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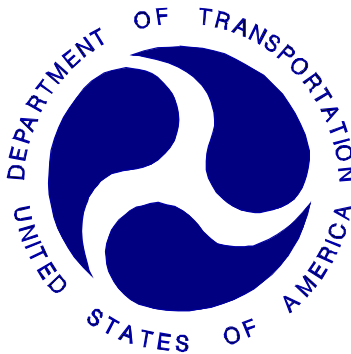
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

TOYOTA MOTOR MANUFACTURING INDIANA, INC.
2002 TOYOTA SEQUOIA
MPV

NHTSA NUMBER: M25109

VERIDIAN TEST NUMBER: 8462-NCAP-03

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
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January 18, 2002

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
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16. Abstract A frontal load cell barrier test of a 2002 Toyota Sequoia MPV was performed at Veridian Engineering crash test facility in Buffalo, New York, on January 18, 2002. The impact velocity was 56.33 kph and the temperature at the barrier face was 20EC. The maximum post-test vehicle crush was 551 mm. The test vehicle was equipped with 3-point restraint systems with torso belt pretensioners and force limiters, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements.					
ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (061)	472.2	44.0	33.3	3418.5	4240.9
Passenger (064)	378.2	43.9	24.4	4579.3	1736.0
17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)				18. Distribution Statement <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 56.33 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 56.33 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-km/h 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, left and right knee sliders, and lower leg instrumentation. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No.064) were used in two tests previous to this test (M25600 and M25110) where they did not exceed FMVSS 208 head, chest and femur injury criteria. 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 143 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 2002 Toyota Sequoia MPV at a velocity of 56.33 kph. The test was performed at Veridian Engineering on January 18, 2002. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The occupant data is summarized below.

	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)	Belt Stretch (mm/m)
Driver ATD	472.2	44.0	33.3	3418.5	4240.9	*	*
Passenger ATD	378.2	43.9	24.4	4579.3	1736.0	*	*

*Not installed due to vehicle being equipped with torso belt pretensioners and force limiters.

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 551 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The 2002 Toyota Sequoia 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.:	<u>M25109</u>	Test Mode:	<u>56.3 kph Frontal Barrier</u>
Test Date:	<u>January 18, 2002</u>	Time:	<u>11:35</u> Temperature: <u>20</u> °C
Vehicle Make/Model/Body Style:	<u>2002 Toyota Sequoia MPV</u>		
Vehicle Test Weight:	<u>2631.5</u>	kg	
Vehicle/Barrier Impact Angle:	<u>0</u>	°	
Impact Velocity:	<u>56.33</u>	kph	
Maximum Static Crush:	<u>551</u>	mm	
Vehicle Rebound:	<u>124</u>	mm	
<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>	
Type:	<u>572E</u>	<u>572E</u>	
Restraint System:	<u>Seatbelt, Airbag, Knee Bolster</u>	<u>Seatbelt, Airbag, Knee Bolster</u>	
Number of Data Channels:	<u>143</u>		
Number of Cameras:	<u>1</u>	Real Time	
	<u>16</u>	High Speed	
<u>DOOR OPENING DATA:</u>	<u>Closed/Operable</u>	- Left Front	
	<u>Closed/Operable</u>	- Right Front	
Front Seat(s) Data:	<u>DRIVER</u>	<u>PASSENGER</u>	
Seat Track Failure: (mm of shift)	<u>0</u>	<u>0</u>	
Seat Back Failure:	<u>None</u>	<u>None</u>	
<u>VISIBLE DUMMY CONTACT POINTS:</u>	<u>DRIVER</u>	<u>PASSENGER</u>	
Head:	<u>The face to the center of the airbag; The back of the head to the left of center of the headrest.</u>	<u>The face to the center of the airbag; The back of the head to the center of the headrest.</u>	
Abdomen:	<u>None</u>	<u>None</u>	
Chest:	<u>Airbag</u>	<u>Airbag</u>	
Knees:	<u>Knee bolster</u>	<u>Knee bolster</u>	

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2002 Toyota Sequoia MPV

NHTSA No. : M25109 ; VIN: 5TDBT44A72S080309 ; Color: Silver

Engine Data: 8 cylinders; - CID; 4.7 Liters; - cc

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

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

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

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

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

Date Received: 1/10/02 ; Odometer Reading 42 km

Selling Dealer: West Herr Toyota

& Address: 4141 Southwestern Boulevard Orchard Park, NY 14127

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Toyota Motor Manufacturing Indiana, Inc.

Date of Manufacture 11/01

GVWR: 2994 kg; GAWR: 1434 kg FRONT; 1769 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: .350 kpa FRONT

350 kpa REAR

Recommended Tire Size: P265/70R16

* Recommended Cold Tire Pressure: 220 kpa FRONT; 220 kpa REAR

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

Vehicle Capacity Data:

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

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

Vehicle Capacity Weight (VCW) = 642.5 kg

No. of Occupants x 68.04 kg = 476.28 kg

Rated Cargo/Luggage Weight (RCLW) = 166.22 kg (136.1 kg maximum)

*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>592.5</u>	kg	Right Rear =	<u>560.0</u>	kg
Left Front =	<u>636.0</u>	kg	Left Rear =	<u>563.0</u>	kg
TOTAL FRONT =	<u>1228.5</u>	kg	TOTAL REAR =	<u>1123.0</u>	kg
TOTAL DELIVERED WEIGHT =	<u>2351.5</u>	kg			
% of Total Front of Vehicle Weight =	<u>52.2%</u>		% of Total Rear Weight =	<u>47.8%</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	<u>2351.5</u>	kg
Rated Cargo/Luggage Weight (RCLW) =	<u>136.1</u>	kg (136.1 kg maximum)
Weight of 2 p.572 Dummies @ 76 each =	<u>152</u>	kg
TARGET TEST WEIGHT =	<u>2639.6</u>	kg

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

Right Front =	<u>631.0</u>	kg	Right Rear =	<u>645.0</u>	kg
Left Front =	<u>683.5</u>	kg	Left Rear =	<u>672.0</u>	kg
TOTAL FRONT =	<u>1314.5</u>	kg	TOTAL REAR =	<u>1317.0</u>	kg
TOTAL TEST WEIGHT =	<u>2631.5</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>118</u>	kg			
Vehicle Components Removed for Weight Reduction:	<u>None</u>				

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>870</u>	LF	<u>865</u>	RR	<u>917</u>	LR	<u>911</u>
FULLY LOADED:	RF	<u>861</u>	LF	<u>856</u>	RR	<u>878</u>	LR	<u>875</u>
AS TESTED:	RF	<u>862</u>	LF	<u>857</u>	RR	<u>895</u>	LR	<u>885</u>
Vehicle's Wheel Base:	<u>3005</u>	mm						
Location of Vehicle's C.G.:	<u>1504</u>	mm rearward of front wheel center.						

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual =	<u>98.4</u>	liters
Usable Capacity Figure Furnished by COTR =	<u>98.4</u>	liters
Test Volume Range (92 to 94% of Usable Capacity) =	<u>90.53</u>	to <u>92.5</u> liters
ACTUAL TEST VOLUME=	<u>90.8</u>	liters (with entire fuel system filled)
Test Fluid Type:	<u>Stoddard Solution</u>	Spec. Grav. = <u>0.764</u>
Kinematic Viscosity =	<u>0.96</u>	centistokes; Color = <u>Orange</u>
Type of Fuel Pump: Electric-	<u>X</u>	Mechanical- <u>-</u>
Does Electric Pump operate with ignition switch "ON" & engine "OFF"	Yes- <u>X</u>	No- <u>-</u>
Details of Fuel System: Tank – left of center ahead of rear axle; lines – inside left frame rail; filler – left side behind rear axle.		

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: January 18, 2002 Time: 11:35 Temperature: 20 °C
Vehicle NHTSA No.: M25109
Required Impact Velocity Range: 55.5 to 57.1 kph

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

Trap No. 1 = 56.33 kph; Trap No. 2 = 56.33 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>5145</u>	C/L = <u>5184</u>	Right = <u>5152</u>
Post-Test	Left = <u>4729</u>	C/L = <u>4665</u>	Right = <u>4601</u>
Crush	Left = <u>416</u>	C/L = <u>519</u>	Right = <u>551</u>
AVERAGE	= <u>495.33</u>	mm	

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

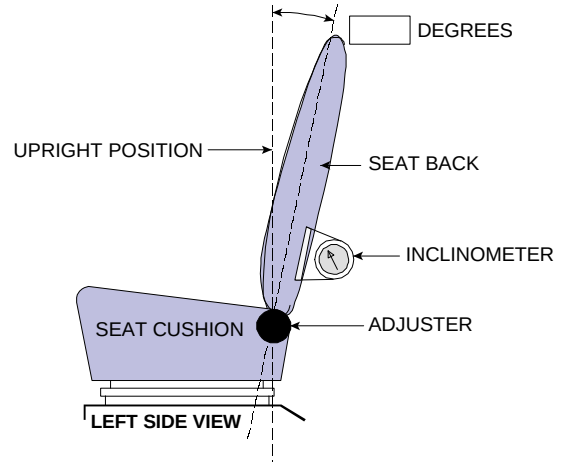
	Left = <u>83</u>	C/L = <u>133</u>	Right = <u>157</u>
AVERAGE	= <u>124</u>	Mm	

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2002 Vehicle Model: Toyota Sequoia 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.



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 5.0°

Measurement instructions: Recline seat ten degrees rearward from most upright position

Seat back angle for passenger's seat: 5.0°

Measurement instructions: Same as the driver's seat

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Seat placed in mid position (105 mm of 210 mm travel)

Positioning of the passenger's seat: Seat placed in mid position (97.5 mm of 195 mm travel)

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 98.4 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 = 98.4 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 90.8 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.

When key is turned to ON position and while 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: Geometric center placed at 25° from sill rocker angle.

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Placed in position 2 of 5 detents with detent 1 being full up.

The diagram illustrates a seated human figure with various measurement points and angles labeled. The labels include:

- SWAE**: Shoulder Width Angle
- HH**: Head Height
- HZ**: Head Z-axis
- HW**: Head Width
- WAE**: Waist Angle
- NAE**: Neck Angle
- NR**: Neck Radius
- CD**: Chest Depth
- CS**: Chest Surface
- ST**: Spine Torque
- SCA**: Shoulder Center Angle
- KD**: Knee Depth
- SK**: Shoulder Kinematics
- SH**: Shoulder Height
- TAE**: Thigh Angle
- PAE**: Pelvis Angle
- SAE**: Spine Angle
- KDAE**: Knee Depth Angle
- Seat Back Angle Line**: The angle between the seat back and the vertical.

-
- The diagram illustrates a human figure with various measurement points and a strike mechanism. A red arrow labeled 'STRIKER' points downwards towards the head. The figure is shown from the back, with a dashed line indicating the head's position. The following points are labeled:
- SH: Shoulder Height
 - SAE: Shoulder Arm Extension
 - HR: Head Radius
 - HS: Head Size
 - AD: Arm Diameter
 - KK: Knee Height
 - HD: Hip Diameter
 - SHY: Shoulder Height
 - AA: Ankle Height

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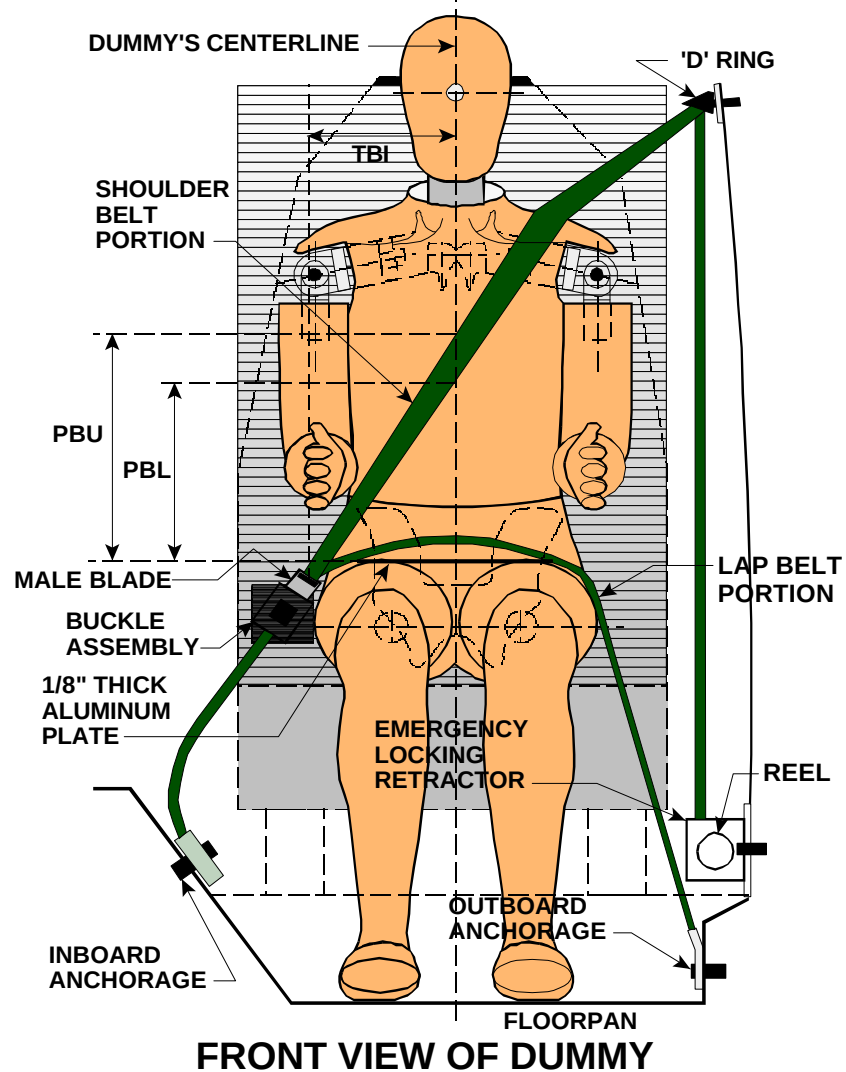
DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ^o	38.7 deg.			N/A		
SWA ^o	65 deg.			N/A		
SCA ^o	25 deg.			N/A		
SA ^o	5.0 deg.			5.0 deg.		
HZ	230			199		
HH	410			390		
HW	621			553		
HR	240			194		
NR	411	Angle	-9 deg.	N/A		
CD	532			524		
CS	297			N/A		
RA	168			N/A		
KDL	180	Angle (KDA)	34 deg.	135		
KDR	172			167	Angle (KDA)	40 deg.
PA ^o	24.9 deg.			23.7 deg.		
TA ^o	45.3 deg.			41.1 deg.		
KK	273			207		
AA	320			233		
ST	517	Angle	14 deg.	525	Angle	12 deg.
SK	690	Angle	96 deg.	680	Angle	95 deg.
SH	330	Angle	120 deg.	315	Angle	129 deg.
SHY	235			225		
HS	334			325		
HD	180			170		
AD	109			114		

Dimensions in millimeters

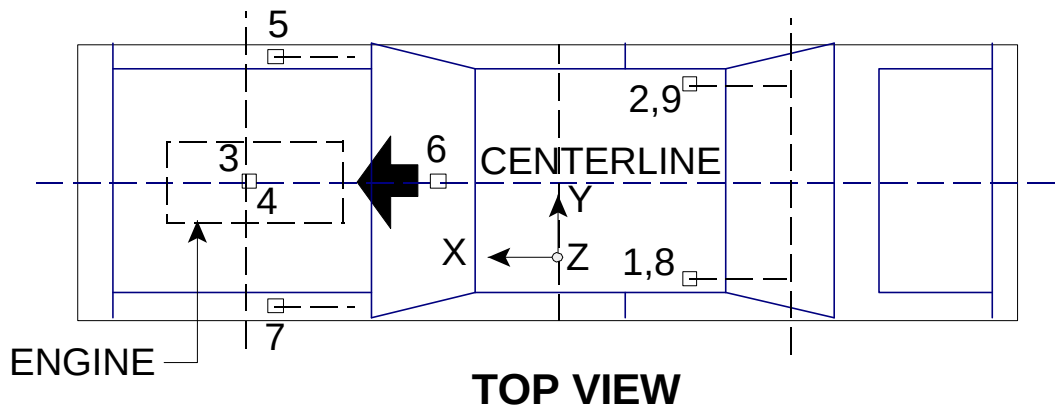
DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

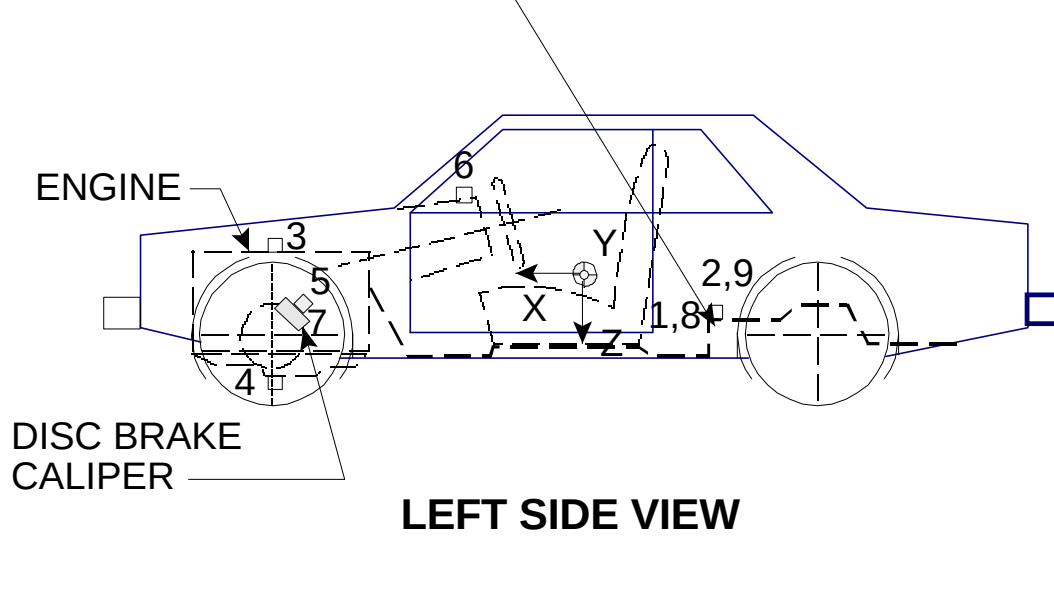


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	340	300
PBL-- Top surface of alum. plate to belt lower edge	260	220
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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	1826	-653	-686
2	Right Rear Seat Cross Member X	1820	644	-722
3	Top of Engine Block	4284	-147	-1080
4	Bottom of Engine	3003	-31	-408
5	Disc Brake Caliper @ Right Side	4134	601	-742
6	Instrument Panel	3466	56	-1040
7	Disc Brake Caliper @Left Side	4141	-577	-736
8	Left Rear Seat Cross Member Z	1826	-653	-686
9	Right Rear Seat Cross Member Z	1820	644	-722

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Left Rear Seat Cross Member X	3.3	128.4	-35.0	42.7
2	Right Rear Seat Cross Member X	2.7	126.3	-35.5	45.4
3	Top of Engine Block	46.0	47.0	-154.8	35.7
4	Bottom of Engine	47.7	45.3	-120.2	36.4
5	Disc Brake Caliper @ Right Side	62.9	30.4	-106.7	38.2
6	Instrument Panel	77.6	31.2	-122.3	35.1
7	Disc Brake Caliper @Left Side	29.5	92.1	-62.7	48.6
8	Left Rear Seat Cross Member Z	6.1	37.6	-8.6	62.4
9	Right Rear Seat Cross Member Z	10.6	32.9	-7.4	79.0

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2002 Toyota Sequoia MPV

NHTSA Test No.: M25109 Test Date: January 18, 2002

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head 9 Array X Arm Y	g	6.1	85.2	-20.0	69.3	2.3	46.0	-18.4	74.1
Head 9 Array X Arm Z	g	34.3	47.7	-8.4	141.3	28.8	63.3	-8.1	91.1
Head 9 Array Y Arm X	g	20.3	236.1	-52.0	80.0	6.5	267.1	-68.5	77.2
Head 9 Array Y Arm Z	g	29.7	47.7	-3.1	140.3	27.4	63.1	-5.8	94.3
Head 9 Array Z Arm X	g	30.7	234.3	-57.4	78.3	11.9	262.4	-56.4	82.1
Head 9 Array Z Arm Y	g	8.7	138.7	-10.8	80.2	4.2	52.3	-12.4	66.0
Head X	g	20.1	234.6	-53.0	78.6	6.5	261.9	-58.9	77.9
Head Y	g	5.9	139.3	-14.5	69.1	2.8	37.3	-12.8	95.2
Head Z	g	29.7	47.7	-1.4	139.4	25.8	47.4	-3.6	113.4
Head Resultant	g	56.2	78.6	0.0	-44.1	61.7	77.2	0.0	-48.5
Redundant Head X	g	20.3	234.7	-53.1	78.1	6.5	261.9	-59.2	77.5
Redundant Head Y	g	5.7	143.7	-14.9	69.1	2.7	37.3	-14.5	92.8
Redundant Head Z	g	30.0	47.7	-1.7	133.1	25.8	47.4	-3.5	113.0
Redundant Head Resultant	g	55.9	78.6	0.0	-40.6	62.1	77.2	0.0	-49.4
Upper Neck Fx	N	296.9	77.5	-660.7	133.4	247.6	89.2	-441.9	143.4
Upper Neck Fy	N	258.3	141.6	-227.5	76.0	331.8	84.1	-247.5	138.2
Upper Neck Fz	N	1618.2	71.3	-419.1	270.7	1217.2	74.5	-203.8	299.7
Upper Neck F Resultant	N	1627.5	71.3	0.9	-25.9	1226.1	74.5	1.9	-48.6
Upper Neck Mx	N-m	14.6	144.5	-8.4	96.3	20.7	94.8	-19.2	129.5
Upper Neck My	N-m	49.6	136.2	-28.6	92.8	34.8	141.7	-21.2	77.9
Upper Neck Mz	N-m	4.5	74.3	-6.4	96.9	29.2	103.1	-12.6	153.0
Upper Neck M Resultant	N-m	51.6	136.2	0.1	-31.4	39.0	141.6	0.1	-48.0
Chest X	g	2.9	147.5	-47.4	85.7	1.8	158.3	-44.6	70.9
Chest Y	g	11.4	83.6	-7.6	45.0	7.6	51.9	-10.6	87.8
Chest Z	g	20.4	49.1	-11.3	105.7	17.3	46.5	-9.6	113.4
Chest Resultant	g	48.3	85.7	0.0	-45.5	45.2	70.8	0.0	-50.0

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

Vehicle Year/Make/Model/Body Style: 2002 Toyota Sequoia MPV

NHTSA Test No.: M25109 Test Date: January 18, 2002

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Redundant Chest X	g	3.1	147.5	-47.6	85.7	1.8	158.0	-44.9	70.9
Redundant Chest Y	g	11.5	83.6	-7.9	45.0	7.4	52.0	-10.9	87.8
Redundant Chest Z	g	19.6	49.1	-11.2	105.8	17.1	46.6	-9.6	113.6
Redundant Chest Resultant	g	48.6	85.7	0.0	-45.3	45.4	70.8	0.0	-50.0
Chest Displacement	mm	0.0	5.9	-33.3	91.1	0.0	-24.0	-24.4	84.5
Pelvic X	g	6.4	118.4	-72.3	45.4	10.8	95.3	-69.6	51.3
Pelvic Y	g	14.6	47.9	-45.1	45.4	16.7	45.6	-11.7	96.5
Pelvic Z	g	17.1	45.3	-24.3	66.0	15.2	45.5	-28.2	73.1
Pelvic Resultant	g	86.7	45.4	0.0	-47.0	71.1	51.3	0.0	-50.0
Left Femur	N	1258.5	48.8	-3418.5	54.8	1668.6	45.7	-4579.3	59.2
Right Femur	N	1995.6	49.4	-4240.9	45.4	1220.2	50.1	-1736.0	64.3
Left Knee Slider Dx	mm	0.1	107.2	-0.1	170.8	1.7	82.6	0.0	-44.5
Right Knee Slider Dx	mm	0.6	88.1	0.0	-45.2	0.3	65.6	-0.4	79.5
Left Upper Tibia Mx	N-m	18.9	54.3	-34.5	41.3	26.9	81.3	-52.6	53.7
Left Upper Tibia My	N-m	25.9	117.9	-94.3	40.7	50.8	107.3	-349.1	44.9
Left Lower Tibia Fz	N	156.0	60.0	-2412.0	40.6	203.6	136.9	-5674.5	44.0
Left Lower Tibia Mx	N-m	76.3	76.7	-26.5	41.7	19.3	88.4	-35.9	45.2
Left Lower Tibia My	N-m	26.7	84.0	-31.2	71.9	35.8	97.4	-183.2	45.3
Right Upper Tibia Mx	N-m	180.1	45.0	-176.3	47.7	28.2	77.5	-9.7	137.3
Right Upper Tibia My	N-m	37.0	119.0	-383.4	45.3	32.8	122.9	-113.2	48.0
Right Lower Tibia Fz	N	522.5	52.8	-14564.4	45.7	79.7	133.1	-1344.0	47.7
Right Lower Tibia Mx	N-m	**	**	**	**	10.1	56.7	-7.6	109.7
Right Lower Tibia My	N-m	123.2	45.8	-105.3	42.9	23.6	85.9	-73.0	47.9
Left Foot Aft Ax	g	14.3	53.4	-74.3	38.3	50.8	52.4	-325.0	44.1
Left Foot Aft Az	g	6.5	46.3	-77.5	41.3	35.3	40.8	-67.8	45.5
Left Foot Fore Az	g	52.6	122.0	-97.1	40.5	125.1	40.9	-423.9	43.6
Right Foot Aft Ax	g	24.6	56.6	-345.3	43.8	24.3	55.2	-131.5	46.1
Right Foot Aft Az	g	46.0	55.6	-424.4	43.8	3.7	252.6	-60.7	52.7
Right Foot Fore Az	g	418.6	45.0	-666.3	42.5	21.6	61.7	-72.0	45.0

** Data is clipped

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

Vehicle Year/Make/Model/Body Style: 2002 Toyota Sequoia MPV

NHTSA Test No.: M25109 Test Date: January 18, 2002

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	472.2	63.1	95.3	46.4
Position #2 - Passenger	378.2	65.8	91.8	46.2

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

CLIP SUMMARY*				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	44.0	84.1	87.1	439.3
Position #2 - Passenger	43.9	69.6	72.6	420.0

* 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: 2002 Toyota Sequoia MPV

NHTSA Test No.: M25109 Test Date: January 18, 2002

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	469.6	63.1	95.2	46.4
Position #2 - Passenger	399.1	65.7	93.7	45.9

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

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	44.2	84.1	87.1	441.3
Position #2 - Passenger	44.0	69.4	72.4	424.8

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

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

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

Driver

Passenger

2080

2080

Shoulder belt length as measured
on Part 572 Dummy.

930

930

Lap belt length as measured
on Part 572 Dummy.

900

900

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.

178

203

SHOULDER BELT RETRACTION DATA:

As determined by film analysis.

76

76

Dimensions in millimeters

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

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

Windshield is bonded in place and covered with a 15 mm molding.

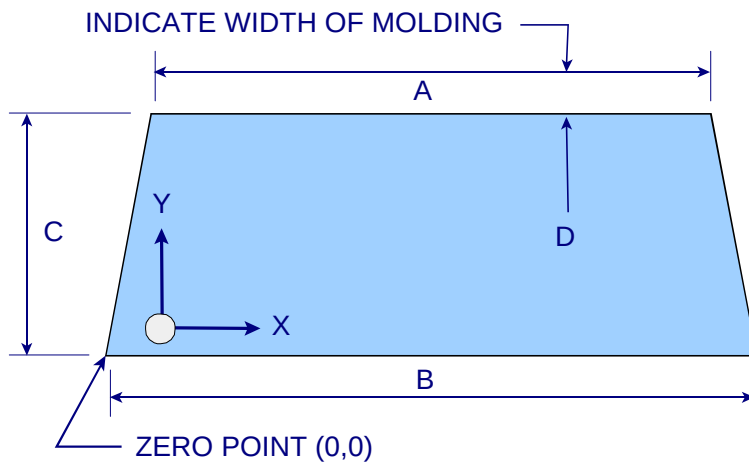
FMVSS 212 REQUIREMENTS:

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	2120	2120	100.0%
LEFT SIDE	2120	2120	100.0%
TOTAL	4240	4240	100.0%

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1330
B	1540
C	685
D	15

FRONT VIEW OF WINDSHIELD

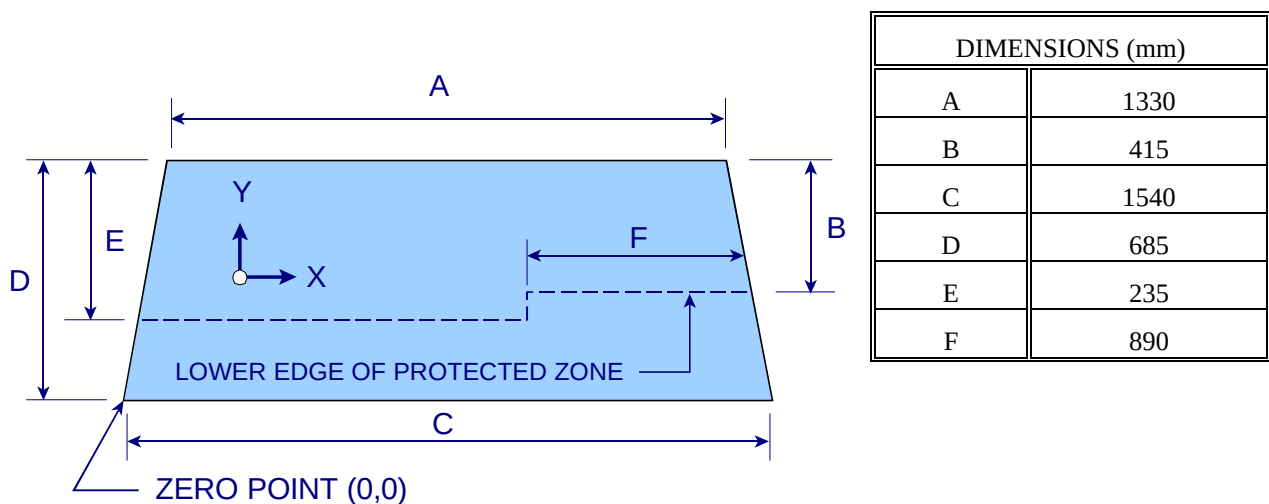
FAILURE DETAILS: None

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

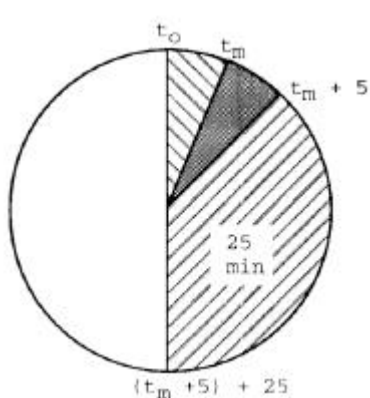
NHTSA TEST No.: M25109 TEST DATE: January 18, 2002
VEHICLE MAKE/MODEL: 2002 Toyota Sequoia MPV

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

=====

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

FUEL SPILLAGE MEASUREMENT:



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

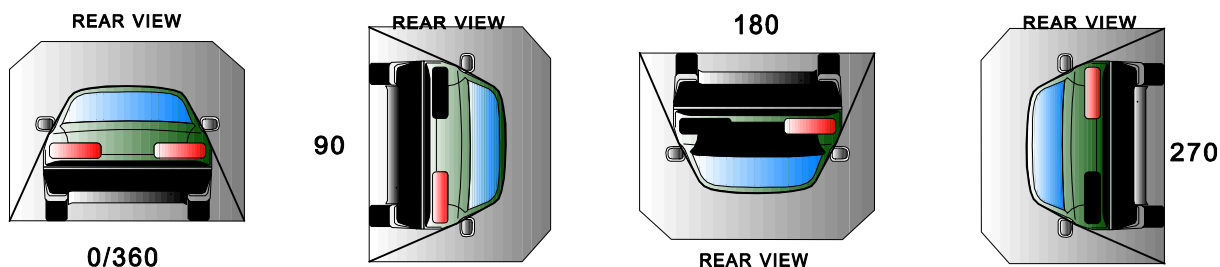
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2002 Toyota Sequoia MPV

NHTSA No.: M25109



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	
0° - 90°	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes
90° - 180°	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes
180°-270°	1	minutes	05	seconds	5	minutes	6	minutes	5	seconds	7	minutes
270°-360°	1	minutes	10	seconds	5	minutes	6	minutes	10	seconds	7	minutes

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

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

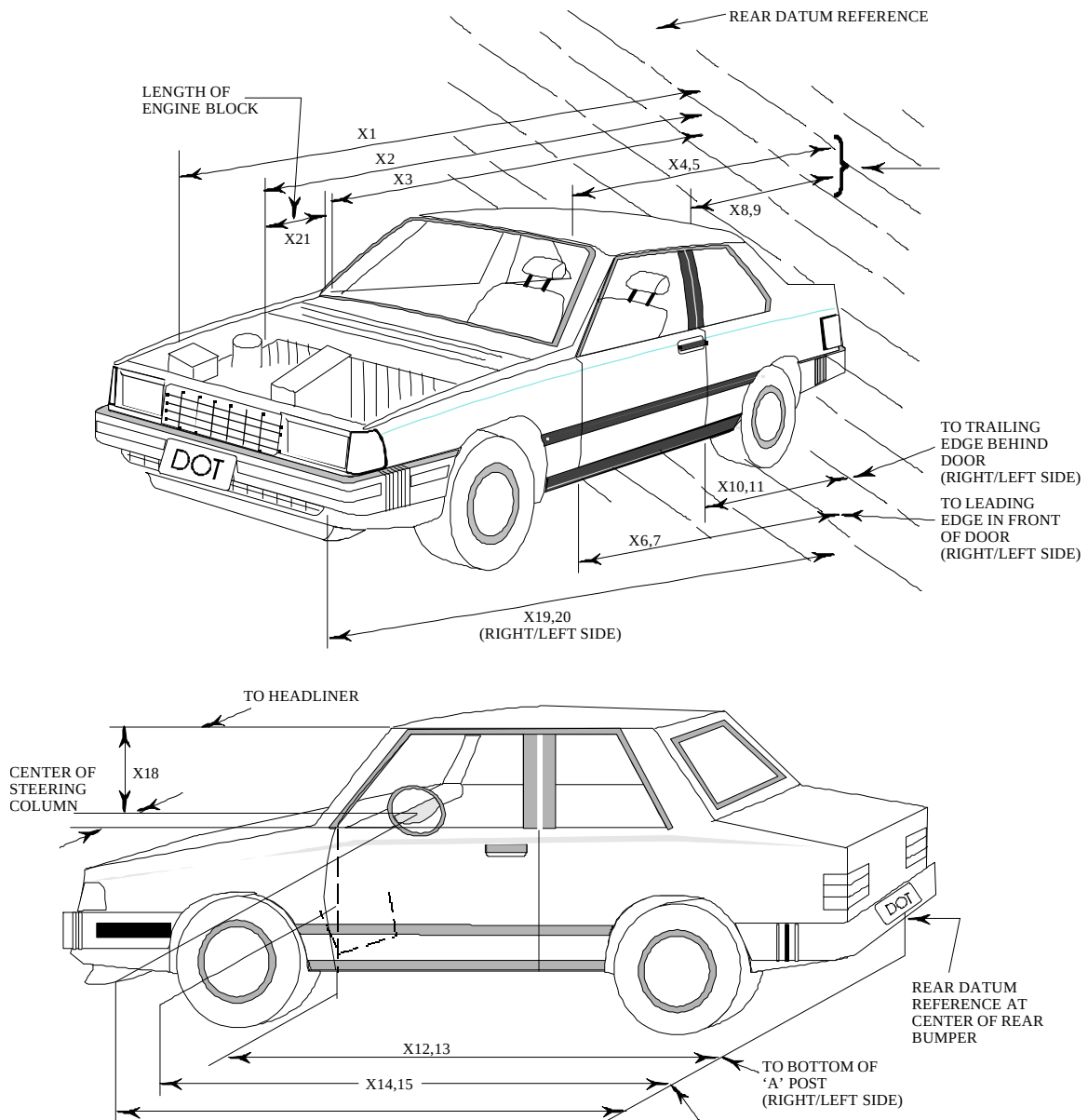
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

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

DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS

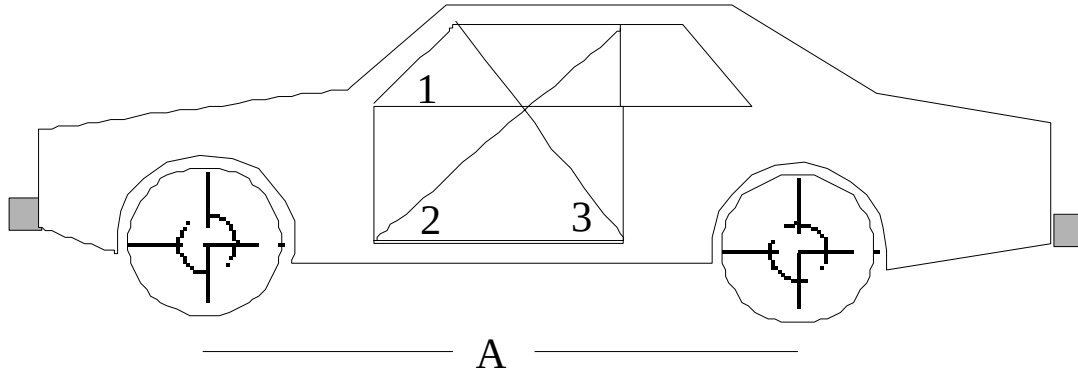


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	5184	4665	519
X2	Rear Surface of Vehicle to Front of Engine	4552	4303	249
X3	Rear Surface of Vehicle to Firewall	3954	3969	-15
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3666	3648	18
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3671	3655	16
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3679	3681	-2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3687	3678	9
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2586	2579	7
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2590	2579	11
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2584	2587	-3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2588	2594	-6
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3703	3703	0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3711	3700	11
X14	Rear Surface of Vehicle to Firewall, Right Side	3956	3926	30
X15	Rear Surface of Vehicle to Firewall, Left Side	3951	3971	-20
X16	Rear Surface of Vehicle to Steering Column	3253	3230	23
X17	Center of Steering Column to "A" Post	275	232	43
X18	Center of Steering Column to Headliner	475	425	50
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5152	4601	551
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5145	4729	416
X21	Length of Engine Block	475	477	-2
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3453	3437	16
CD	Rear Surface of Vehicle to Center of Dash Panel	3473	3461	12
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3465	3446	19

All Dimensions in mm

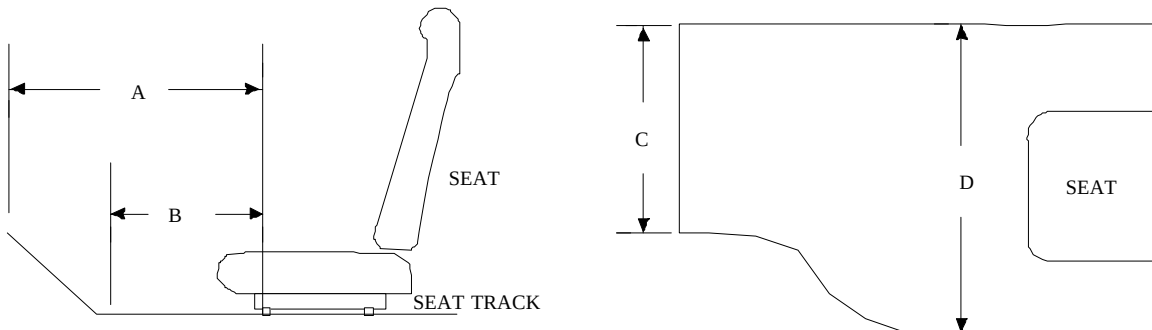
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1003	1623	1191	1015	1628	1194
AFTER TEST	995	1607	1199	995	1611	1194
DIFFERENCE	8	16	-8	20	17	0

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	3005	3005
AFTER TEST	2959	2957
DIFFERENCE	46	48

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



DRIVER

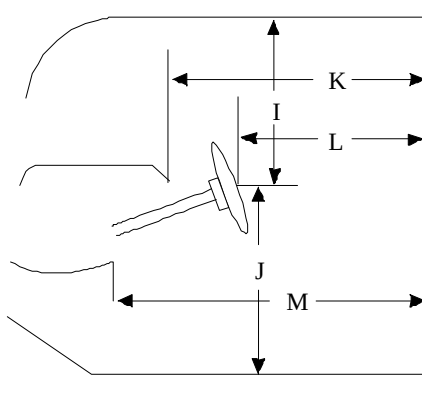
Measurement	Pre-Test	Post-Test	Difference
A	745	647	98
B	626	569	57
C	476	431	45
D	522	535	-13

PASSENGER

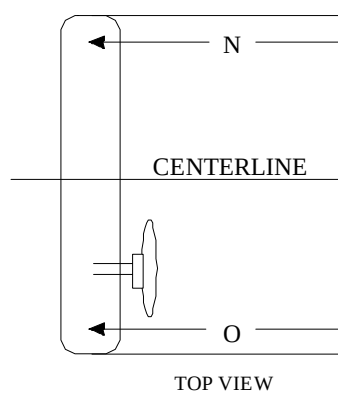
Measurement	Pre-Test	Post-Test	Difference
A	705	610	95
B	578	548	30
C	492	463	29
D	518	530	-12

Units = mm

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

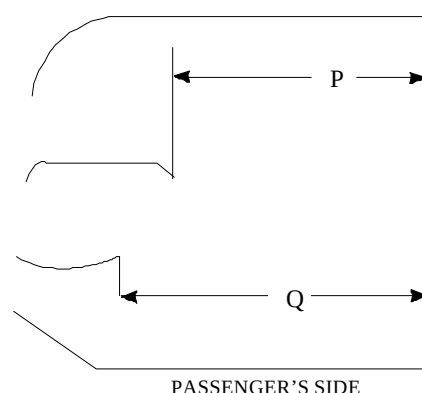


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE

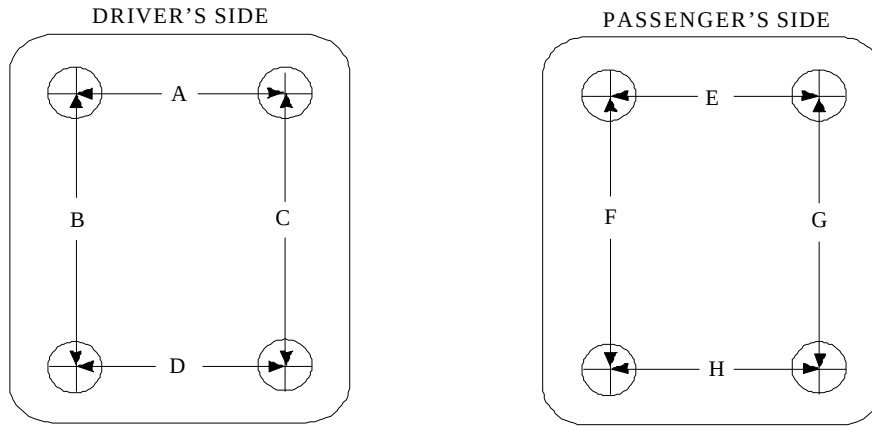


PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	475	425	50
J	661	702	-41
K	1965	1959	6
L	1744	1732	12
M	1995	1988	7
N	1956	1939	17
O	1957	1948	9
P = K (PASS.)	2010	1972	38
Q = M (PASS.)	1994	1972	22

Units = mm

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

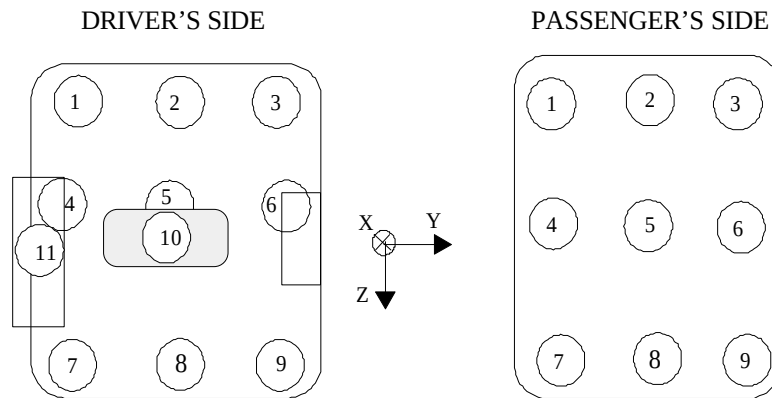


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	476	431	45
B	397	362	35
C	365	335	30
D	522	535	-13
E	492	463	29
F	463	470	-7
G	402	382	20
H	518	530	-12

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	3949	3901	48	-785	-823	38
2	3953	3844	109	-774	-831	57
3	3936	3806	130	-777	-824	47
4	3903	3868	35	-699	-731	32
5	3906	3791	115	-696	-744	48
6	3903	3771	132	-687	-733	46
7	3834	3813	21	-615	-650	35
8	3833	3766	67	-609	-660	51
9	3827	3727	100	-605	-656	51
10	3771	3707	64	-770	-774	4
11	3835	3809	26	-720	-755	35

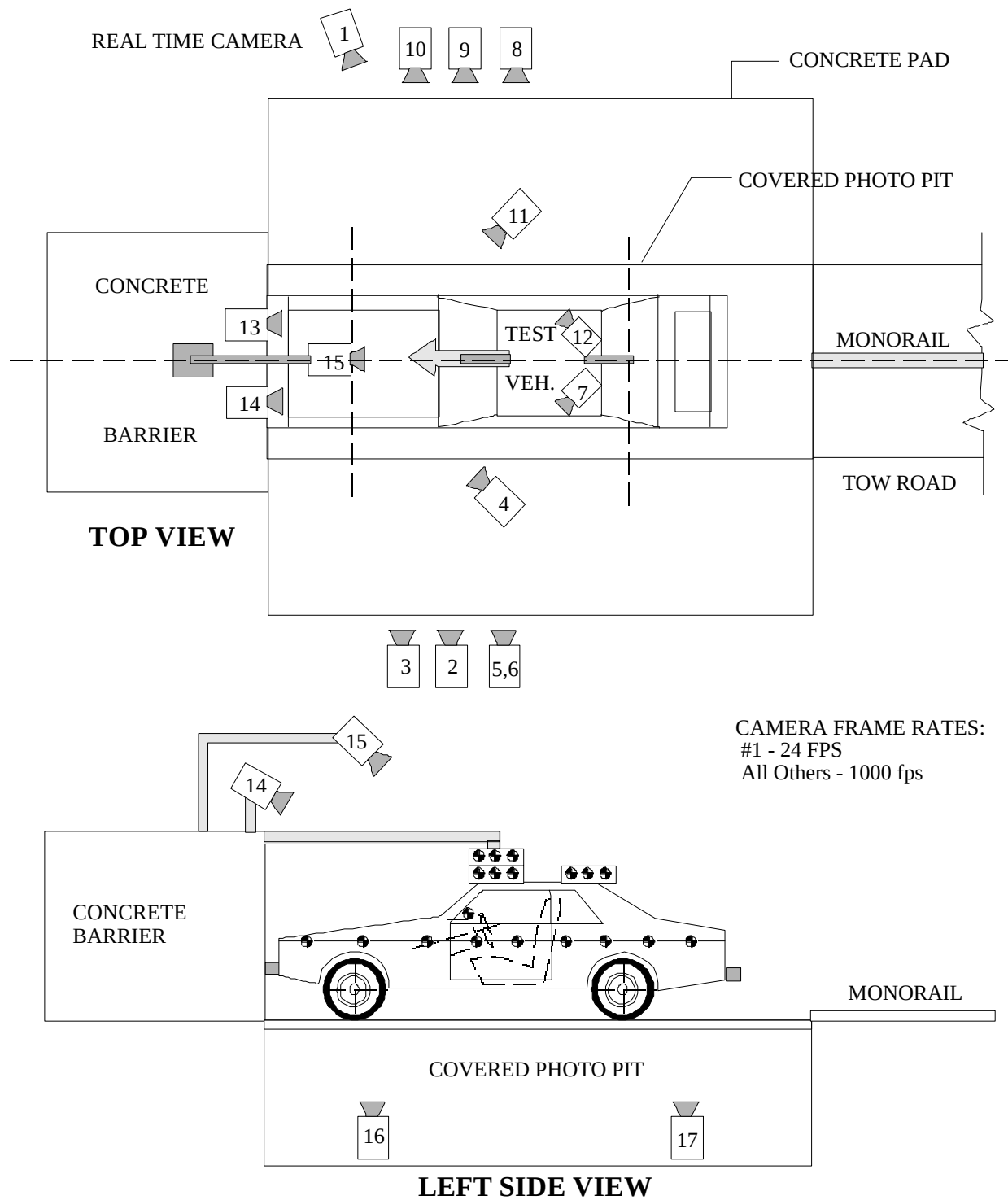
Passenger Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3909	3759	150	-756	-800	44
2	3928	3830	98	-756	-790	34
3	3919	3867	52	-765	-774	9
4	3863	3753	110	-680	-721	41
5	3864	3791	73	-679	-710	31
6	3853	3834	19	-683	-690	7
7	3806	3716	90	-623	-658	35
8	3801	3768	33	-618	-644	26
9	3806	3797	9	-623	-630	7

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

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

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



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

NHTSA Test No.: M25109 Vehicle: 2002 Toyota Sequoia 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	7150	1720	1178	0	6877	12.5	1020
3	Left Side View	8049	815	1220	-2	7776	25	1000
4	Driver and Interior View	8364	1175	1995	-7	-	25	1040
5	Steering Column (Bottom)	8764	895	1177	-2	8491	25	1015
6	Steering Column (Top)	8764	895	1777	-6	8491	25	1010
7	Left Belt	-	-	-	-	-	13	1005
8	Overall Right Side	7620	2143	1226	-2	7971	12.5	1000
9	Right Side View	8729	1284	1259	-2	9080	25	980
10	Right Passenger View	8468	1952	1468	-2	8819	35	1005
11	Passenger and Interior View	8264	2951	1981	-6	-	25	1005
12	Right Belt	-	-	-	-	-	13	1010
13	Passenger Front View	620	-92	1987	-32	-	13	1000
14	Driver Front View	620	-92	1987	-28	-	13	1015
15	Windshield View	0	-530	3374	-61	-	13	1005
16	Pit View of Engine	0	615	-3048	90	-	13	1020
17	Pit View of Fuel Tank	0	2435	-3048	90	-	13	1050

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

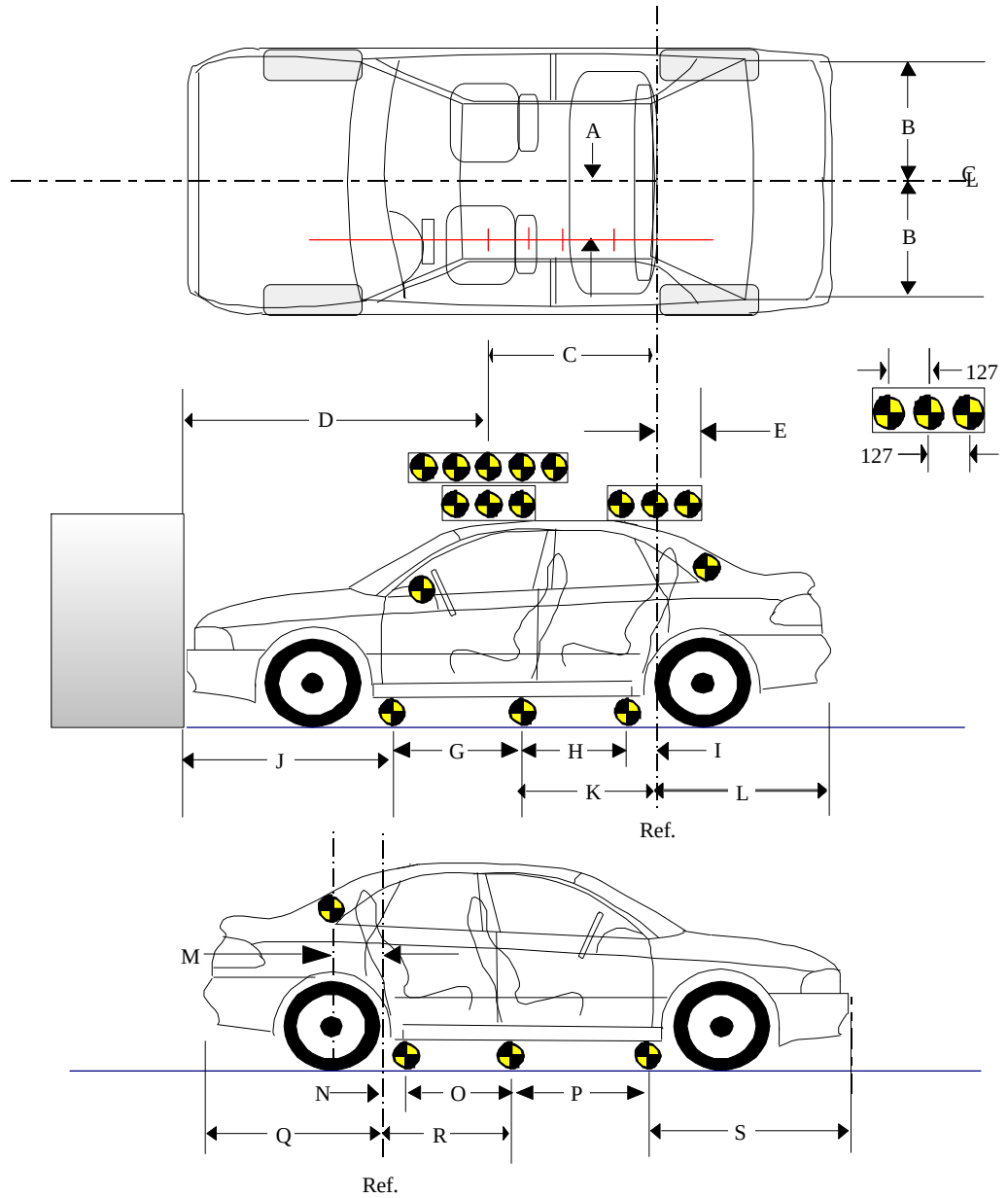
Y = film plane to impact location N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

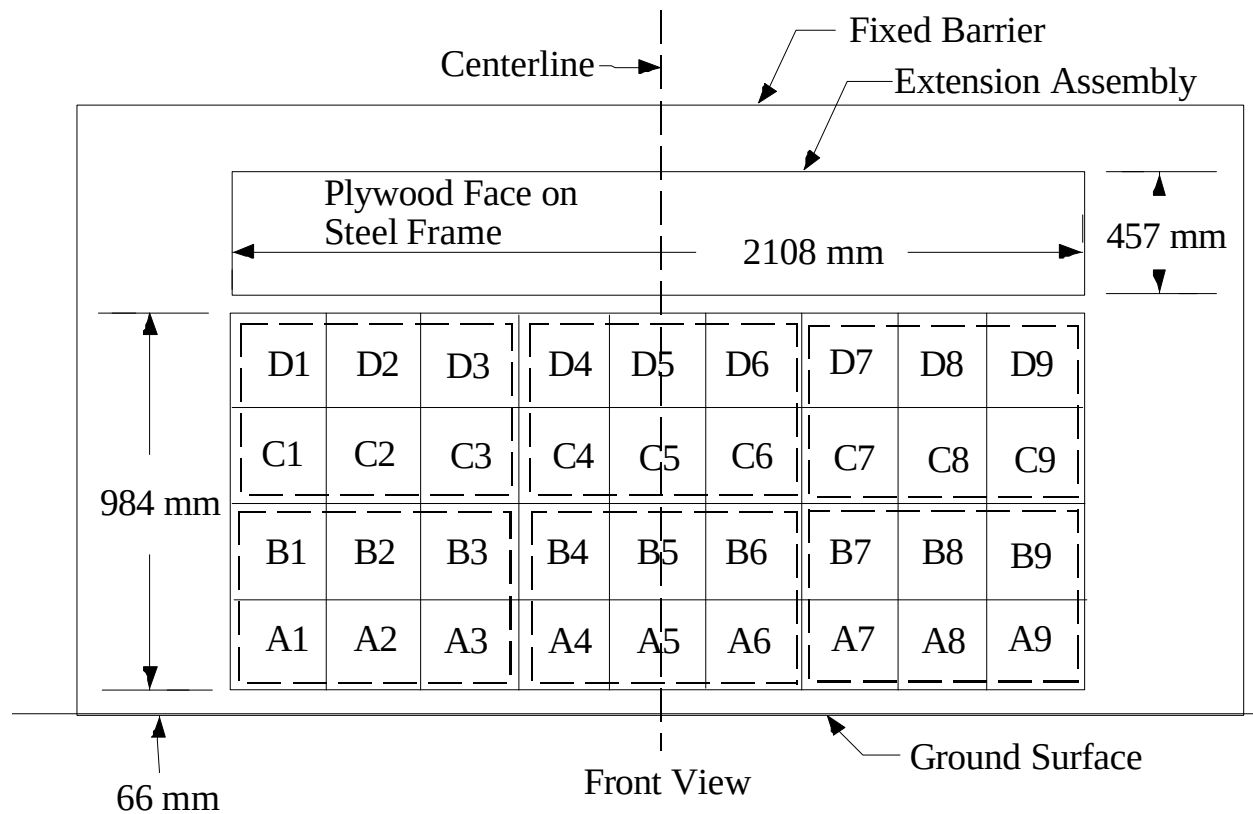
(Dimensions in millimeters)

A	427
B	624
C	1218
D	2230
E	524
F	1699
G	1013
H	990
I	135
J	1434
K	1125
L	1613
M	521
N	146
O	992
P	997
Q	1618
R	1138
S	1432



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.: M25109; Test Date: January 18, 2002; Technician: Patrick MacDiarmid

Vehicle Model Year/Make/Model: 2002 Toyota Sequoia MPV

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

B. Size of vent holes: (mm²) 1257 -Driver 2827 -Passenger

C. Total vent area: (mm²) 2514 -Driver 5654 -Passenger

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

Driver: 650 -Height; 650 -Width; 300 -Depth

Passenger: 650 -Height; 700 -Width; 600 -Depth

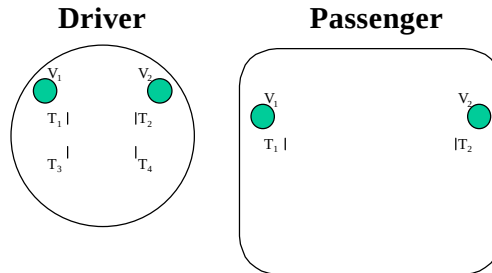
E. Is the air bag tethered?

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

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

Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

(Note: Not to scale; V_n = Vent hole_n, T_n = Tether_n).



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

Driver: Air bag: 45165-0C021 0007376E540 B411E0483

Generator: TAT MXY 1N CBF

Passenger: Air bag: 0005778 G29

Generator: F22 316 2G4 001 L46

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

Vehicle Make/Model/Body Style: Toyota Sequoia MPV

NHTSA Test No.: M25109 VIN: 5TDBT44A72S080309

Model Year: 2002 Build Date: 11/01 Test Date: January 18, 2002

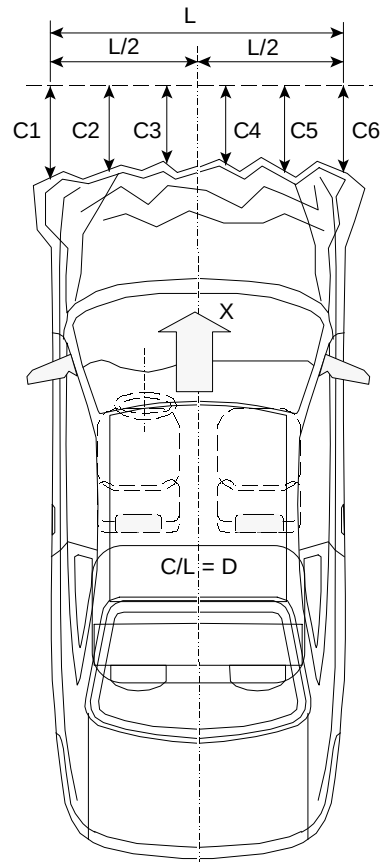
Vehicle Size Category: MPV Test Weight: 2631.5 kg

Vehicle Wheelbase: 3005 mm; Front Overhang: 942 mm; Overall Width: 1940 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4991	4650	341
C2 =	5134	4727	407
C3 =	5184	4692	492
C4 =	5184	4664	520
C5 =	5147	4608	539
C6 =	5002	4607	395



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region:

L1=	<u>1668</u>	mm
L2=	<u>834</u>	mm
L5=	<u>333.6</u>	mm

APPENDIX A
PHOTOGRAPHS

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A-6	PRE-TEST RIGHT SIDE VIEW	A-8
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Figure A-1 LOAD CELL LOCATIONS



Figure A-2 PRE-TEST FRONT VIEW



Figure A-3 POST-TEST FRONT VIEW



Figure A-4 PRE-TEST LEFT SIDE VIEW



Figure A-5 POST-TEST LEFT SIDE VIEW



Figure A-6 PRE-TEST RIGHT SIDE VIEW



Figure A-7 POST-TEST RIGHT SIDE VIEW



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



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



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



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



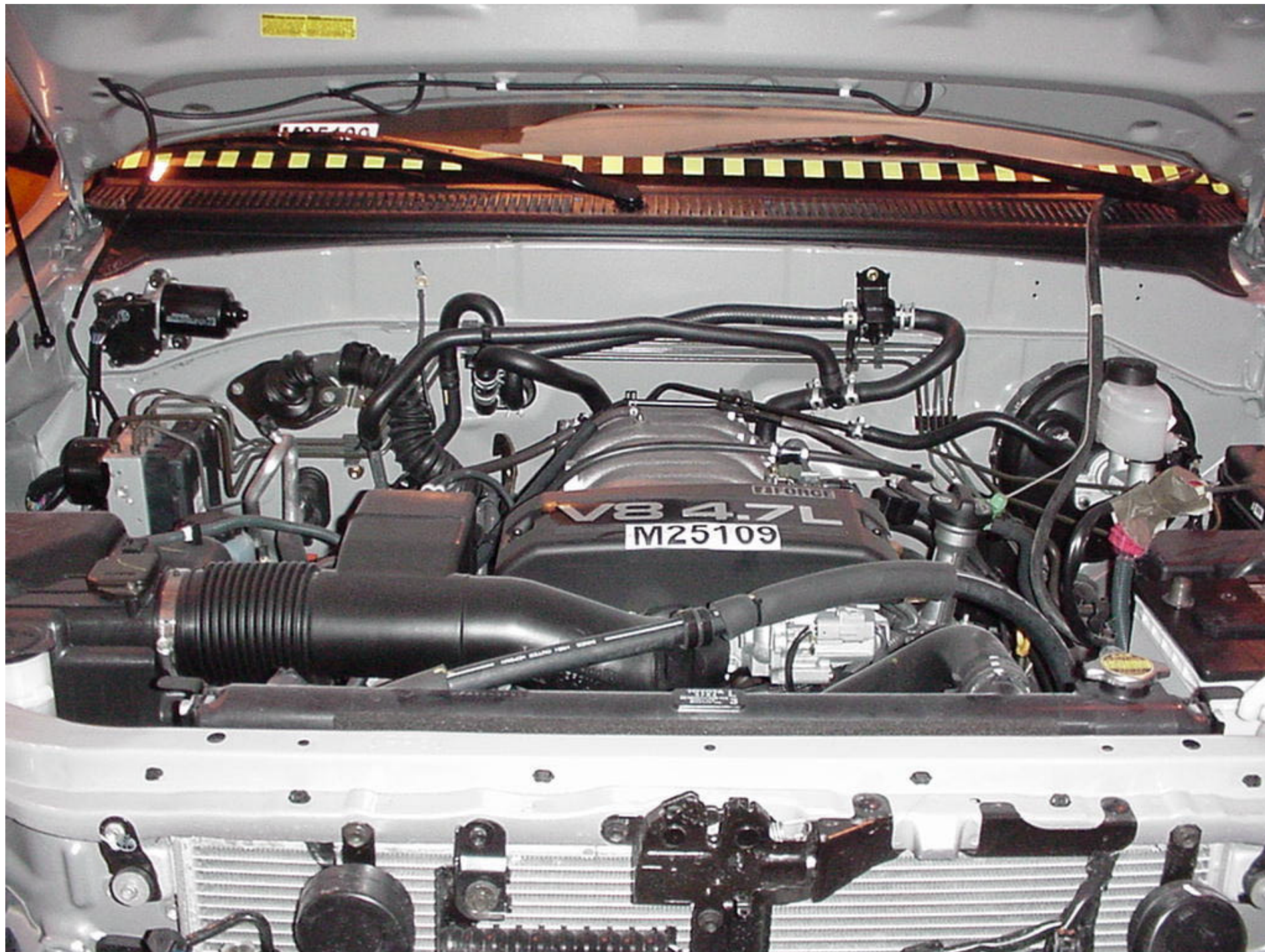
Figure A-12 PRE-TEST WINDSHIELD VIEW



A-15

8462-NCAP-03

Figure A-13 POST-TEST WINDSHIELD VIEW



A-16

8462-NCAP-03

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

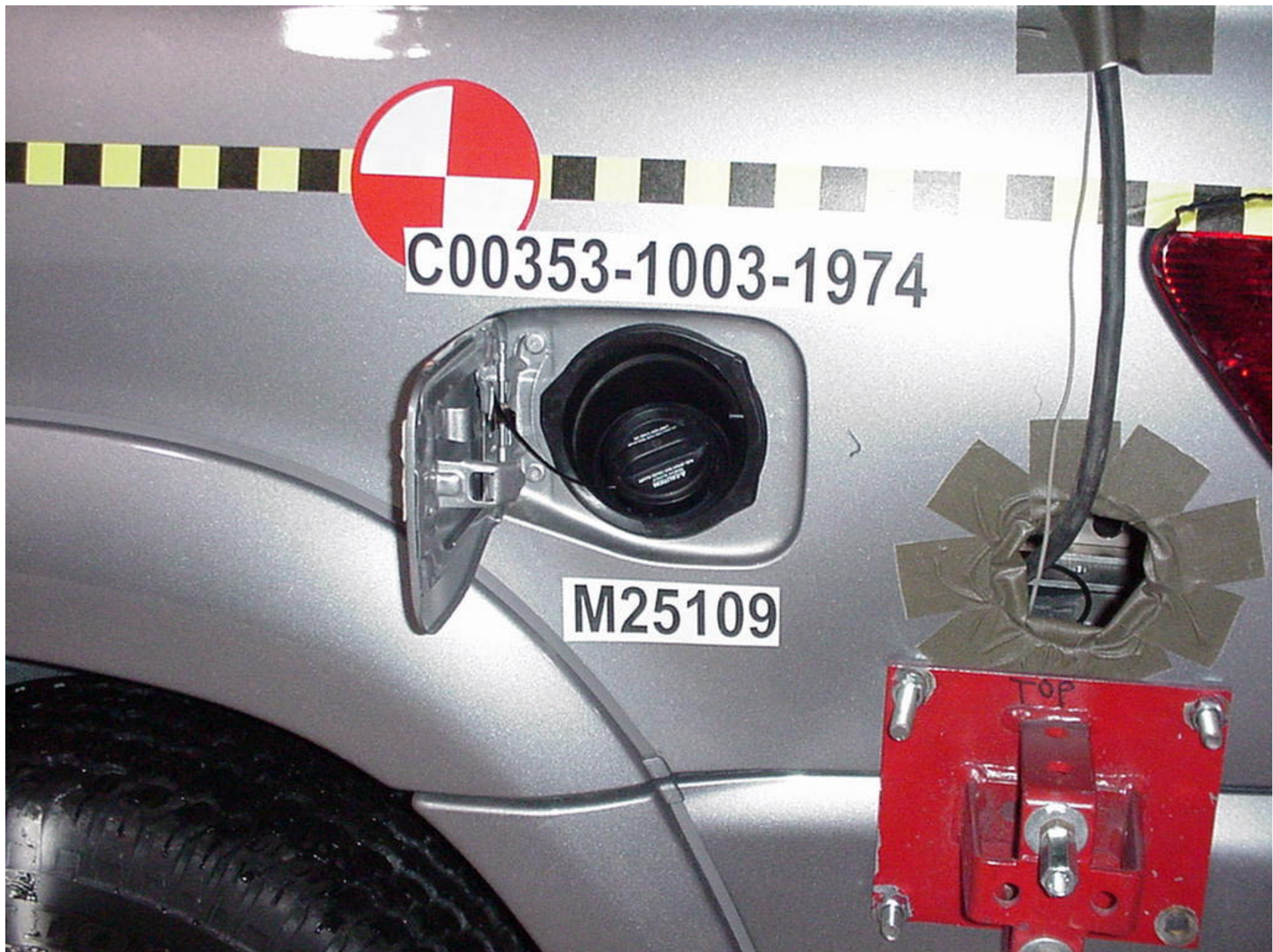


Figure A-15 FUEL CAP VIEW



Figure A-16 PRE-TEST FRONT UNDERBODY VIEW



Figure A-17 POST-TEST FRONT UNDERBODY VIEW



Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW



Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

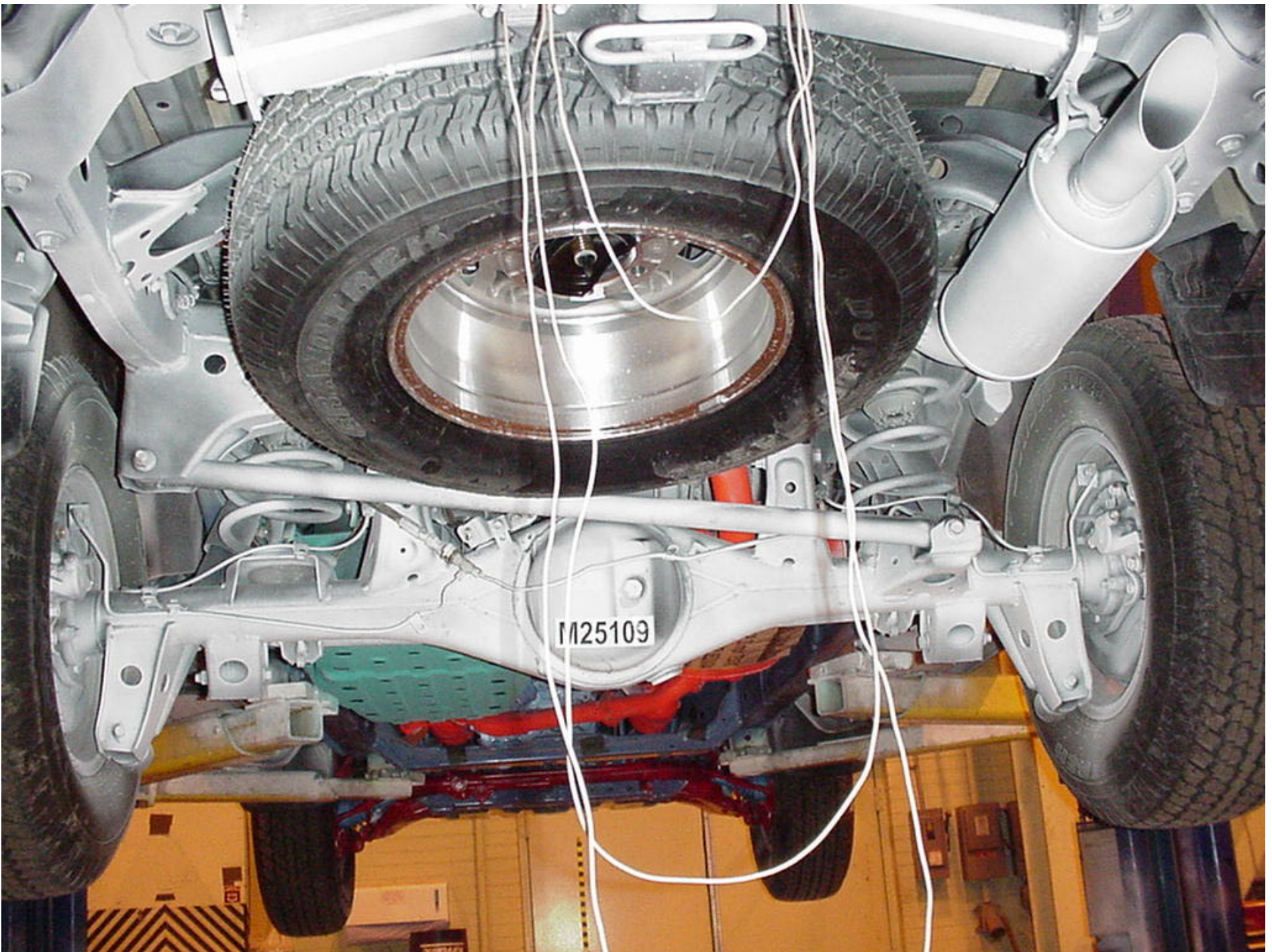


Figure A-20 PRE-TEST REAR UNDERBODY VIEW



Figure A-21 POST-TEST REAR UNDERBODY VIEW



Figure A-22 PRE-TEST DRIVER POSITION VIEW



Figure A-23 POST-TEST DRIVER POSITION VIEW



Figure A-24 PRE-TEST PASSENGER POSITION VIEW



Figure A-25 POST-TEST PASSENGER POSITION VIEW



Figure A-26 PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-27 POST-TEST DRIVER AND INTERIOR VIEW



Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW



Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW



Figure A-30 PRE-TEST DRIVER HEAD LOCATION



Figure A-31 POST-TEST DRIVER HEAD LOCATION



Figure A-32 PRE-TEST PASSENGER HEAD LOCATION



Figure A-33 POST-TEST PASSENGER HEAD LOCATION



Figure A-34 PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-35 POST-TEST DRIVER FLOOR PAN VIEW



Figure A-36 PRE-TEST PASSENGER FLOOR PAN VIEW



Figure A-37 POST-TEST PASSENGER FLOOR PAN VIEW



Figure A-38 ROLLOVER VIEW



Figure A-39 IMPACT VIEW

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

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

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

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO.

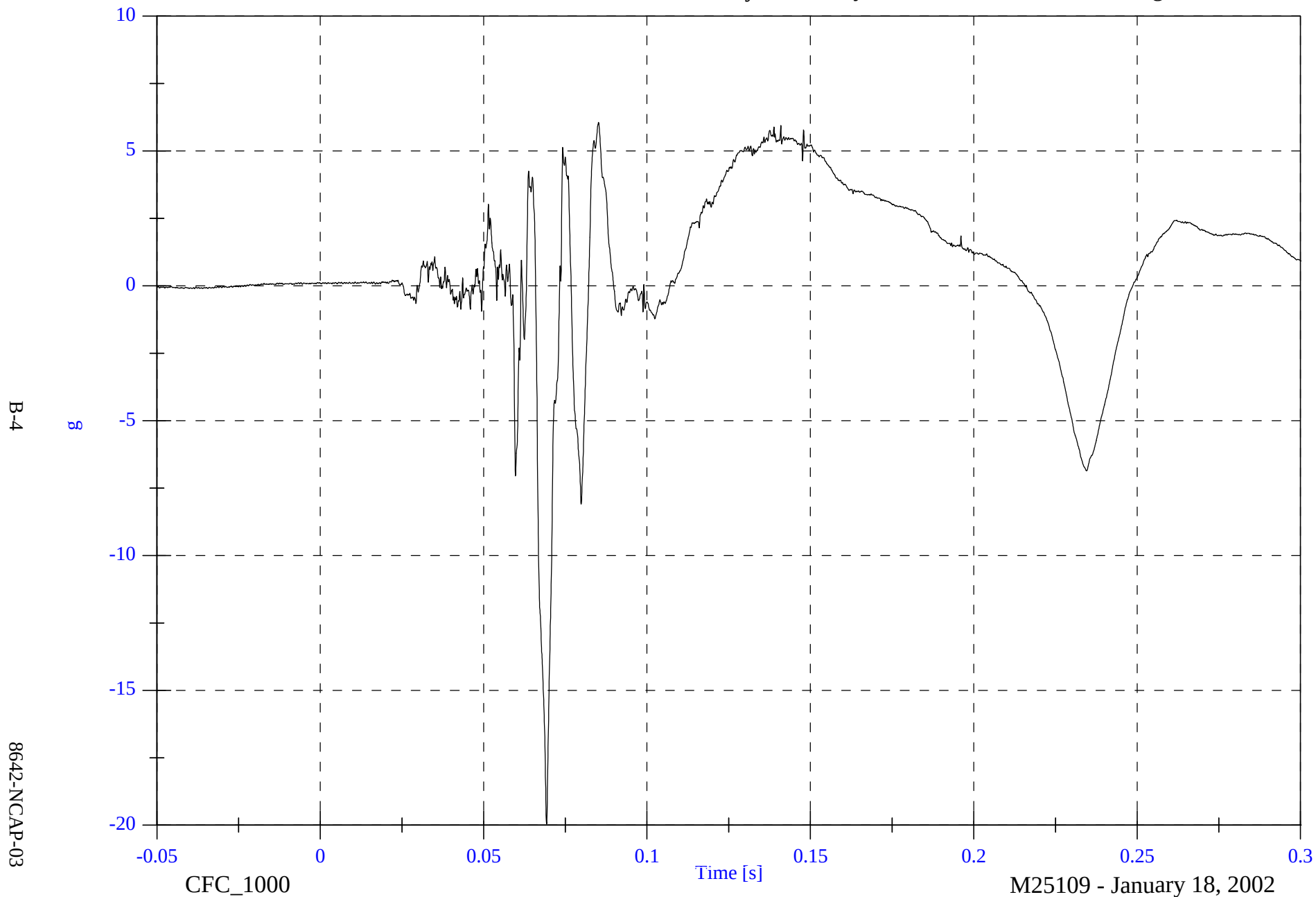
DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	60
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle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

2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head 9 Array X Arm Ay

Max: 6.1 [g] at 0.085 [s]

Min: -20.0 [g] at 0.069 [s]

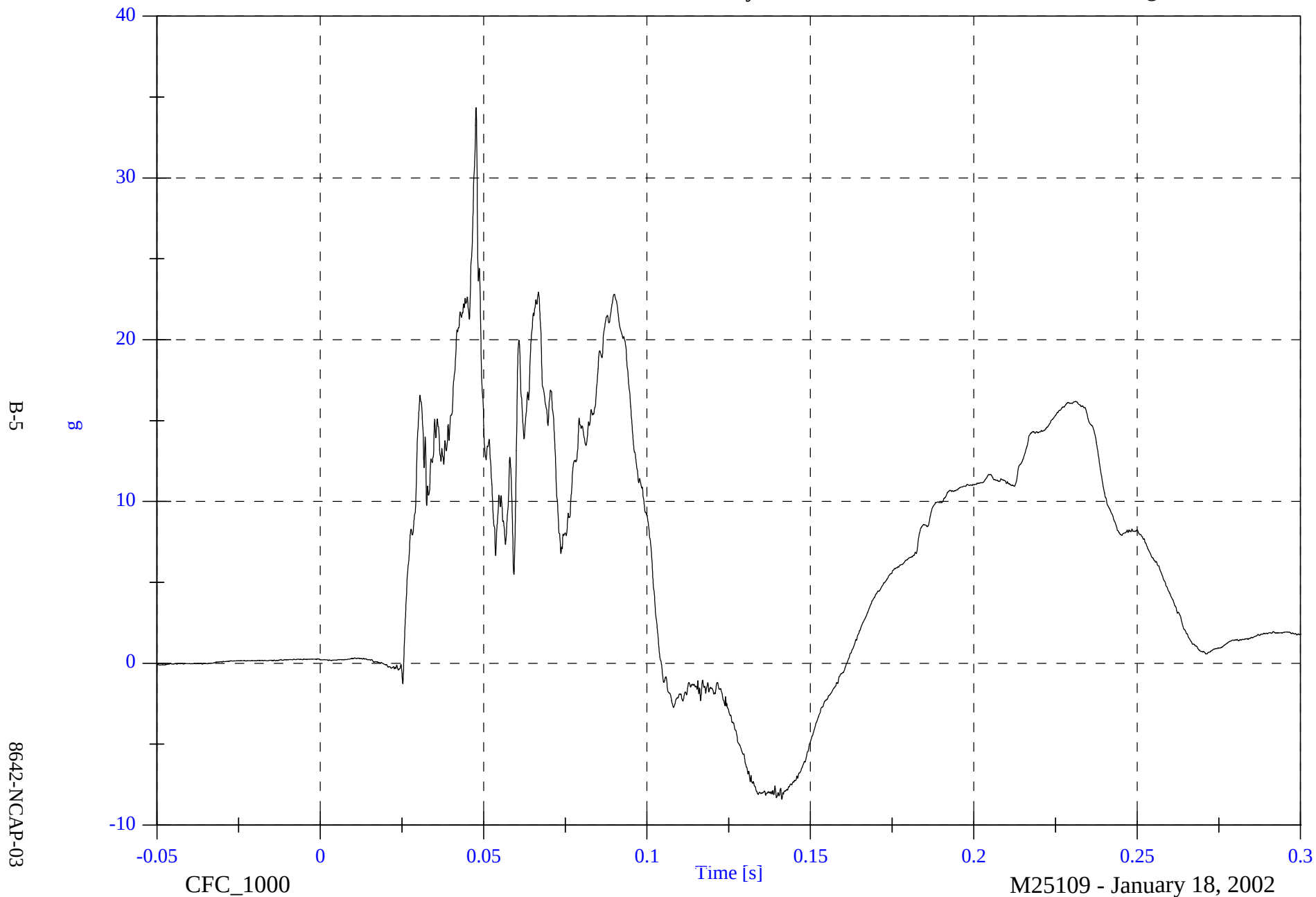


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head 9 Array X Arm Az

Max: 34.3 [g] at 0.048 [s]

Min: -8.4 [g] at 0.141 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

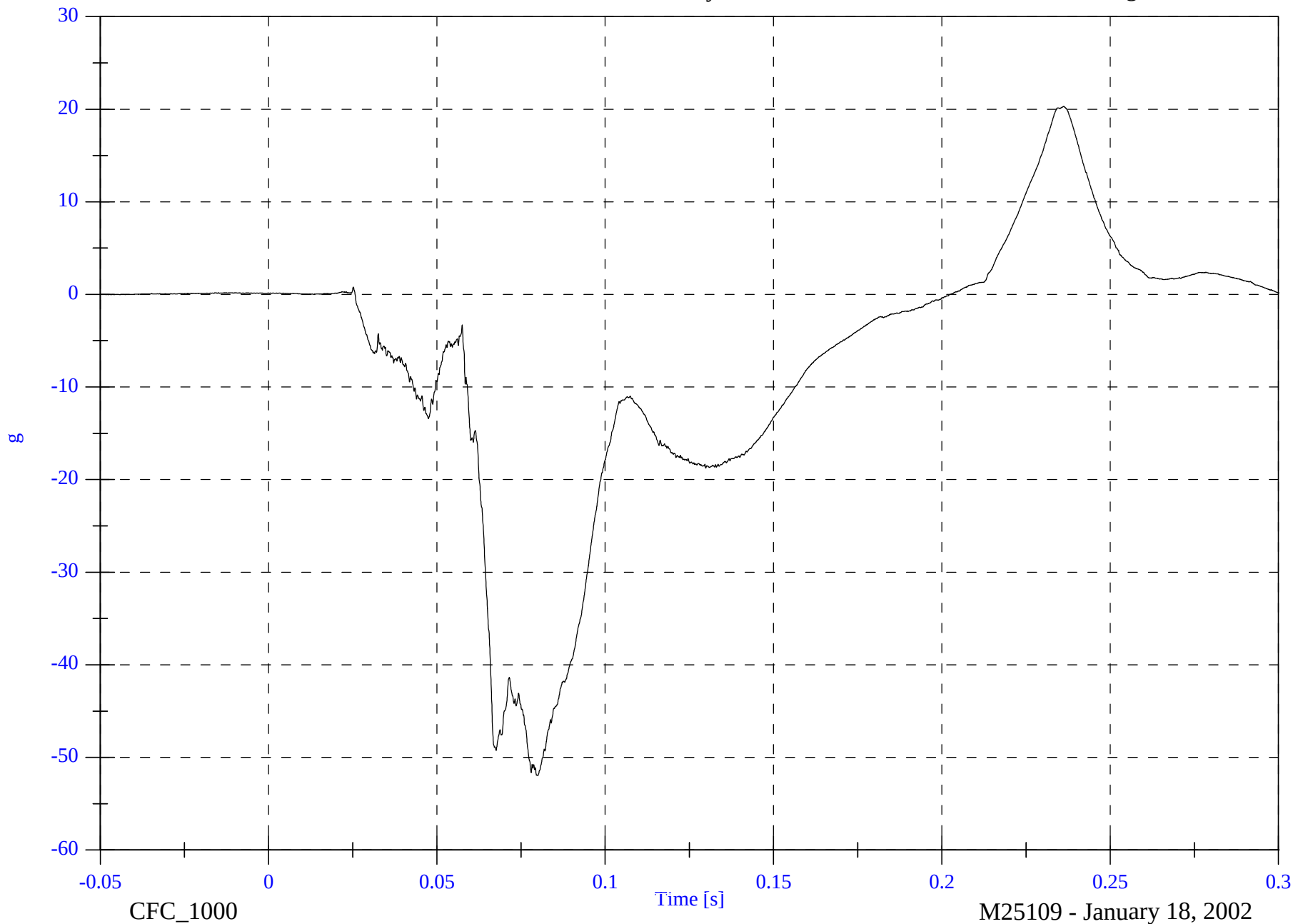
P1 Head 9 Array Y Arm Ax

Max: 20.3 [g] at 0.236 [s]

Min: -52.0 [g] at 0.080 [s]

B-6

8642-NCAP-03

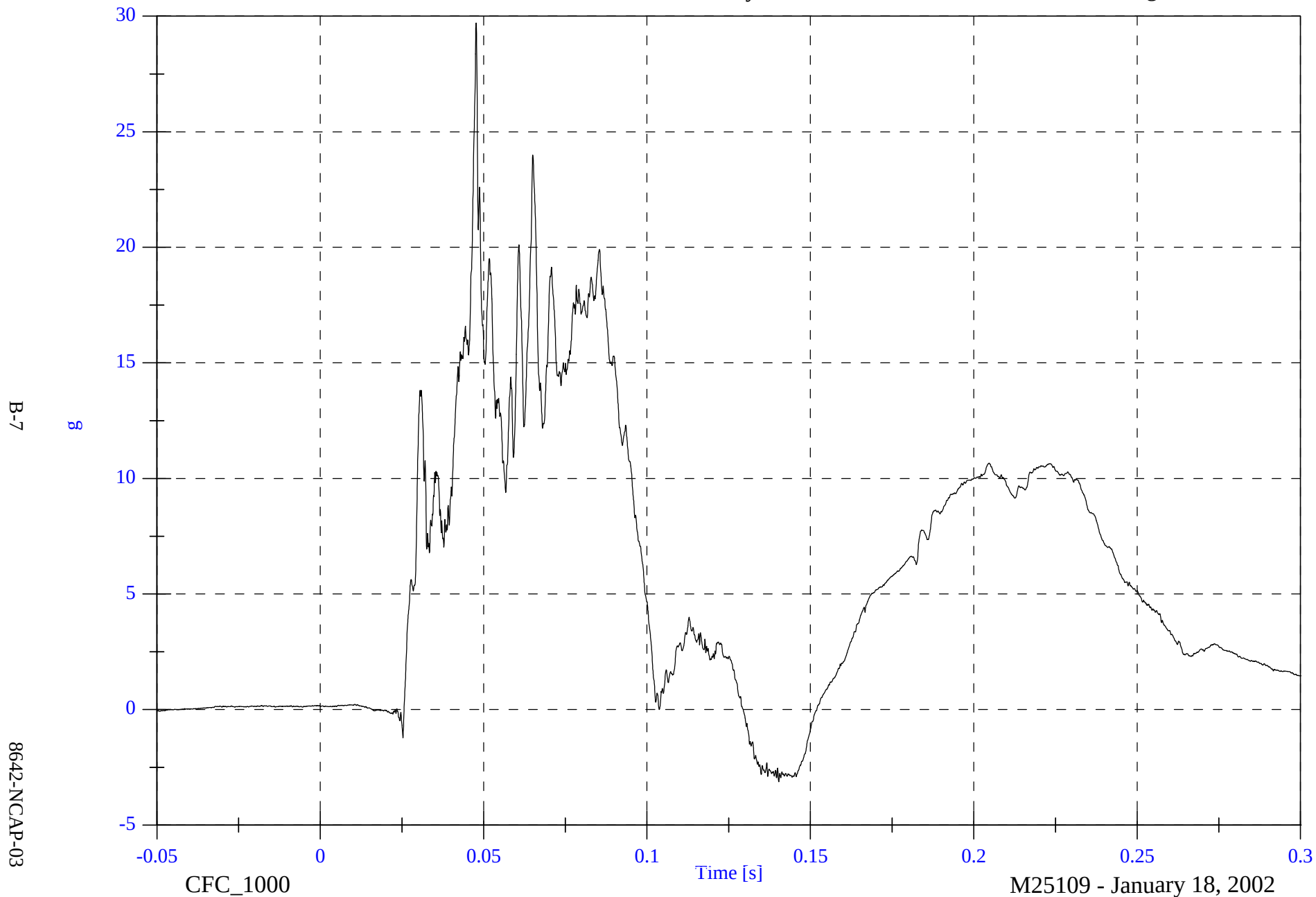


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head 9 Array Y Arm Az

Max: 29.7 [g] at 0.048 [s]

Min: -3.1 [g] at 0.140 [s]

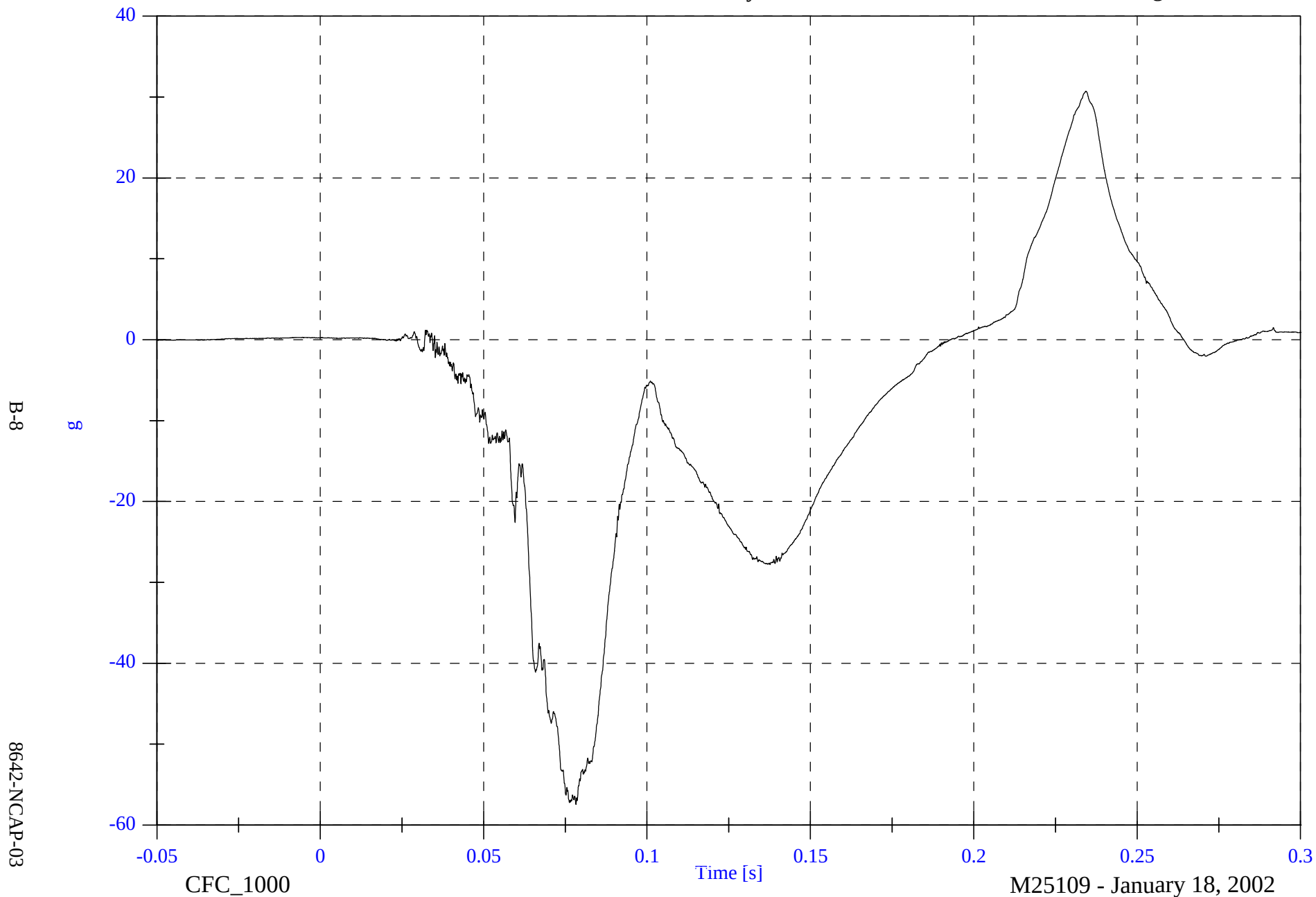


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head 9 Array Z Arm Ax

Max: 30.7 [g] at 0.234 [s]

Min: -57.4 [g] at 0.078 [s]

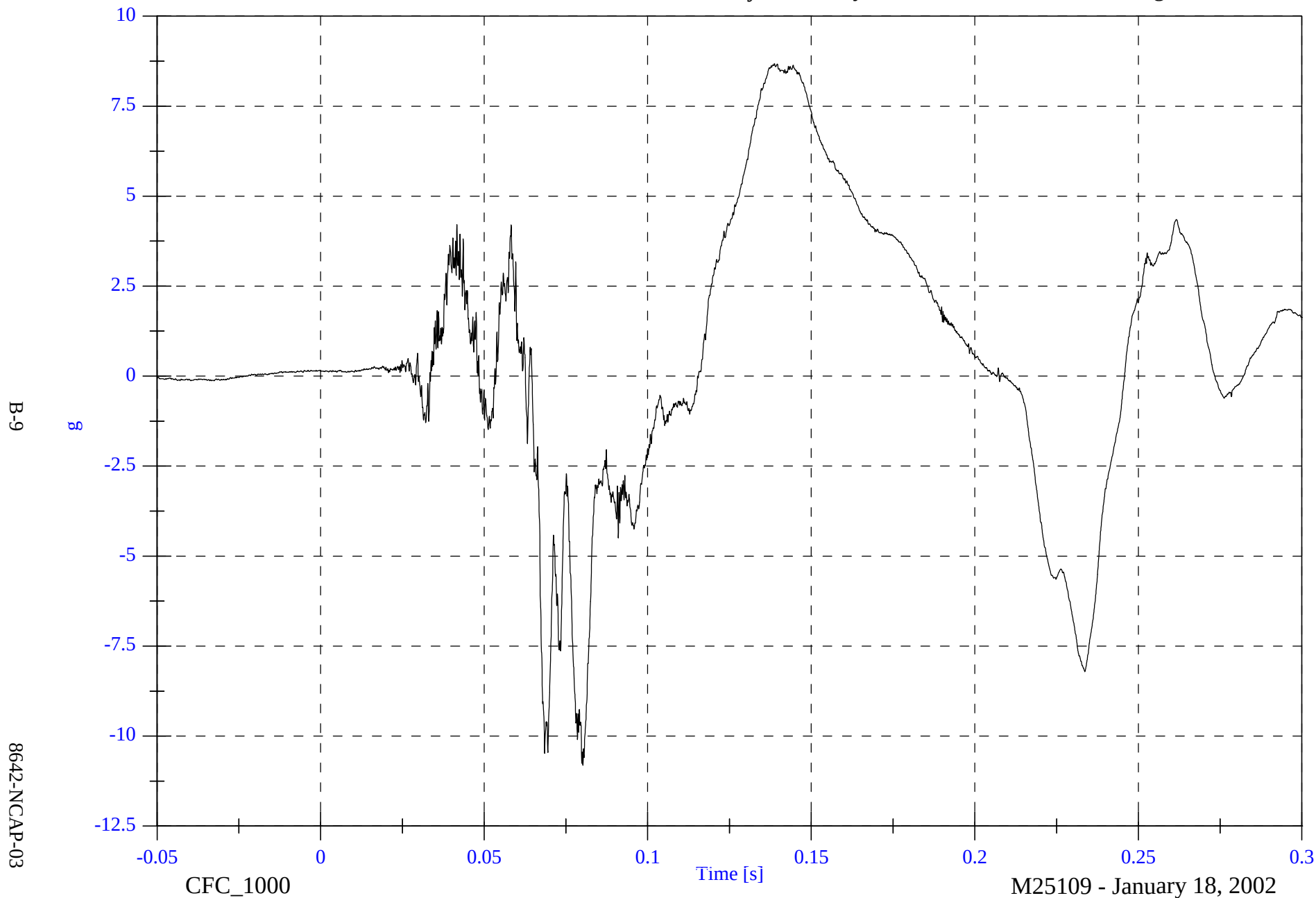


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head 9 Array Z Arm Ay

Max: 8.7 [g] at 0.139 [s]

Min: -10.8 [g] at 0.080 [s]

