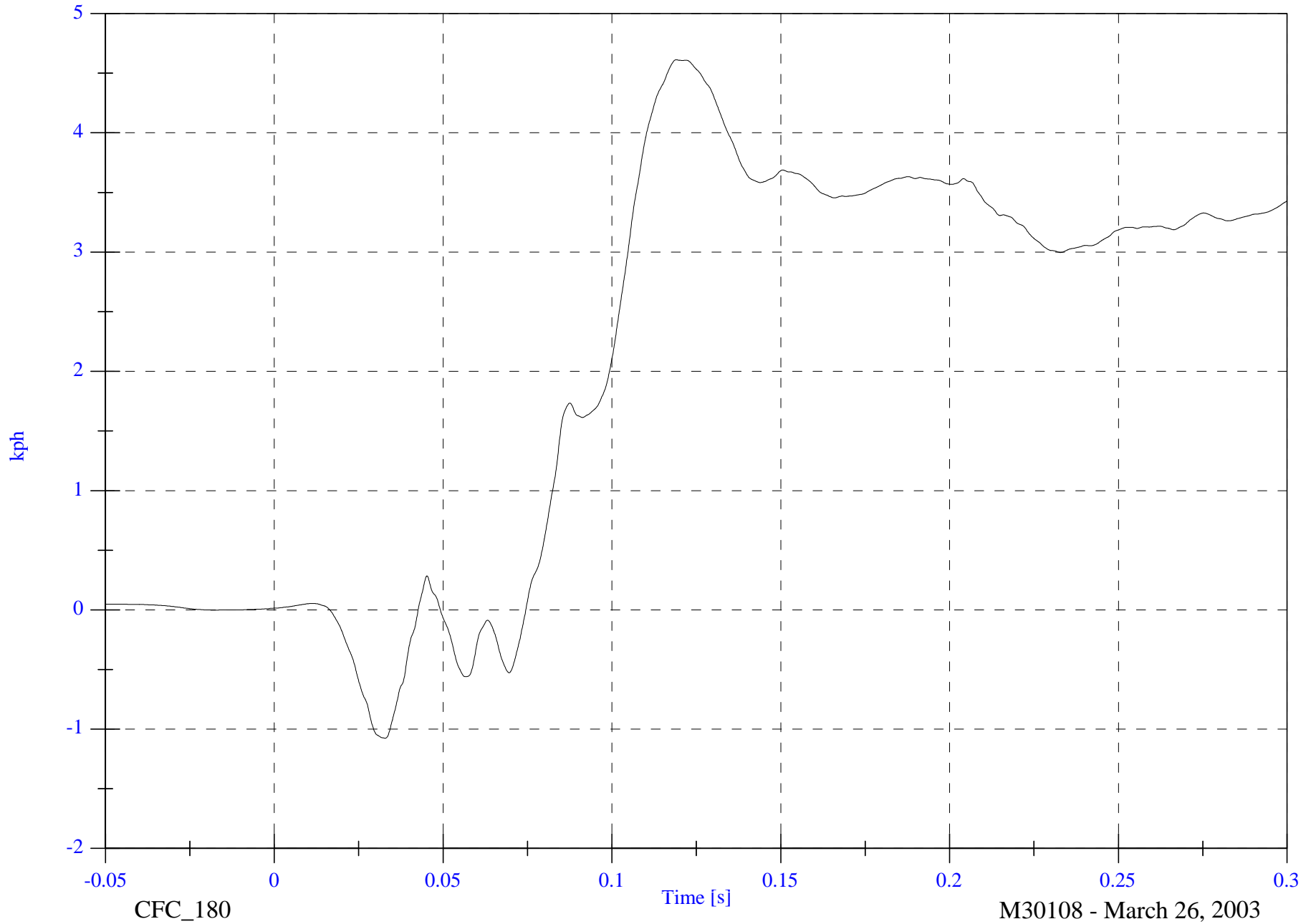
Max: 4.6 [kph] at 0.119 [s]

V1P4 CRS y Velocity

Min: -1.1 [kph] at 0.033 [s]

4-69

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

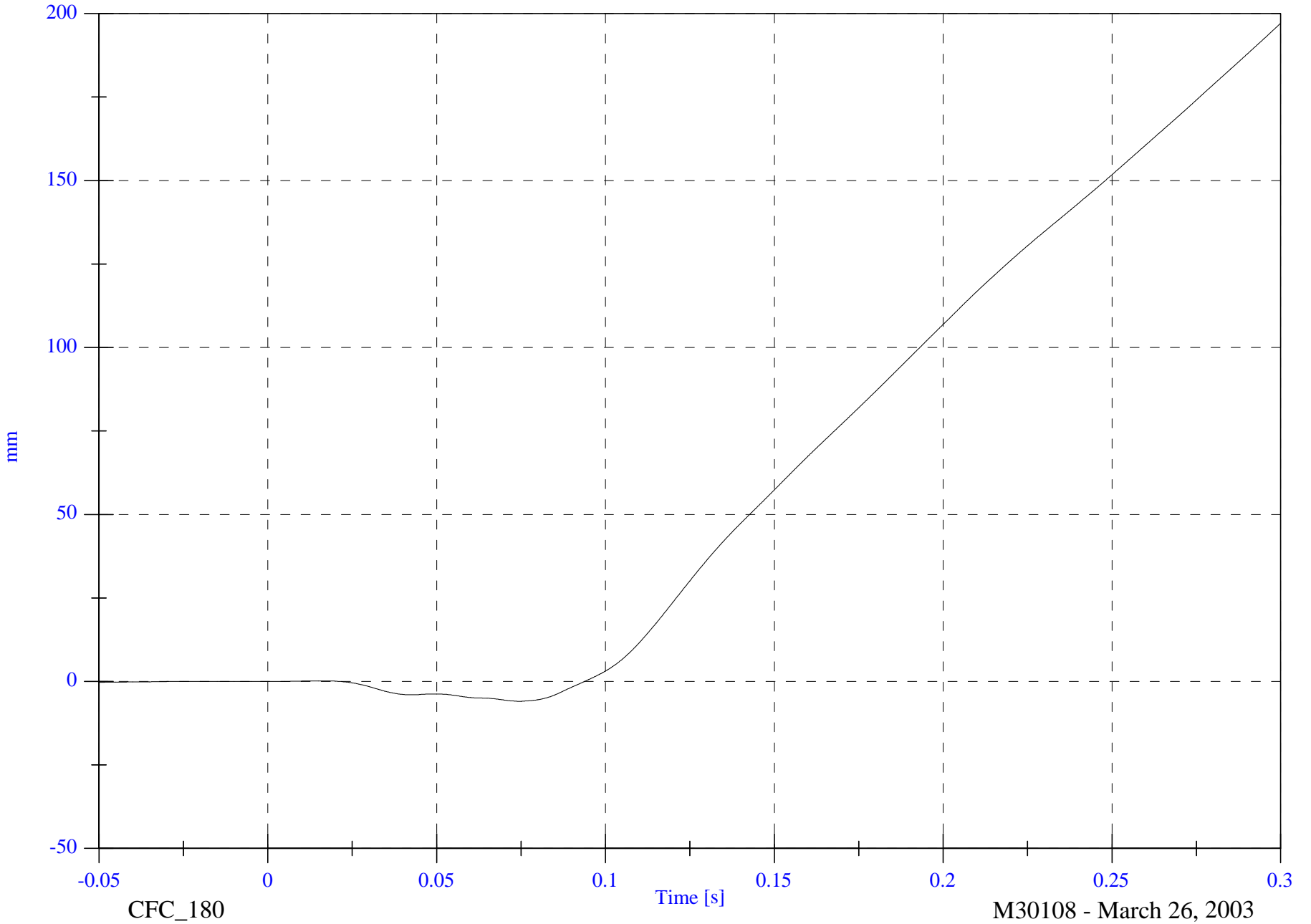
V1P4 CRS y Displacement

Max: 197.0 [mm] at 0.300 [s]

