

REPORT NUMBER: CAL-02-9

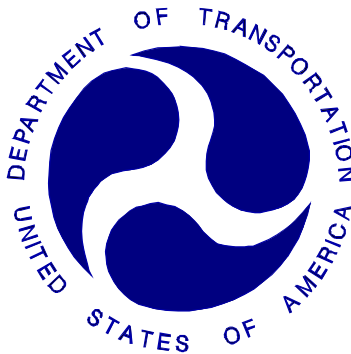
**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
FRONTAL BARRIER 40% OFFSET IMPACT TEST**

**FUJI HEAVY INDUSTRIES**  
2000 SUBARU LEGACY  
4-DOOR SEDAN

NHTSA NUMBER: RY5504

VERIDIAN TEST NUMBER: 8413-65

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



November 8, 2001

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Research and Development  
Crashworthiness Research Division  
Mail Code: NRD-11  
400 Seventh Street, SW, Room No. 6226  
Washington, DC 20590

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by:

---

Patrick G. MacDiarmid, Jr., Project Engineer

Approved by:

---

David J. Travale, Program Manager  
Transportation Science Center

Approval Date:

FINAL REPORT ACCEPTANCE BY OCS:

---

Contracting Officer's Technical Representative (COTR),  
NHTSA, Office of Crashworthiness Standards

---

Date of Report Acceptance

---

Project Engineer  
NHTSA, Research and Development

---

Date of Report Acceptance

**TECHNICAL REPORT STANDARD TITLE PAGE**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                      |                        |                                                                                                                                                                                                                   |                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1. Report No.<br>CAL-02-9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | 2. Government Accession No.                          |                        | 3. Recipient's Catalog No.                                                                                                                                                                                        |                        |
| 4. Title and Subtitle<br>Final Report of Frontal Barrier 40% Offset Testing of a 2000 Subaru Legacy 4-Door Sedan<br>NHTSA No. RY5504                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                      |                        | 5. Report Date<br>November 8, 2001                                                                                                                                                                                |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                      |                        | 6. Performing Organization Code<br>CAL                                                                                                                                                                            |                        |
| 7. Author(s)<br>David J. Travale, Program Manager<br>Patrick G. MacDiarmid, Jr., Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                                                      |                        | 8. Performing Organization Report No.<br>8413-65                                                                                                                                                                  |                        |
| 9. Performing Organization Name and Address<br>Veridian Engineering<br>4455 Genesee Street<br>Buffalo, New York 14225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                                                      |                        | 10. Work Unit No.                                                                                                                                                                                                 |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                      |                        | 11. Contract or Grant No.<br>DTNH22-01-D-32005                                                                                                                                                                    |                        |
| 12. Sponsoring Agency Name and Address<br>U.S. DEPARTMENT OF TRANSPORTATION<br>National Highway Traffic Safety Administration<br>Research and Development<br>Crashworthiness Research Division<br>Mail Code: NRD-11<br>400 Seventh Street, SW, Room No. 6226<br>Washington, DC 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                      |                        | 13. Type of Report and Period Covered<br>Final Report                                                                                                                                                             |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                      |                        | 14. Sponsoring Agency Code<br><br>NRD-11                                                                                                                                                                          |                        |
| 15. Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                                                      |                        |                                                                                                                                                                                                                   |                        |
| 16. Abstract<br><p>This test is to evaluate the use of the Denton leg in the frontal 40% offset deformable barrier test. A frontal 40% offset barrier impact test of a 2000 Subaru Legacy 4-Door Sedan was performed at Veridian Engineering crash test facility in Buffalo, New York, on November 8, 2001.</p> <p>The impact velocity was 59.87 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 432 mm. The test vehicle was equipped with 3-point restraint systems with torso belt pretensioners and load limiters, knee bolsters, and airbags at both the driver and right outboard passenger seating positions.</p> <p>With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements.</p> |            |                                                      |                        |                                                                                                                                                                                                                   |                        |
| <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 (416)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | *          | *                                                    | 22.5                   | 3721.1                                                                                                                                                                                                            | 2941.8                 |
| <b>Passenger (421)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 339.6      | 40.9                                                 | 24.0                   | 2370.3                                                                                                                                                                                                            | 1930.6                 |
| 17. Key Words<br>Frontal 40% Offset Barrier Impact test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                                                      |                        | 18. Distribution Statement<br>Copies of this report are available from:<br>NHTSA Technical Reference Division<br>National Highway Traffic Safety Admin.<br>400 Seventh St., SW, Room 5108<br>Washington, DC 20590 |                        |
| 19. Security Classif. (of this report)<br>UNCLASSIFIED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            | 20. Security Classif. (of this page)<br>UNCLASSIFIED |                        | 21. No. of Pages<br>358                                                                                                                                                                                           | 22. Price              |

**Form DOT F1700.7 (8-69)**

## TABLE OF CONTENTS

| <u>Section</u>    |                                                                           | <u>Page No.</u> |
|-------------------|---------------------------------------------------------------------------|-----------------|
| 1                 | PURPOSE AND SUMMARY OF TEST                                               | 1-1             |
| 2                 | OCCUPANT AND VEHICLE INFORMATION                                          | 2-1             |
| <u>Data Sheet</u> | <u>Description</u>                                                        |                 |
| 1.                | CRASH TEST SUMMARY                                                        | 2-1             |
| 2.                | GENERAL TEST AND VEHICLE PARAMETER DATA                                   | 2-2             |
| 3.                | POST IMPACT DATA                                                          | 2-4             |
| 4.                | TEST VEHICLE INFORMATION                                                  | 2-5             |
| 5.                | DUMMY POSITIONING IN VEHICLE                                              | 2-7             |
| 6.                | SEAT BELT POSITIONING DATA                                                | 2-9             |
| 7.                | VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY                           | 2-10            |
| 8.                | DUMMY INJURY CRITERIA VALUES                                              | 2-12            |
| 9.                | SEAT BELT PERFORMANCE DATA                                                | 2-18            |
| 10.               | SUMMARY OF FMVSS 212 DATA                                                 | 2-19            |
| 11.               | WINDSHIELD ZONE INTRUSION FMVSS 219 DATA                                  | 2-20            |
| 12.               | FMVSS 301 FUEL SYSTEM INTEGRITY DATA                                      | 2-21            |
| 13.               | FMVSS 310 ROLLOVER DATA                                                   | 2-22            |
| 14.               | TEST VEHICLE MEASUREMENTS                                                 | 2-23            |
| 15.               | HIGH SPEED CAMERA LOCATIONS                                               | 2-30            |
| 16.               | VEHICLE REFERENCE PHOTO TARGET LOCATIONS                                  | 2-31            |
| 17.               | LOAD CELL LOCATIONS RELATIVE TO FIXED BARRIER AND DEFORMABLE BARRIER FACE | 2-33            |
| 18.               | POST TEST AIR BAG DATA                                                    | 2-34            |
| 19.               | ACCIDENT INVESTIGATION DIVISION DATA                                      | 2-35            |
| 20.               | OFFSET BARRIER AND VEHICLE ORIENTATION                                    | 2-36            |
| 21.               | OFFSET BARRIER DEFORMATION                                                | 2-37            |
| APPENDIX A        | PHOTOGRAPHS                                                               | A-1             |
| APPENDIX B        | VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA                        | B-1             |
| APPENDIX C        | PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION TESTS           | C-1             |
| APPENDIX D        | DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION                      | D-1             |



## SECTION 1

### PURPOSE AND SUMMARY OF TEST

#### PURPOSE

This 59.87 kph frontal 40% offset barrier impact test is part of the Test Procedure Development Program sponsored by the National Highway Traffic Safety Administration (NHTSA). The purpose of this test was comparative performance of Denton 5th percentile adult female- Hybrid III version lower legs and obtain vehicle crashworthiness and occupant and restraint system performance data.

The frontal 40% offset barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

#### SUMMARY

A deformable honeycomb barrier mounted to a load cell barrier consisting of 30 load cells was impacted by a 2000 Subaru Legacy 4-Door Sedan at 40% overlap at a velocity of 59.87 kph. The test was performed at Veridian Engineering on November 8, 2001. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

Two Part 572O, 5th percentile female 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, knee sliders and Denton lower leg instrumentation. The driver (position 1) ATD (Serial No. 416) and the right-front passenger (position 2) ATD (Serial No. 421) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 191 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 \*. The maximum chest deceleration over 3 milliseconds was \* g's and maximum chest deflection was 22.5 mm. Compressive femur loads were 3721.1 Newtons on the left and 2941.8 Newtons on the right.

The right front passenger's HIC was 339.6. Maximum chest deceleration over 3 milliseconds was 40.9 g's and maximum chest deflection was 24.0 mm. Compressive femur loads were 2370.3 Newtons on the left and 1930.6 Newtons on the right.

## SECTION 2

### GENERAL TEST AND VEHICLE PARAMETER DATA

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

Vehicle NHTSA No.: RY5504 Test Mode: 60.3 kph Offset Frontal Barrier  
Test Date: November 8, 2001 Time: 13:25 Temperature: 21 °C  
Vehicle Make/Model/Body Style: 2000 Subaru Legacy 4-Door Sedan

Vehicle Test Weight: 1725.0 kg

Vehicle/Barrier Impact Angle: 0 °

Impact Velocity: 59.87 kph

Maximum Static Crush: 432 mm

Actual Vehicle Offset: 41.1 %

#### DUMMIES:

#### DRIVER

#### PASSENGER

Type:

5720

5720

Restraint System:

3-Point seat belt with torso belt  
pretensioner, airbag, knee  
bolster

3-Point seat belt with torso belt  
pretensioner, airbag, knee  
bolster

Lower Leg:

Denton

Denton

Number of Data Channels: 200

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:

The face to the center of the  
airbag; The back of the head to  
the left of center of the headrest

The face center of the airbag;  
The back of the head to the  
center of the headrest.

Abdomen:

None

None

Chest

Airbag

Airbag

Knees

Knee Bolster

Knee Bolster

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2000 Subaru Legacy 4-Door Sedan

NHTSA No. : RY5504 ; VIN: 4S3BE6358Y7208750 ; Color: Blue

Engine Data: 4 cylinders; - CID; 2.5 Liters; - cc

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

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

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

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

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

Date Received: - ; Odometer Reading 8787 km

Selling Dealer: -

& Address: -

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Fuji Heavy Industries

Date of Manufacture 10/99

GVWR: 1996 kg; GAWR: 1007 kg FRONT; 989 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 300 kpa FRONT

300 kpa REAR

Recommended Tire Size: P205/60R15

\* Recommended Cold Tire Pressure: 225 kpa FRONT; 210 kpa REAR

Size of Tires on Test Vehicle: P205/60R15 ; Manufacturer: Bridgestone

Vehicle Capacity Data:

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

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

Vehicle Capacity Weight (VCW) = 386 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 45.8 kg

\*Tire pressure used for test

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

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

|                                      |               |    |                          |              |    |
|--------------------------------------|---------------|----|--------------------------|--------------|----|
| Right Front =                        | <u>419.0</u>  | kg | Right Rear =             | <u>324.0</u> | kg |
| Left Front =                         | <u>430.0</u>  | kg | Left Rear =              | <u>334.0</u> | kg |
| TOTAL FRONT =                        | <u>849.0</u>  | kg | TOTAL REAR =             | <u>658.0</u> | kg |
| TOTAL DELIVERED WEIGHT =             | <u>1507.0</u> | kg |                          |              |    |
| % of Total Front of Vehicle Weight = | <u>56.3%</u>  |    | % of Total Rear Weight = | <u>43.7%</u> | %  |

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

|                                       |               |    |
|---------------------------------------|---------------|----|
| Total Delivered Weight (UDW) =        | <u>1507</u>   | kg |
| Rated Cargo/Luggage Weight (RCLW) =   | <u>45.8</u>   | kg |
| Weight of 2 p.572 Dummies @ 49 each = | <u>98</u>     | kg |
| TARGET TEST WEIGHT =                  | <u>1650.8</u> | kg |

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 120 KG OF CARGO WEIGHT:

|                                                   |               |                       |                          |              |    |
|---------------------------------------------------|---------------|-----------------------|--------------------------|--------------|----|
| Right Front =                                     | <u>442.5</u>  | kg                    | Right Rear =             | <u>411.0</u> | kg |
| Left Front =                                      | <u>445.0</u>  | kg                    | Left Rear =              | <u>426.5</u> | kg |
| TOTAL FRONT =                                     | <u>887.5</u>  | kg                    | TOTAL REAR =             | <u>837.5</u> | kg |
| TOTAL TEST WEIGHT =                               | <u>1725.0</u> | kg *requested by COTR |                          |              |    |
| % of Total Front Weight =                         | <u>51.4%</u>  | %                     | % of Total Rear Weight = | <u>48.6%</u> | %  |
| Weight of Ballast Secured in Vehicle Trunk Area = | <u>52</u>     | kg                    |                          |              |    |
| Vehicle Components Removed for Weight Reduction:  | <u>None</u>   |                       |                          |              |    |

VEHICLE ATTITUDE (all dimension in millimeters):

|                             |                |                                    |    |            |    |            |    |            |
|-----------------------------|----------------|------------------------------------|----|------------|----|------------|----|------------|
| AS DELIVERED:               | RF             | <u>674</u>                         | LF | <u>676</u> | RR | <u>669</u> | LR | <u>663</u> |
| FULLY LOADED:               | RF             | <u>659</u>                         | LF | <u>661</u> | RR | <u>651</u> | LR | <u>646</u> |
| AS TESTED:                  | RF             | <u>674</u>                         | LF | <u>672</u> | RR | <u>655</u> | LR | <u>647</u> |
| Vehicle's Wheel Base:       | <u>2650</u>    | mm                                 |    |            |    |            |    |            |
| Location of Vehicle's C.G.: | <u>1286.59</u> | mm rearward of front wheel center. |    |            |    |            |    |            |

FUEL SYSTEM DATA:

|                                                                                                                   |                          |                                         |
|-------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------|
| Fuel System Capacity From Owner's Manual =                                                                        | <u>64</u>                | liters                                  |
| Usable Capacity Figure Furnished by COTR =                                                                        | <u>64</u>                | liters                                  |
| Test Volume Range (92 to 94% of Usable Capacity) =                                                                | <u>58.88</u>             | to <u>60.16</u> liters                  |
| ACTUAL TEST VOLUME=                                                                                               | <u>59.0</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: Filler – left above rear axle; Tank –center ahead of axle; Lines – right frame stiffener. |                          |                                         |

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Offset Frontal Barrier Impact Angle: 0°  
Test Date: November 8, 2001 Time: 13:25 Temperature: 21 °C  
Vehicle NHTSA No.: RY5504  
Required Impact Velocity Range: 59.2 to 60.8 kph

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

Trap No. 1 = 59.87 kph; Trap No. 2 = 59.87 kph  
Distance from vehicle to barrier: (1) entering trap = 813 mm  
(2) exiting trap = 305 mm

VEHICLE STATIC CRUSH: (mm)

Vehicle Length:

|           |        |              |         |             |           |             |
|-----------|--------|--------------|---------|-------------|-----------|-------------|
| Pre-Test  | Left = | <u>4614</u>  | ; C/L = | <u>4681</u> | ; Right = | <u>4620</u> |
| Post-Test | Left = | <u>4201</u>  | ; C/L = | <u>4343</u> | ; Right = | <u>4863</u> |
| Crush     | Left = | <u>413</u>   | ; C/L = | <u>338</u>  | ; Right = | <u>-243</u> |
| AVERAGE   | =      | <u>169.3</u> | mm      |             |           |             |

VEHICLE OFFSET DATA: (mm)

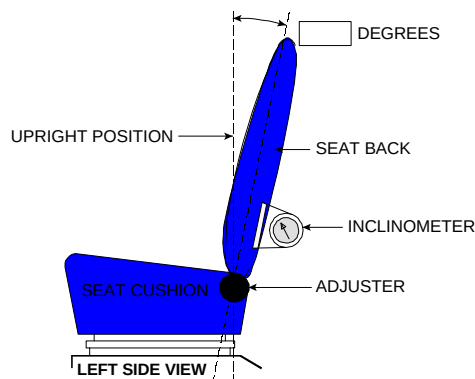
|                        |   |              |                         |
|------------------------|---|--------------|-------------------------|
| Vehicle Width          | = | <u>1735</u>  | mm                      |
| Desired Vehicle Offset | = | <u>694</u>   | mm                      |
| Actual Vehicle Offset  | = | <u>713.4</u> | mm (from film analysis) |
| Offset Difference      | = | <u>-19.4</u> | mm                      |
| Actual Percent Offset  | = | <u>41.1</u>  | %                       |

## DATA SHEET NO. 4 TEST VEHICLE INFORMATION

### VEHICLE IDENTIFICATION:

Model Year: 2000 Vehicle Model: Subaru Legacy Body Style: 4-Door Sedan

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



Seat back angle for driver's seat: 19

Measurement instructions: Adjust for ATD pelvic angle range and head level

Seat back angle for passenger's seat: 19

Measurement instructions: Same as driver's seat.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Full forward

Positioning of the passenger's seat: Full forward

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 64 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 = 64 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 58.9 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.

For 5 seconds after the engine is switched 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:                      Adjust to mid position 22°

---

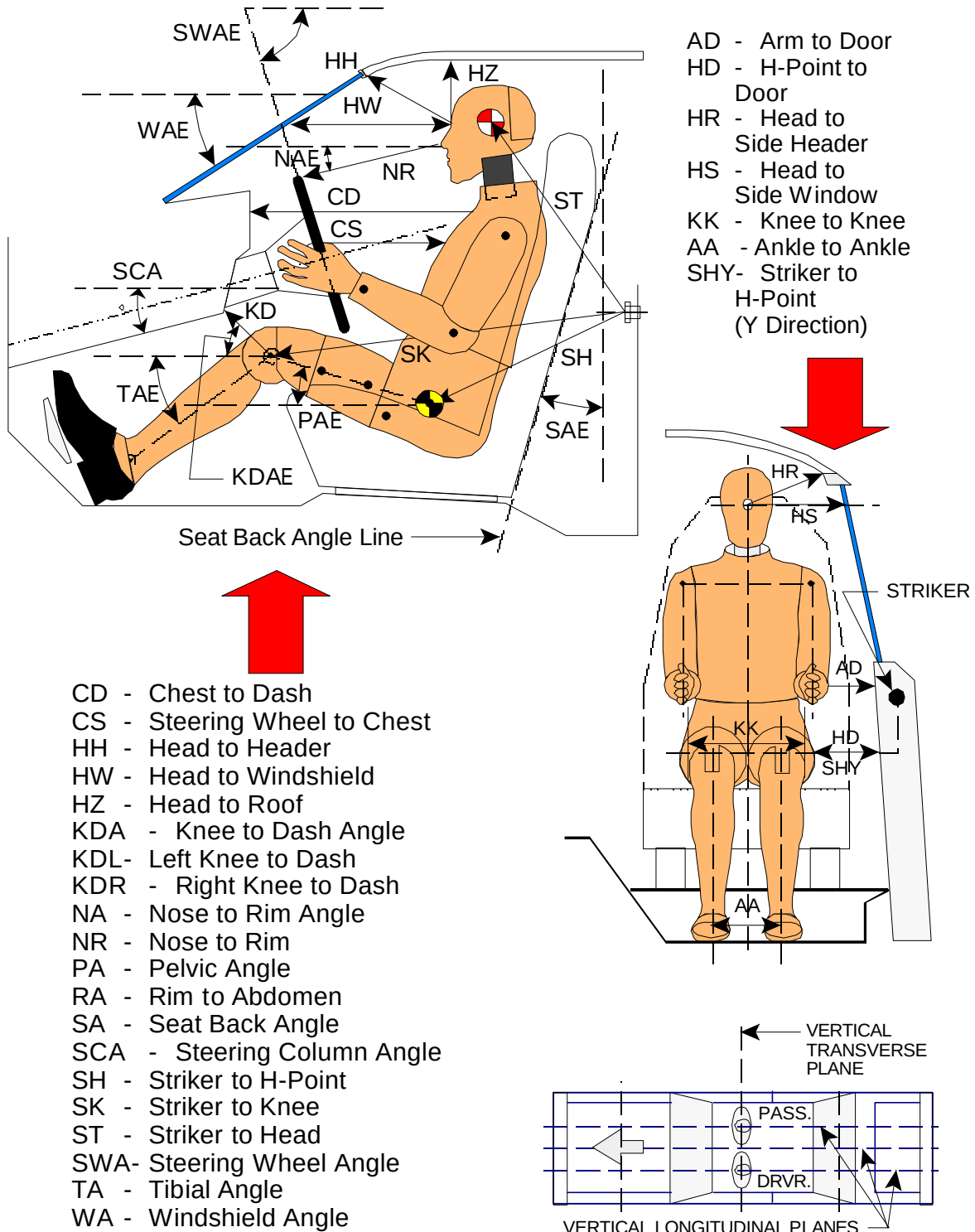
5.    SEAT BELT UPPER ANCHORAGE

Nominal design riding position:            Full Down

---



## DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

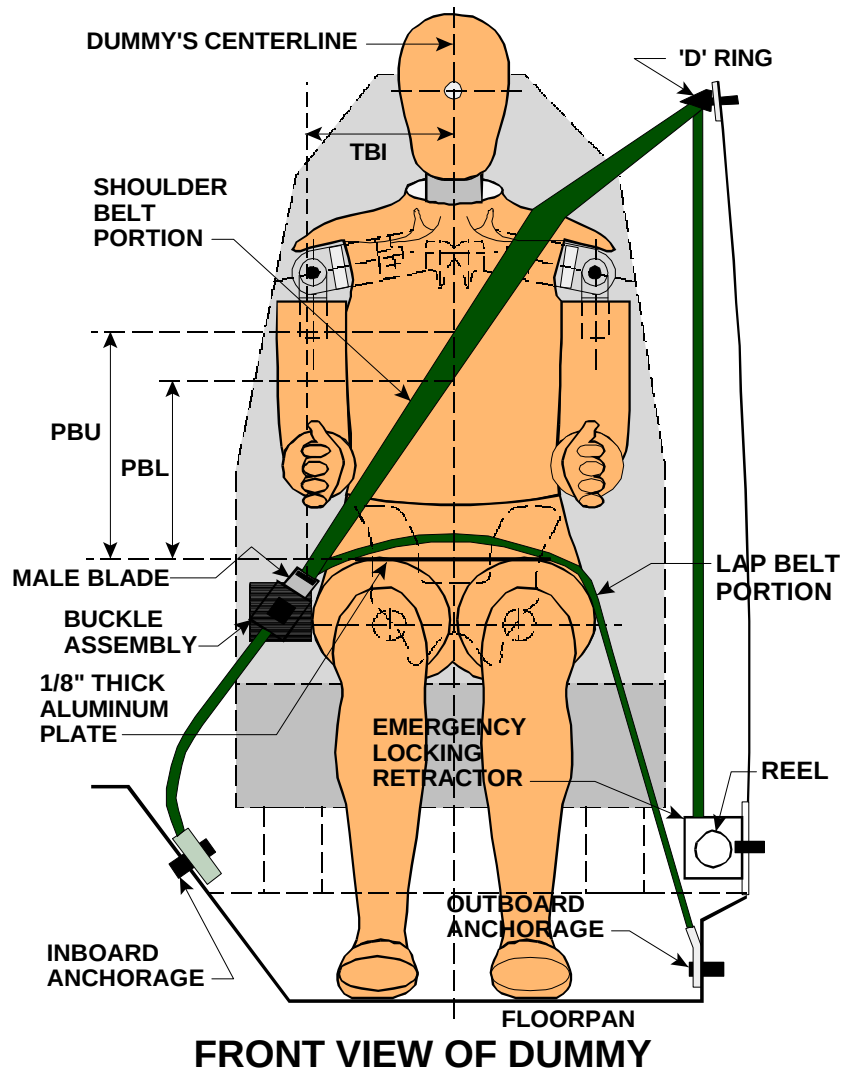


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

|                  | DRIVER (Serial #416) |             |          | PASS. (Serial #421) |             |          |
|------------------|----------------------|-------------|----------|---------------------|-------------|----------|
| WA <sup>o</sup>  | 28.8 deg.            |             |          | N/A                 |             |          |
| SWA <sup>o</sup> | 67.9 deg.            |             |          | N/A                 |             |          |
| SCA <sup>o</sup> | 22.1 deg.            |             |          | N/A                 |             |          |
| SA <sup>o</sup>  | 18.9 deg.            |             |          | 18.9                | deg.        |          |
| HZ               | 214                  |             |          | 217                 |             |          |
| HH               | 250                  |             |          | 242                 |             |          |
| HW               | 550                  |             |          | 533                 |             |          |
| HR               | 267                  |             |          | 251                 |             |          |
| NR               | 231                  | Angle       | 1 deg.   | N/A                 |             |          |
| CD               | 406                  |             |          | 379                 |             |          |
| CS               | 197                  |             |          | N/A                 |             |          |
| RA               | 80                   |             |          | N/A                 |             |          |
| KDL              | 99                   | Angle (KDA) | 40 deg.  | 73                  |             |          |
| KDR              | 92                   |             |          | 88                  | Angle (KDA) | 43 deg.  |
| PA <sup>o</sup>  | 22.2 deg.            |             |          | 20.5 deg.           |             |          |
| TA <sup>o</sup>  | 42.1 deg.            |             |          | 43.8 deg.           |             |          |
| KK               | 260                  |             |          | 250                 |             |          |
| AA               | 270                  |             |          | 182                 |             |          |
| ST               | 495                  | Angle       | 25 deg.  | 520                 | Angle       | 24 deg.  |
| SK               | 660                  | Angle       | 90 deg.  | 663                 | Angle       | 88 deg.  |
| SH               | 358                  | Angle       | 113 deg. | 360                 | Angle       | 108 deg. |
| SHY              | 266                  |             |          | 268                 |             |          |
| HS               | 350                  |             |          | 362                 |             |          |
| HD               | 168                  |             |          | 164                 |             |          |
| AD               | 163                  |             |          | 167                 |             |          |

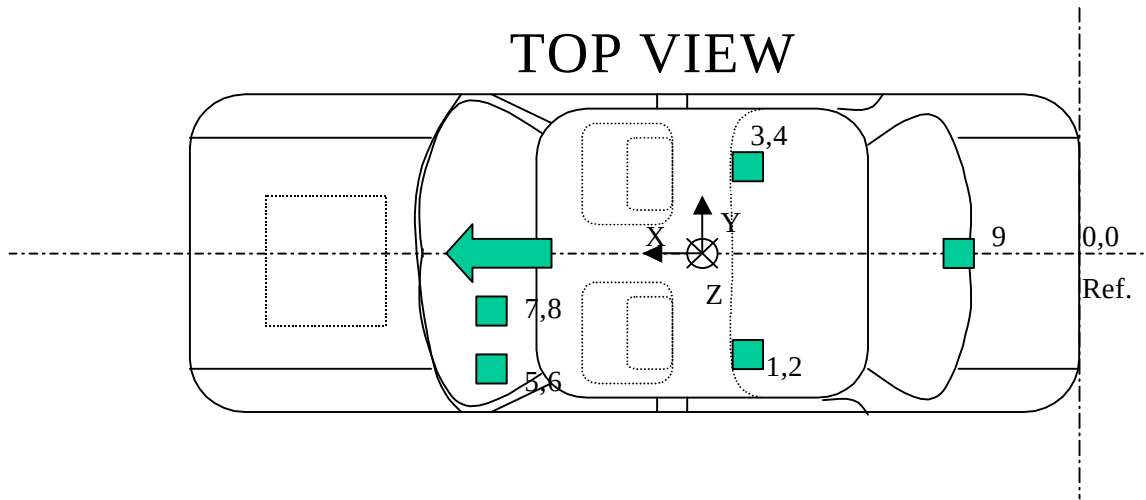
Dimensions in millimeters

## SEAT BELT POSITIONING DATA



|                                                     | DRIVER DUMMY<br>(mm) | PASSENGER DUMMY<br>(mm) |
|-----------------------------------------------------|----------------------|-------------------------|
| PBU -- Top surface of alum. plate to upper edge     | 274                  | 265                     |
| PBL-- Top surface of alum. plate to belt lower edge | 200                  | 190                     |
| <u>LAP BELT TENSION</u>                             | 10 N                 | 10 N                    |
| <u>SHOULDER BELT TENSION</u>                        | Retractor            | Retractor               |

DATA SHEET NO. 7    VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY



| Accelerometer               | X-Direction (mm) | Y-Direction (mm) | Z-Direction (mm) |
|-----------------------------|------------------|------------------|------------------|
| Left Rear Seat Crossmember  | 1913             | -518             | -221             |
| Right Rear Seat Crossmember | 1920             | 521              | -205             |
| Driver Left Side Toe pan    | 3374             | -471             | -349             |
| Driver Right Side Toe pan   | 3419             | -268             | -389             |
| Trunk                       | 1003             | 131              | -483             |

X-Direction is referenced from vehicle rear bumper (positive forward)

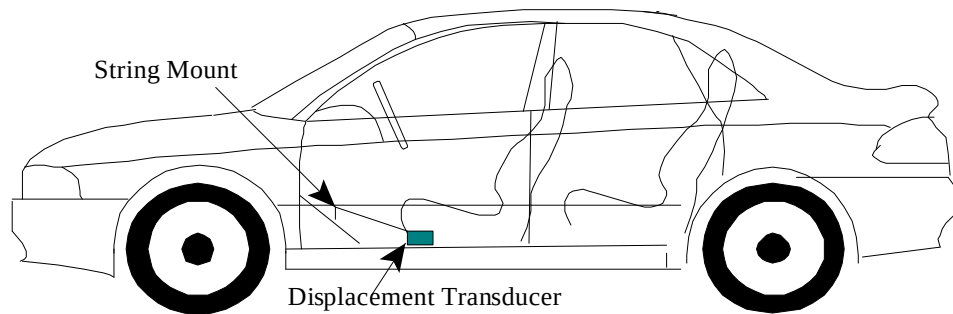
Y-Direction is referenced from vehicle centerline (positive to right)

Z-Direction is referenced from ground plane (positive down)

| LOCATION<br>NUMBER | DESCRIPTION                       | MAXIMUM VALUE (g's) |       |       |       |
|--------------------|-----------------------------------|---------------------|-------|-------|-------|
|                    |                                   | Pos.                | msec. | Neg.  | msec. |
| 1                  | Rear Seat X-Member @ Left Side X  | 1.5                 | 162   | -31.4 | 89.9  |
| 2                  | Rear Seat X-Member @ Left Side Y  | 13.8                | 79.9  | -3.2  | 120.9 |
| 3                  | Rear Seat X-Member @ Right Side X | 1.0                 | 181.3 | -35.4 | 89.9  |
| 4                  | Rear Seat X-Member @ Right Side Y | *                   | *     | *     | *     |
| 5                  | Driver Toe Pan @ Left Side X      | 2.3                 | 158.3 | -38   | 79.5  |
| 6                  | Driver Toe Pan @ Left Side Z      | 13.2                | 91.8  | -18   | 117.7 |
| 7                  | Driver Toe Pan @ Right Side X     | 6.1                 | 37.2  | -43.5 | 85.5  |
| 8                  | Driver Toe Pan @ Right Side Z     | 27.4                | 91.4  | -22.8 | 122.3 |
| 9                  | Trunk Z                           | 11.7                | 122.2 | -8.9  | 98.7  |

\* Data is clipped

# SIDE VIEW



## Driver Toe Pan Displacement

| P1 Toe Pan Spoolout** | X-Direction (mm) | Y-Direction (mm) | Z-Direction (mm) | Vertical Angle* (Deg) |
|-----------------------|------------------|------------------|------------------|-----------------------|
| Pre-Test              | 642.90           | 137.82           | -94.11           | 8.33                  |
| Post-Test             | 563.87           | 98.81            | -68.78           | 6.95                  |

\*\* Measurements taken from string pot mounting base.

\*Referenced from horizontal (0 degrees)

| SENSOR NAME         | MAXIMUM VALUE (mm) |       |       |       |
|---------------------|--------------------|-------|-------|-------|
|                     | Pos.               | msec. | Neg.  | msec. |
| P1 Toe Pan Movement | 0.0                | -56.1 | -85.5 | 126.9 |

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2000 Subaru Legacy 4-Door Sedan

NHTSA Test No.: RY5504 Test Date: November 8, 2001

|                          |      | MAXIMUM VALUE |       |       |       |           |       |        |       |
|--------------------------|------|---------------|-------|-------|-------|-----------|-------|--------|-------|
|                          |      | Driver        |       |       |       | Passenger |       |        |       |
| DESCRIPTION              | Unit | Pos           | msec  | Neg   | msec  | Pos       | msec  | Neg    | msec  |
| Head 9 Array X Arm Y     | g    | 16.7          | 166.3 | -11.0 | 60.1  | 18.3      | 77.6  | -10.4  | 58.5  |
| Head 9 Array X Arm Z     | g    | **            | **    | **    | **    | 26.6      | 62.3  | -9.0   | 140.8 |
| Head 9 Array Y Arm X     | g    | 4.6           | 186.8 | -41.1 | 70.7  | 6.7       | 309.0 | -42.6  | 81.8  |
| Head 9 Array Y Arm Z     | g    | 14.8          | 115.0 | -7.0  | 45.2  | 19.0      | 68.5  | -8.0   | 140.9 |
| Head 9 Array Z Arm X     | g    | 4.9           | 186.1 | -40.8 | 65.8  | 10.5      | 307.7 | -50.1  | 85.7  |
| Head 9 Array Z Arm Y     | g    | 21.0          | 165.8 | -10.6 | 82.6  | 13.0      | 77.6  | -12.6  | 56.8  |
| Head X                   | g    | 3.2           | 186.4 | -43.4 | 71.1  | 6.7       | 309.9 | -45.1  | 81.9  |
| Head Y                   | g    | 16.2          | 166.3 | -6.9  | 59.9  | 11.1      | 106.3 | -6.4   | 59.2  |
| Head Z                   | g    | *             | *     | *     | *     | 18.1      | 99.2  | -9.2   | 140.9 |
| Head Resultant           | g    | 52.0          | 168.1 | 0.0   | -95.6 | 46.2      | 85.7  | 0.0    | -72.5 |
| Redundant Head X         | g    | *             | *     | *     | *     | 6.8       | 309.8 | -45.0  | 81.9  |
| Redundant Head Y         | g    | 16.3          | 166.2 | -6.8  | 59.9  | 11.2      | 103.9 | -6.1   | 59.2  |
| Redundant Head Z         | g    | *             | *     | *     | *     | 19.1      | 98.9  | -9.2   | 142.6 |
| Redundant Head Resultant | g    | *             | *     | *     | *     | 46.0      | 81.8  | 0.0    | -74.9 |
| Upper Neck Fx            | N    | ***           | ***   | ***   | ***   | 296.2     | 68.5  | -123.4 | 50.8  |
| Upper Neck Fy            | N    | ***           | ***   | ***   | ***   | 176.1     | 177.2 | -97.1  | 94.3  |
| Upper Neck Fz            | N    | ***           | ***   | ***   | ***   | 731.9     | 101.3 | -261.8 | 142.4 |
| Upper Neck F Resultant   | N    | ***           | ***   | ***   | ***   | 750.2     | 101.3 | 0.7    | -70.0 |
| Upper Neck Mx            | N-m  | 18.4          | 176.5 | -10.1 | 80.7  | 12.8      | 181.1 | -8.6   | 105.8 |
| Upper Neck My            | N-m  | 14.7          | 175.3 | -97.4 | 72.7  | 24.0      | 68.7  | -10.8  | 51.0  |
| Upper Neck Mz            | N-m  | 7.5           | 111.8 | -9.8  | 399.4 | 4.8       | 74.3  | -12.0  | 139.9 |
| Upper Neck M Resultant   | N-m  | 97.6          | 72.7  | 0.1   | 9.3   | 24.5      | 68.7  | 0.0    | -2.5  |
| Chest X                  | g    | *             | *     | *     | *     | 2.7       | 351.4 | -37.9  | 99.1  |
| Chest Y                  | g    | *             | *     | *     | *     | 14.4      | 105.2 | -1.3   | 181.0 |
| Chest Z                  | g    | *             | *     | *     | *     | 13.4      | 100.7 | -11.0  | 145.1 |
| Chest Resultant          | g    | *             | *     | *     | *     | 41.8      | 99.3  | 0.0    | -77.3 |

\*Data is Questionable

\*\*Data is not accurate

\*\*\*Data us clipped

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

Vehicle Year/Make/Model/Body Style: 2000 Subaru Legacy 4-Door Sedan

NHTSA Test No.: RY5504      Test Date: November 8, 2001

|                             |      | MAXIMUM VALUE |       |         |       |           |       |         |       |
|-----------------------------|------|---------------|-------|---------|-------|-----------|-------|---------|-------|
|                             |      | Driver        |       |         |       | Passenger |       |         |       |
| DESCRIPTION                 | Unit | Pos           | msec  | Neg     | msec  | Pos       | msec  | Neg     | msec  |
| Redundant Chest X           | g    | *             | *     | *       | *     | 2.7       | 345.9 | -37.5   | 99.0  |
| Redundant Chest Y           | g    | *             | *     | *       | *     | 14.2      | 105.2 | -1.4    | 181.1 |
| Redundant Chest Z           | g    | *             | *     | *       | *     | 14.4      | 100.6 | -10.7   | 144.9 |
| Redundant Chest Resultant   | g    | *             | *     | *       | *     | 41.8      | 99.5  | 0.0     | -76.6 |
| Chest Displacement          | mm   | 0.2           | 30.8  | -22.5   | 114.3 | 0.0       | 7.4   | -24.0   | 102.8 |
| Pelvic X                    | g    | *             | *     | *       | *     | 1.8       | 167.8 | -43.0   | 98.0  |
| Pelvic Y                    | g    | *             | *     | *       | *     | 14.2      | 101.8 | -4.6    | 150.1 |
| Pelvic Z                    | g    | *             | *     | *       | *     | 1.8       | 239.9 | -10.9   | 137.3 |
| Pelvic Resultant            | g    | *             | *     | *       | *     | 44.5      | 98.0  | 0.0     | -90.8 |
| Left Femur Fx               | N    | 387.7         | 63.6  | -162.8  | 155.9 | 377.8     | 89.5  | -126.2  | 151.3 |
| Left Femur Fy               | N    | 46.7          | 57.8  | -128.2  | 110.3 | 286.9     | 101.0 | -84.4   | 134.8 |
| Left Femur Fz               | N    | 50.0          | 169.3 | -3721.1 | 100.7 | 224.7     | 138.9 | -2370.3 | 101.6 |
| Left Femur Force Resultant  | N    | 3733.9        | 100.7 | 0.1     | -58.2 | 2398.8    | 101.6 | 0.2     | -70.2 |
| Left Femur Mx               | N-m  | 25.0          | 124.0 | -32.0   | 100.2 | 22.5      | 123.8 | -49.8   | 85.2  |
| Left Femur My               | N-m  | 78.2          | 110.2 | -16.4   | 154.2 | 96.7      | 106.4 | -8.7    | 191.2 |
| Left Femur Mz               | N-m  | 26.8          | 120.2 | -17.1   | 46.9  | 16.8      | 115.0 | -16.8   | 129.9 |
| Left Femur Moment Res.      | N-m  | 80.7          | 110.1 | 0.0     | -47.7 | 98.5      | 106.4 | 0.0     | -14.4 |
| Right Femur Fx              | N    | 489.7         | 92.4  | -194.7  | 165.3 | 279.6     | 67.7  | -162.1  | 149.3 |
| Right Femur Fy              | N    | **            | **    | **      | **    | 172.4     | 150.2 | -75.5   | 225.9 |
| Right Femur Fz              | N    | 678.8         | 165.3 | -2941.8 | 97.3  | 147.9     | 151.7 | -1930.6 | 55.1  |
| Right Femur Force Resultant | N    | 2965.3        | 97.3  | 0.2     | -82.4 | 1931.8    | 55.1  | 0.3     | -79.1 |
| Right Femur Mx              | N-m  | 18.2          | 128.4 | -44.6   | 89.0  | 10.5      | 237.1 | -40.0   | 99.9  |
| Right Femur My              | N-m  | 60.0          | 109.8 | -29.1   | 94.5  | 54.4      | 106.3 | -19.3   | 52.9  |
| Right Femur Mz              | N-m  | 35.1          | 77.9  | -11.8   | 133.3 | 18.6      | 114.3 | -4.3    | 137.6 |
| Right Femur Moment Res.     | N-m  | 64.0          | 109.6 | 0.1     | -46.7 | 61.1      | 106.2 | 0.0     | -34.0 |

\*Data is Questionable

\*\*Spikes in data

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

Vehicle Year/Make/Model/Body Style: 2000 Subaru Legacy 4-Door Sedan

NHTSA Test No.: RY5504      Test Date: November 8, 2001

|                      |      | MAXIMUM VALUE |       |         |       |           |       |         |       |
|----------------------|------|---------------|-------|---------|-------|-----------|-------|---------|-------|
|                      |      | Driver        |       |         |       | Passenger |       |         |       |
| DESCRIPTION          | Unit | Pos           | msec  | Neg     | msec  | Pos       | msec  | Neg     | msec  |
| Left Knee Shear Dx   | mm   | 0.9           | 106.3 | -0.8    | 123.3 | 0.6       | 107.3 | 0.0     | 390.0 |
| Right Knee Shear Dx  | mm   | 0.3           | 78.6  | -0.8    | 135.8 | *         | *     | *       | *     |
| Left Upper Tibia Fx  | N    | 83.6          | 220.0 | -432.4  | 110.6 | 44.8      | 214.0 | -158.5  | 68.8  |
| Left Upper Tibia Fz  | N    | 148.7         | 168.8 | -1573.8 | 87.8  | 100.3     | 156.3 | -1567.7 | 81.9  |
| Left Upper Tibia Mx  | N-m  | 41.1          | 120.9 | -8.9    | 87.7  | 18.6      | 112.9 | -26.0   | 89.4  |
| Left Upper Tibia My  | N-m  | 23.2          | 121.3 | -57.2   | 82.6  | 5.2       | 217.0 | -61.6   | 91.9  |
| Left Lower Tibia Fx  | N    | 61.8          | 177.5 | -735.1  | 104.4 | 36.7      | 245.5 | -507.2  | 83.7  |
| Left Lower Tibia Fz  | N    | 158.4         | 171.7 | -1674.3 | 80.6  | 223.4     | 159.1 | -1760.5 | 81.9  |
| Left Lower Tibia Mx  | N-m  | 42.4          | 121.3 | -3.4    | 275.6 | 25.6      | 106.8 | -16.2   | 87.8  |
| Left Lower Tibia My  | N-m  | 87.0          | 109.6 | -7.3    | 48.7  | 13.0      | 119.1 | -17.9   | 97.6  |
| Right Upper Tibia Fx | N    | 141.6         | 76.6  | -416.3  | 92.1  | 64.8      | 193.8 | -84.3   | 131.3 |
| Right Upper Tibia Fz | N    | 121.4         | 167.9 | -2274.6 | 90.6  | *         | *     | *       | *     |
| Right Upper Tibia Mx | N-m  | 31.5          | 77.9  | -25.8   | 91.3  | 23.0      | 116.9 | -17.2   | 94.5  |
| Right Upper Tibia My | N-m  | 5.5           | 170.1 | -28.1   | 91.9  | 9.8       | 238.2 | -54.8   | 97.6  |
| Right Lower Tibia Fx | N    | 63.1          | 170.5 | -743.2  | 91.6  | 42.4      | 175.7 | -410.4  | 97.7  |
| Right Lower Tibia Fz | N    | 102.9         | 166.5 | -2367.8 | 91.6  | 135.0     | 156.9 | -931.4  | 92.0  |
| Right Lower Tibia Mx | N-m  | 7.4           | 133.4 | -70.9   | 91.3  | 26.4      | 118.7 | -14.5   | 92.0  |
| Right Lower Tibia My | N-m  | 31.8          | 92.1  | -15.6   | 81.8  | 13.0      | 126.2 | -19.3   | 96.6  |

\* Data is not accurate



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

Vehicle Year/Make/Model/Body Style: 2000 Subaru Legacy 4-Door Sedan

NHTSA Test No.: RY5504 Test Date: November 8, 2001

|                    |      | MAXIMUM VALUE |      |       |       |           |      |      |       |
|--------------------|------|---------------|------|-------|-------|-----------|------|------|-------|
|                    |      | Driver        |      |       |       | Passenger |      |      |       |
| DESCRIPTION        | Unit | Pos           | msec | Neg   | msec  | Pos       | msec | Neg  | msec  |
| Left Ankle Ax      | g    | *             | *    | *     | *     | *         | *    | *    | *     |
| Left Ankle Az      | g    | *             | *    | *     | *     | *         | *    | *    | *     |
| Right Ankle Ax     | g    | *             | *    | *     | *     | *         | *    | *    | *     |
| Right Ankle Az     | g    | *             | *    | *     | *     | *         | *    | *    | *     |
| Left Toe Az        | g    | *             | *    | *     | *     | *         | *    | *    | *     |
| Right Toe Az       | g    | *             | *    | *     | *     | *         | *    | *    | *     |
| Lap Belt Load Cell | N    | 611.7         | 94.8 | -12.3 | 200.4 | 2286.9    | 98.8 | -6.0 | 174.4 |

\*Data is Questionable

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

Vehicle Year/Make/Model/Body Style: 2000 Subaru Legacy 4-Door Sedan

NHTSA Test No.: RY5504      Test Date: November 8, 2001

| 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       | ***** | *****                 | *****                 | *****                                                    |
| Position #2 - Passenger    | 339.6 | 72.4                  | 108.3                 | 38.9                                                     |

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

\*\*\* Data is questionable

| CLIP SUMMARY*           |            |                       |                       |       |
|-------------------------|------------|-----------------------|-----------------------|-------|
|                         | CLIP (g's) | t <sub>1</sub> (msec) | t <sub>2</sub> (msec) | CSI   |
| Position #1 - Driver    | *****      | *****                 | *****                 | ***** |
| Position #2 - Passenger | 40.9       | 97.8                  | 100.8                 | 266.3 |

\* 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: 2000 Subaru Legacy 4-Door Sedan  
NHTSA Test No.: RY5504     Test Date: November 8, 2001

| 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                        | ***** | *****                 | *****                 | *****                                                    |
| Position #2 - Passenger                     | 335.8 | 72.4                  | 108.3                 | 38.7                                                     |

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

\*\*\* Data is questionable

| CLIP SUMMARY* <b>REDUNDANT</b> |            |                       |                       |       |
|--------------------------------|------------|-----------------------|-----------------------|-------|
|                                | CLIP (g's) | t <sub>1</sub> (msec) | t <sub>2</sub> (msec) | CSI   |
| Position #1 - Driver           | *****      | *****                 | *****                 | ***** |
| Position #2 - Passenger        | 41.1       | 97.8                  | 100.8                 | 264.5 |

\* 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<br>to bolt hole anchor point for<br>continuous webbing systems. | -             | -                |
| Shoulder belt length as measured<br>on Part 572 Dummy.                                           | -             | -                |
| Lap belt length as measured<br>on Part 572 Dummy.                                                | -             | -                |

SHOULDER BELT SPOOL-OFF DATA:

|                                 |   |   |
|---------------------------------|---|---|
| As determined by film analysis. | - | - |
| As determined mechanically.     | - | - |
| As determined electronically.   | - | - |

BELT STRETCH DATA:

|                                                                              |   |   |
|------------------------------------------------------------------------------|---|---|
| Measured electronically between shoulder<br>belt load cell and the "D" ring. | - | - |
| Measured mechanically.                                                       | - | - |

\_\_\_\_\_  
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.:

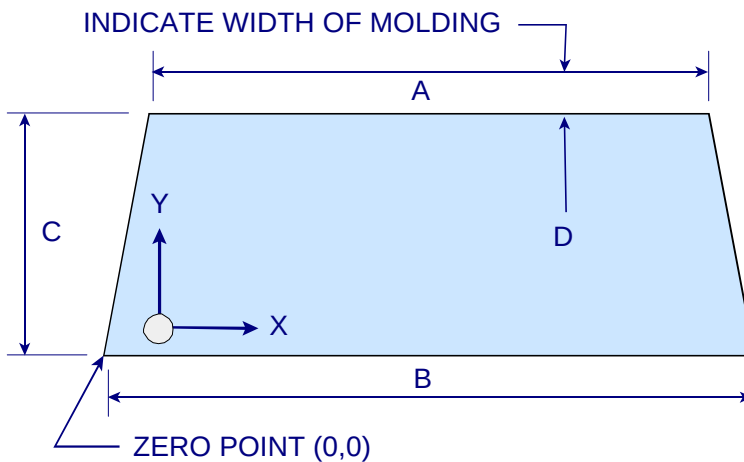
Windshield is bonded in place and covered with a 19 mm molding.

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<br>WINDSHIELD PERIPHERY |               |                |                |
|---------------------------------------------|---------------|----------------|----------------|
|                                             | PRE-TEST (mm) | POST-TEST (mm) | % OF RETENTION |
| RIGHT SIDE                                  | 2018.5        | 2018.5         | 100.0%         |
| LEFT SIDE                                   | 2018.5        | 2018.5         | 100.0%         |
| TOTAL                                       | 4037          | 4037           | 100.0%         |

AREA OF RETENTION FAILURE:



| DIMENSIONS (mm) |      |
|-----------------|------|
| A               | 1161 |
| B               | 1484 |
| C               | 696  |
| D               | 19   |

**FRONT VIEW OF WINDSHIELD**

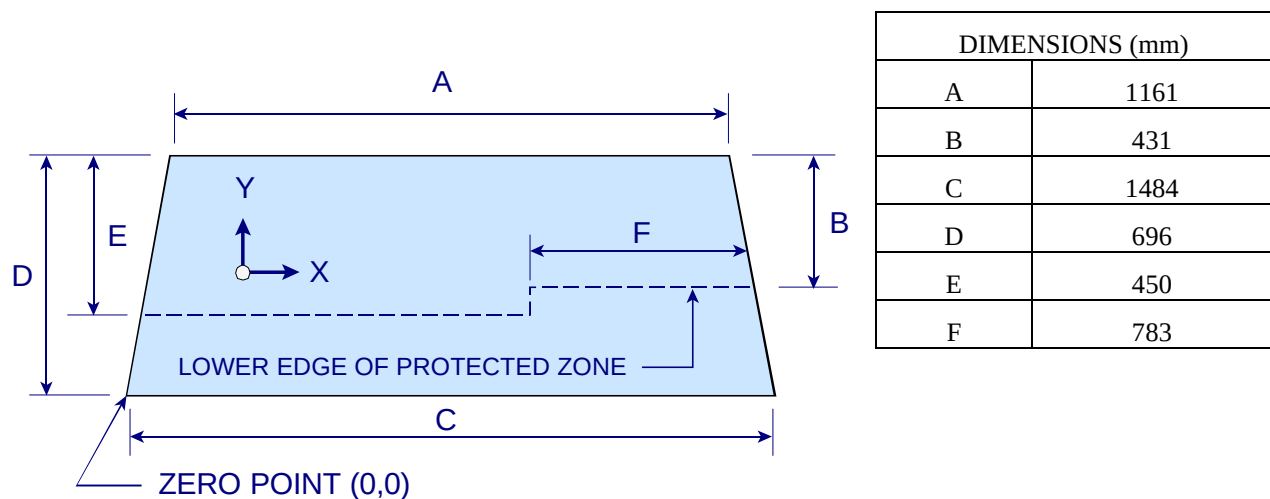
FAILURE DETAILS: None

DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165 mm diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points extend the locus line horizontally to the edges of the windshield, then draw a line on the inner surface of the windshield below and 13 mm distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA:



**FRONT VIEW OF WINDSHIELD**

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

(Show location of penetration on the above sketch)

| COORDINATES |   |   |
|-------------|---|---|
|             | X | Y |
| 1.          | - | - |
| 2.          | - | - |
| 3.          | - | - |
| 4.          | - | - |

DATA SHEET NO. 12 FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

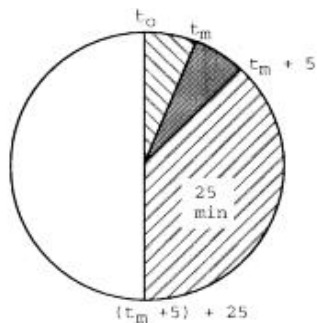
NHTSA TEST No.: RY5504 TEST DATE: November 8, 2001  
VEHICLE MAKE/MODEL: 2000 Subaru Legacy 4-Door Sedan

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

=====

TEST VEHICLE IMPACT TYPE: X Offset Frontal (60.3 kph)  
- Oblique (48 kph) with \_\_\_\_\_ deg. barrier face first  
 contacting \_\_\_\_\_  
- (driver/passenger) side  
- Rear Moving Barrier (48 kph)  
- Lateral Moving Barrier (32 kph)

FUEL SPILLAGE MEASUREMENT:



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

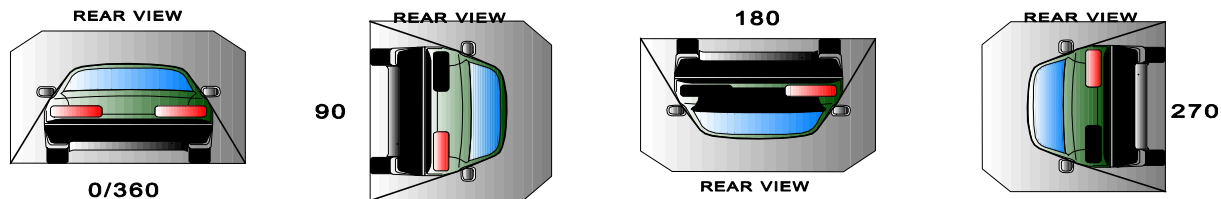
| ACTUAL | MAX ALLOWED |
|--------|-------------|
| 0      | 28 g        |
| 0      | 141 g       |
| 0      | 28 g/min.   |

SOLVENT SPILLAGE DETAILS: None

## DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2000 Subaru Legacy 4-Door Sedan

NHTSA No.: RY5504



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

| Rollover Stage | Rotation Time (spec. 1 -3 min) |         |    |         | FMVSS 301 Hold Time |         | Total Time |         |    |         | Next Whole Minute Interval |         |
|----------------|--------------------------------|---------|----|---------|---------------------|---------|------------|---------|----|---------|----------------------------|---------|
| 0° - 90°       | 1                              | minutes | 14 | seconds | 5                   | minutes | 6          | minutes | 14 | seconds | 7                          | minutes |
| 90° - 180°     | 1                              | minutes | 05 | seconds | 5                   | minutes | 6          | minutes | 5  | seconds | 7                          | minutes |
| 180°-270°      | 1                              | minutes | 01 | seconds | 5                   | minutes | 6          | minutes | 1  | seconds | 7                          | minutes |
| 270°-360°      | 1                              | minutes | 10 | seconds | 5                   | minutes | 6          | minutes | 10 | seconds | 7                          | minutes |

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

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

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

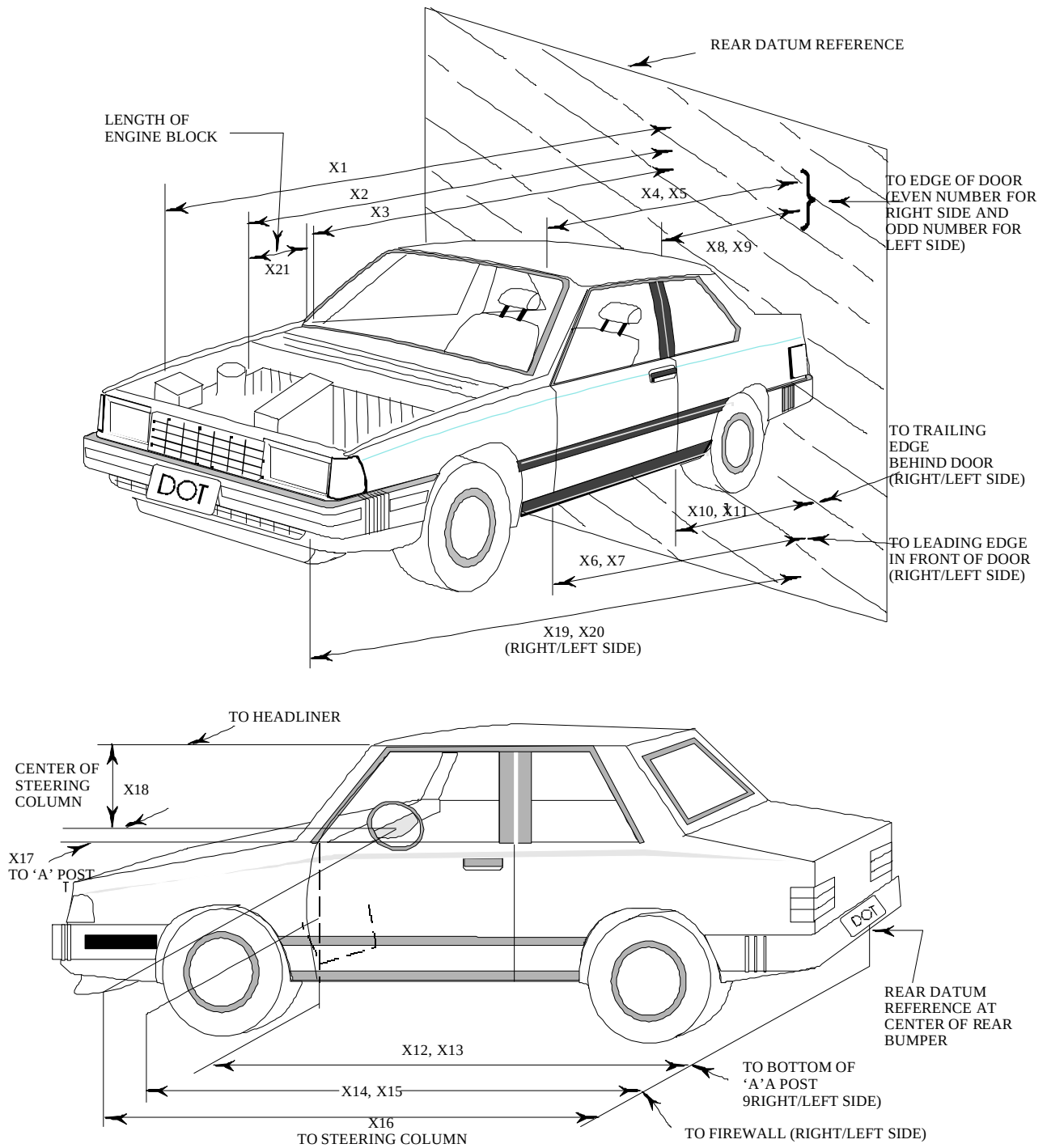
Note: Record spillage for whole minute intervals only as determined above.

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

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



# DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS



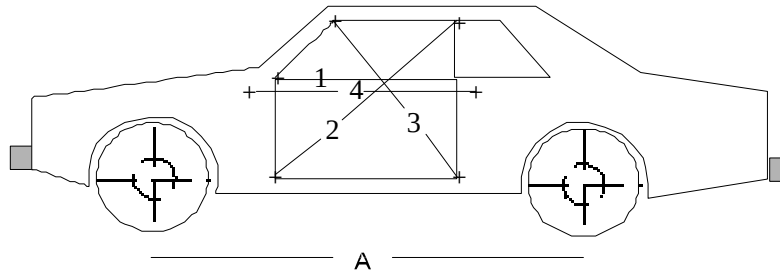
DATA SHEET NO.14      VEHICLE MEASUREMENTS (cont.)

| No. |                                                              | Pre-Test | Post-Test | Difference |
|-----|--------------------------------------------------------------|----------|-----------|------------|
| X1  | Total Length of Vehicle at Centerline                        | 4681     | 4343      | 338        |
| X2  | Rear Surface of Vehicle to Front of Engine                   | 4211     | 4022      | 189        |
| X3  | Rear Surface of Vehicle to Firewall                          | 3519     | 3471      | 48         |
| X4  | Rear Surface of Vehicle to Upper Leading Edge of Right Door  | 3189     | 3186      | 3          |
| X5  | Rear Surface of Vehicle to Upper Leading Edge of Left Door   | 3193     | 3182      | 11         |
| X6  | Rear Surface of Vehicle to Lower Leading Edge of Right Door  | 3210     | 3212      | -2         |
| X7  | Rear Surface of Vehicle to Lower Leading Edge of Left Door   | 3219     | 3203      | 16         |
| X8  | Rear Surface of Vehicle to Upper Trailing Edge of Right Door | 2156     | 2160      | -4         |
| X9  | Rear Surface of Vehicle to Upper Trailing Edge of Left Door  | 2169     | 2158      | 11         |
| X10 | Rear Surface of Vehicle to Lower Trailing Edge of Right Door | 2171     | 2173      | -2         |
| X11 | Rear Surface of Vehicle to Lower Trailing Edge of Left Door  | 2179     | 2175      | 4          |
| X12 | Rear Surface of Vehicle to Bottom of "A" Post of Right Side  | 3240     | 3239      | 1          |
| X13 | Rear Surface of Vehicle to Bottom of "A" Post of Left Side   | 3246     | 3227      | 19         |
| X14 | Rear Surface of Vehicle to Firewall, Right Side              | 3560     | 3525      | 35         |
| X15 | Rear Surface of Vehicle to Firewall, Left Side               | 3555     | 3424      | 131        |
| X16 | Rear Surface of Vehicle to Steering Column                   | 2759     | 2721      | 38         |
| X17 | Center of Steering Column to "A" Post                        | 334      | 322       | 12         |
| X18 | Center of Steering Column to Headliner                       | 430      | 463       | -33        |
| X19 | Rear Surface of Vehicle to Right Side of Front Bumper        | 4620     | 4683      | -63        |
| X20 | Rear Surface of Vehicle to Left Side of Front Bumper         | 4614     | 4201      | 413        |
| X21 | Length of Engine Block                                       | 366      | 366       | 0          |
| RD  | Rear Surface of Vehicle to Right Side of Dash Panel          | 2967     | 2957      | 10         |
| CD  | Rear Surface of Vehicle to Center of Dash Panel              | 2974     | 2922      | 52         |
| LD  | Rear Surface of Vehicle to Left Side of Dash Panel           | 2946     | 2901      | 45         |

All Dimensions in mm

All measurements taken forward from a lateral plane located at the rearmost point of the vehicle.

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

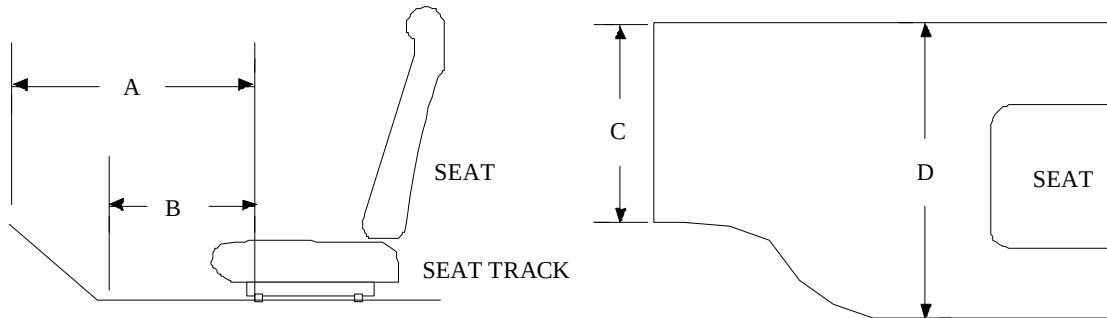


| UNITS (mm)  | LEFT |      |     |      | RIGHT |      |     |
|-------------|------|------|-----|------|-------|------|-----|
| MEASUREMENT | 1    | 2    | 3   | 4*   | 1     | 2    | 3   |
| BEFORE TEST | 967  | 1393 | 912 | 1037 | 970   | 1392 | 925 |
| AFTER TEST  | 950  | 1386 | 940 | 1018 | 968   | 1382 | 933 |
| DIFFERENCE  | 17   | 7    | -28 | 19   | 2     | 10   | -8  |

\* Insurance Institute for Highway Safety (IIHS) measurement for driver's side only

| UNITS (mm)  | A = WHEELBASE LEFT | A = WHEELBASE RIGHT |
|-------------|--------------------|---------------------|
| BEFORE TEST | 2650               | 2650                |
| AFTER TEST  | 2520               | 2726                |
| DIFFERENCE  | 130                | -76                 |

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



DRIVER

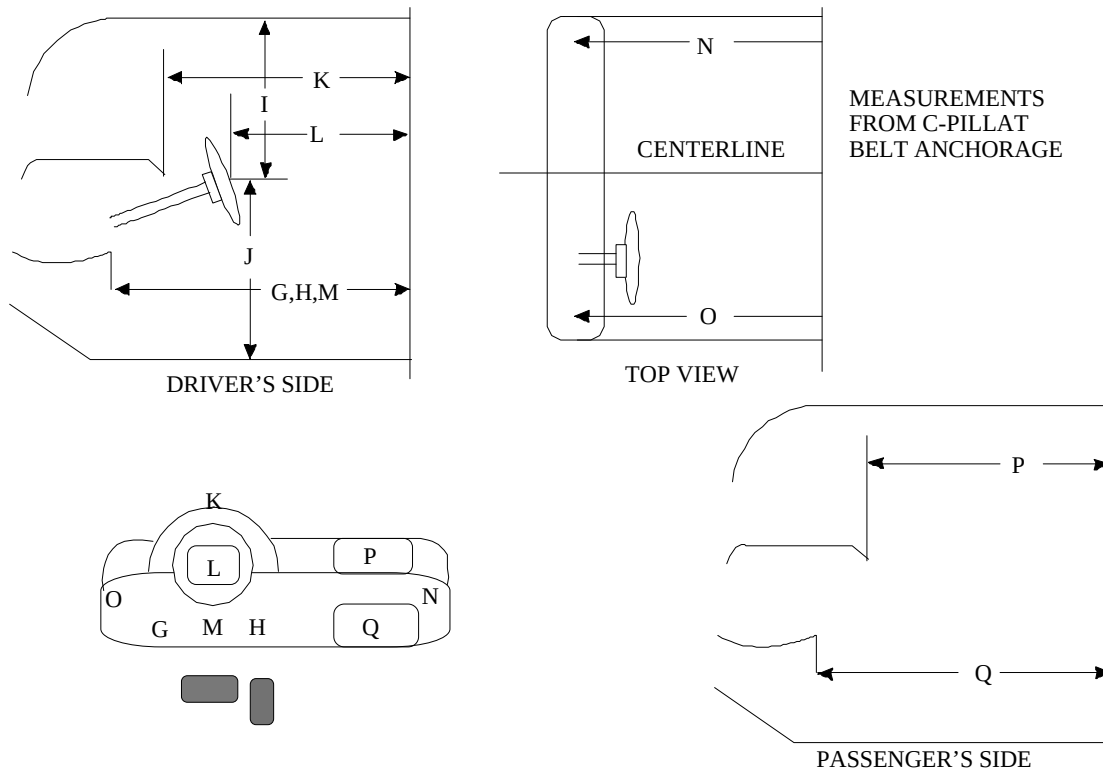
| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A           | 748      | 641       | 107        |
| B           | 606      | 561       | 45         |
| C           | 375      | 366       | 9          |
| D           | 418      | 379       | 39         |

PASSENGER

| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A           | 676      | 652       | 24         |
| B           | 511      | 505       | 6          |
| C           | 378      | 373       | 5          |
| D           | 448      | 436       | 12         |

Units = mm

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

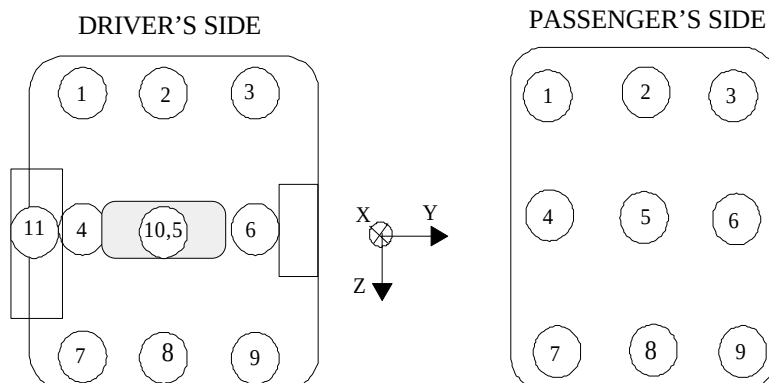


| Measurement   | Pre-Test | Post-Test | Difference |
|---------------|----------|-----------|------------|
| G*            | 1706     | 1675      | 31         |
| H*            | 1707     | 1684      | 23         |
| I             | 430      | 463       | -33        |
| J             | 605      | 598       | 7          |
| K             | 1667     | 1608      | 59         |
| L             | 1483     | 1440      | 43         |
| M             | 1754     | 1732      | 22         |
| N             | 1705     | 1692      | 13         |
| O             | 1670     | 1621      | 49         |
| P = K (PASS.) | 1781     | 1750      | 31         |
| Q = M (PASS.) | 1760     | 1745      | 15         |

\* IIHS measurement locations; 15 cm left and right of steering wheel center 45 cm from floor.

Units = mm

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



**Driver Side Toe-pan Measurements**

| Toe-pan Location | X Deformation (mm) |      |     | Y Deformation (mm) |      |     | Z Deformation (mm) |      |     |
|------------------|--------------------|------|-----|--------------------|------|-----|--------------------|------|-----|
|                  | Pre                | Post | ?   | Pre                | Post | ?   | Pre                | Post | ?   |
| 1                | 3429               | 3324 | 105 | -481               | -449 | -32 | -451               | -562 | 111 |
| 2                | 3479               | 3357 | 122 | -353               | -341 | -12 | -491               | -532 | 41  |
| 3                | 3475               | 3371 | 104 | -193               | -244 | 51  | -500               | -568 | 68  |
| 4*               | 3410               | 3305 | 105 | -495               | -475 | -20 | -413               | -453 | 40  |
| 5* <sup>A</sup>  | 3419               | 3330 | 89  | -348               | -334 | -14 | -389               | -431 | 42  |
| 6*               | 3428               | 3264 | 164 | -209               | -141 | -68 | -405               | -413 | 8   |
| 7                | 3346               | 3287 | 59  | -508               | -465 | -43 | -321               | -354 | 33  |
| 8                | 3337               | 3277 | 60  | -341               | -334 | -7  | -319               | -351 | 32  |
| 9                | 3330               | 3290 | 40  | -217               | -178 | -39 | -304               | -330 | 26  |
| 10               | 3300               | 3169 | 131 | -361               | -364 | 3   | -441               | -491 | 50  |
| 11*              | 3330               | 3271 | 59  | -599               | -582 | -17 | -432               | -459 | 27  |

**Passenger Side Toe-pan Measurements**

| Toe-pan Location | X Deformation (mm) |      |    | Y Deformation (mm) |      |    | Z Deformation (mm) |      |     |
|------------------|--------------------|------|----|--------------------|------|----|--------------------|------|-----|
|                  | Pre                | Post | ?  | Pre                | Post | ?  | Pre                | Post | ?   |
| 1                | 3375               | 3324 | 51 | 206                | 205  | 1  | -411               | -437 | 26  |
| 2                | 3389               | 3365 | 24 | 359                | 365  | -6 | -423               | -430 | 7   |
| 3                | 3377               | 3362 | 15 | 517                | 513  | 4  | -431               | -438 | 7   |
| 4                | 3298               | 3267 | 31 | 204                | 202  | 2  | -344               | -338 | -6  |
| 5                | 3302               | 3280 | 22 | 358                | 353  | 5  | -350               | -338 | -12 |
| 6                | 3313               | 3293 | 20 | 495                | 483  | 12 | -355               | -350 | -5  |
| 7                | 3232               | 3202 | 30 | 196                | 199  | -3 | -268               | -242 | -26 |
| 8                | 3225               | 3218 | 7  | 353                | 352  | 1  | -251               | -243 | -8  |
| 9                | 3218               | 3227 | -9 | 504                | 510  | -6 | -249               | -248 | -1  |

Reference: (SAE) X = Rear Bumper (pos: forward); Y = Vehicle Centerline (pos: right); Z = Ground (pos: down)

\* IIHS measurement locations

\*<sup>A</sup> IIHS measurement located directly behind 10 (brake pedal center) on the vehicle floorpan in same vertical plane.

**DATA SHEET NO.14      VEHICLE MEASUREMENTS (cont.)**  
**INSURANCE INSTITUTE MEASUREMENT LOCATION AND FLOOR PAN DEFORMATION DATA**

**IIHS Measurement Location Data**

| Meas.<br>Loc* | X Measurement (mm) |      |     | Y Measurement (mm) |      |     | Z Measurement (mm) |      |     |
|---------------|--------------------|------|-----|--------------------|------|-----|--------------------|------|-----|
|               | Pre                | Post | ?   | Pre                | Post | ?   | Pre                | Post | ?   |
| 1             | 2759               | 2721 | 38  | -339               | -365 | 26  | -846               | -831 | -15 |
| 2             | 2982               | 2956 | 26  | -469               | -472 | 3   | -690               | -673 | -17 |
| 3             | 2984               | 2964 | 20  | -170               | -165 | -5  | -687               | -673 | -14 |
| 4             | 3300               | 3169 | 131 | -361               | -364 | 3   | -441               | -491 | 50  |
| 5             | 3410               | 3305 | 105 | -495               | -475 | -20 | -413               | -453 | 40  |
| 6             | 3419               | 3330 | 89  | -348               | -334 | -14 | -389               | -431 | 42  |
| 7             | 3428               | 3264 | 164 | -209               | -141 | -68 | -405               | -413 | 8   |
| 8             | 3330               | 3271 | 59  | -599               | -582 | -17 | -432               | -459 | 27  |
| 17            | 3195               | 3175 | 20  | -771               | -776 | 5   | -881               | -878 | -3  |
| 18            | 2158               | 2158 | 0   | -757               | -756 | -1  | -904               | -899 | -5  |

**Floor Pan Deformation Measurement Data**

| Meas.<br>Loc** | X Measurement (mm) |      |    | Y Measurement (mm) |      |     | Z Measurement (mm) |      |     |
|----------------|--------------------|------|----|--------------------|------|-----|--------------------|------|-----|
|                | Pre                | Post | ?  | Pre                | Post | ?   | Pre                | Post | ?   |
| P0             | 2731               | 2716 | 15 | -609               | -562 | -47 | -255               | -281 | 26  |
| P1             | 3240               | 3222 | 18 | -500               | -490 | -10 | -255               | -247 | -8  |
| P2             | 3227               | 3222 | 5  | -354               | -343 | -11 | -256               | -237 | -19 |
| P3             | 3205               | 3197 | 8  | -202               | -218 | 16  | -297               | -288 | -9  |
| P4             | 3136               | 3130 | 6  | -498               | -499 | 1   | -241               | -234 | -7  |
| P5             | 3130               | 3124 | 6  | -342               | -337 | -5  | -249               | -228 | -21 |
| P6             | 3123               | 3118 | 5  | -200               | -205 | 5   | -309               | -298 | -11 |
| P7             | 3036               | 3033 | 3  | -501               | -492 | -9  | -237               | -231 | -6  |
| P8             | 3030               | 3031 | -1 | -346               | -339 | -7  | -244               | -229 | -15 |
| P9             | 3040               | 3017 | 23 | -207               | -187 | -20 | -302               | -304 | 2   |

Reference: (SAE) X = Rear Bumper (pos: forward); Y = Vehicle Centerline (pos: right); Z = Ground (pos: down)

**Measurement Location Descriptions\***

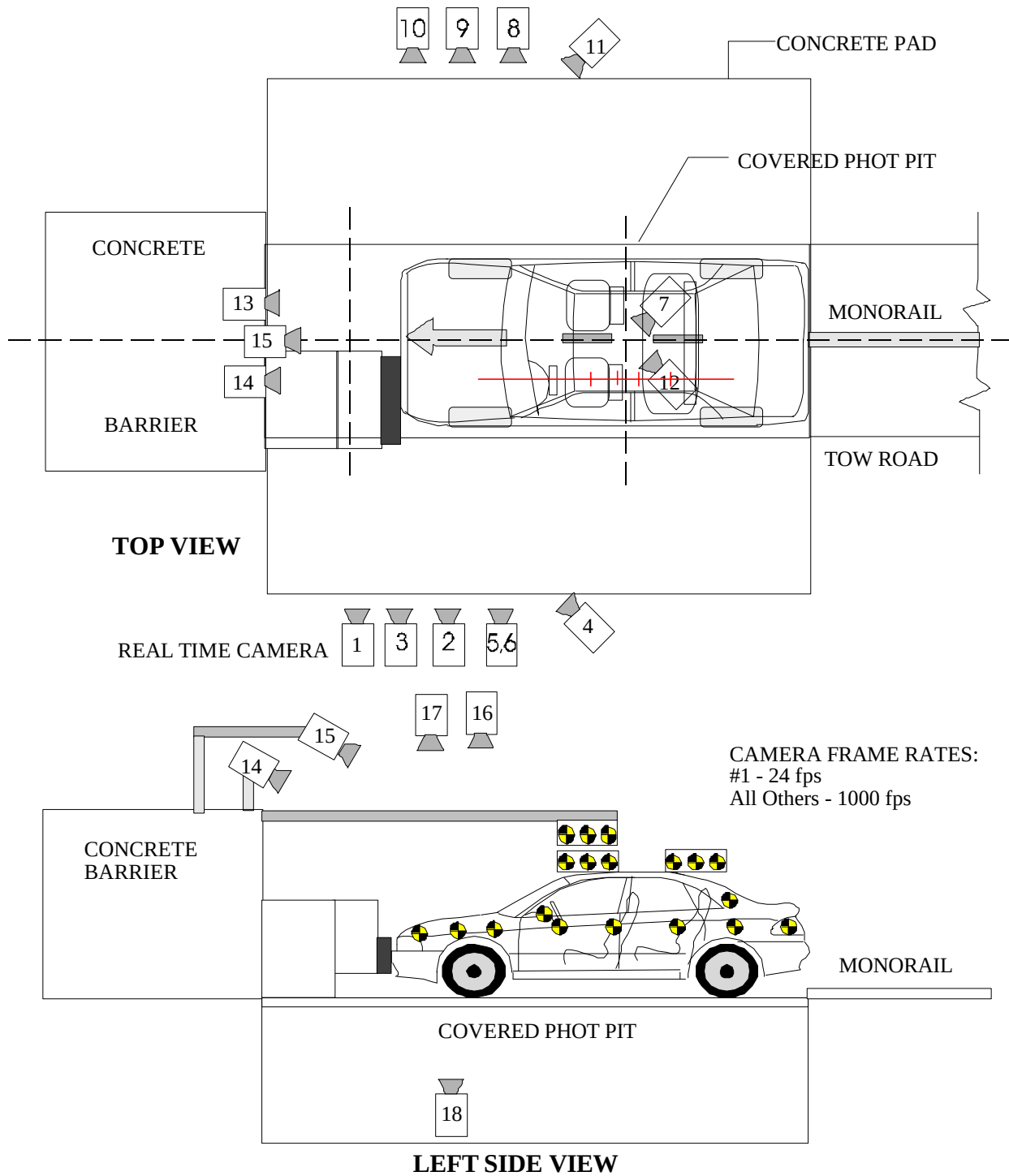
**P0. Front Outside Seat Anchor Bolt**

1. Steering Column - Geometric center of the steering wheel on airbag door.
2. Lower Instrument Panel Left - Taken 45 cm above floorpan and 15 cm to the left of the steering wheel center.
3. Lower Instrument Panel Right - Taken 45 cm above floorpan and 15 cm to the right of the steering wheel center.
4. Brake Pedal - Geometric center of the brake pedal.
5. Toepan Left - Taken 15 cm to the left of the brake pedal center on the same vertical plane on the vehicle toepan.
6. Toepan Center - Taken directly behind the brake pedal center on the same vertical plane on the vehicle toepan.
7. Toepan Right - Taken 15 cm to the right of the brake pedal center on the same vertical plane on the vehicle toepan.
8. Left Footrest - Taken 25 cm to the left of the brake pedal center on the same vertical plane on the vehicle toepan.
17. A-pillar - Taken on the vehicle exterior at the same vertical coordinate as the base on the left front window.
18. B-pillar - Taken on the vehicle exterior at the same vertical coordinate as the lower A-pillar mark.

\*\* There is an equal spaced 3 x 3 floor pan matrix. Position 1 if floor pan left side forwardmost position; Position 9 is located on the right side rearmost position of the 3 x 3 grid.