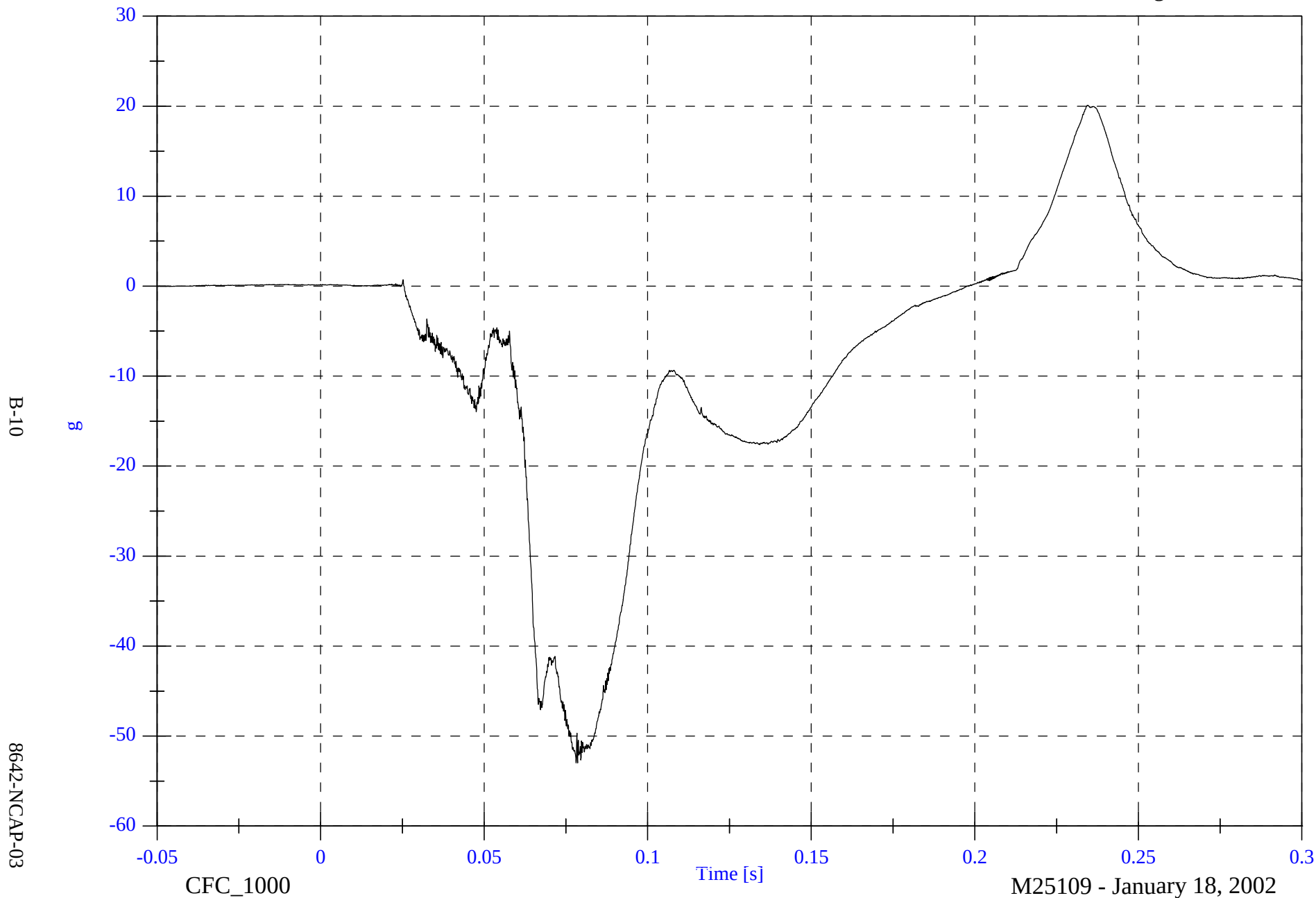


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head CG x

Max: 20.1 [g] at 0.235 [s]

Min: -53.0 [g] at 0.079 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

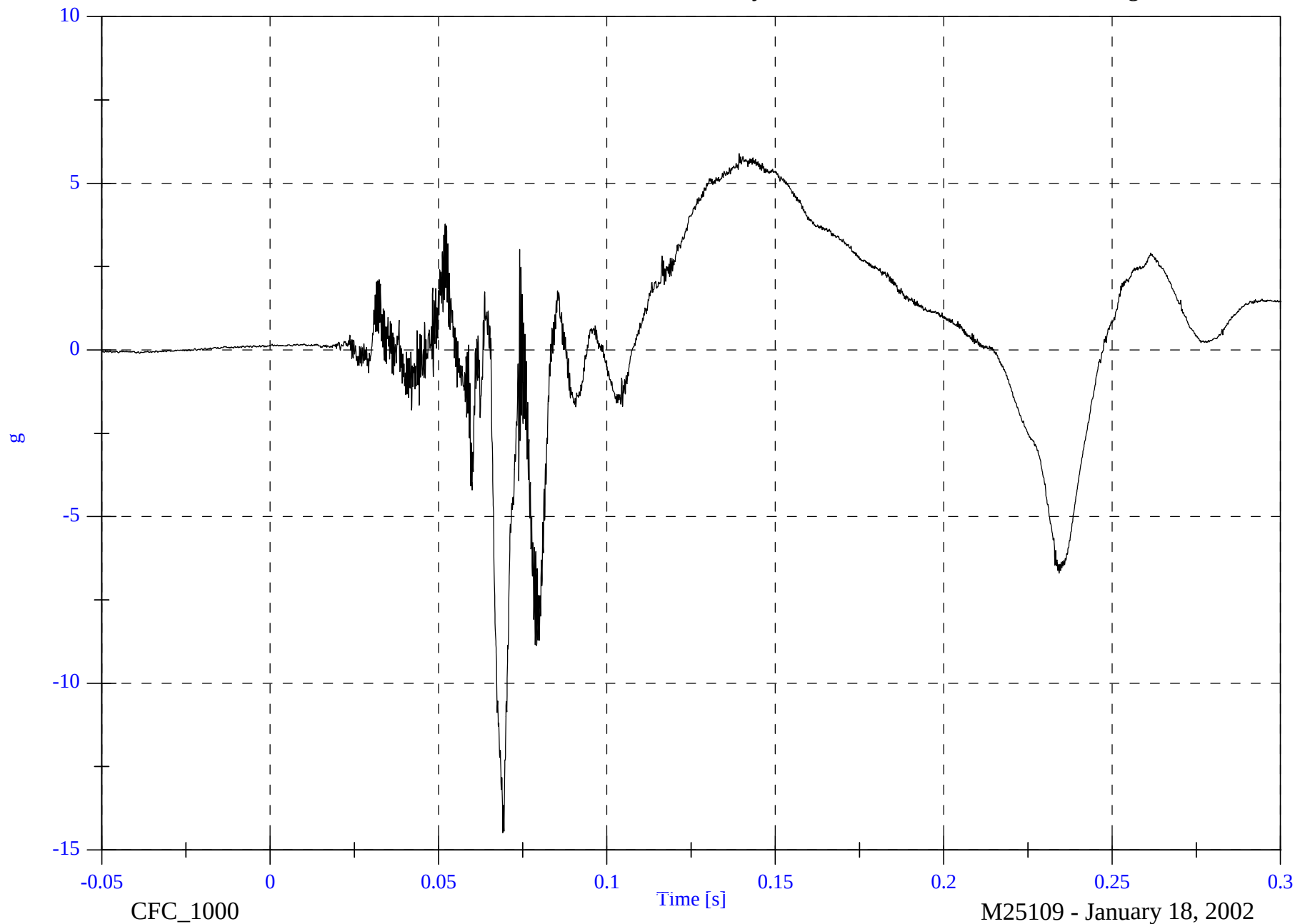
P1 Head CG y

Max: 5.9 [g] at 0.139 [s]

Min: -14.5 [g] at 0.069 [s]

B-11

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

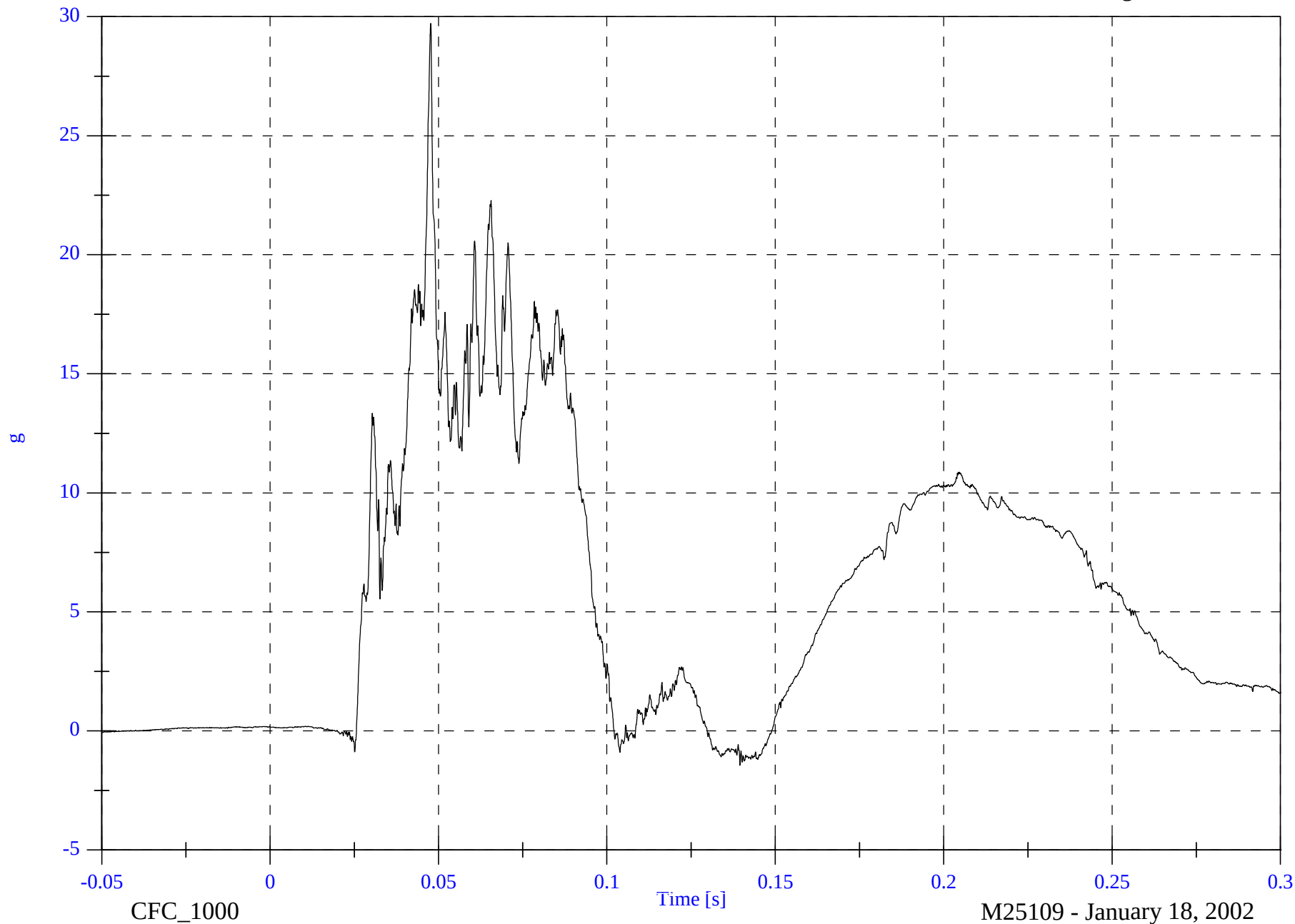
P1 Head CG z

Max: 29.7 [g] at 0.048 [s]

Min: -1.4 [g] at 0.139 [s]

B-12

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

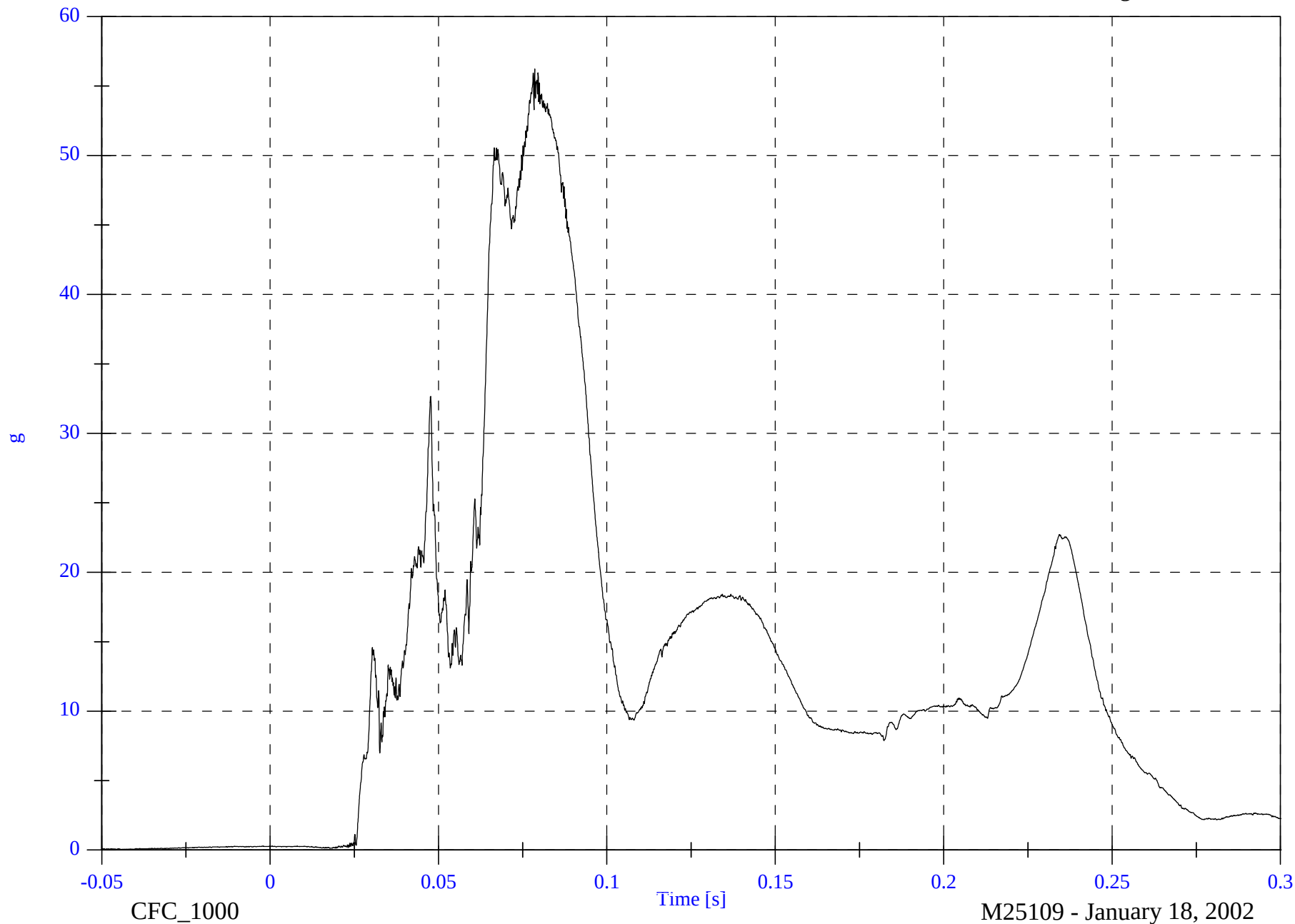
P1 Head CG Resultant

Max: 56.2 [g] at 0.079 [s]

Min: 0.0 [g] at -0.044 [s]

B-13

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

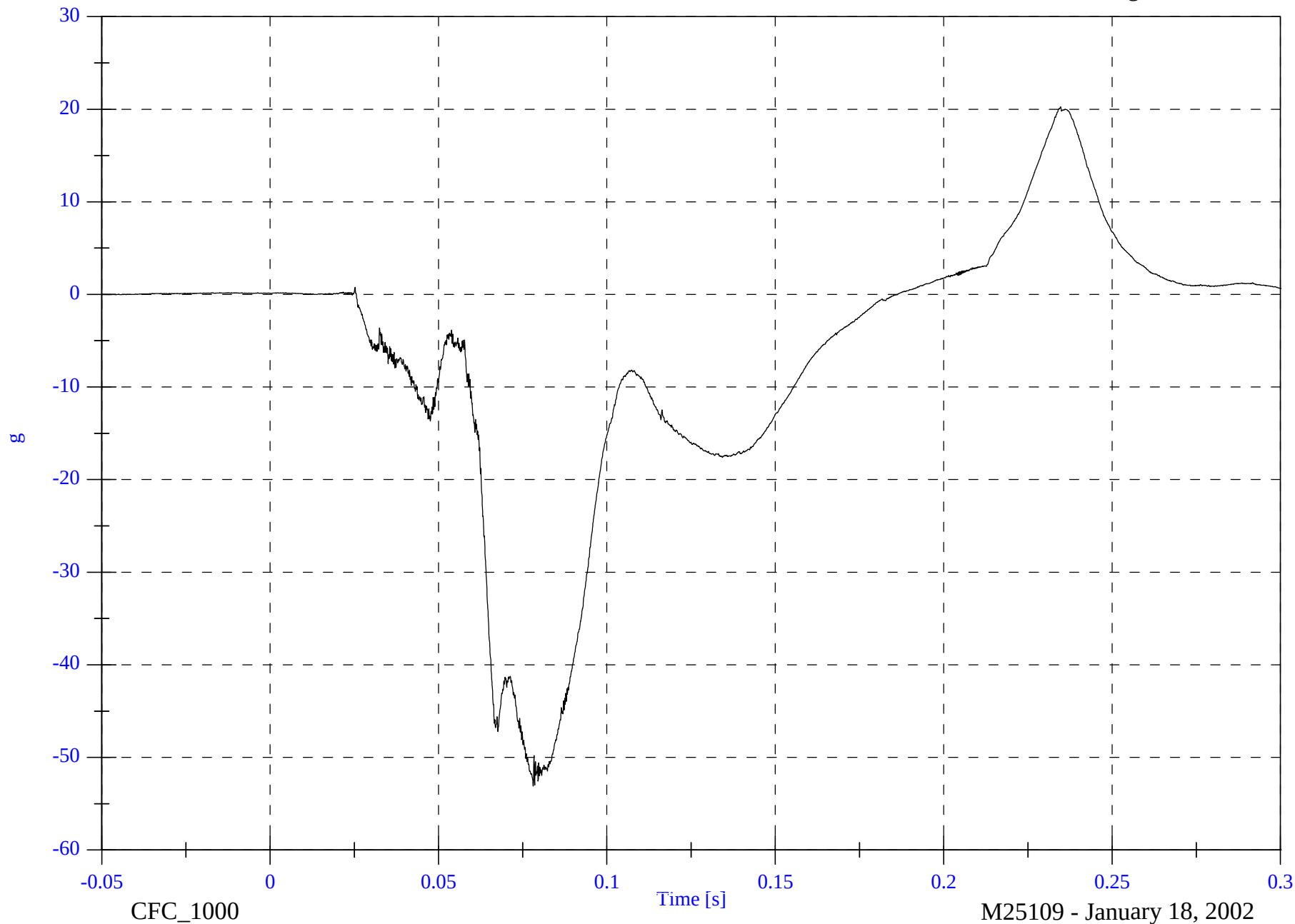
P1 Head CG Red x

Max: 20.3 [g] at 0.235 [s]

Min: -53.1 [g] at 0.078 [s]

B-14

8642-NCAP-03

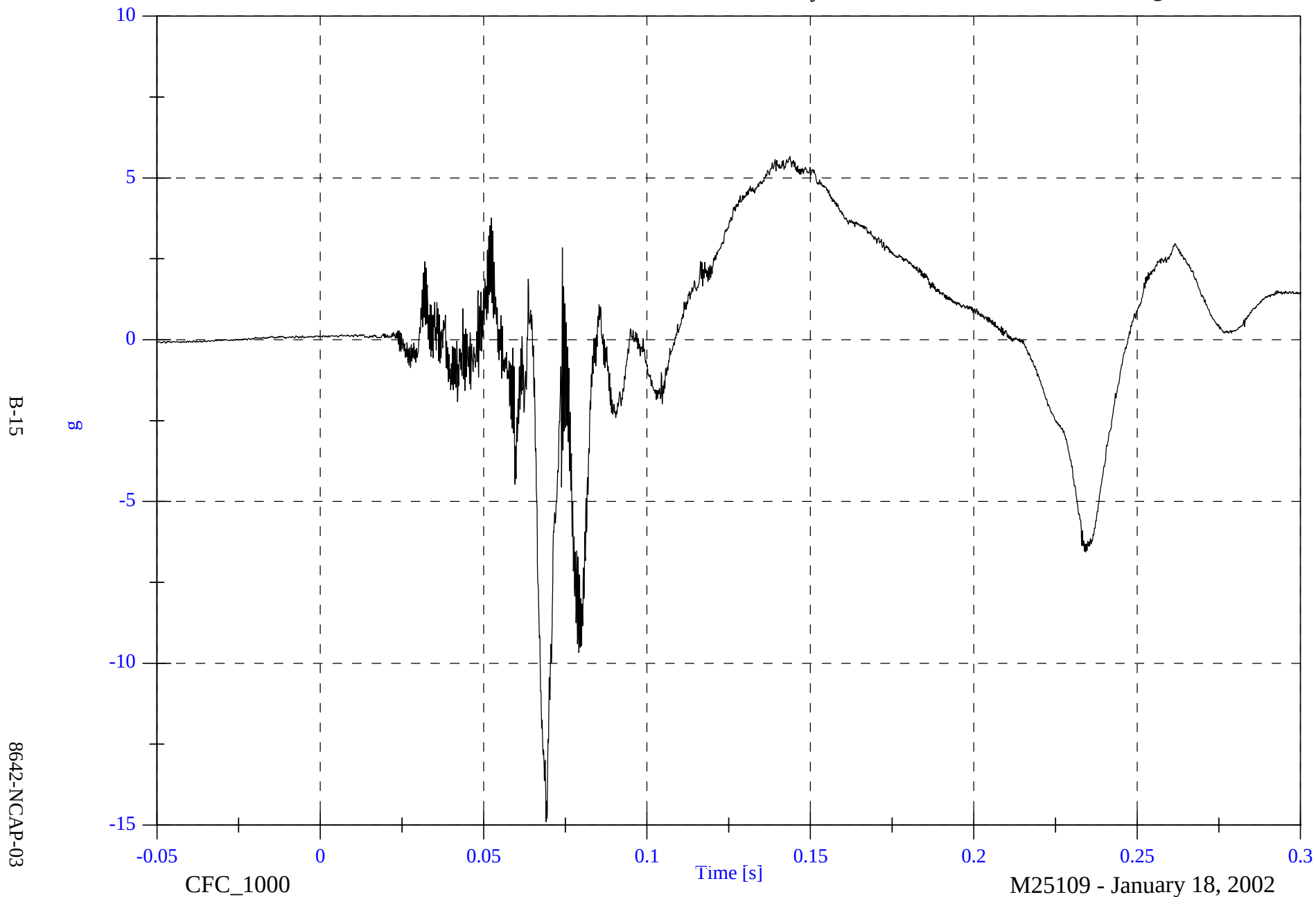


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head CG Red y

Max: 5.7 [g] at 0.144 [s]

Min: -14.9 [g] at 0.069 [s]

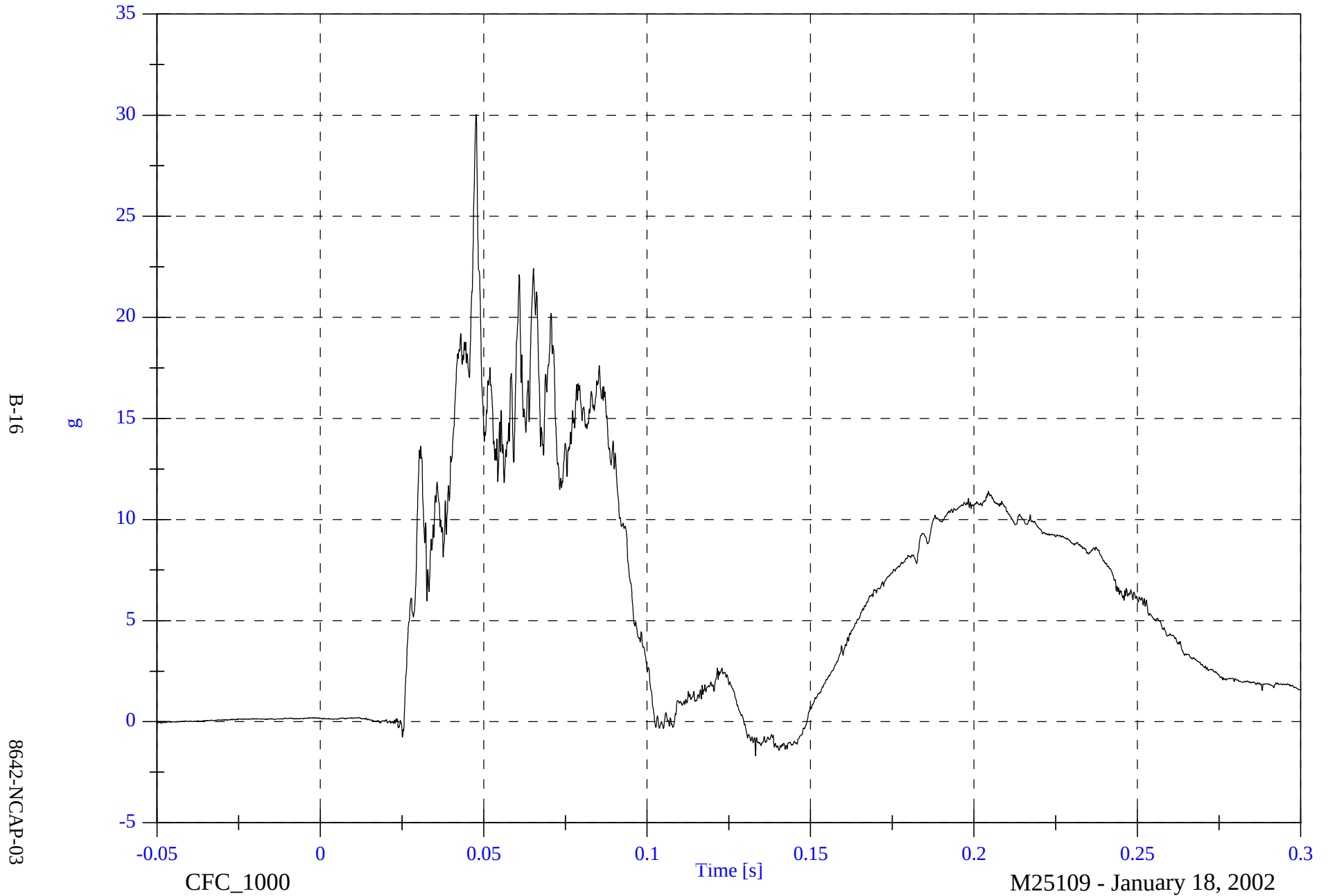


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Head CG Red z

Max: 30.0 [g] at 0.048 [s]

Min: -1.7 [g] at 0.133 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

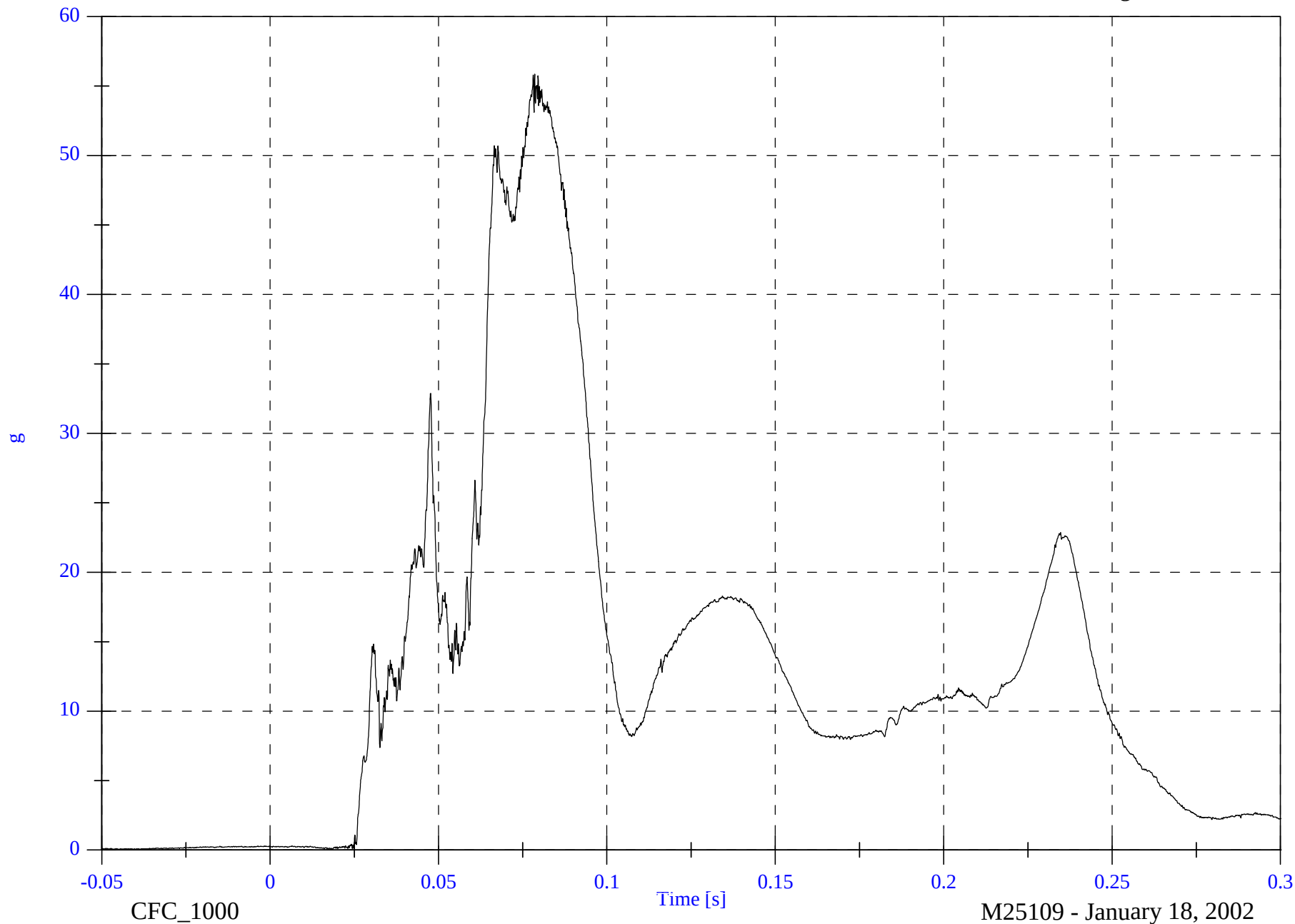
P1 Head CG Red Resultant

Max: 55.9 [g] at 0.079 [s]

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

B-17

8642-NCAP-03

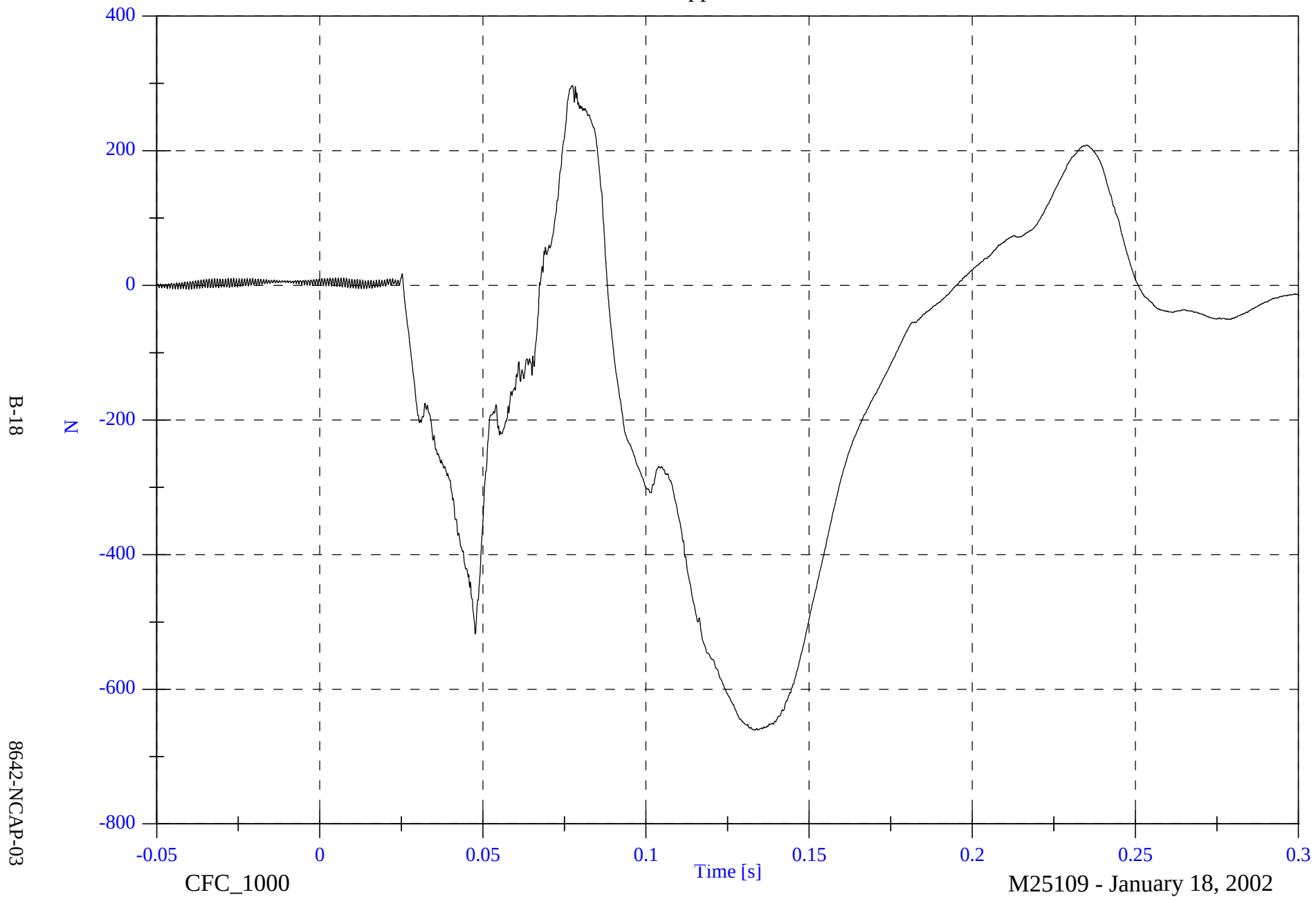


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Upper Neck Fx

Max: 296.9 [N] at 0.077 [s]

Min: -660.7 [N] at 0.133 [s]

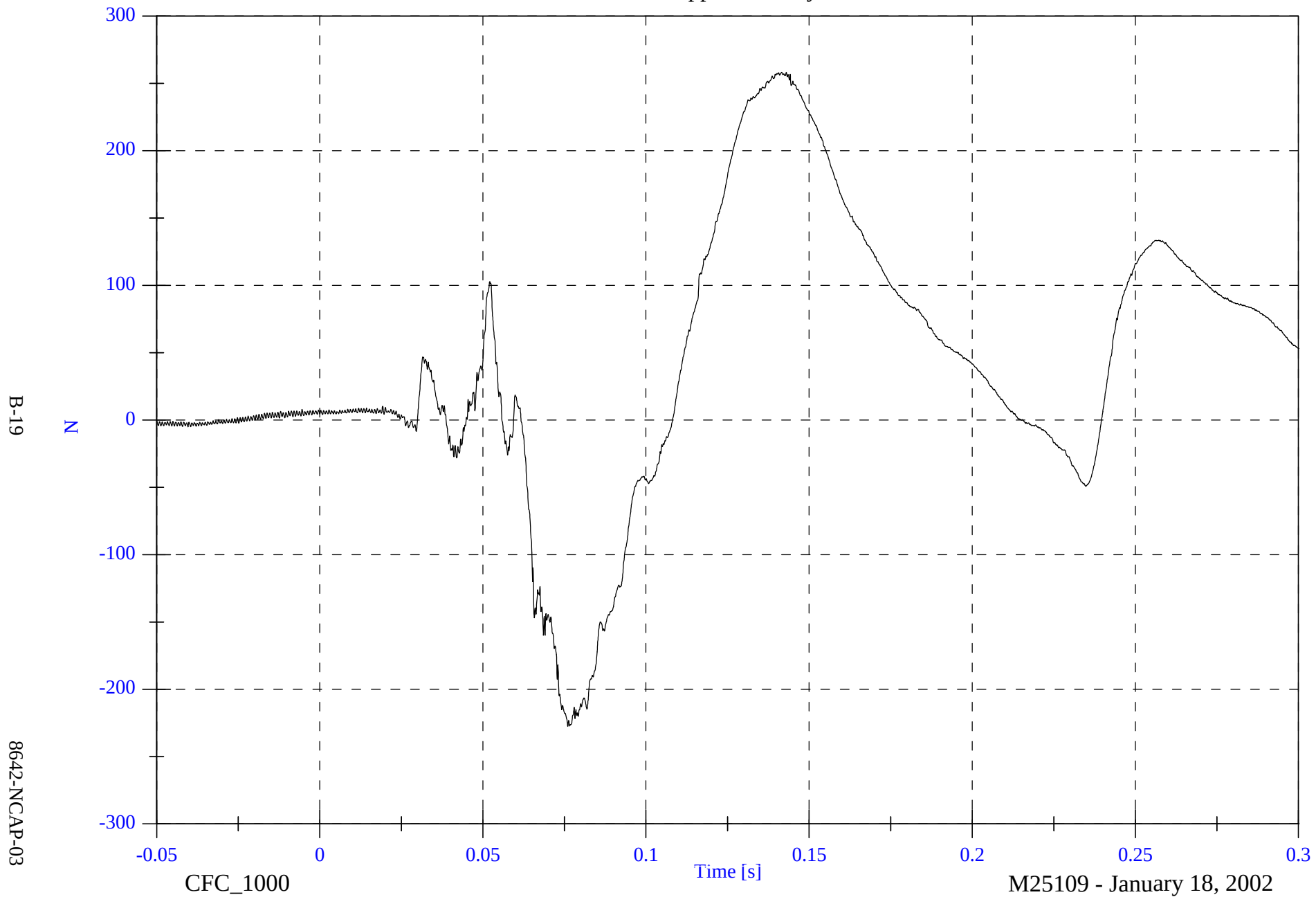


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Upper Neck Fy

Max: 258.3 [N] at 0.142 [s]

Min: -227.5 [N] at 0.076 [s]

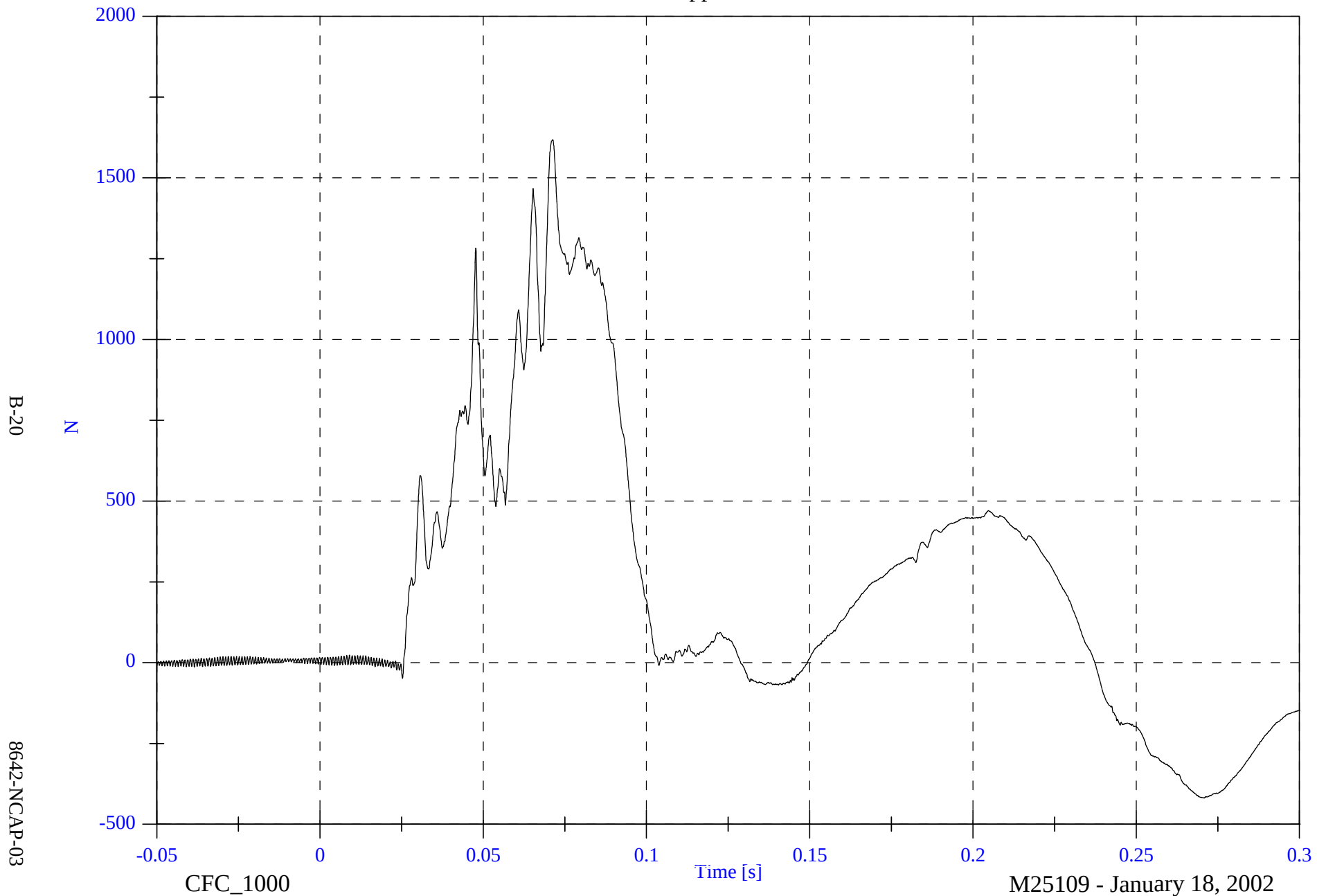


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Upper Neck Fz

Max: 1618.2 [N] at 0.071 [s]

Min: -419.1 [N] at 0.271 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

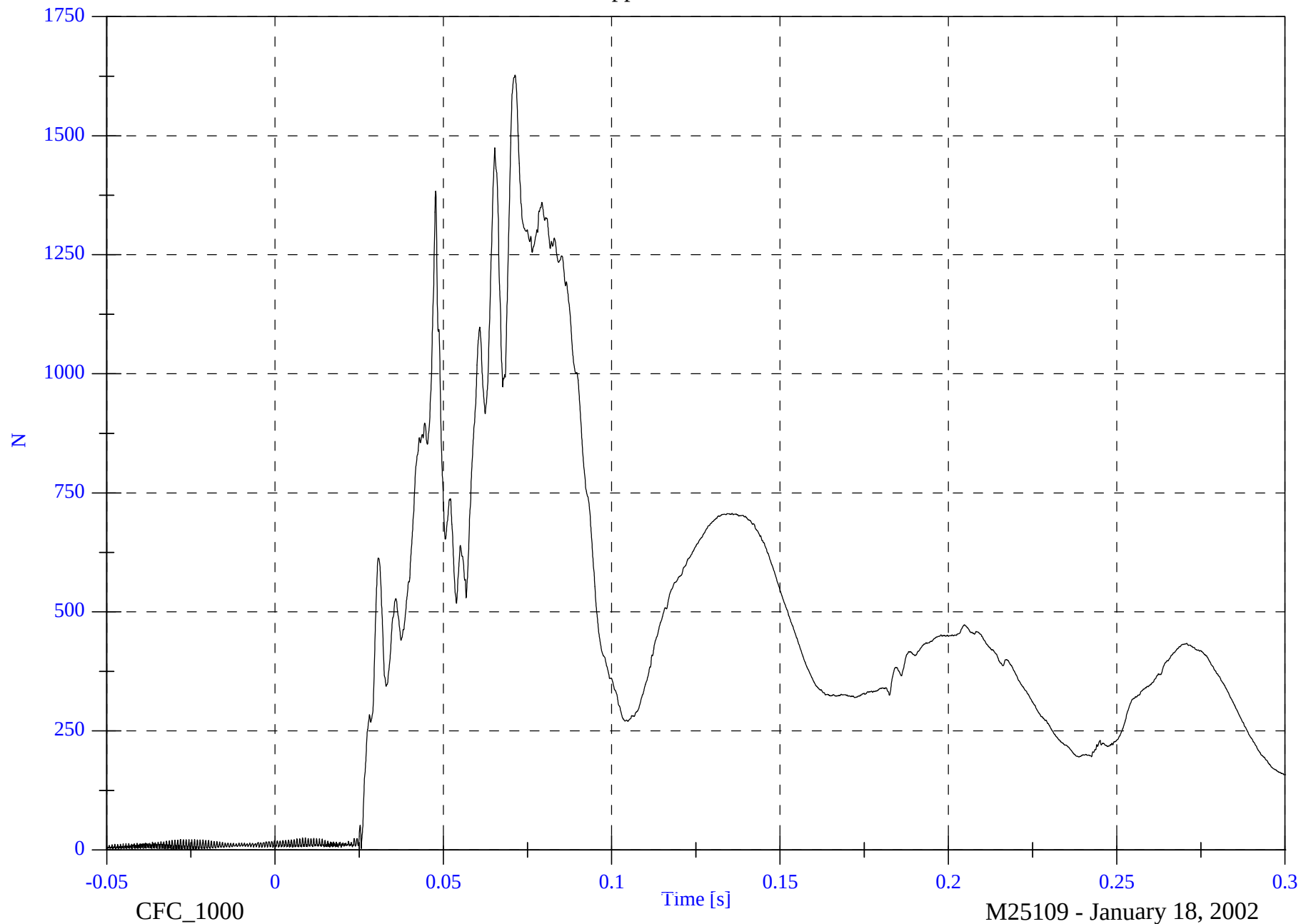
P1 Upper Neck F Resultant

Max: 1627.5 [N] at 0.071 [s]

Min: 0.9 [N] at -0.026 [s]

B-21

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

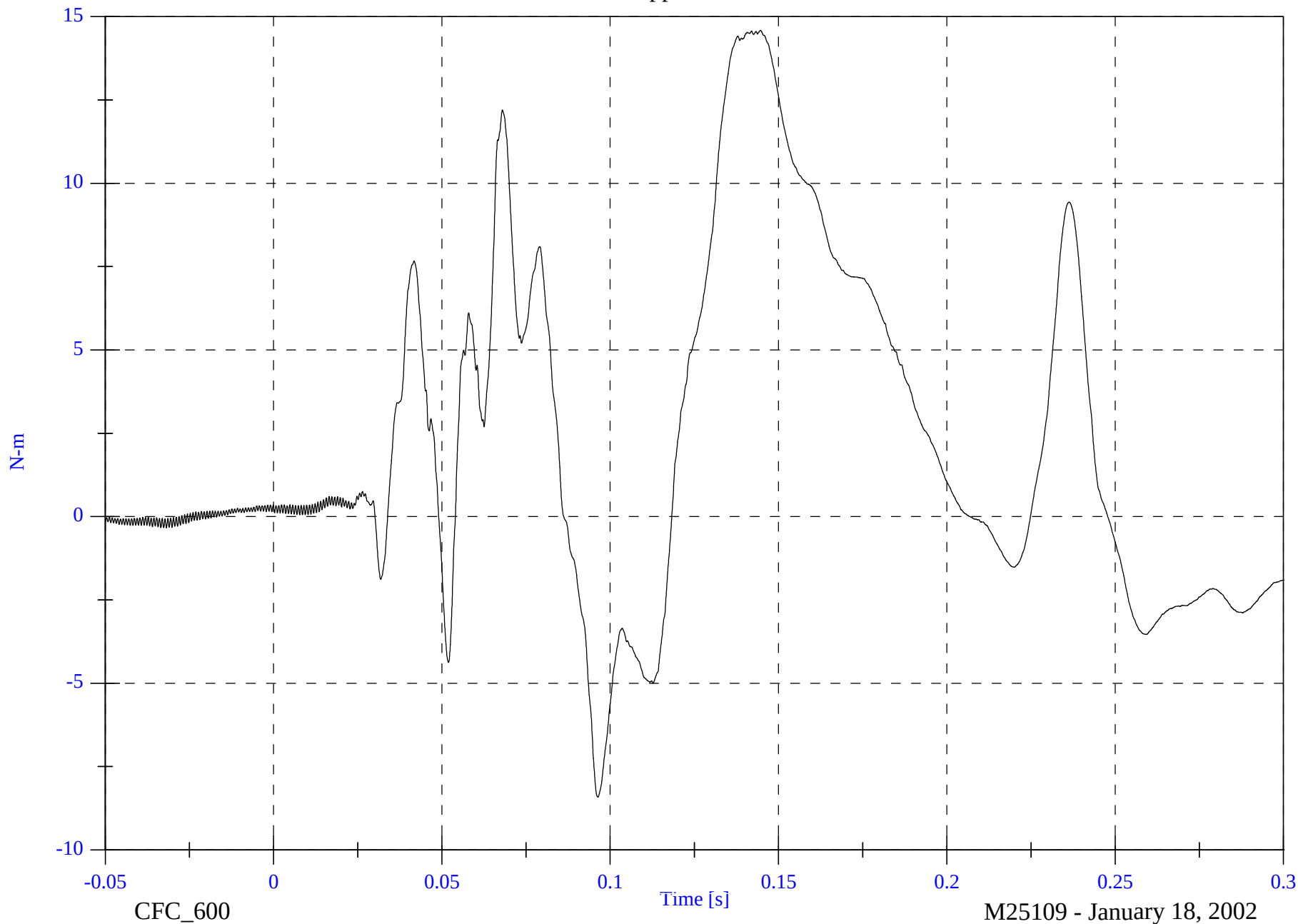
P1 Upper Neck Mx

Max: 14.6 [N-m] at 0.145 [s]

Min: -8.4 [N-m] at 0.096 [s]

B-22

8642-NCAP-03



CFC_600

Time [s]

M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

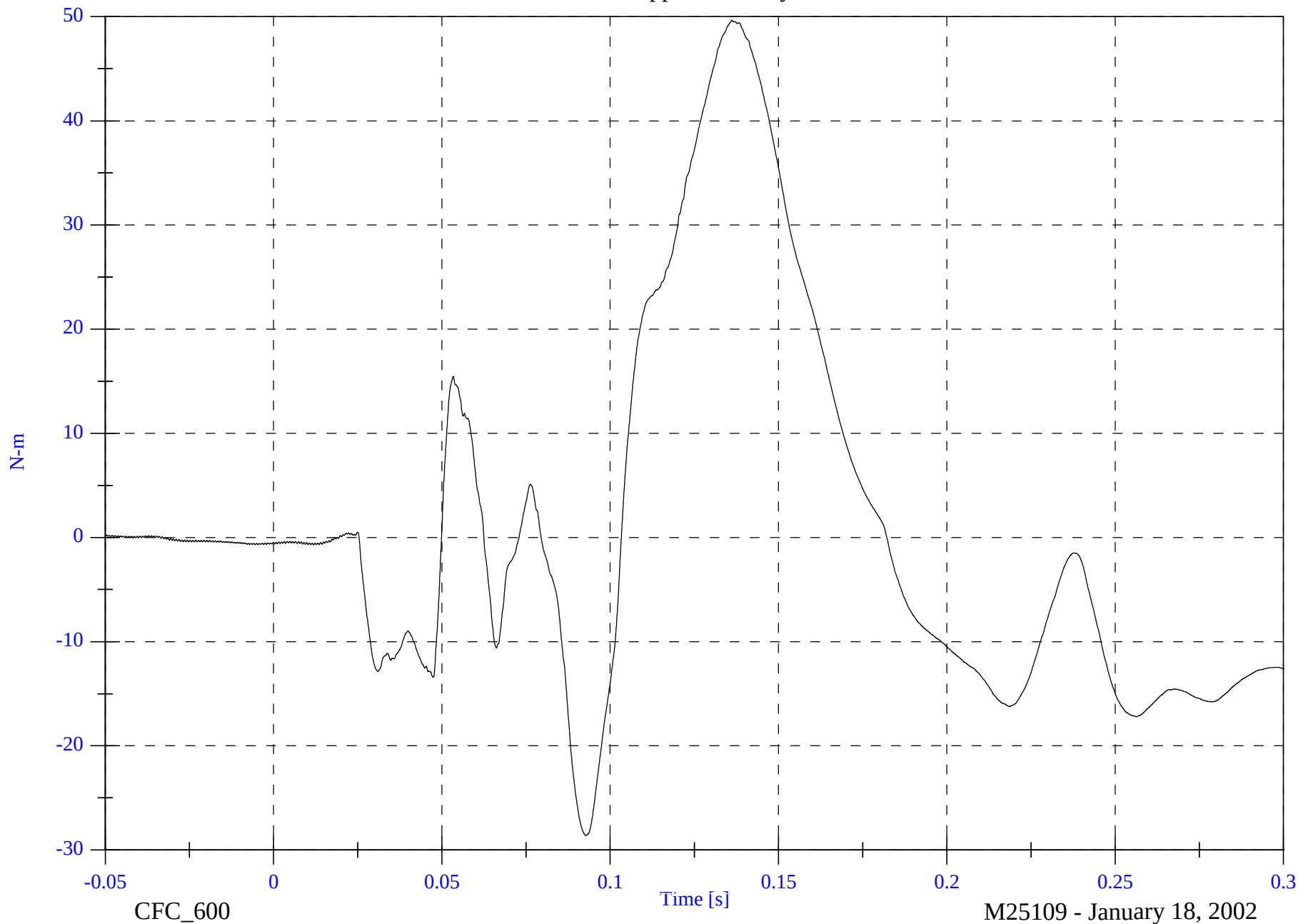
P1 Upper Neck My

Max: 49.6 [N-m] at 0.136 [s]

Min: -28.6 [N-m] at 0.093 [s]

B-23

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

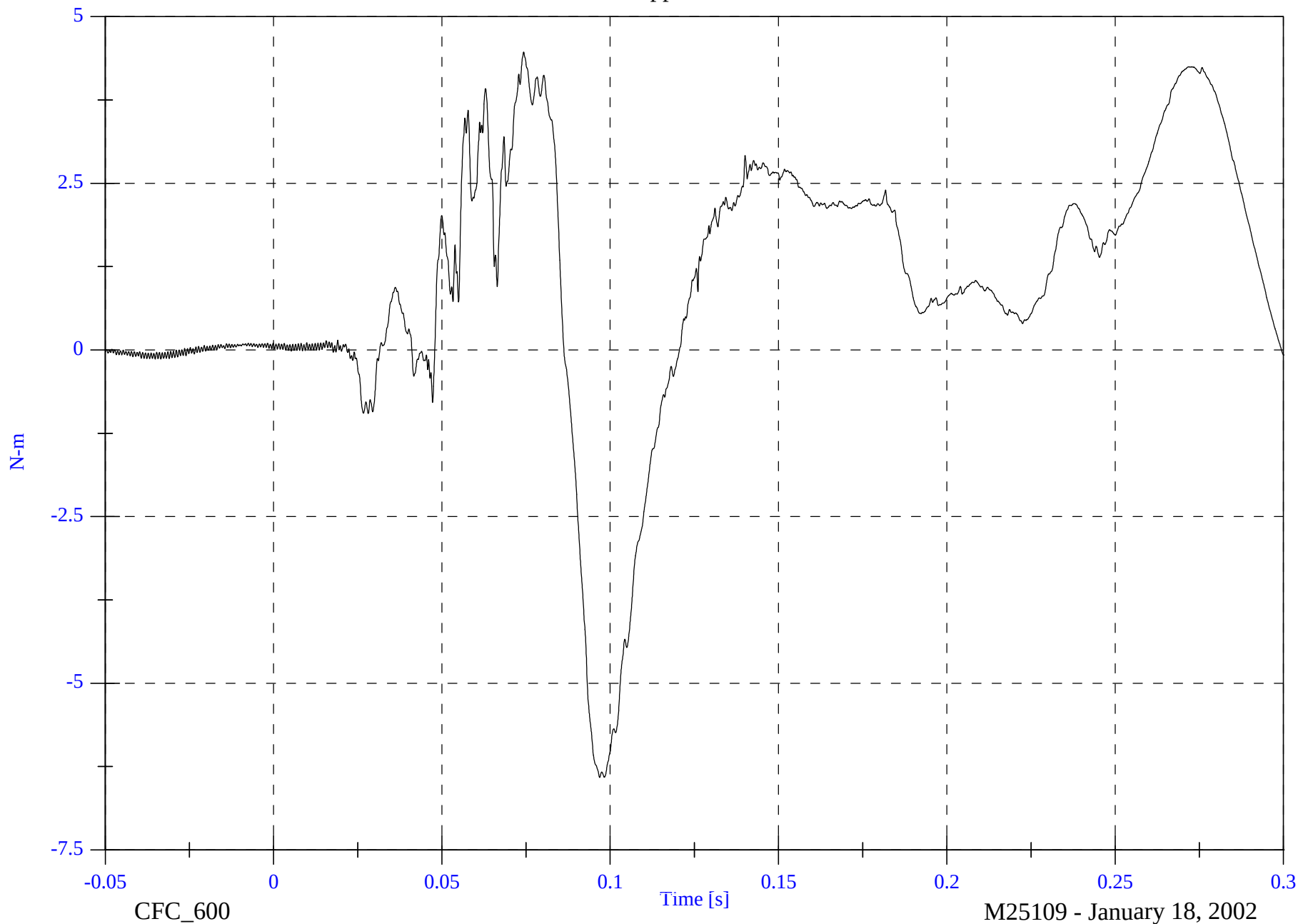
P1 Upper Neck Mz

Max: 4.5 [N-m] at 0.074 [s]

Min: -6.4 [N-m] at 0.097 [s]

B-24

8642-NCAP-03



CFC_600

M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

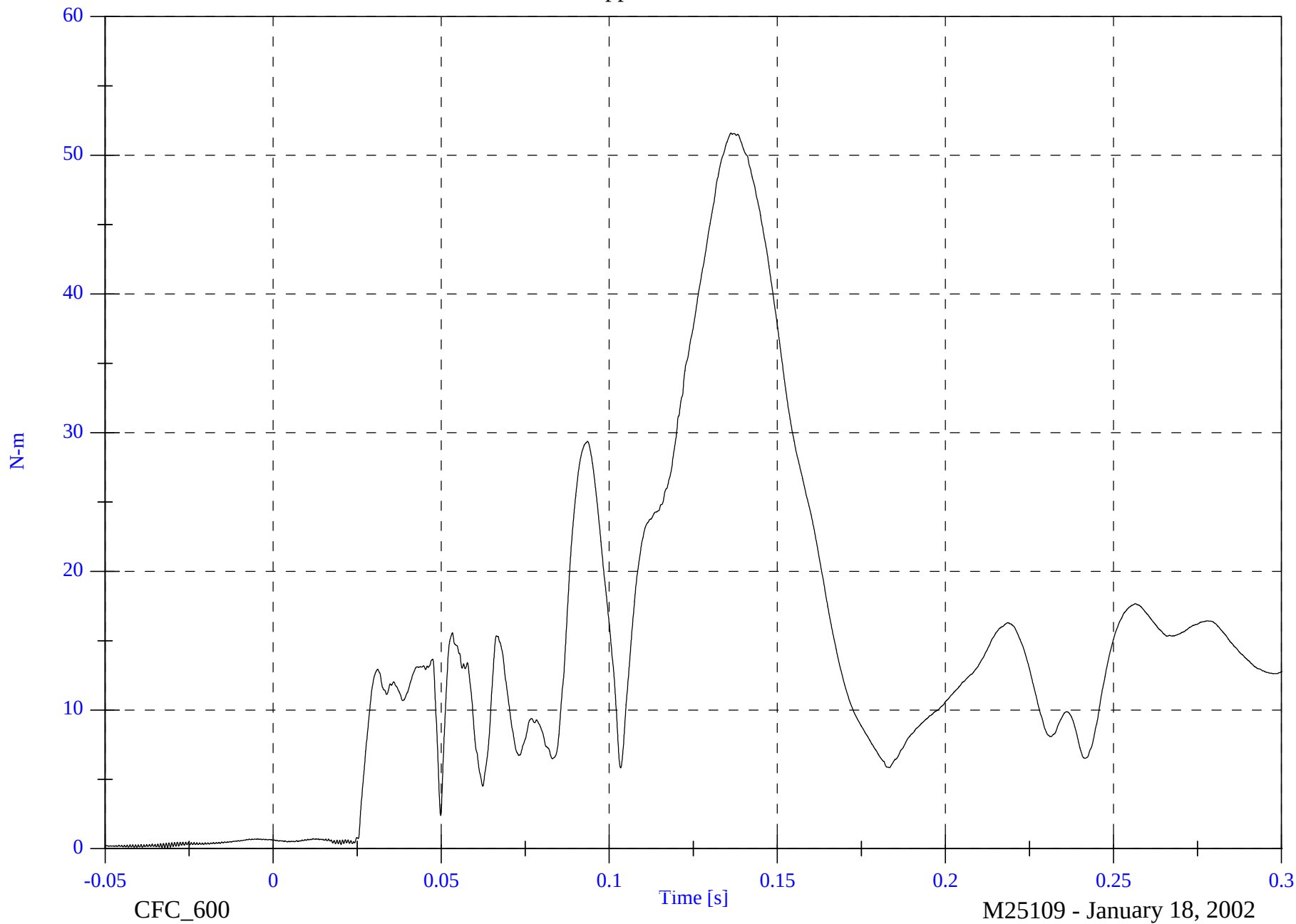
P1 Upper Neck M Resultant

Max: 51.6 [N-m] at 0.136 [s]

Min: 0.1 [N-m] at -0.031 [s]

B-25

8642-NCAP-03

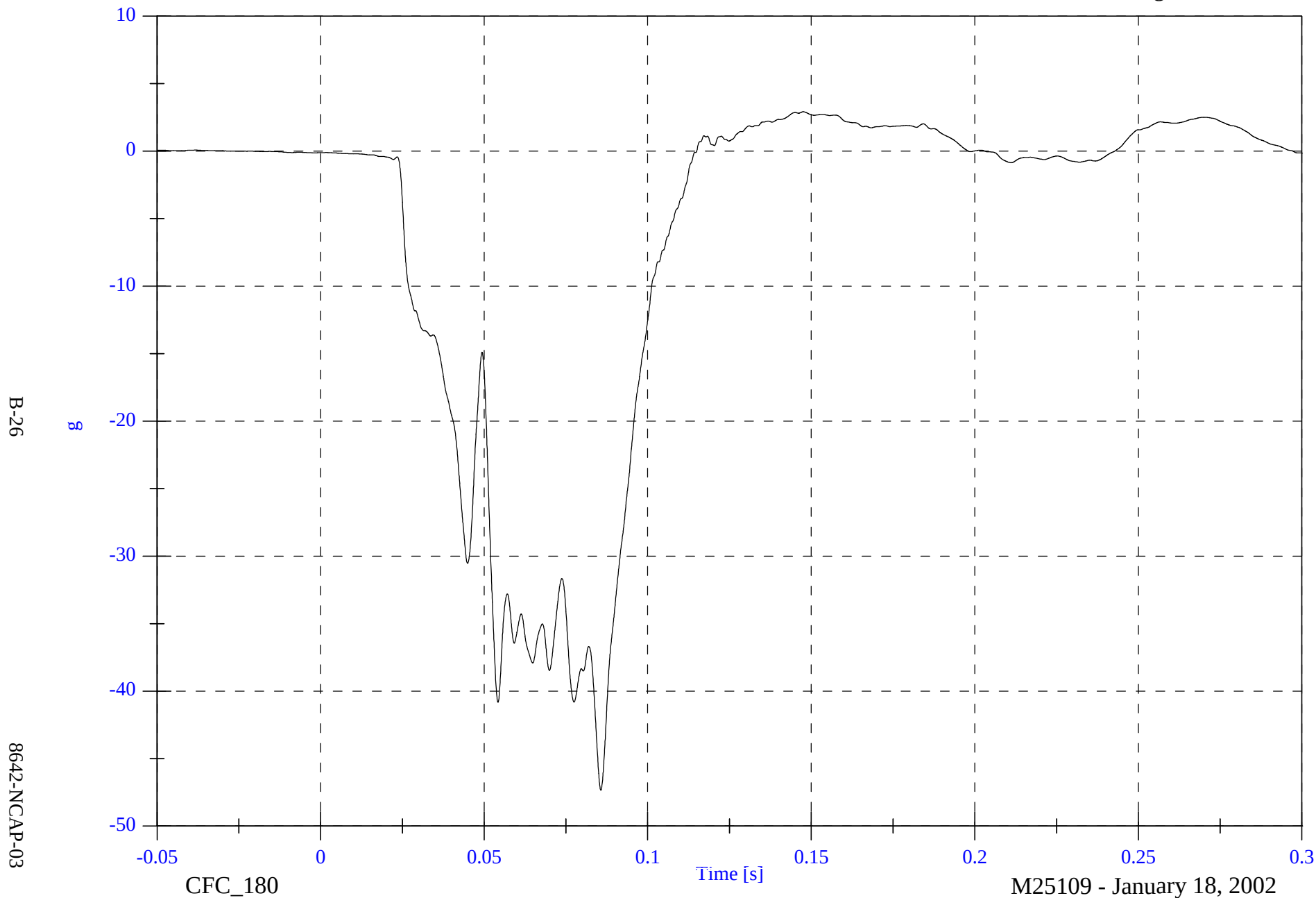


2002 NCAP Test 3-2002 Toyota Sequoia

Max: 2.9 [g] at 0.148 [s]

Min: -47.4 [g] at 0.086 [s]

P1 Chest x

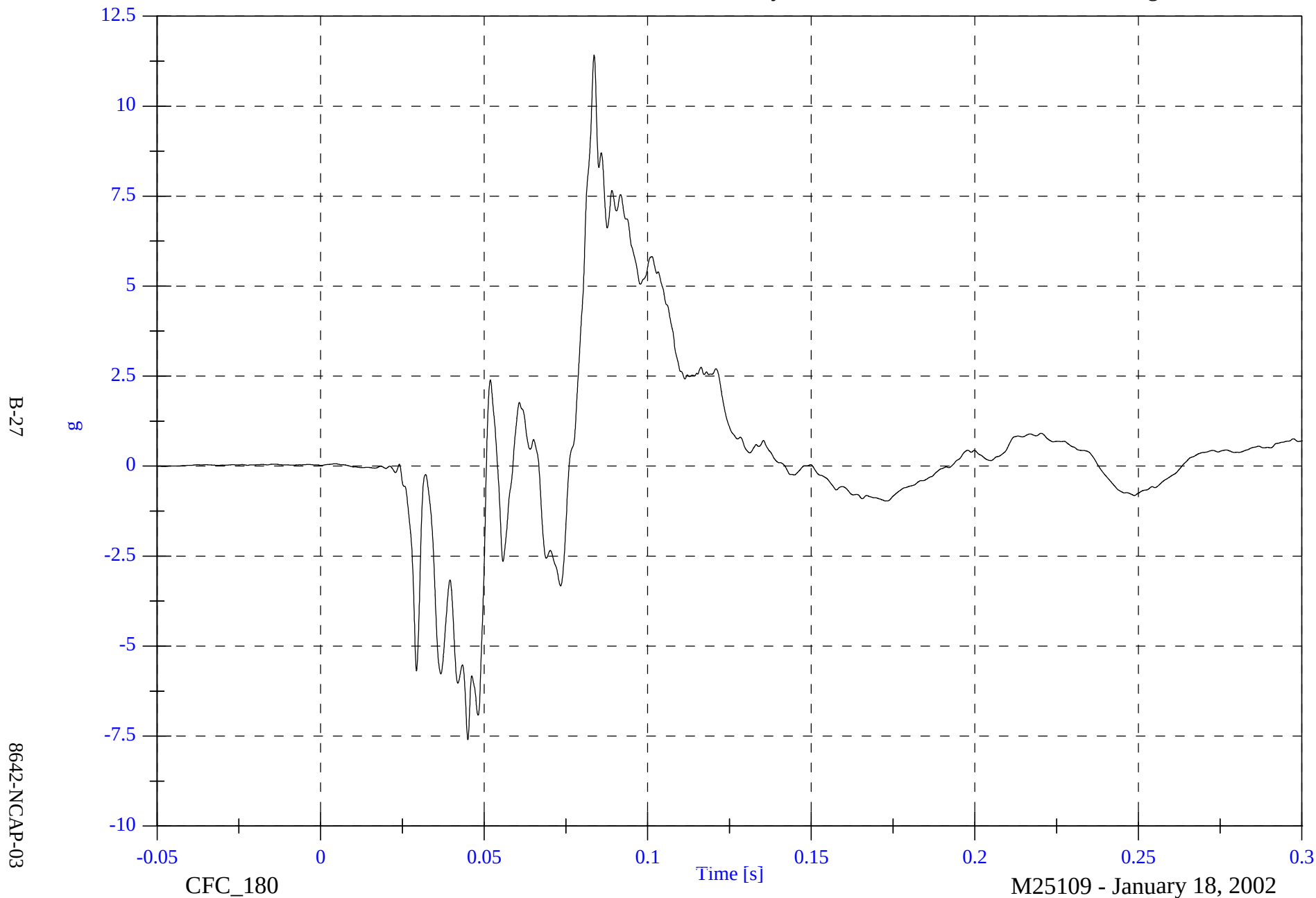


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Chest y

Max: 11.4 [g] at 0.084 [s]

Min: -7.6 [g] at 0.045 [s]

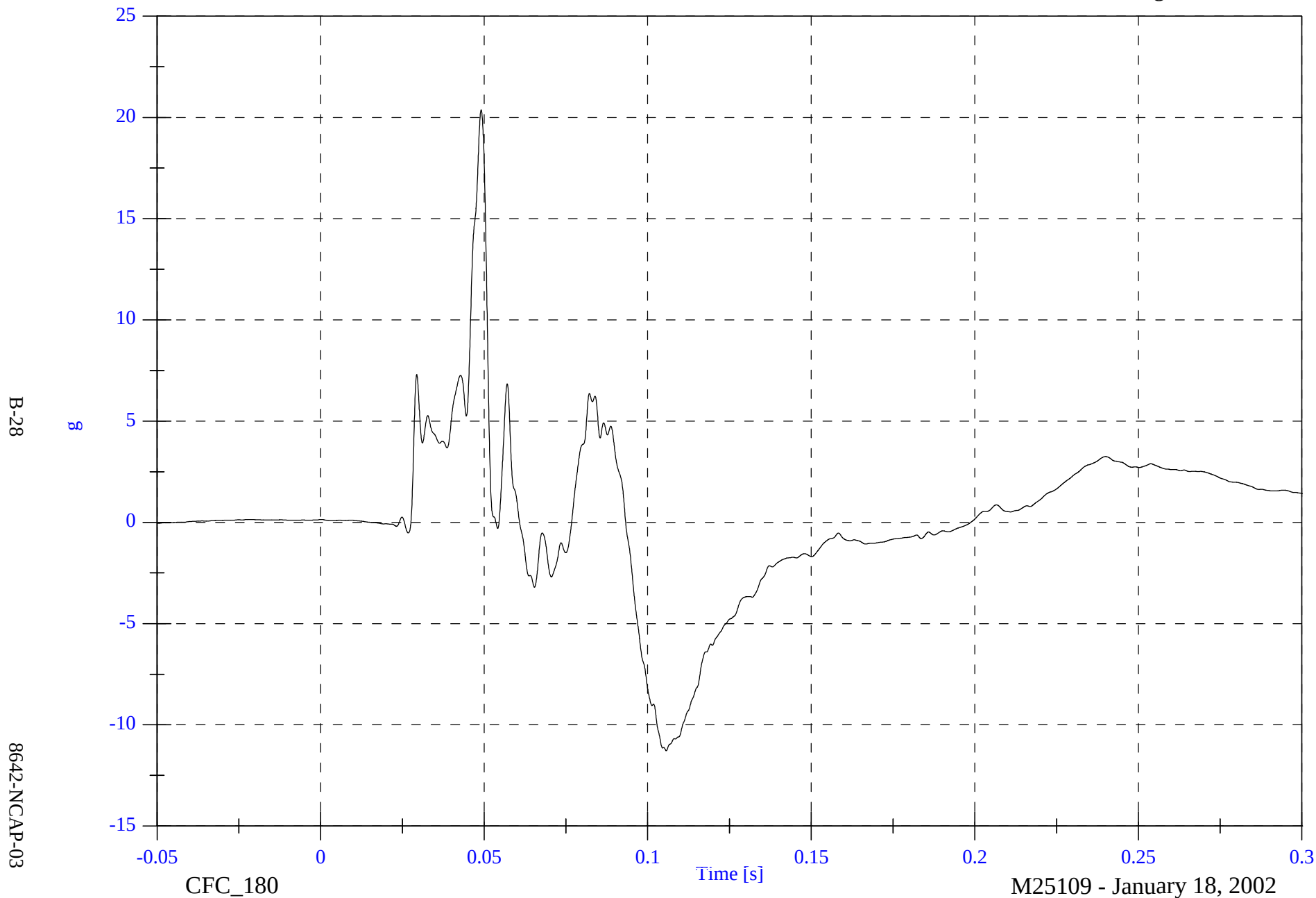


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Chest z

Max: 20.4 [g] at 0.049 [s]

Min: -11.3 [g] at 0.106 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

P1 Chest Resultant

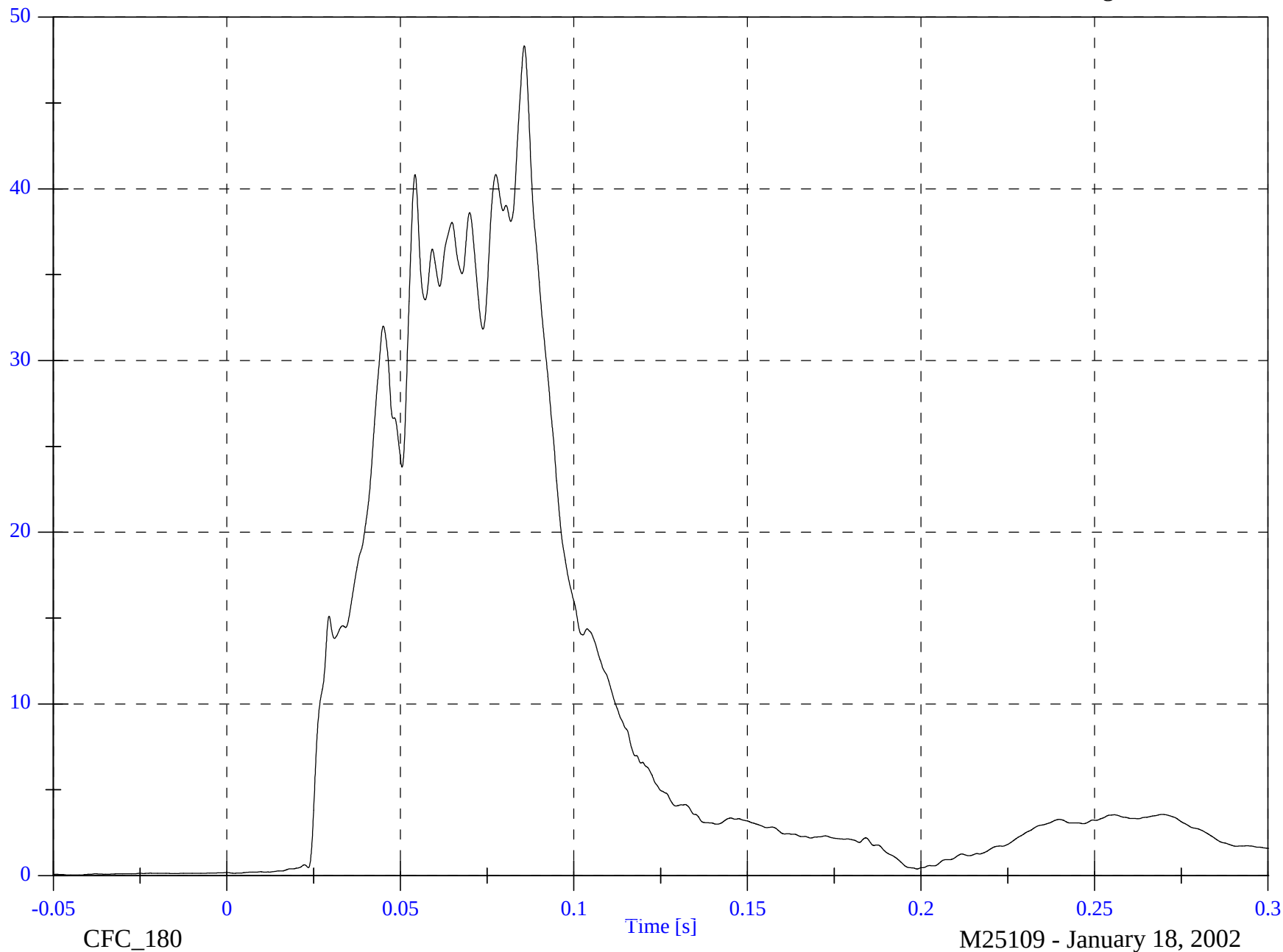
Max: 48.3 [g] at 0.086 [s]

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

B-29

8642-NCAP-03

g



CFC_180

Time [s]

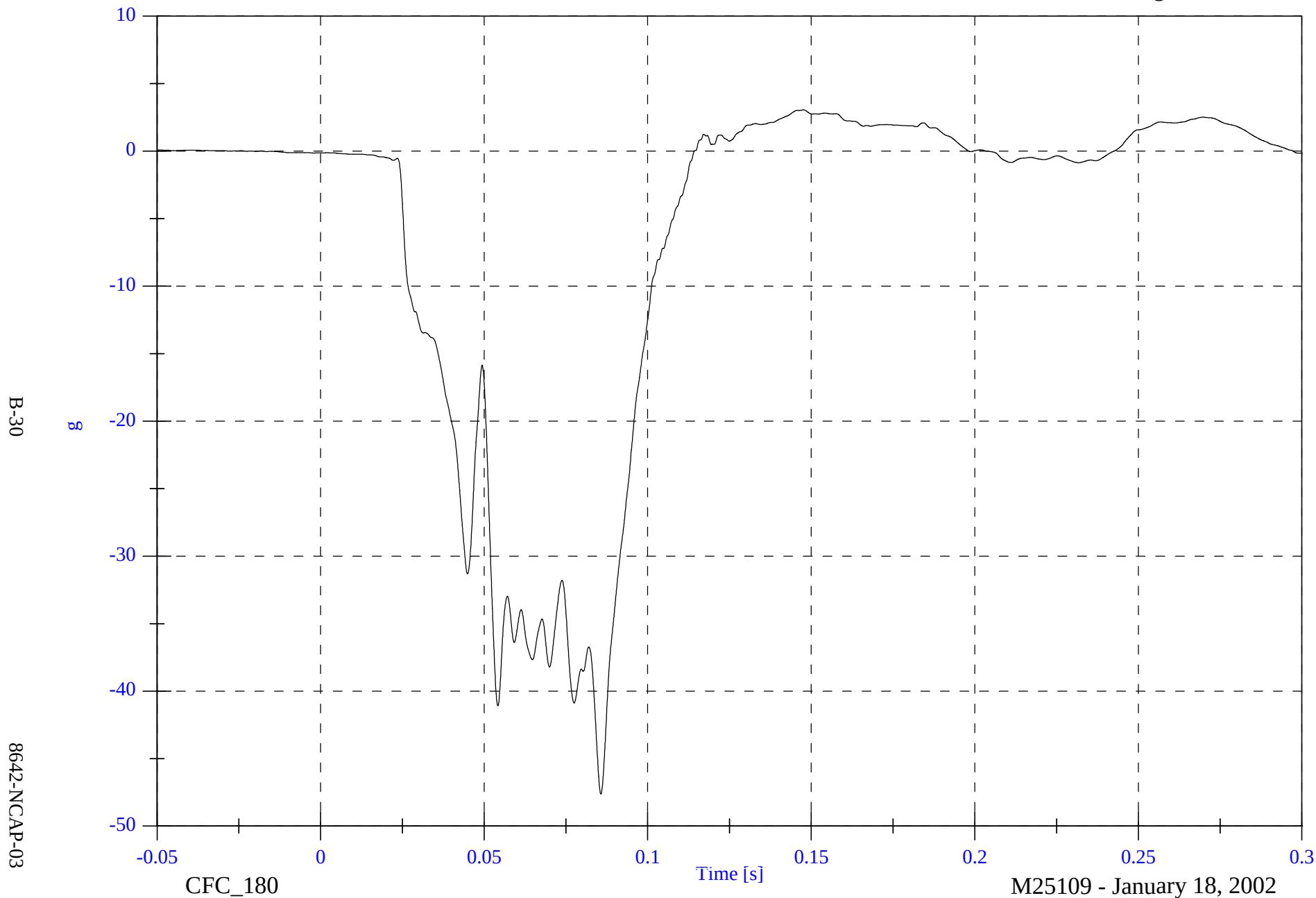
M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

P1 Chest Red x

Max: 3.1 [g] at 0.148 [s]

Min: -47.6 [g] at 0.086 [s]

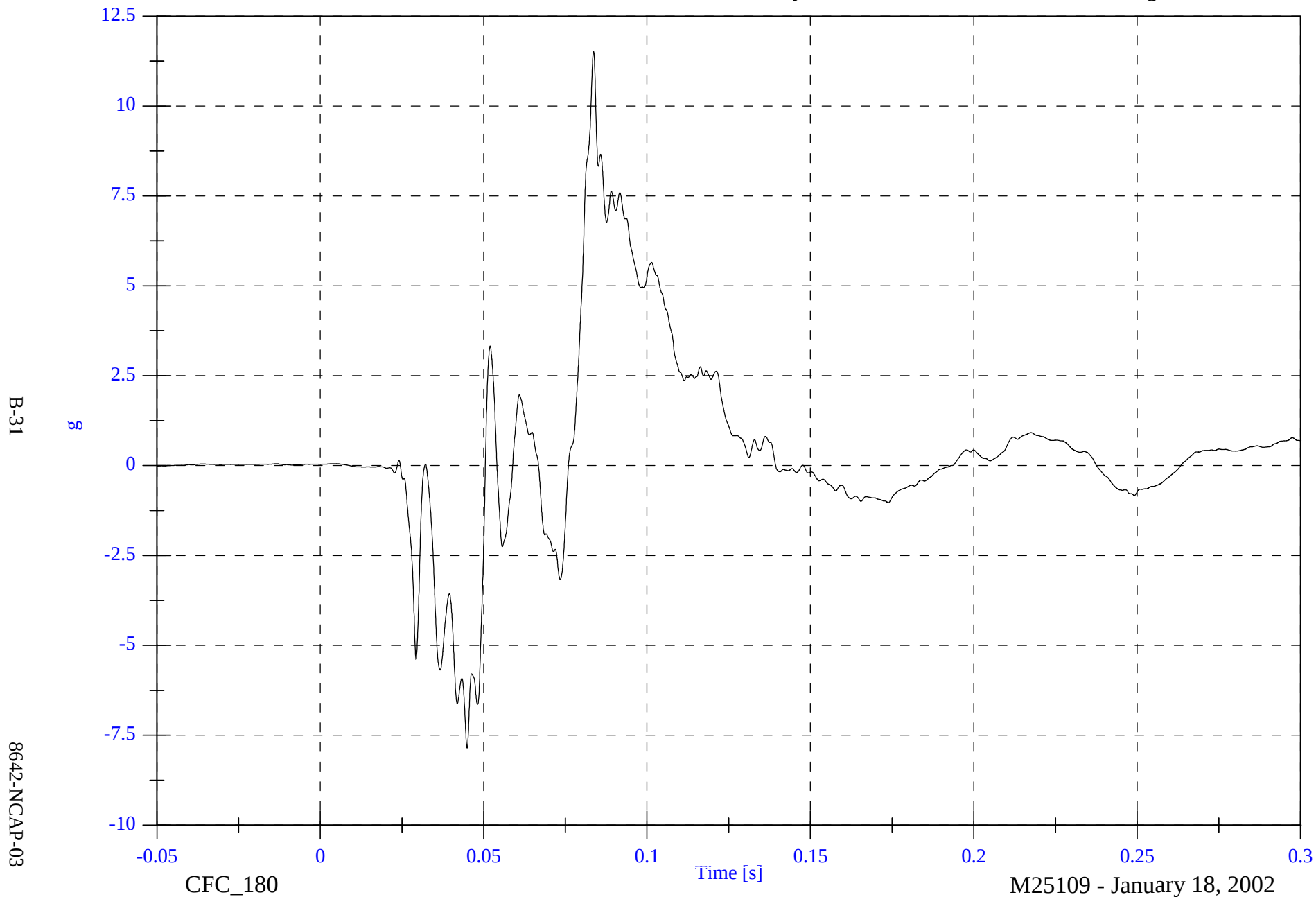


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Chest Red y

Max: 11.5 [g] at 0.084 [s]

Min: -7.9 [g] at 0.045 [s]

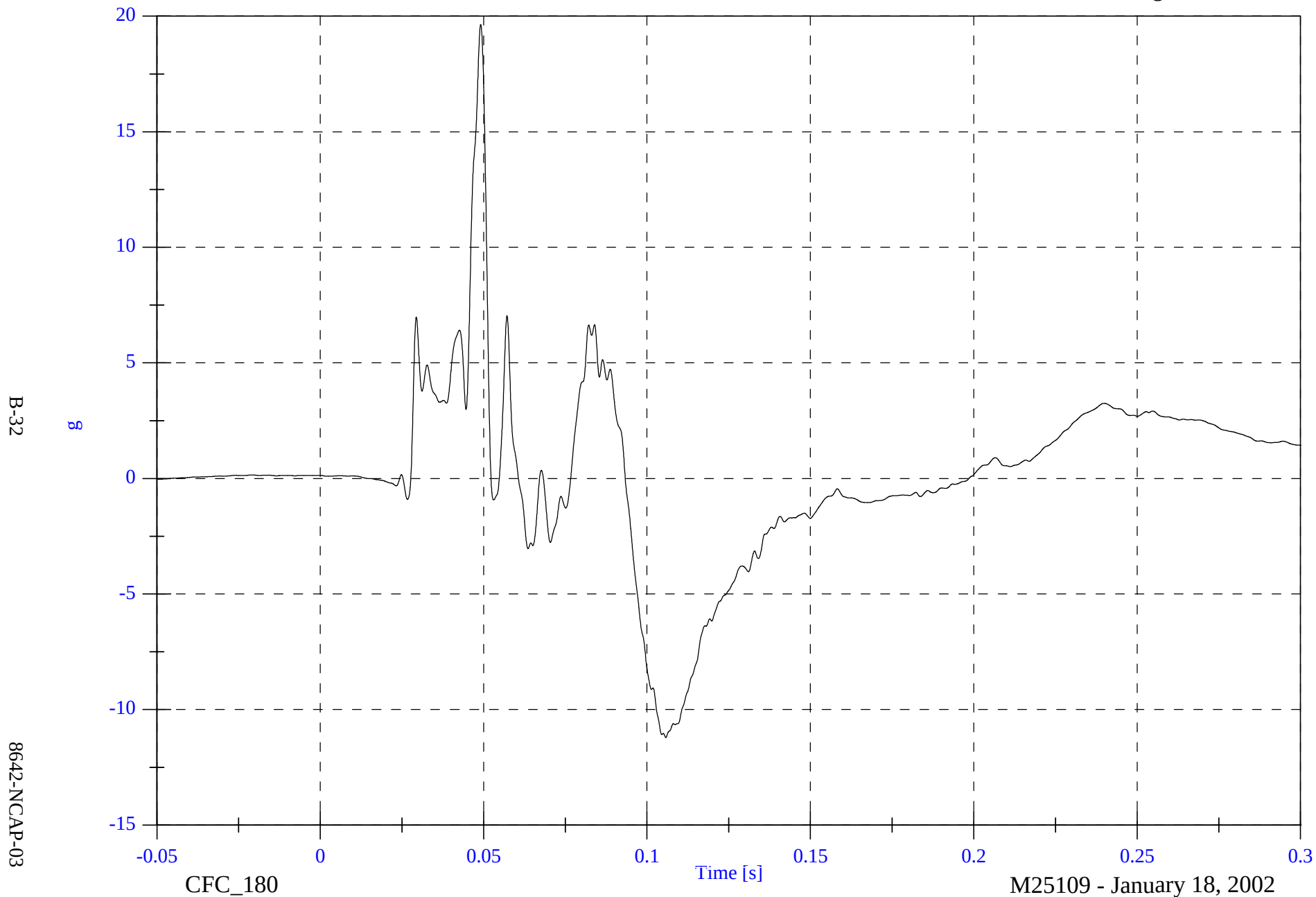


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Chest Red z

Max: 19.6 [g] at 0.049 [s]

Min: -11.2 [g] at 0.106 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

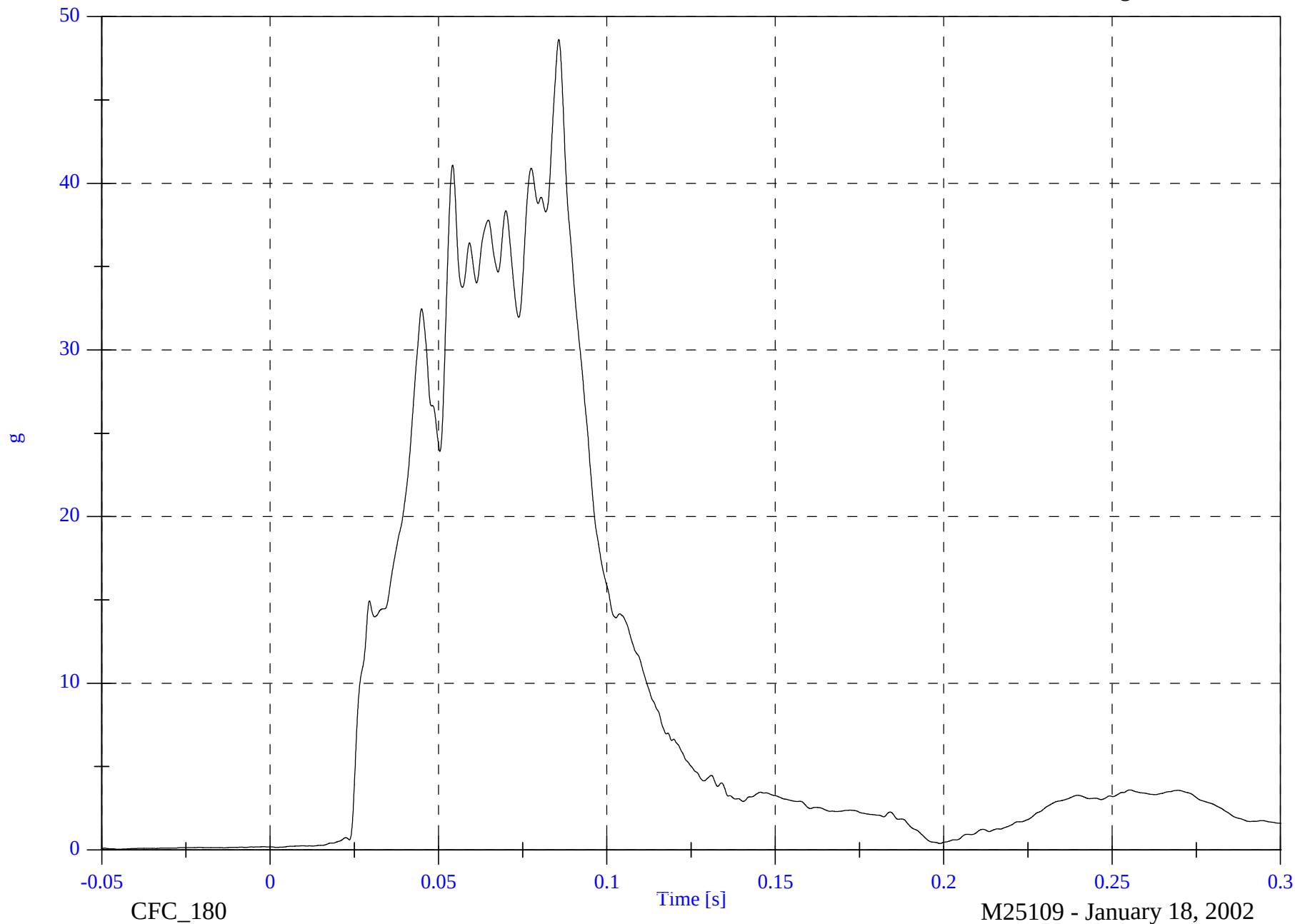
P1 Chest Red Resultant

Max: 48.6 [g] at 0.086 [s]

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

B-33

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

P1 Chest Compression x

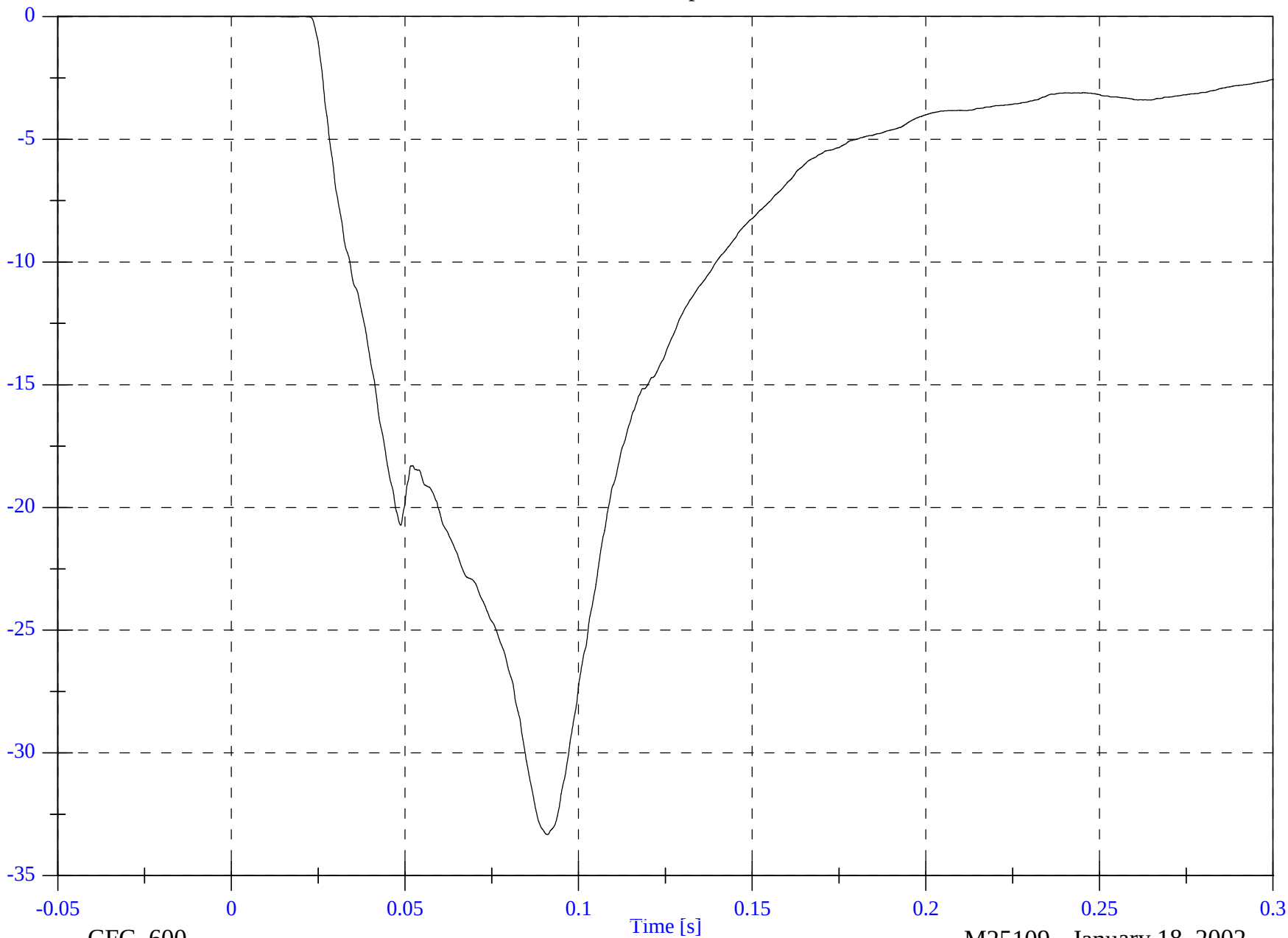
Max: 0.0 [mm] at 0.006 [s]

Min: -33.3 [mm] at 0.091 [s]