Min: -5.9 [mm] at 0.074 [s]

4-70

8642-NCAP-36



CFC\_180

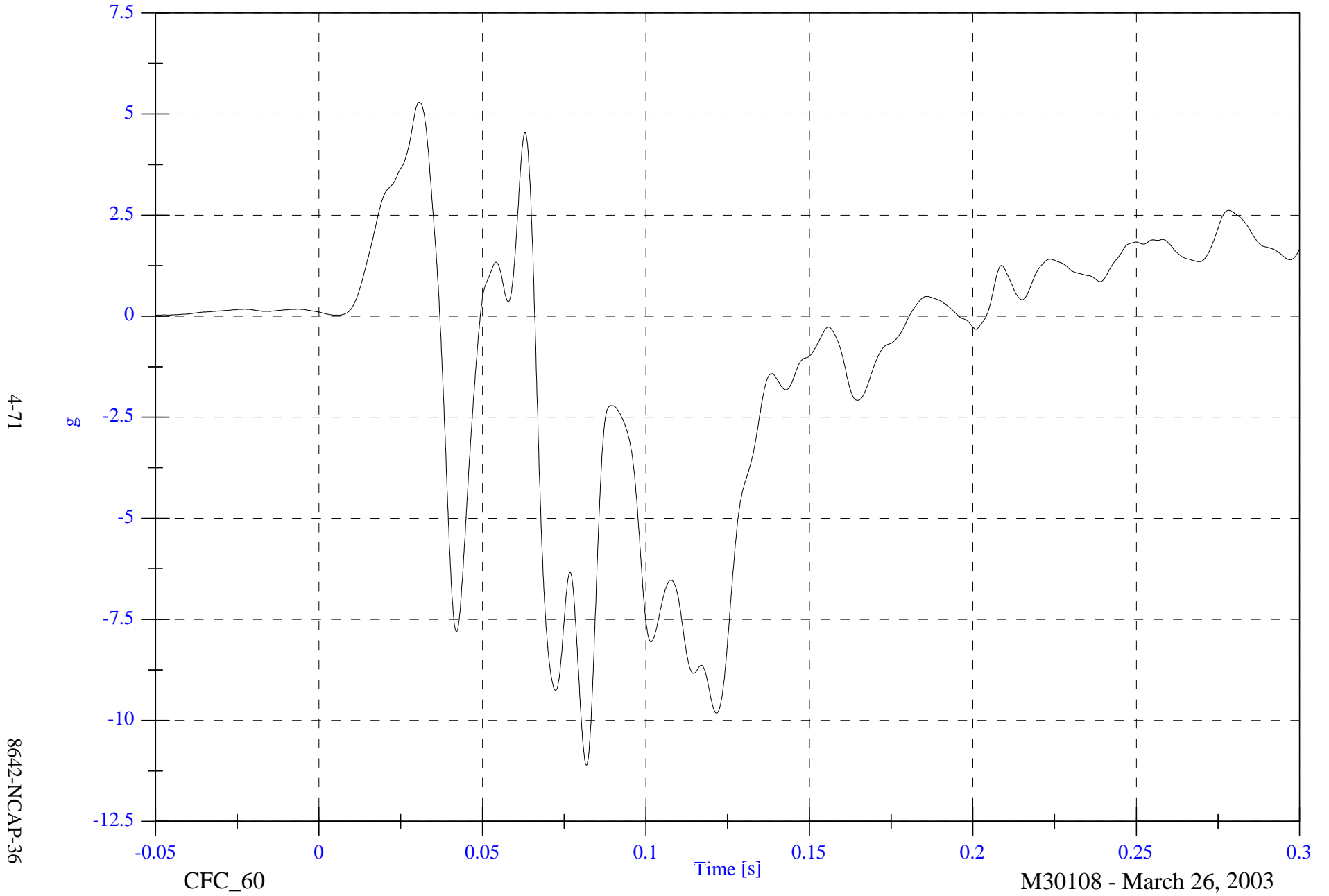
M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

V1P4 CRS z

Max: 5.3 [g] at 0.031 [s]

Min: -11.1 [g] at 0.082 [s]



NCAP Test #14 - 2003 Chevrolet Suburban

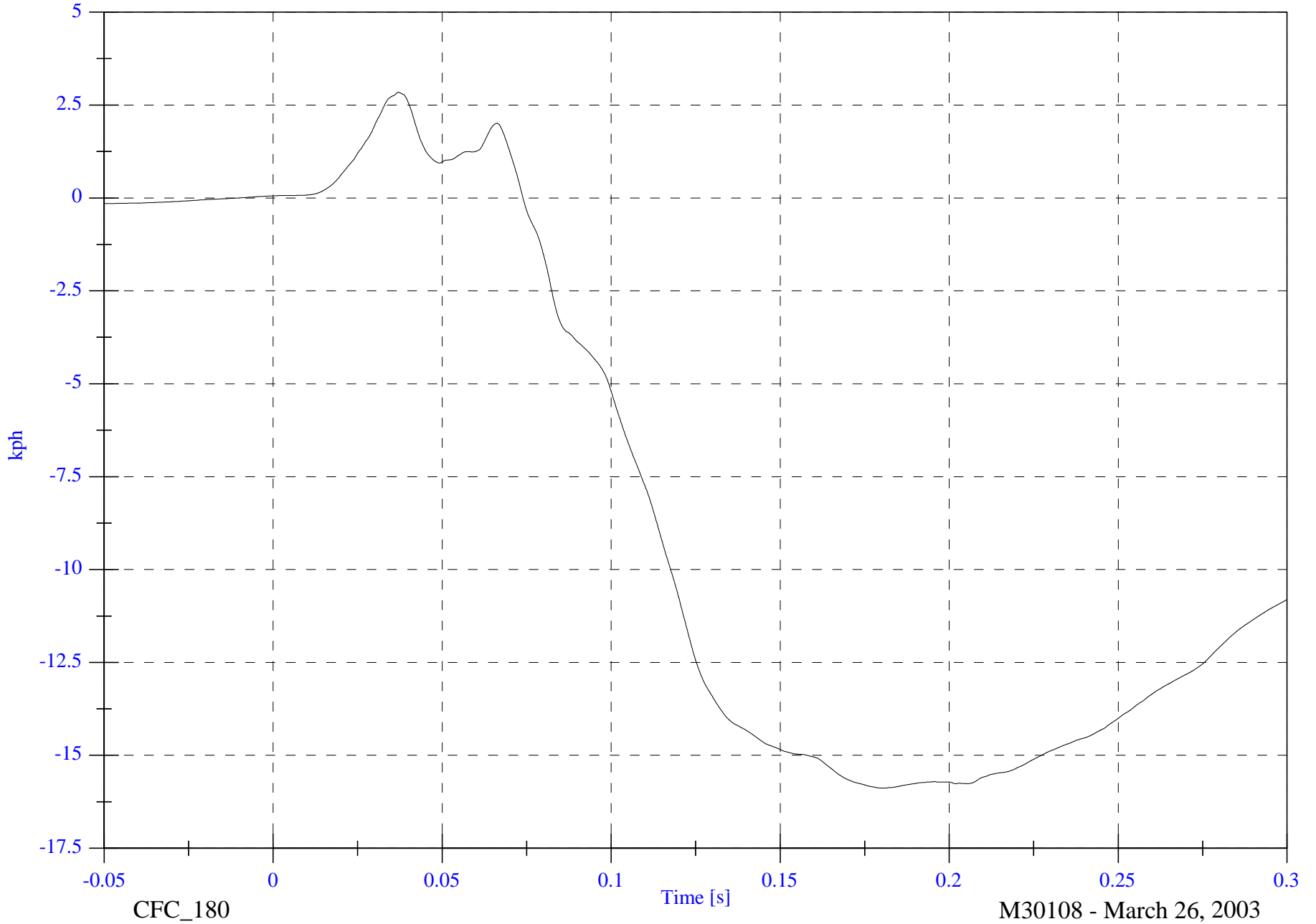
V1P4 CRS z Velocity

Max: 2.8 [kph] at 0.037 [s]