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.: RY5504 Vehicle: 2000 Subaru Legacy 4-Door Sedan

| CAMERA NO. | VIEW                        | CAMERA POSITIONS (mm)* |       |       | ANGLE (deg)** | FILM PLANE TO HEAD TARGET | LENS (mm) | SPEED (fps) |
|------------|-----------------------------|------------------------|-------|-------|---------------|---------------------------|-----------|-------------|
|            |                             | X                      | Y     | Z     |               |                           |           |             |
| 1          | Real-Time Camera            | -                      | -     | -     | -             | -                         | -         | 24          |
| 2          | Overall Left Side           | 7280                   | 1390  | 1068  | -5            | 6930                      | 12.5      | 1005        |
| 3          | Left Side View              | 8954                   | 785   | 1090  | -5            | 8604                      | 25        | 1000        |
| 4          | Driver and Interior View    | 9159                   | 2378  | 1987  | -10           | -                         | 25        | 1010        |
| 5          | Steering Column (Bottom)    | 9359                   | 1724  | 1177  | -5            | 9009                      | 25        | 1010        |
| 6          | Steering Column (Top)       | 9359                   | 1724  | 1777  | -9            | 9009                      | 25        | 1005        |
| 7          | Interior Driver View        | -                      | -     | -     | -             | -                         | -         | -           |
| 8          | Overall Right Side View     | 7620                   | 1575  | 1132  | -3            | 7876                      | 12.5      | 1005        |
| 9          | Right Side View             | 9909                   | 778   | 1118  | -5            | 10165                     | 25        | 1060        |
| 10         | Right Passenger View        | 9359                   | 1445  | 1425  | -4            | 9615                      | 35        | 1000        |
| 11         | Passenger and Interior View | 8579                   | 2464  | 1892  | -10           | -                         | 25        | 1015        |
| 12         | Interior Passenger View     | -                      | -     | -     | -             | -                         | -         | -           |
| 13         | Passenger Front View        | -520                   | -2050 | 1987  | -28           | -                         | 13        | 1005        |
| 14         | Driver Front View           | -520                   | -2050 | 3488  | -27           | -                         | 13        | 1010        |
| 15         | Windshield View             | 0                      | -2050 | 3048  | -46           | -                         | 13        | 1000        |
| 16         | Overhead Overall View       | 0                      | 156   | 4880  | -90           | -                         | 13        | 1010        |
| 17         | Overhead Close-Up View      | 0                      | 323   | 4880  | -90           | -                         | 35        | 1010        |
| 18         | Pit View of Engine          | 0                      | 1325  | -3048 | 90            | -                         | 13        | 990         |

\*X = film plane to monorail centerline

\*\* = referenced to horizontal plane

Y = film plane to impact location

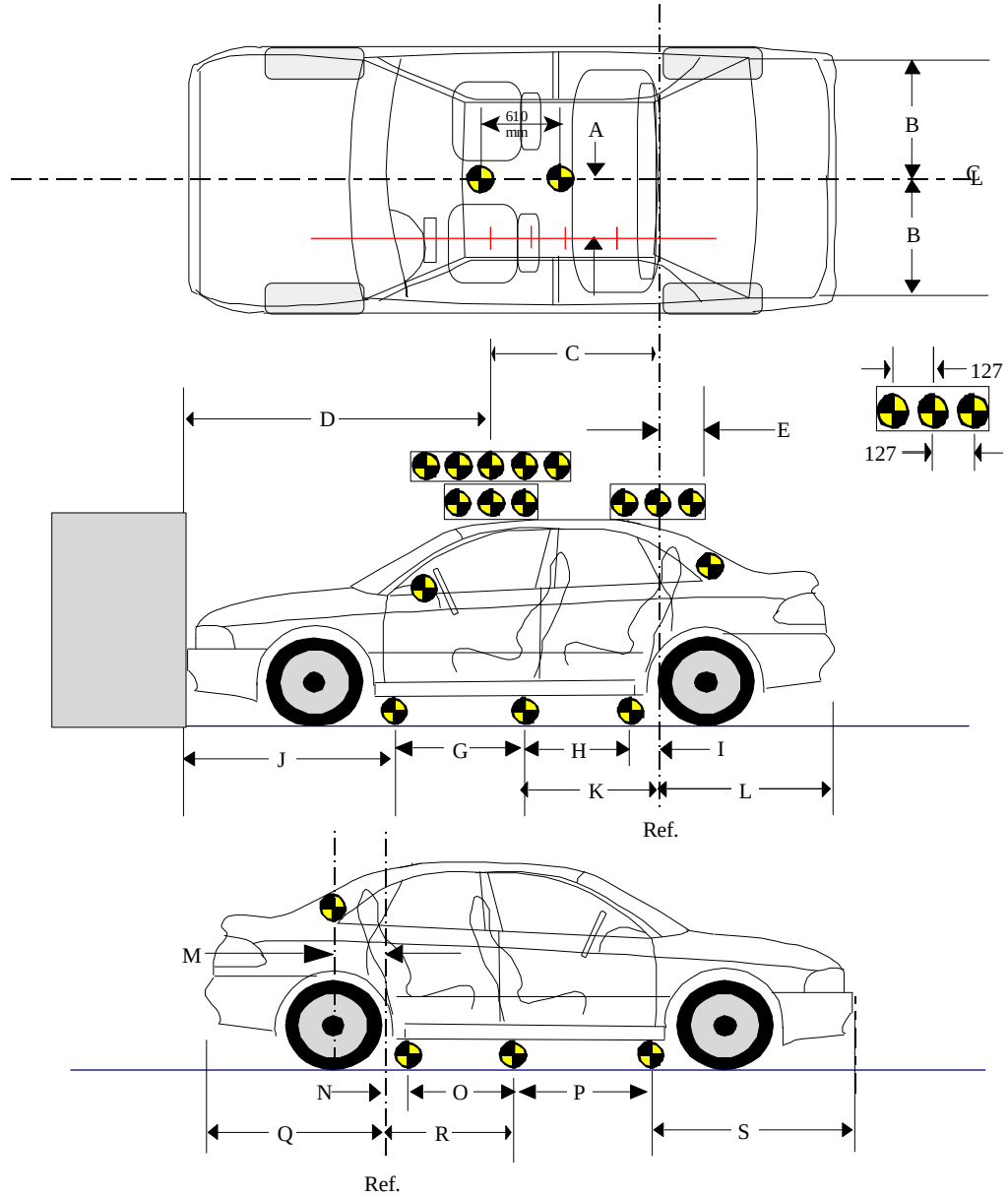
N.T. indicates No Timing

Z = film plane to ground

# DATA SHEET NO. 16      VEHICLE REFERENCE PHOTO TARGET LOCATIONS

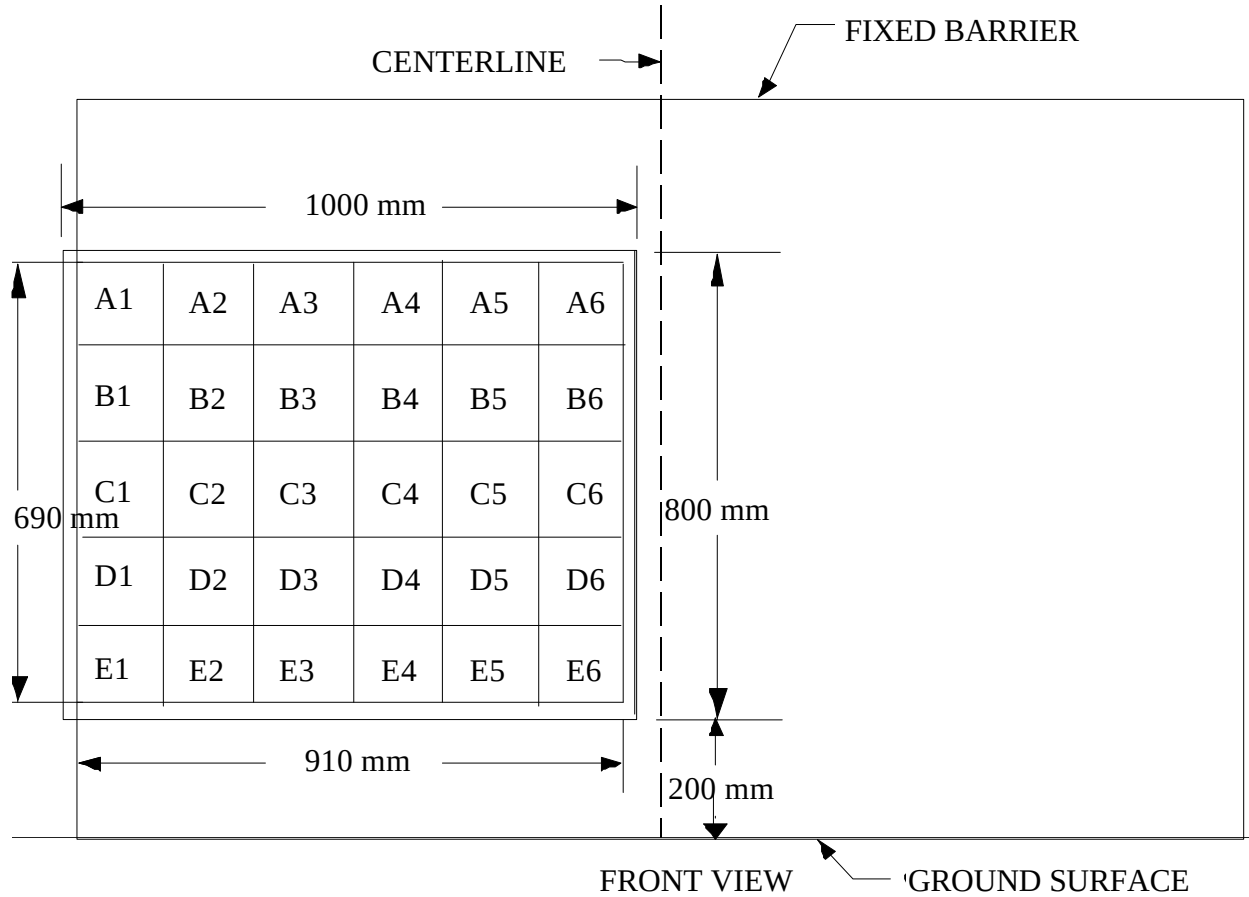
(Dimensions in millimeters)

|   |      |
|---|------|
| A | 332  |
| B | 606  |
| C | 1221 |
| D | 2103 |
| E | 325  |
| F | 1541 |
| G | 920  |
| H | 882  |
| I | 119  |
| J | 1389 |
| K | 1001 |
| L | 1370 |
| M | 325  |
| N | 107  |
| O | 902  |
| P | 901  |
| Q | 1371 |
| R | 1009 |
| S | 1350 |



DATA SHEET NO. 17      LOAD CELL LOCATIONS RELATIVE TO FIXED BARRIER AND  
DEFORMABLE BARRIER FACE

30      Load Cells  
 5      Rows  
 6      Columns



|                                   |        |
|-----------------------------------|--------|
| Load cell width                   | 146 mm |
| Load cell height                  | 133 mm |
| Vertical gap between load cells   | 6 mm   |
| Horizontal gap between load cells | 6 mm   |
| Vertical filler block width       | 55 mm  |

The following data is presented in Appendix B:

- (1)X Direction Data from load cells A1 through A6
- (2)X and Y Direction Data from load cells B1 through E6

DATA SHEET NO. 18 POST TEST AIR BAG DATA

NHTSA No.: RY5504; Test Date: November 8, 2001; Technician: Patrick G. MacDiarmid

Vehicle Model Year/Make/Model: 2000 Subaru Legacy 4-Door Sedan

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

B. Size of vent holes: (mm<sup>2</sup>) 1963.5 -Driver 7854 -Passenger

C. Total vent area: (mm<sup>2</sup>) 3927 -Driver 15708 -Passenger

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

Driver: 650 -Height; 650 -Width; 250 -Depth

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

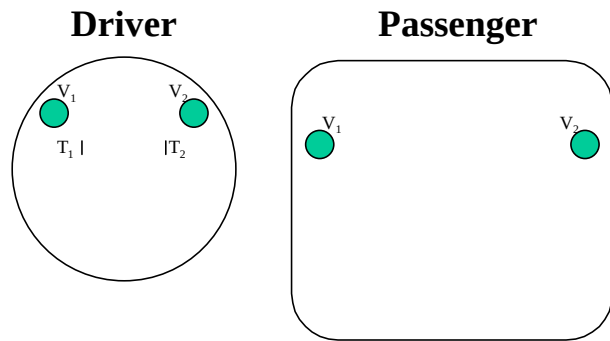
E. Is the air bag tethered?

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

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

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

(Note: Not to scale; V<sub>n</sub> = Vent hole<sub>n</sub>, T<sub>n</sub> = Tether<sub>n</sub>).



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

Driver: Air bag: 65420-33150 LU09 044109

Generator: 1LU09044109 102078699Y66

Passenger: Air bag: 000660 05 10 99 S A044662

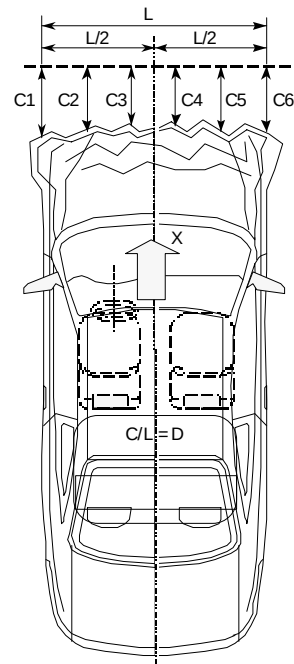
Generator: 66L-S08 7LU09041859 BAM PTI-0637

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

Vehicle Make/Model/Body Style: Subaru Legacy 4-Door Sedan  
 NHTSA Test No.: RY5504 VIN: 4S3BE6358Y7208750  
 Model Year: 2000 Build Date: 10/99 Test Date: November 8, 2001  
 Vehicle Size Category: Mid-Size Test Weight: 1725.0 kg  
 Vehicle Wheelbase: 2650 mm; Front Overhang: 969 mm; Overall Width: 1735 mm  
 Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions

|      | PRE  | POST | DIFF |    |
|------|------|------|------|----|
| C1 = | 4535 | 4110 | 425  | mm |
| C2 = | 4640 | 4221 | 419  | mm |
| C3 = | 4675 | 4243 | 432  | mm |
| C4 = | 4676 | 4450 | 226  | mm |
| C5 = | 4641 | 4640 | 1    | mm |
| C6 = | 4536 | 4773 | -237 | mm |



Midpoint of Damage:  $D = \text{Vehicle Centerline (Longitudinal)}$   
 Length of Damaged Region: L1= 1344 mm  
 L2= 672 mm  
 L5= 268.8 mm

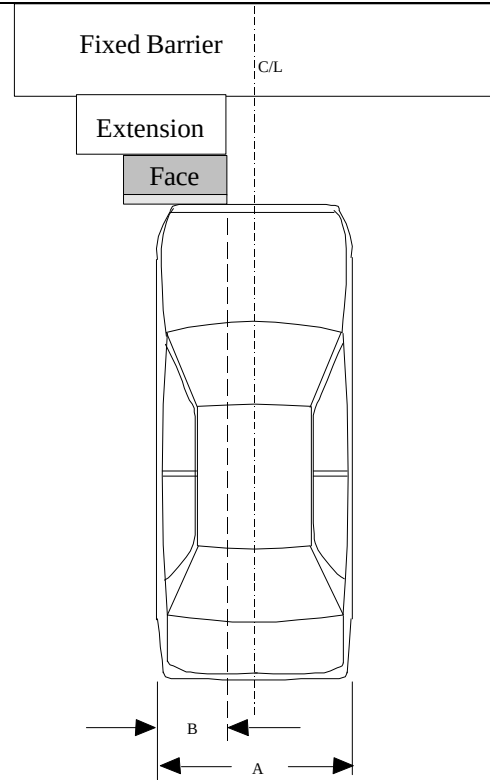
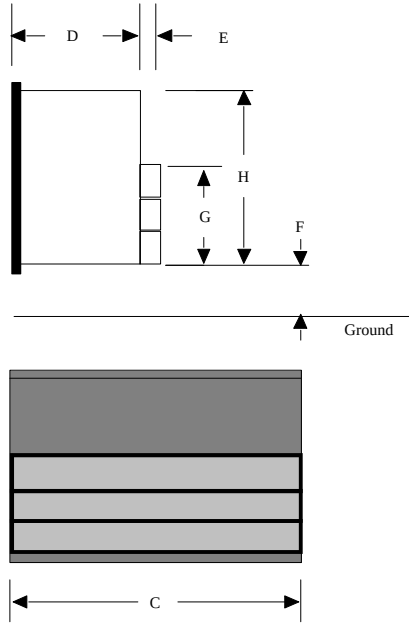
# DATA SHEET NO. 20 OFFSET BARRIER AND VEHICLE ORIENTATION

NHTSA Test No.: RY5504

Vehicle: 2000 Subaru Legacy 4-Door Sedan

Barrier Manufacturer and Serial Number:

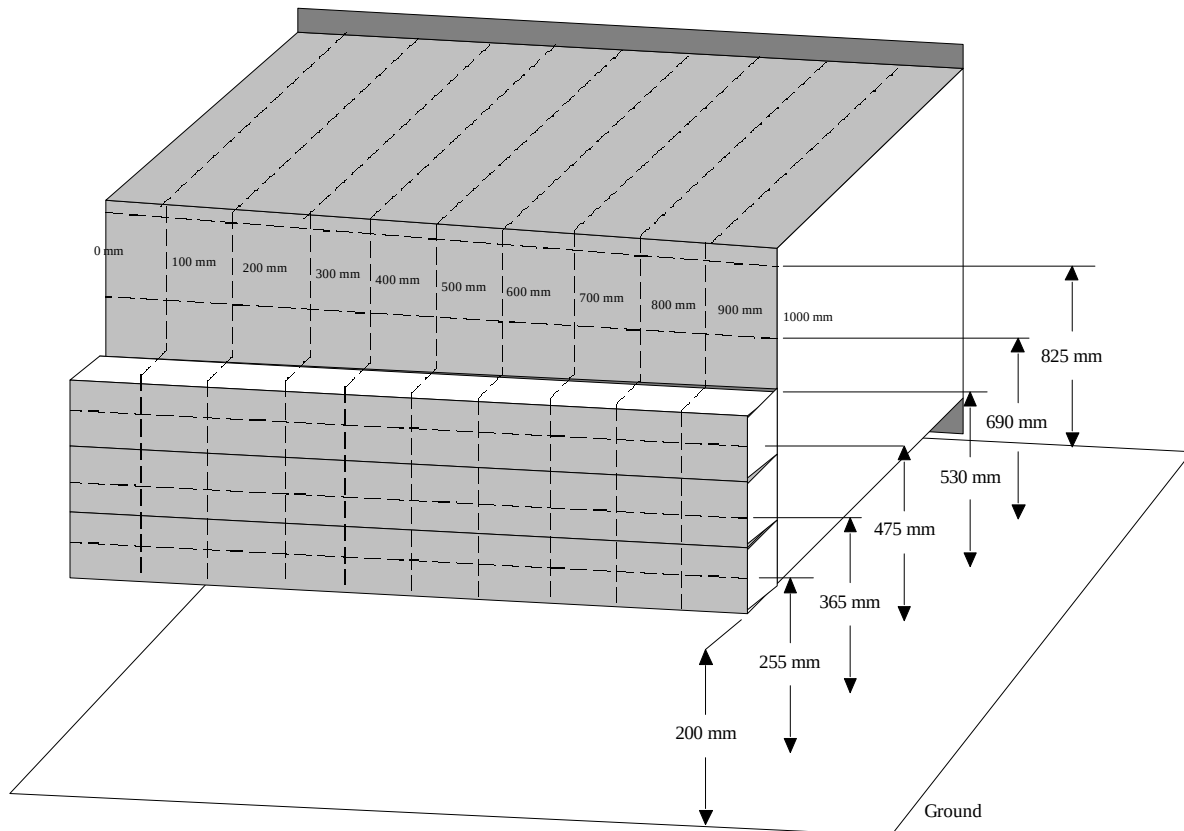
Cellbond



|    |                                     |       |    |
|----|-------------------------------------|-------|----|
| A  | Total Vehicle Width                 | 1735  | mm |
| B  | 40% Overlap Distance                | 694.0 | mm |
| C  | Deformable Face Width               | 1000  | mm |
| D  | Single Stage Honeycomb Depth        | 450   | mm |
| E  | Bumper Element Depth                | 90    | mm |
| F  | Lower Edge Height From Ground       | 200   | mm |
| G* | Bumper Element Height               | 330   | mm |
| H  | Deformable Barrier Honeycomb Height | 650   | mm |

\* The bumper element consists of three 110 mm height blocks of 1.723 MPa honeycomb

## Offset Barrier Measurement Locations



DATA SHEET NO. 21 OFFSET BARRIER DEFORMATION (continued)

**EXTERIOR STATIC CRUSH FOR BARRIER FACE**  
**(Grid as looking at barrier from front)**

Vehicle: \_ 2000 Subaru Legacy 4-Door Sedan

NHTSA No. RY5504

NOTE: All dimensions are in millimeters with a tolerance of  $\pm 3$  mm

| LEVEL                    | HEIGHT<br>AT CL<br>(mm)* |       | DISTANCE RIGHT OF CENTER (mm) |     |     |     |     | 0   | DISTANCE LEFT OF CENTER (mm) |     |     |     |     |
|--------------------------|--------------------------|-------|-------------------------------|-----|-----|-----|-----|-----|------------------------------|-----|-----|-----|-----|
|                          |                          |       | 500                           | 400 | 300 | 200 | 100 |     | 100                          | 200 | 300 | 400 | 500 |
| LEVEL 6<br>TOP<br>STACK  | 825                      | PRE   | 546                           | 546 | 546 | 546 | 546 | 546 | 546                          | 546 | 546 | 546 | 546 |
|                          |                          | POST  | 505                           | 533 | 559 | 617 | 692 | 769 | 827                          | 874 | 905 | 927 | 964 |
|                          |                          | CRUSH | -41                           | -13 | 13  | 71  | 146 | 223 | 281                          | 328 | 359 | 381 | 418 |
| LEVEL 5<br>MID<br>STACK  | 687                      | PRE   | 546                           | 546 | 546 | 546 | 546 | 546 | 546                          | 546 | 546 | 546 | 546 |
|                          |                          | POST  | 494                           | 544 | 583 | 661 | 741 | 818 | 867                          | 917 | 959 | 956 | 982 |
|                          |                          | CRUSH | -52                           | -2  | 37  | 115 | 195 | 272 | 321                          | 371 | 413 | 410 | 436 |
| LEVEL 4<br>TOP<br>BUMPER | 530                      | PRE   | 546                           | 546 | 546 | 546 | 546 | 546 | 546                          | 546 | 546 | 546 | 546 |
|                          |                          | POST  | 534                           | 572 | 666 | 747 | 809 | 875 | 905                          | 951 | 968 | 969 | 989 |
|                          |                          | CRUSH | -12                           | 26  | 120 | 201 | 263 | 329 | 359                          | 405 | 422 | 423 | 443 |
| LEVEL 3<br>BUMPER<br>TOP | 475                      | PRE   | 456                           | 456 | 456 | 456 | 456 | 456 | 456                          | 456 | 456 | 456 | 456 |
|                          |                          | POST  | 436                           | 516 | 601 | 671 | 725 | 786 | 864                          | 931 | 955 | 956 | 990 |
|                          |                          | CRUSH | -20                           | 60  | 145 | 215 | 269 | 330 | 408                          | 475 | 499 | 500 | 534 |
| LEVEL 2<br>BUMPER<br>MID | 365                      | PRE   | 456                           | 456 | 456 | 456 | 456 | 456 | 456                          | 456 | 456 | 456 | 456 |
|                          |                          | POST  | 471                           | 528 | 617 | 670 | 715 | 736 | 813                          | 865 | 881 | 881 | 927 |
|                          |                          | CRUSH | 15                            | 72  | 161 | 214 | 259 | 280 | 357                          | 409 | 425 | 425 | 471 |
| LEVEL 1<br>BUMPER<br>LOW | 255                      | PRE   | 456                           | 456 | 456 | 456 | 456 | 456 | 456                          | 456 | 456 | 456 | 456 |
|                          |                          | POST  | 482                           | 506 | 571 | 627 | 668 | 701 | 754                          | 808 | 825 | 855 | 904 |
|                          |                          | CRUSH | 26                            | 50  | 115 | 171 | 212 | 245 | 298                          | 352 | 369 | 399 | 448 |

\*Heights measured above ground level.



**APPENDIX A**  
**PHOTOGRAPHS**

# TABLE OF PHOTOGRAPHS

| <u>Figure</u> | <u>Title</u>                             | <u>Page</u> |
|---------------|------------------------------------------|-------------|
| A-1           | PRE-TEST FRONT VIEW                      | A-3         |
| A-2           | POST-TEST FRONT VIEW                     | A-4         |
| A-3           | PRE-TEST LEFT SIDE VIEW                  | A-5         |
| A-4           | POST-TEST LEFT SIDE VIEW                 | A-6         |
| A-5           | PRE-TEST RIGHT SIDE VIEW                 | A-7         |
| A-6           | POST-TEST RIGHT SIDE VIEW                | A-8         |
| A-7           | PRE-TEST RIGHT FRONT THREE-QUARTER VIEW  | A-9         |
| A-8           | POST-TEST RIGHT FRONT THREE-QUARTER VIEW | A-10        |
| A-9           | PRE-TEST LEFT REAR THREE-QUARTER VIEW    | A-11        |
| A-10          | POST-TEST LEFT REAR THREE-QUARTER VIEW   | A-12        |
| A-11          | PRE-TEST WINDSHIELD VIEW                 | A-13        |
| A-12          | POST-TEST WINDSHIELD VIEW                | A-14        |
| A-13          | PRE-TEST ENGINE COMPARTMENT VIEW         | A-15        |
| A-14          | FUEL CAP VIEW                            | A-16        |
| A-15          | PRE-TEST FRONT UNDERBODY VIEW            | A-17        |
| A-16          | POST-TEST FRONT UNDERBODY VIEW           | A-18        |
| A-17          | PRE-TEST FRONT SIDE UNDERBODY VIEW       | A-19        |
| A-18          | POST-TEST FRONT SIDE UNDERBODY VIEW      | A-20        |
| A-19          | PRE-TEST REAR UNDERBODY VIEW             | A-21        |
| A-20          | POST-TEST REAR UNDERBODY VIEW            | A-22        |
| A-21          | PRE-TEST DRIVER POSITION VIEW            | A-23        |
| A-22          | POST-TEST DRIVER POSITION VIEW           | A-24        |
| A-23          | PRE-TEST PASSENGER POSITION VIEW         | A-25        |
| A-24          | POST-TEST PASSENGER POSITION VIEW        | A-26        |
| A-25          | PRE-TEST DRIVER AND INTERIOR VIEW        | A-27        |
| A-26          | POST-TEST DRIVER AND INTERIOR VIEW       | A-28        |
| A-27          | PRE-TEST PASSENGER AND INTERIOR VIEW     | A-29        |
| A-28          | POST-TEST PASSENGER AND INTERIOR VIEW    | A-30        |
| A-29          | PRE-TEST DRIVER HEAD LOCATION            | A-31        |
| A-30          | POST-TEST DRIVER HEAD LOCATION           | A-32        |
| A-31          | PRE-TEST PASSENGER HEAD LOCATION         | A-33        |
| A-32          | POST-TEST PASSENGER HEAD LOCATION        | A-34        |
| A-33          | PRE-TEST DRIVER FLOOR PAN VIEW           | A-35        |
| A-34          | POST-TEST DRIVER FLOOR PAN VIEW          | A-36        |
| A-35          | PRE-TEST PASSENGER FLOOR PAN VIEW        | A-37        |
| A-36          | POST-TEST PASSENGER FLOOR PAN VIEW       | A-38        |
| A-37          | PRE-TEST BARRIER FRONT VIEW              | A-39        |
| A-38          | POST-TEST BARRIER FRONT VIEW             | A-40        |
| A-39          | PRE-TEST BARRIER LEFT SIDE VIEW          | A-41        |
| A-40          | POST-TEST BARRIER LEFT SIDE VIEW         | A-42        |
| A-41          | PRE-TEST BARRIER RIGHT SIDE VIEW         | A-43        |
| A-42          | POST-TEST BARRIER RIGHT SIDE VIEW        | A-44        |
| A-43          | PRE-TEST BARRIER TOP VIEW                | A-45        |
| A-44          | POST-TEST BARRIER TOP VIEW               | A-46        |
| A-45          | POST-TEST OVERHEAD VIEW                  | A-47        |
| A-46          | ROLLOVER VIEW                            | A-48        |
| A-47          | IMPACT VIEW                              | A-49        |

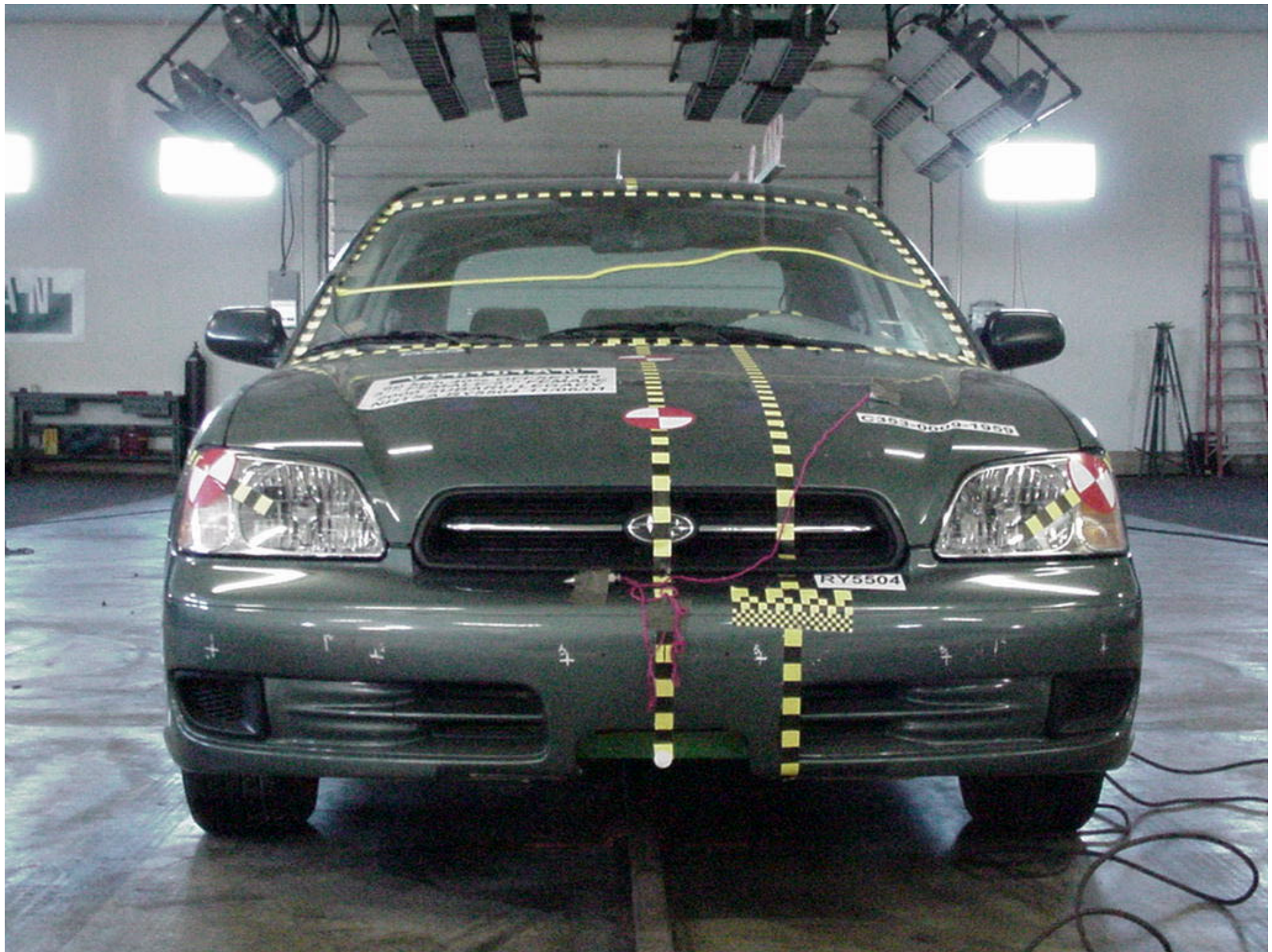


Figure A-1 PRE-TEST FRONT VIEW





Figure A-2 POST-TEST FRONT VIEW





Figure A-3 PRE-TEST LEFT SIDE VIEW





Figure A-4 POST-TEST LEFT SIDE VIEW





Figure A-5 PRE-TEST RIGHT SIDE VIEW





Figure A-6 POST-TEST RIGHT SIDE VIEW





Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW





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





Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW





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



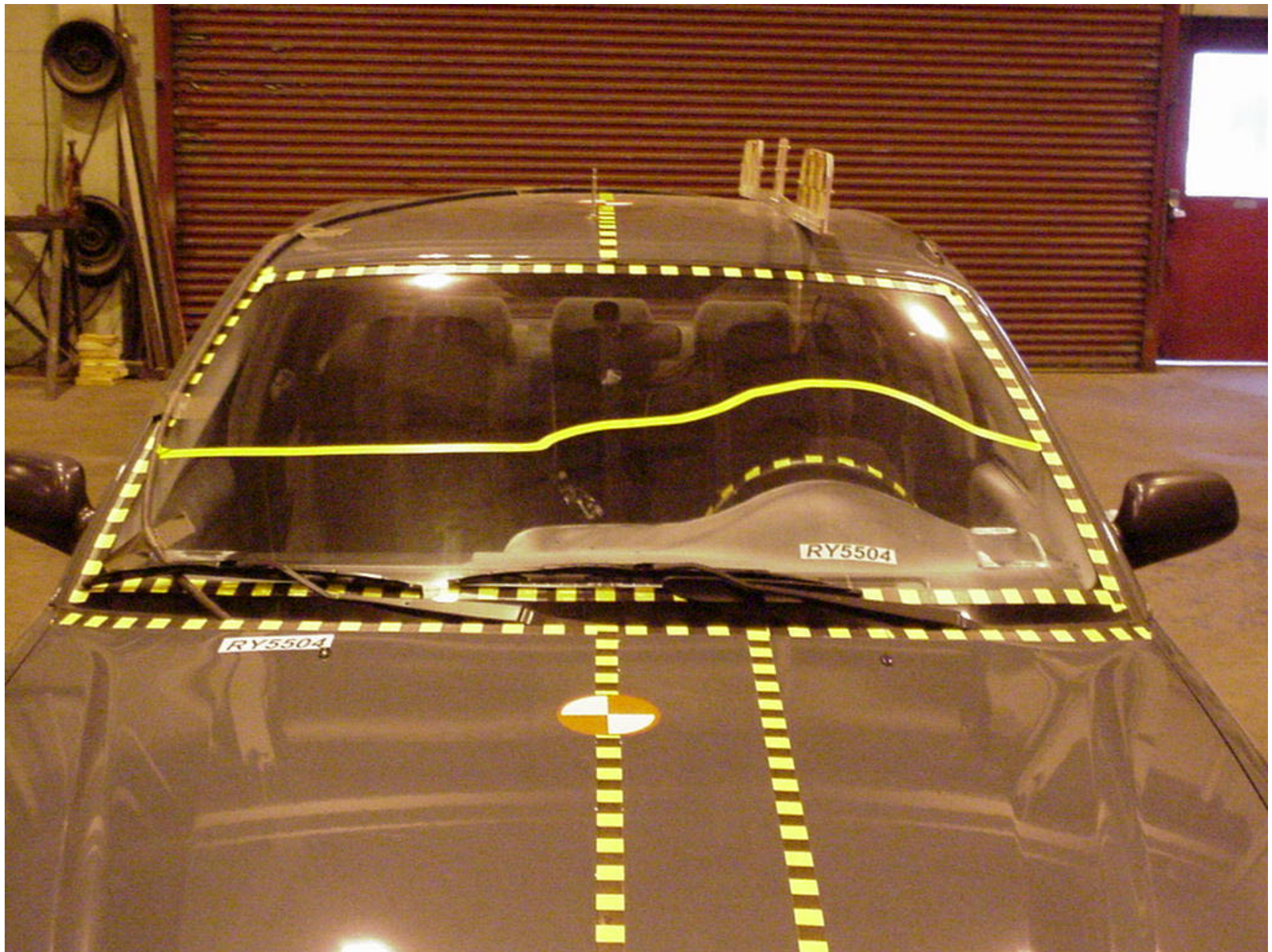


Figure A-11 PRE-TEST WINDSHIELD VIEW





Figure A-12 POST-TEST WINDSHIELD VIEW





Figure A-13 PRE-TEST ENGINE COMPARTMENT VIEW



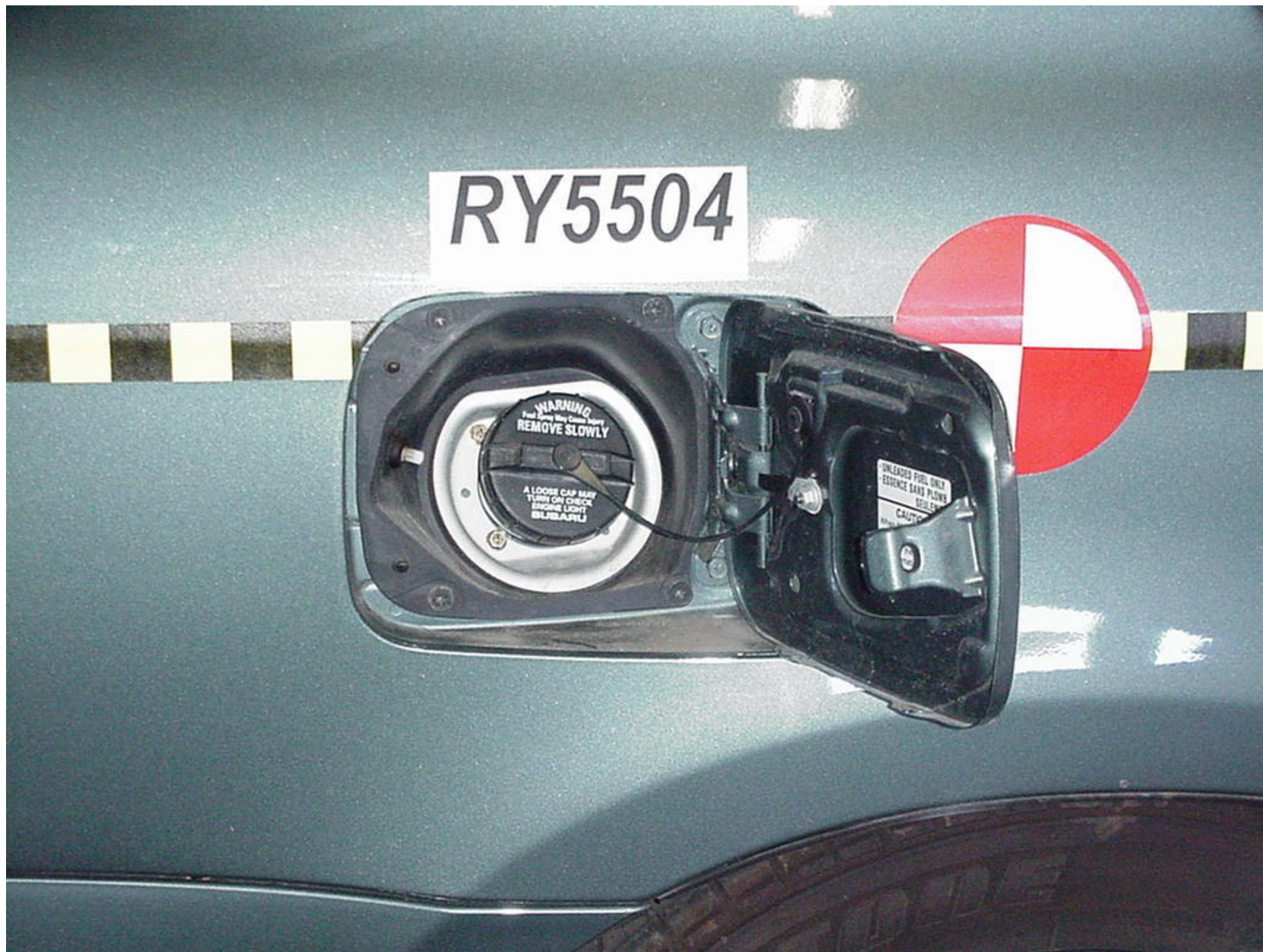


Figure A-14 FUEL CAP VIEW



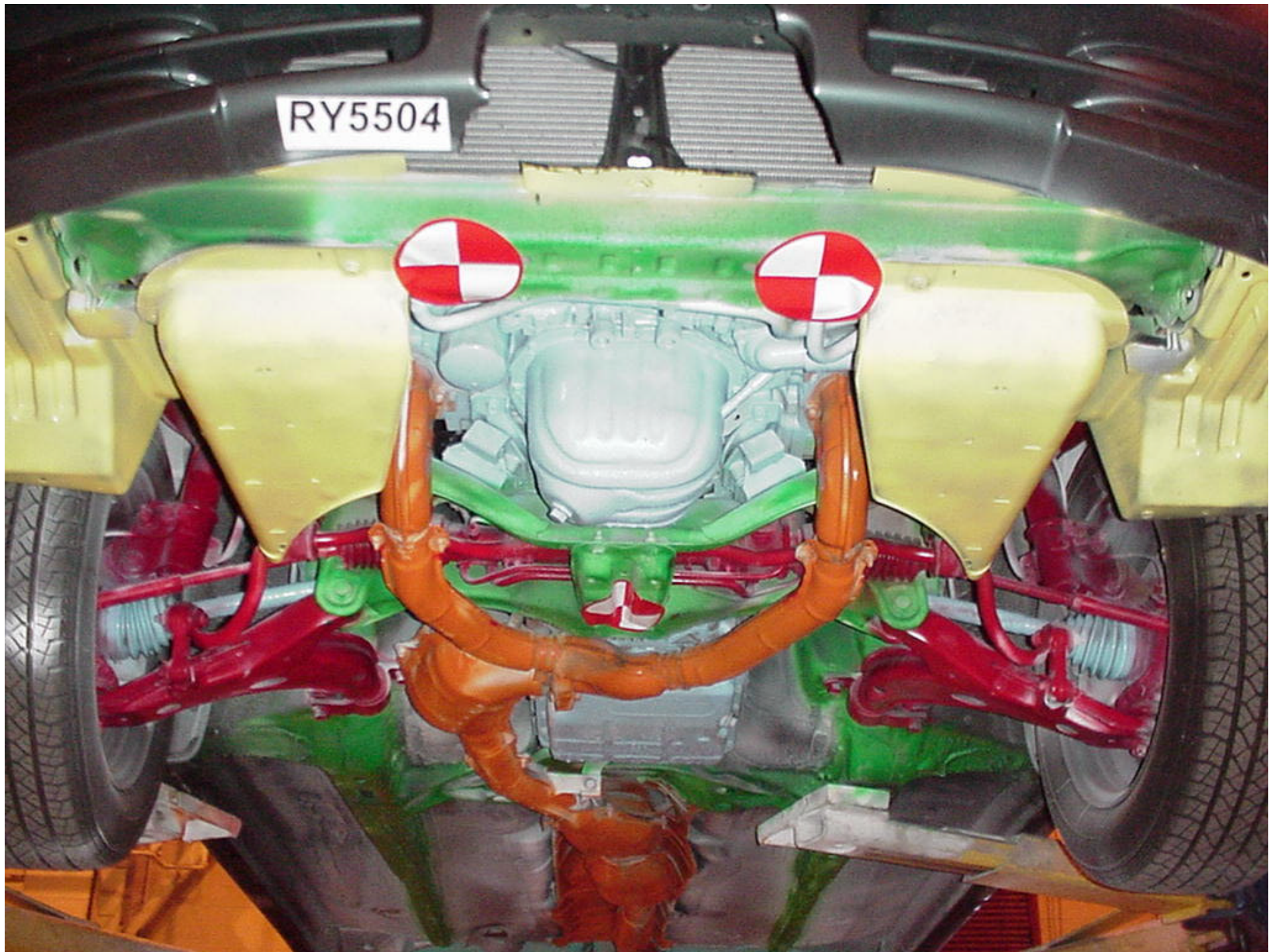


Figure A-15 PRE-TEST FRONT UNDERBODY VIEW





Figure A-16 POST-TEST FRONT UNDERBODY VIEW





Figure A-17 PRE-TEST FRONT SIDE UNDERBODY VIEW





Figure A-18 POST-TEST FRONT SIDE UNDERBODY VIEW



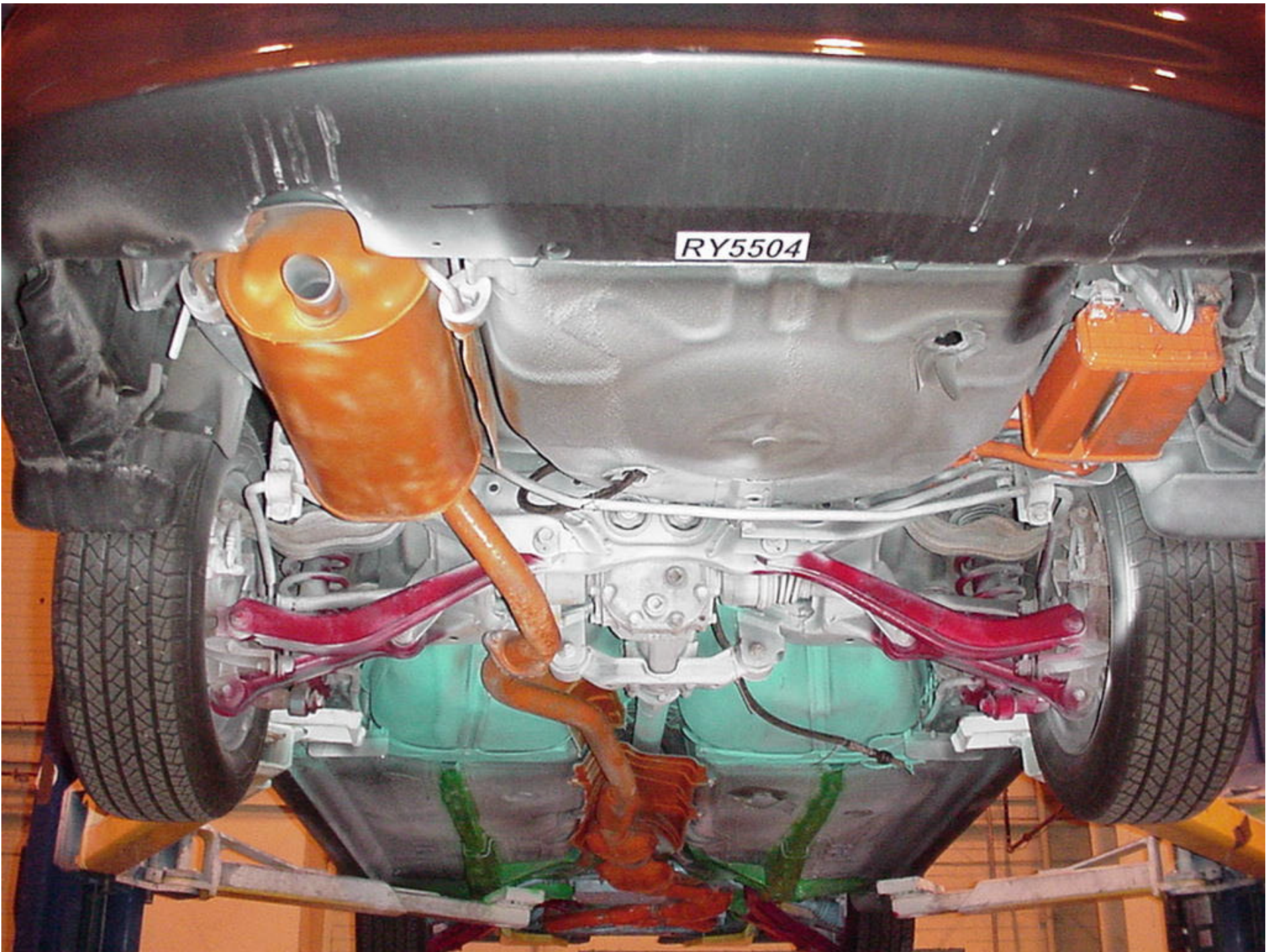


Figure A-19 PRE-TEST REAR UNDERBODY VIEW





Figure A-20 POST-TEST REAR UNDERBODY VIEW





Figure A-21 PRE-TEST DRIVER POSITION VIEW





Figure A-22 POST-TEST DRIVER POSITION VIEW





Figure A-23 PRE-TEST PASSENGER POSITION VIEW





Figure A-24 POST-TEST PASSENGER POSITION VIEW





Figure A-25 PRE-TEST DRIVER AND INTERIOR VIEW





Figure A-26 POST-TEST DRIVER AND INTERIOR VIEW





Figure A-27 PRE-TEST PASSENGER AND INTERIOR VIEW





Figure A-28 POST-TEST PASSENGER AND INTERIOR VIEW





Figure A-29 PRE-TEST DRIVER HEAD LOCATION





Figure A-30 POST-TEST DRIVER HEAD LOCATION





Figure A-31 PRE-TEST PASSENGER HEAD LOCATION





Figure A-32 POST-TEST PASSENGER HEAD LOCATION





Figure A-33 PRE-TEST DRIVER FLOOR PAN VIEW



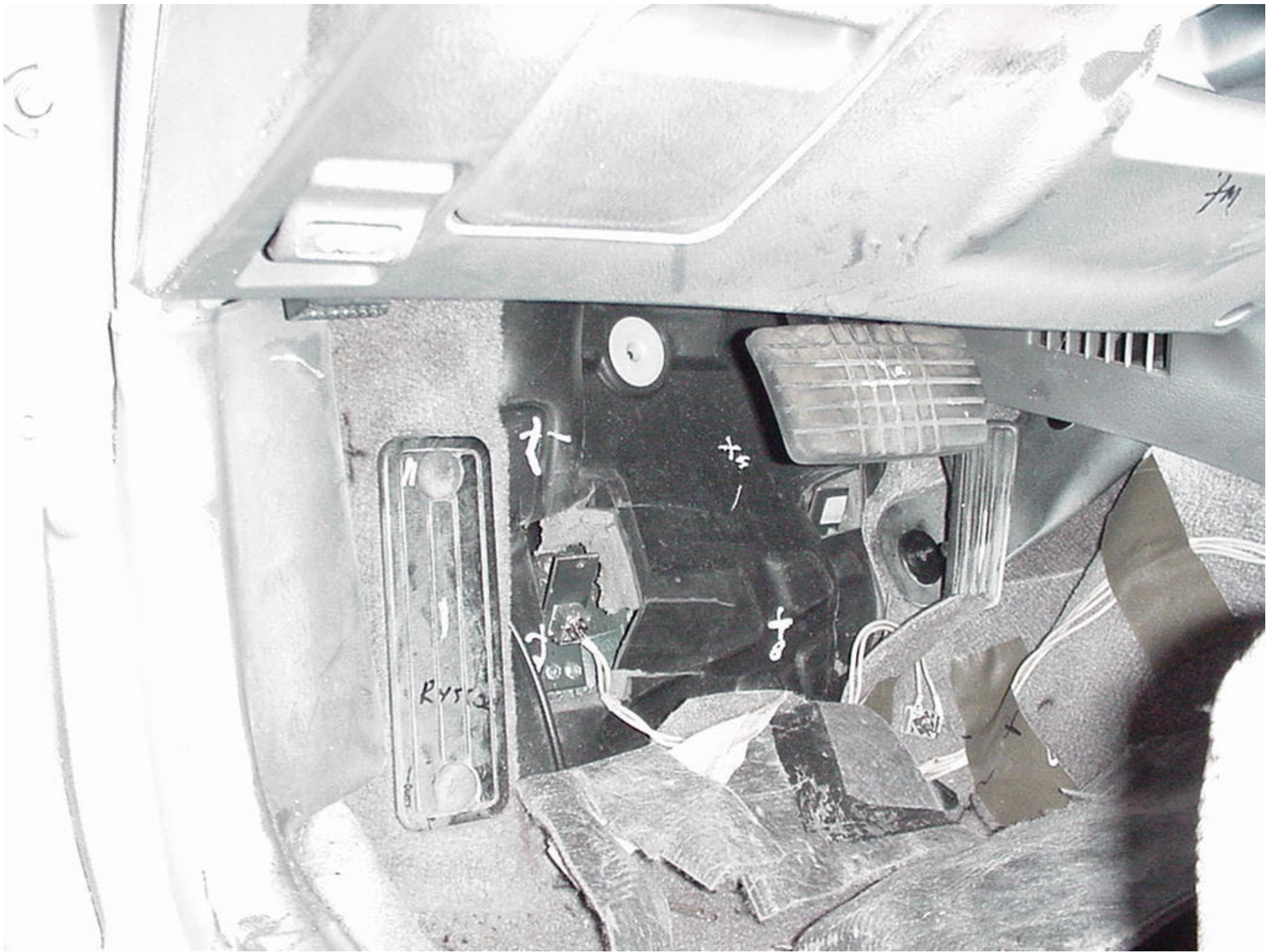


Figure A-34 POST-TEST DRIVER FLOOR PAN VIEW





Figure A-35 PRE-TEST PASSENGER FLOOR PAN VIEW





Figure A-36 POST-TEST PASSENGER FLOOR PAN VIEW





Figure A-37 PRE-TEST BARRIER FRONT VIEW





Figure A-38 POST-TEST BARRIER FRONT VIEW





Figure A-39 PRE-TEST BARRIER LEFT SIDE VIEW



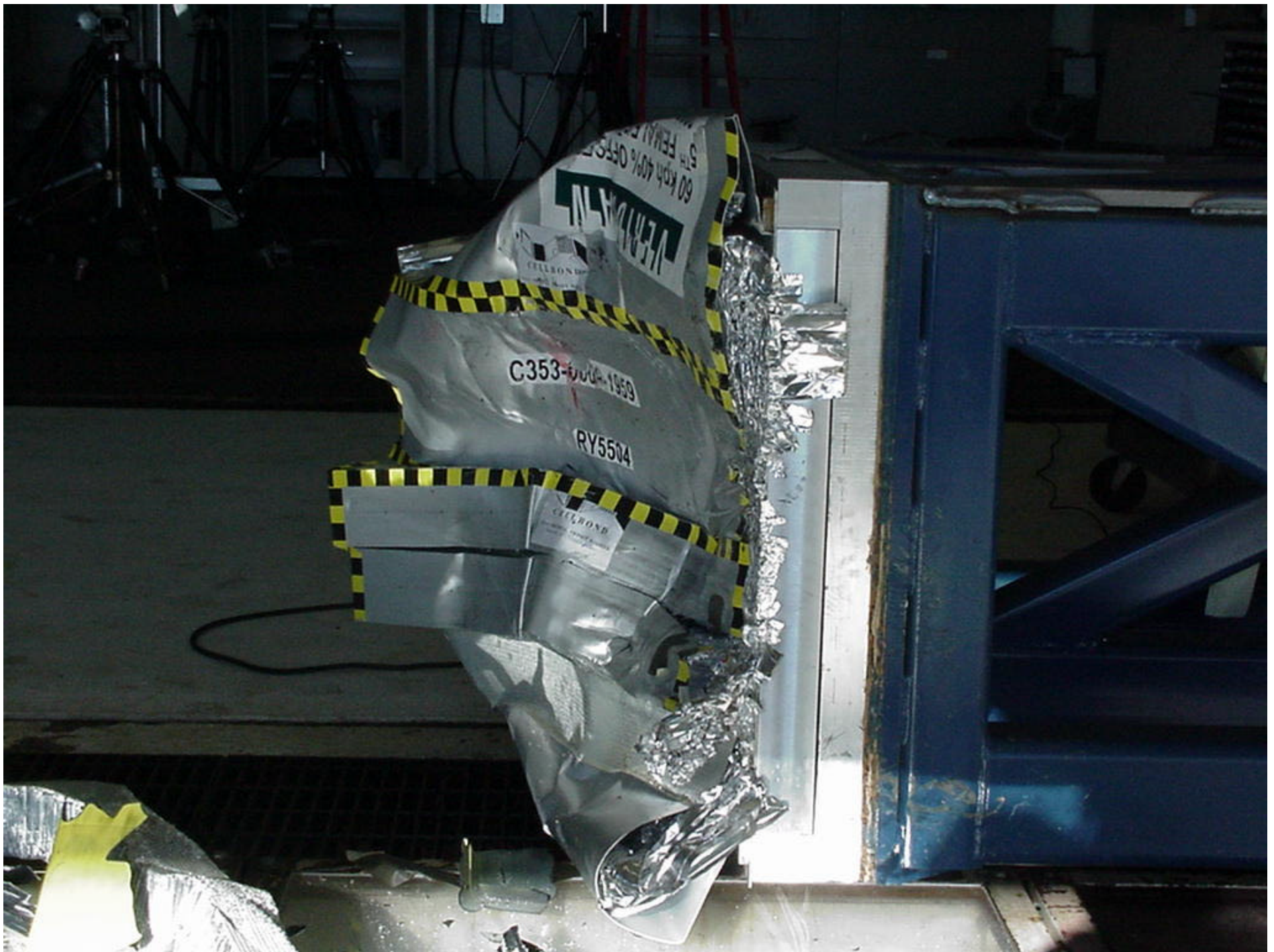


Figure A-40 POST-TEST BARRIER LEFTSIDE VIEW





Figure A-41 PRE-TEST BARRIER RIGHT SIDE VIEW





Figure A-42 POST-TEST BARRIER RIGHT SIDE VIEW





Figure A-43 PRE-TEST BARRIER TOP VIEW





Figure A-44 POST-TEST BARRIER TOP VIEW



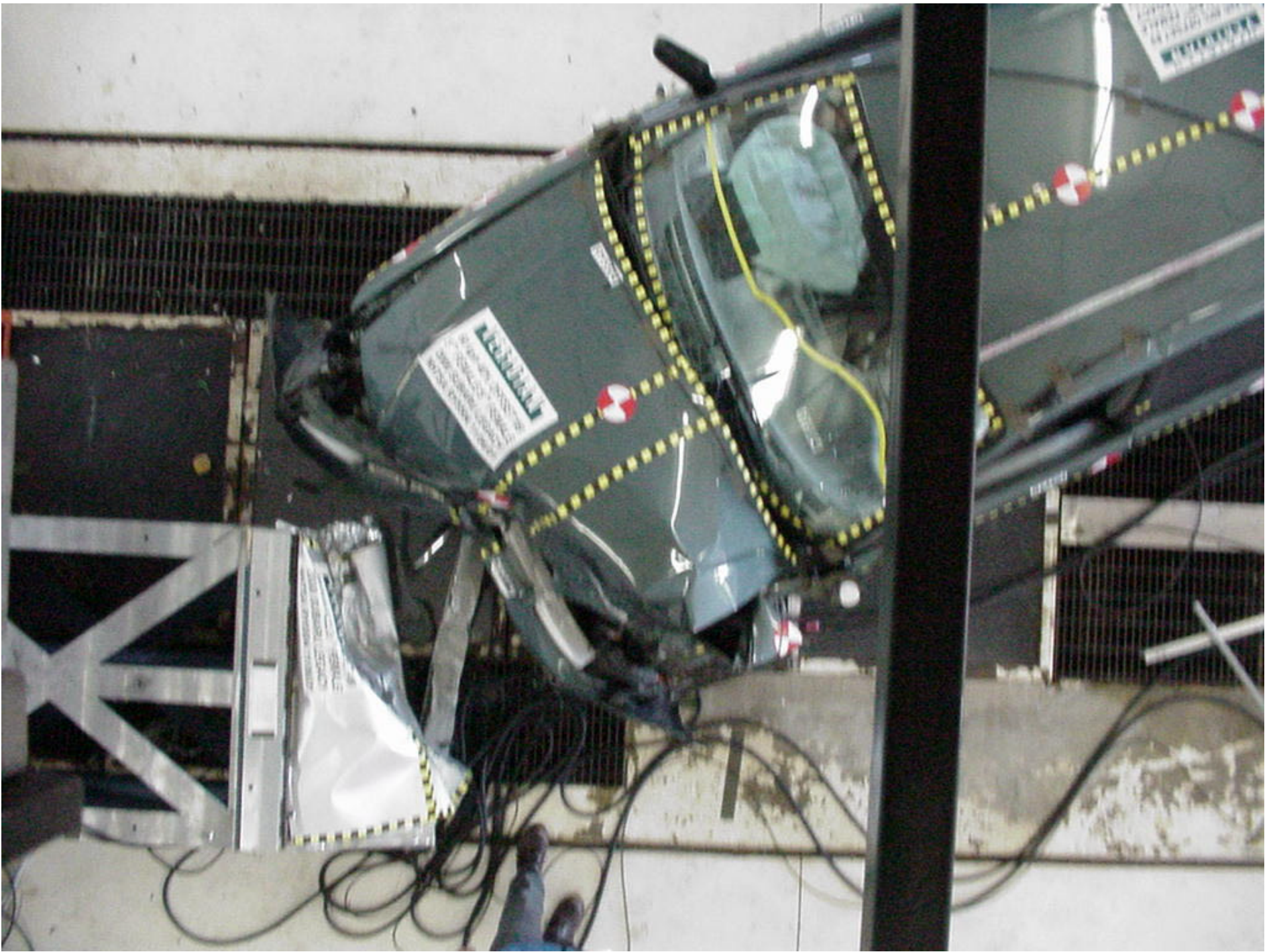


Figure A-45 POST-TEST OVERHEADVIEW





Figure A-46 ROLLOVER VIEW





Figure A-47 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, Chest Forward<br>Fy Head leftward, Chest rightward<br>Fz Head Upward, Chest Downward<br>Mx Left ear toward left shoulder<br>My Chin toward sternum (flexion)<br>Mz Chin toward 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<br>(right and left leg)       | Fx Knee Upward, Upper Femur Downward<br>Fy Knee Rightward, Upper Femur Leftward<br>Fz Knee Forward, Pelvis Rearward<br>Mx Knee Leftward, Hold Upper Femur in Place<br>My Knee Upward, Hold Upper Femur in Place<br>Mz Tibia Leftward, Hold Pelvis in Place |
| Upper Tibia Load Cell<br>(right and left leg) | Fx Ankle Forward, Knee Rearward<br>Fy Ankle Rightward, Knee Leftward<br>Fz Tibia Downward, Femur Upward<br>Mx Ankle Leftward, Hold Knee in Place<br>My Ankle Forward, Bottom of Knee Clevis Rearward                                                       |
| Lower Tibia Load Cell<br>(right and left leg) | Fx Ankle Forward, Knee Rearward<br>Fy Ankle Rightward, Knee Leftward<br>Fz Tibia Downward, Femur Upward<br>Mx Ankle Leftward, Hold Knee in Place<br>My Ankle Forward, Bottom of Knee Clevis Rearward                                                       |
| Knee Shear Displacement                       | X Hold Femur Move Tibia Forward                                                                                                                                                                                                                            |
| Tibia Mid-Shaft Accelerometer                 | X Forward<br>Y To the Right                                                                                                                                                                                                                                |
| Foot Rotations<br>(left foot)                 | X Eversion<br>Y Dorsi Flexion<br>Z Internal Rotation                                                                                                                                                                                                       |
| Foot Rotations<br>(right foot)                | X Inversion<br>Y Dorsi Flexion<br>Z External Rotation                                                                                                                                                                                                      |
| Foot Accelerometer<br>(right and left foot)   | X Forward<br>Y To the Right<br>Z Down                                                                                                                                                                                                                      |



## DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO. RY5504

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

| PLOT | PLOT NAME[UNITS, CHANNEL FILTER CLASS]  | PAGE |
|------|-----------------------------------------|------|
| 1    | P1 Head 9 Array X Arm Ay [g, CFC_1000]  | B-10 |
| 2    | P1 Head 9 Array X Arm Az [g, CFC_1000]  | B-11 |
| 3    | P1 Head 9 Array Y Arm Ax [g, CFC_1000]  | B-12 |
| 4    | P1 Head 9 Array Y Arm Az [g, CFC_1000]  | B-13 |
| 5    | P1 Head 9 Array Z Arm Ax [g, CFC_1000]  | B-14 |
| 6    | P1 Head 9 Array Z Arm Ay [g, CFC_1000]  | B-15 |
| 7    | P1 Head Ax [g, CFC_1000]                | B-16 |
| 8    | P1 Head Ay [g, CFC_1000]                | B-17 |
| 9    | P1 Head Az [g, CFC_1000]                | B-18 |
| 10   | P1 Head A Resultant [g, CFC_1000]       | B-19 |
| 11   | P1 Head Red Ax [g, CFC_1000]            | B-20 |
| 12   | P1 Head Red Ay [g, CFC_1000]            | B-21 |
| 13   | P1 Head Red Az [g, CFC_1000]            | B-22 |
| 14   | P1 Head Red A Resultant [g, CFC_1000]   | B-23 |
| 15   | P1 Upper Neck Fx [N, CFC_1000]          | B-24 |
| 16   | P1 Upper Neck Fy [N, CFC_1000]          | B-25 |
| 17   | P1 Upper Neck Fz [N, CFC_1000]          | B-26 |
| 18   | P1 Upper Neck F Resultant [N, CFC_1000] | B-27 |
| 19   | P1 Upper Neck Mx [Nm, CFC_600]          | B-28 |
| 20   | P1 Upper Neck My [Nm, CFC_600]          | B-29 |
| 21   | P1 Upper Neck Mz [Nm, CFC_600]          | B-30 |
| 22   | P1 Upper Neck M Resultant [Nm, CFC_600] | B-31 |
| 23   | P1 Chest Ax [g, CFC_180]                | B-32 |
| 24   | P1 Chest Ay [g, CFC_180]                | B-33 |
| 25   | P1 Chest Az [g, CFC_180]                | B-34 |
| 26   | P1 Chest A Resultant [g, CFC_180]       | B-35 |
| 27   | P1 Chest Red Ax [g, CFC_180]            | B-36 |
| 28   | P1 Chest Red Ay [g, CFC_180]            | B-37 |
| 29   | P1 Chest Red Az [g, CFC_180]            | B-38 |
| 30   | P1 Chest Red A Resultant [g, CFC_180]   | B-39 |
| 31   | P1 Chest Displacement [mm, CFC_600]     | B-40 |
| 32   | P1 Pelvic Ax [g, CFC_1000]              | B-41 |
| 33   | P1 Pelvic Ay [g, CFC_1000]              | B-42 |
| 34   | P1 Pelvic Az [g, CFC_1000]              | B-43 |
| 35   | P1 Pelvic A Resultant [g, CFC_1000]     | B-44 |
| 36   | P1 Left Femur Fx [N, CFC_600]           | B-45 |
| 37   | P1 Left Femur Fy [N, CFC_600]           | B-46 |
| 38   | P1 Left Femur Fz [N, CFC_600]           | B-47 |
| 39   | P1 Left Femur F Resultant [N, CFC_600]  | B-48 |
| 40   | P1 Left Femur Mx [Nm, CFC_600]          | B-49 |
| 41   | P1 Left Femur My [Nm, CFC_600]          | B-50 |
| 42   | P1 Left Femur Mz [Nm, CFC_600]          | B-51 |
| 43   | P1 Left Femur M Resultant [Nm, CFC_600] | B-52 |
| 44   | P1 Right Femur Fx [N, CFC_600]          | B-53 |
| 45   | P1 Right Femur Fy [N, CFC_600]          | B-54 |



| PLOT | PLOT NAME[UNITS, CHANNEL FILTER CLASS]   | PAGE |
|------|------------------------------------------|------|
| 46   | P1 Right Femur Fz [N, CFC_600]           | B-55 |
| 47   | P1 Right Femur F Resultant [N, CFC_600]  | B-56 |
| 48   | P1 Right Femur Mx [Nm, CFC_600]          | B-57 |
| 49   | P1 Right Femur My [Nm, CFC_600]          | B-58 |
| 50   | P1 Right Femur Mz [Nm, CFC_600]          | B-59 |
| 51   | P1 Right Femur M Resultant [Nm, CFC_600] | B-60 |
| 52   | P1 Left Knee Shear [mm, CFC_180]         | B-61 |
| 53   | P1 Right Knee Shear Dx [mm, CFC_180]     | B-62 |
| 54   | P1 Left Upper Tibia Fx [N, CFC_600]      | B-63 |
| 55   | P1 Left Upper Tibia Fz [N, CFC_600]      | B-64 |
| 56   | P1 Left Upper Tibia Mx [Nm, CFC_600]     | B-65 |
| 57   | P1 Left Upper Tibia My [Nm, CFC_600]     | B-66 |
| 58   | P1 Left Lower Tibia Fx [N, CFC_600]      | B-67 |
| 59   | P1 Left Lower Tibia Fz [N, CFC_600]      | B-68 |
| 60   | P1 Left Lower Tibia Mx [Nm, CFC_600]     | B-69 |
| 61   | P1 Left Lower Tibia My [Nm, CFC_600]     | B-70 |
| 62   | P1 Right Upper Tibia Fx [N, CFC_600]     | B-71 |
| 63   | P1 Right Upper Tibia Fz [N, CFC_600]     | B-72 |
| 64   | P1 Right Upper Tibia Mx [Nm, CFC_600]    | B-73 |
| 65   | P1 Right Upper Tibia My [Nm, CFC_600]    | B-74 |
| 66   | P1 Right Lower Tibia Fx [N, CFC_600]     | B-75 |
| 67   | P1 Right Lower Tibia Fz [Nm, CFC_600]    | B-76 |
| 68   | P1 Right Lower Tibia Mx [Nm, CFC_600]    | B-77 |
| 69   | P1 Right Lower Tibia My [Nm, CFC_600]    | B-78 |
| 70   | P1 Left Ankle Ax [g, CFC_600]            | B-79 |
| 71   | P1 Left Ankle Az [g, CFC_600]            | B-80 |
| 72   | P1 Right Ankle Ax [g, CFC_600]           | B-81 |
| 73   | P1 Right Ankle Az [g, CFC_600]           | B-82 |
| 74   | P1 Left Toe Az [g, CFC_600]              | B-83 |
| 75   | P1 Right Toe Az [g, CFC_600]             | B-84 |
| 76   | P1 Lap Belt Force [N, CFC_60]            | B-85 |
| 77   | P2 Head 9 Array X Arm Ay [g, CFC_1000]   | B-86 |
| 78   | P2 Head 9 Array X Arm Az [g, CFC_1000]   | B-87 |
| 79   | P2 Head 9 Array Y Arm Ax [g, CFC_1000]   | B-88 |
| 80   | P2 Head 9 Array Y Arm Az [g, CFC_1000]   | B-89 |
| 81   | P2 Head 9 Array Z Arm Ax [g, CFC_1000]   | B-90 |
| 82   | P2 Head 9 Array Z Arm Ay [g, CFC_1000]   | B-91 |
| 83   | P2 Head Ax [g, CFC_1000]                 | B-92 |
| 84   | P2 Head Ay [g, CFC_1000]                 | B-93 |
| 85   | P2 Head Az [g, CFC_1000]                 | B-94 |
| 86   | P2 Head A Resultant [g, CFC_1000]        | B-95 |
| 87   | P2 Head Red Ax [g, CFC_1000]             | B-96 |
| 88   | P2 Head Red Ay [g, CFC_1000]             | B-97 |
| 89   | P2 Head Red Az [g, CFC_1000]             | B-98 |
| 90   | P2 Head Red A Resultant [g, CFC_1000]    | B-99 |

| PLOT | PLOT NAME[UNITS, CHANNEL FILTER CLASS]   | PAGE  |
|------|------------------------------------------|-------|
| 91   | P2 Upper Neck Fx [N, CFC_1000]           | B-100 |
| 92   | P2 Upper Neck Fy [N, CFC_1000]           | B-101 |
| 93   | P2 Upper Neck Fz [N, CFC_1000]           | B-102 |
| 94   | P2 Upper Neck F Resultant [N, CFC_1000]  | B-103 |
| 95   | P2 Upper Neck Mx [Nm, CFC_600]           | B-104 |
| 96   | P2 Upper Neck My [Nm, CFC_600]           | B-105 |
| 97   | P2 Upper Neck Mz [Nm, CFC_600]           | B-106 |
| 98   | P2 Upper Neck M Resultant [Nm, CFC_600]  | B-107 |
| 99   | P2 Chest Ax [g, CFC_180]                 | B-108 |
| 100  | P2 Chest Ay [g, CFC_180]                 | B-109 |
| 101  | P2 Chest Az [g, CFC_180]                 | B-110 |
| 102  | P2 Chest A Resultant [g, CFC_180]        | B-111 |
| 103  | P2 Chest Red Ax [g, CFC_180]             | B-112 |
| 104  | P2 Chest Red Ay [g, CFC_180]             | B-113 |
| 105  | P2 Chest Red Az [g, CFC_180]             | B-114 |
| 106  | P2 Chest Red A Resultant [g, CFC_180]    | B-115 |
| 107  | P2 Chest Displacement [mm, CFC_600]      | B-116 |
| 108  | P2 Pelvic Ax [g, CFC_1000]               | B-117 |
| 109  | P2 Pelvic Ay [g, CFC_1000]               | B-118 |
| 110  | P2 Pelvic Az [g, CFC_1000]               | B-119 |
| 111  | P2 Pelvic A Resultant [g, CFC_1000]      | B-120 |
| 112  | P2 Left Femur Fx [N, CFC_600]            | B-121 |
| 113  | P2 Left Femur Fy [N, CFC_600]            | B-122 |
| 114  | P2 Left Femur Fz [N, CFC_600]            | B-123 |
| 115  | P2 Left Femur F Resultant [N, CFC_600]   | B-124 |
| 116  | P2 Left Femur Mx [Nm, CFC_600]           | B-125 |
| 117  | P2 Left Femur My [Nm, CFC_600]           | B-126 |
| 118  | P2 Left Femur Mz [Nm, CFC_600]           | B-127 |
| 119  | P2 Left Femur M Resultant [Nm, CFC_600]  | B-128 |
| 120  | P2 Right Femur Fx [N, CFC_600]           | B-129 |
| 121  | P2 Right Femur Fy [N, CFC_600]           | B-130 |
| 122  | P2 Right Femur Fz [N, CFC_600]           | B-131 |
| 123  | P2 Right Femur F Resultant [N, CFC_600]  | B-132 |
| 124  | P2 Right Femur Mx [Nm, CFC_600]          | B-133 |
| 125  | P2 Right Femur My [Nm, CFC_600]          | B-134 |
| 126  | P2 Right Femur Mz [Nm, CFC_600]          | B-135 |
| 127  | P2 Right Femur M Resultant [Nm, CFC_600] | B-136 |
| 128  | P2 Left Knee Shear Dx [mm, CFC_180]      | B-137 |
| 129  | P2 Right Knee Shear Dx [mm, CFC_180]     | B-138 |
| 130  | P2 Left Upper Tibia Fx [N, CFC_600]      | B-139 |
| 131  | P2 Left Upper Tibia Fz [N, CFC_600]      | B-140 |
| 132  | P2 Left Upper Tibia Mx [Nm, CFC_600]     | B-141 |
| 133  | P2 Left Upper Tibia My [Nm, CFC_600]     | B-142 |
| 134  | P2 Left Lower Tibia Fx [N, CFC_600]      | B-143 |
| 135  | P2 Left Lower Tibia Fz [N, CFC_600]      | B-144 |



| PLOT | PLOT NAME[UNITS, CHANNEL FILTER CLASS]             | PAGE  |
|------|----------------------------------------------------|-------|
| 136  | P2 Left Lower Tibia Mx [Nm, CFC_600]               | B-145 |
| 137  | P2 Left Lower Tibia My [Nm, CFC_600]               | B-146 |
| 138  | P2 Right Upper Tibia Fx [N, CFC_600]               | B-147 |
| 139  | P2 Right Upper Tibia Fz [N, CFC_600]               | B-148 |
| 140  | P2 Right Upper Tibia Mx [Nm, CFC_600]              | B-149 |
| 141  | P2 Right Upper Tibia My [Nm, CFC_600]              | B-150 |
| 142  | P2 Right Lower Tibia Fx [N, CFC_600]               | B-151 |
| 143  | P2 Right Lower Tibia Fz [N, CFC_600]               | B-152 |
| 144  | P2 Right Lower Tibia Mx [Nm, CFC_600]              | B-153 |
| 145  | P2 Right Lower Tibia My [Nm, CFC_600]              | B-154 |
| 146  | P2 Left ankle Ax [g, CFC_600]                      | B-155 |
| 147  | P2 Left Ankle Az [g, CFC_600]                      | B-156 |
| 148  | P2 Right Ankle Ax [g, CFC_600]                     | B-157 |
| 149  | P2 Right Ankle Az [g, CFC_600]                     | B-158 |
| 150  | P2 Left Toe Az [g, CFC_600]                        | B-159 |
| 151  | P2 Right Toe Az [g, CFC_600]                       | B-160 |
| 152  | P2 Lap Belt Force [N, CFC_60]                      | B-161 |
| 153  | Acc 1 Rear XMBR Left X [g, CFC_60]                 | B-162 |
| 154  | Acc 1 Rear XMBR Left X Velocity [kph, CFC_180]     | B-163 |
| 155  | Acc 1 Rear XMBR Left X Displacement [mm, CFC_180]  | B-164 |
| 156  | Acc 2 Rear XMBR Left Y [g, CFC_60]                 | B-165 |
| 157  | Acc 2 Rear XMBR Left Y Velocity [kph, CFC_180]     | B-166 |
| 158  | Acc 2 Rear XMBR Left Y Displacement [mm, CFC_180]  | B-167 |
| 159  | Acc 3 Rear XMBR Right X [g, CFC_60]                | B-168 |
| 160  | Acc 3 Rear XMBR Right X Velocity [kph, CFC_180]    | B-169 |
| 161  | Acc 3 Rear XMBR Right X Displacement [mm, CFC_180] | B-170 |
| 162  | Acc 4 Rear XMBR Right Y [g, CFC_60]                | B-171 |
| 163  | Acc 4 Rear XMBR Right Y Velocity [kph, CFC_180]    | B-172 |
| 164  | Acc 4 Rear XMBR Right Y Displacement [mm, CFC_180] | B-173 |
| 165  | Acc 5 P1 Toepan Left X [g, CFC_60]                 | B-174 |
| 166  | Acc 5 P1 Toepan Left X Velocity [kph, CFC_180]     | B-175 |
| 167  | Acc 5 P1 Toepan Left X Displacement [mm, CFC_180]  | B-176 |
| 168  | Acc 6 P1 Toepan Left Z [g, CFC_60]                 | B-177 |
| 169  | Acc 6 P1 Toepan Left Z Velocity [kph, CFC_180]     | B-178 |
| 170  | Acc 6 P1 Toepan Left Z Displacement [mm, CFC_180]  | B-179 |
| 171  | Acc 7 P1 Toepan Right X [g, CFC_60]                | B-180 |
| 172  | Acc 7 P1 Toepan Right X Velocity [kph, CFC_180]    | B-181 |
| 173  | Acc 7 P1 Toepan Right X Displacement [mm, CFC_180] | B-182 |
| 174  | Acc 8 P1 Toepan Right Z [g, CFC_60]                | B-183 |
| 175  | Acc 8 P1 Toepan Right Z Velocity [kph, CFC_180]    | B-184 |
| 176  | Acc 8 P1 Toepan Right Z Displacement [mm, CFC_180] | B-185 |
| 177  | Acc 9 Trunk Z [g, CFC_60]                          | B-186 |
| 178  | Acc 9 Trunk Z Velocity [kph, CFC_180]              | B-187 |
| 179  | Acc 9 Trunk Z Displacement [mm, CFC_180]           | B-188 |
| 180  | Toe Pan Movement [mm, CFC_60]                      | B-189 |

| PLOT | PLOT NAME[UNITS, CHANNEL FILTER CLASS] | PAGE  |
|------|----------------------------------------|-------|
| 181  | Barrier Load Cell E2 FY [N, CFC_60]    | B-190 |
| 182  | Barrier Load Cell E3 FY [N, CFC_60]    | B-191 |
| 183  | Barrier Load Cell E4 FY [N, CFC_60]    | B-192 |
| 184  | Barrier Load Cell E5 FY [N, CFC_60]    | B-193 |
| 185  | Barrier Load Cell E6 FY [N, CFC_60]    | B-194 |
| 186  | Barrier Load Cell E1 FX [N, CFC_60]    | B-195 |
| 187  | Barrier Load Cell E2 FX [N, CFC_60]    | B-196 |
| 188  | Barrier Load Cell E3 FX [N, CFC_60]    | B-197 |
| 189  | Barrier Load Cell E4 FX [N, CFC_60]    | B-198 |
| 190  | Barrier Load Cell E5 FX [N, CFC_60]    | B-199 |
| 191  | Barrier Load Cell E6 FX [N, CFC_60]    | B-200 |
| 192  | Barrier Load Cell D2 FY [N, CFC_60]    | B-201 |
| 193  | Barrier Load Cell D3 FY [N, CFC_60]    | B-202 |
| 194  | Barrier Load Cell D4 FY [N, CFC_60]    | B-203 |
| 195  | Barrier Load Cell D5 FY [N, CFC_60]    | B-204 |
| 196  | Barrier Load Cell D6 FY [N, CFC_60]    | B-205 |
| 197  | Barrier Load Cell D1 FX [N, CFC_60]    | B-206 |
| 198  | Barrier Load Cell D2 FX [N, CFC_60]    | B-207 |
| 199  | Barrier Load Cell D3 FX [N, CFC_60]    | B-208 |
| 200  | Barrier Load Cell D4 FX [N, CFC_60]    | B-209 |
| 201  | Barrier Load Cell D5 FX [N, CFC_60]    | B-210 |
| 202  | Barrier Load Cell D6 FX [N, CFC_60]    | B-211 |
| 203  | Barrier Load Cell C2 FY [N, CFC_60]    | B-212 |
| 204  | Barrier Load Cell C3 FY [N, CFC_60]    | B-213 |
| 205  | Barrier Load Cell C4 FY [N, CFC_60]    | B-214 |
| 206  | Barrier Load Cell C5 FY [N, CFC_60]    | B-215 |
| 207  | Barrier Load Cell C6 FY [N, CFC_60]    | B-216 |
| 208  | Barrier Load Cell C1 FX [N, CFC_60]    | B-217 |
| 209  | Barrier Load Cell C2 FX [N, CFC_60]    | B-218 |
| 210  | Barrier Load Cell C3 FX [N, CFC_60]    | B-219 |
| 211  | Barrier Load Cell C4 FX [N, CFC_60]    | B-220 |
| 212  | Barrier Load Cell C5 FX [N, CFC_60]    | B-221 |
| 213  | Barrier Load Cell C6 FX [N, CFC_60]    | B-222 |
| 214  | Barrier Load Cell B3 FY [N, CFC_60]    | B-223 |
| 215  | Barrier Load Cell B4 FY [N, CFC_60]    | B-224 |
| 216  | Barrier Load Cell B5 FY [N, CFC_60]    | B-225 |
| 217  | Barrier Load Cell B6 FY [N, CFC_60]    | B-226 |
| 218  | Barrier Load Cell B1 FX [N, CFC_60]    | B-227 |
| 219  | Barrier Load Cell B2 FX [N, CFC_60]    | B-228 |
| 220  | Barrier Load Cell B3 FX [N, CFC_60]    | B-229 |
| 221  | Barrier Load Cell B4 FX [N, CFC_60]    | B-230 |
| 222  | Barrier Load Cell B5 FX [N, CFC_60]    | B-231 |
| 223  | Barrier Load Cell B6 FX [N, CFC_60]    | B-232 |
| 224  | Barrier Load Cell A1 FX [N, CFC_60]    | B-233 |
| 225  | Barrier Load Cell A2 FX [N, CFC_60]    | B-234 |



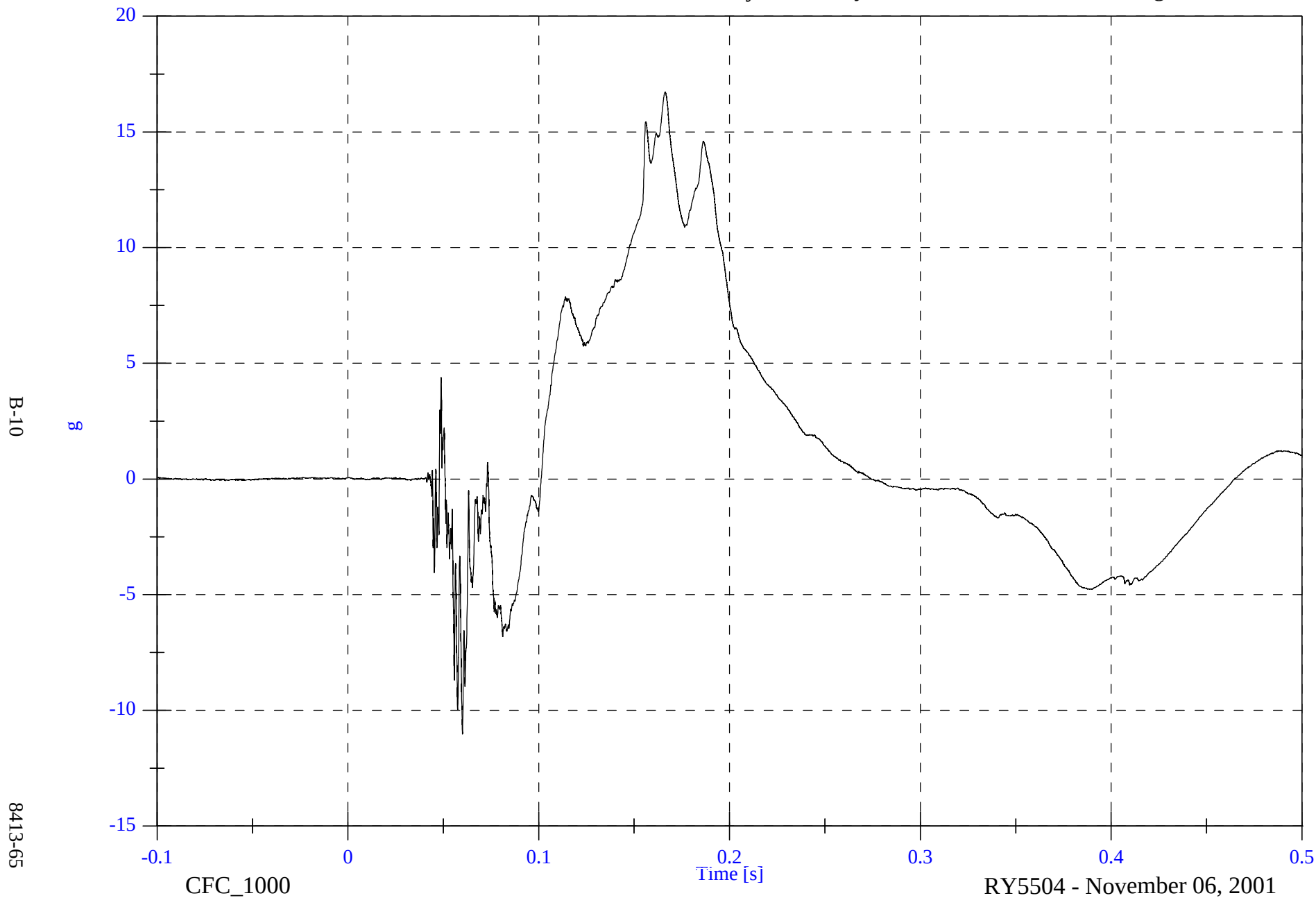
| PLOT | PLOT NAME[UNITS, CHANNEL FILTER CLASS] | PAGE  |
|------|----------------------------------------|-------|
| 226  | Barrier Load Cell A3 FX [N, CFC_60]    | B-235 |
| 227  | Barrier Load Cell A4 FX [N, CFC_60]    | B-236 |
| 228  | Barrier Load Cell A5 FX [N, CFC_60]    | B-237 |
| 229  | Barrier Load Cell A6 FX [N, CFC_60]    | B-238 |