B-34

8642-NCAP-03

mm



CFC_600

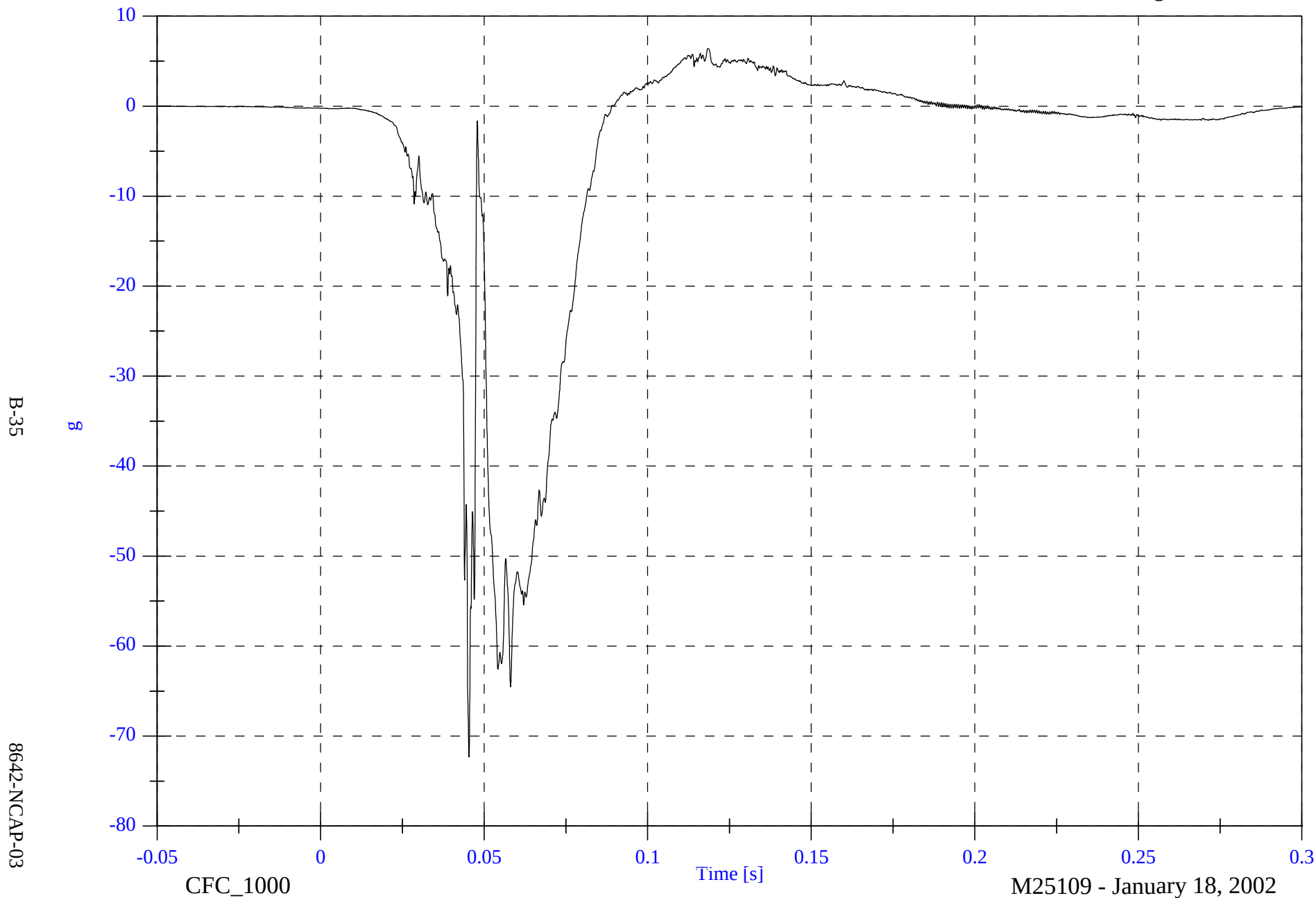
M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

Max: 6.4 [g] at 0.118 [s]

Min: -72.3 [g] at 0.045 [s]

P1 Pelvic x

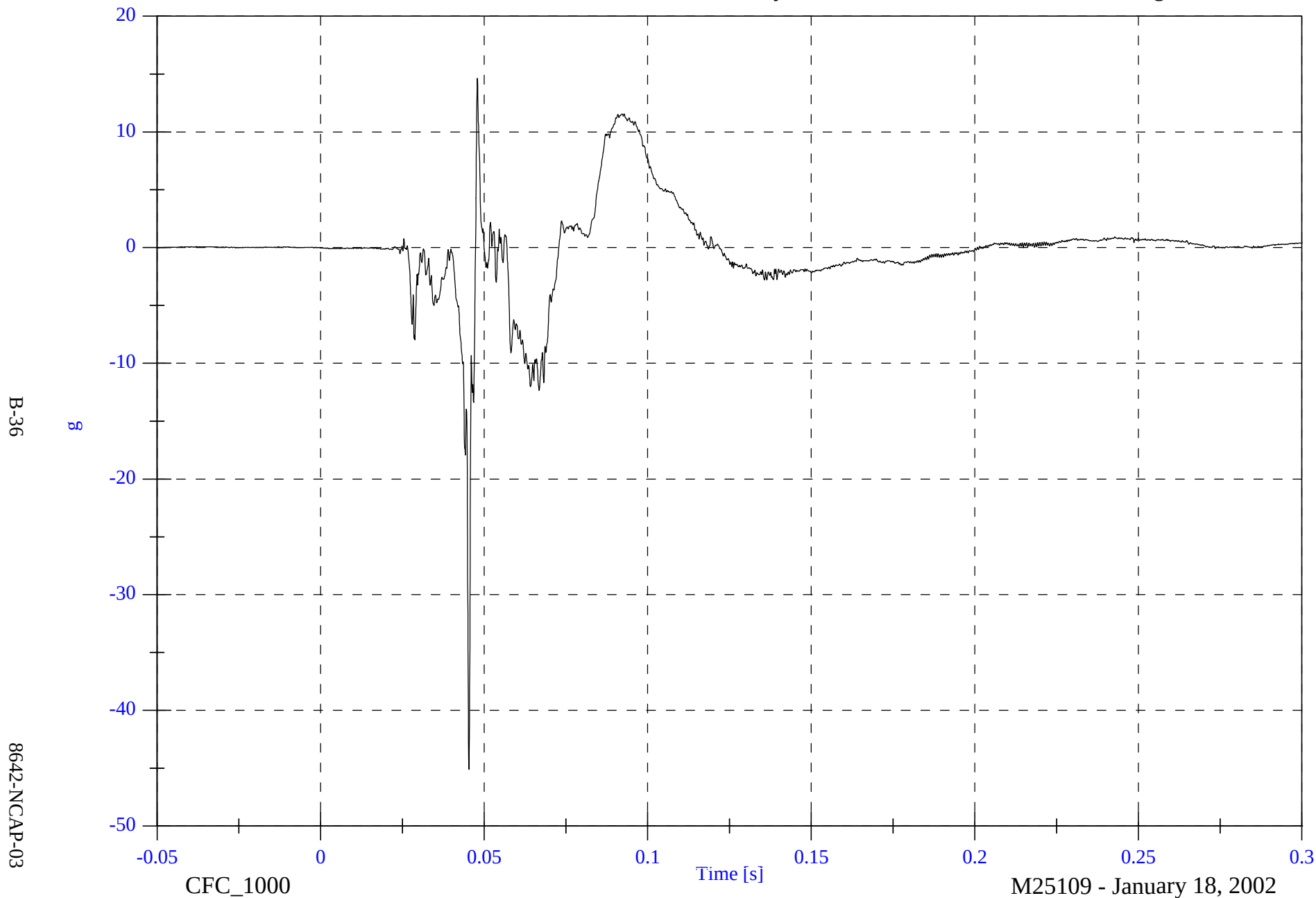


2002 NCAP Test 3-2002 Toyota Sequoia

Max: 14.6 [g] at 0.048 [s]

Min: -45.1 [g] at 0.045 [s]

P1 Pelvic y

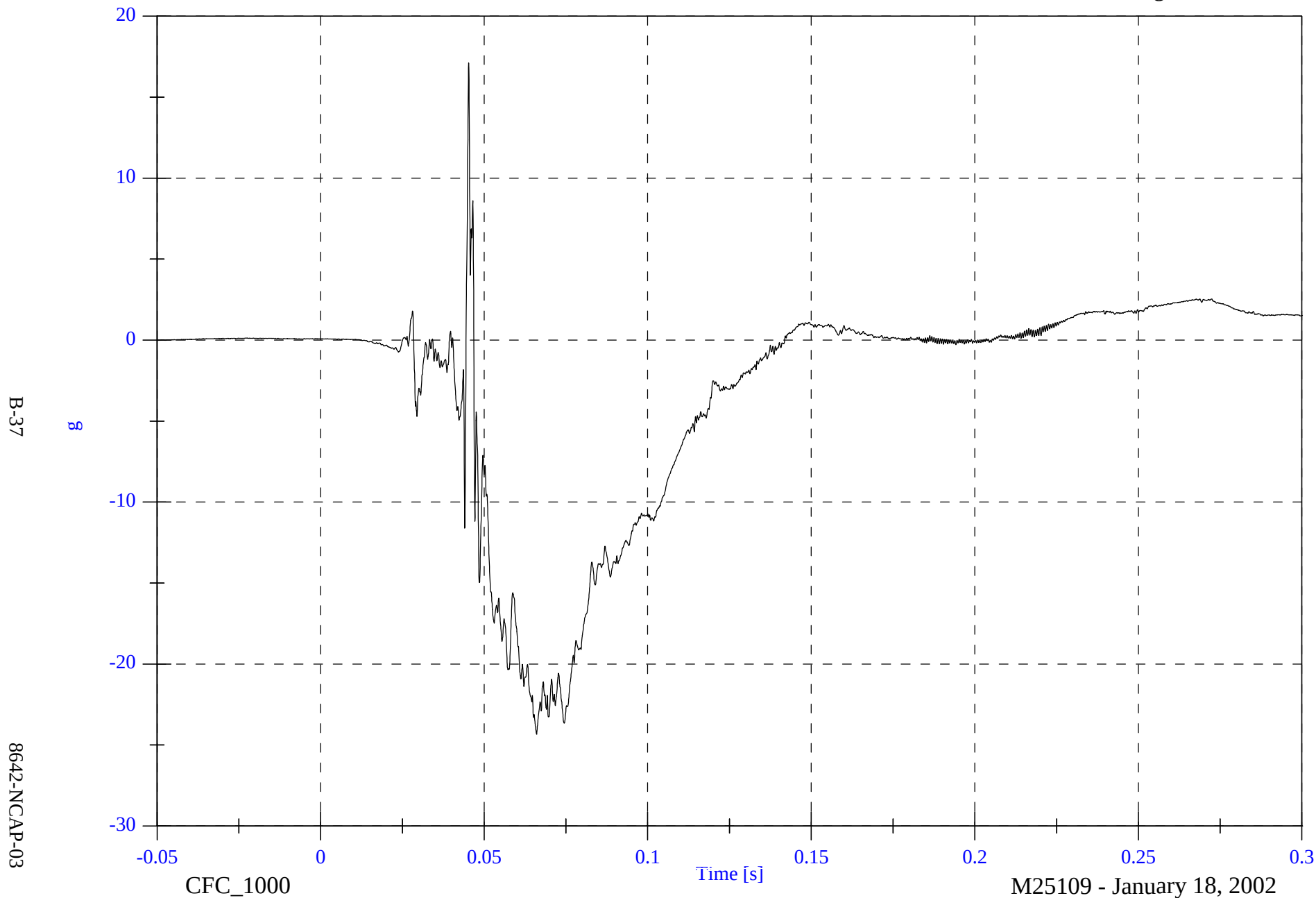


2002 NCAP Test 3-2002 Toyota Sequoia

Max: 17.1 [g] at 0.045 [s]

Min: -24.3 [g] at 0.066 [s]

P1 Pelvic z



2002 NCAP Test 3-2002 Toyota Sequoia

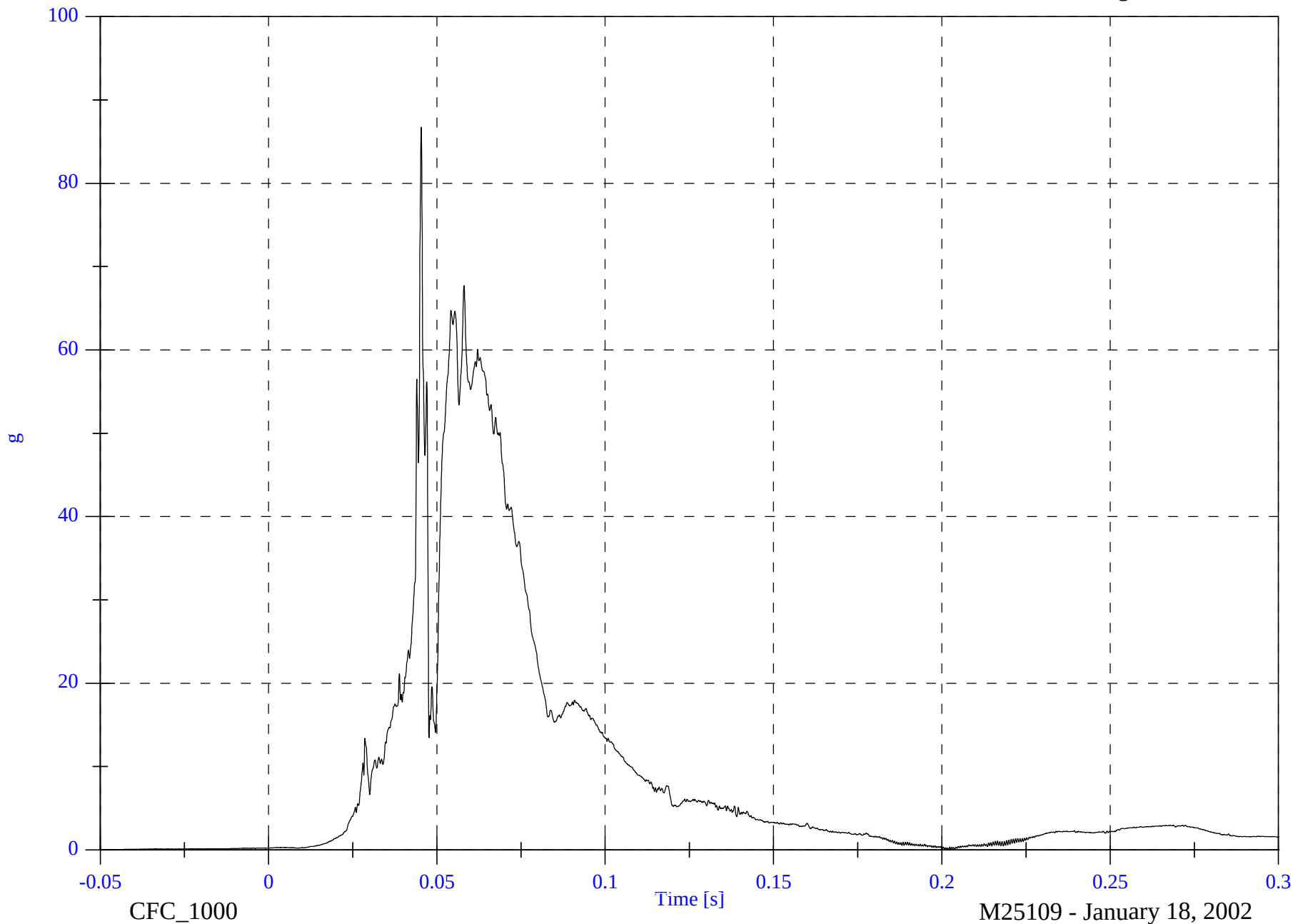
P1 Pelvic Resultant

Max: 86.7 [g] at 0.045 [s]

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

B-38

8642-NCAP-03

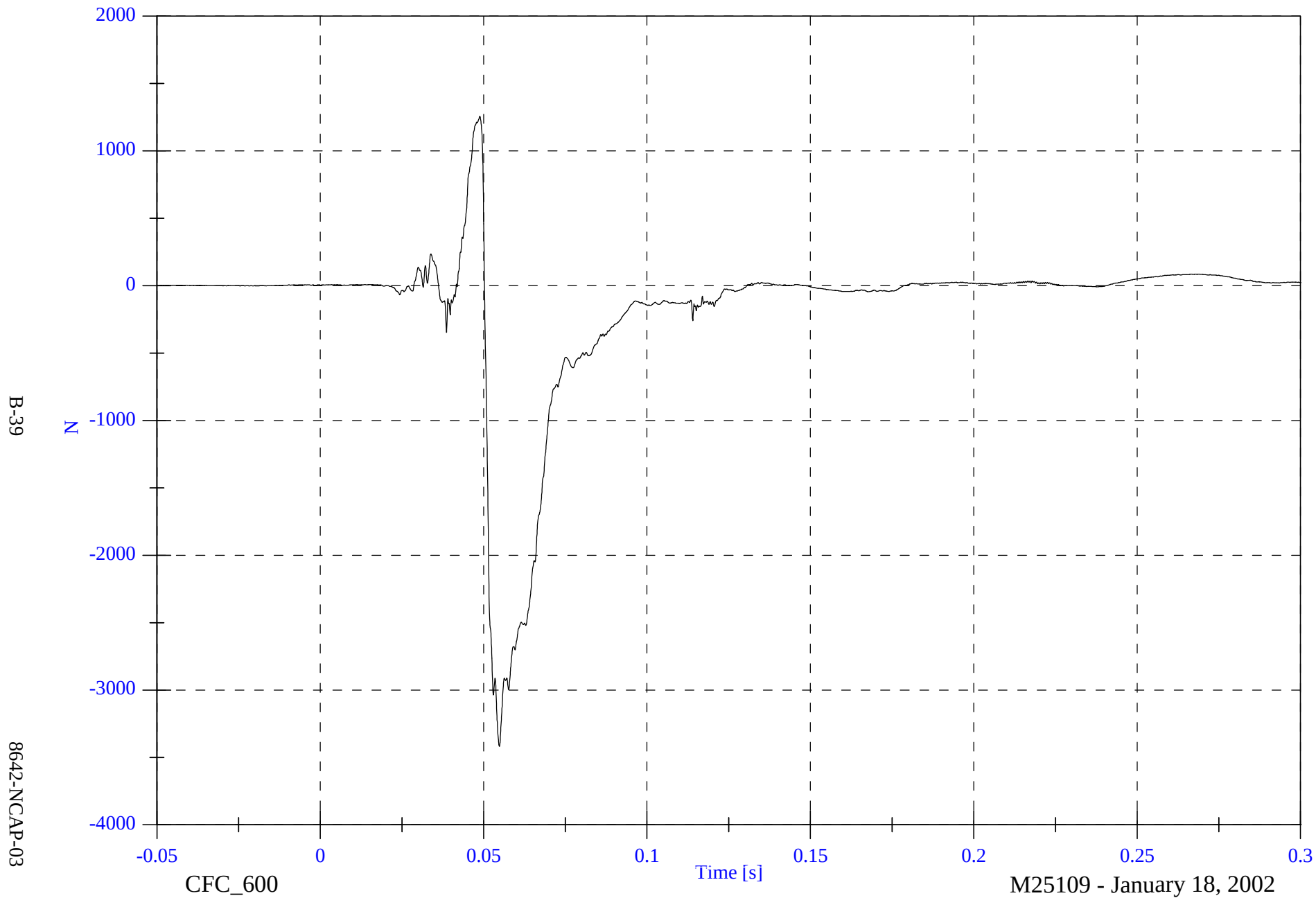


2002 NCAP Test 3-2002 Toyota Sequoia

Max: 1258.5 [N] at 0.049 [s]

Min: -3418.5 [N] at 0.055 [s]

P1 Left Femur z

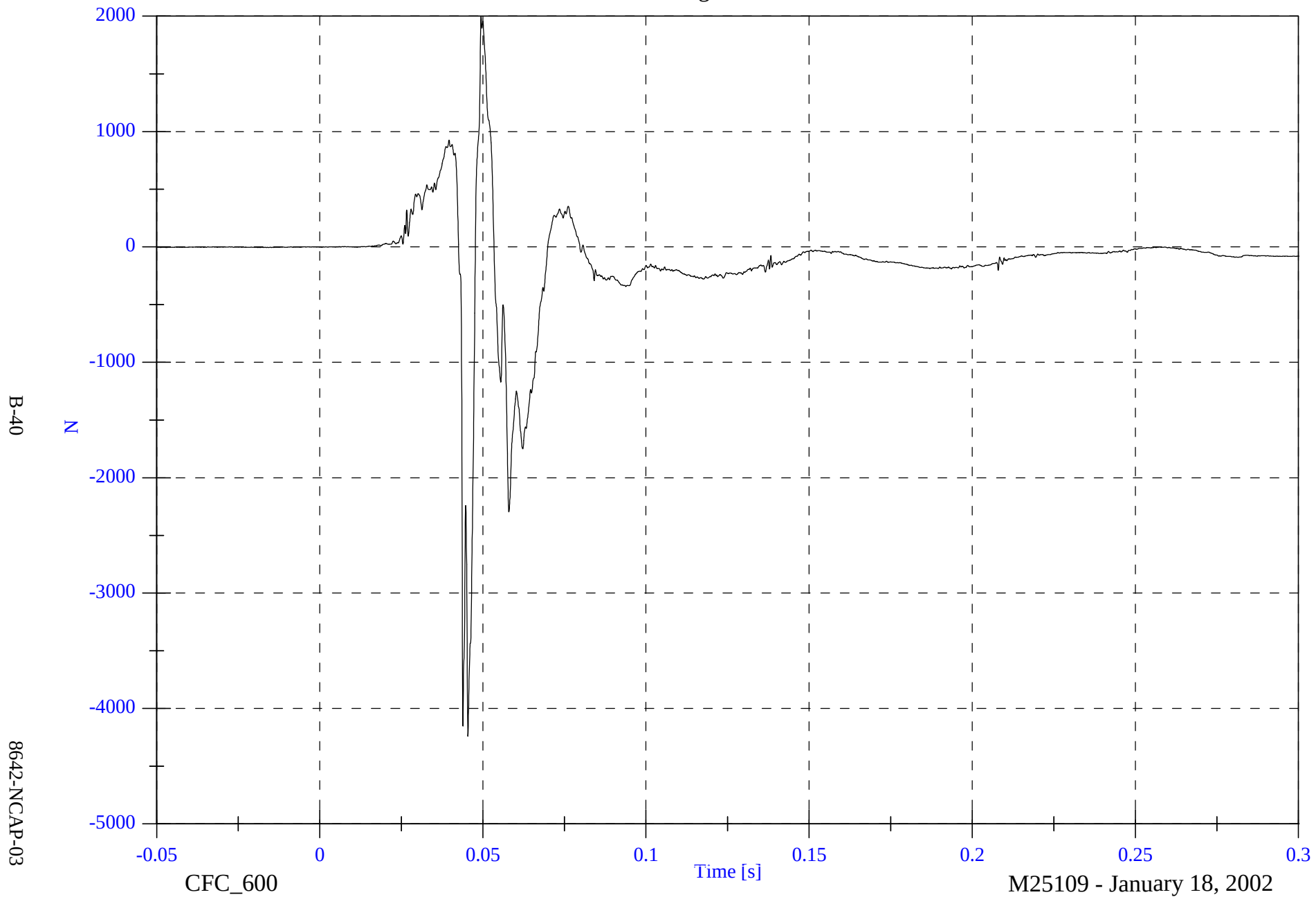


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Femur z

Max: 1995.6 [N] at 0.049 [s]

Min: -4240.9 [N] at 0.045 [s]

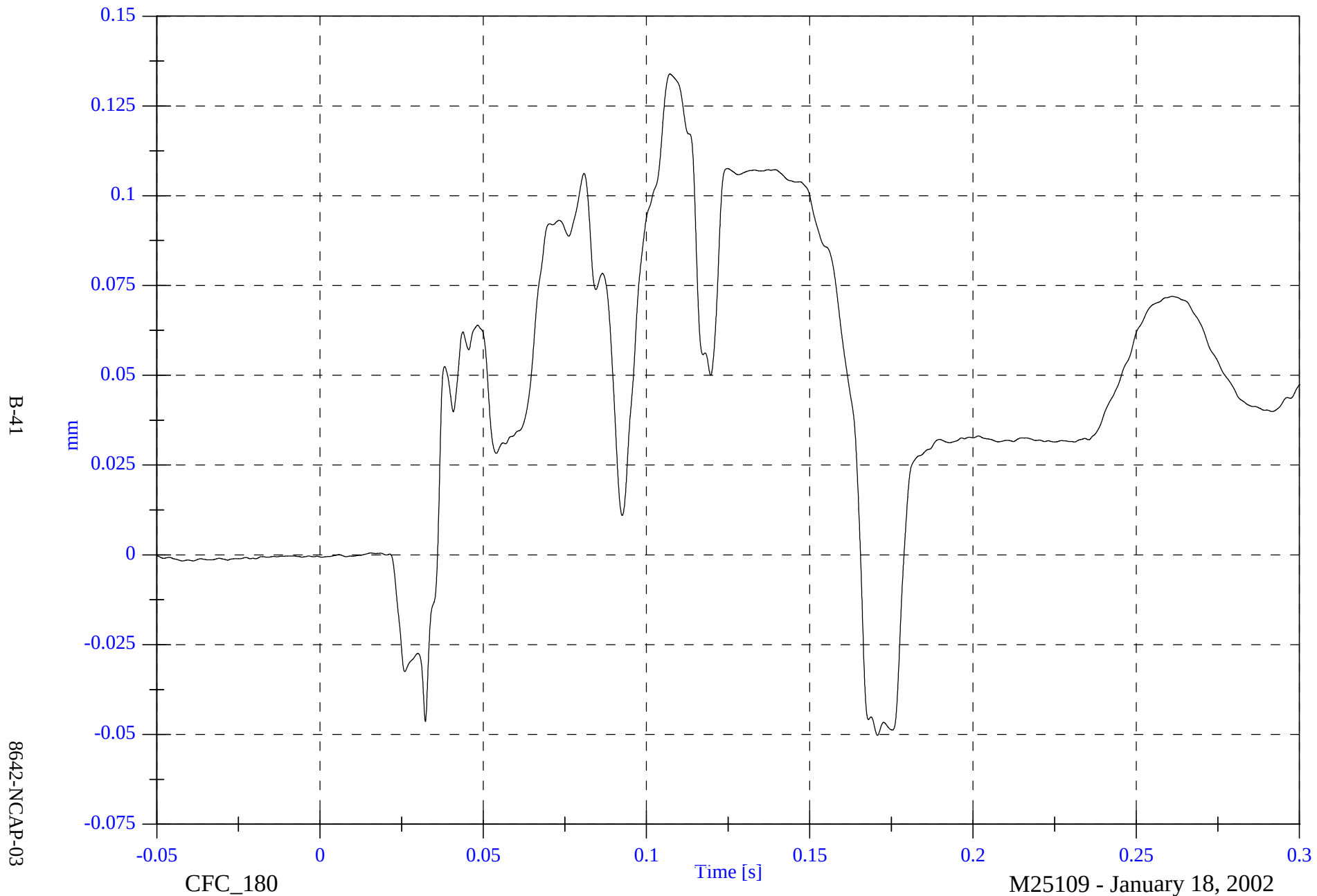


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Left Knee Shear

Max: 0.1 [mm] at 0.107 [s]

Min: -0.1 [mm] at 0.171 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

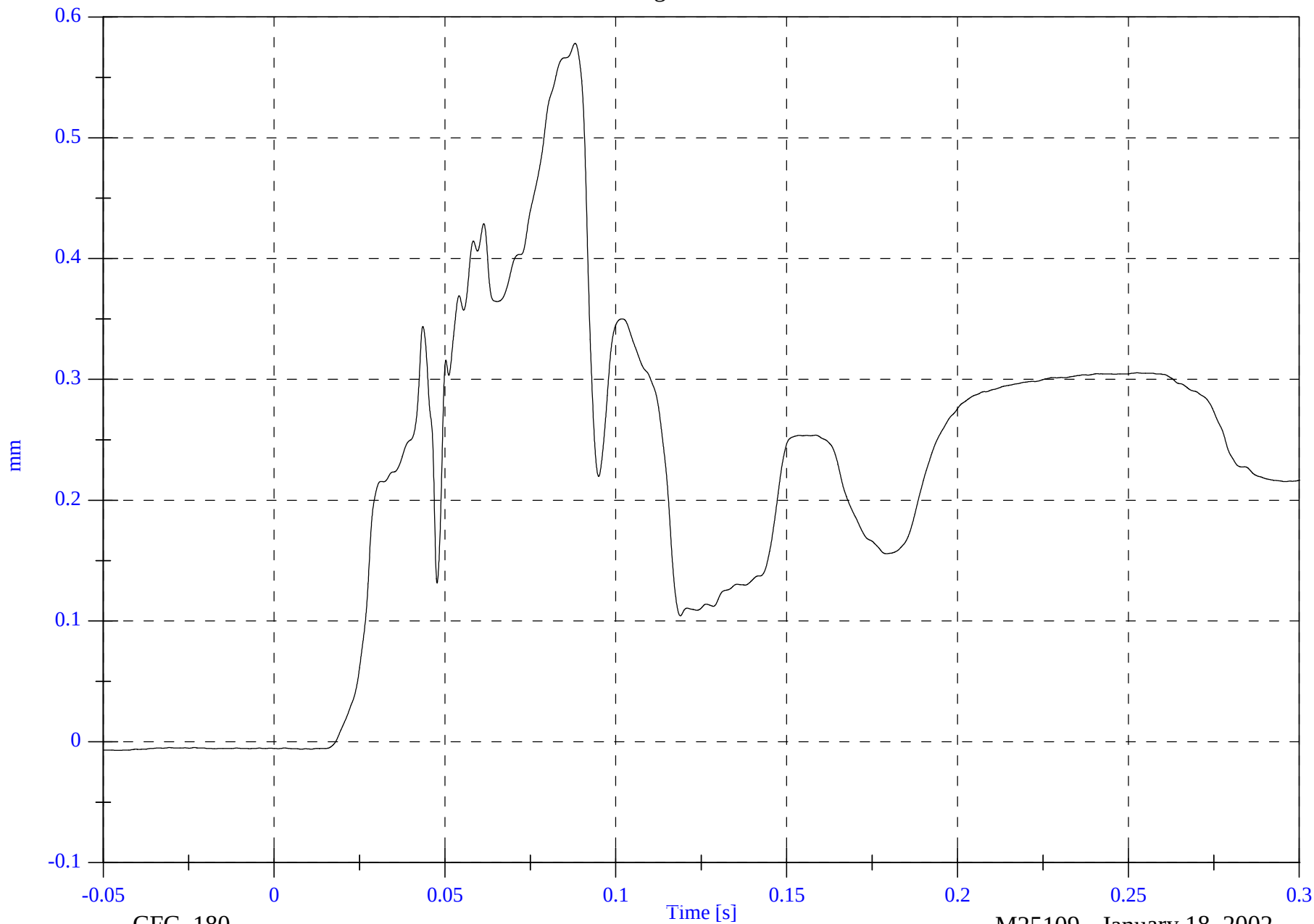
P1 Right Knee Shear

Max: 0.6 [mm] at 0.088 [s]

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

B-42

8642-NCAP-03



CFC_180

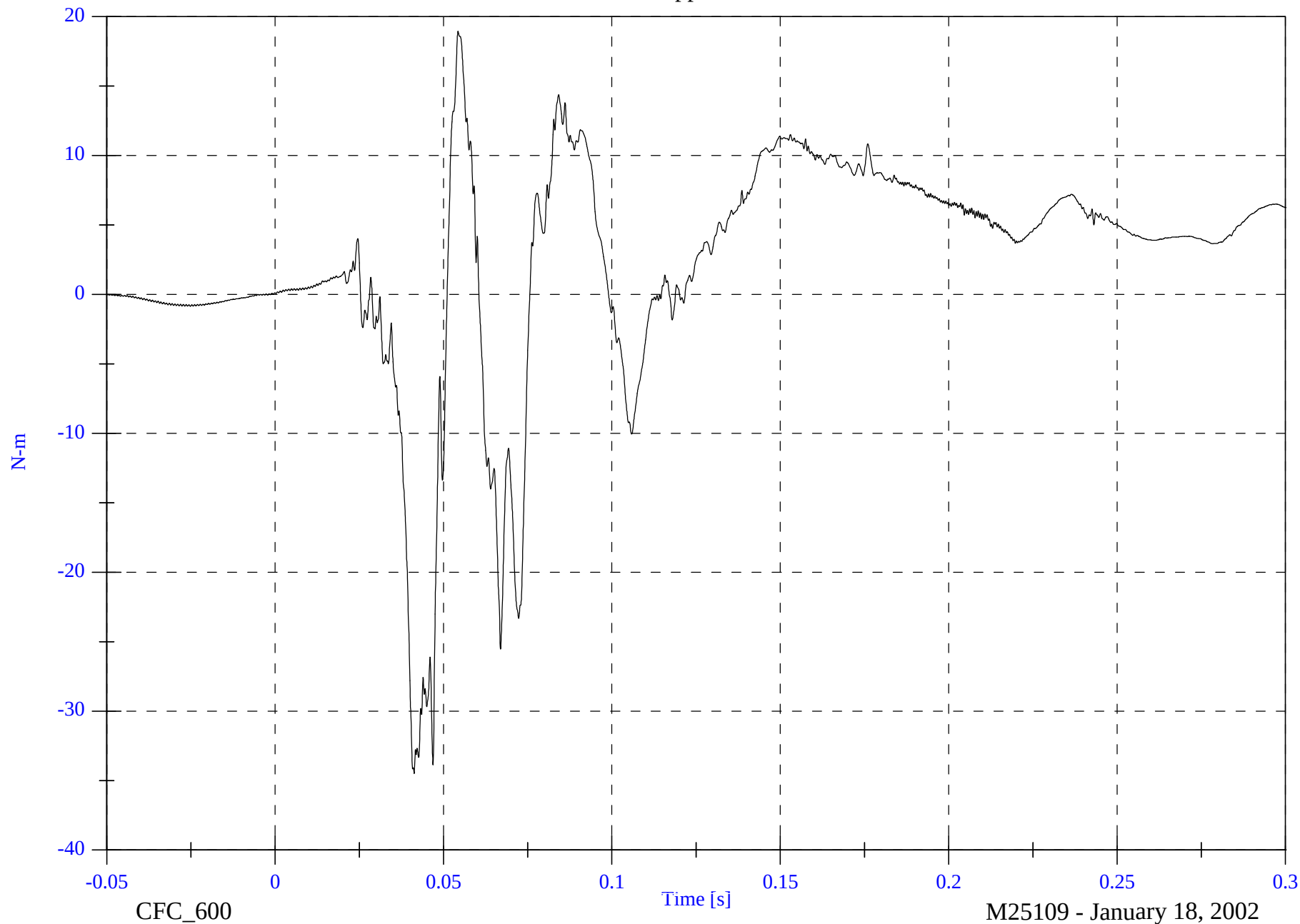
M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

P1 Left Upper Tibia Mx

Max: 18.9 [N-m] at 0.054 [s]

Min: -34.5 [N-m] at 0.041 [s]



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8642-NCAP-03

2002 NCAP Test 3-2002 Toyota Sequoia

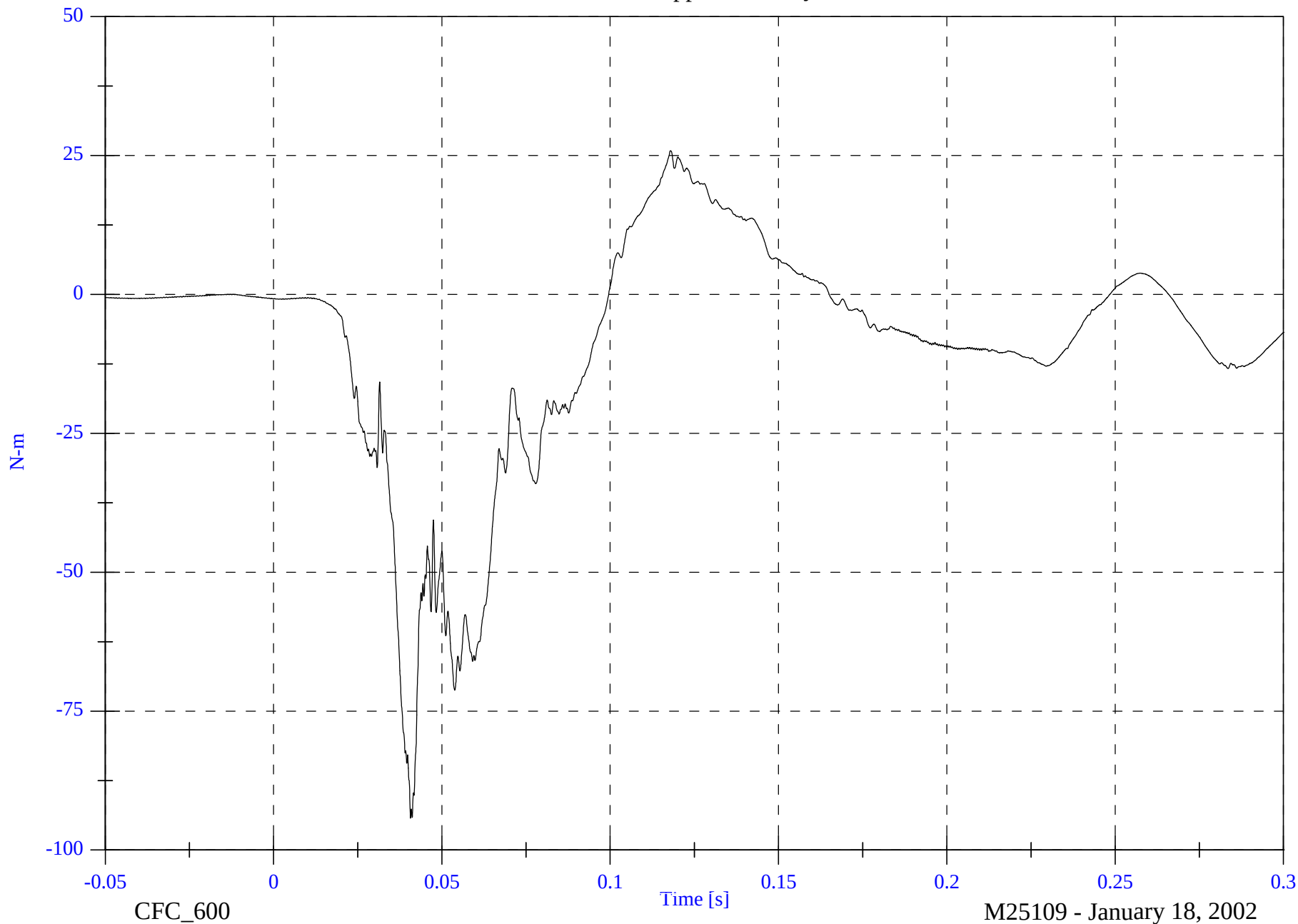
P1 Left Upper Tibia My

Max: 25.9 [N-m] at 0.118 [s]

Min: -94.3 [N-m] at 0.041 [s]

B-44

8642-NCAP-03

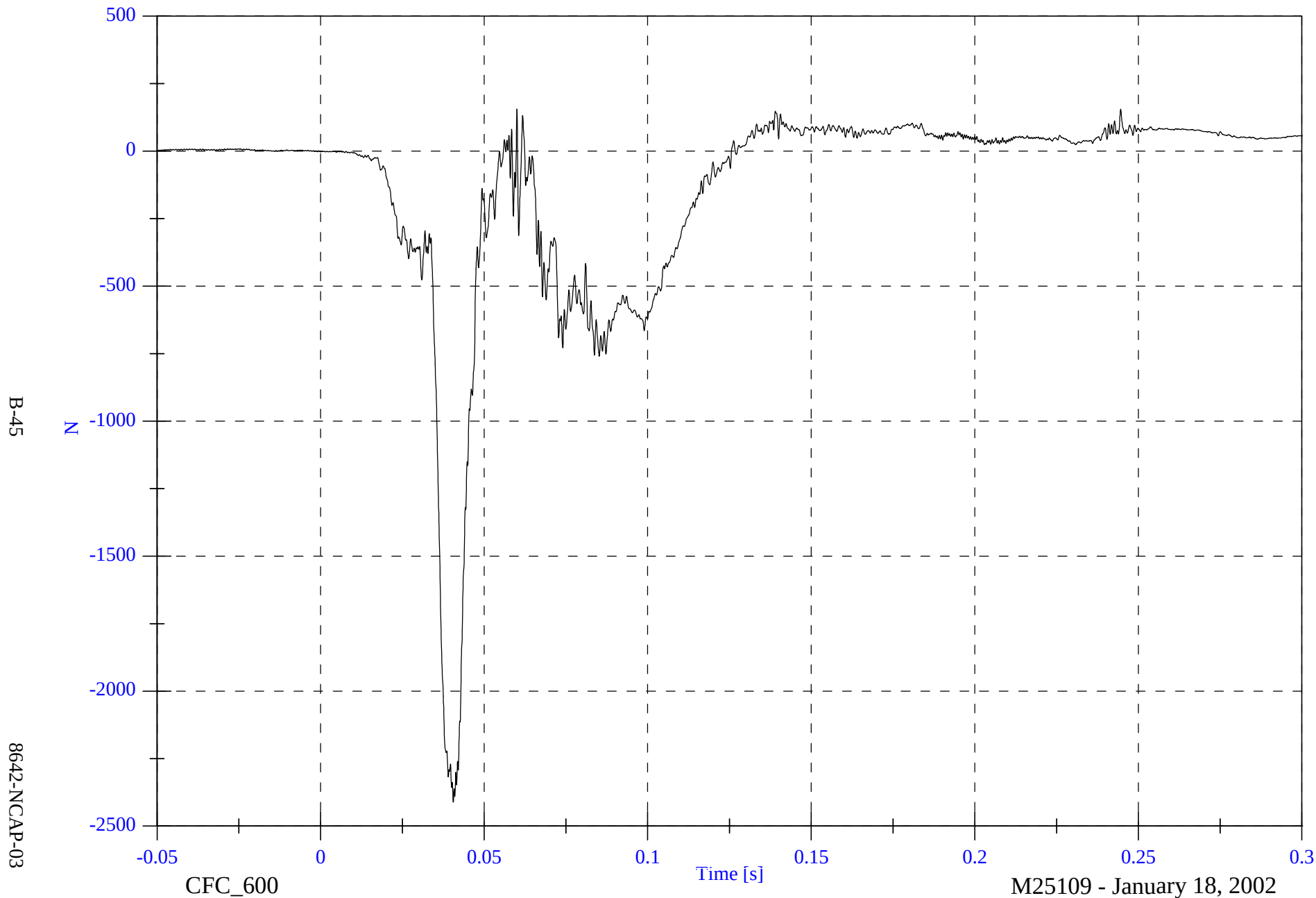


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Left Lower Tibia Fz

Max: 156.0 [N] at 0.060 [s]

Min: -2412.0 [N] at 0.041 [s]

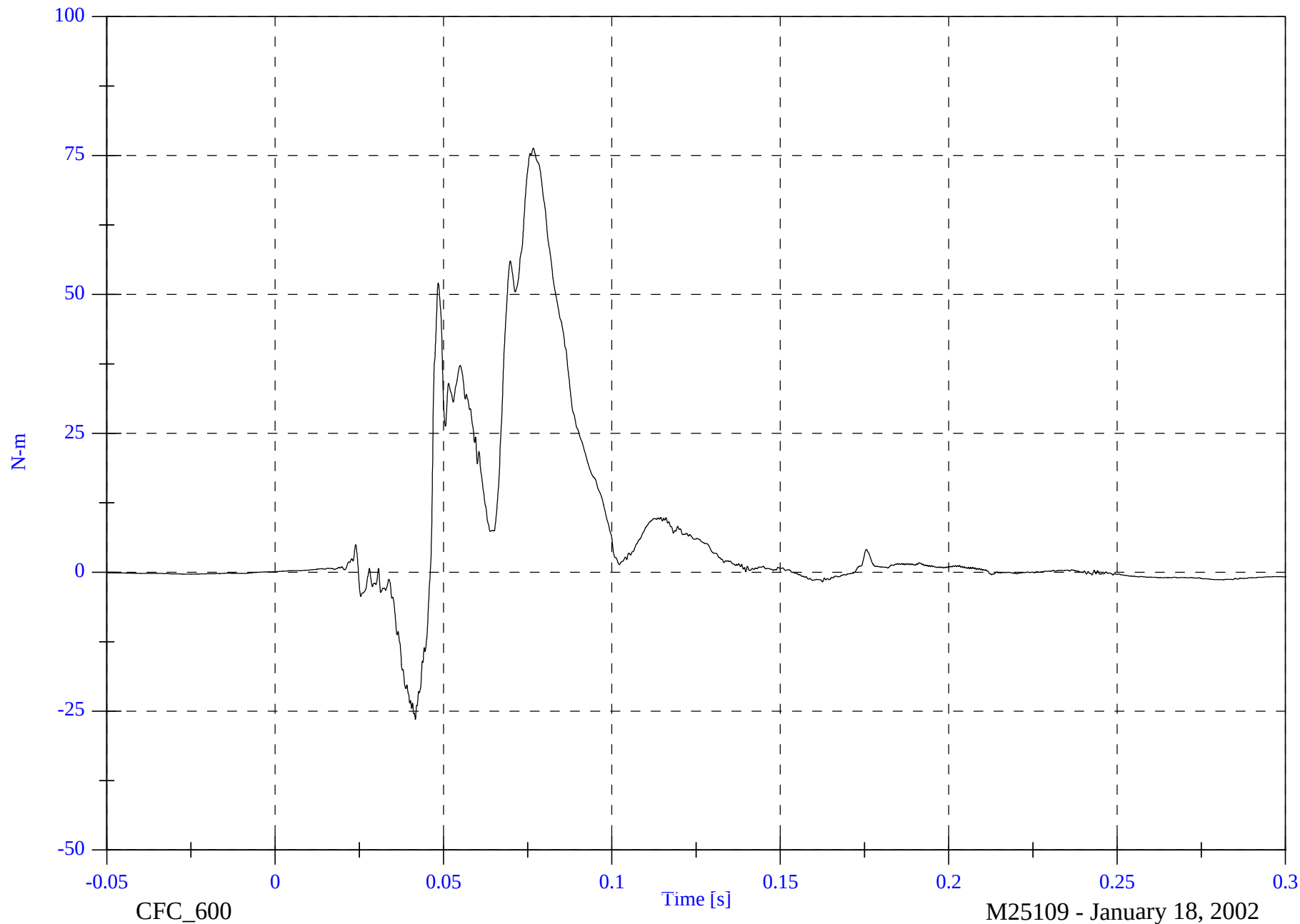


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Left Lower Tibia Mx

Max: 76.3 [N-m] at 0.077 [s]

Min: -26.5 [N-m] at 0.042 [s]



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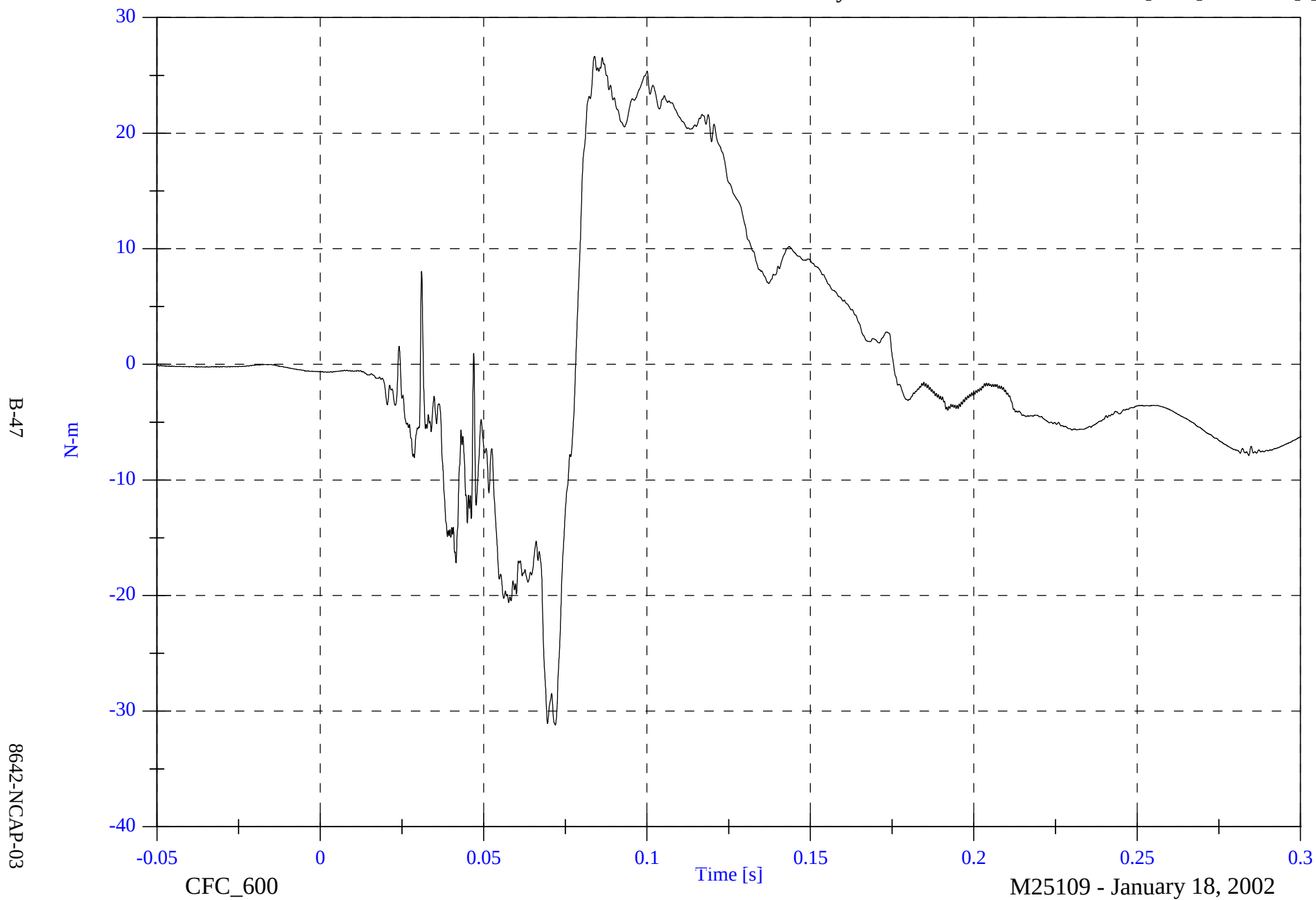
8642-NCAP-03

2002 NCAP Test 3-2002 Toyota Sequoia

Max: 26.7 [N-m] at 0.084 [s]

Min: -31.2 [N-m] at 0.072 [s]

P1 Left Lower Tibia My

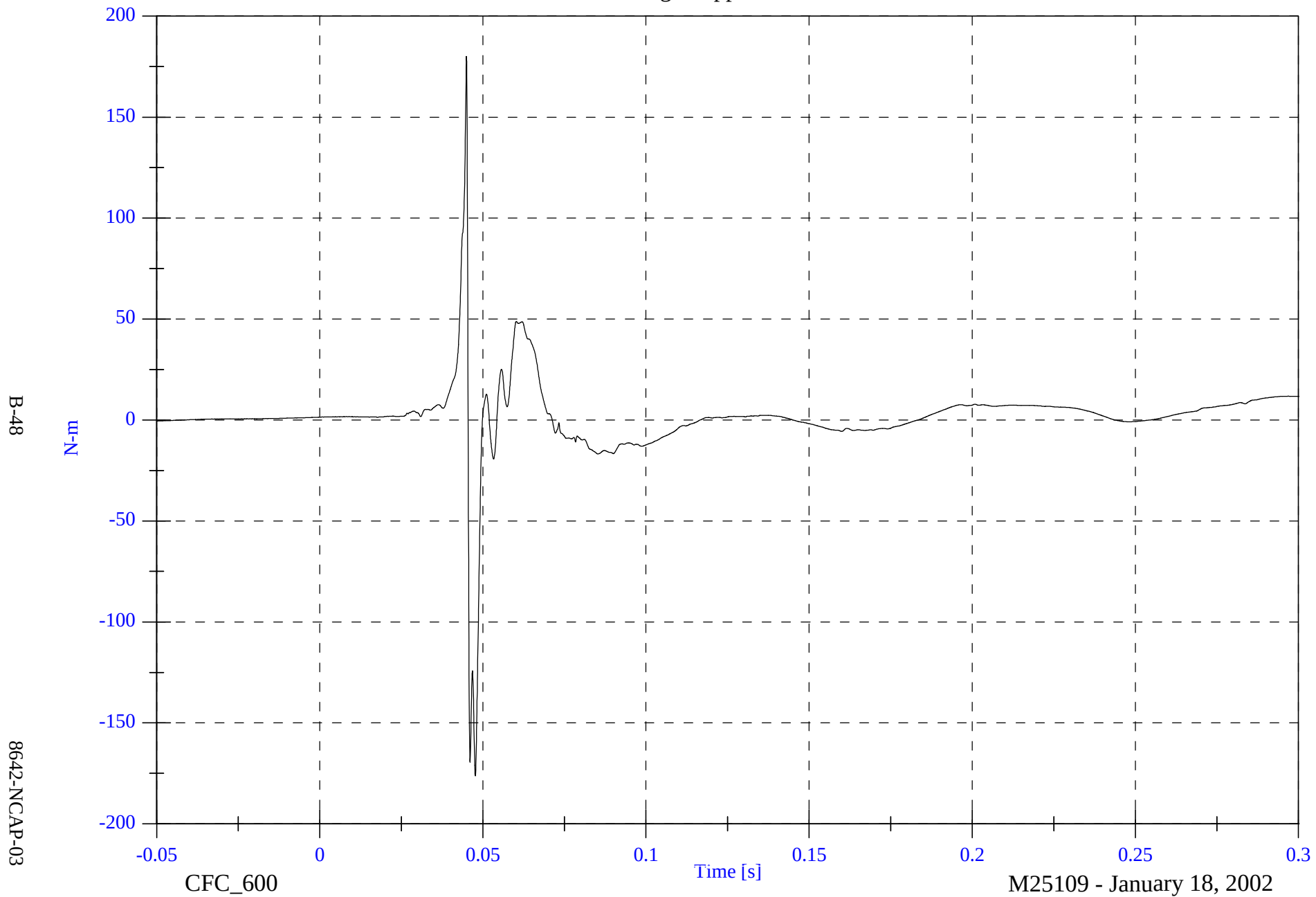


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Upper Tibia Mx

Max: 180.1 [N-m] at 0.045 [s]

Min: -176.3 [N-m] at 0.048 [s]

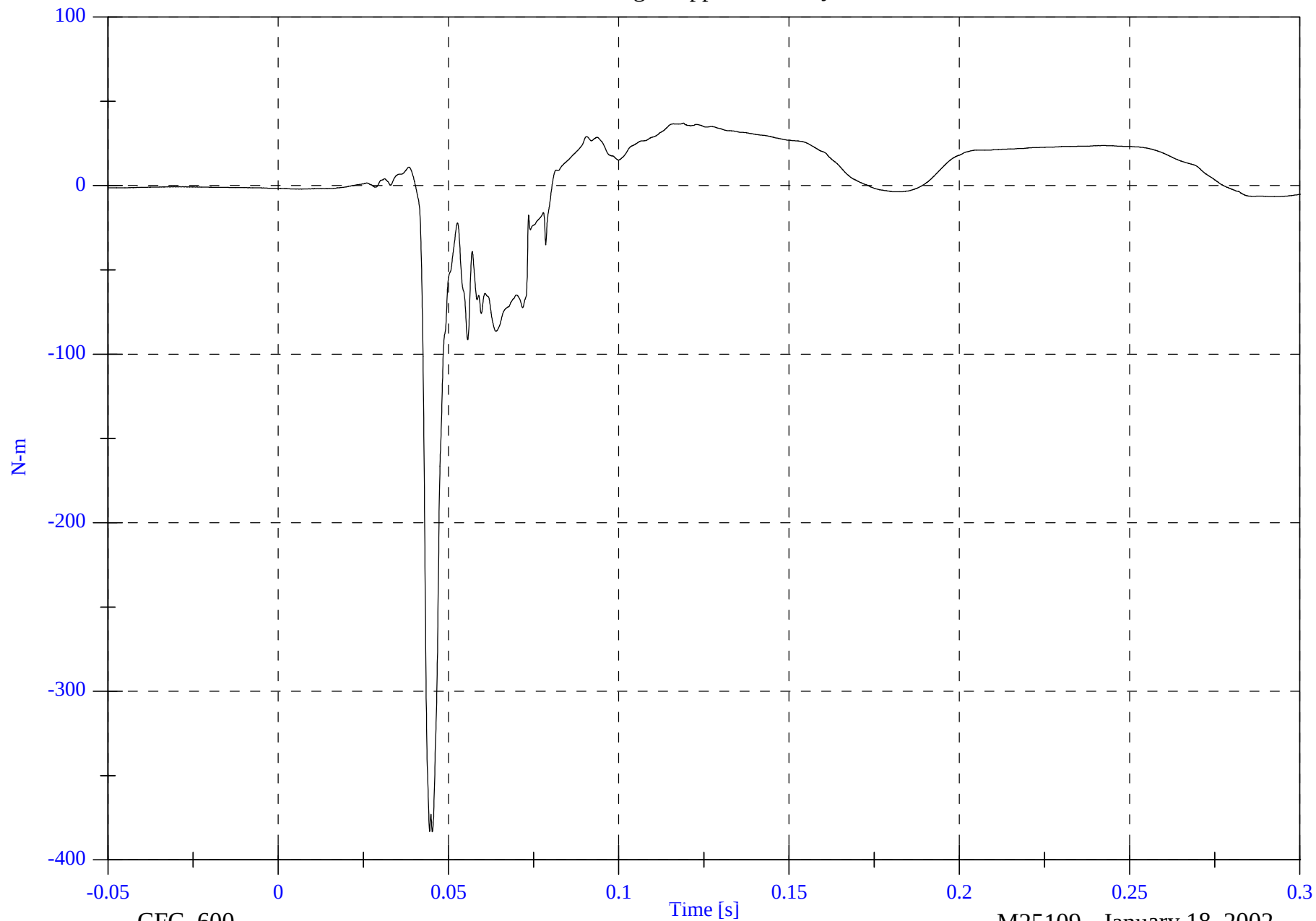


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Upper Tibia My

Max: 37.0 [N-m] at 0.119 [s]

Min: -383.4 [N-m] at 0.045 [s]



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8642-NCAP-03

CFC_600

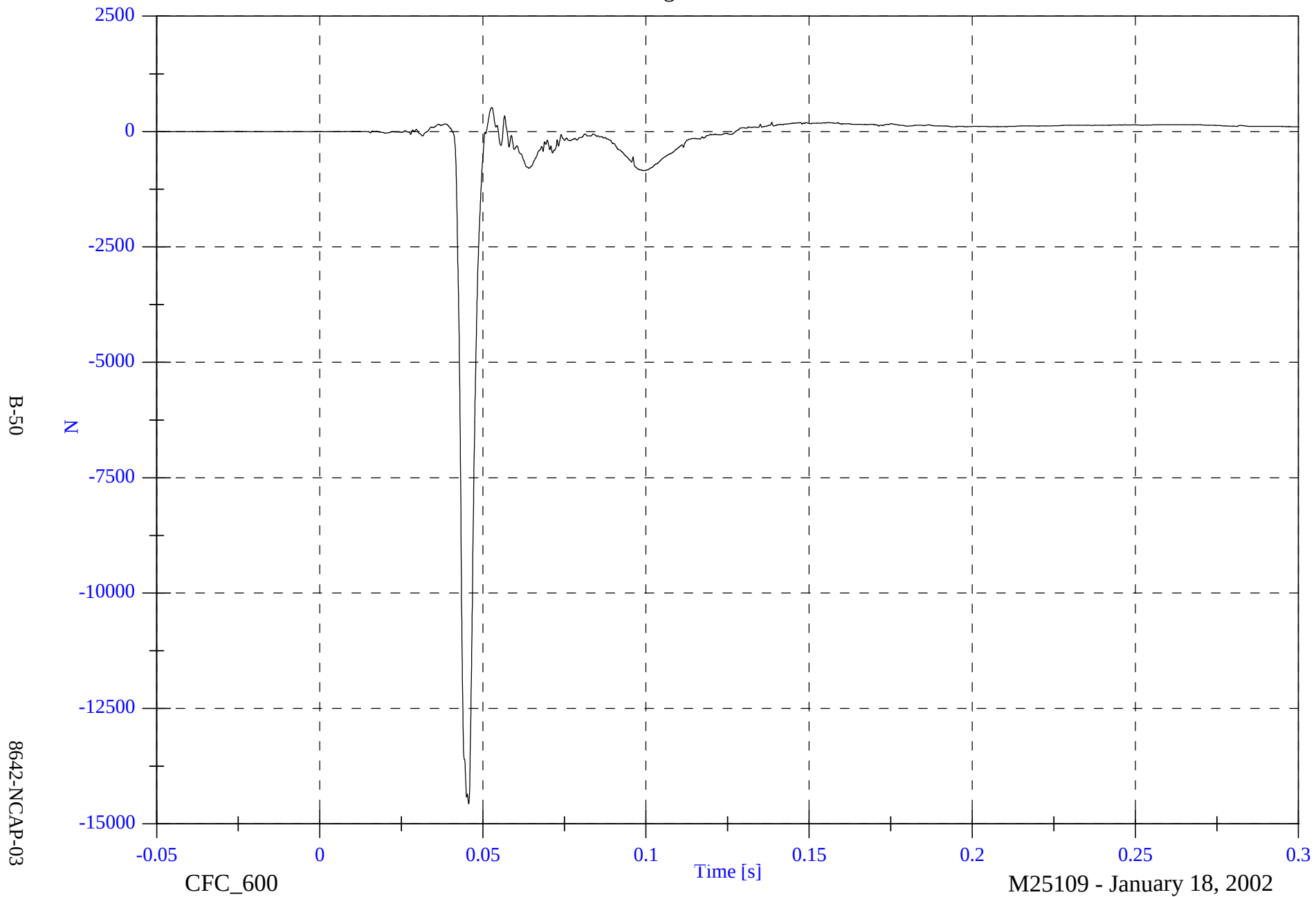
M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Lower Tibia Fz

Max: 522.5 [N] at 0.053 [s]

Min: -14564.4 [N] at 0.046 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

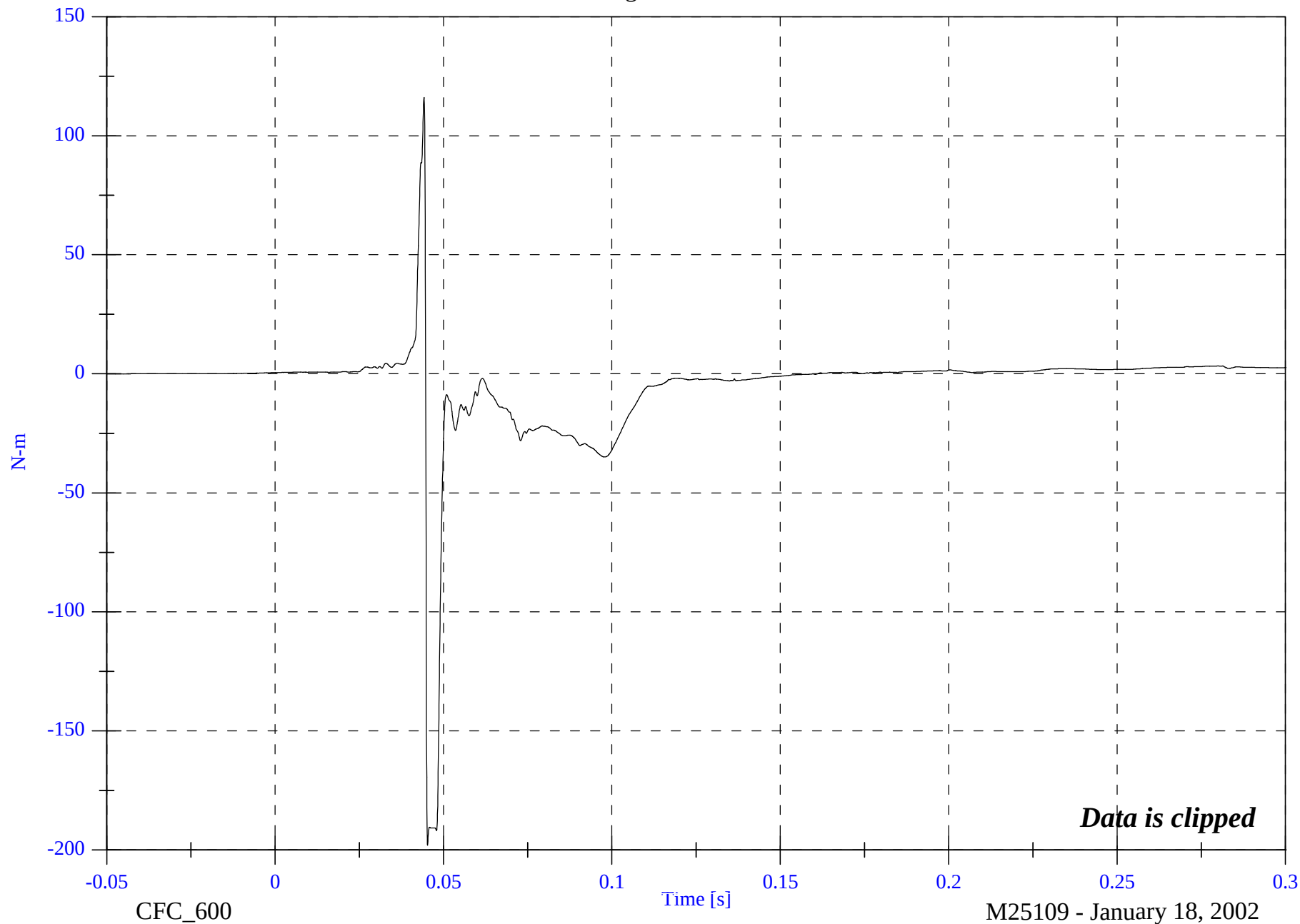
P1 Right Lower Tibia Mx

Max: 116.0 [N-m] at 0.044 [s]

Min: -198.0 [N-m] at 0.045 [s]

B-51

8642-NCAP-03



Data is clipped

2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Lower Tibia My

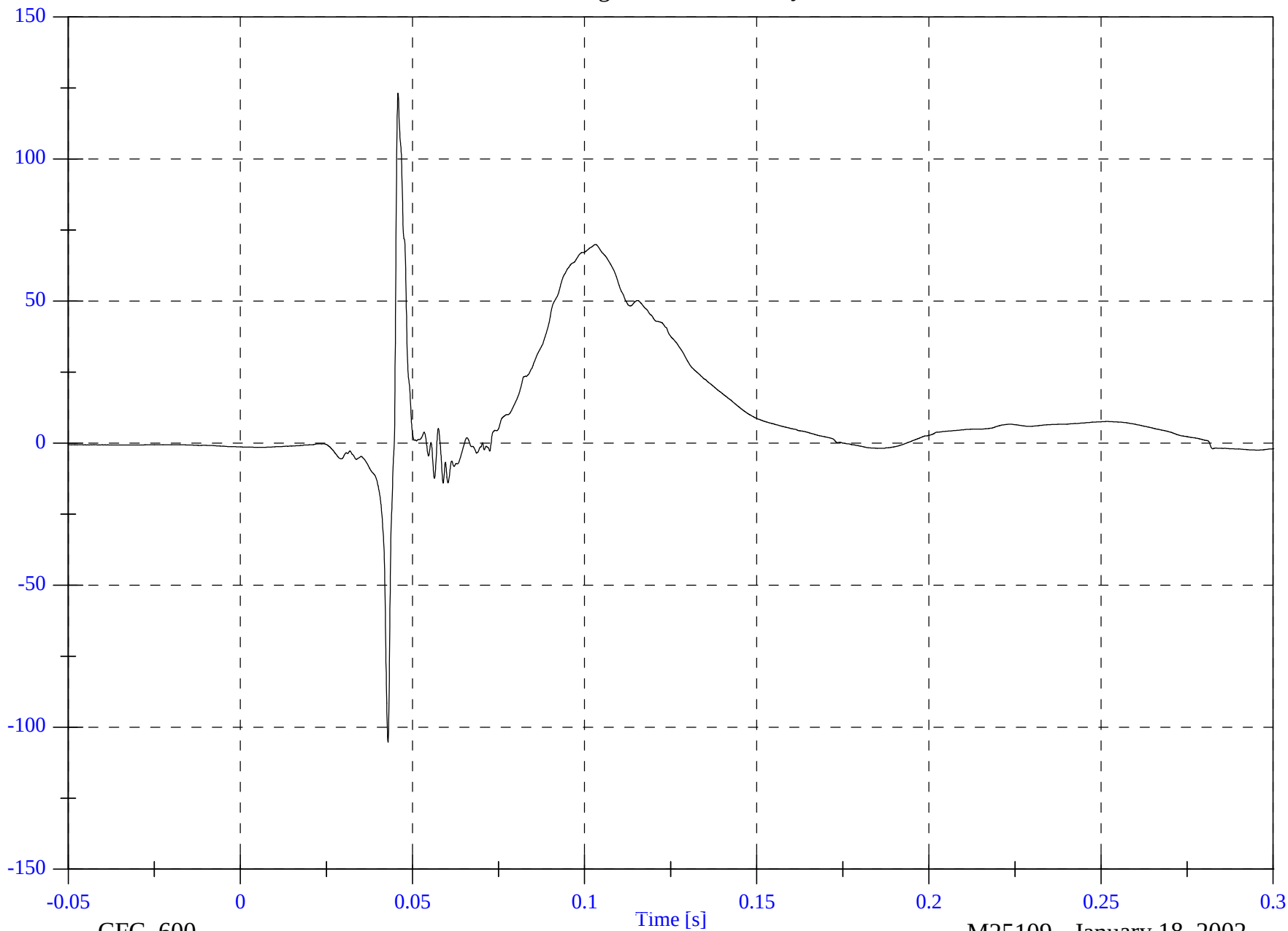
Max: 123.2 [N-m] at 0.046 [s]

Min: -105.3 [N-m] at 0.043 [s]

B-52

N-m

8642-NCAP-03



CFC_600

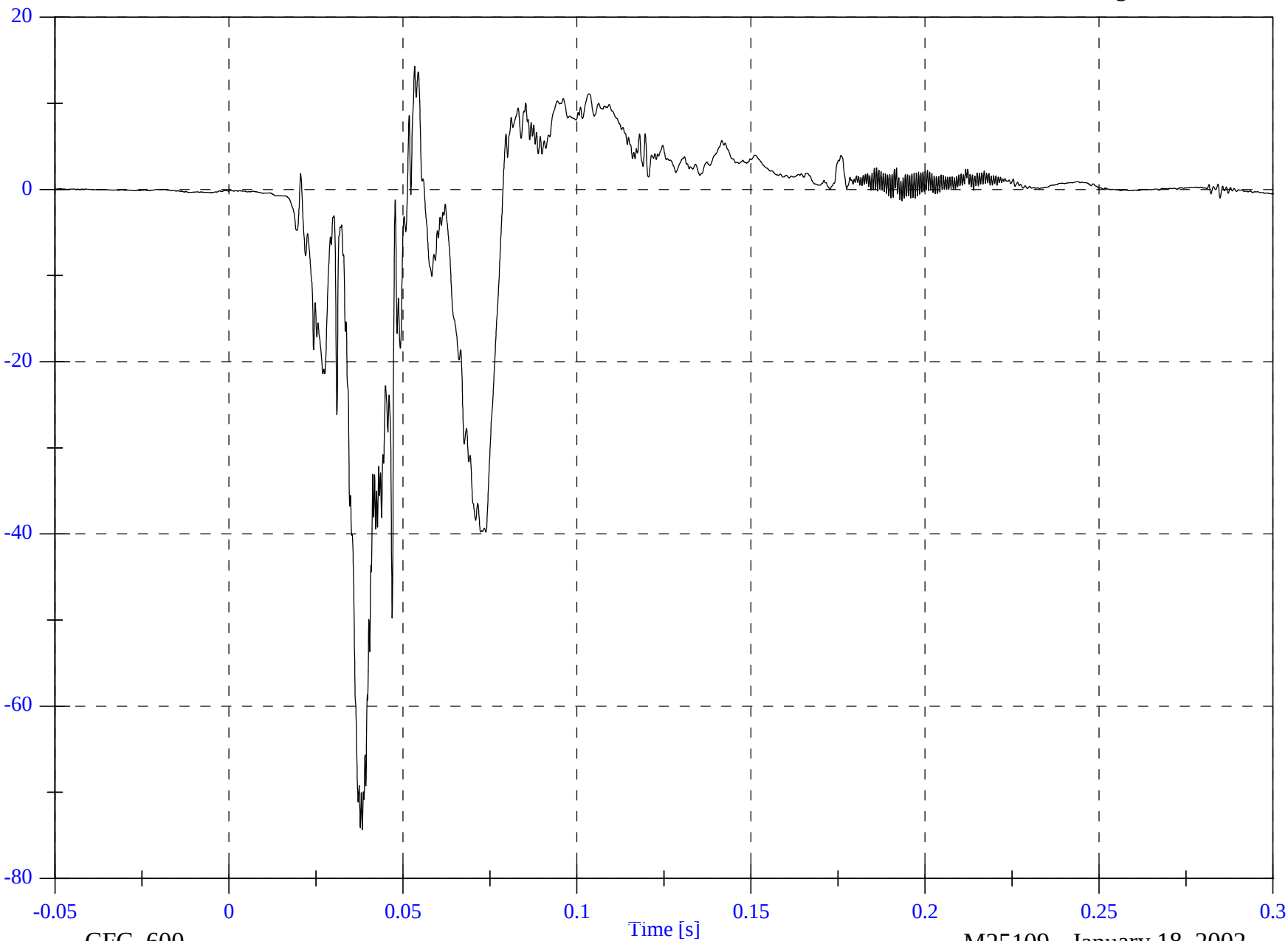
M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

P1 Left Foot Aft x

Max: 14.3 [g] at 0.053 [s]

Min: -74.3 [g] at 0.038 [s]



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CFC_600

Time [s]

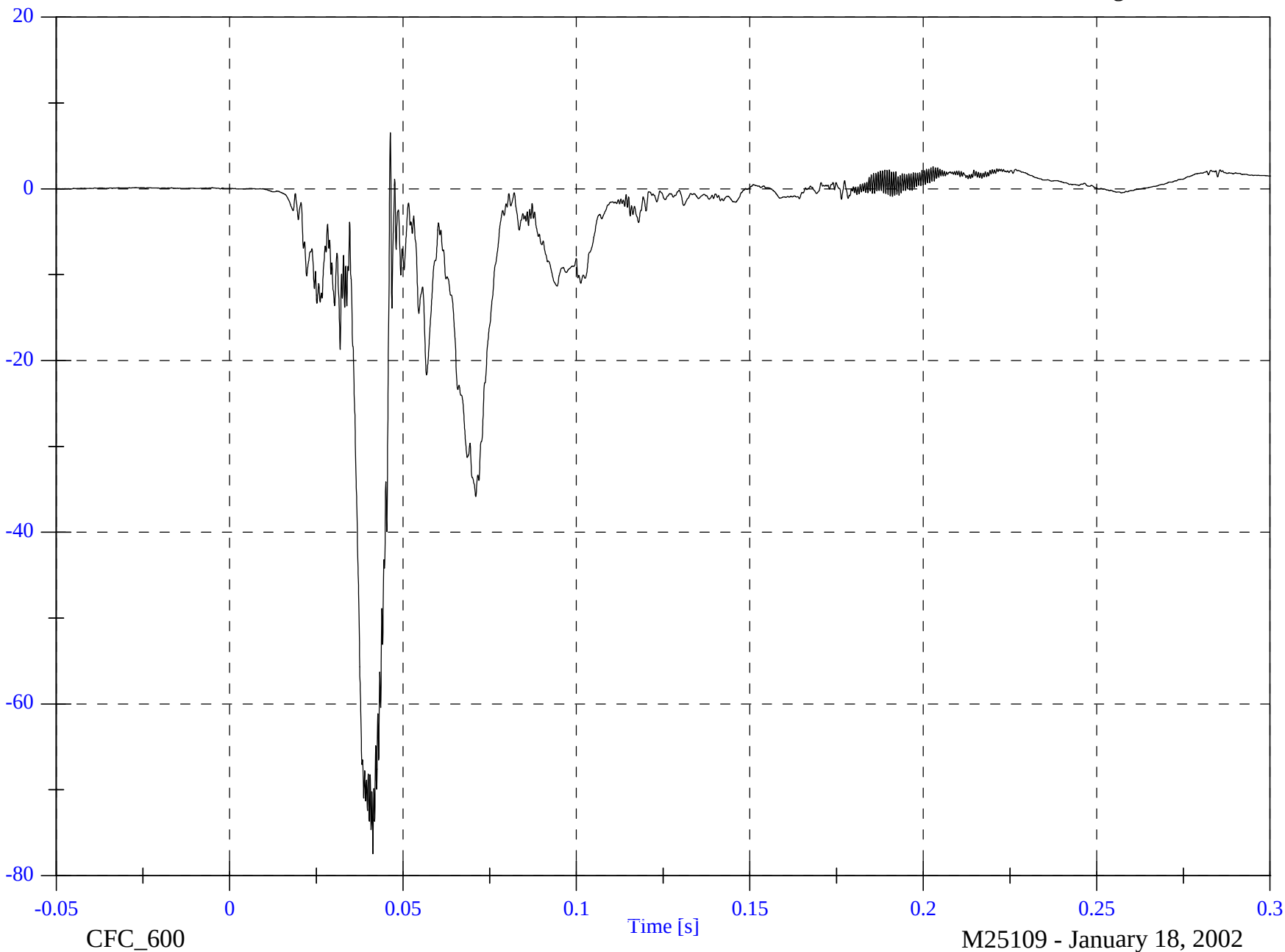
M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

P1 Left Foot Aft z

Max: 6.5 [g] at 0.046 [s]

Min: -77.5 [g] at 0.041 [s]



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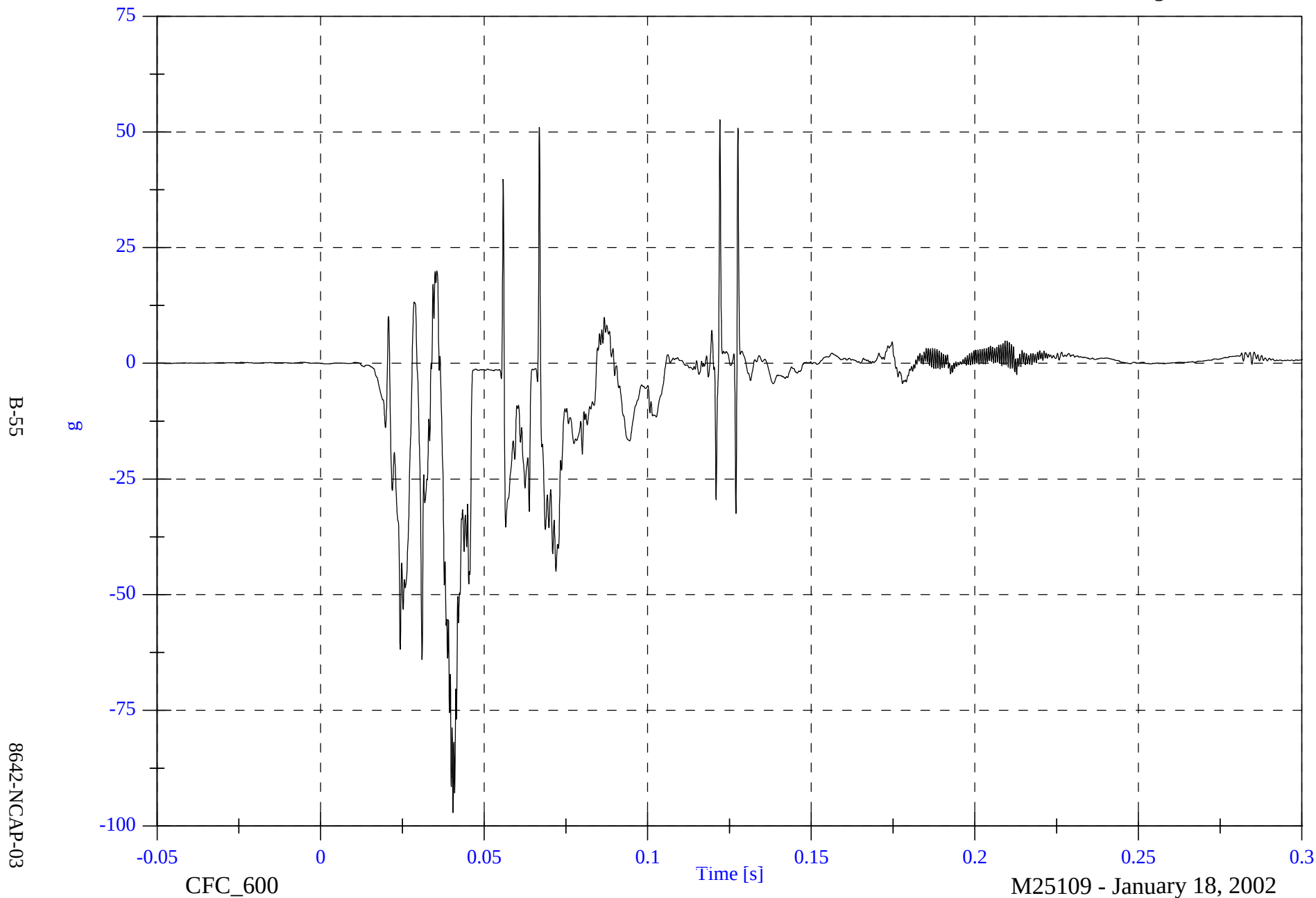
8642-NCAP-03

2002 NCAP Test 3-2002 Toyota Sequoia

Max: 52.6 [g] at 0.122 [s]

Min: -97.1 [g] at 0.040 [s]

P1 Left Foot Fore z

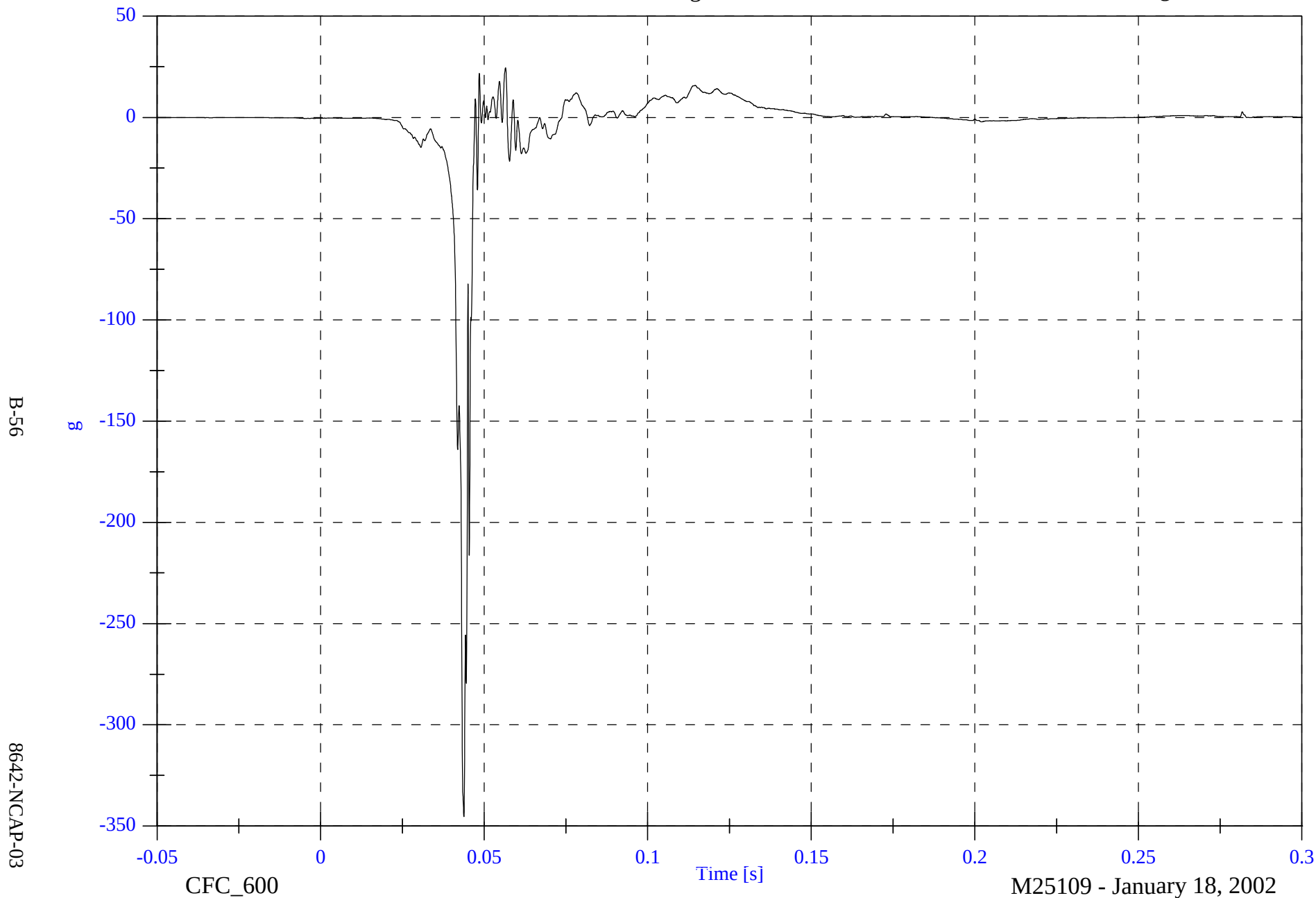


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Foot Aft x

Max: 24.6 [g] at 0.057 [s]

Min: -345.3 [g] at 0.044 [s]

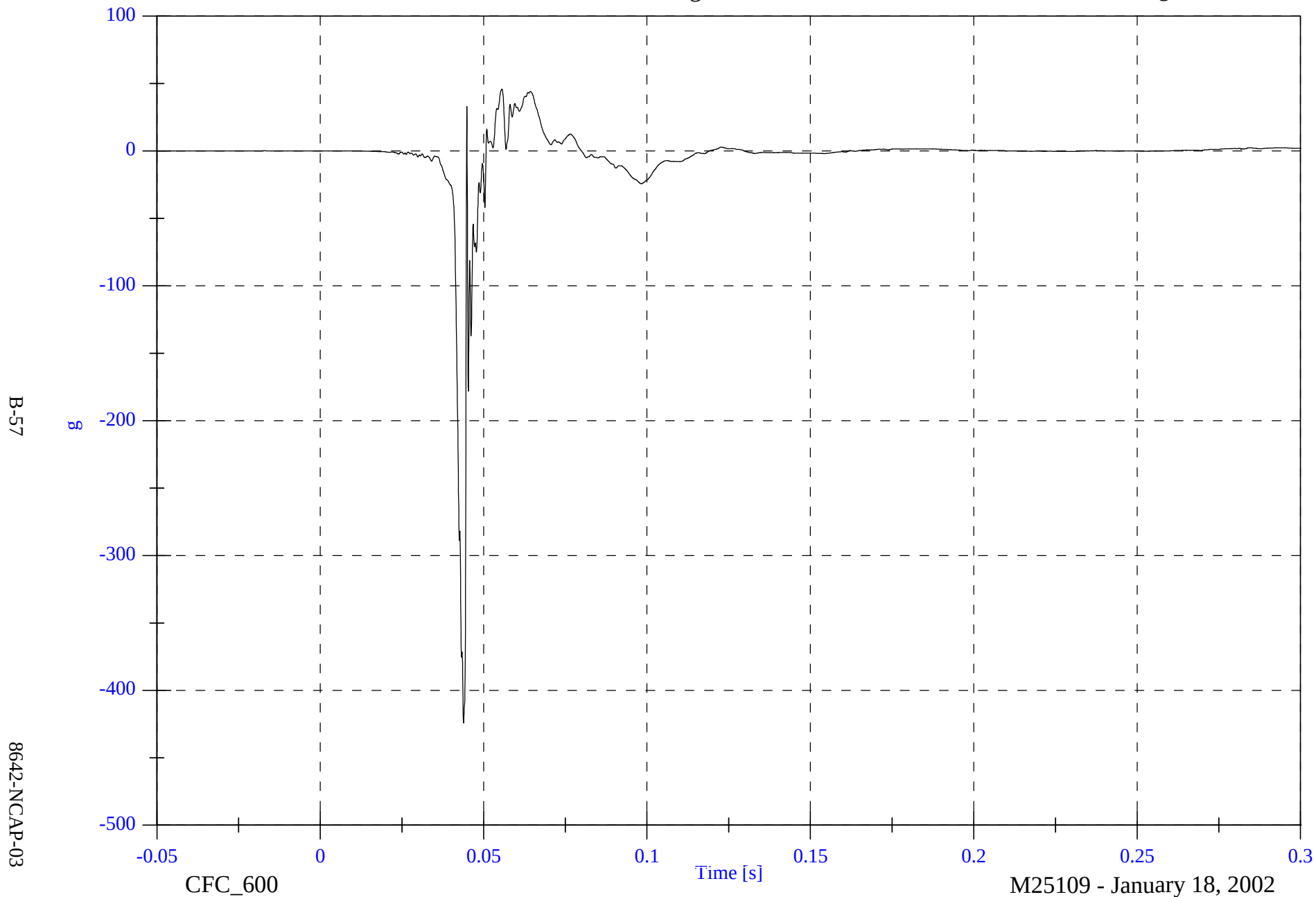


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Foot Aft z

Max: 46.0 [g] at 0.056 [s]

Min: -424.4 [g] at 0.044 [s]

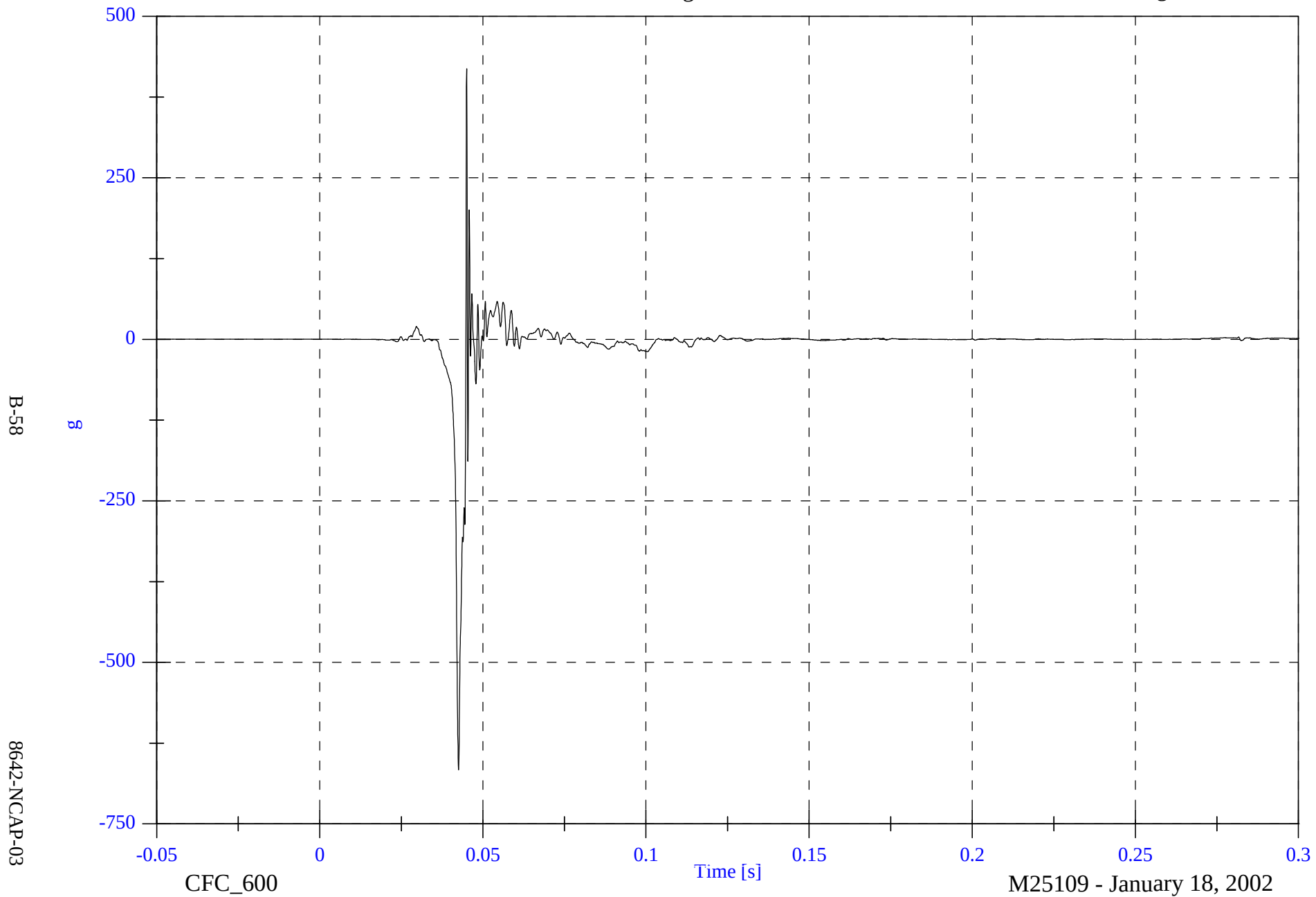


2002 NCAP Test 3-2002 Toyota Sequoia

P1 Right Foot Fore z

Max: 418.6 [g] at 0.045 [s]

Min: -666.3 [g] at 0.043 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

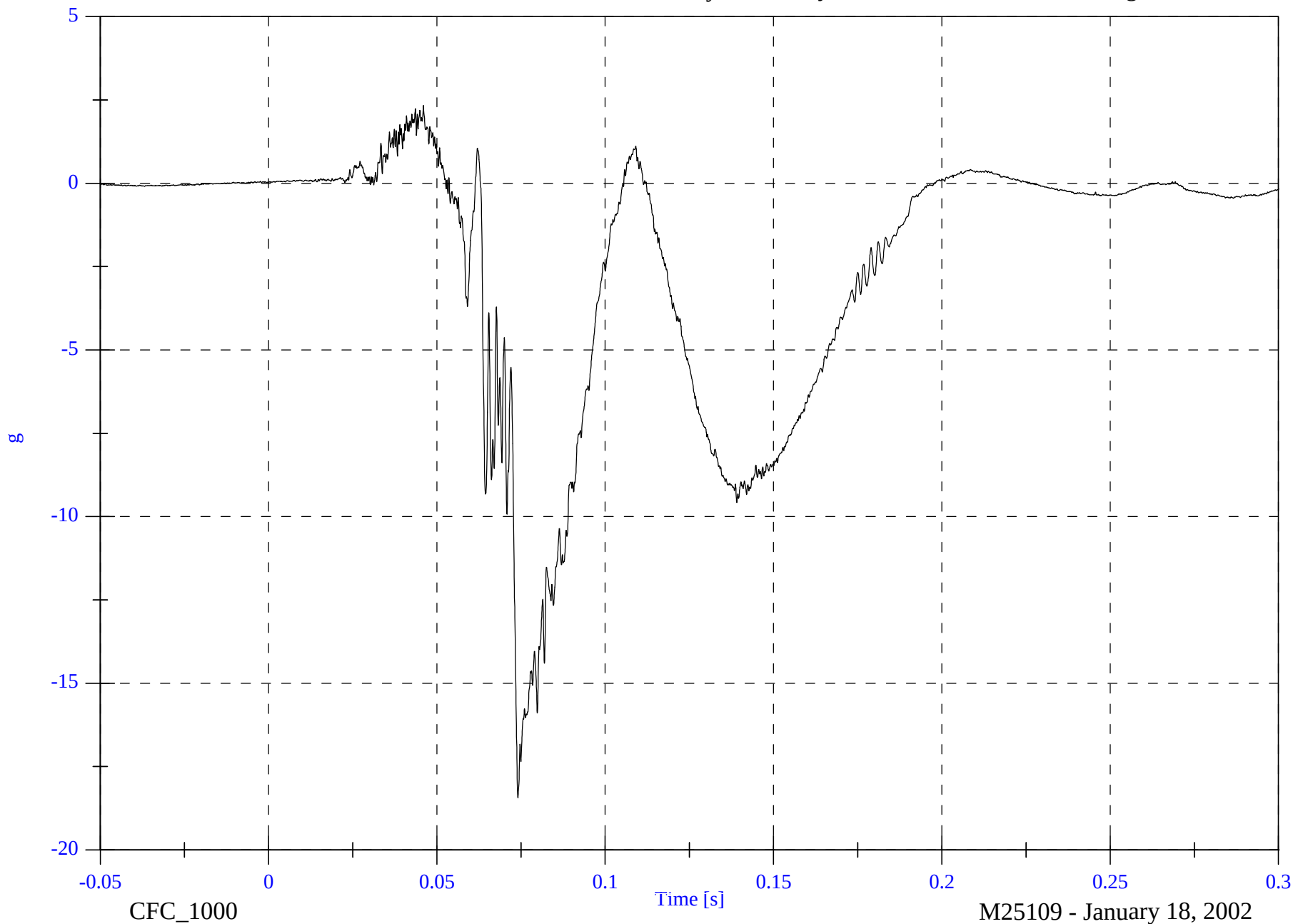
P2 Head 9 Array X Arm Ay

Max: 2.3 [g] at 0.046 [s]

Min: -18.4 [g] at 0.074 [s]

