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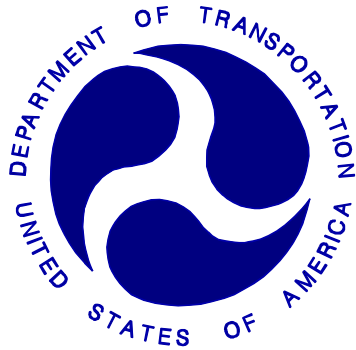
**NEW CAR ASSESSMENT PROGRAM (NCAP)  
FRONTAL BARRIER IMPACT TEST**

**TOYOTA MOTOR MANUFACTURING  
2001 TOYOTA TUNDRA  
4-DOOR PICK-UP**

NHTSA NUMBER: M15108

VERIDIAN TEST NUMBER: 8602-3

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



November 17, 2000

FINAL REPORT

PREPARED FOR:

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

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\_\_\_\_\_  
Date of Report Acceptance

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

\_\_\_\_\_  
Date of Report Acceptance

# **TECHNICAL REPORT STANDARD TITLE PAGE**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                                                             |                        |                                                                                                                                                                                                                                 |                        |
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| 1. <i>Report No.</i><br>CAL-01-03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            | 2. <i>Government Accession No.</i>                          |                        | 3. <i>Recipient's Catalog No.</i>                                                                                                                                                                                               |                        |
| 4. <i>Title and Subtitle</i><br>Final Report of NEW CAR ASSESSMENT PROGRAM (NCAP)<br>Testing of a 2001 Toyota Tundra 4-Door Pick-up<br>NHTSA No. M15108                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                                                             |                        | 5. <i>Report Date</i><br>November 17, 2000                                                                                                                                                                                      |                        |
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| 15. <i>Supplementary Notes</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                             |                        |                                                                                                                                                                                                                                 |                        |
| 16. <i>Abstract</i><br><br>A frontal load cell barrier test of a 2001 Toyota Tundra 4-Door Pick-up was performed at Veridian Engineering crash test facility in Buffalo, New York, on November 17, 2000.<br>The impact velocity was 56.96 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 532 mm. The test vehicle was equipped with 3-point restraint systems, knee bolsters, and airbags at both the driver and right outboard passenger seating positions.<br>With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements. |            |                                                             |                        |                                                                                                                                                                                                                                 |                        |
| <b>ATD Position</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>HIC</b> | <b>Clip (g's)</b>                                           | <b>Chest Disp (mm)</b> | <b>Left Femur (N)</b>                                                                                                                                                                                                           | <b>Right Femur (N)</b> |
| <b>Driver (061)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 774.9      | 53.8                                                        | 46.5                   | -4154                                                                                                                                                                                                                           | -6551                  |
| <b>Passenger (245)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 940.9      | 47.6                                                        | 38.7                   | -4343                                                                                                                                                                                                                           | -2832                  |
| 17. <i>Key Words</i><br>56 kph Frontal Barrier Impact test<br>New Car Assessment Program (NCAP)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                                                             |                        | 18. <i>Distribution Statement</i><br><u>Copies of this report are available from:</u><br>NHTSA Technical Reference Division<br>National Highway Traffic Safety Admin.<br>400 Seventh St., SW, Room 5108<br>Washington, DC 20590 |                        |
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## SECTION 1

### PURPOSE AND SUMMARY OF TEST M15108

#### PURPOSE

This 56.96 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-96-D-02010. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.96 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

#### SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2001 Toyota Tundra 4-Door Pick-up at a velocity of 56.96 kph. The test was performed at Veridian Engineering on November 17, 2000. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest, and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 245) The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 245) were used in two impacts (M10102 and M10300) previous to this test where they did not exceed FMVSS head, chest and femur requirements (test M10300 failed the driver left femur and was recalibrated before test M15108). Certification details, along with instrumentation calibration data, are found in Appendix C.

The 135 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load

cell barrier and dummy response data traces.

The driver's HIC was 774.9. The maximum chest deceleration over 3 milliseconds was 53.8 g's and maximum chest deflection was 46.5 mm. Compressive femur loads were -4154 Newtons on the left and -6551 Newtons on the right.

The right front passenger's HIC was 940.9. Maximum chest deceleration over 3 milliseconds was 47.6 g's and maximum chest deflection was 38.7 mm. Compressive femur loads were -4343 Newtons on the left and -2832 Newtons on the right.

## SECTION 2

### GENERAL TEST AND VEHICLE PARAMETER DATA

#### DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. : M15108 Test Mode : 56.3 kph Frontal Barrier

Test Date : November 17, 2000 Time: 11:45 Temperature : 14 °C

Vehicle Make/Model/Body Style : 2001 Toyota Tundra 4-Door Pick-up

Vehicle Test Weight : 2269 kg

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 56.96 kph

Maximum Static Crush : 532 mm

Vehicle Rebound : 331 mm

#### DUMMIES:

#### DRIVER

#### PASSENGER

Type :

572E

572E

Restraint System :

3-point belt system with airbag

3-point belt system with airbag

Number of Data Channels : 135

Number of Cameras : 1 Real Time

16 High Speed

#### DOOR OPENING DATA :

Closed / Operable - Left Front

Closed / Operable - Right Front

Front Seat(s) Data :

#### DRIVER

#### PASSENGER

Seat Track Failure :(mm of shift)

0

0

Seat Back Failure :

none

none

#### VISIBLE DUMMY CONTACT POINTS :

#### DRIVER

#### PASSENGER

Head :

Airbag / Back of head to headrest

Airbag / Back of head to headrest

Abdomen :

-

Chest

Airbag

Airbag

Knees

Knee Bolster

Knee Bolster

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 2001 Toyota Tundra 4-Door Pick-up

NHTSA No. : M15108 ; VIN: 5TBRT341015137921 ; Color : Tan

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

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

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

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

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

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

Date Received : 11/2/00 ; Odometer Reading 32 km

Selling Dealer : West Herr

& Address: 4141 Southwestern Blvd. Orchard Park, N.Y. 14127

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : Toyota Motor Manufacturing

Date of Manufacture 9/00

GVWR : 2812 kg; GAWR: 1433 kg FRONT; 1706 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 180 kpa FRONT

200 kpa REAR

Recommended Tire Size : P265/70R16

\* Recommended Cold Tire Pressure : 180 kpa FRONT; 200 kpa REAR

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

Vehicle Capacity Data :

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

Number of Occupants: 3 Front; 3 Rear; 6 Total

Vehicle Capacity Weight (VCW) = 825.0 kg

No. of Occupants x 68 kg = 408.2 kg

Rated Cargo/Luggage Weight (RCLW) = 416.8 kg 136 kg maximum

\*Tire pressure used for test

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

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

|                                                  |   |               |    |                                        |   |              |    |
|--------------------------------------------------|---|---------------|----|----------------------------------------|---|--------------|----|
| Right Front                                      | = | <u>561</u>    | kg | Right Rear                             | = | <u>407</u>   | kg |
| Left Front                                       | = | <u>580.5</u>  | kg | Left Rear                              | = | <u>438.5</u> | kg |
| TOTAL FRONT                                      | = | <u>1141.5</u> | kg | TOTAL REAR                             | = | <u>845.5</u> | kg |
| TOTAL DELIVERED WEIGHT = <u>1987.0</u> kg        |   |               |    |                                        |   |              |    |
| % of Total Front of Vehicle Weight = <u>57.4</u> |   |               |    | % of Total Rear Weight = <u>42.6</u> % |   |              |    |

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

|                                     |   |               |    |                |
|-------------------------------------|---|---------------|----|----------------|
| Total Delivered Weight (UDW)        | = | <u>1987.0</u> | kg |                |
| Rated Cargo/Luggage Weight (RCLW)   | = | <u>136.0</u>  | kg | 136 kg maximum |
| Weight of 2 p.572 Dummies @ 76 each | = | <u>152.0</u>  | kg |                |
| TARGET TEST WEIGHT                  | = | <u>2275.0</u> | kg |                |

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 130 KG OF CARGO WEIGHT:

|                                                                |   |               |    |                                        |   |               |    |
|----------------------------------------------------------------|---|---------------|----|----------------------------------------|---|---------------|----|
| Right Front                                                    | = | <u>595</u>    | kg | Right Rear                             | = | <u>519</u>    | kg |
| Left Front                                                     | = | <u>610</u>    | kg | Left Rear                              | = | <u>545</u>    | kg |
| TOTAL FRONT                                                    | = | <u>1205.0</u> | kg | TOTAL REAR                             | = | <u>1064.0</u> | kg |
| TOTAL TEST WEIGHT = <u>2269.0</u> kg                           |   |               |    |                                        |   |               |    |
| % of Total Front Weight = <u>53.1</u> %                        |   |               |    | % of Total Rear Weight = <u>46.9</u> % |   |               |    |
| Weight of Ballast Secured in Vehicle Trunk Area = <u>55</u> kg |   |               |    |                                        |   |               |    |
| Vehicle Components Removed for Weight Reduction:               |   |               |    | <u>None</u>                            |   |               |    |

VEHICLE ATTITUDE (all dimension in millimeters):

|                                                                               |    |            |    |            |    |            |    |            |
|-------------------------------------------------------------------------------|----|------------|----|------------|----|------------|----|------------|
| AS DELIVERED :                                                                | RF | <u>882</u> | LF | <u>880</u> | RR | <u>938</u> | LR | <u>937</u> |
| FULLY LOADED :                                                                | RF | <u>870</u> | LF | <u>869</u> | RR | <u>910</u> | LR | <u>909</u> |
| AS TESTED :                                                                   | RF | <u>871</u> | LF | <u>870</u> | RR | <u>911</u> | LR | <u>910</u> |
| Vehicle's Wheel Base : <u>3280</u> mm                                         |    |            |    |            |    |            |    |            |
| Location of Vehicle's C.G. : <u>1538.1</u> mm rearward of front wheel center. |    |            |    |            |    |            |    |            |

FUEL SYSTEM DATA :

|                                                                                                                      |                          |               |                                         |
|----------------------------------------------------------------------------------------------------------------------|--------------------------|---------------|-----------------------------------------|
| Fuel System Capacity From Owner's Manual                                                                             | =                        | <u>99.9</u>   | liters                                  |
| Usable Capacity Figure Furnished by COTR                                                                             | =                        | <u>99.9</u>   | liters                                  |
| Test Volume Range (92 to 94% of Usable Capacity)                                                                     | =                        | <u>91.9</u>   | to <u>93.9</u> liters                   |
| ACTUAL TEST VOLUME                                                                                                   | =                        | <u>92.0</u>   | liters (with entire fuel system filled) |
| Test Fluid Type:                                                                                                     | <u>Stoddard Solution</u> | ;             | Spec. Grav. = <u>0.764</u>              |
| Kinematic Viscosity                                                                                                  | =                        | <u>0.96</u>   | centistokes; Color = <u>Orange</u>      |
| Type of Fuel Pump:                                                                                                   | Electric- <u>x</u>       | ;             | Mechanical- <u>-</u>                    |
| Does Electric Pump operate with ignition switch "ON" & engine "OFF"                                                  |                          | Yes- <u>x</u> | No- <u>-</u>                            |
| Details of Fuel System <u>Fuel tank is centered fore of rear axle with fuel lines running along left frame rail.</u> |                          |               |                                         |

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°

Test Date : November 17, 2000 Time: 11:45 Temperature: 14 °C

Vehicle NHTSA No. : M15108

Required Impact Velocity Range : 55.5 to 57.1 kph

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

Trap No. 1 = 56.96 kph; Trap No. 2 = 56.96 kph

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

(2) exiting trap = 305 mm

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

Vehicle Length:

Pre-Test Right = 5434 ; C/L = 5499 ; Left = 5426

Post-Test Right = 4969 ; C/L = 4983 ; Left = 4944

Crush Right = 465.0 ; C/L = 516.0 ; Left = 482.0

AVERAGE = 487.7 mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

Right = 326 ; C/L = 331 ; Left = 335

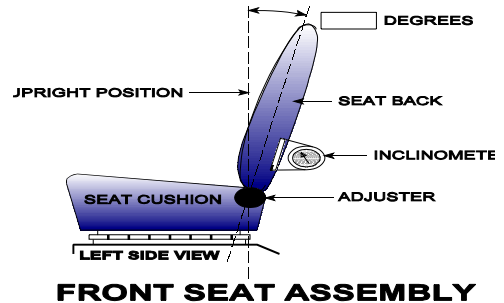
AVERAGE = 330.7 mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2001 Vehicle Model: Toyota Tundra Body Style : 4-Door Pick-up

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



Seat back angle for driver's seat: 10

Measurement instructions: Reclined 5 notches from forward most notch

Seat back angle for passenger's seat: 10

Measurement instructions: Reclined 5 notches from forward most notch

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Located 15 positions and seat was placed in eight notch from forward most position

Positioning of the passenger's seat: Located 15 positions and seat was placed in eight notch from forward most position

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 99.9 liters

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

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

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 92.0 liters

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

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

With ignition turned on

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

4. STEERING COLUMN ADJUSTMENTS :

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

Operational Instructions: Tilt 3 notches down to 4<sup>th</sup> notch position from top position

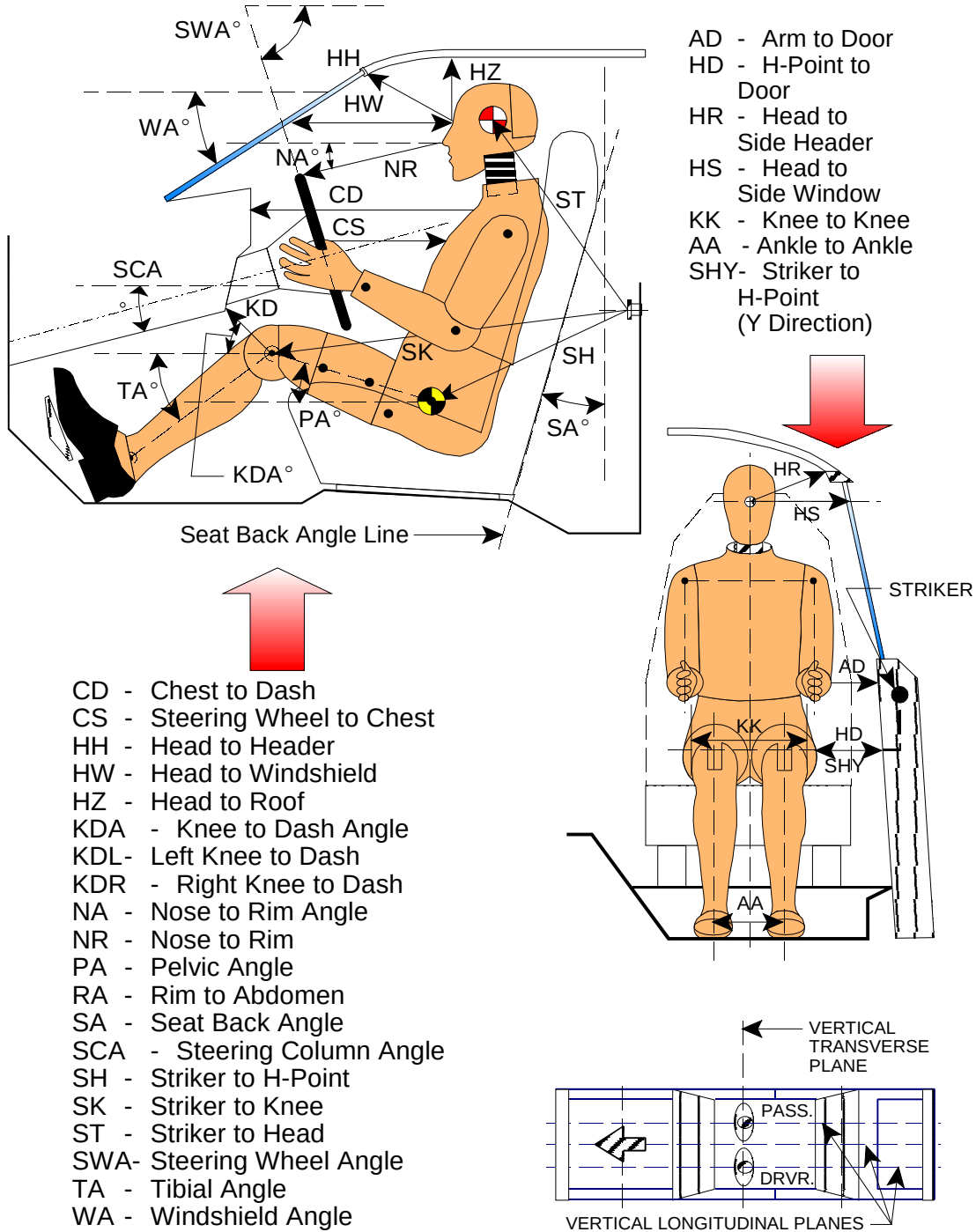
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5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Anchorage set in upper most position

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## DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

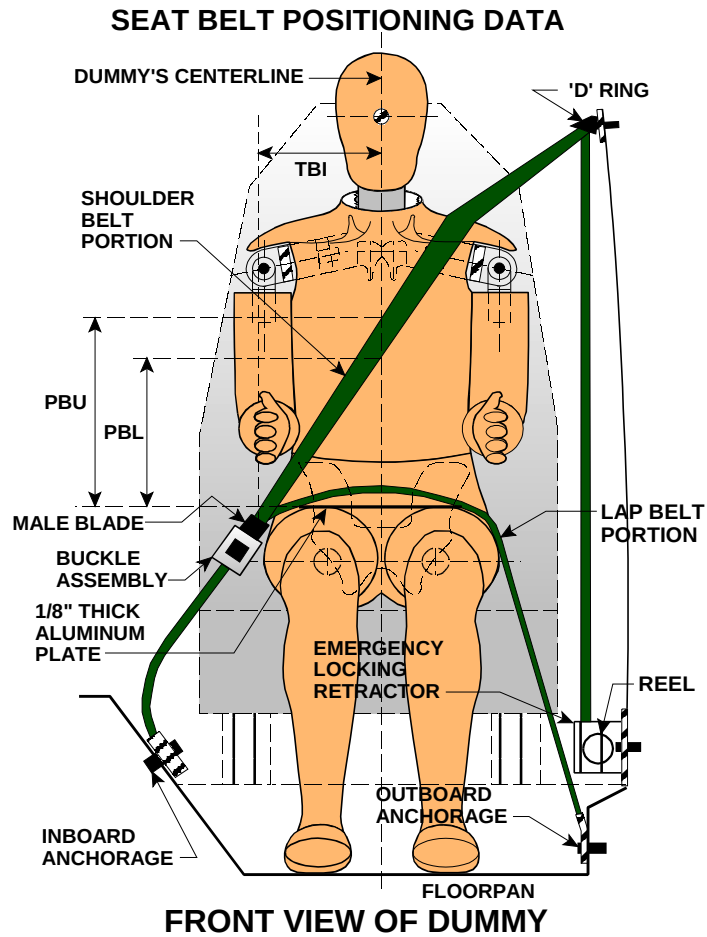


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

|                  | DRIVER (Serial #061) |             |          | PASS. (Serial # 245) |             |          |
|------------------|----------------------|-------------|----------|----------------------|-------------|----------|
| WA <sup>o</sup>  | 40 deg.              |             |          | N/A                  |             |          |
| SWA <sup>o</sup> | 70 deg.              |             |          | N/A                  |             |          |
| SCA <sup>o</sup> | 20 deg.              |             |          | N/A                  |             |          |
| SA <sup>o</sup>  | 10 deg.              |             |          | 10 deg.              |             |          |
| HZ               | 235                  |             |          | 230                  |             |          |
| HH               | 394                  |             |          | 381                  |             |          |
| HW               | 573                  |             |          | 564                  |             |          |
| HR               | 255                  |             |          | 255                  |             |          |
| NR               | 382                  | Angle       | 18 deg.  | N/A                  |             |          |
| CD               | 531                  |             |          | 525                  |             |          |
| CS               | 253                  |             |          | N/A                  |             |          |
| RA               | 175                  |             |          | N/A                  |             |          |
| KDL              | 184                  | Angle (KDA) | 31 deg.  | 161                  |             |          |
| KDR              | 145                  |             |          | 174                  | Angle (KDA) | 41 deg.  |
| PA <sup>o</sup>  | 23 deg.              |             |          | 22.5 deg.            |             |          |
| TA <sup>o</sup>  | 41 deg.              |             |          | 43 deg.              |             |          |
| KK               | 273                  |             |          | 270                  |             |          |
| AA               | -                    |             |          | -                    |             |          |
| ST               | 561                  | Angle       | 63 deg.  | 564                  | Angle       | 63 deg.  |
| SK               | 751                  | Angle       | 89 deg.  | 749                  | Angle       | 90 deg.  |
| SH               | 417                  | Angle       | 121 deg. | 416                  | Angle       | 120 deg. |
| SHY              | 269                  |             |          | 261                  |             |          |
| HS               | 307                  |             |          | 305                  |             |          |
| HD               | 181                  |             |          | 180                  |             |          |
| AD               | 107                  |             |          | 105                  |             |          |

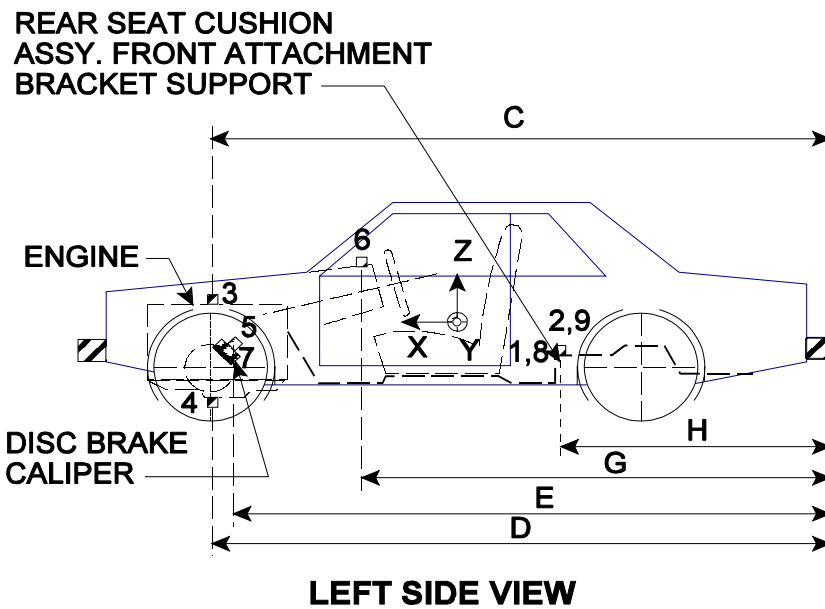
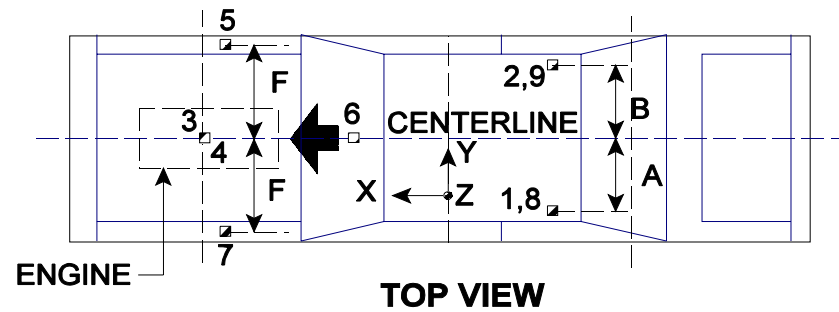
Dimensions in millimeters

# DATA SHEET NO. 6 SEAT BELT POSITIONING DATA



|                                                     | DRIVER DUMMY<br>(mm) | PASSENGER DUMMY<br>(mm) |
|-----------------------------------------------------|----------------------|-------------------------|
| PBU -- Top surface of alum. plate to upper edge     | 211                  | 211                     |
| PBL-- Top surface of alum. plate to belt lower edge | 311                  | 311                     |
| <u>LAP BELT TENSION</u>                             | 10 nwt               | 10 nwt                  |
| <u>SHOULDER BELT TENSION</u>                        | Retractor            | Retractor               |

## VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



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

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

| DIMENSION                           | PRE-TEST LENGTH (mm) |
|-------------------------------------|----------------------|
| A   Left Rear Seat Crossmember   Y  | -576                 |
| B   Right Rear Seat Crossmember   Y | 548                  |
| C   Top of Engine   X               | 4654                 |
| D   Bottom of Engine   X            | 3145                 |
| E   Disc Brake Calipers   X         | 3218                 |
| F   Disc Brake Calipers   Y         | 729                  |
| G   Instrument Panel   X            | 4037                 |
| H   Rear Seat Crossmembers   X      | 2833                 |

| LOCATION<br>NUMBER | DESCRIPTION                          | MAXIMUM VALUE (g's) |       |        |       |
|--------------------|--------------------------------------|---------------------|-------|--------|-------|
|                    |                                      | Pos.                | msec. | Neg.   | msec. |
| 1                  | Rear Seat X-Member @ Left Side       | 4.8                 | 145.1 | -44.5  | 34.0  |
| 2                  | Rear Seat X-Member @ Right Side      | 7.9                 | 143.6 | -38.2  | 62.5  |
| 3                  | Top of Engine Block                  | 51.6                | 42.7  | -163.7 | 34.9  |
| 4                  | Bottom of Engine                     | 147.5               | 35.3  | -36.9  | 43.3  |
| 5                  | Disc Brake Caliper @ Right Side      | 44.0                | 20.9  | -115.2 | 41.9  |
| 6                  | Instrument Panel                     | 25.9                | 55.6  | -58.4  | 48.9  |
| 7                  | Disc Brake Caliper @Left Side        | 36.7                | 21.8  | -103.0 | 45.2  |
| 8                  | Rear Seat X-Member @ Left-Redundant  | 5.0                 | 145.1 | -45.8  | 34.2  |
| 9                  | Rear Seat X-Member @ Right-Redundant | 6.0                 | 143.8 | -46.8  | 62.0  |

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2001 Toyota Tundra 4-Door Pick-up

NHTSA Test No.: M15108 Test Date: November 17, 2000

|                           |      | MAXIMUM VALUE |       |        |       |           |       |        |       |
|---------------------------|------|---------------|-------|--------|-------|-----------|-------|--------|-------|
|                           |      | Driver        |       |        |       | Passenger |       |        |       |
| DESCRIPTION               | Unit | Pos           | msec  | Neg    | msec  | Pos       | msec  | Neg    | msec  |
| Head X                    | g    | 64.4          | 185.0 | -61.7  | 75.6  | 36.9      | 182.6 | -75.5  | 77.7  |
| Head Y                    | g    | 10.1          | 184.9 | -18.7  | 82.0  | 5.1       | 174.2 | -12.4  | 60.7  |
| Head Z                    | g    | 30.6          | 48.0  | -3.4   | 111.9 | 27.8      | 58.0  | -2.0   | 119.7 |
| Head Resultant            | g    | 67.6          | 75.6  | 0.0    | 13.7  | 76.9      | 77.7  | 0.0    | 17.8  |
| Redundant Head X          | g    | 65.2          | 185.0 | -62.1  | 75.0  | 37.4      | 182.2 | -77.1  | 76.1  |
| Redundant Head Y          | g    | 9.8           | 184.9 | -17.1  | 79.7  | 4.9       | 204.8 | -12.8  | 60.7  |
| Redundant Head Z          | g    | 31.2          | 48.0  | -3.5   | 111.9 | 28.9      | 58.3  | -1.6   | 117.6 |
| Redundant Head Resultant  | g    | 68.4          | 75.7  | 0.0    | 12.6  | 79.3      | 76.1  | 0.1    | 17.1  |
| Upper Neck Fx             | N    | 183.1         | 188.5 | -537.1 | 52.8  | 508.0     | 80.5  | -373.5 | 53.8  |
| Upper Neck Fy             | N    | 129.3         | 51.1  | -457.0 | 79.0  | 285.0     | 87.3  | -196.8 | 59.4  |
| Upper Neck Fz             | N    | 2389.2        | 71.5  | -674.2 | 210.0 | 1340.9    | 71.9  | -668.8 | 216.1 |
| Upper Neck F Resultant    | N    | 2403.5        | 71.5  | 1.0    | 14.7  | 1372.1    | 71.9  | 2.7    | -49.8 |
| Upper Neck Mx             | N-m  | 34.2          | 64.7  | -9.0   | 100.2 | 7.8       | 221.3 | -20.7  | 64.7  |
| Upper Neck My             | N-m  | 38.4          | 118.6 | -34.5  | 210.0 | 25.9      | 81.4  | -30.3  | 202.3 |
| Upper Neck Mz             | N-m  | 16.3          | 97.6  | -7.7   | 71.6  | 24.5      | 101.1 | -8.4   | 153.3 |
| Upper Neck M Resultant    | N-m  | 38.9          | 113.7 | 0.2    | 22.3  | 33.8      | 202.0 | 0.1    | -49.8 |
| Chest X                   | g    | 6.2           | 174.6 | -56.5  | 60.8  | 10.7      | 172.5 | -48.8  | 63.8  |
| Chest Y                   | g    | 2.0           | 87.8  | -11.1  | 54.9  | 3.2       | 54.2  | -6.5   | 65.5  |
| Chest Z                   | g    | 15.1          | 46.8  | -3.1   | 87.3  | 15.3      | 47.9  | -3.7   | 115.9 |
| Chest Resultant           | g    | 56.6          | 60.8  | 0.0    | -44.7 | 49.0      | 63.8  | 0.1    | -40.1 |
| Redundant Chest X         | g    | 6.1           | 174.9 | -55.2  | 60.8  | 11.0      | 172.4 | -49.2  | 63.1  |
| Redundant Chest Y         | g    | 2.2           | 87.8  | -11.3  | 55.0  | 3.3       | 54.1  | -6.9   | 65.5  |
| Redundant Chest Z         | g    | 14.9          | 46.7  | -3.3   | 87.3  | 15.2      | 47.9  | -3.8   | 114.7 |
| Redundant Chest Resultant | g    | 55.3          | 60.8  | 0.0    | -46.2 | 49.4      | 63.1  | 0.0    | -48.2 |
| Chest Displacement        | mm   | 0.0           | -49.0 | -46.5  | 78.9  | 0.0       | -26.5 | -38.7  | 80.5  |

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

Vehicle Year/Make/Model/Body Style: 2001 Toyota Tundra 4-Door Pick-up

NHTSA Test No.: M15108      Test Date: November 17, 2000

|                         |      | MAXIMUM VALUE |       |          |       |           |       |         |       |
|-------------------------|------|---------------|-------|----------|-------|-----------|-------|---------|-------|
|                         |      | Driver        |       |          |       | Passenger |       |         |       |
| DESCRIPTION             | Unit | Pos           | msec  | Neg      | msec  | Pos       | msec  | Neg     | msec  |
| Pelvic X                | g    | 5.0           | 134.3 | -73.2    | 54.4  | 6.1       | 124.5 | -76.3   | 54.2  |
| Pelvic Y                | g    | 7.0           | 87.0  | -25.9    | 45.5  | 5.8       | 43.4  | -8.2    | 46.5  |
| Pelvic Z                | g    | 19.2          | 45.5  | -29.1    | 53.7  | 8.0       | 43.7  | -23.2   | 67.3  |
| Pelvic Resultant        | g    | 78.8          | 54.4  | 0.0      | -48.7 | 78.2      | 54.2  | 0.0     | -42.7 |
| Left Femur              | N    | 509.3         | 68.3  | -4154.1  | 49.5  | 1255.5    | 48.6  | -4342.8 | 53.8  |
| Right Femur             | N    | 915.8         | 41.5  | -6551.3  | 55.1  | 516.2     | 39.5  | -2832.1 | 58.6  |
| Left Upper Tibia Mx     | N-m  | 106.0         | 45.1  | -67.6    | 58.5  | 28.2      | 75.2  | -81.5   | 44.0  |
| Left Upper Tibia My     | N-m  | 23.2          | 122.5 | -152.1   | 48.9  | 12.4      | 135.0 | -271.7  | 43.5  |
| Left Lower Tibia Fz     | N    | 115.6         | 128.9 | -2667.1  | 46.0  | 272.3     | 170.8 | -5926.4 | 42.8  |
| Left Lower Tibia Mx     | N-m  | 132.5         | 57.4  | -43.3    | 43.1  | 72.3      | 51.3  | -73.7   | 43.6  |
| Left Lower Tibia My     | N-m  | 21.5          | 57.4  | -58.5    | 44.7  | 40.4      | 46.6  | -151.2  | 43.4  |
| Right Upper Tibia Mx    | N-m  | 64.2          | 59.1  | -86.0    | 45.2  | 35.2      | 47.4  | -21.0   | 63.3  |
| Right Upper Tibia My †† | N-m  | 26.4          | 135.4 | -283.4   | 43.6  | 20.4      | 137.5 | -126.2  | 52.7  |
| Right Lower Tibia Fz    | N    | 302.7         | 154.8 | -10752.0 | 44.7  | 164.9     | 158.9 | -2965.7 | 46.3  |
| Right Lower Tibia Mx    | N-m  | 72.3          | 59.8  | -78.1    | 45.6  | 19.3      | 44.9  | -42.2   | 74.8  |
| Right Lower Tibia My    | N-m  | 191.1         | 63.5  | -146.5   | 43.6  | 33.8      | 78.2  | -54.9   | 48.3  |
| Left Foot Aft Ax        | g    | 17.1          | 56.0  | -117.4   | 46.0  | 78.8      | 52.9  | -325.4  | 43.4  |
| Left Foot Aft Az        | g    | 60.0          | 44.9  | -120.9   | 45.5  | 23.8      | 40.1  | -103.2  | 45.6  |
| Left Foot Fore Az       | g    | 30.9          | 39.5  | -183.3   | 45.5  | 76.9      | 39.9  | -496.5  | 42.2  |
| Right Foot Aft Ax       | g    | 43.3          | 56.6  | -377.9   | 43.4  | 15.3      | 73.5  | -104.3  | 49.5  |
| Right Foot Aft Az       | g    | 63.7          | 53.9  | -307.3   | 44.2  | 5.4       | 63.3  | -113.8  | 49.0  |
| Right Foot Fore Az      | g    | 121.5         | 53.1  | -505.3   | 42.1  | 91.7      | 44.9  | -215.8  | 48.9  |
| Lap Belt Load           | N    | 9384.5        | 60.4  | -10.6    | 203.2 | 8950.5    | 59.7  | -2.3    | 267.8 |
| Torso Belt              | N    | 6881.6        | 50.6  | -8.1     | 170.5 | 6003.8    | 70.2  | -12.0   | 248.7 |

†† The signal was clipped

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

Vehicle Year/Make/Model/Body Style: 2001 Toyota Tundra 4-Door Pick-up

NHTSA Test No.: M15108      Test Date: November 17, 2000

| HEAD INJURY CRITERIA (HIC) |       |                       |                       |                                                          |
|----------------------------|-------|-----------------------|-----------------------|----------------------------------------------------------|
|                            | HIC** | t <sub>1</sub> (msec) | t <sub>2</sub> (msec) | Average Acceleration<br>t <sub>1</sub> to t <sub>2</sub> |
| Position #1 - Driver       | 774.9 | 57.1                  | 93.1                  | 54.1                                                     |
| Position #2 - Passenger    | 940.9 | 59.8                  | 94.1                  | 59.6                                                     |

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

| CLIP SUMMARY*           |            |                       |                       |       |
|-------------------------|------------|-----------------------|-----------------------|-------|
|                         | CLIP (g's) | t <sub>1</sub> (msec) | t <sub>2</sub> (msec) | CSI   |
| Position #1 - Driver    | 53.8       | 59.2                  | 62.2                  | 559   |
| Position #2 - Passenger | 47.6       | 62.3                  | 65.3                  | 502.4 |

\* 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: 2001 Toyota Tundra 4-Door Pick-up

NHTSA Test No.: M15108 Test Date: November 17, 2000

| HEAD INJURY CRITERIA (HIC) <b>REDUNDANT</b> |       |                       |                       |                                                          |
|---------------------------------------------|-------|-----------------------|-----------------------|----------------------------------------------------------|
|                                             | HIC** | t <sub>1</sub> (msec) | t <sub>2</sub> (msec) | Average Acceleration<br>t <sub>1</sub> to t <sub>2</sub> |
| Position #1 - Driver                        | 799.7 | 57.1                  | 93.1                  | 54.8                                                     |
| Position #2 - Passenger                     | 935.1 | 59.9                  | 94.2                  | 59.5                                                     |

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

| CLIP SUMMARY* <b>REDUNDANT</b> |            |                       |                       |       |
|--------------------------------|------------|-----------------------|-----------------------|-------|
|                                | CLIP (g's) | t <sub>1</sub> (msec) | t <sub>2</sub> (msec) | CSI   |
| Position #1 - Driver           | 52.7       | 59.1                  | 62.1                  | 528.4 |
| Position #2 - Passenger        | 48.6       | 62.2                  | 65.2                  | 528.6 |

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

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

|                                                                                            | <u>Driver</u>  | <u>Passenger</u> |
|--------------------------------------------------------------------------------------------|----------------|------------------|
| Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems. | <u>2667 mm</u> | <u>2654 mm</u>   |
| Shoulder belt length as measured on Part 572 Dummy.                                        | <u>887 mm</u>  | <u>870 mm</u>    |
| Lap belt length as measured on Part 572 Dummy.                                             | <u>910 mm</u>  | <u>915 mm</u>    |

SHOULDER BELT SPOOL-OFF DATA:

|                                 |                  |                 |
|---------------------------------|------------------|-----------------|
| As determined by film analysis. | <u>133.25 mm</u> | <u>152.4 mm</u> |
| As determined mechanically.     | <u>125 mm</u>    | <u>153 mm</u>   |
| As determined electronically.   | <u>101 mm</u>    | <u>156 mm</u>   |

BELT STRETCH DATA:

|                                                                           |               |               |
|---------------------------------------------------------------------------|---------------|---------------|
| Measured electronically between shoulder belt load cell and the "D" ring. | <u>1.3 mm</u> | <u>2.7 mm</u> |
| Measured mechanically.                                                    | <u>1 mm</u>   | <u>1 mm</u>   |

\_\_\_\_\_  
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 23 mm molding.

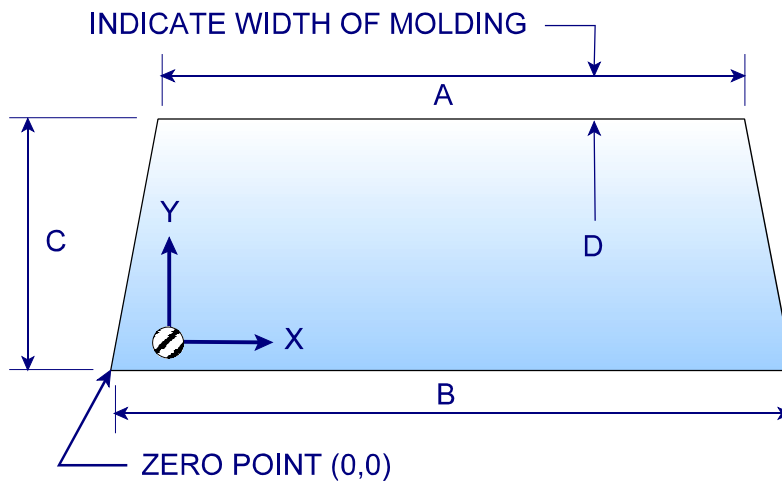
FMVSS 212 REQUIREMENTS:

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 | 2013.5               | 2013.5        | 100            |
| LEFT SIDE  | 2013.5               | 2013.5        | 100            |
| TOTAL      | 4027                 | 4027          | 100            |

AREA OF RETENTION FAILURE:



| DIMENSIONS (mm) |      |
|-----------------|------|
| A               | 1281 |
| B               | 1566 |
| C               | 590  |
| D               | 23   |

**FRONT VIEW OF WINDSHIELD**

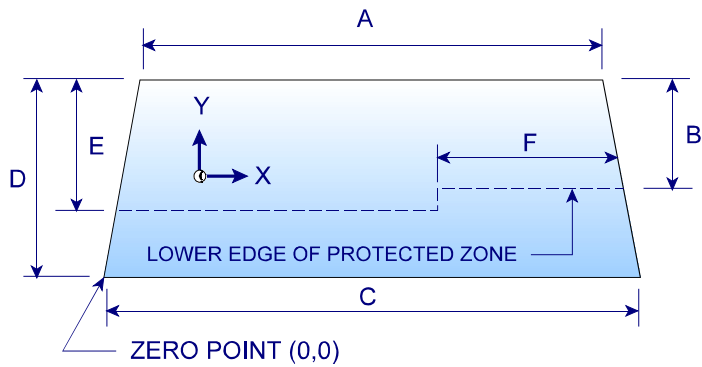
FAILURE DETAILS: None

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:



| DIMENSIONS (mm) |      |
|-----------------|------|
| A               | 1281 |
| B               | 371  |
| C               | 1566 |
| D               | 590  |
| E               | 400  |
| F               | 599  |

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

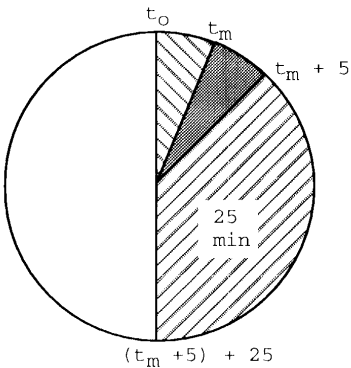
NHTSA TEST No.: M15108 TEST DATE: November 17, 2000  
VEHICLE MAKE/MODEL: 2001 Toyota Tundra

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

=====

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

FUEL SPILLAGE MEASUREMENT:



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

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

SOLVENT SPILLAGE DETAILS: None

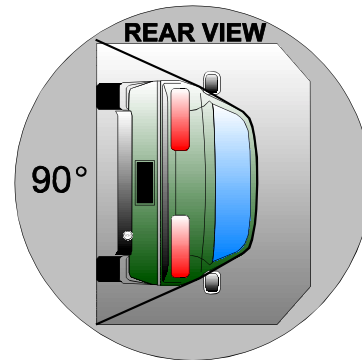
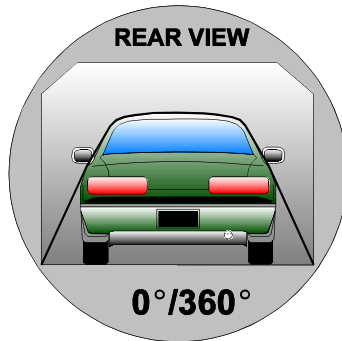
# DATA SHEET 13

## FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Vehicle: 2001 Toyota Tundra

NHTSA No. M15108

0 - 90 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |          |         |           |         |
|------------------------------------|----------|---------|-----------|---------|
| Rollover Fixture 90° Rotation Time | <u>1</u> | minutes | <u>13</u> | seconds |
| (Spec. Range = 1 to 3 minutes)     |          |         |           |         |
| FMVSS 301 Position Hold Time +     | <u>5</u> | minutes | <u>0</u>  | seconds |
| TOTAL                              | <u>6</u> | minutes | <u>13</u> | seconds |
| Next whole minute interval         | <u>7</u> | minutes |           |         |

### II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

### IV. SOLVENT SPILLAGE LOCATION(S) :

None

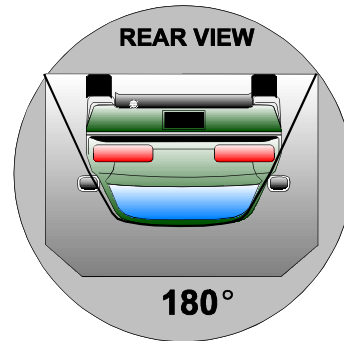
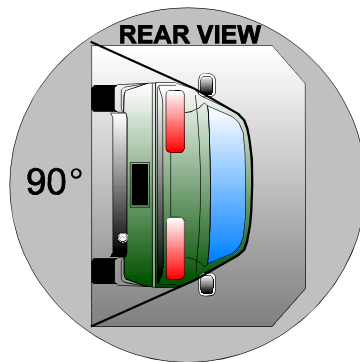
# DATA SHEET 13

## FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Toyota Tundra

NHTSA No. M15108

90 - 180 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |          |         |           |         |
|------------------------------------|----------|---------|-----------|---------|
| Rollover Fixture 90° Rotation Time | <u>1</u> | minutes | <u>24</u> | seconds |
| (Spec. Range = 1 to 3 minutes)     |          |         |           |         |
| FMVSS 301 Position Hold Time +     | <u>5</u> | minutes | <u>0</u>  | seconds |
| TOTAL                              | <u>6</u> | minutes | <u>24</u> | seconds |
| Next whole minute interval         | <u>7</u> | minutes |           |         |

### II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

### IV. SOLVENT SPILLAGE LOCATION(S) :

None

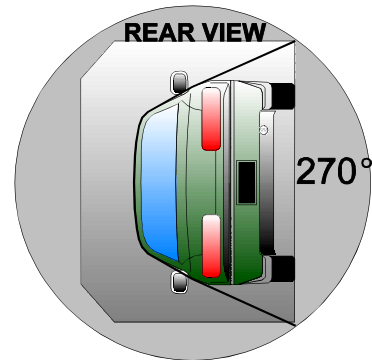
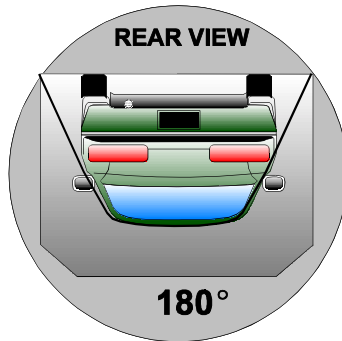
# DATA SHEET 13

## FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Toyota Tundra

NHTSA No. M15108

180 - 270 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |          |         |           |         |
|------------------------------------|----------|---------|-----------|---------|
| Rollover Fixture 90° Rotation Time | <u>1</u> | minutes | <u>18</u> | seconds |
| (Spec. Range = 1 to 3 minutes)     |          |         |           |         |
| FMVSS 301 Position Hold Time +     | <u>5</u> | minutes | <u>0</u>  | seconds |
| TOTAL                              | <u>6</u> | minutes | <u>18</u> | seconds |
| Next whole minute interval         | <u>7</u> | minutes |           |         |

### II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

### IV. SOLVENT SPILLAGE LOCATION(S) :

None

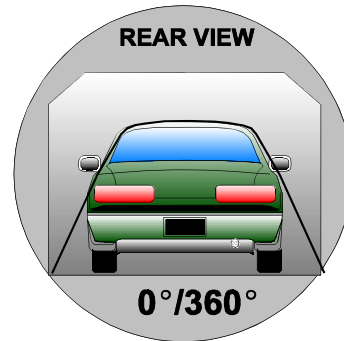
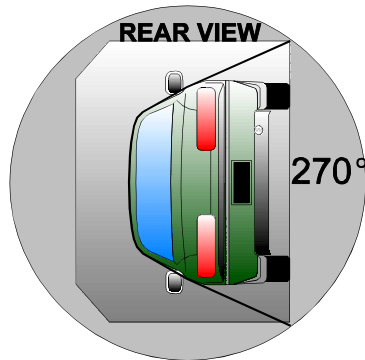
# DATA SHEET 13

## FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Toyota Tundra

NHTSA No. M15108

270 - 360 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |          |         |           |         |
|------------------------------------|----------|---------|-----------|---------|
| Rollover Fixture 90° Rotation Time | <u>1</u> | minutes | <u>13</u> | seconds |
| (Spec. Range = 1 to 3 minutes)     |          |         |           |         |
| FMVSS 301 Position Hold Time +     | <u>5</u> | minutes | <u>0</u>  | seconds |
| <b>TOTAL</b>                       | <u>6</u> | minutes | <u>13</u> | seconds |
| Next whole minute interval         | <u>7</u> | minutes |           |         |

### II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

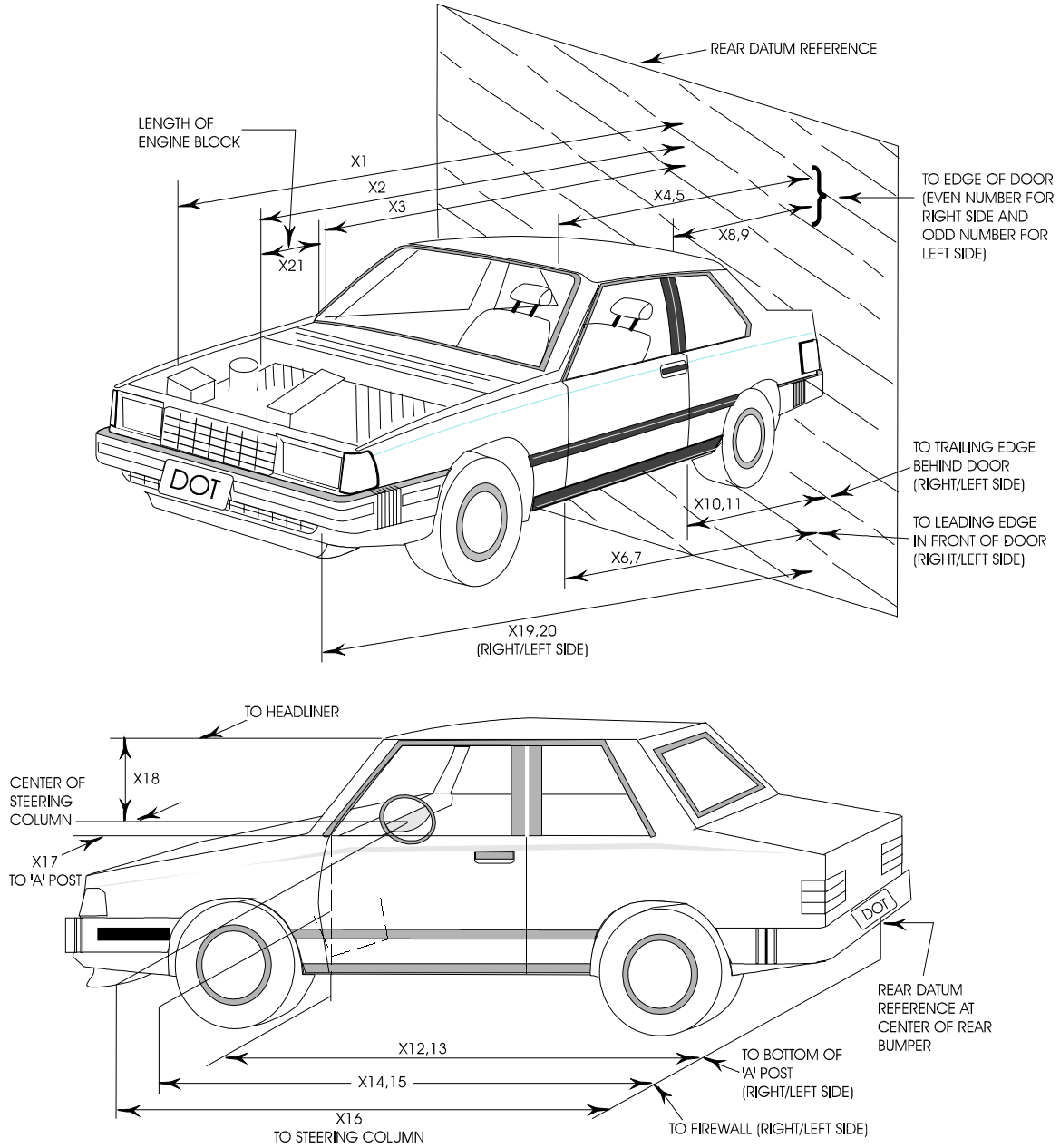
|     |     |     |     |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

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

### IV. SOLVENT SPILLAGE LOCATION(S) :

None

# DATA SHEET NO. 14    TEST VEHICLE MEASUREMENTS

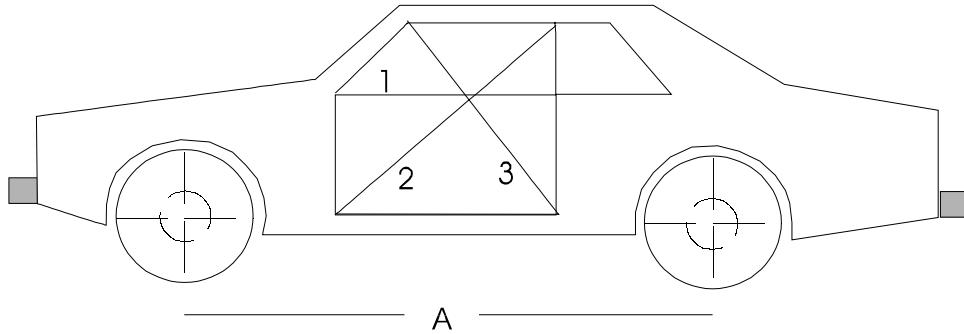


DATA SHEET NO.14      VEHICLE MEASUREMENTS (cont.)

| No. |                                                              | Pre-Test | Post-Test | Difference |
|-----|--------------------------------------------------------------|----------|-----------|------------|
| X1  | Total Length of Vehicle at Centerline                        | 5499     | 4983      | 516        |
| X2  | Rear Surface of Vehicle to Front of Engine                   | 4914     | 4724      | 190        |
| X3  | Rear Surface of Vehicle to Firewall                          | 4318     | 4314      | 4          |
| X4  | Rear Surface of Vehicle to Upper Leading Edge of Right Door  | 4064     | 4074      | -10        |
| X5  | Rear Surface of Vehicle to Upper Leading Edge of Left Door   | 4056     | 4039      | 17         |
| X6  | Rear Surface of Vehicle to Lower Leading Edge of Right Door  | 4037     | 4087      | -50        |
| X7  | Rear Surface of Vehicle to Lower Leading Edge of Left Door   | 4038     | 4015      | 23         |
| X8  | Rear Surface of Vehicle to Upper Trailing Edge of Right Door | 2913     | 2930      | -17        |
| X9  | Rear Surface of Vehicle to Upper Trailing Edge of Left Door  | 2916     | 2905      | 11         |
| X10 | Rear Surface of Vehicle to Lower Trailing Edge of Right Door | 2895     | 2951      | -56        |
| X11 | Rear Surface of Vehicle to Lower Trailing Edge of Left Door  | 2904     | 2885      | 19         |
| X12 | Rear Surface of Vehicle to Bottom of "A" Post of Right Side  | 4089     | 4141      | -52        |
| X13 | Rear Surface of Vehicle to Bottom of "A" Post of Left Side   | 4075     | 4066      | 9          |
| X14 | Rear Surface of Vehicle to Firewall, Right Side              | 4314     | 4333      | -19        |
| X15 | Rear Surface of Vehicle to Firewall, Left Side               | 4310     | 4312      | -2         |
| X16 | Rear Surface of Vehicle to Steering Column                   | 3606     | 3639      | -33        |
| X17 | Center of Steering Column to "A" Post                        | 304      | 316       | -12        |
| X18 | Center of Steering Column to Headliner                       | 480      | 441       | 39         |
| X19 | Rear Surface of Vehicle to Right Side of Front Bumper        | 5434     | 4969      | 465        |
| X20 | Rear Surface of Vehicle to Left Side of Front Bumper         | 5426     | 4944      | 482        |
| X21 | Length of Engine Block                                       | 505      | 505       | 0          |
| RD  | Rear Surface of Vehicle to Right Side of Dash Panel          | 3883     | 3906      | -23        |
| CD  | Rear Surface of Vehicle to Center of Dash Panel              | 3821     | 3824      | -3         |
| LD  | Rear Surface of Vehicle to Left Side of Dash Panel           | 3889     | 3884      | 5          |

All Dimensions in mm

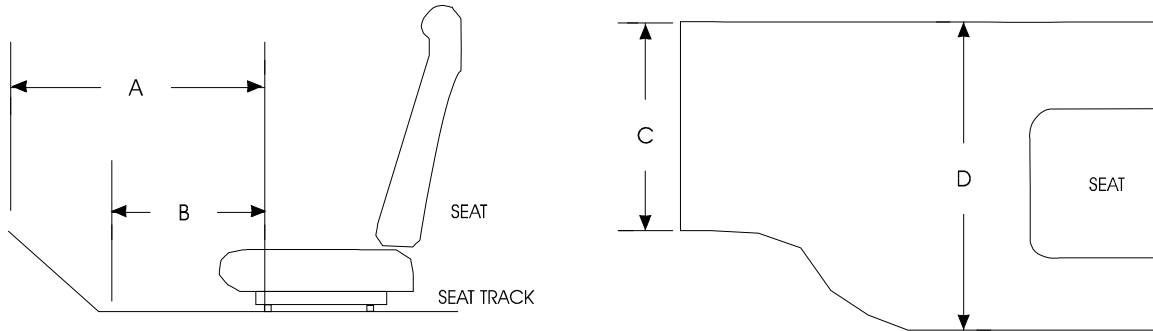
DATA SHEET NO.14      VEHICLE MEASUREMENTS (cont.)  
 VEHICLE INTRUSION MEASUREMENTS  
 DOOR OPENING WIDTH



| UNITS (mm)  | LEFT |      |      | RIGHT |      |      |
|-------------|------|------|------|-------|------|------|
| MEASUREMENT | 1    | 2    | 3    | 1     | 2    | 3    |
| BEFORE TEST | 1071 | 1527 | 1258 | 1055  | 1520 | 1259 |
| AFTER TEST  | 1071 | 1532 | 1258 | 1069  | 1513 | 1262 |
| DIFFERENCE  | 0    | -5   | 0    | -14   | 7    | -3   |

| UNITS (mm)  | A = WHEELBASE LEFT | A = WHEELBASE RIGHT |
|-------------|--------------------|---------------------|
| BEFORE TEST | 3260               | 3255                |
| AFTER TEST  | 3221               | 3187                |
| DIFFERENCE  | 39                 | 68                  |

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



DRIVER

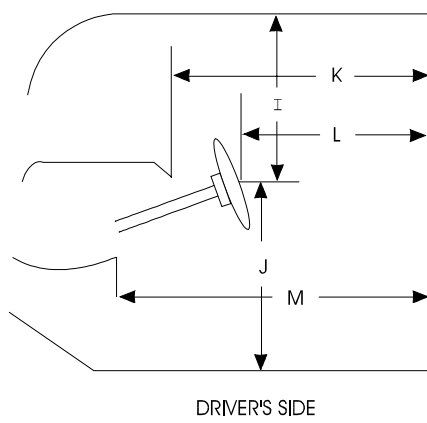
| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A           | 685      | 594       | 91         |
| B           | 596      | 588       | 8          |
| C           | 488      | 470       | 18         |
| D           | 548      | 542       | 6          |

PASSENGER

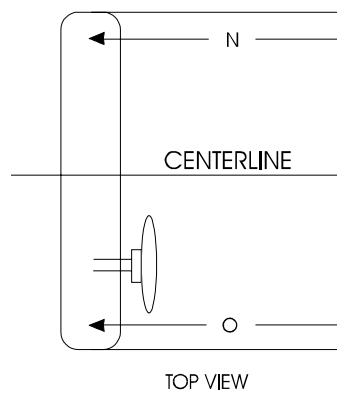
| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A           | 699      | 632       | 67         |
| B           | 617      | 569       | 48         |
| C           | 501      | 512       | -11        |
| D           | 500      | 513       | -13        |

Units = mm

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

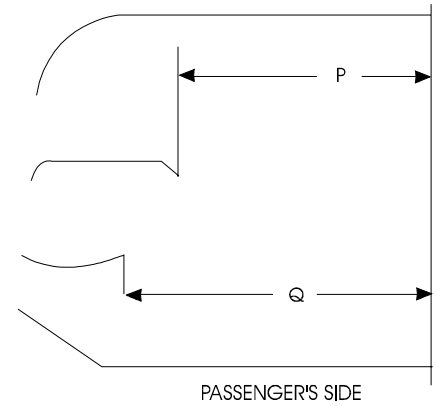


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS  
FROM C-PILLAR  
BELT ANCHORAGE

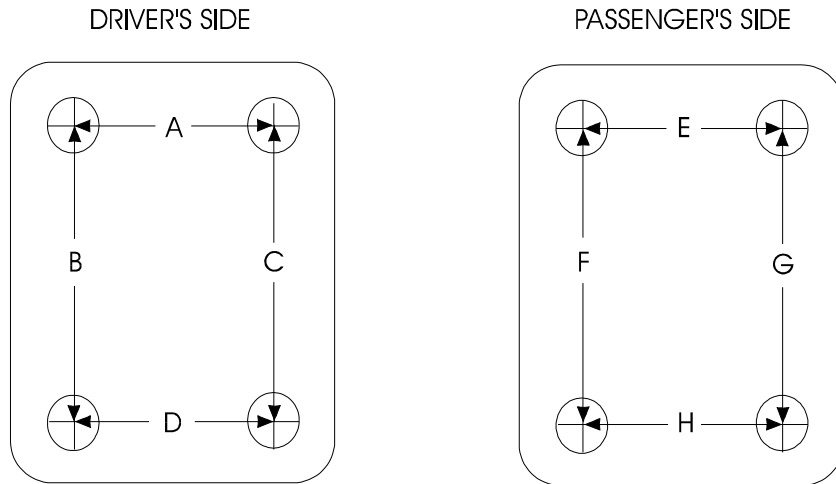


PASSENGER'S SIDE

| Measurement   | Pre-Test | Post-Test | Difference |
|---------------|----------|-----------|------------|
| I             | 480      | 441       | 39         |
| J             | 598      | 631       | -33        |
| K             | 1540     | 1563      | -23        |
| L             | 1311     | 1360      | -49        |
| M             | 1579     | 1589      | -10        |
| N             | 1584     | 1503      | 81         |
| O             | 1594     | 1584      | 10         |
| P = K (PASS.) | 1536     | 1458      | 78         |
| Q = M (PASS.) | 1565     | 1494      | 71         |

Units = mm

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

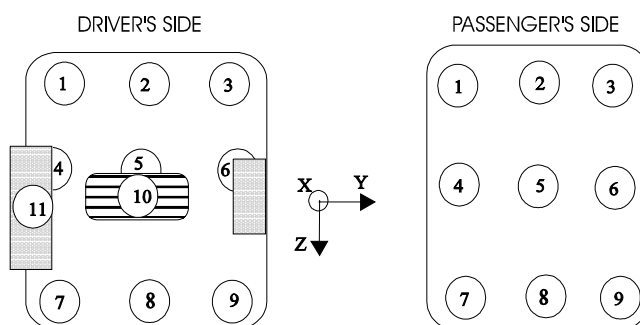


TOP VIEW THROUGH FLOOR PAN

| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A           | 470      | 465       | 5          |
| B           | 920      | 910       | 10         |
| C           | 900      | 895       | 5          |
| D           | 520      | 520       | 0          |
| E           | 470      | 470       | 0          |
| F           | 900      | 900       | 0          |
| G           | 920      | 915       | 5          |
| H           | 520      | 520       | 0          |

Units = mm

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



**Driver Side Floorpan Measurements**

| Floorpan Location | X Deformation (mm) |           |            | Z Deformation (mm) |           |            |
|-------------------|--------------------|-----------|------------|--------------------|-----------|------------|
|                   | Pre-Test           | Post-Test | Difference | Pre-Test           | Post-Test | Difference |
| 1                 | 4275               | 4246      | 29         | -706               | -699      | -7         |
| 2                 | 4279               | 4140      | 139        | -710               | -730      | 20         |
| 3                 | 4276               | 4176      | 100        | -718               | -753      | 35         |
| 4                 | 4254               | 4220      | 34         | -659               | -672      | 13         |
| 5                 | 4243               | 4162      | 81         | -652               | -687      | 35         |
| 6                 | 4240               | 4124      | 116        | -663               | -702      | 39         |
| 7                 | 4198               | 4169      | 29         | -605               | -597      | -8         |
| 8                 | 4190               | 4135      | 55         | -607               | -625      | 18         |
| 9                 | 4187               | 4120      | 67         | -603               | -647      | 44         |
| 10                | 4130               | 4116      | 14         | -755               | -758      | 3          |
| 11                | 4183               | 4161      | 22         | -689               | -681      | -8         |

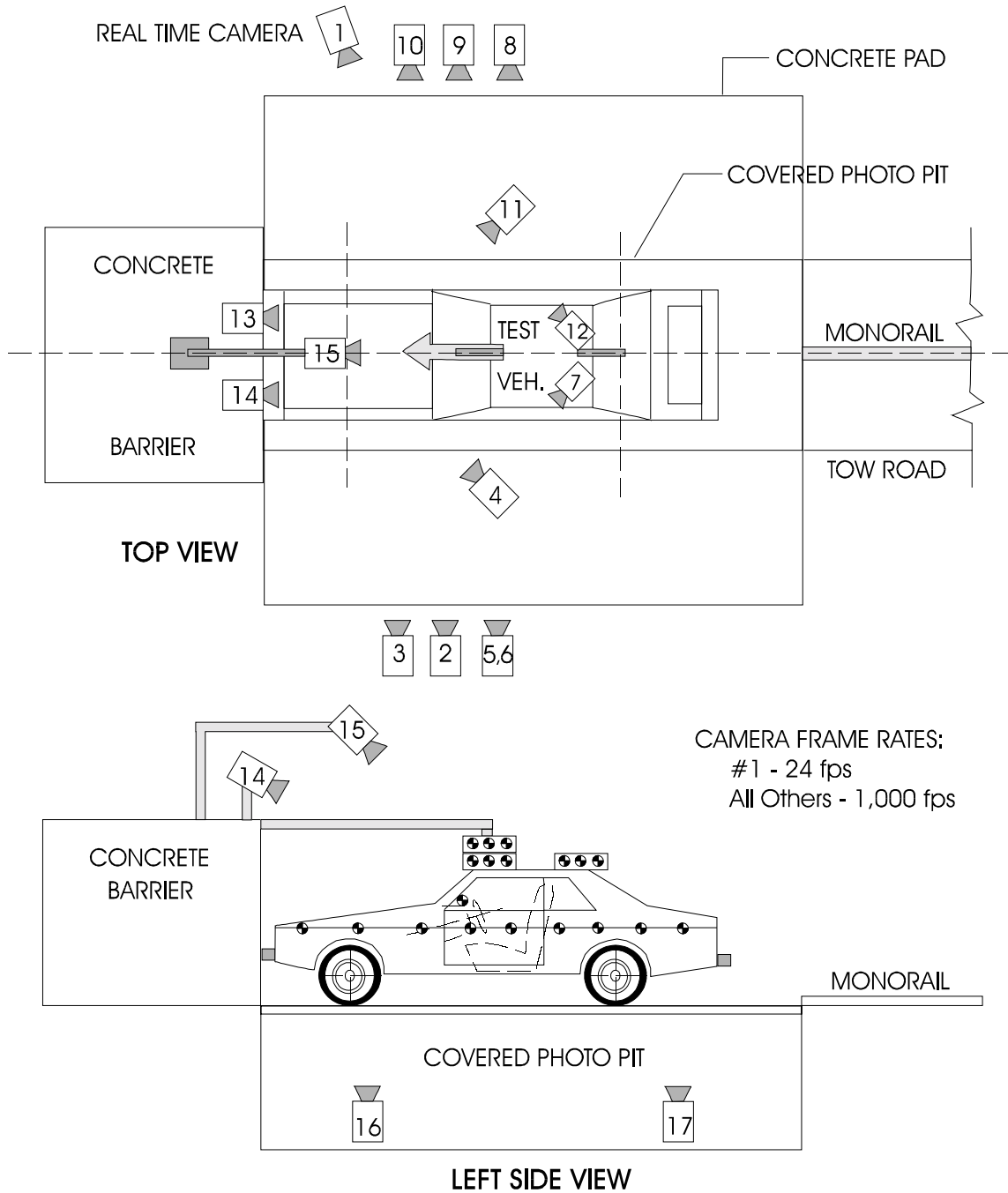
**Passenger Side Floorpan Measurements**

| Floorpan Location | X Deformation (mm) |           |            | Z Deformation (mm) |           |            |
|-------------------|--------------------|-----------|------------|--------------------|-----------|------------|
|                   | Pre-Test           | Post-Test | Difference | Pre-Test           | Post-Test | Difference |
| 1                 | 4262               | 4215      | 47         | -719               | -850      | 131        |
| 2                 | 4283               | 4261      | 22         | -718               | -852      | 134        |
| 3                 | 4275               | 4305      | -30        | -724               | -854      | 130        |
| 4                 | 4234               | 4221      | 13         | -675               | -809      | 134        |
| 5                 | 4246               | 4243      | 3          | -671               | -813      | 142        |
| 6                 | 4235               | 4273      | -38        | -673               | -803      | 130        |
| 7                 | 4184               | 4159      | 25         | -625               | -768      | 143        |
| 8                 | 4201               | 4198      | 3          | -621               | -762      | 141        |
| 9                 | 4203               | 4239      | -36        | -626               | -744      | 118        |

Reference: X = Rear Bumper; Z = Ground

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.: M15108 Vehicle: 2001 Toyota Tundra 4-Door Pick-up

| 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           | 7772                   | 1963 | 1069  | 2.1           | 7287                      | 12.5      | 1000        |
| 3          | Left Side View              | 8651                   | 1241 | 1101  | 1.7           | 8166                      | 25        | 1010        |
| 4          | Driver and Interior View    | 7631                   | 2889 | 1942  | 7.5           | -                         | 25        | 1010        |
| 5          | Steering Column (Bottom)    | 8696                   | 2215 | 1167  | 2.2           | 8211                      | 25        | 1000        |
| 6          | Steering Column (Top)       | 8696                   | 2215 | 1774  | 6.8           | 8211                      | 25        | 1000        |
| 7          | Left Belt                   | -                      | -    | -     | -             | -                         | 8         | 1000        |
| 8          | Overall Right Side          | 7731                   | 2215 | 1093  | 1.5           | 7246                      | 12.5      | 1000        |
| 9          | Right Side View             | 8565                   | 1411 | 1084  | 1.1           | 8080                      | 25        | 1000        |
| 10         | Right Passenger View        | 8466                   | 1963 | 1391  | 1.8           | 7981                      | 35        | 1000        |
| 11         | Passenger and Interior View | 7641                   | 2812 | 1972  | 6.0           | -                         | 25        | 1000        |
| 12         | Right Belt                  | -                      | -    | -     | -             | -                         | 8         | 1000        |
| 13         | Passenger Front View        | 620                    | -92  | 1987  | -41           | -                         | 13        | 1000        |
| 14         | Driver Front View           | 620                    | -92  | 1987  | -40           | -                         | 13        | 1000        |
| 15         | Windshield View             | 0                      | -530 | 3374  | -53           | -                         | 13        | 1000        |
| 16         | Pit View of Engine          | 0                      | 1138 | -3048 | 90            | -                         | 13        | 1000        |
| 17         | Pit View of Fuel Tank       | 0                      | 3150 | -3048 | 90            | -                         | 13        | 1010        |

\*X = film plane to monorail centerline

\*\* = referenced to horizontal plane

Y = film plane to impact location

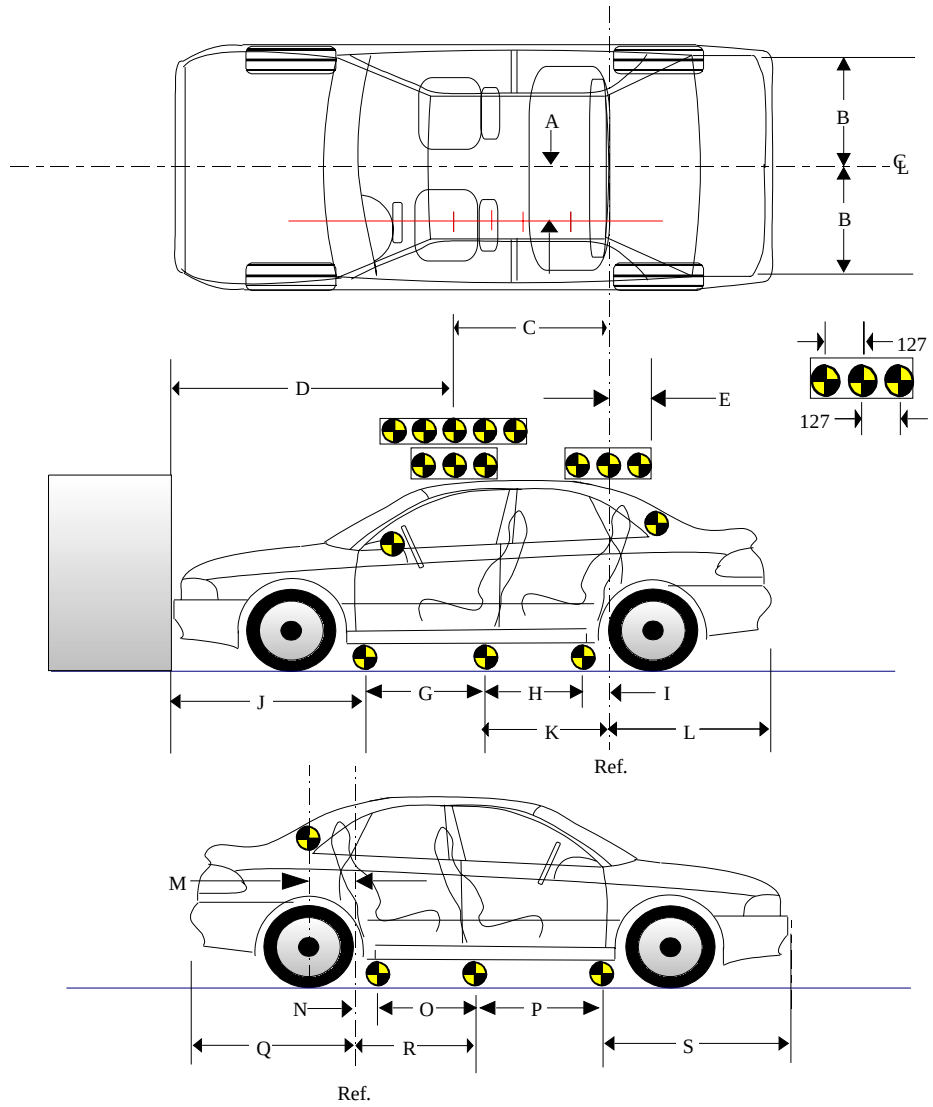
N.T. indicates No Timing

Z = film plane to ground

# DATA SHEET NO. 16      VEHICLE REFERENCE PHOTO TARGET LOCATIONS

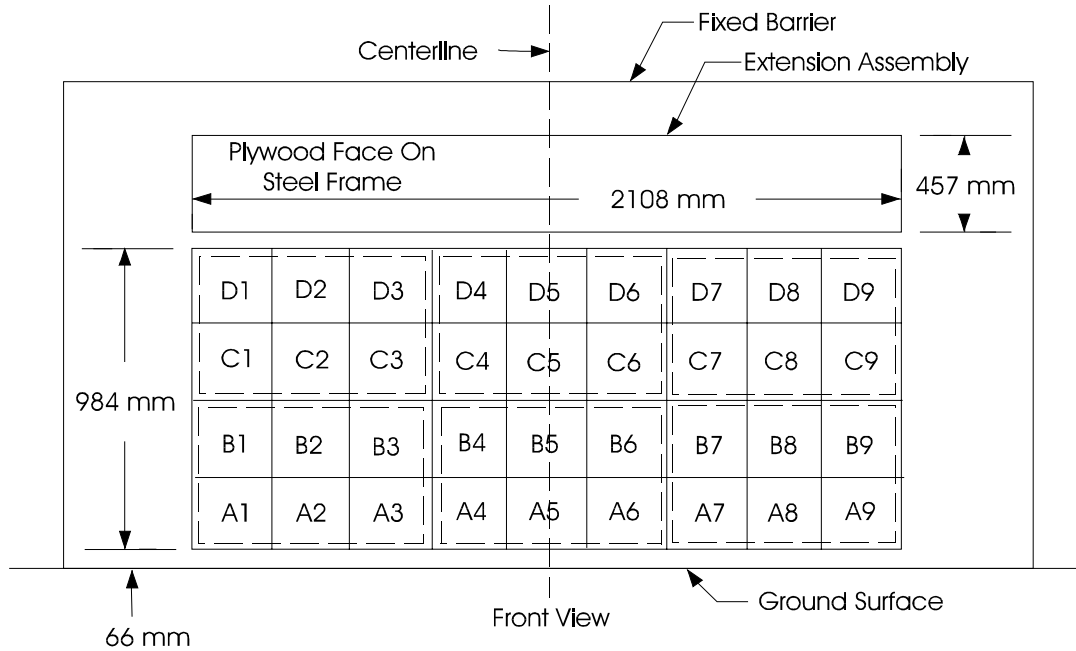
(Dimensions in millimeters)

|   |      |
|---|------|
| A | 409  |
| B | 762  |
| C | 1216 |
| D | 2466 |
| E | -480 |
| F | 1975 |
| G | 1082 |
| H | 1074 |
| I | 173  |
| J | 1445 |
| K | 1247 |
| L | 1724 |
| M | -485 |
| N | 161  |
| O | 1083 |
| P | 1082 |
| Q | 1731 |
| R | 1244 |
| S | 1441 |



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<br>C1 thru D3 | Group 5<br>C4 thru D6 | Group 6<br>C7 thru D9 |
| Group 1<br>A1 thru B3 | Group 2<br>A4 thru B6 | Group 3<br>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. : M15108; Test Date: November 17, 2000; Technician: James A. Czarnecki

Vehicle Model Year/Make/Model: 2001 Toyota Tundra

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

B. Size of vent holes: (mm<sup>2</sup>) 35 -Driver 70 -Passenger

C. Total vent area: (mm<sup>2</sup>) 70 -Driver 100 -Passenger

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

Driver: - -Length; - -Width; 675 -Diameter

Passenger: 825 -Height; 750 -Width; 400 -Depth

E. Is the air bag tethered?

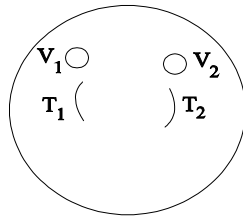
Driver: x -Yes; - -No; If yes, record length of tether- 225

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

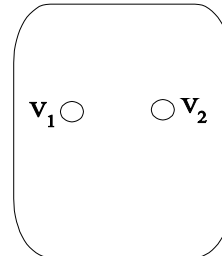
Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

(Note: Not to scale;  $V_n$  = Vent hole<sub>n</sub>,  $T_n$  = Tether<sub>n</sub>).

**Driver**



**Passenger**



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

Driver: Air bag: 501229100A25

Generator: TALL8R1NDCZ

Passenger: Air bag: -

Generator: F22 2421 T2900L46

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

Vehicle Make/Model/Body Style: Toyota Tundra 4-Door Pick-up

NHTSA Test No.: M15108      VIN: 5TBRT341015137921

Model Year: 2001      Build Date: 9/00      Test Date: November 17, 2000

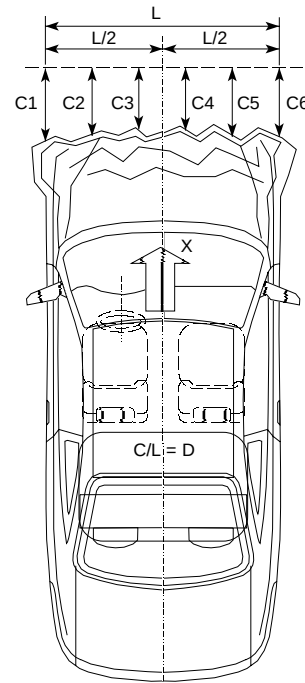
Vehicle Size Category: Pickup      Test Weight: 2269 kg

Vehicle Wheelbase: 3280 mm; Front Overhang: 1441 mm; Overall Width: 1910 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

|      | PRE  | POST | DIFF  |    |
|------|------|------|-------|----|
| C1 = | 5365 | 4939 | 426.0 | mm |
| C2 = | 5472 | 4959 | 513.0 | mm |
| C3 = | 5497 | 4965 | 532.0 | mm |
| C4 = | 5502 | 4975 | 527.0 | mm |
| C5 = | 5479 | 4970 | 509.0 | mm |
| C6 = | 5377 | 4962 | 415.0 | mm |



Midpoint of Damage:      D = Vehicle Centerline  
(Longitudinal)

Length of Damaged Region:

L1= 1910 mm

L2= 955.0 mm

L3= 636.7 mm

**APPENDIX A**  
**PHOTOGRAPHS**

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Figure A-1: LOAD CELL LOCATIONS.



Figure A-2: PRE-TEST FRONT VIEW

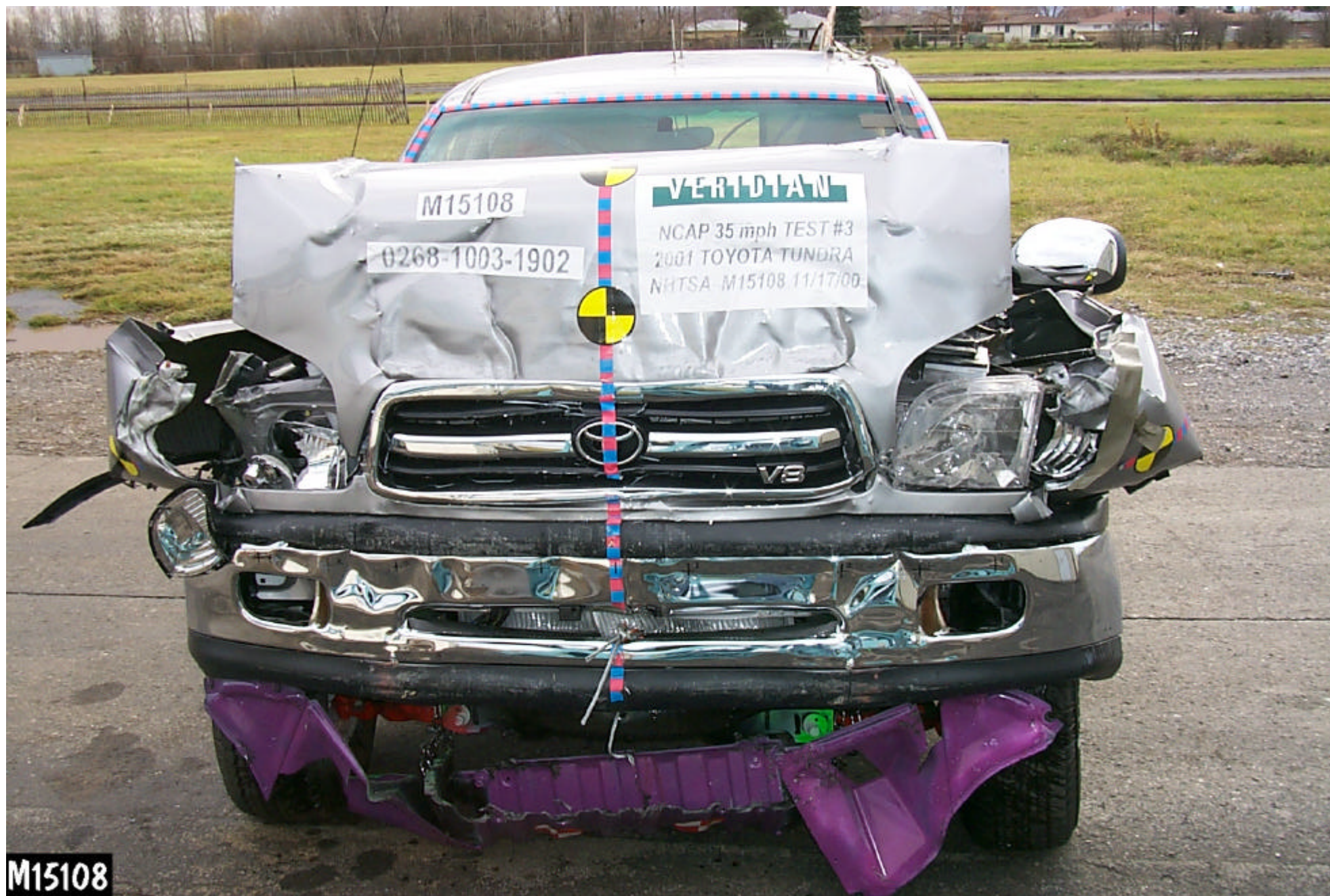


Figure A-3: POST-TEST FRONT VIEW.



Figure A-4: PRE-TEST LEFT SIDE VIEW



Figure A-5: POST-TEST LEFT SIDE VIEW



Figure A-6: PRE-TEST RIGHT SIDE VIEW



Figure A-7: POST-TEST RIGHT SIDE VIEW



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



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



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



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



Figure A-12: PRE-TEST WINDSHIELD VIEW



Figure A-13: POST-TEST WINDSHIELD VIEW

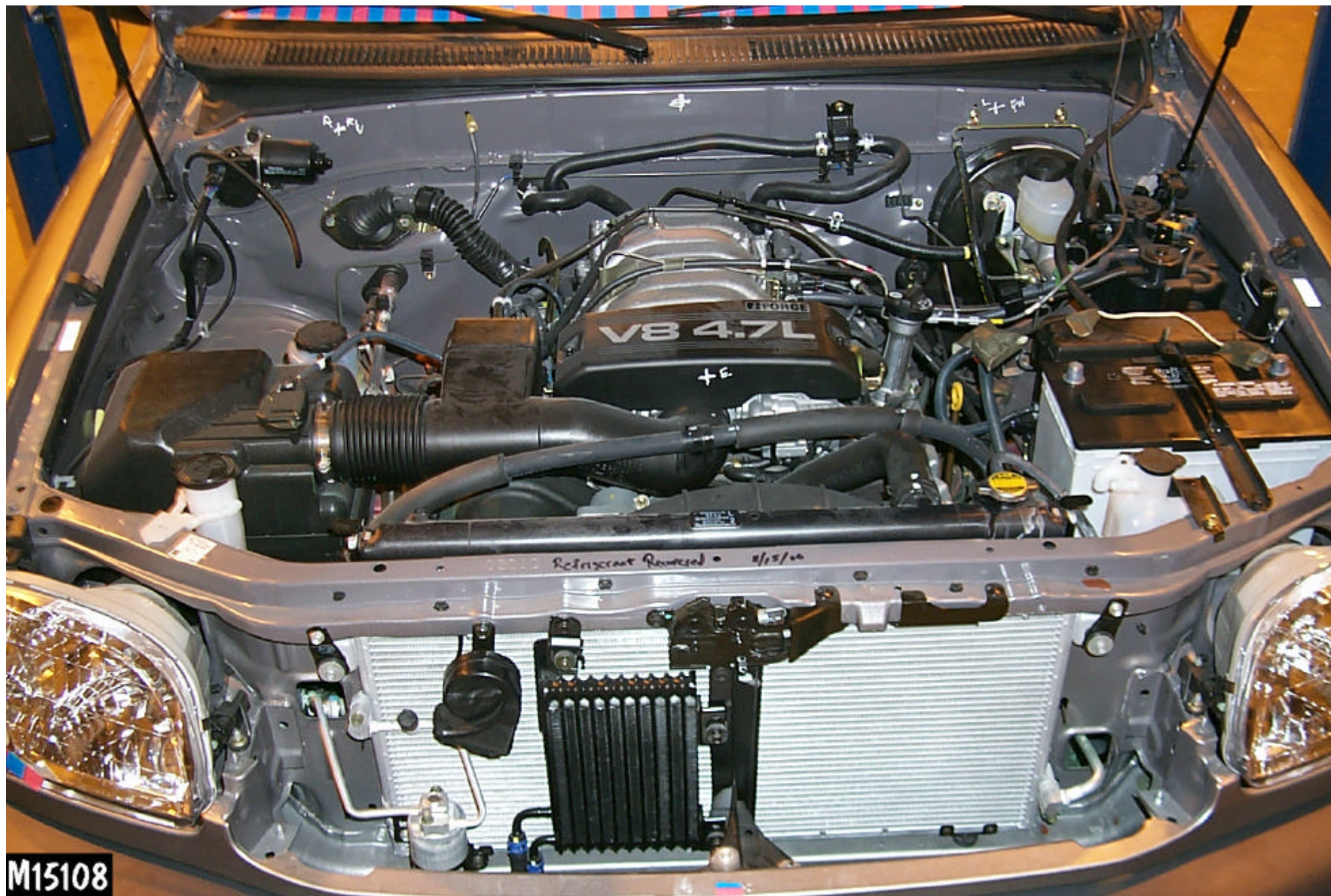


Figure A-14: PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15: FUEL CAP VIEW



Figure A-16: PRE-TEST FRONT UNDERBODY VIEW

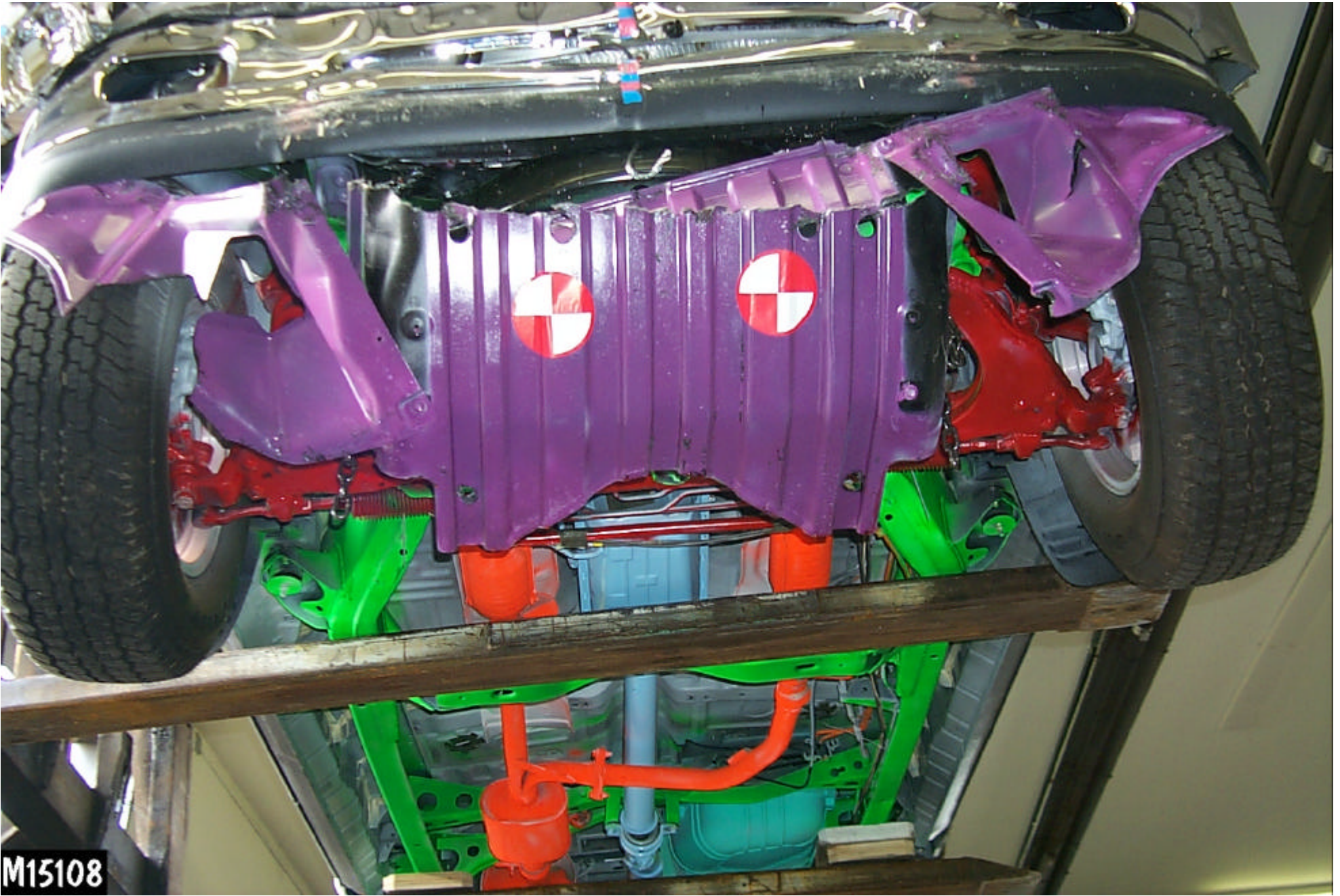


Figure A-17: POST-TEST FRONT UNDERBODY VIEW

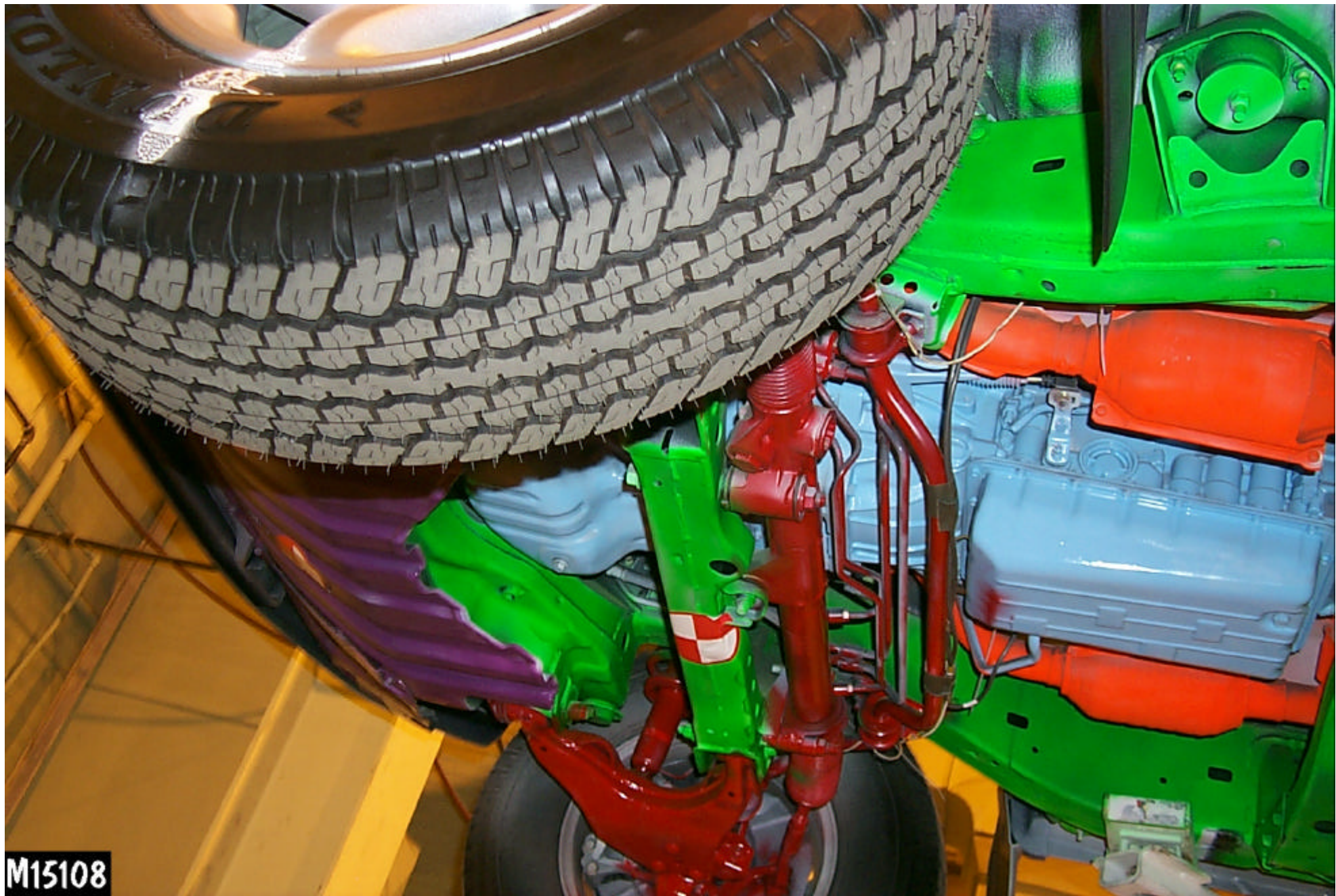


Figure A-18: PRE-TEST FRONT SIDE UNDERBODY VIEW



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



Figure A-20: PRE-TEST REAR UNDERBODY VIEW

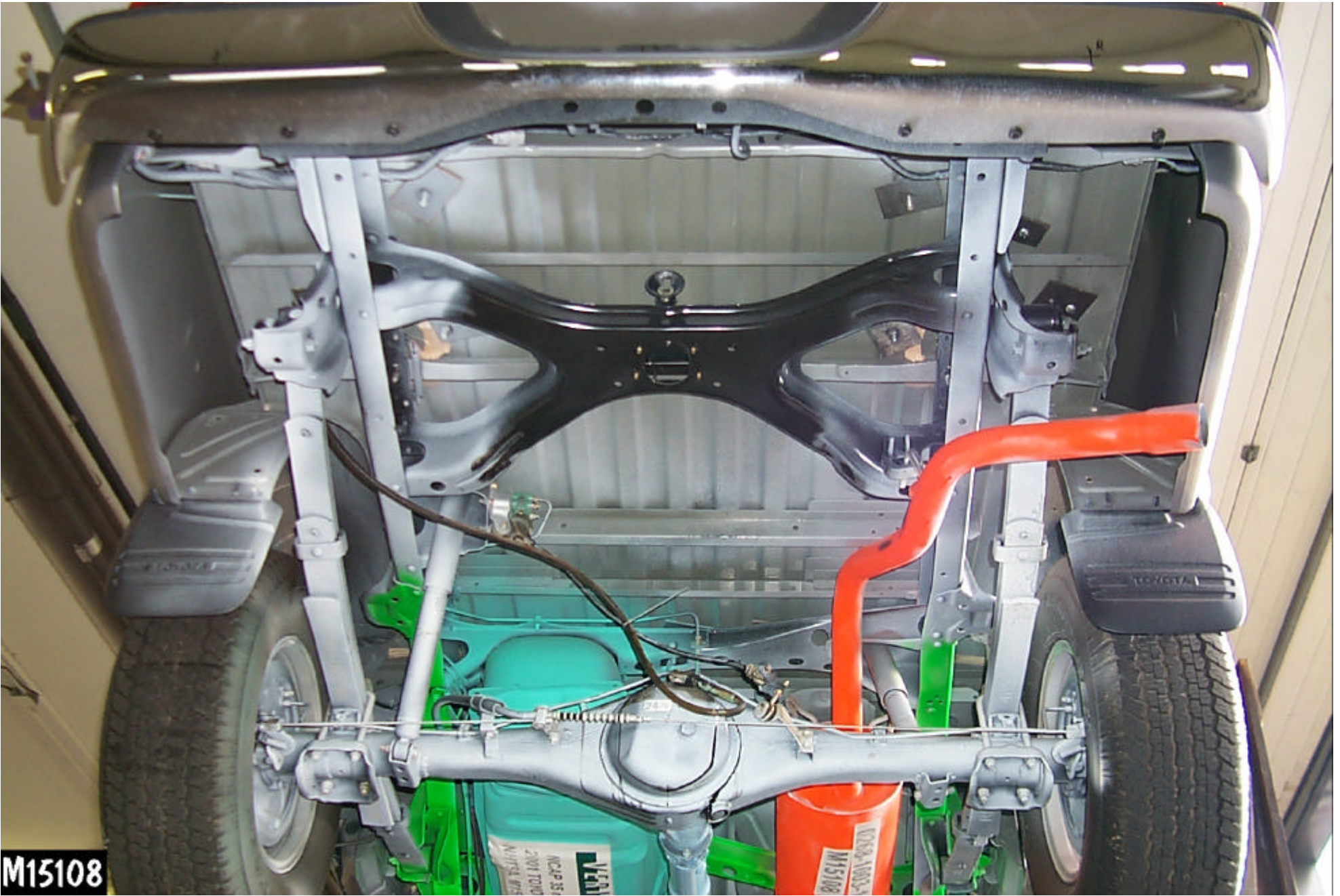


Figure A-21: POST-TEST REAR UNDERBODY VIEW



Figure A-22: PRE-TEST DRIVER POSITION VIEW



Figure A-23: POST-TEST DRIVER POSITION VIEW



Figure A-24: PRE-TEST PASSENGER POSITION VIEW



Figure A-25: POST-TEST PASSENGER POSITION VIEW



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



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



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



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



Figure A-30: PRE-TEST DRIVER HEAD LOCATION

**M15108**

Figure A-31: POST-TEST DRIVER HEAD LOCATION



Figure A-32: PRE-TEST PASSENGER HEAD LOCATION



Figure A-33: POST-TEST PASSENGER HEAD LOCATION



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



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



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



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



Figure A-38: ROLLOVER VIEW



Figure A-39: IMPACT VIEW

## **APPENDIX B**

### **DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA**

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

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

## DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO. M15108

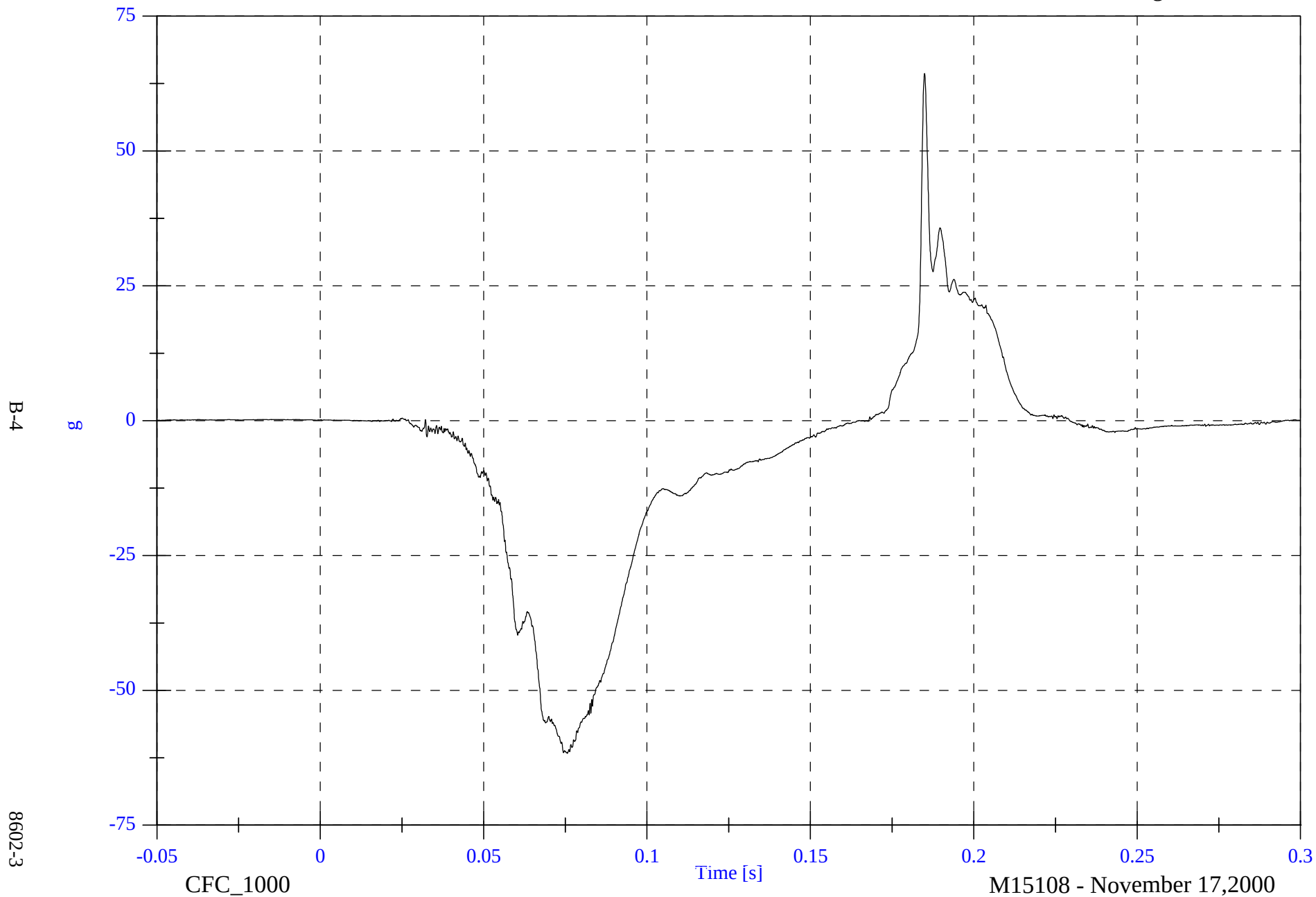
| <b>DATA TYPE</b>                  | <b>SAE FILTER CLASS (Hz)</b> |
|-----------------------------------|------------------------------|
| Dummy Head Accelerations          | 1000                         |
| Dummy Chest Accelerations         | 180                          |
| Dummy Chest Displacements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

NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head x

Max: 64.4 [g] at 0.185 [s]

Min: -61.7 [g] at 0.076 [s]

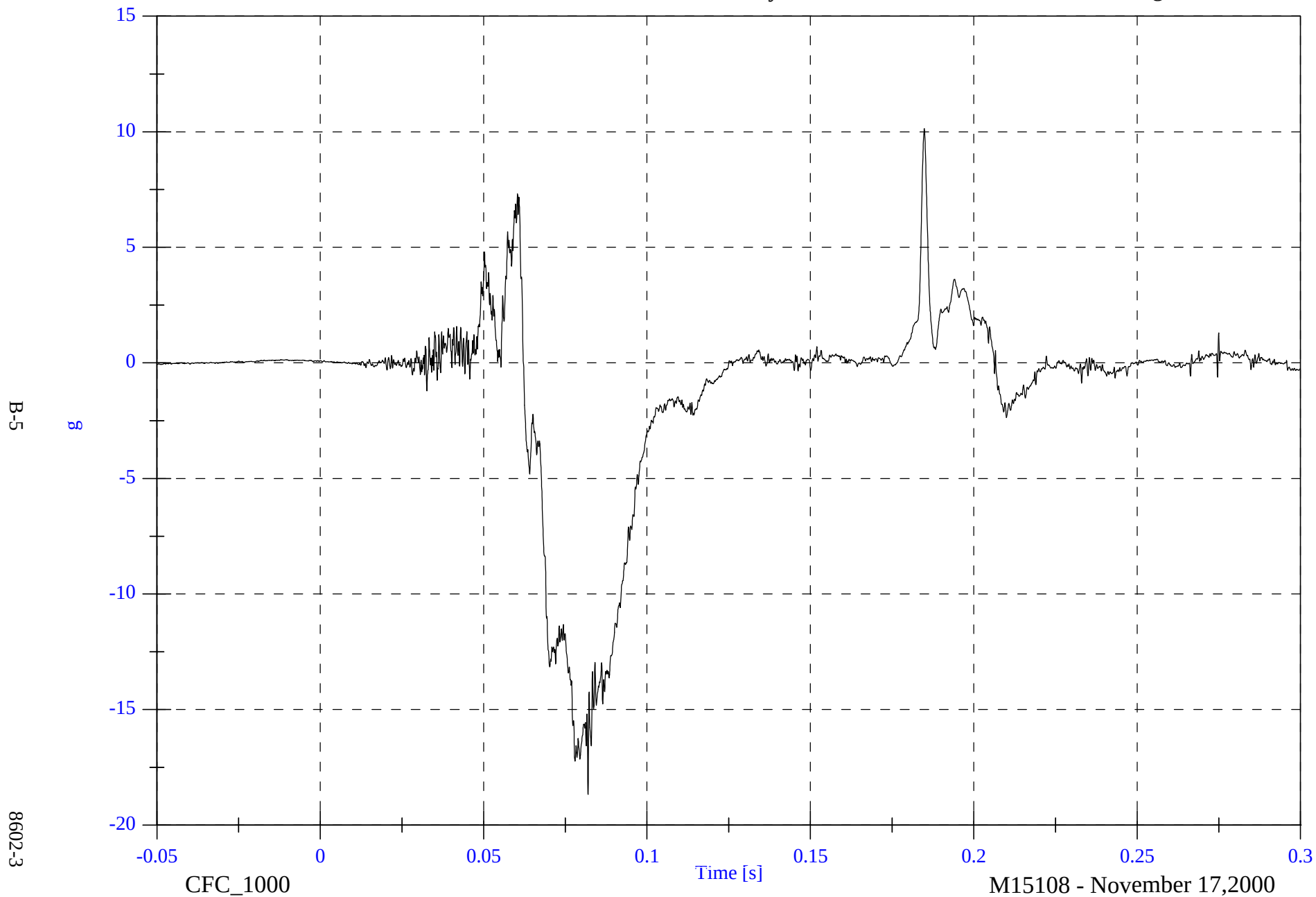


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head y

Max: 10.1 [g] at 0.185 [s]

Min: -18.7 [g] at 0.082 [s]

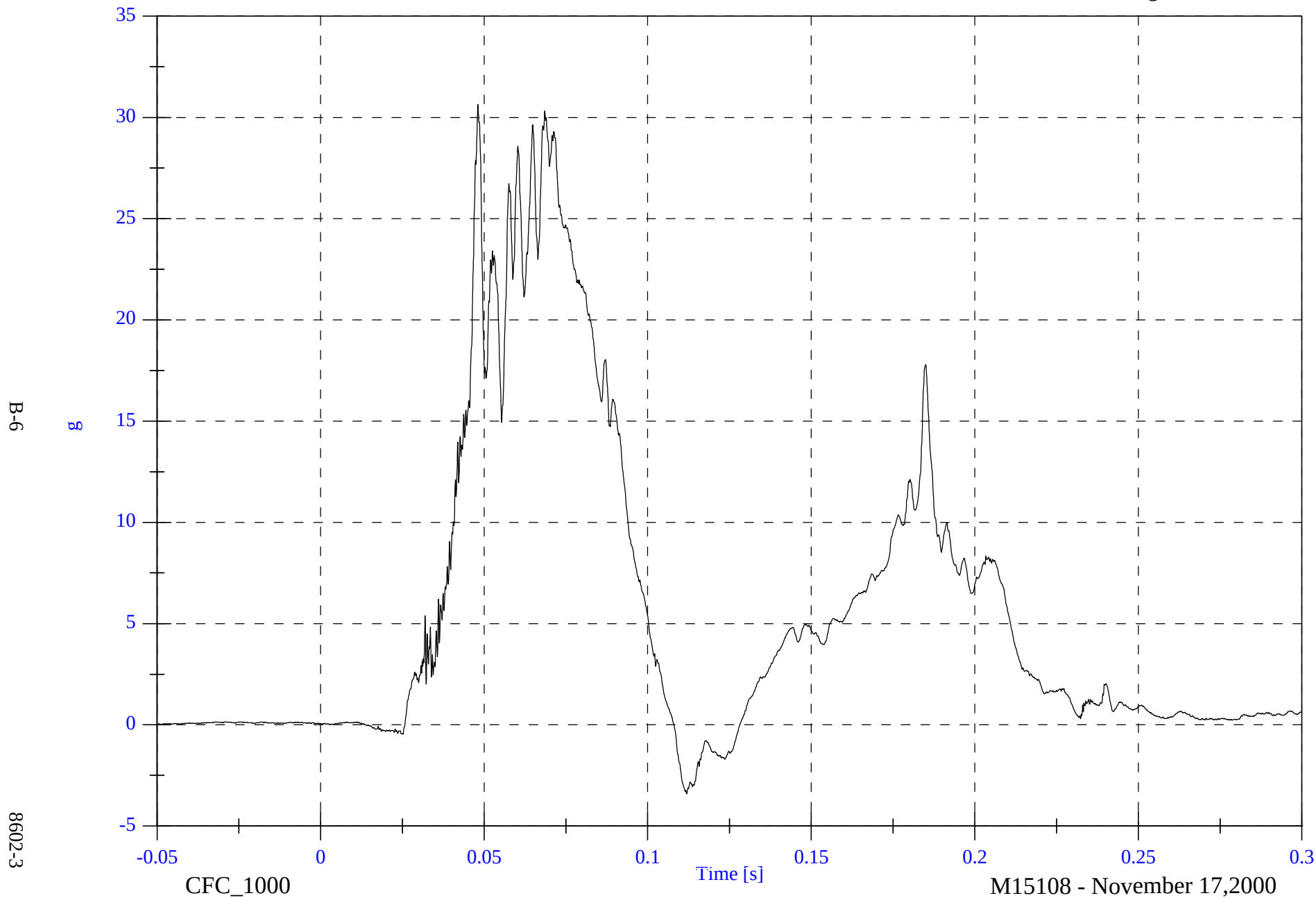


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head z

Max: 30.6 [g] at 0.048 [s]

Min: -3.4 [g] at 0.112 [s]

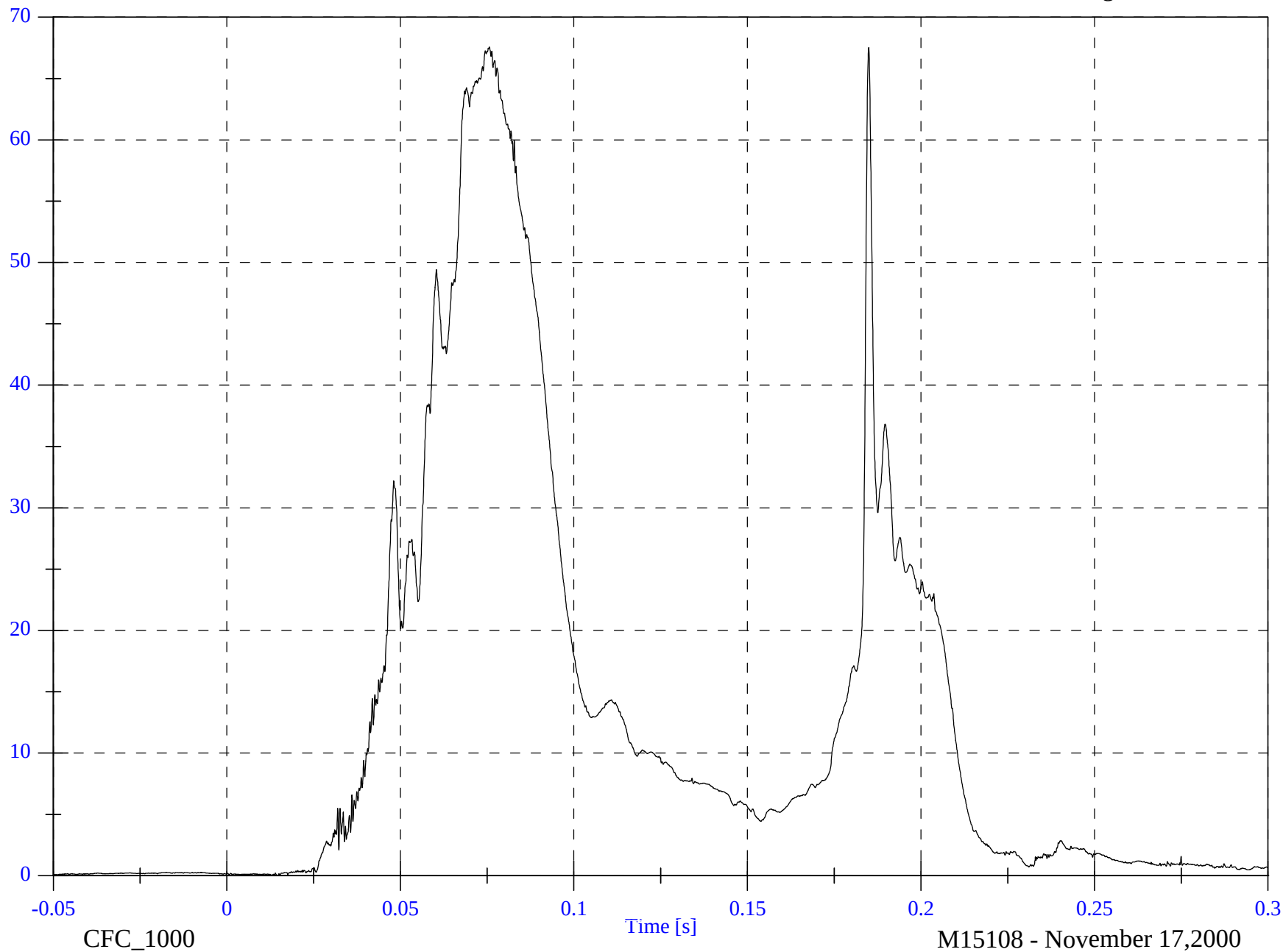


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head Resultant

Max: 67.6 [g] at 0.076 [s]

Min: 0.0 [g] at 0.014 [s]



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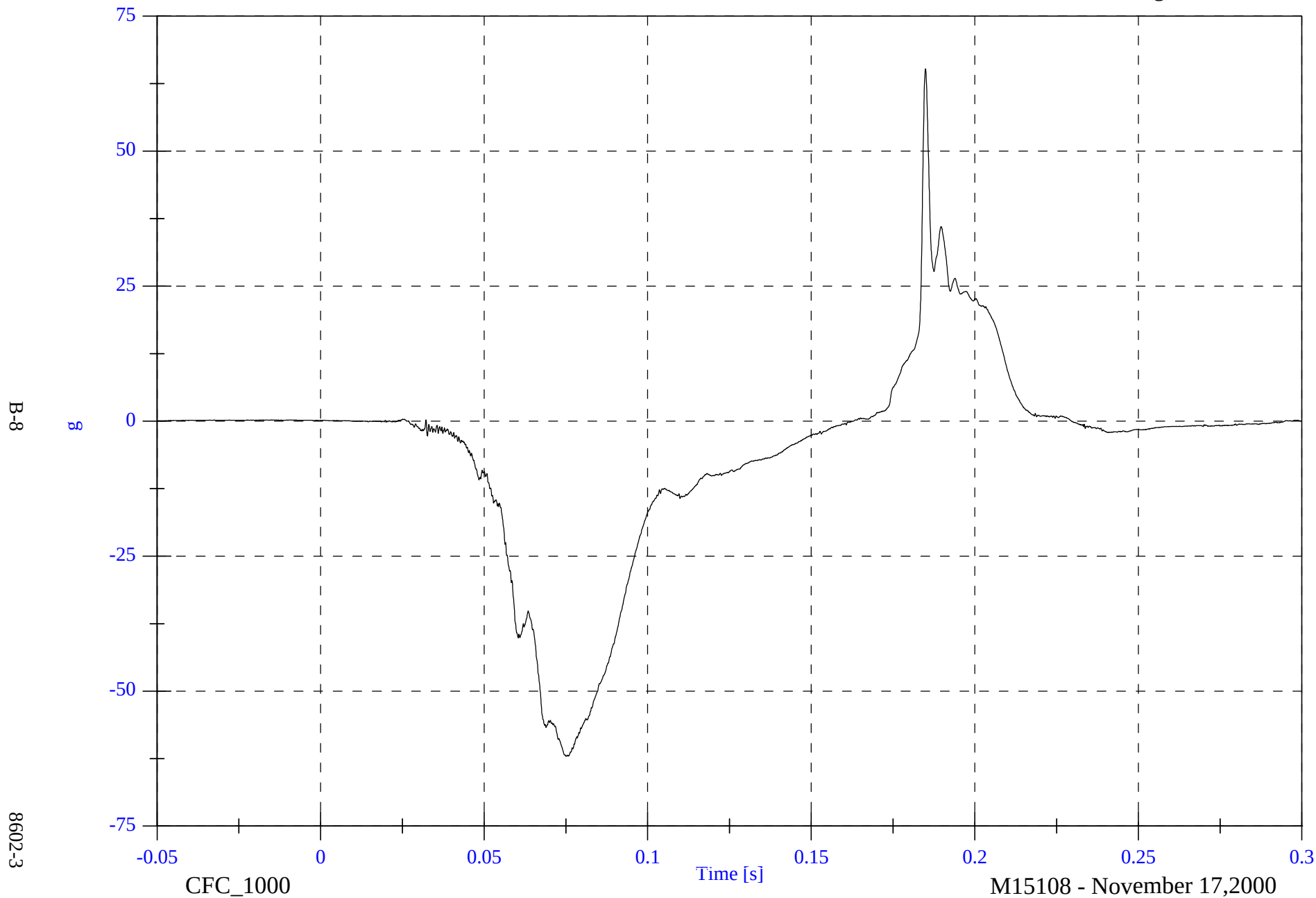
8602-3

NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head Red x

Max: 65.2 [g] at 0.185 [s]

Min: -62.1 [g] at 0.075 [s]

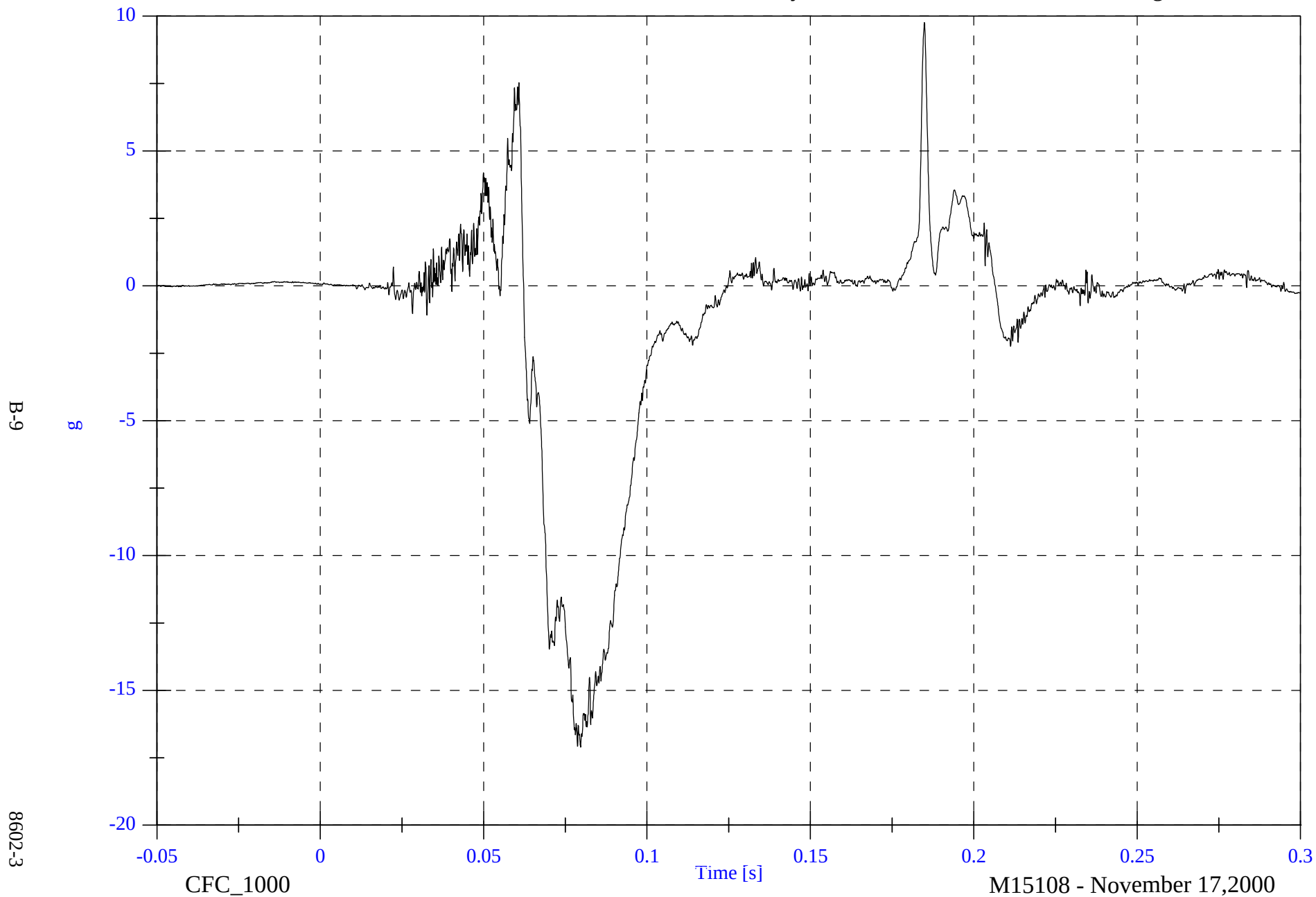


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head Red y

Max: 9.8 [g] at 0.185 [s]

Min: -17.1 [g] at 0.080 [s]

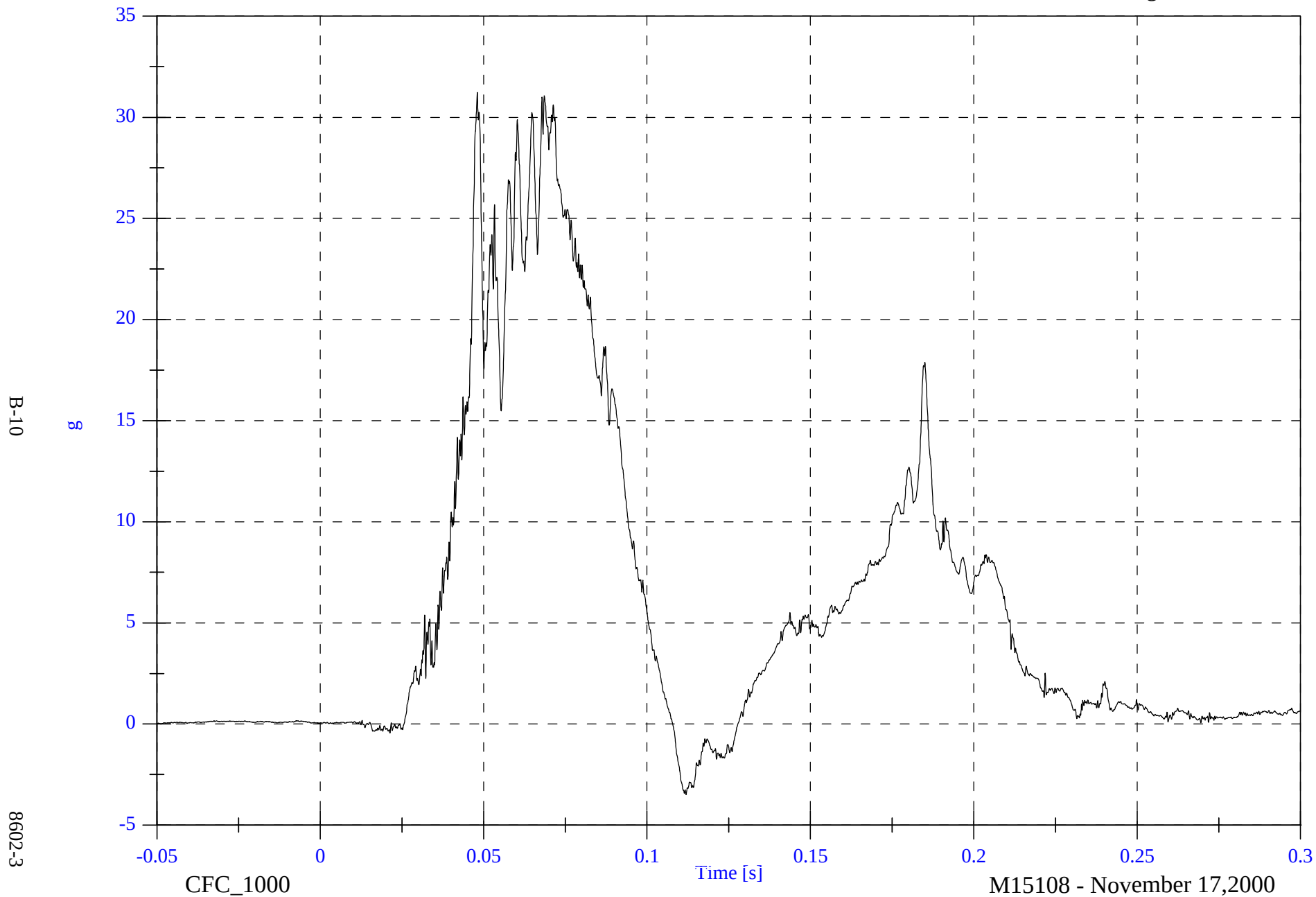


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head Red z

Max: 31.2 [g] at 0.048 [s]

Min: -3.5 [g] at 0.112 [s]

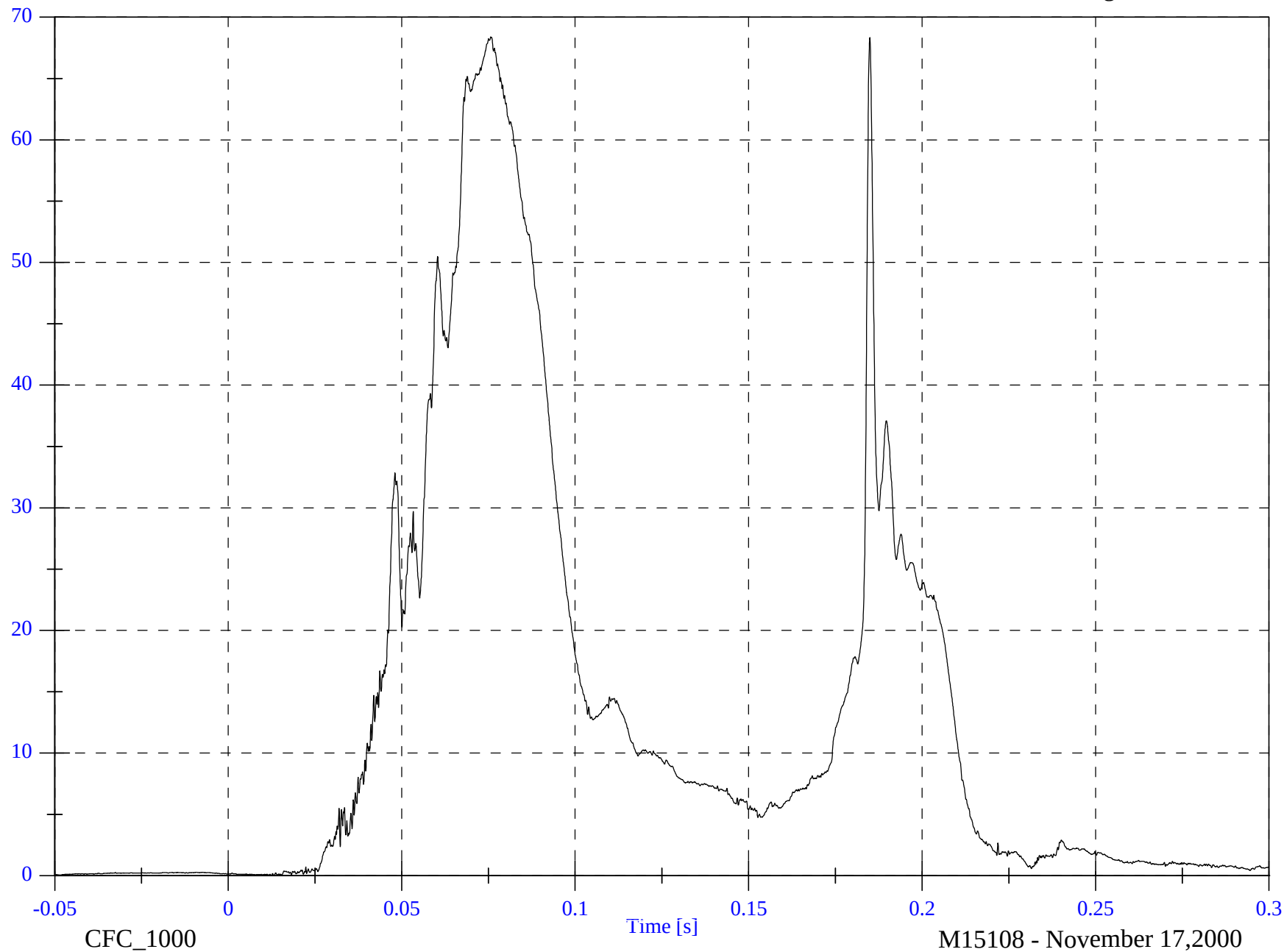


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Head Red Resultant

Max: 68.4 [g] at 0.076 [s]

Min: 0.0 [g] at 0.013 [s]



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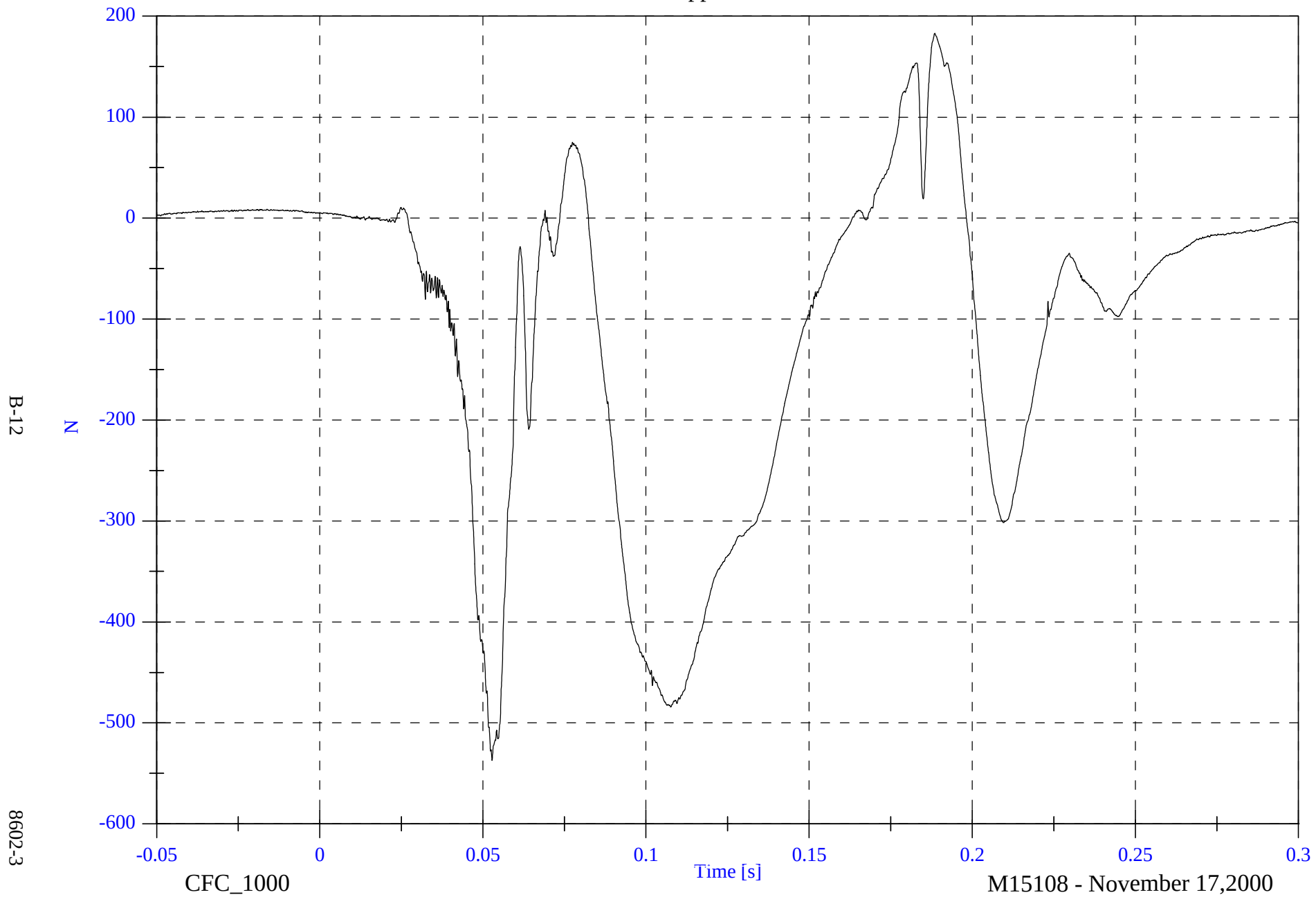
8602-3

NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck Fx

Max: 183.1 [N] at 0.188 [s]

Min: -537.1 [N] at 0.053 [s]

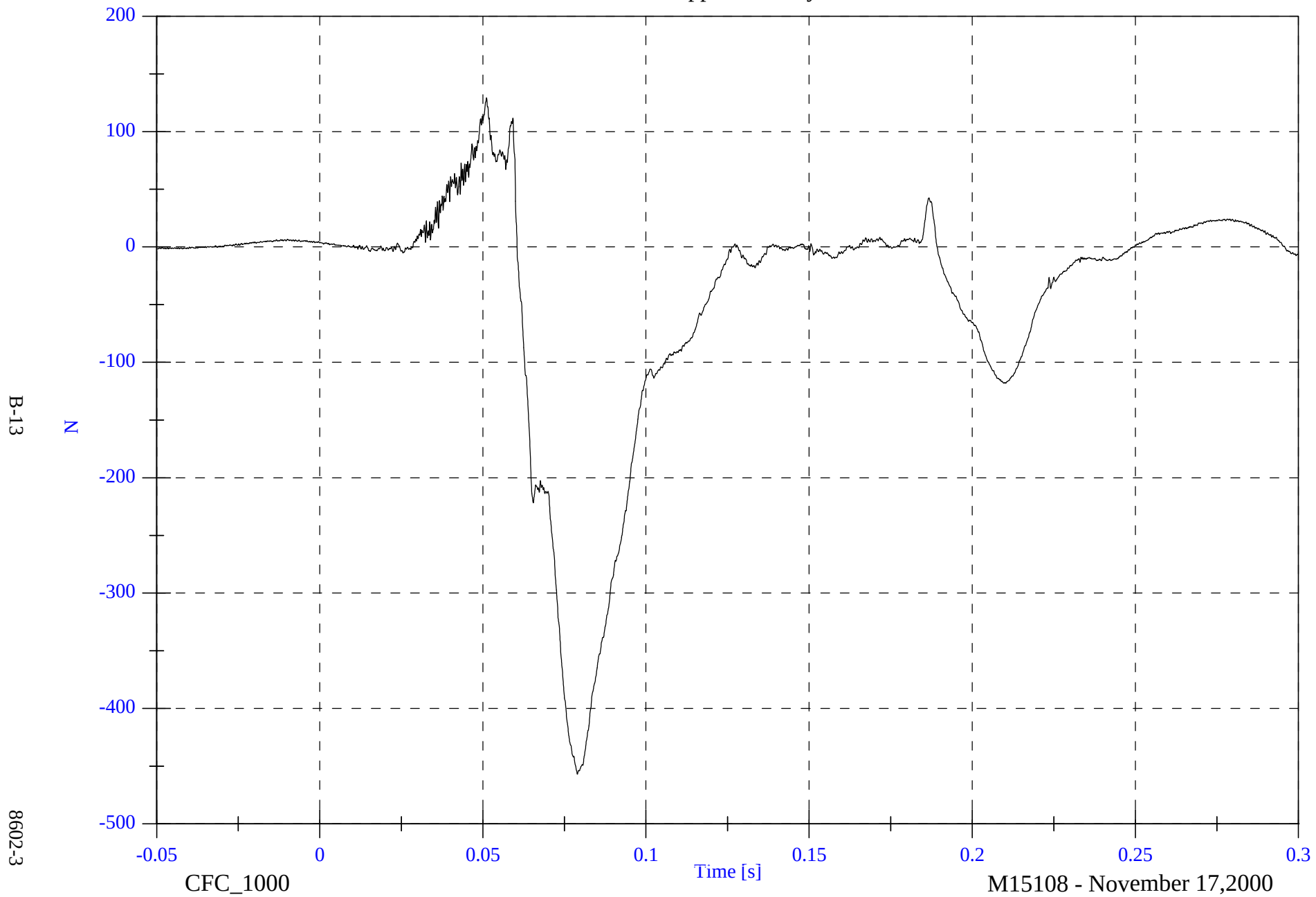


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck Fy

Max: 129.3 [N] at 0.051 [s]

Min: -457.0 [N] at 0.079 [s]

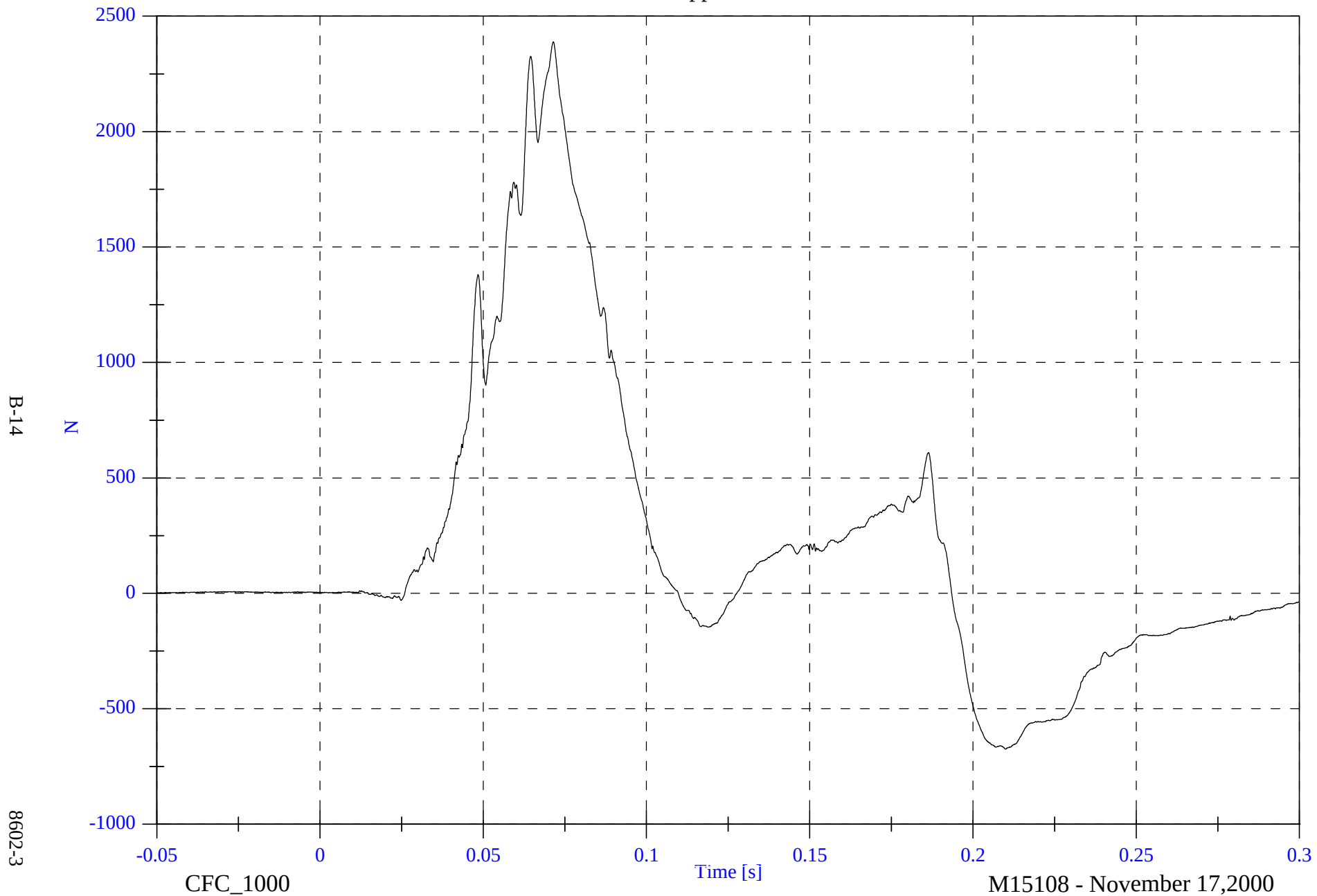


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck Fz

Max: 2389.2 [N] at 0.071 [s]

Min: -674.2 [N] at 0.210 [s]

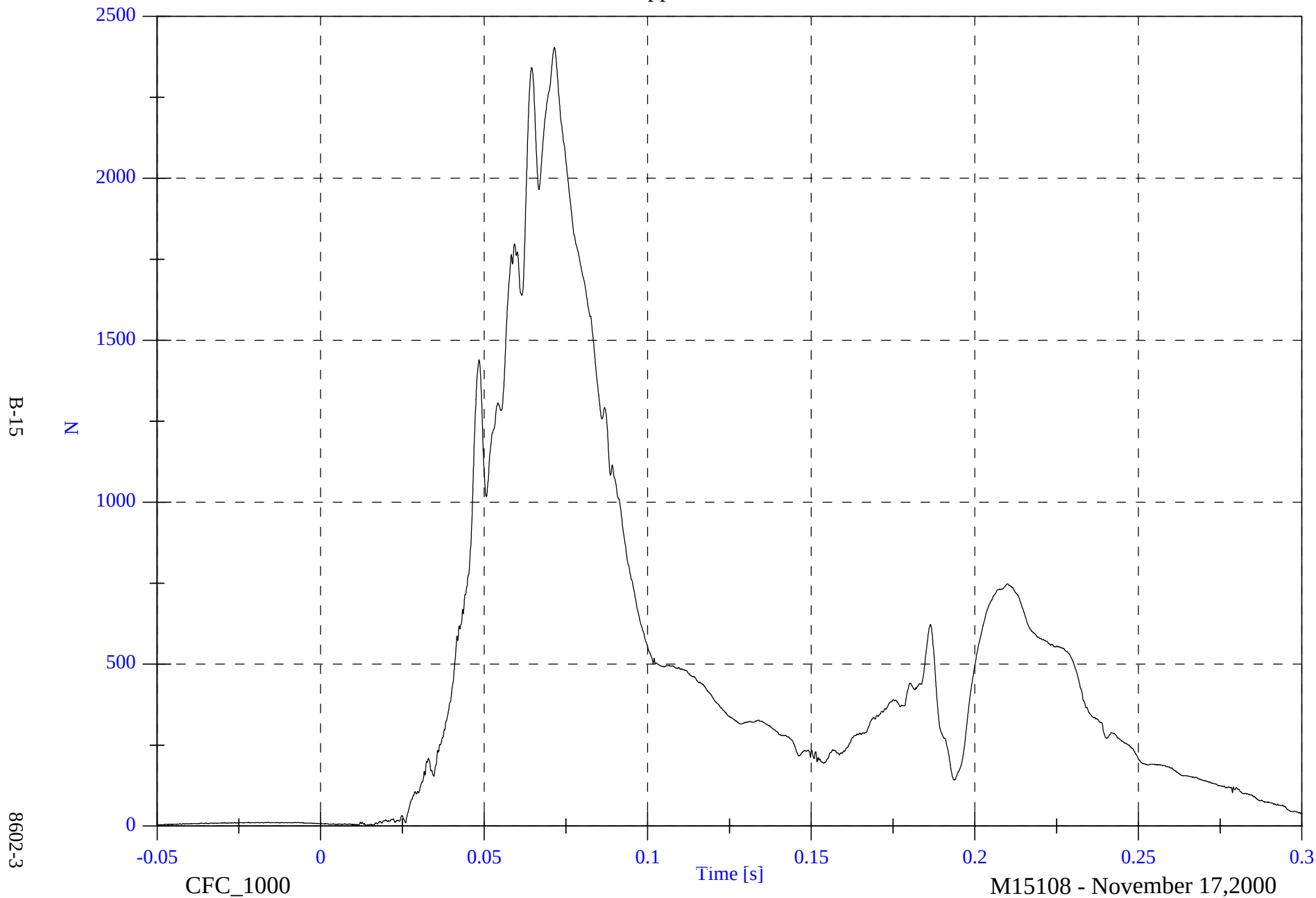


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck F Resultant

Max: 2403.5 [N] at 0.071 [s]

Min: 1.0 [N] at 0.015 [s]

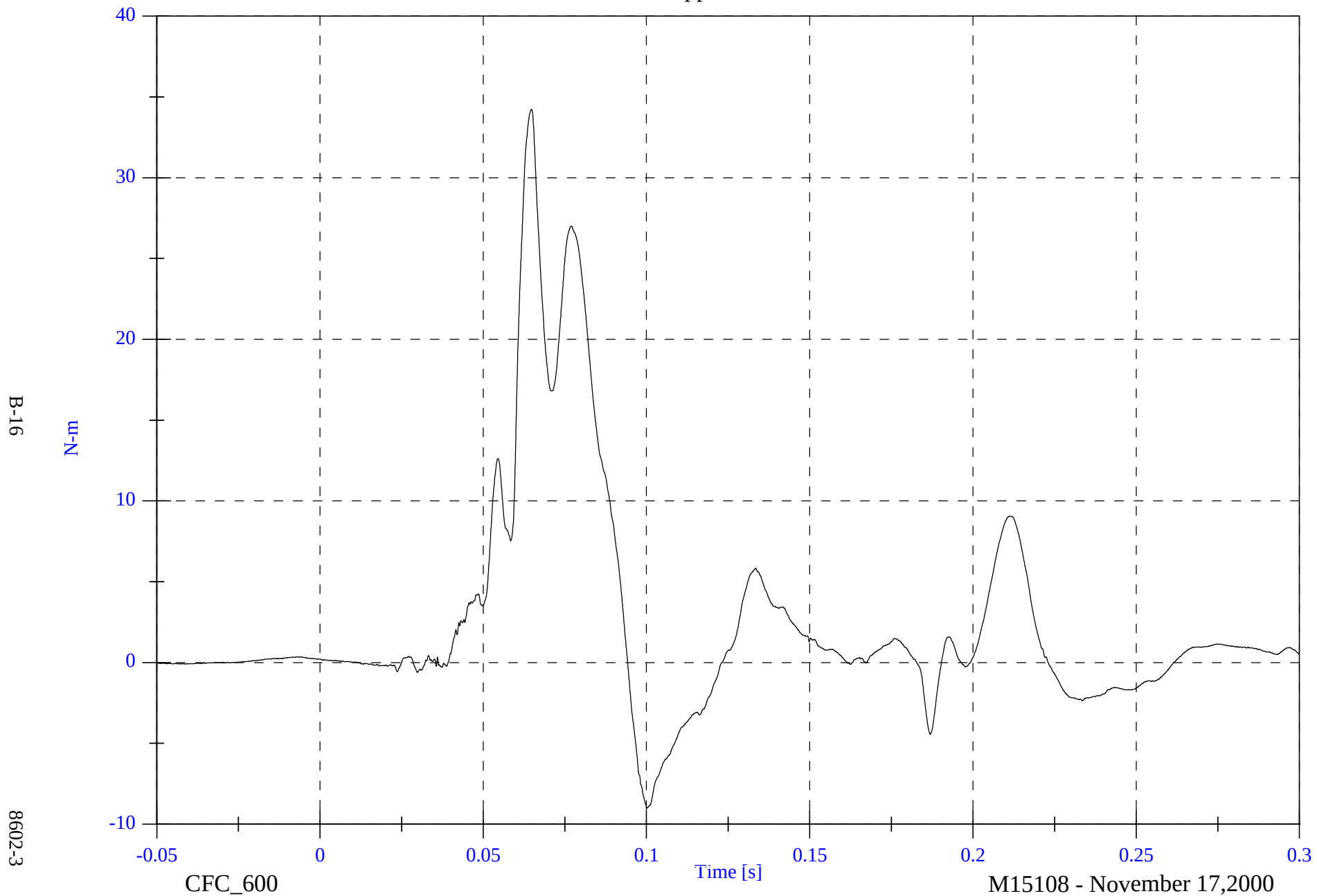


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck Mx

Max: 34.2 [N-m] at 0.065 [s]

Min: -9.0 [N-m] at 0.100 [s]

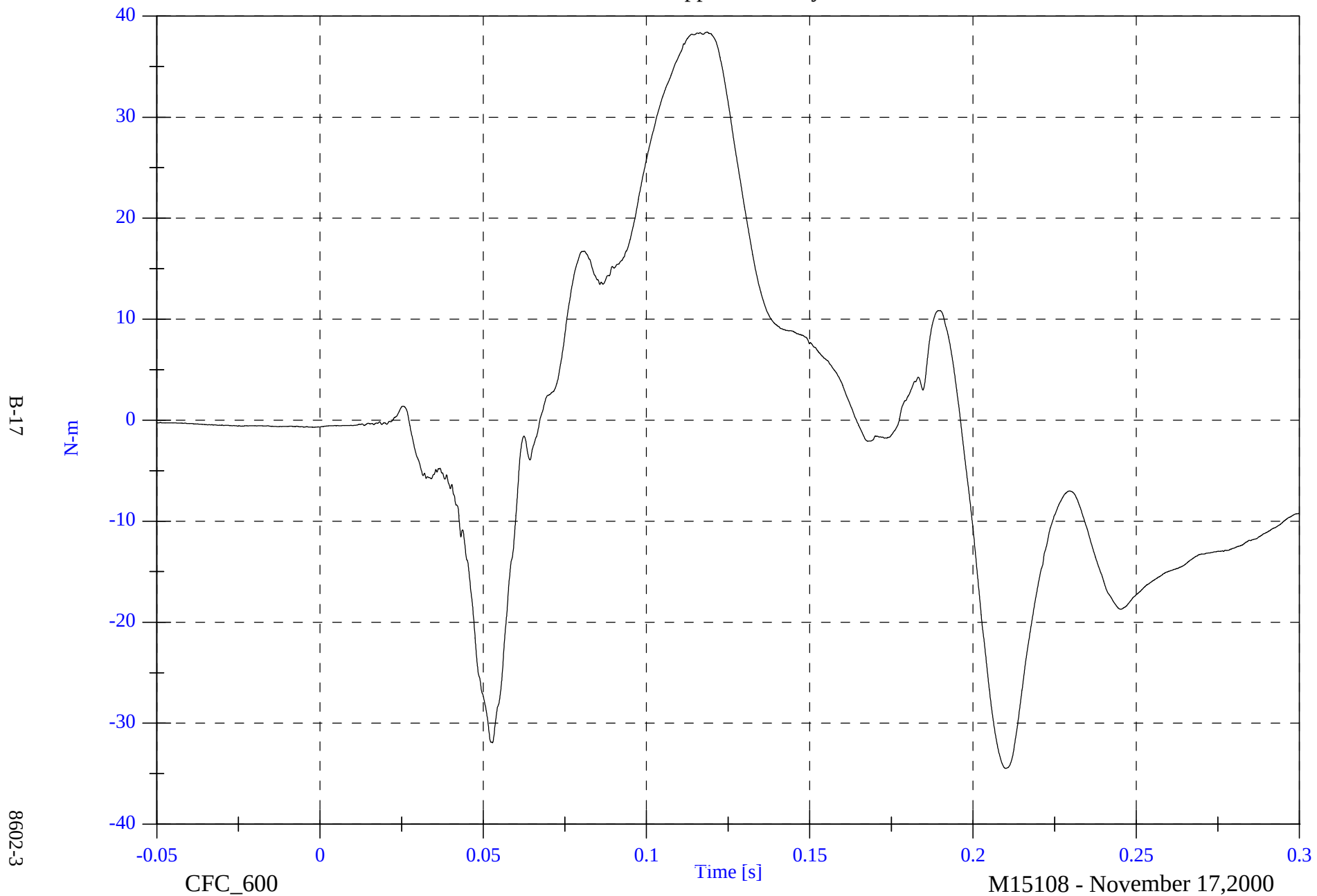


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck My

Max: 38.4 [N-m] at 0.119 [s]

Min: -34.5 [N-m] at 0.210 [s]

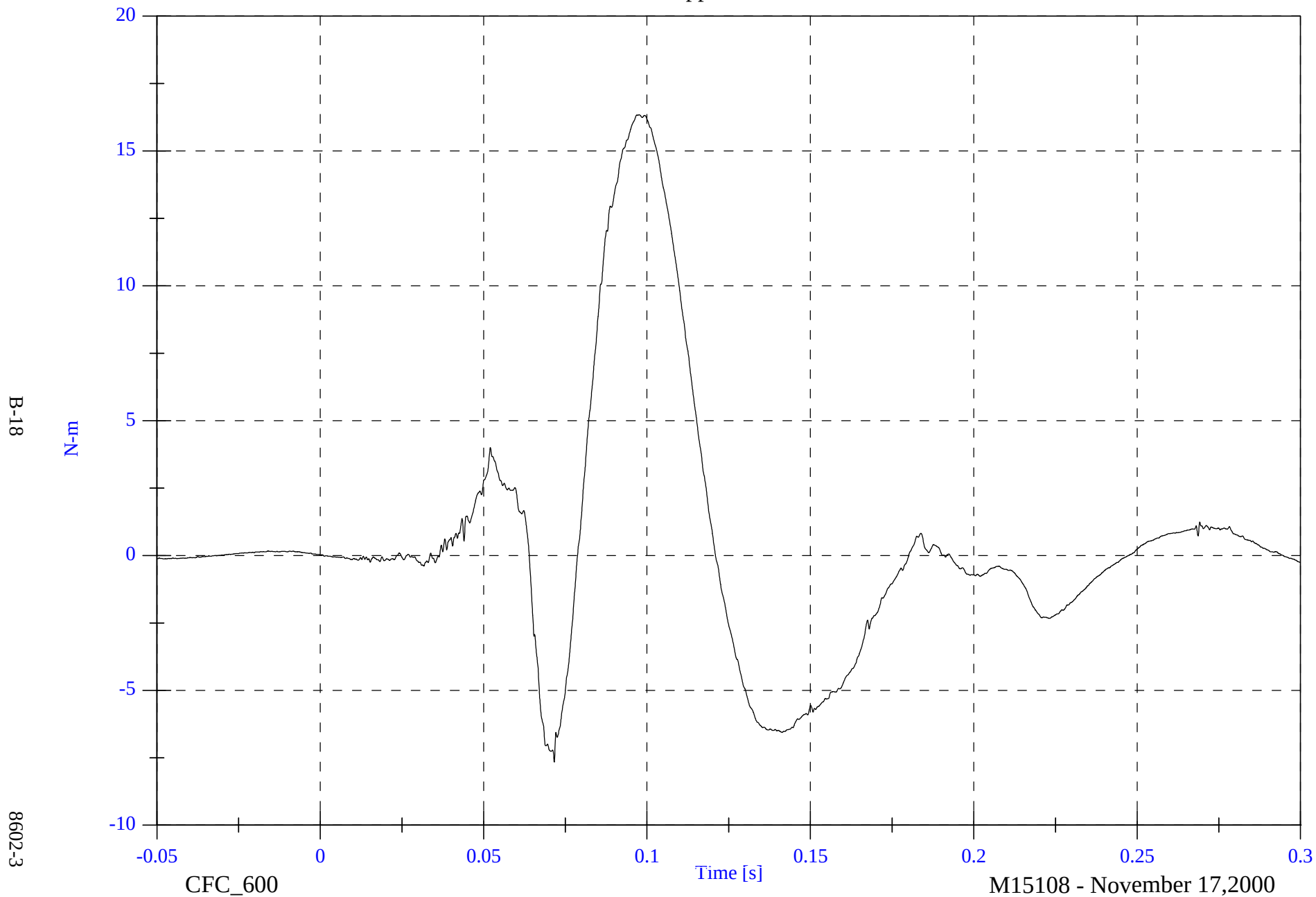


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck Mz

Max: 16.3 [N-m] at 0.098 [s]

Min: -7.7 [N-m] at 0.072 [s]

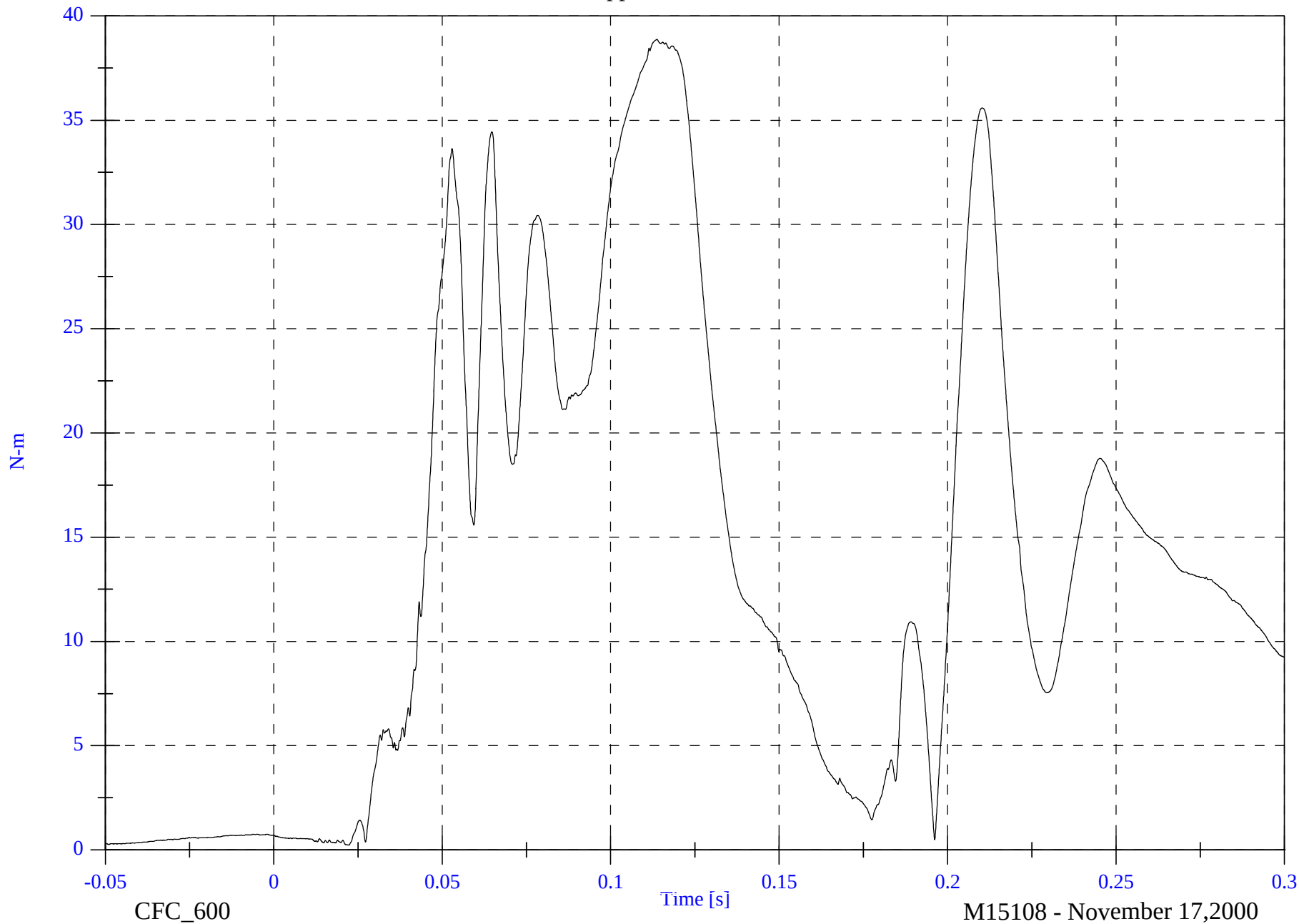


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Upper Neck M Resultant

Max: 38.9 [N-m] at 0.114 [s]

Min: 0.2 [N-m] at 0.022 [s]



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8602-3

CFC\_600

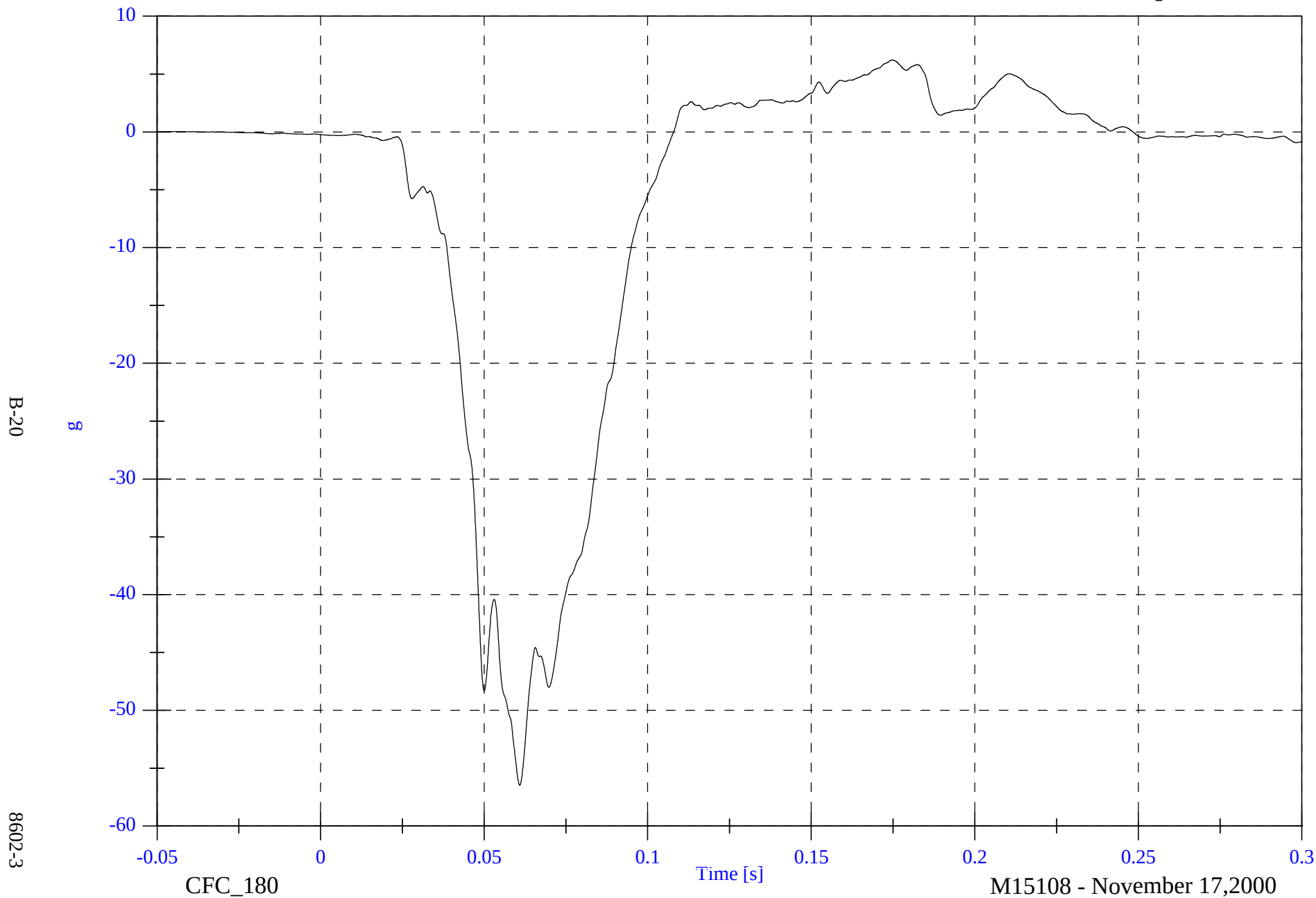
M15108 - November 17,2000

# NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Chest x

Max: 6.2 [g] at 0.175 [s]

Min: -56.5 [g] at 0.061 [s]

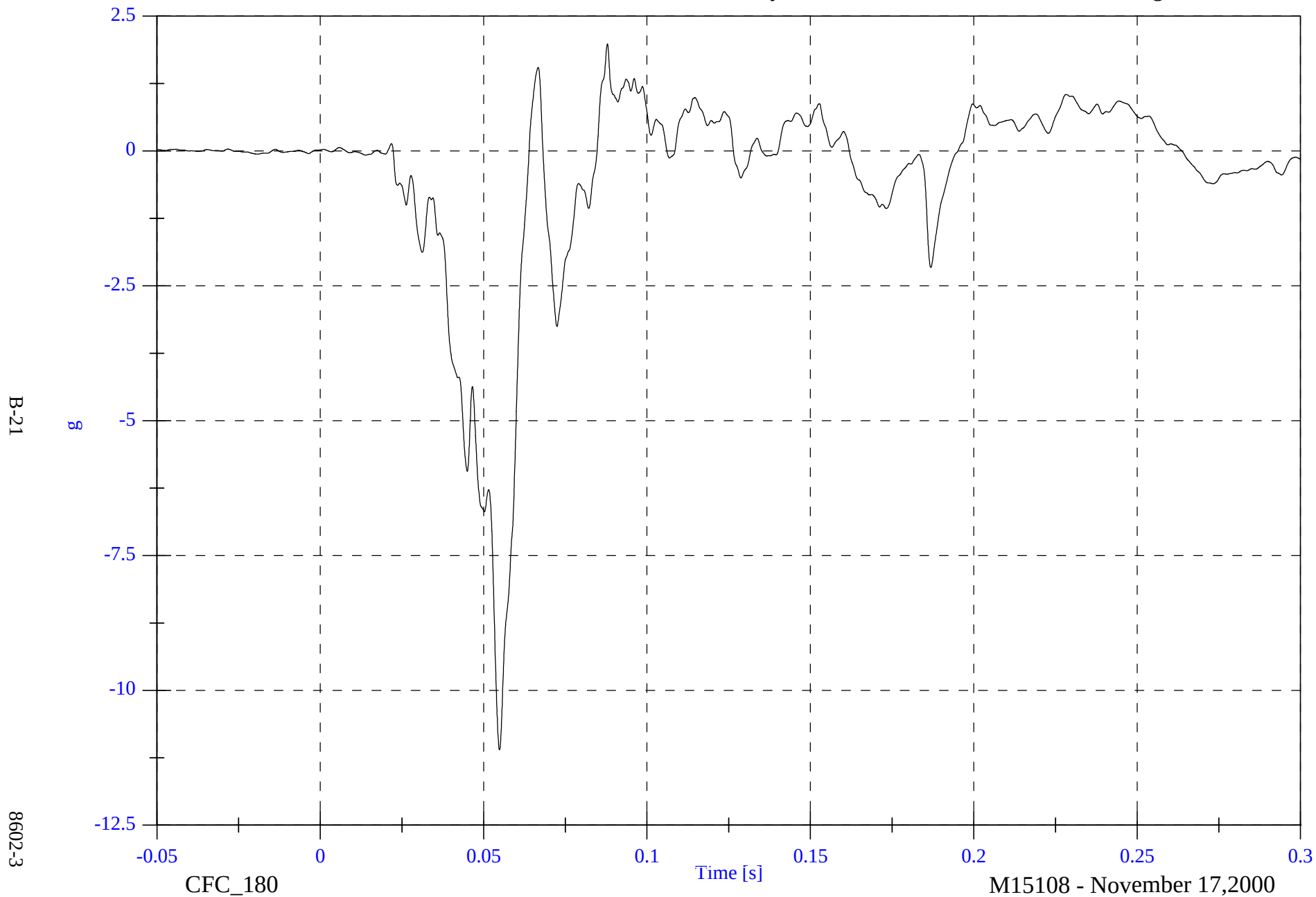


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Chest y

Max: 2.0 [g] at 0.088 [s]

Min: -11.1 [g] at 0.055 [s]

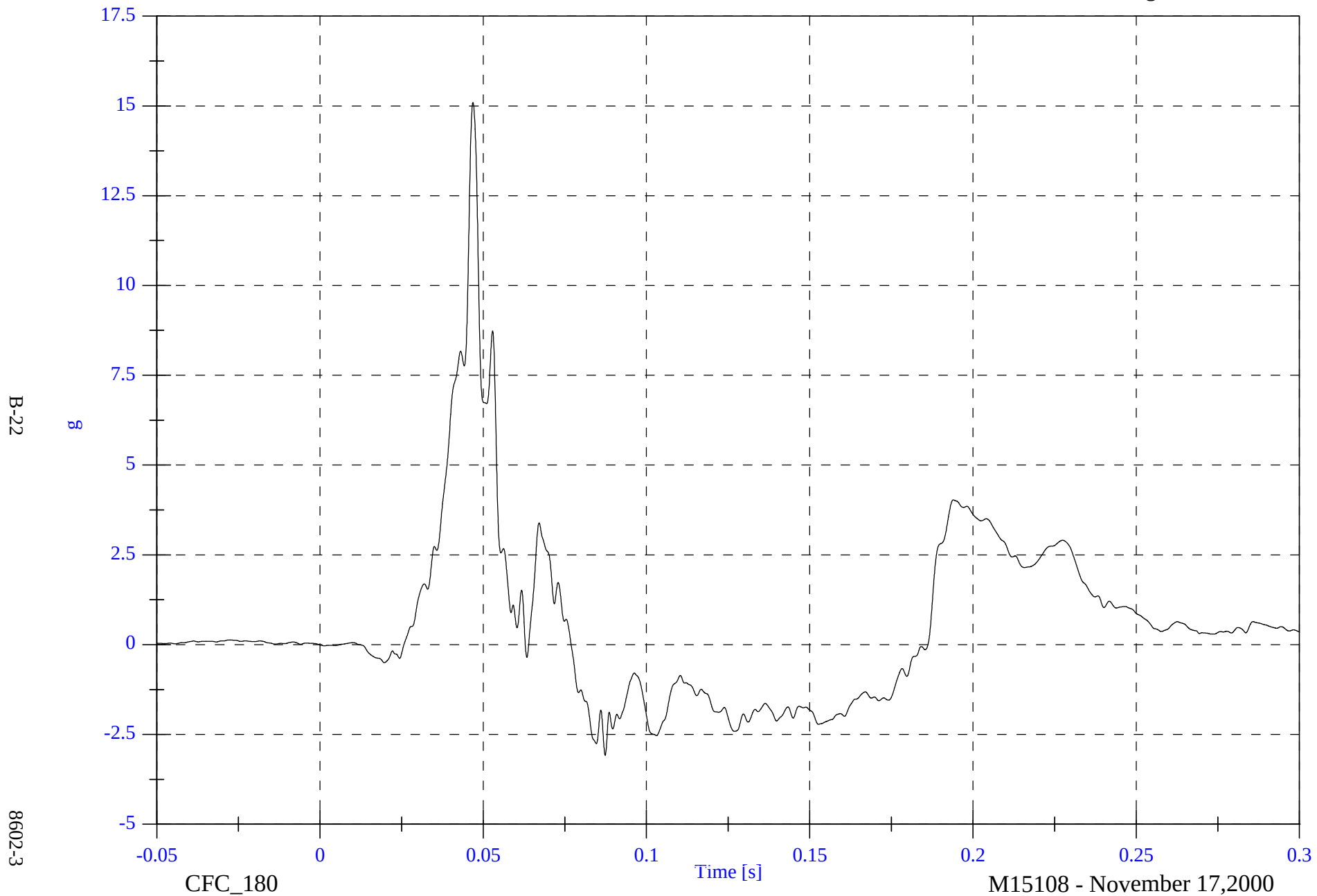


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Chest z

Max: 15.1 [g] at 0.047 [s]

Min: -3.1 [g] at 0.087 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

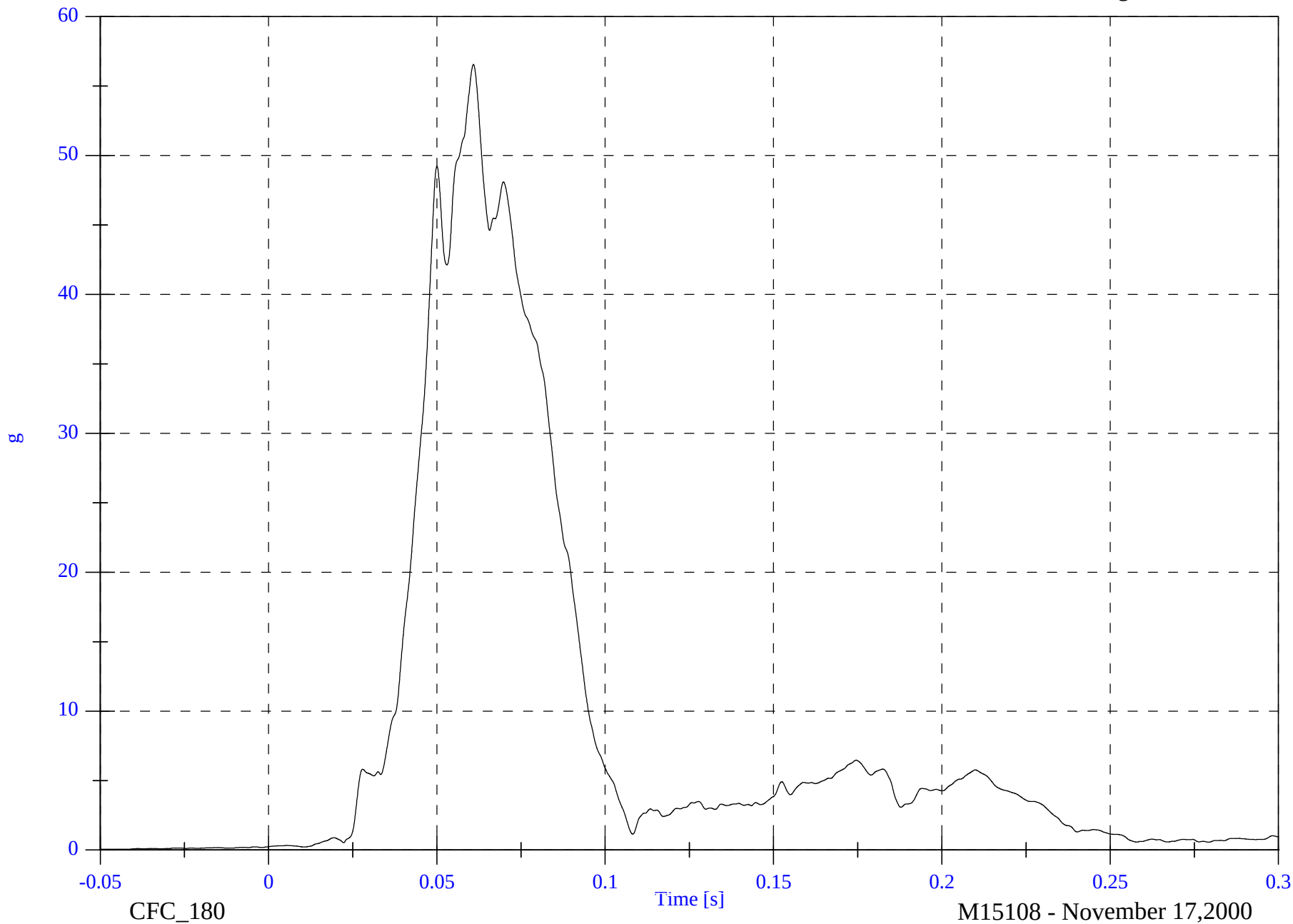
P1 Chest Resultant

Max: 56.6 [g] at 0.061 [s]

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

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8602-3



NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Chest Red x

Max: 6.1 [g] at 0.175 [s]

Min: -55.2 [g] at 0.061 [s]

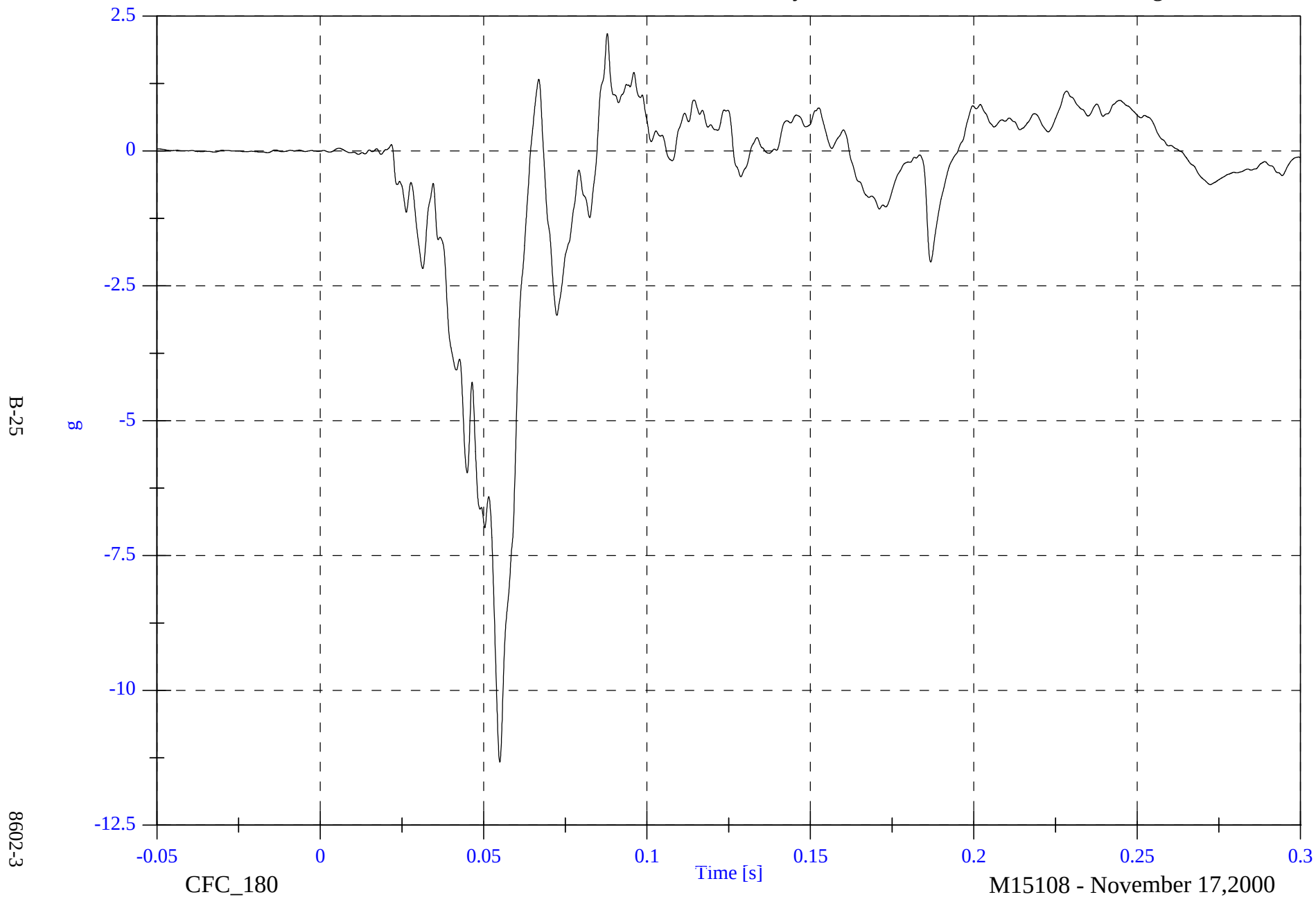


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Chest Red y

Max: 2.2 [g] at 0.088 [s]

Min: -11.3 [g] at 0.055 [s]

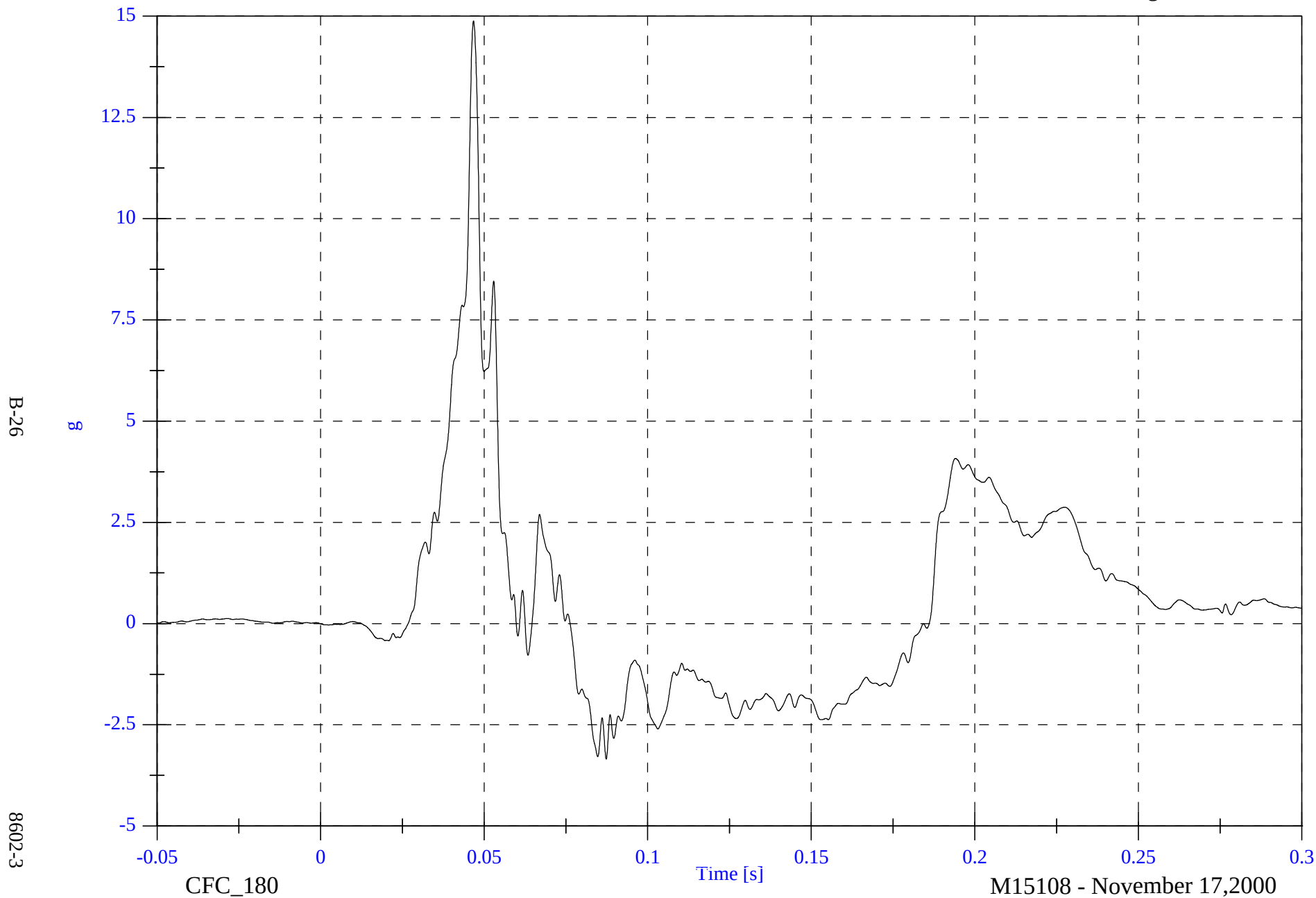


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Chest Red z

Max: 14.9 [g] at 0.047 [s]

Min: -3.3 [g] at 0.087 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

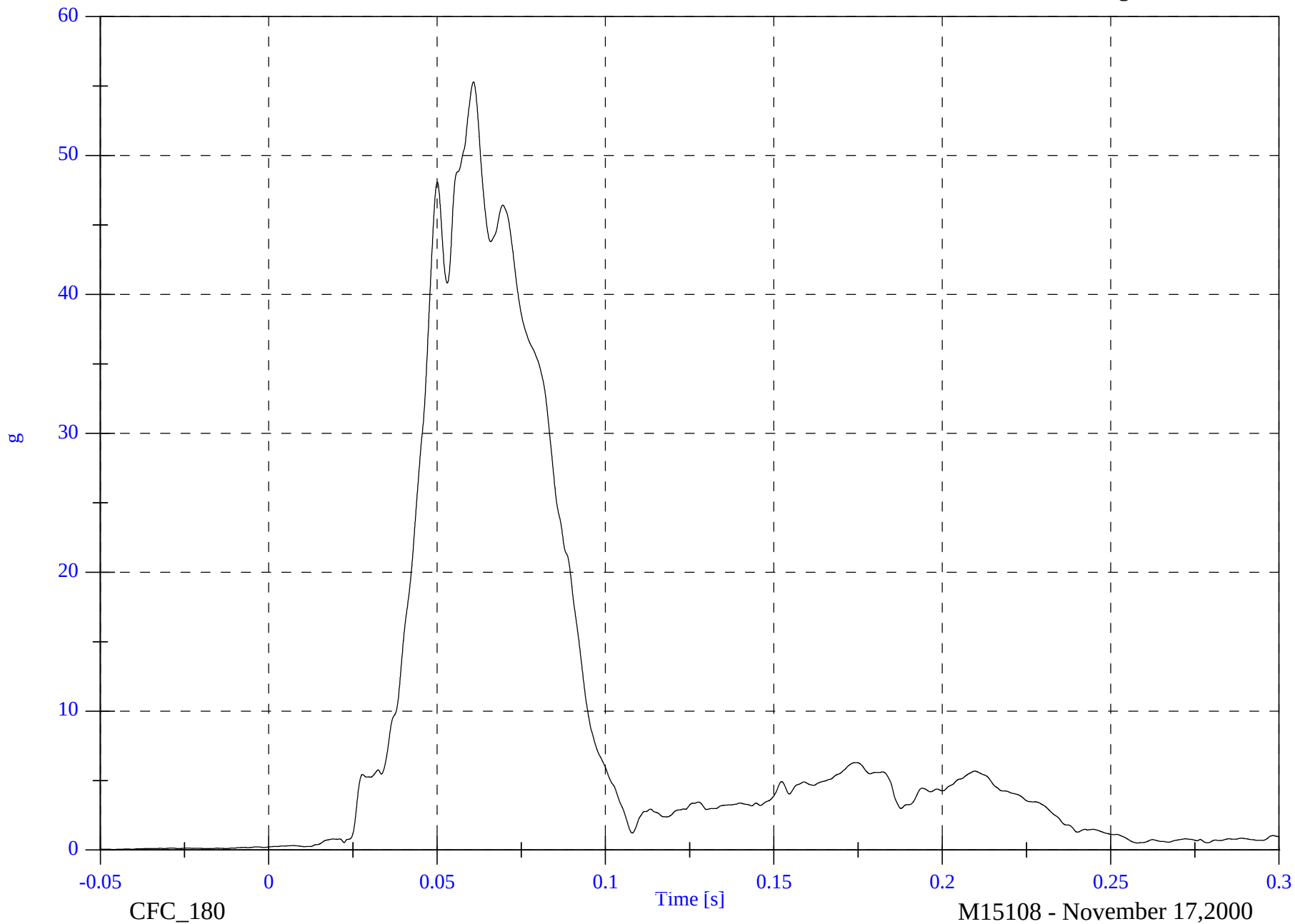
P1 Chest Red Resultant

Max: 55.3 [g] at 0.061 [s]

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

B-27

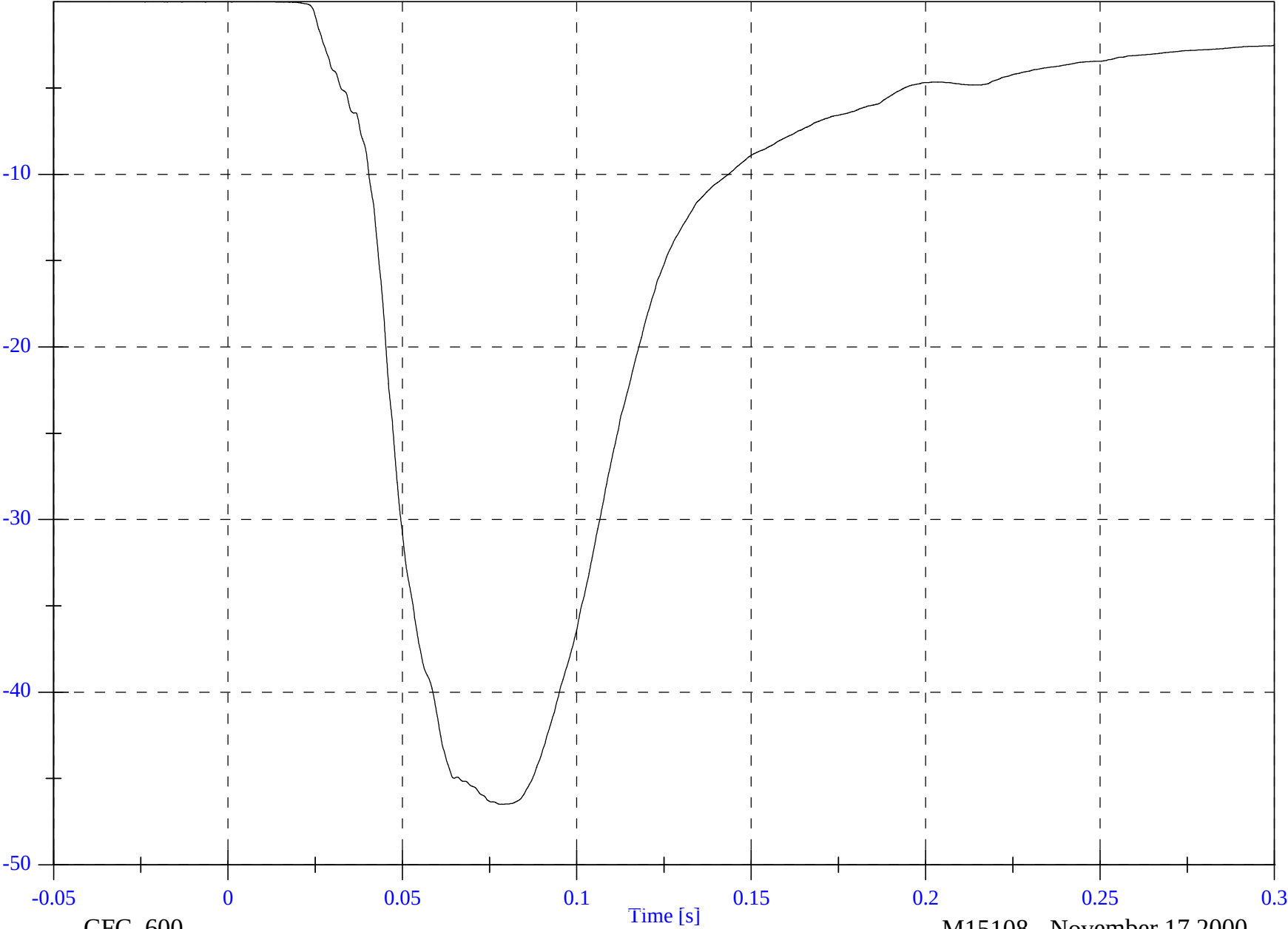
8602-3



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8602-3

mm

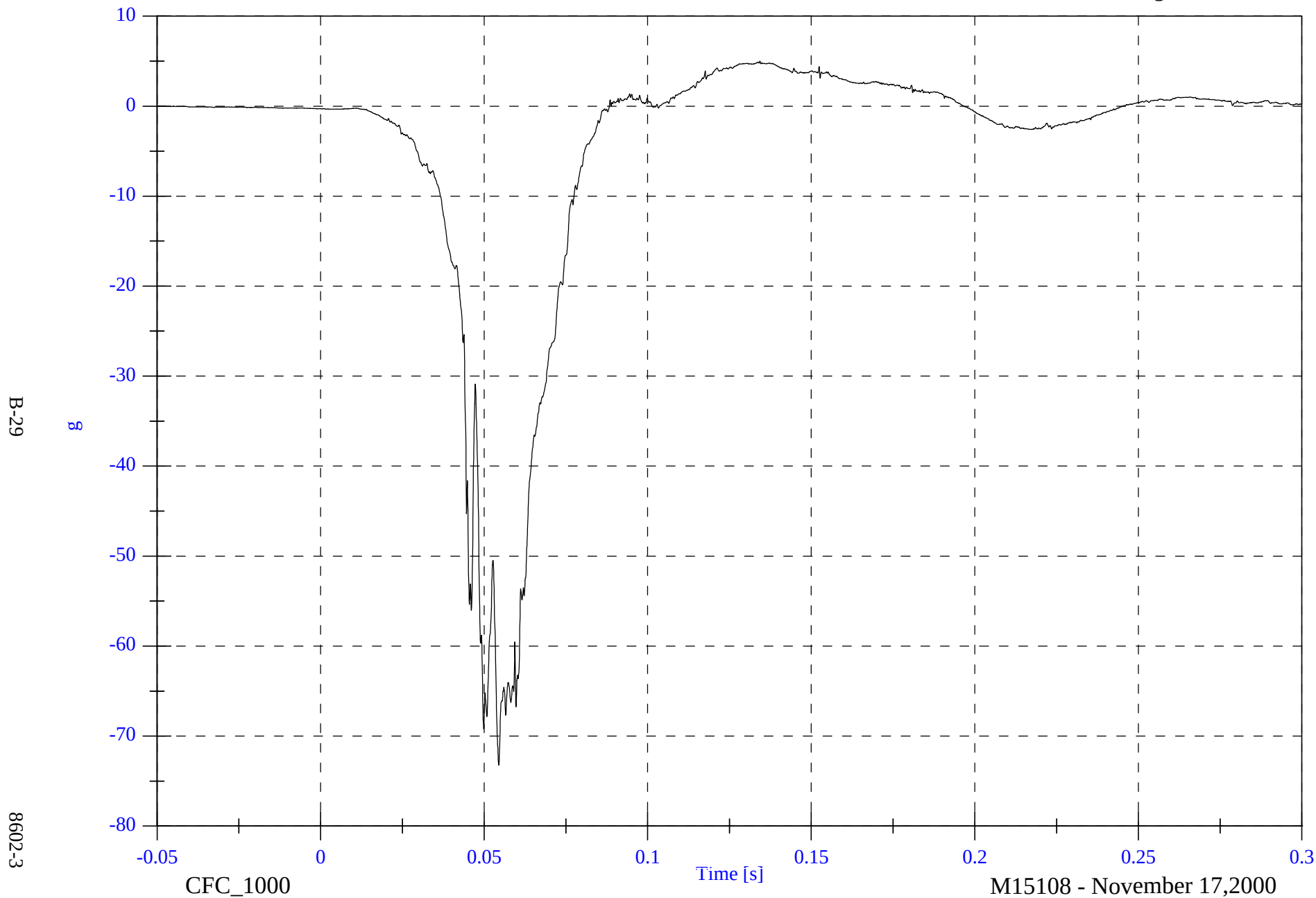


NCAP 2001 Test 3 - 2001 Toyota Tundra

Max: 5.0 [g] at 0.134 [s]

Min: -73.2 [g] at 0.054 [s]

