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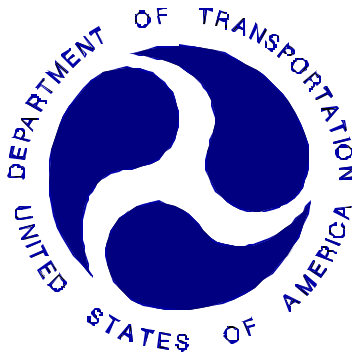
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

TOYOTA MOTOR CORP.
2002 TOYOTA CAMRY
4-DOOR SEDAN

NHTSA NUMBER: M25104

VERIDIAN TEST NUMBER: 8642-NCAP-13

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



May 10, 2002

FINAL REPORT

PREPARED FOR:

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Safety Performance Standards
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16. Abstract A frontal load cell barrier test of a 2002 Toyota Camry 4-Door Sedan was performed at Veridian Engineering crash test facility in Buffalo, New York, on May 10, 2002. The impact velocity was 56.65 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 565 mm. The test vehicle was equipped with 3-point restraint systems with torso belt pretensioners and load limiters, knee bolsters, adjustable head restraints 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)	339.9	41.8	30.7	422.7	981.1
Passenger (064)	445.6	45.3	30.2	1211.5	1272.8
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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.65 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-32005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.65 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

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

One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

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

Both ATDs were fully instrumented with nine accelerometer array head, chest and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No.064) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 198 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 Camry 4-Door Sedan at a velocity of 56.65 kph. The test was performed at Veridian Engineering on May 10, 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/50 mm)
Driver ATD	339.9	41.8	30.7	422.7	981.1	-	-
Passenger ATD	445.6	45.3	30.2	1211.5	1272.8	-	-

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 565 mm and both the driver and passenger side doors remained closed during the impact event and were operable without the use of tools after the impact.

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

The 2002 Toyota Camry 4-Door Sedan did not exceed the requirements of FMVSS 208, FMVSS 212, FMVSS 219, and FMVSS 301. Data pertaining to these standards are presented in the data sheets.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No.: M25104 Test Mode: 56.3 kph Frontal Barrier
Test Date: May 10, 2002 Time: 11:51 Temperature: 21 °C
Vehicle Make/Model/Body Style: 2002 Toyota Camry 4-Door Sedan

Vehicle Test Weight: 1633.0 kg

Vehicle/Barrier Impact Angle: 0 °

Impact Velocity: 56.65 kph

Maximum Static Crush: 565 mm

Vehicle Rebound: 566 mm

DUMMIES:

DRIVER

PASSENGER

Type:

572E

572E

Restraint System:

Seatbelt with torso belt
pretensioner and load limiter,
airbag, knee bolster and
adjustable head restraint

Seatbelt with torso belt
pretensioner and load limiter,
airbag, knee bolster and
adjustable head restraint

Number of Data Channels: 198

Number of Cameras: 1 Real Time

16 High Speed

DOOR OPENING DATA:

Closed, latched and operable without tools - Left Front

Closed, latched and operable without tools - Right Front

Front Seat(s) Data:

DRIVER

PASSENGER

Seat Track Failure: (mm of shift)

0

0

Seat Back Failure:

None

None

VISIBLE DUMMY CONTACT POINTS:

DRIVER

PASSENGER

Head:

The face to the bottom center of
the airbag, the back of the head
to the center of the headrest.

The face to the top center of the
airbag, the back of the head to
the right of center of the
headrest.

Abdomen:

None

None

Chest:

Airbag

Airbag

Knees:

Knee bolster

Knee bolster

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2002 Toyota Camry 4-Door Sedan

NHTSA No. : M25104 ; VIN: JTDBE32KX20058825 ; Color: White

Engine Data: 4 cylinders; - CID; 2.4 Liters; - cc

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

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

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

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

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

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

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

Date Received: April 24, 2002 ; Odometer Reading 64 km

Selling Dealer: West Herr Toyota

& Address: S-4141 Southwestern Boulevard Orchard Park, NY 14217

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Toyota Motor Corp.

Date of Manufacture 12/01

GVWR: 1855 kg; GAWR: 1210 kg FRONT; 1210 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 300 kpa FRONT

300 kpa REAR

Recommended Tire Size: P205/65R15

* Recommended Cold Tire Pressure: 210 kpa FRONT; 210 kpa REAR

Size of Tires on Test Vehicle: P205/65R15 ; Manufacturer: Bridgestone

Vehicle Capacity Data:

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

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

Vehicle Capacity Weight (VCW) = 410 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 69.8 kg

*Tire pressure used for test

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

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

Right Front	=	<u>423.0</u>	kg	Right Rear	=	<u>284.0</u>	kg
Left Front	=	<u>406.5</u>	kg	Left Rear	=	<u>304.5</u>	kg
TOTAL FRONT	=	<u>829.5</u>	kg	TOTAL REAR	=	<u>588.5</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1418.0</u>	kg				
% of Total Front of Vehicle Weight	=	<u>58.5%</u>		% of Total Rear Weight	=	<u>41.5%</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	<u>1418.0</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>69.8</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152</u>	kg
TARGET TEST WEIGHT	=	<u>1639.8</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 63.0 KG OF CARGO WEIGHT:

Right Front	=	<u>458.5</u>	kg	Right Rear	=	<u>348.0</u>	kg
Left Front	=	<u>451.5</u>	kg	Left Rear	=	<u>375.0</u>	kg
TOTAL FRONT	=	<u>910.0</u>	kg	TOTAL REAR	=	<u>723.0</u>	kg
TOTAL TEST WEIGHT	=	<u>1633.0</u>	kg				
% of Total Front Weight	=	<u>55.7%</u>	%	% of Total Rear Weight	=	<u>44.3%</u>	%
Weight of Ballast Secured in Vehicle Trunk Area	=	<u>01</u>	kg				
Vehicle Components Removed for Weight Reduction:				Muffler, tail lamps, trunk lid, rear side windows, side mirrors, rear headrest, and 8 liters of stoddard			

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>716</u>	LF	<u>715</u>	RR	<u>707</u>	LR	<u>708</u>
FULLY LOADED:	RF	<u>703</u>	LF	<u>703</u>	RR	<u>675</u>	LR	<u>678</u>
AS TESTED:	RF	<u>707</u>	LF	<u>707</u>	RR	<u>677</u>	LR	<u>679</u>
Vehicle's Wheel Base:		<u>2716</u>	mm					
Location of Vehicle's C.G.:		<u>1202</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual	=	<u>70</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>70</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>64.4</u>	to <u>65.8</u> liters
ACTUAL TEST VOLUME	=	<u>56.78*</u>	liters (with entire fuel system filled)
Test Fluid Type:	<u>Stoddard Solution</u>	Spec. Grav. =	<u>0.764</u>
Kinematic Viscosity	=	<u>0.96</u>	centistokes; Color = <u>Orange</u>
Type of Fuel Pump: Electric-	<u>X</u>	Mechanical-	<u>-</u>
Does Electric Pump operate with ignition switch "ON" & engine "OFF"		Yes- <u>X</u>	No- <u>-</u>
Details of Fuel System:	<u>Tank – centered ahead of rear axle; filler neck is located on the left side aft of the rear axle; fuel lines – run along inside of left frame stiffener.</u>		

* 8 liters of Stoddard solvent were removed to achieve vehicle test weight.

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: May 10, 2002 Time: 11:51 Temperature: 21 °C
Vehicle NHTSA No.: M25104
Required Impact Velocity Range: 55.5 to 57.1 kph

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

Trap No. 1 = 56.65 kph; Trap No. 2 = 56.65 kph
Distance from vehicle to barrier: (1) entering trap = 813 mm
(2) exiting trap = 305 mm

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

Vehicle Length:

Pre-Test	Left = <u>4730</u> ; C/L = <u>4800</u> ; Right = <u>4732</u>
Post-Test	Left = <u>4291</u> ; C/L = <u>4235</u> ; Right = <u>4259</u>
Crush	Left = <u>439</u> ; C/L = <u>565</u> ; Right = <u>473</u>
AVERAGE	= <u>492.33</u> mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

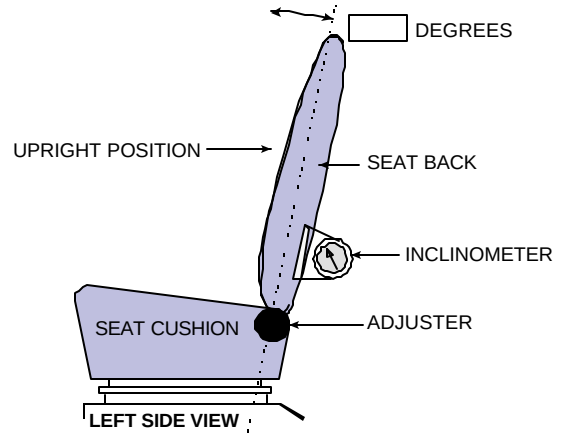
	Left = <u>523</u> ; C/L = <u>582</u> ; Right = <u>593</u>
AVERAGE	= <u>566</u> mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2002 Vehicle Model: Toyota Camry Body Style : 4-Door Sedan

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



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 87

Measurement instructions: Recline 3 notches rearward from most upright

Seat back angle for passenger's seat: 87

Measurement instructions: Recline 4 notches rearward from most upright

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Place in neutral position (detent 9 of 17 total, 120 mm from most forward and rearmost detent)

Positioning of the passenger's seat: Same as the driver's seat.

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 70 liters

B. "Usable Capacity" of the optional equipment fuel tank is 0 liters

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 70 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 65.8 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 the vehicle ignition is turned to the ON position

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

4. STEERING COLUMN ADJUSTMENTS:

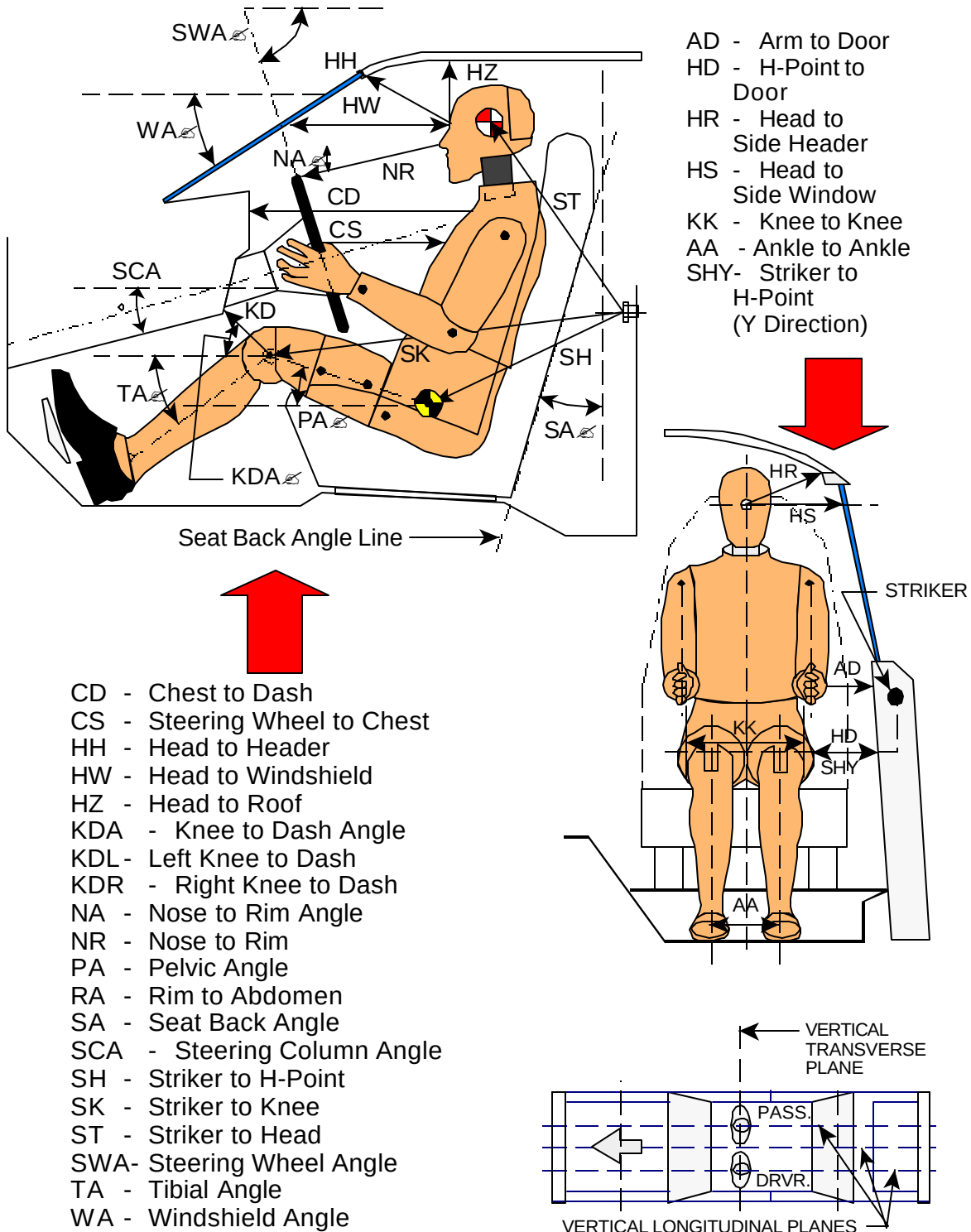
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: Place in geometric center (25° to the rocker panel)

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Place in position 2 with uppermost position being 1 (5 total detents).

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



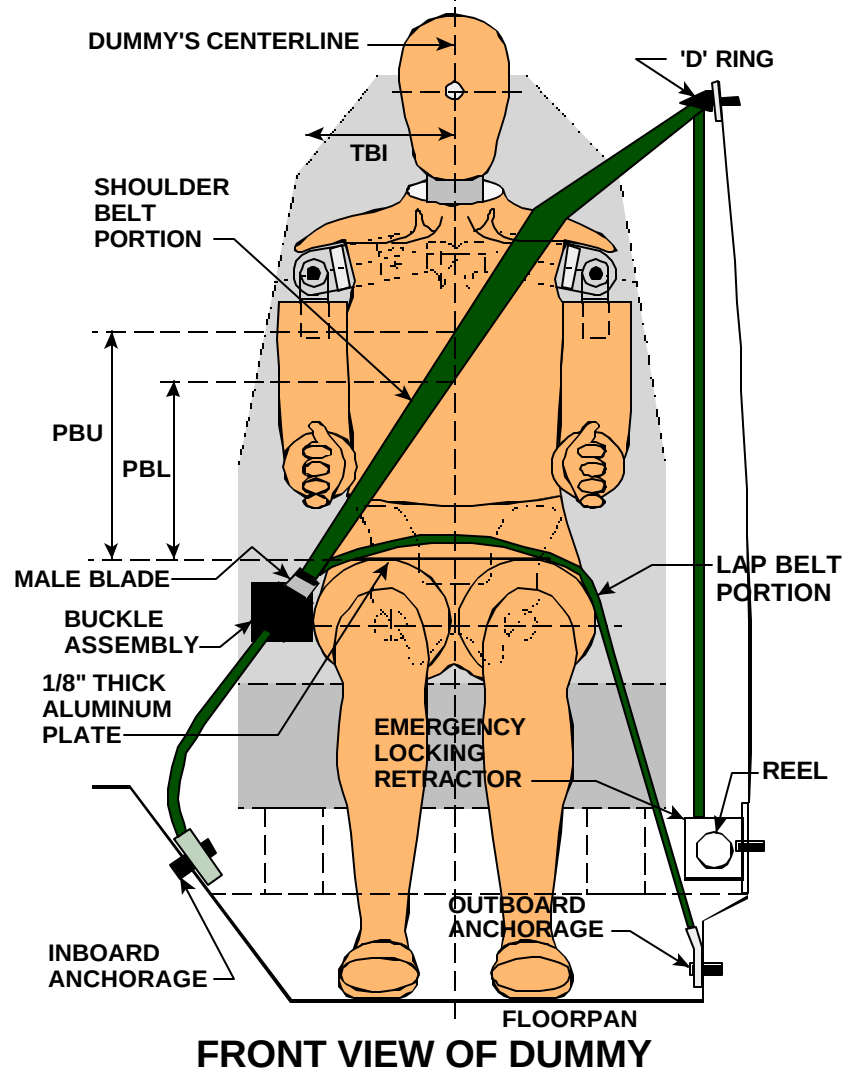
DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ⁰	27.0 deg.			N/A		
SWA ⁰	65.1 deg.			N/A		
SCA ⁰	24.9 deg.			N/A		
SA ⁰	87 deg.			87 deg.		
HZ	189			165		
HH	338			322		
HW	625			546		
HR	212			215		
NR	391	Angle	-12 deg.	N/A		
CD	525			480		
CS	300			N/A		
RA	197			N/A		
KDL	177	Angle (KDA)	39 deg.	122		
KDR	158			151	Angle (KDA)	42 deg.
PA ⁰	22.5 deg.			22.0 deg.		
TA ⁰	43.8 deg.			42.5 deg.		
KK	333			264		
AA	320			205		
ST	425	Angle	11 deg.	445	Angle	11 deg.
SK	615	Angle	93 deg.	630	Angle	95 deg.
SH	314	Angle	125 deg.	308	Angle	122 deg.
SHY	243			236		
HS	325			327		
HD	147			141		
AD	136			118		

Dimensions in millimeters

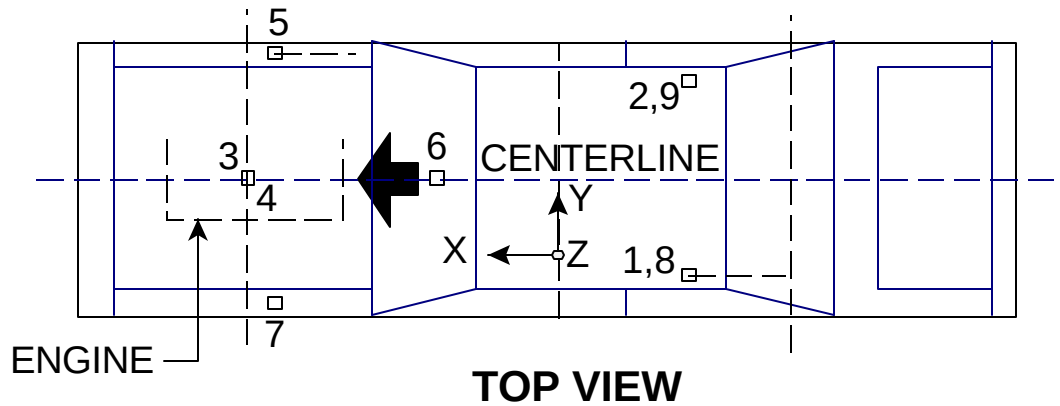
DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

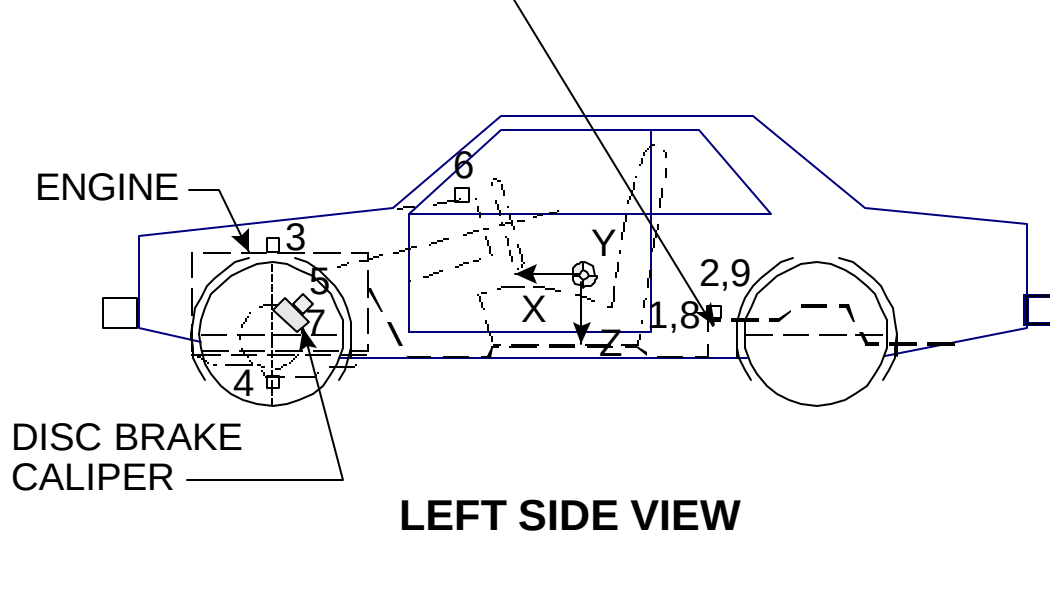


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	370	370
PBL-- Top surface of alum. plate to belt lower edge	280	280
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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	2007	-511	-198
2	Right Rear Seat Cross Member X	1990	563	-202
3	Top of Engine Block	3867	-65	-856
4	Bottom of Engine	3819	174	-191
5	Disc Brake Caliper @ Right Side	3775	788	-416
6	Instrument Panel	3240	10	-968
7	Disc Brake Caliper @Left Side	3790	-766	-430
8	Left Rear Seat Cross Member Z	2007	-511	-198
9	Right Rear Seat Cross Member Z	1990	563	-202

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Left Rear Seat Cross Member X	1.7	127.7	-37.3	62.5
2	Right Rear Seat Cross Member X	1.5	145.9	-39.1	54.6
3	Top of Engine Block	39.9	43.2	-177.1	33.1
4	Bottom of Engine	75.3	42.8	-134	30
5	Disc Brake Caliper @ Right Side	27.4	43.1	-108.6	50.8
6	Instrument Panel	24.6	94.6	-101.2	39.1
7	Disc Brake Caliper @Left Side	4.3	79.3	-56	29.5
8	Left Rear Seat Cross Member Z	9.3	33	-17.8	38.4
9	Right Rear Seat Cross Member Z	6.8	19.9	-14.1	39.1

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2002 Toyota Camry 4-Door Sedan

NHTSA Test No.: M25104 Test Date: May 10, 2002

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head 9 Array X Arm Y	g	6.6	56.1	-7.9	49.1	9.1	58.9	-7.0	68.6
Head 9 Array X Arm Z	g	21.9	54.2	-6.9	124.7	23.6	50.0	-6.3	128.9
Head 9 Array Y Arm X	g	11.7	184.1	-49.9	78.1	7.2	237.7	-60.2	78.1
Head 9 Array Y Arm Z	g	16.2	50.7	-4.3	98.1	19.0	72.3	-8.9	105.7
Head 9 Array Z Arm X	g	17.5	184.1	-52.1	80.6	12.1	234.7	-60.1	71.4
Head 9 Array Z Arm Y	g	4.8	68.2	-6.5	84.5	5.8	61.2	-9.7	68.6
Head X	g	11.8	184.1	-50.5	78.2	30.5	250.6	-59.6	78.3
Head Y	g	4.1	56.0	-4.6	49.2	8.2	35.1	-6.2	74.0
Head Z	g	17.1	50.8	-5.3	98.0	18.8	50.1	-7.9	105.4
Head Resultant	g	51.1	78.2	0.1	-38.1	60.6	78.3	0.0	12.3
Redundant Head X	g	12.4	184.1	-50.9	78.2	8.0	238.6	-59.1	78.3
Redundant Head Y	g	3.8	56.0	-4.7	49.2	8.3	35.1	-4.9	74.0
Redundant Head Z	g	17.2	50.8	-4.8	98.0	19.0	50.1	-7.9	105.6
Redundant Head Resultant	g	51.7	78.2	0.0	-34.3	59.9	78.3	0.1	11.5
Upper Neck Fx	N	263.3	69.2	-331.7	135.3	228.0	89.7	-433.7	51.5
Upper Neck Fy	N	77.3	70.7	-58.3	36.2	*	*	*	*
Upper Neck Fz	N	957.6	51.0	-57.1	17.5	1025.3	71.8	-229.5	102.1
Upper Neck F Resultant	N	988.5	50.9	1.7	-38.3	*	*	*	*
Upper Neck Mx	N-m	7.3	120.2	-15.5	74.4	17.4	82.3	-4.7	131.4
Upper Neck My	N-m	34.6	123.7	-26.5	100.4	25.2	129.1	-27.7	105.6
Upper Neck Mz	N-m	4.6	66.7	-5.5	92.4	6.0	85.0	-4.6	137.9
Upper Neck M Resultant	N-m	35.0	123.7	0.1	-40.8	30.6	78.9	0.1	-50.0
Chest X	g	2.9	262.0	-42.6	70.4	2.7	265.9	-46.6	77.2
Chest Y	g	5.9	73.9	-4.2	45.9	3.7	47.8	-3.2	64.0
Chest Z	g	7.8	39.5	-9.2	71.2	10.5	39.7	-11.2	101.9
Chest Resultant	g	43.4	70.5	0.0	-28.0	46.8	77.2	0.1	-21.4

* Data is Questionable

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

Vehicle Year/Make/Model/Body Style: 2002 Toyota Camry 4-Door Sedan

NHTSA Test No.: M25104 Test Date: May 10, 2002

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Redundant Chest X	g	5.9	165.9	-42.5	70.4	2.7	265.8	-46.7	77.1
Redundant Chest Y	g	6.0	73.9	-4.2	45.9	3.2	44.5	-2.9	64.0
Redundant Chest Z	g	7.4	39.6	-9.2	71.2	9.9	39.8	-11.1	101.9
Redundant Chest Resultant	g	43.3	70.5	0.0	-28.2	46.9	77.1	0.1	-21.6
Chest Displacement	mm	0.0	13.4	-30.7	72.0	0.0	-10.9	-30.2	80.1
Pelvic X	g	5.8	91.1	-45.8	63.5	6.2	99.9	-41.2	52.3
Pelvic Y	g	4.5	81.7	-6.0	39.8	5.3	76.9	-8.2	76.5
Pelvic Z	g	2.8	256.0	-31.2	71.7	6.4	34.4	-29.7	76.7
Pelvic Resultant	g	53.8	66.7	0.0	-27.1	46.5	76.5	0.1	-7.1
Left Femur	N	1016.4	52.4	-422.7	92.3	304.8	23.8	-1211.5	76.7
Right Femur	N	855.1	49.5	-981.1	64.9	1160.9	75.9	-1272.8	34.5
Left Upper Tibia Mx	N-m	25.7	55.0	-9.3	78.1	9.6	78.2	-52.7	61.0
Left Upper Tibia My	N-m	24.5	250.0	-109.4	58.9	18.4	110.2	-120.2	65.0
Left Lower Tibia Fz	N	150.2	109.8	-1736.9	33.6	69.6	135.3	-3183.5	82.6
Left Lower Tibia Mx	N-m	8.5	30.9	-5.7	94.4	36.1	77.9	-16.2	60.6
Left Lower Tibia My	N-m	24.6	41.8	-45.2	58.8	22.1	76.7	-31.9	49.7
Right Upper Tibia Mx	N-m	38.2	48.0	-13.4	124.7	15.4	78.3	-31.0	35.0
Right Upper Tibia My	N-m	16.5	97.1	-93.8	47.3	21.0	278.8	-145.4	64.7
Right Lower Tibia Fz	N	160.3	121.2	-2526.9	41.3	113.2	156.8	-4005.5	34.6
Right Lower Tibia Mx	N-m	10.1	46.8	-53.9	64.8	33.2	66.0	-17.4	34.8
Right Lower Tibia My	N-m	23.2	83.8	-42.6	47.3	23.5	34.2	-30.1	58.8
Left Foot Aft Ax	g	28.9	41.5	-51.5	30.2	7.5	74.6	-72.2	33.5
Left Foot Aft Az	g	8.6	189.3	-39.8	31.5	20.8	68.5	-42.6	40.7
Left Foot Fore Az	g	21.0	198.9	-60.7	27.9	43.9	68.6	-58.4	40.3
Right Foot Aft Ax	g	10.1	81.6	-96.9	46.7	13.3	76.2	-49.2	58.1
Right Foot Aft Az	g	4.4	221.5	-76.6	46.3	2.5	131.6	-59.7	35.3
Right Foot Fore Az	g	*	*	*	*	14.4	46.1	-64.0	31.1

* Data is questionable

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

Vehicle Year/Make/Model/Body Style: 2002 Toyota Camry 4-Door Sedan

NHTSA Test No.: M25104 Test Date: May 10, 2002

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	339.9	62.1	97.1	39.4
Position #2 - Passenger	445.6	59.1	92.7	44.6

** HIC is as defined in FM VSS 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	41.8	72.7	75.7	384.7
Position #2 - Passenger	45.3	75.2	78.2	399.6

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

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

Vehicle Year/Make/Model/Body Style: 2002 Toyota Camry 4-Door Sedan
 NHTSA Test No.: M25104 Test Date: May 10, 2002

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	347.0	62.1	96.9	39.8
Position #2 - Passenger	436.3	59.0	92.7	44.2

** 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	41.6	72.5	75.5	380.5
Position #2 - Passenger	45.8	75.4	78.4	407.4

* 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

1875

1875

Shoulder belt length as measured
on Part 572 Dummy.

895

895

Lap belt length as measured
on Part 572 Dummy.

980

980

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 10 mm molding.

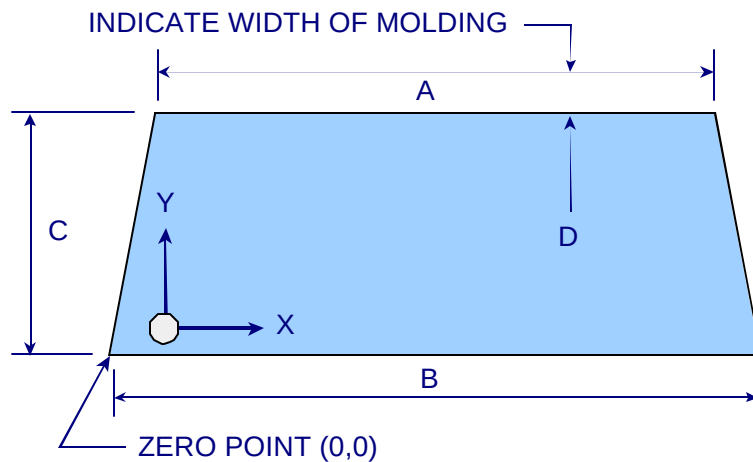
FMVSS 212 REQUIREMENTS:

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	2170	2170	100.0%
LEFT SIDE	2170	2170	100.0%
TOTAL	4340	4340	100.0%

AREA OF RETENTION FAILURE: None



DIMENSIONS (mm)	
A	1210
B	1530
C	800
D	10

FRONT VIEW OF WINDSHIELD

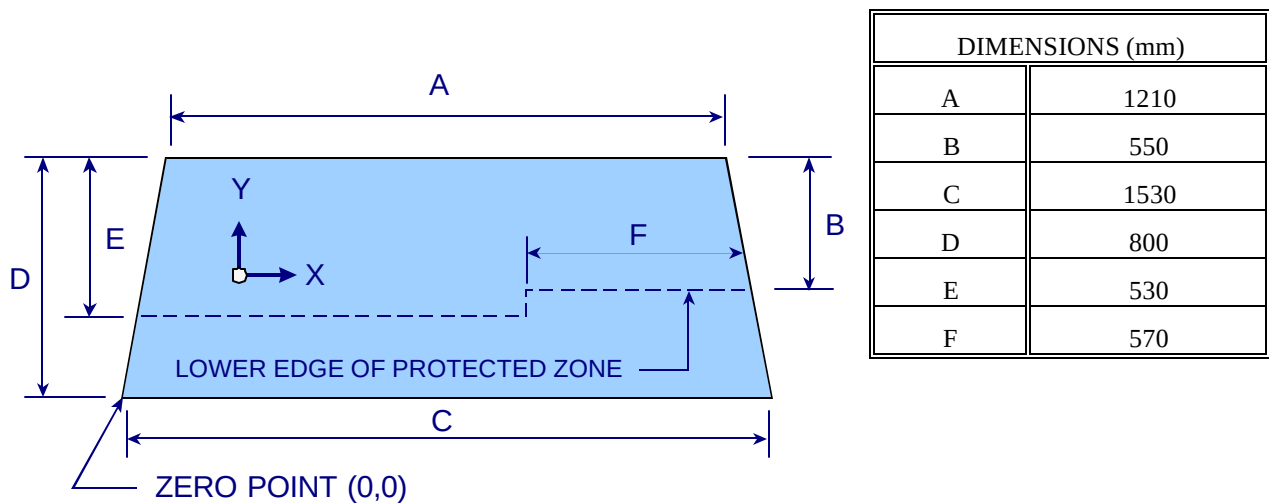
FAILURE DETAILS: None

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

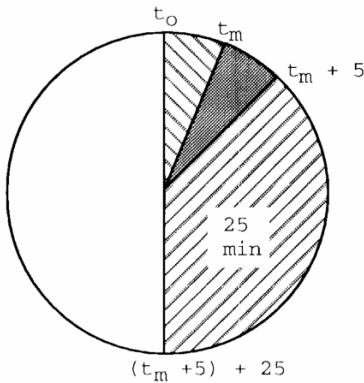
NHTSA TEST No.: M25104 TEST DATE: May 10, 2002
VEHICLE MAKE/MODEL: 2002 Toyota Camry 4-Door Sedan

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

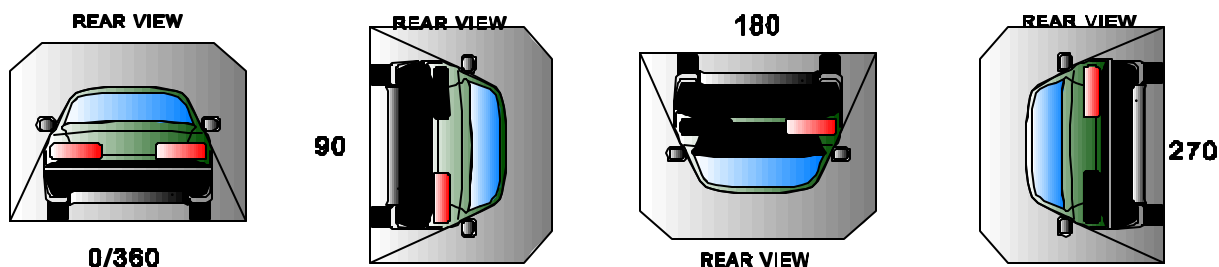
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2002 Toyota Camry 4-Door Sedan

NHTSA No.: M25104



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	22	seconds	5	minutes	6	minutes	22	seconds	7	minutes
90° - 180°	1	minutes	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes
180°-270°	1	minutes	02	seconds	5	minutes	6	minutes	2	seconds	7	minutes
270°-360°	1	minutes	09	seconds	5	minutes	6	minutes	9	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:

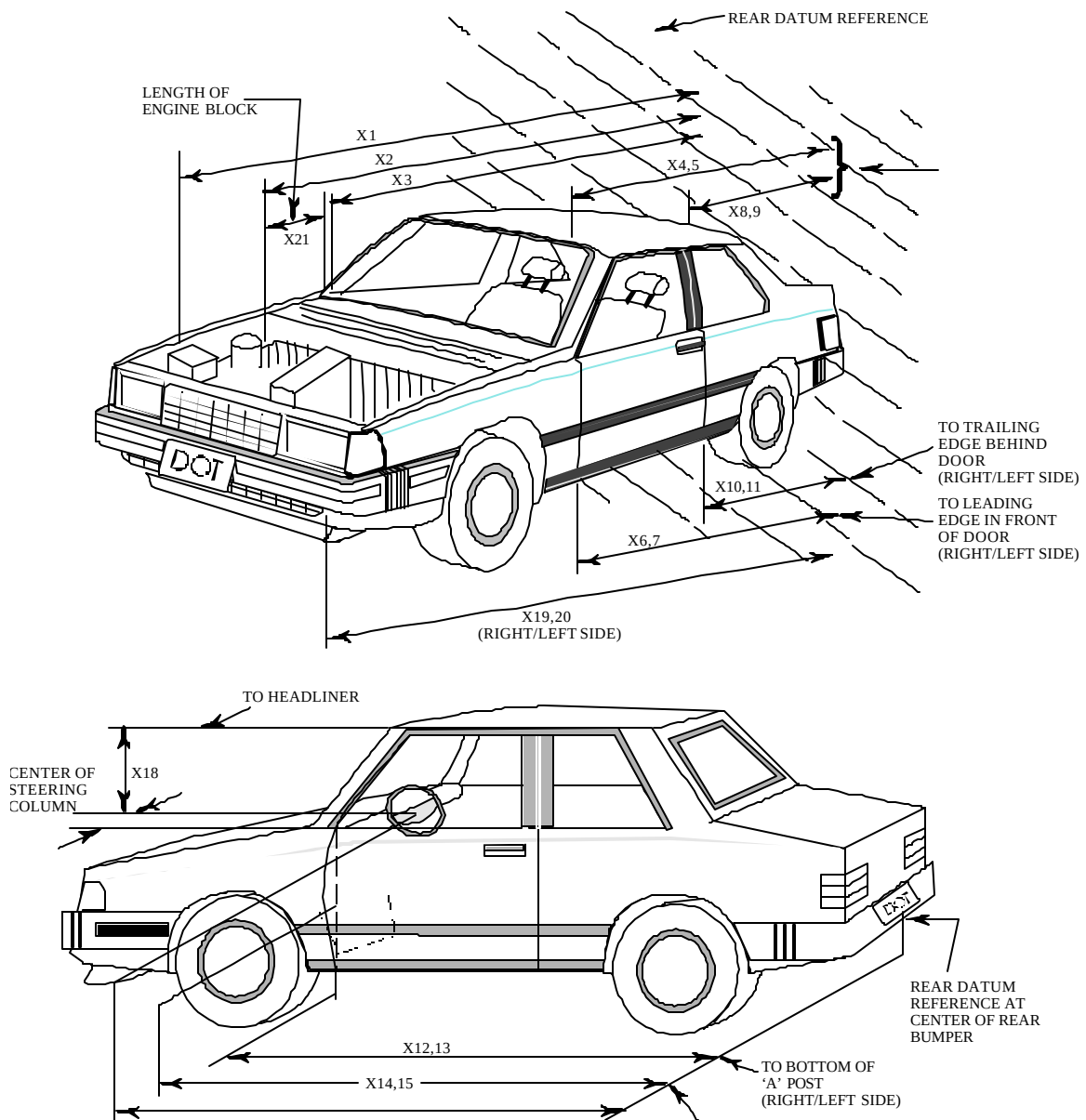
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	NA
90° - 180°	0	0	0	NA
180°-270°	0	0	0	NA
270°-360°	0	0	0	NA

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

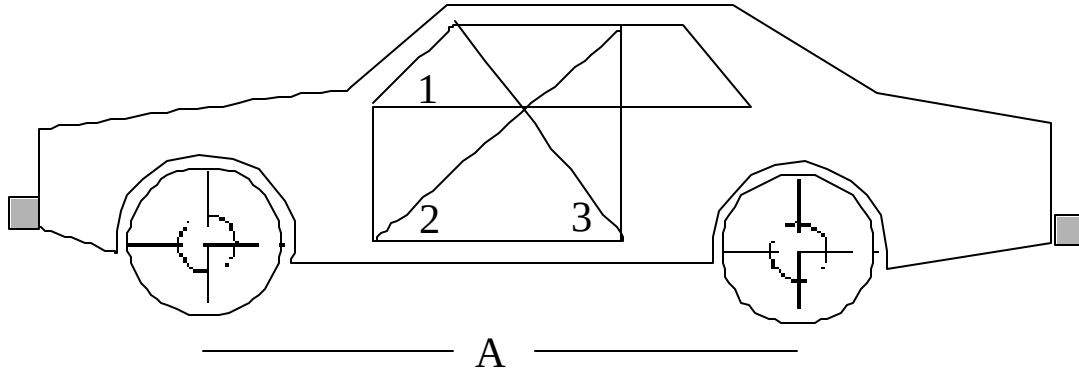


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4800	4235	565
X2	Rear Surface of Vehicle to Front of Engine	4289	4062	227
X3	Rear Surface of Vehicle to Firewall	3671	3660	11
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3374	3388	-14
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3376	3378	-2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3355	3380	-25
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3359	3360	-1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2274	2289	-15
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2277	2275	2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2274	2294	-20
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2268	2273	-5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3384	3394	-10
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3386	3389	-3
X14	Rear Surface of Vehicle to Firewall, Right Side	3730	3686	44
X15	Rear Surface of Vehicle to Firewall, Left Side	3735	3713	22
X16	Rear Surface of Vehicle to Steering Column	2889	2904	-15
X17	Center of Steering Column to "A" Post	324	314	10
X18	Center of Steering Column to Headliner	424	418	6
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4732	4259	473
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4730	4291	439
X21	Length of Engine Block	416	416	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3073	3086	-13
CD	Rear Surface of Vehicle to Center of Dash Panel	3128	3129	-1
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3101	3096	5

All Dimensions in mm

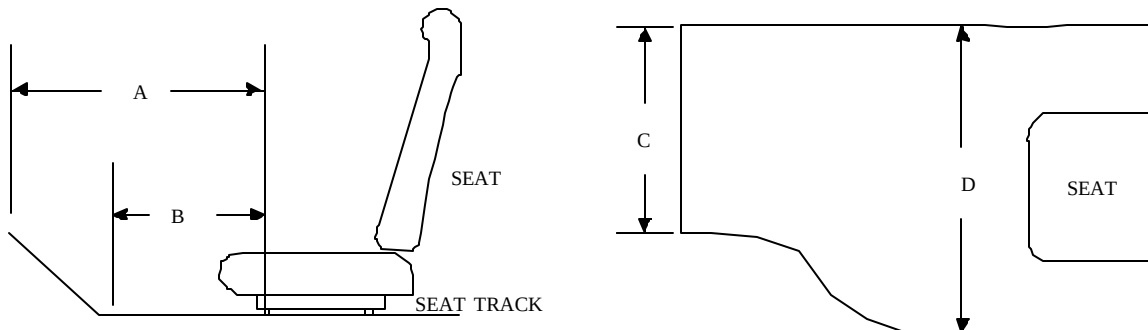
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1041	1446	1003	1048	1442	976
AFTER TEST	1040	1450	988	1047	1448	986
DIFFERENCE	1	-4	15	1	-6	-10

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2716	2716
AFTER TEST	2654	2660
DIFFERENCE	62	56

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



DRIVER

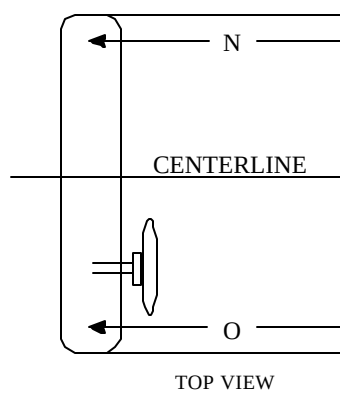
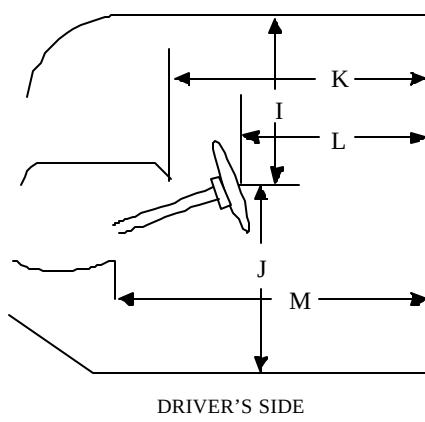
Measurement	Pre-Test	Post-Test	Difference
A	732	716	16
B	539	543	-4
C	554	485	69
D	500	496	4

PASSENGER

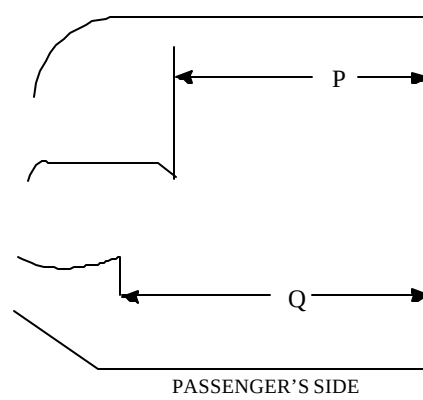
Measurement	Pre-Test	Post-Test	Difference
A	754	698	56
B	547	564	-17
C	455	484	-29
D	463	475	-12

Units = mm

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



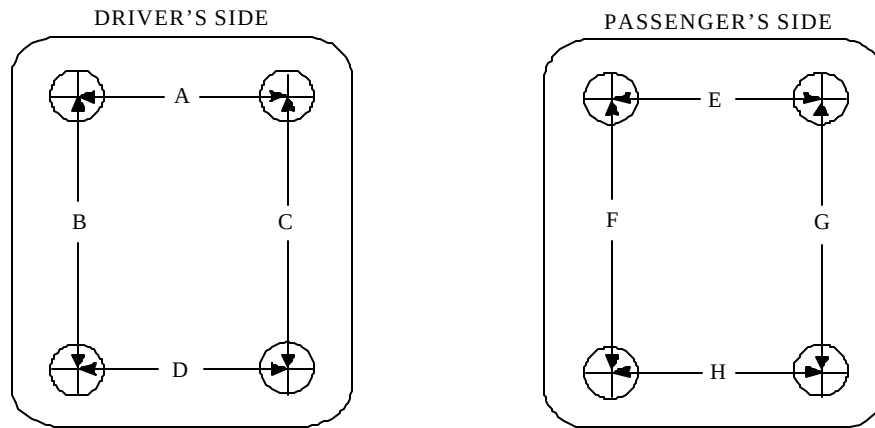
MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



Measurement	Pre-Test	Post-Test	Difference
I	424	418	6
J	653	674	-21
K	1929	1923	6
L	1719	1732	-13
M	2001	2000	1
N	1901	1914	-13
O	1931	1924	7
P = K (PASS.)	1952	1964	-12
Q = M (PASS.)	1966	1972	-6

Units = mm

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

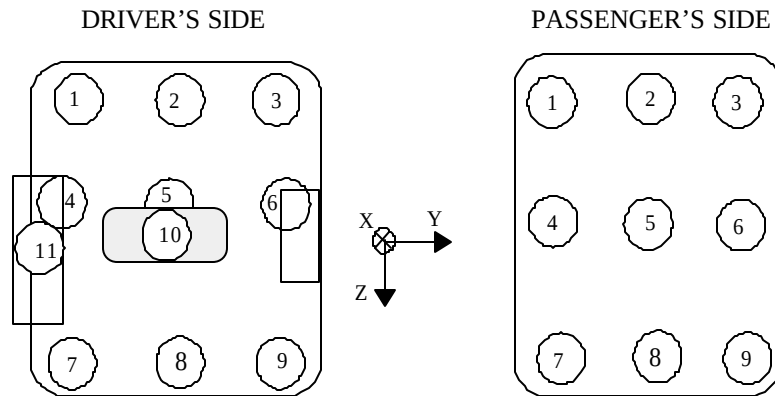


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	554	485	68
B	363	369	-5
C	333	387	-54
D	500	496	4
E	455	484	-29
F	474	455	19
G	443	384	59
H	463	475	-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	3557	3538	19	-449	-442	-7
2	3551	3530	21	-448	-445	-3
3	3542	3484	58	-459	-432	-27
4	3468	3454	14	-358	-349	-9
5	3461	3447	14	-352	-338	-14
6	3437	3396	41	-345	-310	-35
7	3363	3365	-2	-286	-274	-12
8	3358	3356	2	-287	-265	-22
9	3295	3352	-57	-287	-267	-20
10	3384	3389	-5	-454	-428	-26
11	3477	3466	11	-448	-440	-8

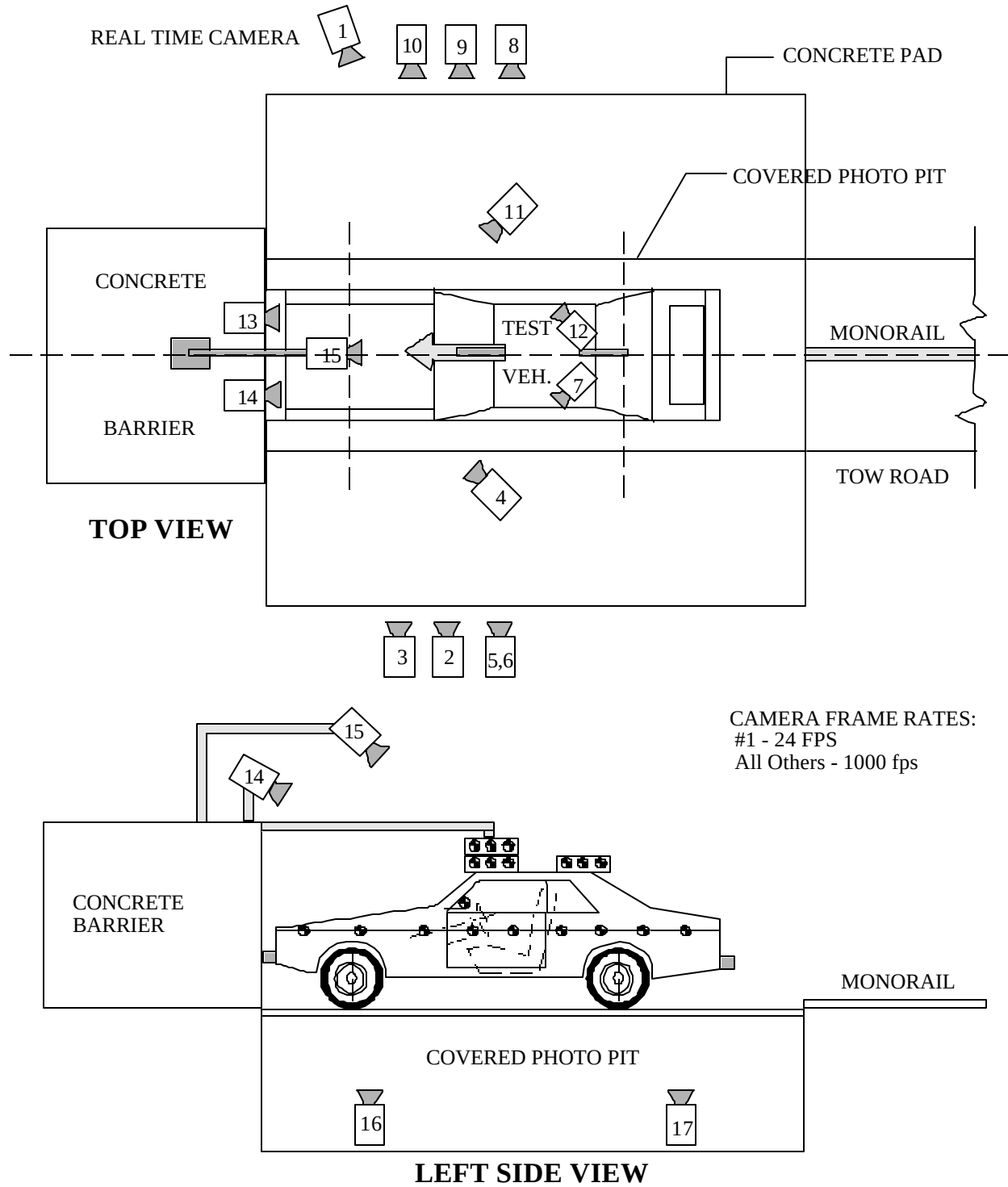
Passenger Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3562	3476	86	-464	-516	52
2	3570	3514	56	-491	-481	-10
3	3517	3475	42	-502	-488	-14
4	3469	3412	57	-364	-399	35
5	3452	3473	-21	-364	-386	22
6	3479	3479	0	-380	-400	20
7	3355	3367	-12	-291	-296	5
8	3362	3379	-17	-293	-319	26
9	3377	3324	53	-296	-282	-14

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.: M25104 Vehicle: 2002 Toyota Camry 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	6710	1597	1074	-2	6372	12.5	1010
3	Left Side View	8042	923	1080	-4	7704	25	955
4	Driver and Interior View	7376	1653	2003	-10	-	25	1010
5	Steering Column (Bottom)	7493	1857	1170	-4	7155	25	1015
6	Steering Column (Top)	7493	1857	1777	-8	7155	25	1020
7	Left Belt	-	-	-	-	-	-	-
8	Overall Right Side	6848	1559	1132	-2	7148	12.5	1010
9	Right Side View	8153	1129	1094	-1	8453	25	1005
10	Right Passenger View	7970	1639	1424	-3	8270	35	1000
11	Passenger and Interior View	7410	2359	1964	-8	-	25	1005
12	Right Belt	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	-39	-	13	1005
14	Driver Front View	620	-92	1987	-37	-	13	1000
15	Windshield View	0	-530	3374	-52	-	13	1000
16	Pit View of Engine	0	615	-3048	90	-	13	985
17	Pit View of Fuel Tank	0	3063	-3048	90	-	13	1000

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

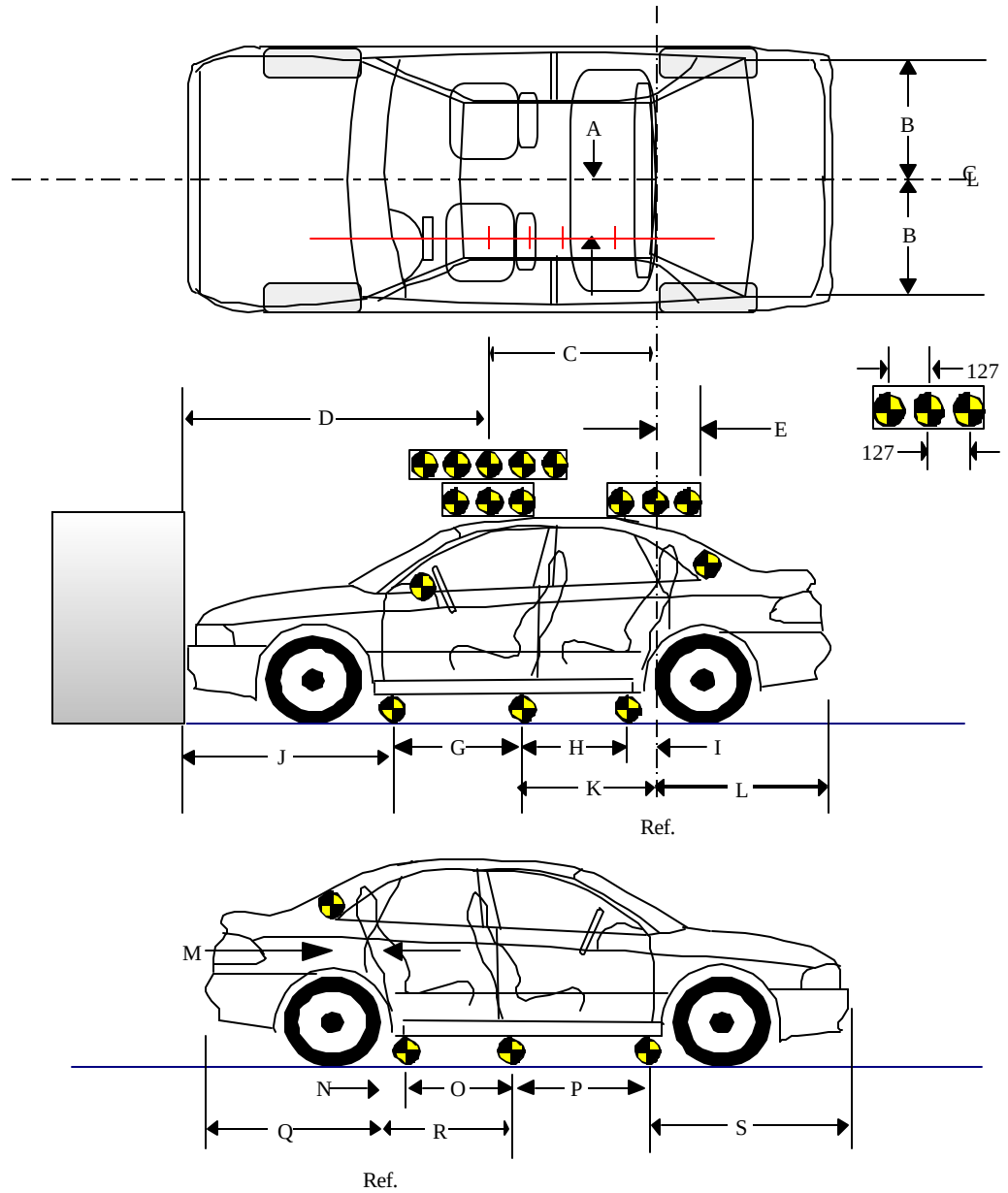
Y = film plane to impact location N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

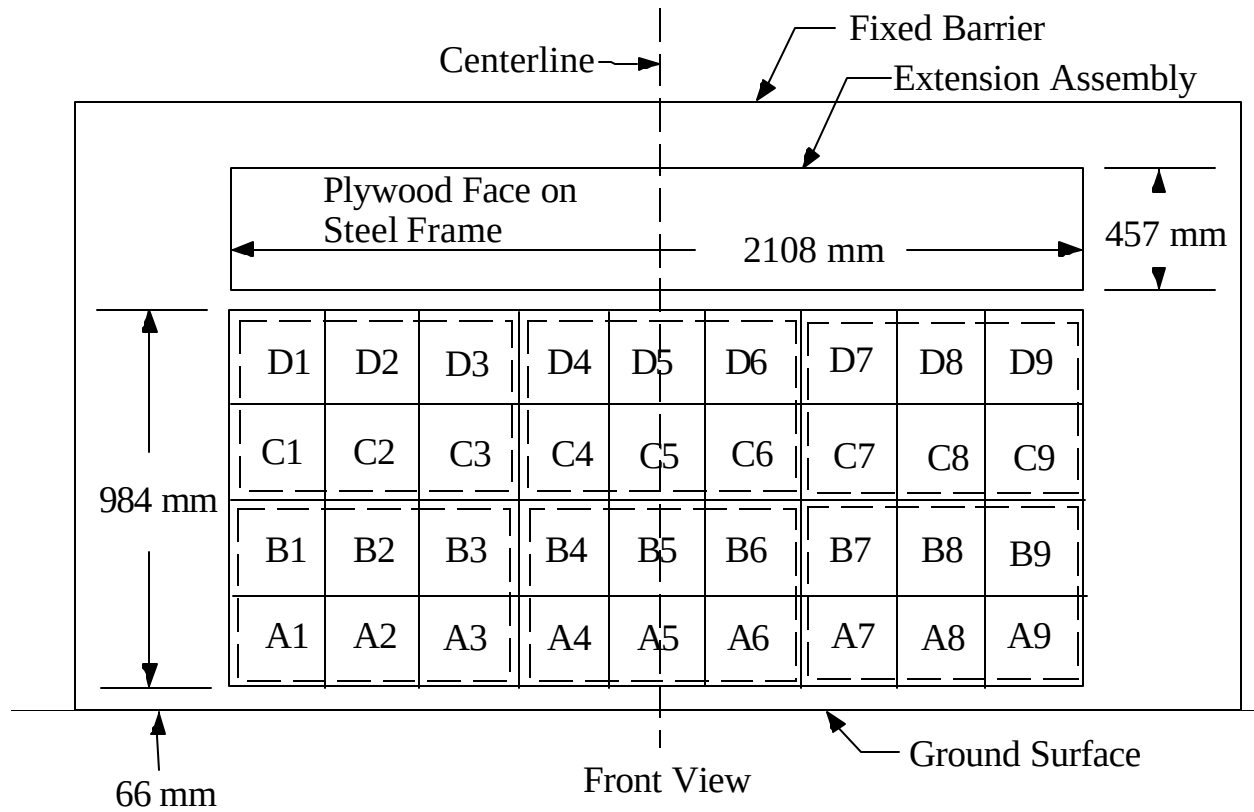
(Dimensions in millimeters)

A	376
B	638
C	1224
D	2109
E	297
F	1532
G	928
H	926
I	98
J	1380
K	1024
L	1468
M	297
N	107
O	926
P	916
Q	1467
R	1033
S	1383



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.: M25104; Test Date: May 10, 2002; Technician: P. MacDiarmid

Vehicle Model Year/Make/Model: 2002 Toyota Camry 4-Door Sedan

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

B. Size of vent holes: (mm²) 490.9 -Driver 1963.5 -Passenger

C. Total vent area: (mm²) 981.8 -Driver 3927 -Passenger

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

Driver: 600 -Height; 550 -Width; 350 -Depth

Passenger: 760 -Height; 420 -Width; 450 -Depth

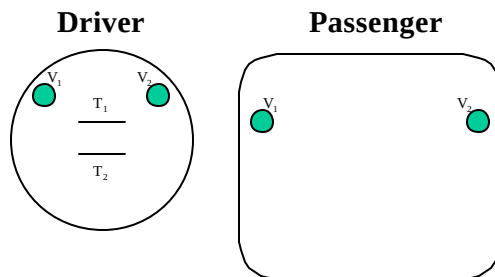
E. Is the air bag tethered?

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

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

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

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



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

Driver: Air bag: 931570580

Generator: Z01D1187361

Passenger: Air bag: THHMZ606AKJ

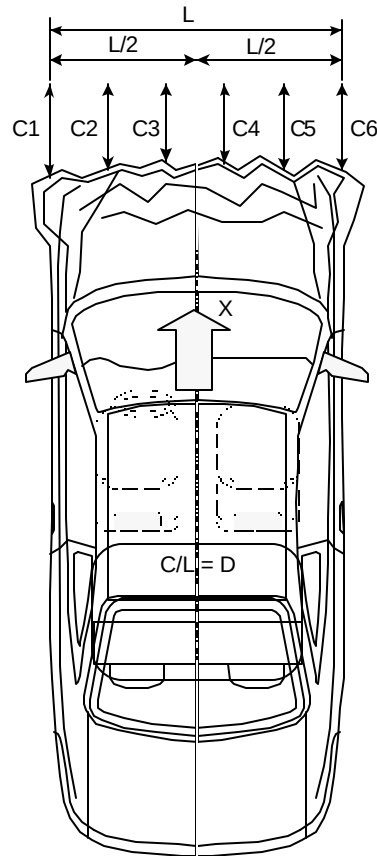
Generator: AGWMZB101PMV 6005320-02A

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

Vehicle Make/Model/Body Style: Toyota Camry 4-Door Sedan
 NHTSA Test No.: M25104 VIN: JTDBE32KX20058825
 Model Year: 2002 Build Date: 12/01 Test Date: May 10, 2002
 Vehicle Size Category: Mid-Size Test Weight: 1633.0 kg
 Vehicle Wheelbase: 2716 mm; Front Overhang: 944 mm; Overall Width: 1795 mm
 Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4628	4298	330
C2 =	4742	4281	461
C3 =	4792	4256	536
C4 =	4794	4241	553
C5 =	4748	4243	505
C6 =	4634	4287	347



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1446.0 mm
 L2= 723.0 mm
 L5= 289.2 mm

APPENDIX A
PHOTOGRAPHS

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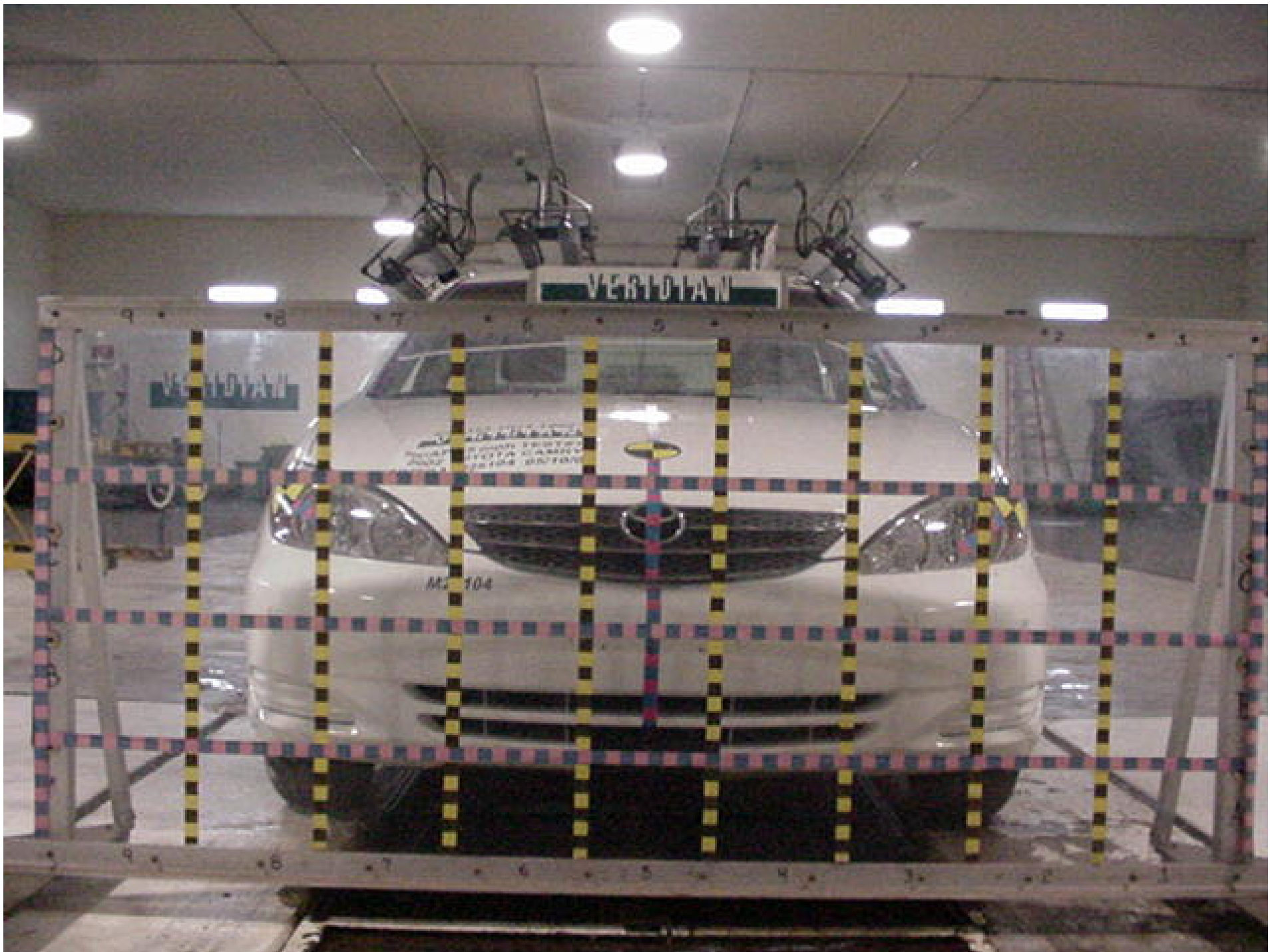


Figure A-1 LOAD CELL LOCATIONS



Figure A-2 PRE-TEST FRONT VIEW



Figure A-3 POST-TEST FRONT VIEW



Figure A-4 PRE-TEST LEFT SIDE VIEW



Figure A-5 POST-TEST LEFT SIDE VIEW



Figure A-6 PRE-TEST RIGHT SIDE VIEW



Figure A-7 POST-TEST RIGHT SIDE VIEW



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



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



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



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



Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW



A-16

8642-NCAP-13

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15 FUEL CAP VIEW

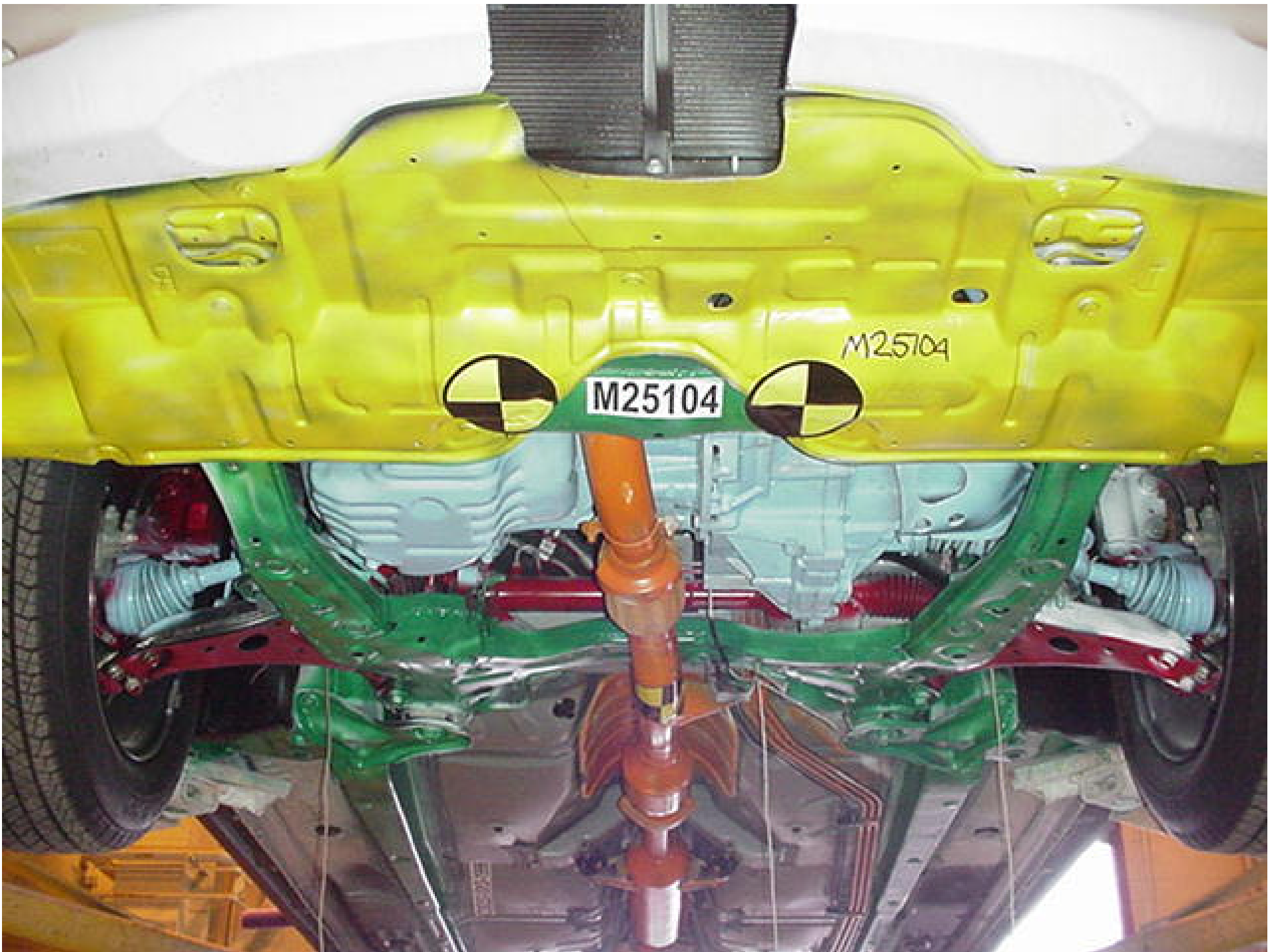


Figure A-16 PRE-TEST FRONT UNDERBODY VIEW



Figure A-17 POST-TEST FRONT UNDERBODY VIEW

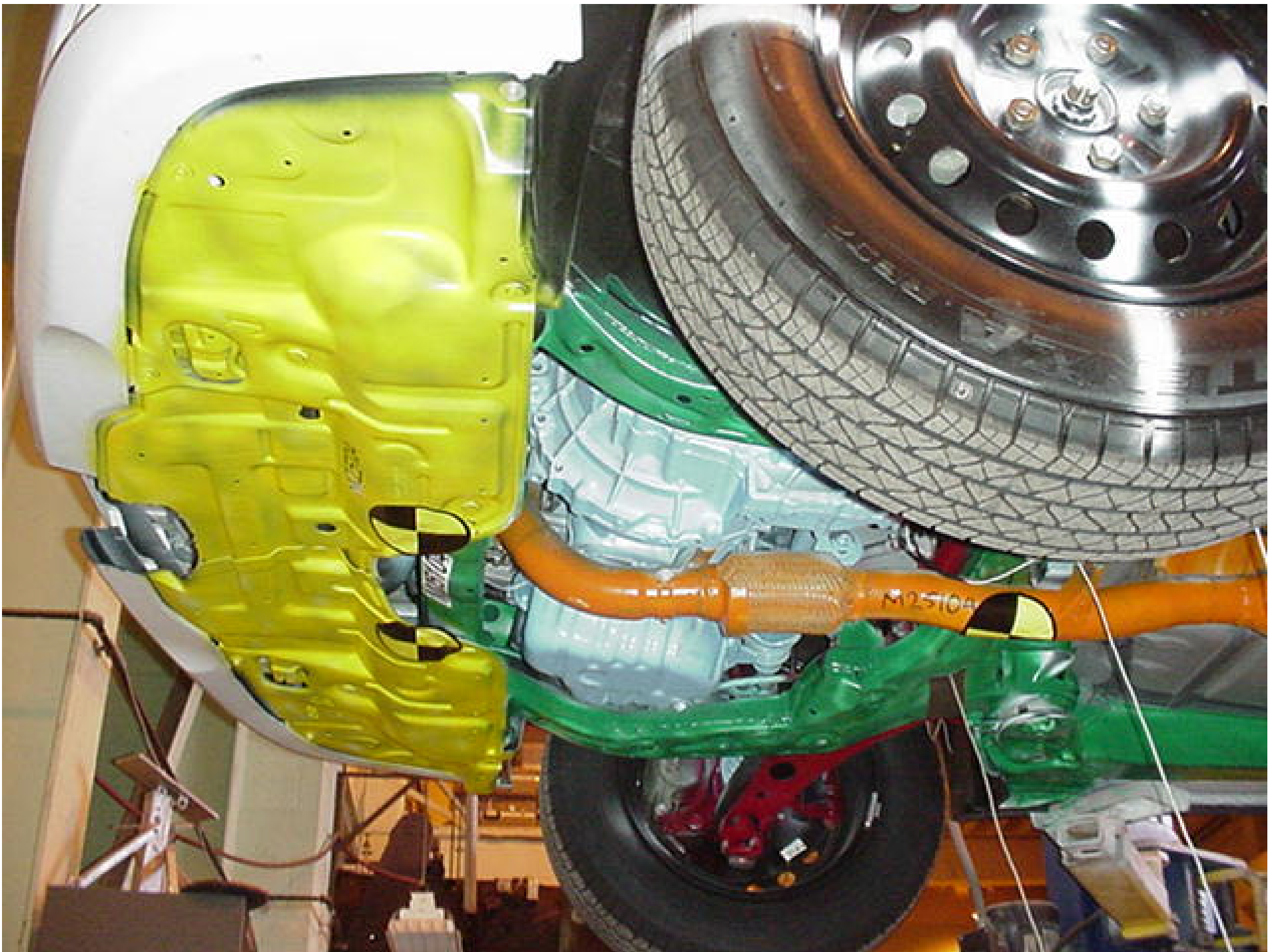


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

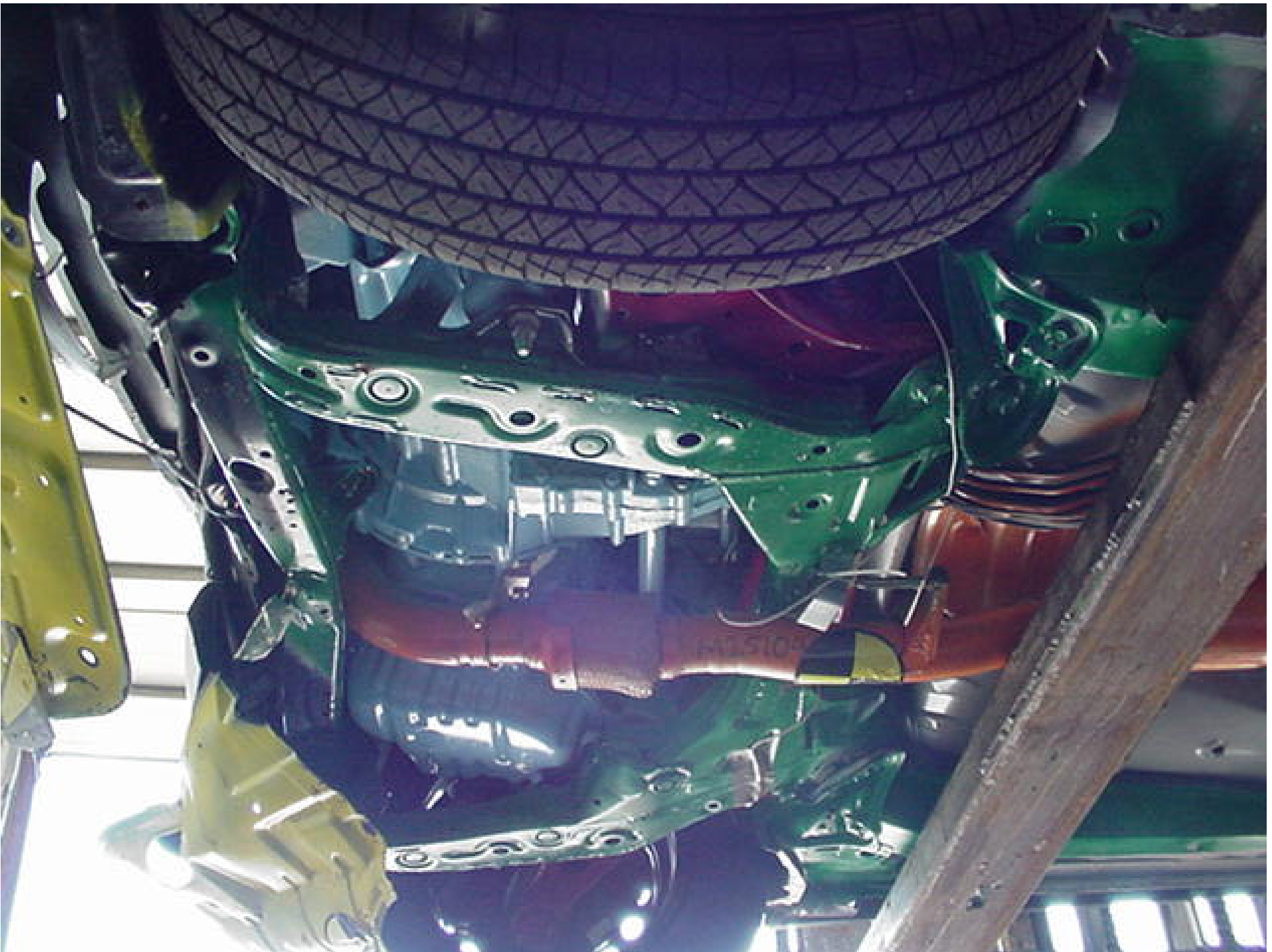


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW



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



A-33

8642-NCAP-13

Figure A-31 POST-TEST DRIVER HEAD LOCATION



Figure A-32 PRE-TEST PASSENGER HEAD LOCATION

FILE CORUPTED – PHOTOGRAPH NOT AVAILABLE

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

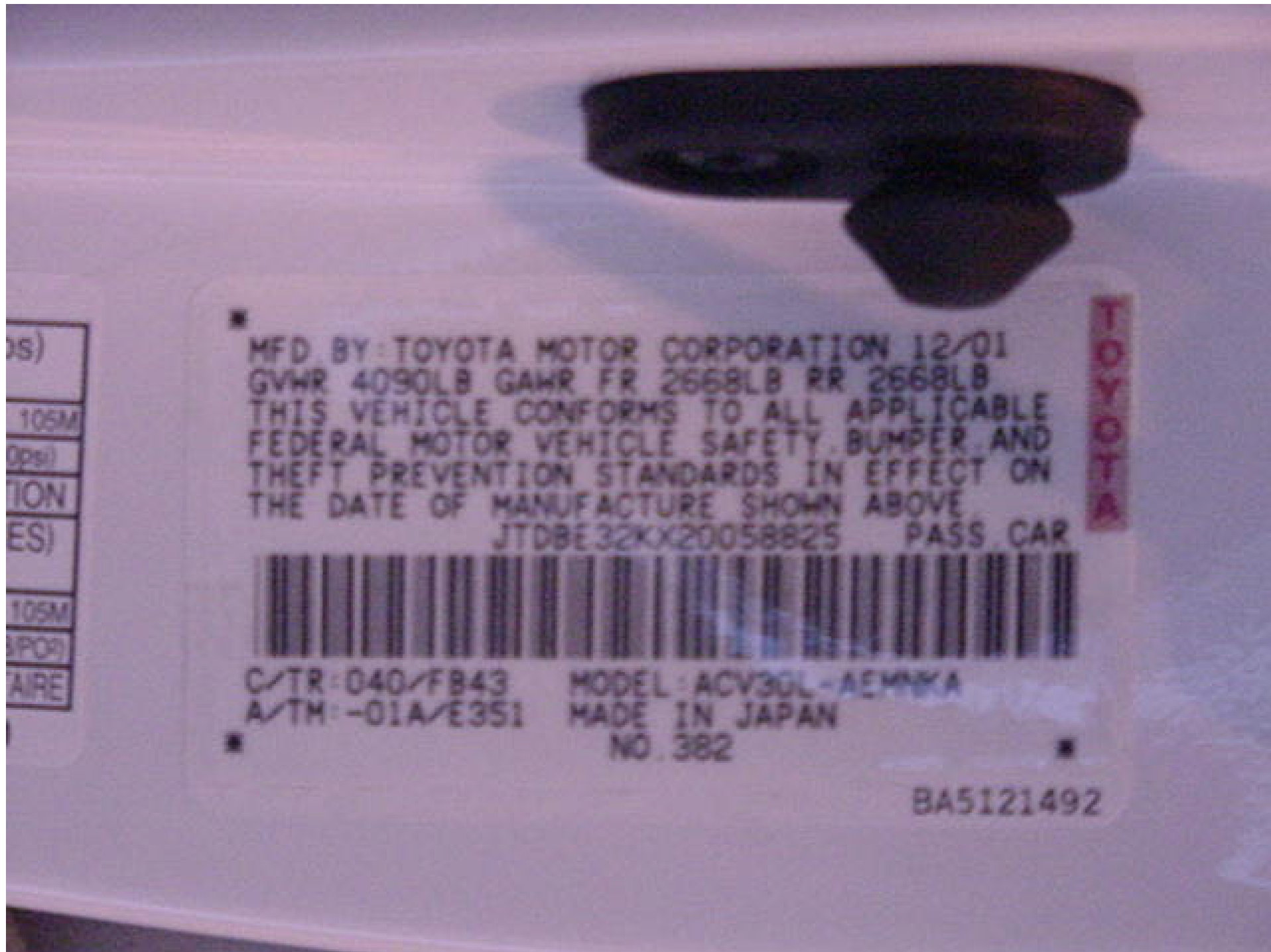


Figure A-40 VEHICLE PLACARD

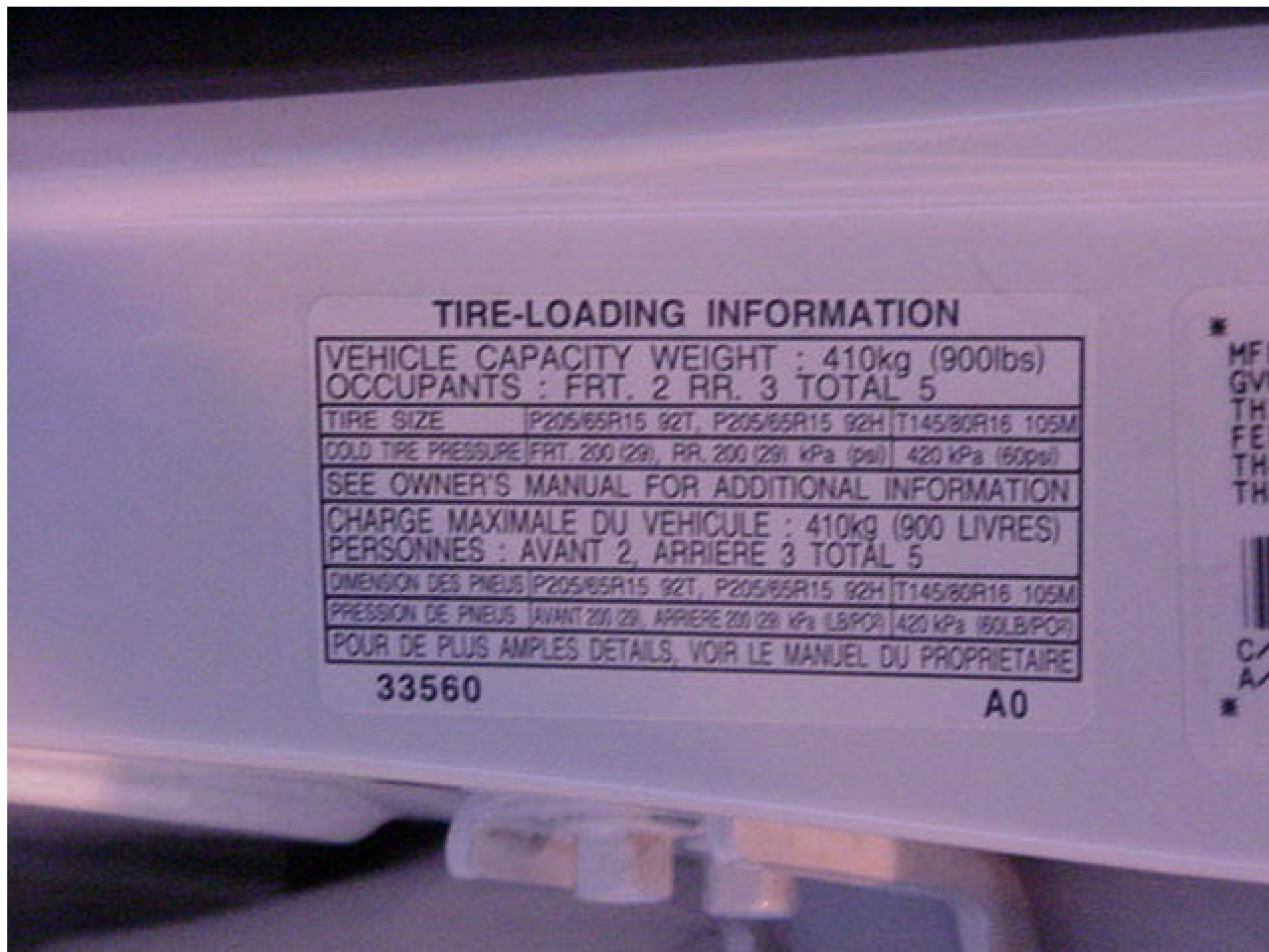


Figure A-41 TIRE PLACARD

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

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

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

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO.

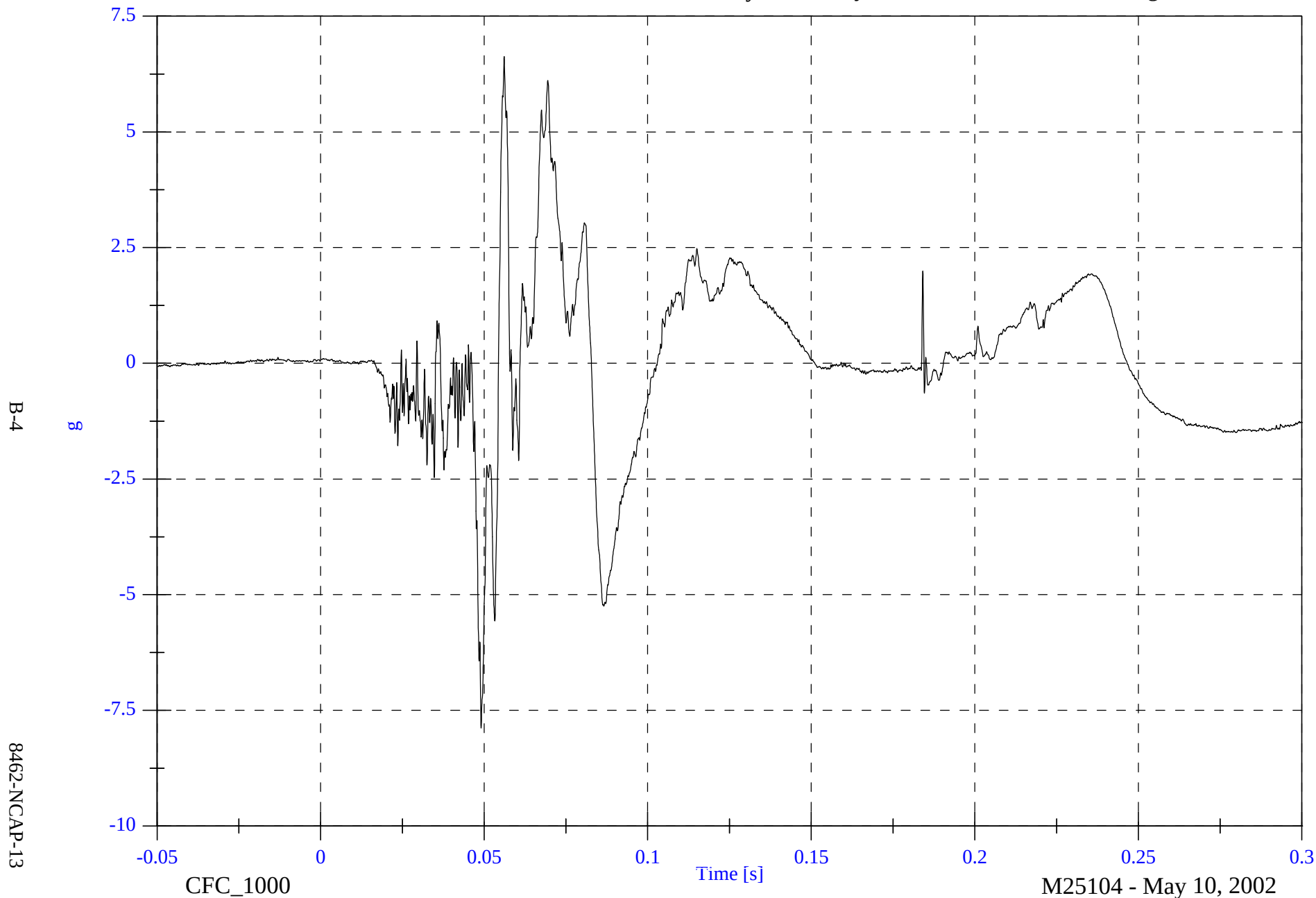
DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	600
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle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

2002 NCAP Test 13 - 2002 Toyota Camry

P1 Head 9 Array X Arm Ay

Max: 6.6 [g] at 0.056 [s]

Min: -7.9 [g] at 0.049 [s]

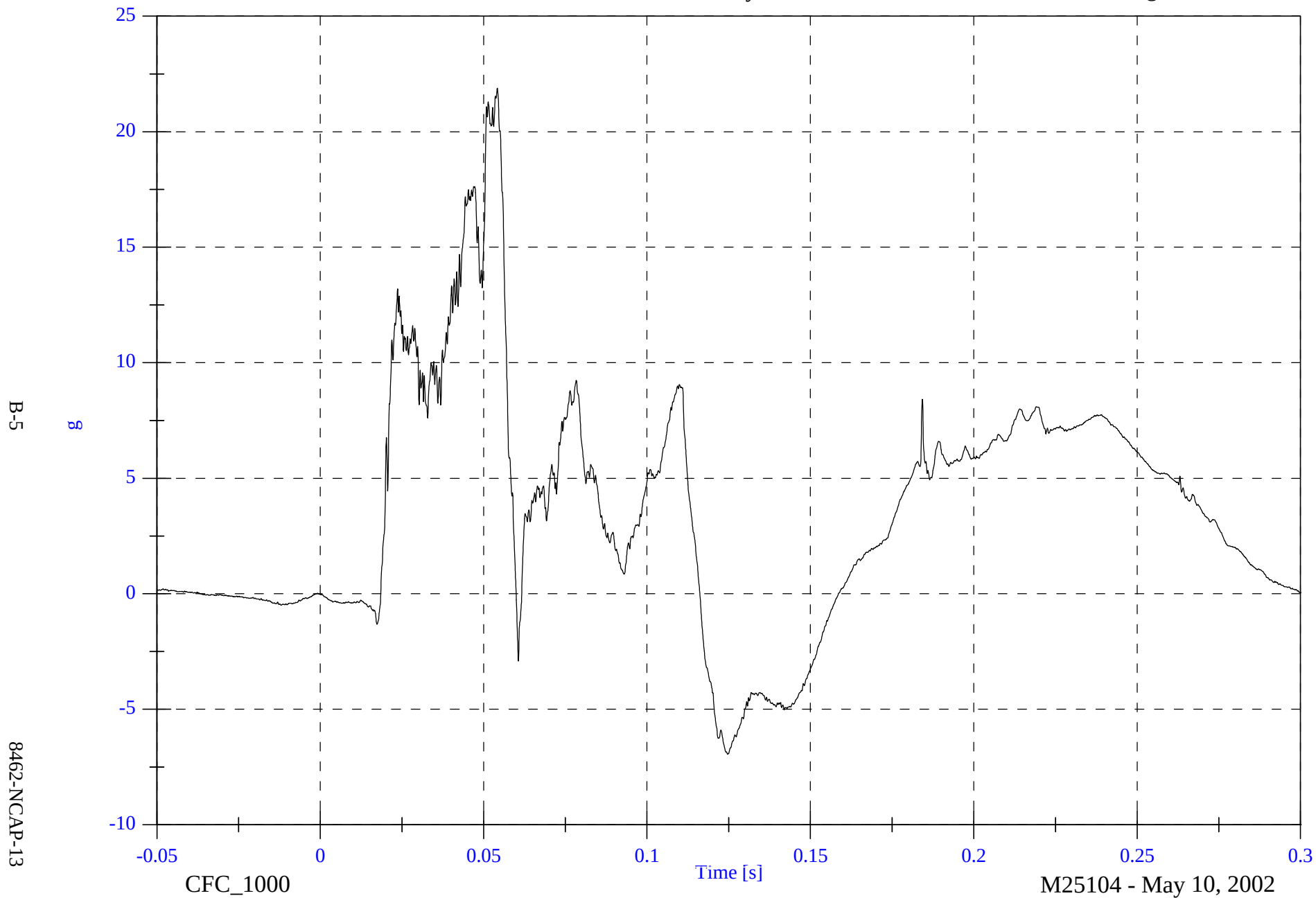


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Head 9 Array X Arm Az

Max: 21.9 [g] at 0.054 [s]

Min: -6.9 [g] at 0.125 [s]

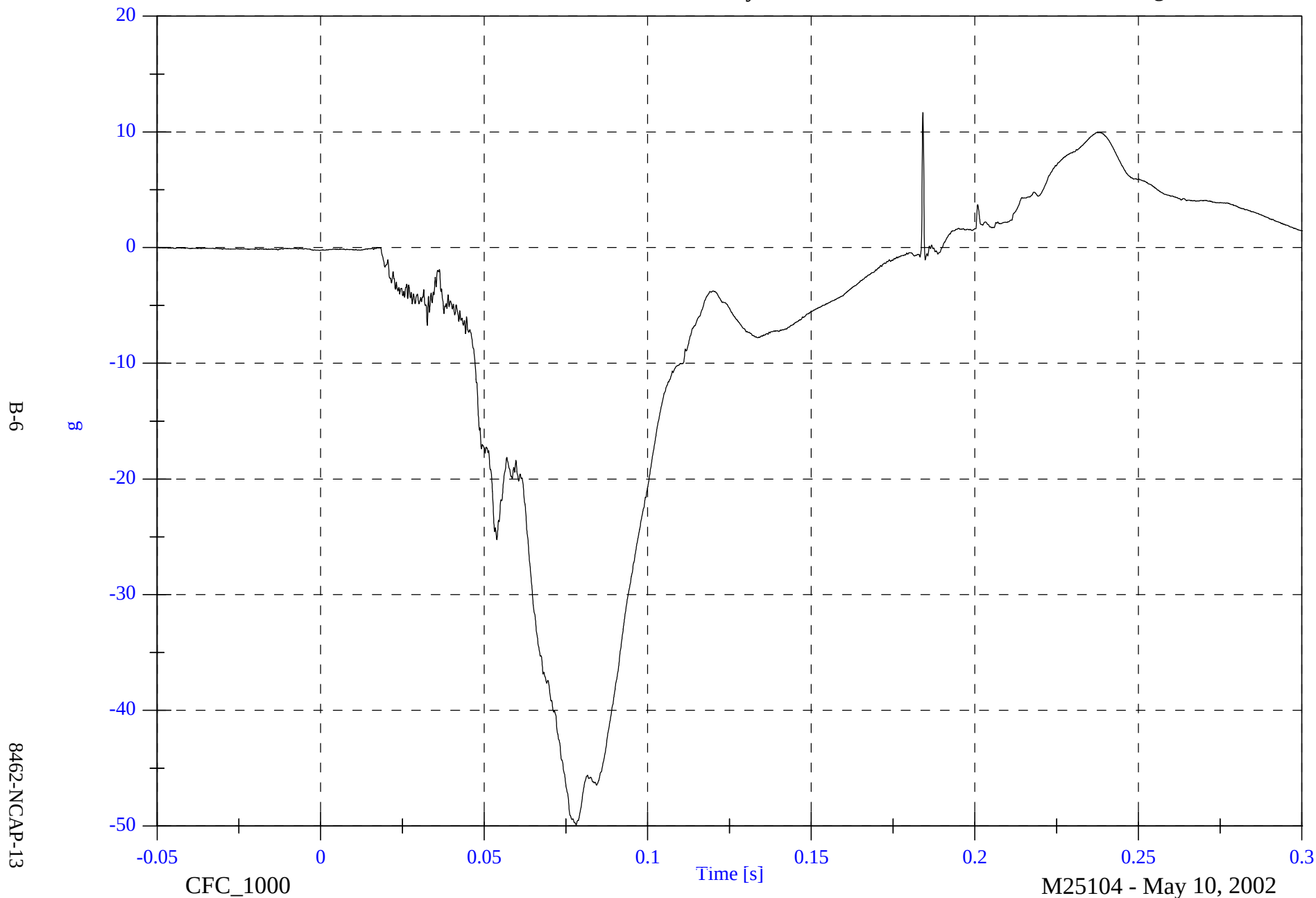


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Head 9 Array Y Arm Ax

Max: 11.7 [g] at 0.184 [s]

Min: -49.9 [g] at 0.078 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

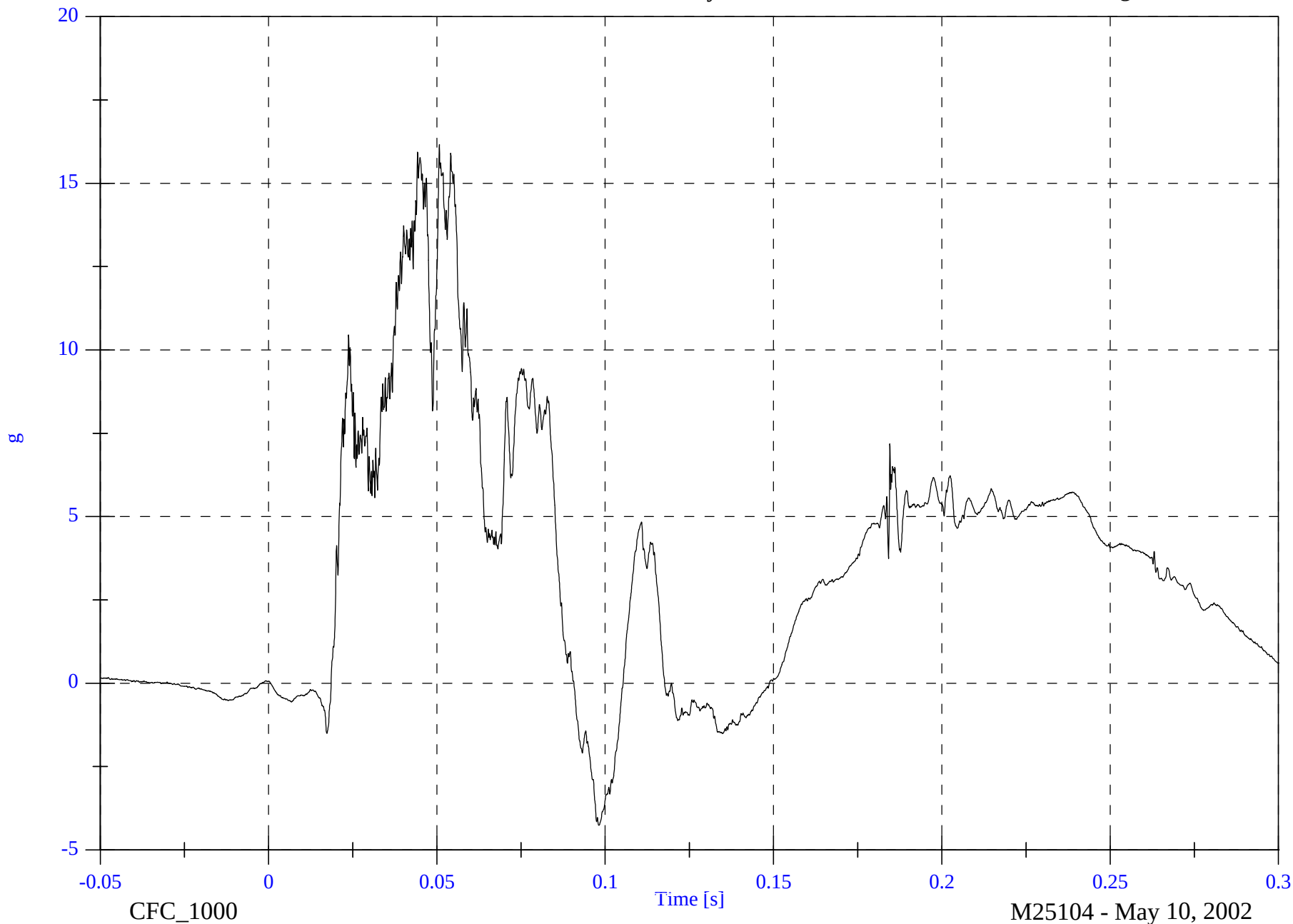
P1 Head 9 Array Y Arm Az

Max: 16.2 [g] at 0.051 [s]

Min: -4.3 [g] at 0.098 [s]

B-7

8462-NCAP-13

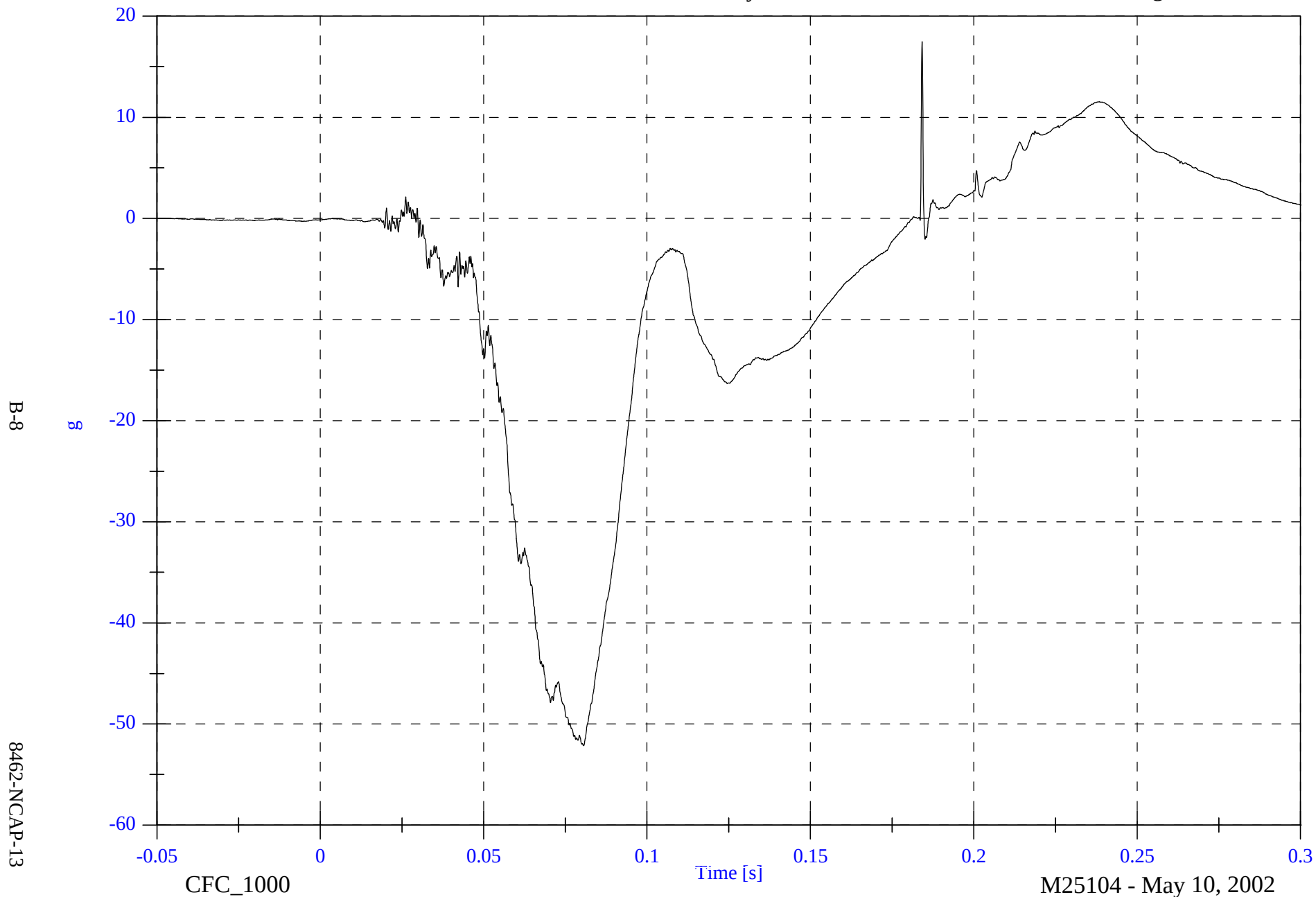


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Head 9 Array Z Arm Ax

Max: 17.5 [g] at 0.184 [s]

Min: -52.1 [g] at 0.081 [s]

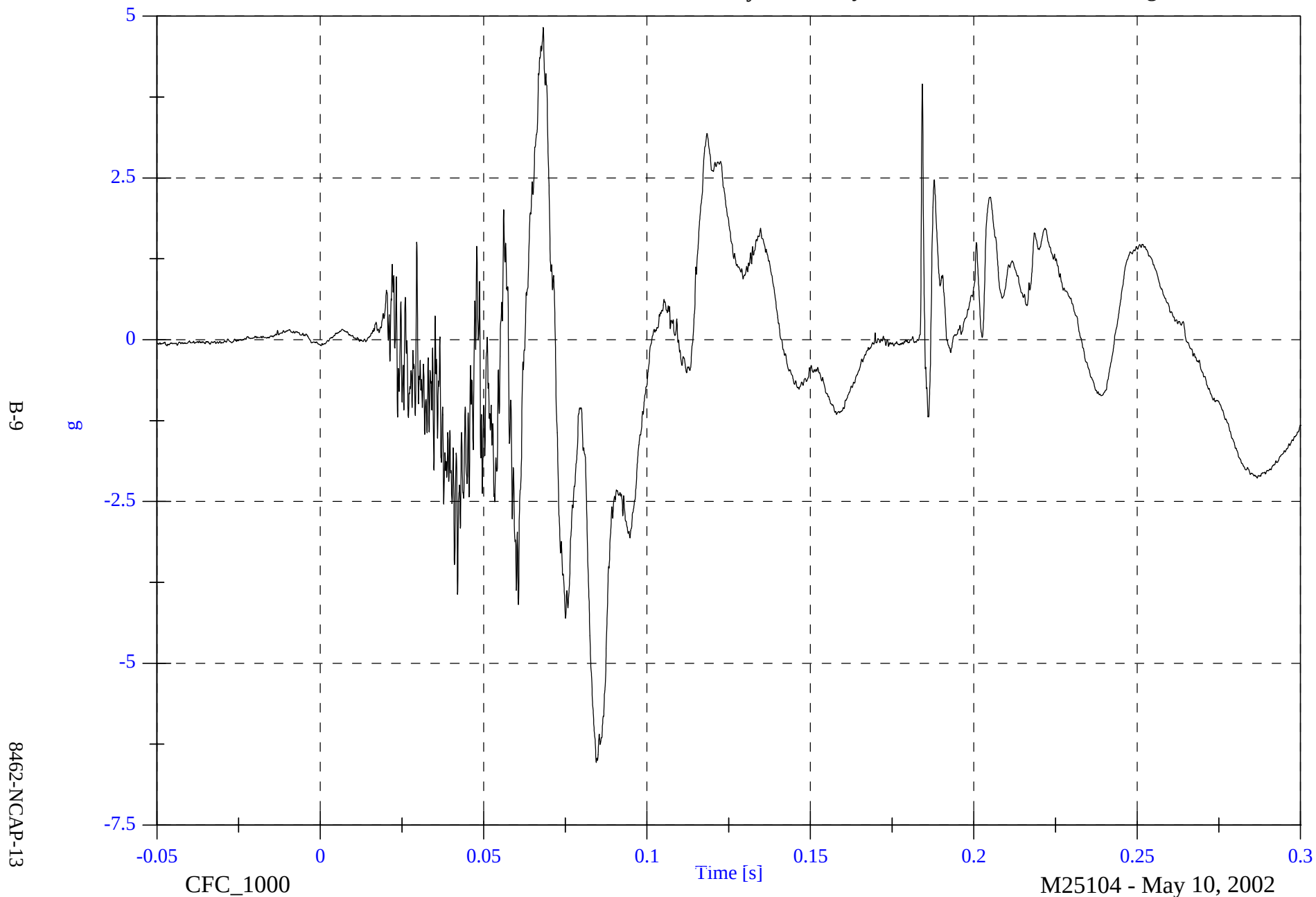


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Head 9 Array Z Arm Ay

Max: 4.8 [g] at 0.068 [s]

Min: -6.5 [g] at 0.084 [s]

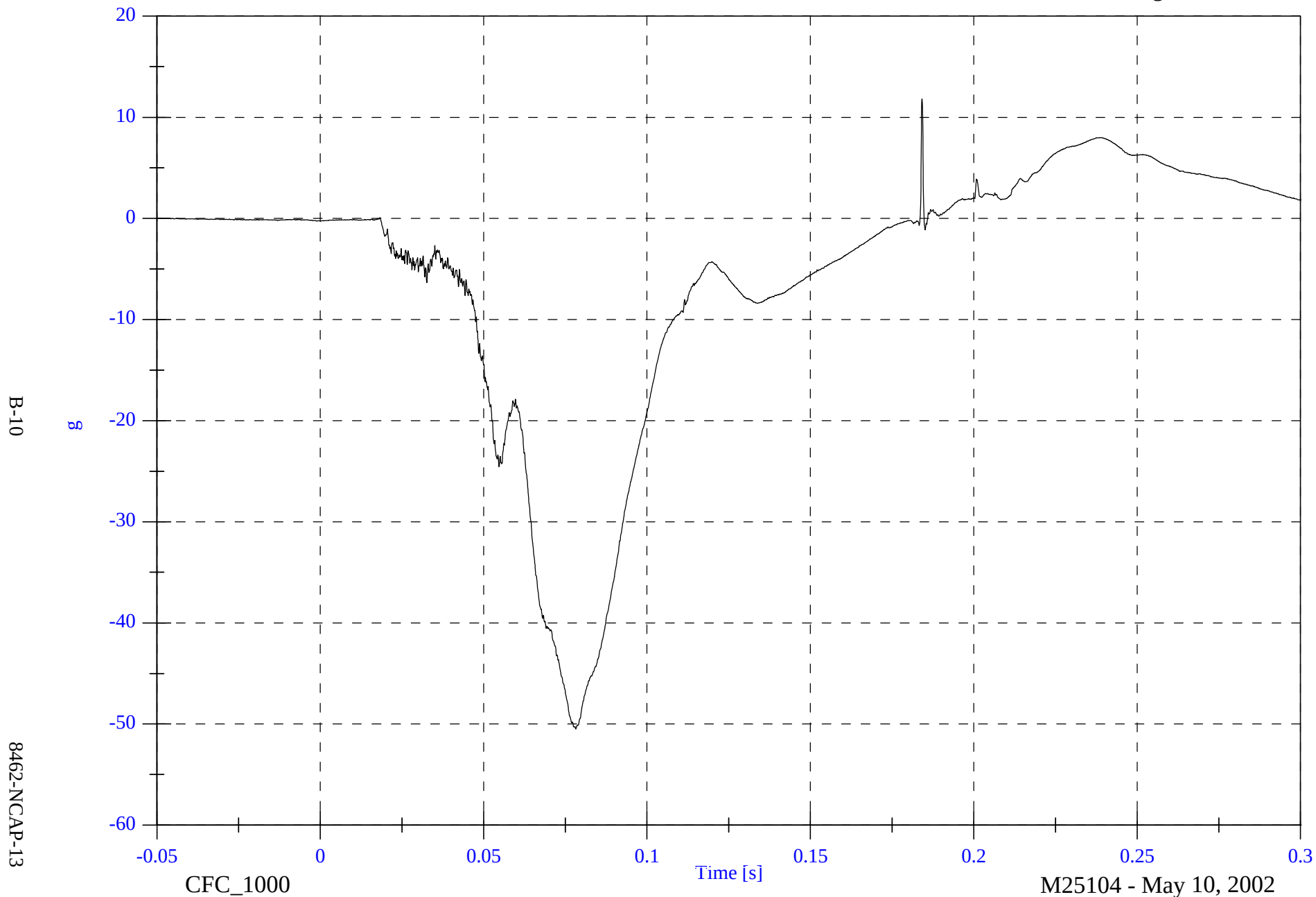


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Head CG x

Max: 11.8 [g] at 0.184 [s]

Min: -50.5 [g] at 0.078 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

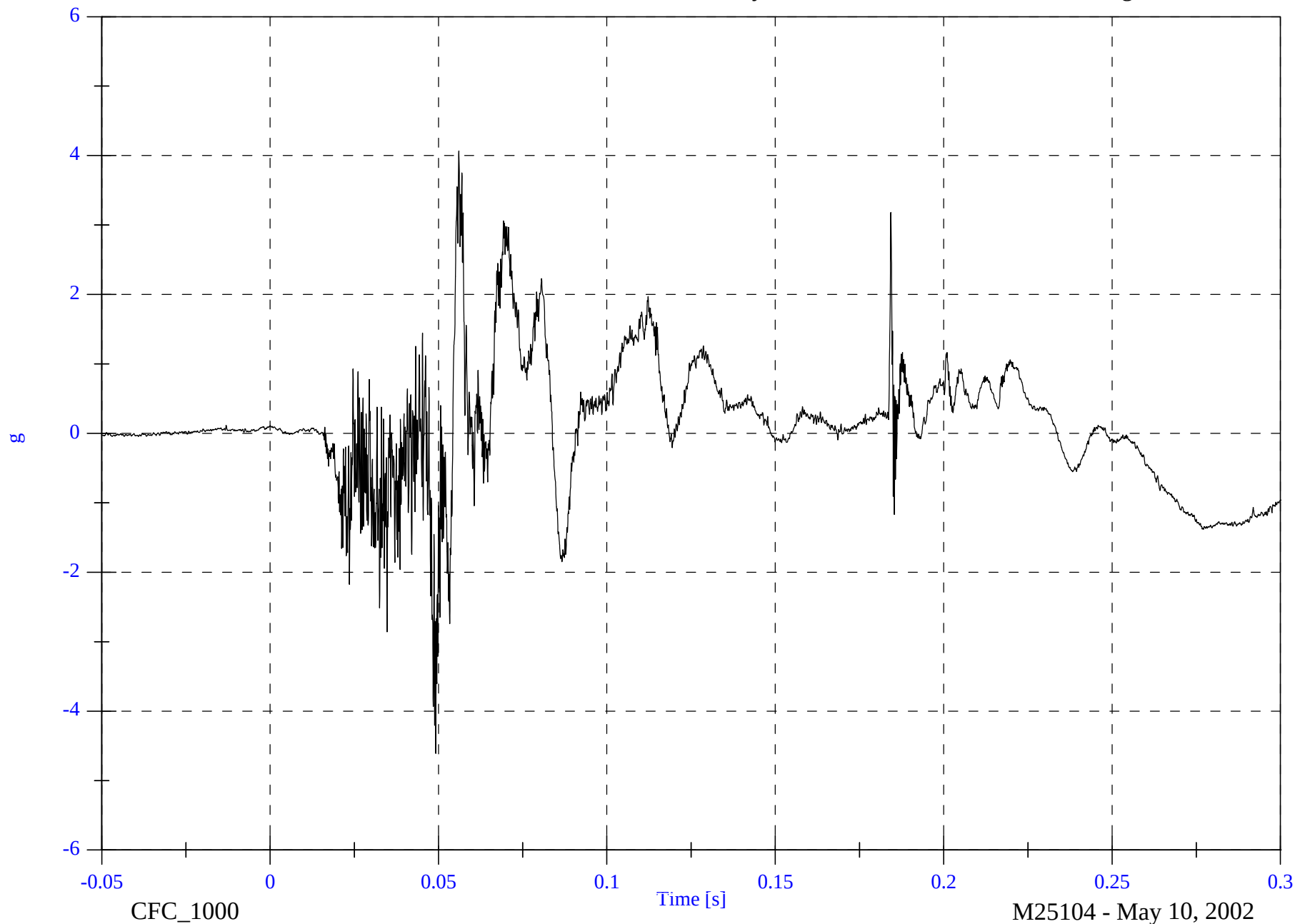
P1 Head CG y

Max: 4.1 [g] at 0.056 [s]

Min: -4.6 [g] at 0.049 [s]

B-11

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

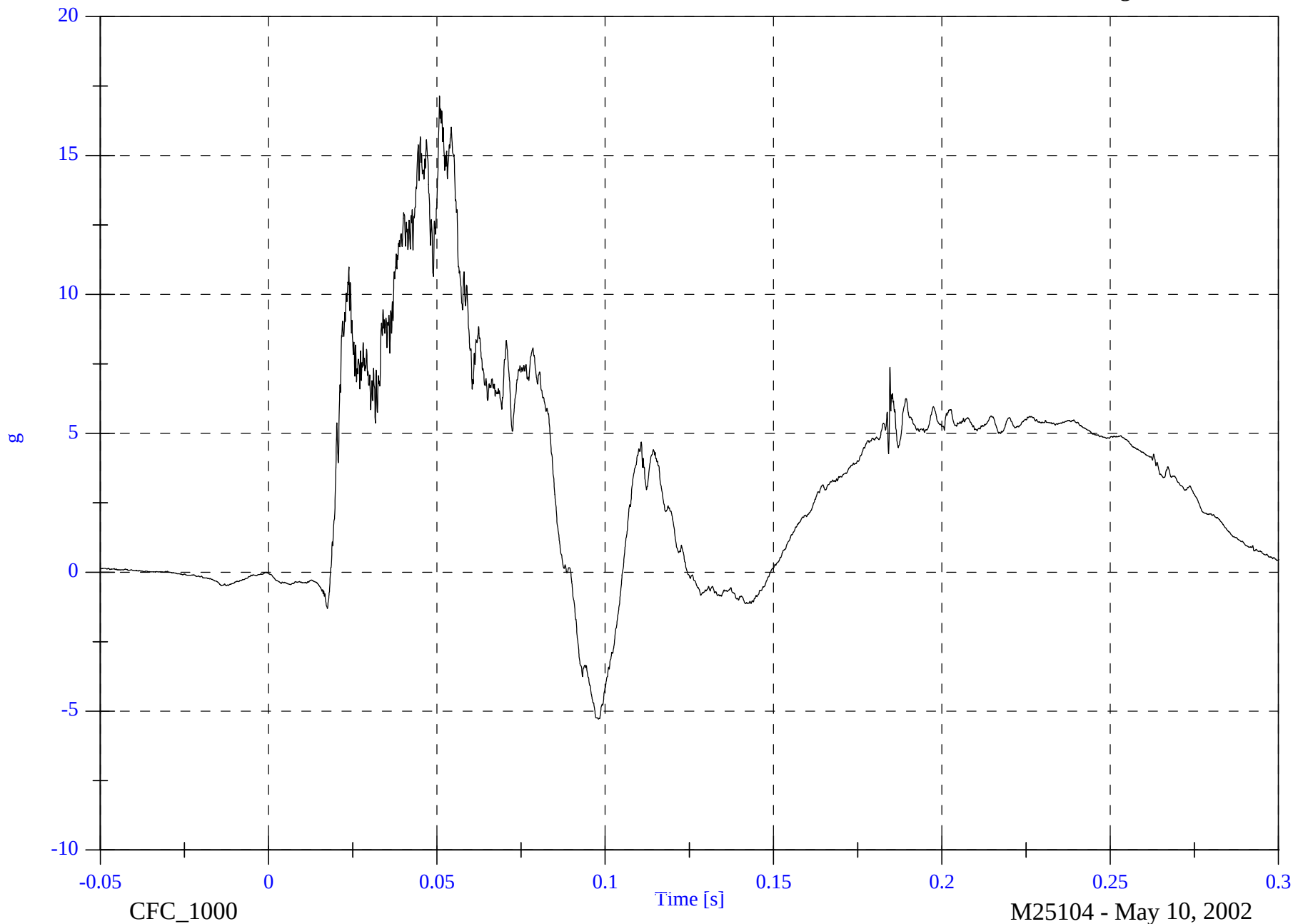
P1 Head CG z

Max: 17.1 [g] at 0.051 [s]

Min: -5.3 [g] at 0.098 [s]

B-12

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

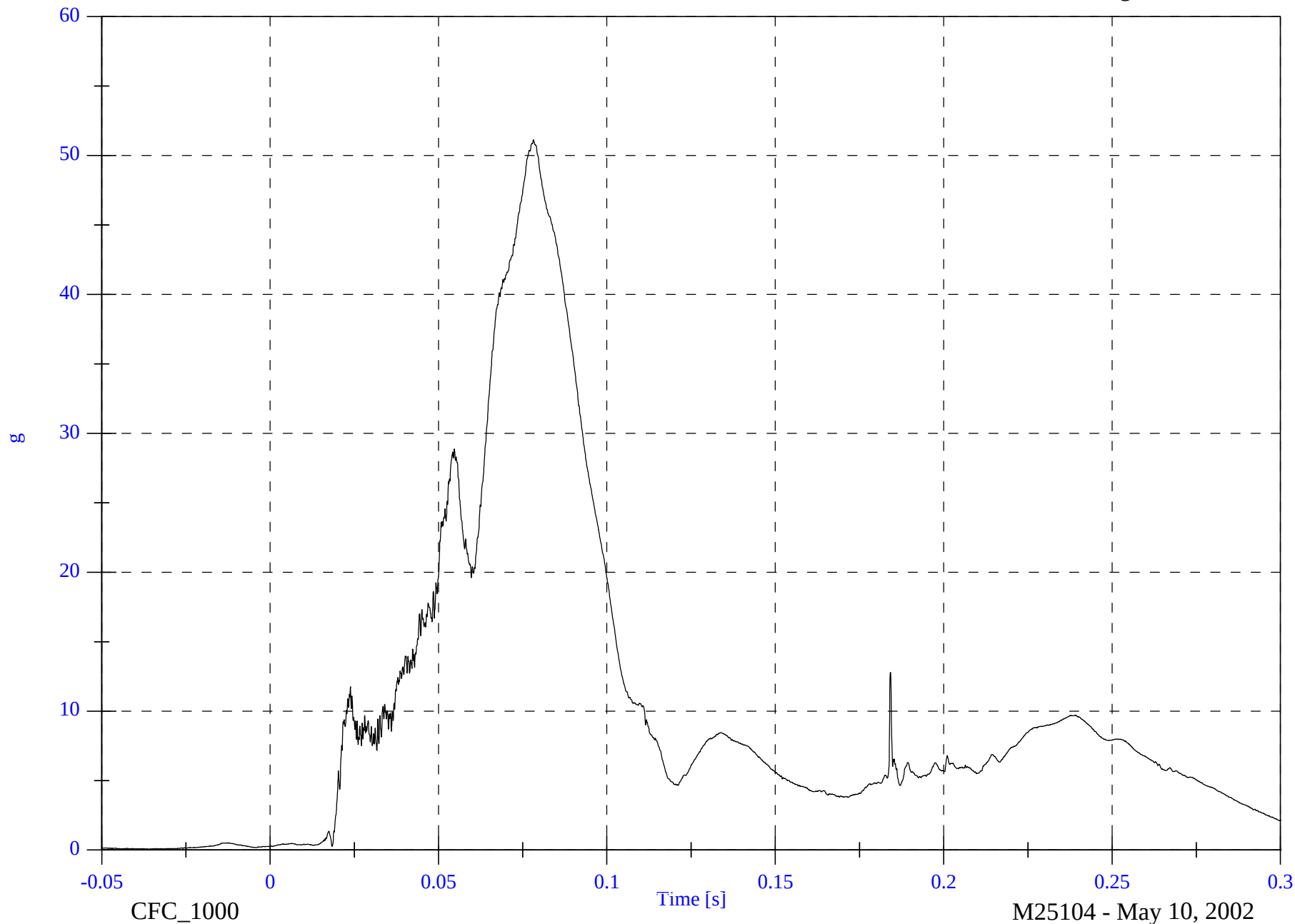
P1 Head CG Resultant

Max: 51.1 [g] at 0.078 [s]

Min: 0.1 [g] at -0.038 [s]

B-13

8462-NCAP-13

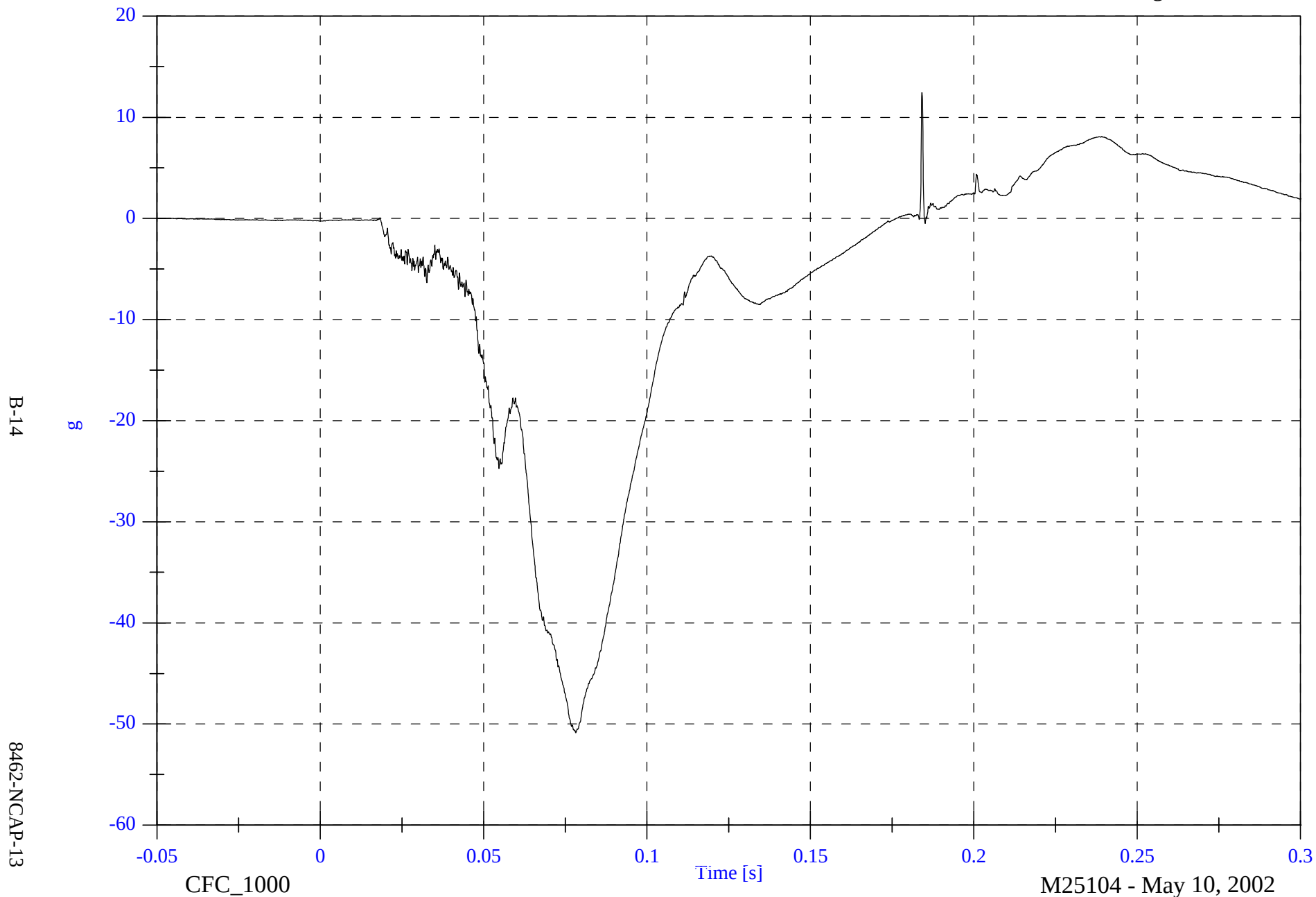


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Head CG Red x

Max: 12.4 [g] at 0.184 [s]

Min: -50.9 [g] at 0.078 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

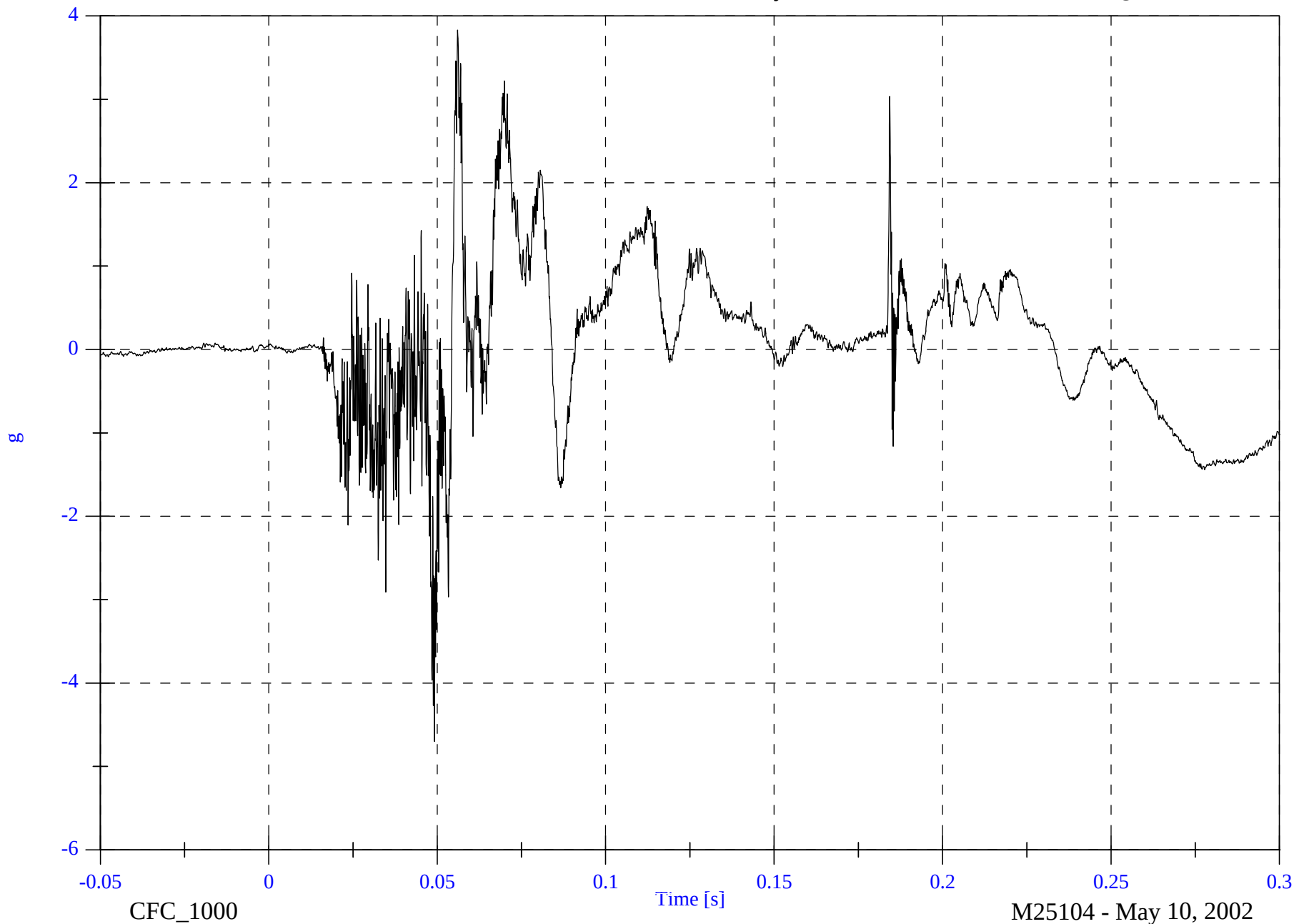
P1 Head CG Red y

Max: 3.8 [g] at 0.056 [s]

Min: -4.7 [g] at 0.049 [s]

B-15

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

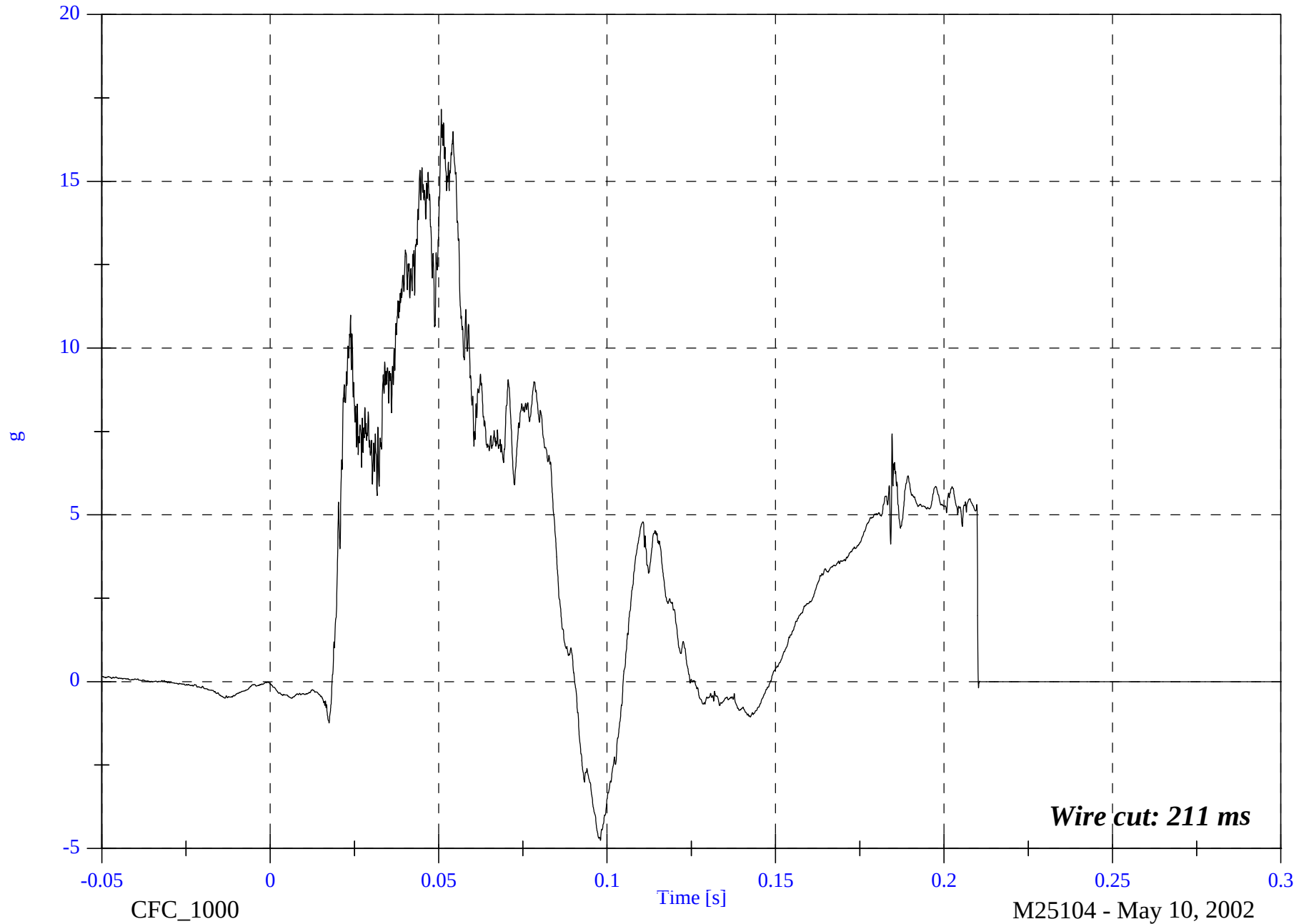
P1 Head CG Red z

Max: 17.2 [g] at 0.051 [s]

Min: -4.8 [g] at 0.098 [s]

B-16

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

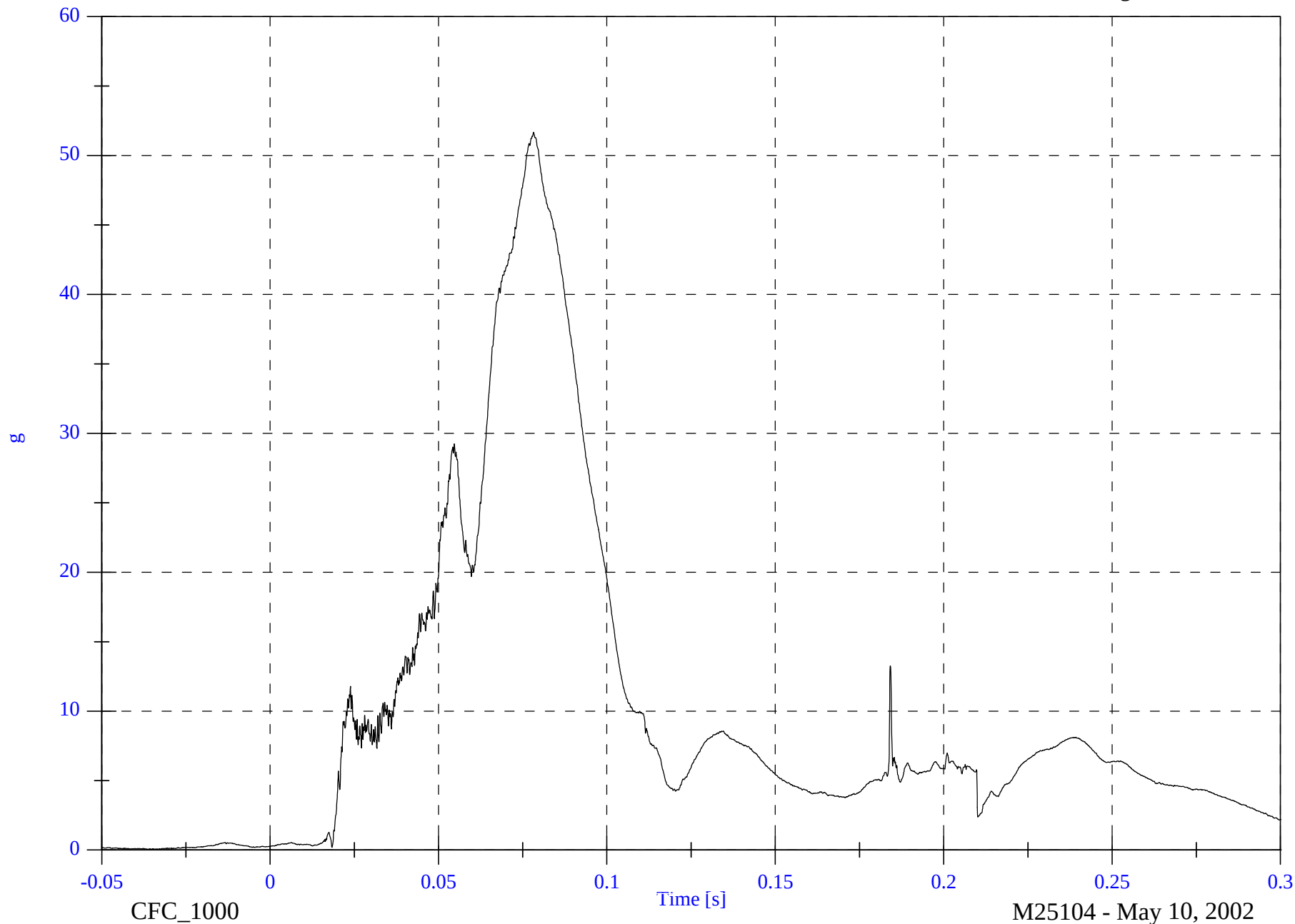
P1 Head CG Red Resultant

Max: 51.7 [g] at 0.078 [s]