B-59

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

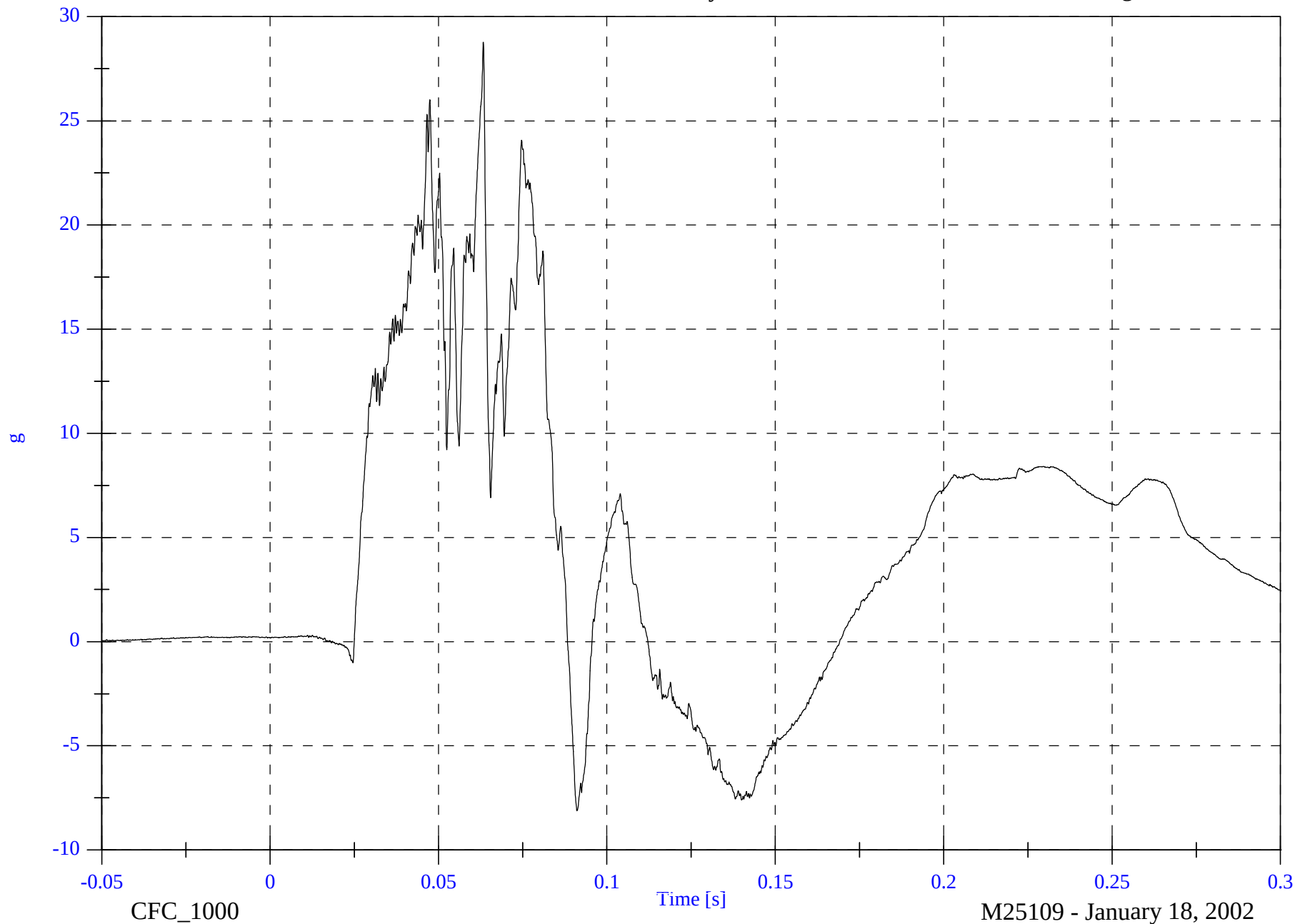
P2 Head 9 Array X Arm Az

Max: 28.8 [g] at 0.063 [s]

Min: -8.1 [g] at 0.091 [s]

B-60

8642-NCAP-03

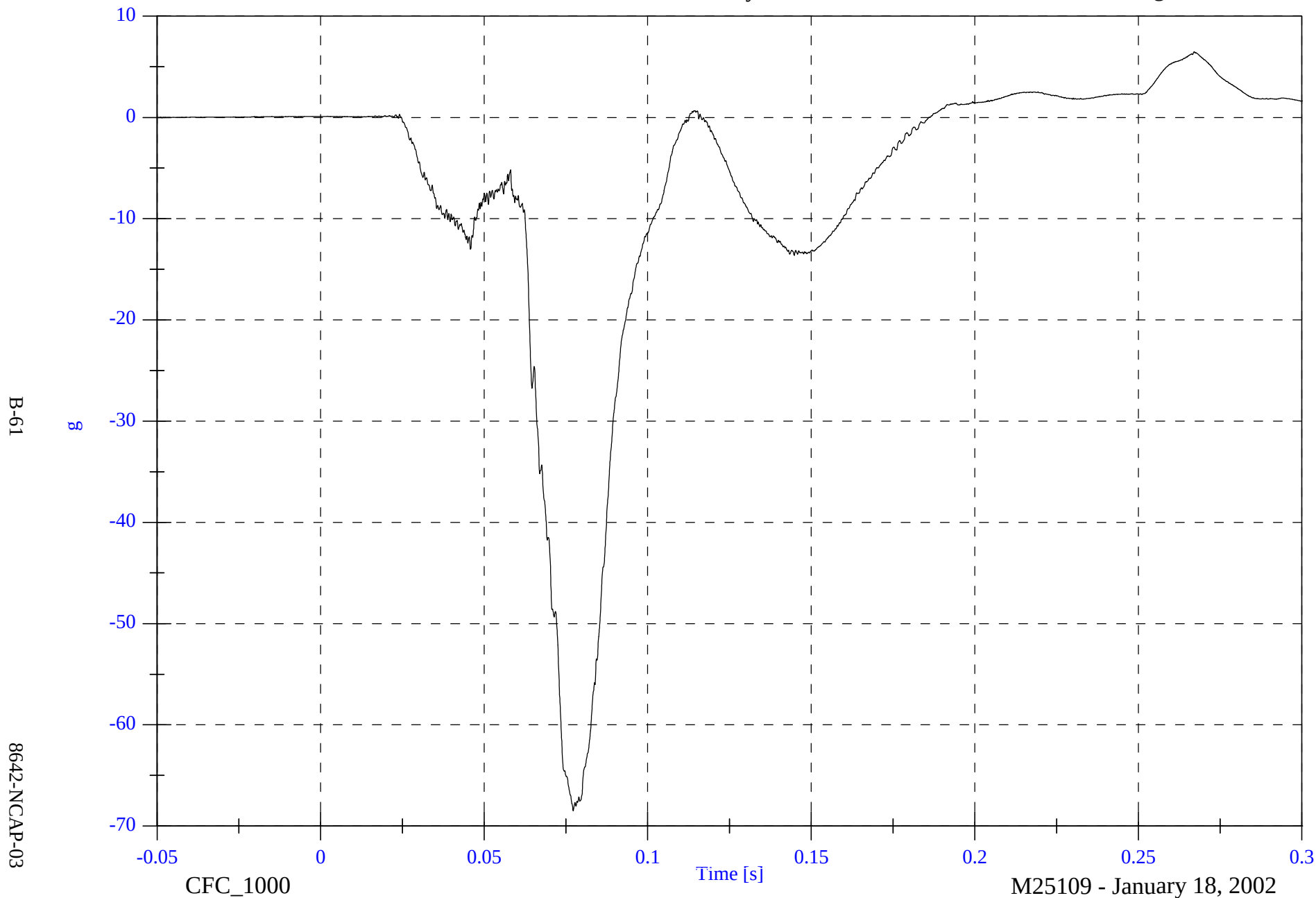


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Head 9 Array Y Arm Ax

Max: 6.5 [g] at 0.267 [s]

Min: -68.5 [g] at 0.077 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

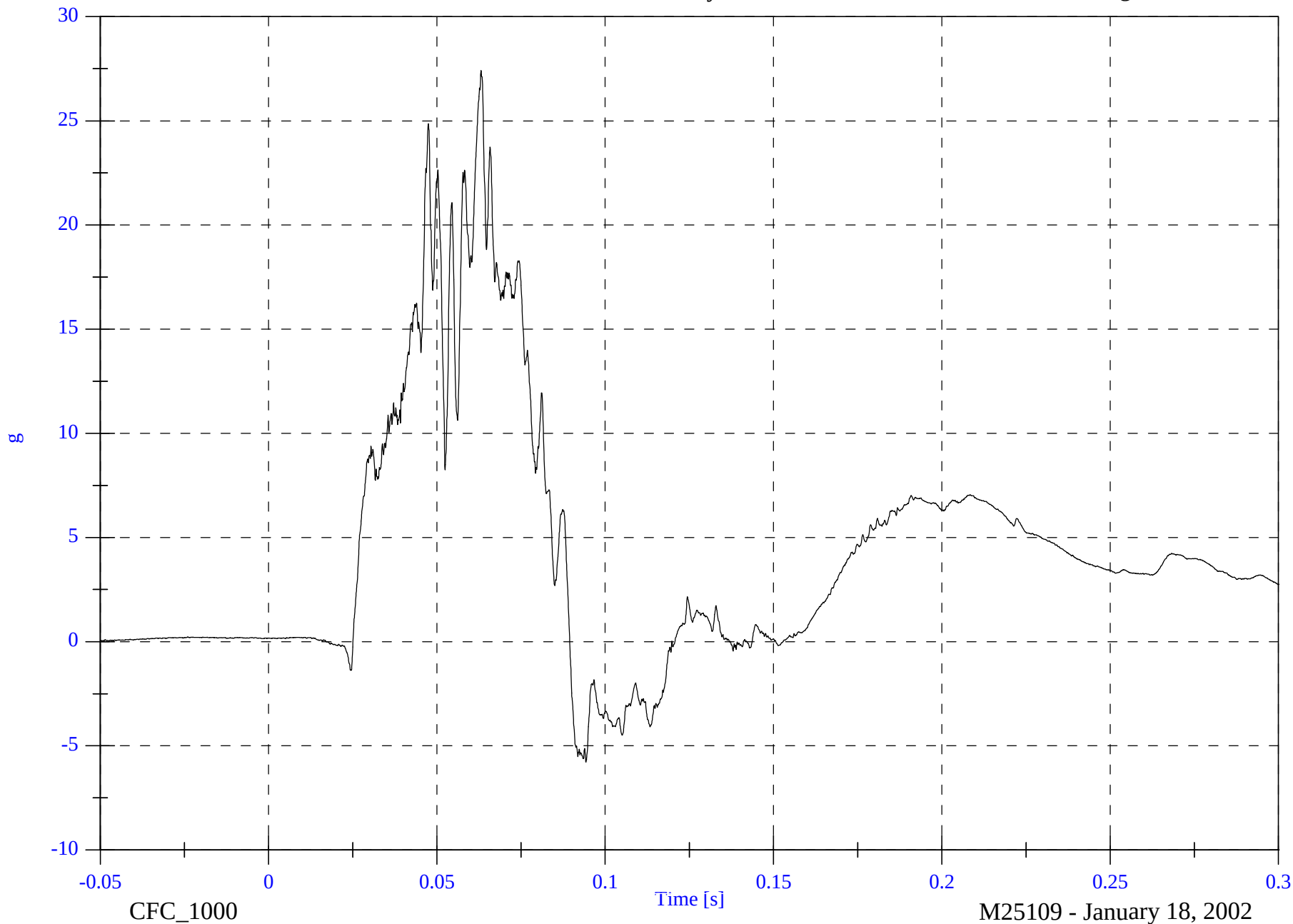
P2 Head 9 Array Y Arm Az

Max: 27.4 [g] at 0.063 [s]

Min: -5.8 [g] at 0.094 [s]

B-62

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

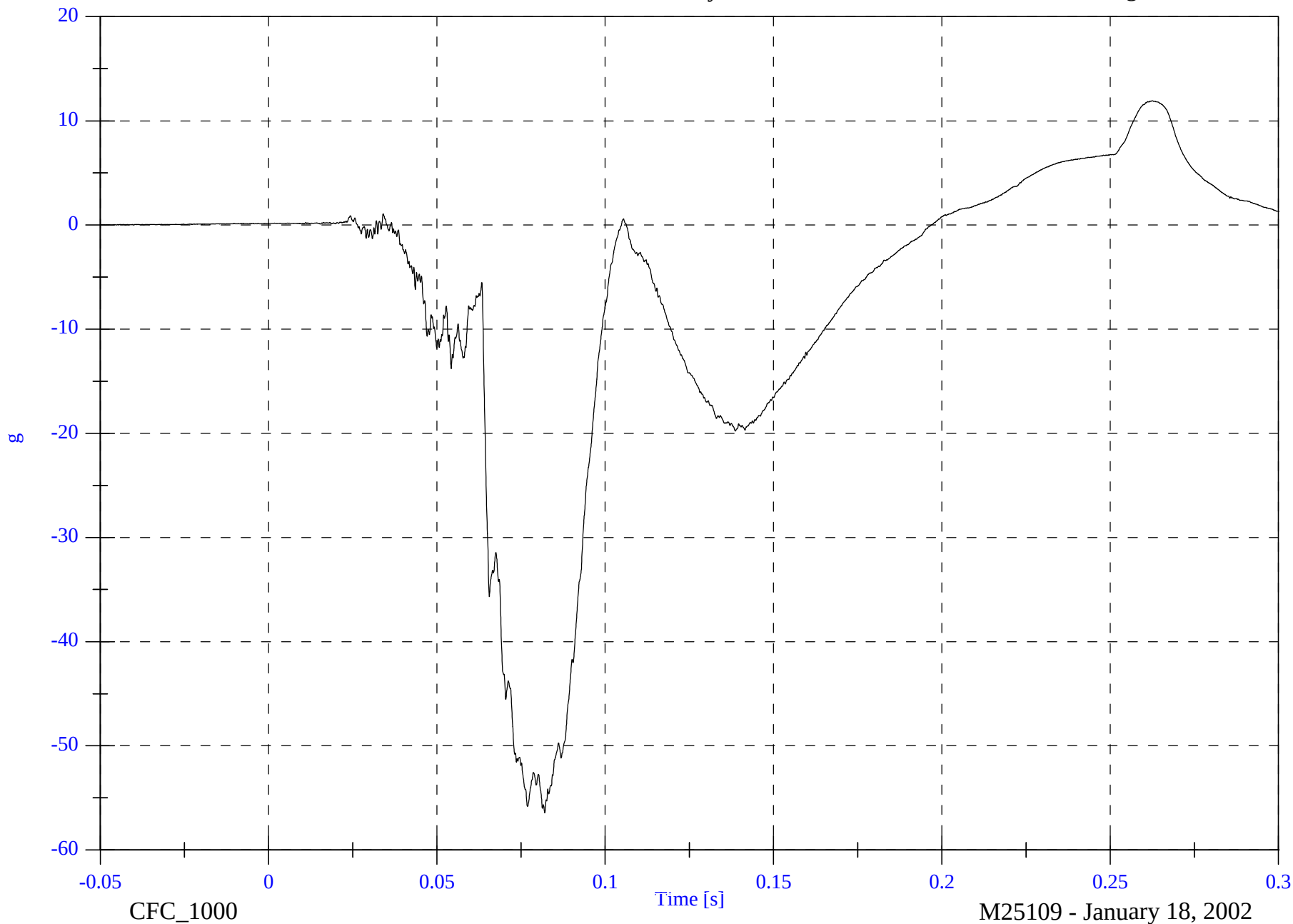
P2 Head 9 Array Z Arm Ax

Max: 11.9 [g] at 0.262 [s]

Min: -56.4 [g] at 0.082 [s]

B-63

8642-NCAP-03

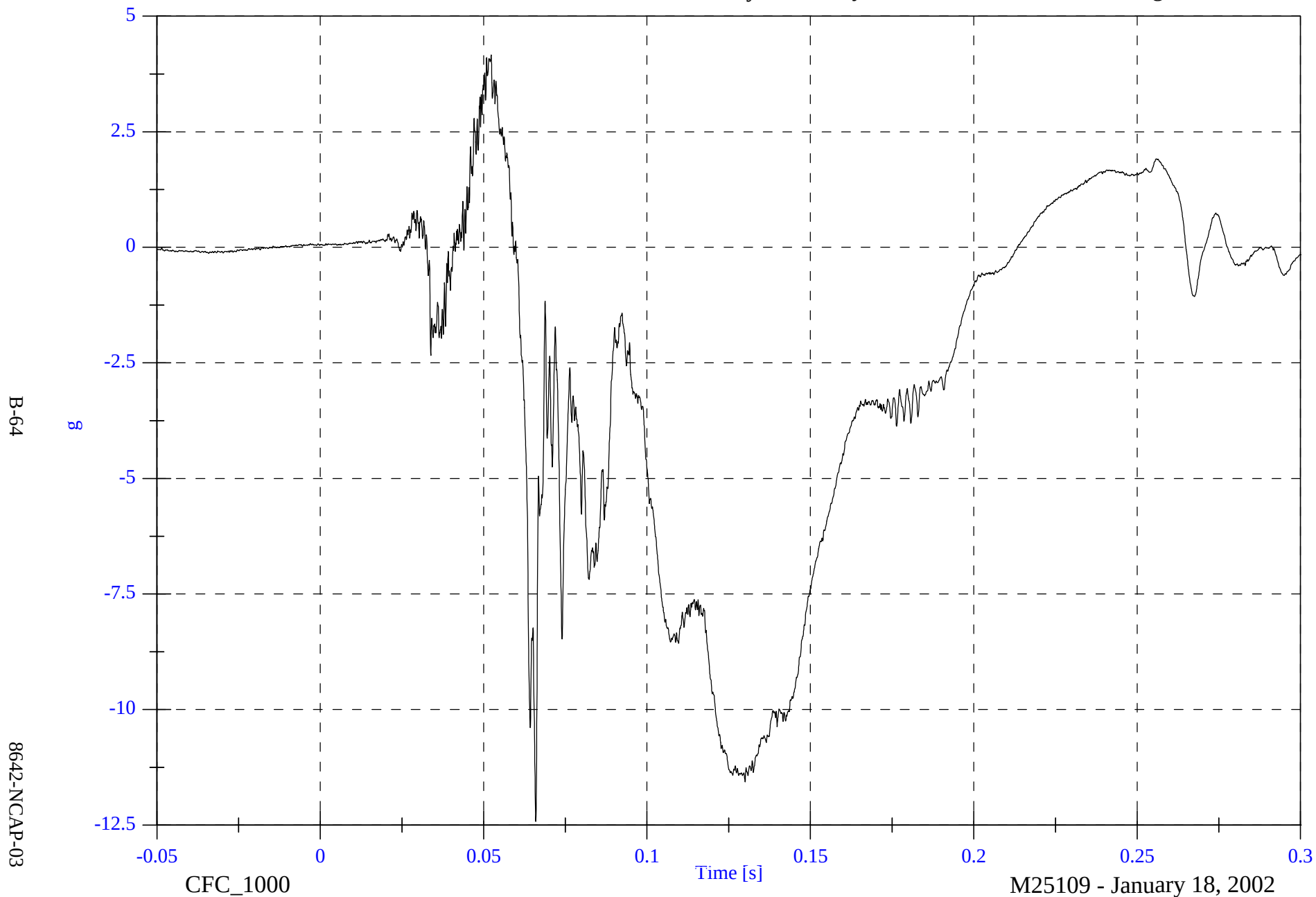


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Head 9 Array Z Arm Ay

Max: 4.2 [g] at 0.052 [s]

Min: -12.4 [g] at 0.066 [s]

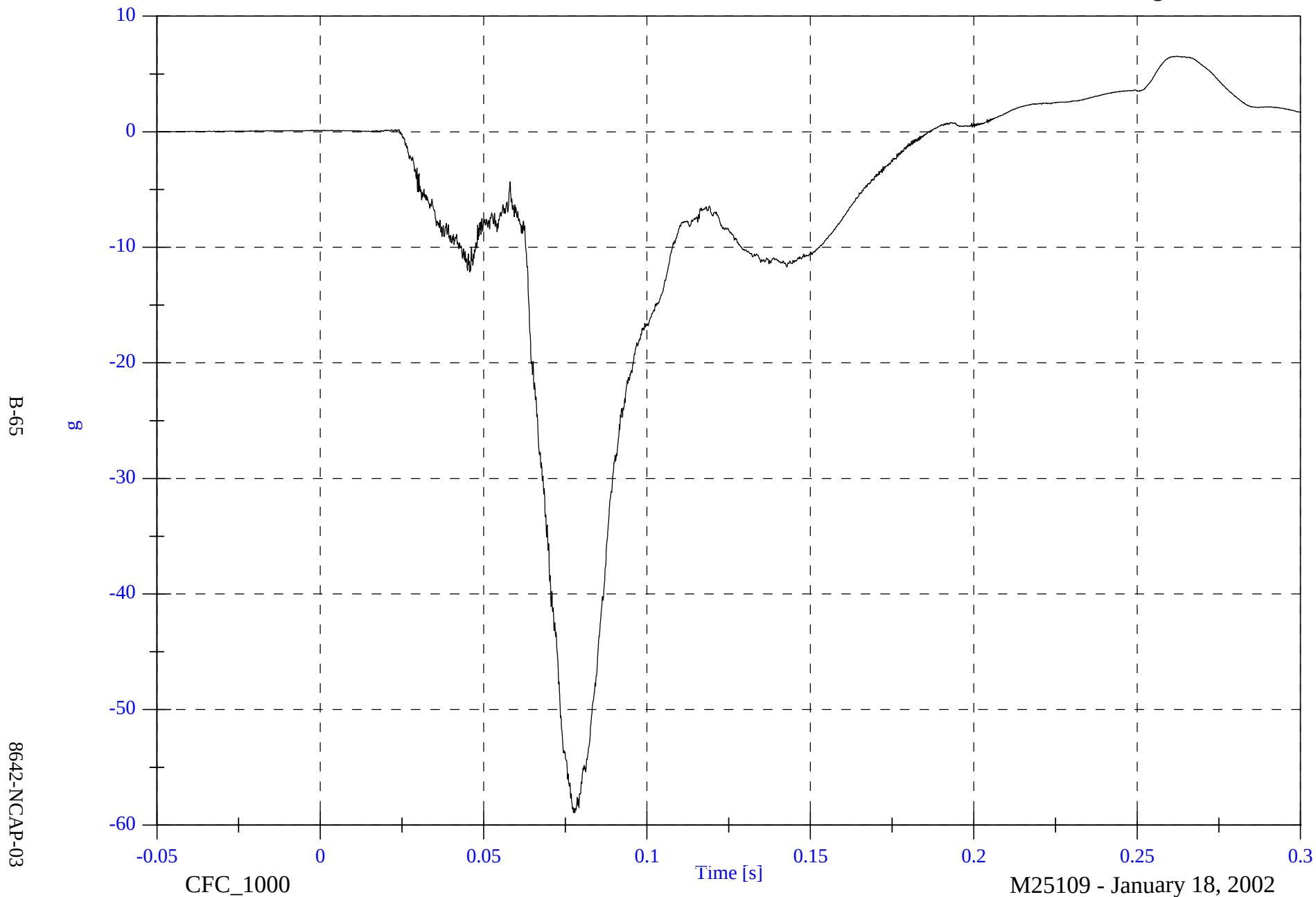


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Head CG x

Max: 6.5 [g] at 0.262 [s]

Min: -58.9 [g] at 0.078 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

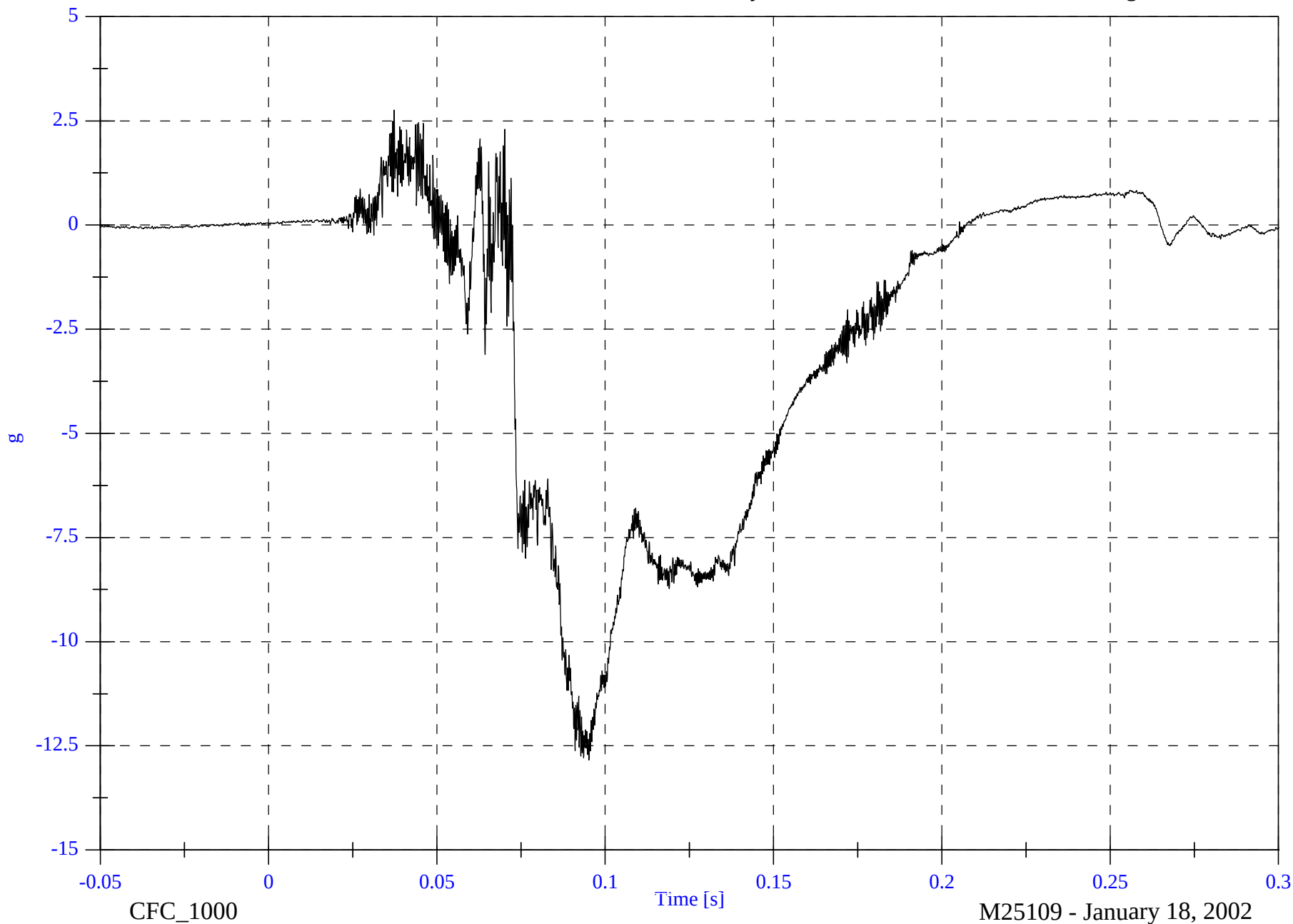
P2 Head CG y

Max: 2.8 [g] at 0.037 [s]

Min: -12.8 [g] at 0.095 [s]

B-66

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

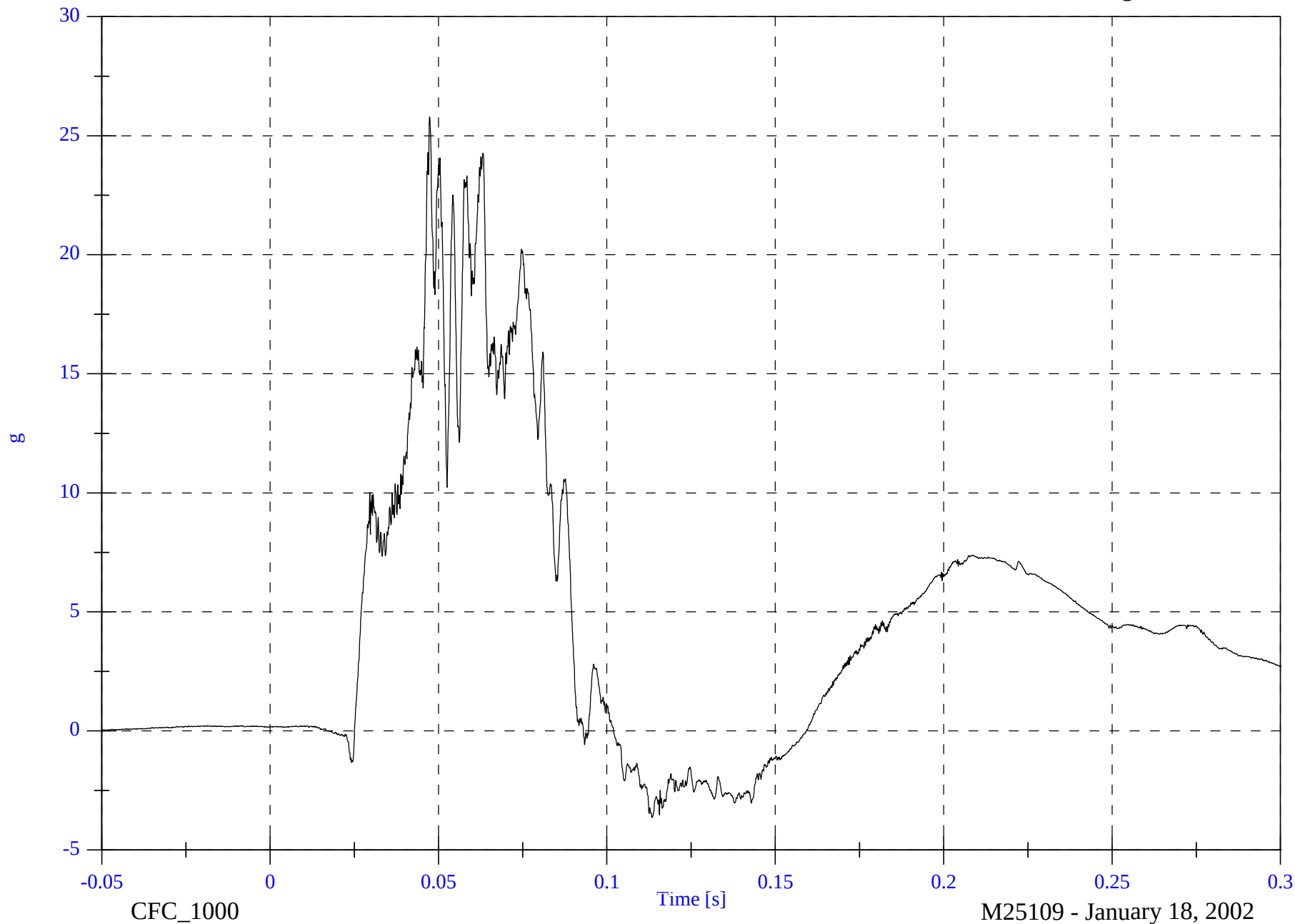
P2 Head CG z

Max: 25.8 [g] at 0.047 [s]

Min: -3.6 [g] at 0.113 [s]

B-67

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

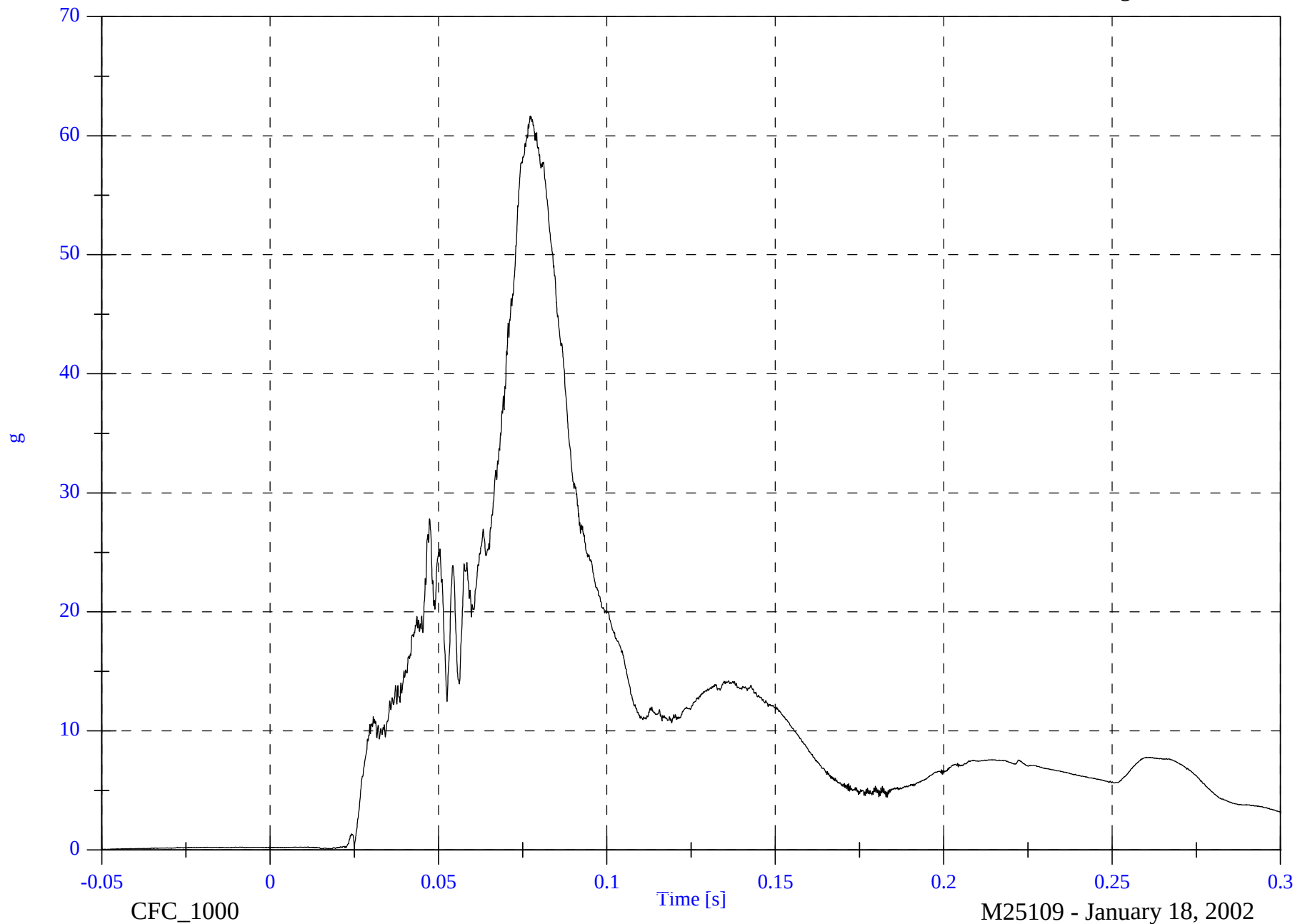
P2 Head CG Resultant

Max: 61.7 [g] at 0.077 [s]

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

B-68

8642-NCAP-03

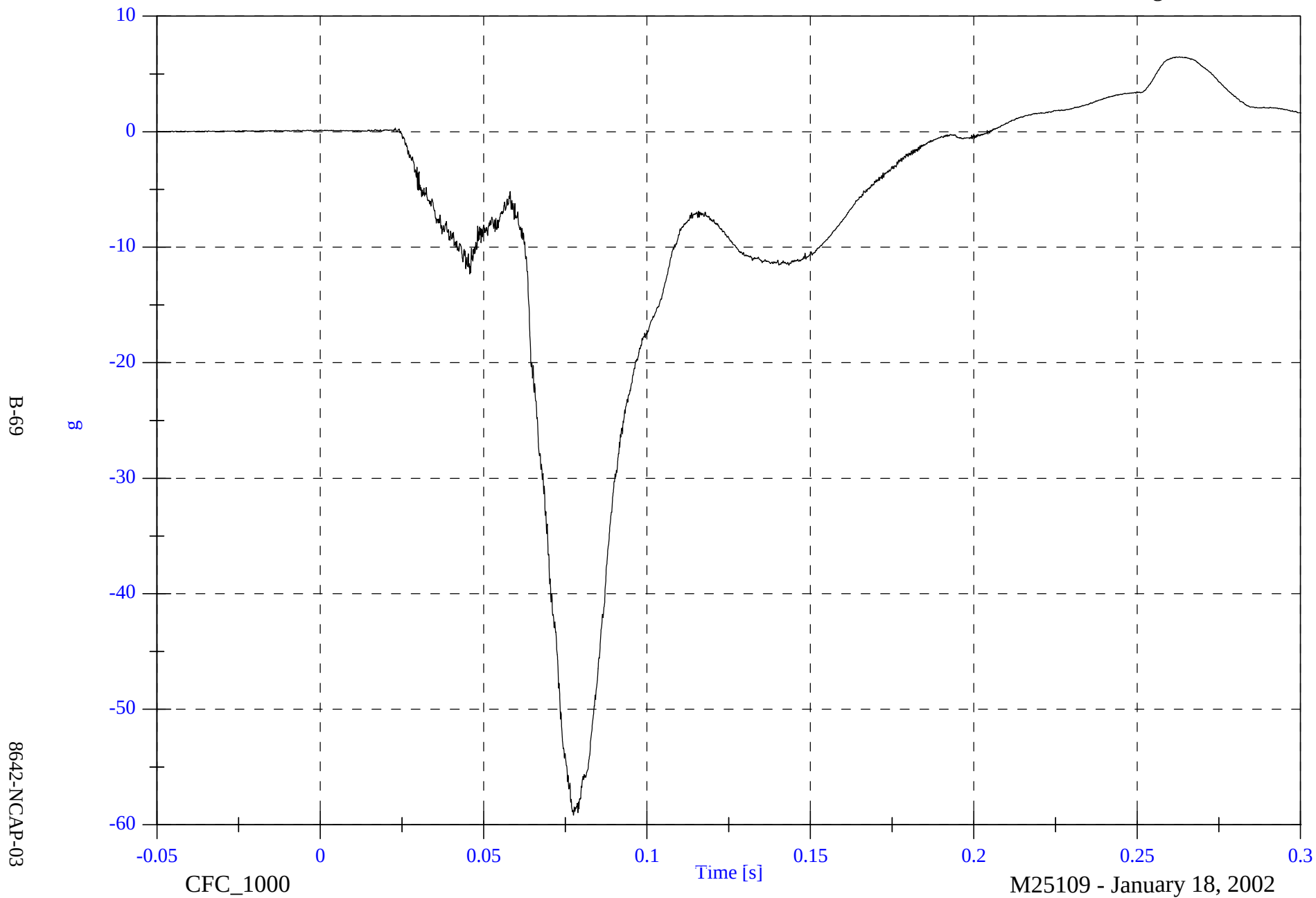


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Head CG Red x

Max: 6.5 [g] at 0.262 [s]

Min: -59.2 [g] at 0.078 [s]

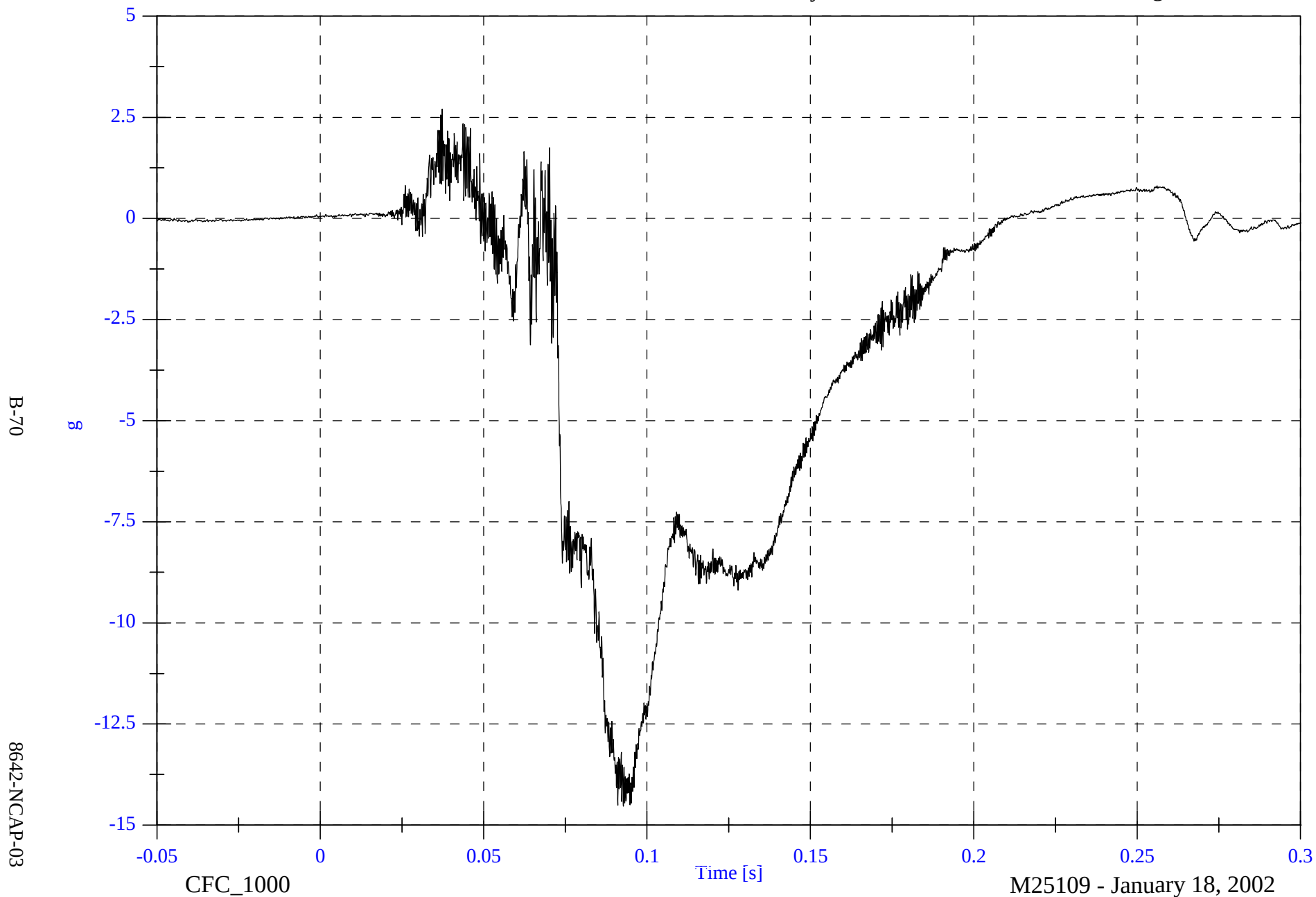


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Head CG Red y

Max: 2.7 [g] at 0.037 [s]

Min: -14.5 [g] at 0.093 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

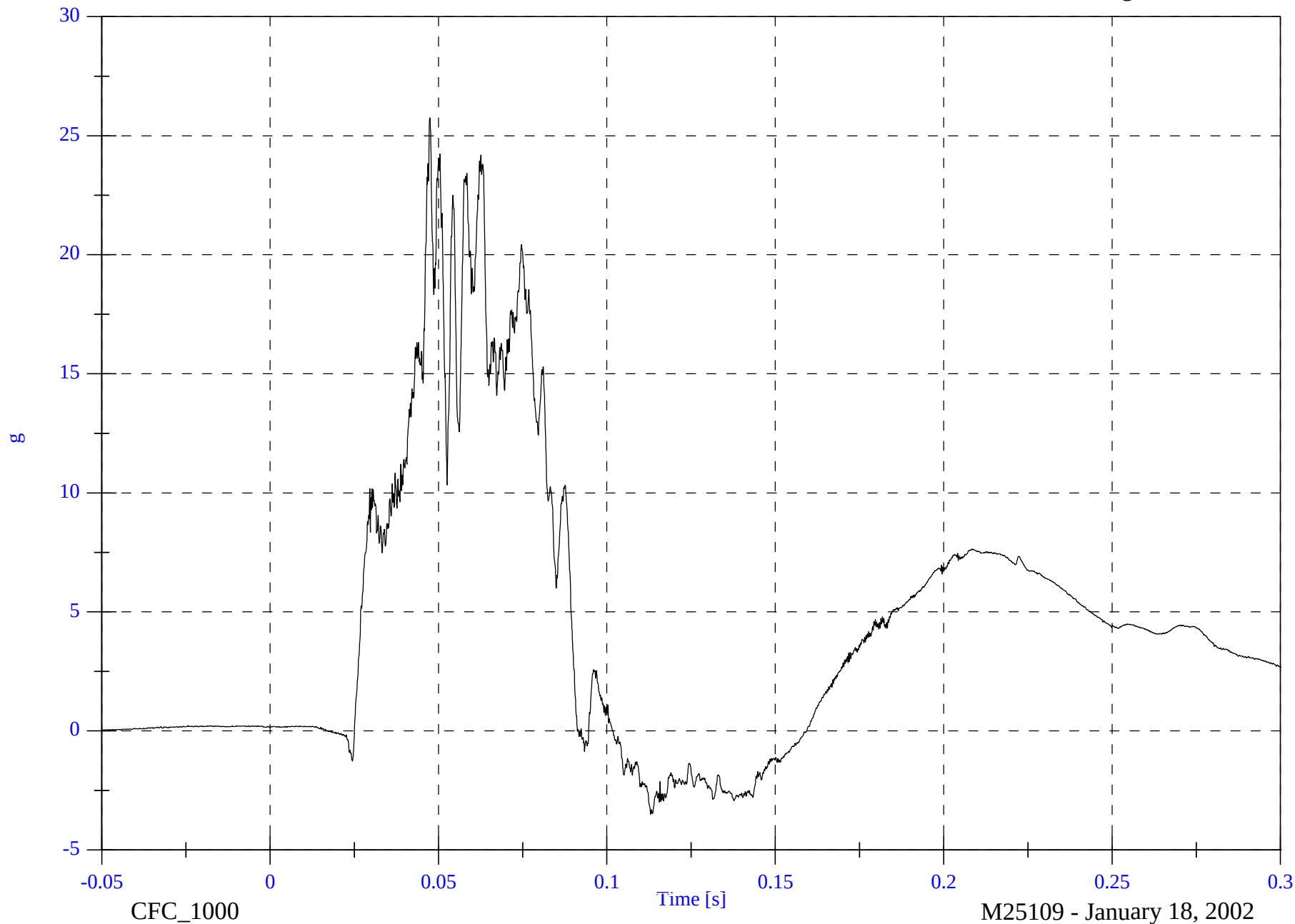
P2 Head CG Red z

Max: 25.8 [g] at 0.047 [s]

Min: -3.5 [g] at 0.113 [s]

B-71

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

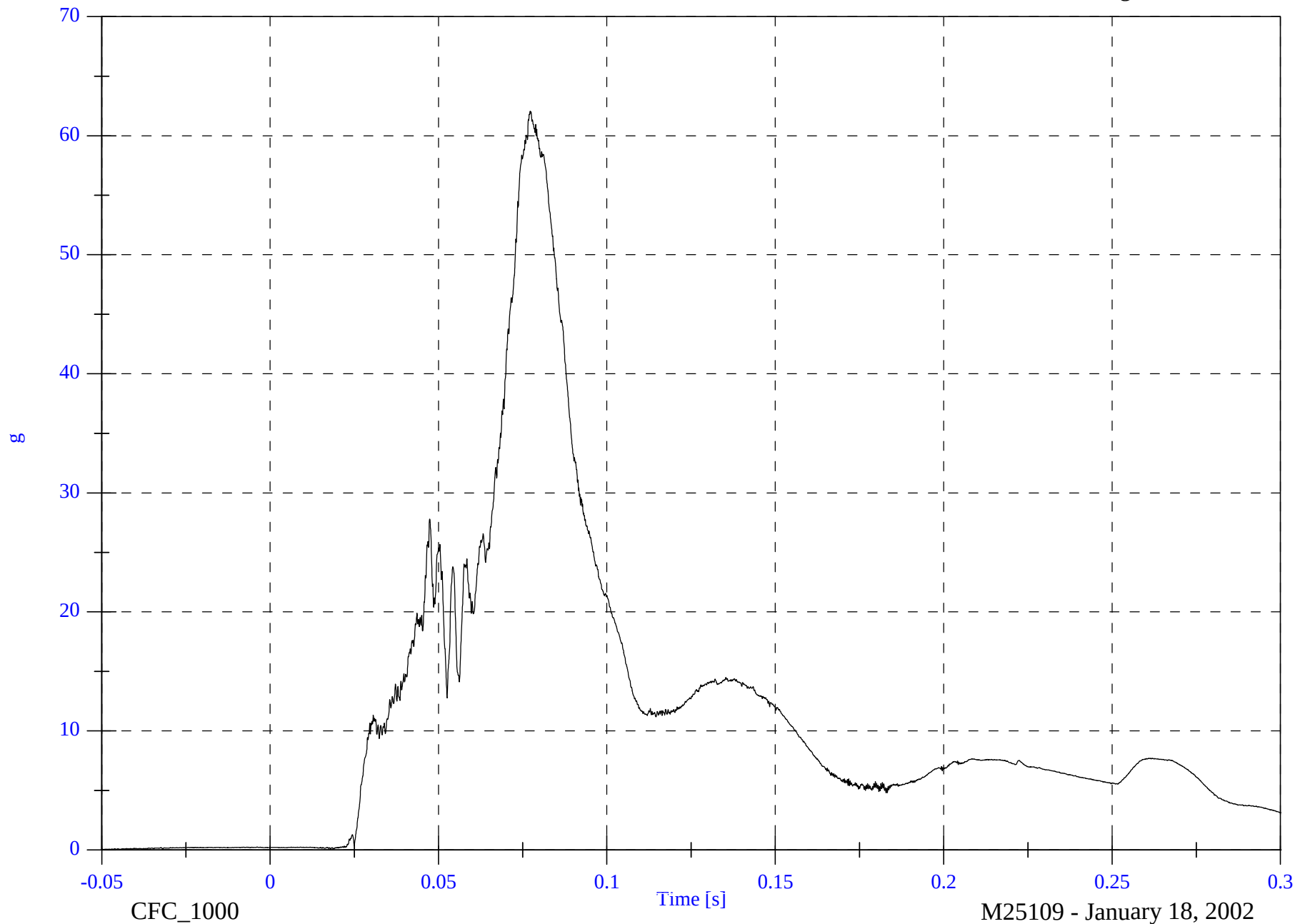
P2 Head CG Red Resultant

Max: 62.1 [g] at 0.077 [s]

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

B-72

8642-NCAP-03

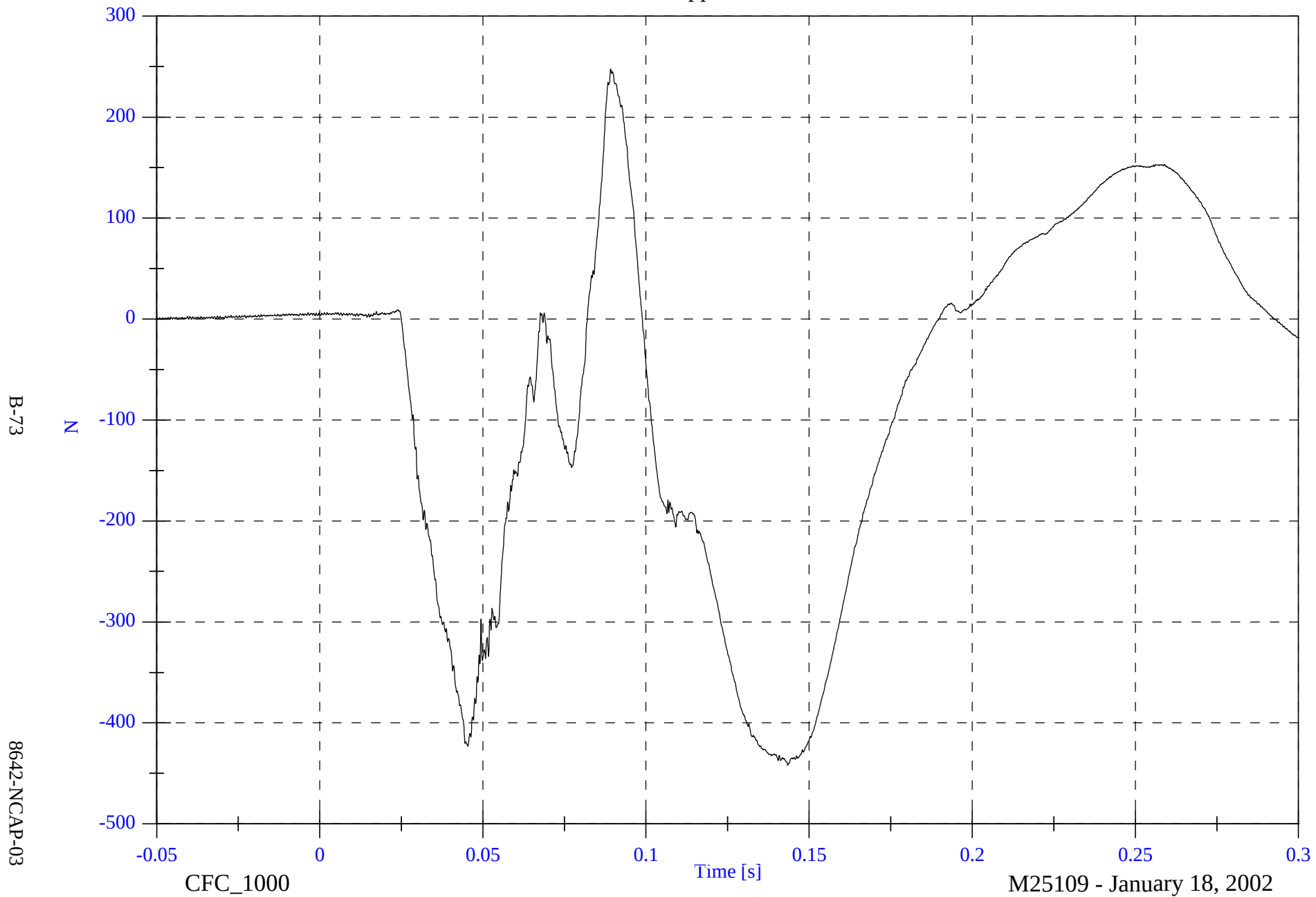


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Upper Neck Fx

Max: 247.6 [N] at 0.089 [s]

Min: -441.9 [N] at 0.143 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

P2 Upper Neck Fy

Max: 331.8 [N] at 0.084 [s]

Min: -247.5 [N] at 0.138 [s]

B-74

N

8642-NCAP-03

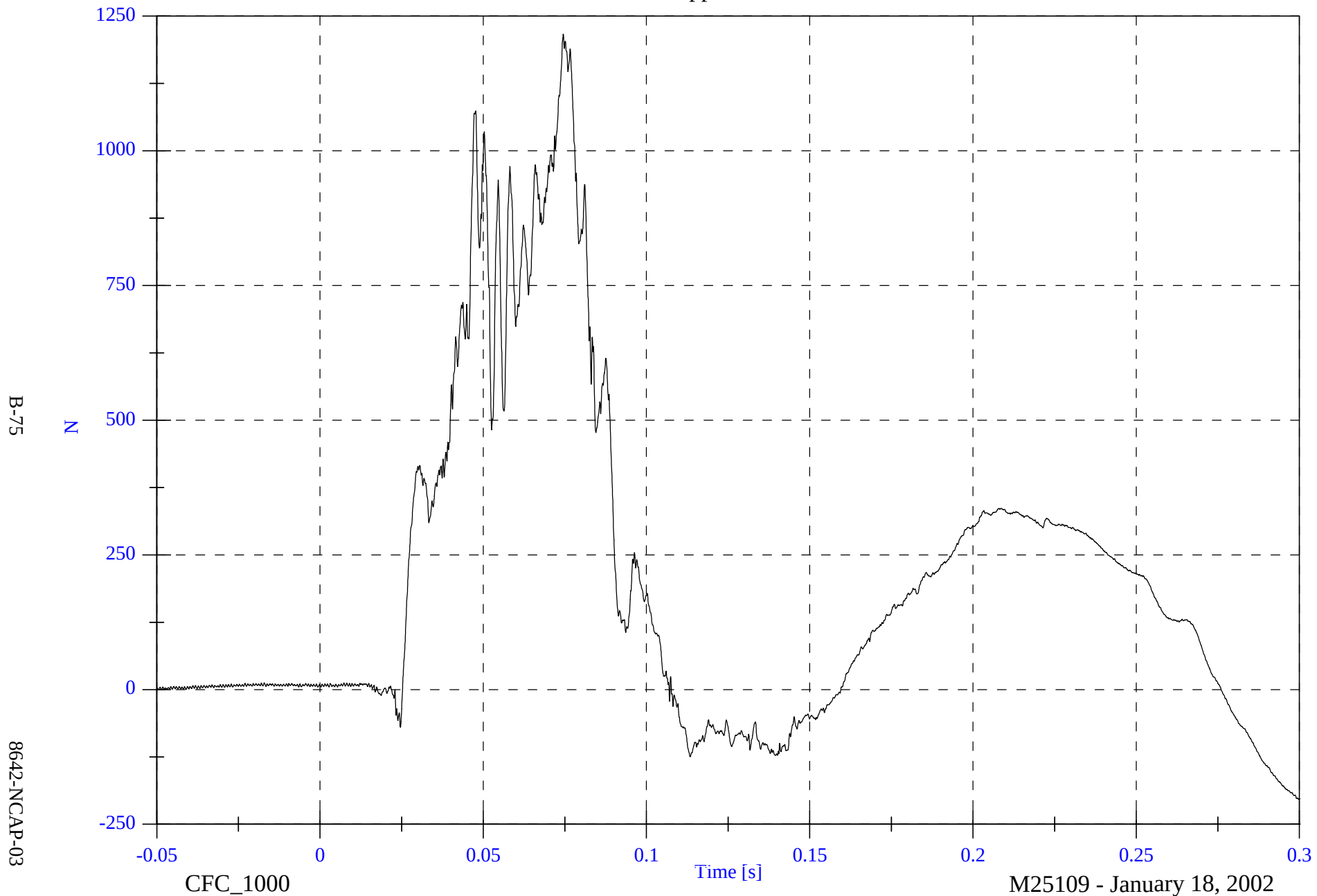


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Upper Neck Fz

Max: 1217.2 [N] at 0.075 [s]

Min: -203.8 [N] at 0.300 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

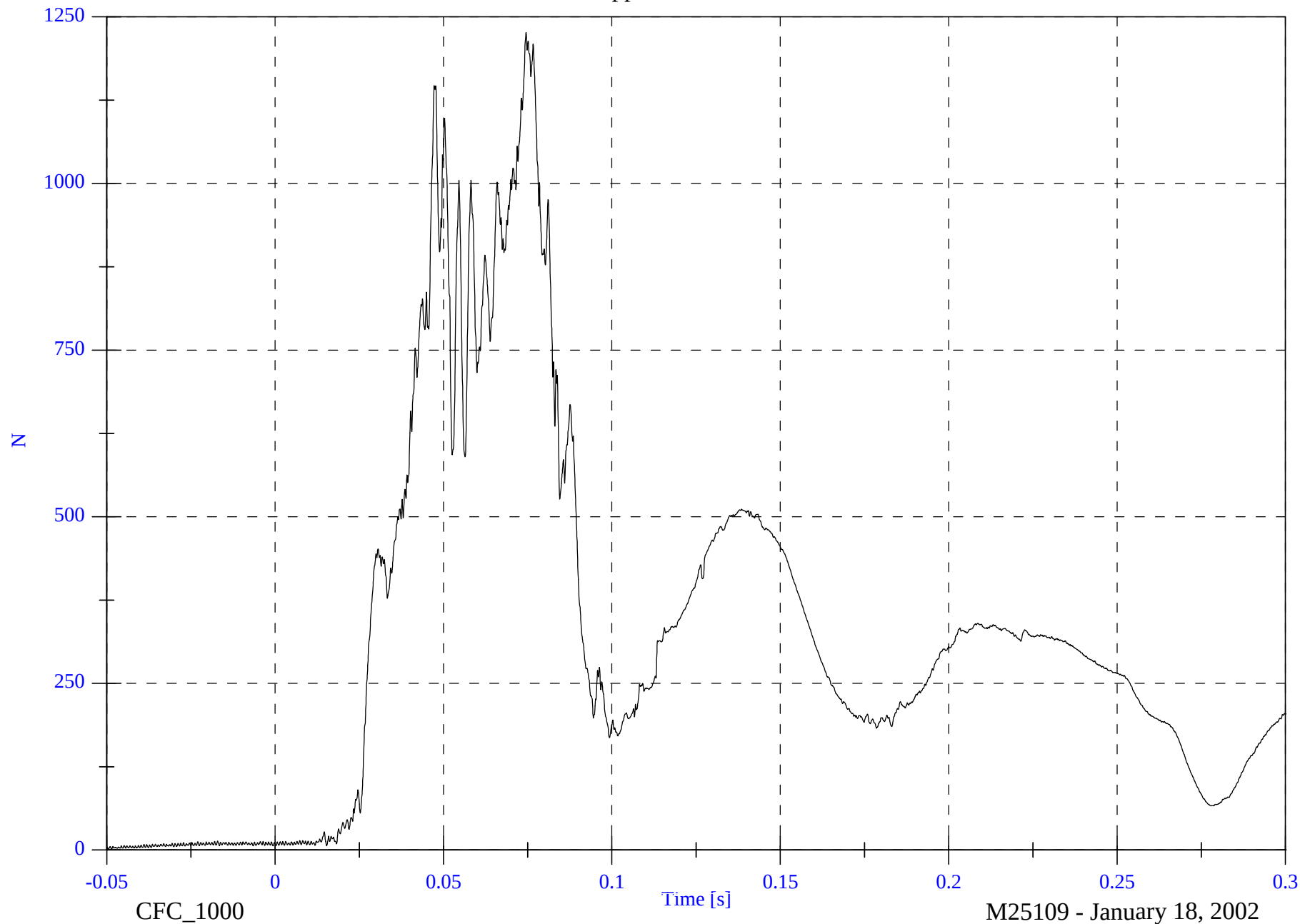
P2 Upper Neck F Resultant

Max: 1226.1 [N] at 0.075 [s]

Min: 1.9 [N] at -0.049 [s]

B-76

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

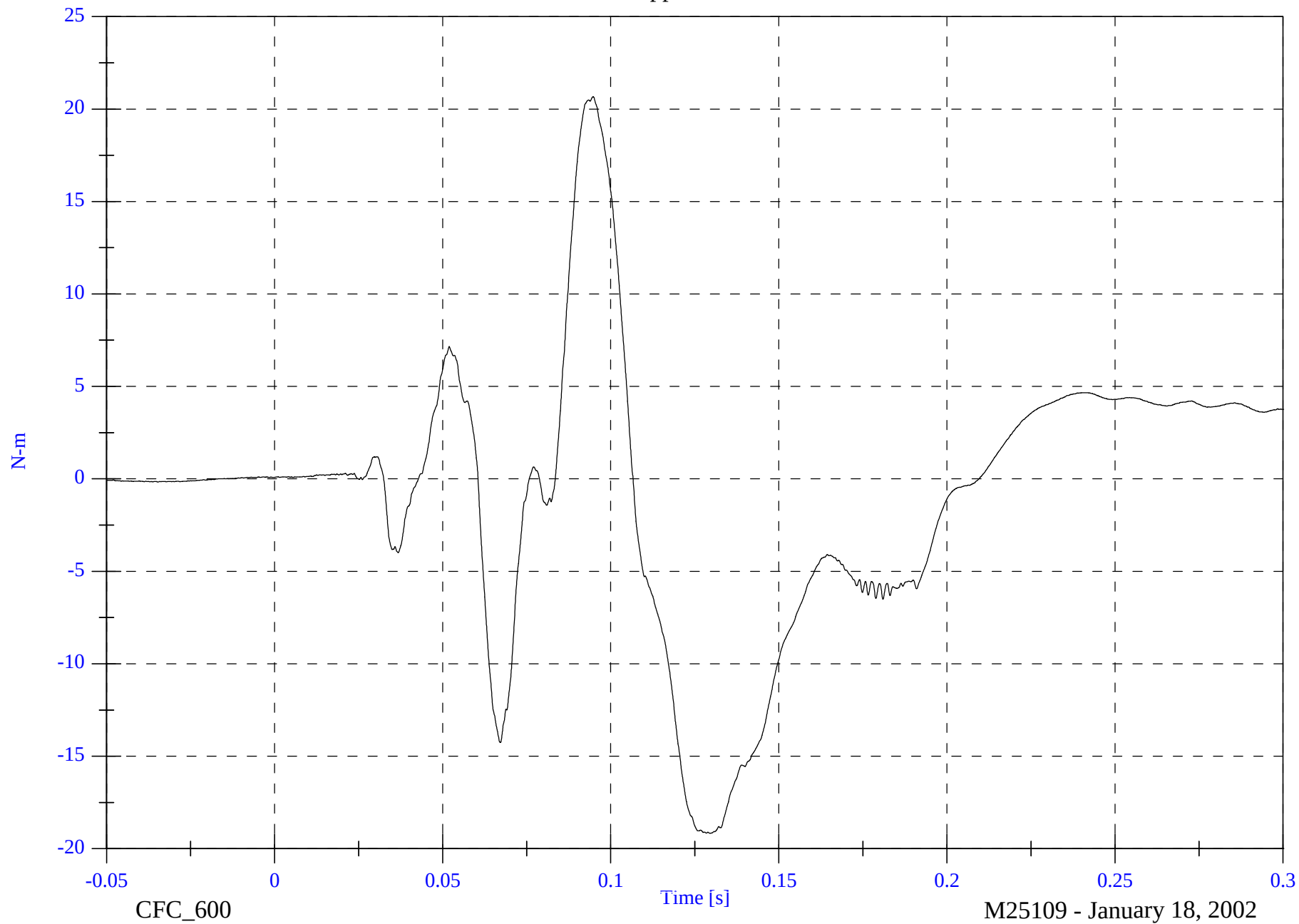
P2 Upper Neck Mx

Max: 20.7 [N-m] at 0.095 [s]

Min: -19.2 [N-m] at 0.130 [s]

B-77

8642-NCAP-03



2002 NCAP Test 3-2002 Toyota Sequoia

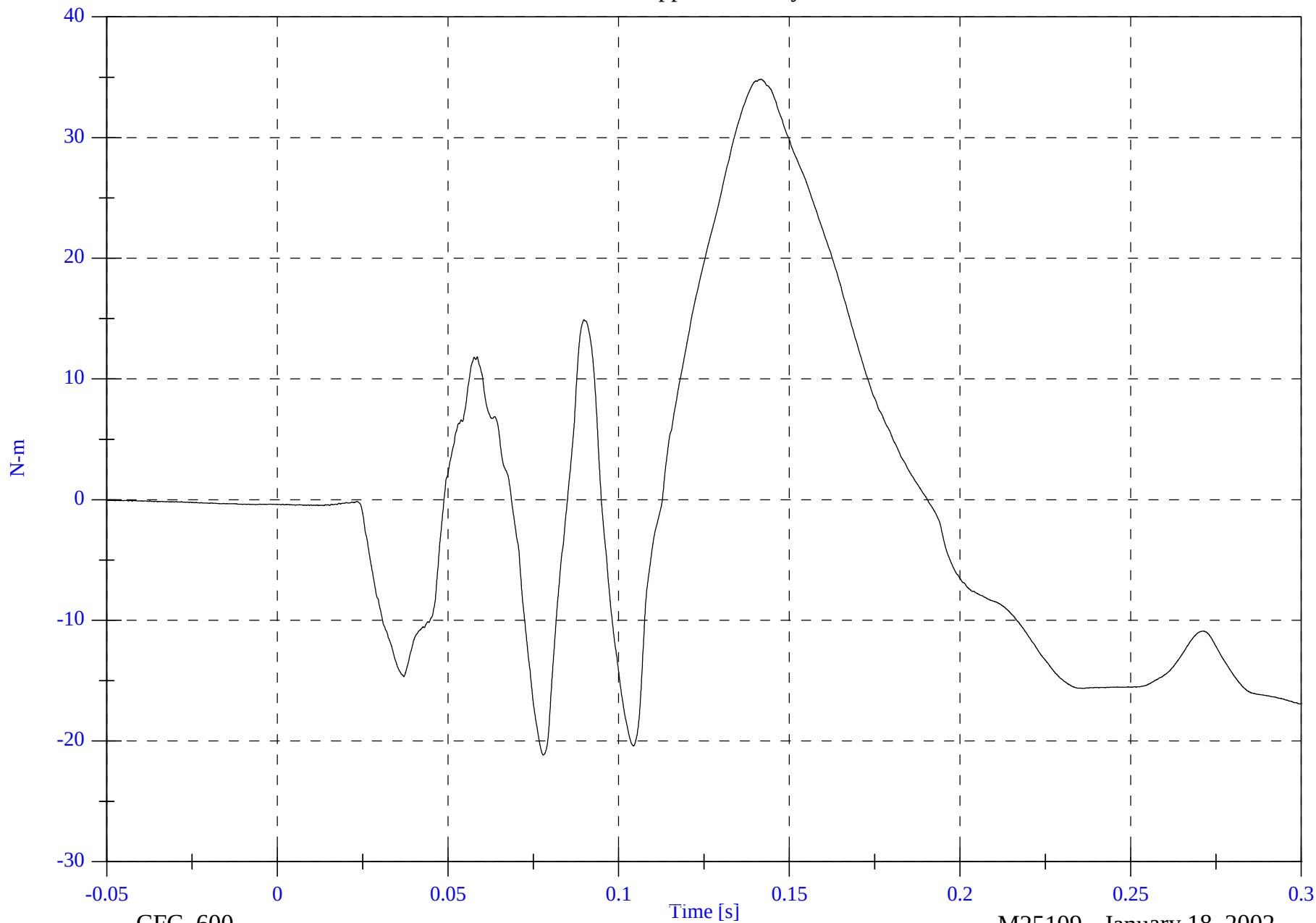
P2 Upper Neck My

Max: 34.8 [N-m] at 0.142 [s]

Min: -21.2 [N-m] at 0.078 [s]

B-78

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P2 Upper Neck Mz

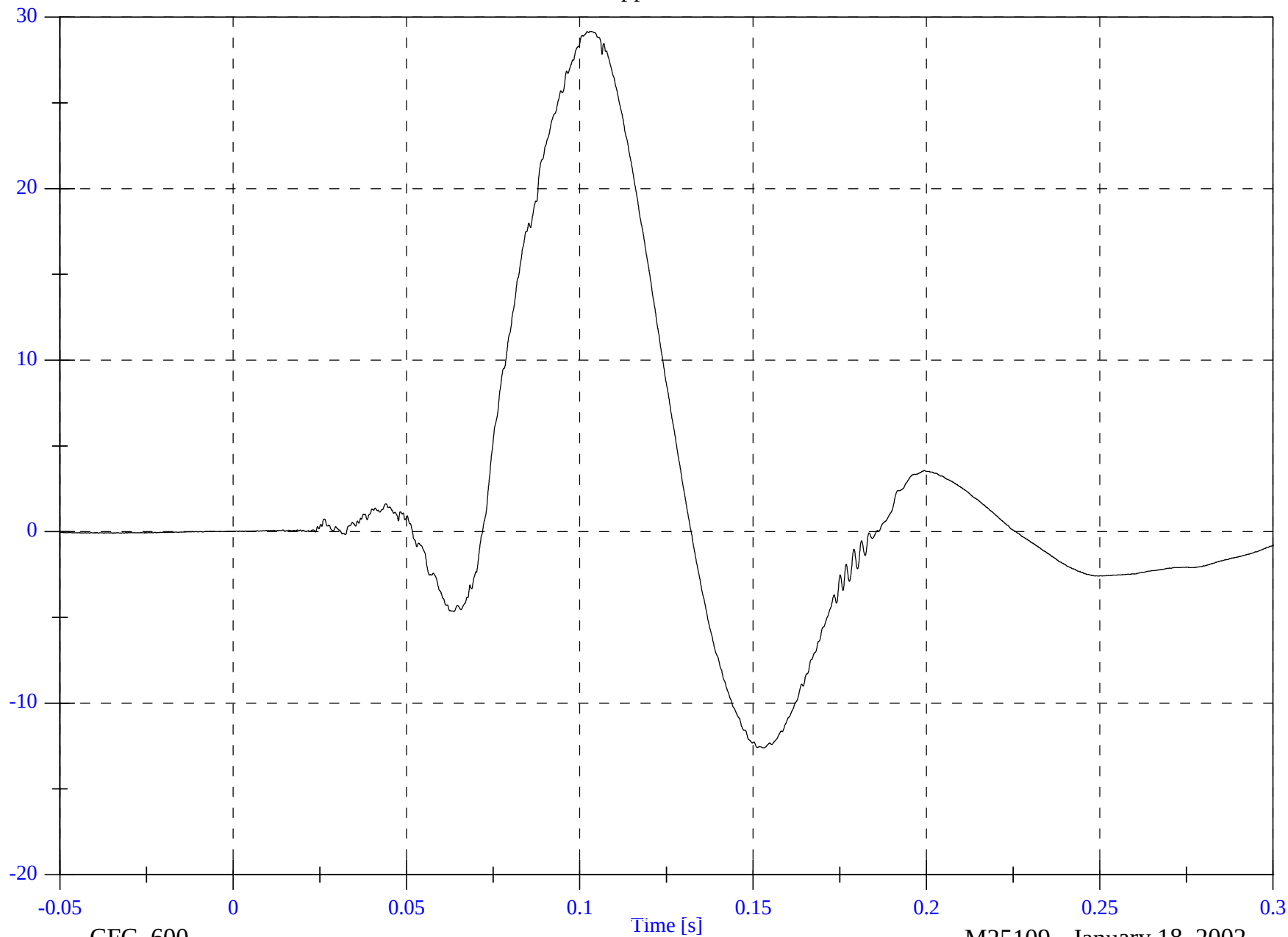
Max: 29.2 [N-m] at 0.103 [s]

Min: -12.6 [N-m] at 0.153 [s]

B-79

N-m

8642-NCAP-03



CFC_600

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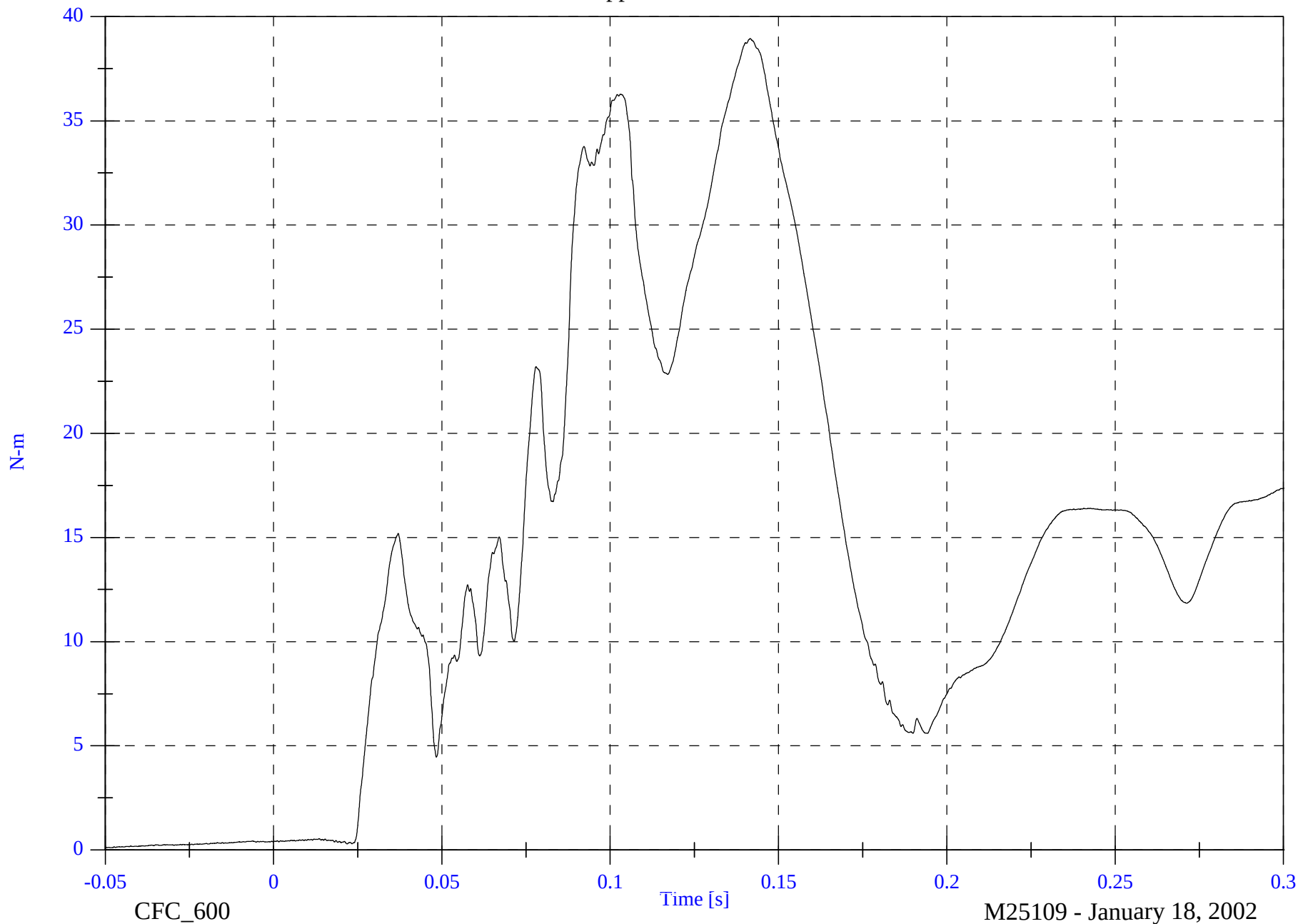
P2 Upper Neck M Resultant

Max: 39.0 [N-m] at 0.142 [s]

Min: 0.1 [N-m] at -0.048 [s]

B-80

8642-NCAP-03

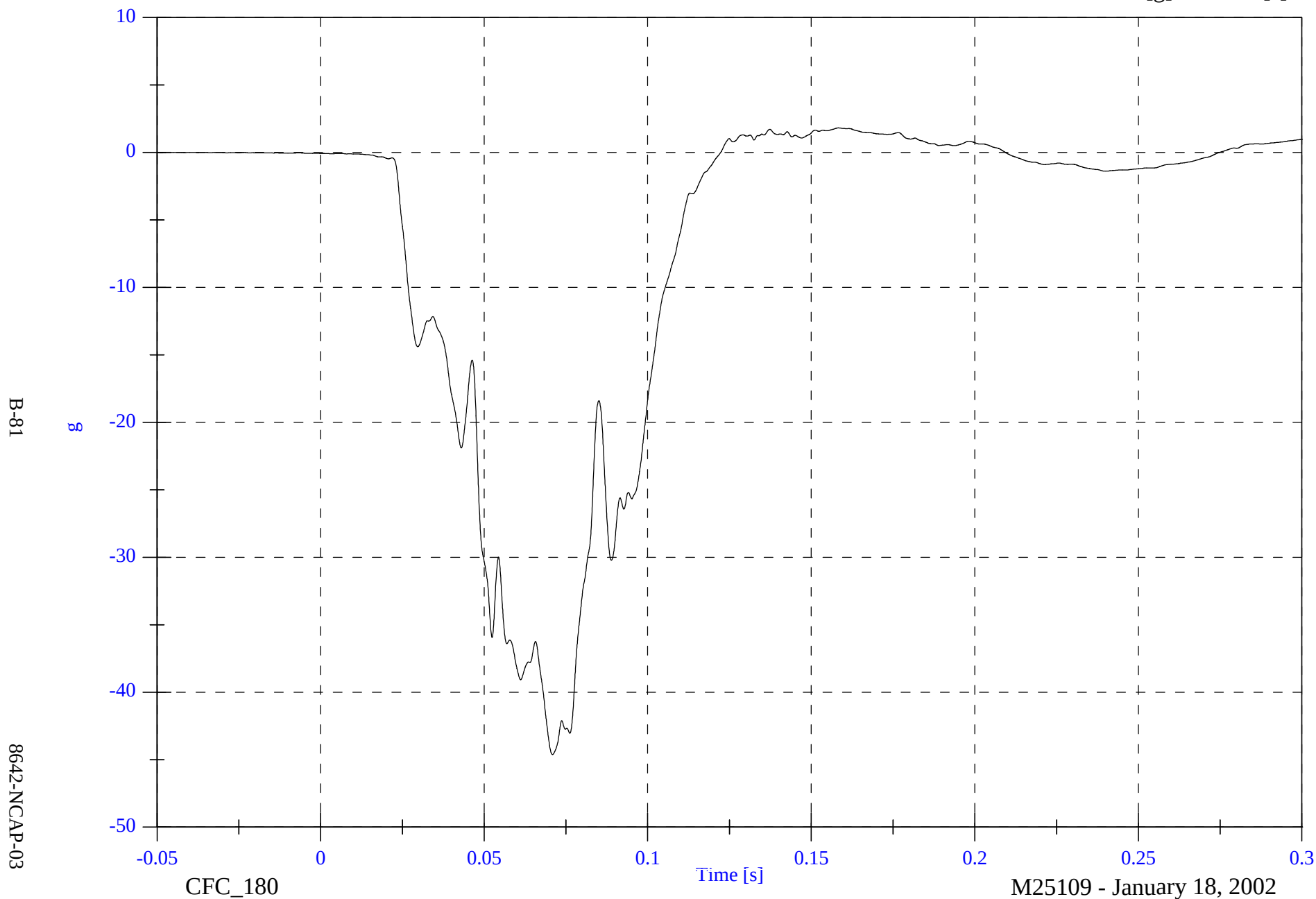


2002 NCAP Test 3-2002 Toyota Sequoia

Max: 1.8 [g] at 0.158 [s]

Min: -44.6 [g] at 0.071 [s]

P2 Chest x

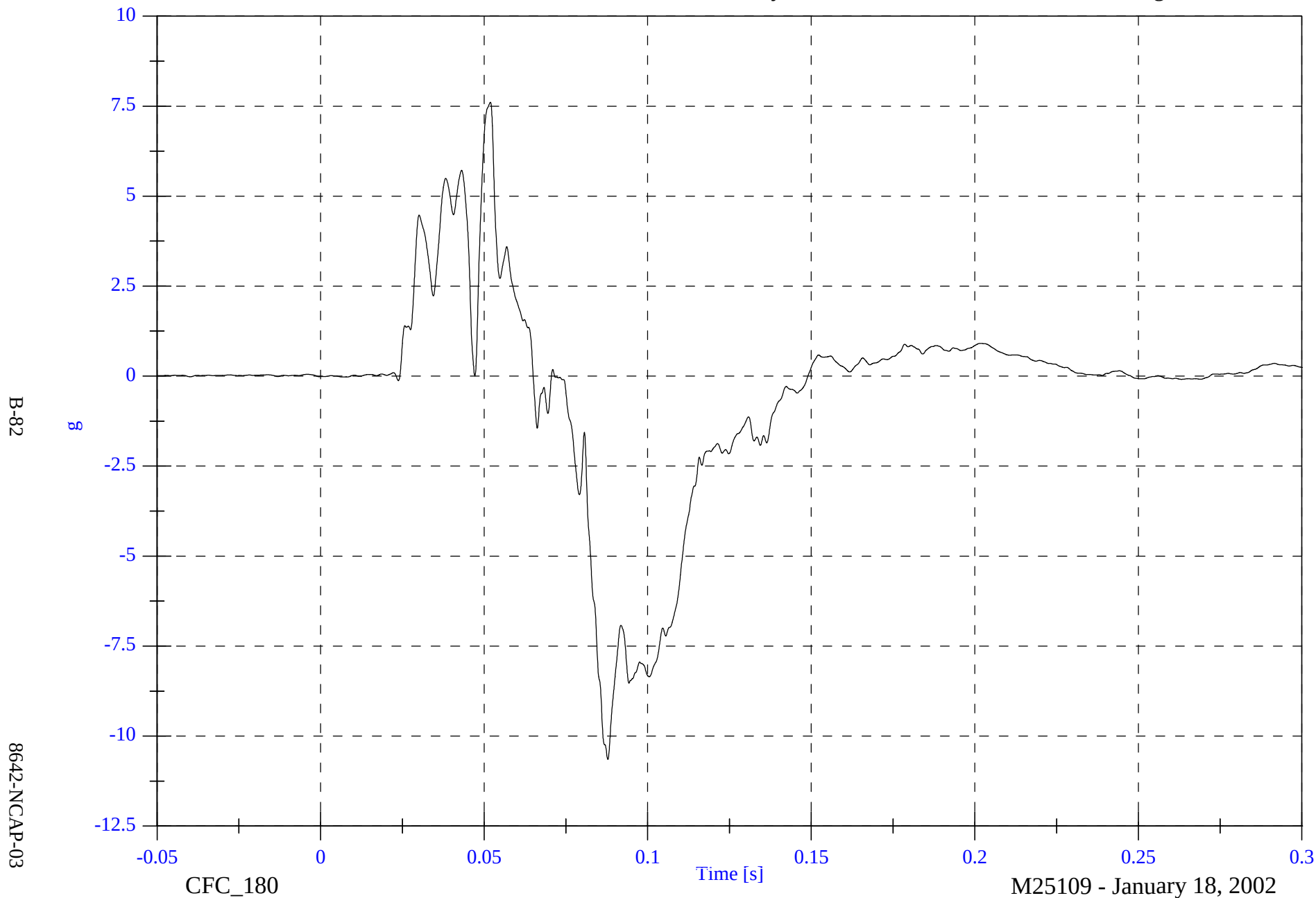


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Chest y

Max: 7.6 [g] at 0.052 [s]

Min: -10.6 [g] at 0.088 [s]

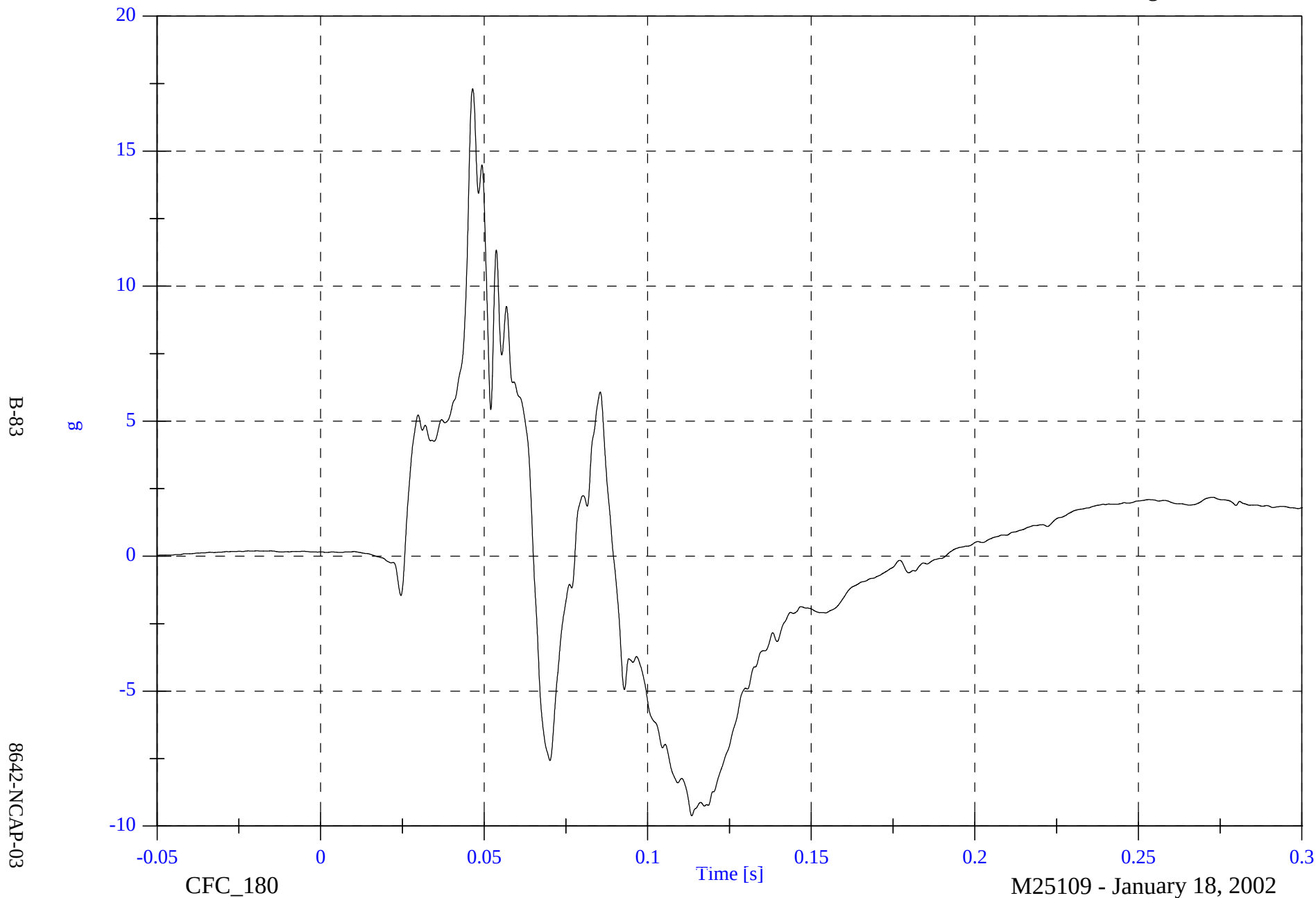


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Chest z

Max: 17.3 [g] at 0.046 [s]

Min: -9.6 [g] at 0.113 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

P2 Chest Resultant

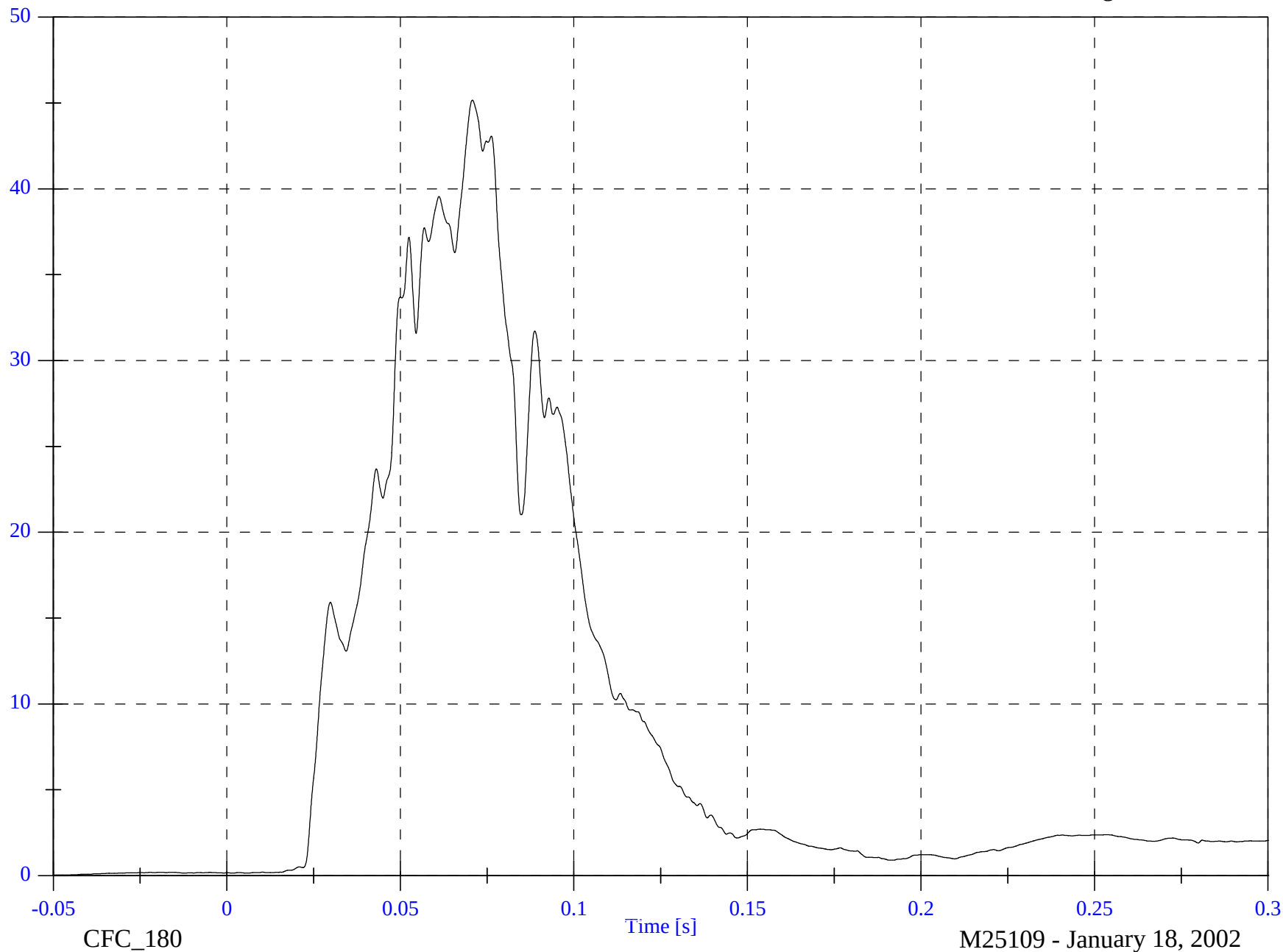
Max: 45.2 [g] at 0.071 [s]

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

B-84

8642-NCAP-03

g

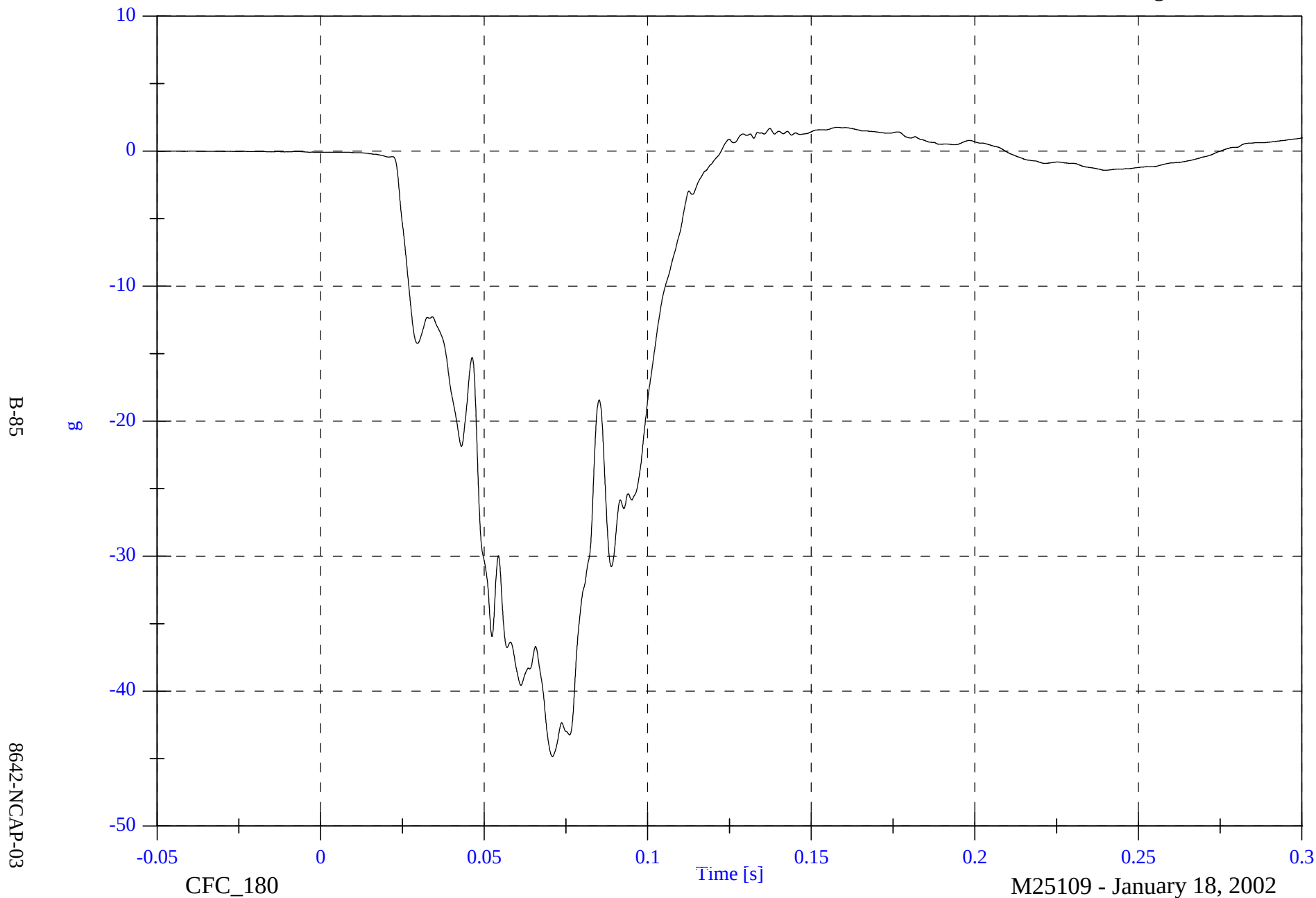


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Chest Red x

Max: 1.8 [g] at 0.158 [s]

Min: -44.9 [g] at 0.071 [s]