P1 Pelvic x

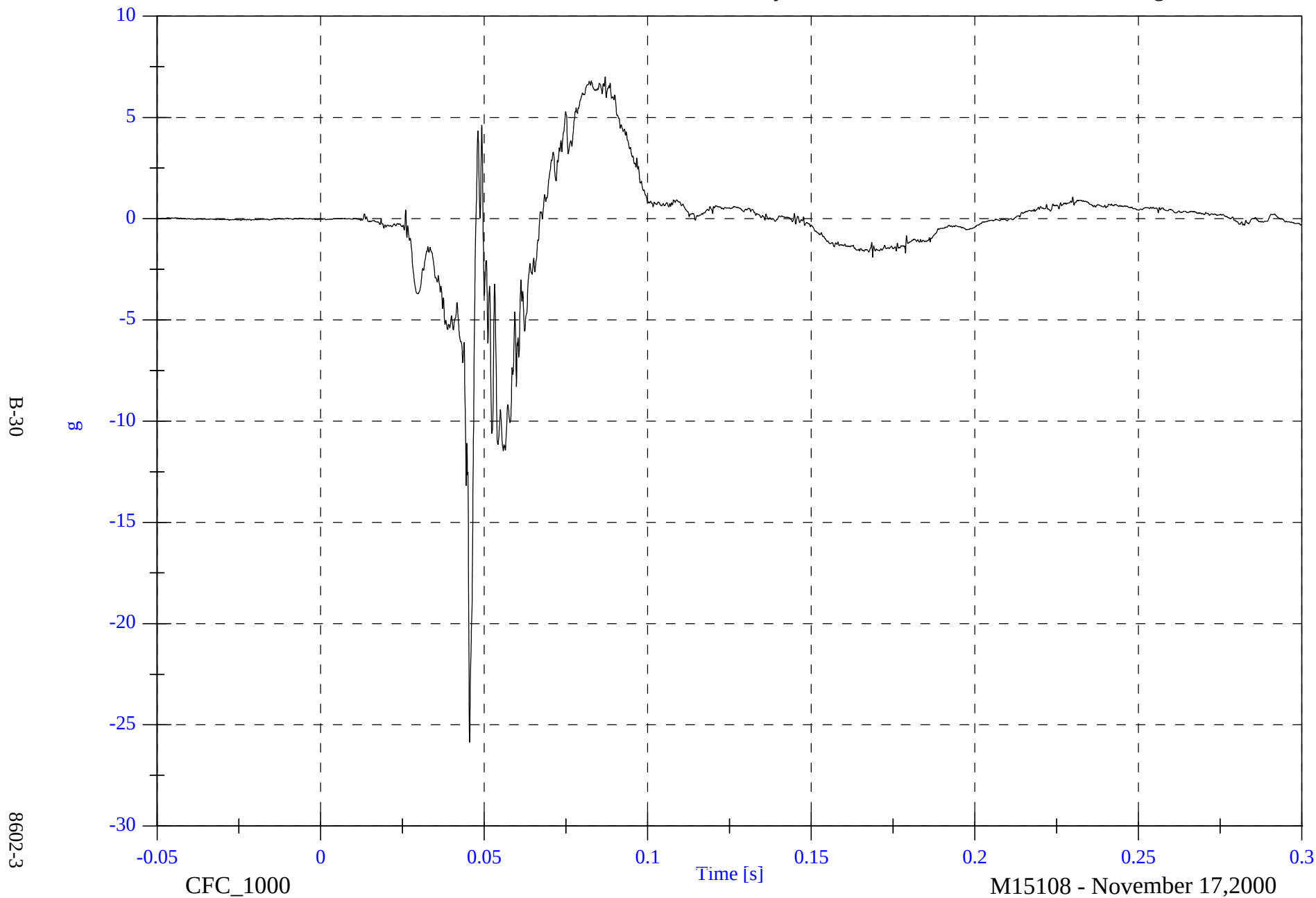


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Pelvic y

Max: 7.0 [g] at 0.087 [s]

Min: -25.9 [g] at 0.046 [s]

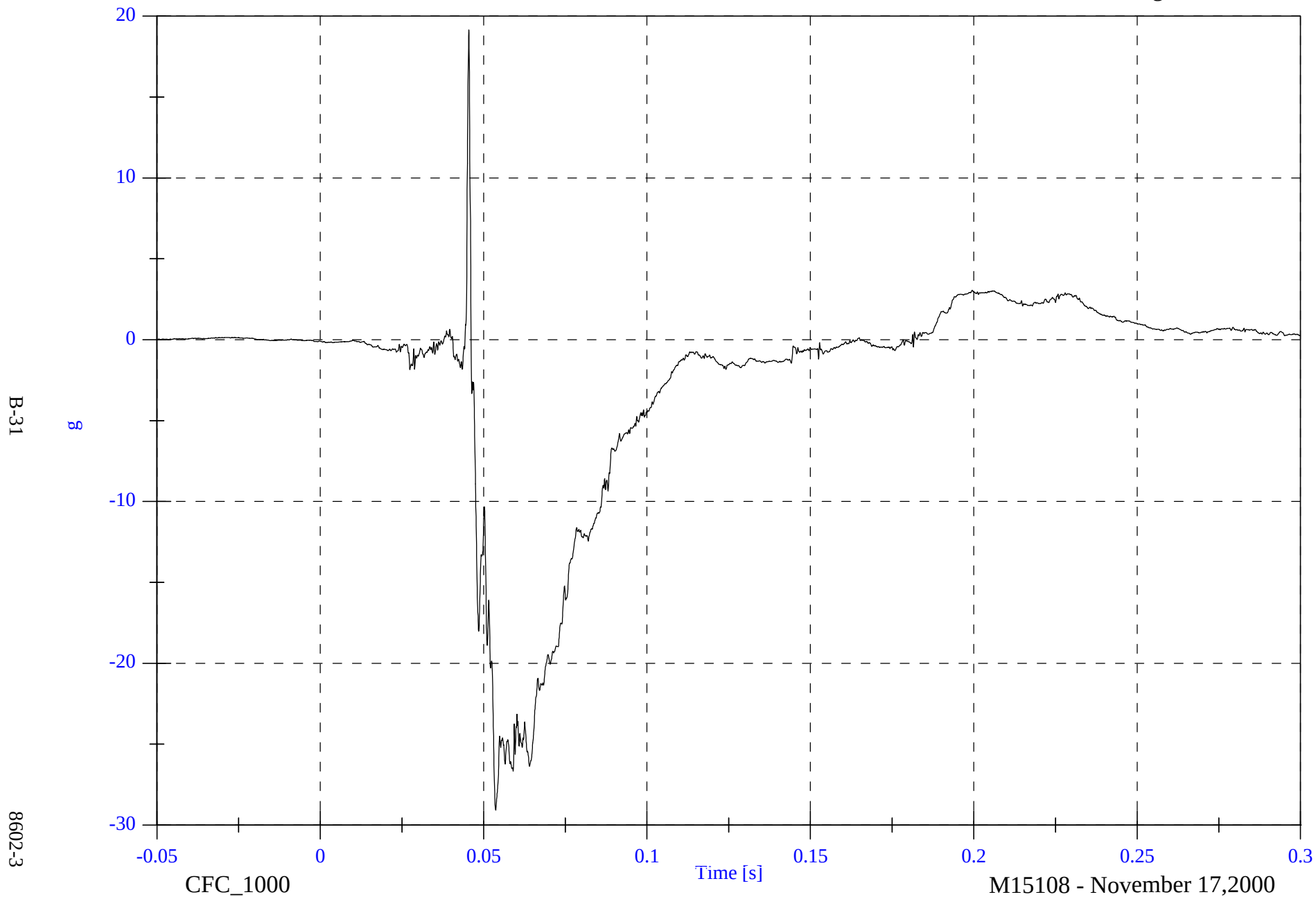


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Pelvic z

Max: 19.2 [g] at 0.045 [s]

Min: -29.1 [g] at 0.054 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

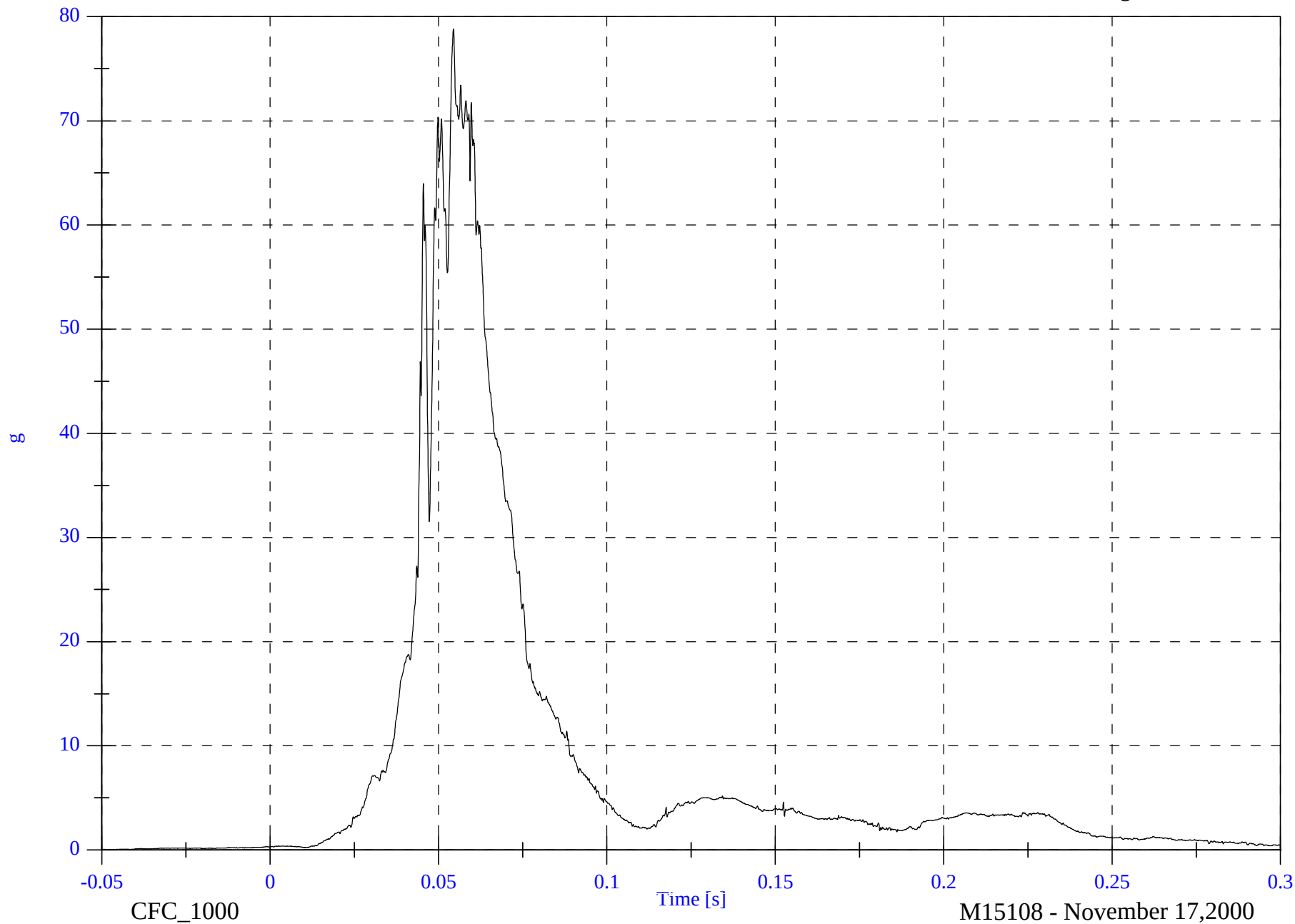
P1 Pelvic Resultant

Max: 78.8 [g] at 0.054 [s]

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

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8602-3

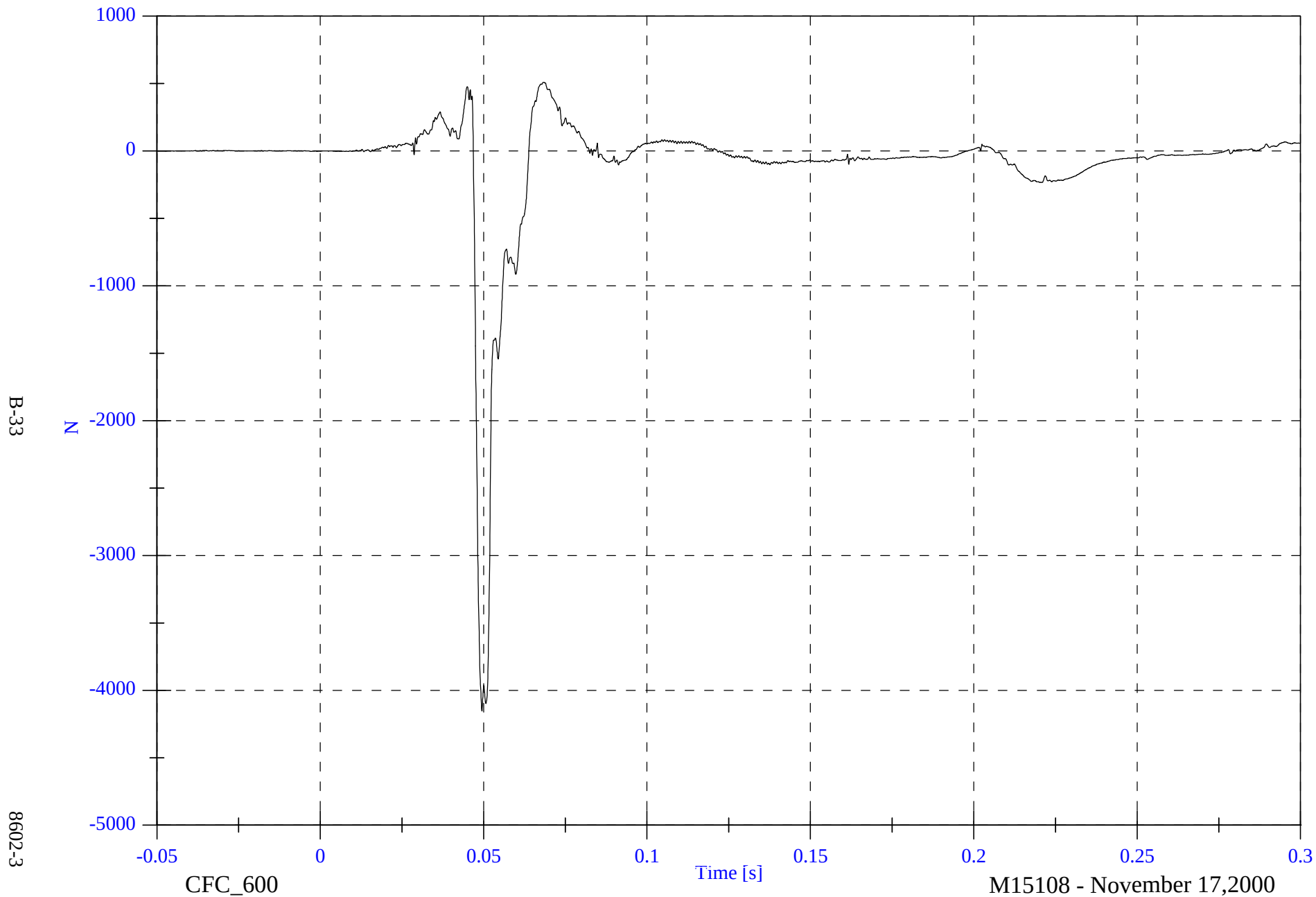


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Femur z

Max: 509.3 [N] at 0.068 [s]

Min: -4154.1 [N] at 0.049 [s]

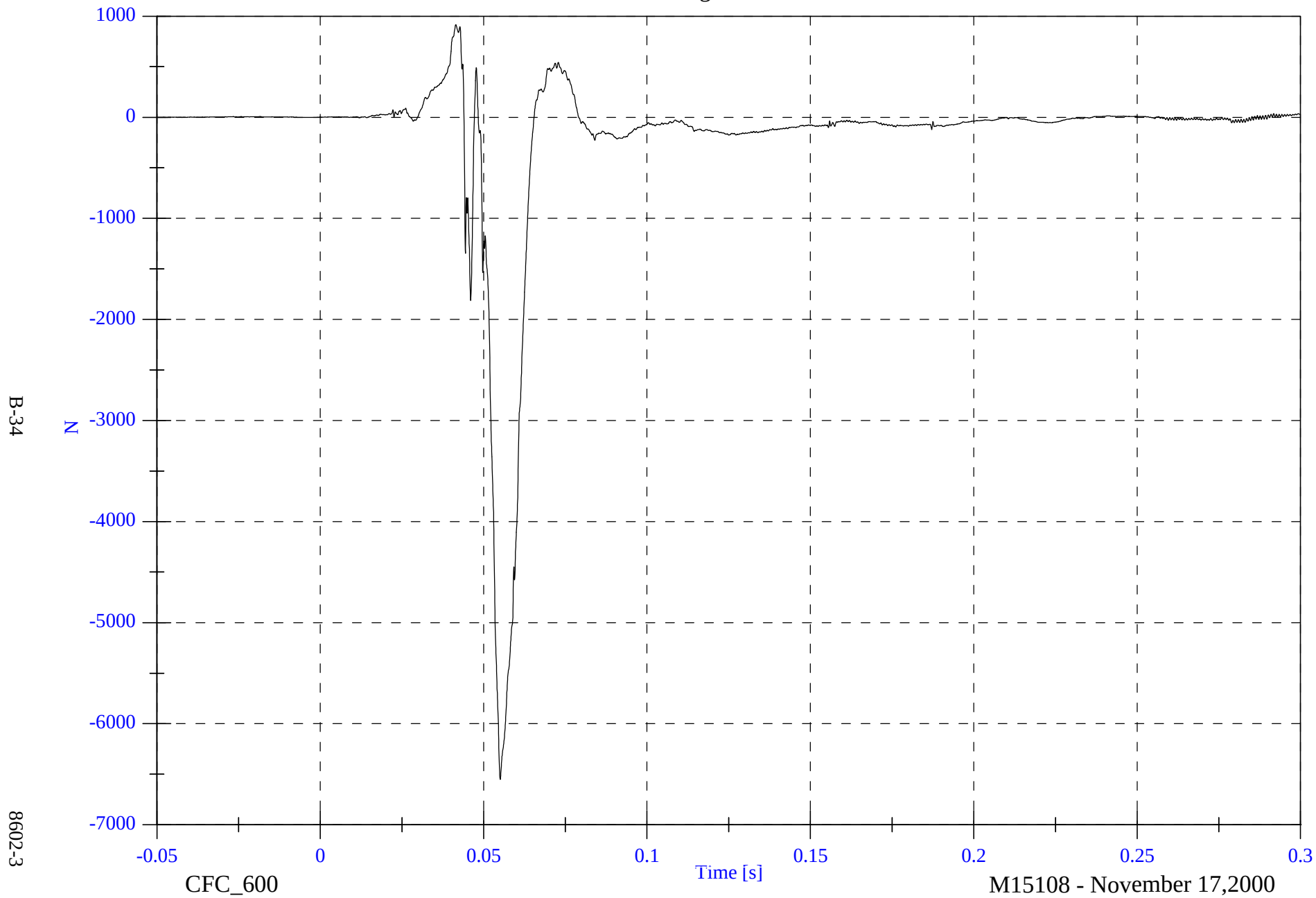


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Femur z

Max: 915.8 [N] at 0.042 [s]

Min: -6551.3 [N] at 0.055 [s]

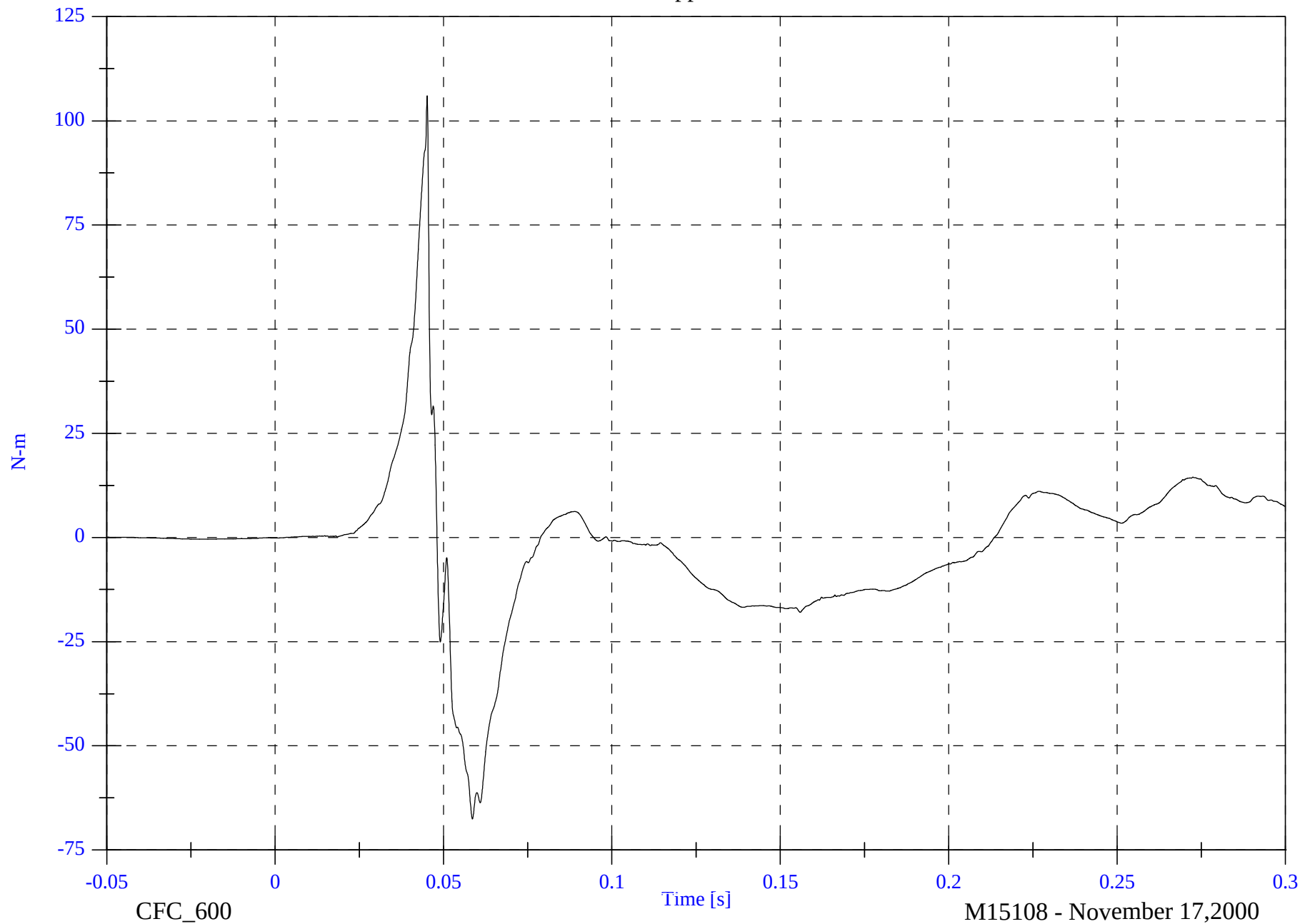


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Upper Tibia Mx

Max: 106.0 [N-m] at 0.045 [s]

Min: -67.6 [N-m] at 0.059 [s]



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8602-3

CFC\_600

Time [s]

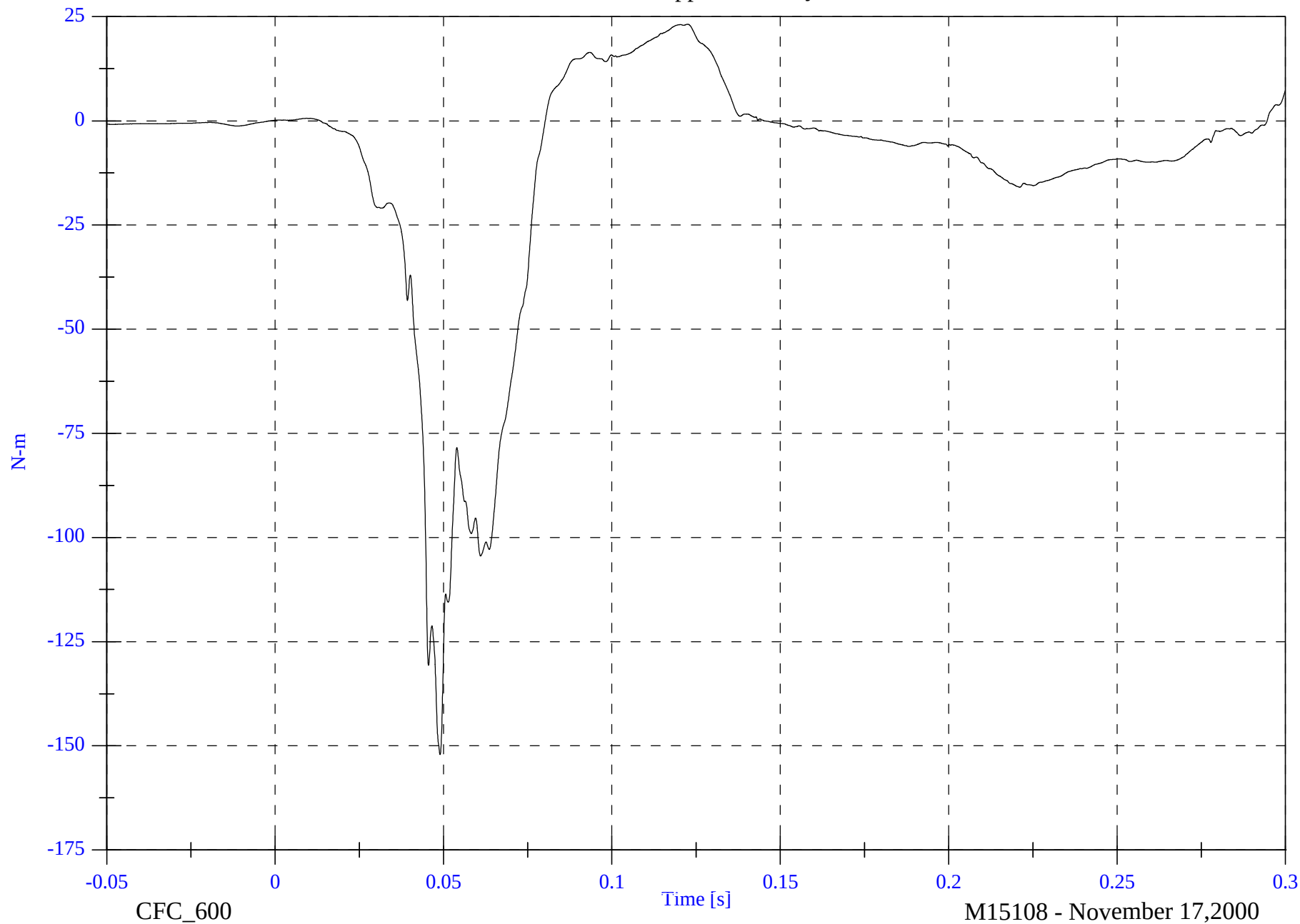
M15108 - November 17,2000

NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Upper Tibia My

Max: 23.2 [N-m] at 0.122 [s]

Min: -152.1 [N-m] at 0.049 [s]



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8602-3

CFC\_600

Time [s]

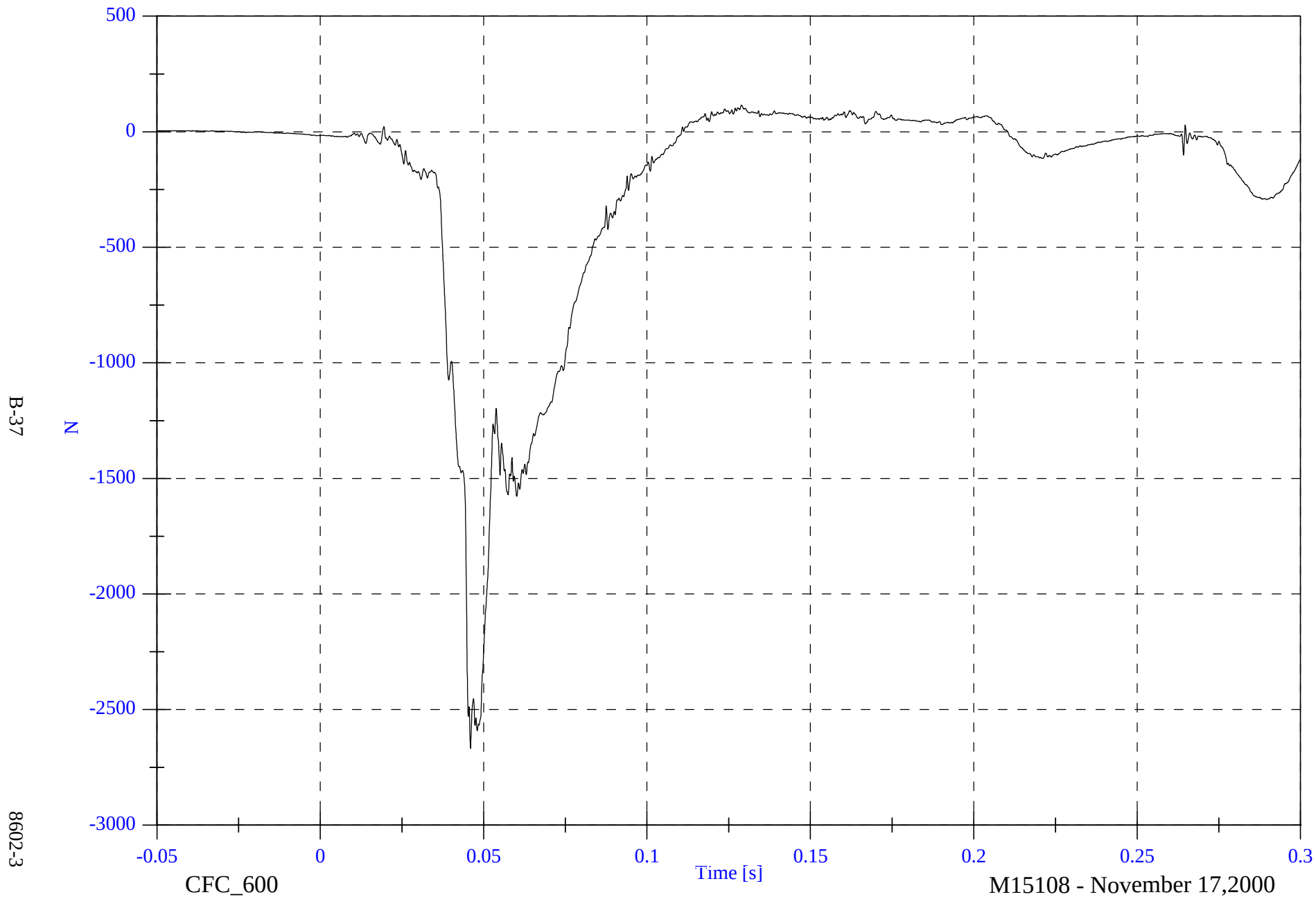
M15108 - November 17,2000

NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Lower Tibia Fz

Max: 115.6 [N] at 0.129 [s]

Min: -2667.1 [N] at 0.046 [s]

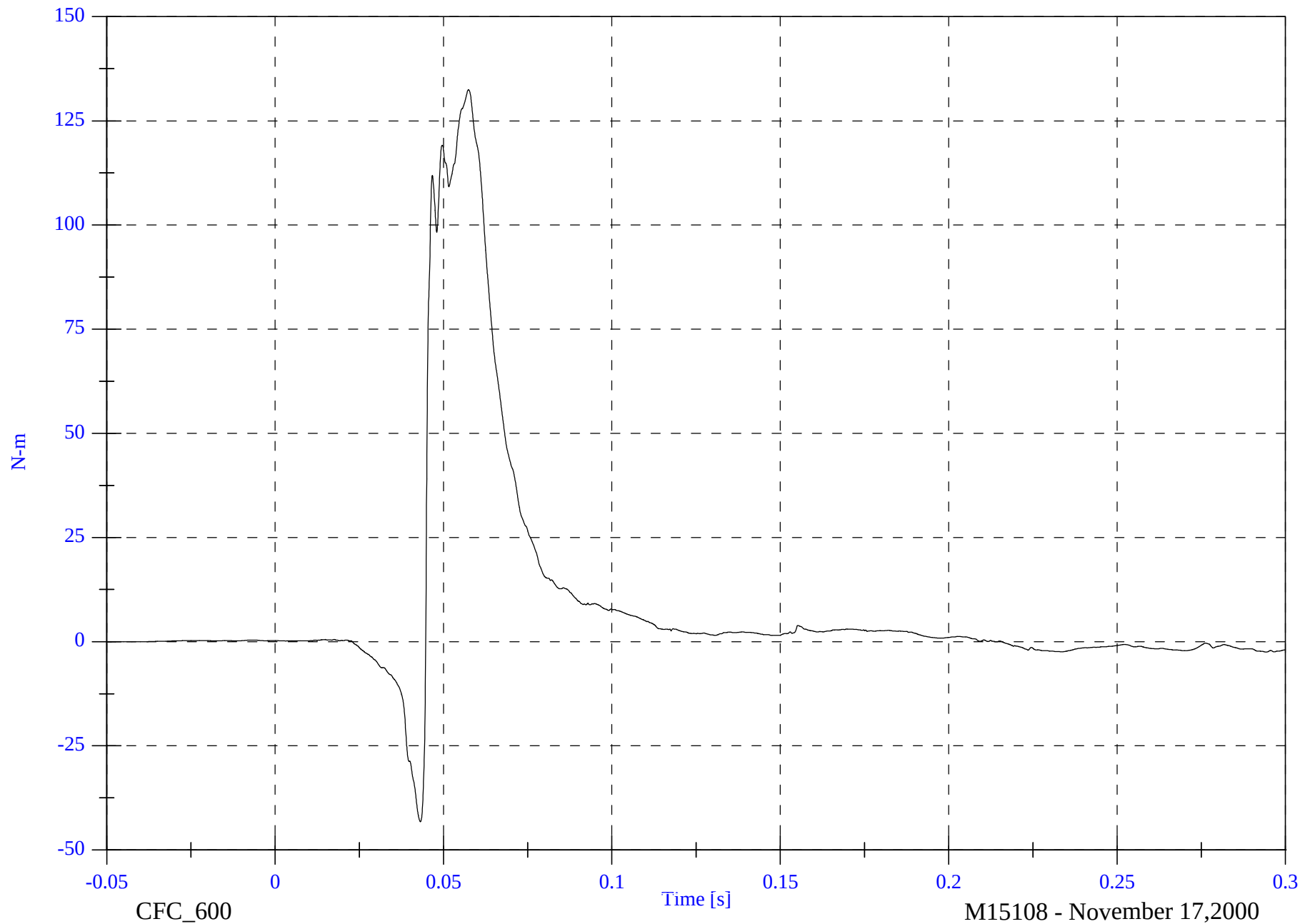


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Lower Tibia Mx

Max: 132.5 [N-m] at 0.057 [s]

Min: -43.3 [N-m] at 0.043 [s]



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NCAP 2001 Test 3 - 2001 Toyota Tundra

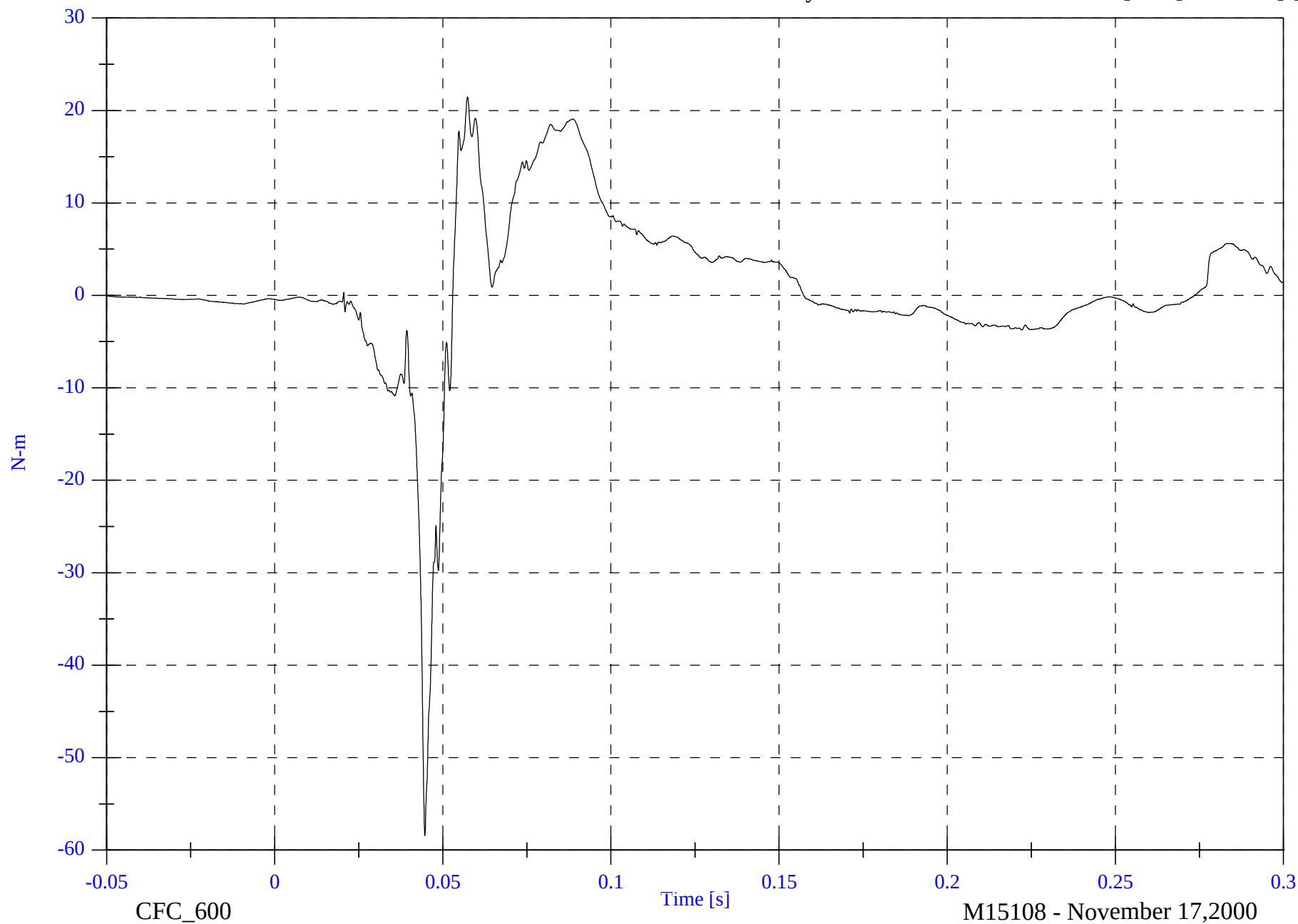
P1 Left Lower Tibia My

Max: 21.5 [N-m] at 0.057 [s]

Min: -58.5 [N-m] at 0.045 [s]

B-39

8602-3

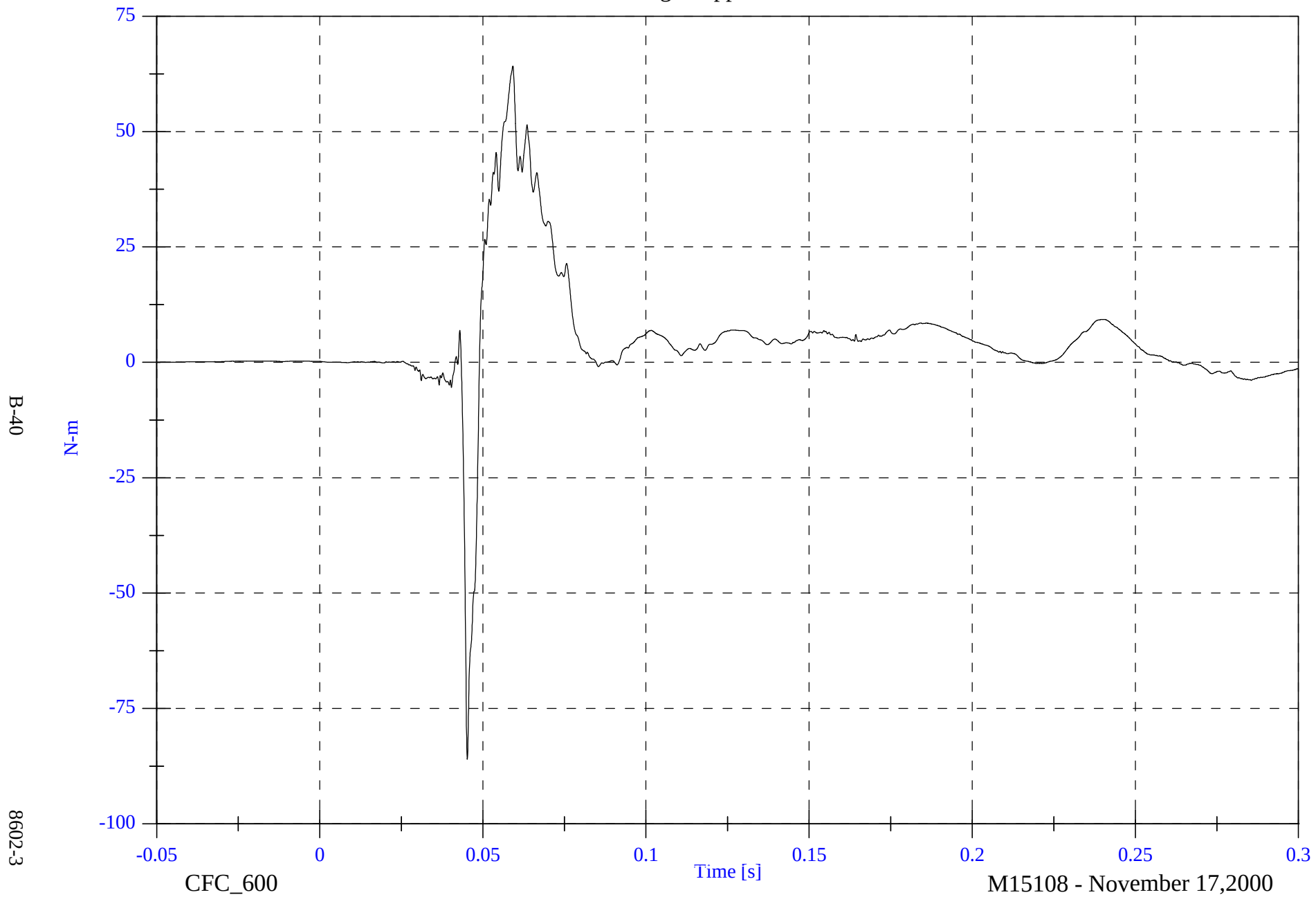


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Upper Tibia Mx

Max: 64.2 [N-m] at 0.059 [s]

Min: -86.0 [N-m] at 0.045 [s]

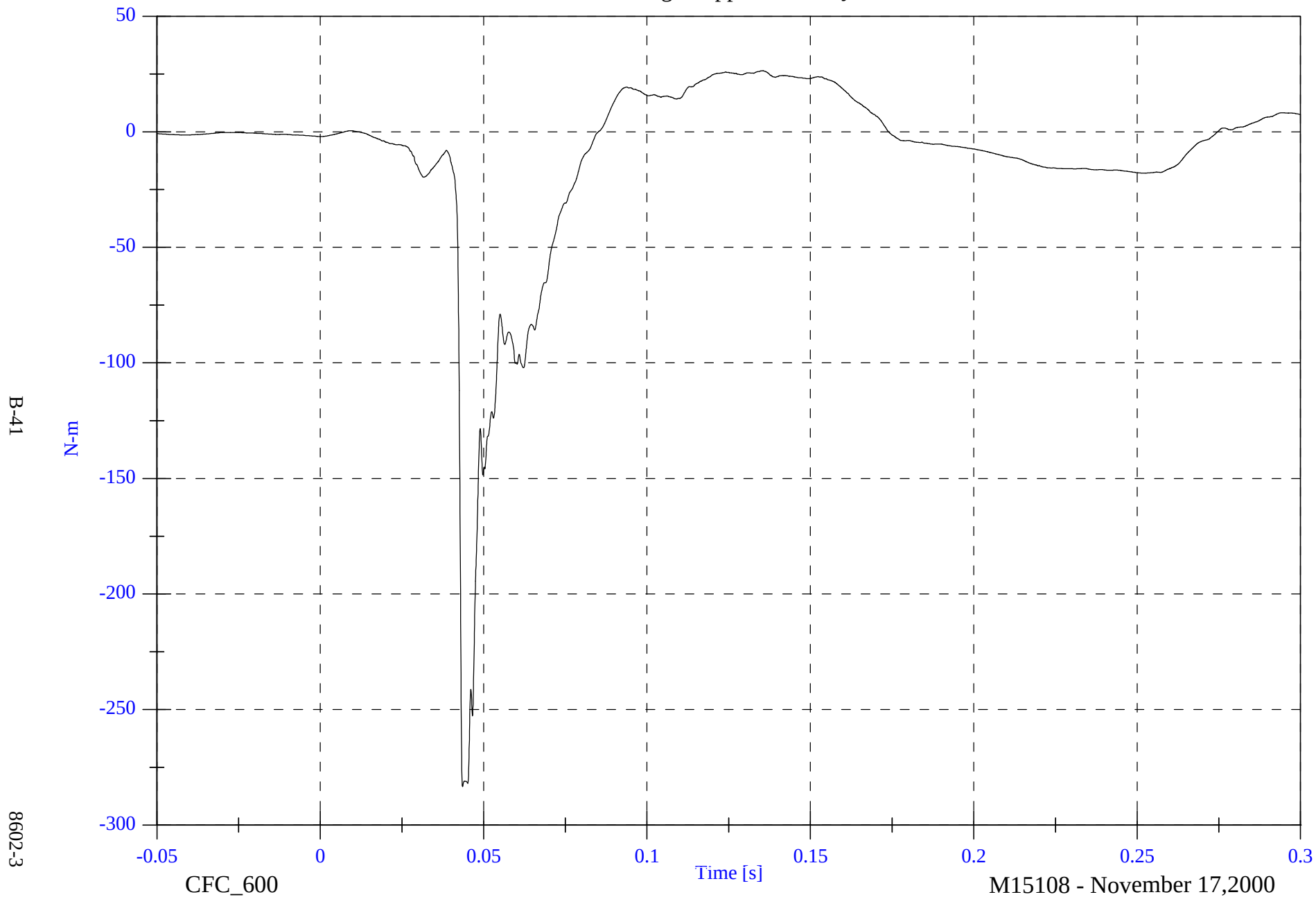


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Upper Tibia My

Max: 26.4 [N-m] at 0.135 [s]

Min: -283.4 [N-m] at 0.044 [s]

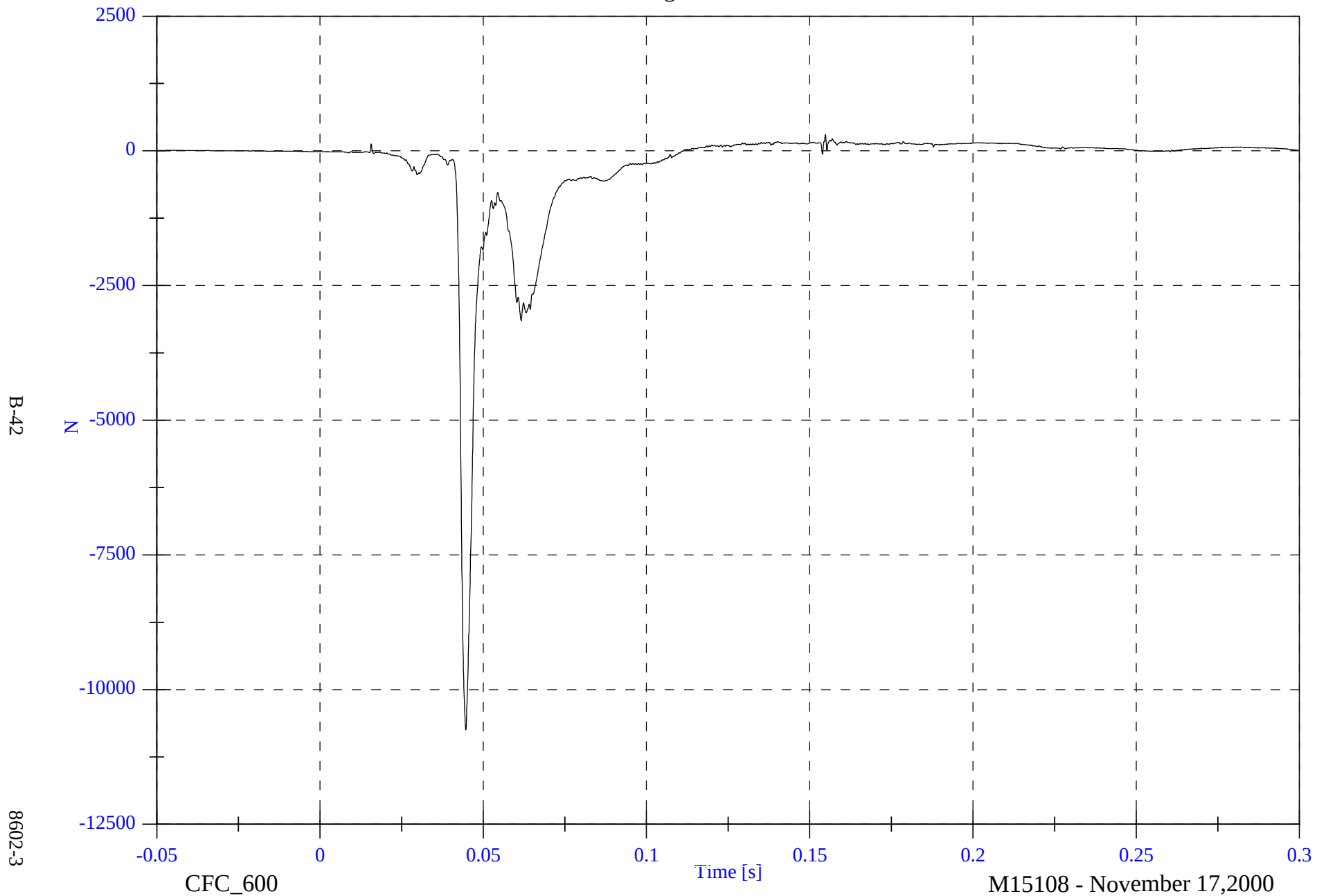


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Lower Tibia Fz

Max: 302.7 [N] at 0.155 [s]

Min: -10752.0 [N] at 0.045 [s]

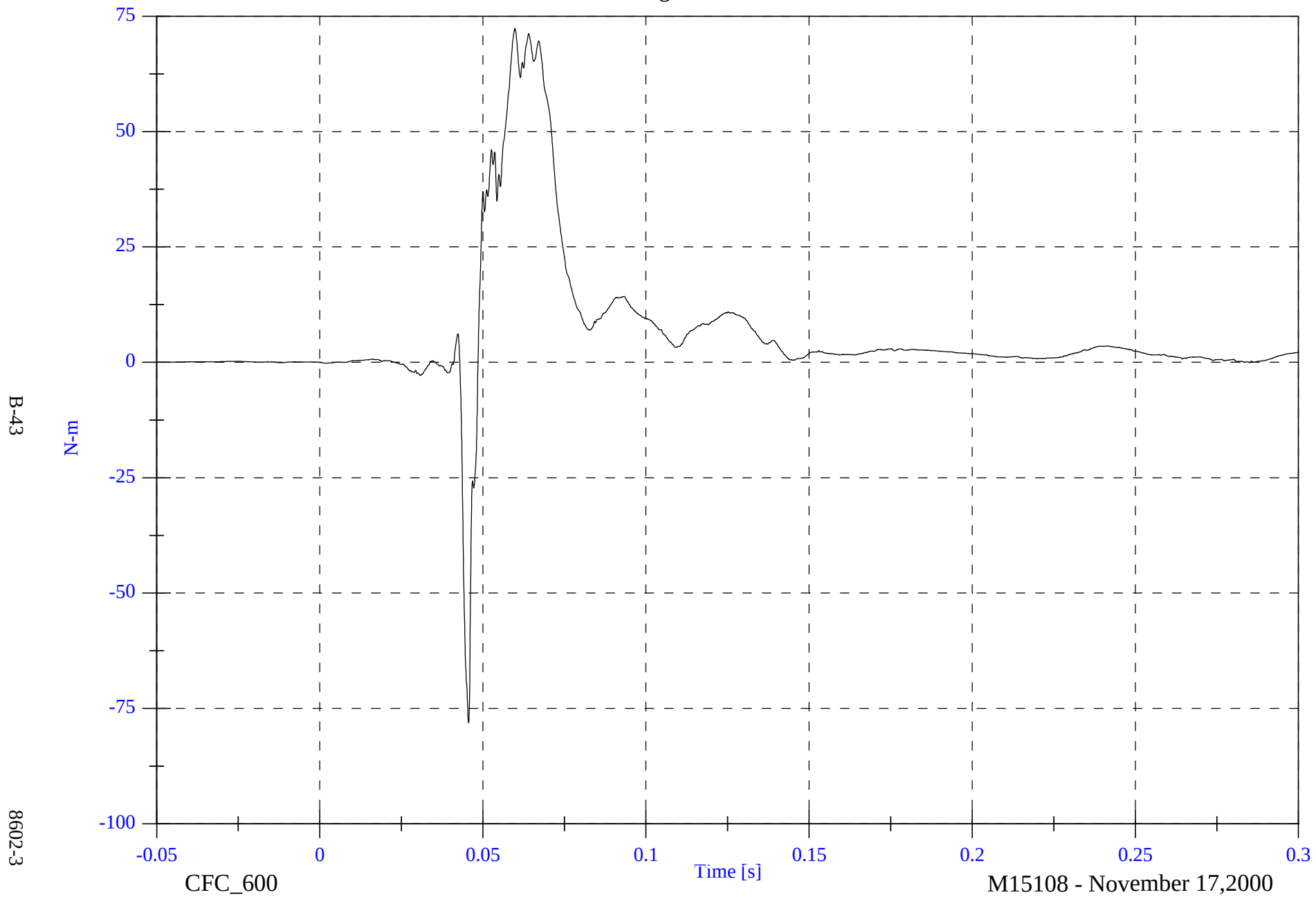


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Lower Tibia Mx

Max: 72.3 [N-m] at 0.060 [s]

Min: -78.1 [N-m] at 0.046 [s]

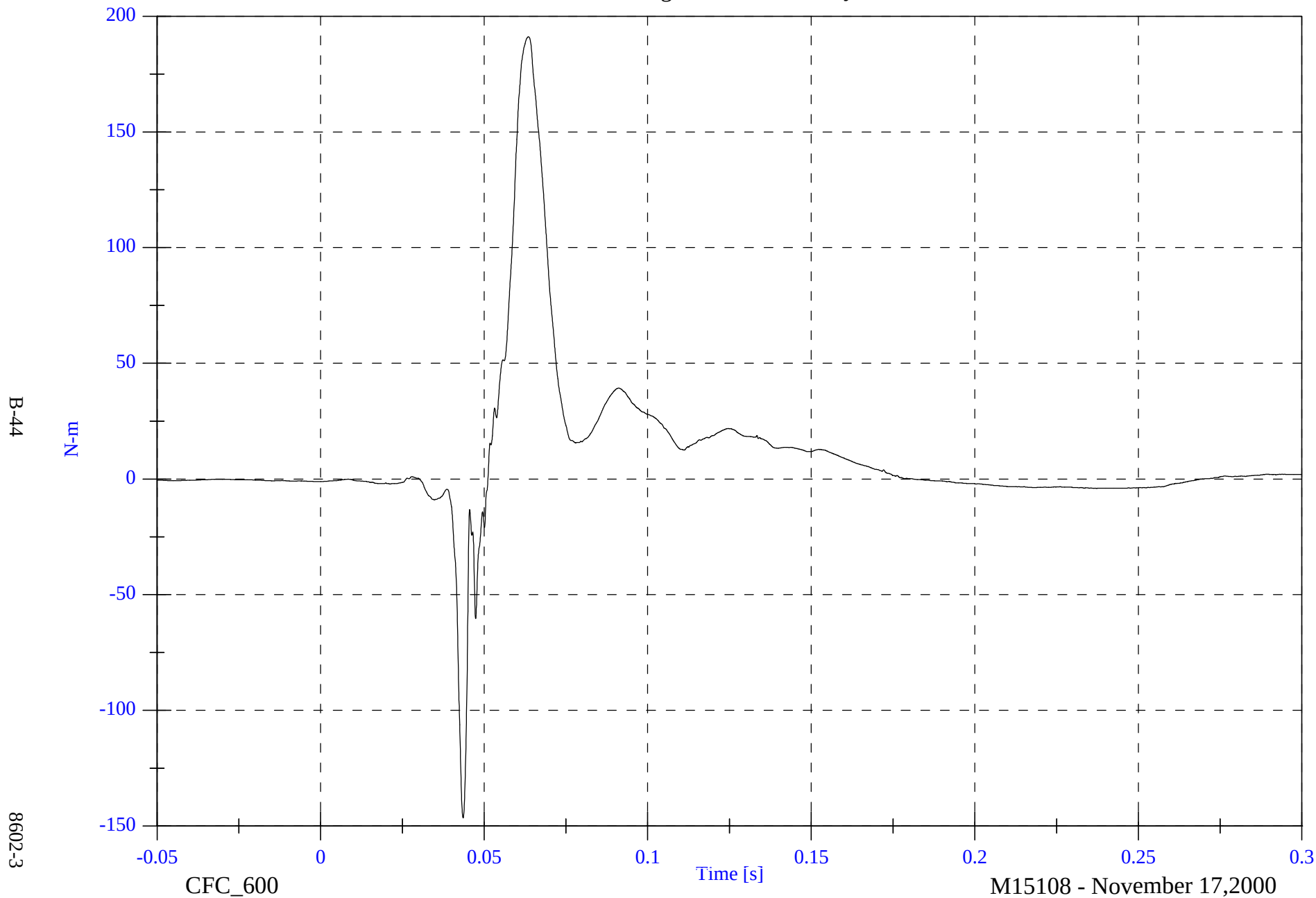


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Lower Tibia My

Max: 191.1 [N-m] at 0.064 [s]

Min: -146.5 [N-m] at 0.044 [s]

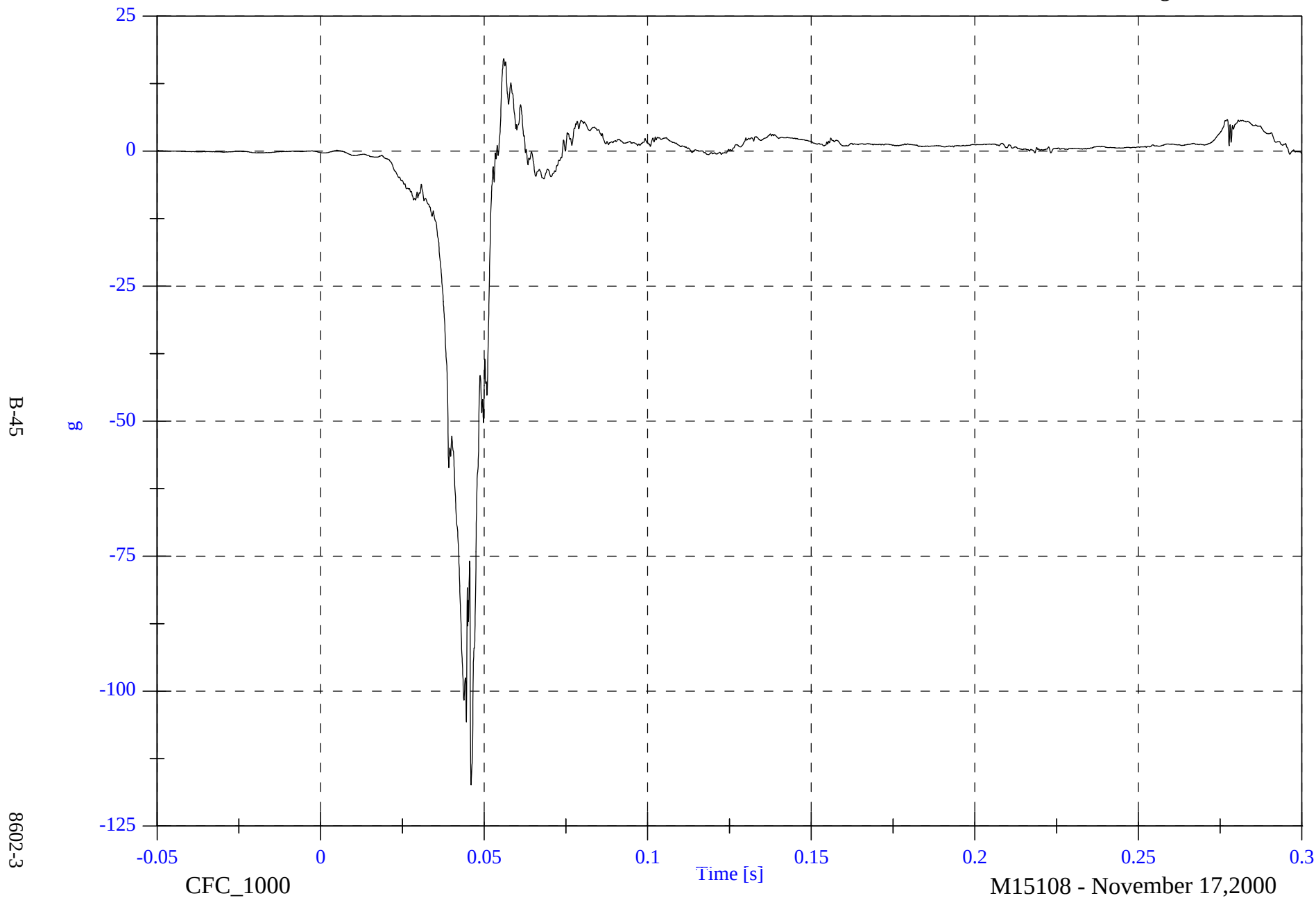


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Foot Aft x

Max: 17.1 [g] at 0.056 [s]

Min: -117.4 [g] at 0.046 [s]

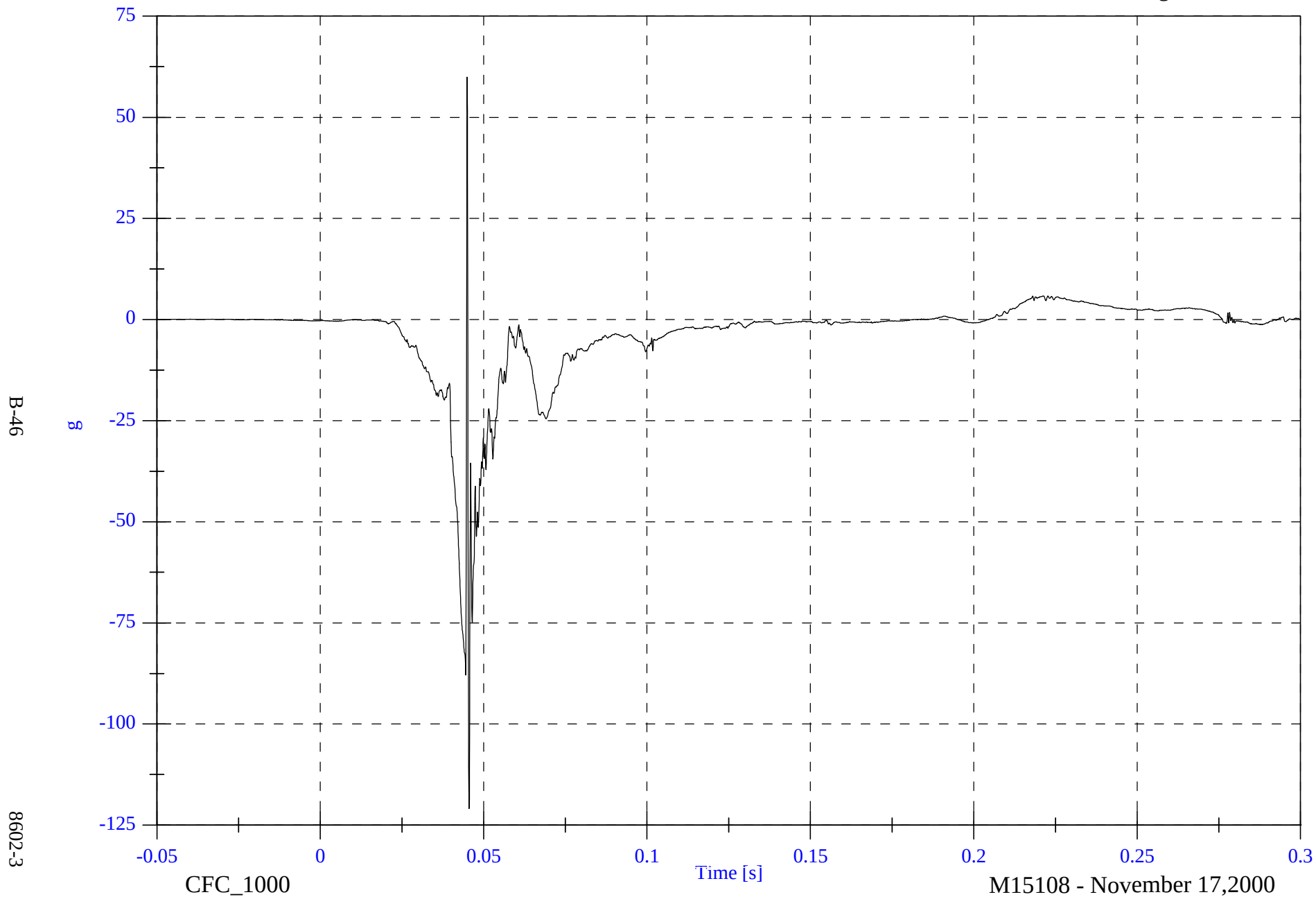


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Foot Aft z

Max: 60.0 [g] at 0.045 [s]

Min: -120.9 [g] at 0.046 [s]

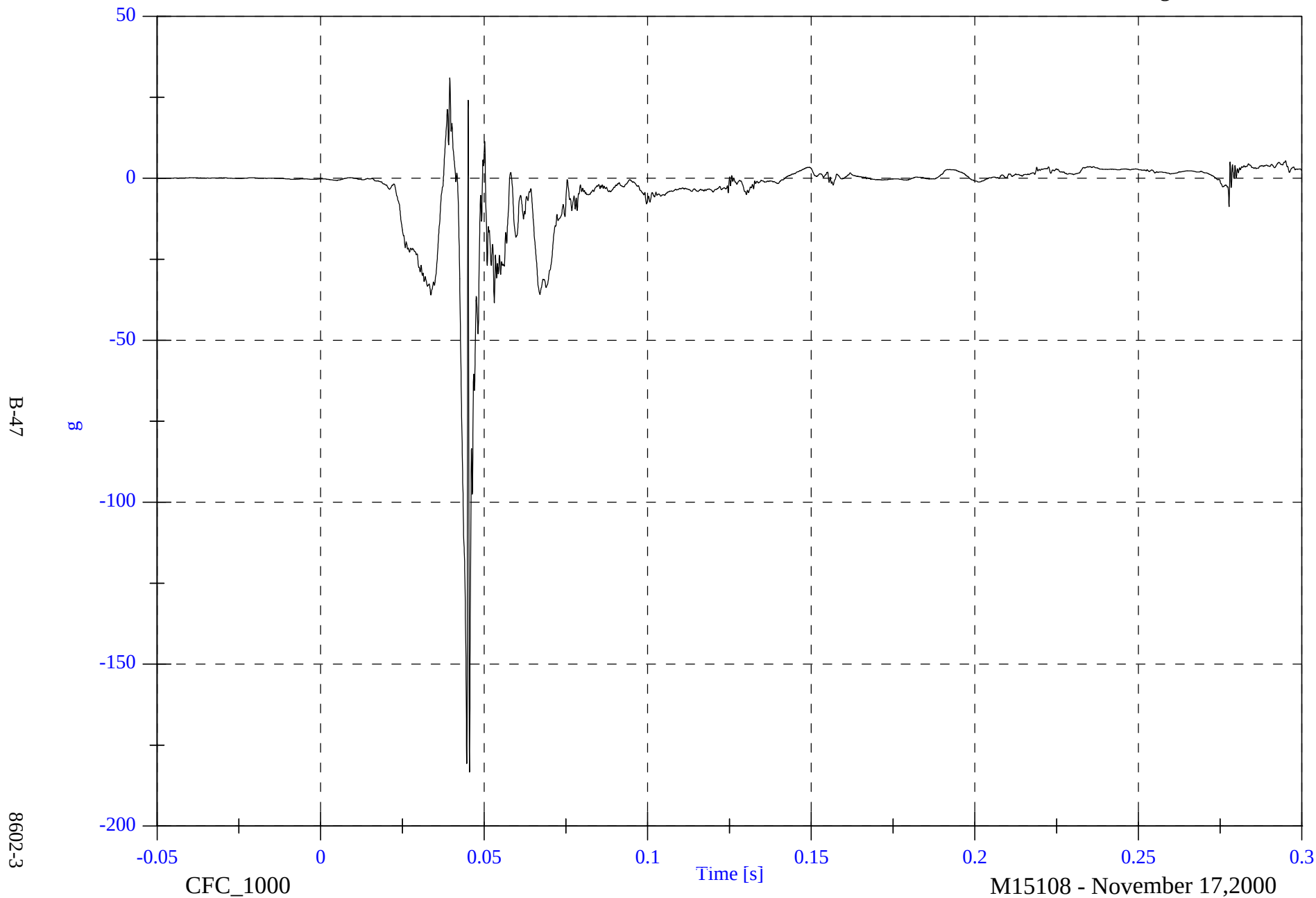


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Left Foot Fore z

Max: 30.9 [g] at 0.039 [s]

Min: -183.3 [g] at 0.046 [s]

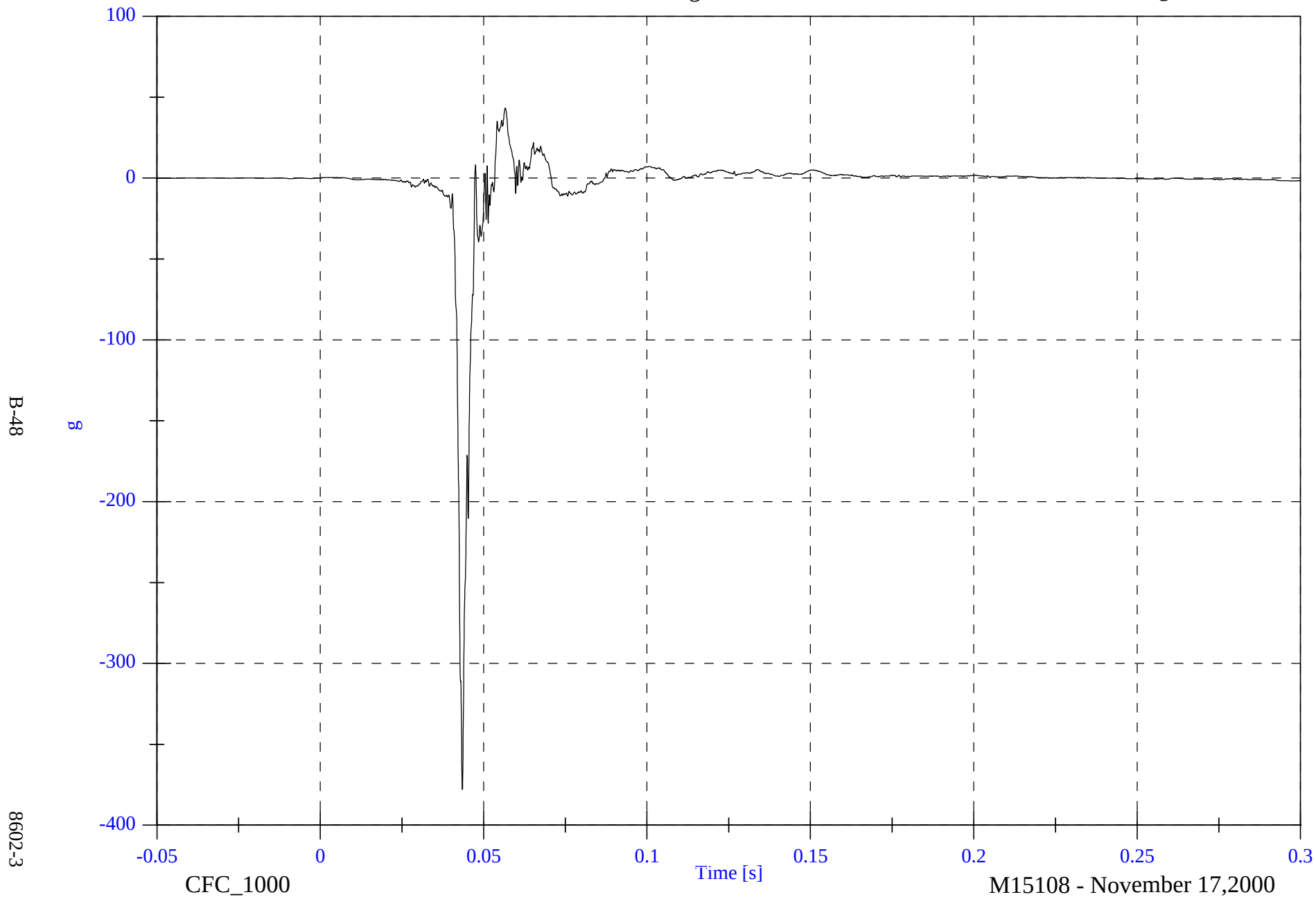


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Foot Aft x

Max: 43.3 [g] at 0.057 [s]

Min: -377.9 [g] at 0.043 [s]

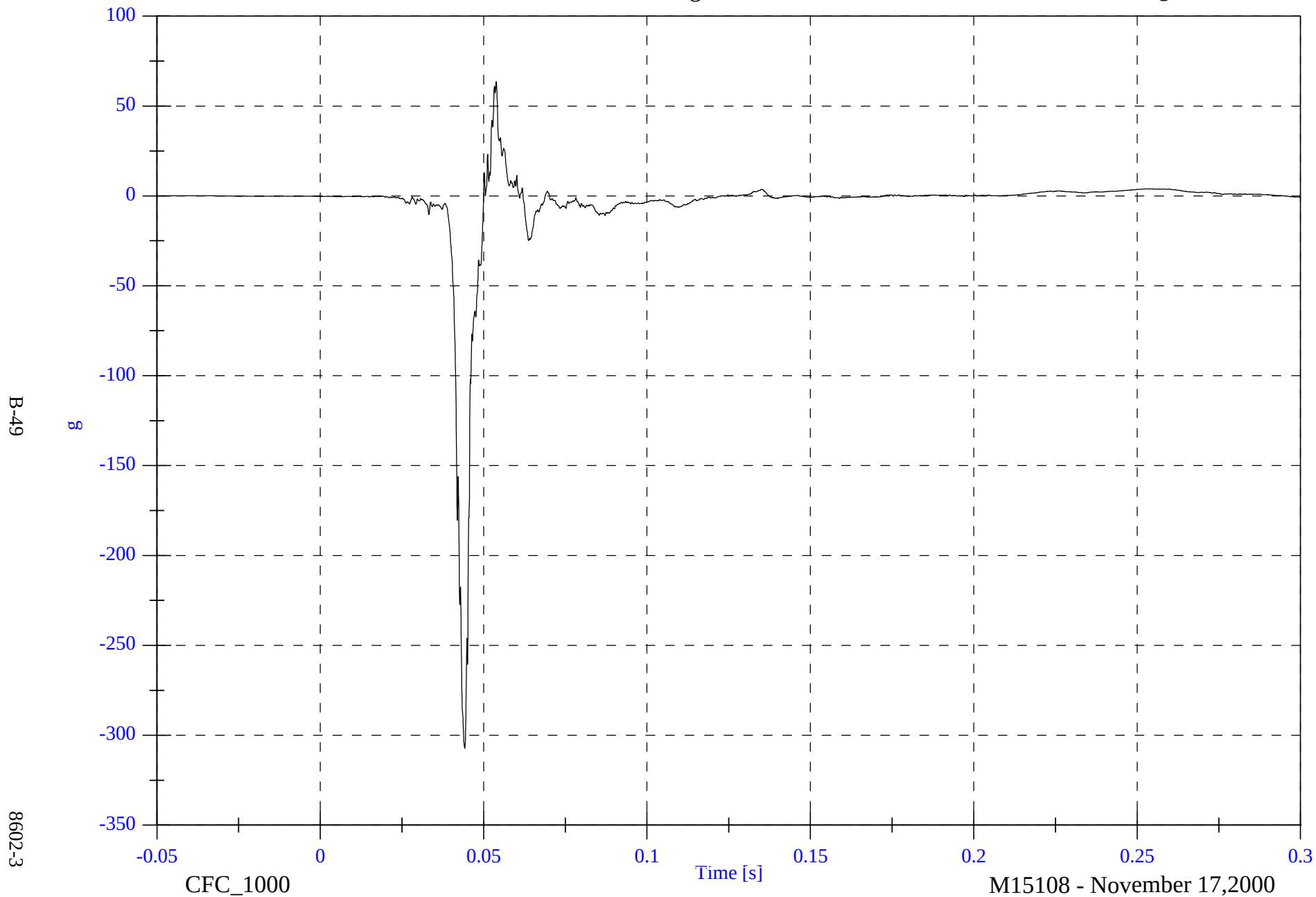


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Foot Aft z

Max: 63.7 [g] at 0.054 [s]

Min: -307.3 [g] at 0.044 [s]

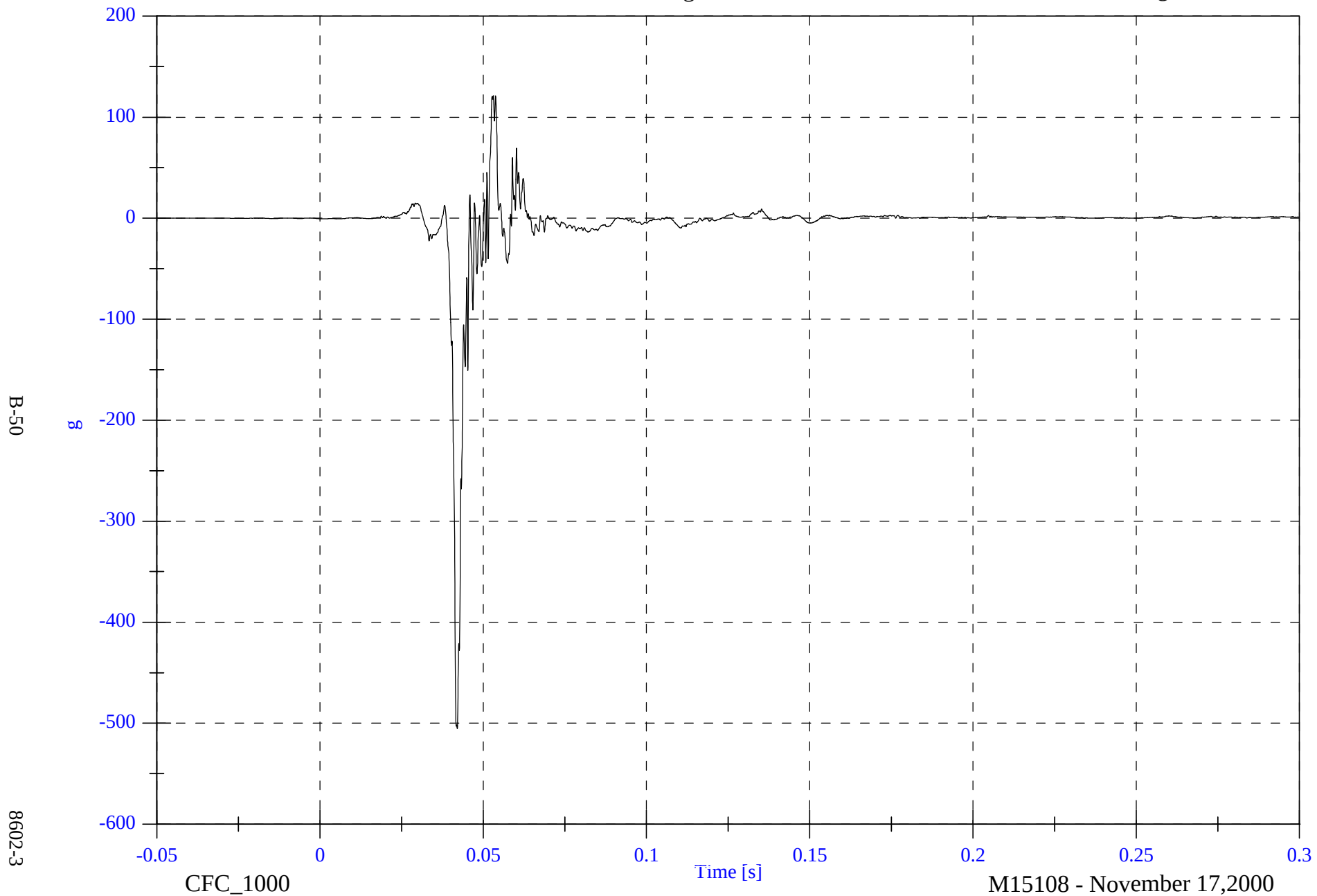


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Right Foot Fore z

Max: 121.5 [g] at 0.053 [s]

Min: -505.3 [g] at 0.042 [s]

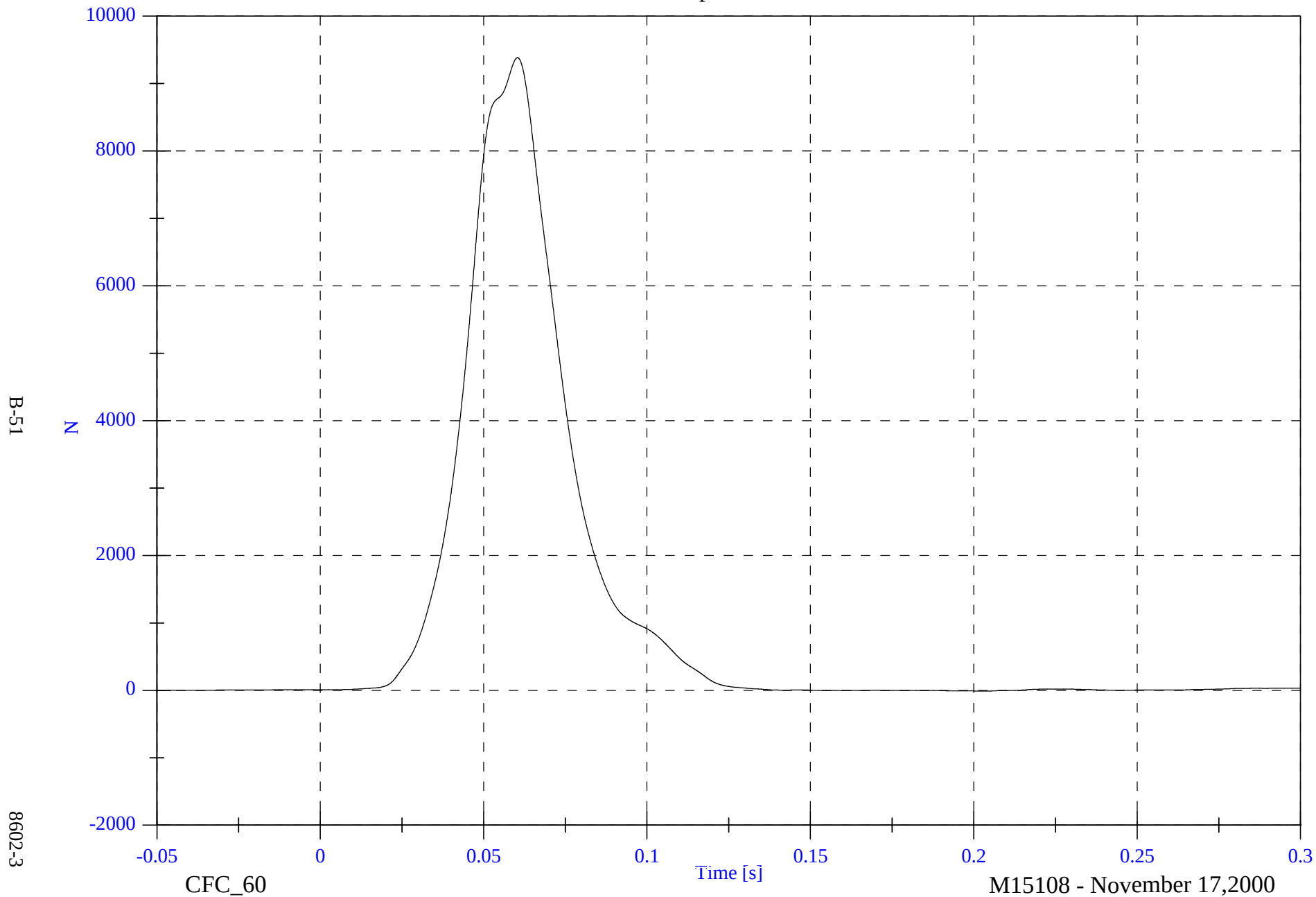


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Lap Belt Force

Max: 9384.5 [N] at 0.060 [s]

Min: -10.6 [N] at 0.203 [s]

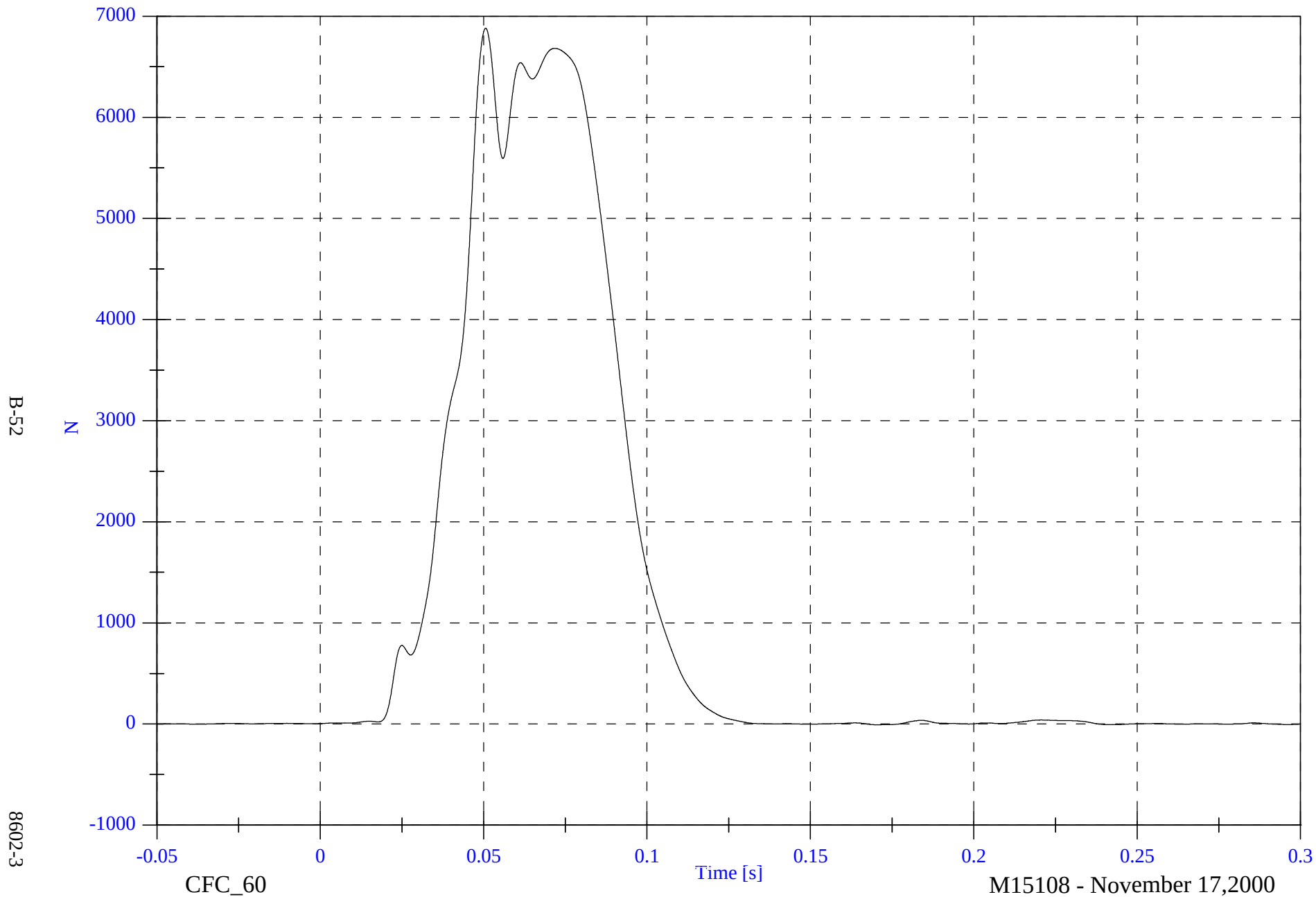


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Shoulder Belt Force

Max: 6881.6 [N] at 0.051 [s]

Min: -8.1 [N] at 0.170 [s]

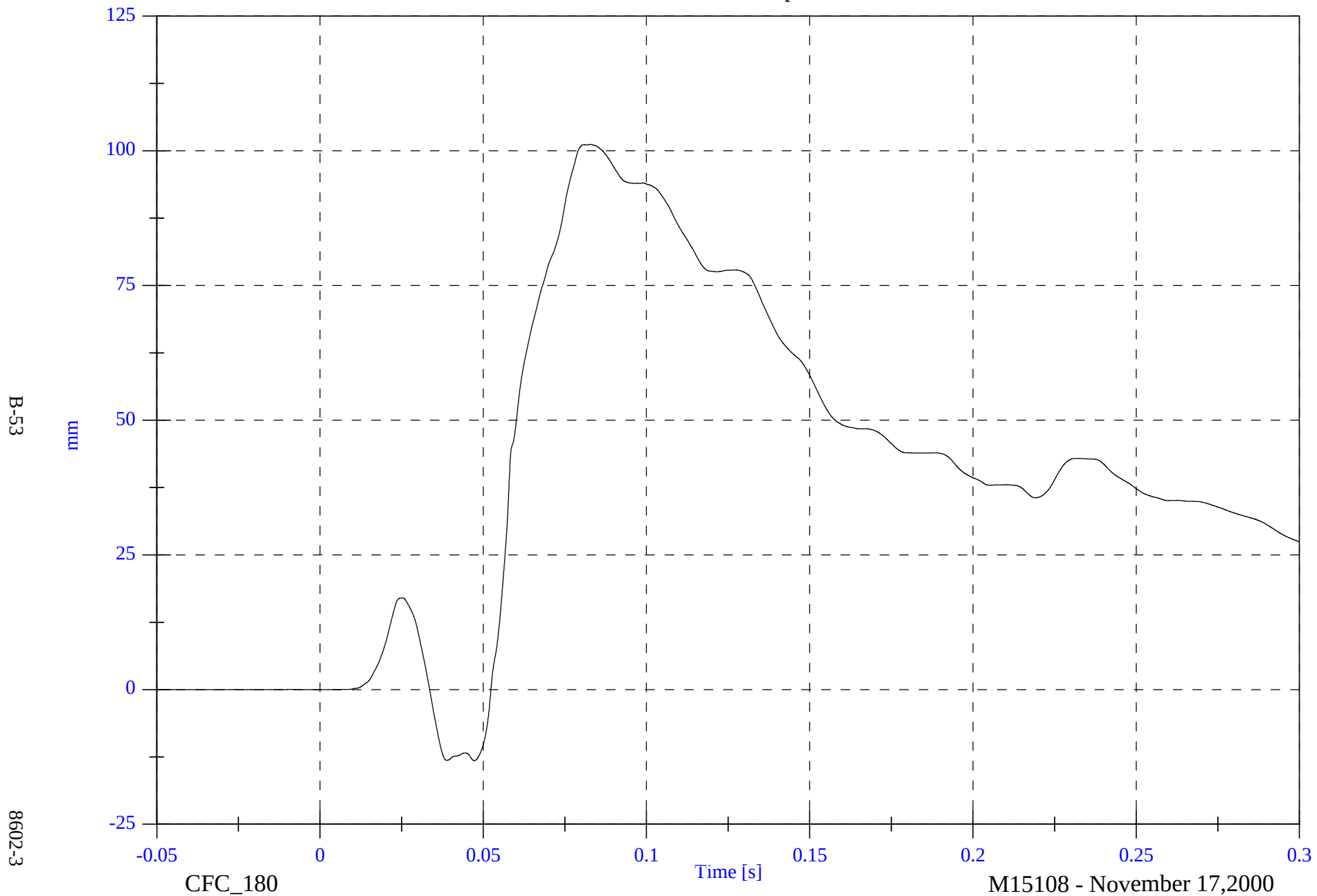


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Shoulder Belt Spoolout

Max: 101.2 [mm] at 0.083 [s]

Min: -13.2 [mm] at 0.047 [s]

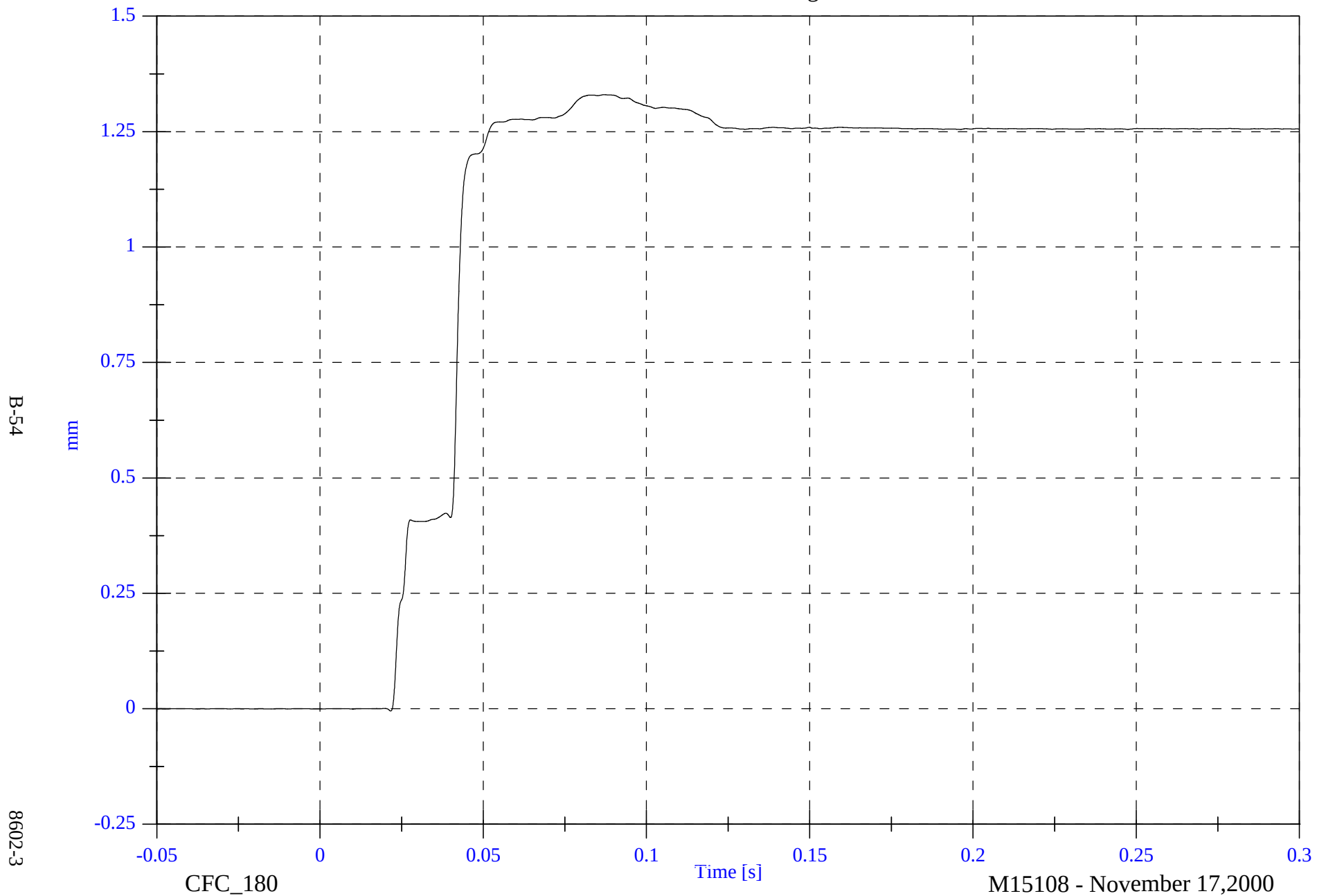


NCAP 2001 Test 3 - 2001 Toyota Tundra

P1 Shoulder Belt Elongation

Max: 1.3 [mm] at 0.087 [s]

Min: -0.0 [mm] at 0.022 [s]

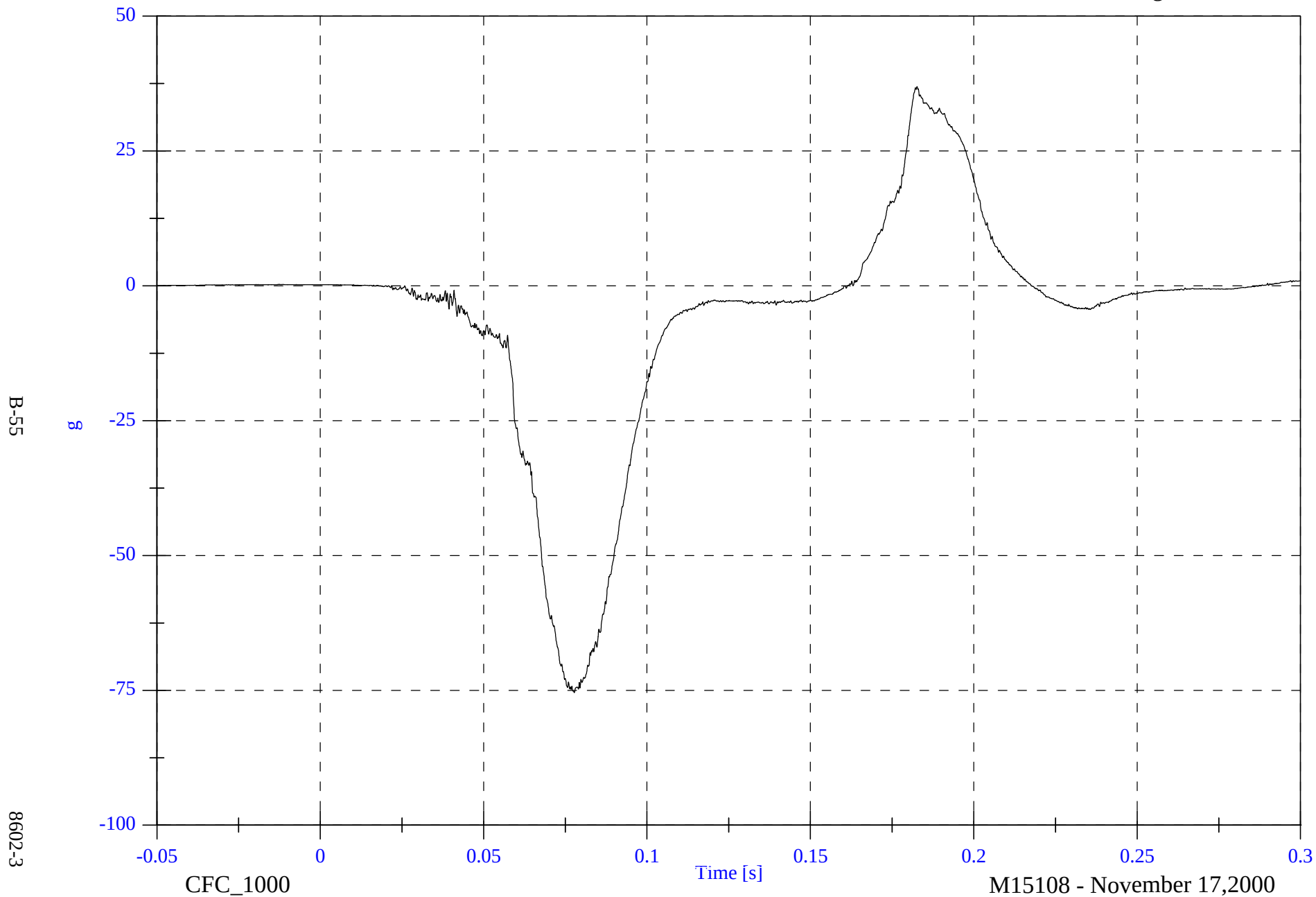


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Head x

Max: 36.9 [g] at 0.183 [s]