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head 9 Array X Arm Ay

Max: 16.7 [g] at 0.166 [s]

Min: -11.0 [g] at 0.060 [s]





40% Frontal Offset Test #9 - 2000 Subaru Legacy

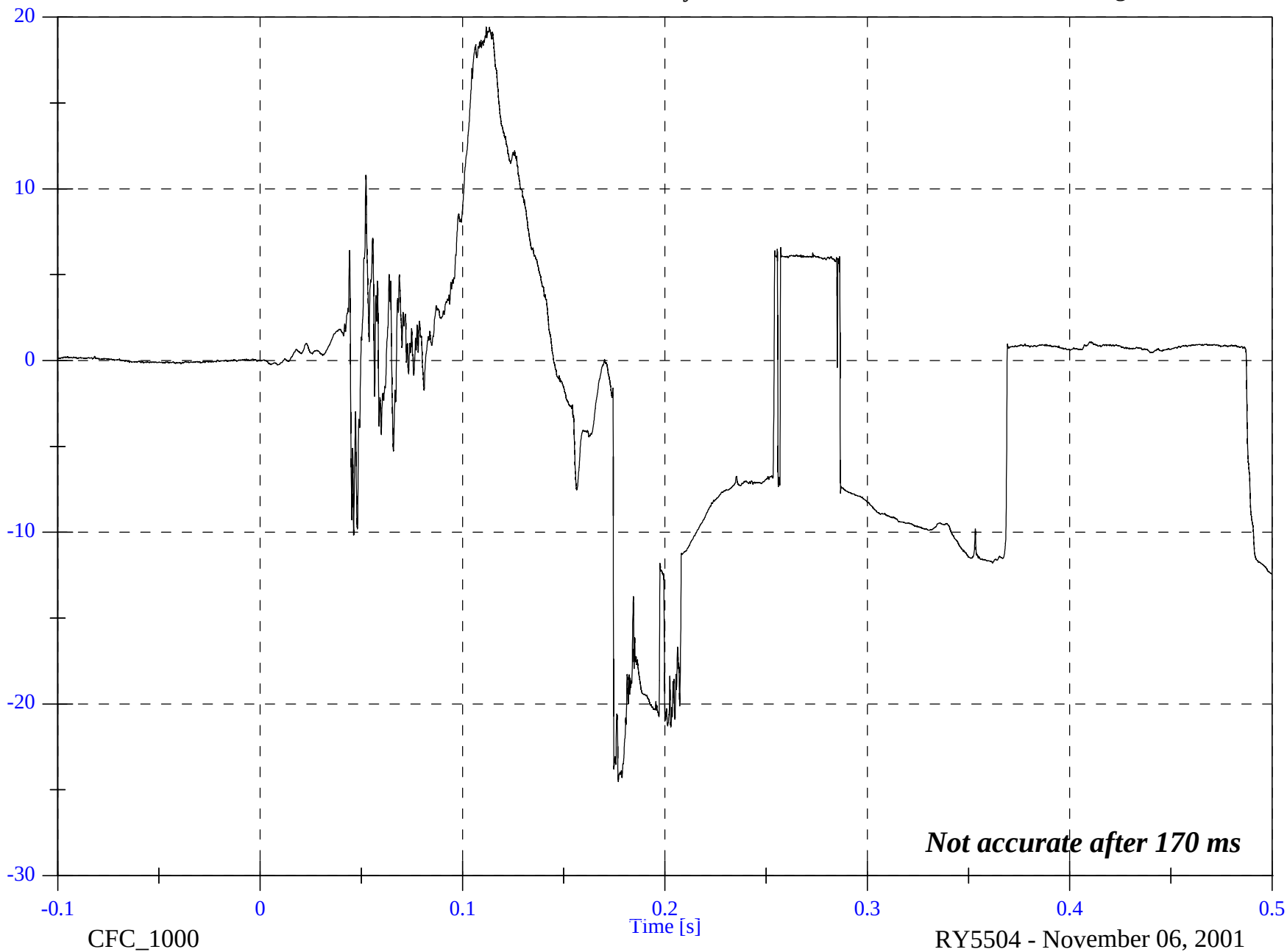
P1 Head 9 Array X Arm Az

Max: 19.4 [g] at 0.112 [s]

Min: -24.5 [g] at 0.177 [s]

B-11

g



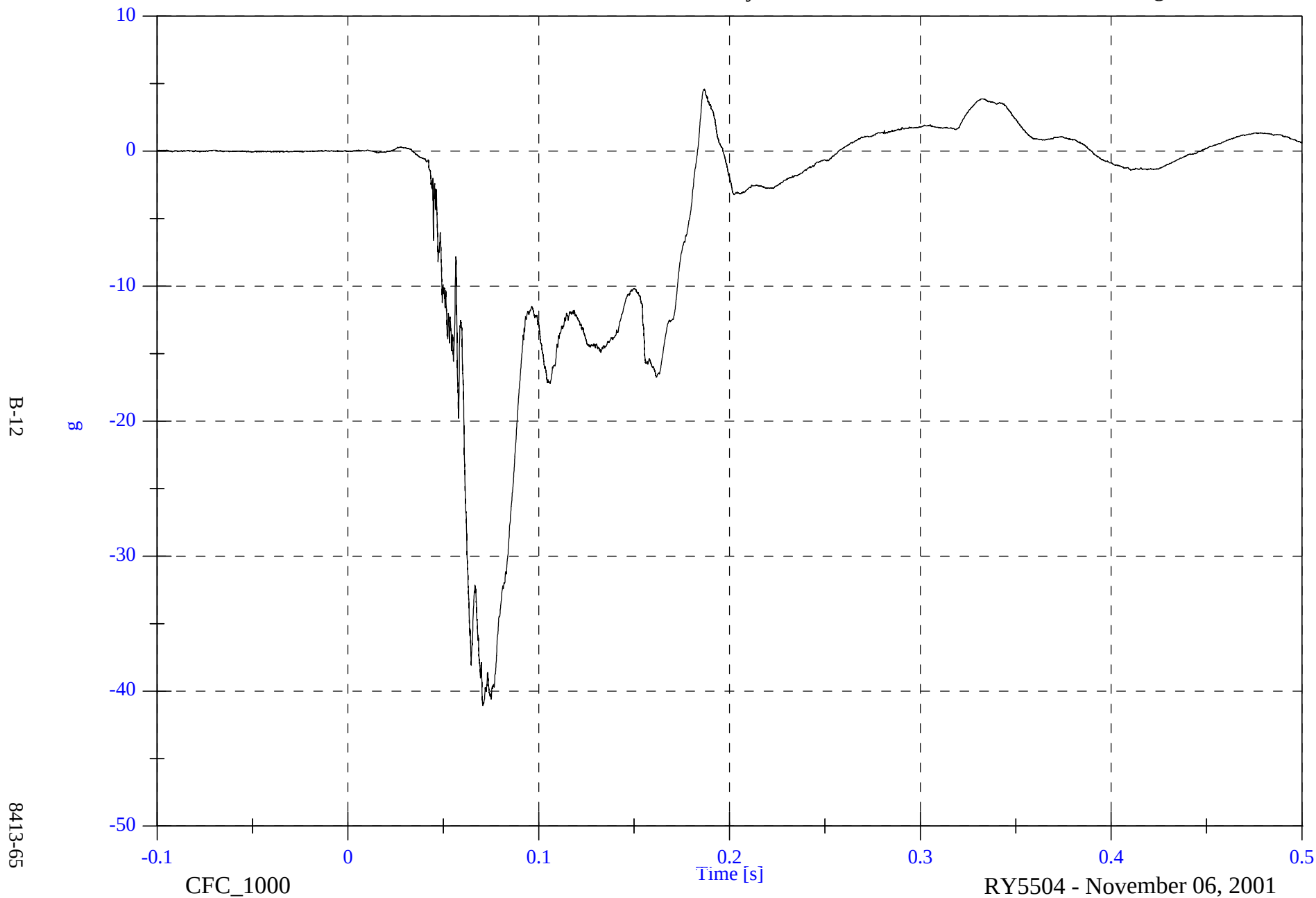
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head 9 Array Y Arm Ax

Max: 4.6 [g] at 0.187 [s]

Min: -41.1 [g] at 0.071 [s]



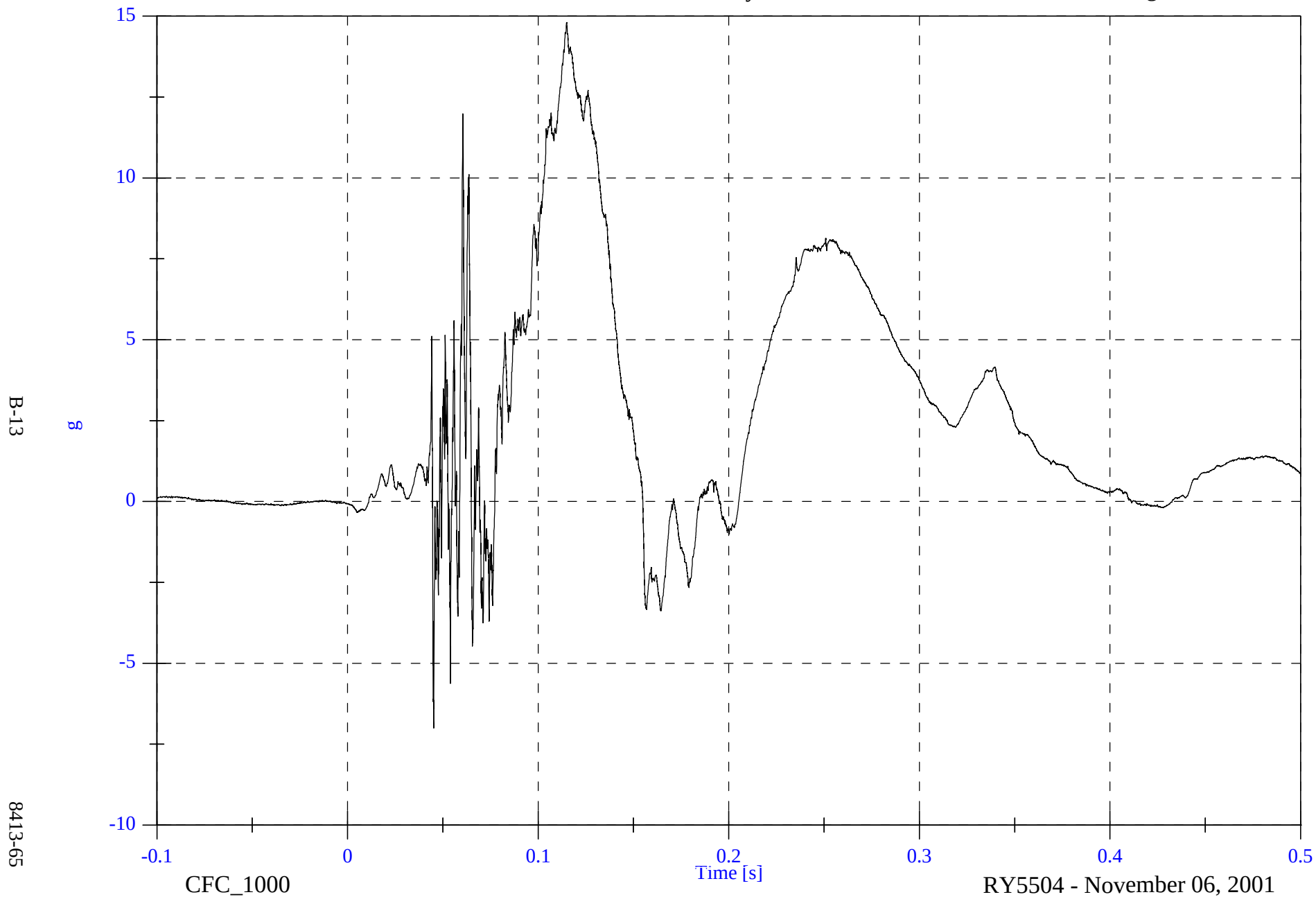


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head 9 Array Y Arm Az

Max: 14.8 [g] at 0.115 [s]

Min: -7.0 [g] at 0.045 [s]

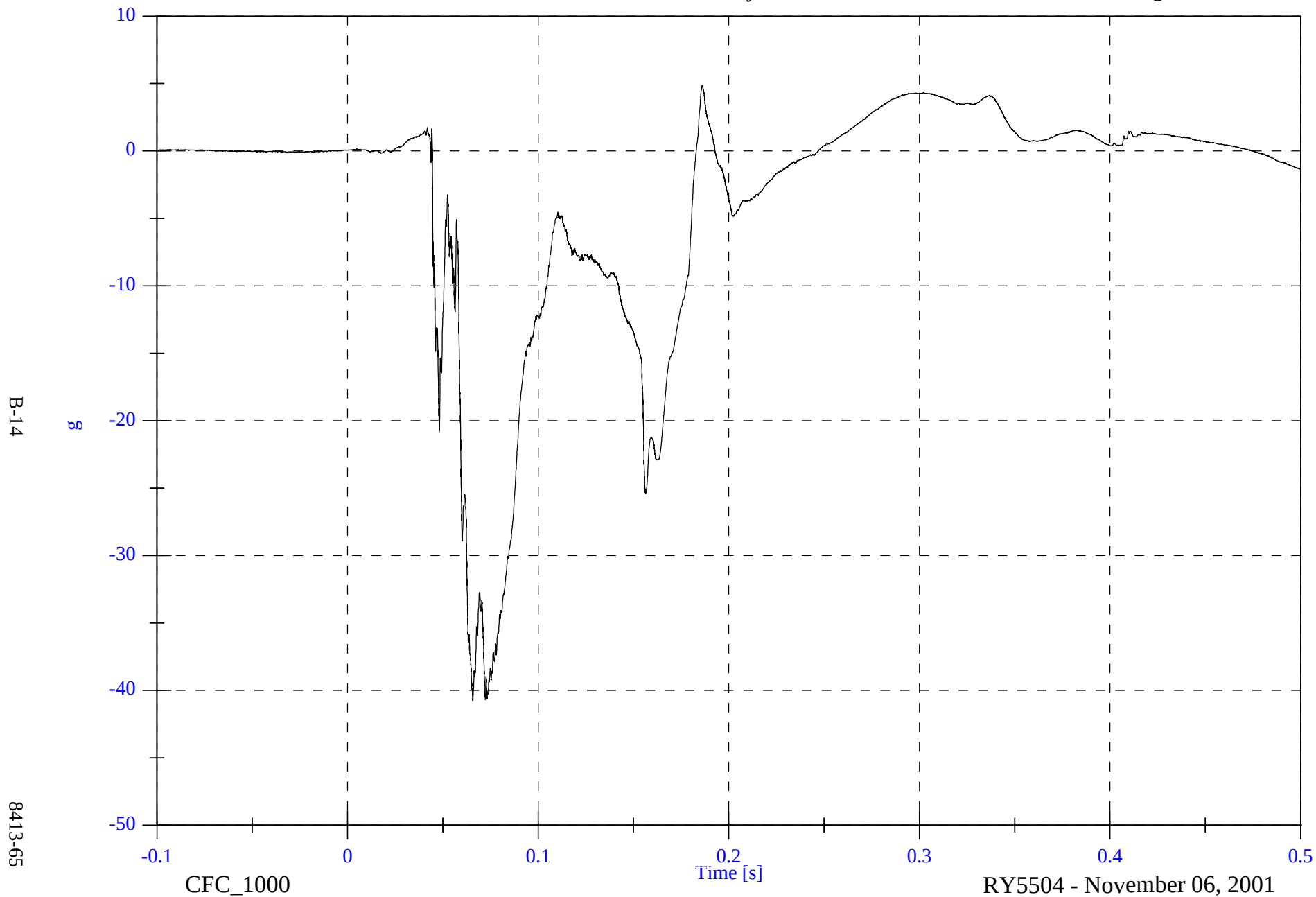


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head 9 Array Z Arm Ax

Max: 4.9 [g] at 0.186 [s]

Min: -40.8 [g] at 0.066 [s]



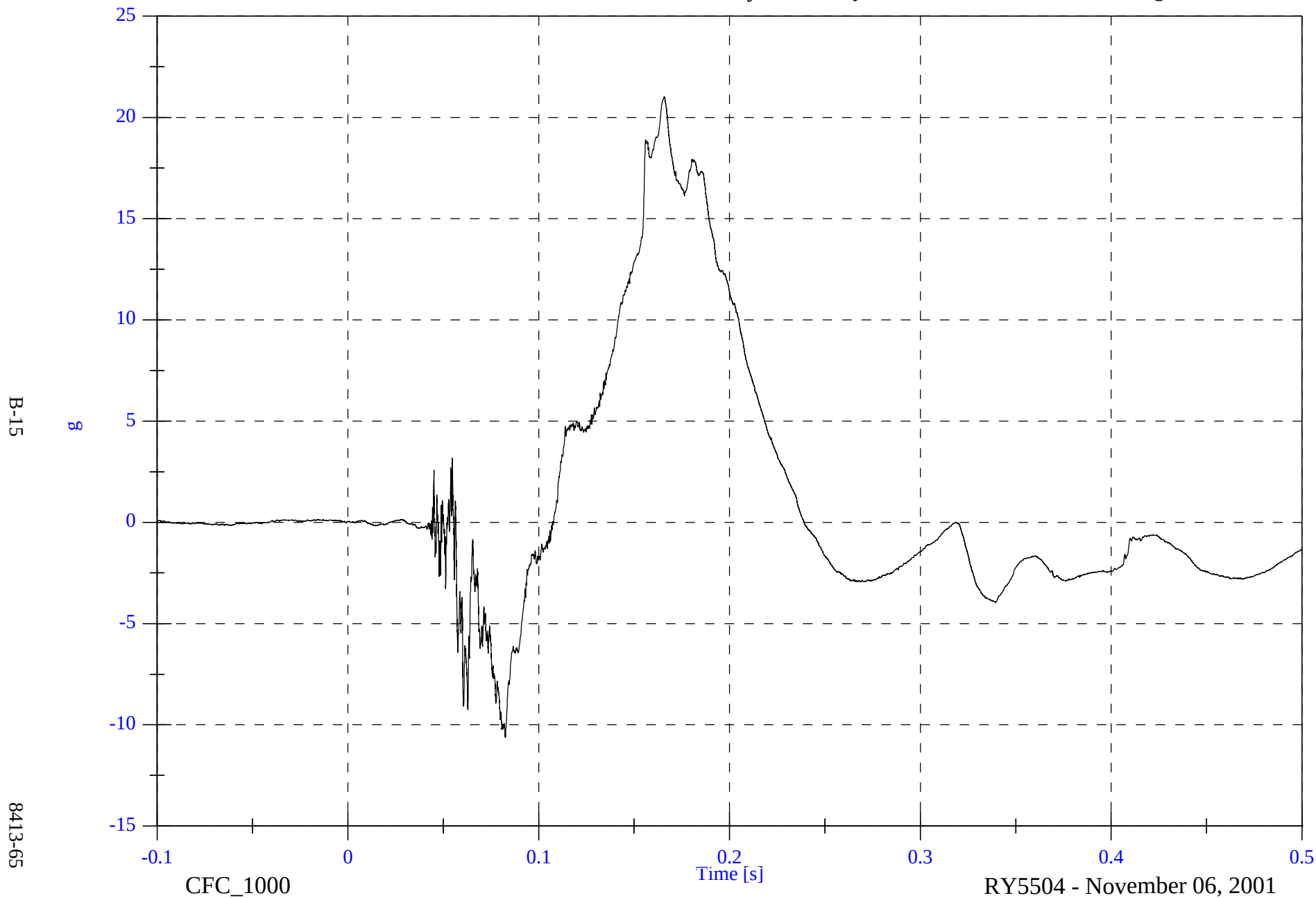


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head 9 Array Z Arm Ay

Max: 21.0 [g] at 0.166 [s]

Min: -10.6 [g] at 0.083 [s]

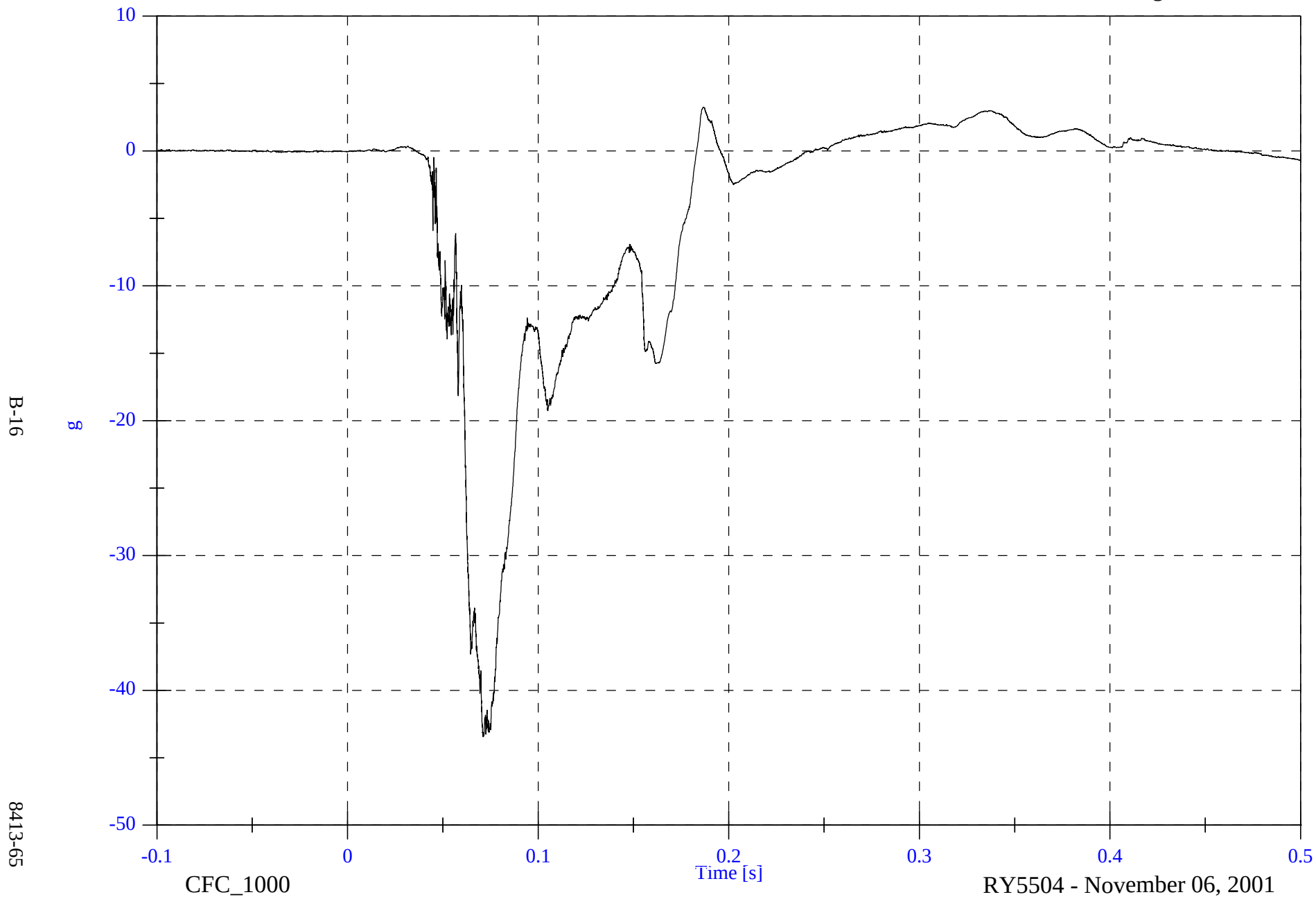


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head Ax

Max: 3.2 [g] at 0.186 [s]

Min: -43.4 [g] at 0.071 [s]





40% Frontal Offset Test #9 - 2000 Subaru Legacy

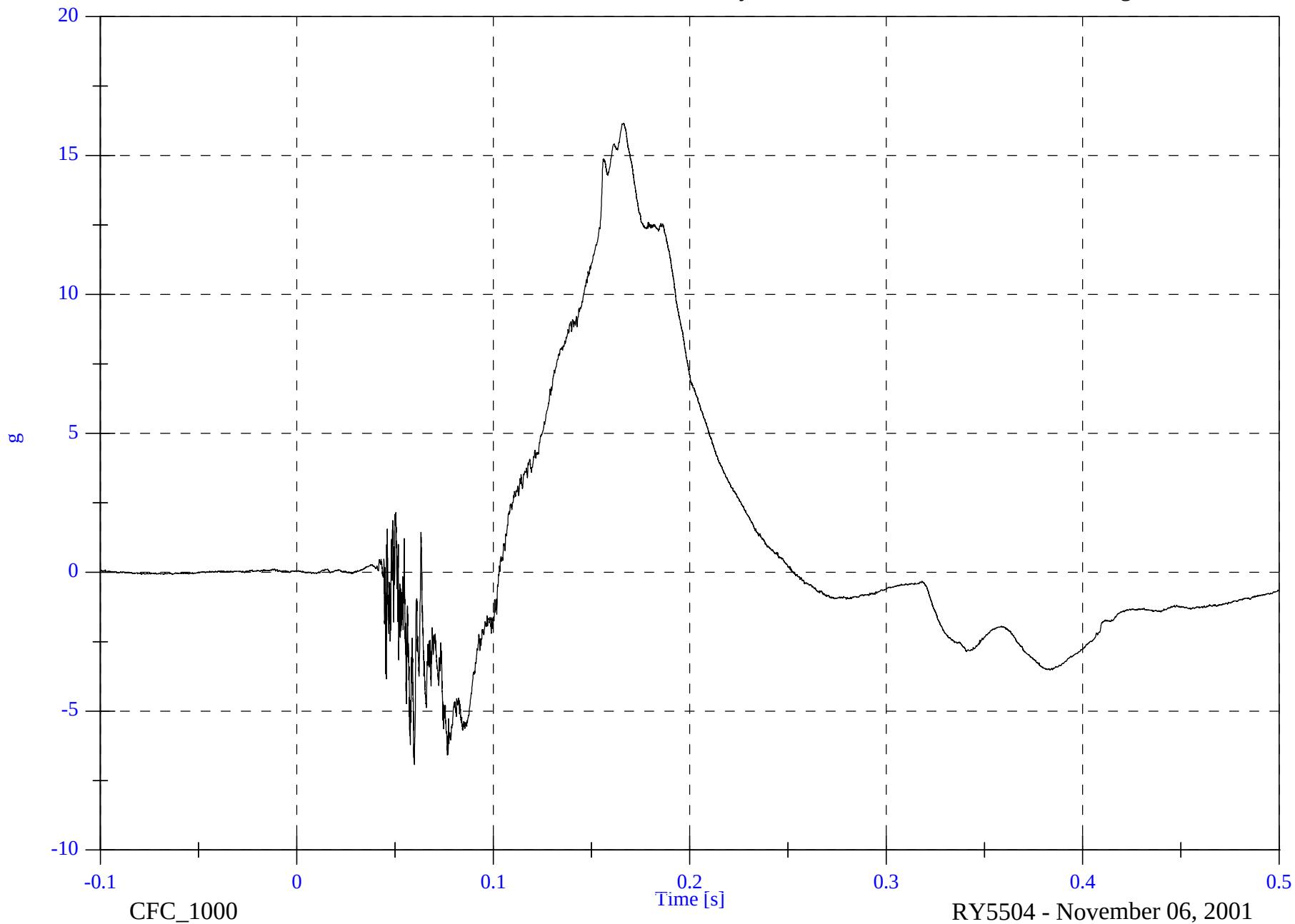
P1 Head Ay

Max: 16.2 [g] at 0.166 [s]

Min: -6.9 [g] at 0.060 [s]

B-17

8413-65

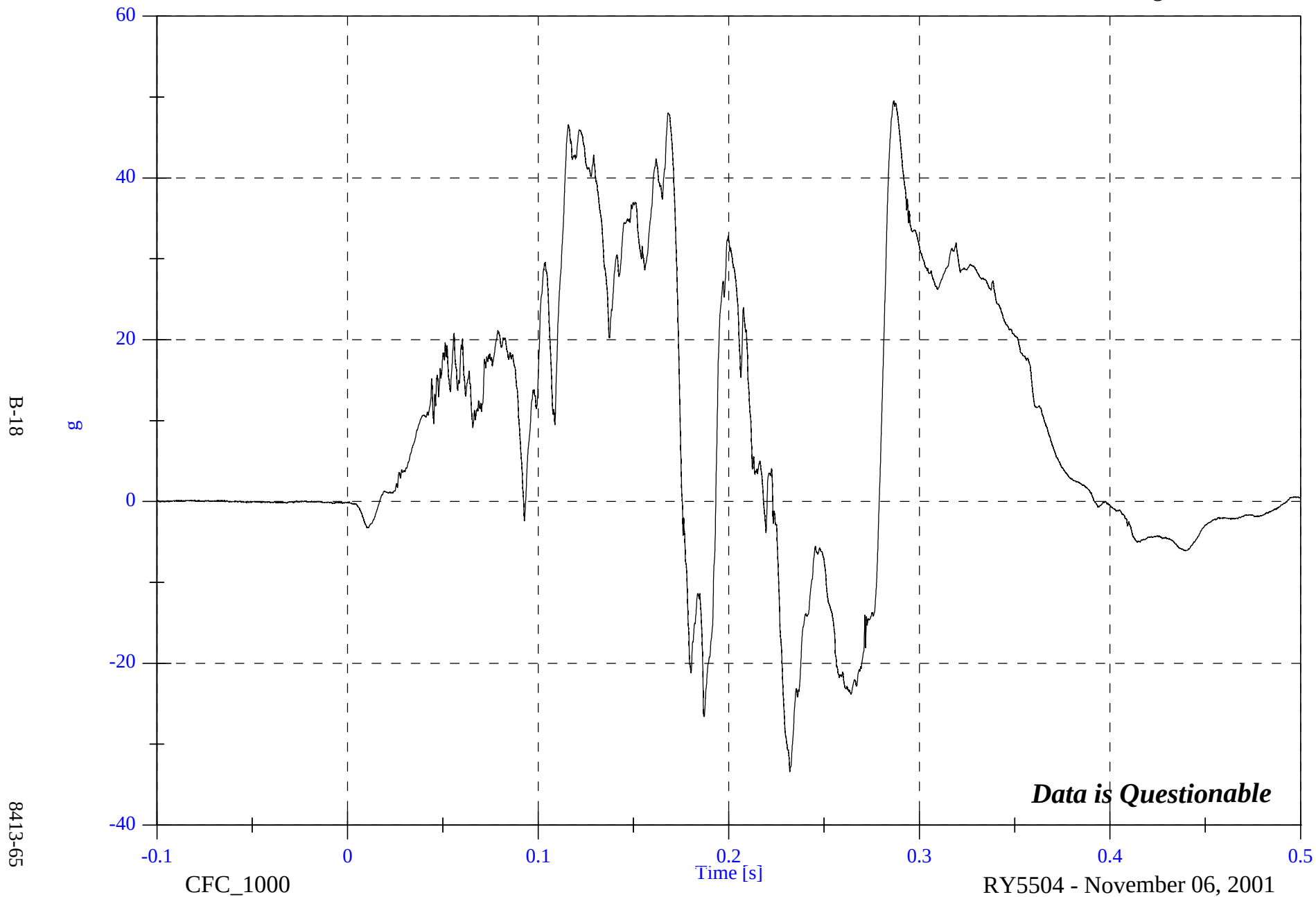


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head Az

Max: 49.5 [g] at 0.287 [s]

Min: -33.4 [g] at 0.232 [s]



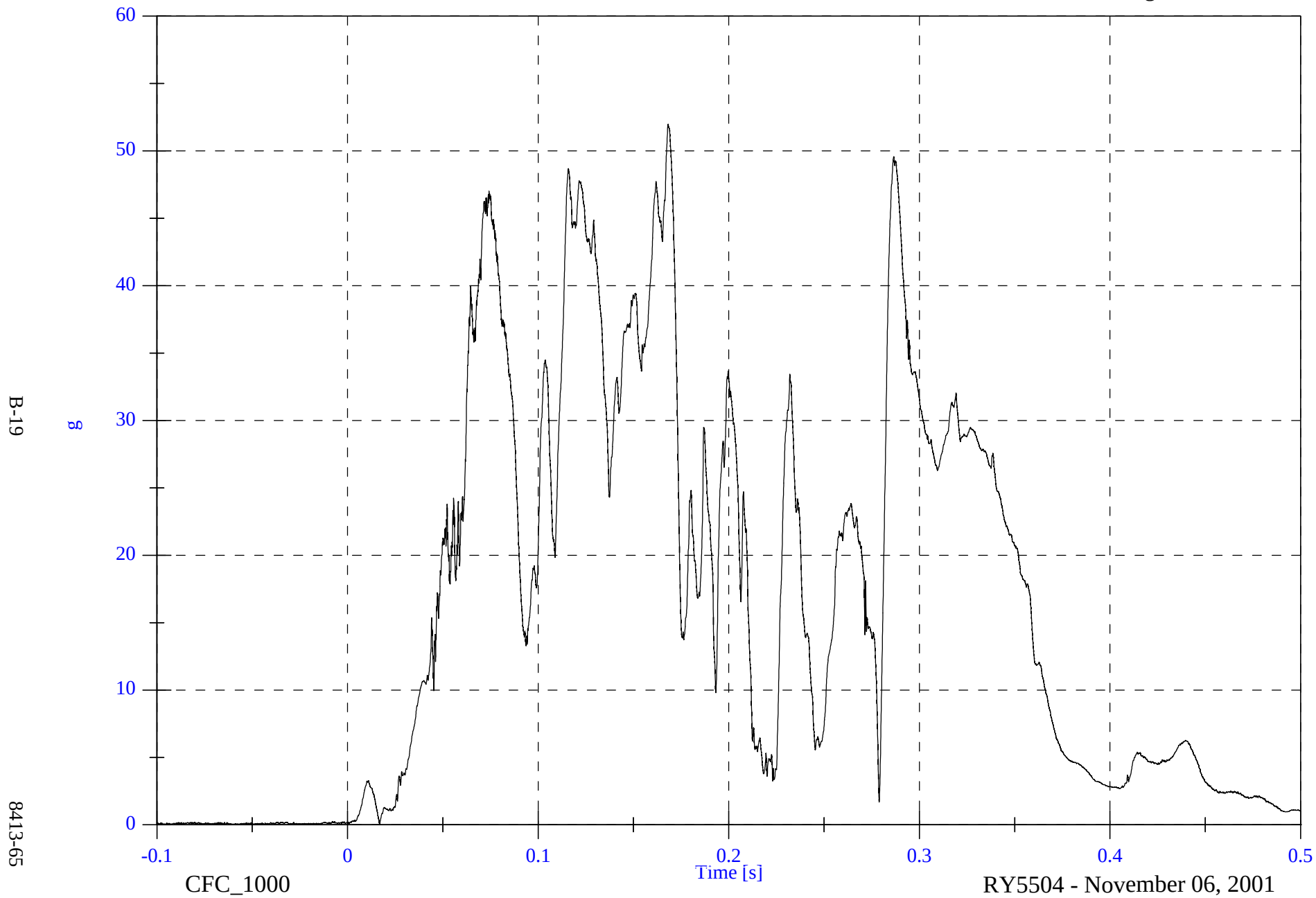
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head A Resultant

Max: 52.0 [g] at 0.168 [s]

Min: 0.0 [g] at -0.096 [s]



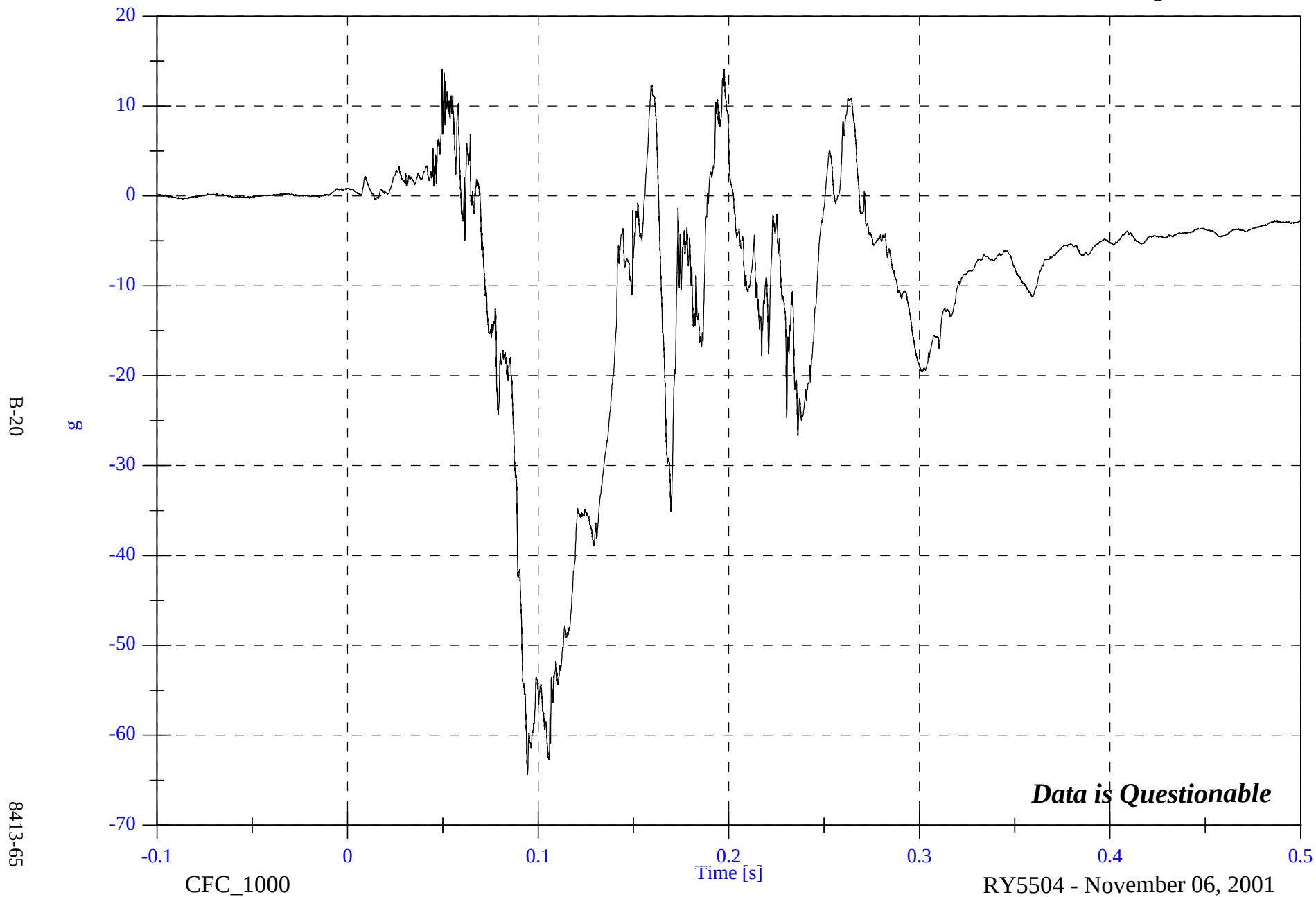


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head Red Ax

Max: 14.1 [g] at 0.050 [s]

Min: -64.4 [g] at 0.094 [s]

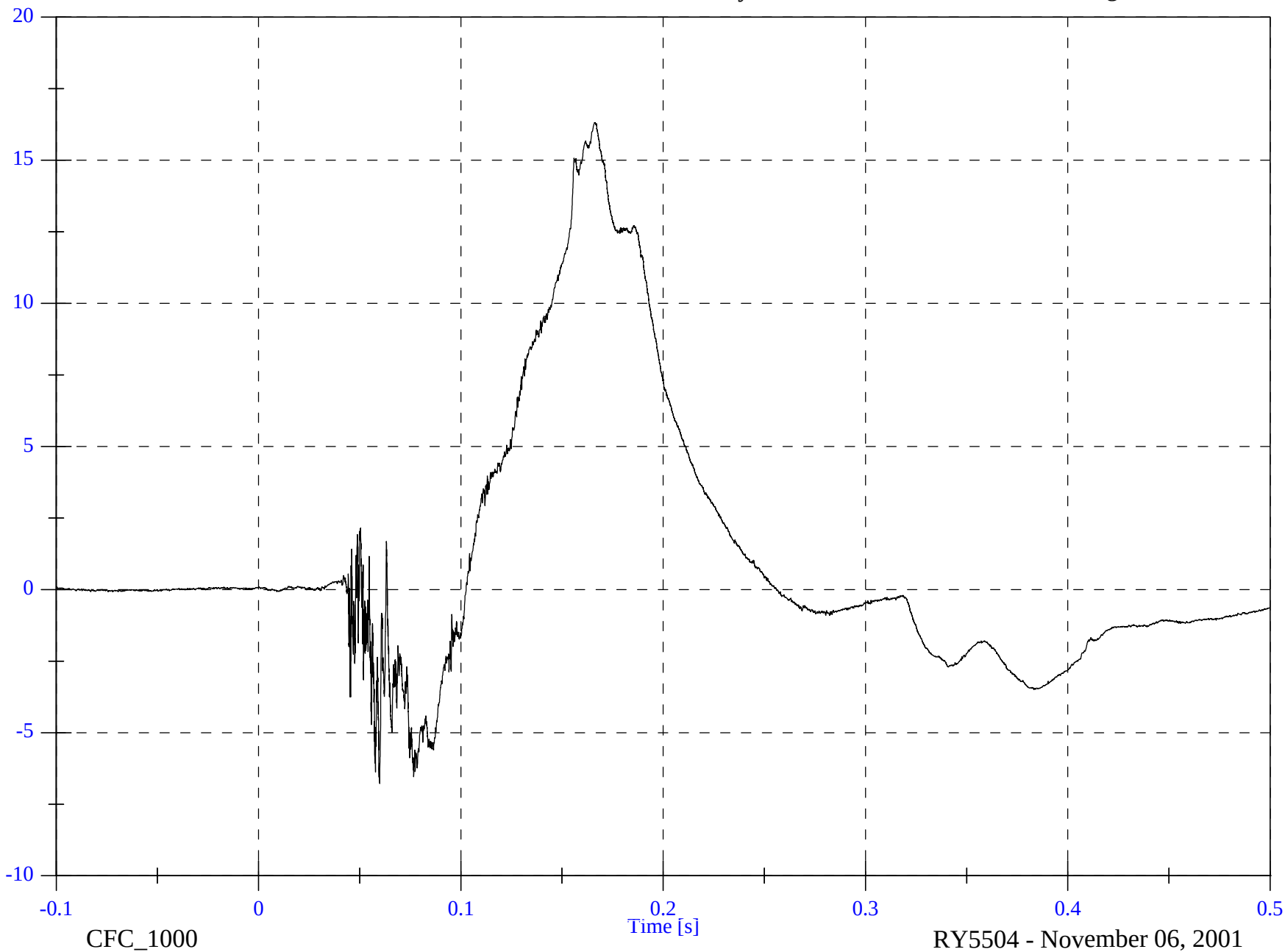


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head Red Ay

Max: 16.3 [g] at 0.166 [s]

Min: -6.8 [g] at 0.060 [s]



B-21

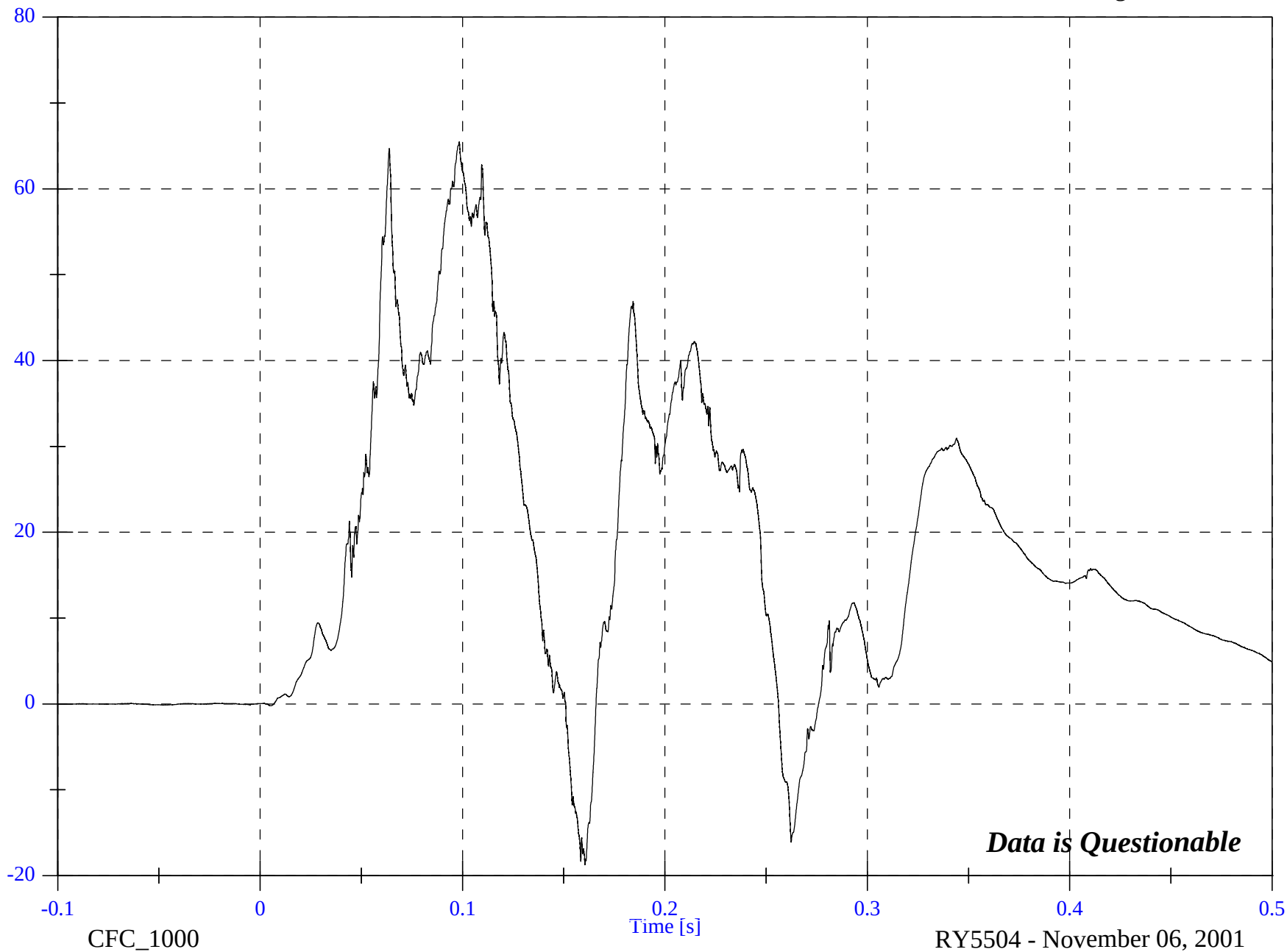
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head Red Az

Max: 65.5 [g] at 0.098 [s]

Min: -18.7 [g] at 0.160 [s]



B-22

8413-65

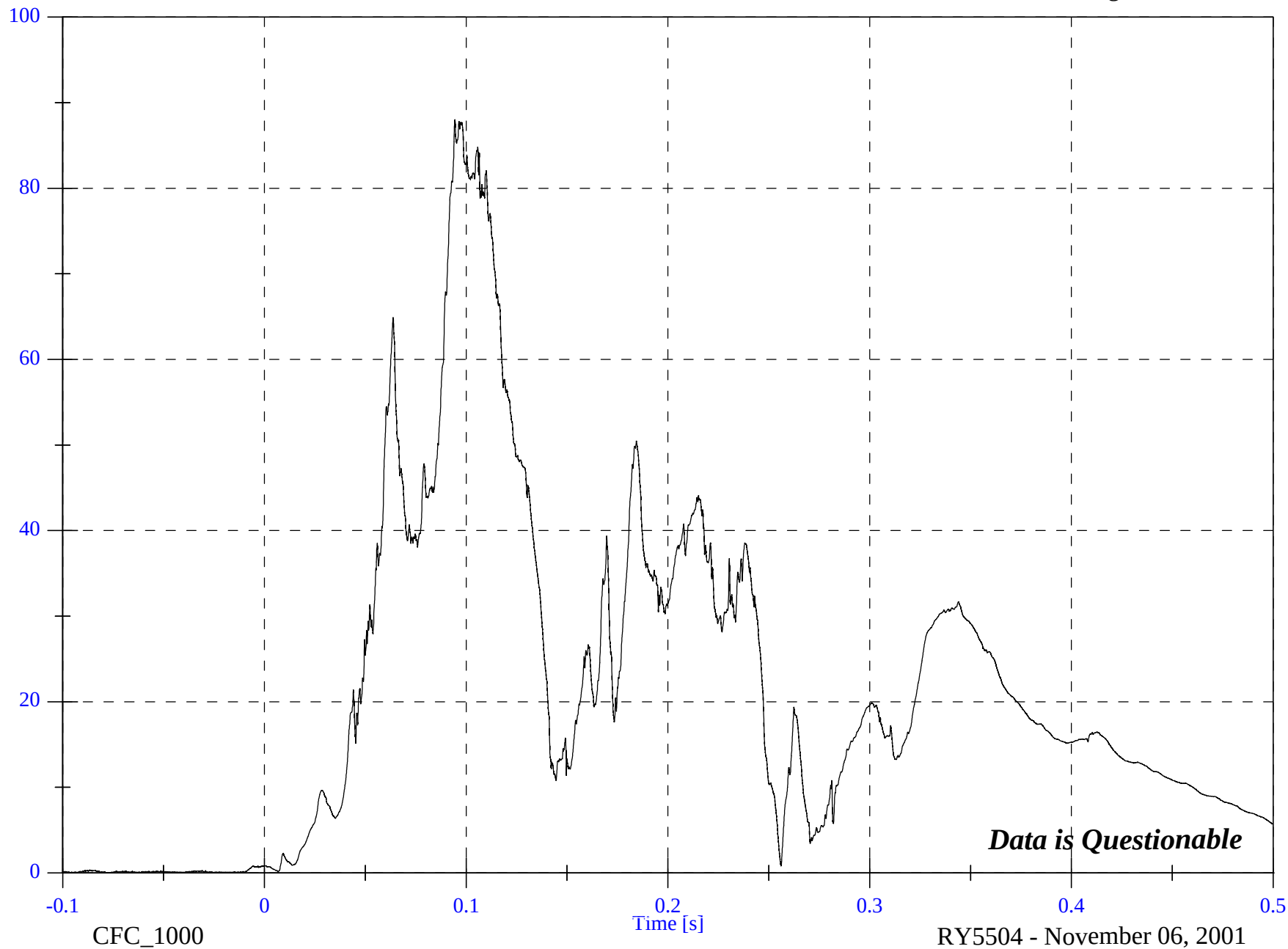


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Head Red A Resultant

Max: 88.0 [g] at 0.094 [s]

Min: 0.0 [g] at -0.078 [s]



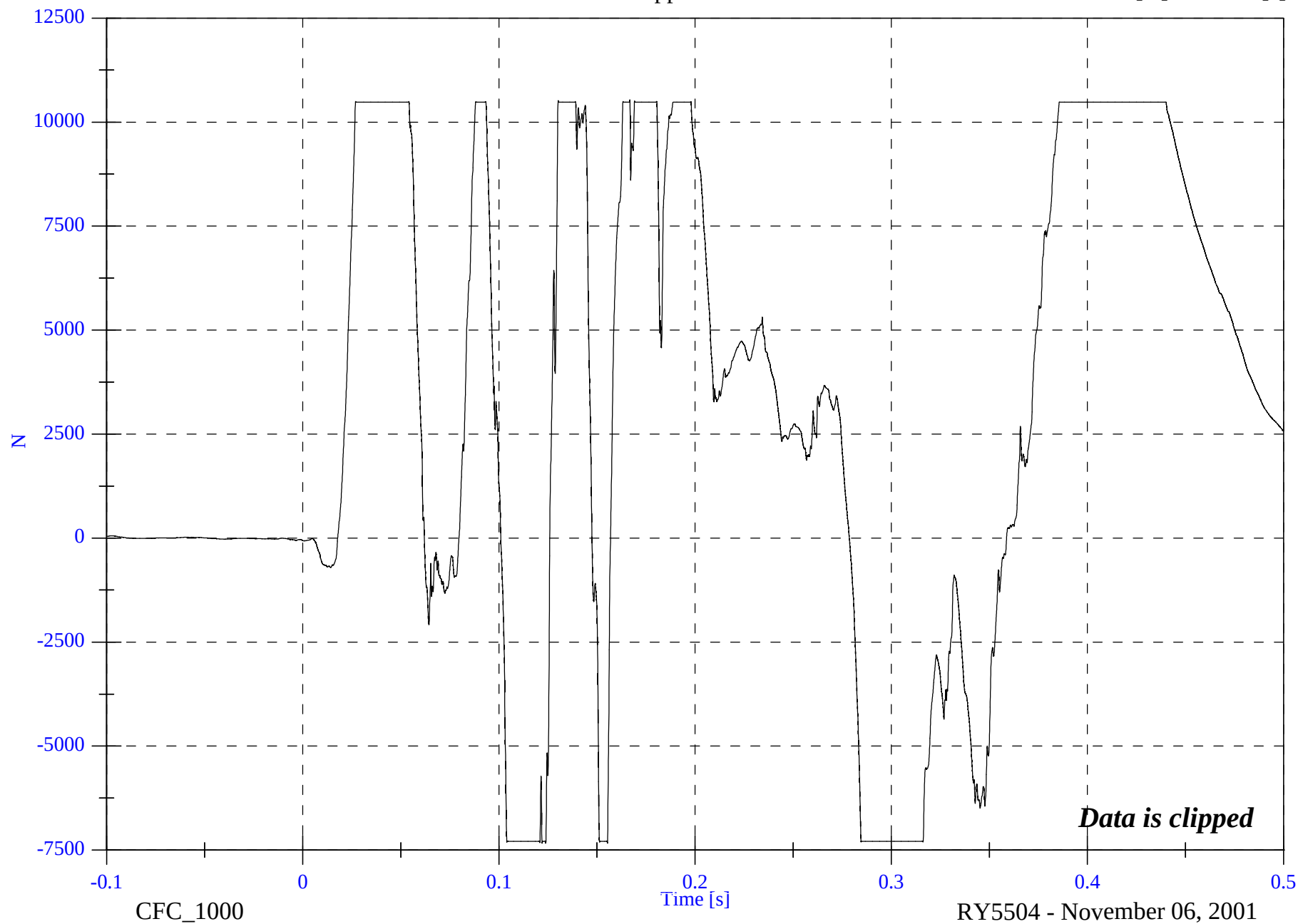
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Upper Neck Fx

Max: 10533.9 [N] at 0.167 [s]

Min: -7334.2 [N] at 0.155 [s]

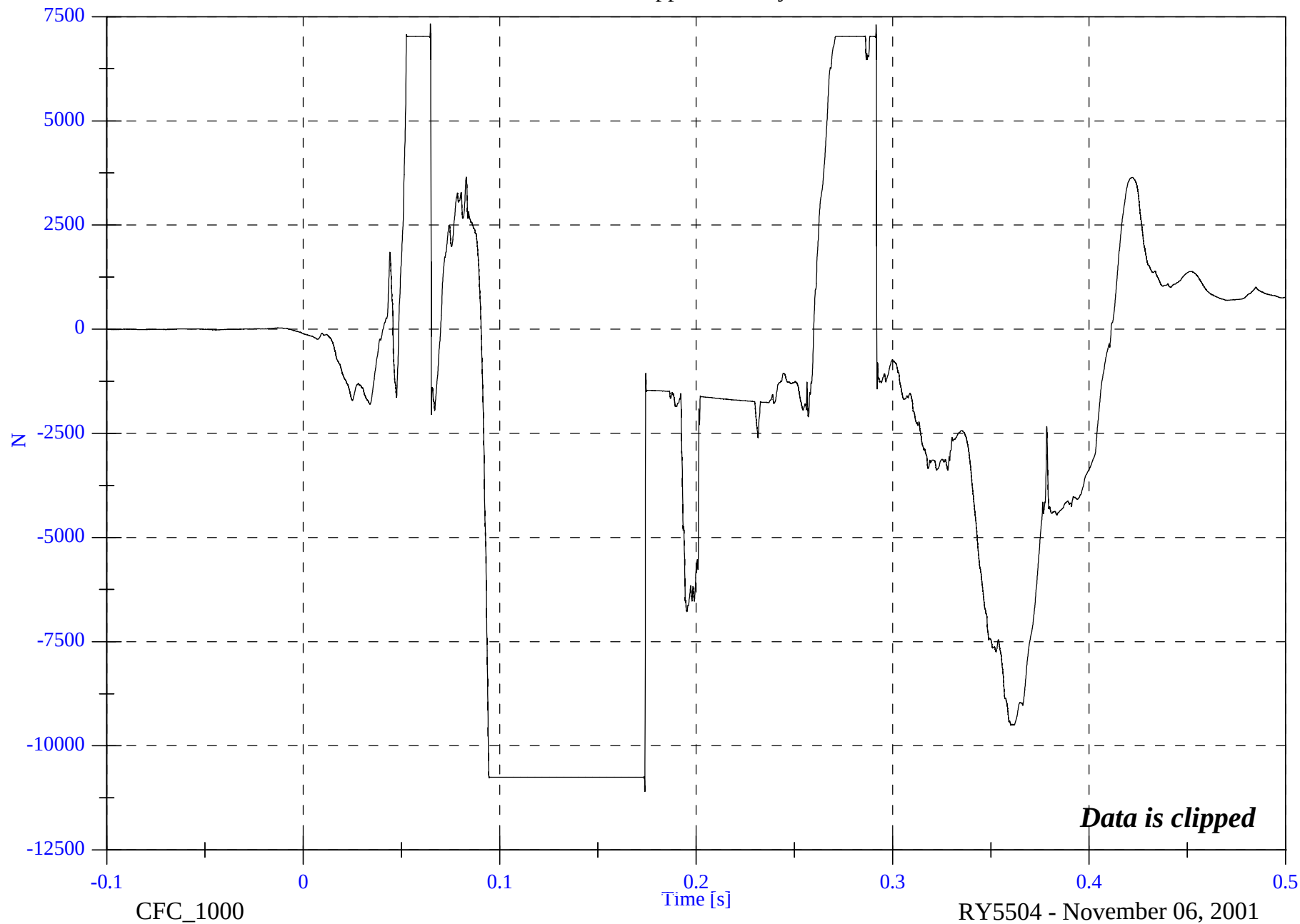


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Upper Neck Fy

Max: 7329.2 [N] at 0.065 [s]

Min: -11097.5 [N] at 0.174 [s]



B-25

8413-65

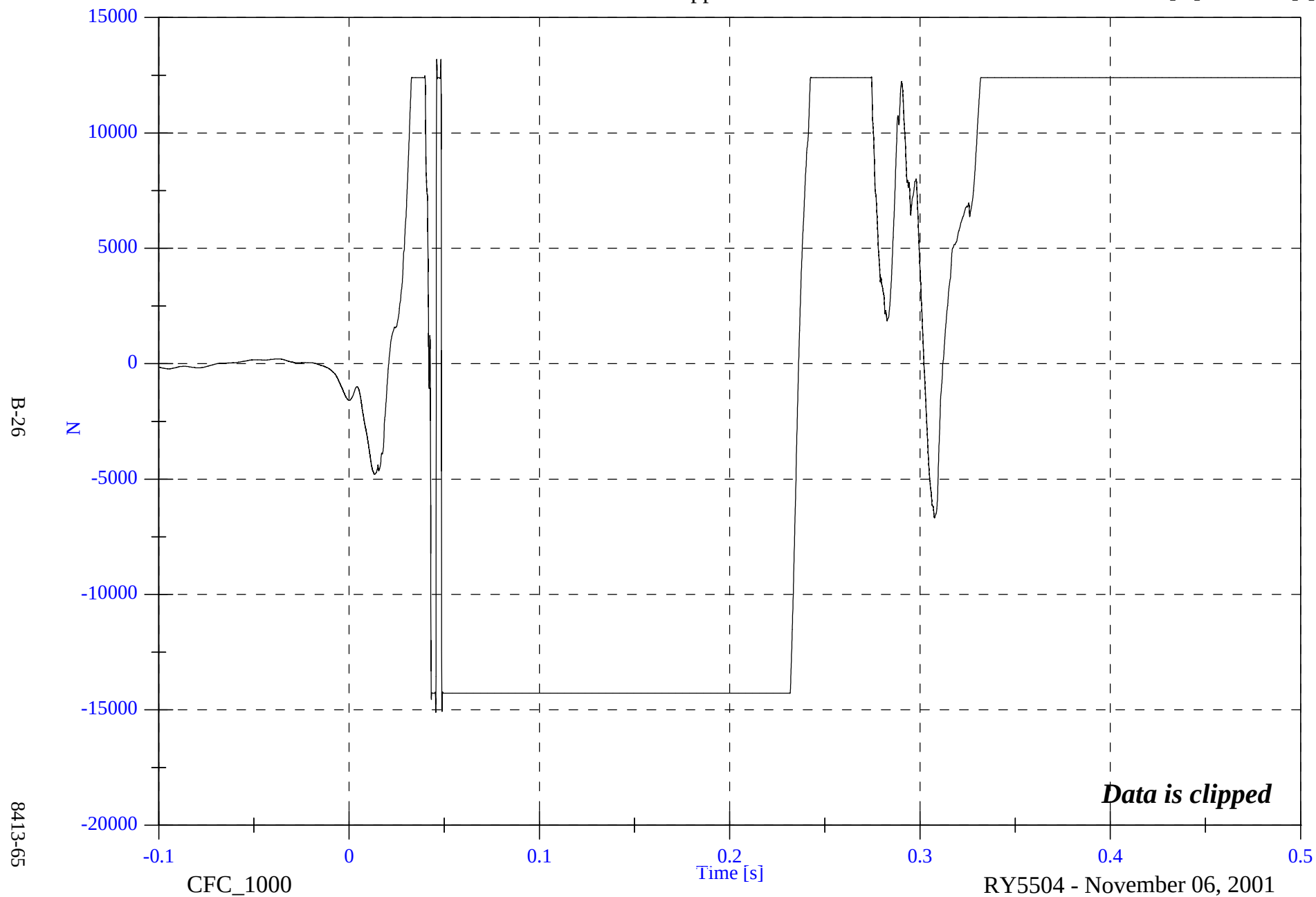


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Upper Neck Fz

Max: 13195.1 [N] at 0.046 [s]

Min: -15112.4 [N] at 0.046 [s]

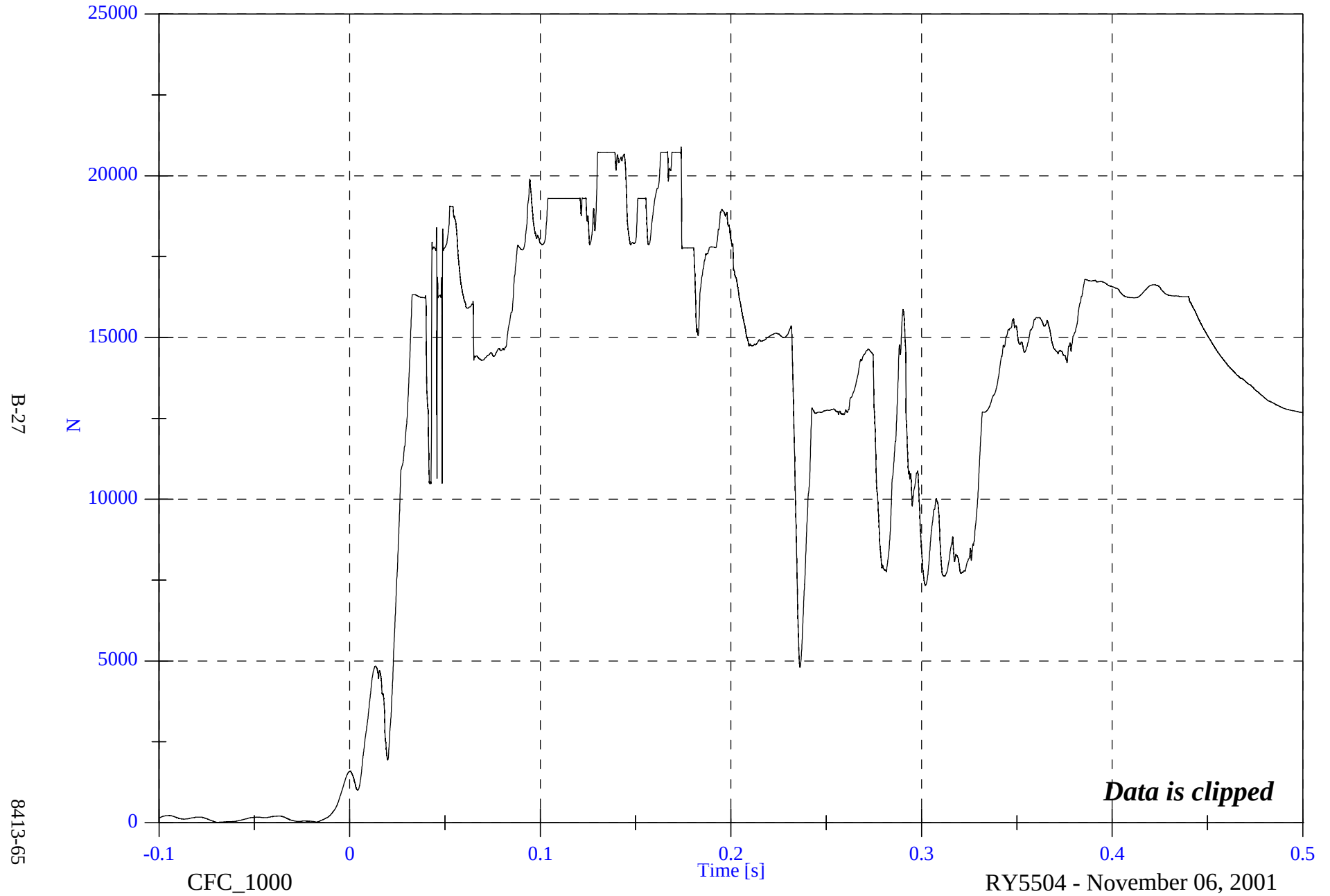


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Upper Neck F Resultant

Max: 20898.1 [N] at 0.174 [s]

Min: 7.9 [N] at -0.069 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

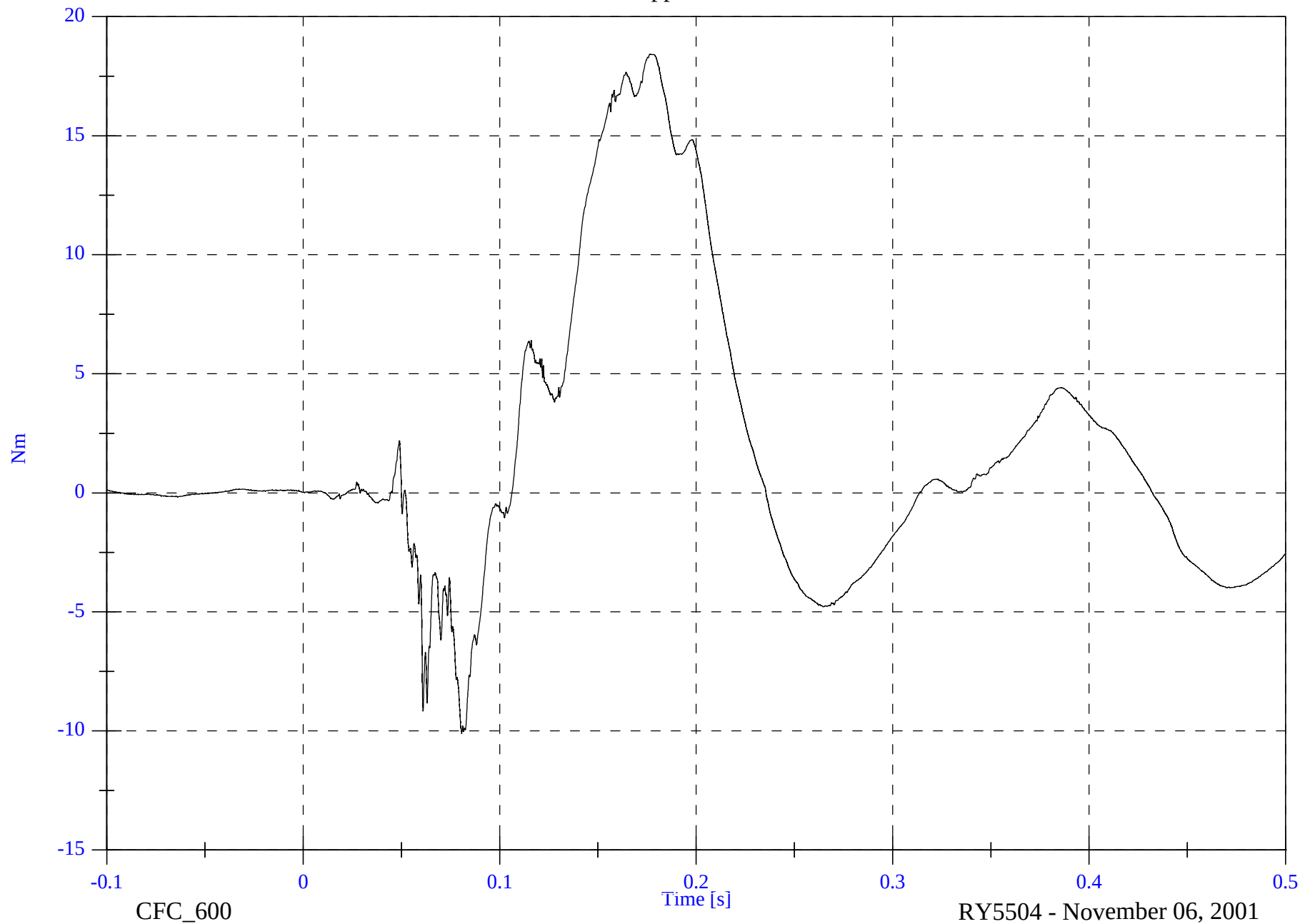
P1 Upper Neck Mx

Max: 18.4 [Nm] at 0.177 [s]

Min: -10.1 [Nm] at 0.081 [s]

B-28

8413-65



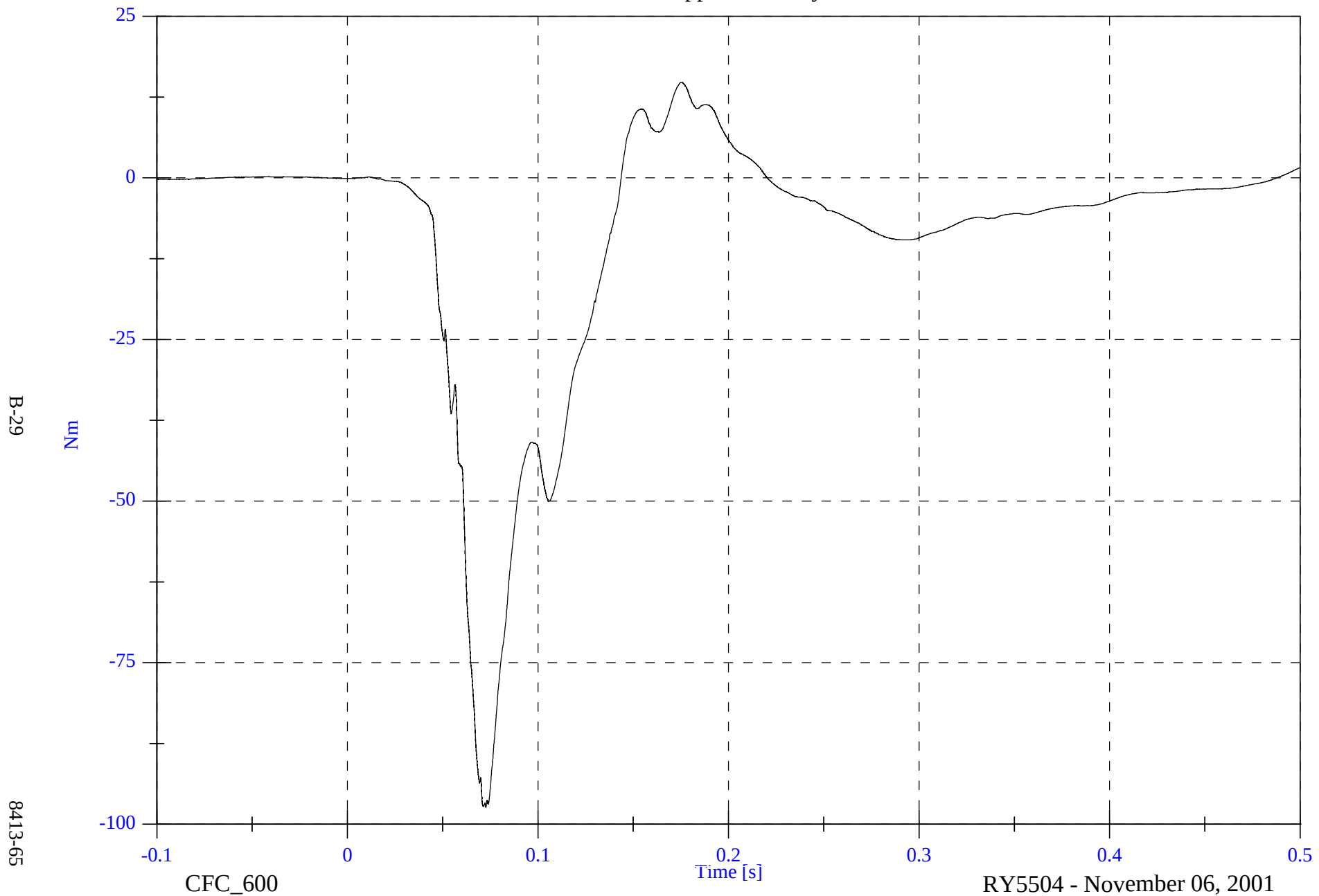


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Upper Neck My

Max: 14.7 [Nm] at 0.175 [s]

Min: -97.4 [Nm] at 0.073 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Upper Neck Mz

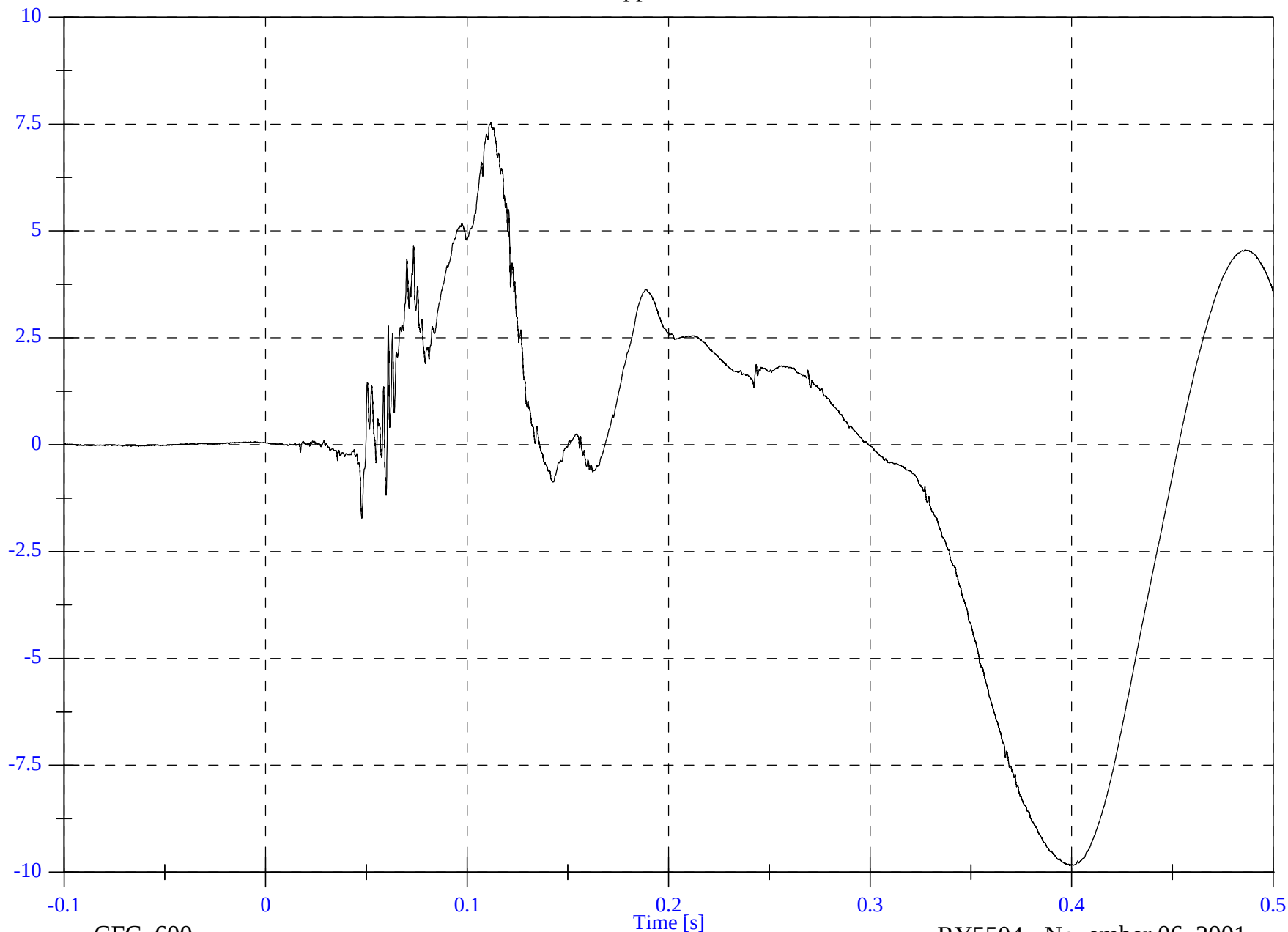
Max: 7.5 [Nm] at 0.112 [s]

Min: -9.8 [Nm] at 0.399 [s]

B-30

Nm

8413-65



CFC\_600

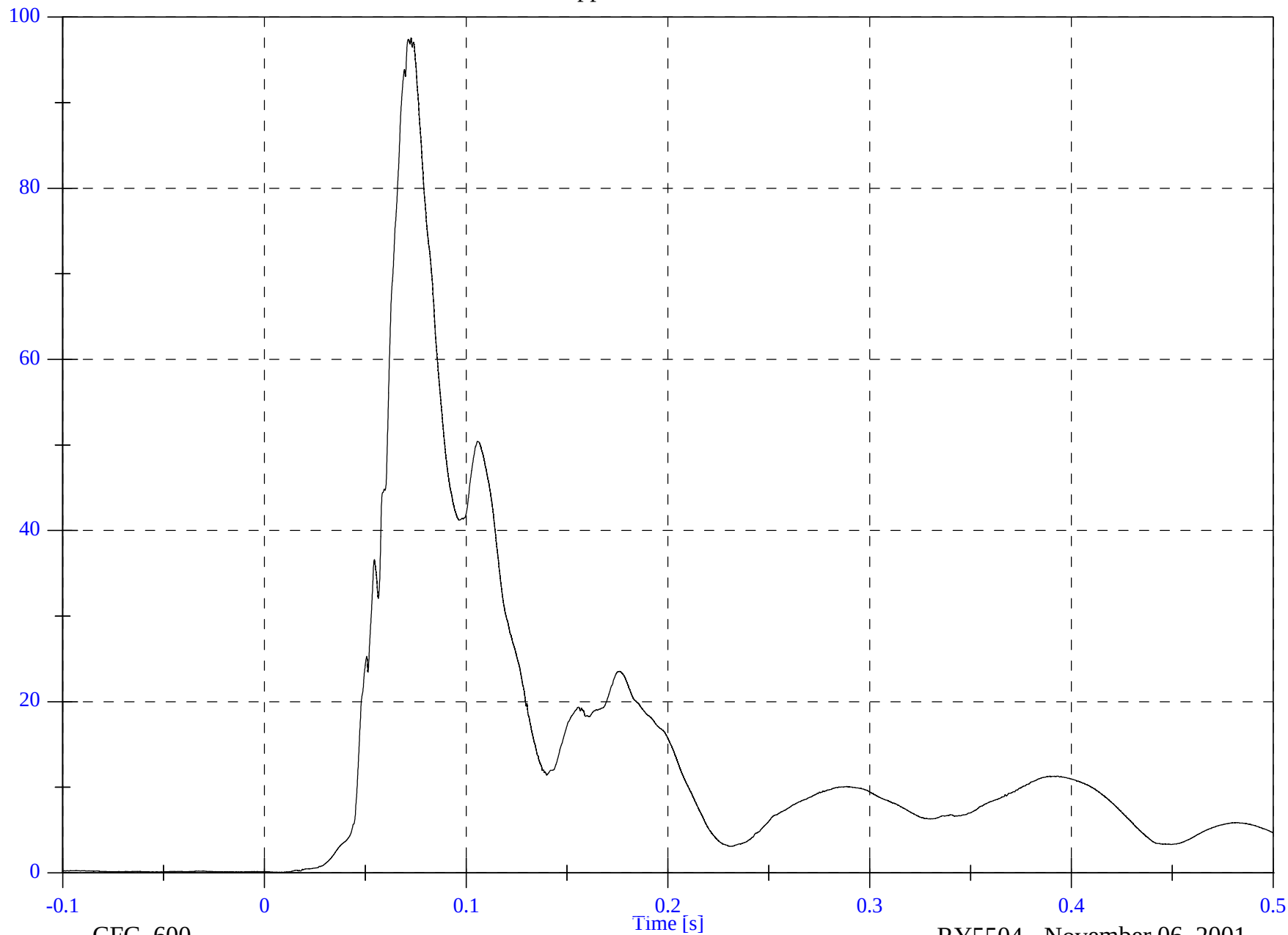
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Upper Neck M Resultant

Max: 97.6 [Nm] at 0.073 [s]

Min: 0.1 [Nm] at 0.009 [s]