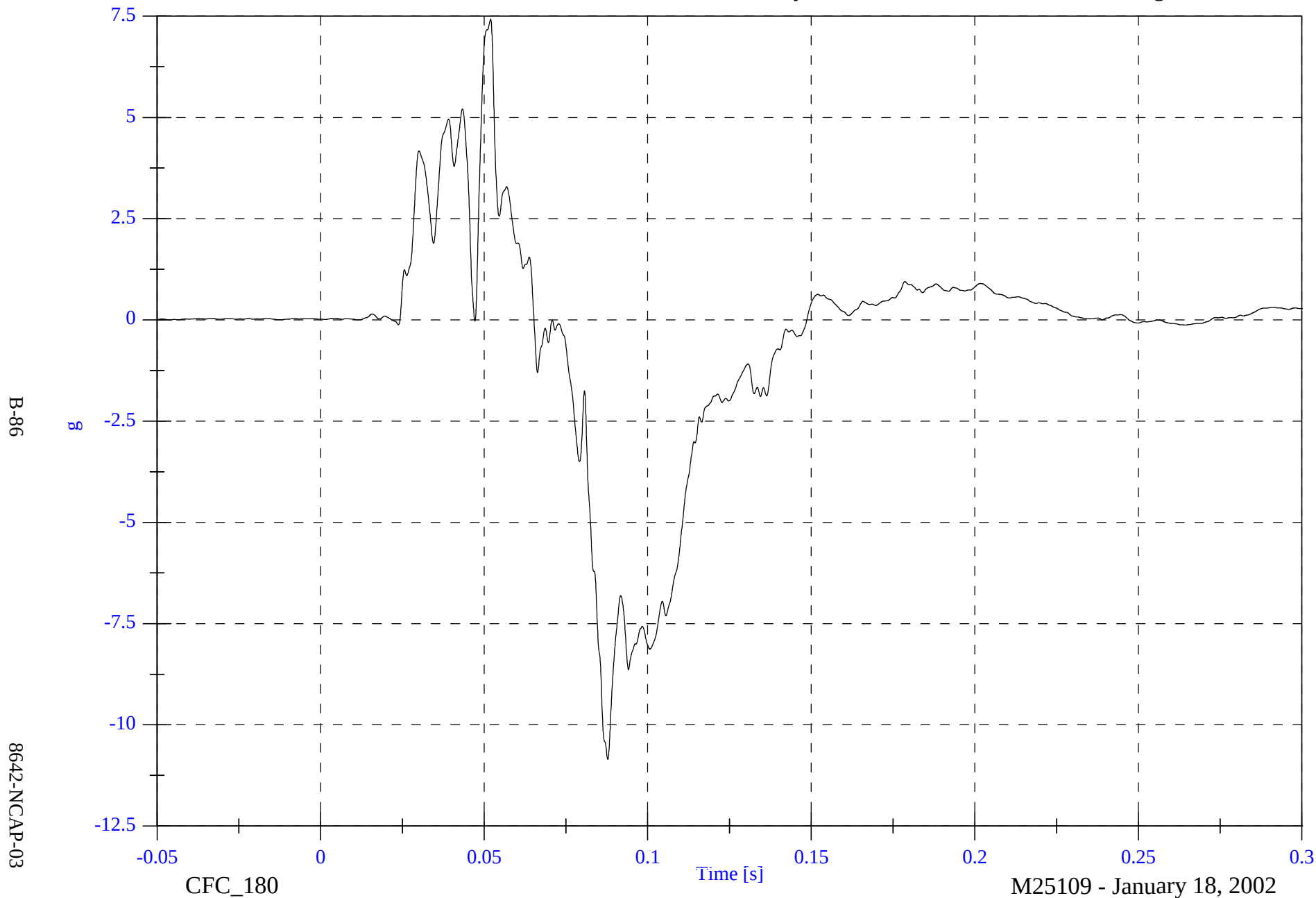


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Chest Red y

Max: 7.4 [g] at 0.052 [s]

Min: -10.9 [g] at 0.088 [s]

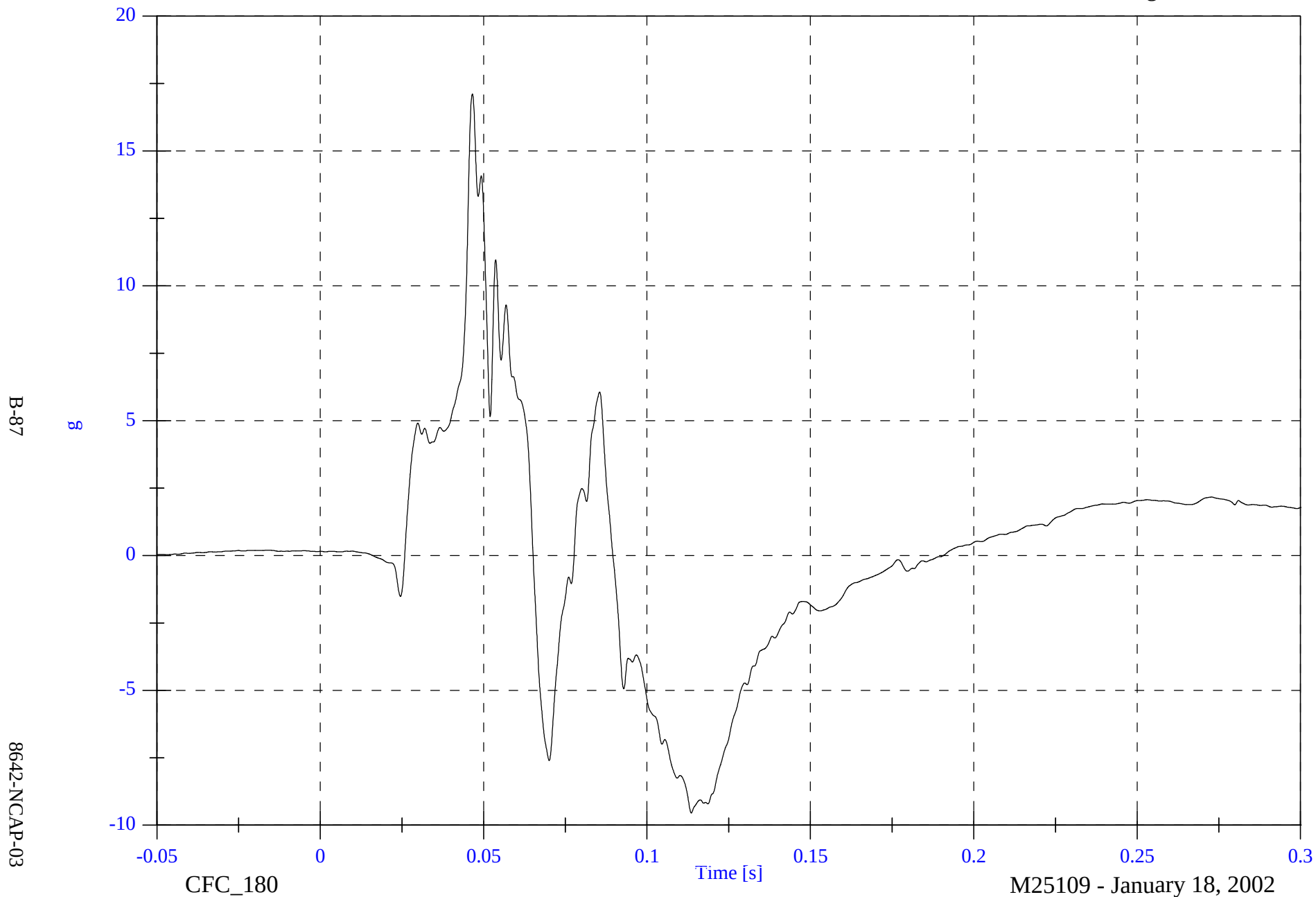


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Chest Red z

Max: 17.1 [g] at 0.047 [s]

Min: -9.6 [g] at 0.114 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

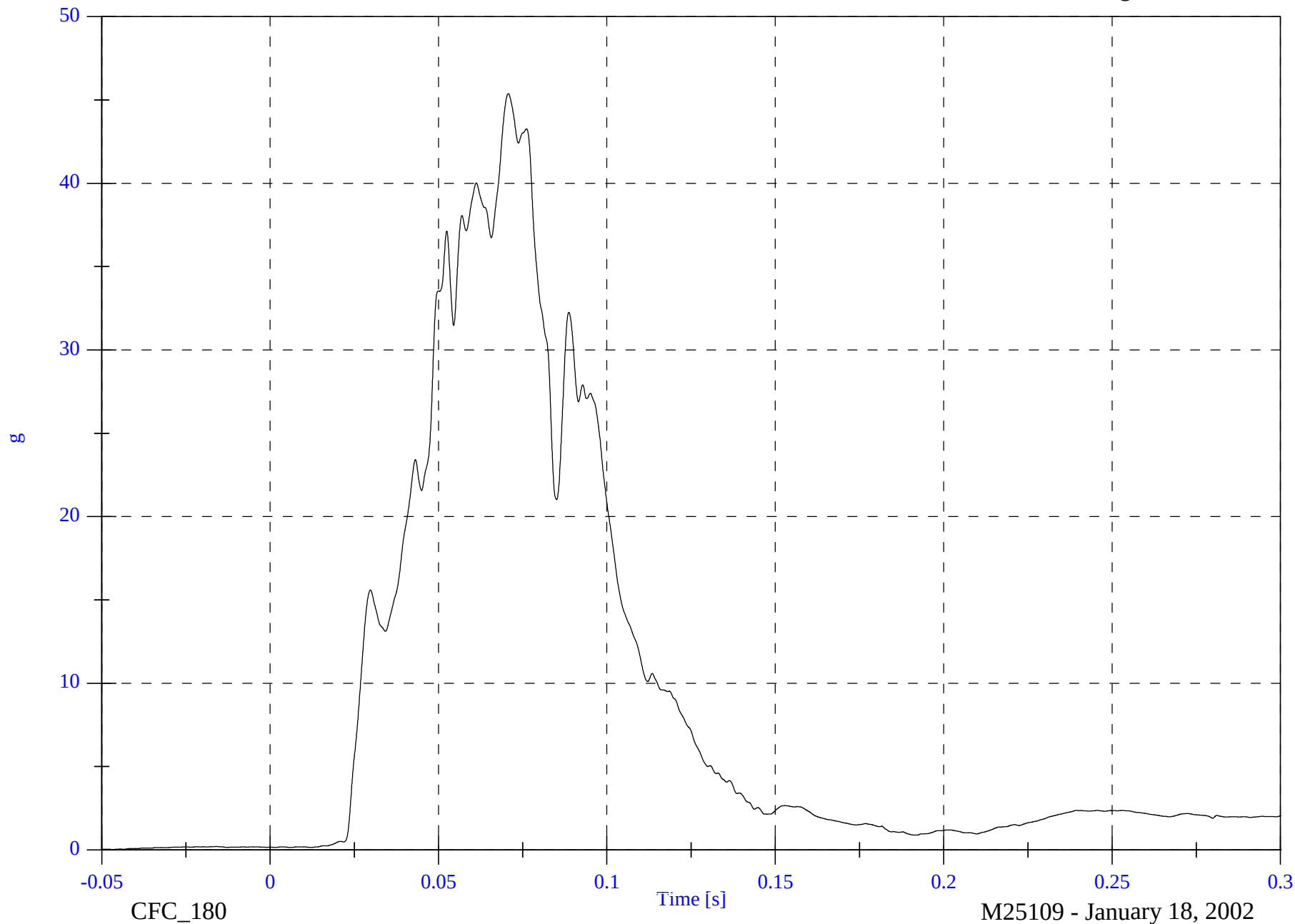
P2 Chest Red Resultant

Max: 45.4 [g] at 0.071 [s]

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

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2002 NCAP Test 3-2002 Toyota Sequoia

P2 Chest Compression x

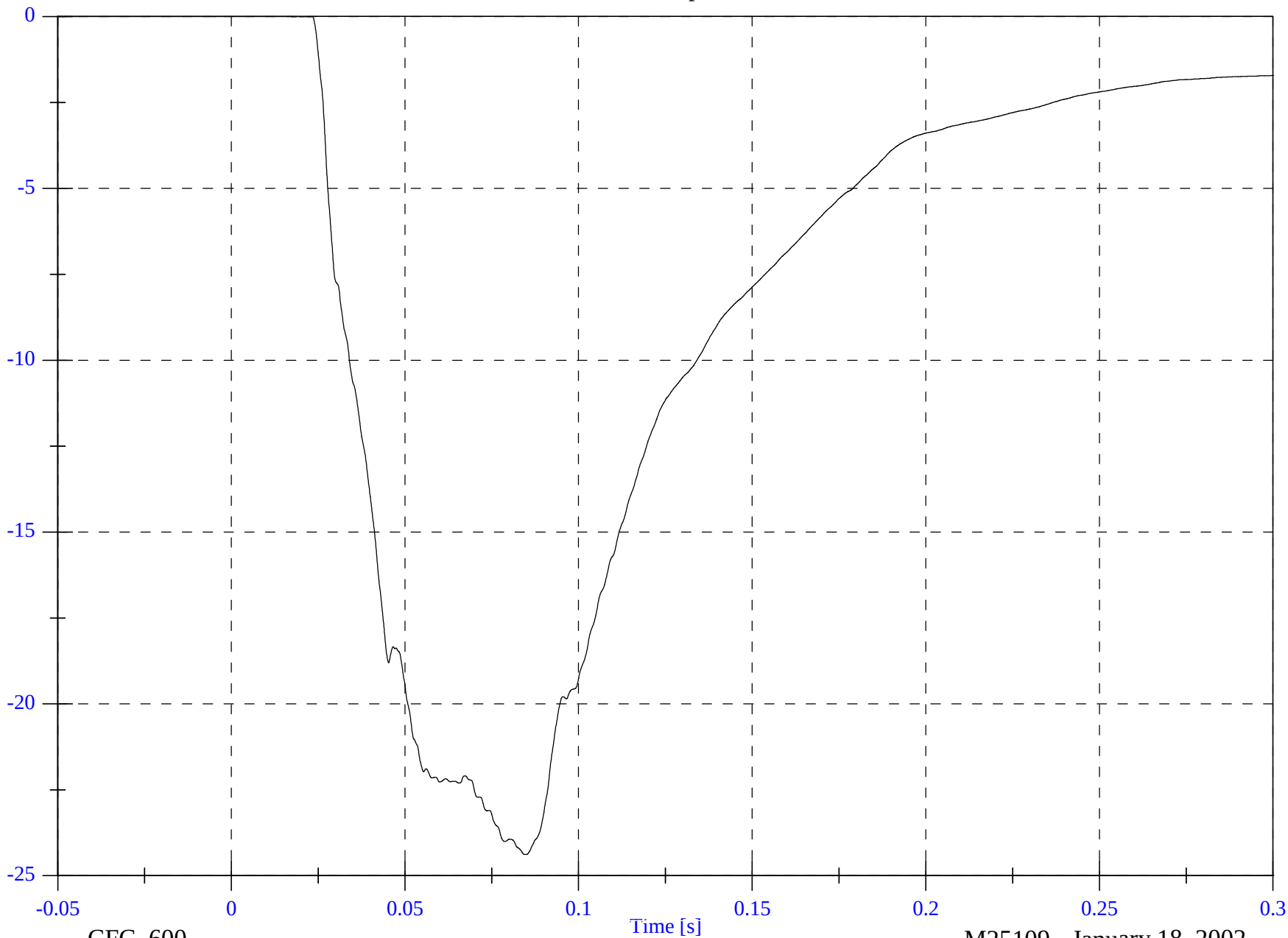
Max: 0.0 [mm] at -0.024 [s]

Min: -24.4 [mm] at 0.085 [s]

B-89

8642-NCAP-03

mm



CFC_600

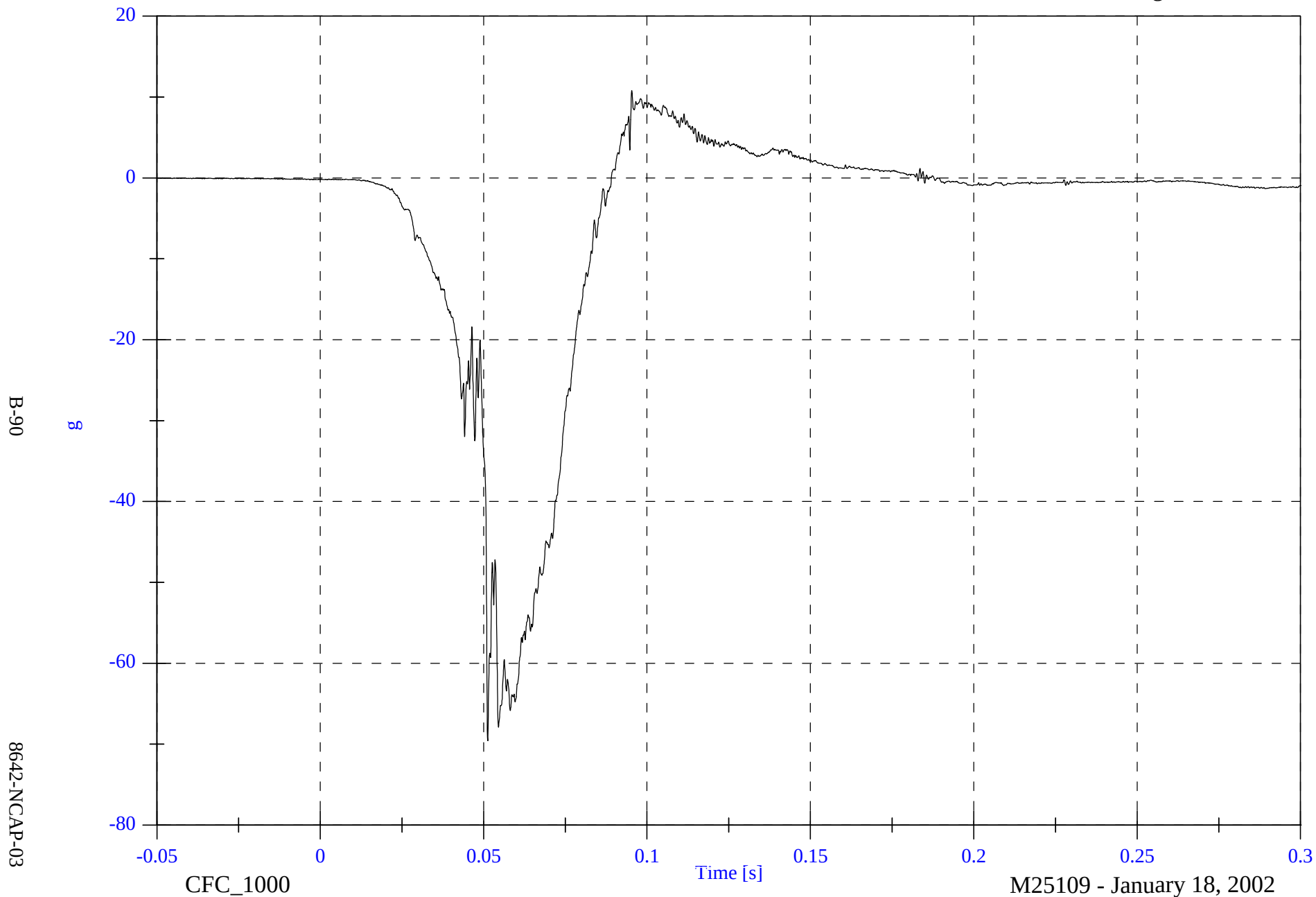
M25109 - January 18, 2002

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Max: 10.8 [g] at 0.095 [s]

Min: -69.6 [g] at 0.051 [s]

P2 Pelvic x

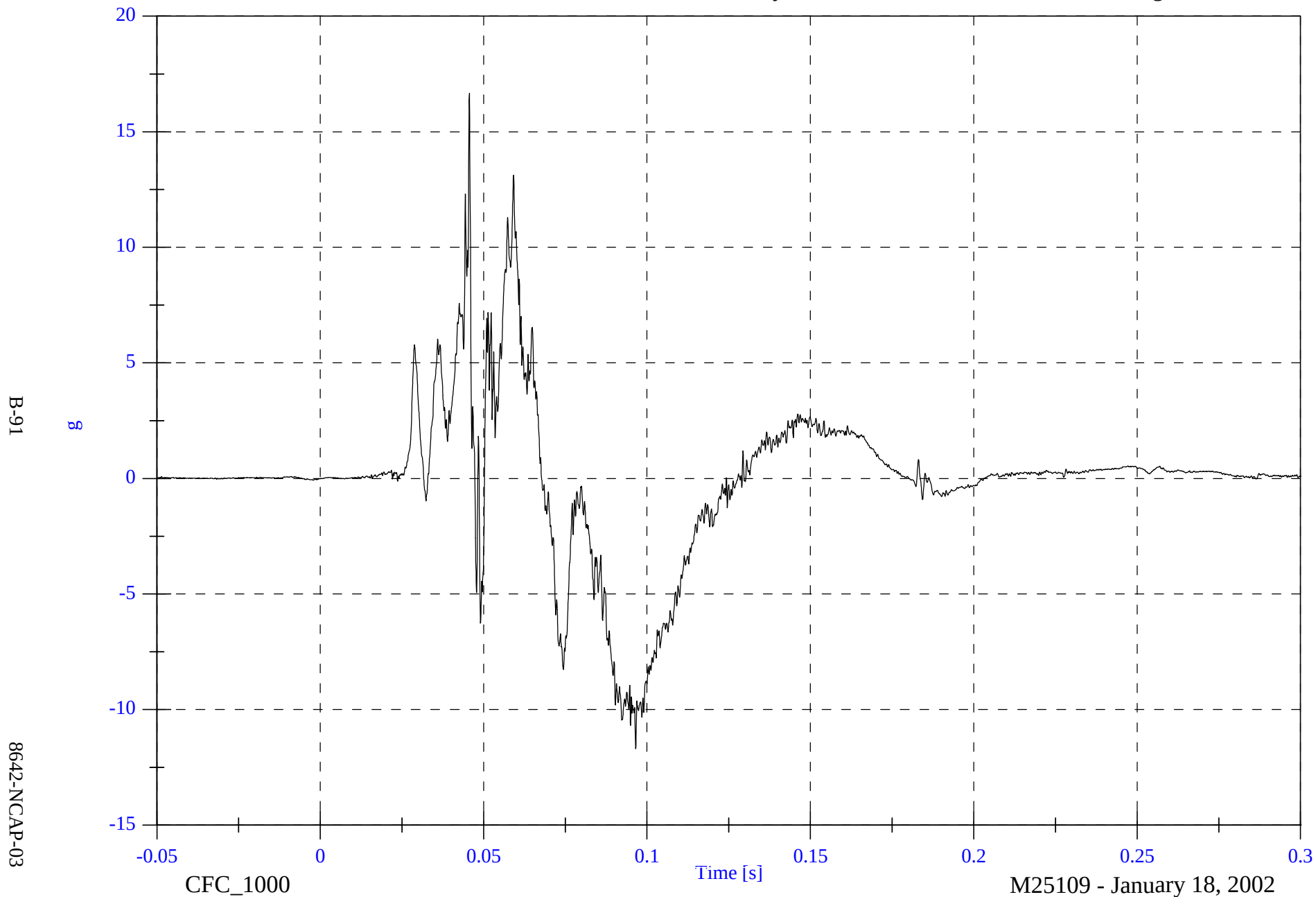


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Pelvic y

Max: 16.7 [g] at 0.046 [s]

Min: -11.7 [g] at 0.097 [s]

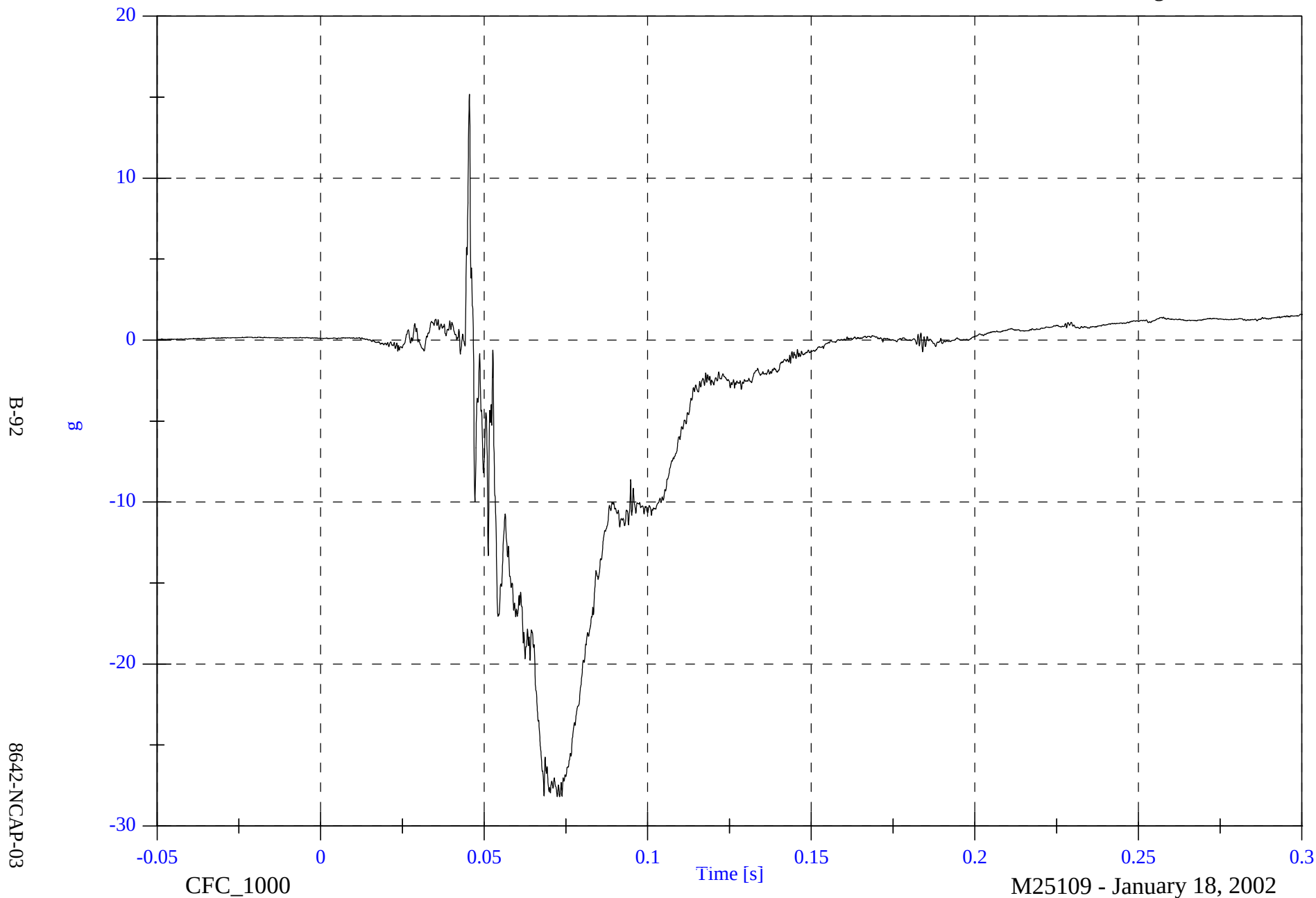


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Max: 15.2 [g] at 0.046 [s]

Min: -28.2 [g] at 0.073 [s]

P2 Pelvic z



2002 NCAP Test 3-2002 Toyota Sequoia

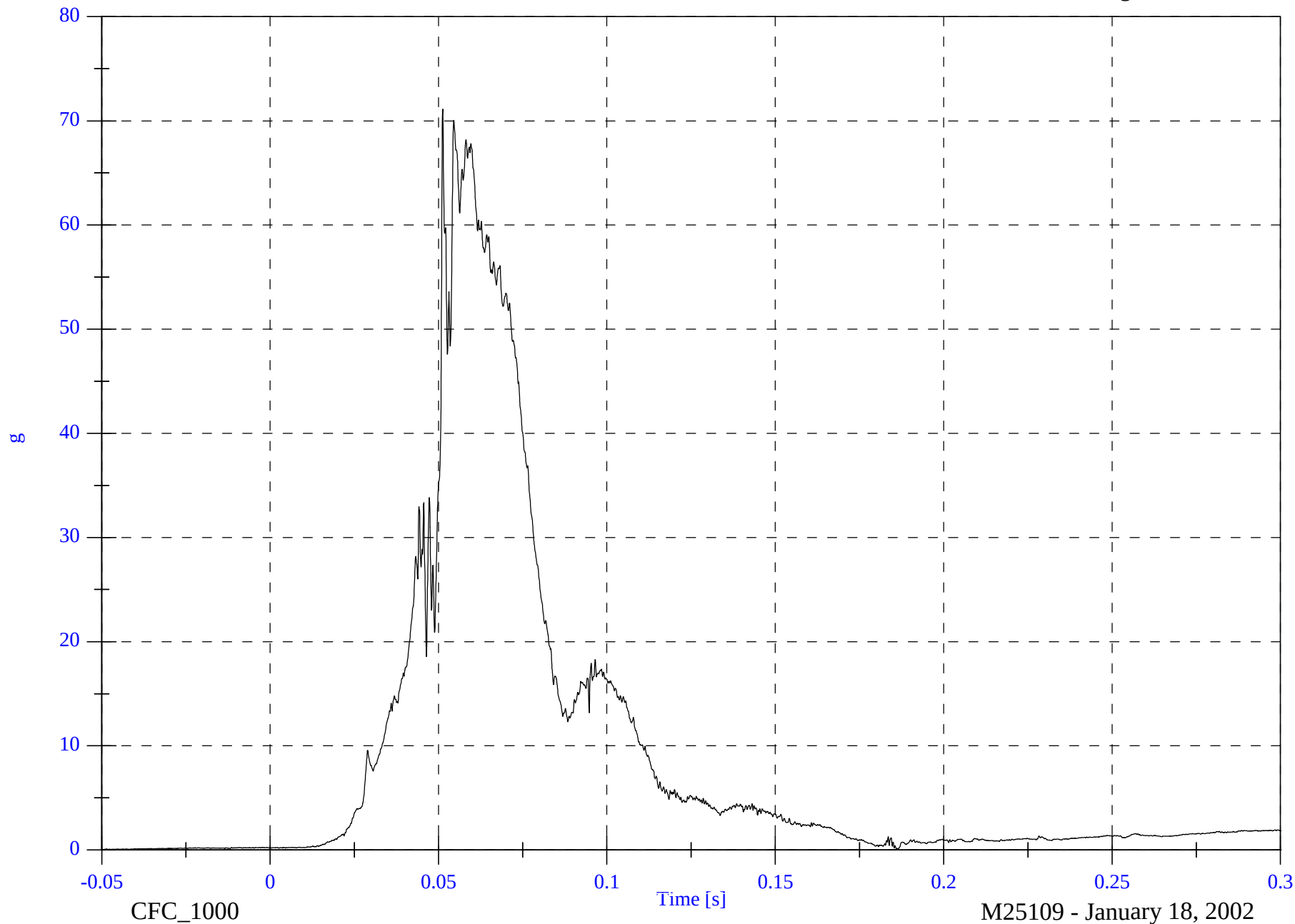
P2 Pelvic Resultant

Max: 71.1 [g] at 0.051 [s]

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

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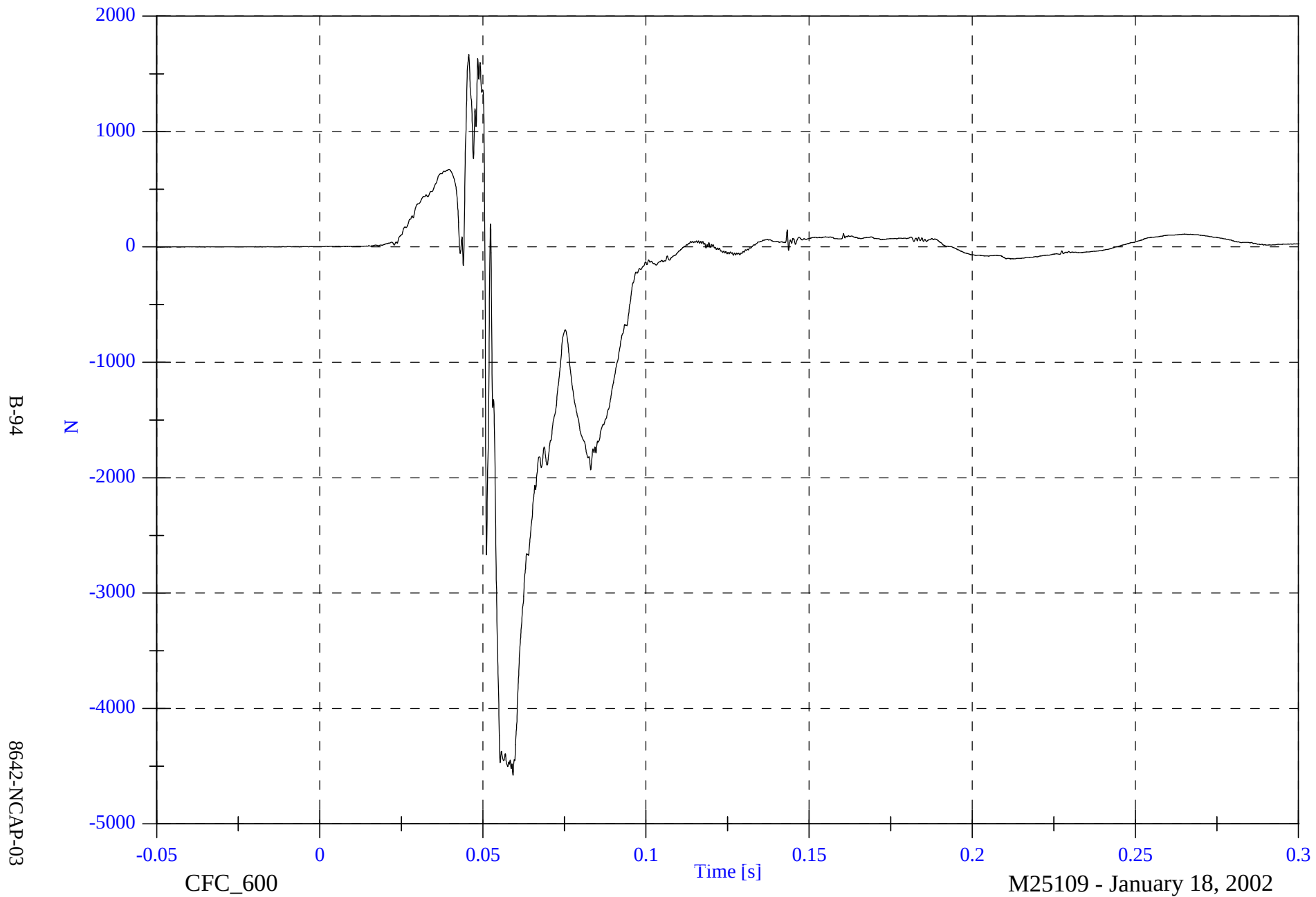


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Left Femur z

Max: 1668.6 [N] at 0.046 [s]

Min: -4579.3 [N] at 0.059 [s]

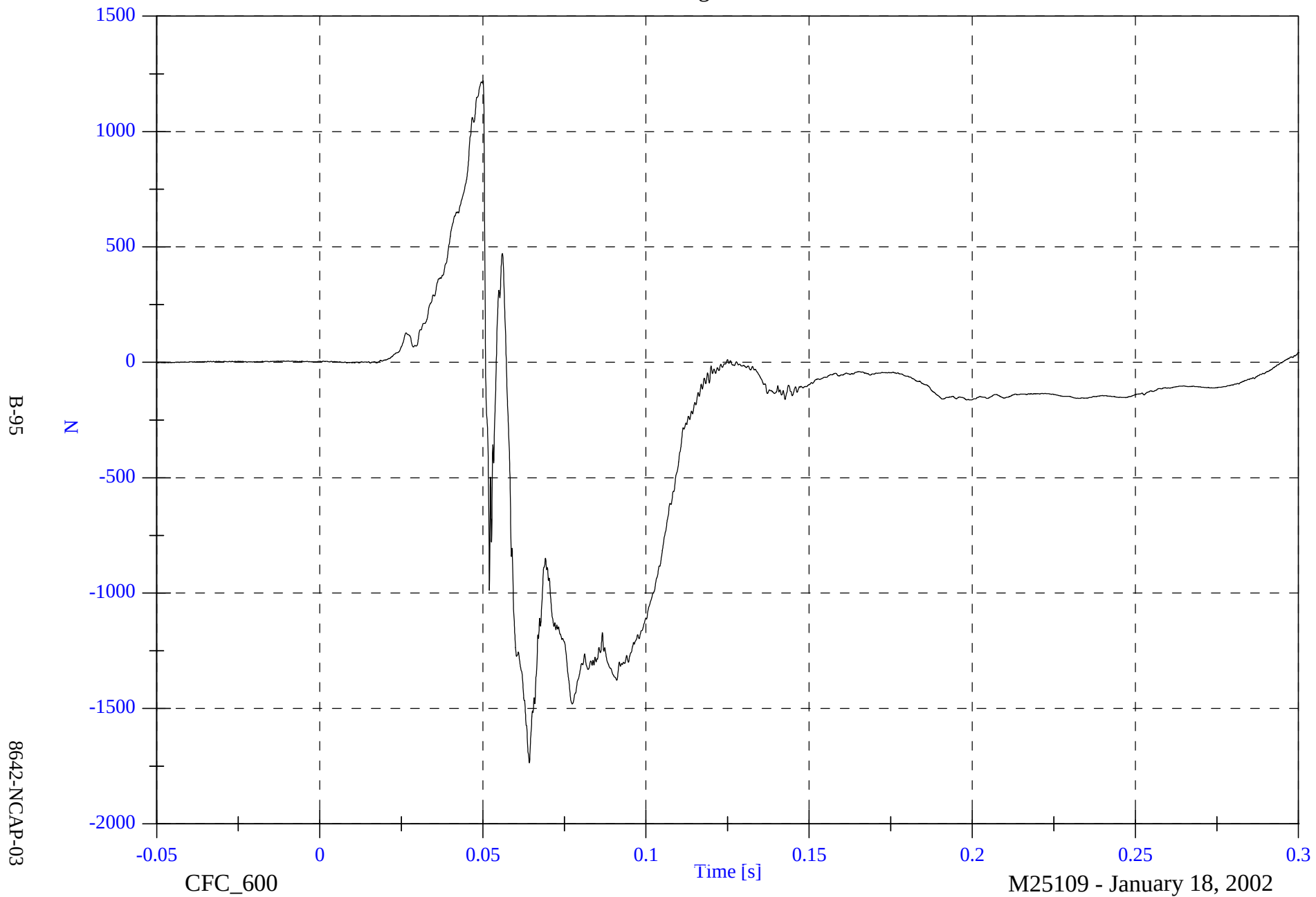


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Right Femur z

Max: 1220.2 [N] at 0.050 [s]

Min: -1736.0 [N] at 0.064 [s]

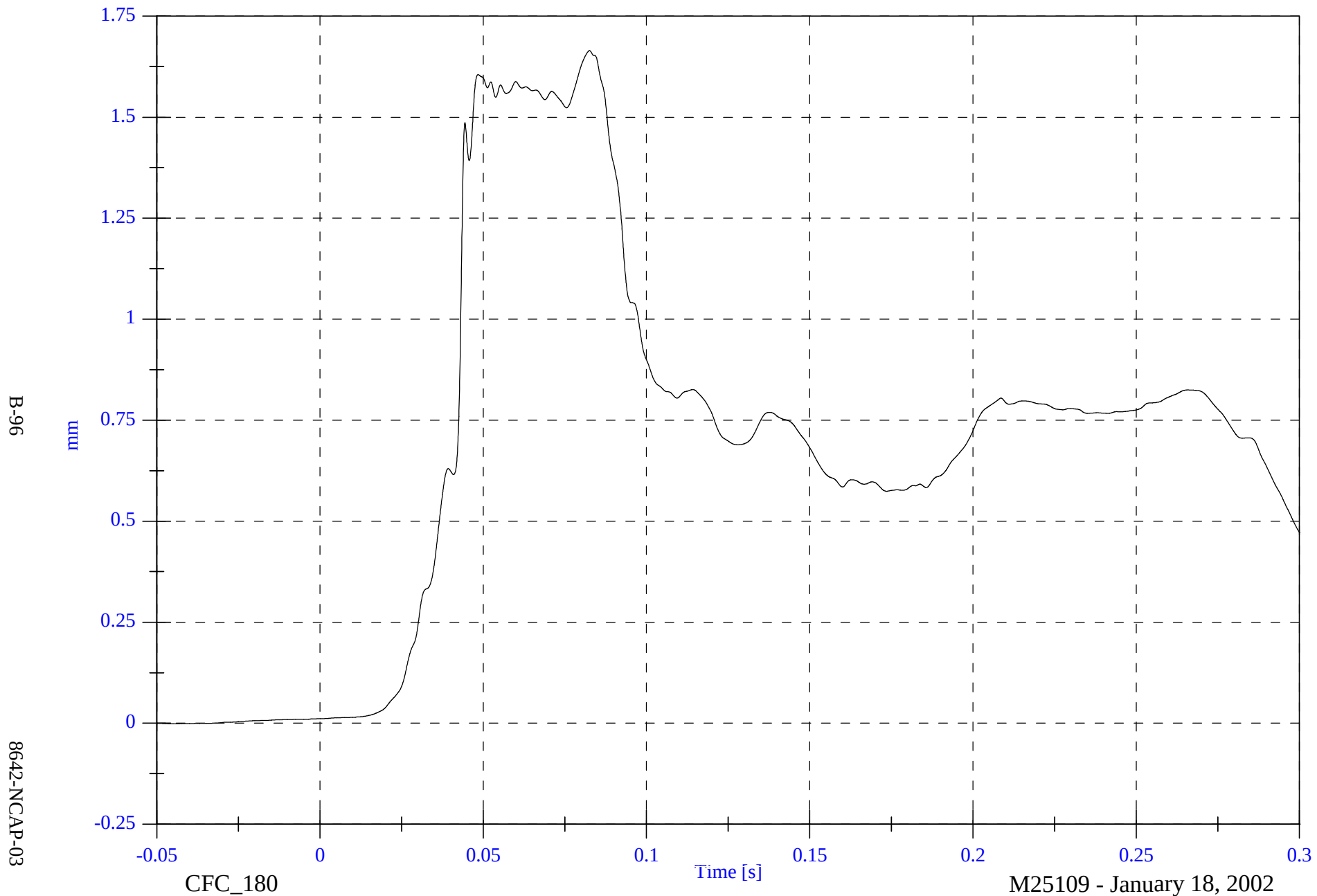


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Left Knee Shear

Max: 1.7 [mm] at 0.083 [s]

Min: -0.0 [mm] at -0.044 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

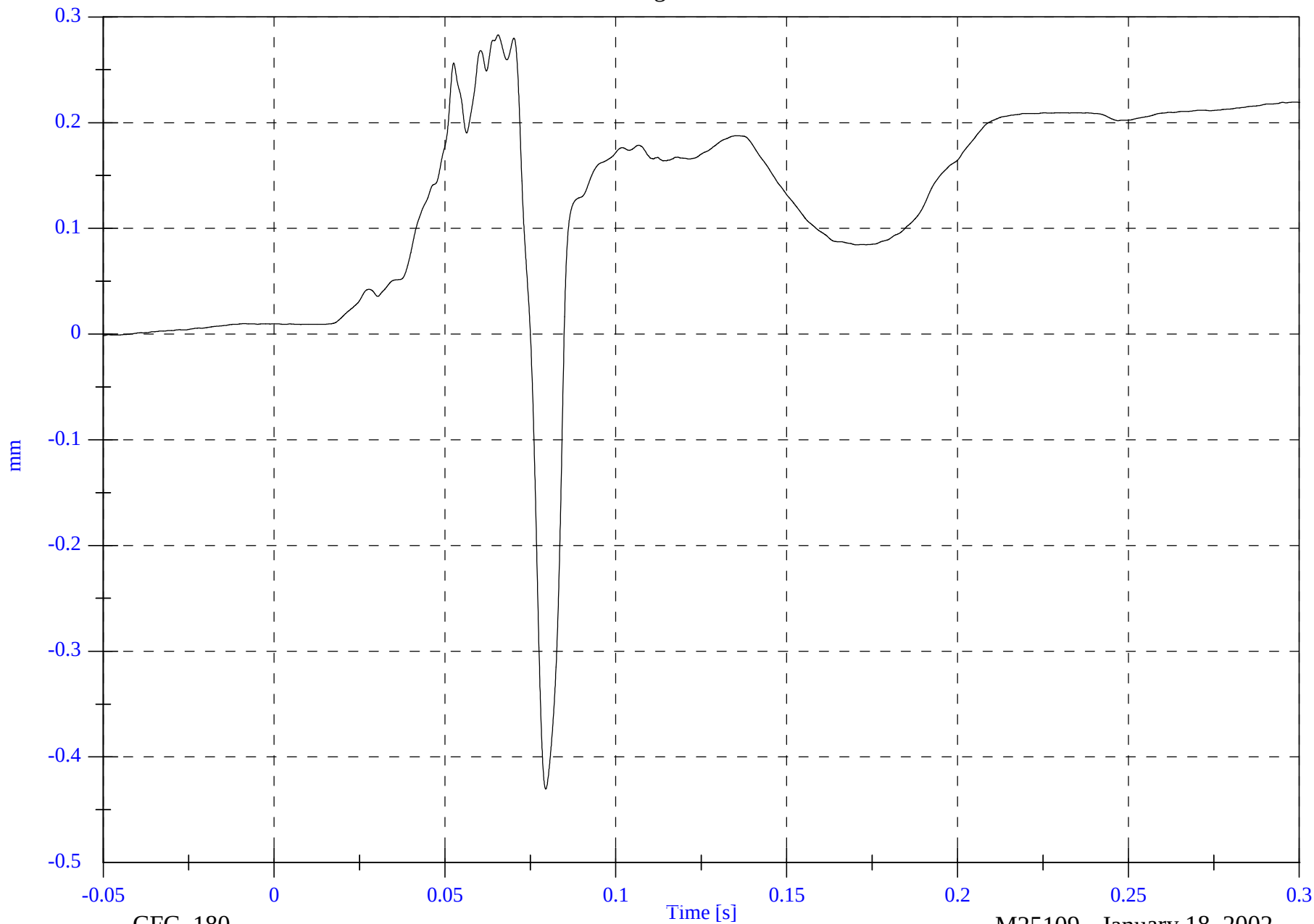
P2 Right Knee Shear

Max: 0.3 [mm] at 0.066 [s]

Min: -0.4 [mm] at 0.080 [s]

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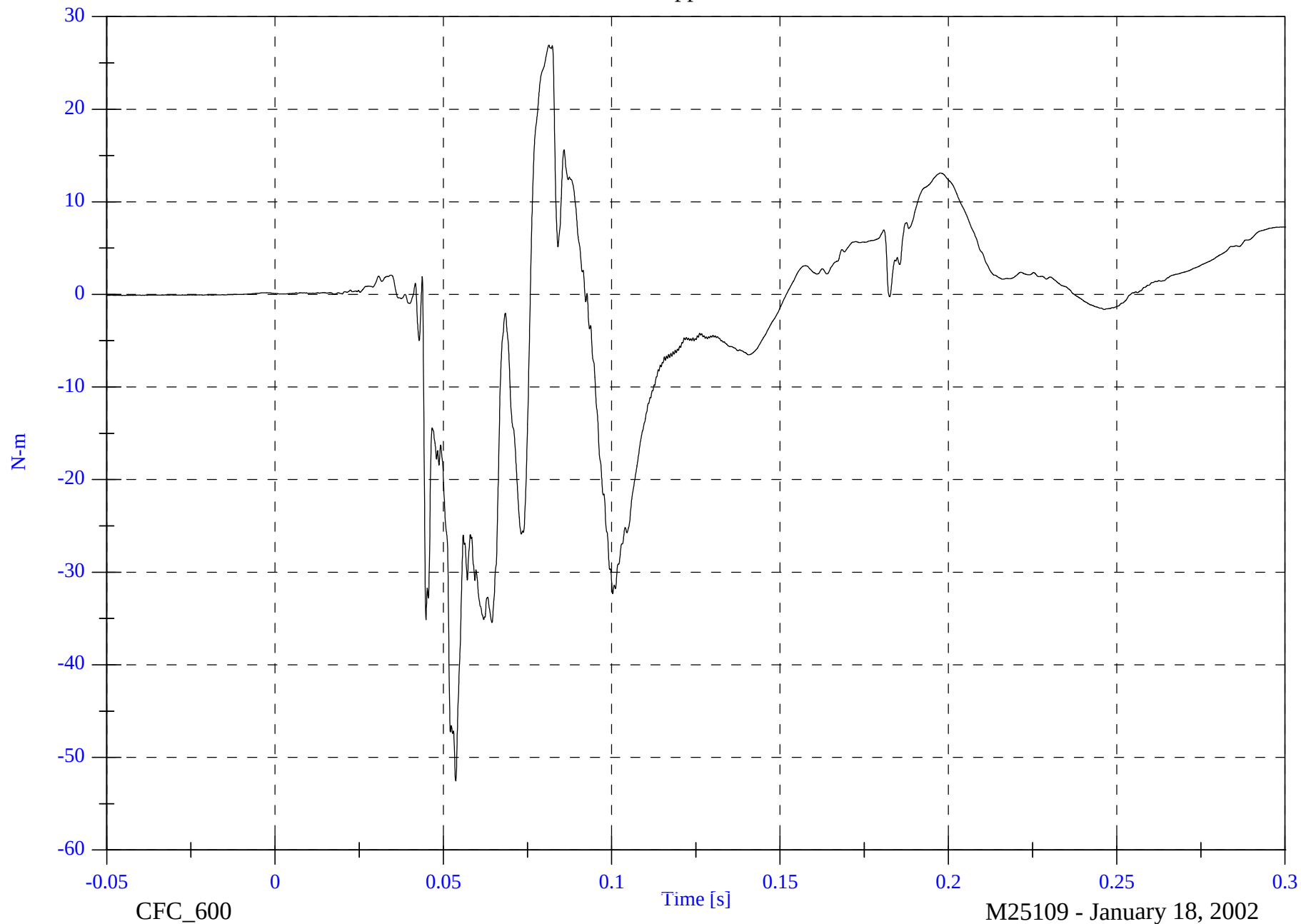
P2 Left Upper Tibia Mx

Max: 26.9 [N-m] at 0.081 [s]

Min: -52.6 [N-m] at 0.054 [s]

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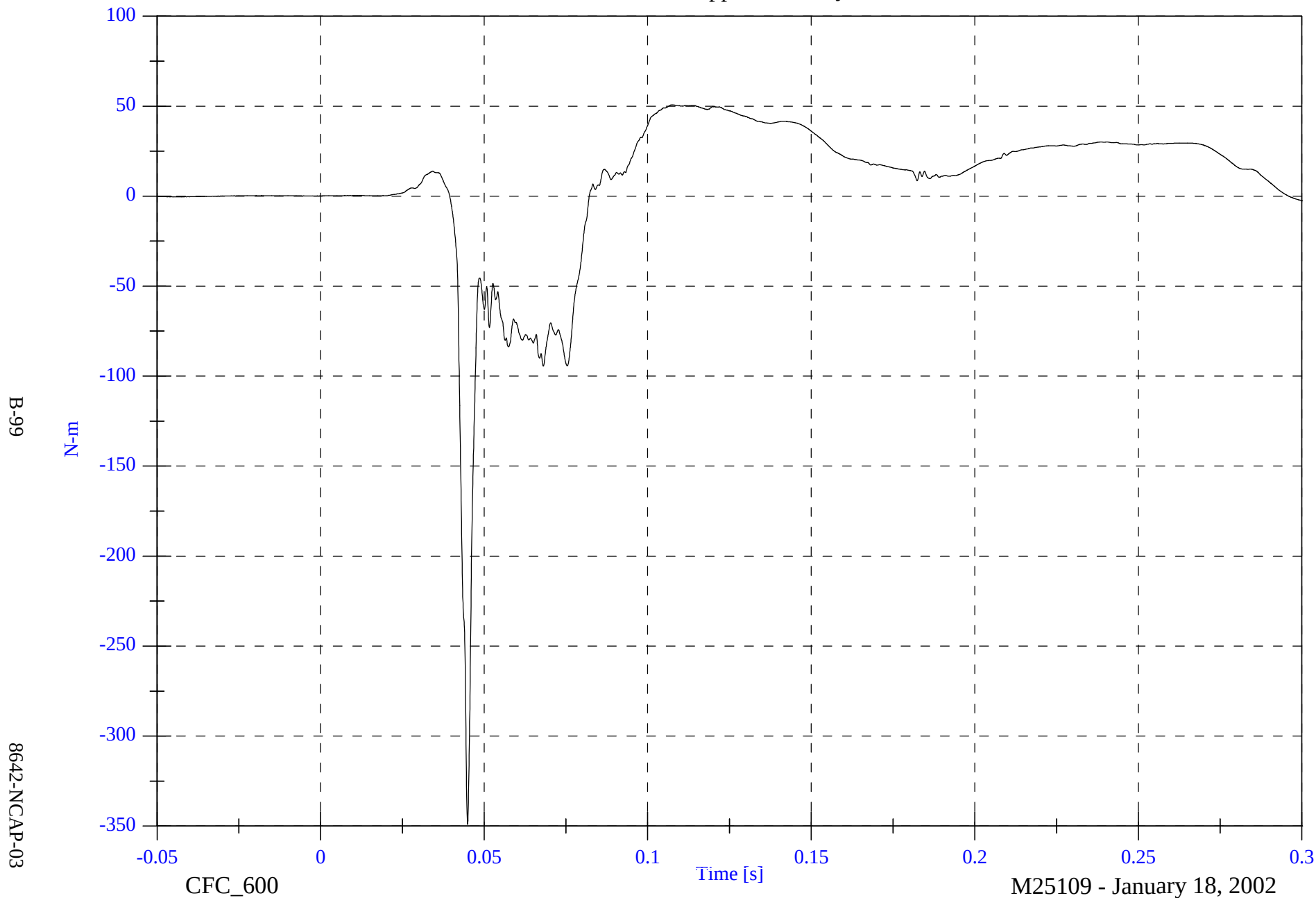


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P2 Left Upper Tibia My

Max: 50.8 [N-m] at 0.107 [s]

Min: -349.1 [N-m] at 0.045 [s]

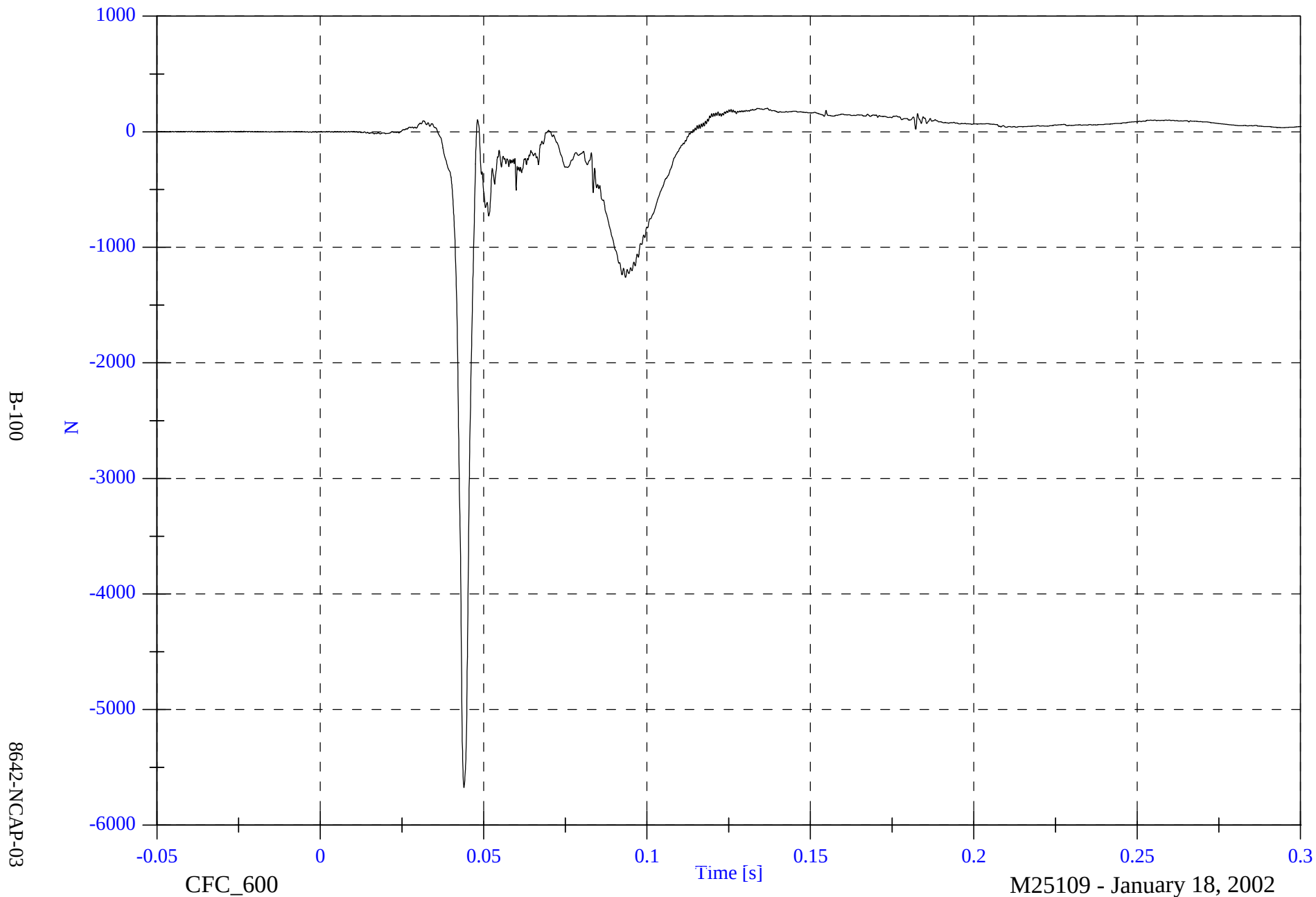


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Left Lower Tibia Fz

Max: 203.6 [N] at 0.137 [s]

Min: -5674.5 [N] at 0.044 [s]



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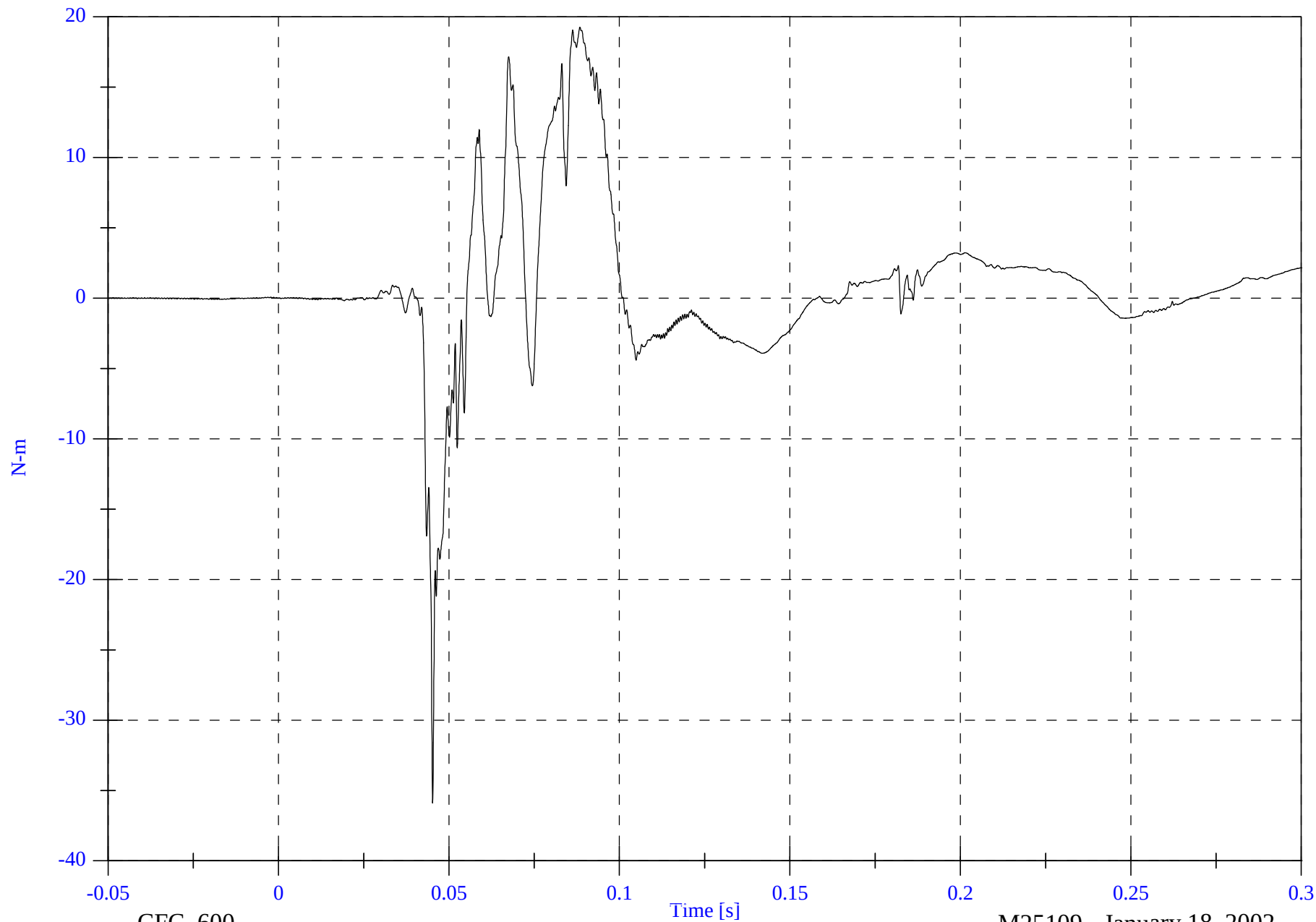
P2 Left Lower Tibia Mx

Max: 19.3 [N-m] at 0.088 [s]

Min: -35.9 [N-m] at 0.045 [s]

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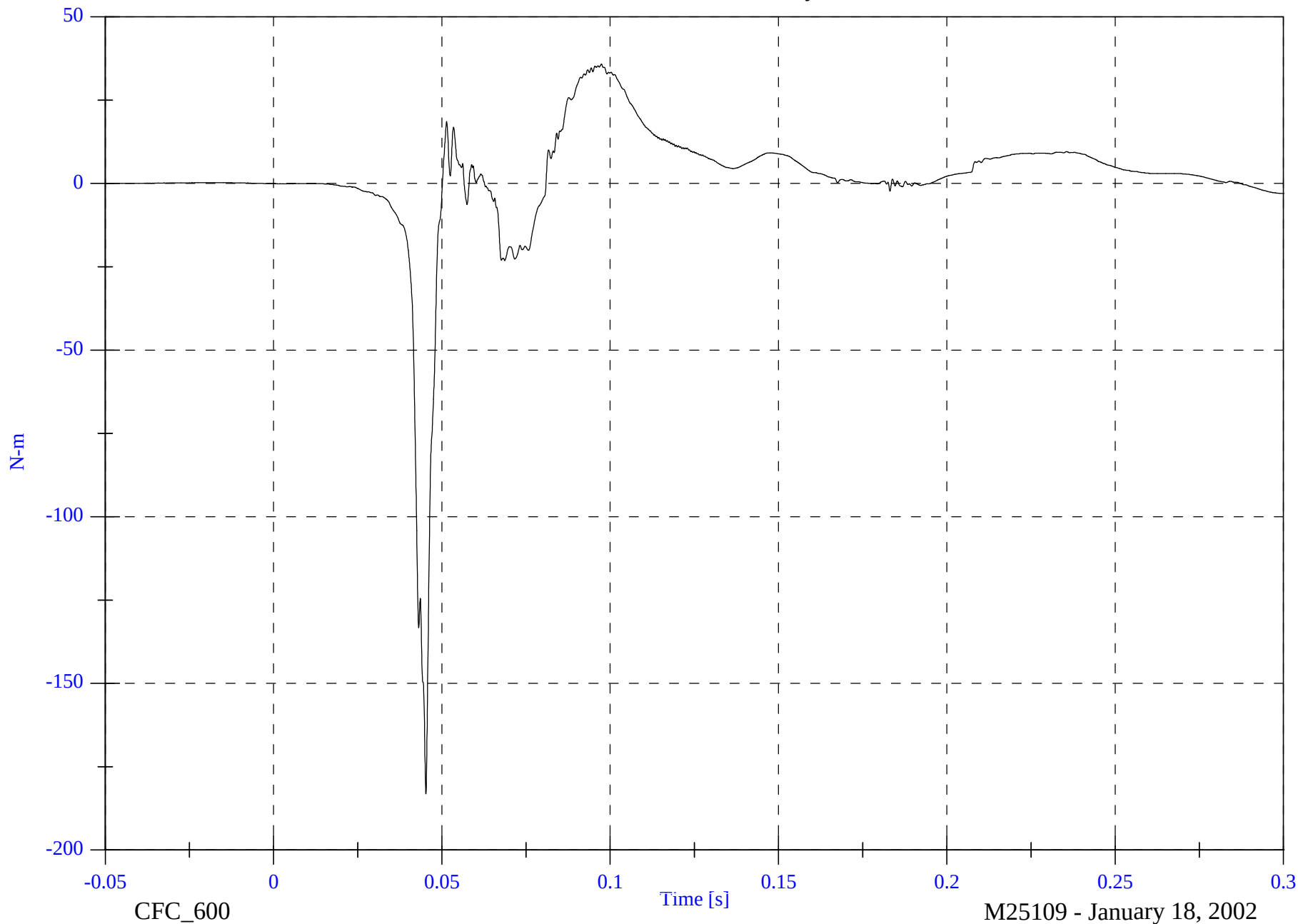
P2 Left Lower Tibia My

Max: 35.8 [N-m] at 0.097 [s]

Min: -183.2 [N-m] at 0.045 [s]

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Time [s]

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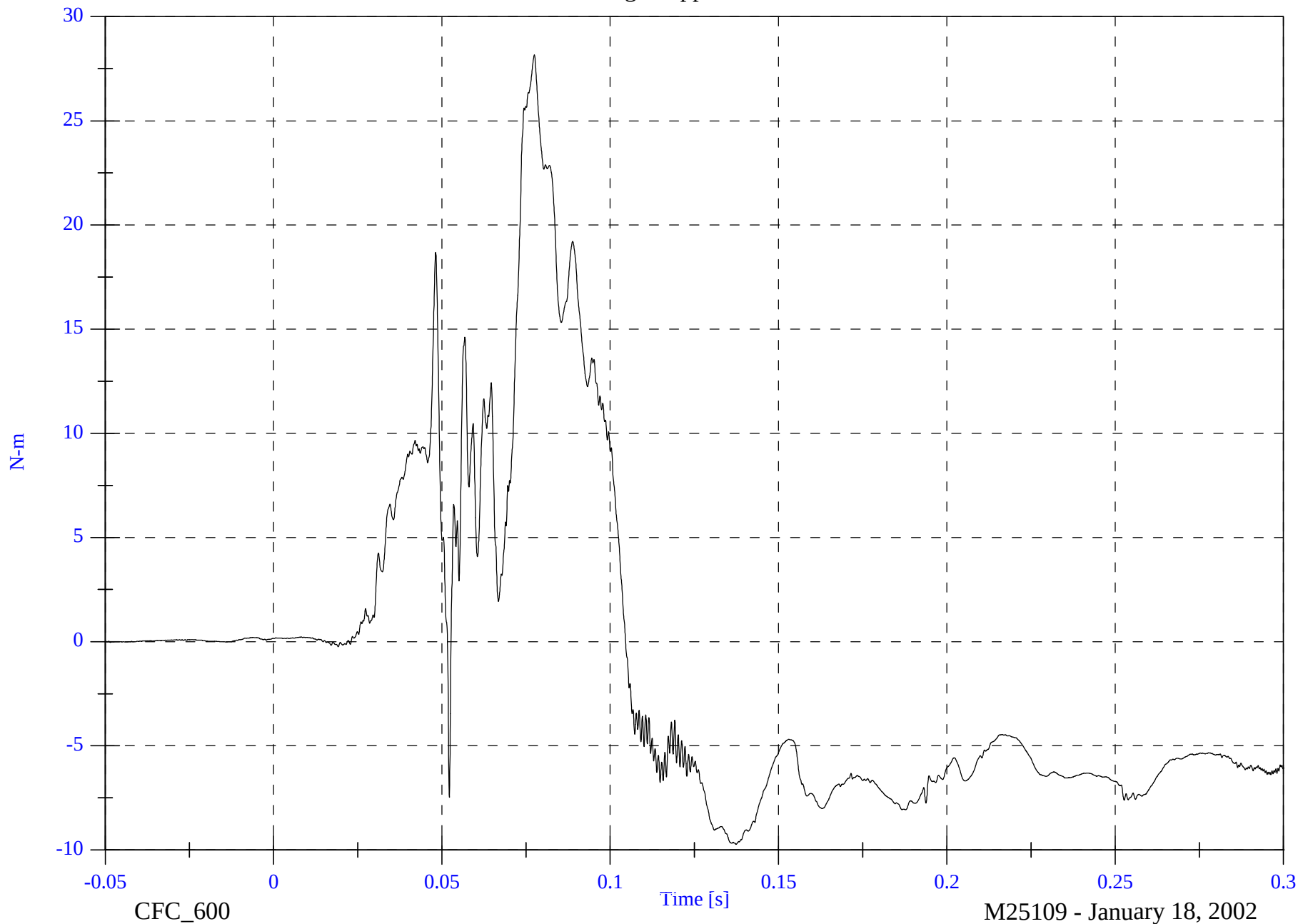
P2 Right Upper Tibia Mx

Max: 28.2 [N-m] at 0.077 [s]

Min: -9.7 [N-m] at 0.137 [s]

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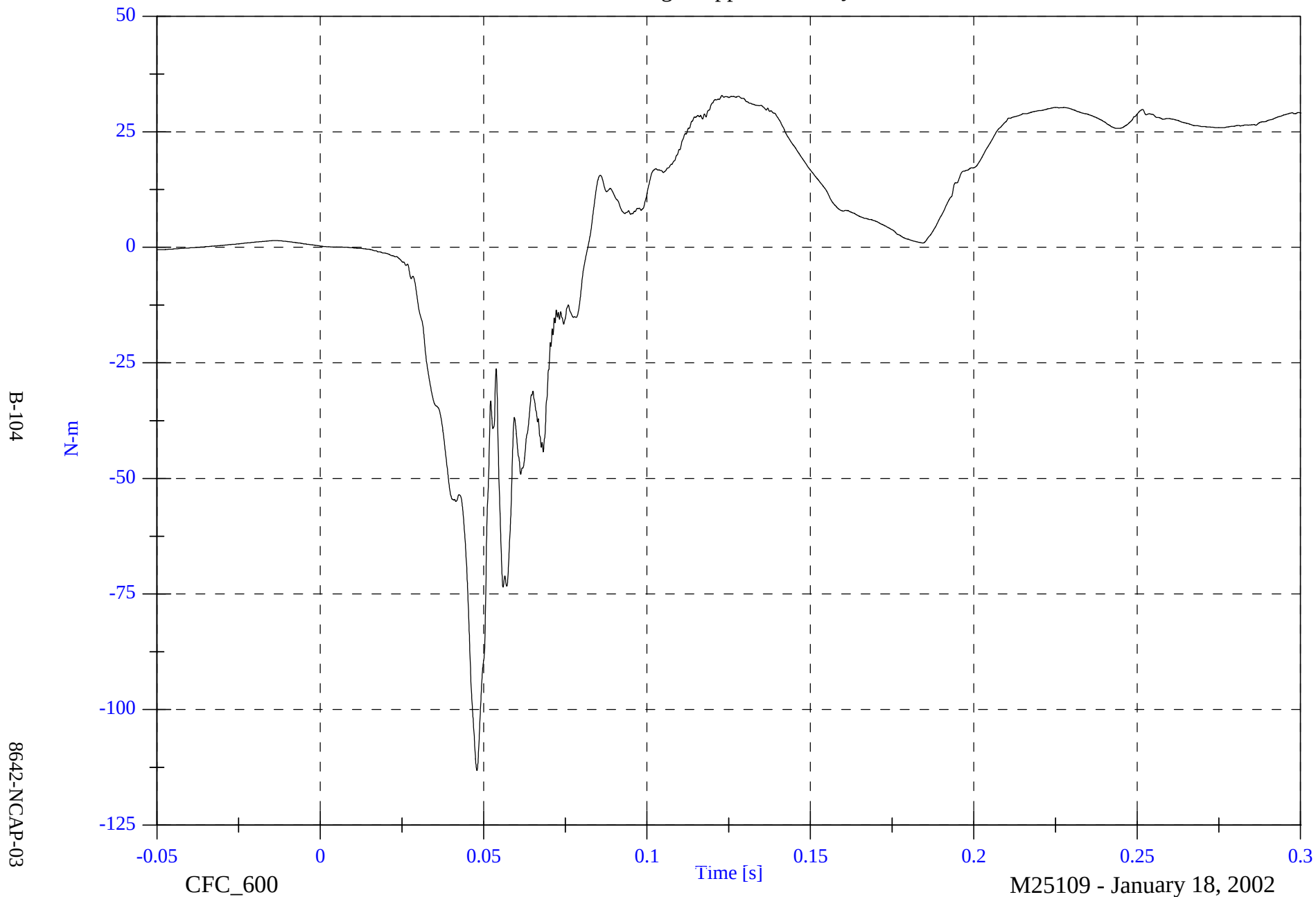


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Right Upper Tibia My

Max: 32.8 [N-m] at 0.123 [s]

Min: -113.2 [N-m] at 0.048 [s]

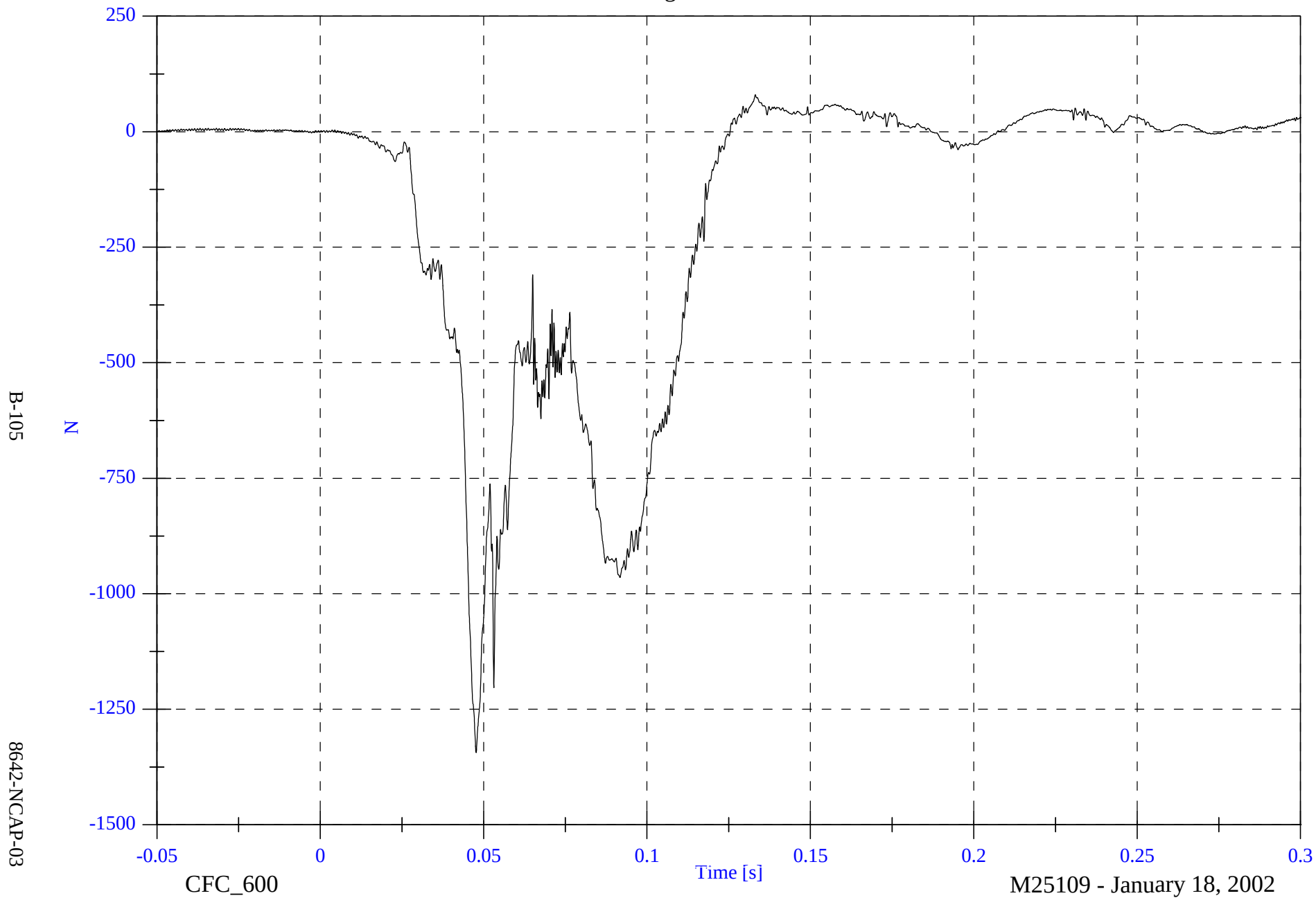


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Right Lower Tibia Fz

Max: 79.7 [N] at 0.133 [s]

Min: -1344.0 [N] at 0.048 [s]

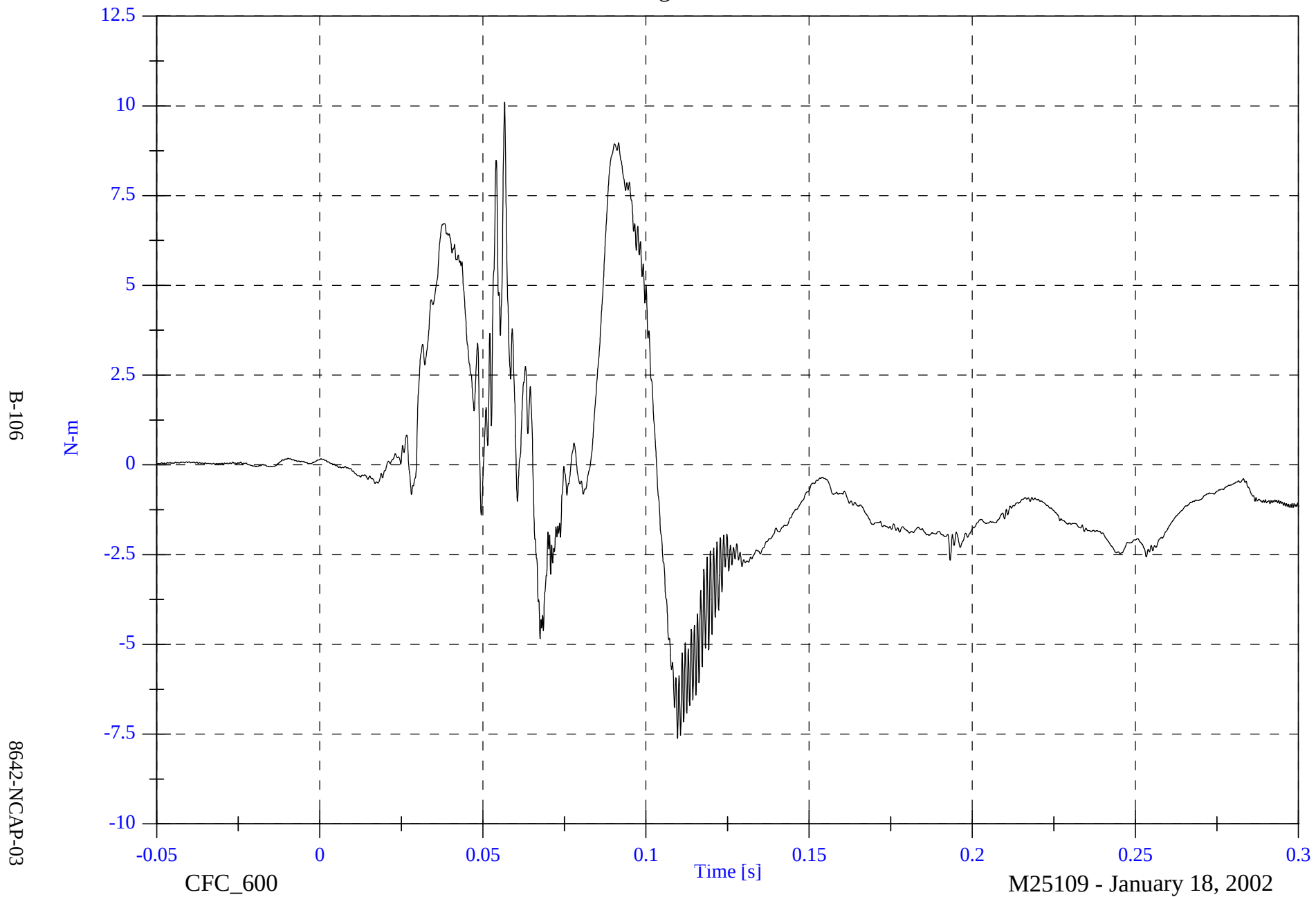


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Right Lower Tibia Mx

Max: 10.1 [N-m] at 0.057 [s]

Min: -7.6 [N-m] at 0.110 [s]

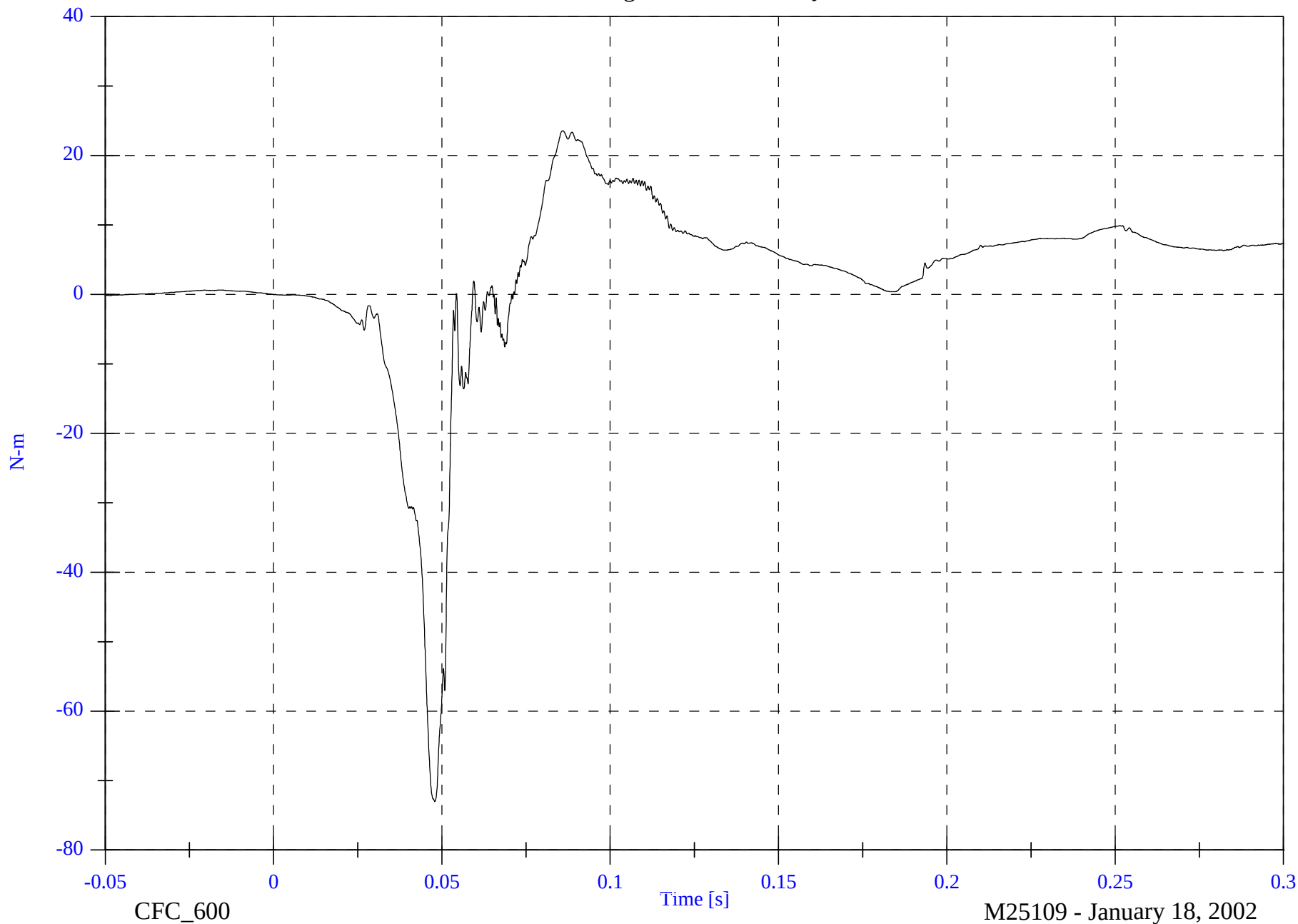


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Right Lower Tibia My

Max: 23.6 [N-m] at 0.086 [s]

Min: -73.0 [N-m] at 0.048 [s]



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CFC_600

Time [s]

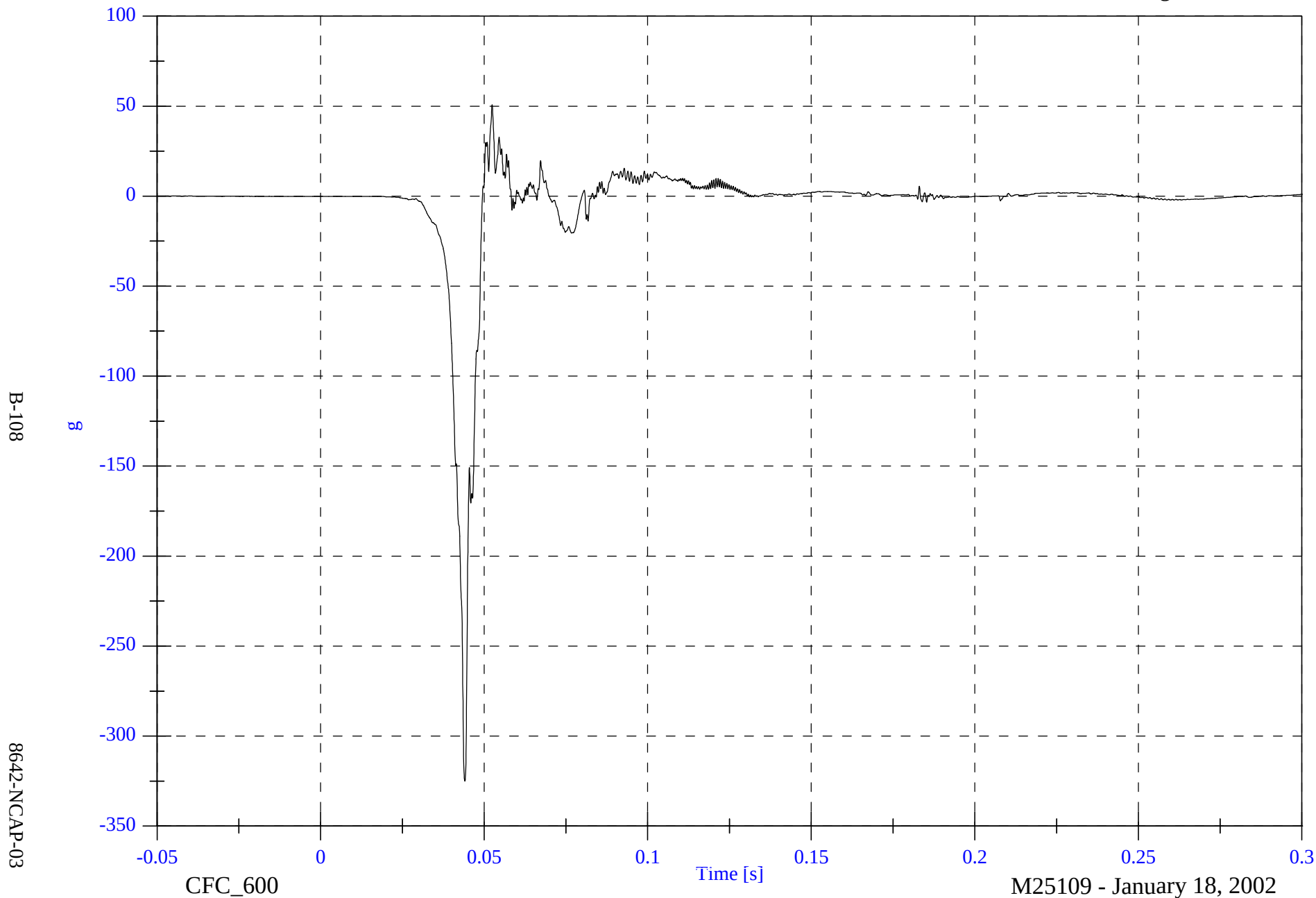
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P2 Left Foot Aft x

Max: 50.8 [g] at 0.052 [s]

Min: -325.0 [g] at 0.044 [s]

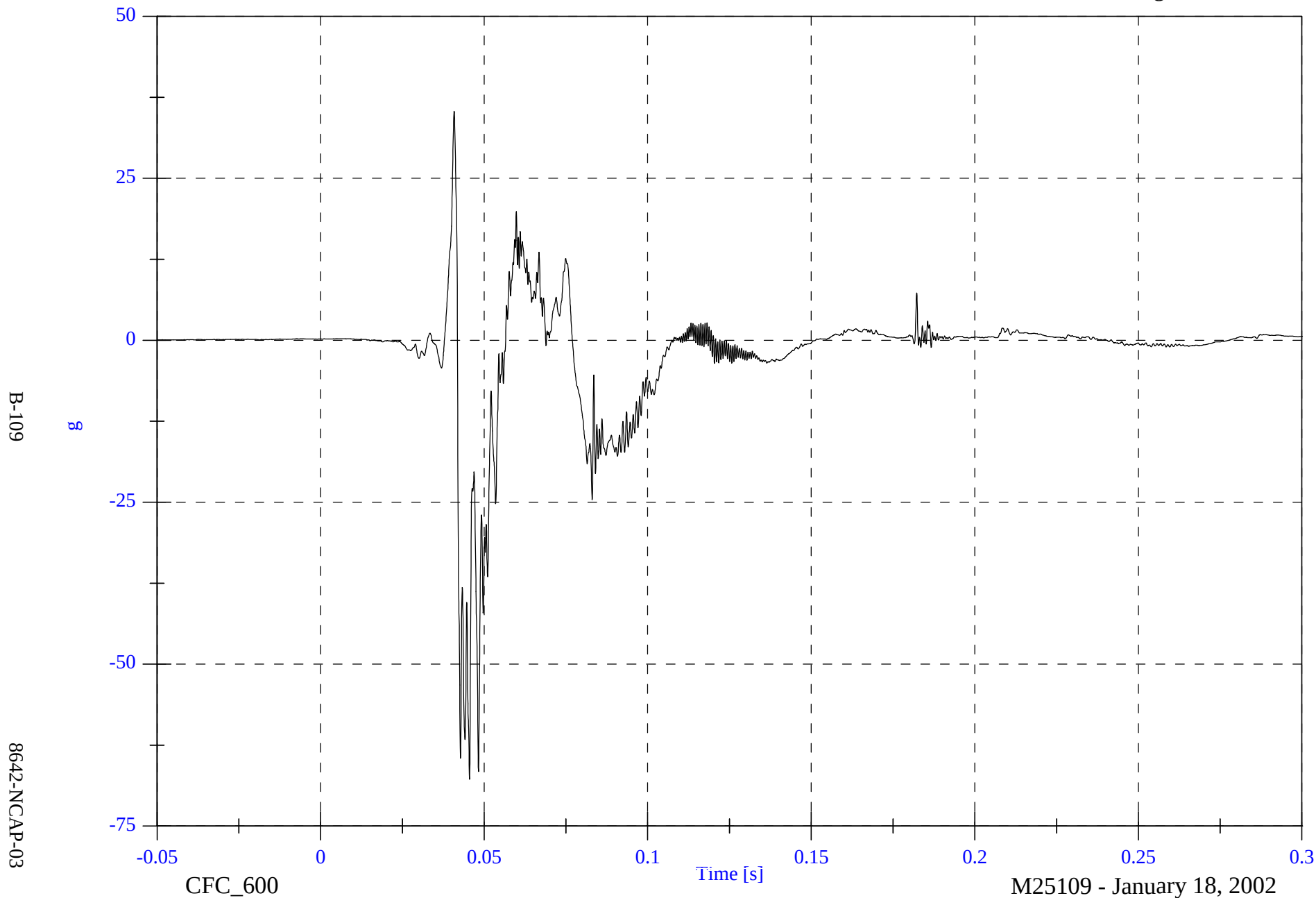


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Max: 35.3 [g] at 0.041 [s]

Min: -67.8 [g] at 0.046 [s]

P2 Left Foot Aft z

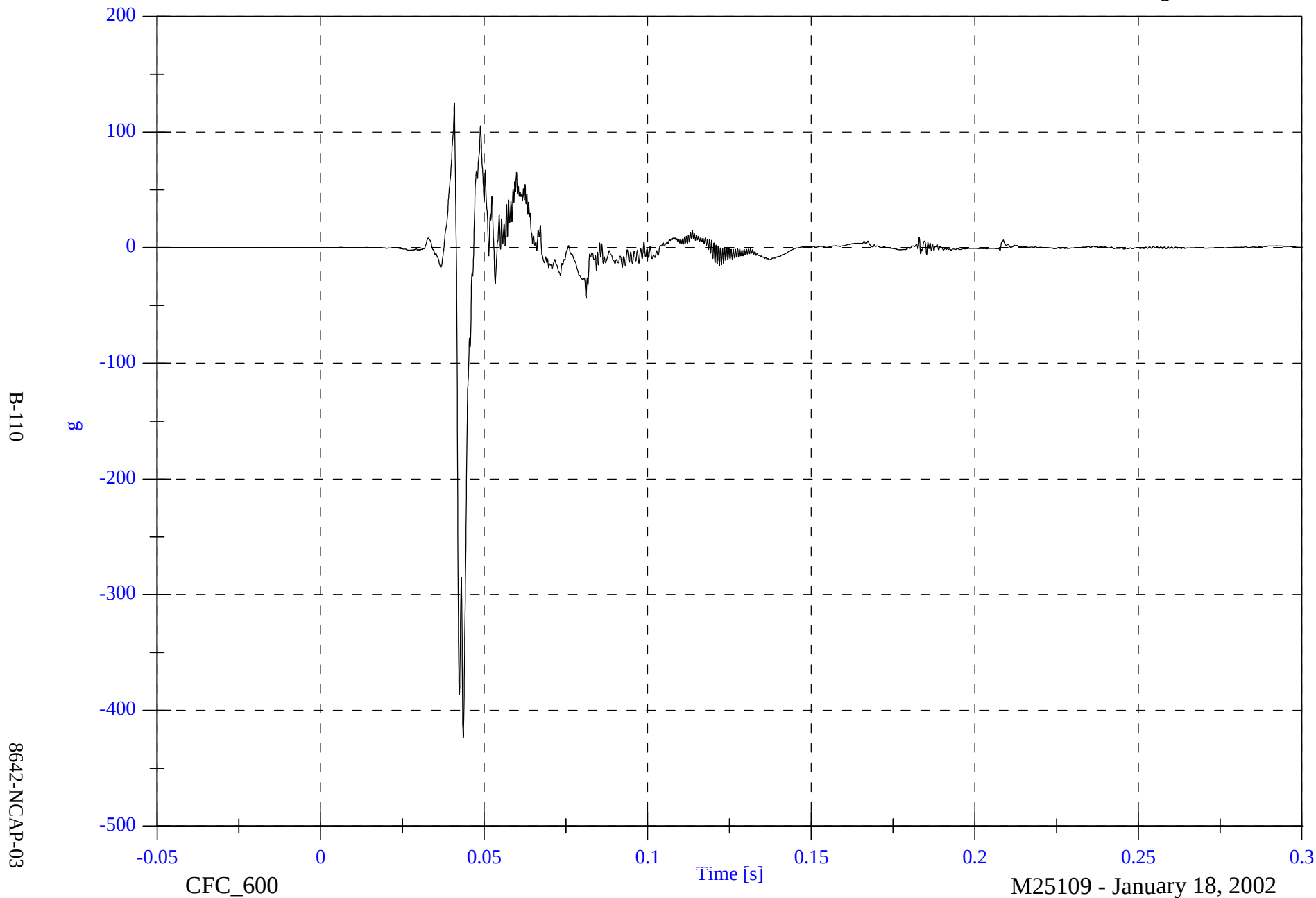


2002 NCAP Test 3-2002 Toyota Sequoia

P2 Left Foot Fore z

Max: 125.1 [g] at 0.041 [s]

Min: -423.9 [g] at 0.044 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

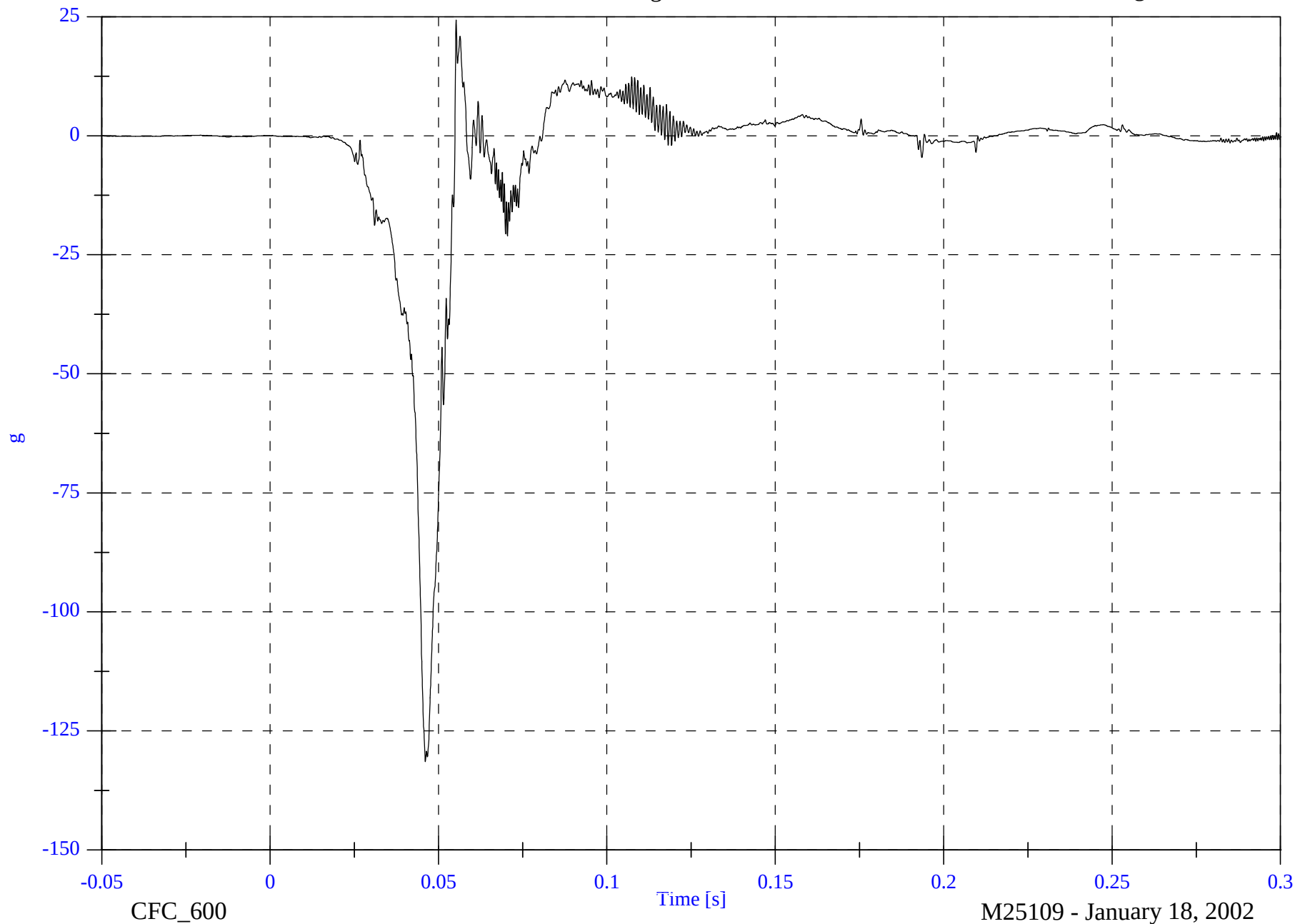
P2 Right Foot Aft x

Max: 24.3 [g] at 0.055 [s]