Min: -75.5 [g] at 0.078 [s]

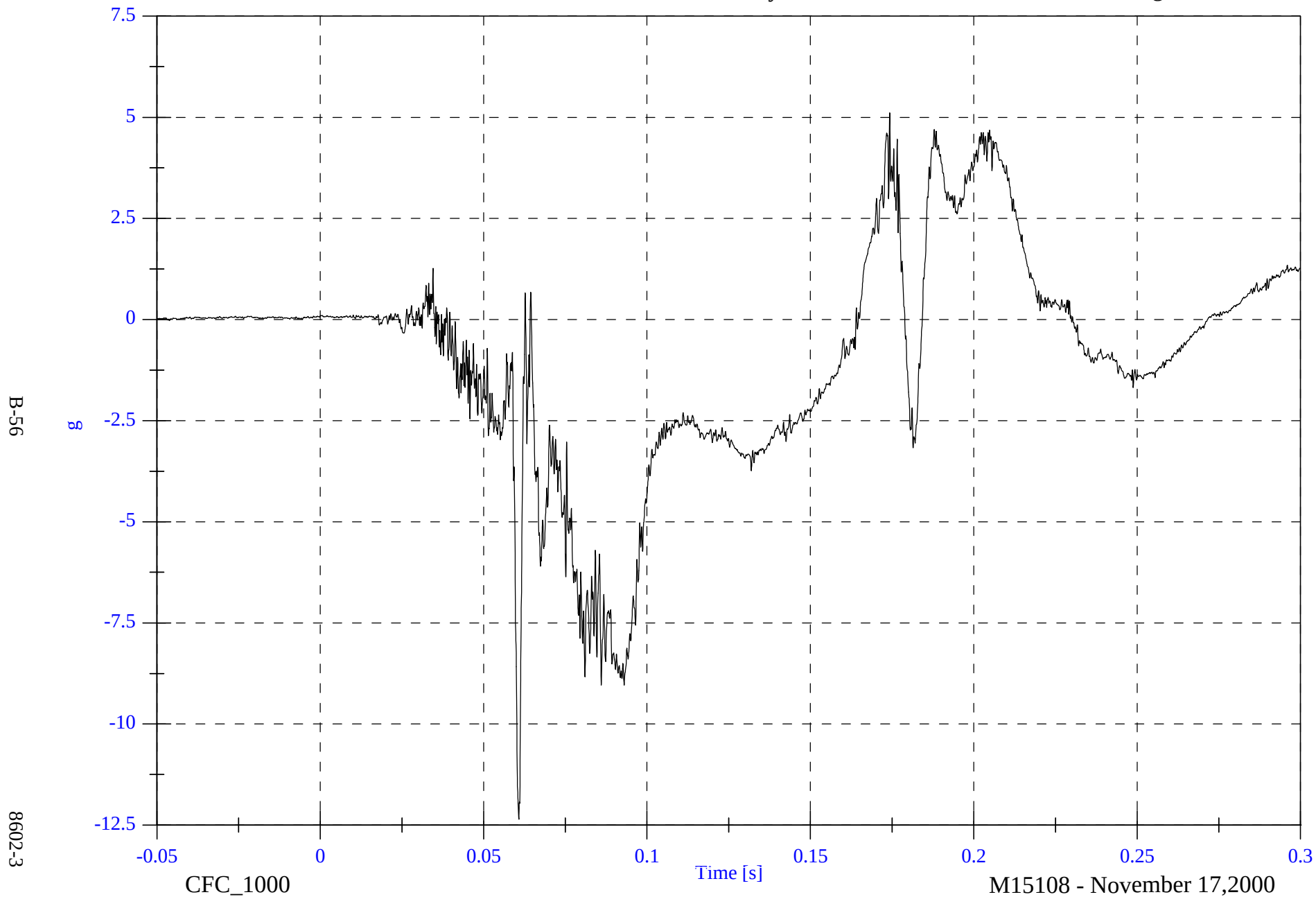


# NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Head y

Max: 5.1 [g] at 0.174 [s]

Min: -12.4 [g] at 0.061 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

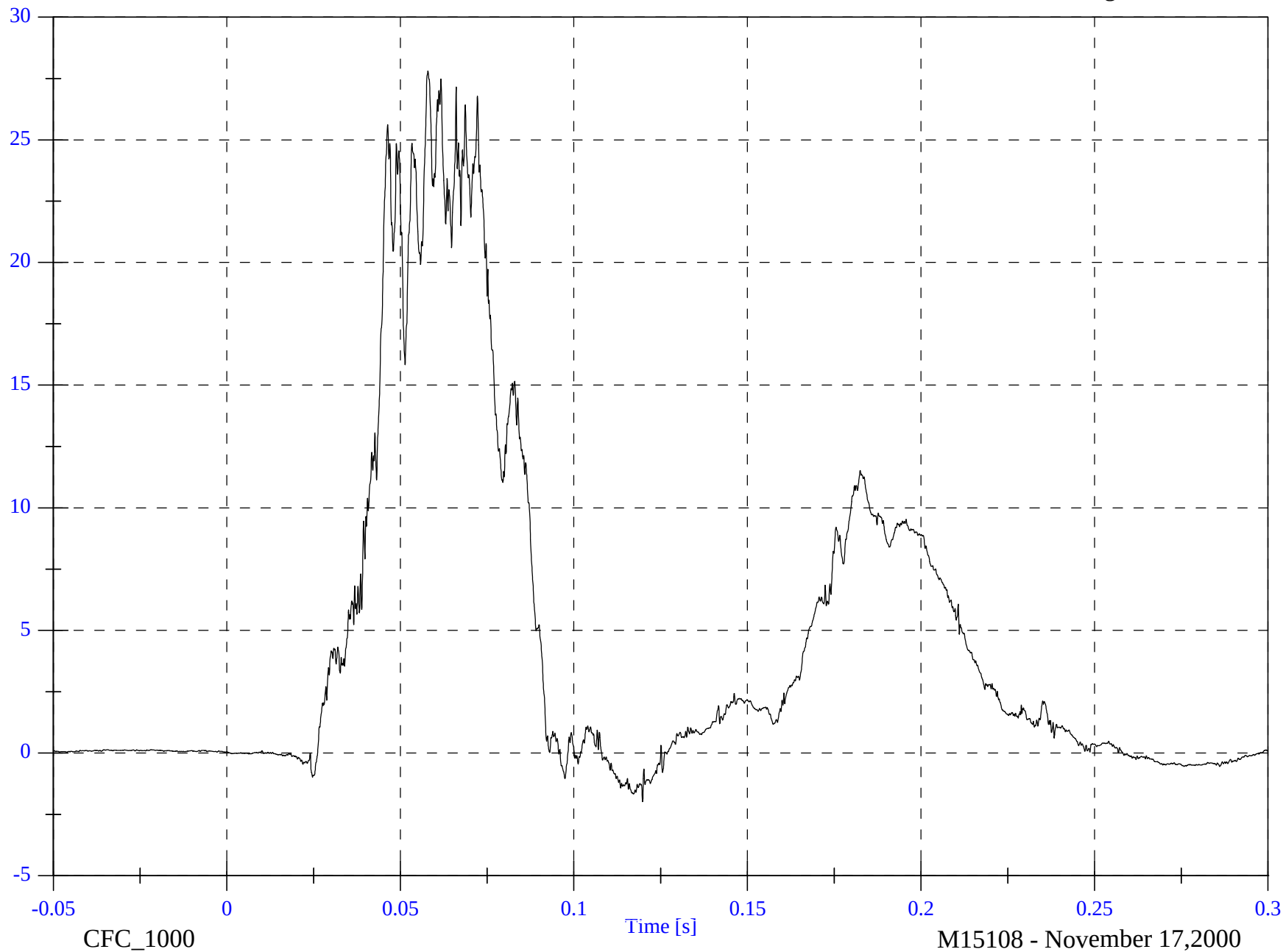
P2 Head z

Max: 27.8 [g] at 0.058 [s]

Min: -2.0 [g] at 0.120 [s]

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8602-3

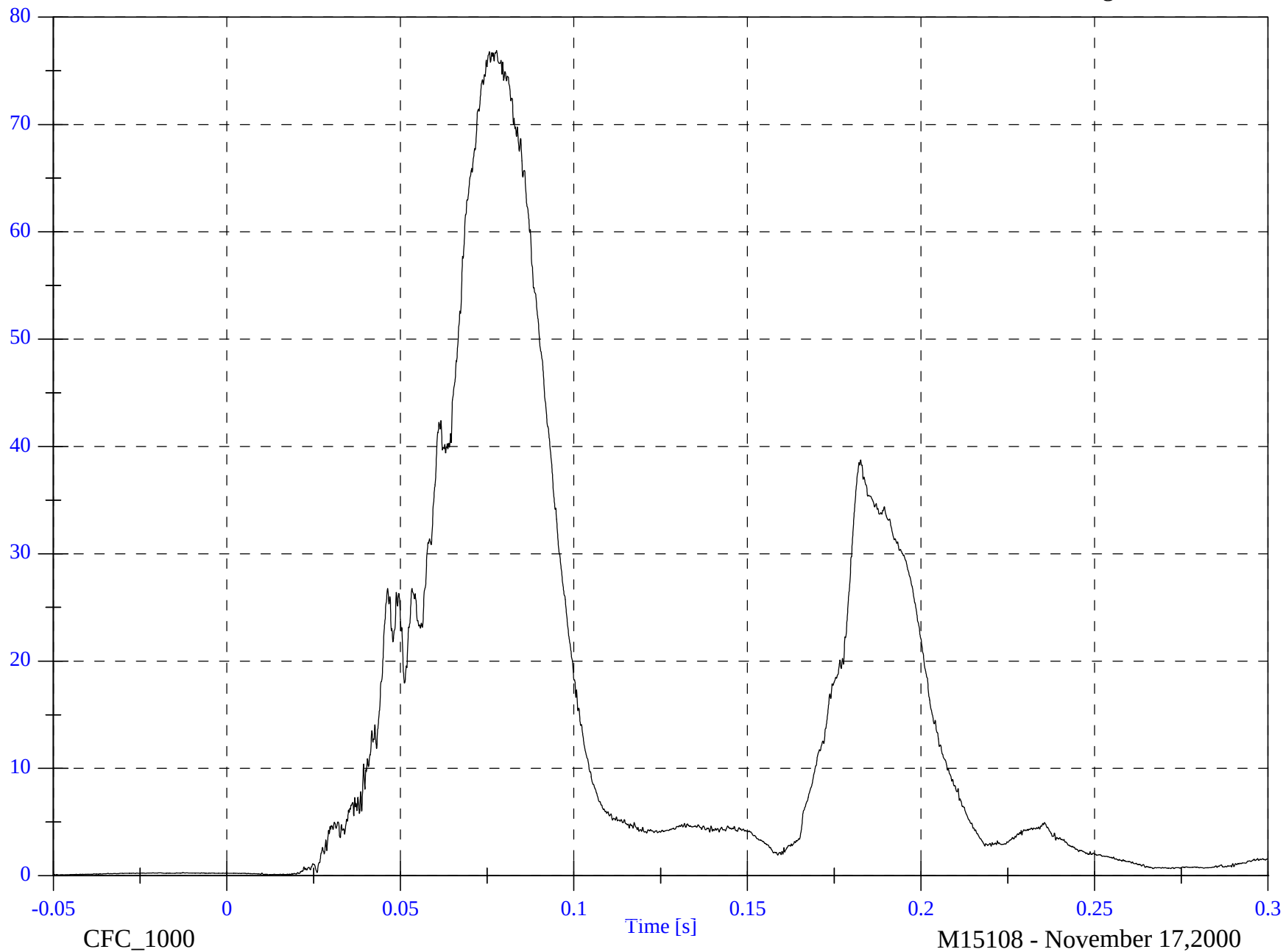


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Head Resultant

Max: 76.9 [g] at 0.078 [s]

Min: 0.0 [g] at 0.018 [s]



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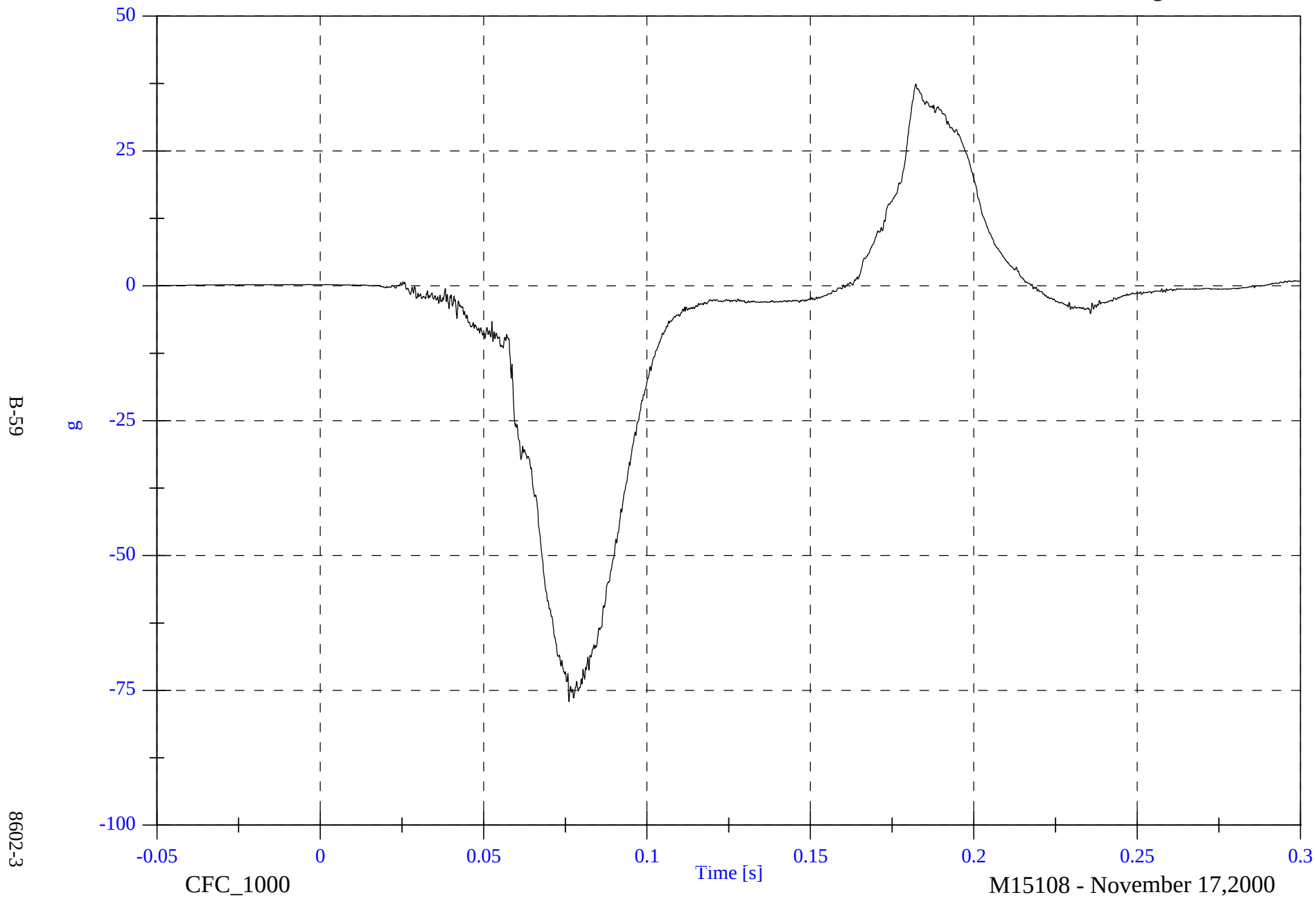
8602-3

NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Head Red x

Max: 37.4 [g] at 0.182 [s]

Min: -77.1 [g] at 0.076 [s]

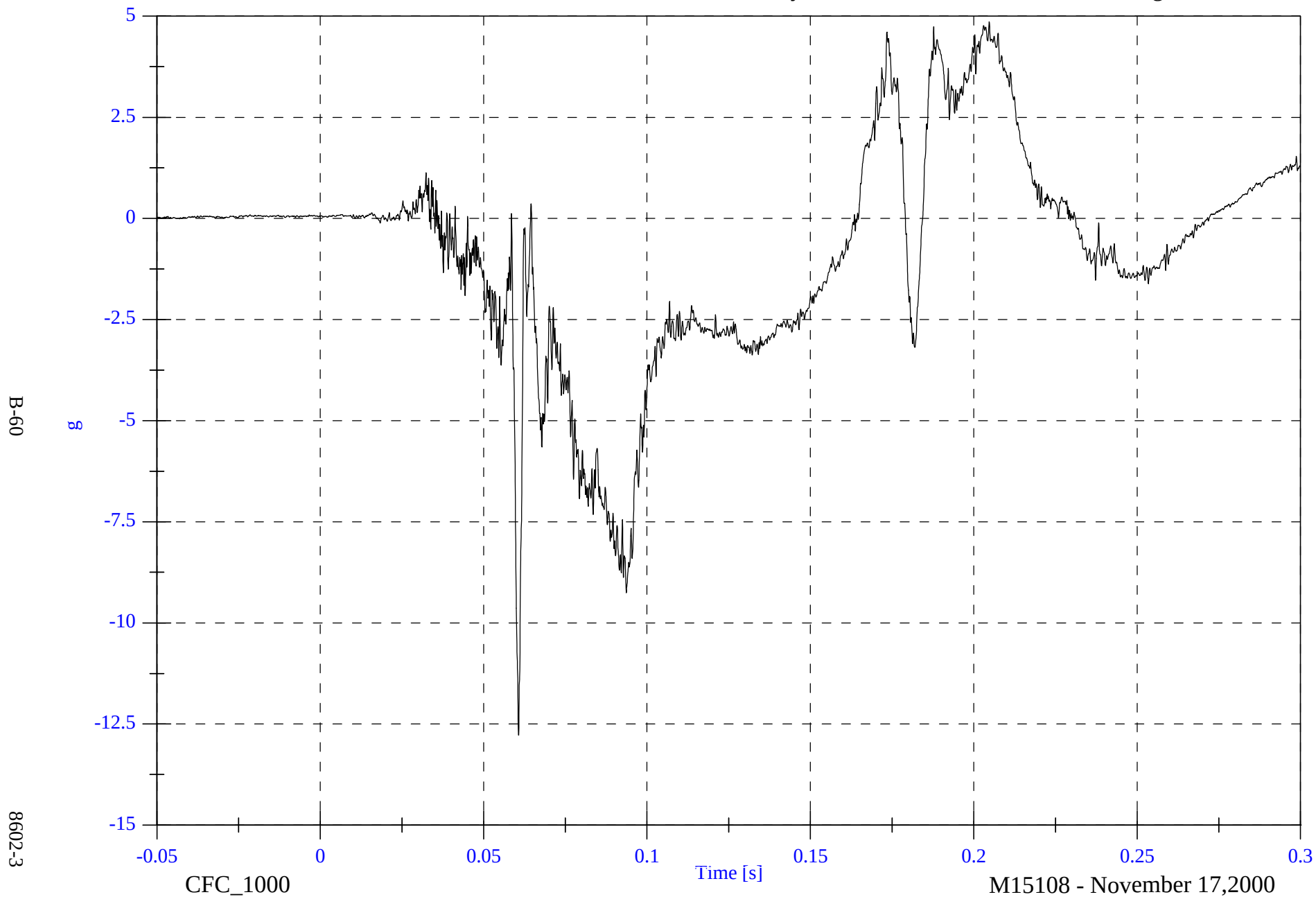


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Head Red y

Max: 4.9 [g] at 0.205 [s]

Min: -12.8 [g] at 0.061 [s]

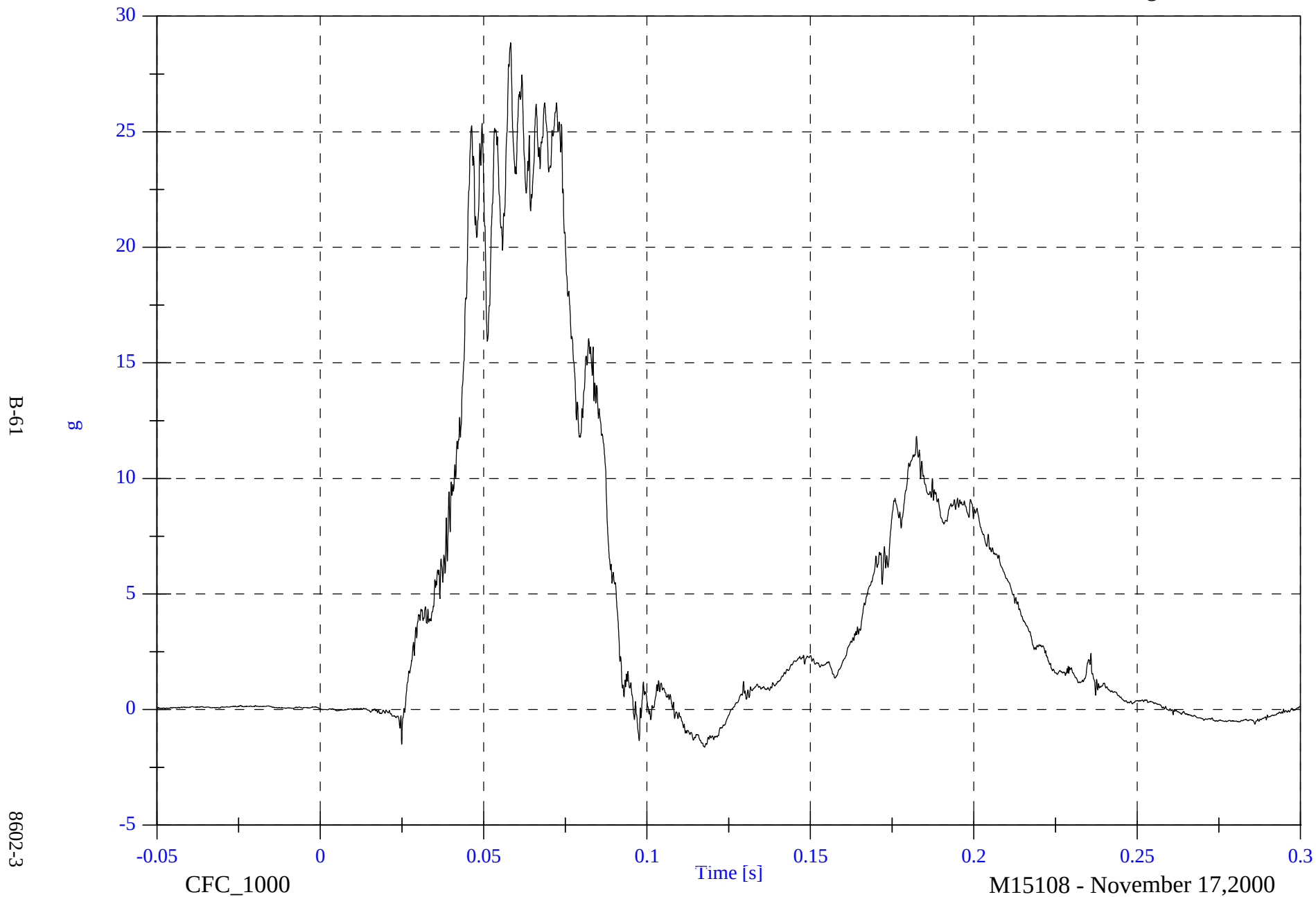


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Head Red z

Max: 28.9 [g] at 0.058 [s]

Min: -1.6 [g] at 0.118 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

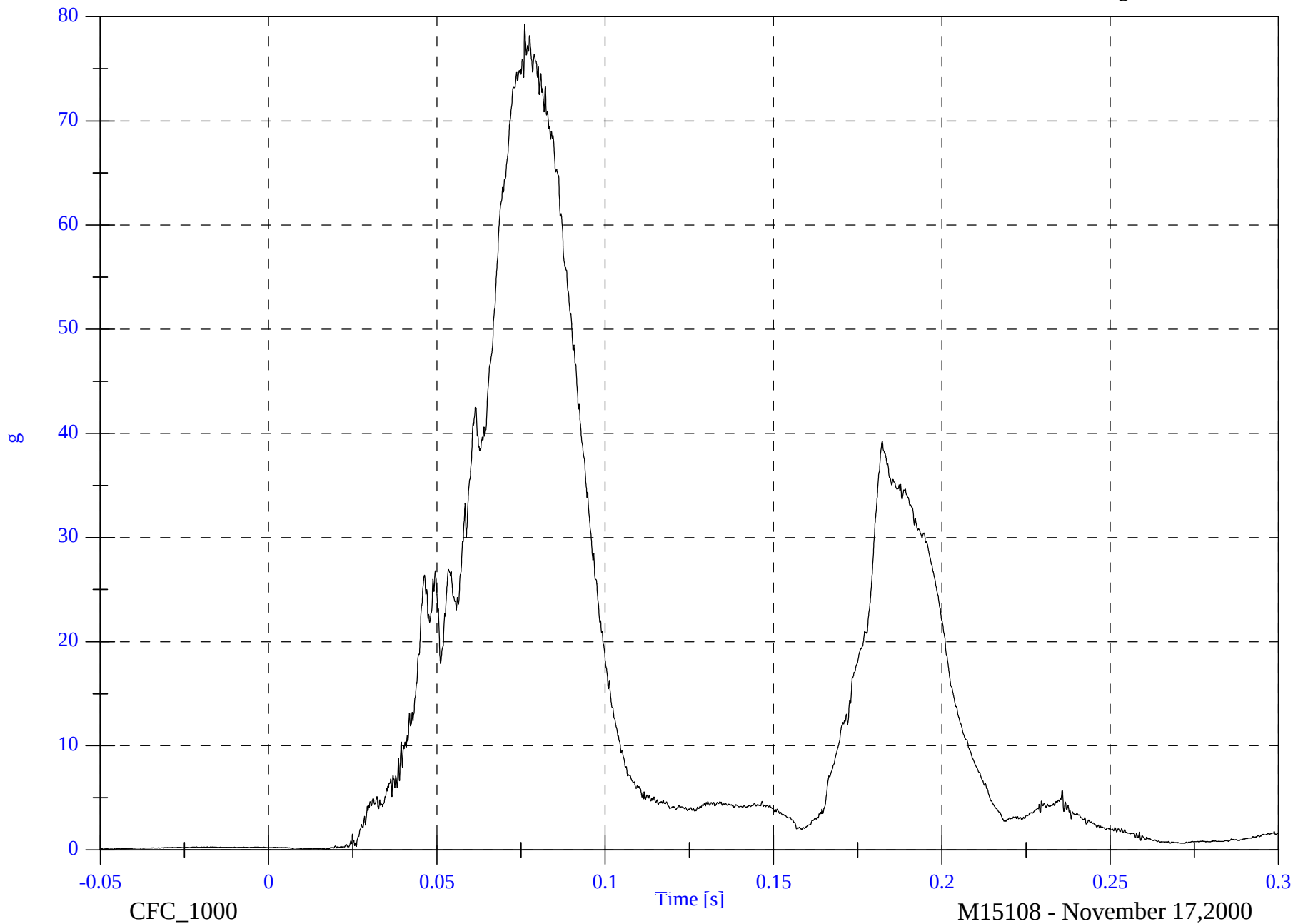
P2 Head Red Resultant

Max: 79.3 [g] at 0.076 [s]

Min: 0.1 [g] at 0.017 [s]

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8602-3

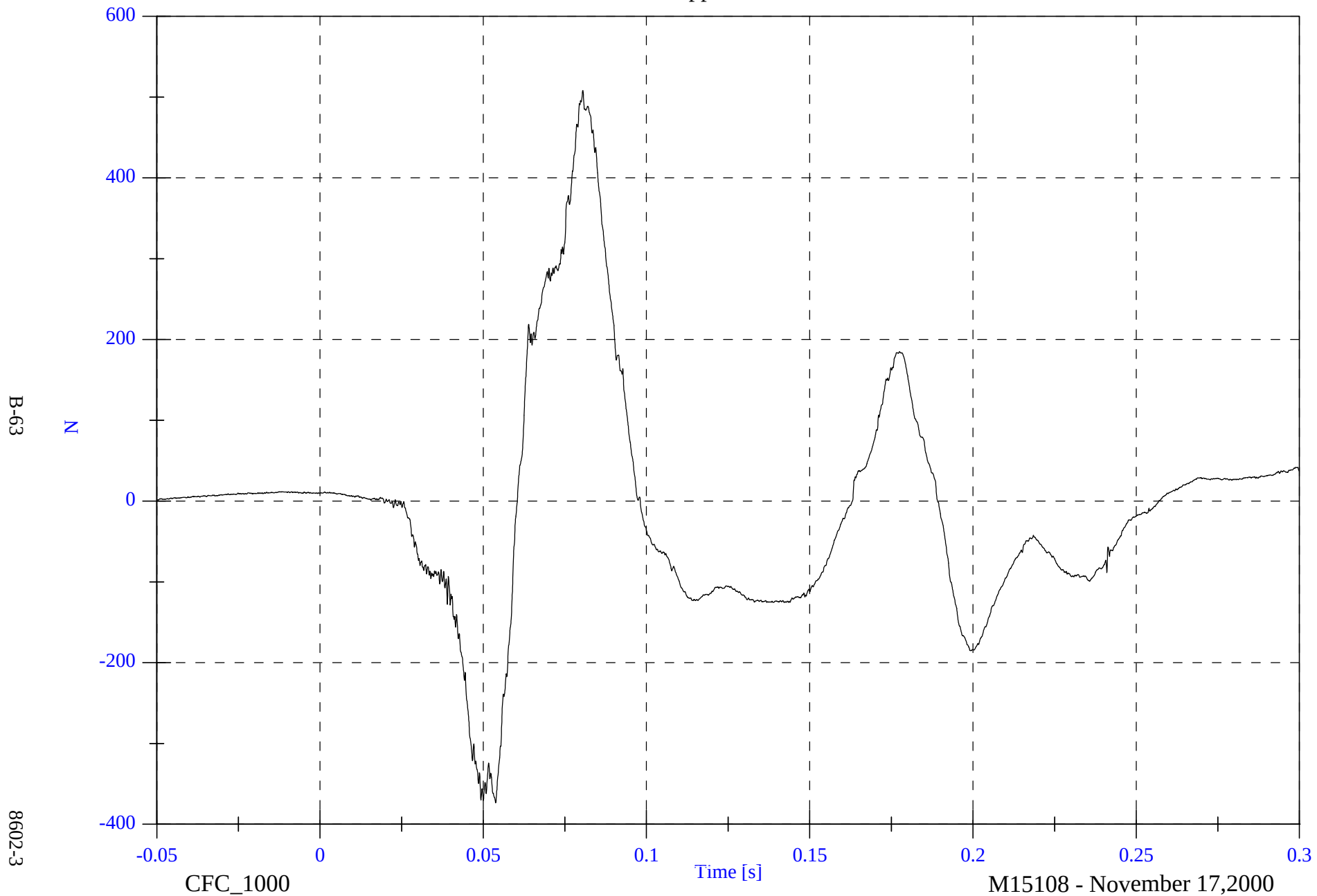


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Upper Neck Fx

Max: 508.0 [N] at 0.081 [s]

Min: -373.5 [N] at 0.054 [s]

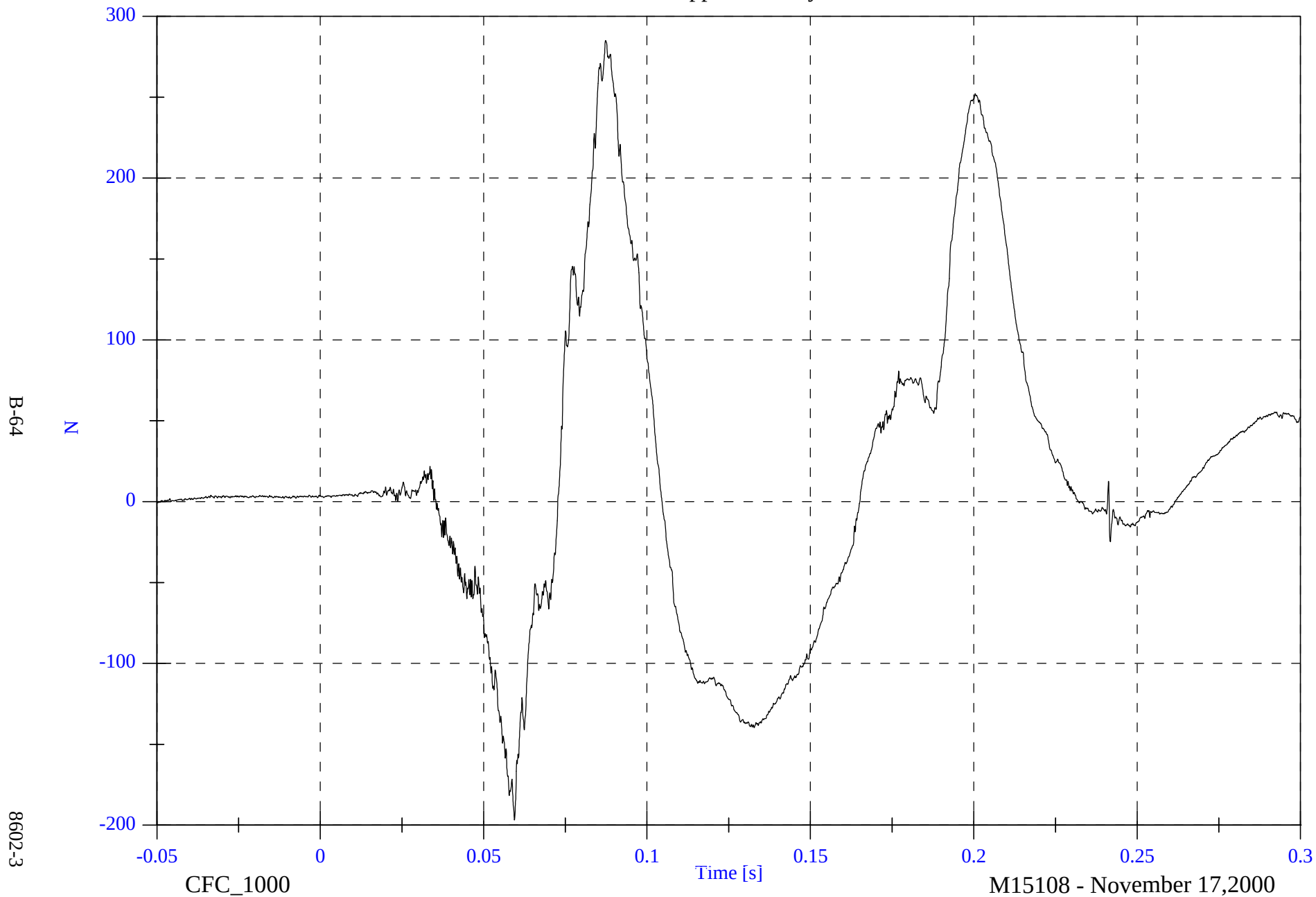


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Upper Neck Fy

Max: 285.0 [N] at 0.087 [s]

Min: -196.8 [N] at 0.059 [s]

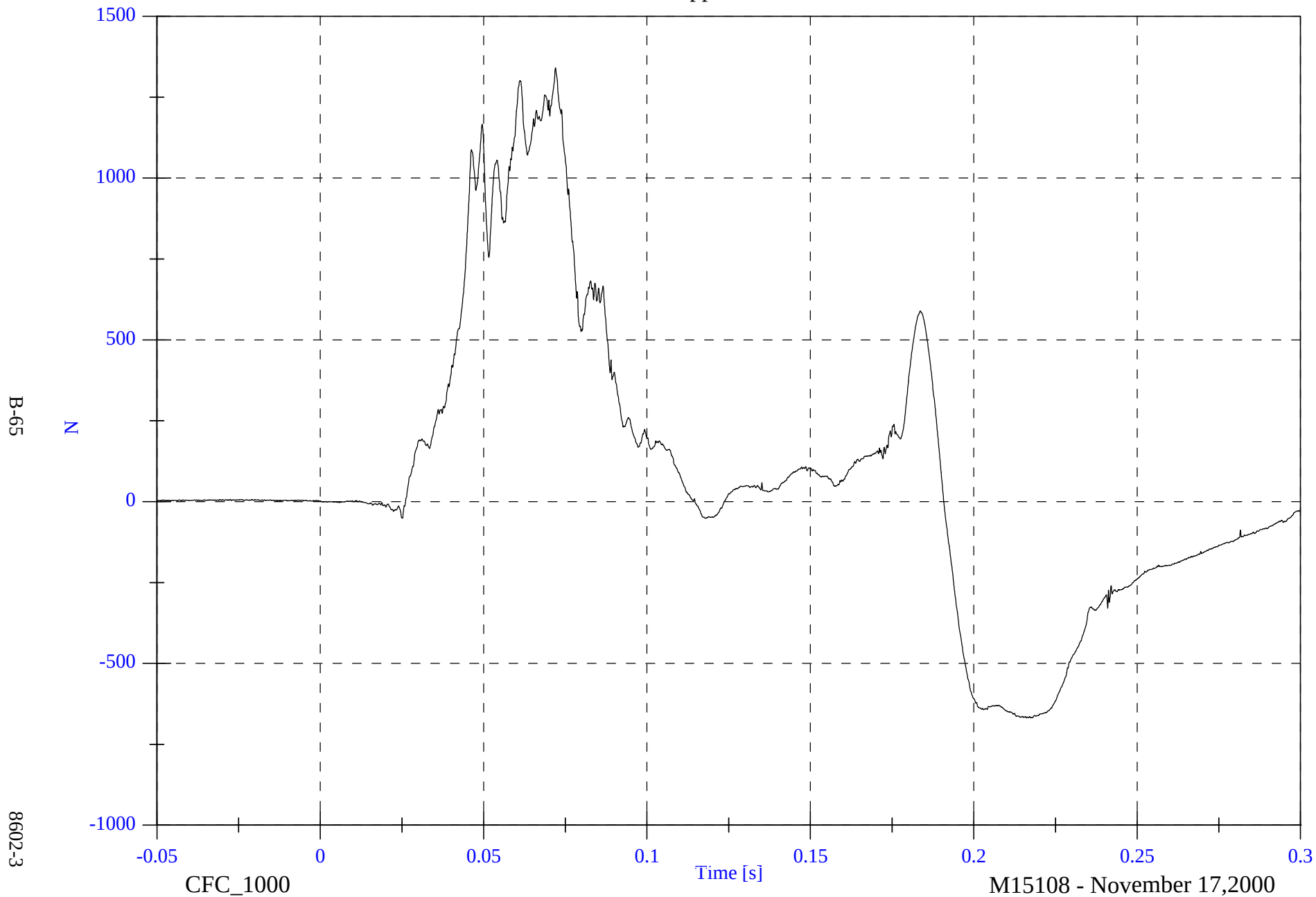


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Upper Neck Fz

Max: 1340.9 [N] at 0.072 [s]

Min: -668.8 [N] at 0.216 [s]

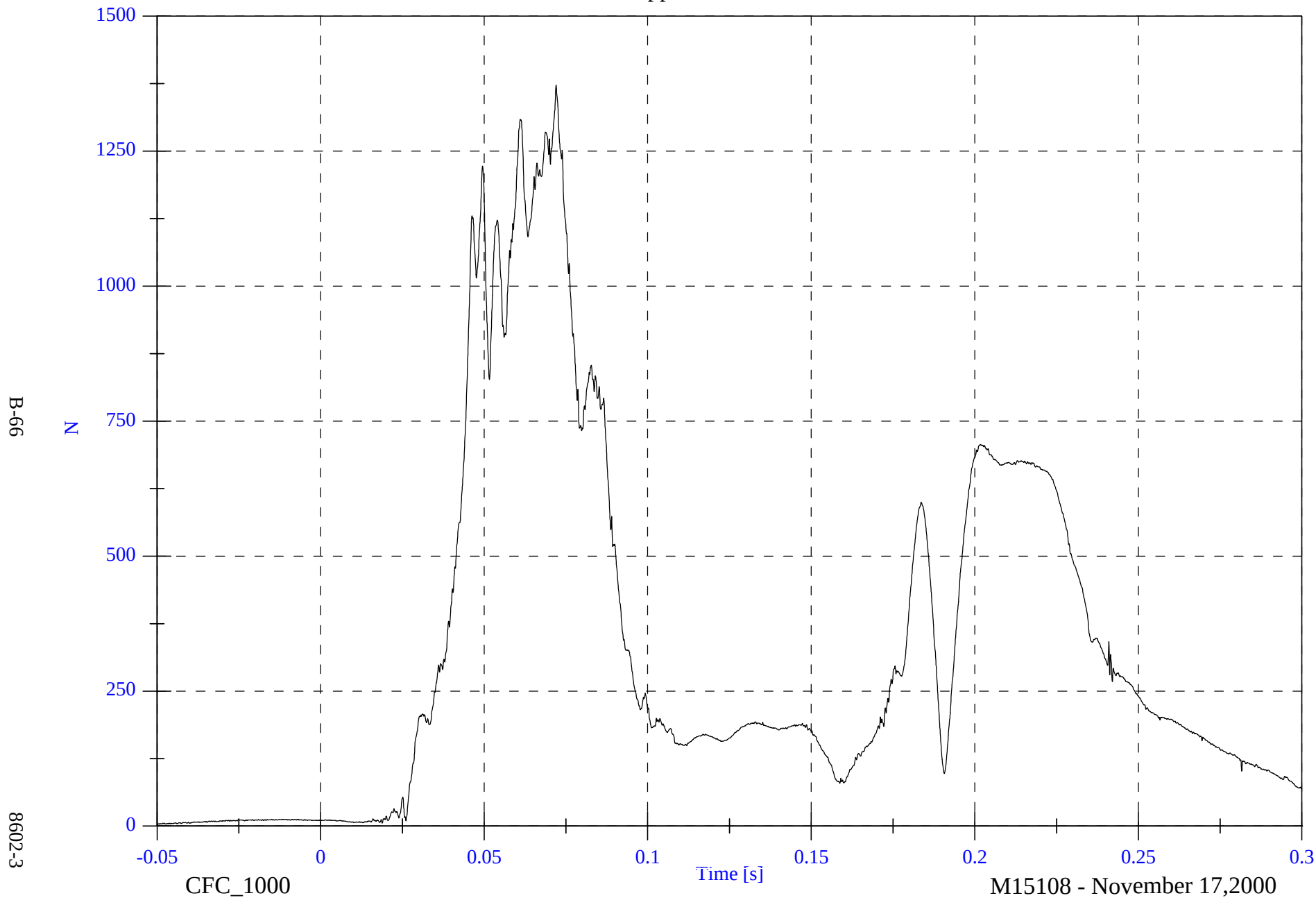


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Upper Neck F Resultant

Max: 1372.1 [N] at 0.072 [s]

Min: 2.7 [N] at -0.050 [s]

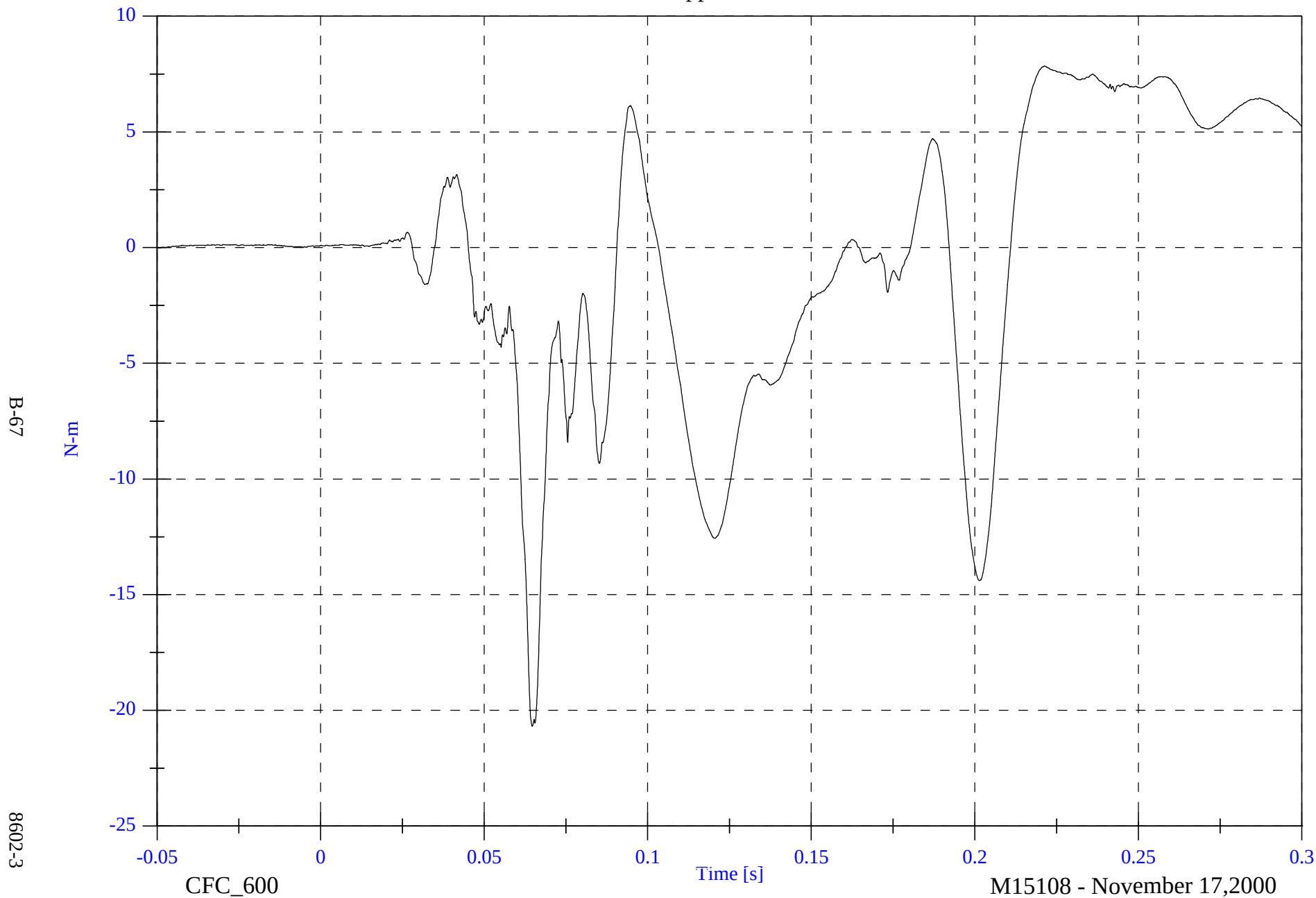


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Upper Neck Mx

Max: 7.8 [N-m] at 0.221 [s]

Min: -20.7 [N-m] at 0.065 [s]

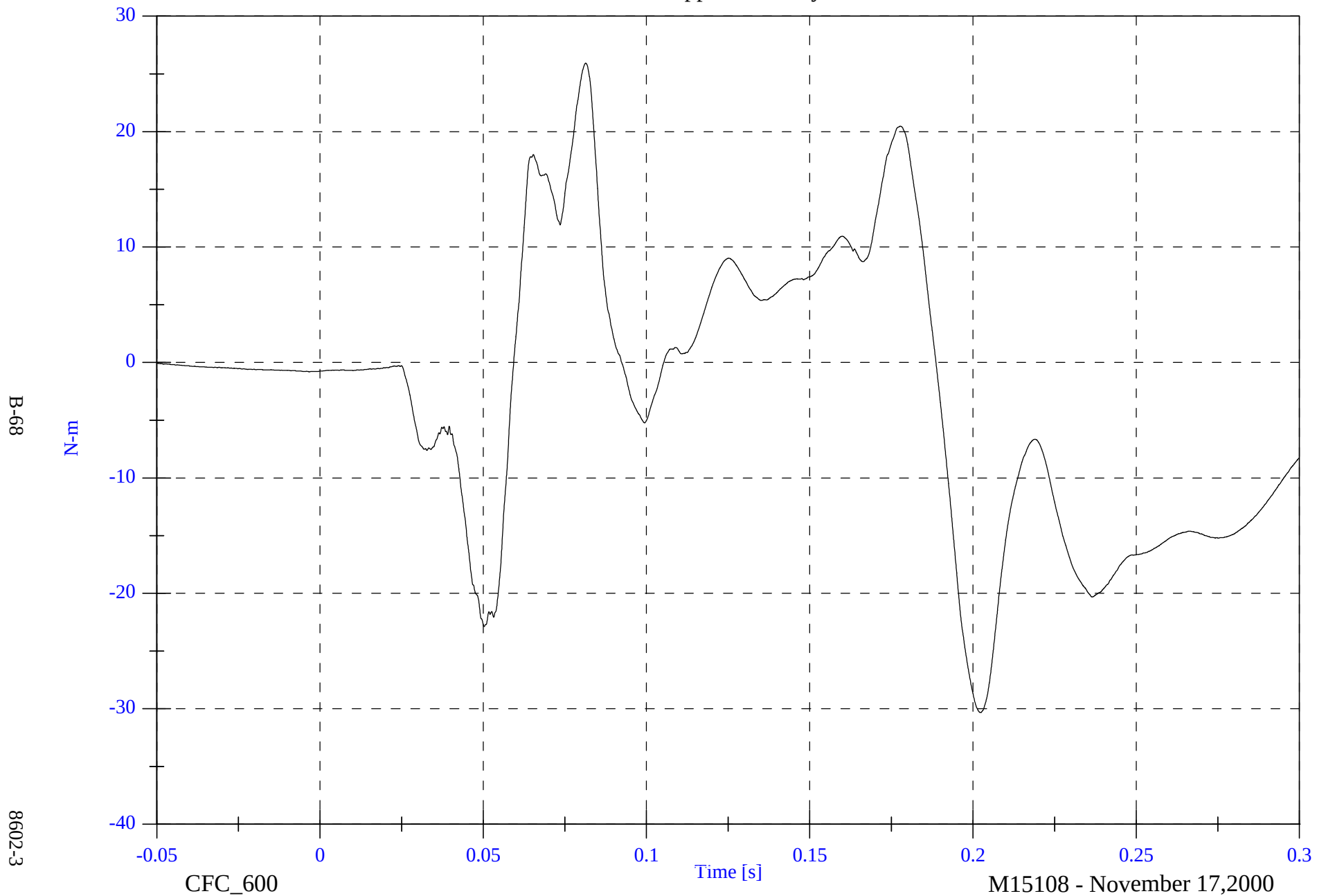


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Upper Neck My

Max: 25.9 [N-m] at 0.081 [s]

Min: -30.3 [N-m] at 0.202 [s]

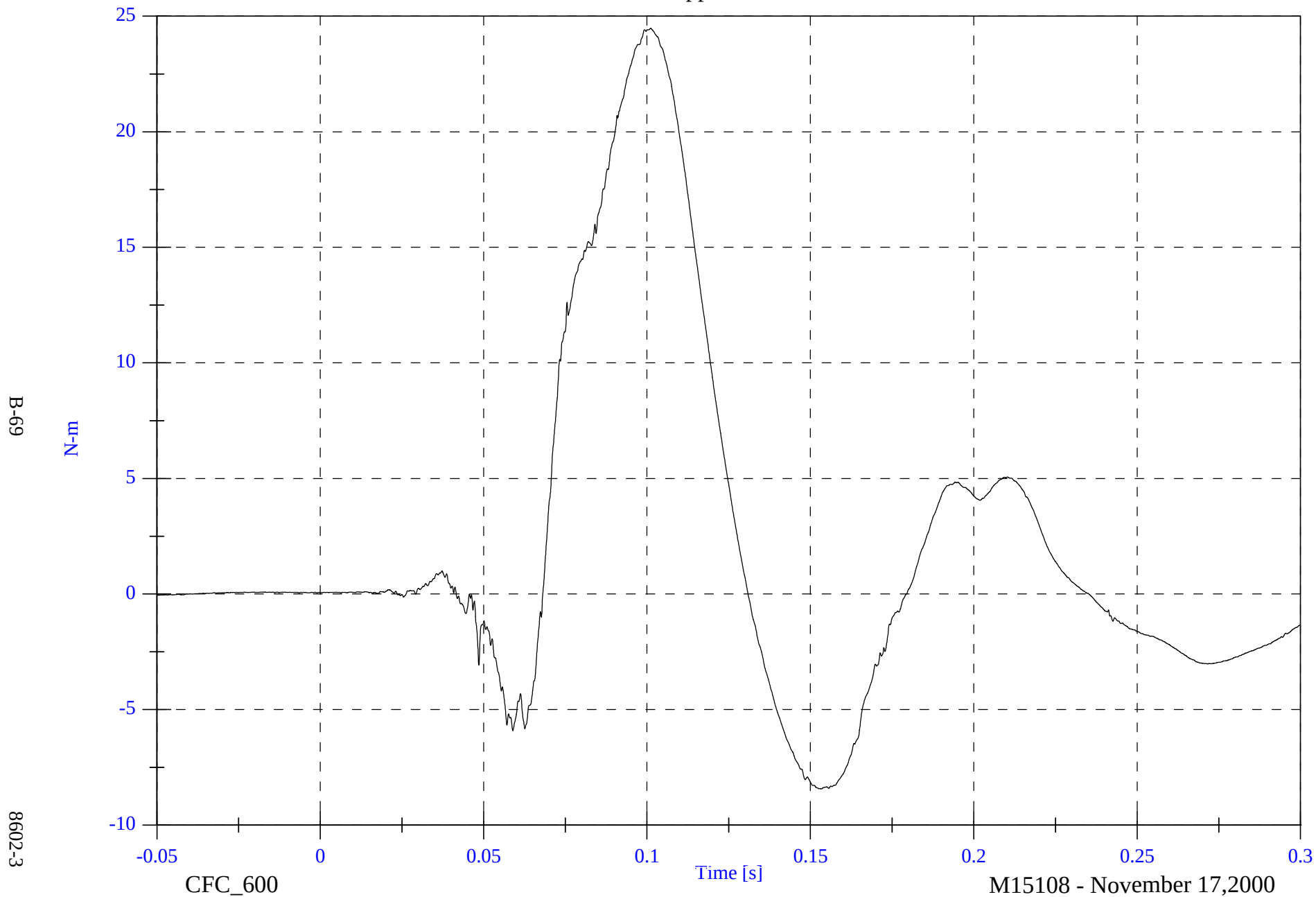


NCAP 2001 Test 3 - 2001 Toyota Tundra

Max: 24.5 [N-m] at 0.101 [s]

Min: -8.4 [N-m] at 0.153 [s]

P2 Upper Neck Mz

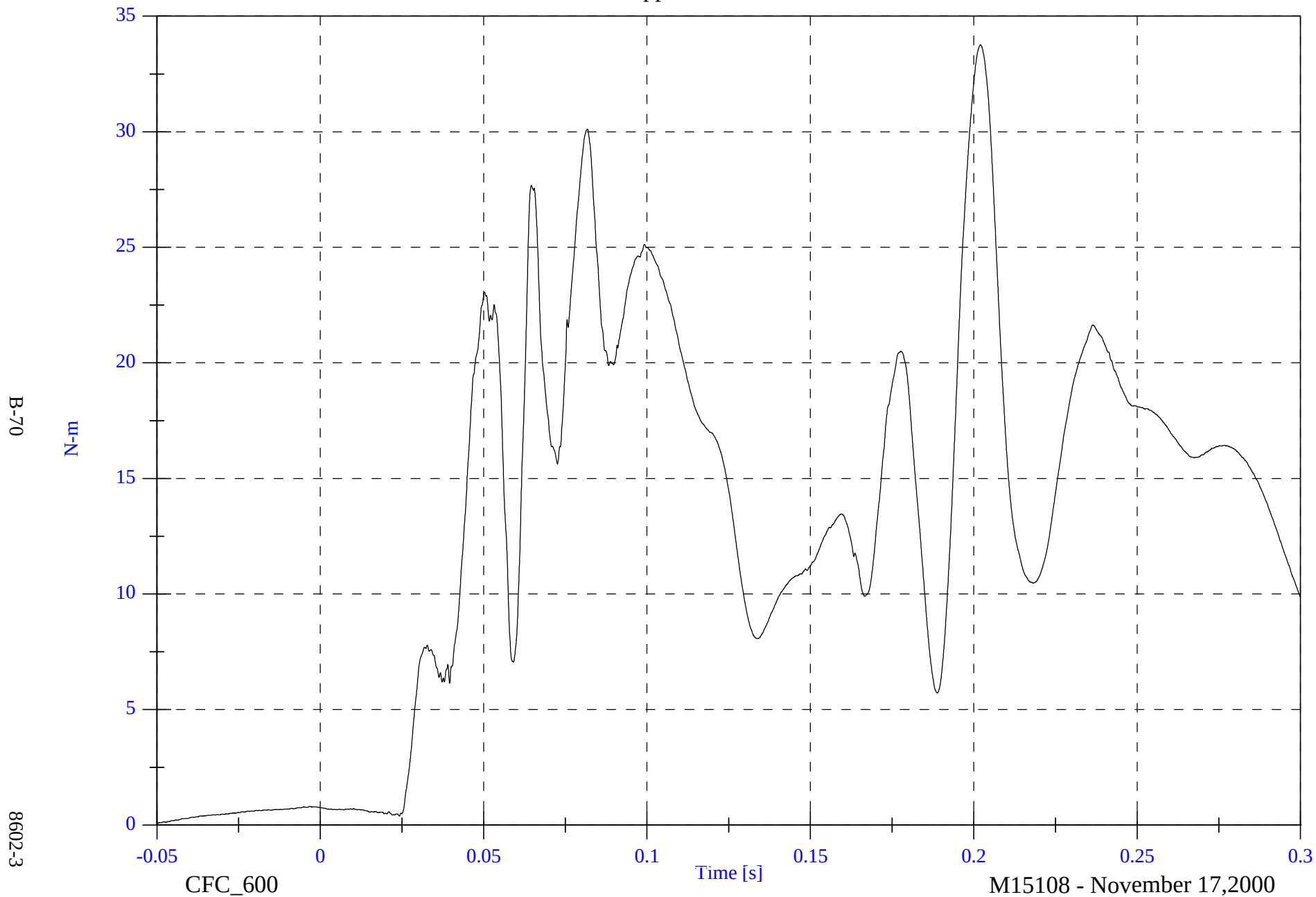


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Upper Neck M Resultant

Max: 33.8 [N-m] at 0.202 [s]

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

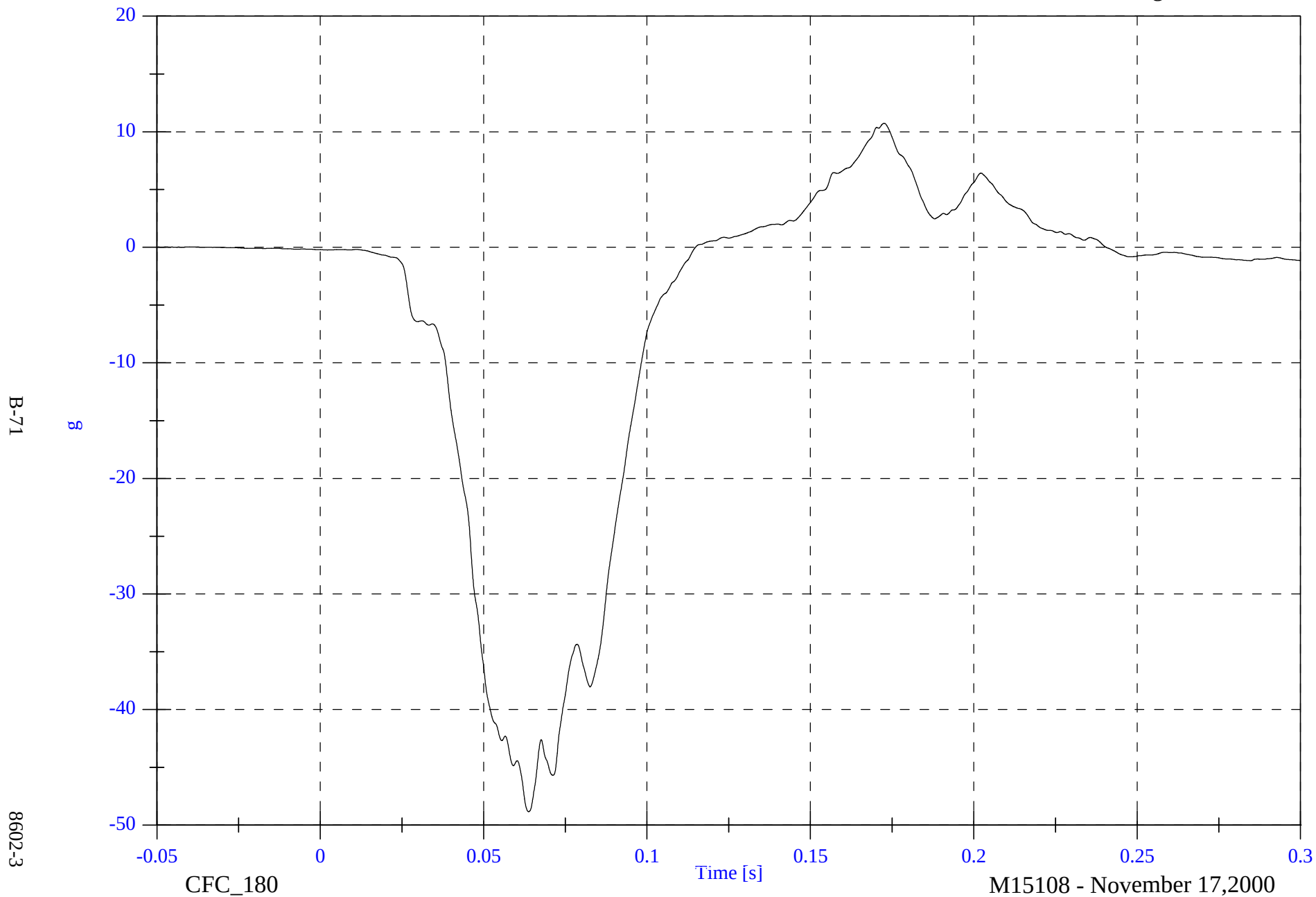


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest x

Max: 10.7 [g] at 0.173 [s]

Min: -48.8 [g] at 0.064 [s]

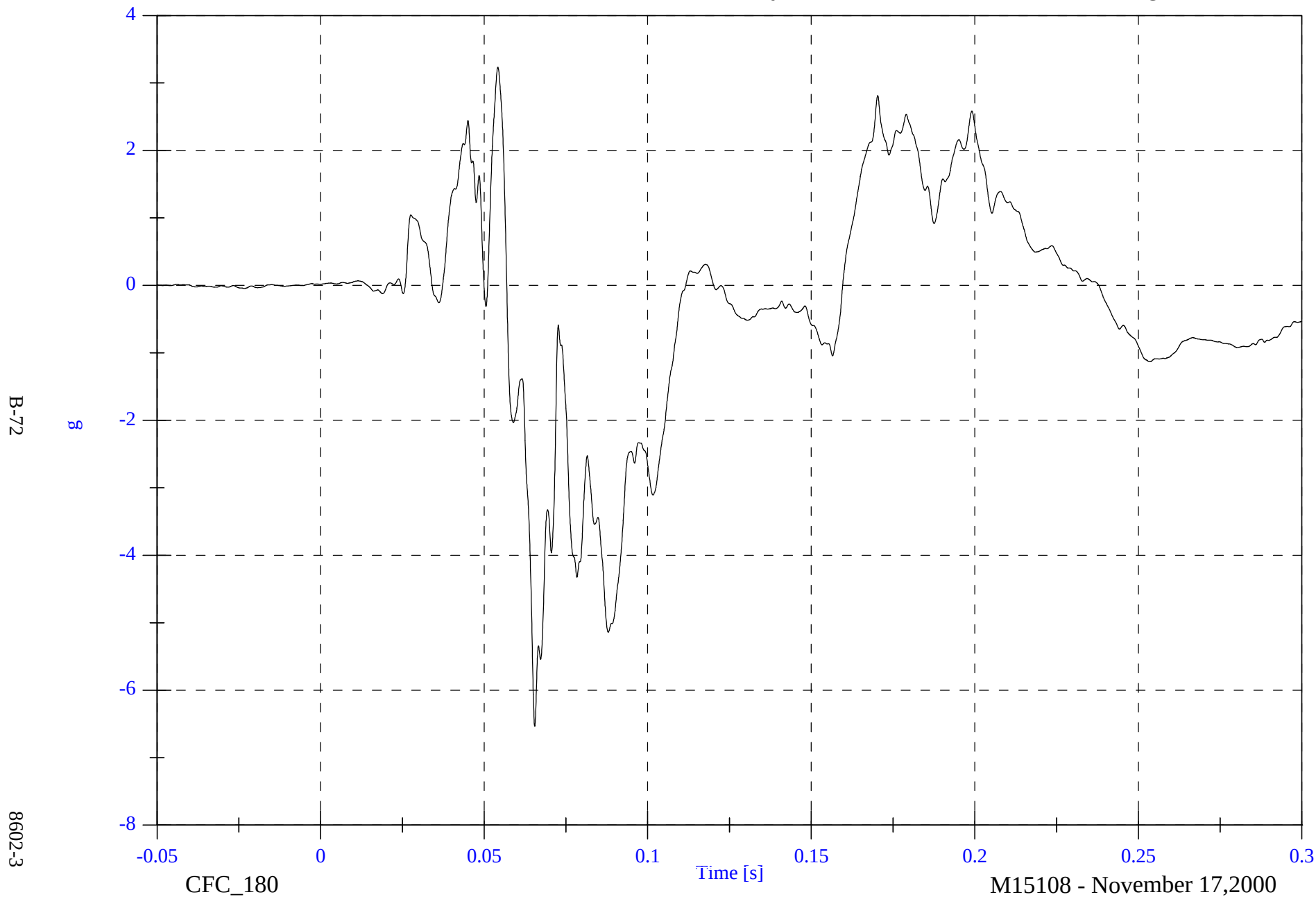


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest y

Max: 3.2 [g] at 0.054 [s]

Min: -6.5 [g] at 0.065 [s]

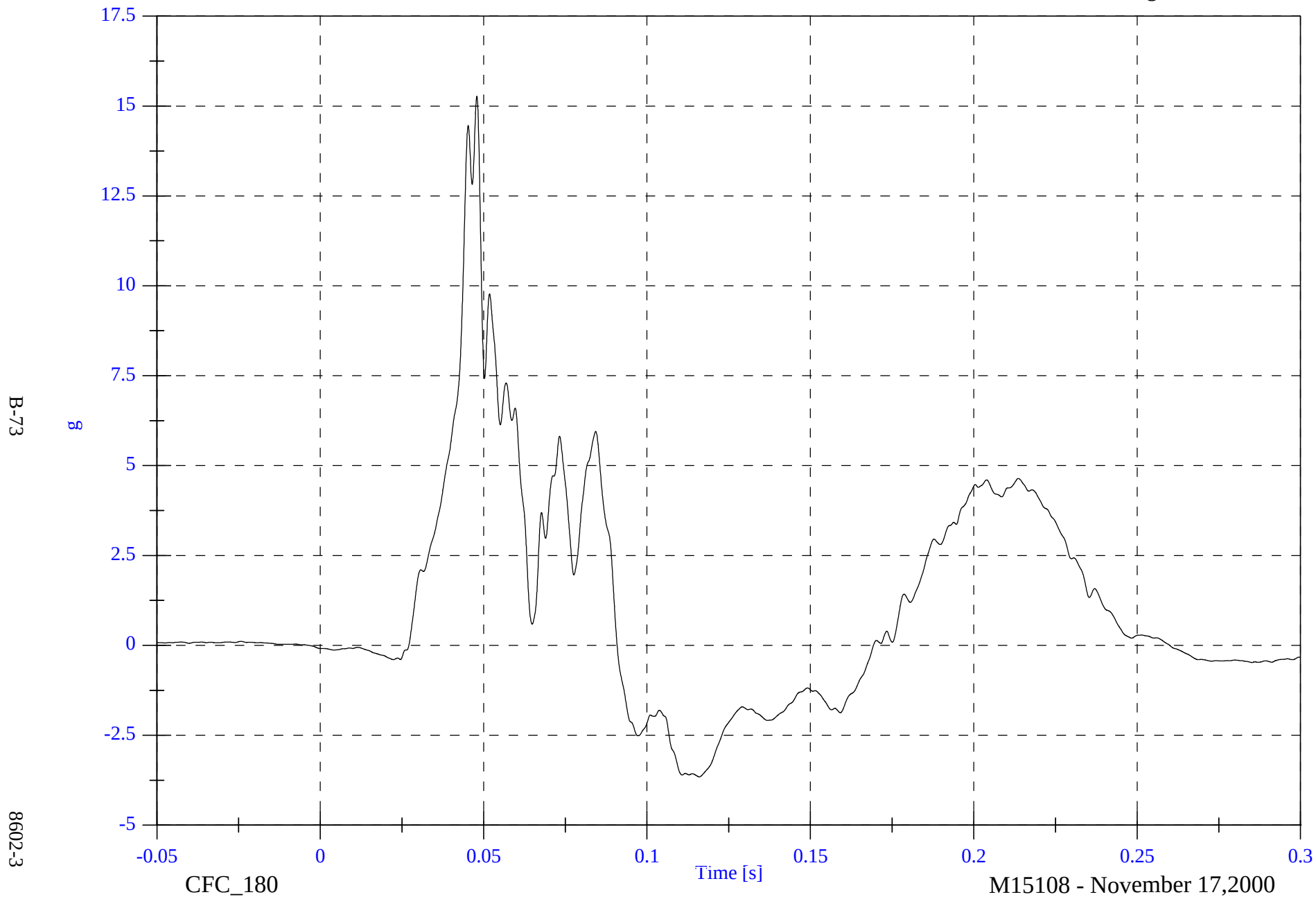


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest z

Max: 15.3 [g] at 0.048 [s]

Min: -3.7 [g] at 0.116 [s]

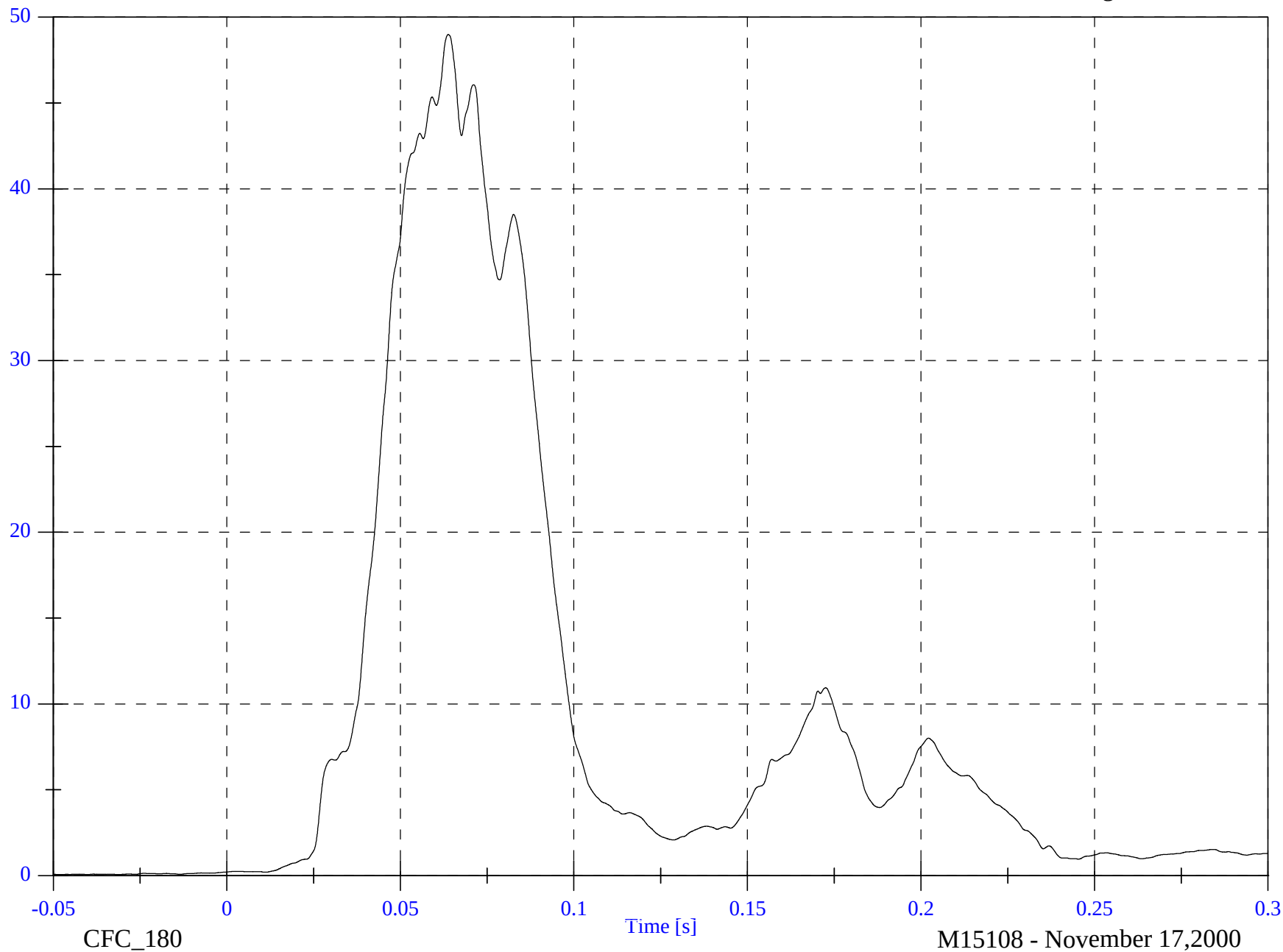


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest Resultant

Max: 49.0 [g] at 0.064 [s]

Min: 0.1 [g] at -0.040 [s]



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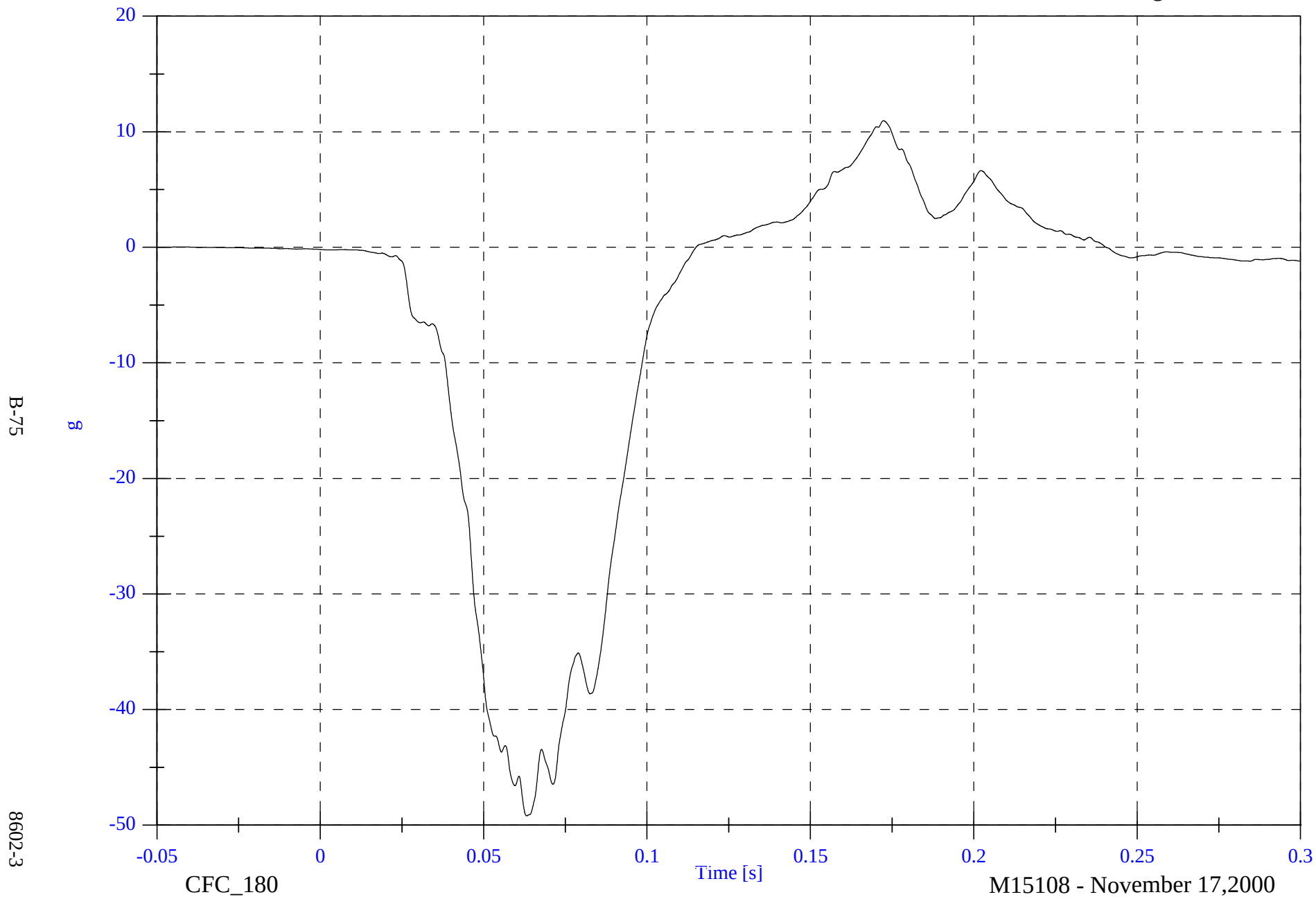
8602-3

NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest Red x

Max: 11.0 [g] at 0.172 [s]

Min: -49.2 [g] at 0.063 [s]

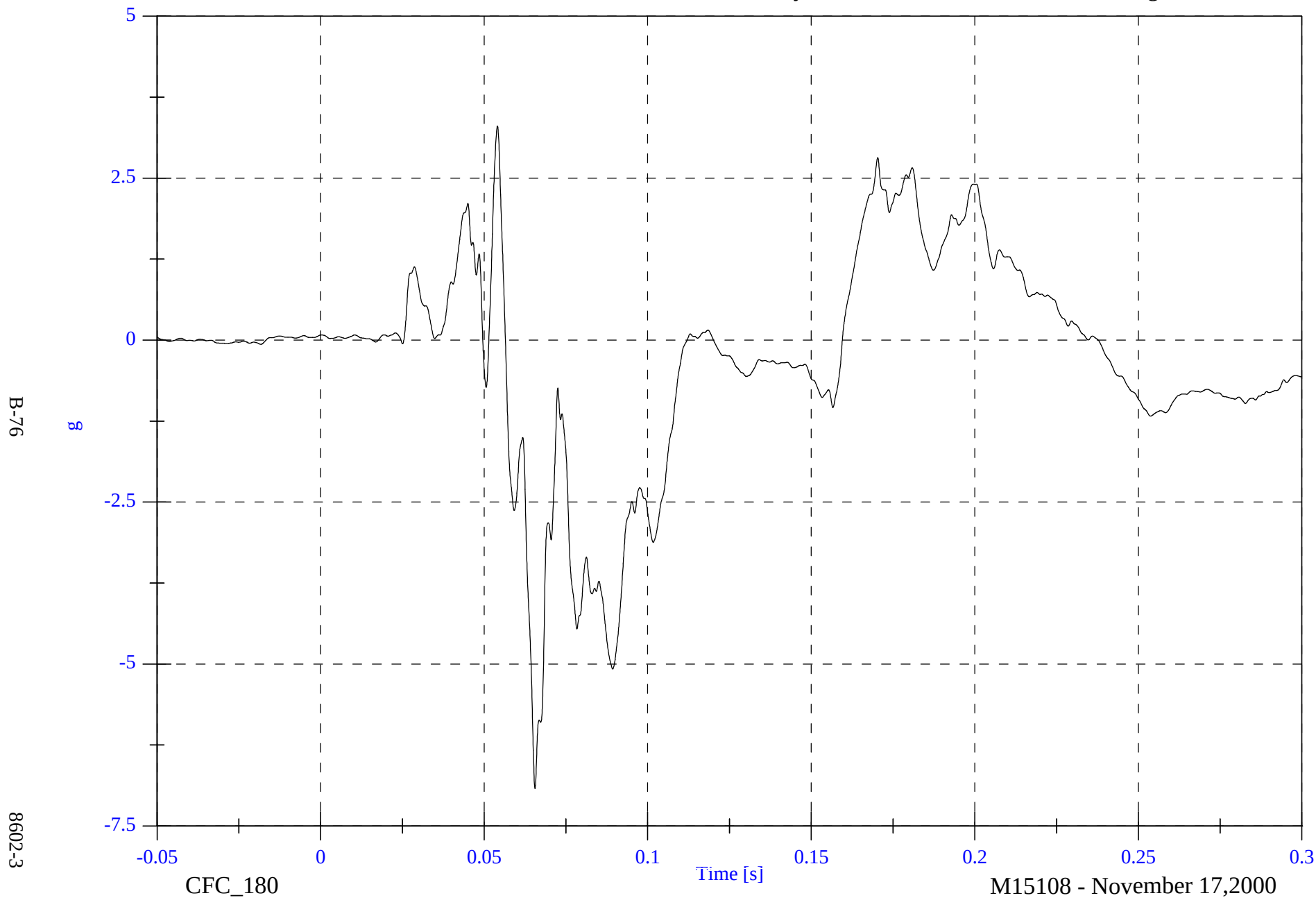


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest Red y

Max: 3.3 [g] at 0.054 [s]

Min: -6.9 [g] at 0.066 [s]

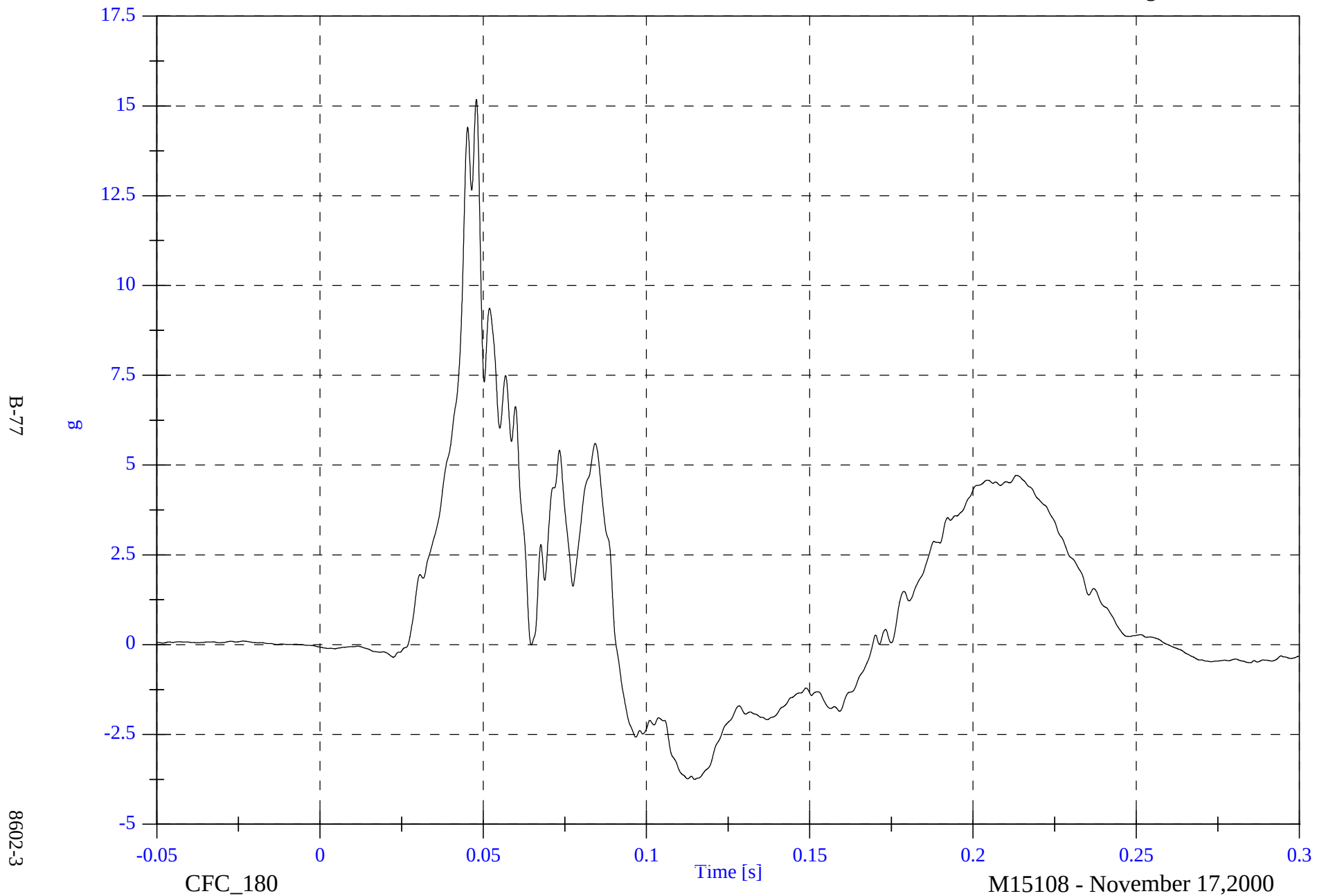


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest Red z

Max: 15.2 [g] at 0.048 [s]

Min: -3.8 [g] at 0.115 [s]

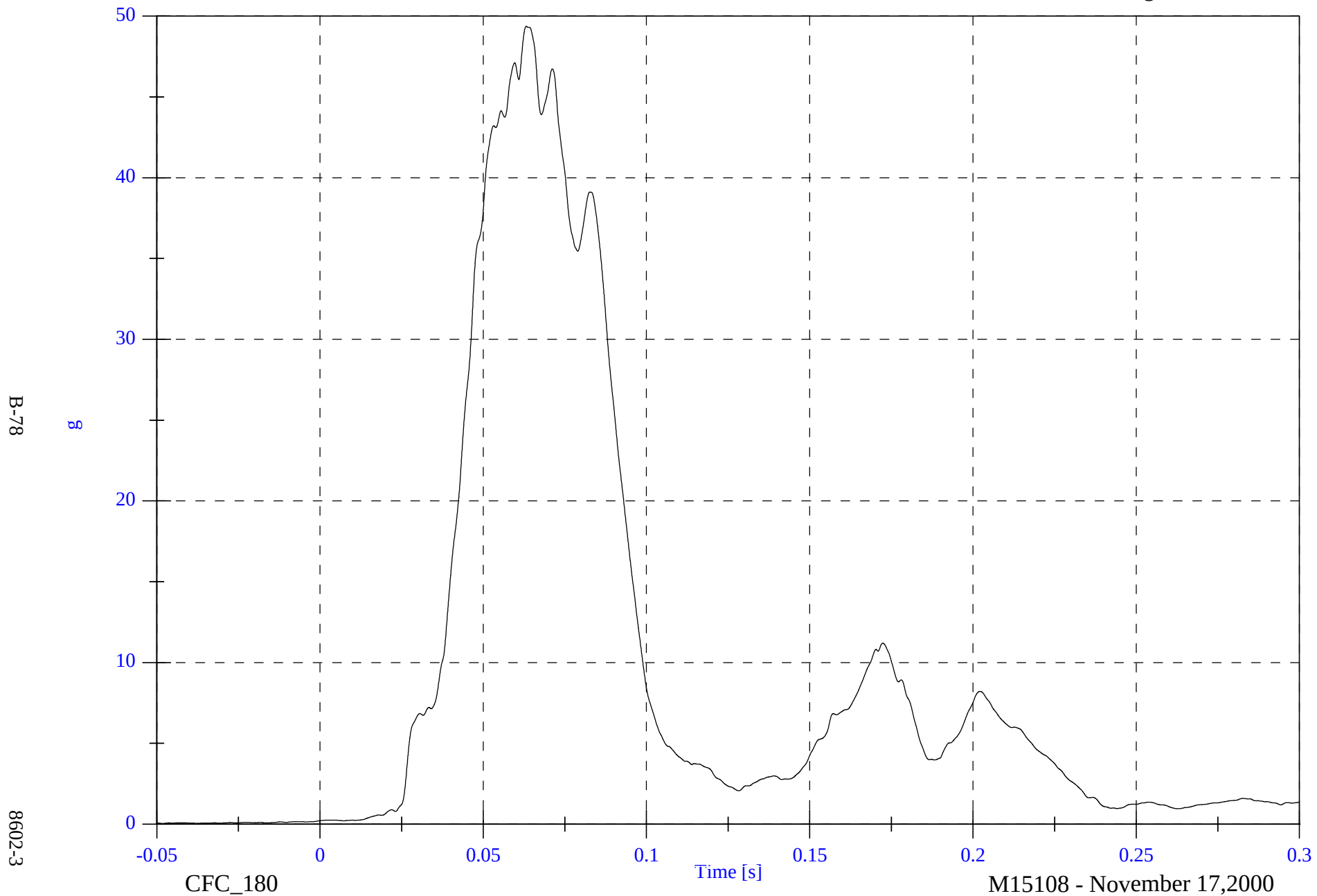


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest Red Resultant

Max: 49.4 [g] at 0.063 [s]

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

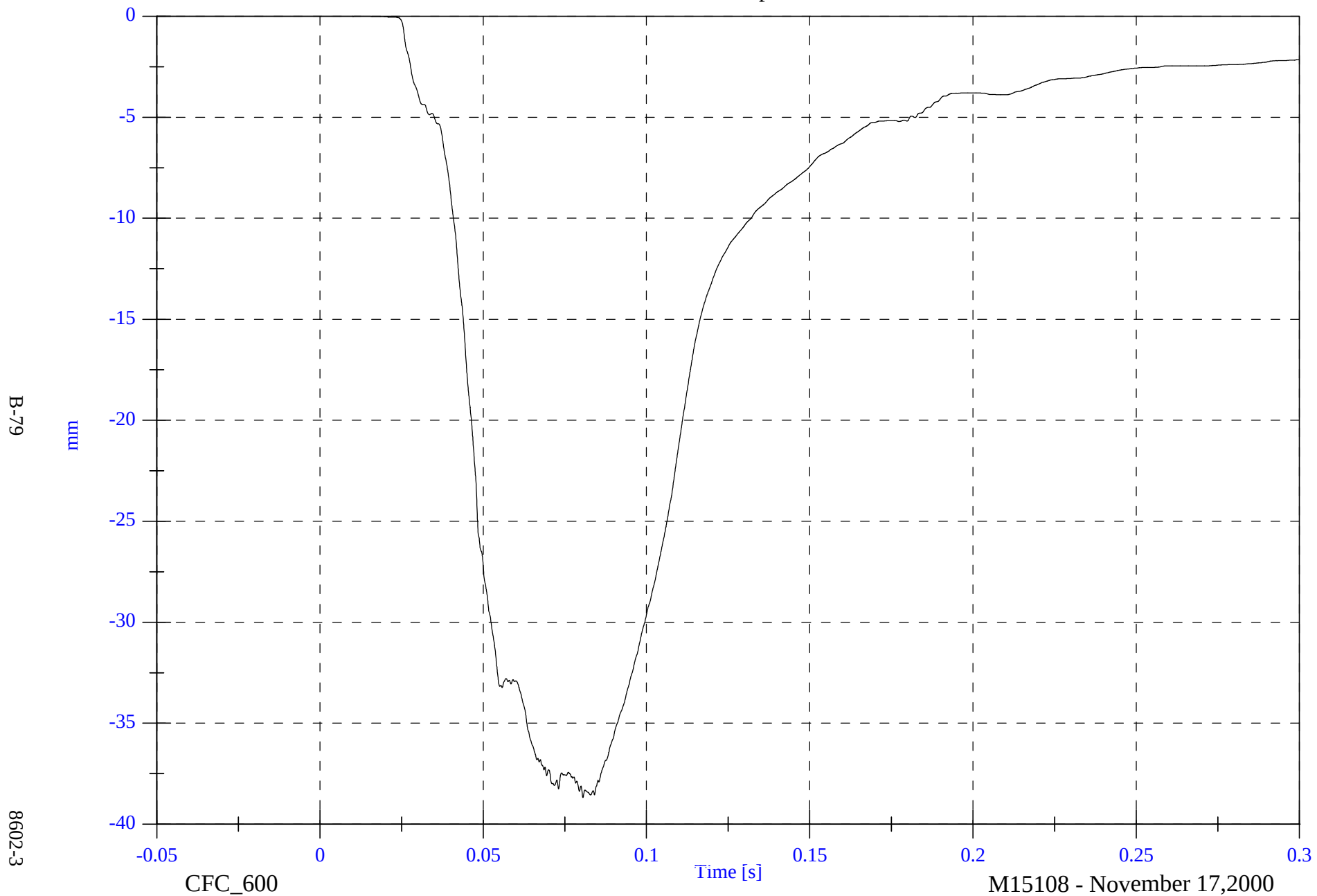


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Chest Compression

Max: 0.0 [mm] at -0.027 [s]

Min: -38.7 [mm] at 0.081 [s]

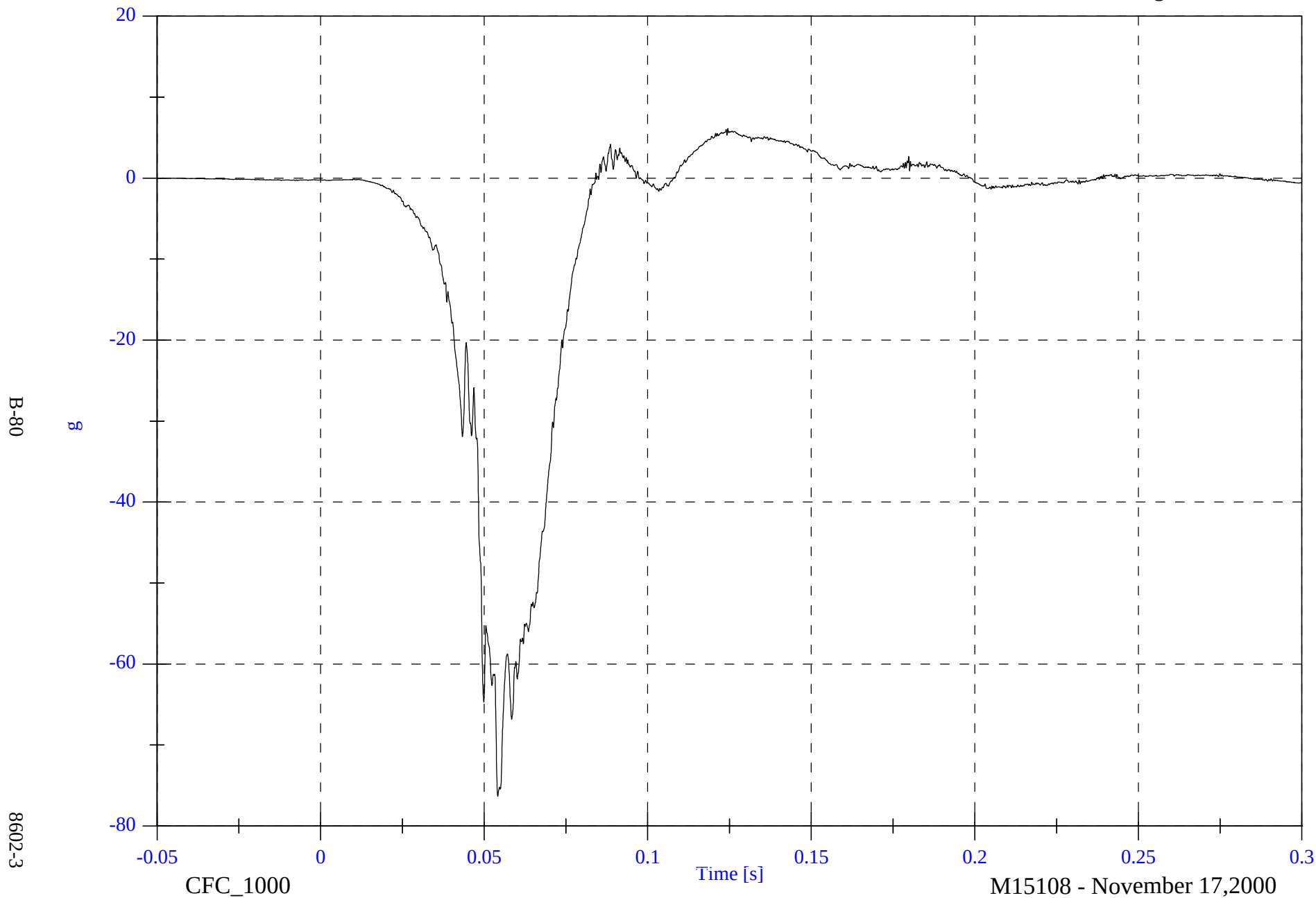


NCAP 2001 Test 3 - 2001 Toyota Tundra

Max: 6.1 [g] at 0.125 [s]

Min: -76.3 [g] at 0.054 [s]

P2 Pelvic x

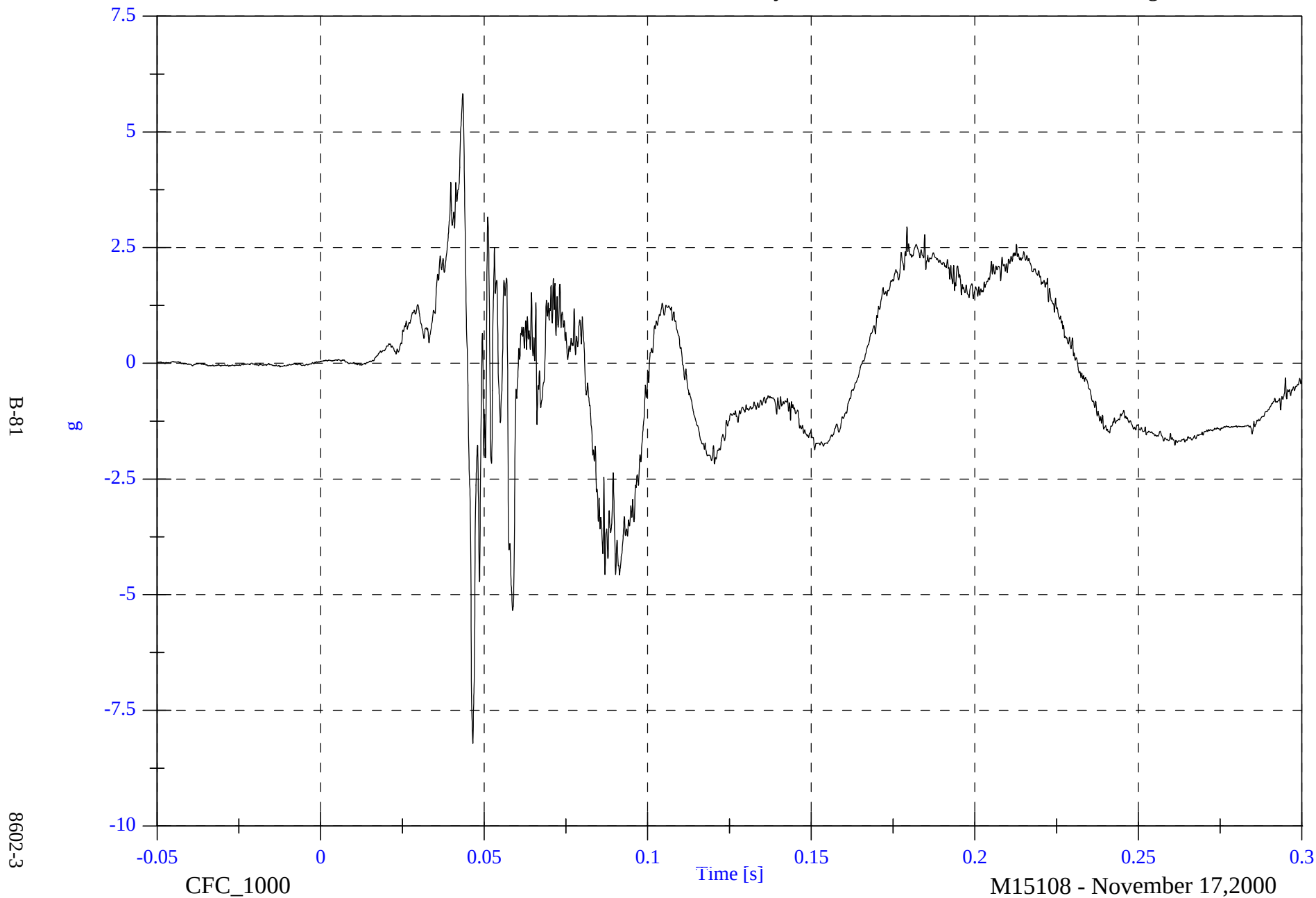


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Pelvic y

Max: 5.8 [g] at 0.043 [s]