Min: -15.9 [kph] at 0.180 [s]

4-72

8642-NCAP-36



CFC\_180

Time [s]

M30108 - March 26, 2003

NCAP Test #14 - 2003 Chevrolet Suburban

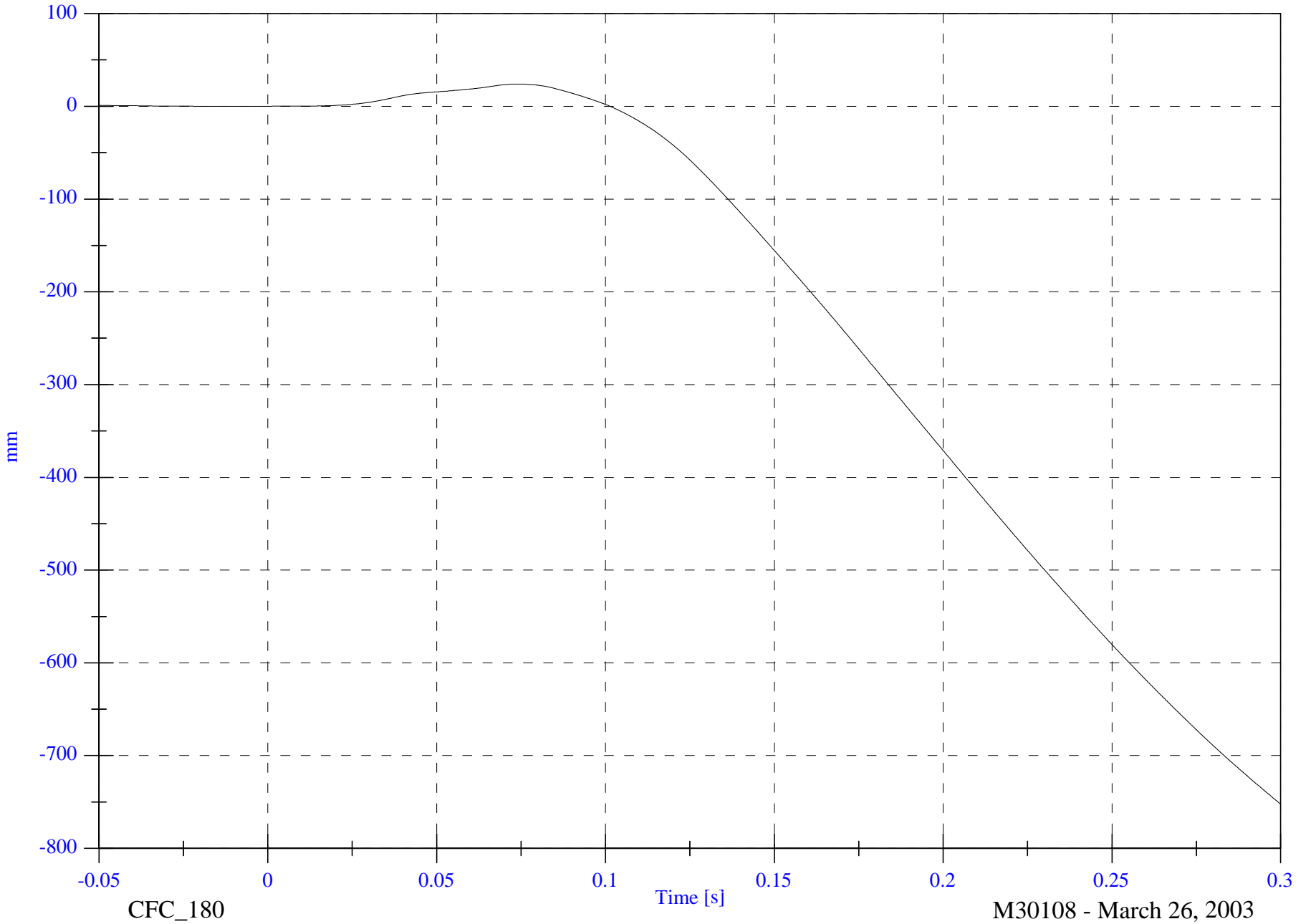
V1P4 CRS z Displacement

Max: 24.0 [mm] at 0.074 [s]

Min: -752.1 [mm] at 0.300 [s]

4-73

8642-NCAP-36



NCAP Test #14 - 2003 Chevrolet Suburban

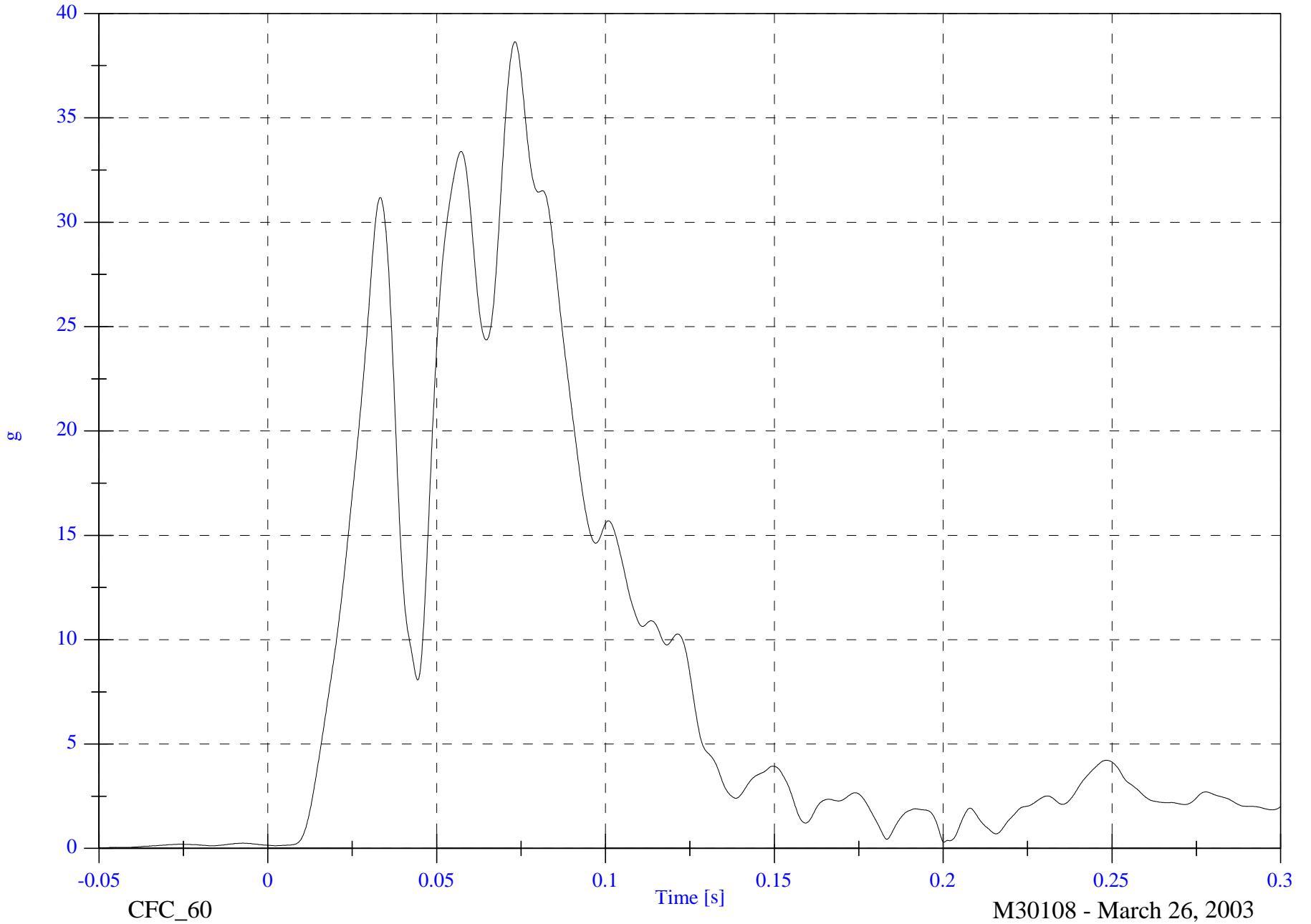
V1P4 CRS Resultant

Max: 38.6 [g] at 0.073 [s]

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

4-74

8642-NCAP-36



## **SECTION 5**

### **CHILD DUMMY CALIBRATION INFORMATION**

ATD 044: Certified January 28, 2003.