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

B-17

8462-NCAP-13

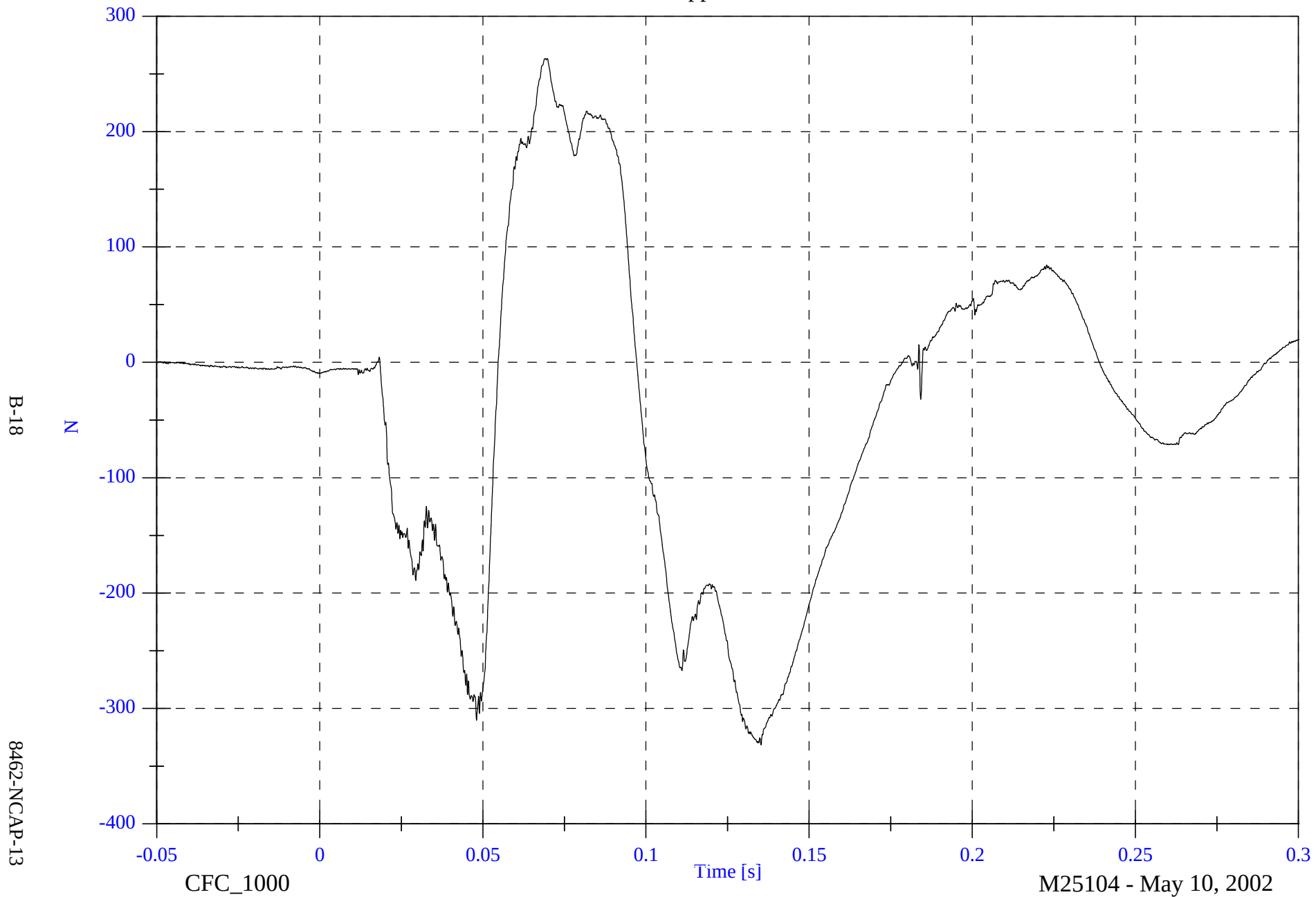


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Upper Neck Fx

Max: 263.3 [N] at 0.069 [s]

Min: -331.7 [N] at 0.135 [s]

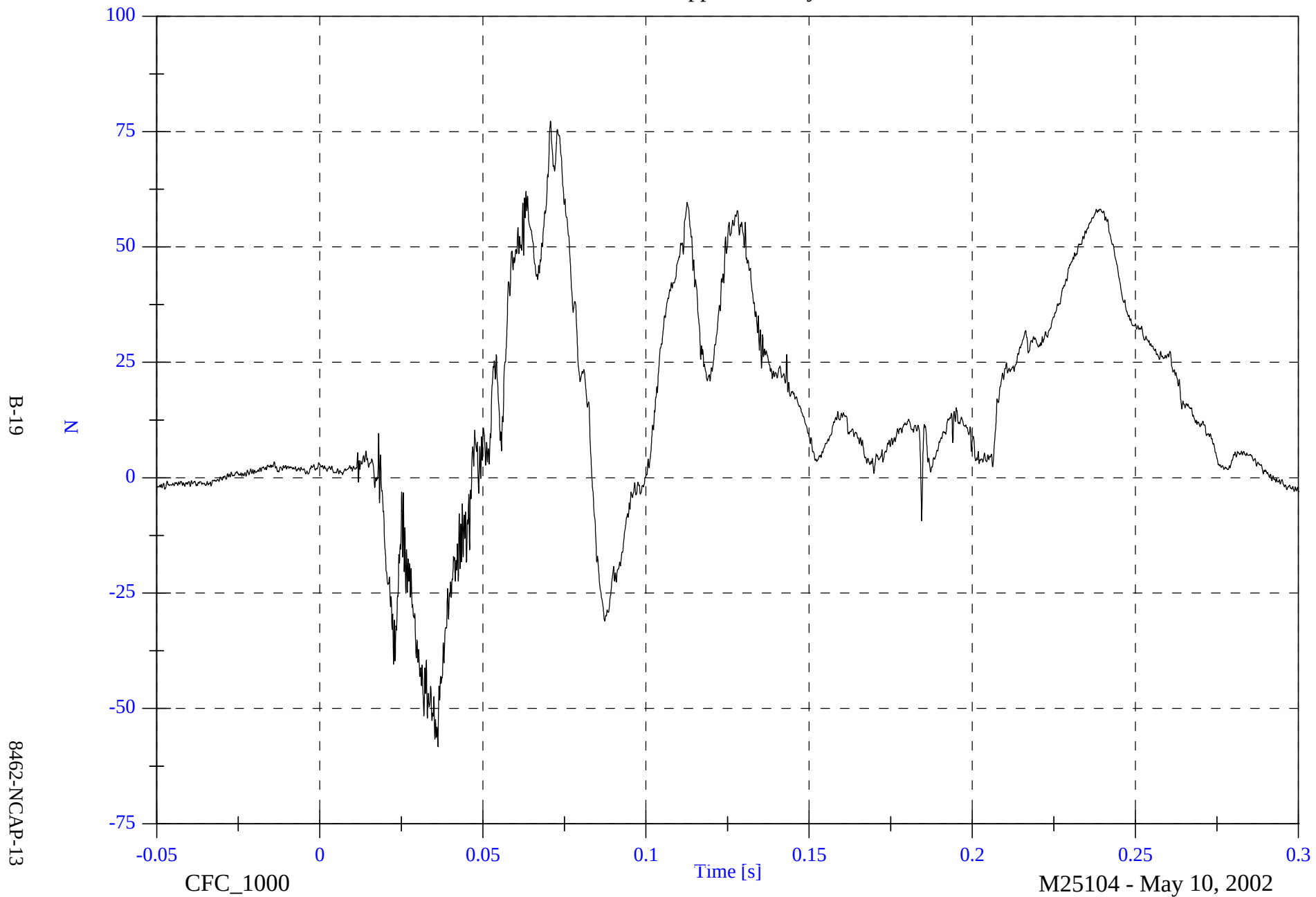


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Upper Neck Fy

Max: 77.3 [N] at 0.071 [s]

Min: -58.3 [N] at 0.036 [s]

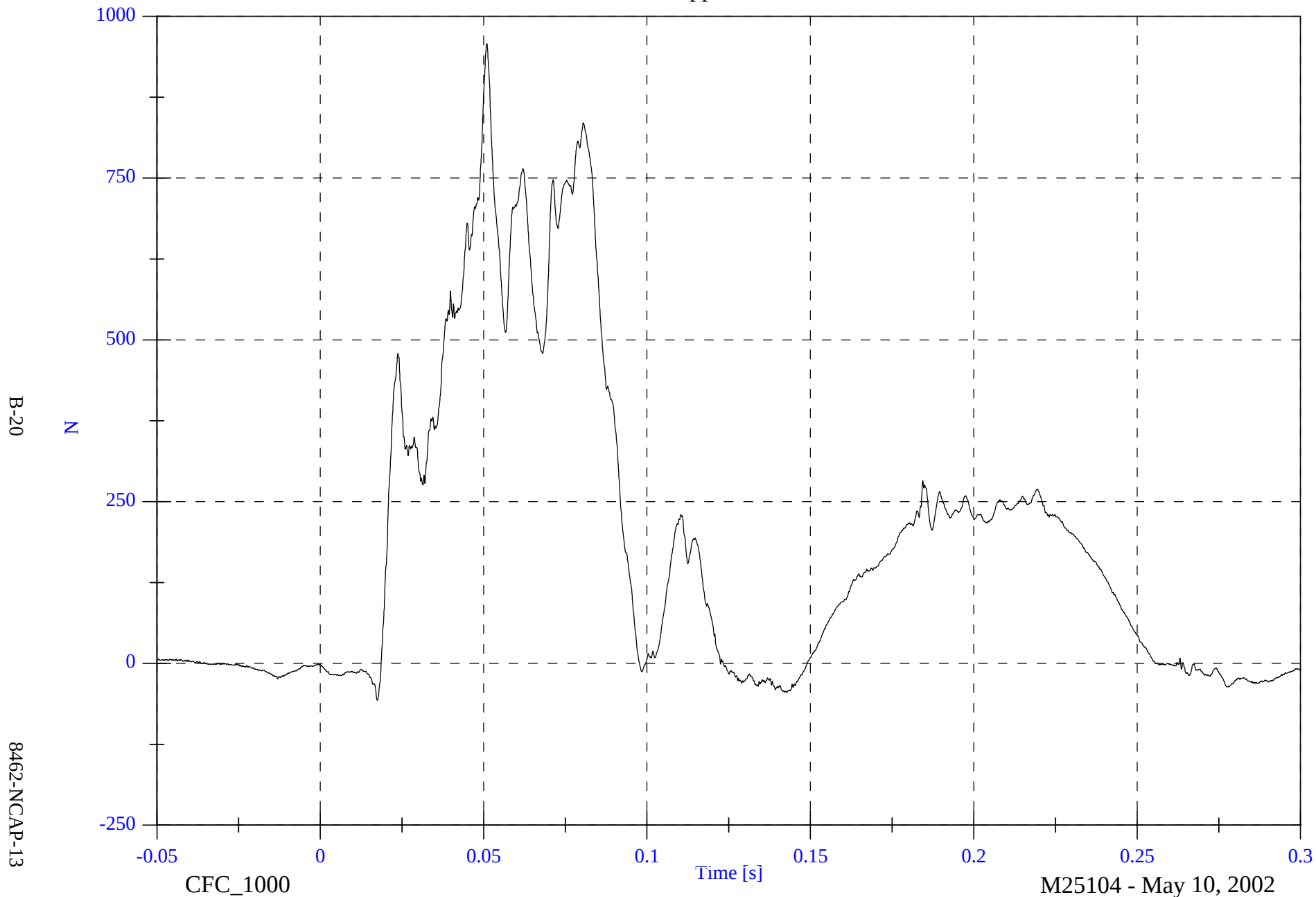


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Upper Neck Fz

Max: 957.6 [N] at 0.051 [s]

Min: -57.1 [N] at 0.017 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

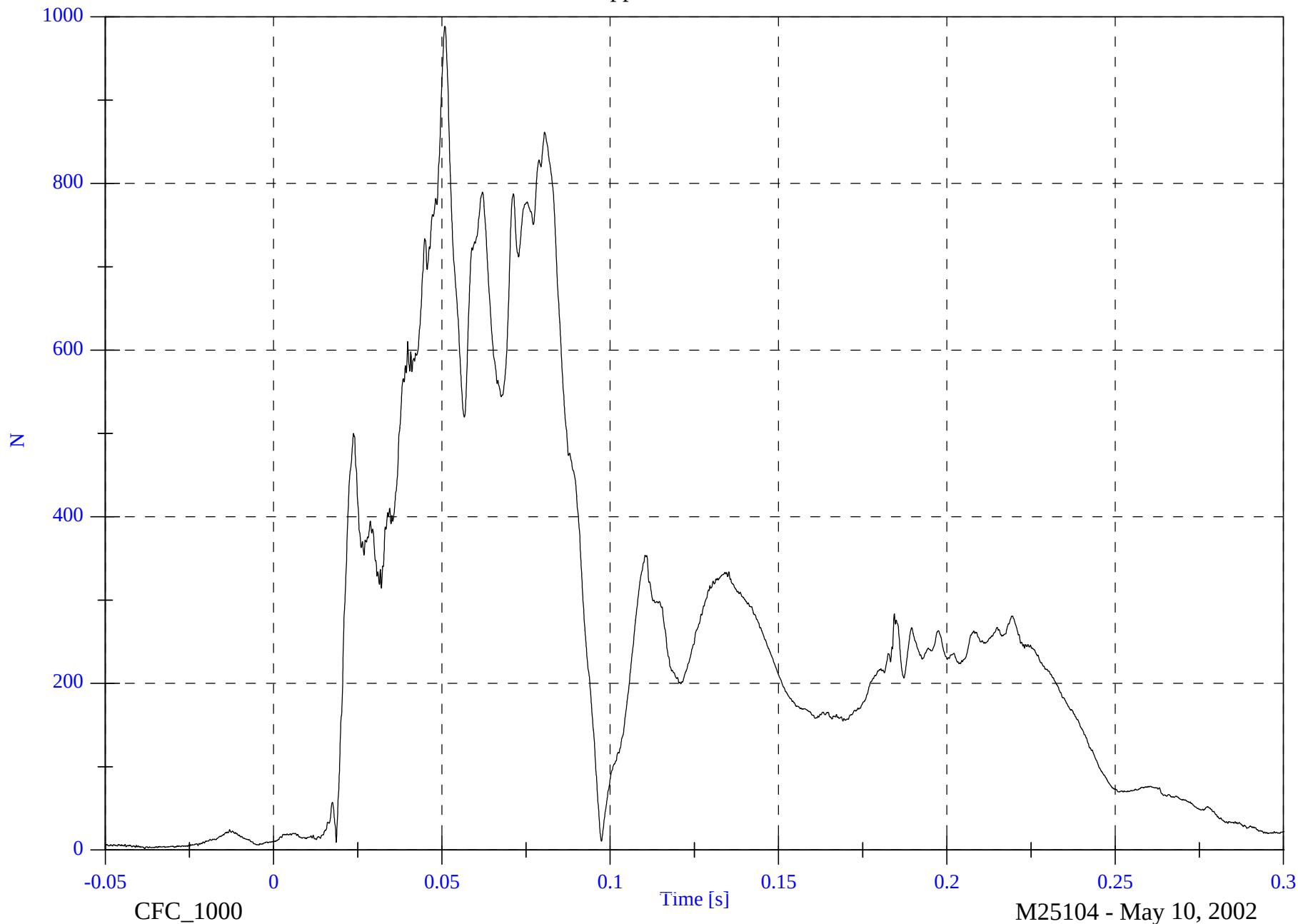
P1 Upper Neck F Resultant

Max: 988.5 [N] at 0.051 [s]

Min: 1.7 [N] at -0.038 [s]

B-21

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

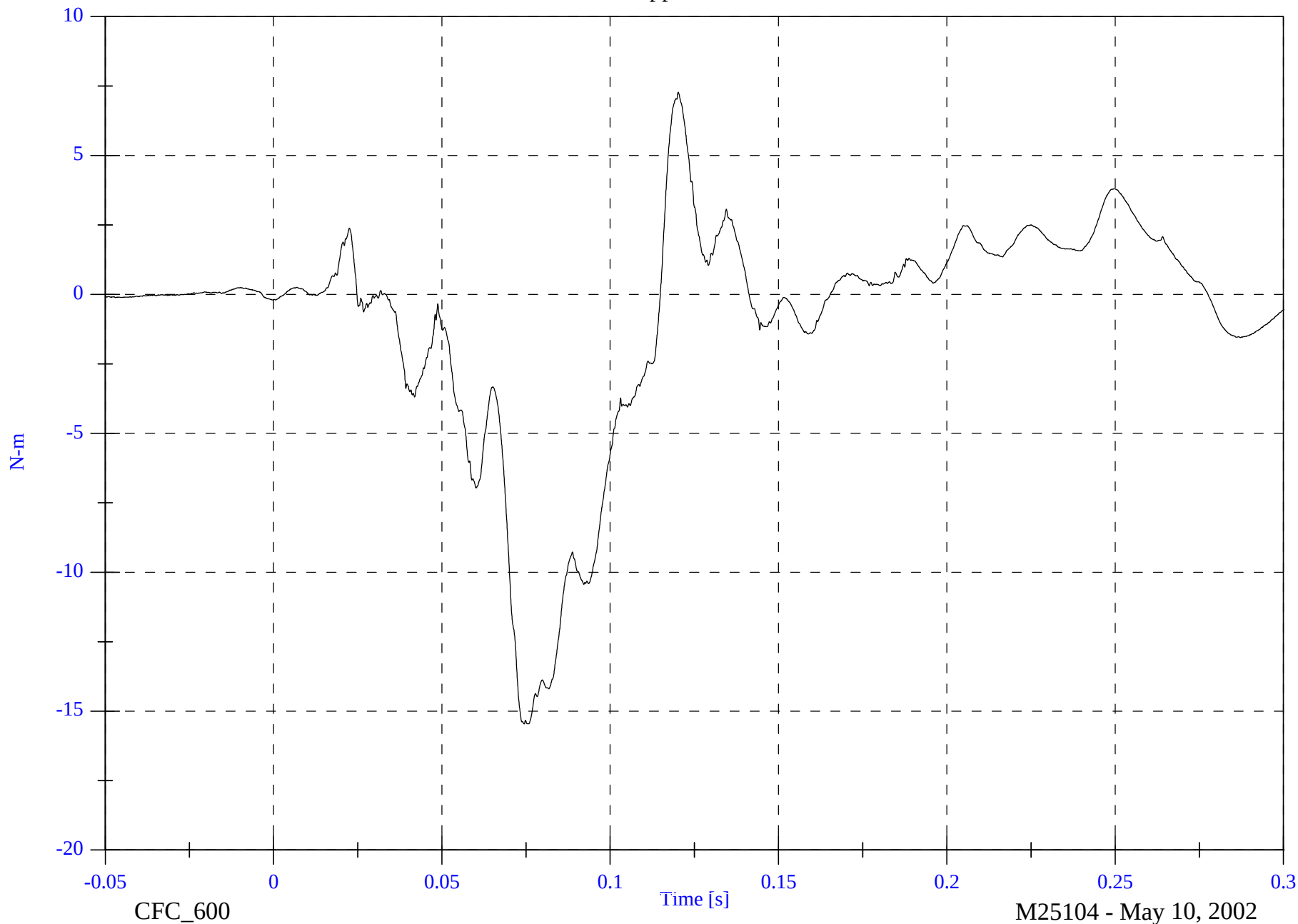
P1 Upper Neck Mx

Max: 7.3 [N-m] at 0.120 [s]

Min: -15.5 [N-m] at 0.074 [s]

B-22

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

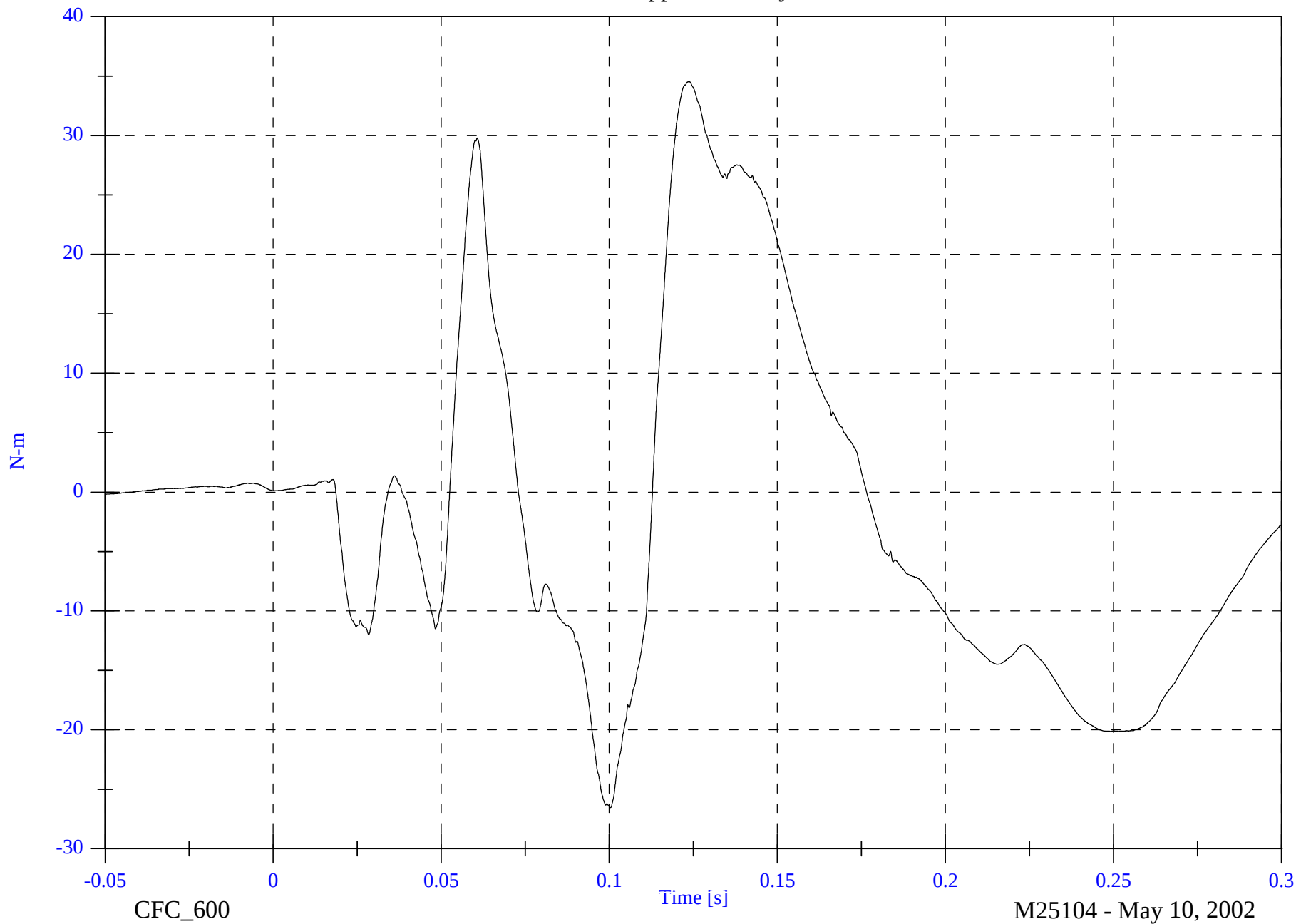
P1 Upper Neck My

Max: 34.6 [N-m] at 0.124 [s]

Min: -26.5 [N-m] at 0.100 [s]

B-23

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

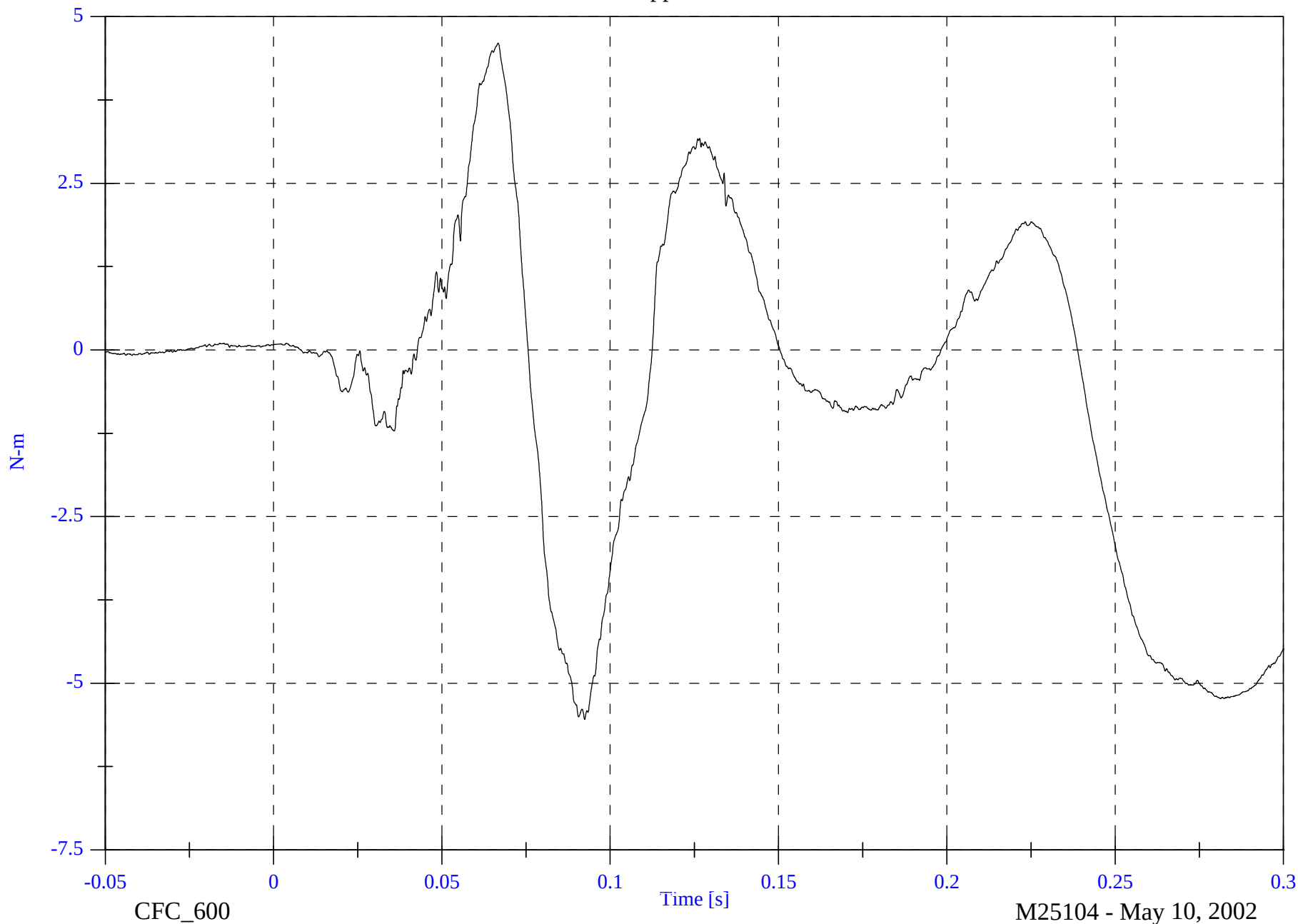
P1 Upper Neck Mz

Max: 4.6 [N-m] at 0.067 [s]

Min: -5.5 [N-m] at 0.092 [s]

B-24

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

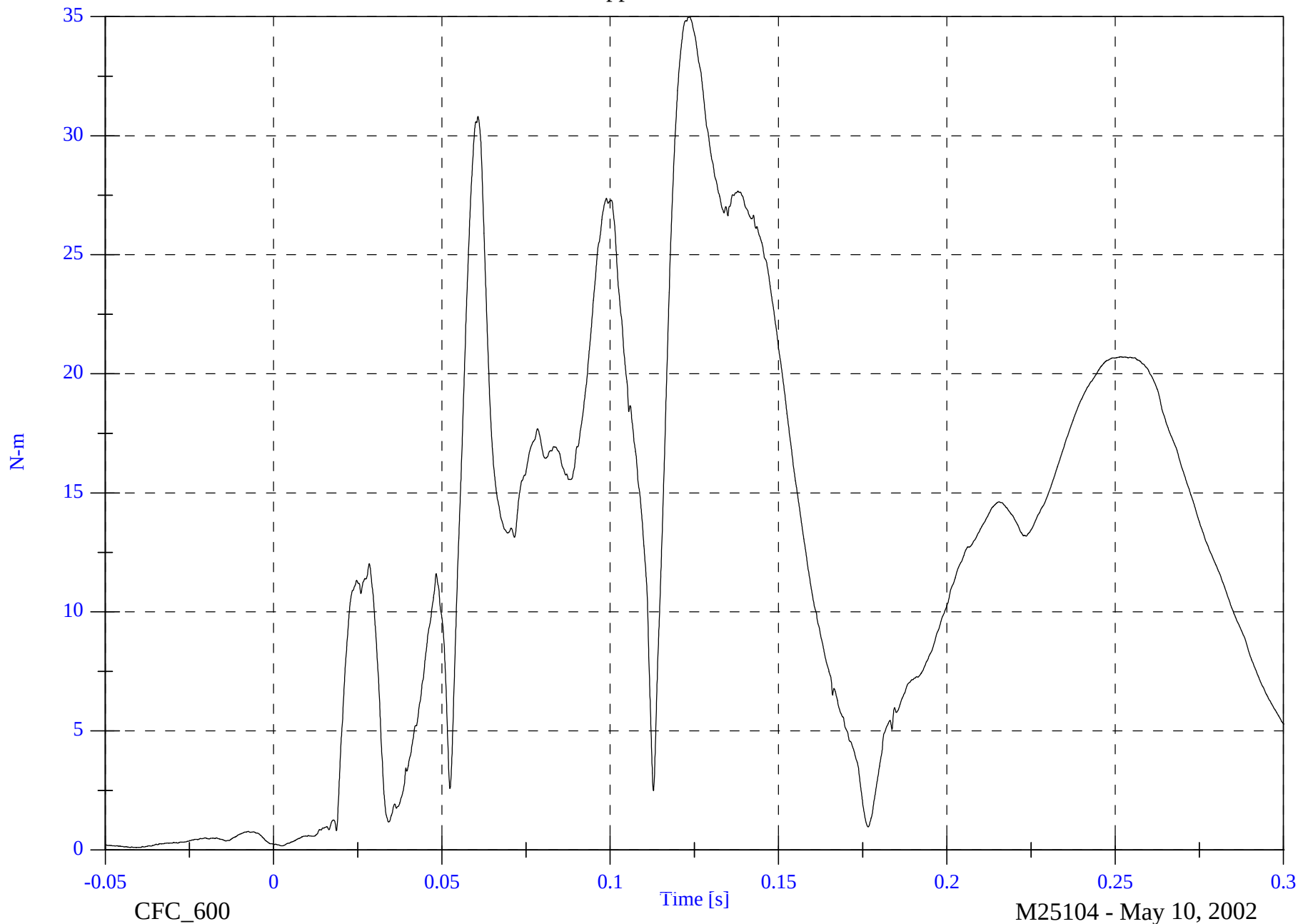
P1 Upper Neck M Resultant

Max: 35.0 [N-m] at 0.124 [s]

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

B-25

8462-NCAP-13

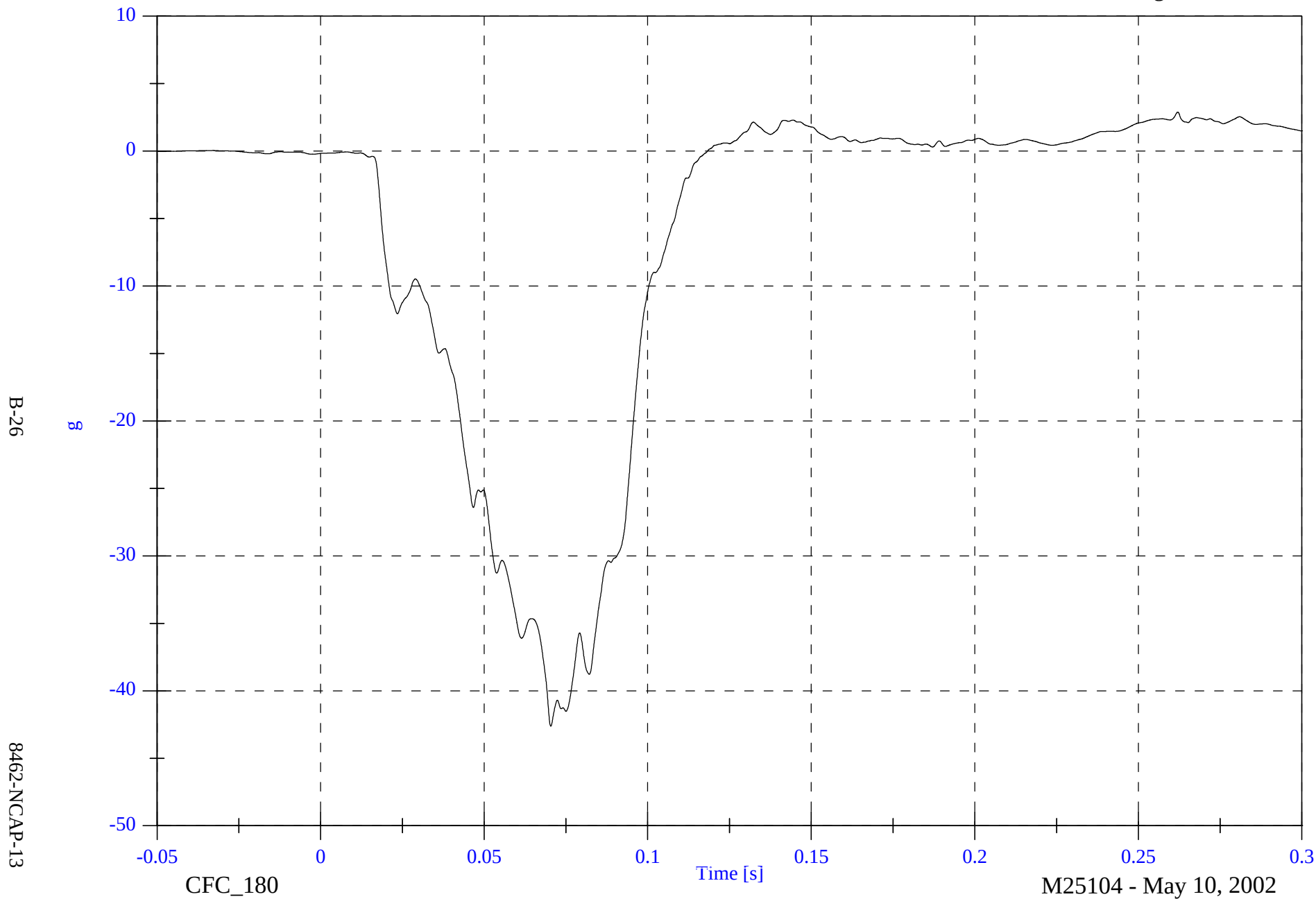


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 2.9 [g] at 0.262 [s]

Min: -42.6 [g] at 0.070 [s]

P1 Chest x



2002 NCAP Test 13 - 2002 Toyota Camry

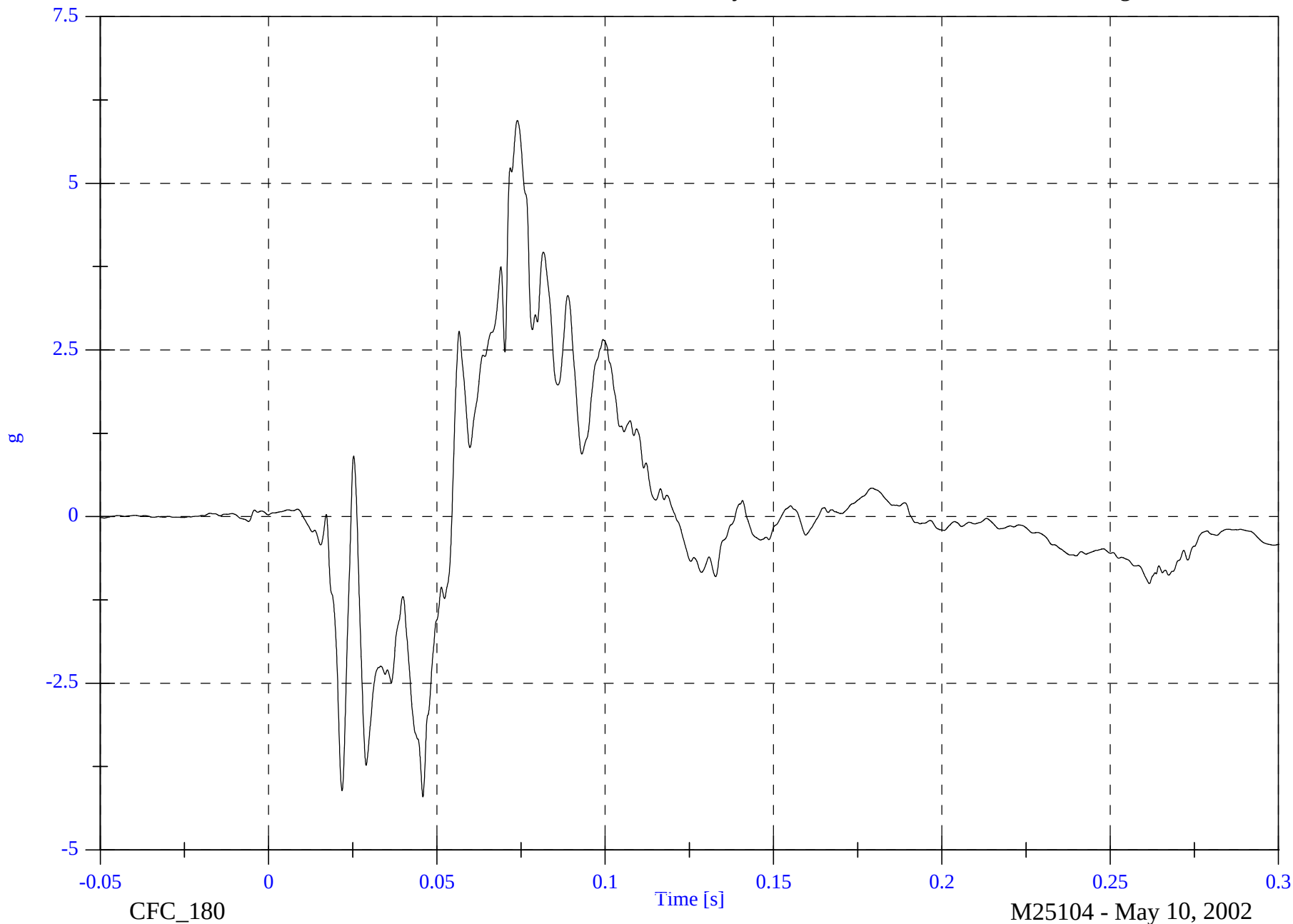
P1 Chest y

Max: 5.9 [g] at 0.074 [s]

Min: -4.2 [g] at 0.046 [s]

B-27

8462-NCAP-13

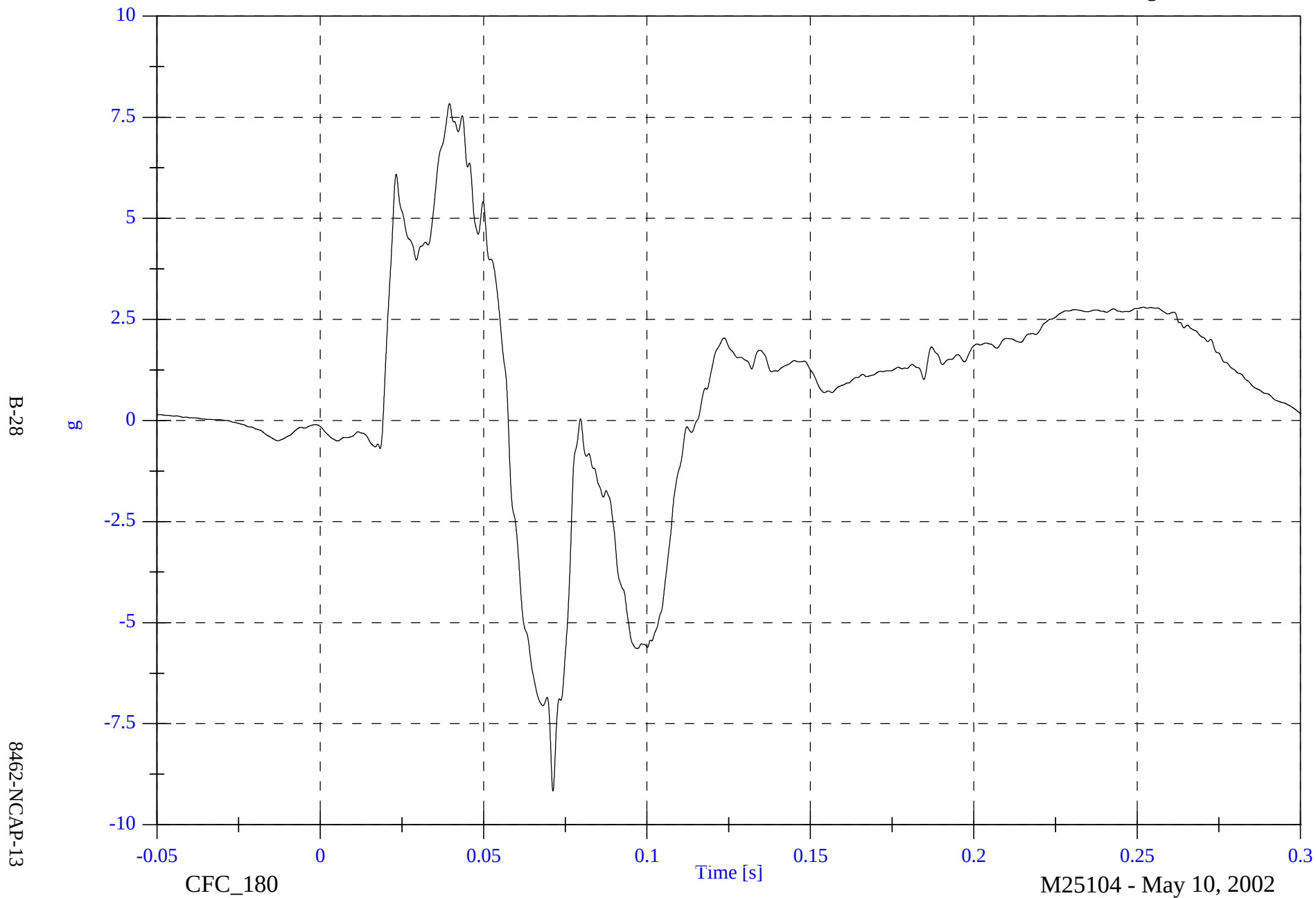


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Chest z

Max: 7.8 [g] at 0.040 [s]

Min: -9.2 [g] at 0.071 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

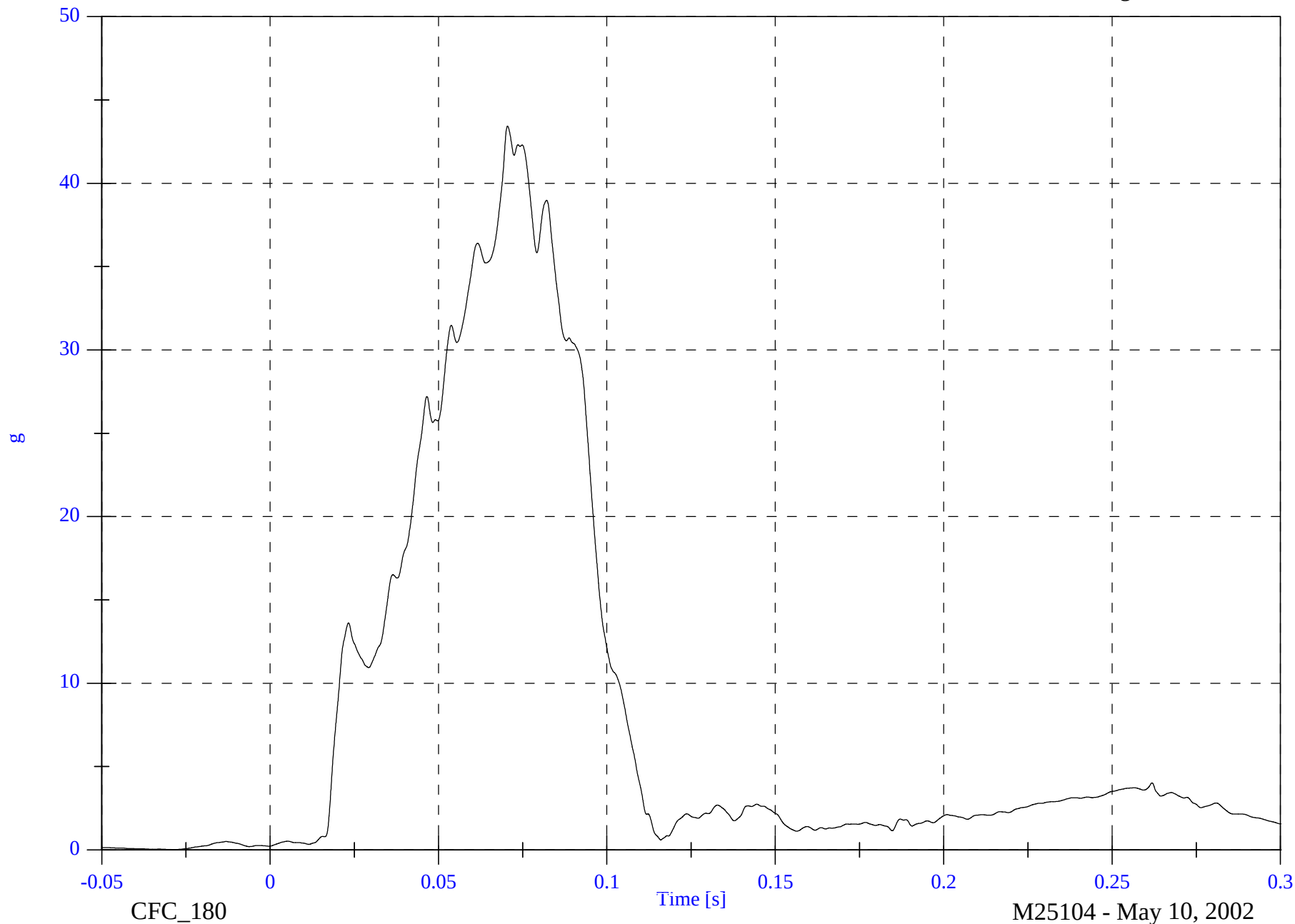
P1 Chest Resultant

Max: 43.4 [g] at 0.071 [s]

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

B-29

8462-NCAP-13

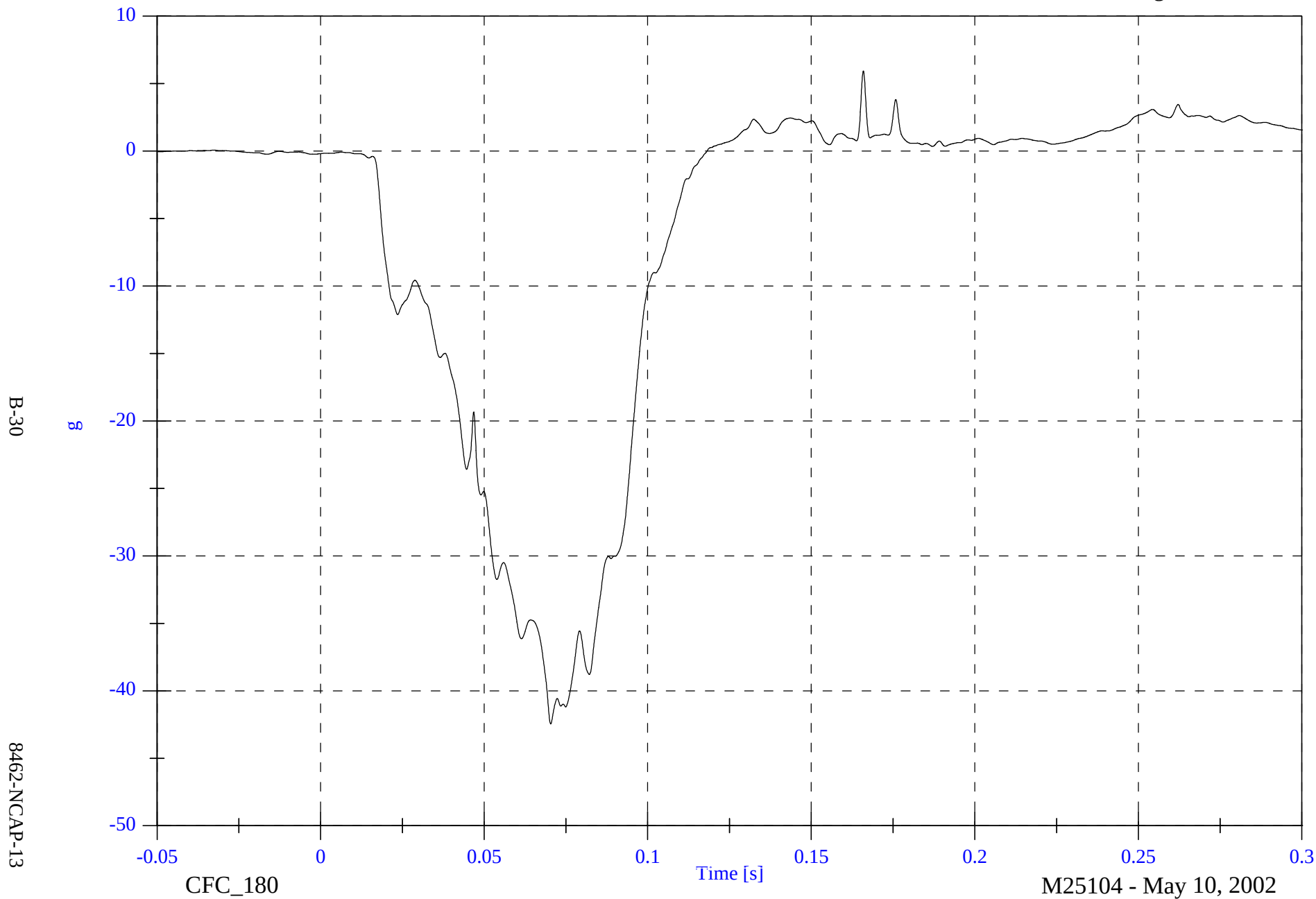


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Chest Red x

Max: 5.9 [g] at 0.166 [s]

Min: -42.5 [g] at 0.070 [s]

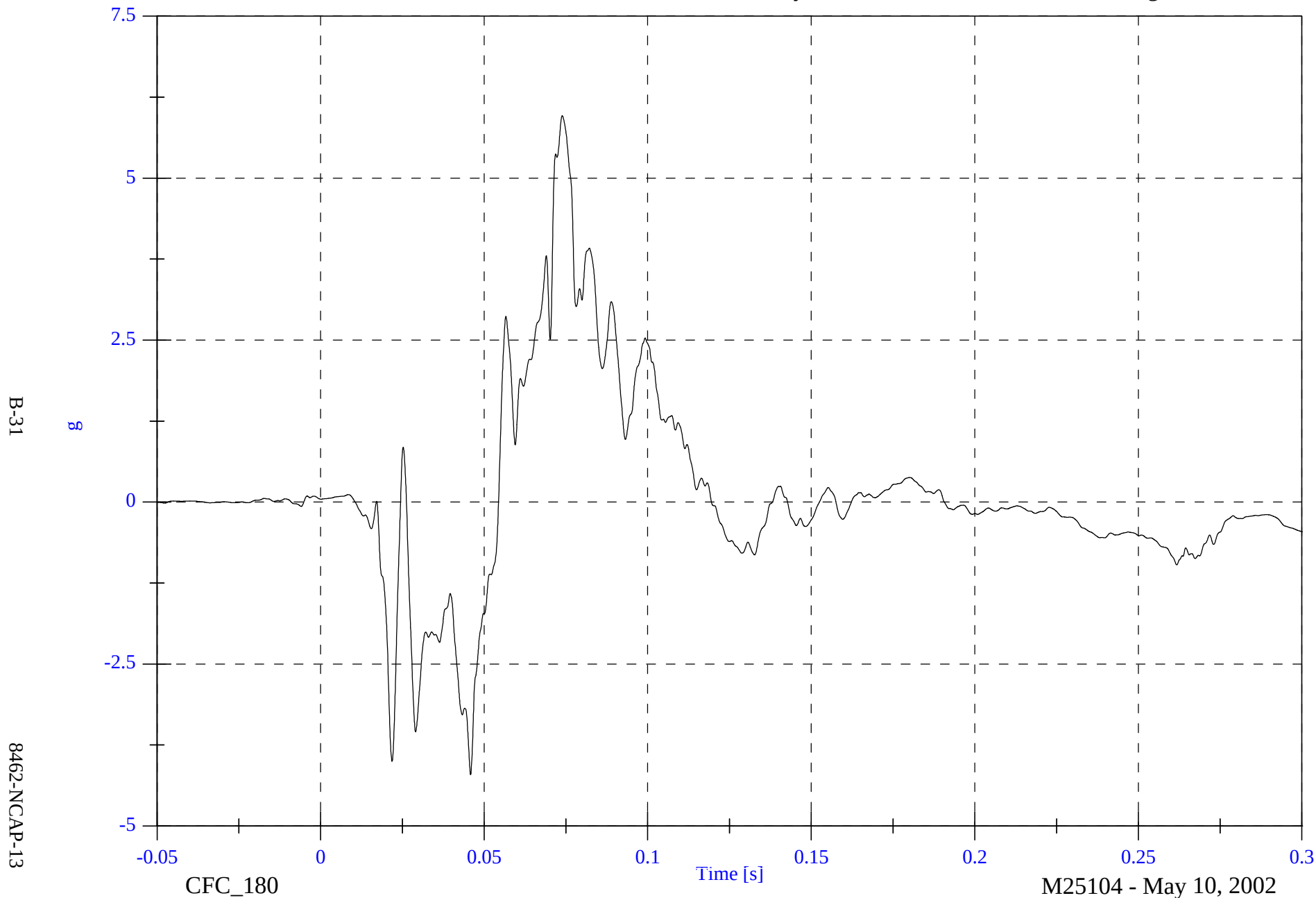


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 6.0 [g] at 0.074 [s]

Min: -4.2 [g] at 0.046 [s]

P1 Chest Red y

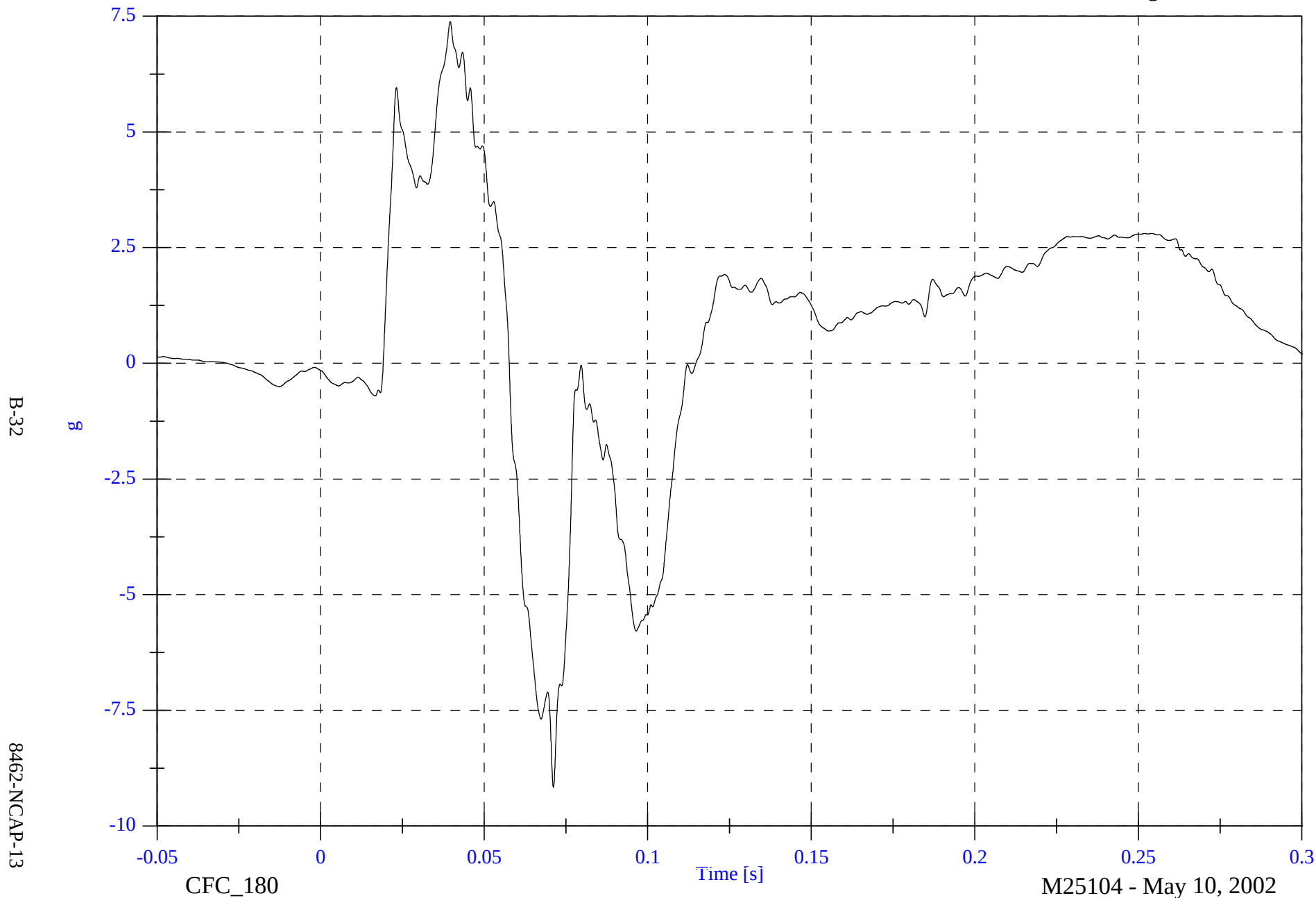


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Chest Red z

Max: 7.4 [g] at 0.040 [s]

Min: -9.2 [g] at 0.071 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

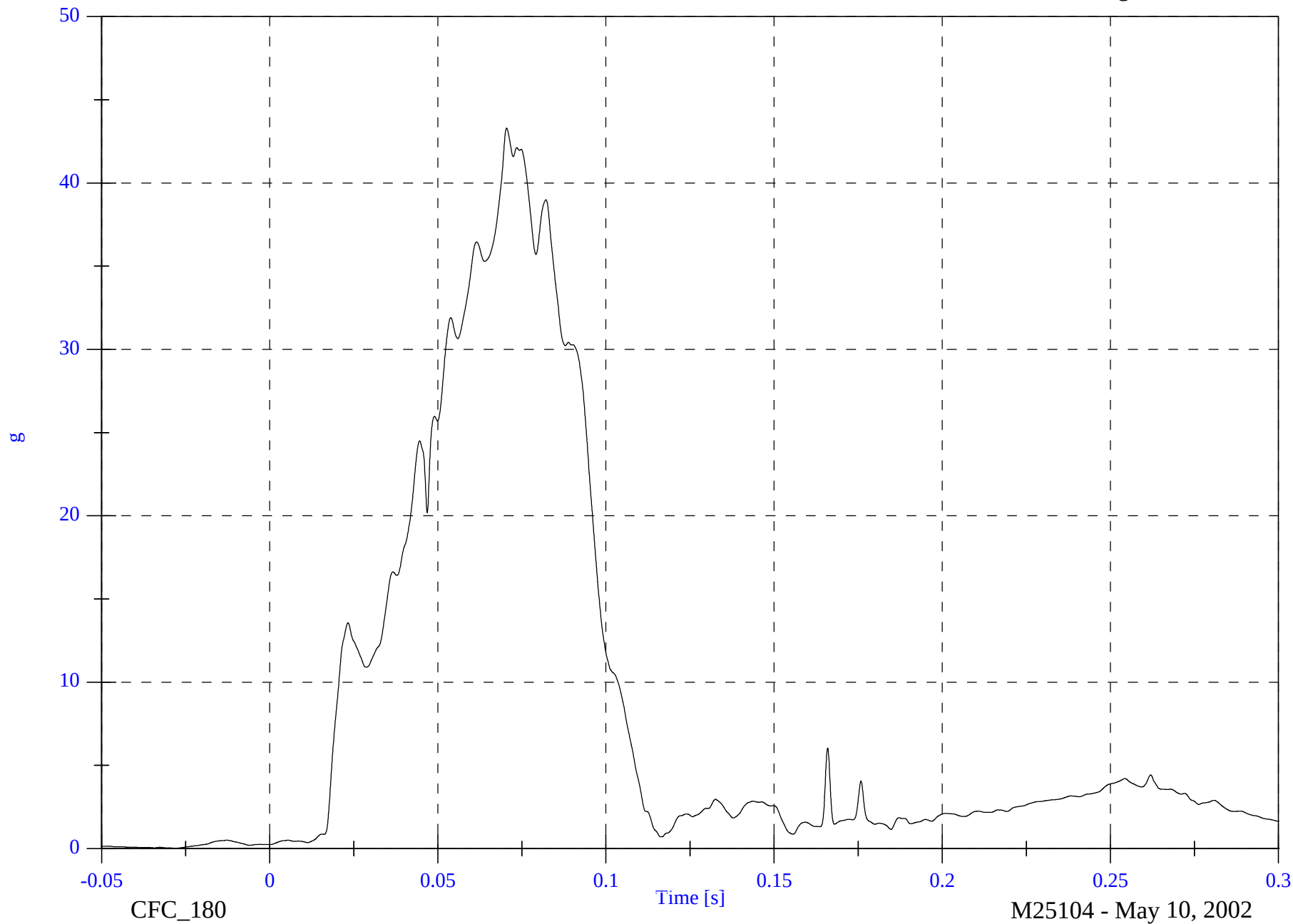
P1 Chest Red Resultant

Max: 43.3 [g] at 0.070 [s]

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

B-33

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

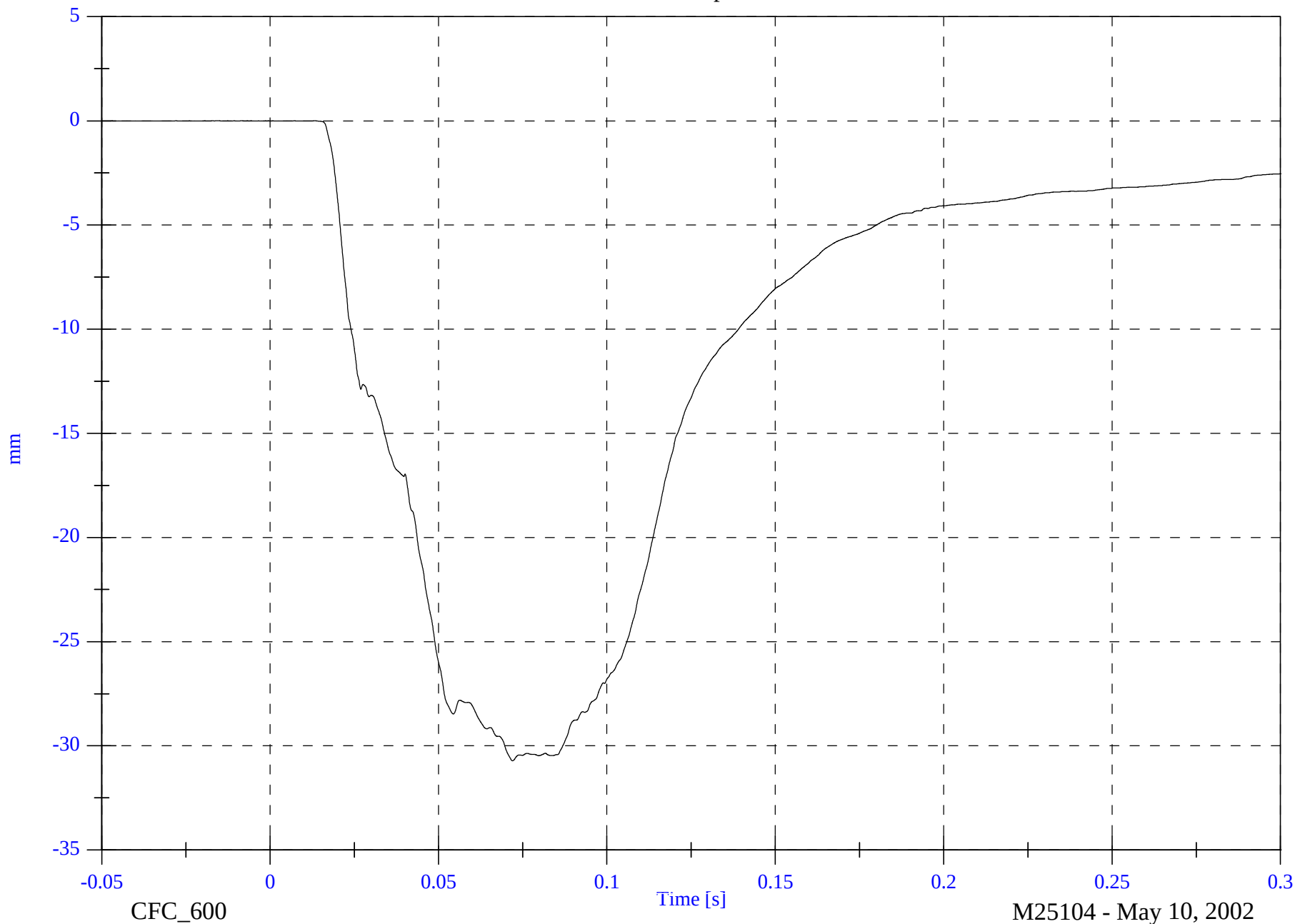
P1 Chest Compression x

Max: 0.0 [mm] at 0.013 [s]

Min: -30.7 [mm] at 0.072 [s]

B-34

8462-NCAP-13

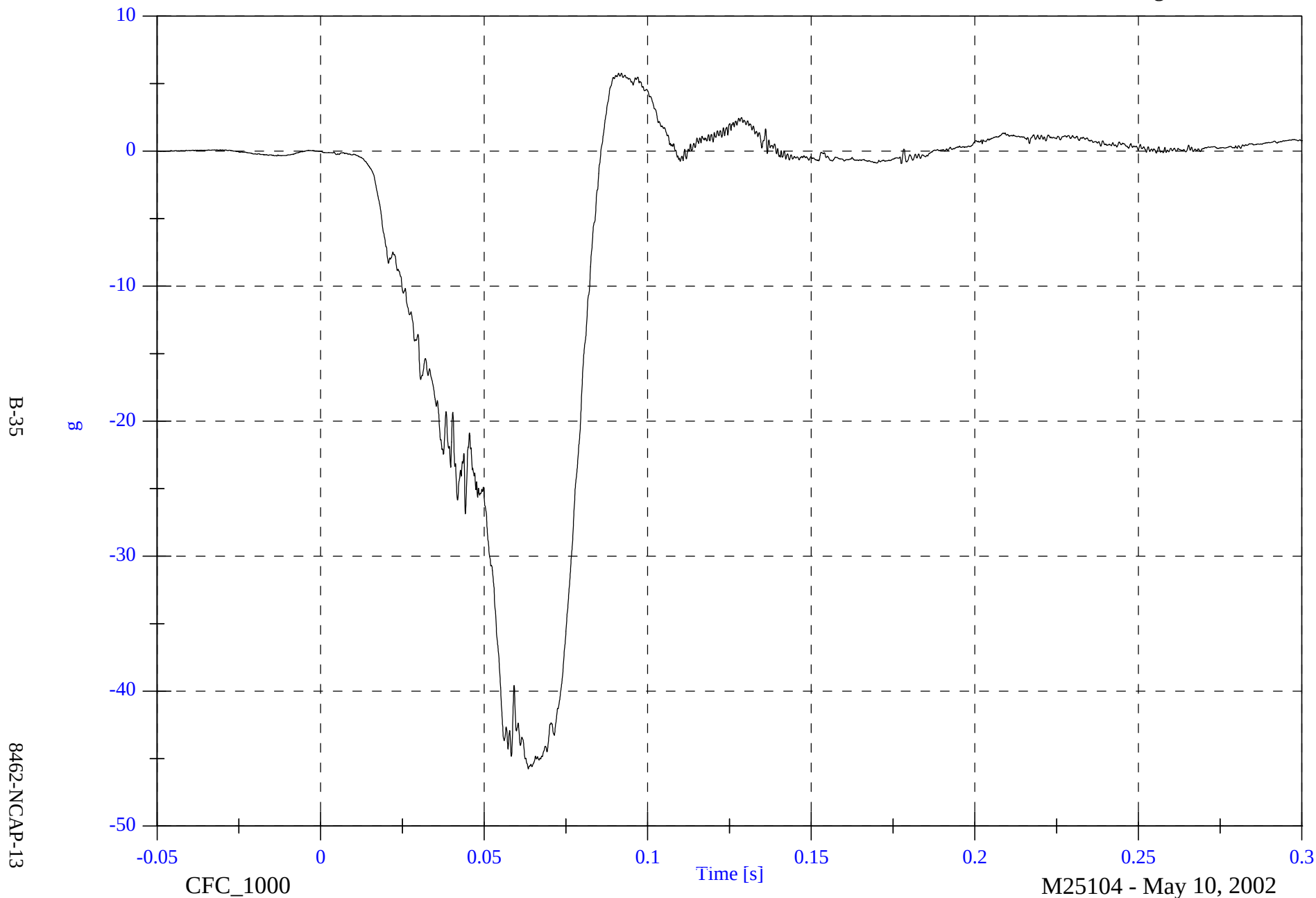


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 5.8 [g] at 0.091 [s]

Min: -45.8 [g] at 0.063 [s]

P1 Pelvic x

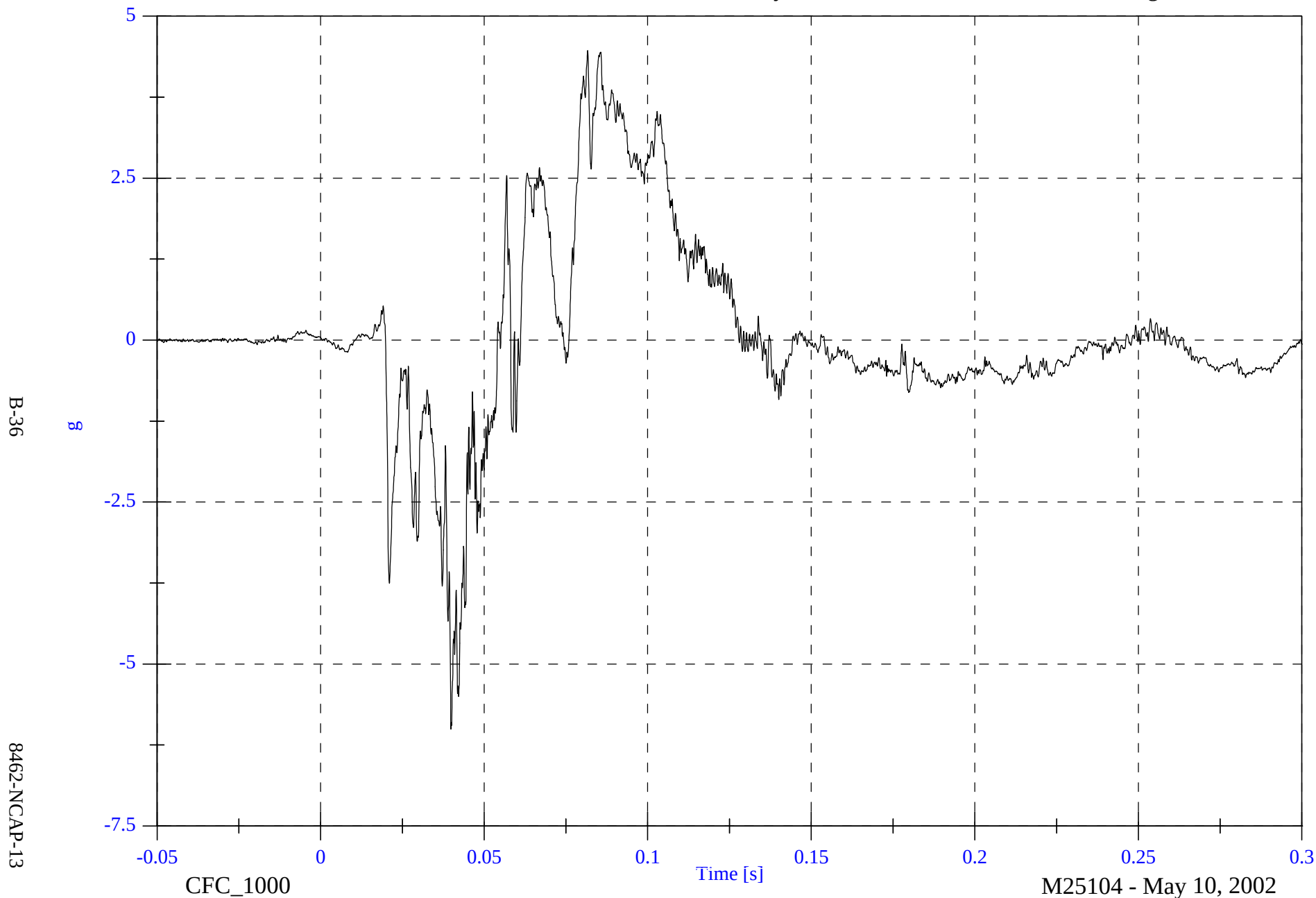


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 4.5 [g] at 0.082 [s]

Min: -6.0 [g] at 0.040 [s]

P1 Pelvic y

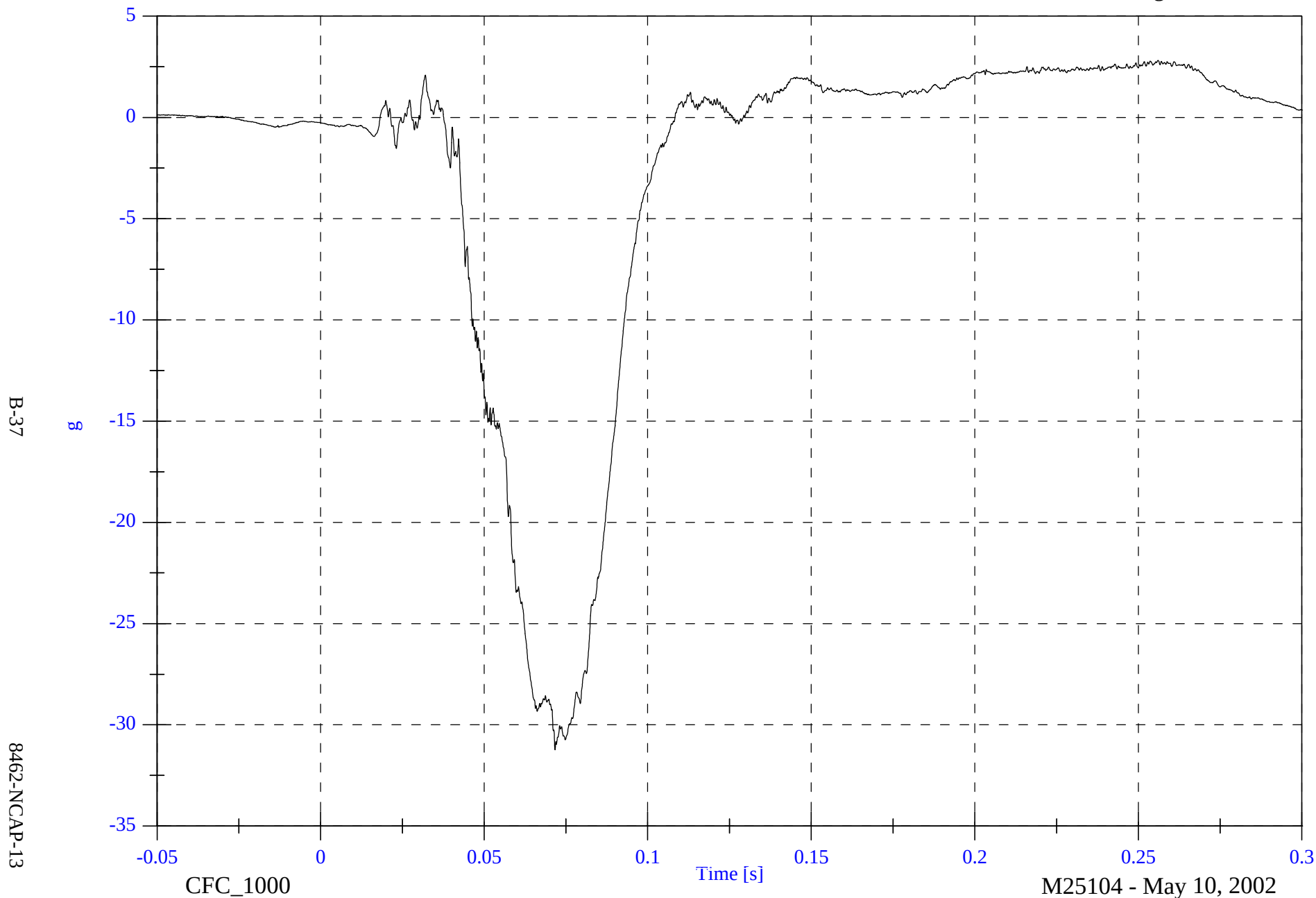


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 2.8 [g] at 0.256 [s]

Min: -31.2 [g] at 0.072 [s]

P1 Pelvic z



2002 NCAP Test 13 - 2002 Toyota Camry

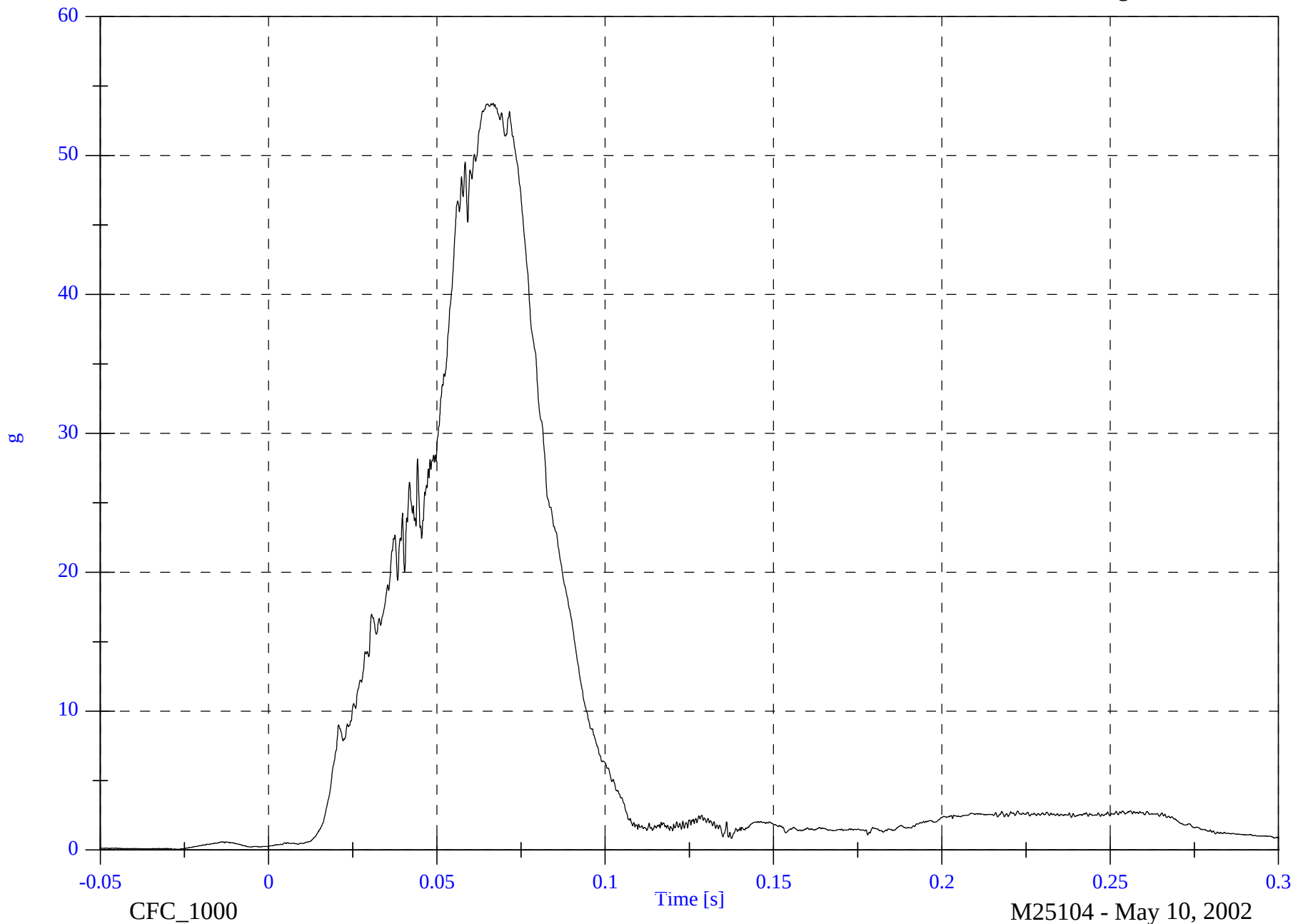
P1 Pelvic Resultant

Max: 53.8 [g] at 0.067 [s]

Min: 0.0 [g] at -0.027 [s]

B-38

8462-NCAP-13

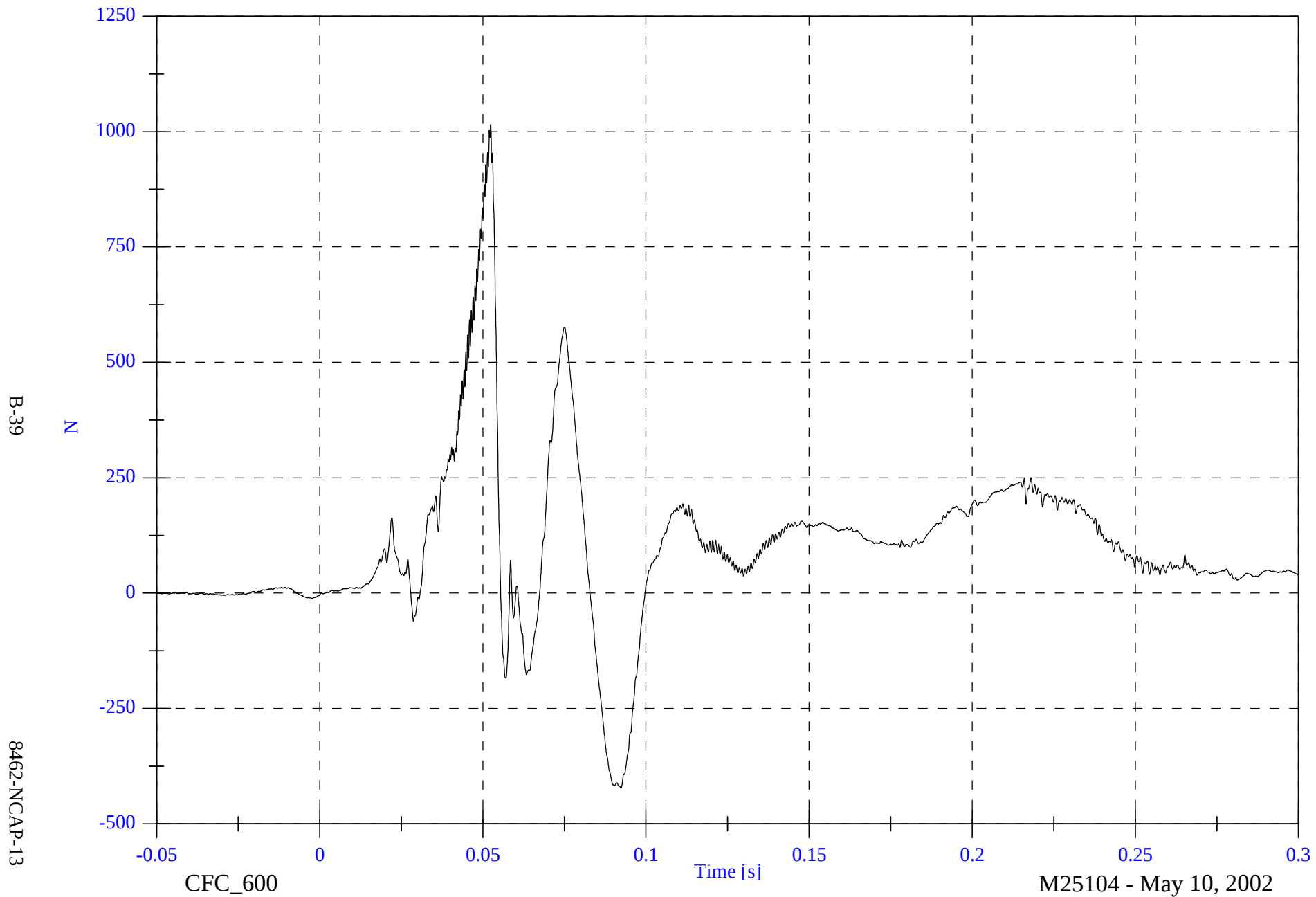


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 1016.4 [N] at 0.052 [s]

P1 Left Femur z

Min: -422.7 [N] at 0.092 [s]

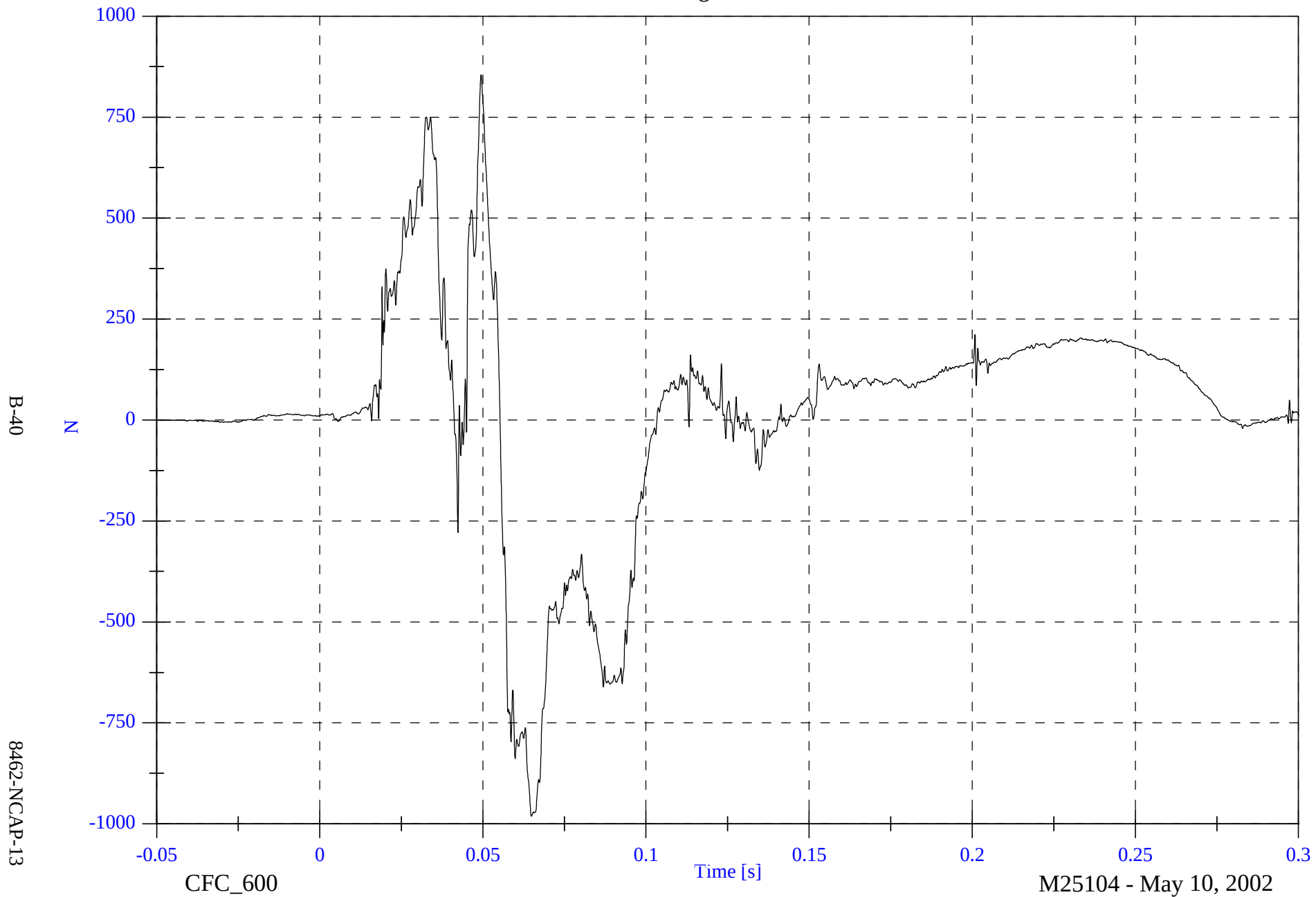


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Right Femur z

Max: 855.1 [N] at 0.049 [s]

Min: -981.1 [N] at 0.065 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

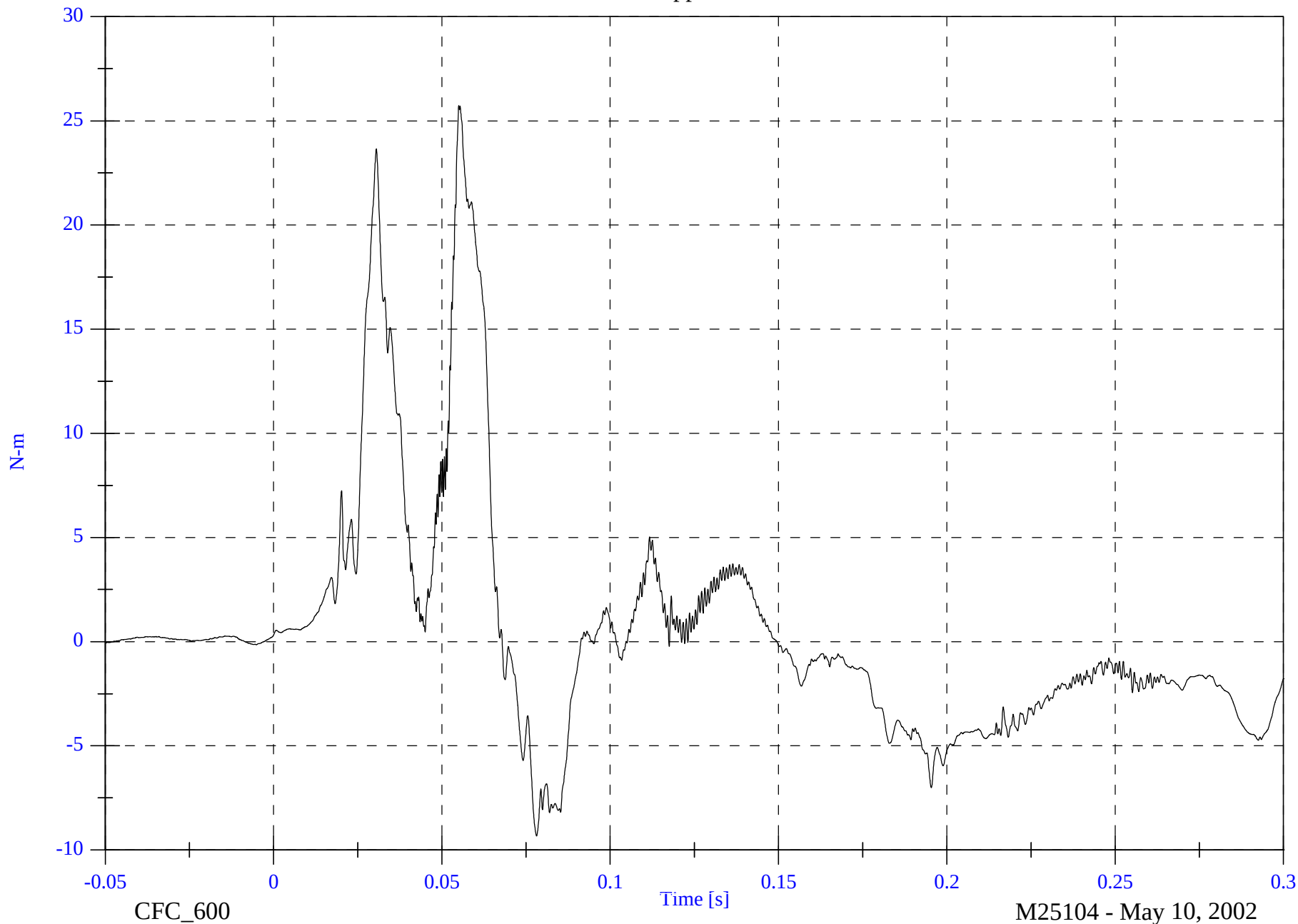
P1 Left Upper Tibia Mx

Max: 25.7 [N-m] at 0.055 [s]

Min: -9.3 [N-m] at 0.078 [s]

B-41

8462-NCAP-13

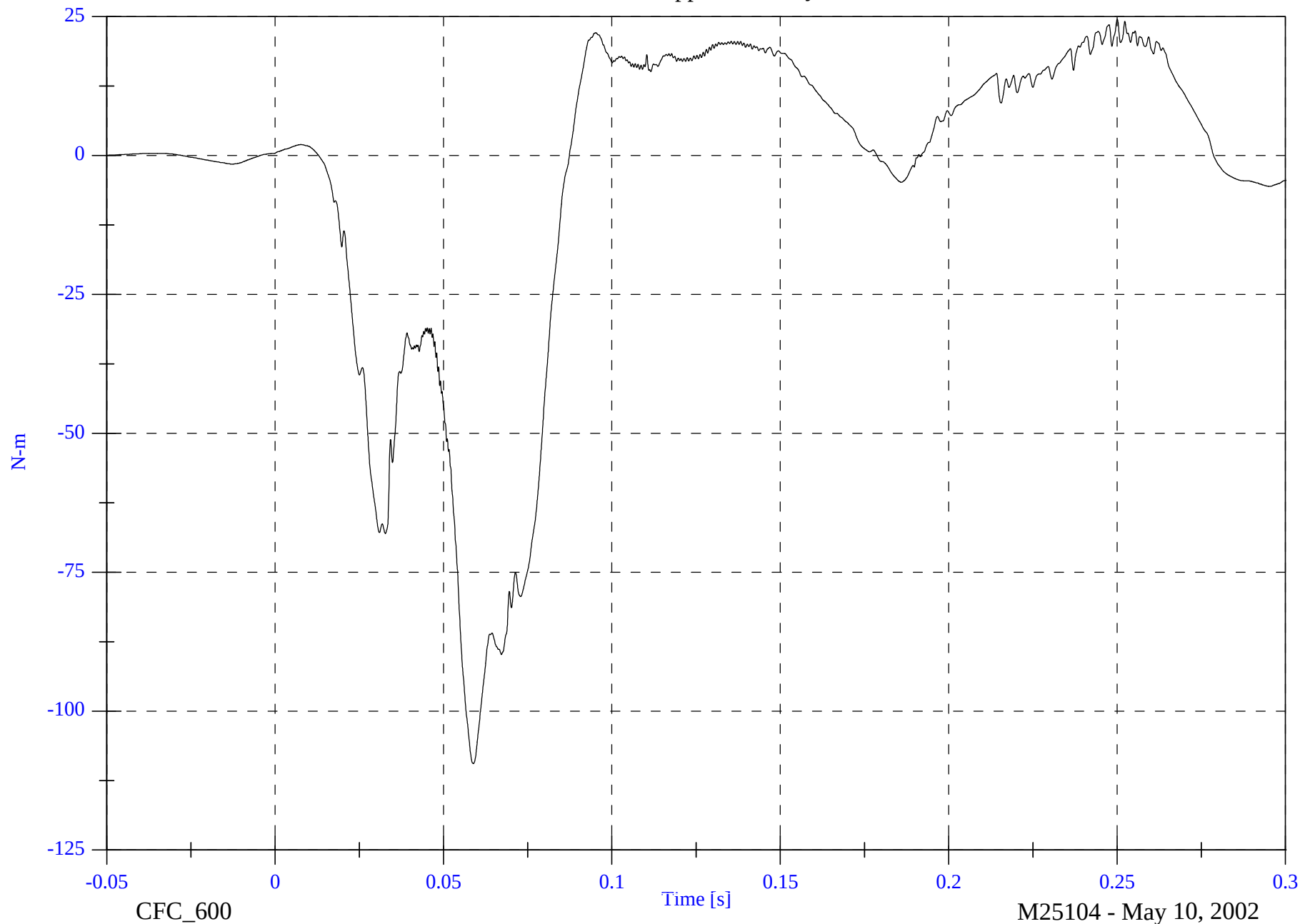


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Left Upper Tibia My

Max: 24.5 [N-m] at 0.250 [s]

Min: -109.4 [N-m] at 0.059 [s]



B-42

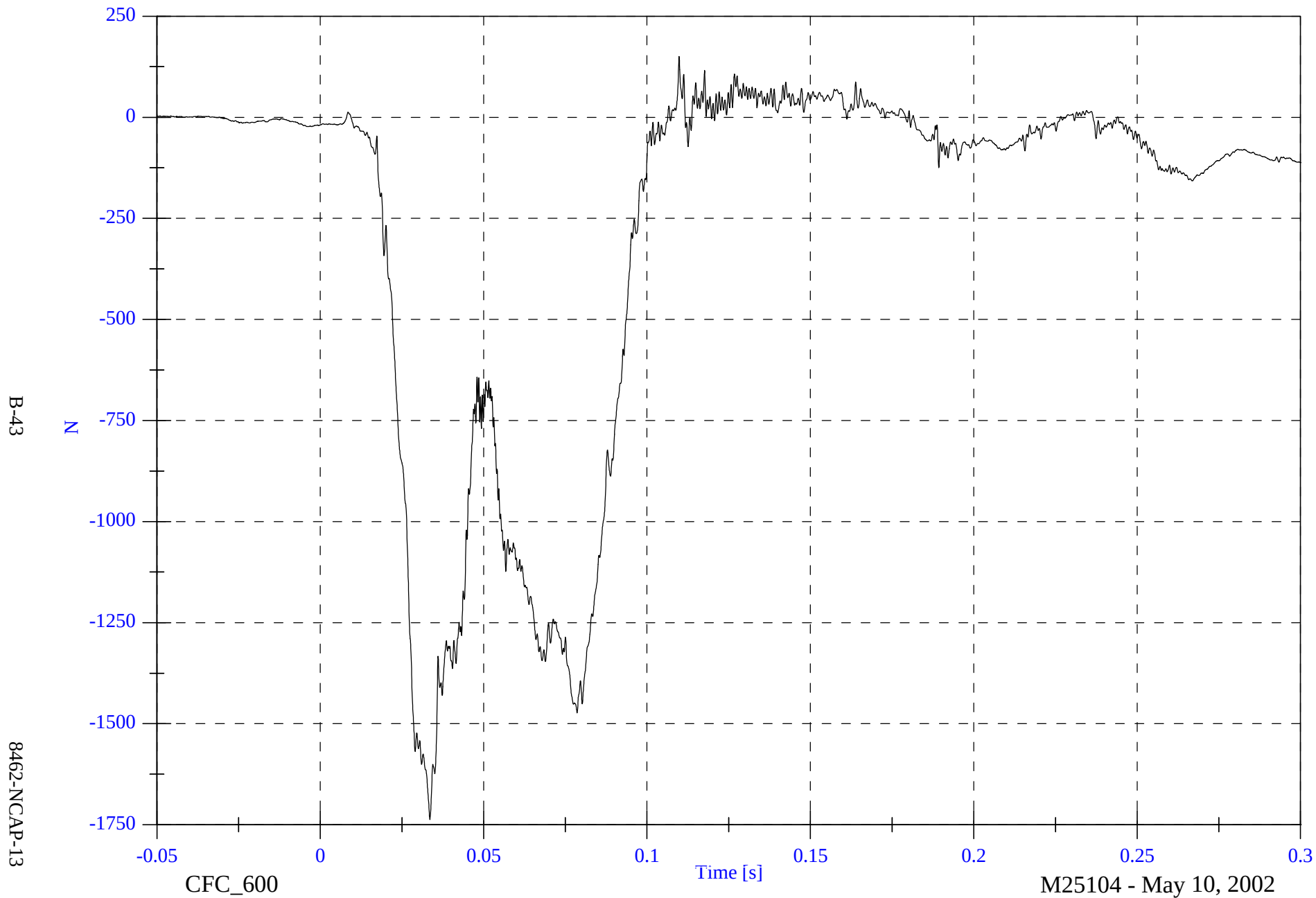
8462-NCAP-13

2002 NCAP Test 13 - 2002 Toyota Camry

P1 Left Lower Tibia Fz

Max: 150.2 [N] at 0.110 [s]

Min: -1736.9 [N] at 0.034 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

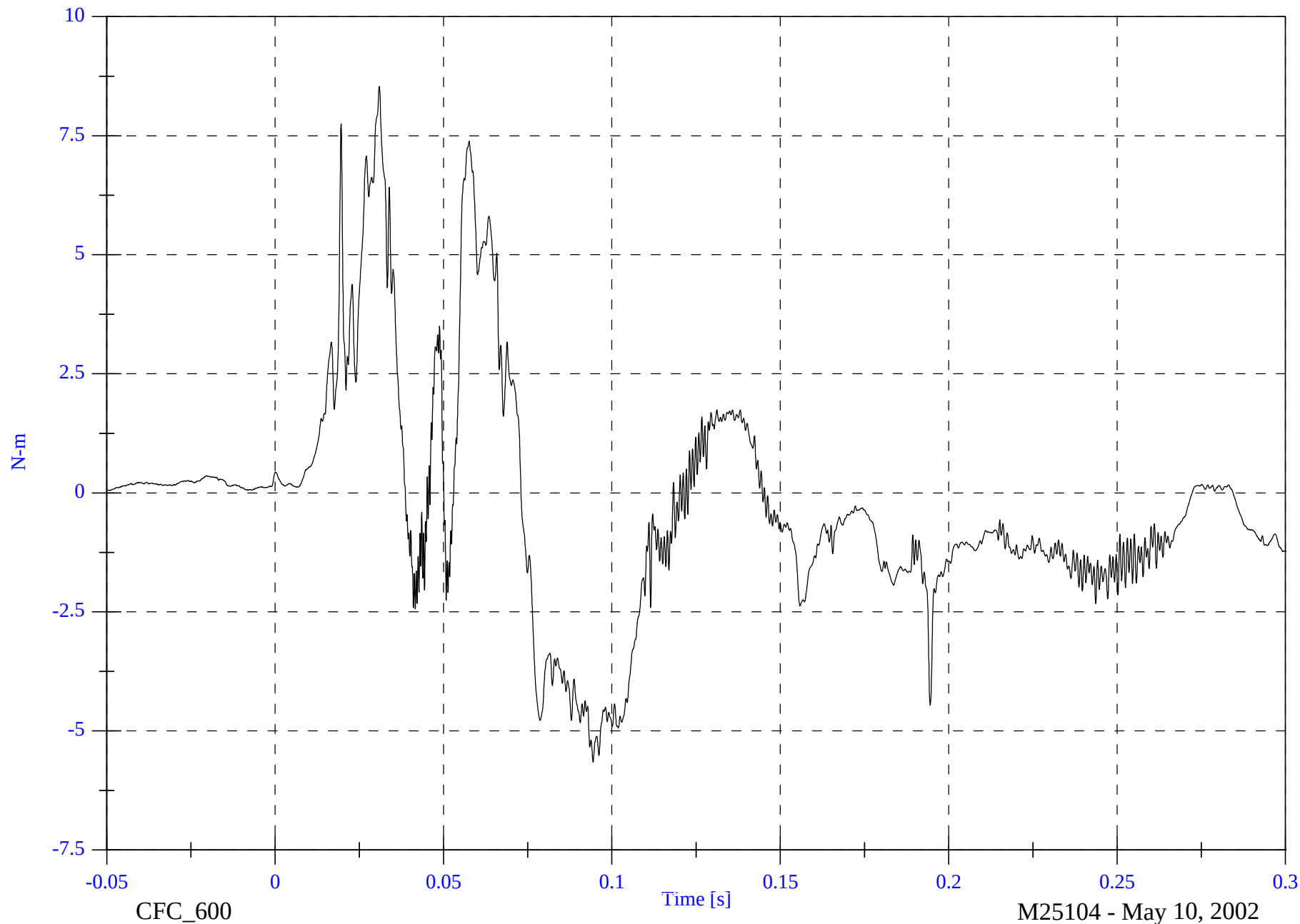
P1 Left Lower Tibia Mx

Max: 8.5 [N-m] at 0.031 [s]

Min: -5.7 [N-m] at 0.094 [s]

B-44

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

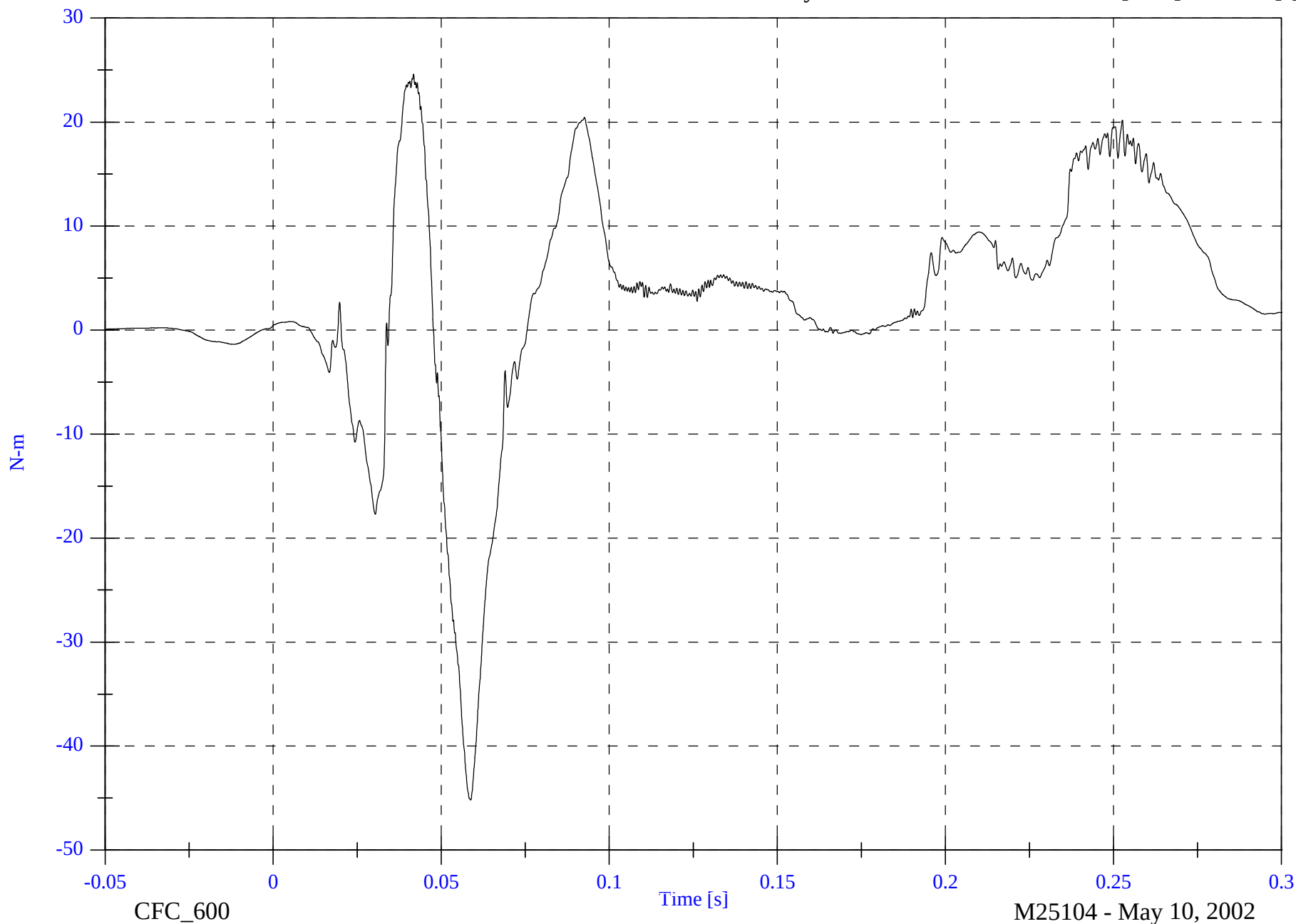
P1 Left Lower Tibia My

Max: 24.6 [N-m] at 0.042 [s]

Min: -45.2 [N-m] at 0.059 [s]

B-45

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

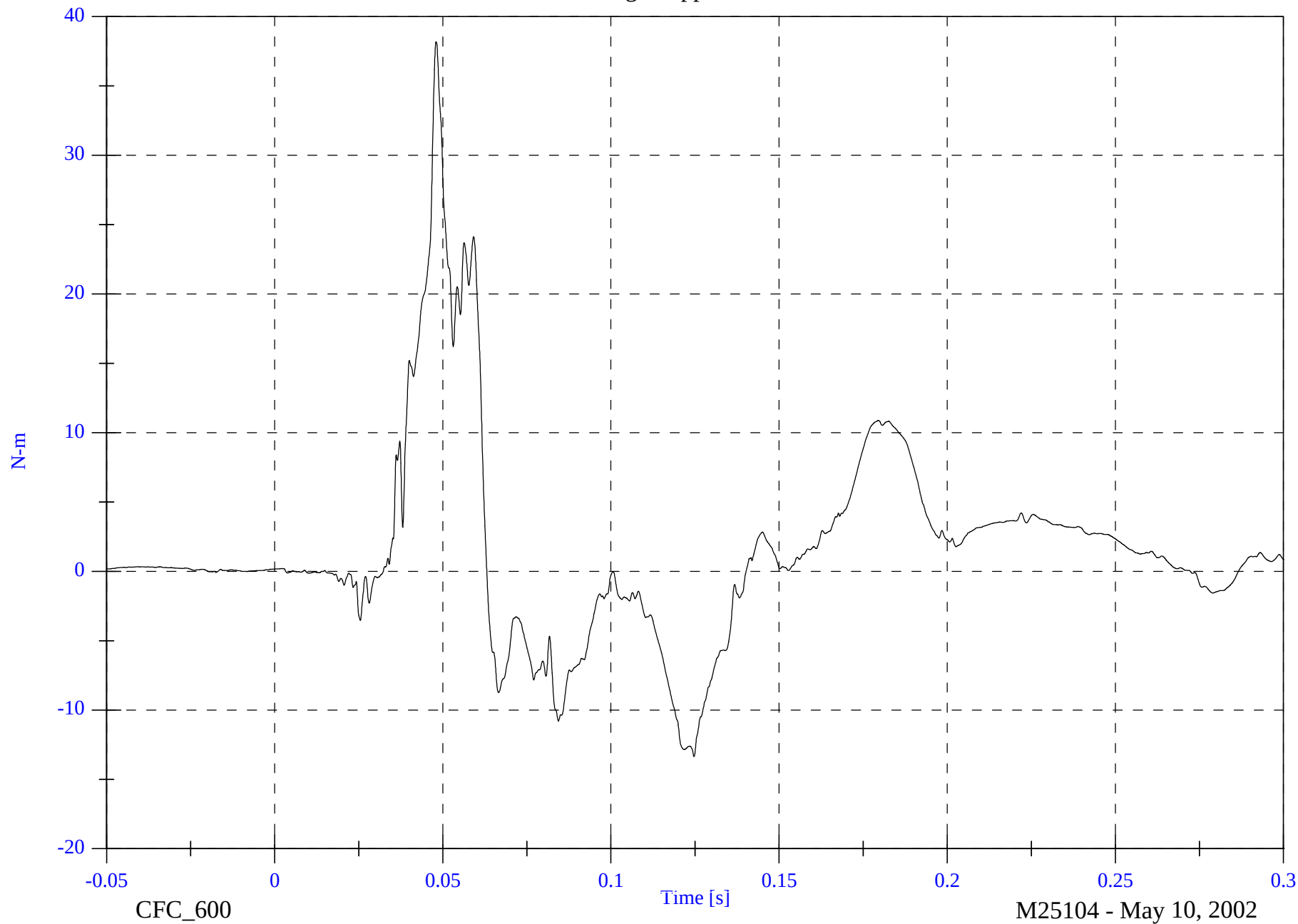
P1 Right Upper Tibia Mx

Max: 38.2 [N-m] at 0.048 [s]

Min: -13.4 [N-m] at 0.125 [s]

B-46

8462-NCAP-13

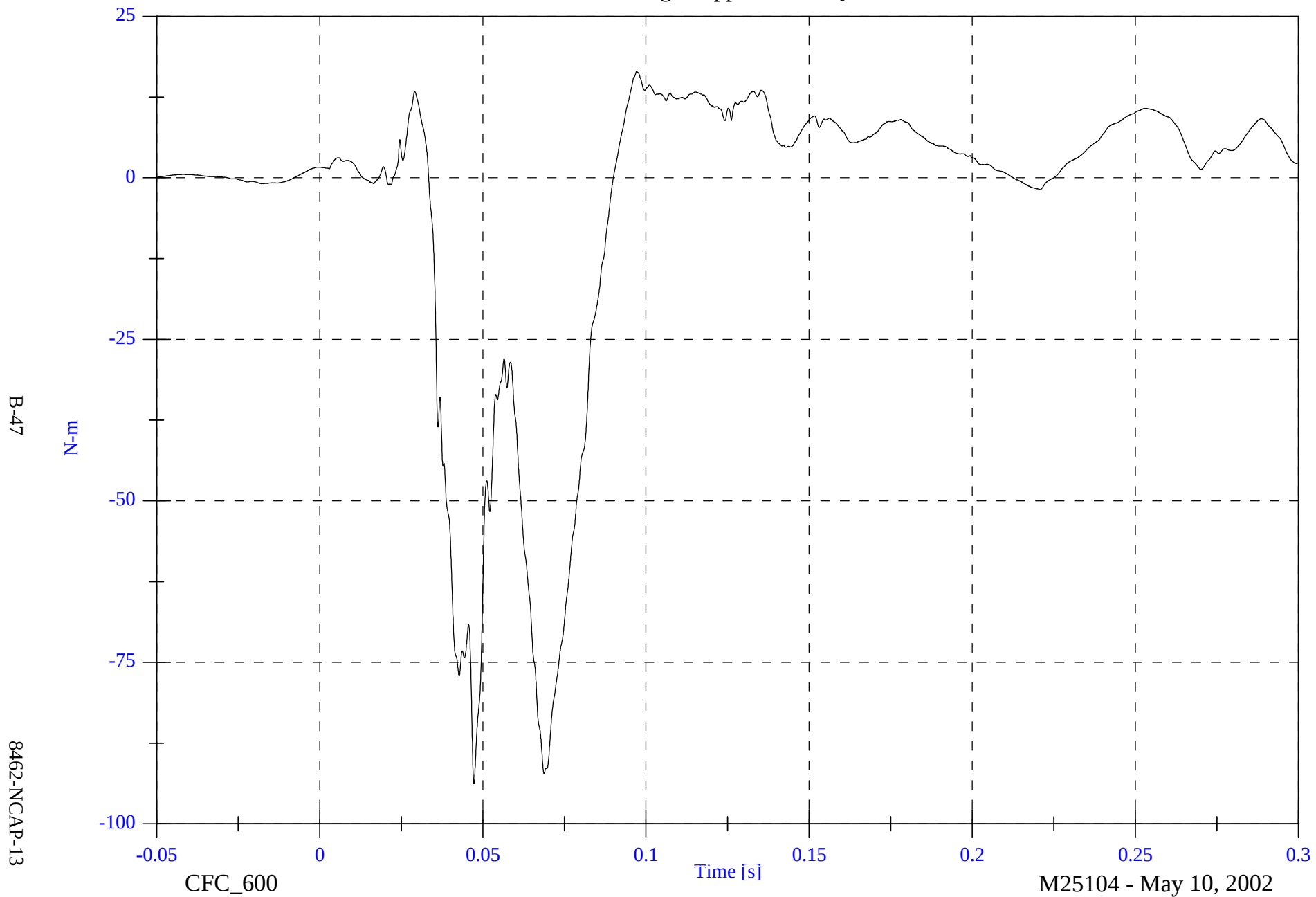


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Right Upper Tibia My

Max: 16.5 [N-m] at 0.097 [s]

Min: -93.8 [N-m] at 0.047 [s]

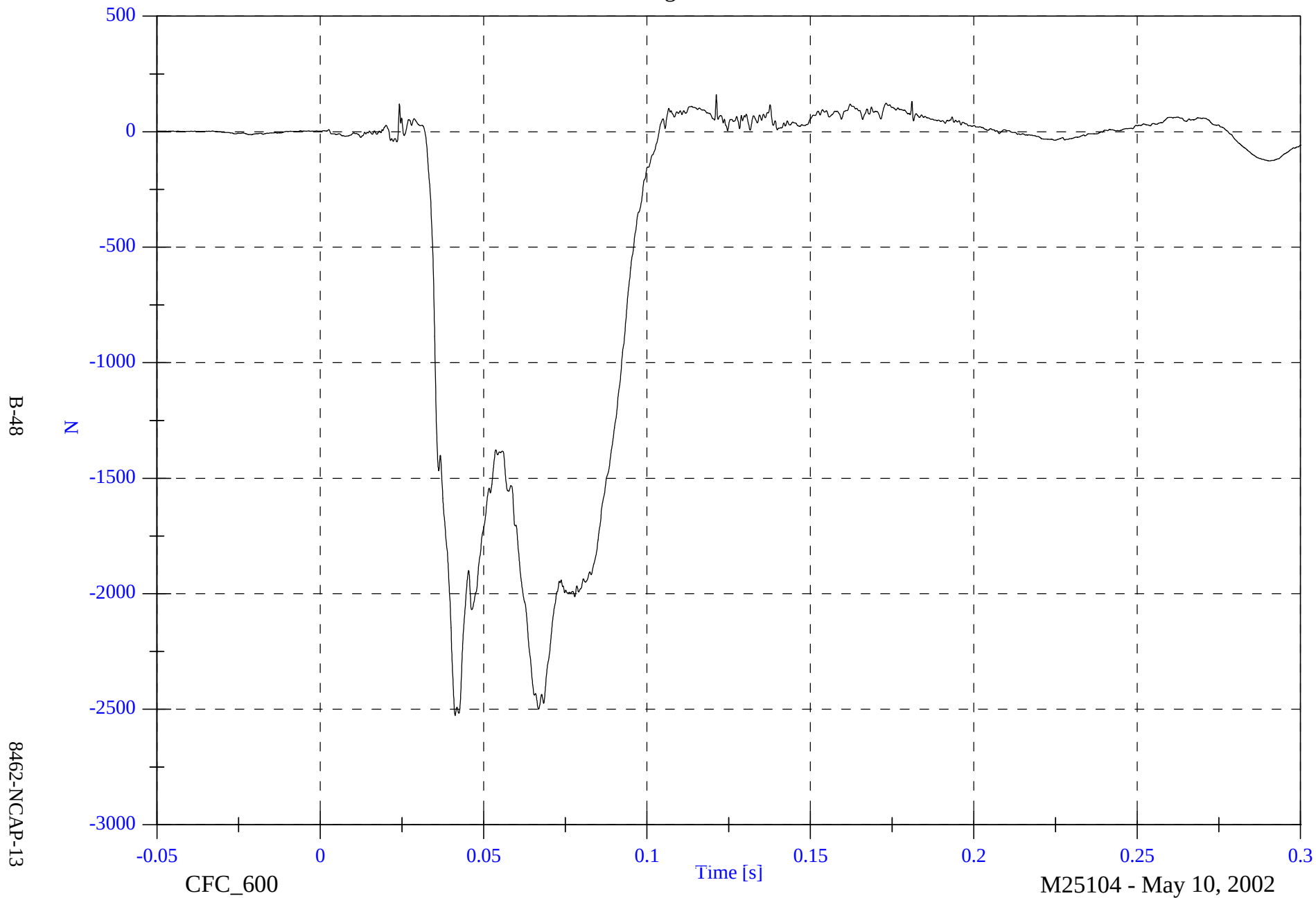


2002 NCAP Test 13 - 2002 Toyota Camry

P1 Right Lower Tibia Fz

Max: 160.3 [N] at 0.121 [s]

Min: -2526.9 [N] at 0.041 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

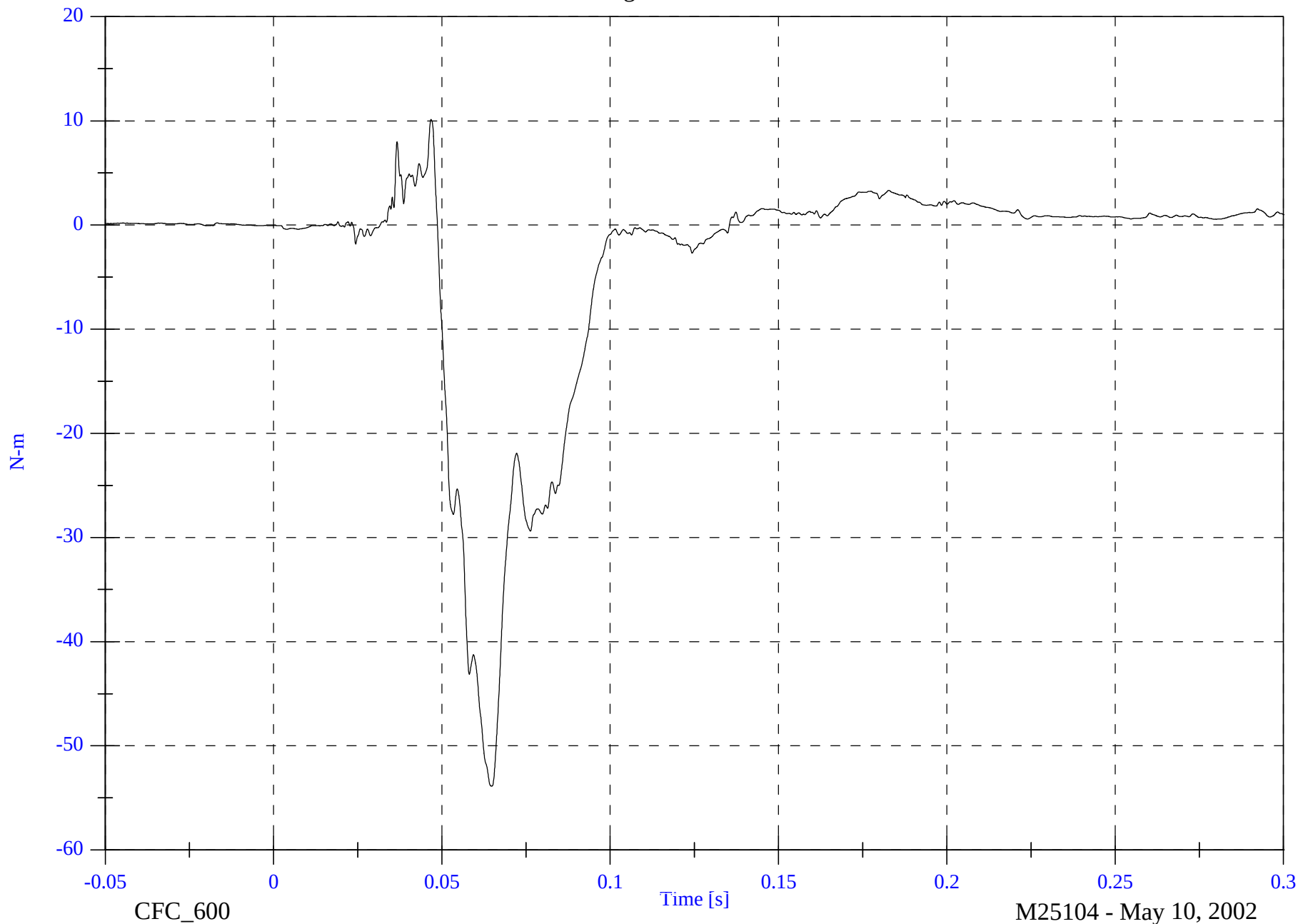
P1 Right Lower Tibia Mx

Max: 10.1 [N-m] at 0.047 [s]

Min: -53.9 [N-m] at 0.065 [s]

B-49

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

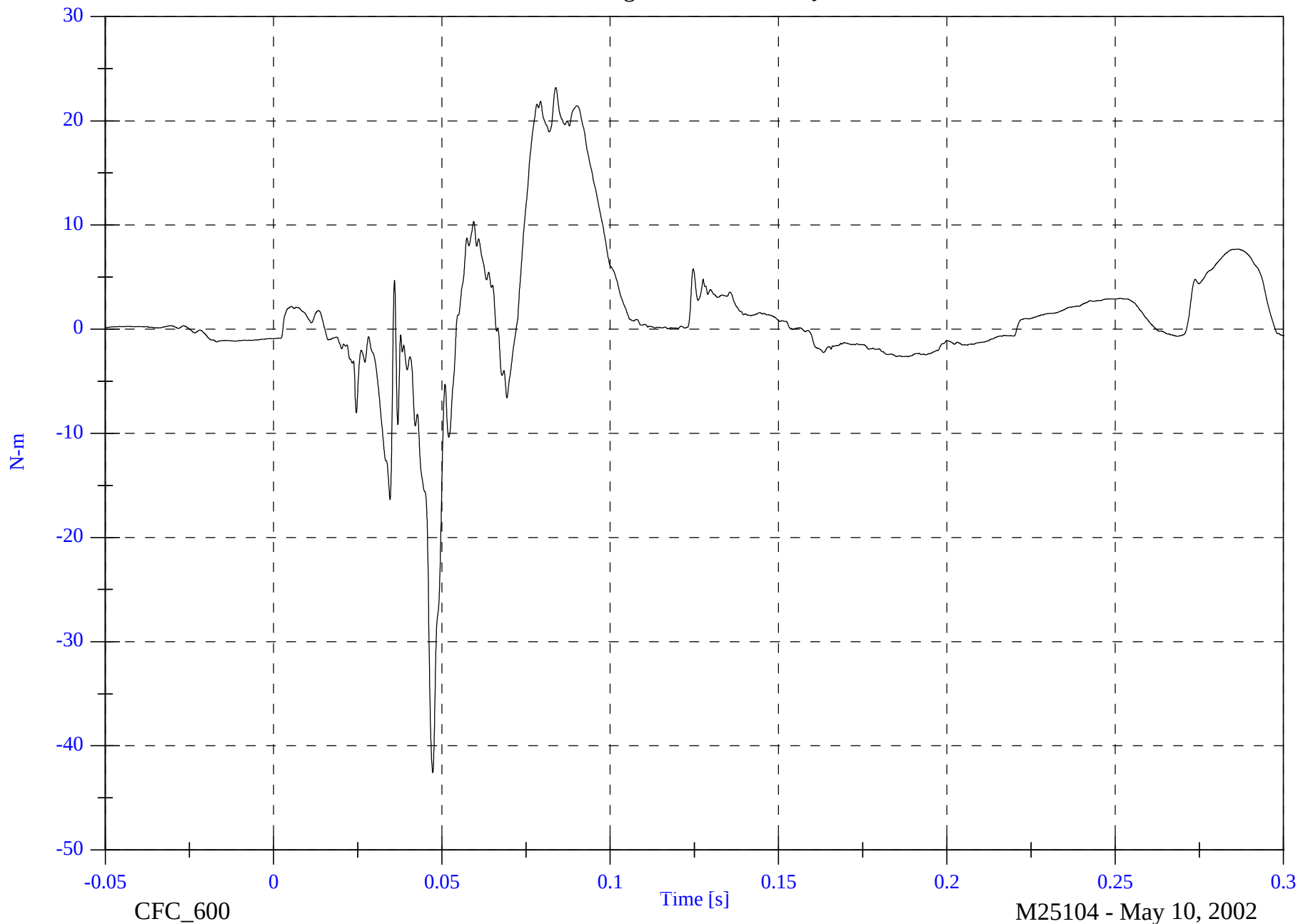
P1 Right Lower Tibia My

Max: 23.2 [N-m] at 0.084 [s]

Min: -42.6 [N-m] at 0.047 [s]

B-50

8462-NCAP-13

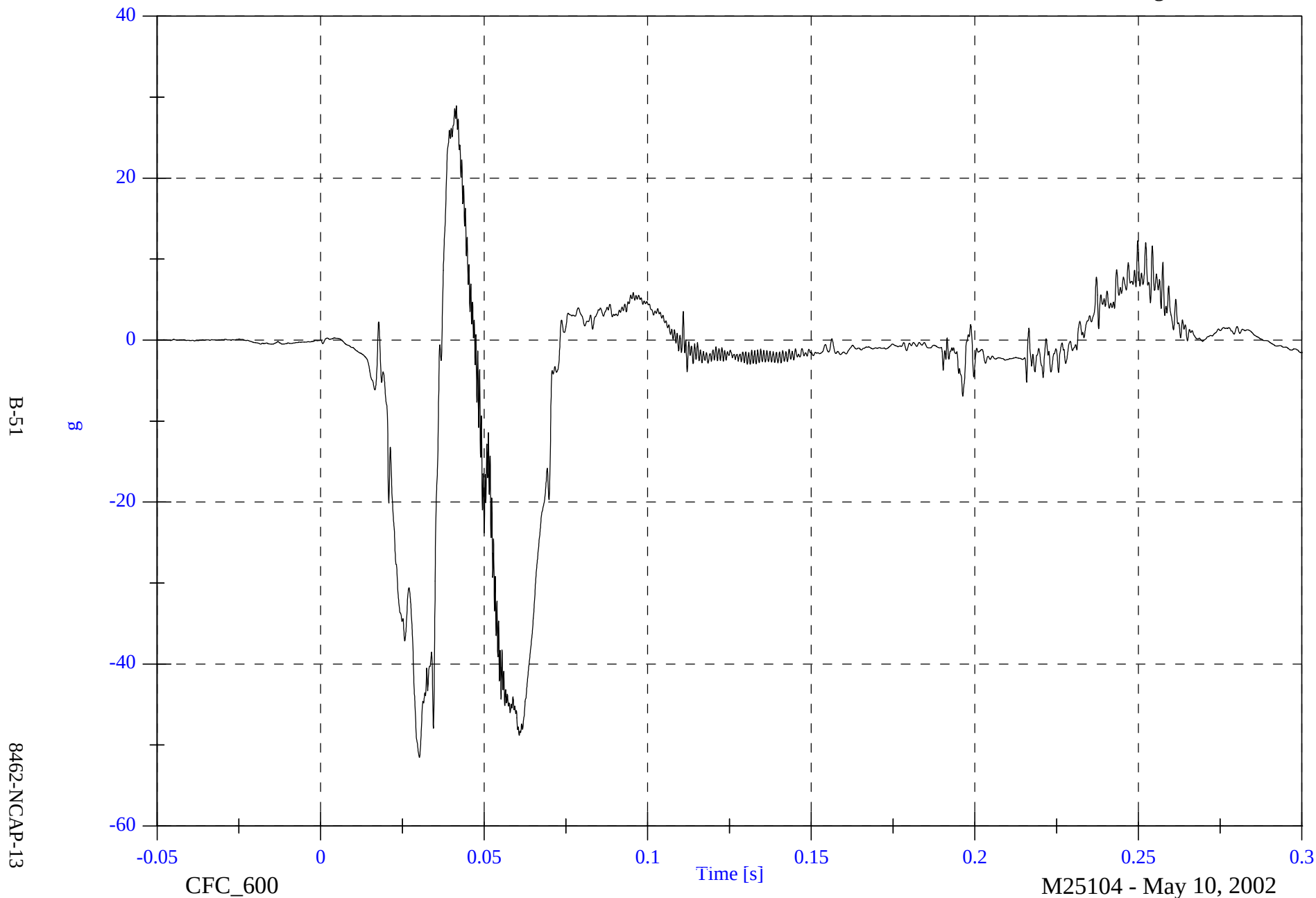


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 28.9 [g] at 0.042 [s]

Min: -51.5 [g] at 0.030 [s]

P1 Left Foot Aft x



2002 NCAP Test 13 - 2002 Toyota Camry

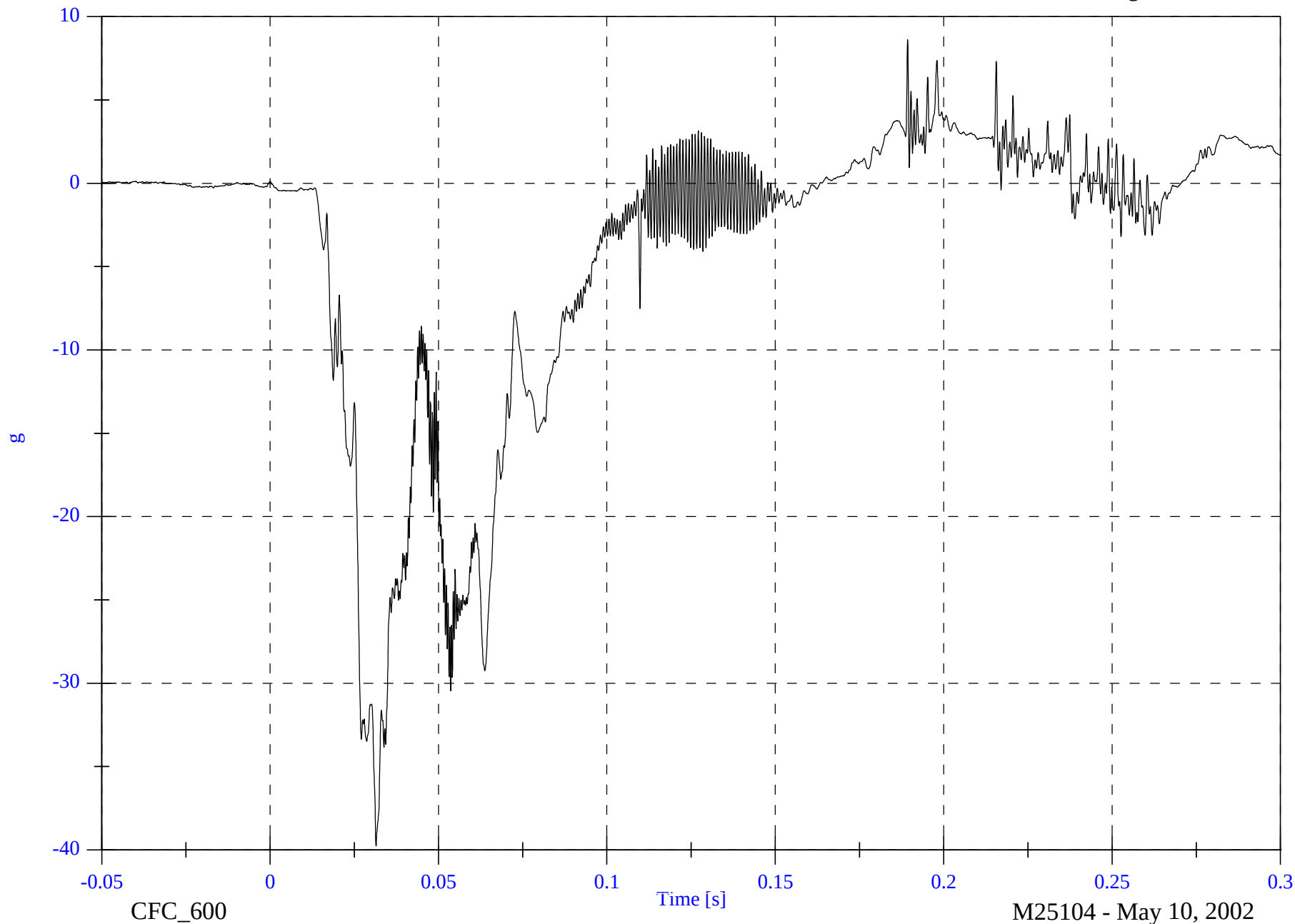
P1 Left Foot Aft z

Max: 8.6 [g] at 0.189 [s]

Min: -39.8 [g] at 0.031 [s]

B-52

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

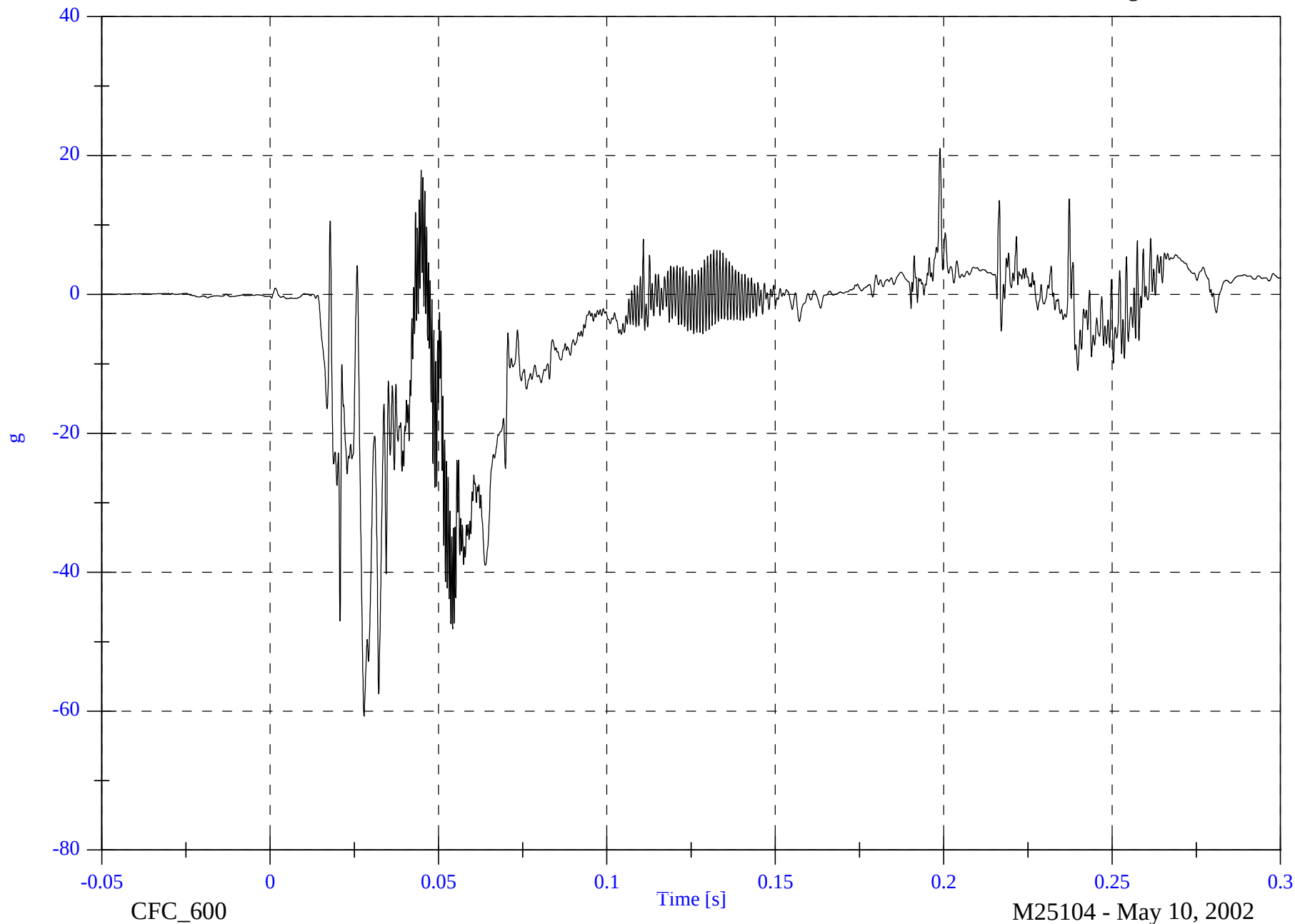
P1 Left Foot Fore z

Max: 21.0 [g] at 0.199 [s]

Min: -60.7 [g] at 0.028 [s]

B-53

8462-NCAP-13

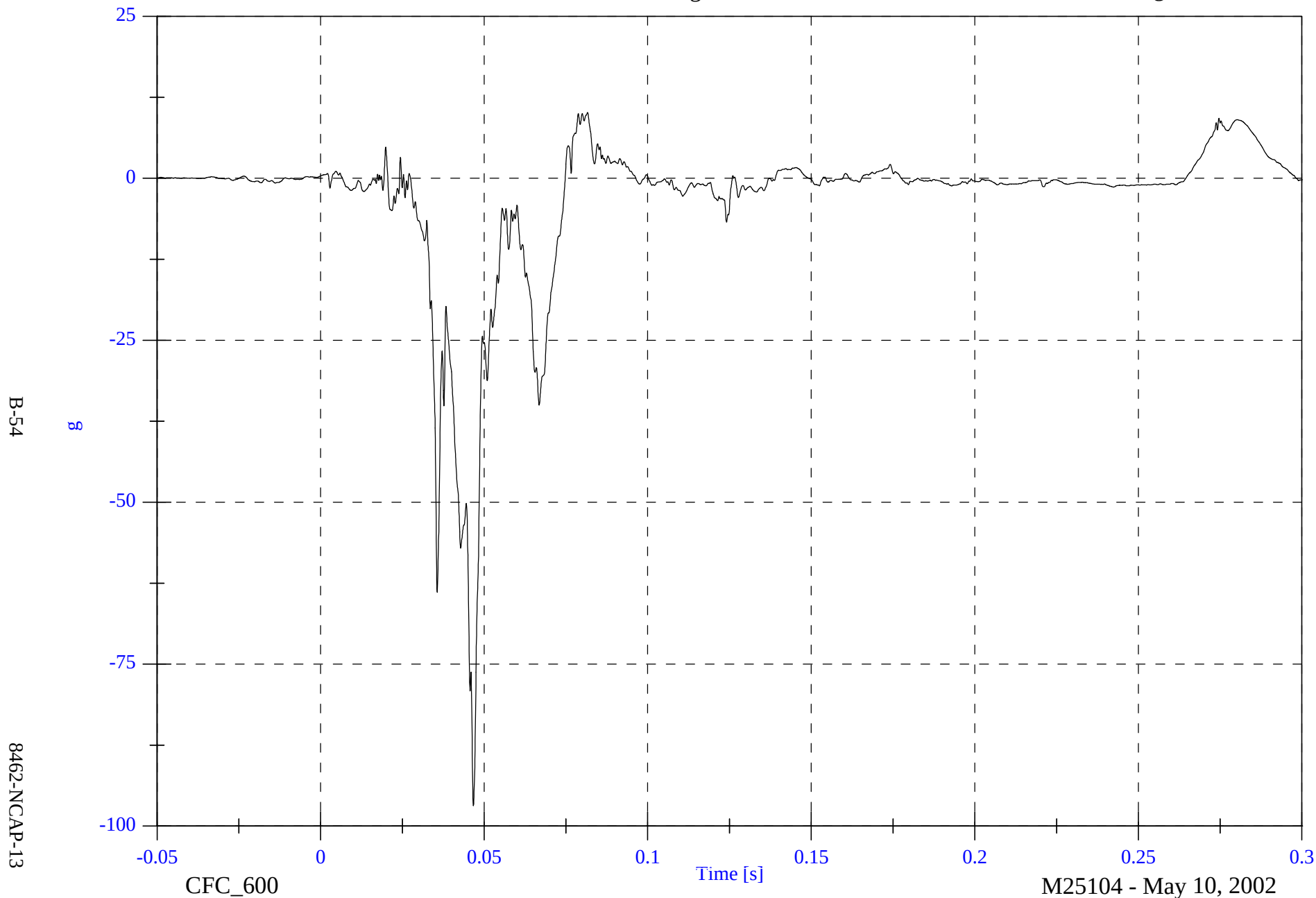


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 10.1 [g] at 0.082 [s]