B-31

8413-65

CFC\_600

RY5504 - November 06, 2001



40% Frontal Offset Test #9 - 2000 Subaru Legacy

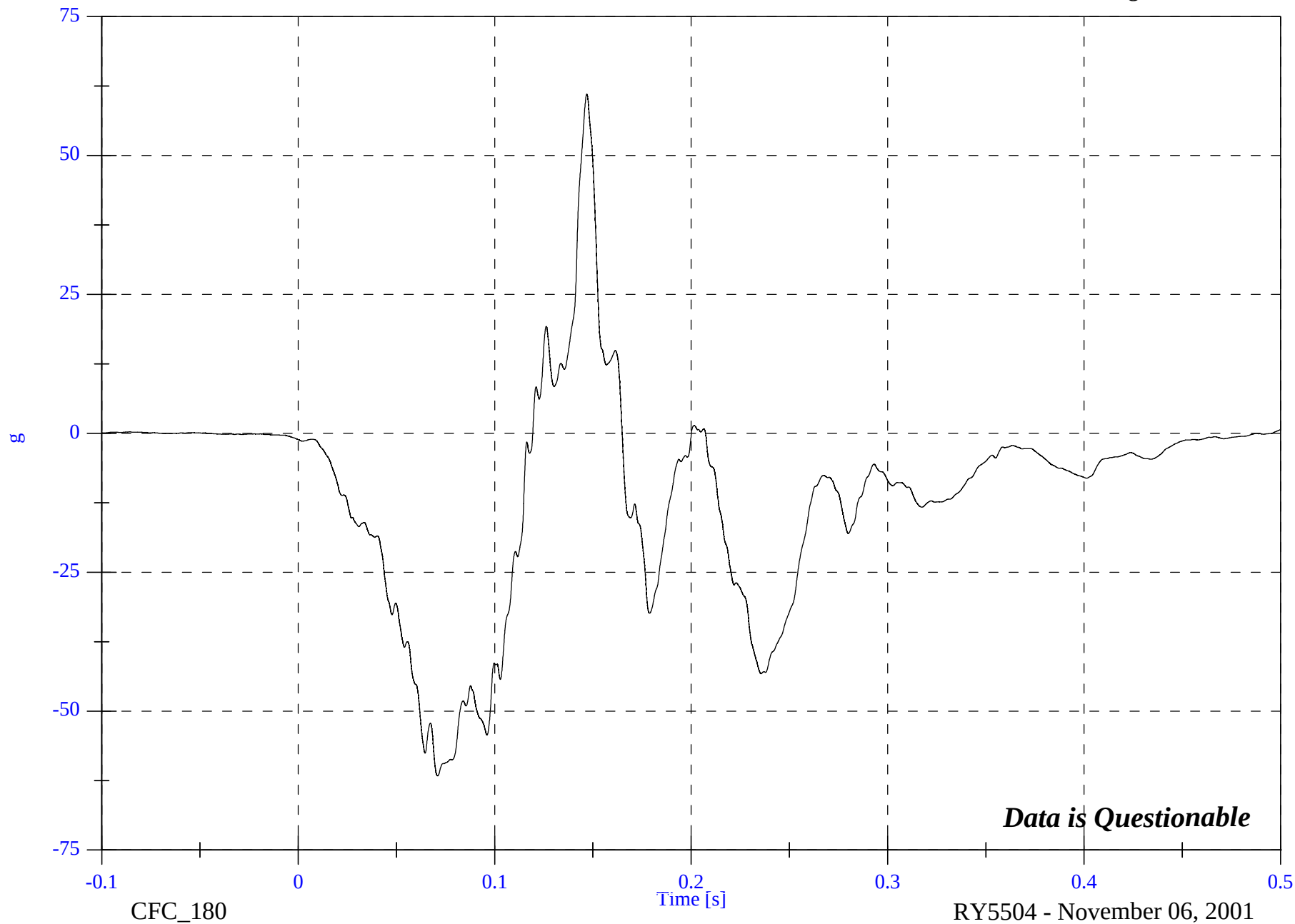
P1 Chest Ax

Max: 61.1 [g] at 0.147 [s]

Min: -61.7 [g] at 0.071 [s]

B-32

8413-65



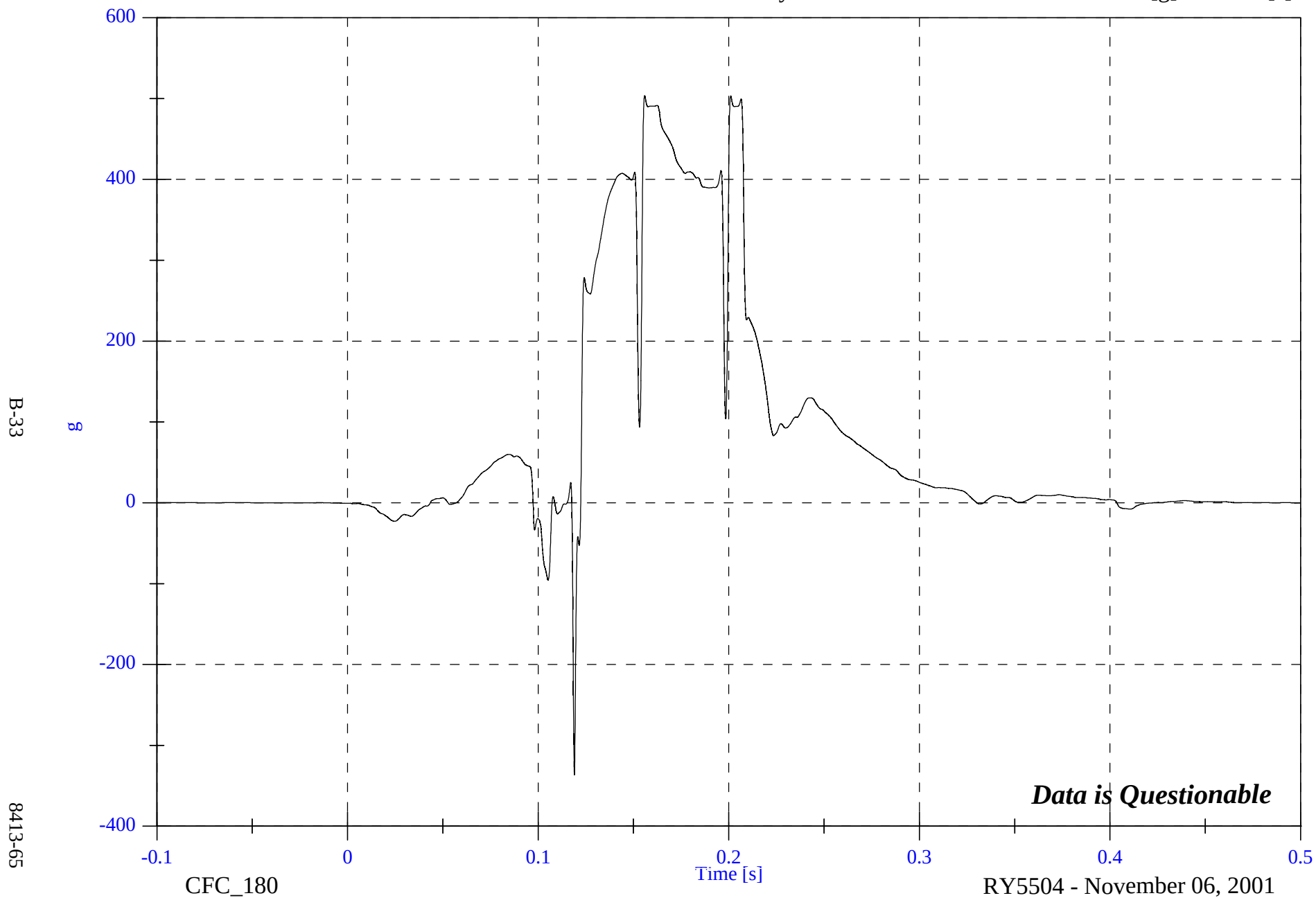
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Chest Ay

Max: 503.4 [g] at 0.156 [s]

Min: -336.7 [g] at 0.119 [s]

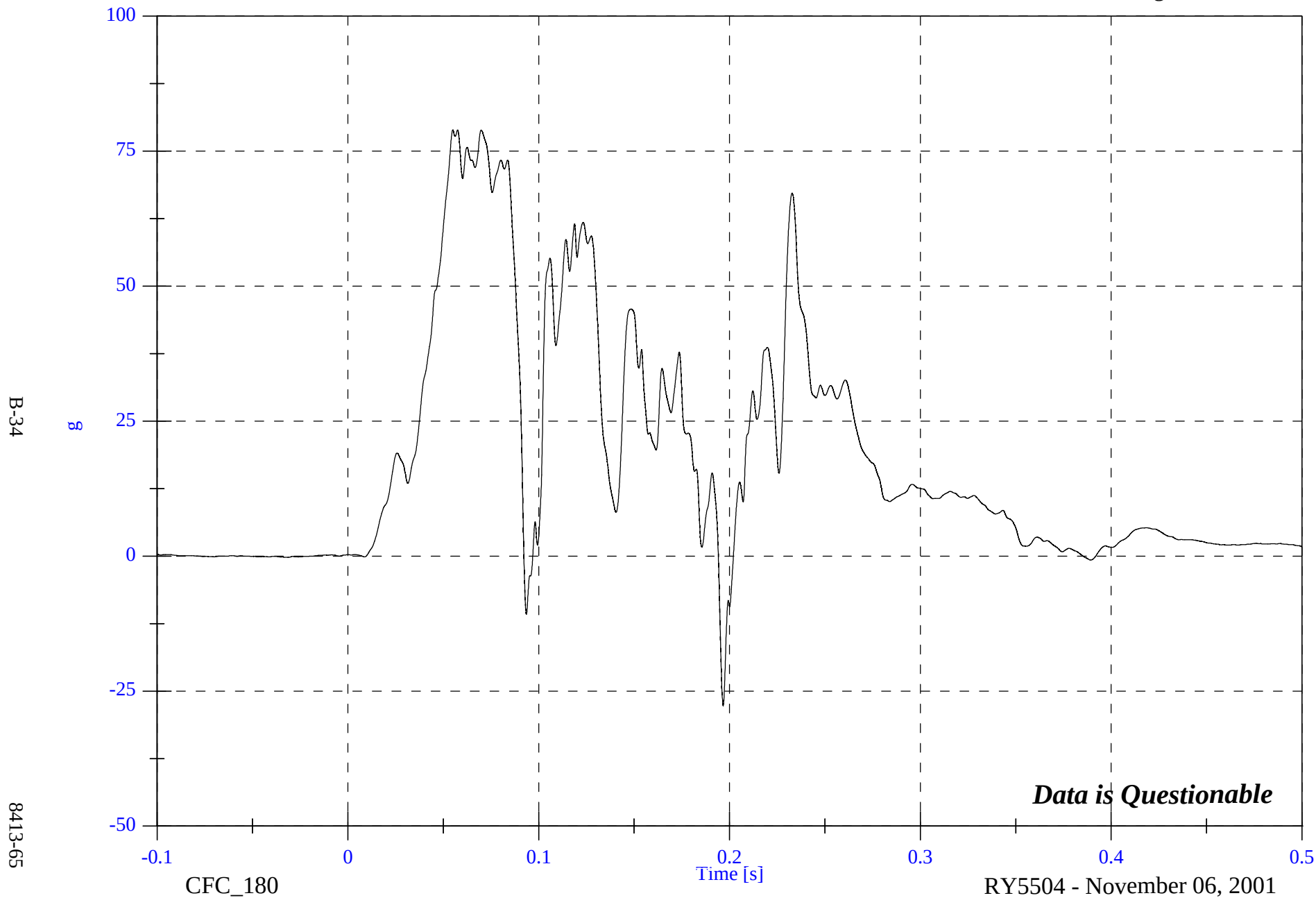


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Chest Az

Max: 79.0 [g] at 0.055 [s]

Min: -27.7 [g] at 0.197 [s]





40% Frontal Offset Test #9 - 2000 Subaru Legacy

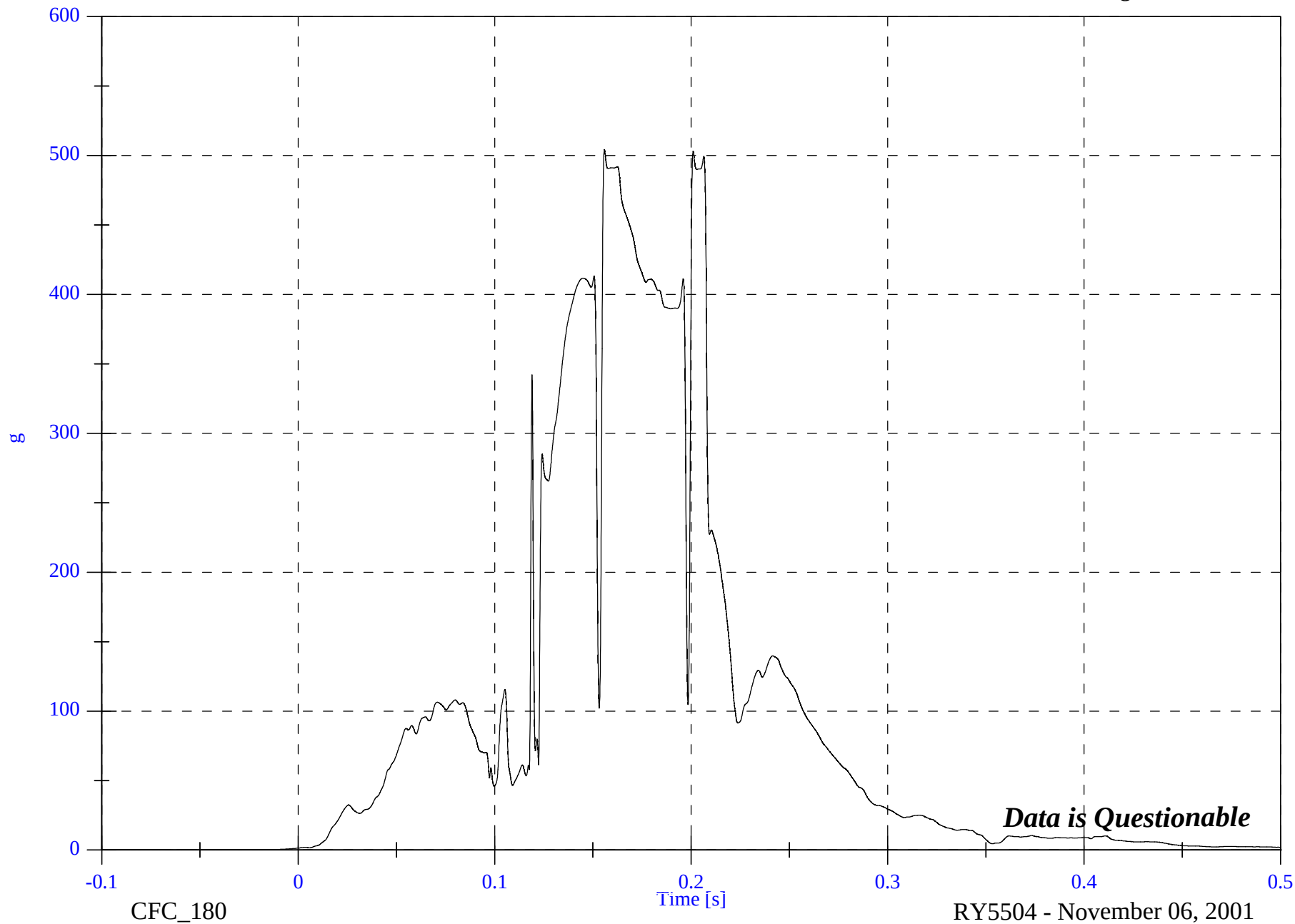
P1 Chest A Resultant

Max: 504.4 [g] at 0.156 [s]

Min: 0.0 [g] at -0.066 [s]

B-35

8413-65

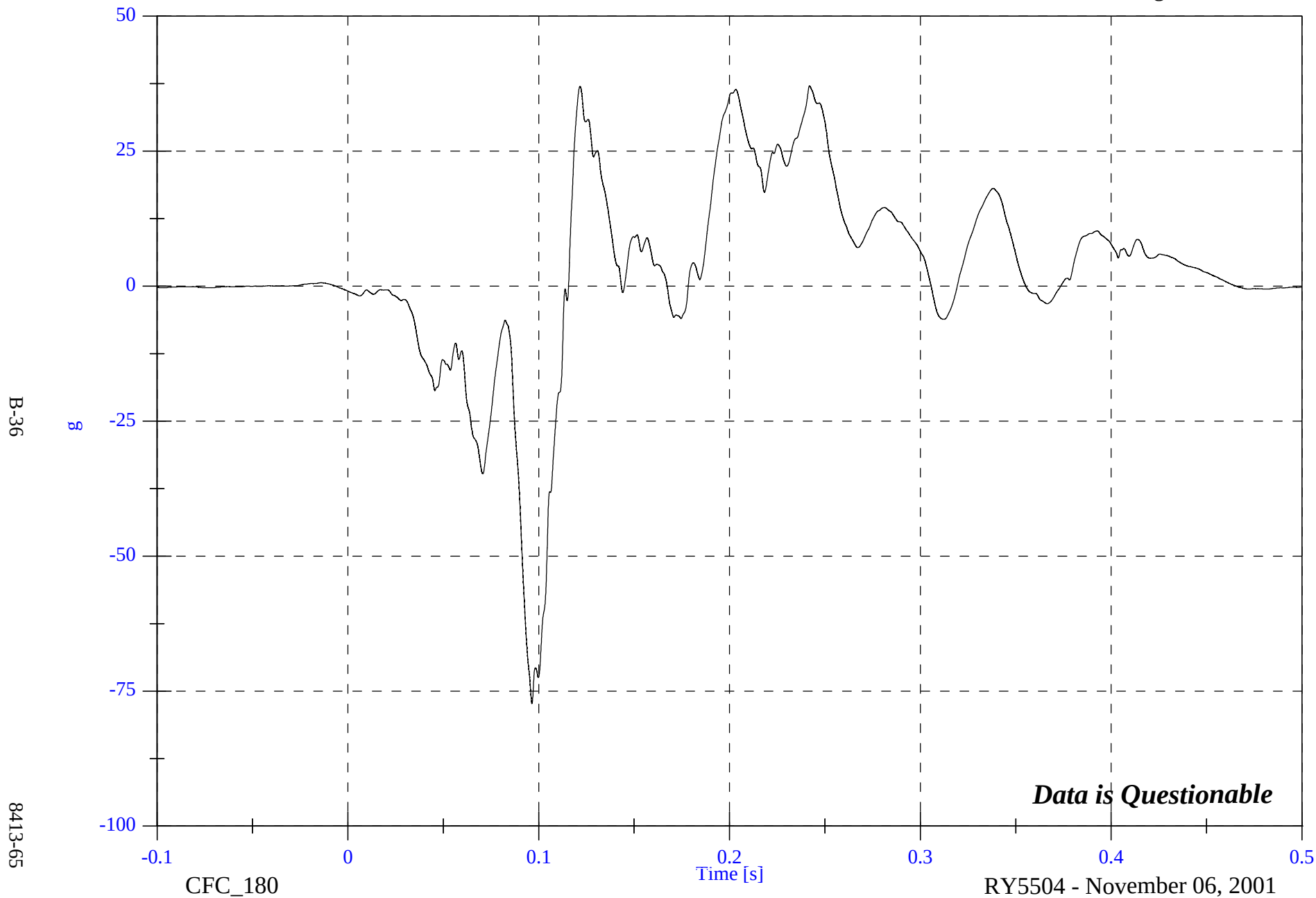


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Chest Red Ax

Max: 37.1 [g] at 0.242 [s]

Min: -77.4 [g] at 0.096 [s]



8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

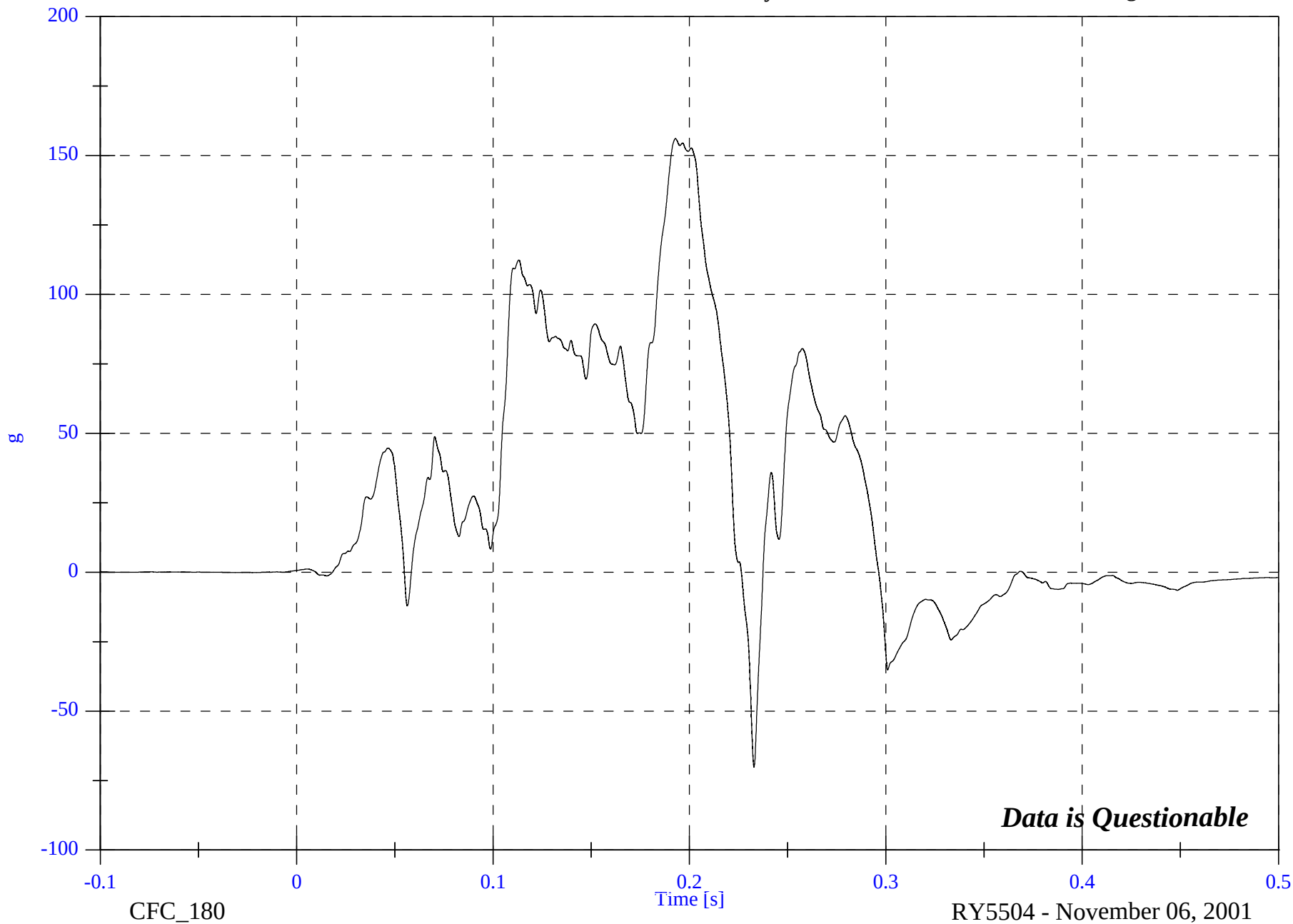
P1 Chest Red Ay

Max: 156.1 [g] at 0.193 [s]

Min: -70.2 [g] at 0.233 [s]

B-37

8413-65



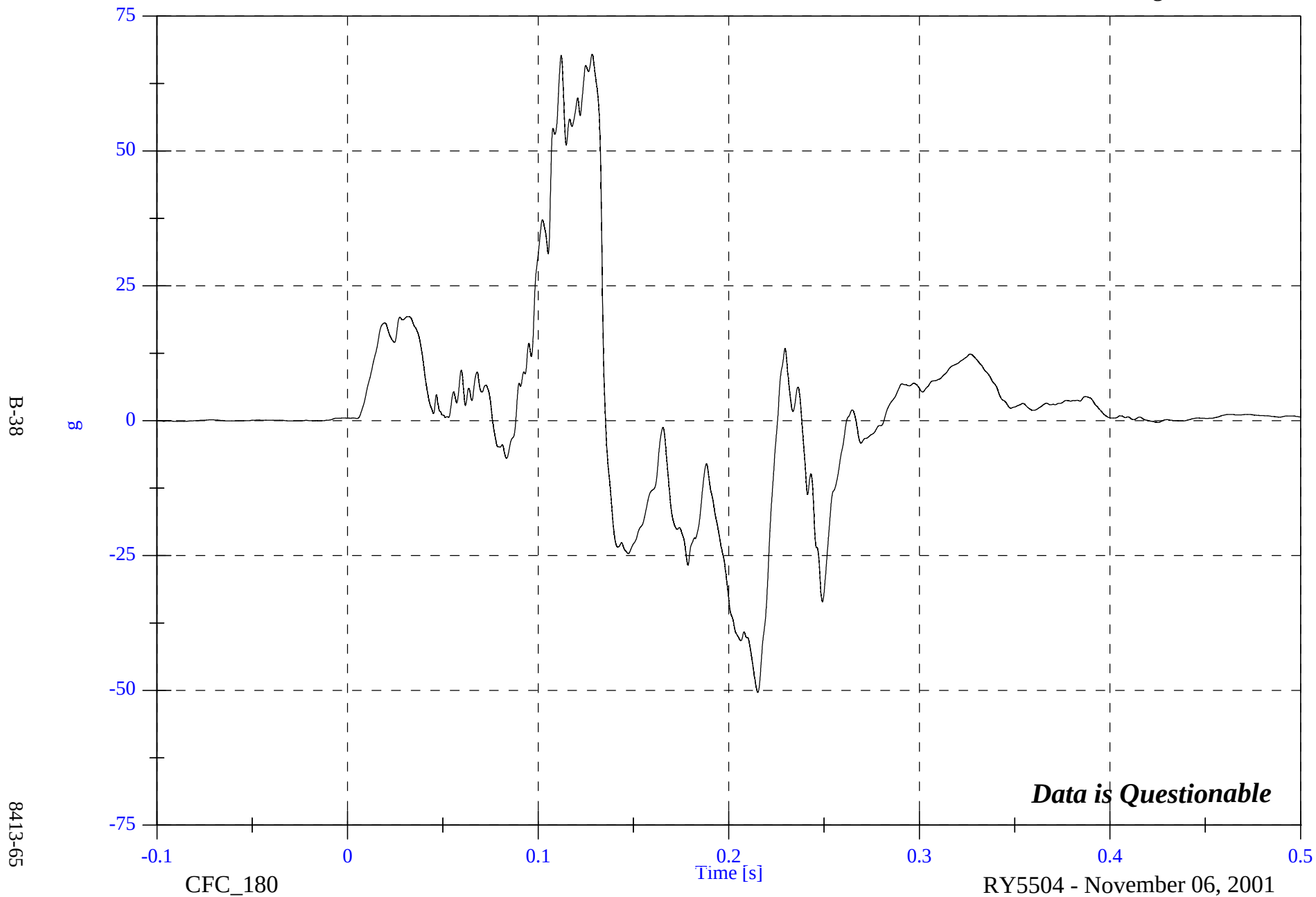


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Chest Red Az

Max: 67.9 [g] at 0.128 [s]

Min: -50.4 [g] at 0.215 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

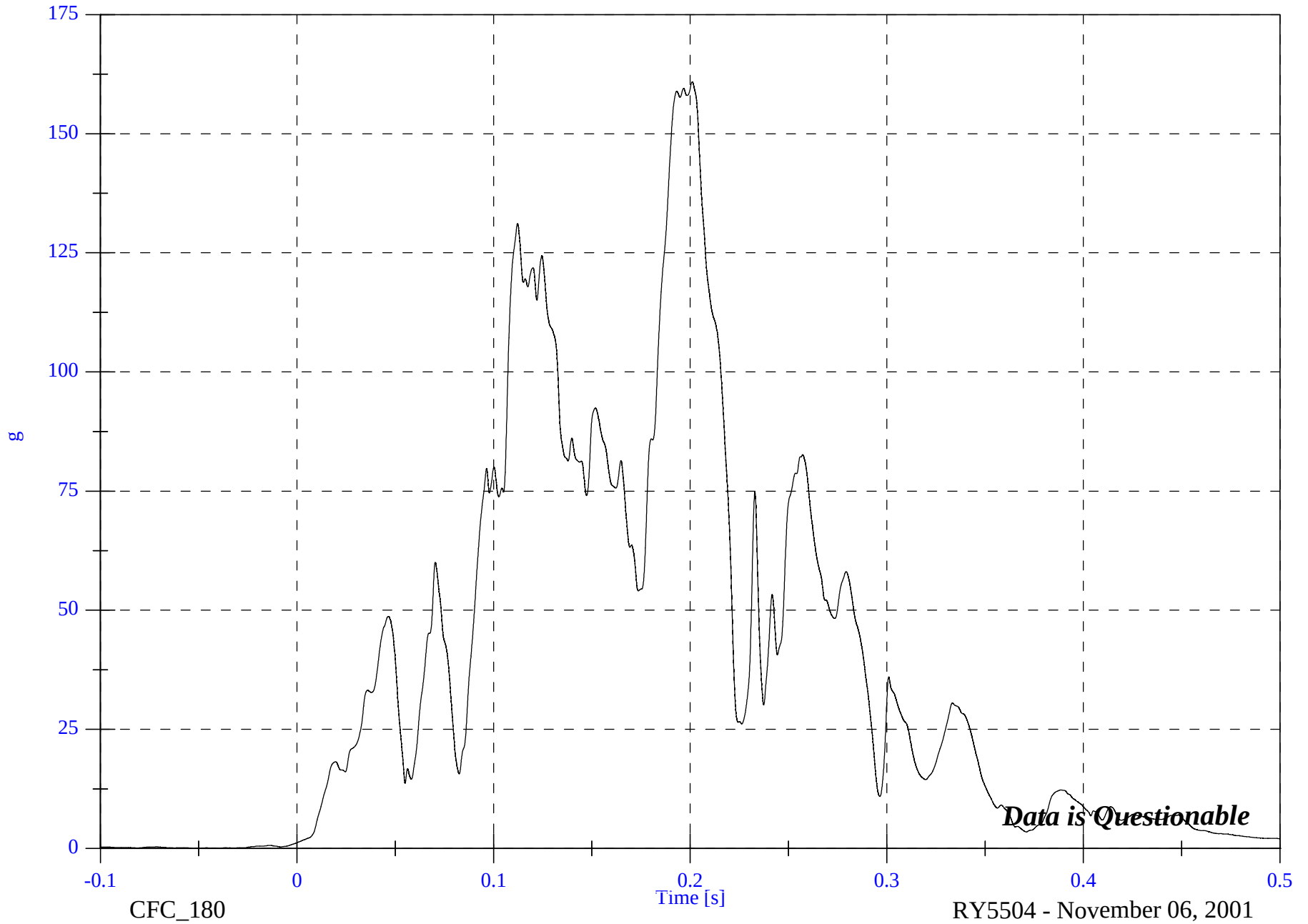
P1 Chest Red A Resultant

Max: 160.9 [g] at 0.201 [s]

Min: 0.0 [g] at -0.053 [s]

B-39

8413-65

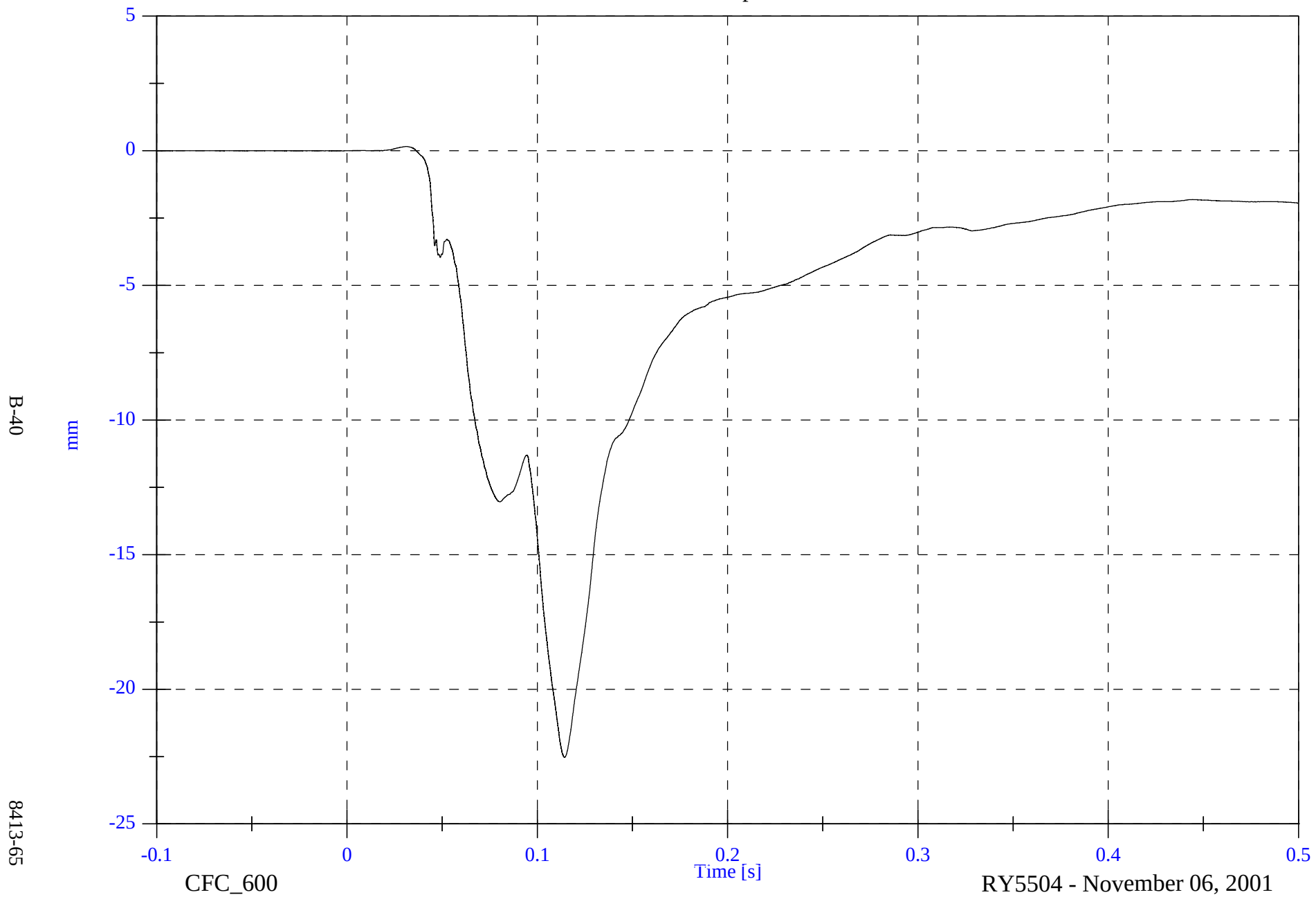


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Chest Displacement

Max: 0.2 [mm] at 0.031 [s]

Min: -22.5 [mm] at 0.114 [s]





40% Frontal Offset Test #9 - 2000 Subaru Legacy

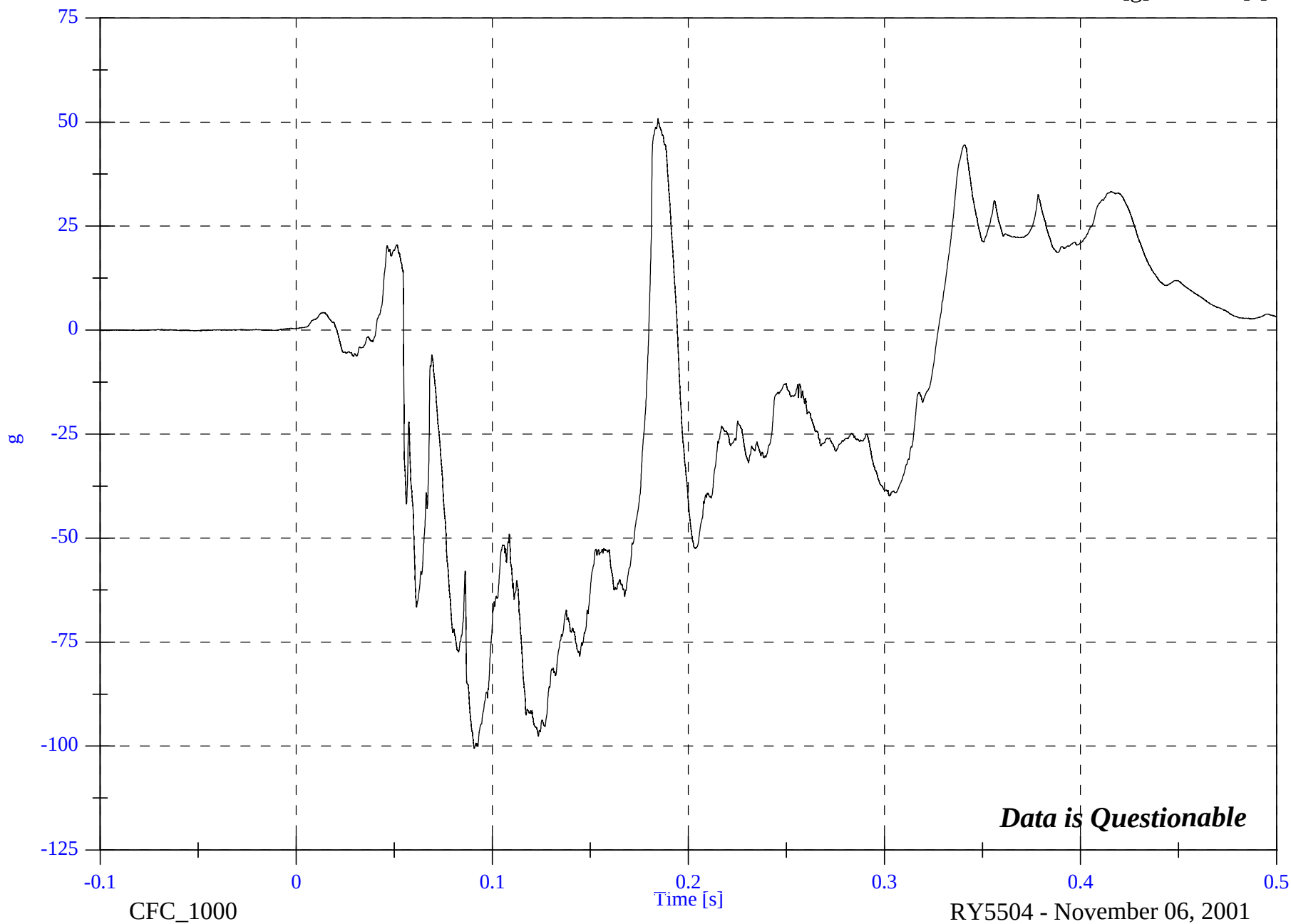
P1 Pelvic Ax

Max: 50.9 [g] at 0.185 [s]

Min: -100.6 [g] at 0.091 [s]

B-41

8413-65



R5Y5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

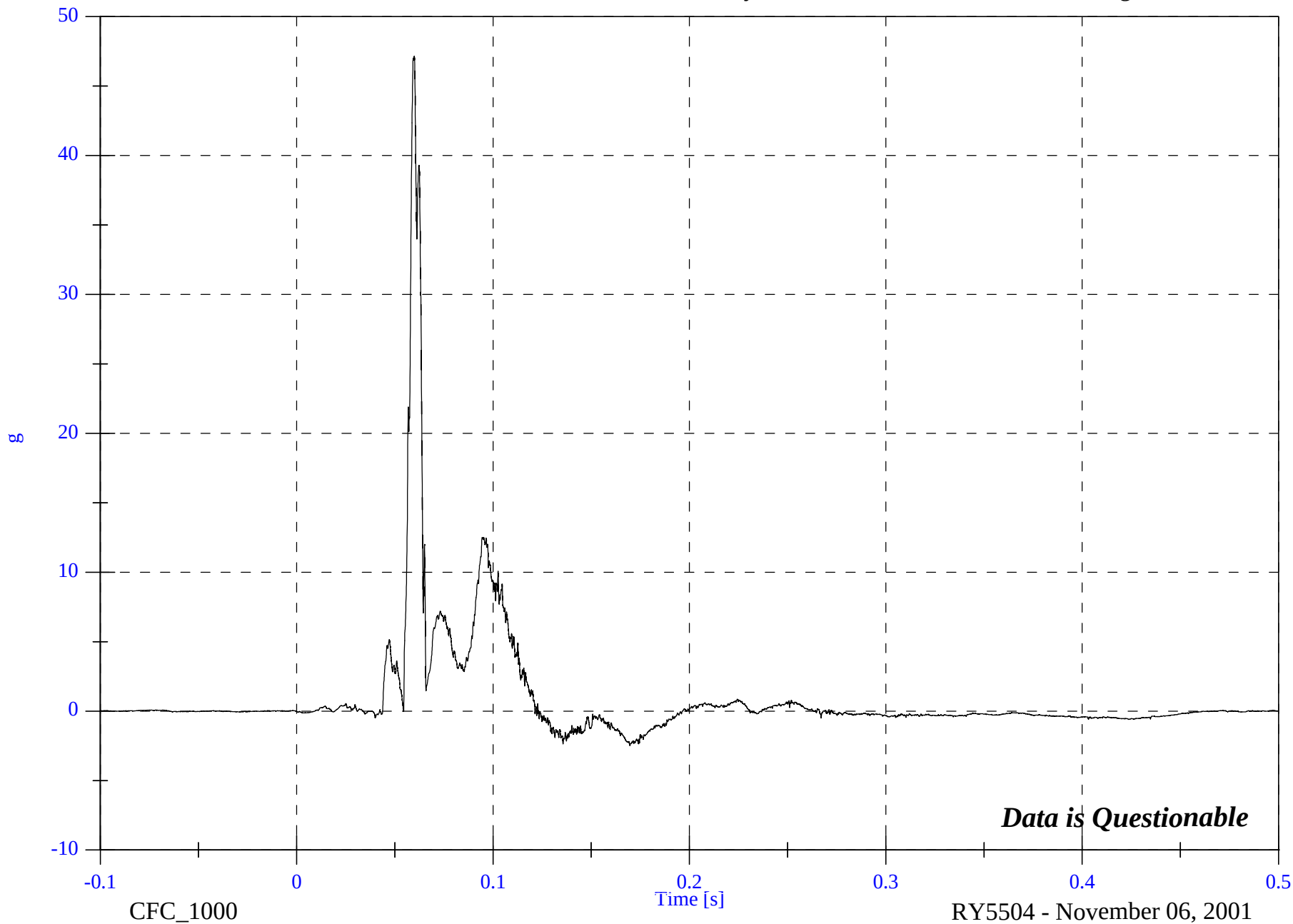
P1 Pelvic Ay

Max: 47.2 [g] at 0.060 [s]

Min: -2.5 [g] at 0.170 [s]

B-42

8413-65



40% Frontal Offset Test #9 - 2000 Subaru Legacy

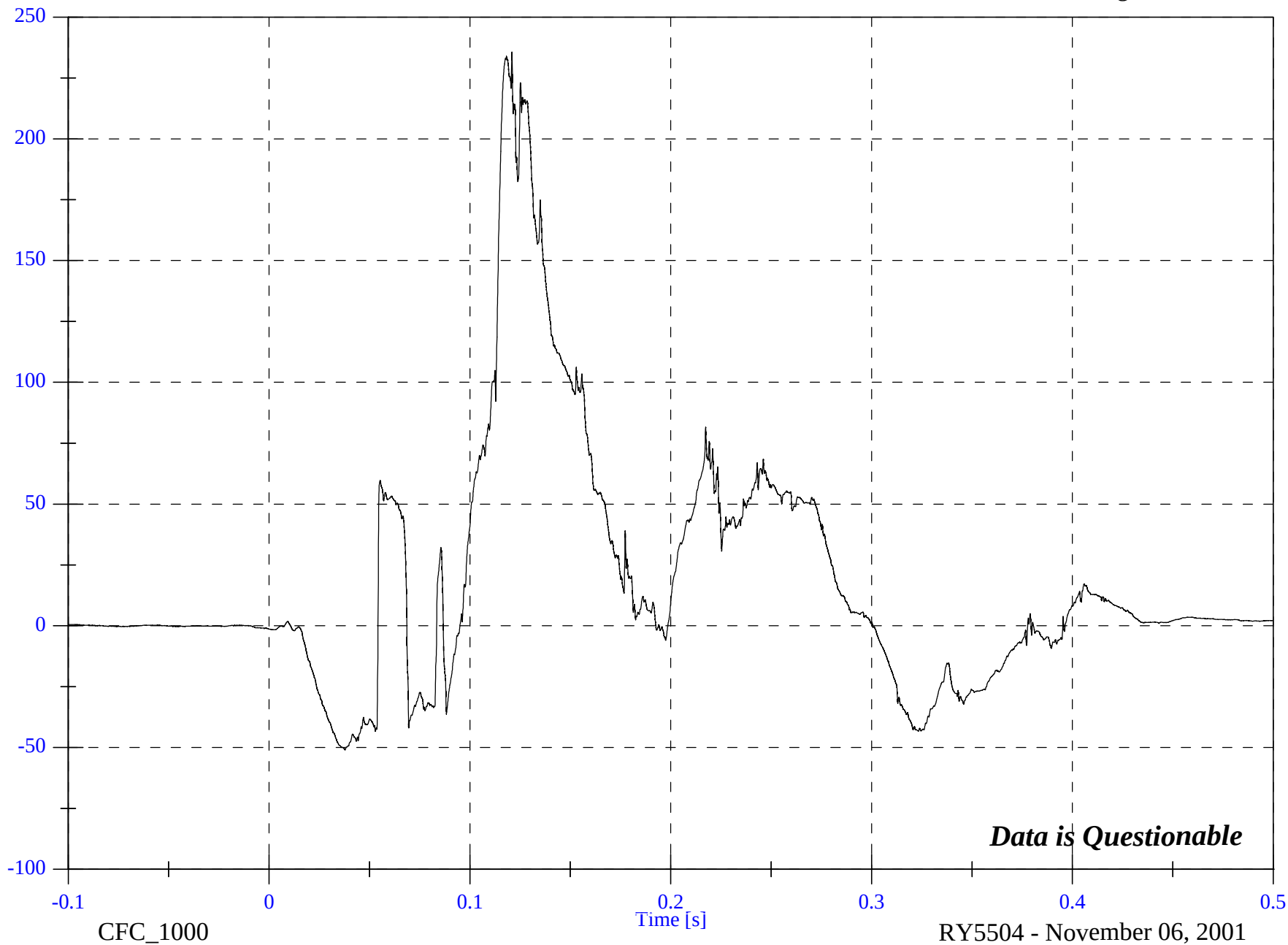
P1 Pelvic Az

Max: 235.7 [g] at 0.121 [s]

Min: -51.0 [g] at 0.038 [s]

B-43

8413-65





40% Frontal Offset Test #9 - 2000 Subaru Legacy

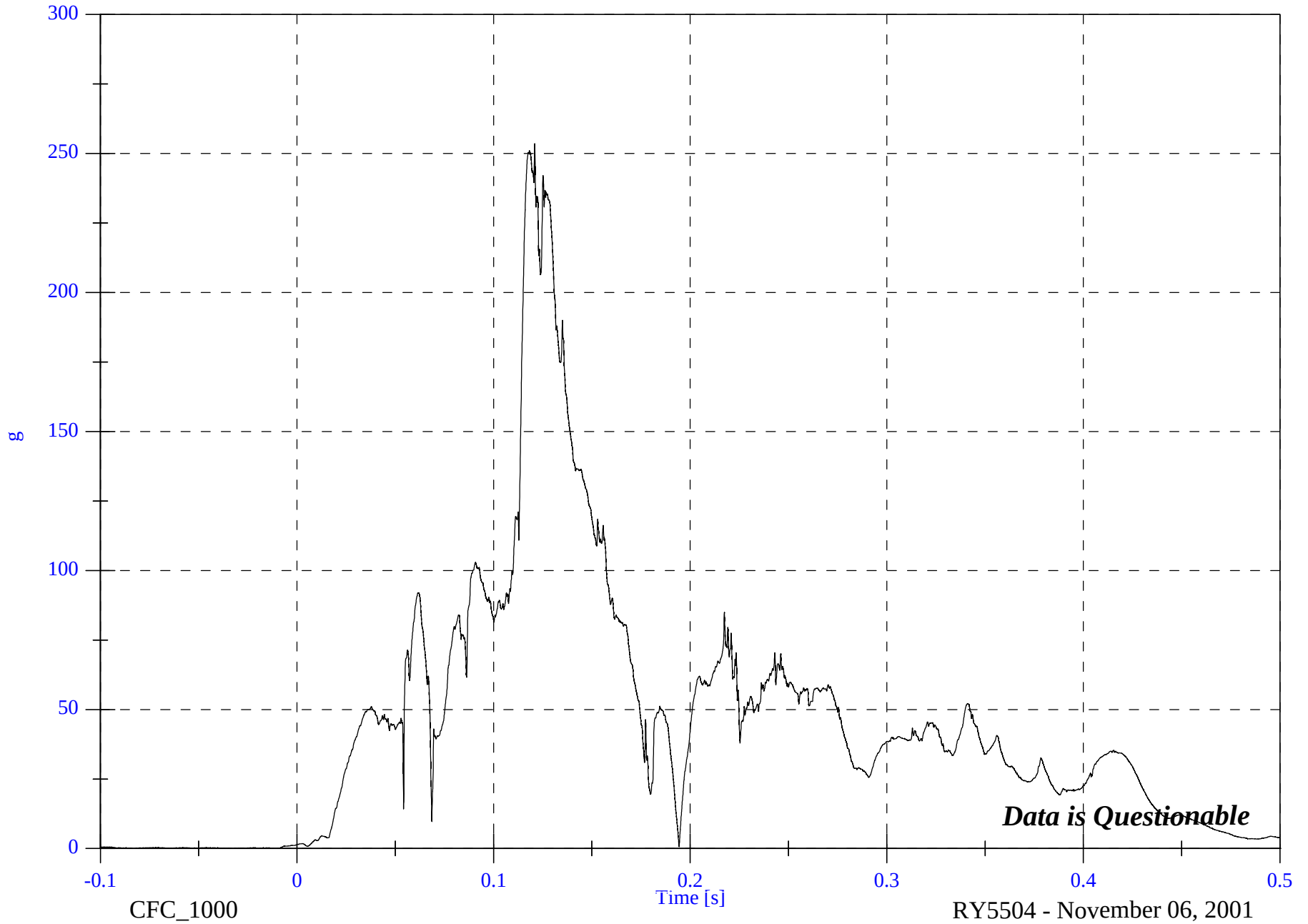
P1 Pelvic A Resultant

Max: 253.6 [g] at 0.121 [s]

Min: 0.0 [g] at -0.083 [s]

B-44

8413-65

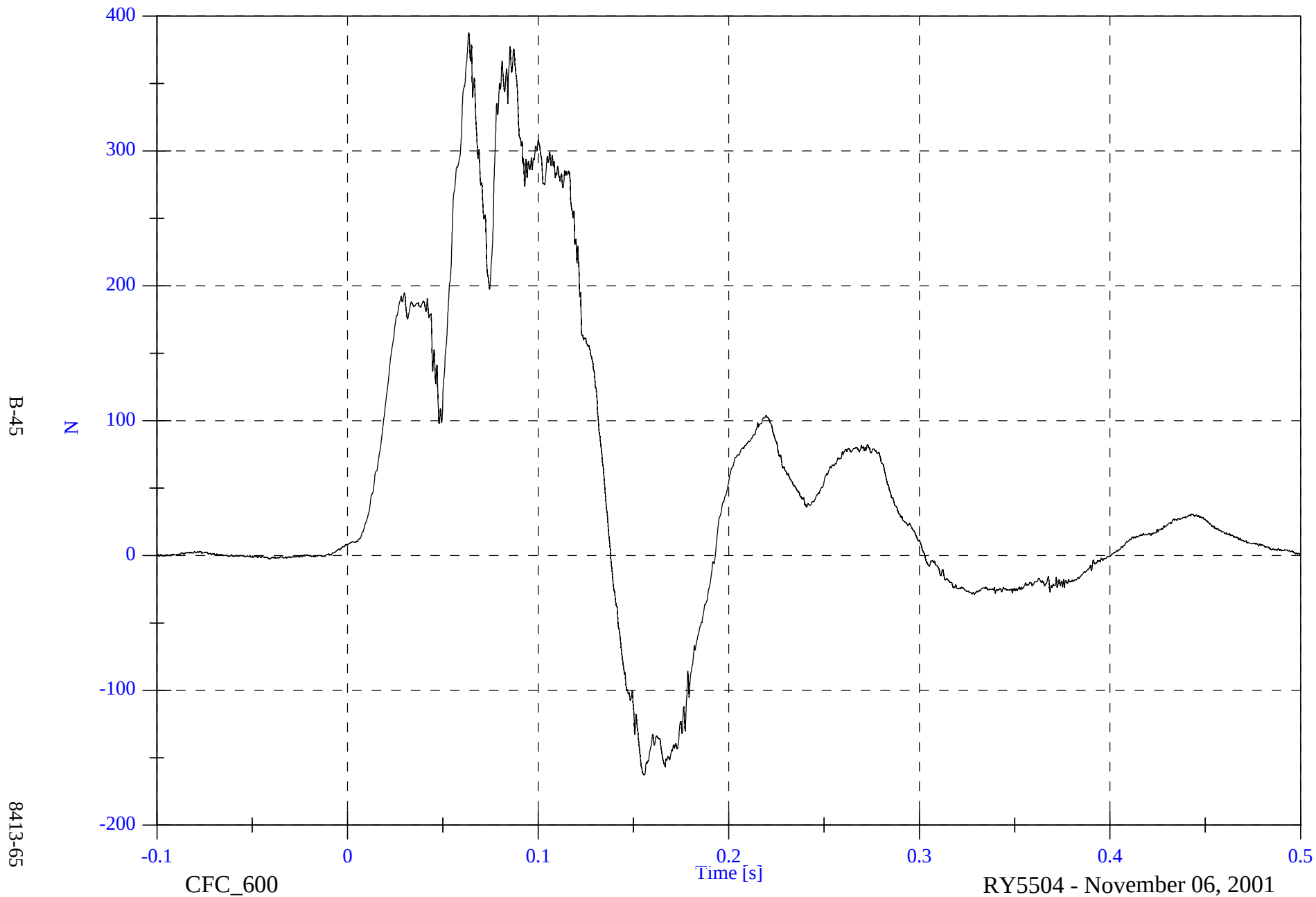


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur Fx

Max: 387.7 [N] at 0.064 [s]

Min: -162.8 [N] at 0.156 [s]

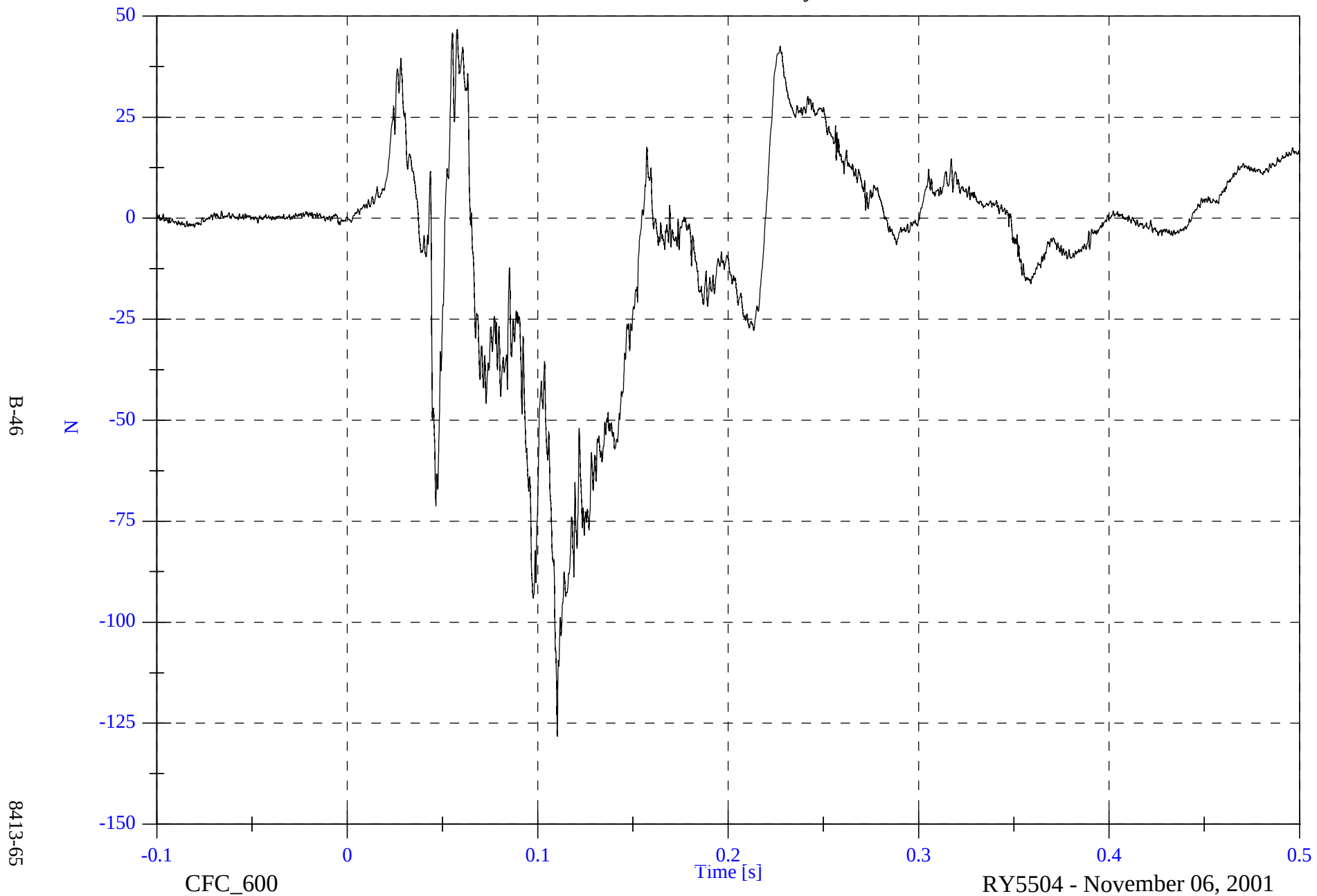


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur Fy

Max: 46.7 [N] at 0.058 [s]

Min: -128.2 [N] at 0.110 [s]



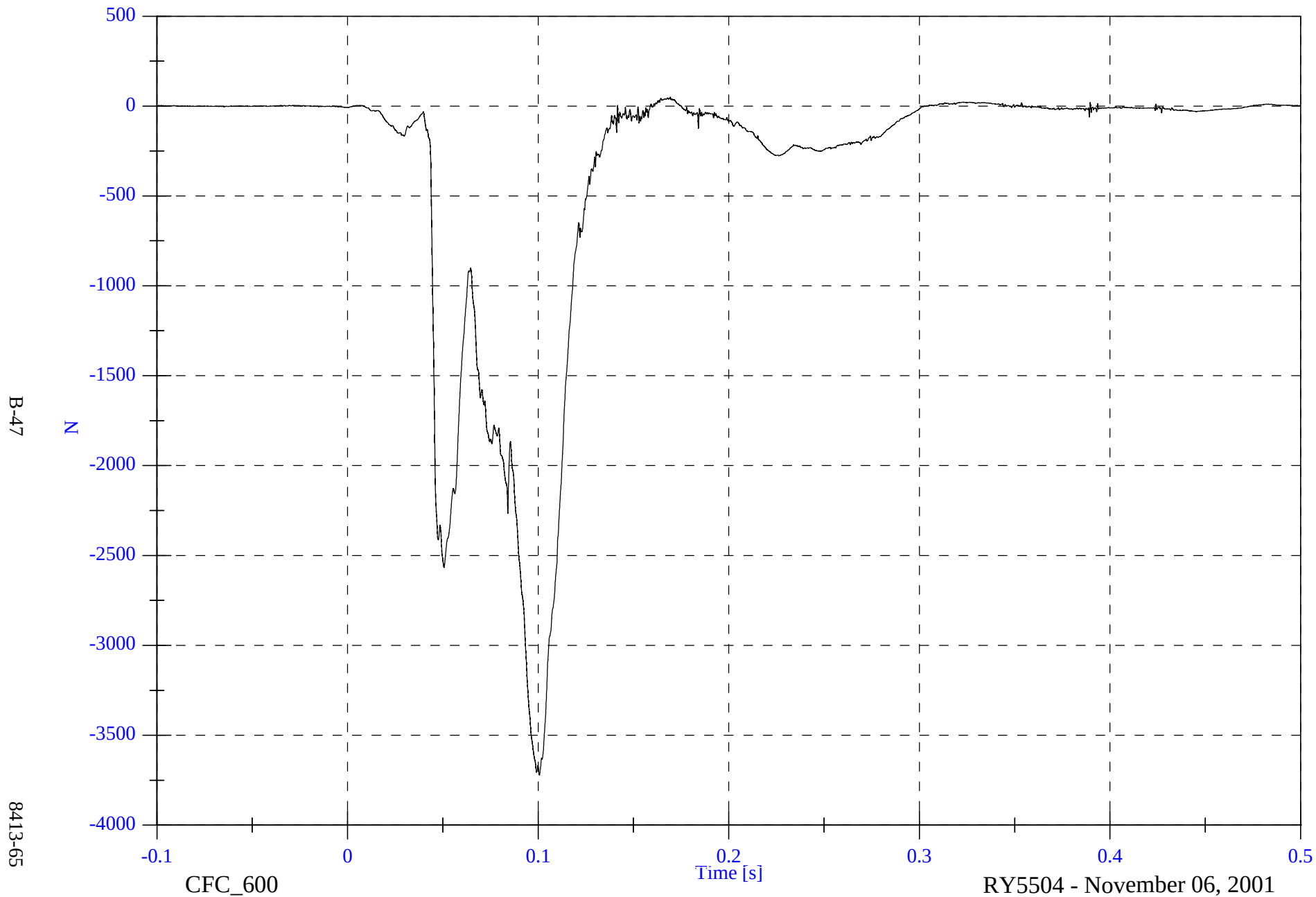


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur Fz

Max: 50.0 [N] at 0.169 [s]

Min: -3721.1 [N] at 0.101 [s]

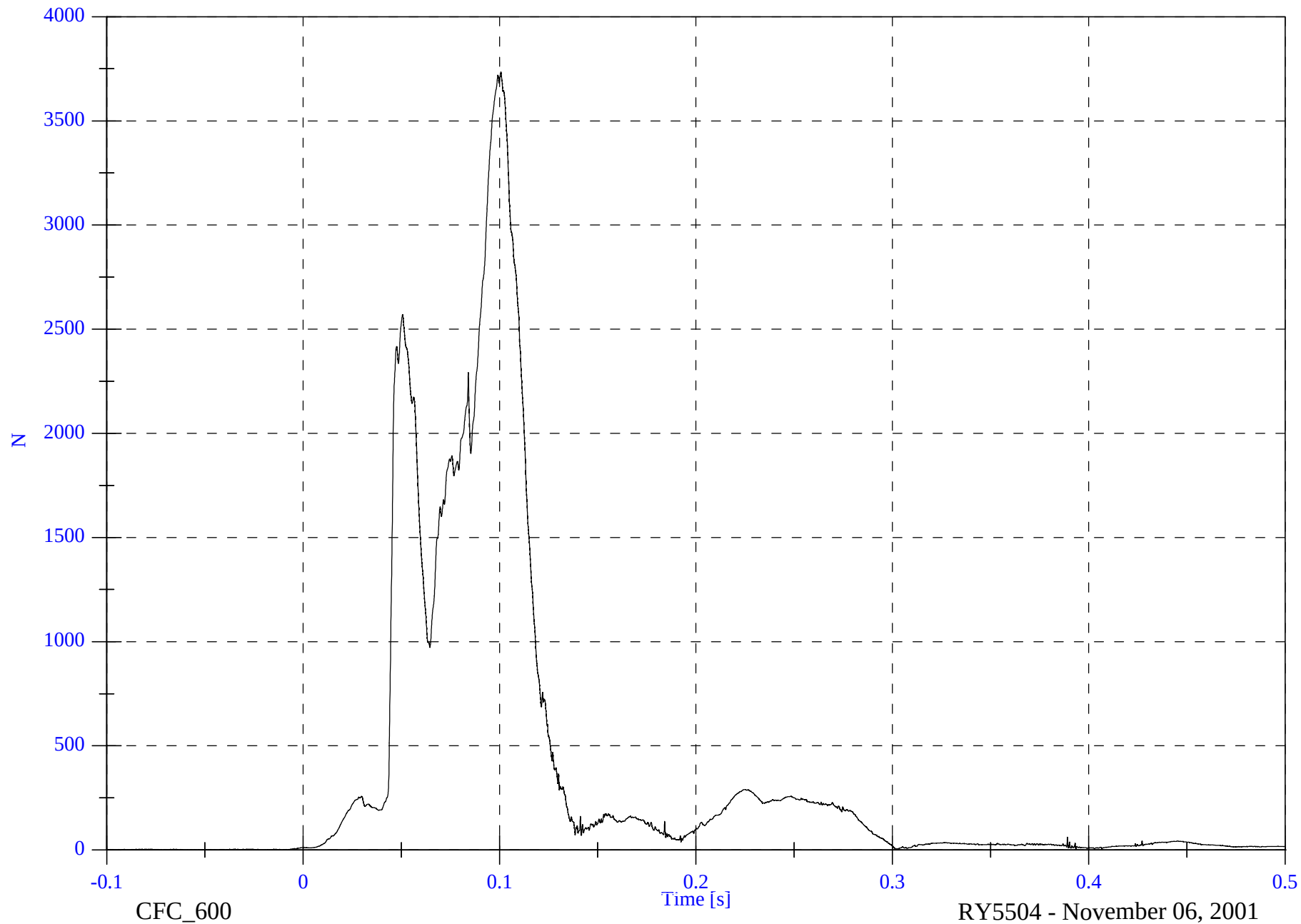


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur F Resultant

Max: 3733.9 [N] at 0.101 [s]

Min: 0.1 [N] at -0.058 [s]

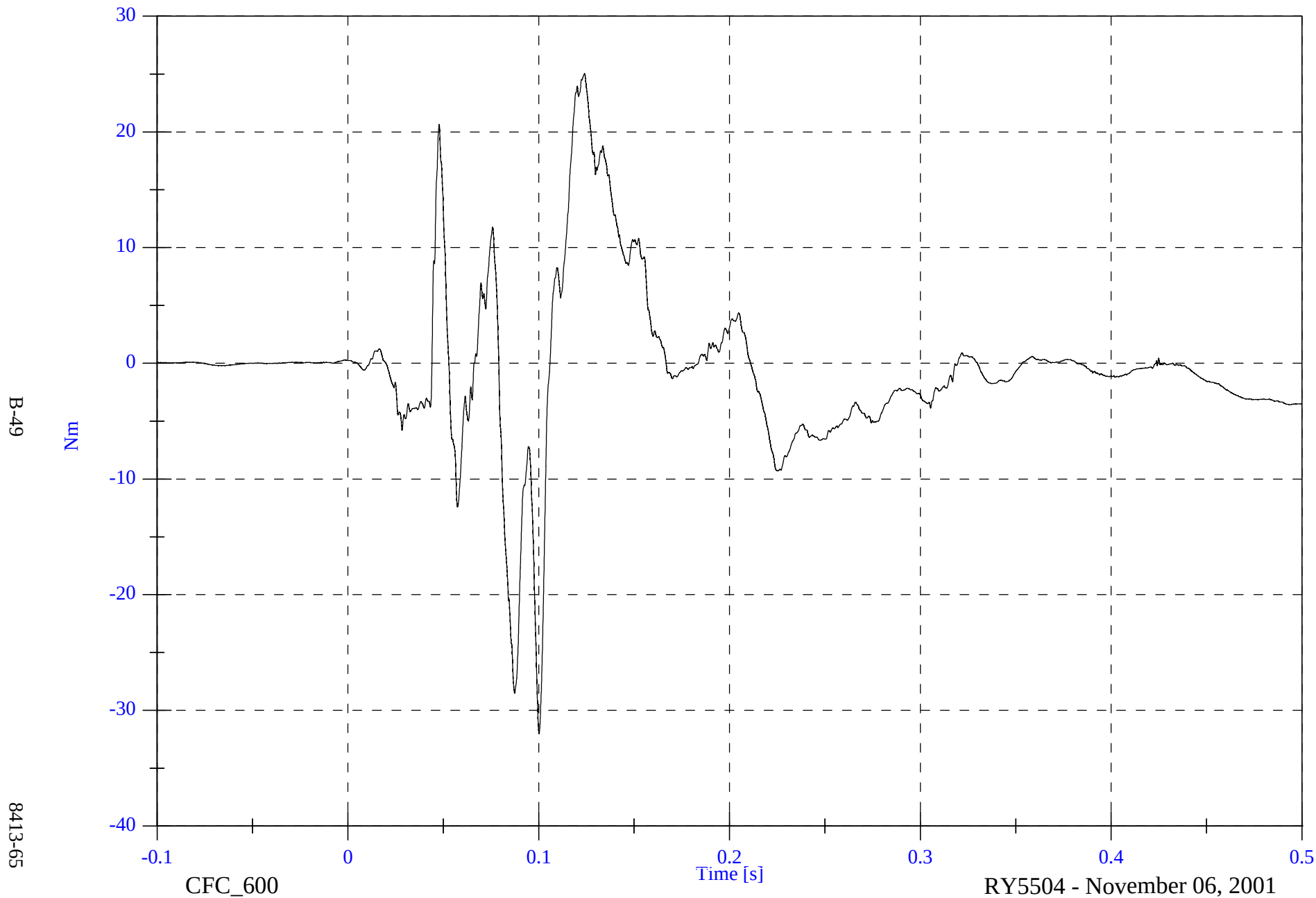


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur Mx

Max: 25.0 [Nm] at 0.124 [s]

Min: -32.0 [Nm] at 0.100 [s]



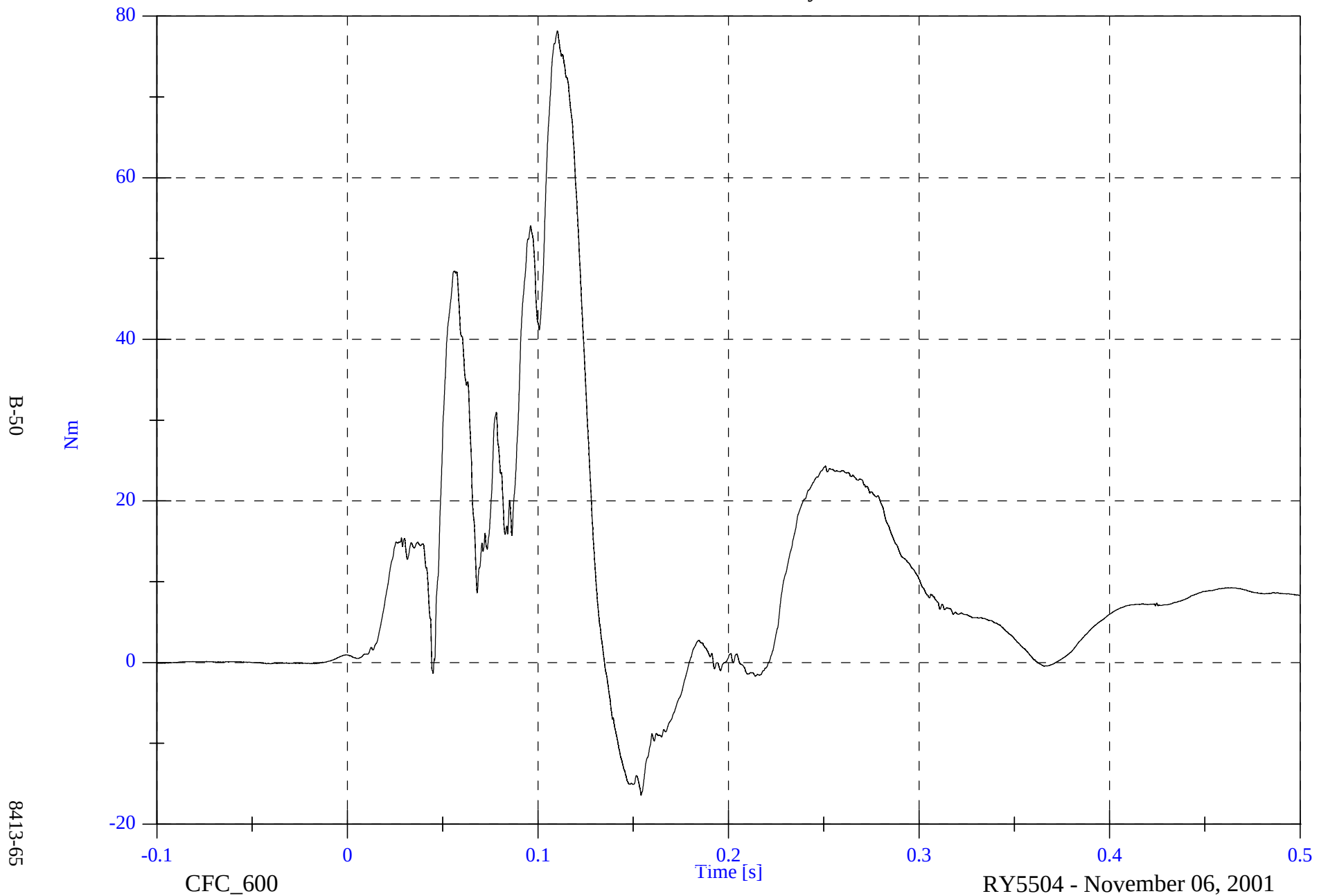


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur My

Max: 78.2 [Nm] at 0.110 [s]

Min: -16.4 [Nm] at 0.154 [s]

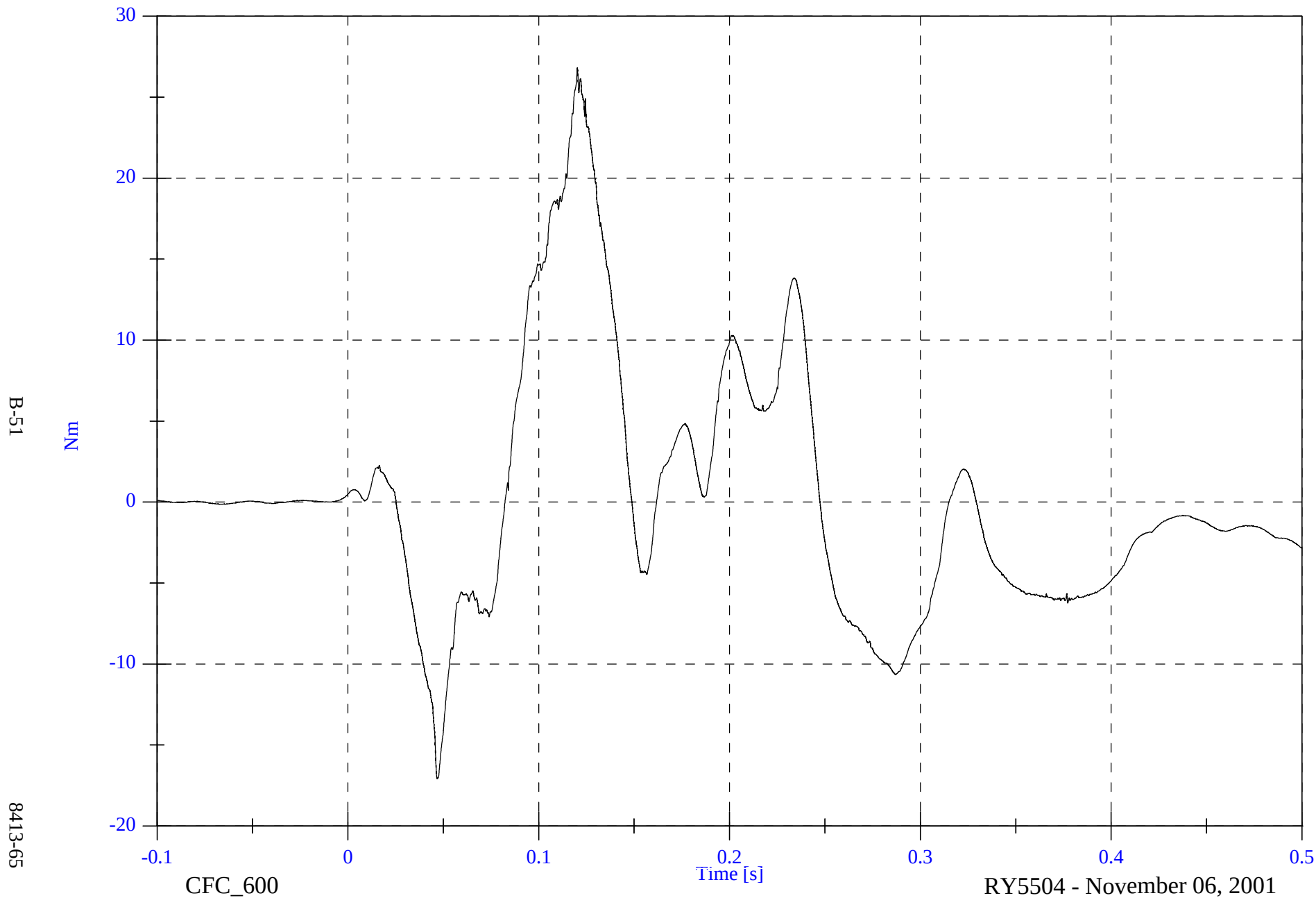


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur Mz

Max: 26.8 [Nm] at 0.120 [s]

Min: -17.1 [Nm] at 0.047 [s]

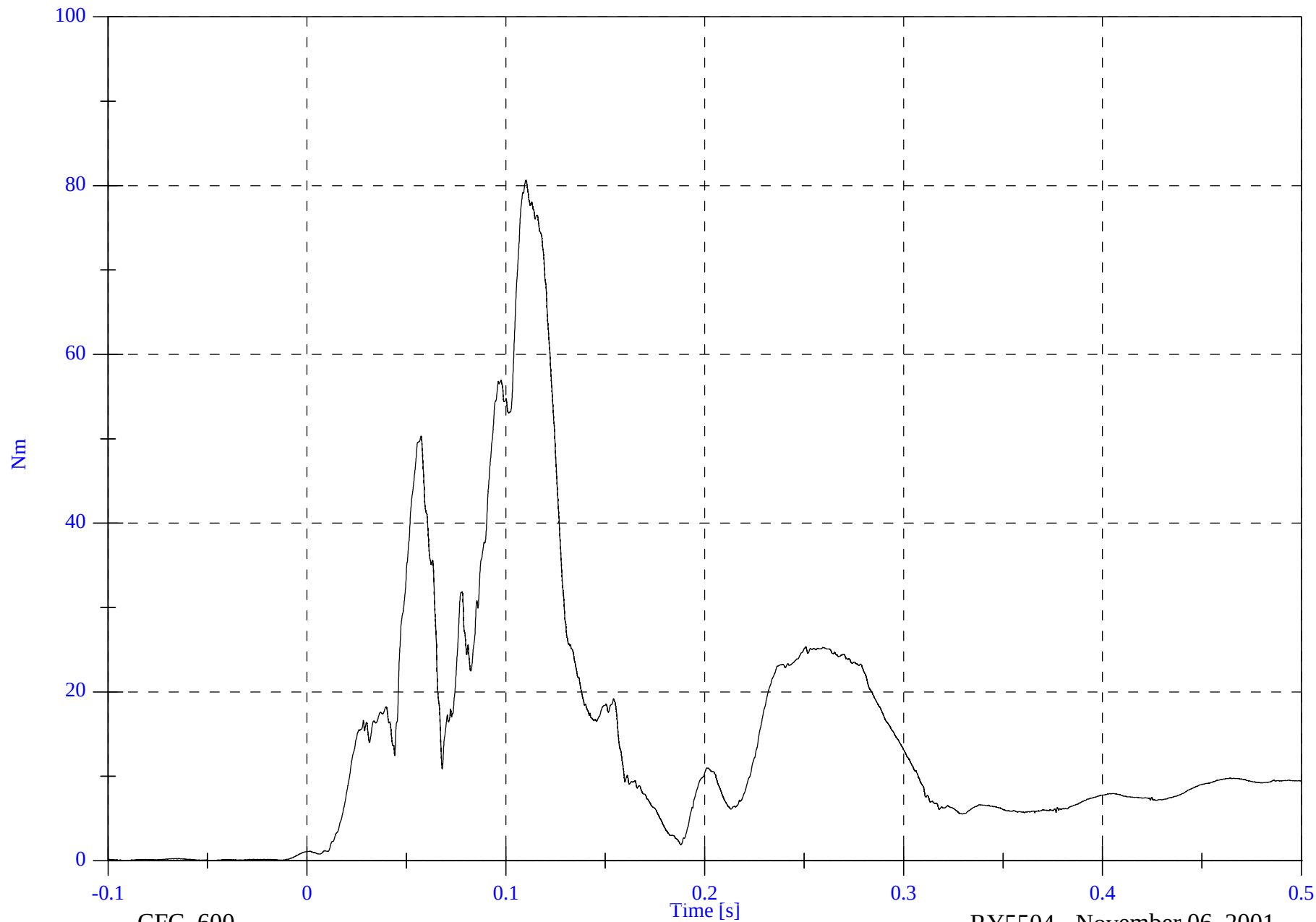


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Femur M Resultant

Max: 80.7 [Nm] at 0.110 [s]

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



B-52

8413-65

CFC\_600

RY5504 - November 06, 2001

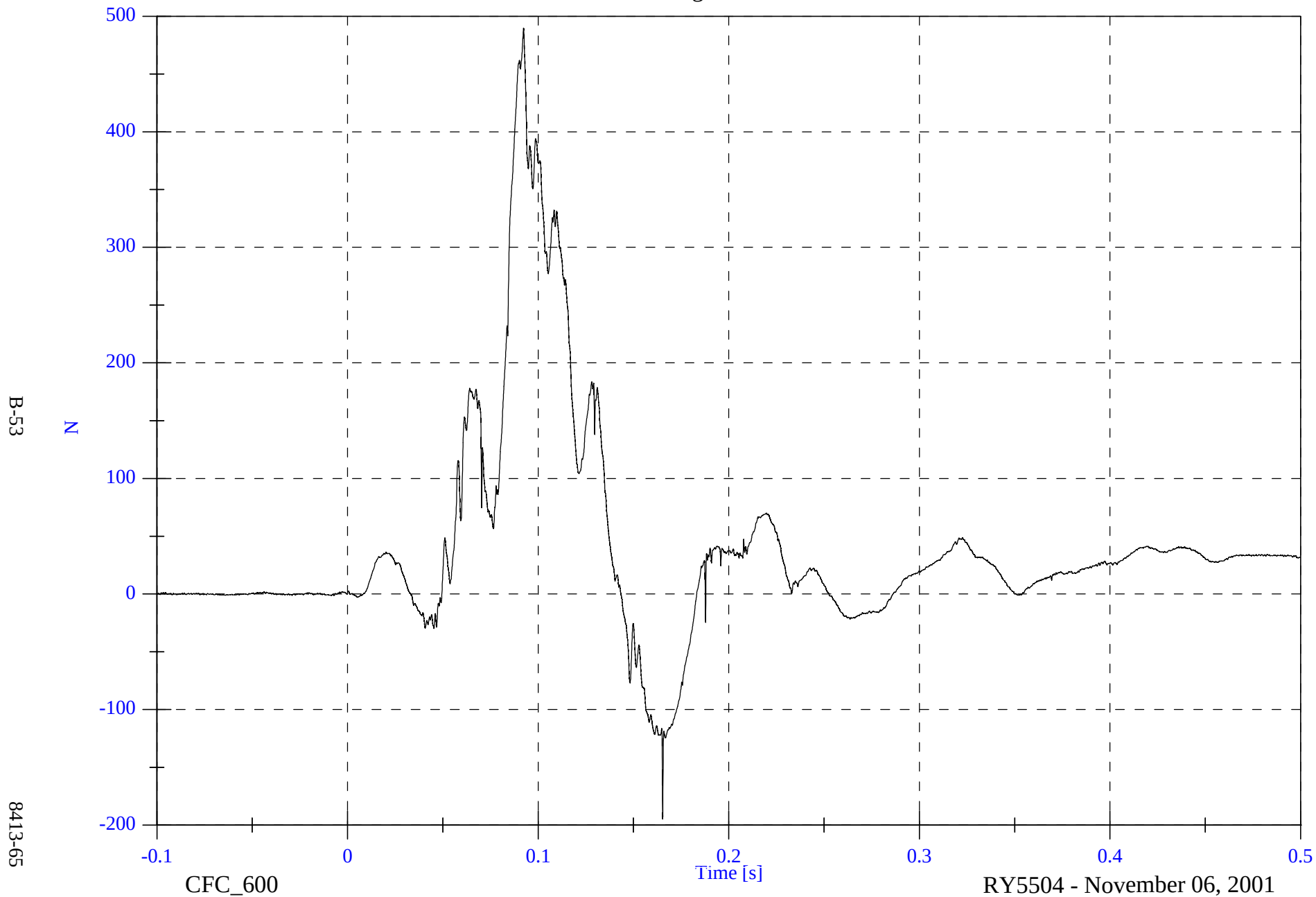


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Femur Fx

Max: 489.7 [N] at 0.092 [s]