ATD 093: Certified March 8, 2003 by VRTC, data is included in the bound test report.

# 044 Head Drop

Part 572P Head Drop

Calibration Date: 01-27-03

Serial No: 044

Work File: 044H 01-27-03

## -----TEST RESULTS-----

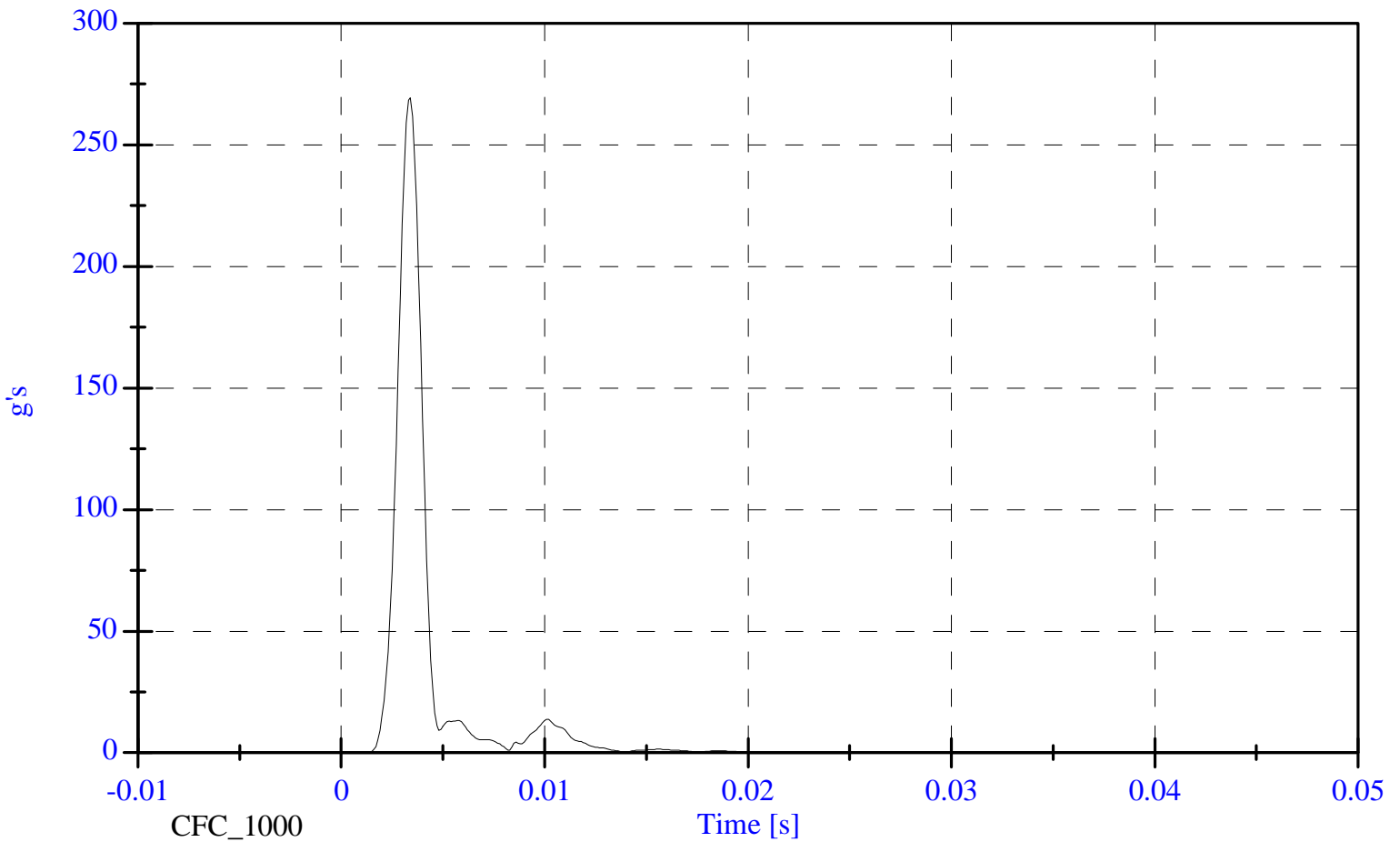
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	66.0-78.0 F	70.0 F	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Peak Resultant Accel.:	250-280 Gs	269.30 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	3.21 Gs	Passed
Curve PerCent NonModal:	< 10%	5.12 %	Passed

044 Head Drop

Head Resultant

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

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



# 044 Chest Impact

Part 572P Thorax Impact

Calibration Date: 01-28-03

Serial No: 044

Work File: 044T1 01-28-03

## -----TEST RESULTS-----

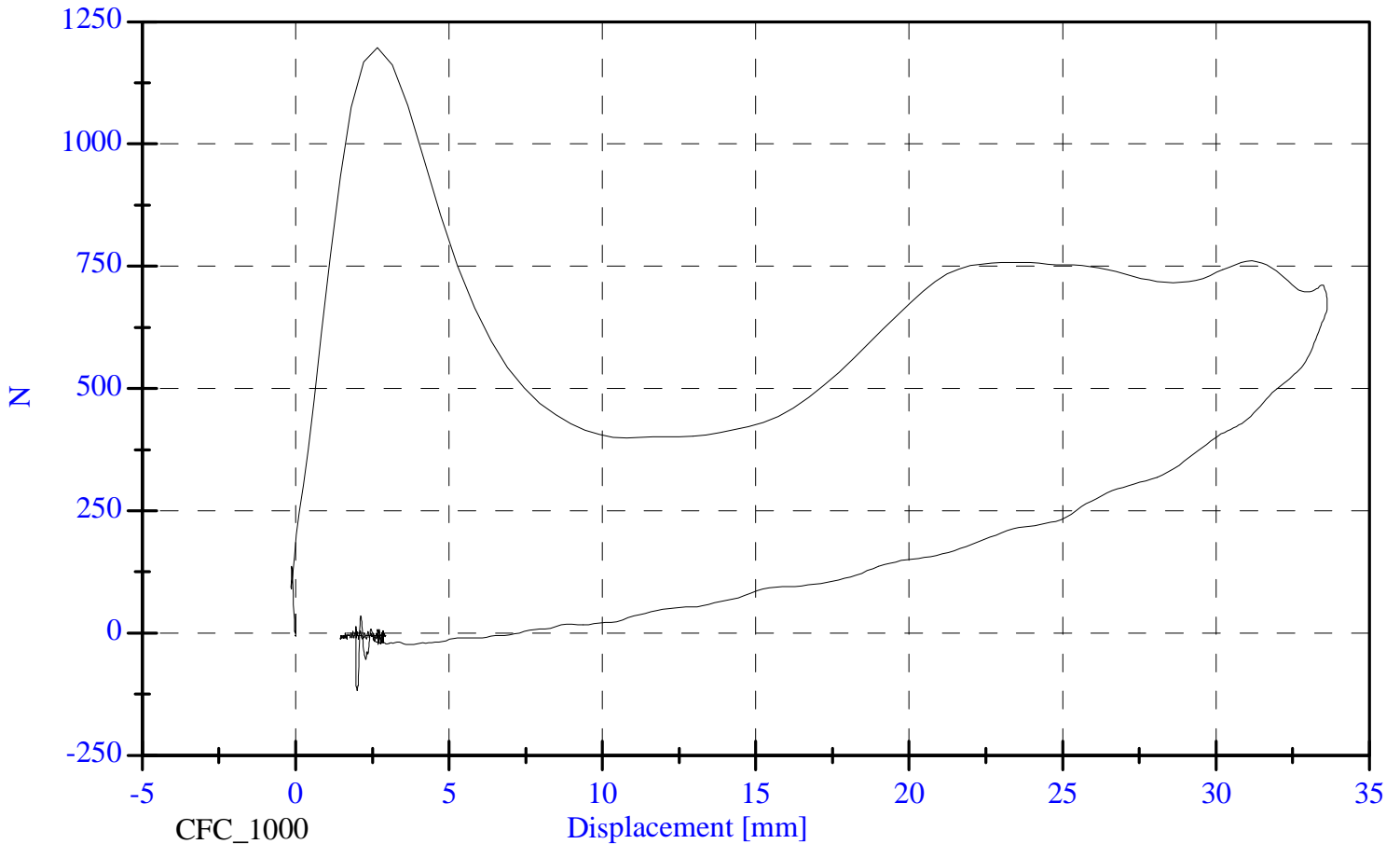
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Pendulum Velocity:	5.90- 6.10 m/s	5.94 m/s	Passed
Maximum Deflection:	32.00-38.00 mm	33.62 mm	Passed
Maximum Res. Force:	680.00- 810.00 N	740.30 N	Passed
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 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-----