Min: -131.5 [g] at 0.046 [s]

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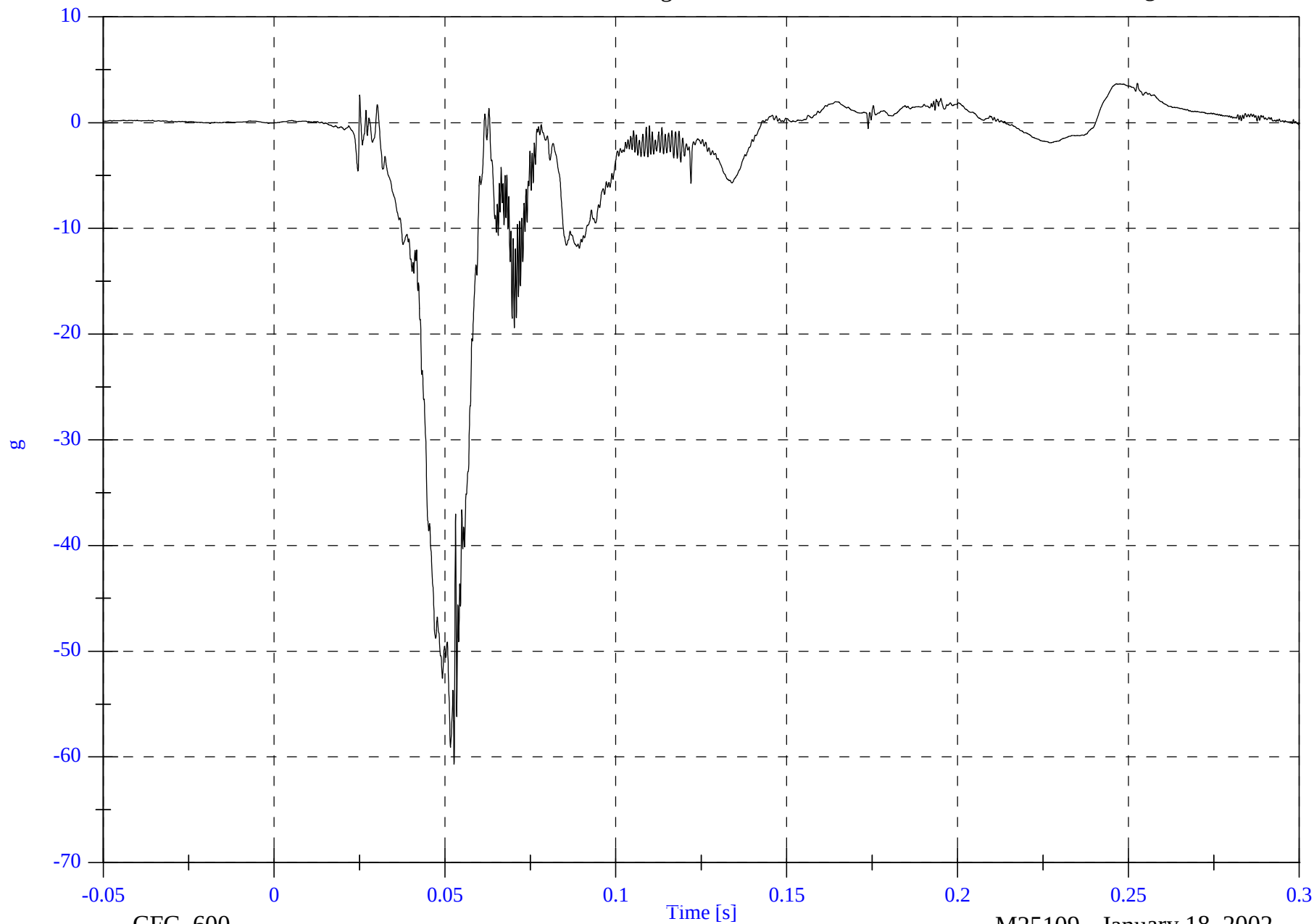


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P2 Right Foot Aft z

Max: 3.7 [g] at 0.253 [s]

Min: -60.7 [g] at 0.053 [s]



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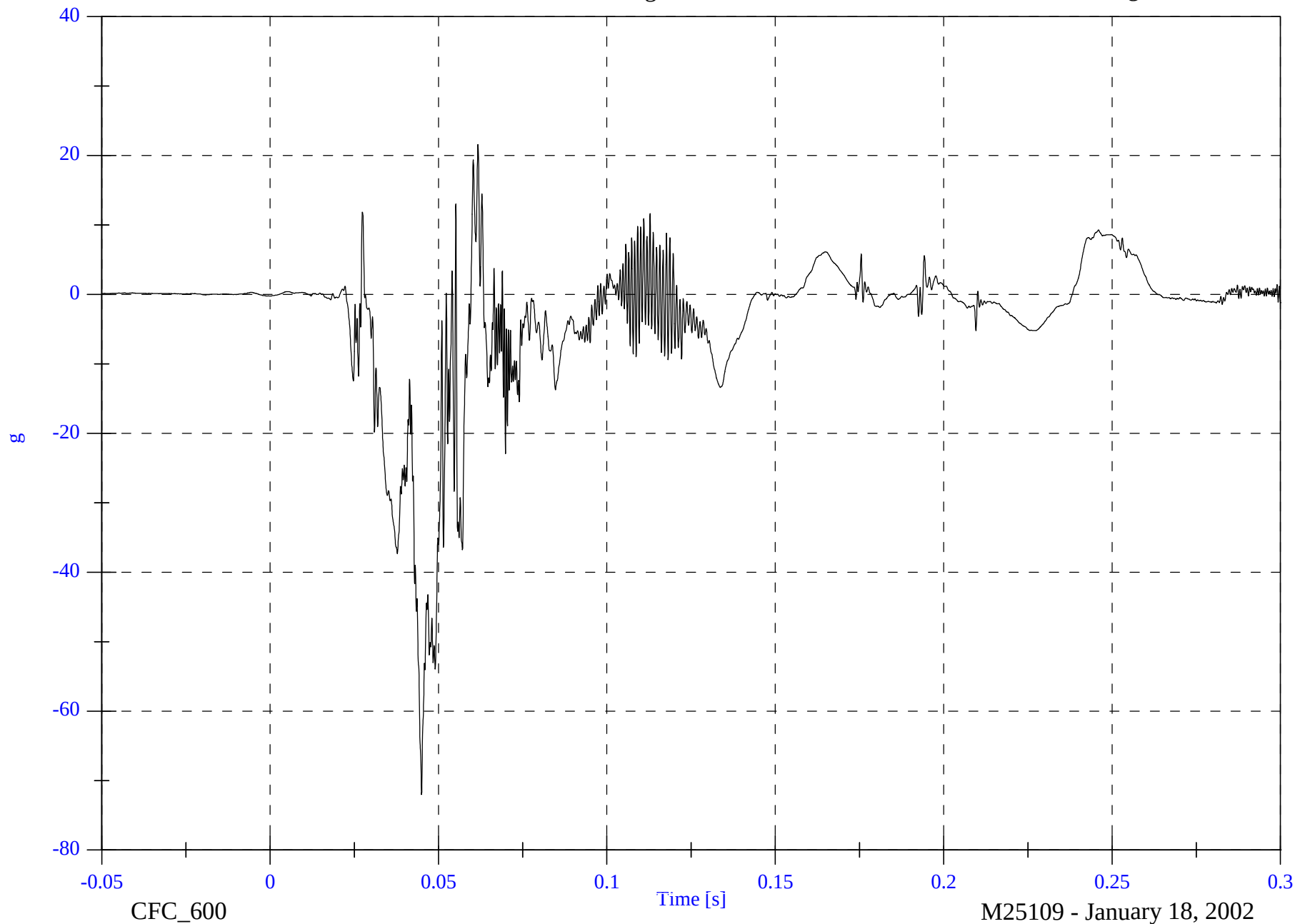
P2 Right Foot Fore z

Max: 21.6 [g] at 0.062 [s]

Min: -72.0 [g] at 0.045 [s]

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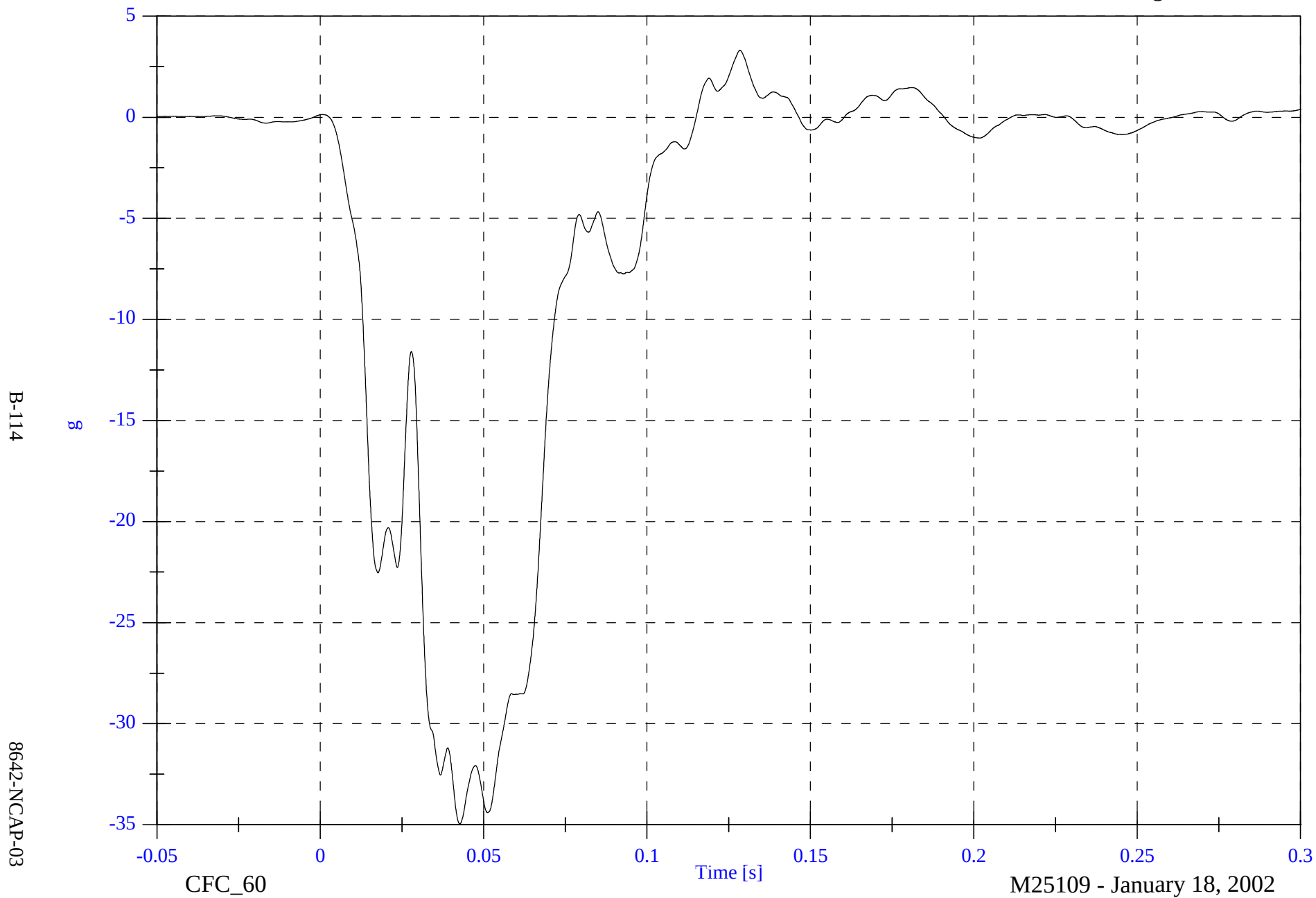


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Left Rear #1x

Max: 3.3 [g] at 0.128 [s]

Min: -35.0 [g] at 0.043 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

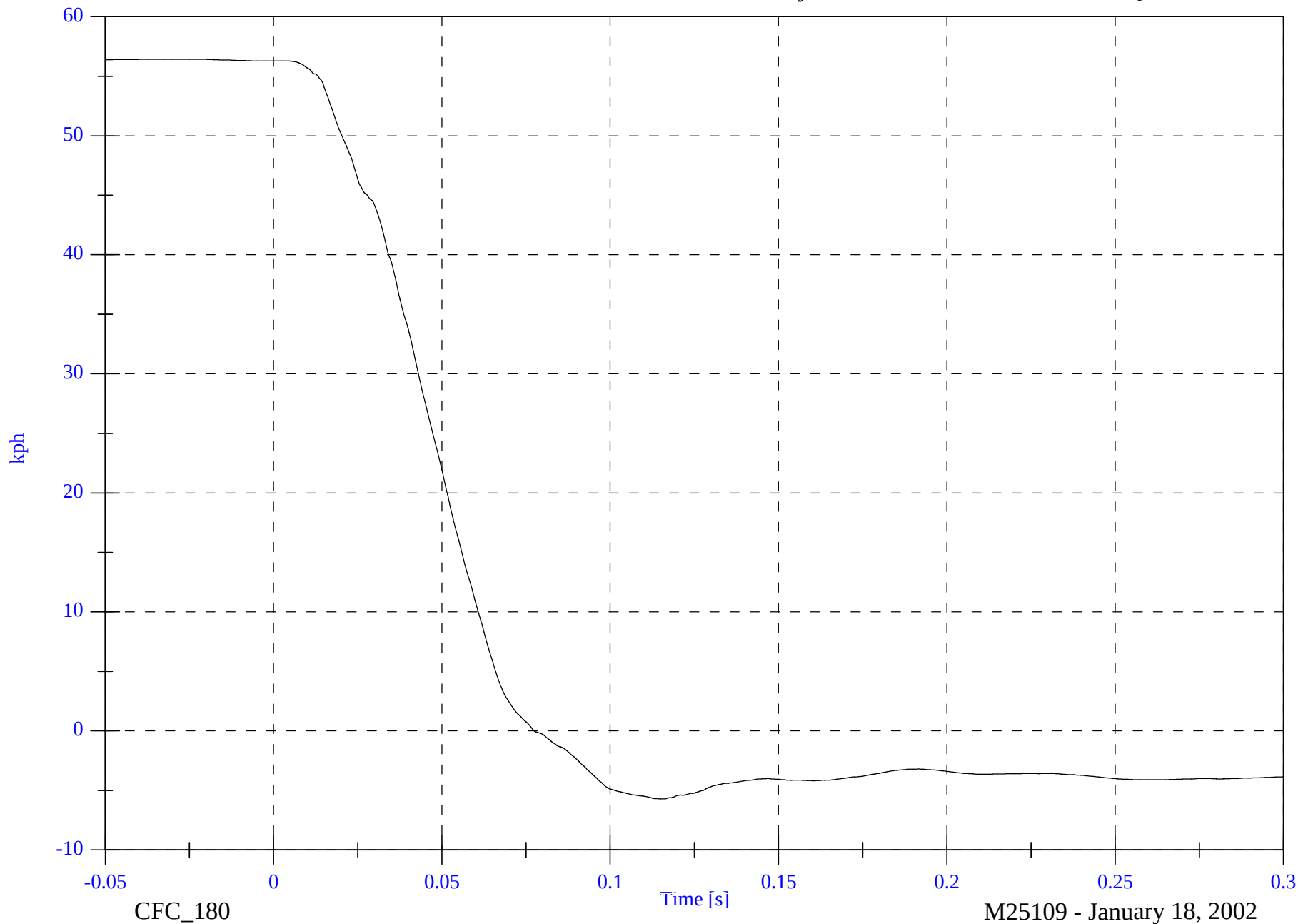
Max: 56.4 [kph] at -0.028 [s]

Left Rear #1x Velocity

Min: -5.7 [kph] at 0.115 [s]

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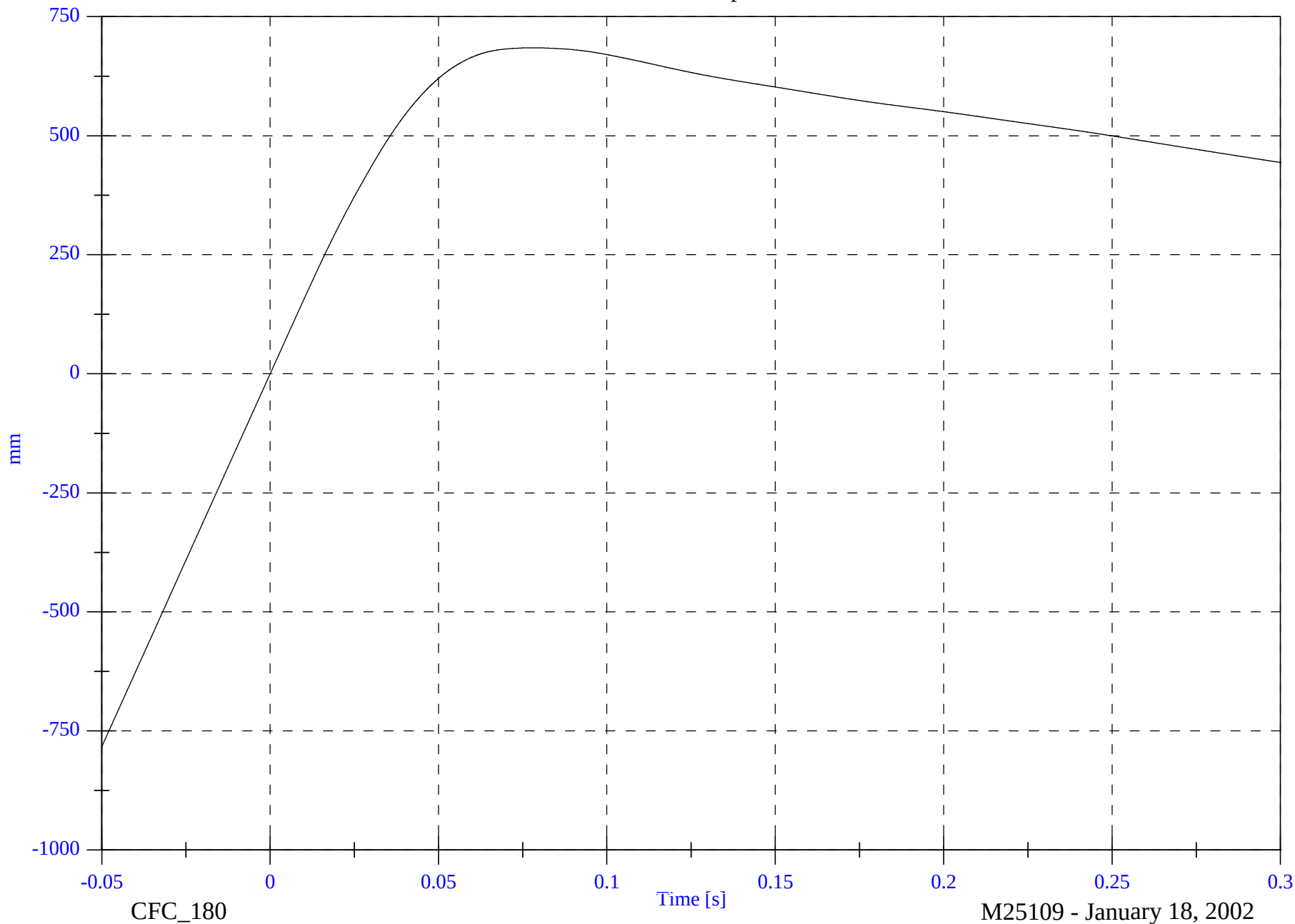
Left Rear #1x Displacement

Max: 684.5 [mm] at 0.077 [s]

Min: -783.1 [mm] at -0.050 [s]

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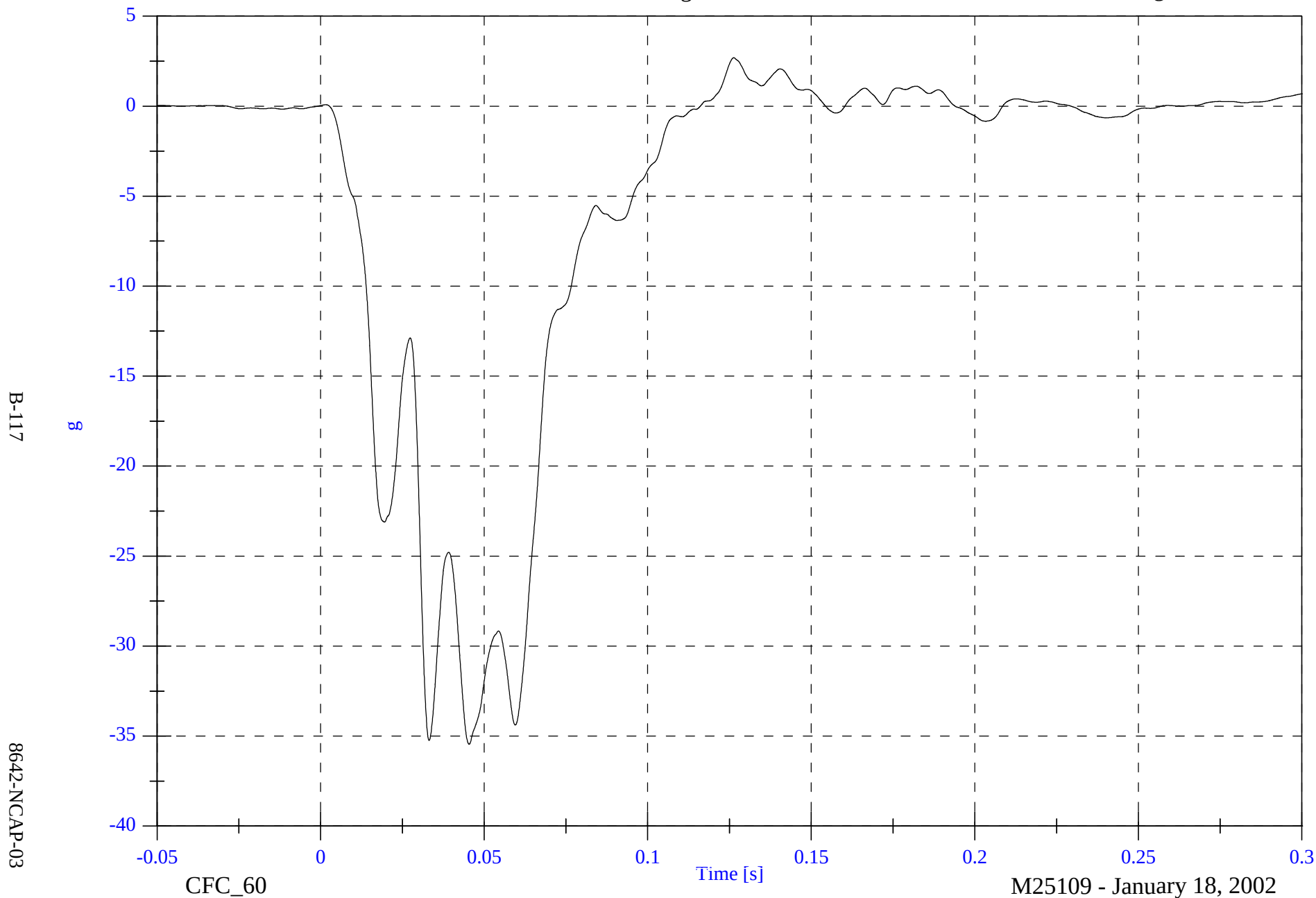


2002 NCAP Test 3-2002 Toyota Sequoia

Right Rear #2x

Max: 2.7 [g] at 0.126 [s]

Min: -35.5 [g] at 0.045 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

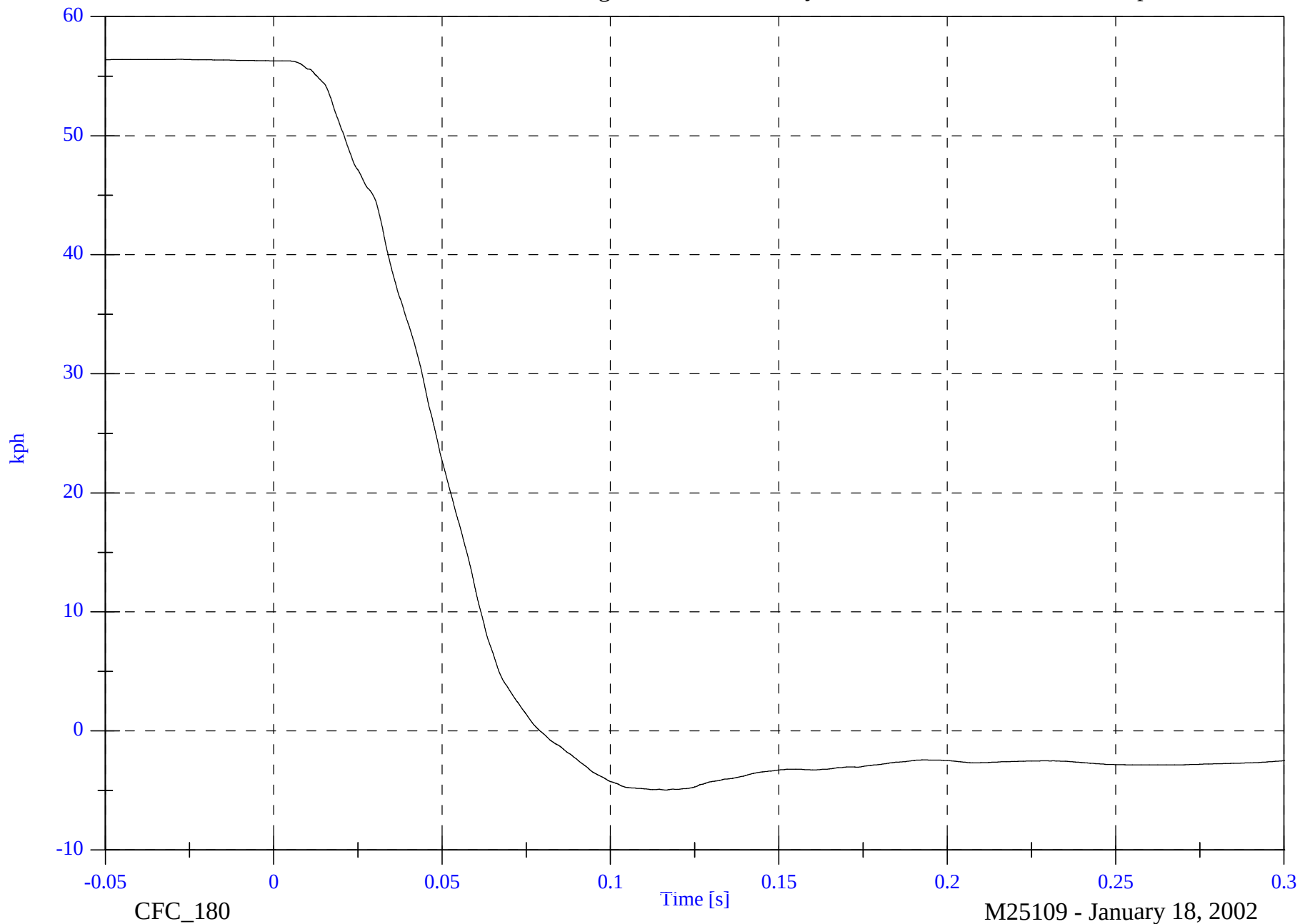
Max: 56.4 [kph] at -0.028 [s]

Right Rear #2x Velocity

Min: -5.0 [kph] at 0.117 [s]

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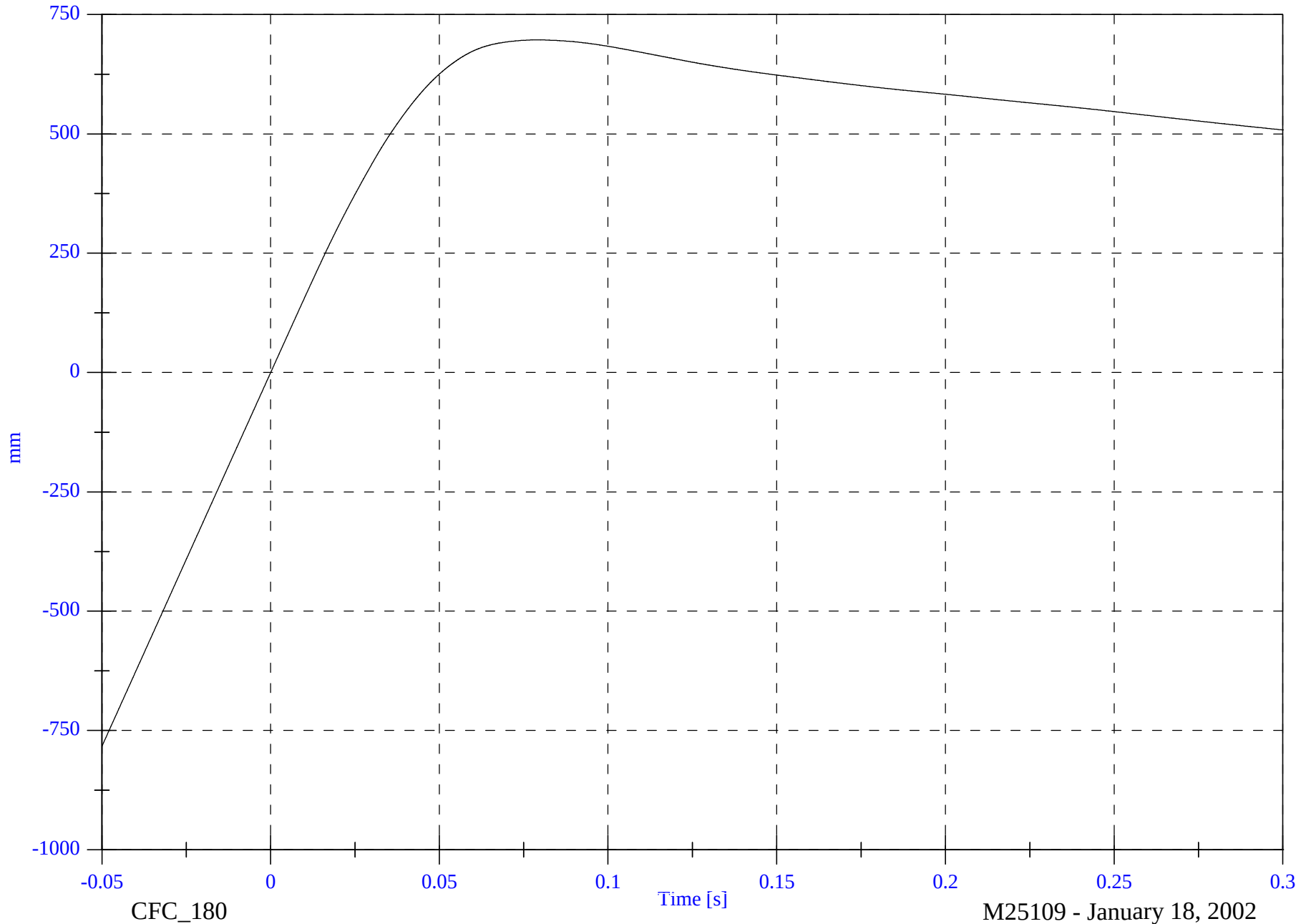
Right Rear #2x Displacement

Max: 696.8 [mm] at 0.079 [s]

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

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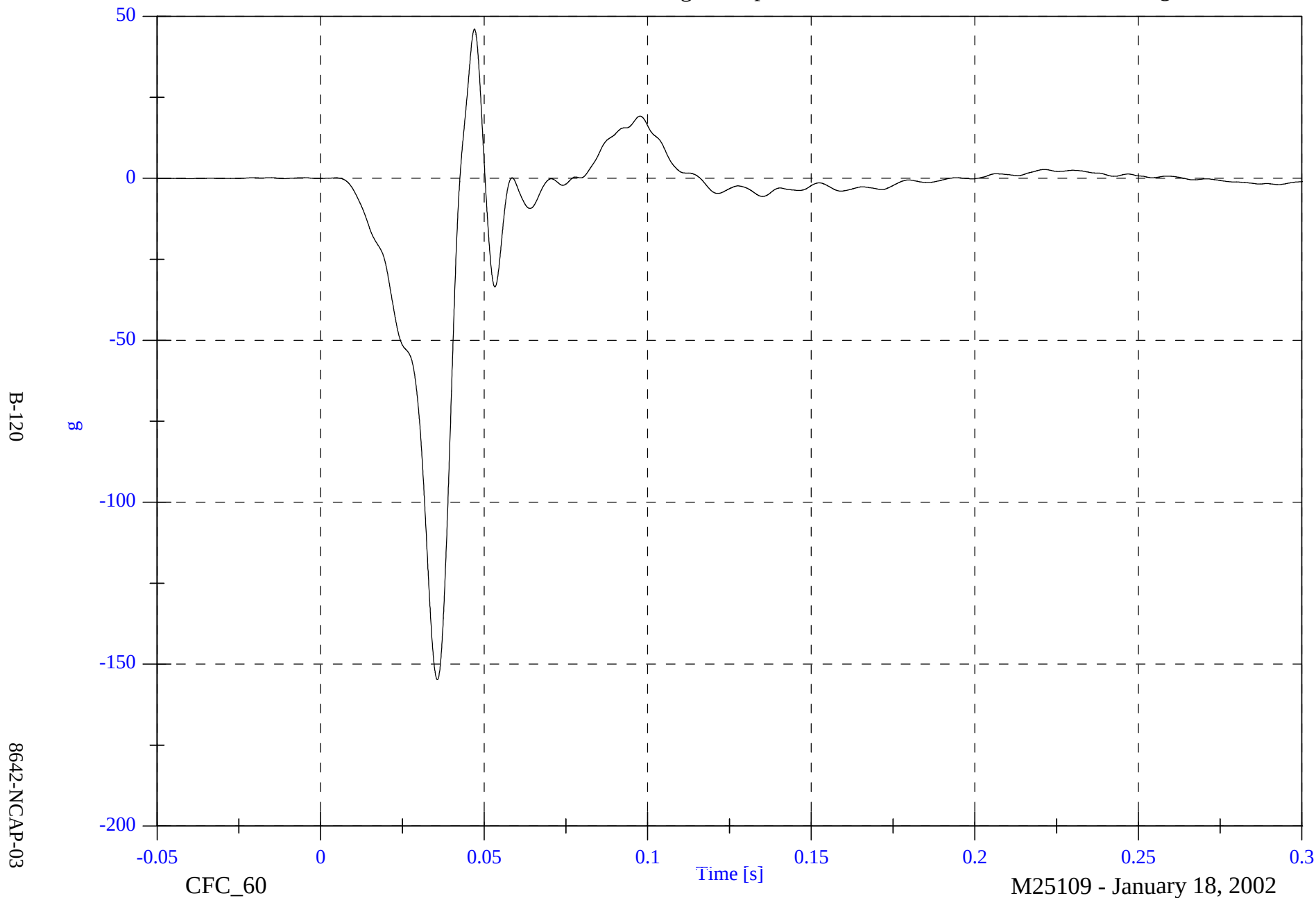


2002 NCAP Test 3-2002 Toyota Sequoia

Engine Top #3x

Max: 46.0 [g] at 0.047 [s]

Min: -154.8 [g] at 0.036 [s]

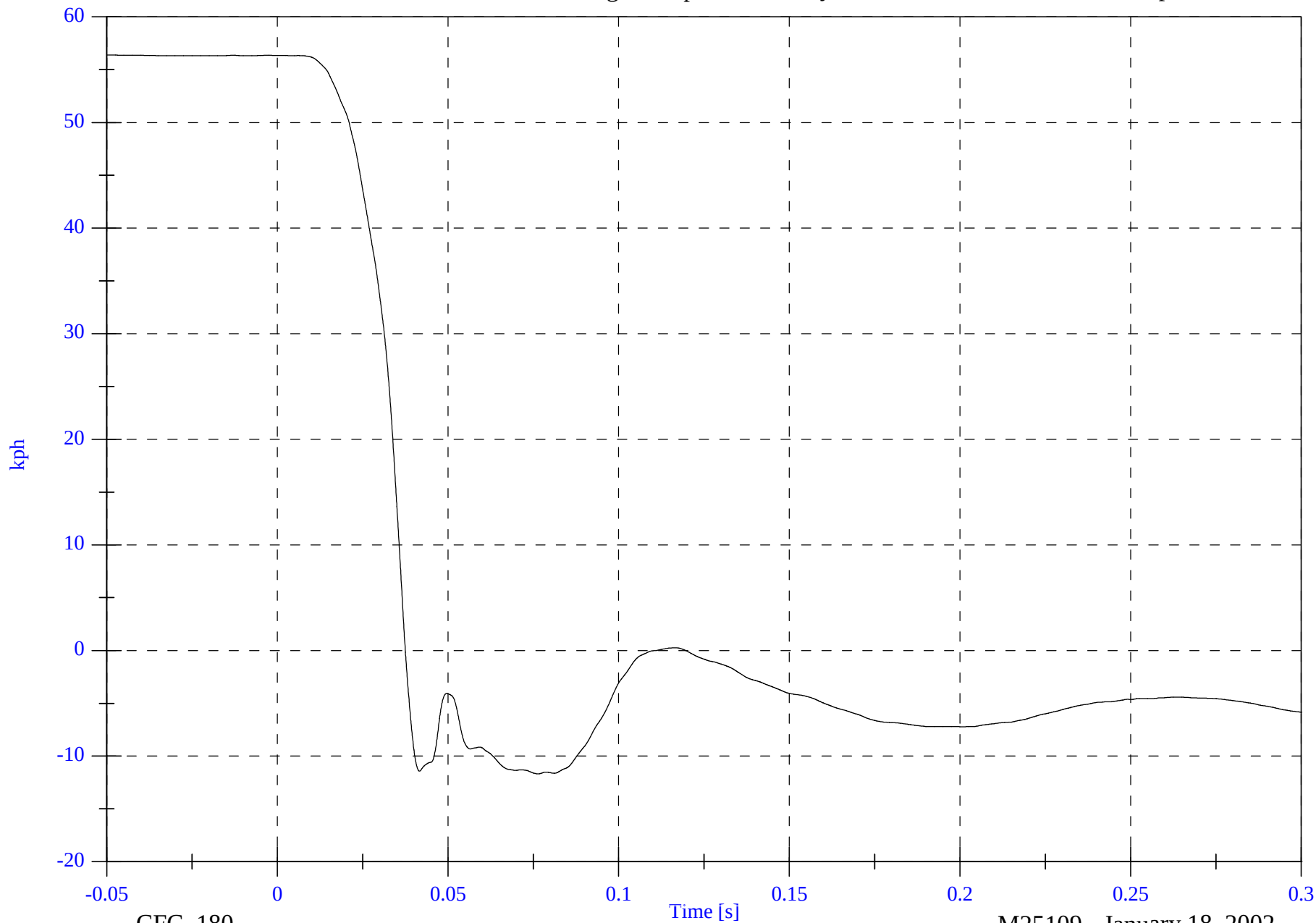


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Engine Top #3x Velocity

Max: 56.4 [kph] at -0.050 [s]

Min: -11.7 [kph] at 0.076 [s]



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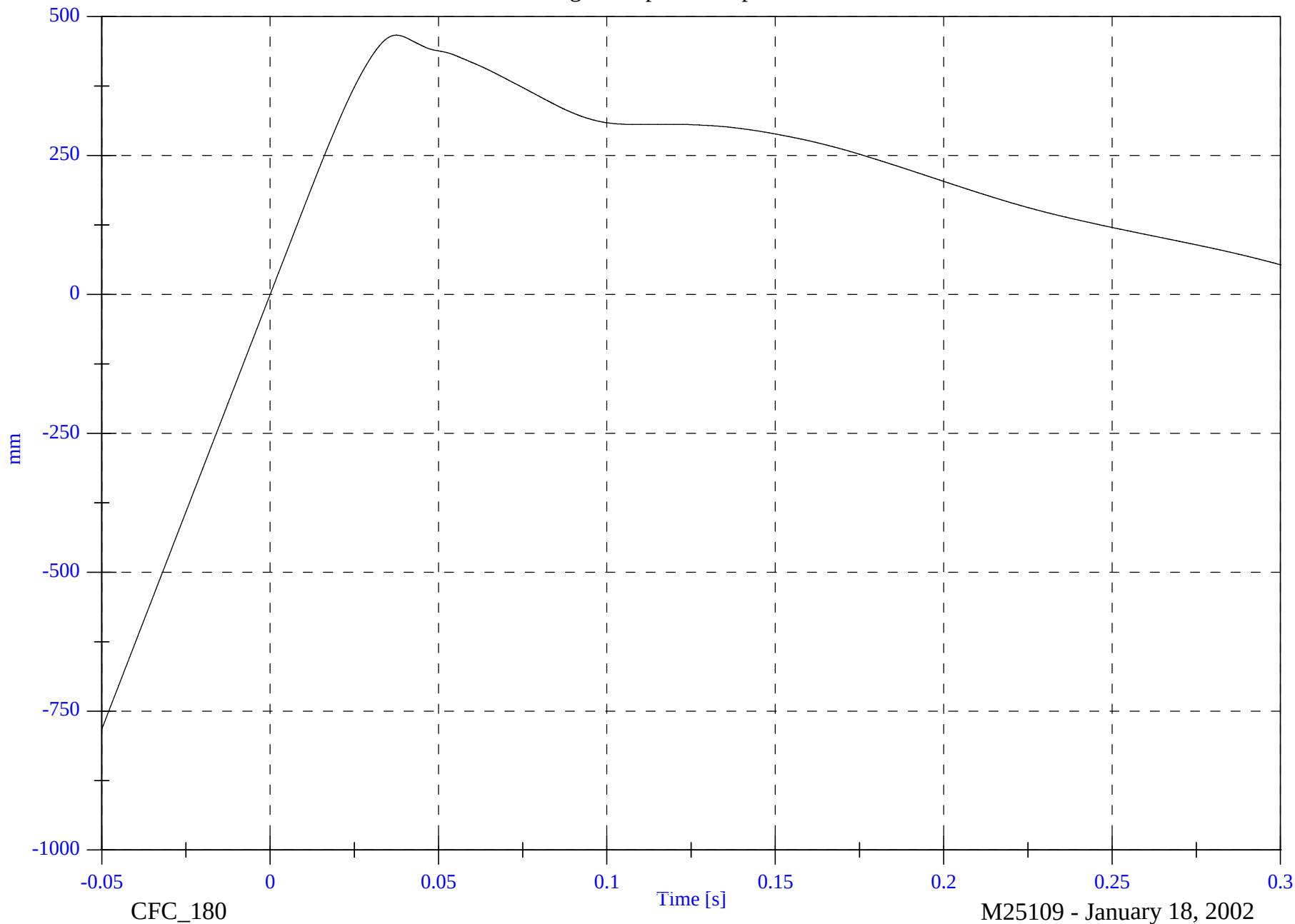
Engine Top #3x Displacement

Max: 466.7 [mm] at 0.037 [s]

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

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CFC_180

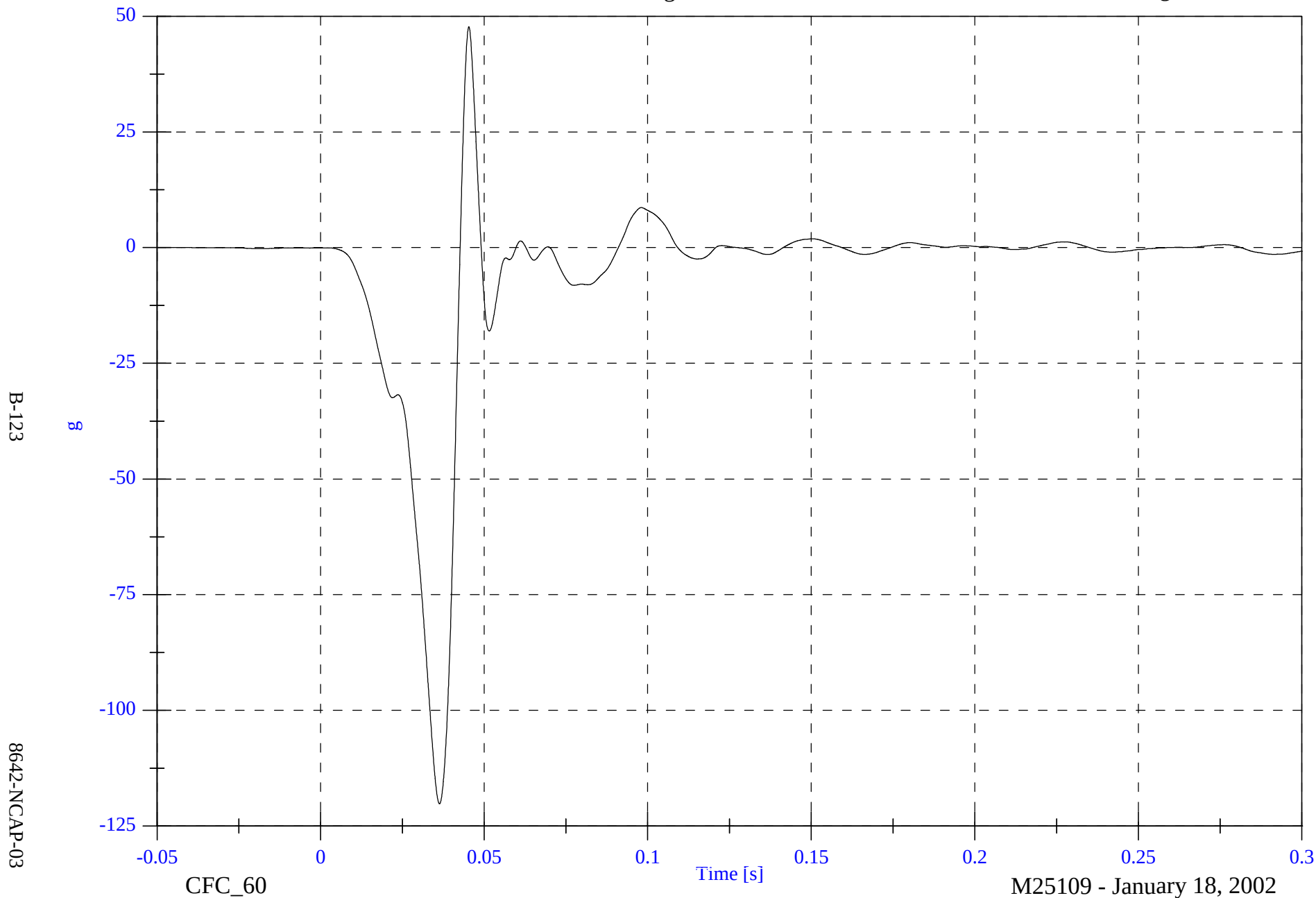
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Engine Bottom #4x

Max: 47.7 [g] at 0.045 [s]

Min: -120.2 [g] at 0.036 [s]



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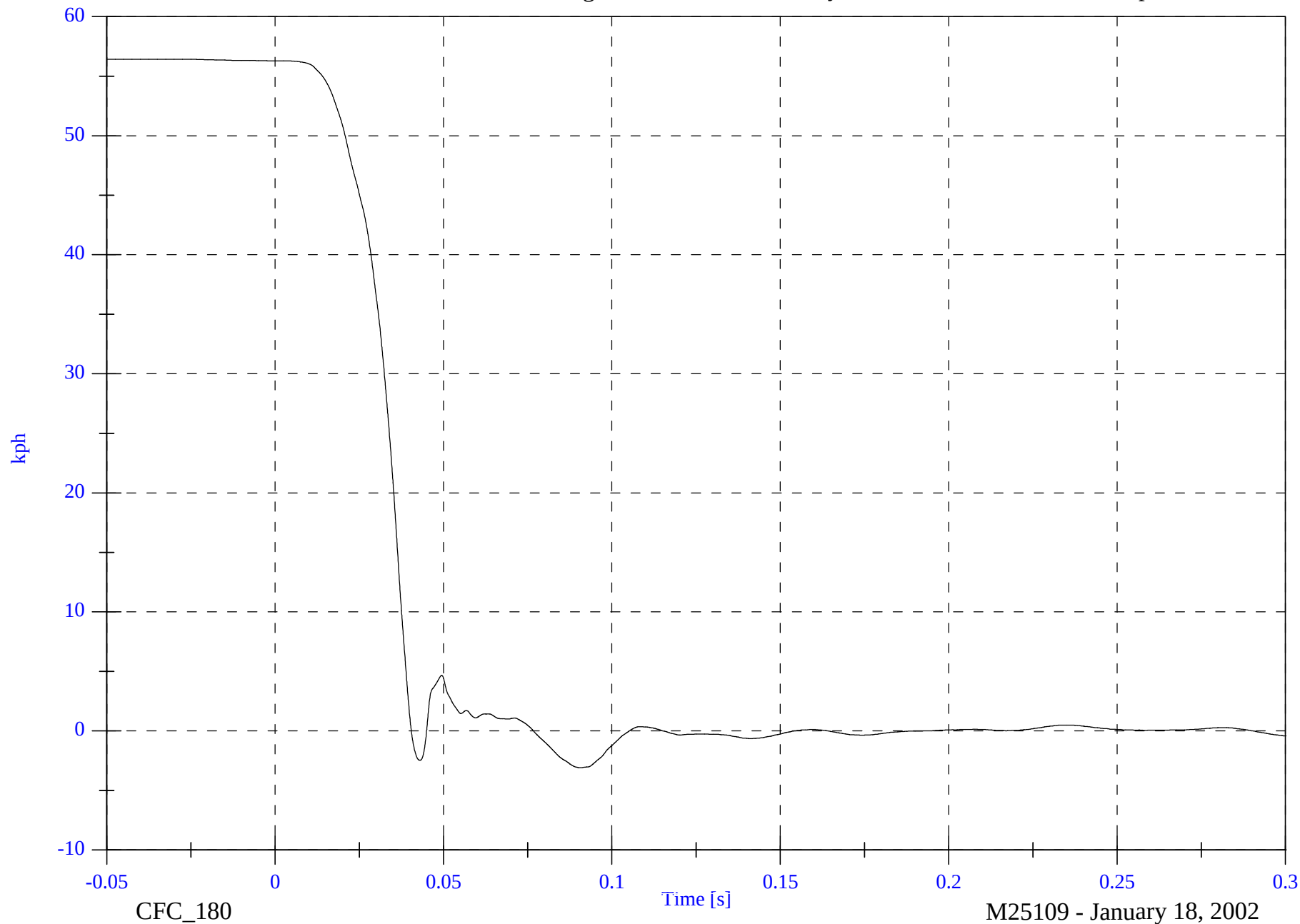
Engine Bottom #4x Velocity

Max: 56.4 [kph] at -0.042 [s]

Min: -3.1 [kph] at 0.091 [s]

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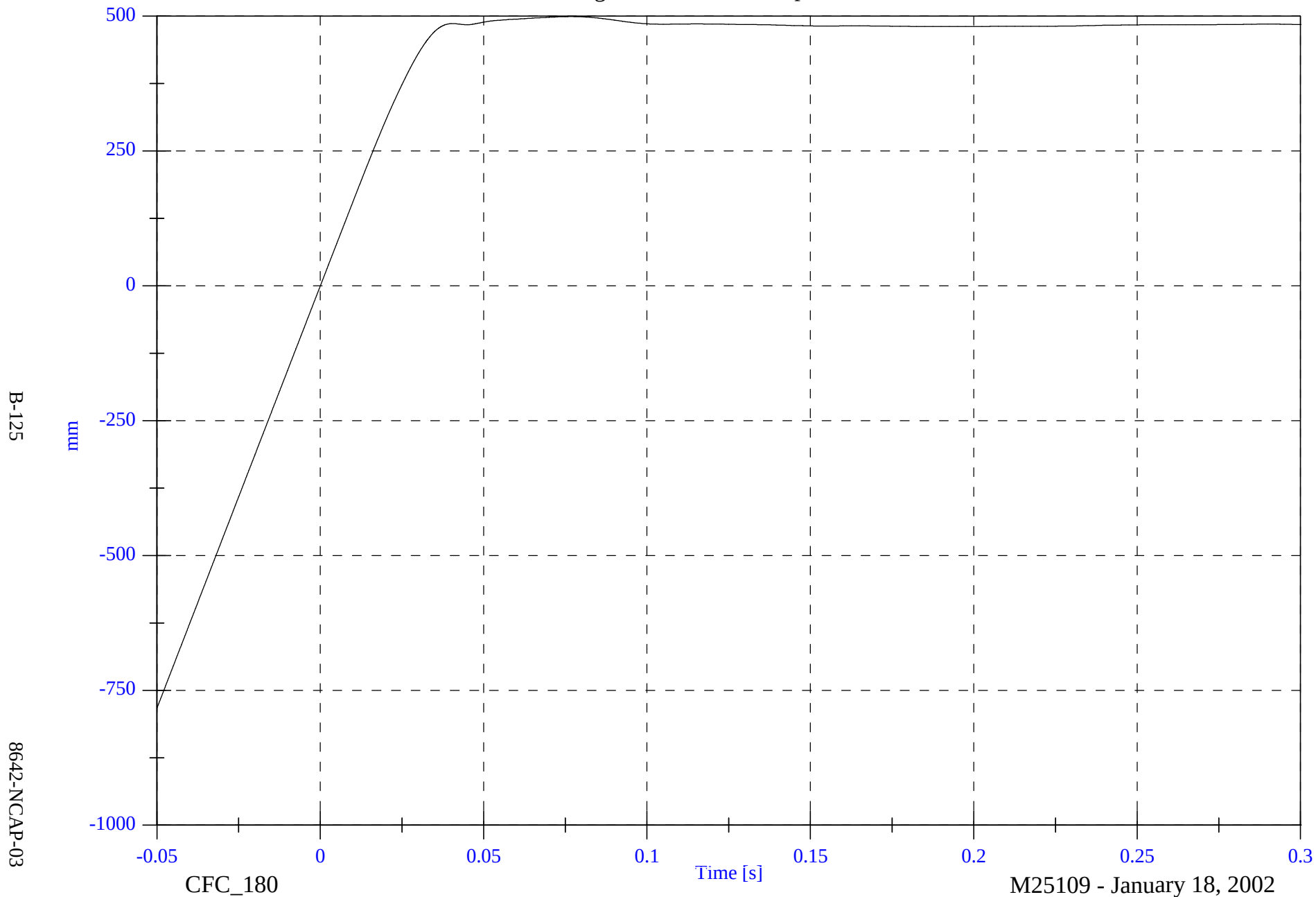


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Engine Bottom #4x Displacement

Max: 499.3 [mm] at 0.077 [s]

Min: -783.1 [mm] at -0.050 [s]

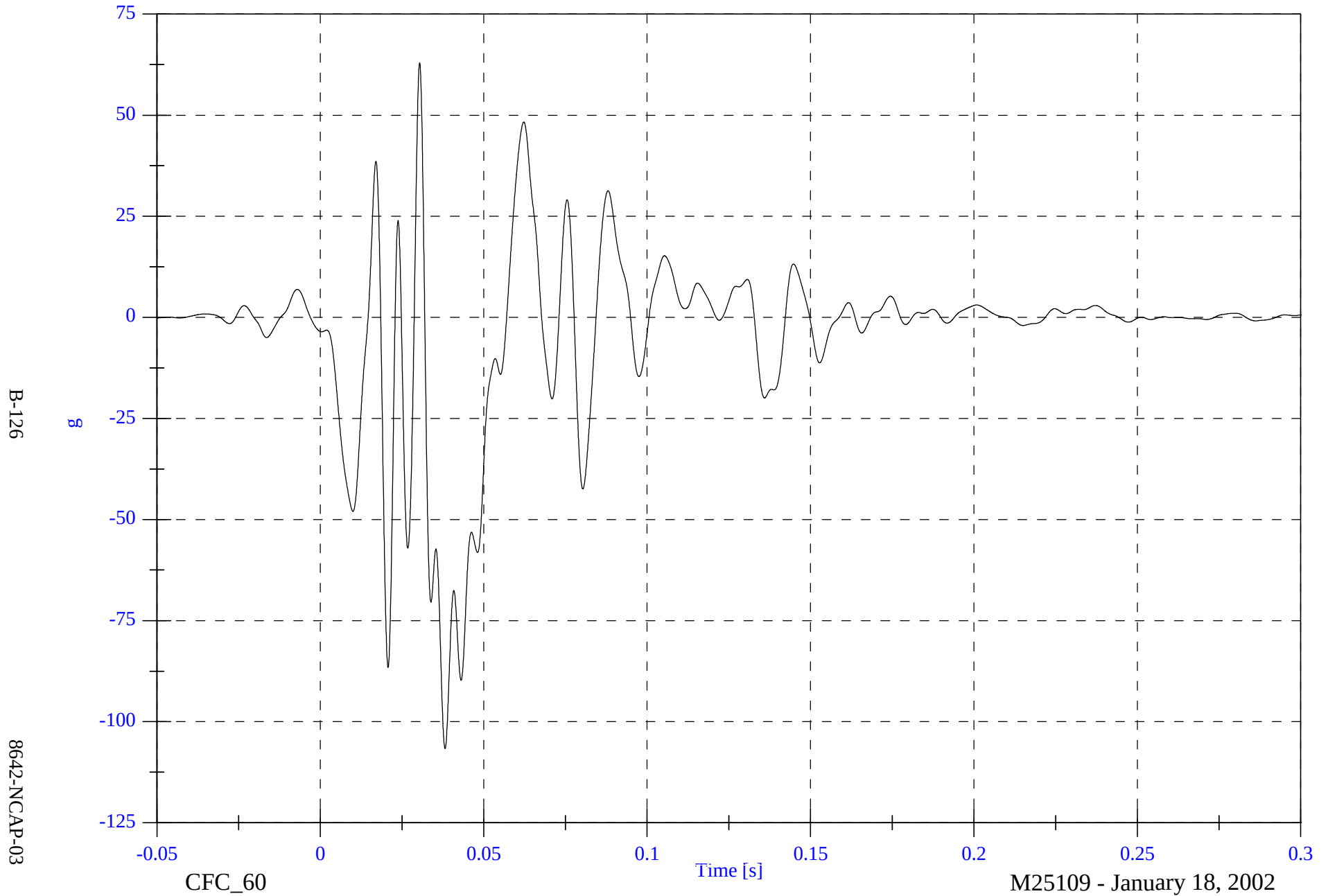


2002 NCAP Test 3-2002 Toyota Sequoia

Right Caliper #5x

Max: 62.9 [g] at 0.030 [s]

Min: -106.7 [g] at 0.038 [s]

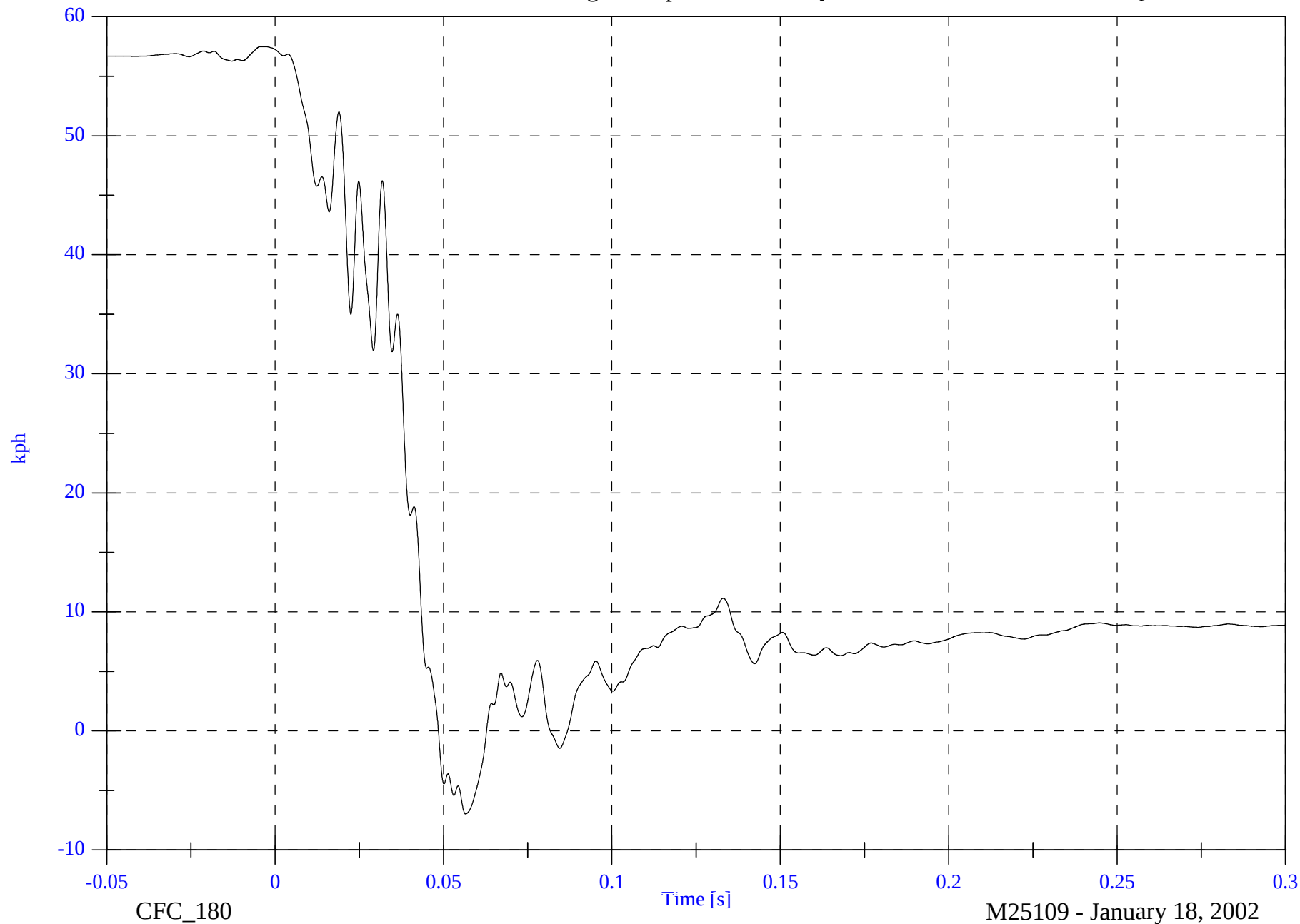


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Right Caliper #5x Velocity

Max: 57.5 [kph] at -0.004 [s]

Min: -7.0 [kph] at 0.057 [s]



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CFC_180

Time [s]

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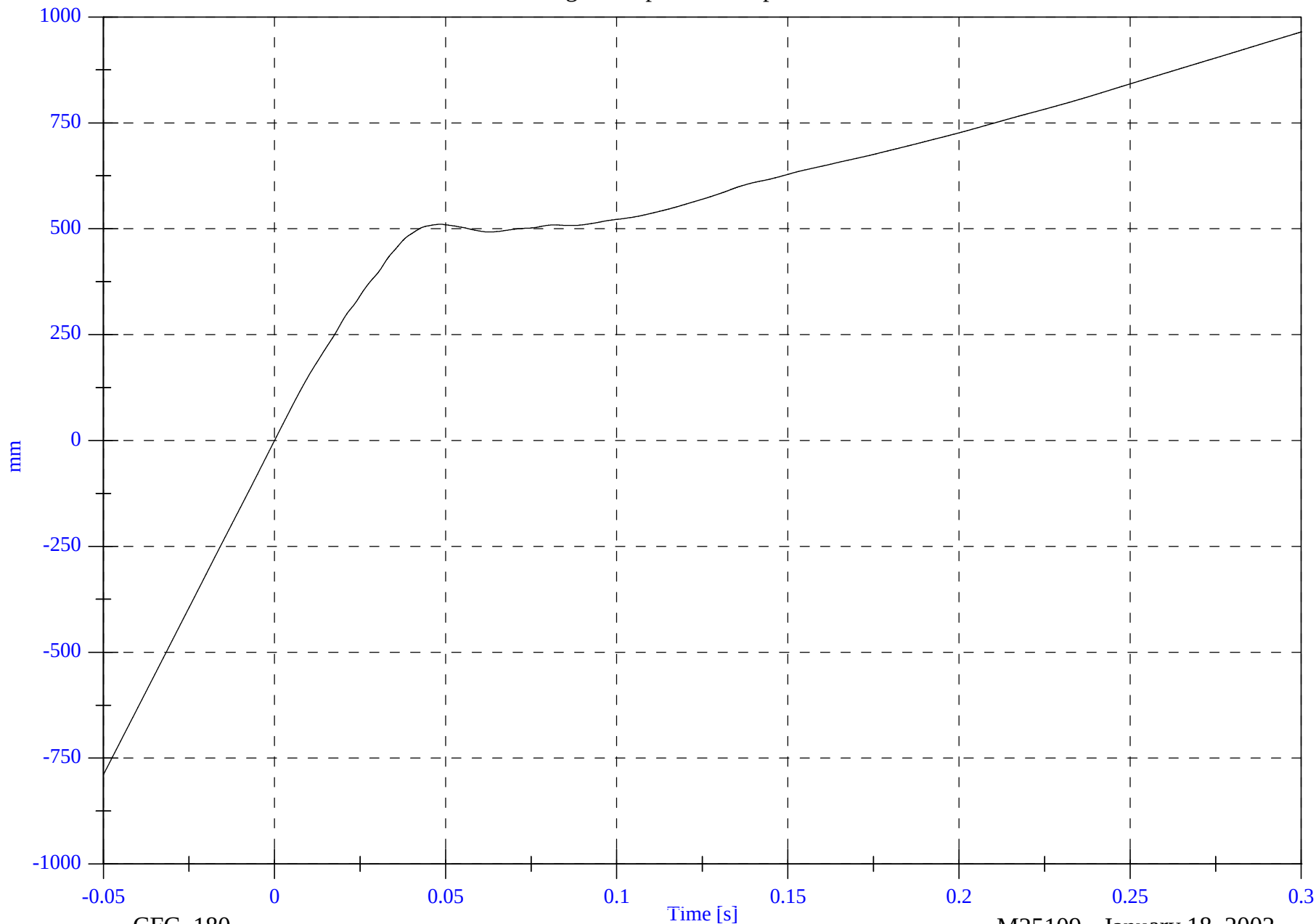
Right Caliper #5x Displacement

Max: 964.6 [mm] at 0.300 [s]

Min: -789.0 [mm] at -0.050 [s]

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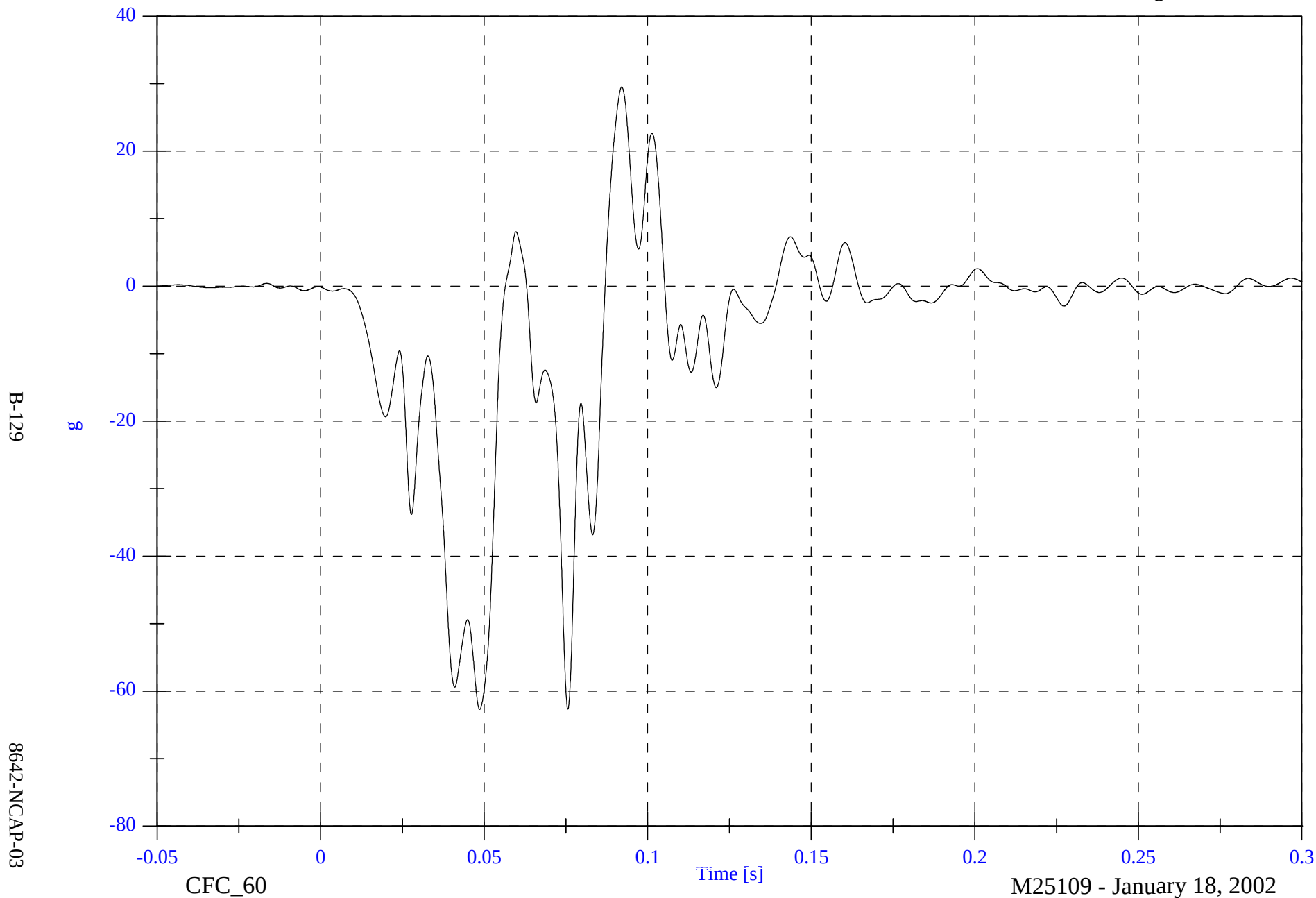
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Instrument Panel #6x

Max: 29.5 [g] at 0.092 [s]

Min: -62.7 [g] at 0.049 [s]



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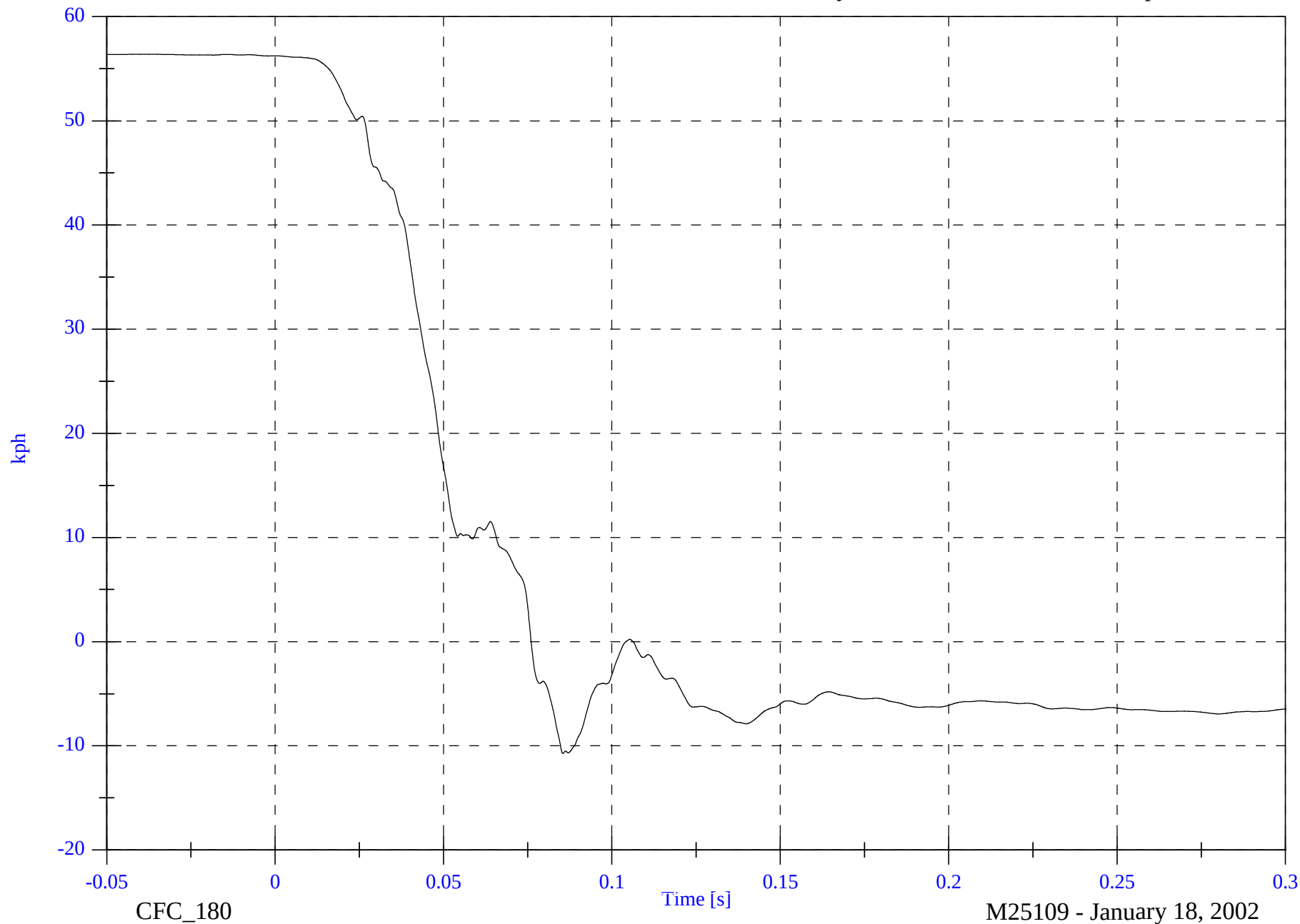
Instrument Panel #6x Velocity

Max: 56.4 [kph] at -0.039 [s]

Min: -10.7 [kph] at 0.085 [s]

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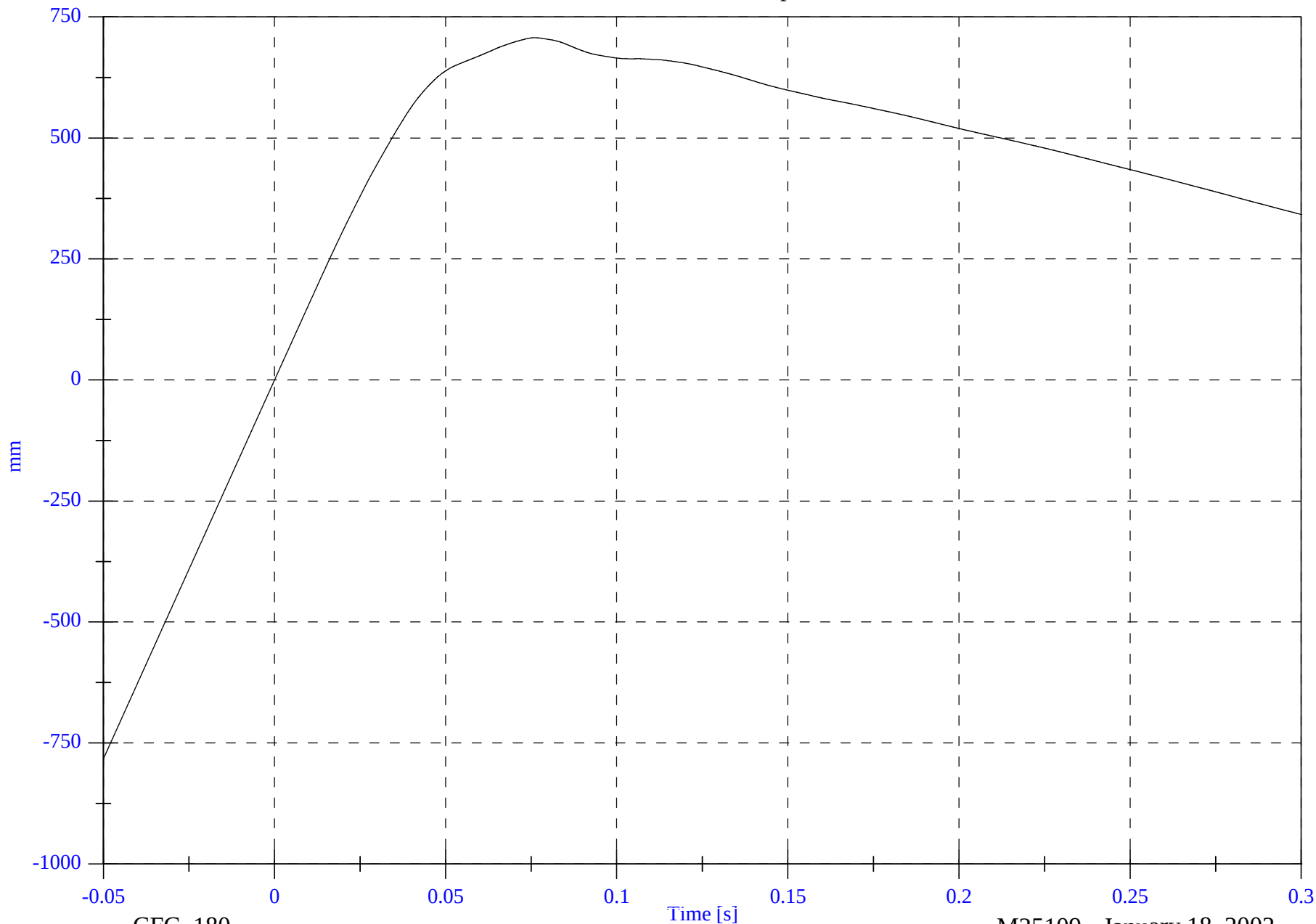
Instrument Panel #6x Displacement

Max: 707.2 [mm] at 0.076 [s]

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

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CFC_180

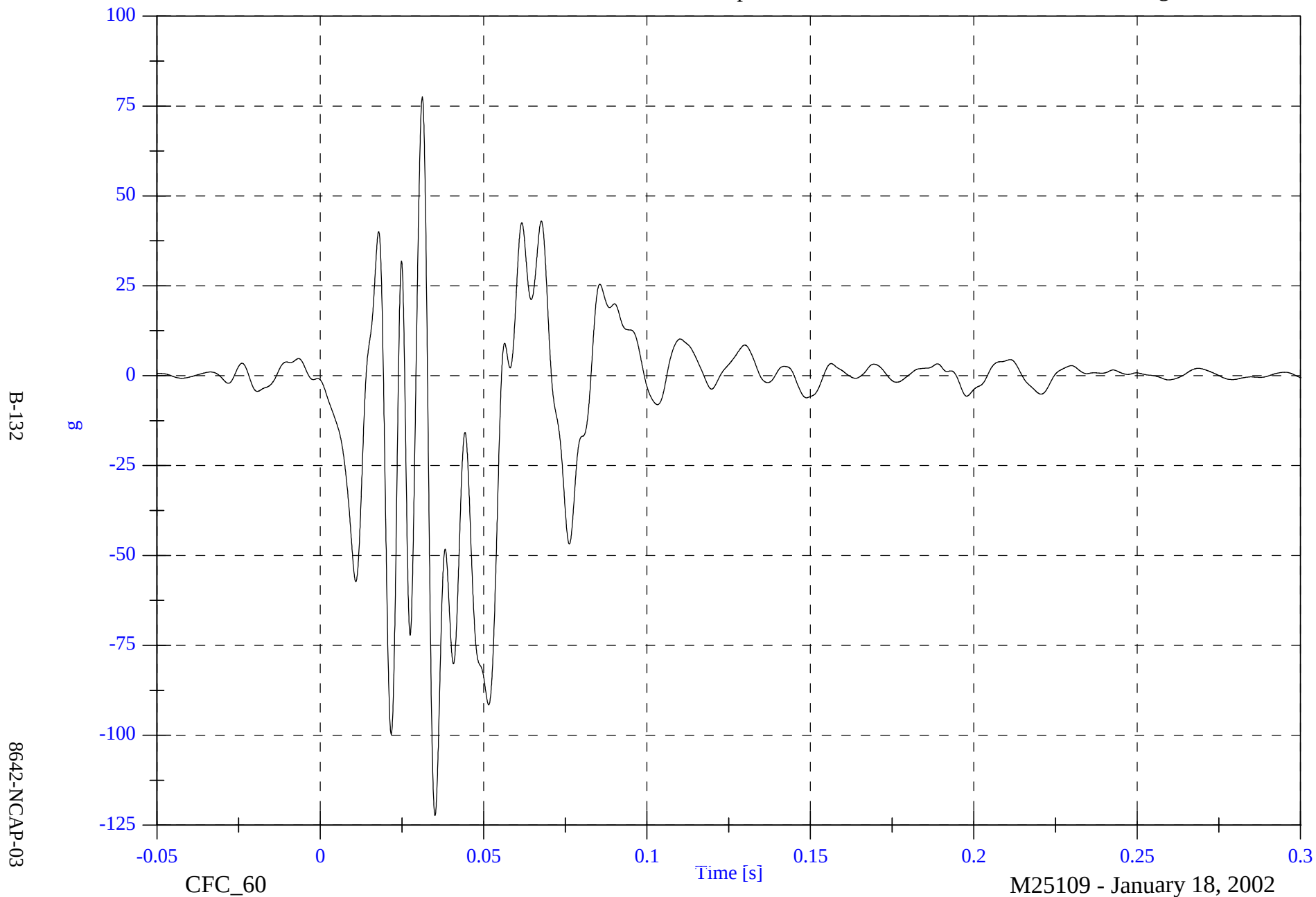
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Left Caliper #7x

Max: 77.6 [g] at 0.031 [s]

Min: -122.3 [g] at 0.035 [s]



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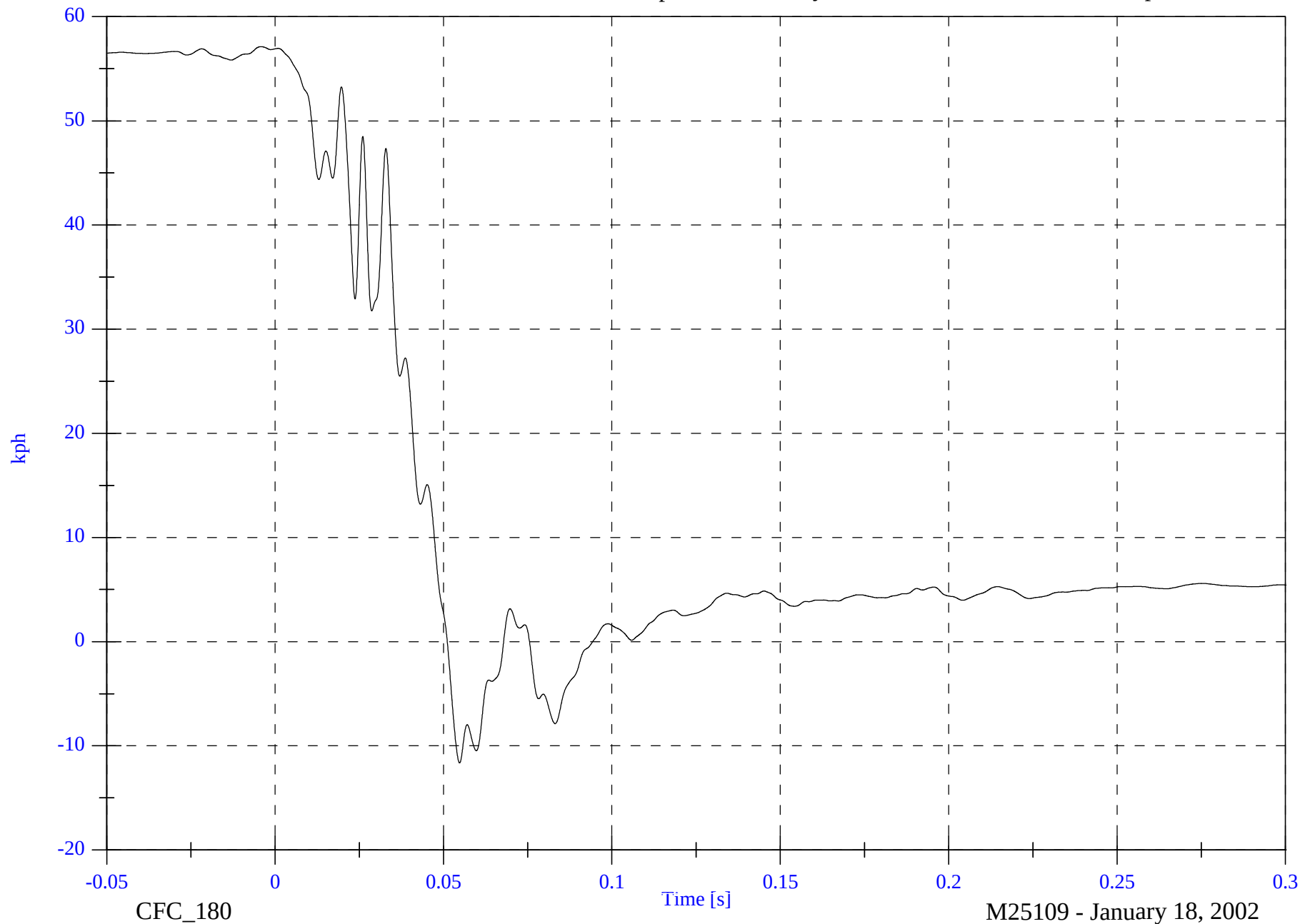
Left Caliper #7x Velocity

Max: 57.1 [kph] at -0.004 [s]

Min: -11.6 [kph] at 0.055 [s]

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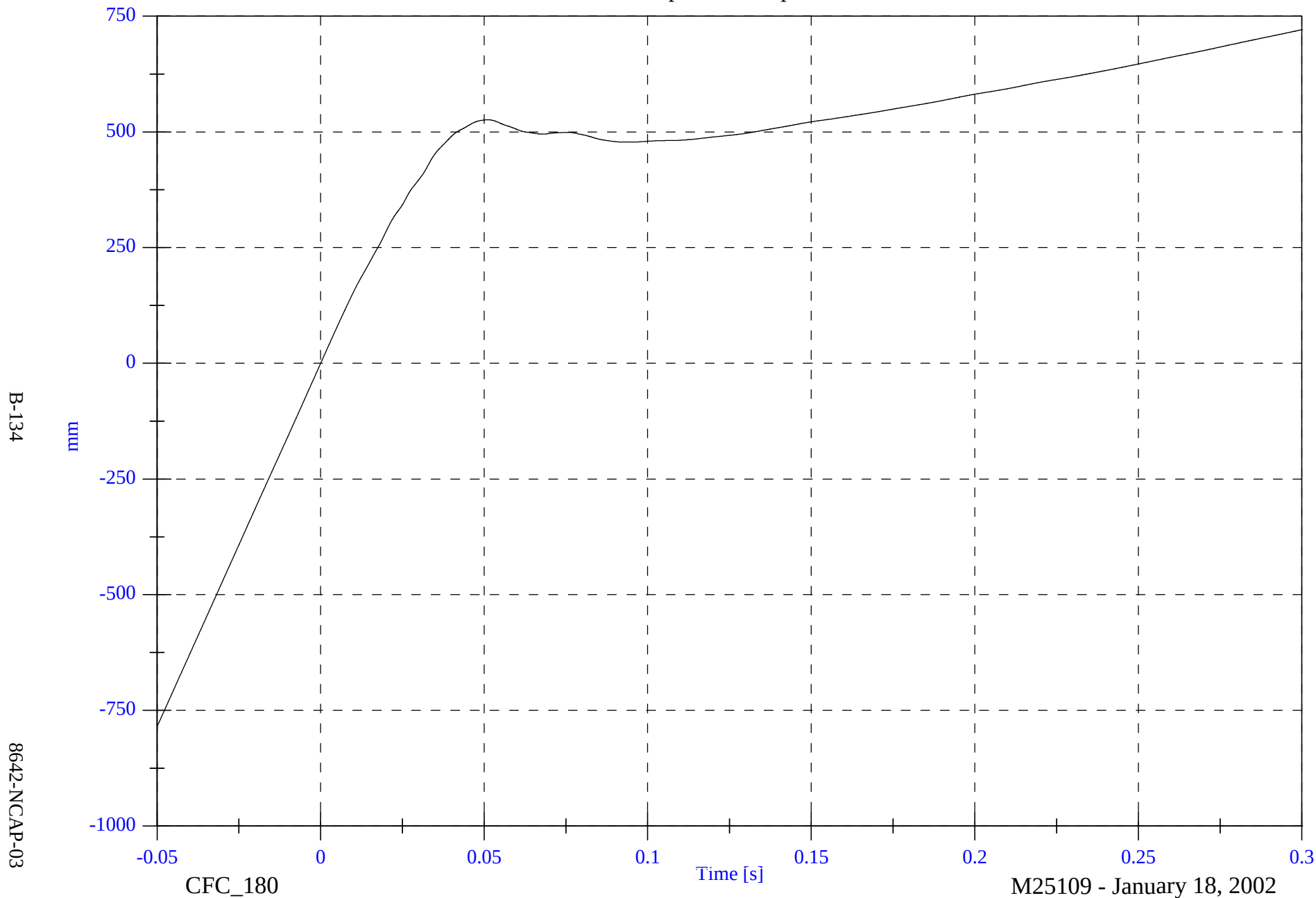


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Left Caliper #7x Displacement

Max: 720.8 [mm] at 0.300 [s]

Min: -785.0 [mm] at -0.050 [s]

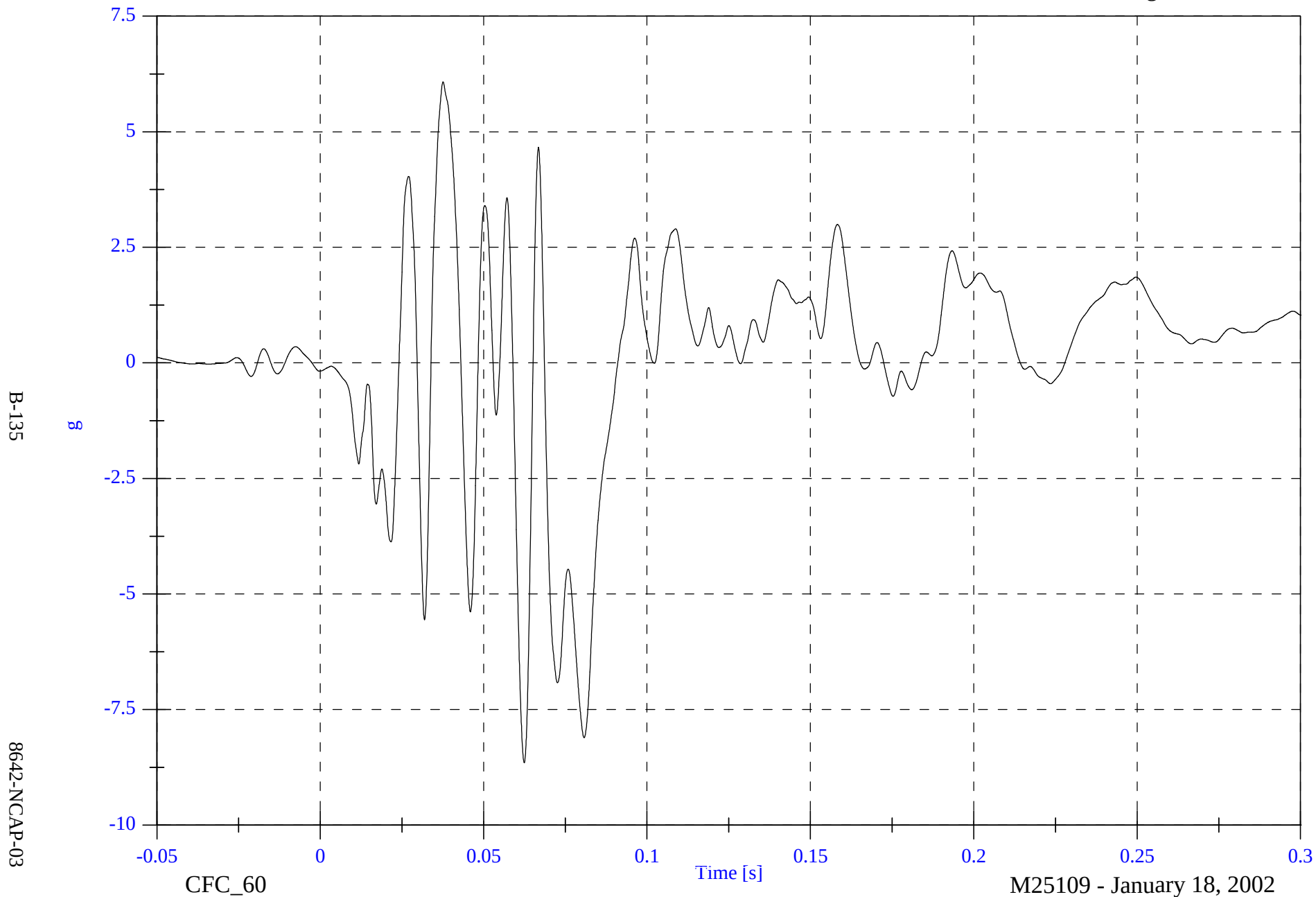


2002 NCAP Test 3-2002 Toyota Sequoia

Left Rear #8z

Max: 6.1 [g] at 0.038 [s]

Min: -8.6 [g] at 0.062 [s]



2002 NCAP Test 3-2002 Toyota Sequoia

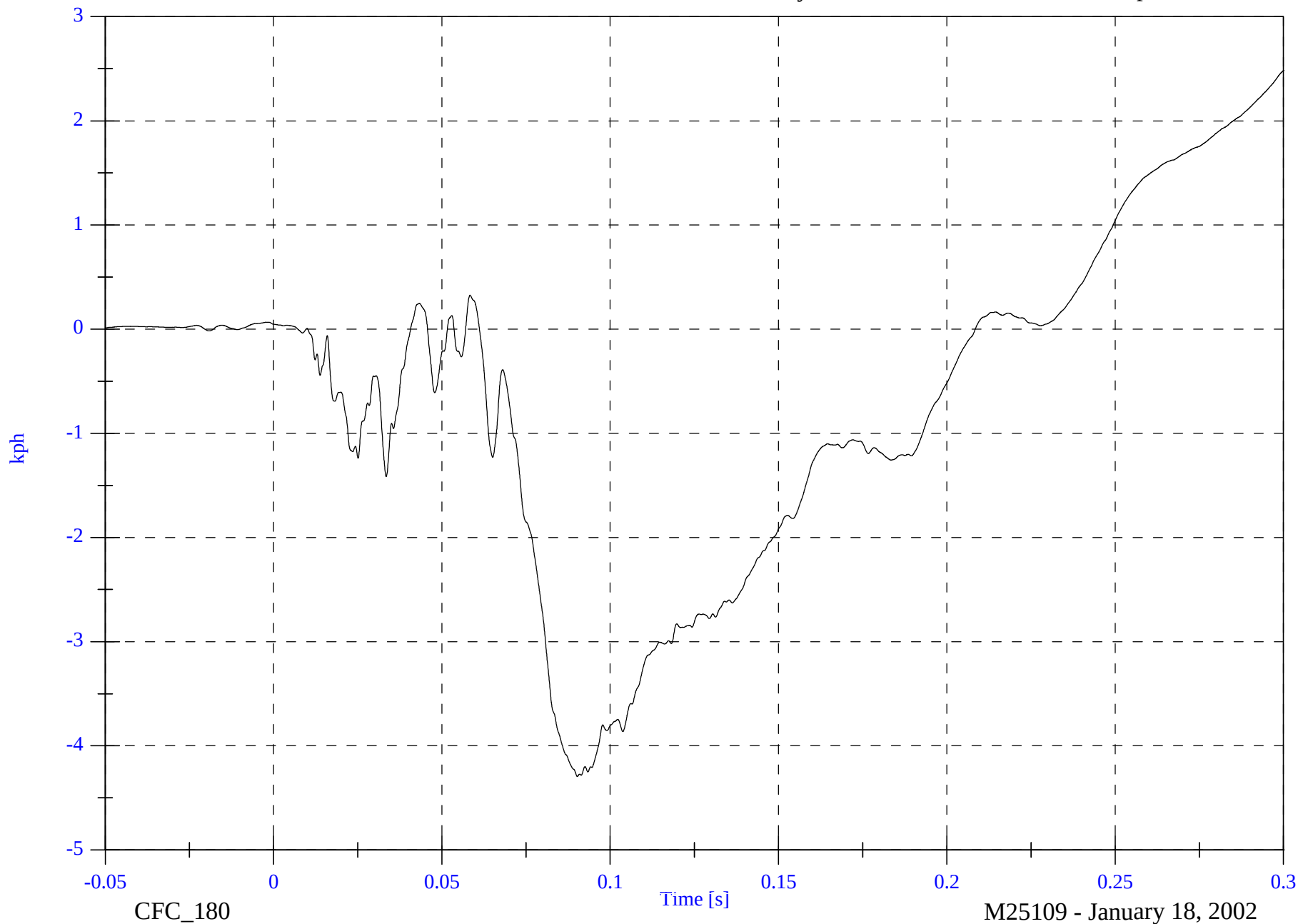
Left Rear #8z Velocity

Max: 2.5 [kph] at 0.300 [s]