Min: -8.2 [g] at 0.046 [s]

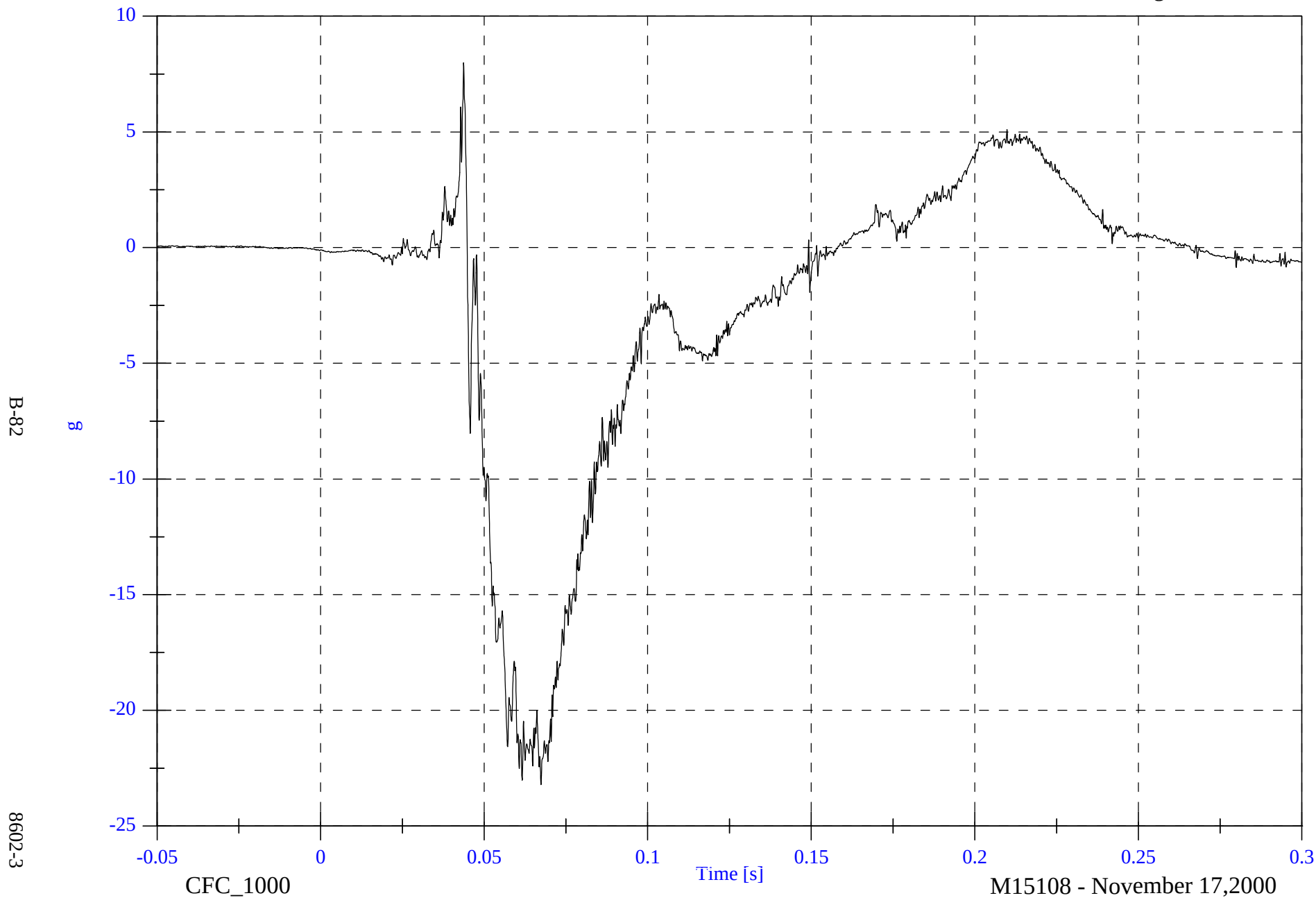


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Pelvic z

Max: 8.0 [g] at 0.044 [s]

Min: -23.2 [g] at 0.067 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

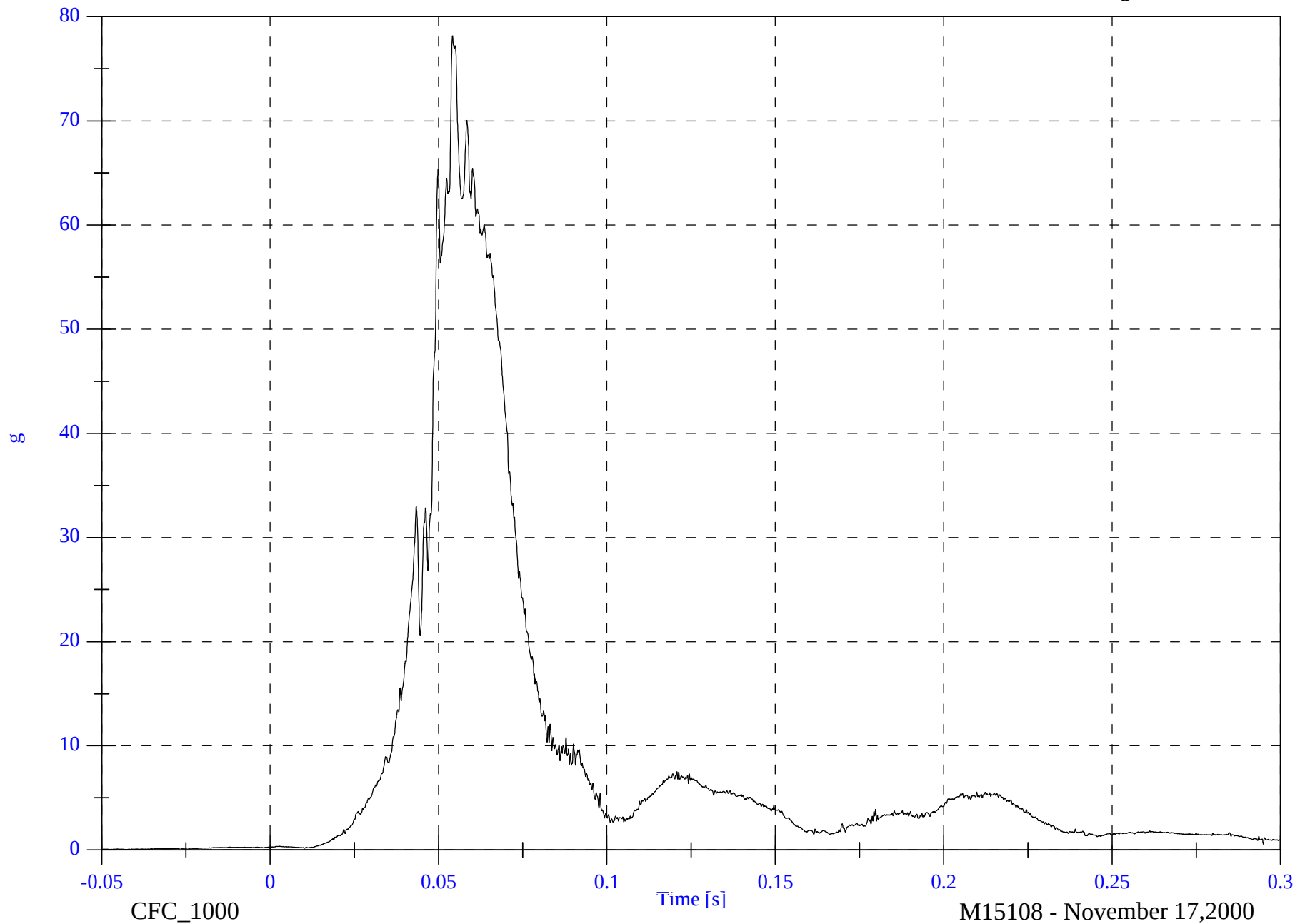
P2 Pelvic Resultant

Max: 78.2 [g] at 0.054 [s]

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

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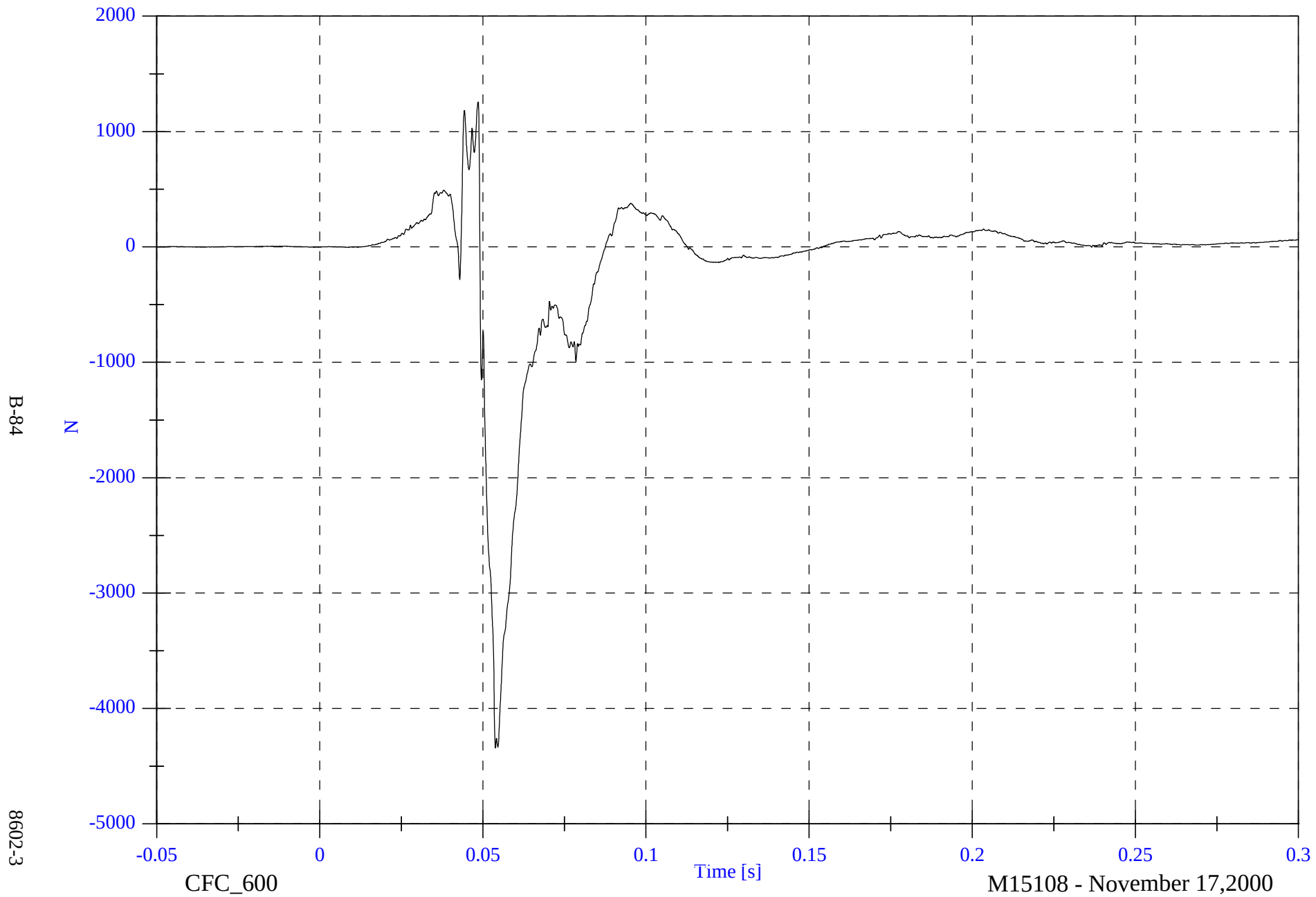


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Femur

Max: 1255.5 [N] at 0.049 [s]

Min: -4342.8 [N] at 0.054 [s]

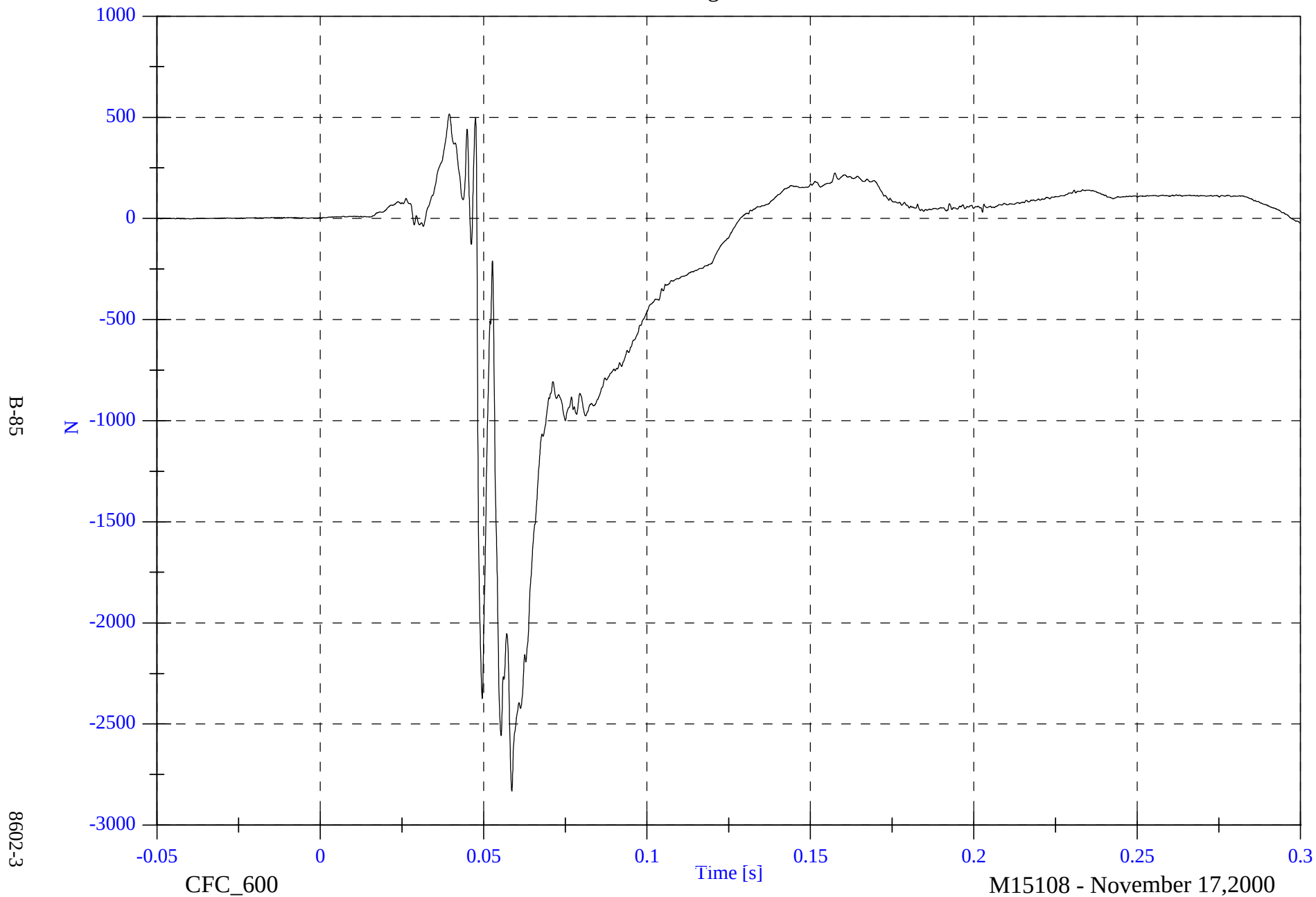


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Femur

Max: 516.2 [N] at 0.039 [s]

Min: -2832.1 [N] at 0.059 [s]

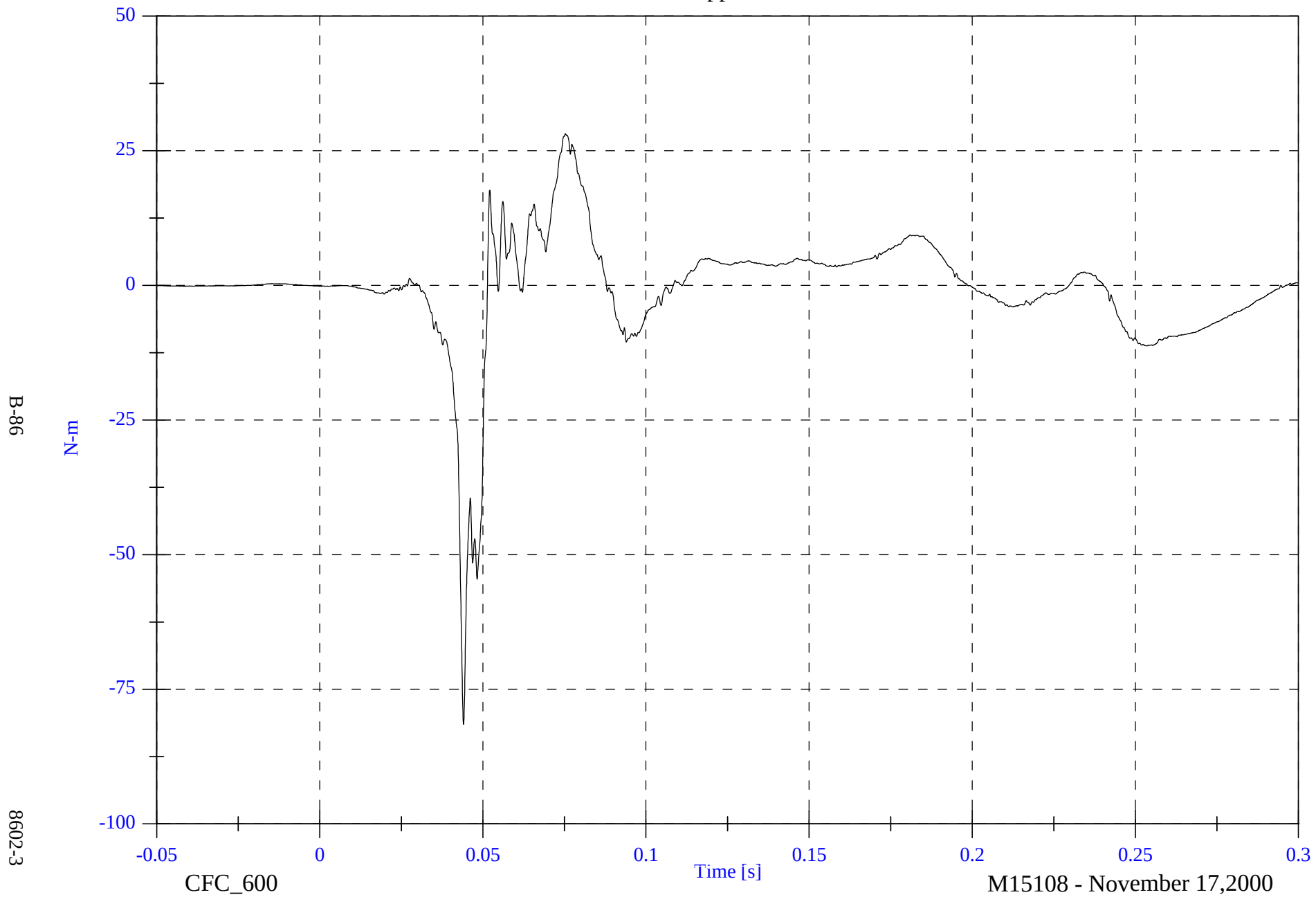


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Upper Tibia Mx

Max: 28.2 [N-m] at 0.075 [s]

Min: -81.5 [N-m] at 0.044 [s]

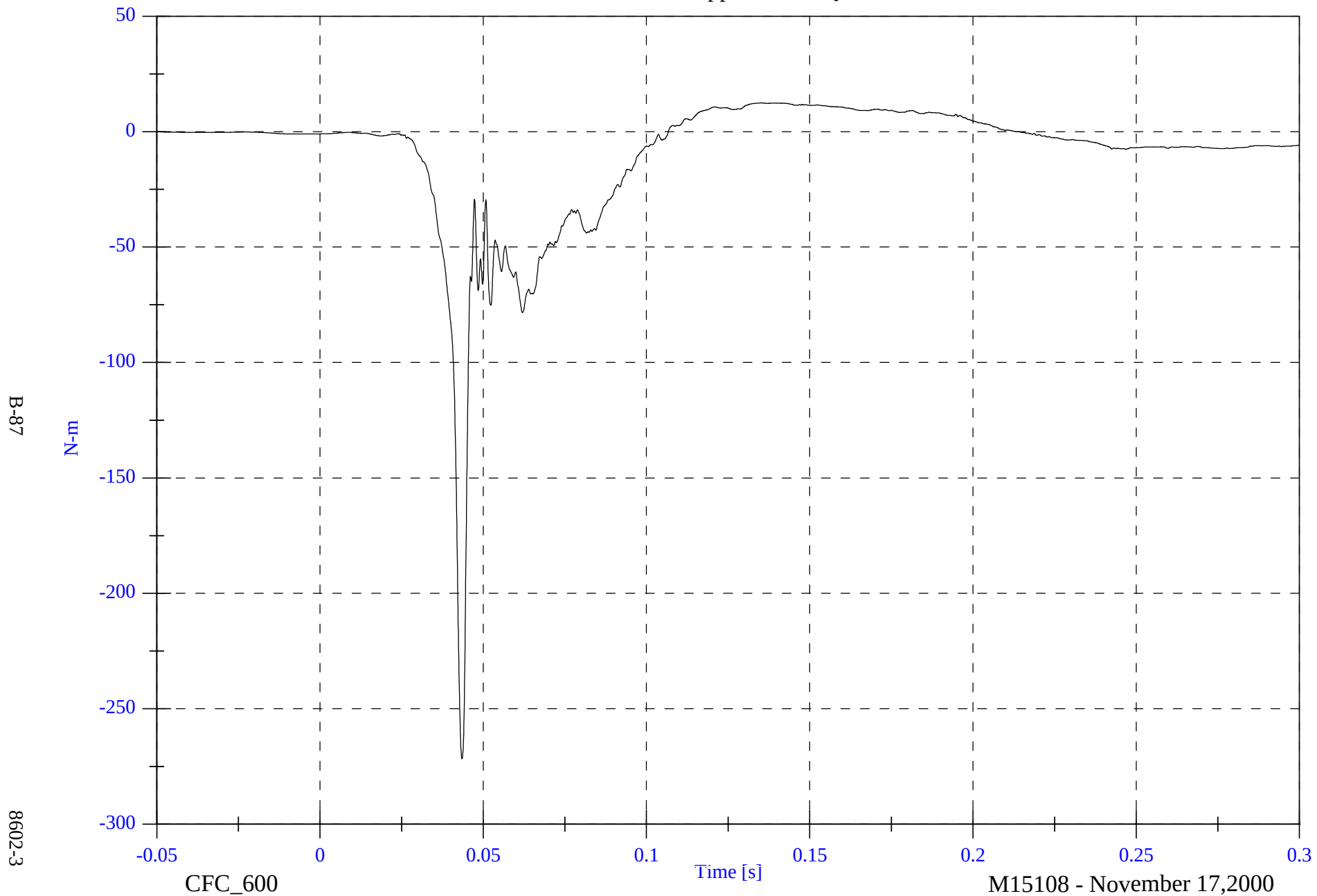


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Upper Tibia My

Max: 12.4 [N-m] at 0.135 [s]

Min: -271.7 [N-m] at 0.043 [s]

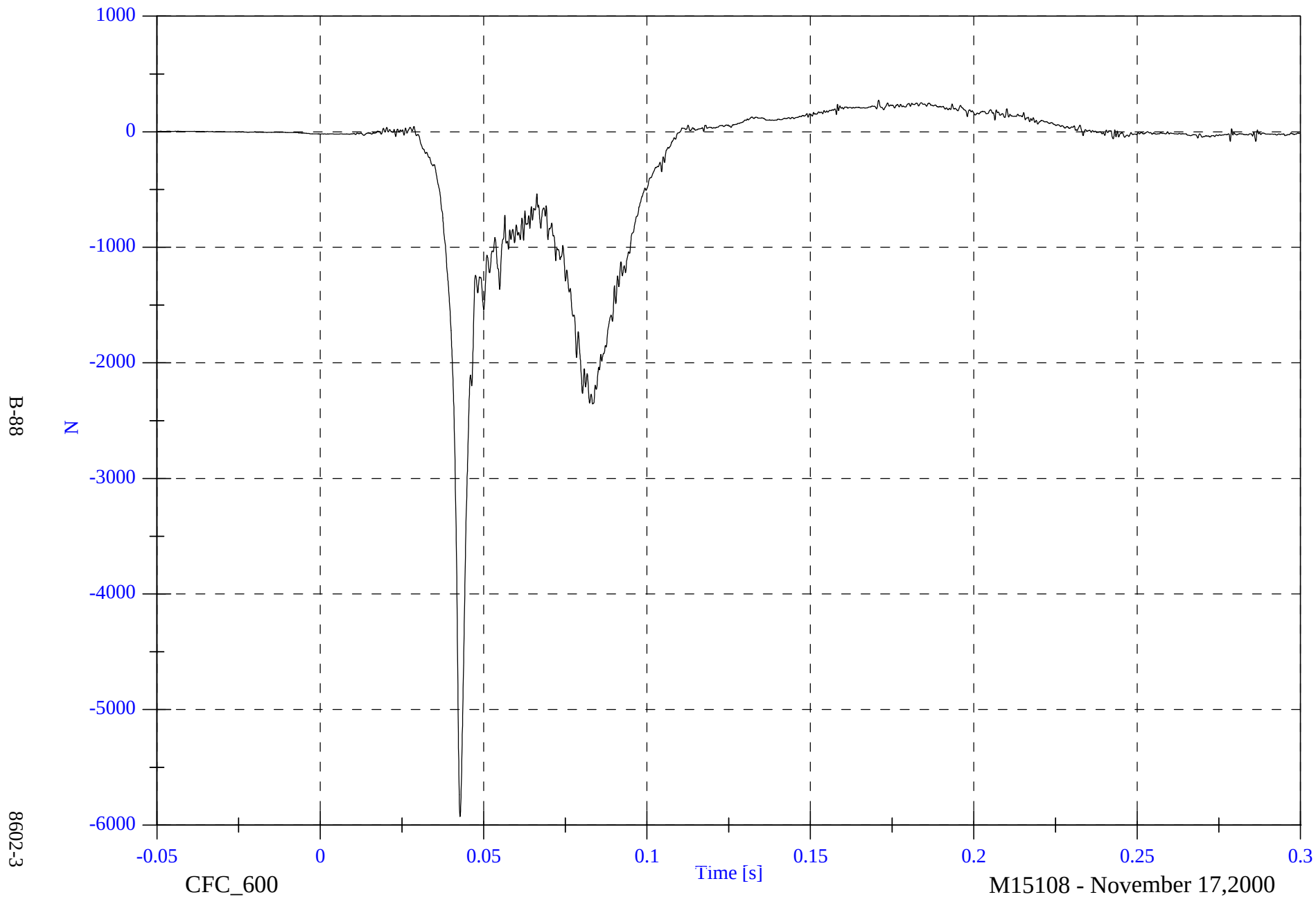


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Lower Tibia Fz

Max: 272.3 [N] at 0.171 [s]

Min: -5926.4 [N] at 0.043 [s]

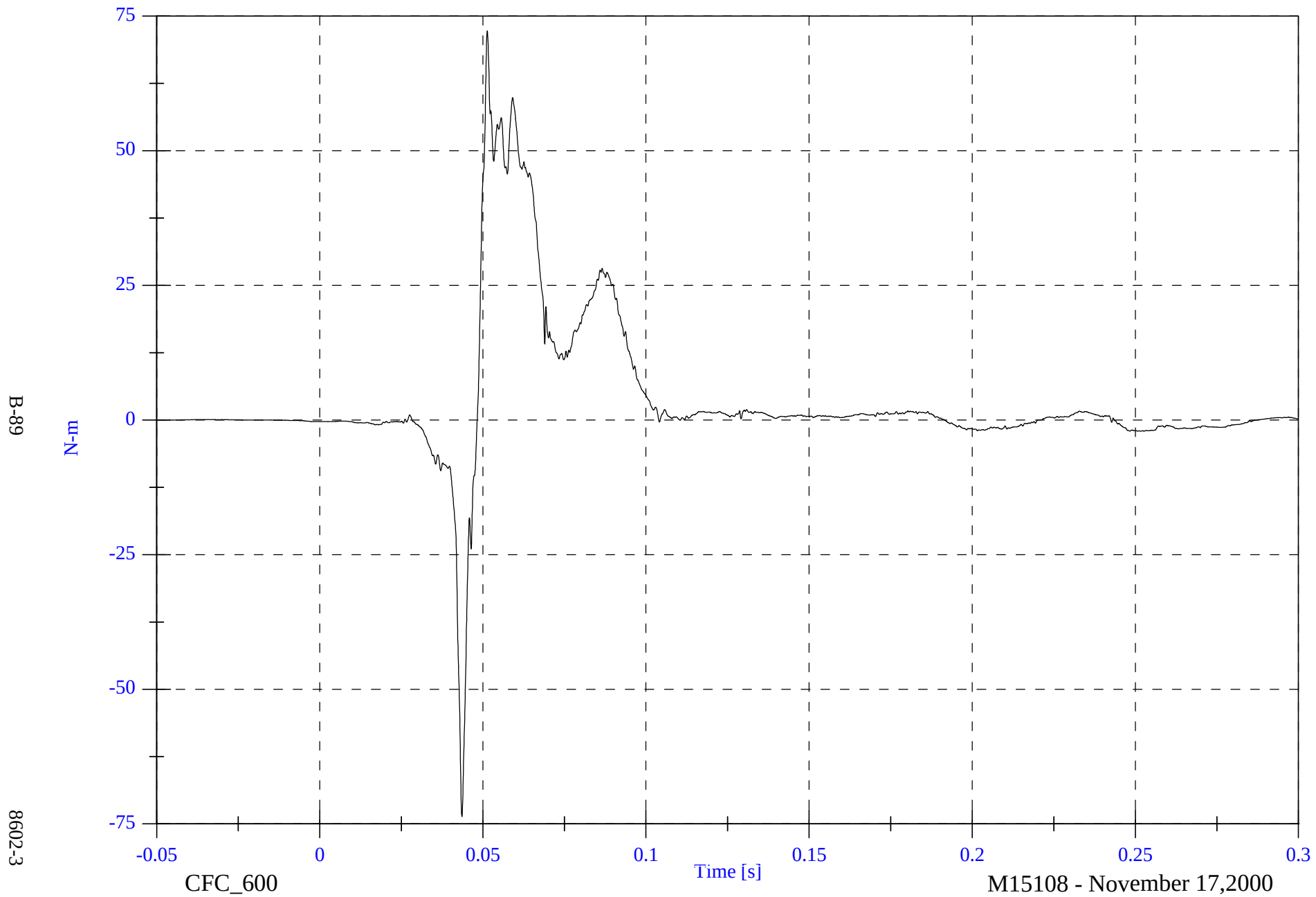


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Lower Tibia Mx

Max: 72.3 [N-m] at 0.051 [s]

Min: -73.7 [N-m] at 0.044 [s]

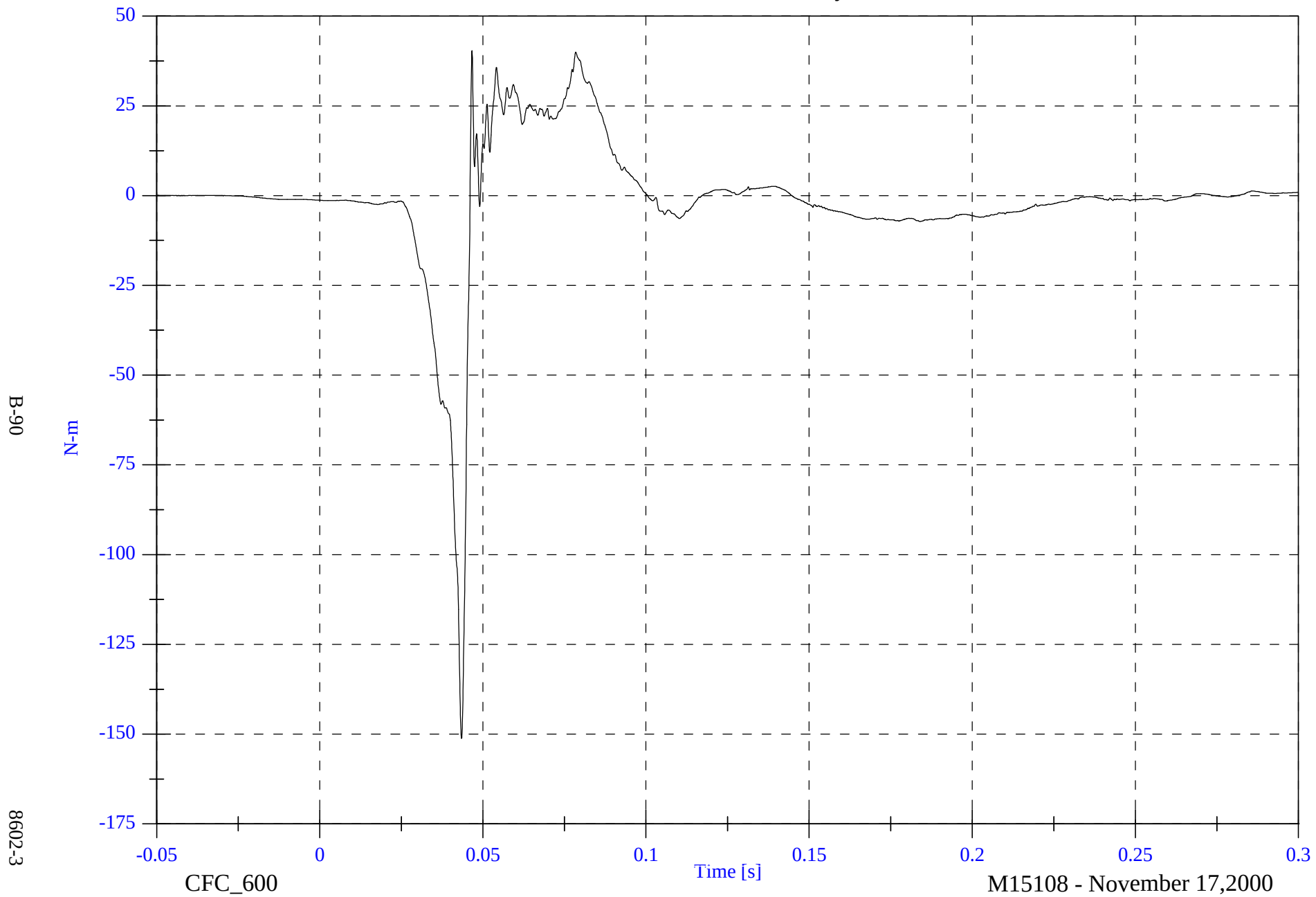


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Lower Tibia My

Max: 40.4 [N-m] at 0.047 [s]

Min: -151.2 [N-m] at 0.043 [s]

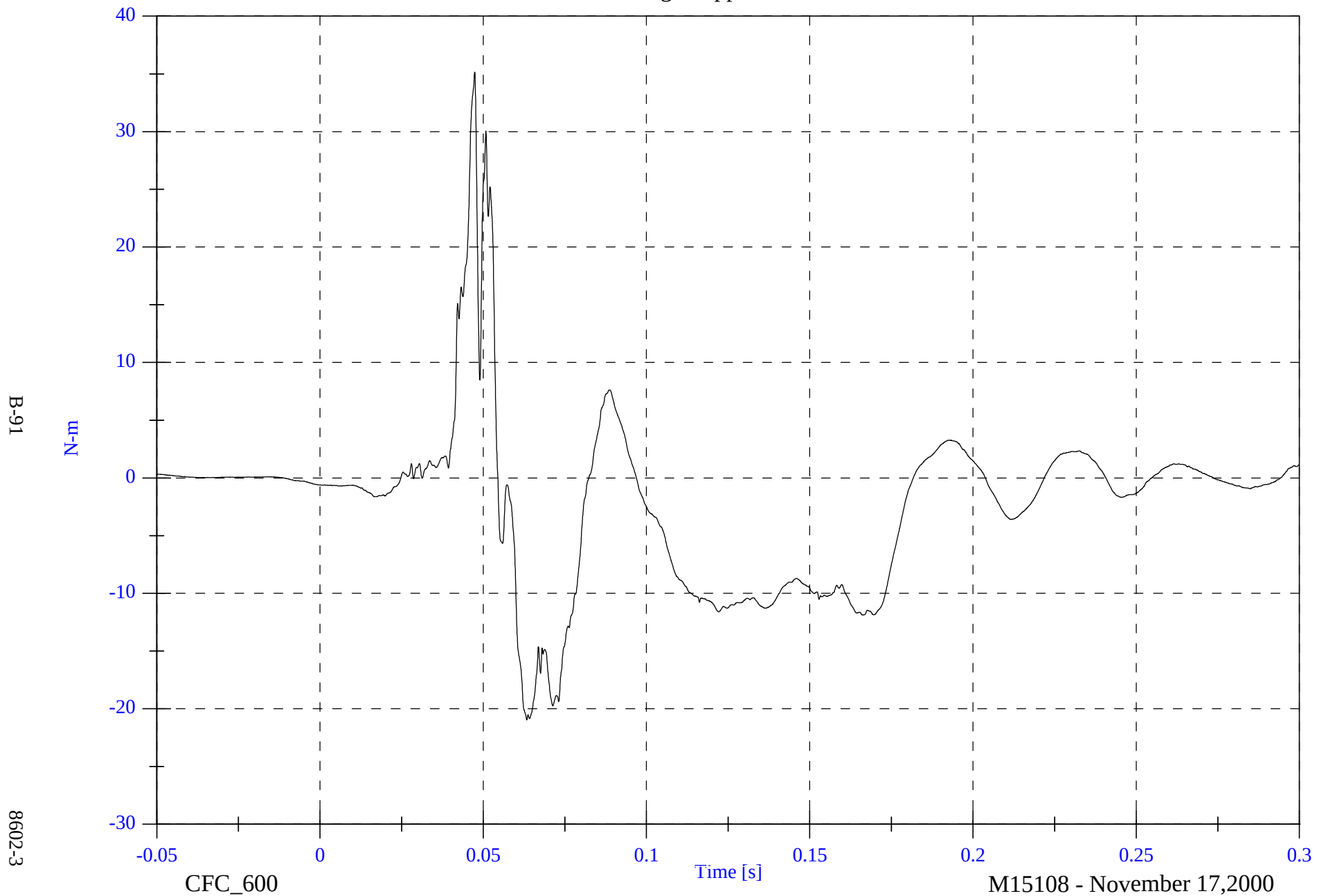


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Upper Tibia Mx

Max: 35.2 [N-m] at 0.047 [s]

Min: -21.0 [N-m] at 0.063 [s]

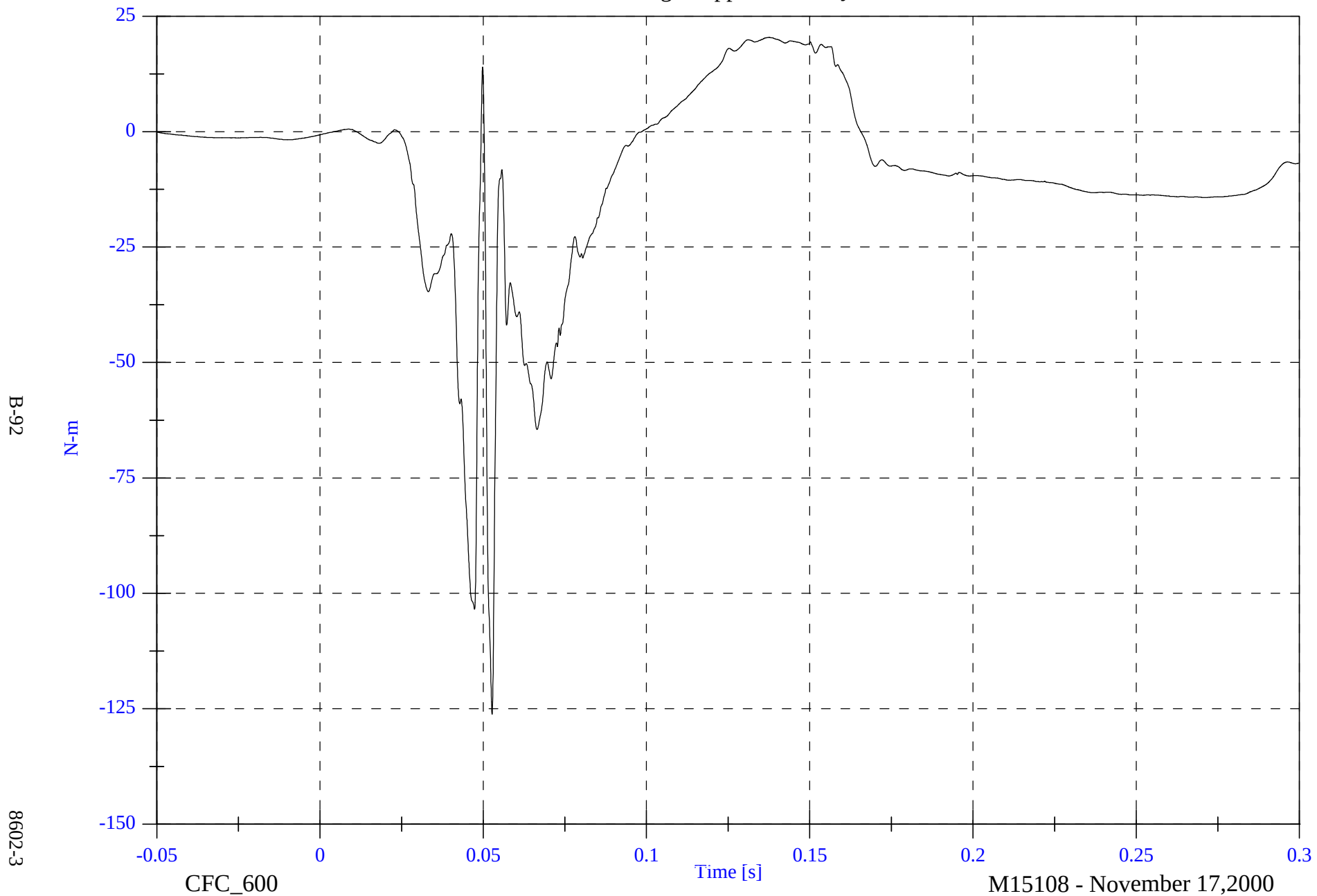


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Upper Tibia My

Max: 20.4 [N-m] at 0.138 [s]

Min: -126.2 [N-m] at 0.053 [s]

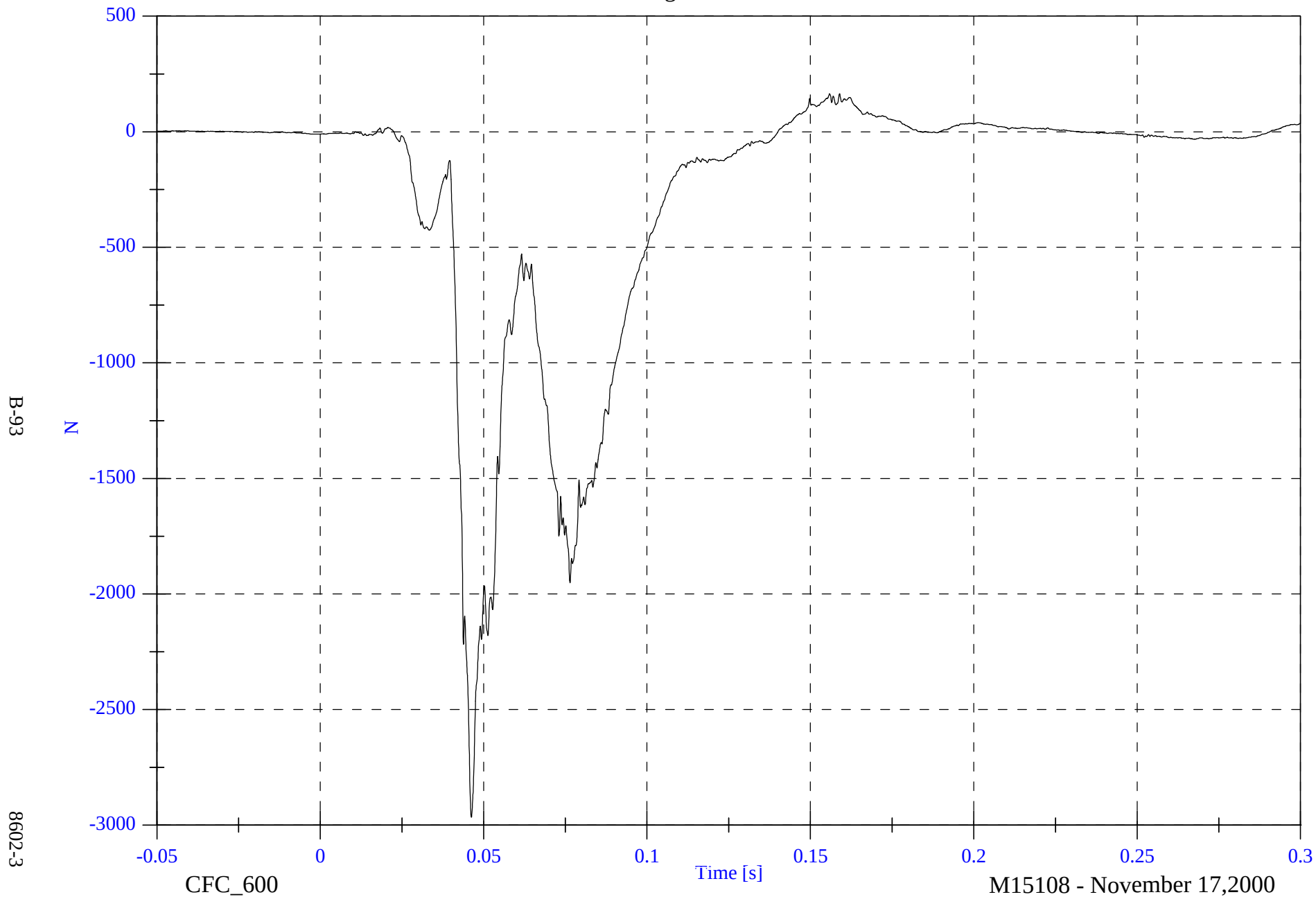


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Lower Tibia Fz

Max: 164.9 [N] at 0.159 [s]

Min: -2965.7 [N] at 0.046 [s]

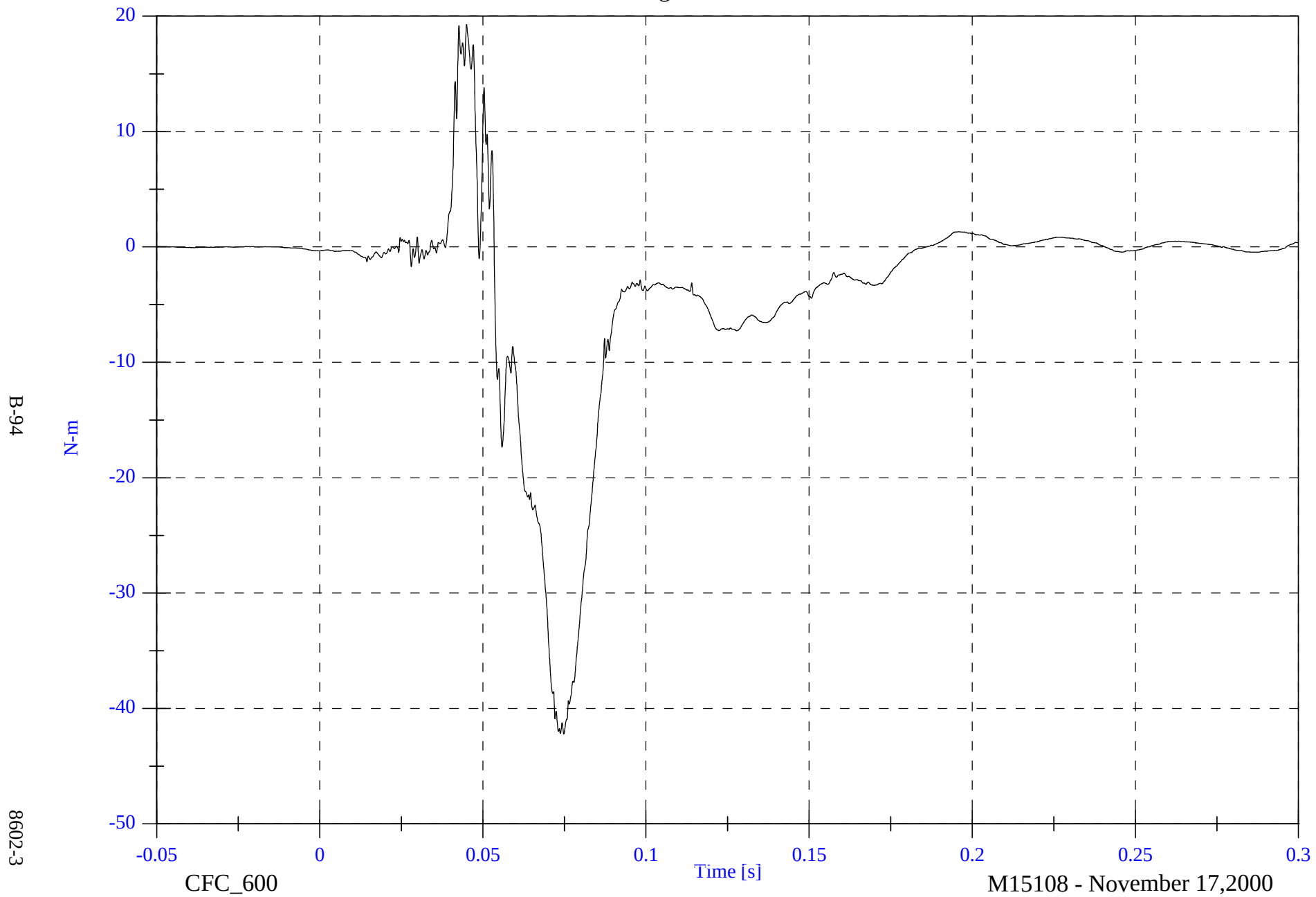


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Lower Tibia Mx

Max: 19.3 [N-m] at 0.045 [s]

Min: -42.2 [N-m] at 0.075 [s]

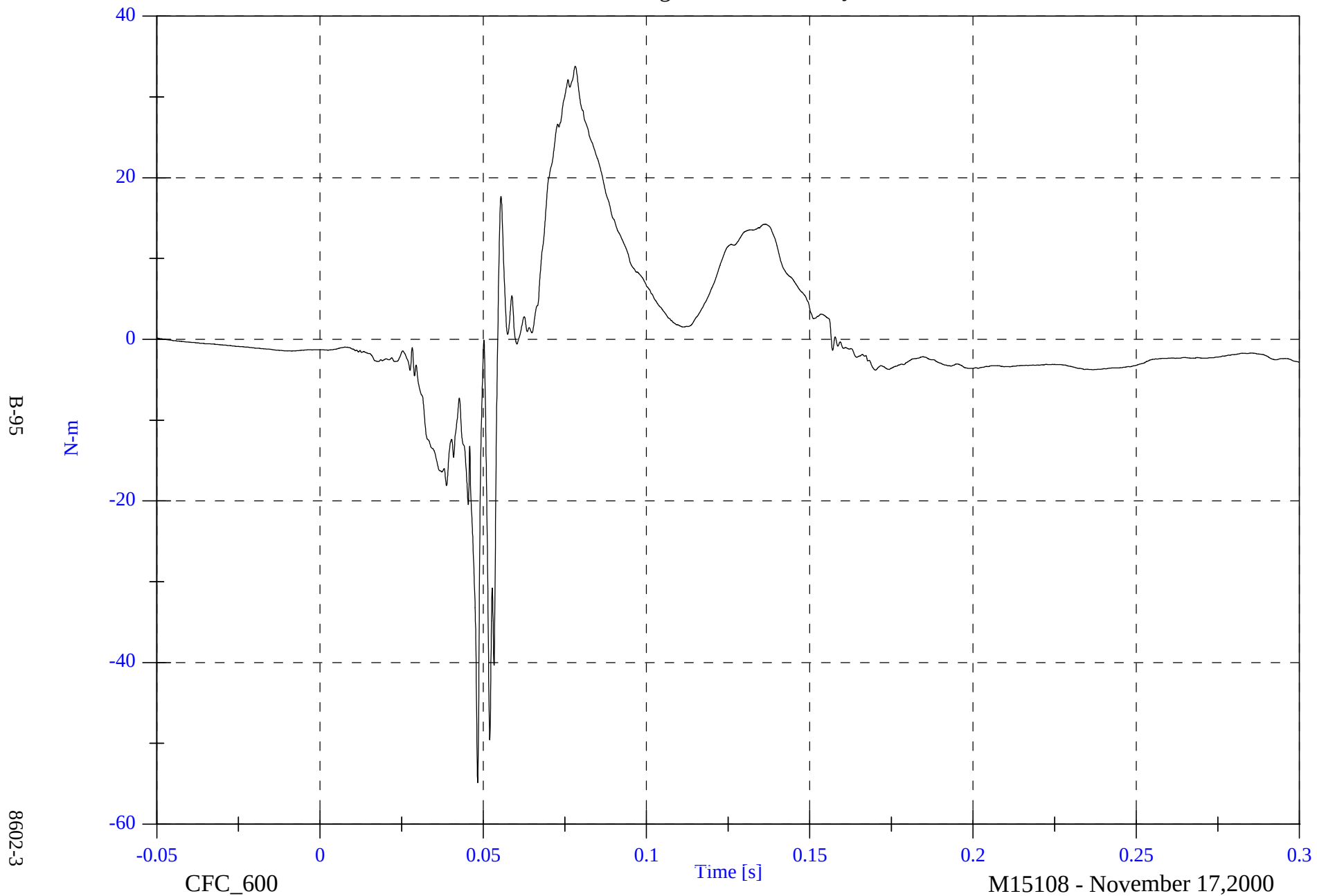


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Lower Tibia My

Max: 33.8 [N-m] at 0.078 [s]

Min: -54.9 [N-m] at 0.048 [s]

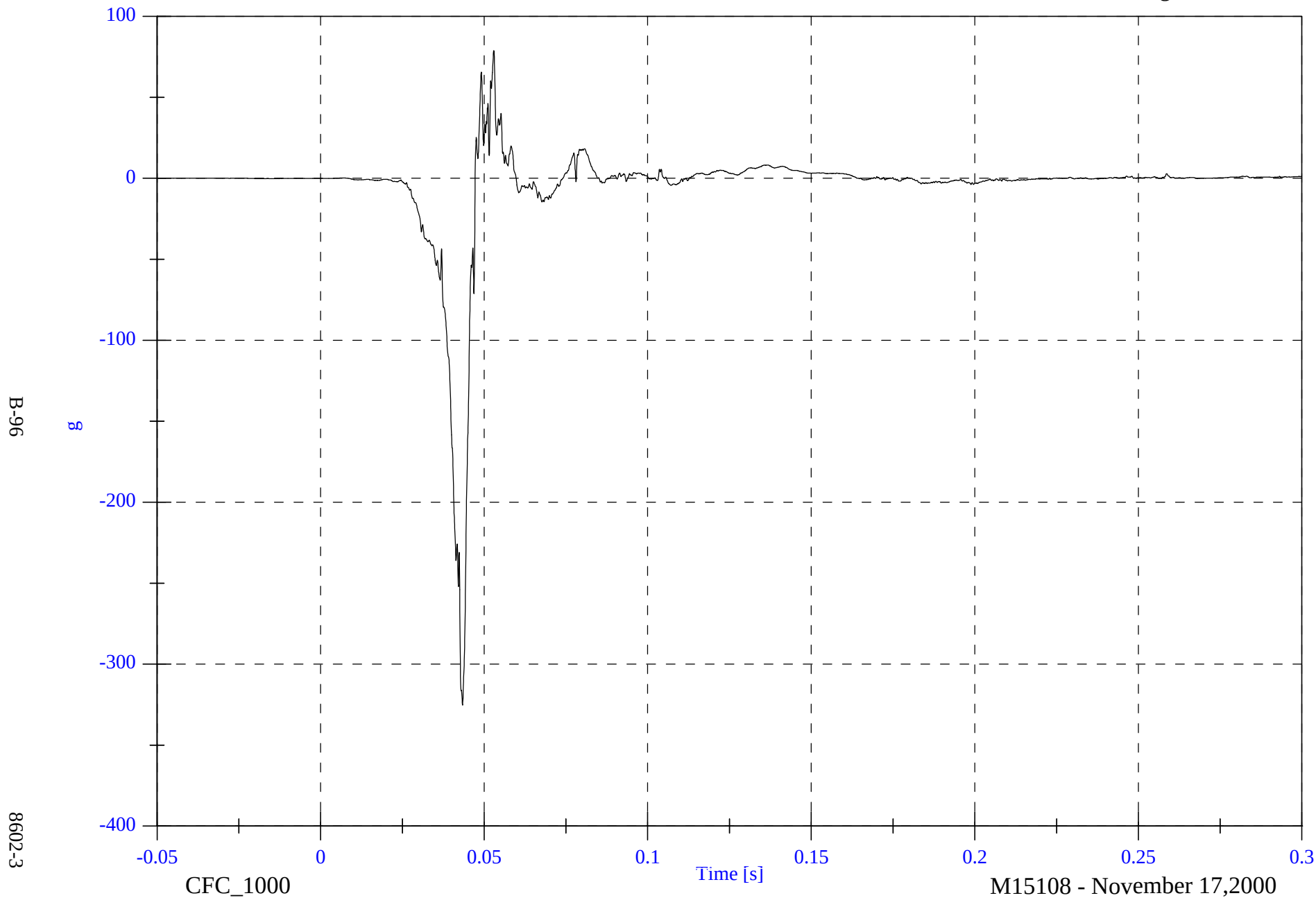


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Foot Aft x

Max: 78.8 [g] at 0.053 [s]

Min: -325.4 [g] at 0.043 [s]

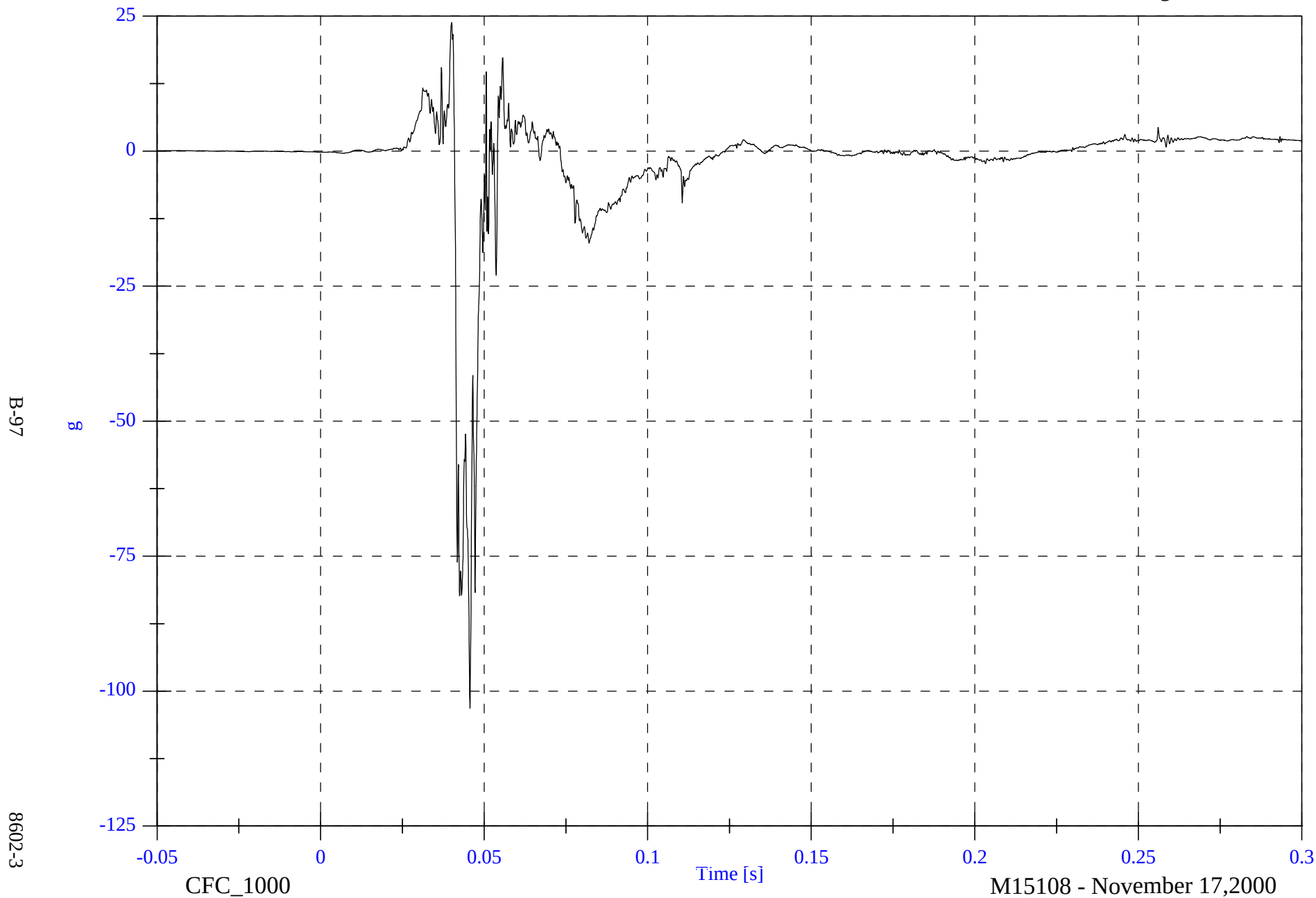


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Foot Aft z

Max: 23.8 [g] at 0.040 [s]

Min: -103.2 [g] at 0.046 [s]

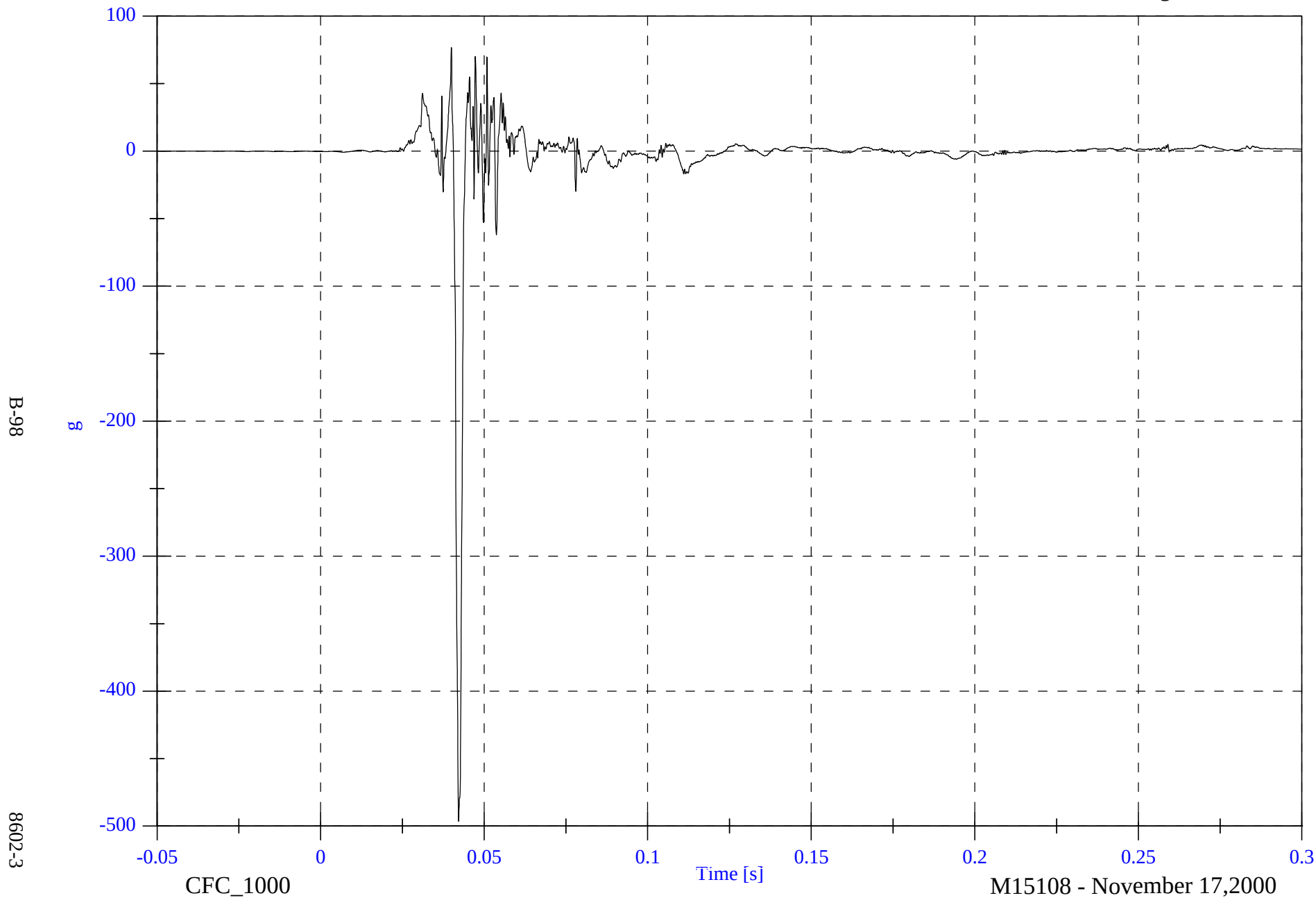


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Left Foot Fore z

Max: 76.9 [g] at 0.040 [s]

Min: -496.5 [g] at 0.042 [s]

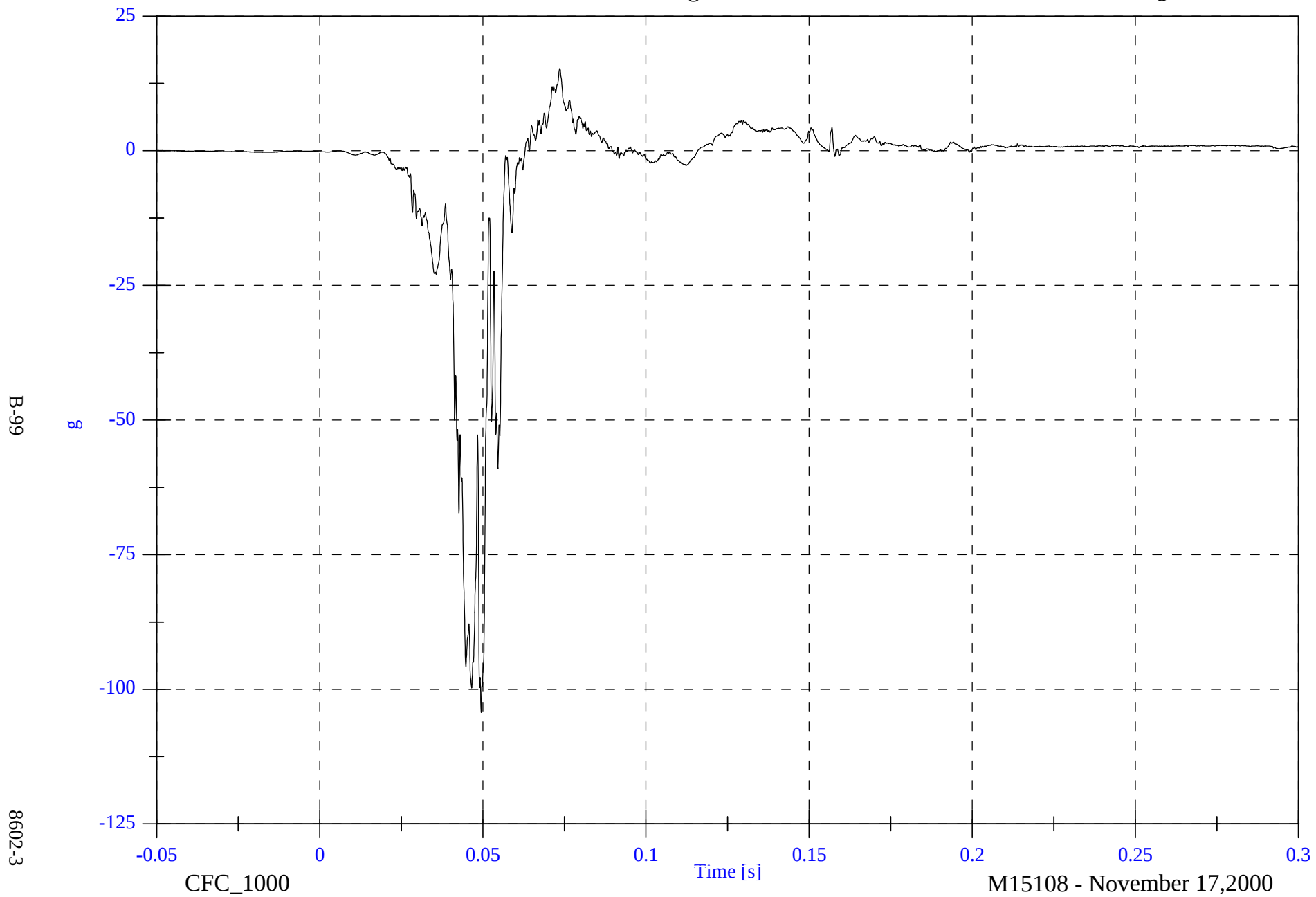


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Foot Aft x

Max: 15.3 [g] at 0.074 [s]

Min: -104.3 [g] at 0.049 [s]

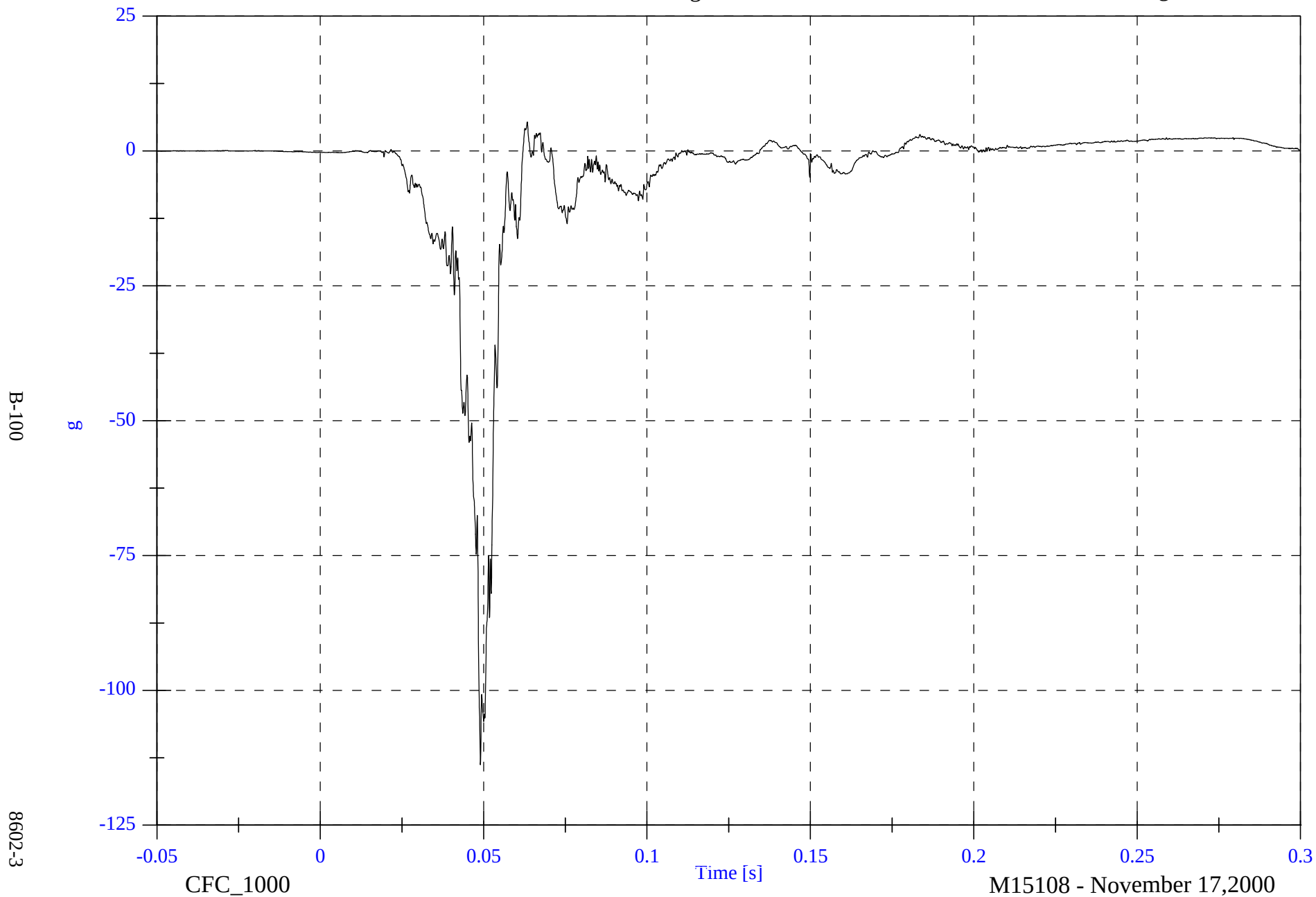


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Foot Aft z

Max: 5.4 [g] at 0.063 [s]

Min: -113.8 [g] at 0.049 [s]

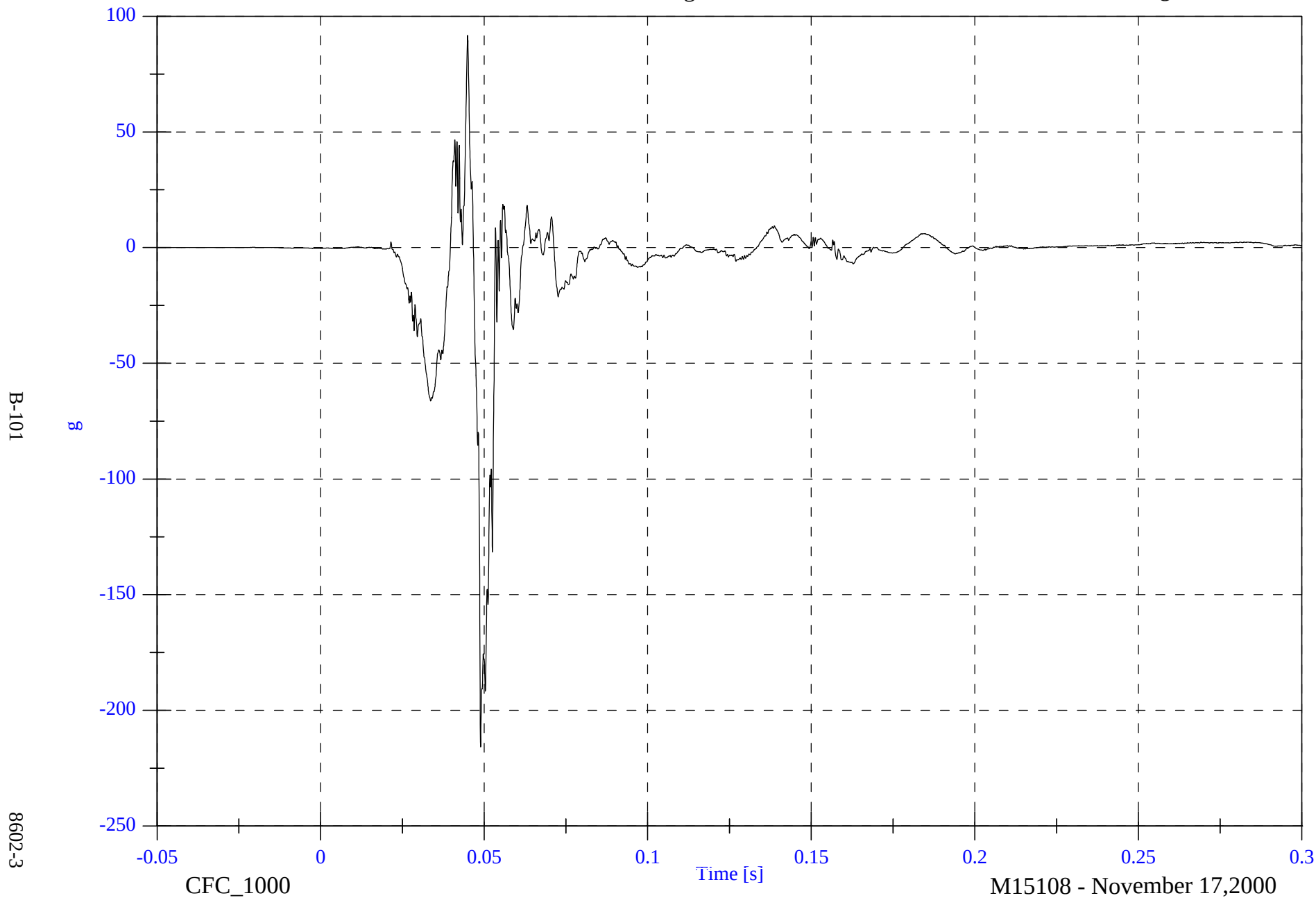


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Right Foot Fore x

Max: 91.7 [g] at 0.045 [s]

Min: -215.8 [g] at 0.049 [s]

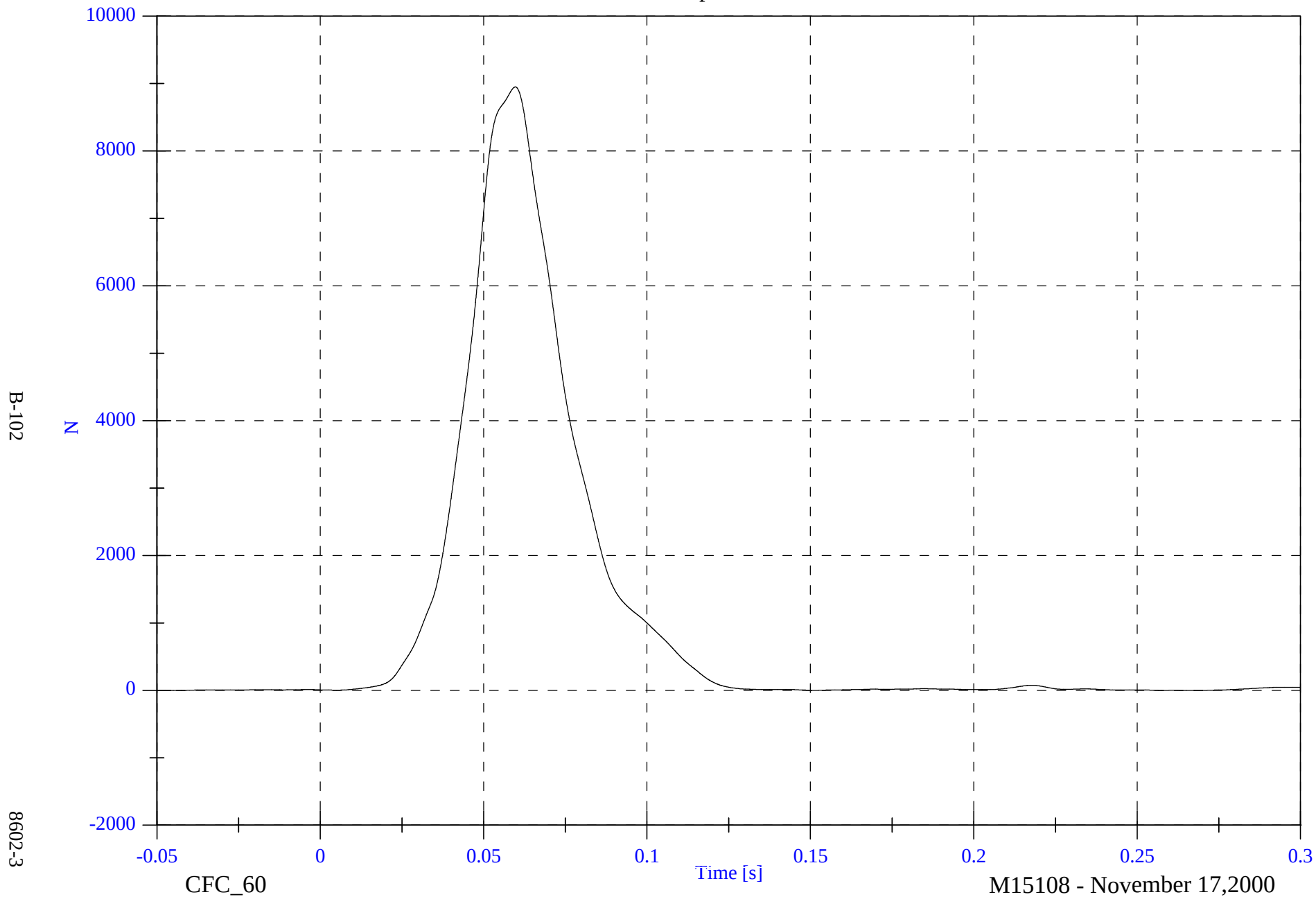


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Lap Belt Force

Max: 8950.5 [N] at 0.060 [s]

Min: -2.3 [N] at 0.268 [s]

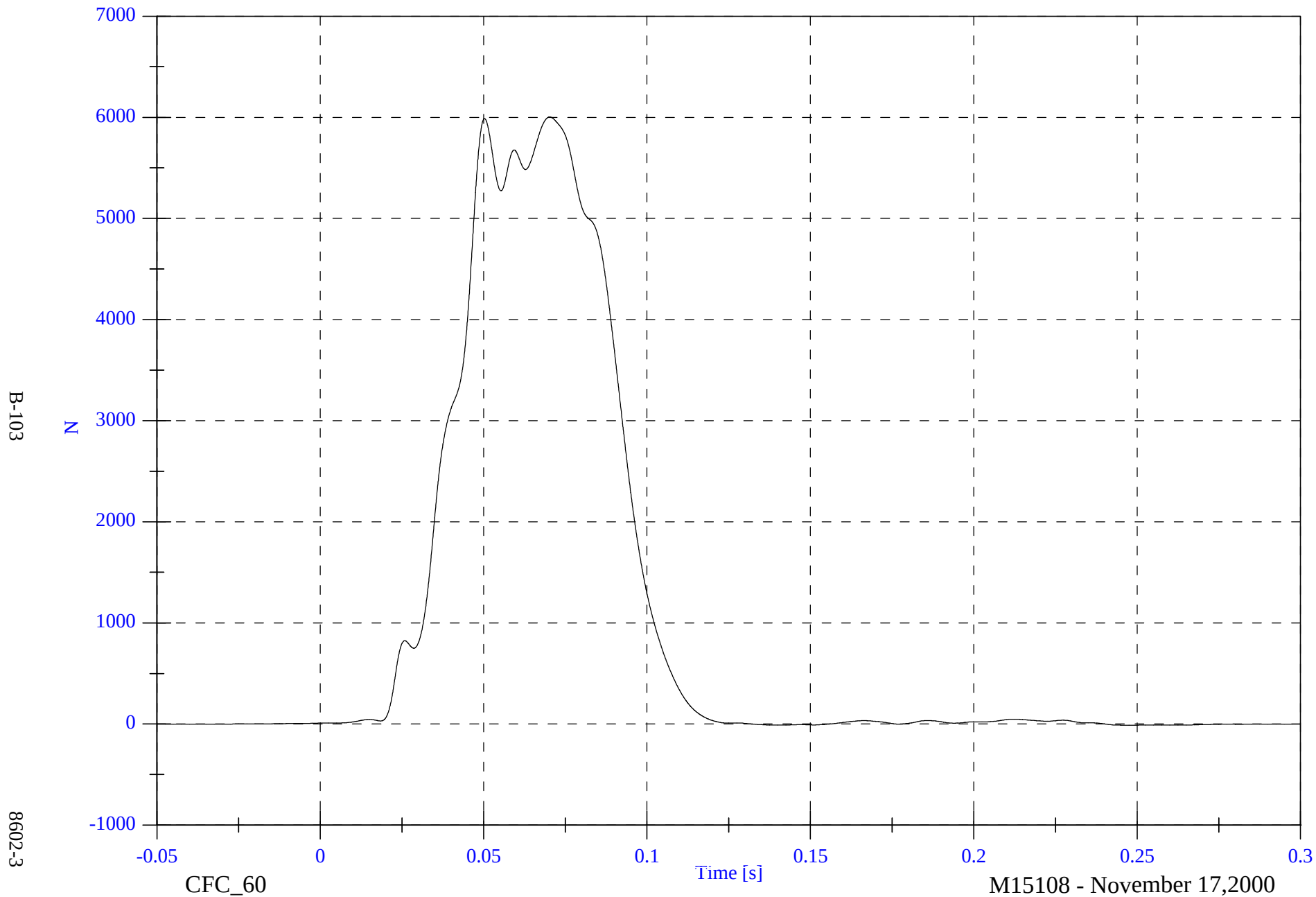


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Shoulder Belt Force

Max: 6003.8 [N] at 0.070 [s]

Min: -12.0 [N] at 0.249 [s]

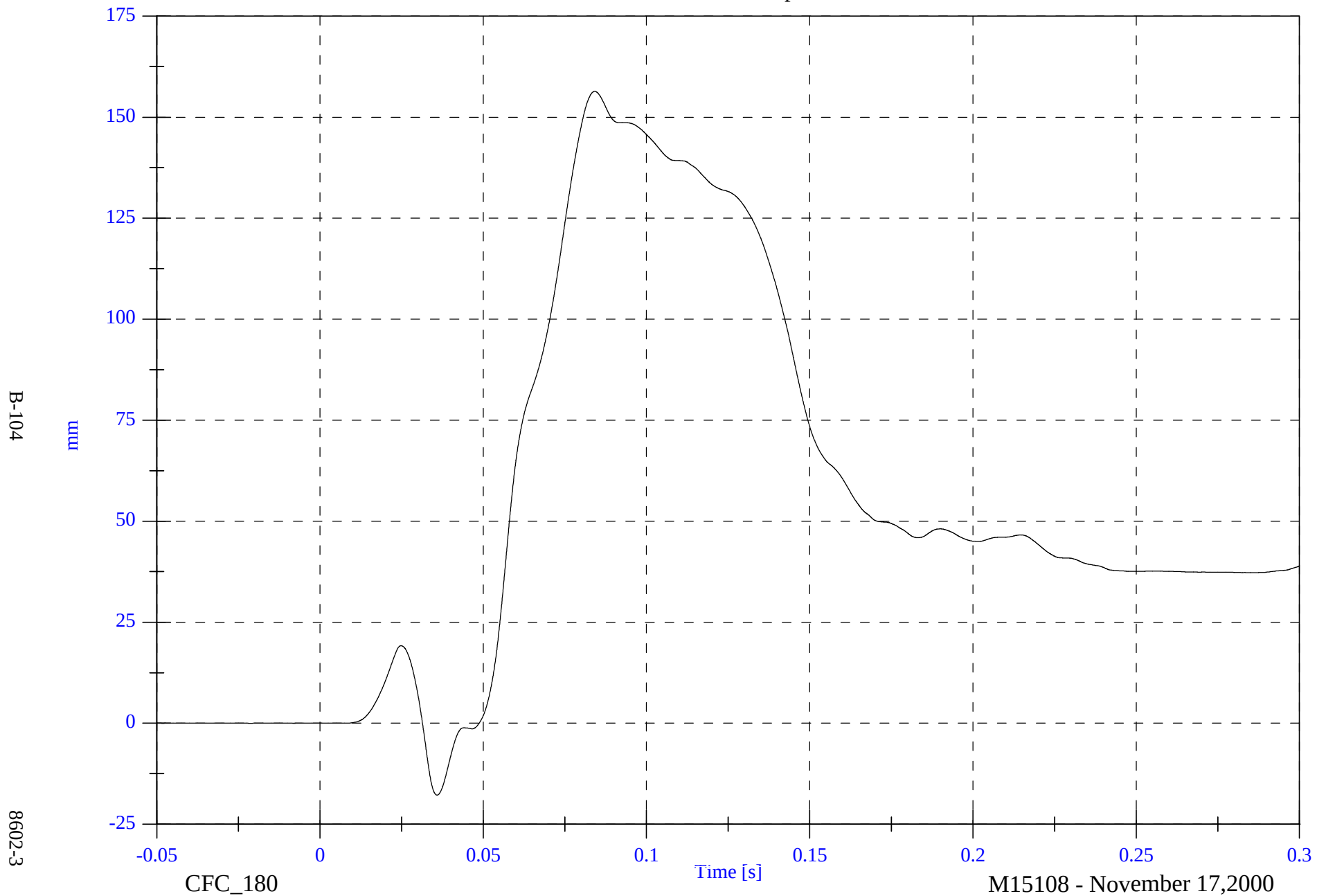


NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Shoulder Belt Spoolout

Max: 156.4 [mm] at 0.084 [s]

Min: -17.8 [mm] at 0.036 [s]



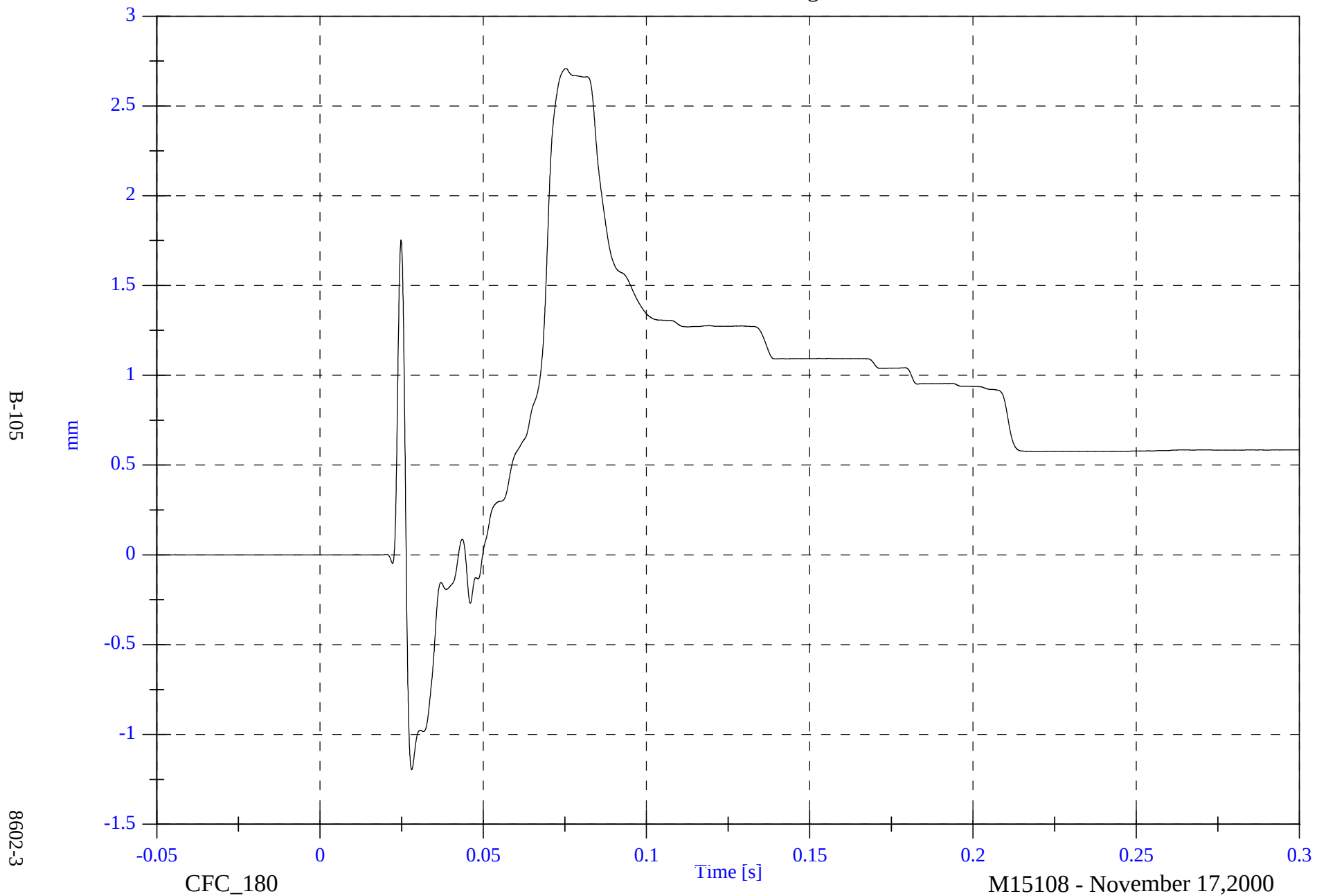
8602-3

NCAP 2001 Test 3 - 2001 Toyota Tundra

P2 Shoulder Belt Elongation

Max: 2.7 [mm] at 0.075 [s]

Min: -1.2 [mm] at 0.028 [s]

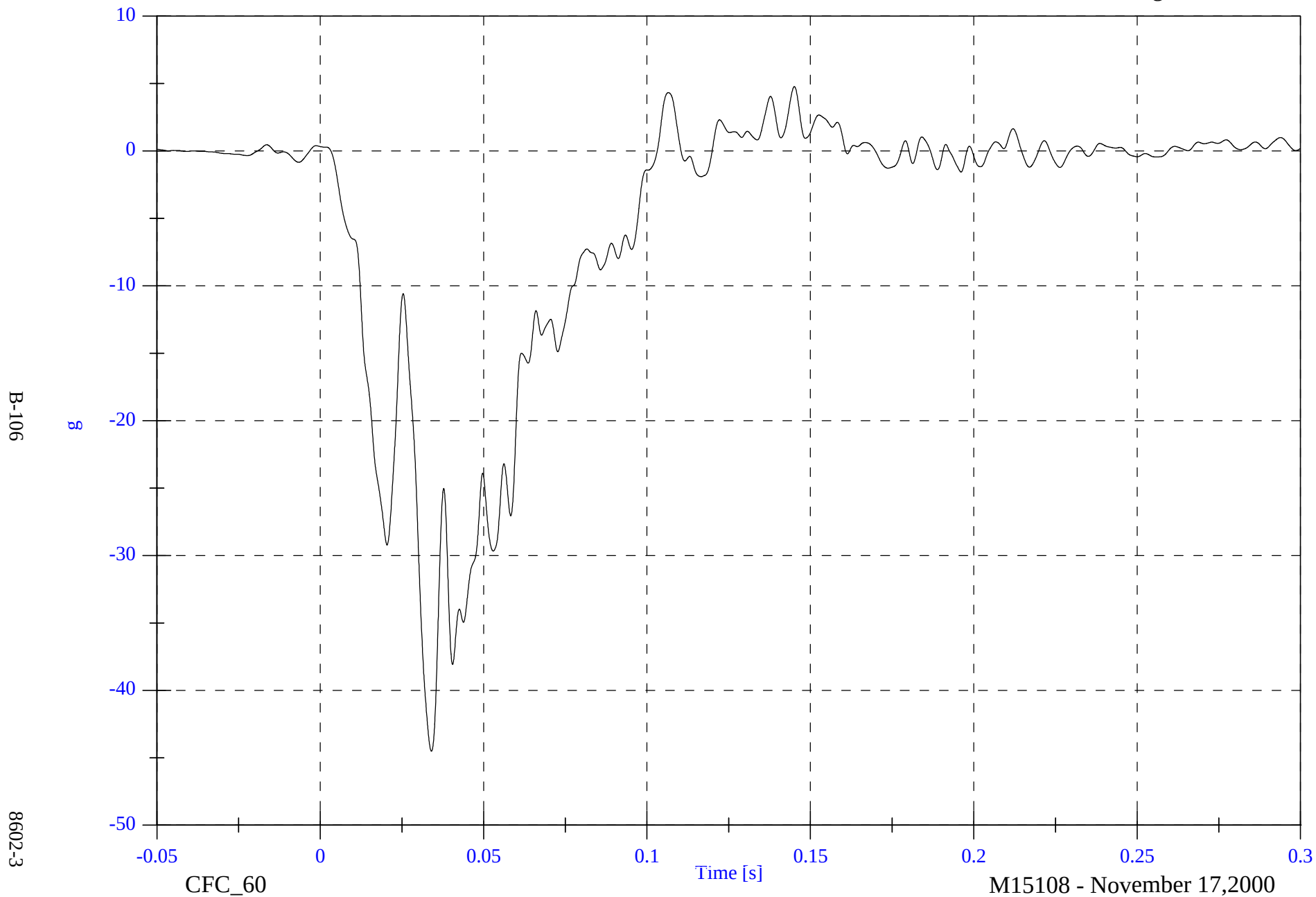


NCAP 2001 Test 3 - 2001 Toyota Tundra

Left Rear #1x

Max: 4.8 [g] at 0.145 [s]