Min: -194.7 [N] at 0.165 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Femur Fy

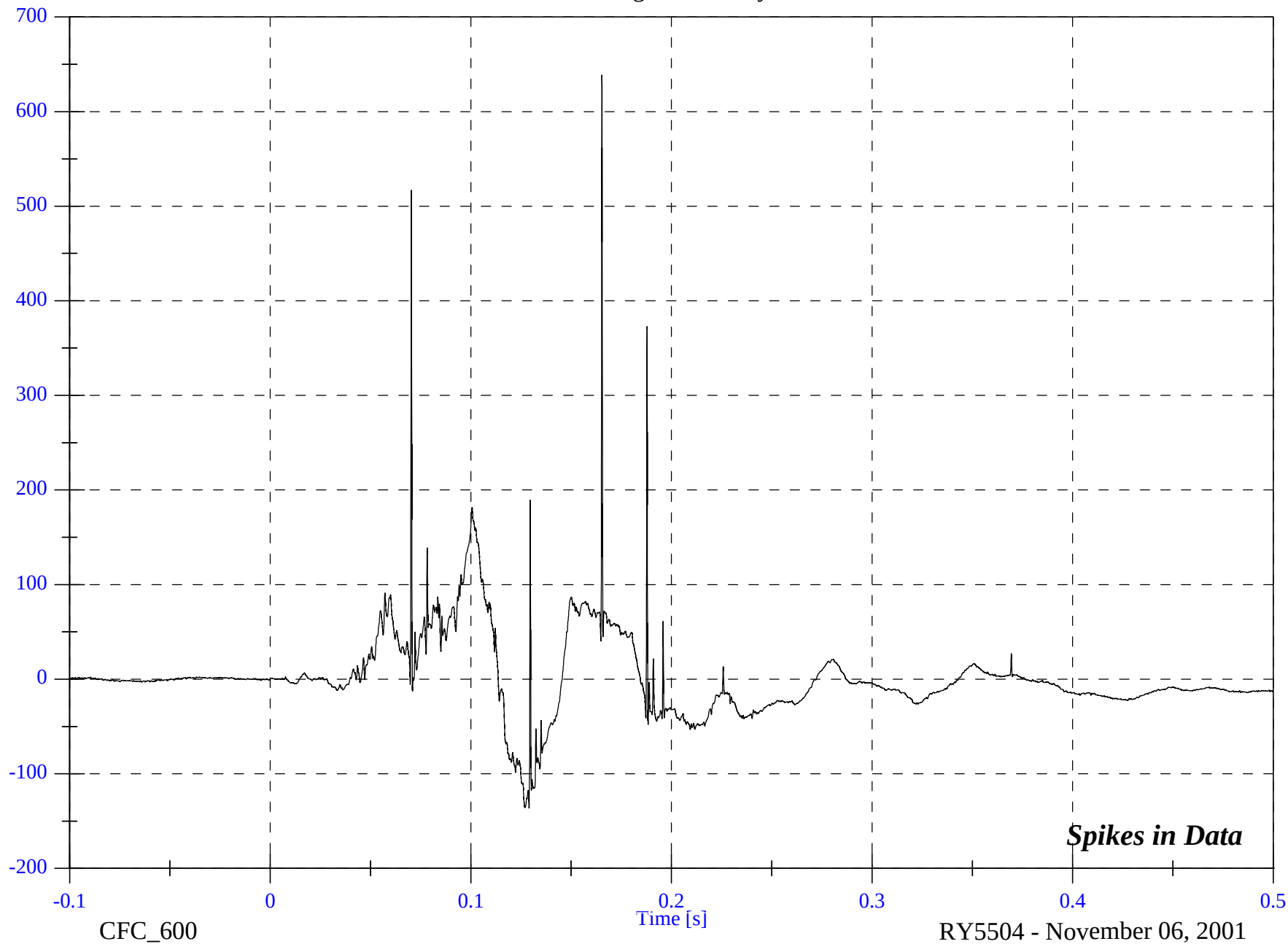
Max: 638.8 [N] at 0.165 [s]

Min: -136.3 [N] at 0.129 [s]

B-54

N

8413-65

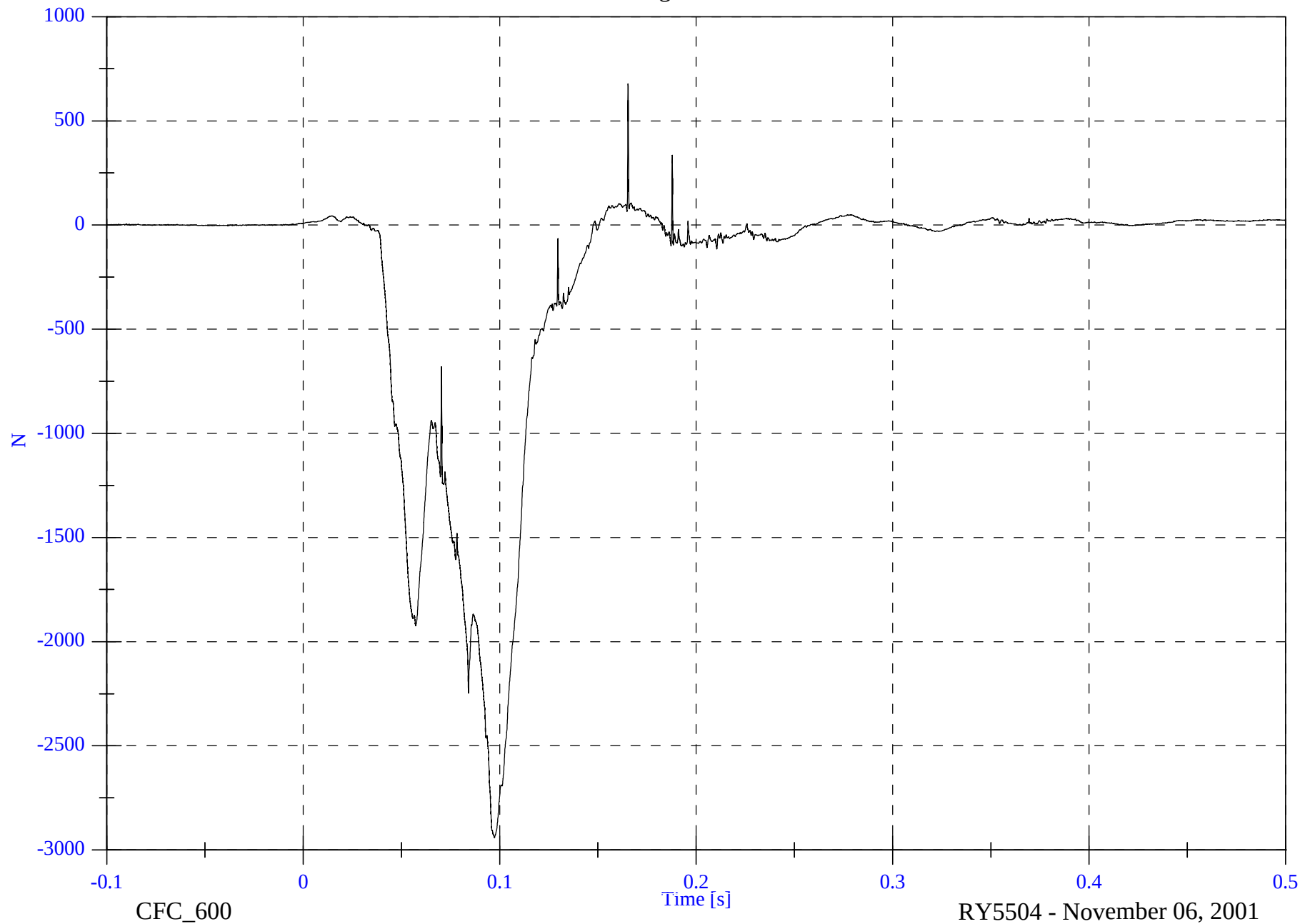


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Femur Fz

Max: 678.8 [N] at 0.165 [s]

Min: -2941.8 [N] at 0.097 [s]



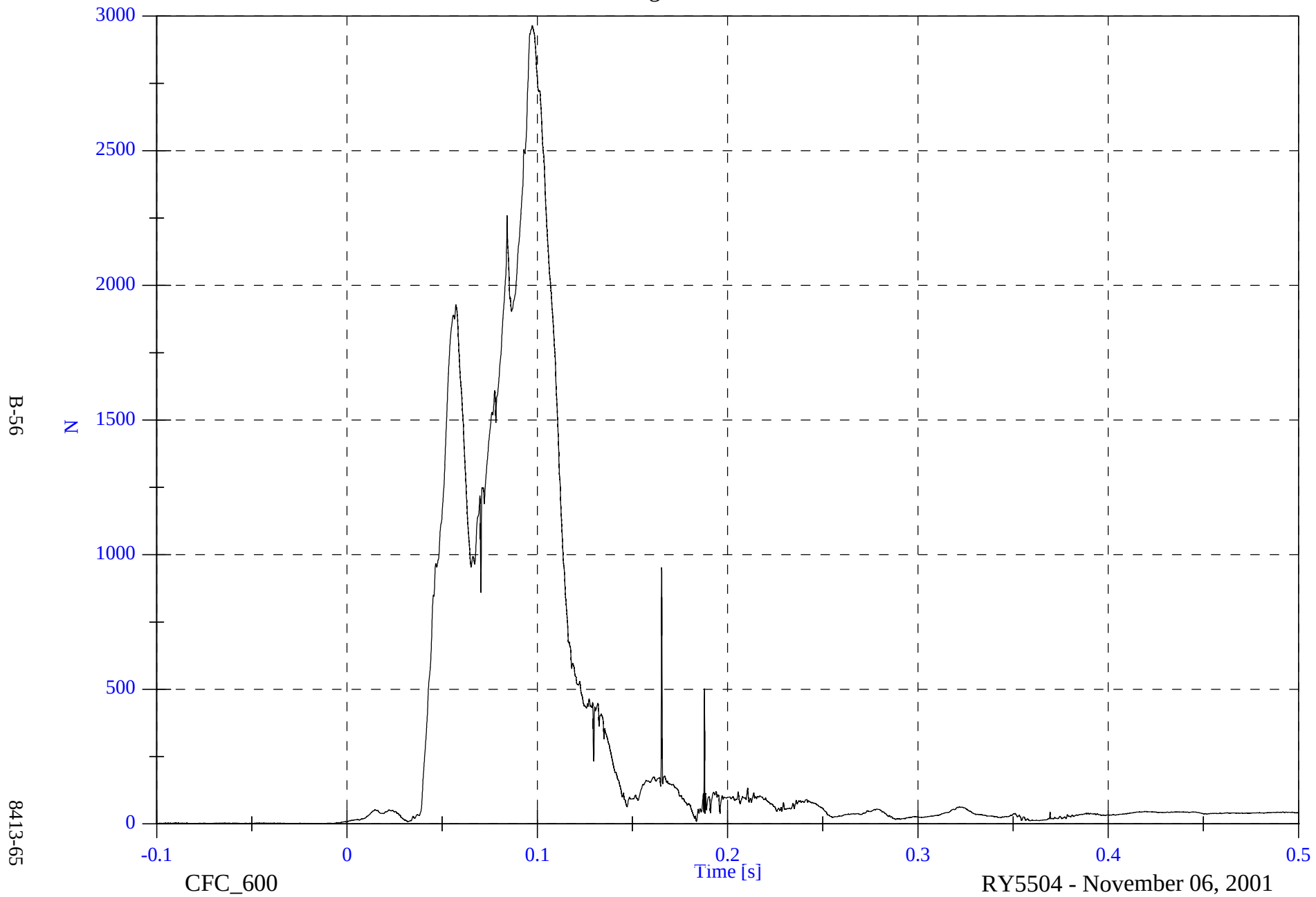


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Femur F Resultant

Max: 2965.3 [N] at 0.097 [s]

Min: 0.2 [N] at -0.082 [s]

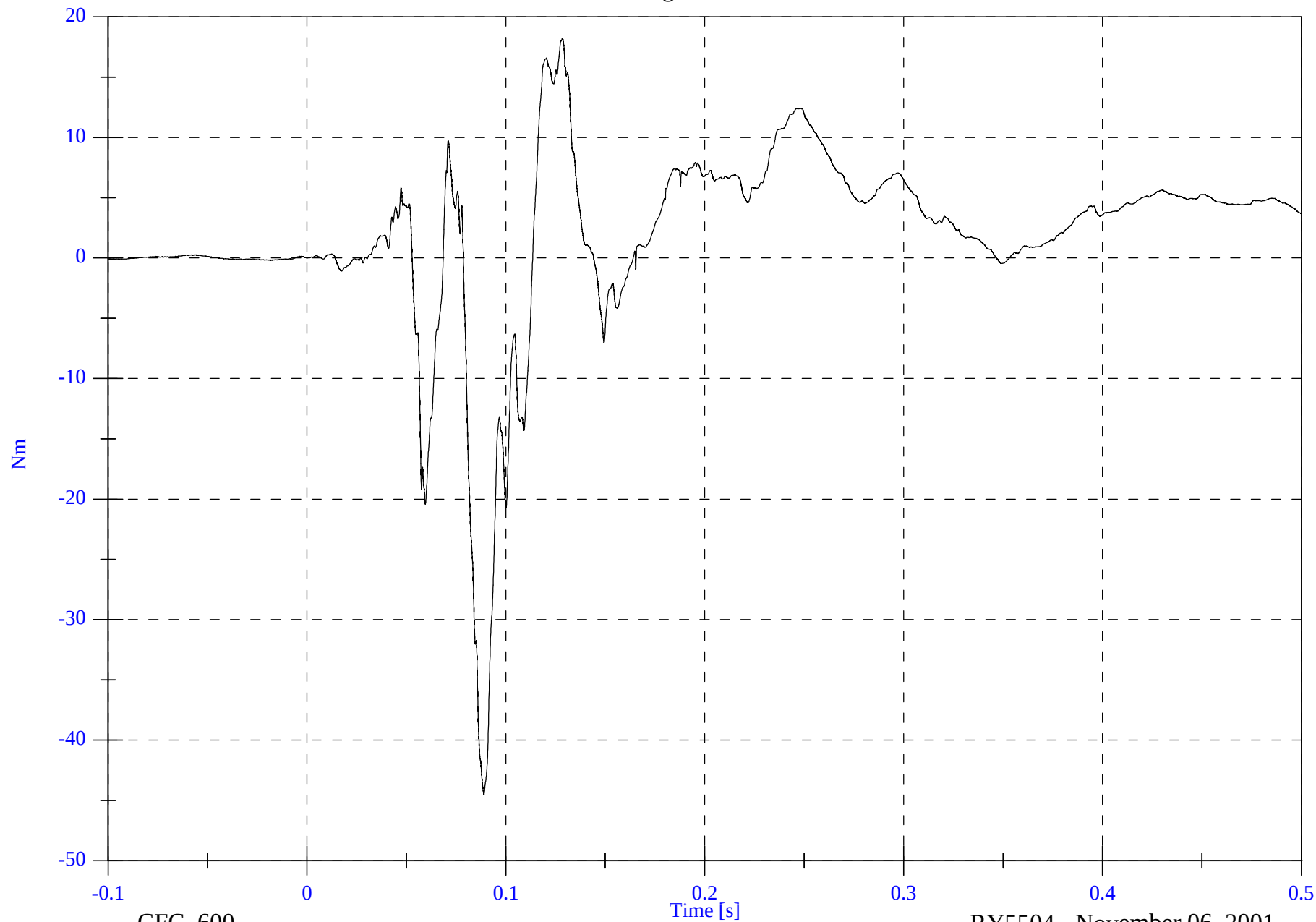


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Femur Mx

Max: 18.2 [Nm] at 0.128 [s]

Min: -44.6 [Nm] at 0.089 [s]



B-57

8413-65

CFC\_600

RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

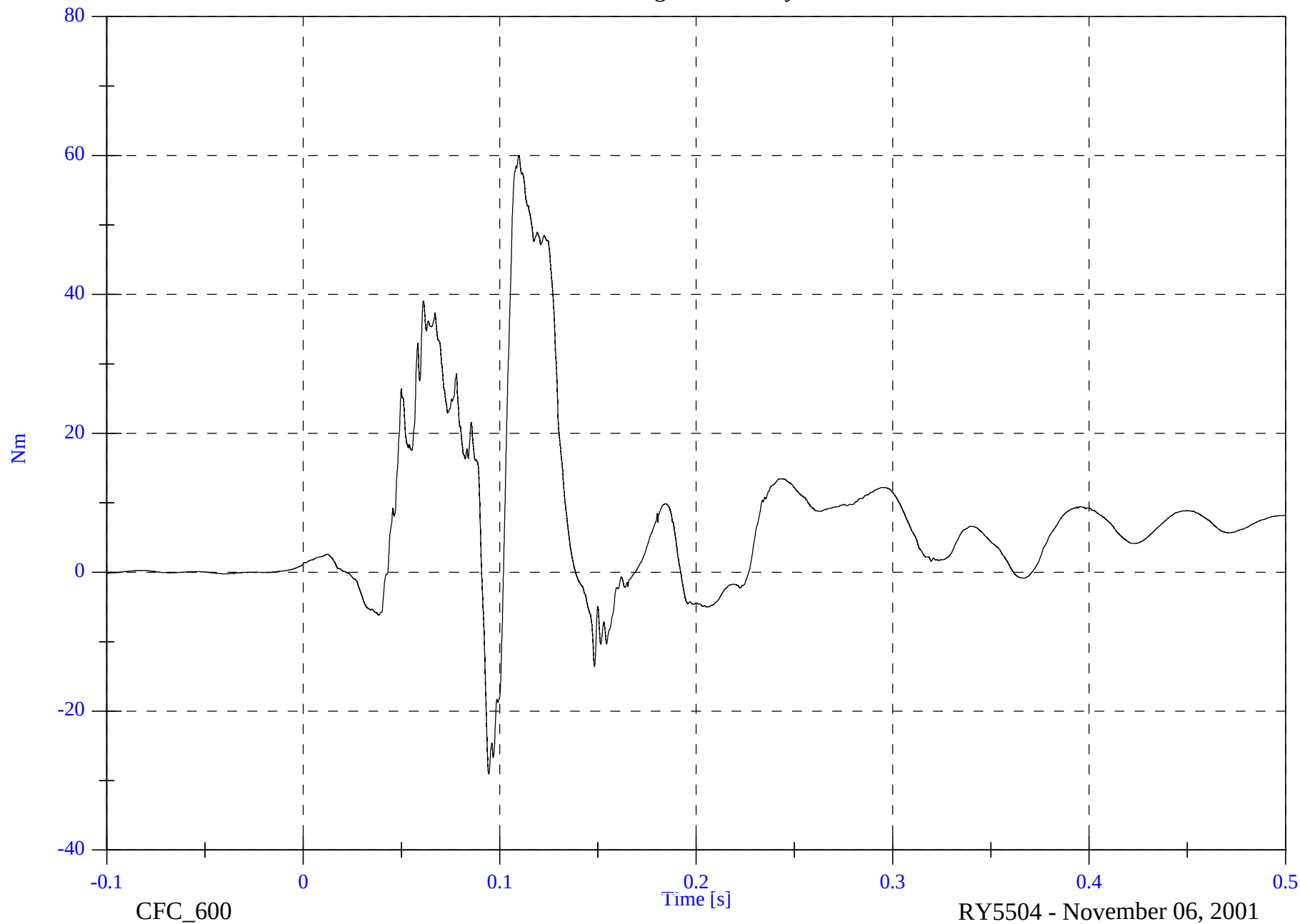
P1 Right Femur My

Max: 60.0 [Nm] at 0.110 [s]

Min: -29.1 [Nm] at 0.094 [s]

B-58

8413-65



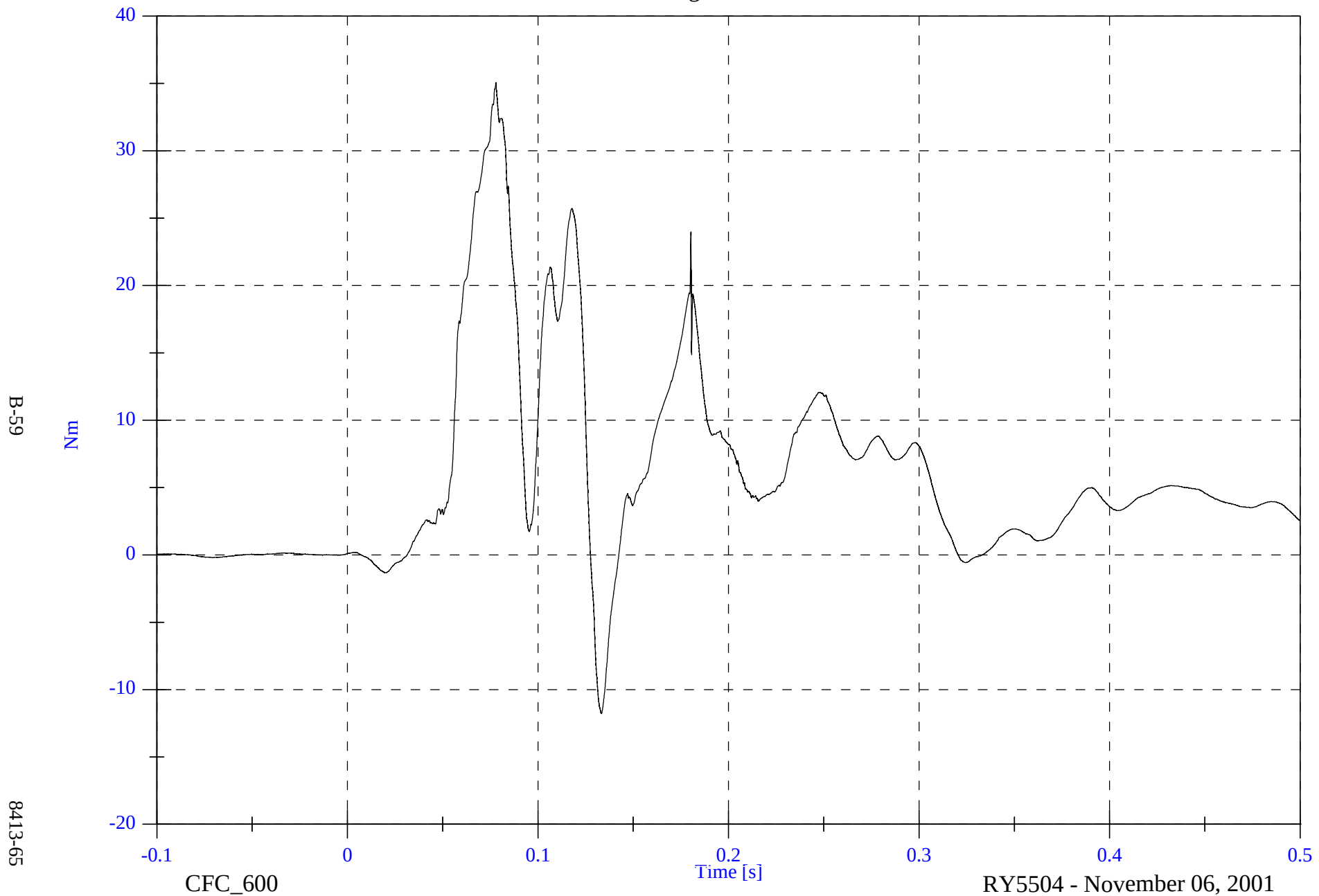


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Max: 35.1 [Nm] at 0.078 [s]

P1 Right Femur Mz

Min: -11.8 [Nm] at 0.133 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

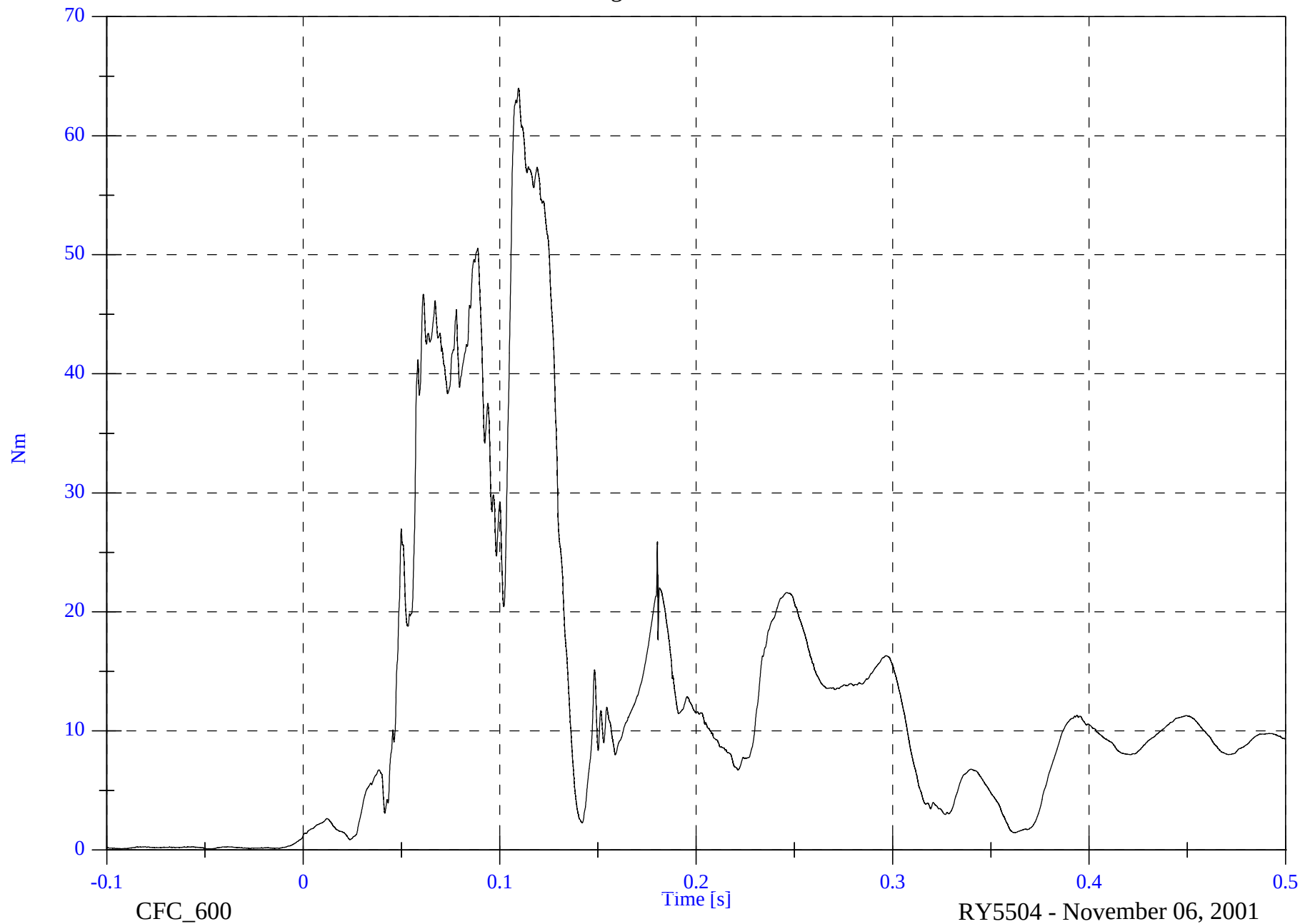
P1 Right Femur M Resultant

Max: 64.0 [Nm] at 0.110 [s]

Min: 0.1 [Nm] at -0.047 [s]

B-60

8413-65

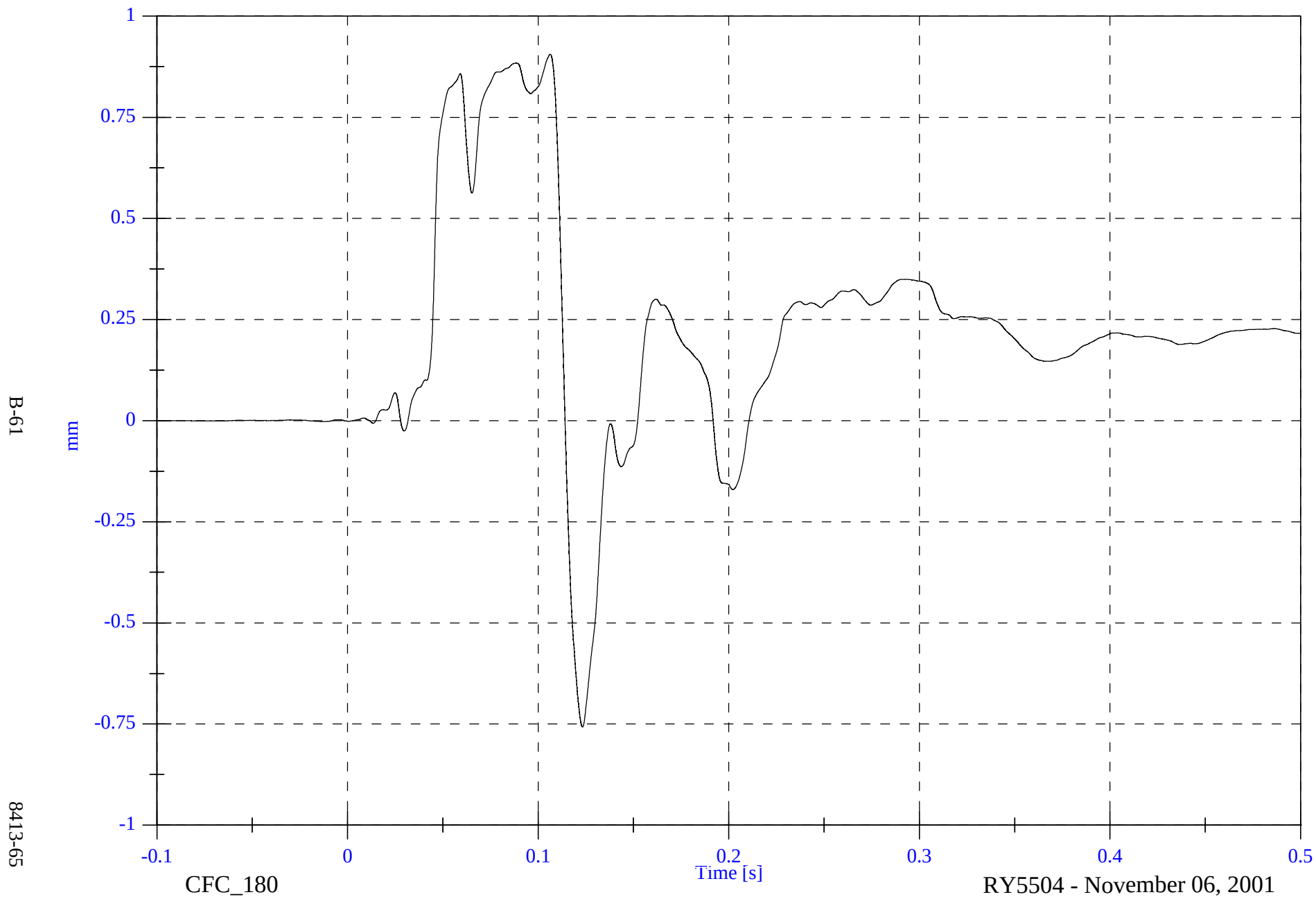


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Knee Shear

Max: 0.9 [mm] at 0.106 [s]

Min: -0.8 [mm] at 0.123 [s]

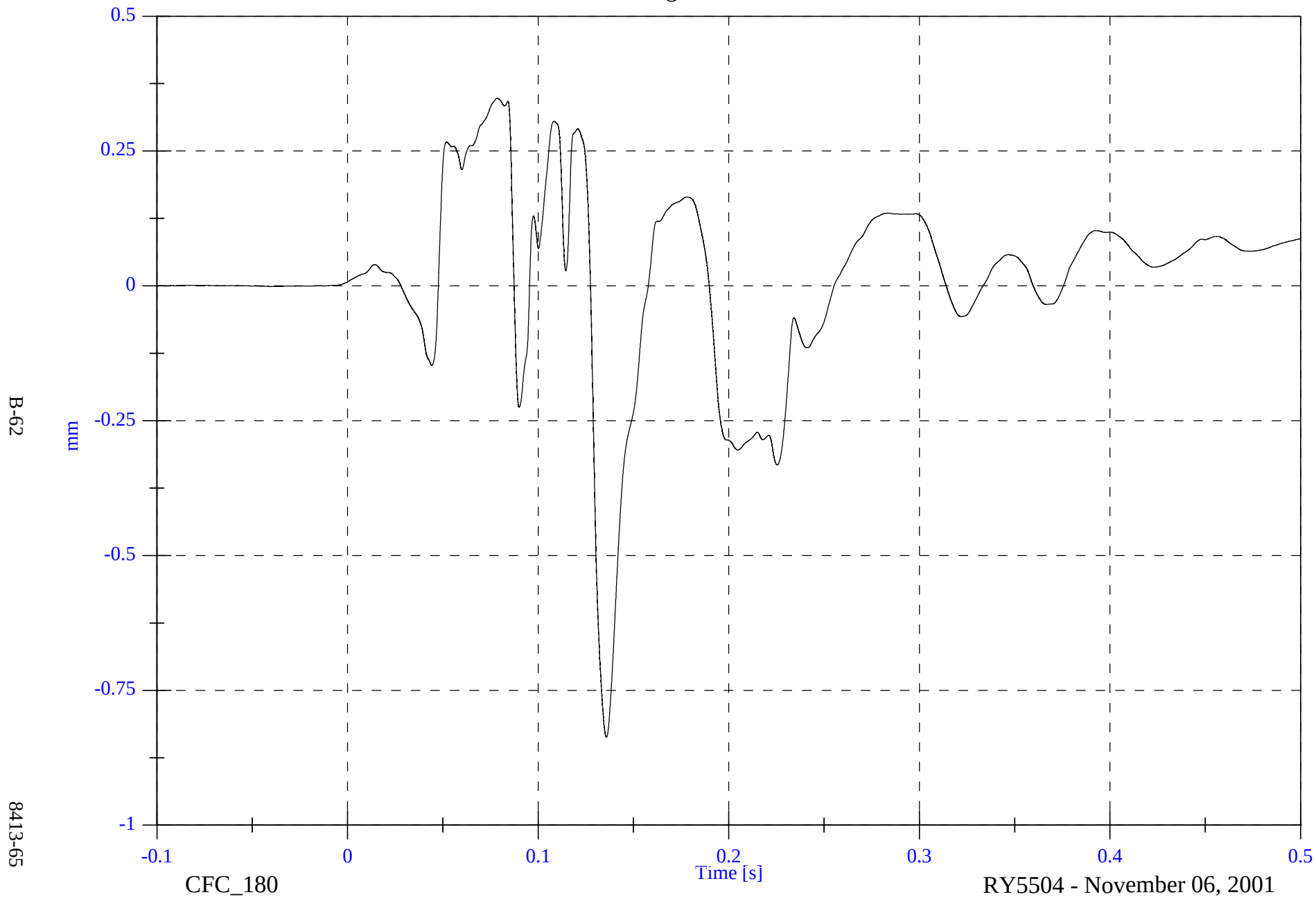


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Knee Shear Dx

Max: 0.3 [mm] at 0.079 [s]

Min: -0.8 [mm] at 0.136 [s]



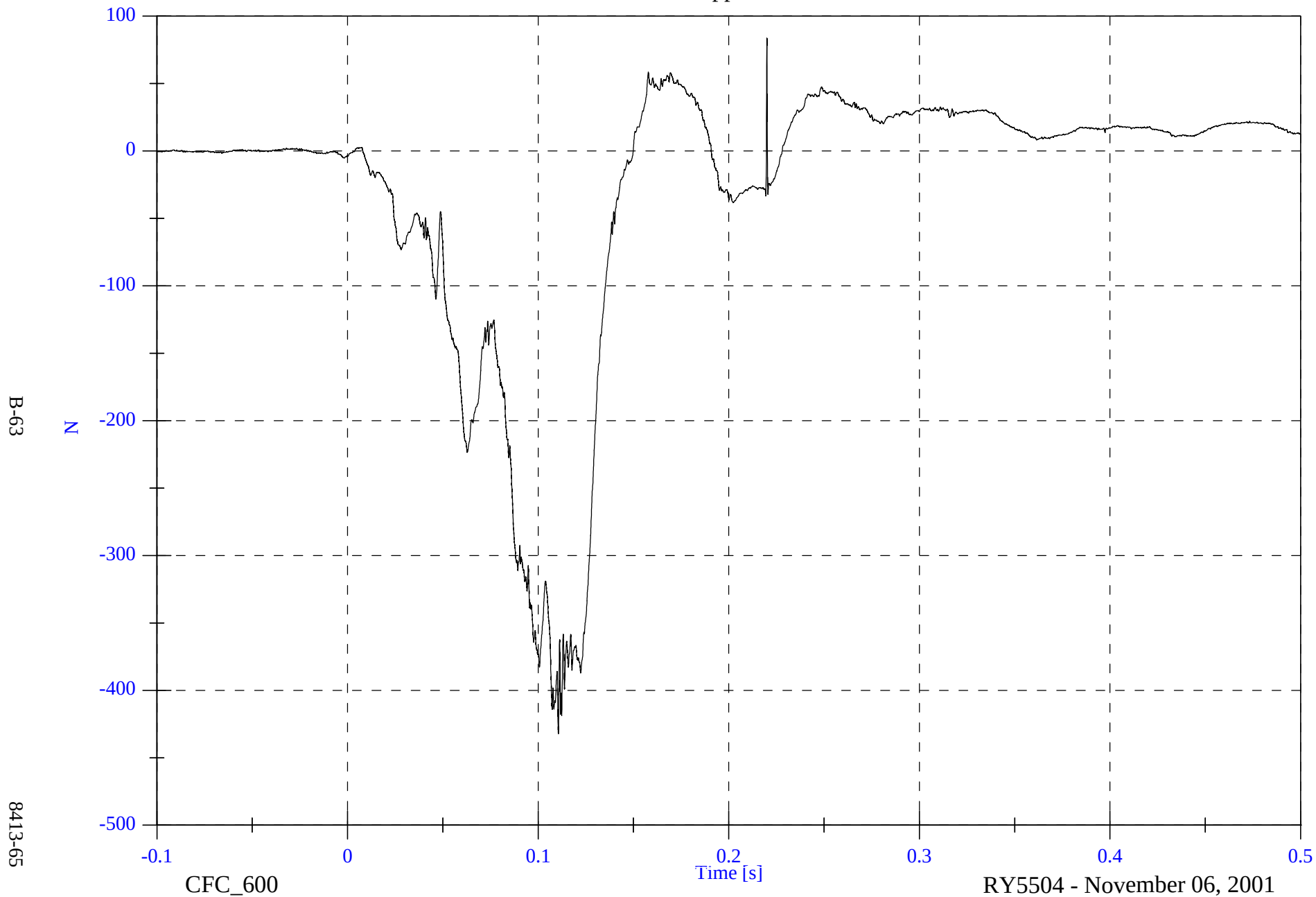


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Upper Tibia Fx

Max: 83.6 [N] at 0.220 [s]

Min: -432.4 [N] at 0.111 [s]

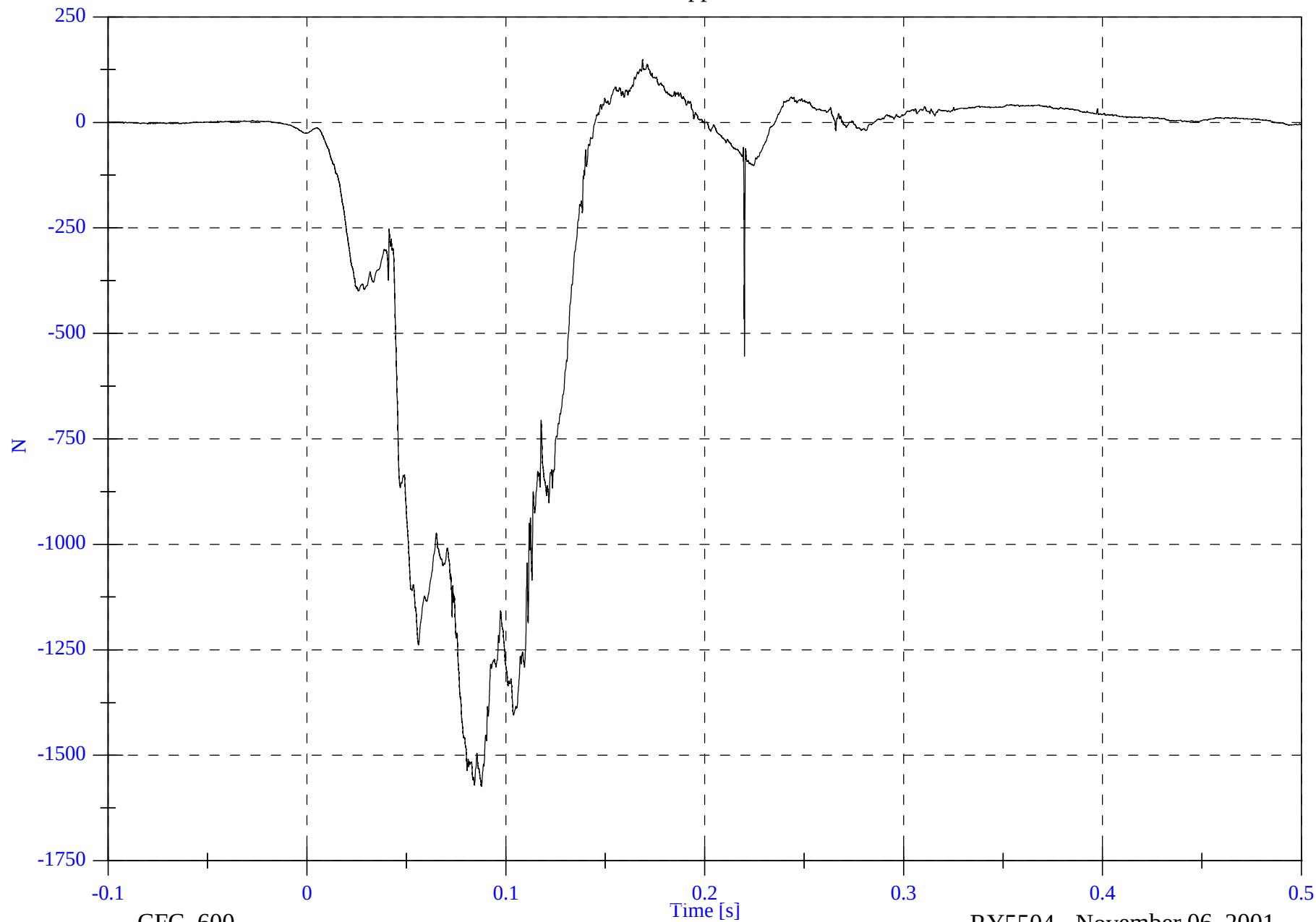


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Max: 148.7 [N] at 0.169 [s]

P1 Left Upper Tibia Fz

Min: -1573.8 [N] at 0.088 [s]



B-64

8413-65

CFC\_600

RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

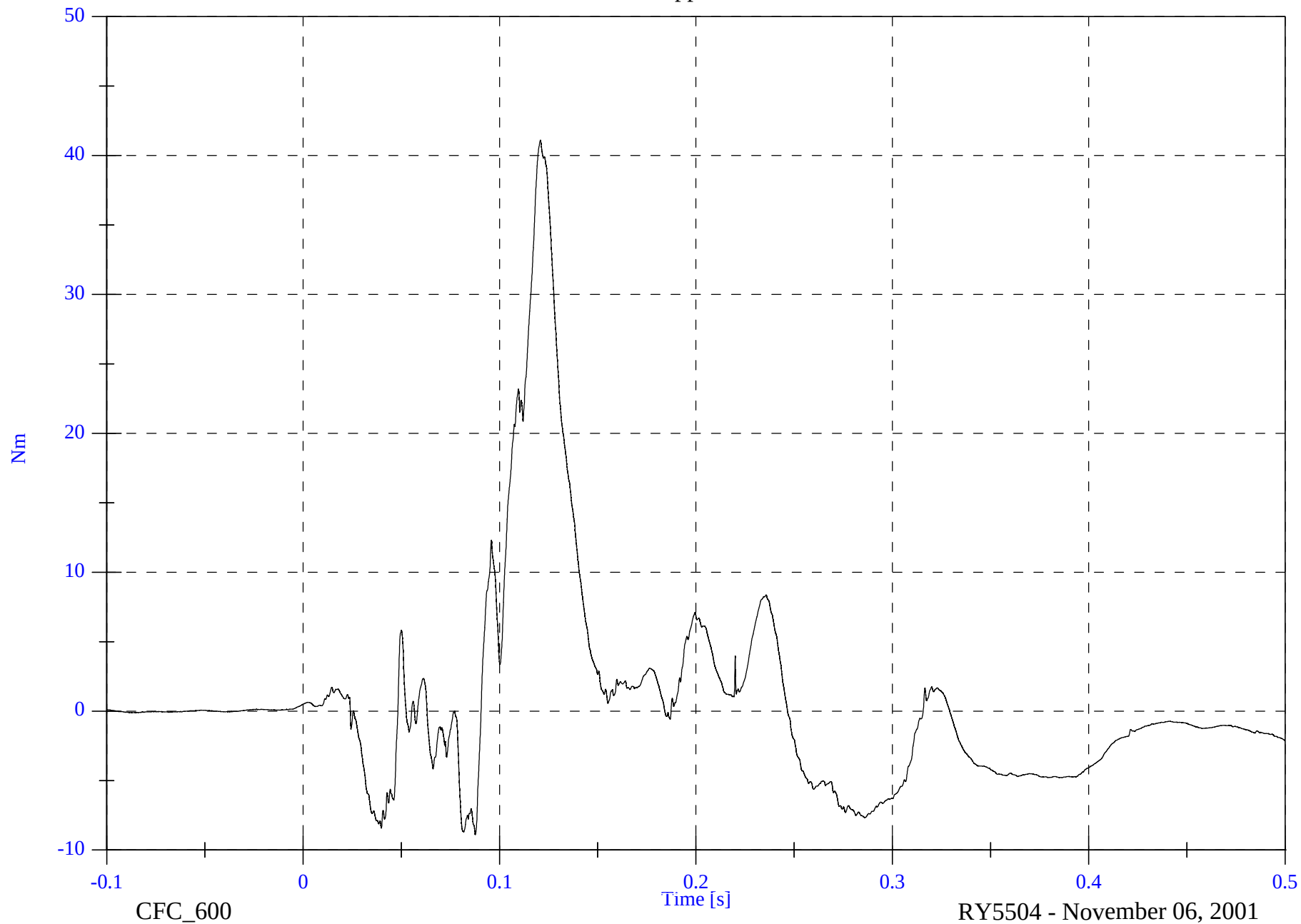
P1 Left Upper Tibia Mx

Max: 41.1 [Nm] at 0.121 [s]

Min: -8.9 [Nm] at 0.088 [s]

B-65

8413-65

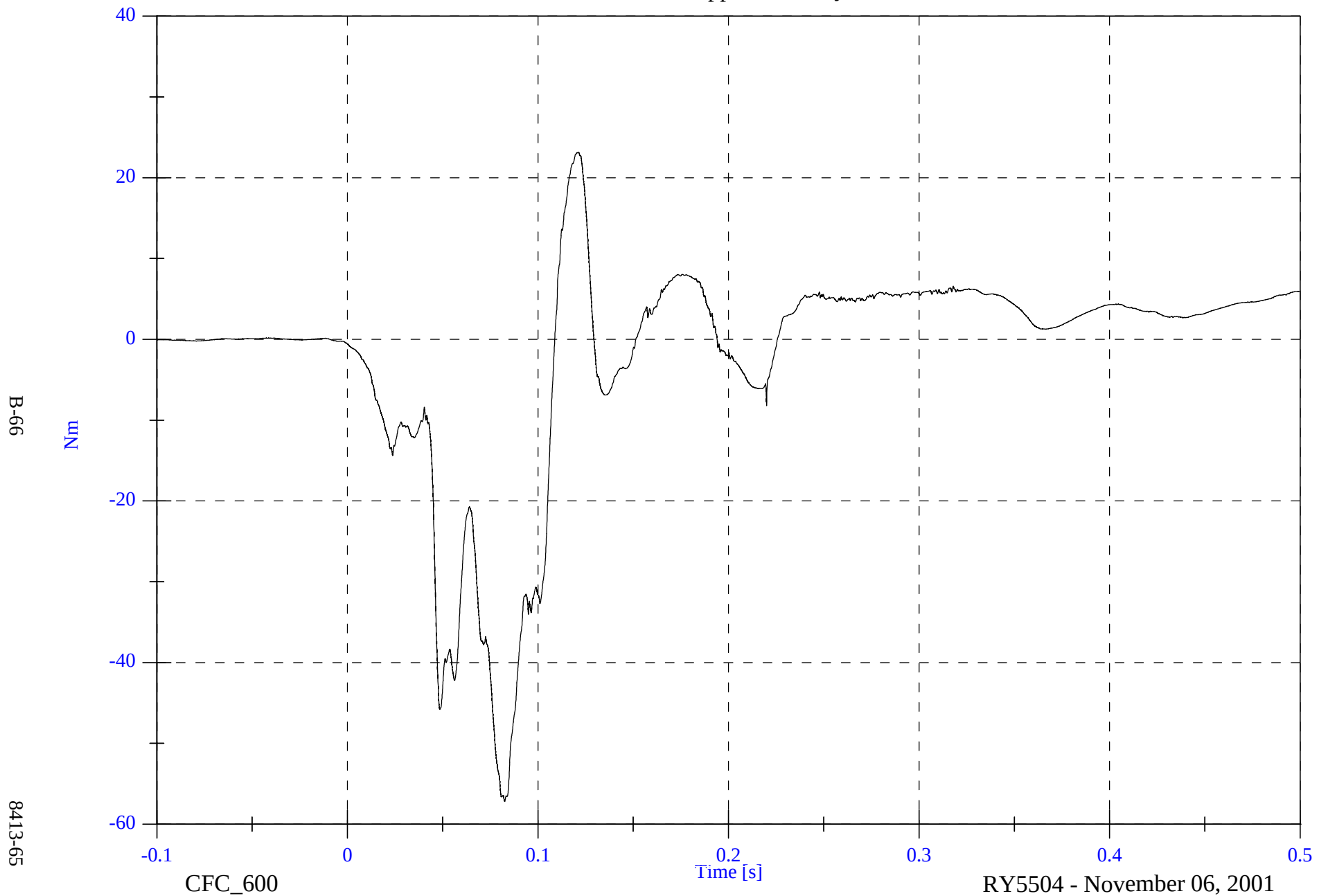


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Upper Tibia My

Max: 23.2 [Nm] at 0.121 [s]

Min: -57.2 [Nm] at 0.083 [s]



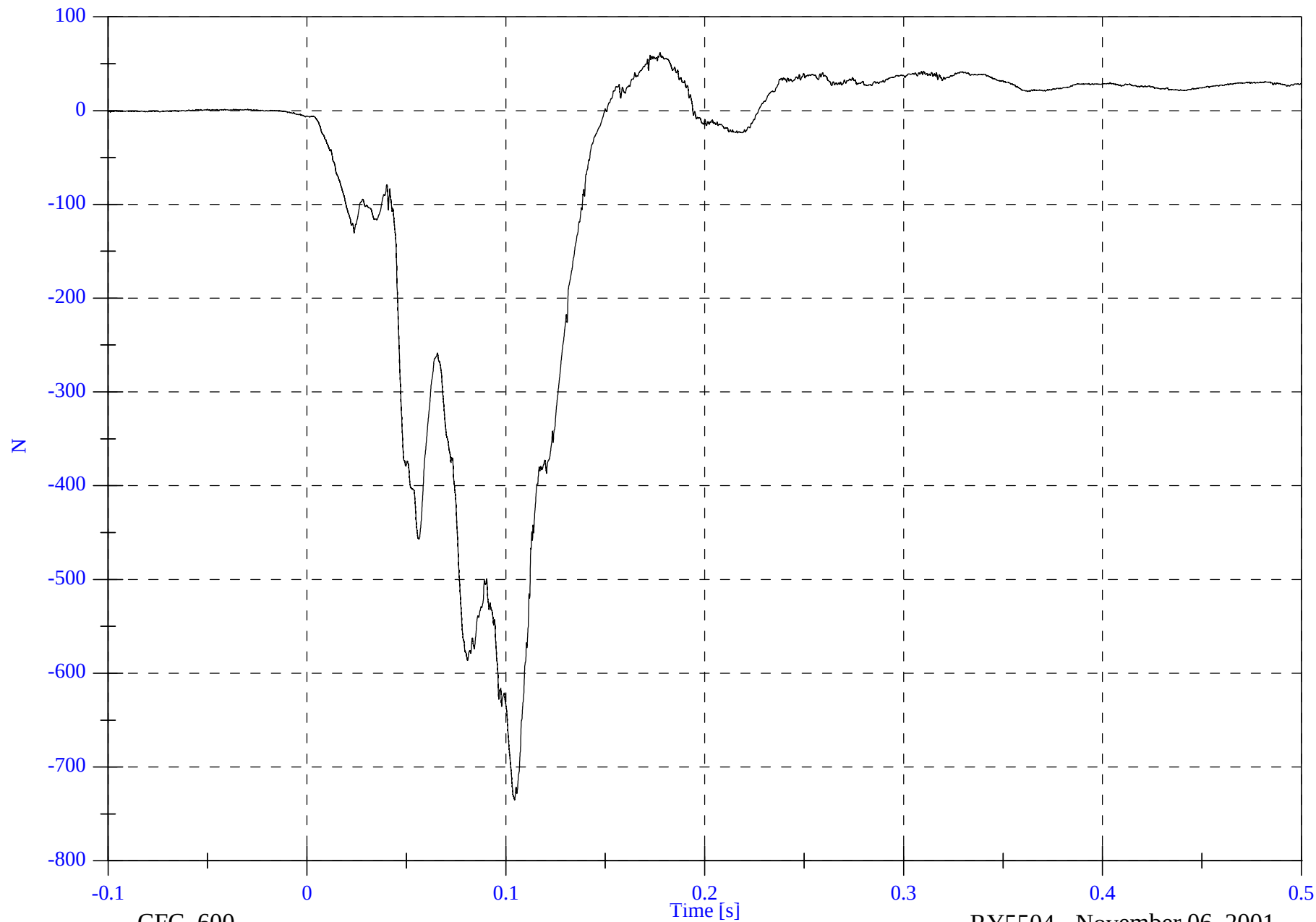


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Lower Tibia Fx

Max: 61.8 [N] at 0.177 [s]

Min: -735.1 [N] at 0.104 [s]



B-67

8413-65

CFC\_600

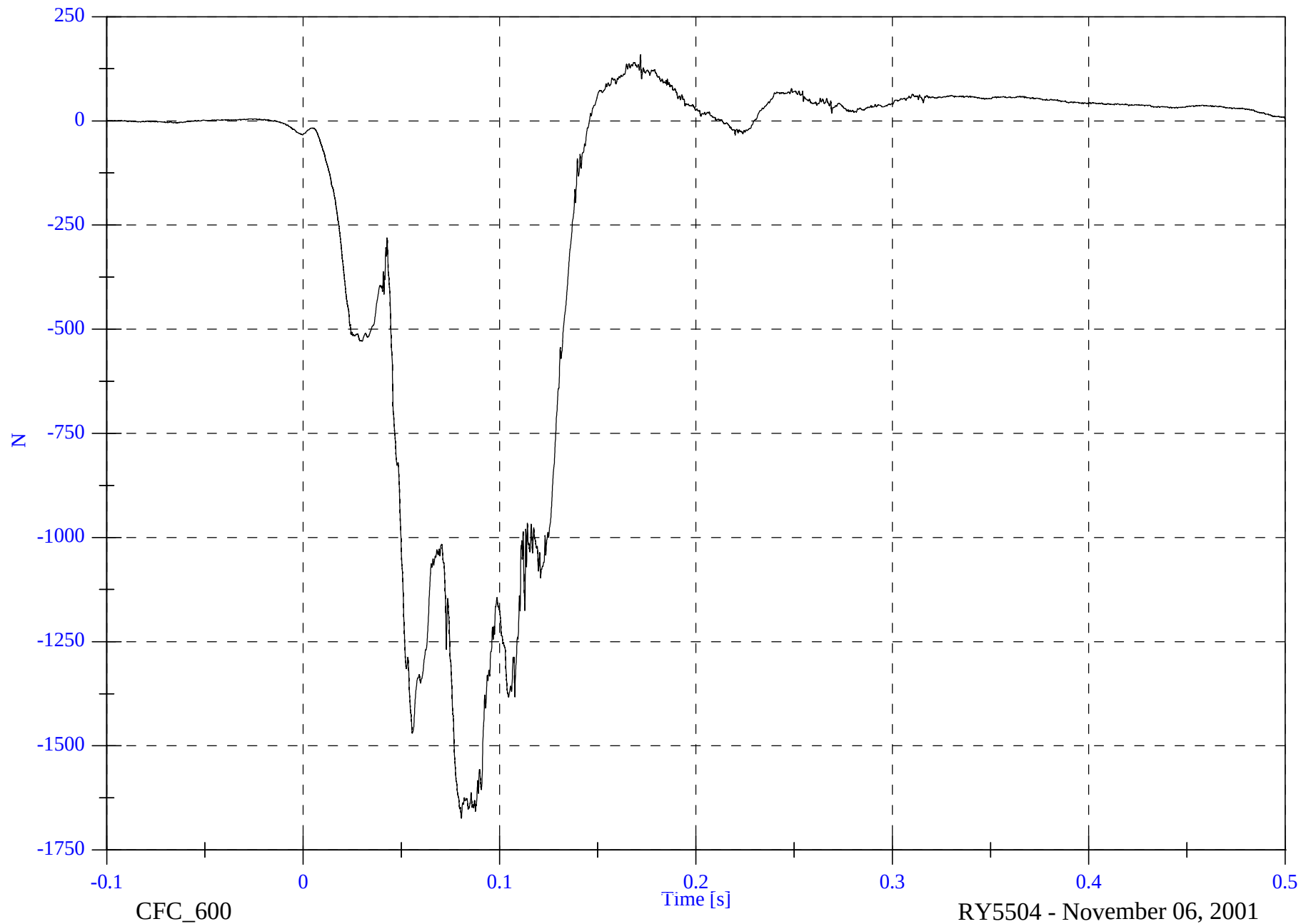
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Lower Tibia Fz

Max: 158.4 [N] at 0.172 [s]

Min: -1674.3 [N] at 0.081 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

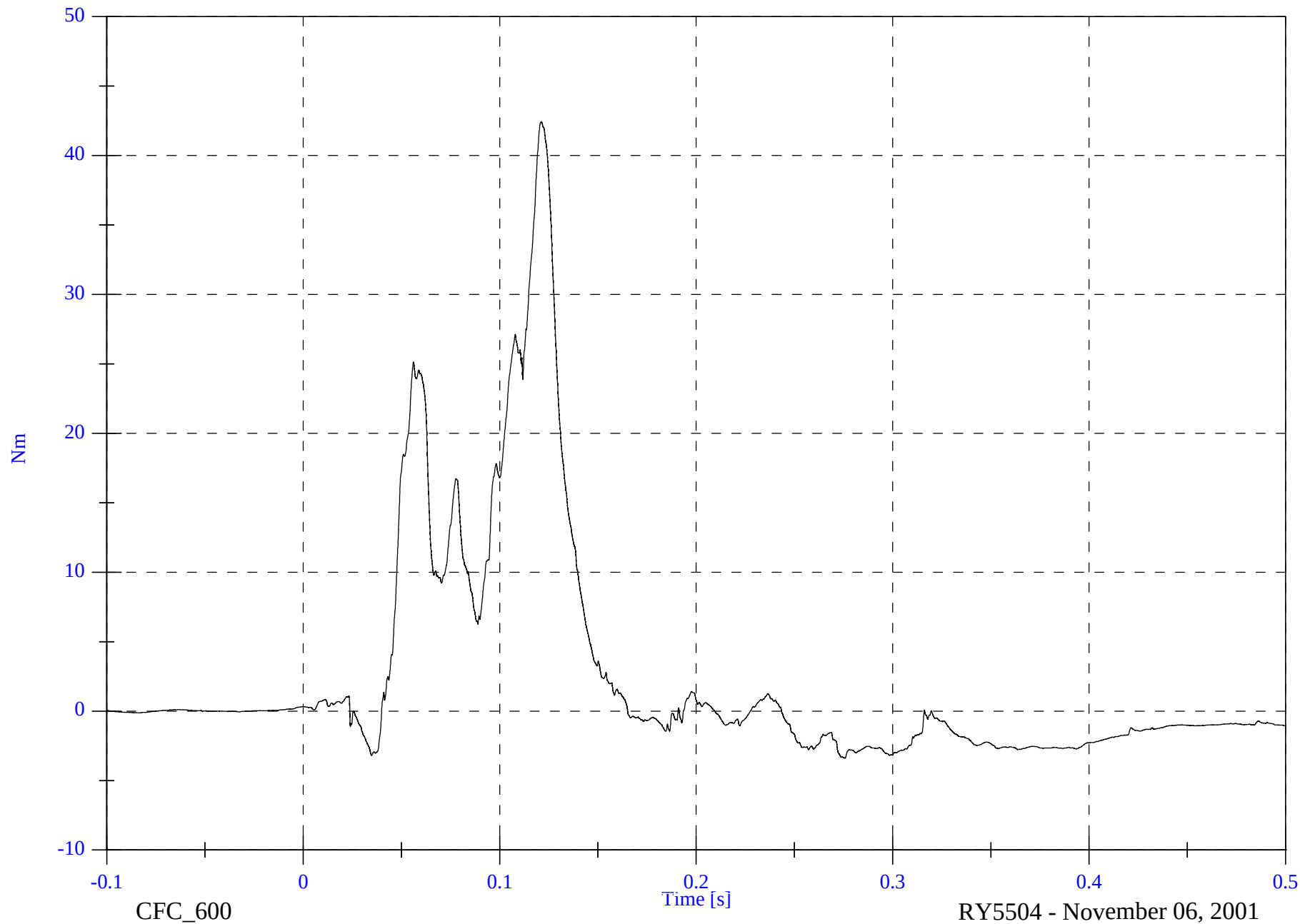
P1 Left Lower Tibia Mx

Max: 42.4 [Nm] at 0.121 [s]

Min: -3.4 [Nm] at 0.276 [s]

B-69

8413-65

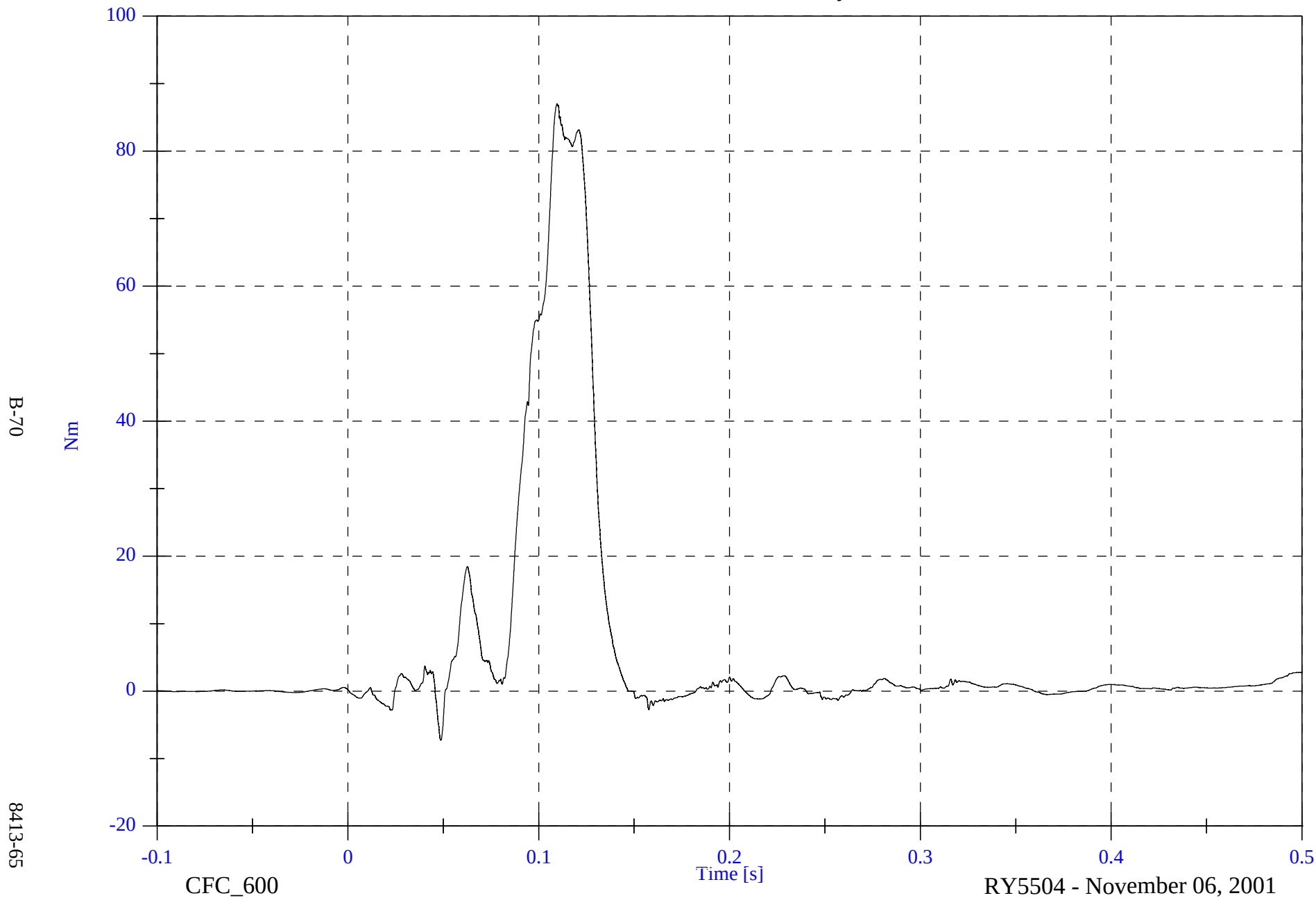


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Lower Tibia My

Max: 87.0 [Nm] at 0.110 [s]

Min: -7.3 [Nm] at 0.049 [s]



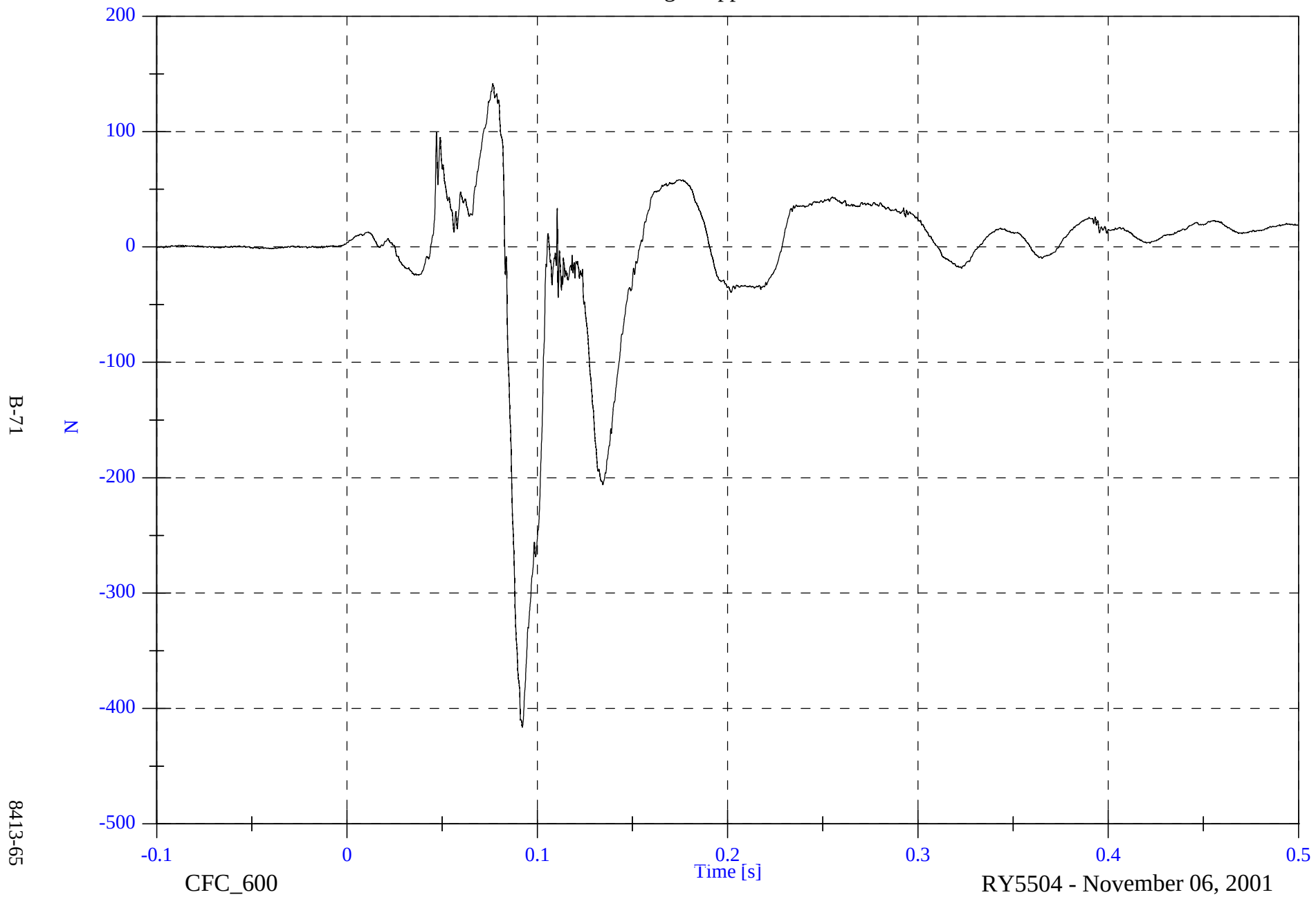


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Upper Tibia Fx

Max: 141.6 [N] at 0.077 [s]

Min: -416.3 [N] at 0.092 [s]

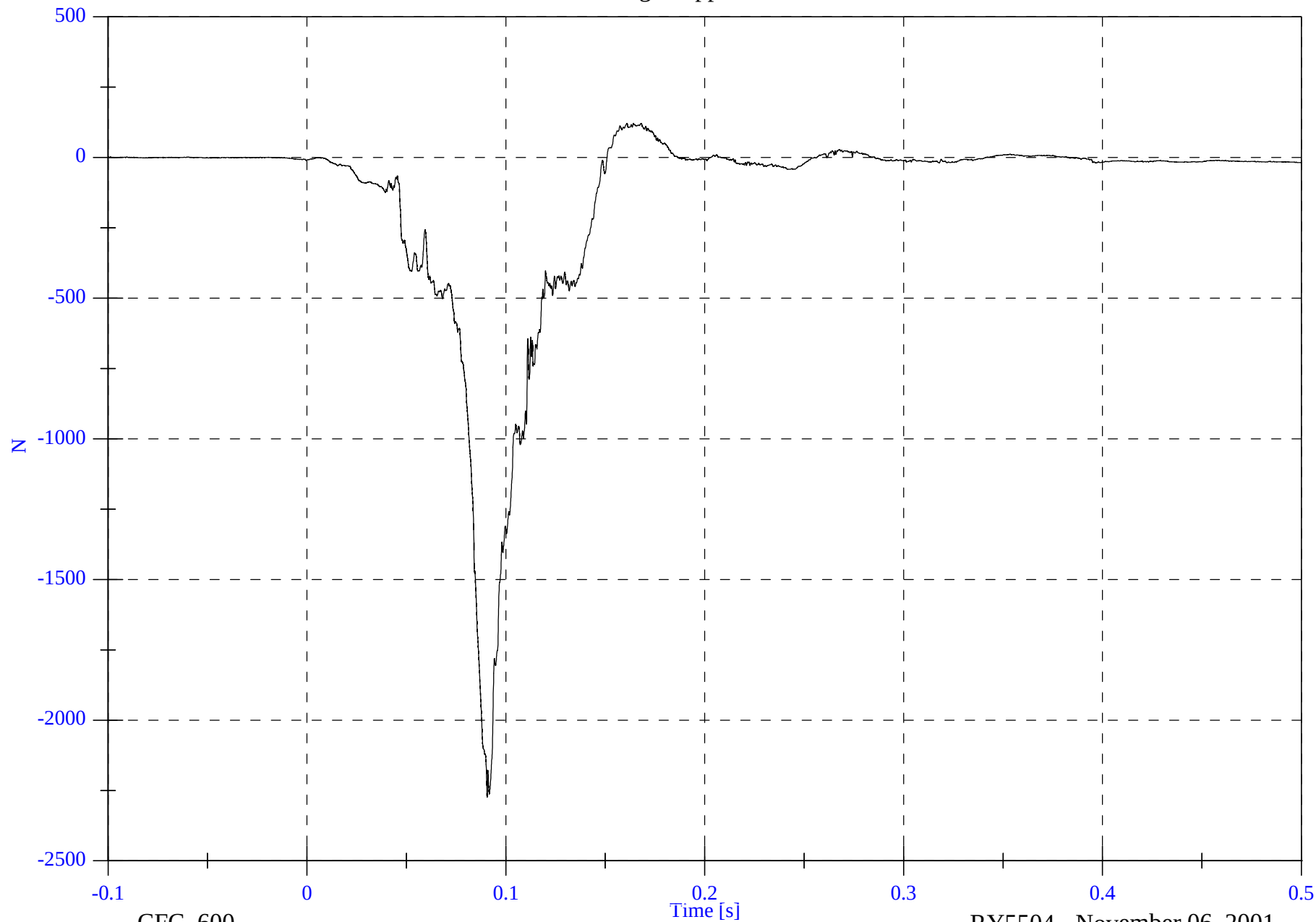


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Max: 121.4 [N] at 0.168 [s]

P1 Right Upper Tibia Fz

Min: -2274.6 [N] at 0.091 [s]



B-72

8413-65

CFC\_600

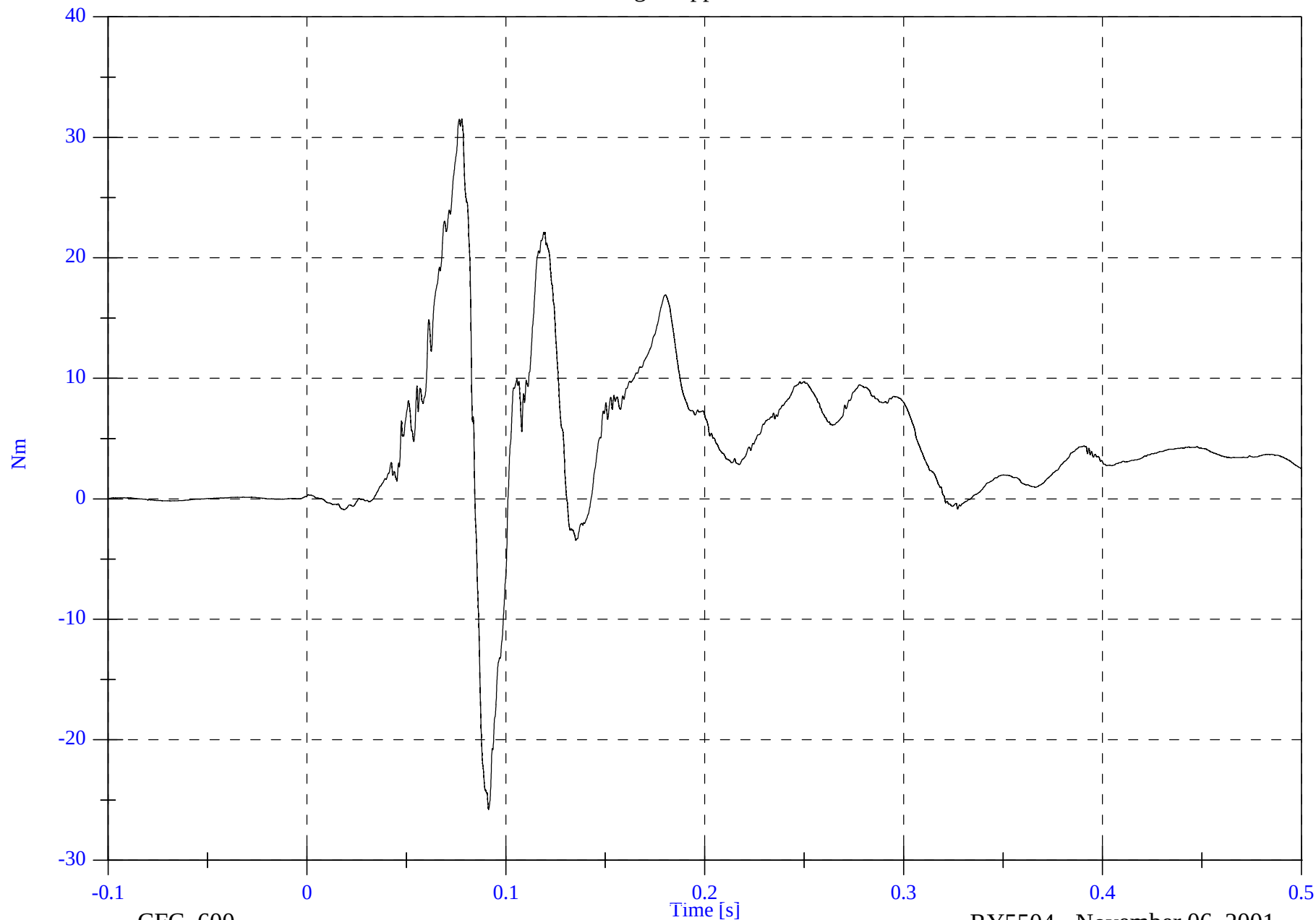
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Upper Tibia Mx

Max: 31.5 [Nm] at 0.078 [s]

Min: -25.8 [Nm] at 0.091 [s]



B-73

8413-65

CFC\_600

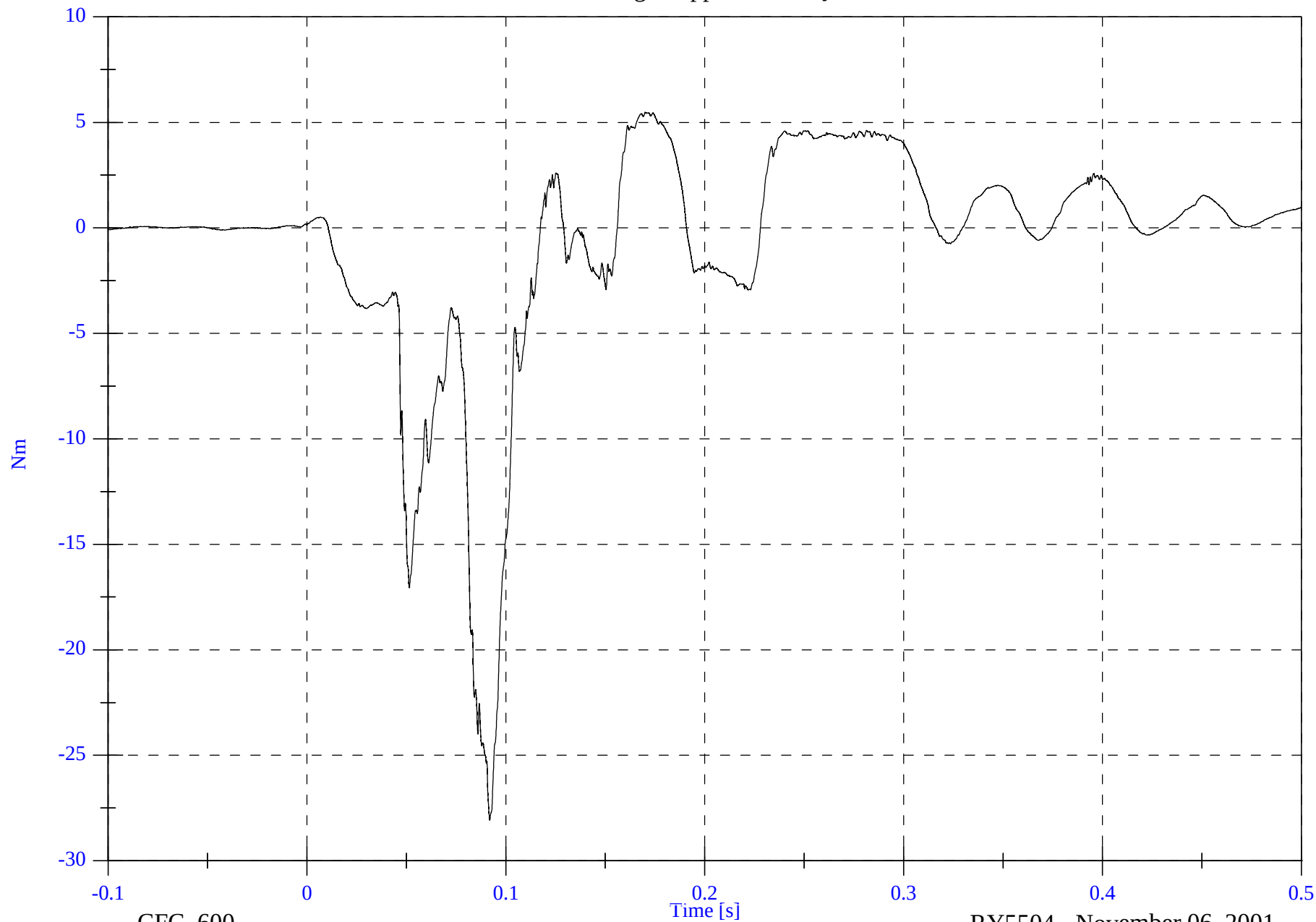
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Upper Tibia My

Max: 5.5 [Nm] at 0.170 [s]

Min: -28.1 [Nm] at 0.092 [s]