Min: -4.3 [kph] at 0.090 [s]

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8642-NCAP-03

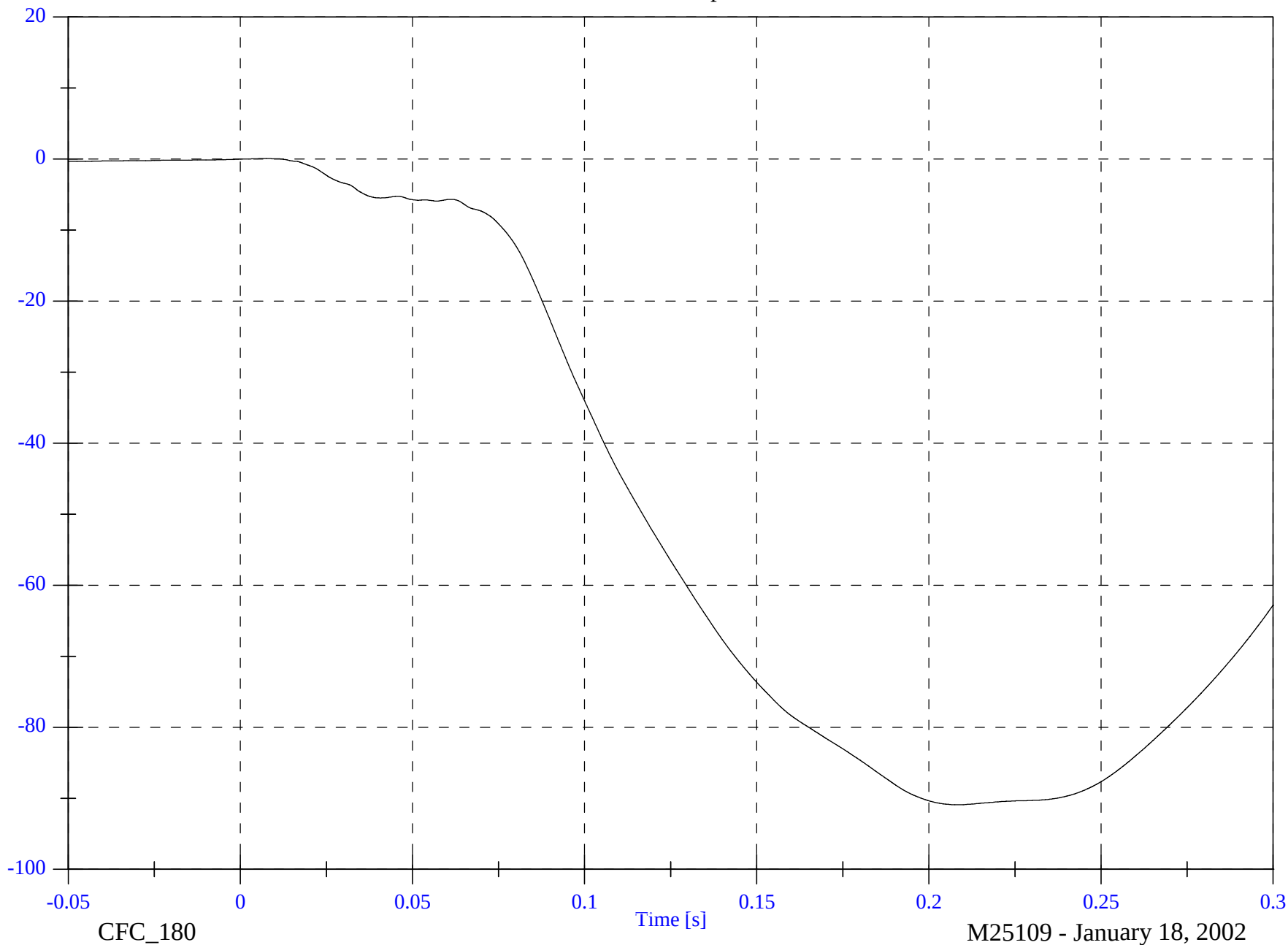


2002 NCAP Test 3-2002 Toyota Sequoia

Left Rear #8z Displacement

Max: 0.1 [mm] at 0.007 [s]

Min: -90.9 [mm] at 0.208 [s]



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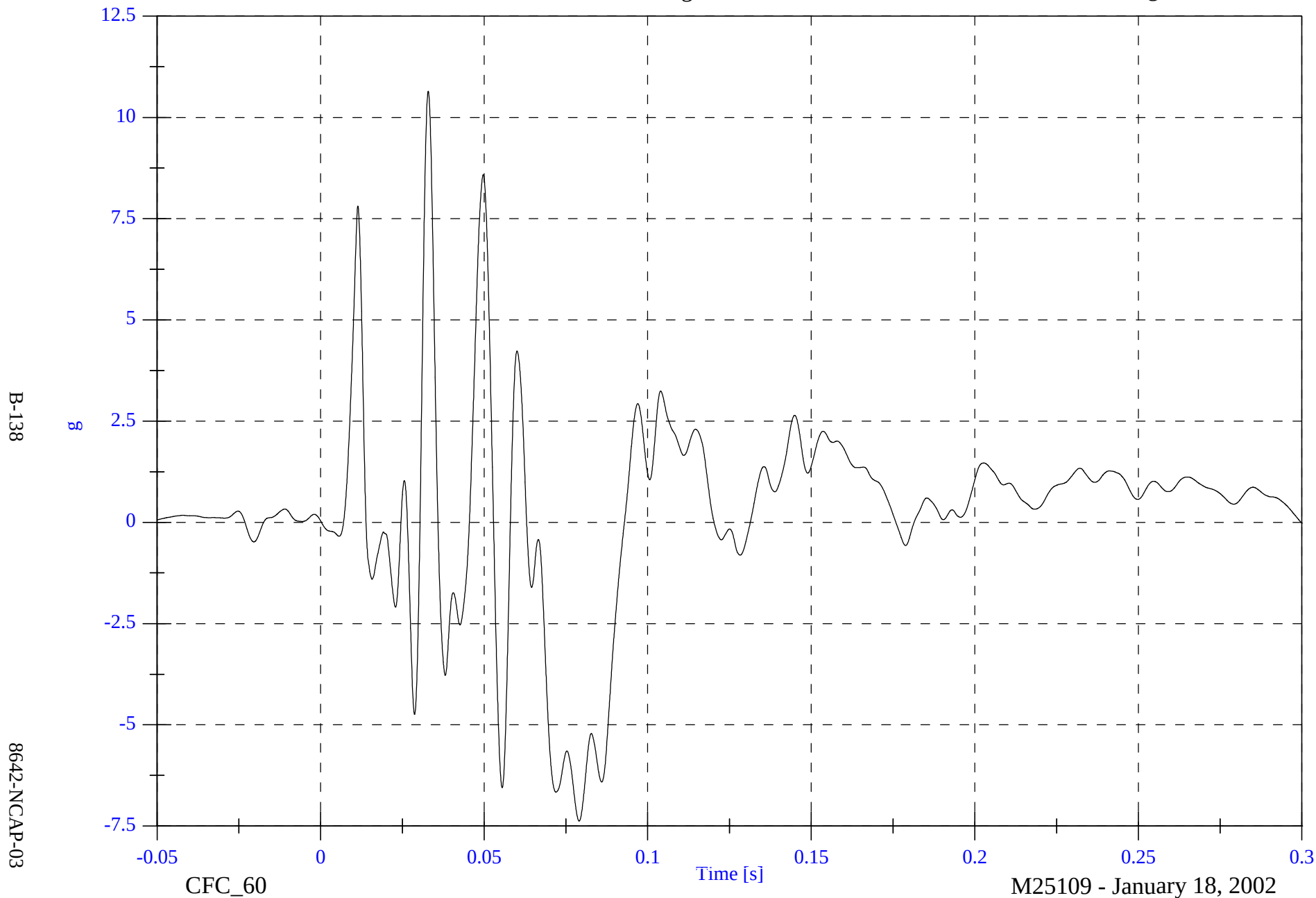
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Right Rear #9z

Max: 10.6 [g] at 0.033 [s]

Min: -7.4 [g] at 0.079 [s]



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Right Rear #9z Velocity

Max: 4.0 [kph] at 0.300 [s]

Min: -3.0 [kph] at 0.094 [s]

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CFC_180

Time [s]

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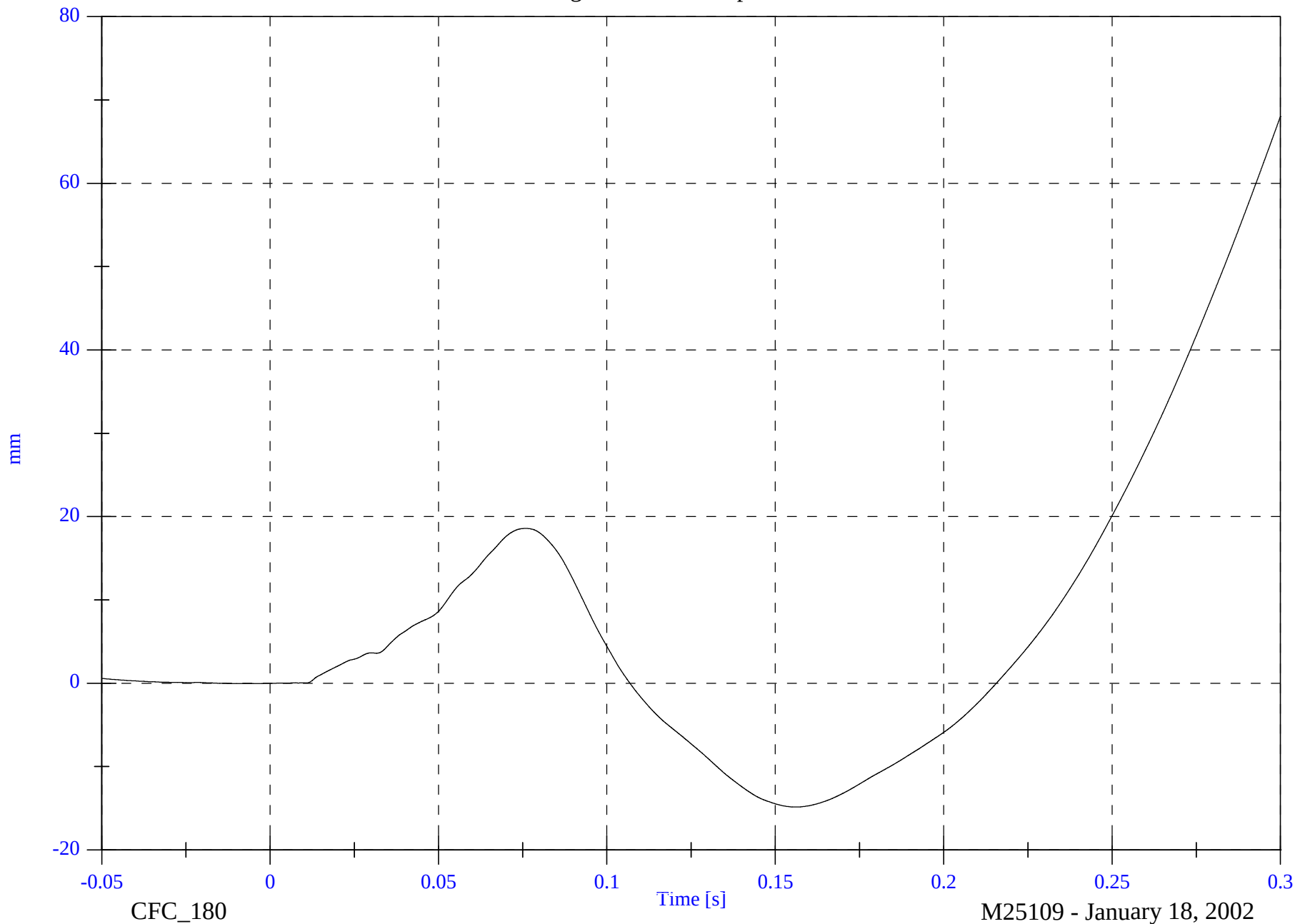
Right Rear #9z Displacement

Max: 68.0 [mm] at 0.300 [s]

Min: -14.8 [mm] at 0.156 [s]

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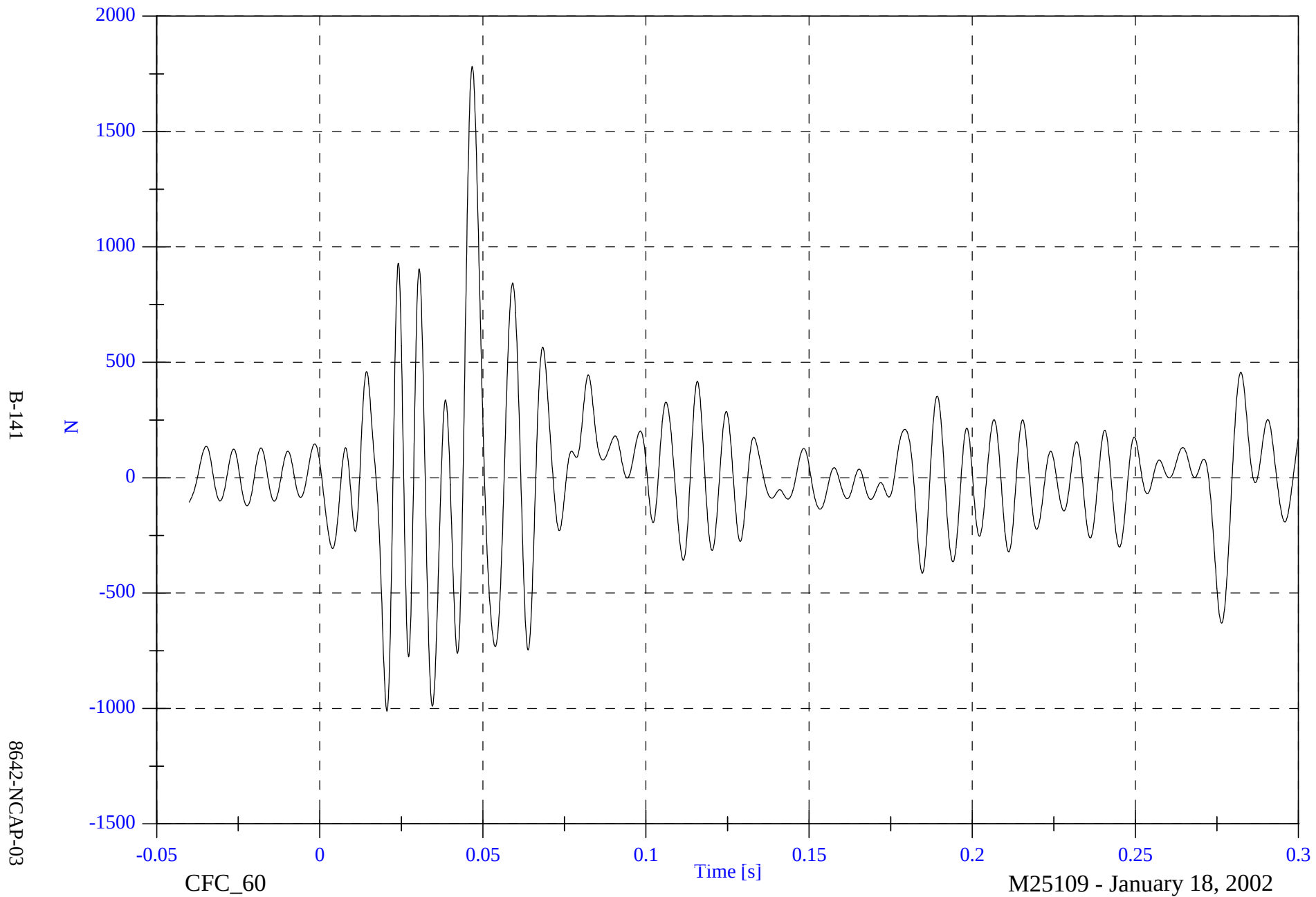


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell A1 Fx

Max: 1782.3 [N] at 0.047 [s]

Min: -1012.4 [N] at 0.021 [s]

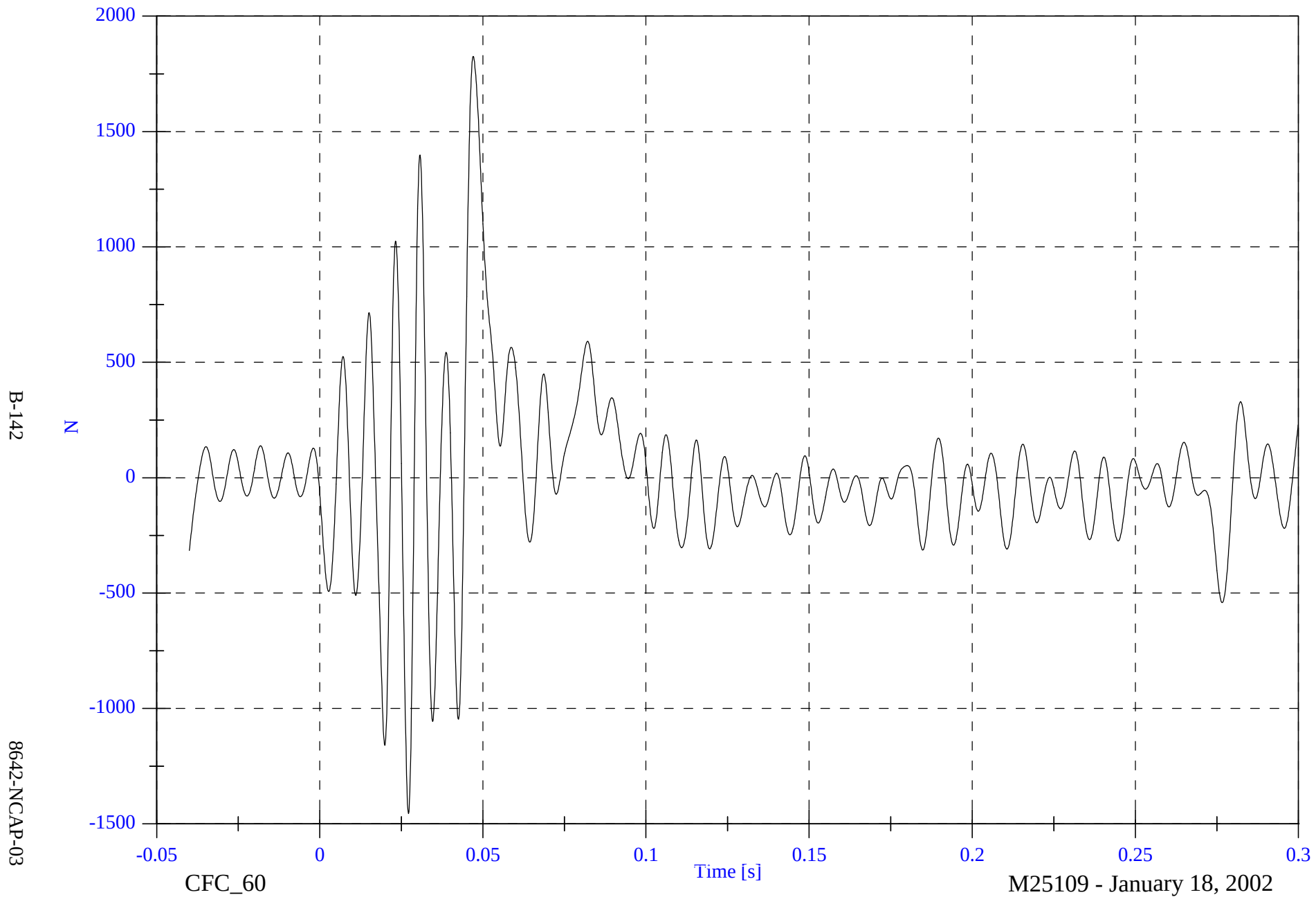


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Barrier Load Cell A2 Fx

Max: 1825.4 [N] at 0.047 [s]

Min: -1455.4 [N] at 0.027 [s]

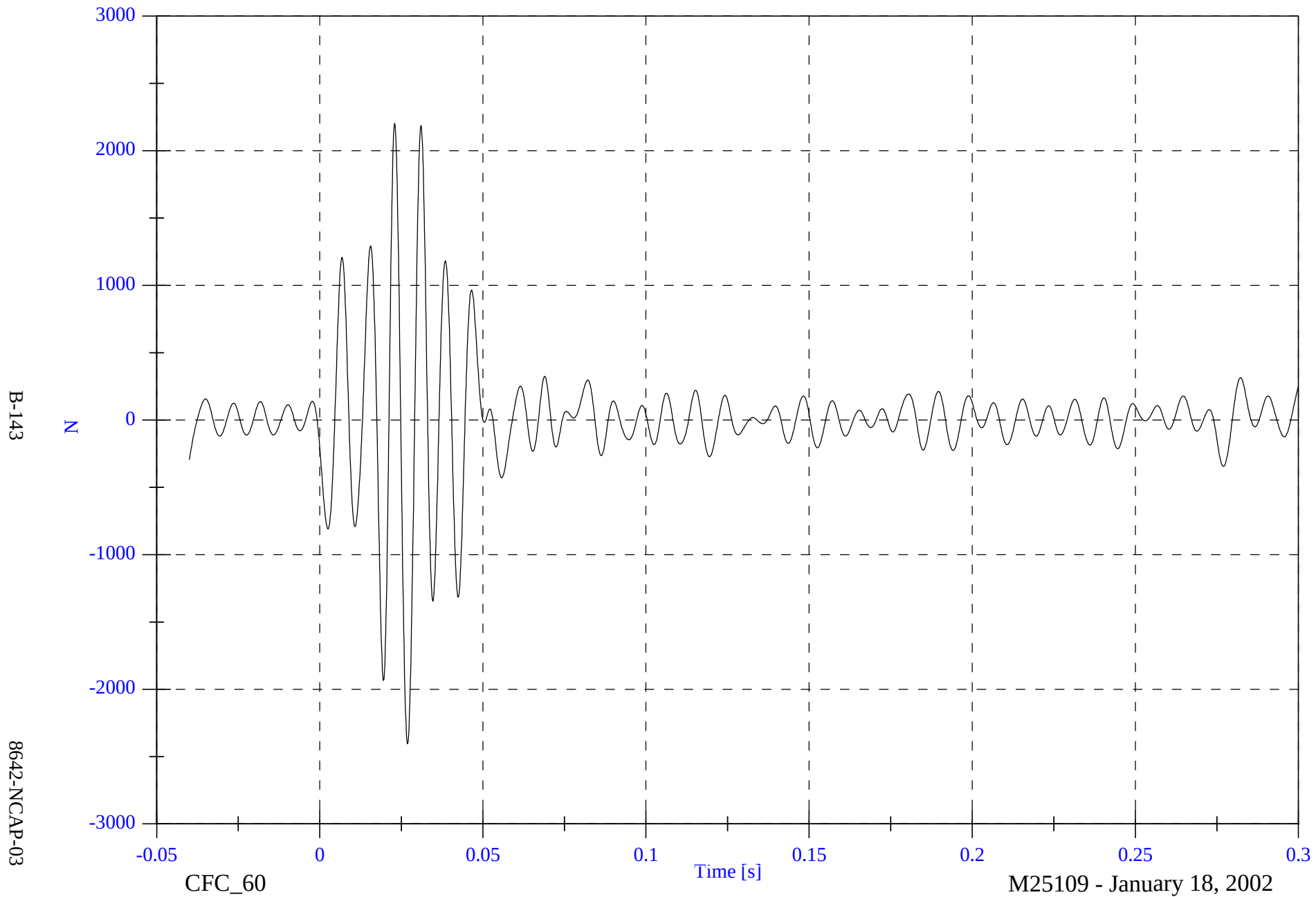


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Barrier Load Cell A3 Fx

Max: 2204.5 [N] at 0.023 [s]

Min: -2406.2 [N] at 0.027 [s]

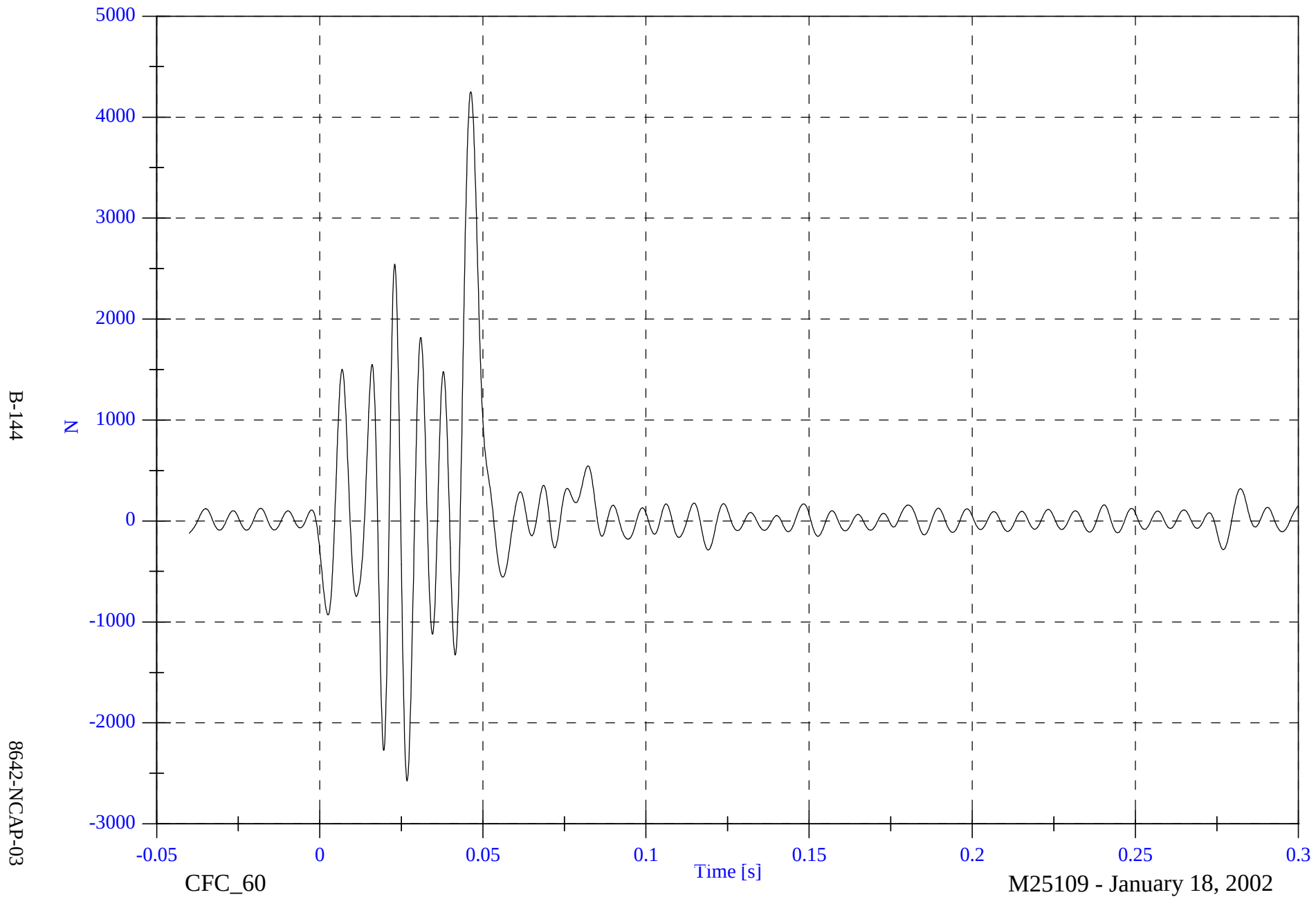


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell A4 Fx

Max: 4251.6 [N] at 0.046 [s]

Min: -2574.5 [N] at 0.027 [s]

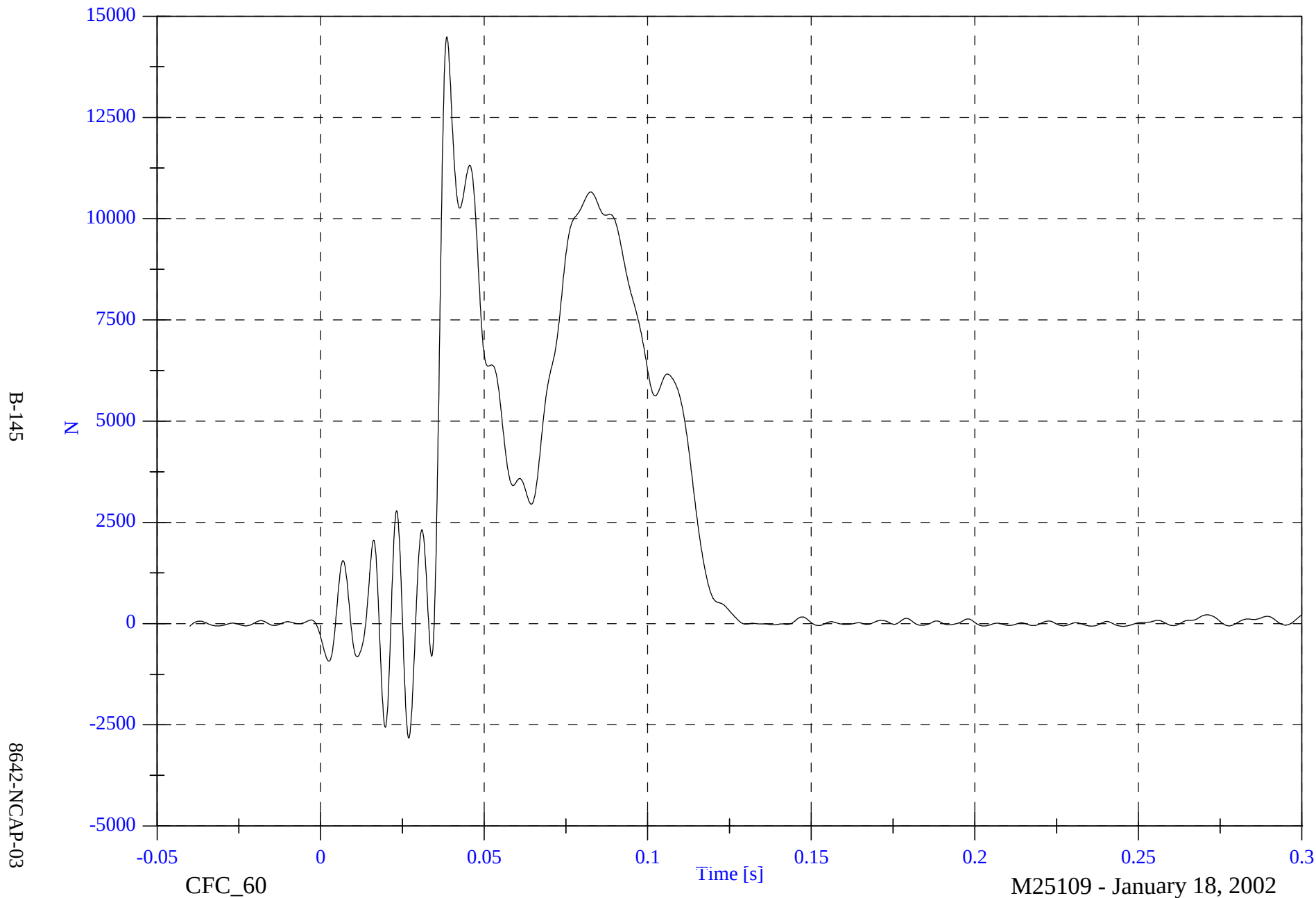


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell A5 Fx

Max: 14494.6 [N] at 0.039 [s]

Min: -2829.0 [N] at 0.027 [s]

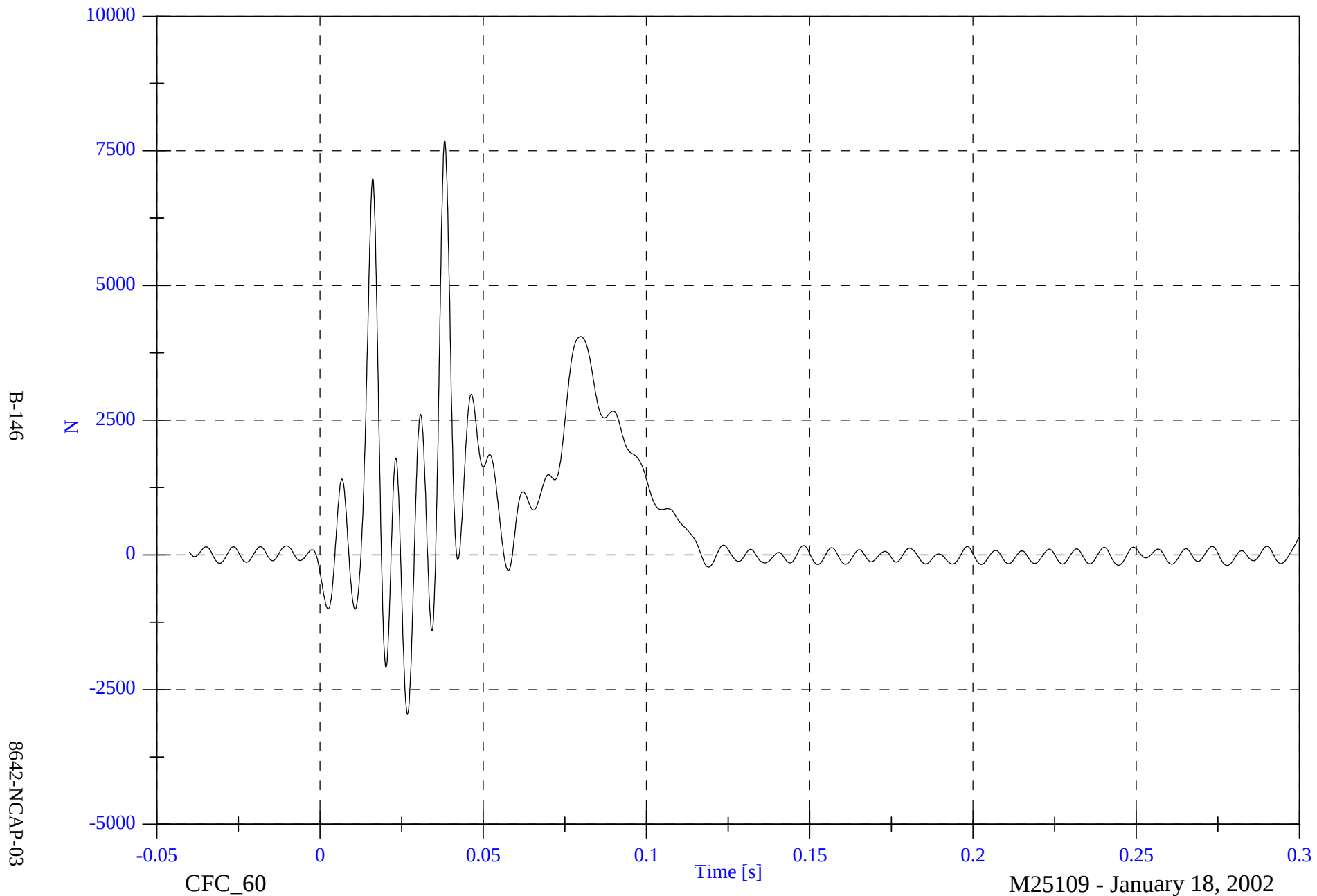


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell A6 Fx

Max: 7692.7 [N] at 0.038 [s]

Min: -2954.1 [N] at 0.027 [s]

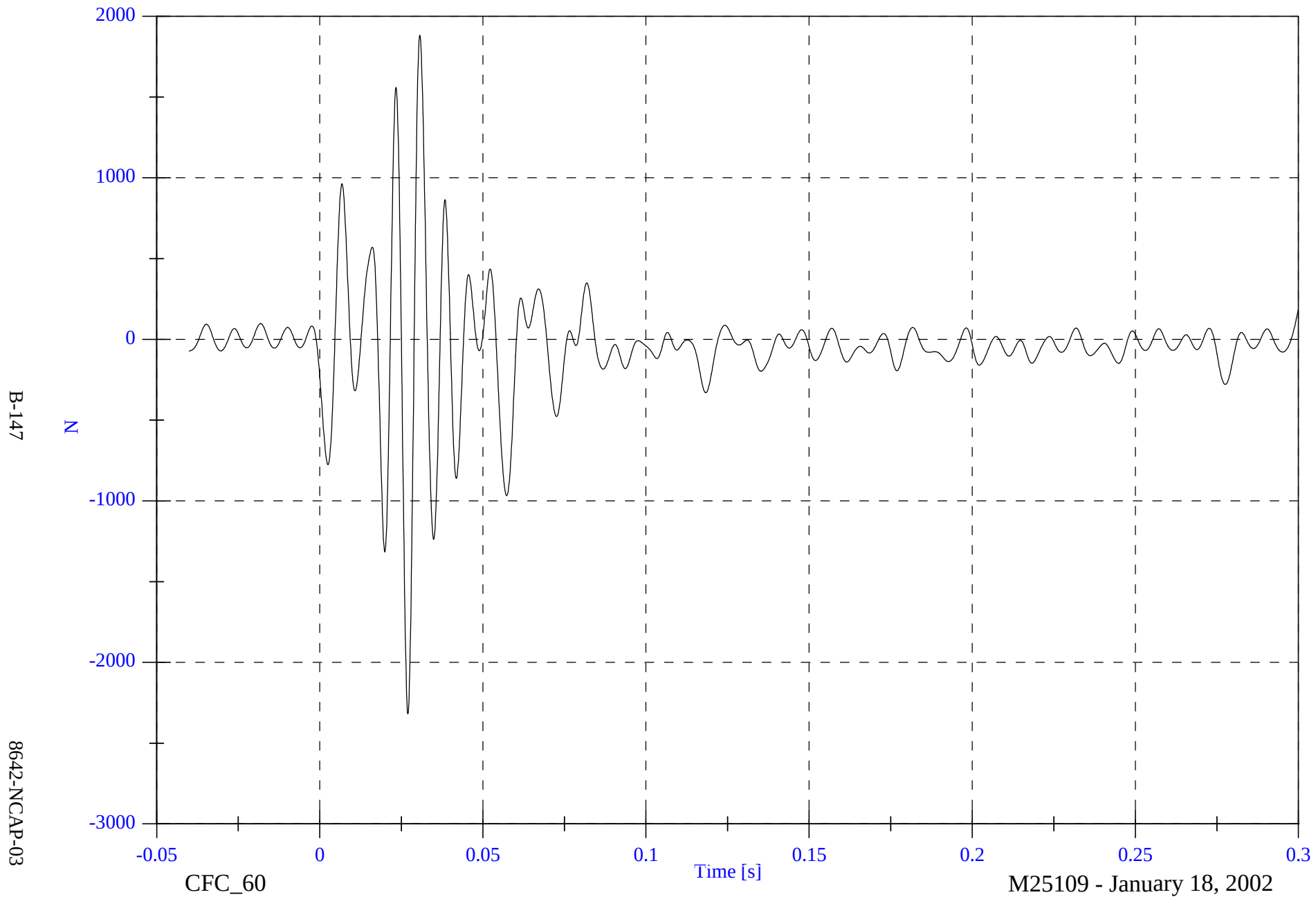


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell A7 Fx

Max: 1881.4 [N] at 0.031 [s]

Min: -2320.2 [N] at 0.027 [s]

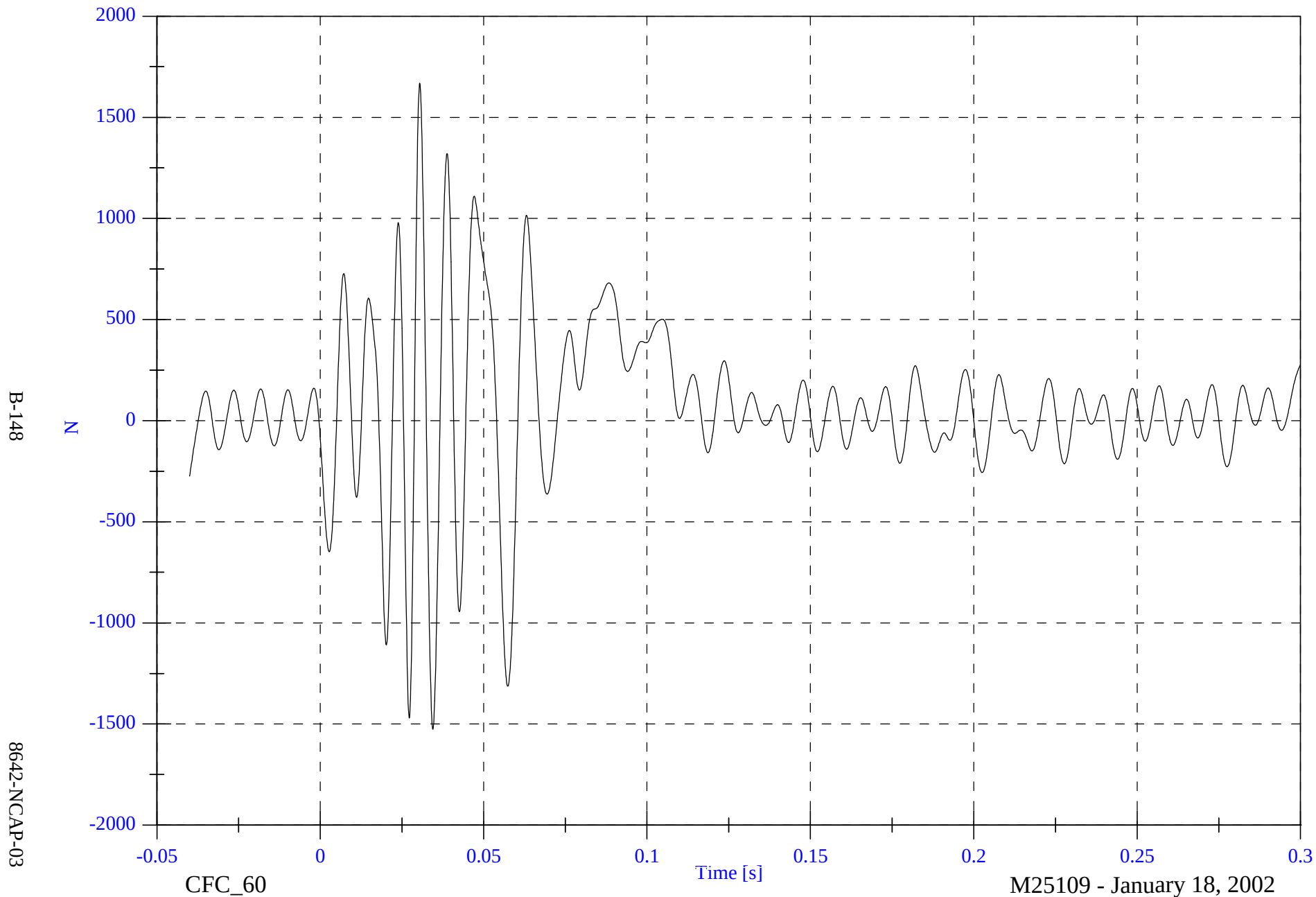


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell A8 Fx

Max: 1669.7 [N] at 0.030 [s]

Min: -1525.7 [N] at 0.034 [s]

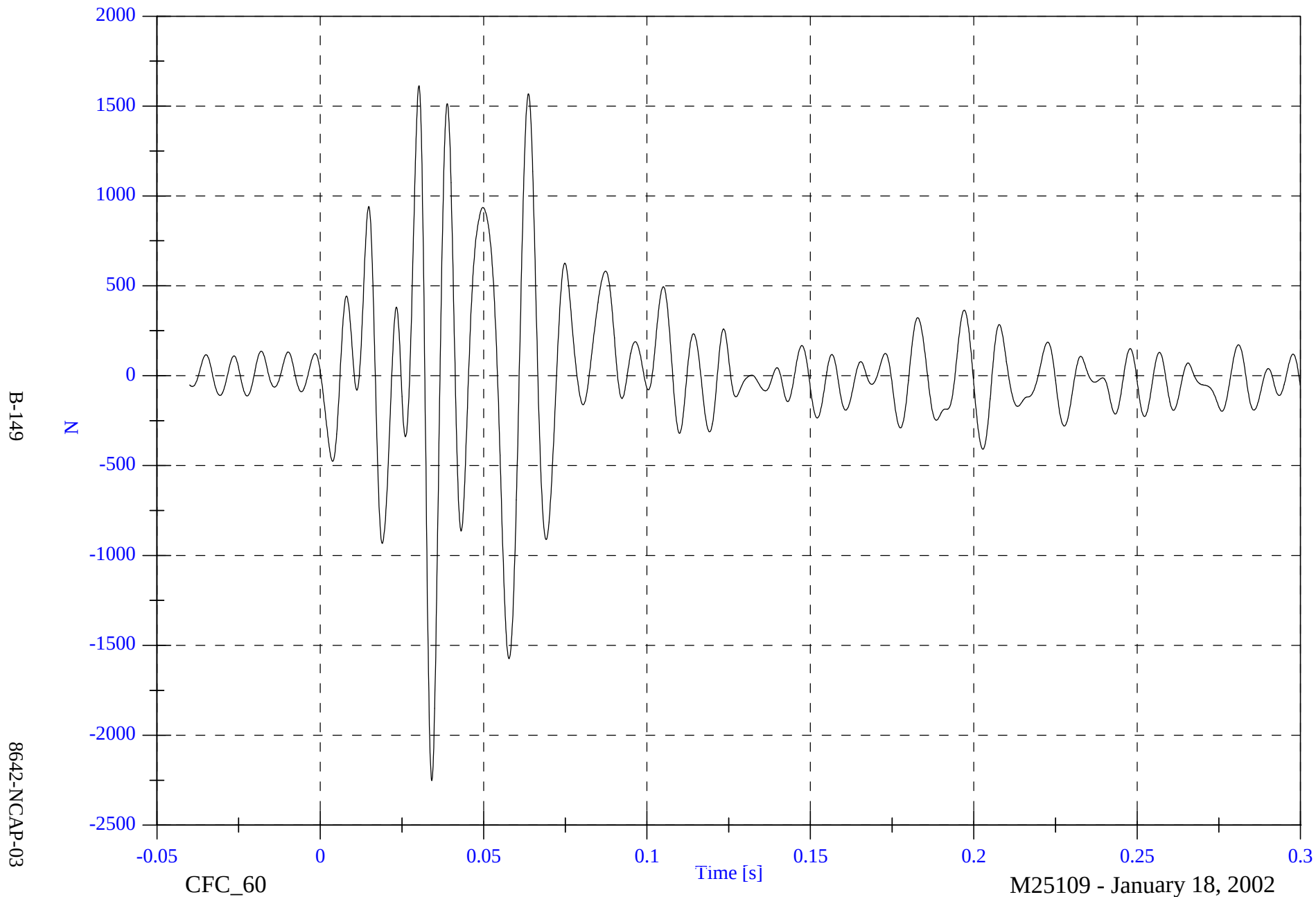


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell A9 Fx

Max: 1613.4 [N] at 0.030 [s]

Min: -2252.2 [N] at 0.034 [s]

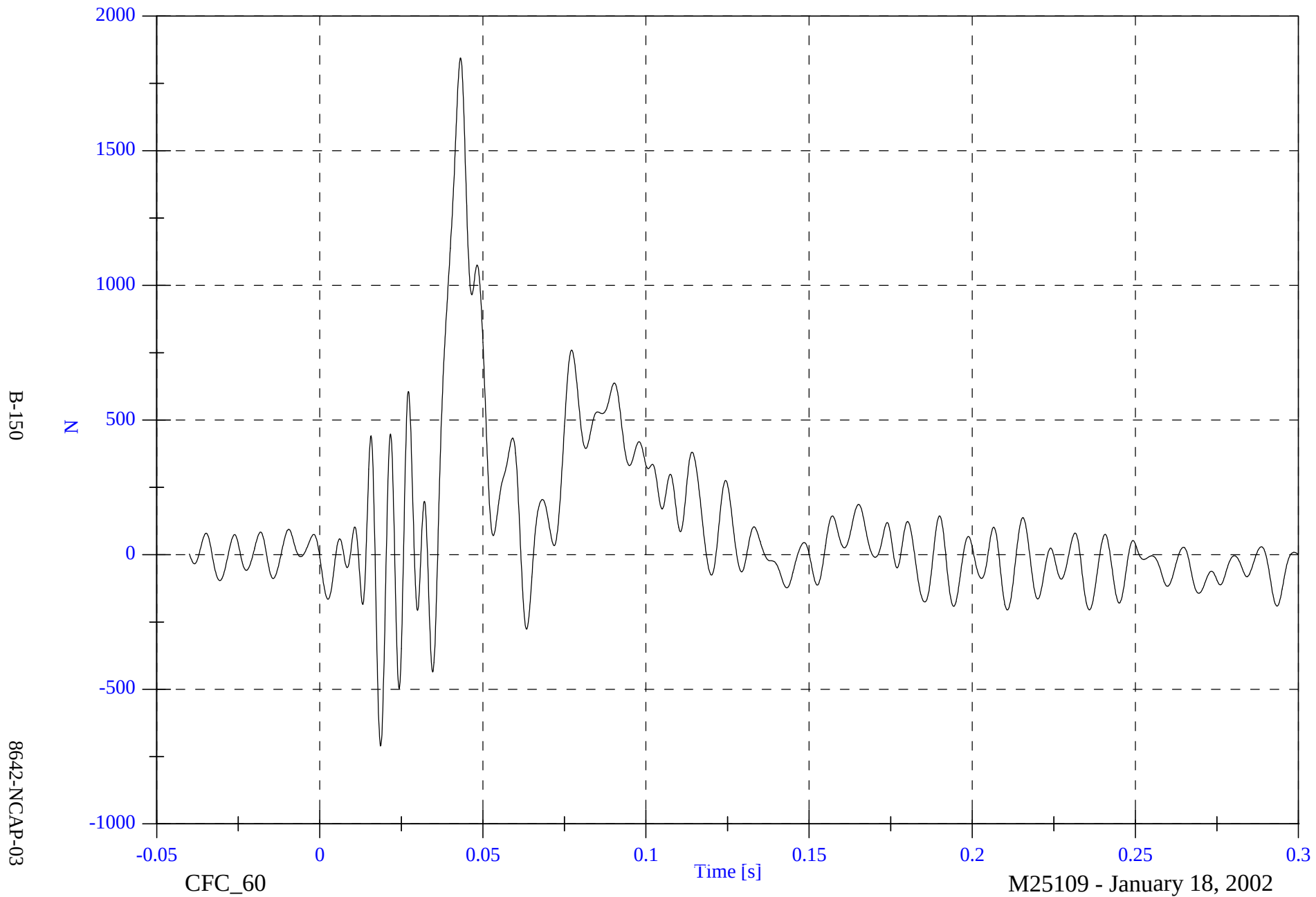


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B1 Fx

Max: 1845.2 [N] at 0.043 [s]

Min: -710.8 [N] at 0.019 [s]

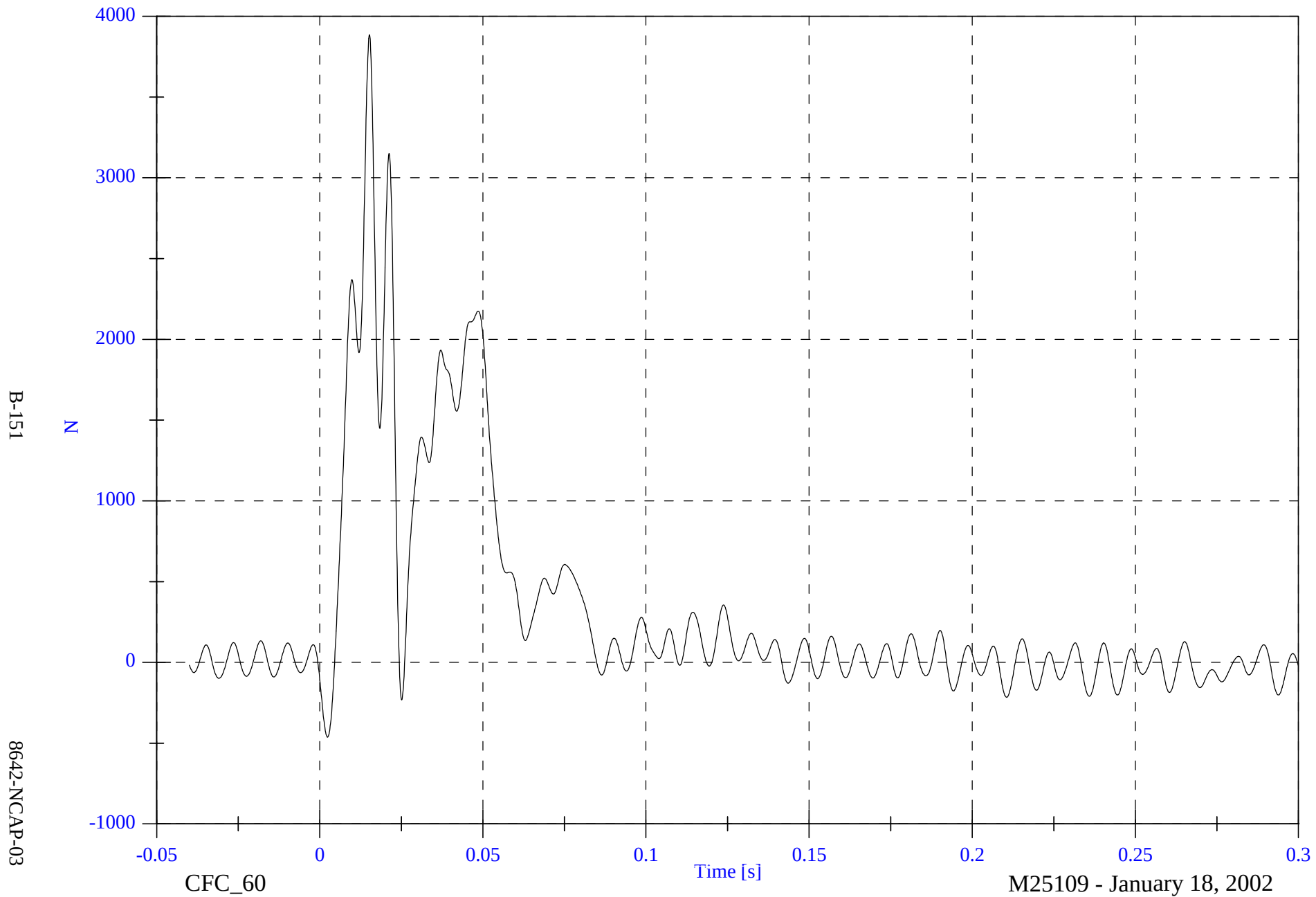


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B2 Fx

Max: 3885.8 [N] at 0.015 [s]

Min: -463.1 [N] at 0.002 [s]

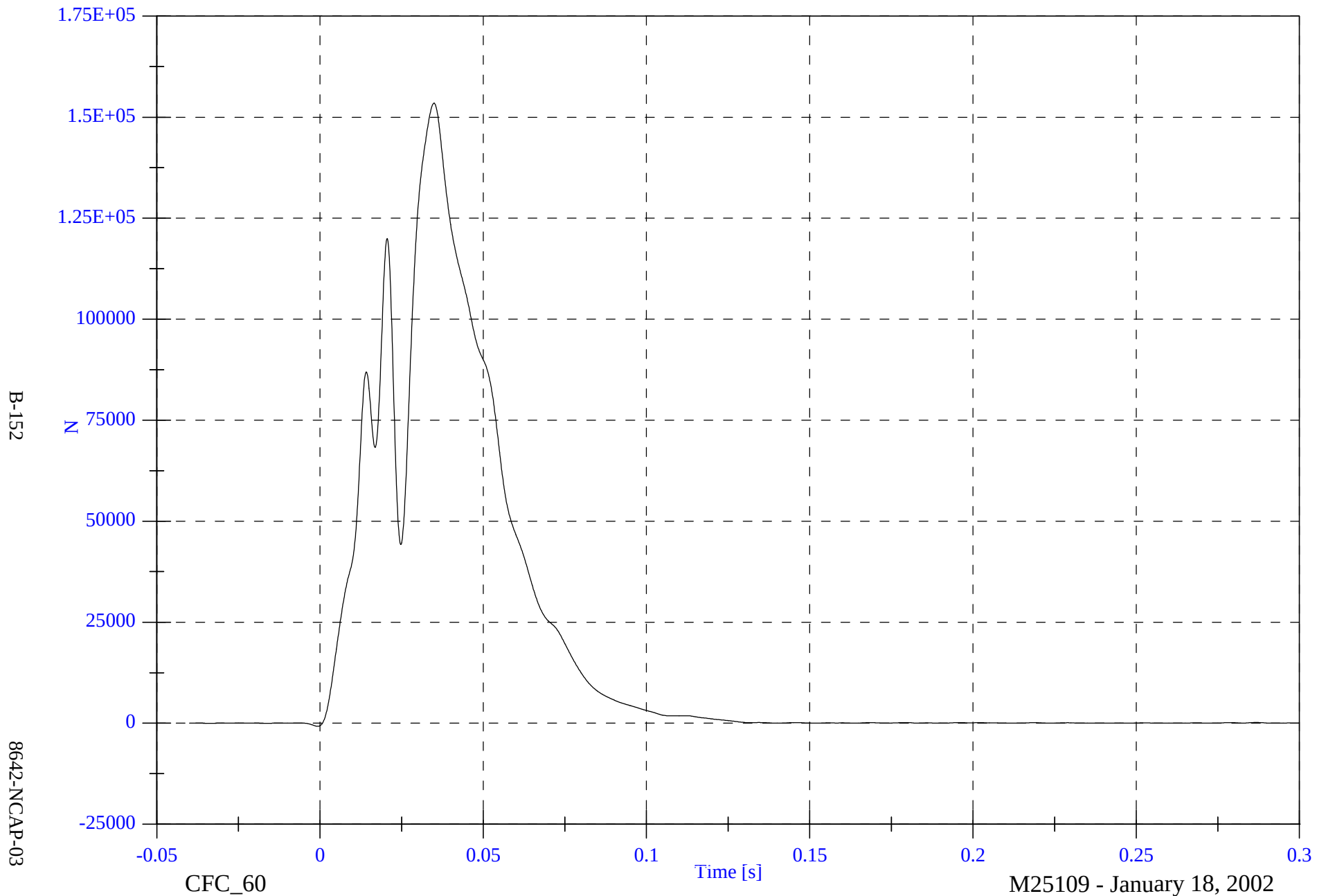


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B3 Fx

Max: 153484.8 [N] at 0.035 [s]

Min: -758.4 [N] at -0.001 [s]

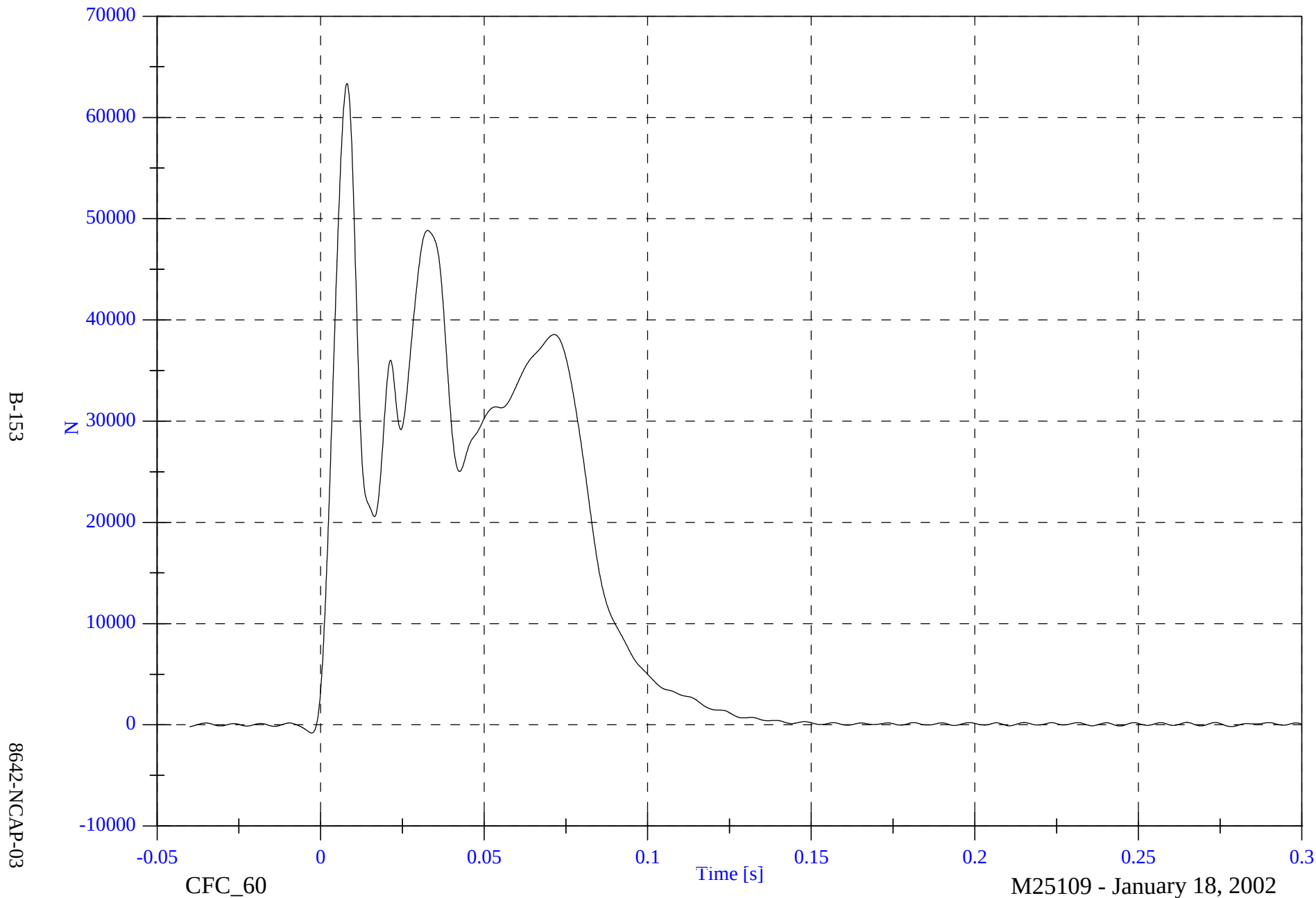


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B4 Fx

Max: 63358.1 [N] at 0.008 [s]

Min: -806.2 [N] at -0.003 [s]

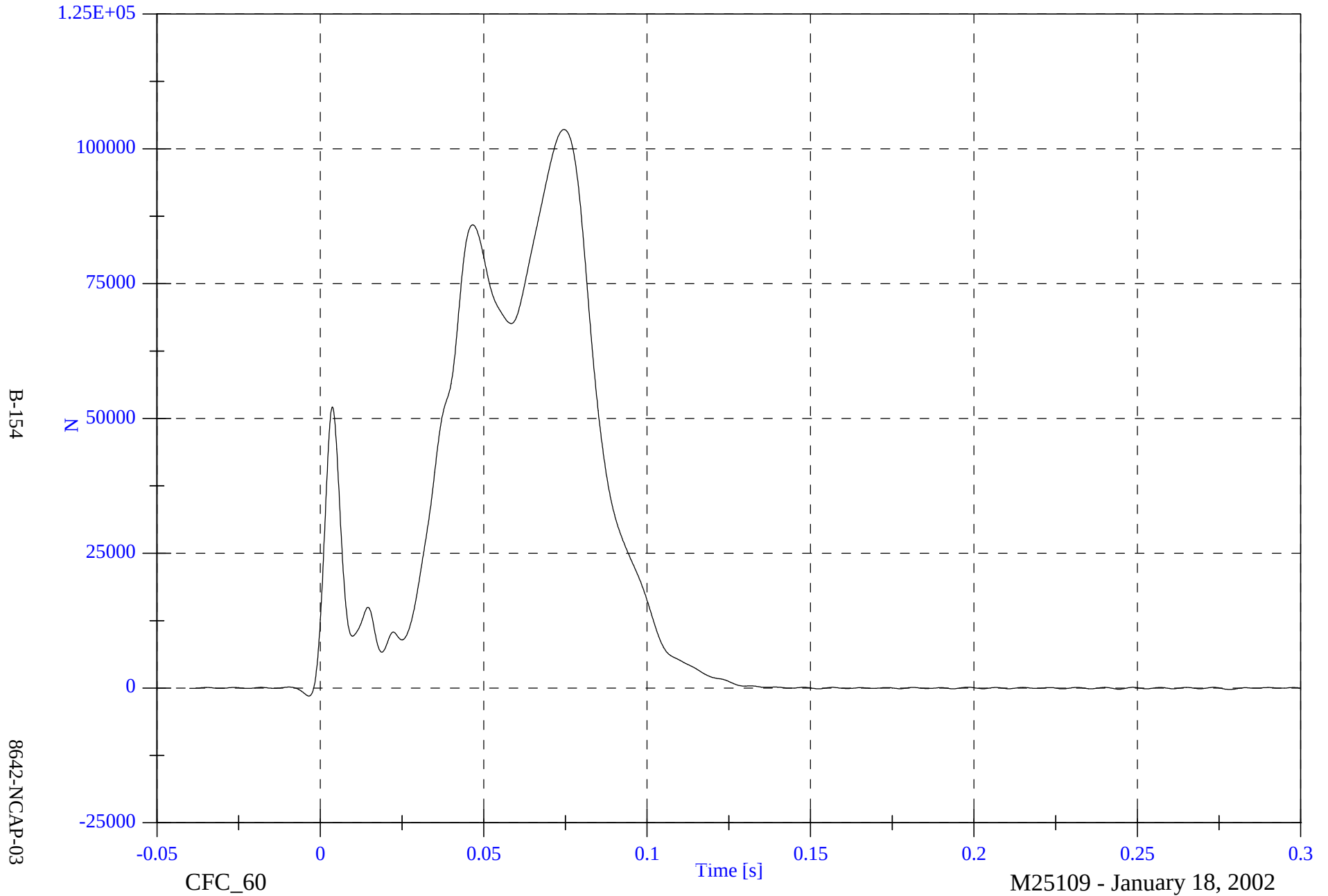


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B5 Fx

Max: 103596.3 [N] at 0.075 [s]

Min: -1480.1 [N] at -0.004 [s]

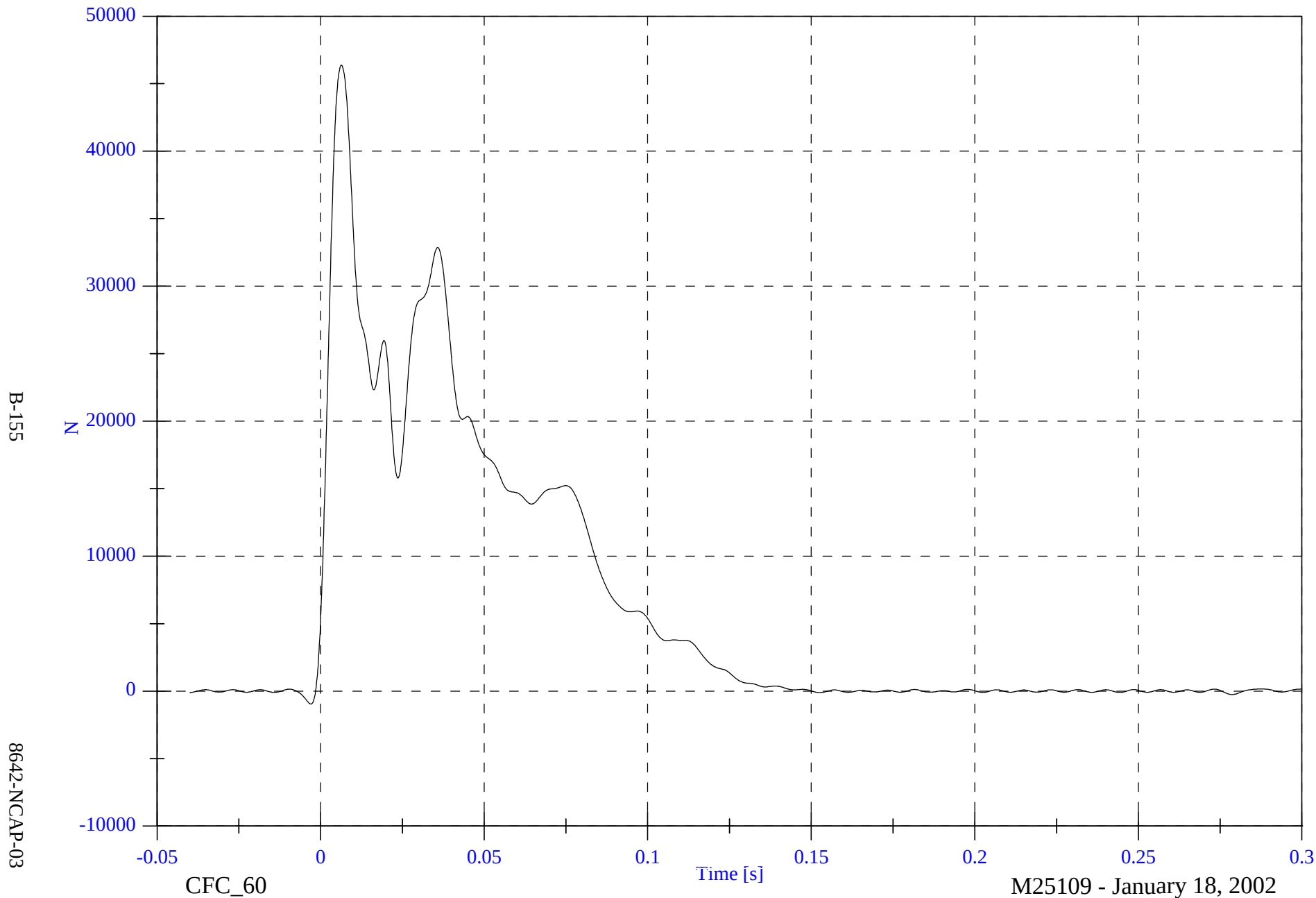


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B6 Fx

Max: 46369.6 [N] at 0.006 [s]

Min: -957.8 [N] at -0.003 [s]

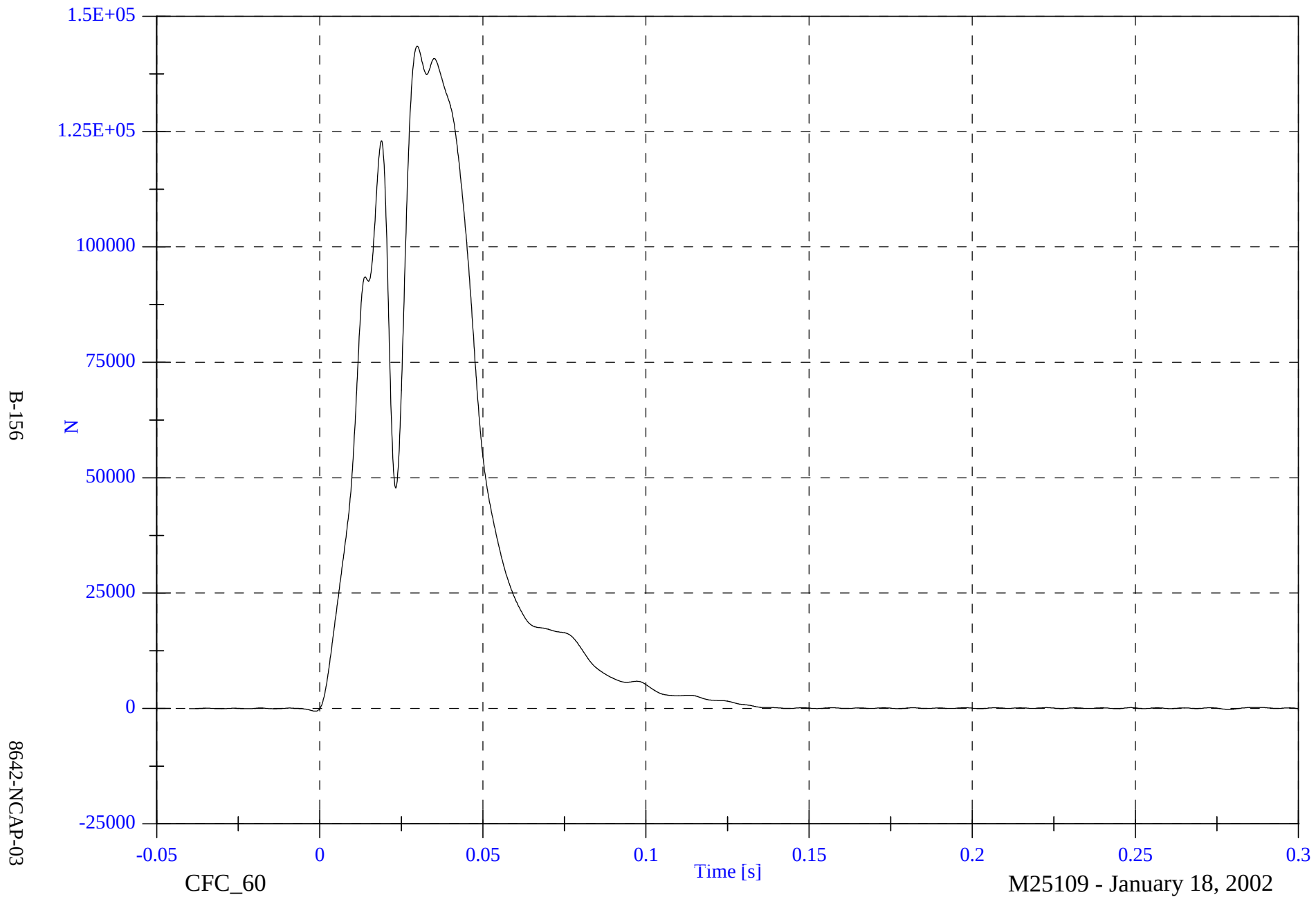


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B7 Fx

Max: 143493.1 [N] at 0.030 [s]

Min: -578.8 [N] at -0.001 [s]

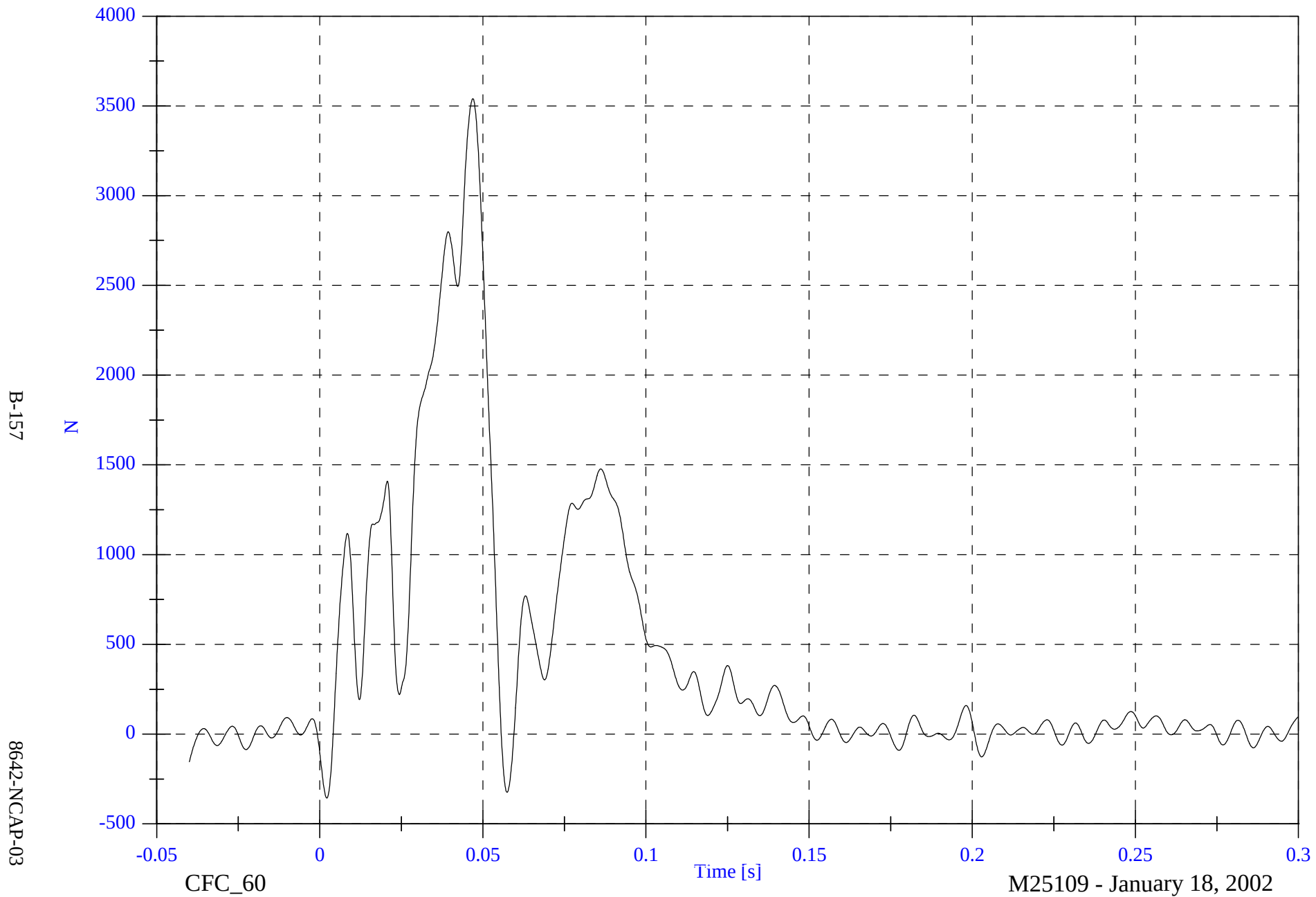


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B8 Fx

Max: 3539.9 [N] at 0.047 [s]

Min: -356.2 [N] at 0.002 [s]

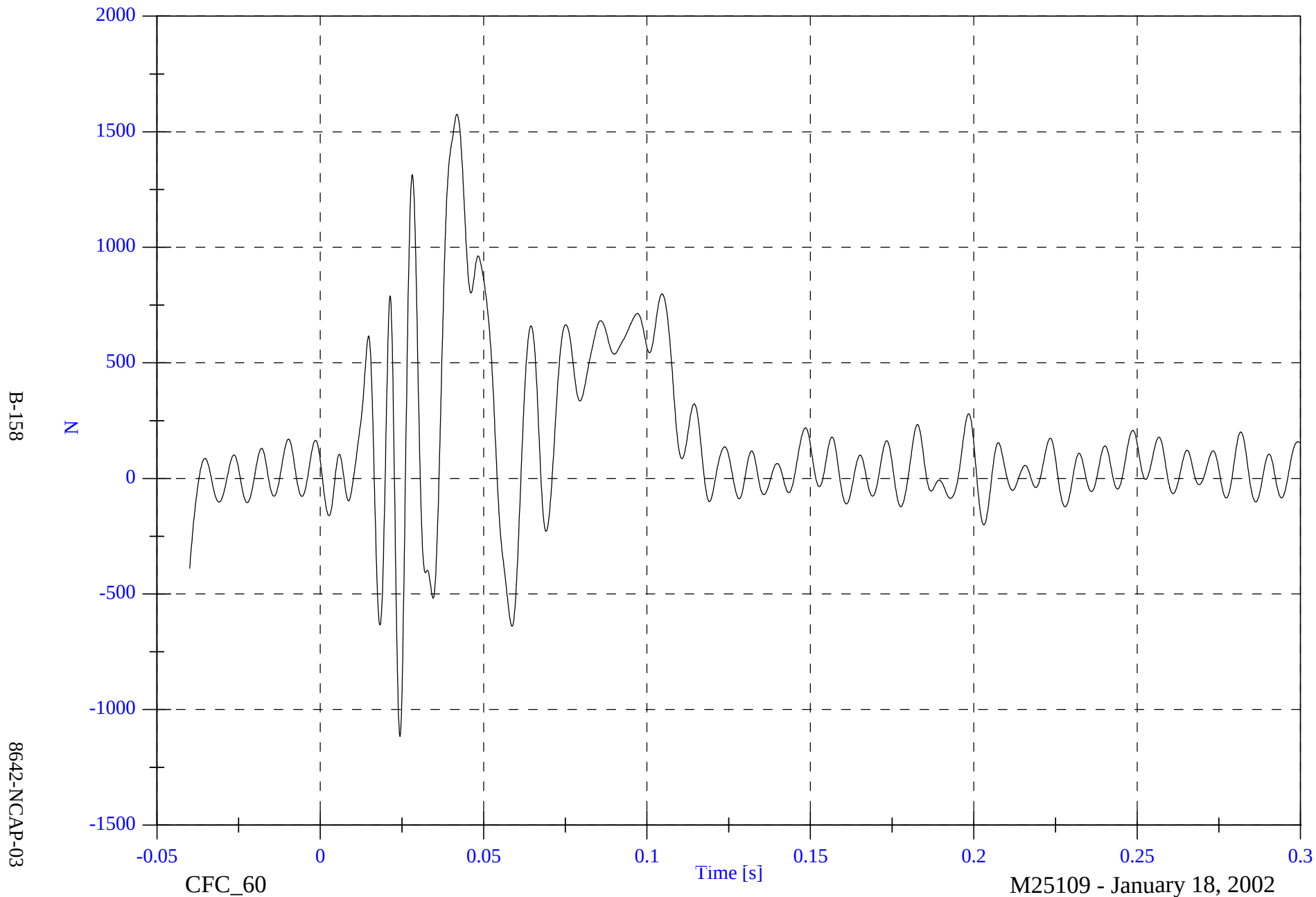


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell B9 Fx

Max: 1575.6 [N] at 0.042 [s]

Min: -1116.7 [N] at 0.024 [s]

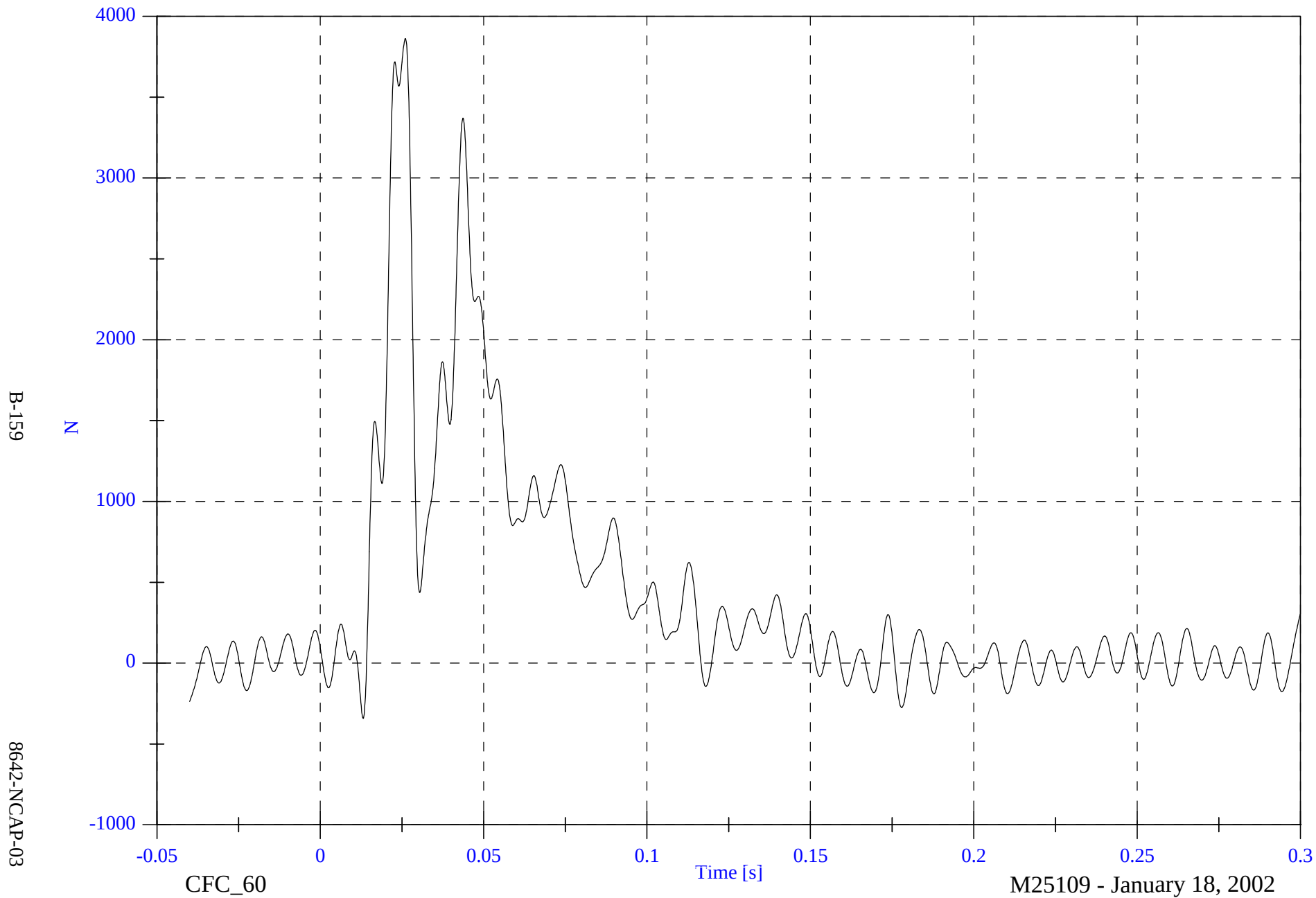


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C1 Fx

Max: 3862.1 [N] at 0.026 [s]

Min: -342.6 [N] at 0.013 [s]

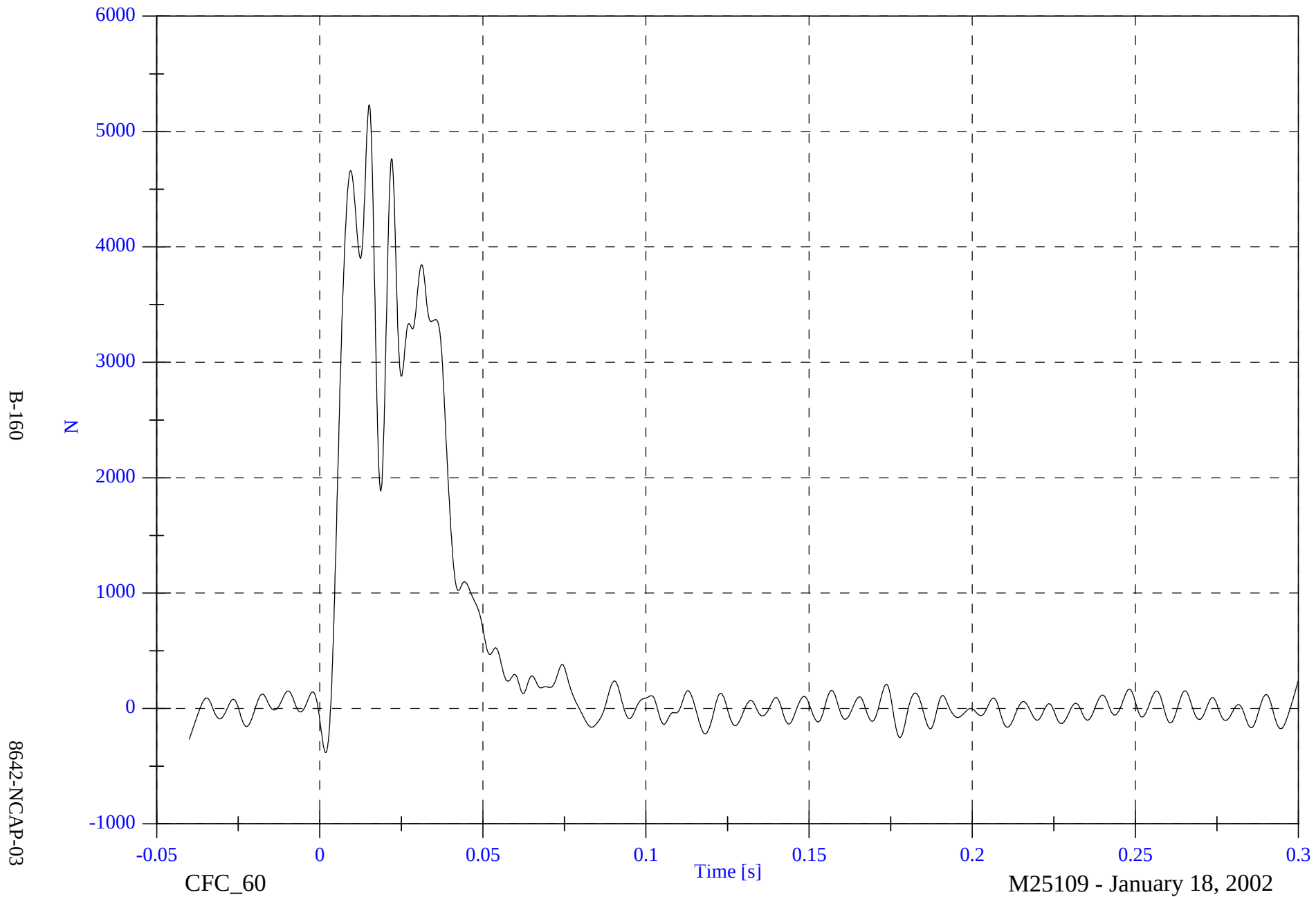


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C2 Fx

Max: 5231.3 [N] at 0.015 [s]

Min: -382.6 [N] at 0.002 [s]

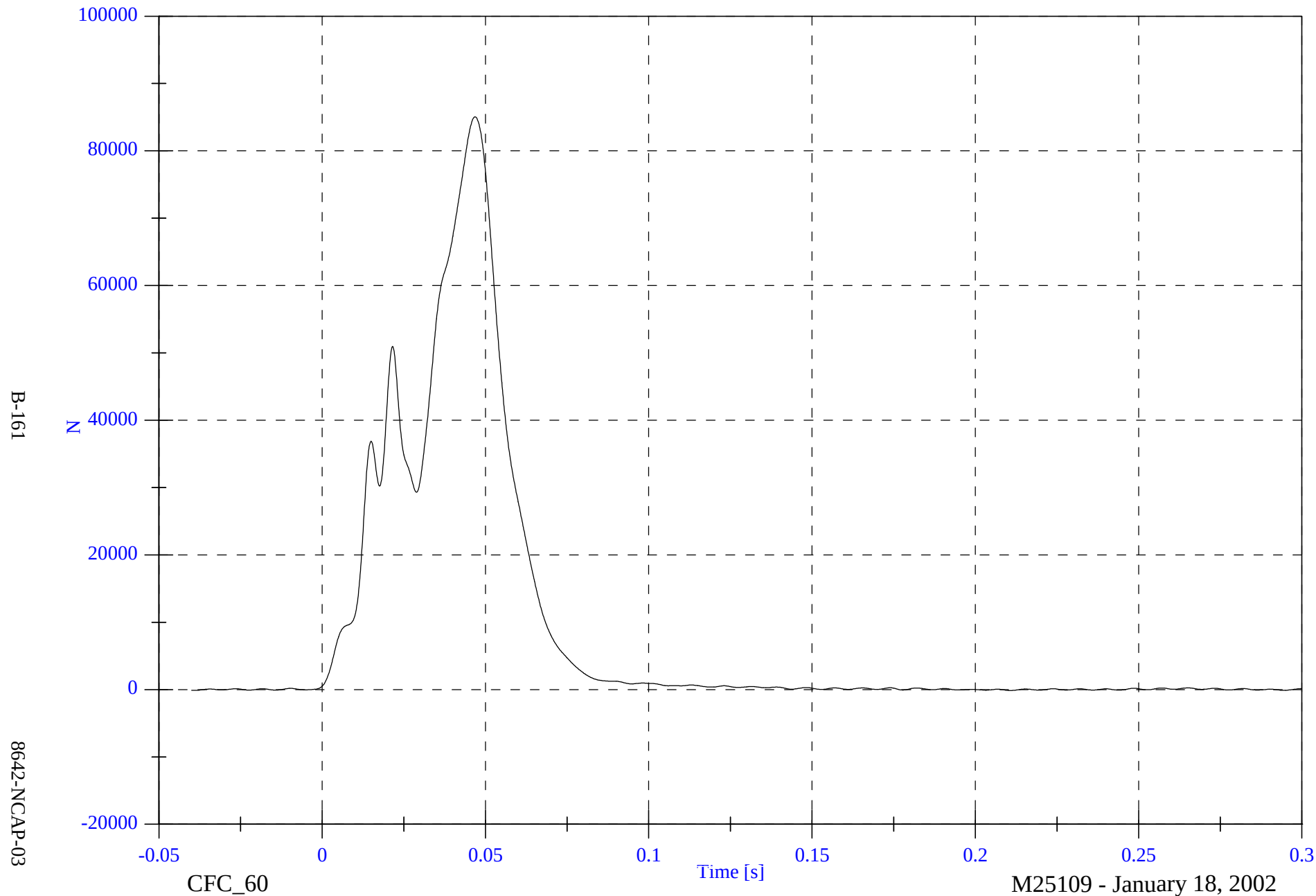


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C3 Fx

Max: 85055.1 [N] at 0.047 [s]

Min: -150.2 [N] at 0.211 [s]

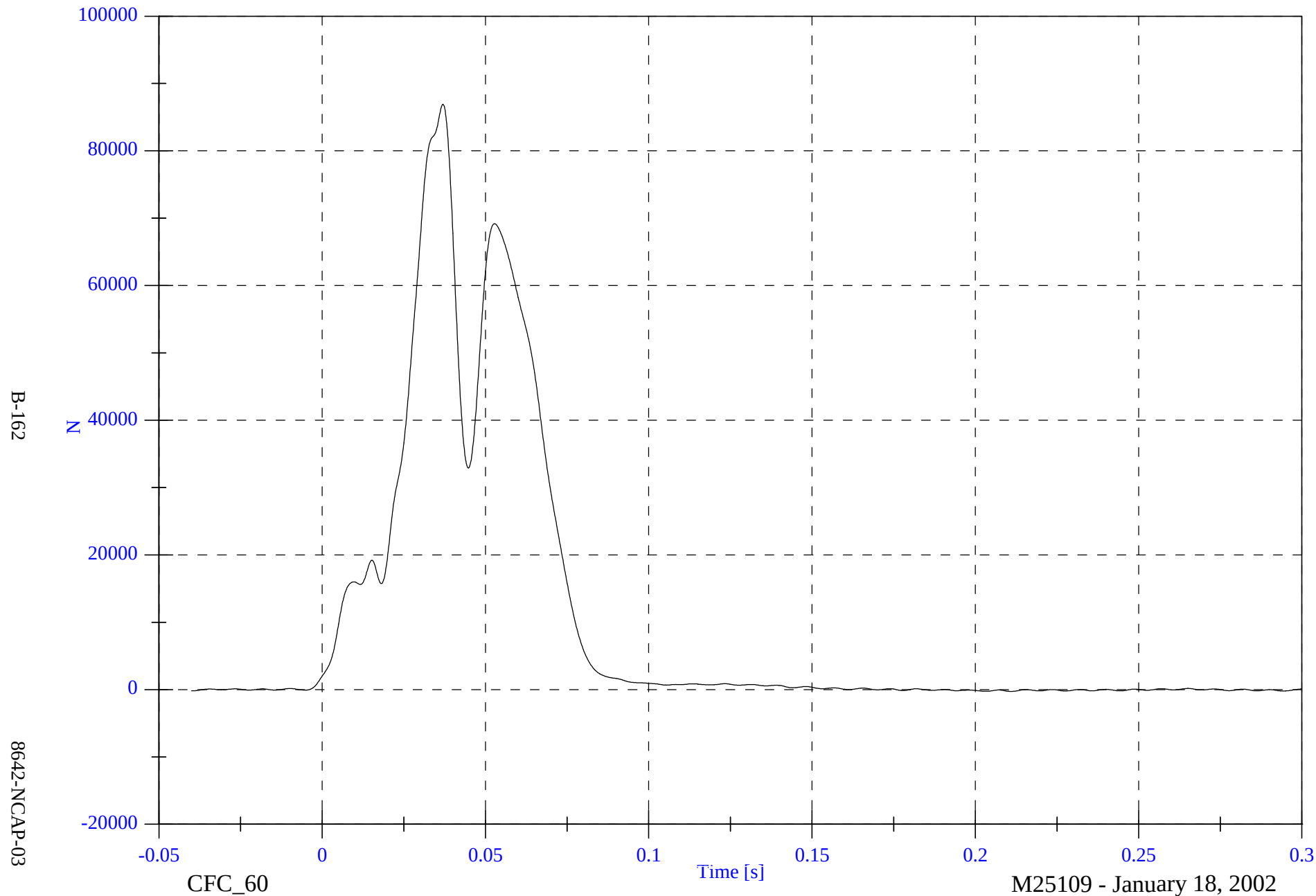


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C4 Fx

Max: 86917.1 [N] at 0.037 [s]

Min: -274.4 [N] at 0.211 [s]