Min: -96.9 [g] at 0.047 [s]

P1 Right Foot Aft x

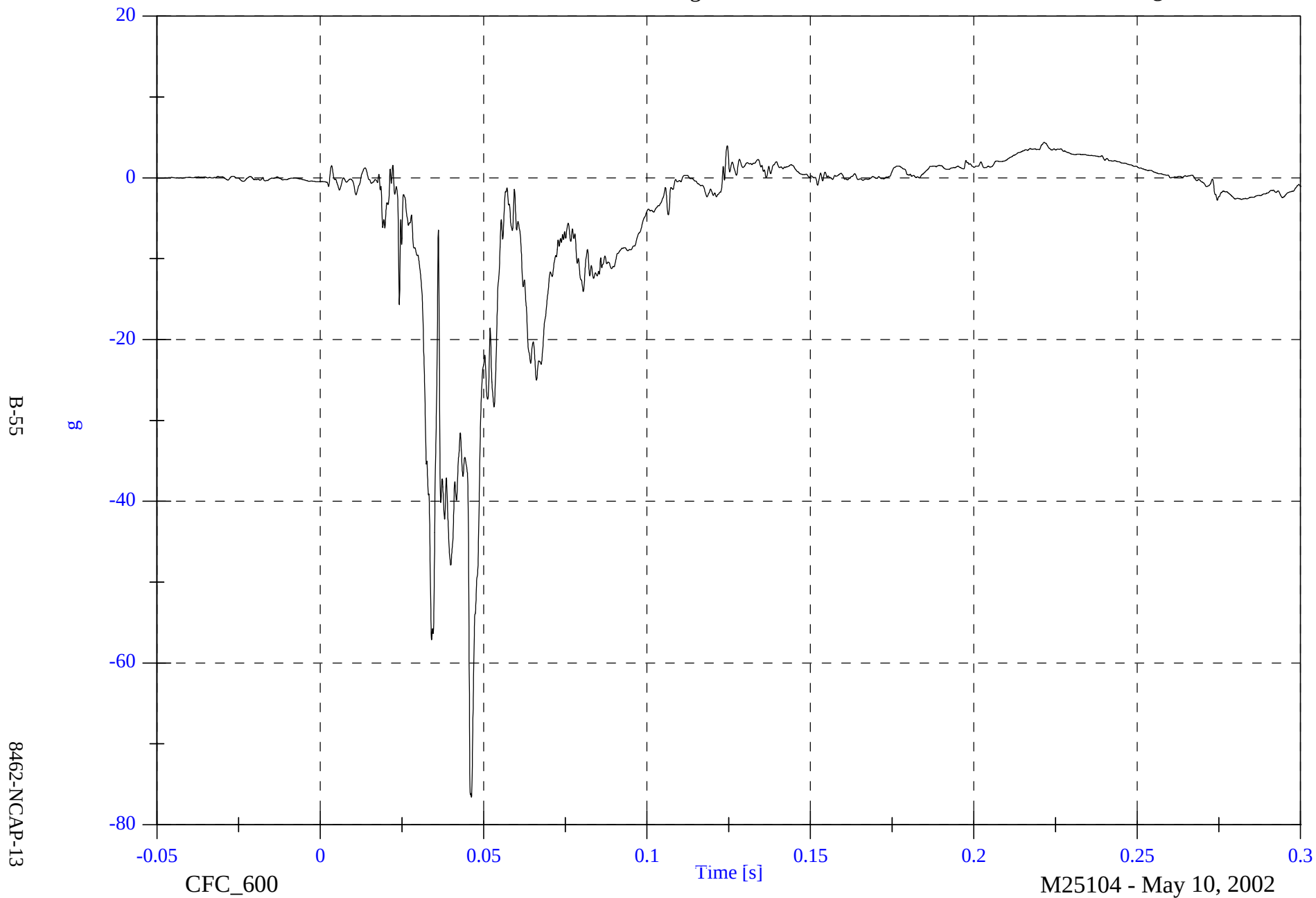


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 4.4 [g] at 0.222 [s]

Min: -76.6 [g] at 0.046 [s]

P1 Right Foot Aft z

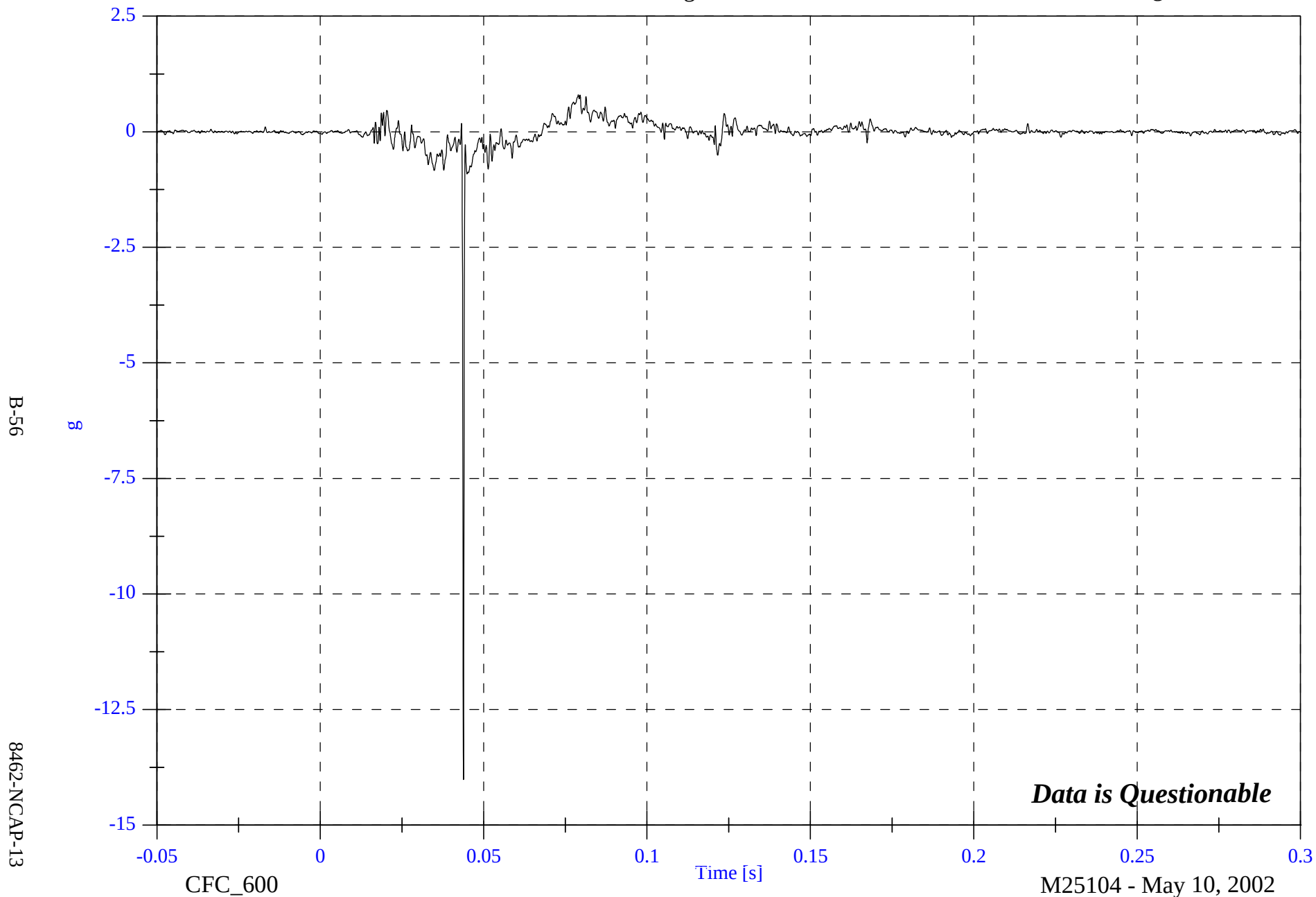


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 0.8 [g] at 0.079 [s]

Min: -14.0 [g] at 0.044 [s]

P1 Right Foot Fore z

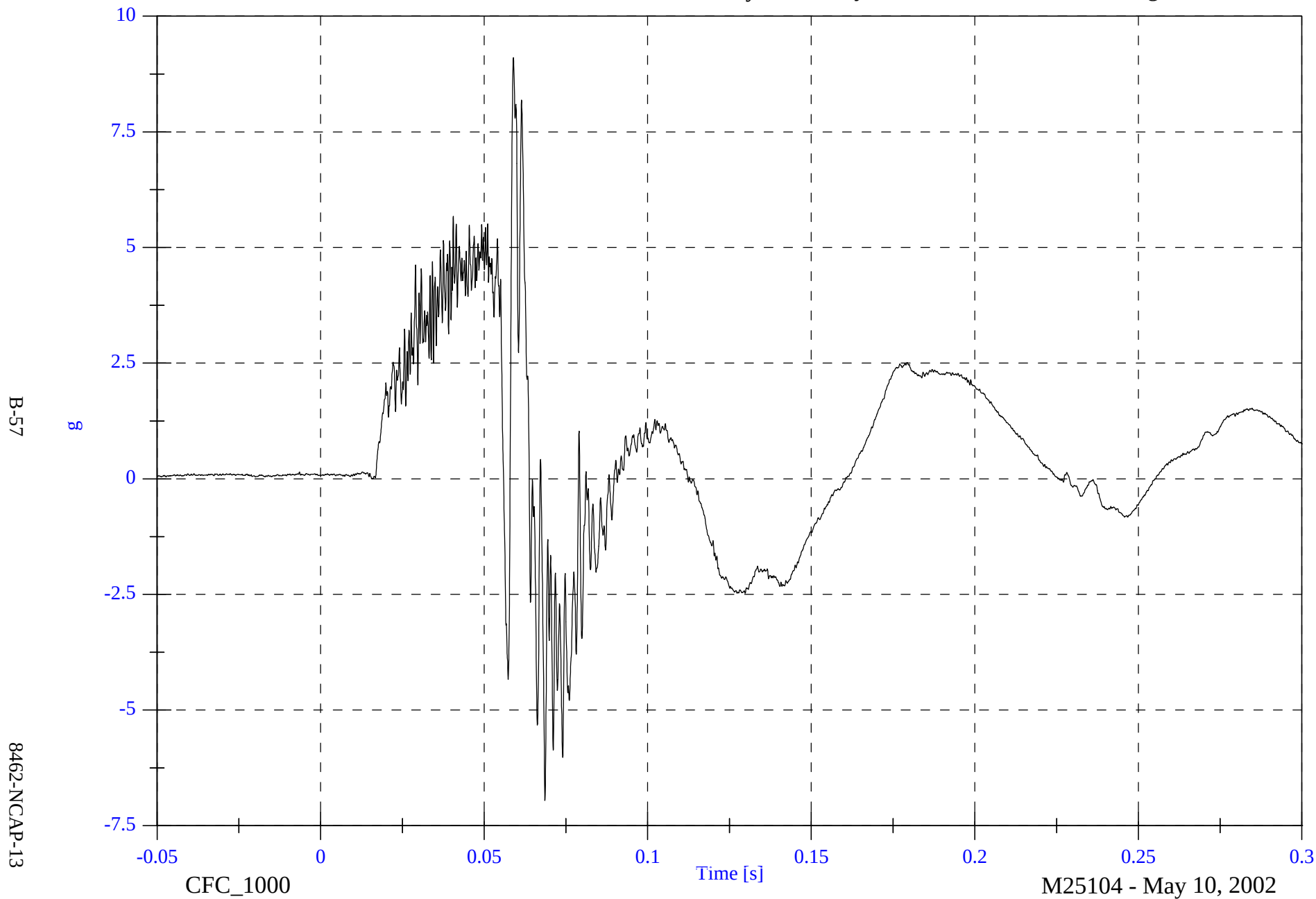


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head 9 Array X Arm Ay

Max: 9.1 [g] at 0.059 [s]

Min: -7.0 [g] at 0.069 [s]

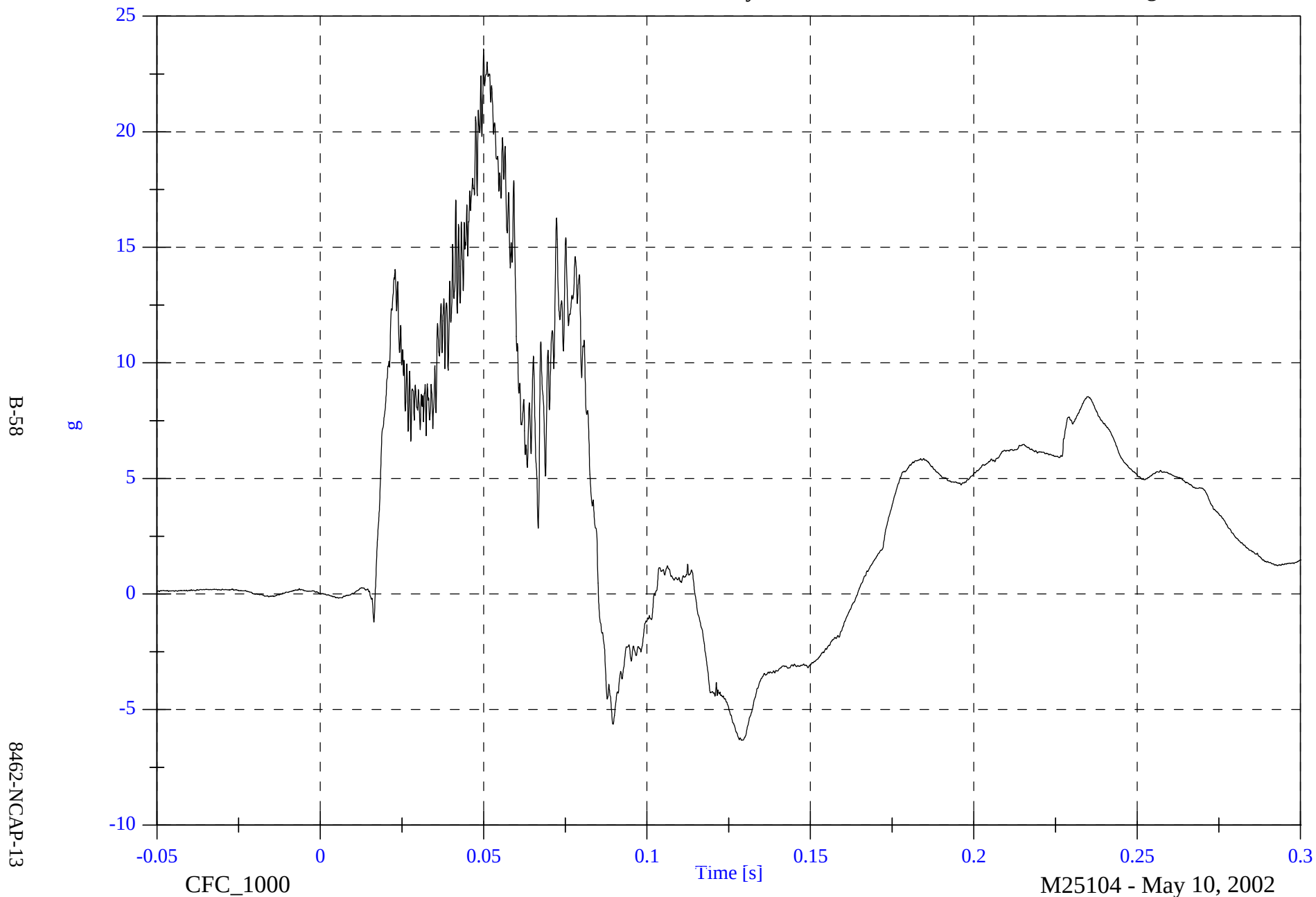


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head 9 Array X Arm Az

Max: 23.6 [g] at 0.050 [s]

Min: -6.3 [g] at 0.129 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

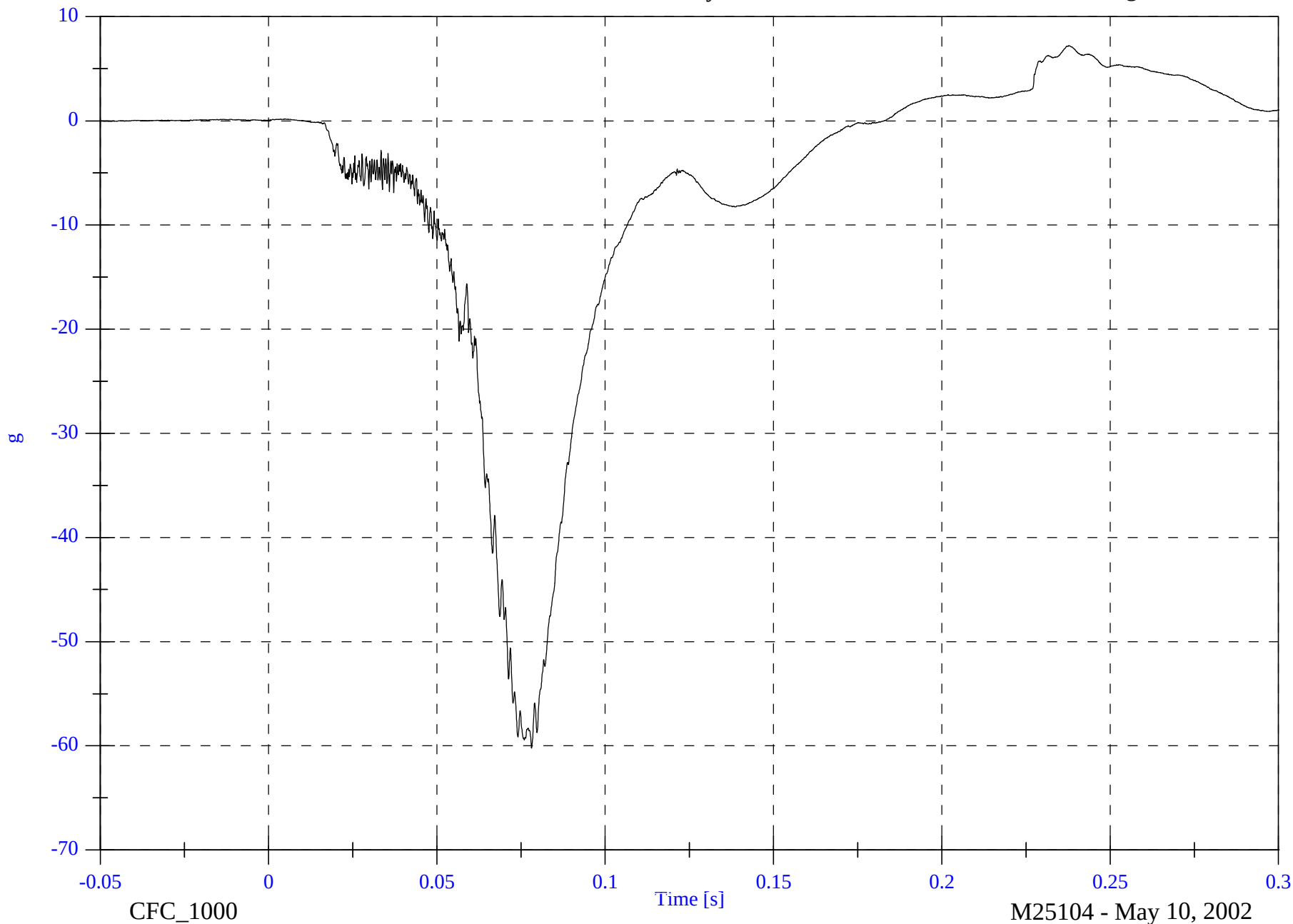
P2 Head 9 Array Y Arm Ax

Max: 7.2 [g] at 0.238 [s]

Min: -60.2 [g] at 0.078 [s]

B-59

8462-NCAP-13

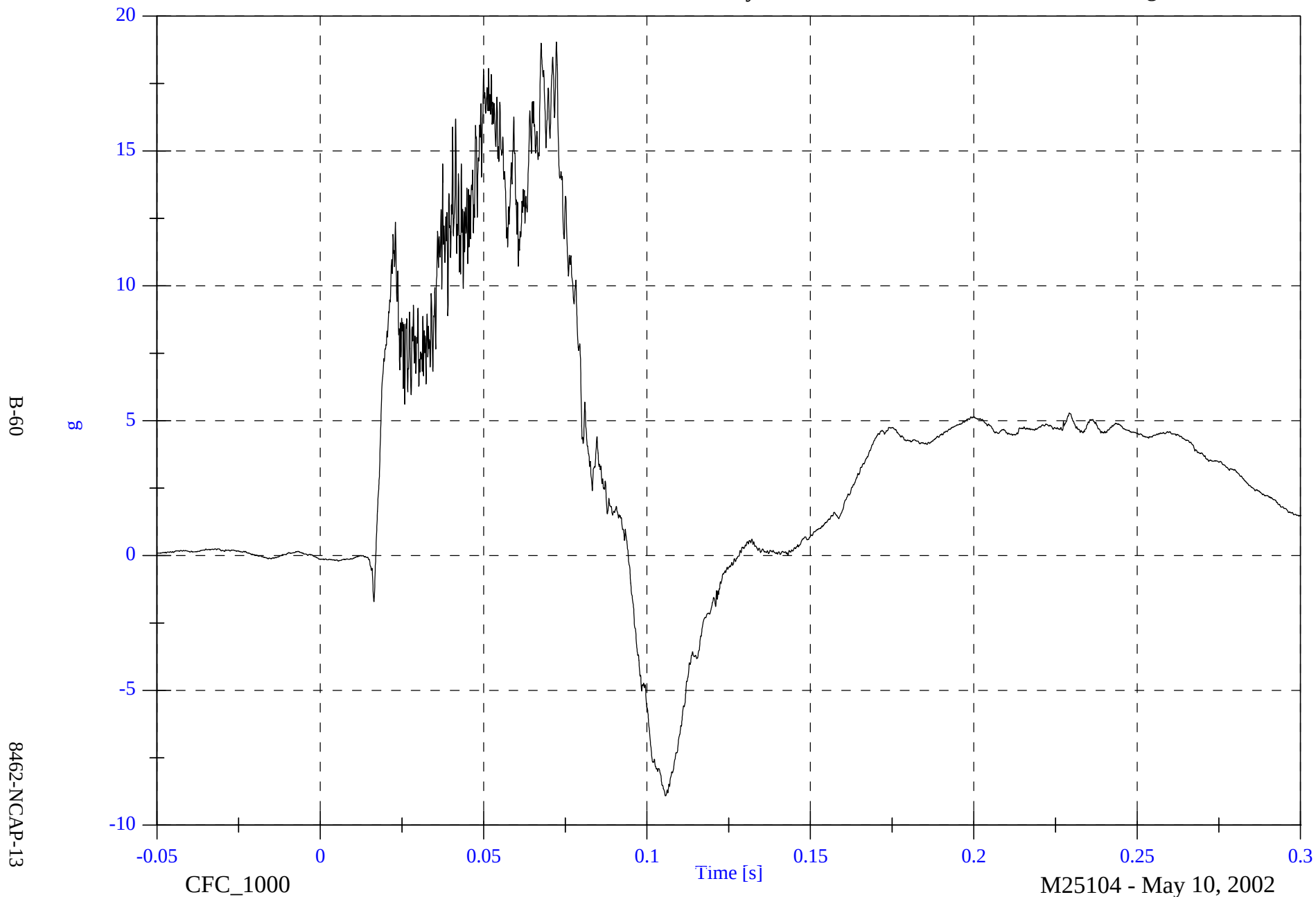


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head 9 Array Y Arm Az

Max: 19.0 [g] at 0.072 [s]

Min: -8.9 [g] at 0.106 [s]

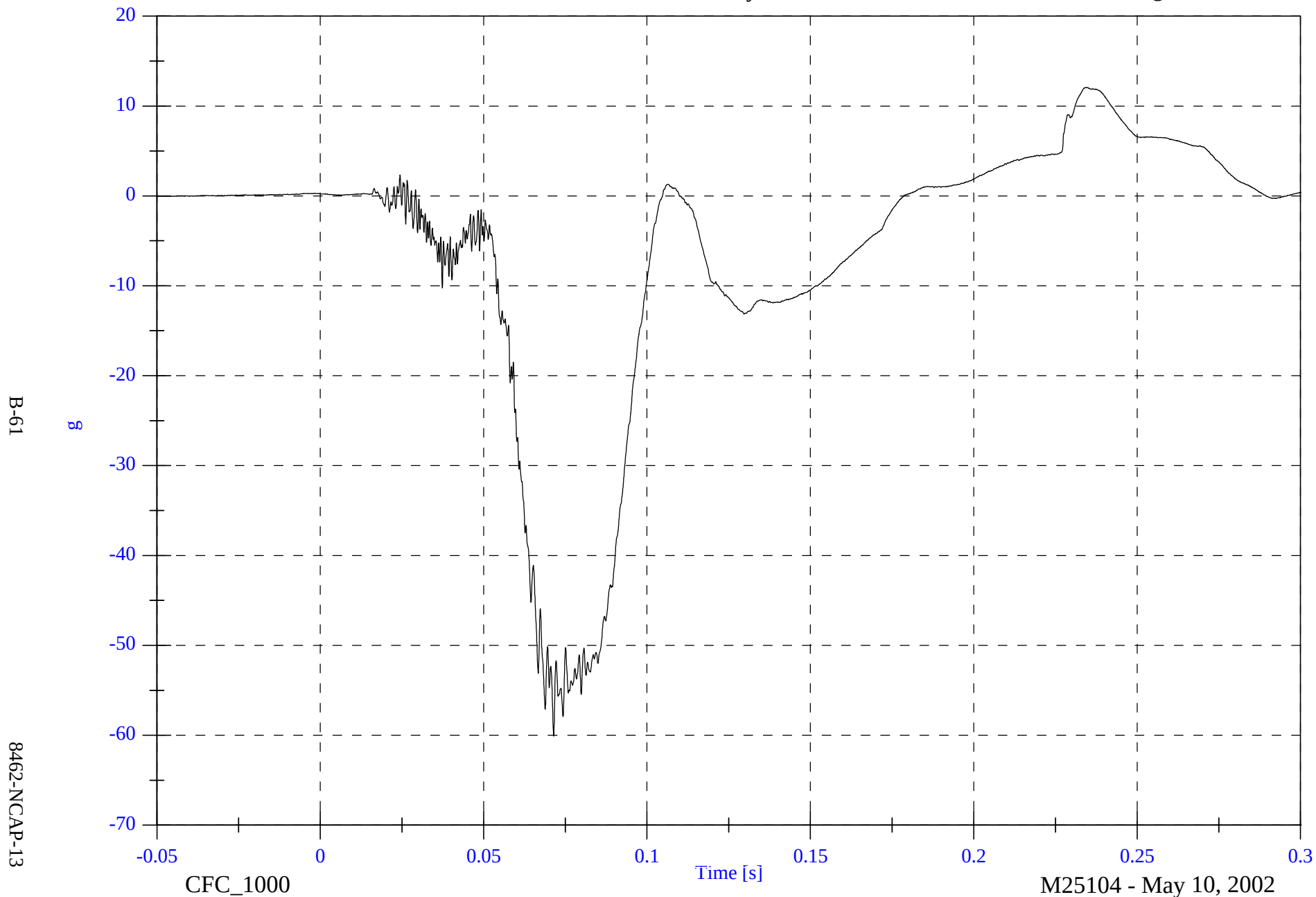


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head 9 Array Z Arm Ax

Max: 12.1 [g] at 0.235 [s]

Min: -60.1 [g] at 0.071 [s]

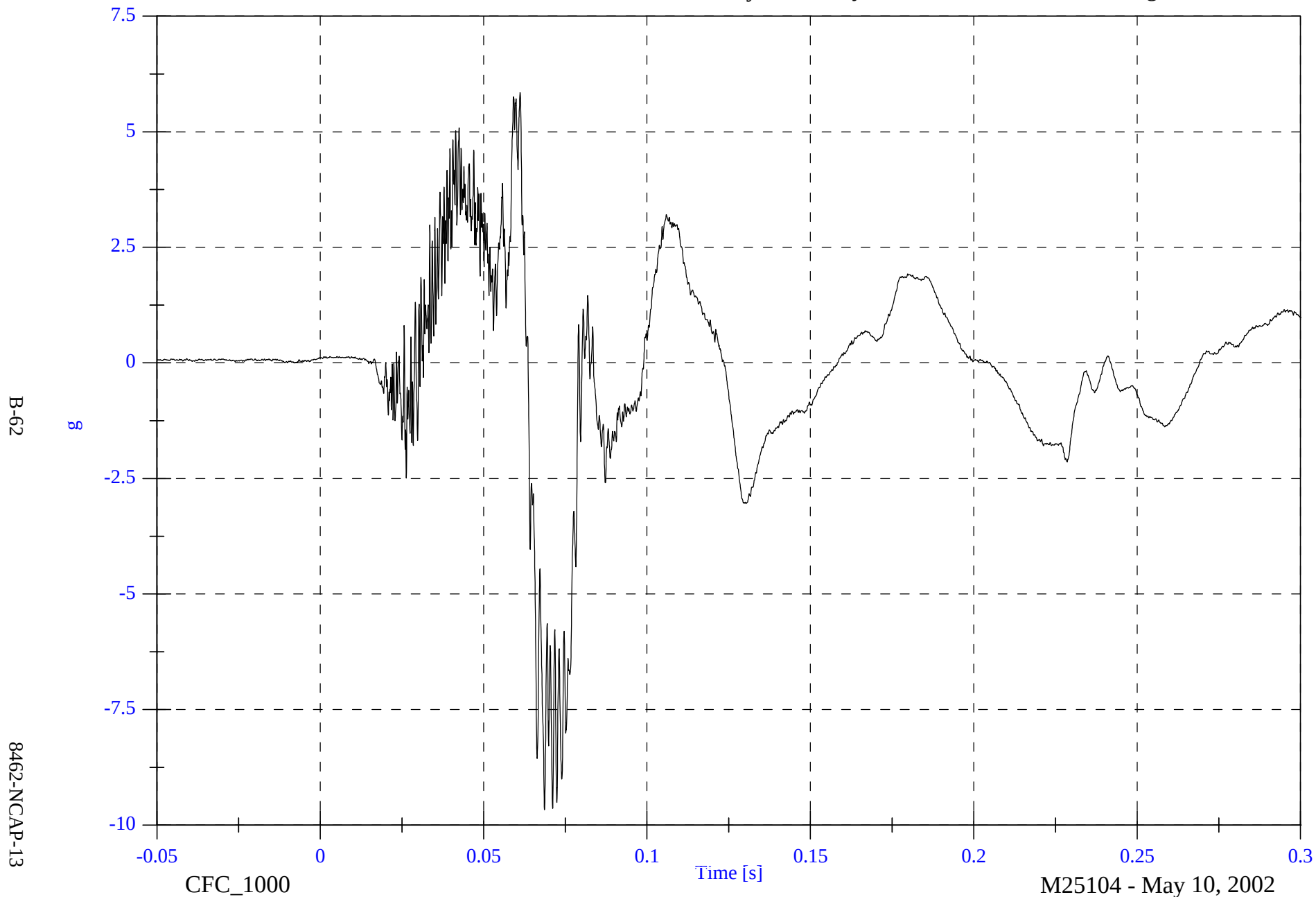


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head 9 Array Z Arm Ay

Max: 5.8 [g] at 0.061 [s]

Min: -9.7 [g] at 0.069 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

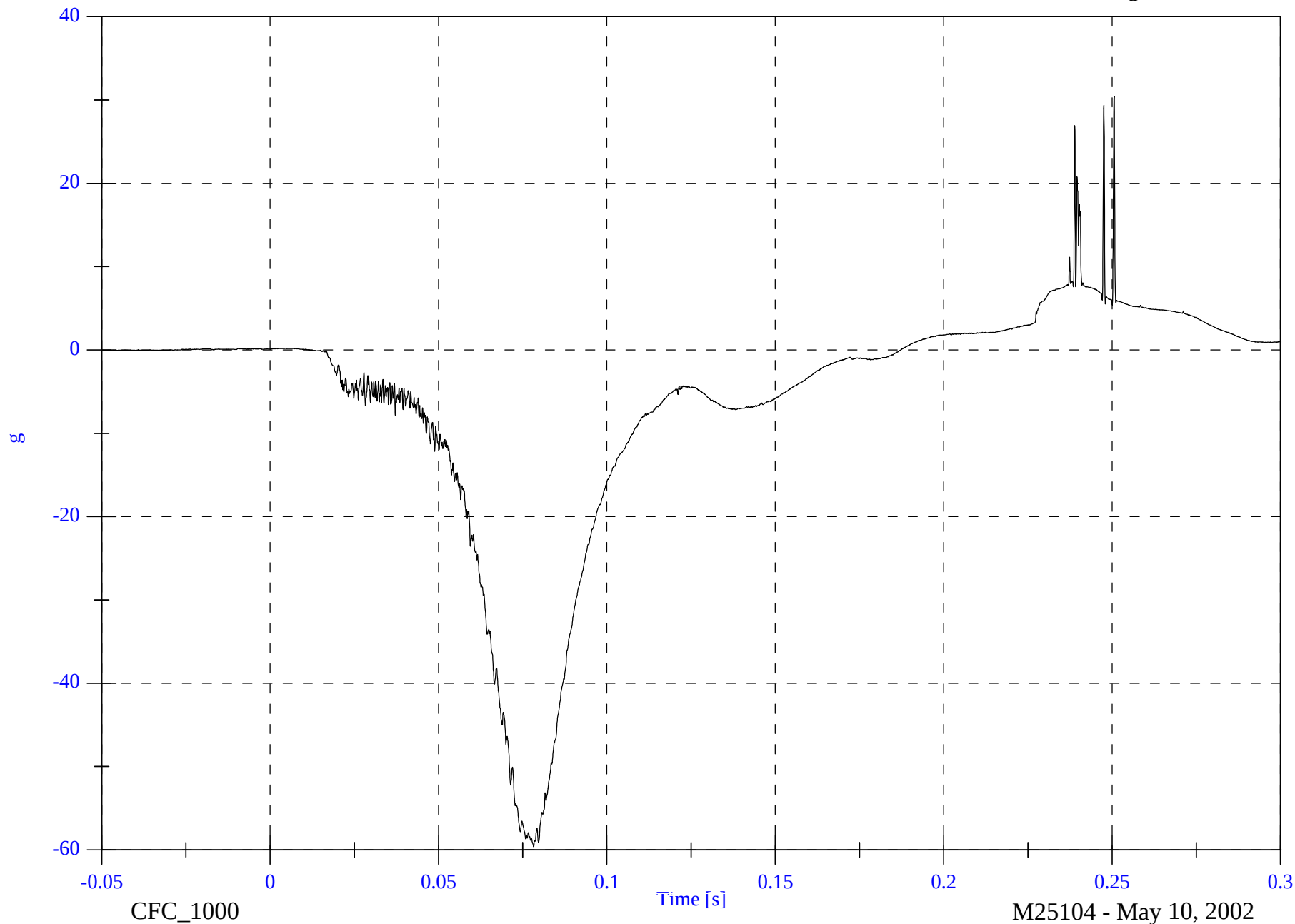
P2 Head CG x

Max: 30.5 [g] at 0.251 [s]

Min: -59.6 [g] at 0.078 [s]

B-63

8462-NCAP-13

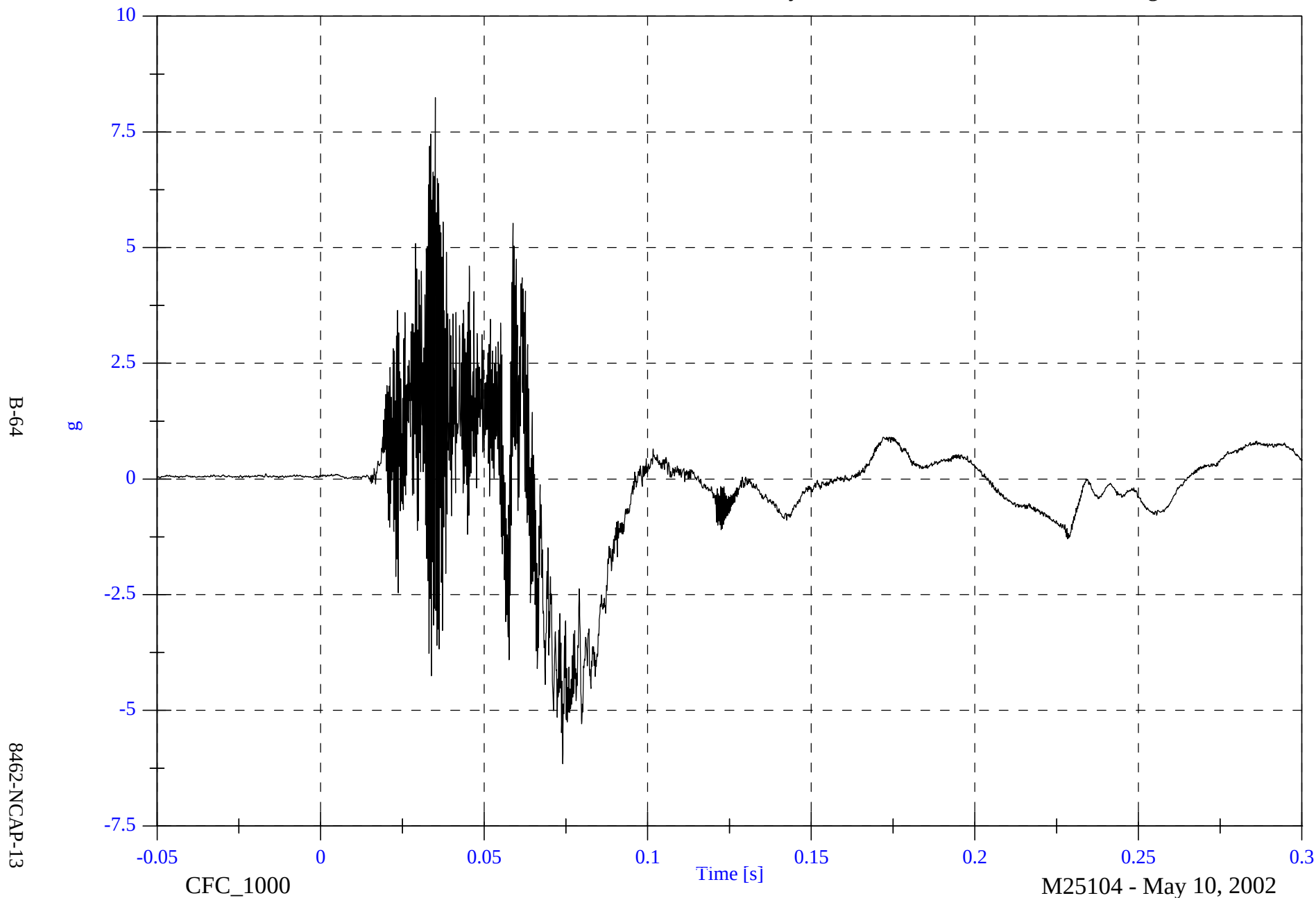


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head CG y

Max: 8.2 [g] at 0.035 [s]

Min: -6.2 [g] at 0.074 [s]

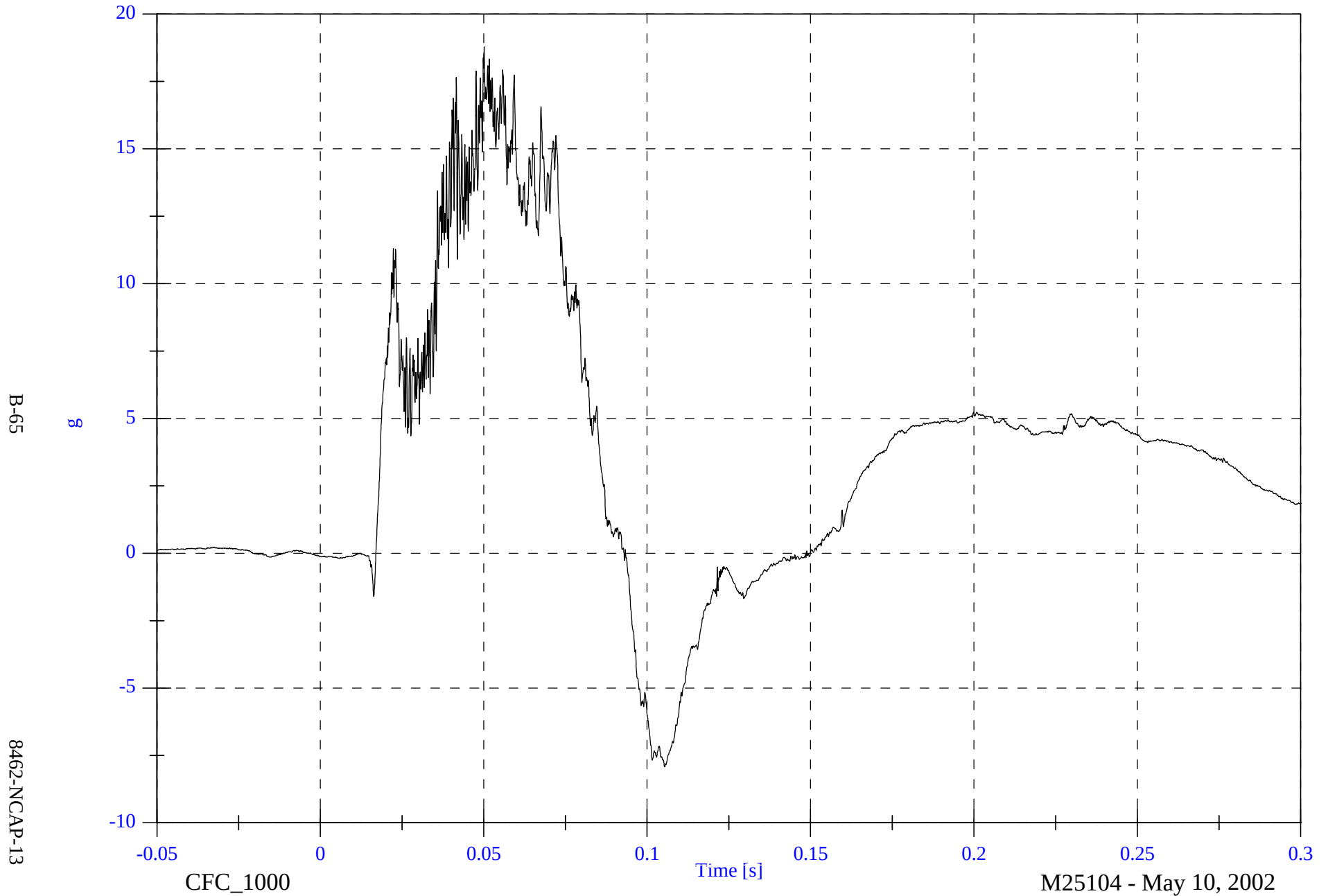


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head CG z

Max: 18.8 [g] at 0.050 [s]

Min: -7.9 [g] at 0.105 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

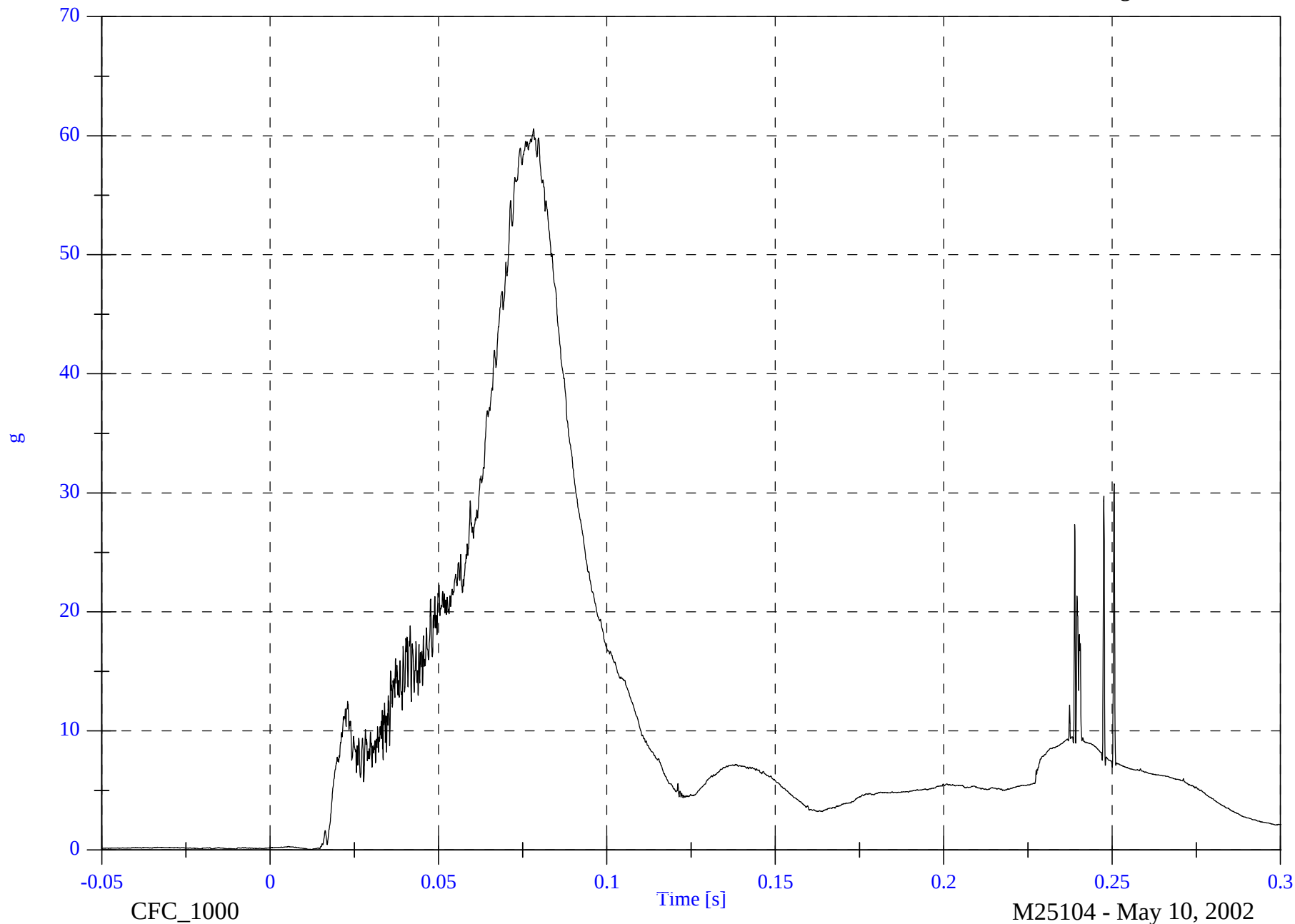
P2 Head CG Resultant

Max: 60.6 [g] at 0.078 [s]

Min: 0.0 [g] at 0.012 [s]

B-66

8462-NCAP-13

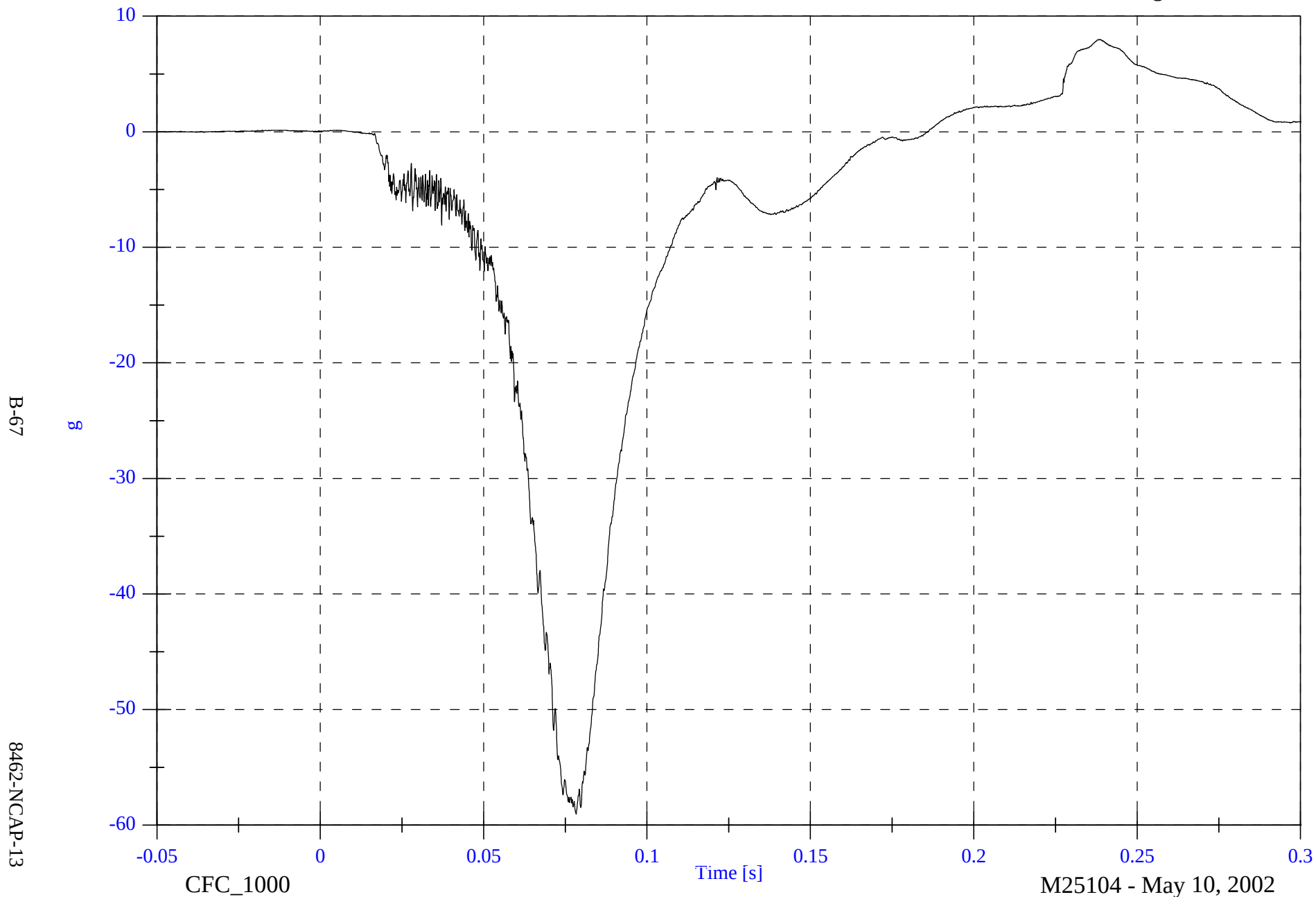


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head CG Red x

Max: 8.0 [g] at 0.239 [s]

Min: -59.1 [g] at 0.078 [s]

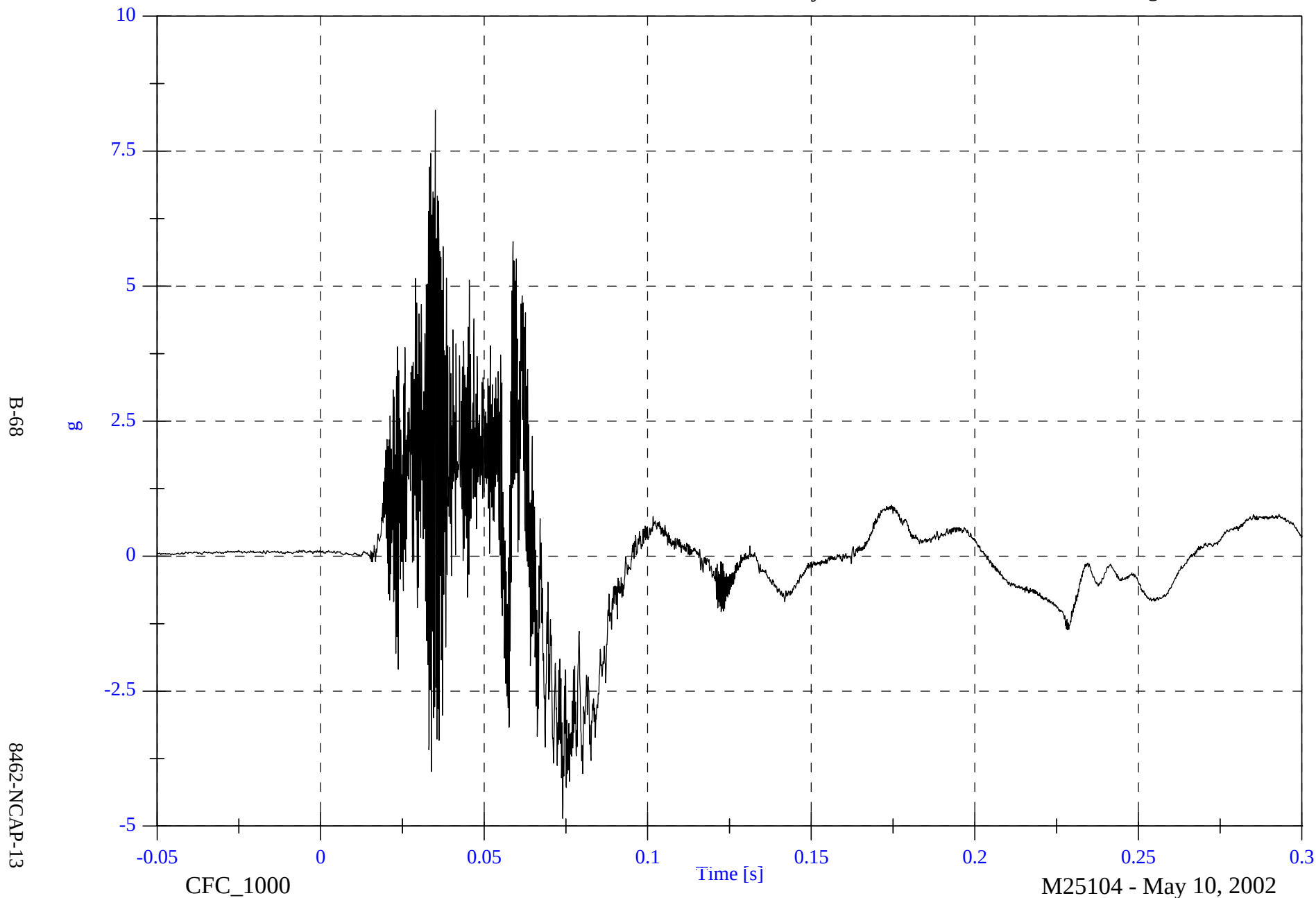


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head CG Red y

Max: 8.3 [g] at 0.035 [s]

Min: -4.9 [g] at 0.074 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

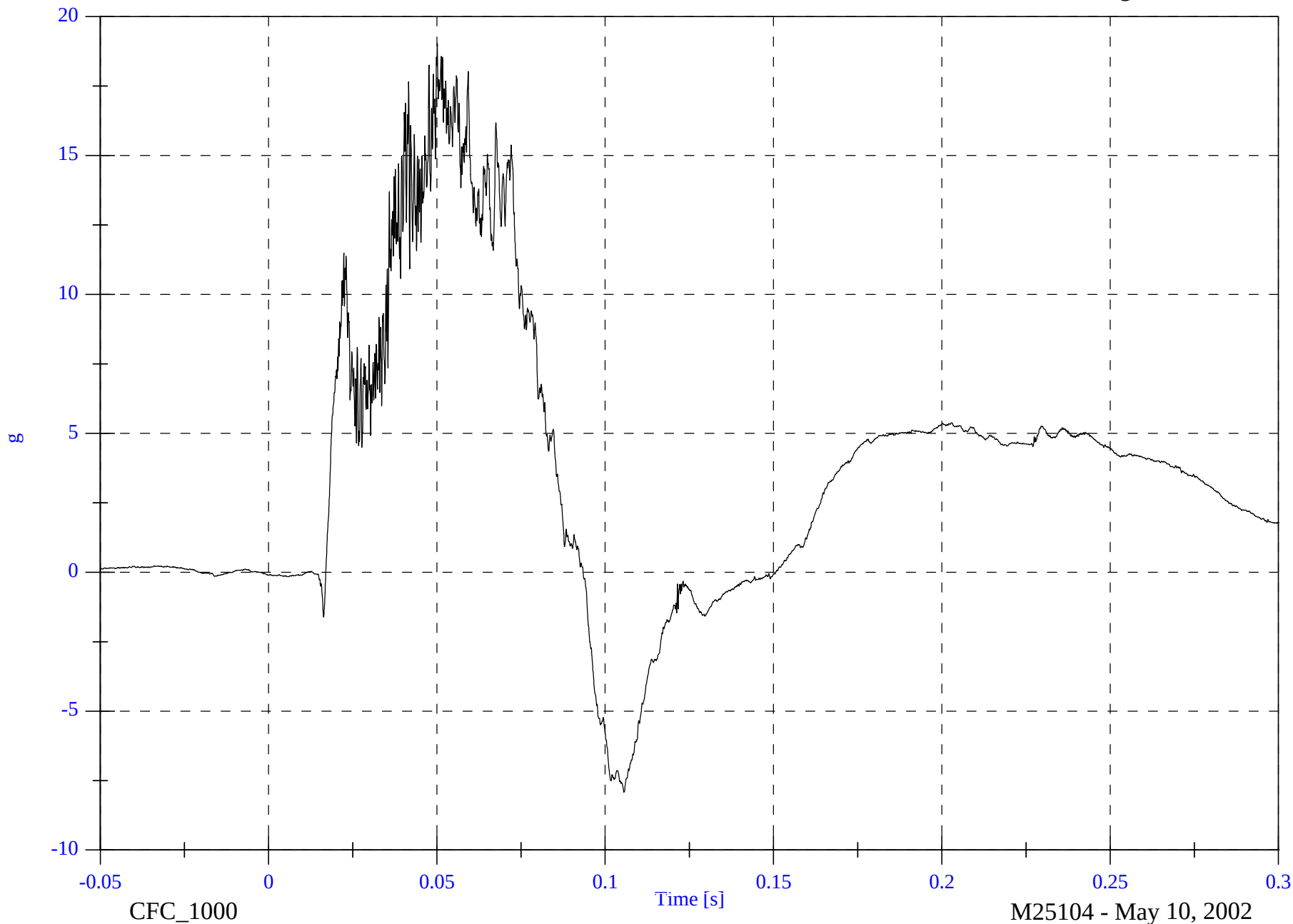
P2 Head CG Red z

Max: 19.0 [g] at 0.050 [s]

Min: -7.9 [g] at 0.106 [s]

B-69

8462-NCAP-13

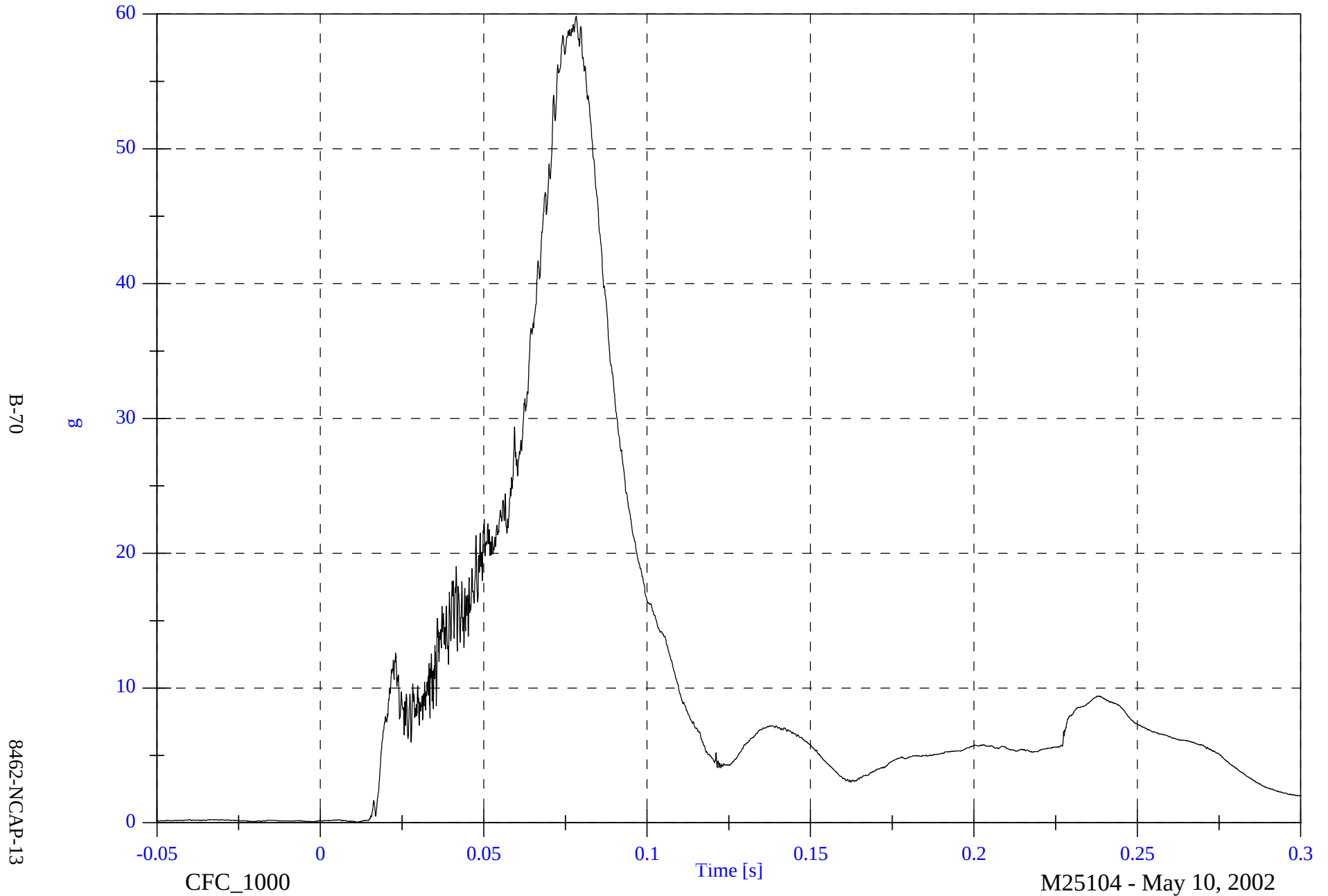


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Head CG Red Resultant

Max: 59.9 [g] at 0.078 [s]

Min: 0.1 [g] at 0.011 [s]

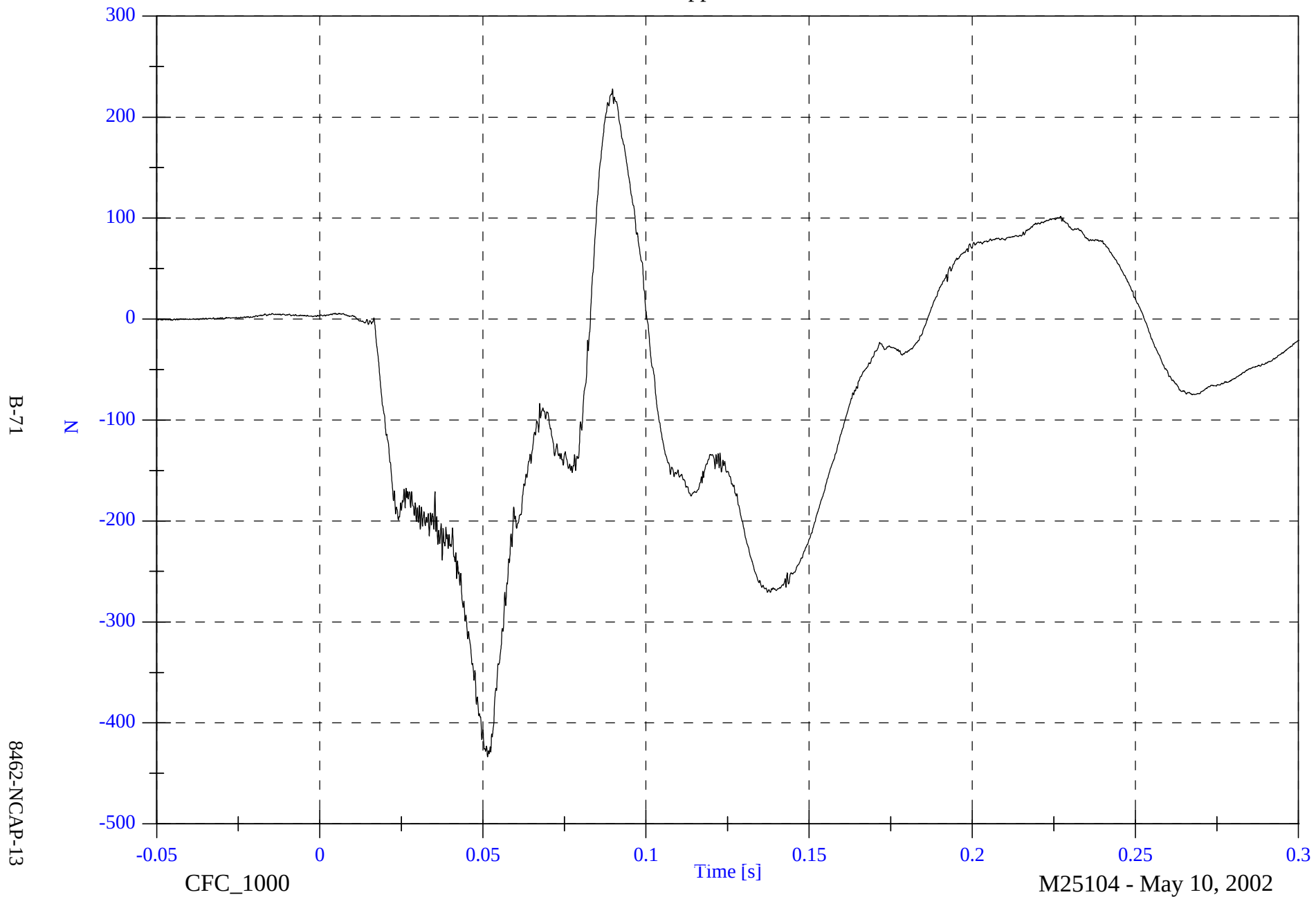


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Upper Neck Fx

Max: 228.0 [N] at 0.090 [s]

Min: -433.7 [N] at 0.051 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

Max: 1359.7 [N] at 0.078 [s]

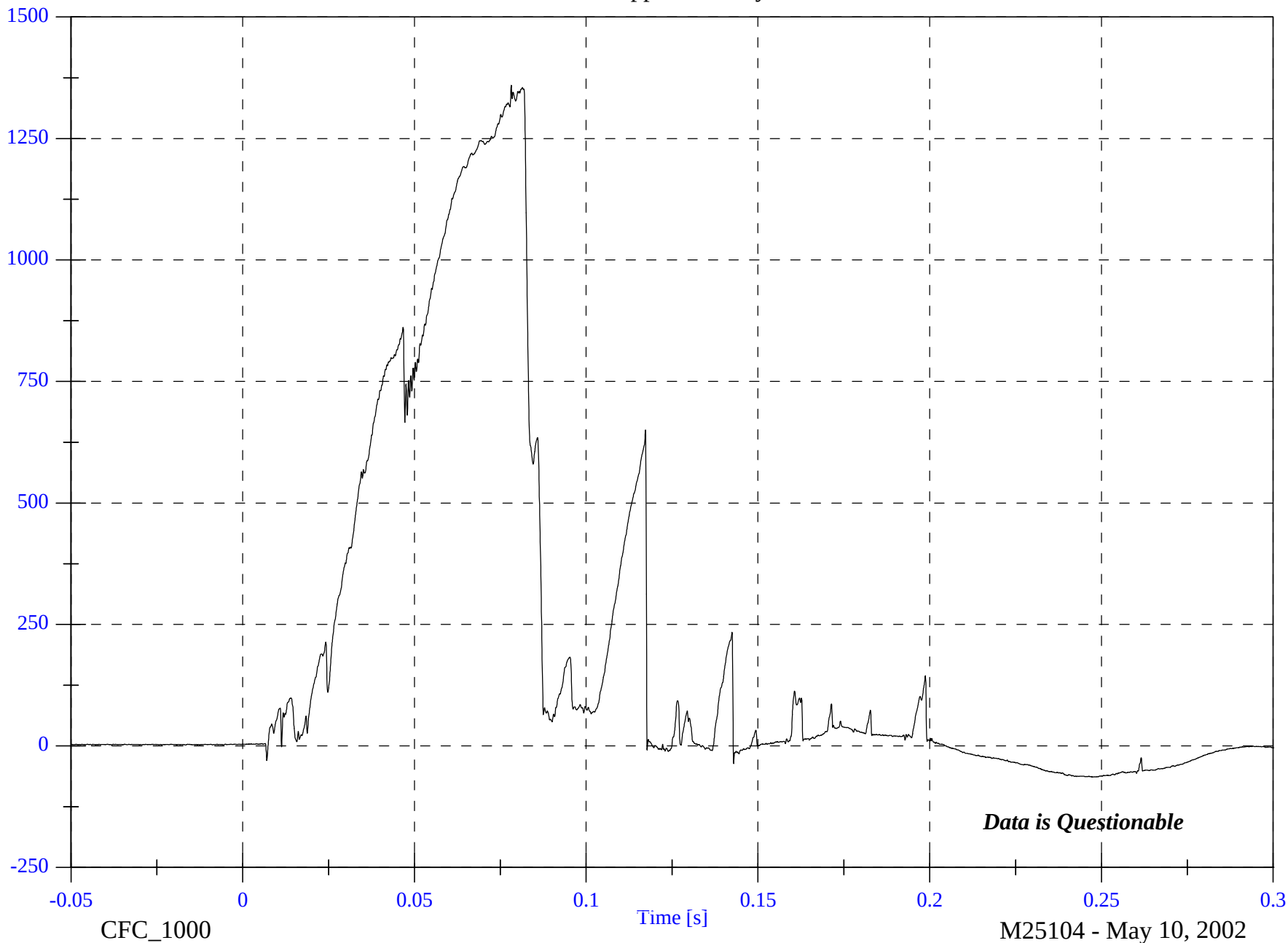
Min: -64.1 [N] at 0.247 [s]

P2 Upper Neck Fy

B-72

N

8462-NCAP-13

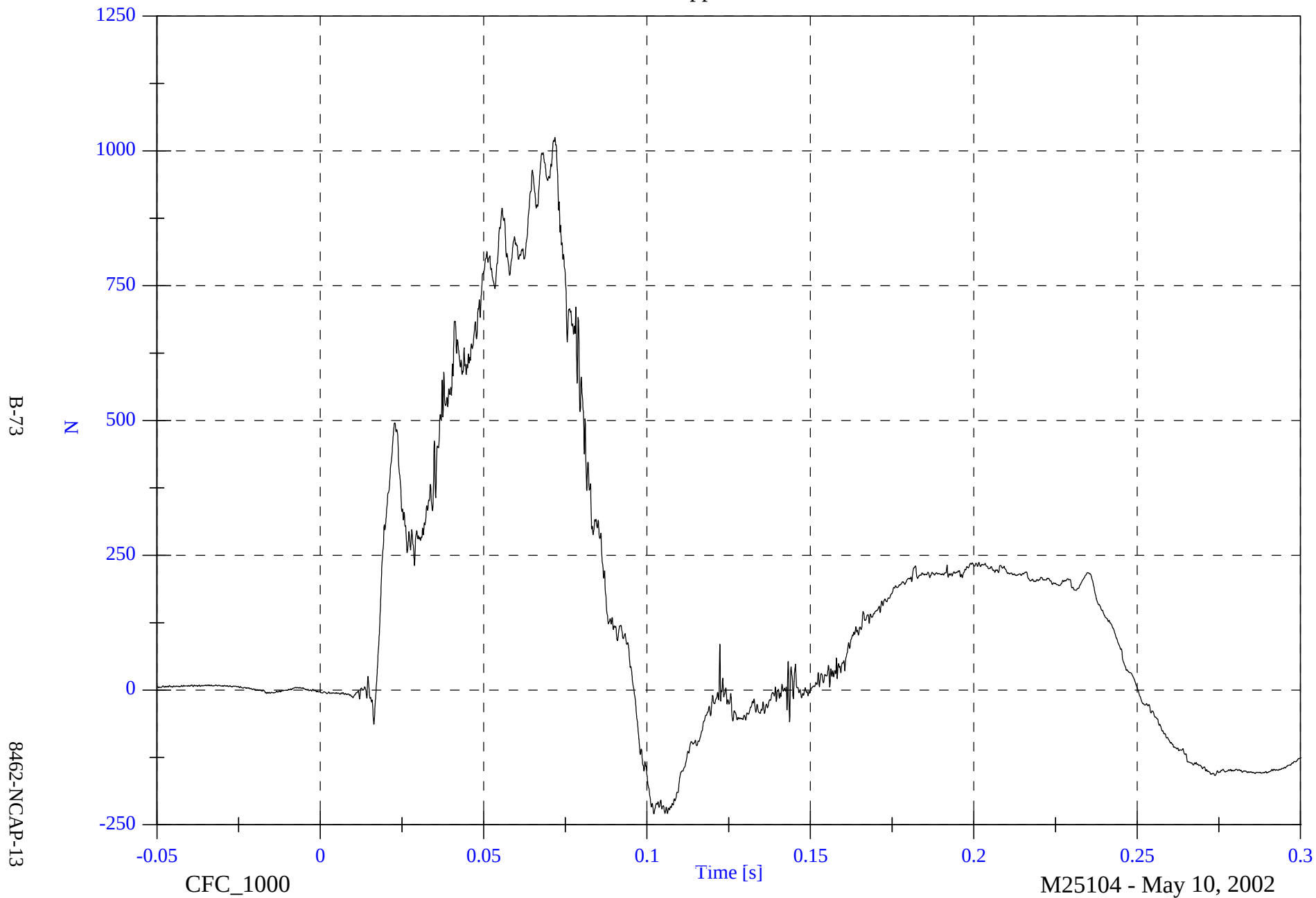


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Upper Neck Fz

Max: 1025.3 [N] at 0.072 [s]

Min: -229.5 [N] at 0.102 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

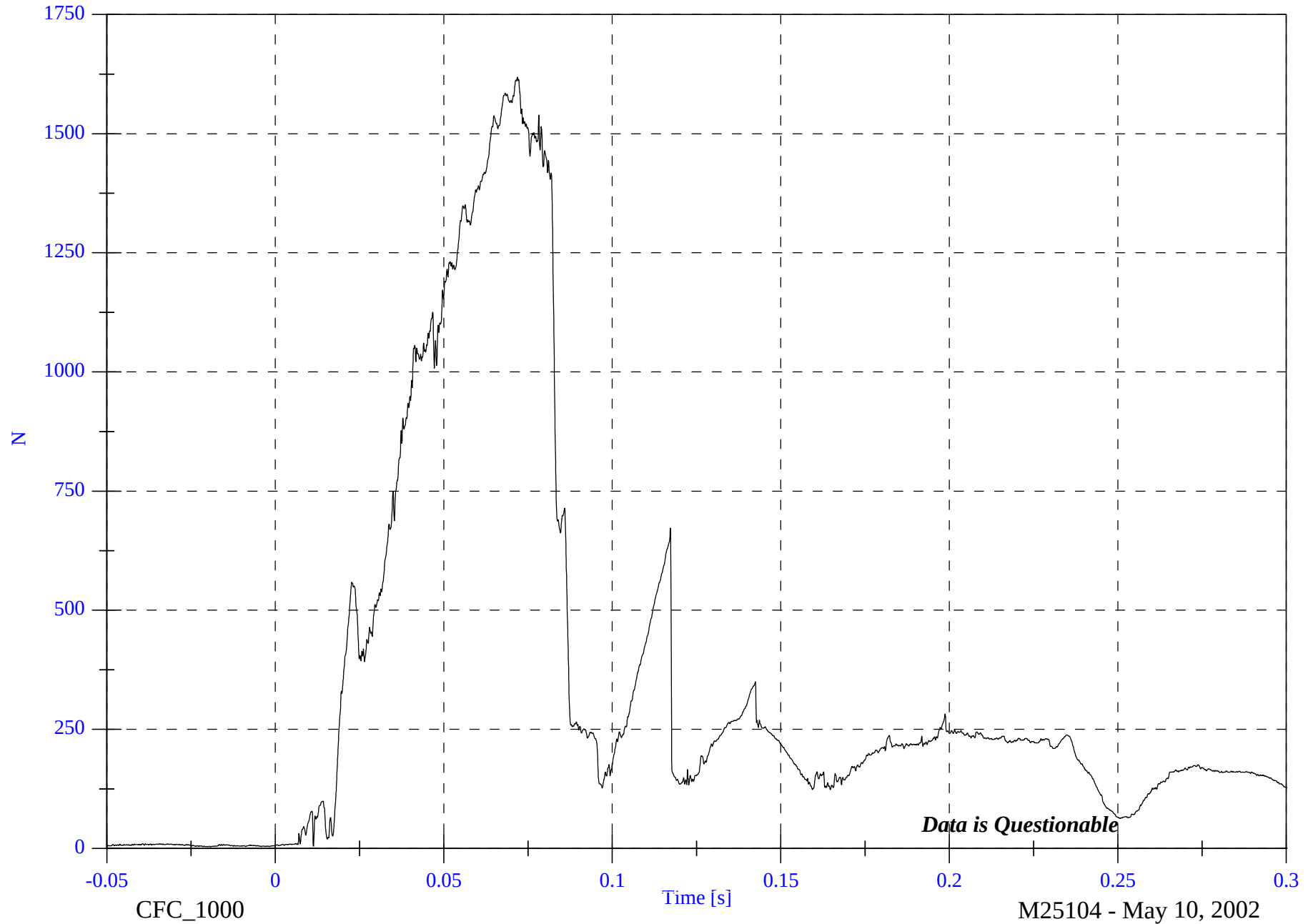
P2 Upper Neck F Resultant

Max: 1618.8 [N] at 0.072 [s]

Min: 3.4 [N] at -0.019 [s]

B-74

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

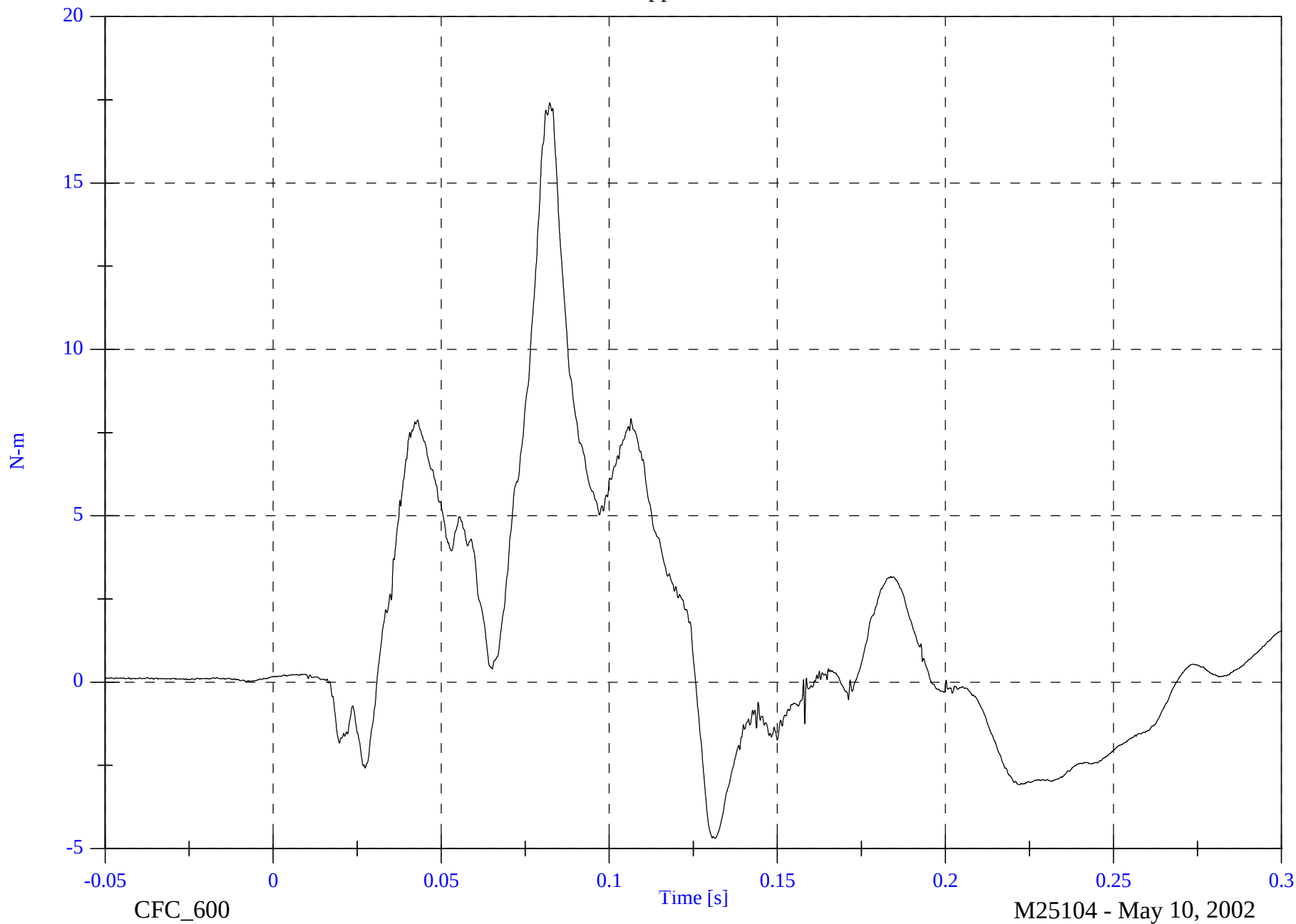
P2 Upper Neck Mx

Max: 17.4 [N-m] at 0.082 [s]

Min: -4.7 [N-m] at 0.131 [s]

B-75

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

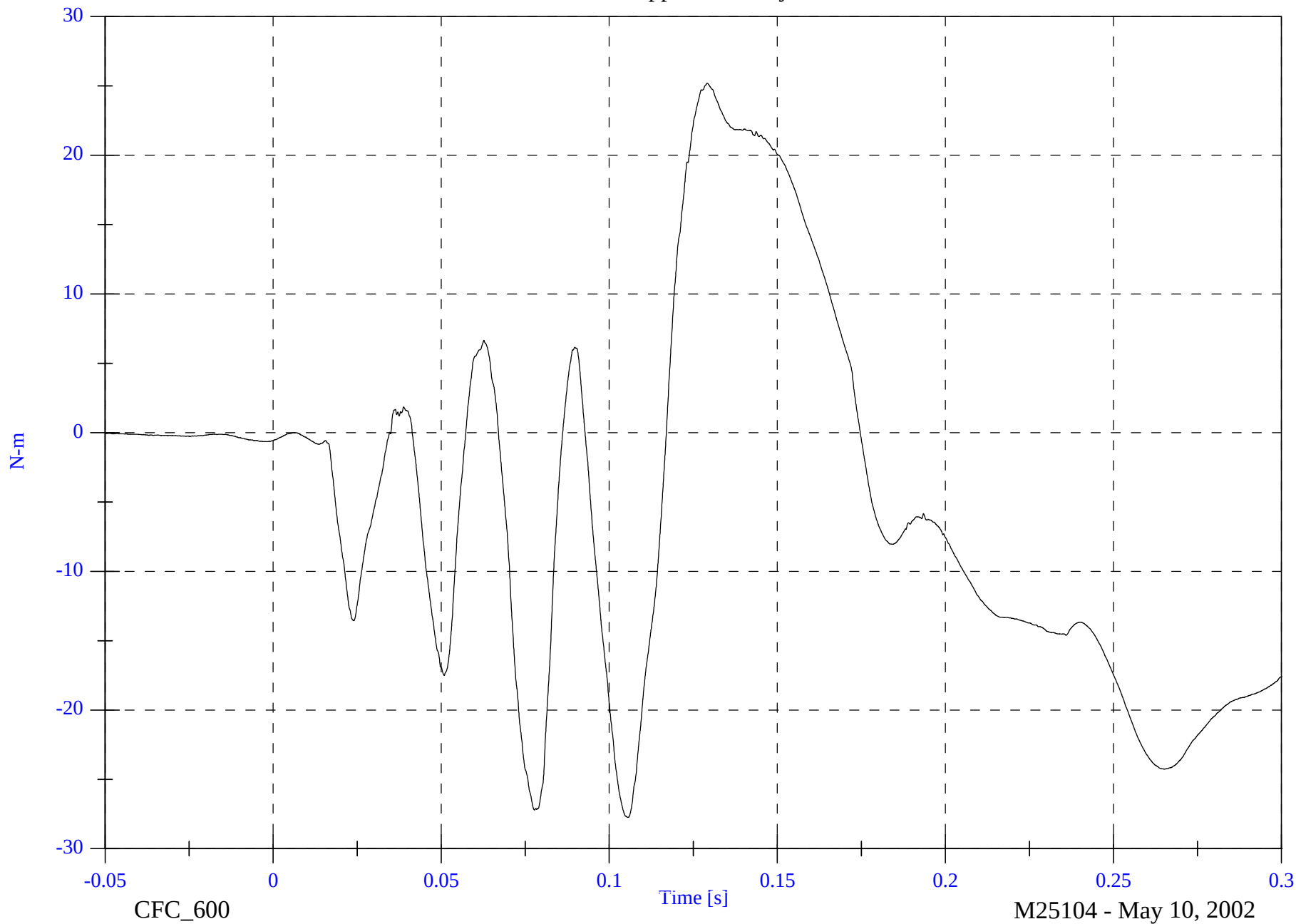
P2 Upper Neck My

Max: 25.2 [N-m] at 0.129 [s]

Min: -27.7 [N-m] at 0.106 [s]

B-76

8462-NCAP-13

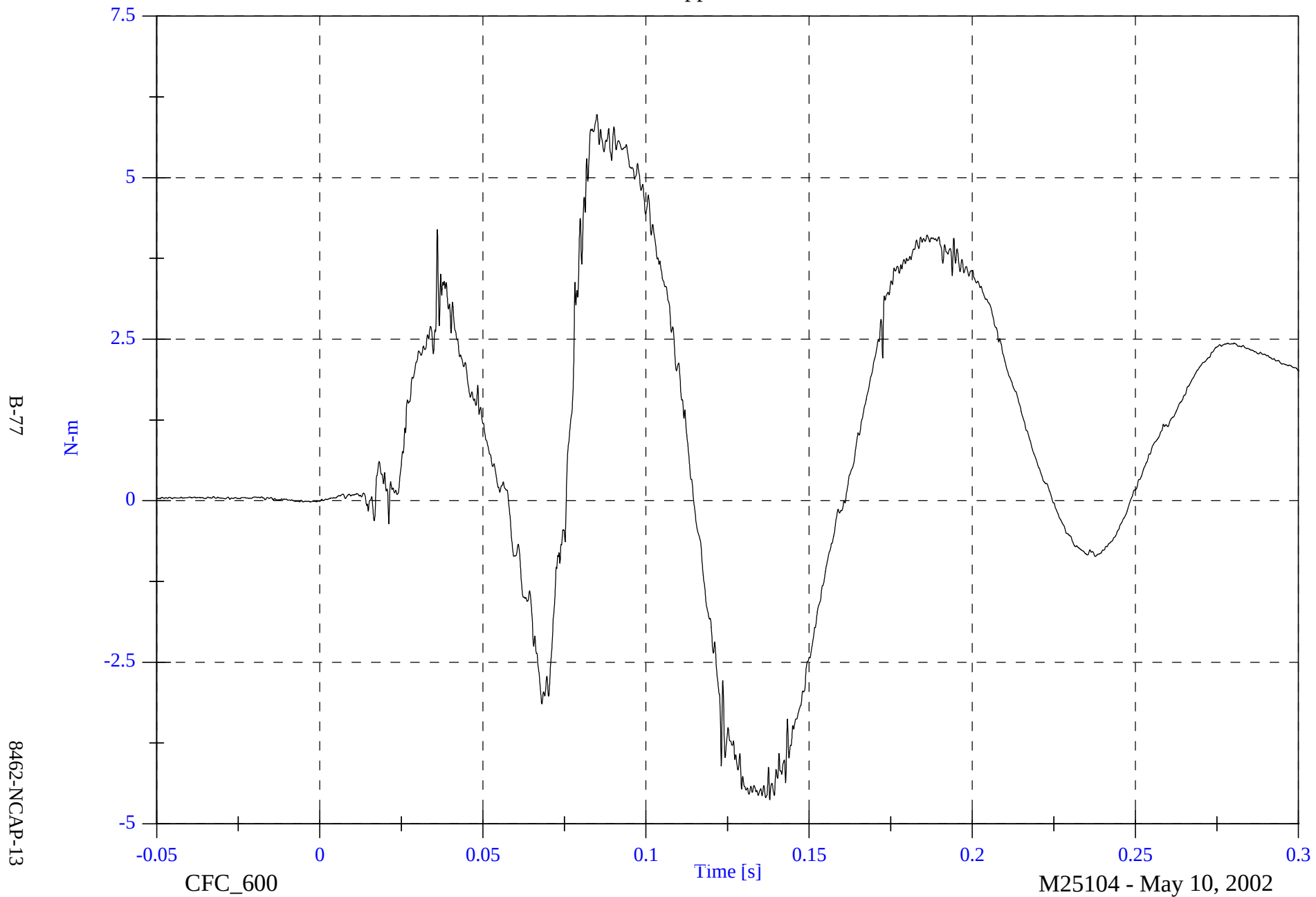


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Upper Neck Mz

Max: 6.0 [N-m] at 0.085 [s]

Min: -4.6 [N-m] at 0.138 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

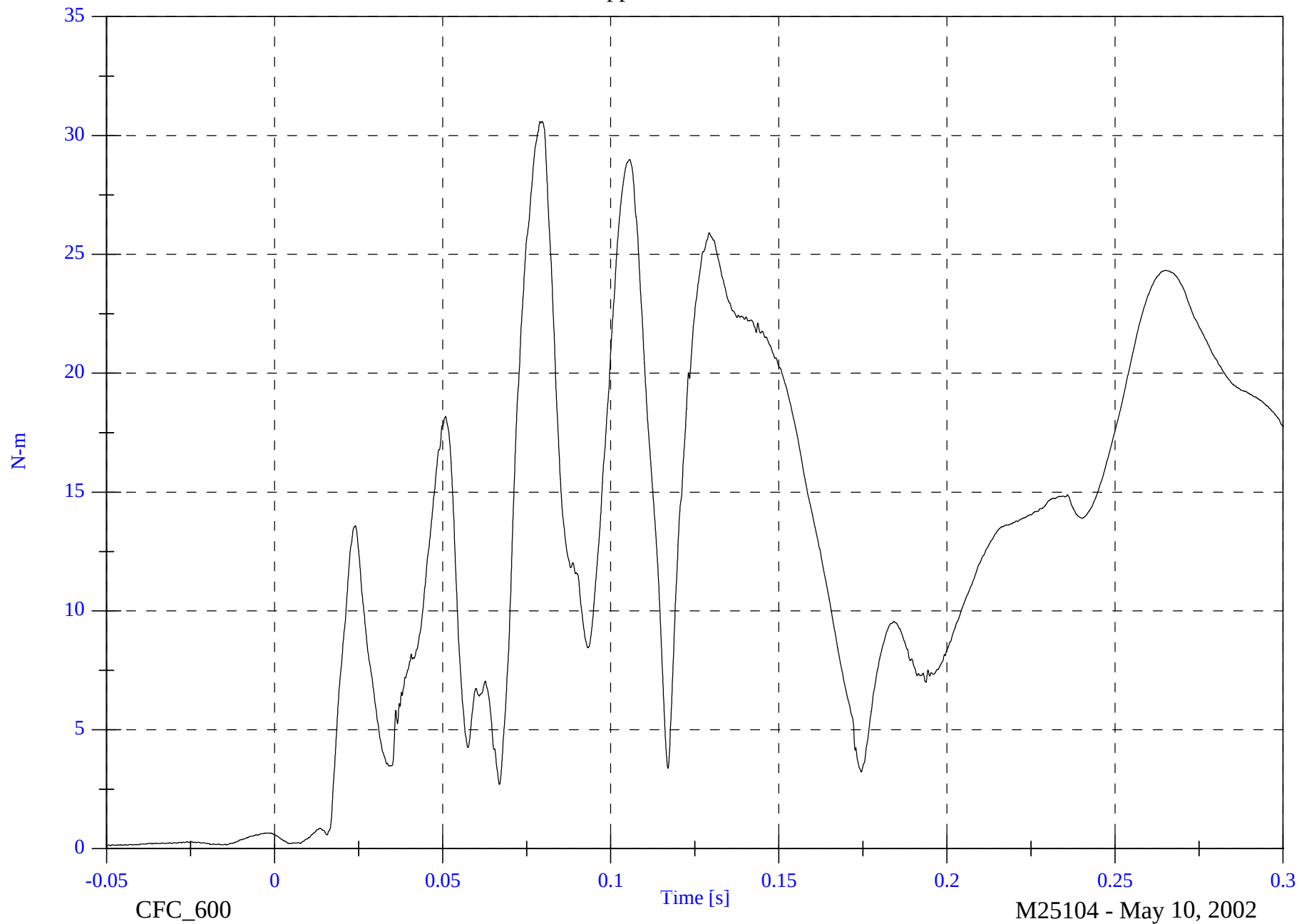
P2 Upper Neck M Resultant

Max: 30.6 [N-m] at 0.079 [s]

Min: 0.1 [N-m] at -0.050 [s]

B-78

8462-NCAP-13

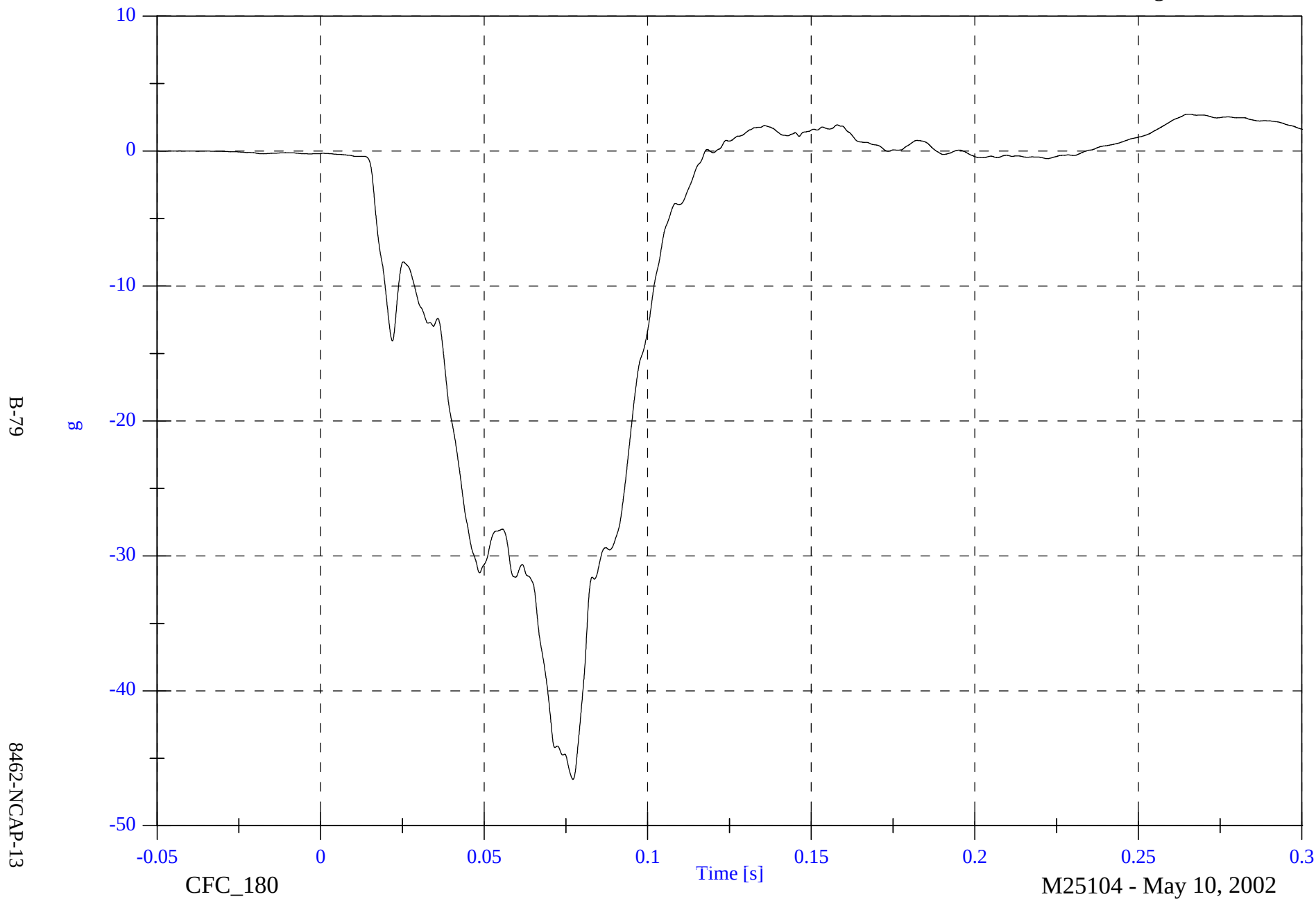


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 2.7 [g] at 0.266 [s]

Min: -46.6 [g] at 0.077 [s]

P2 Chest x

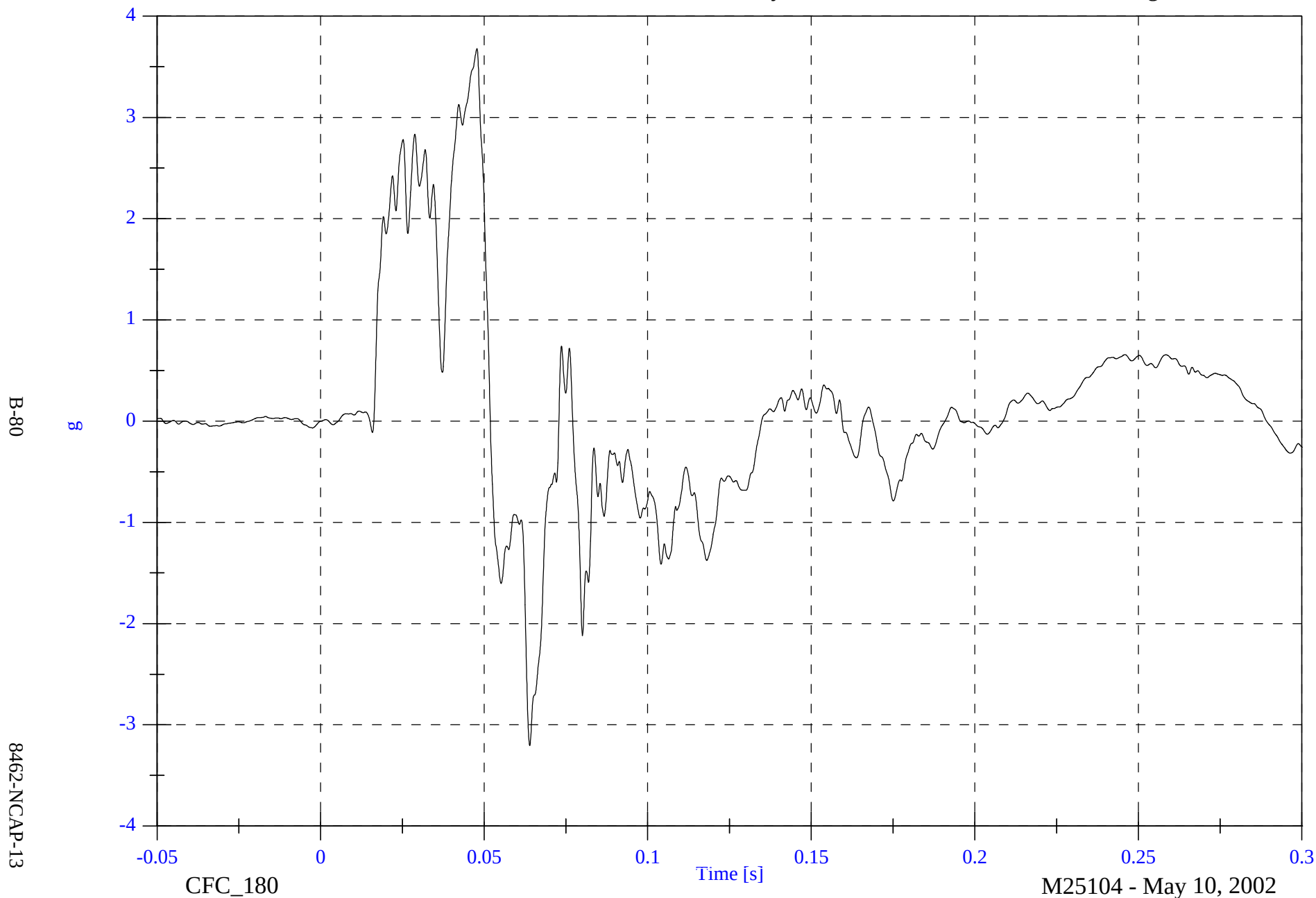


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Chest y

Max: 3.7 [g] at 0.048 [s]

Min: -3.2 [g] at 0.064 [s]

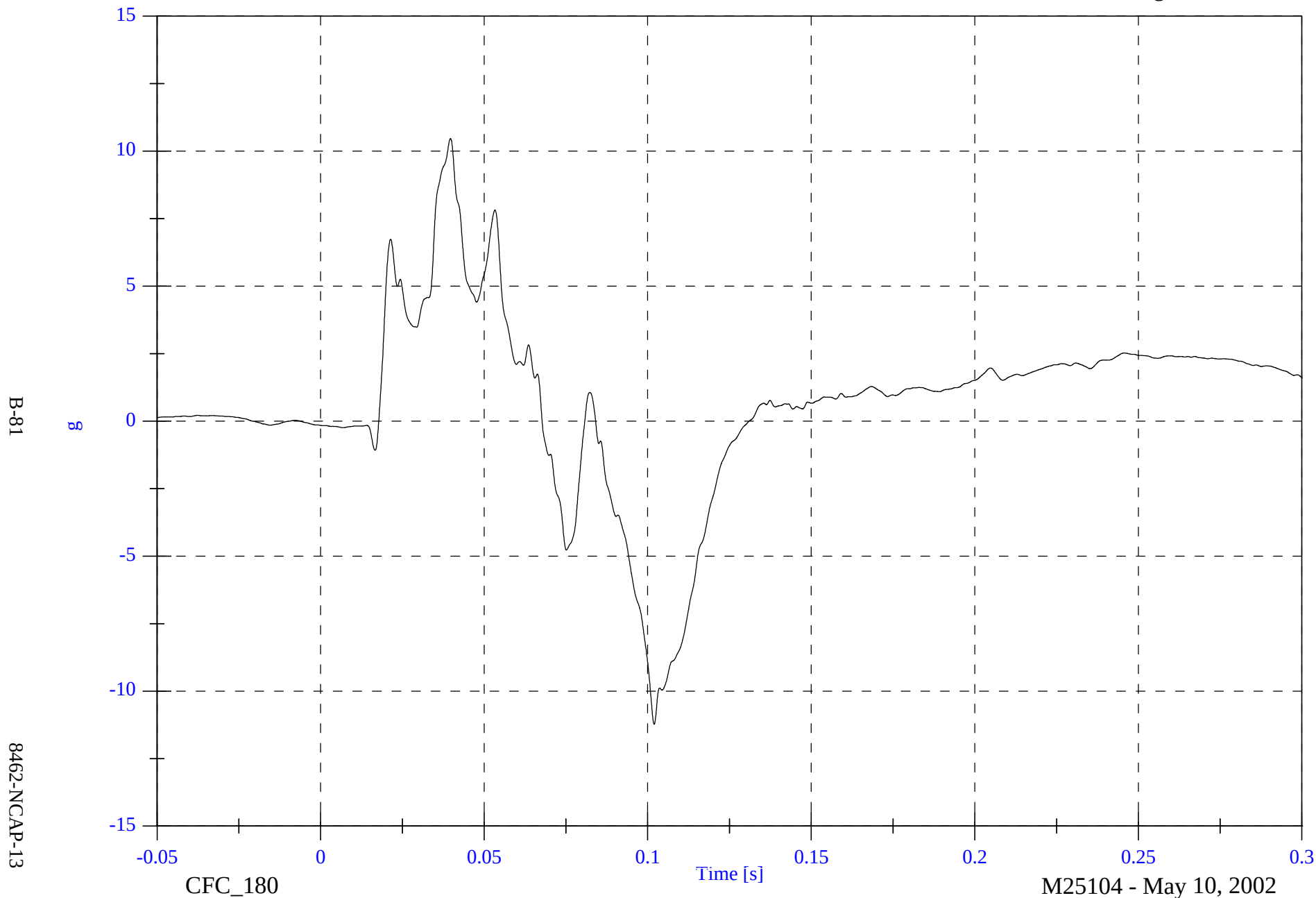


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Chest z

Max: 10.5 [g] at 0.040 [s]

Min: -11.2 [g] at 0.102 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

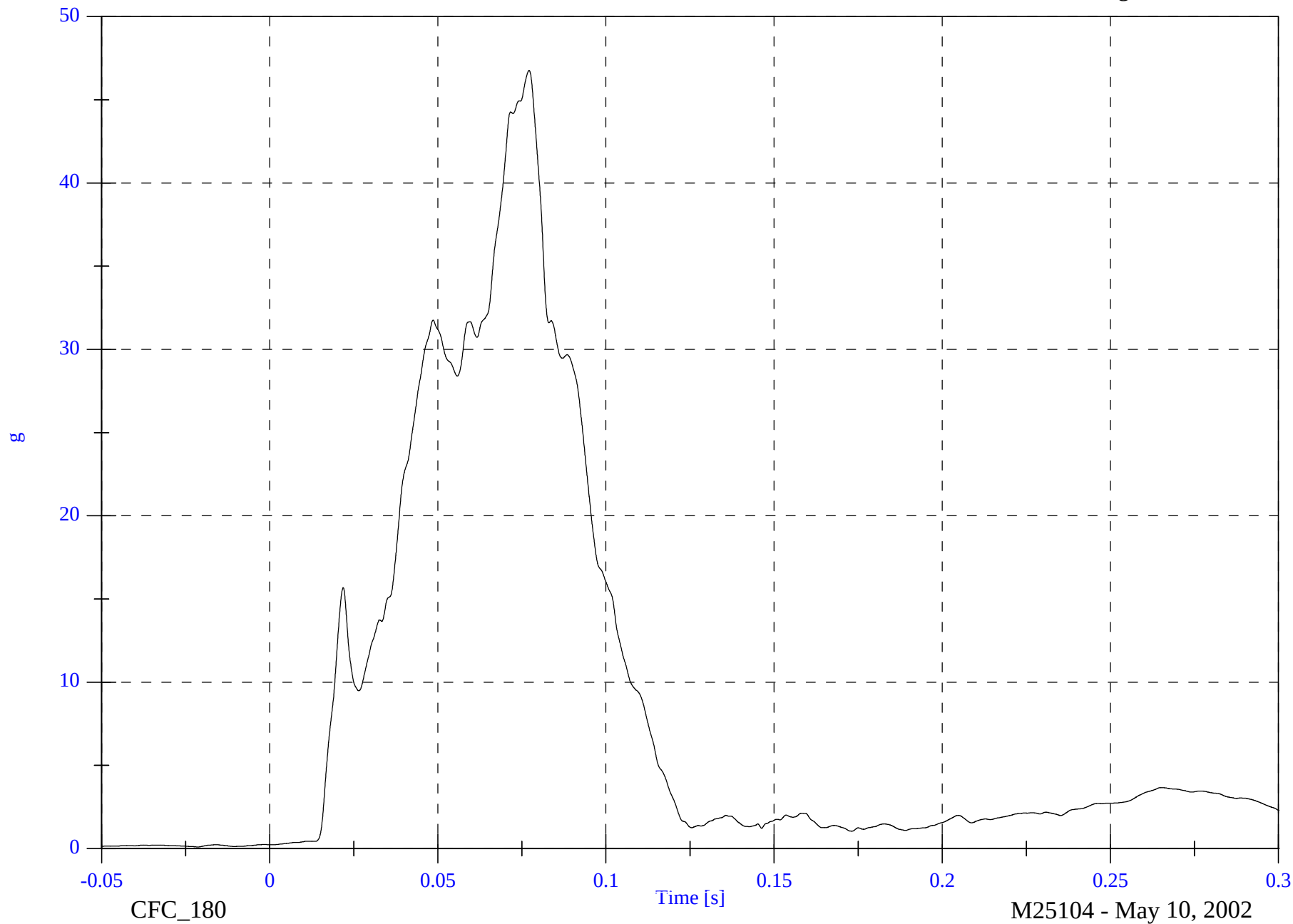
P2 Chest Resultant

Max: 46.8 [g] at 0.077 [s]

Min: 0.1 [g] at -0.021 [s]

B-82

8462-NCAP-13

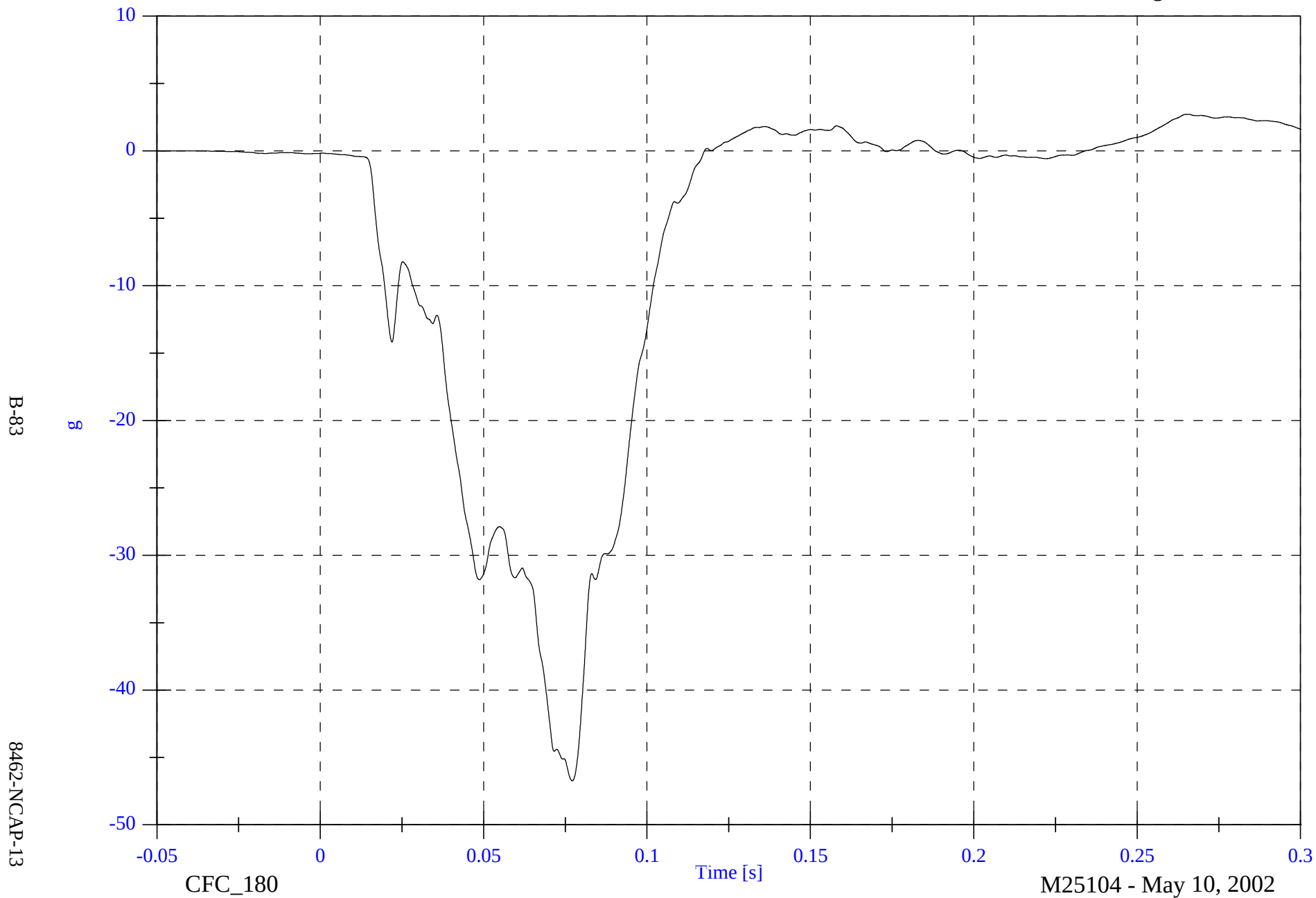


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Chest Red x

Max: 2.7 [g] at 0.266 [s]

Min: -46.7 [g] at 0.077 [s]

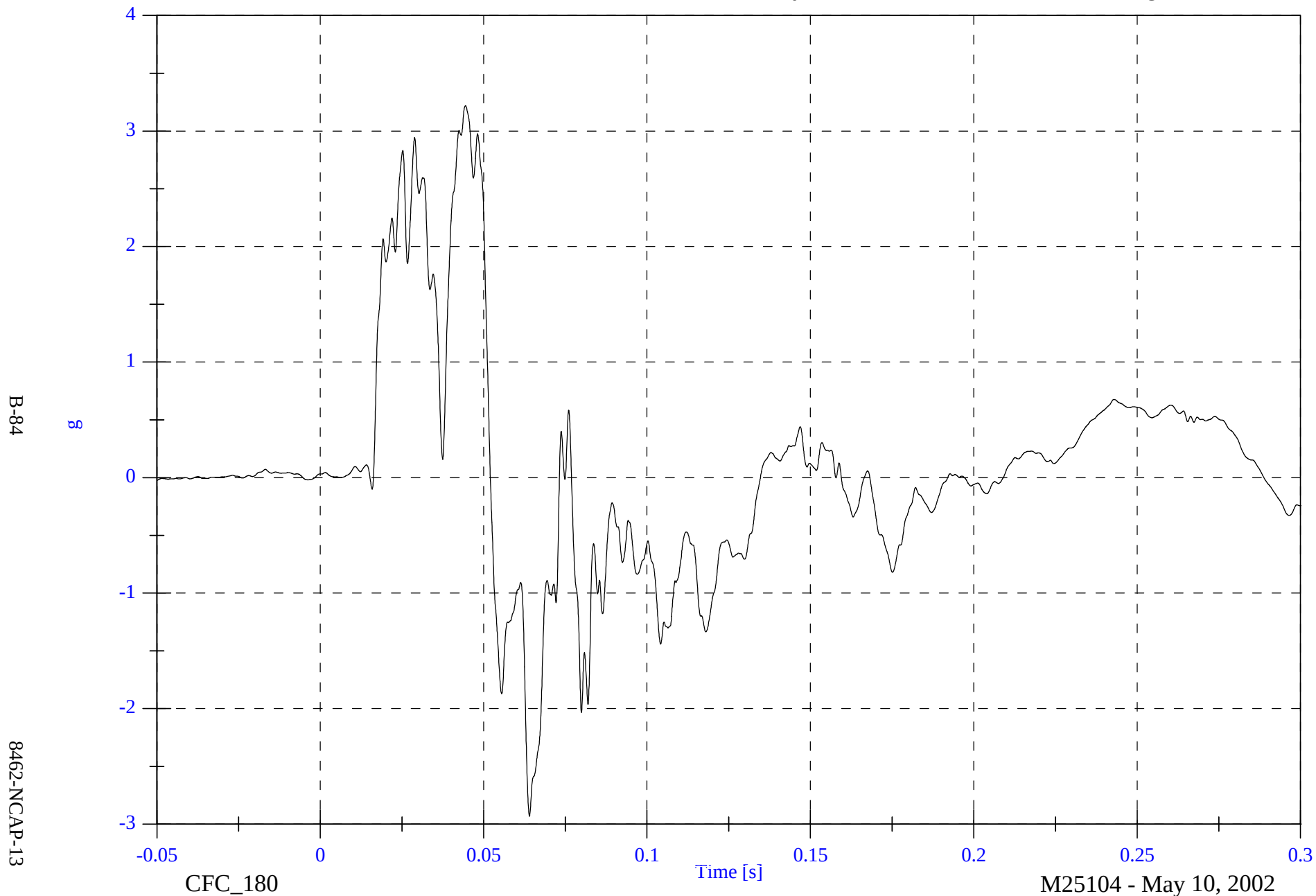


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Chest Red y

Max: 3.2 [g] at 0.044 [s]

Min: -2.9 [g] at 0.064 [s]

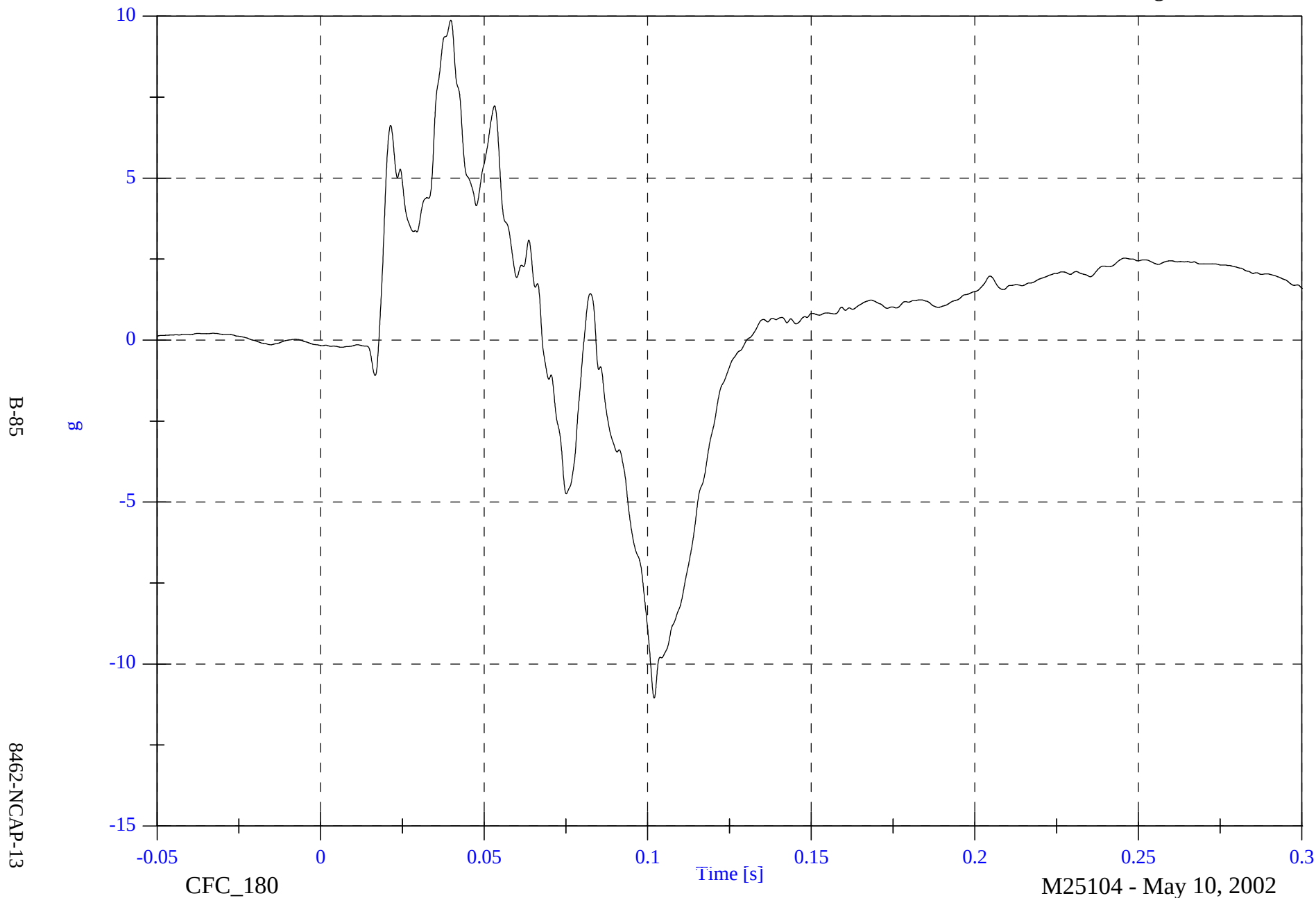


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 9.9 [g] at 0.040 [s]

Min: -11.1 [g] at 0.102 [s]

P2 Chest Red z



2002 NCAP Test 13 - 2002 Toyota Camry

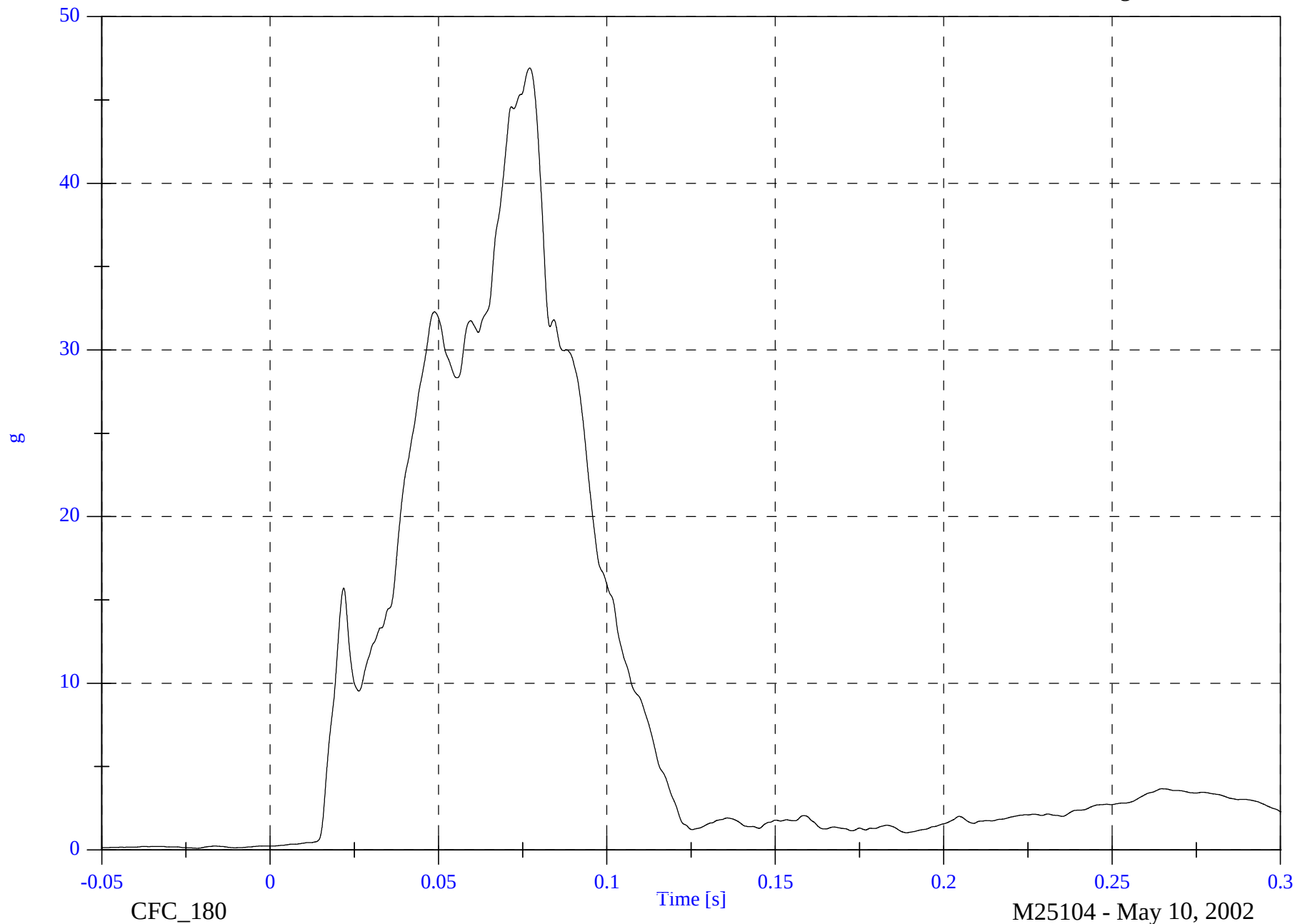
P2 Chest Red Resultant

Max: 46.9 [g] at 0.077 [s]

Min: 0.1 [g] at -0.022 [s]

B-86

8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

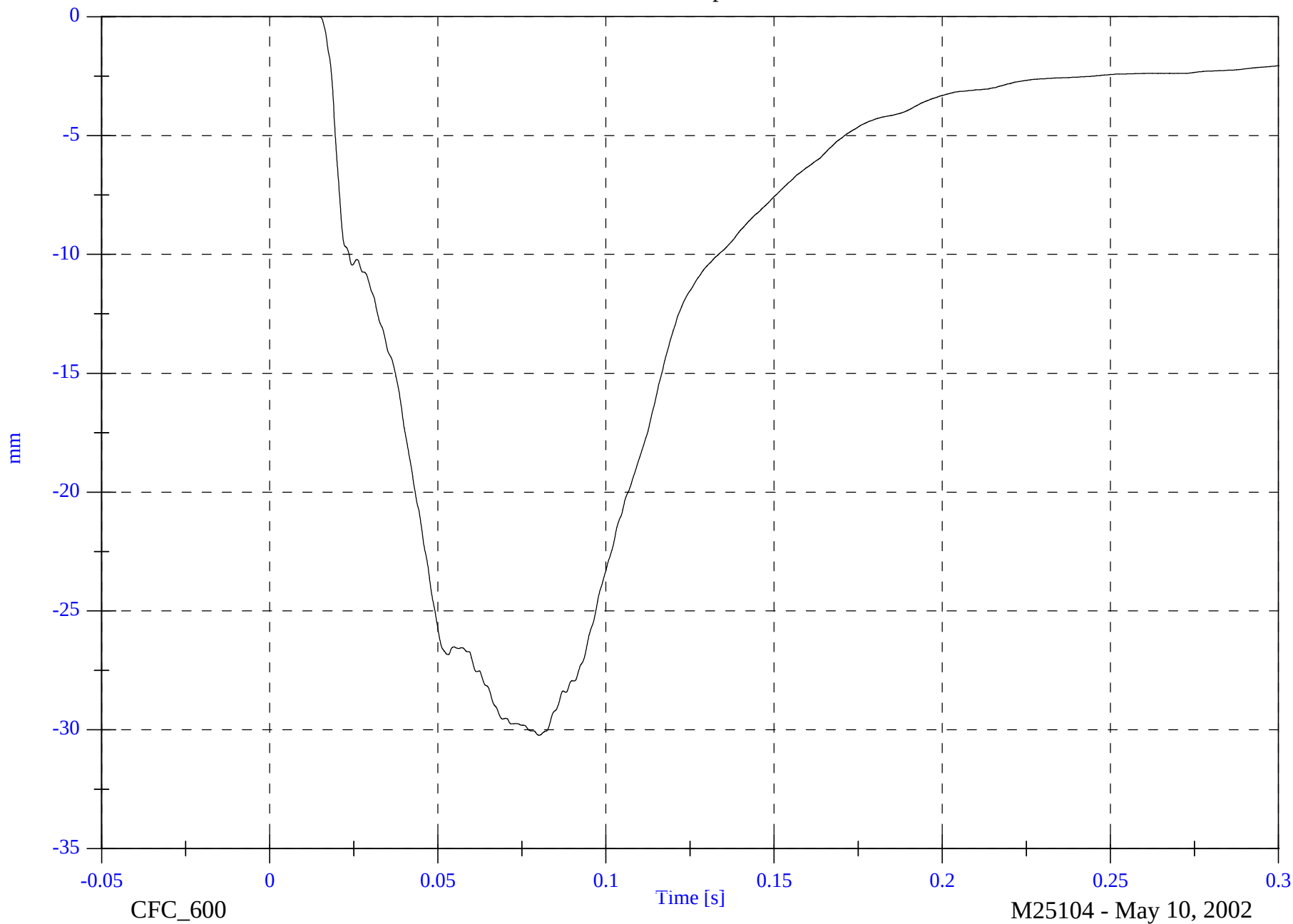
P2 Chest Compression x

Max: 0.0 [mm] at -0.011 [s]

Min: -30.2 [mm] at 0.080 [s]

B-87

8462-NCAP-13

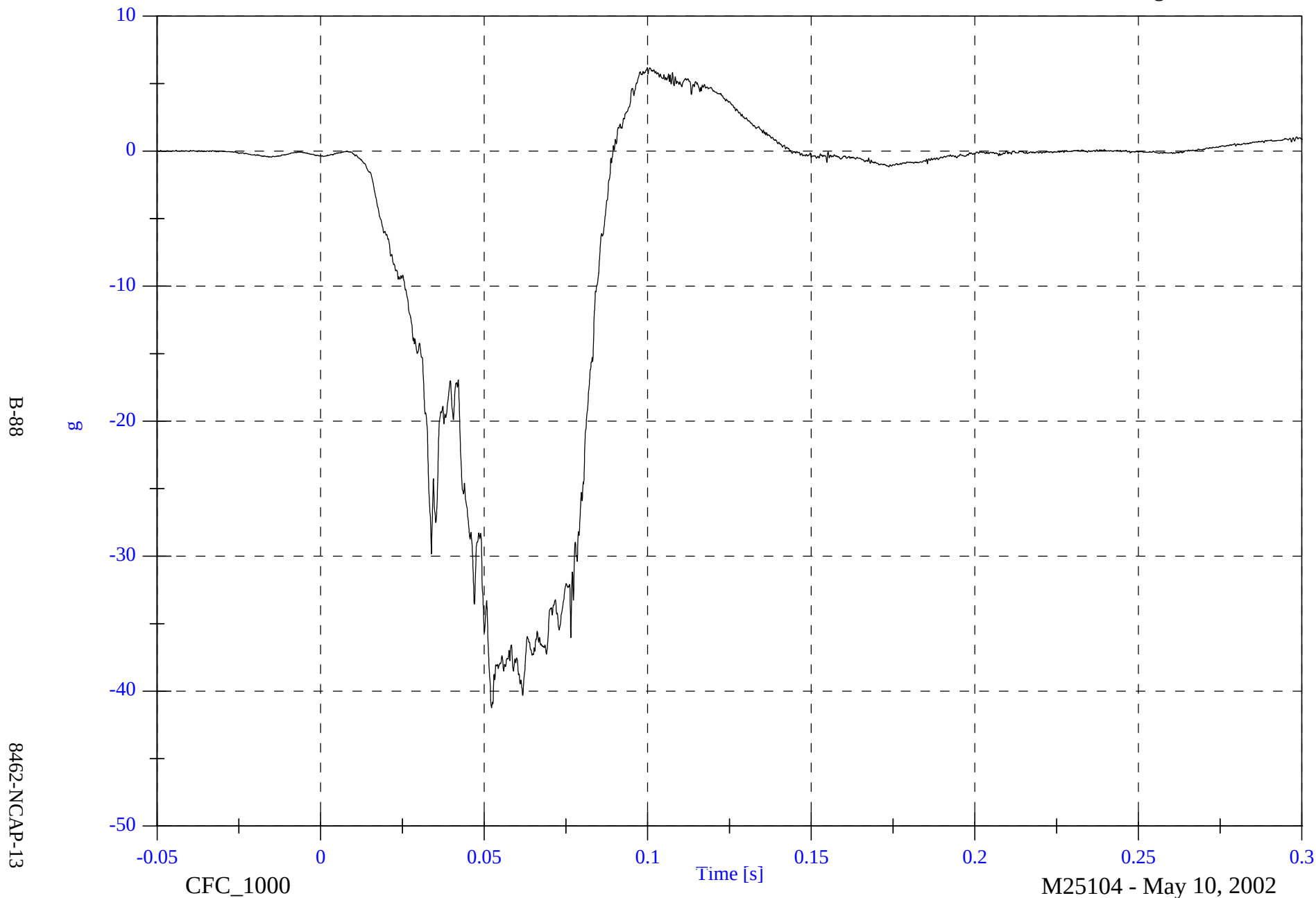


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 6.2 [g] at 0.100 [s]

Min: -41.2 [g] at 0.052 [s]

P2 Pelvic x

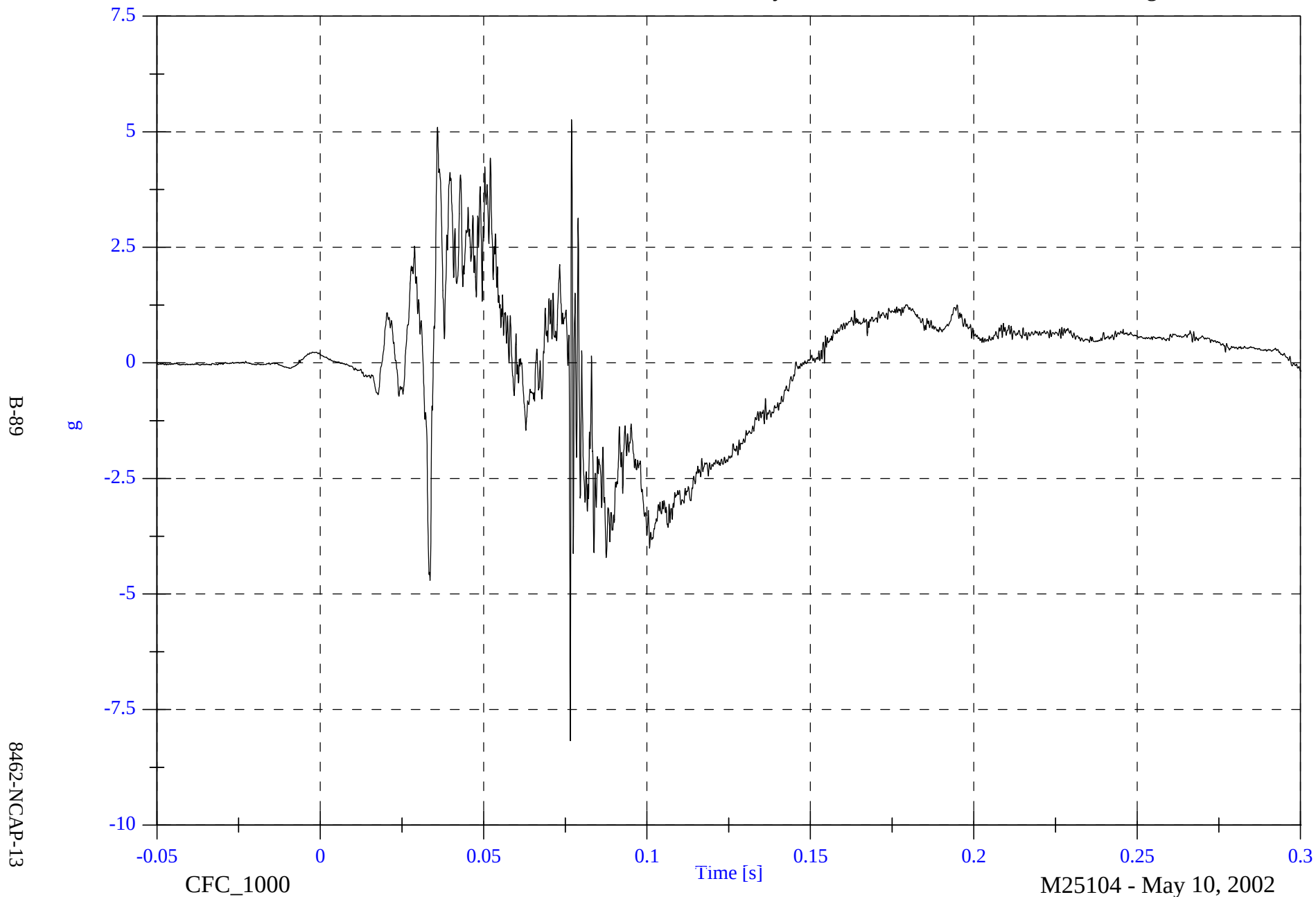


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Pelvic y

Max: 5.3 [g] at 0.077 [s]

Min: -8.2 [g] at 0.077 [s]

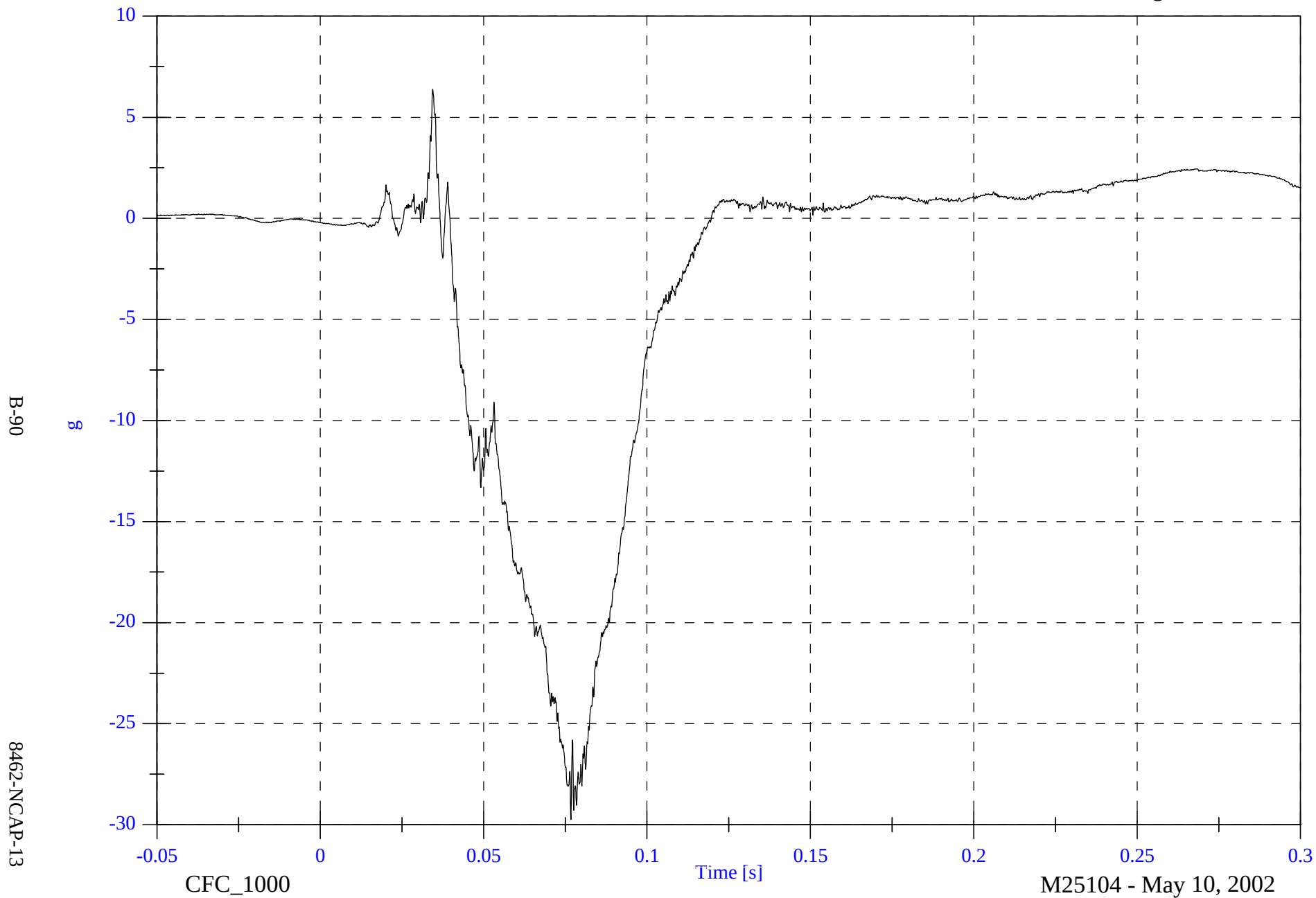


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 6.4 [g] at 0.034 [s]

Min: -29.7 [g] at 0.077 [s]

P2 Pelvic z



2002 NCAP Test 13 - 2002 Toyota Camry

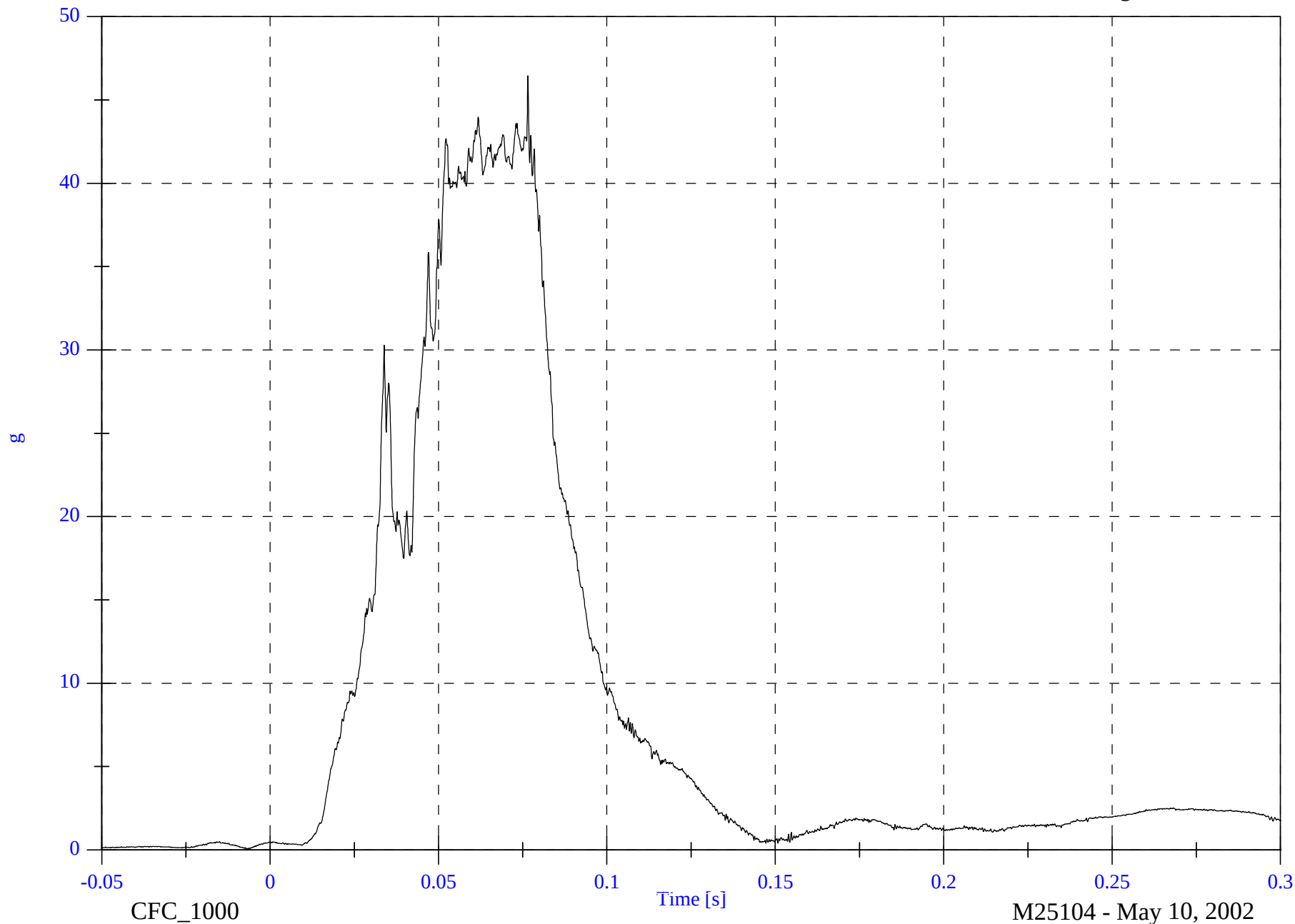
P2 Pelvic Resultant

Max: 46.5 [g] at 0.077 [s]