Min: -44.5 [g] at 0.034 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

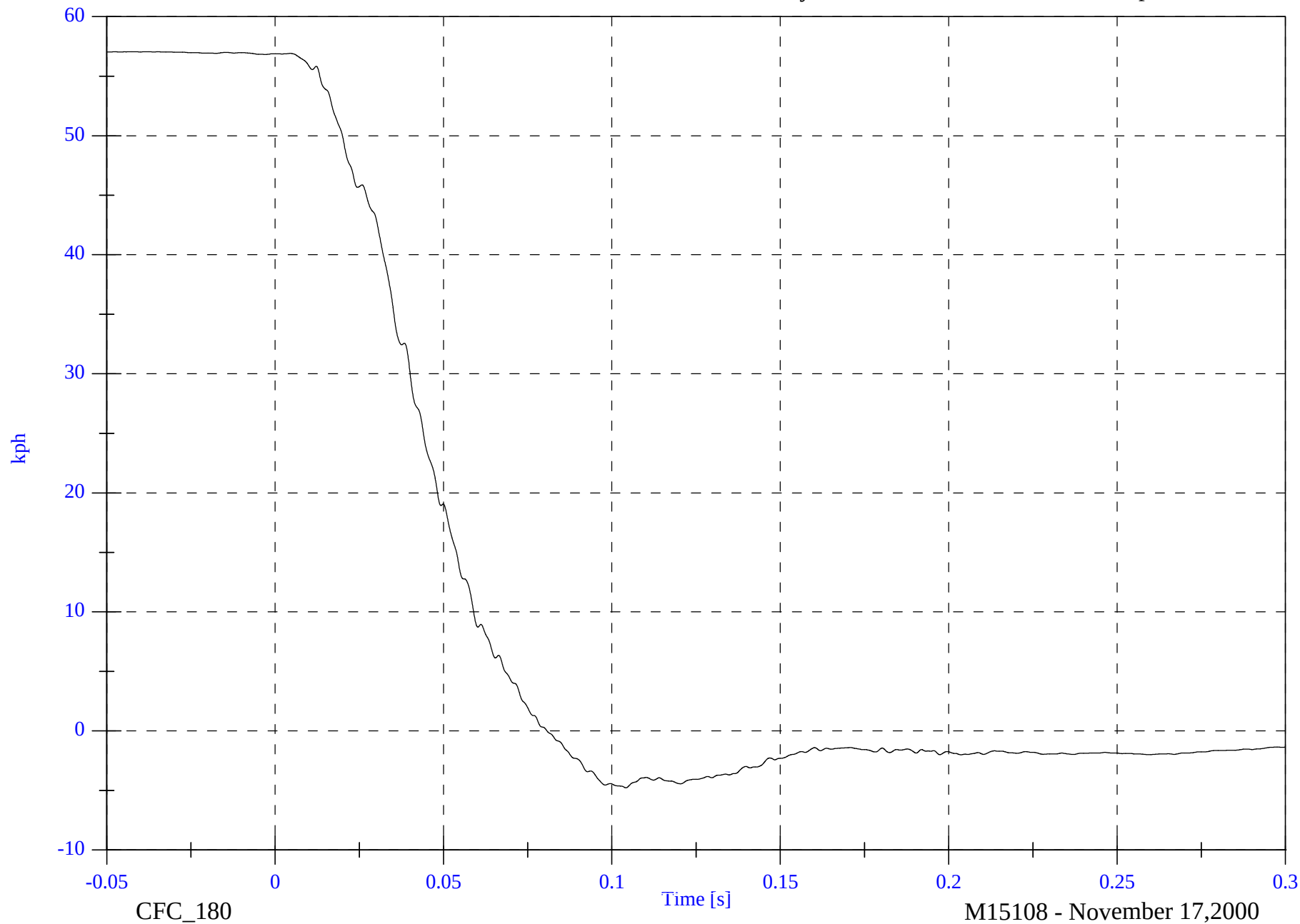
Left Rear #1x Velocity

Max: 57.0 [kph] at -0.042 [s]

Min: -4.8 [kph] at 0.104 [s]

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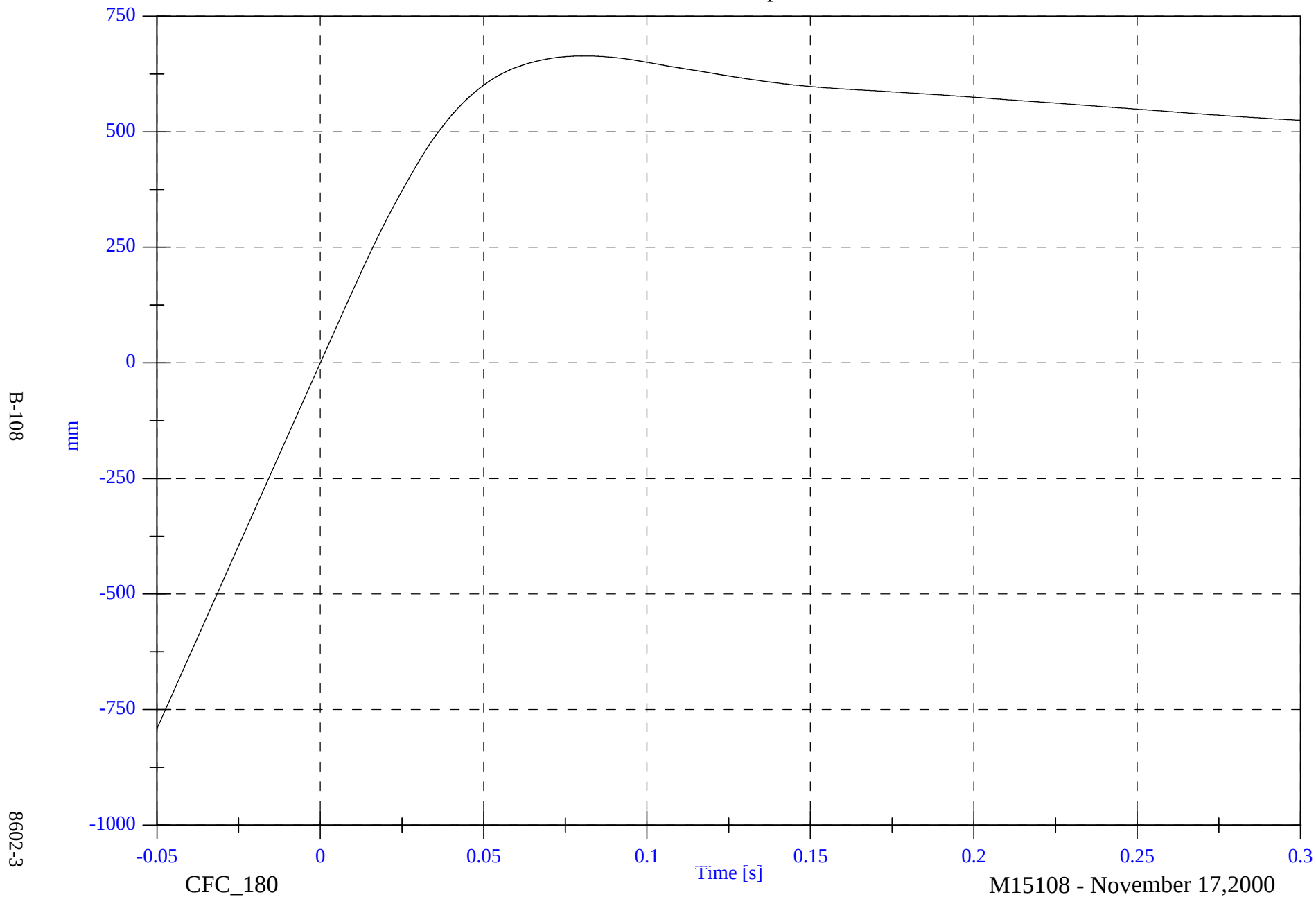


NCAP 2001 Test 3 - 2001 Toyota Tundra

Left Rear #1x Displacement

Max: 664.0 [mm] at 0.081 [s]

Min: -791.4 [mm] at -0.050 [s]

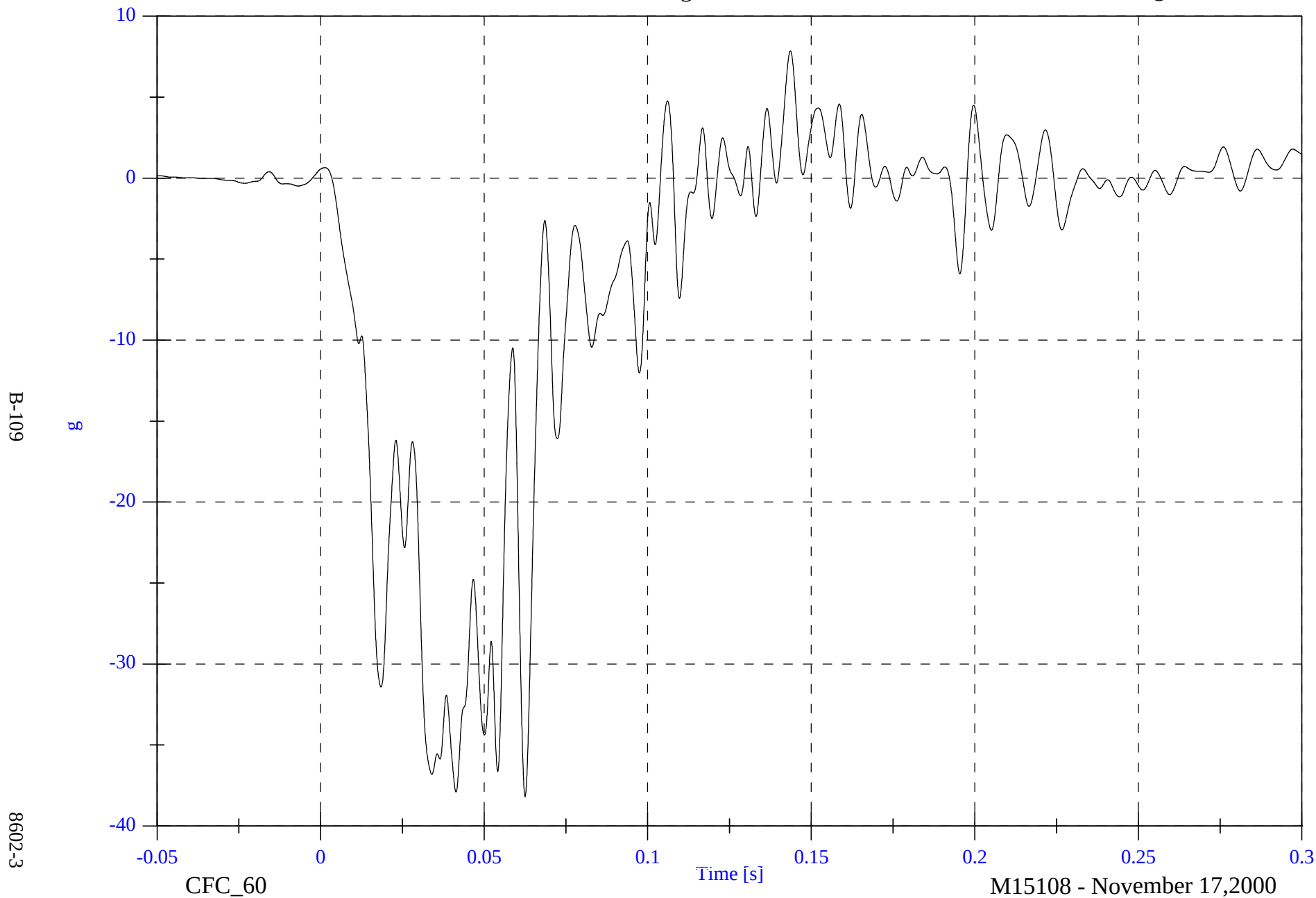


NCAP 2001 Test 3 - 2001 Toyota Tundra

Right Rear #2x

Max: 7.9 [g] at 0.144 [s]

Min: -38.2 [g] at 0.062 [s]

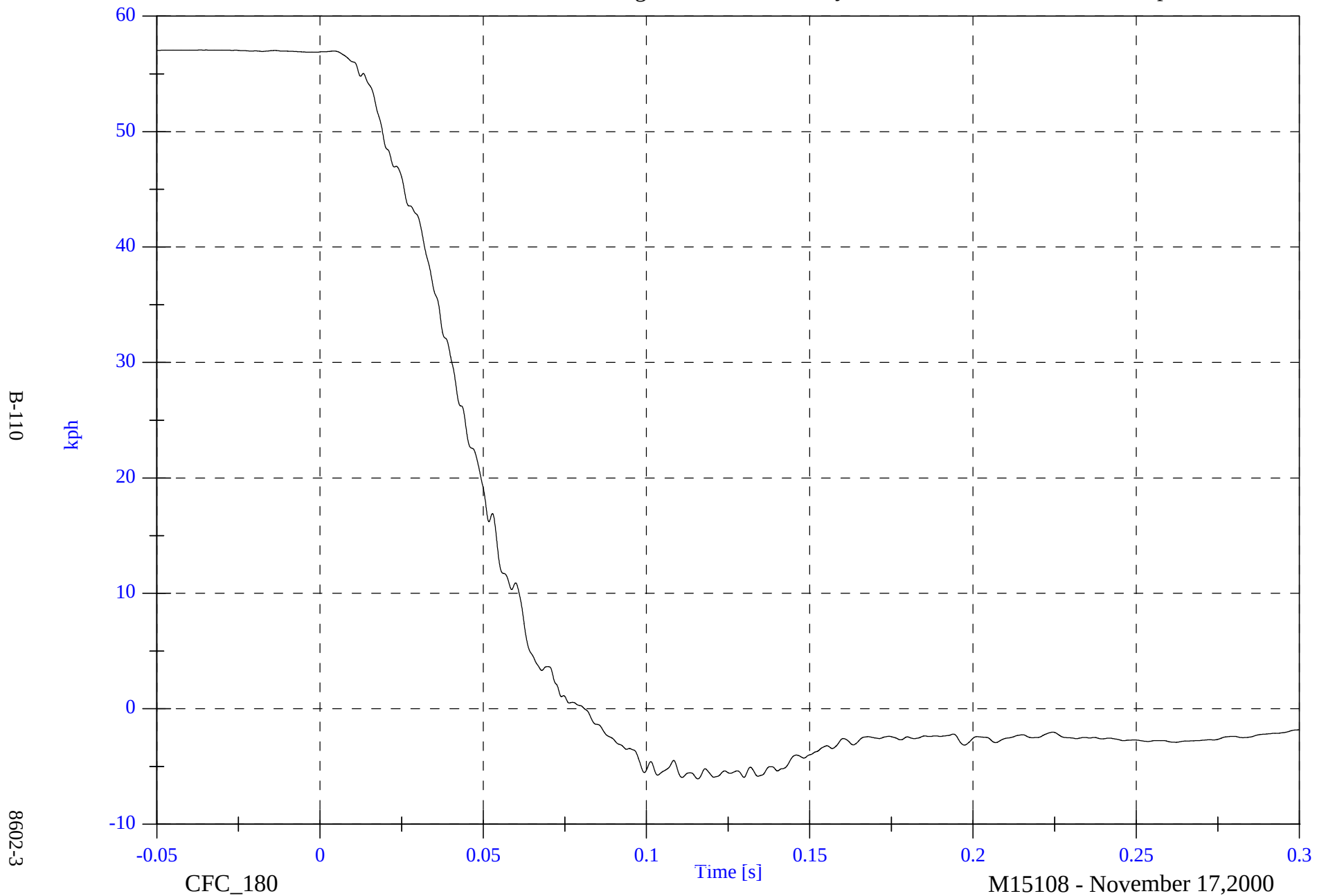


NCAP 2001 Test 3 - 2001 Toyota Tundra

Max: 57.1 [kph] at -0.037 [s]

Right Rear #2x Velocity

Min: -6.1 [kph] at 0.116 [s]

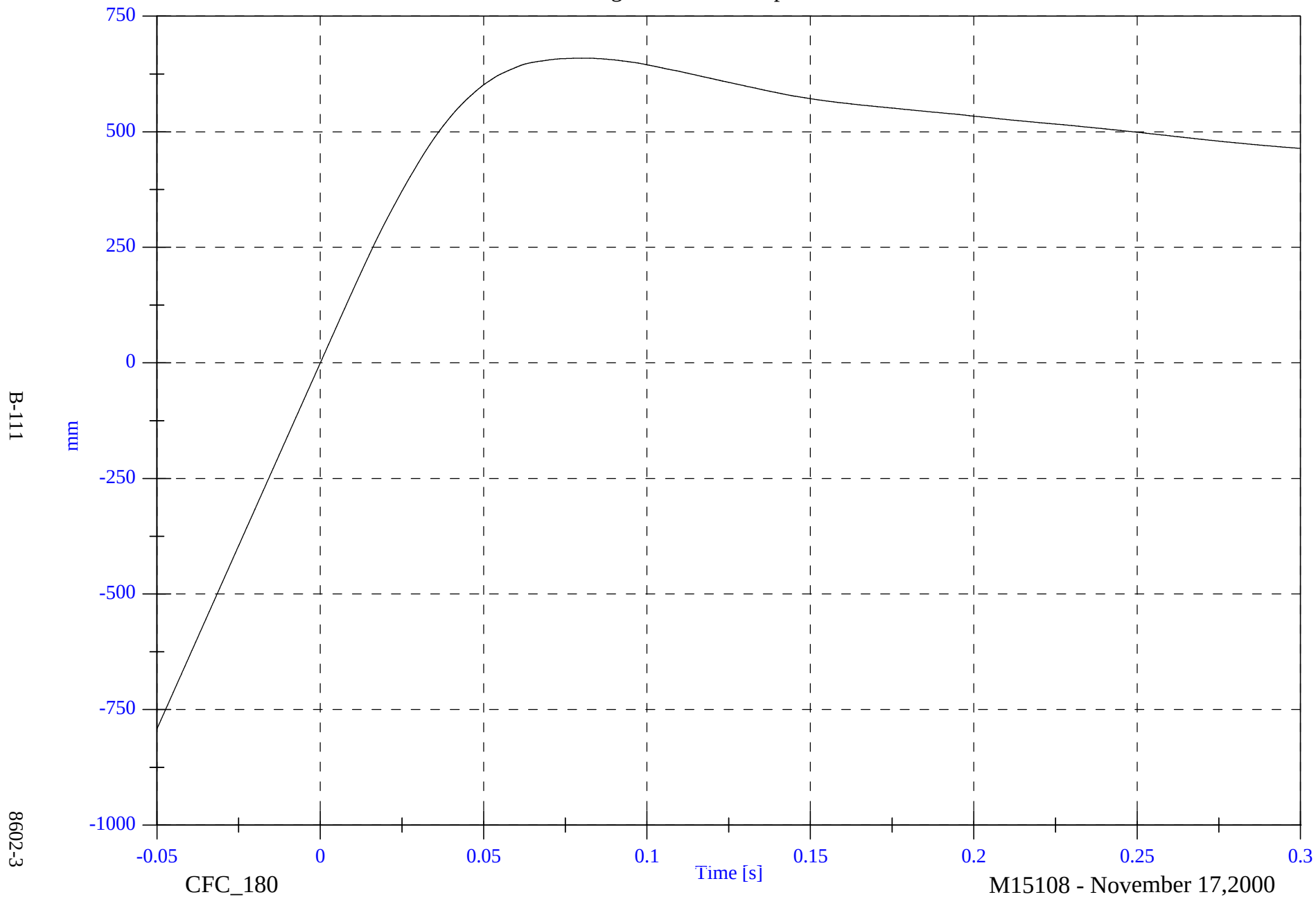


NCAP 2001 Test 3 - 2001 Toyota Tundra

Right Rear #2x Displacement

Max: 659.1 [mm] at 0.081 [s]

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



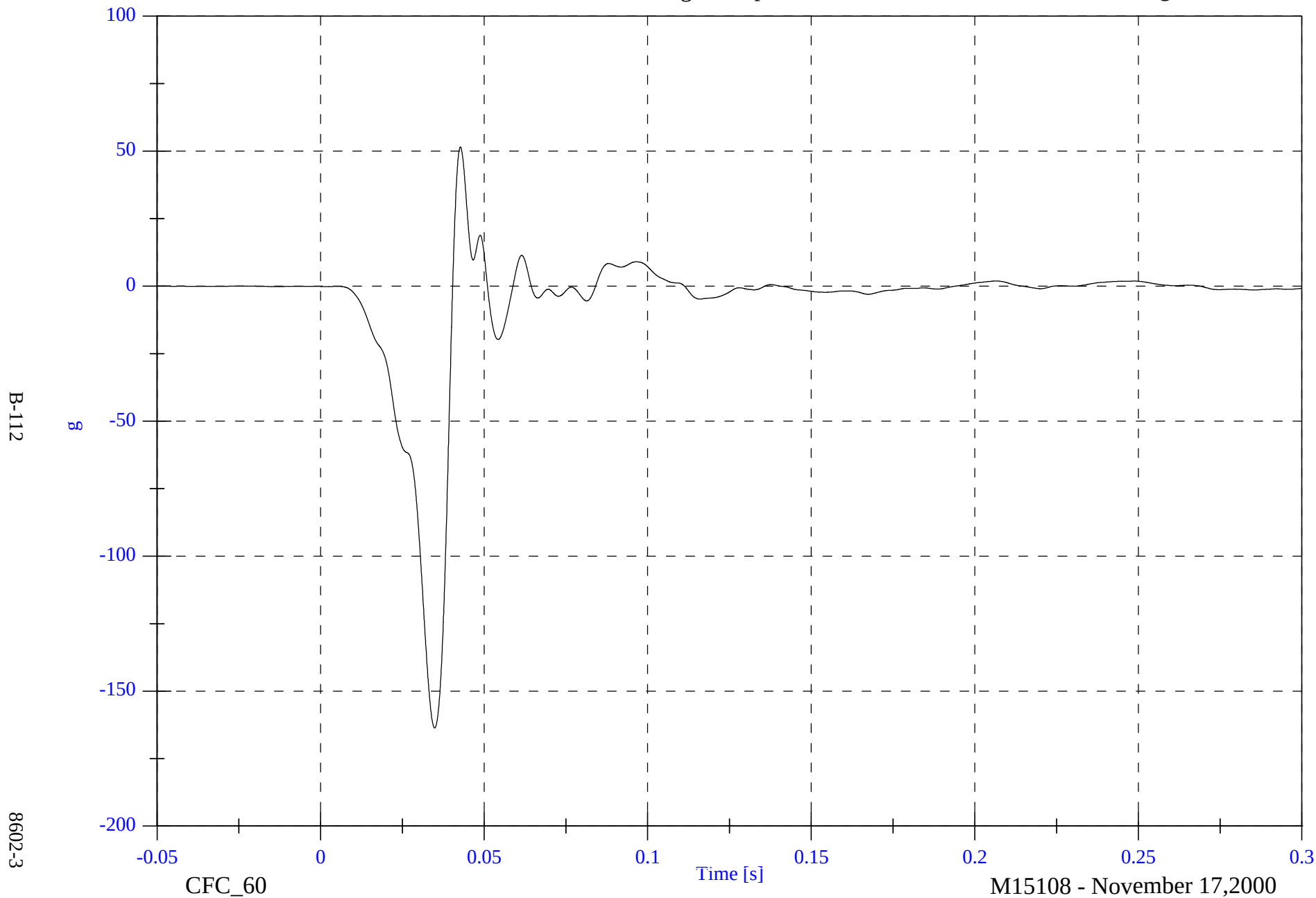
8602-3

NCAP 2001 Test 3 - 2001 Toyota Tundra

Engine Top #3x

Max: 51.6 [g] at 0.043 [s]

Min: -163.7 [g] at 0.035 [s]

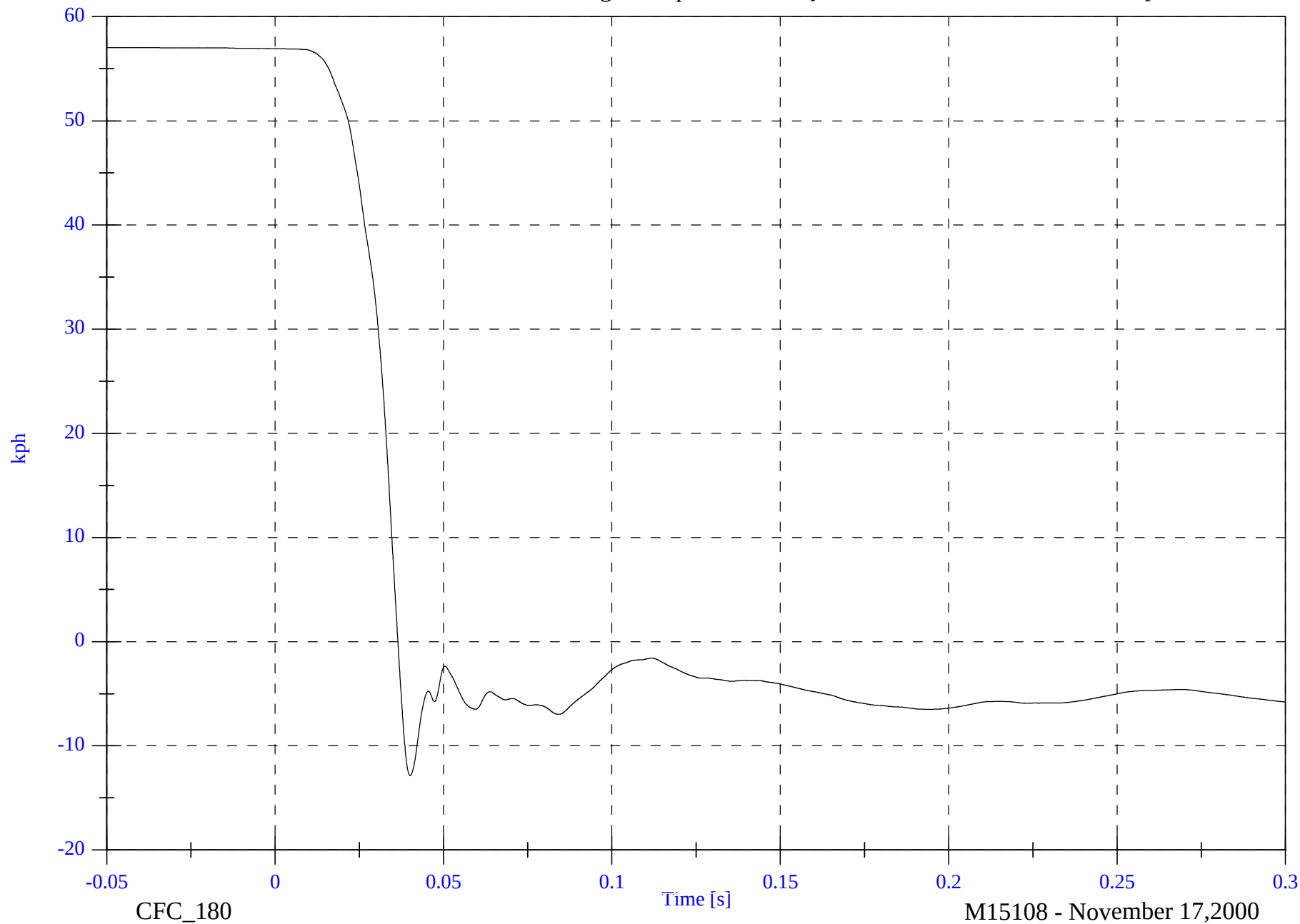


NCAP 2001 Test 3 - 2001 Toyota Tundra

Engine Top #3x Velocity

Max: 57.0 [kph] at -0.047 [s]

Min: -12.8 [kph] at 0.040 [s]



B-113

8602-3

CFC\_180

Time [s]

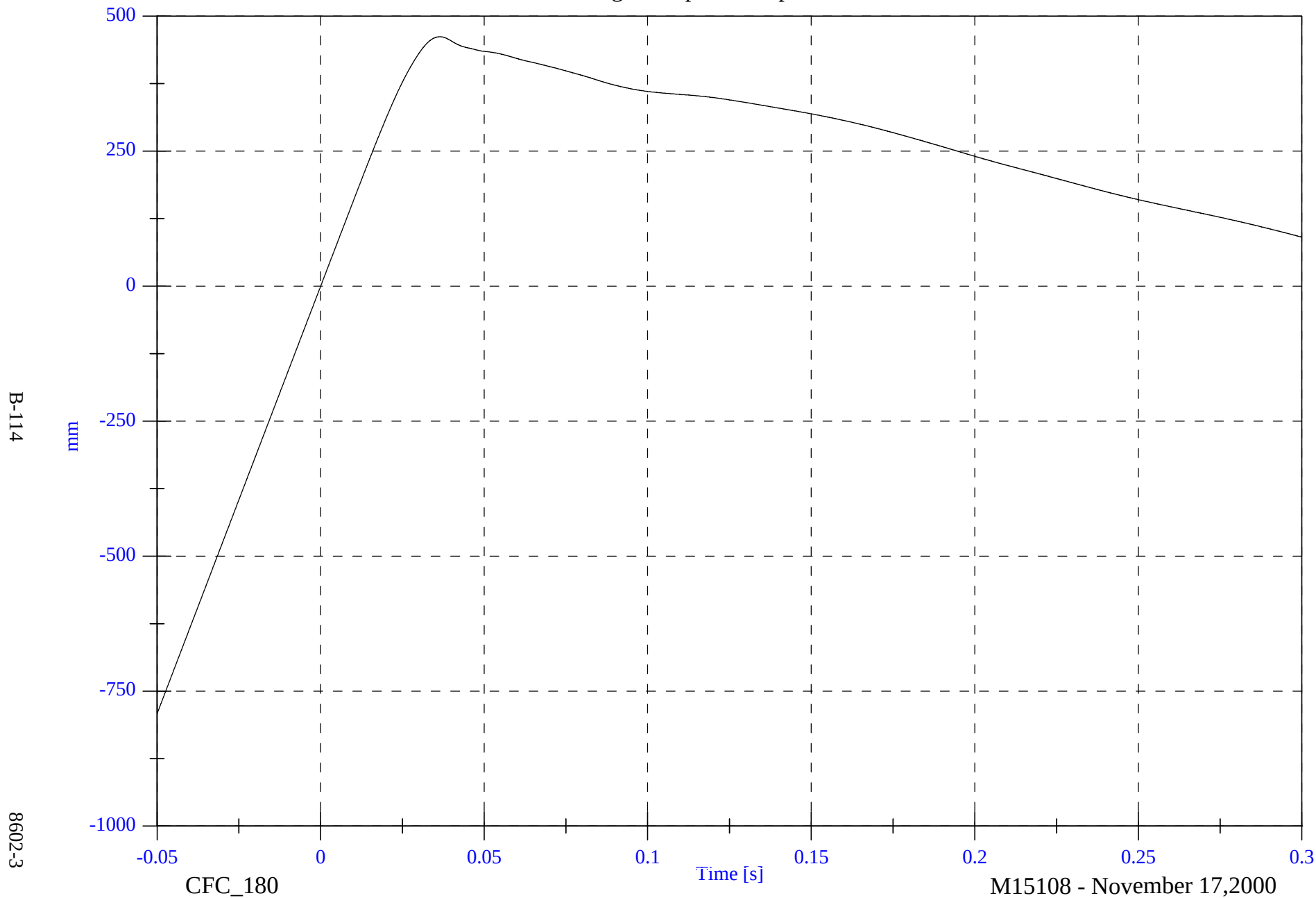
M15108 - November 17, 2000

NCAP 2001 Test 3 - 2001 Toyota Tundra

Engine Top #3x Displacement

Max: 462.0 [mm] at 0.036 [s]

Min: -791.7 [mm] at -0.050 [s]

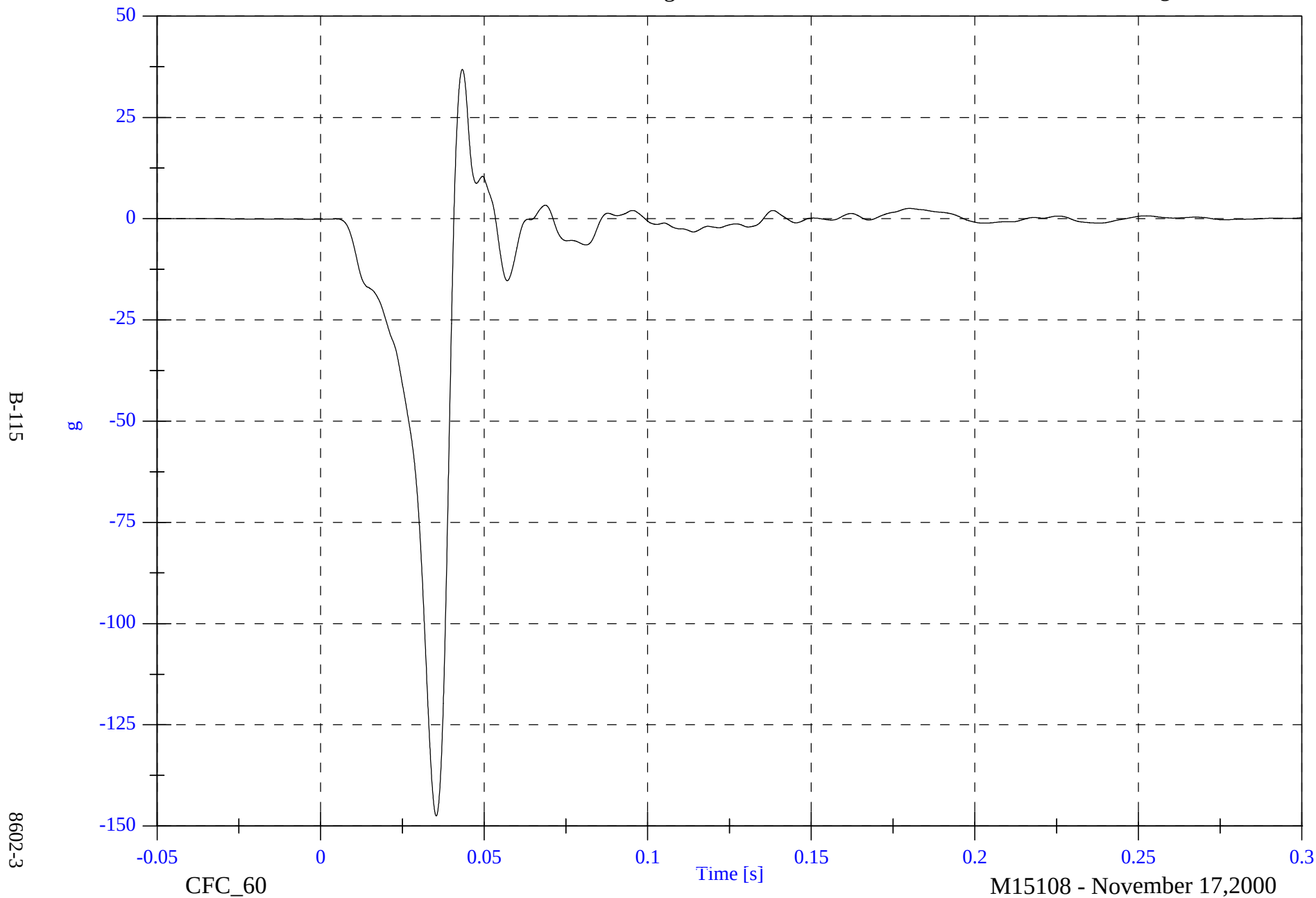


NCAP 2001 Test 3 - 2001 Toyota Tundra

Engine Bottom #4x

Max: 36.9 [g] at 0.043 [s]

Min: -147.5 [g] at 0.035 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

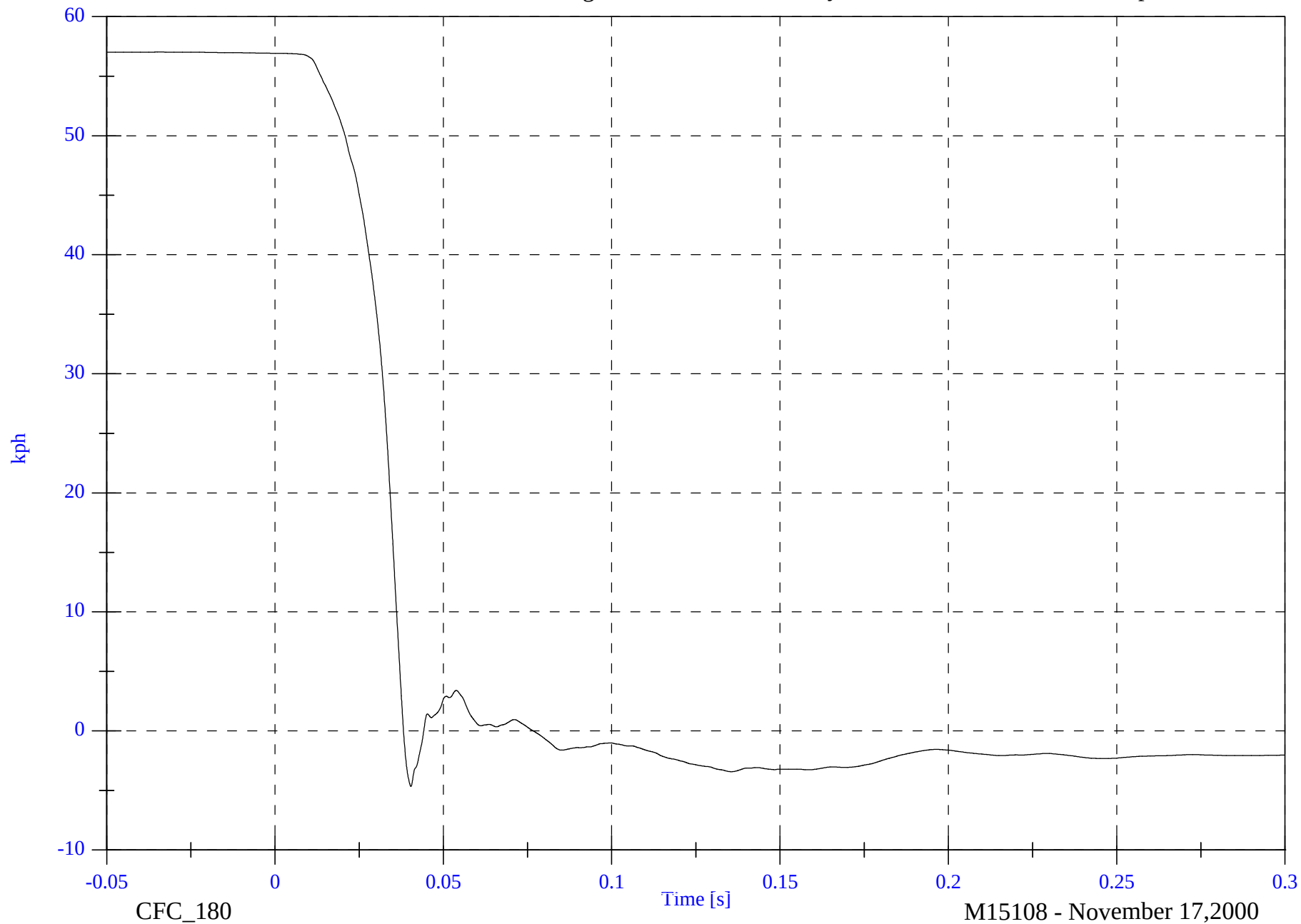
Engine Bottom #4x Velocity

Max: 57.0 [kph] at -0.034 [s]

Min: -4.7 [kph] at 0.040 [s]

B-116

8602-3

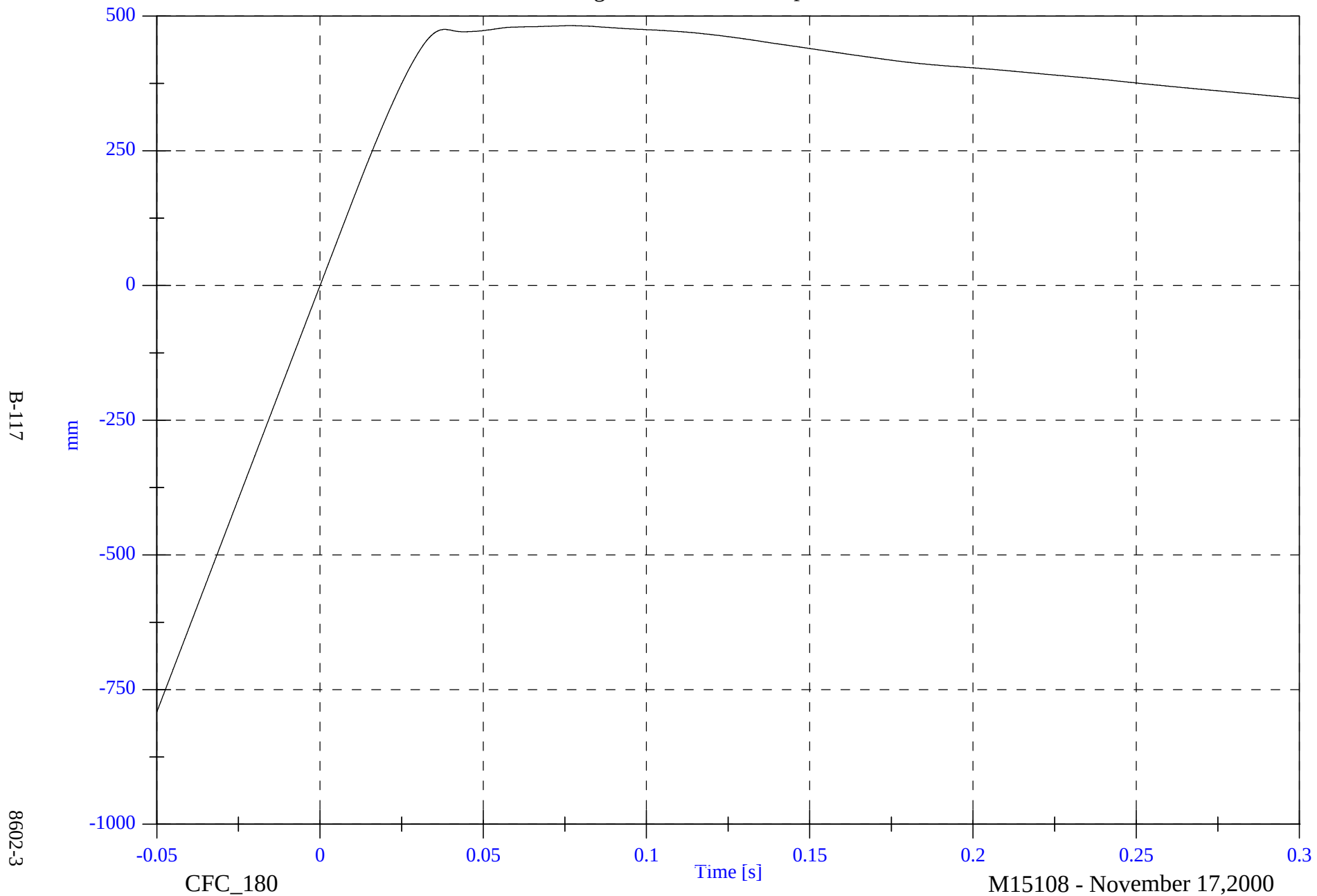


NCAP 2001 Test 3 - 2001 Toyota Tundra

Engine Bottom #4x Displacement

Max: 482.4 [mm] at 0.077 [s]

Min: -791.7 [mm] at -0.050 [s]



B-117

8602-3

CFC\_180

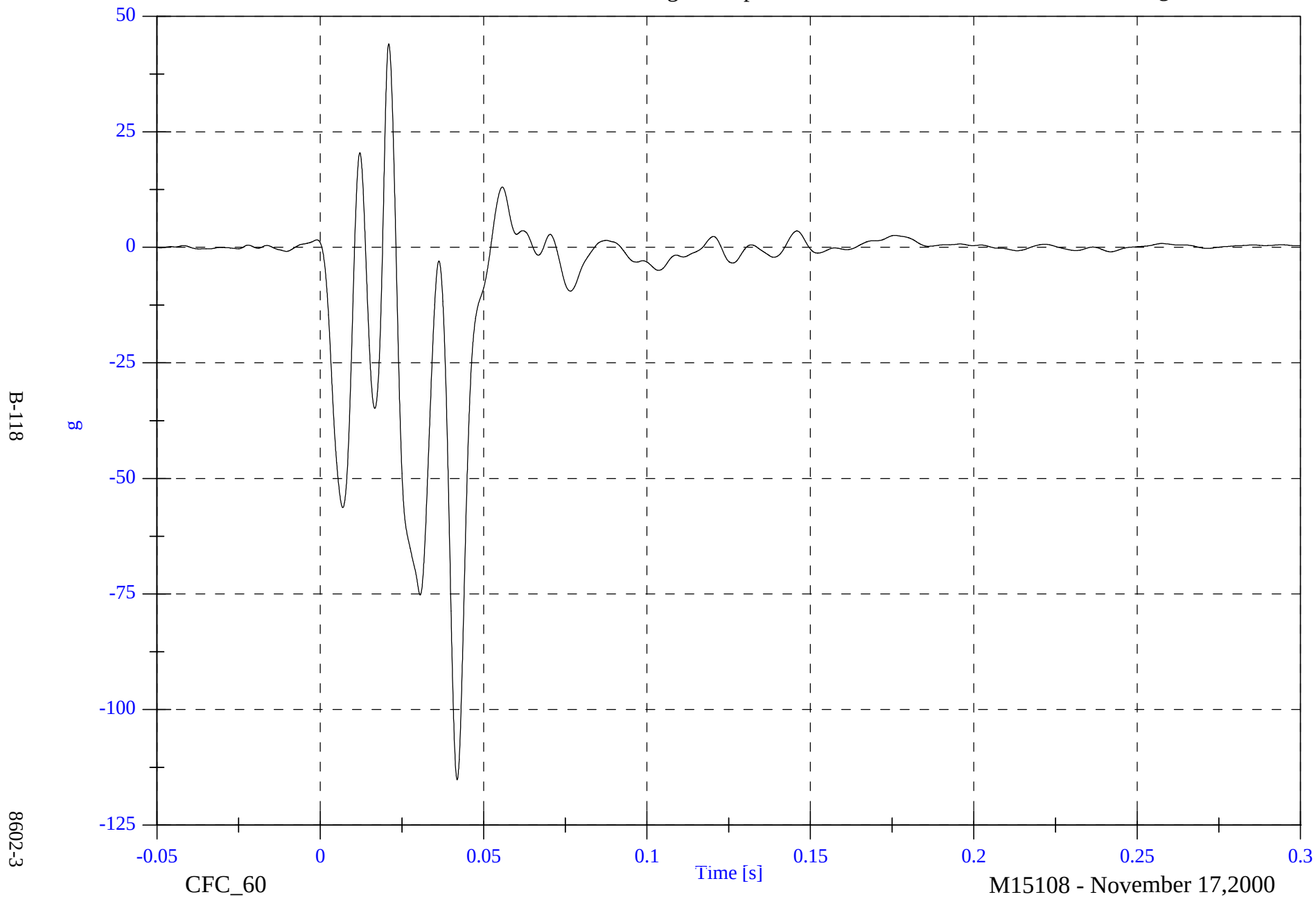
M15108 - November 17, 2000

NCAP 2001 Test 3 - 2001 Toyota Tundra

Right Caliper #5x

Max: 44.0 [g] at 0.021 [s]

Min: -115.2 [g] at 0.042 [s]

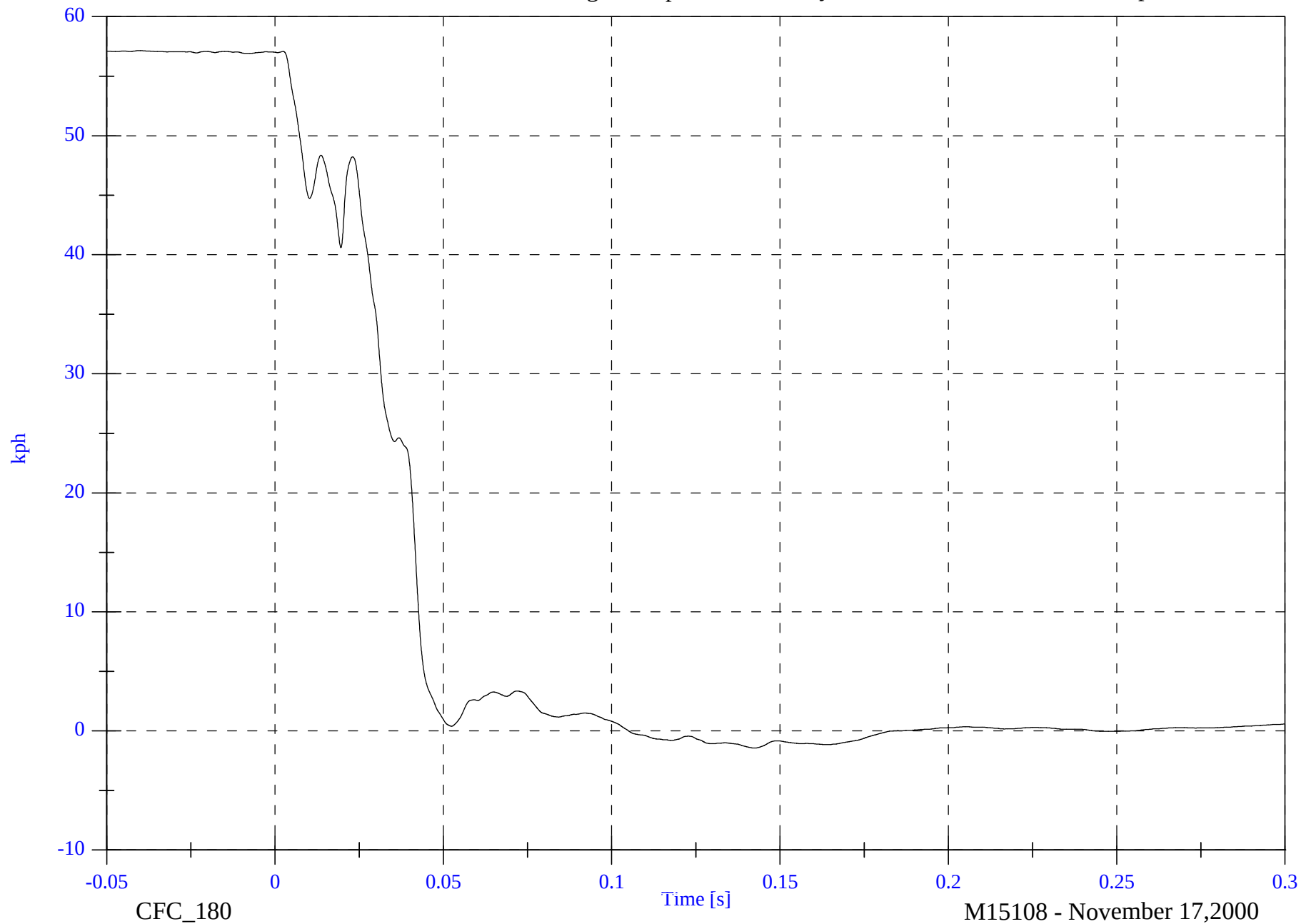


NCAP 2001 Test 3 - 2001 Toyota Tundra

Right Caliper #5x Velocity

Max: 57.1 [kph] at -0.040 [s]

Min: -1.4 [kph] at 0.142 [s]



B-119

8602-3

CFC\_180

Time [s]

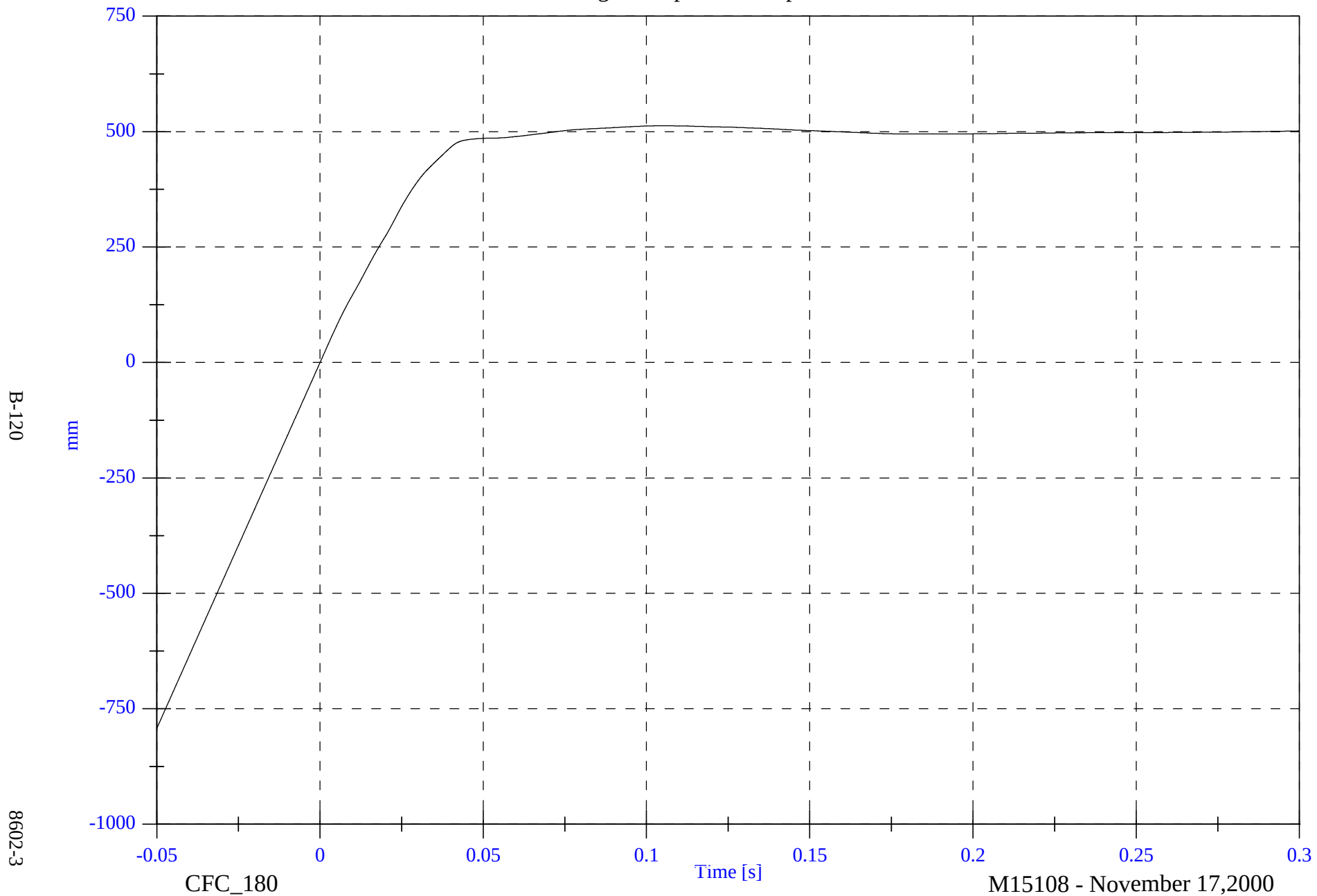
M15108 - November 17,2000

NCAP 2001 Test 3 - 2001 Toyota Tundra

Right Caliper #5x Displacement

Max: 512.7 [mm] at 0.105 [s]

Min: -792.3 [mm] at -0.050 [s]

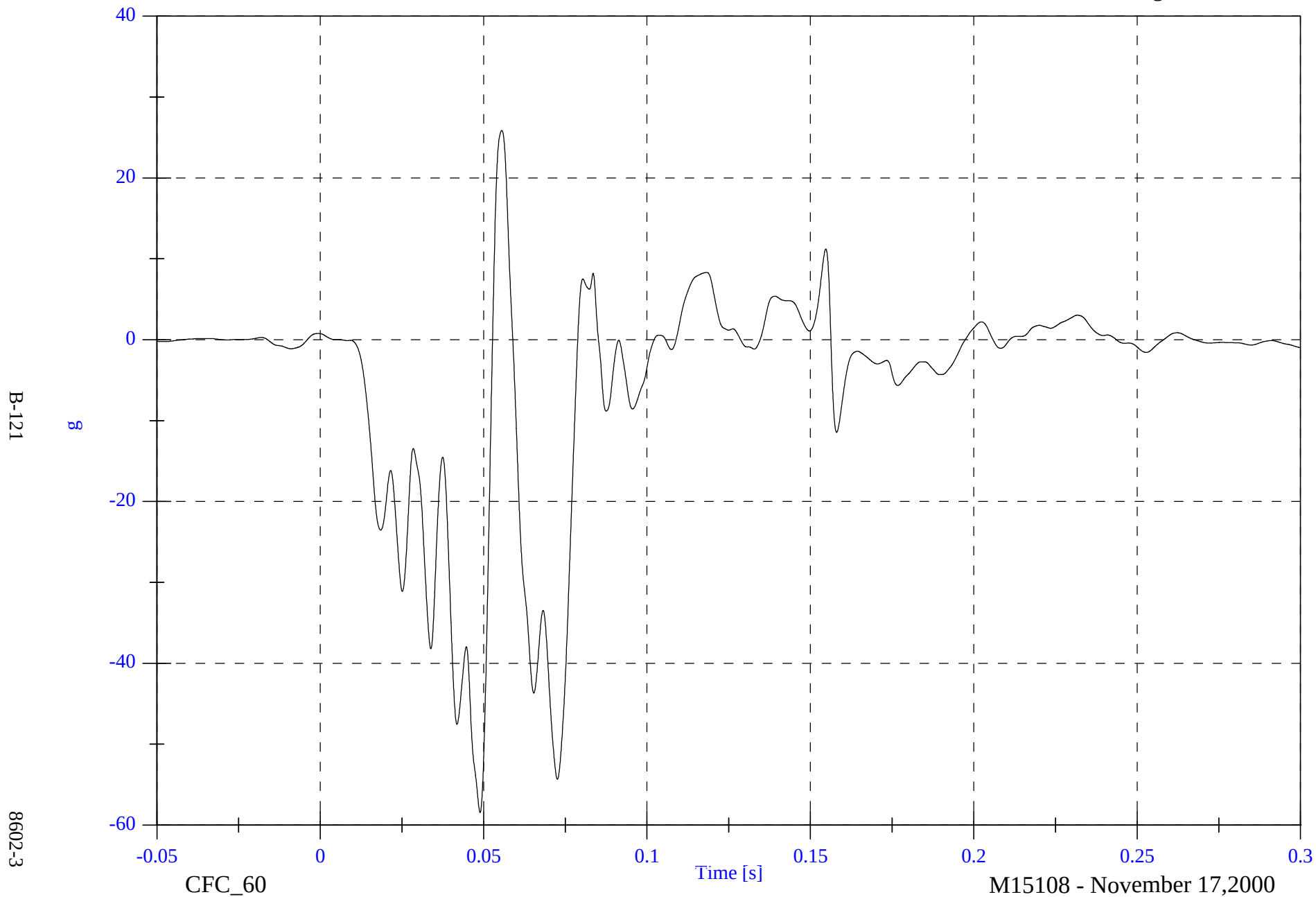


NCAP 2001 Test 3 - 2001 Toyota Tundra

Instrument Panel #6x

Max: 25.9 [g] at 0.056 [s]

Min: -58.4 [g] at 0.049 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

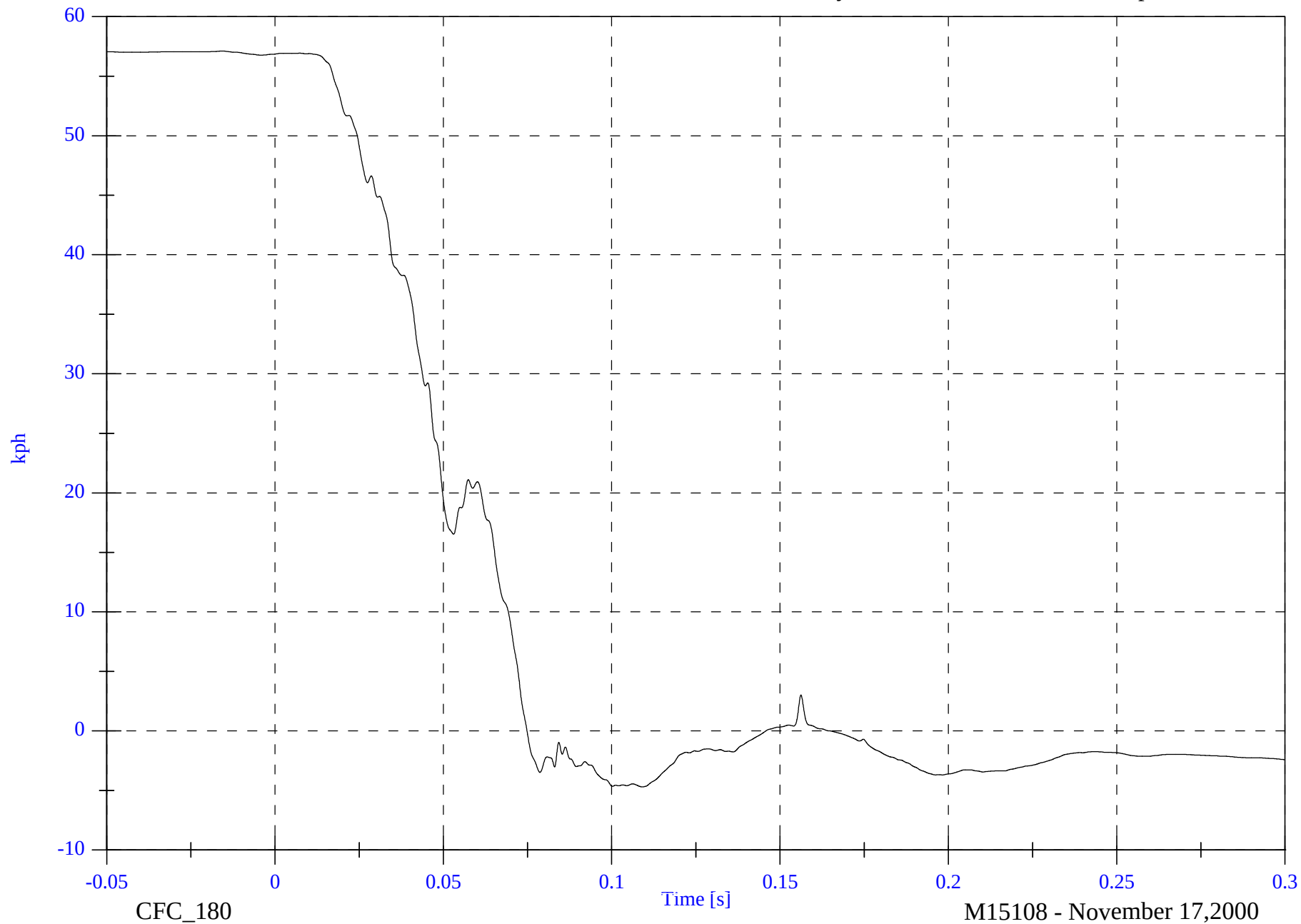
Instrument Panel #6x Velocity

Max: 57.1 [kph] at -0.016 [s]

Min: -4.7 [kph] at 0.109 [s]

B-122

8602-3

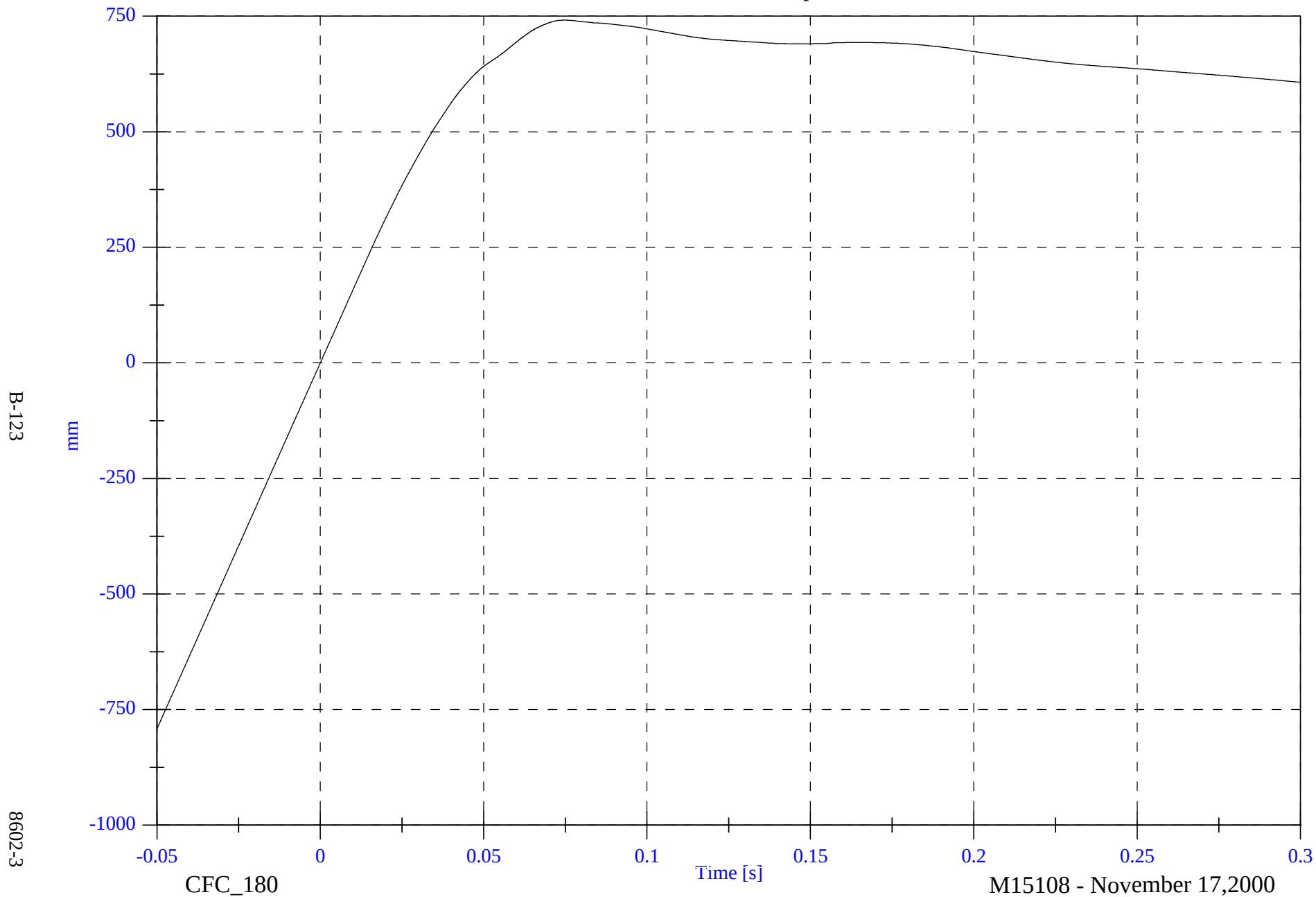


NCAP 2001 Test 3 - 2001 Toyota Tundra

Instrument Panel #6x Displacement

Max: 741.6 [mm] at 0.075 [s]

Min: -791.7 [mm] at -0.050 [s]

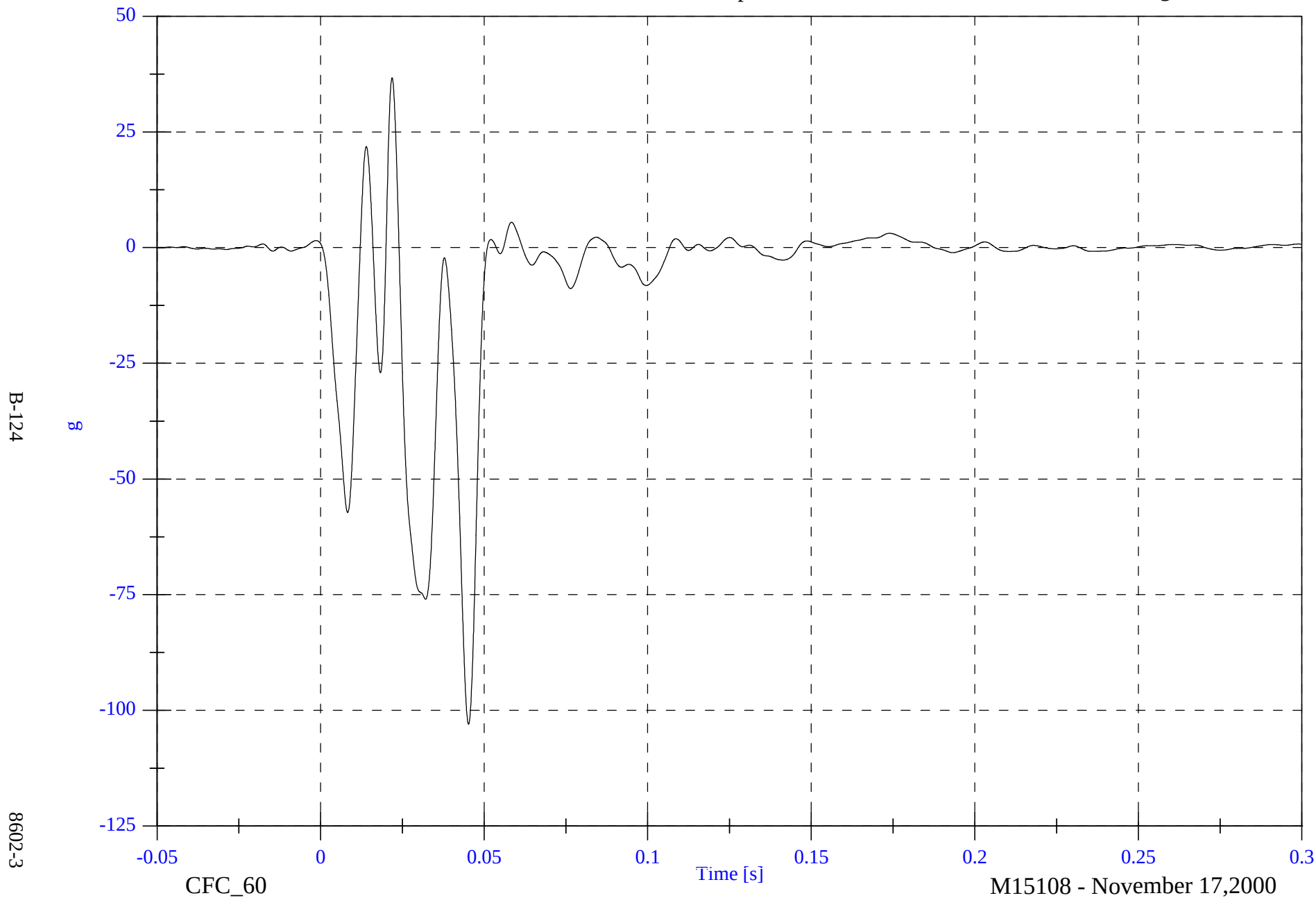


NCAP 2001 Test 3 - 2001 Toyota Tundra

Left Caliper #7x

Max: 36.7 [g] at 0.022 [s]

Min: -103.0 [g] at 0.045 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

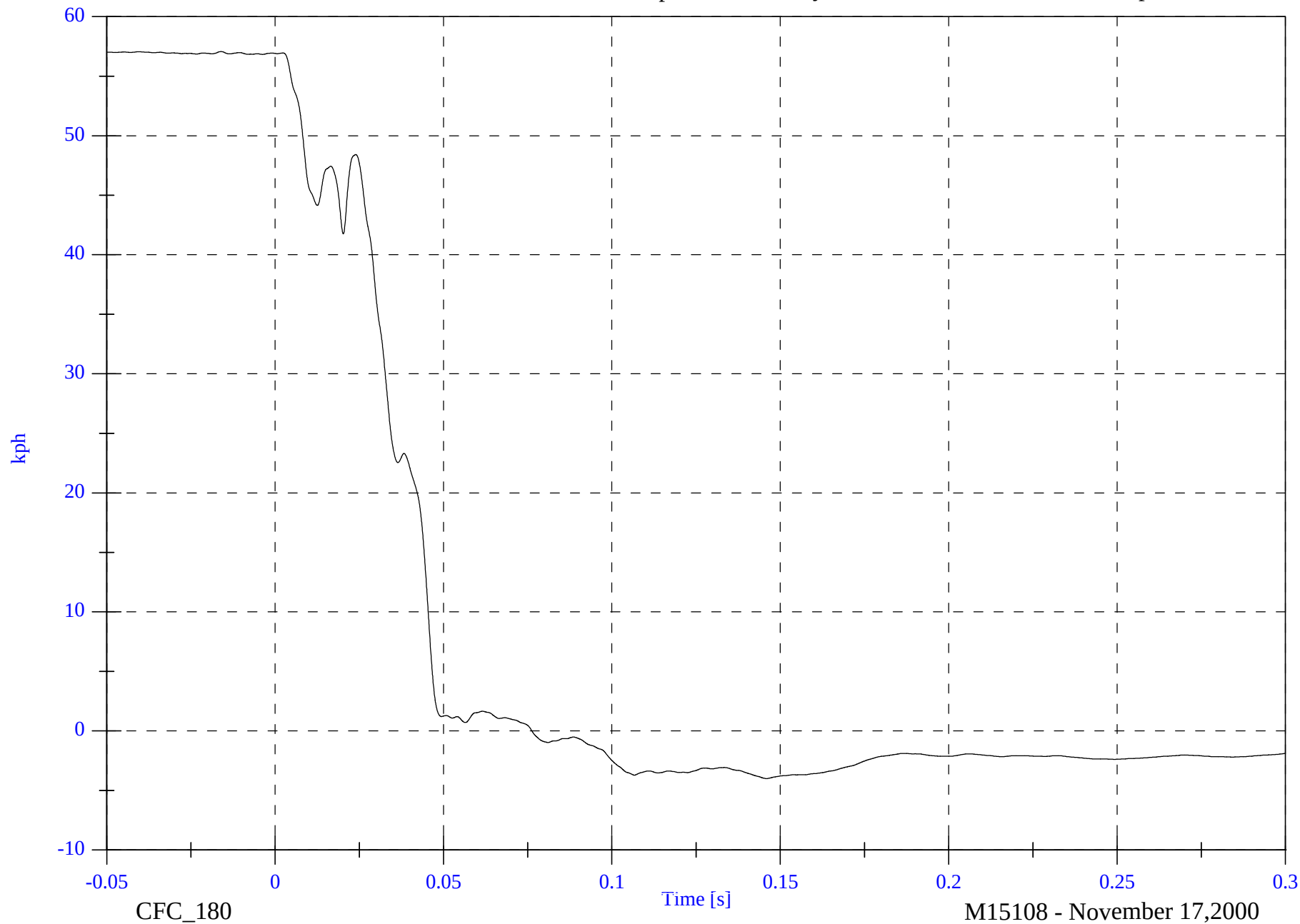
Left Caliper #7x Velocity

Max: 57.1 [kph] at -0.016 [s]

Min: -4.0 [kph] at 0.146 [s]

B-125

8602-3

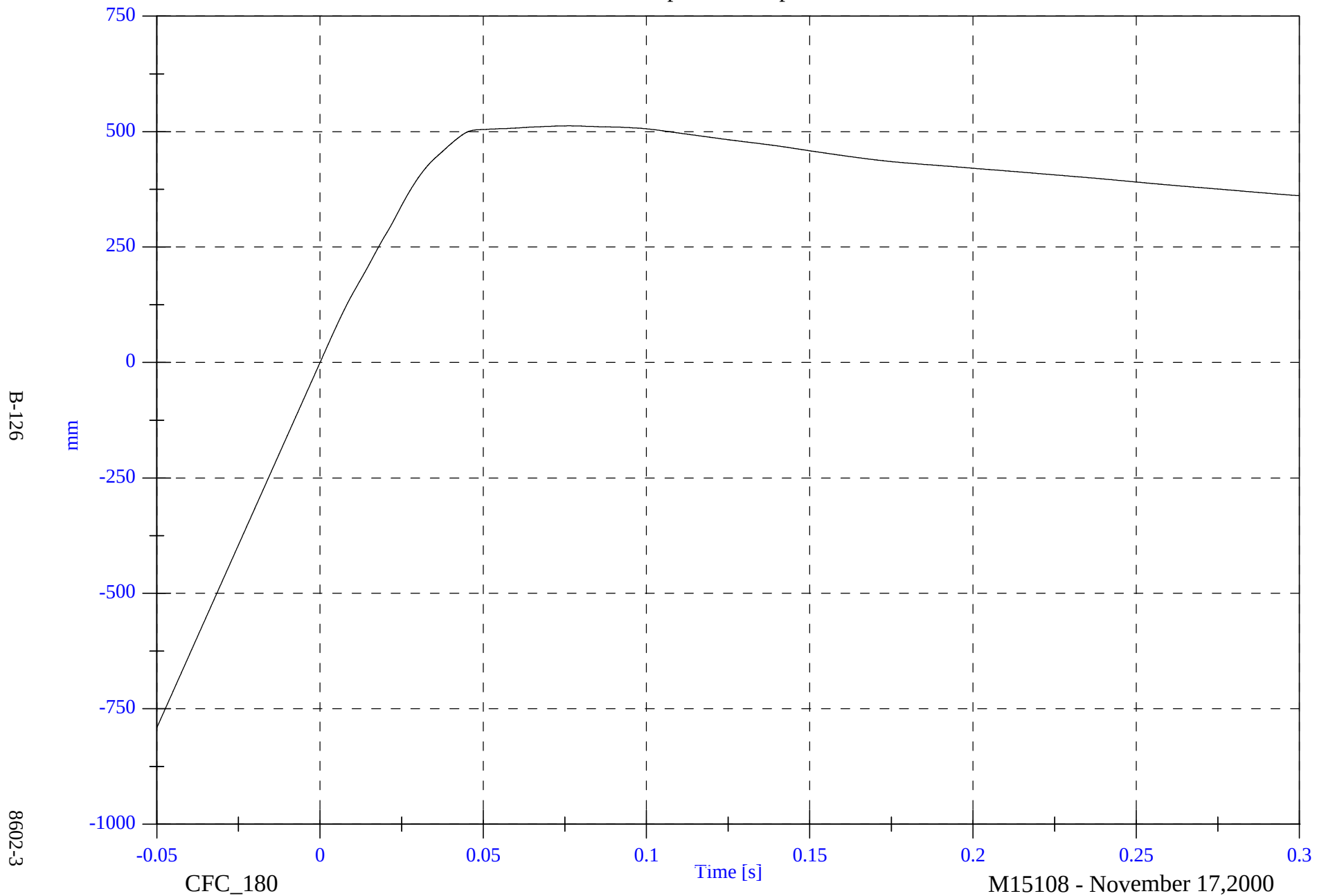


NCAP 2001 Test 3 - 2001 Toyota Tundra

Left Caliper #7x Displacement

Max: 512.6 [mm] at 0.076 [s]

Min: -791.0 [mm] at -0.050 [s]



# NCAP 2001 Test 3 - 2001 Toyota Tundra

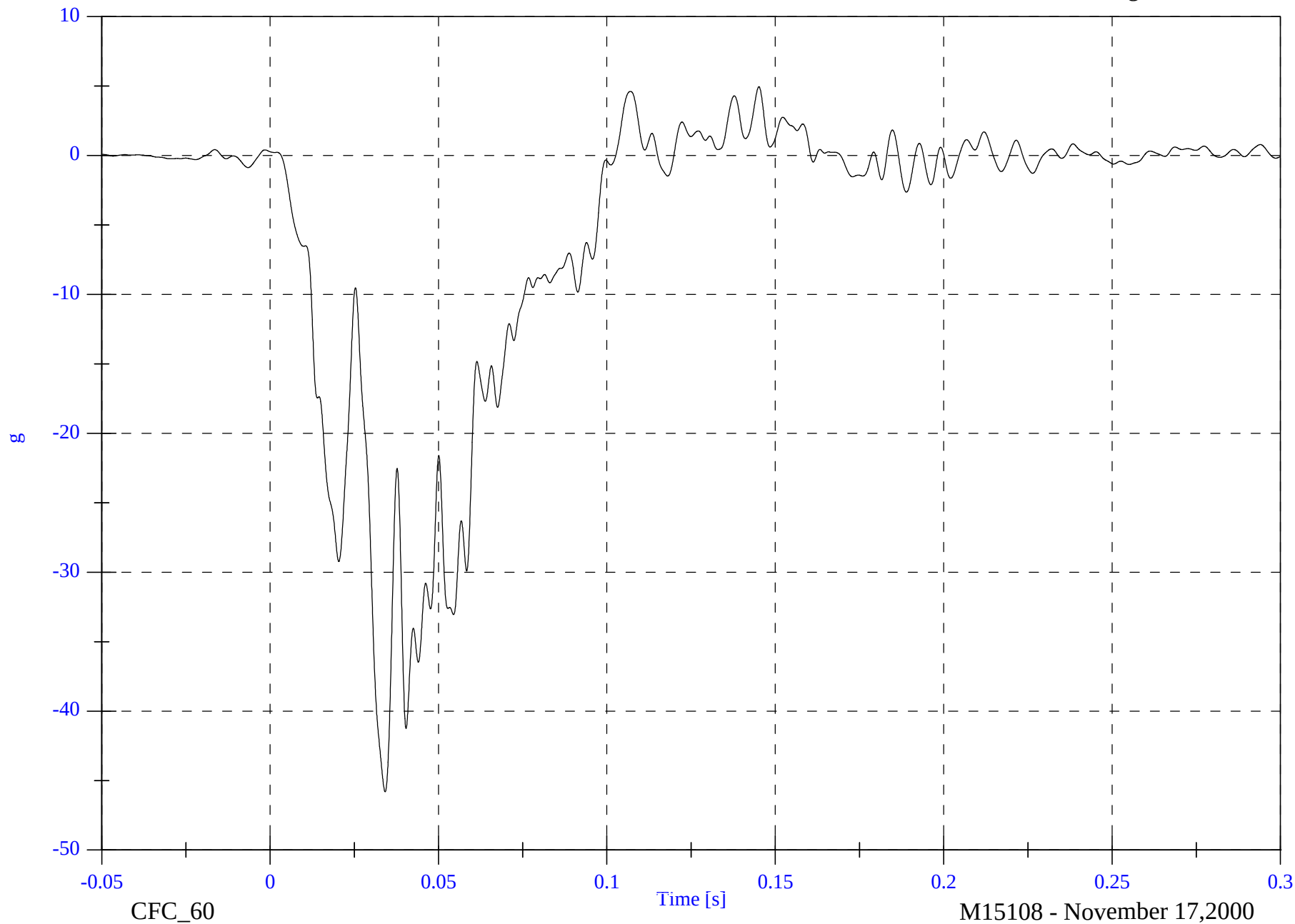
Left Rear Red #8x

Max: 5.0 [g] at 0.145 [s]

Min: -45.8 [g] at 0.034 [s]

B-127

8602-3



NCAP 2001 Test 3 - 2001 Toyota Tundra

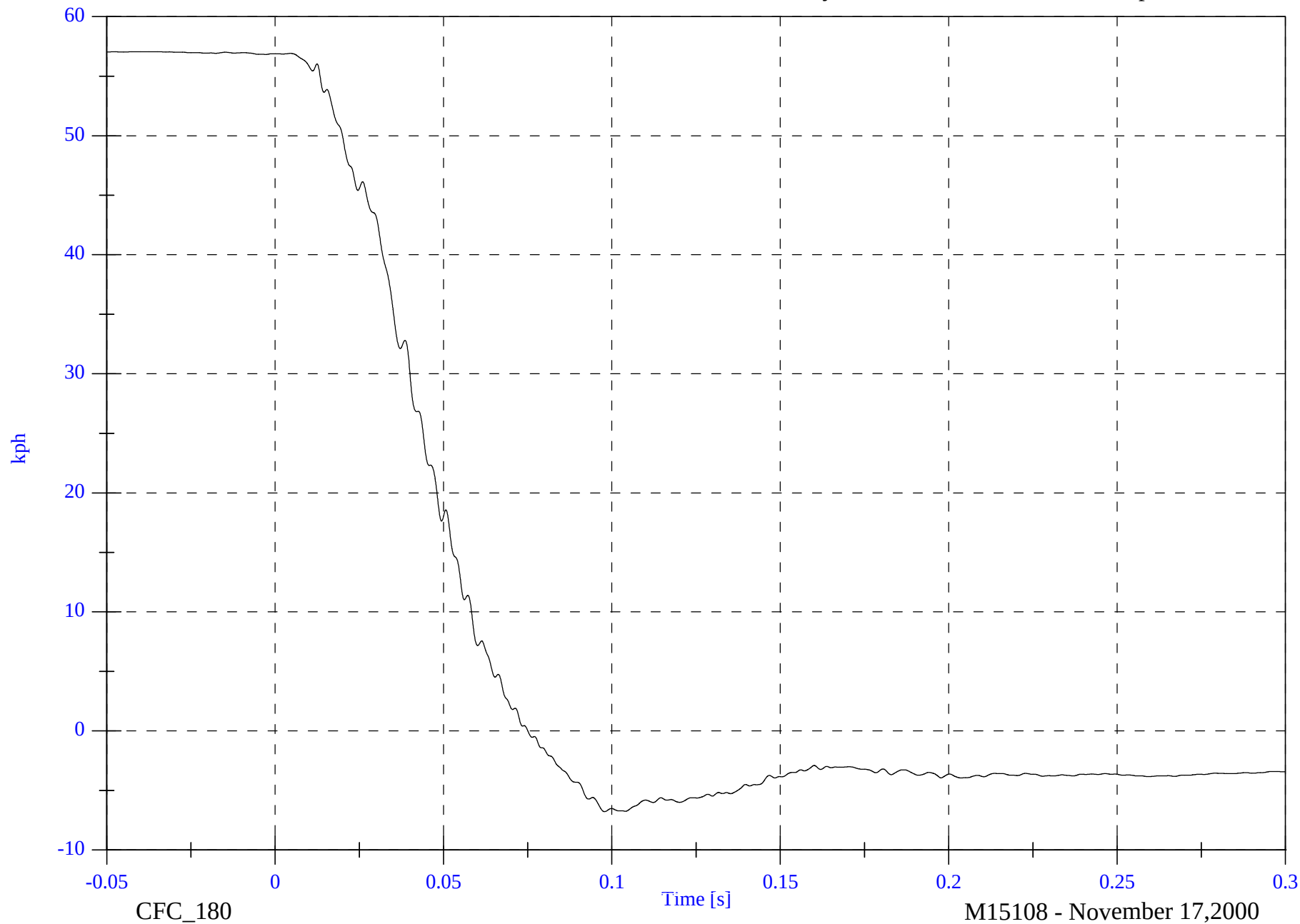
Left Rear Red #8x Velocity

Max: 57.1 [kph] at -0.035 [s]

Min: -6.8 [kph] at 0.098 [s]

B-128

8602-3

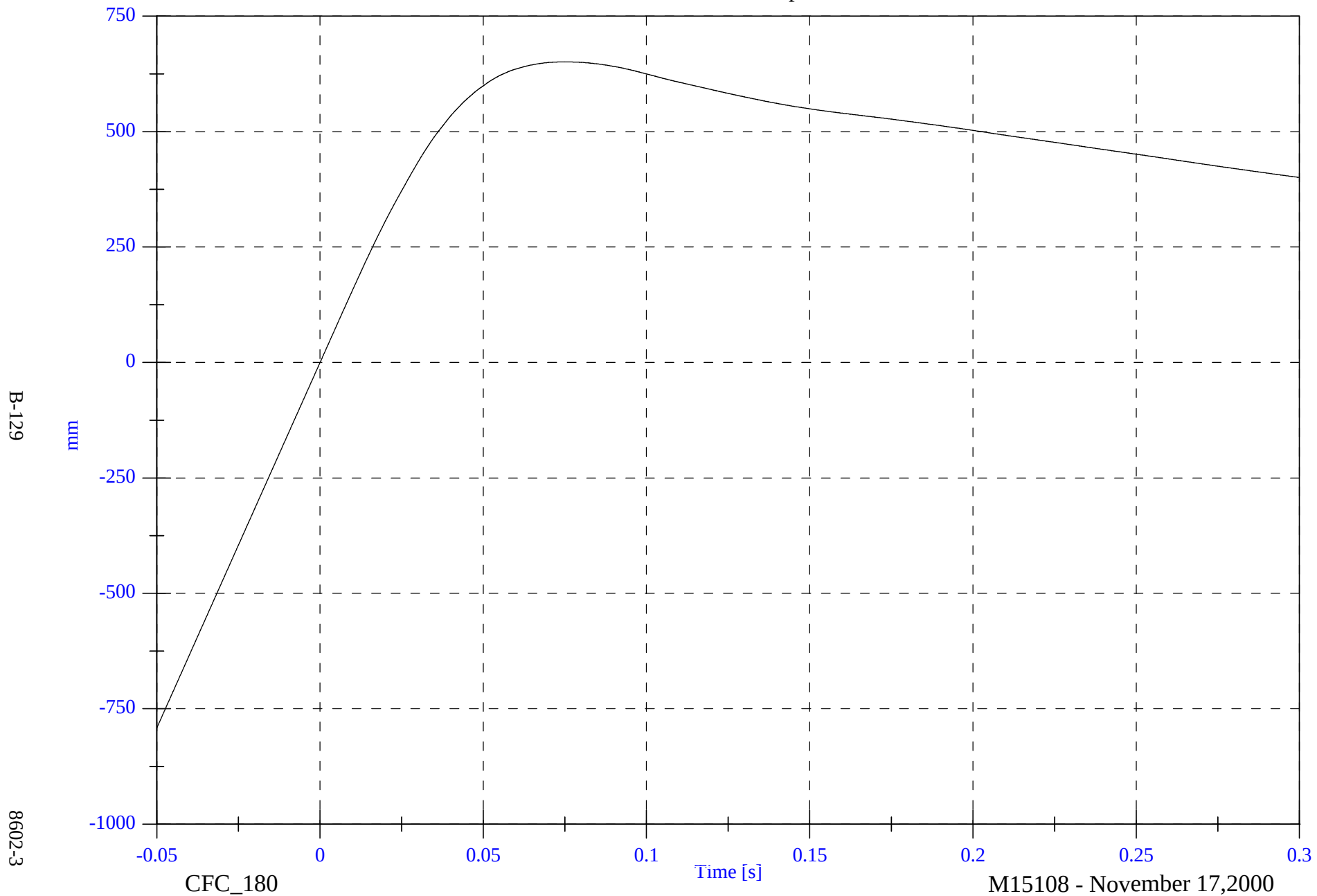


NCAP 2001 Test 3 - 2001 Toyota Tundra

Left Rear Red #8x Displacement

Max: 651.1 [mm] at 0.075 [s]

Min: -791.5 [mm] at -0.050 [s]

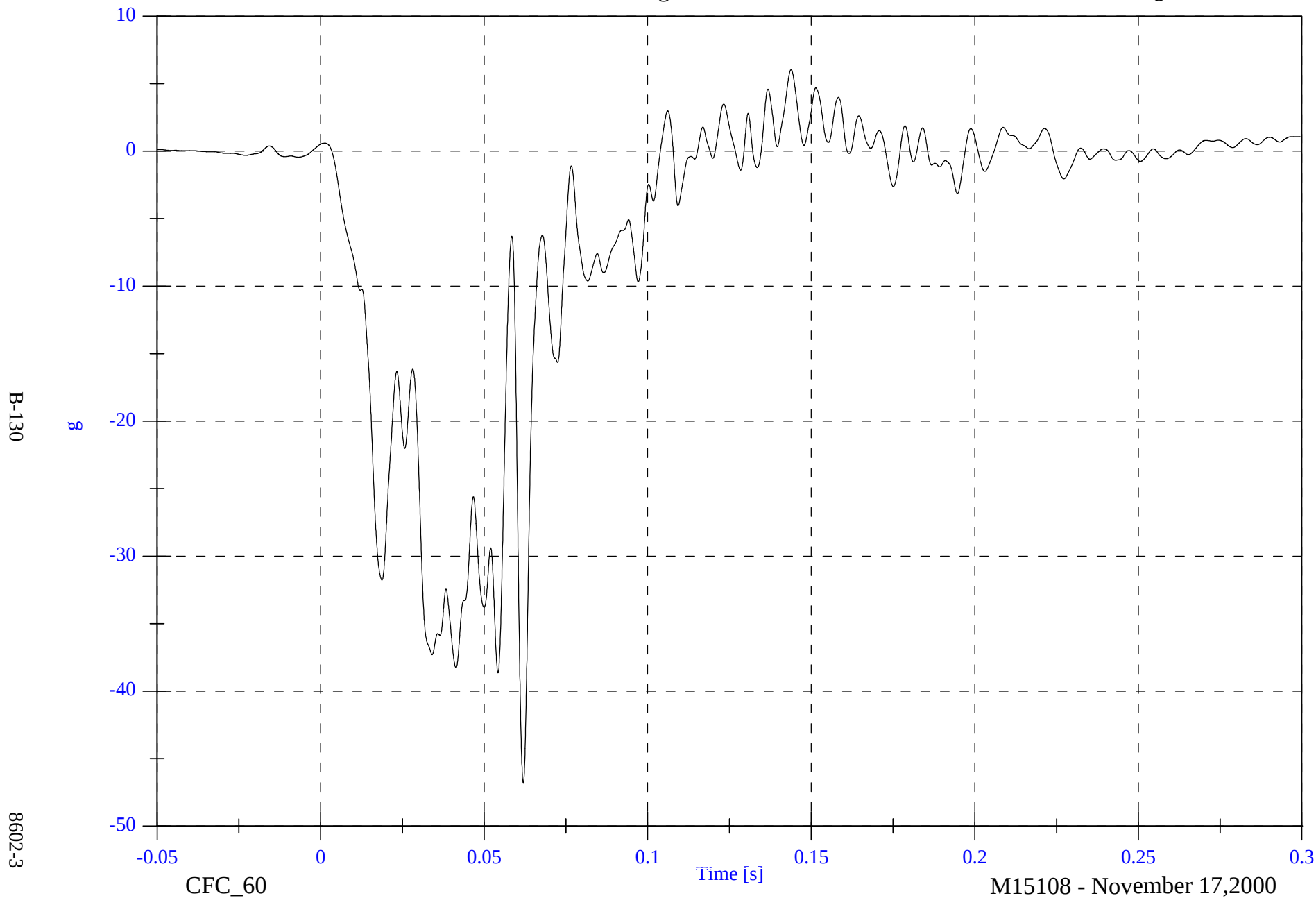


NCAP 2001 Test 3 - 2001 Toyota Tundra

Right Rear Red #9x

Max: 6.0 [g] at 0.144 [s]

Min: -46.8 [g] at 0.062 [s]



NCAP 2001 Test 3 - 2001 Toyota Tundra

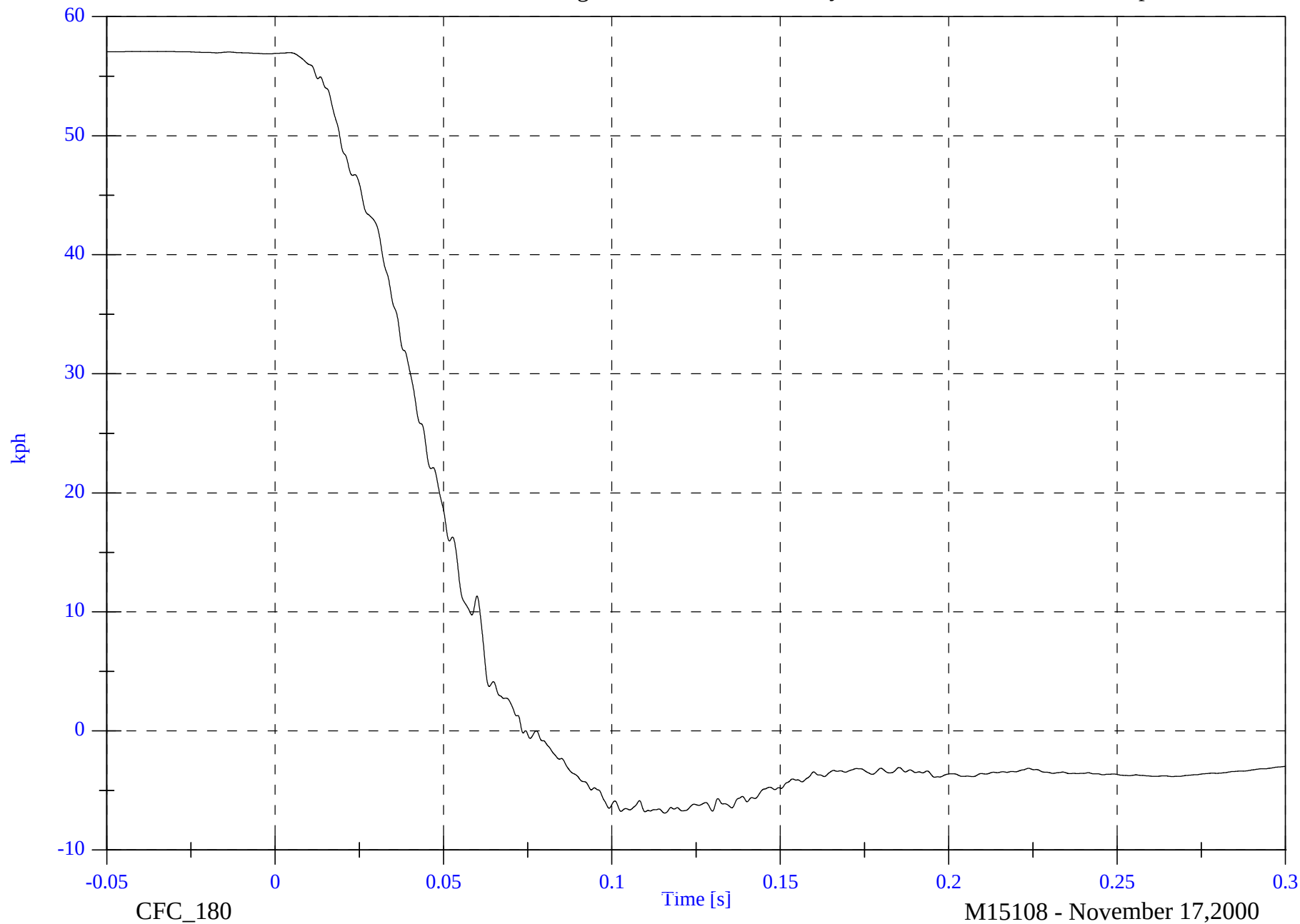
Right Rear Red #9x Velocity

Max: 57.1 [kph] at -0.037 [s]

Min: -6.9 [kph] at 0.116 [s]

B-131

8602-3

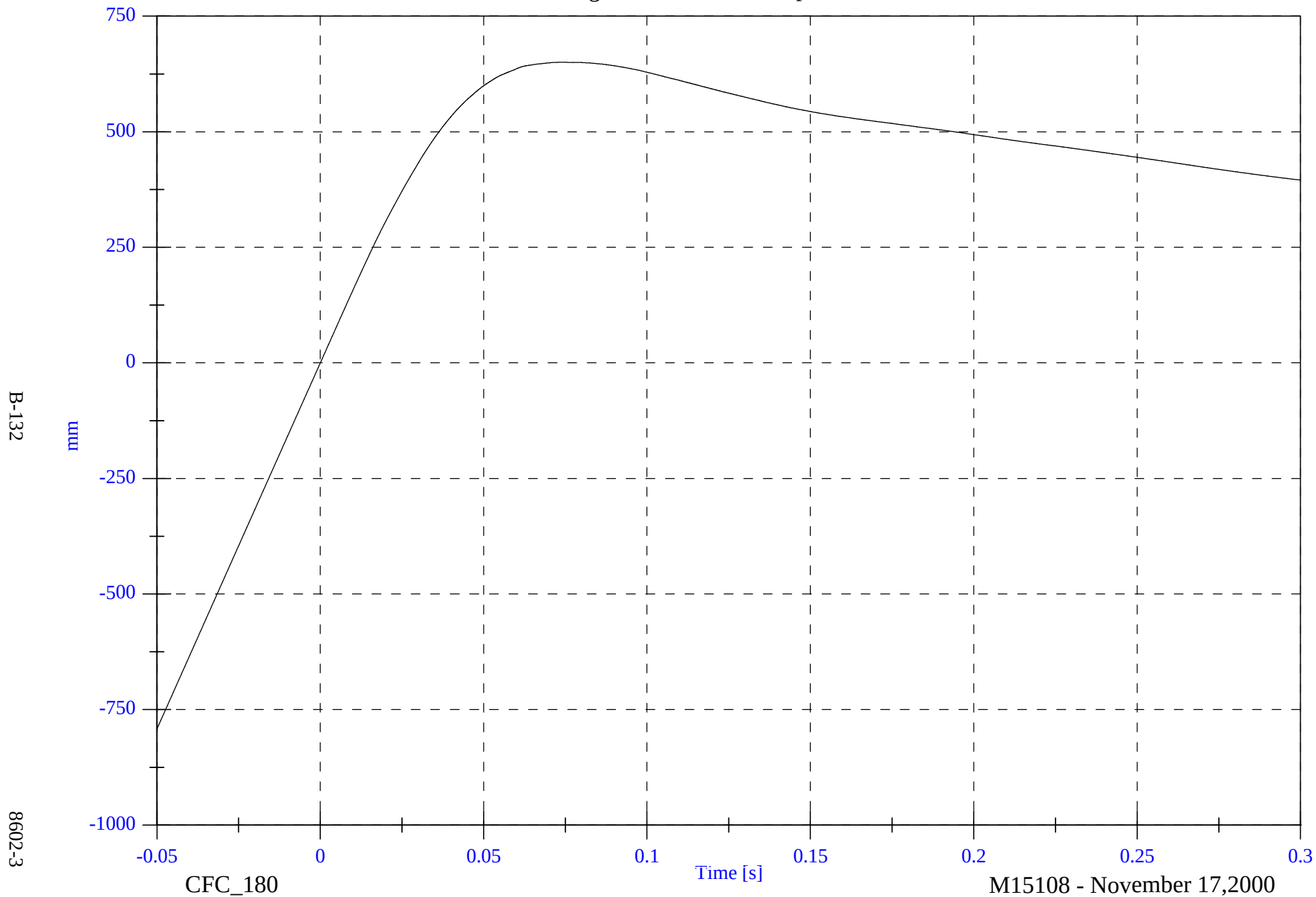


NCAP 2001 Test 3 - 2001 Toyota Tundra

Right Rear Red #9x Displacement

Max: 650.3 [mm] at 0.073 [s]