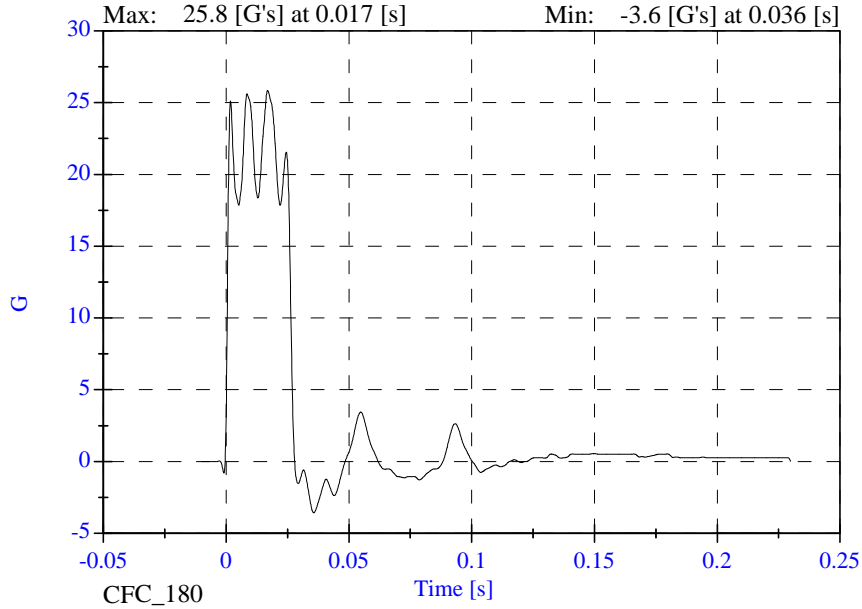
Maximum Rotation:	70.0-82.0 Deg	75.22 Deg	Passed
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## -----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