B-74

8413-65

CFC\_600

RY5504 - November 06, 2001

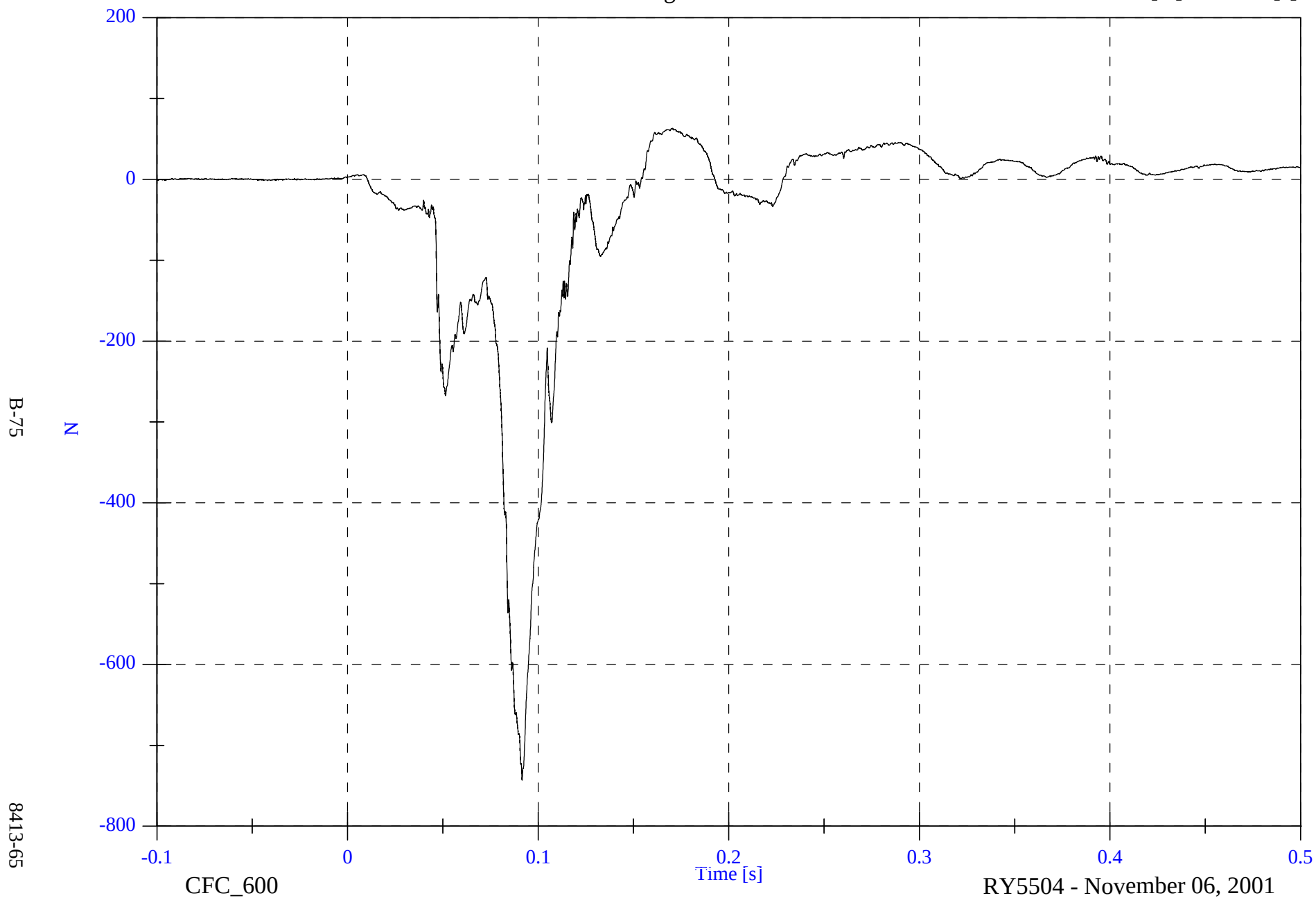


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Lower Tibia Fx

Max: 63.1 [N] at 0.170 [s]

Min: -743.2 [N] at 0.092 [s]

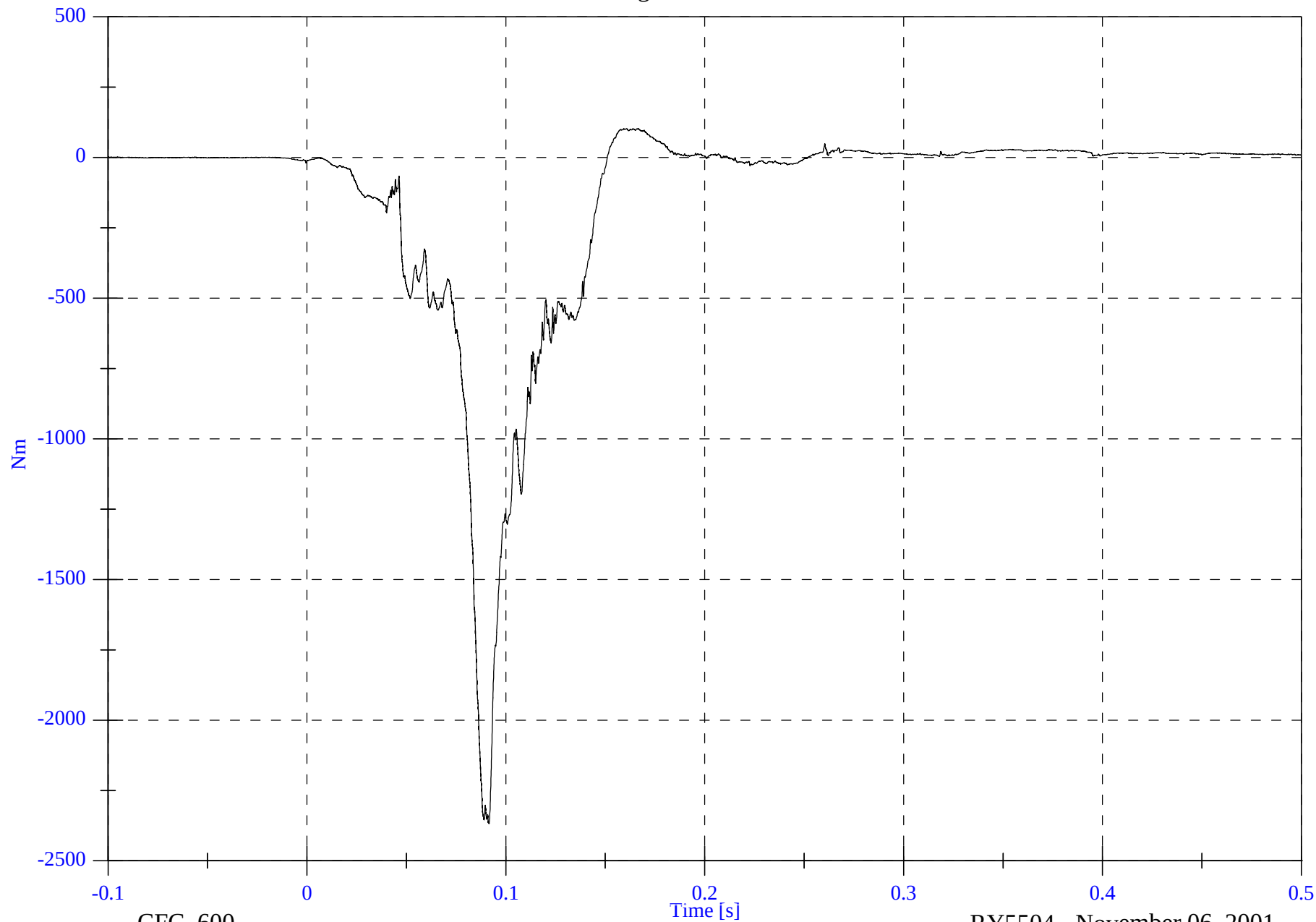


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Lower Tibia Fz

Max: 102.9 [Nm] at 0.167 [s]

Min: -2367.8 [Nm] at 0.092 [s]



B-76

8413-65

CFC\_600

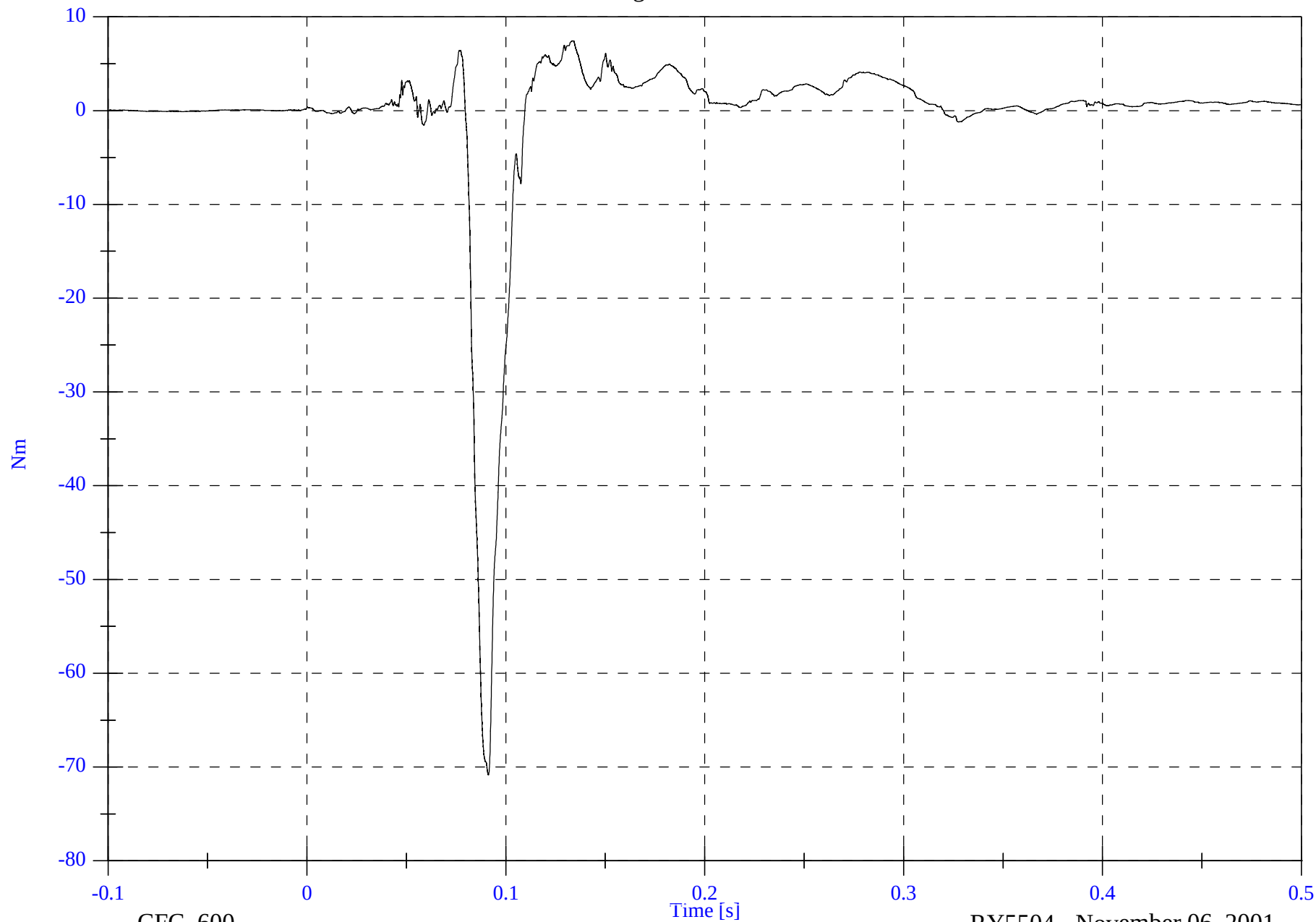
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Lower Tibia Mx

Max: 7.4 [Nm] at 0.133 [s]

Min: -70.9 [Nm] at 0.091 [s]



B-77

8413-65

CFC\_600

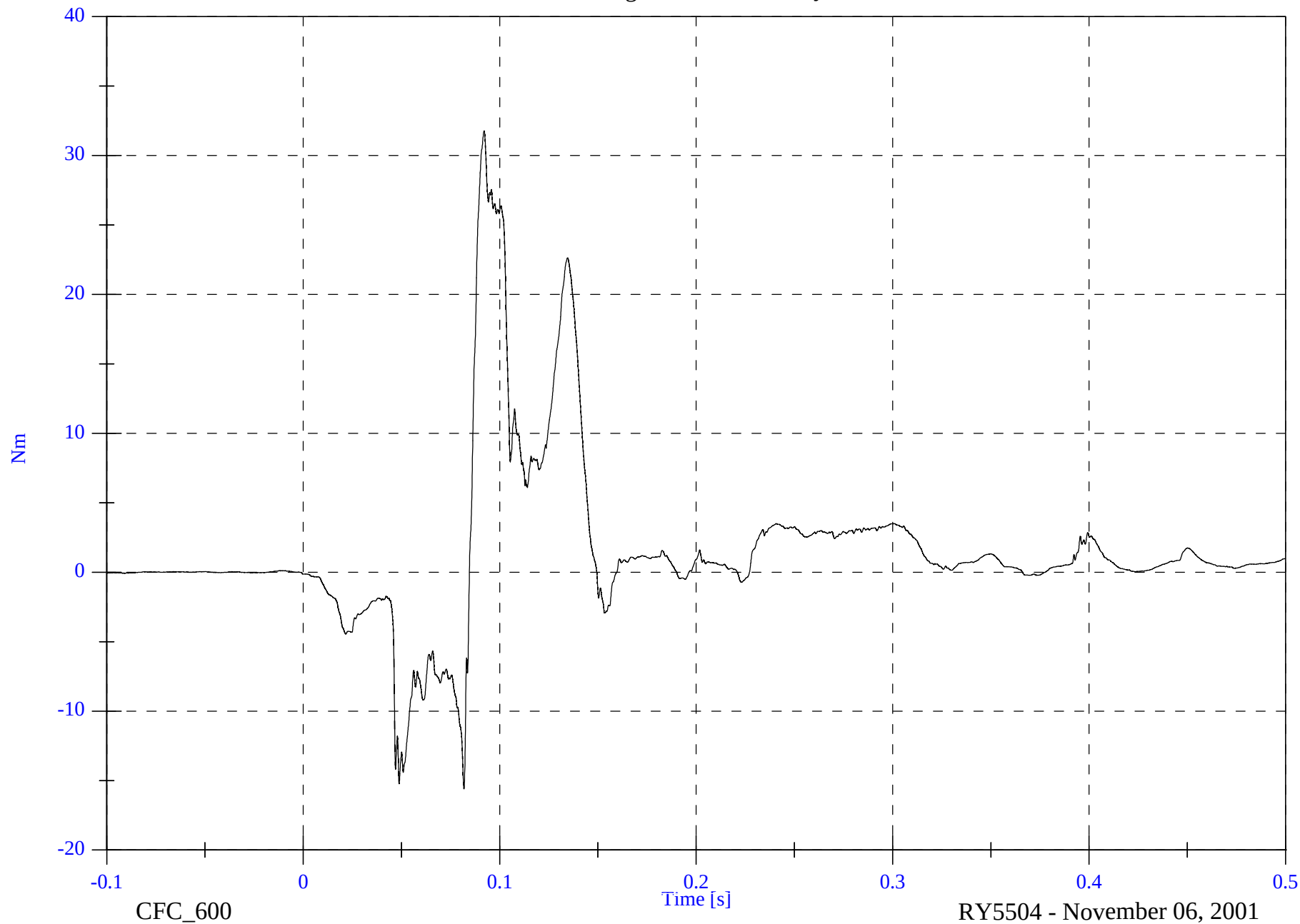
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Lower Tibia My

Max: 31.8 [Nm] at 0.092 [s]

Min: -15.6 [Nm] at 0.082 [s]



B-78

8413-65

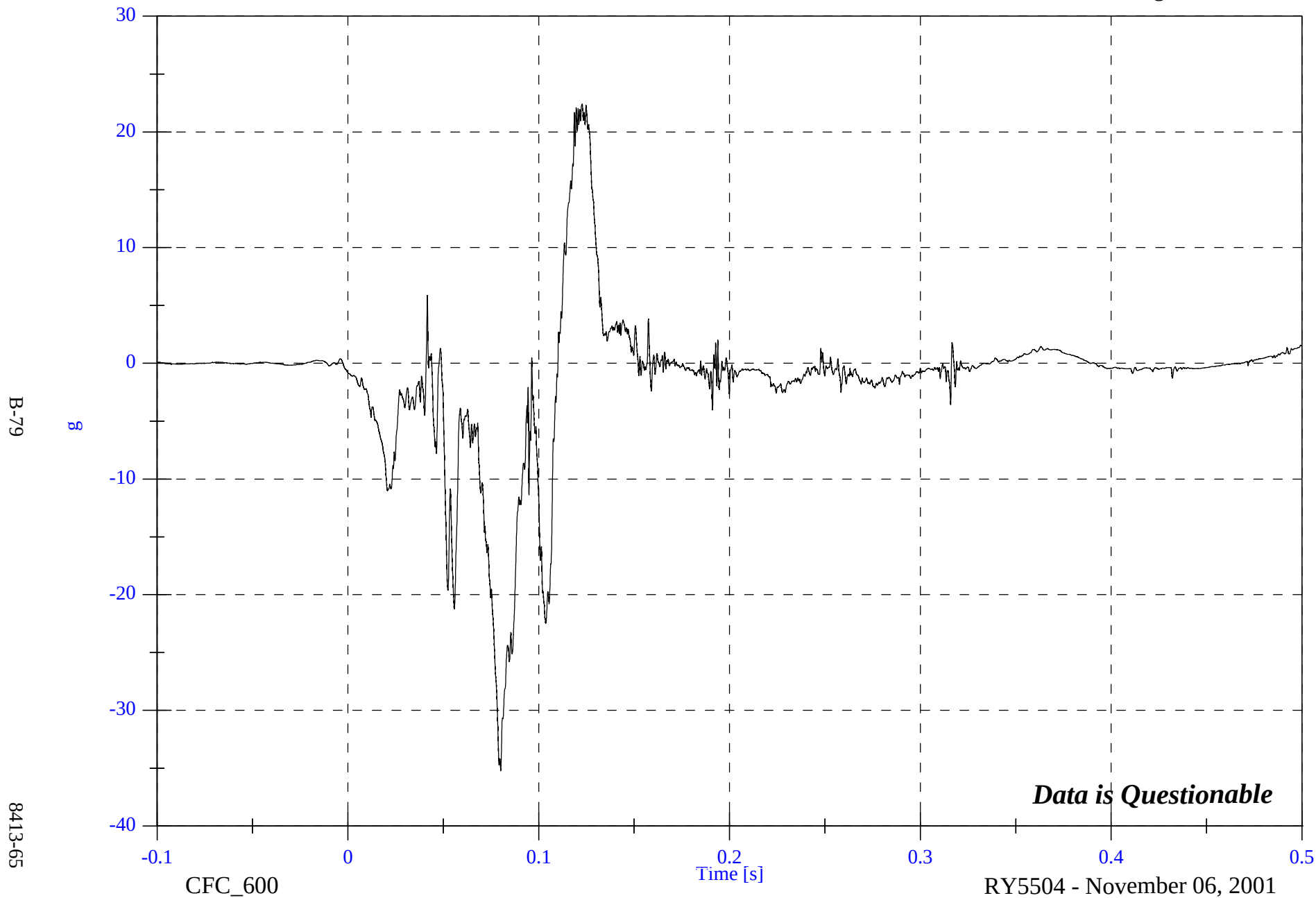


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Ankle Ax

Max: 22.4 [g] at 0.123 [s]

Min: -35.2 [g] at 0.080 [s]



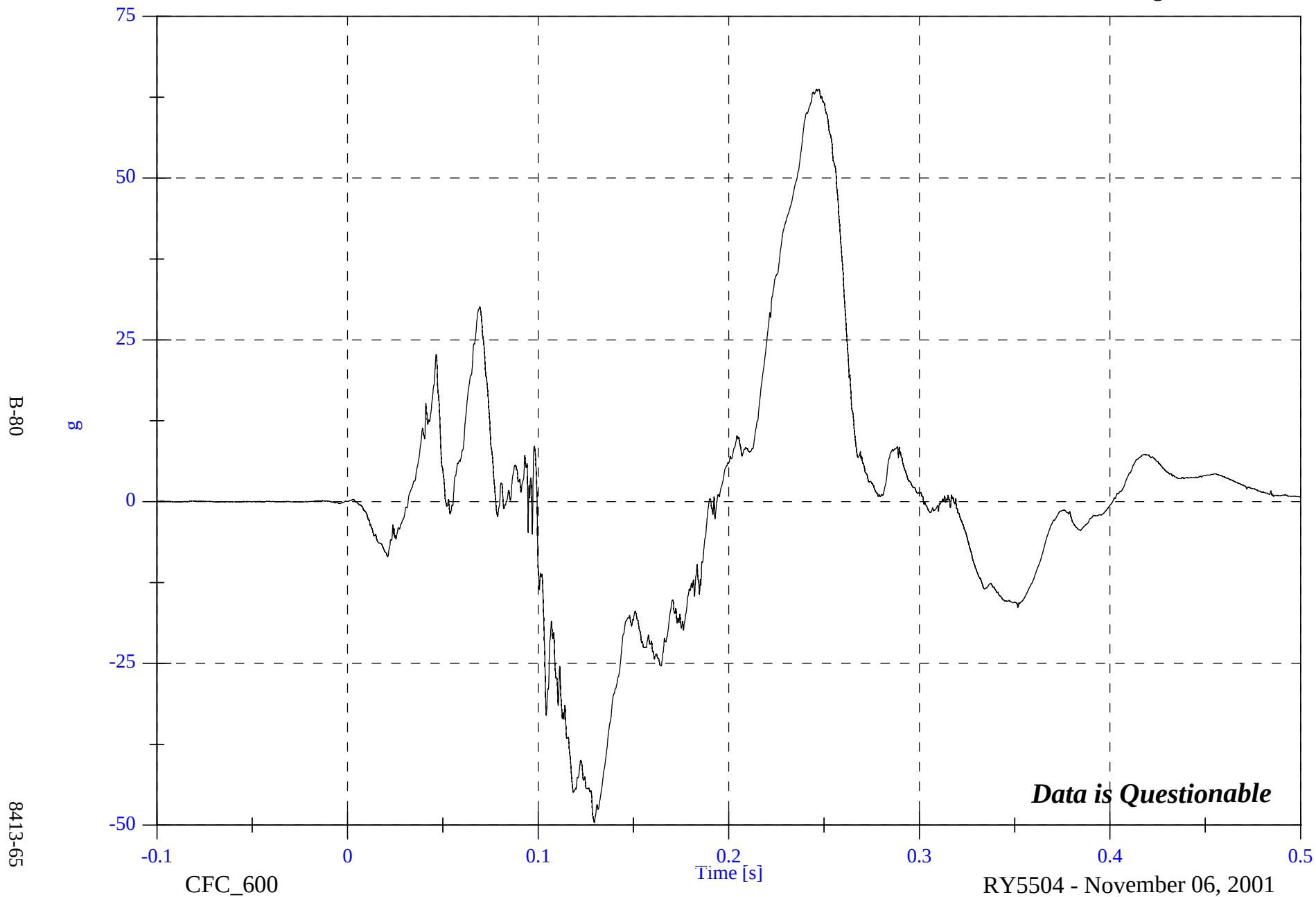
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Left Ankle Az

Max: 63.7 [g] at 0.246 [s]

Min: -49.6 [g] at 0.130 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

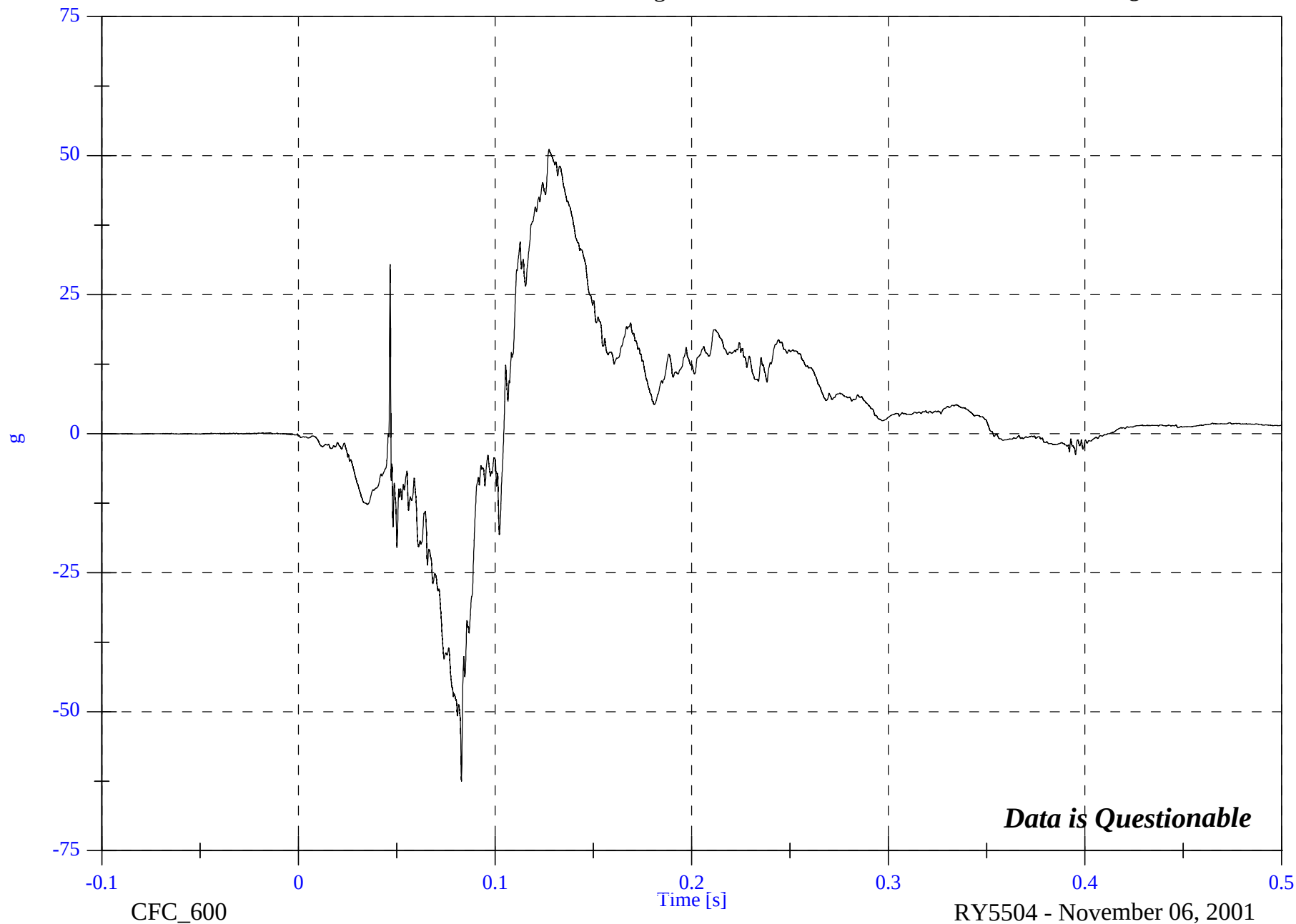
P1 Right Ankle Ax

Max: 51.1 [g] at 0.127 [s]

Min: -62.5 [g] at 0.083 [s]

B-81

8413-65



40% Frontal Offset Test #9 - 2000 Subaru Legacy

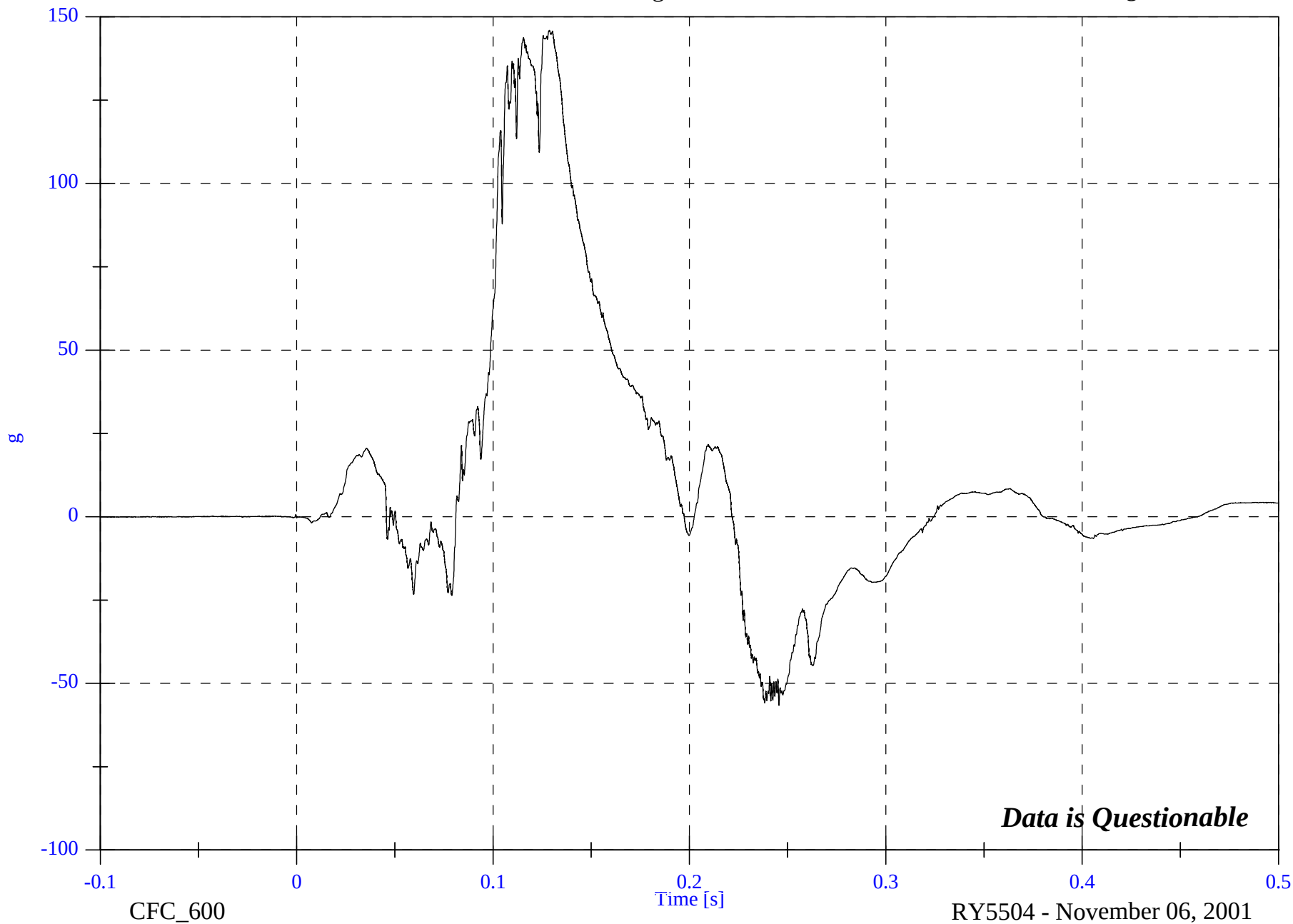
P1 Right Ankle Az

Max: 145.9 [g] at 0.129 [s]

Min: -56.6 [g] at 0.246 [s]

B-82

8413-65



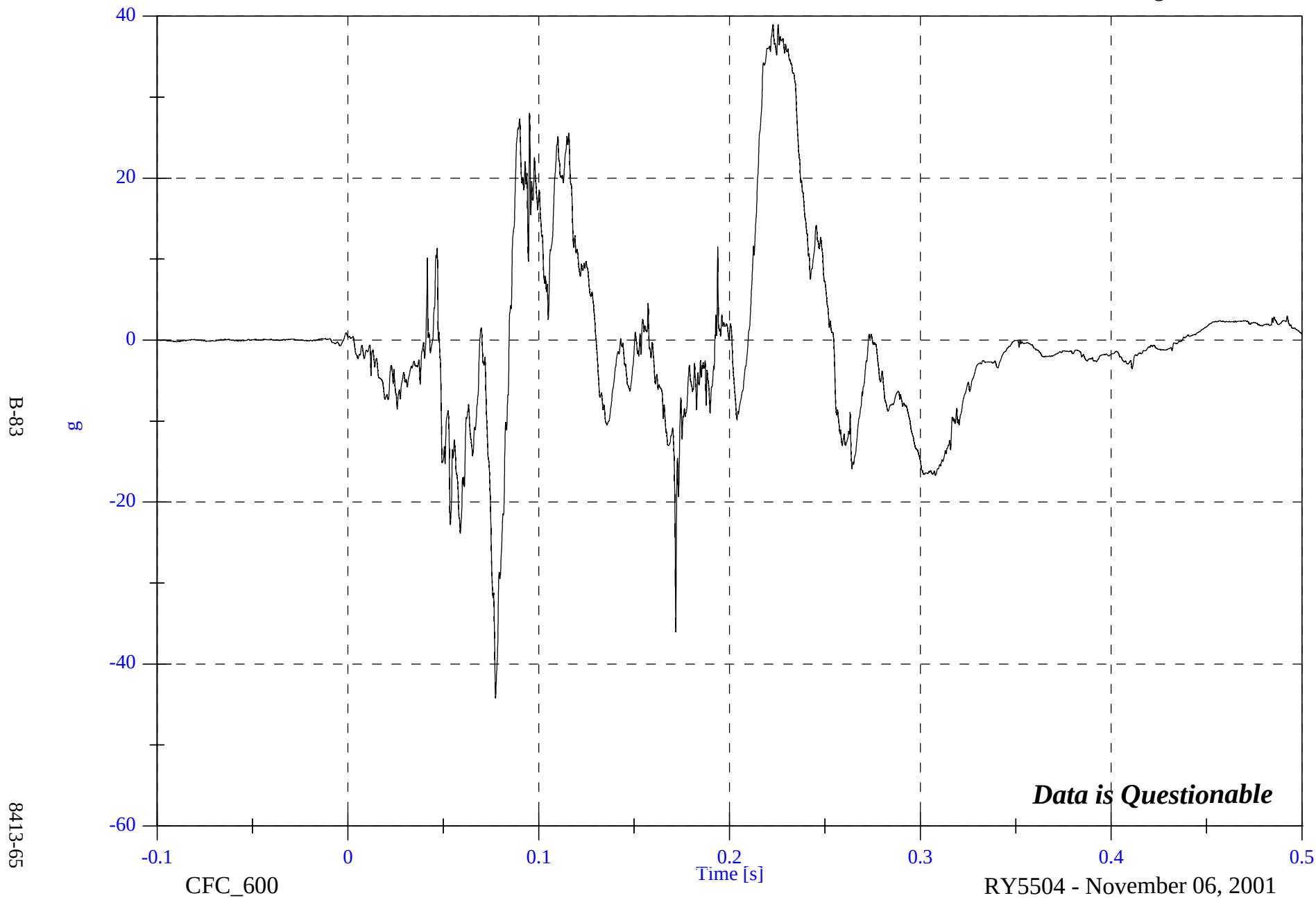


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Max: 39.0 [g] at 0.223 [s]

P1 Left Toe Az

Min: -44.2 [g] at 0.077 [s]

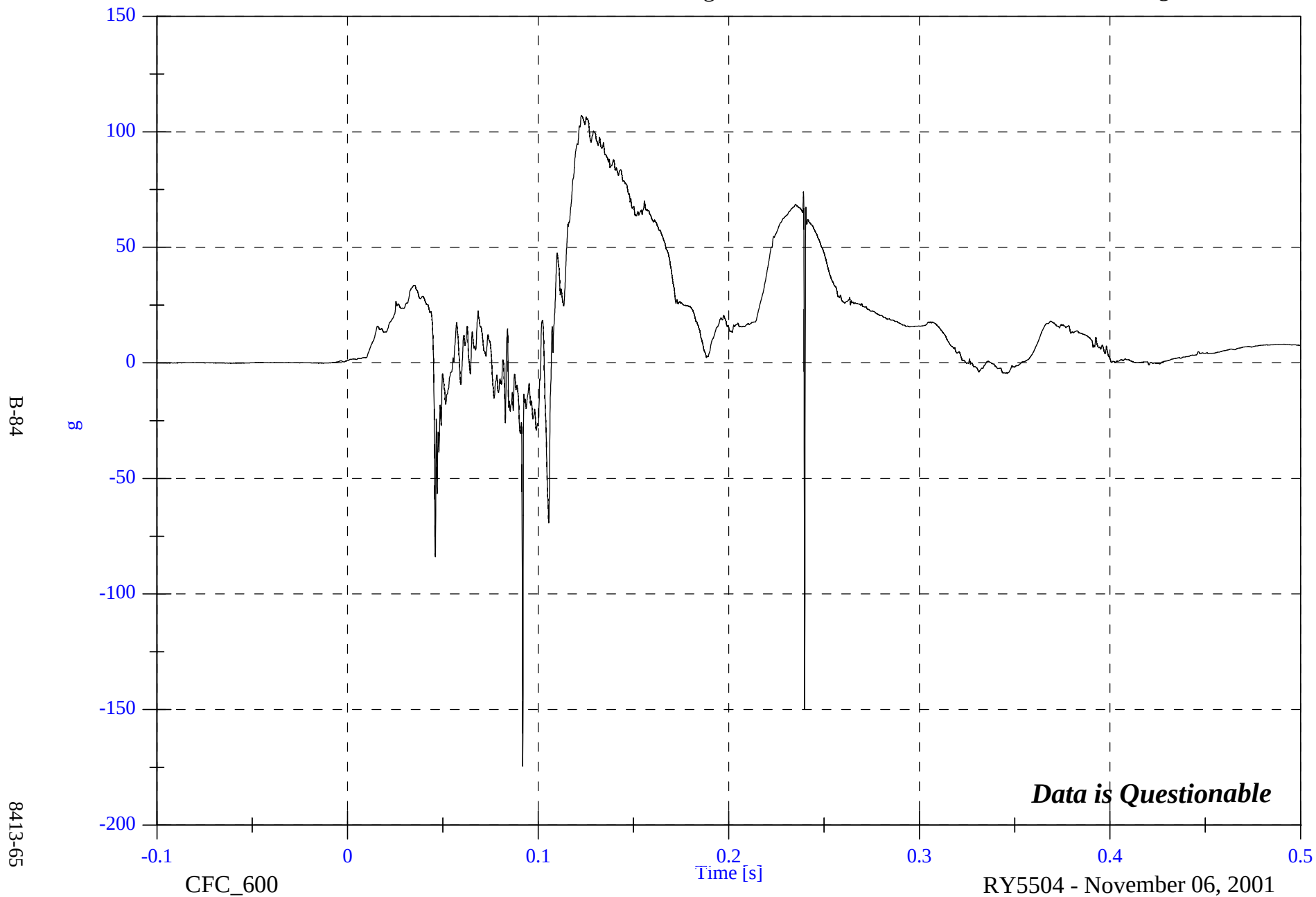


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Right Toe Az

Max: 107.1 [g] at 0.123 [s]

Min: -174.5 [g] at 0.092 [s]

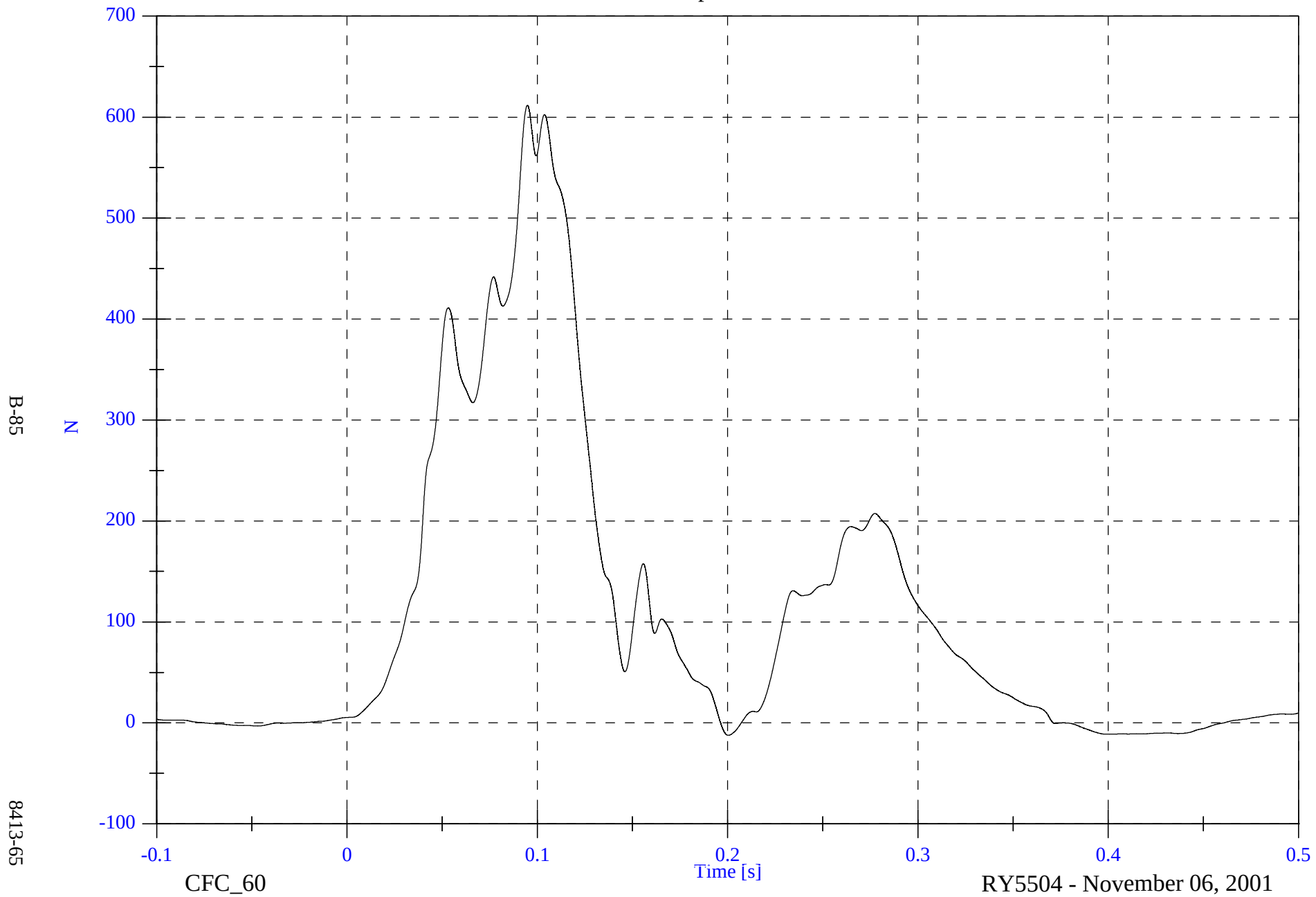


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P1 Lap Belt Force

Max: 611.7 [N] at 0.095 [s]

Min: -12.3 [N] at 0.200 [s]

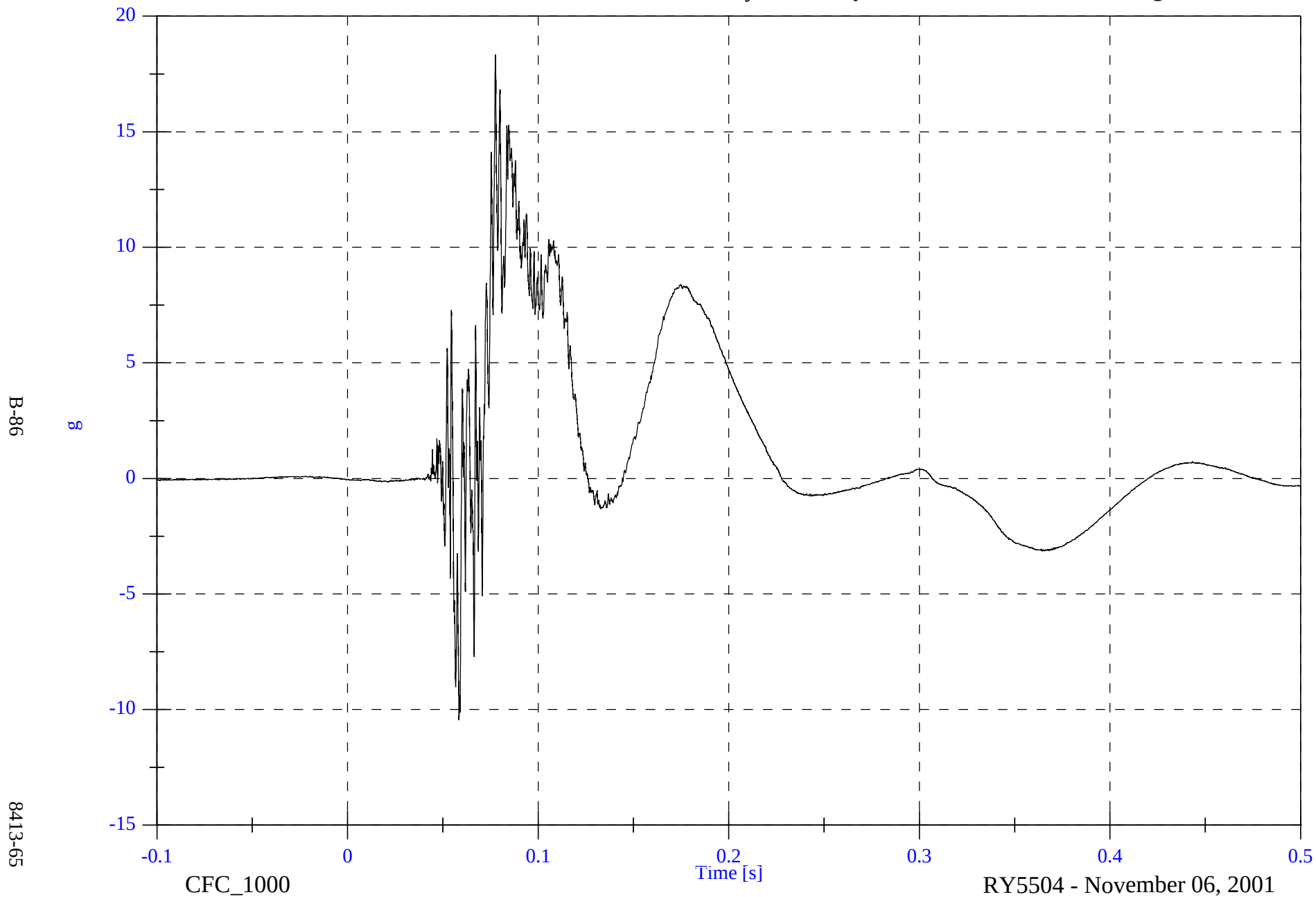


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head 9 Array X Arm Ay

Max: 18.3 [g] at 0.078 [s]

Min: -10.4 [g] at 0.058 [s]



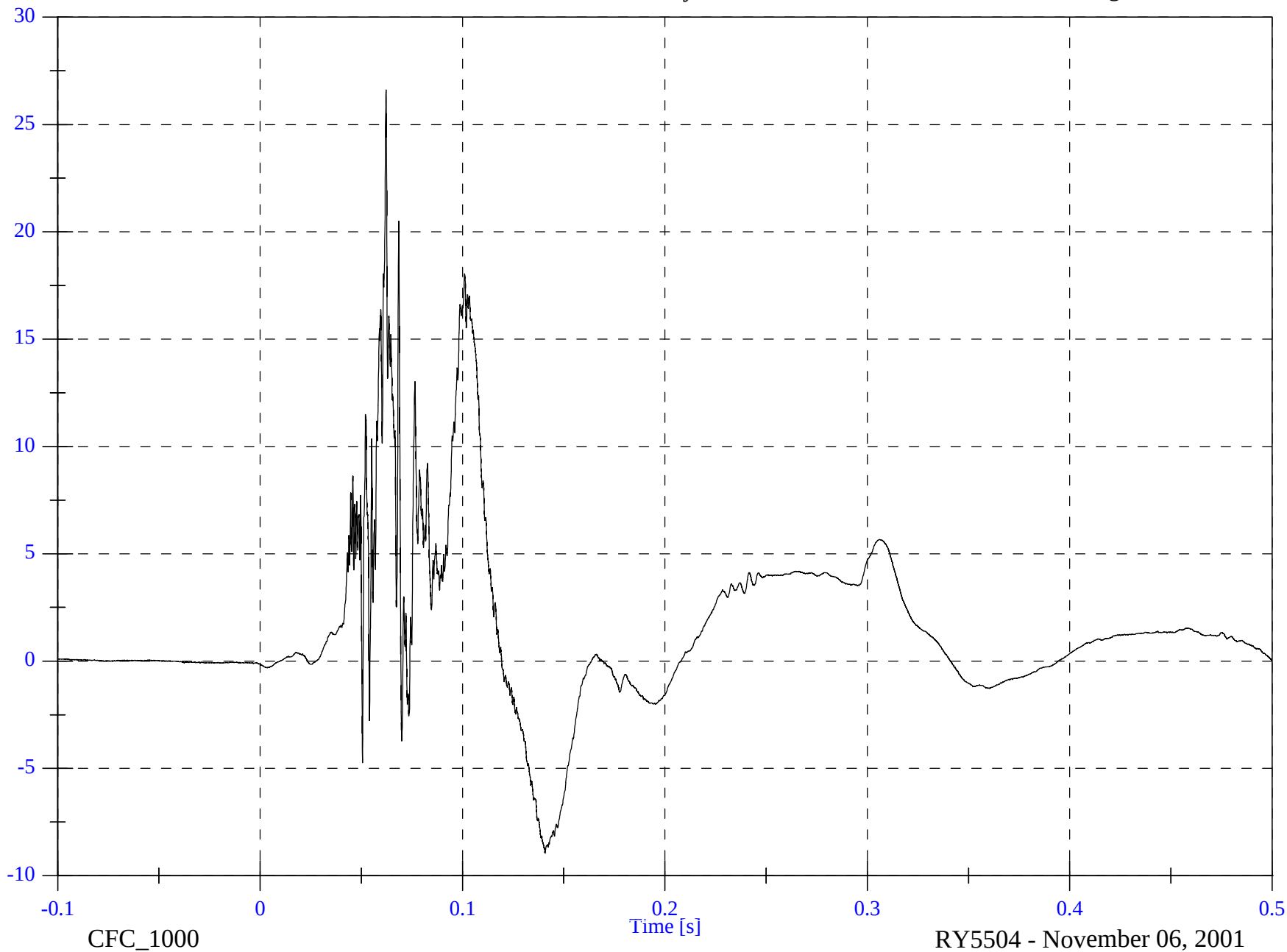


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head 9 Array X Arm Az

Max: 26.6 [g] at 0.062 [s]

Min: -9.0 [g] at 0.141 [s]



B-87

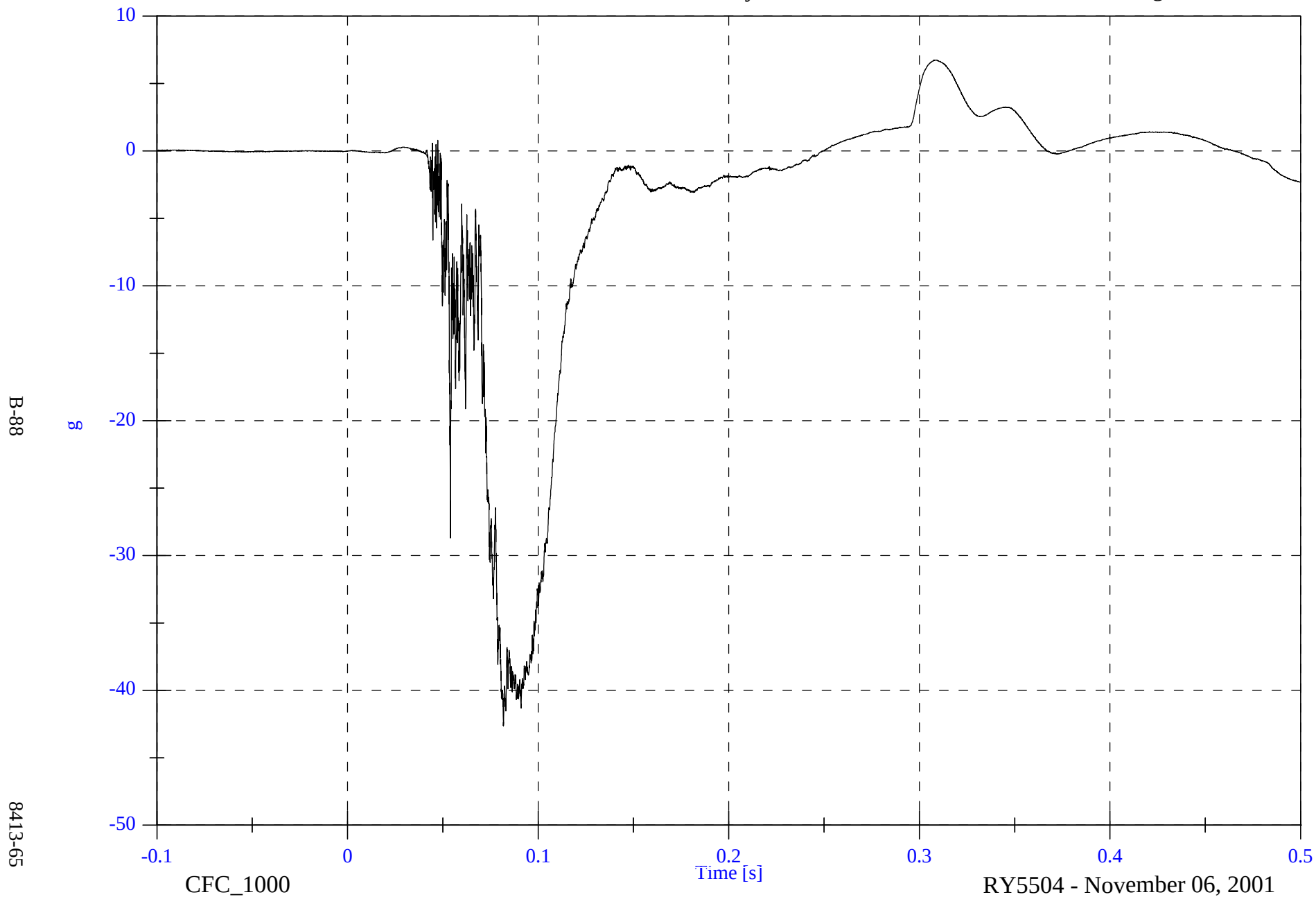
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head 9 Array Y Arm Ax

Max: 6.7 [g] at 0.309 [s]

Min: -42.6 [g] at 0.082 [s]

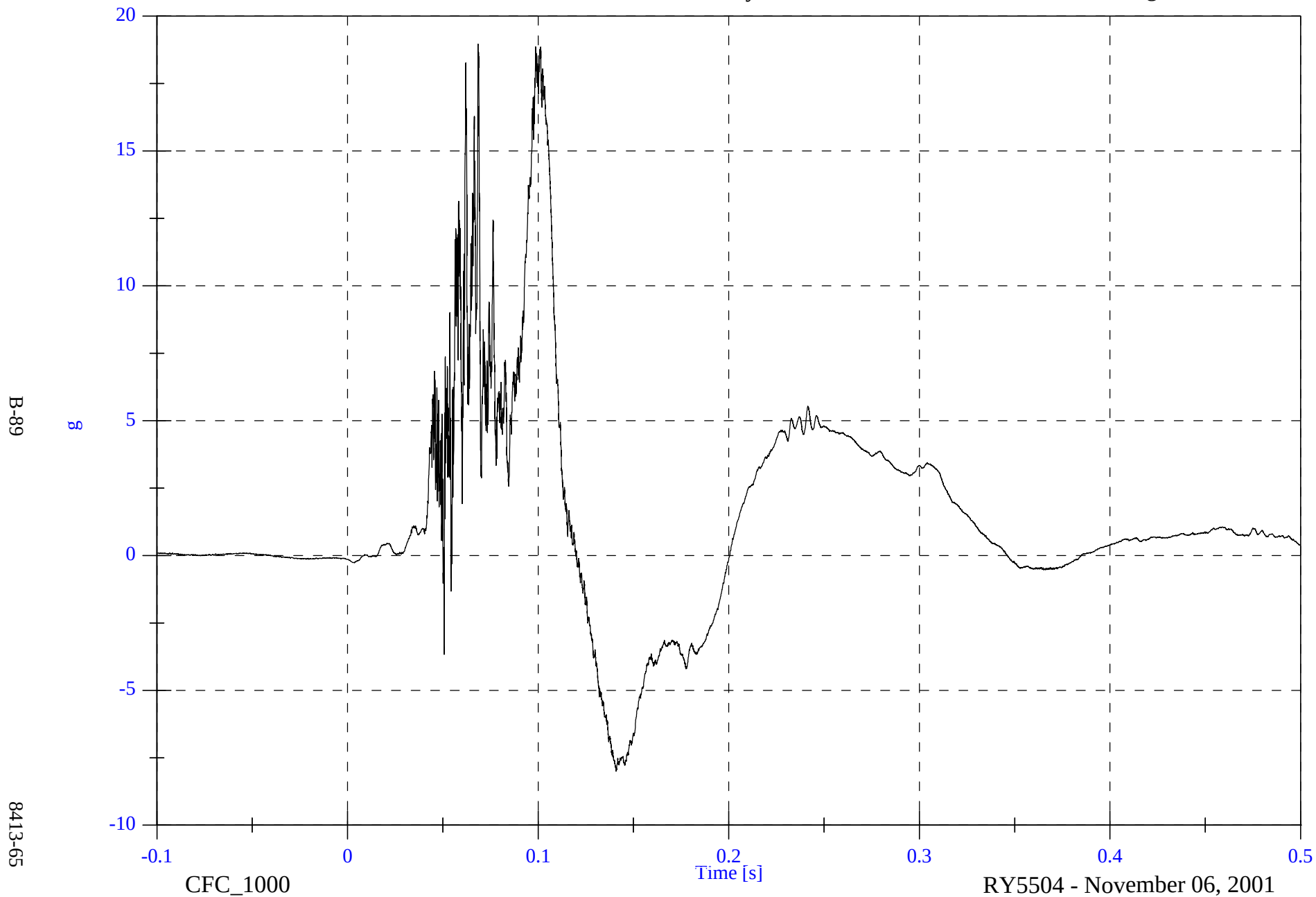


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head 9 Array Y Arm Az

Max: 19.0 [g] at 0.068 [s]

Min: -8.0 [g] at 0.141 [s]

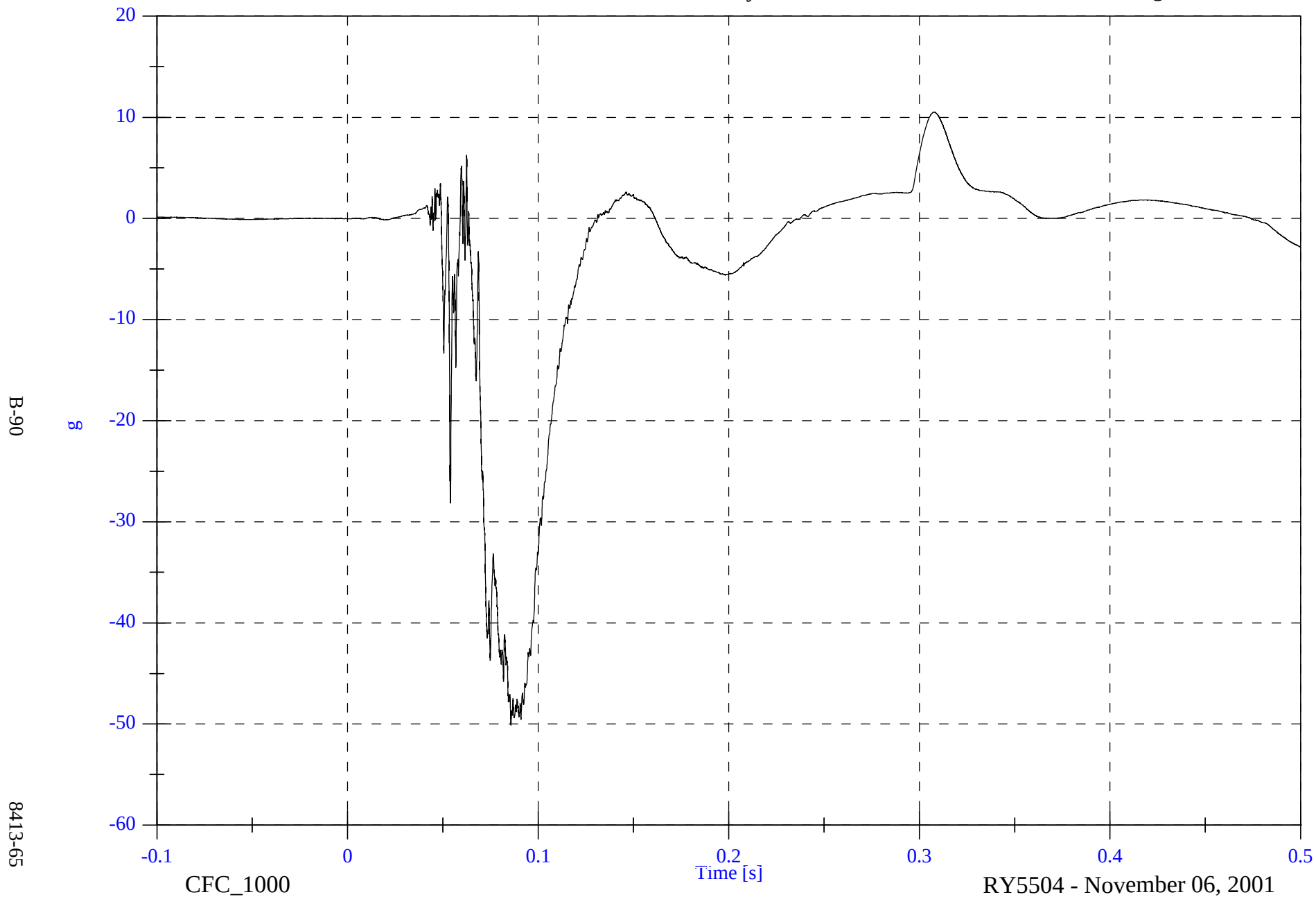


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head 9 Array Z Arm Ax

Max: 10.5 [g] at 0.308 [s]

Min: -50.1 [g] at 0.086 [s]



B-90

8413-65

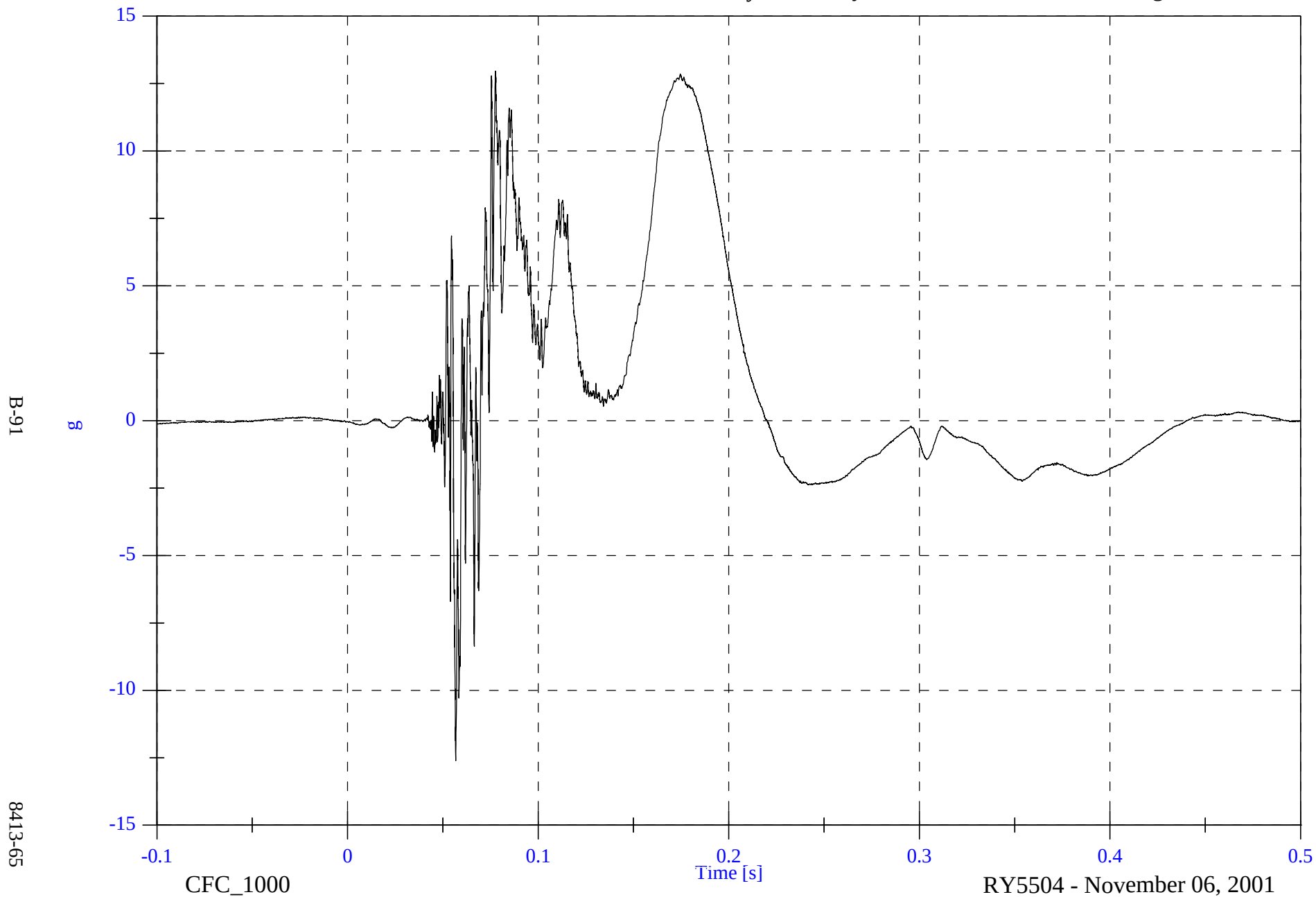


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head 9 Array Z Arm Ay

Max: 13.0 [g] at 0.078 [s]

Min: -12.6 [g] at 0.057 [s]

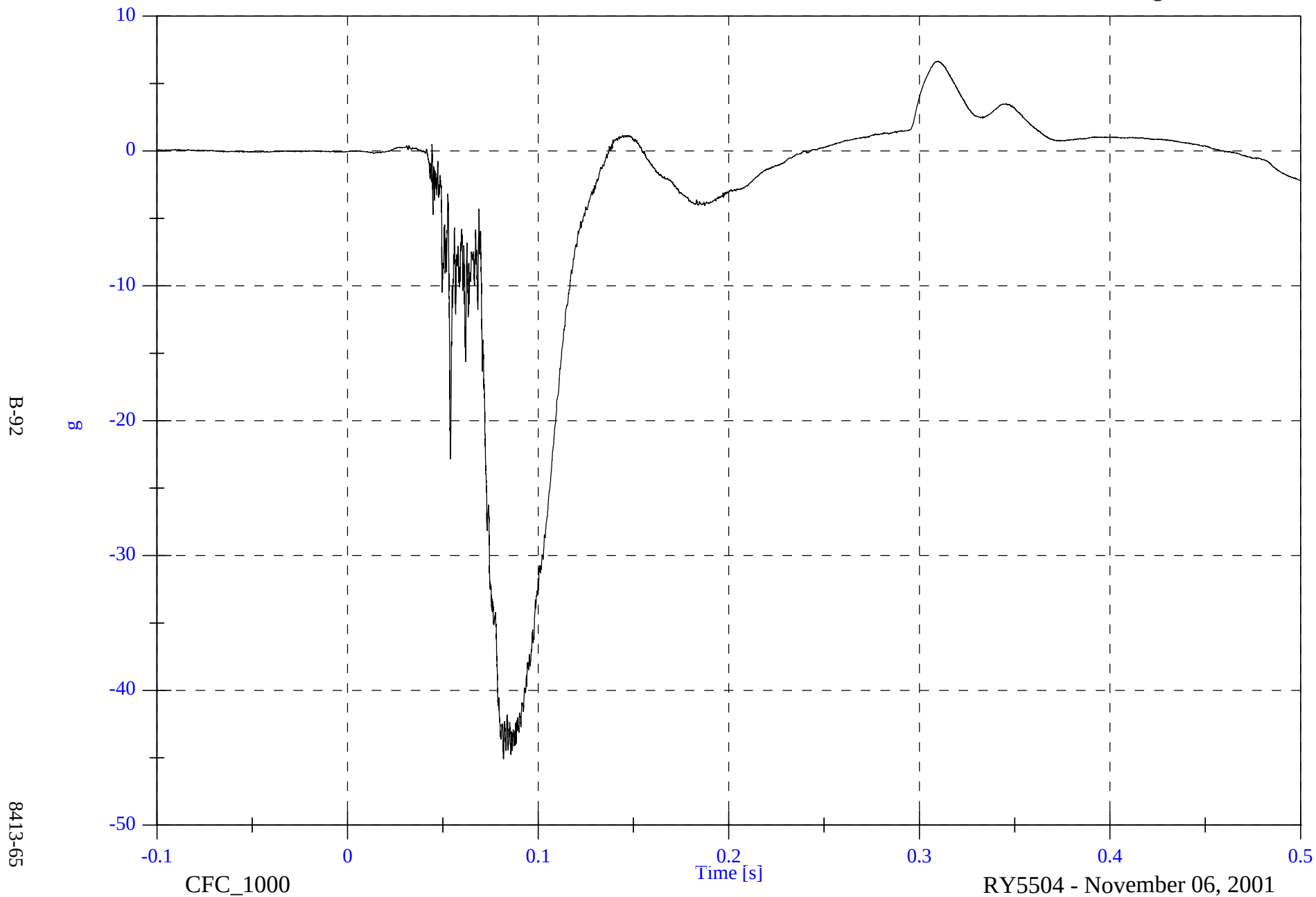


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head Ax

Max: 6.7 [g] at 0.310 [s]

Min: -45.1 [g] at 0.082 [s]

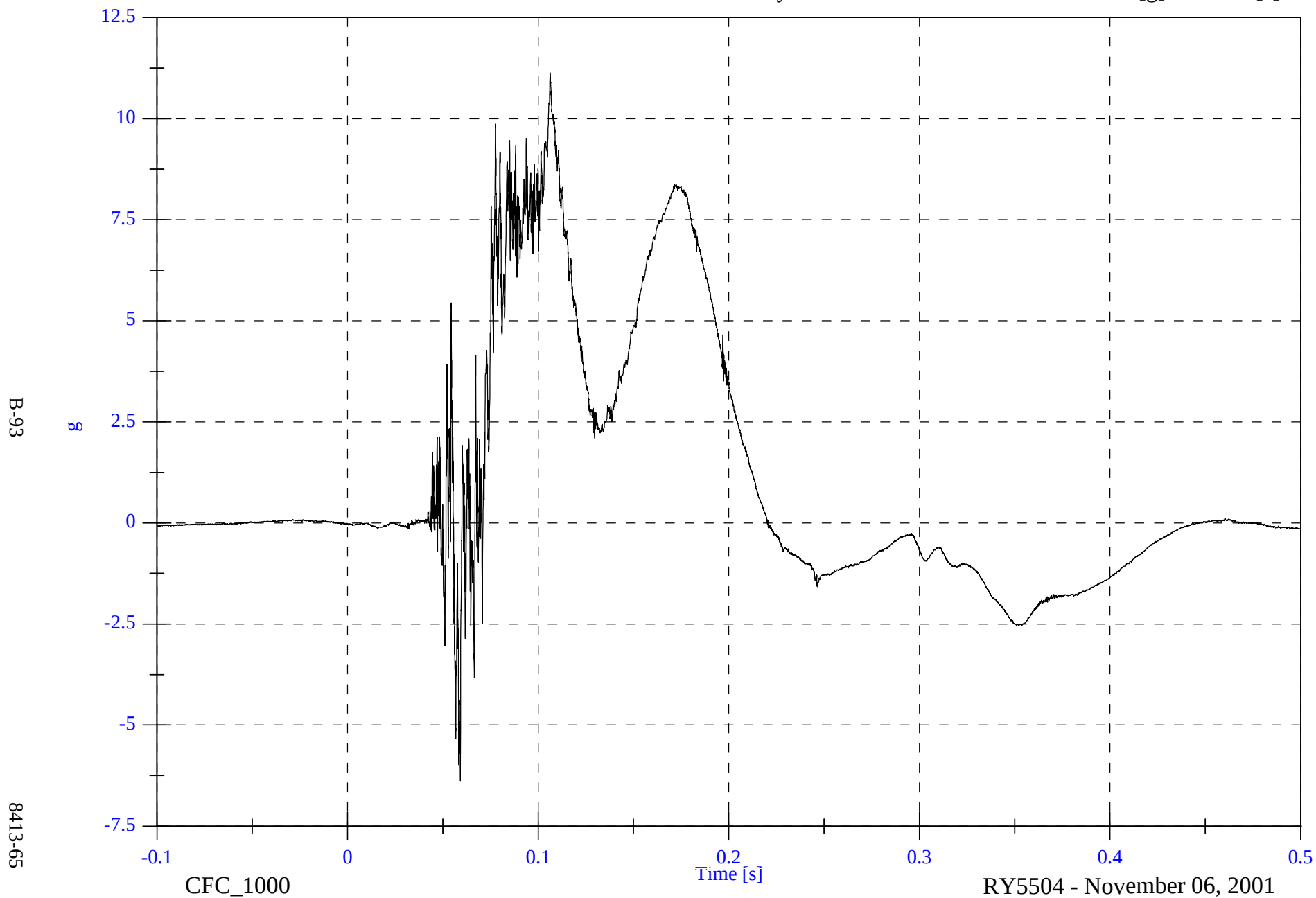


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head Ay

Max: 11.1 [g] at 0.106 [s]

Min: -6.4 [g] at 0.059 [s]

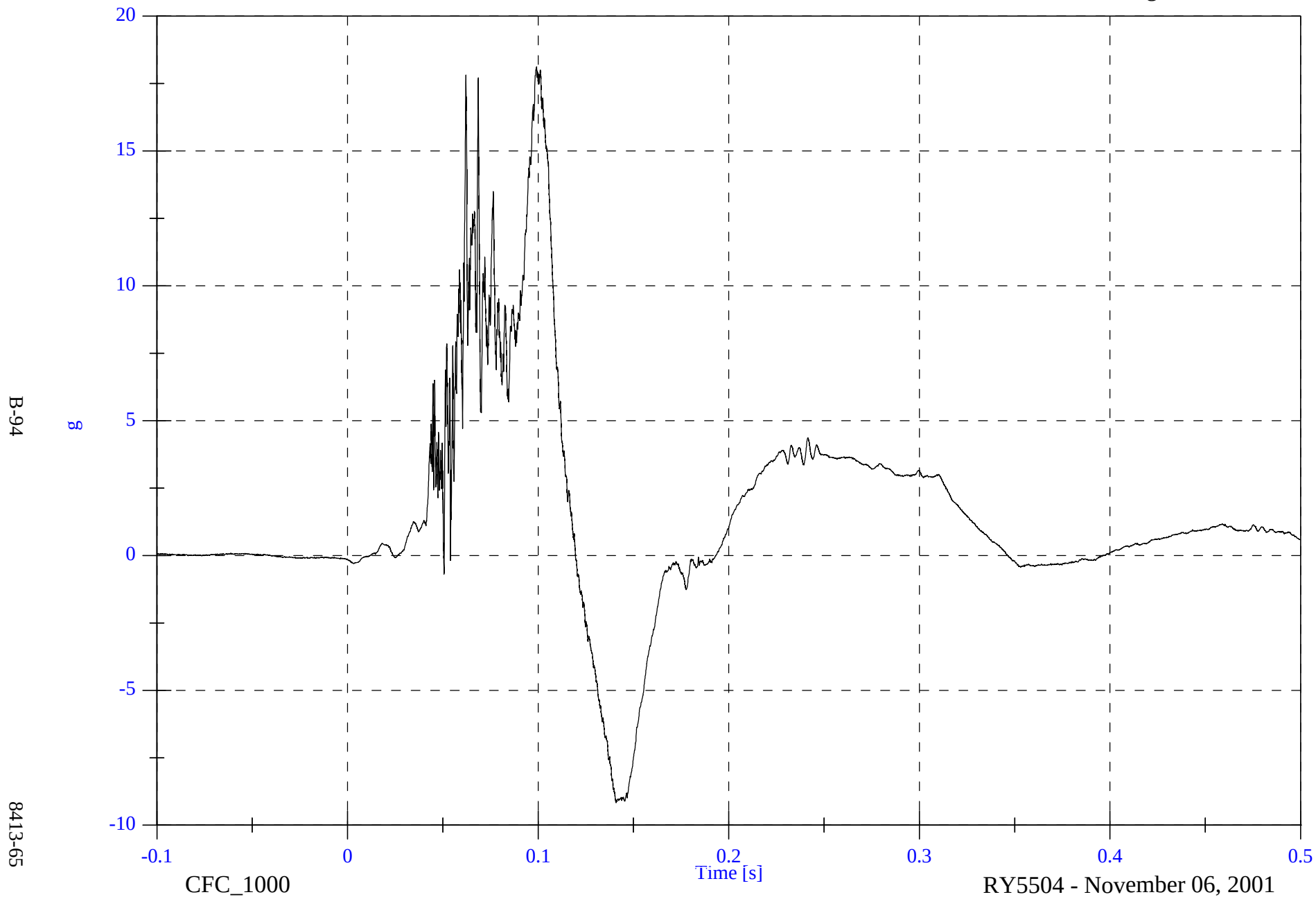


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Max: 18.1 [g] at 0.099 [s]

P2 Head Az

Min: -9.2 [g] at 0.141 [s]





40% Frontal Offset Test #9 - 2000 Subaru Legacy

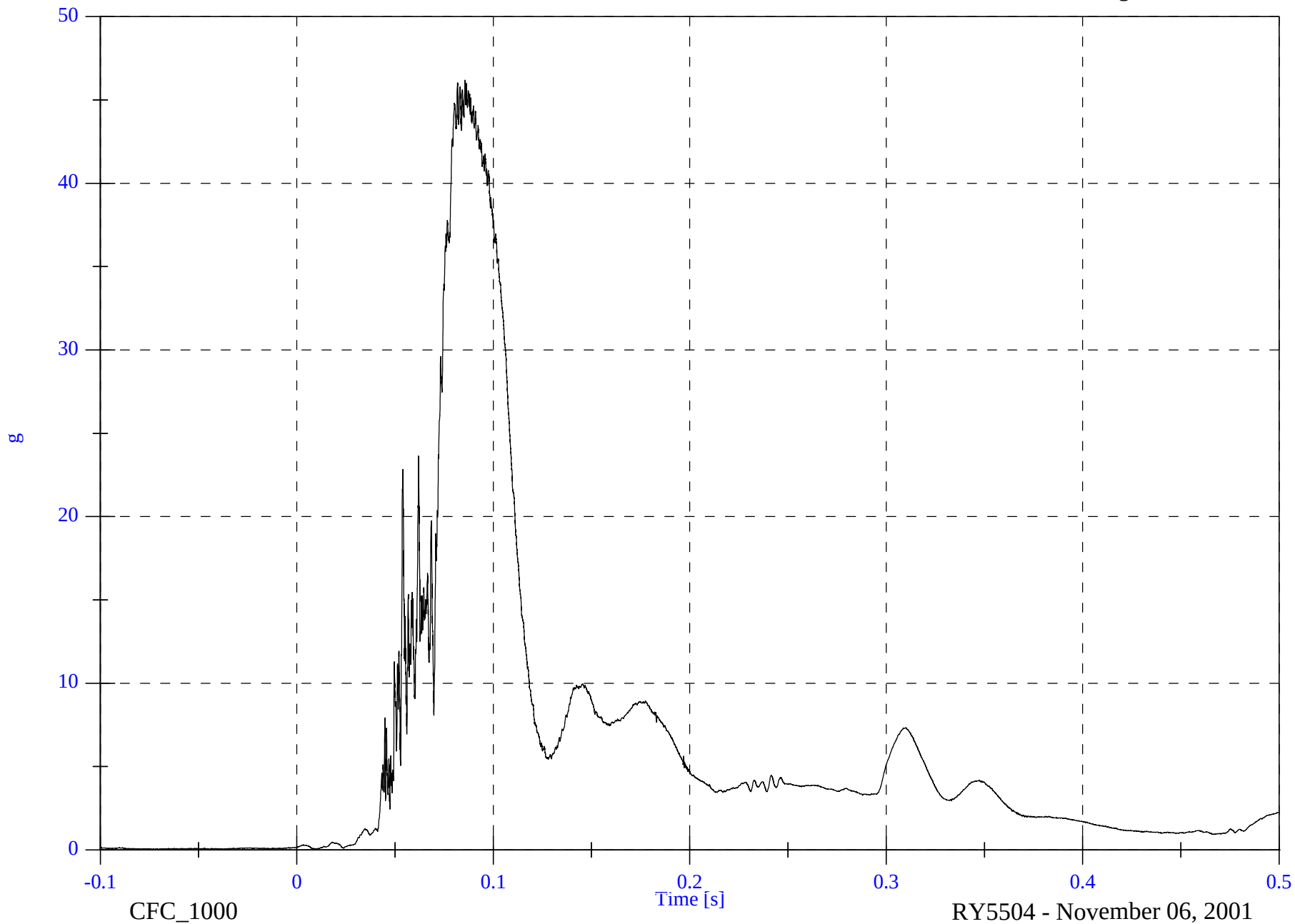
P2 Head A Resultant

Max: 46.2 [g] at 0.086 [s]

Min: 0.0 [g] at -0.072 [s]

B-95

8413-65

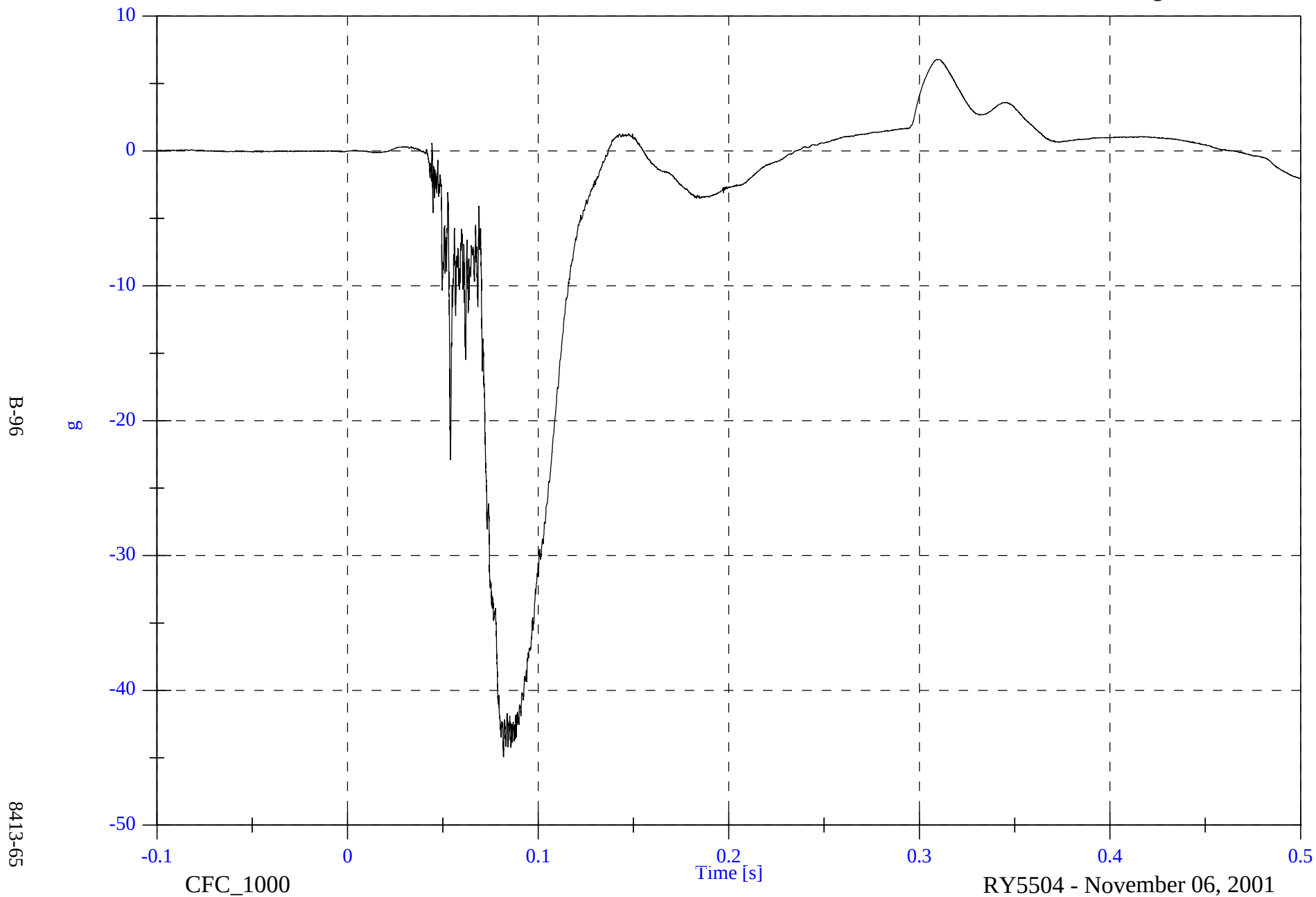


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head Red Ax

Max: 6.8 [g] at 0.310 [s]