Min: 0.1 [g] at -0.007 [s]

B-91

8462-NCAP-13

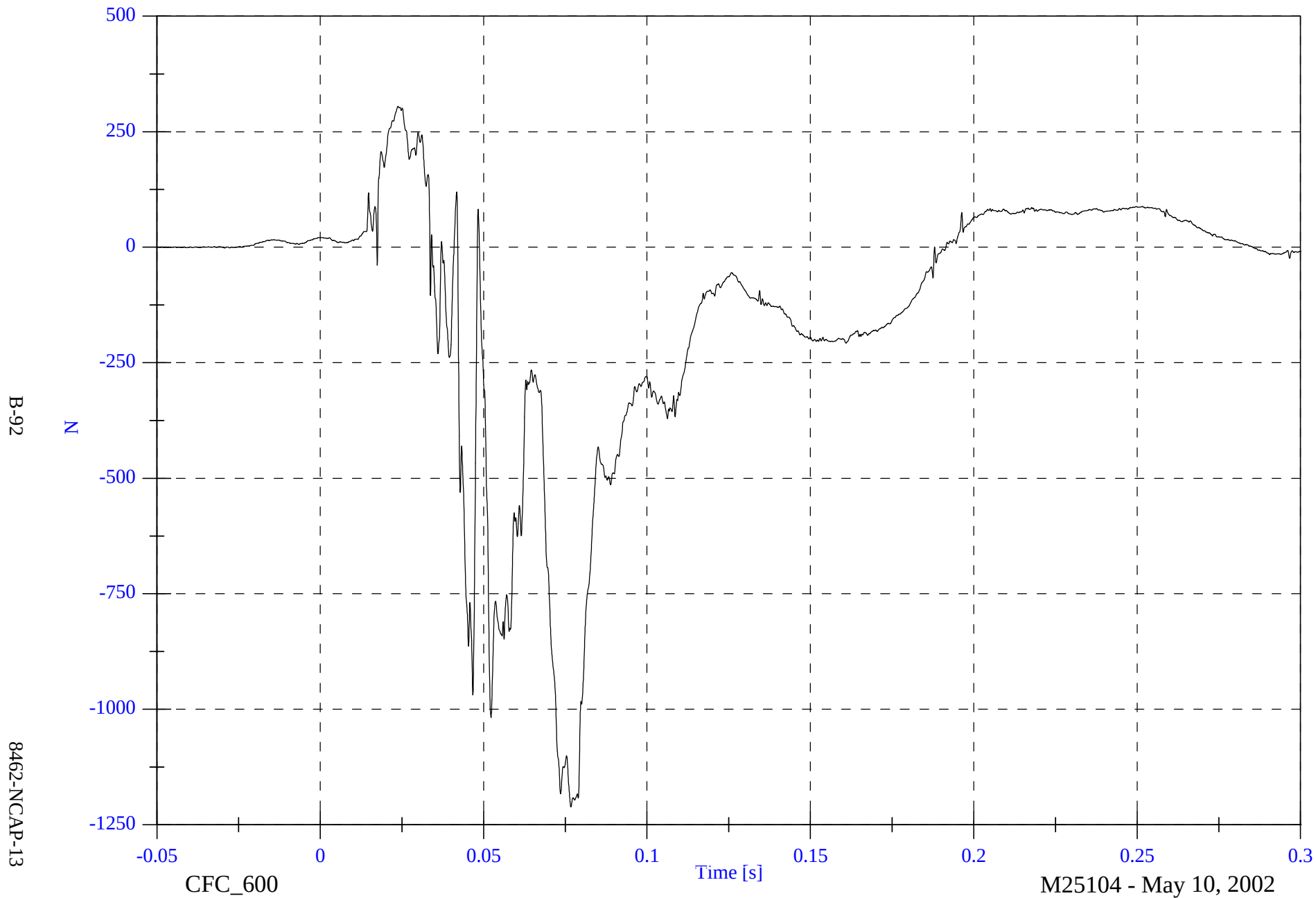


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Left Femur z

Max: 304.8 [N] at 0.024 [s]

Min: -1211.5 [N] at 0.077 [s]

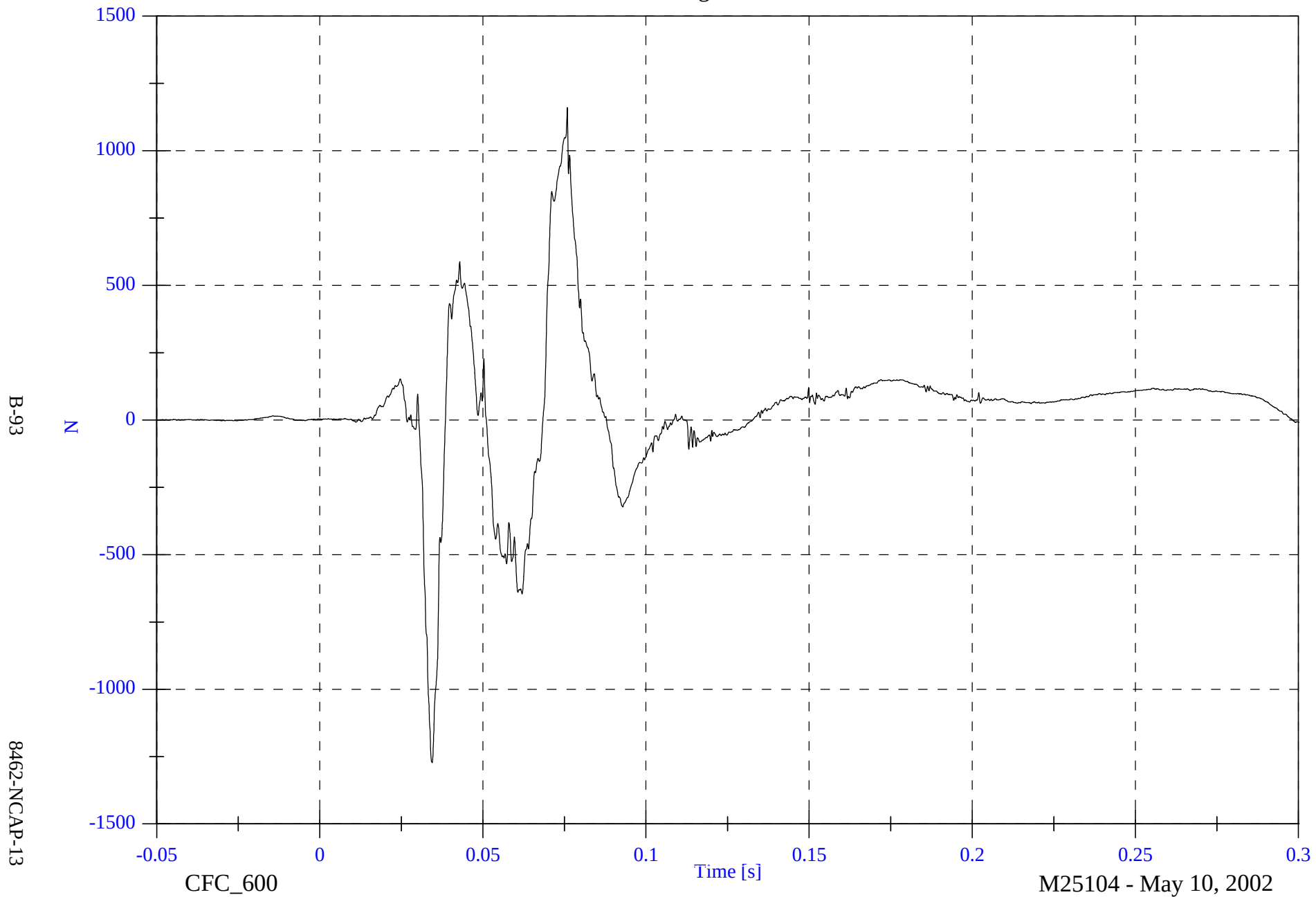


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Right Femur z

Max: 1160.9 [N] at 0.076 [s]

Min: -1272.8 [N] at 0.034 [s]

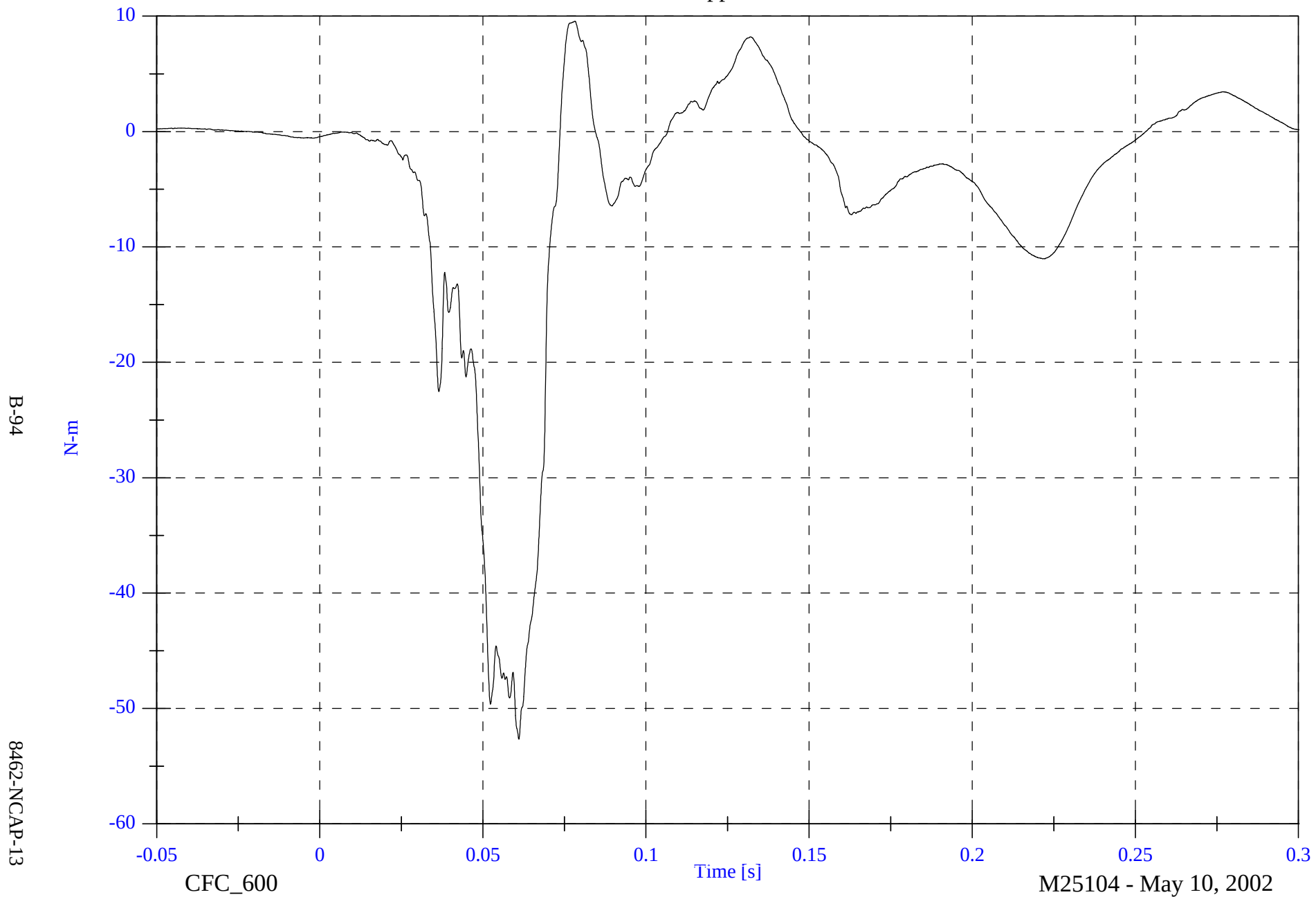


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Left Upper Tibia Mx

Max: 9.6 [N-m] at 0.078 [s]

Min: -52.7 [N-m] at 0.061 [s]

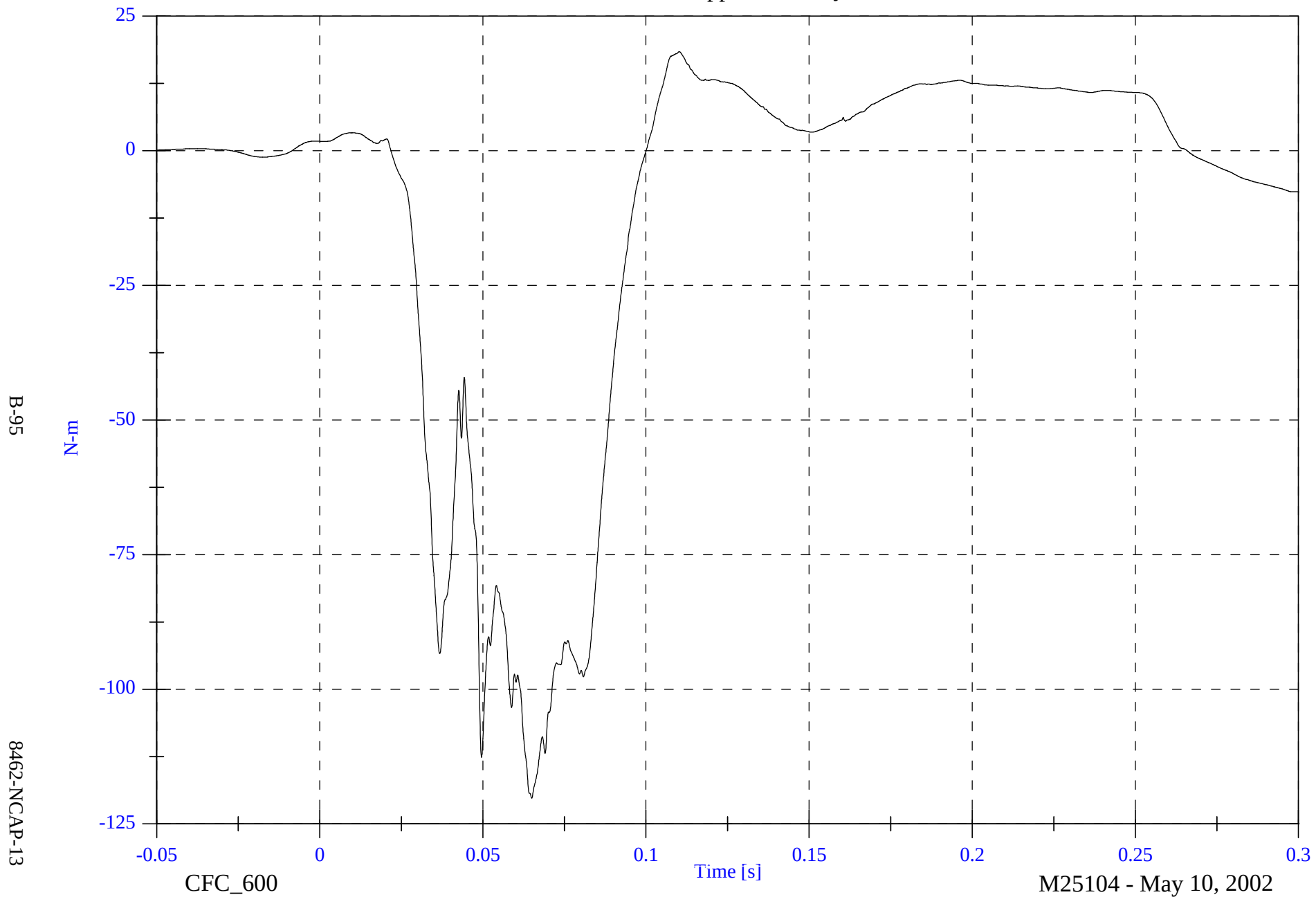


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Left Upper Tibia My

Max: 18.4 [N-m] at 0.110 [s]

Min: -120.2 [N-m] at 0.065 [s]

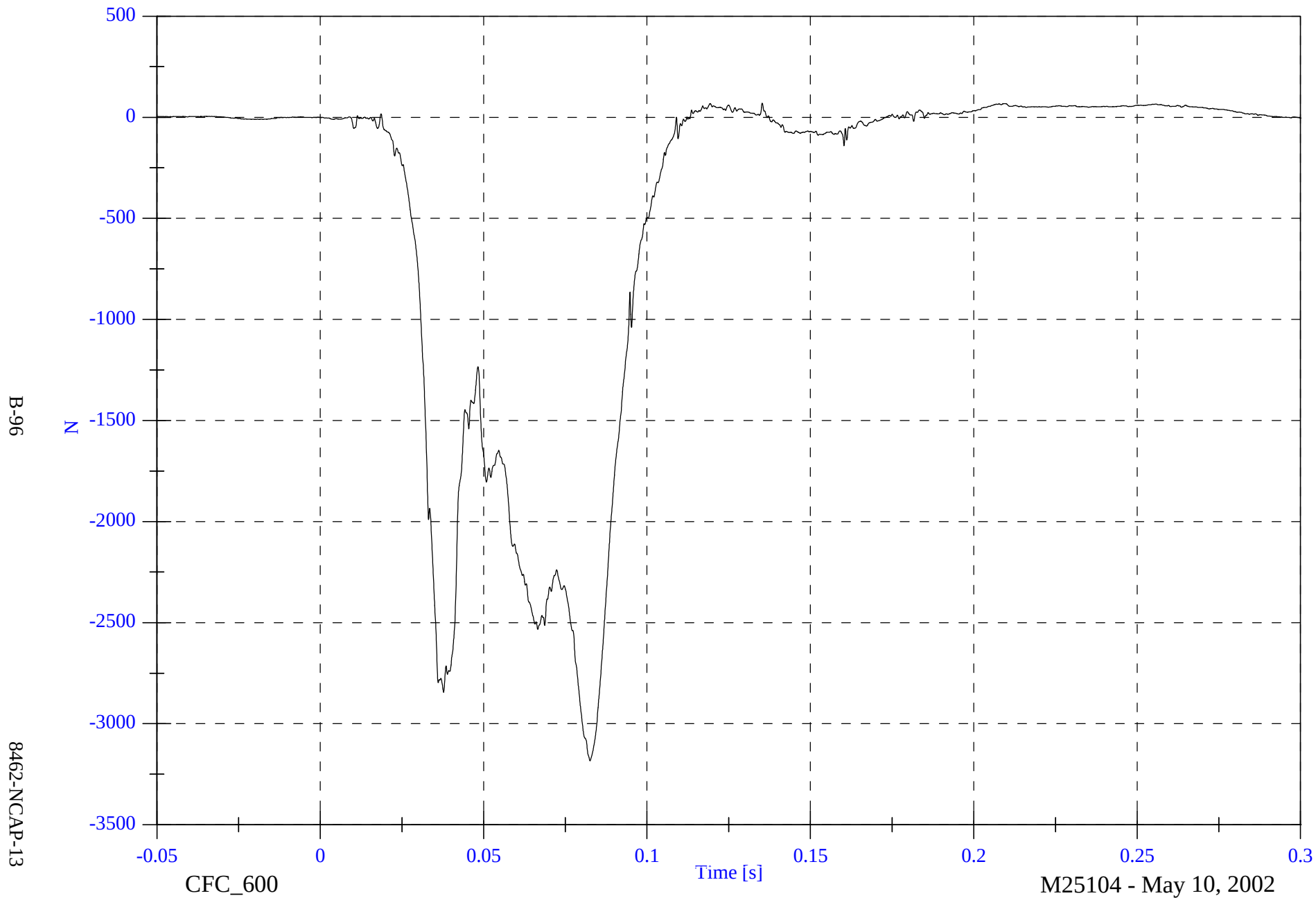


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Left Lower Tibia Fz

Max: 69.6 [N] at 0.135 [s]

Min: -3183.5 [N] at 0.083 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

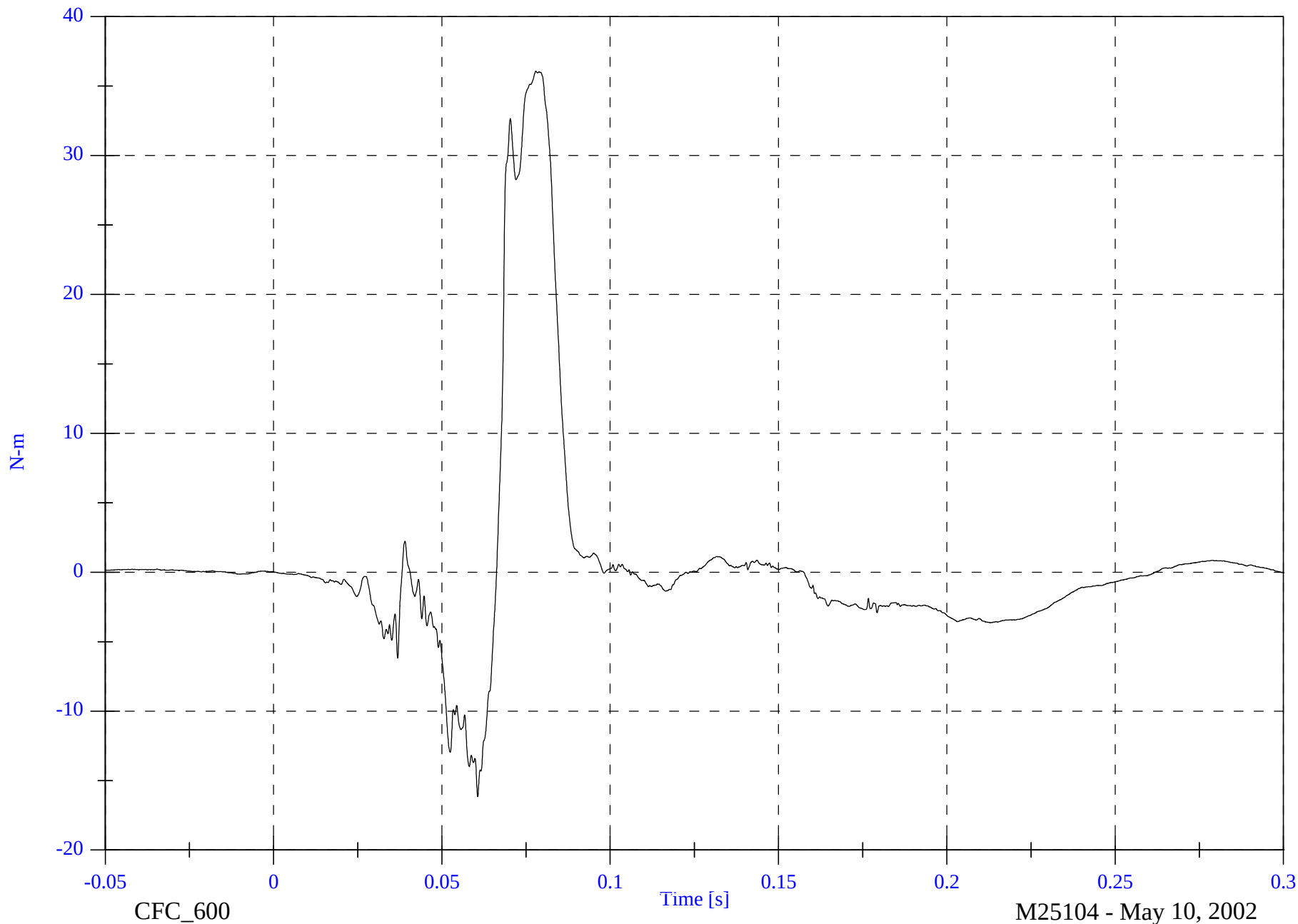
P2 Left Lower Tibia Mx

Max: 36.1 [N-m] at 0.078 [s]

Min: -16.2 [N-m] at 0.061 [s]

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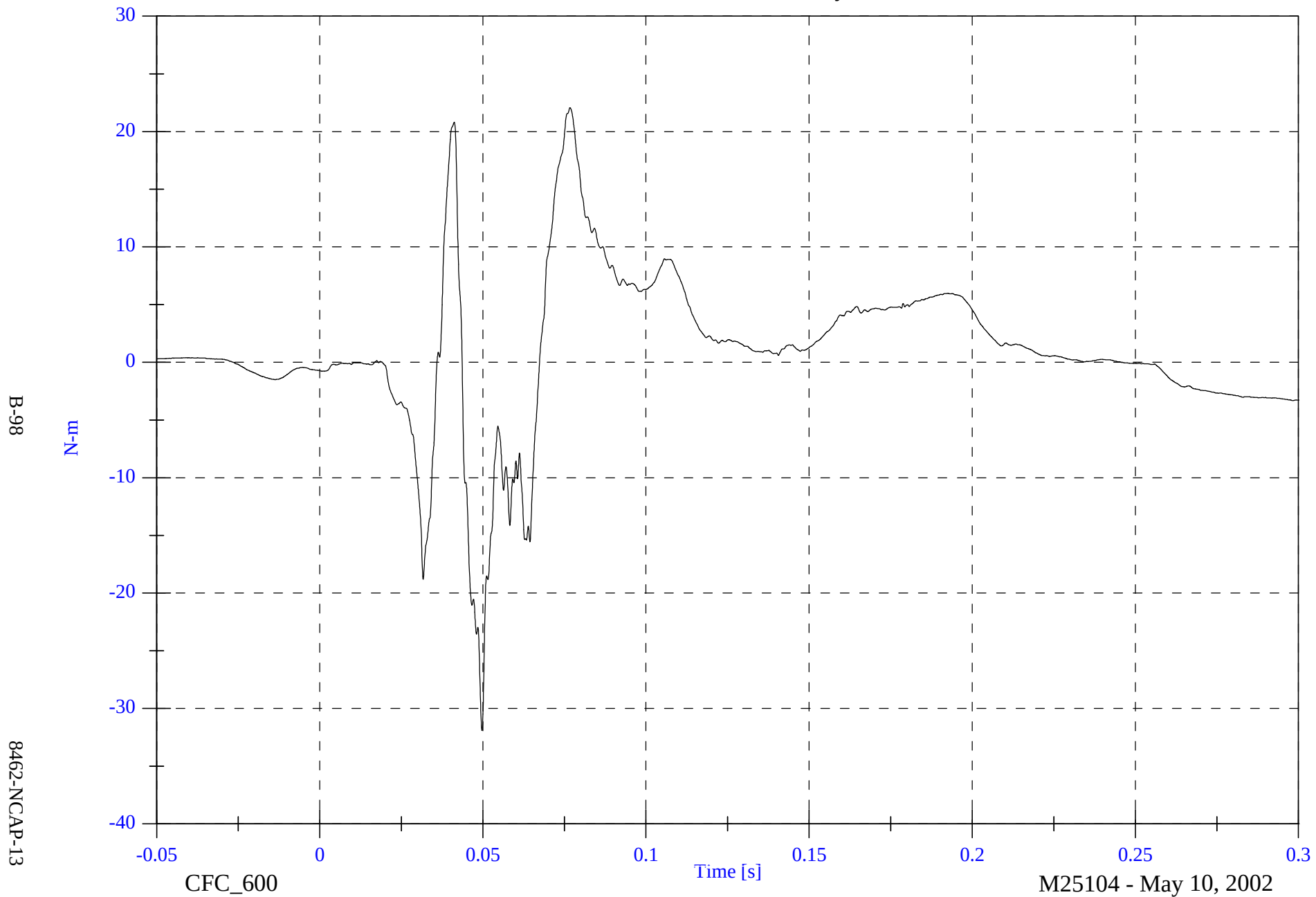


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Left Lower Tibia My

Max: 22.1 [N-m] at 0.077 [s]

Min: -31.9 [N-m] at 0.050 [s]

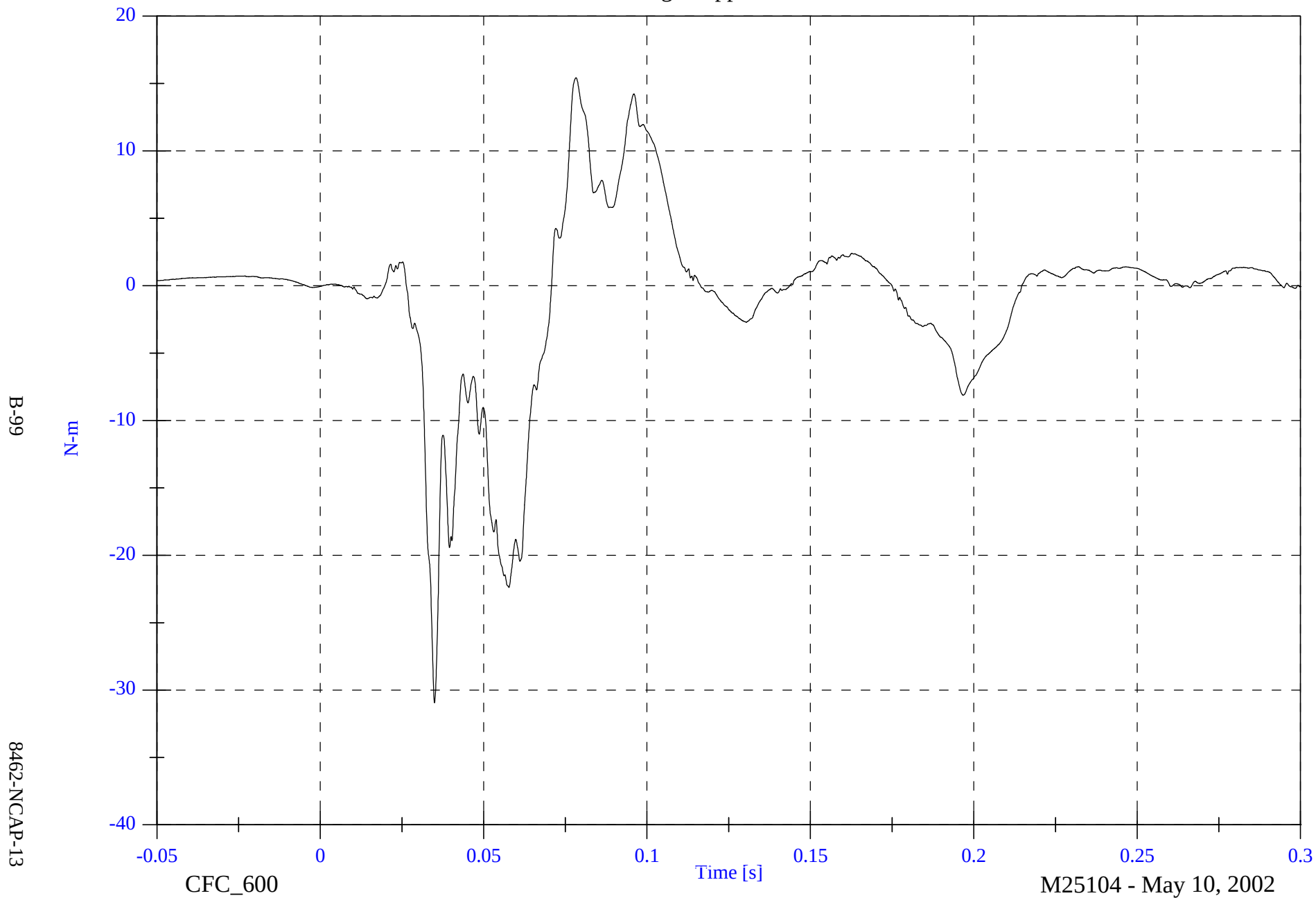


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 15.4 [N-m] at 0.078 [s]

Min: -31.0 [N-m] at 0.035 [s]

P2 Right Upper Tibia Mx

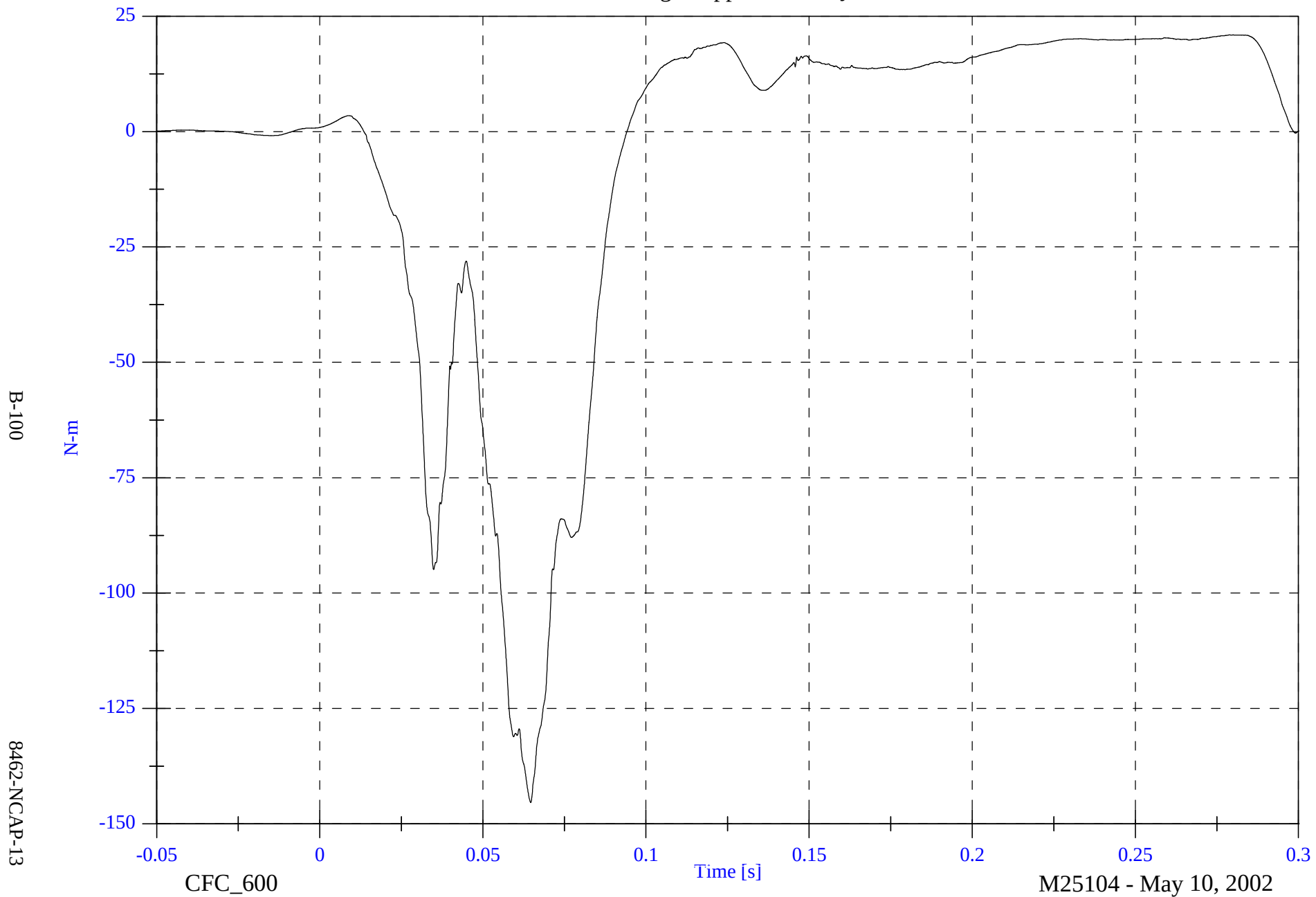


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Right Upper Tibia My

Max: 21.0 [N-m] at 0.279 [s]

Min: -145.4 [N-m] at 0.065 [s]

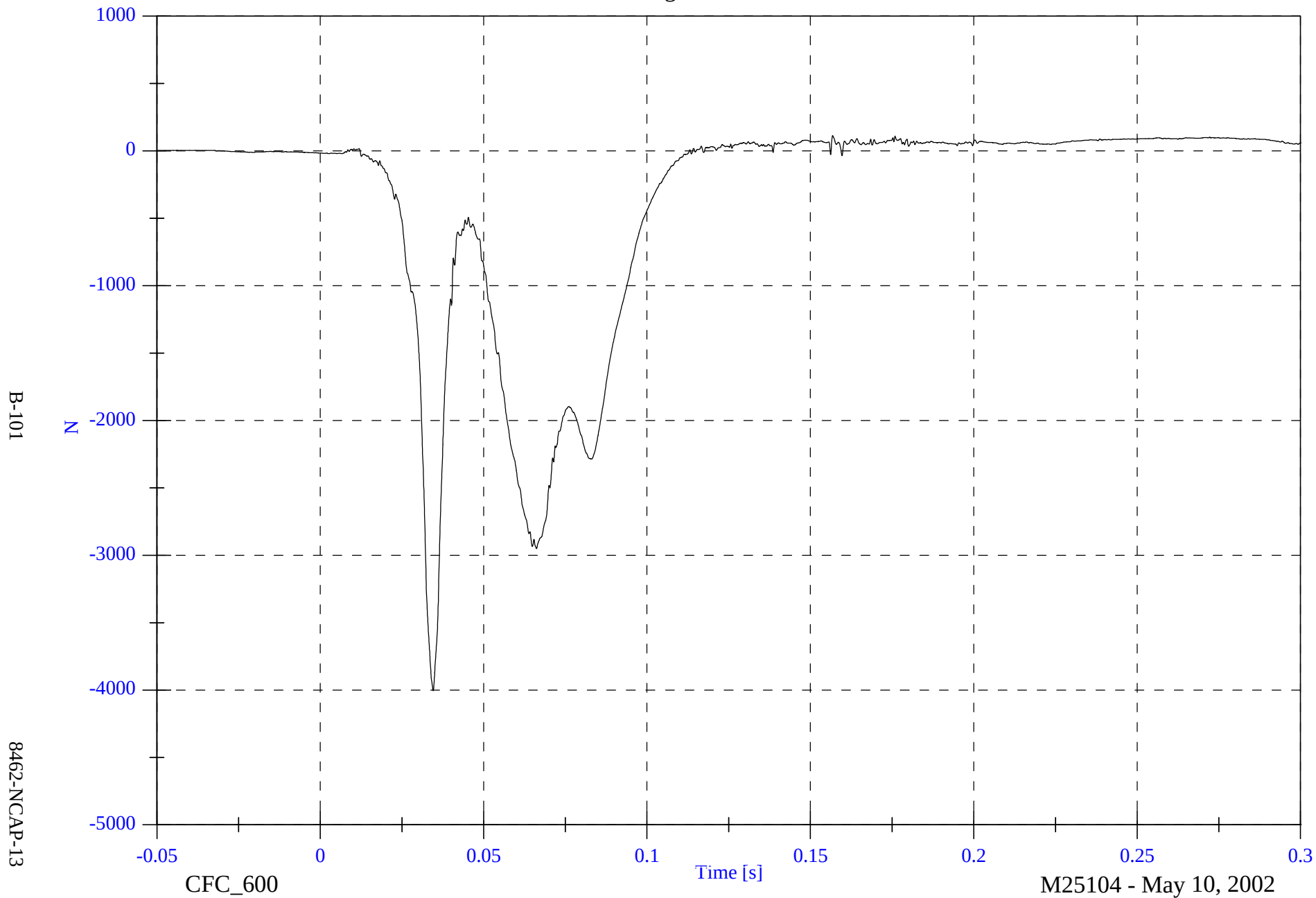


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Right Lower Tibia Fz

Max: 113.2 [N] at 0.157 [s]

Min: -4005.5 [N] at 0.035 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

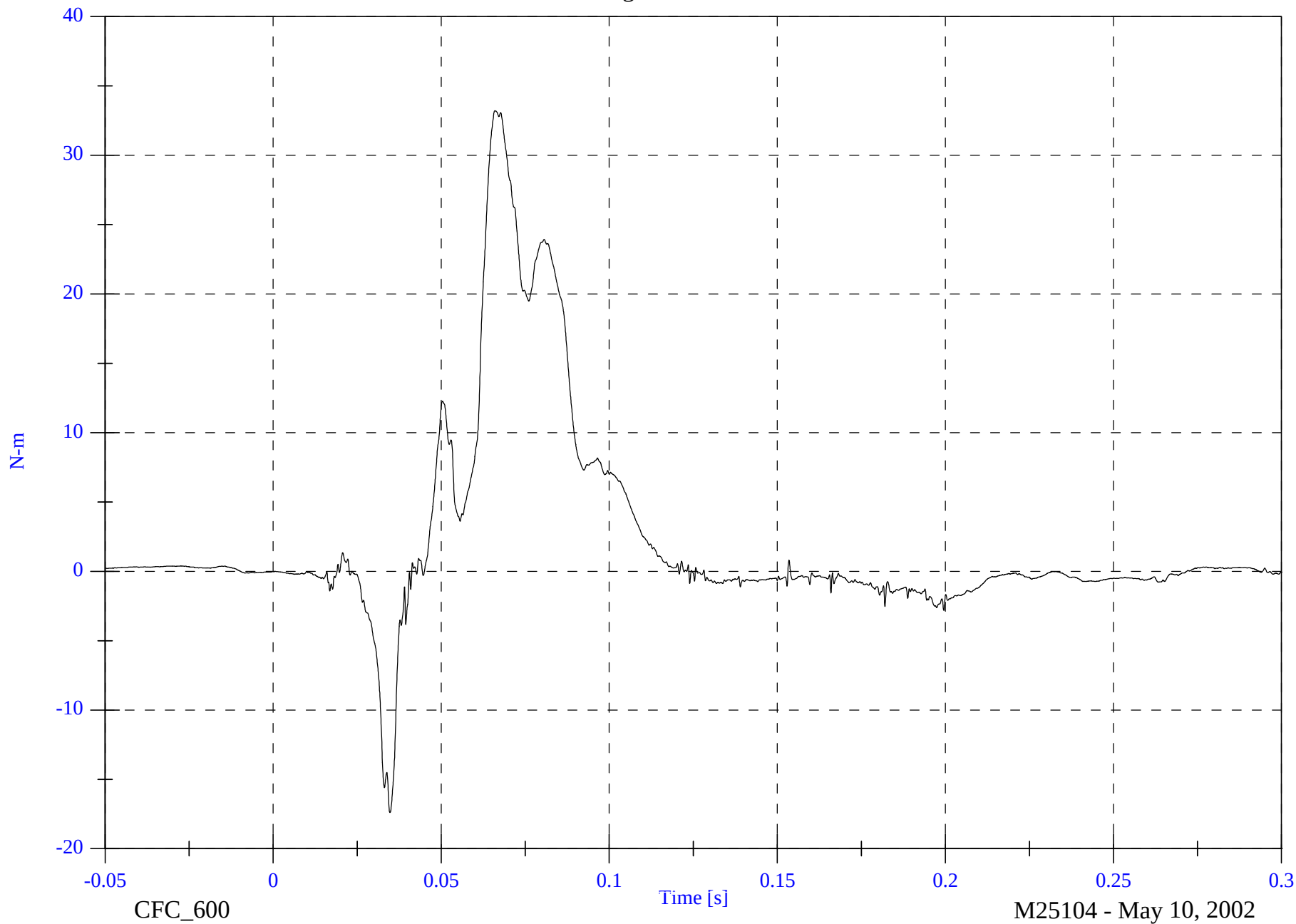
P2 Right Lower Tibia Mx

Max: 33.2 [N-m] at 0.066 [s]

Min: -17.4 [N-m] at 0.035 [s]

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8462-NCAP-13

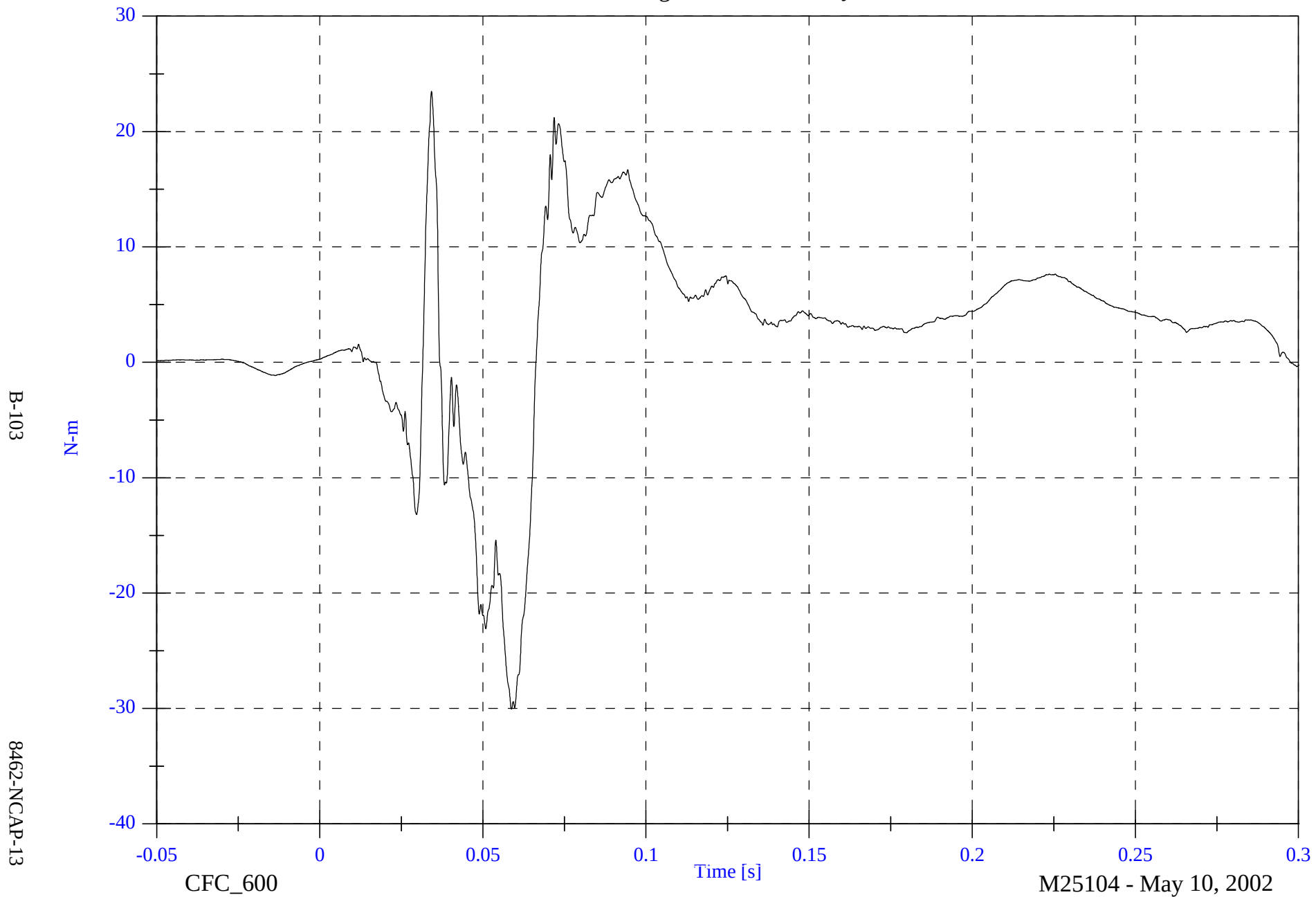


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Right Lower Tibia My

Max: 23.5 [N-m] at 0.034 [s]

Min: -30.1 [N-m] at 0.059 [s]

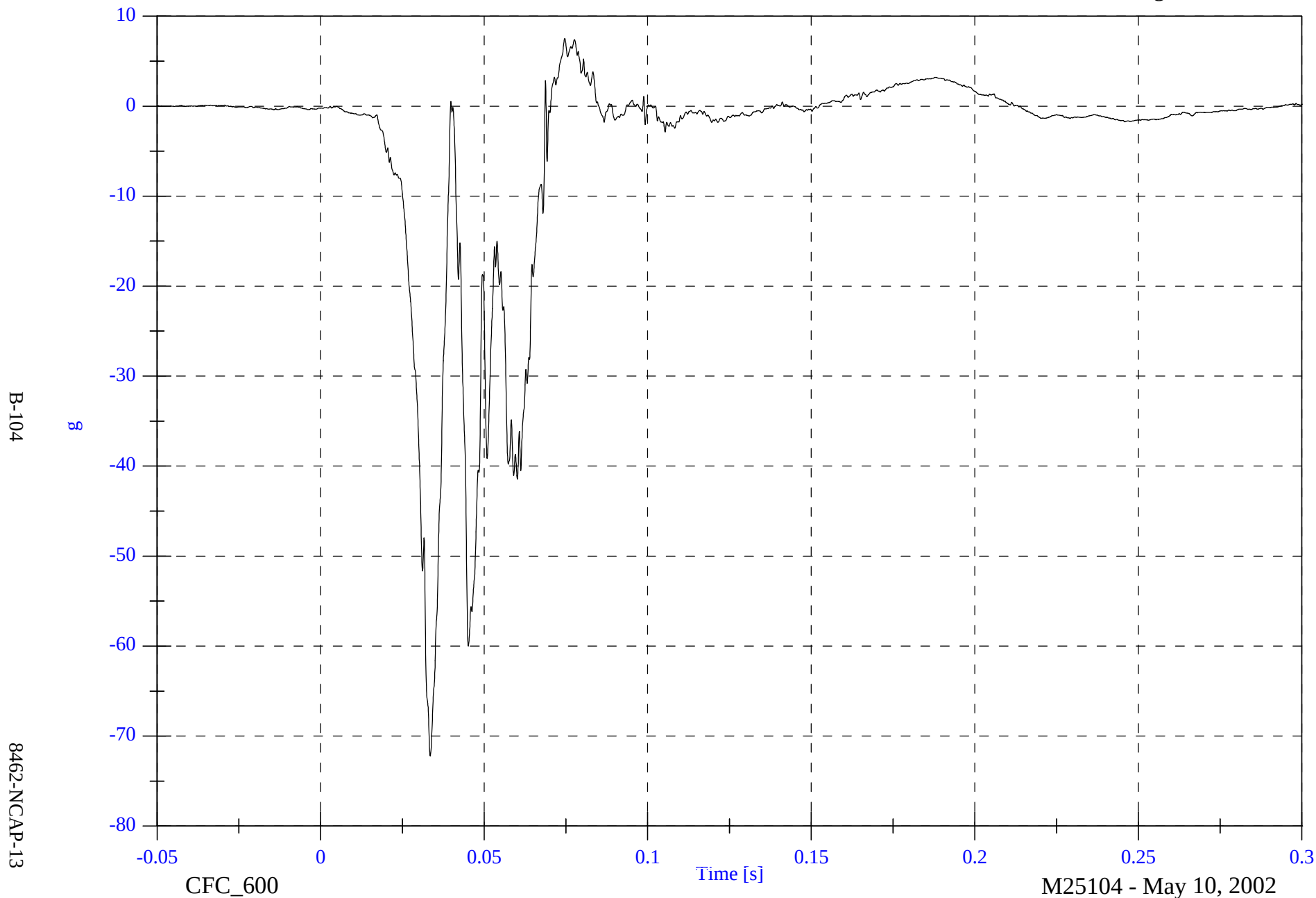


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 7.5 [g] at 0.075 [s]

Min: -72.2 [g] at 0.034 [s]

P2 Left Foot Aft x



2002 NCAP Test 13 - 2002 Toyota Camry

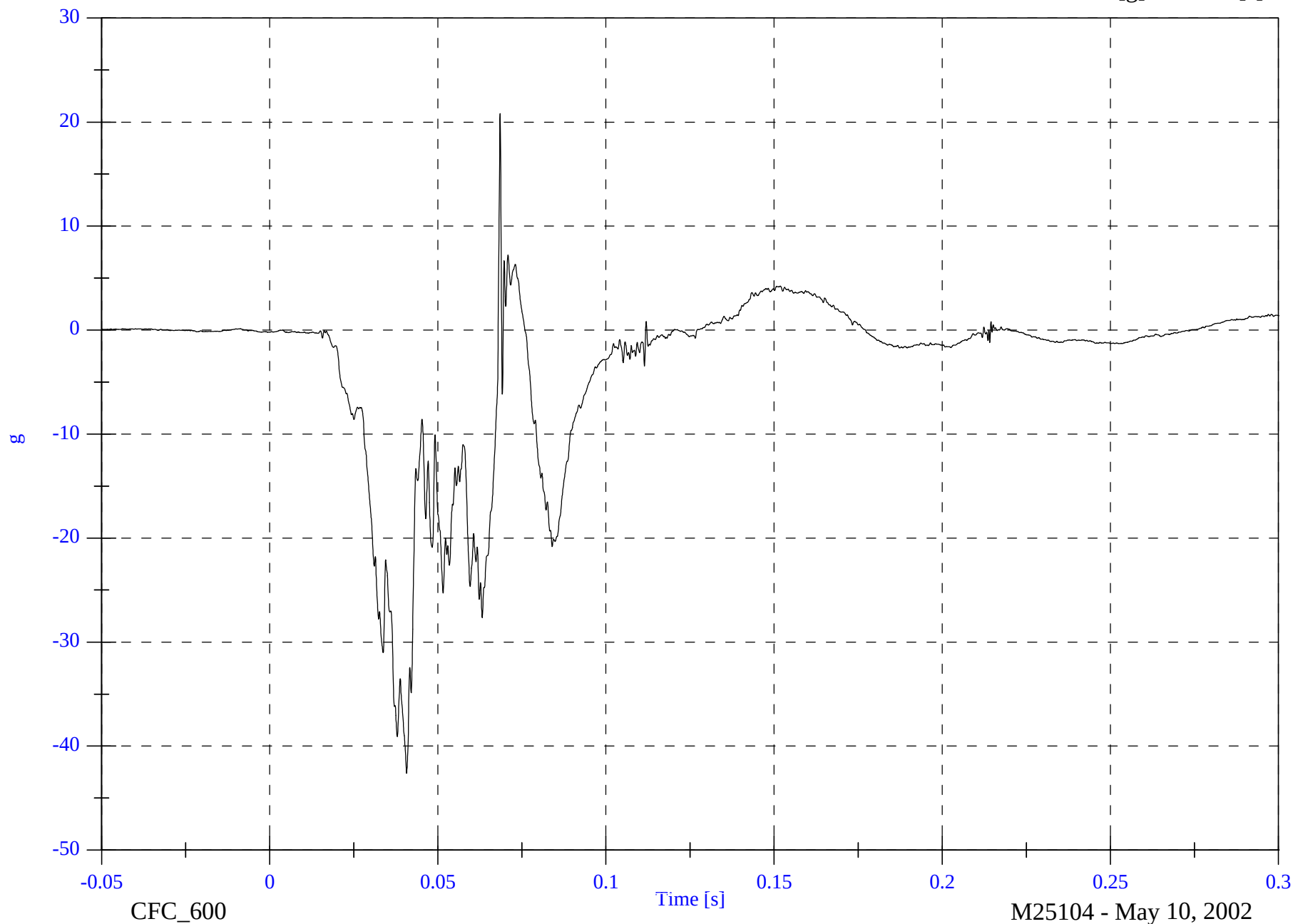
P2 Left Foot Aft z

Max: 20.8 [g] at 0.069 [s]

Min: -42.6 [g] at 0.041 [s]

B-105

8462-NCAP-13



CFC_600

Time [s]

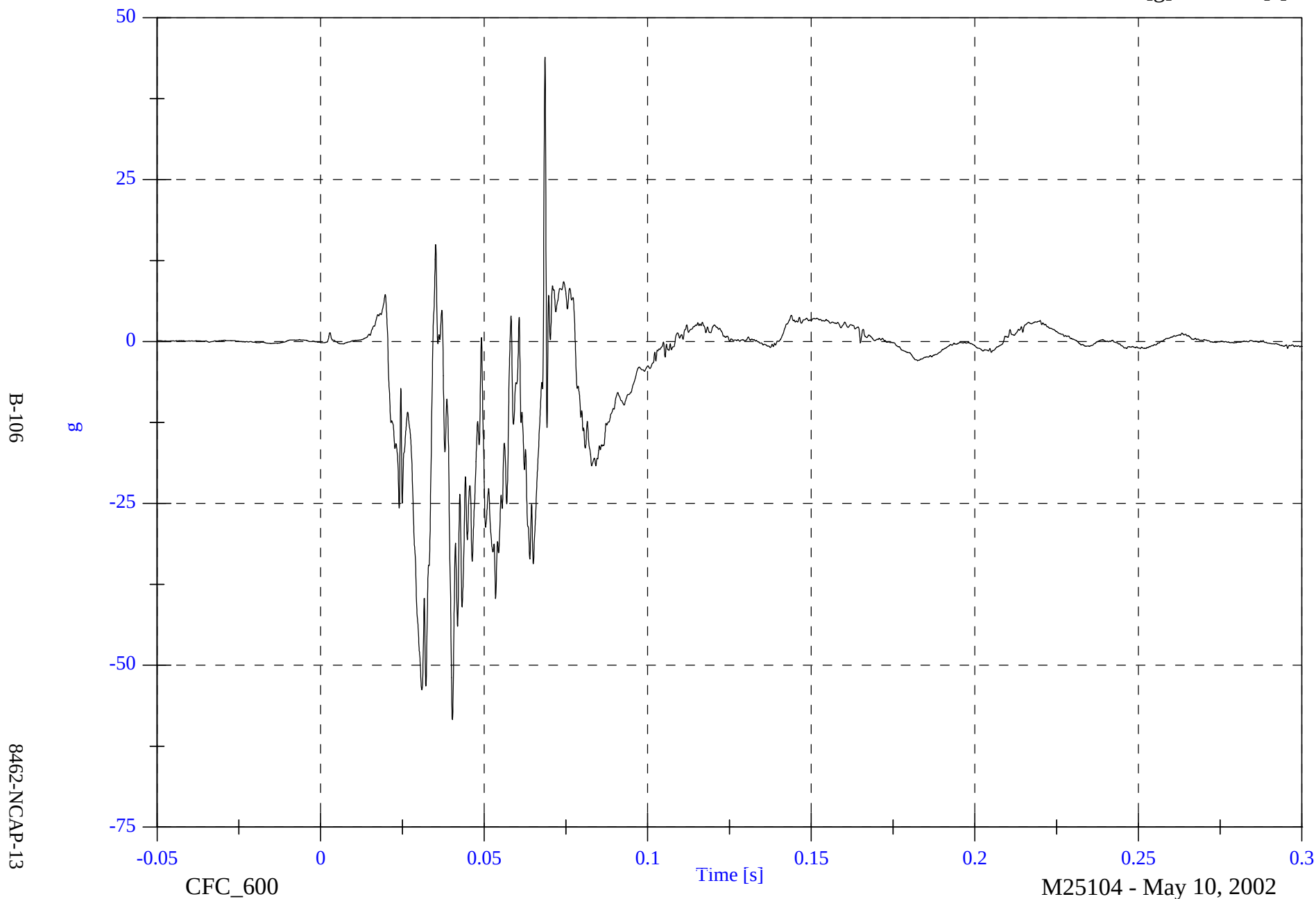
M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

Max: 43.9 [g] at 0.069 [s]

Min: -58.4 [g] at 0.040 [s]

P2 Left Foot Fore z

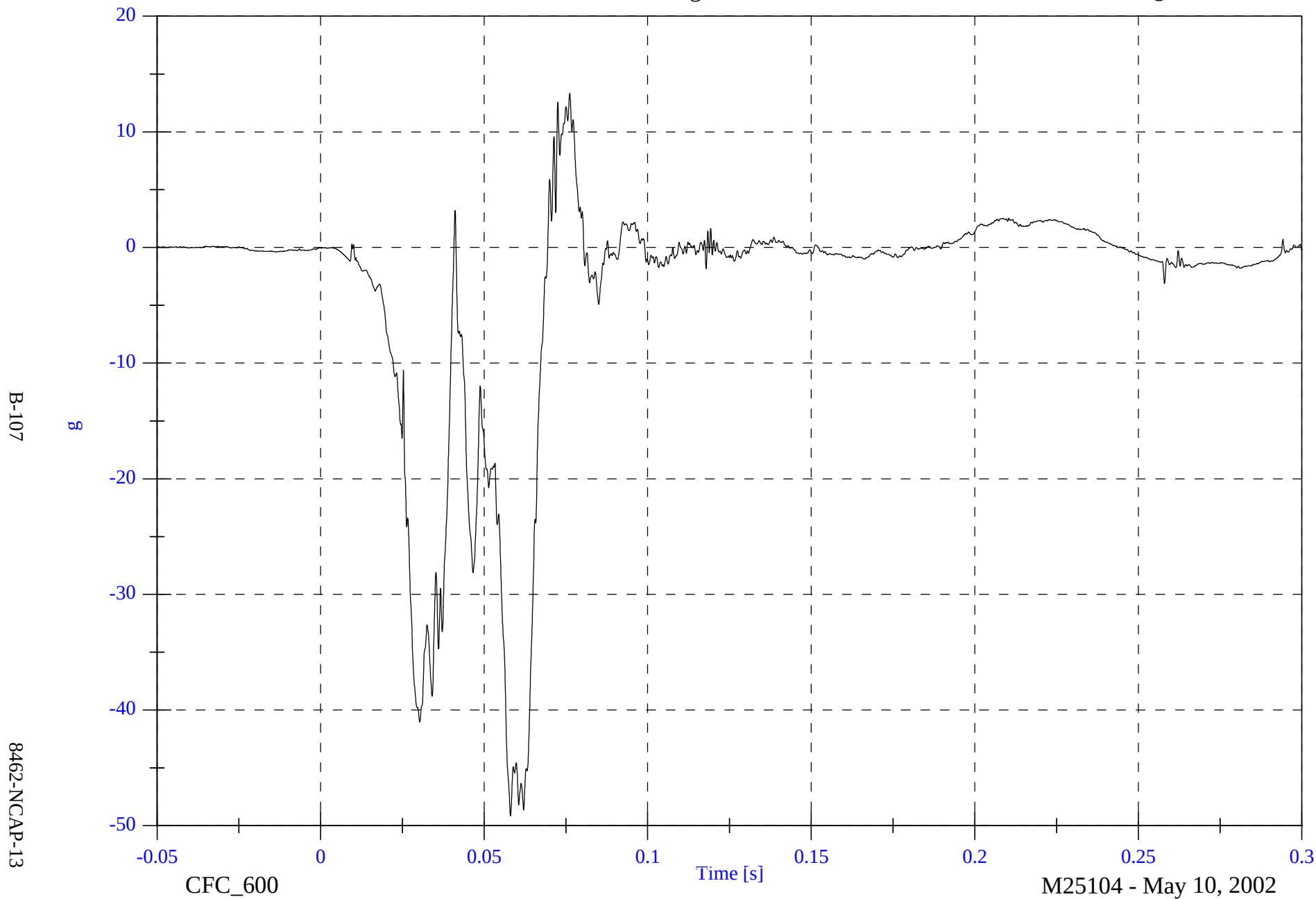


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 13.3 [g] at 0.076 [s]

Min: -49.2 [g] at 0.058 [s]

P2 Right Foot Aft x

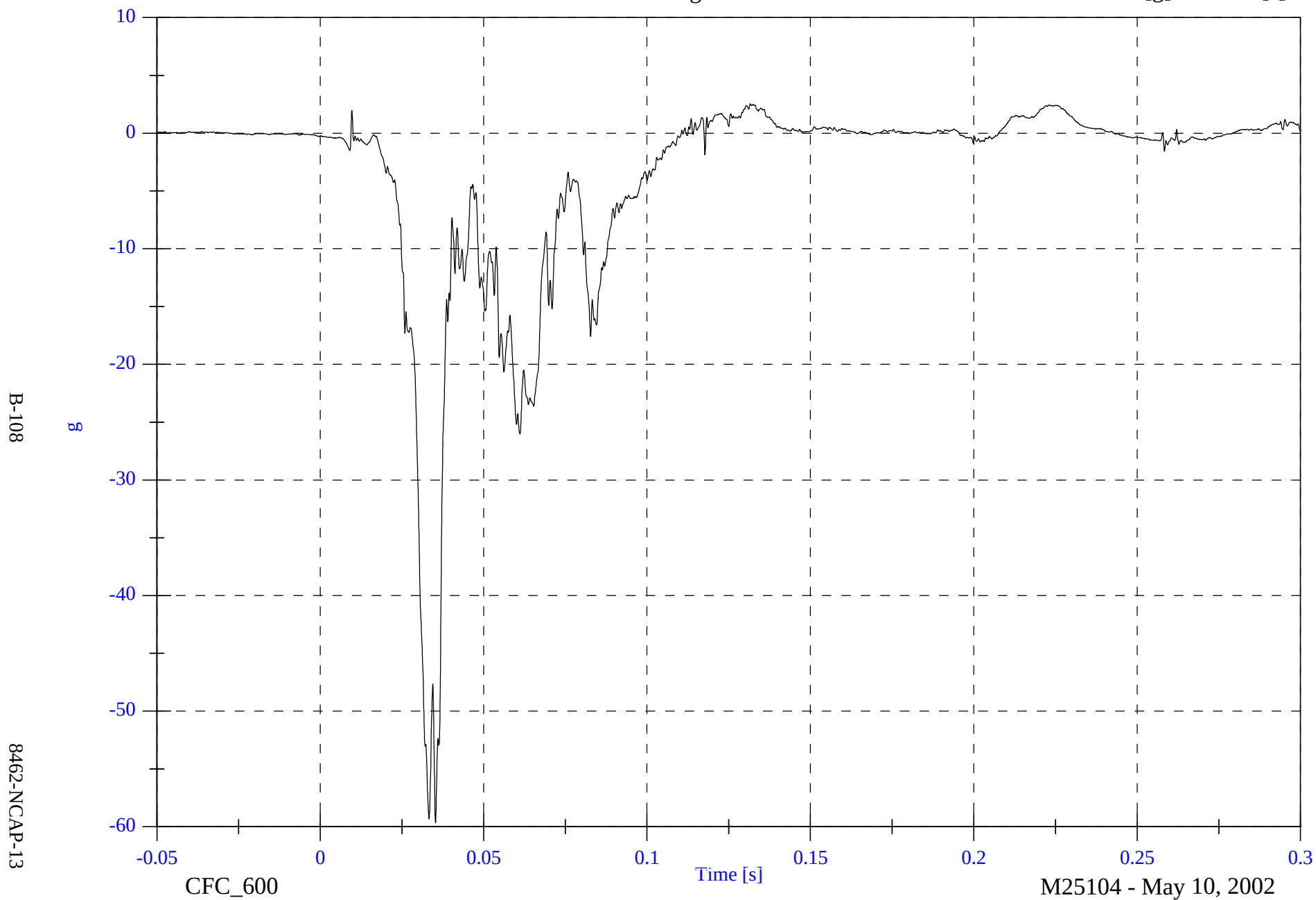


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 2.5 [g] at 0.132 [s]

Min: -59.7 [g] at 0.035 [s]

P2 Right Foot Aft z

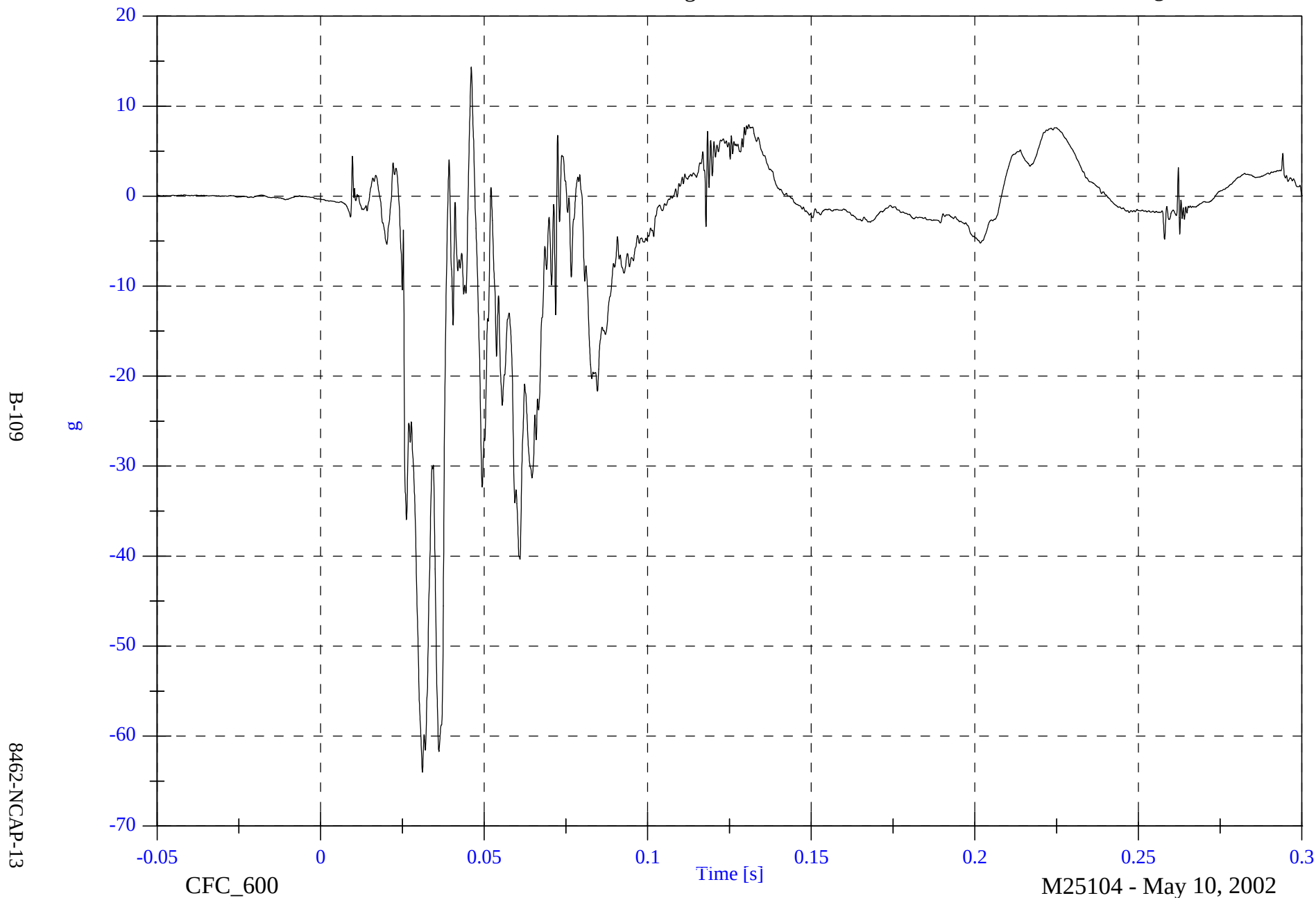


2002 NCAP Test 13 - 2002 Toyota Camry

P2 Right Foot Fore z

Max: 14.4 [g] at 0.046 [s]

Min: -64.0 [g] at 0.031 [s]

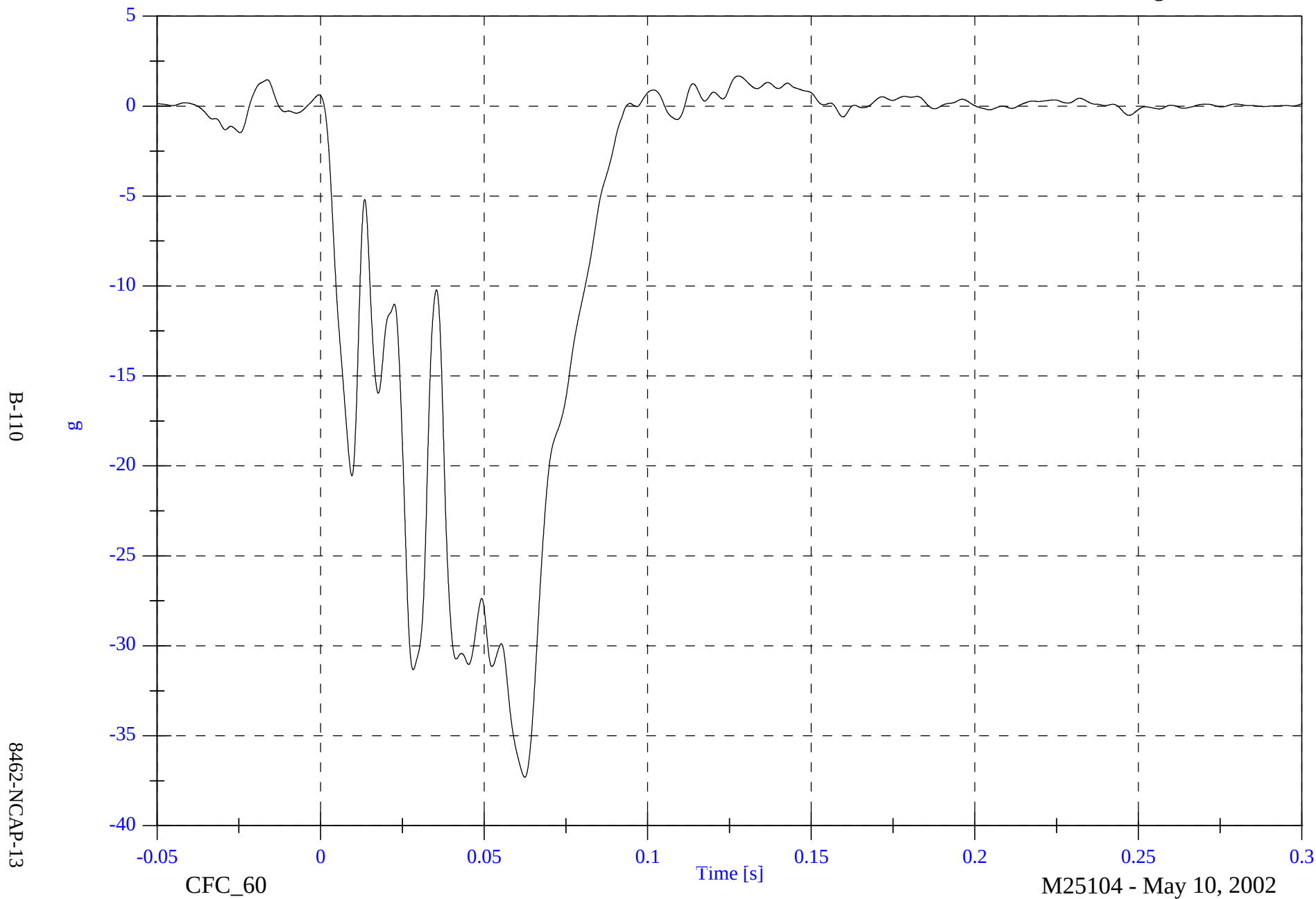


2002 NCAP Test 13 - 2002 Toyota Camry

Left Rear #1x

Max: 1.7 [g] at 0.128 [s]

Min: -37.3 [g] at 0.062 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

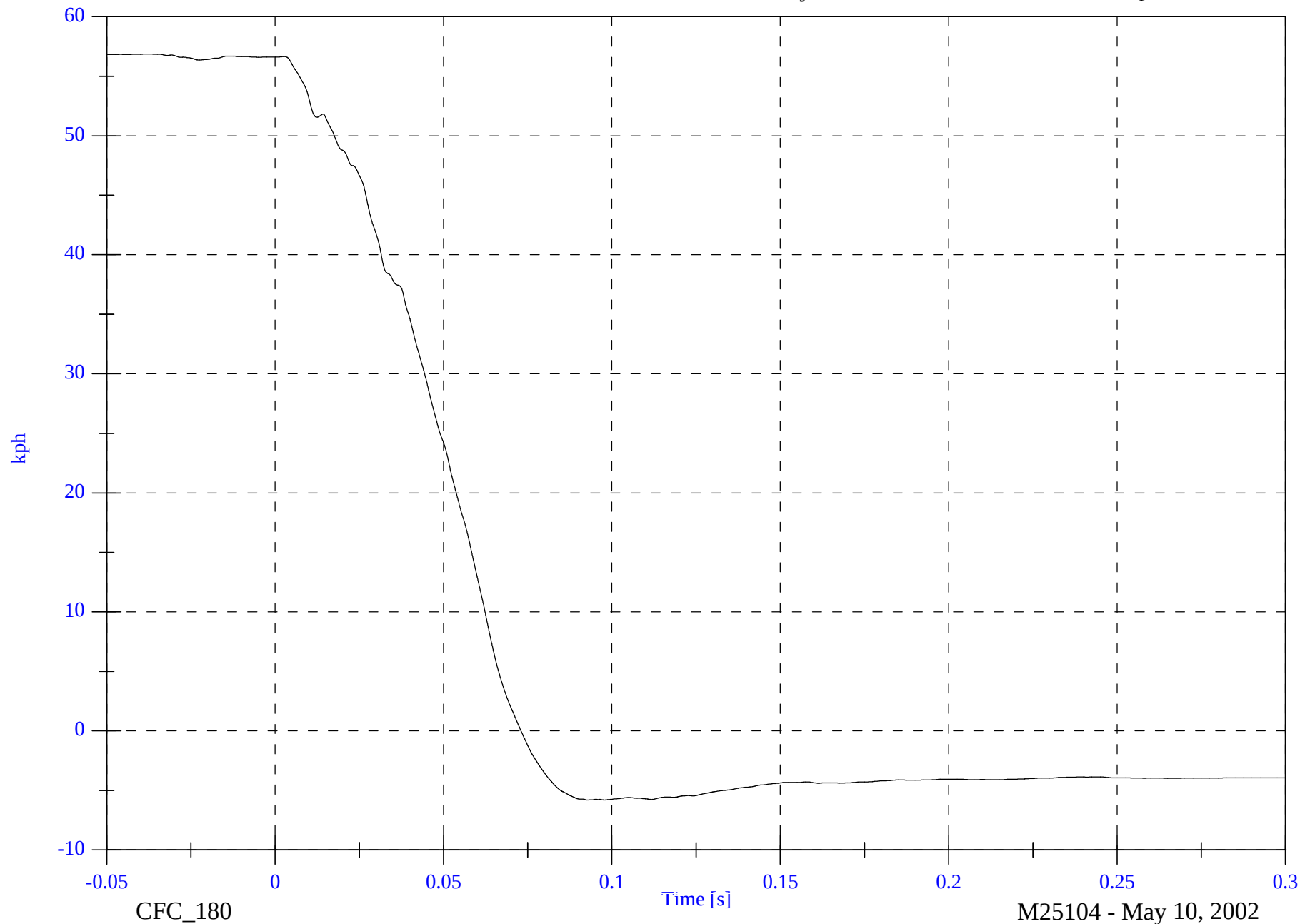
Max: 56.9 [kph] at -0.038 [s]

Left Rear #1x Velocity

Min: -5.8 [kph] at 0.093 [s]

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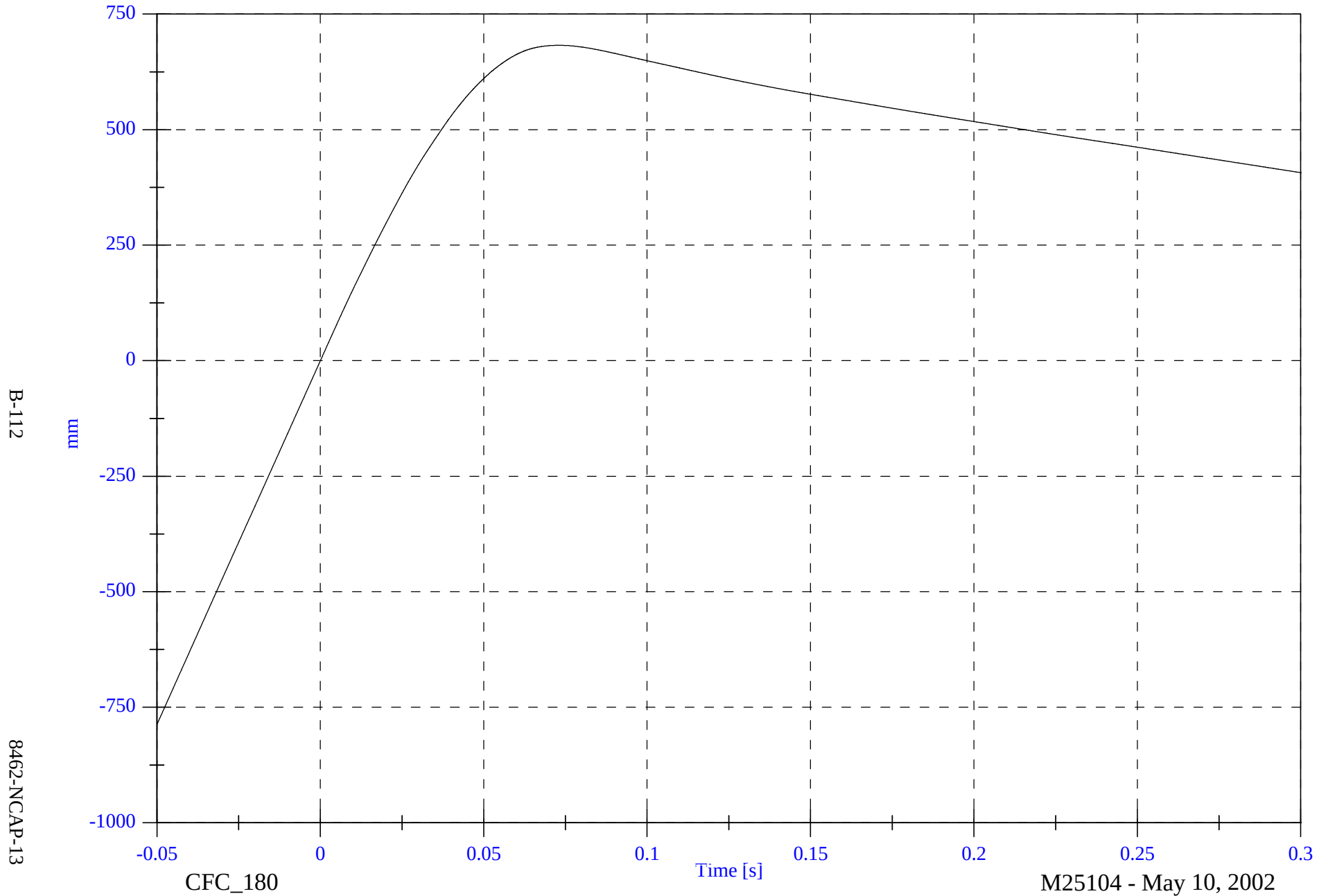


2002 NCAP Test 13 - 2002 Toyota Camry

Left Rear #1x Displacement

Max: 682.5 [mm] at 0.073 [s]

Min: -787.2 [mm] at -0.050 [s]

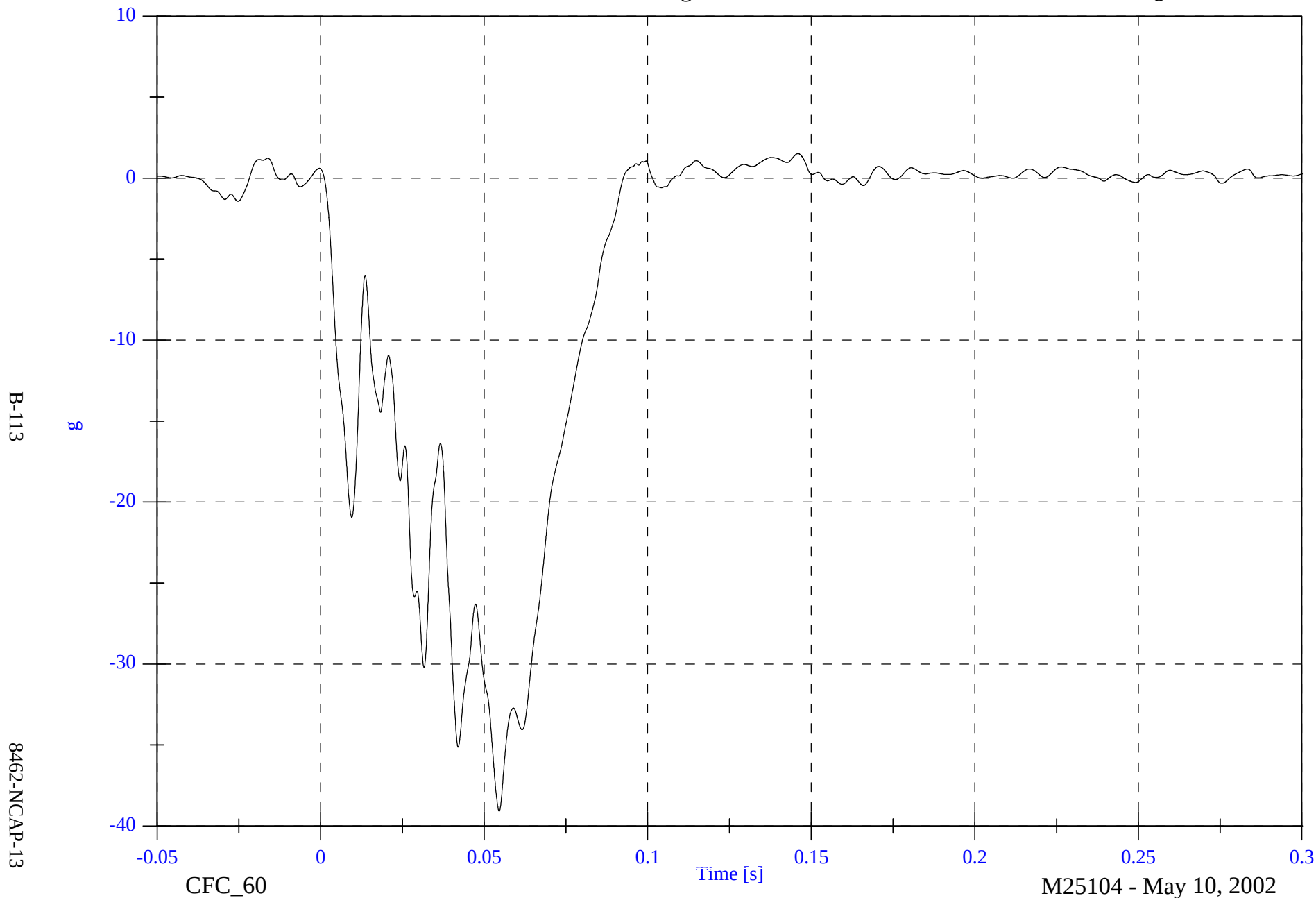


2002 NCAP Test 13 - 2002 Toyota Camry

Right Rear #2x

Max: 1.5 [g] at 0.146 [s]

Min: -39.1 [g] at 0.055 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

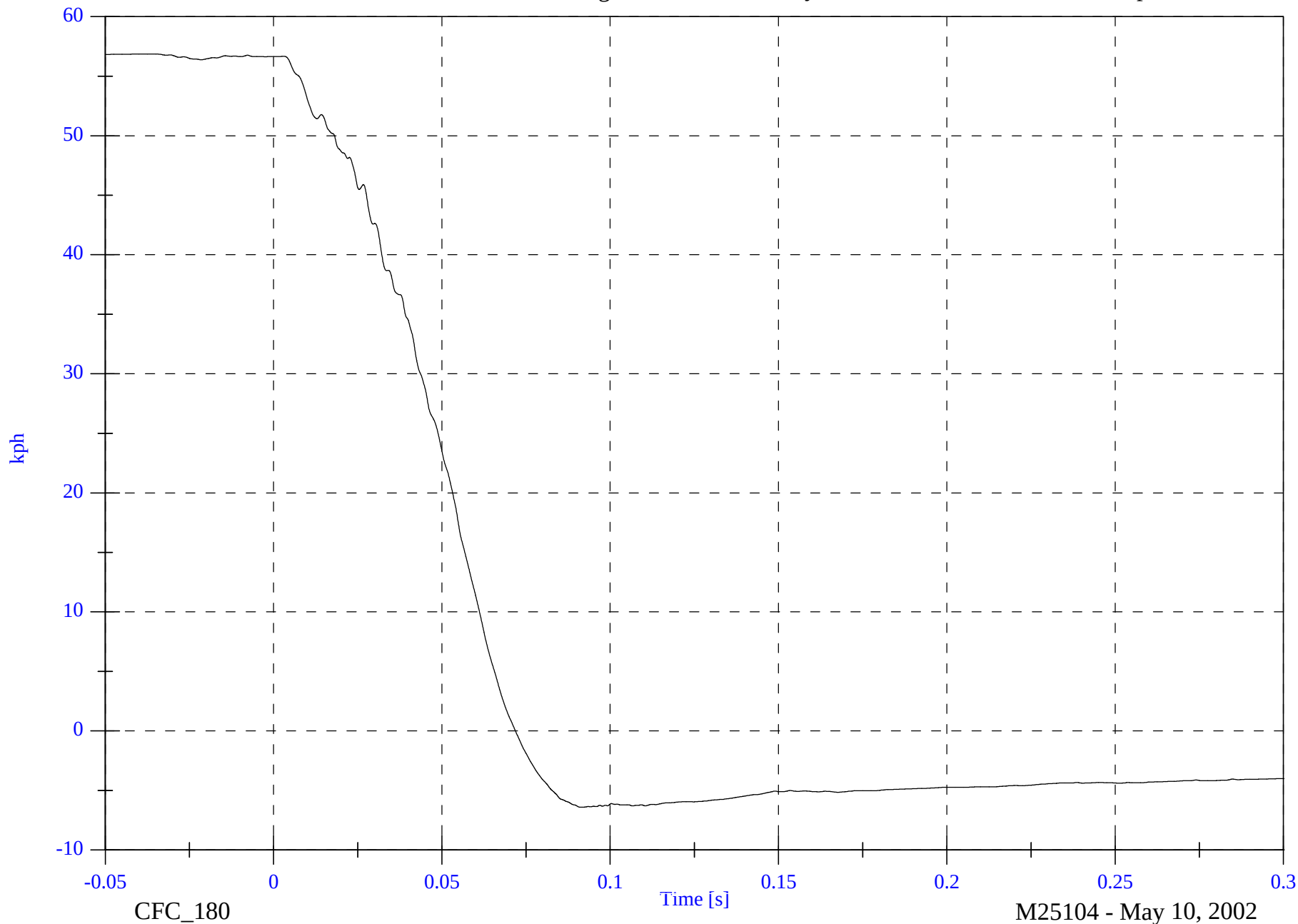
Right Rear #2x Velocity

Max: 56.9 [kph] at -0.038 [s]

Min: -6.4 [kph] at 0.092 [s]

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2002 NCAP Test 13 - 2002 Toyota Camry

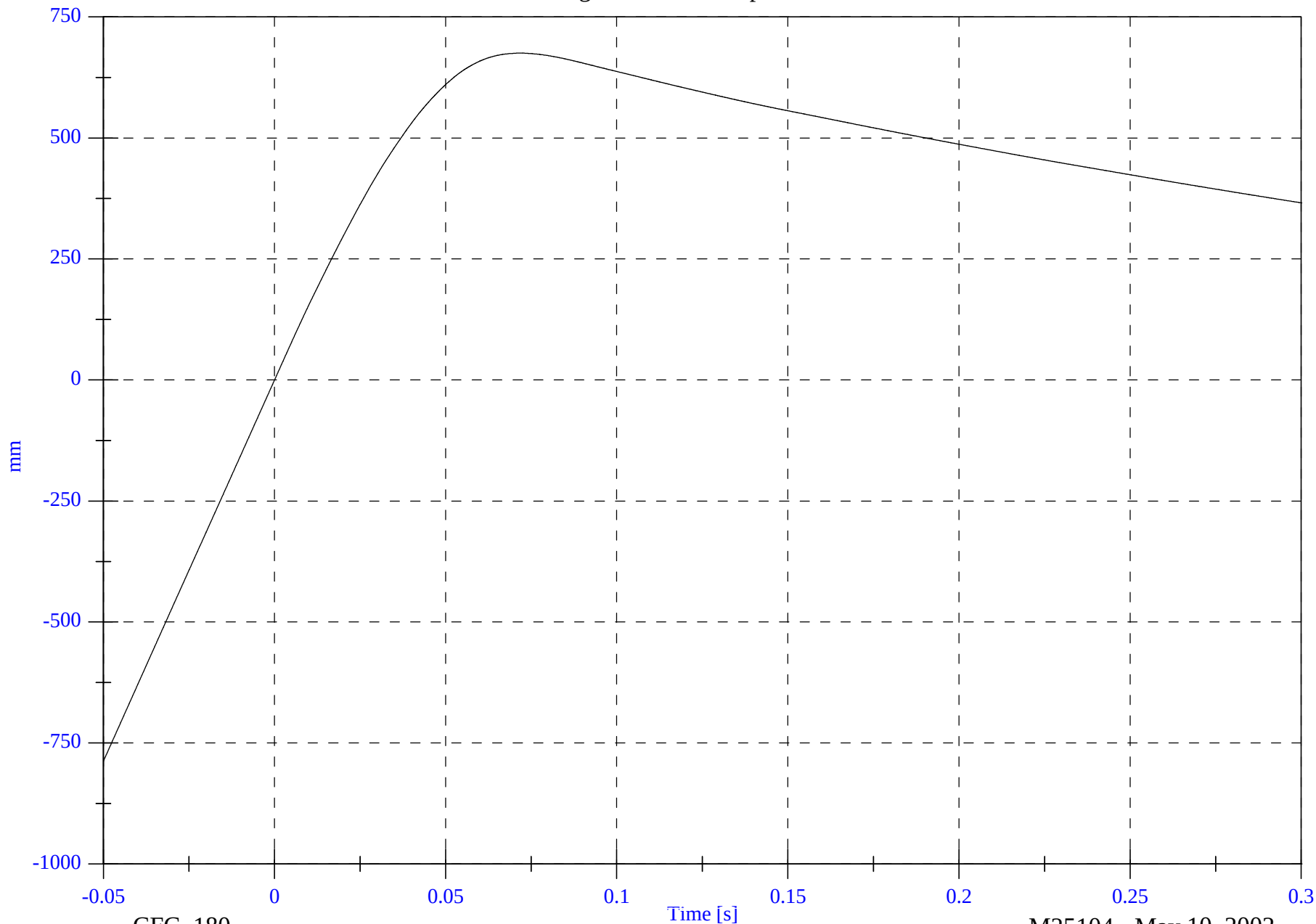
Right Rear #2x Displacement

Max: 675.2 [mm] at 0.072 [s]

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

B-115

8462-NCAP-13



CFC_180

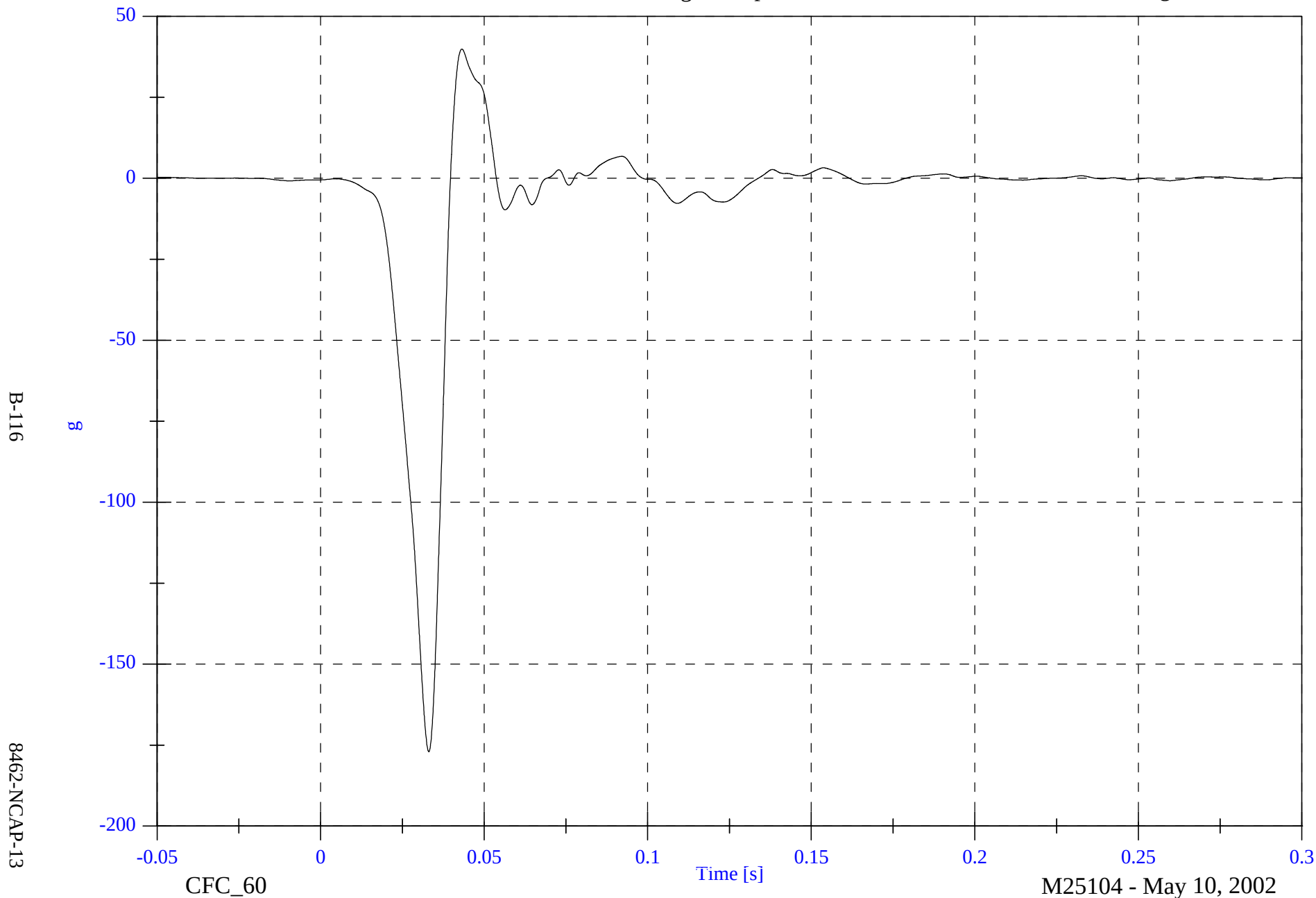
M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

Engine Top #3x

Max: 39.9 [g] at 0.043 [s]

Min: -177.1 [g] at 0.033 [s]

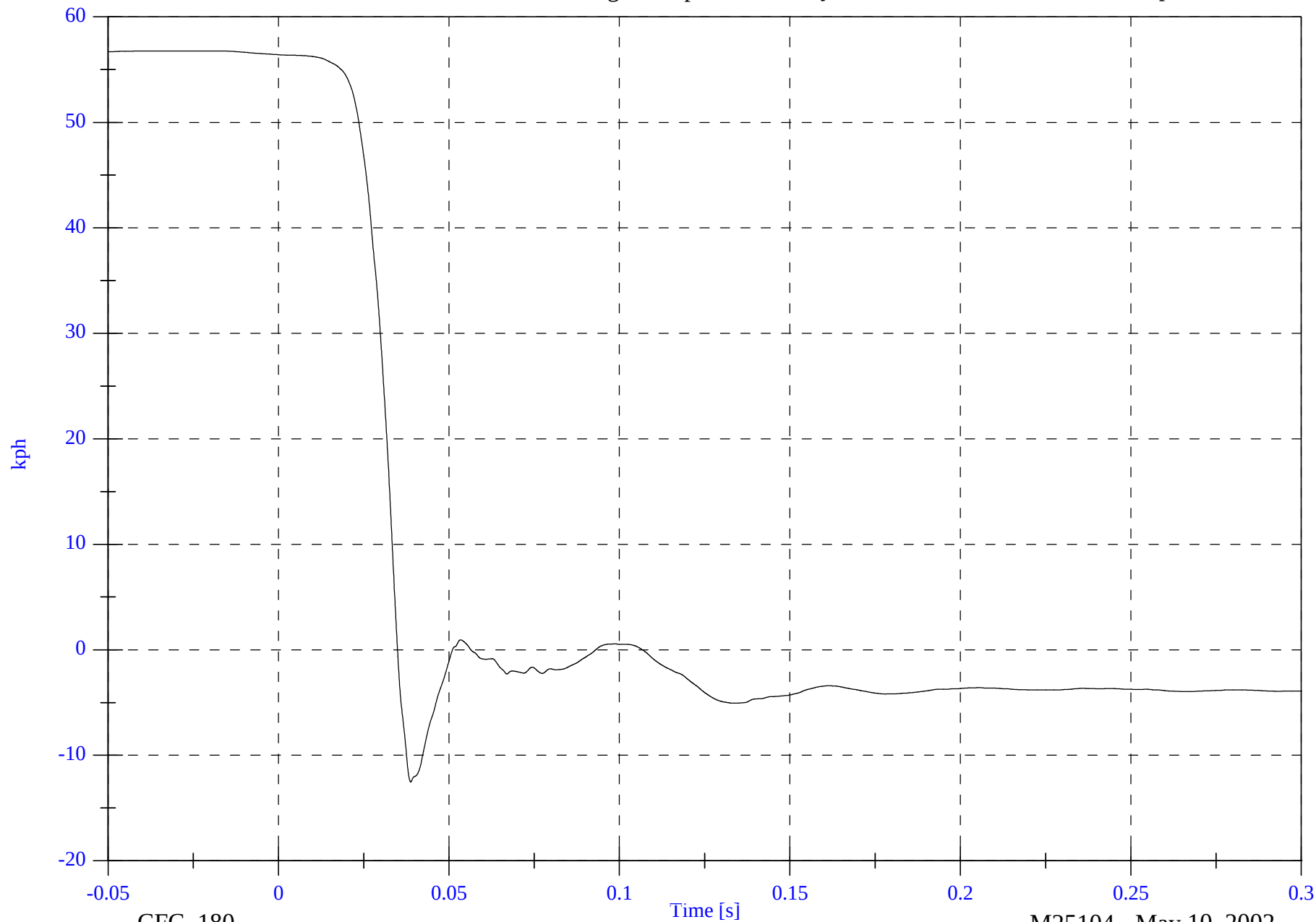


2002 NCAP Test 13 - 2002 Toyota Camry

Engine Top #3x Velocity

Max: 56.8 [kph] at -0.024 [s]

Min: -12.5 [kph] at 0.039 [s]



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CFC_180

M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

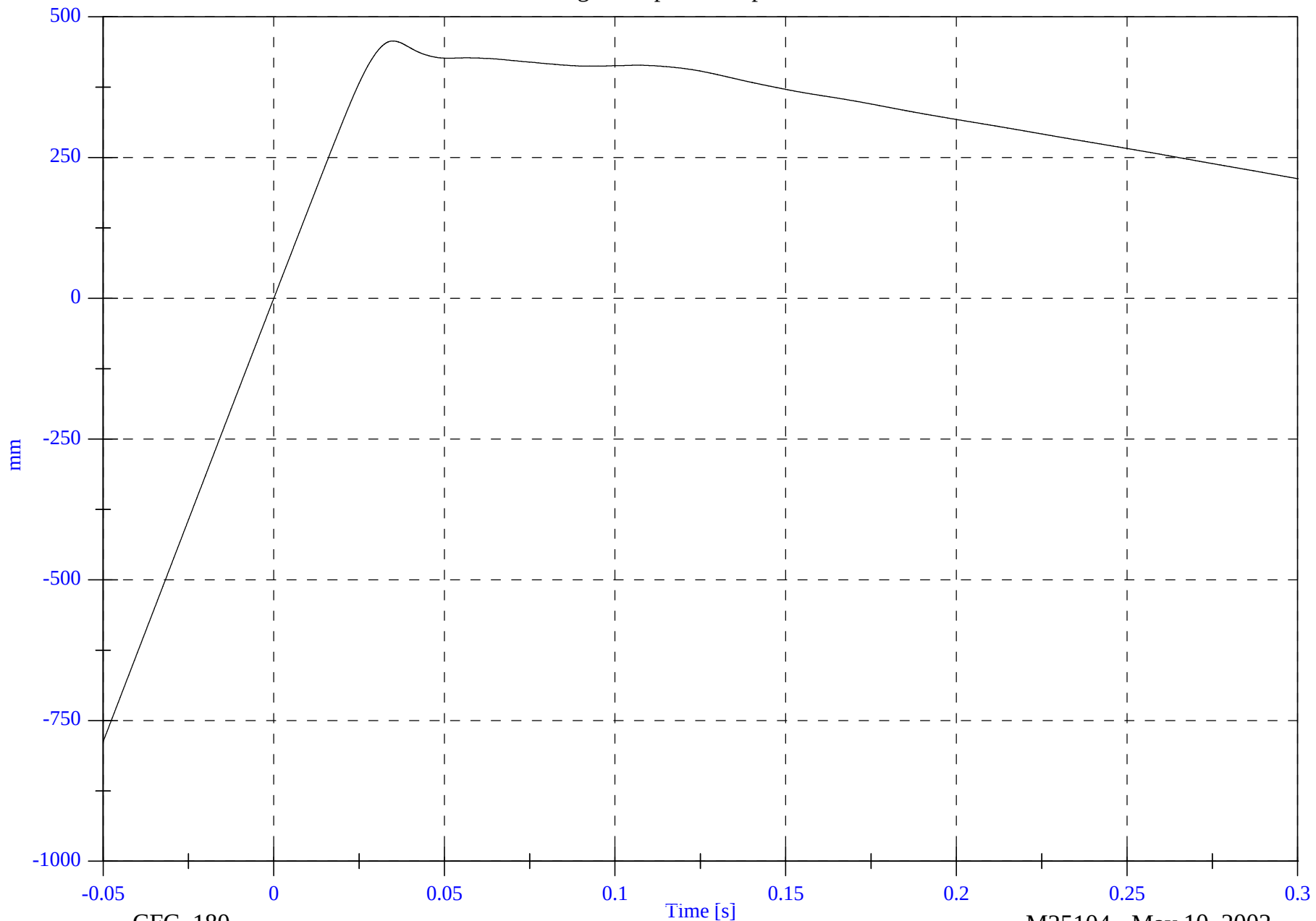
Engine Top #3x Displacement

Max: 457.2 [mm] at 0.035 [s]

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

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8462-NCAP-13



CFC_180

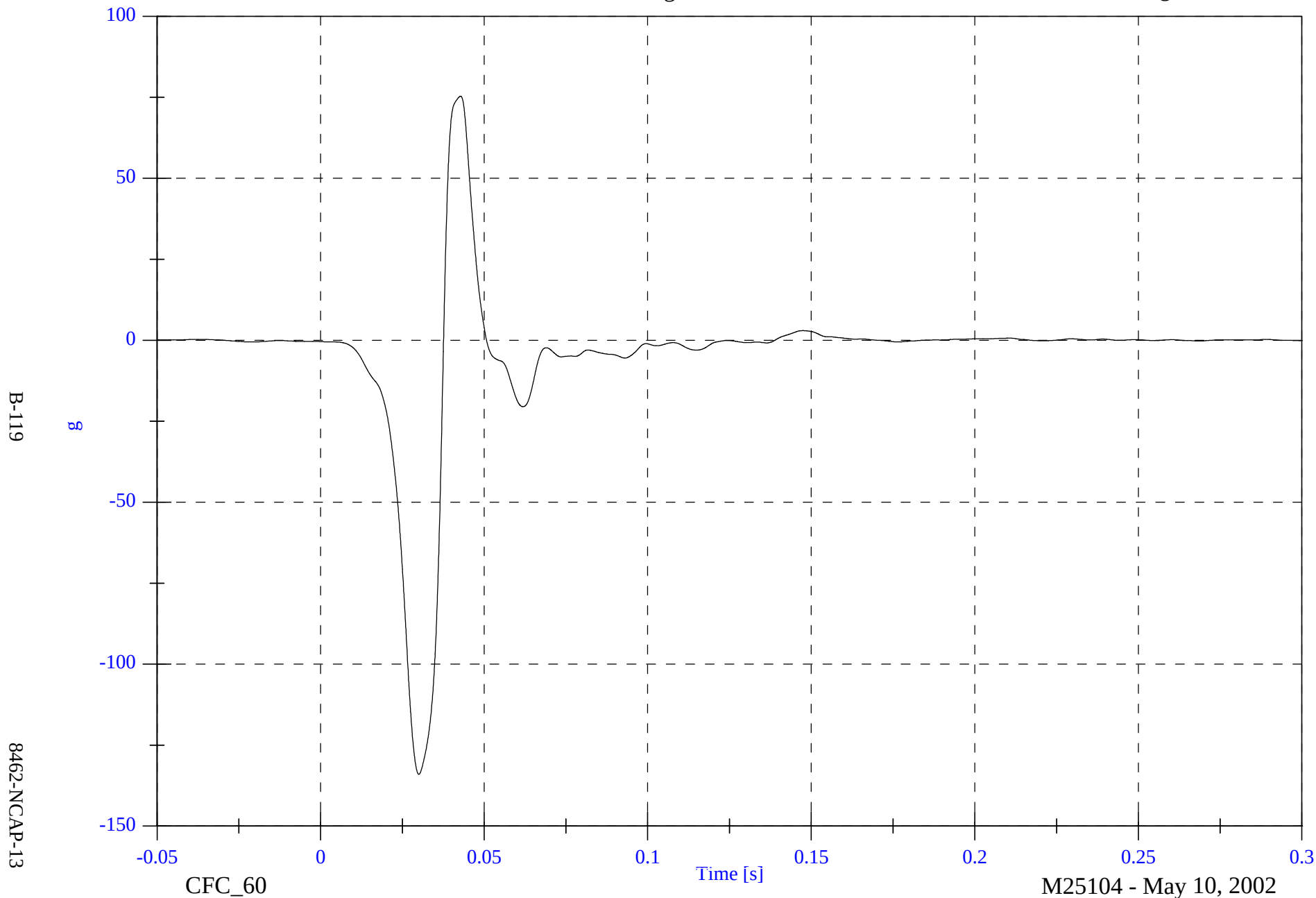
M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

Engine Bottom #4x

Max: 75.3 [g] at 0.043 [s]

Min: -134.0 [g] at 0.030 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

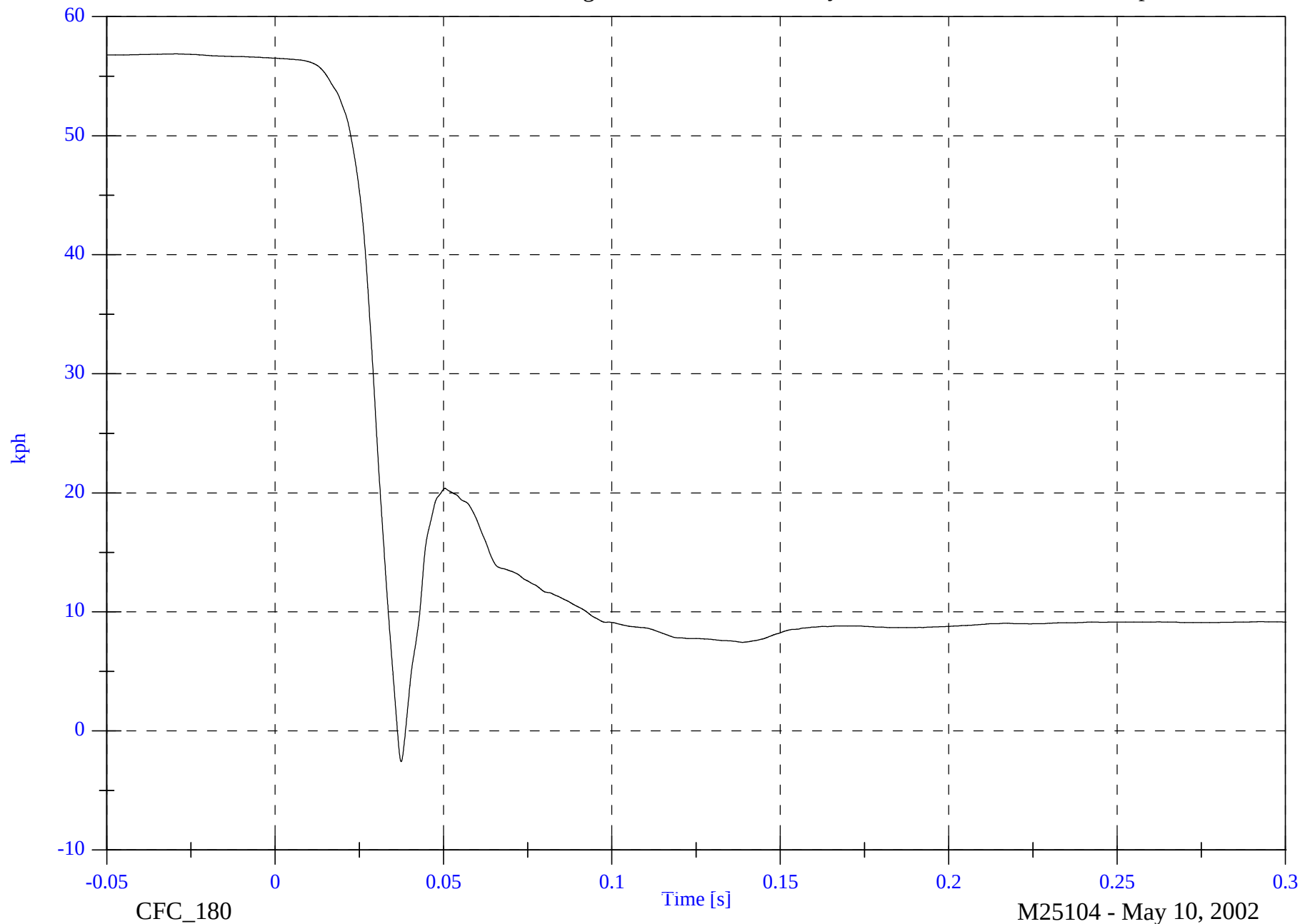
Engine Bottom #4x Velocity

Max: 56.9 [kph] at -0.029 [s]

Min: -2.6 [kph] at 0.037 [s]

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8462-NCAP-13

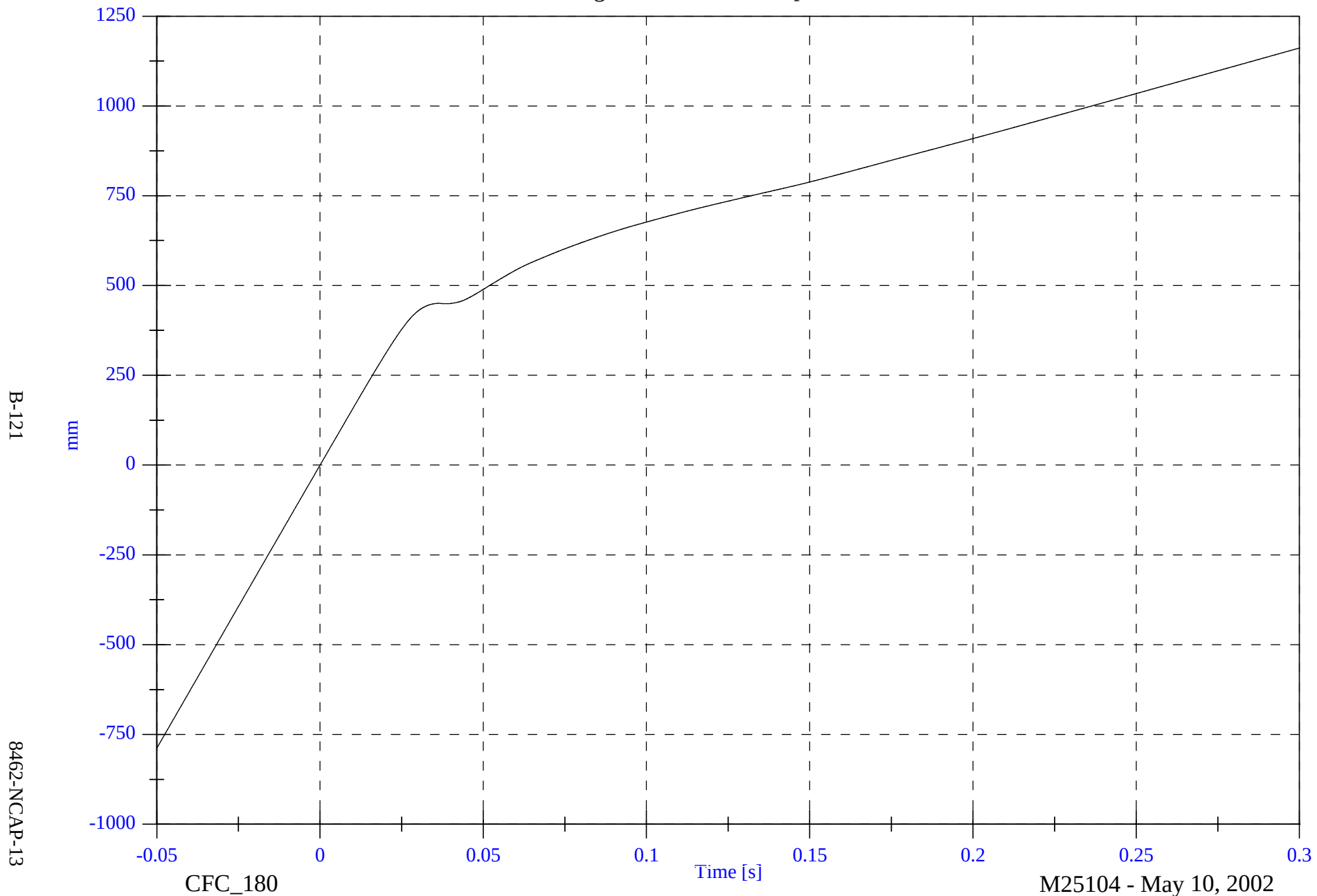


2002 NCAP Test 13 - 2002 Toyota Camry

Engine Bottom #4x Displacement

Max: 1161.3 [mm] at 0.300 [s]

Min: -788.2 [mm] at -0.050 [s]

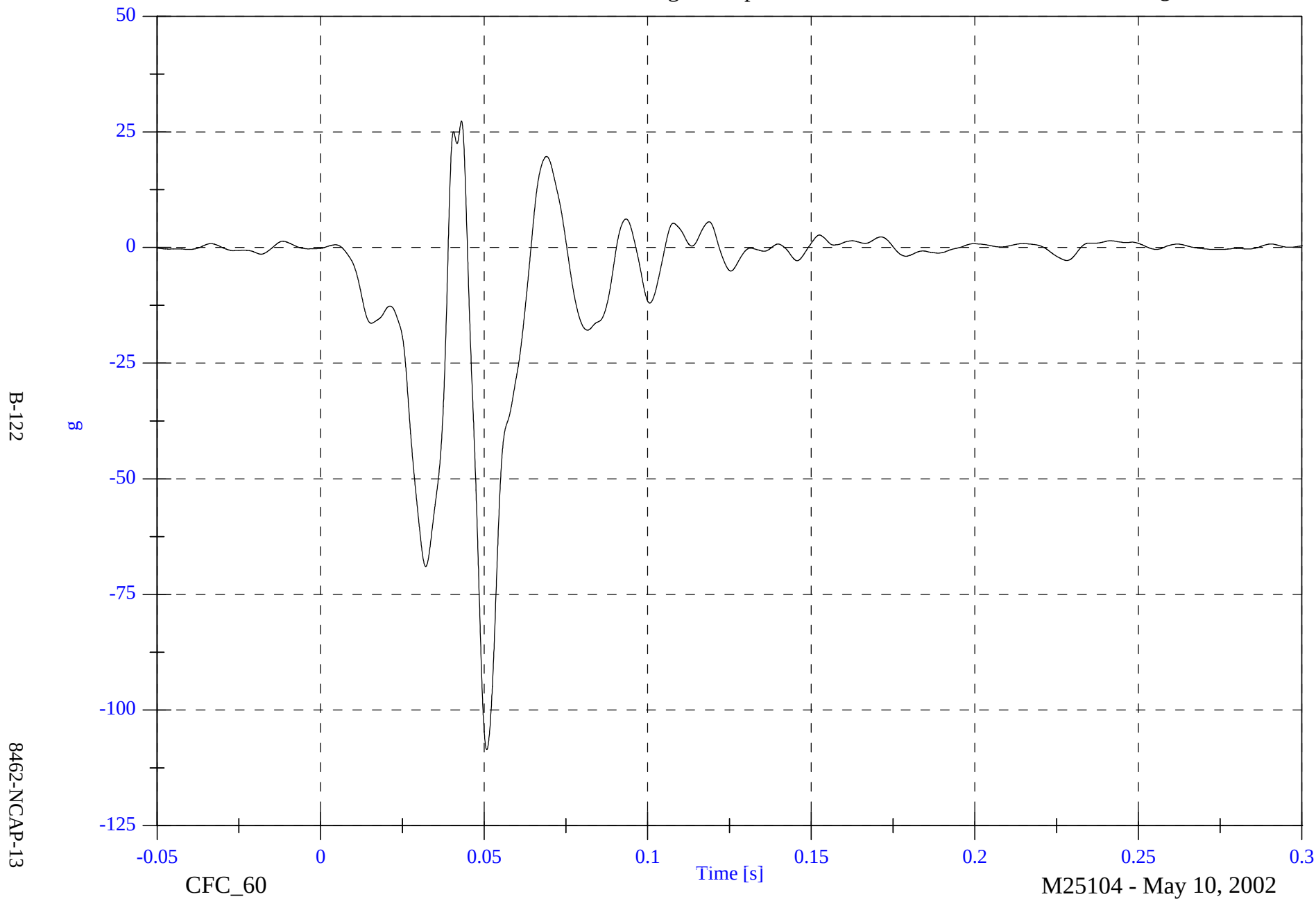


2002 NCAP Test 13 - 2002 Toyota Camry

Right Caliper #5x

Max: 27.4 [g] at 0.043 [s]

Min: -108.6 [g] at 0.051 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

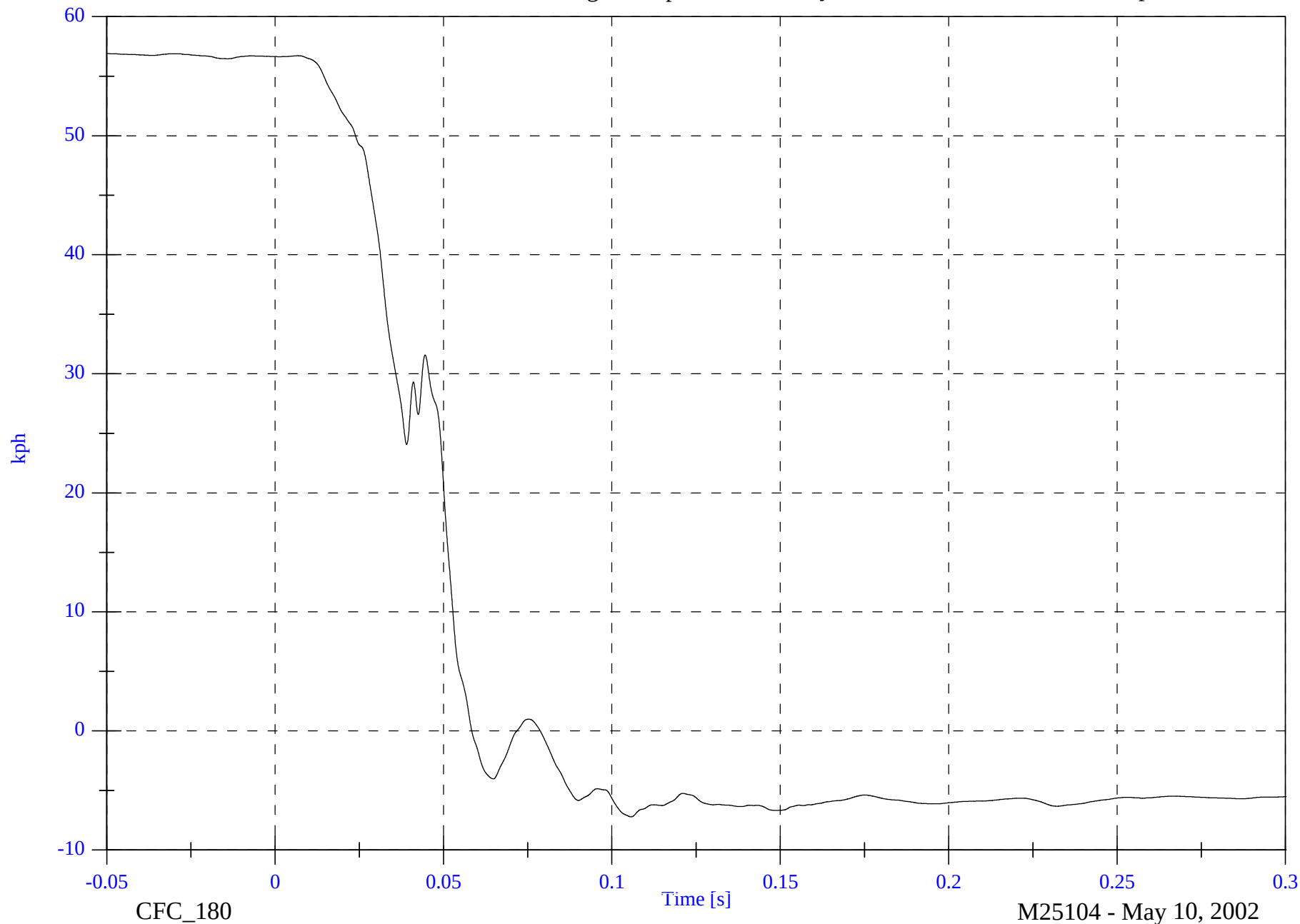
Right Caliper #5x Velocity

Max: 56.9 [kph] at -0.050 [s]

Min: -7.2 [kph] at 0.106 [s]

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8462-NCAP-13

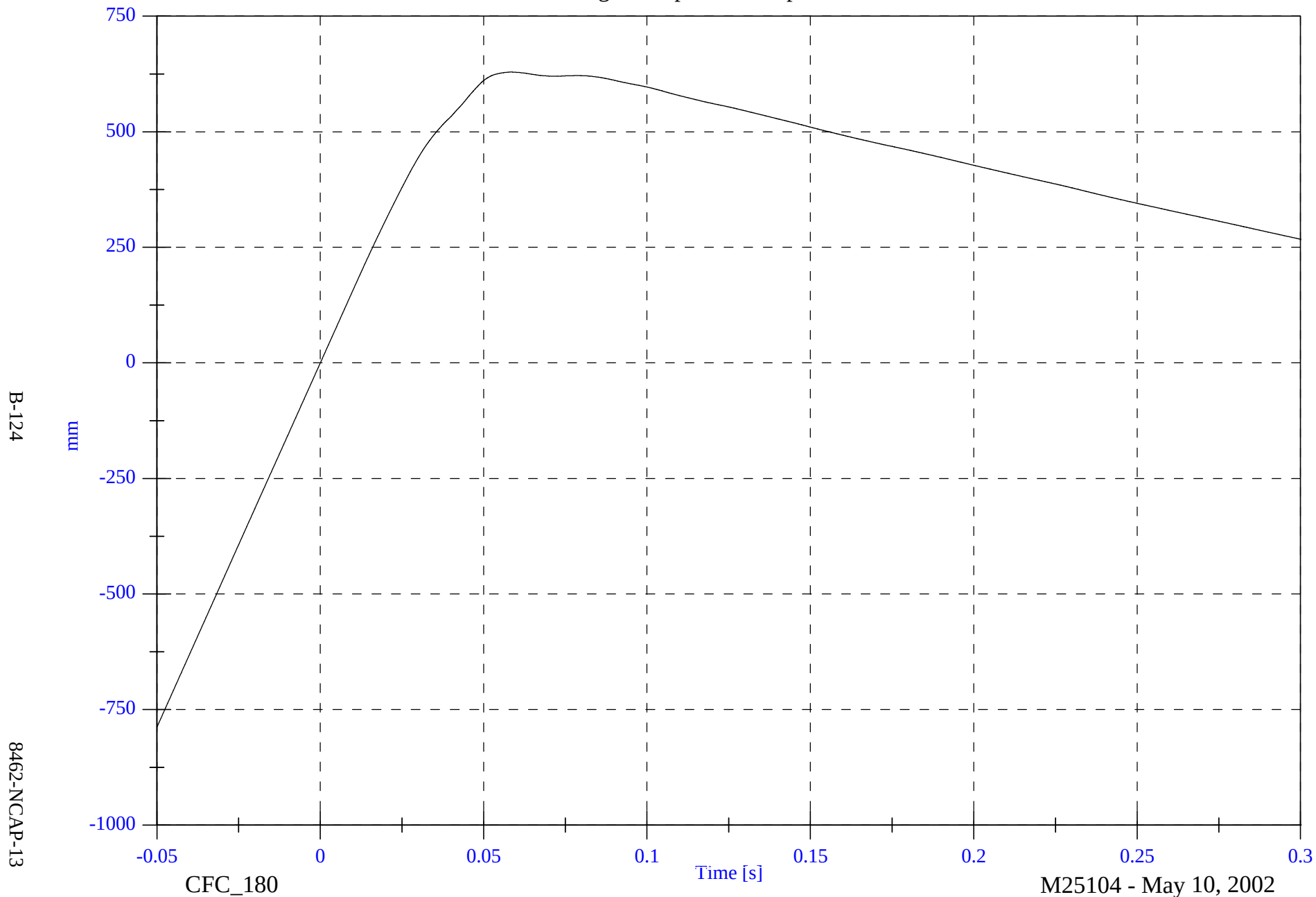


2002 NCAP Test 13 - 2002 Toyota Camry

Right Caliper #5x Displacement

Max: 629.0 [mm] at 0.058 [s]

Min: -788.0 [mm] at -0.050 [s]

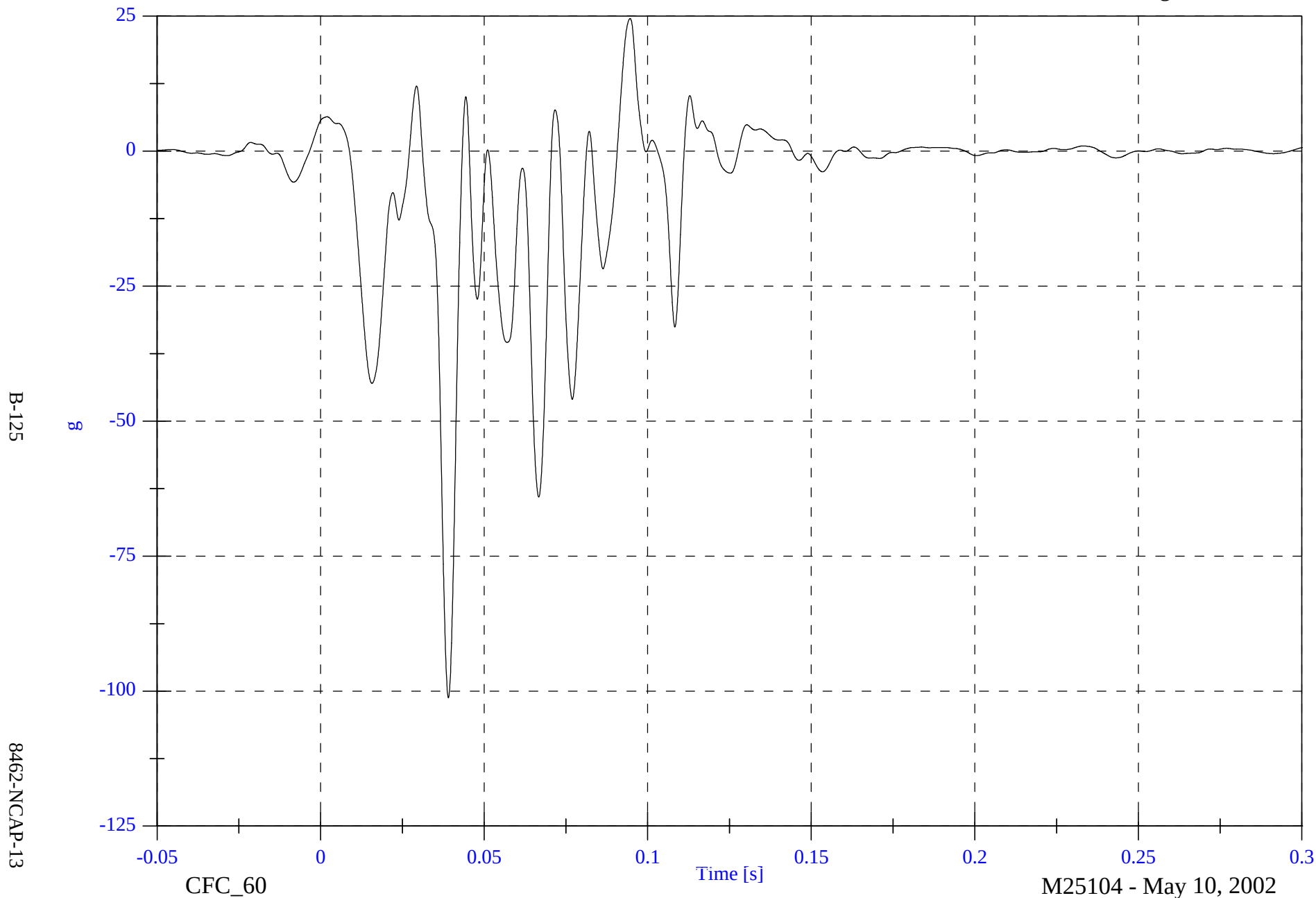


2002 NCAP Test 13 - 2002 Toyota Camry

Instrument Panel #6x

Max: 24.6 [g] at 0.095 [s]

Min: -101.2 [g] at 0.039 [s]

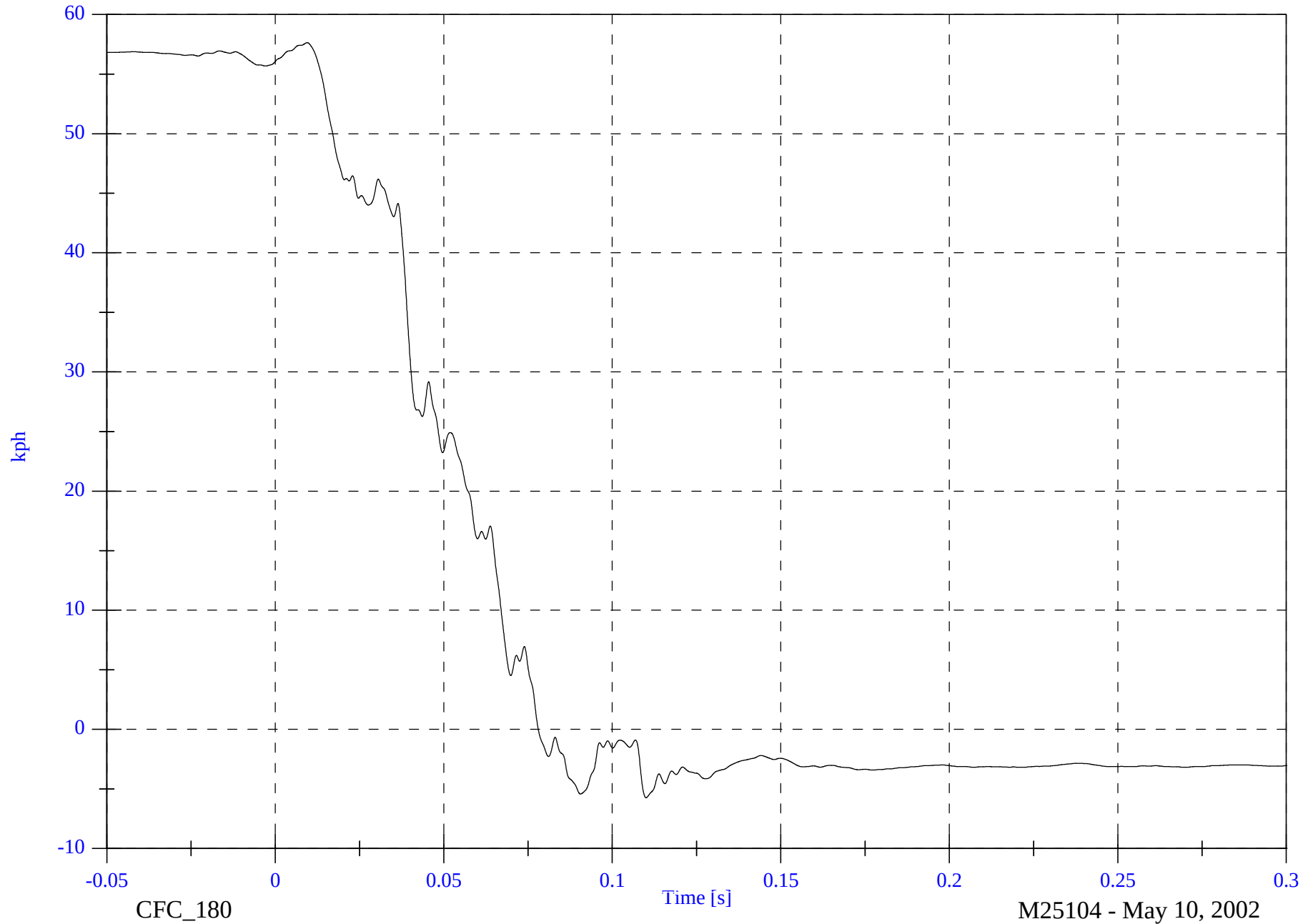


2002 NCAP Test 13 - 2002 Toyota Camry

Instrument Panel #6x Velocity

Max: 57.6 [kph] at 0.009 [s]

Min: -5.7 [kph] at 0.110 [s]



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CFC_180

Time [s]

M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

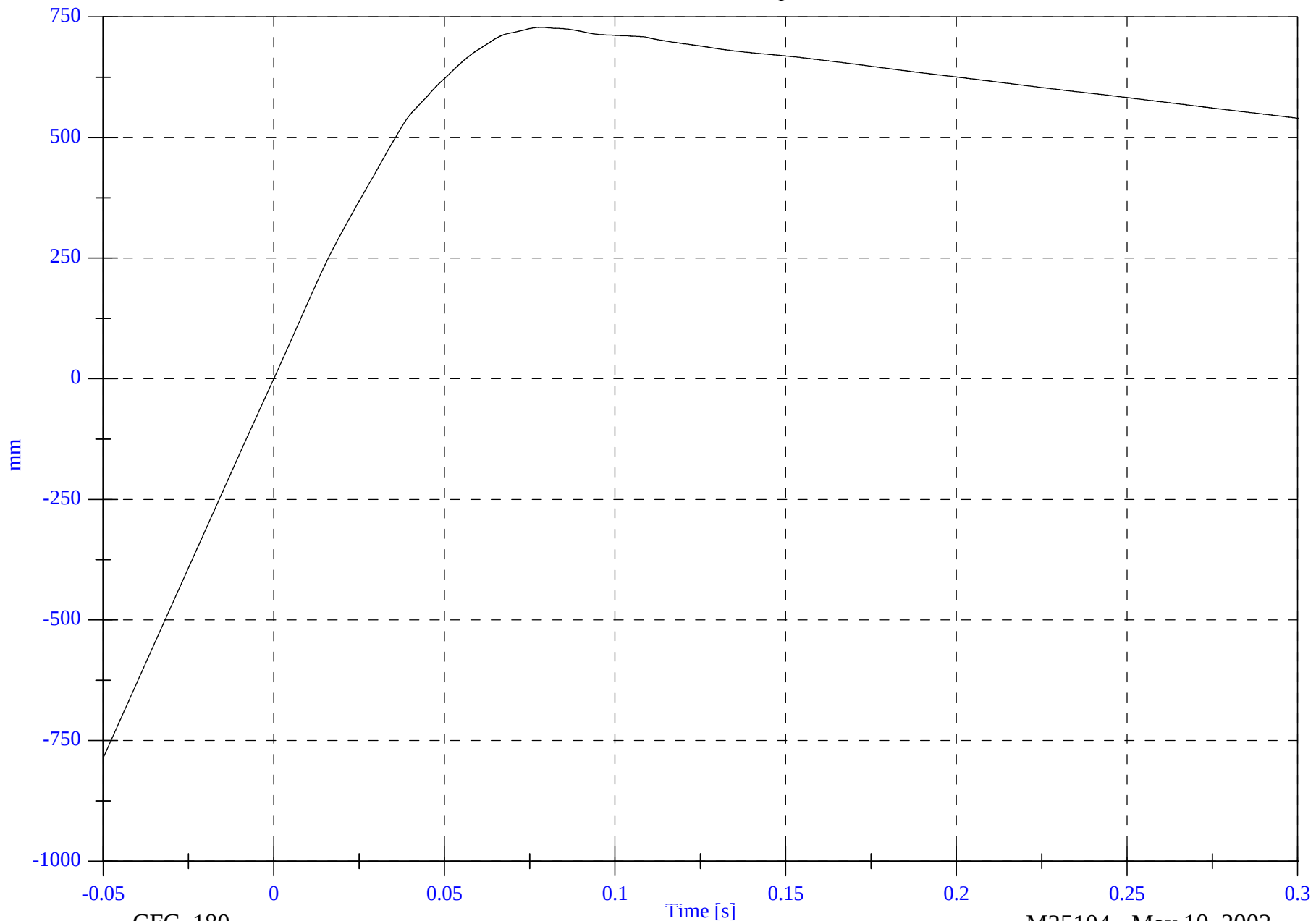
Instrument Panel #6x Displacement

Max: 728.2 [mm] at 0.078 [s]