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

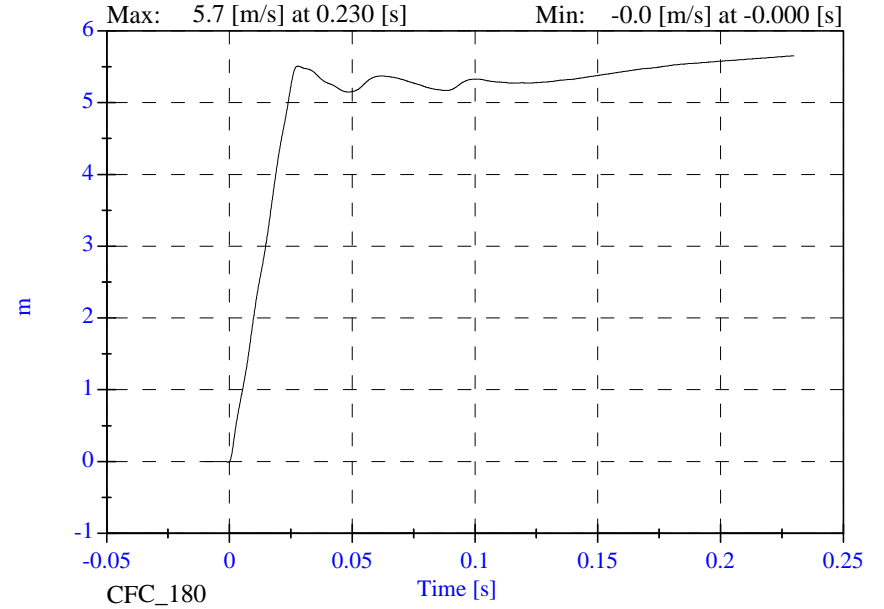
# 044 Neck Flexion

## Pendulum Acceleration

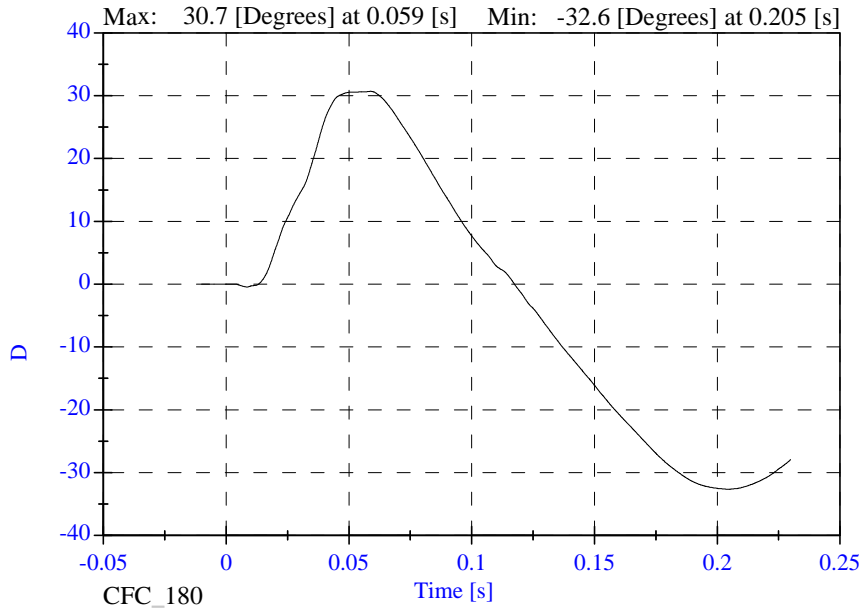


# 70 - 01-27-03

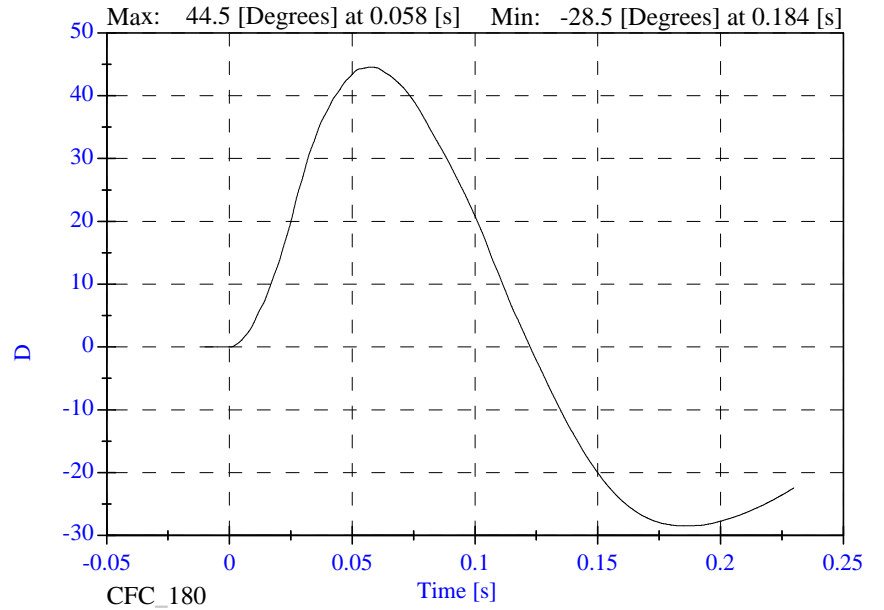
## Pendulum Velocity



## Head Rotation

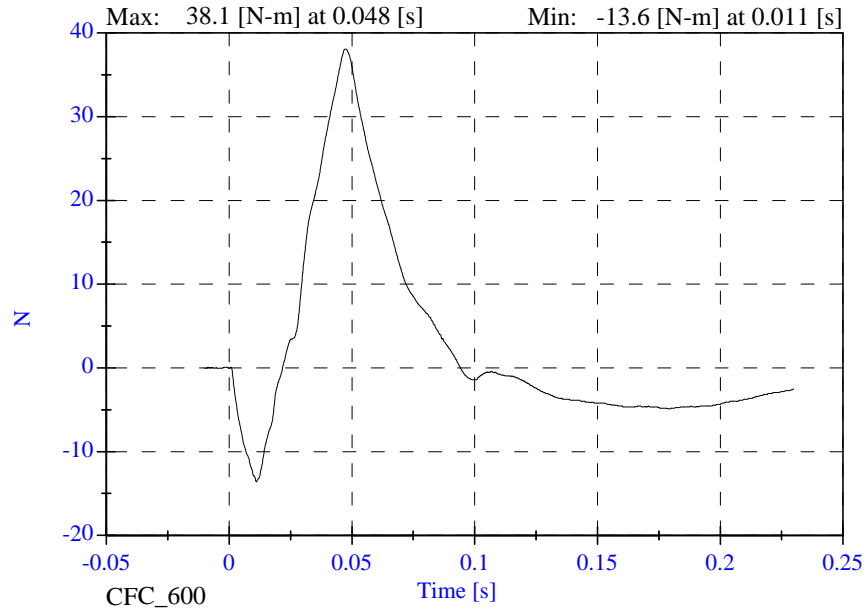


## Arm Rotation



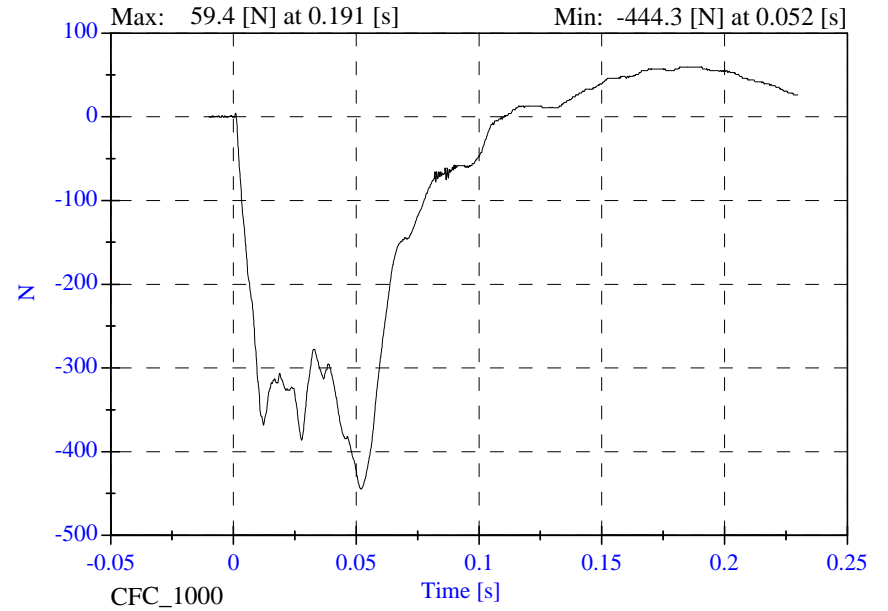
### 044 Neck Flexion

Neck Moment Y

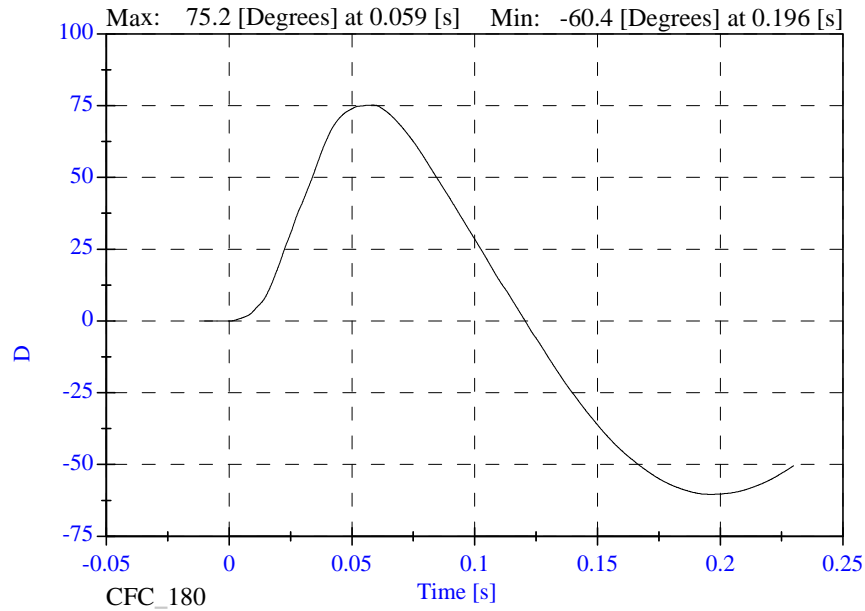


### 70 - 01-27-03

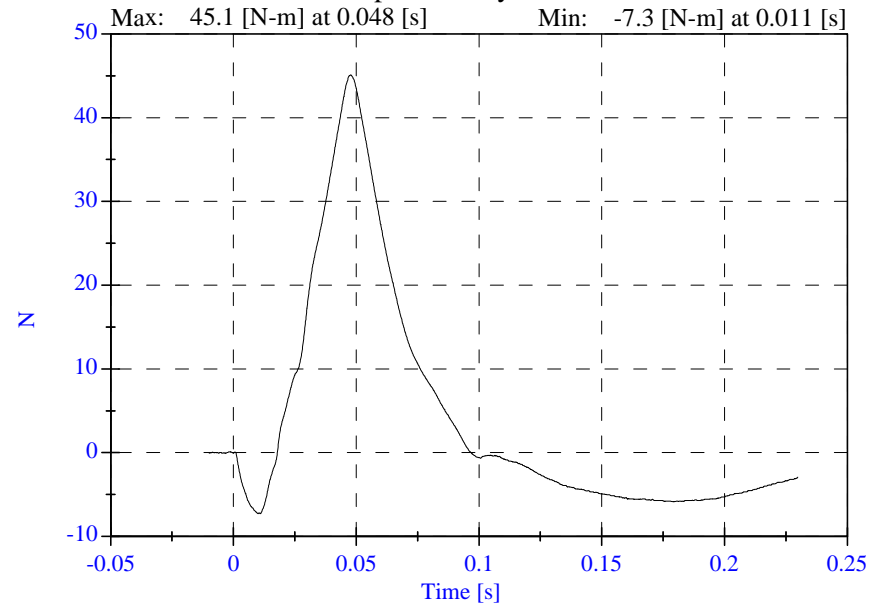
Neck Force X



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-----

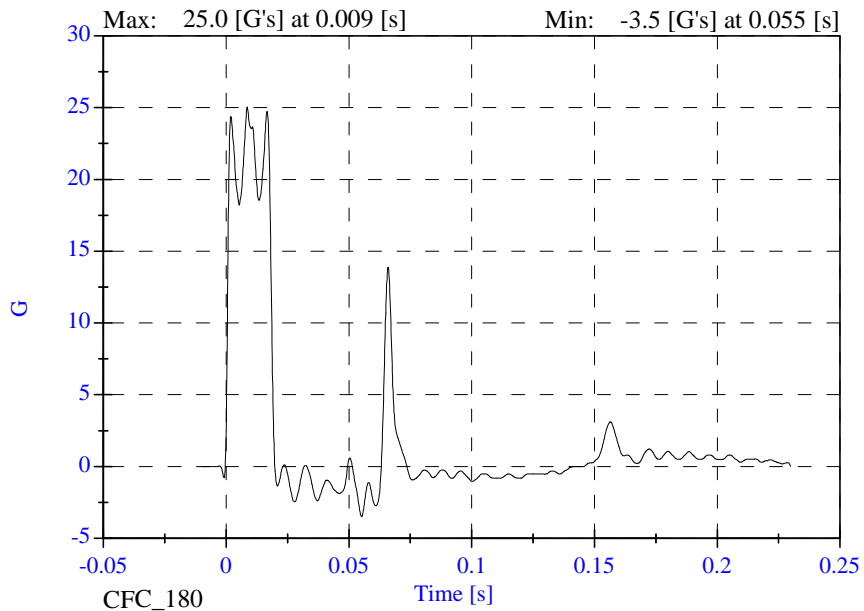
Maximum Rotation:	83.0-93.0 Deg	83.96 Deg	Passed
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## -----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