Min: -791.9 [mm] at -0.050 [s]

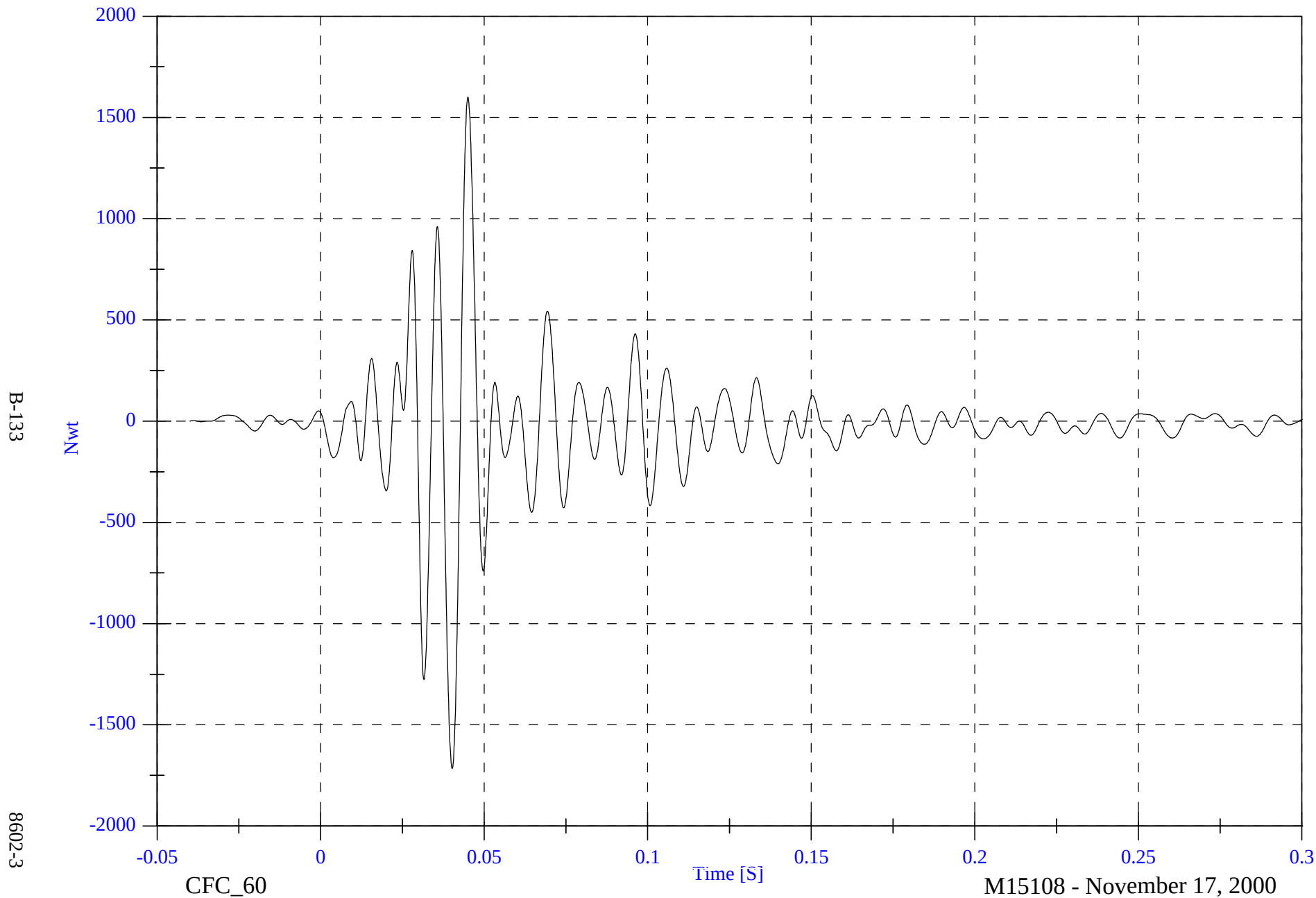


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A1 Fx

Max: 1600.3 [Nwt] at 0.045 [S]

Min: -1716.3 [Nwt] at 0.040 [S]

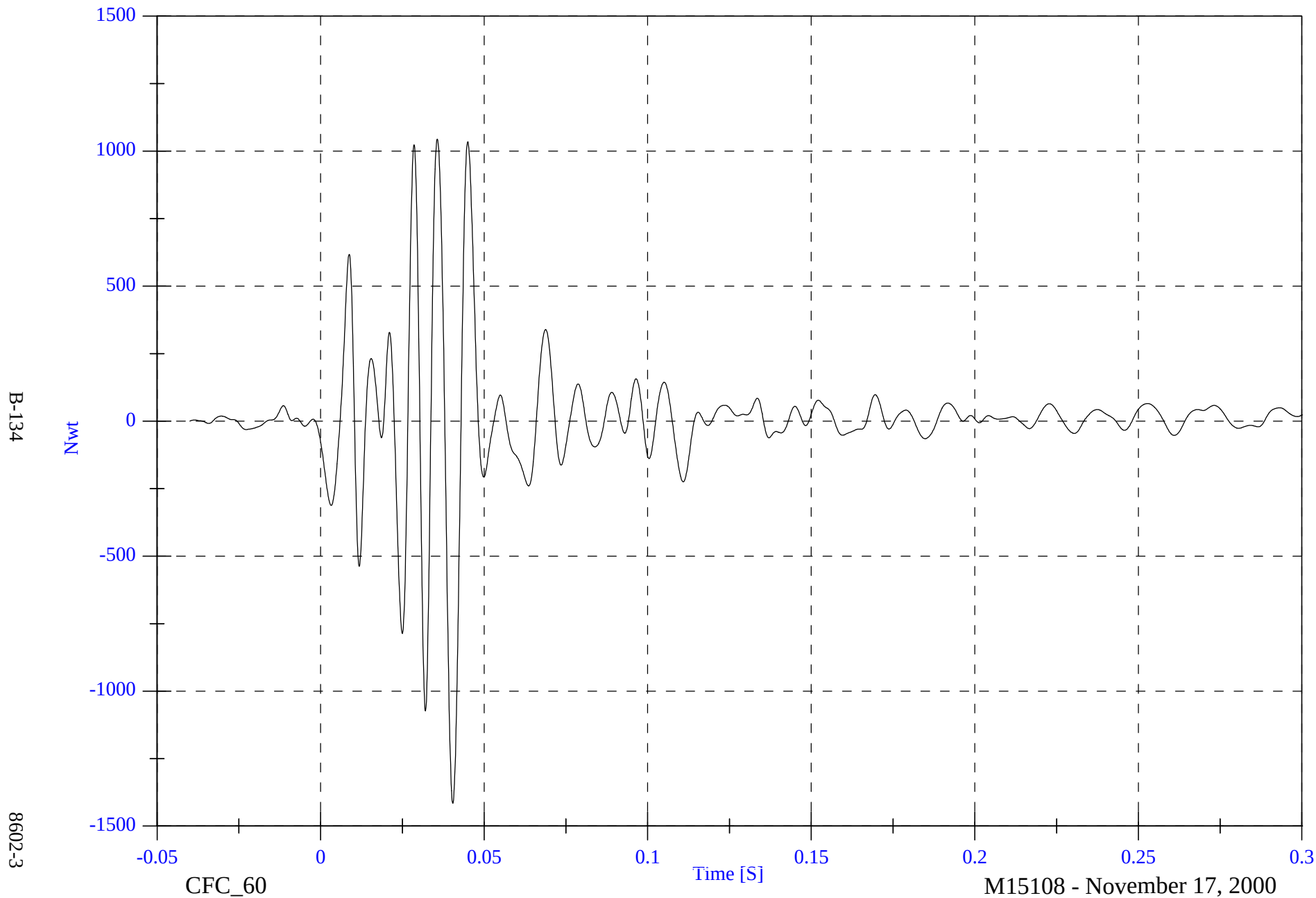


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A2 Fx

Max: 1045.1 [Nwt] at 0.036 [S]

Min: -1415.9 [Nwt] at 0.040 [S]

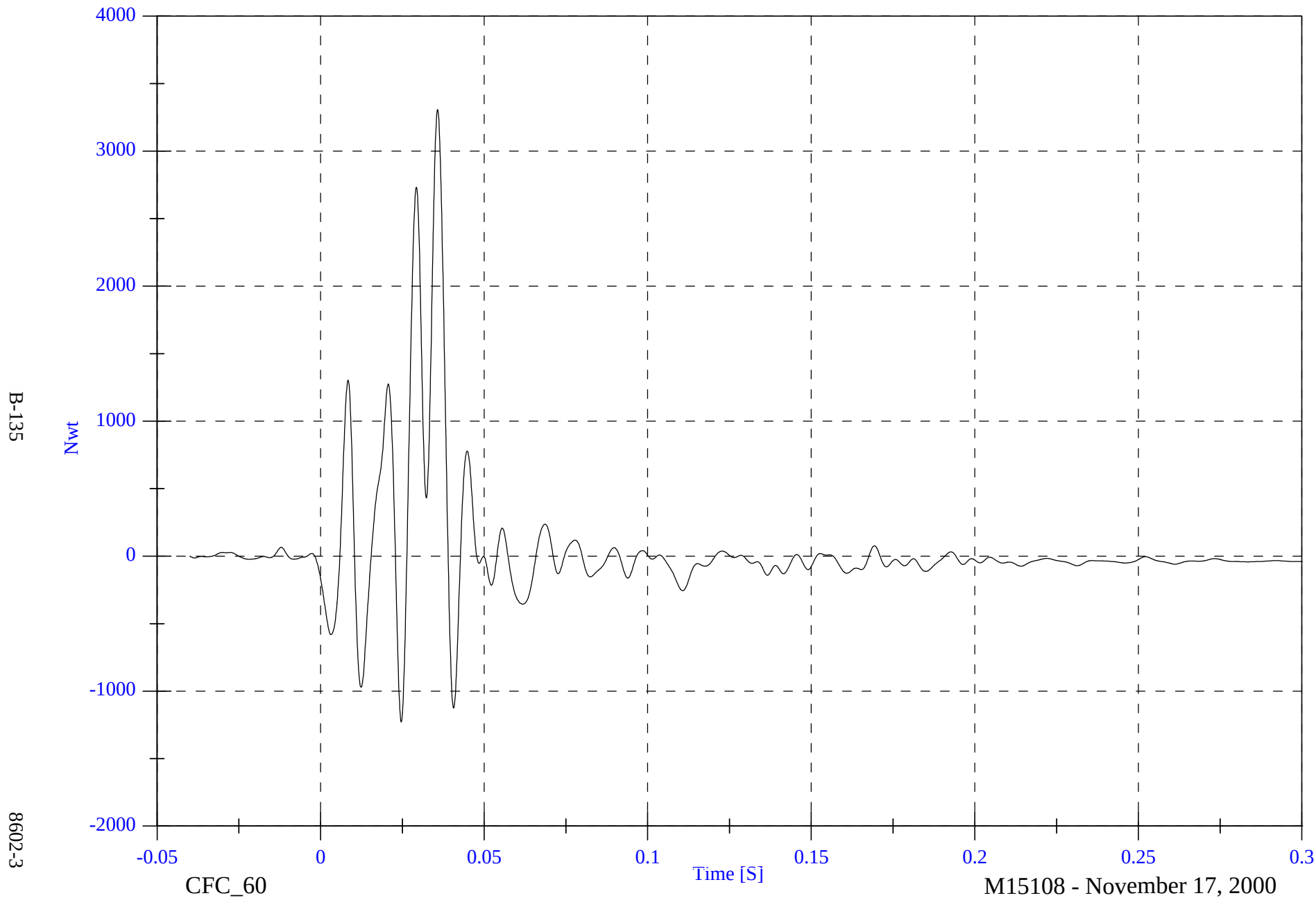


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A3 Fx

Max: 3307.6 [Nwt] at 0.036 [S]

Min: -1229.3 [Nwt] at 0.025 [S]

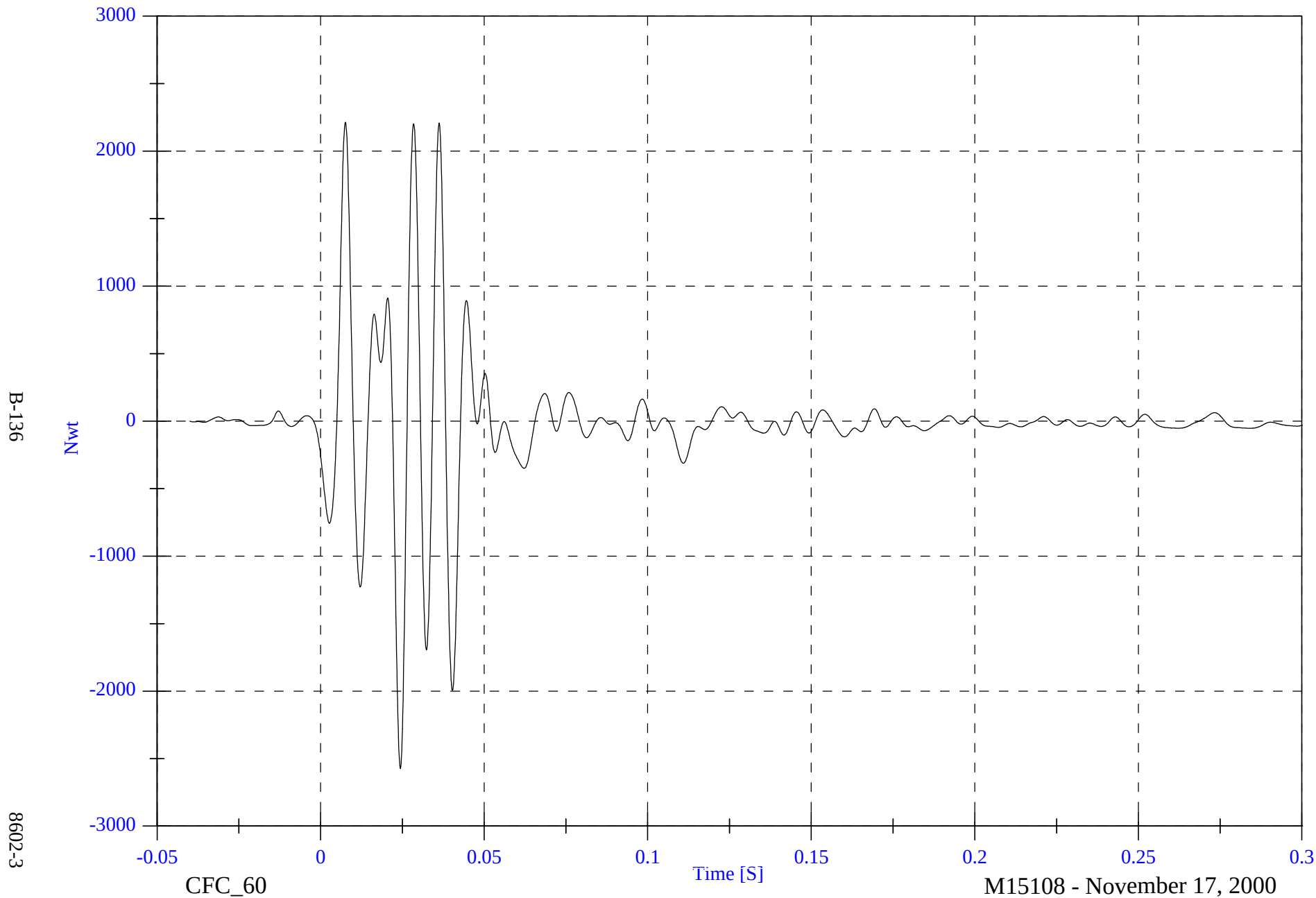


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A4 Fx

Max: 2214.9 [Nwt] at 0.007 [S]

Min: -2575.0 [Nwt] at 0.024 [S]

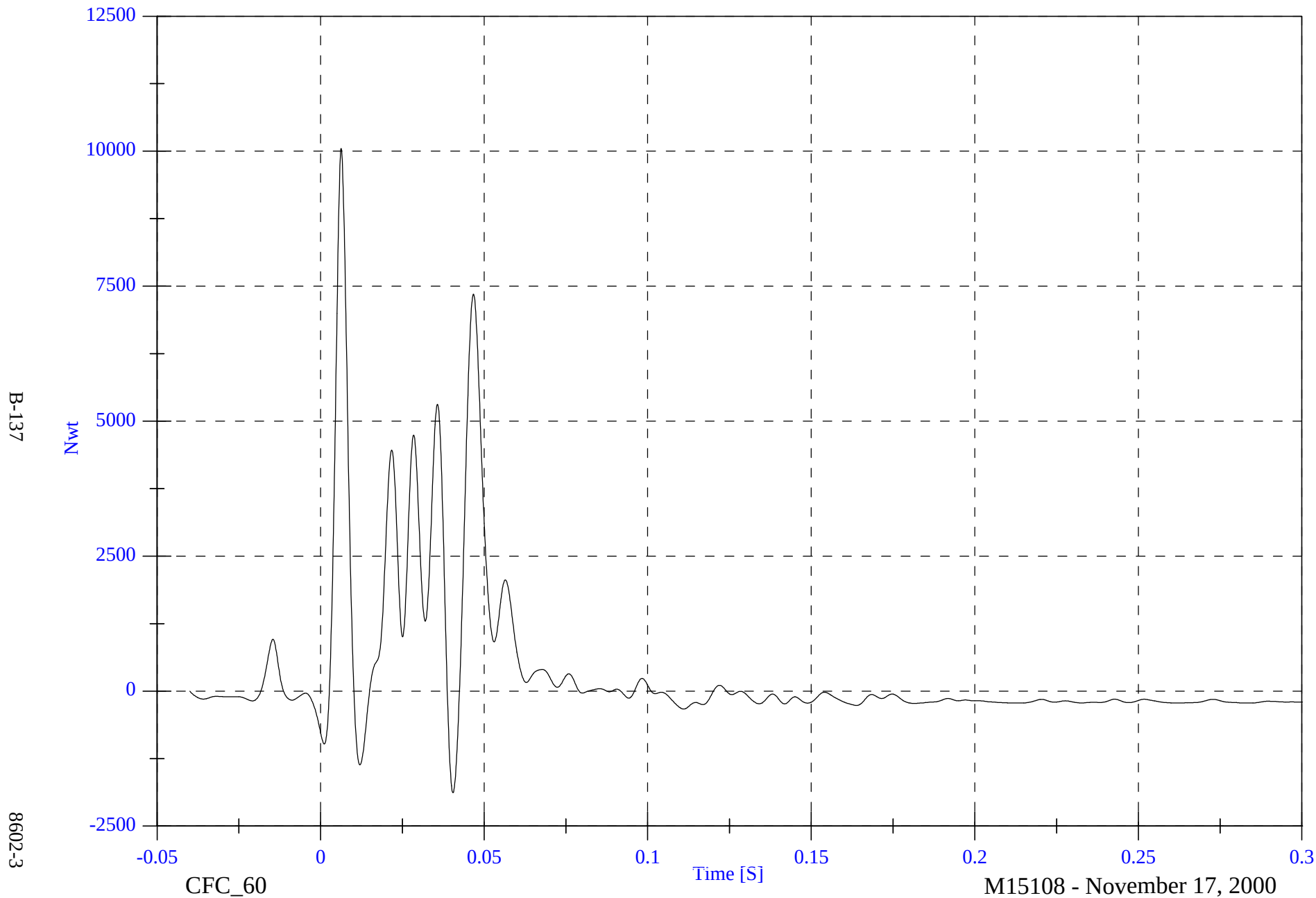


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A5 Fx

Max: 10049.7 [Nwt] at 0.006 [S]

Min: -1883.2 [Nwt] at 0.040 [S]

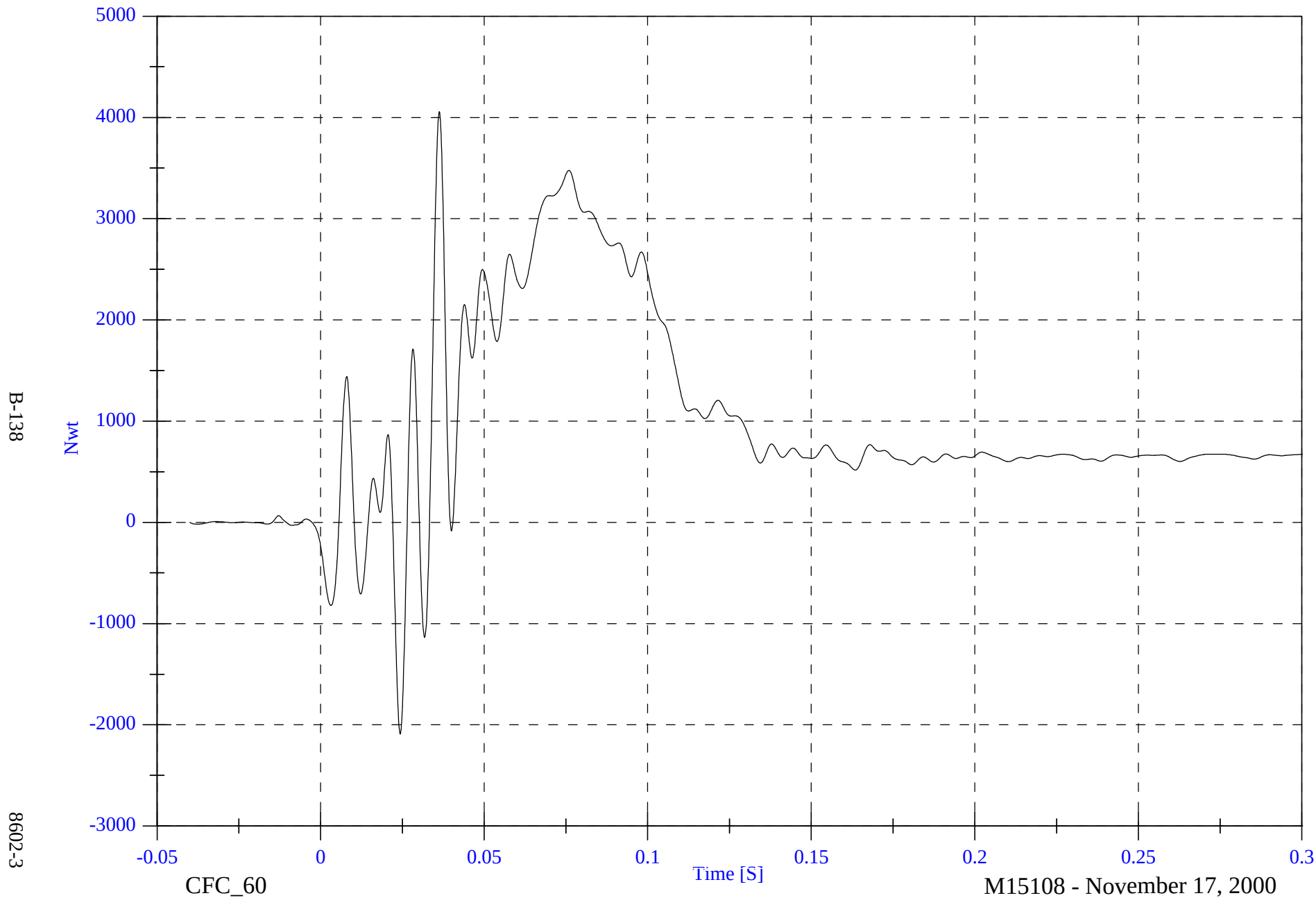


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A6 Fx

Max: 4058.1 [Nwt] at 0.036 [S]

Min: -2090.8 [Nwt] at 0.024 [S]

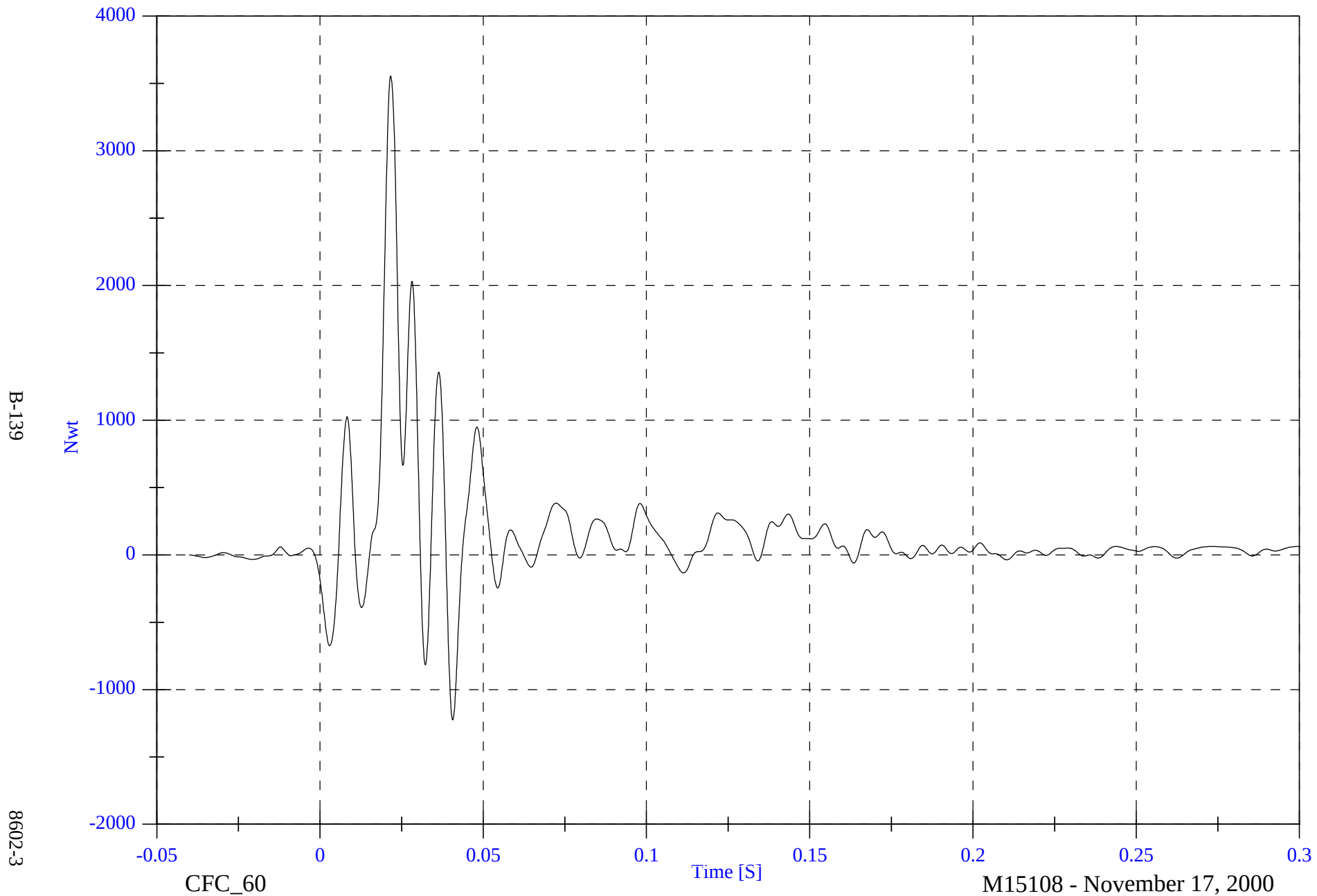


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A7 Fx

Max: 3556.6 [Nwt] at 0.022 [S]

Min: -1226.2 [Nwt] at 0.041 [S]

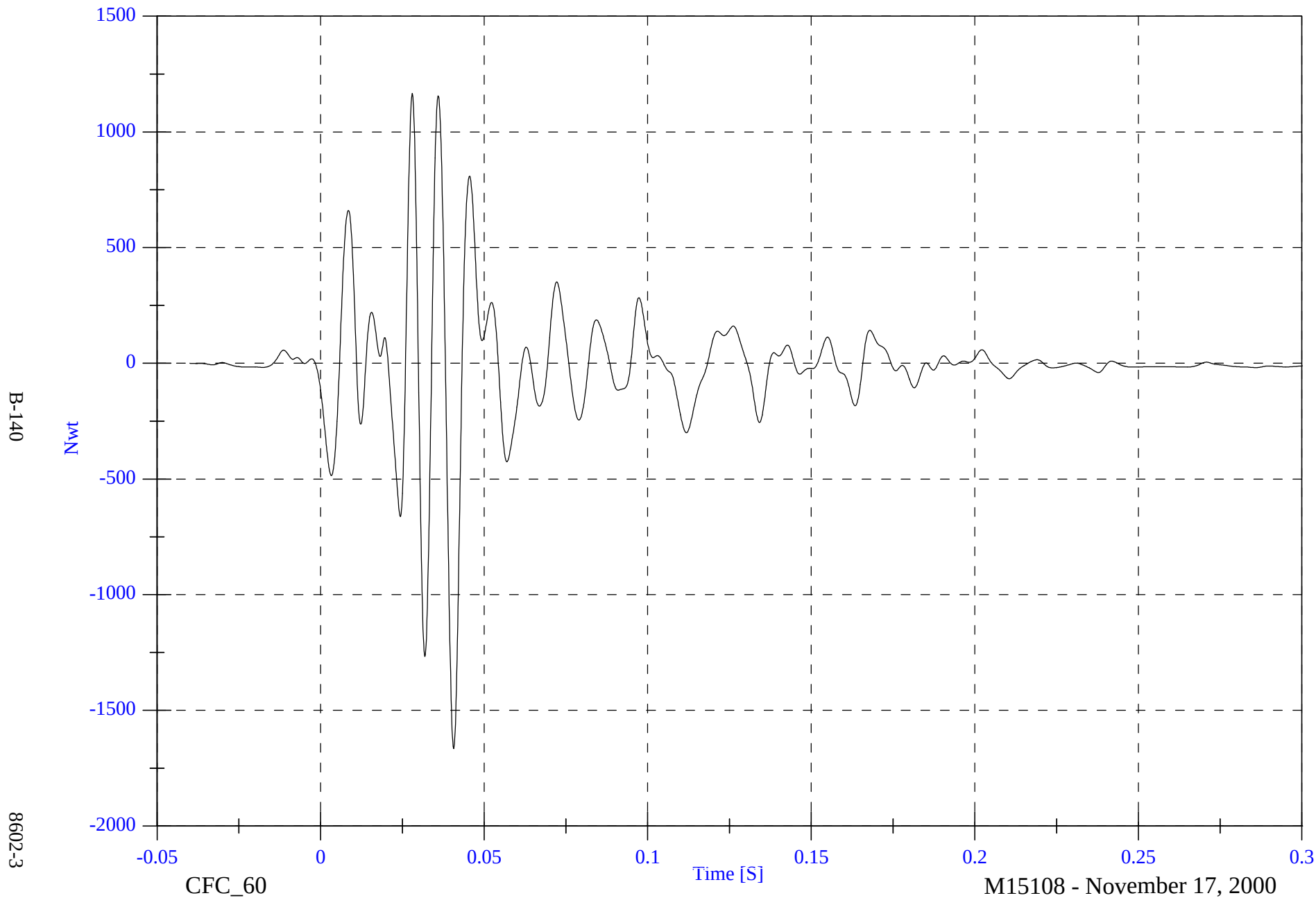


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A8 Fx

Max: 1166.2 [Nwt] at 0.028 [S]

Min: -1665.6 [Nwt] at 0.041 [S]

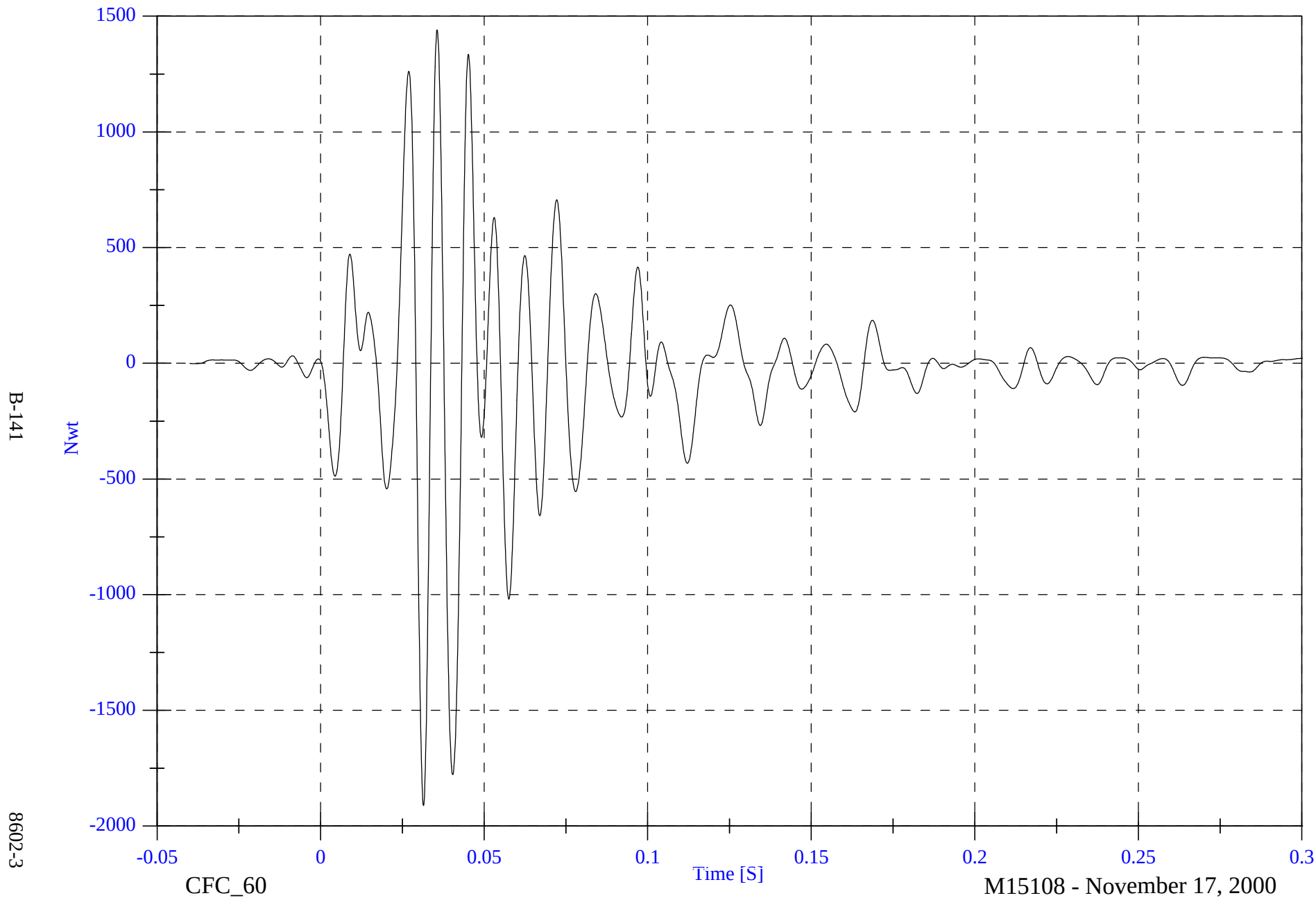


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell A9 Fx

Max: 1441.1 [Nwt] at 0.036 [S]

Min: -1911.3 [Nwt] at 0.031 [S]

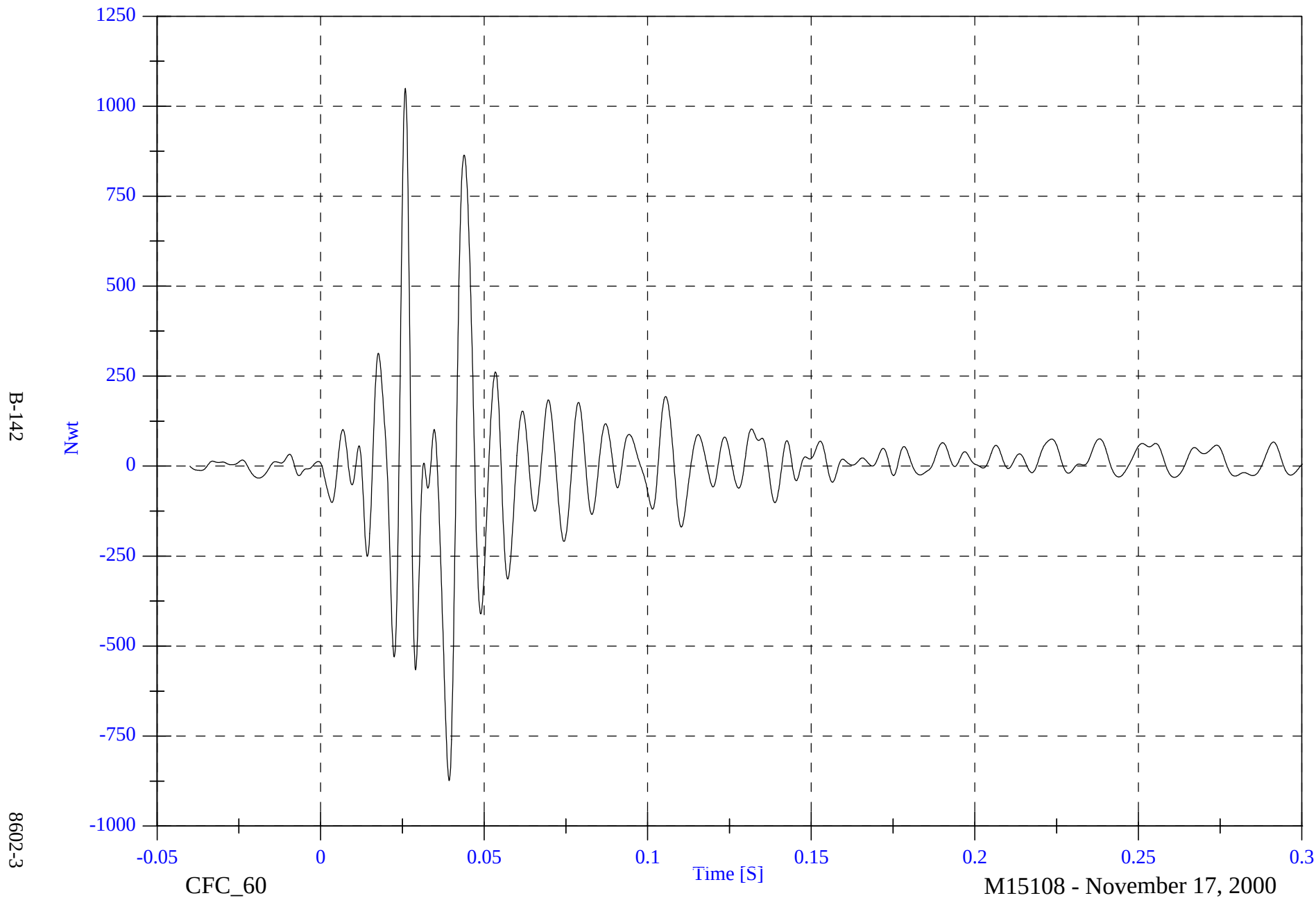


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B1 Fx

Max: 1049.9 [Nwt] at 0.026 [S]

Min: -874.0 [Nwt] at 0.039 [S]

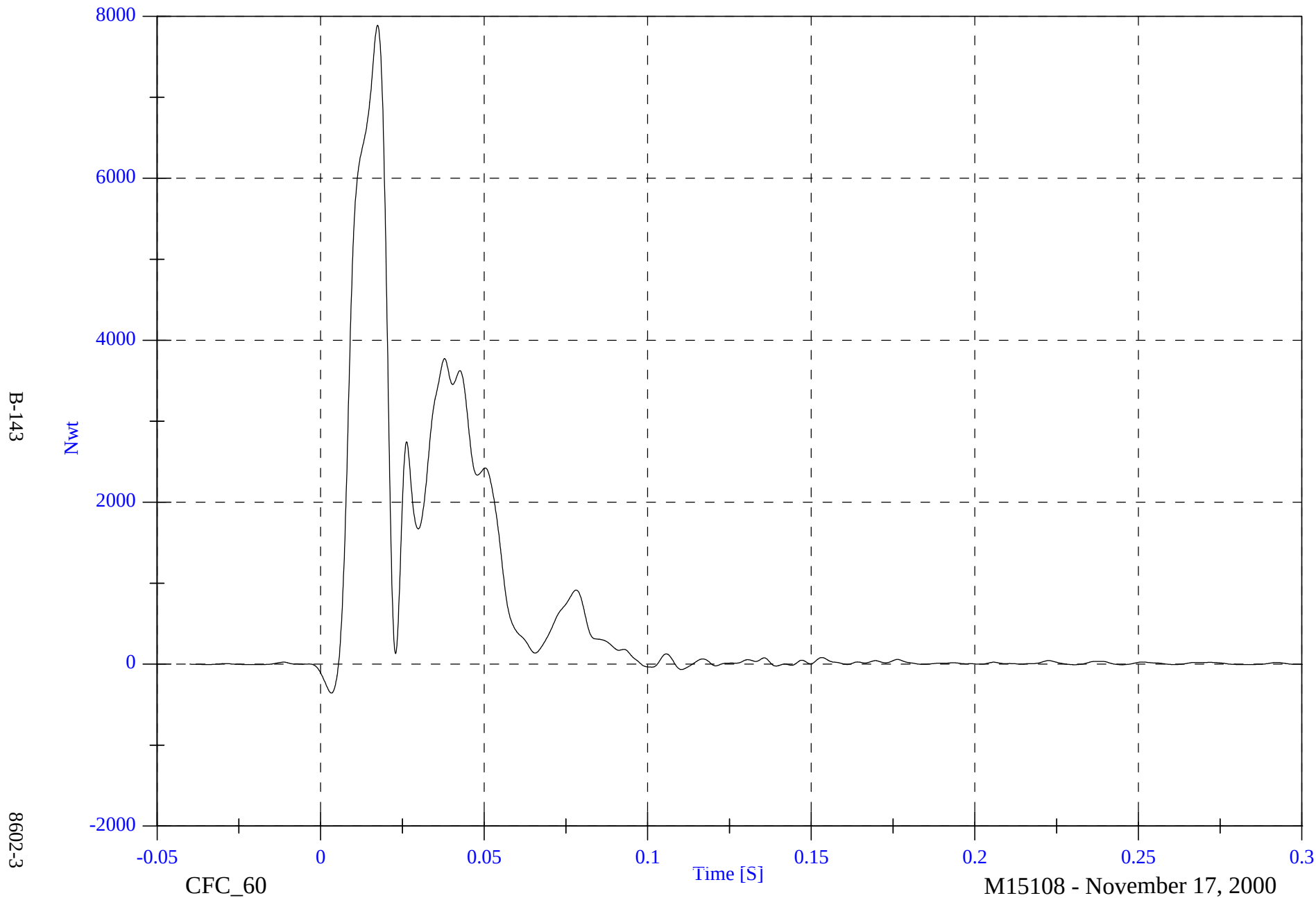


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B2 Fx

Max: 7888.0 [Nwt] at 0.017 [S]

Min: -358.3 [Nwt] at 0.003 [S]

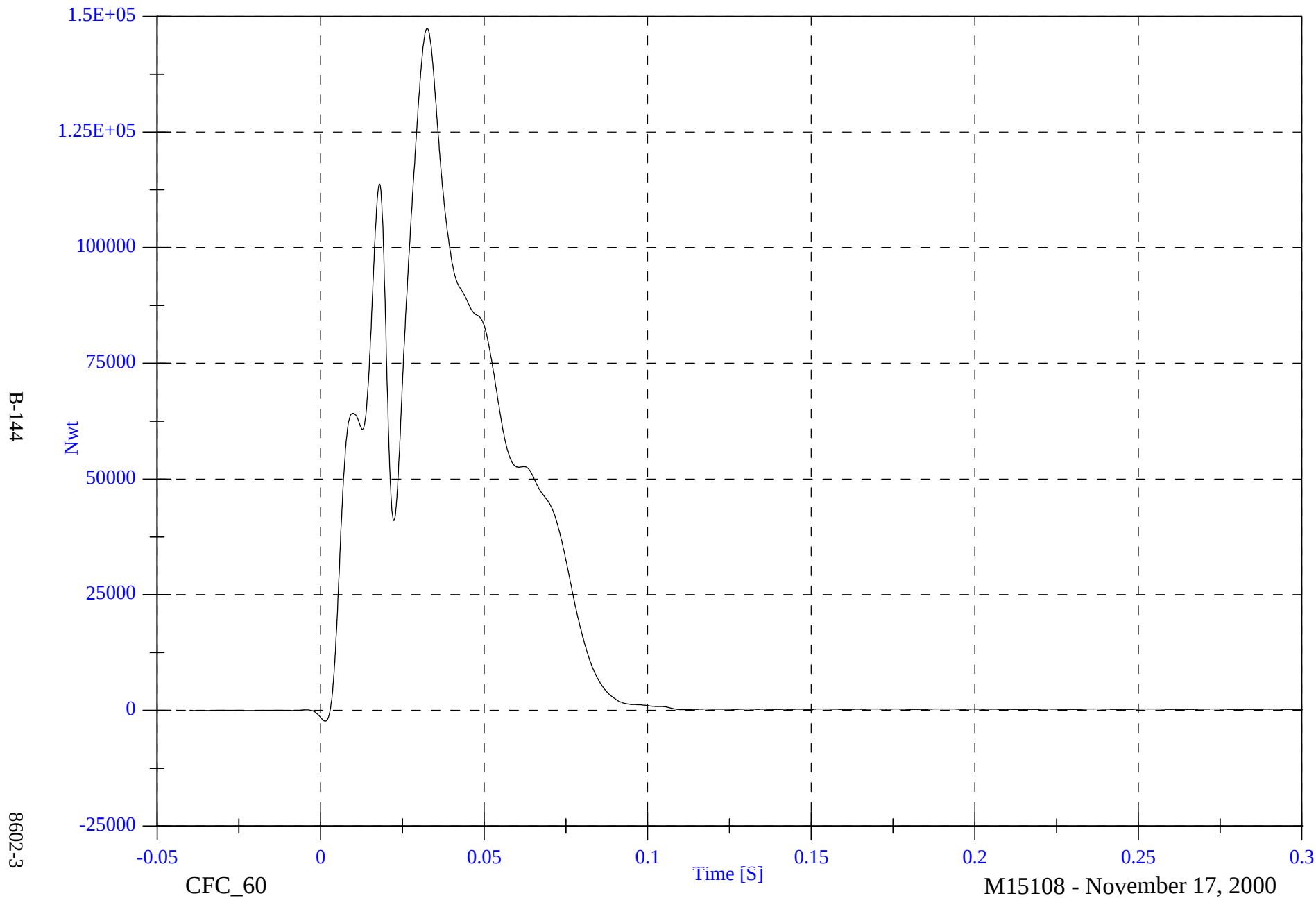


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B3 Fx

Max: 147425.6 [Nwt] at 0.033 [S]

Min: -2313.7 [Nwt] at 0.001 [S]

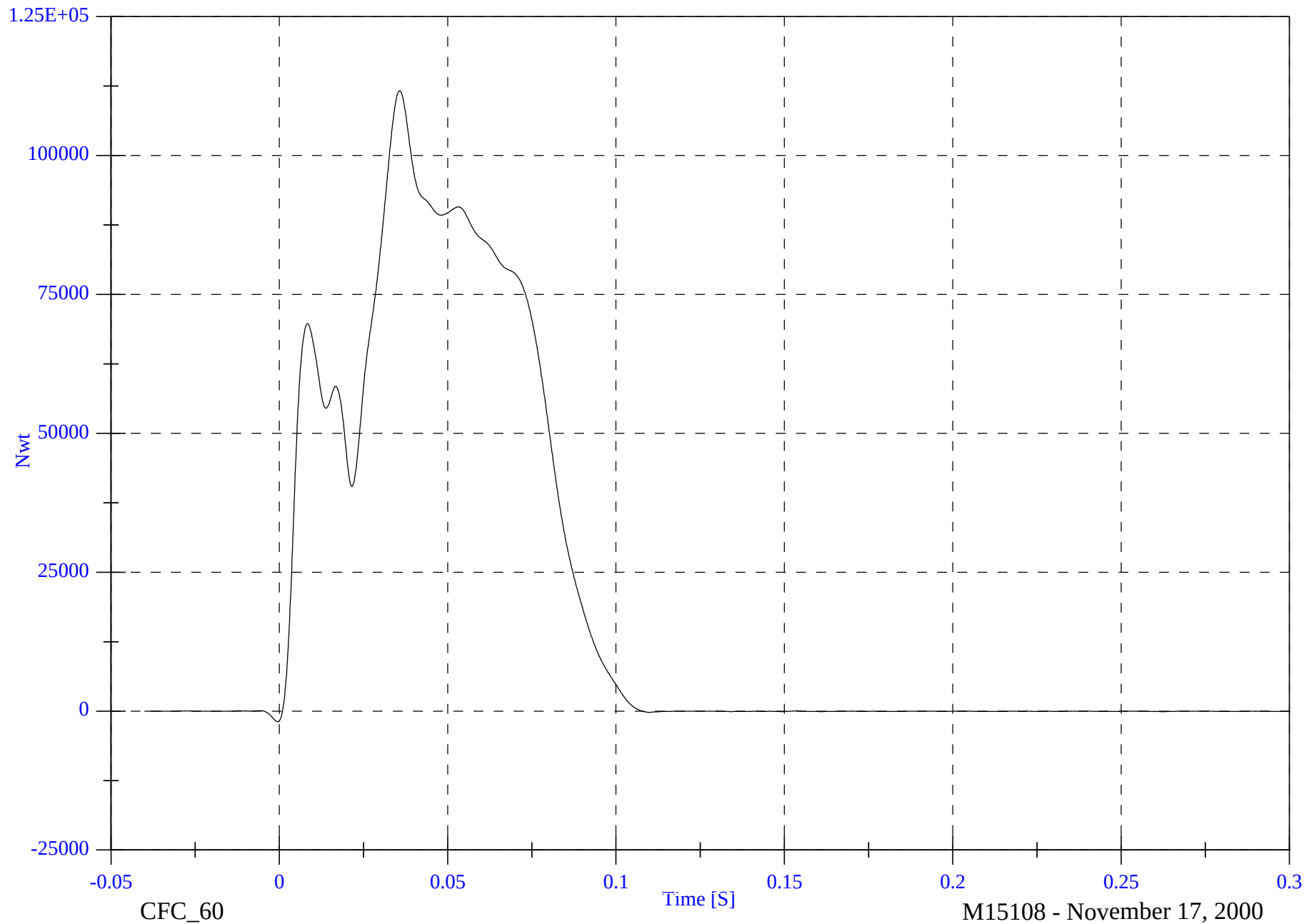


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B4 Fx

Max: 111650.0 [Nwt] at 0.036 [S]

Min: -1922.4 [Nwt] at -0.001 [S]

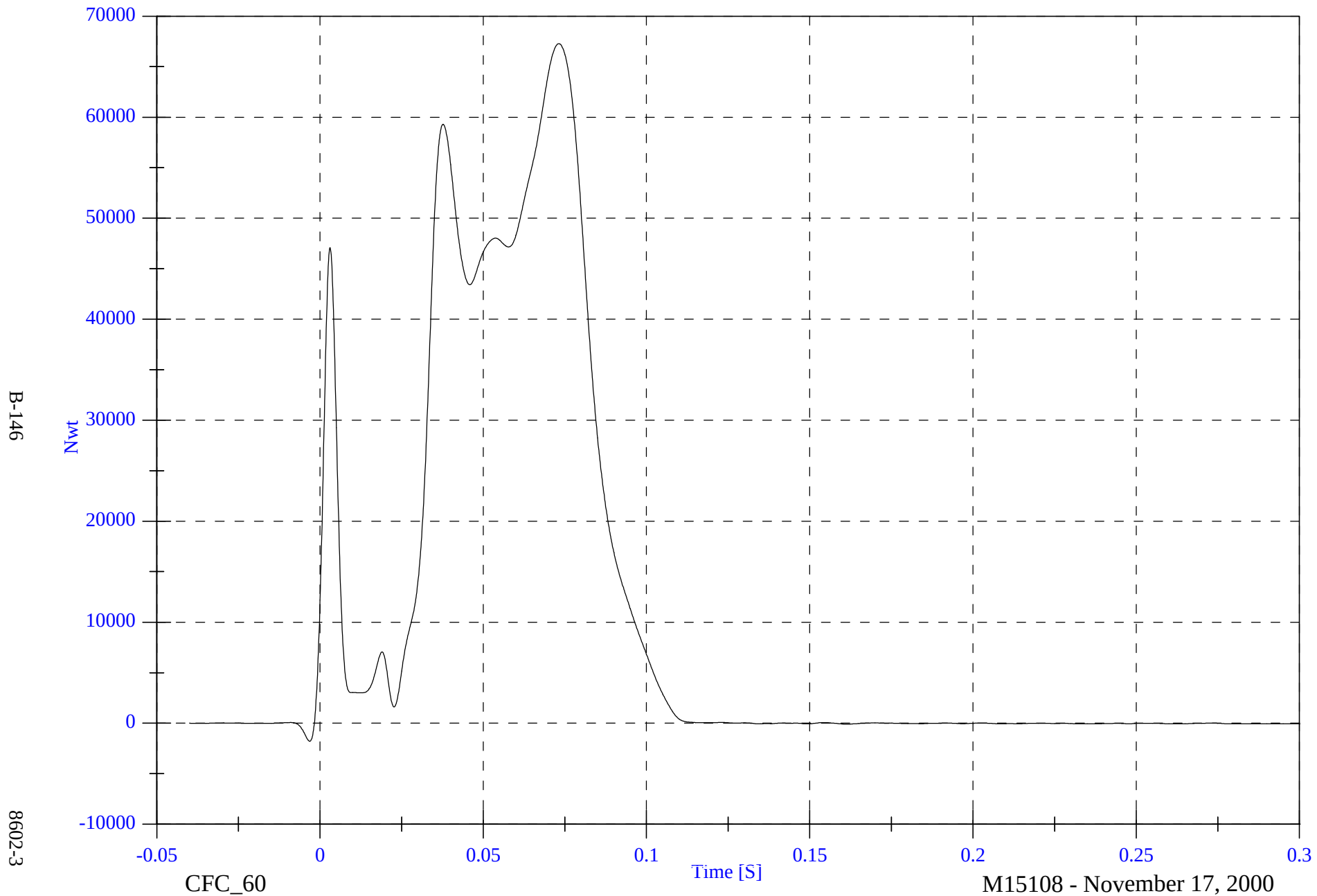


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B5 Fx

Max: 67280.8 [Nwt] at 0.073 [S]

Min: -1788.0 [Nwt] at -0.003 [S]

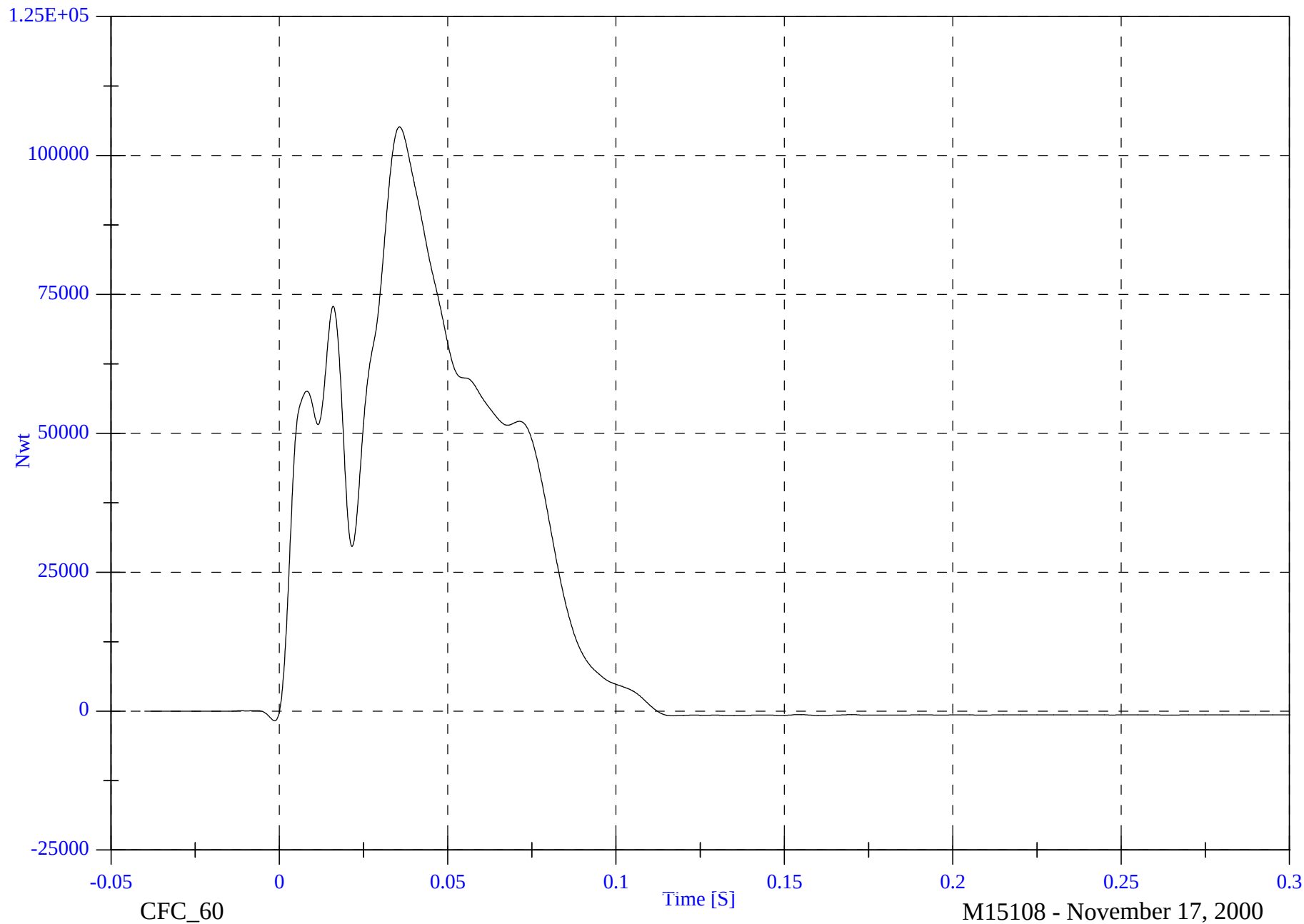


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B6 Fx

Max: 105162.5 [Nwt] at 0.036 [S]

Min: -1747.4 [Nwt] at -0.001 [S]

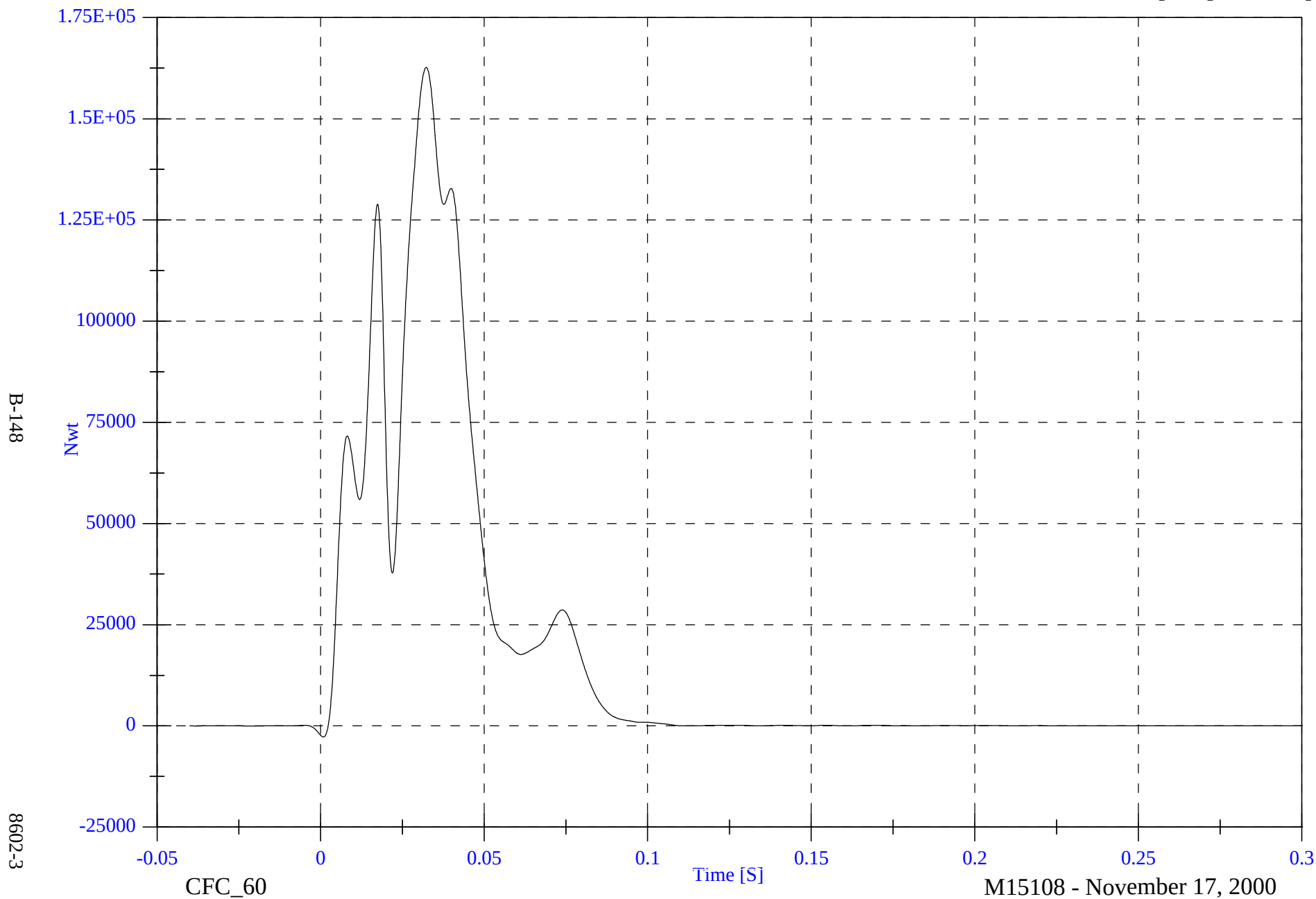


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B7 Fx

Max: 162684.8 [Nwt] at 0.032 [S]

Min: -2745.7 [Nwt] at 0.001 [S]

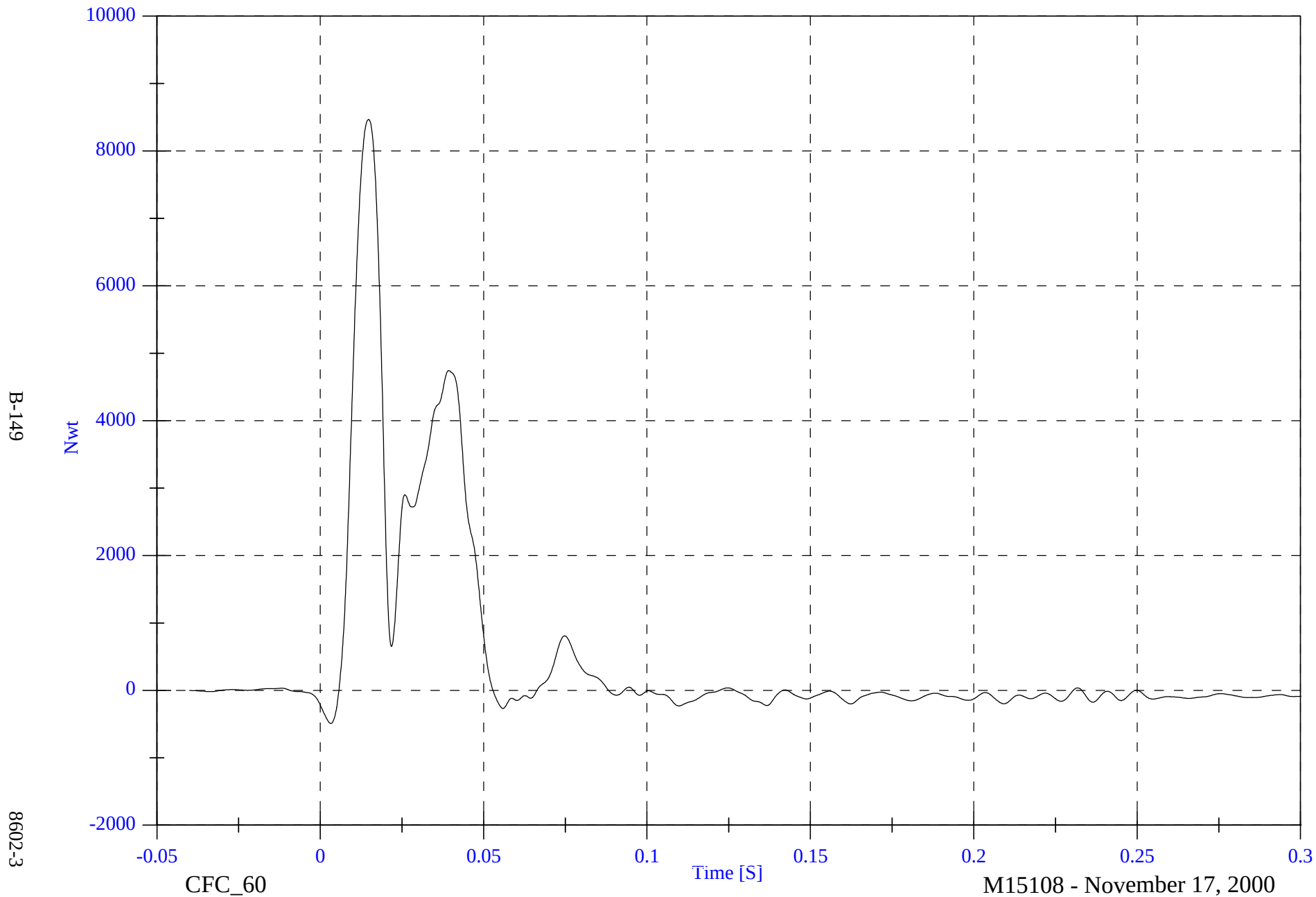


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B8 Fx

Max: 8468.9 [Nwt] at 0.015 [S]

Min: -491.7 [Nwt] at 0.003 [S]

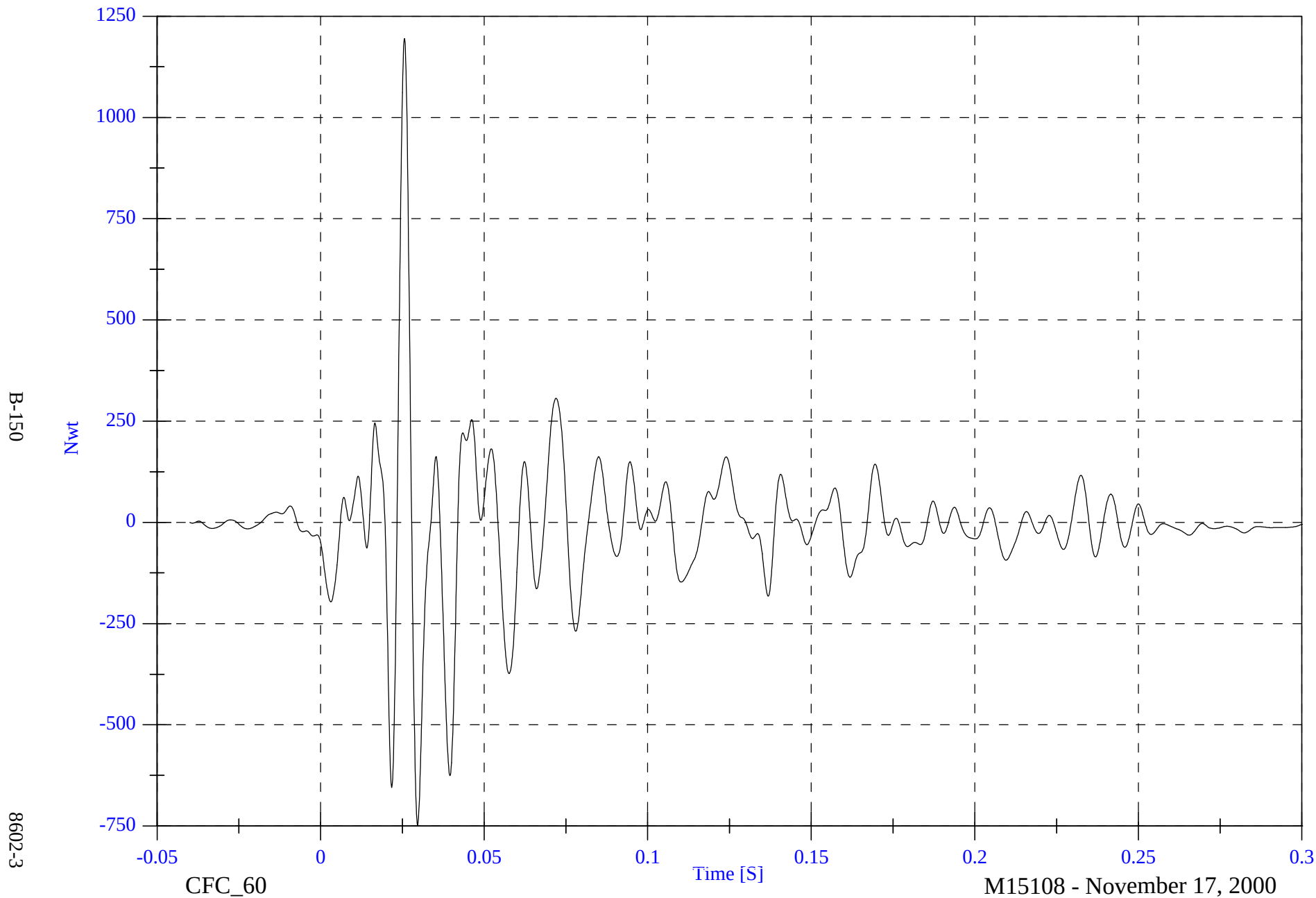


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell B9 Fx

Max: 1194.7 [Nwt] at 0.026 [S]

Min: -748.0 [Nwt] at 0.030 [S]

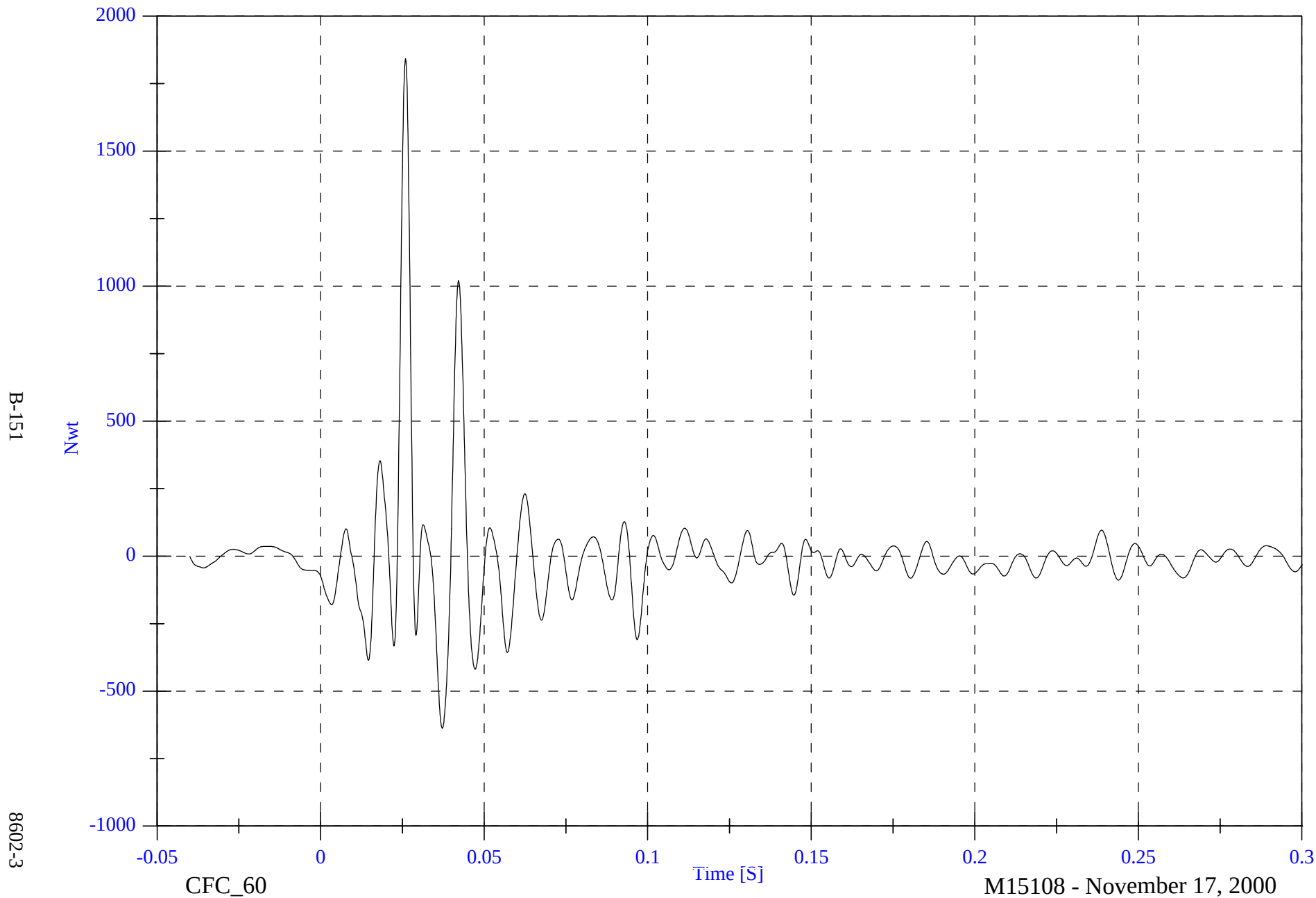


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C1 Fx

Max: 1842.9 [Nwt] at 0.026 [S]

Min: -638.1 [Nwt] at 0.037 [S]

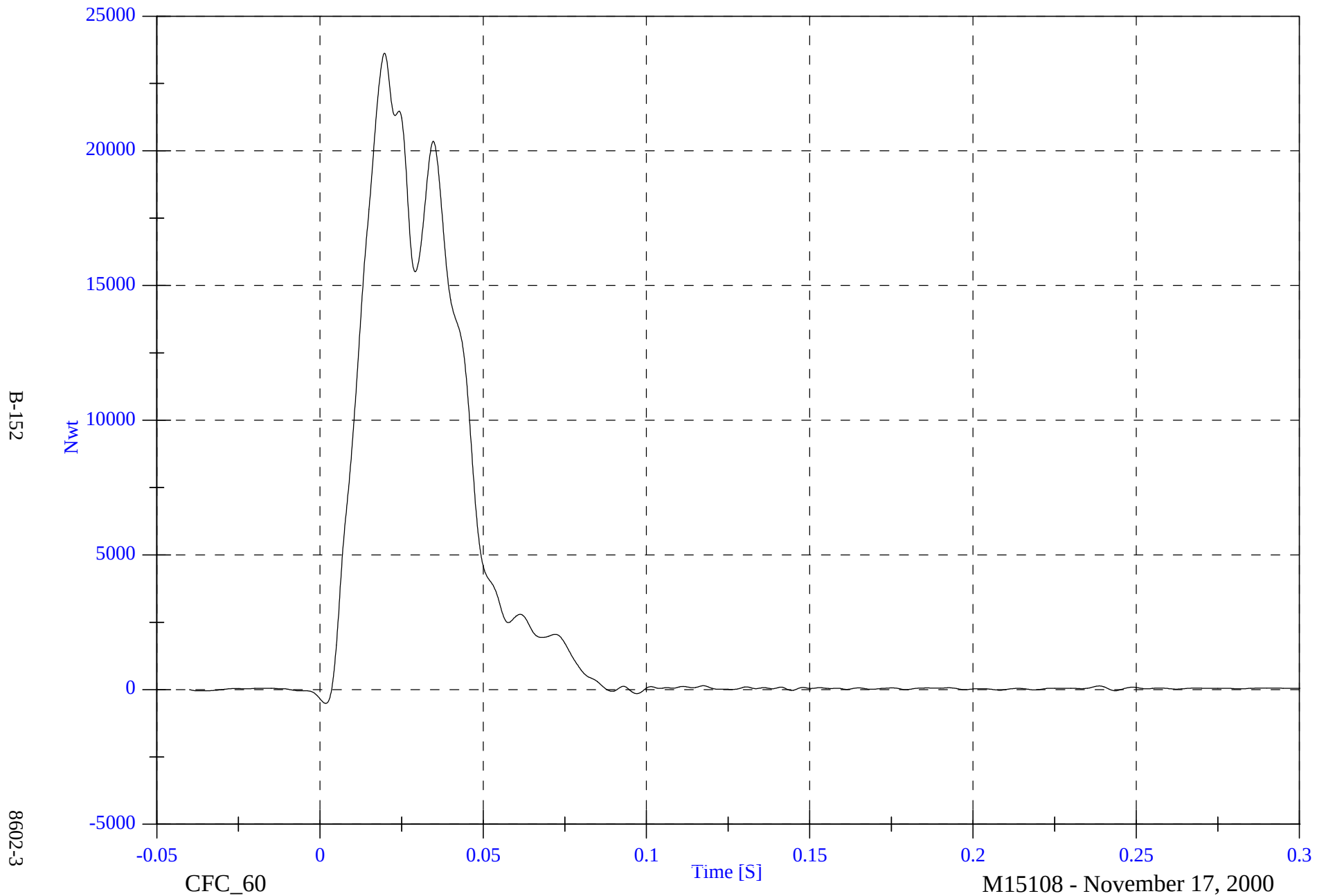


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C2 Fx

Max: 23625.9 [Nwt] at 0.020 [S]

Min: -514.1 [Nwt] at 0.002 [S]

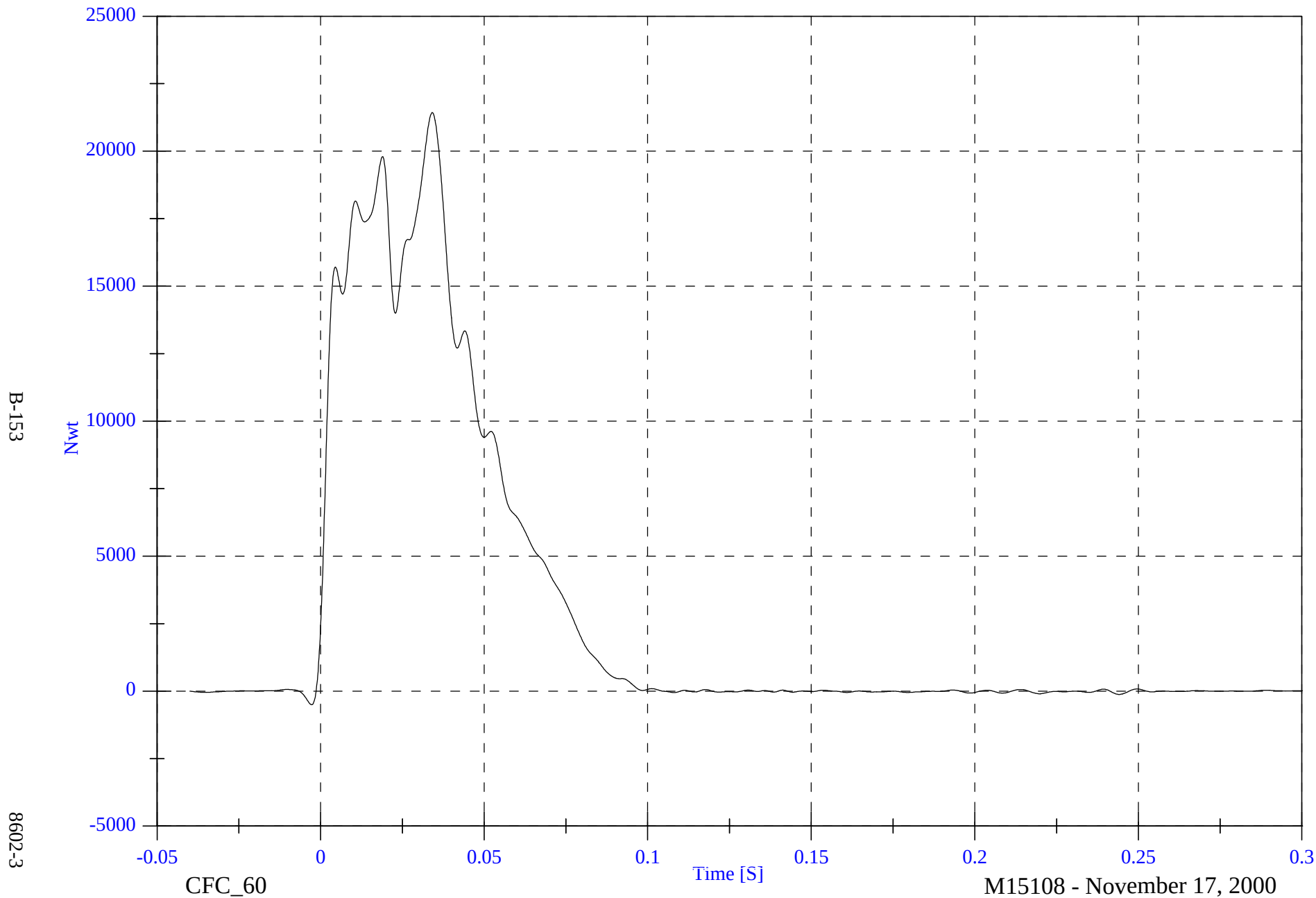


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C3 Fx

Max: 21429.9 [Nwt] at 0.034 [S]

Min: -505.0 [Nwt] at -0.003 [S]

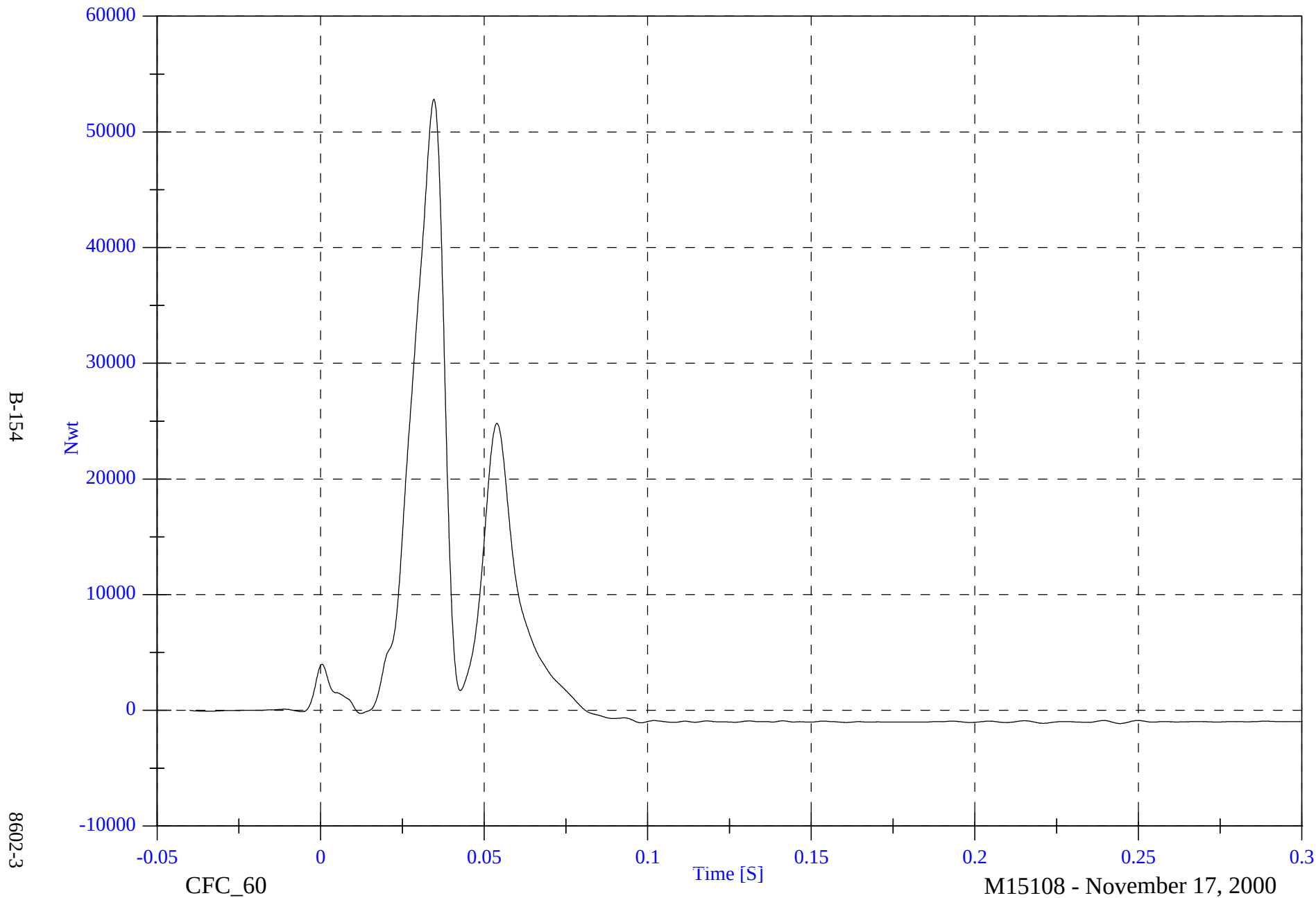


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C4 Fx

Max: 52823.3 [Nwt] at 0.035 [S]

Min: -1135.2 [Nwt] at 0.244 [S]

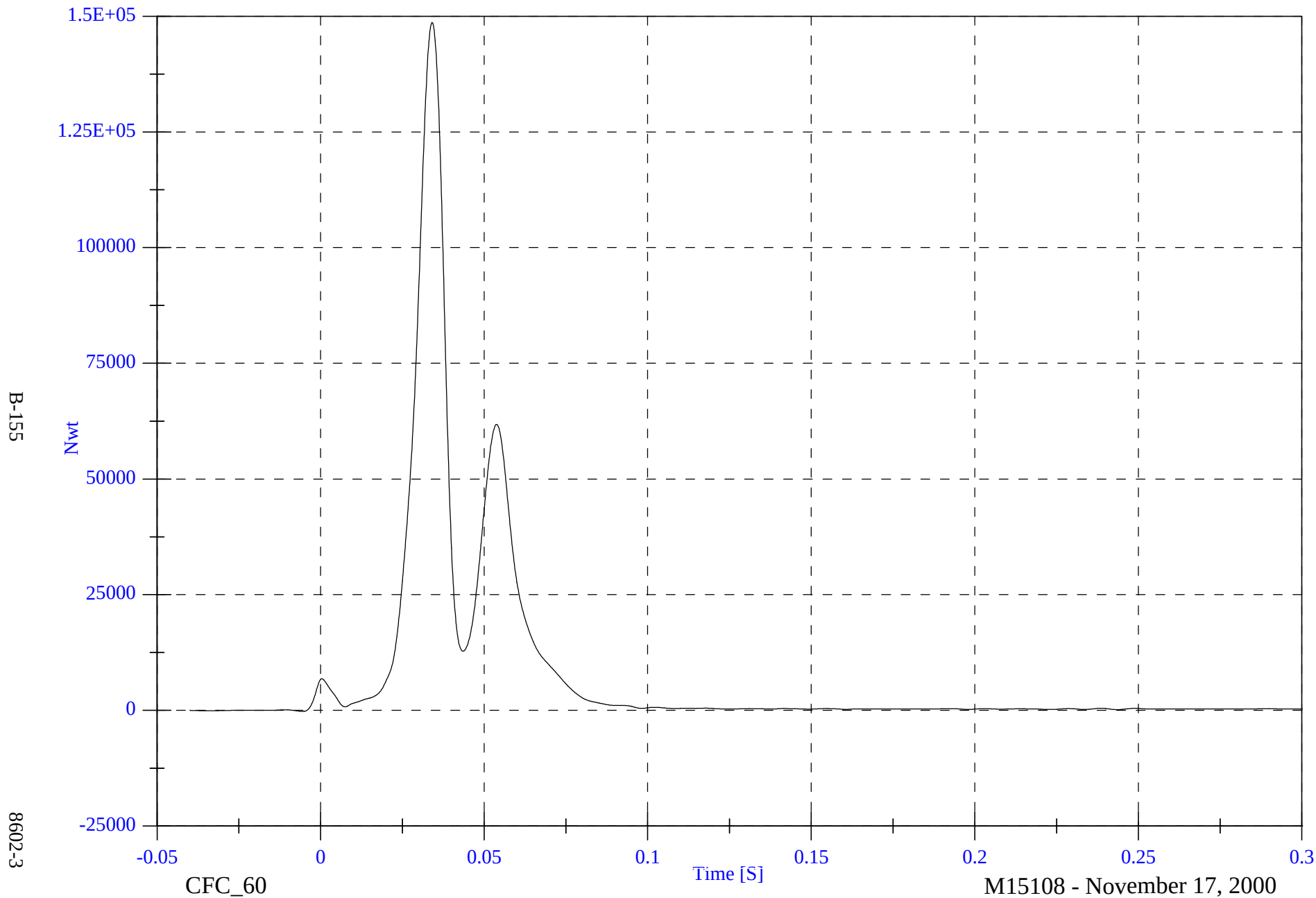


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C5 Fx

Max: 148663.2 [Nwt] at 0.034 [S]

Min: -245.2 [Nwt] at -0.006 [S]

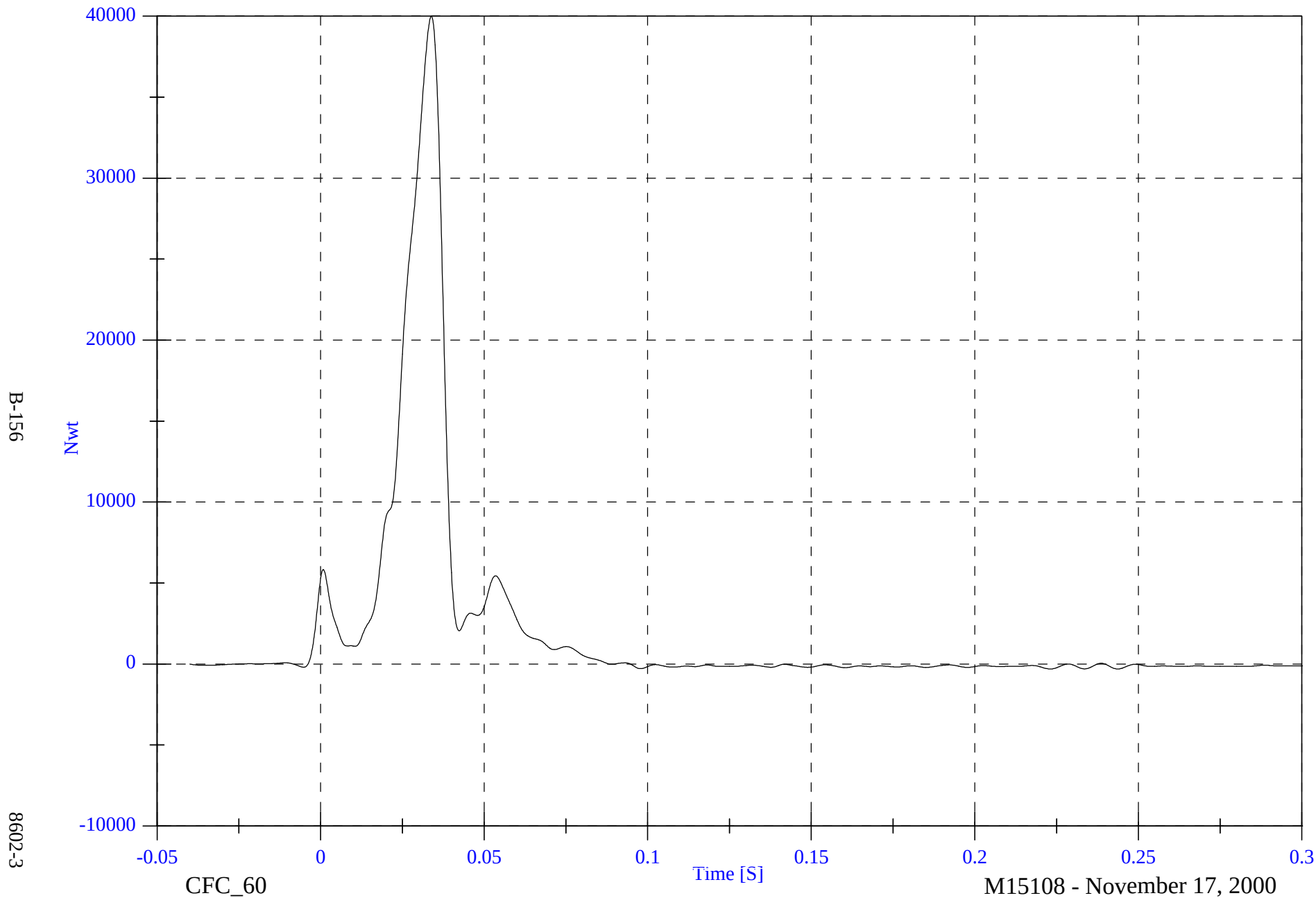


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C6 Fx

Max: 39999.9 [Nwt] at 0.034 [S]

Min: -304.0 [Nwt] at 0.244 [S]

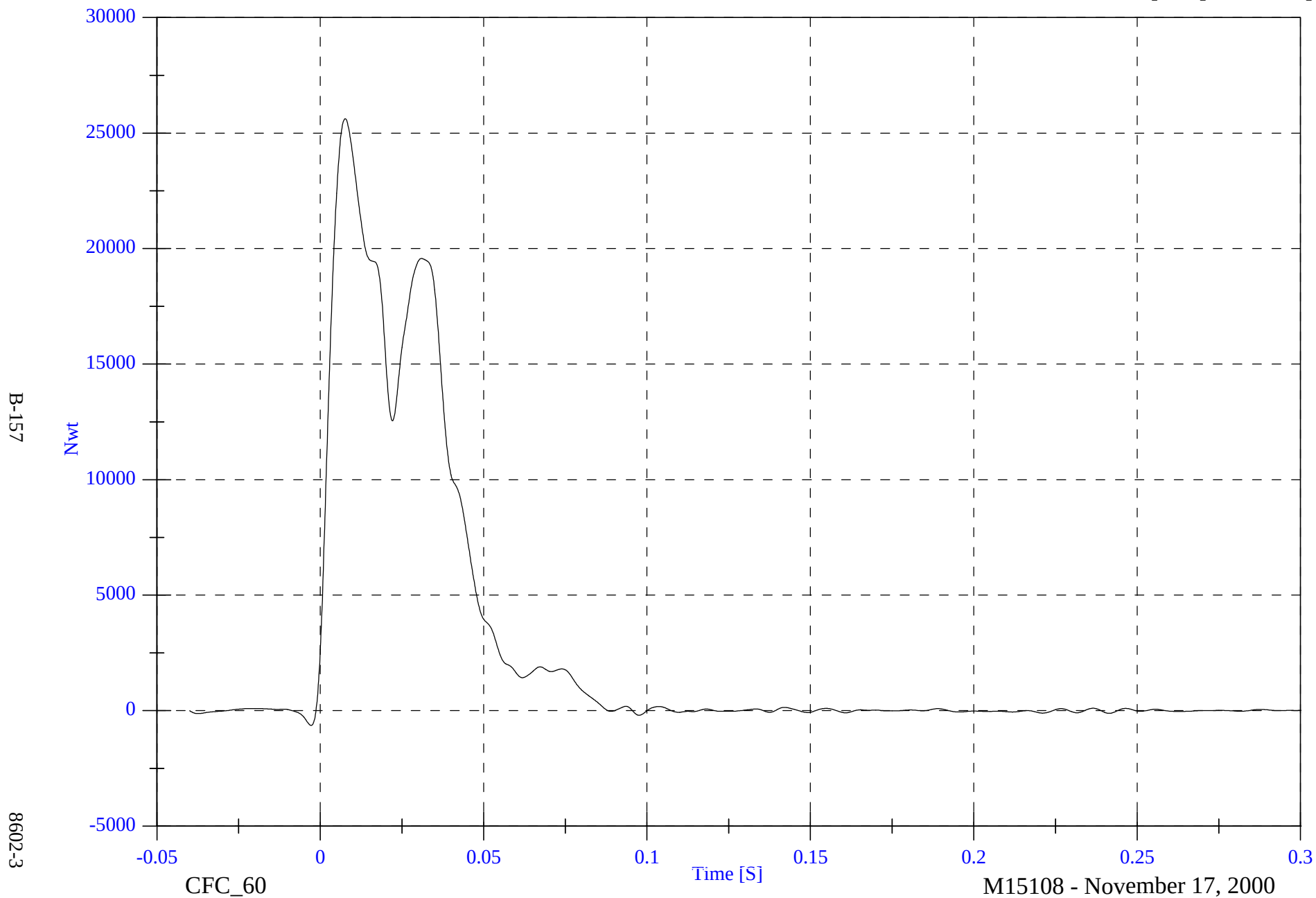


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C7 Fx

Max: 25623.8 [Nwt] at 0.008 [S]

Min: -641.1 [Nwt] at -0.003 [S]