Min: -786.2 [mm] at -0.050 [s]

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CFC_180

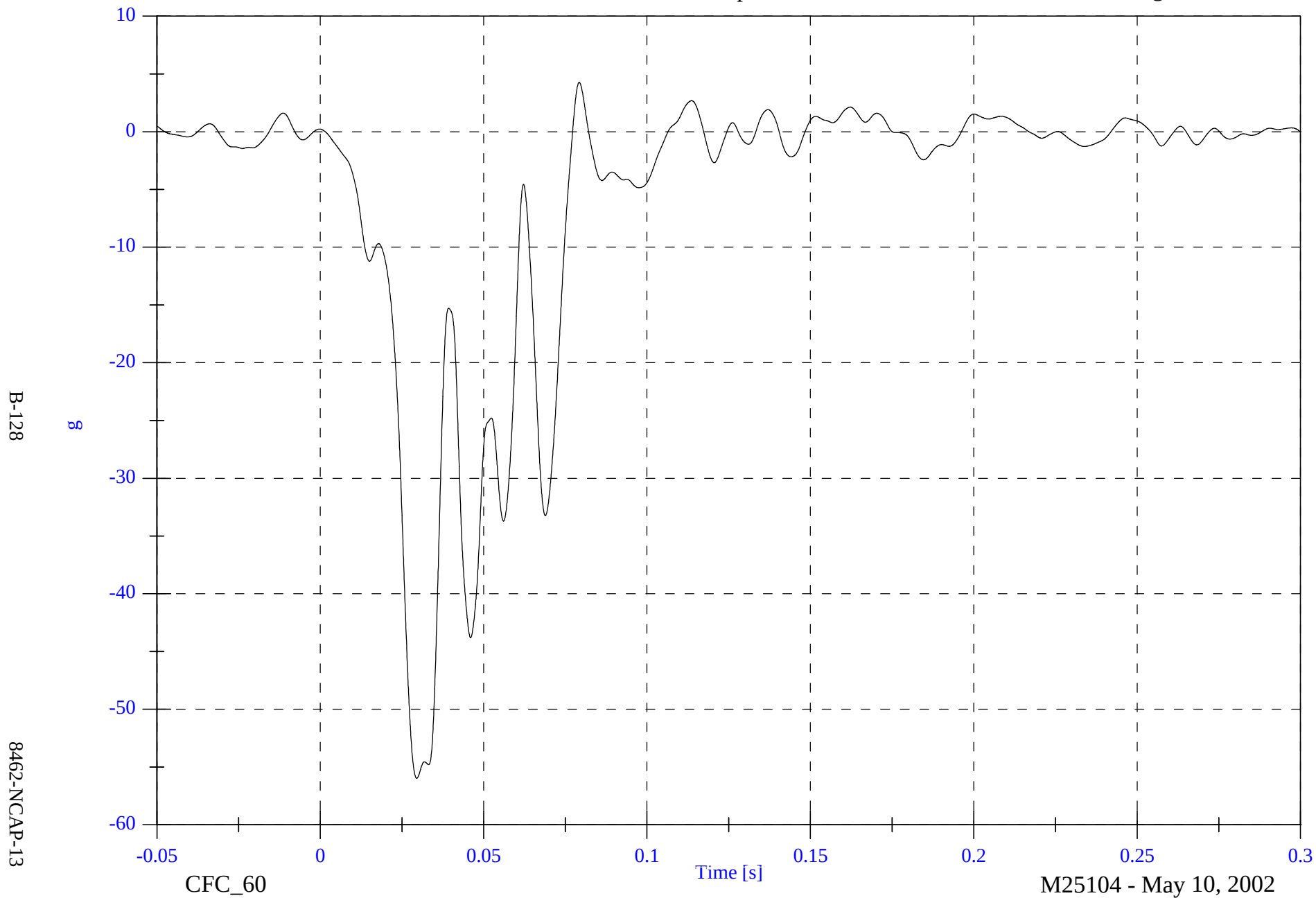
M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

Left Caliper #7x

Max: 4.3 [g] at 0.079 [s]

Min: -56.0 [g] at 0.030 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

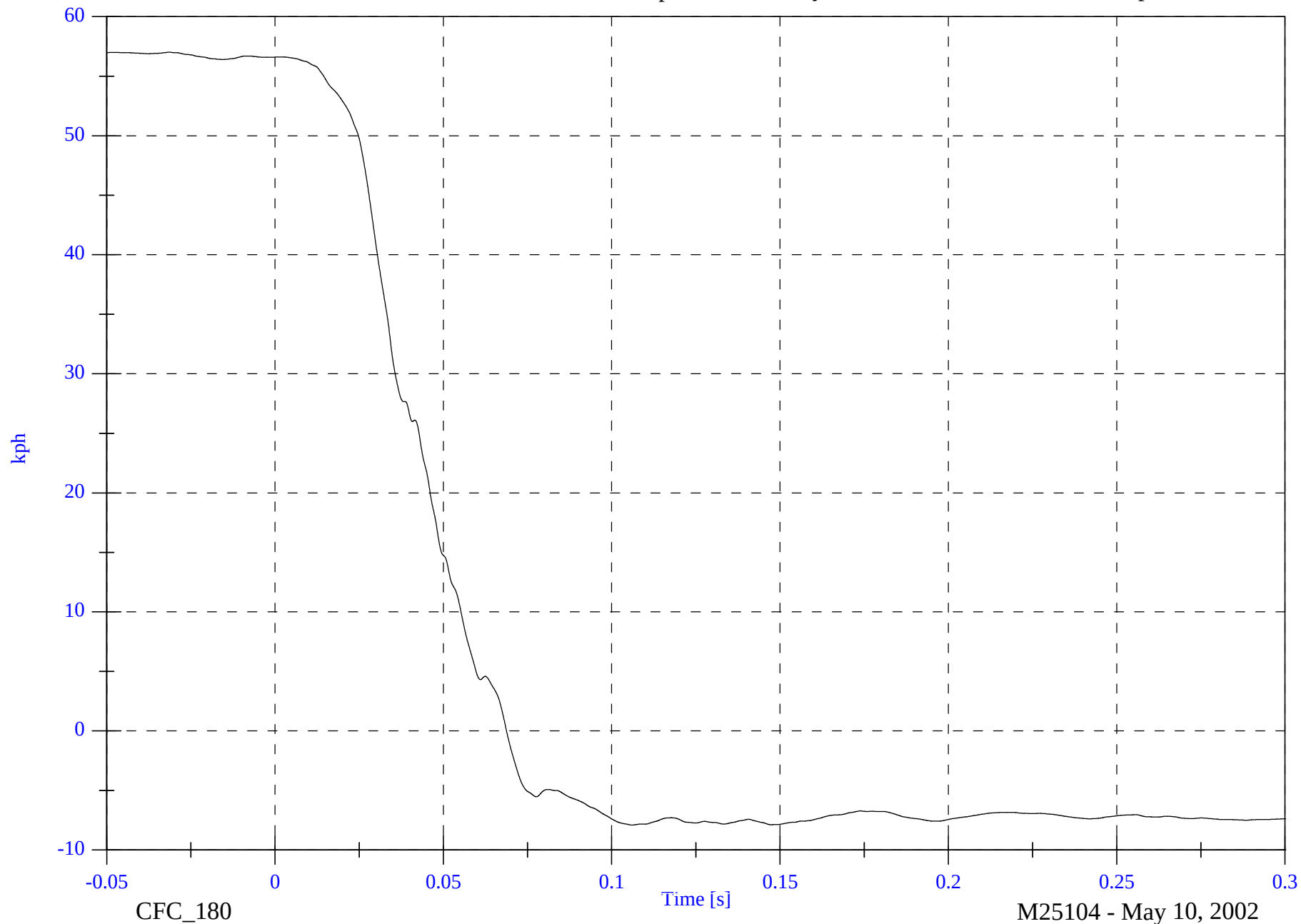
Max: 57.0 [kph] at -0.031 [s]

Left Caliper #7x Velocity

Min: -7.9 [kph] at 0.106 [s]

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8462-NCAP-13

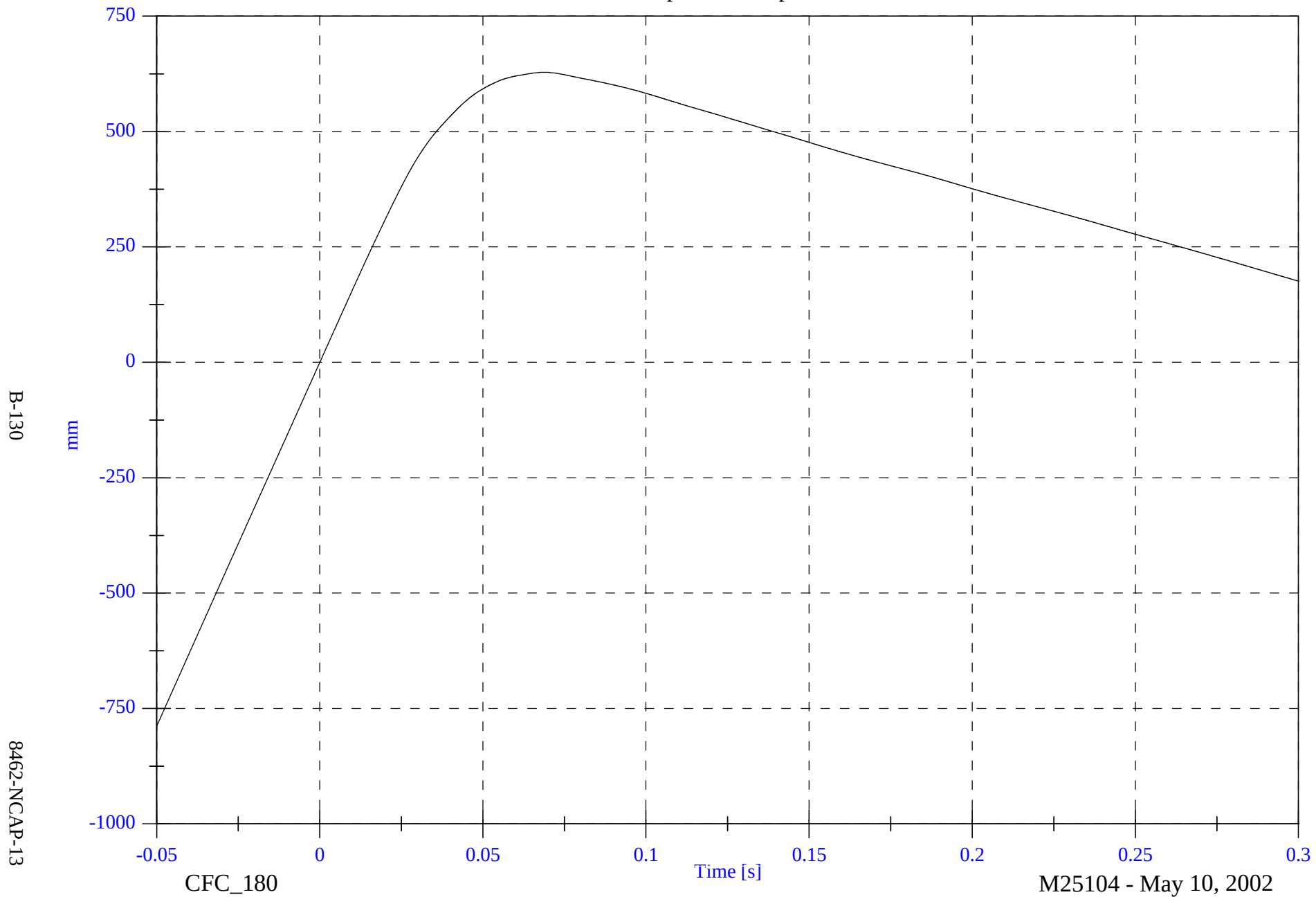


2002 NCAP Test 13 - 2002 Toyota Camry

Left Caliper #7x Displacement

Max: 628.4 [mm] at 0.069 [s]

Min: -788.3 [mm] at -0.050 [s]

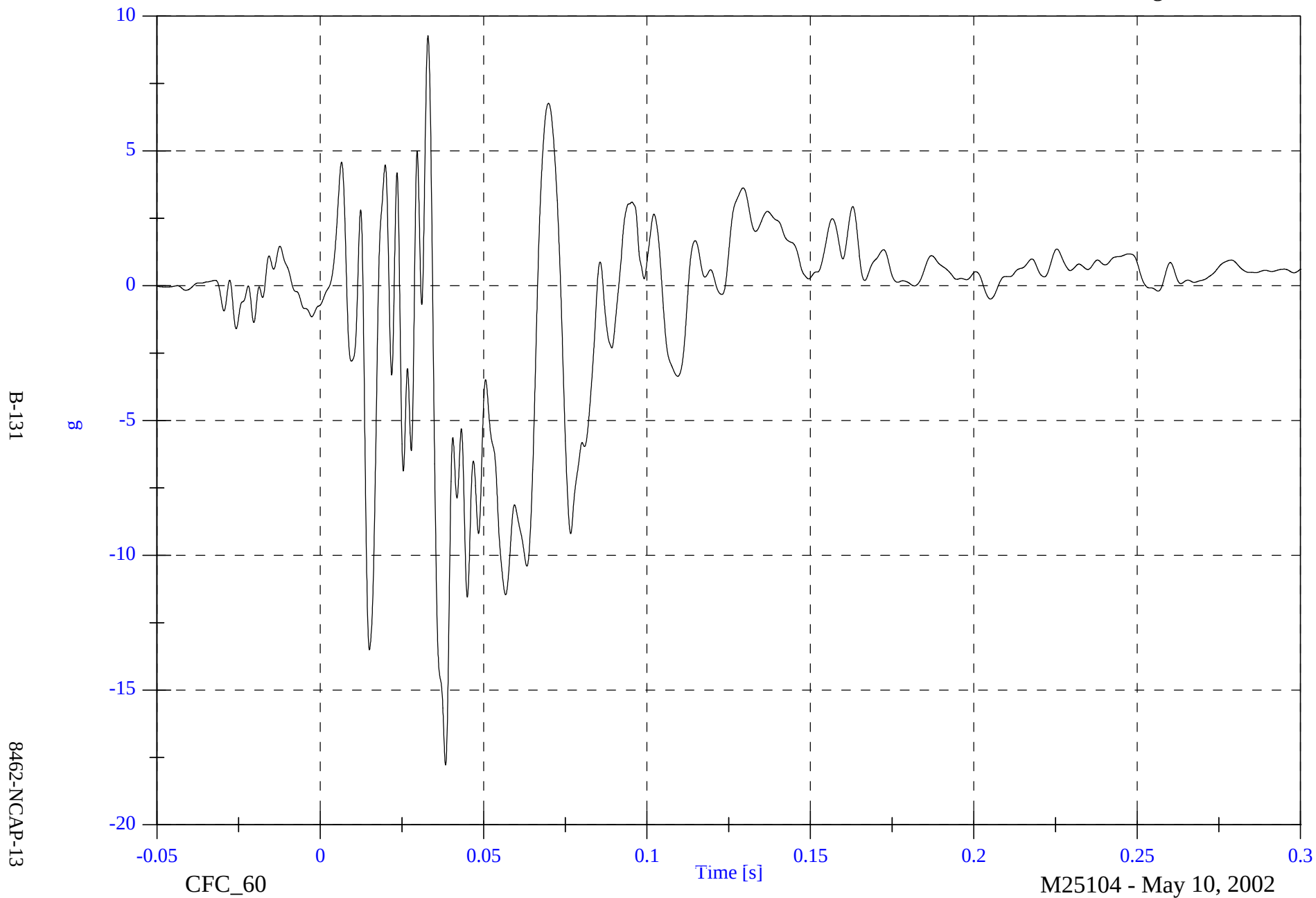


2002 NCAP Test 13 - 2002 Toyota Camry

Left Rear #8z

Max: 9.3 [g] at 0.033 [s]

Min: -17.8 [g] at 0.038 [s]

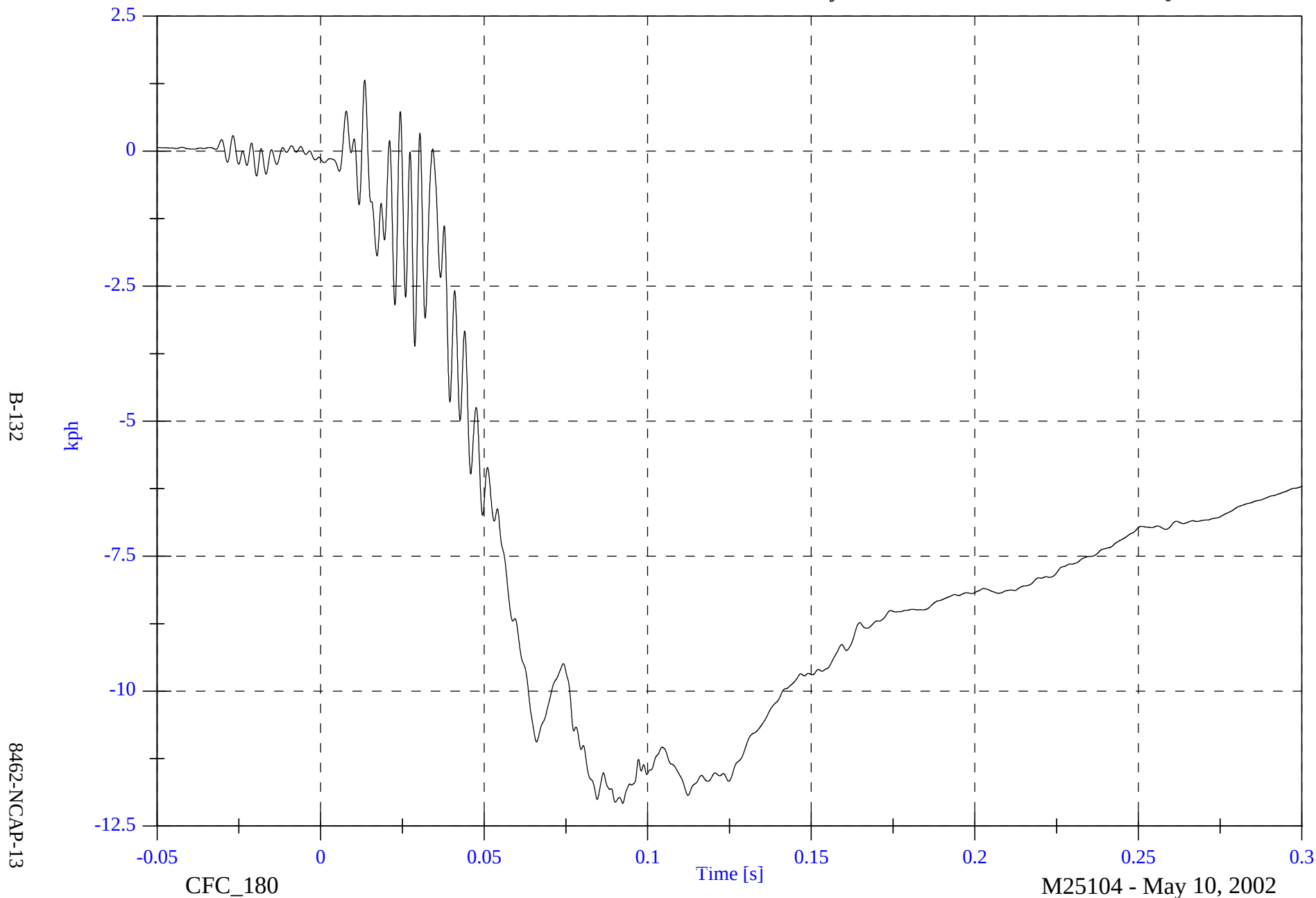


2002 NCAP Test 13 - 2002 Toyota Camry

Left Rear #8z Velocity

Max: 1.3 [kph] at 0.013 [s]

Min: -12.1 [kph] at 0.092 [s]

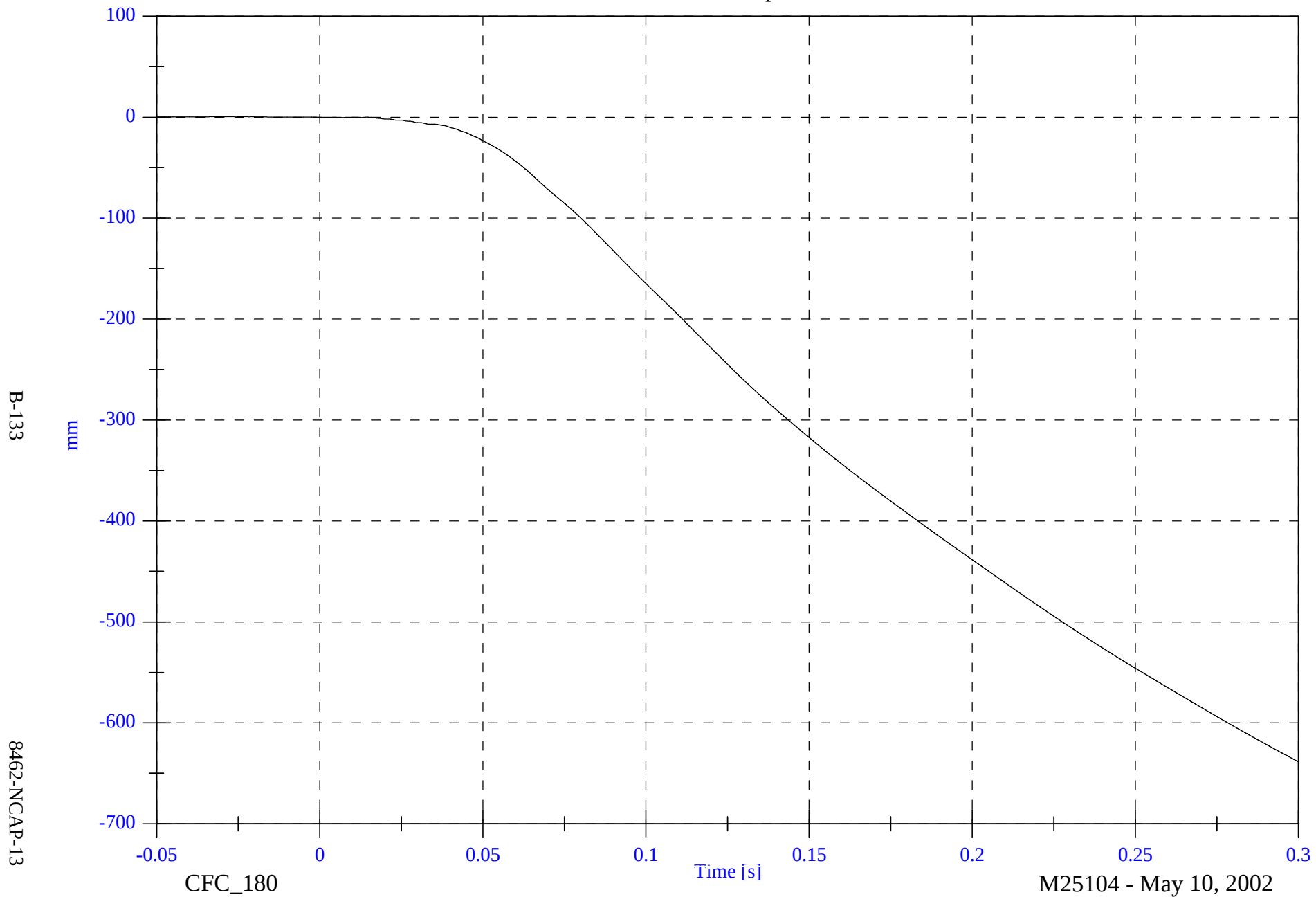


2002 NCAP Test 13 - 2002 Toyota Camry

Left Rear #8z Displacement

Max: 0.6 [mm] at -0.026 [s]

Min: -638.5 [mm] at 0.300 [s]

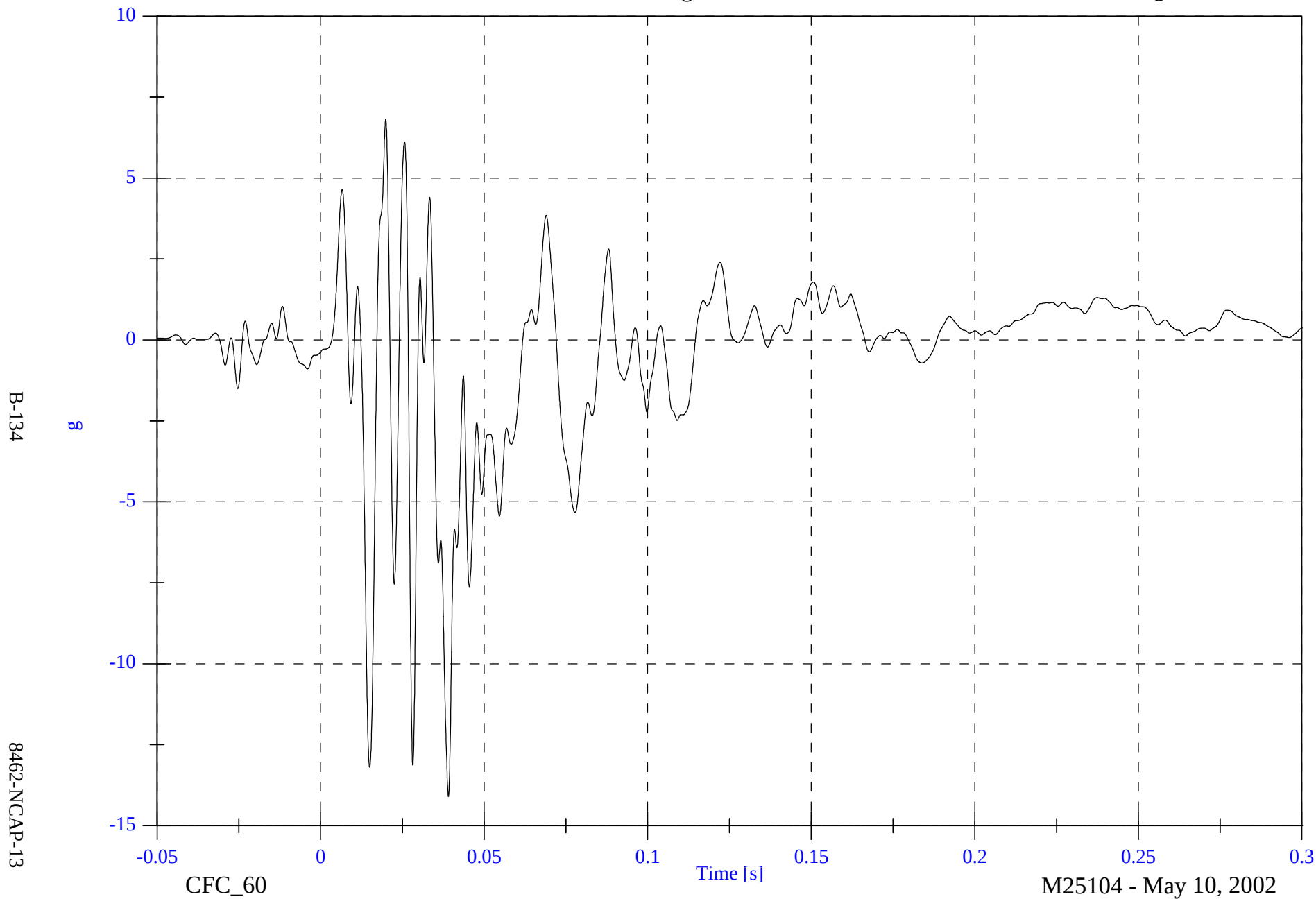


2002 NCAP Test 13 - 2002 Toyota Camry

Right Rear #9z

Max: 6.8 [g] at 0.020 [s]

Min: -14.1 [g] at 0.039 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

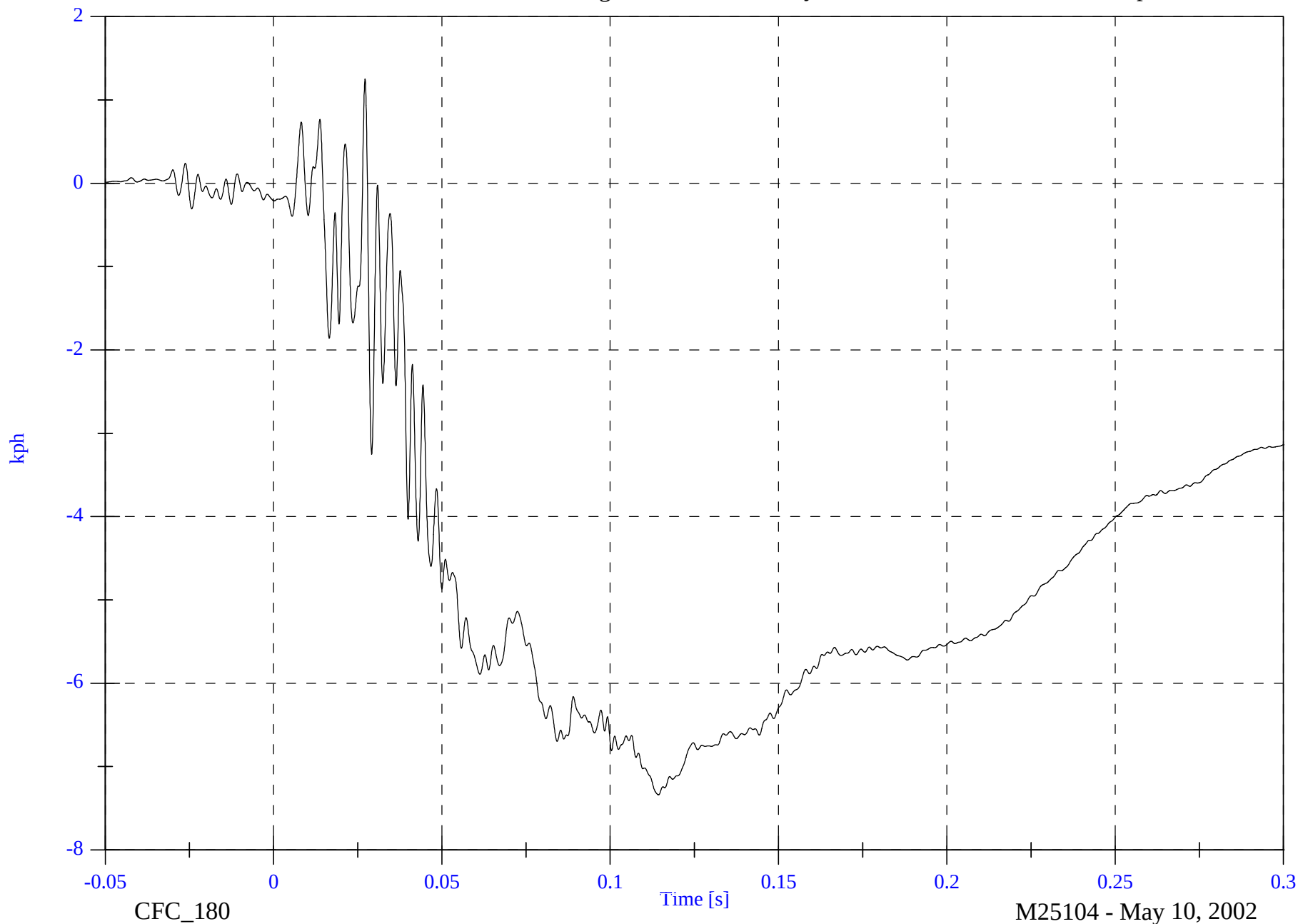
Right Rear #9z Velocity

Max: 1.3 [kph] at 0.027 [s]

Min: -7.3 [kph] at 0.114 [s]

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8462-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

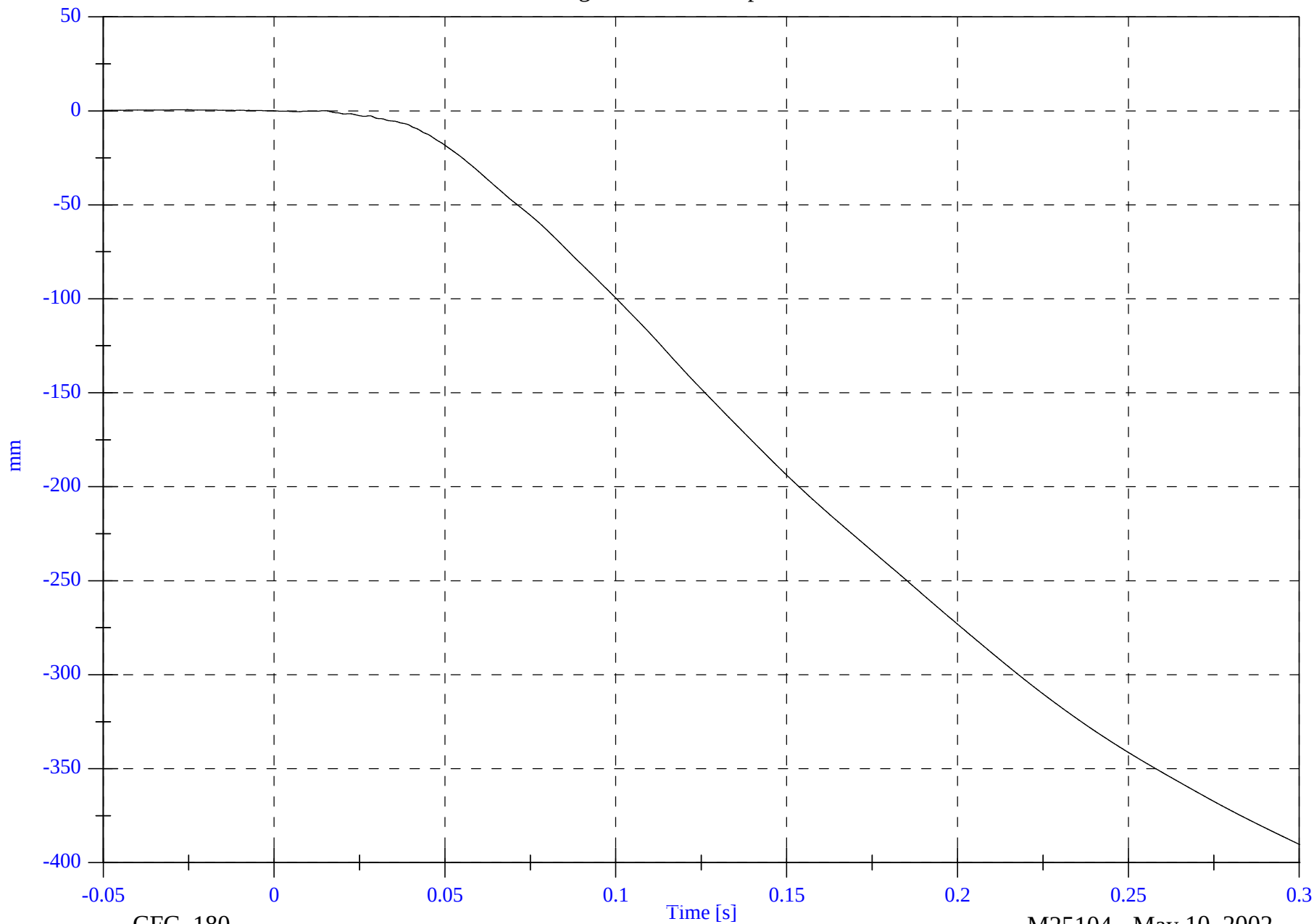
Right Rear #9z Displacement

Max: 0.6 [mm] at -0.025 [s]

Min: -390.3 [mm] at 0.300 [s]

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8462-NCAP-13



CFC_180

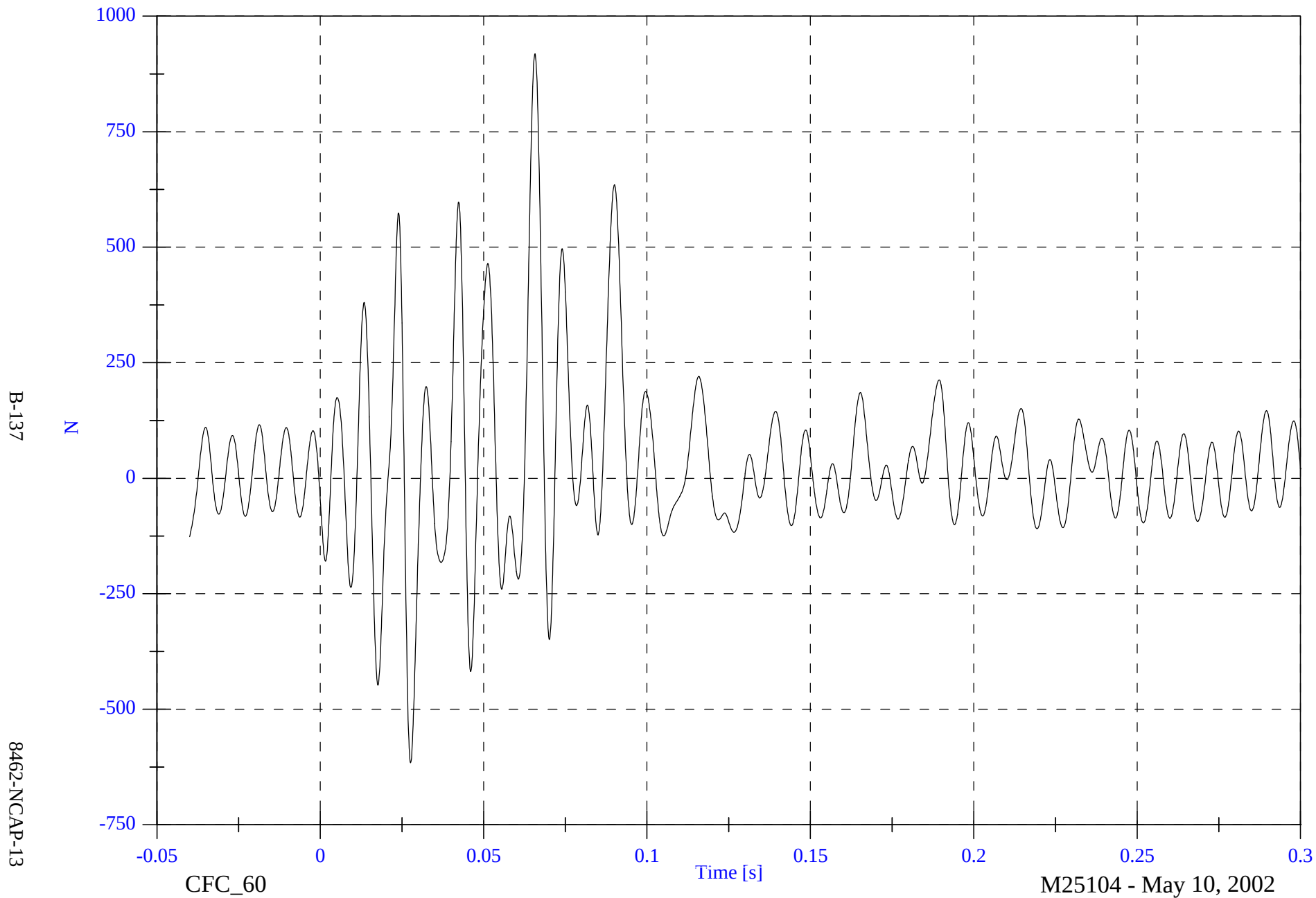
M25104 - May 10, 2002

NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A1 Fx

Max: 918.8 [N] at 0.066 [s]

Min: -615.7 [N] at 0.028 [s]



NCAP Test 13 - 2002 Toyota Camry

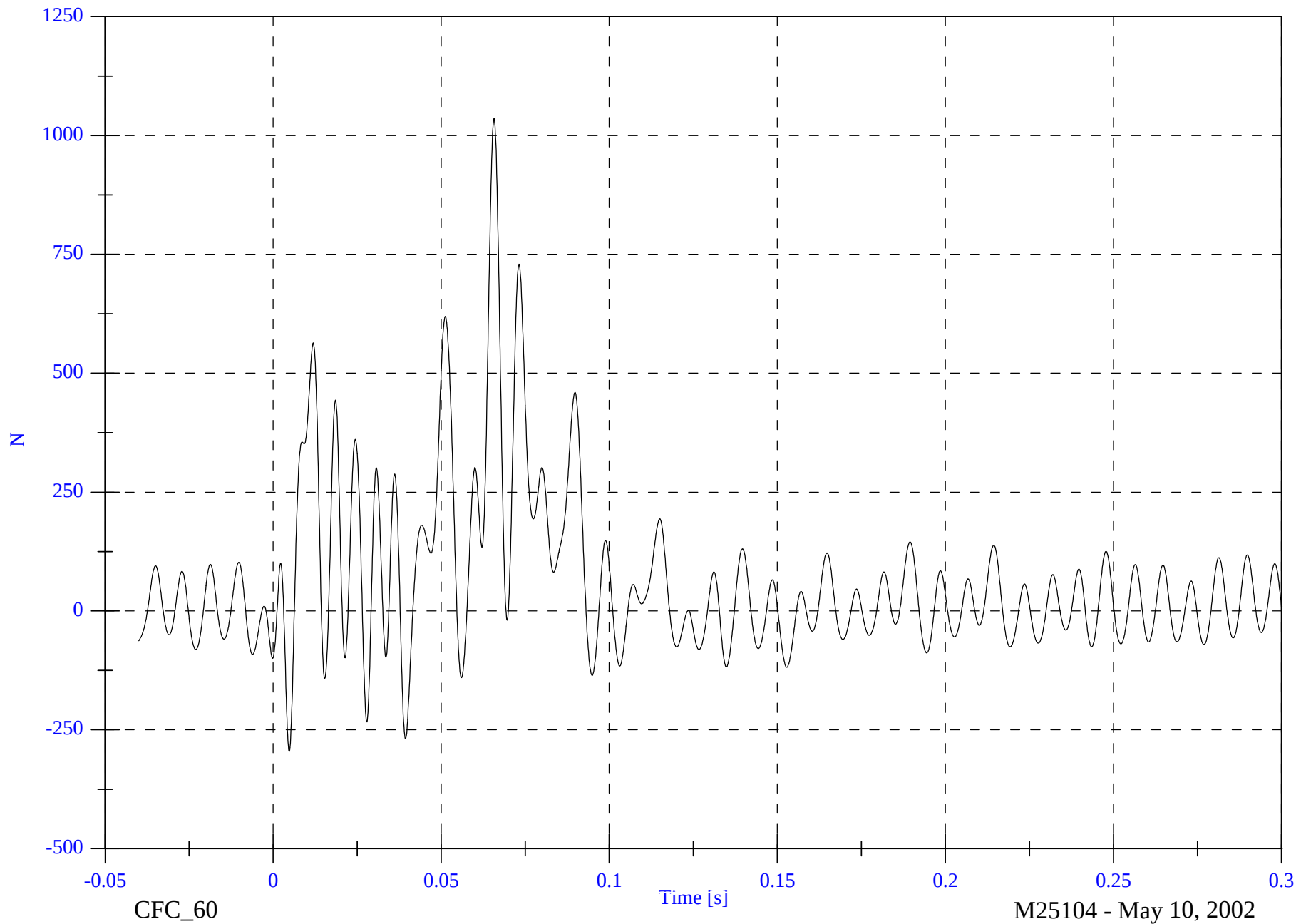
Barrier Load Cell A2 Fx

Max: 1035.6 [N] at 0.066 [s]

Min: -295.3 [N] at 0.005 [s]

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8462-NCAP-13

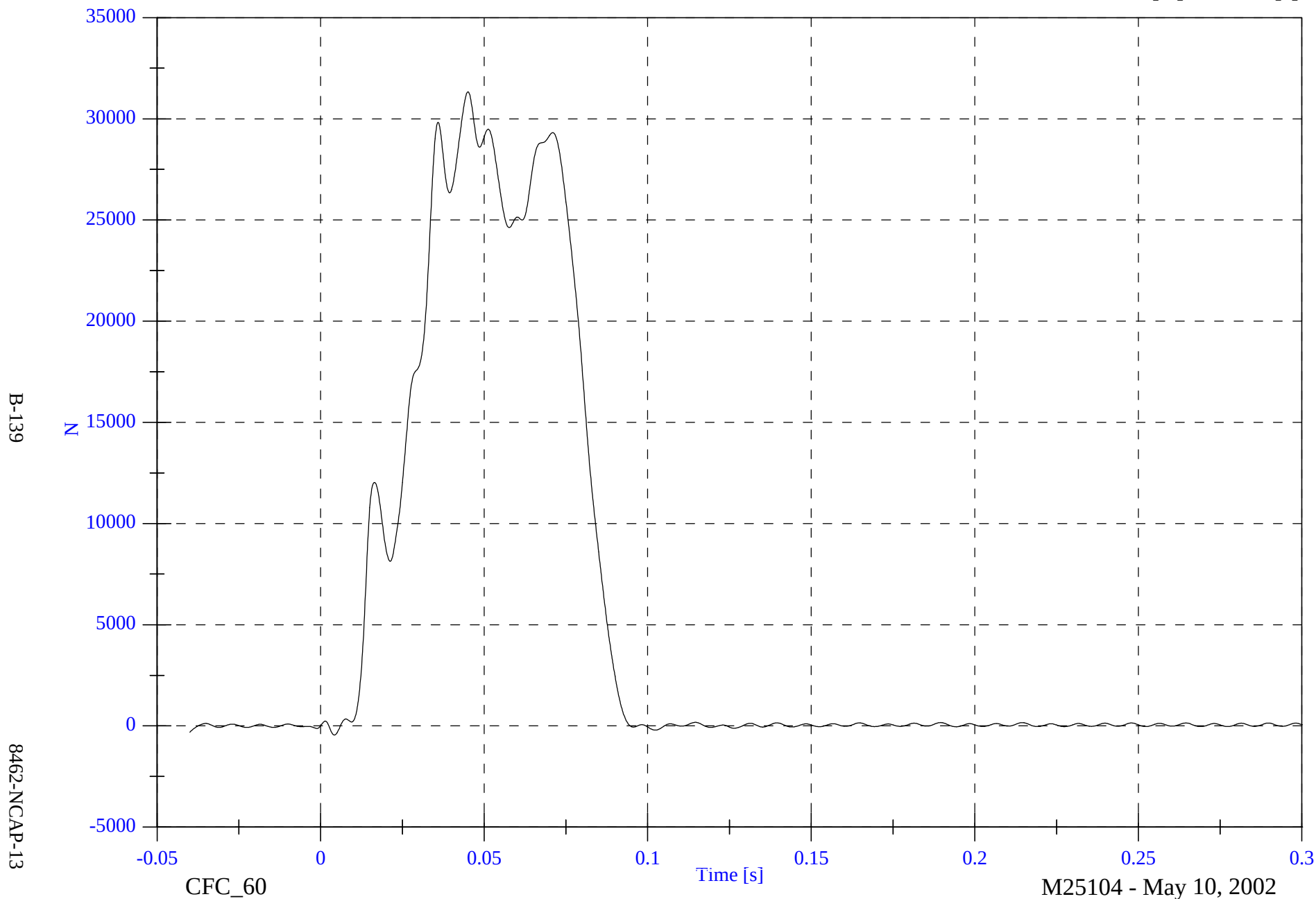


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A3 Fx

Max: 31331.1 [N] at 0.045 [s]

Min: -453.0 [N] at 0.004 [s]

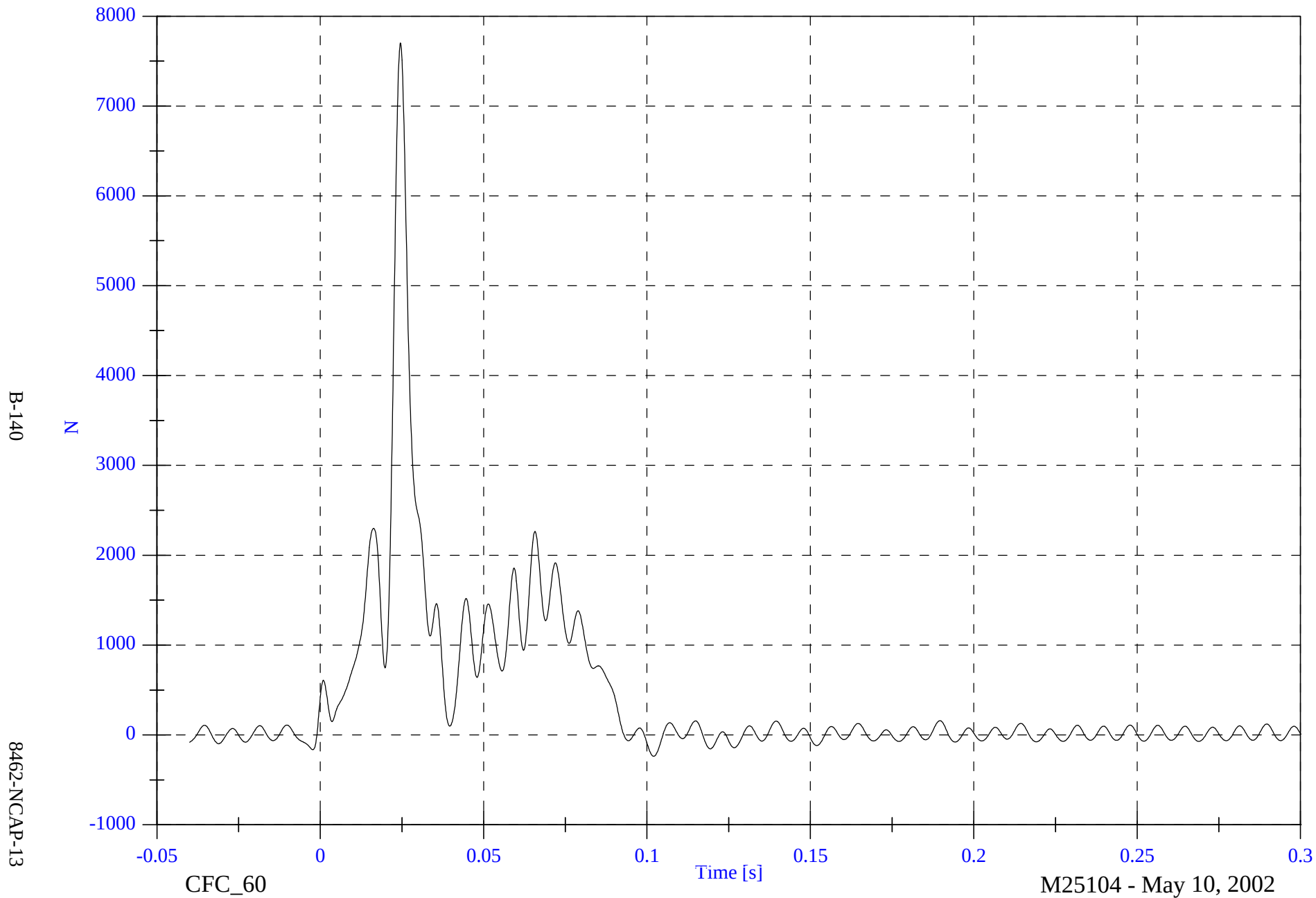


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A4 Fx

Max: 7702.8 [N] at 0.024 [s]

Min: -238.2 [N] at 0.102 [s]

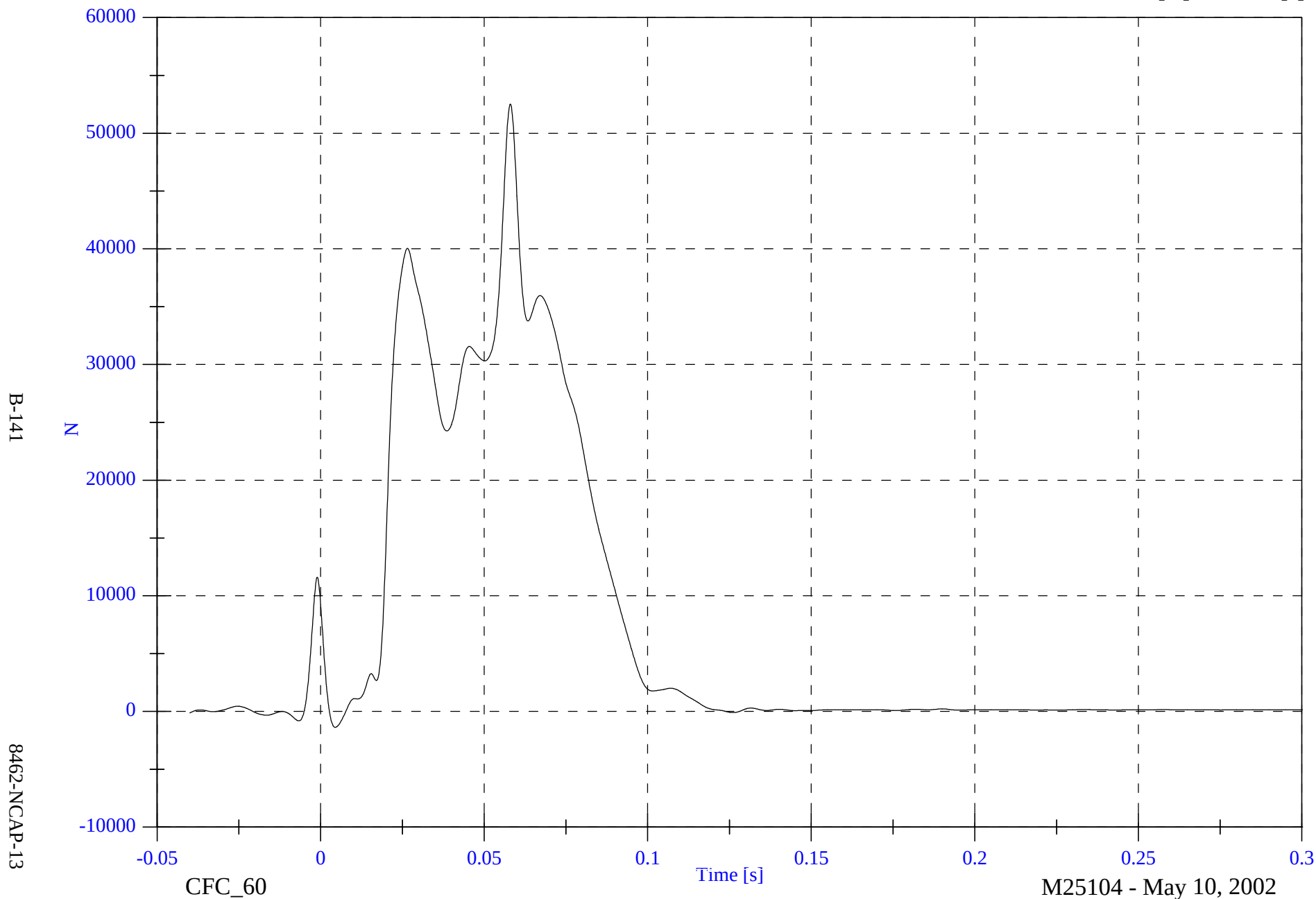


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A5 Fx

Max: 52515.0 [N] at 0.058 [s]

Min: -1373.7 [N] at 0.004 [s]

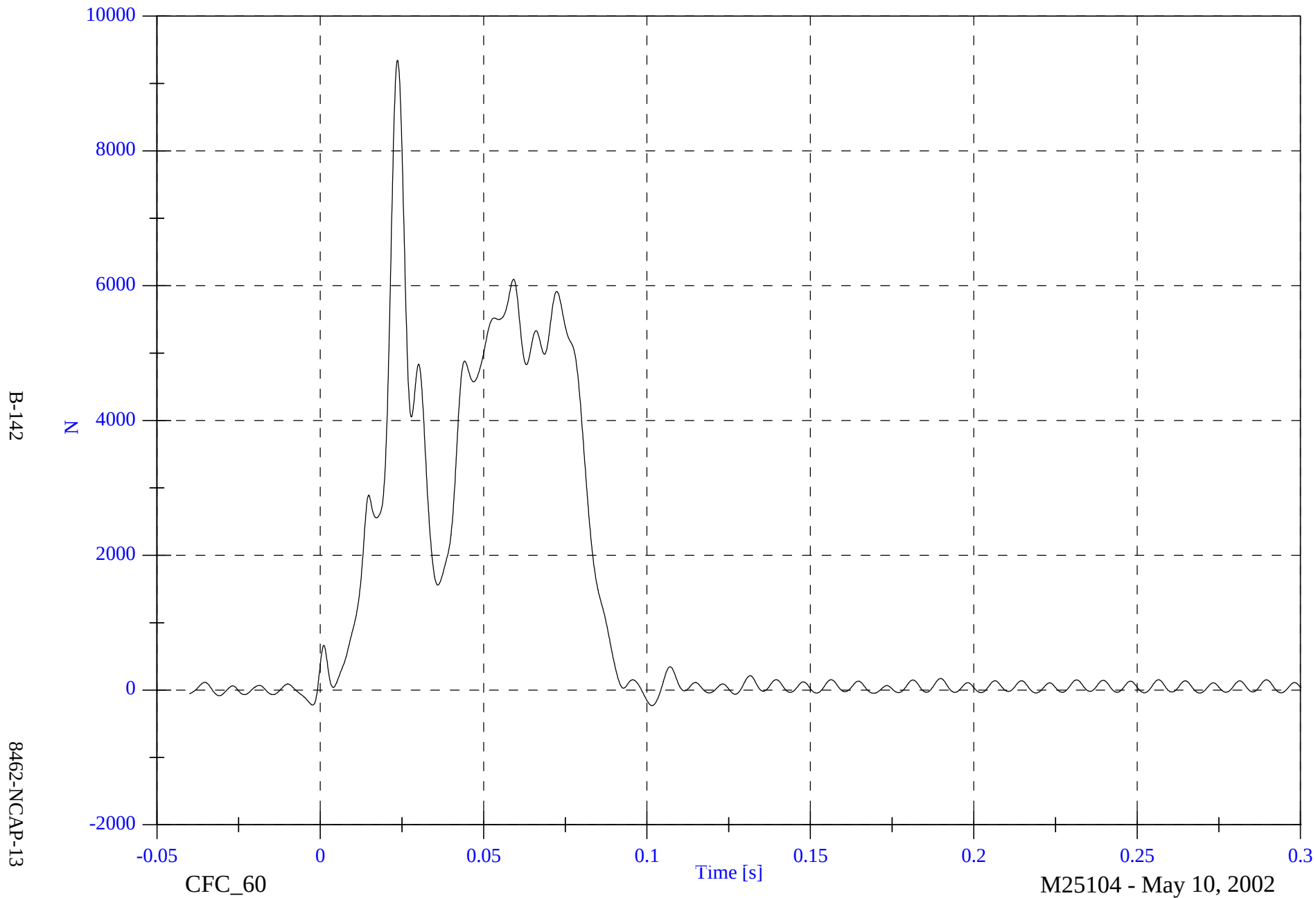


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A6 Fx

Max: 9348.9 [N] at 0.024 [s]

Min: -231.7 [N] at 0.101 [s]

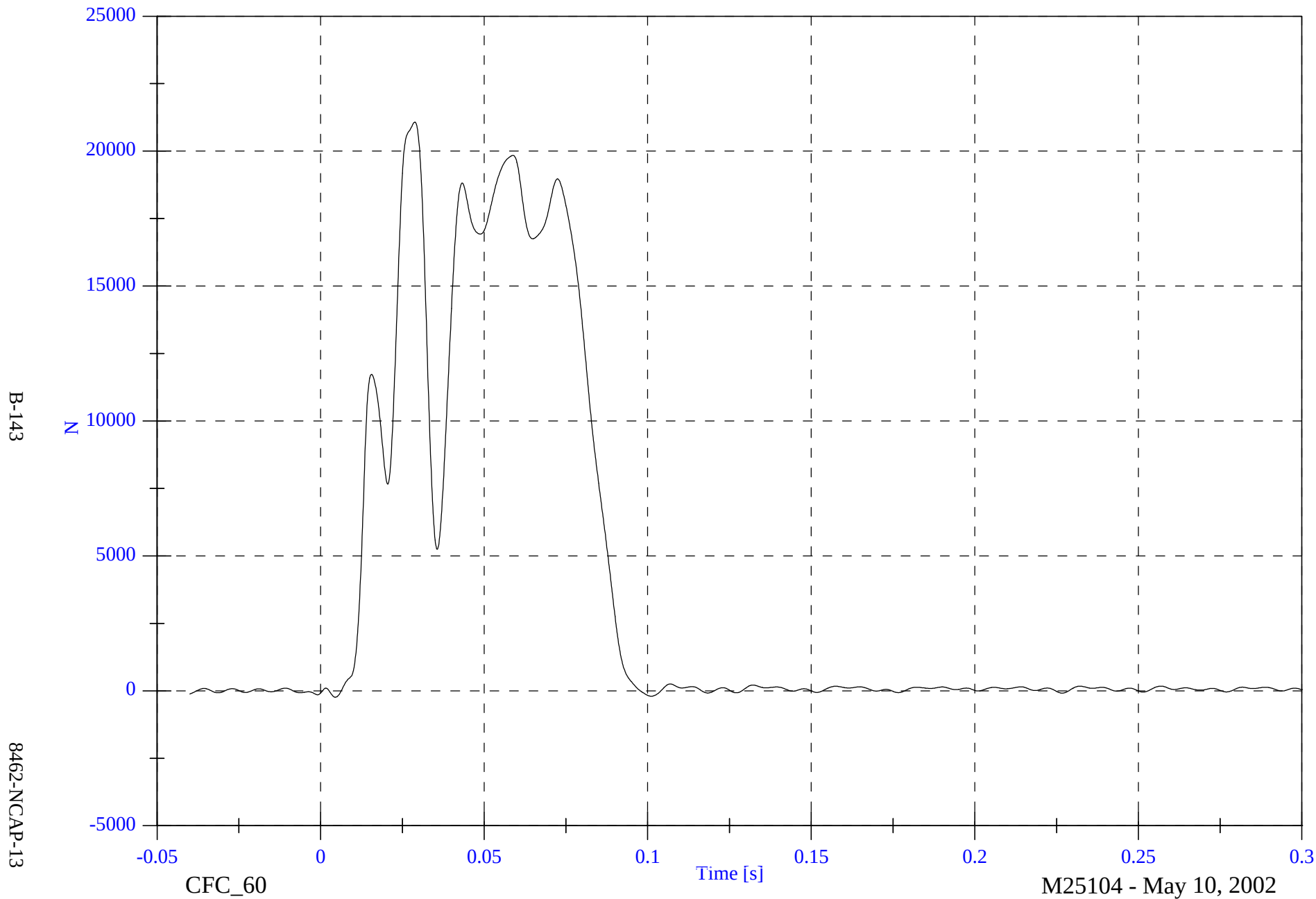


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A7 Fx

Max: 21076.5 [N] at 0.029 [s]

Min: -238.6 [N] at 0.004 [s]

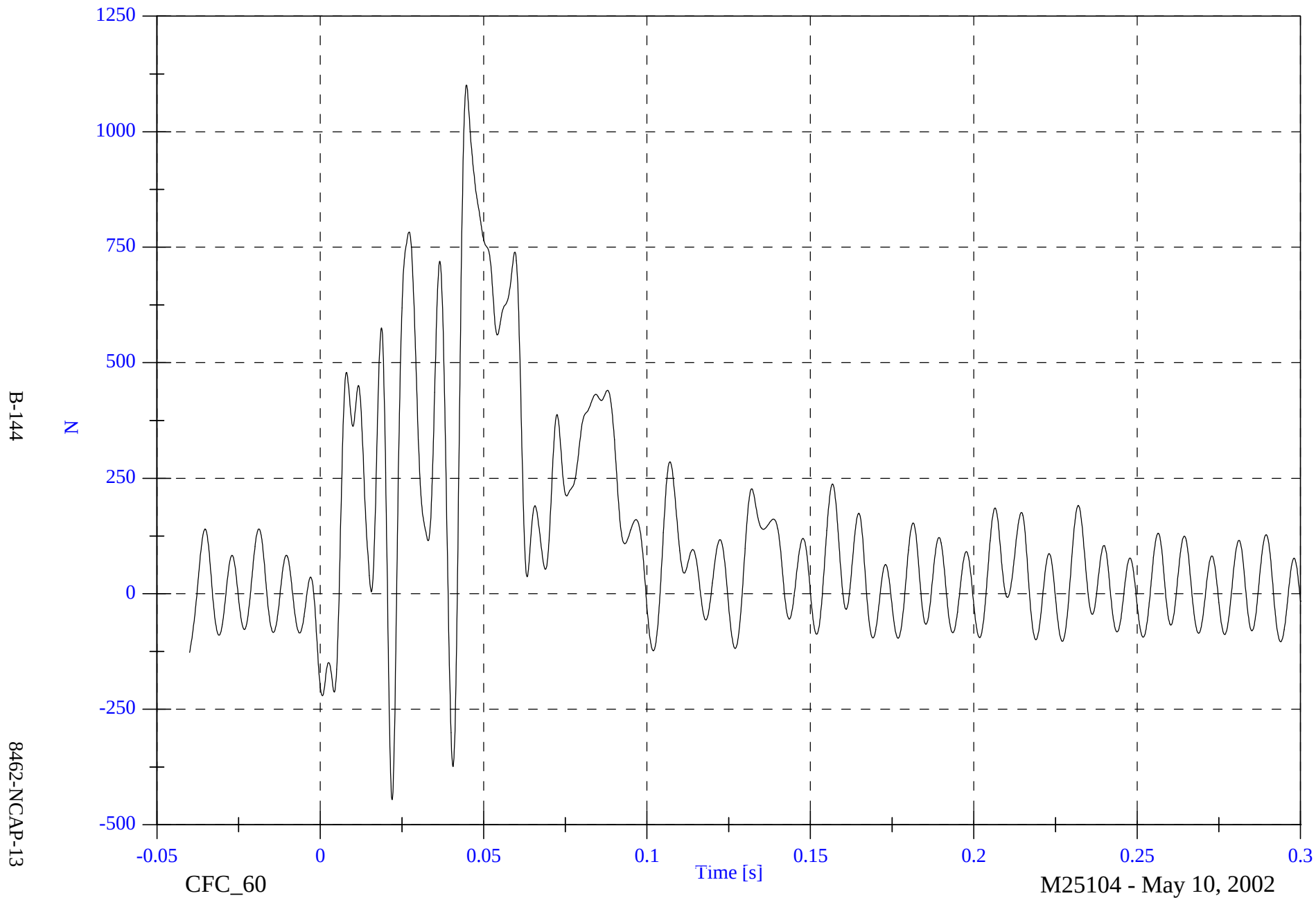


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A8 Fx

Max: 1101.1 [N] at 0.045 [s]

Min: -445.5 [N] at 0.022 [s]

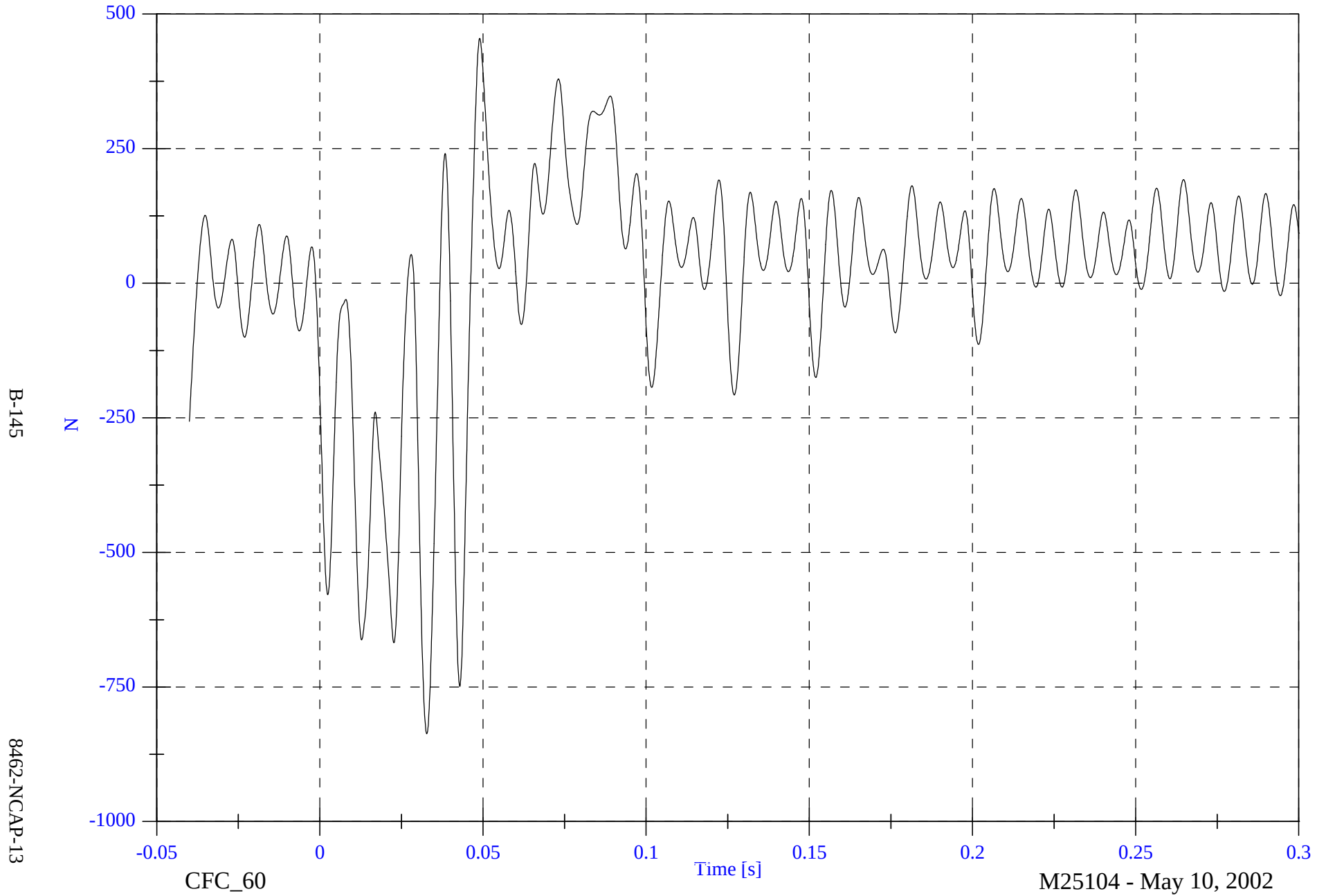


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell A9 Fx

Max: 455.0 [N] at 0.049 [s]

Min: -837.2 [N] at 0.033 [s]

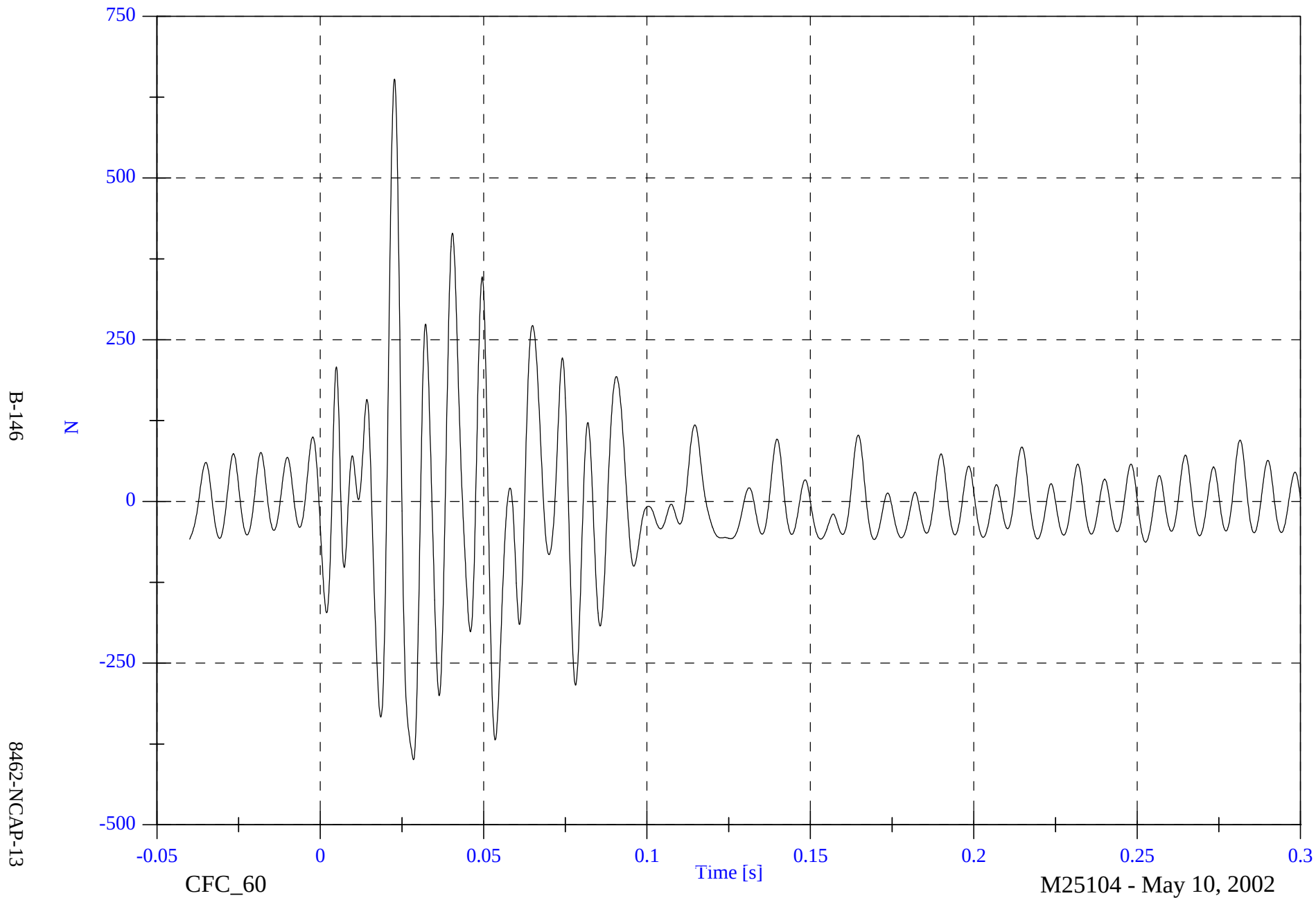


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B1 Fx

Max: 652.7 [N] at 0.023 [s]

Min: -399.5 [N] at 0.028 [s]

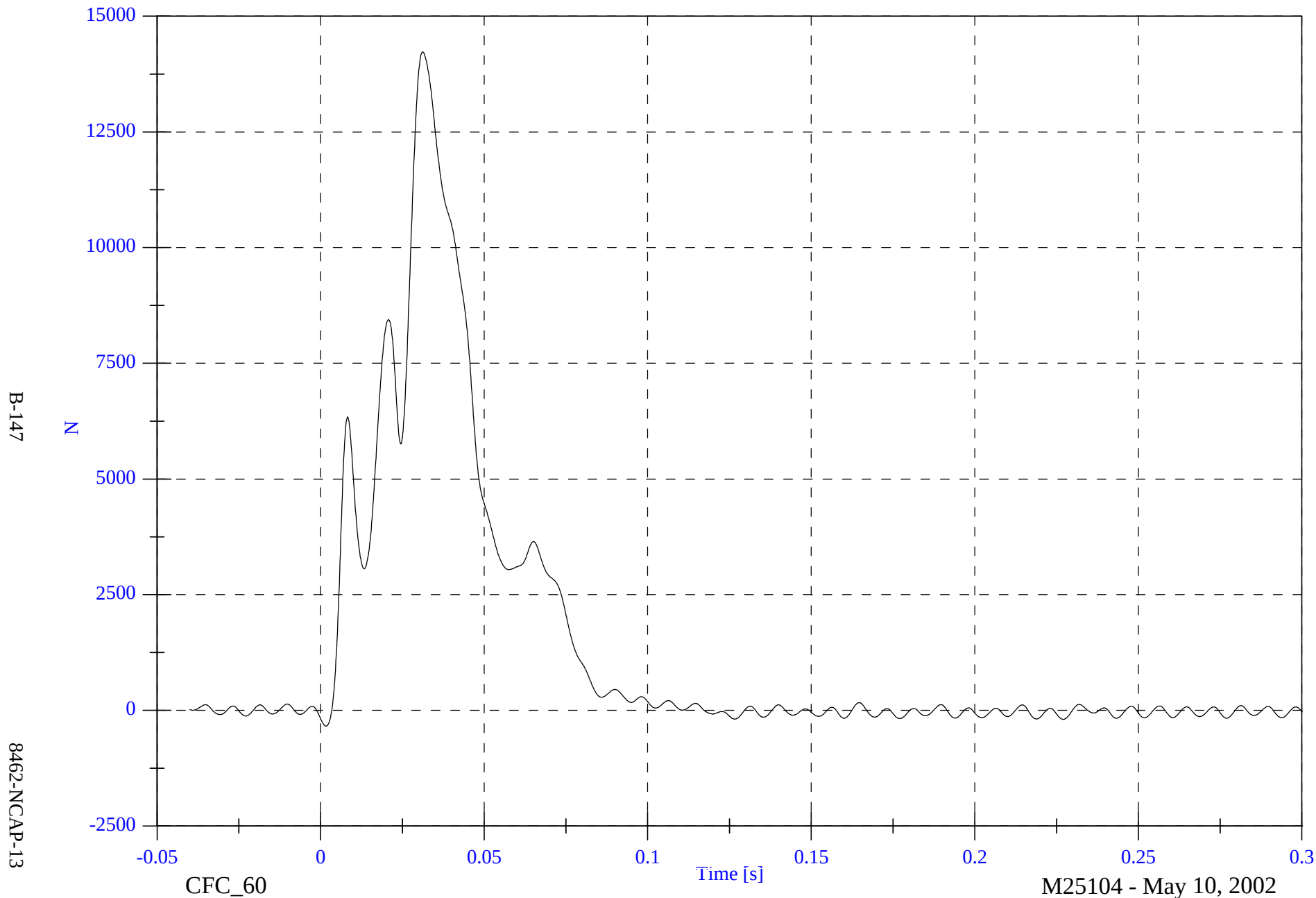


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B2 Fx

Max: 14228.7 [N] at 0.031 [s]

Min: -341.2 [N] at 0.002 [s]

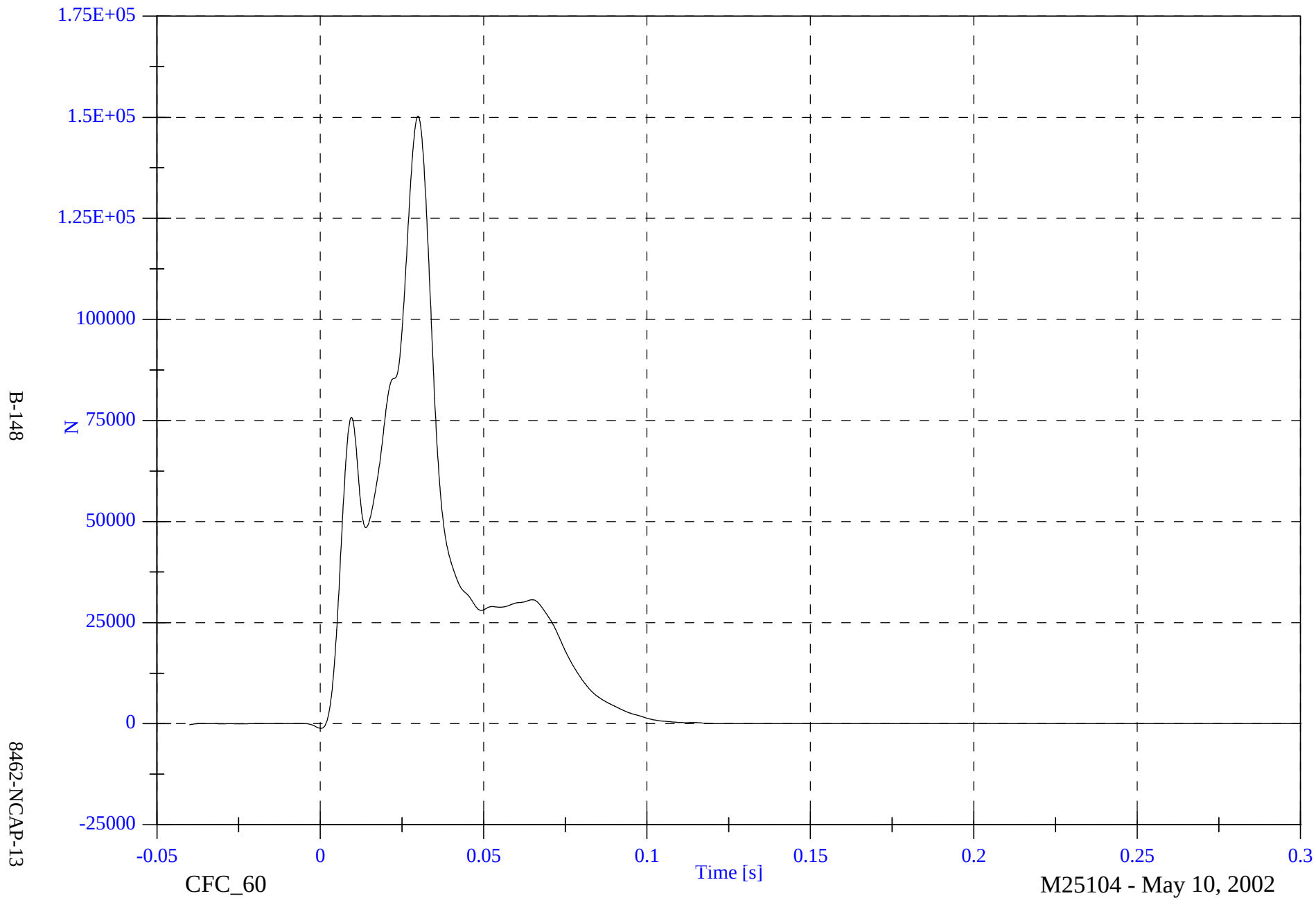


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B3 Fx

Max: 150283.7 [N] at 0.030 [s]

Min: -1154.2 [N] at 0.000 [s]

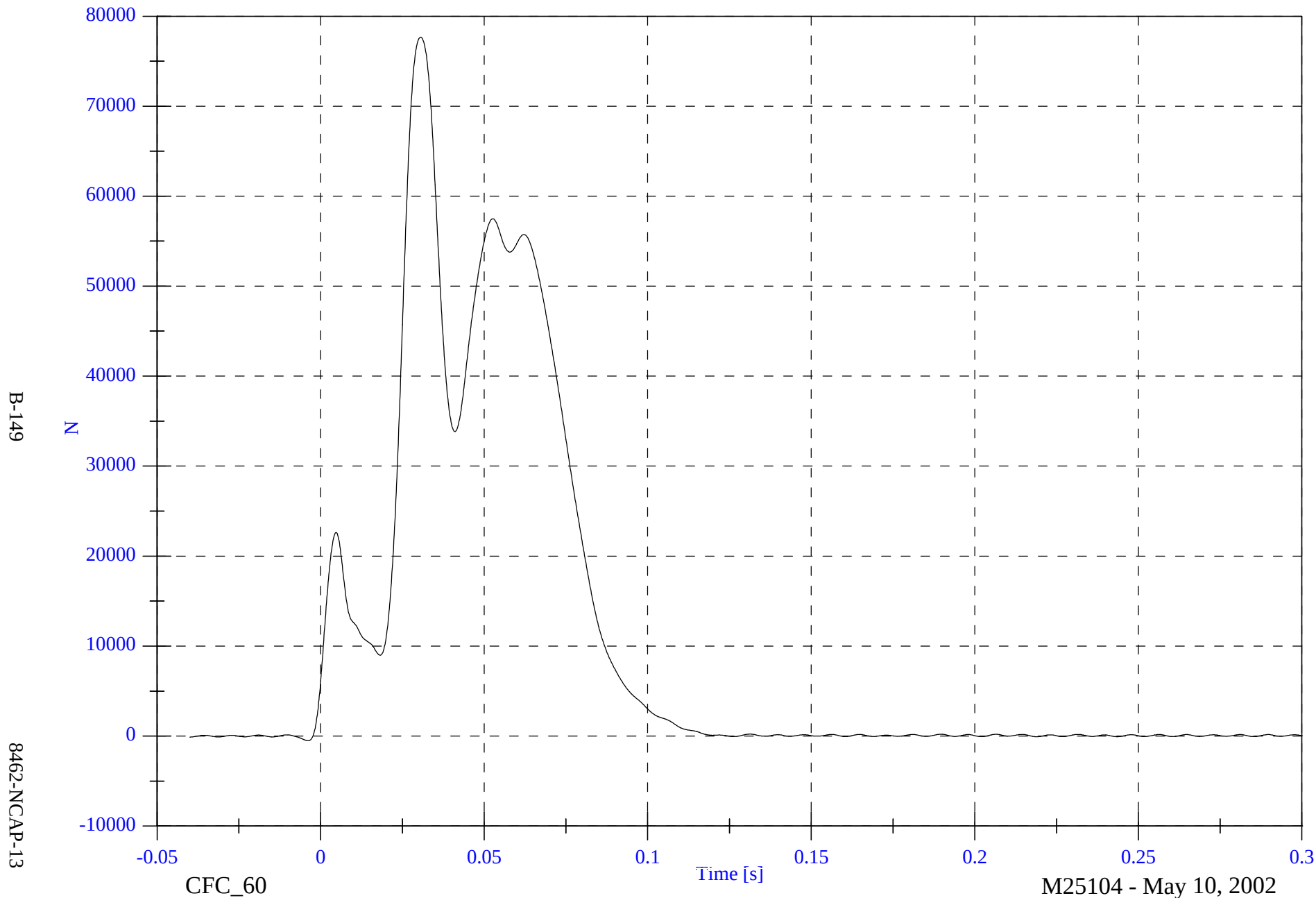


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B4 Fx

Max: 77666.9 [N] at 0.031 [s]

Min: -524.1 [N] at -0.004 [s]

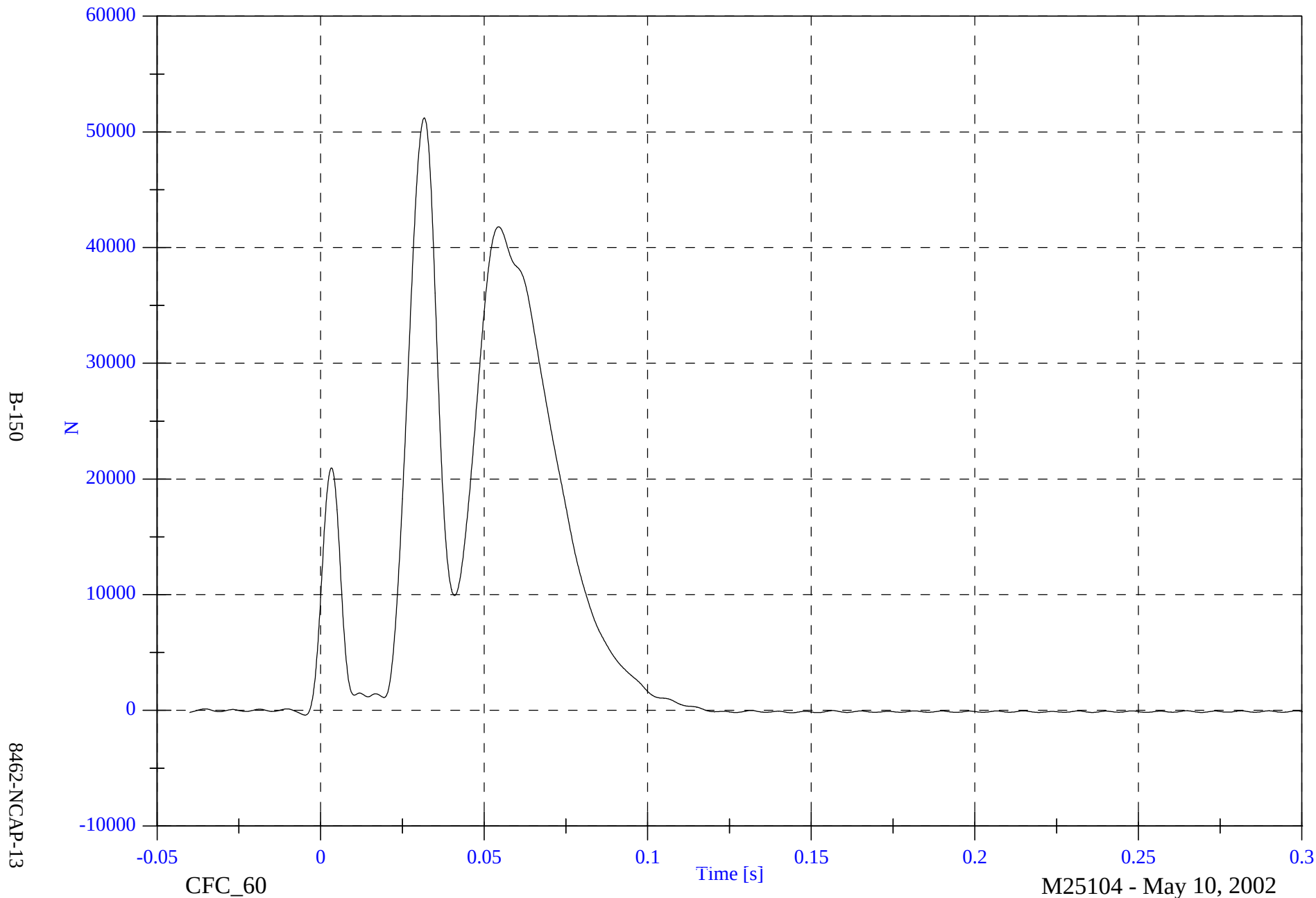


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B5 Fx

Max: 51207.9 [N] at 0.032 [s]

Min: -407.7 [N] at -0.005 [s]

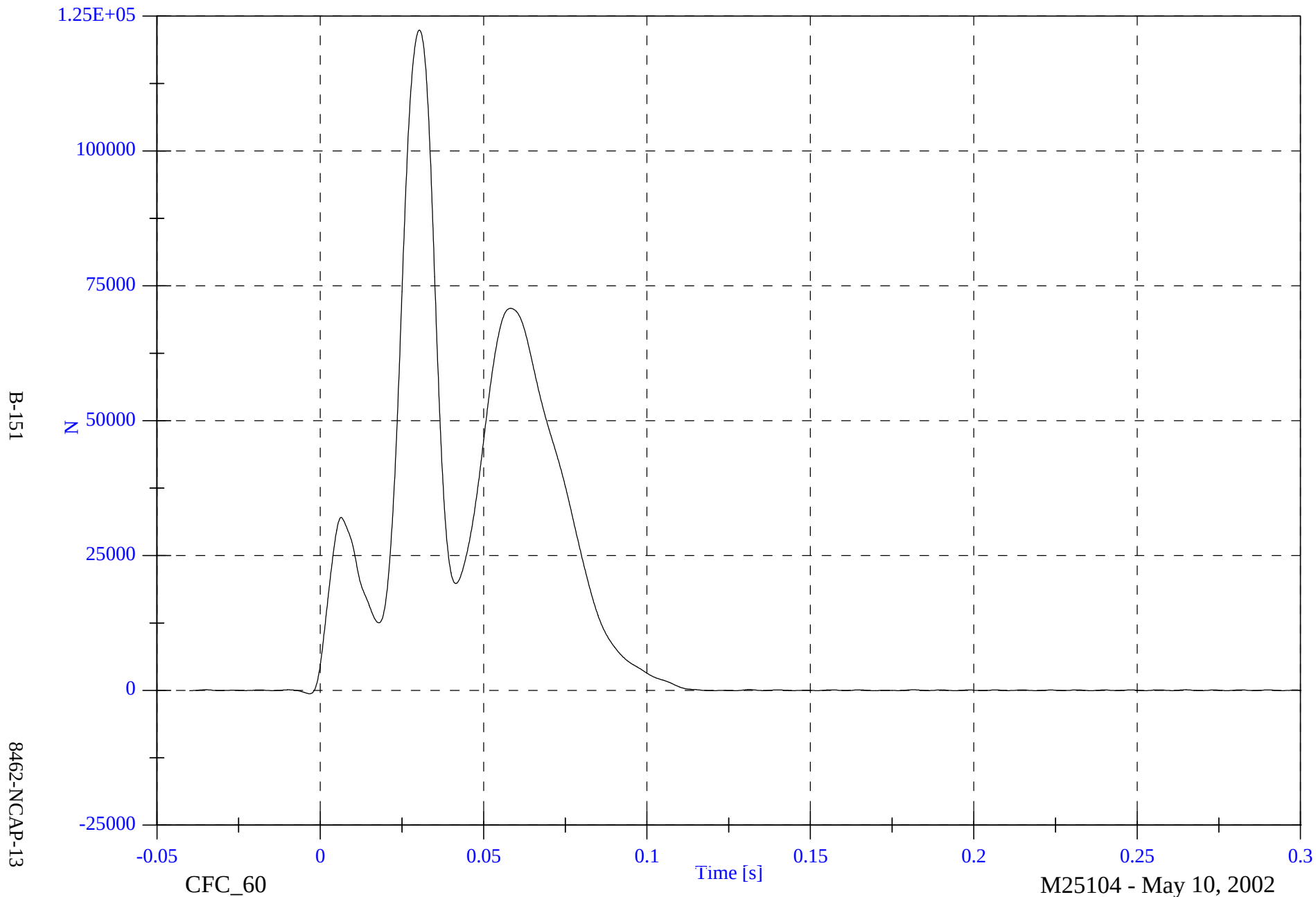


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B6 Fx

Max: 122425.2 [N] at 0.030 [s]

Min: -638.6 [N] at -0.003 [s]

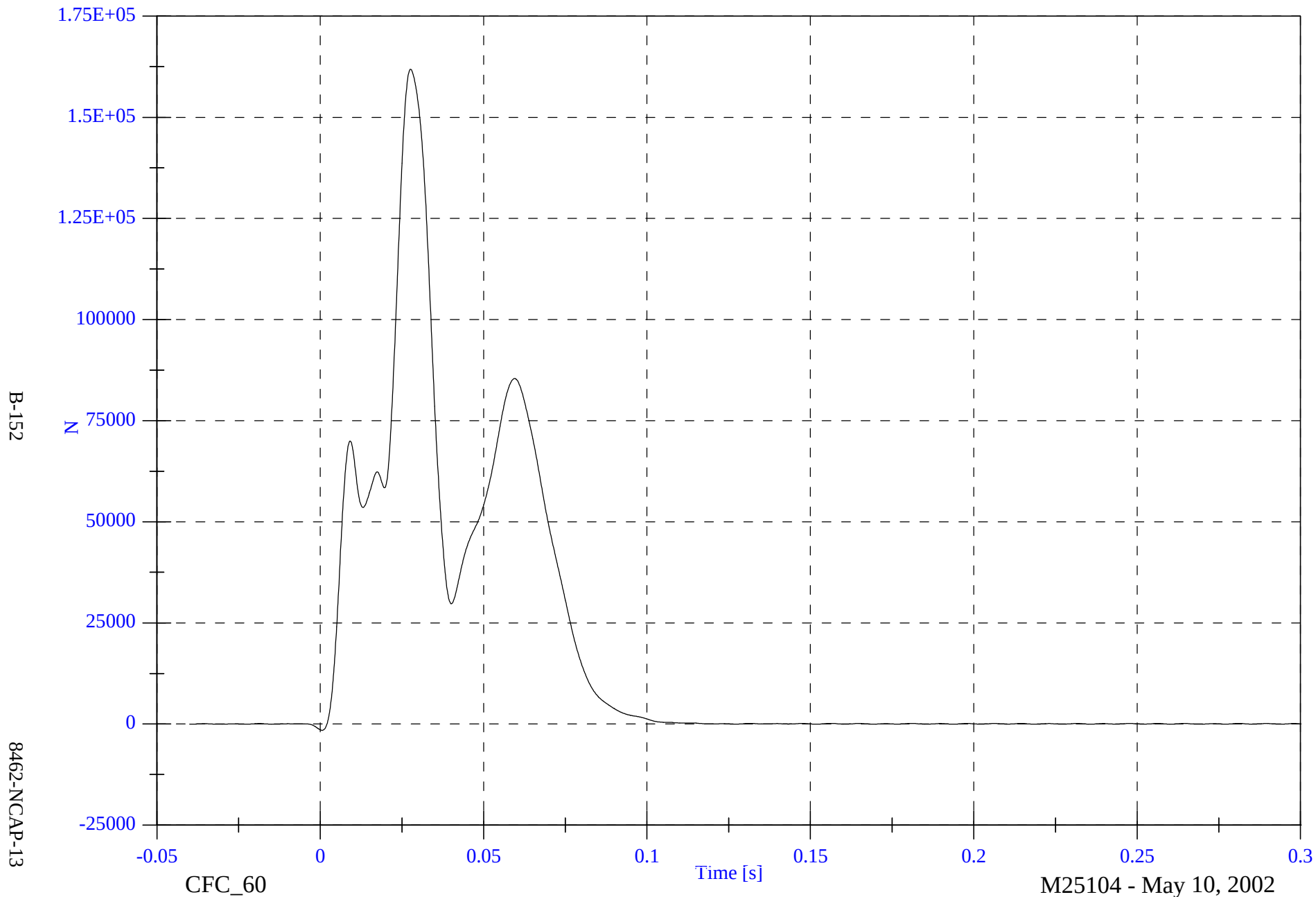


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B7 Fx

Max: 161880.9 [N] at 0.028 [s]

Min: -1555.7 [N] at 0.001 [s]

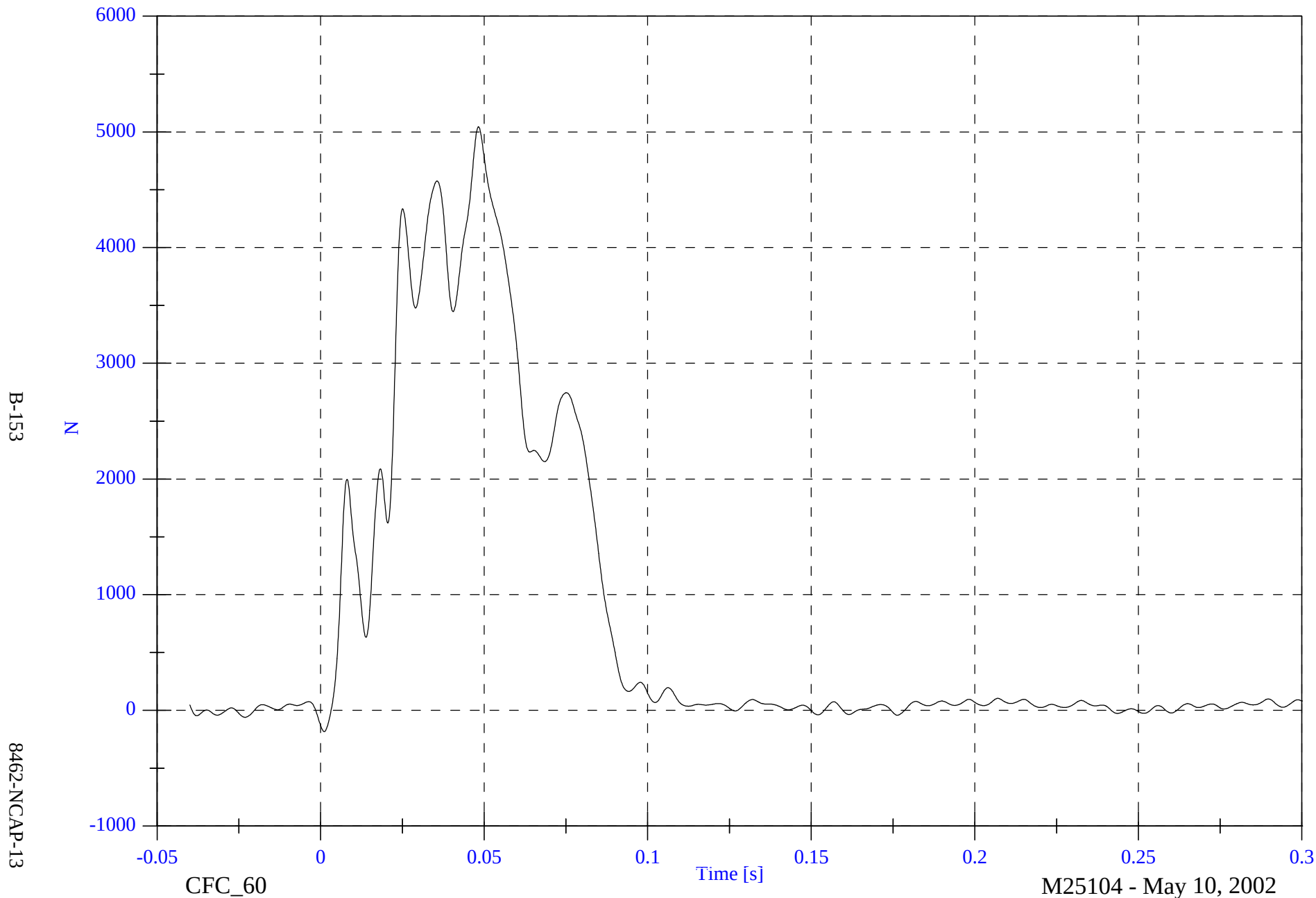


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B8 Fx

Max: 5044.5 [N] at 0.048 [s]

Min: -183.4 [N] at 0.001 [s]

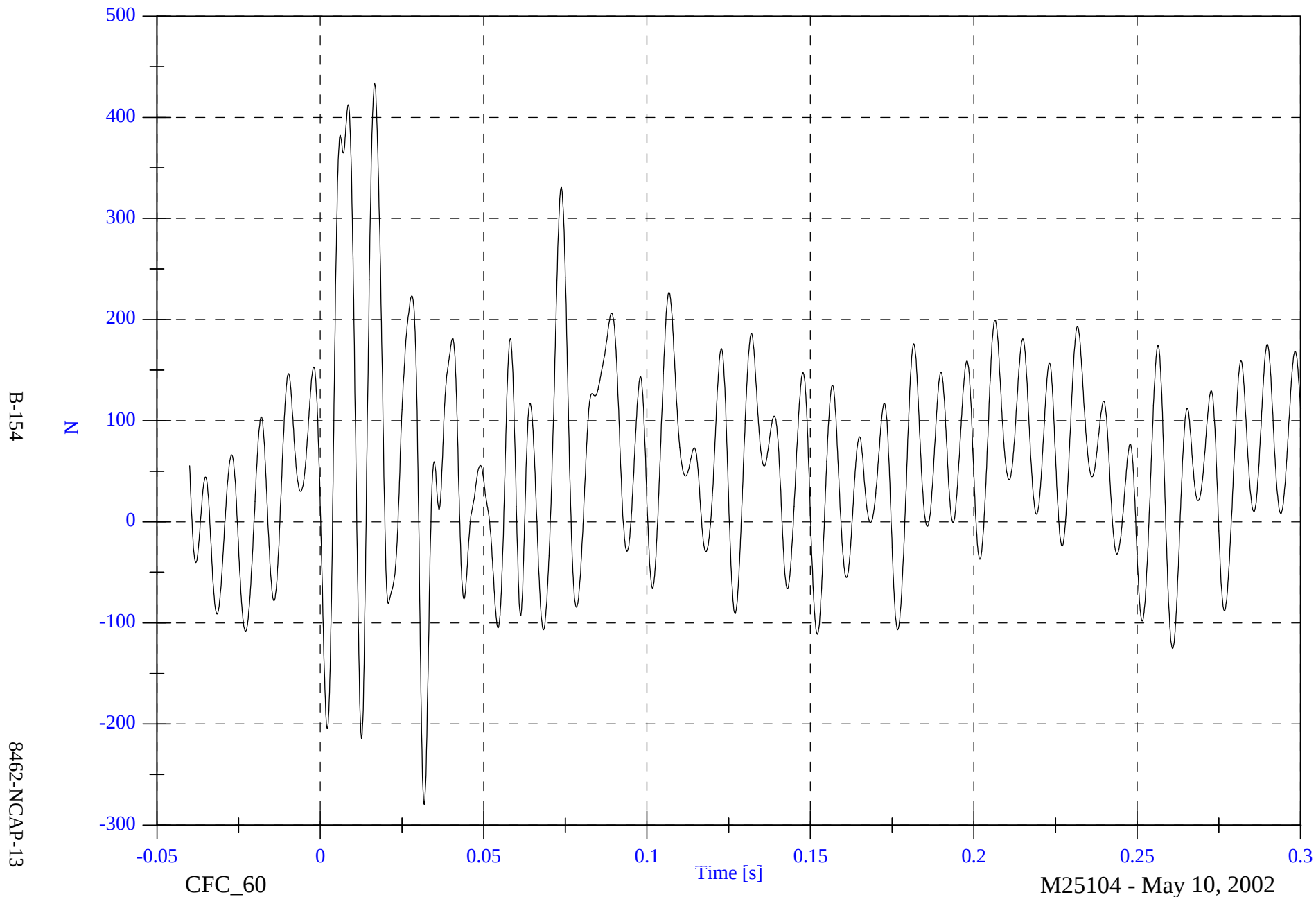


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell B9 Fx

Max: 433.4 [N] at 0.017 [s]

Min: -279.6 [N] at 0.032 [s]

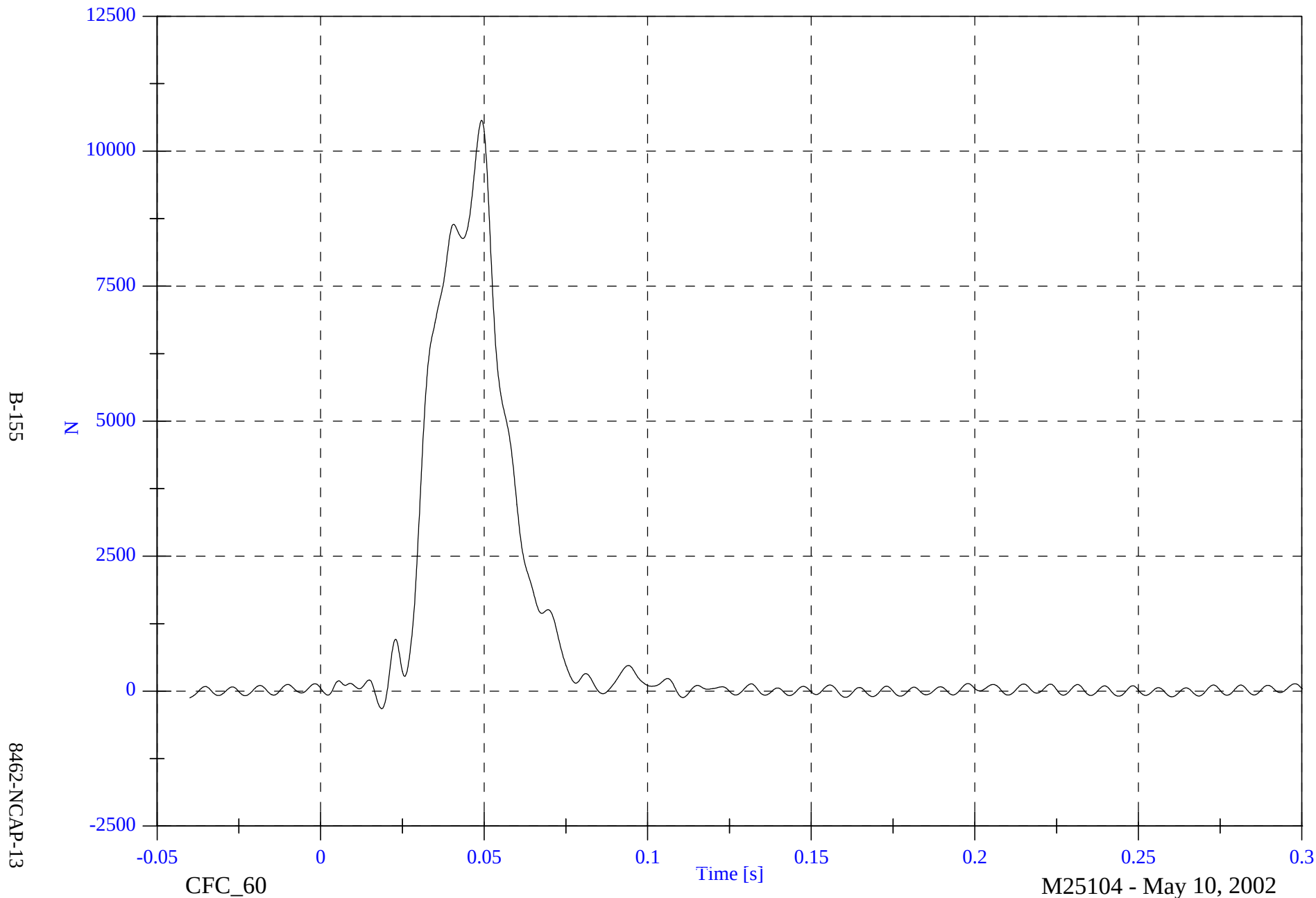


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C1 Fx

Max: 10571.2 [N] at 0.049 [s]

Min: -325.3 [N] at 0.019 [s]

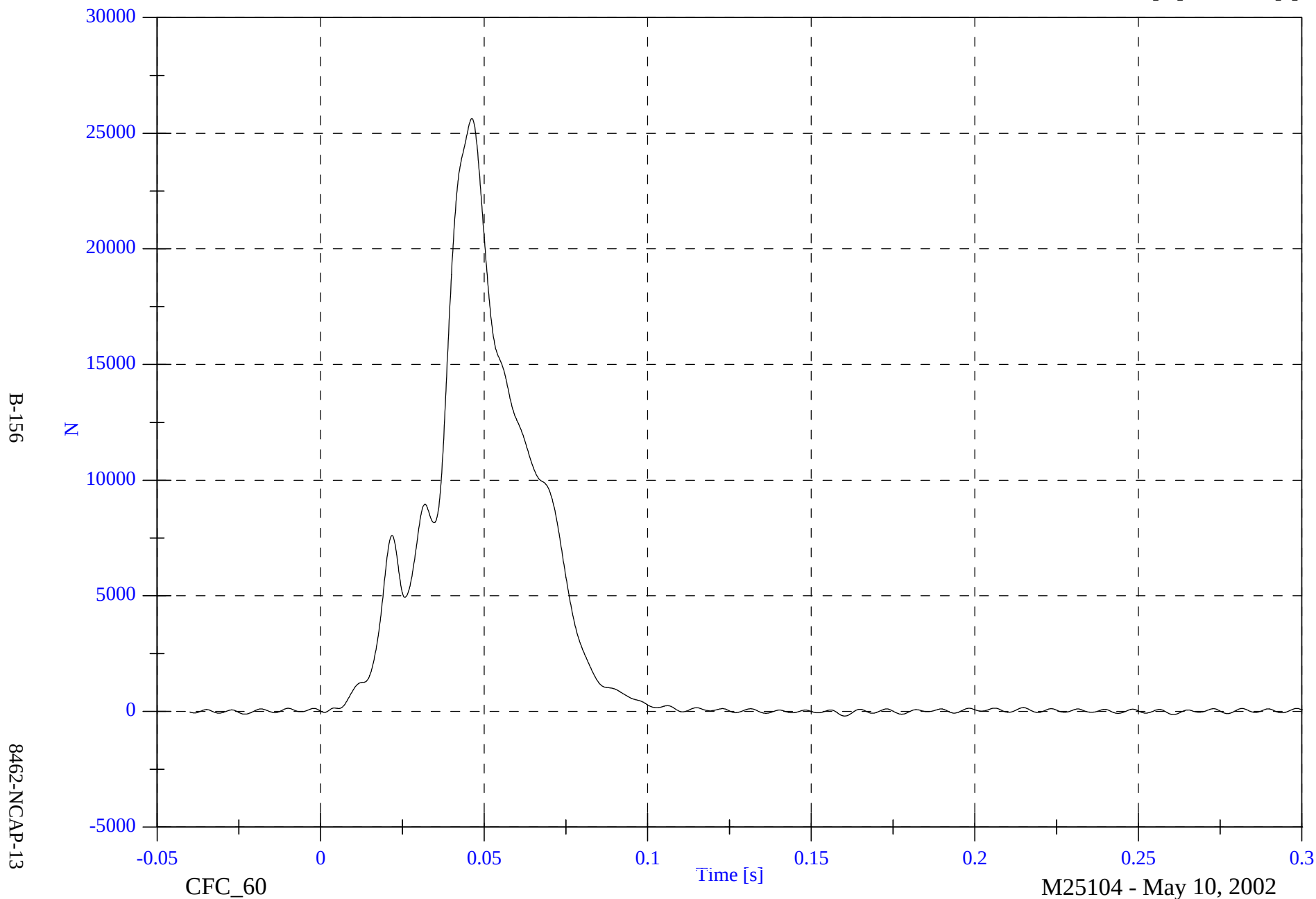


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C2 Fx

Max: 25637.1 [N] at 0.046 [s]

Min: -198.9 [N] at 0.160 [s]

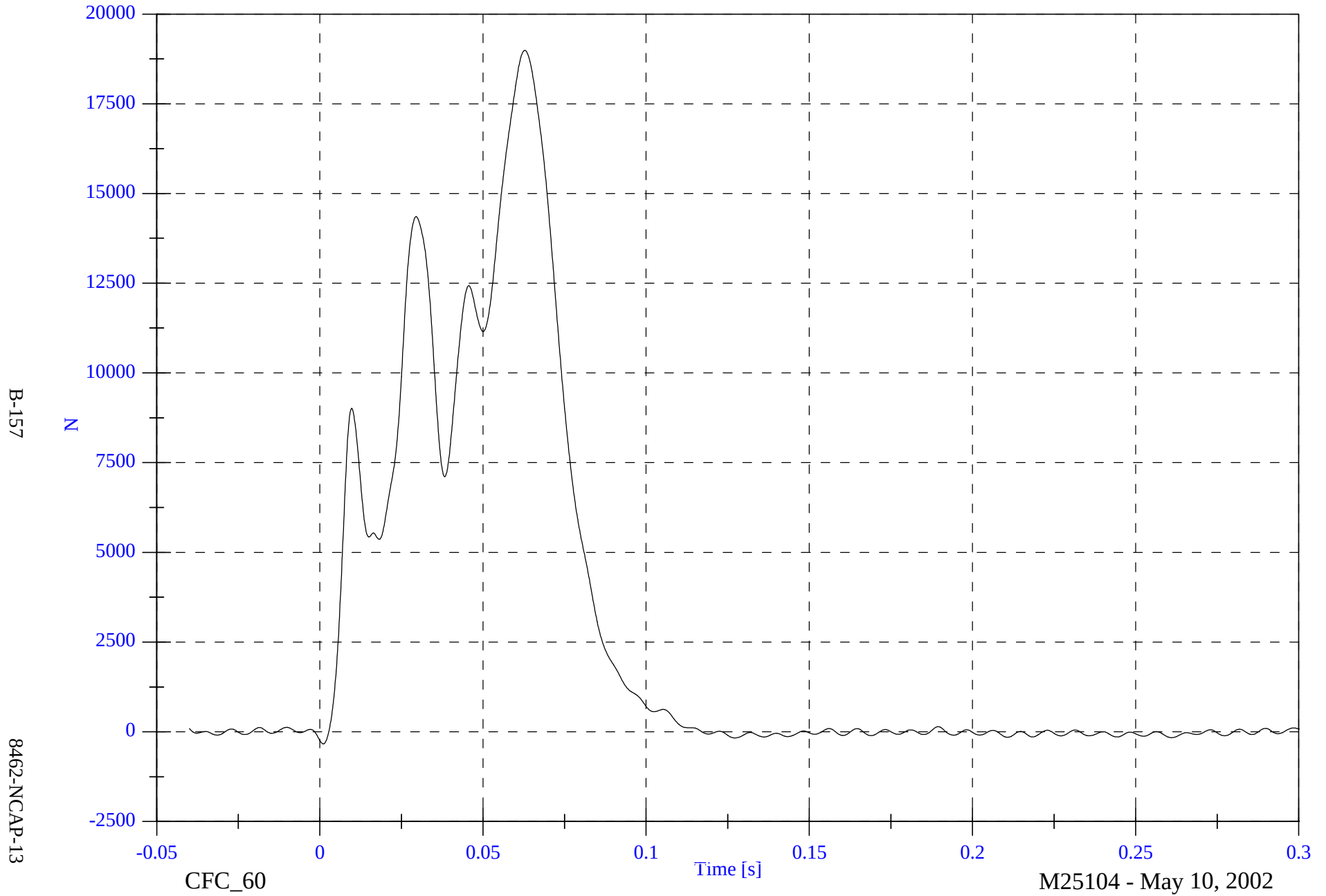


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C3 Fx

Max: 18990.2 [N] at 0.063 [s]

Min: -337.5 [N] at 0.001 [s]

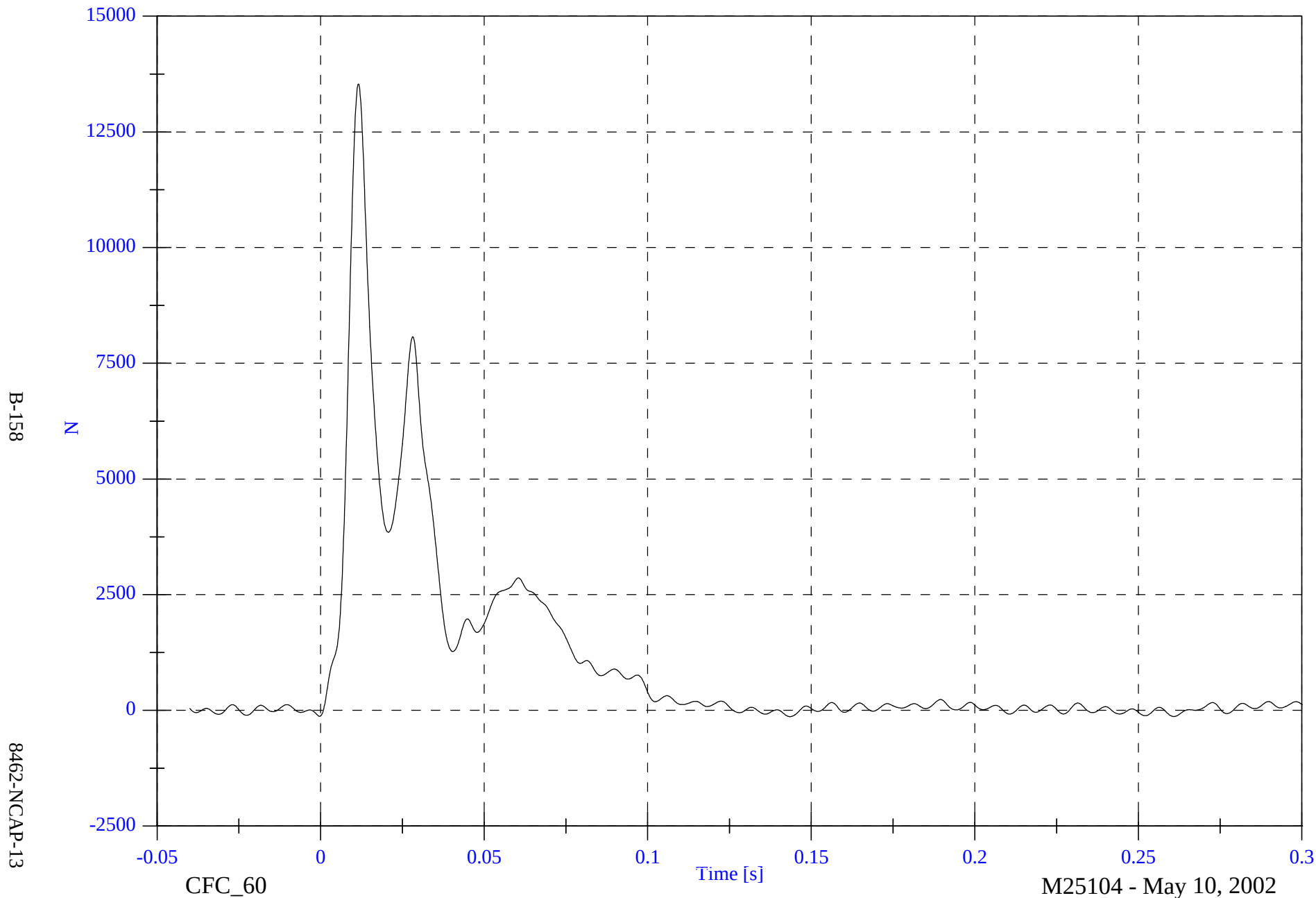


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C4 Fx

Max: 13537.4 [N] at 0.011 [s]

Min: -135.2 [N] at 0.143 [s]

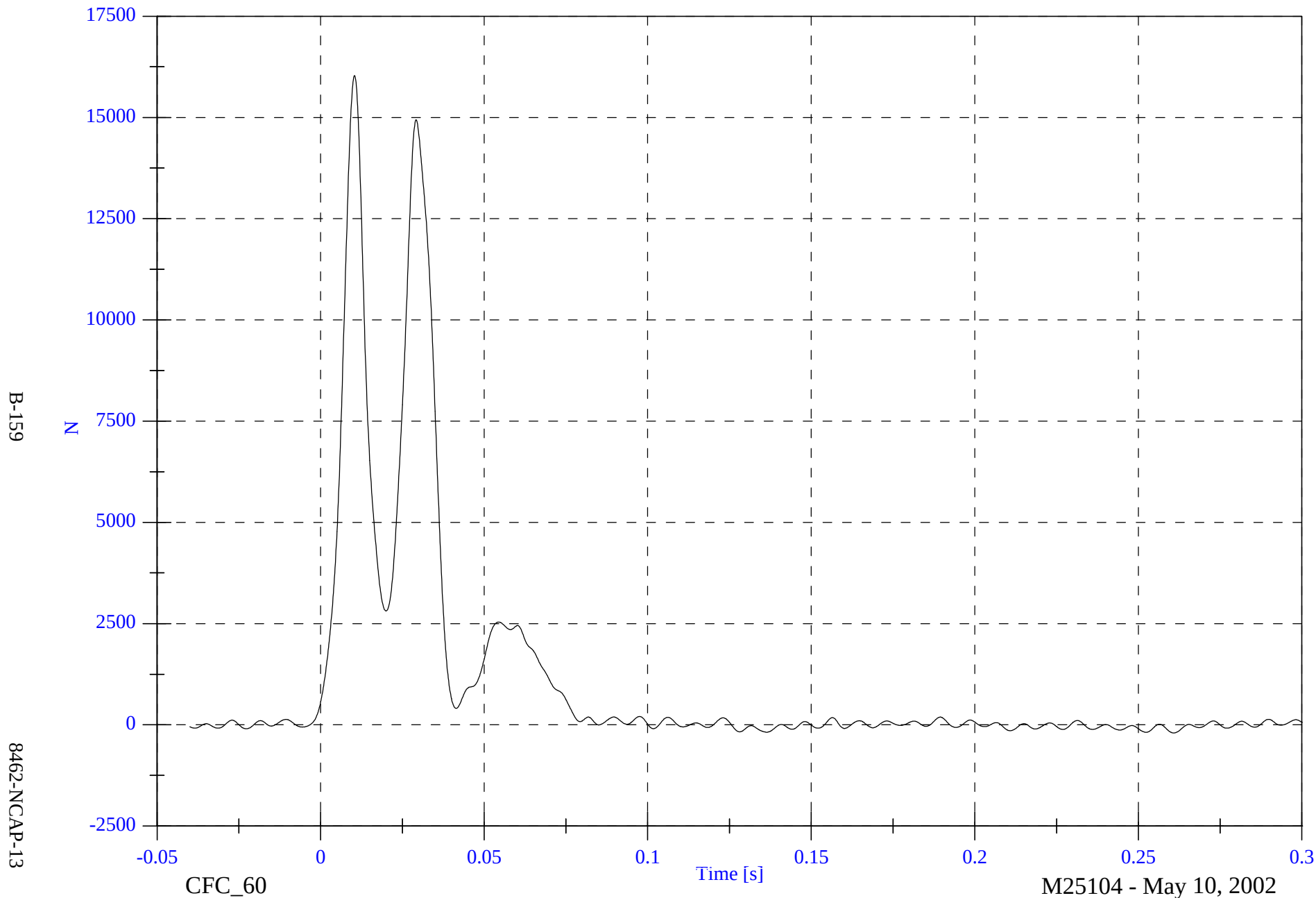


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C5 Fx

Max: 16036.2 [N] at 0.010 [s]

Min: -200.6 [N] at 0.261 [s]

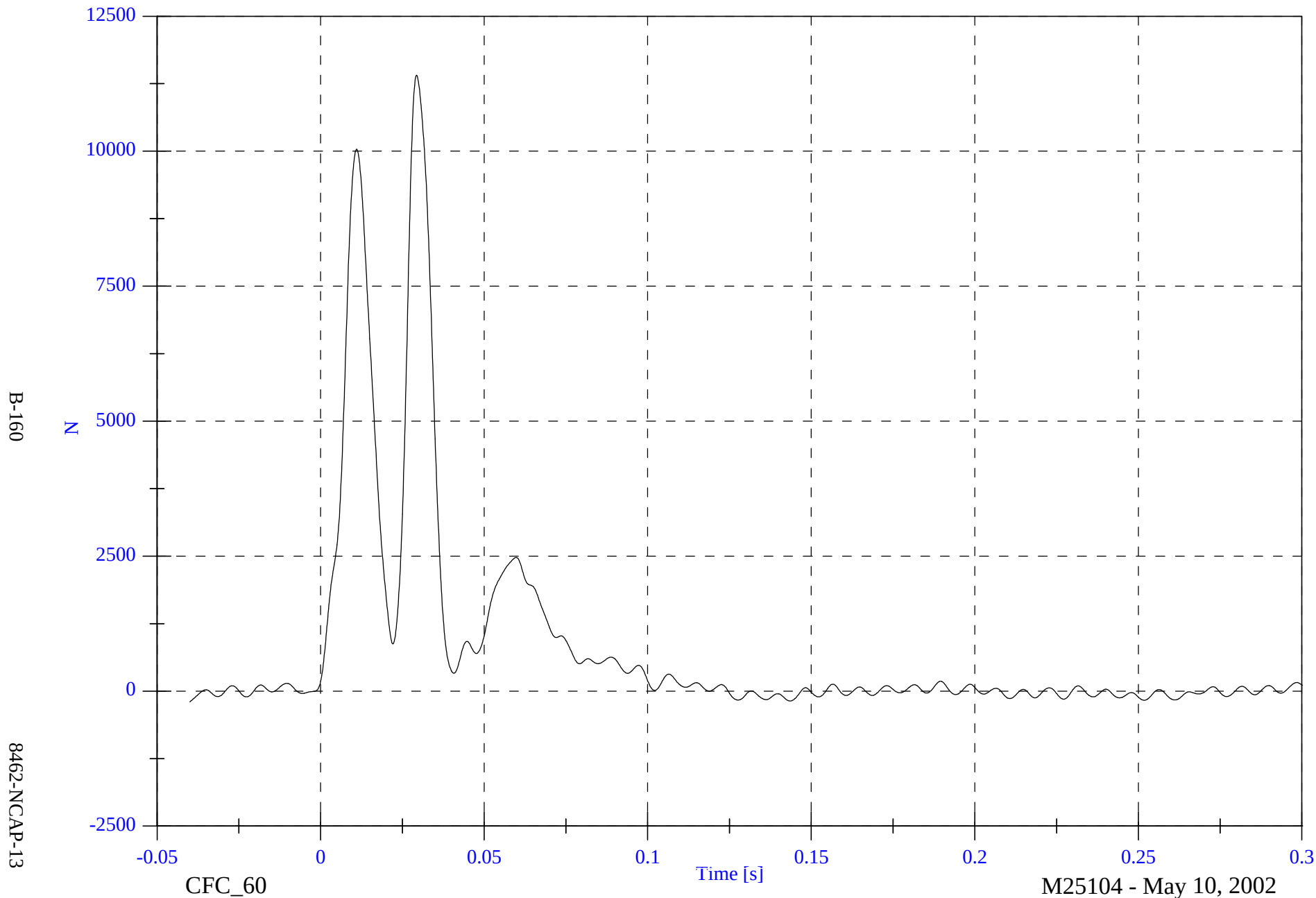


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C6 Fx

Max: 11407.7 [N] at 0.029 [s]

Min: -200.0 [N] at -0.040 [s]

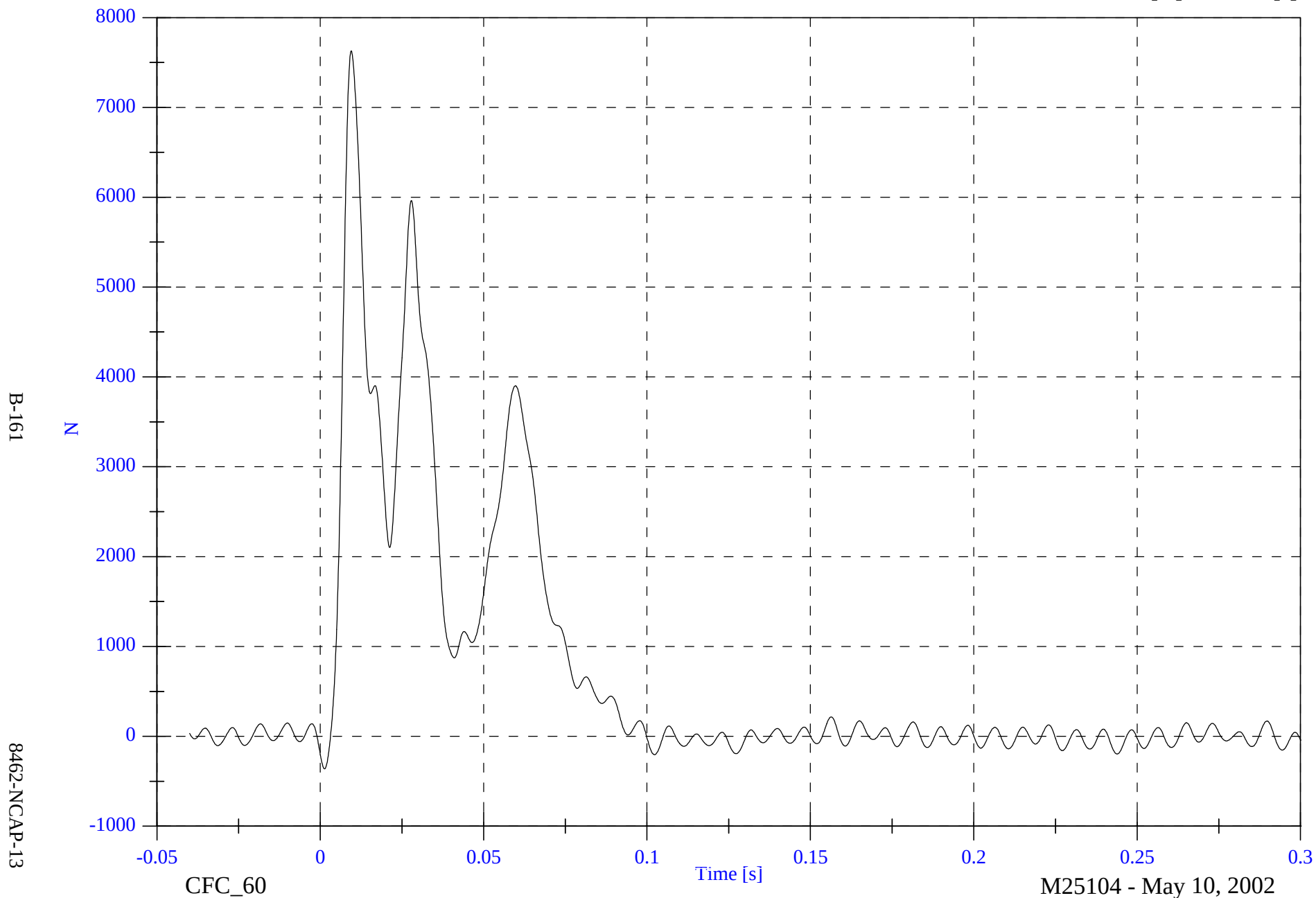


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C7 Fx

Max: 7628.2 [N] at 0.009 [s]

Min: -362.4 [N] at 0.001 [s]

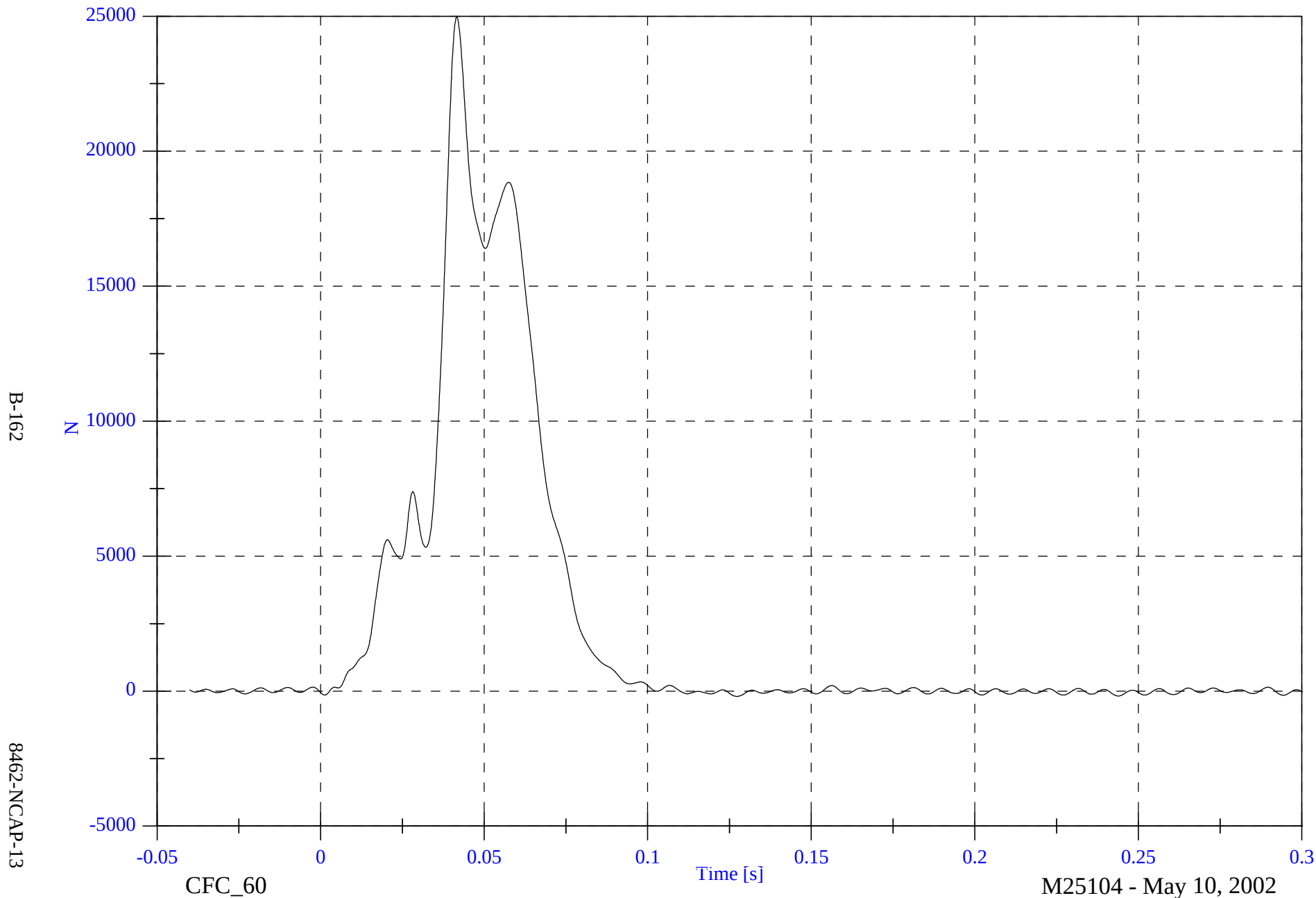


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell C8 Fx

Max: 24970.1 [N] at 0.042 [s]

Min: -196.9 [N] at 0.127 [s]



NCAP Test 13 - 2002 Toyota Camry

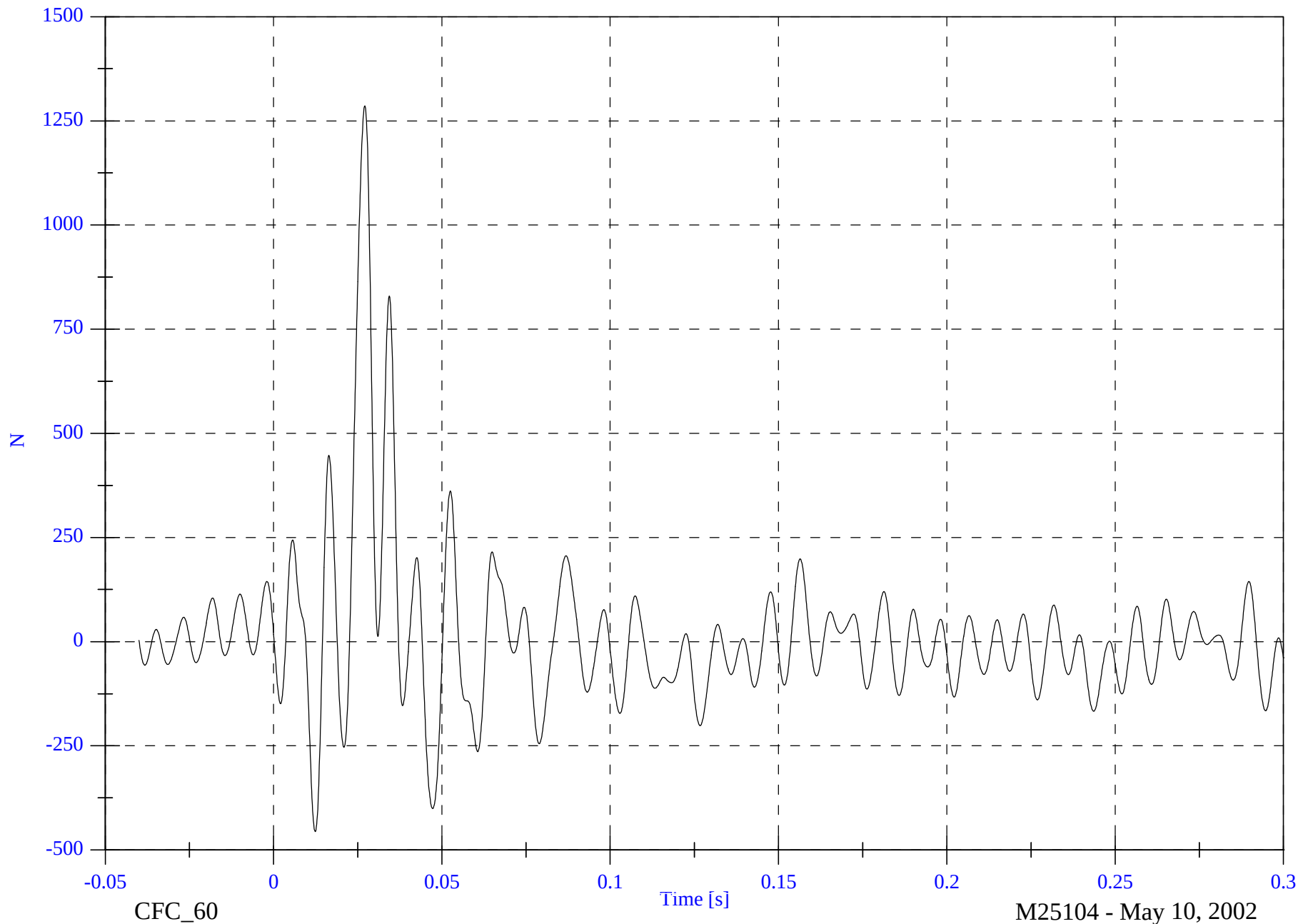
Barrier Load Cell C9 Fx

Max: 1285.6 [N] at 0.027 [s]

Min: -455.7 [N] at 0.012 [s]

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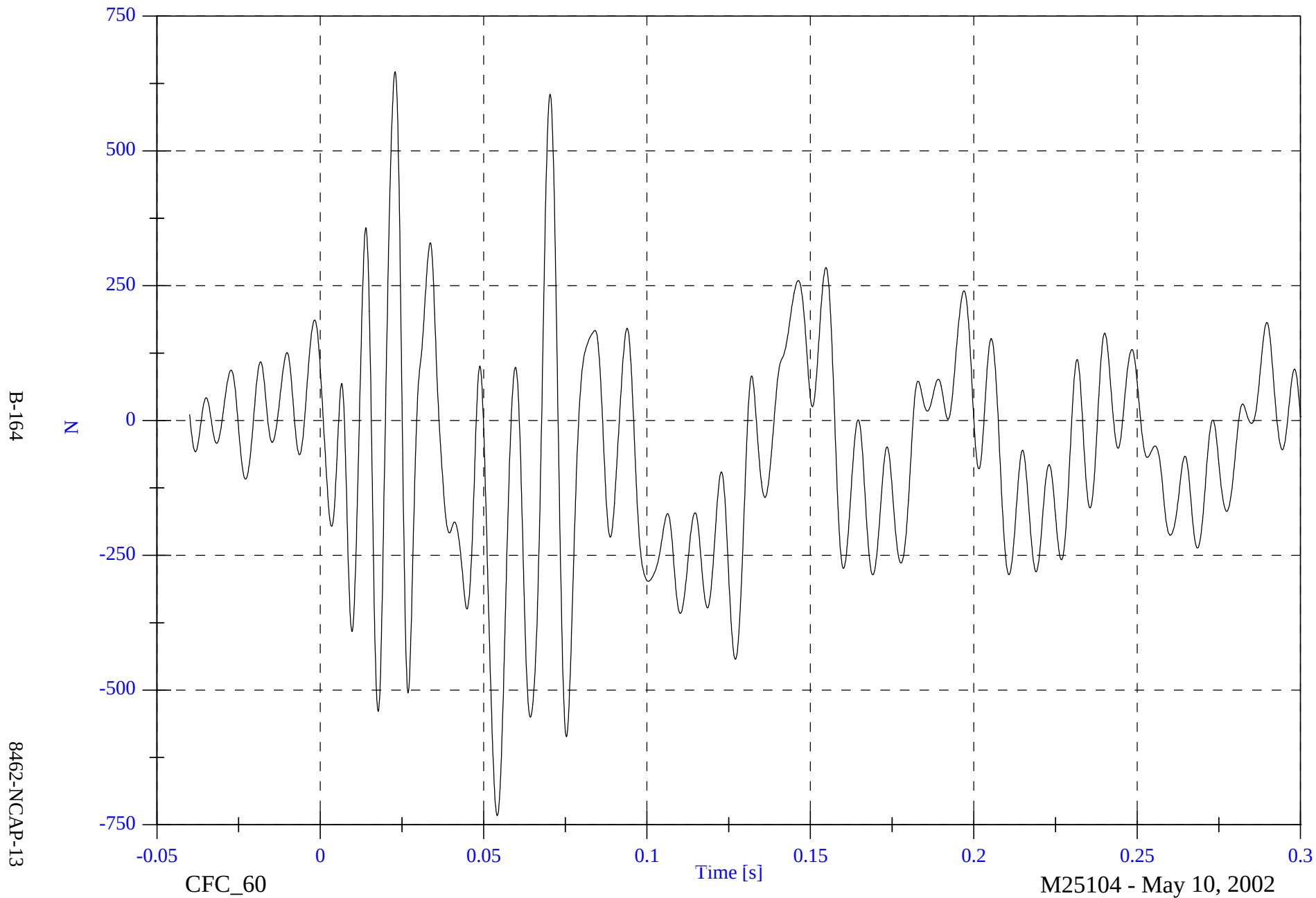