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

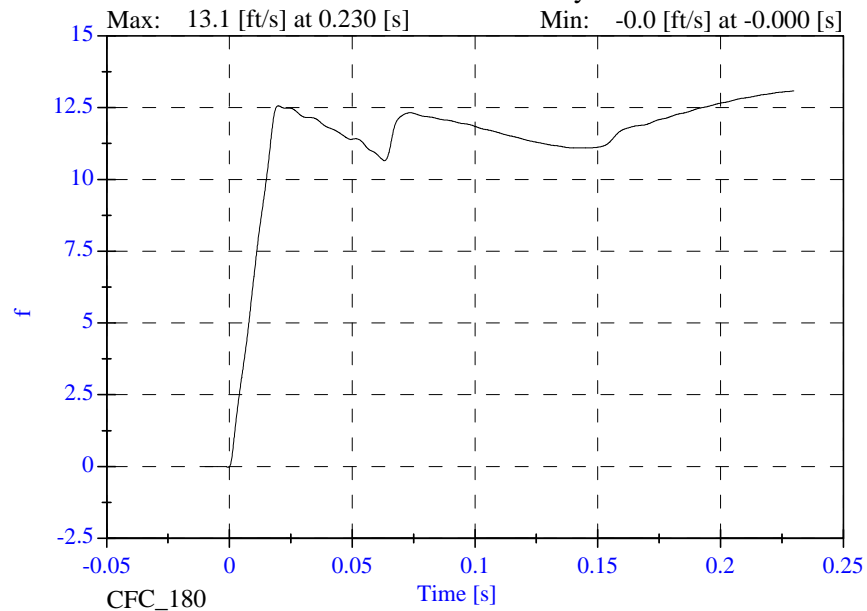
# 044 Neck Extension

## Pendulum Acceleration

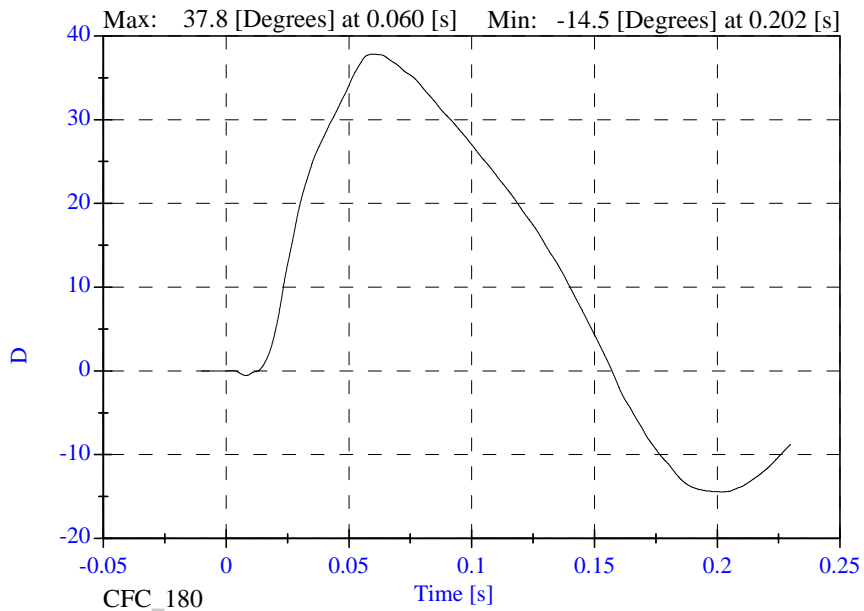


# 71 - 01-28-03

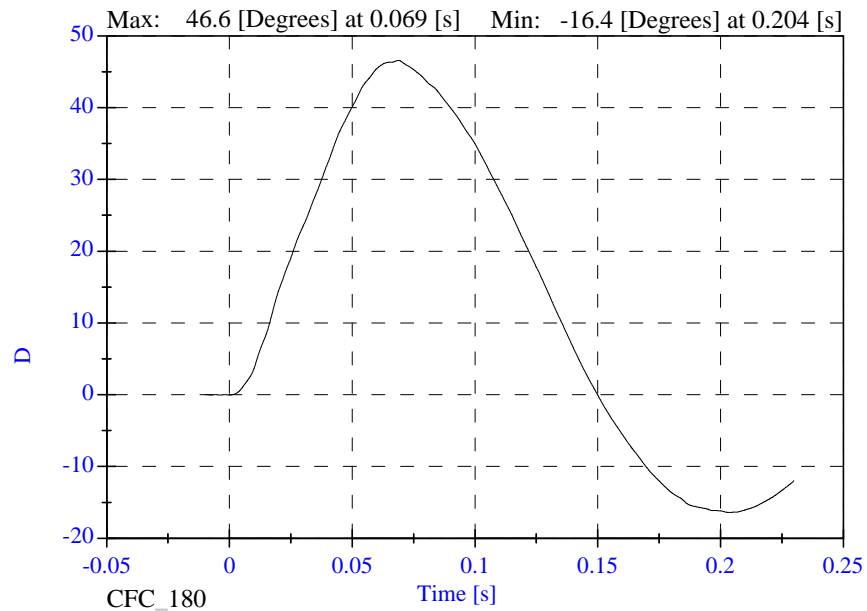
## Pendulum Velocity



## Head Rotation

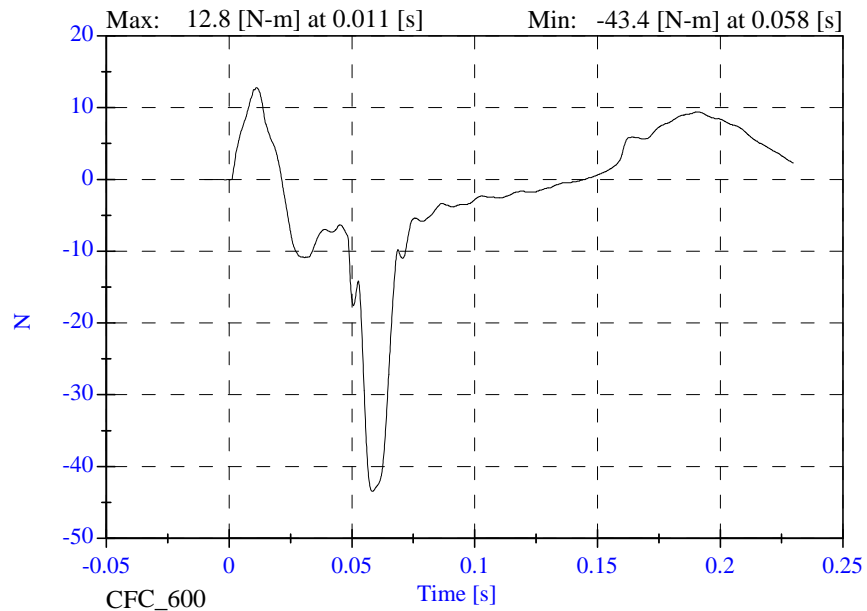


## Arm Rotation



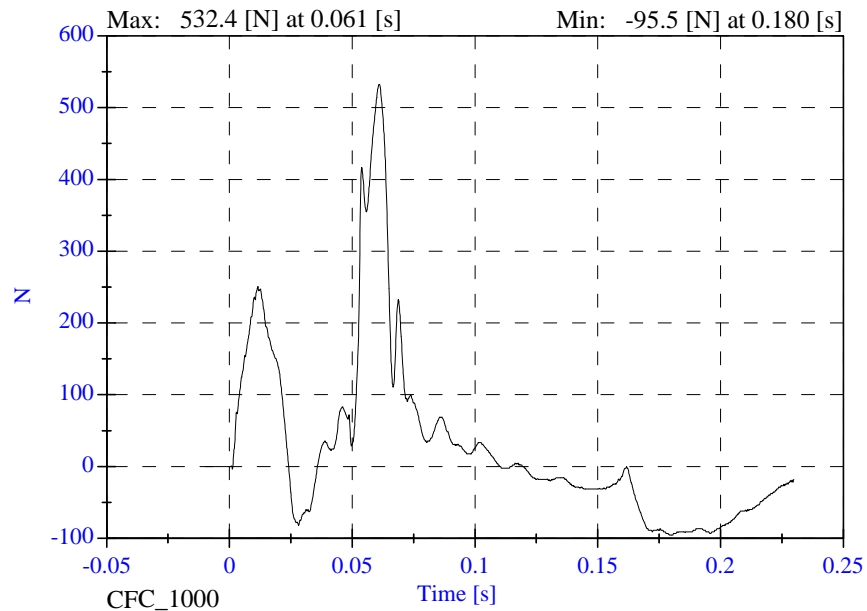
### 044 Neck Extension

Neck Moment Y

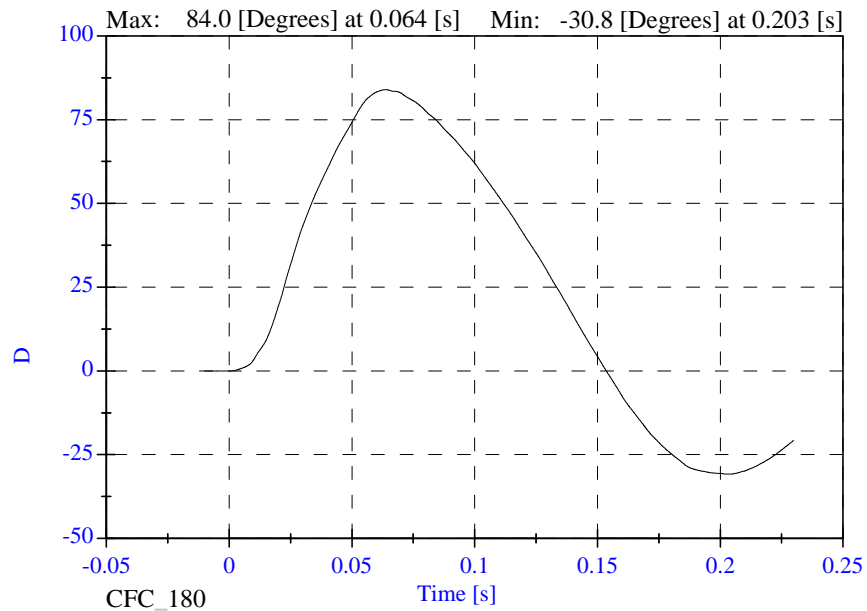


### 71 - 01-28-03

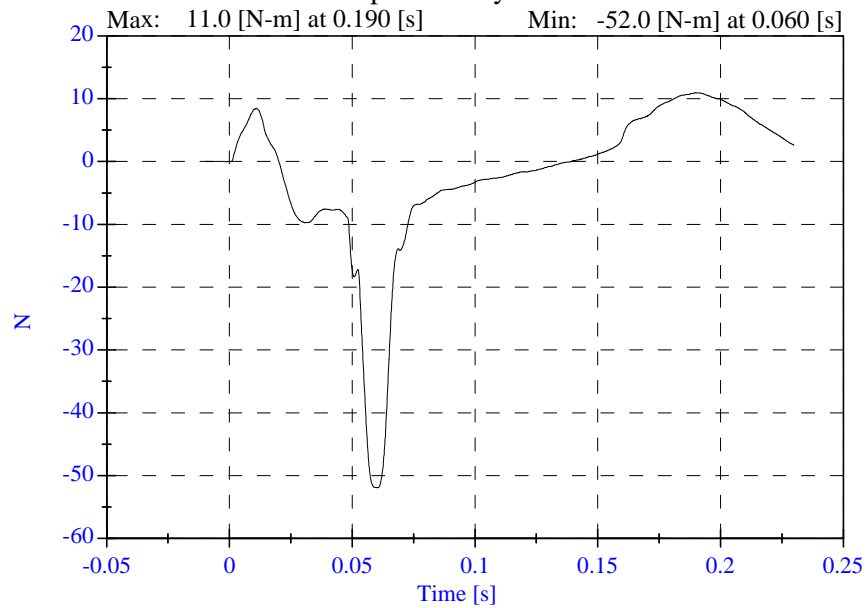
Neck Force X



Total Rotation



Occipital Condyle Moment



Spine\_Flexion\_test.txt

044 Lumbar Spine Flexion

Date: 1-28-03

Result: 45 degrees - 38.8 lbf

Certified By: B. Swieczki Date: 01-28-03

**SECTION 6**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**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 DX	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
TETHER	ENDEVCO	AC-P17255	11-Feb-03

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**INSTRUMENTATION**