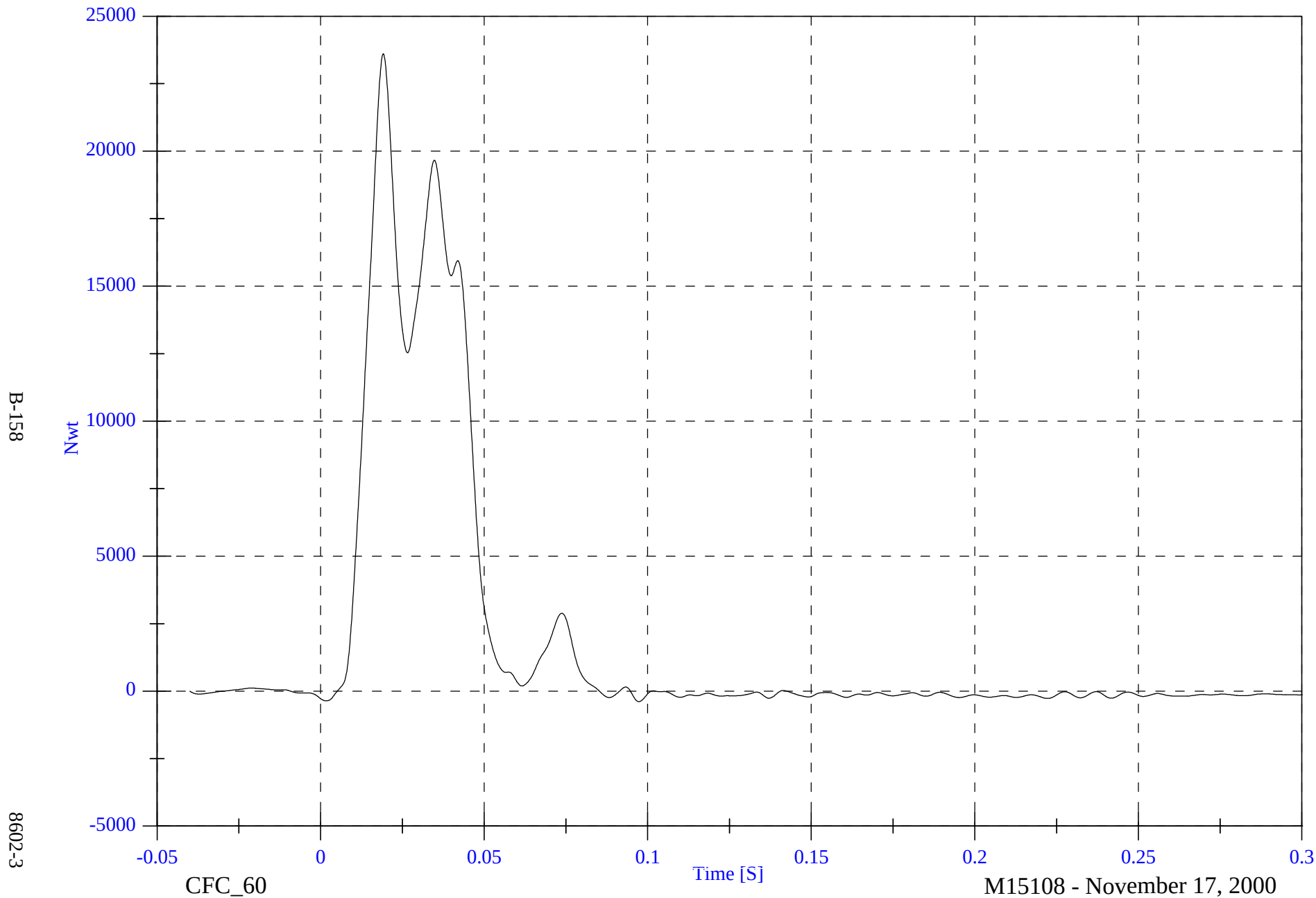


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C8 Fx

Max: 23612.1 [Nwt] at 0.019 [S]

Min: -393.0 [Nwt] at 0.097 [S]

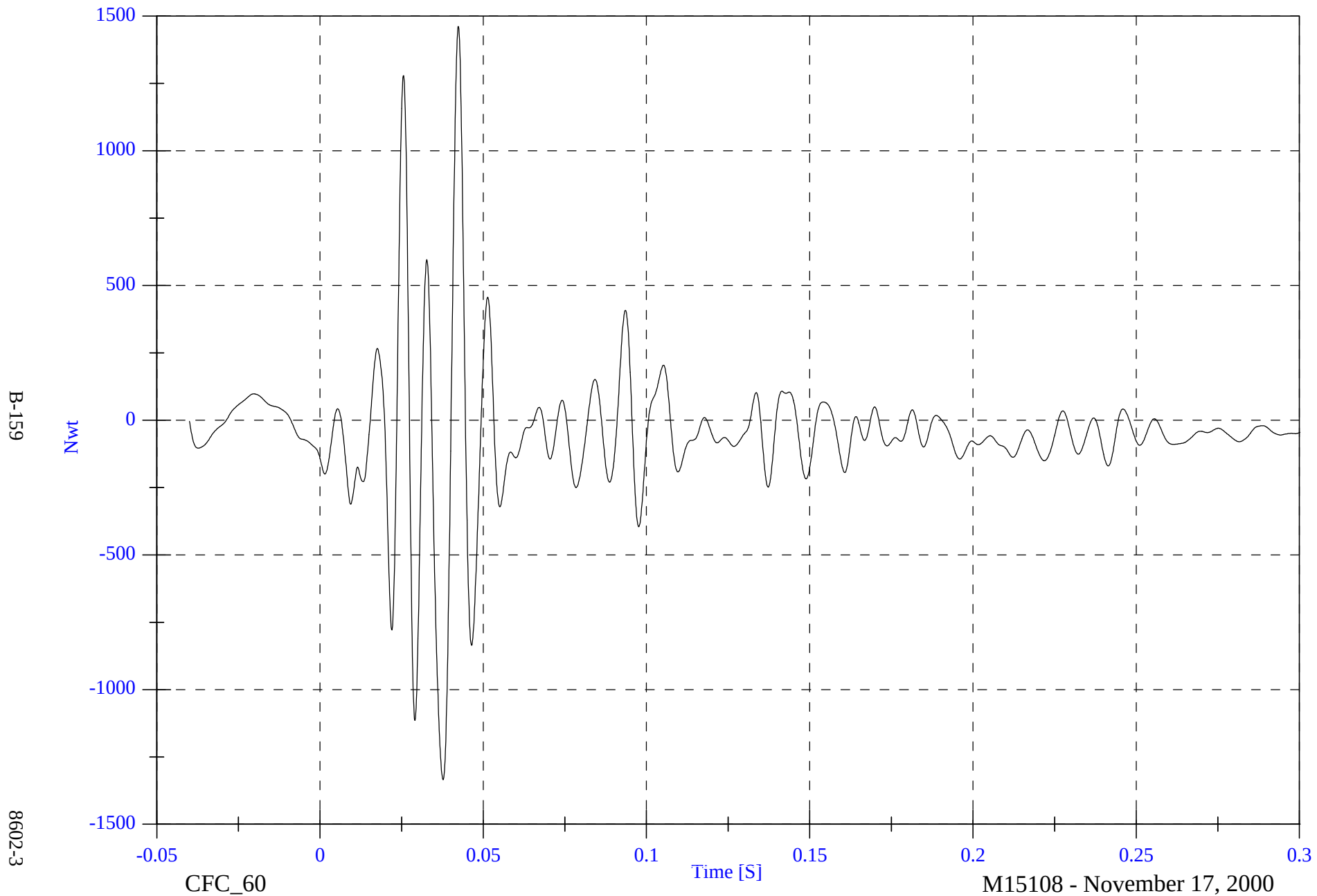


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell C9 Fx

Max: 1461.9 [Nwt] at 0.042 [S]

Min: -1335.1 [Nwt] at 0.038 [S]

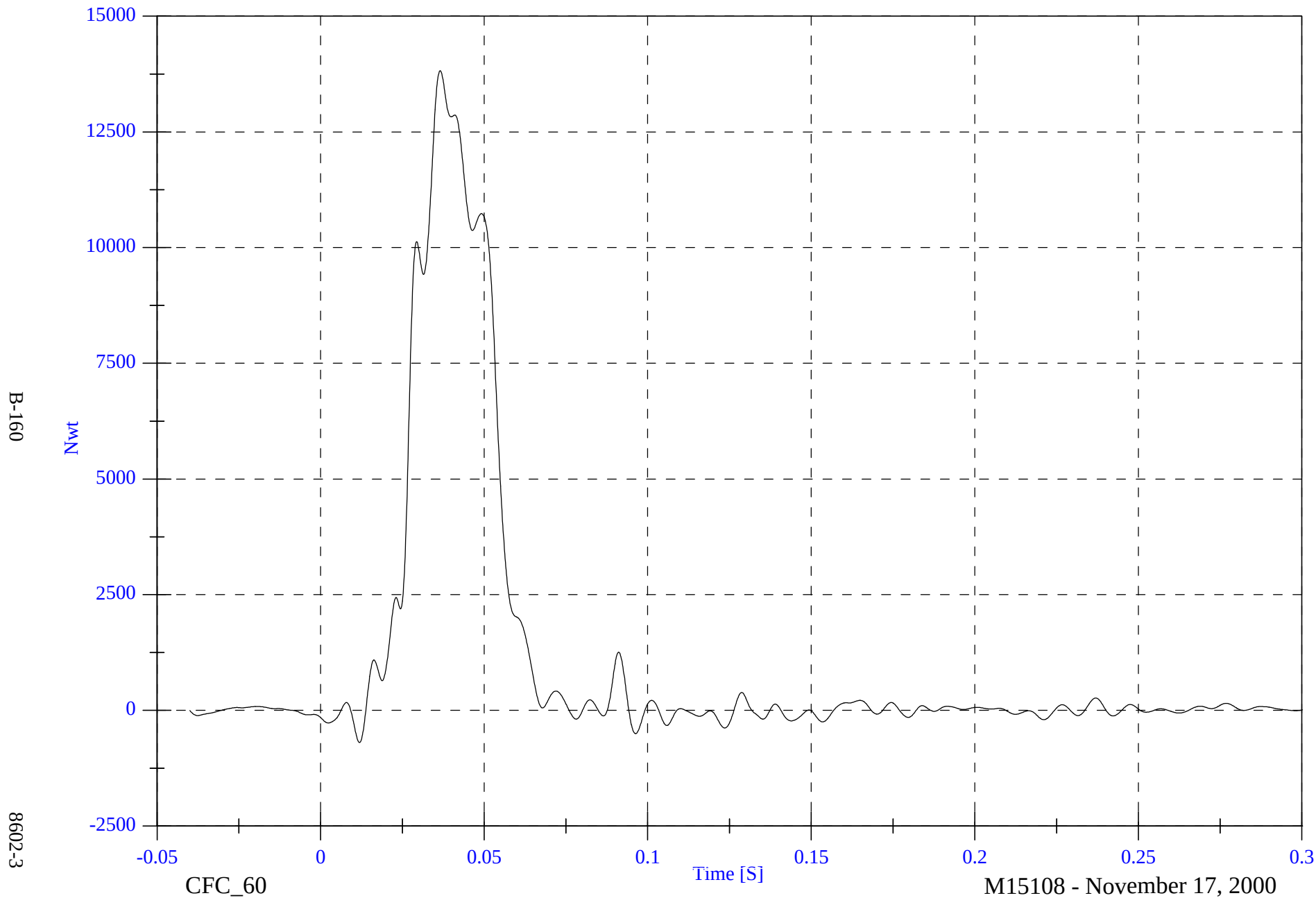


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D1 Fx

Max: 13822.1 [Nwt] at 0.036 [S]

Min: -696.7 [Nwt] at 0.012 [S]

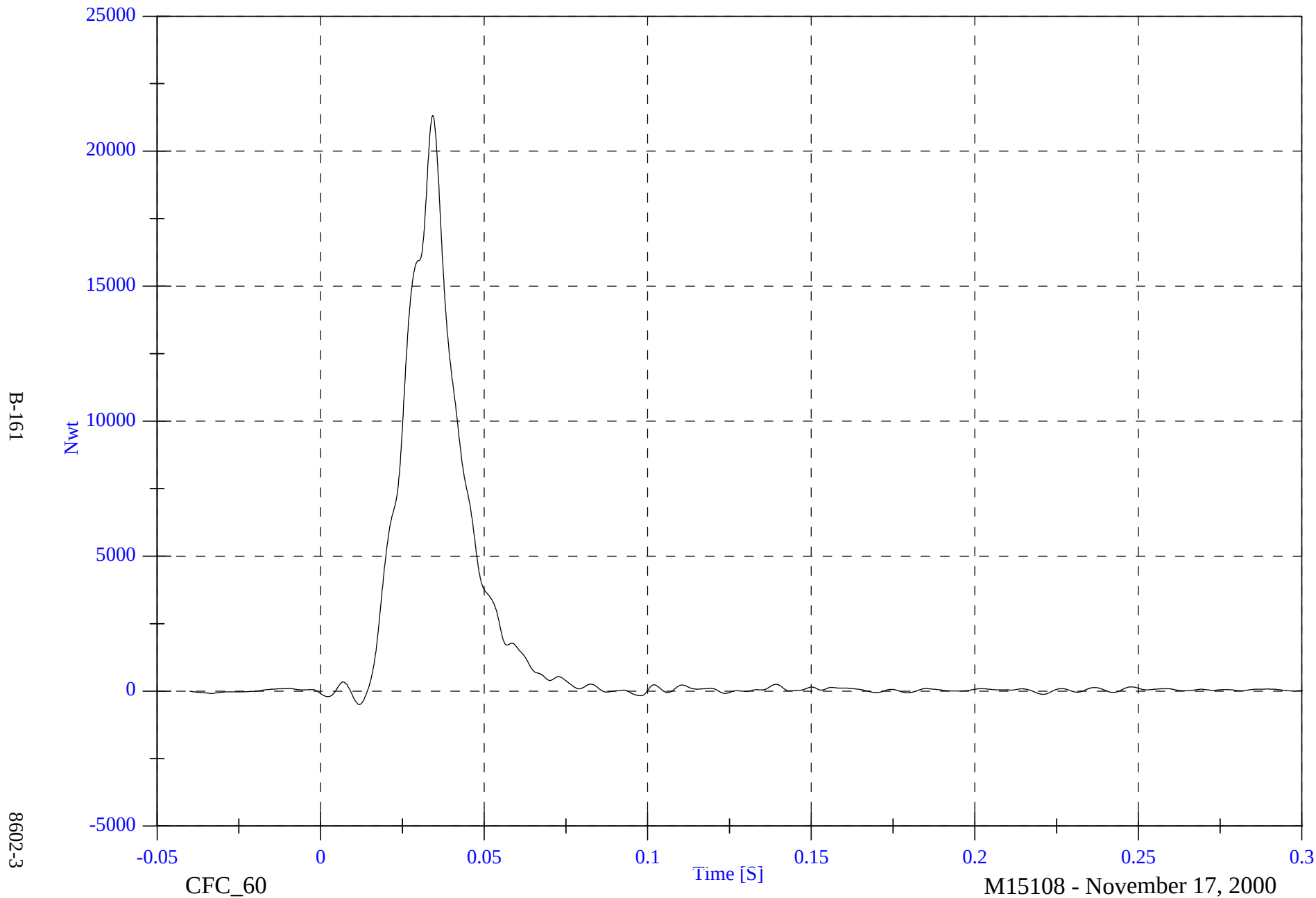


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D2 Fx

Max: 21320.8 [Nwt] at 0.034 [S]

Min: -502.4 [Nwt] at 0.012 [S]

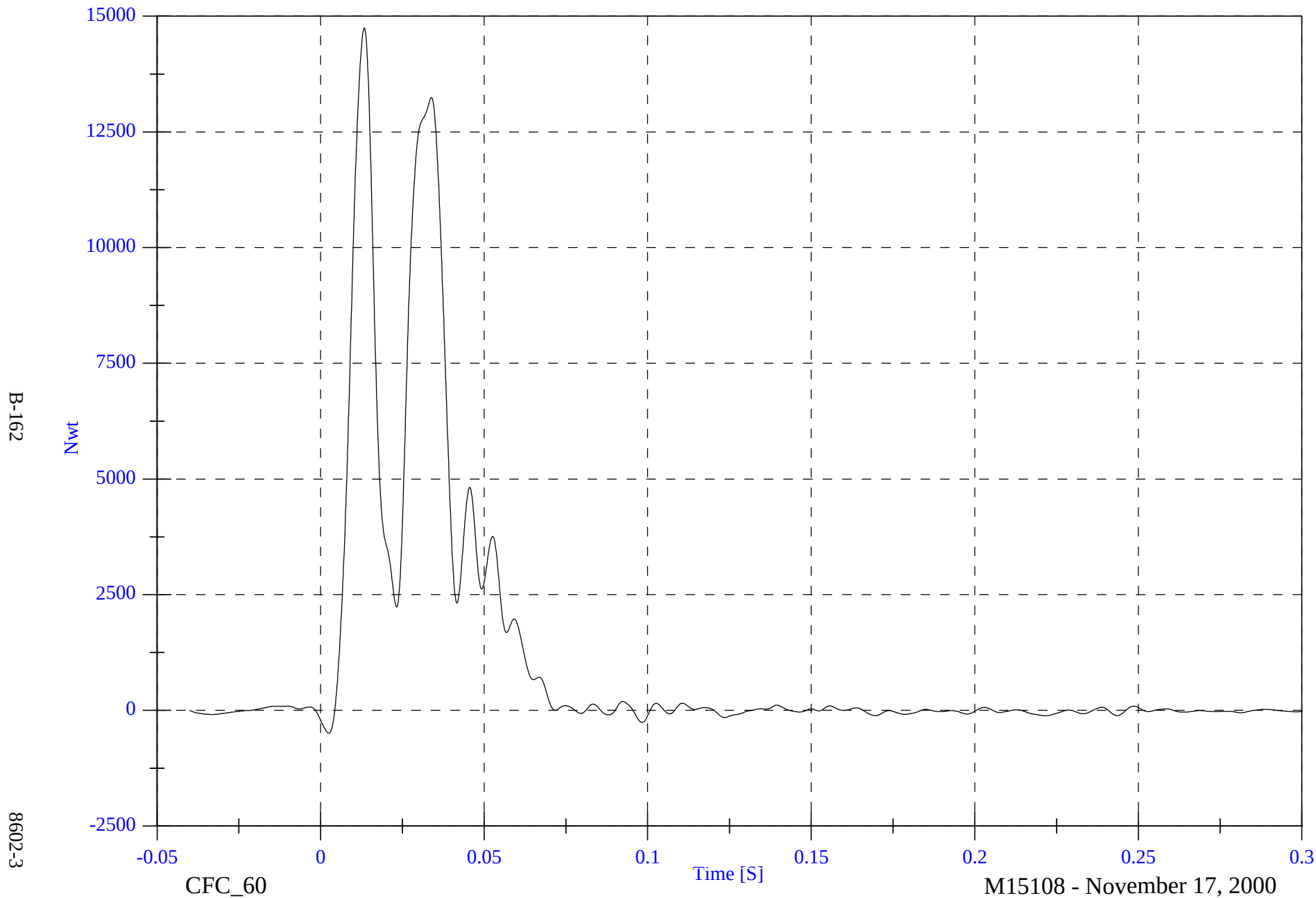


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D3 Fx

Max: 14747.6 [Nwt] at 0.013 [S]

Min: -494.5 [Nwt] at 0.002 [S]

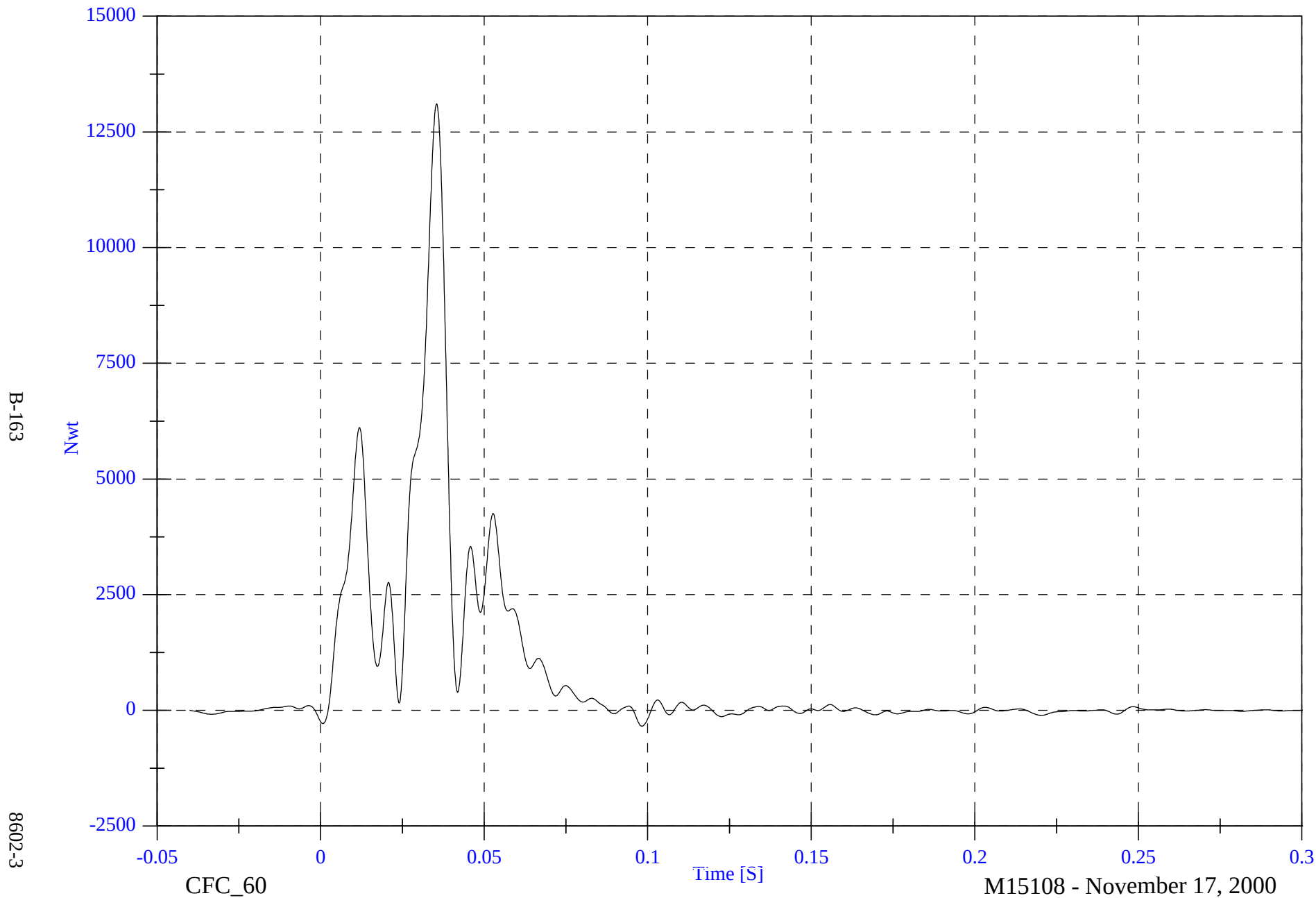


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D4 Fx

Max: 13110.4 [Nwt] at 0.035 [S]

Min: -341.1 [Nwt] at 0.098 [S]

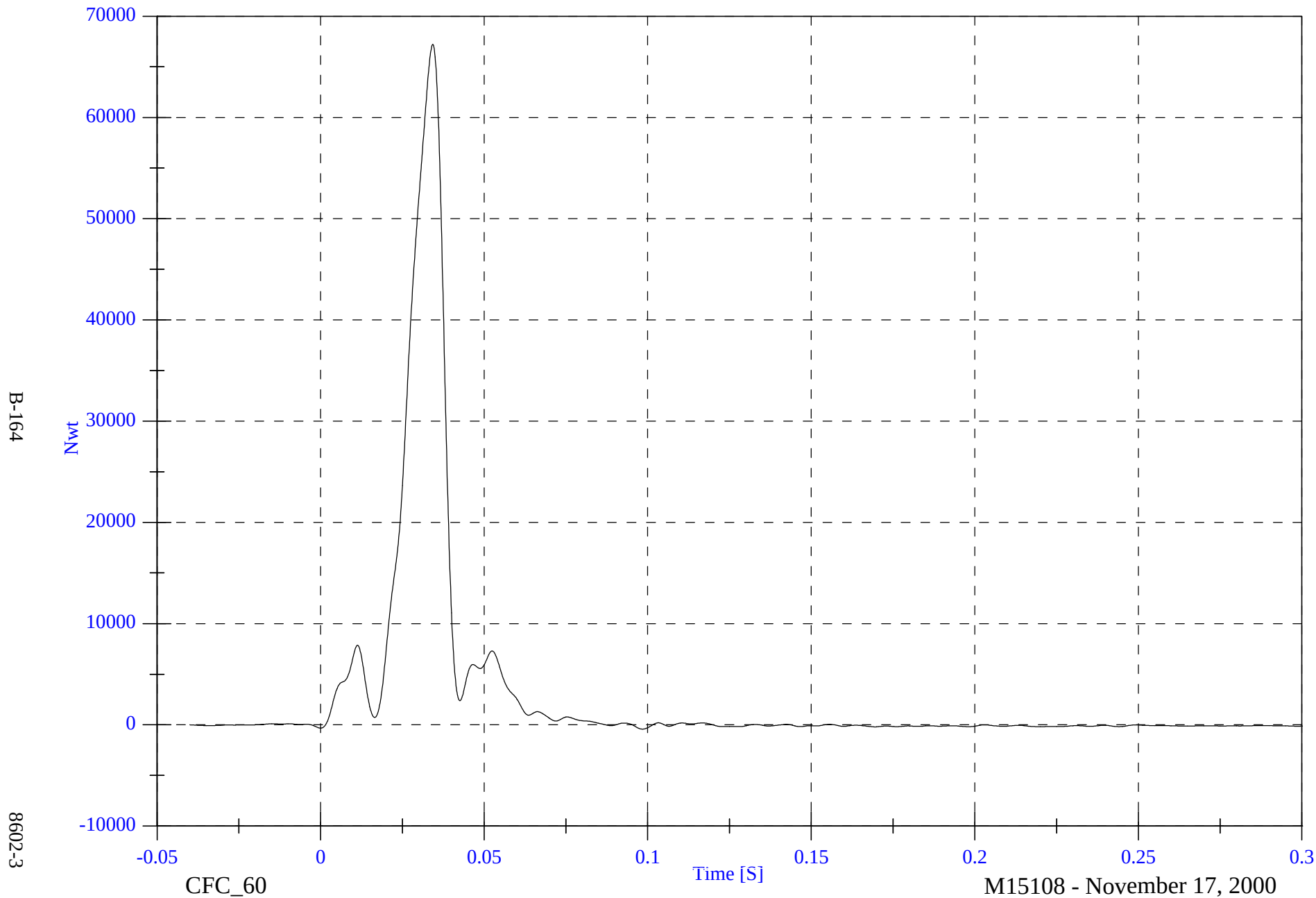


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D5 Fx

Max: 67213.2 [Nwt] at 0.034 [S]

Min: -423.7 [Nwt] at 0.098 [S]

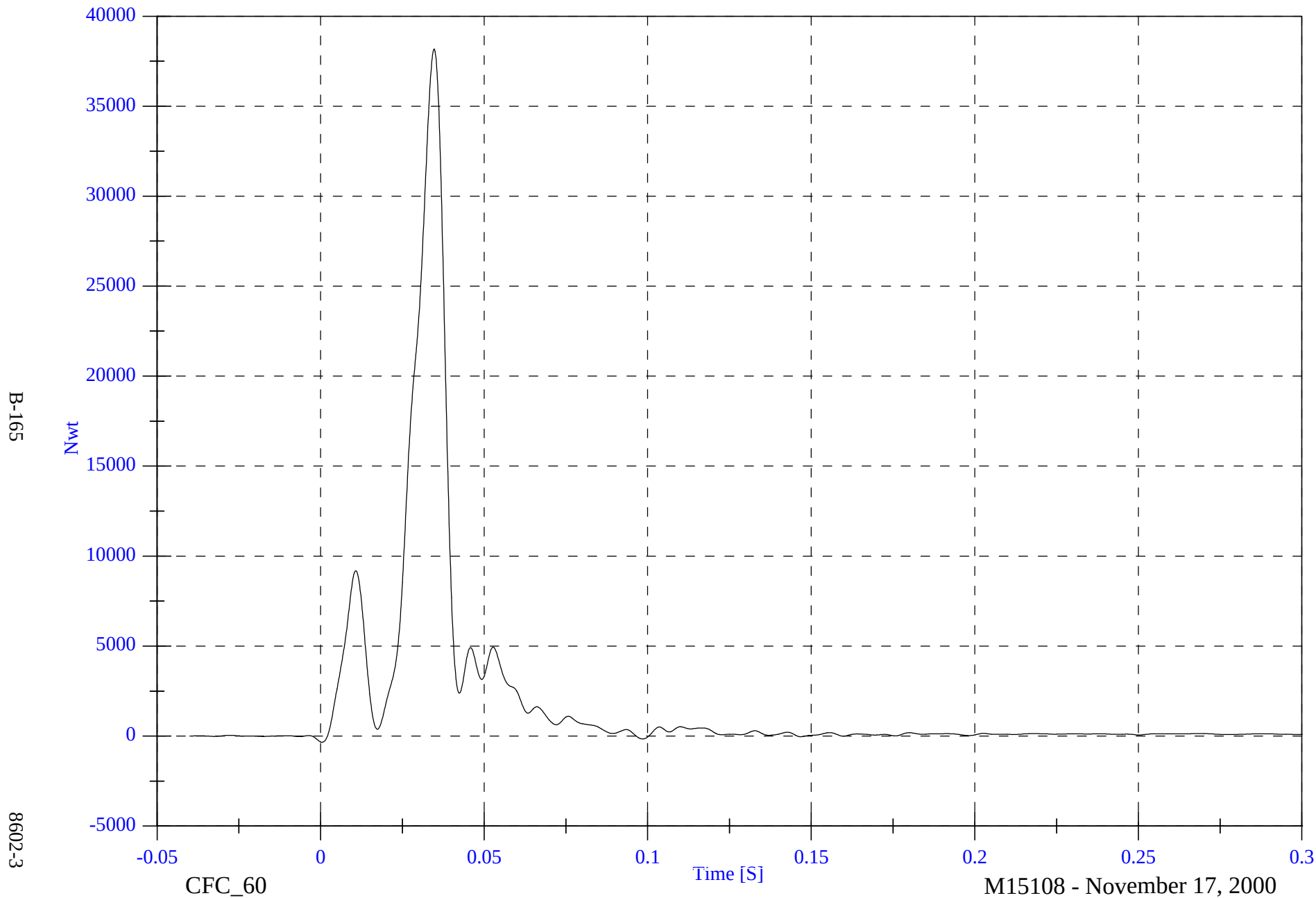


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D6 Fx

Max: 38181.7 [Nwt] at 0.035 [S]

Min: -343.4 [Nwt] at 0.000 [S]

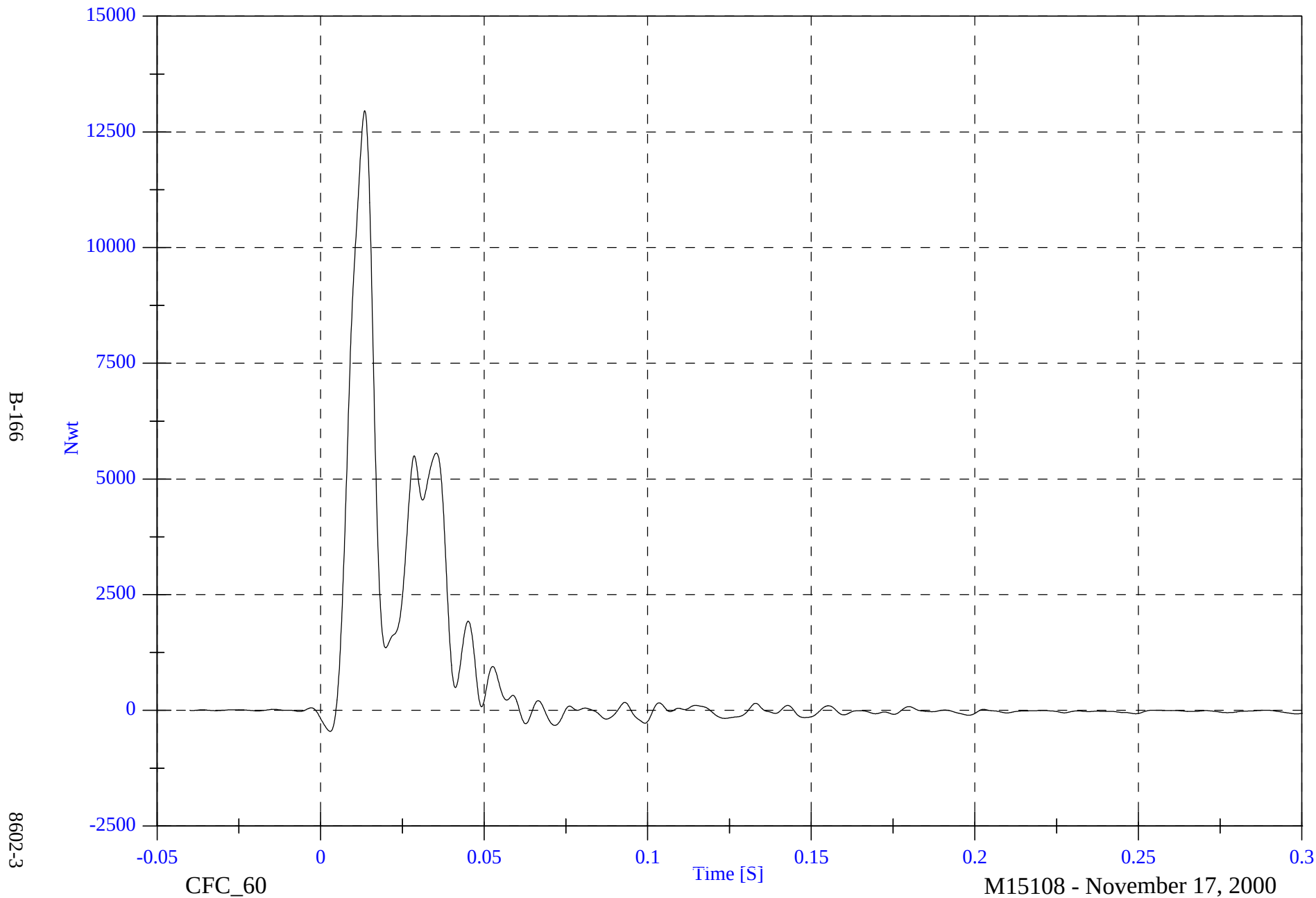


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D7 Fx

Max: 12960.4 [Nwt] at 0.013 [S]

Min: -454.7 [Nwt] at 0.003 [S]

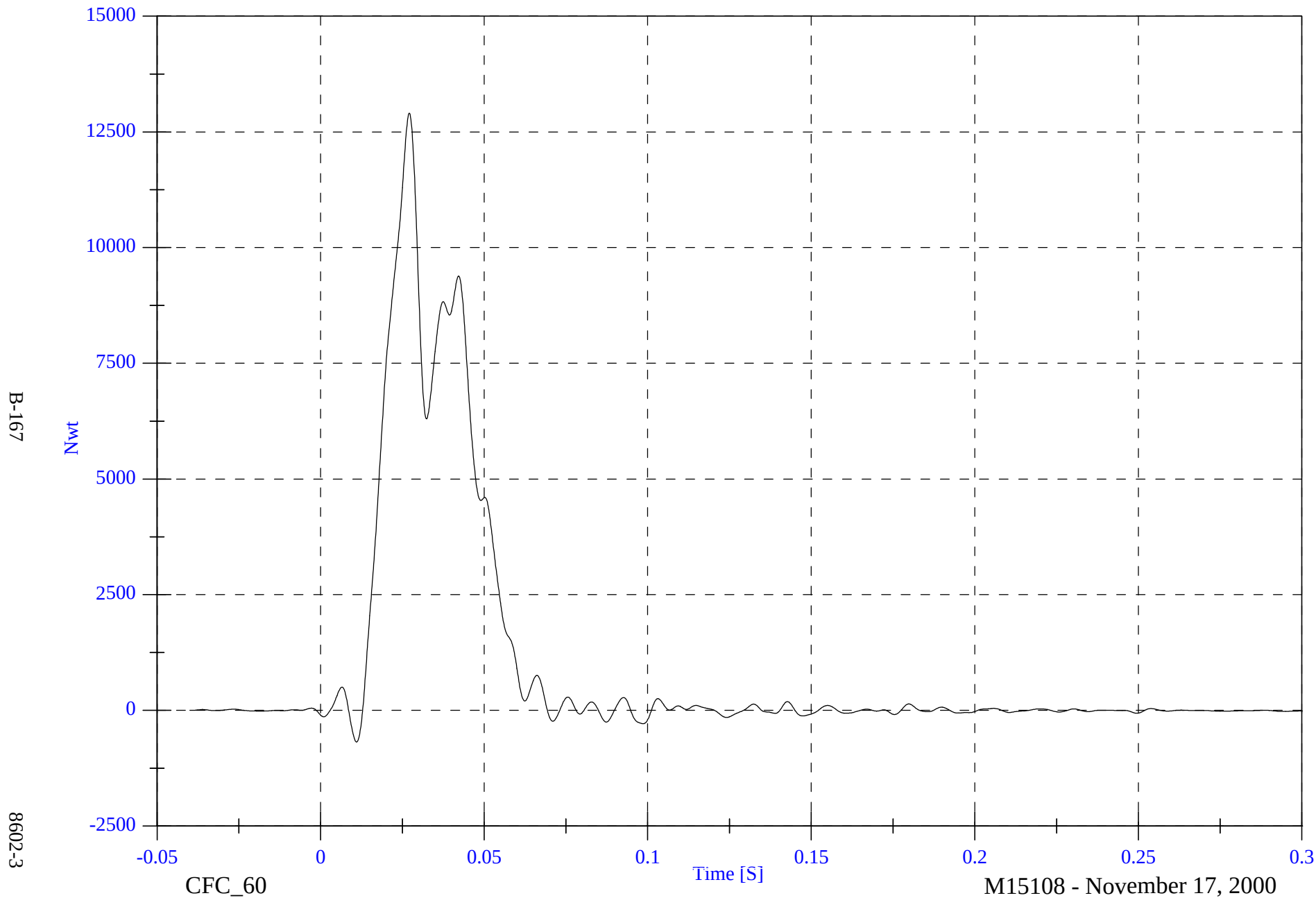


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D8 Fx

Max: 12904.5 [Nwt] at 0.027 [S]

Min: -685.8 [Nwt] at 0.011 [S]

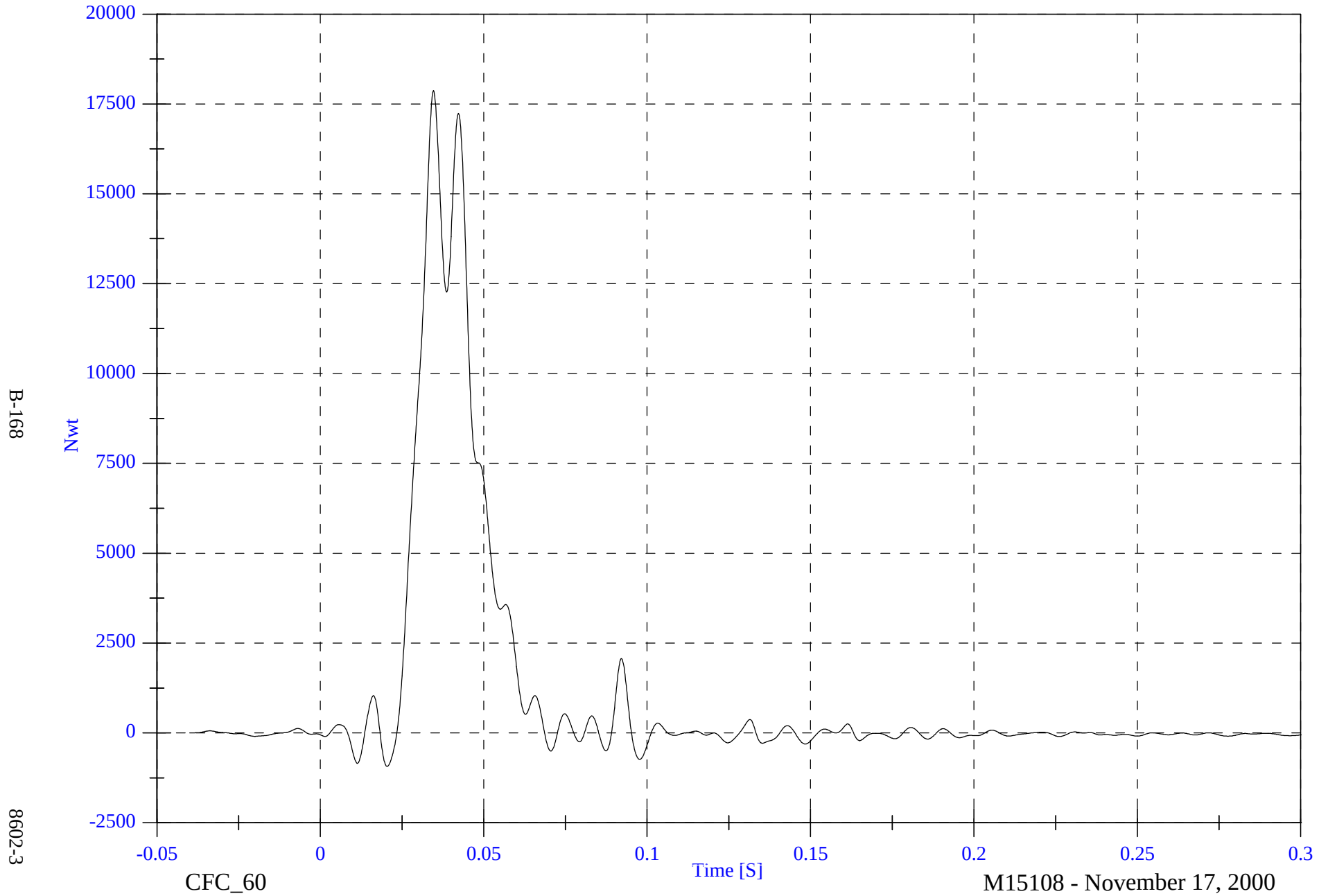


NCAP 2001 TEST 3 - 2001 Toyota Tundra

Barrier Load Cell D9 Fx

Max: 17871.4 [Nwt] at 0.035 [S]

Min: -930.1 [Nwt] at 0.020 [S]

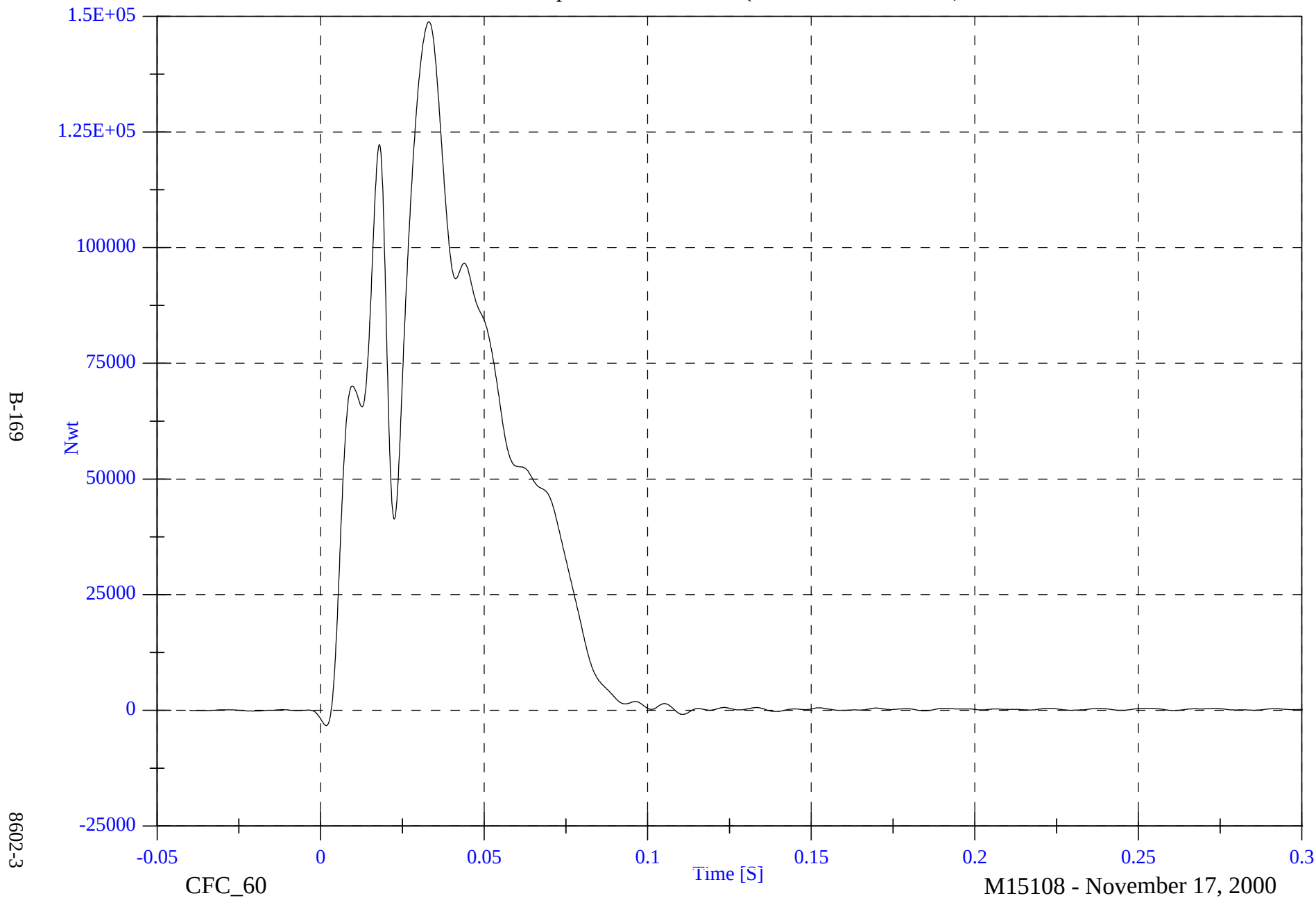


NCAP 2001 TEST 3 - 2001 Toyota Tundra

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

Max: 148802.4 [Nwt] at 0.033 [S]

Min: -3292.4 [Nwt] at 0.002 [S]

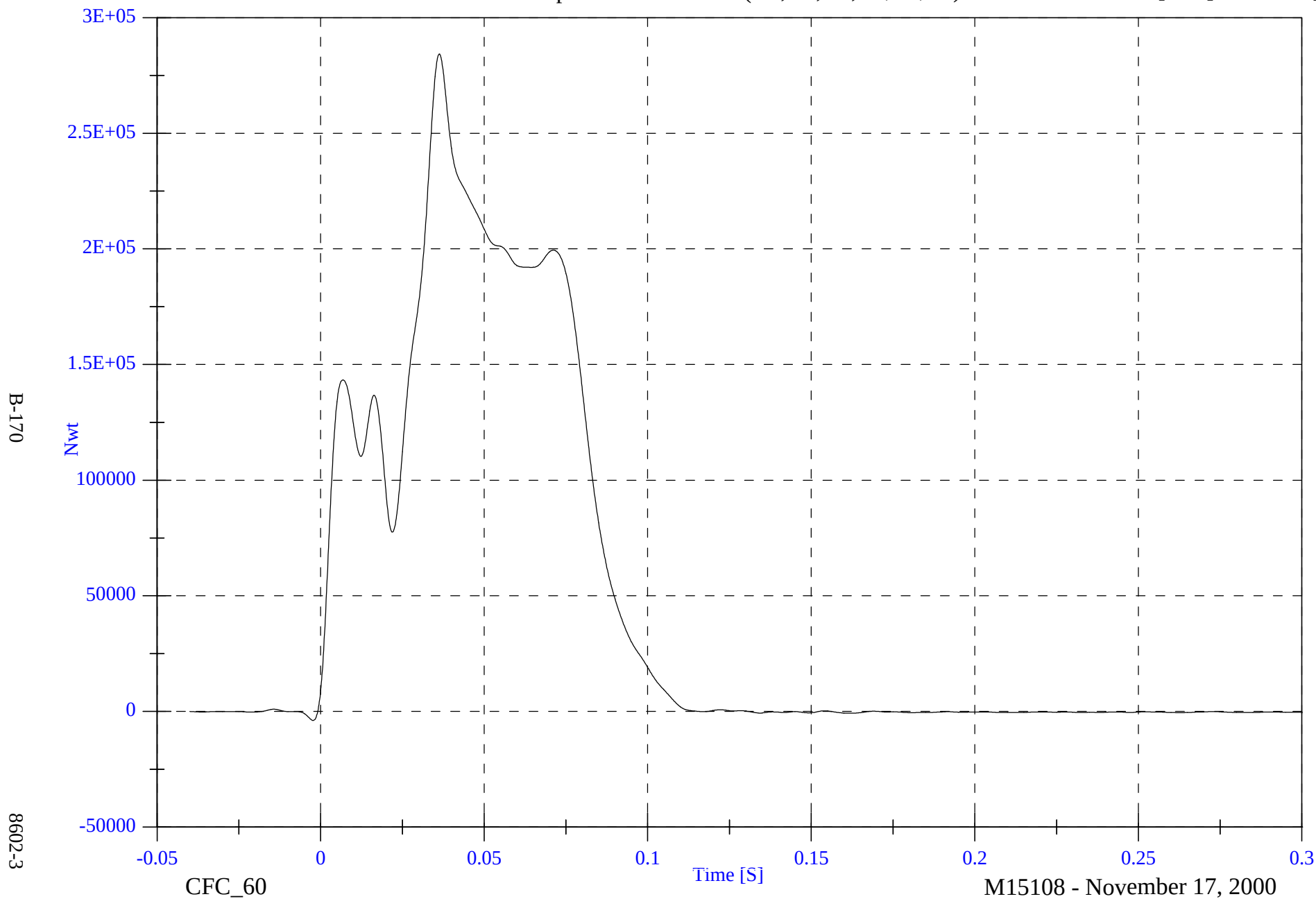


NCAP 2001 TEST 3 - 2001 Toyota Tundra

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

Max: 284294.1 [Nwt] at 0.036 [S]

Min: -3882.9 [Nwt] at -0.002 [S]

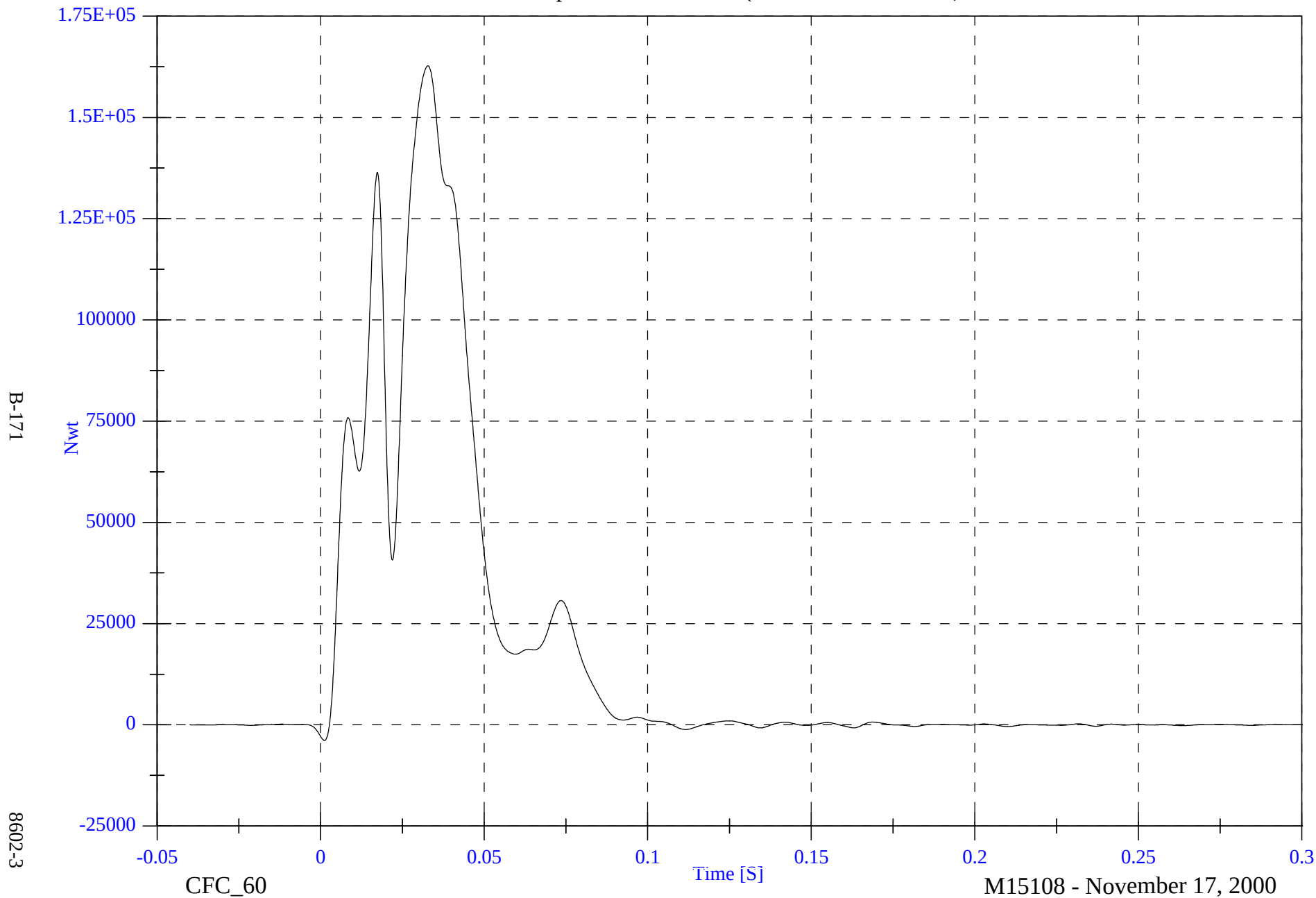


NCAP 2001 TEST 3 - 2001 Toyota Tundra

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

Max: 162762.8 [Nwt] at 0.033 [S]

Min: -3864.7 [Nwt] at 0.001 [S]

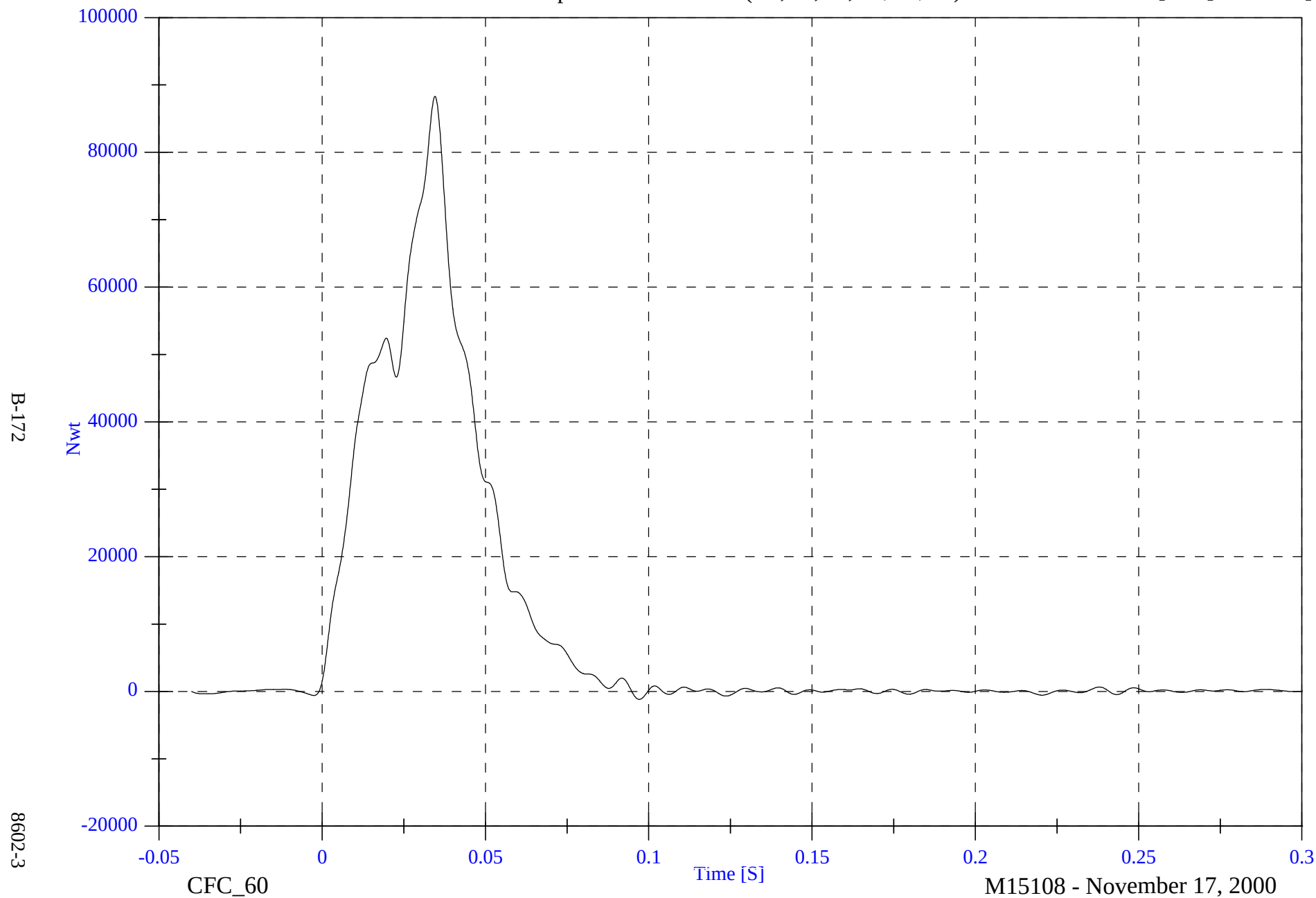


NCAP 2001 TEST 3 - 2001 Toyota Tundra

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

Max: 88306.4 [Nwt] at 0.034 [S]

Min: -1180.2 [Nwt] at 0.097 [S]

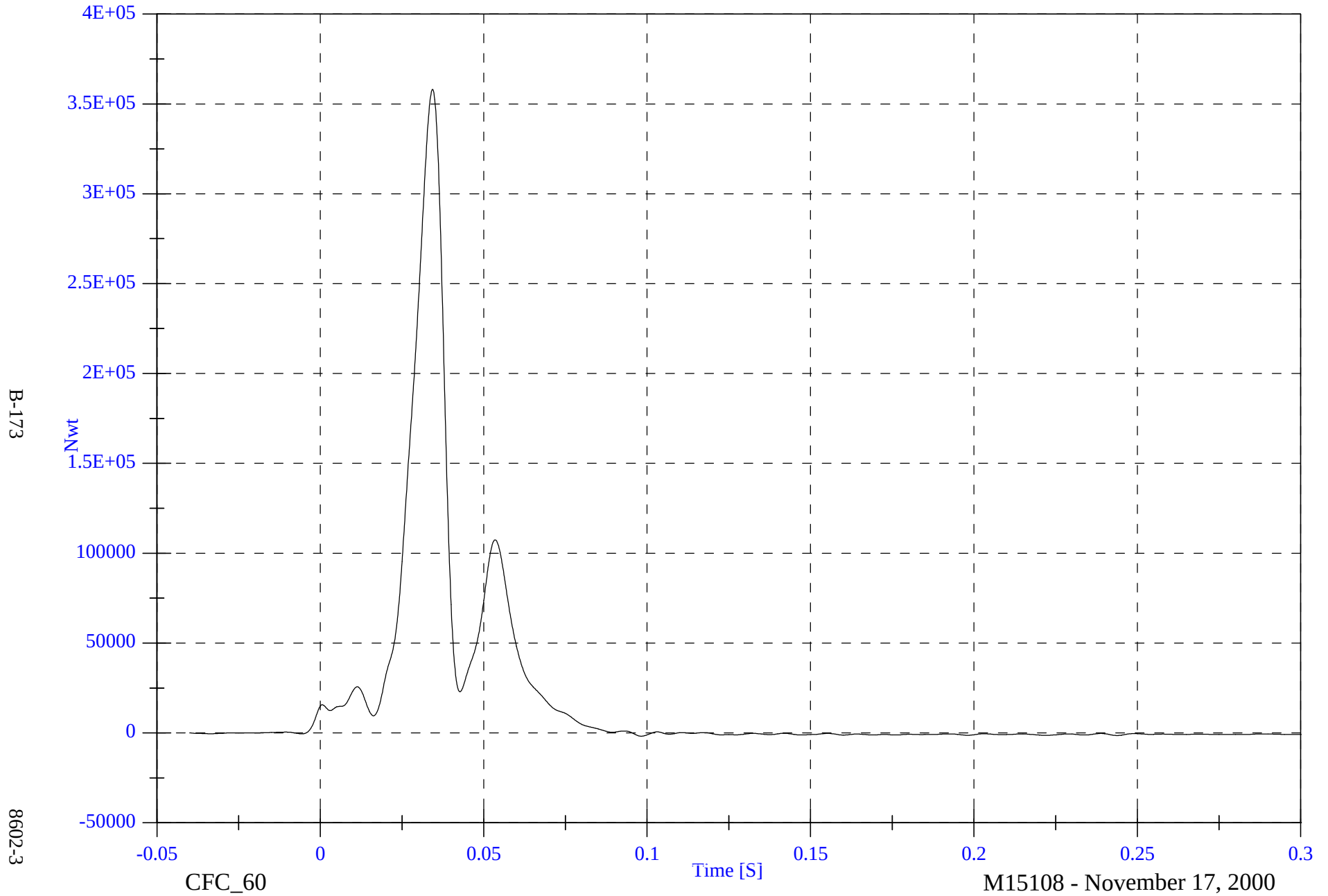


NCAP 2001 TEST 3 - 2001 Toyota Tundra

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

Max: 358148.3 [Nwt] at 0.034 [S]

Min: -1838.0 [Nwt] at 0.098 [S]

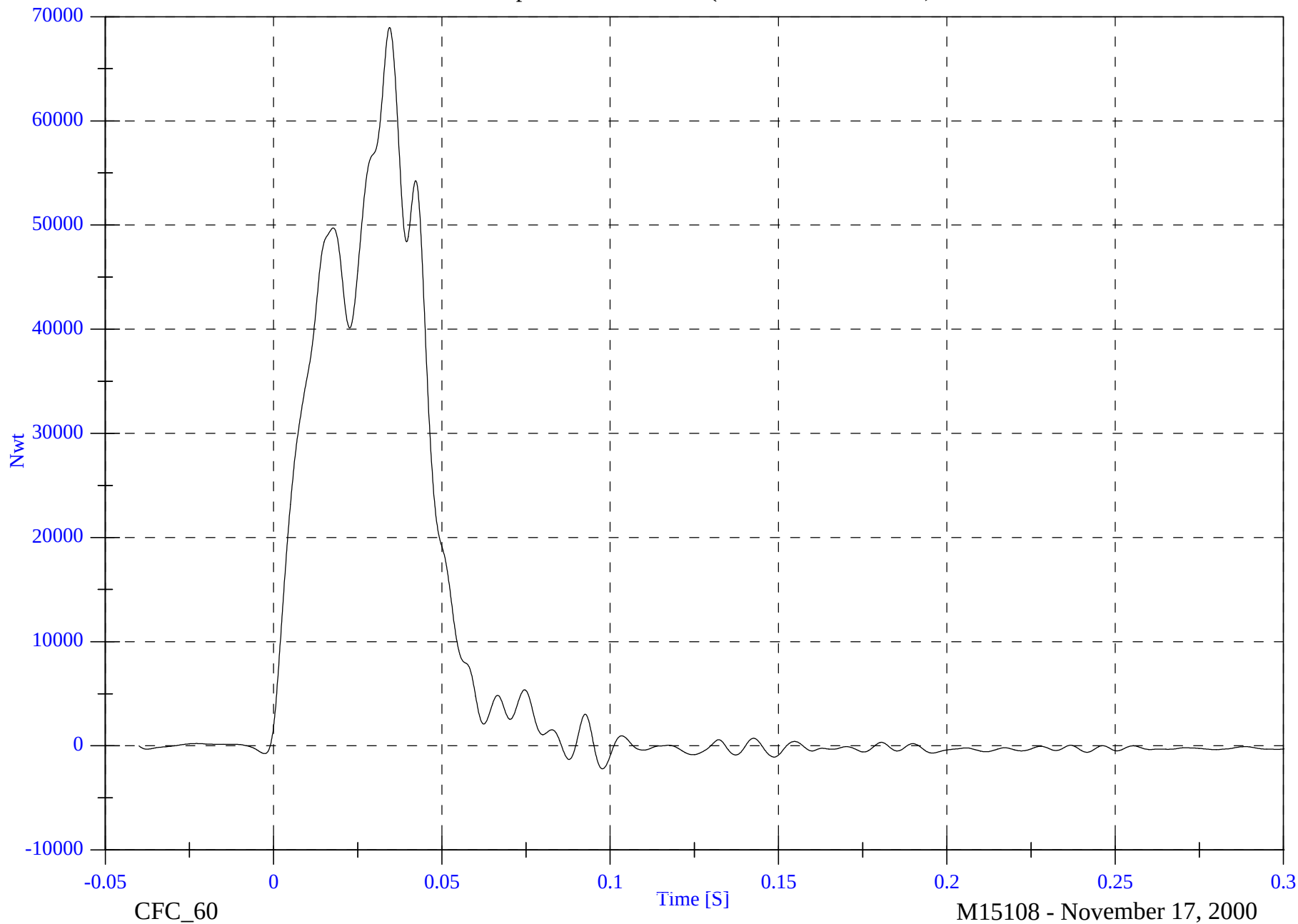


NCAP 2001 TEST 3 - 2001 Toyota Tundra

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

Max: 68954.8 [Nwt] at 0.034 [S]

Min: -2206.0 [Nwt] at 0.098 [S]



B-174

8602-3

CFC\_60

Time [S]

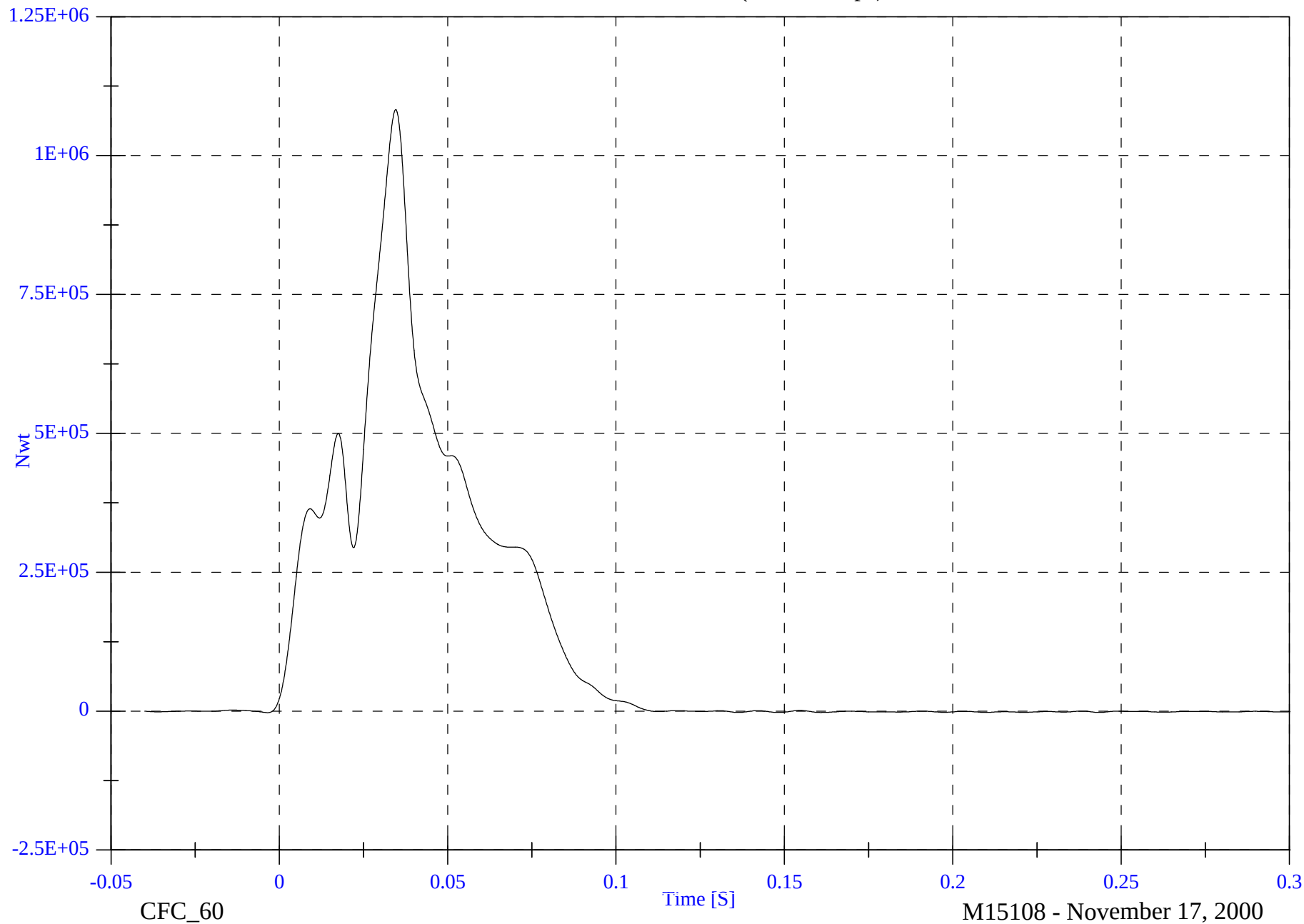
M15108 - November 17, 2000

NCAP 2001 TEST 3 - 2001 Toyota Tundra

Total Load Cell Sum (All 6 Groups)

Max: 1082872.2 [Nwt] at 0.035 [S]

Min: -2782.7 [Nwt] at -0.004 [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:

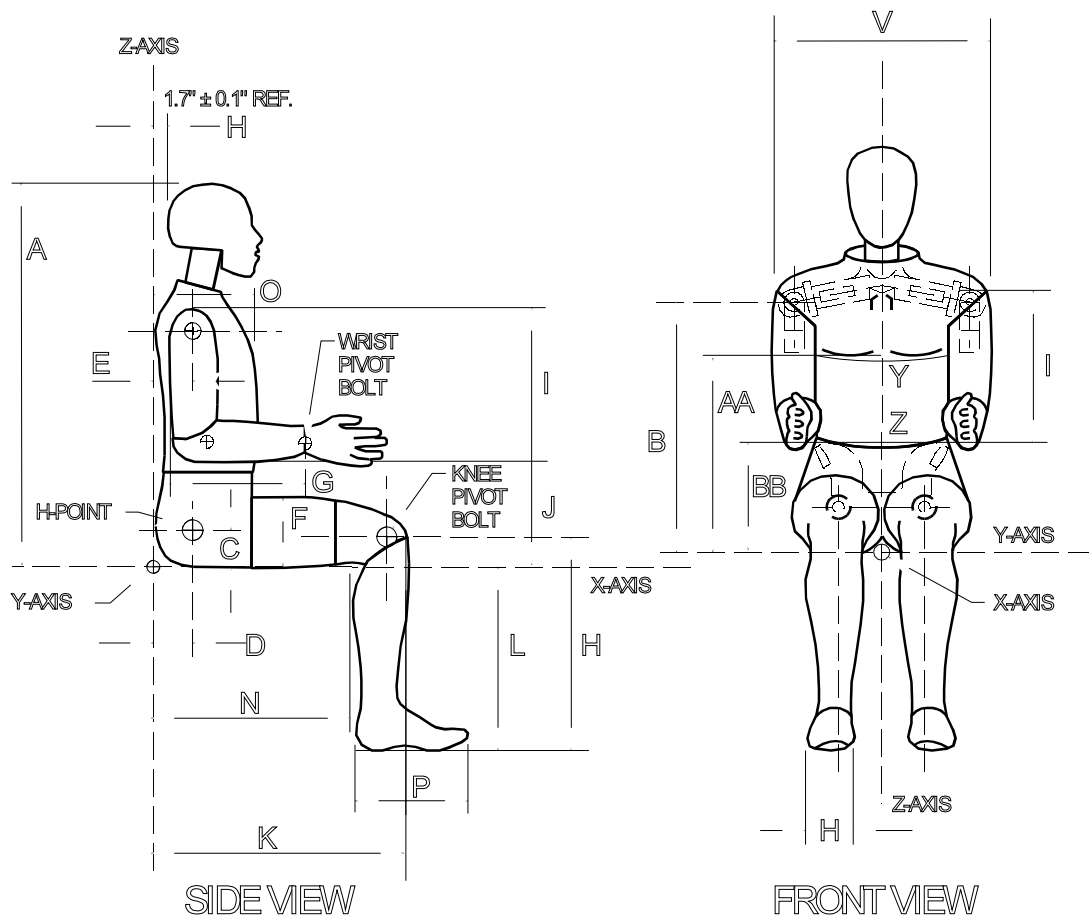
| <u>Position No./Location</u> | <u>Serial No.</u> | <u>Completion Date</u> |
|------------------------------|-------------------|------------------------|
| #1/Driver                    | 061               | 11/16/2000             |
| #2/Right Front Passenger     | 245               | 11/9/2000              |

#### Electronic Test Equipment

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

## DUMMY CONFIGURATION DIMENSIONS

### EXTERNAL DIMENSIONS SPECIFICATIONS



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

PART 572E  
HEAD DROP TEST

Dummy Serial Number 061  
Sequential Test Number 2  
Date October 22, 2000  
Workfile 061200.hdp

| TEST PARAMETER                  | SPECIFICATION | TEST RESULTS |
|---------------------------------|---------------|--------------|
| Temperature                     | 66-78 Deg F   | 71.0         |
| Relative Humidity               | 10% - 70%     | 31.0         |
| Peak Resultant Acceleration     | 225-275 G's   | 242.84       |
| Peak Lateral Acceleration       | 15 G's Max    | 3.64         |
| Is Acceleration Curve Unimodal? | YES           | YES          |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
NECK FLEXION TEST

|                        |                  |                        |
|------------------------|------------------|------------------------|
| Dummy Serial Number    | 061              |                        |
| Sequential Test Number | 2                |                        |
| Date                   | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile               | 061200.nfl       |                        |

| TEST PARAMETER                                  |       | SPECIFICATION      | TEST RESULTS |
|-------------------------------------------------|-------|--------------------|--------------|
| Temperature                                     |       | 69-72 Deg F        | 70.0         |
| Relative Humidity                               |       | 10% - 70%          | 31.0         |
| Impact Velocity                                 |       | 22.60 - 23.40 Ft/s | 23.19        |
| Pendulum Deceleration                           | 10 ms | 22.50 - 27.50 G's  | 22.76        |
|                                                 | 20 ms | 17.60 - 22.60 G's  | 20.41        |
|                                                 | 30 ms | 12.50 - 18.50 G's  | 16.37        |
| Max Pendulum G's Above 30 ms                    |       | 29 G's Max         | 16.37        |
| Deceleration - Time Curve Decay Time to 5 G's   |       | 34 - 42 ms         | 39.00        |
| D Plane Rotation                                | Max   | 64 - 78 Deg        | 70.65        |
|                                                 | Time  | 57 - 64 ms         | 57.38        |
| Moment About Occipital Condyle                  | Max   | 65 - 80 Ft-Lbs     | 74.01        |
|                                                 | Time  | 47 - 58 ms         | 52.62        |
| Rotation Angle - Time Curve Decay Time to Zero  |       | 113 - 128 ms       | 124.12       |
| Positive Moment - Time Curve Decay Time to Zero |       | 97 - 107 ms        | 99.75        |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
NECK EXTENSION TEST

|                        |                  |                        |
|------------------------|------------------|------------------------|
| Dummy Serial Number    | 061              |                        |
| Sequential Test Number | 2                |                        |
| Date                   | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile               | 061200.nex       |                        |

| TEST PARAMETER                                  |       | SPECIFICATION        | TEST RESULTS |
|-------------------------------------------------|-------|----------------------|--------------|
| Temperature                                     |       | 69-72 Deg F          | 70.0         |
| Relative Humidity                               |       | 10% - 70%            | 31.0         |
| Impact Velocity                                 |       | 19.50 - 20.30 Ft/s   | 19.90        |
| Pendulum Deceleration                           | 10 ms | 17.20 - 21.20 G's    | 17.92        |
|                                                 | 20 ms | 14.00 - 19.00 G's    | 16.46        |
|                                                 | 30 ms | 11.00 - 16.00 G's    | 14.16        |
| Max Pendulum G's Above 30 ms                    |       | 22 G's Max           | 14.16        |
| Deceleration - Time Curve Decay Time to 5 G's   |       | 38 - 46 ms           | 41.38        |
| D Plane Rotation                                | Max   | 81 - 106 Deg         | 96.35        |
|                                                 | Time  | 72 - 82 ms           | 74.12        |
| Moment About Occipital Condyle                  | Max   | -59.0 - -39.0 Ft-Lbs | -49.61       |
|                                                 | Time  | 65 - 79 ms           | 69.75        |
| Rotation Angle - Time Curve Decay Time to Zero  |       | 147 - 174 ms         | 149.12       |
| Positive Moment - Time Curve Decay Time to Zero |       | 120 - 148 ms         | 137.38       |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
THORAX IMPACT TEST

Dummy Serial Number        061  
Sequential Test Number       2  
Date                              October 23, 2000  
Workfile                         061200.th3

| TEST PARAMETER          | SPECIFICATION    | TEST RESULTS |
|-------------------------|------------------|--------------|
| Temperature             | 69-72 Deg F      | 70.0         |
| Relative Humidity       | 10% - 70%        | 32.0         |
| Pendulum Velocity       | 21.6 - 22.4 Ft/s | 21.8         |
| Maximum Deflection      | 2.50 - 2.86 in   | 2.59         |
| Maximum Resistive Force | 1160 - 1325 Lbs  | 1197.66      |
| Internal Hysteresis     | 69 - 85 %        | 74.34        |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
KNEE IMPACT TEST

Dummy Serial Number           061  
Sequential Test Number        2  
Date                               November 9 and November 16,  
                                          2000  
Workfile                         061300.lf/061200.rf

| TEST PARAMETER         | SPECIFICATION   | TEST RESULTS |
|------------------------|-----------------|--------------|
| <b>LEFT KNEE</b>       |                 |              |
| Temperature            | 66 - 78 Deg F   | 70           |
| Relative Humidity      | 10% - 70%       | 32           |
| Probe Velocity         | 6.8 - 7.0 Ft/s  | 7.0          |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1200.76      |
| <b>RIGHT KNEE</b>      |                 |              |
| Temperature            | 66 - 78 Deg F   | 71.0         |
| Relative Humidity      | 10% - 70%       | 32.0         |
| Probe Velocity         | 6.8 - 7.0 Ft/s  | 6.9          |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1245.82      |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
EXTERNAL DIMENSIONS

Dummy Serial Number           061  
Sequential Test Number        2  
Date                                11/09/2000

| TEST PARAMETER                    |    | SPECIFICATION  | TEST RESULTS |
|-----------------------------------|----|----------------|--------------|
| Temperature                       |    |                | 70           |
| Relative Humidity                 |    |                | 32           |
| Location for Chest Circumference  | AA | 16.9 - 17.1 in | 17.0         |
| Location for Waist Circumference  | BB | 8.9 - 9.1 in   | 9.0          |
| Chest Circumference (With Jacket) | Y  | 38.2 - 39.4 in | 39.2         |
| Waist Circumference               | Z  | 32.9 - 34.1 in | 33.5         |
| Chest Depth                       | O  | 8.4 - 9.0 in   | 8.5          |
| 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 | 23.4         |
| Buttock Popliteal Length          | N  | 17.8 - 18.8 in | 18.3         |
| 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 | 20.2         |
| 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 245  
Sequential Test Number 4  
Date October 22, 2000  
Workfile 245400.hdp

| TEST PARAMETER                  | SPECIFICATION | TEST RESULTS |
|---------------------------------|---------------|--------------|
| Temperature                     | 66-78 Deg F   | 71.0         |
| Relative Humidity               | 10% - 70%     | 31.0         |
| Peak Resultant Acceleration     | 225-275 G's   | 250.99       |
| Peak Lateral Acceleration       | 15 G's Max    | 9.16         |
| Is Acceleration Curve Unimodal? | YES           | YES          |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
NECK FLEXION TEST

|                        |                  |                        |
|------------------------|------------------|------------------------|
| Dummy Serial Number    | 245              |                        |
| Sequential Test Number | 4                |                        |
| Date                   | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile               | 245400.nfl       |                        |

| TEST PARAMETER                                  |       | SPECIFICATION      | TEST RESULTS |
|-------------------------------------------------|-------|--------------------|--------------|
| Temperature                                     |       | 69-72 Deg F        | 70.0         |
| Relative Humidity                               |       | 10% - 70%          | 30.0         |
| Impact Velocity                                 |       | 22.60 - 23.40 Ft/s | 22.80        |
| Pendulum Deceleration                           | 10 ms | 22.50 - 27.50 G's  | 22.99        |
|                                                 | 20 ms | 17.60 - 22.60 G's  | 20.58        |
|                                                 | 30 ms | 12.50 - 18.50 G's  | 15.75        |
| Max Pendulum G's Above 30 ms                    |       | 29 G's Max         | 15.75        |
| Deceleration - Time Curve Decay Time to 5 G's   |       | 34 - 42 ms         | 37.88        |
| D Plane Rotation                                | Max   | 64 - 78 Deg        | 72.70        |
|                                                 | Time  | 57 - 64 ms         | 62.88        |
| Moment About Occipital Condyle                  | Max   | 65 - 80 Ft-Lbs     | 79.87        |
|                                                 | Time  | 47 - 58 ms         | 53.12        |
| Rotation Angle - Time Curve Decay Time to Zero  |       | 113 - 128 ms       | 125.38       |
| Positive Moment - Time Curve Decay Time to Zero |       | 97 - 107 ms        | 99.38        |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
NECK EXTENSION TEST

|                        |                  |                        |
|------------------------|------------------|------------------------|
| Dummy Serial Number    | 245              |                        |
| Sequential Test Number | 4                |                        |
| Date                   | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile               | 245400.nex       |                        |

| TEST PARAMETER                                  |       | SPECIFICATION        | TEST RESULTS |
|-------------------------------------------------|-------|----------------------|--------------|
| Temperature                                     |       | 69-72 Deg F          | 70.0         |
| Relative Humidity                               |       | 10% - 70%            | 30.0         |
| Impact Velocity                                 |       | 19.50 - 20.30 Ft/s   | 19.90        |
| Pendulum Deceleration                           | 10 ms | 17.20 - 21.20 G's    | 18.46        |
|                                                 | 20 ms | 14.00 - 19.00 G's    | 17.29        |
|                                                 | 30 ms | 11.00 - 16.00 G's    | 13.38        |
| Max Pendulum G's Above 30 ms                    |       | 22 G's Max           | 13.38        |
| Deceleration - Time Curve Decay Time to 5 G's   |       | 38 - 46 ms           | 44.75        |
| D Plane Rotation                                | Max   | 81 - 106 Deg         | 98.28        |
|                                                 | Time  | 72 - 82 ms           | 74.38        |
| Moment About Occipital Condyle                  | Max   | -59.0 - -39.0 Ft-Lbs | -54.89       |
|                                                 | Time  | 65 - 79 ms           | 67.00        |
| Rotation Angle - Time Curve Decay Time to Zero  |       | 147 - 174 ms         | 151.38       |
| Positive Moment - Time Curve Decay Time to Zero |       | 120 - 148 ms         | 133.00       |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E  
THORAX IMPACT TEST

Dummy Serial Number        245  
Sequential Test Number      4  
Date                              October 23, 2000  
Workfile                        245400.th3

| TEST PARAMETER          | SPECIFICATION    | TEST RESULTS |
|-------------------------|------------------|--------------|
| Temperature             | 69-72 Deg F      | 70.0         |
| Relative Humidity       | 10% - 70%        | 32.0         |
| Pendulum Velocity       | 21.6 - 22.4 Ft/s | 21.7         |
| Maximum Deflection      | 2.50 - 2.86 in   | 2.59         |
| Maximum Resistive Force | 1160 - 1325 Lbs  | 1203.30      |
| Internal Hysteresis     | 69 - 85 %        | 72.12        |

Remarks:

Laboratory Technician:     B. Swiecicki

PART 572E  
KNEE IMPACT TEST

Dummy Serial Number            245  
Sequential Test Number        4  
Date                                November 9, 2000  
Workfile                         245400.lf/245400.rf

| TEST PARAMETER         | SPECIFICATION   | TEST RESULTS |
|------------------------|-----------------|--------------|
| <b>LEFT KNEE</b>       |                 |              |
| Temperature            | 66 - 78 Deg F   | 71.0         |
| Relative Humidity      | 10% - 70%       | 32.0         |
| Probe Velocity         | 6.8 - 7.0 Ft/s  | 7.0          |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1293.26      |
| <b>RIGHT KNEE</b>      |                 |              |
| Temperature            | 66 - 78 Deg F   | 71.0         |
| Relative Humidity      | 10% - 70%       | 32.0         |
| Probe Velocity         | 6.8 - 7.0 Ft/s  | 7.0          |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1270.77      |

Remarks:

Laboratory Technician:     B. Swiecicki

PART 572E  
EXTERNAL DIMENSIONS

Dummy Serial Number            245  
Sequential Test Number         4  
Date                                    11/9/2000

| TEST PARAMETER                    |    | SPECIFICATION  | TEST RESULTS |
|-----------------------------------|----|----------------|--------------|
| Temperature                       |    |                | 70           |
| Relative Humidity                 |    |                | 32           |
| Location for Chest Circumference  | AA | 16.9 - 17.1 in | 17.0         |
| Location for Waist Circumference  | BB | 8.9 - 9.1 in   | 9.0          |
| Chest Circumference (With Jacket) | Y  | 38.2 - 39.4 in | 39.0         |
| Waist Circumference               | Z  | 32.9 - 34.1 in | 33.6         |
| Chest Depth                       | O  | 8.4 - 9.0 in   | 8.4          |
| H-Point Height                    | C  | 3.3 - 3.5 in   | 3.2          |
| H-Point from Backline             | D  | 5.3 - 5.5 in   | 5.4          |
| Skull Cap to Backline             | H  | 1.6 - 1.8 in   | 1.7          |
| Total Sitting Height              | A  | 34.6 - 35.0 in | 34.8         |
| Thigh Clearance                   | F  | 5.5 - 6.1 in   | 6.0          |
| Buttock Knee Length               | K  | 22.8 - 23.8 in | 23.4         |
| Buttock Popliteal Length          | N  | 17.8 - 18.8 in | 18.3         |
| Popliteal Height                  | L  | 16.9 - 17.9 in | 17.5         |
| Knee Pivot Height                 | M  | 19.1 - 19.7 in | 19.2         |
| Foot Length                       | P  | 9.9 - 10.5 in  | 10.2         |
| Foot Breadth                      | W  | 3.6 - 4.2 in   | 3.8          |
| Shoulder Pivot from Backline      | E  | 3.3 - 3.7 in   | 3.6          |
| Shoulder Breadth                  | V  | 16.6 - 17.2 in | 16.8         |
| Shoulder Pivot Height             | B  | 19.9 - 20.5 in | 20.2         |
| Elbow Rest Height                 | J  | 7.5 - 8.3 in   | 8.0          |
| Shoulder - Elbow Length           | I  | 13.0 - 13.6 in | 13.2         |
| Back of Elbow to Wrist Pivot      | G  | 11.4 - 12.0 in | 11.6         |

Remarks:

Laboratory Technician: B. Swiecicki

## **APPENDIX D**

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

# INSTRUMENT CALIBRATION FOR DRIVER DUMMY

( 6 Month Calibration Minimum )

| DRIVER DUMMY (S/N 061) |       | Manufacturer | Serial #  | Calibration |          |
|------------------------|-------|--------------|-----------|-------------|----------|
|                        |       |              |           | Last        | Next     |
| Head                   | X     | ENDEVCO      | AC-J33019 | 06/19/00    | 12/19/00 |
|                        | Y     | ENDEVCO      | AC-J33127 | 06/14/00    | 12/14/00 |
|                        | Z     | ENDEVCO      | AC-J32782 | 06/21/00    | 12/21/00 |
| Head                   | X (R) | ENDEVCO      | AC-J31060 | 06/05/00    | 12/05/00 |
|                        | Y (R) | ENDEVCO      | AC-J31050 | 06/05/00    | 12/05/00 |
|                        | Z (R) | ENDEVCO      | AC-J32143 | 06/05/00    | 12/05/00 |
| Neck Load Cell         | X     | DENTON       | LC-205Fx  | 08/28/00    | 02/28/01 |
|                        | Y     | DENTON       | LC-205Fy  | 08/28/00    | 02/28/01 |
|                        | Z     | DENTON       | LC-205Fz  | 08/28/00    | 02/28/01 |
| Neck Moment            | X     | DENTON       | LC-205Mx  | 08/28/00    | 02/28/01 |
|                        | Y     | DENTON       | LC-205My  | 08/28/00    | 02/28/01 |
|                        | Z     | DENTON       | LC-205Mz  | 08/28/00    | 02/28/01 |
| Chest                  | X     | ENDEVCO      | AC-J33351 | 06/14/00    | 12/14/00 |
|                        | Y     | ENDEVCO      | AC-J32787 | 06/14/00    | 12/14/00 |
|                        | Z     | ENDEVCO      | AC-J32838 | 06/14/00    | 12/14/00 |
| Chest                  | X (R) | ENDEVCO      | AC-J32791 | 06/14/00    | 12/14/00 |
|                        | Y (R) | ENDEVCO      | AC-J33156 | 06/14/00    | 12/14/00 |
|                        | Z (R) | ENDEVCO      | AC-J33020 | 06/15/00    | 12/15/00 |
| Chest Deflection Gauge |       | SERVO        | DS-061    | 11/10/00    | 05/10/01 |
| Hybrid III Use Only    |       |              |           |             |          |
| Pelvic                 | X     | ENDEVCO      | AC-J32383 | 08/04/00    | 02/04/01 |
|                        | Y     | ENDEVCO      | AC-J32186 | 08/04/00    | 02/04/01 |
|                        | Z     | ENDEVCO      | AC-J32098 | 08/04/00    | 02/04/01 |

# INSTRUMENT CALIBRATION FOR DRIVER DUMMY

( 6 Month Calibration Minimum )

| DRIVER DUMMY (S/N 061)   |    | Manufacturer | Serial #  | Calibration |          |
|--------------------------|----|--------------|-----------|-------------|----------|
|                          |    |              |           | Last        | Next     |
| Left Femur Load Cell     |    | GSE          | LC-954    | 06/01/00    | 12/01/00 |
| Right Femur Load Cell    |    | GSE          | LC-955    | 06/01/00    | 12/01/00 |
| Left Upper Tibia         | Mx | DENTON       | LC-045Mx  | 11/04/00    | 05/04/01 |
|                          | My | DENTON       | LC-045My  | 11/04/00    | 05/04/01 |
| Left Lower Tibia         | Fz | DENTON       | LC-125Fz  | 11/04/00    | 05/04/01 |
|                          | Mx | DENTON       | LC-125Mx  | 11/04/00    | 05/04/01 |
|                          | My | DENTON       | LC-125My  | 11/04/00    | 05/04/01 |
| Right Upper Tibia        | Mx | DENTON       | LC-038Mx  | 11/09/00    | 05/09/01 |
|                          | My | DENTON       | LC-038My  | 11/09/00    | 05/09/01 |
| Right Lower Tibia        | Fz | DENTON       | LC-124Fz  | 11/09/00    | 05/09/01 |
|                          | Mx | DENTON       | LC-124Mx  | 11/09/00    | 05/09/01 |
|                          | My | DENTON       | LC-124My  | 11/09/00    | 05/09/01 |
| Left Foot Rear           | X  | ENDEVCO      | AC-P16951 | 10/02/00    | 04/02/01 |
|                          | Z  | ENDEVCO      | AC-P17152 | 10/02/00    | 04/02/01 |
| Left Foot Front          | Z  | ENDEVCO      | AC-P16975 | 10/02/00    | 04/02/01 |
| Right Foot Rear          | X  | ENDEVCO      | AC-J31042 | 11/07/00    | 05/07/01 |
|                          | Z  | ENDEVCO      | AC-J32176 | 11/07/00    | 05/07/01 |
| Right Foot Front         | Z  | ENDEVCO      | AC-J31009 | 11/08/00    | 05/08/01 |
| Lap Belt Load Cells      |    | LEBOW        | LC-706    | 06/01/00    | 12/01/00 |
| Shoulder Belt Load Cells |    | LEBOW        | LC-707    | 06/01/00    | 12/01/00 |
| Spool-Out Potentiometer  |    | MAGNETEK     | DS-M5     | 06/20/00    | 12/20/00 |
| Belt Stretch Transducer  |    | CAL          | DS-E5     | 08/07/00    | 02/07/01 |

# INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

( 6 Month Calibration Minimum )

| PASSENGER DUMMY (S/N 245) |       | Manufacturer | Serial #  | Calibration |          |
|---------------------------|-------|--------------|-----------|-------------|----------|
|                           |       |              |           | Last        | Next     |
| Head                      | X     | ENDEVCO      | AC-J32184 | 06/05/00    | 12/05/00 |
|                           | Y     | ENDEVCO      | AC-J32185 | 06/05/00    | 12/05/00 |
|                           | Z     | ENDEVCO      | AC-J31011 | 06/05/00    | 12/05/00 |
| Head                      | X (R) | ENDEVCO      | AC-J31020 | 06/05/00    | 12/05/00 |
|                           | Y (R) | ENDEVCO      | AC-J31101 | 06/05/00    | 12/05/00 |
|                           | Z (R) | ENDEVCO      | AC-J31059 | 06/05/00    | 12/05/00 |
| Neck Load Cell            | X     | DENTON       | LC-076Fx  | 08/28/00    | 02/28/01 |
|                           | Y     | DENTON       | LC-076Fy  | 08/28/00    | 02/28/01 |
|                           | Z     | DENTON       | LC-076Fz  | 08/28/00    | 02/28/01 |
| Neck Moment               | X     | DENTON       | LC-076Mx  | 08/28/00    | 02/28/01 |
|                           | Y     | DENTON       | LC-076My  | 08/28/00    | 02/28/01 |
|                           | Z     | DENTON       | LC-076Mz  | 08/28/00    | 02/28/01 |
| Chest                     | X     | ENDEVCO      | AC-J34019 | 06/19/00    | 12/19/00 |
|                           | Y     | ENDEVCO      | AC-J33018 | 06/19/00    | 12/19/00 |
|                           | Z     | ENDEVCO      | AC-J32783 | 06/19/00    | 12/19/00 |
| Chest                     | X (R) | ENDEVCO      | AC-J31066 | 08/04/00    | 12/04/00 |
|                           | Y (R) | ENDEVCO      | AC-J31021 | 08/04/00    | 12/04/00 |
|                           | Z (R) | ENDEVCO      | AC-J31022 | 08/04/00    | 12/04/00 |
| Chest Deflection Gauge    |       | SERVO        | DS-245    | 06/06/00    | 12/06/00 |
| Hybrid III Use Only       |       |              |           |             |          |
| Pelvic                    | X     | ENDEVCO      | AC-J31034 | 05/26/00    | 11/26/00 |
|                           | Y     | ENDEVCO      | AC-J31058 | 05/26/00    | 11/26/00 |
|                           | Z     | ENDEVCO      | AC-J31010 | 05/26/00    | 11/26/00 |

# INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

( 6 Month Calibration Minimum )

| PASSENGER DUMMY (S/N 245) |    | Manufacturer | Serial #  | Calibration |          |
|---------------------------|----|--------------|-----------|-------------|----------|
|                           |    |              |           | Last        | Next     |
| Left Femur Load Cell      |    | GSE          | LC-723    | 06/01/00    | 12/01/00 |
| Right Femur Load Cell     |    | GSE          | LC-419    | 06/01/00    | 12/01/00 |
| Left Upper Tibia          | Mx | DENTON       | LC-016Mx  | 11/09/00    | 05/09/01 |
|                           | My | DENTON       | LC-016My  | 11/09/00    | 05/09/01 |
| Left Lower Tibia          | Fz | DENTON       | LC-123Fz  | 11/09/00    | 05/09/01 |
|                           | Mx | DENTON       | LC-123Mx  | 11/09/00    | 05/09/01 |
|                           | My | DENTON       | LC-123My  | 11/09/00    | 05/09/01 |
| Right Upper Tibia         | Mx | DENTON       | LC-023Mx  | 11/09/00    | 05/09/01 |
|                           | My | DENTON       | LC-023My  | 11/09/00    | 05/09/01 |
| Right Lower Tibia         | Fz | DENTON       | LC-111Fz  | 11/09/00    | 05/09/01 |
|                           | Mx | DENTON       | LC-111Mx  | 11/09/00    | 05/09/01 |
|                           | My | DENTON       | LC-111My  | 11/09/00    | 05/09/01 |
| Left Foot Rear            | X  | ENDEVCO      | AC-APA30  | 07/06/00    | 01/06/01 |
|                           | Z  | ENDEVCO      | AC-J31026 | 09/21/00    | 03/21/01 |
| Left Foot Front           | Z  | ENDEVCO      | AC-J32831 | 07/06/00    | 01/06/01 |
| Right Foot Rear           | X  | ENDEVCO      | AC-J32832 | 06/14/00    | 12/14/00 |
|                           | Z  | ENDEVCO      | AC-J33376 | 07/06/00    | 01/06/01 |
| Right Foot Front          | Z  | ENDEVCO      | AC-J18400 | 09/28/00    | 03/28/01 |
| Lap Belt Load Cells       |    | LEBOW        | LC-711    | 06/01/00    | 12/01/00 |
| Shoulder Belt Load Cells  |    | LEBOW        | LC-712    | 06/01/00    | 12/01/00 |
| Spool-Out Potentiometer   |    | PATRIOT      | DS-M97    | 07/17/00    | 01/17/01 |
| Belt Stretch Transducer   |    | CAL          | DS-E6     | 08/08/00    | 02/08/01 |

# INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

( 6 Month Calibration Minimum )

|                                 | Manufacturer | Serial #  | Calibration |          |
|---------------------------------|--------------|-----------|-------------|----------|
|                                 |              |           | Last        | Next     |
| Left Seat Rear Crossmember      | ICS          | AC-D30    | 08/11/00    | 02/11/01 |
| Right Rear Seat Crossmember     | ICS          | AC-X88    | 08/14/00    | 02/14/01 |
| Top of Engine                   | ICS          | AC-D32    | 08/25/00    | 02/25/01 |
| Bottom of Engine                | ENDEVCO      | AC-BA80   | 09/28/00    | 03/28/01 |
| Right Disc Brake Caliper        | ENDEVCO      | AC-APBF4  | 06/12/00    | 12/12/00 |
| Instrument Panel                | ENDEVCO      | AC-A14077 | 08/07/00    | 02/07/01 |
| Left Disc Brake Caliper         | ENDEVCO      | AC-BA65   | 08/31/00    | 02/31/01 |
| Left Seat Rear Crossmember (R)  | ICS          | AC-D88    | 08/14/00    | 02/14/01 |
| Right Seat Rear Crossmember (R) | ICS          | AC-X33    | 08/25/00    | 02/25/01 |