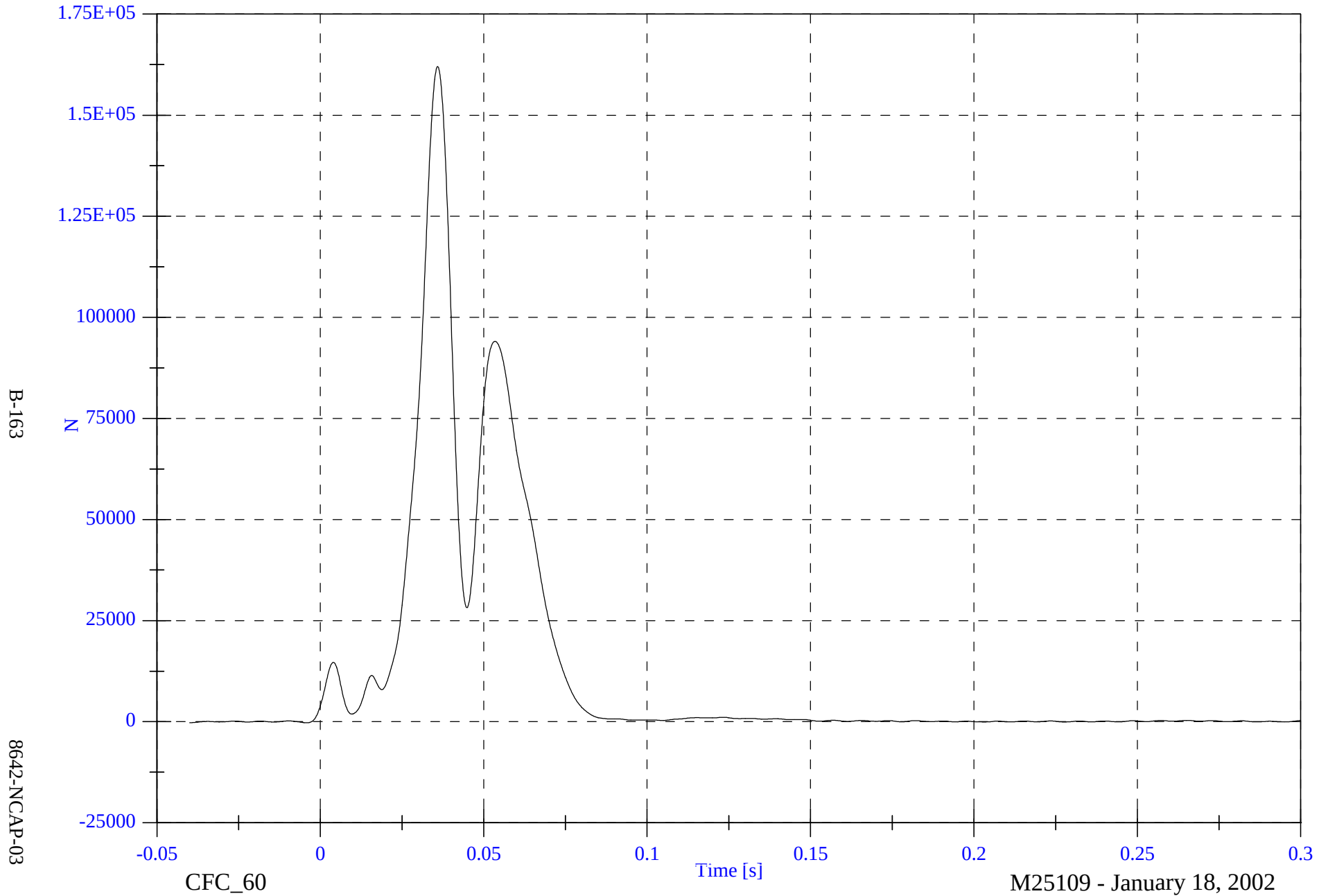


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C5 Fx

Max: 162026.2 [N] at 0.036 [s]

Min: -267.2 [N] at -0.004 [s]

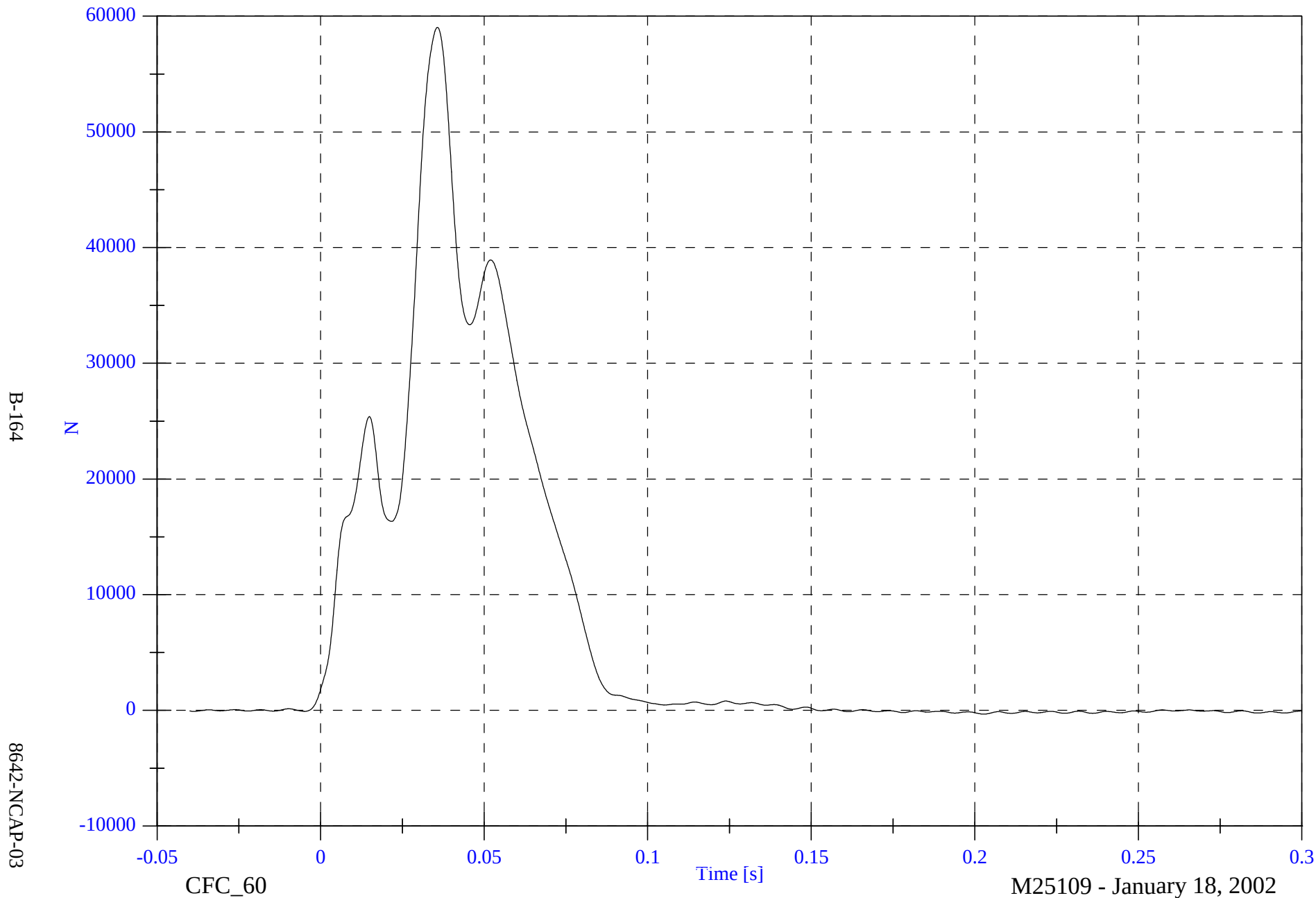


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C6 Fx

Max: 59039.6 [N] at 0.036 [s]

Min: -320.2 [N] at 0.203 [s]

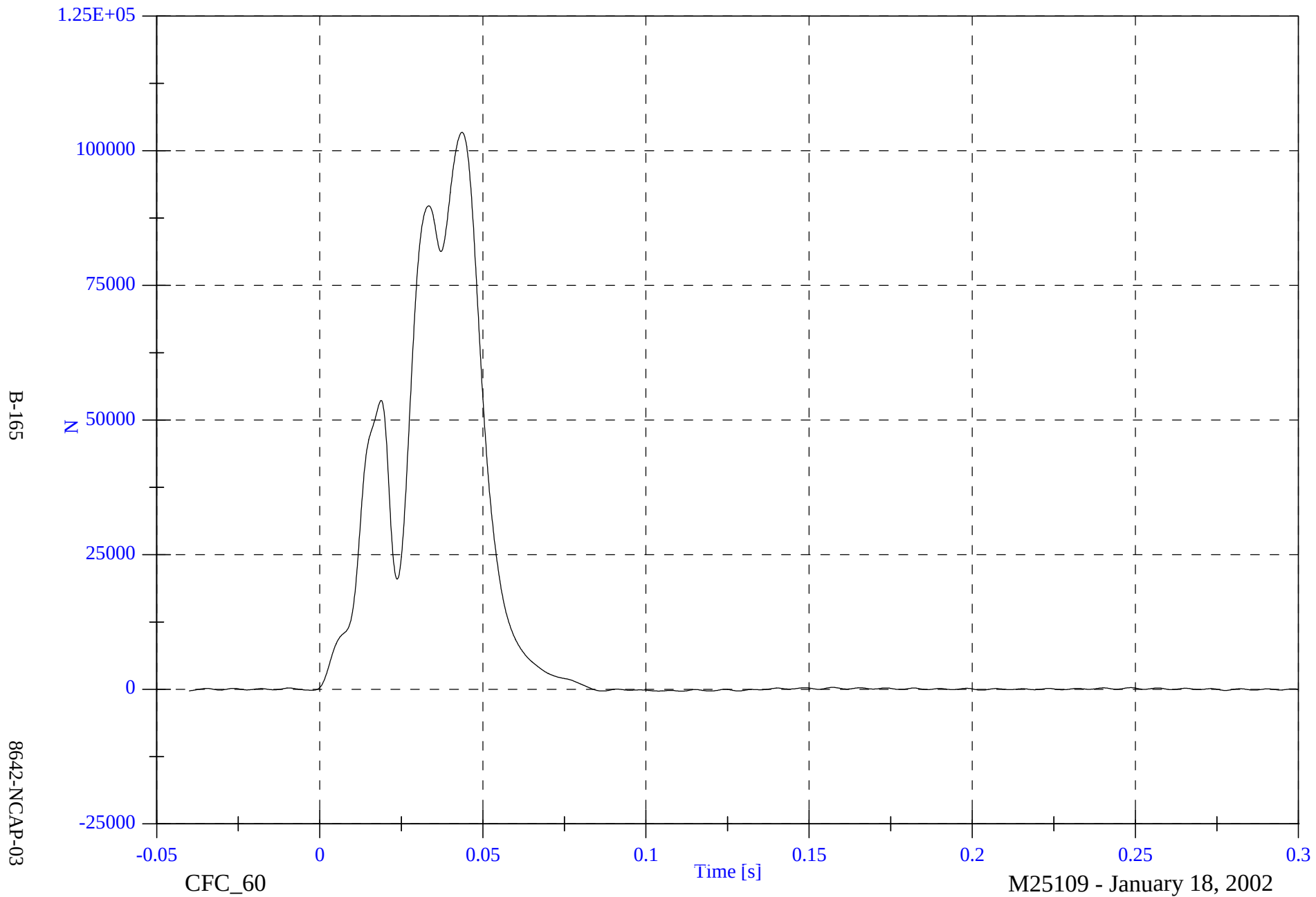


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C7 Fx

Max: 103414.0 [N] at 0.044 [s]

Min: -361.3 [N] at 0.111 [s]

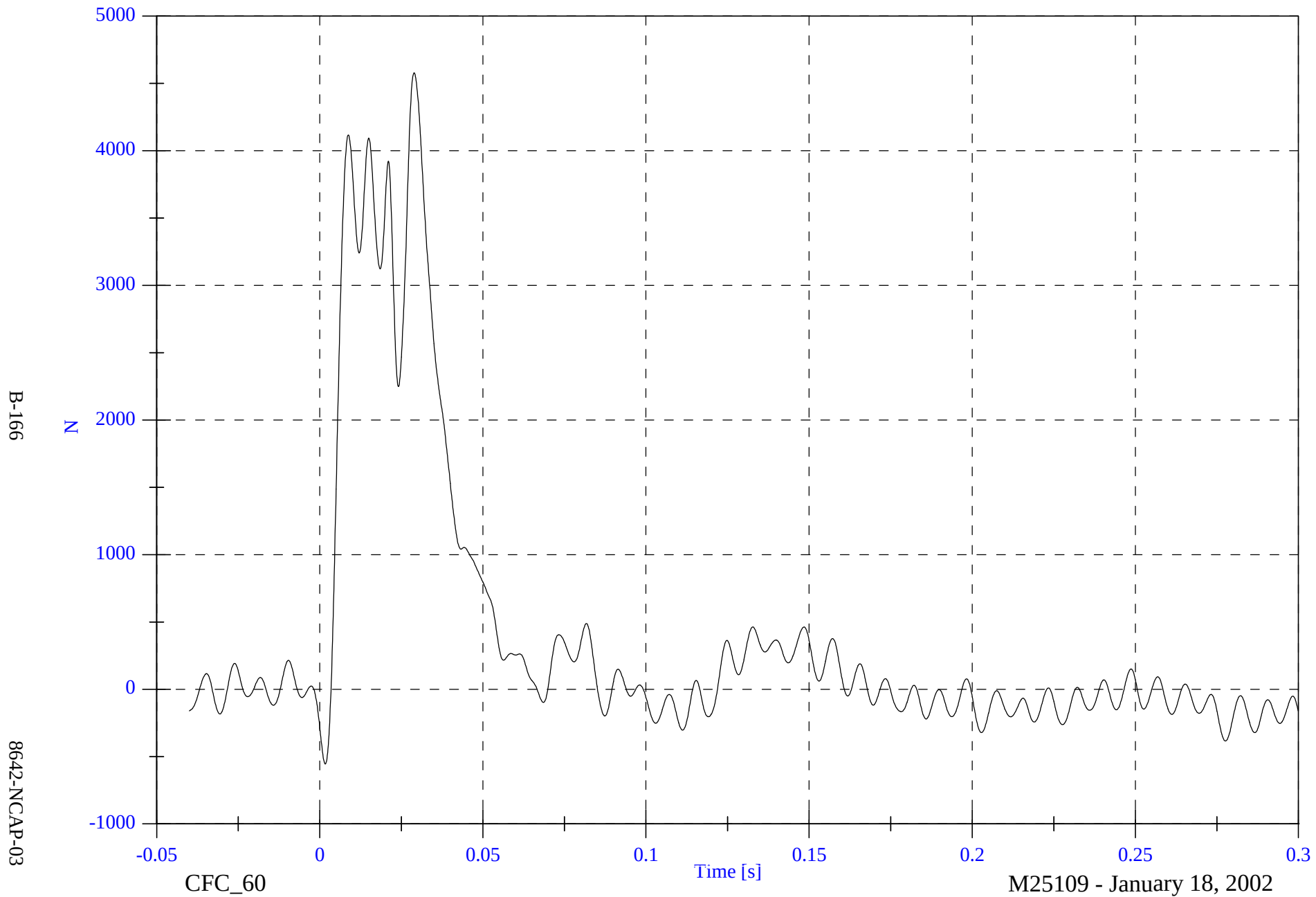


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C8 Fx

Max: 4579.9 [N] at 0.029 [s]

Min: -555.5 [N] at 0.002 [s]

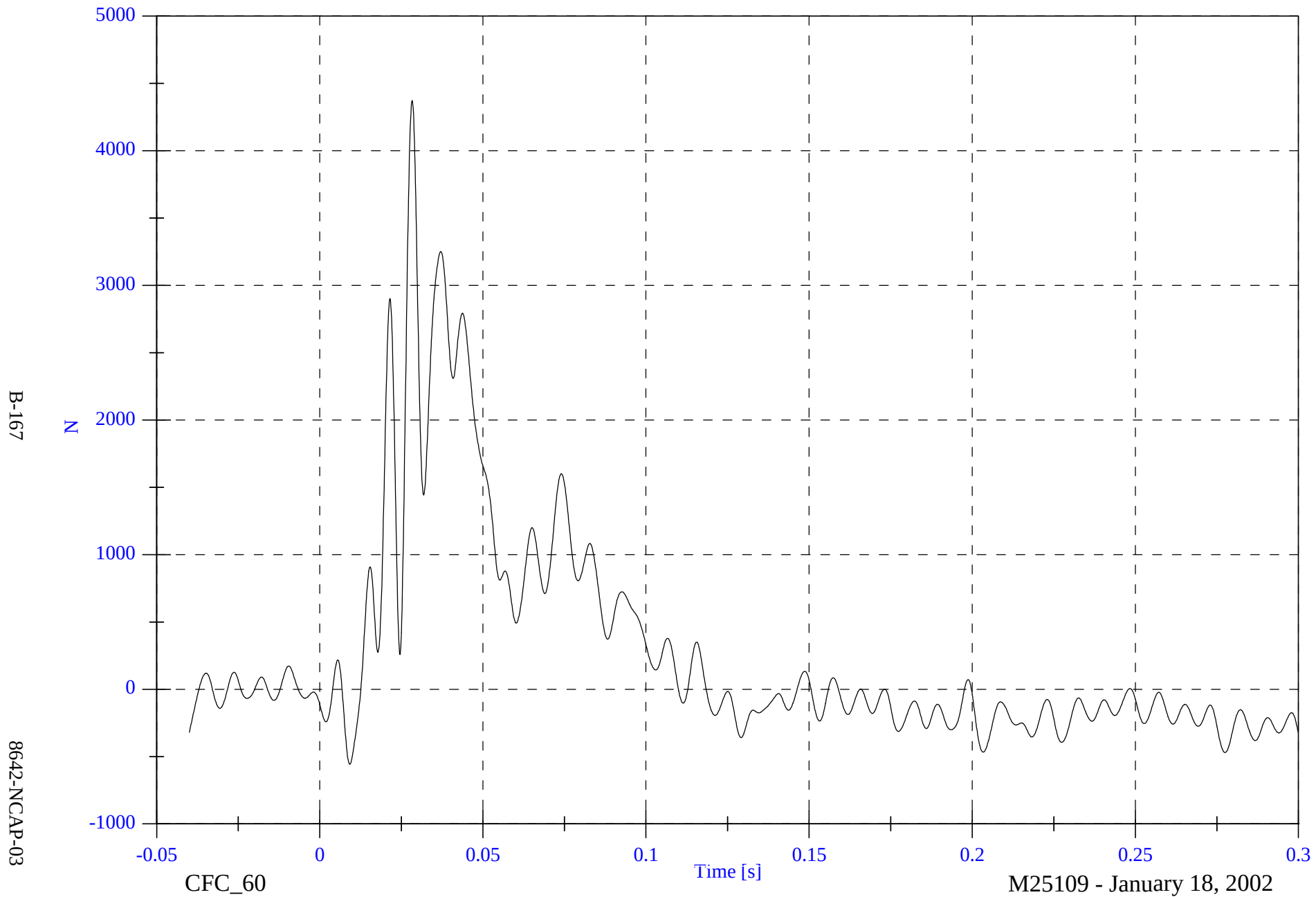


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell C9 Fx

Max: 4373.7 [N] at 0.028 [s]

Min: -556.8 [N] at 0.009 [s]

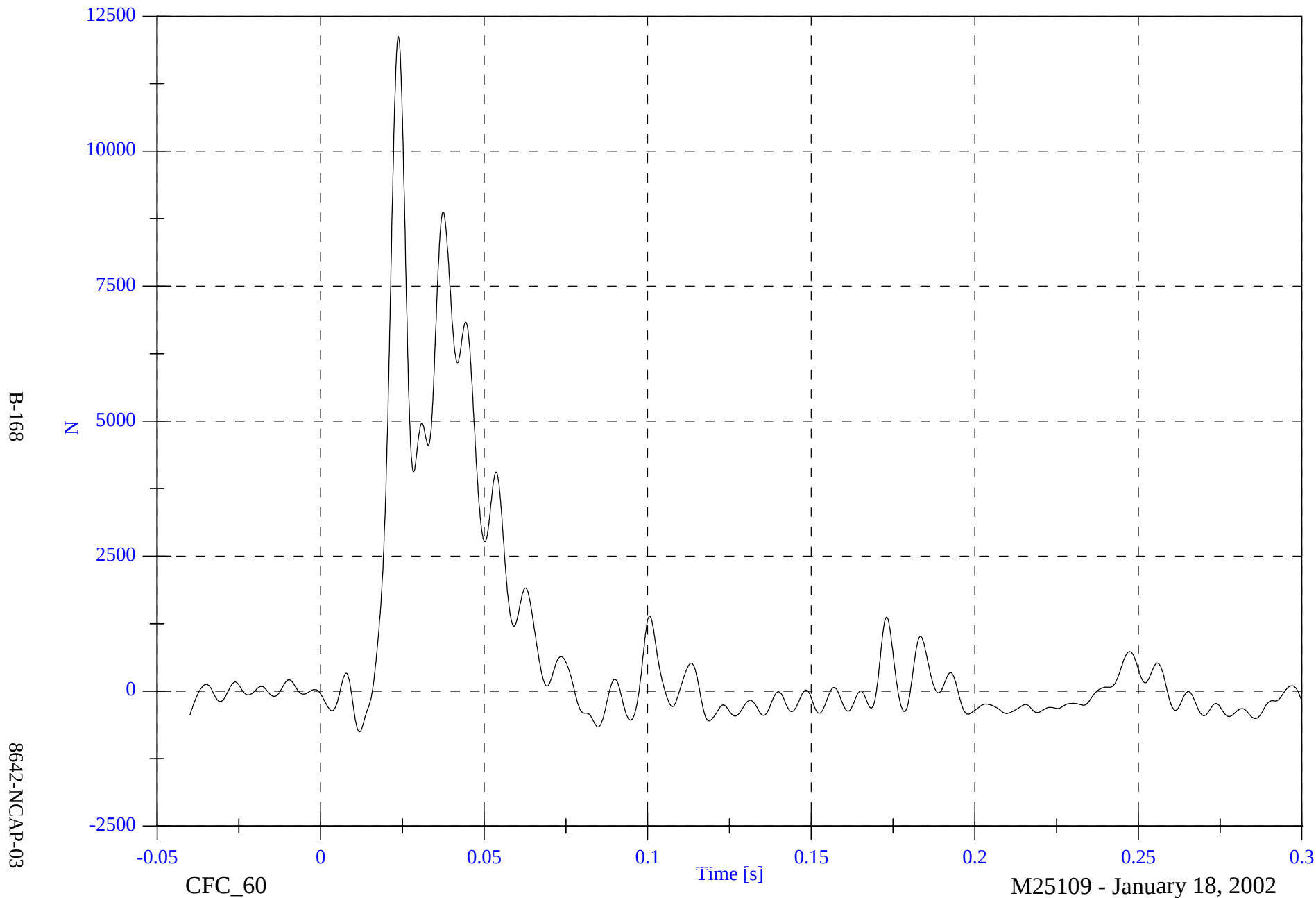


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D1 Fx

Max: 12123.5 [N] at 0.024 [s]

Min: -757.4 [N] at 0.012 [s]

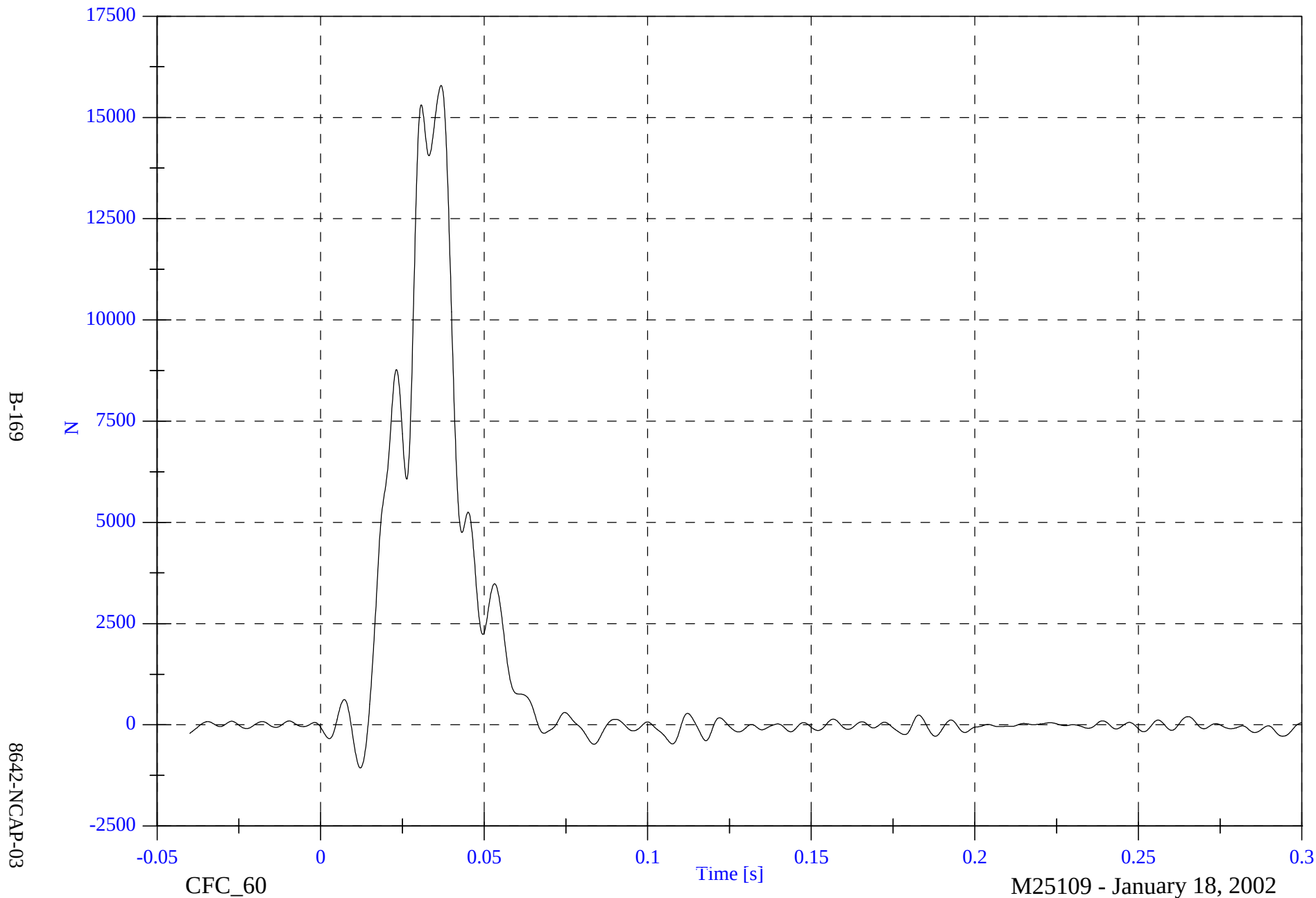


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D2 Fx

Max: 15790.6 [N] at 0.037 [s]

Min: -1065.6 [N] at 0.012 [s]

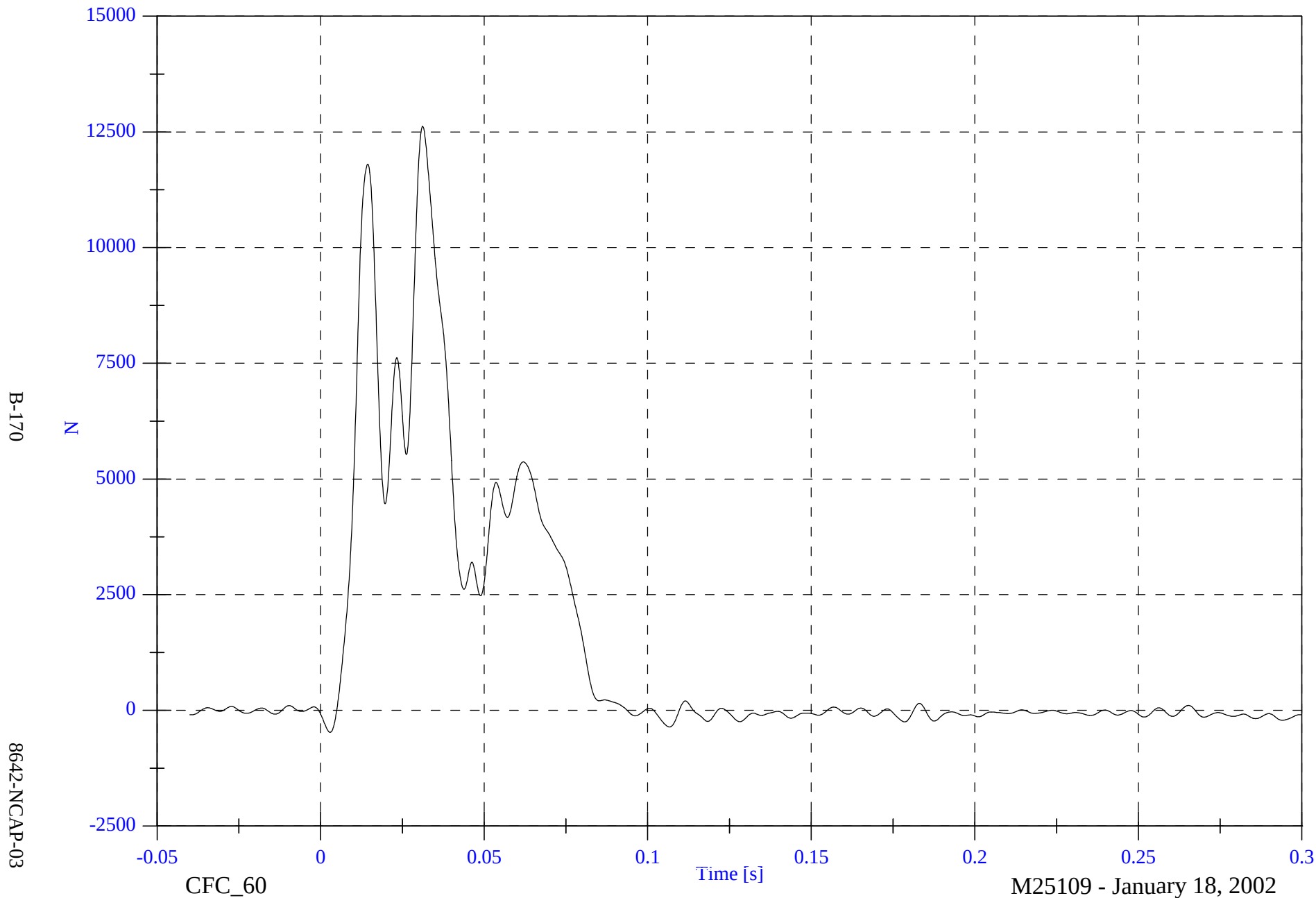


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D3 Fx

Max: 12622.6 [N] at 0.031 [s]

Min: -476.5 [N] at 0.003 [s]

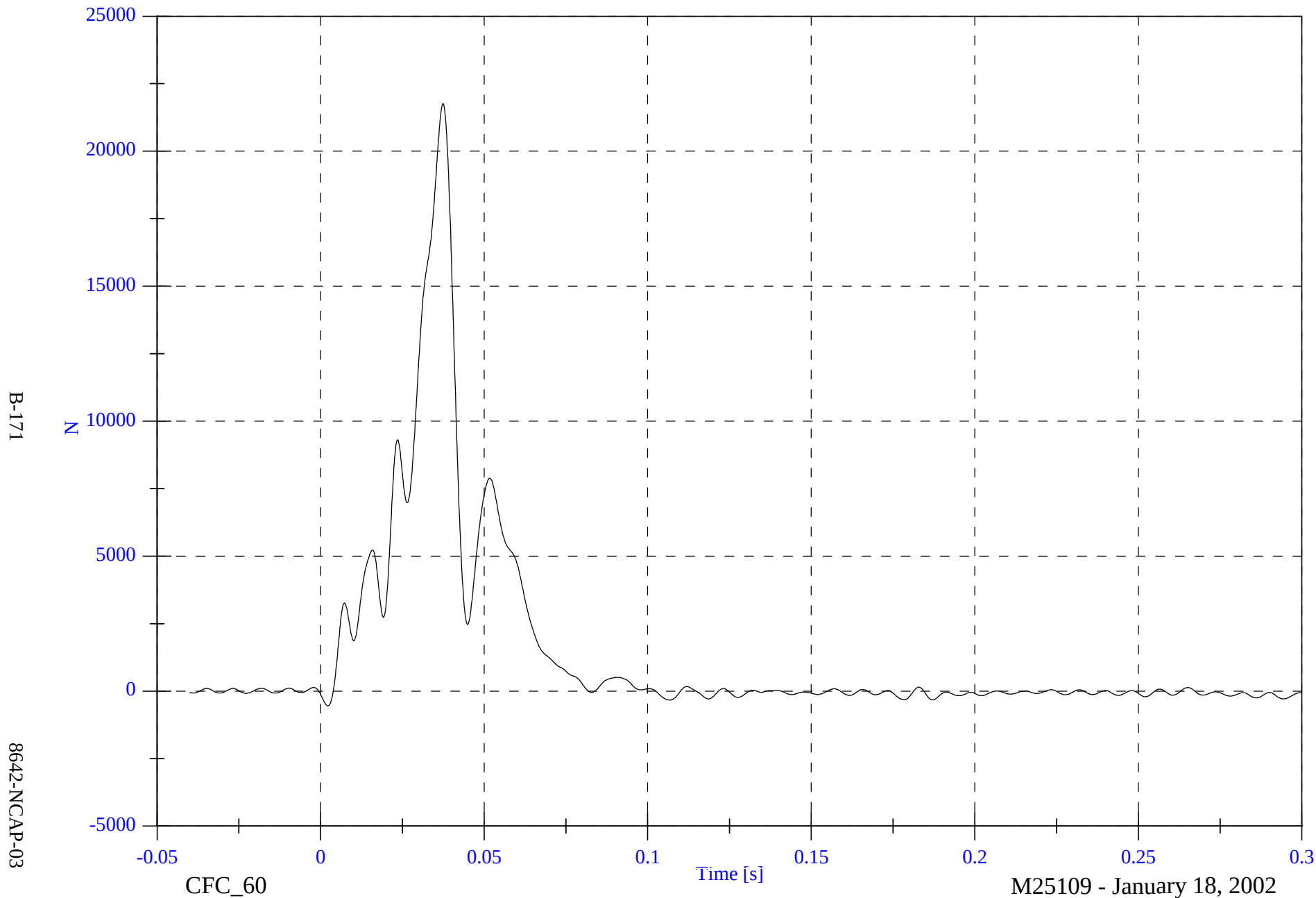


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D4 Fx

Max: 21762.2 [N] at 0.037 [s]

Min: -547.3 [N] at 0.002 [s]

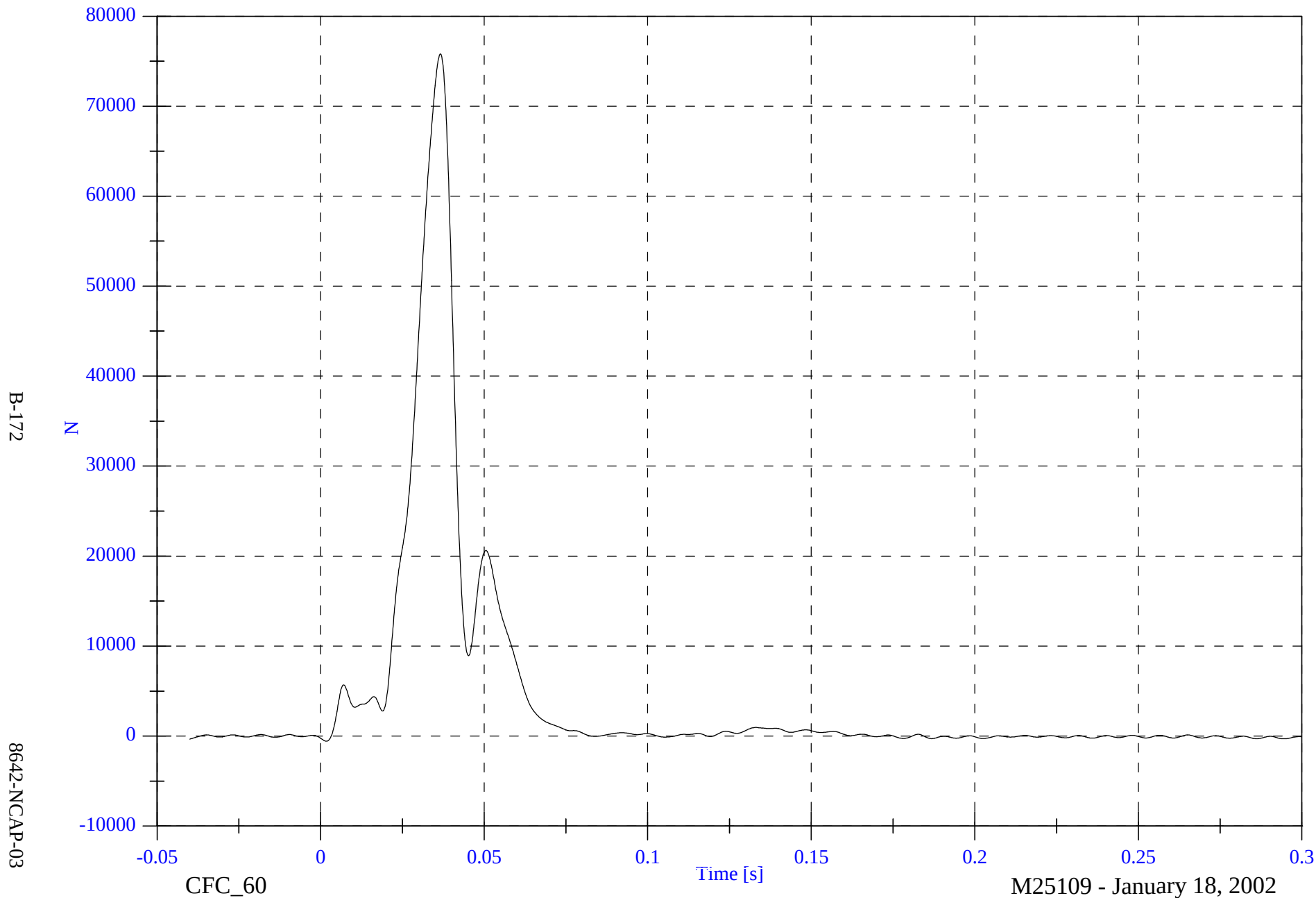


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D5 Fx

Max: 75813.9 [N] at 0.037 [s]

Min: -568.0 [N] at 0.002 [s]

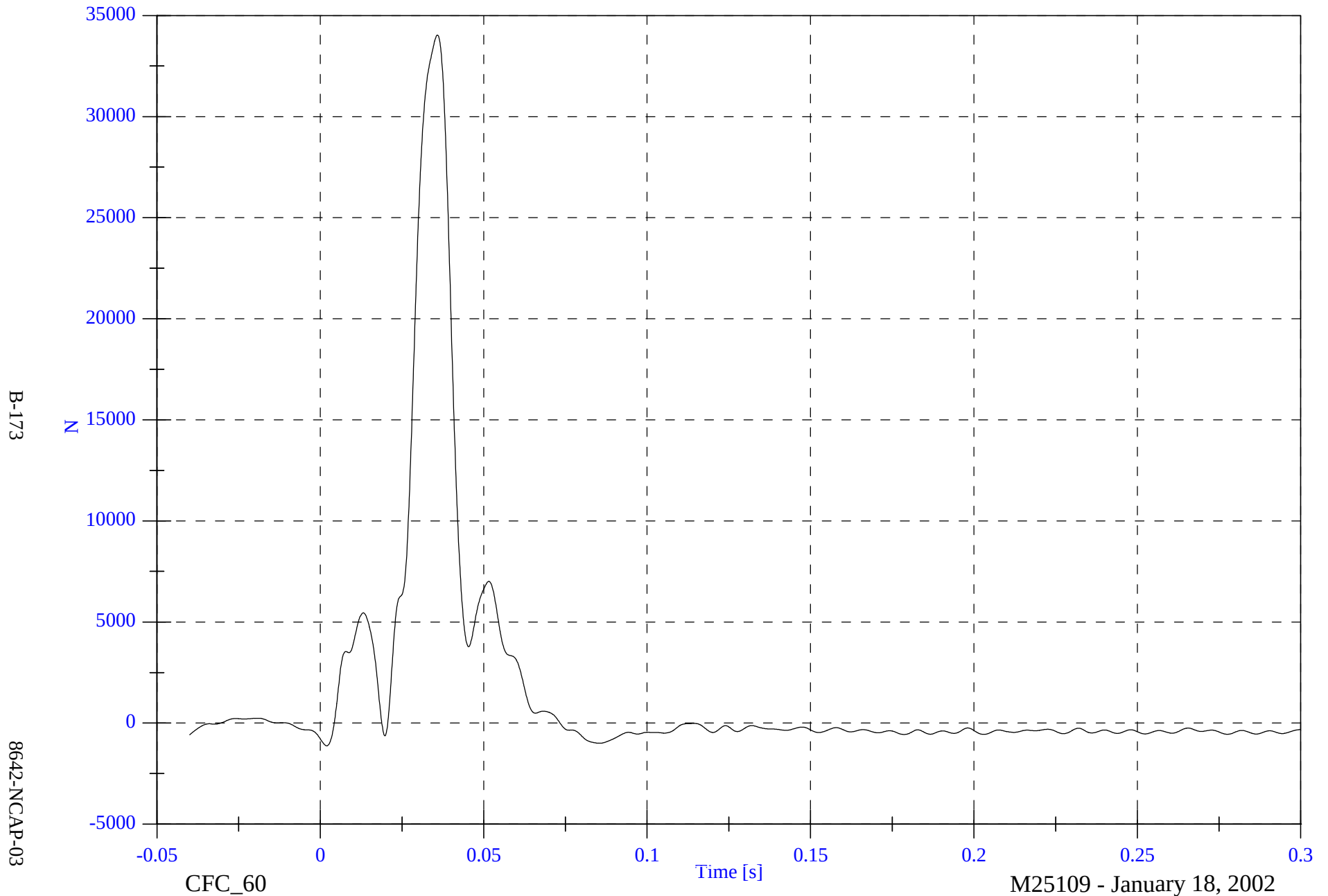


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D6 Fx

Max: 34031.2 [N] at 0.036 [s]

Min: -1123.4 [N] at 0.002 [s]

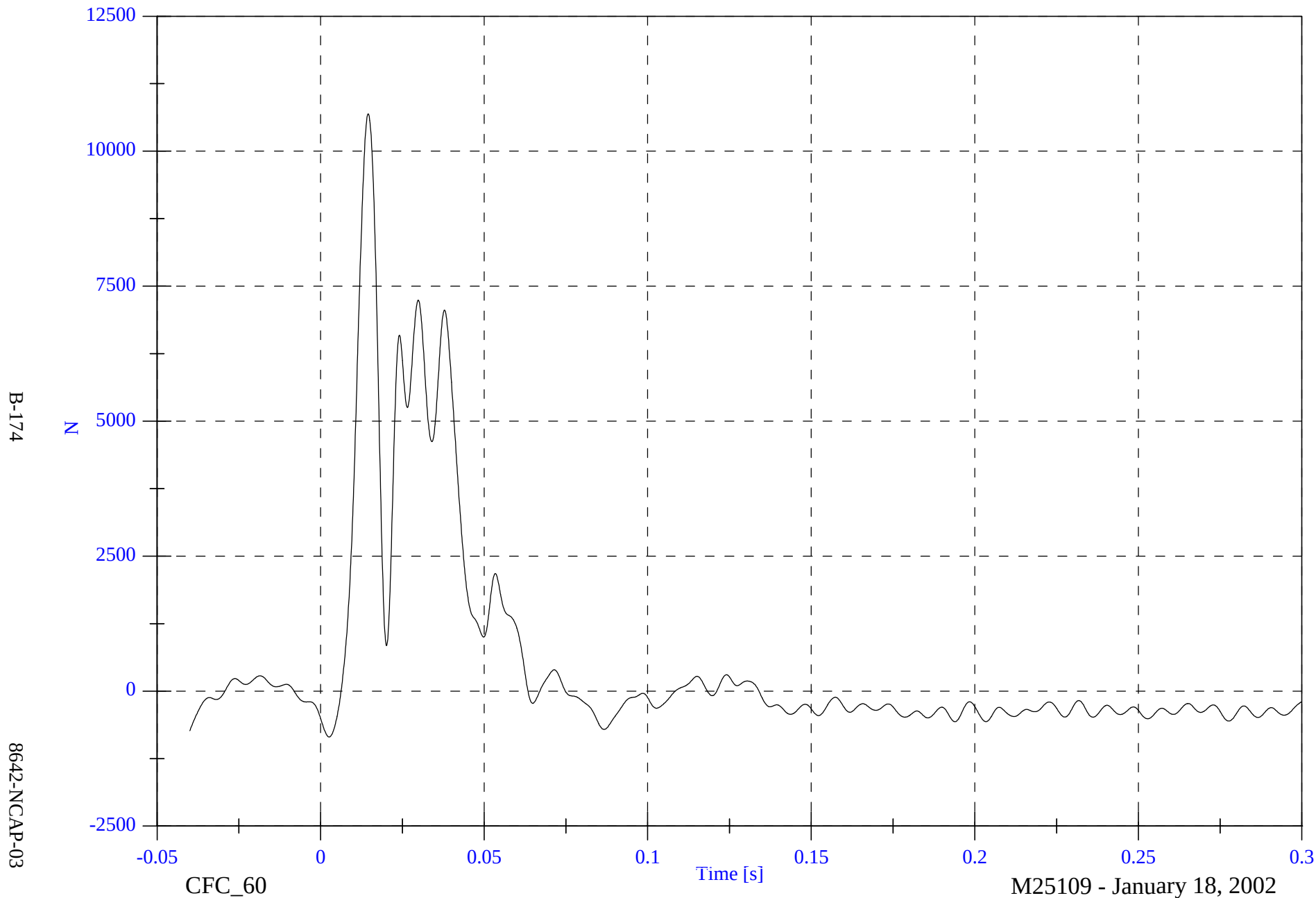


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D7 Fx

Max: 10691.5 [N] at 0.014 [s]

Min: -850.5 [N] at 0.003 [s]

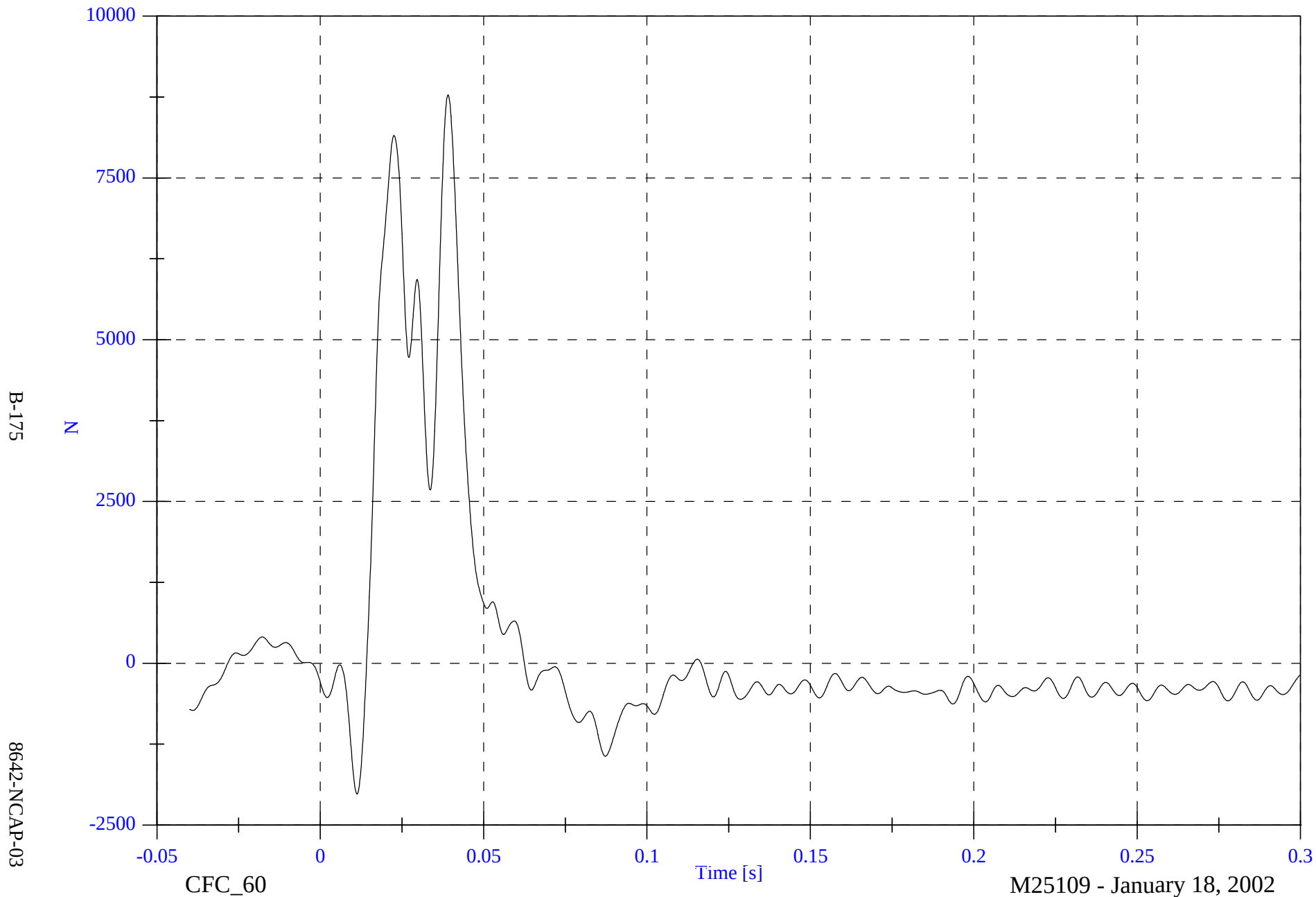


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D8 Fx

Max: 8785.2 [N] at 0.039 [s]

Min: -2020.0 [N] at 0.011 [s]

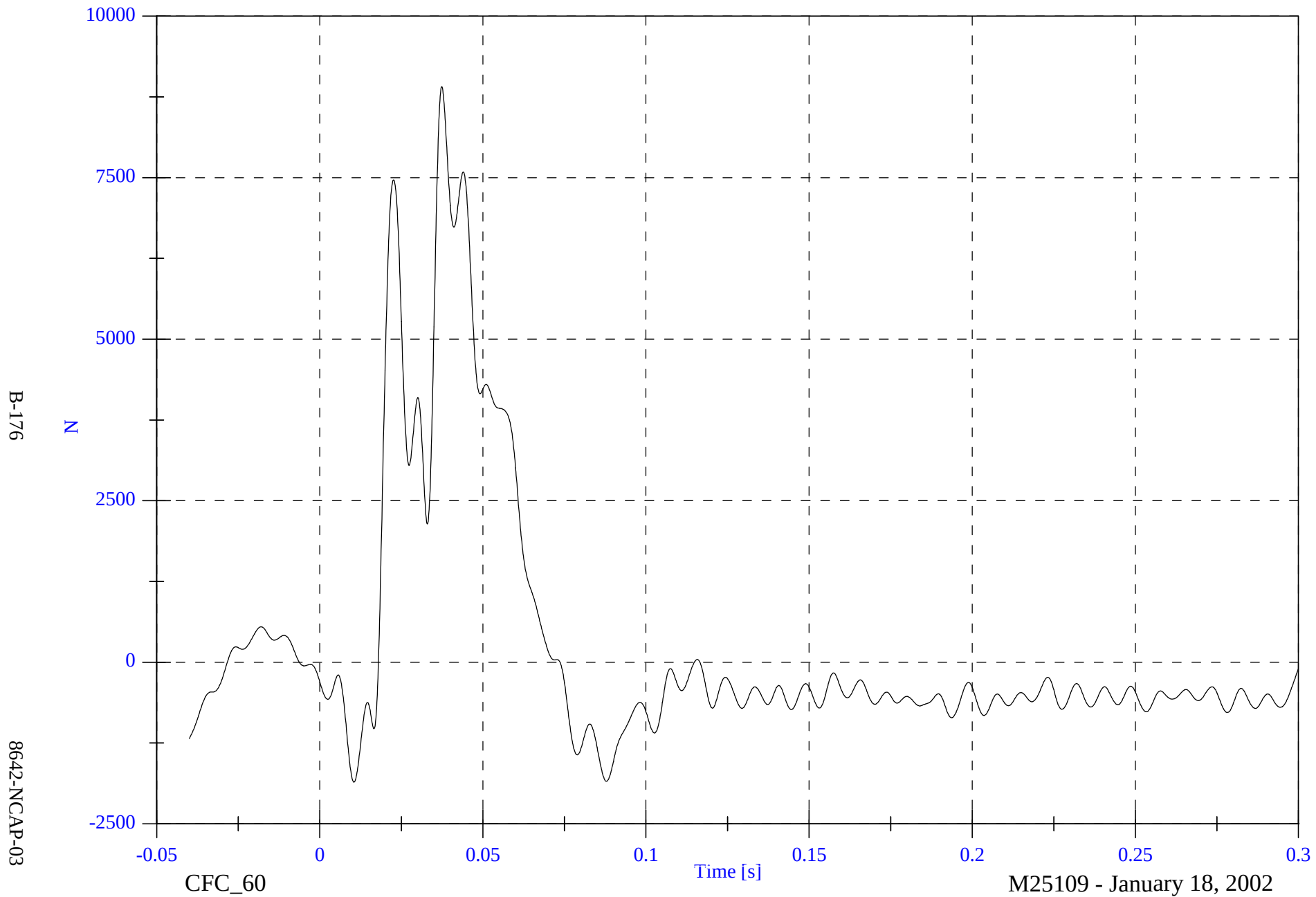


2002 NCAP Test 3-2002 Toyota Sequoia

Barrier Load Cell D9 Fx

Max: 8910.0 [N] at 0.037 [s]

Min: -1854.3 [N] at 0.010 [s]

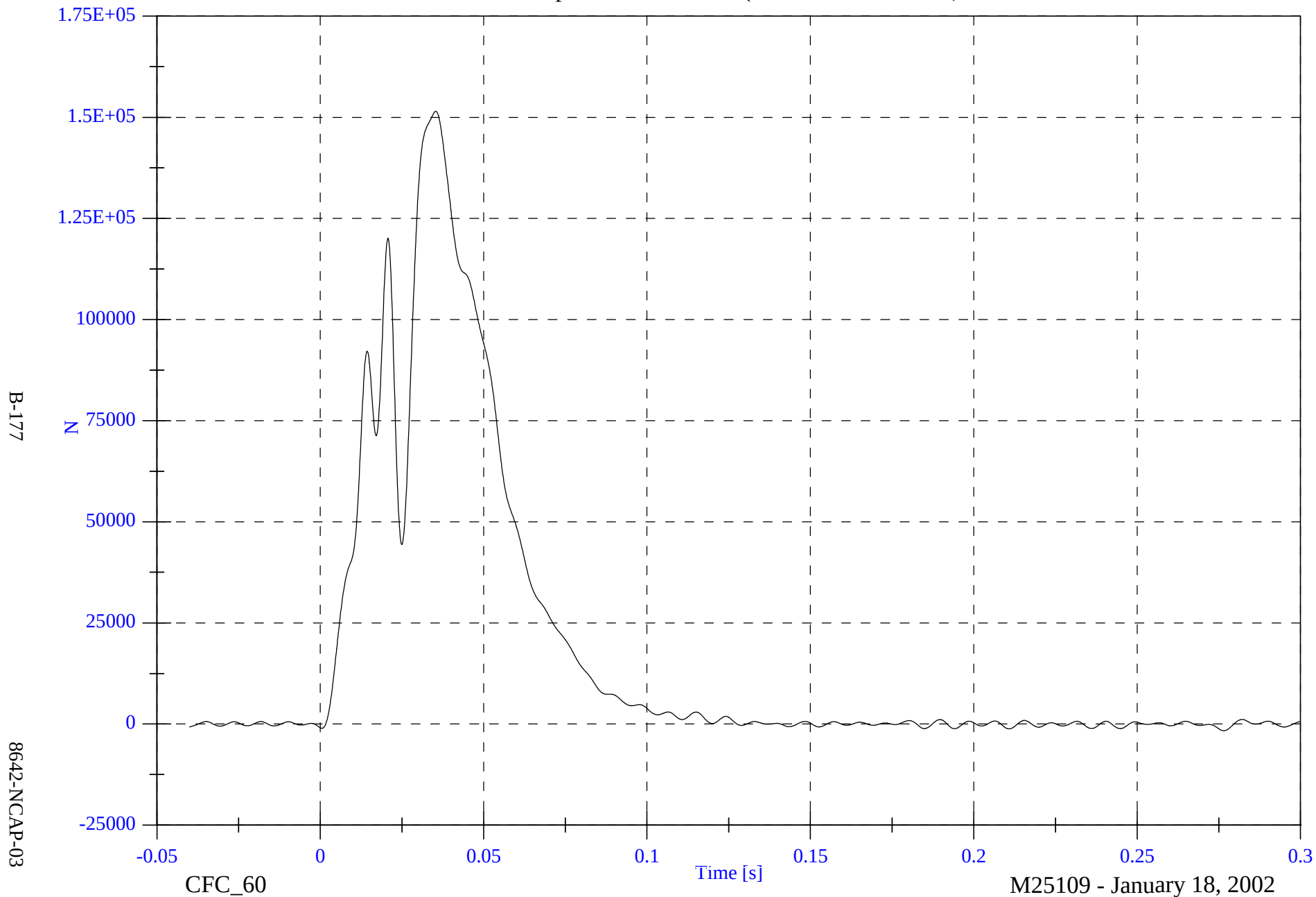


2002 NCAP Test 3-2002 Toyota Sequoia

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

Max: 151481.0 [N] at 0.035 [s]

Min: -1651.8 [N] at 0.276 [s]

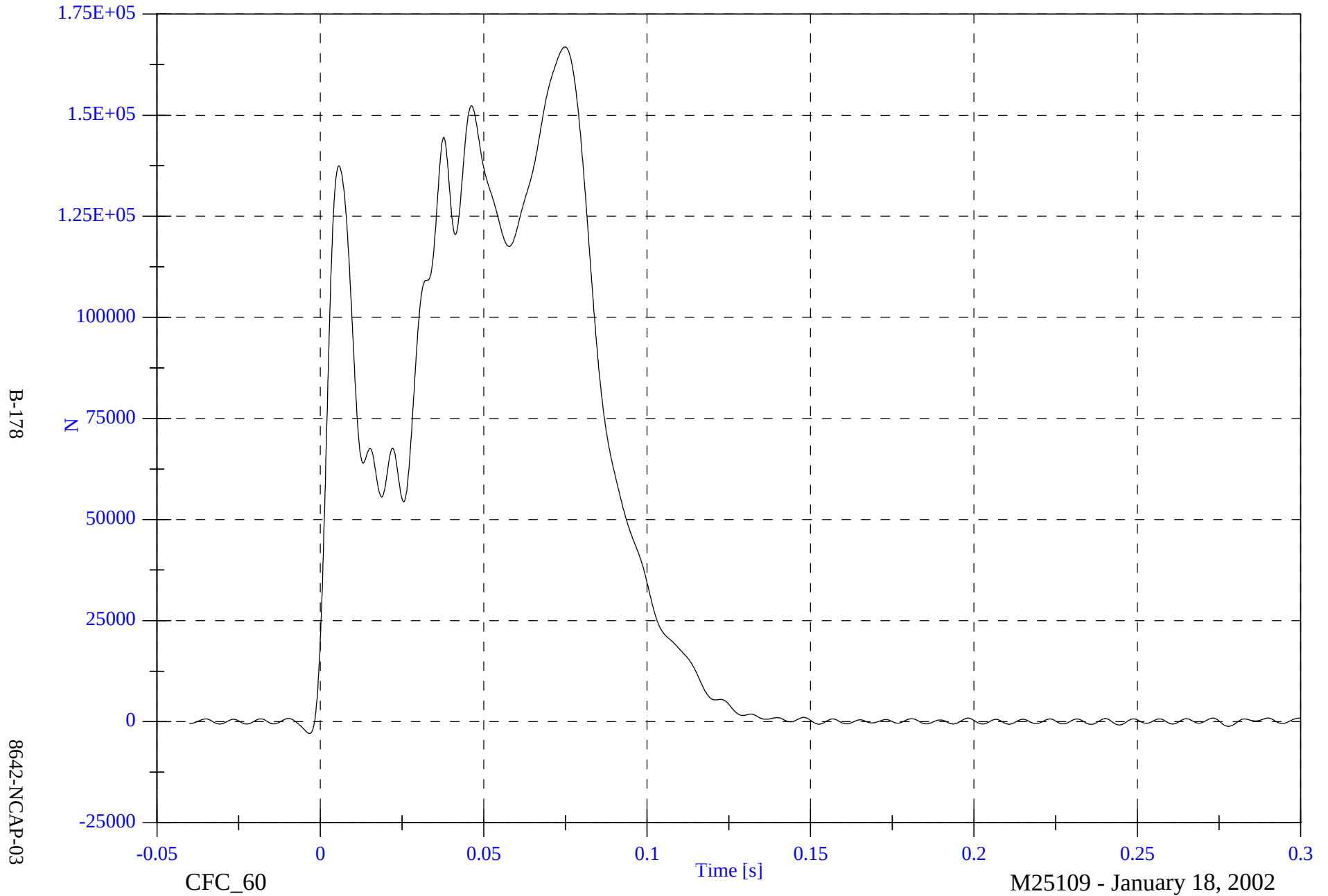


2002 NCAP Test 3-2002 Toyota Sequoia

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

Max: 166886.5 [N] at 0.075 [s]

Min: -2920.5 [N] at -0.003 [s]

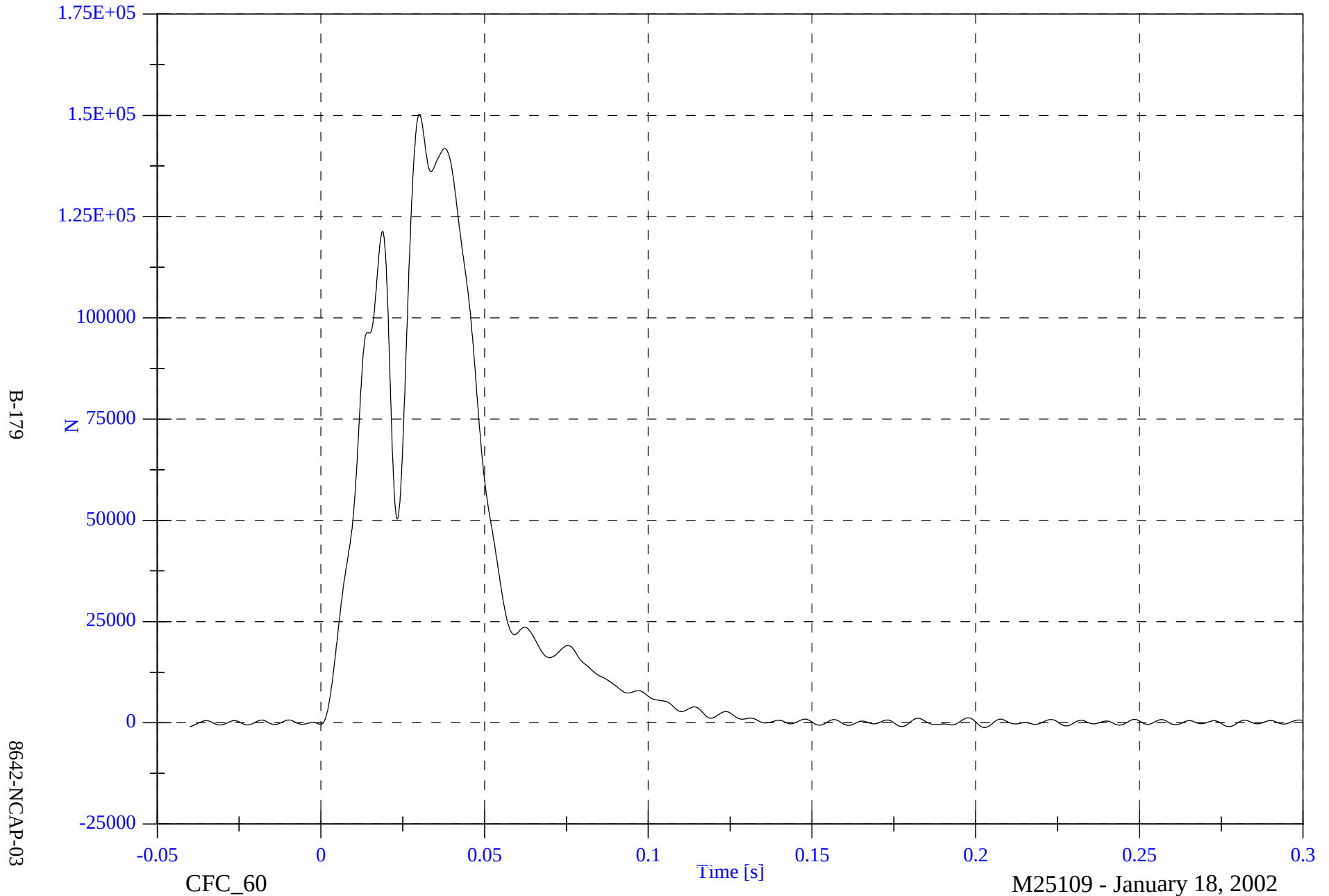


2002 NCAP Test 3-2002 Toyota Sequoia

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

Max: 150309.4 [N] at 0.030 [s]

Min: -1166.0 [N] at 0.203 [s]

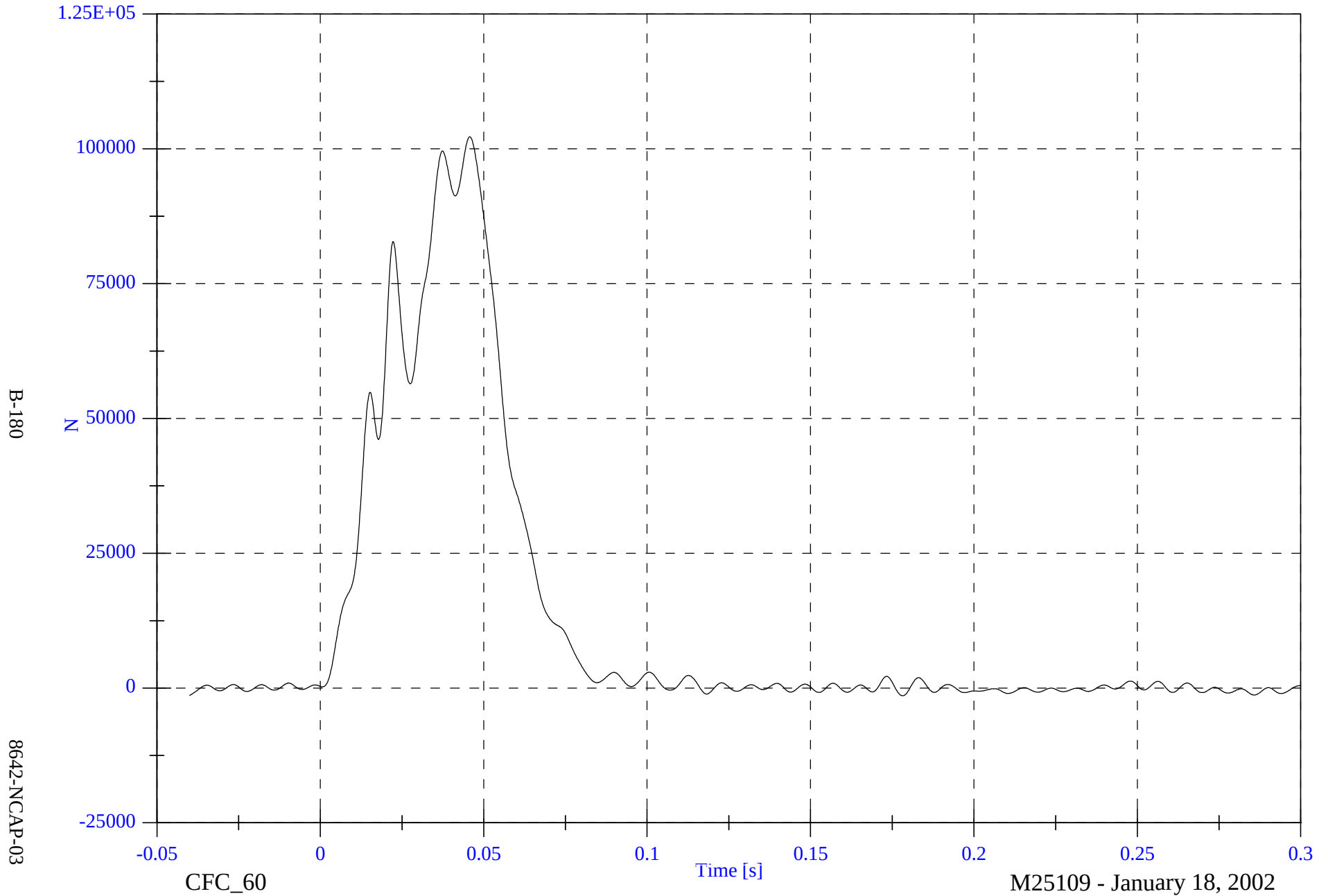


2002 NCAP Test 3-2002 Toyota Sequoia

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

Max: 102252.1 [N] at 0.046 [s]

Min: -1440.1 [N] at 0.178 [s]

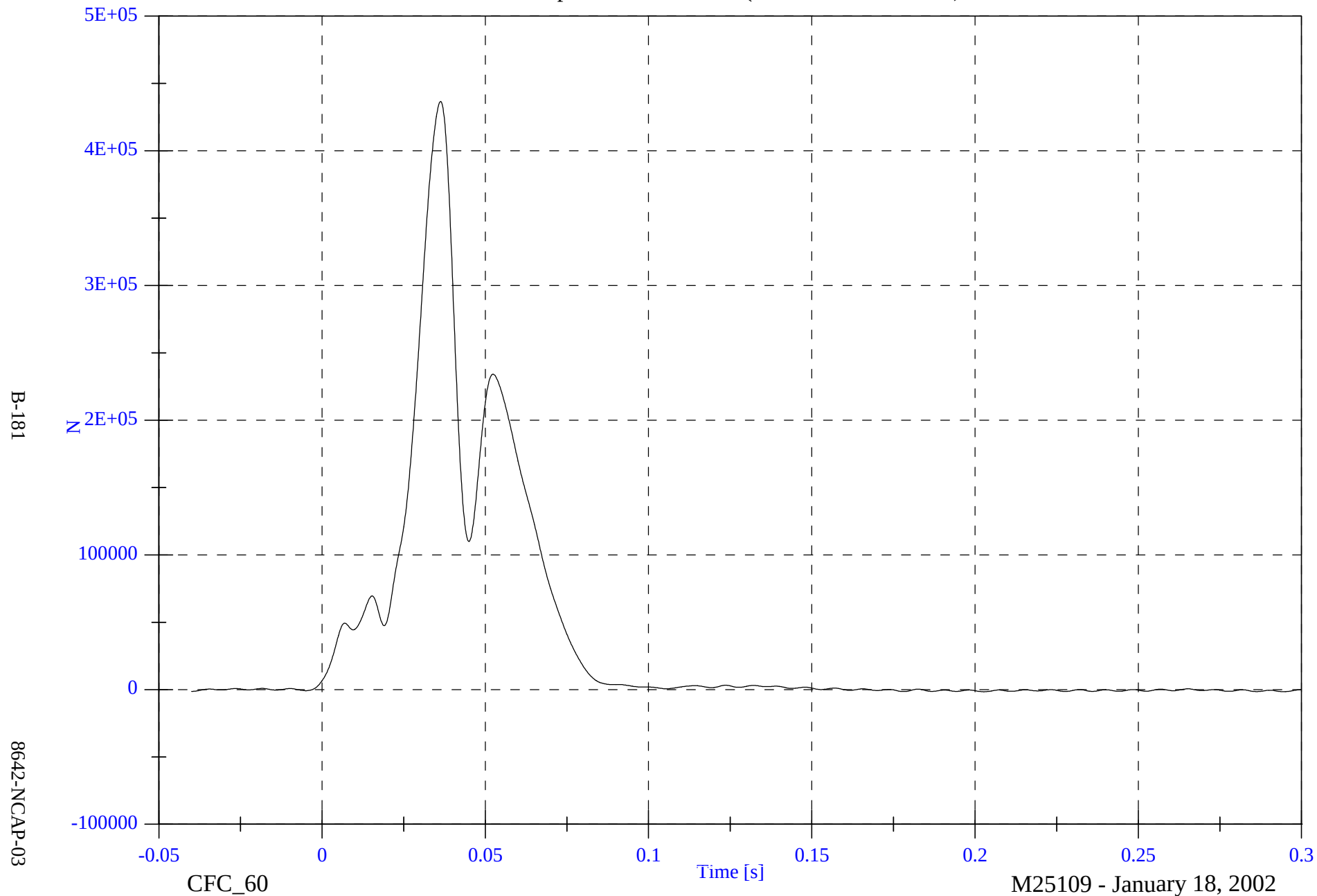


2002 NCAP Test 3-2002 Toyota Sequoia

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

Max: 436707.3 [N] at 0.036 [s]

Min: -1632.1 [N] at 0.203 [s]

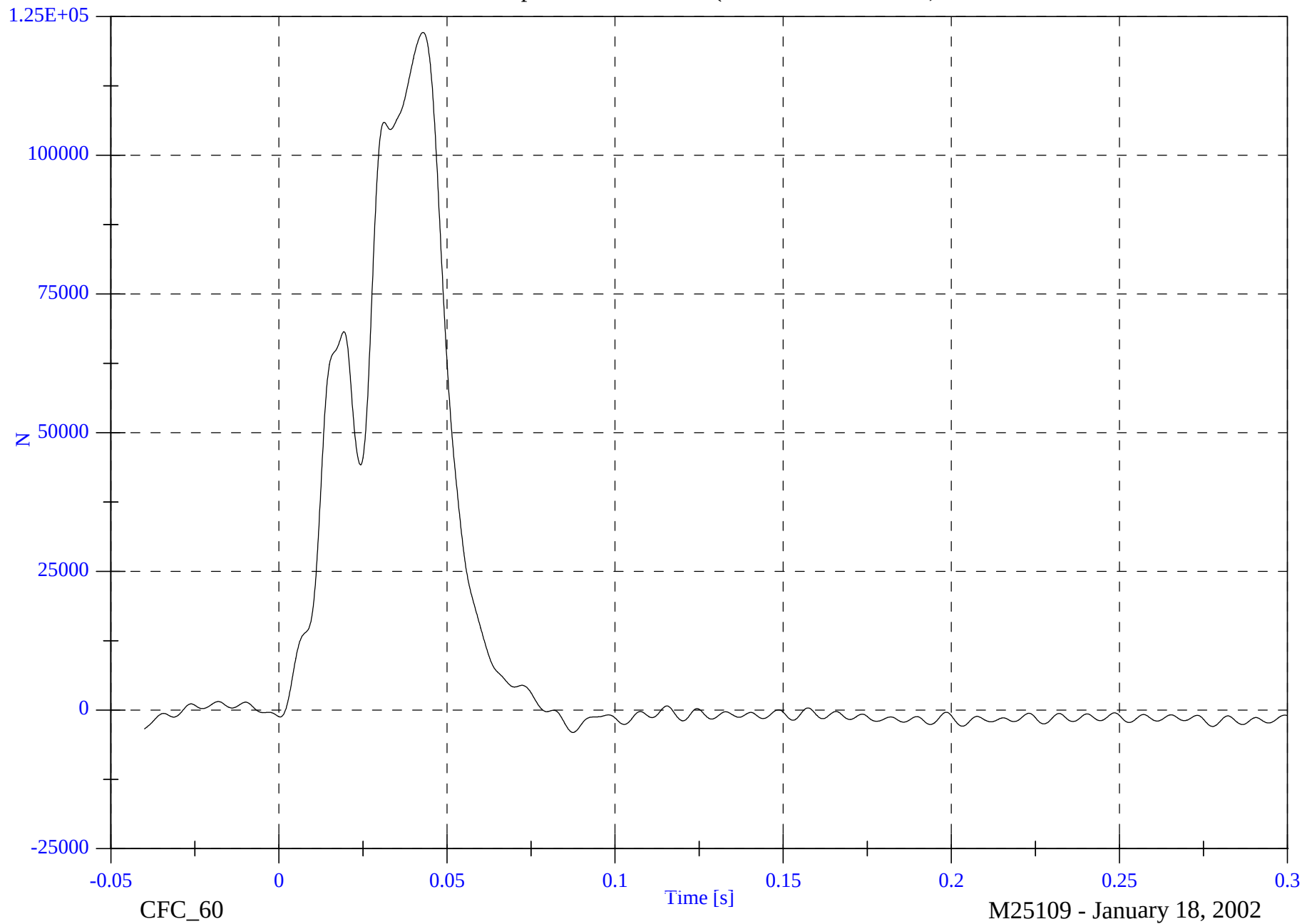


2002 NCAP Test 3-2002 Toyota Sequoia

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

Max: 122151.8 [N] at 0.043 [s]

Min: -4044.8 [N] at 0.087 [s]



B-182

8642-NCAP-03

CFC_60

Time [s]

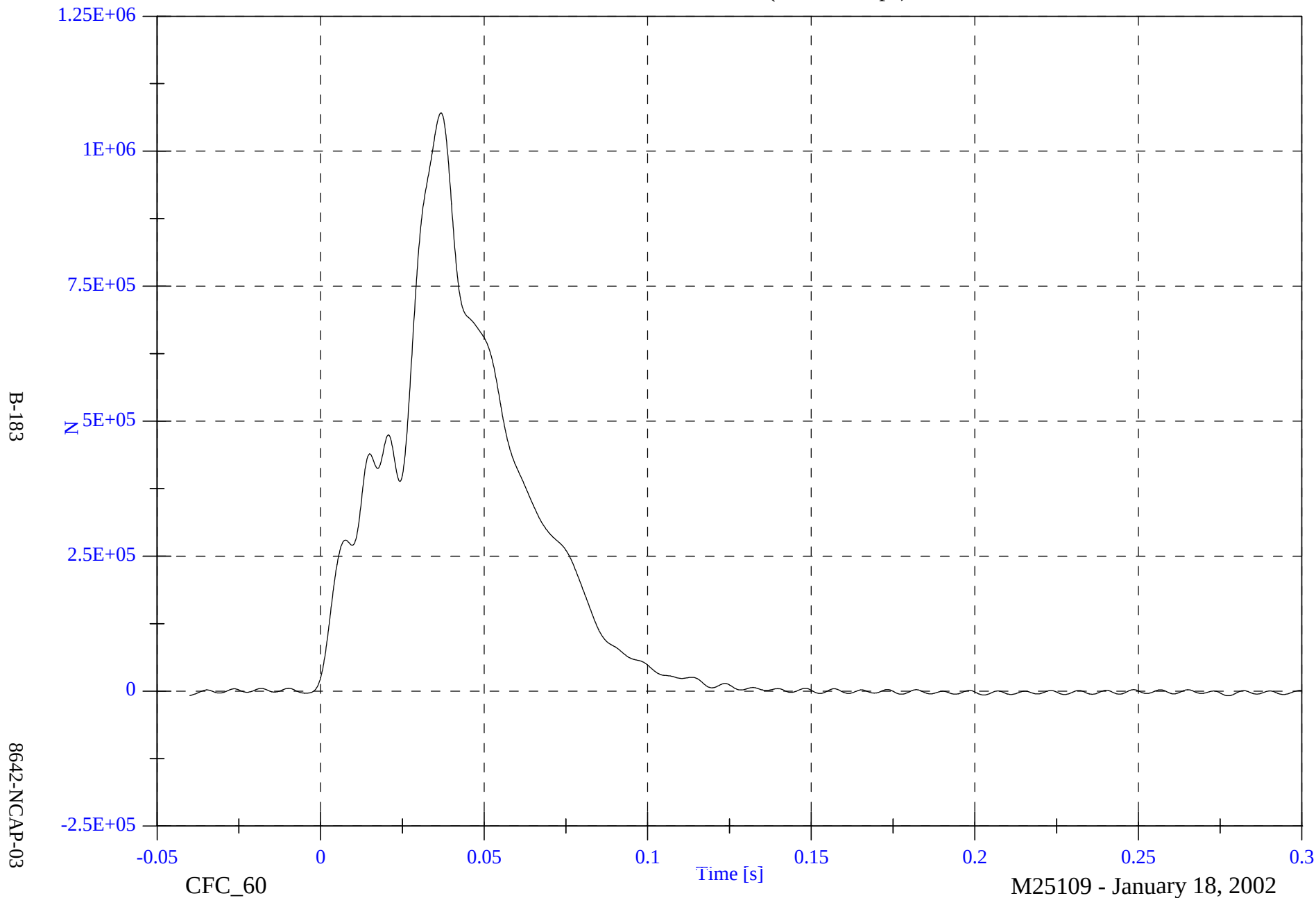
M25109 - January 18, 2002

2002 NCAP Test 3-2002 Toyota Sequoia

Total Load Cell Sum (All 6 Groups)

Max: 1070870.6 [N] at 0.037 [s]

Min: -8682.5 [N] at 0.277 [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:

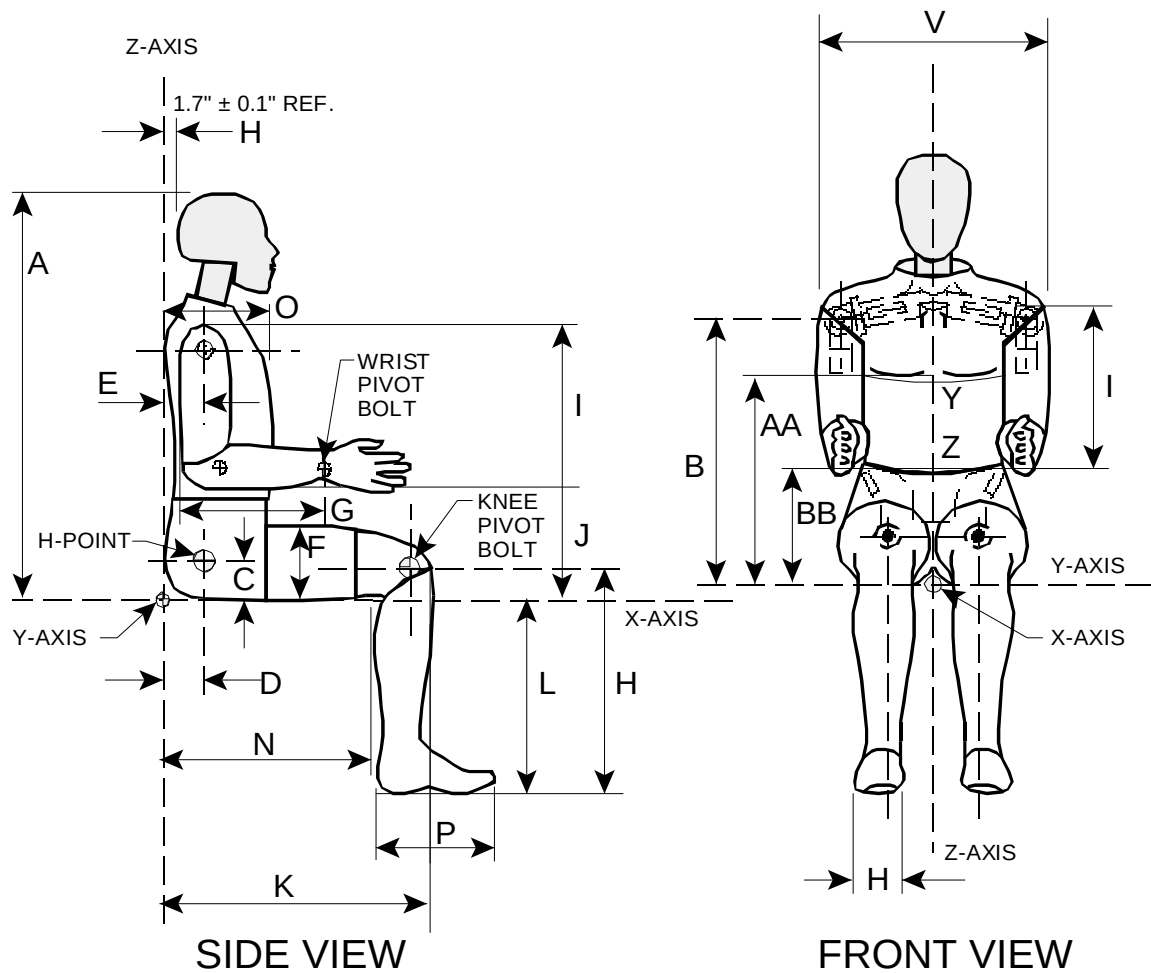
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	10/24/01
#2/Right Front Passenger	064	10/24/01

Electronic Test Equipment

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

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude.
(REF: S572.31(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 2
Date October 18, 2001
Workfile 016201.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	31
Peak Resultant Acceleration	225-275 G's	229.30
Peak Lateral Acceleration	15 G's Max	8.79
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	2	
Date	October 22, 2001	6 Axis Neck Transducer
Workfile	061201.nfl	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	29
Impact Velocity		22.60 - 23.40 Ft/s	23.12
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.14
	20 ms	17.60 - 22.60 G's	20.25
	30 ms	12.50 - 18.50 G's	17.08
Max Pendulum G's Above 30 ms		29 G's Max	17.08
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.88
D Plane Rotation	Max	64 - 78 Deg	70.27
	Time	57 - 64 ms	59.88
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	79.52
	Time	47 - 58 ms	52.38
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.88
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.12

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	2	
Date	October 22, 2001	6 Axis Neck Transducer
Workfile	061201.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	29
Impact Velocity		19.50 - 20.30 Ft/s	19.85
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.14
	20 ms	14.00 - 19.00 G's	17.32
	30 ms	11.00 - 16.00 G's	14.26
Max Pendulum G's Above 30 ms		22 G's Max	14.26
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	43.12
D Plane Rotation	Max	81 - 106 Deg	94.32
	Time	72 - 82 ms	75.62
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-46.45
	Time	65 - 79 ms	71.25
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	153.50
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	135.12

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 2
Date October 24, 2001
Workfile 061201.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	32.0
Pendulum Velocity	21.6 - 22.4 Ft/s	22.2
Maximum Deflection	2.50 - 2.86 in	2.70
Maximum Resistive Force	1160 - 1325 Lbs	1162.38
Internal Hysteresis	69 - 85 %	79.62

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 2
Date October 24, 2001
Workfile 061201.lf/061201.rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1192.79
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1123.70

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 2
Date October 24, 2001

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			31
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.5
Chest Depth	O	8.4 - 9.0 in	8.4
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.9
Thigh Clearance	F	5.5 - 6.1 in	6.1
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.5
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.1
Elbow Rest Height	J	7.5 - 8.3 in	7.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.4
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 064
Sequential Test Number 2
Date October 18, 2001
Workfile 064201.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	31.0
Peak Resultant Acceleration	225-275 G's	252.15
Peak Lateral Acceleration	15 G's Max	10.67
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	2	
Date	October 23, 2001	6 Axis Neck Transducer
Workfile	064201.nfl	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.0
Relative Humidity		10% - 70%	32.0
Impact Velocity		22.60 - 23.40 Ft/s	23.12
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.81
	20 ms	17.60 - 22.60 G's	21.05
	30 ms	12.50 - 18.50 G's	16.86
Max Pendulum G's Above 30 ms		29 G's Max	16.86
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	39.75
D Plane Rotation	Max	64 - 78 Deg	71.90
	Time	57 - 64 ms	59.12
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	77.55
	Time	47 - 58 ms	52.12
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.62
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	101.00

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	2	
Date	October 23, 2001	6 Axis Neck Transducer
Workfile	064201.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.0
Relative Humidity		10% - 70%	33.0
Impact Velocity		19.50 - 20.30 Ft/s	19.66
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.64
	20 ms	14.00 - 19.00 G's	17.07
	30 ms	11.00 - 16.00 G's	14.31
Max Pendulum G's Above 30 ms		22 G's Max	14.31
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	42.88
D Plane Rotation	Max	81 - 106 Deg	96.10
	Time	72 - 82 ms	75.38
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-45.20
	Time	65 - 79 ms	72.75
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	155.62
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	135.25

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 2
Date October 24, 2001
Workfile 064201.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	32.0
Pendulum Velocity	21.6 - 22.4 Ft/s	22.2
Maximum Deflection	2.50 - 2.86 in	2.68
Maximum Resistive Force	1160 - 1325 Lbs	1175.14
Internal Hysteresis	69 - 85 %	74.19

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 2
Date October 24, 2001
Workfile 064201.lf/064201.rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1200.36
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1118.79

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 2
Date October 24, 2001

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			31
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.6
Chest Depth	O	8.4 - 9.0 in	8.6
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.3
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.4
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.3
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician:

B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array X Arm Y		ENDEVCO	AC-P18558	28-Aug-01	28-Feb-02
Head 9 Array X Arm Z		ENDEVCO	AC-P19212	28-Aug-01	28-Feb-02
Head 9 Array Y Arm X		ENDEVCO	AC-P19197	28-Aug-01	28-Feb-02
Head 9 Array Y Arm Z		ENDEVCO	AC-P18738	29-Aug-01	28-Feb-02
Head 9 Array Z Arm X		ENDEVCO	AC-P19217	28-Aug-01	28-Feb-02
Head 9 Array Z Arm Y		ENDEVCO	AC-P18739	29-Aug-01	28-Feb-02
Head	X	ENDEVCO	AC-P23276	01-Oct-01	01-Apr-02
	Y	ENDEVCO	AC-P22943	01-Oct-01	01-Apr-02
	Z	ENDEVCO	AC-P23134	24-Sep-01	24-Mar-02
Head	X (R)	ENDEVCO	AC-P23288	01-Oct-01	01-Apr-02
	Y (R)	ENDEVCO	AC-P23471	01-Oct-01	01-Apr-02
	Z (R)	ENDEVCO	AC-P18948	01-Oct-01	01-Apr-02
Neck Load Cell	X	DENTON	LC-205Fx	27-Jul-01	27-Jan-02
	Y	DENTON	LC-205Fy	27-Jul-01	27-Jan-02
	Z	DENTON	LC-205Fz	27-Jul-01	27-Jan-02
Neck Moment	X	DENTON	LC-205Mx	27-Jul-01	27-Jan-02
	Y	DENTON	LC-205My	27-Jul-01	27-Jan-02
	Z	DENTON	LC-205Mz	27-Jul-01	27-Jan-02
Chest	X	ENDEVCO	AC-P21373	24-Sep-01	24-Mar-02
	Y	ENDEVCO	AC-P22639	01-Oct-01	01-Apr-02
	Z	ENDEVCO	AC-P21297	24-Sep-01	24-Mar-02
Chest	X (R)	ENDEVCO	AC-P21171	24-Sep-01	24-Mar-02
	Y (R)	ENDEVCO	AC-P23136	11-Oct-01	11-Apr-02
	Z (R)	ENDEVCO	AC-P23128	24-Sep-01	24-Mar-02
Chest Deflection Gauge		SERVO	DS-061	16-Oct-01	16-Apr-02
Pelvic	X	ENDEVCO	AC-P21441	24-Sep-01	24-Mar-02
	Y	ENDEVCO	AC-P19246	24-Sep-01	24-Mar-02
	Z	ENDEVCO	AC-P21516	24-Sep-01	24-Mar-02

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-659	24-Jul-01	24-Jan-02
Right Femur Load Cell		GSE	LC-723	24-Jul-01	24-Jan-02
Left Knee Shear		SpaceAge Control	DS-821	02-Feb-01	02-Aug-01
Right Knee Shear		SpaceAge Control	DS-817	02-Feb-01	02-Aug-01
Left Upper Tibia	Mx	DENTON	LC-016Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-016My	05-Sep-01	05-Mar-02
Left Lower Tibia	Fz	DENTON	LC-123Fz	05-Sep-01	05-Mar-02
	Mx	DENTON	LC-123Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-123My	05-Sep-01	05-Mar-02
Right Upper Tibia	Mx	DENTON	LC-023Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-023My	05-Sep-01	05-Mar-02
Right Lower Tibia	Fz	DENTON	LC-111Fz	05-Sep-01	05-Mar-02
	Mx	DENTON	LC-111Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-111My	05-Sep-01	05-Mar-02
Left Foot Rear	X	ENDEVCO	AC-P19343	27-Aug-01	27-Feb-02
	Z	ENDEVCO	AC-P16583	27-Aug-01	27-Feb-02
Left Foot Front	Z	ENDEVCO	AC-P18728	27-Aug-01	27-Feb-02
Right Foot Rear	X	ENDEVCO	AC-P18628	27-Aug-01	27-Feb-02
	Z	ENDEVCO	AC-P18741	27-Aug-01	27-Feb-02
Right Foot Front	Z	ENDEVCO	AC-P16587	27-Aug-01	27-Feb-02

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array X Arm Y		ENDEVCO	AC-P17531	29-Aug-01	28-Feb-02
Head 9 Array X Arm Z		ENDEVCO	AC-P14965	29-Aug-01	28-Feb-02
Head 9 Array Y Arm X		ENDEVCO	AC-P17563	29-Aug-01	28-Feb-02
Head 9 Array Y Arm Z		ENDEVCO	AC-P18551	29-Aug-01	28-Feb-02
Head 9 Array Z Arm X		ENDEVCO	AC-P17539	29-Aug-01	28-Feb-02
Head 9 Array Z Arm Y		ENDEVCO	AC-P18718	29-Aug-01	28-Feb-02
Head	X	ENDEVCO	AC-P23138	24-Sep-01	24-Mar-02
	Y	ENDEVCO	AC-P19111	24-Sep-01	24-Mar-02
	Z	ENDEVCO	AC-P21392	24-Sep-01	24-Mar-02
Head	X (R)	ENDEVCO	AC-P19253	24-Sep-01	24-Mar-02
	Y (R)	ENDEVCO	AC-P21135	24-Sep-01	24-Mar-02
	Z (R)	ENDEVCO	AC-P23161	24-Sep-01	24-Mar-02
Neck Load Cell	X	DENTON	LC-440Fx	27-Jul-01	27-Jan-02
	Y	DENTON	LC-440Fy	27-Jul-01	27-Jan-02
	Z	DENTON	LC-440Fz	27-Jul-01	27-Jan-02
Neck Moment	X	DENTON	LC-440Mx	27-Jul-01	27-Jan-02
	Y	DENTON	LC-440My	27-Jul-01	27-Jan-02
	Z	DENTON	LC-440Mz	27-Jul-01	27-Jan-02
Chest	X	ENDEVCO	AC-P23155	24-Sep-01	24-Mar-02
	Y	ENDEVCO	AC-P23358	01-Oct-01	01-Apr-02
	Z	ENDEVCO	AC-P23282	01-Oct-01	01-Apr-02
Chest	X (R)	ENDEVCO	AC-P21484	24-Sep-01	24-Mar-02
	Y (R)	ENDEVCO	AC-P23465	01-Oct-01	01-Apr-02
	Z (R)	ENDEVCO	AC-P21399	24-Sep-01	24-Mar-02
Chest Deflection Gauge		SERVO	DS-064	17-Oct-01	17-Apr-02
Pelvic	X	ENDEVCO	AC-P23174	24-Sep-01	24-Mar-02
	Y	ENDEVCO	AC-P23164	24-Sep-01	24-Mar-02
	Z	ENDEVCO	AC-P23137	24-Sep-01	24-Mar-02

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-954	24-Jul-01	24-Jan-02
Right Femur Load Cell		GSE	LC-955	24-Jul-01	24-Jan-02
Left Knee Shear		SpaceAge Control	DS-819	02-Feb-01	02-Aug-01
Right Knee Shear		SpaceAge Control	DS-815	02-Feb-01	02-Aug-01
Left Upper Tibia	Mx	DENTON	LC-045Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-045My	05-Sep-01	05-Mar-02
Left Lower Tibia	Fz	DENTON	LC-125Fz	05-Sep-01	05-Mar-02
	Mx	DENTON	LC-125Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-125My	05-Sep-01	05-Mar-02
Right Upper Tibia	Mx	DENTON	LC-038Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-038My	05-Sep-01	05-Mar-02
Right Lower Tibia	Fz	DENTON	LC-124Fz	05-Sep-01	05-Mar-02
	Mx	DENTON	LC-124Mx	05-Sep-01	05-Mar-02
	My	DENTON	LC-124My	05-Sep-01	05-Mar-02
Left Foot Rear	X	ENDEVCO	AC-J30491	28-Aug-01	28-Feb-02
	Z	ENDEVCO	AC-J31026	28-Aug-01	28-Feb-02
Left Foot Front	Z	ENDEVCO	AC-J32831	28-Aug-01	28-Feb-02
Right Foot Rear	X	ENDEVCO	AC-J33376	28-Aug-01	28-Feb-02
	Z	ENDEVCO	AC-J32832	28-Aug-01	28-Feb-02
Right Foot Front	Z	ENDEVCO	AC-J31095	28-Aug-01	28-Feb-02

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember	ICS	Y05	30-Oct-01	30-May-02
Right Rear Seat Crossmember	ICS	D30	30-Oct-01	30-May-02
Top of Engine	ENDEVCO	AA35	1-Oct-01	1-May-02
Bottom of Engine	ENDEVCO	B11407	29-Aug-01	28-Feb-02
Right Disc Brake Caliper	ENDEVCO	B10827	29-Aug-01	28-Feb-02
Instrument Panel	ENDEVCO	A13513	29-Aug-01	28-Feb-02
Left Disc Brake Caliper	ENDEVCO	B11408	29-Aug-01	28-Feb-02
Left Seat Rear Crossmember Z	ENDEVCO	B10481	25-Sep-01	25-Mar-02
Right Seat Rear Crossmember Z	ENDEVCO	A14433	25-Sep-01	25-Mar-02