	POSITION #4 (LEFT) SERIAL NO.: 093		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	ENTRAN	AC-02I02I05-F20	13-Nov-02
HEAD AY	ENTRAN	AC-02I02I10-N19	14-Nov-02
HEAD AZ	ENTRAN	AC-02I02I05-F03	13-Nov-02
UPPER NECK FX	DENTON	LC-280-FX	16-Dec-02
UPPER NECK FY	DENTON	LC-280-FY	16-Dec-02
UPPER NECK FZ	DENTON	LC-280-FZ	16-Dec-02
UPPER NECK MX	DENTON	LC-280-MX	16-Dec-02
UPPER NECK MY	DENTON	LC-280-MY	16-Dec-02
UPPER NECK MZ	DENTON	LC-280-MZ	16-Dec-02
CHEST AX	ENTRAN	AC-02I02I05-F16	13-Nov-02
CHEST AY	ENTRAN	AC-02I02I05-F06	13-Nov-02
CHEST AZ	ENTRAN	AC-02I02I05-F07	13-Nov-02
PELVIS AX	ENTRAN	AC-02I02I05-F11	5-Nov-02
PELVIS AY	ENTRAN	AC-02I02I10-N06	14-Nov-02
PELVIS AZ	ENTRAN	AC-02I02I16-A05	14-Nov-02
LAP BELT F	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-J32383	21-Jan-03
P3 CRS (Y)	ENDEVCO	AC-J25745	21-Jan-03
P3 CRS (Z)	ENDEVCO	AC-J29805	21-Jan-03
P4 CRS (X)	ENDEVCO	AC-P17255	11-Feb-03
P4 CRS (Y)	ENDEVCO	AC-P17145	11-Feb-03
P4 CRS (Z)	ENDEVCO	AC-P16813	11-Feb-03

**REMARKS:** None