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D1 Fx

Max: 647.2 [N] at 0.023 [s]

Min: -733.3 [N] at 0.054 [s]

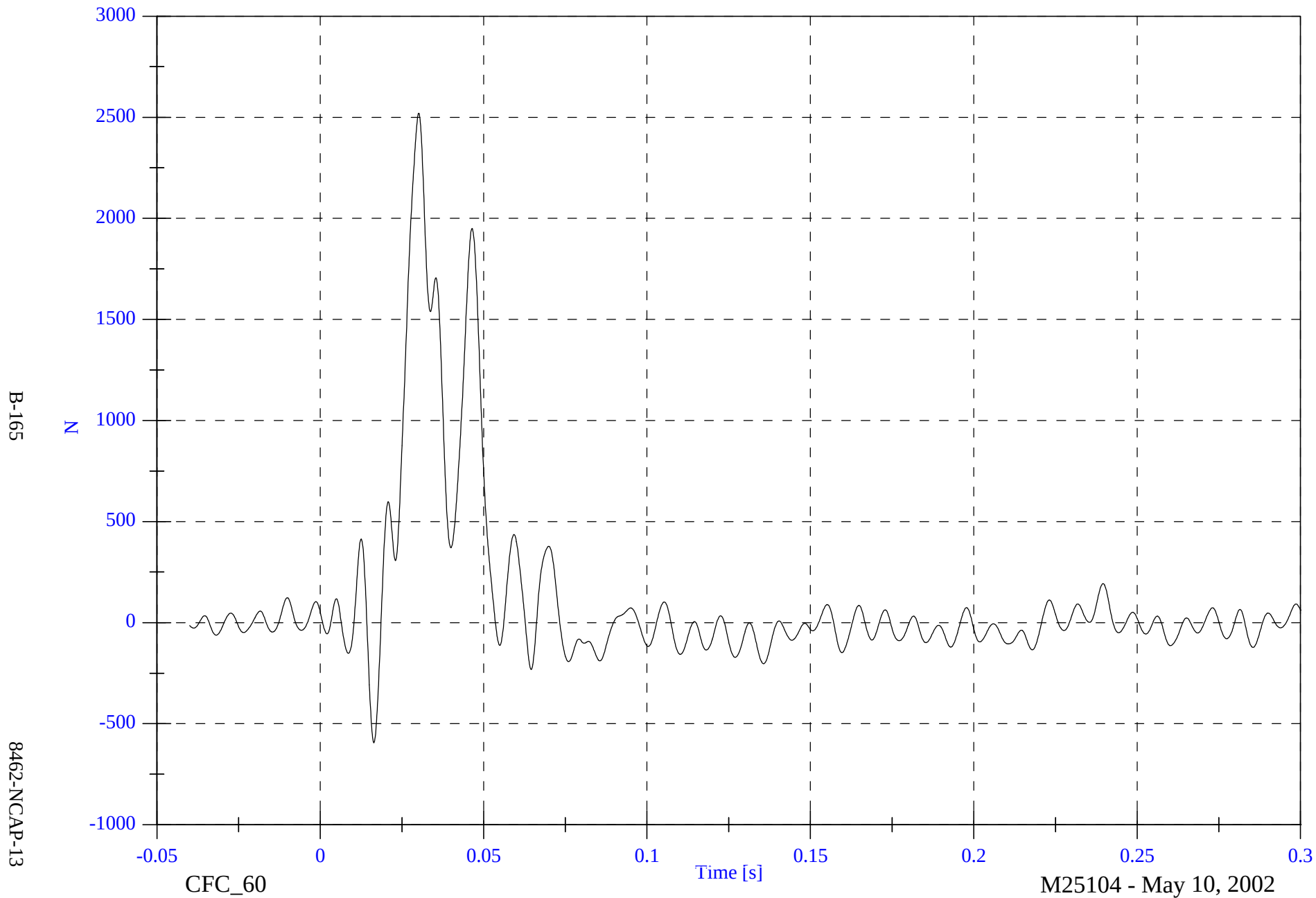


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D2 Fx

Max: 2520.2 [N] at 0.030 [s]

Min: -594.6 [N] at 0.016 [s]

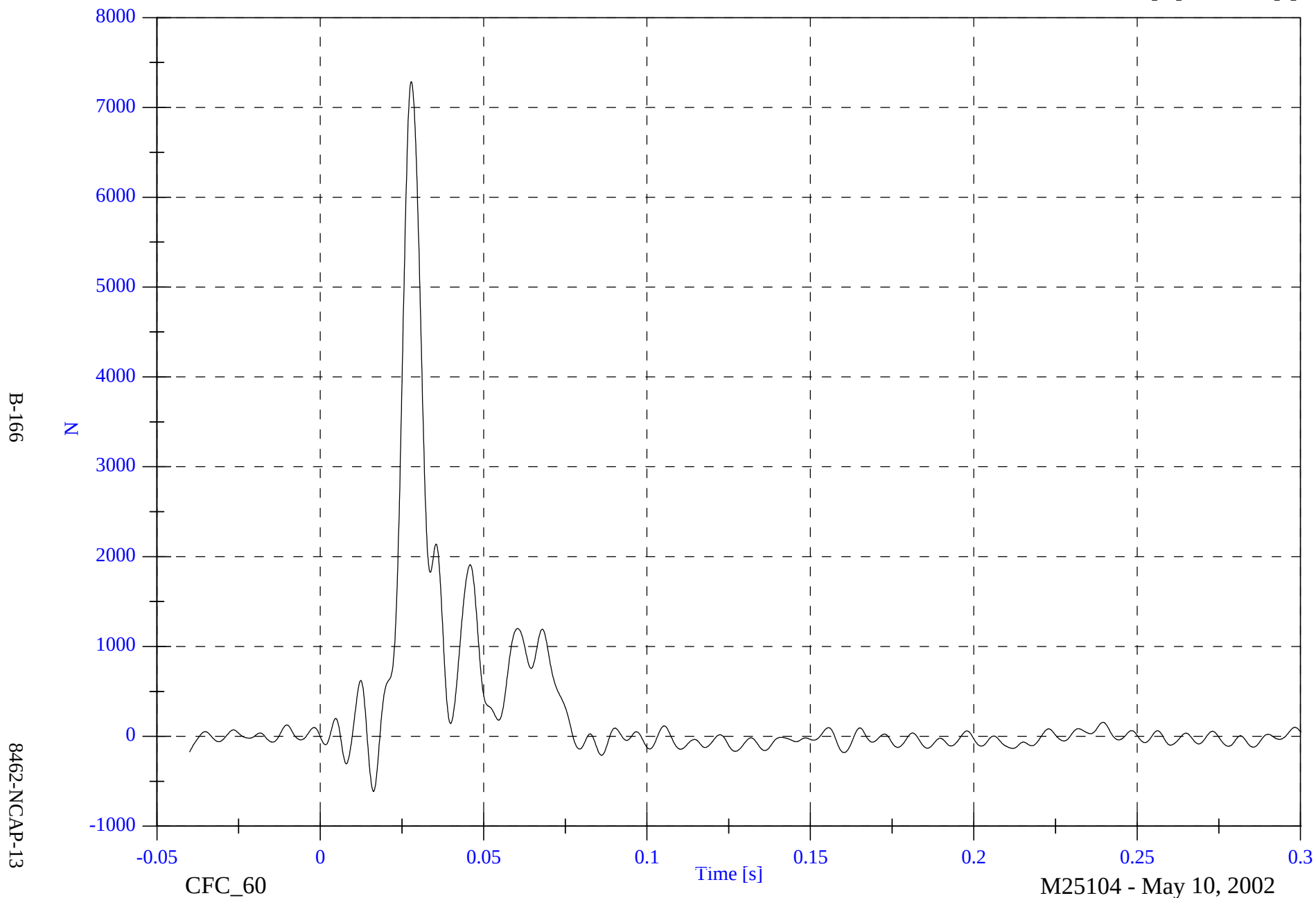


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D3 Fx

Max: 7287.1 [N] at 0.028 [s]

Min: -614.5 [N] at 0.016 [s]

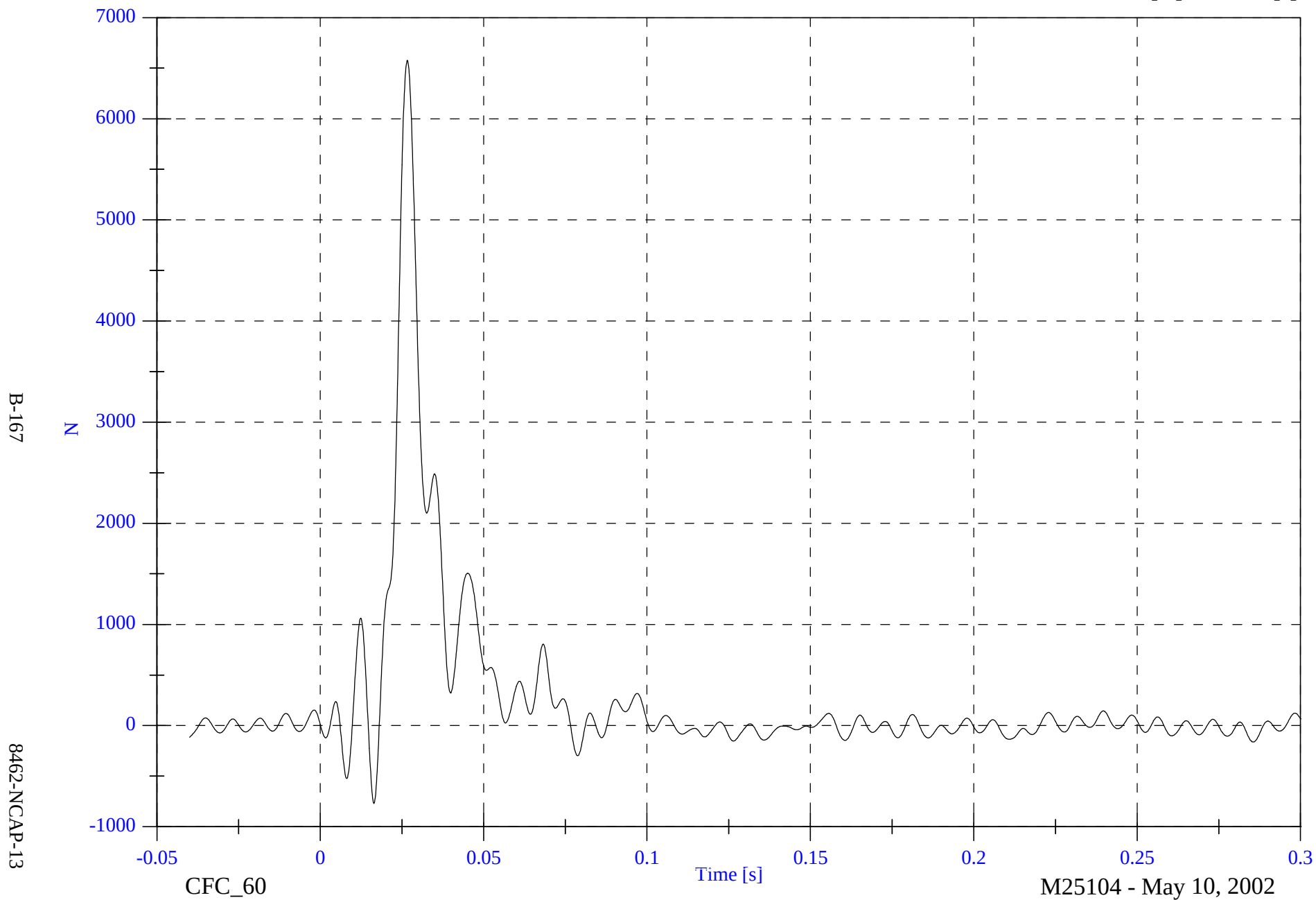


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D4 Fx

Max: 6577.6 [N] at 0.027 [s]

Min: -770.6 [N] at 0.016 [s]

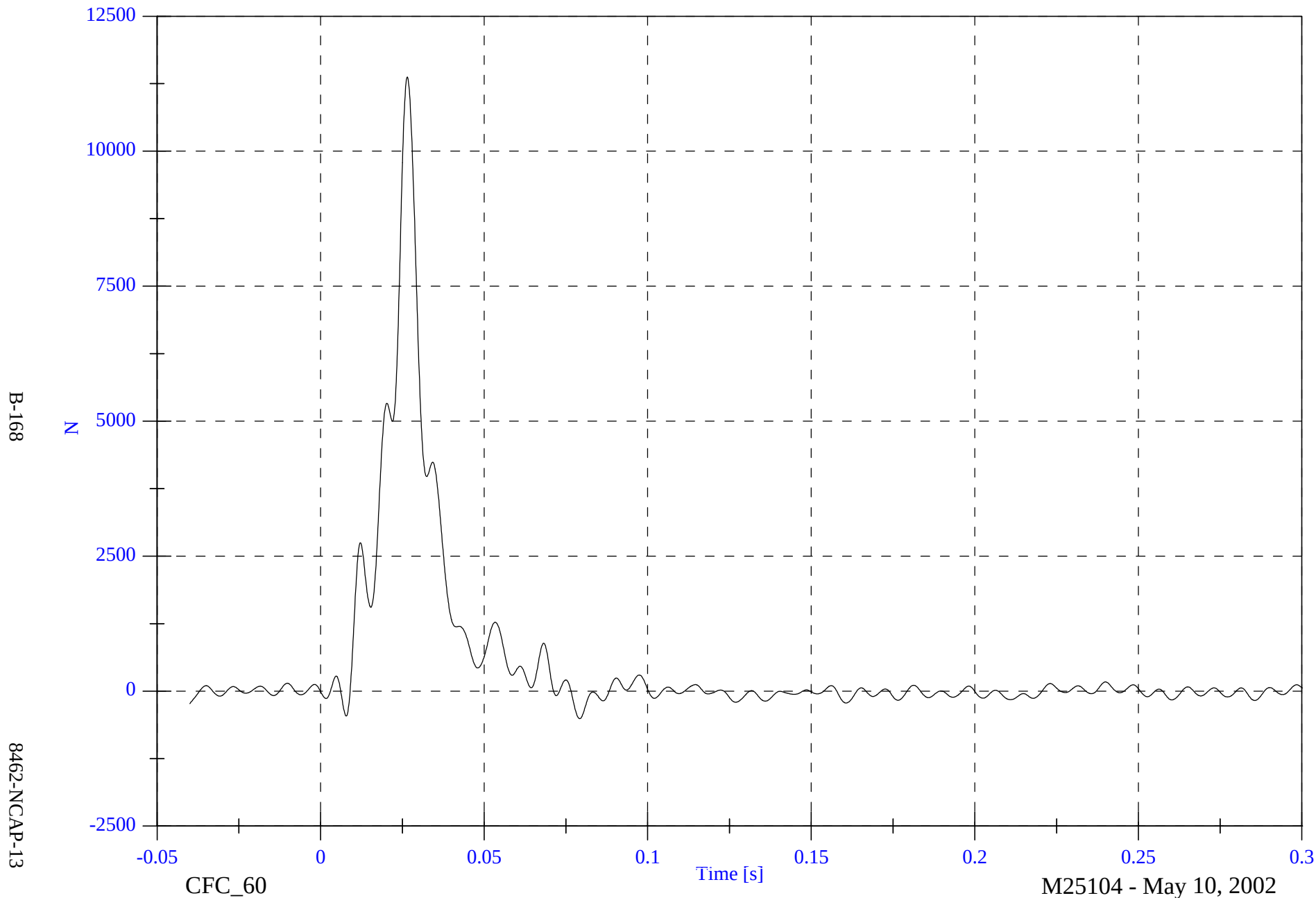


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D5 Fx

Max: 11375.0 [N] at 0.026 [s]

Min: -511.8 [N] at 0.079 [s]

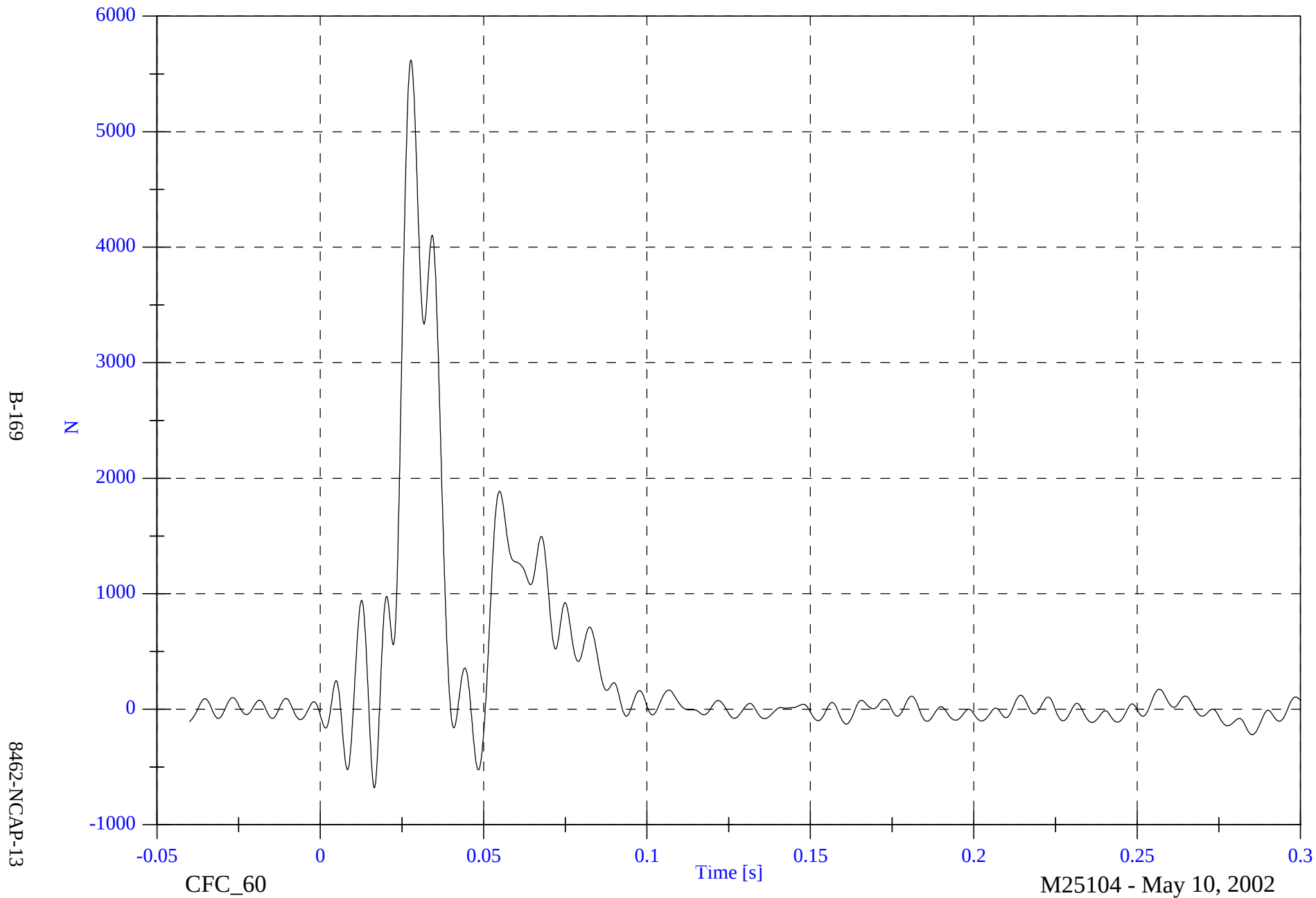


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D6 Fx

Max: 5620.2 [N] at 0.028 [s]

Min: -681.1 [N] at 0.016 [s]

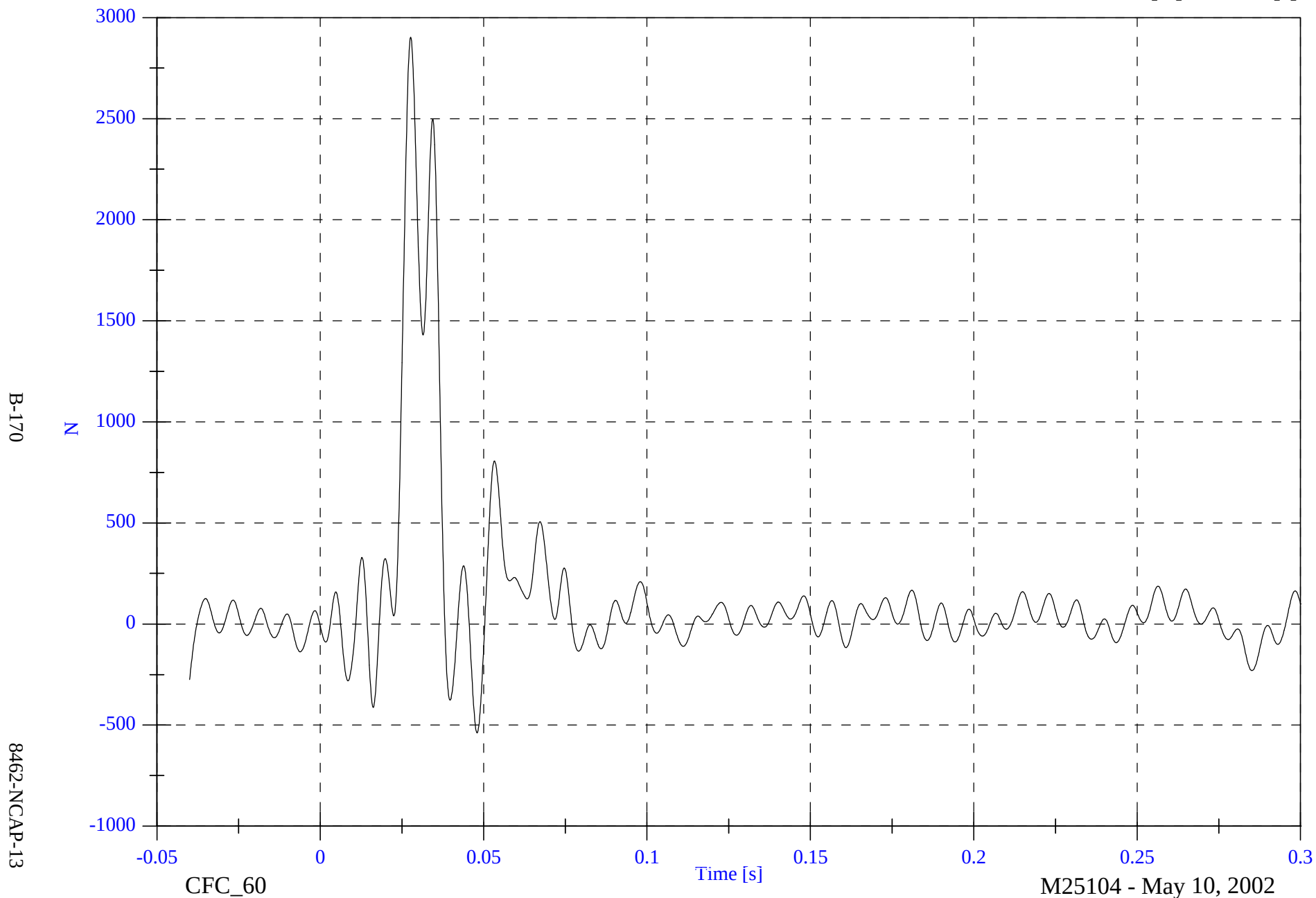


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D7 Fx

Max: 2902.4 [N] at 0.028 [s]

Min: -538.8 [N] at 0.048 [s]

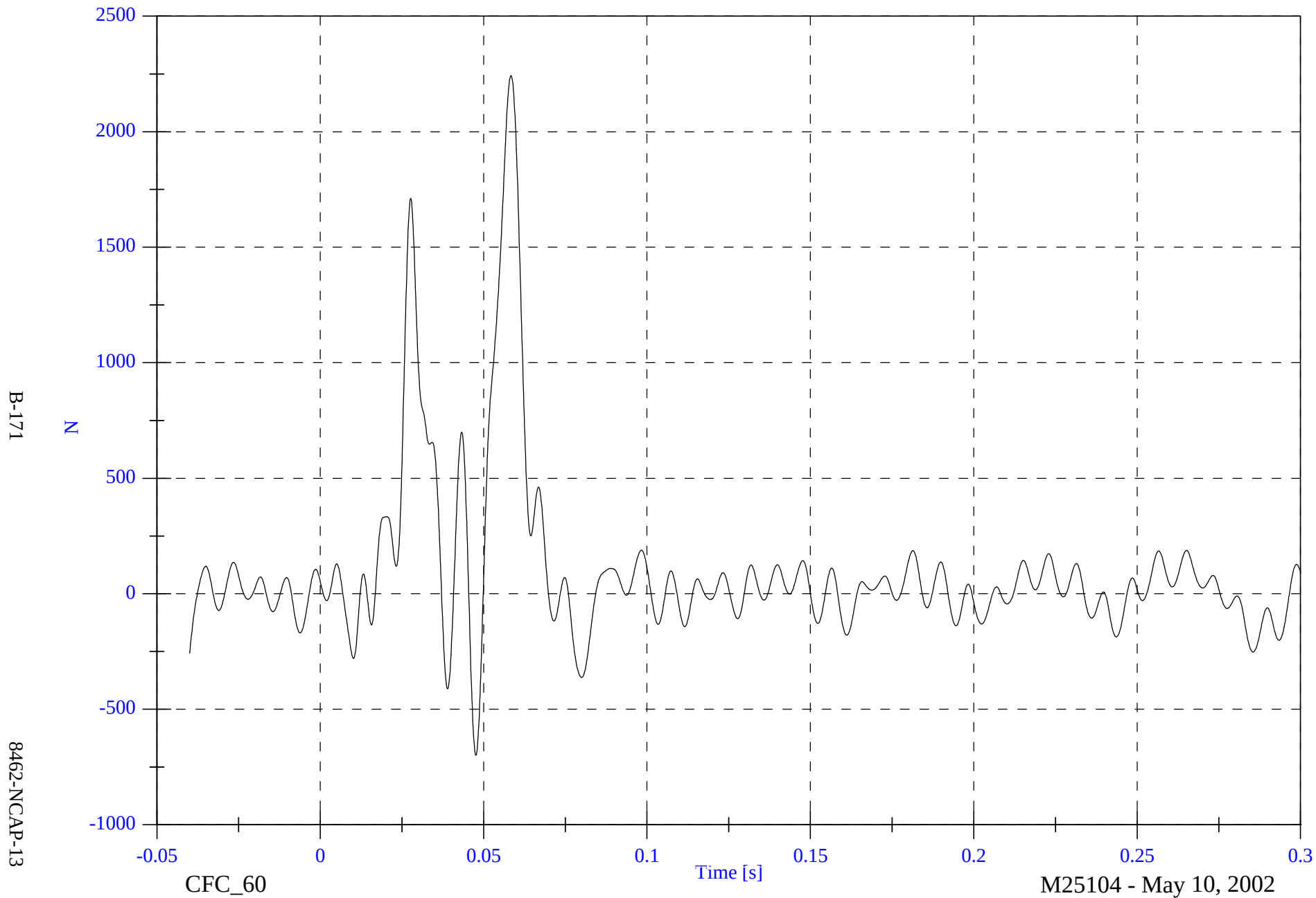


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D8 Fx

Max: 2242.9 [N] at 0.058 [s]

Min: -699.4 [N] at 0.048 [s]

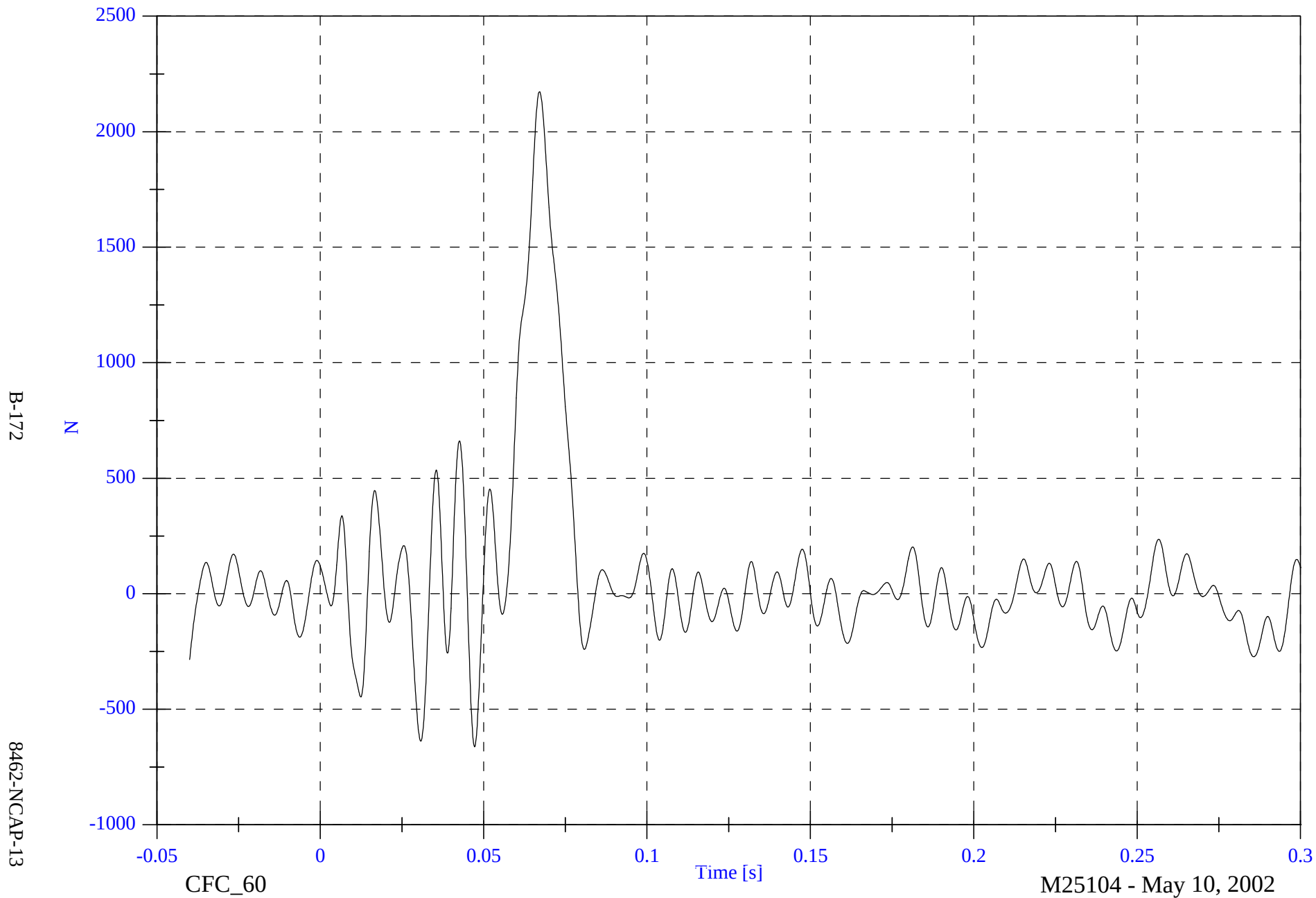


NCAP Test 13 - 2002 Toyota Camry

Barrier Load Cell D9 Fx

Max: 2173.4 [N] at 0.067 [s]

Min: -662.6 [N] at 0.047 [s]

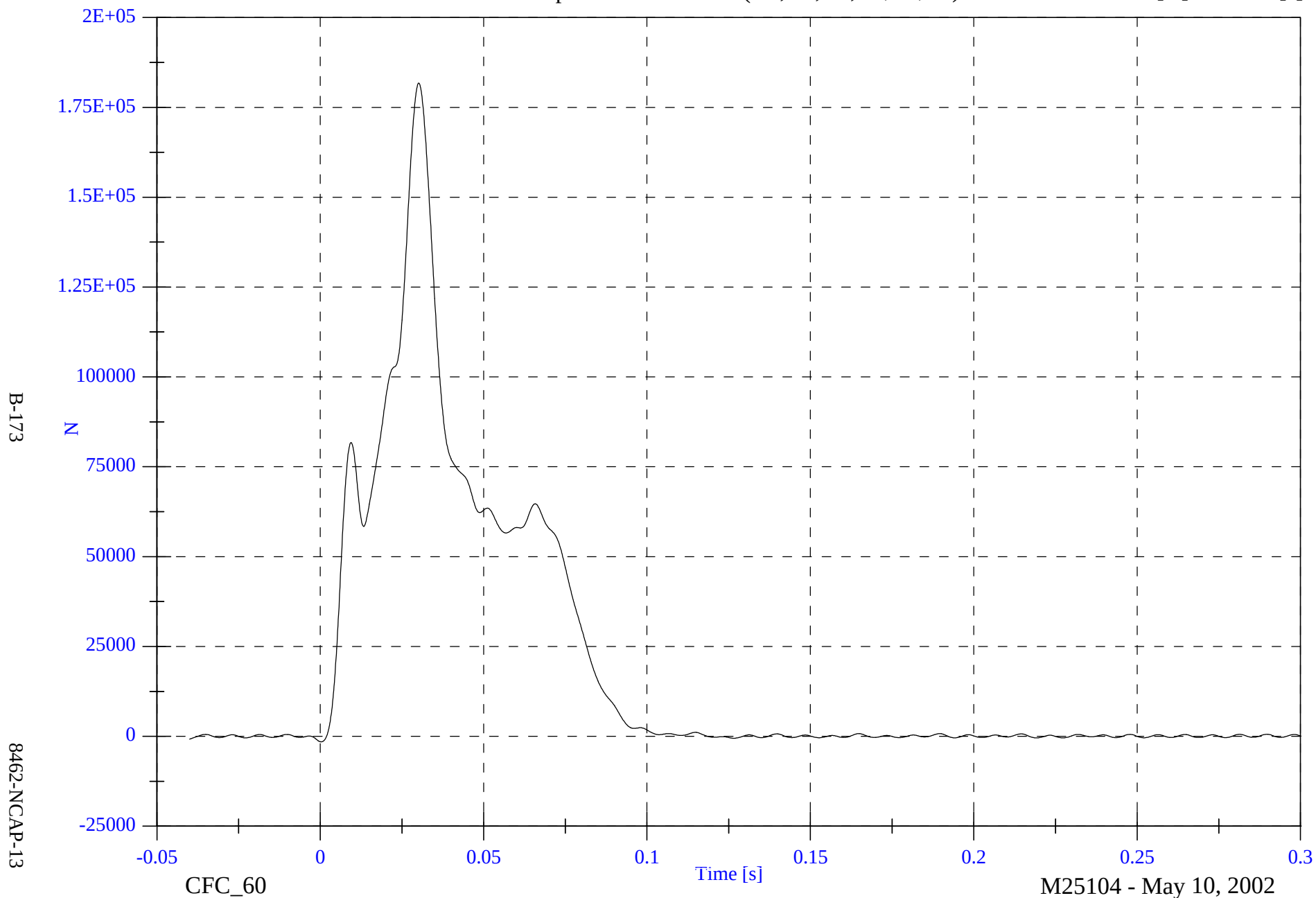


NCAP Test 13 - 2002 Toyota Camry

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

Max: 181766.0 [N] at 0.030 [s]

Min: -1540.4 [N] at 0.000 [s]

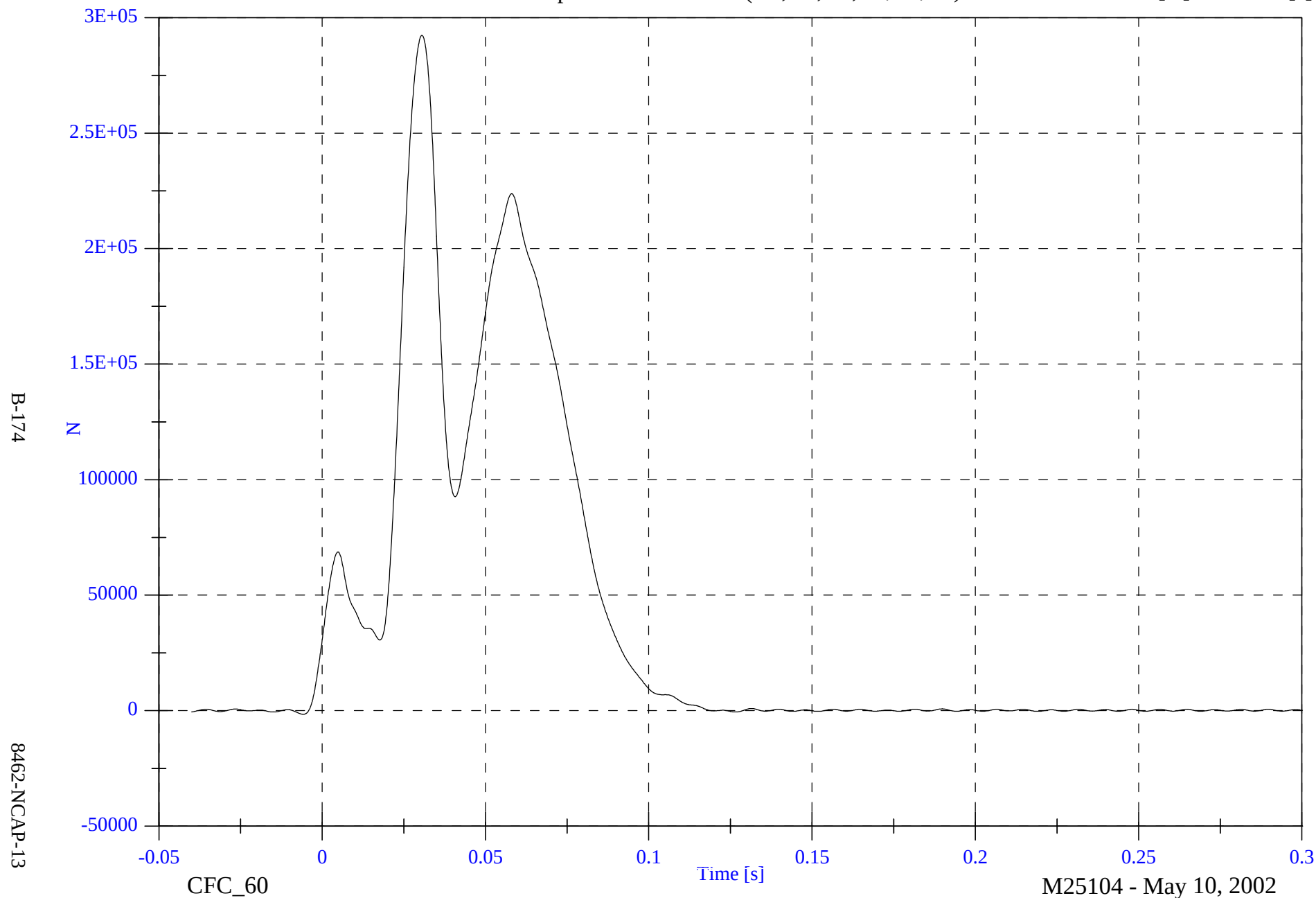


NCAP Test 13 - 2002 Toyota Camry

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

Max: 292341.9 [N] at 0.030 [s]

Min: -1581.4 [N] at -0.006 [s]

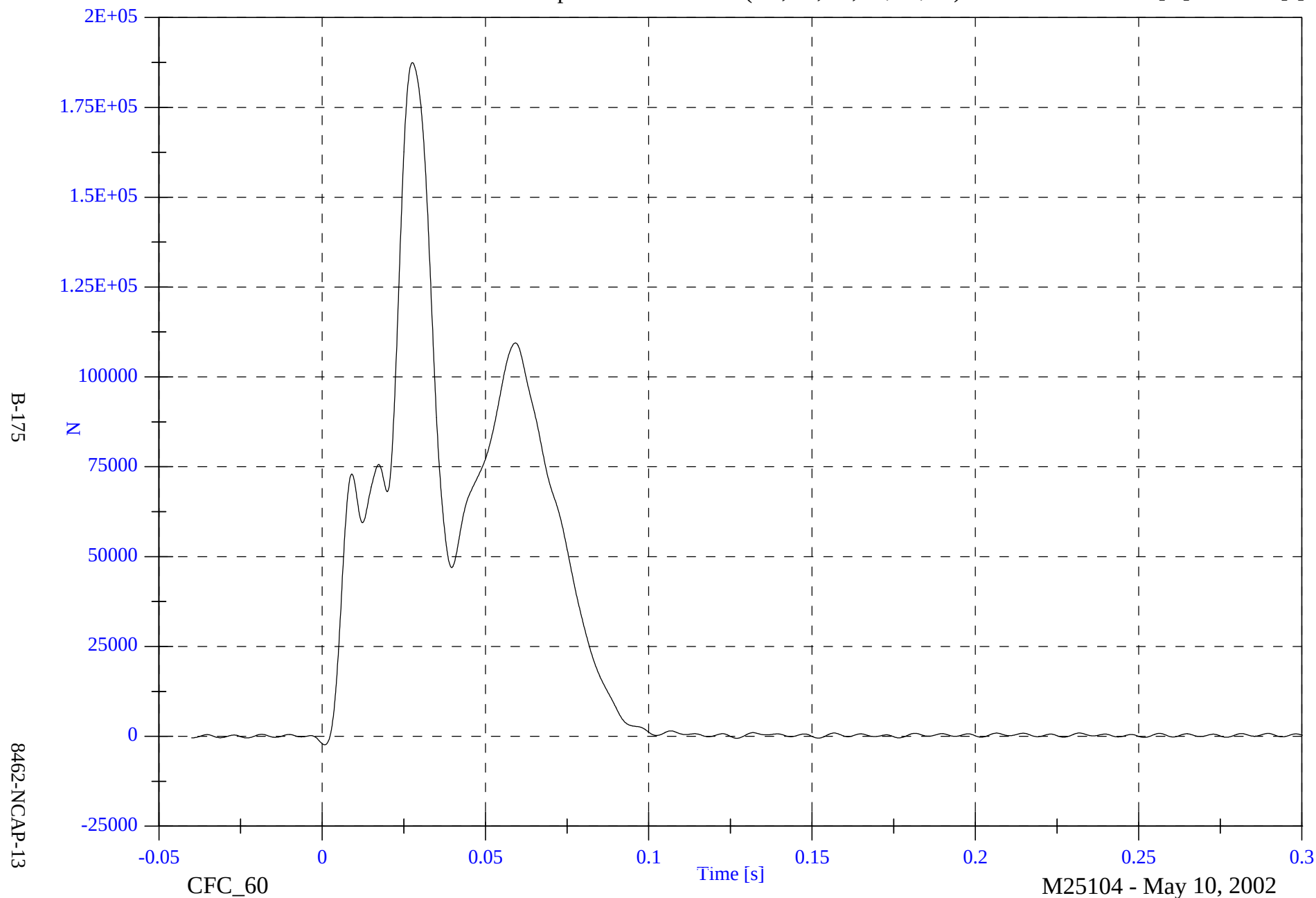


NCAP Test 13 - 2002 Toyota Camry

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

Max: 187477.6 [N] at 0.028 [s]

Min: -2364.9 [N] at 0.001 [s]

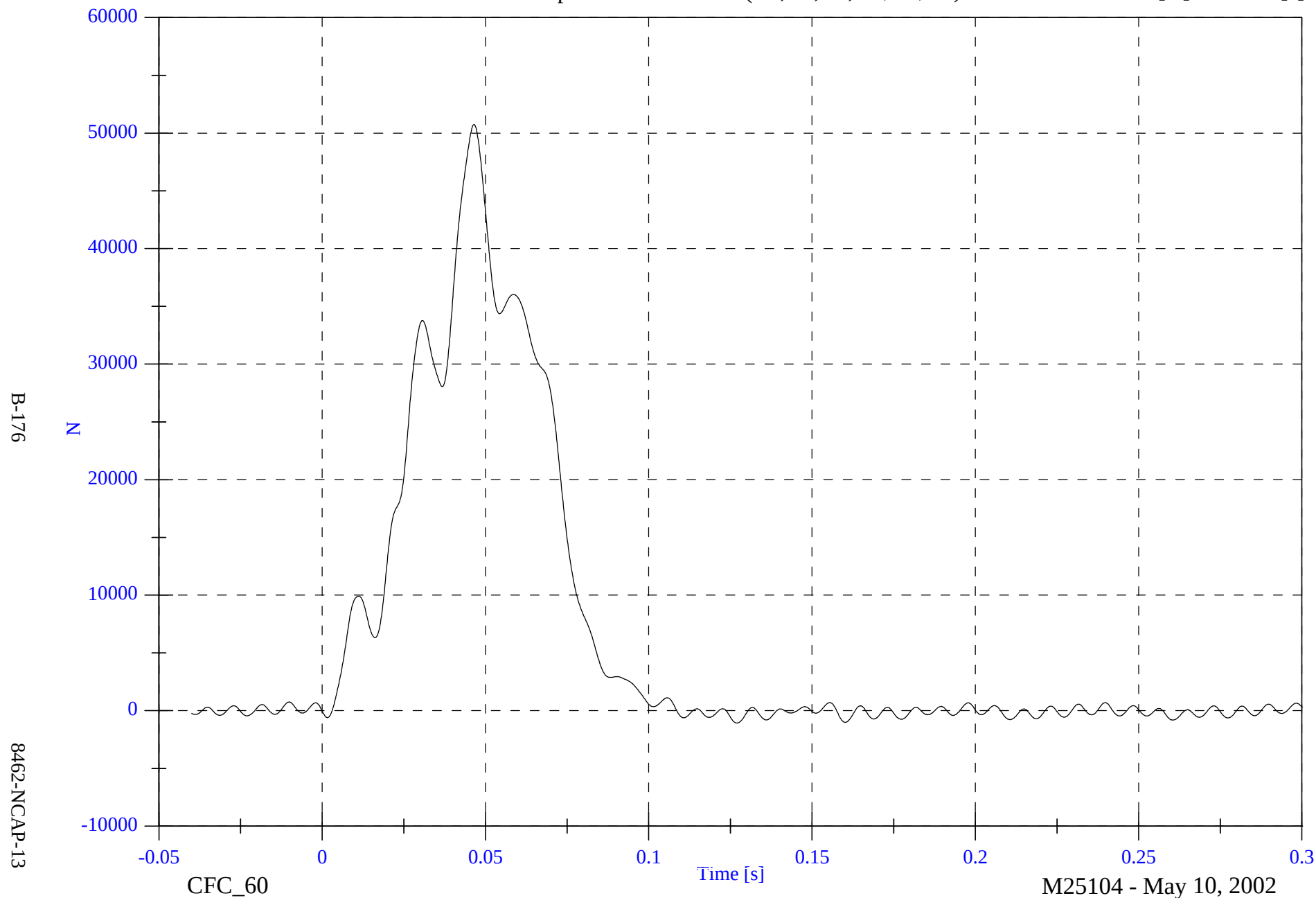


NCAP Test 13 - 2002 Toyota Camry

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

Max: 50746.7 [N] at 0.046 [s]

Min: -1076.8 [N] at 0.127 [s]

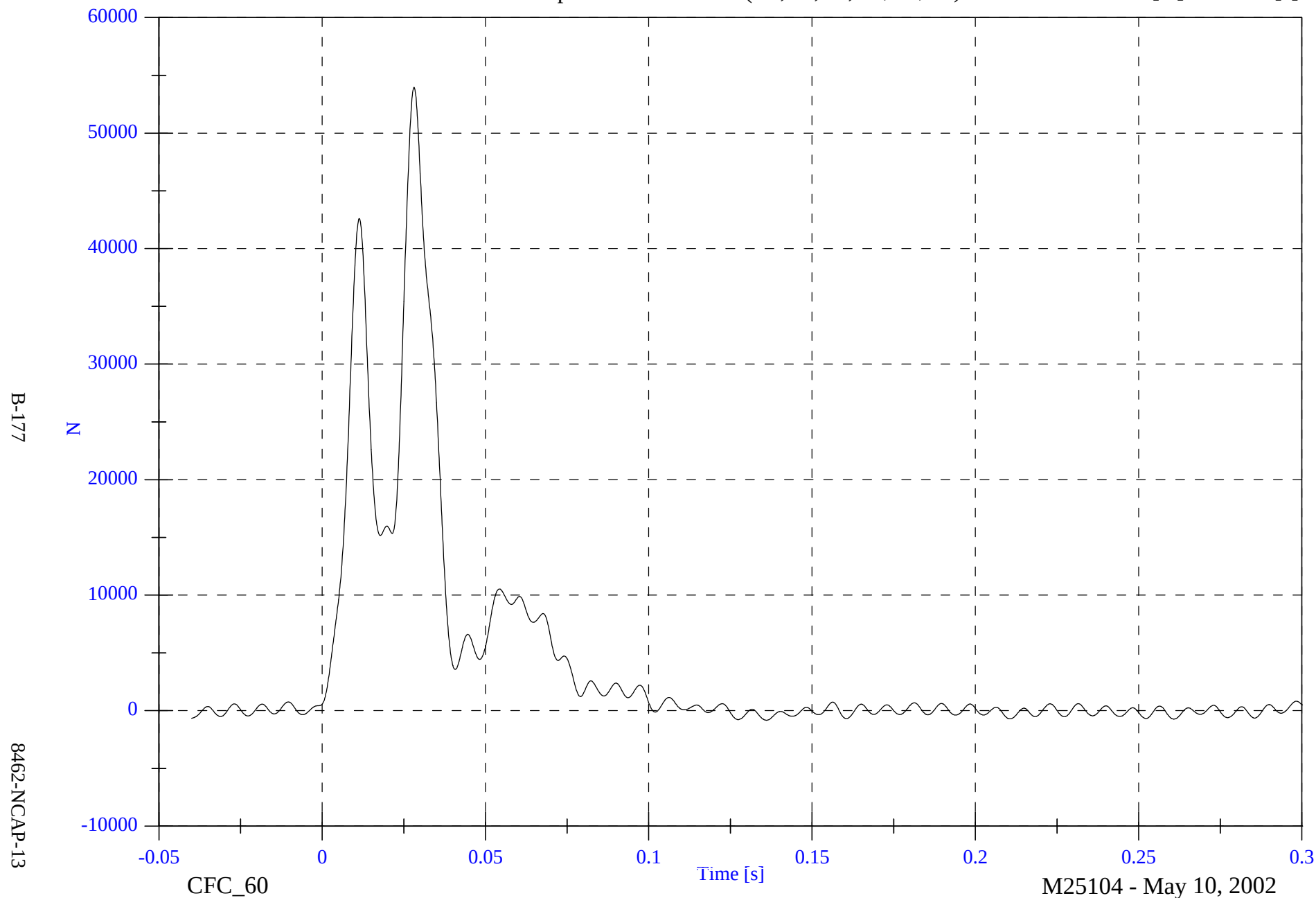


NCAP Test 13 - 2002 Toyota Camry

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

Max: 53962.4 [N] at 0.028 [s]

Min: -830.5 [N] at 0.136 [s]

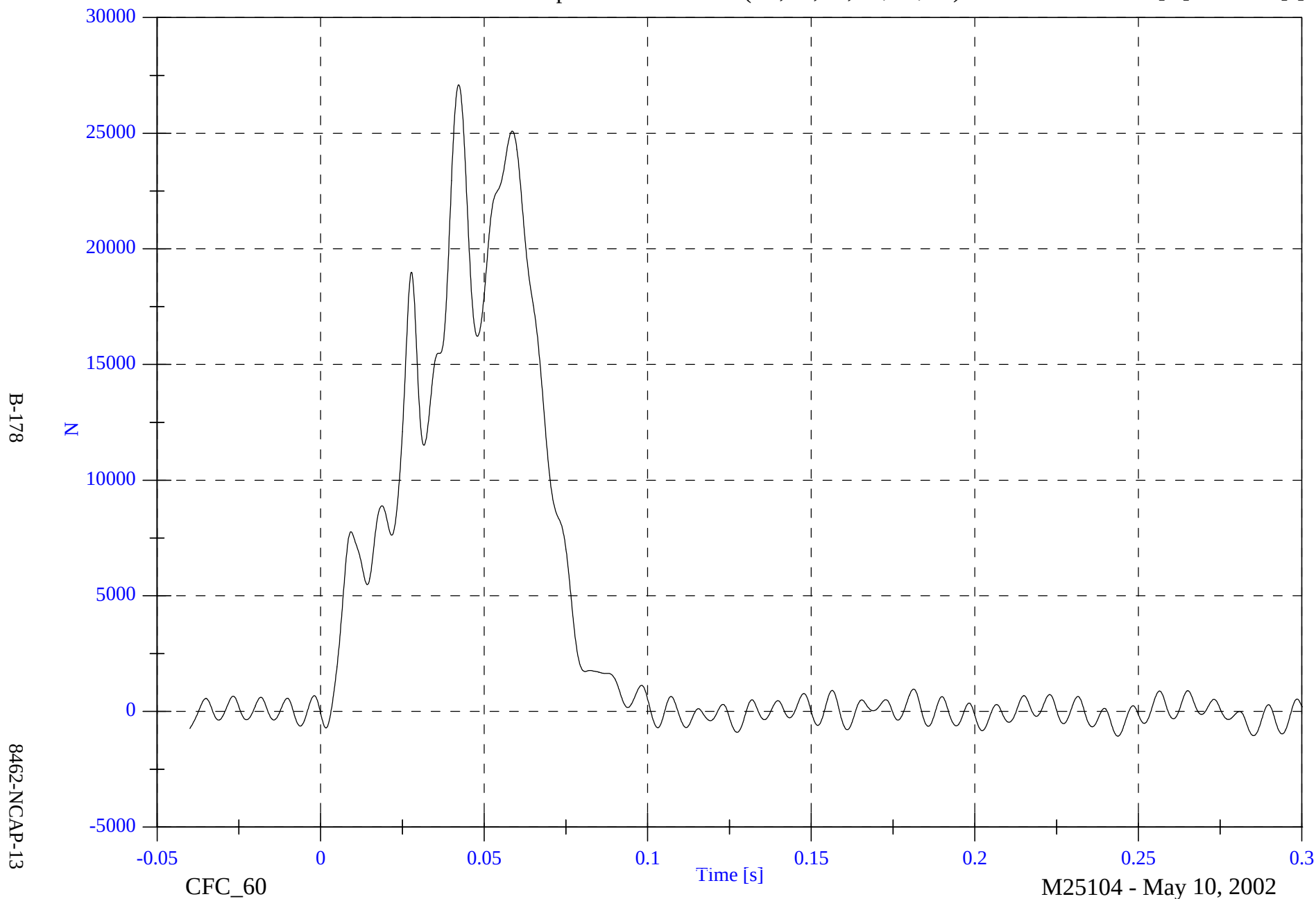


NCAP Test 13 - 2002 Toyota Camry

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

Max: 27099.5 [N] at 0.042 [s]

Min: -1071.0 [N] at 0.244 [s]

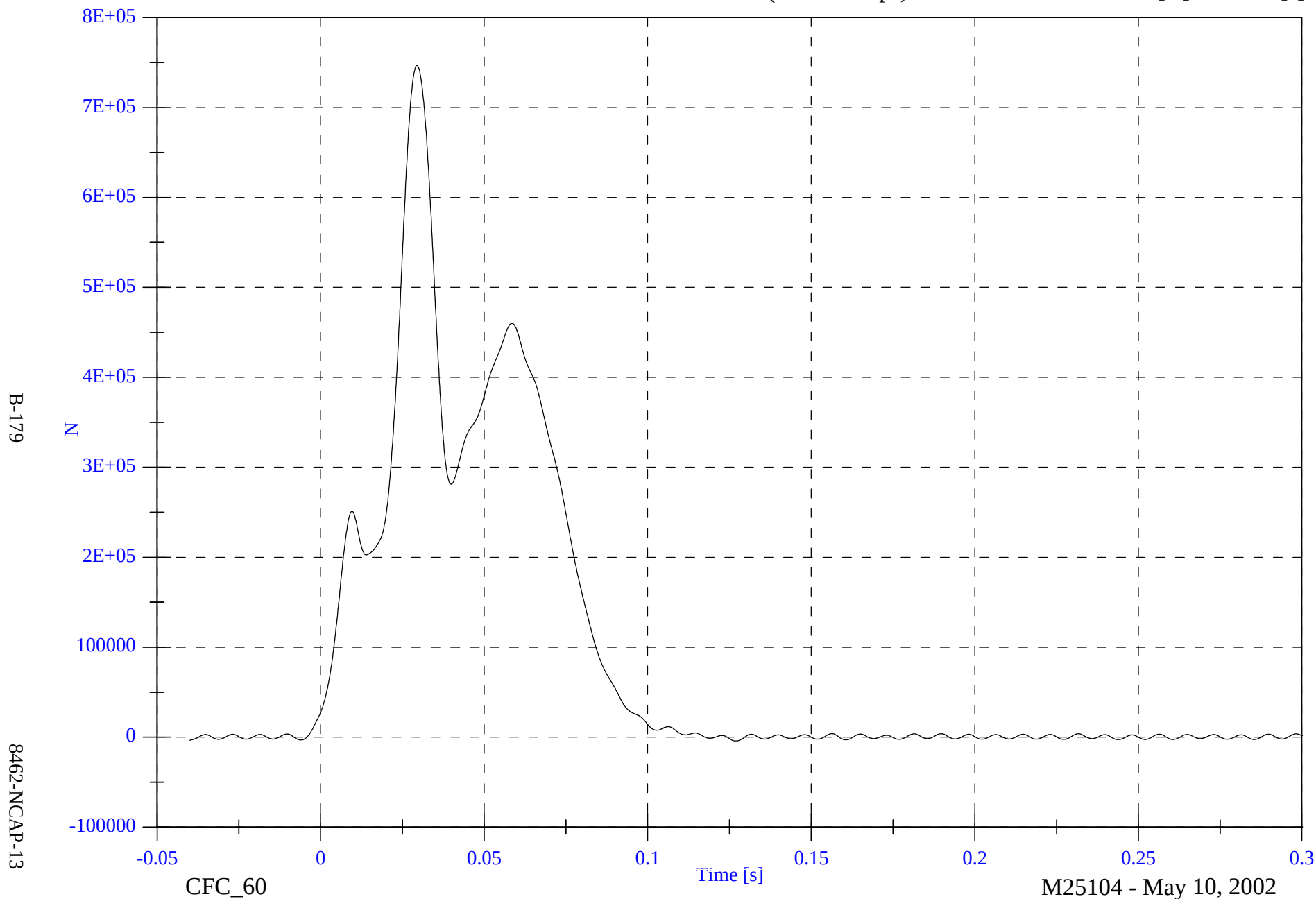


NCAP Test 13 - 2002 Toyota Camry

Total Load Cell Sum (All 6 Groups)

Max: 746942.5 [N] at 0.029 [s]

Min: -4355.7 [N] at 0.127 [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:

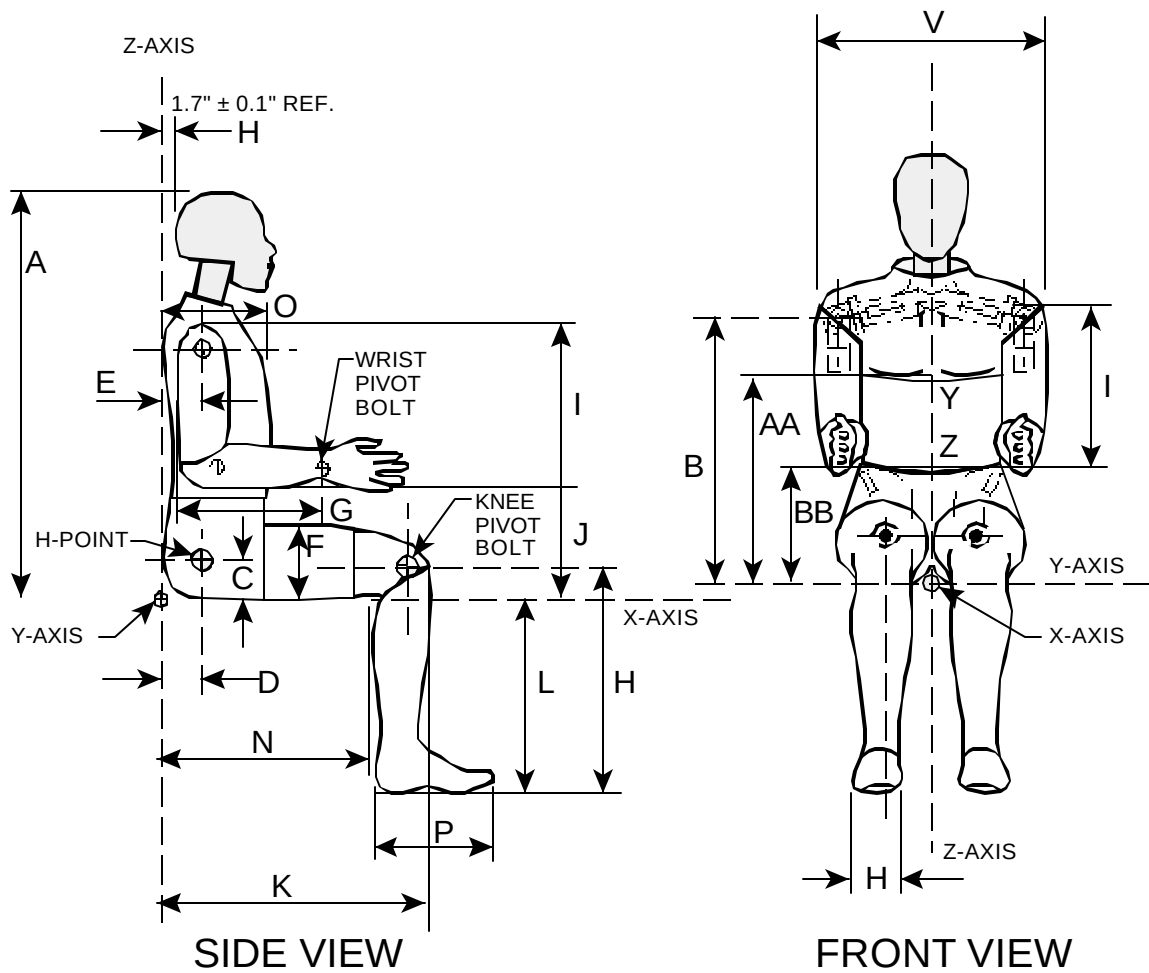
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	May 7, 2002
#2/Right Front Passenger	064	May 7, 2002

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 1
Date 5/7/02
Workfile 061H

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	73
Relative Humidity	10% - 70%	30
Peak Resultant Acceleration	225-275 G's	265.15
Peak Lateral Acceleration	15 G's Max	2.92
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	5/2/02	6 Axis Neck Transducer
Workfile	061Flx	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71
Relative Humidity		10% - 70%	41
Impact Velocity		22.60 - 23.40 Ft/s	23.19
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.60
	20 ms	17.60 - 22.60 G's	21.71
	30 ms	12.50 - 18.50 G's	15.69
Max Pendulum G's Above 30 ms		29 G's Max	15.69
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	41.70
D Plane Rotation	Max	64 - 78 Deg	68.98
	Time	57 - 64 ms	60.60
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	79.12
	Time	47 - 58 ms	52.60
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	116.20
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	99.20

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	5/2/02	6 Axis Neck Transducer
Workfile	061Ext	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	41
Impact Velocity		19.50 - 20.30 Ft/s	19.71
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.35
	20 ms	14.00 - 19.00 G's	16.44
	30 ms	11.00 - 16.00 G's	13.10
Max Pendulum G's Above 30 ms		22 G's Max	13.54
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	39.90
D Plane Rotation	Max	81 - 106 Deg	91.21
	Time	72 - 82 ms	75.20
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-41.35
	Time	65 - 79 ms	71.30
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	152.60
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	143.50

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 5/7/02
Workfile 061T

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	71
Relative Humidity	10% - 70%	35
Pendulum Velocity	21.6 - 22.4 Ft/s	22.20
Maximum Deflection	2.50 - 2.86 in	2.76
Maximum Resistive Force	1160 - 1325 Lbs	1244.85
Internal Hysteresis	69 - 85 %	74.88

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 5/7/02
Workfile 061LF/061RF

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	40
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1147.59
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	40
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1138.88

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 1
Date 5/7/02

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			40
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	8.5
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	6.1
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 1
Date 4/30/02
Workfile 064H

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	72
Relative Humidity	10% - 70%	31
Peak Resultant Acceleration	225-275 G's	264.94
Peak Lateral Acceleration	15 G's Max	6.48
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	5/01/02	6 Axis Neck Transducer
Workfile	064Flx	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71
Relative Humidity		10% - 70%	34
Impact Velocity		22.60 - 23.40 Ft/s	23.12
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.30
	20 ms	17.60 - 22.60 G's	21.82
	30 ms	12.50 - 18.50 G's	15.43
Max Pendulum G's Above 30 ms		29 G's Max	15.43
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	36.40
D Plane Rotation	Max	64 - 78 Deg	67.21
	Time	57 - 64 ms	57.80
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	79.07
	Time	47 - 58 ms	50.50
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.00
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	100.90

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	5/01/02	6 Axis Neck Transducer
Workfile	064Ext	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71
Relative Humidity		10% - 70%	34
Impact Velocity		19.50 - 20.30 Ft/s	19.76
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.41
	20 ms	14.00 - 19.00 G's	15.11
	30 ms	11.00 - 16.00 G's	13.64
Max Pendulum G's Above 30 ms		22 G's Max	13.64
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	45.60
D Plane Rotation	Max	81 - 106 Deg	90.73
	Time	72 - 82 ms	77.60
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-39.30
	Time	65 - 79 ms	75.40
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	158.90
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	125.90

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 5/7/02
Workfile 064T

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	71
Relative Humidity	10% - 70%	35
Pendulum Velocity	21.6 - 22.4 Ft/s	22.17
Maximum Deflection	2.50 - 2.86 in	2.51
Maximum Resistive Force	1160 - 1325 Lbs	1243.18
Internal Hysteresis	69 - 85 %	73.88

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 5/7/02
Workfile 064LF/064RF

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	40
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1100.35
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	40
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1161.37

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 1
Date 5/7/02

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			40
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	33.8
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	ENTRAN	AC-01G18-F06	21-Jan-02	27-Jul-02
	X Arm Z	ENTRAN	AC-00L13-F39	22-Jan-02	22-Jul-02
	Y Arm X	ENTRAN	AC-00L13-F14	21-Jan-02	27-Jul-02
	Y Arm Z	ENTRAN	AC-01G18-F16	22-Jan-02	22-Jul-02
	Z Arm X	ENTRAN	AC-00L13-F72	21-Jan-02	27-Jul-02
	Z Arm Y	ENTRAN	AC-01G18-F12	21-Jan-02	27-Jul-02
Head	X	ENTRAN	AC-00L13-F04	22-Jan-02	22-Jul-02
	Y	ENTRAN	AC-01G18-F15	21-Jan-02	27-Jul-02
	Z	ENTRAN	AC-01G18-F14	22-Jan-02	22-Jul-02
Head	X (R)	ENTRAN	AC-01G18-F20	21-Jan-02	27-Jul-02
	Y (R)	ENTRAN	AC-01G18-F05	22-Jan-02	22-Jul-02
	Z (R)	ENTRAN	AC-00L13-F16	21-Jan-02	27-Jul-02
Neck Load Cell	X	DENTON	LC-205Fx	22-Jan-02	22-Jul-02
	Y	DENTON	LC-205Fy	22-Jan-02	22-Jul-02
	Z	DENTON	LC-205Fz	22-Jan-02	22-Jul-02
Neck Moment	X	DENTON	LC-205Mx	22-Jan-02	22-Jul-02
	Y	DENTON	LC-205My	22-Jan-02	22-Jul-02
	Z	DENTON	LC-205Mz	22-Jan-02	22-Jul-02
Chest	X	ENDEVCO	AC-P21373	14-Mar-02	14-Sep-02
	Y	ENDEVCO	AC-P22639	14-Mar-02	14-Sep-02
	Z	ENDEVCO	AC-P21297	14-Mar-02	14-Sep-02
Chest	X (R)	ENDEVCO	AC-P21171	14-Mar-02	14-Sep-02
	Y (R)	ENDEVCO	AC-P23136	14-Mar-02	14-Sep-02
	Z (R)	ENDEVCO	AC-P23128	14-Mar-02	14-Sep-02
Chest Deflection	X	SERVO	DS-061	14-Mar-02	14-Sep-02
Pelvic	X	ENDEVCO	AC-P21441	14-Mar-02	14-Sep-02
	Y	ENDEVCO	AC-P19246	14-Mar-02	14-Sep-02
	Z	ENDEVCO	AC-P21516	14-Mar-02	14-Sep-02

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-659	12-Feb-02	12-Aug-02
Right Femur Load Cell	Fz	GSE	LC-723	12-Feb-02	12-Aug-02
Left Upper Tibia	Mx	DENTON	LC-016Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-016My	08-Apr-02	08-Oct-02
Left Lower Tibia	Fz	DENTON	LC-123Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-123Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-123My	08-Apr-02	08-Oct-02
Right Upper Tibia	Mx	DENTON	LC-023Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-023My	08-Apr-02	08-Oct-02
Right Lower Tibia	Fz	DENTON	LC-111Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-111Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-111My	08-Apr-02	08-Oct-02
Left Foot Rear	X	ENDEVCO	AC-P19343	04-Apr-02	04-Oct-02
	Z	ENDEVCO	AC-P16583	04-Apr-02	04-Oct-02
Left Foot Front	Z	ENDEVCO	AC-P18525	27-Feb-02	27-Aug-02
Right Foot Rear	X	ENDEVCO	AC-P18628	04-Apr-02	04-Oct-02
	Z	ENDEVCO	AC-P18741	04-Apr-02	04-Oct-02
Right Foot Front	Z	ENDEVCO	AC-P16587	04-Apr-02	04-Oct-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	ENTRAN	AC-01G18-F08	22-Jan-02	22-Jul-02
	X Arm Z	ENTRAN	AC-00L20-A13	22-Jan-02	22-Jul-02
	Y Arm X	ENTRAN	AC-00L20-A08	21-Jan-02	27-Jul-02
	Y Arm Z	ENTRAN	AC-01G18-F13	22-Jan-02	22-Jul-02
	Z Arm X	ENTRAN	AC-01J02-F18	22-Jan-02	22-Jul-02
	Z Arm Y	ENTRAN	AC-01G25-N11	21-Jan-02	27-Jul-02
Head	X	ENTRAN	AC-01G18-F18	22-Jan-02	22-Jul-02
	Y	ENTRAN	AC-01G18-F07	21-Jan-02	27-Jul-02
	Z	ENTRAN	AC-01G18-F10	21-Jan-02	27-Jul-02
Head	X (R)	ENTRAN	AC-01J02-F09	21-Jan-02	27-Jul-02
	Y (R)	ENTRAN	AC-01G18-F03	22-Jan-02	22-Jul-02
	Z (R)	ENTRAN	AC-01G18-F09	22-Jan-02	22-Jul-02
Neck Load Cell	X	DENTON	LC-440Fx	22-Jan-02	22-Jul-02
	Y	DENTON	LC-440Fy	22-Jan-02	22-Jul-02
	Z	DENTON	LC-440Fz	22-Jan-02	22-Jul-02
Neck Moment	X	DENTON	LC-440Mx	22-Jan-02	22-Jul-02
	Y	DENTON	LC-440My	22-Jan-02	22-Jul-02
	Z	DENTON	LC-440Mz	22-Jan-02	22-Jul-02
Chest	X	ENDEVCO	AC-P23155	15-Mar-02	15-Sep-02
	Y	ENDEVCO	AC-P23358	15-Mar-02	15-Sep-02
	Z	ENDEVCO	AC-P23282	15-Mar-02	15-Sep-02
Chest	X (R)	ENDEVCO	AC-P21484	15-Mar-02	15-Sep-02
	Y (R)	ENDEVCO	AC-P16951	15-Mar-02	15-Sep-02
	Z (R)	ENDEVCO	AC-P21399	15-Mar-02	15-Sep-02
Chest Deflection	X	SERVO	DS-064	20-Mar-02	20-Sep-02
Pelvic	X	ENDEVCO	AC-P23174	15-Mar-02	15-Sep-02
	Y	ENDEVCO	AC-P23164	15-Mar-02	15-Sep-02
	Z	ENDEVCO	AC-P23137	15-Mar-02	15-Sep-02

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-954	12-Feb-02	12-Aug-02
Right Femur Load Cell	Fz	GSE	LC-955	12-Feb-02	12-Aug-02
Left Upper Tibia	Mx	DENTON	LC-045Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-045My	08-Apr-02	08-Oct-02
Left Lower Tibia	Fz	DENTON	LC-125Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-125Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-125My	08-Apr-02	08-Oct-02
Right Upper Tibia	Mx	DENTON	LC-038Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-038My	08-Apr-02	08-Oct-02
Right Lower Tibia	Fz	DENTON	LC-124Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-124Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-124My	08-Apr-02	08-Oct-02
Left Foot Rear	X	ENDEVCO	AC-J30491	21-Mar-02	27-Sep-02
	Z	ENDEVCO	AC-J31026	21-Mar-02	27-Sep-02
Left Foot Front	Z	ENDEVCO	AC-J32831	21-Mar-02	27-Sep-02
Right Foot Rear	X	ENDEVCO	AC-J33376	21-Mar-02	27-Sep-02
	Z	ENDEVCO	AC-J32832	21-Mar-02	27-Sep-02
Right Foot Front	Z	ENDEVCO	AC-J31095	21-Mar-02	27-Sep-02

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	AC-X86	25-Apr-02	25-Oct-02
Right Rear Seat Crossmember X	ICS	AC-X83	15-Jan-02	15-Jul-02
Top of Engine	ENDEVCO	AC-J32383	14-Feb-02	14-Aug-02
Bottom of Engine	ENDEVCO	AC-P16665	15-Jan-02	15-Jul-02
Right Disc Brake Caliper	ENDEVCO	AC-J31050	14-Feb-02	14-Aug-02
Instrument Panel	ENDEVCO	AC-P23276	25-Apr-02	25-Oct-02
Left Disc Brake Caliper	ENDEVCO	AC-P17247	26-Feb-02	26-Aug-02
Left Seat Rear Crossmember Z	ICS	AC-Y13	11-Feb-02	17-Aug-02
Right Seat Rear Crossmember Z	ICS	AC-D82	04-Apr-02	04-Oct-02

REPORT NUMBER: CAL-02-13

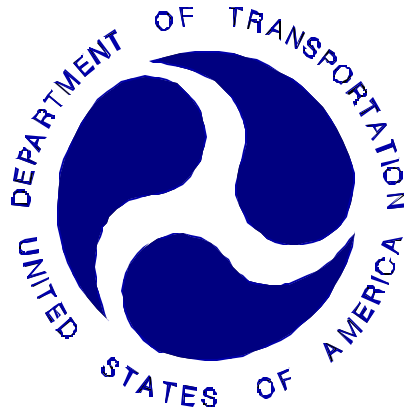
NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

GRACO SNUGRIDE USING VEHICLE ALR
GRACO SNUGRIDE LATCH

NHTSA NUMBER: M25104

VERIDIAN ENGINEERING TEST NUMBER: 8642-NCAP-13

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
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May 10, 2002

FINAL REPORT

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

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16. Abstract A frontal load cell barrier test was conducted on the subject CRS GRACO Snugride using vehicle ALR and GRACO Snugride with LATCH in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at the Veridian Engineering Crash Test Facility in Buffalo, New York, on May 10, 2002.					
17. Key Words New Car Assessment Program (NCAP)				18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division Room 5108 (NAD-52) 400 Seventh St., S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 ATTN: Robert Hornicle	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M25104

The purpose of this test was to obtain CRS performance data in a frontal impact NCAP condition.

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

SUMMARY

Both child dummies were instrumented with head, chest, and pelvic triaxial accelerometers. In addition, redundant head z acceleration, upper and lower six axial neck and lower lumbar force and moment load cell sensors were utilized.

The right rear (Position 3) child dummy (serial no. 090) and left rear (Position 4) child dummy (serial no. 093) were calibrated previous to this test. Child dummy certification information is found in section 5.

The right rear child dummy's HIC was 456.5, maximum chest deceleration over 3 ms was 57.6 g's. The left rear child dummy's HIC was 390.0, maximum chest deceleration over 3 ms was 40.8 g's.

SECTION 2
DATA SHEET NO. 1
CRASH TEST SUMMARY

TEST DUMMY INFORMATION:

DESCRIPTION	Position #3 CRS	Position #4 CRS
ATD Type/Serial No.	CRABI/090	CRABI/093
Restraint System:	GRACO Snugride using ALR**	GRACO Snugride LATCH

Number of Data Channels 76

Number of Cameras: 1 Real Time

2 High Speed

POST TEST DOOR OPENING

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, latched and operable without tools	Closed, latched and operable without tools
Right Side Doors	Closed, latched and operable without tools	Closed, latched and operable without tools
Hatch/Other Door	NA	NA

POST TEST SEAT DATA

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

VISIBLE DUMMY CONTACT POINTS

	Position #3	Position #4
Head Contact:	The top of the head to Position #2 seatback	The top of the head to Position #1 seatback
Upper Torso Contact:	None	None
Lower Torso Contact:	None	None
Left Knee Contact:	None	None
Right Knee Contact:	None	P4 CRS seat base

** ALR – Automatic Locking Retractor – Safety belt feature used to hold a child restraint where seat belt is locked in position and cannot be extended.

DATA SHEET NO. 2

CRS PARAMETER DATA

CRS: GRACO Snugride ALR/LATCH

NHTSA No. M25104

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 1418.0 kg (A)

AS TESTED WEIGHT OF VEHICLE (2 ATDs + 2 CRABI w/ CRS +CARGO + EQUIPMENT & INSTRUMENTATION):

Left Front	=	<u>451.5</u>	kg	Left Rear	=	<u>375.0</u>	kg
Right Front	=	<u>458.5</u>	kg	Right Rear	=	<u>348.0</u>	kg
TOTAL FRONT	=	<u>910.0</u>	kg	TOTAL REAR	=	<u>723.0</u>	kg
TOTAL TEST WEIGHT =		<u>1633.0</u>	kg				

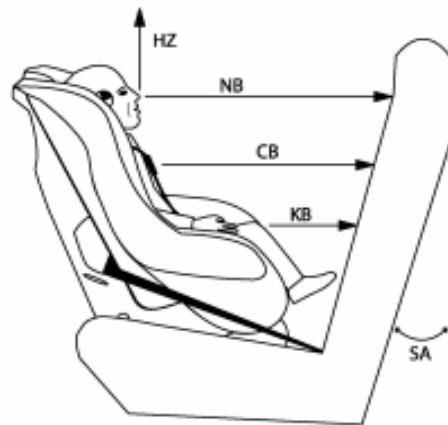
DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE

CRS: GRACO Snugride ALR/ LATCH

NHTSA No. M25104

Dummy Measurements for Rear-facing CRS Passengers



X—Z View

HZ	-	Head to Roof
NB	-	Nose to Front of Back Seat
CB	-	Chest to Front of Back Seat
KB	-	Knee to Front of Back Seat
SA	-	Seat Back Angle

Measurement	Pre-Test (mm)		Post Test (mm)	
	P3 CRS (090)	P4 CRS (093)	P3 CRS (090)	P4 CRS (093)
SA	30°	30°	30°	30°
HZ	429	434	NA	NA
NB	527	531	NA	NA
CB	437	417	NA	NA
KB – LEFT	211	200	NA	NA
KB – RIGHT	211	201	NA	NA

All dimensions in mm (unless noted)

P3 – Right Rear Passenger (CRS #1)

P4 – Left Rear Passenger (CRS #2)

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES

CRS: GRACO Snugride ALR/LATCH

NHTSA No. M25104

DESCRIPTION	Unit	MAXIMUM VALUE							
		Position #3				Position #4			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	52.3	93.9	-4.0	121.1	37.2	114.5	-25.1	177.4
Head Y	g	5.5	114.9	-25.6	89.3	6.8	121.8	-8.1	116.6
Head Z	g	58.9	70.6	-20.5	97.4	59.9	78.4	-3.4	172.3
Head Resultant	g	66.6	70.8	0.1	8.8	60.6	78.4	0.2	-44.8
Redundant Head Z	g	58.3	70.4	-21.4	93.5	61.2	78.6	-10.9	123.5
Upper Neck Fx	N	274.9	98.0	-194.5	63.2	61.7	96.7	-153.4	74.2
Upper Neck Fy	N	55.3	169.5	-123.9	93.5	47.9	118.1	-54.4	78.7
Upper Neck Fz	N	1431.9	74.0	-119.9	100.0	1570.9	77.4	-123.7	147.9
Upper Neck F Resultant	N	1443.3	74.0	3.2	9.2	1578.3	77.4	1.9	-50.0
Upper Neck Mx	N-m	6.8	99.6	-3.6	120.0	**	**	**	**
Upper Neck My	N-m	16.7	98.9	-7.1	61.1	4.1	156.0	-6.8	182.5
Upper Neck Mz	N-m	2.8	168.9	-2.1	84.1	1.7	213.1	-2.2	160.8
Upper Neck M Resultant	N-m	18.1	98.9	0.1	-10.8	**	**	**	**
Lower Neck Fx	N	438.4	97.8	-85.7	124.0	204.8	97.0	-102.1	177.0
Lower Neck Fy	N	53.0	99.9	-133.5	79.9	66.3	120.4	-32.6	77.3
Lower Neck Fz	N	1572.4	74.5	-79.4	100.0	1676.3	76.8	-115.3	145.4
Lower Neck F Resultant	N	1578.6	74.5	1.6	-26.6	1679.0	76.8	1.8	-50.0
Lower Neck Mx	N-m	5.4	163.7	-5.6	80.2	2.1	120.3	-2.7	77.0
Lower Neck My	N-m	3.4	299.9	-16.1	97.7	6.5	145.8	-6.3	96.1
Lower Neck Mz	N-m	2.1	171.6	-0.1	3.3	1.1	115.3	-1.5	159.1
Lower Neck M Resultant	N-m	16.1	97.8	0.0	-6.4	6.5	145.8	0.0	-41.4
Chest X	g	42.8	86.7	-5.8	219.1	28.9	91.1	-11.7	202.1
Chest Y	g	5.1	110.3	-6.2	77.5	4.9	155.0	-5.7	116.1
Chest Z	g	50.0	72.1	-14.6	94.0	35.9	76.0	-7.0	143.2
Chest Resultant	g	58.8	72.2	0.1	-35.5	41.3	76.7	0.0	10.6
Lumbar Fx	N	*	*	*	*	7.6	-3.2	-342.8	114.7
Lumbar Fy	N	17.8	137.8	-150.0	106.7	60.7	152.2	-46.6	117.5
Lumbar Fz	N	265.5	86.8	-62.5	299.9	719.2	101.0	-298.2	169.6
Lumbar F Resultant	N	*	*	*	*	737.4	101.0	0.5	-24.2
Lumbar Mx	N-m	1.9	51.8	-6.7	107.8	1.3	140.2	-2.4	116.1
Lumbar My	N-m	11.5	103.9	-2.1	14.3	11.1	114.9	-0.3	-0.9
Lumbar Mz	N-m	1.3	13.7	-3.1	88.6	1.0	87.2	-1.3	152.3
Lumbar M Resultant	N-m	13.0	104.3	0.0	8.4	11.3	115.0	0.0	-25.5
Pelvic X	g	31.5	90.6	-5.9	210.0	32.6	74.0	-63.9	110.9
Pelvic Y	g	10.7	83.2	-5.3	52.8	14.6	111.2	-30.8	116.8
Pelvic Z	g	57.1	72.5	-5.5	96.4	33.1	55.8	-23.8	94.0
Pelvic Resultant	g	58.2	72.5	0.1	-28.5	66.8	110.9	0.1	-26.7

* Data Questionable - wire cut at 137 ms; ** Questionable Data - Noise

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: GRACO Snugride ALR/LATCH

NHTSA No. M25104

	HEAD INJURY CRITERIA (HIC15)			
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration (g's) t ₁ to t ₂
Position #3 - Right	456.5	62.8	77.8	62.1
Position #4 - Left	390.0	72.4	87.4	58.3

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 15 milliseconds.

	CLIP SUMMARY*			
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #3 - Right	57.6	70.2	73.2	746.0
Position #4 - Left	40.8	75.1	78.1	402.9

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

Position 3 Neck Injury Summary (CRABI – In Position)

Nij V10	Nij	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
Ntf	0.6	83.9	902.4	-35.8	0.0
Nte	1.2	74.1	1431.0	-174.6	-3.9
Ncf	0.4	98.9	-108.6	272.7	15.1
Nce	0.0	9.0	-0.2	2.1	-0.1

Peak Tension (CFC1000) 1431.9 N

Peak Compression (CFC1000) 119.9 N

Critical Values

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

Condyle Offset -0.0058

Position 4 Neck Injury Summary (CRABI – In Position)

Nij V10	Nij	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
Ntf	0.9	93.0	1214.6	28.1	0.9
Nte	1.3	69.8	1480.9	-132.0	-5.2
Ncf	0.2	156.1	-69.5	-14.3	4.2
Nce	0.2	140.8	-18.3	-89.7	-2.7

Peak Tension (CFC1000) 1570.9 N

Peak Compression (CFC1000) 123.7 N

Critical Values

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

Condyle Offset -0.0058

DATA SHEET NO. 5**CRS PERFORMANCE DATA**CRS: GRACO Snugride ALR/LATCHNHTSA No. M25104

		MAXIMUM VALUE			
DESCRIPTION	Unit	Positive	Time (ms)	Negative	Time (ms)
P4 CRS X	g	21.3	113.1	-43.9	67.3
P4 CRS Y	g	23.3	106.3	-24.2	112.2
P4 CRS Z	g	23.3	157.3	-43.1	94.7
P4 CRS Resultant	g	44.8	67.3	0.1	-32.5

DATA SHEET NO. 5**CRS PERFORMANCE DATA (CONTINUED)**CRS: GRACO Snugride ALR/LATCHNHTSA No. M25104**POSITION #3 CRS POST-TEST INSPECTION (Model No. 8446VIN)**

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

POSITION #4 CRS POST-TEST INSPECTION (Model No. 8446VIN)*

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

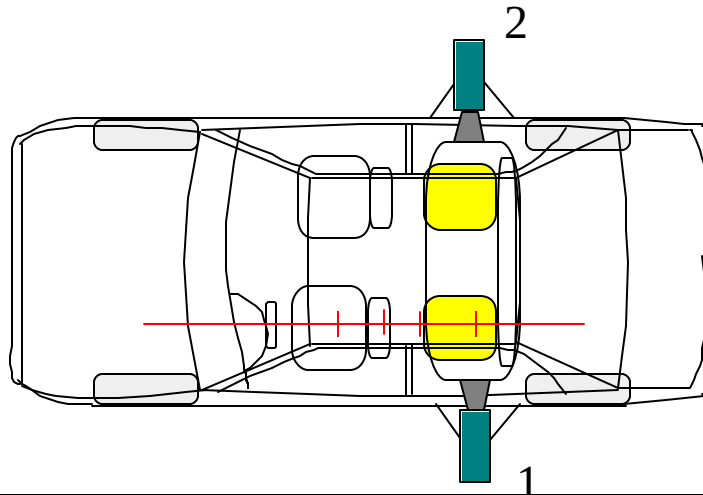
*Position 4 CRS released from its base during the event.

DATA SHEET NO. 6

CRS CAMERA DATA

CRS: GRACO Snugride ALR/LATCH

NHTSA No. M25104



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	2952	2859	2557	-27	25	505
2	Right side CRS lateral view	2955	2612	2533	-29	25	500

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

X = + Forward

Y = + To Right

Z = + Down

SECTION 3

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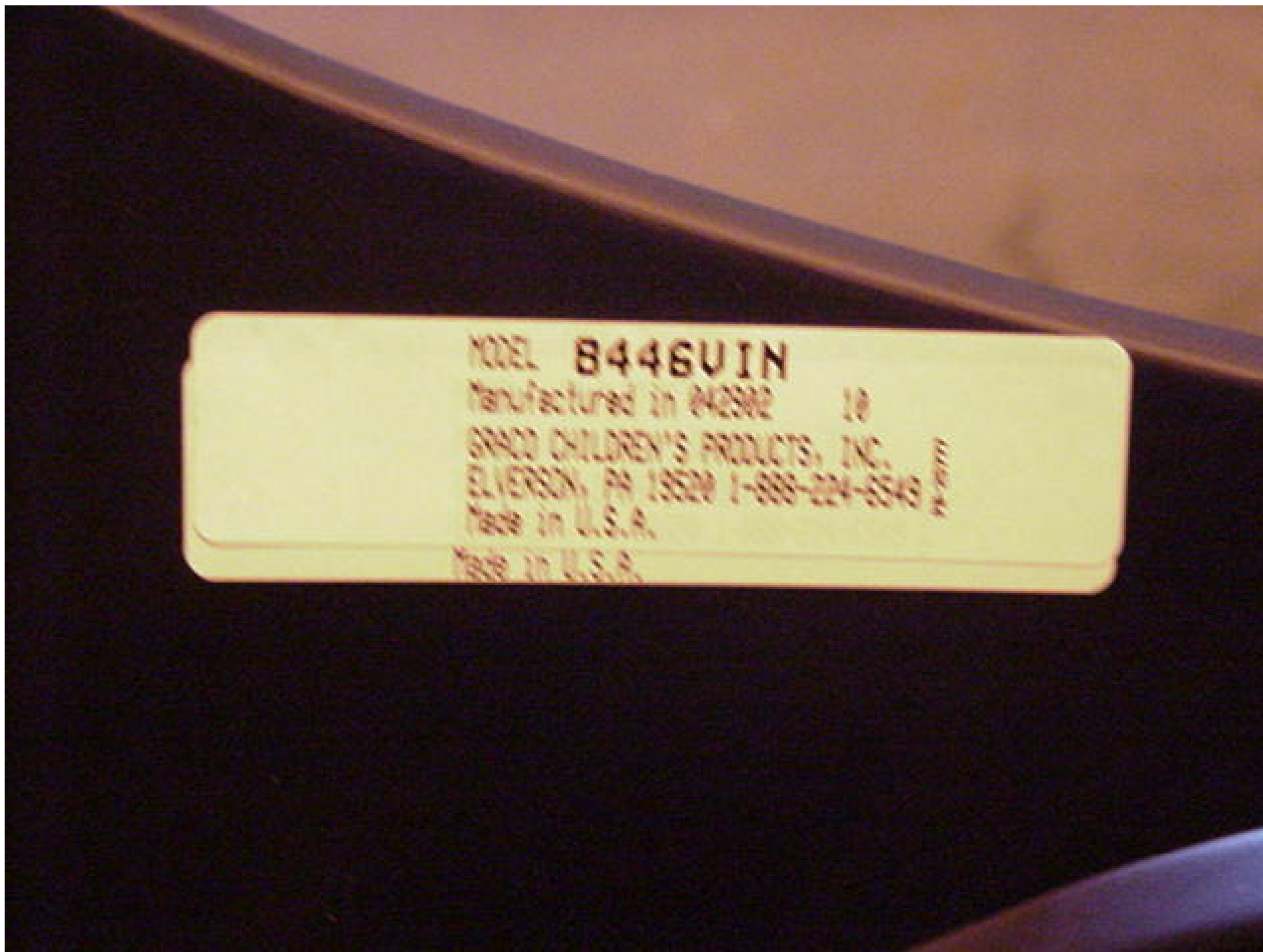


Figure 3-1 CLOSE-UP VIEW OF POSITION 3 CRS LABEL



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



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



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



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



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



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



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



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

MODEL **8446UIN**

Manufactured in 042902 10

GRACO CHILDREN'S PRODUCTS, INC. E

ELVERSON, PA 19520 1-888-224-6549 2

Made in U.S.A.

10000 011 0000110

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



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



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



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



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



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



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



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



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

M25104



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



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



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



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



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



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



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



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



Figure 3-27 PRE-TEST POSITION 3 REAR VIEW



Figure 3-28 POST-TEST POSITION 3 REAR VIEW



Figure 3-29 PRE-TEST POSITION 4 REAR VIEW



Figure 3-30 POST-TEST POSITION 4 REAR VIEW

SECTION 4

CHILD DUMMY RESPONSE AND CRS DATA TRACES

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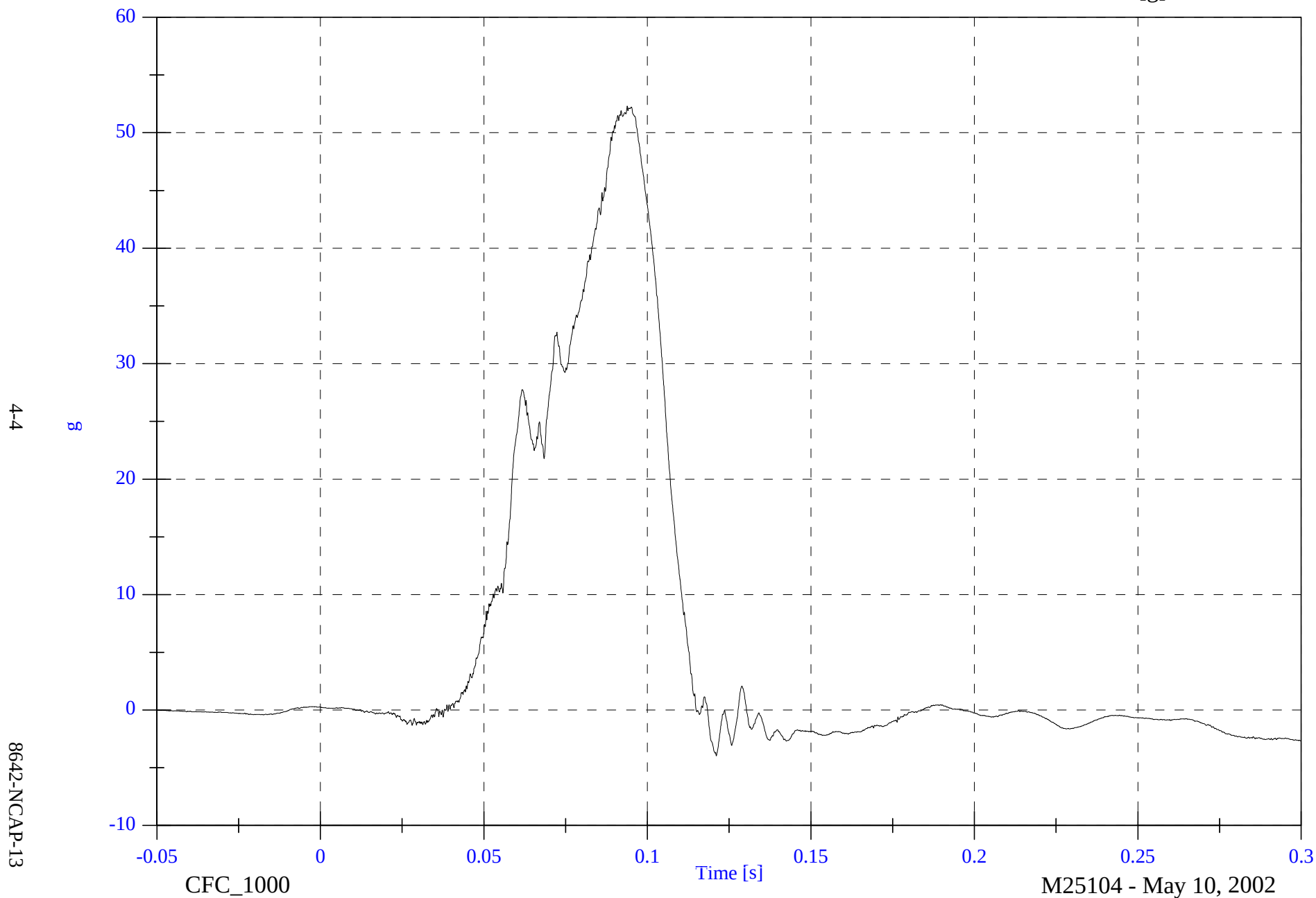
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Max: 52.3 [g] at 0.094 [s]

Min: -4.0 [g] at 0.121 [s]

P3 Head x

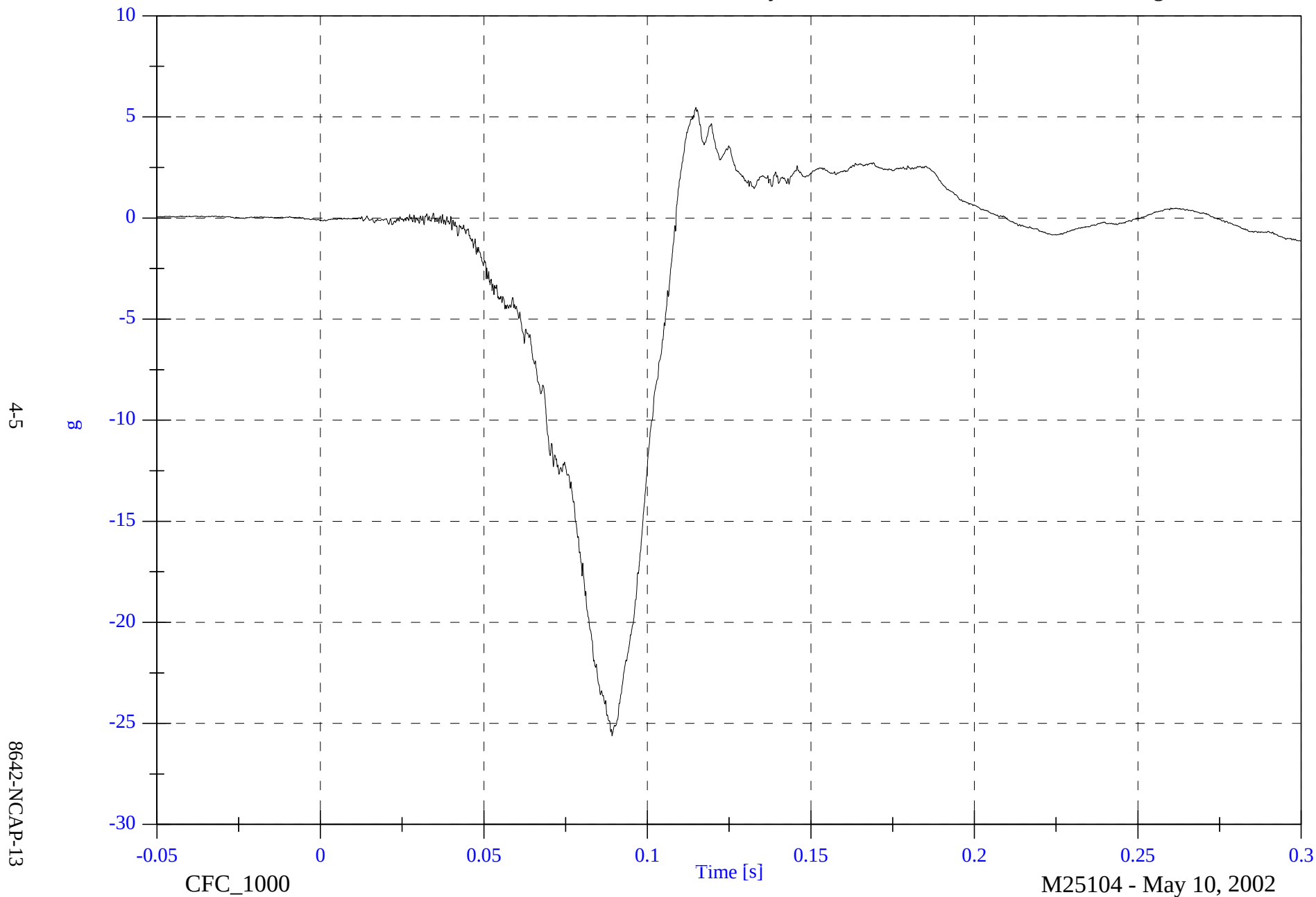


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Head y

Max: 5.5 [g] at 0.115 [s]

Min: -25.6 [g] at 0.089 [s]

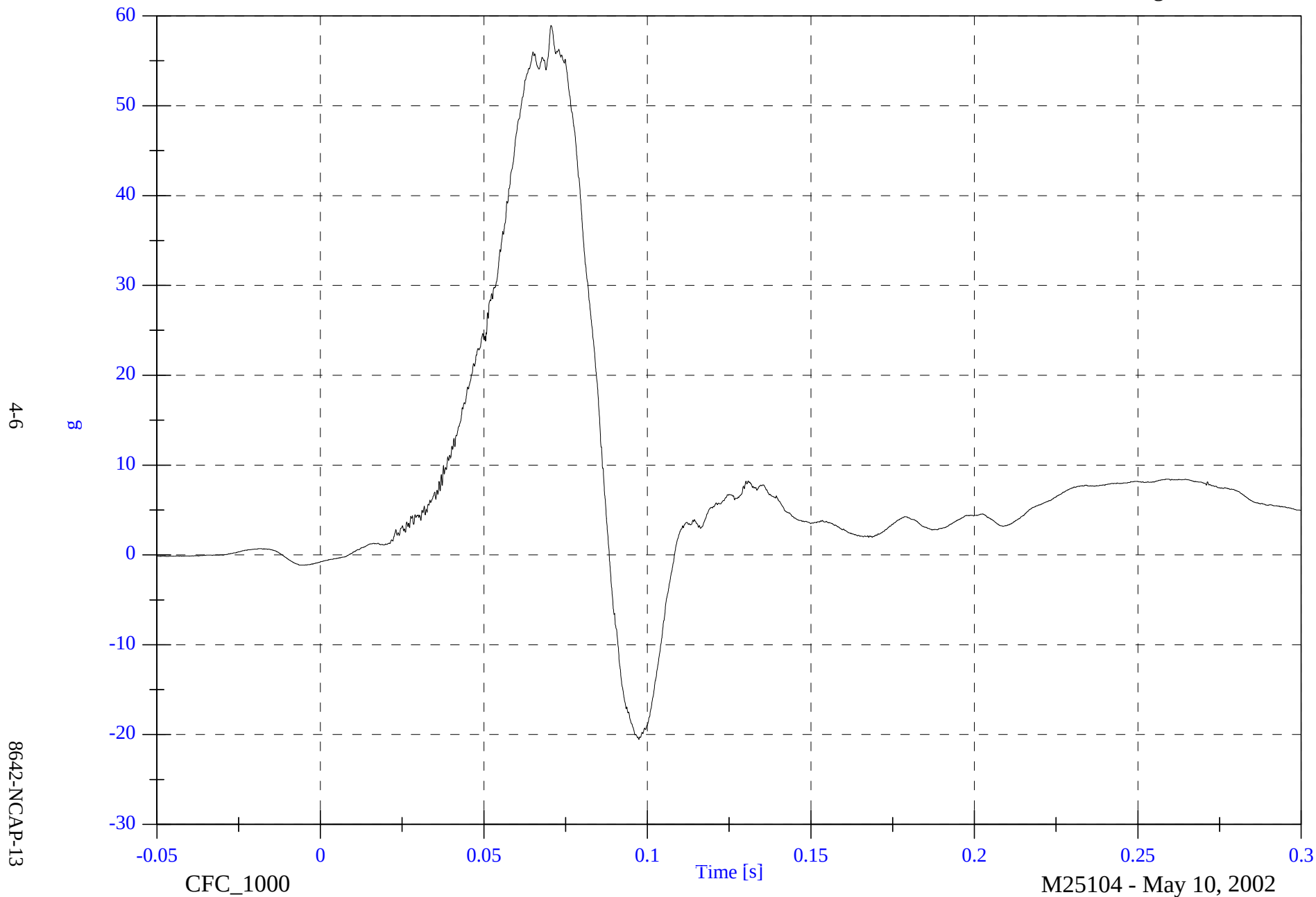


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Head z

Max: 58.9 [g] at 0.071 [s]

Min: -20.5 [g] at 0.097 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

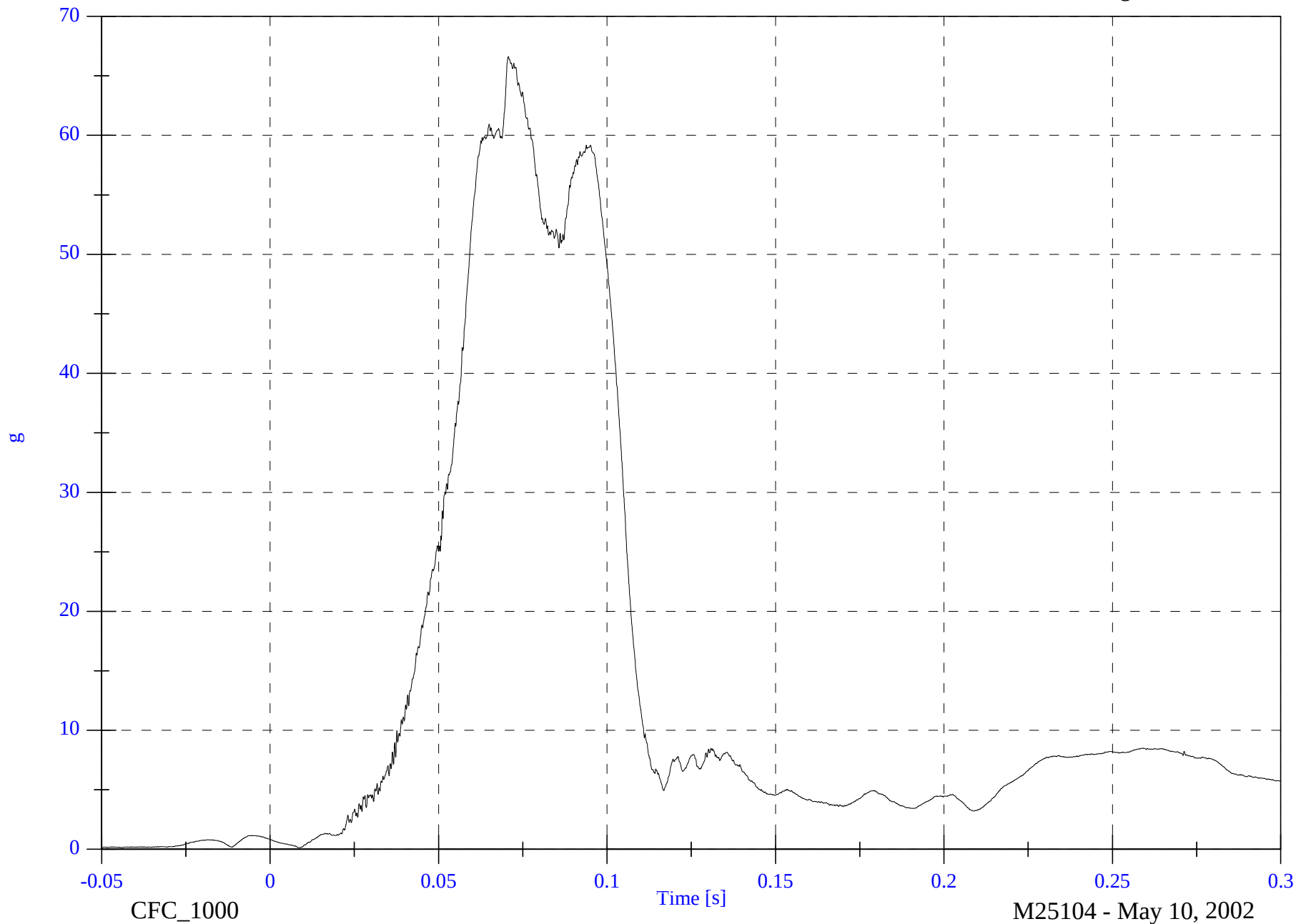
P3 Head Resultant

Max: 66.6 [g] at 0.071 [s]

Min: 0.1 [g] at 0.009 [s]

4-7

8642-NCAP-13

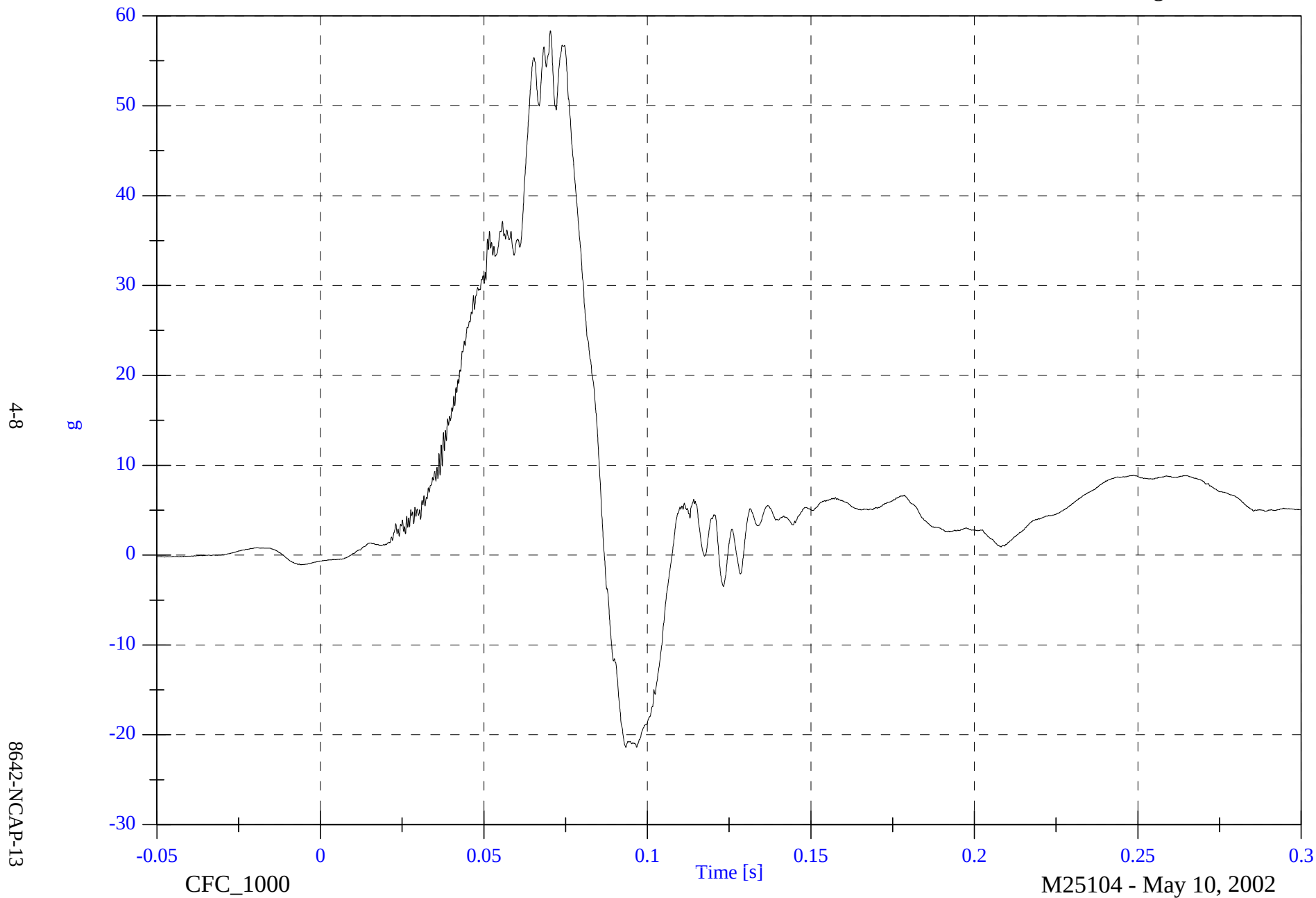


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Head Red z

Max: 58.3 [g] at 0.070 [s]

Min: -21.4 [g] at 0.093 [s]

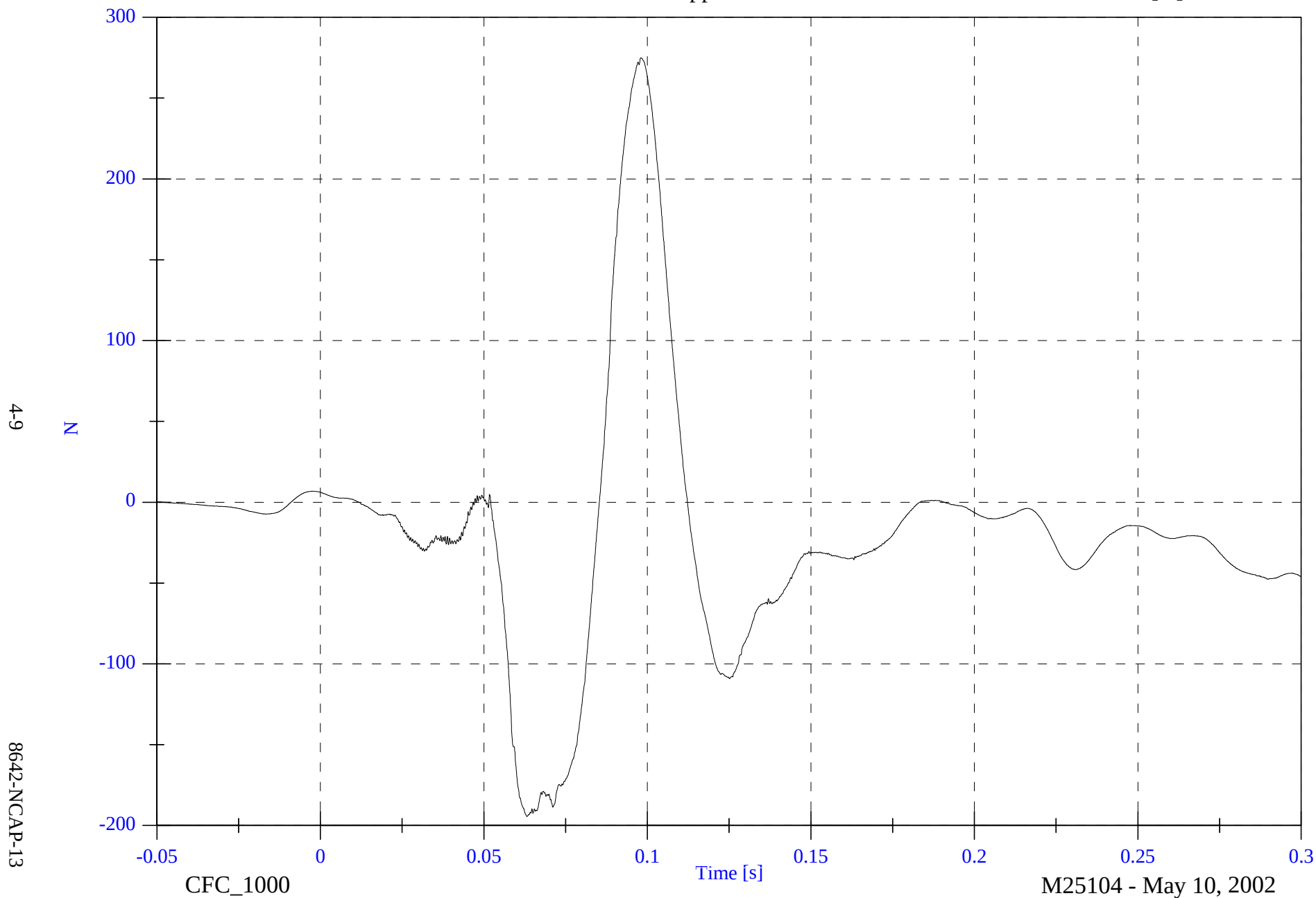


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Upper Neck Fx

Max: 274.9 [N] at 0.098 [s]

Min: -194.5 [N] at 0.063 [s]

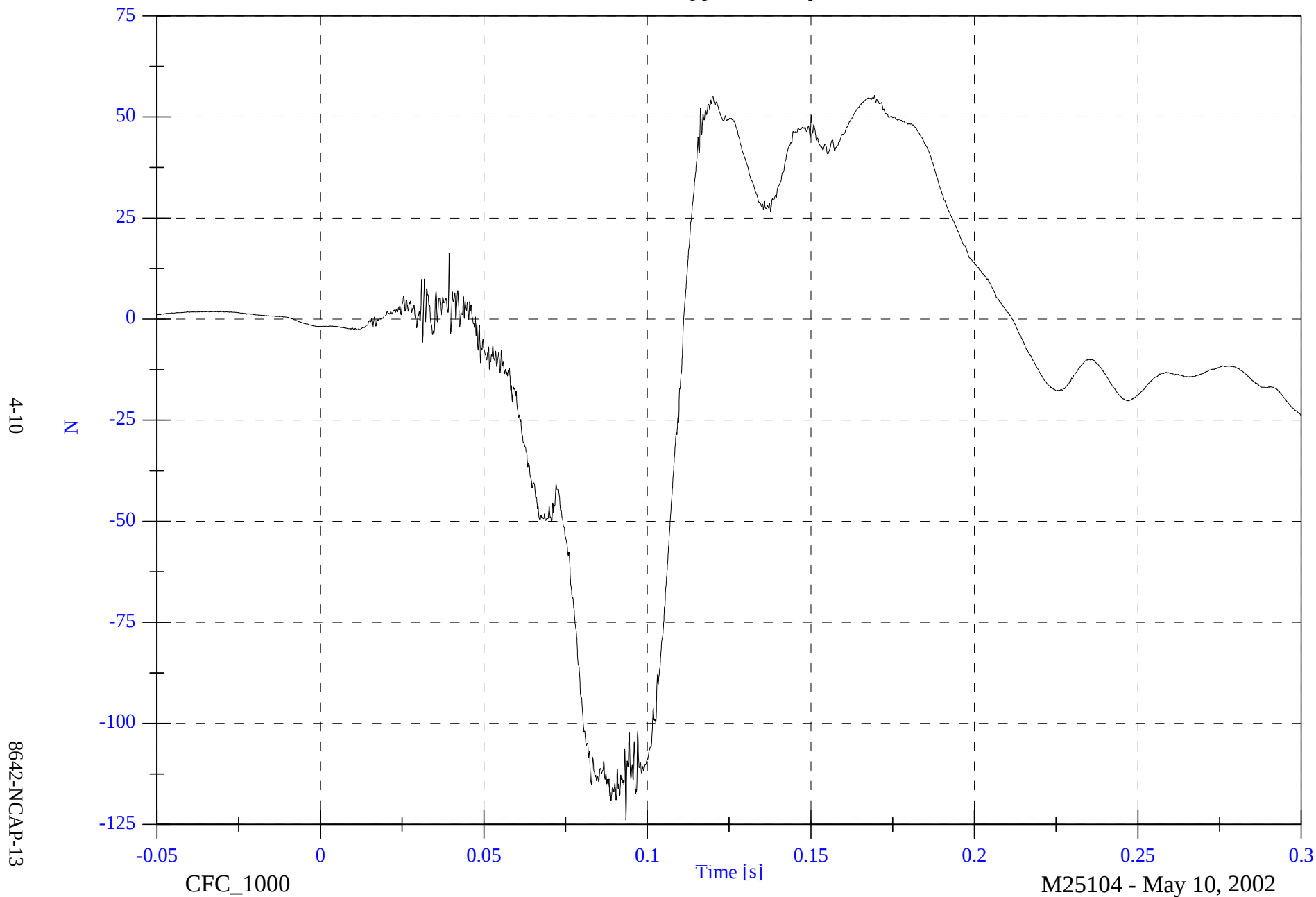


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P3 Upper Neck Fy

Max: 55.3 [N] at 0.170 [s]

Min: -123.9 [N] at 0.093 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

P3 Upper Neck Fz

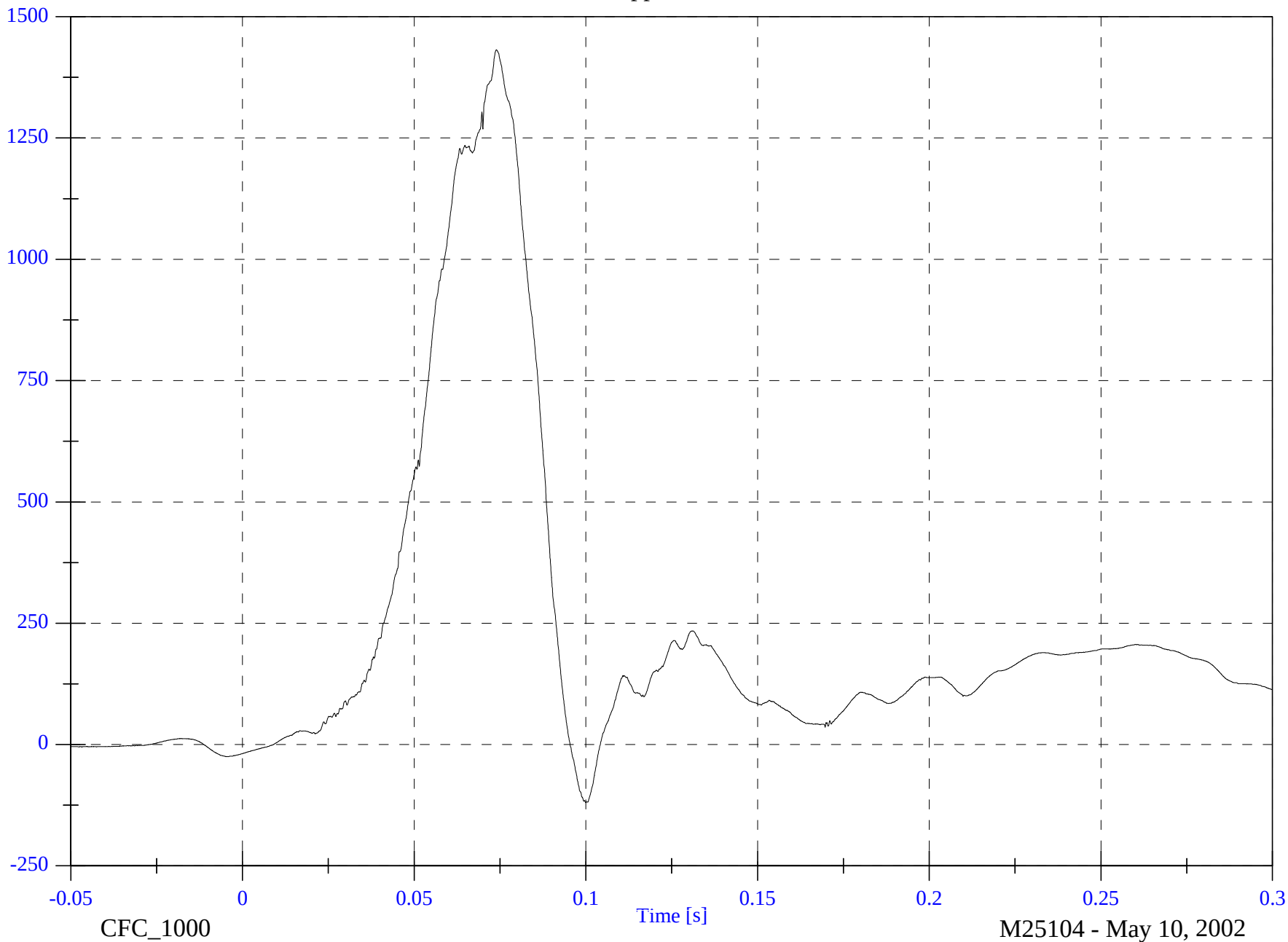
Max: 1431.9 [N] at 0.074 [s]

Min: -119.9 [N] at 0.100 [s]

4-11

N

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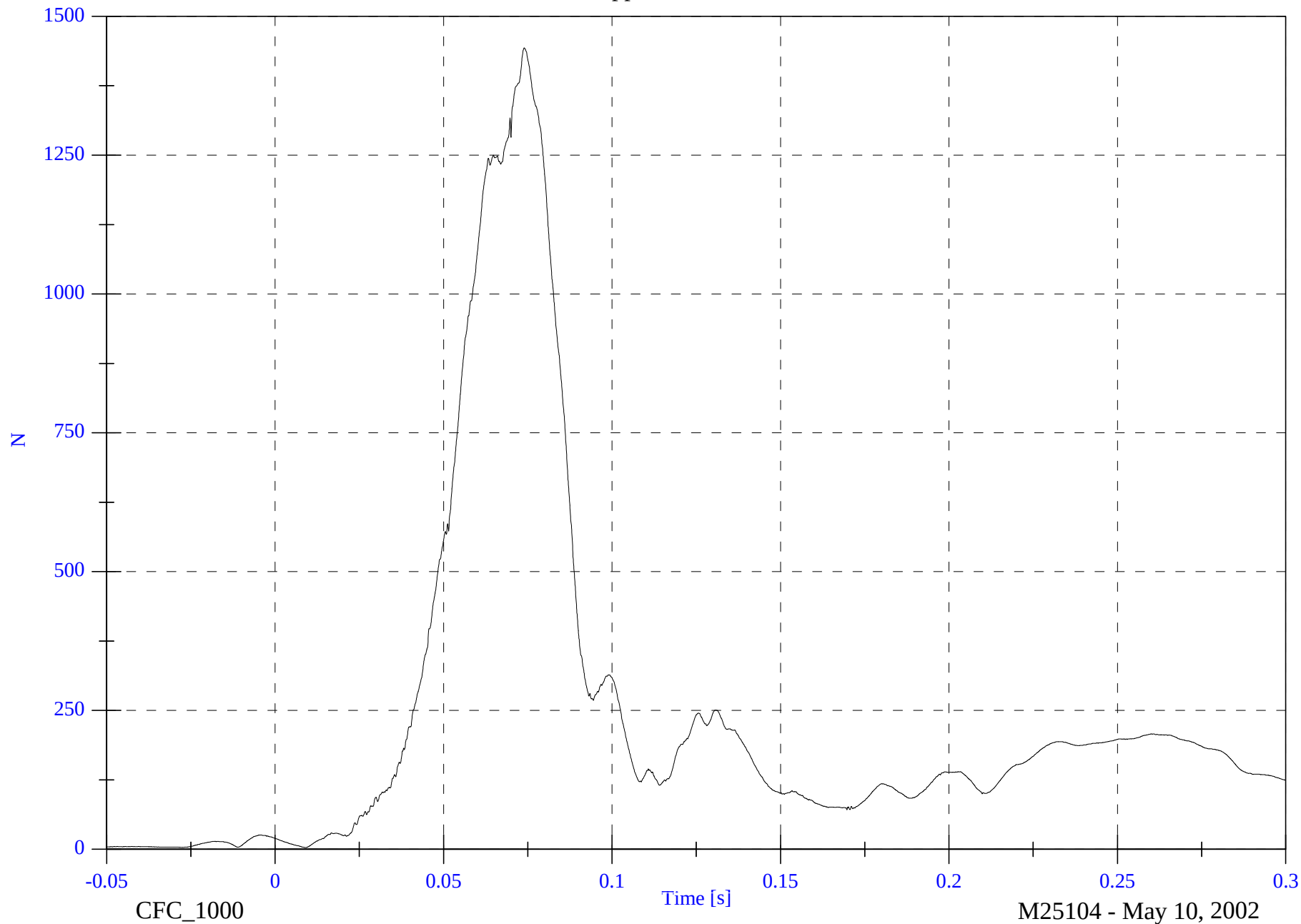
P3 Upper Neck F Resultant

Max: 1443.3 [N] at 0.074 [s]

Min: 3.2 [N] at 0.009 [s]

4-12

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

P3 Upper Neck Mx

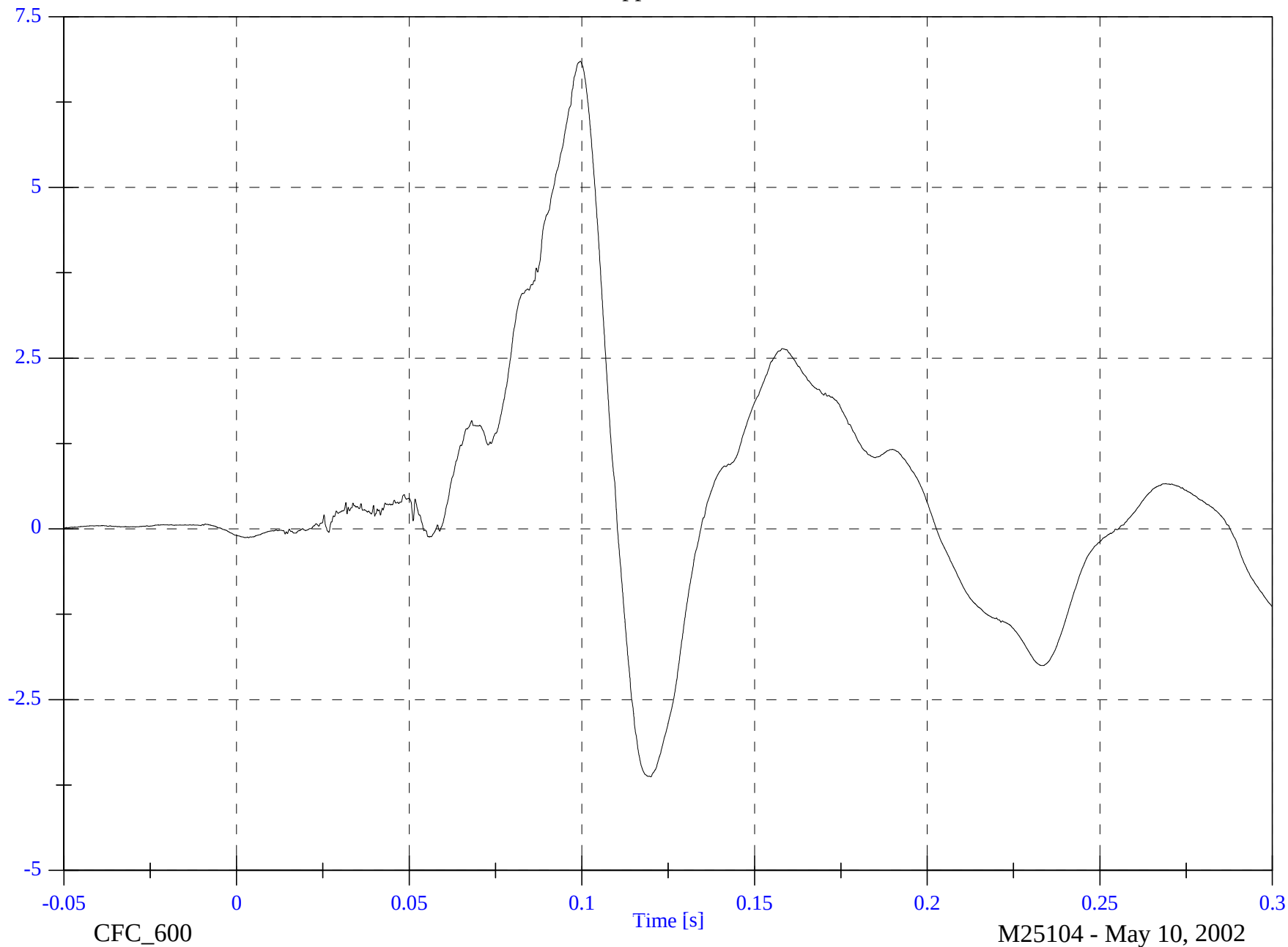
Max: 6.8 [N-m] at 0.100 [s]

Min: -3.6 [N-m] at 0.120 [s]

4-13

N-m

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

P3 Upper Neck My

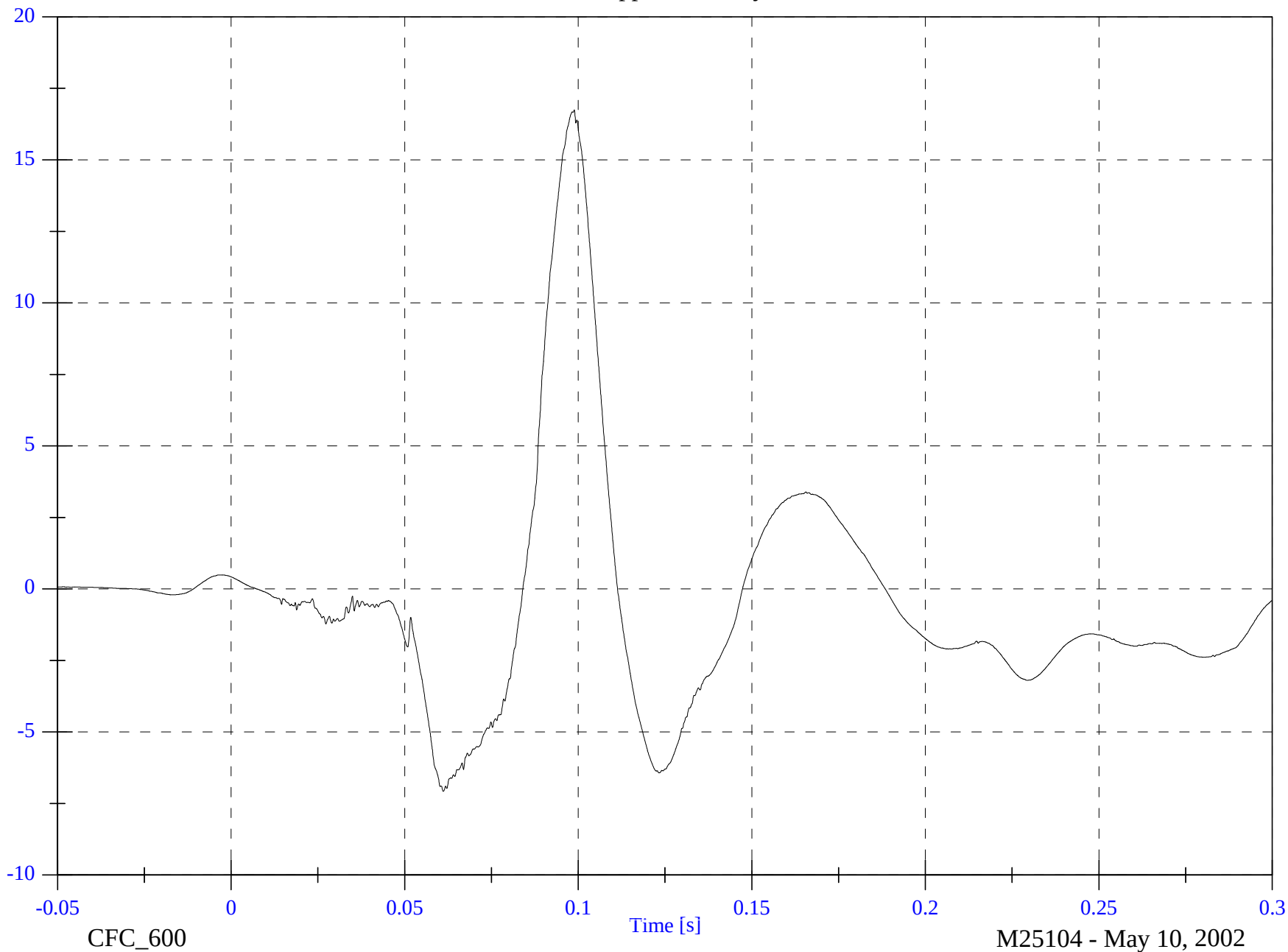
Max: 16.7 [N-m] at 0.099 [s]

Min: -7.1 [N-m] at 0.061 [s]

4-14

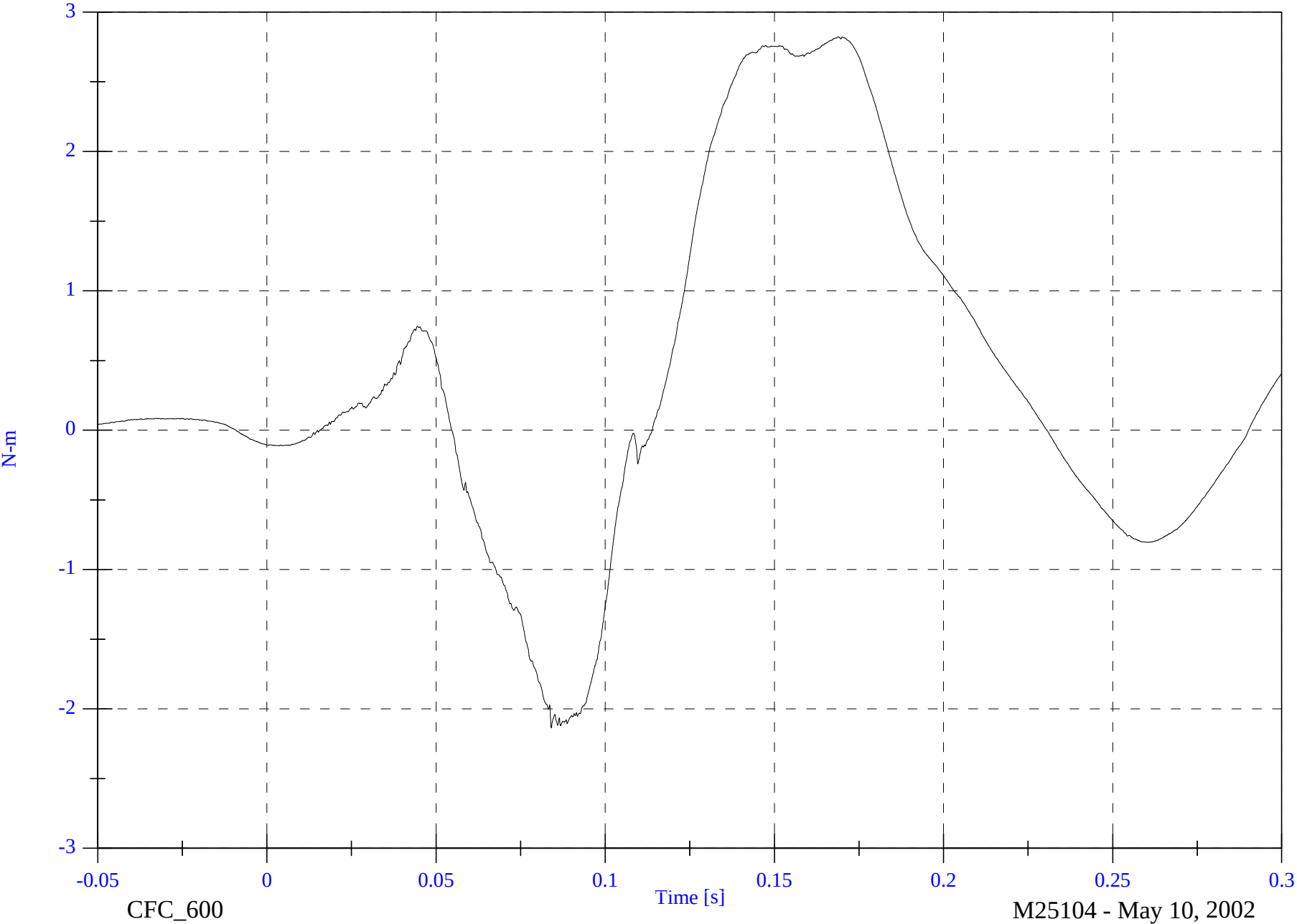
N-m

8642-NCAP-13



4-15

8642-NCAP-13

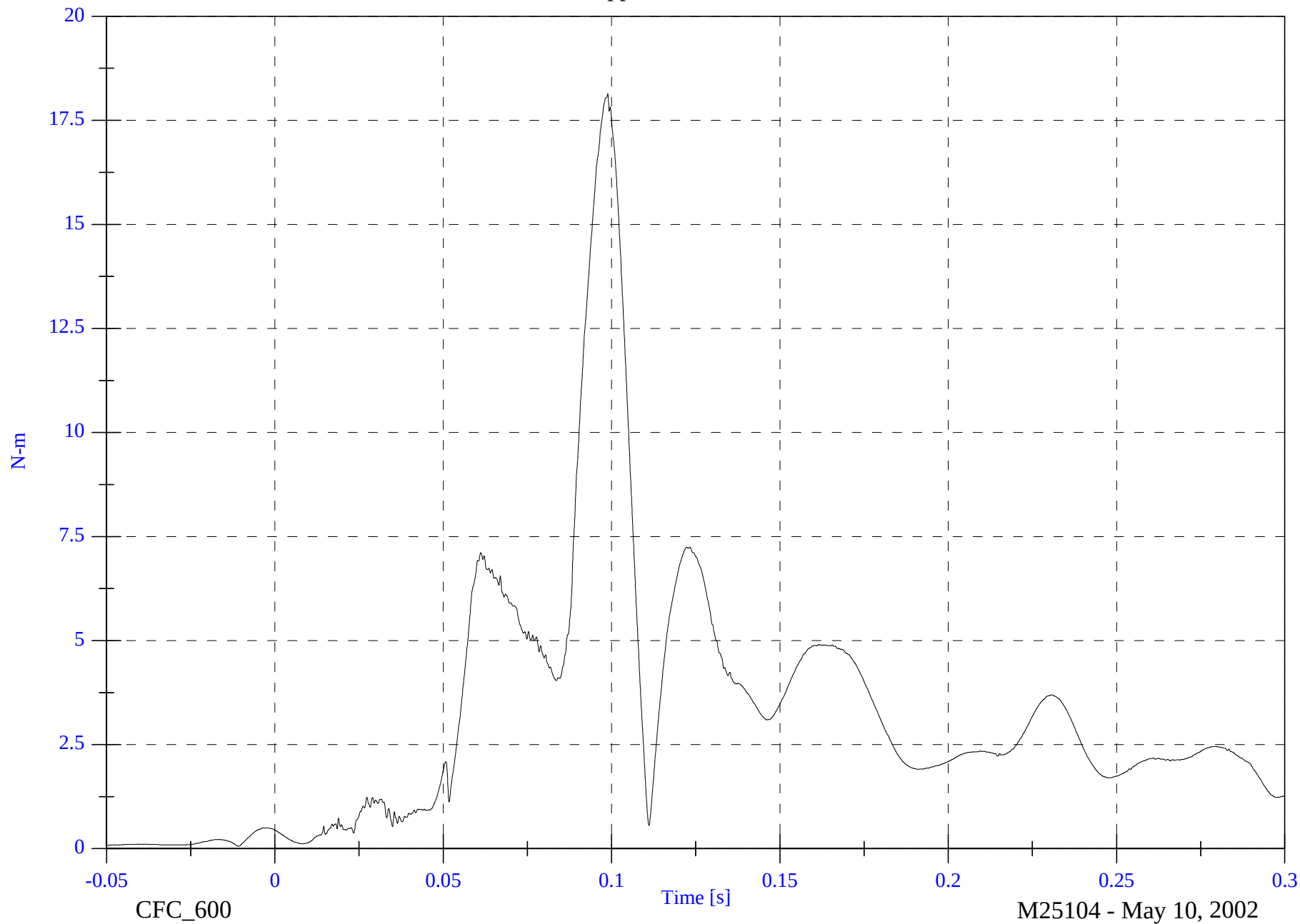


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Upper Neck M Resultant

Max: 18.1 [N-m] at 0.099 [s]