Min: -45.0 [g] at 0.082 [s]

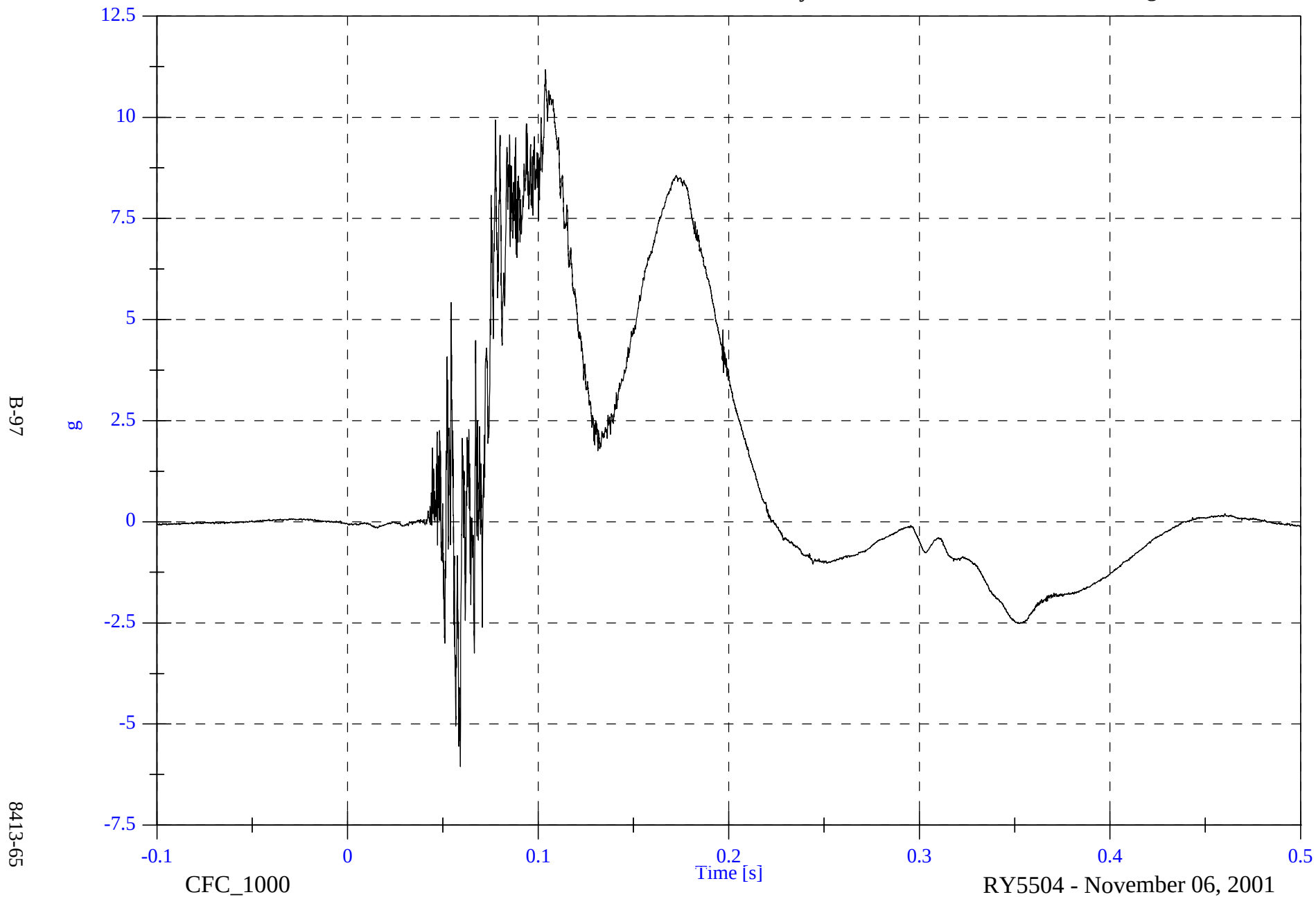


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head Red Ay

Max: 11.2 [g] at 0.104 [s]

Min: -6.1 [g] at 0.059 [s]

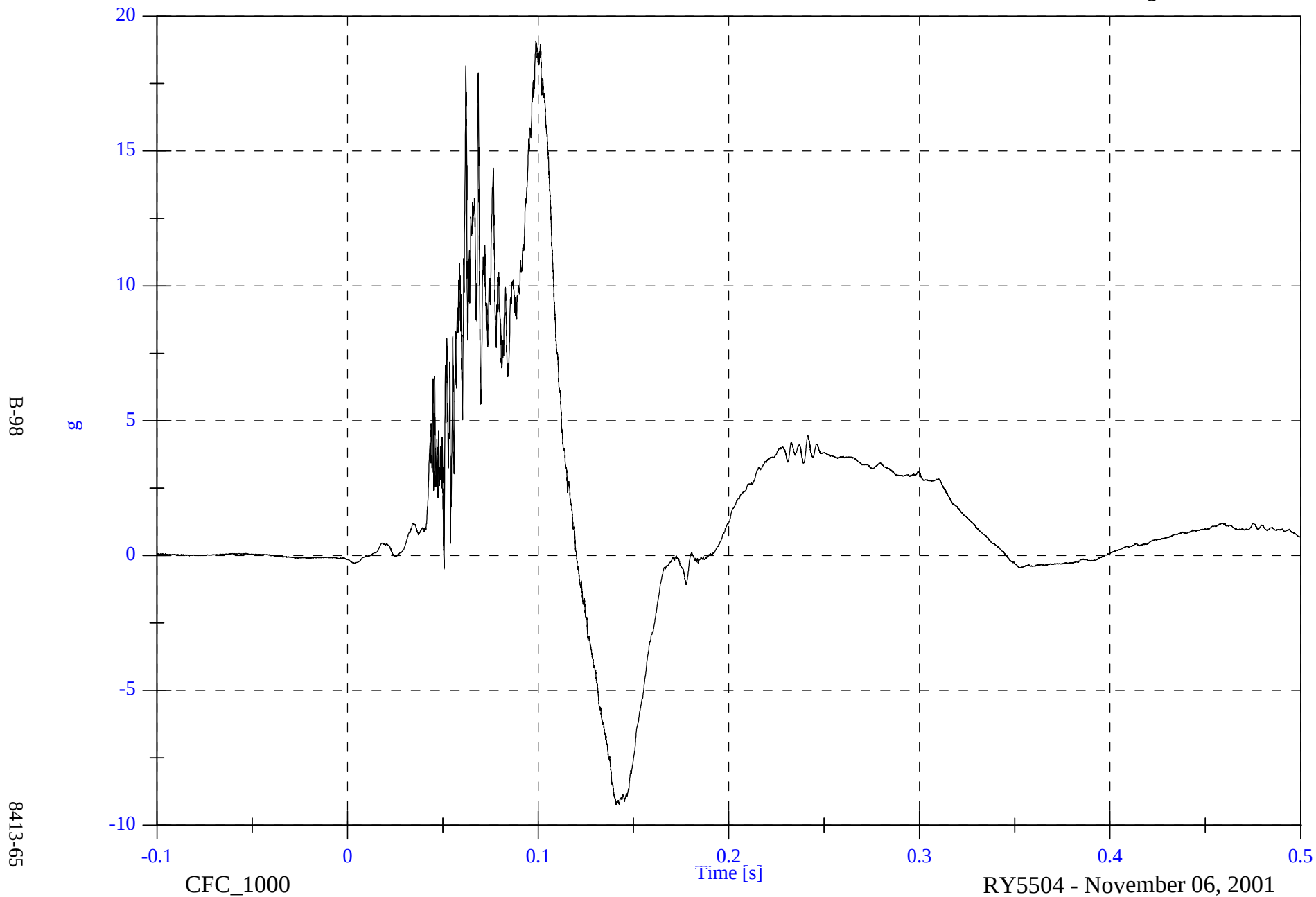


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Head Red Az

Max: 19.1 [g] at 0.099 [s]

Min: -9.2 [g] at 0.143 [s]





40% Frontal Offset Test #9 - 2000 Subaru Legacy

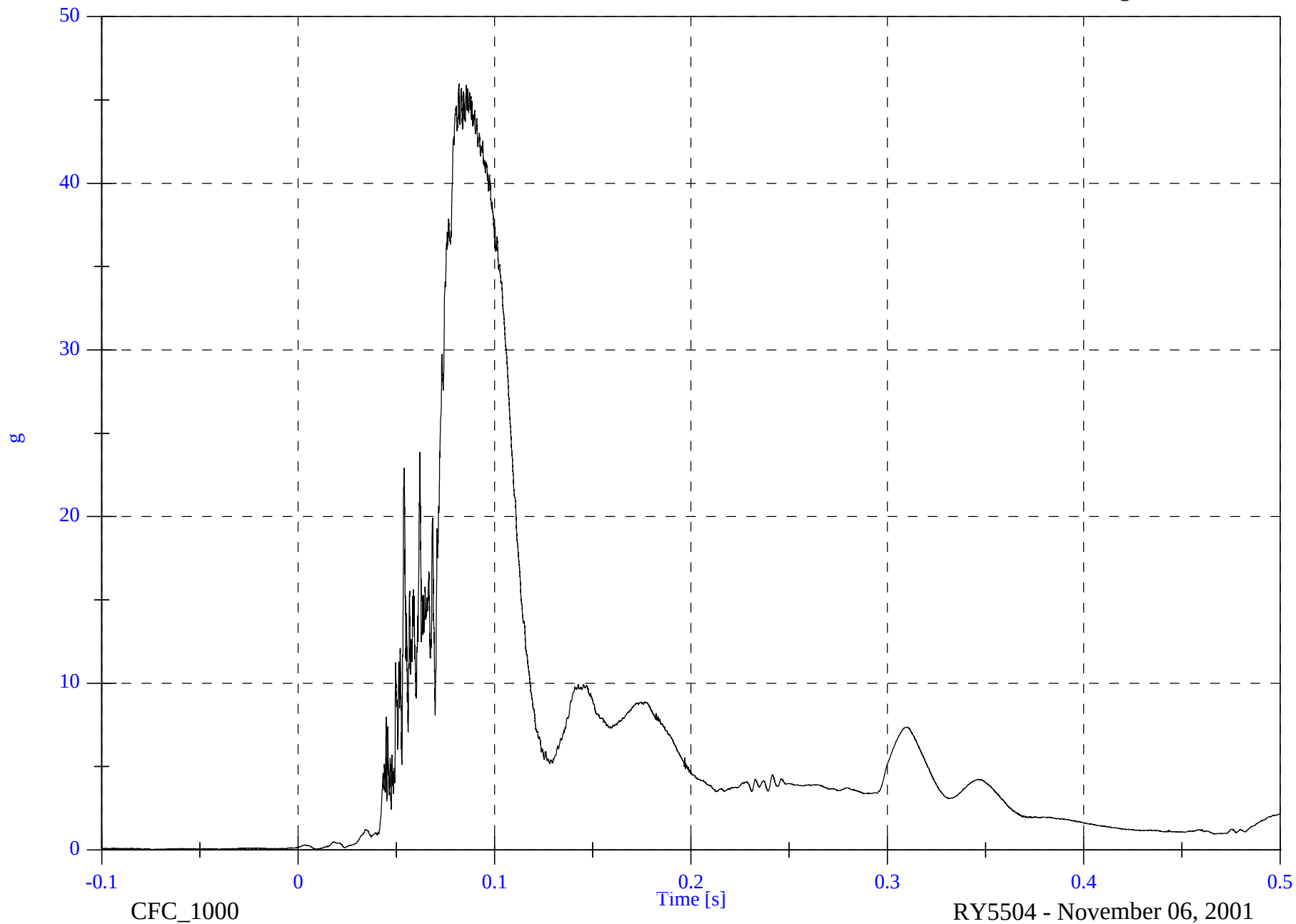
P2 Head Red A Resultant

Max: 46.0 [g] at 0.082 [s]

Min: 0.0 [g] at -0.075 [s]

B-99

8413-65

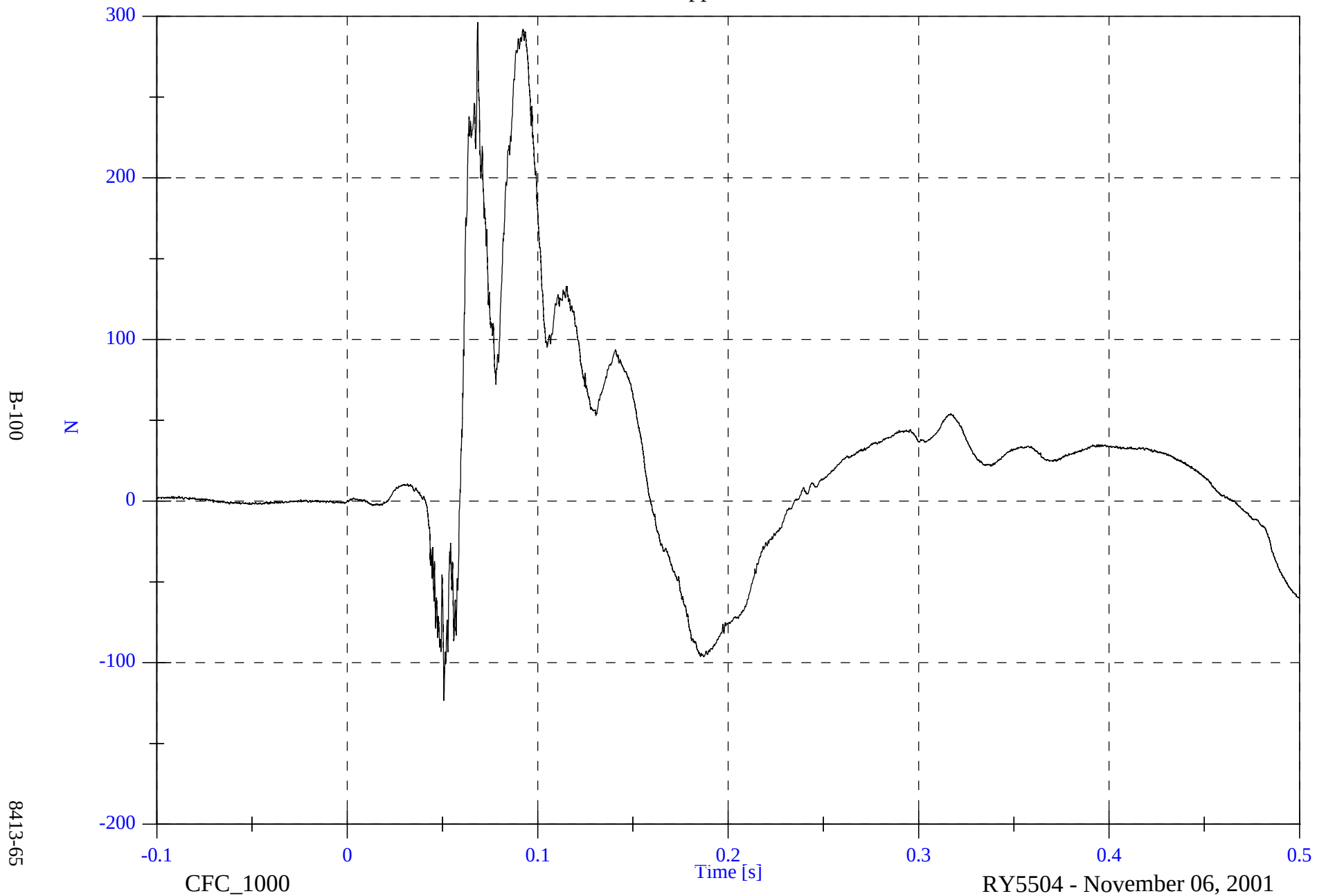


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Upper Neck Fx

Max: 296.2 [N] at 0.069 [s]

Min: -123.4 [N] at 0.051 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

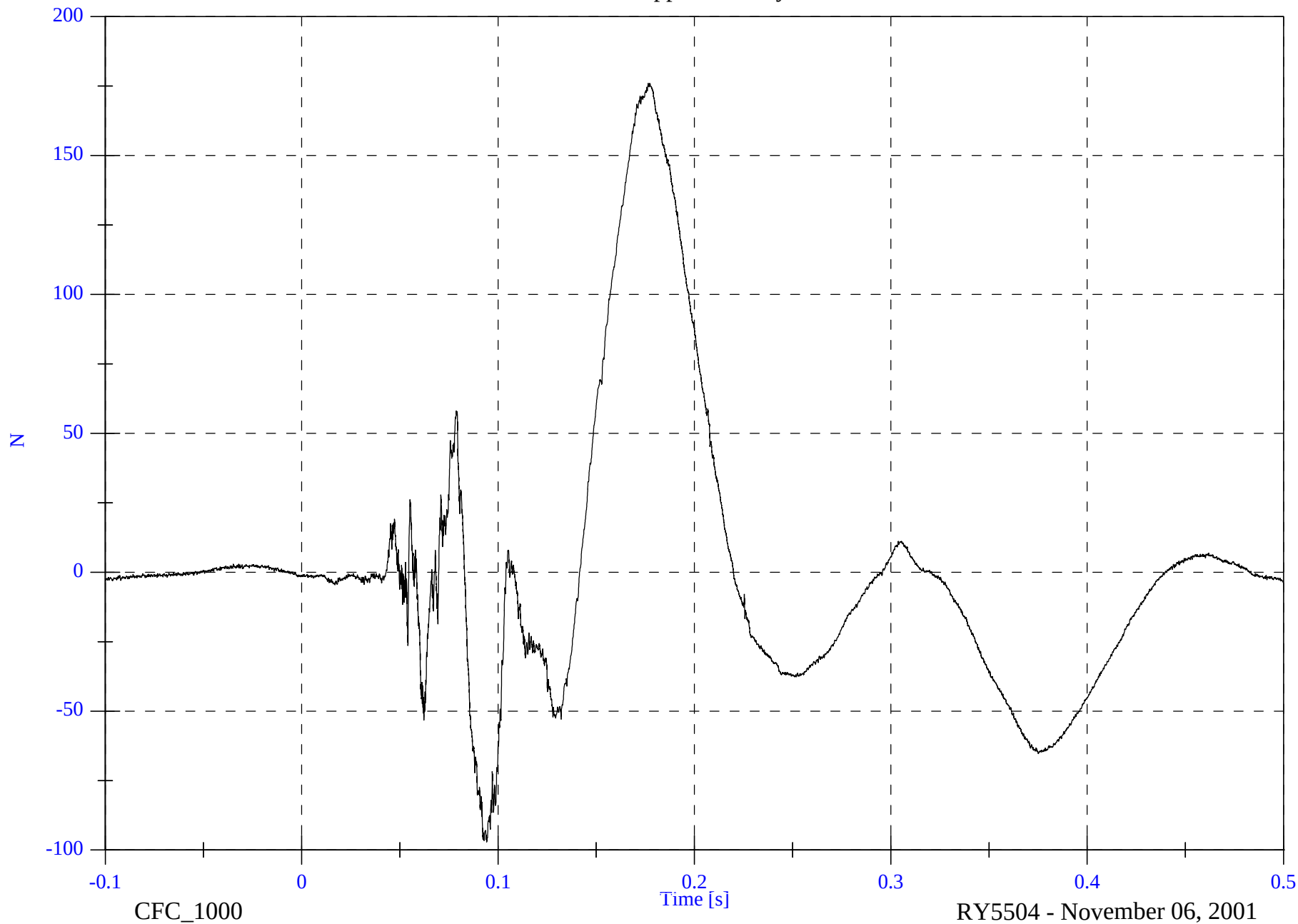
P2 Upper Neck Fy

Max: 176.1 [N] at 0.177 [s]

Min: -97.1 [N] at 0.094 [s]

B-101

8413-65

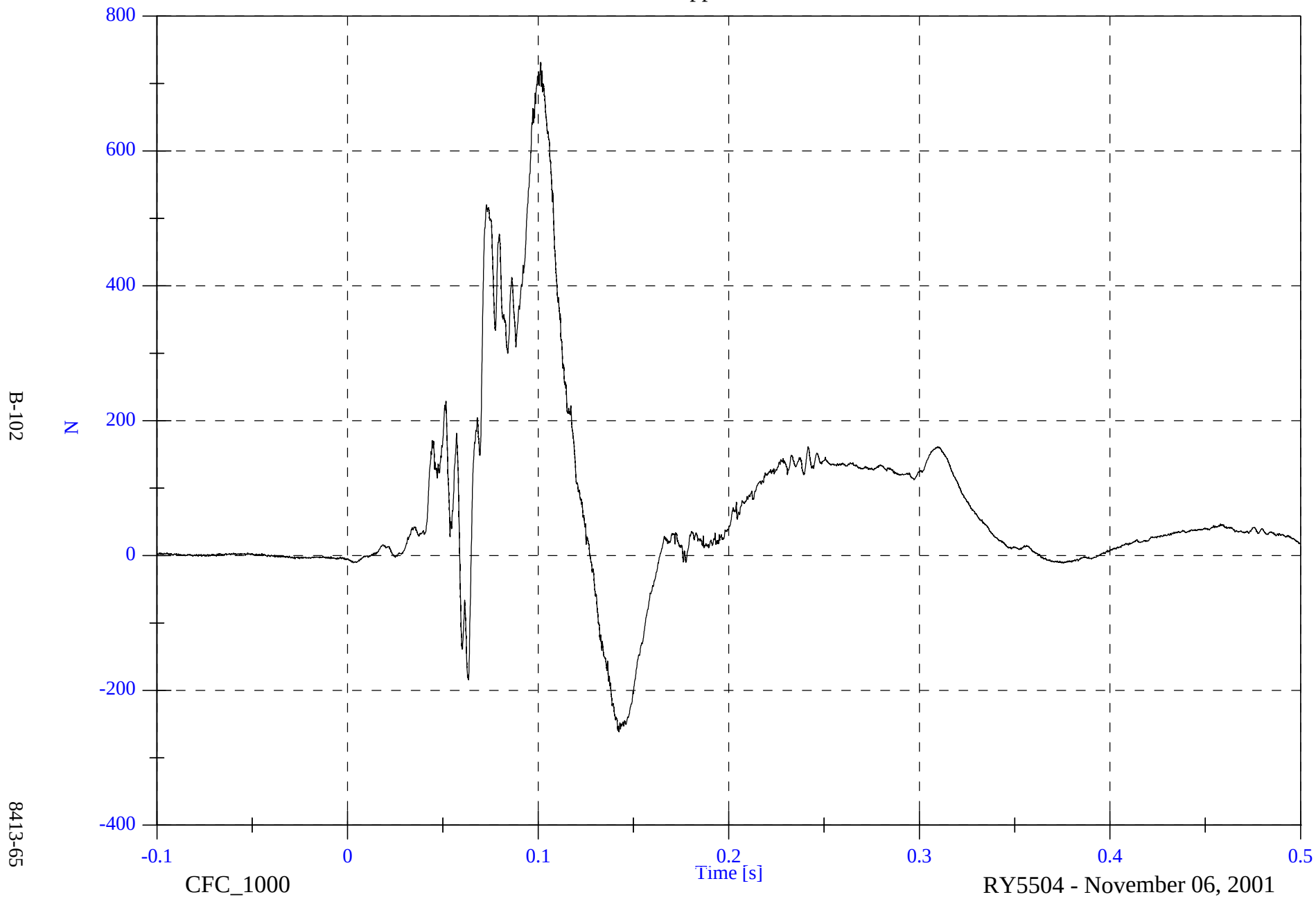


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Upper Neck Fz

Max: 731.9 [N] at 0.101 [s]

Min: -261.8 [N] at 0.142 [s]



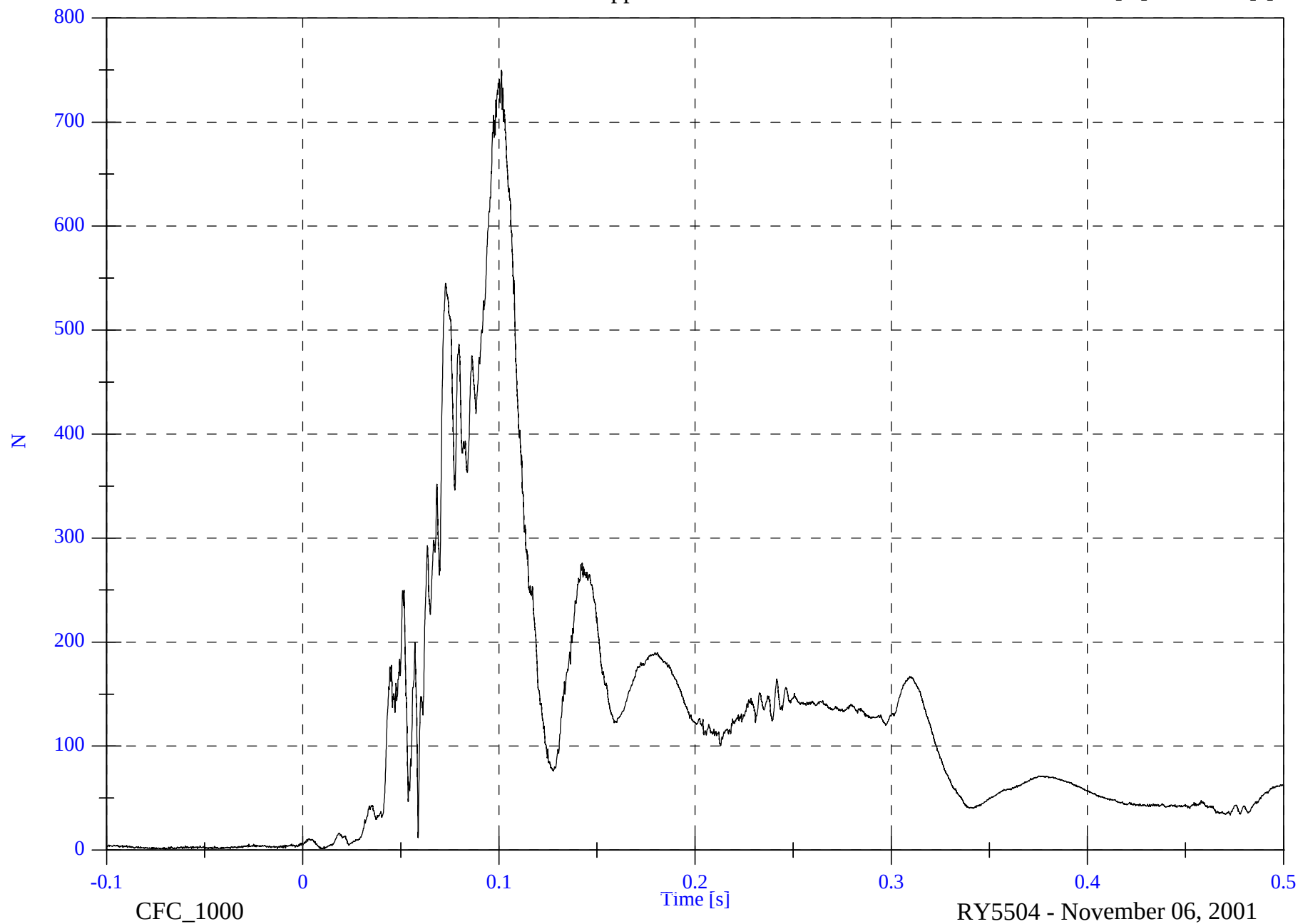


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Upper Neck F Resultant

Max: 750.2 [N] at 0.101 [s]

Min: 0.7 [N] at -0.070 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

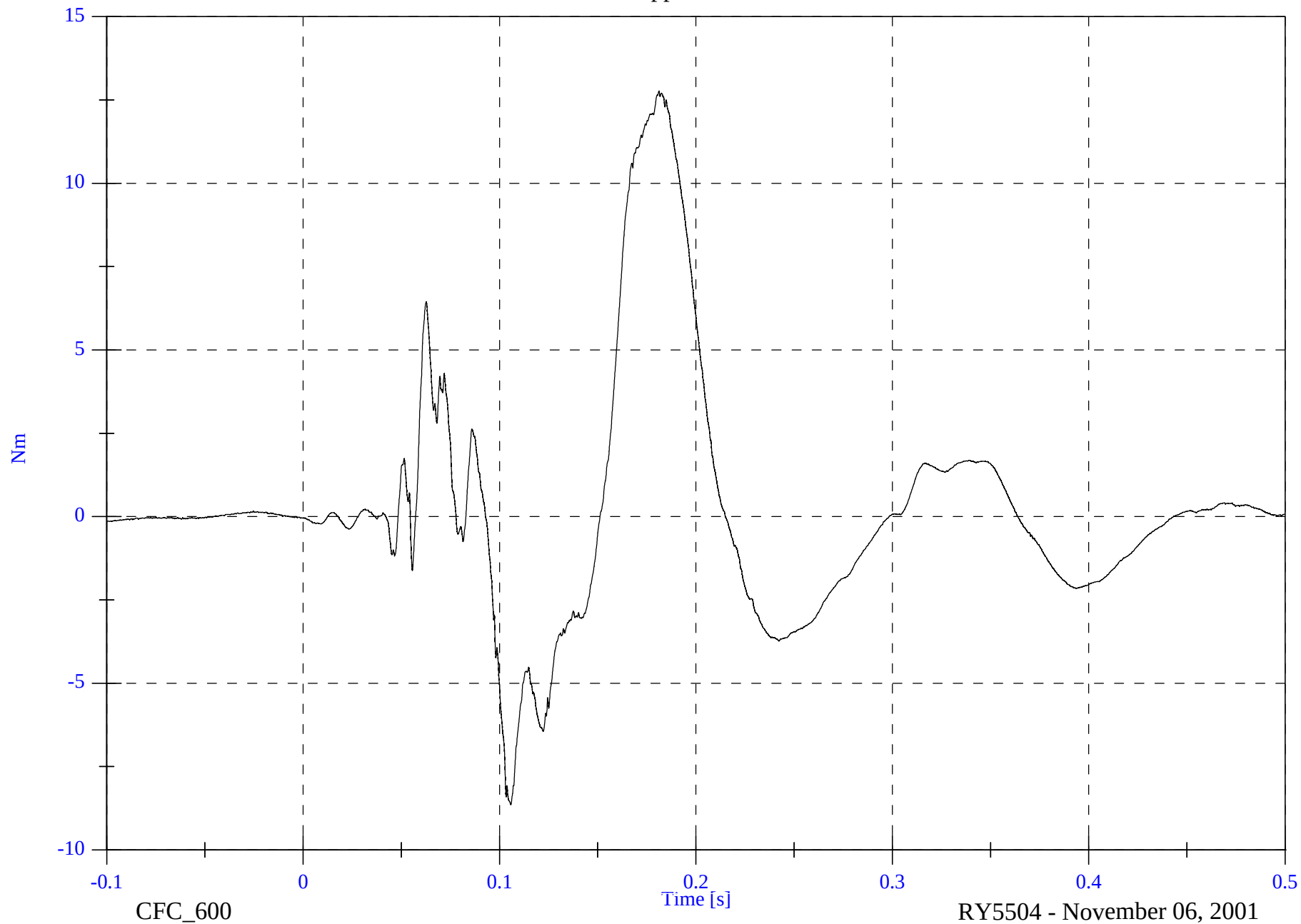
P2 Upper Neck Mx

Max: 12.8 [Nm] at 0.181 [s]

Min: -8.6 [Nm] at 0.106 [s]

B-104

8413-65



40% Frontal Offset Test #9 - 2000 Subaru Legacy

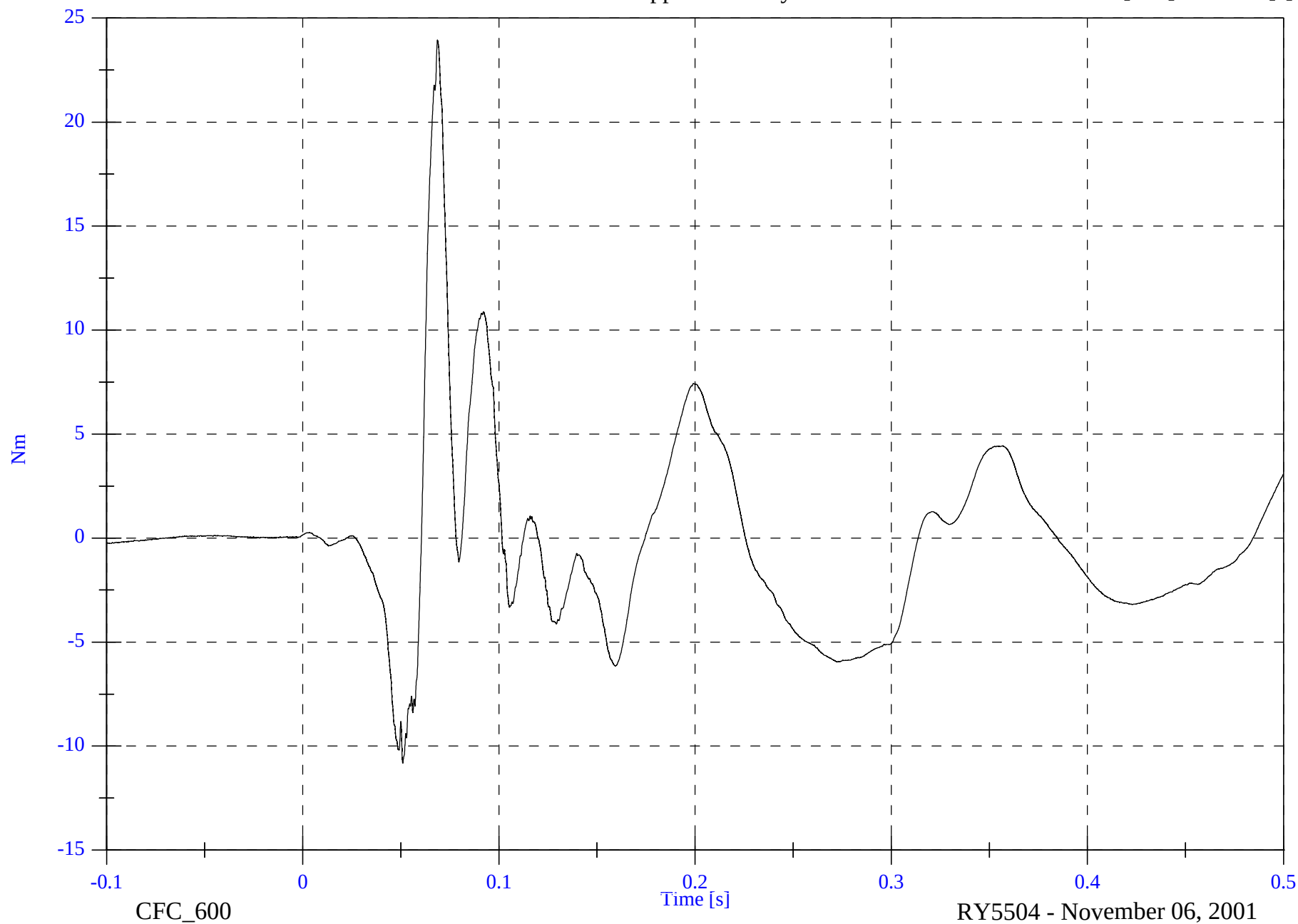
P2 Upper Neck My

Max: 24.0 [Nm] at 0.069 [s]

Min: -10.8 [Nm] at 0.051 [s]

B-105

8413-65

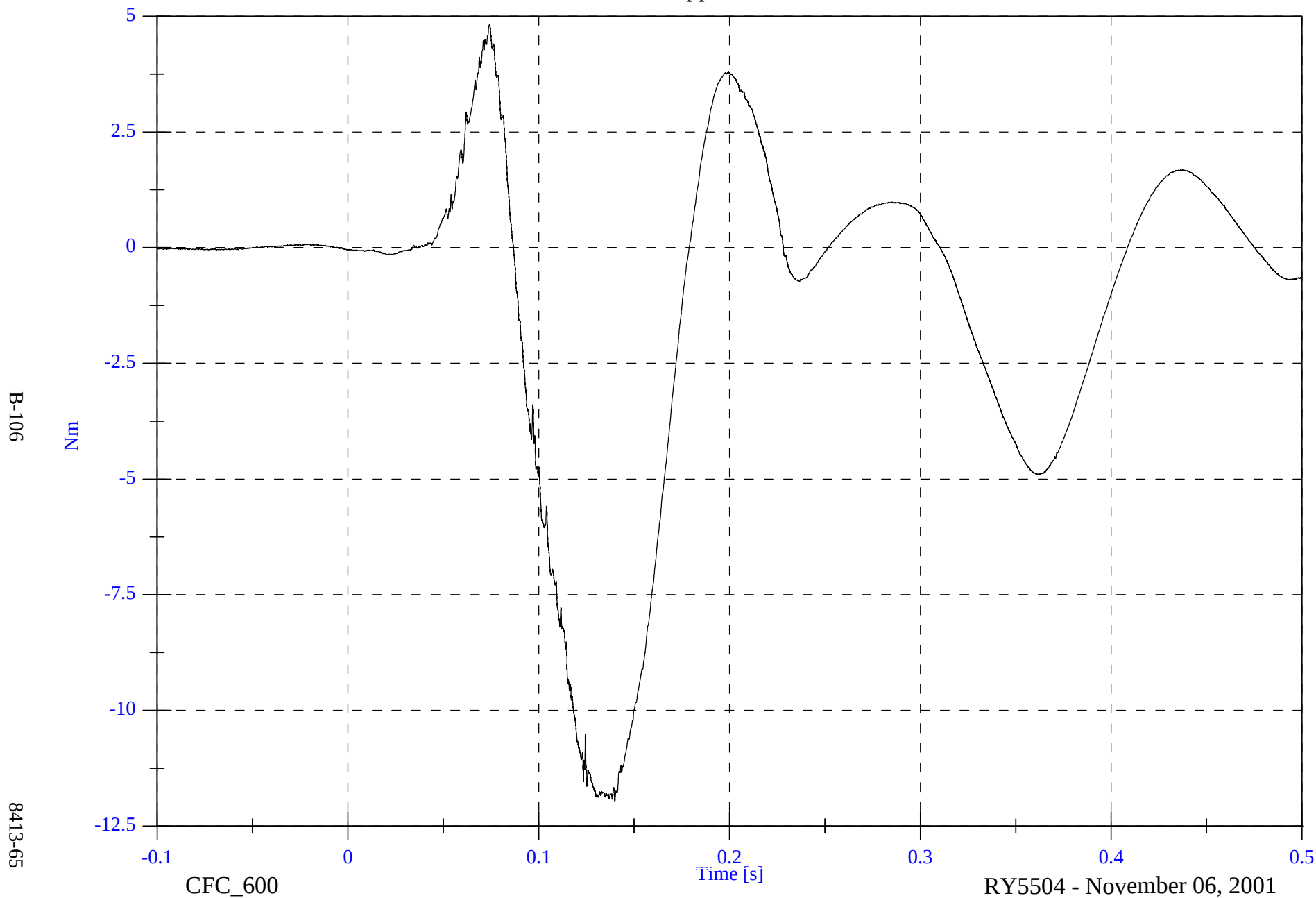


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Upper Neck Mz

Max: 4.8 [Nm] at 0.074 [s]

Min: -12.0 [Nm] at 0.140 [s]



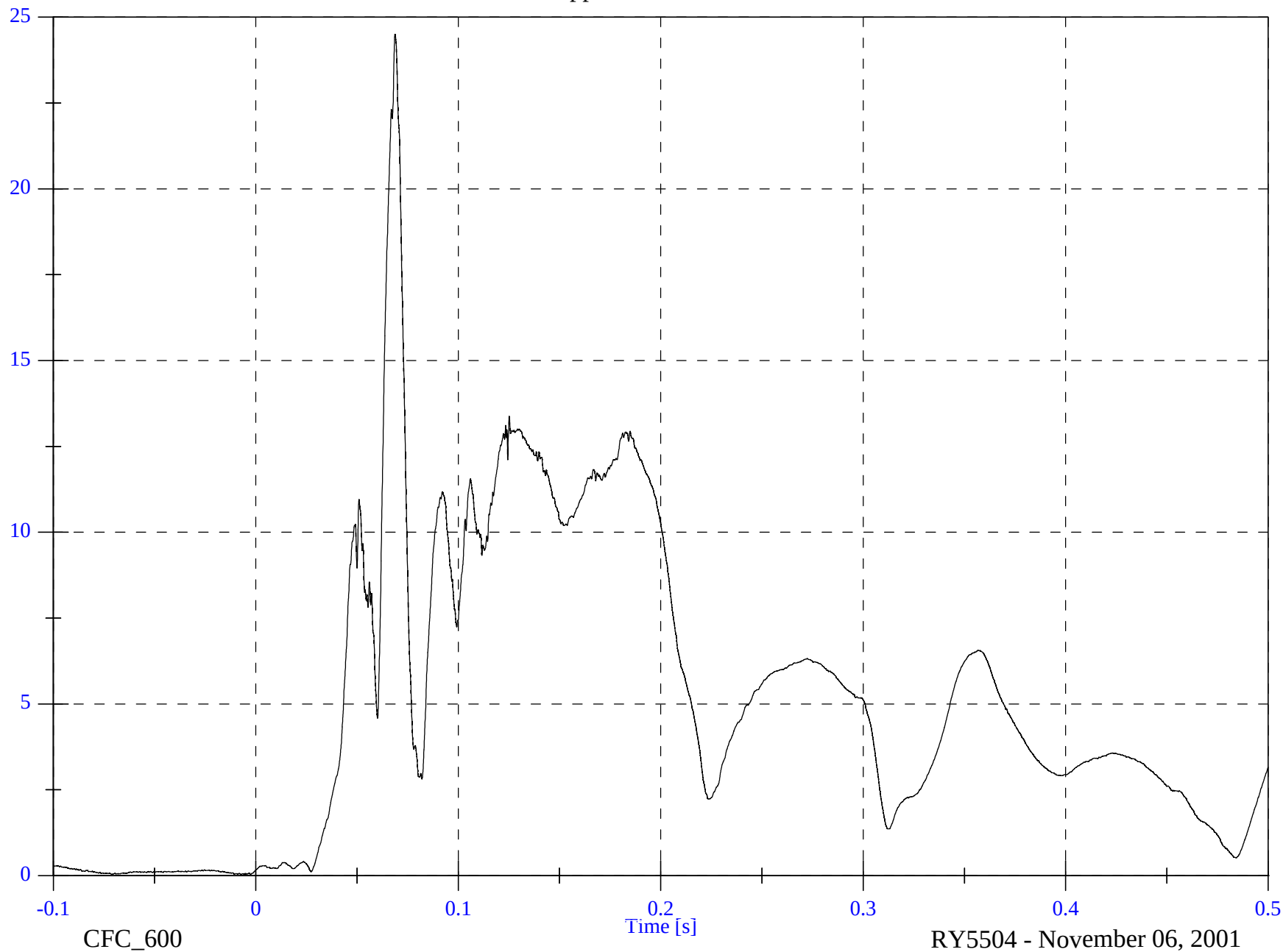


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Upper Neck M Resultant

Max: 24.5 [Nm] at 0.069 [s]

Min: 0.0 [Nm] at -0.003 [s]



B-107

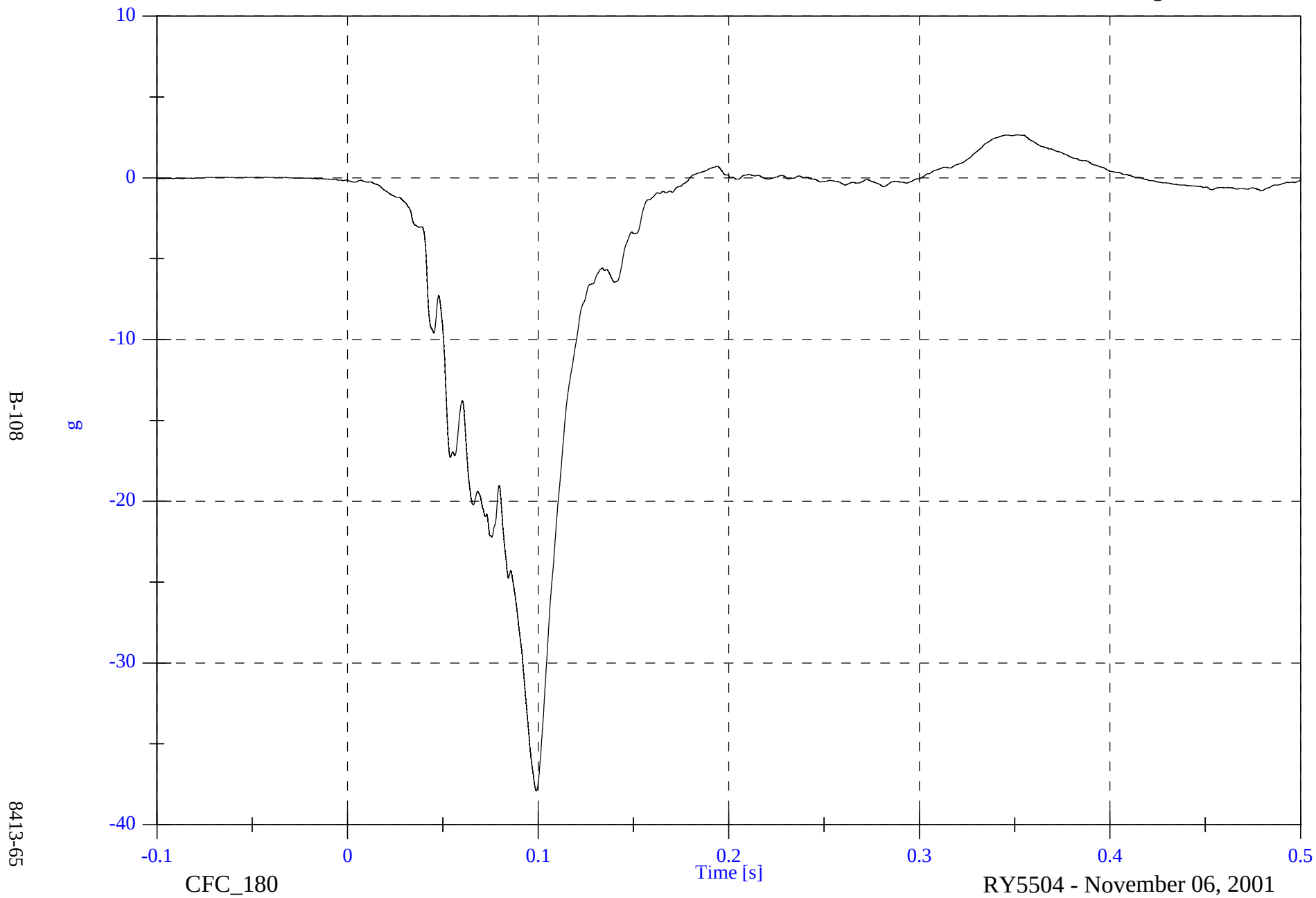
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Chest Ax

Max: 2.7 [g] at 0.351 [s]

Min: -37.9 [g] at 0.099 [s]

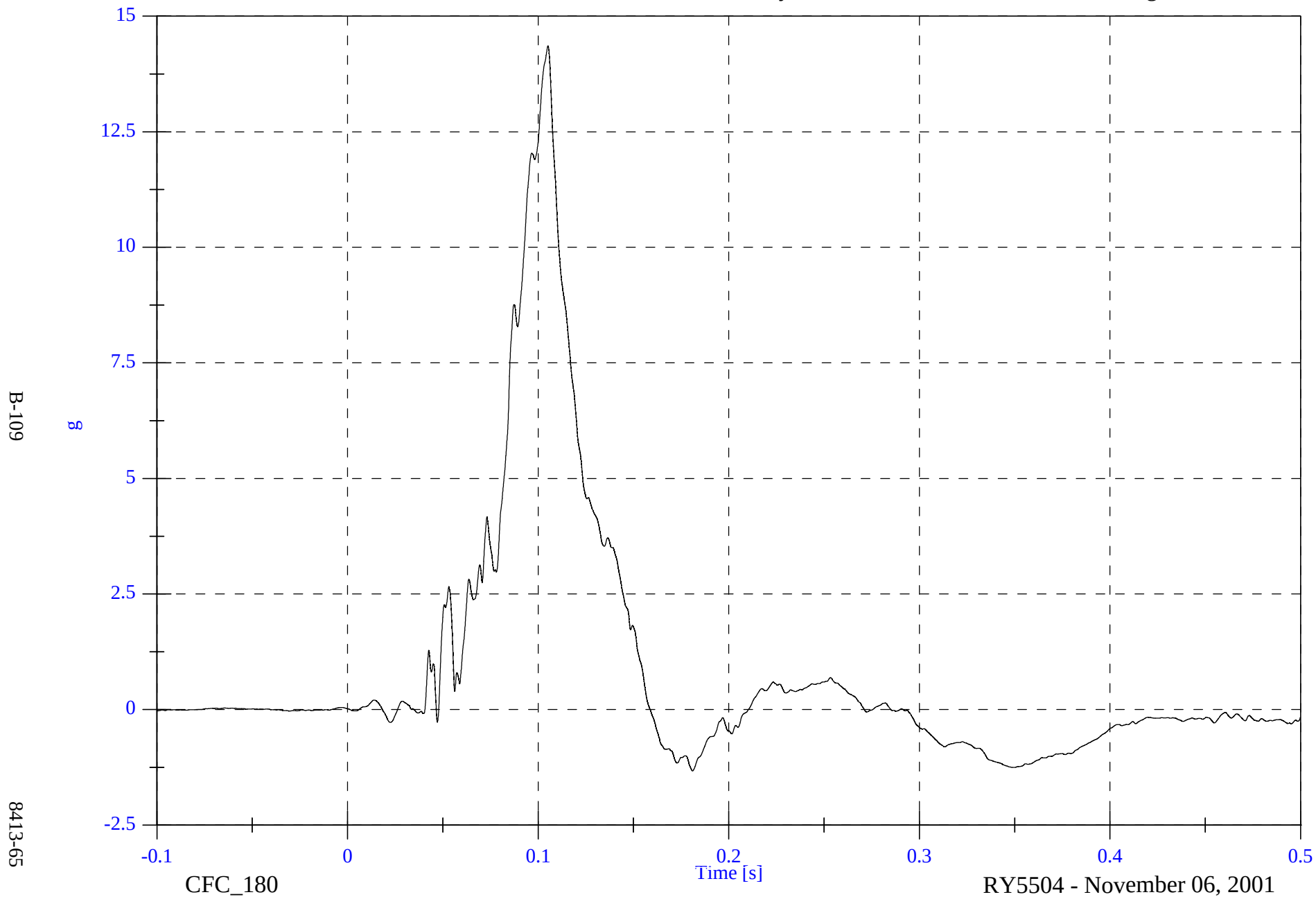


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Chest Ay

Max: 14.4 [g] at 0.105 [s]

Min: -1.3 [g] at 0.181 [s]

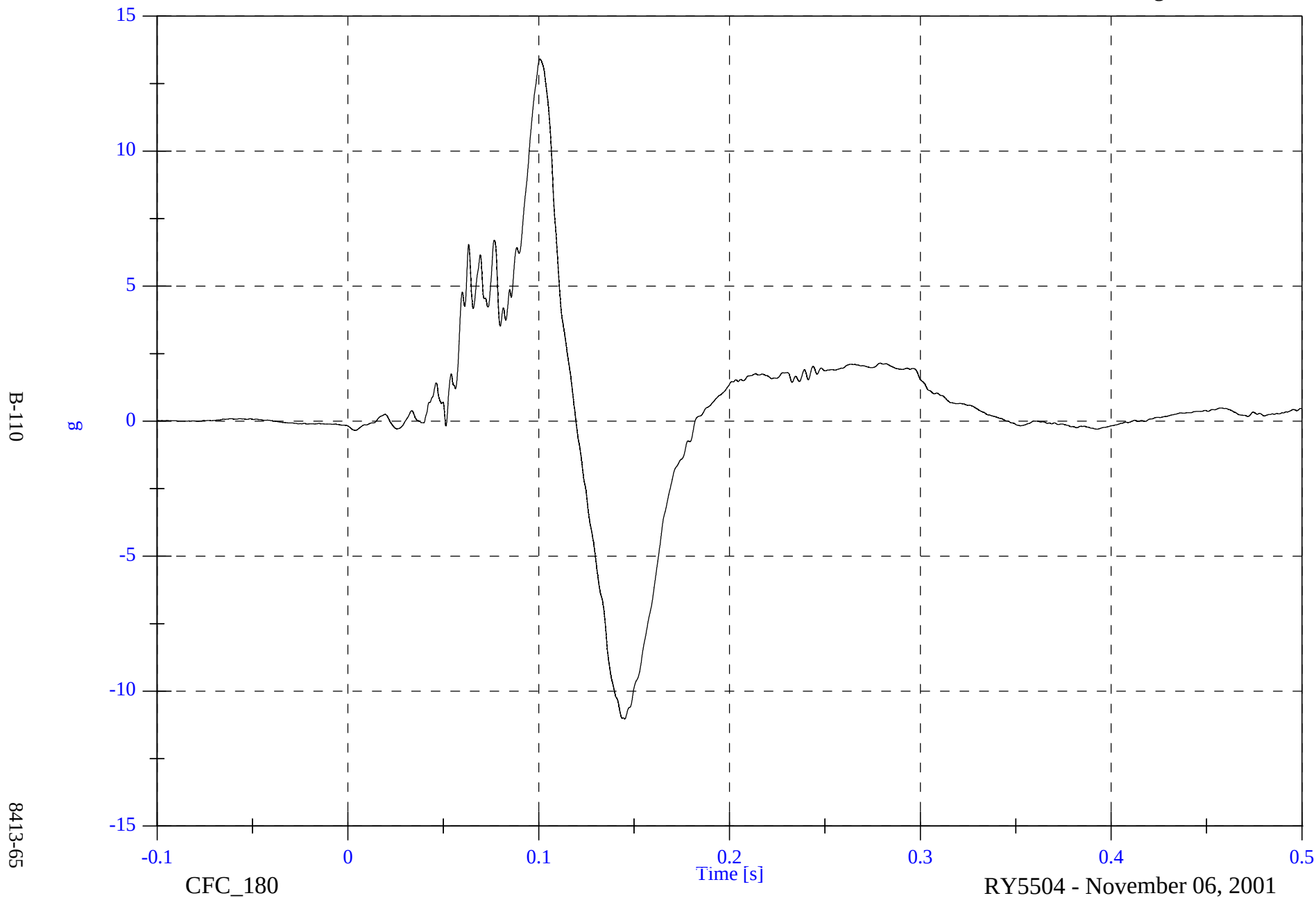


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Chest Az

Max: 13.4 [g] at 0.101 [s]

Min: -11.0 [g] at 0.145 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

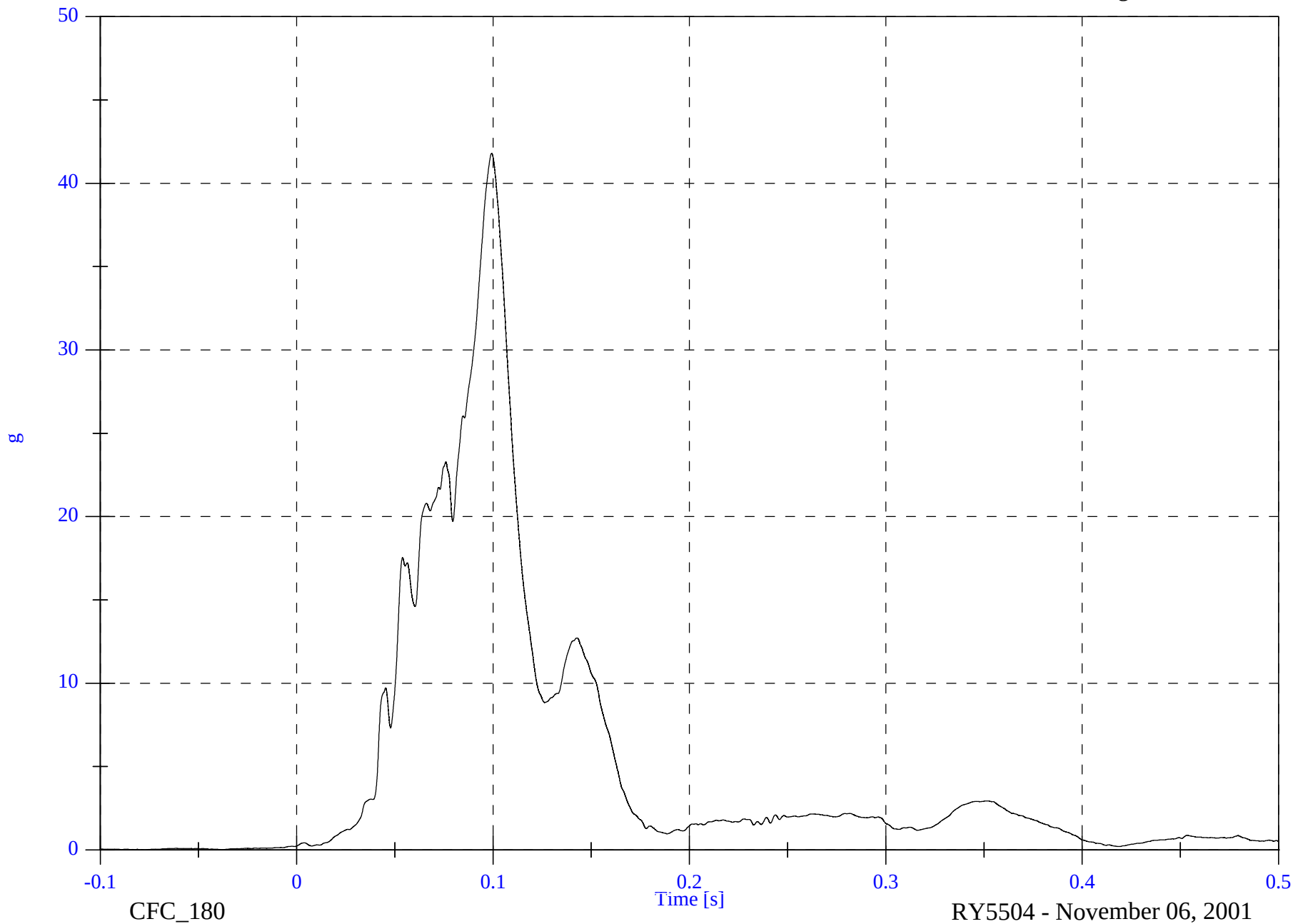
P2 Chest A Resultant

Max: 41.8 [g] at 0.099 [s]

Min: 0.0 [g] at -0.077 [s]

B-111

8413-65



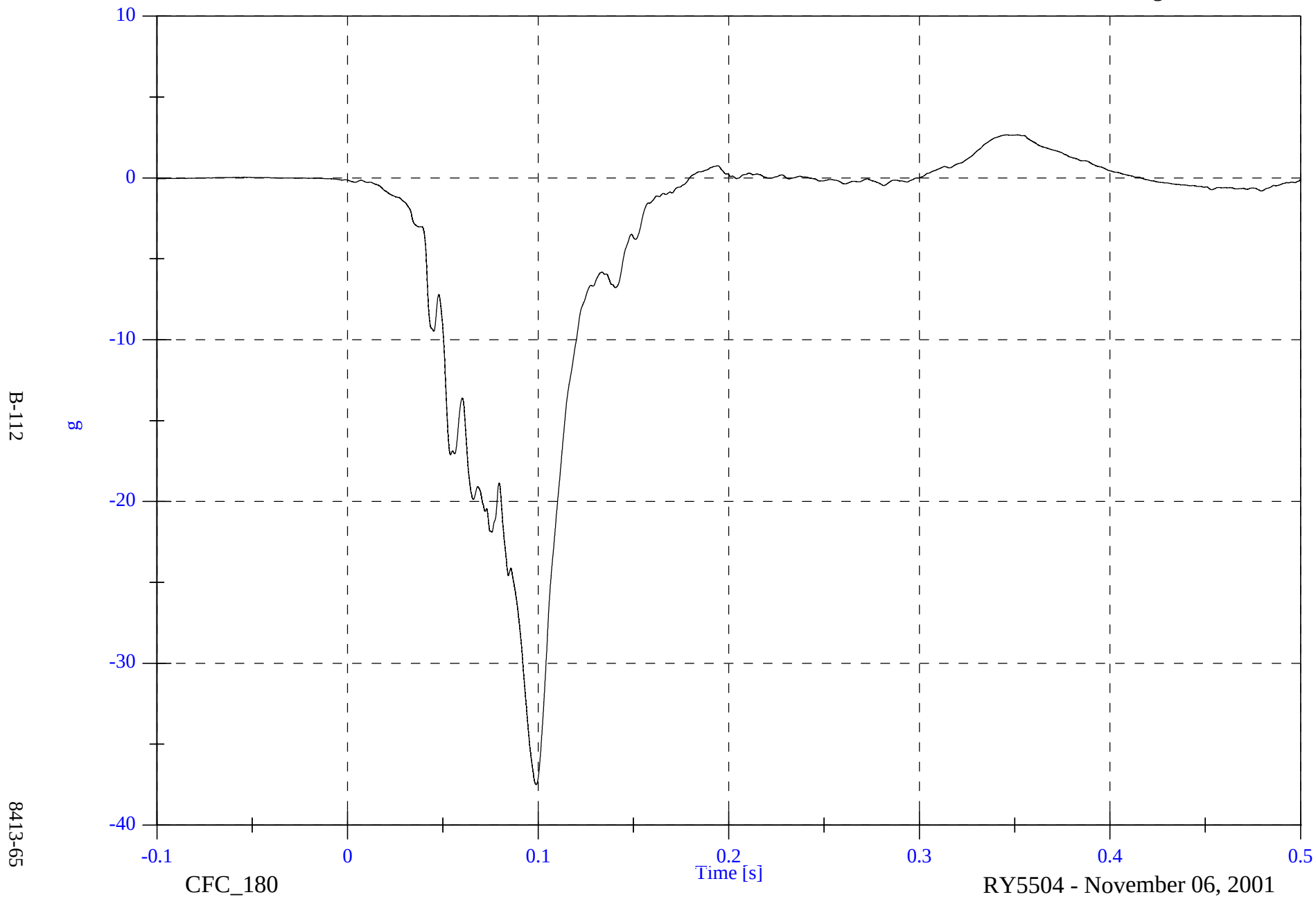


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Chest Red Ax

Max: 2.7 [g] at 0.346 [s]

Min: -37.5 [g] at 0.099 [s]

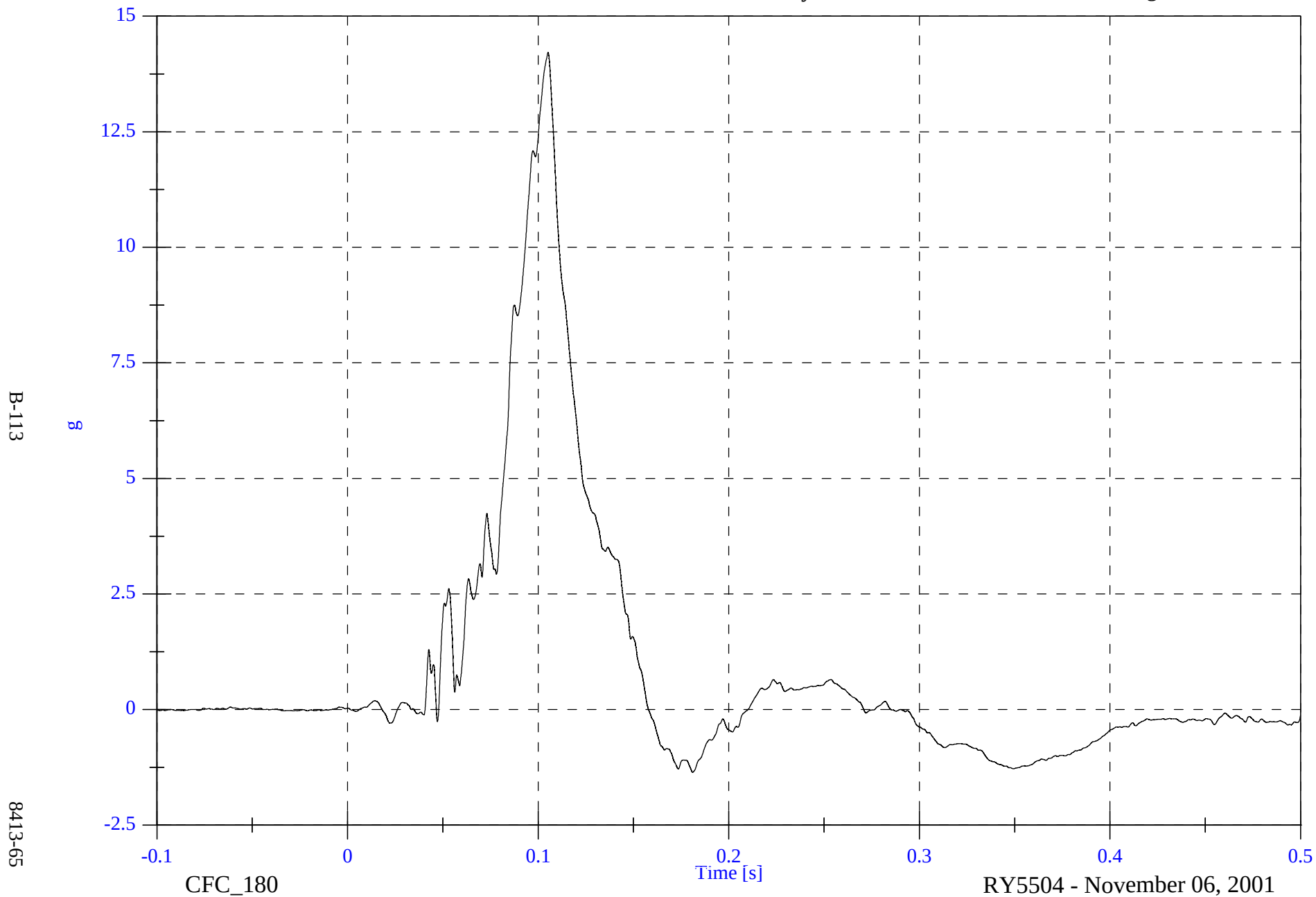


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Chest Red Ay

Max: 14.2 [g] at 0.105 [s]

Min: -1.4 [g] at 0.181 [s]

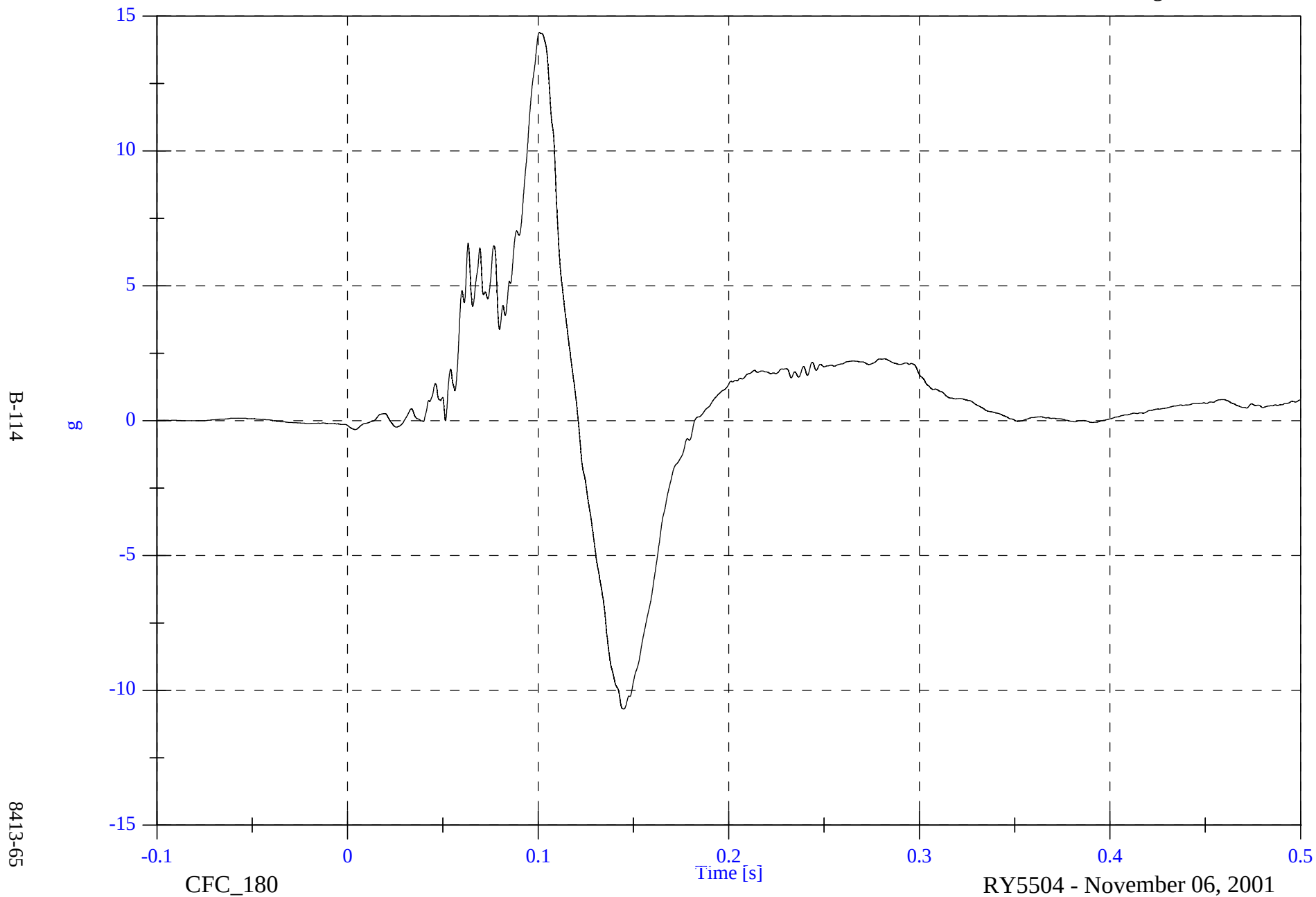


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Chest Red Az

Max: 14.4 [g] at 0.101 [s]

Min: -10.7 [g] at 0.145 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

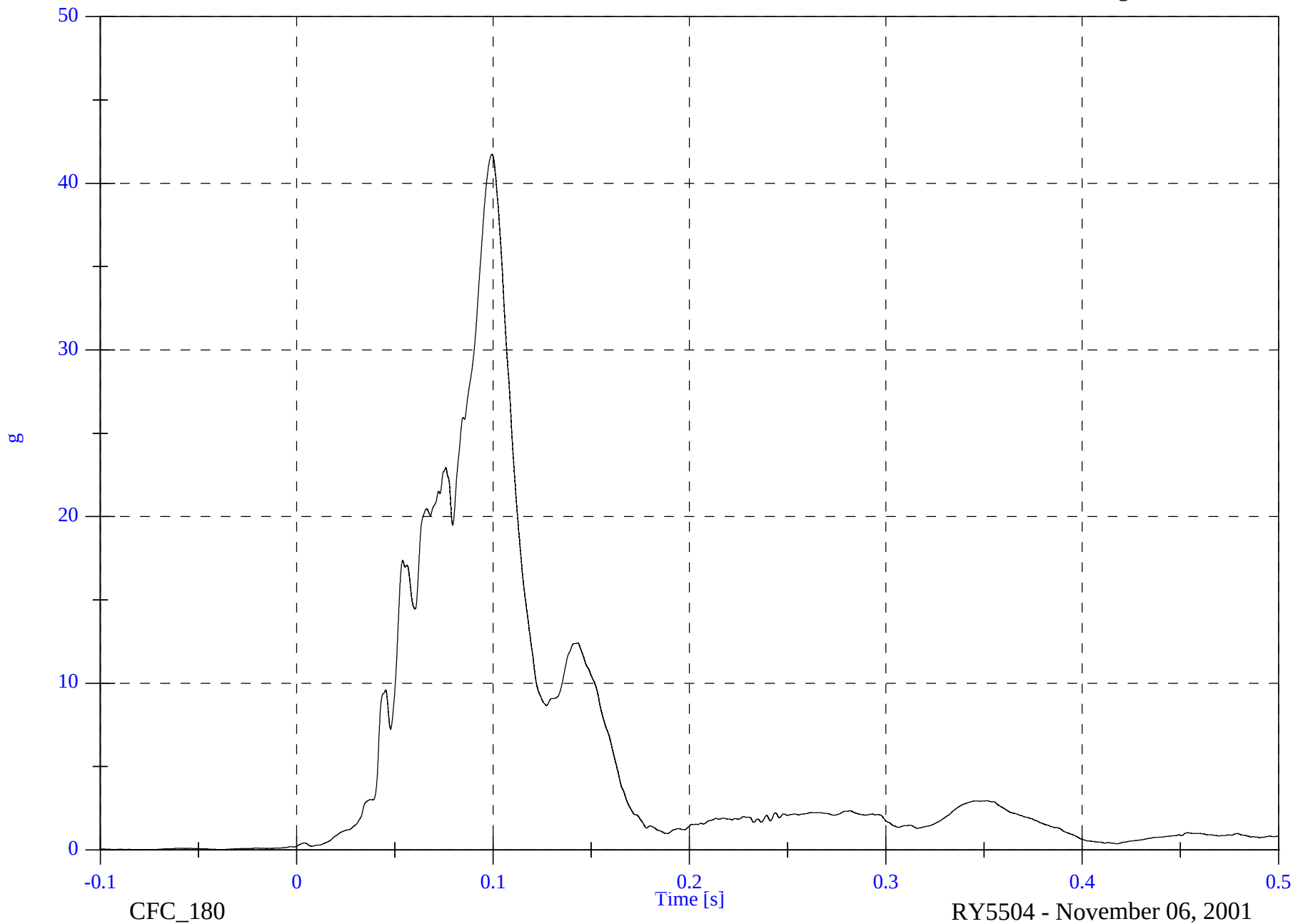
P2 Chest Red A Resultant

Max: 41.8 [g] at 0.099 [s]

Min: 0.0 [g] at -0.077 [s]

B-115

8413-65



40% Frontal Offset Test #9 - 2000 Subaru Legacy

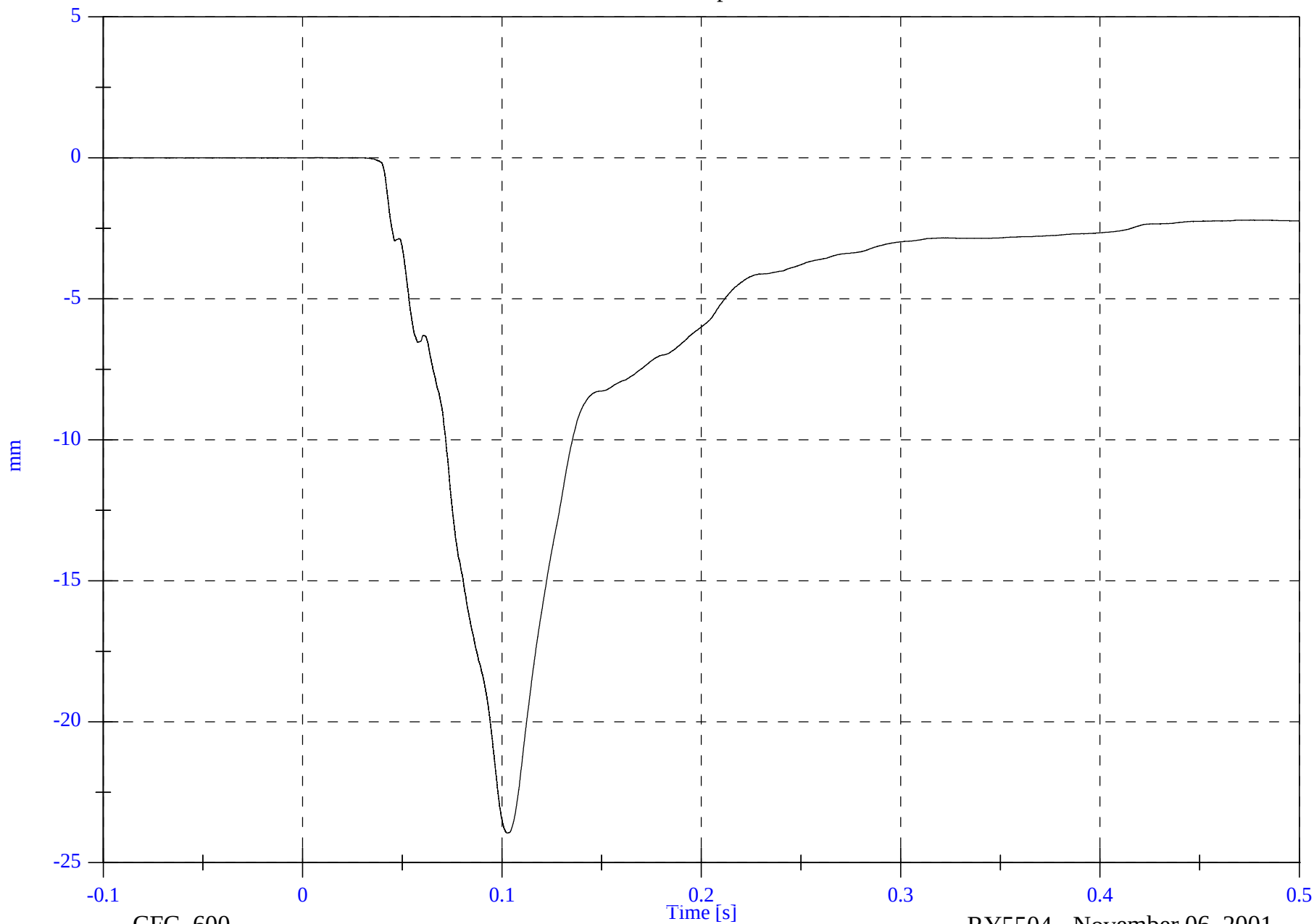
P2 Chest Displacement

Max: 0.0 [mm] at 0.007 [s]

Min: -24.0 [mm] at 0.103 [s]

B-116

8413-65



CFC\_600

RY5504 - November 06, 2001

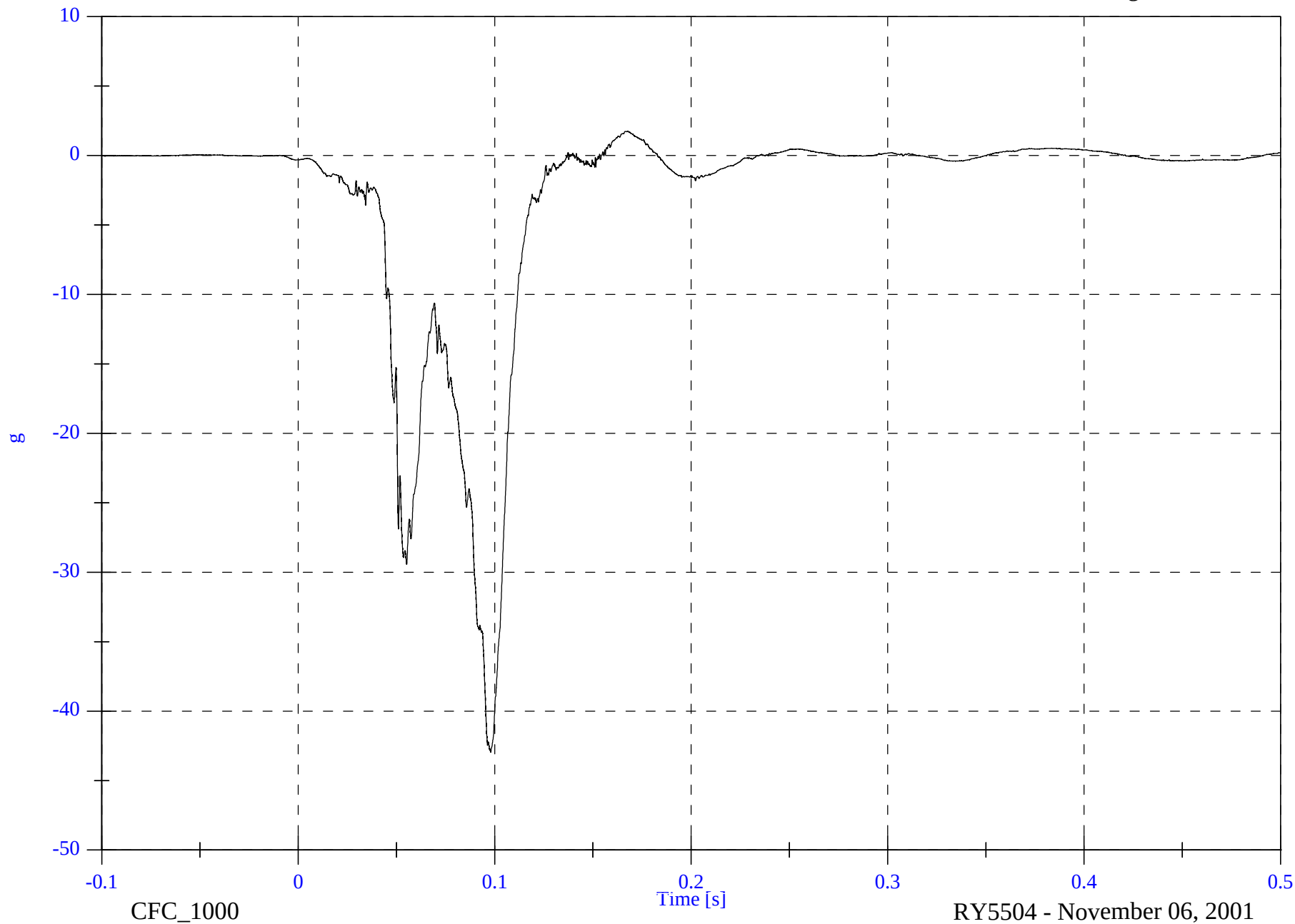


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Pelvic Ax

Max: 1.8 [g] at 0.168 [s]

Min: -43.0 [g] at 0.098 [s]