Min: 0.1 [N-m] at -0.011 [s]



4-16

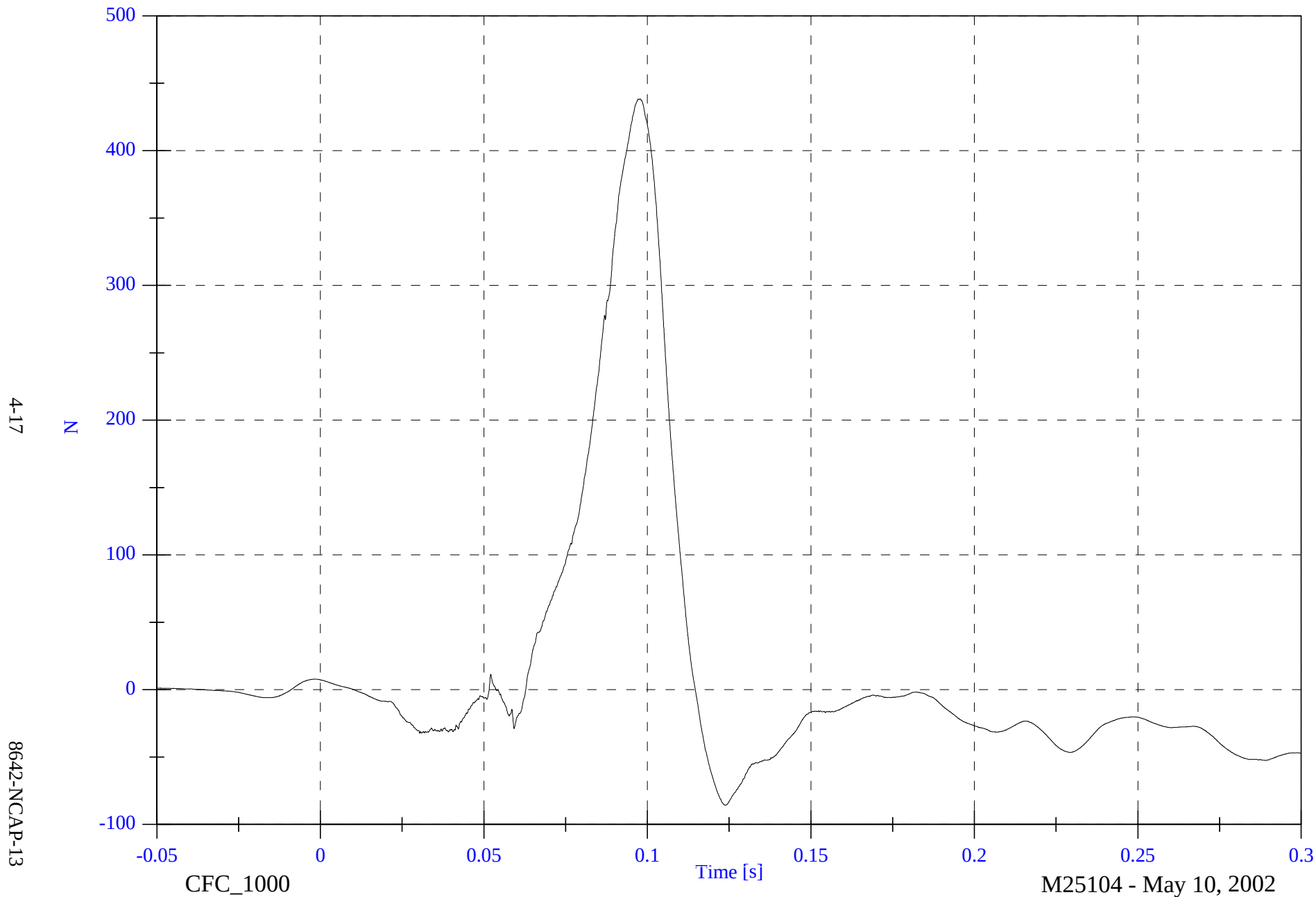
8642-NCAP-13

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Max: 438.4 [N] at 0.098 [s]

Min: -85.7 [N] at 0.124 [s]

P3 Lower Neck Fx



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P3 Lower Neck Fy

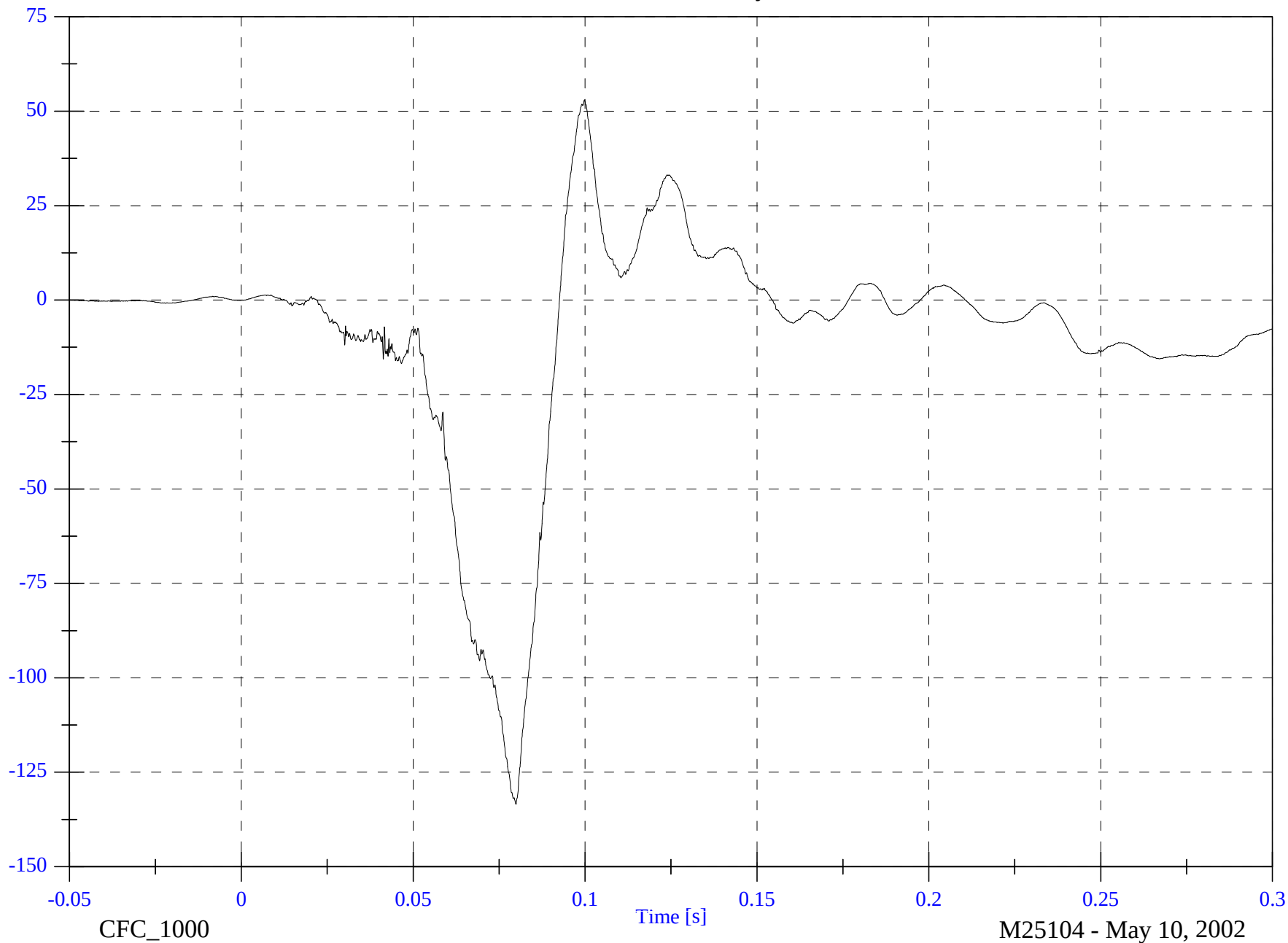
Max: 53.0 [N] at 0.100 [s]

Min: -133.5 [N] at 0.080 [s]

4-18

N

8642-NCAP-13

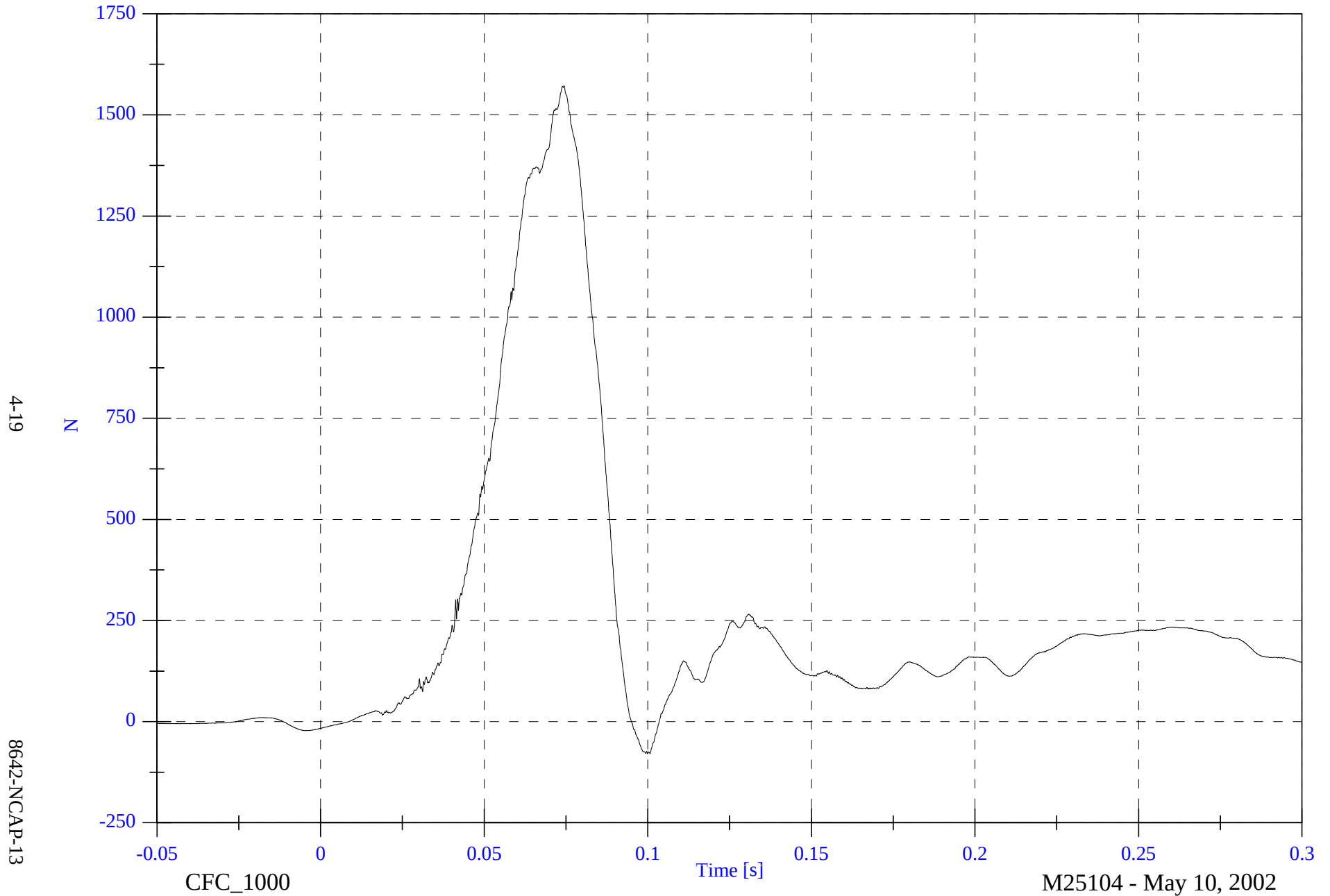


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P3 Lower Neck Fz

Max: 1572.4 [N] at 0.074 [s]

Min: -79.4 [N] at 0.100 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lower Neck F Resultant

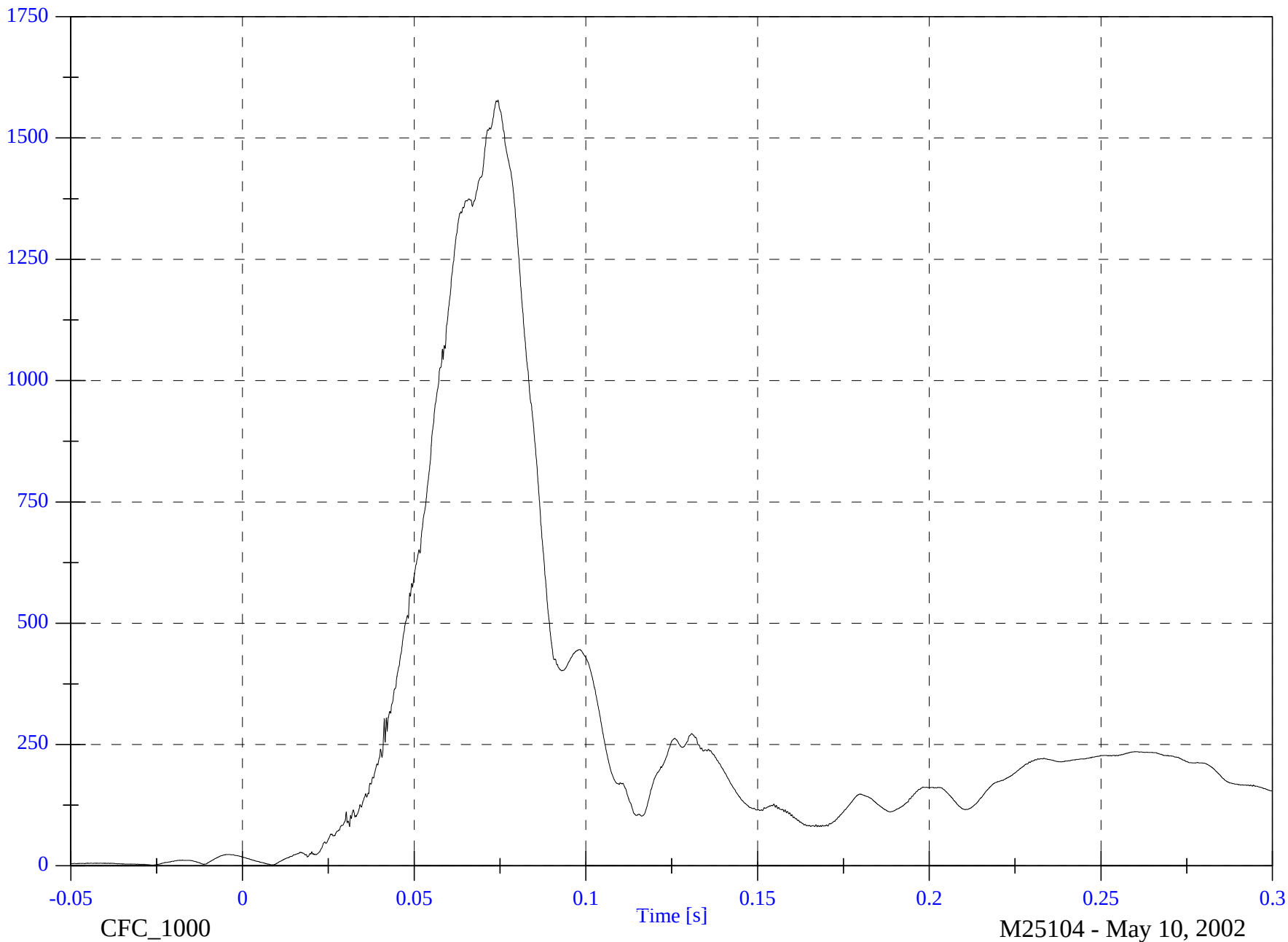
Max: 1578.6 [N] at 0.074 [s]

Min: 1.6 [N] at -0.027 [s]

4-20

N

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

Max: 5.4 [N-m] at 0.164 [s]

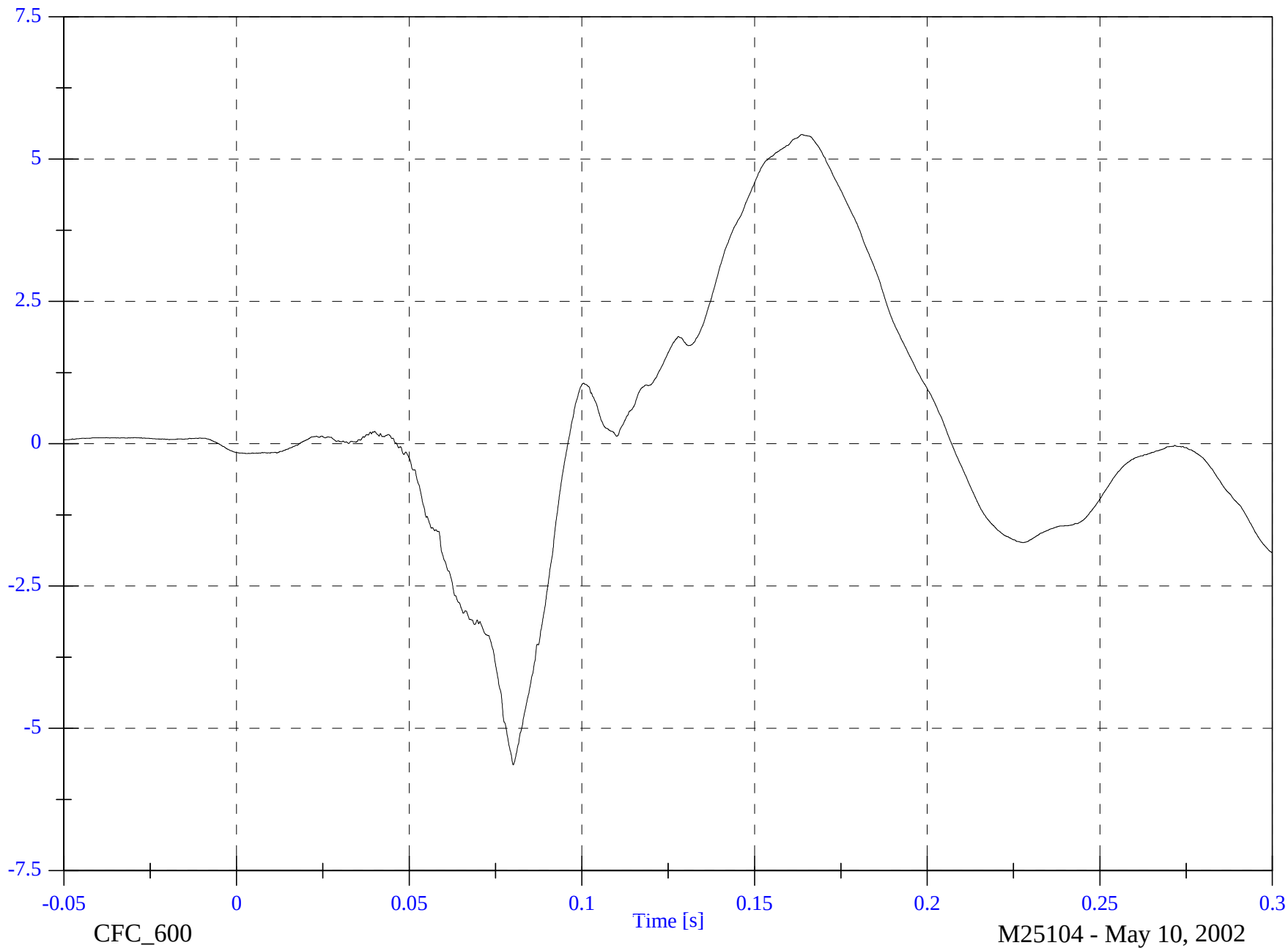
Min: -5.6 [N-m] at 0.080 [s]

P3 Lower Neck Mx

4-21

N-m

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

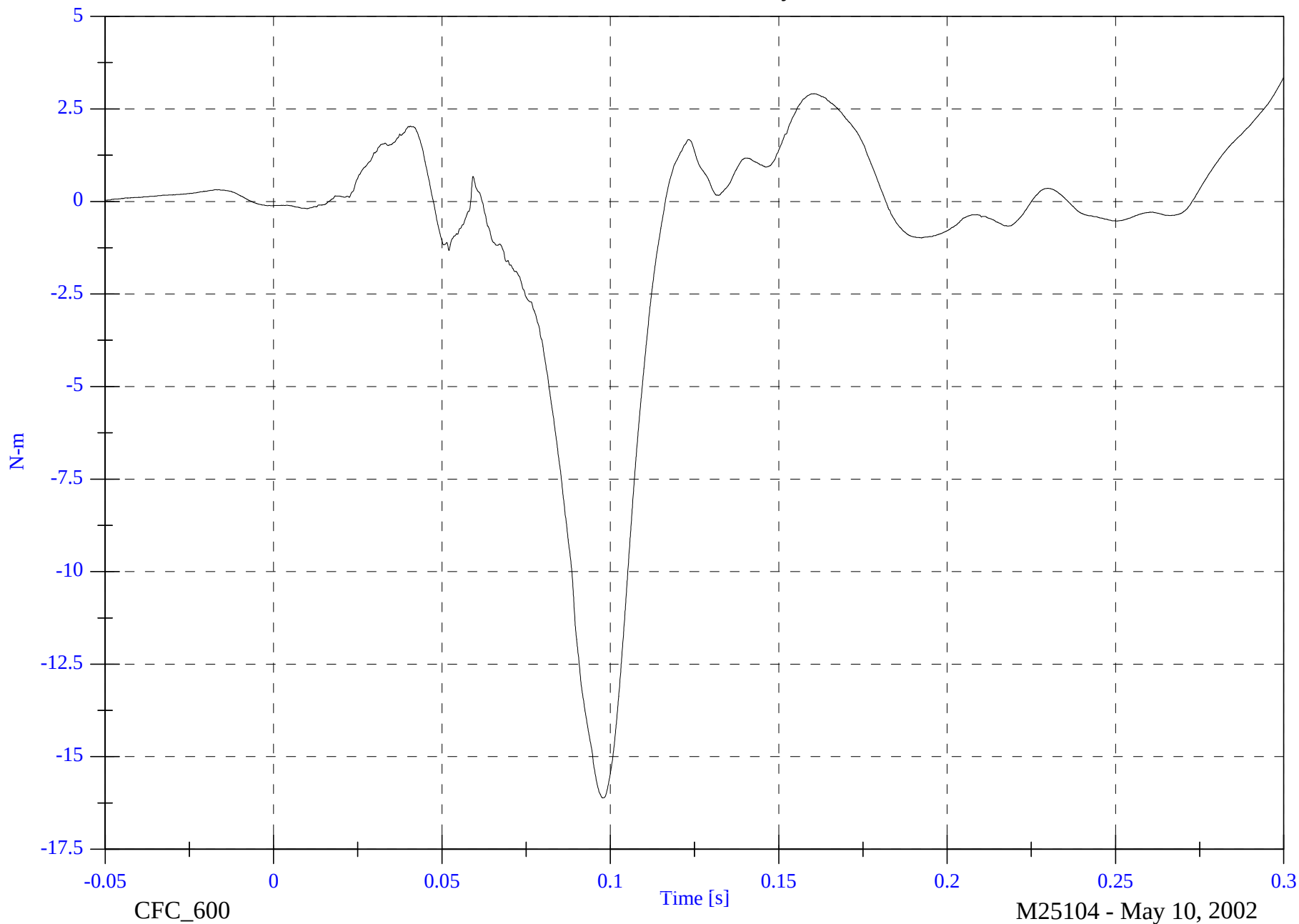
P3 Lower Neck My

Max: 3.4 [N-m] at 0.300 [s]

Min: -16.1 [N-m] at 0.098 [s]

4-22

8642-NCAP-13

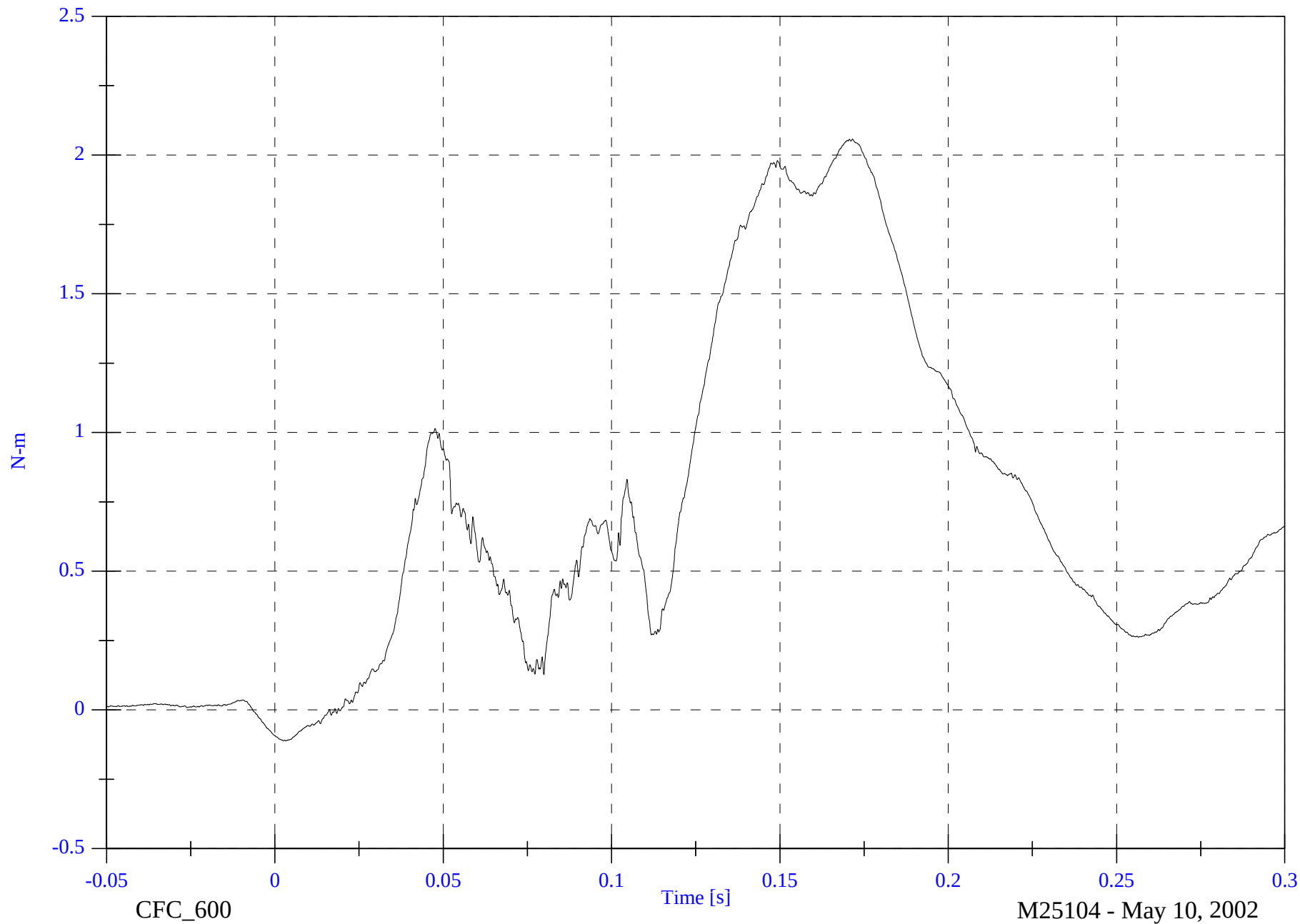


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lower Neck Mz

Max: 2.1 [N-m] at 0.172 [s]

Min: -0.1 [N-m] at 0.003 [s]

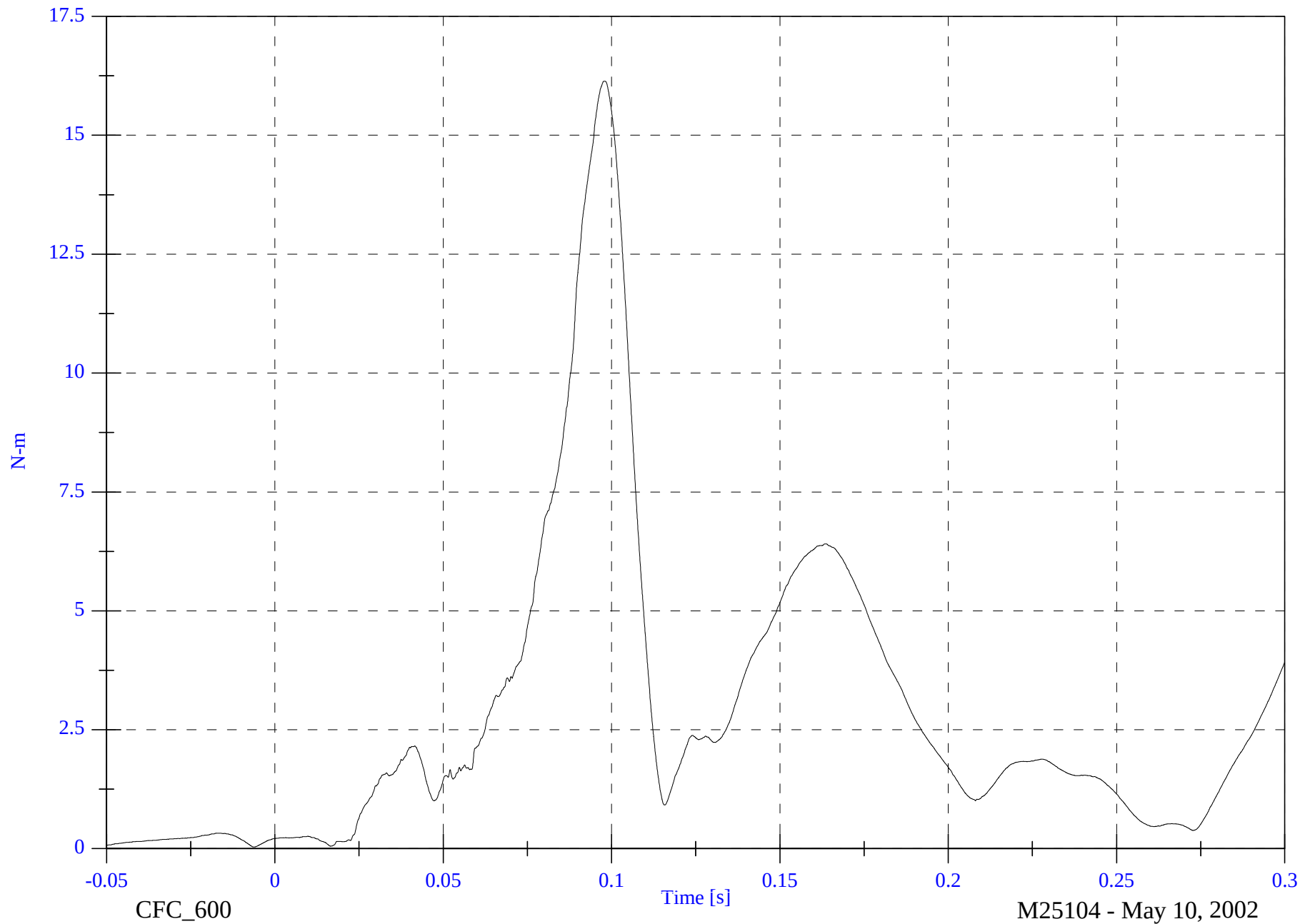


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lower Neck M Resultant

Max: 16.1 [N-m] at 0.098 [s]

Min: 0.0 [N-m] at -0.006 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

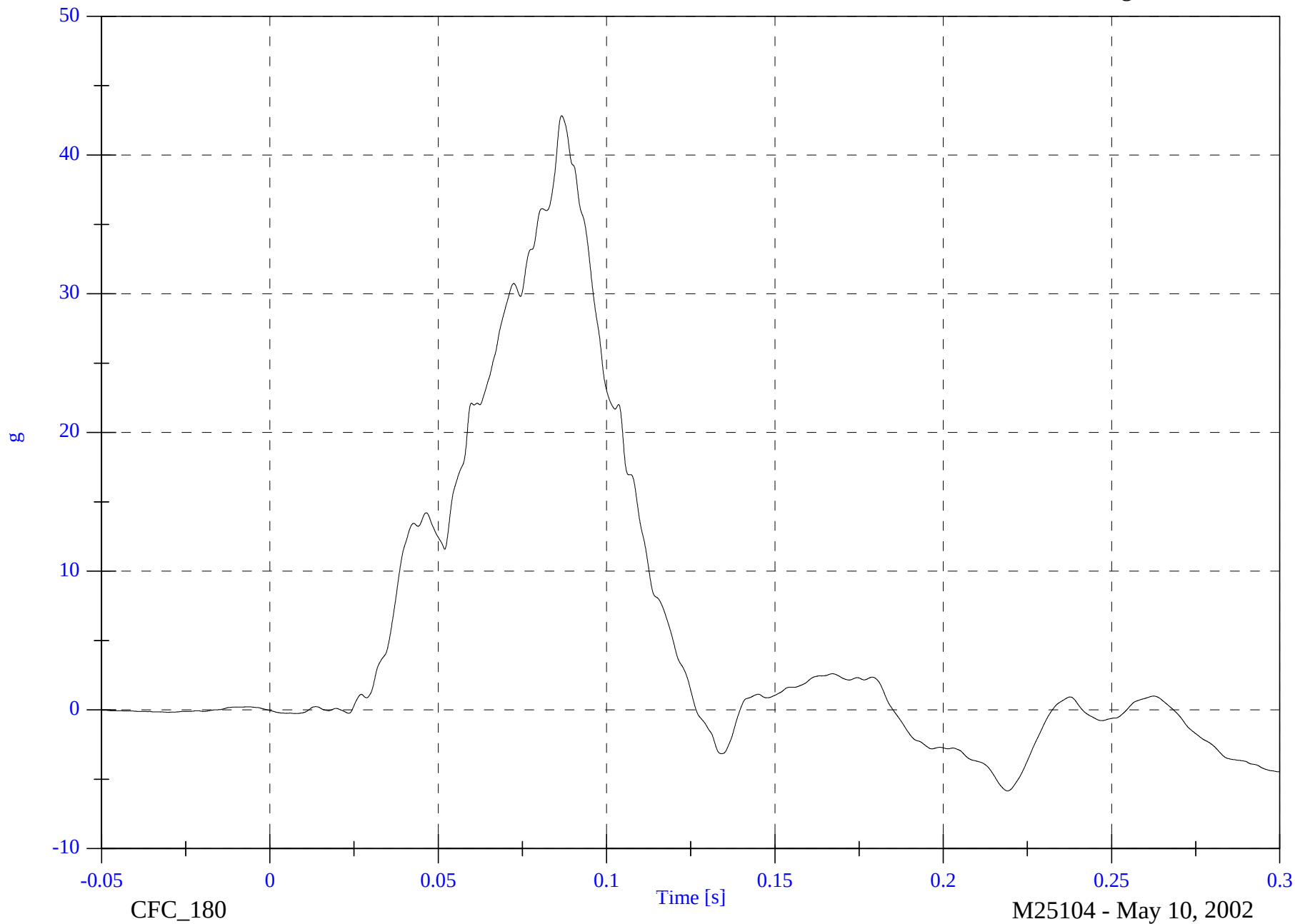
P3 Chest x

Max: 42.8 [g] at 0.087 [s]

Min: -5.8 [g] at 0.219 [s]

4-25

8642-NCAP-13

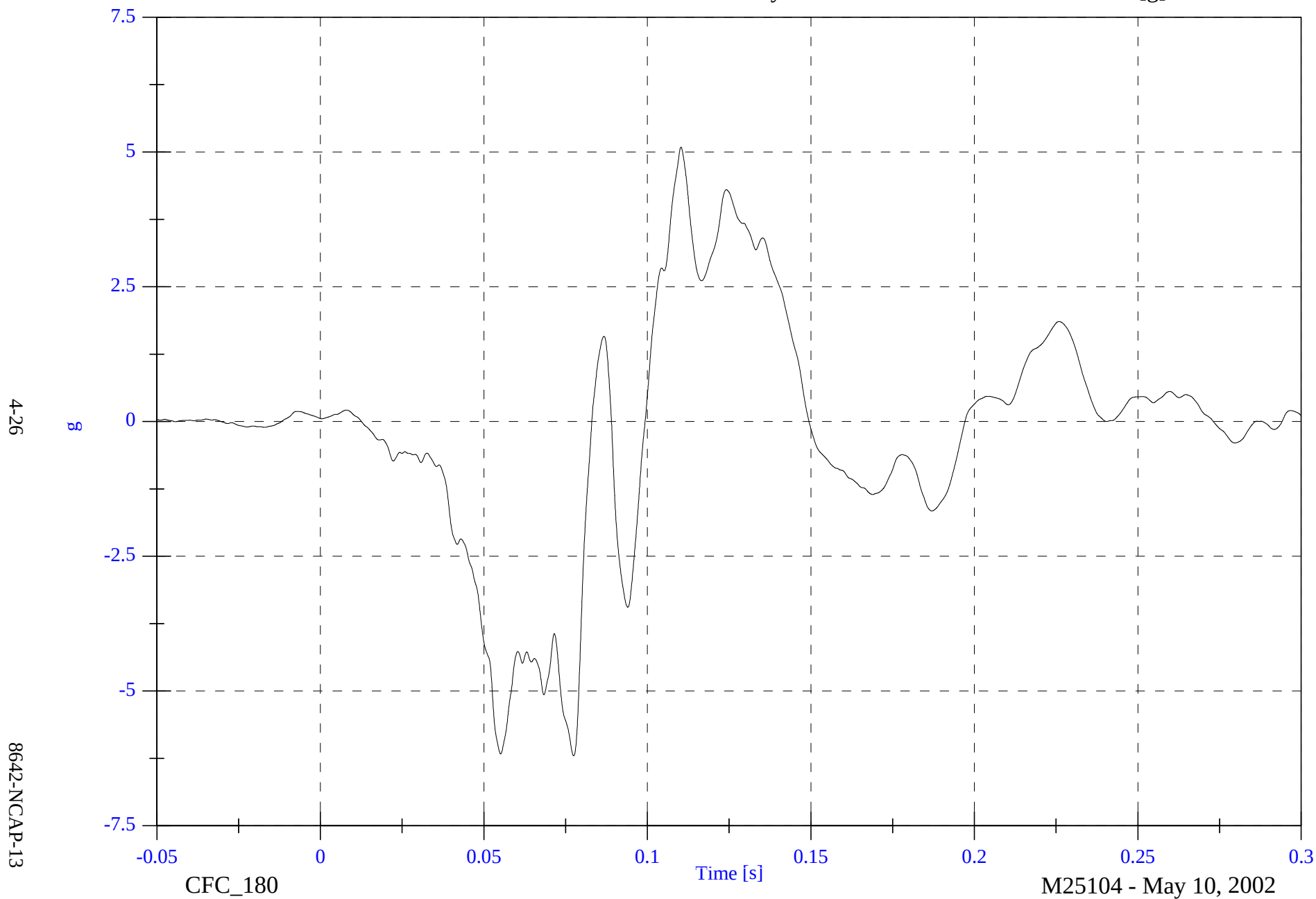


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 5.1 [g] at 0.110 [s]

Min: -6.2 [g] at 0.077 [s]

P3 Chest y



2002 NCAP Test 13 - 2002 Toyota Camry

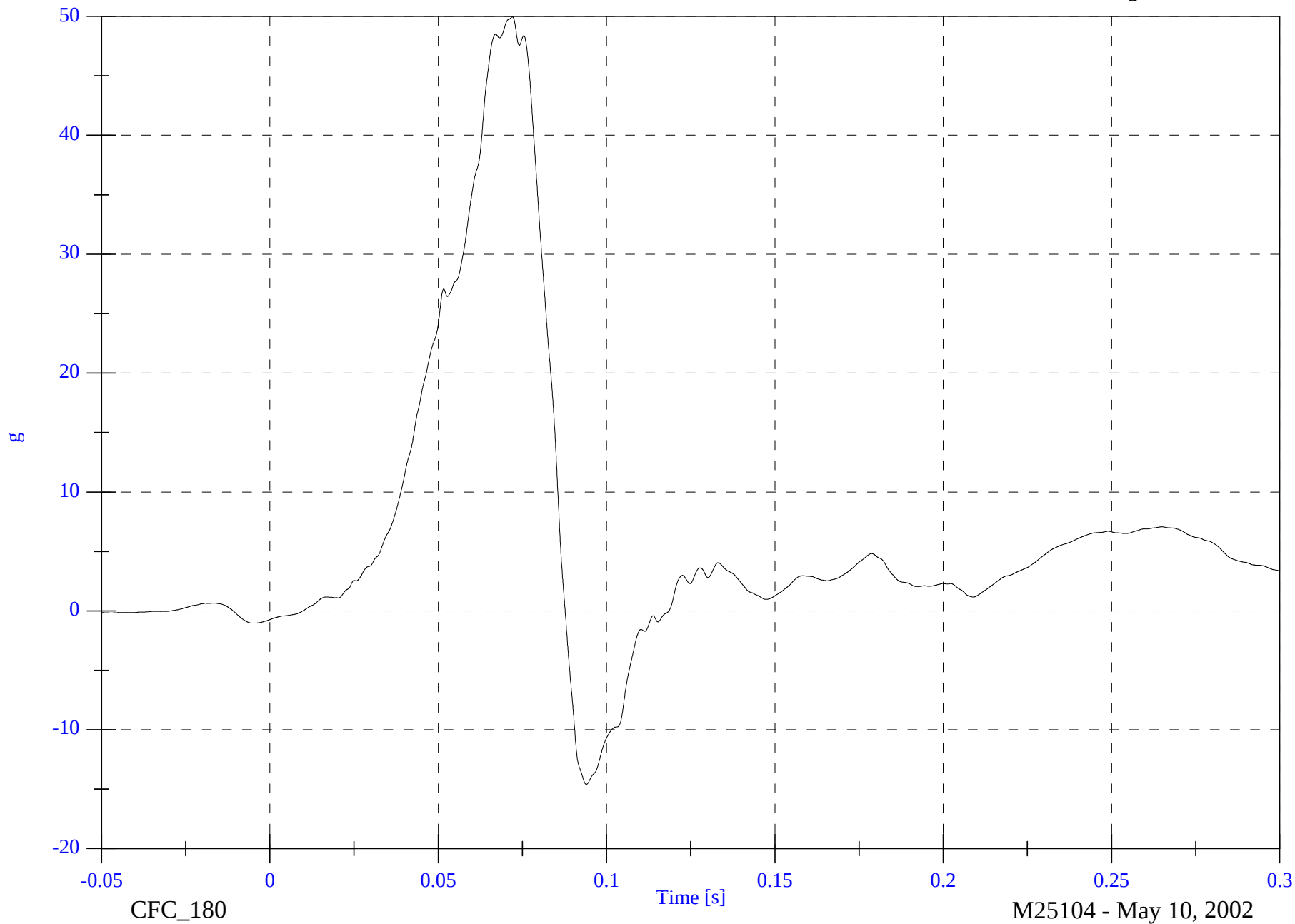
P3 Chest z

Max: 50.0 [g] at 0.072 [s]

Min: -14.6 [g] at 0.094 [s]

4-27

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

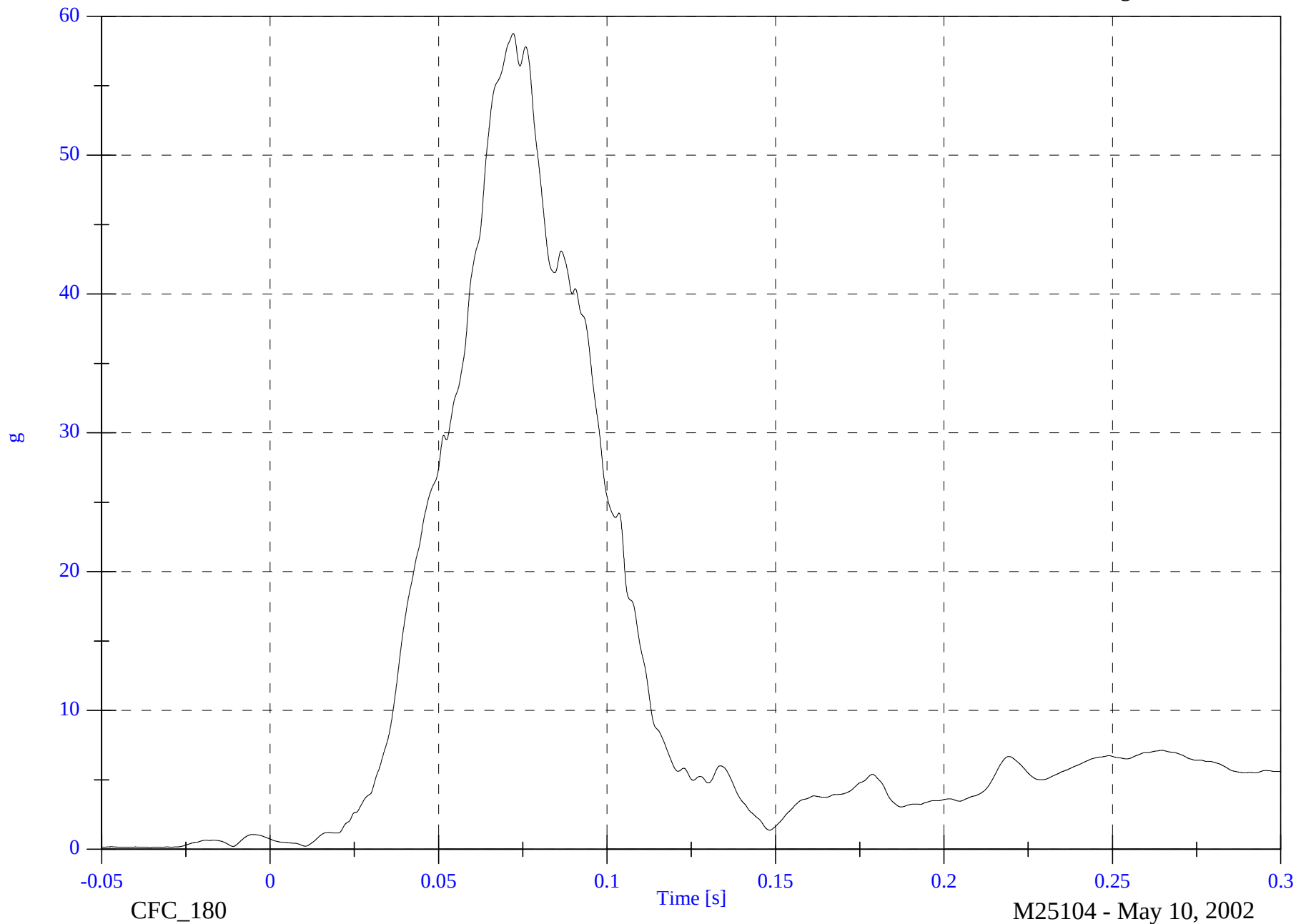
P3 Chest Resultant

Max: 58.8 [g] at 0.072 [s]

Min: 0.1 [g] at -0.036 [s]

4-28

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

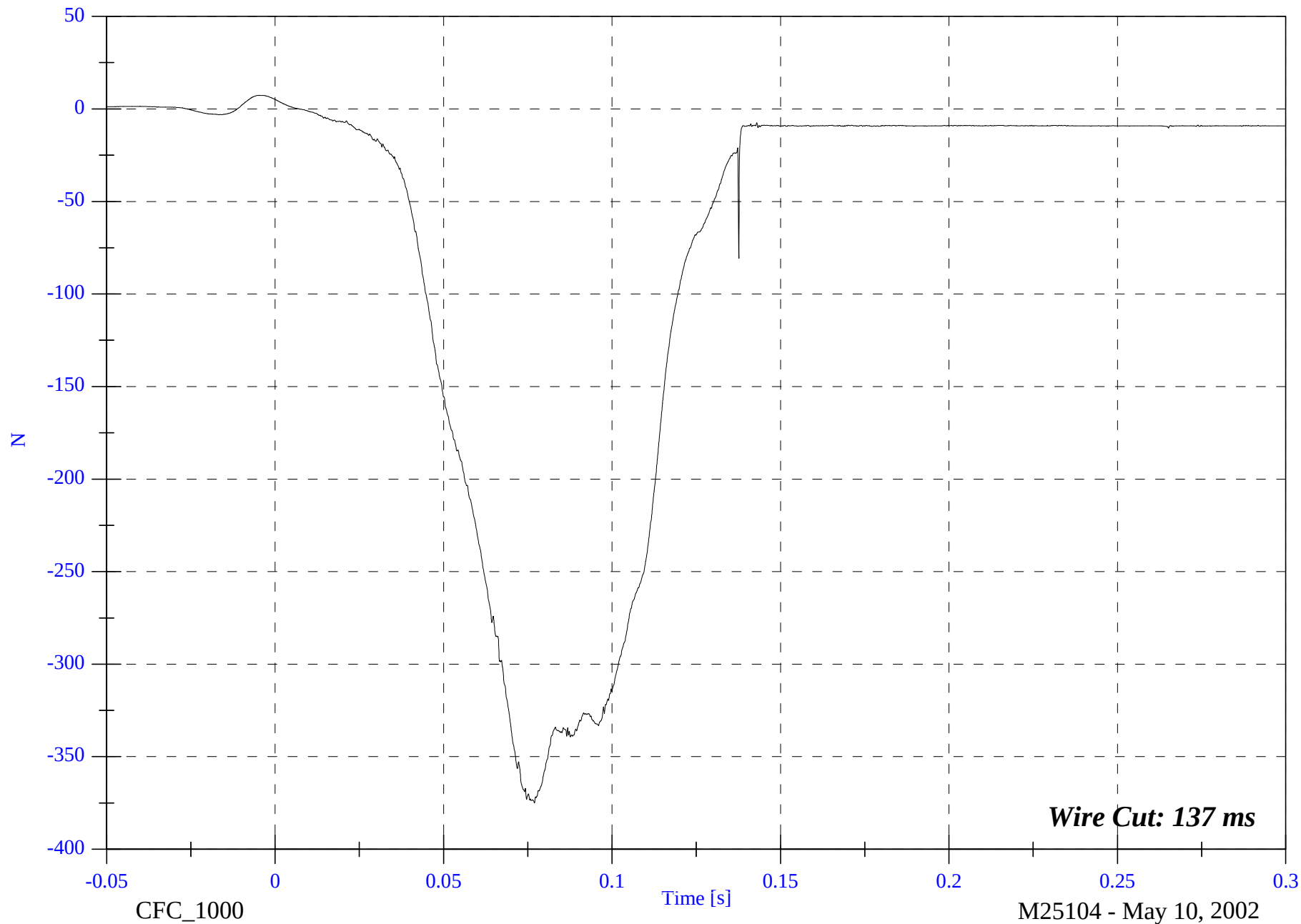
Max: 7.3 [N] at -0.005 [s]

Min: -375.0 [N] at 0.077 [s]

P3 Lumbar Fx

4-29

8642-NCAP-13

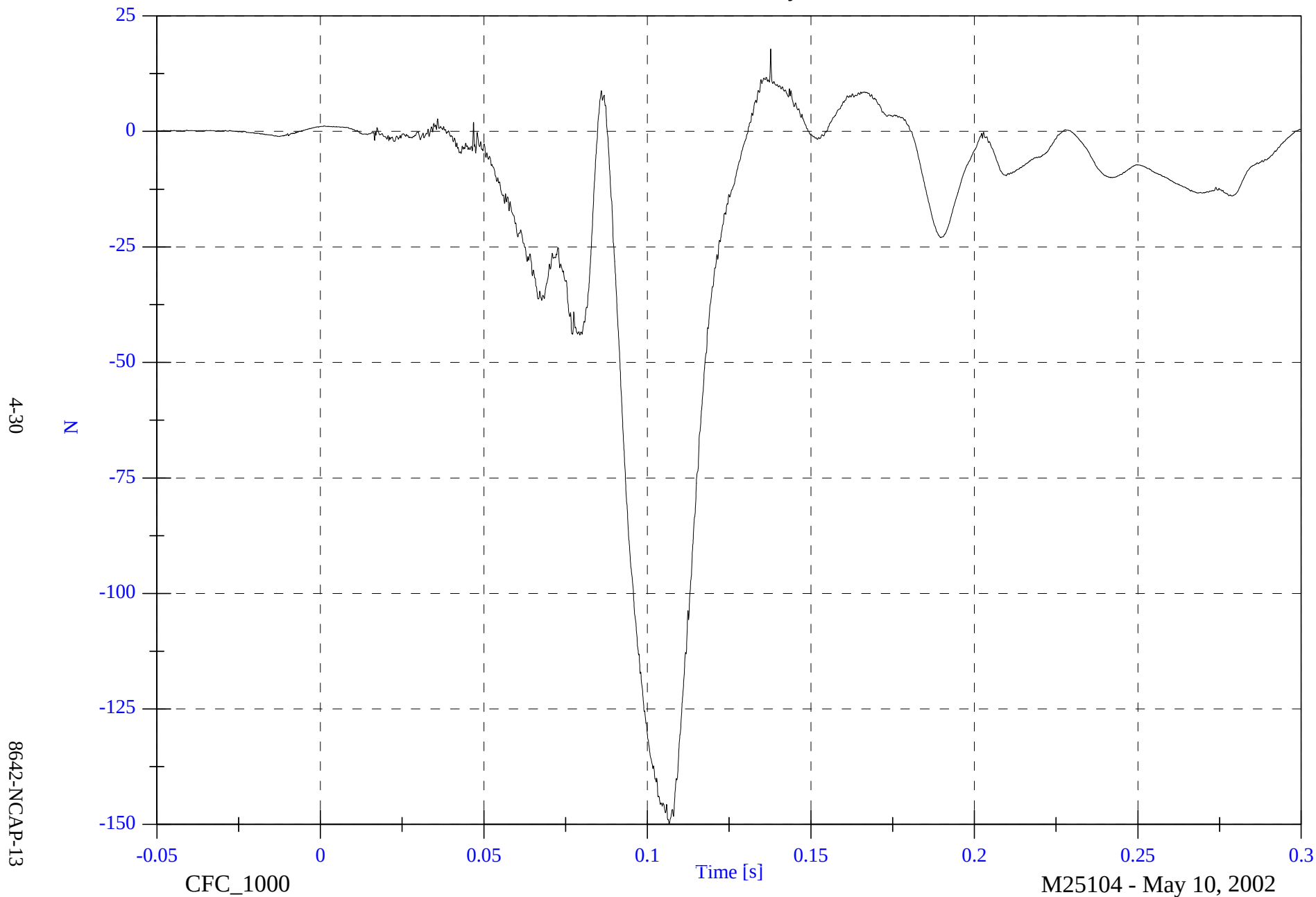


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lumbar Fy

Max: 17.8 [N] at 0.138 [s]

Min: -150.0 [N] at 0.107 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

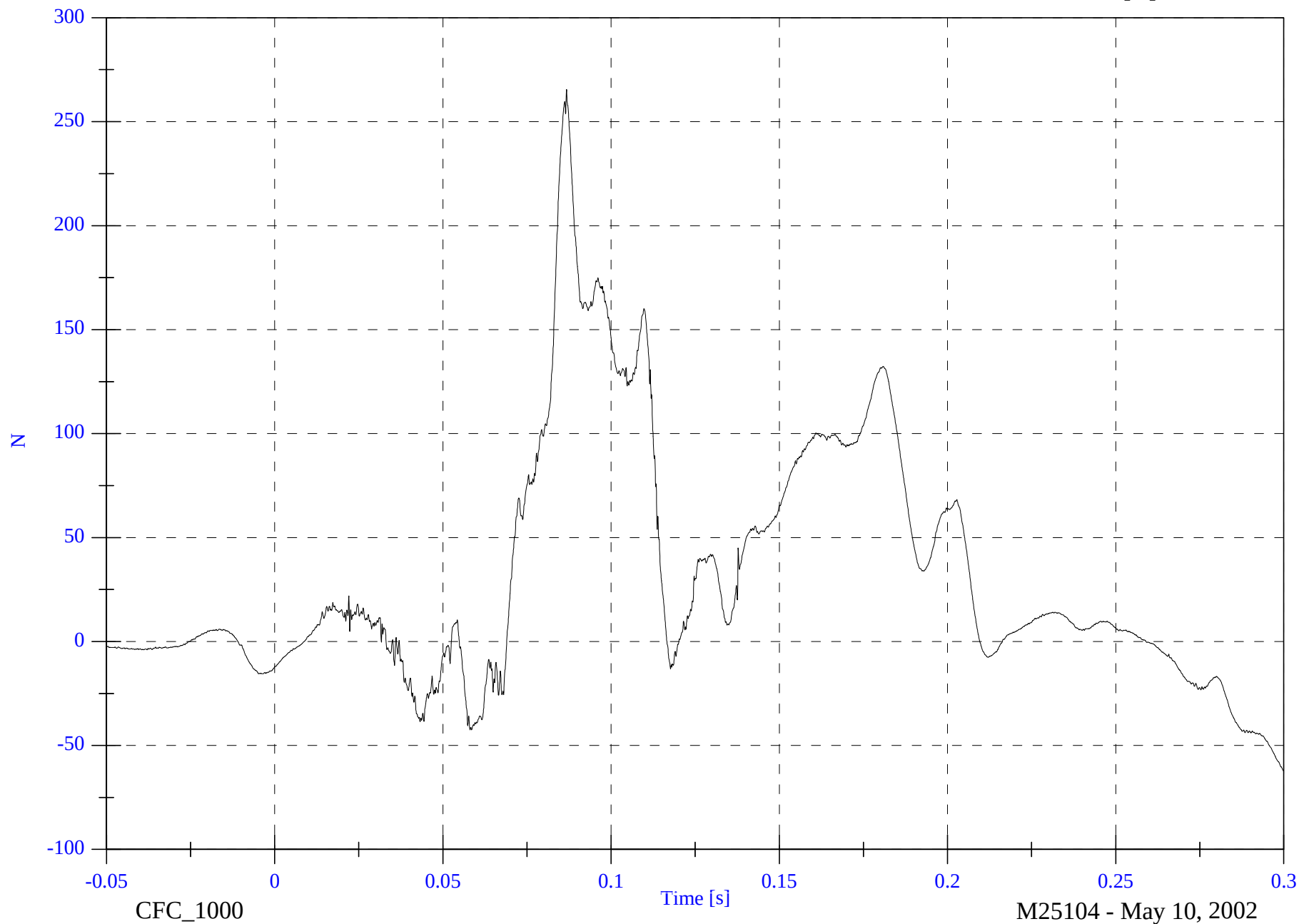
P3 Lumbar Fz

Max: 265.5 [N] at 0.087 [s]

Min: -62.5 [N] at 0.300 [s]

4-31

8642-NCAP-13

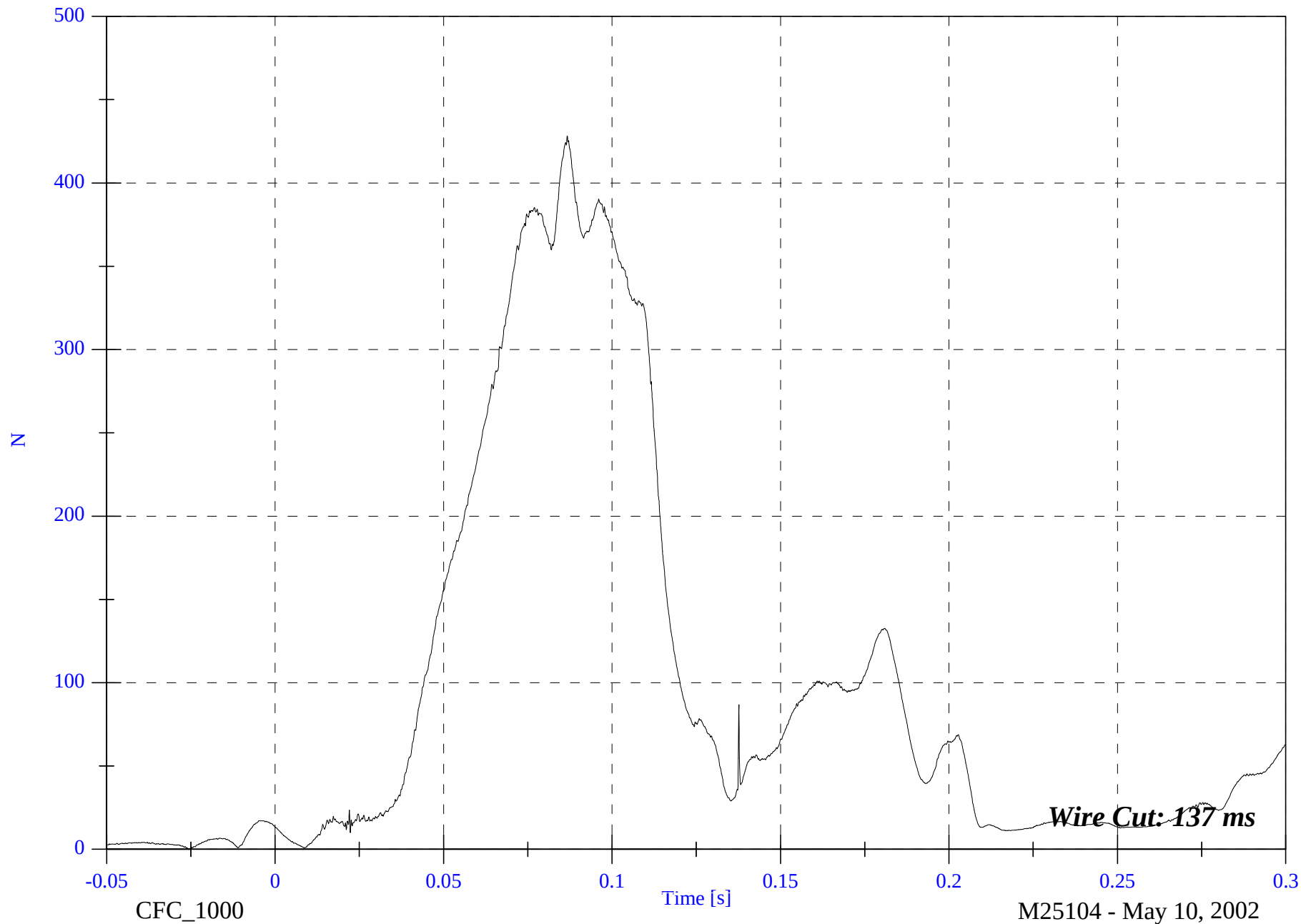


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lumbar F Resultant

Max: 428.2 [N] at 0.087 [s]

Min: 0.2 [N] at -0.026 [s]

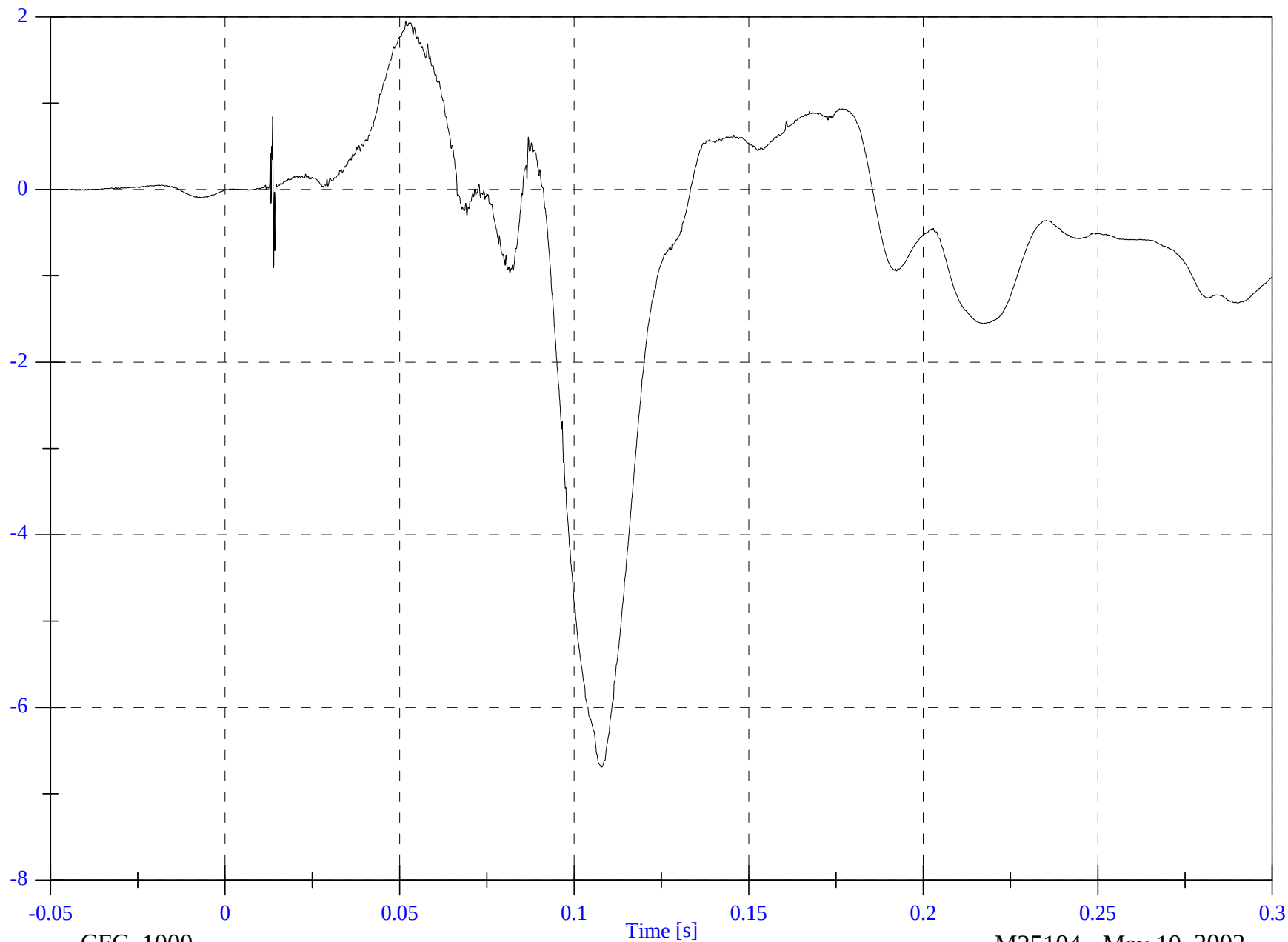


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lumbar Mx

Max: 1.9 [N-m] at 0.052 [s]

Min: -6.7 [N-m] at 0.108 [s]



4-33

8642-NCAP-13

CFC_1000

M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

Max: 11.5 [N-m] at 0.104 [s]

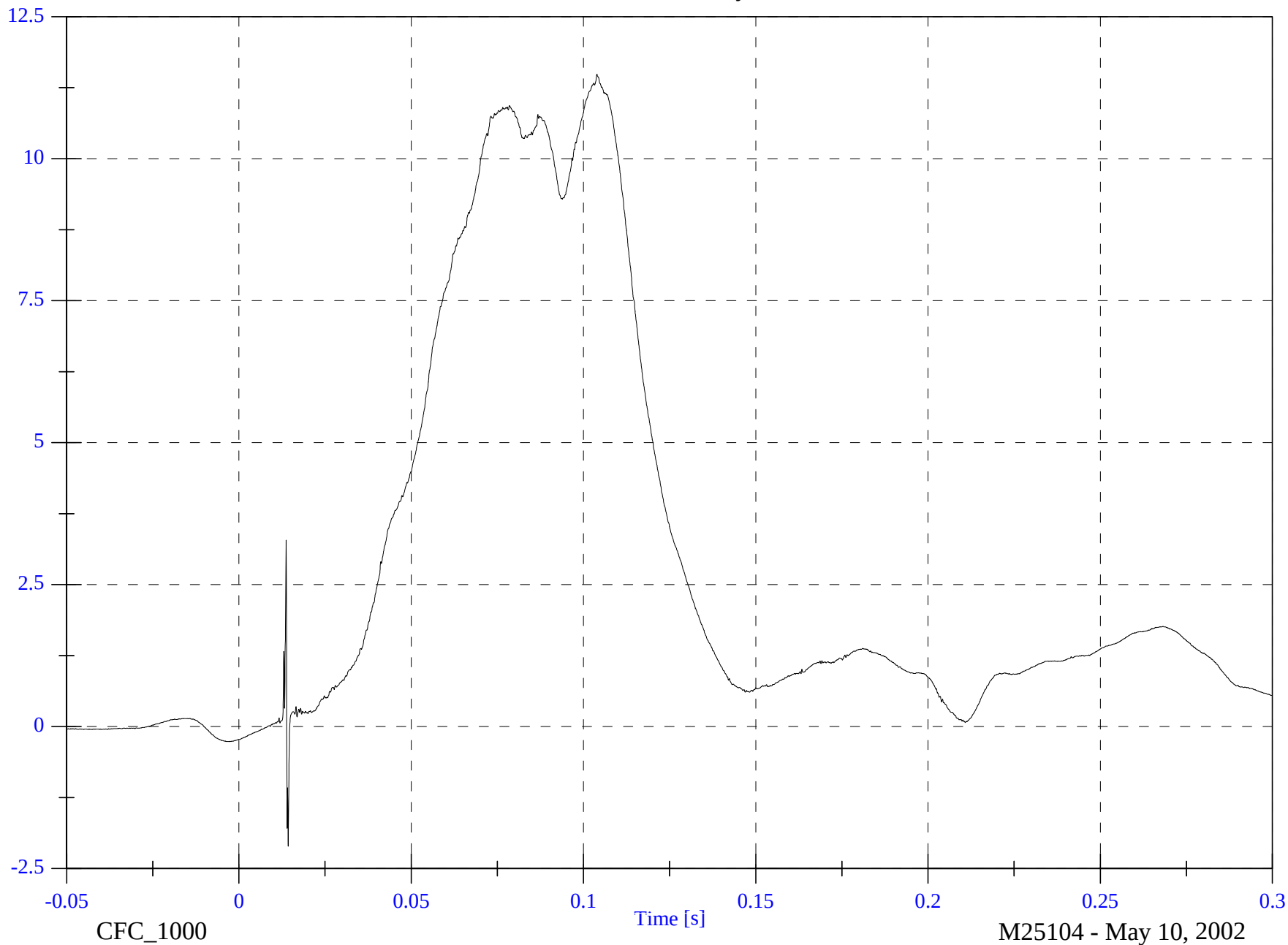
Min: -2.1 [N-m] at 0.014 [s]

P3 Lumbar My

4-34

N-m

8642-NCAP-13

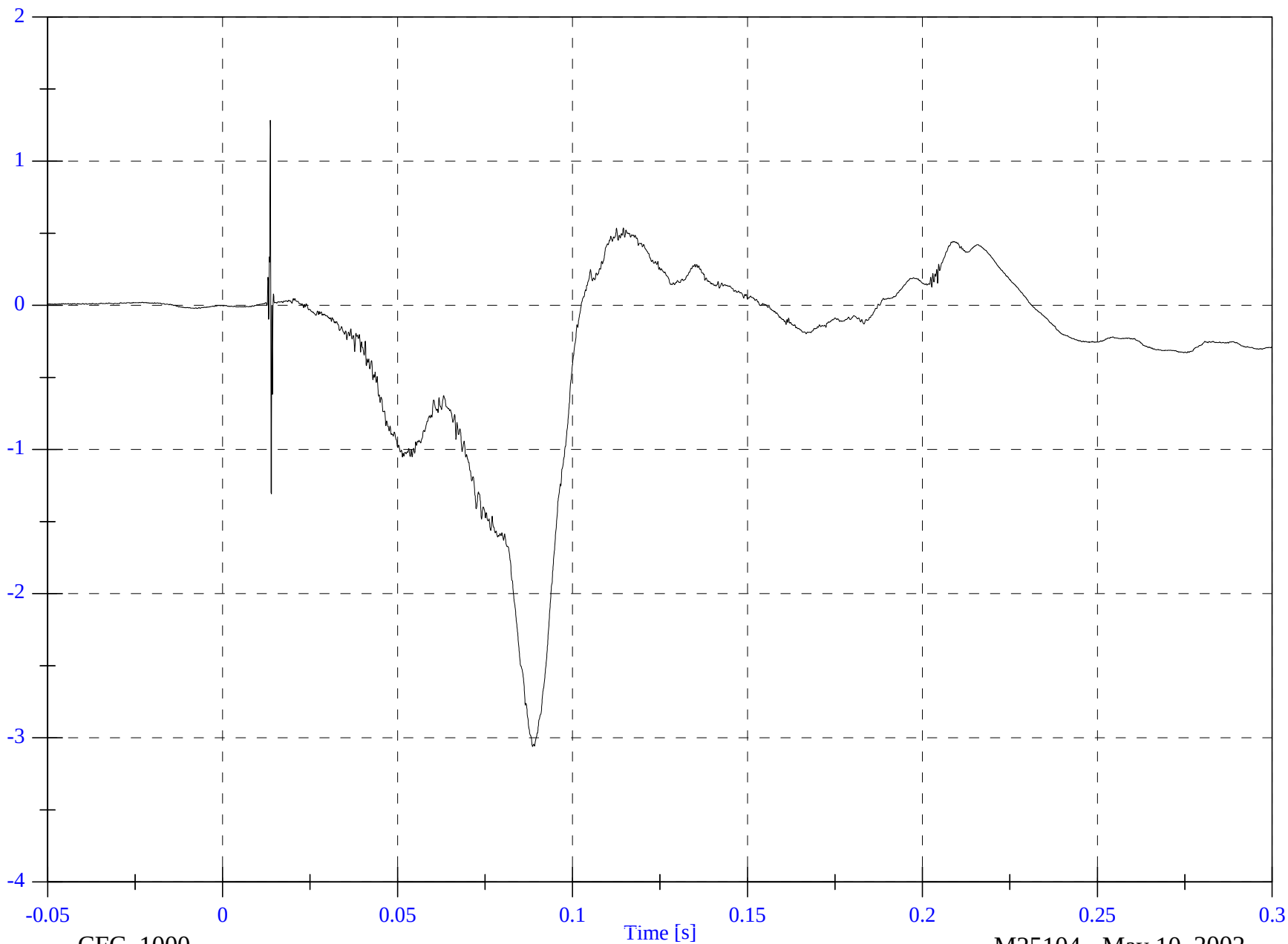


2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lumbar Mz

Max: 1.3 [N-m] at 0.014 [s]

Min: -3.1 [N-m] at 0.089 [s]



4-35

8642-NCAP-13

CFC_1000

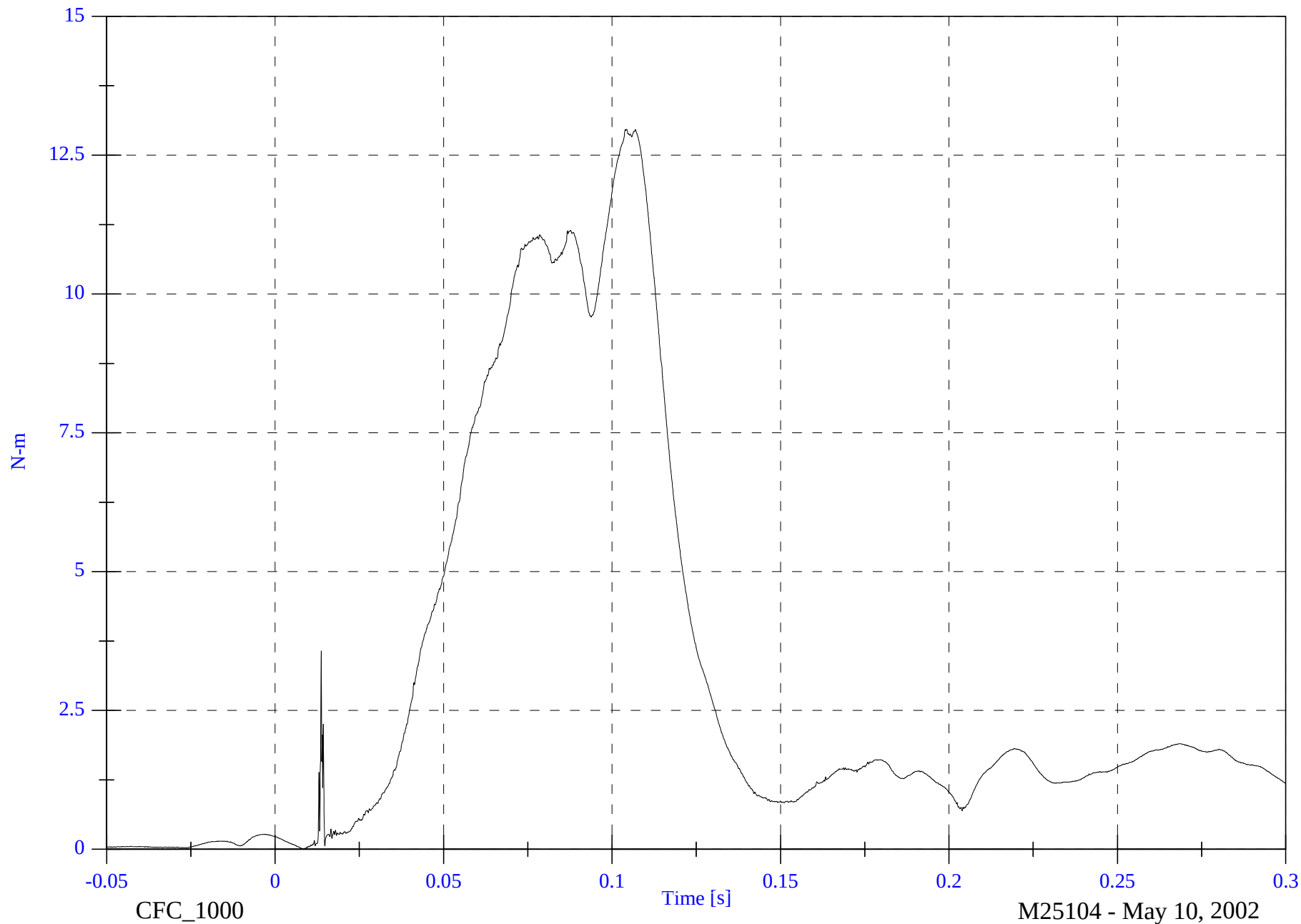
M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

P3 Lumbar M Resultant

Max: 13.0 [N-m] at 0.104 [s]

Min: 0.0 [N-m] at 0.008 [s]



4-36

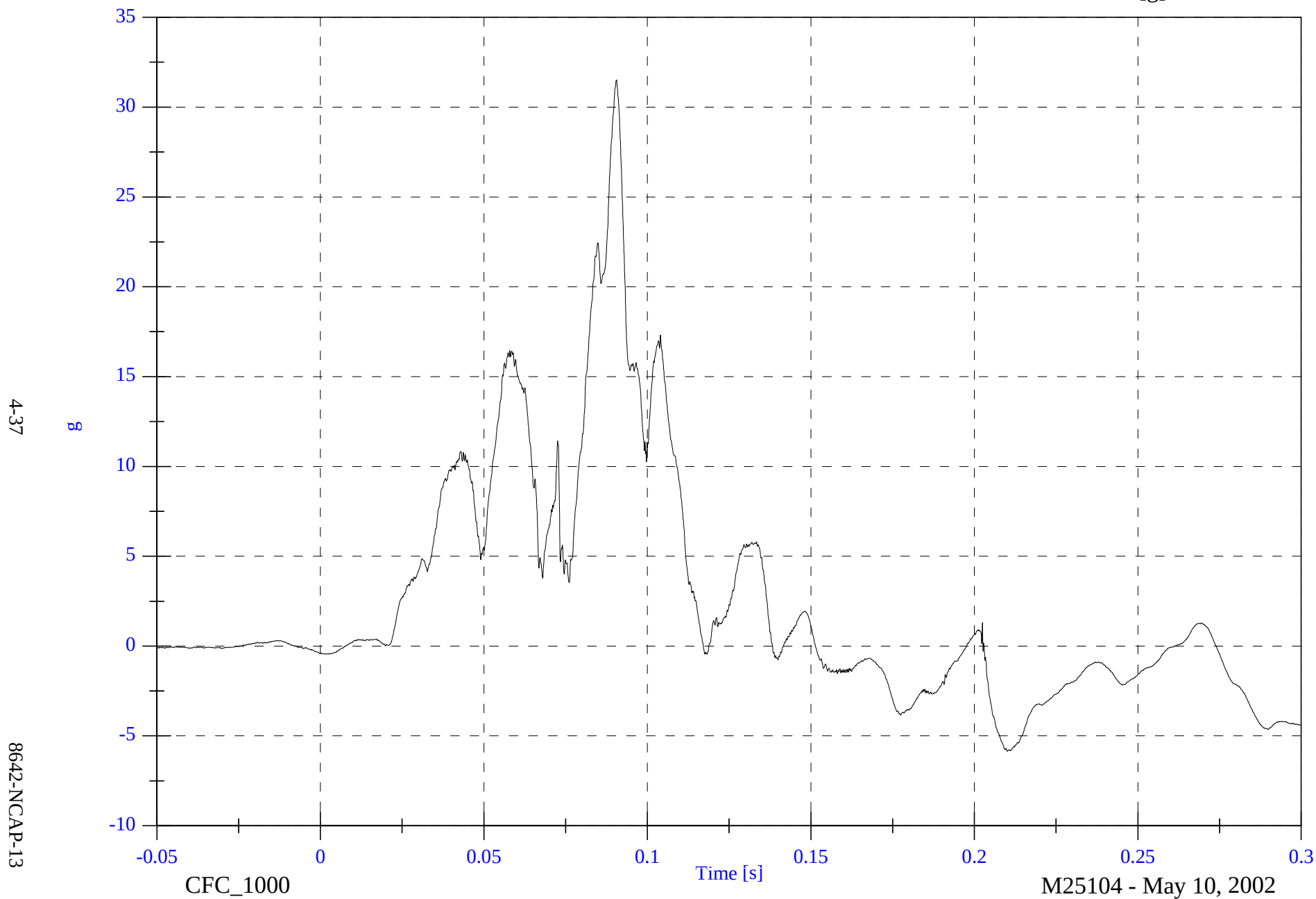
8642-NCAP-13

2002 NCAP Test 13 - 2002 Toyota Camry

Max: 31.5 [g] at 0.091 [s]

Min: -5.9 [g] at 0.210 [s]

P3 Pelvic x



2002 NCAP Test 13 - 2002 Toyota Camry

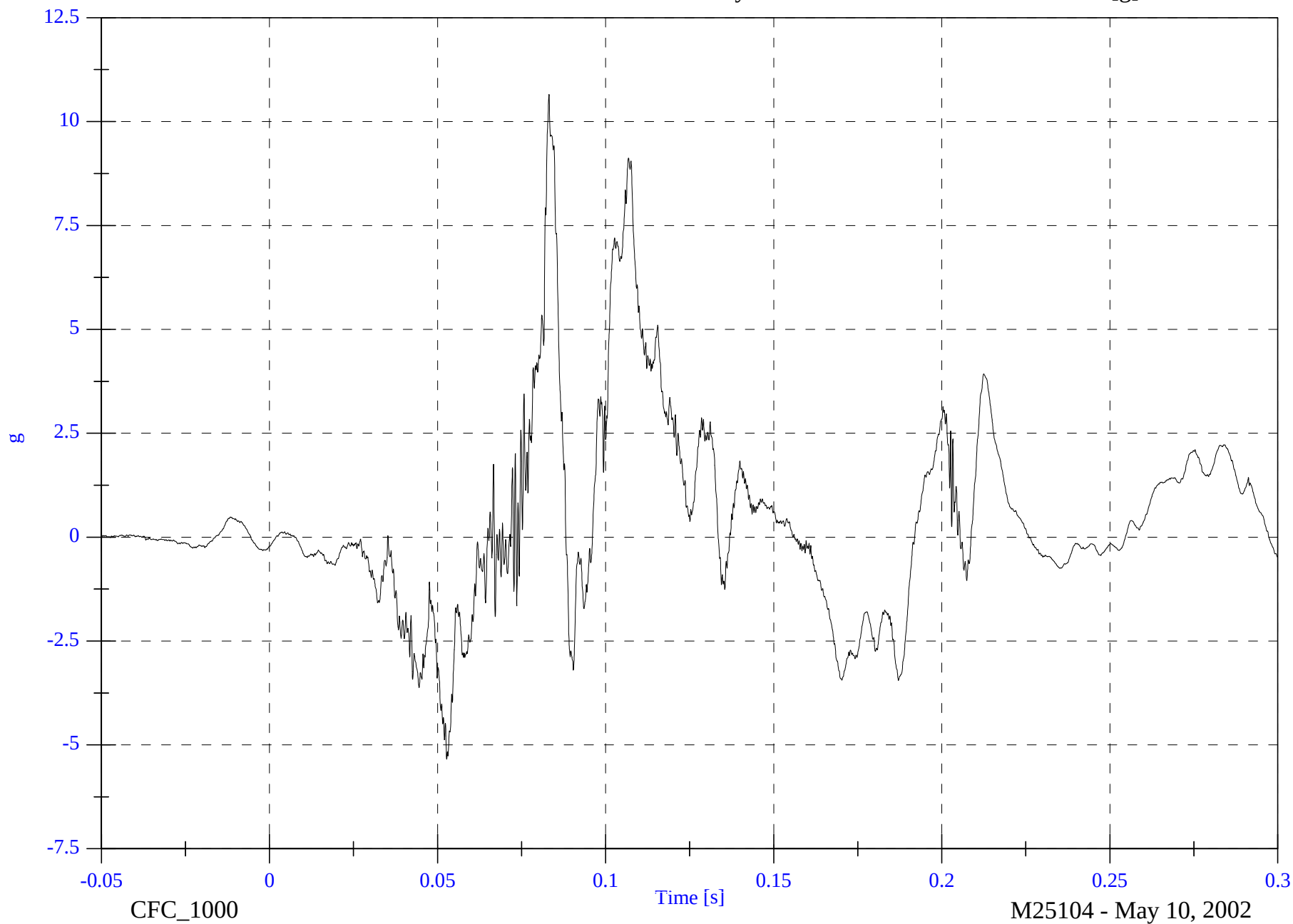
Max: 10.7 [g] at 0.083 [s]

Min: -5.3 [g] at 0.053 [s]

P3 Pelvic y

4-38

8642-NCAP-13

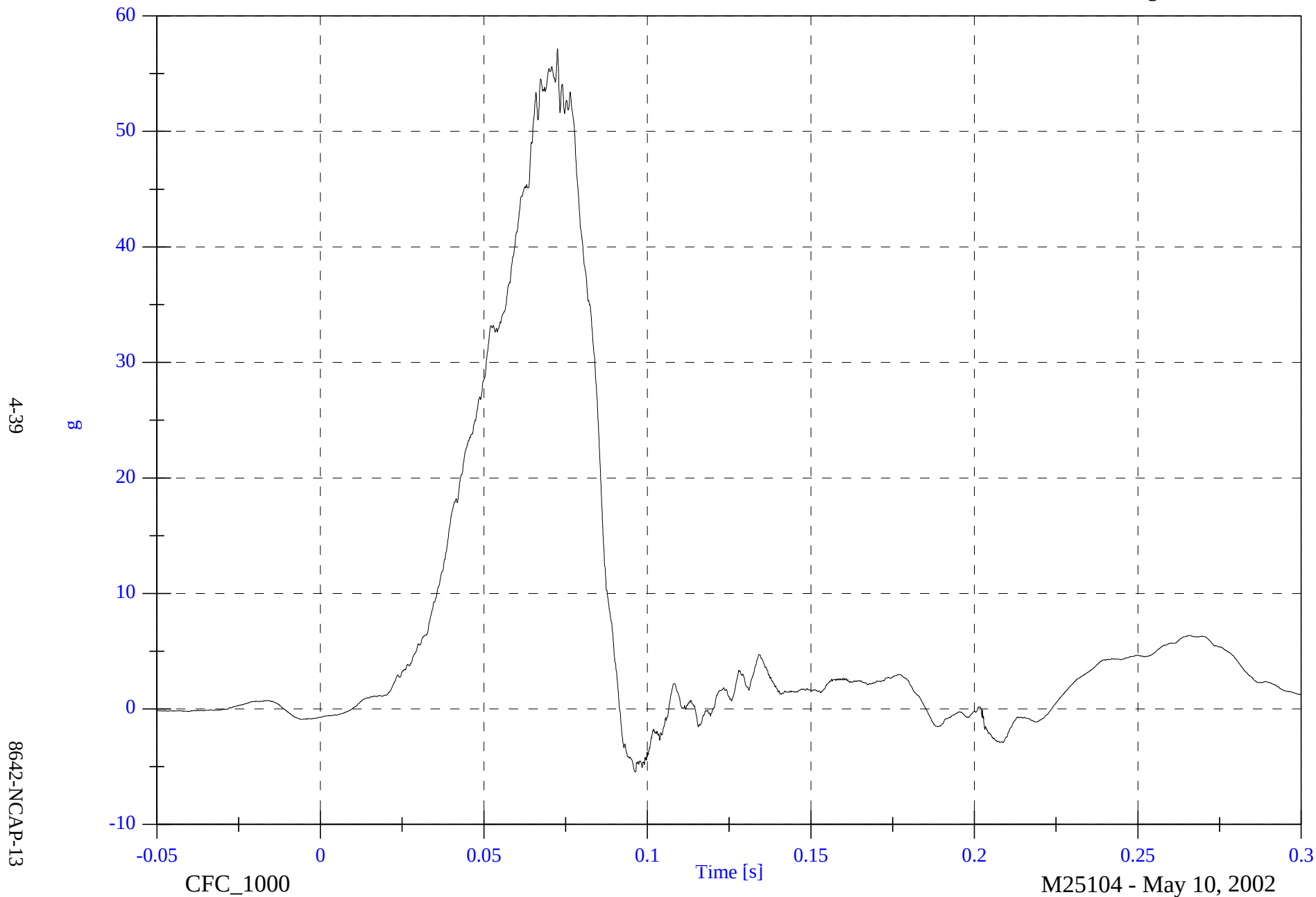


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 57.1 [g] at 0.073 [s]

Min: -5.5 [g] at 0.096 [s]

P3 Pelvic z



8642-NCAP-13

2002 NCAP Test 13 - 2002 Toyota Camry

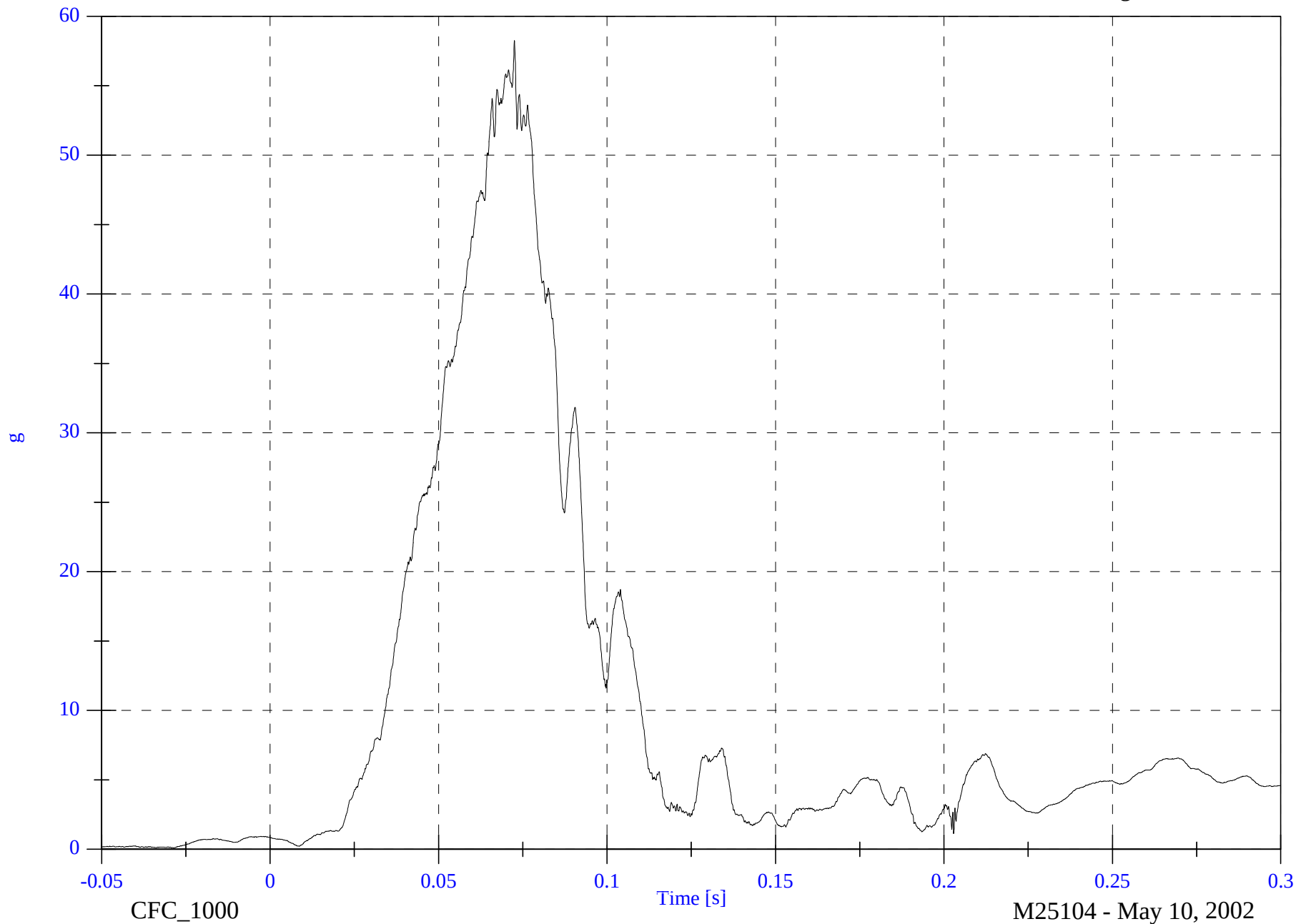
P3 Pelvic Resultant

Max: 58.2 [g] at 0.073 [s]

Min: 0.1 [g] at -0.029 [s]

4-40

8642-NCAP-13

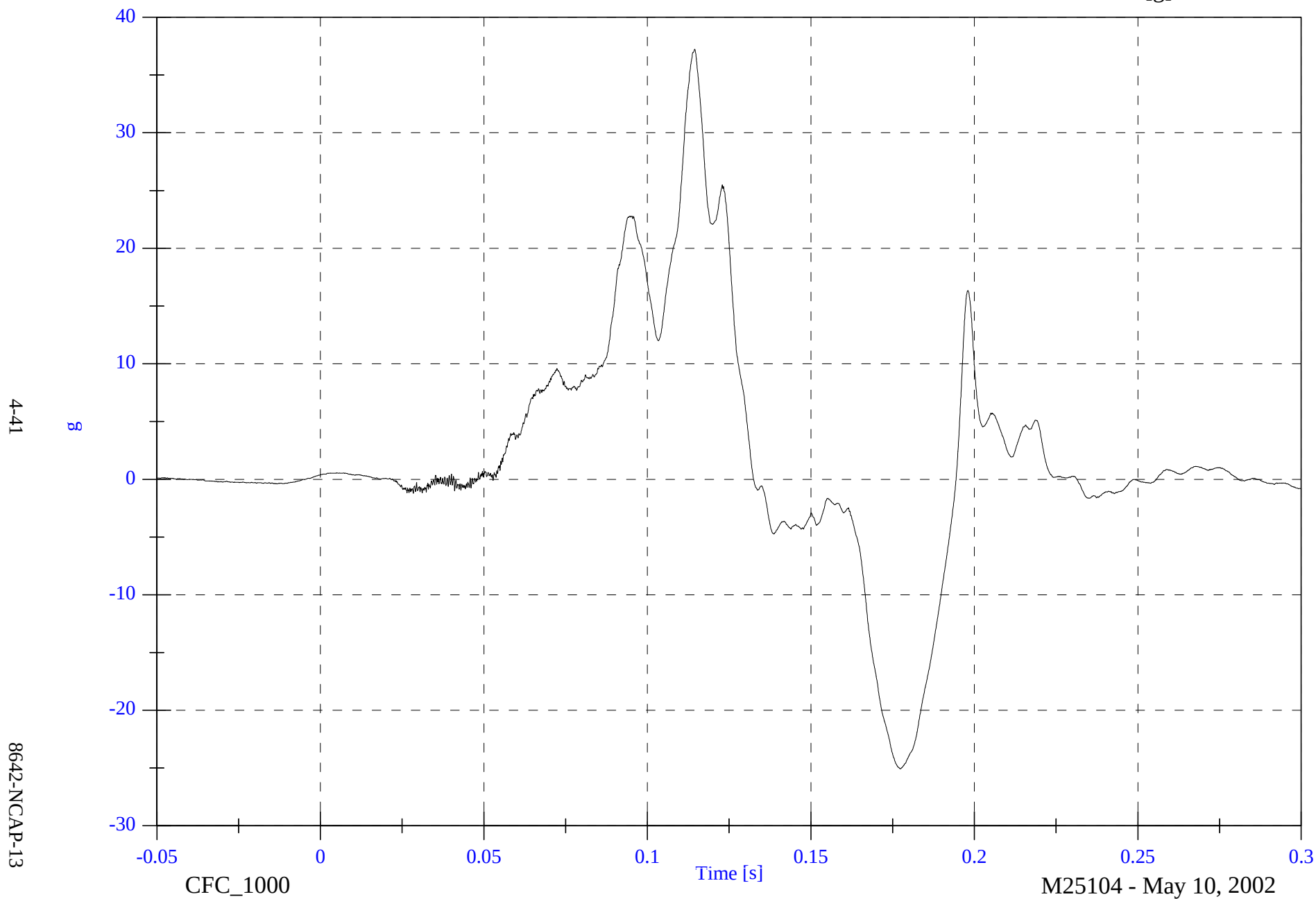


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 37.2 [g] at 0.115 [s]

Min: -25.1 [g] at 0.177 [s]

P4 Head x

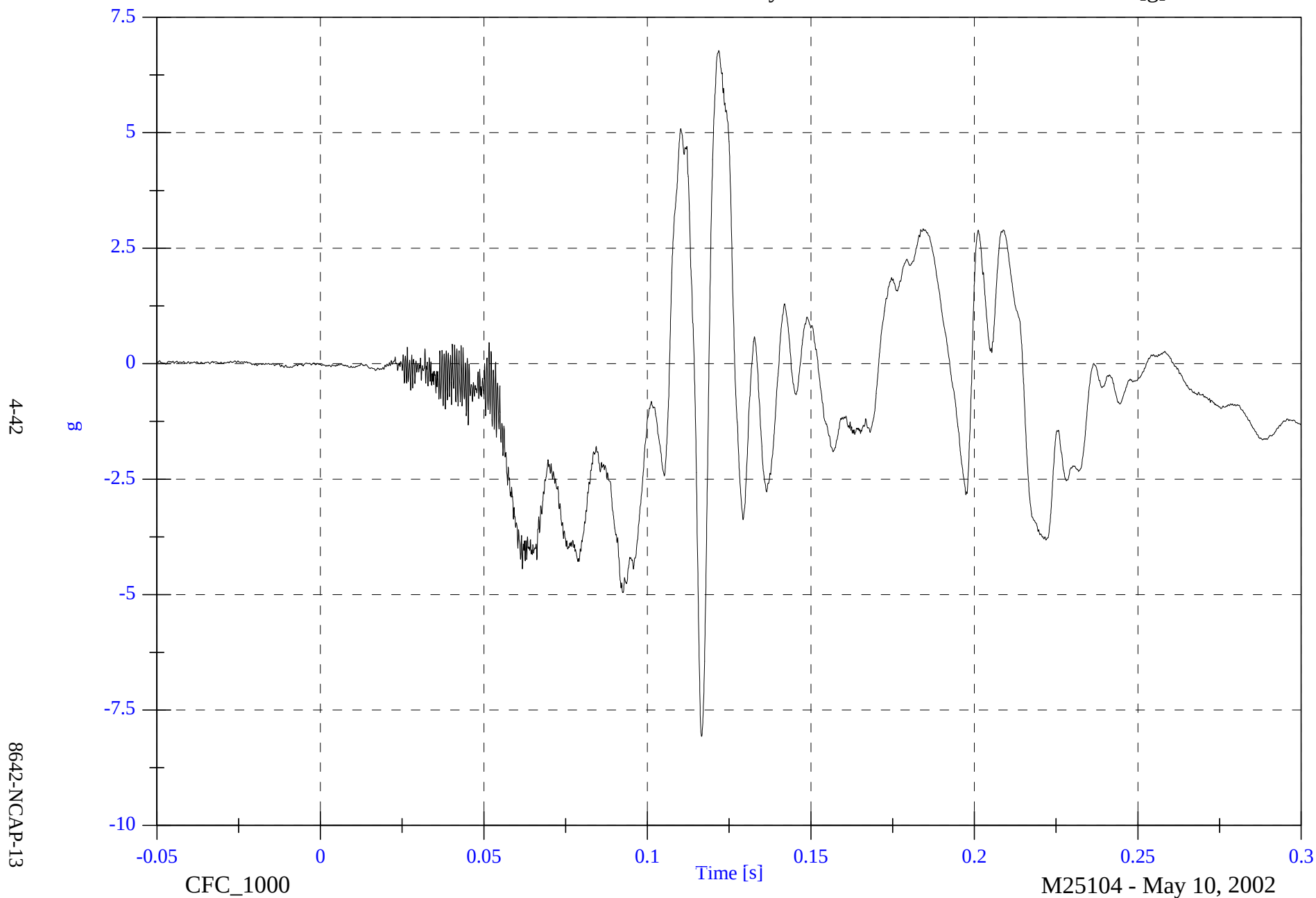


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 6.8 [g] at 0.122 [s]

Min: -8.1 [g] at 0.117 [s]

P4 Head y



2002 NCAP Test 13 - 2002 Toyota Camry

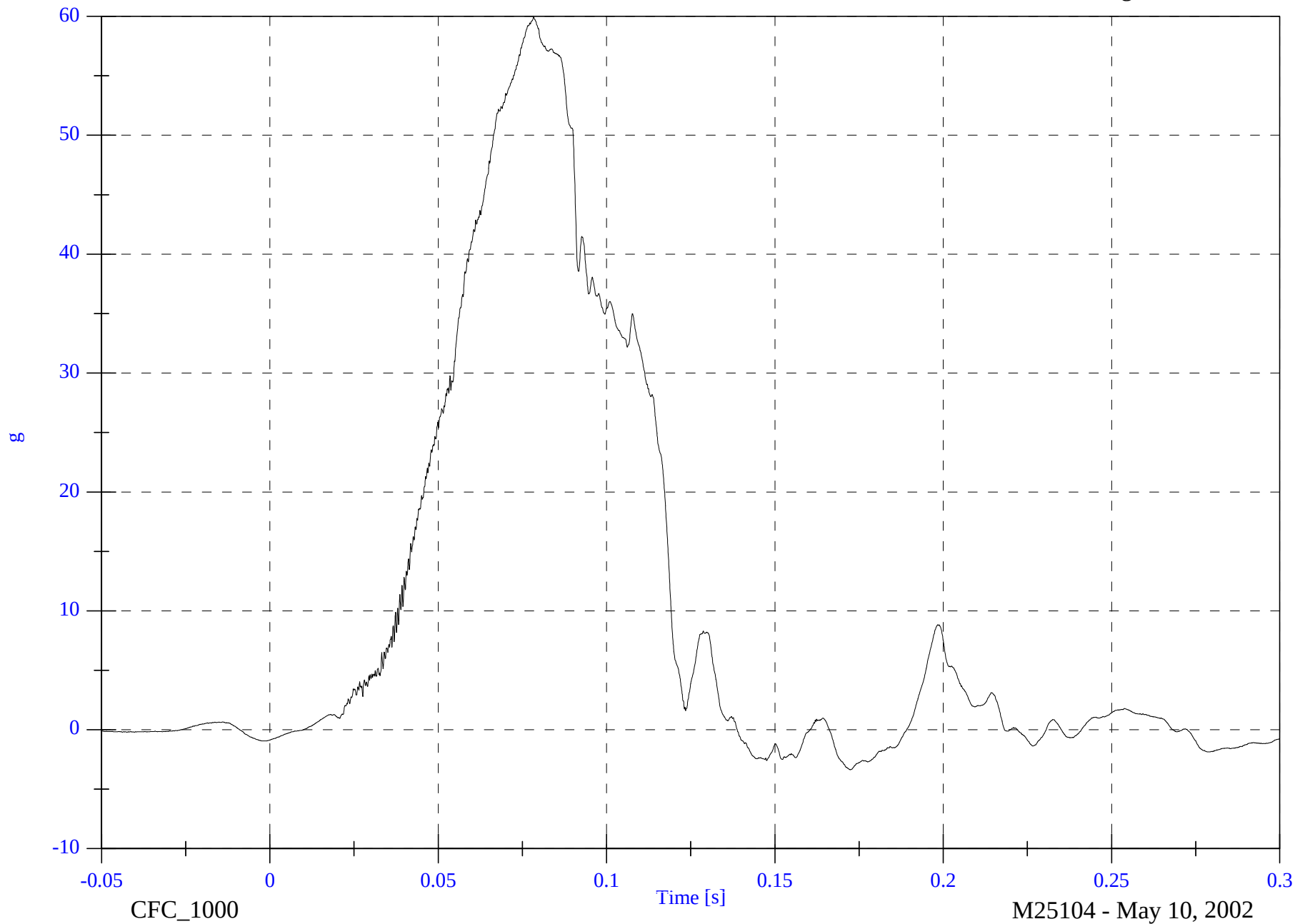
P4 Head z

Max: 59.9 [g] at 0.078 [s]

Min: -3.4 [g] at 0.172 [s]

4-43

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

P4 Head Resultant

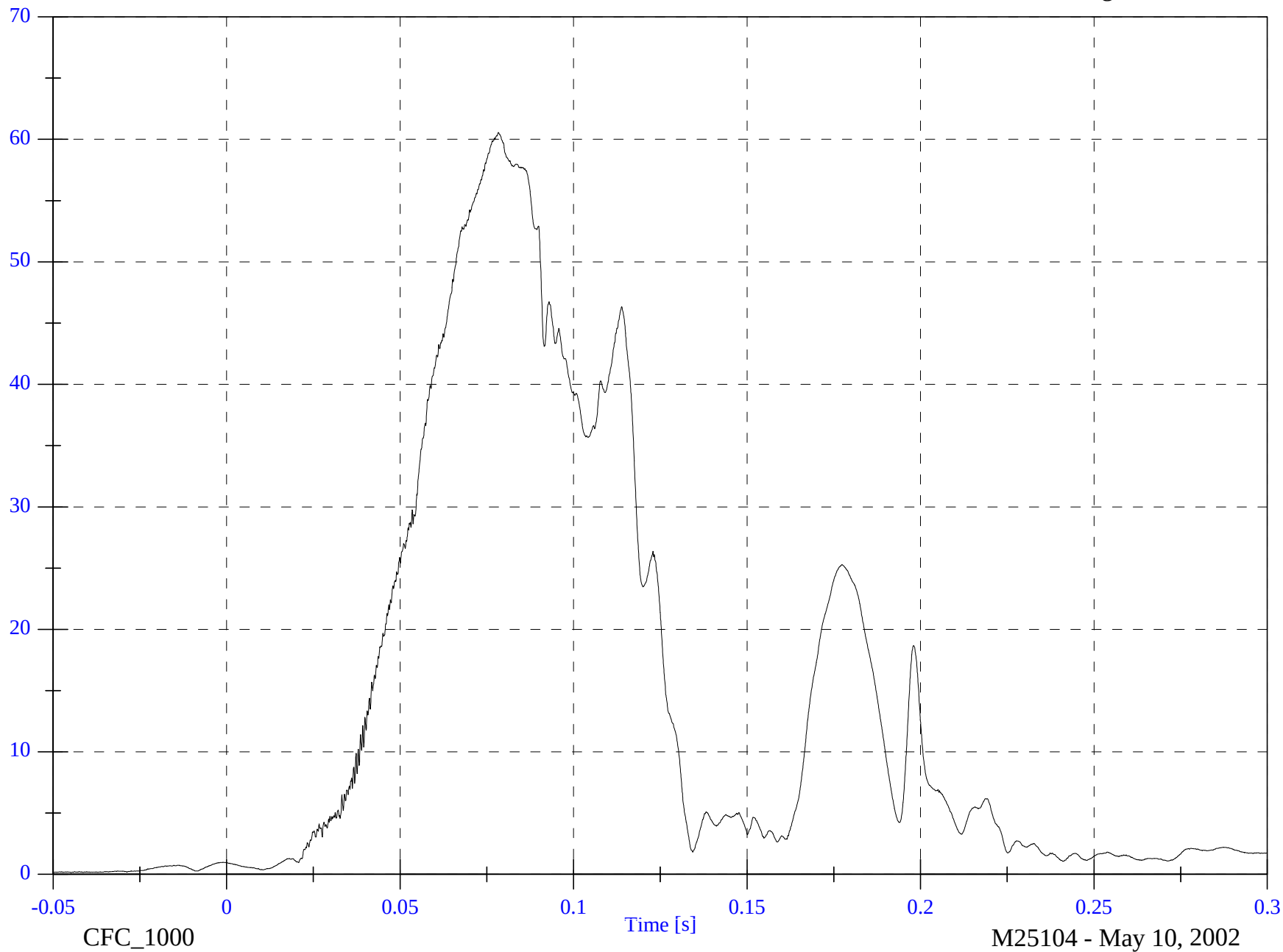
Max: 60.6 [g] at 0.078 [s]

Min: 0.2 [g] at -0.045 [s]

4-44

8642-NCAP-13

g



2002 NCAP Test 13 - 2002 Toyota Camry

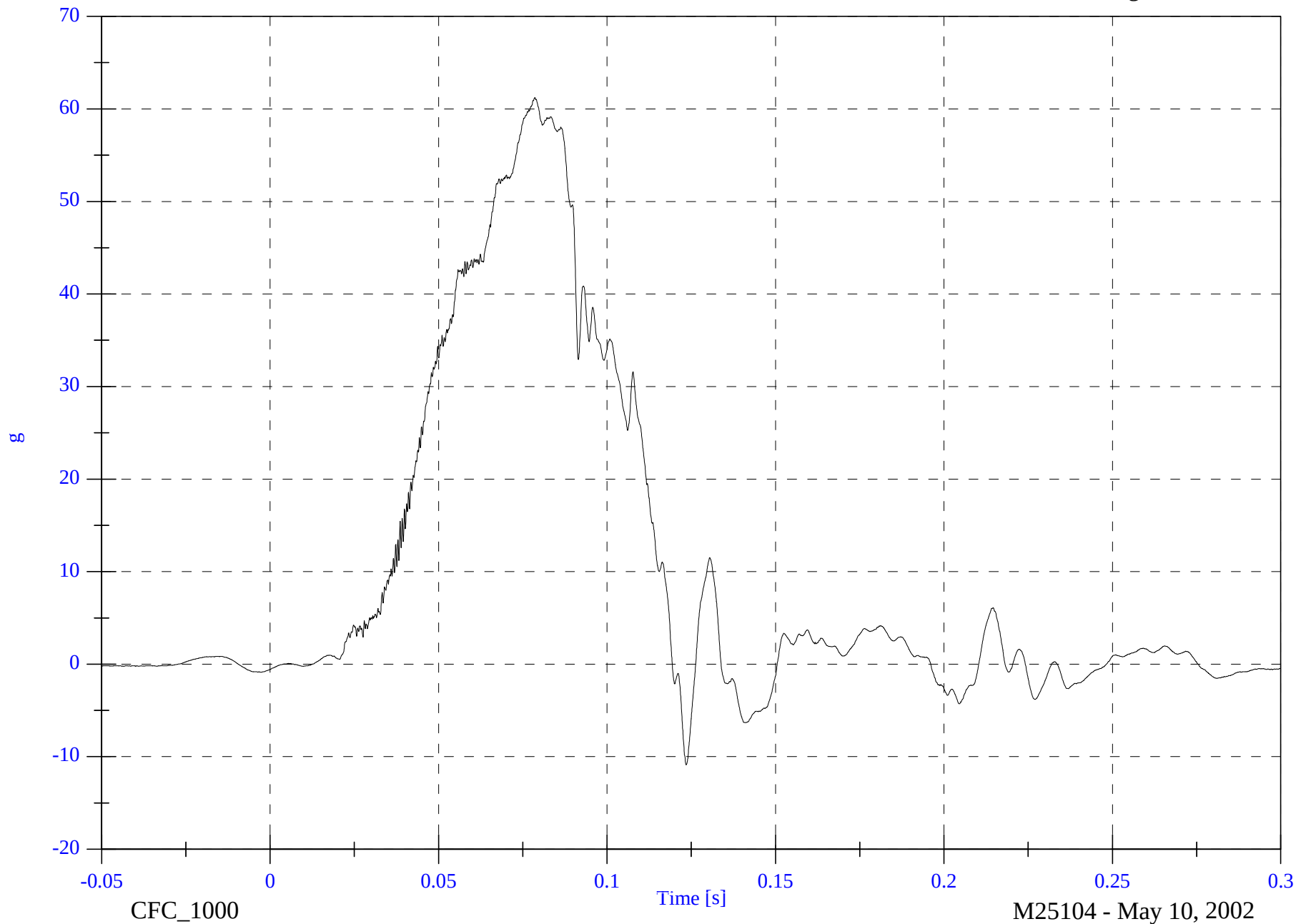
P4 Head Red z

Max: 61.2 [g] at 0.079 [s]

Min: -10.9 [g] at 0.123 [s]

4-45

8642-NCAP-13

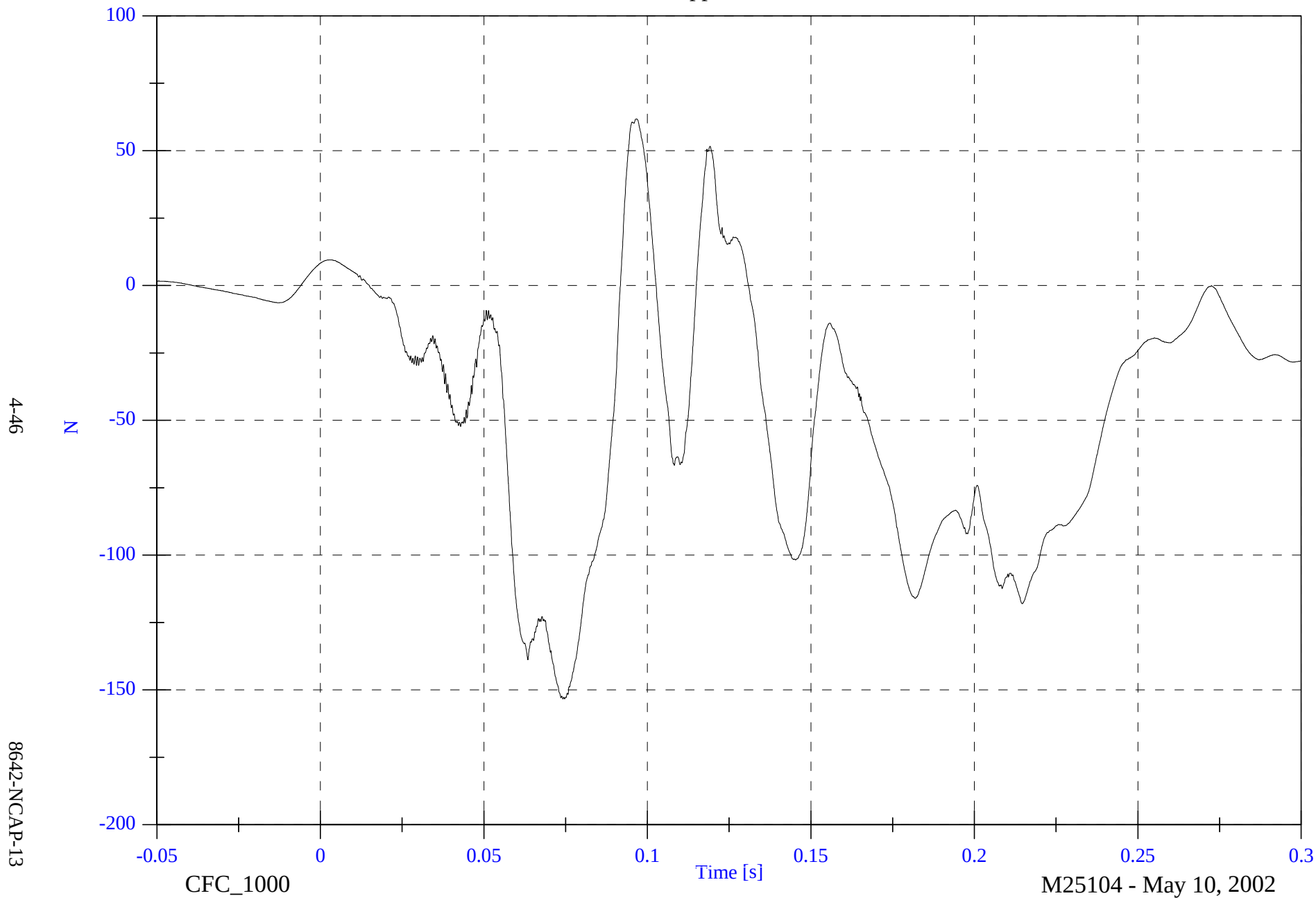


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Upper Neck Fx

Max: 61.7 [N] at 0.097 [s]

Min: -153.4 [N] at 0.074 [s]

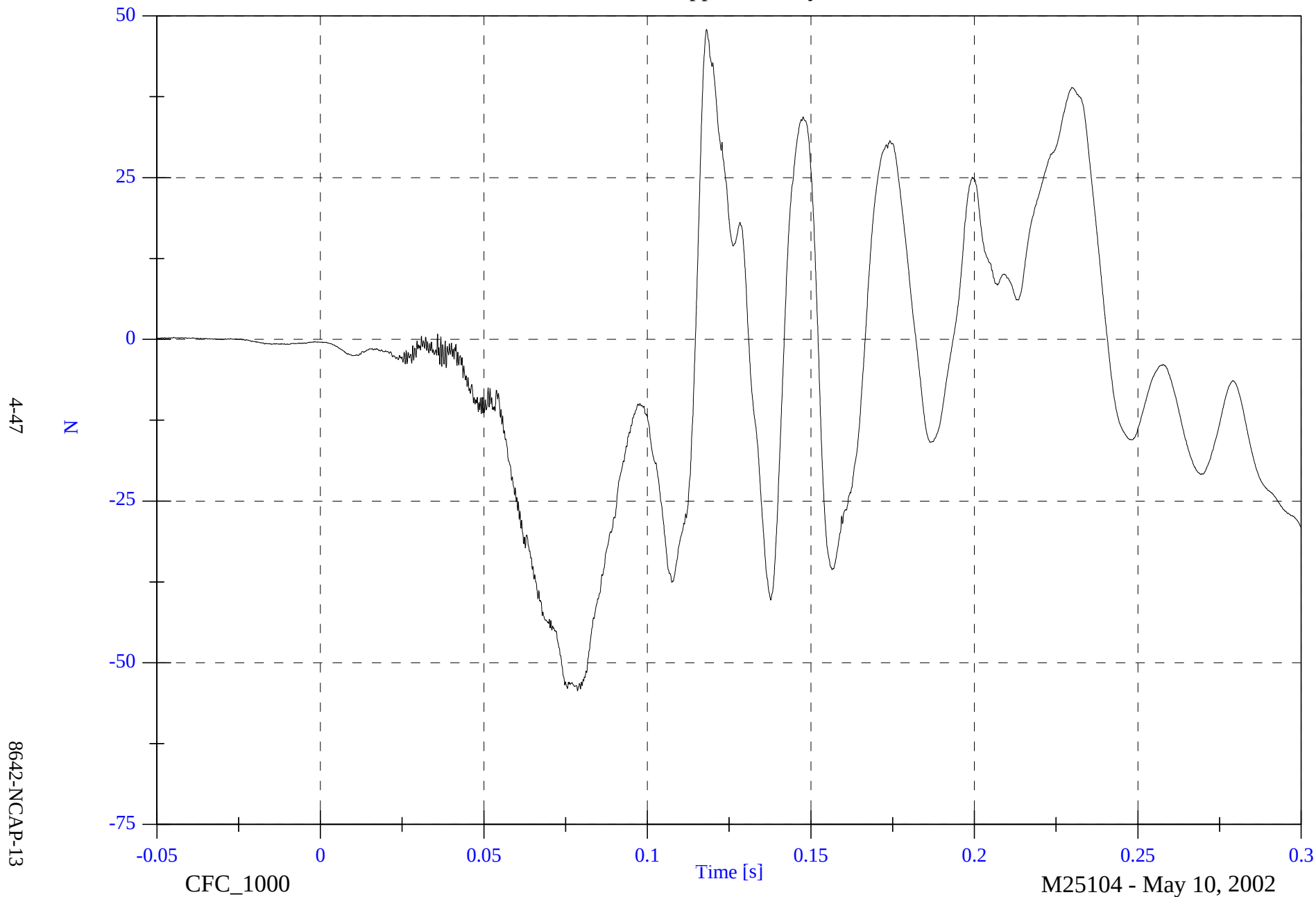


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 47.9 [N] at 0.118 [s]

Min: -54.4 [N] at 0.079 [s]

P4 Upper Neck Fy



2002 NCAP Test 13 - 2002 Toyota Camry

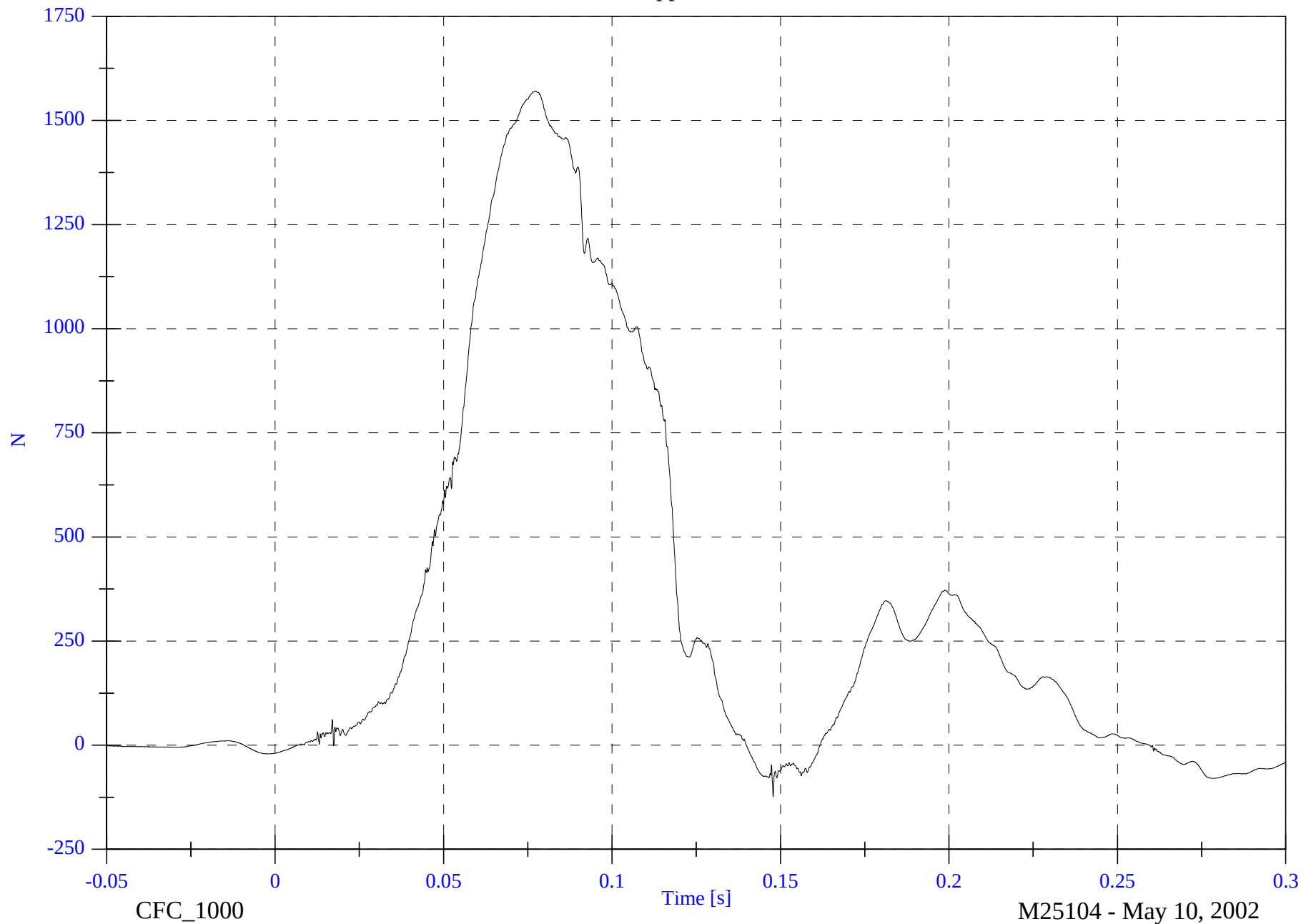
P4 Upper Neck Fz

Max: 1570.9 [N] at 0.077 [s]

Min: -123.7 [N] at 0.148 [s]

4-48

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

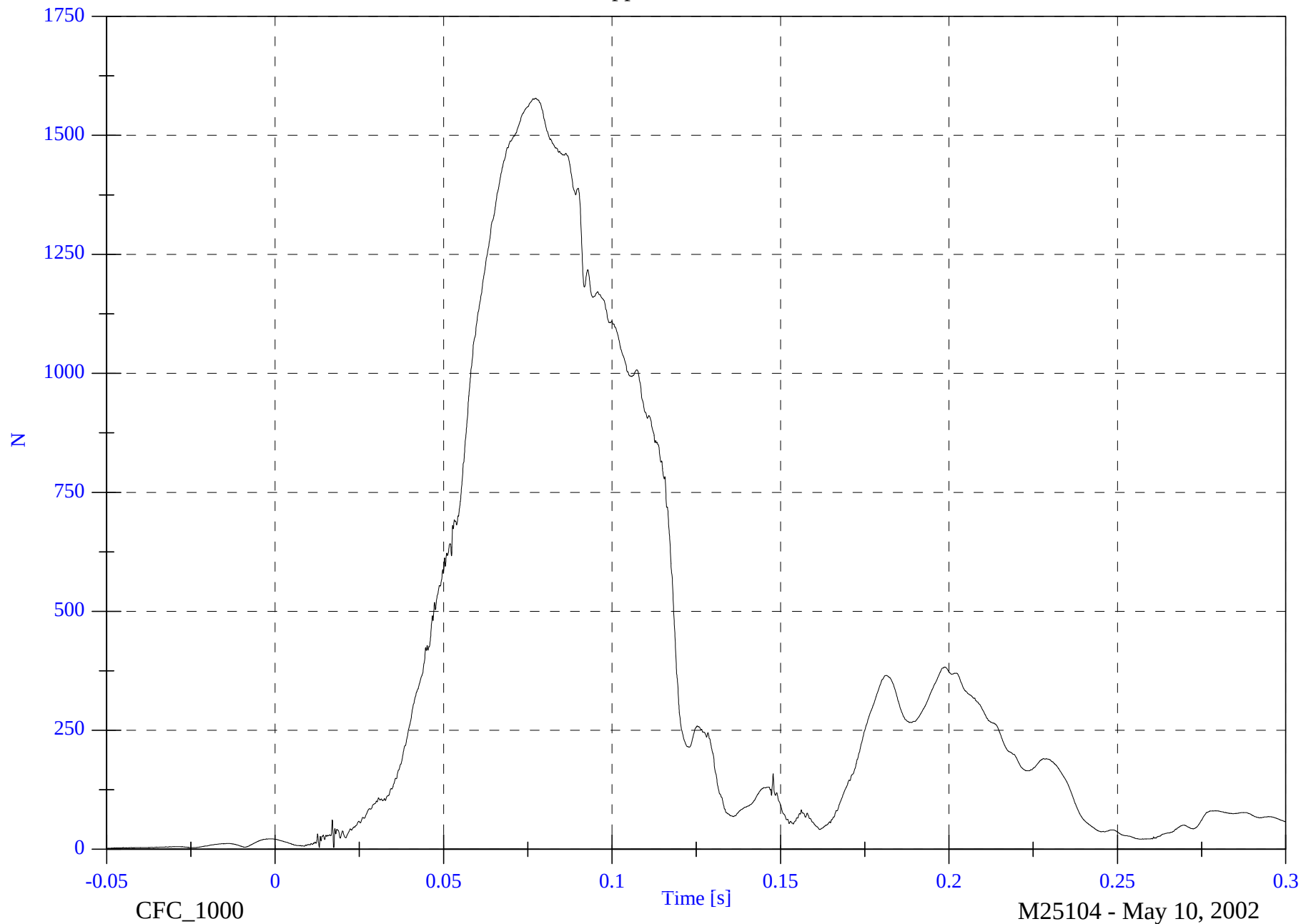
P4 Upper Neck F Resultant

Max: 1578.3 [N] at 0.077 [s]

Min: 1.9 [N] at -0.050 [s]

4-49

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

Max: 1.9 [N-m] at 0.083 [s]

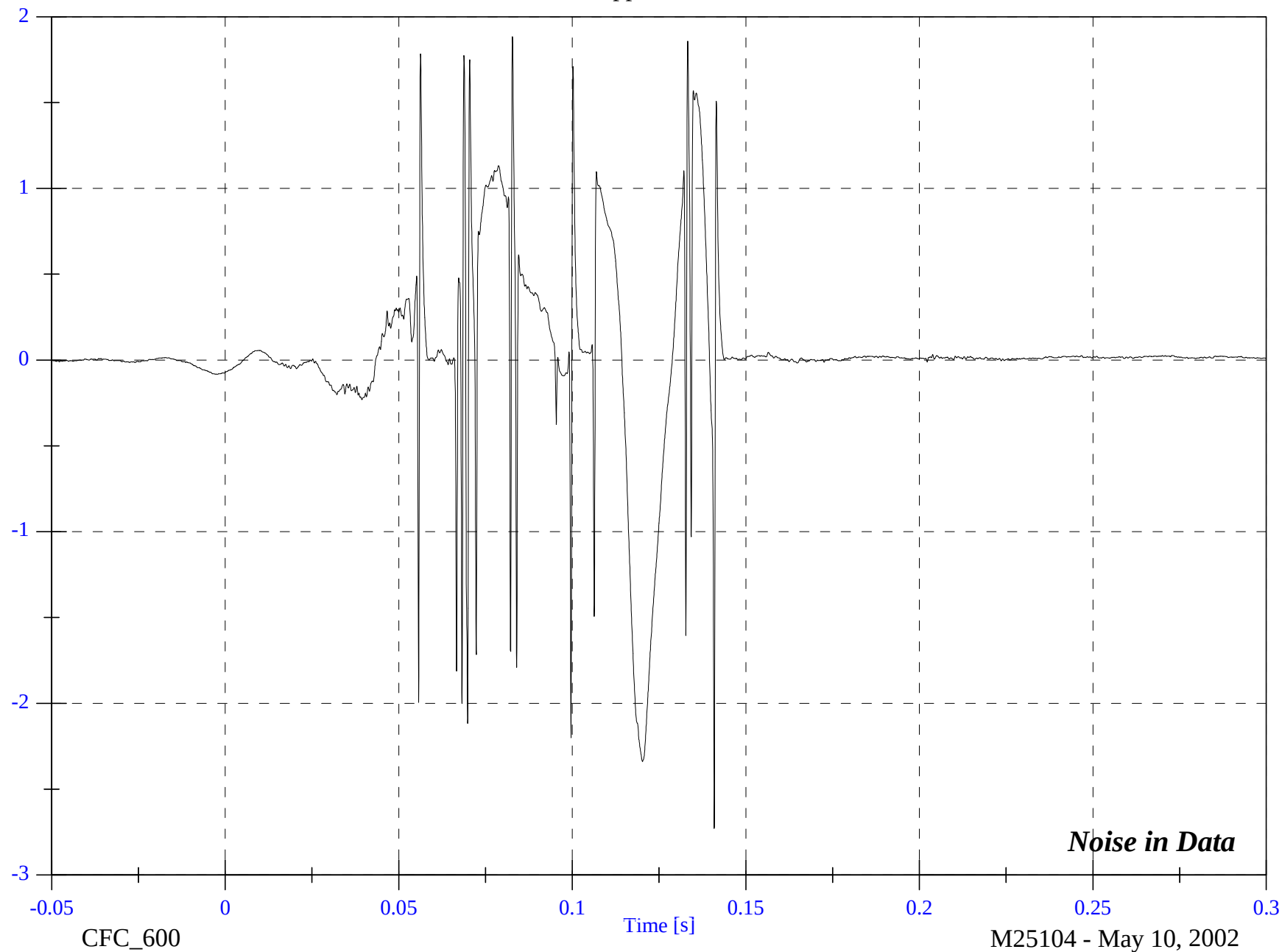
Min: -2.7 [N-m] at 0.141 [s]

P4 Upper Neck Mx

4-50

N-m

8642-NCAP-13



Noise in Data

CFC_600

M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

P4 Upper Neck My

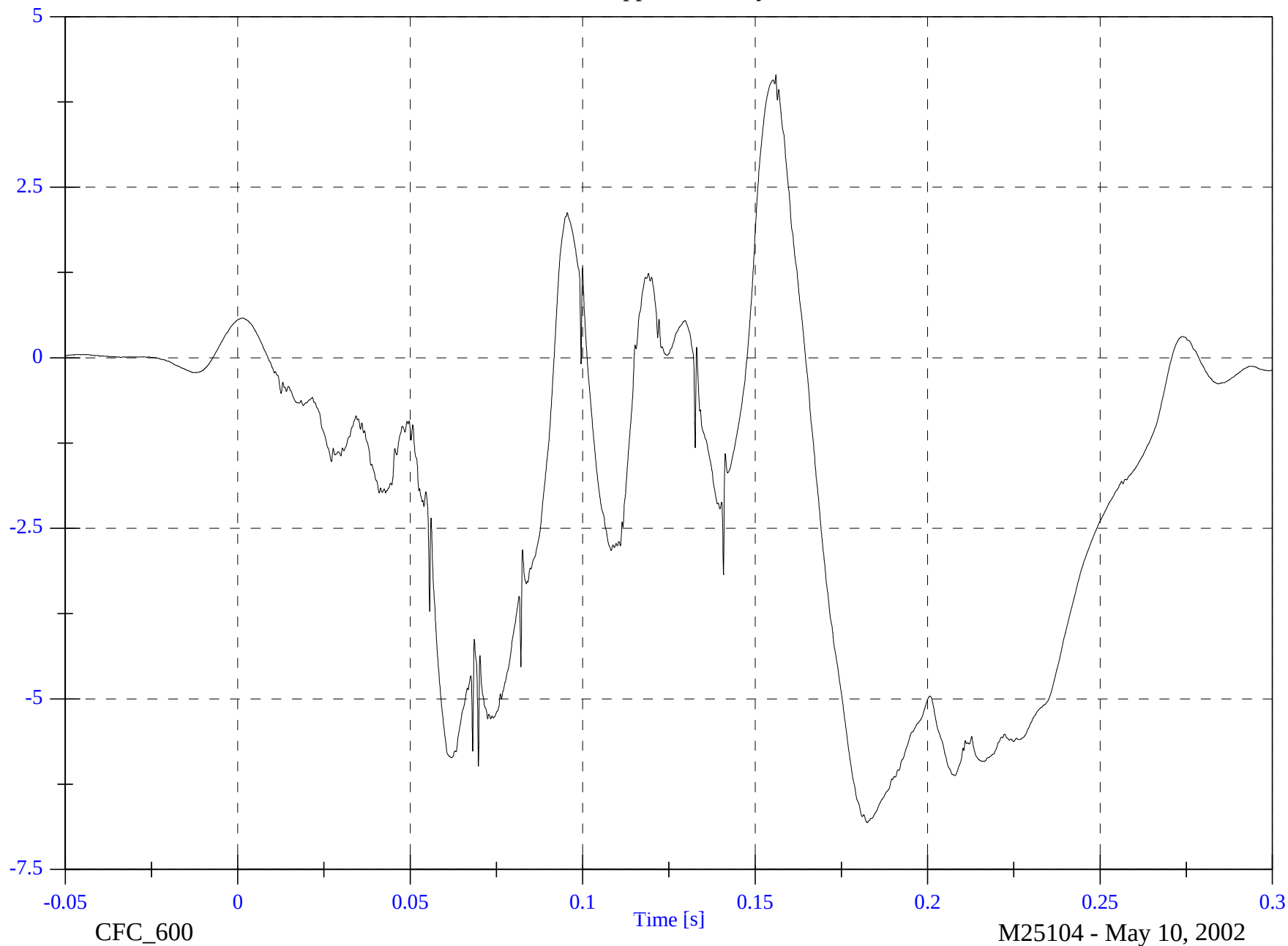
Max: 4.1 [N-m] at 0.156 [s]

Min: -6.8 [N-m] at 0.183 [s]

4-51

N-m

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

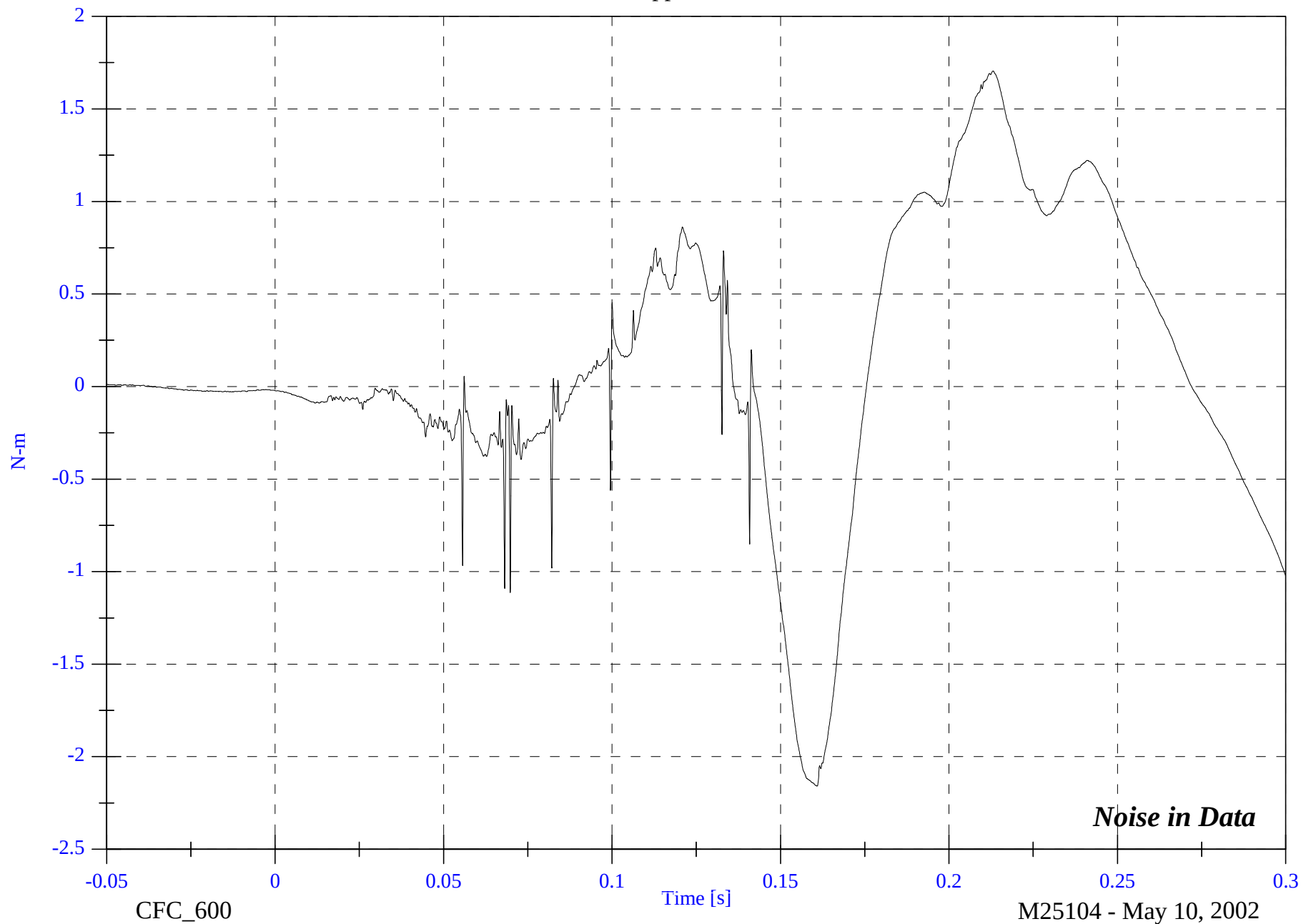
P4 Upper Neck Mz

Max: 1.7 [N-m] at 0.213 [s]

Min: -2.2 [N-m] at 0.161 [s]

4-52

8642-NCAP-13

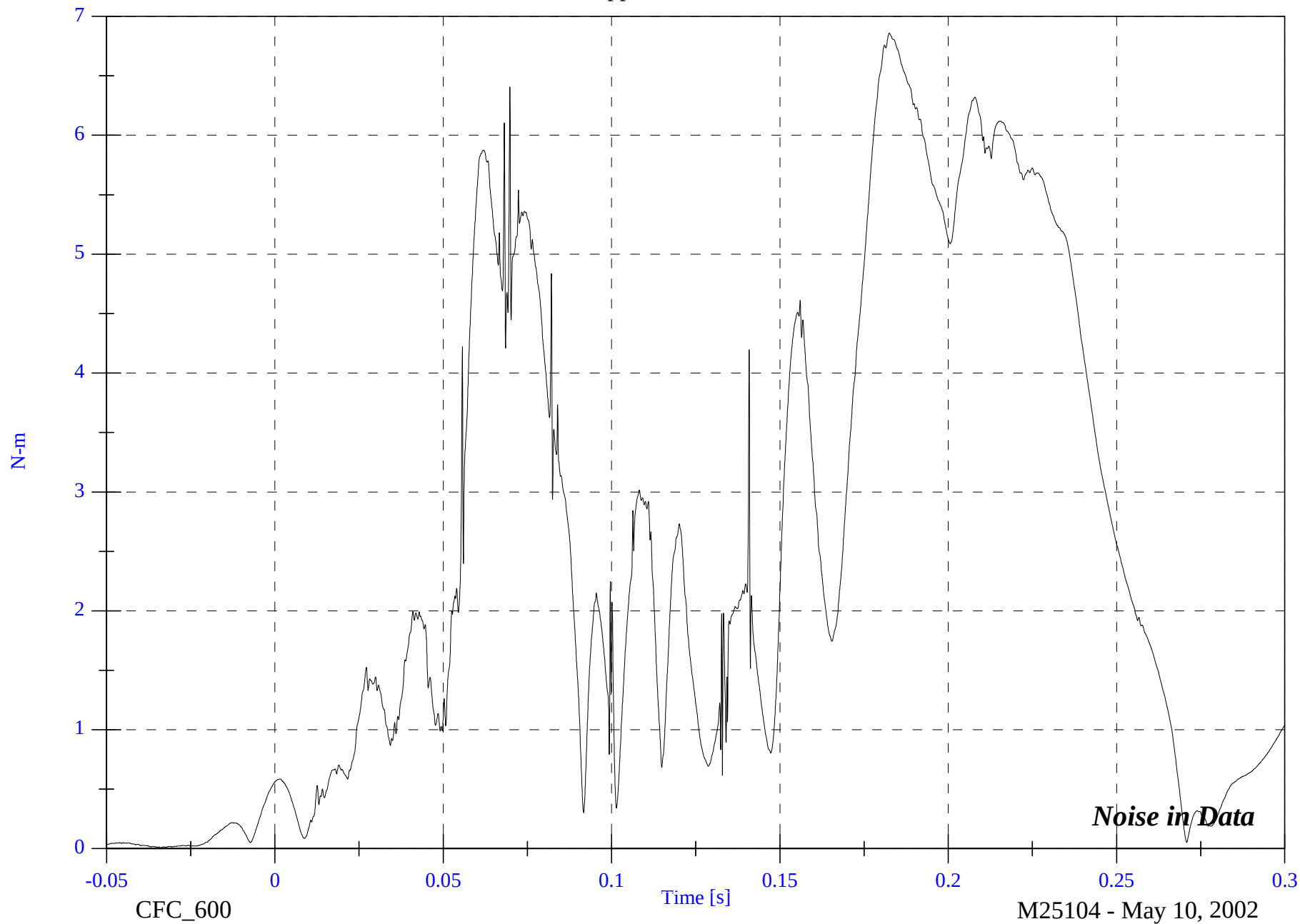


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Upper Neck M Resultant

Max: 6.9 [N-m] at 0.183 [s]

Min: 0.0 [N-m] at -0.034 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

P4 Lower Neck Fx

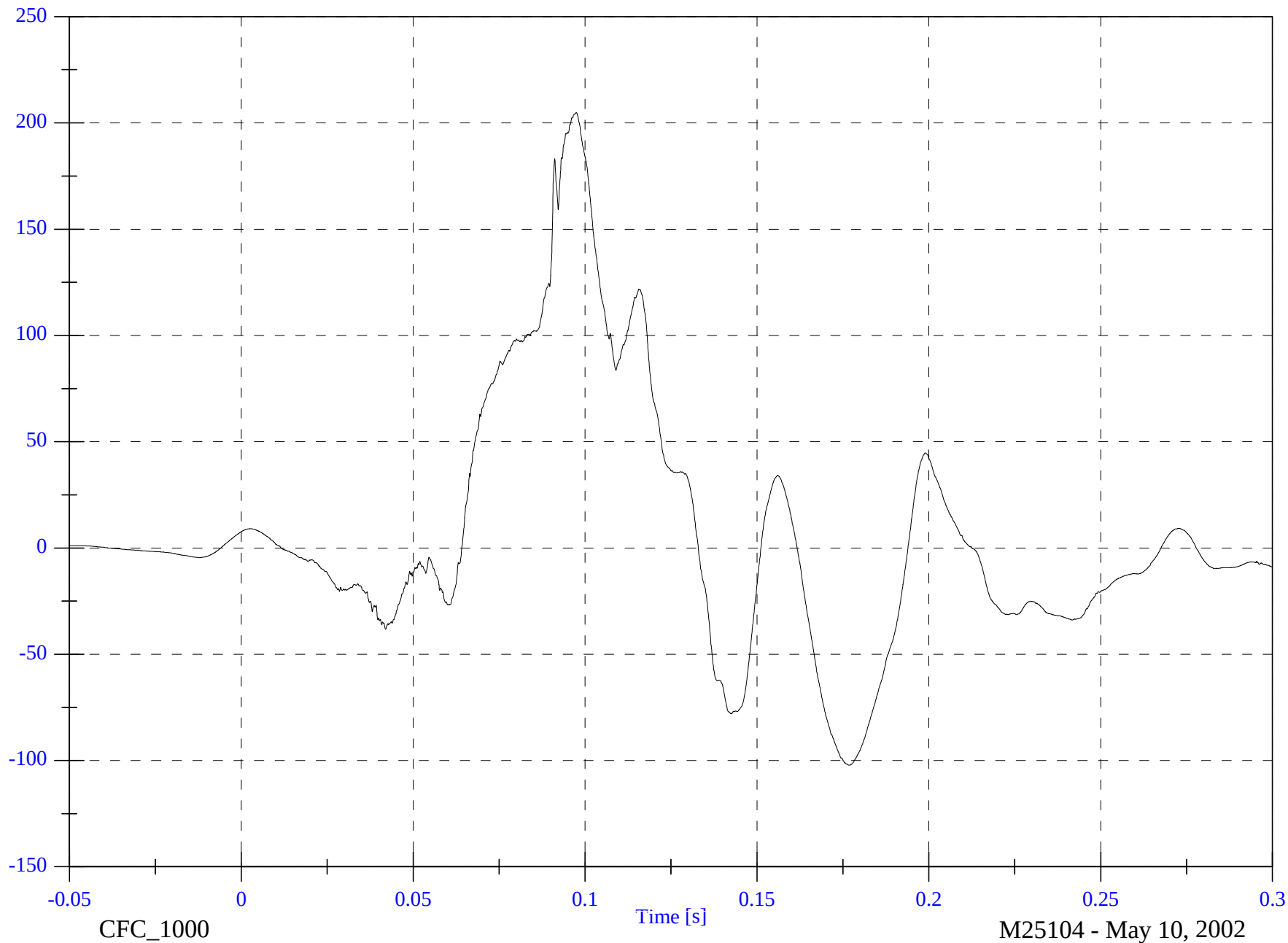
Max: 204.8 [N] at 0.097 [s]

Min: -102.1 [N] at 0.177 [s]

4-54

N

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

P4 Lower Neck Fy

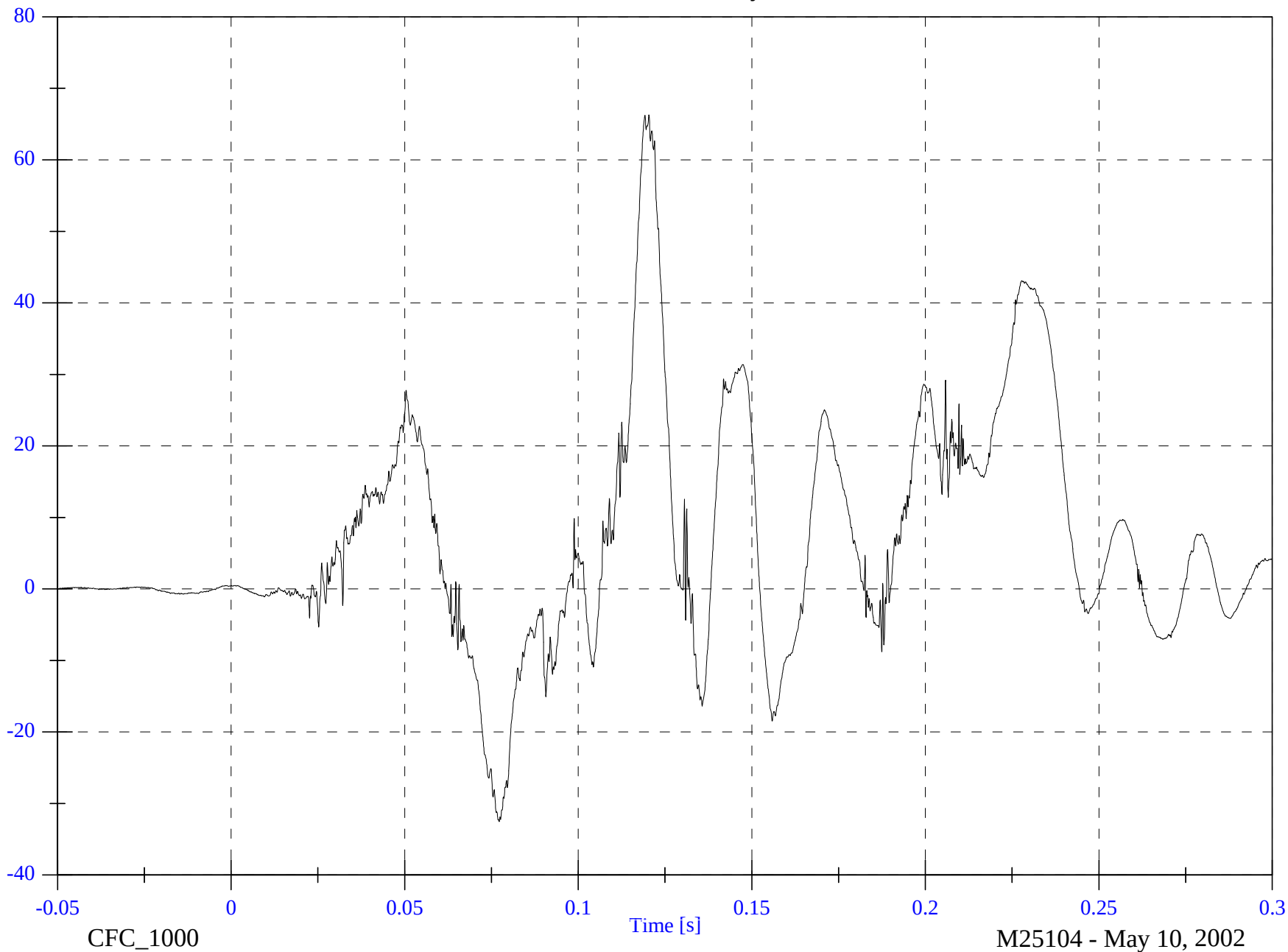
Max: 66.3 [N] at 0.120 [s]

Min: -32.6 [N] at 0.077 [s]

4-55

8642-NCAP-13

N



2002 NCAP Test 13 - 2002 Toyota Camry

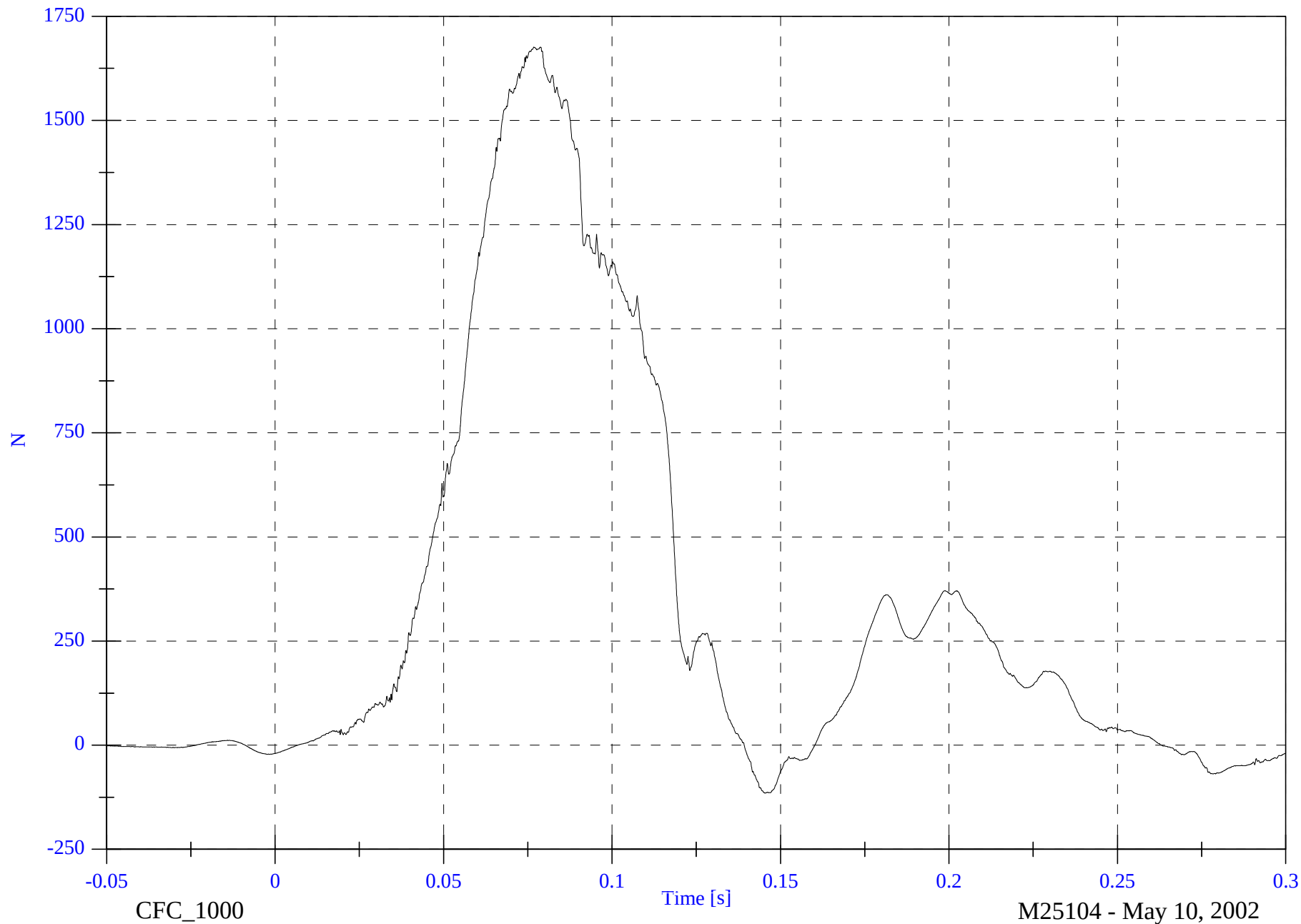
P4 Lower Neck Fz

Max: 1676.3 [N] at 0.077 [s]

Min: -115.3 [N] at 0.145 [s]

4-56

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

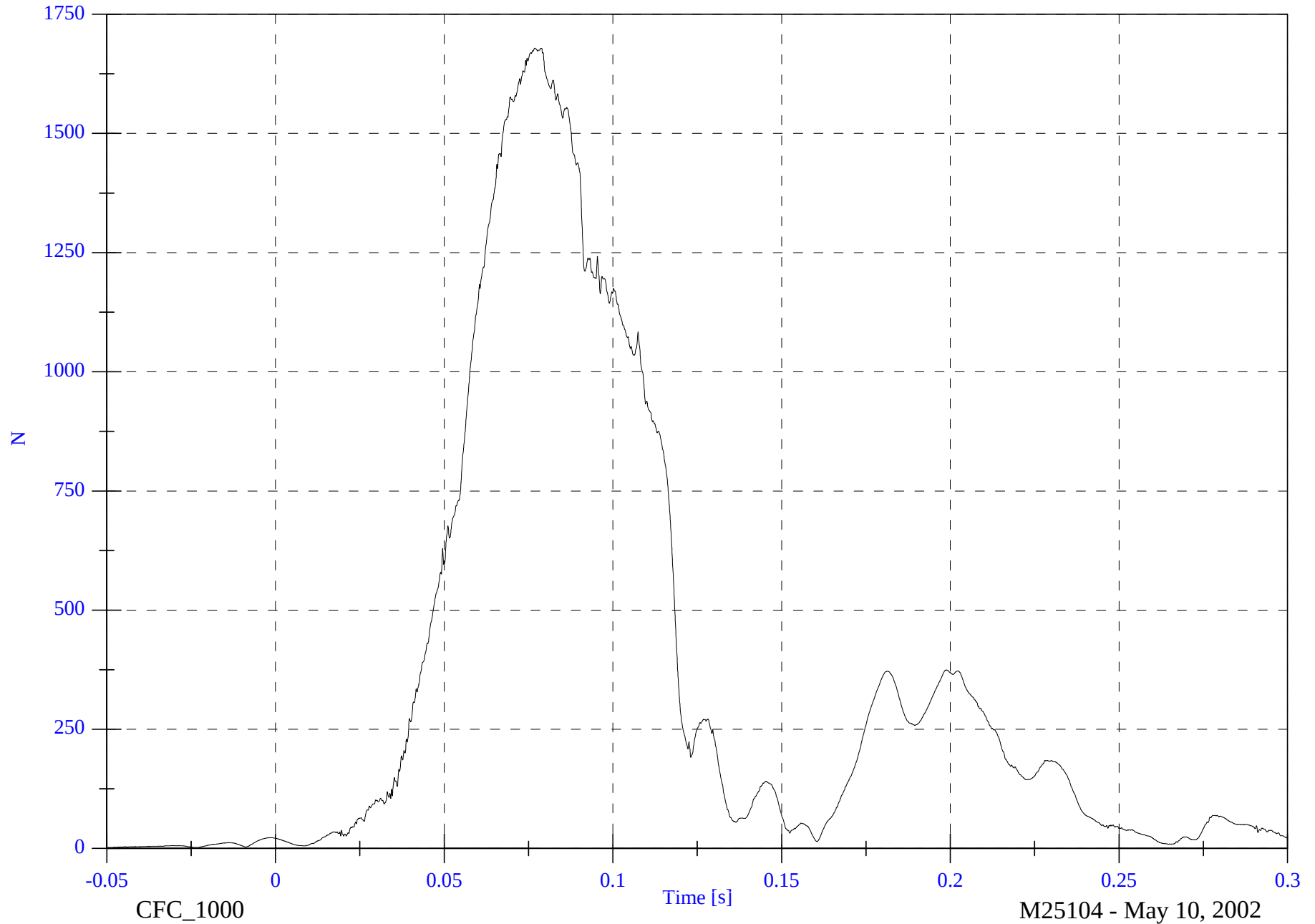
P4 Lower Neck F Resultant

Max: 1679.0 [N] at 0.077 [s]

Min: 1.8 [N] at -0.050 [s]

4-57

8642-NCAP-13

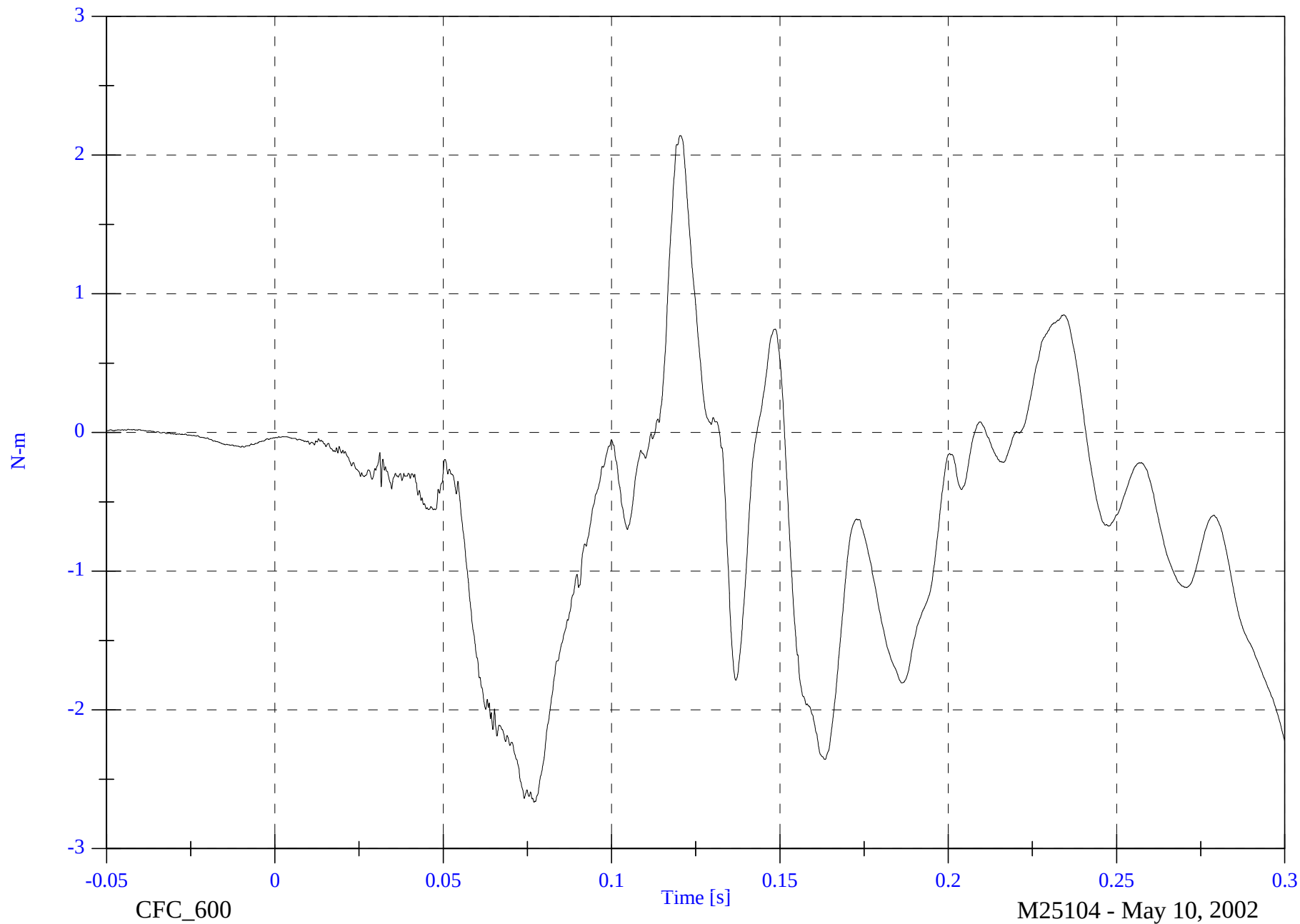


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Lower Neck Mx

Max: 2.1 [N-m] at 0.120 [s]

Min: -2.7 [N-m] at 0.077 [s]



4-58

8642-NCAP-13

2002 NCAP Test 13 - 2002 Toyota Camry

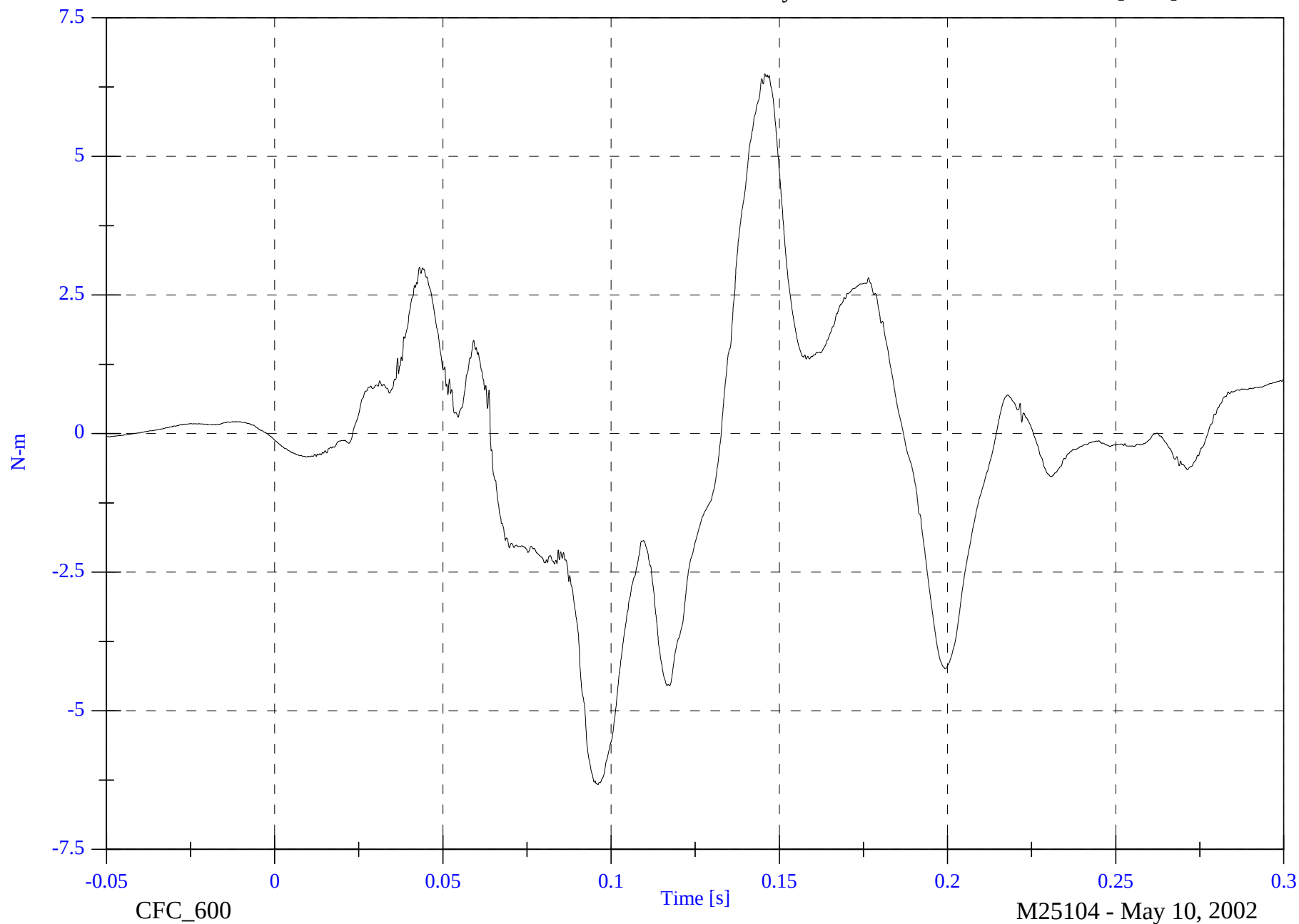
P4 Lower Neck My

Max: 6.5 [N-m] at 0.146 [s]

Min: -6.3 [N-m] at 0.096 [s]

4-59

8642-NCAP-13

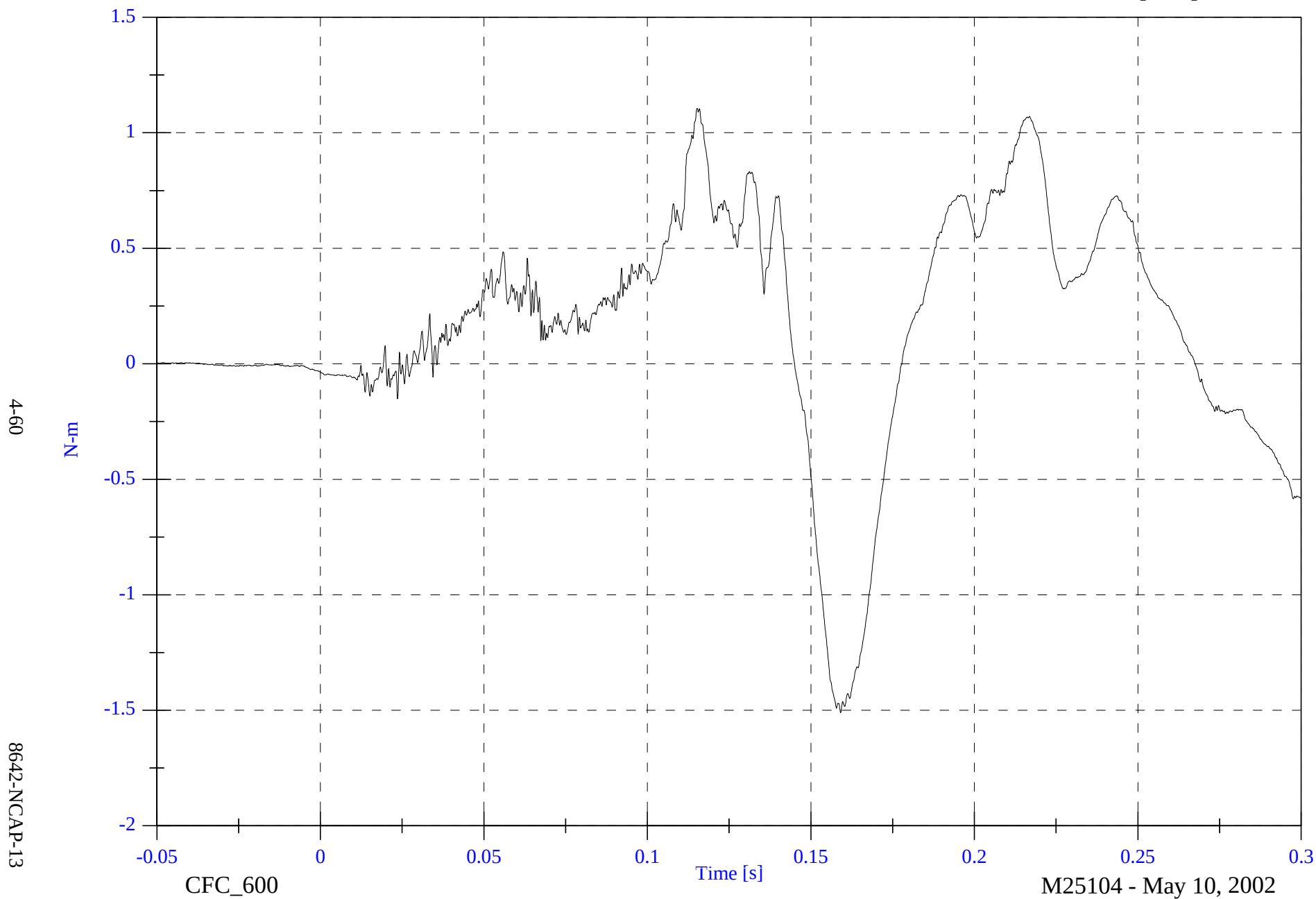


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 1.1 [N-m] at 0.115 [s]

Min: -1.5 [N-m] at 0.159 [s]

P4 Lower Neck Mz

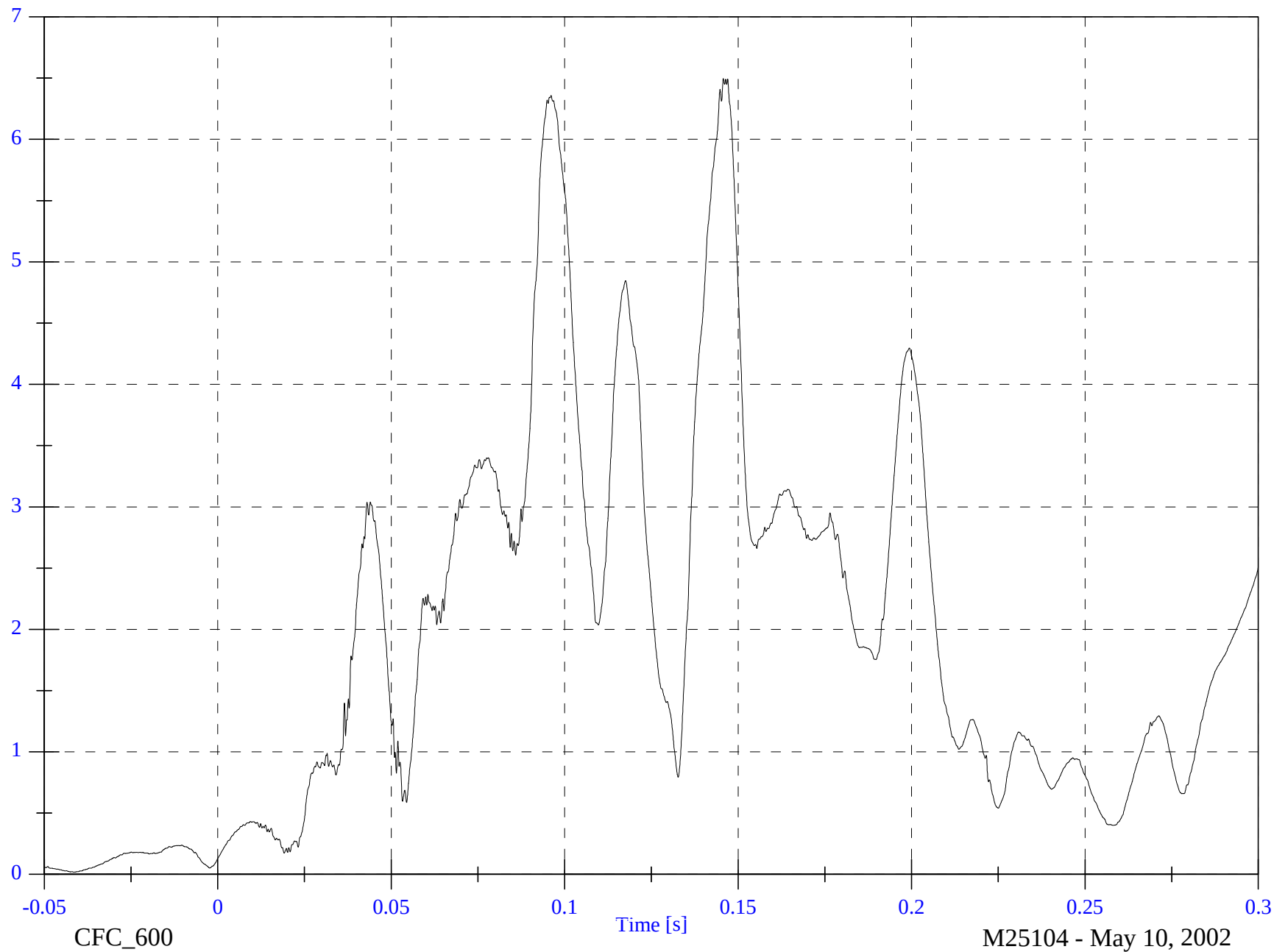


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Lower Neck M Resultant

Max: 6.5 [N-m] at 0.146 [s]

Min: 0.0 [N-m] at -0.041 [s]



4-61

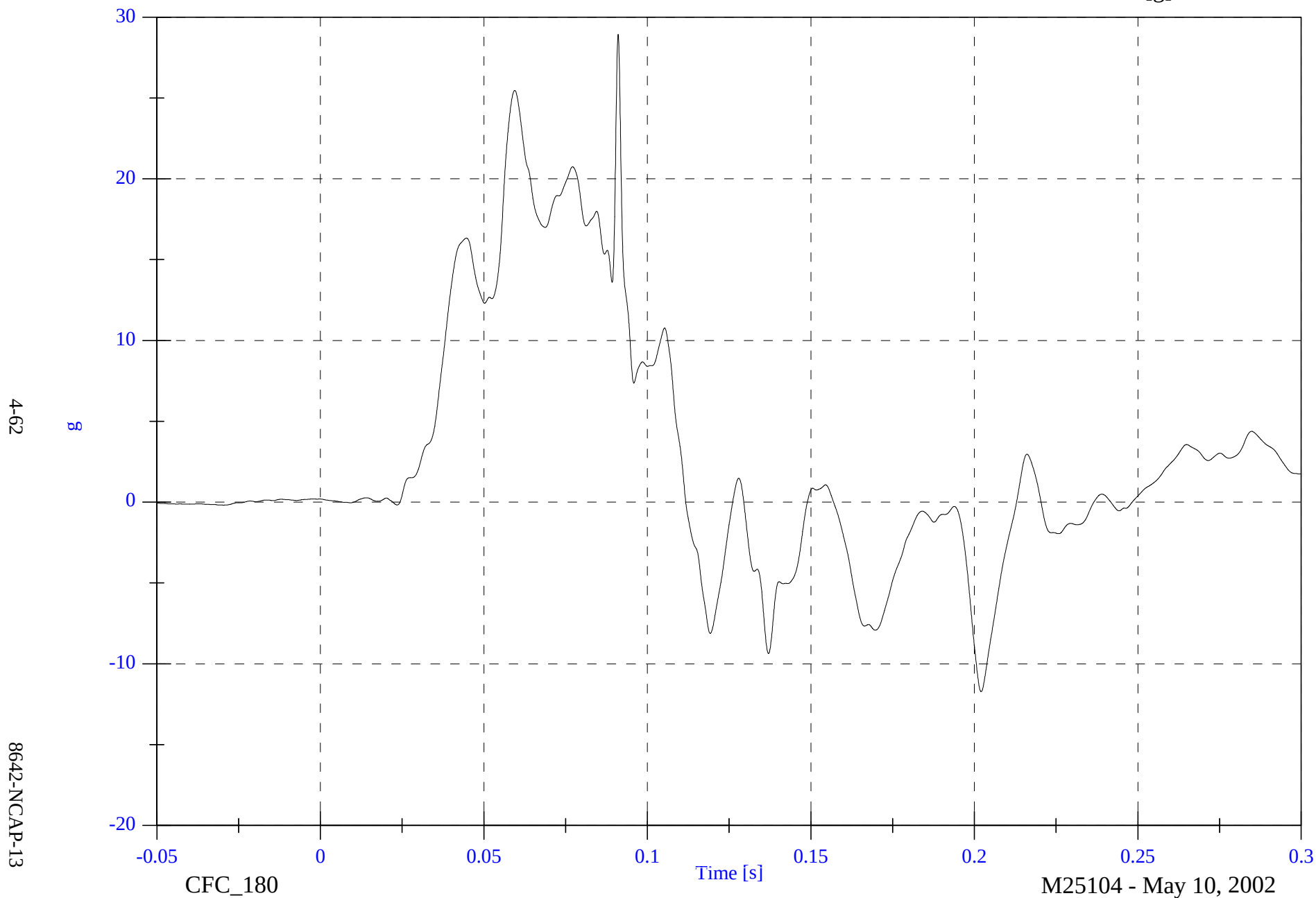
8642-NCAP-13

2002 NCAP Test 13 - 2002 Toyota Camry

P4 Chest x

Max: 28.9 [g] at 0.091 [s]

Min: -11.7 [g] at 0.202 [s]

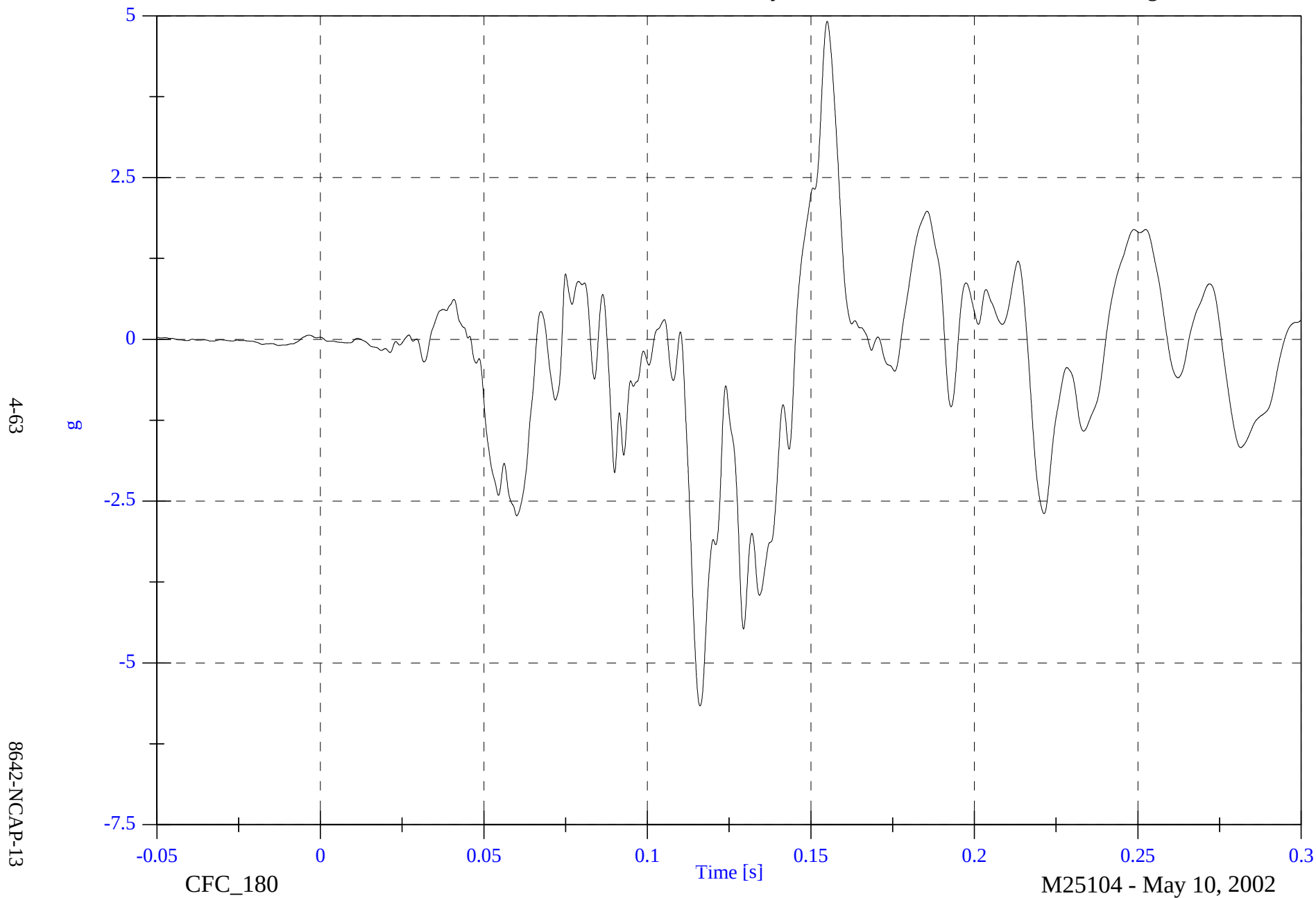


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 4.9 [g] at 0.155 [s]

Min: -5.7 [g] at 0.116 [s]

P4 Chest y

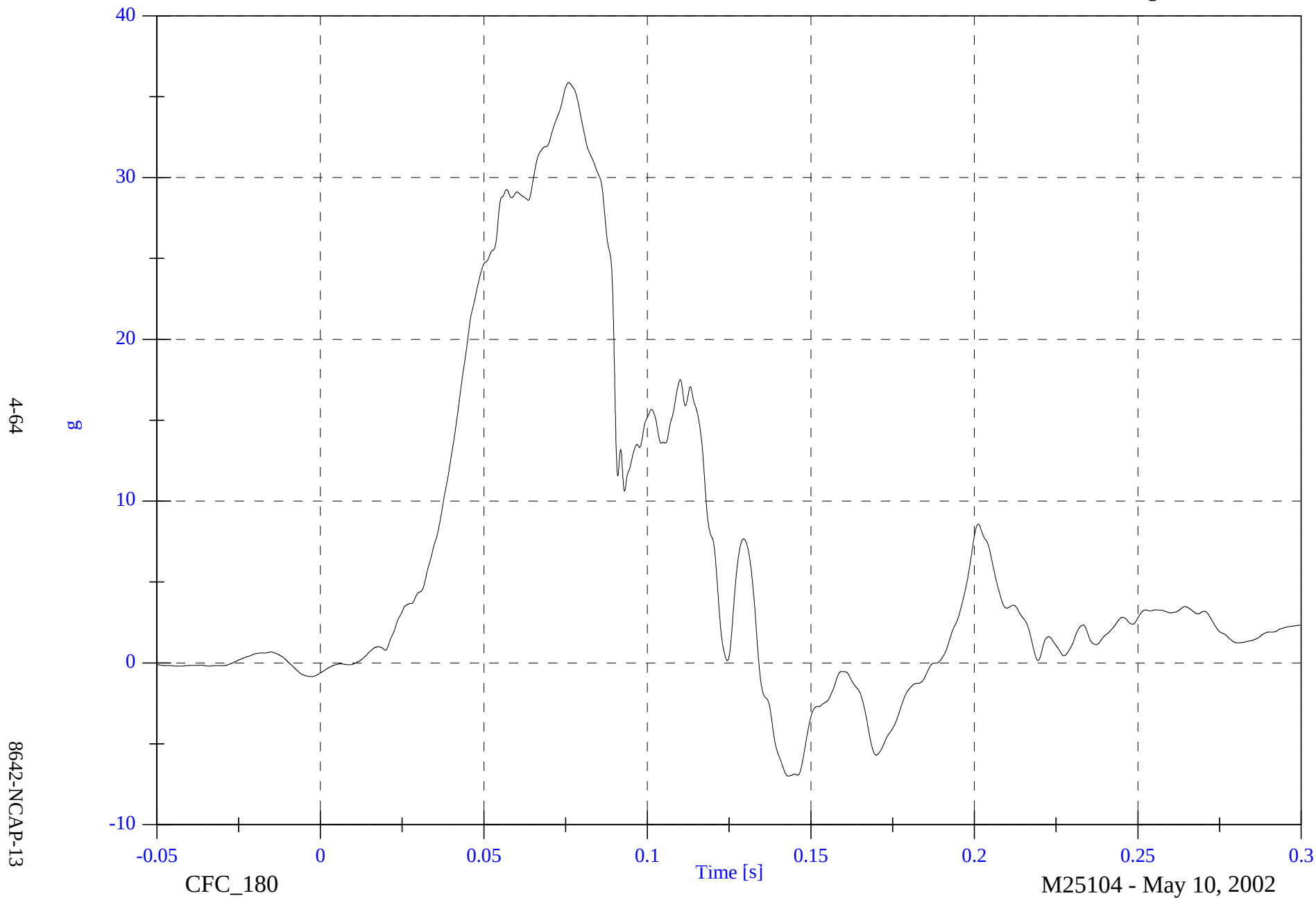


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Chest z

Max: 35.9 [g] at 0.076 [s]

Min: -7.0 [g] at 0.143 [s]

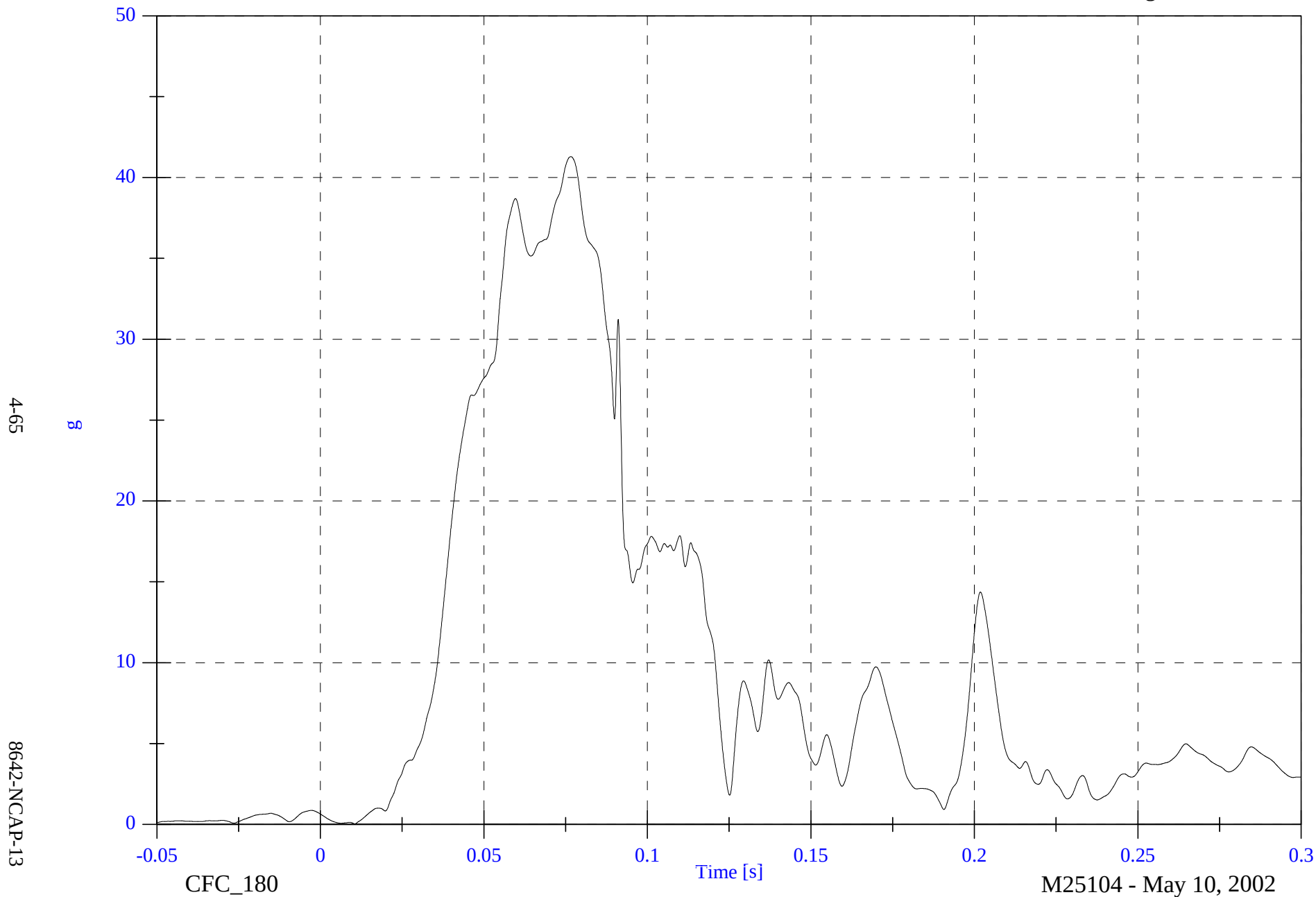


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Chest Resultant

Max: 41.3 [g] at 0.077 [s]

Min: 0.0 [g] at 0.011 [s]

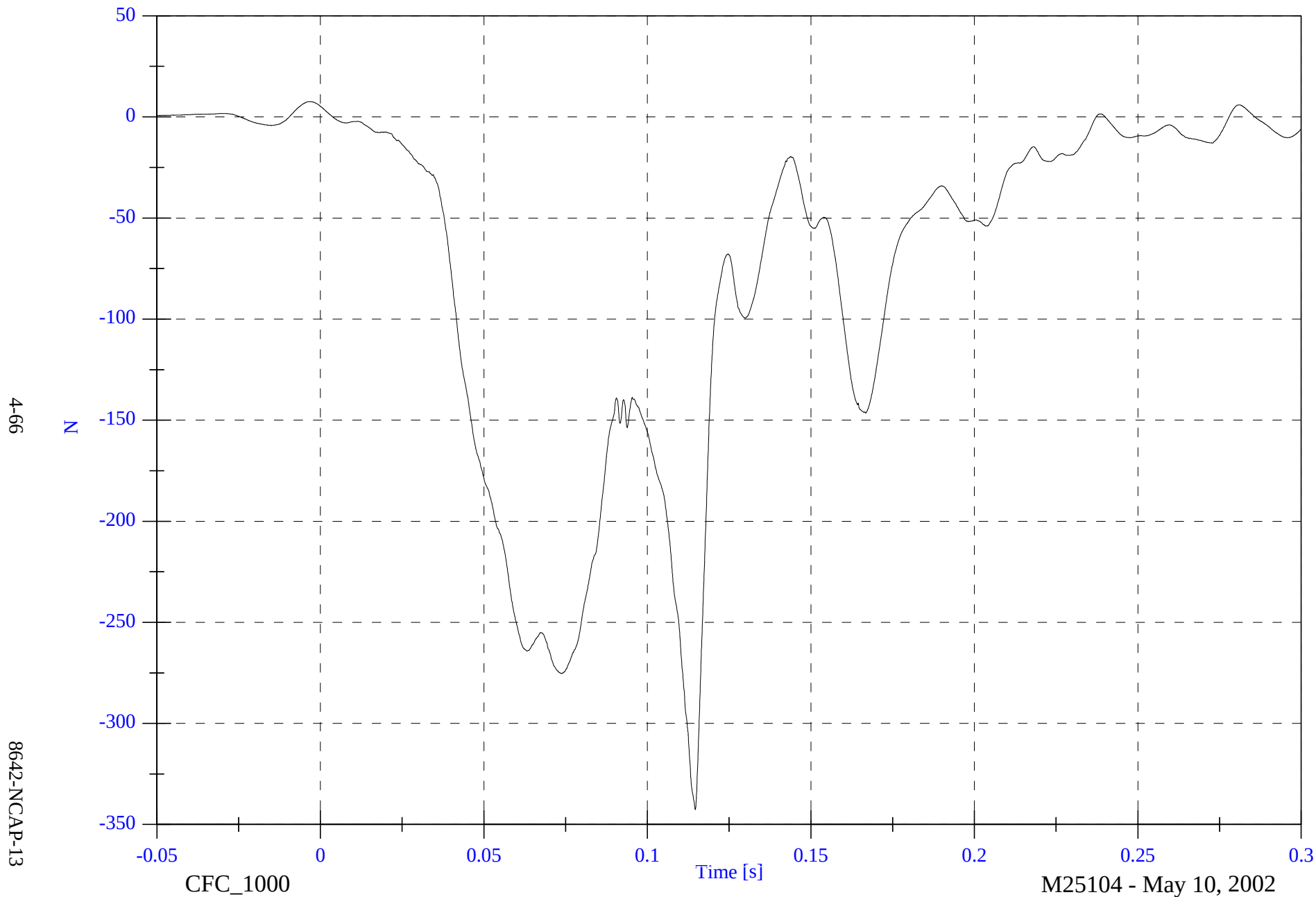


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Lumbar Fx

Max: 7.6 [N] at -0.003 [s]

Min: -342.8 [N] at 0.115 [s]

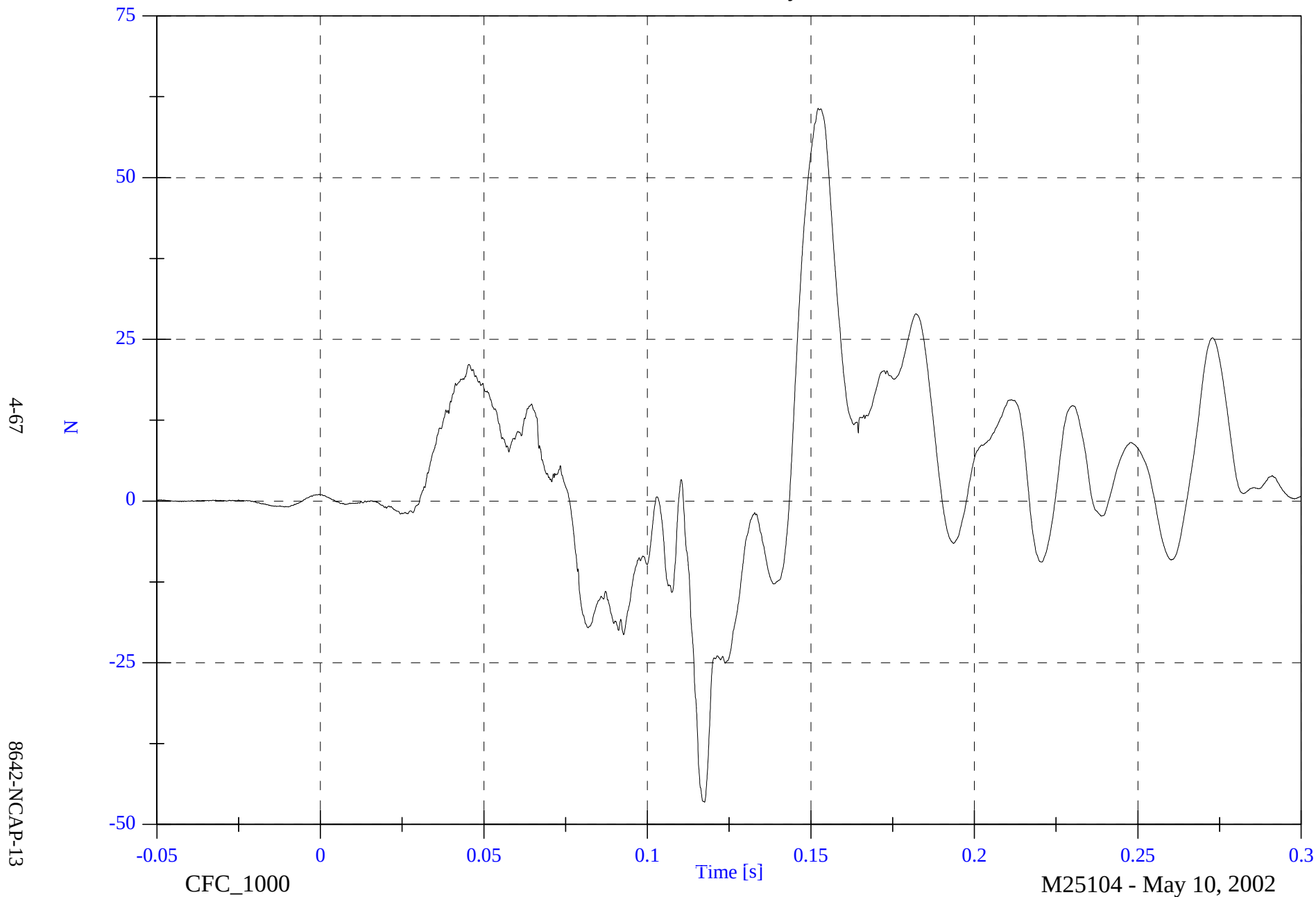


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Lumbar Fy

Max: 60.7 [N] at 0.152 [s]

Min: -46.6 [N] at 0.117 [s]

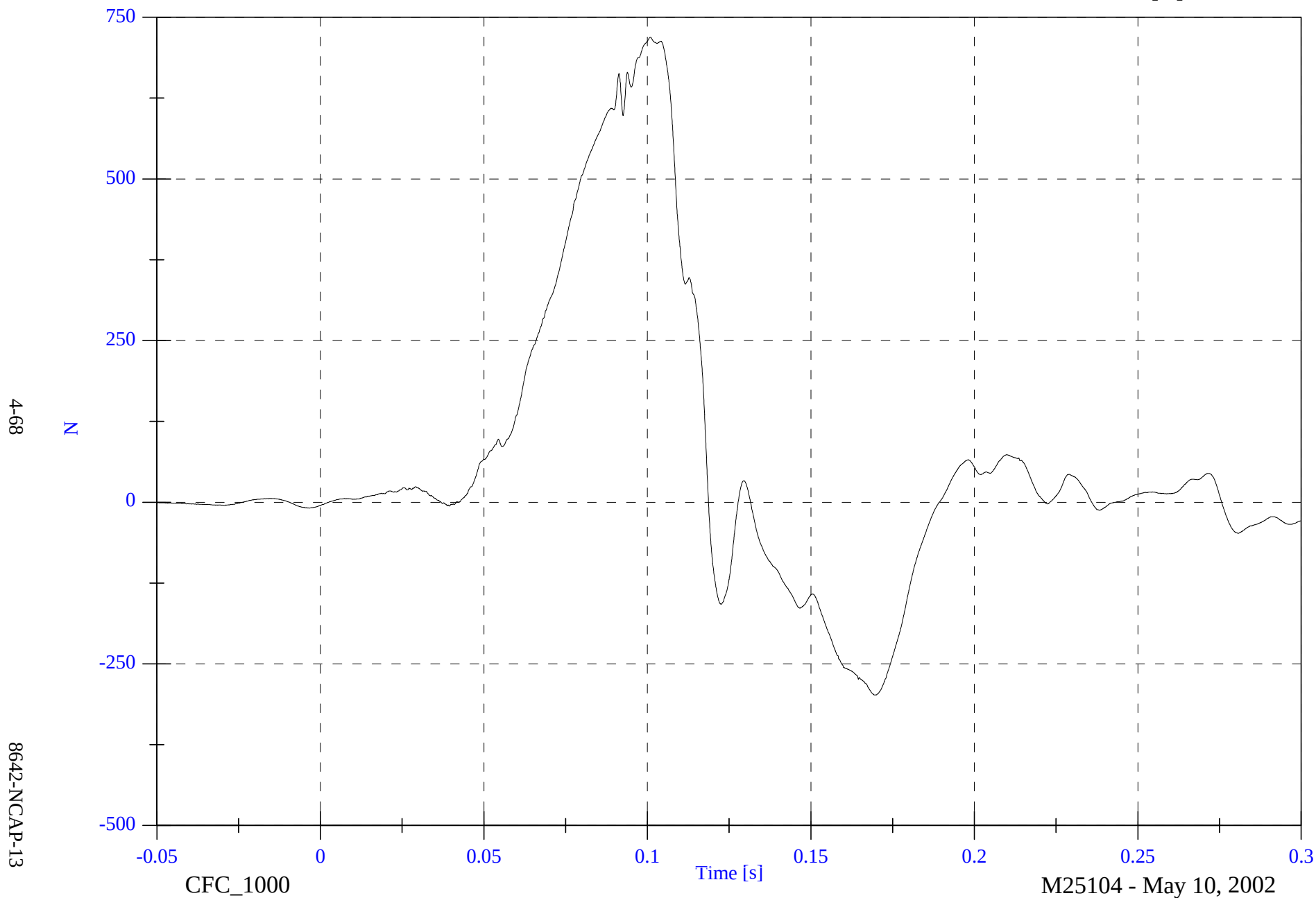


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 719.2 [N] at 0.101 [s]

Min: -298.2 [N] at 0.170 [s]

P4 Lumbar Fz



2002 NCAP Test 13 - 2002 Toyota Camry

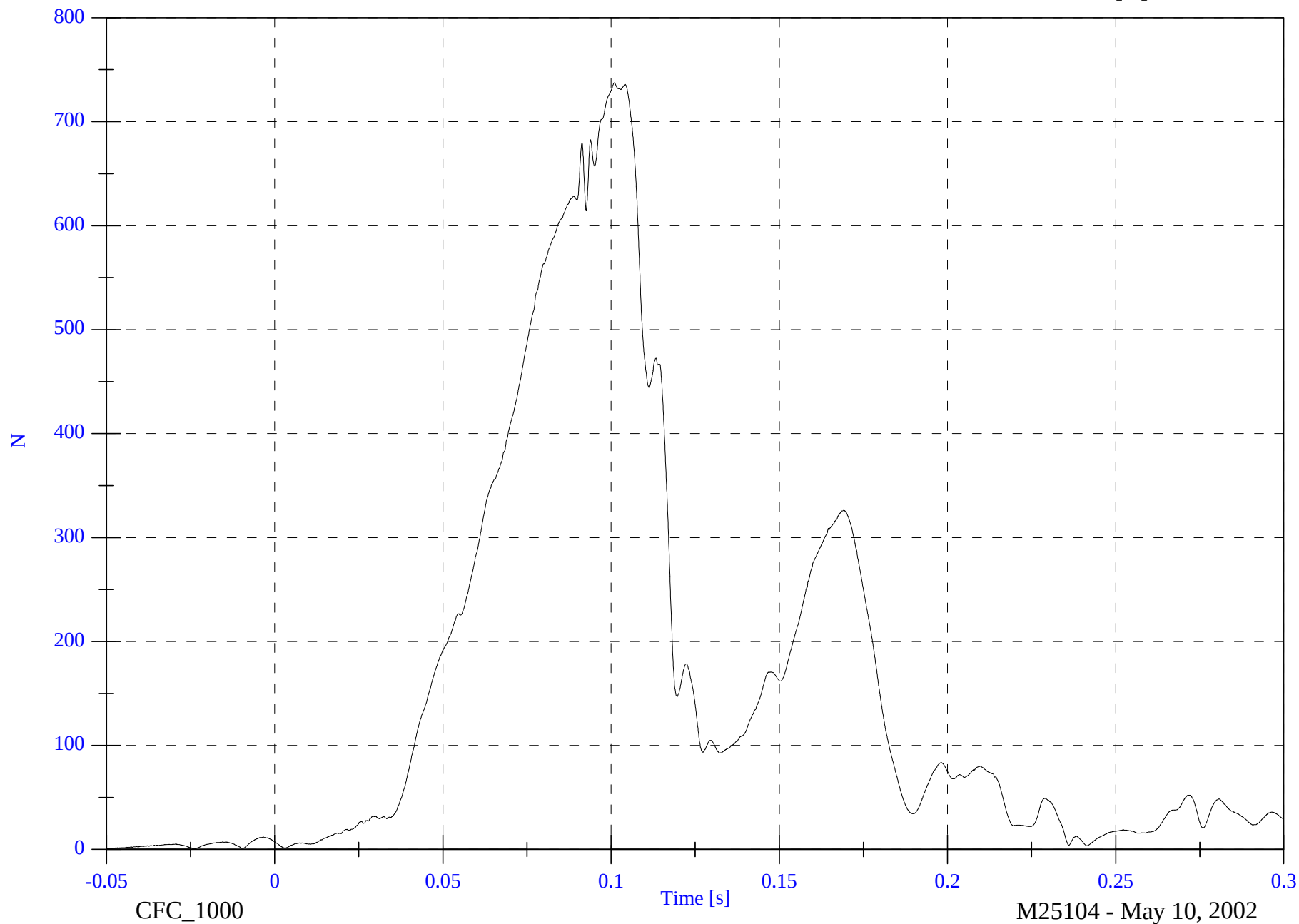
P4 Lumbar F Resultant

Max: 737.4 [N] at 0.101 [s]

Min: 0.5 [N] at -0.024 [s]

4-69

8642-NCAP-13

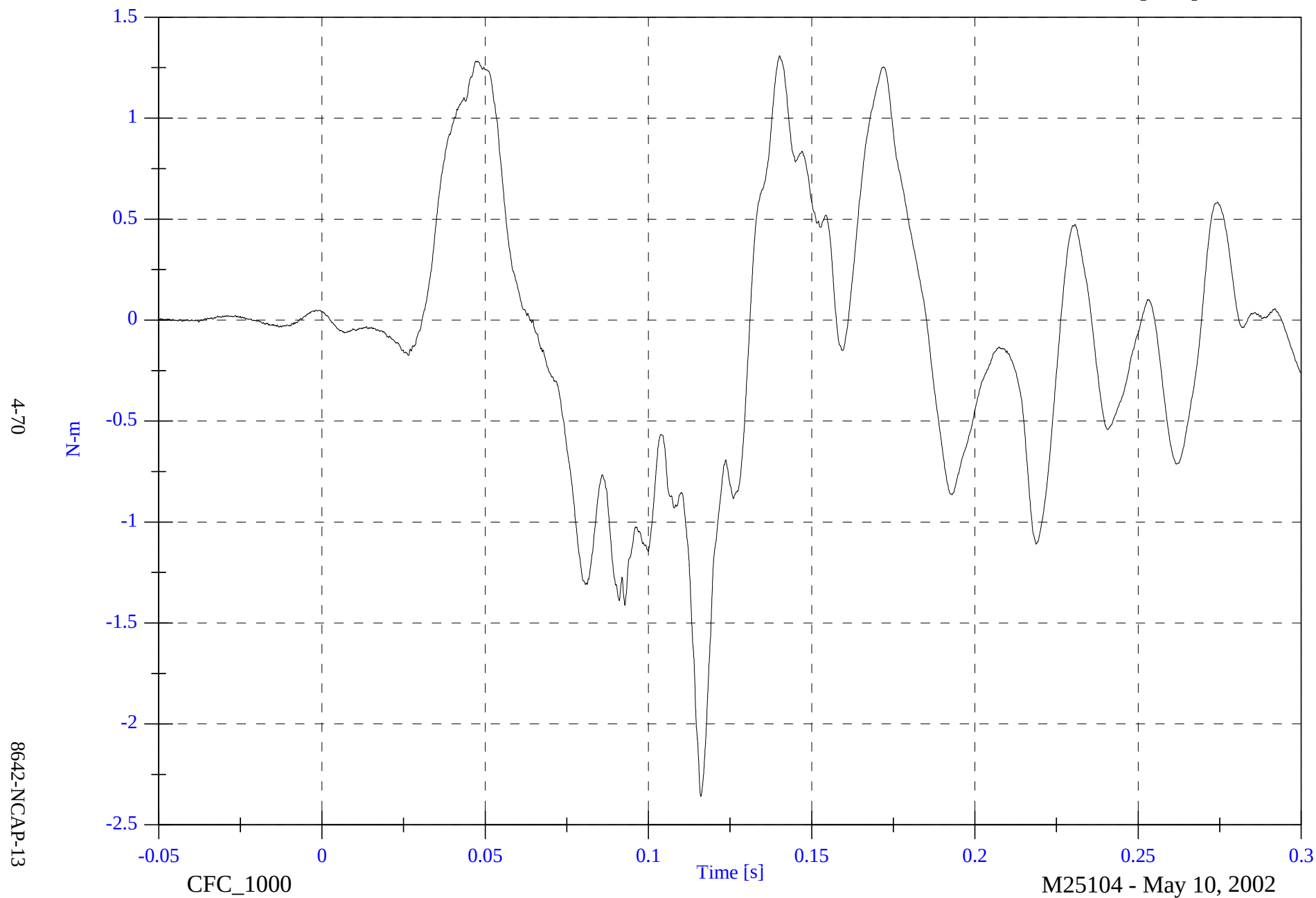


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 1.3 [N-m] at 0.140 [s]

Min: -2.4 [N-m] at 0.116 [s]

P4 Lumbar Mx



2002 NCAP Test 13 - 2002 Toyota Camry

Max: 11.1 [N-m] at 0.115 [s]

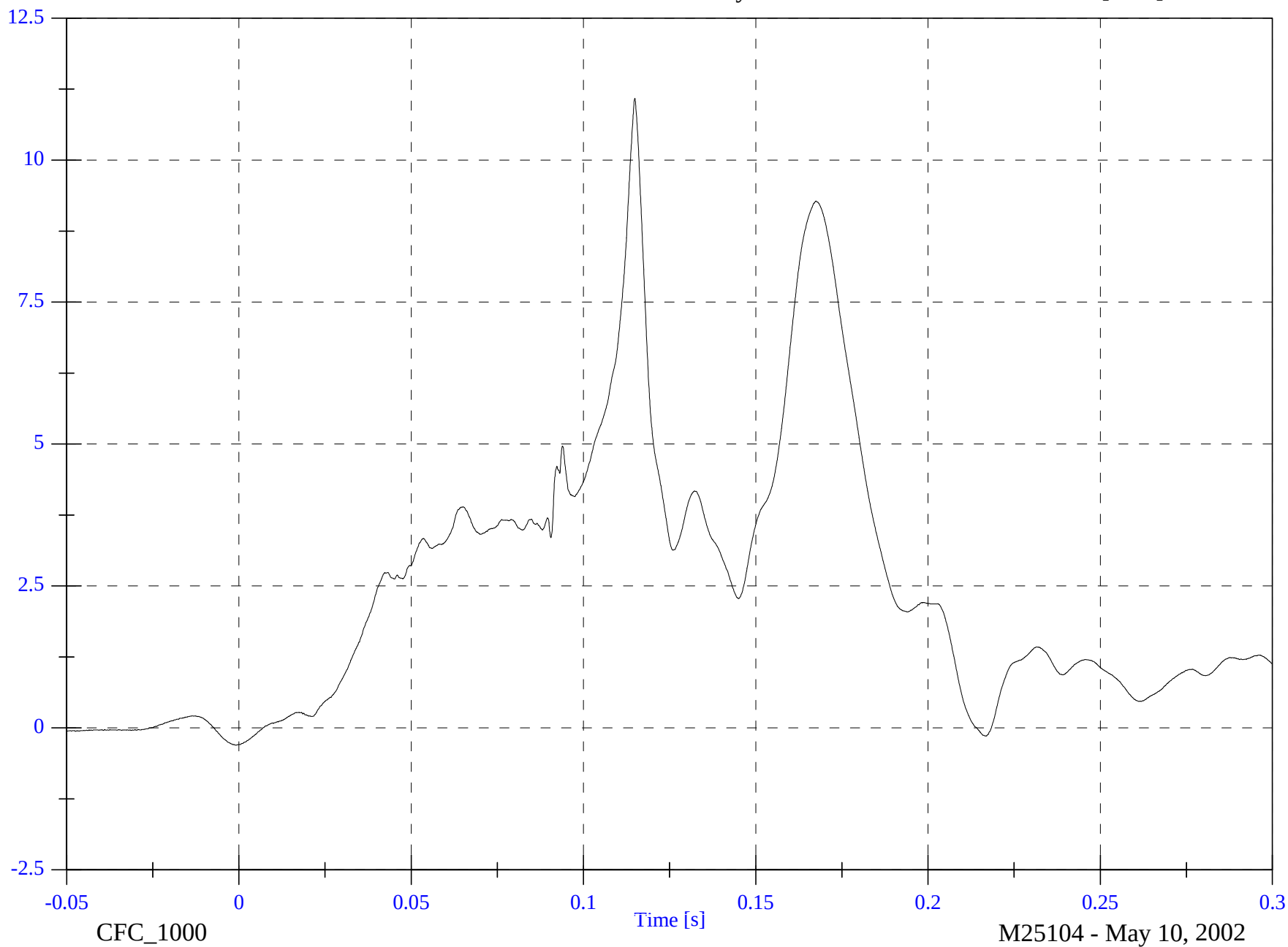
Min: -0.3 [N-m] at -0.001 [s]

P4 Lumbar My

4-71

N-m

8642-NCAP-13

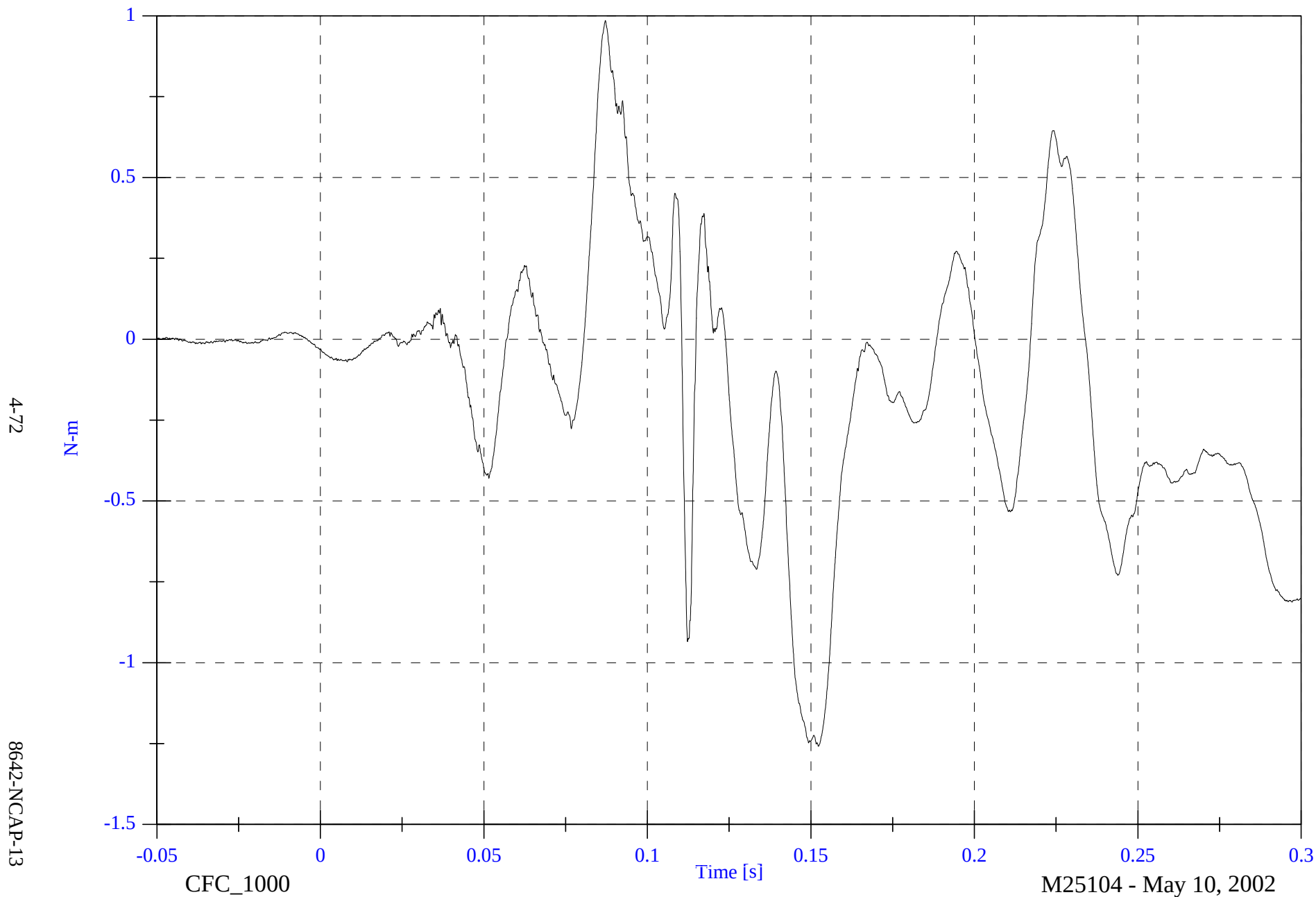


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Lumbar Mz

Max: 1.0 [N-m] at 0.087 [s]

Min: -1.3 [N-m] at 0.152 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

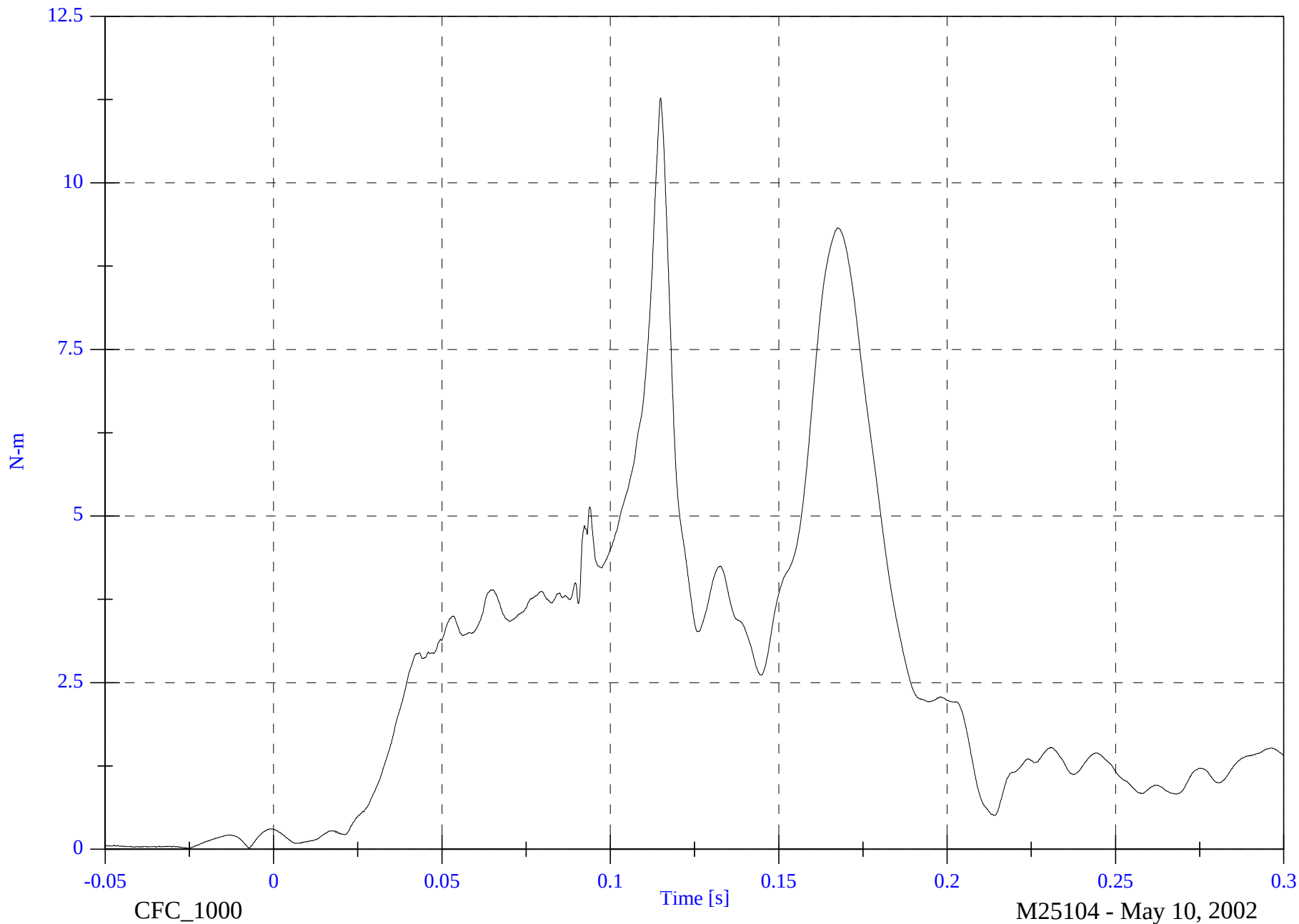
P4 Lumbar M Resultant

Max: 11.3 [N-m] at 0.115 [s]

Min: 0.0 [N-m] at -0.026 [s]

4-73

8642-NCAP-13

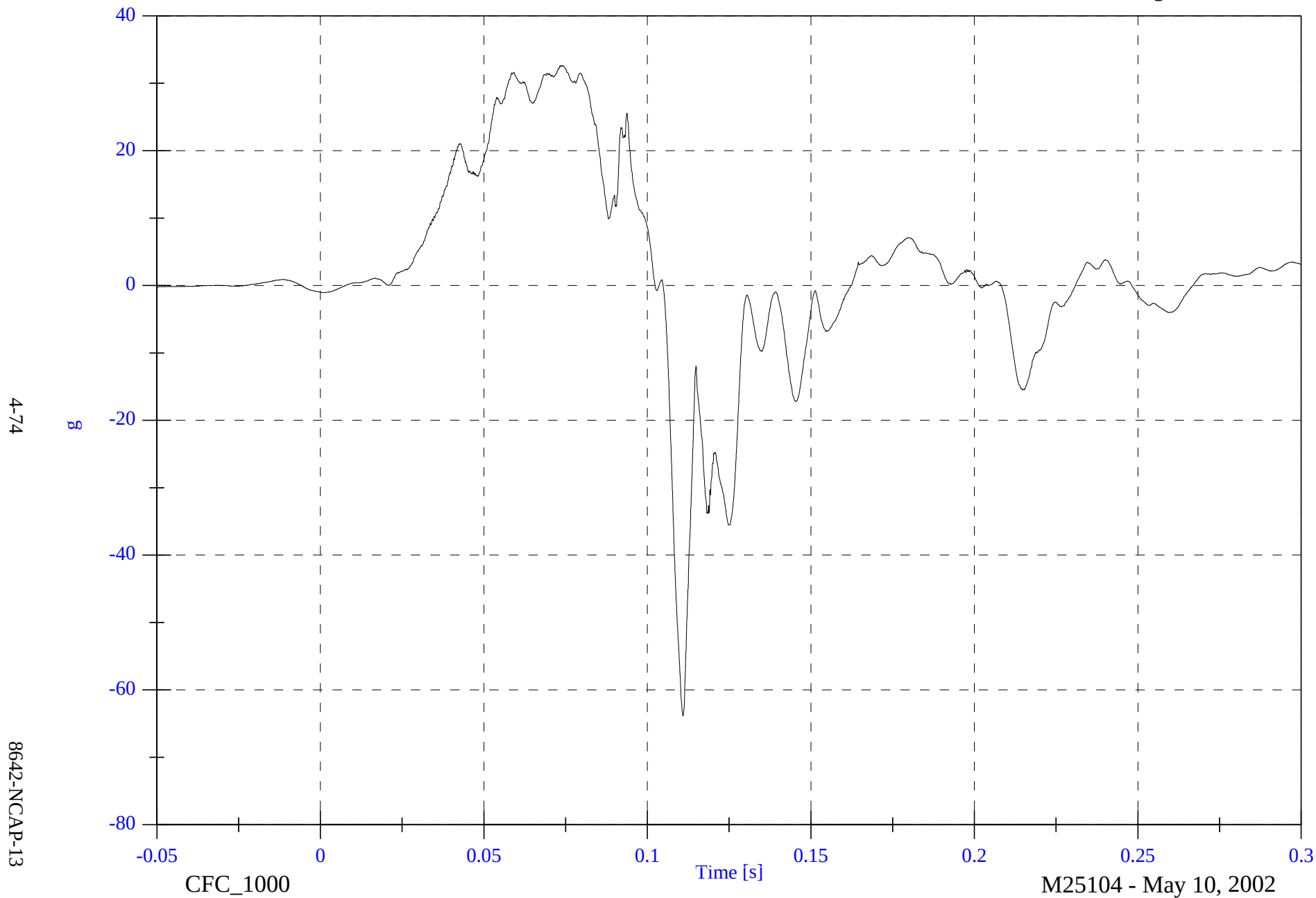


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 32.6 [g] at 0.074 [s]

Min: -63.9 [g] at 0.111 [s]

P4 Pelvic x

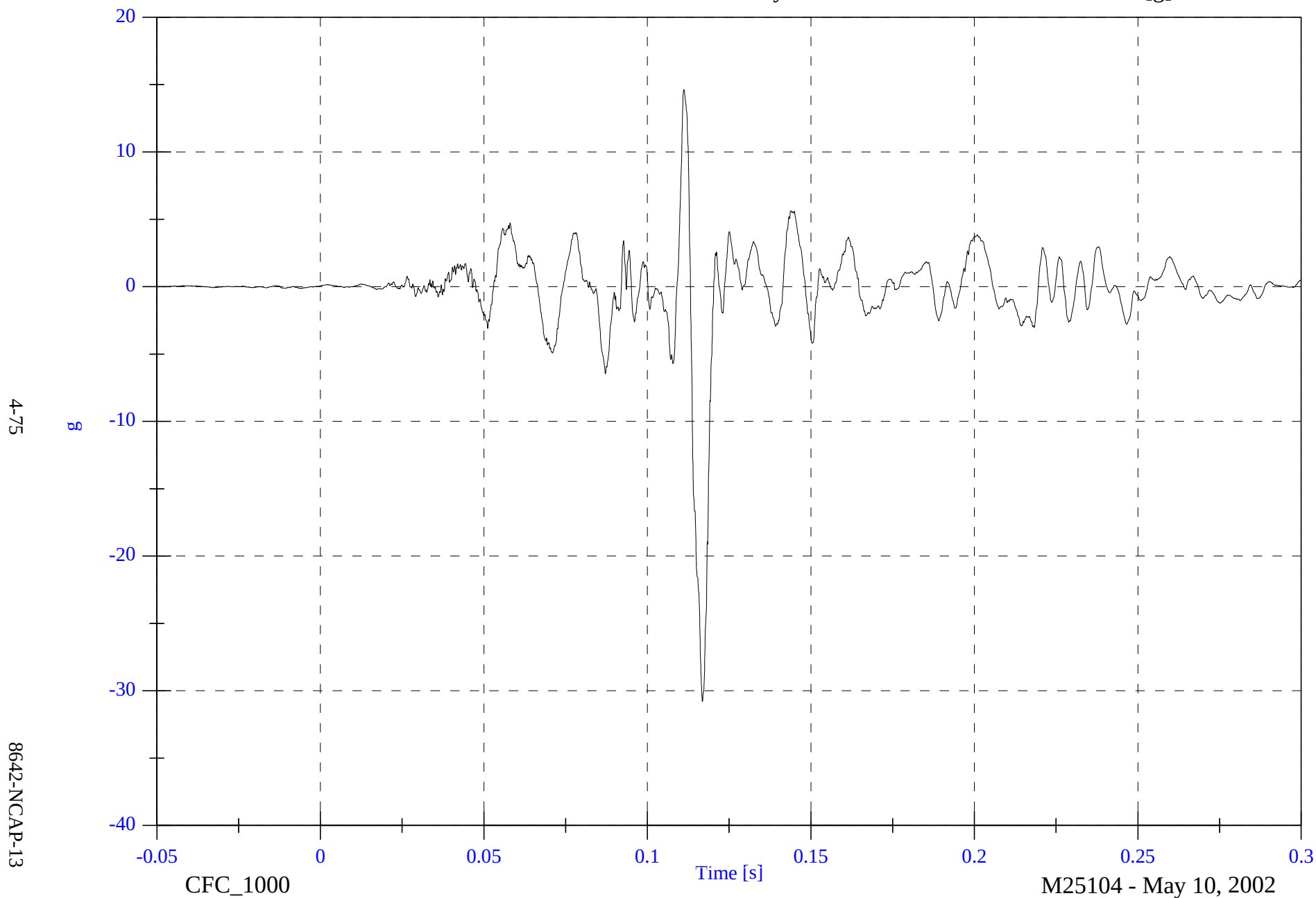


2002 NCAP Test 13 - 2002 Toyota Camry

Max: 14.6 [g] at 0.111 [s]

Min: -30.8 [g] at 0.117 [s]

P4 Pelvic y

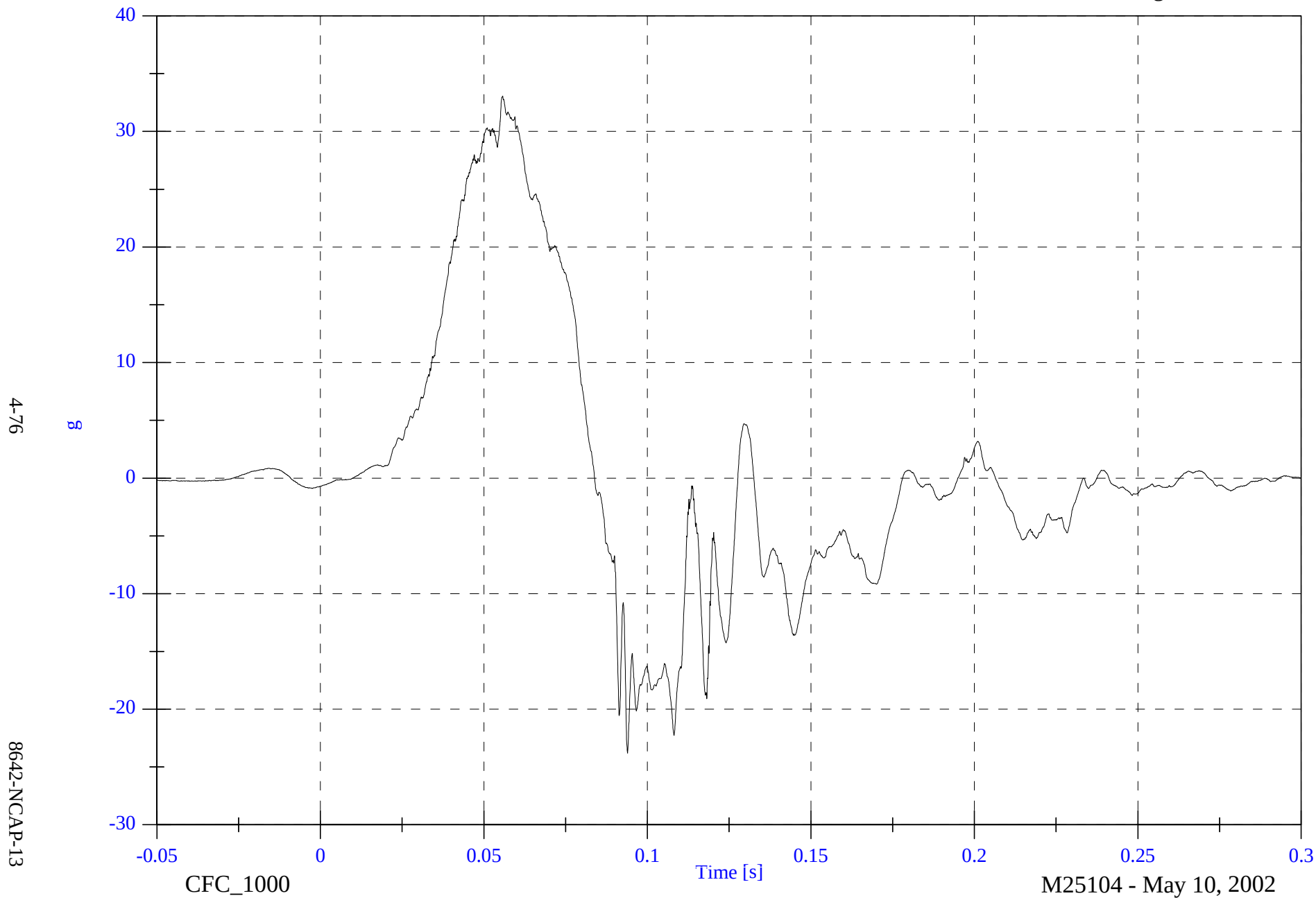


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Pelvic z

Max: 33.1 [g] at 0.056 [s]

Min: -23.8 [g] at 0.094 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

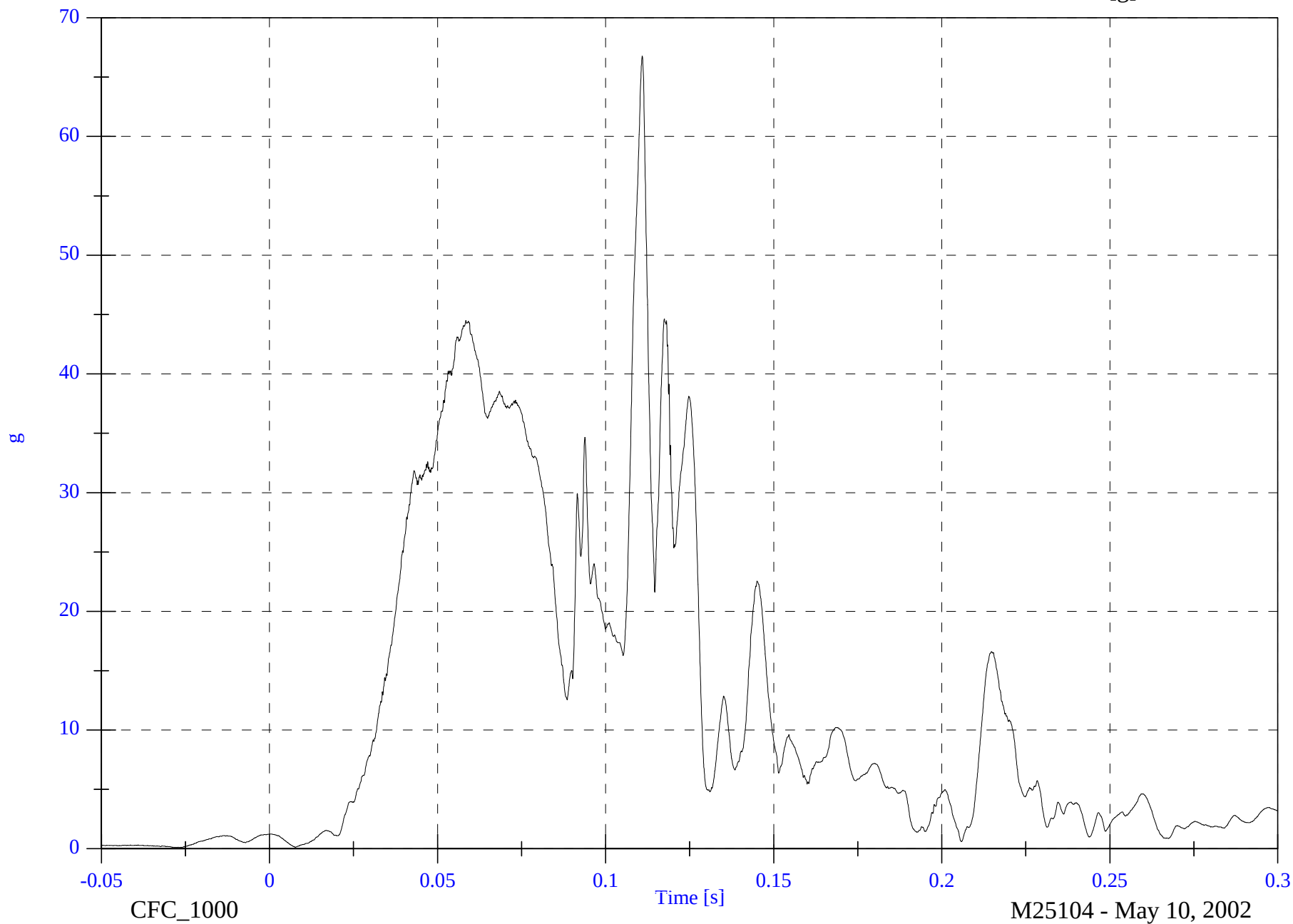
P4 Pelvic Resultant

Max: 66.8 [g] at 0.111 [s]

Min: 0.1 [g] at -0.027 [s]

4-77

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

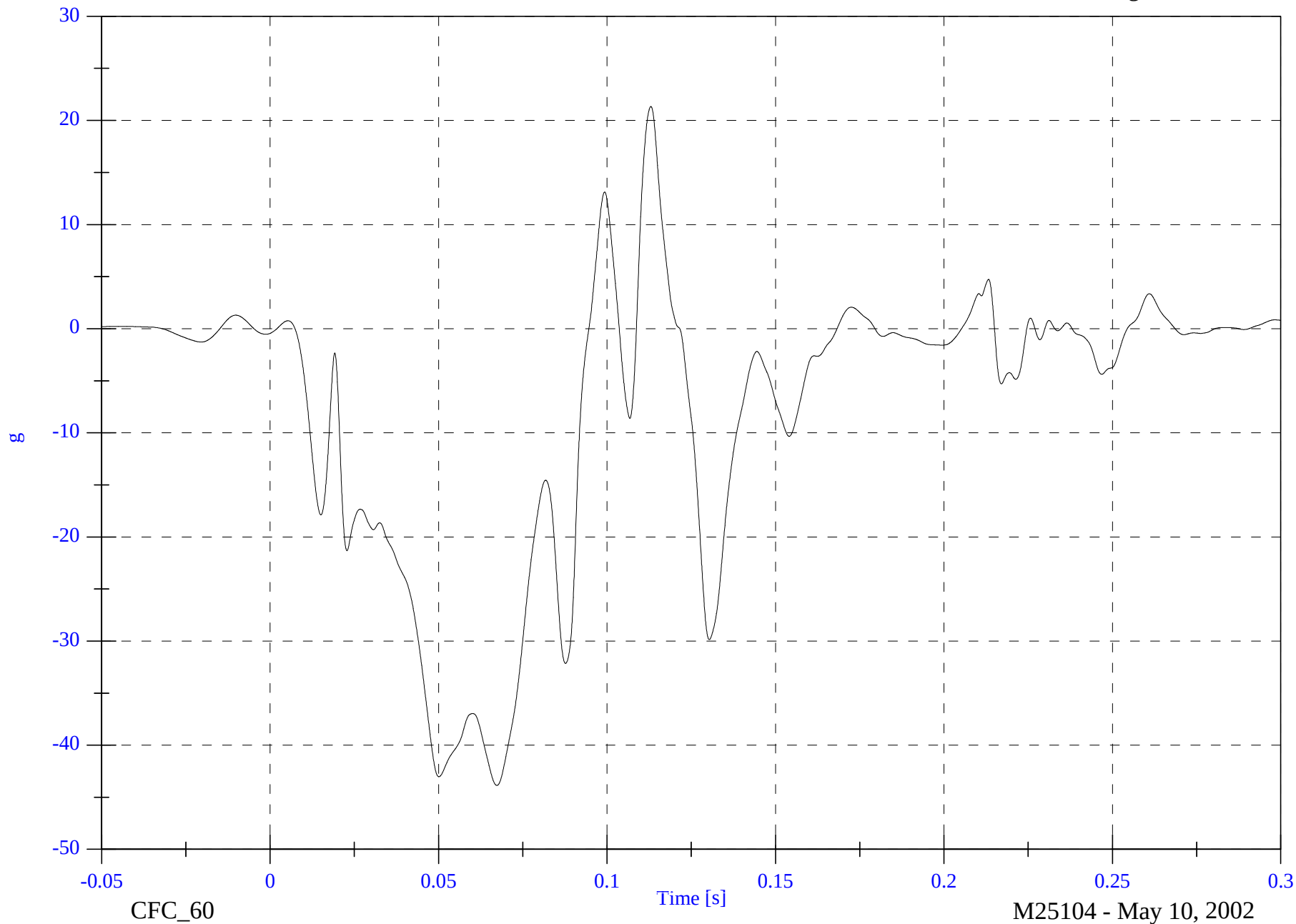
P4 Child Seat x

Max: 21.3 [g] at 0.113 [s]

Min: -43.9 [g] at 0.067 [s]

4-78

8642-NCAP-13



2002 NCAP Test 13 - 2002 Toyota Camry

P4 Child Seat x Velocity

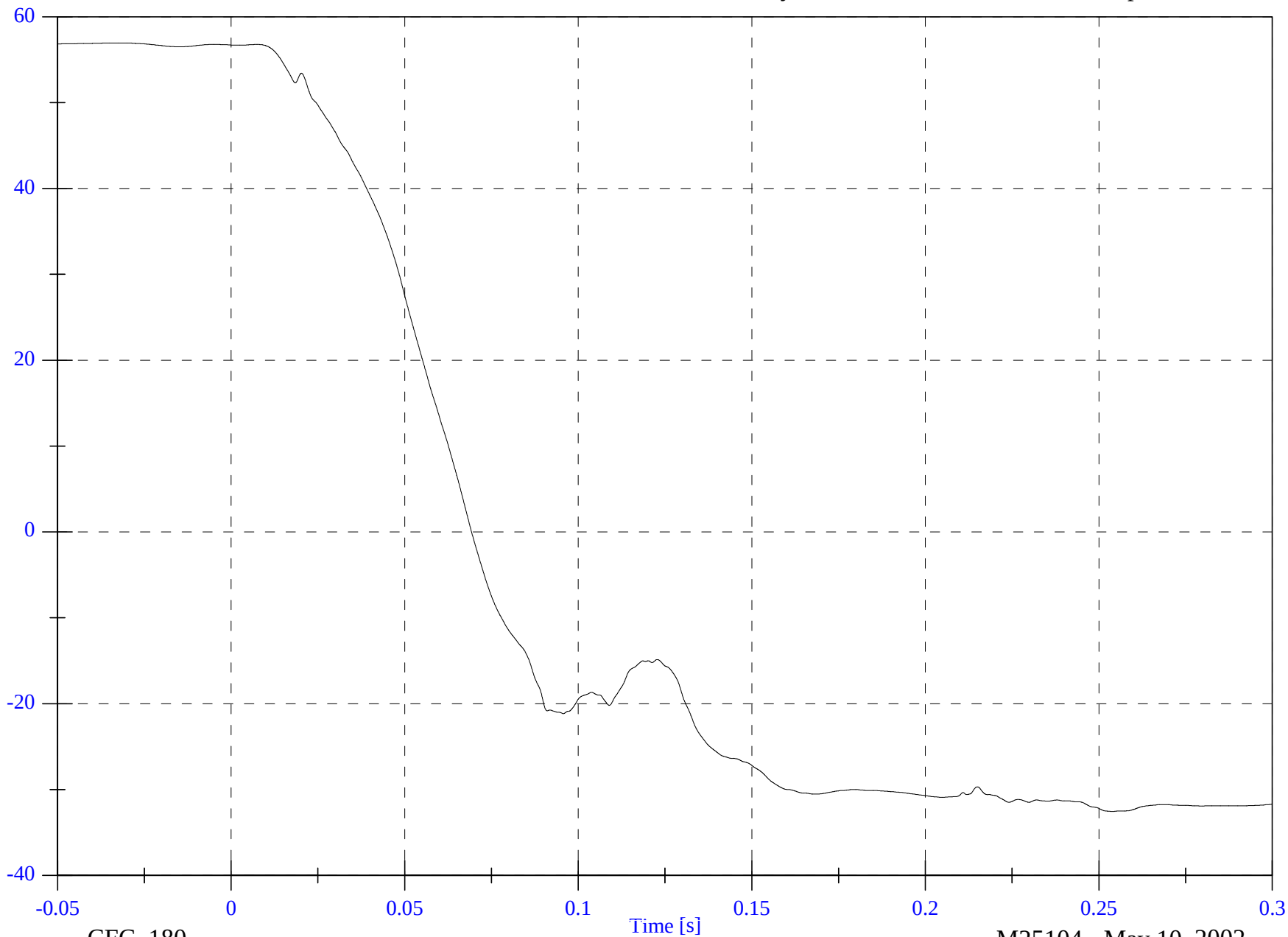
Max: 57.0 [kph] at -0.032 [s]

Min: -32.5 [kph] at 0.254 [s]

4-79

8642-NCAP-13

kph



CFC_180

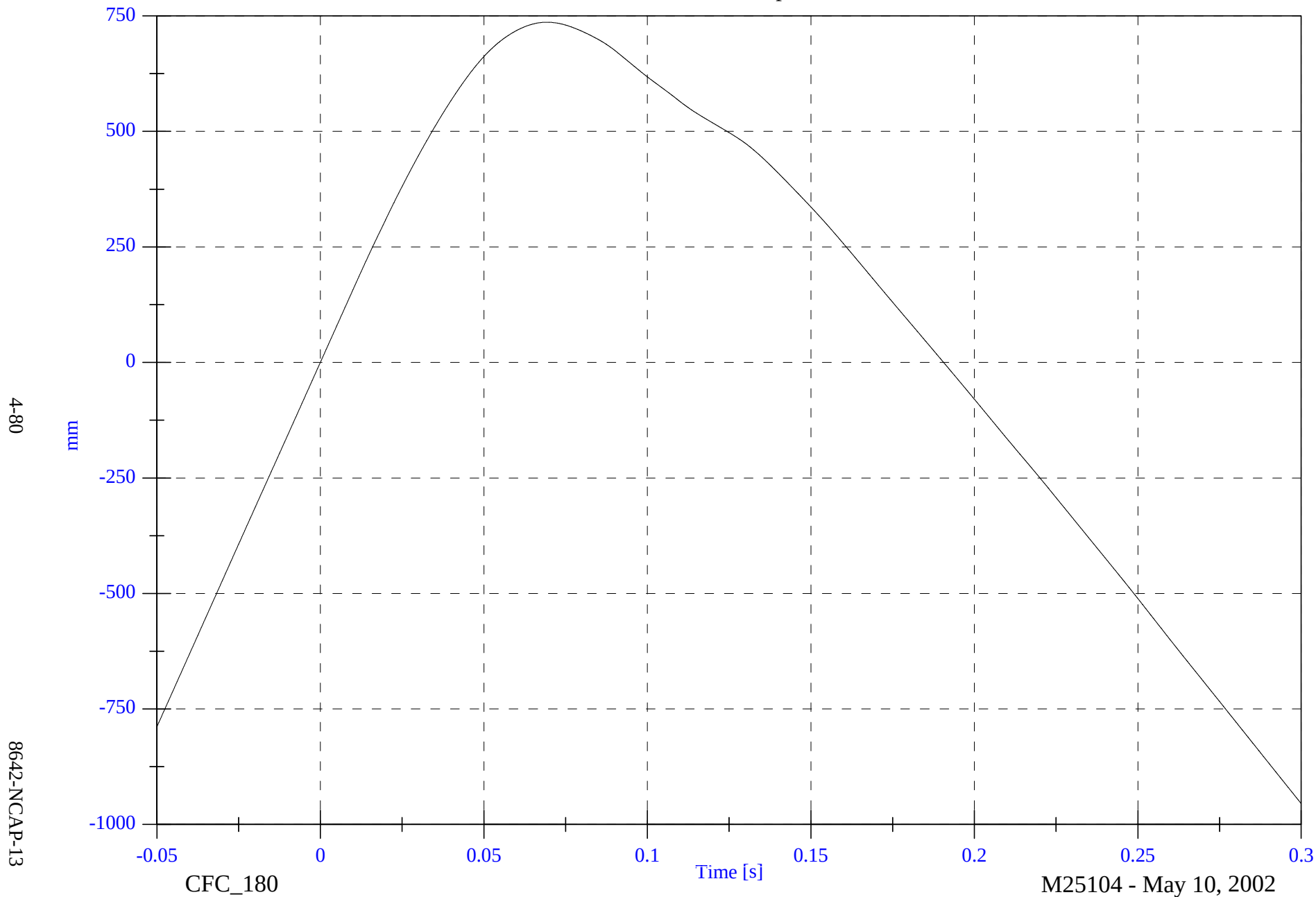
M25104 - May 10, 2002

2002 NCAP Test 13 - 2002 Toyota Camry

P4 Child Seat x Displacement

Max: 736.2 [mm] at 0.069 [s]

Min: -954.7 [mm] at 0.300 [s]

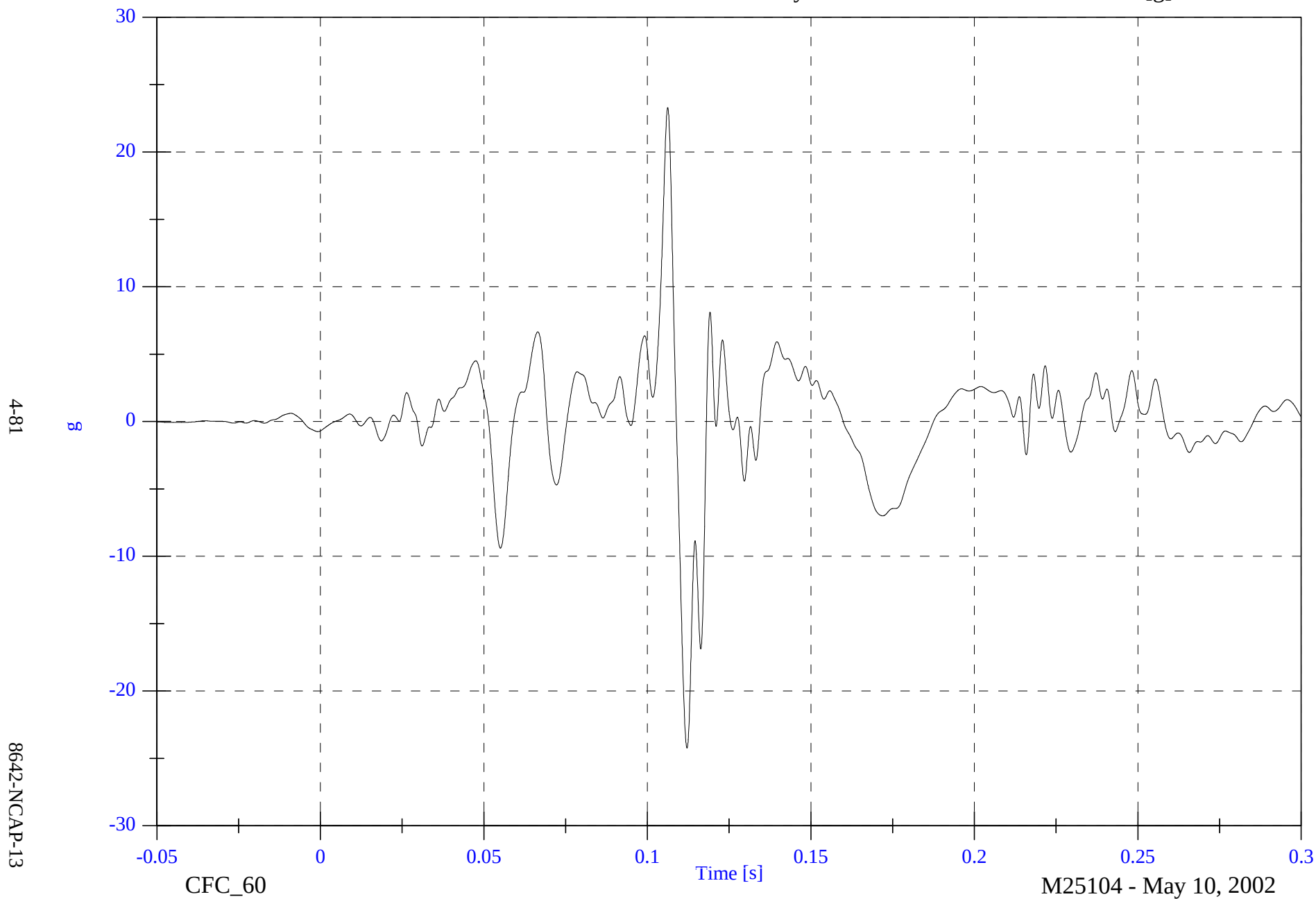


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Child Seat y

Max: 23.3 [g] at 0.106 [s]

Min: -24.2 [g] at 0.112 [s]

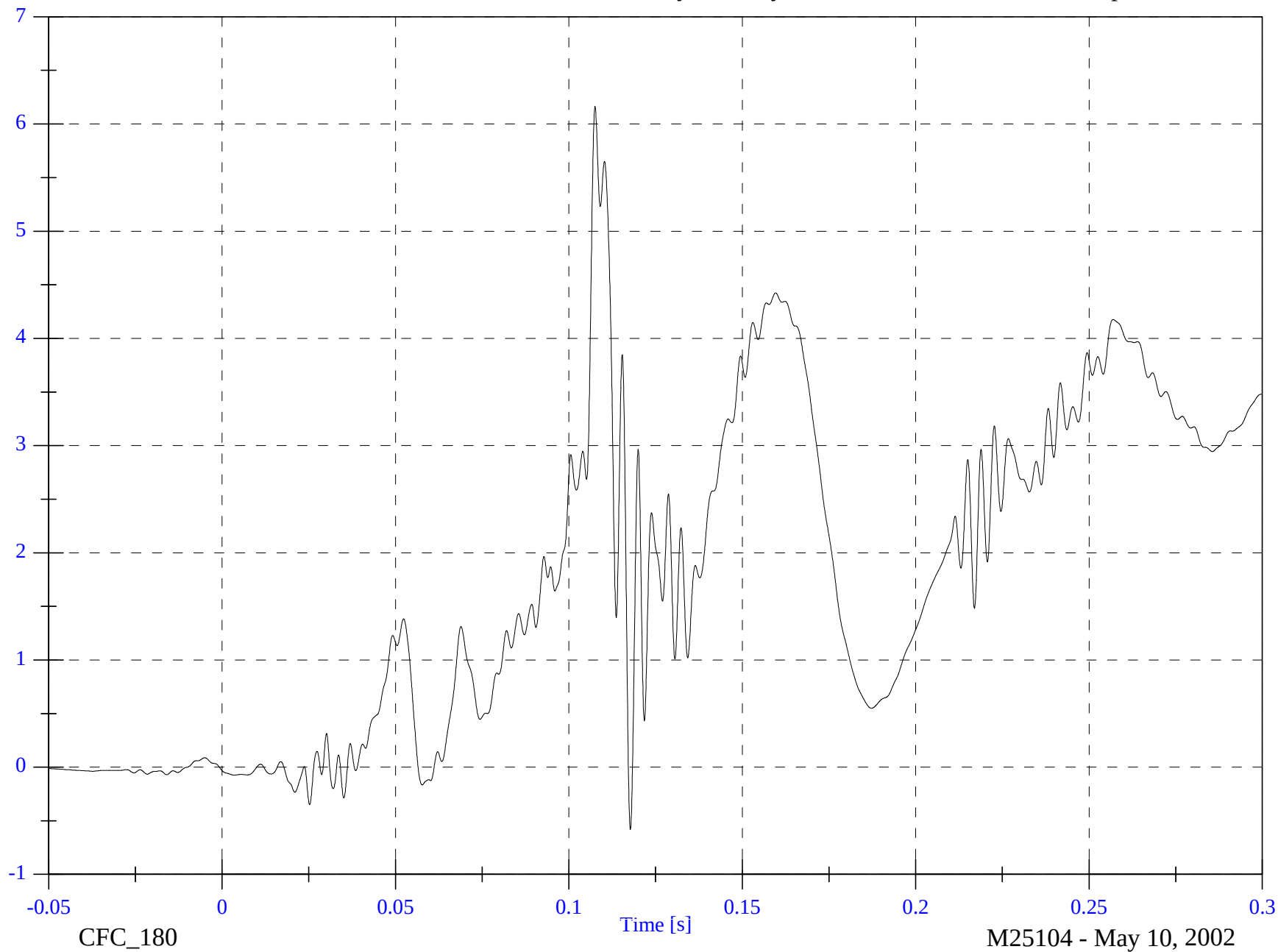


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Child Seat y Velocity

Max: 6.2 [kph] at 0.108 [s]

Min: -0.6 [kph] at 0.118 [s]



4-82

8642-NCAP-13

2002 NCAP Test 13 - 2002 Toyota Camry

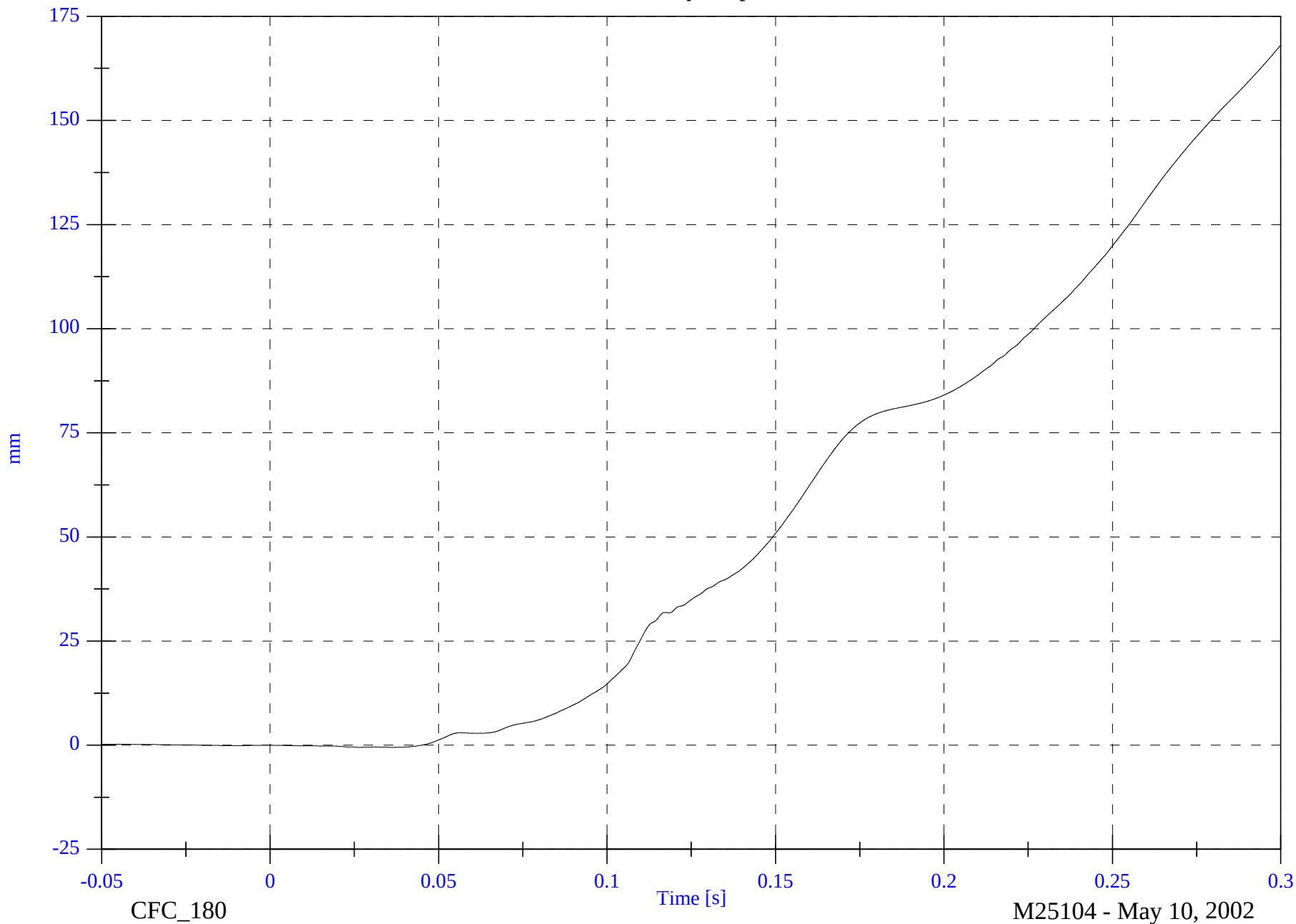
P4 Child Seat y Displacement

Max: 168.1 [mm] at 0.300 [s]

Min: -0.6 [mm] at 0.036 [s]

4-83

8642-NCAP-13

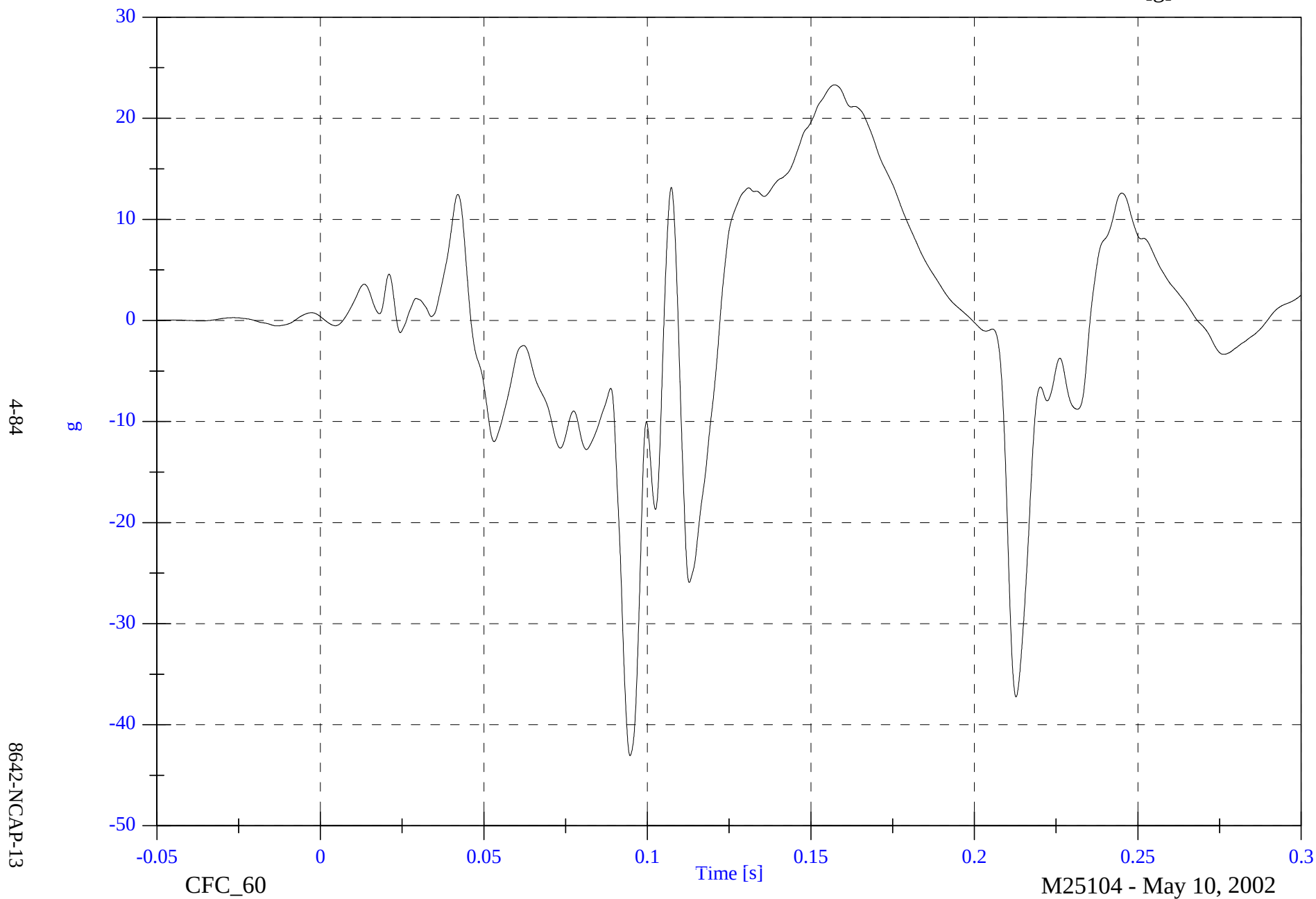


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Child Seat z

Max: 23.3 [g] at 0.157 [s]

Min: -43.1 [g] at 0.095 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

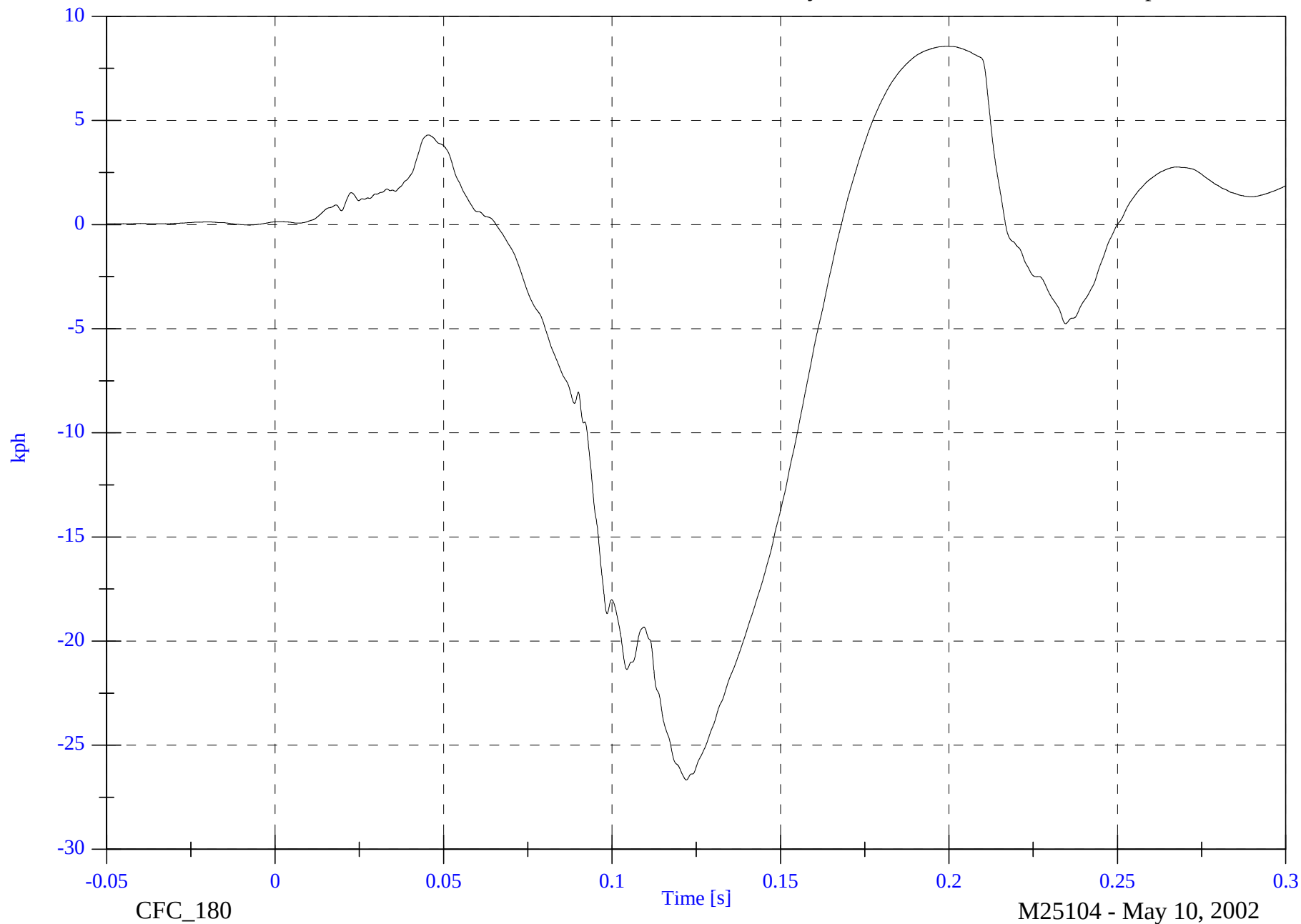
P4 Child Seat z Velocity

Max: 8.6 [kph] at 0.199 [s]

Min: -26.7 [kph] at 0.122 [s]

4-85

8642-NCAP-13

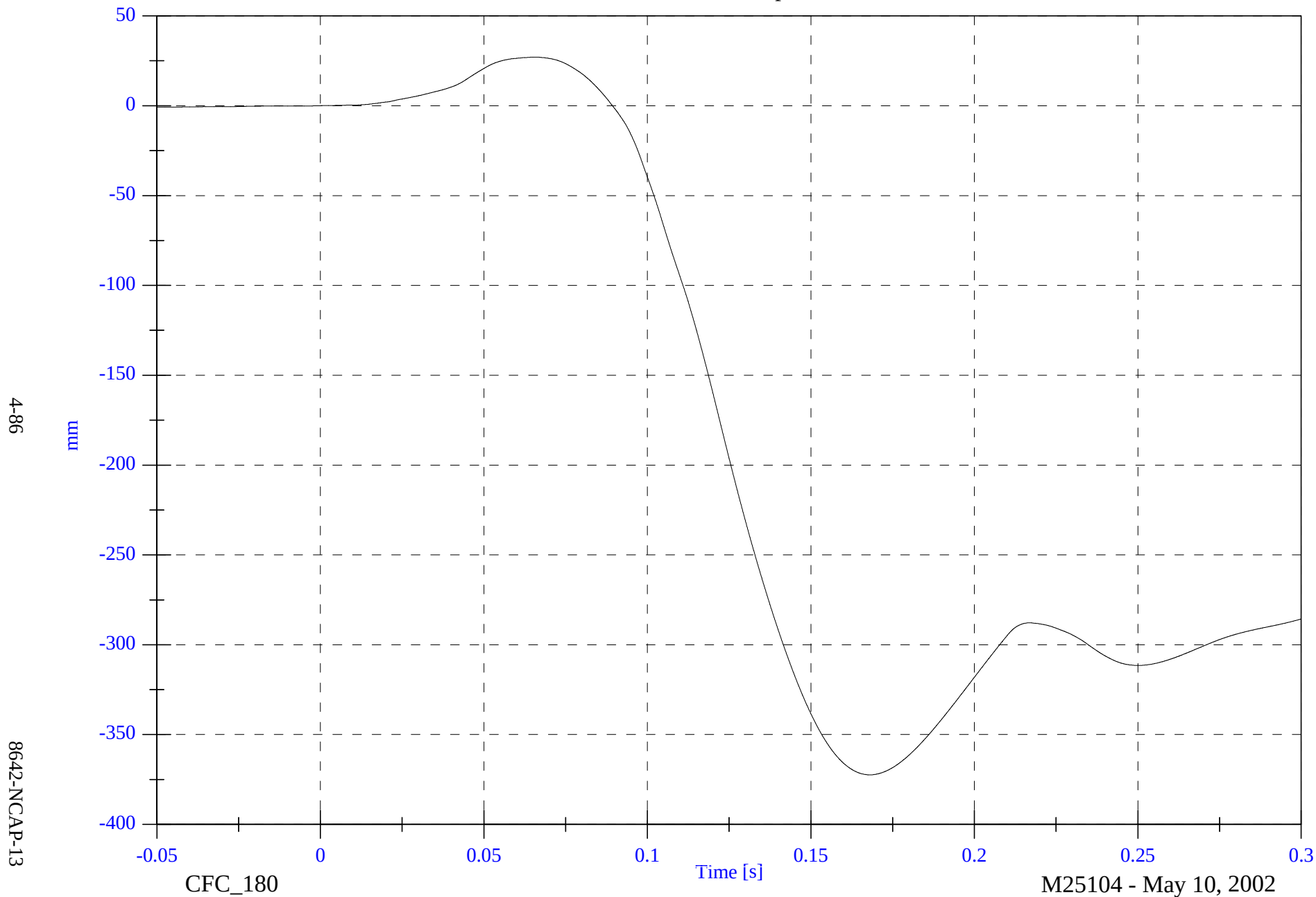


2002 NCAP Test 13 - 2002 Toyota Camry

P4 Child Seat z Displacement

Max: 27.0 [mm] at 0.066 [s]

Min: -372.4 [mm] at 0.168 [s]



2002 NCAP Test 13 - 2002 Toyota Camry

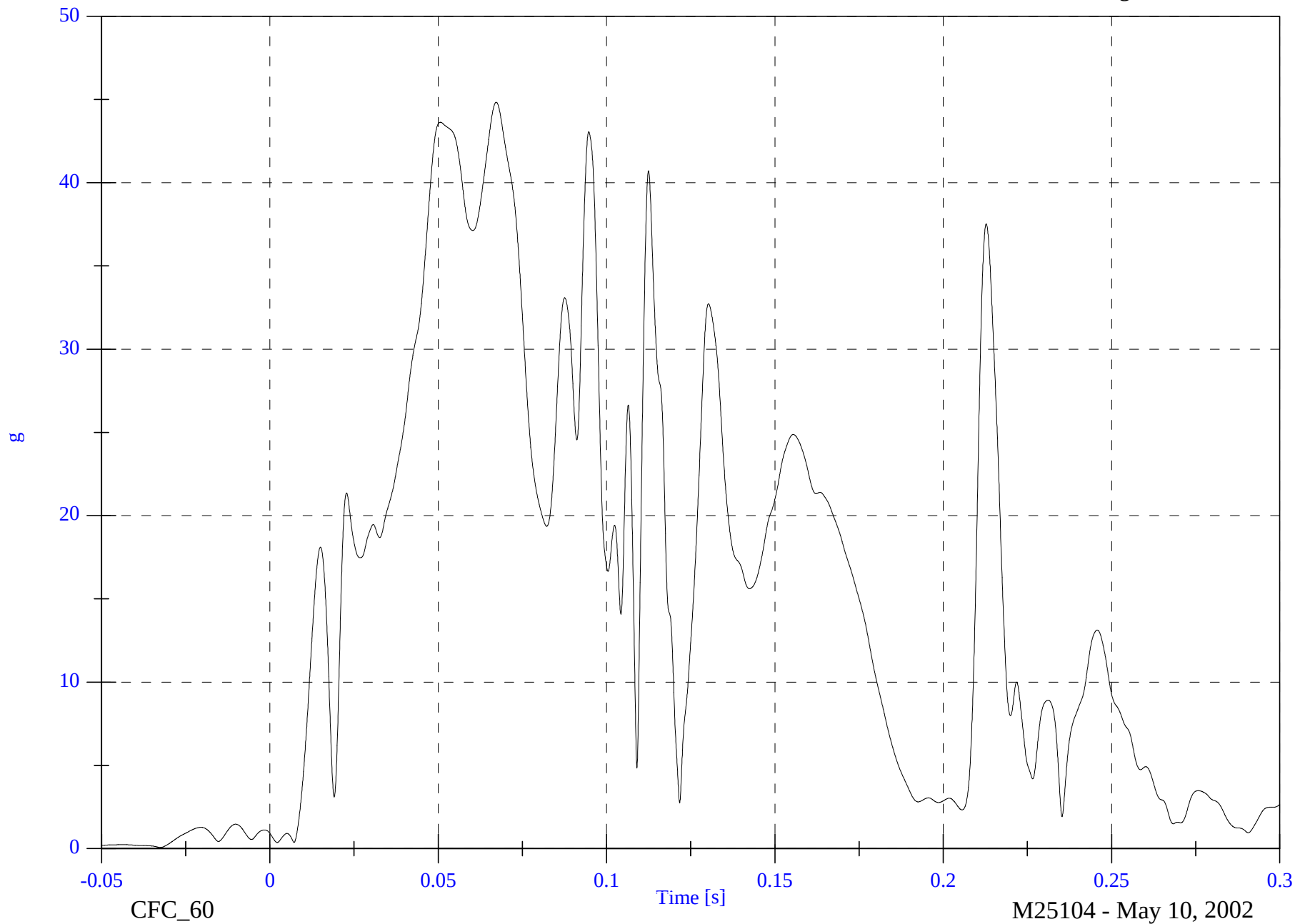
P4 Child Seat Resultant

Max: 44.8 [g] at 0.067 [s]

Min: 0.1 [g] at -0.032 [s]

4-87

8642-NCAP-13



SECTION 5

CHILD DUMMY CALIBRATION INFORMATION

ATDs were certified by VRTC prior to the test program.
Certification details can be found in the bound report.

SECTION 6

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

P572C INSTRUMENTATION

	POSITION #3 (RIGHT) SERIAL NO.: 090		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-00L13-F33	ENTRAN	22-Jan-02
HEAD AY	AC-98H10-F01	ENTRAN	22-Jan-02
HEAD AZ	AC-01J02-F08	ENTRAN	22-Jan-02
HEAD RAZ	AC-98H13-F15	ENTRAN	22-Jan-02
UPPER NECK FX	LC-276Fx	DENTON	14-Jan-02
UPPER NECK FY	LC-276Fy	DENTON	14-Jan-02
UPPER NECK FZ	LC-276Fz	DENTON	14-Jan-02
UPPER NECK MX	LC-276Mx	DENTON	14-Jan-02
UPPER NECK MY	LC-276My	DENTON	14-Jan-02
UPPER NECK MZ	LC-276Mz	DENTON	14-Jan-02
LOWER NECK FX	LC-281Fx	DENTON	15-Jan-02
LOWER NECK FY	LC-281Fy	DENTON	15-Jan-02
LOWER NECK FZ	LC-281Fz	DENTON	15-Jan-02
LOWER NECK MX	LC-281Mx	DENTON	15-Jan-02
LOWER NECK MY	LC-281My	DENTON	15-Jan-02
LOWER NECK MZ	LC-281Mz	DENTON	15-Jan-02
CHEST AX	AC-01G25-N18	ENTRAN	24-Jan-02
CHEST AY	AC-98H10-F18	ENTRAN	22-Jan-02
CHEST AZ	AC-01G25-N04	ENTRAN	25-Jan-02
LUMBAR FX	LC-278Fx	DENTON	14-Jan-02
LUMBAR FY	LC-278Fy	DENTON	14-Jan-02
LUMBAR FZ	LC-278Fz	DENTON	14-Jan-02
LUMBAR MX	LC-278Mx	DENTON	14-Jan-02
LUMBAR MY	LC-278My	DENTON	14-Jan-02
LUMBAR MZ	LC-278Mz	DENTON	14-Jan-02
PELVIS AX	AC-00L20-A15	ENTRAN	22-Jan-02
PELVIS AY	AC-01G18-F02	ENTRAN	22-Jan-02
PELVIS AZ	AC-00L20-A14	ENTRAN	22-Jan-02

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

P572C INSTRUMENTATION

	POSITION #4 (LEFT) SERIAL NO.: 093		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-B02A25-N05	ENTRAN	08-Feb-02
HEAD AY	AC-B02A18-N13	ENTRAN	08-Feb-02
HEAD AZ	AC-B02A18-N03	ENTRAN	11-Feb-02
HEAD RAZ	AC-B02A25-N01	ENTRAN	08-Feb-02
UPPER NECK FX	LC-282-FX	DENTON	15-Jan-02
UPPER NECK FY	LC-282-FY	DENTON	15-Jan-02
UPPER NECK FZ	LC-282-FZ	DENTON	15-Jan-02
UPPER NECK MX	LC-282-MX	DENTON	15-Jan-02
UPPER NECK MY	LC-282-MY	DENTON	15-Jan-02
UPPER NECK MZ	LC-282-MZ	DENTON	15-Jan-02
LOWER NECK FX	LC-279-FX	DENTON	15-Jan-02
LOWER NECK FY	LC-279-FY	DENTON	15-Jan-02
LOWER NECK FZ	LC-279-FZ	DENTON	15-Jan-02
LOWER NECK MX	LC-279-MX	DENTON	15-Jan-02
LOWER NECK MY	LC-279-MY	DENTON	15-Jan-02
LOWER NECK MZ	LC-279-MZ	DENTON	15-Jan-02
CHEST AX	AC-B02A09-F05	ENTRAN	08-Feb-02
CHEST AY	AC-02A16-A13	ENTRAN	30-Jan-02
CHEST AZ	AC-B02A09-F04	ENTRAN	08-Feb-02
LUMBAR FX	LC-211-FX	DENTON	05-Jan-02
LUMBAR FY	LC-211-FY	DENTON	05-Jan-02
LUMBAR FZ	LC-211-FZ	DENTON	05-Jan-02
LUMBAR MX	LC-211-MX	DENTON	05-Jan-02
LUMBAR MY	LC-211-MY	DENTON	05-Jan-02
LUMBAR MZ	LC-211-MZ	DENTON	05-Jan-02
PELVIS AX	AC-02A18-N03	ENTRAN	01-Feb-02
PELVIS AY	AC-B02A25-N04	ENTRAN	08-Feb-02
PELVIS AZ	AC-B02A18-N14	ENTRAN	08-Feb-02

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE AND MDB INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
P4 CRS (X)	AC-P23471	ENDEVCO	26-Feb-02
P4 CRS (Y)	AC-P22943	ENDEVCO	26-Feb-02
P4 CRS (Z)	AC-P18948	ENDEVCO	26-Feb-02

REMARKS: None