B-117

8413-65

CFC\_1000

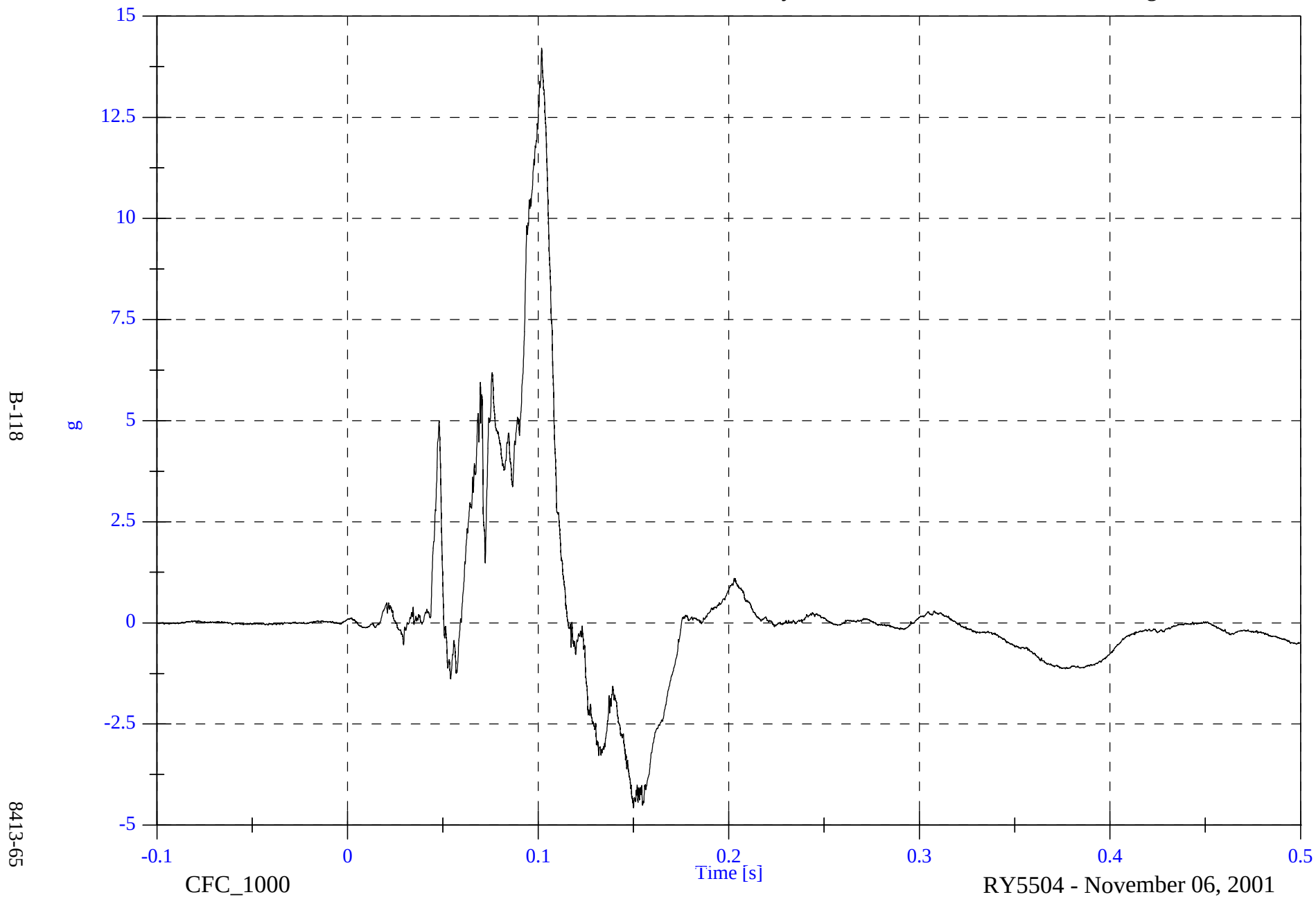
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Pelvic Ay

Max: 14.2 [g] at 0.102 [s]

Min: -4.6 [g] at 0.150 [s]

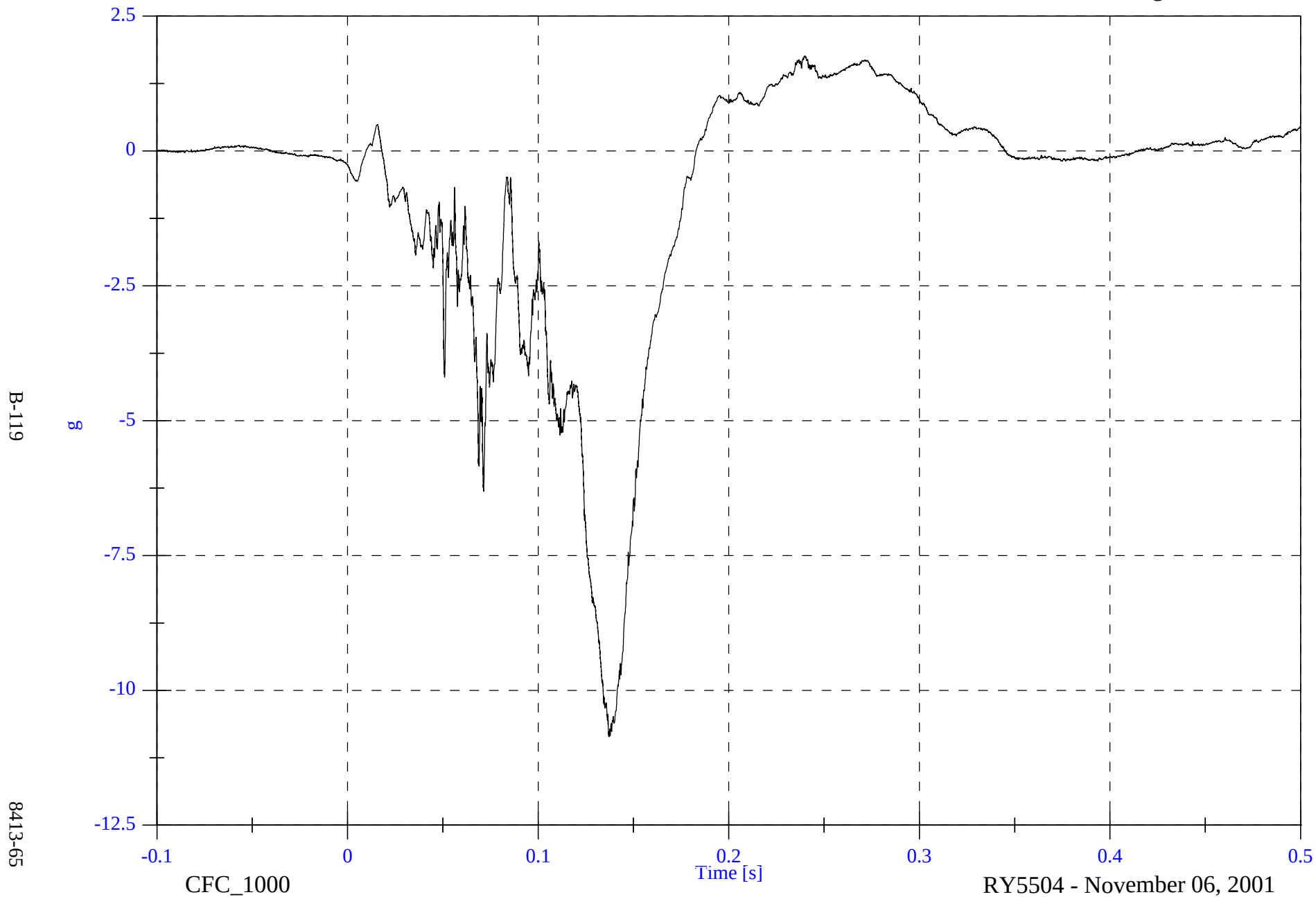


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Pelvic Az

Max: 1.8 [g] at 0.240 [s]

Min: -10.9 [g] at 0.137 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

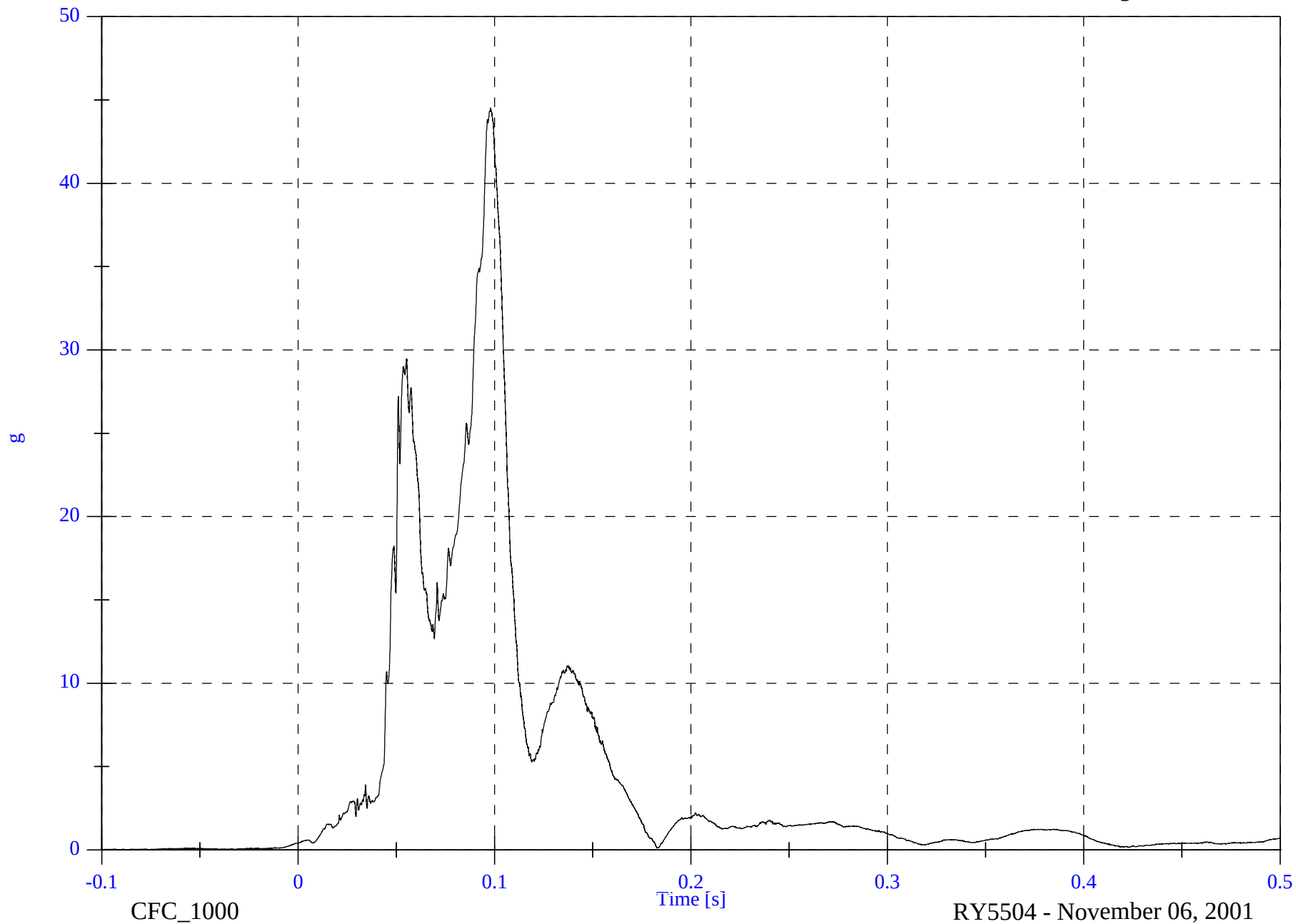
P2 Pelvic A Resultant

Max: 44.5 [g] at 0.098 [s]

Min: 0.0 [g] at -0.091 [s]

B-120

8413-65

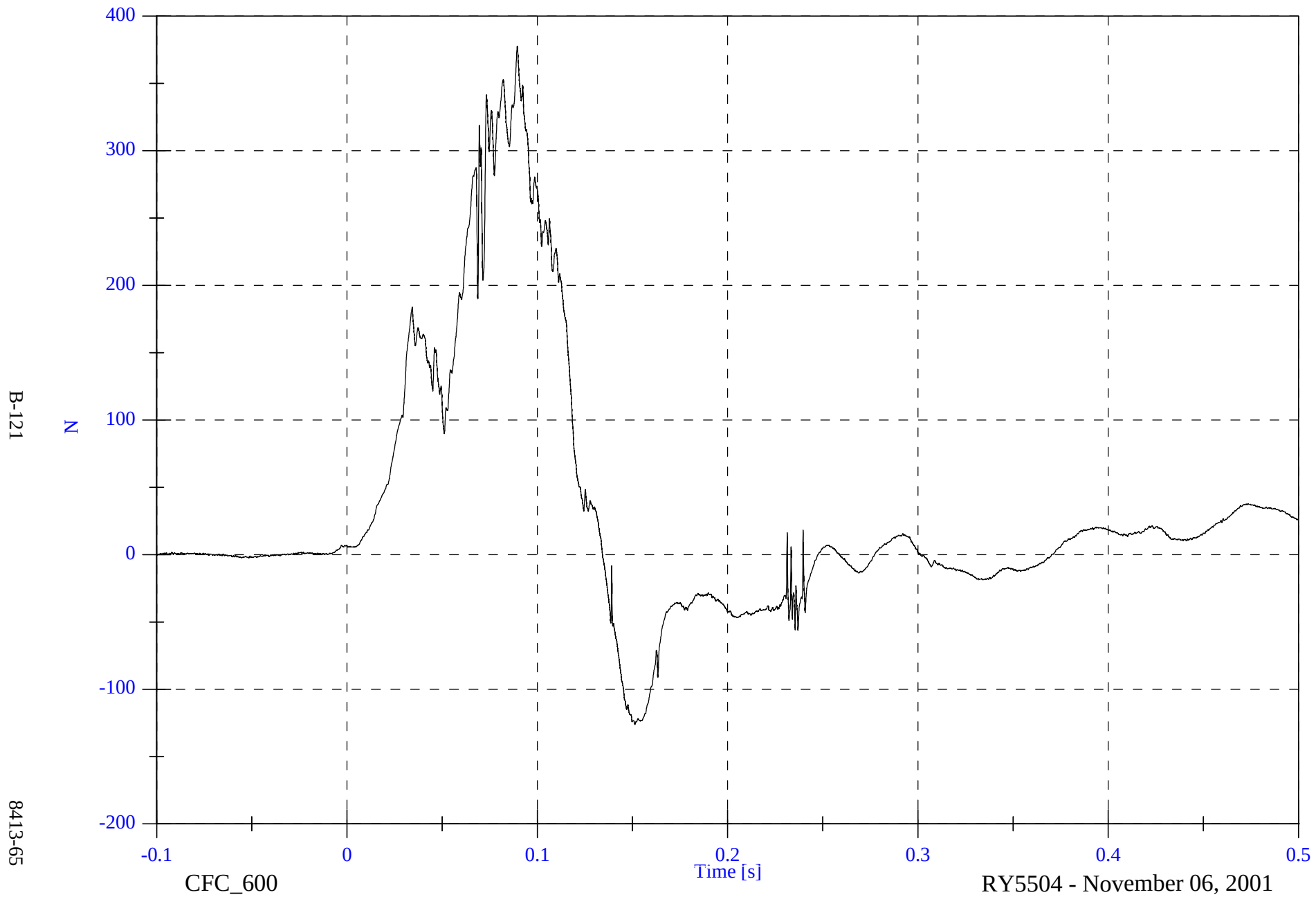


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur Fx

Max: 377.8 [N] at 0.089 [s]

Min: -126.2 [N] at 0.151 [s]



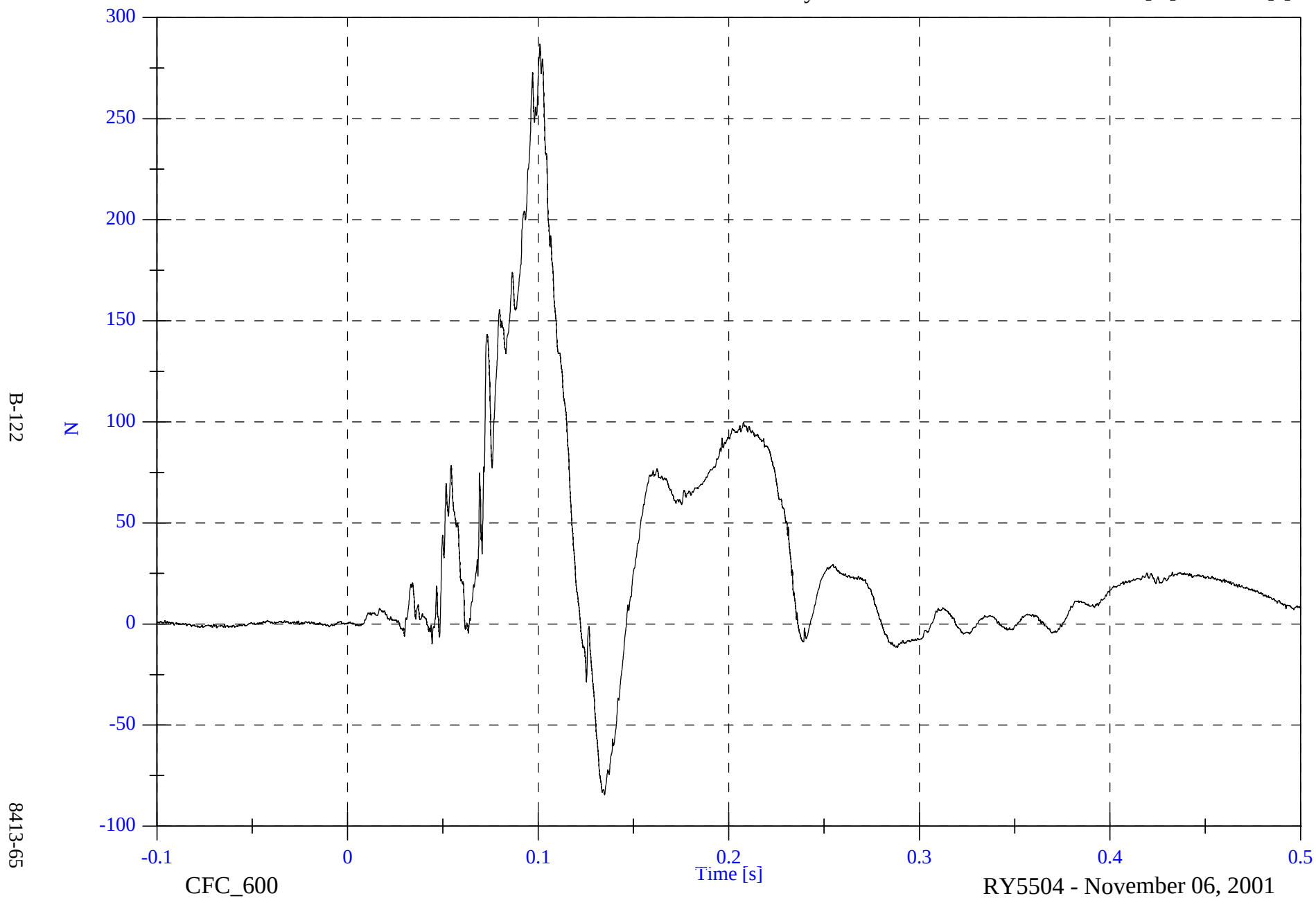


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur Fy

Max: 286.9 [N] at 0.101 [s]

Min: -84.4 [N] at 0.135 [s]

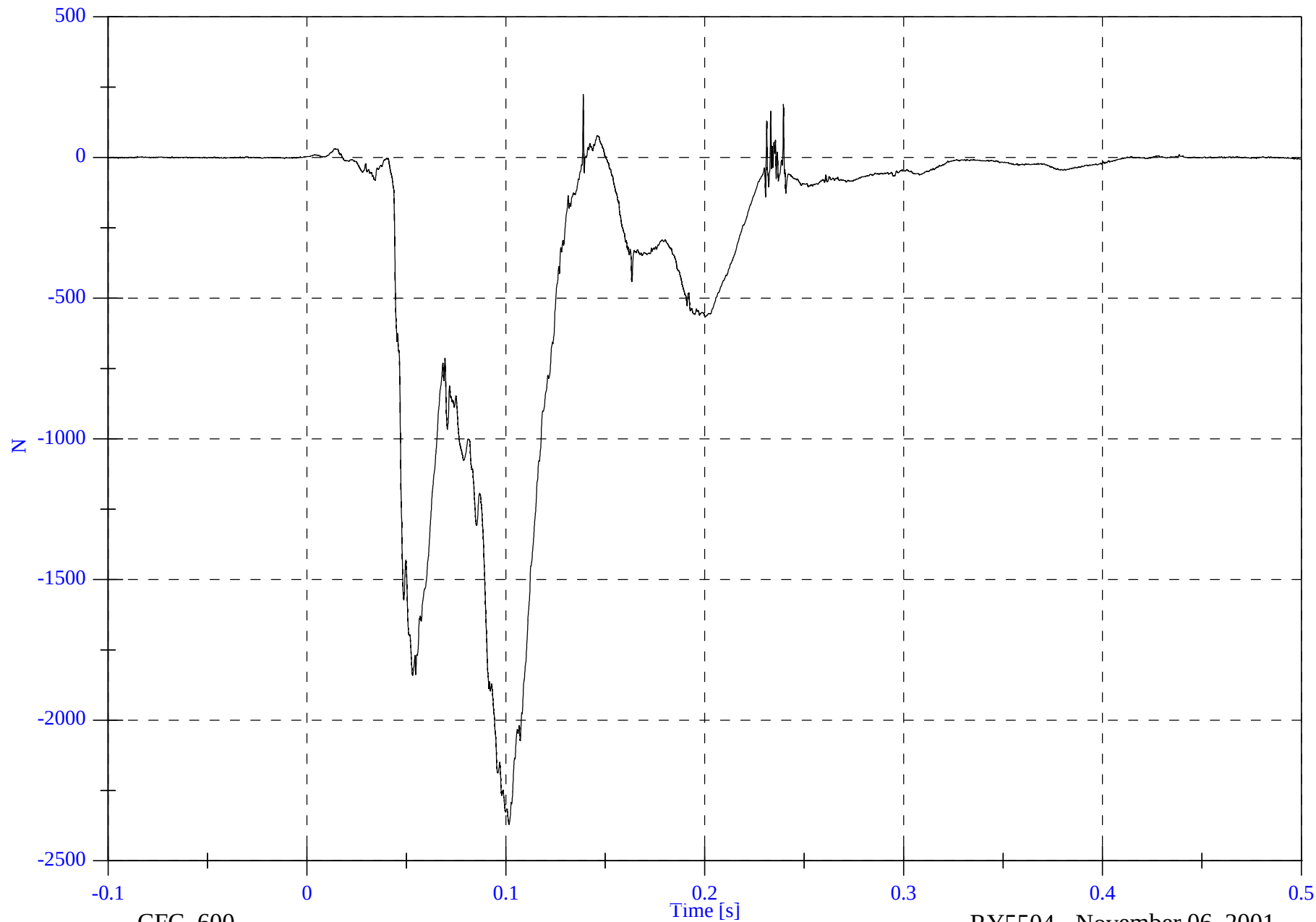


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur Fz

Max: 224.7 [N] at 0.139 [s]

Min: -2370.3 [N] at 0.102 [s]



B-123

8413-65

CFC\_600

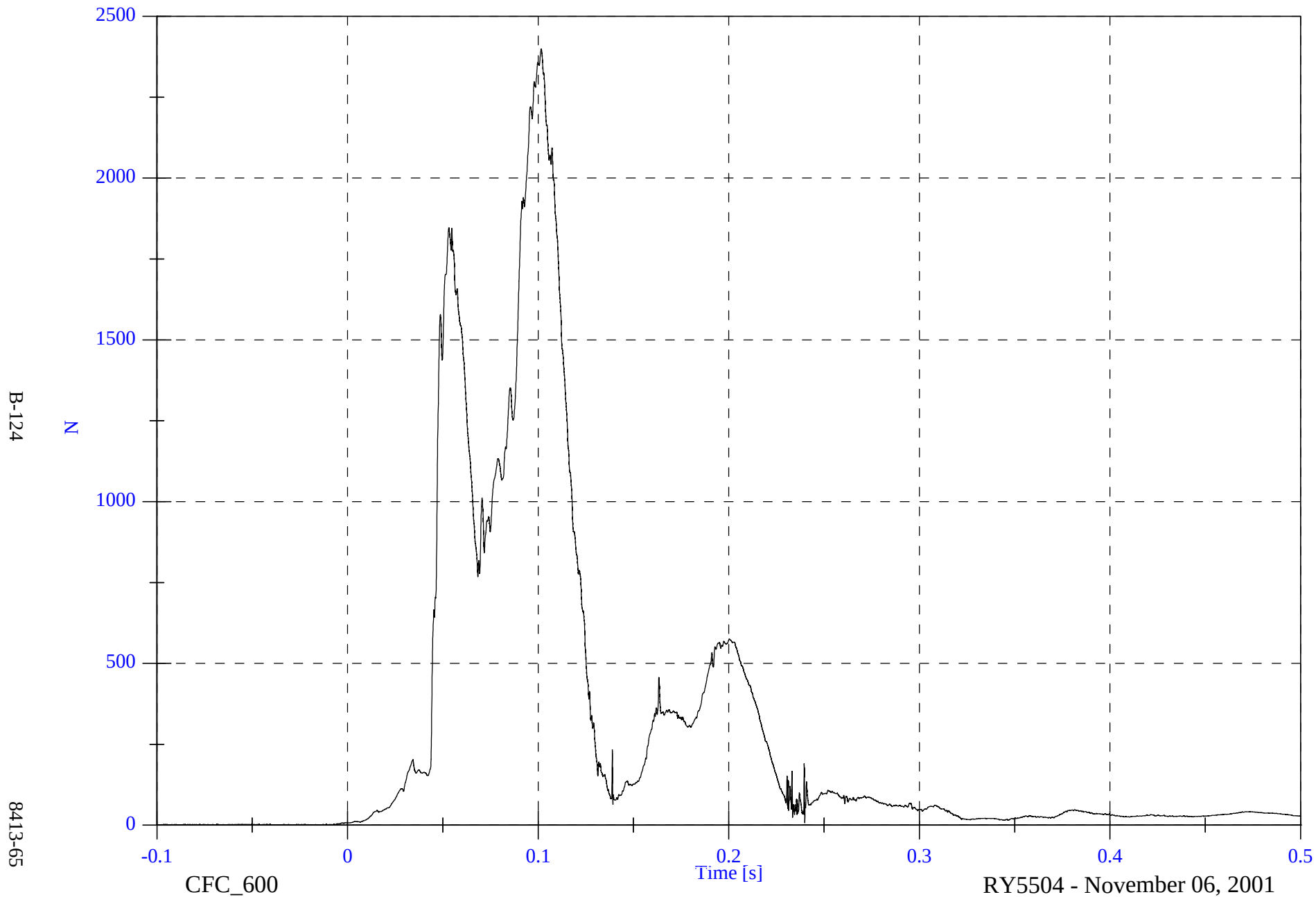
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur F Resultant

Max: 2398.8 [N] at 0.102 [s]

Min: 0.2 [N] at -0.070 [s]

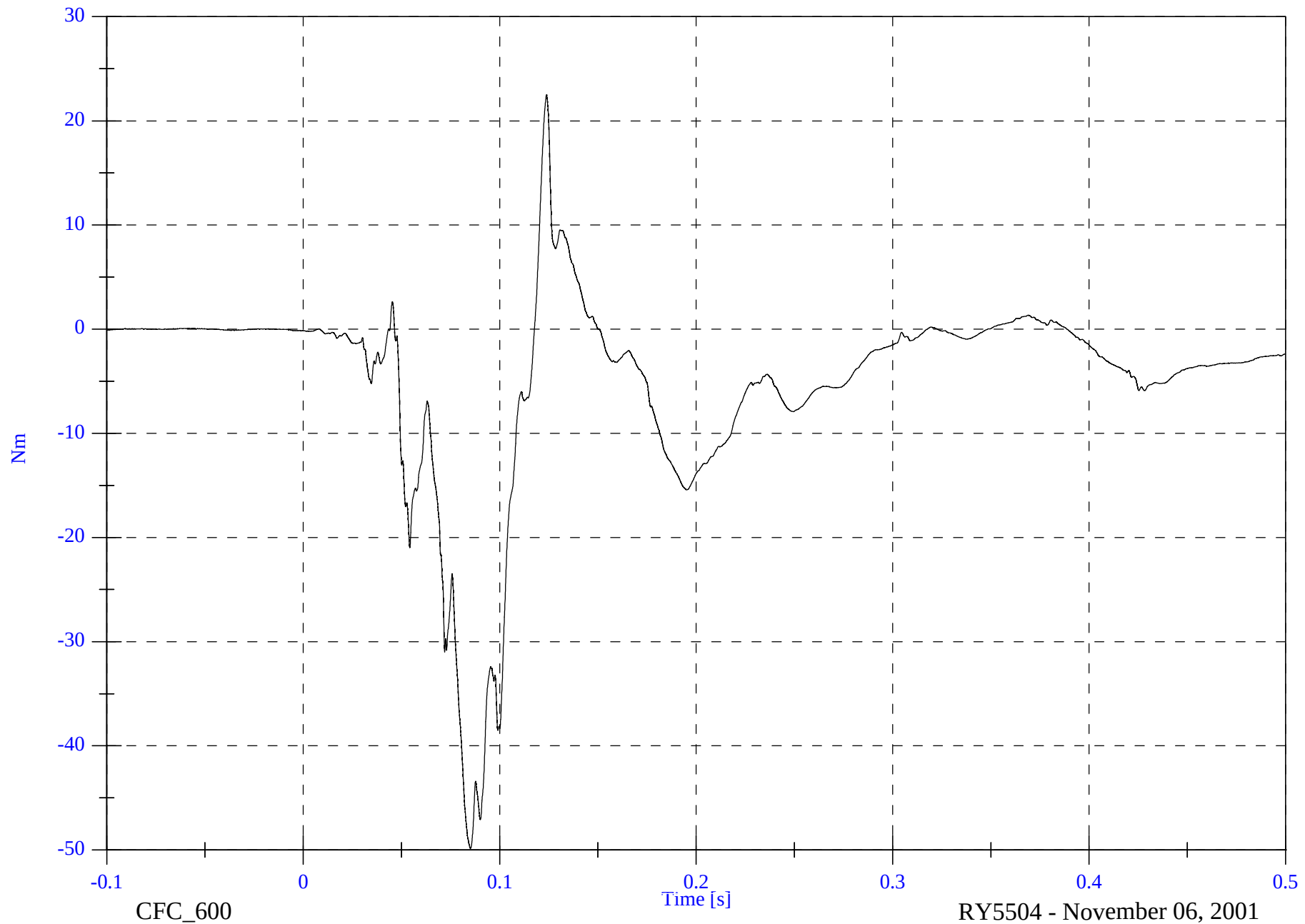


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur Mx

Max: 22.5 [Nm] at 0.124 [s]

Min: -49.8 [Nm] at 0.085 [s]



B-125

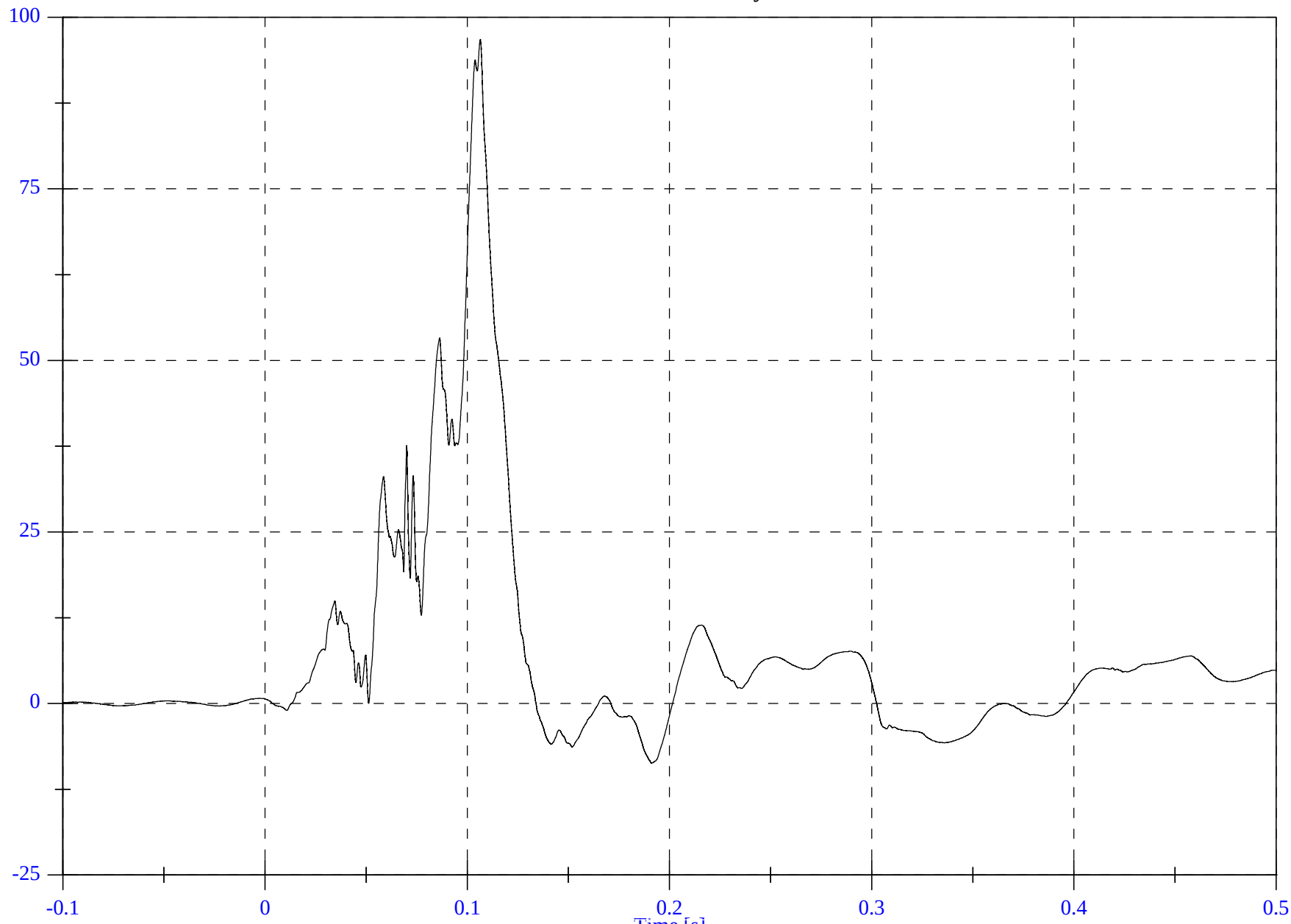
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur My

Max: 96.7 [Nm] at 0.106 [s]

Min: -8.7 [Nm] at 0.191 [s]



B-126

8413-65

CFC\_600

RY5504 - November 06, 2001

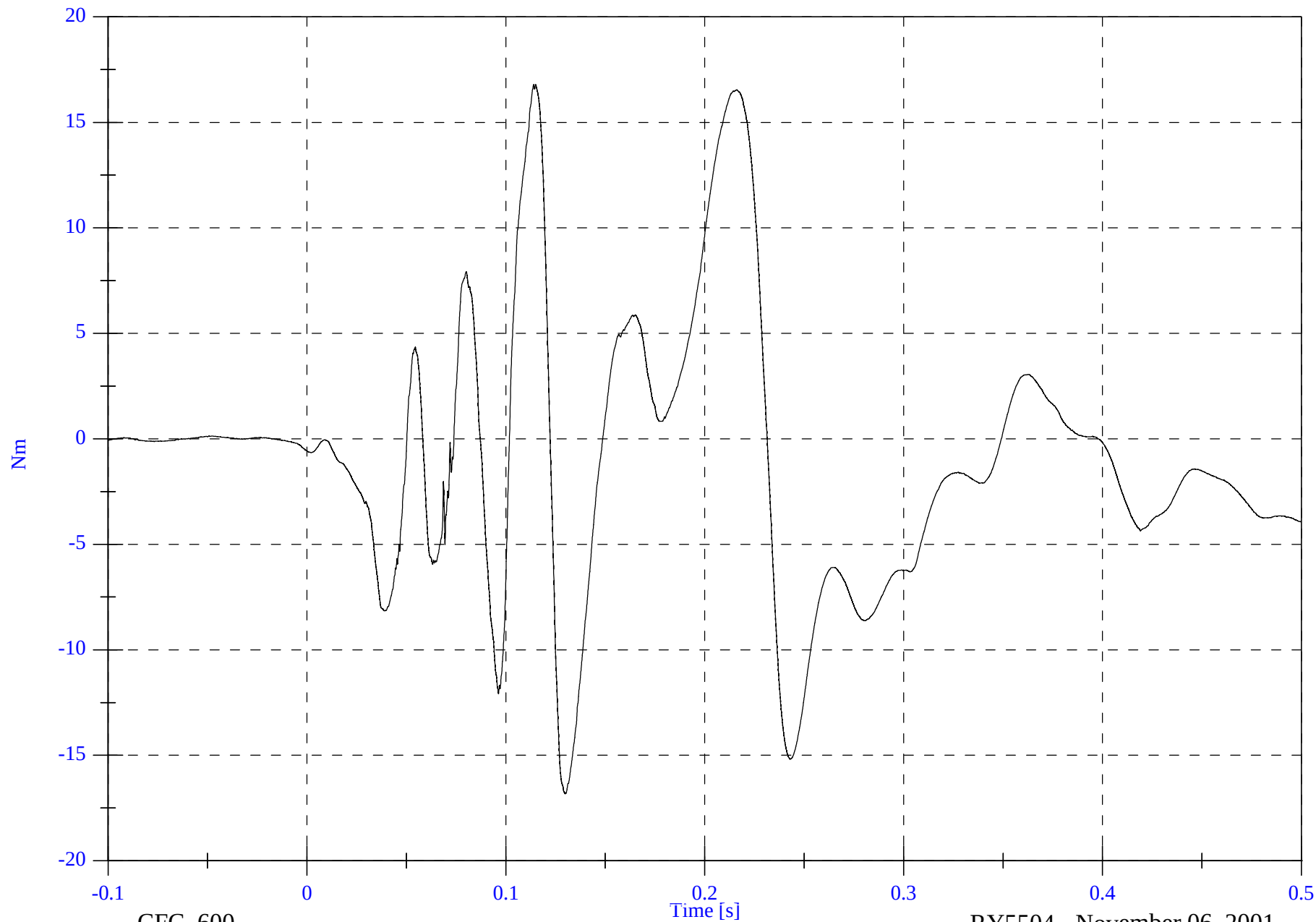


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur Mz

Max: 16.8 [Nm] at 0.115 [s]

Min: -16.8 [Nm] at 0.130 [s]



B-127

8413-65

CFC\_600

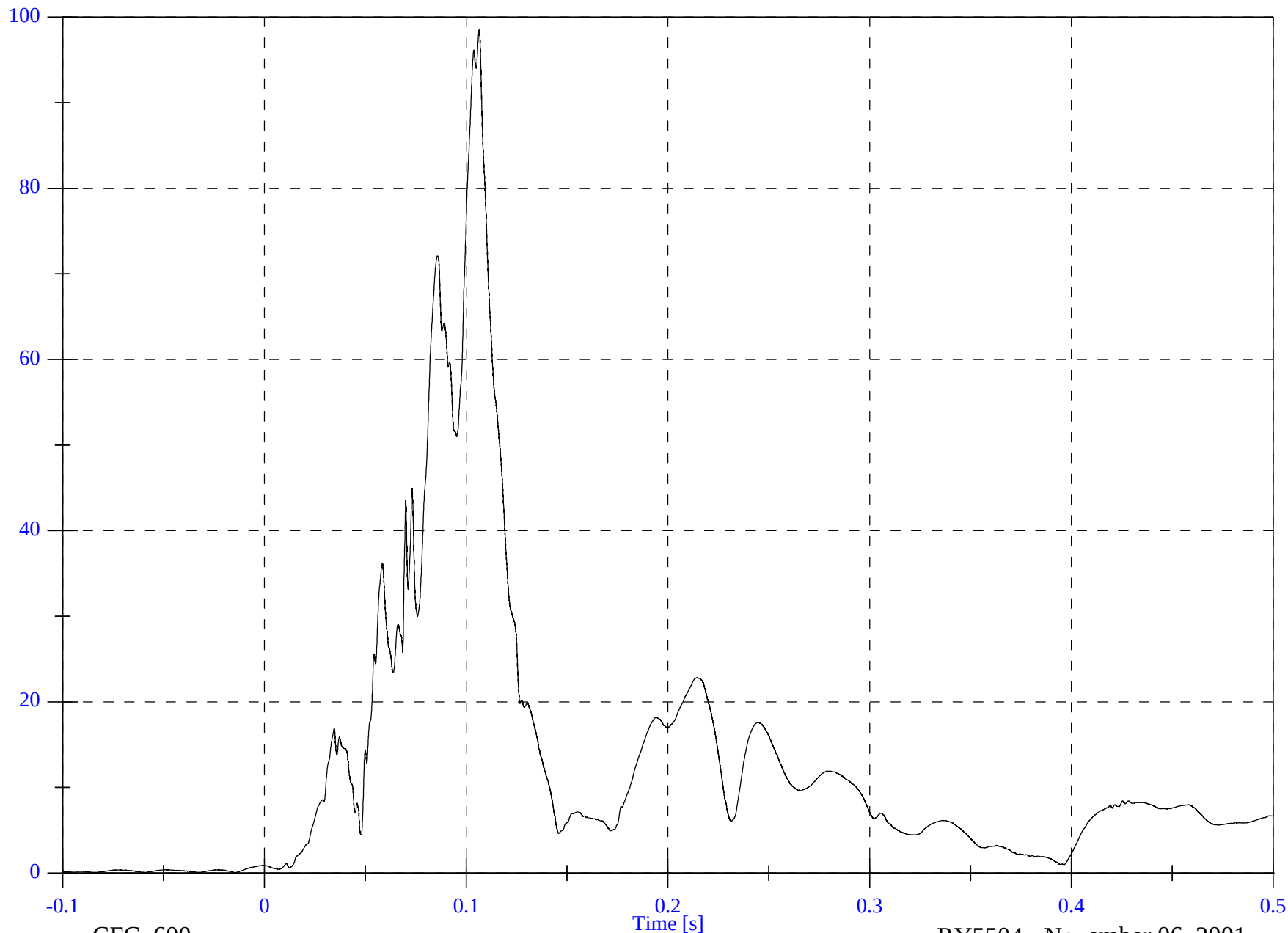
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Femur M Resultant

Max: 98.5 [Nm] at 0.106 [s]

Min: 0.0 [Nm] at -0.014 [s]



B-128

8413-65

CFC\_600

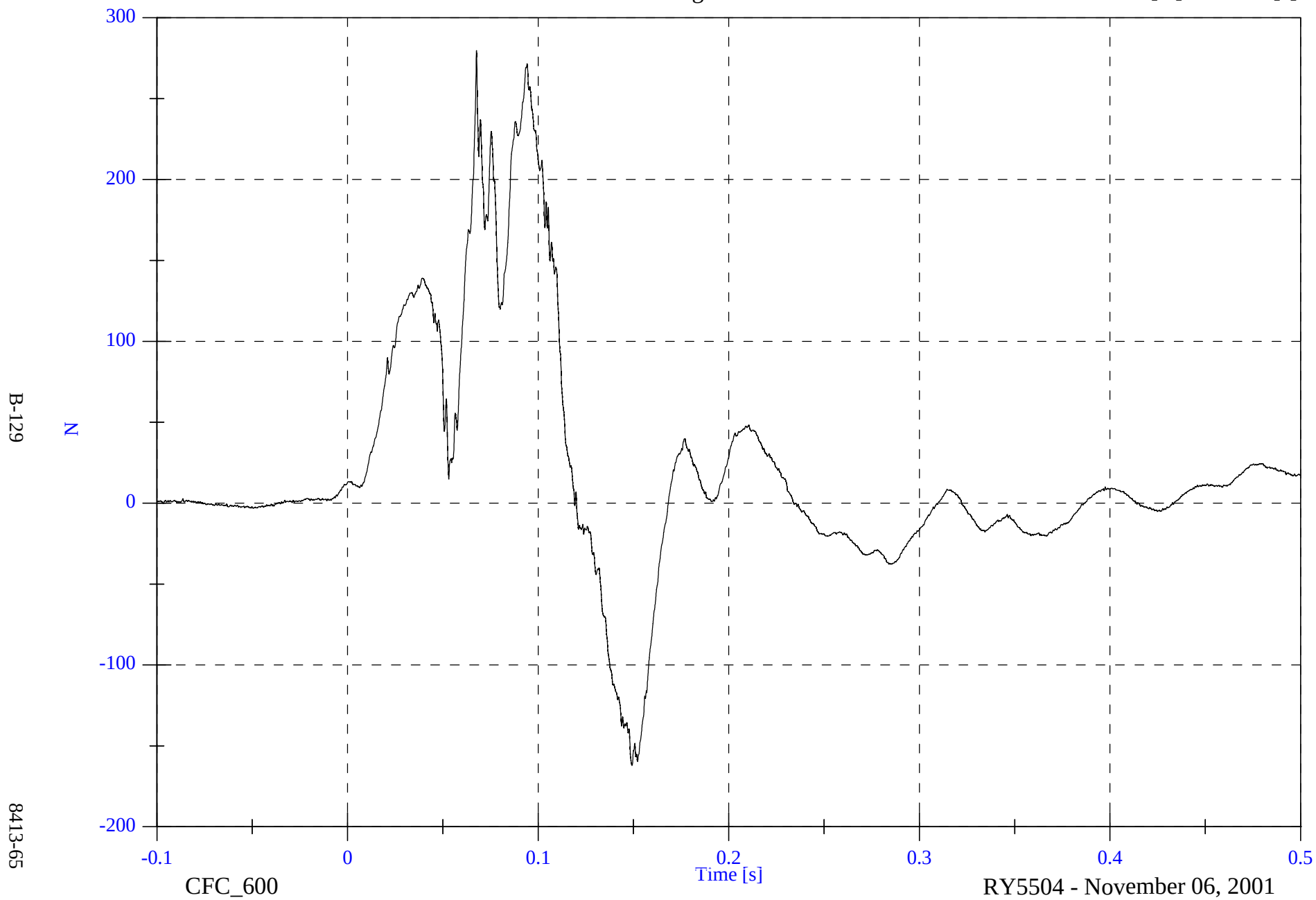
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Femur Fx

Max: 279.6 [N] at 0.068 [s]

Min: -162.1 [N] at 0.149 [s]

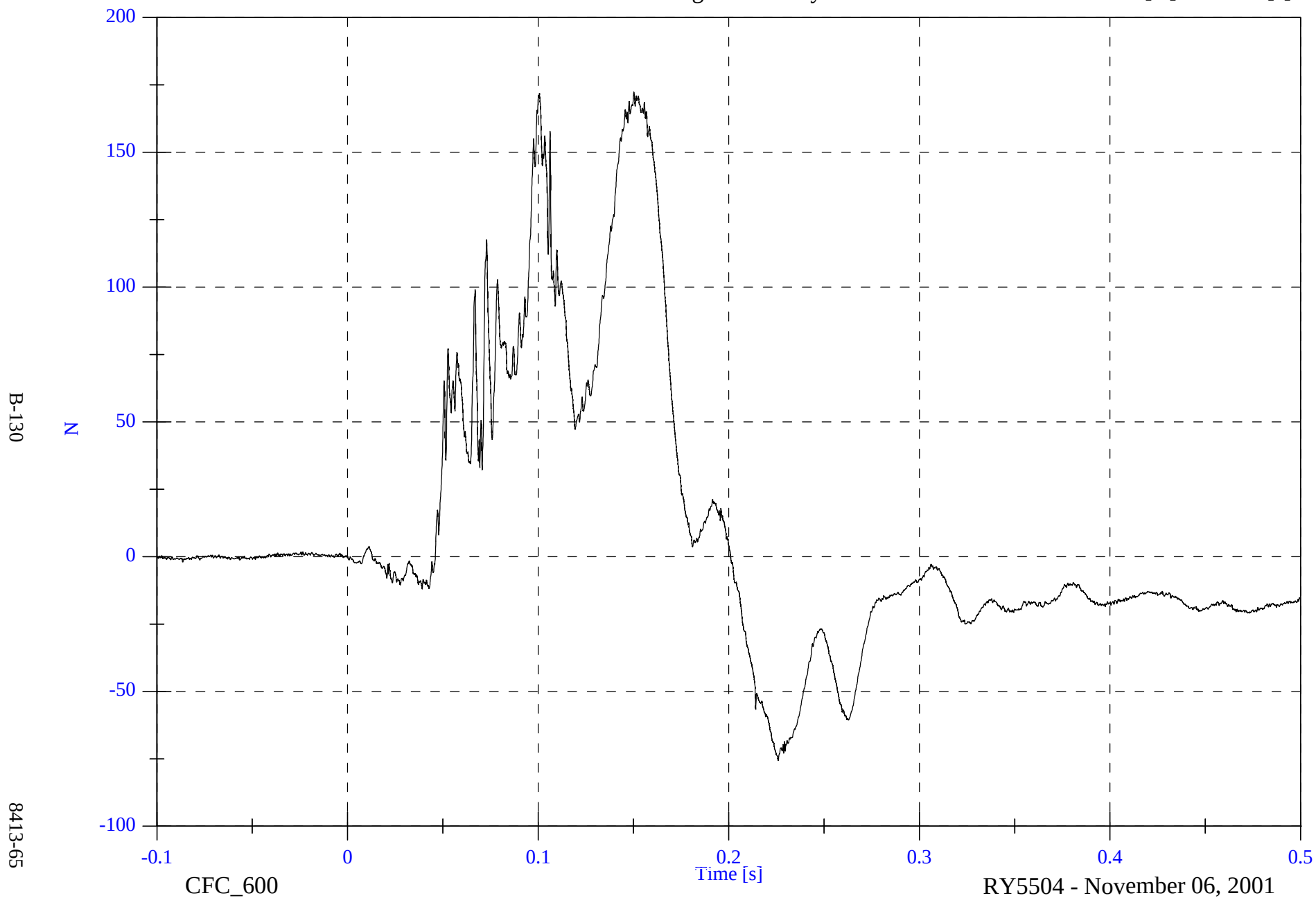


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Femur Fy

Max: 172.4 [N] at 0.150 [s]

Min: -75.5 [N] at 0.226 [s]

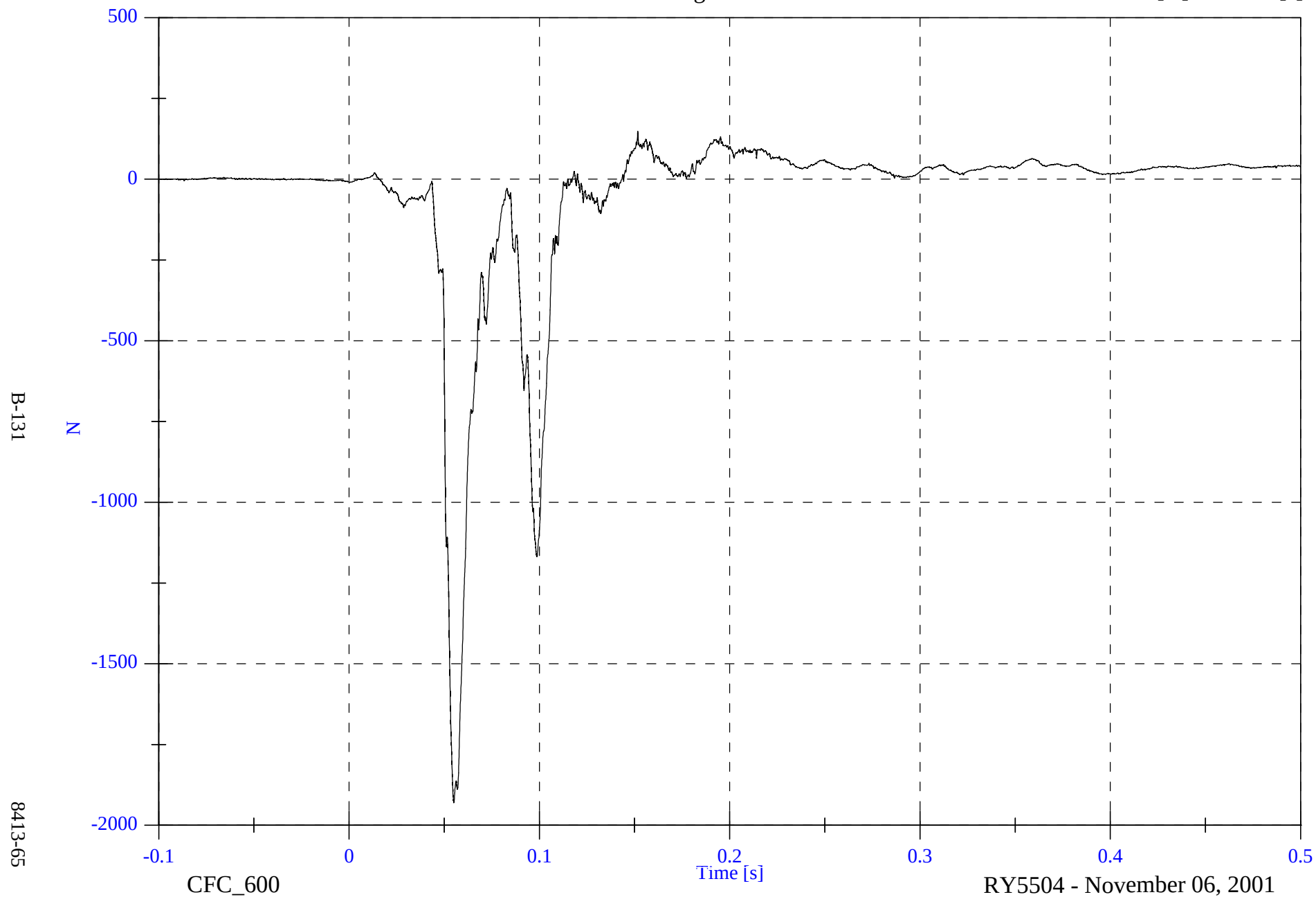


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Femur Fz

Max: 147.9 [N] at 0.152 [s]

Min: -1930.6 [N] at 0.055 [s]



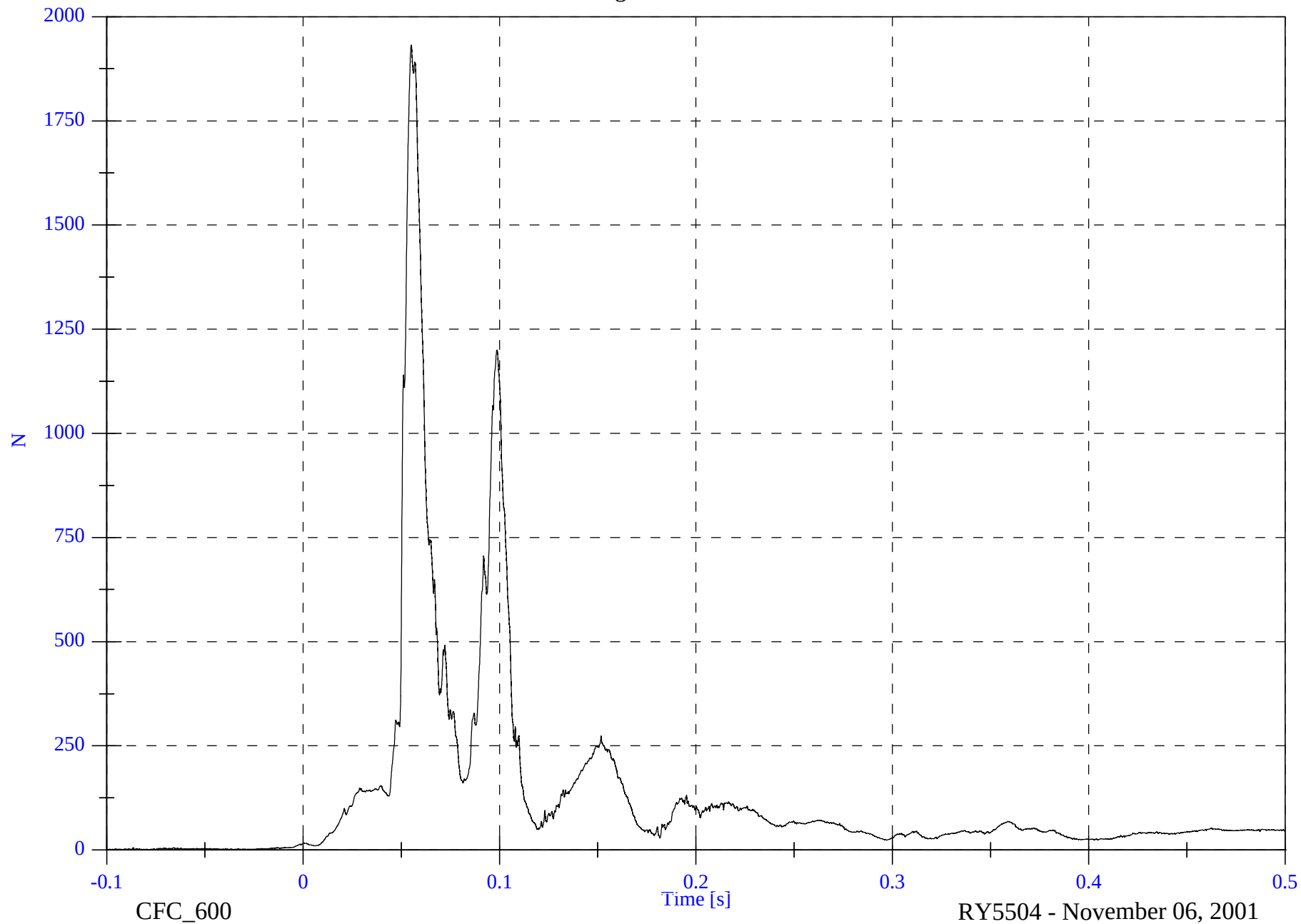


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Femur F Resultant

Max: 1931.8 [N] at 0.055 [s]

Min: 0.3 [N] at -0.079 [s]



B-132

8413-65

CFC\_600

RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

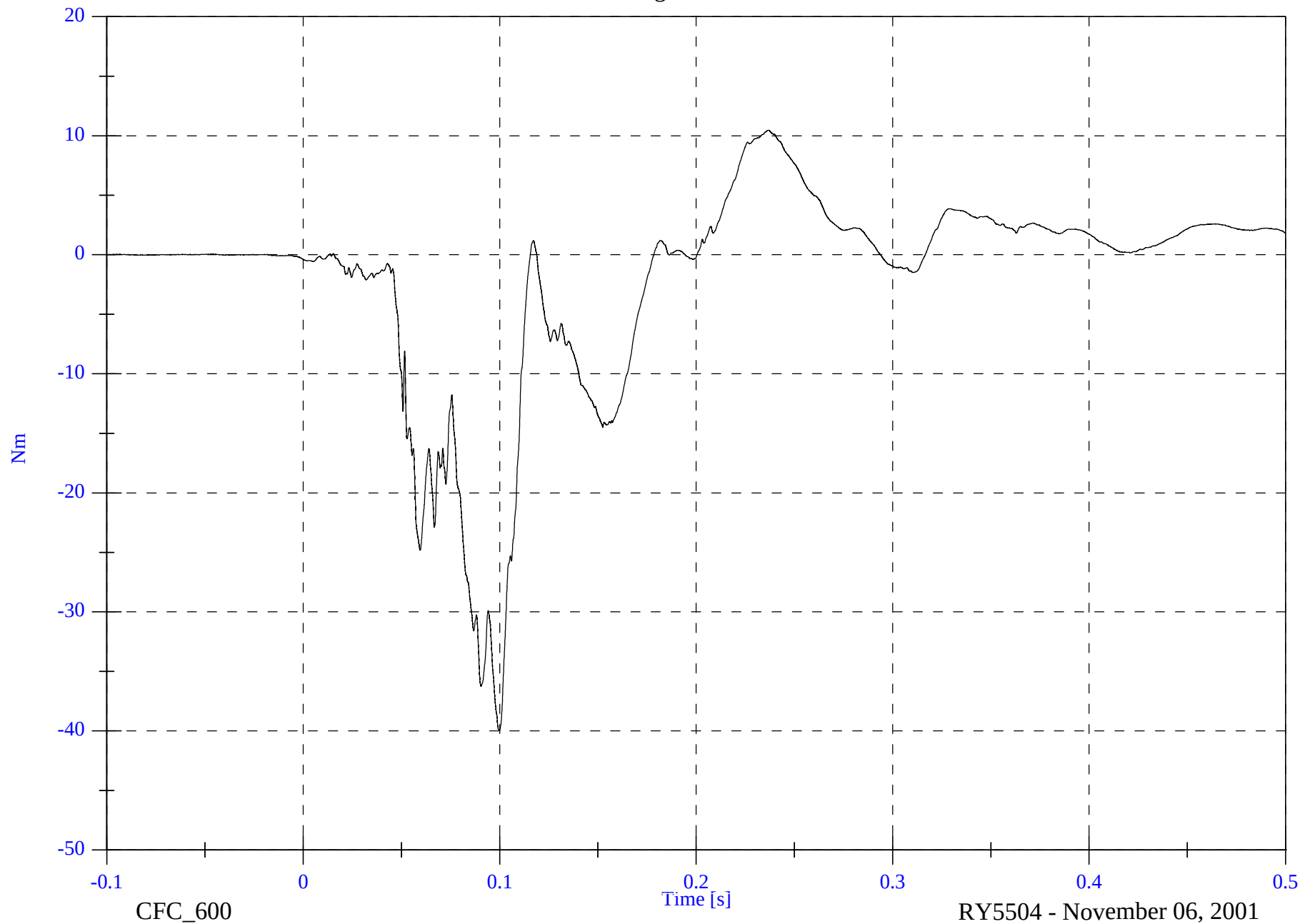
P2 Right Femur Mx

Max: 10.5 [Nm] at 0.237 [s]

Min: -40.0 [Nm] at 0.100 [s]

B-133

8413-65

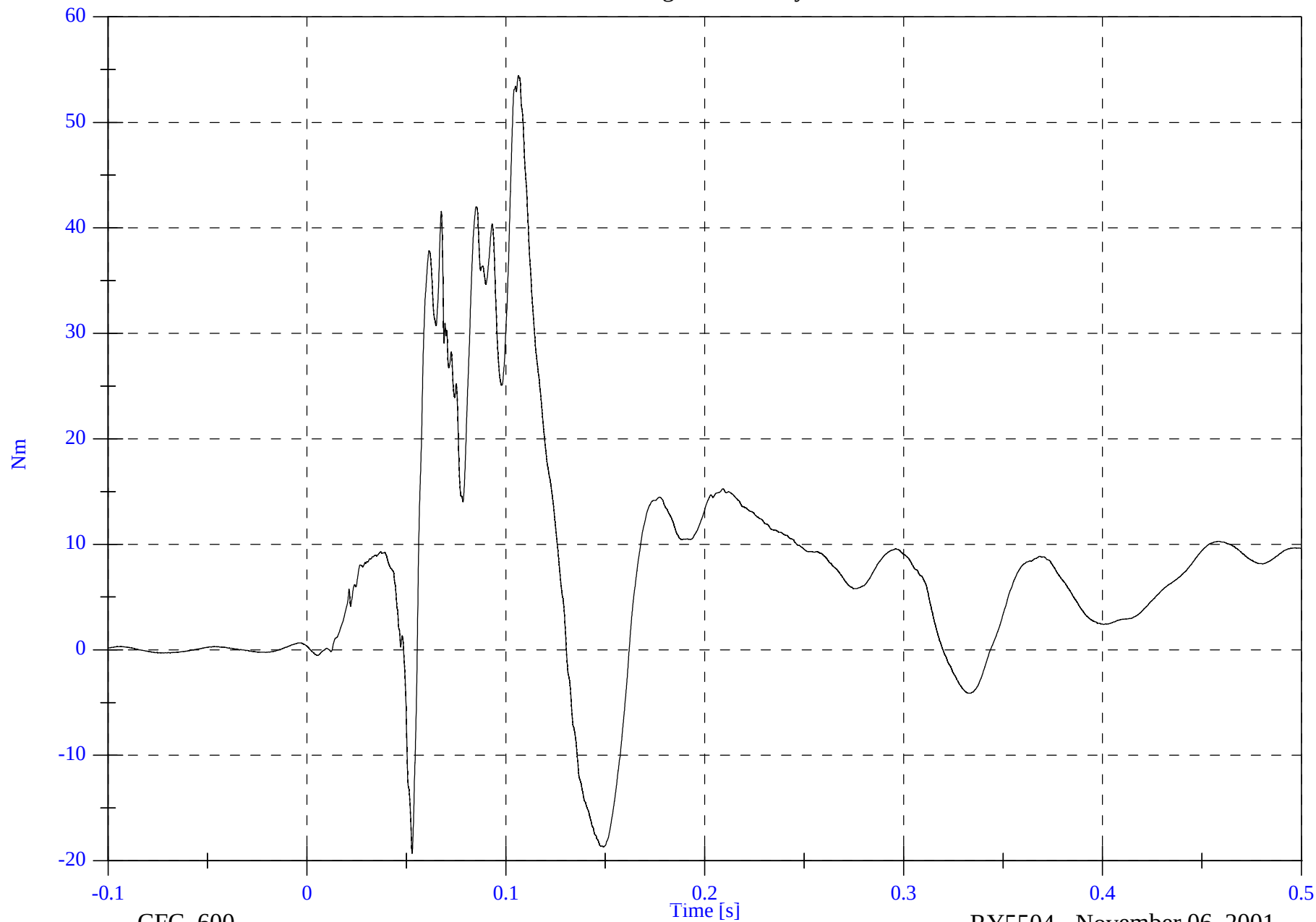


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Femur My

Max: 54.4 [Nm] at 0.106 [s]

Min: -19.3 [Nm] at 0.053 [s]



B-134

8413-65

CFC\_600

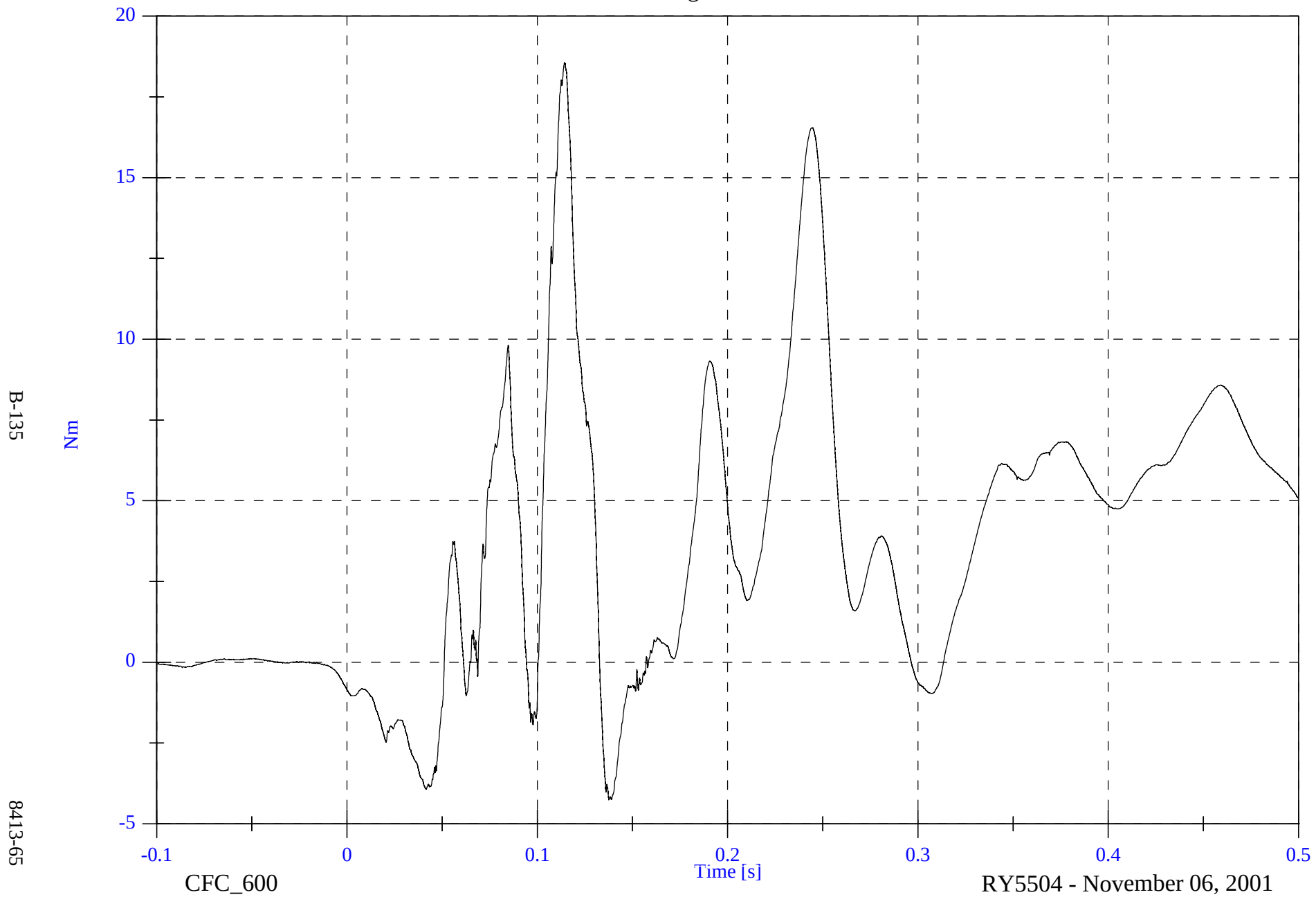
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Femur Mz

Max: 18.6 [Nm] at 0.114 [s]

Min: -4.3 [Nm] at 0.138 [s]

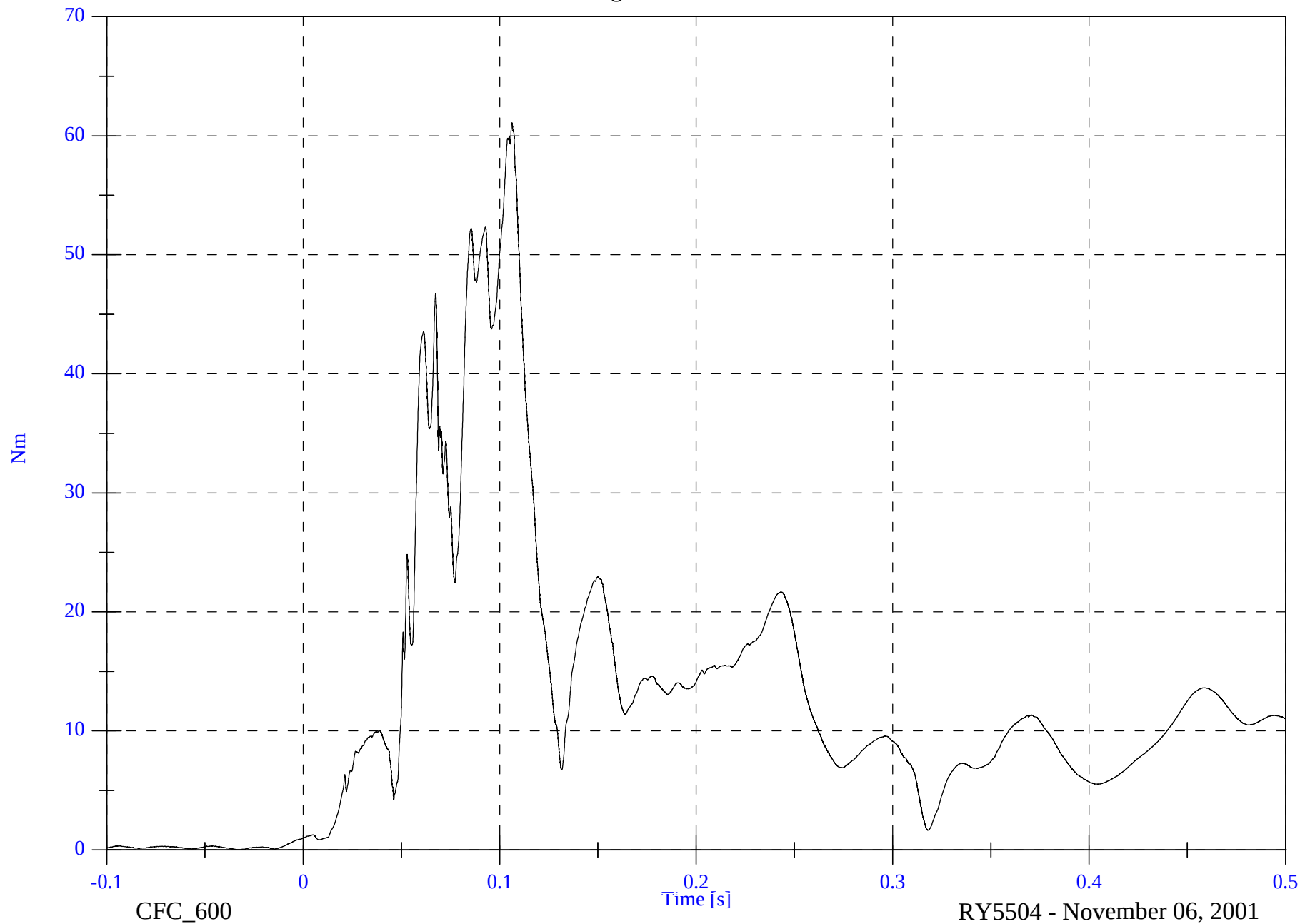


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Femur M Resultant

Max: 61.1 [Nm] at 0.106 [s]

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



B-136

8413-65



40% Frontal Offset Test #9 - 2000 Subaru Legacy

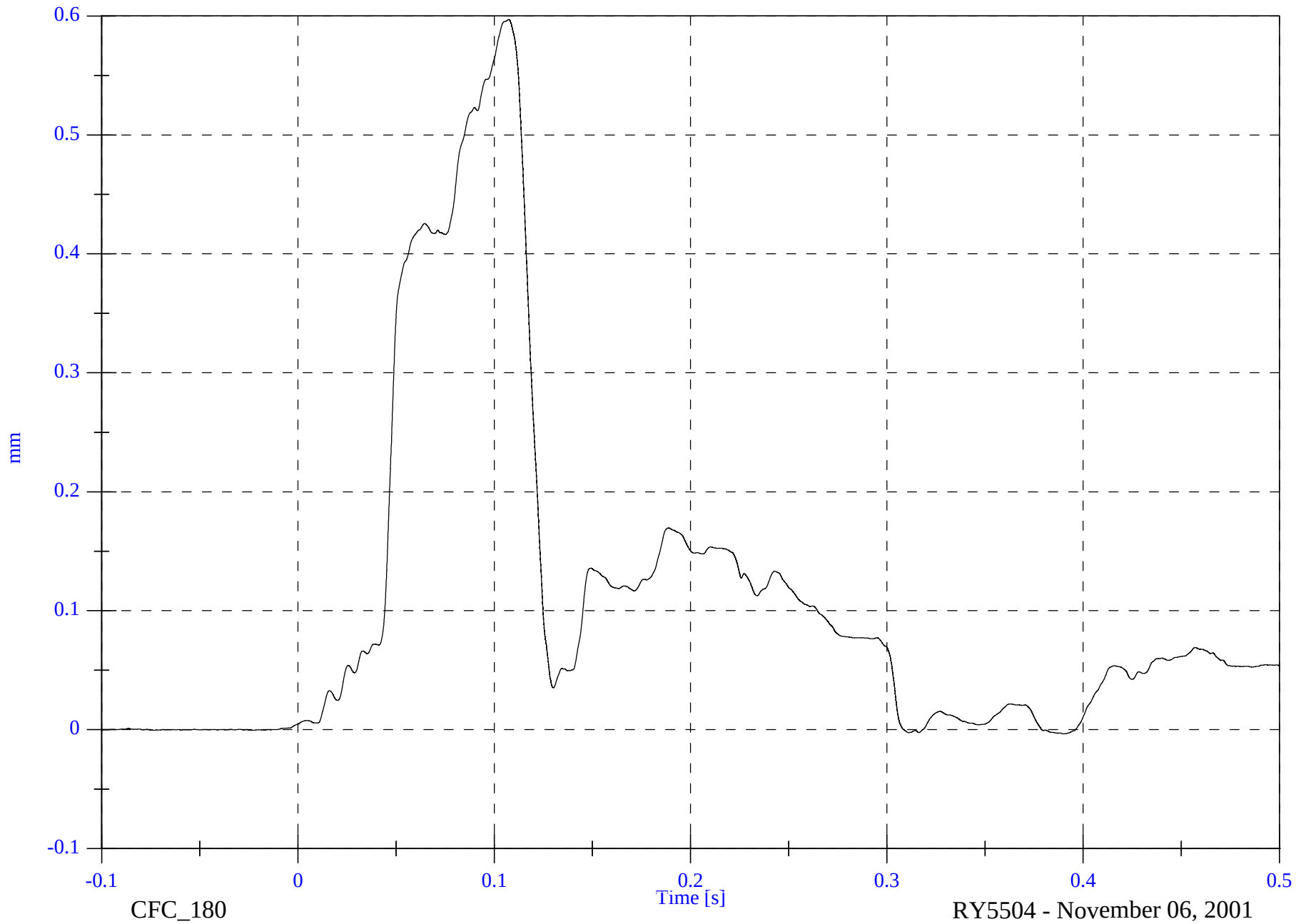
P2 Left Knee Shear Dx

Max: 0.6 [mm] at 0.107 [s]

Min: -0.0 [mm] at 0.390 [s]

B-137

8413-65

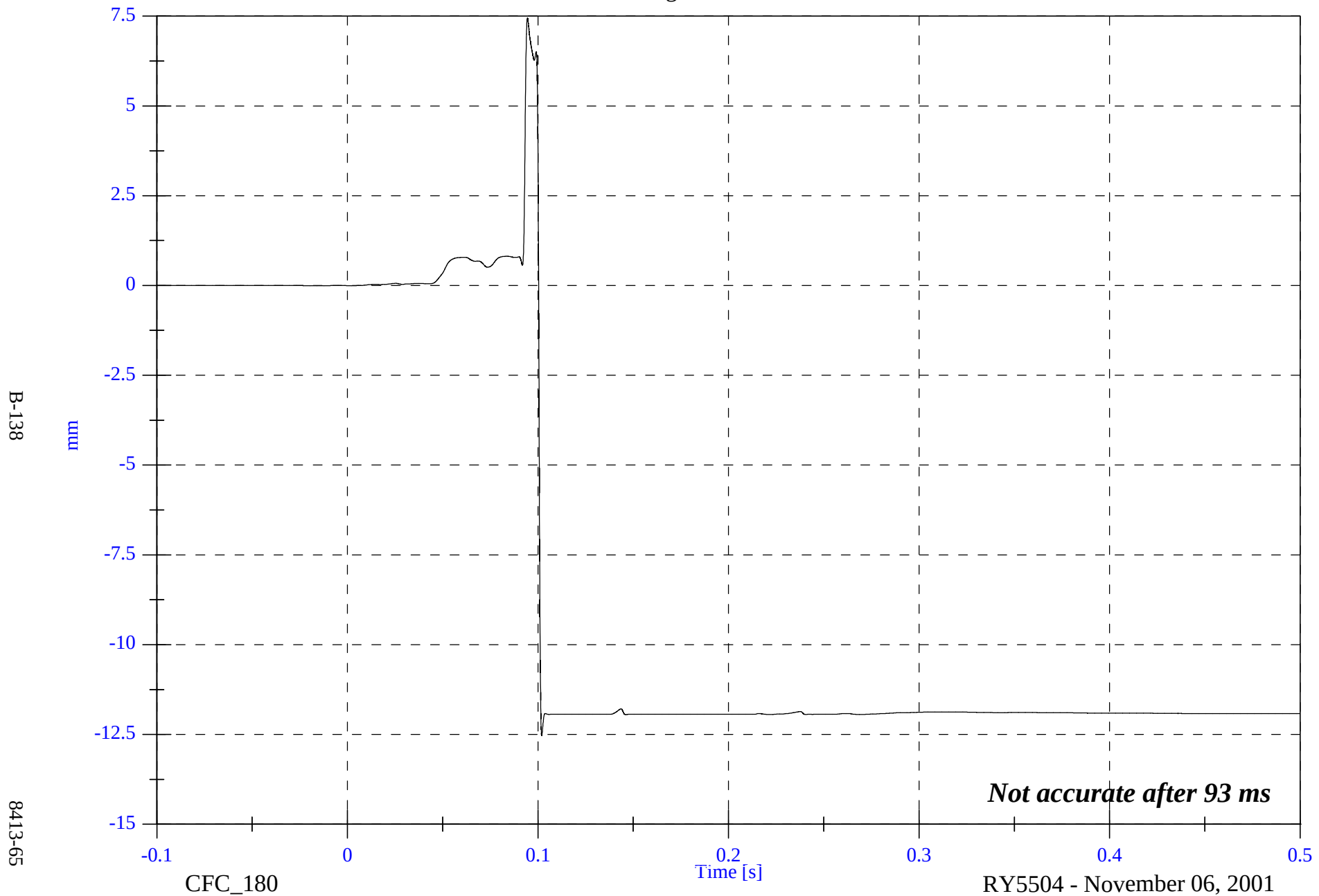


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Knee Shear Dx

Max: 7.4 [mm] at 0.094 [s]

Min: -12.5 [mm] at 0.102 [s]

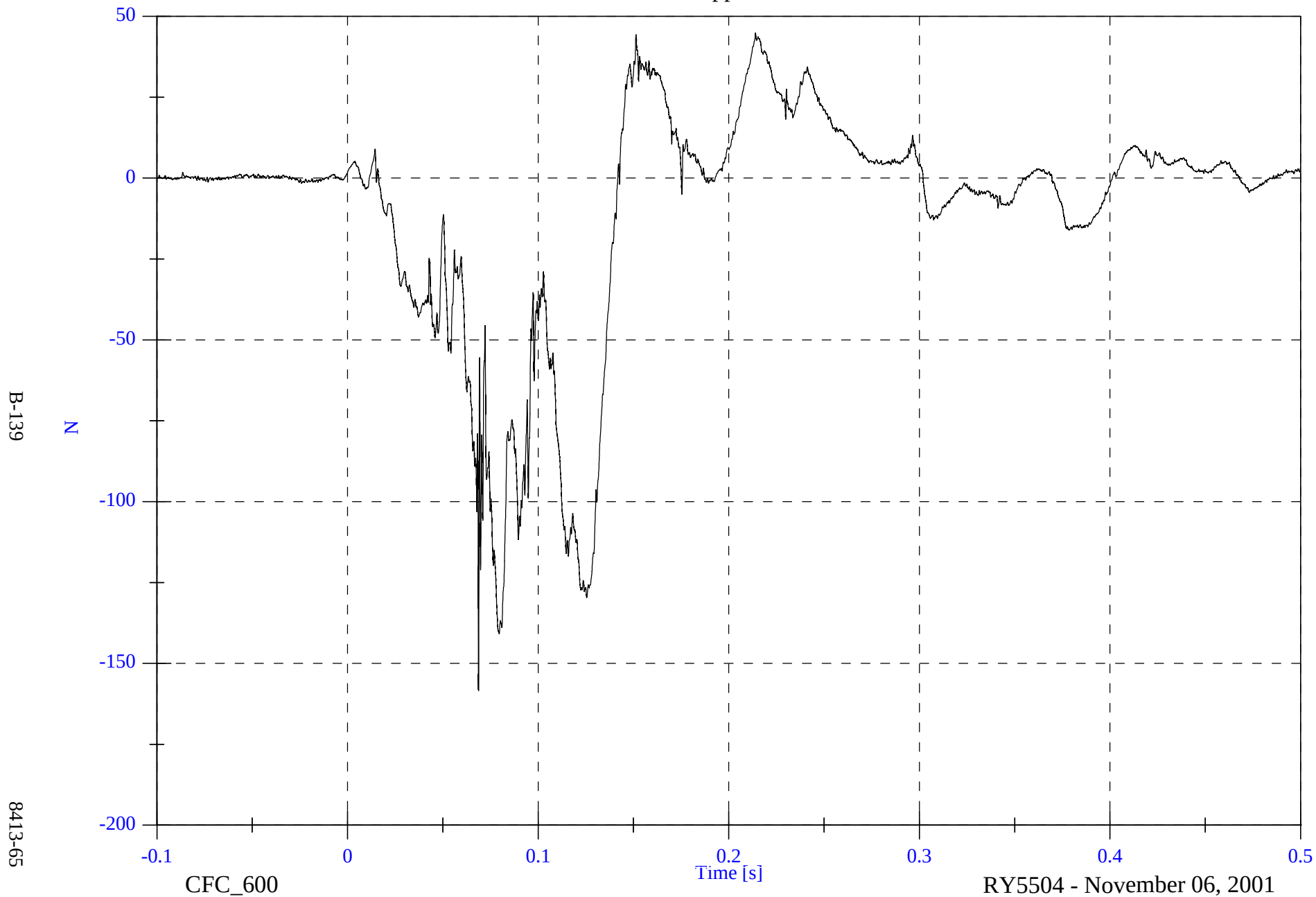


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Upper Tibia Fx

Max: 44.8 [N] at 0.214 [s]

Min: -158.5 [N] at 0.069 [s]

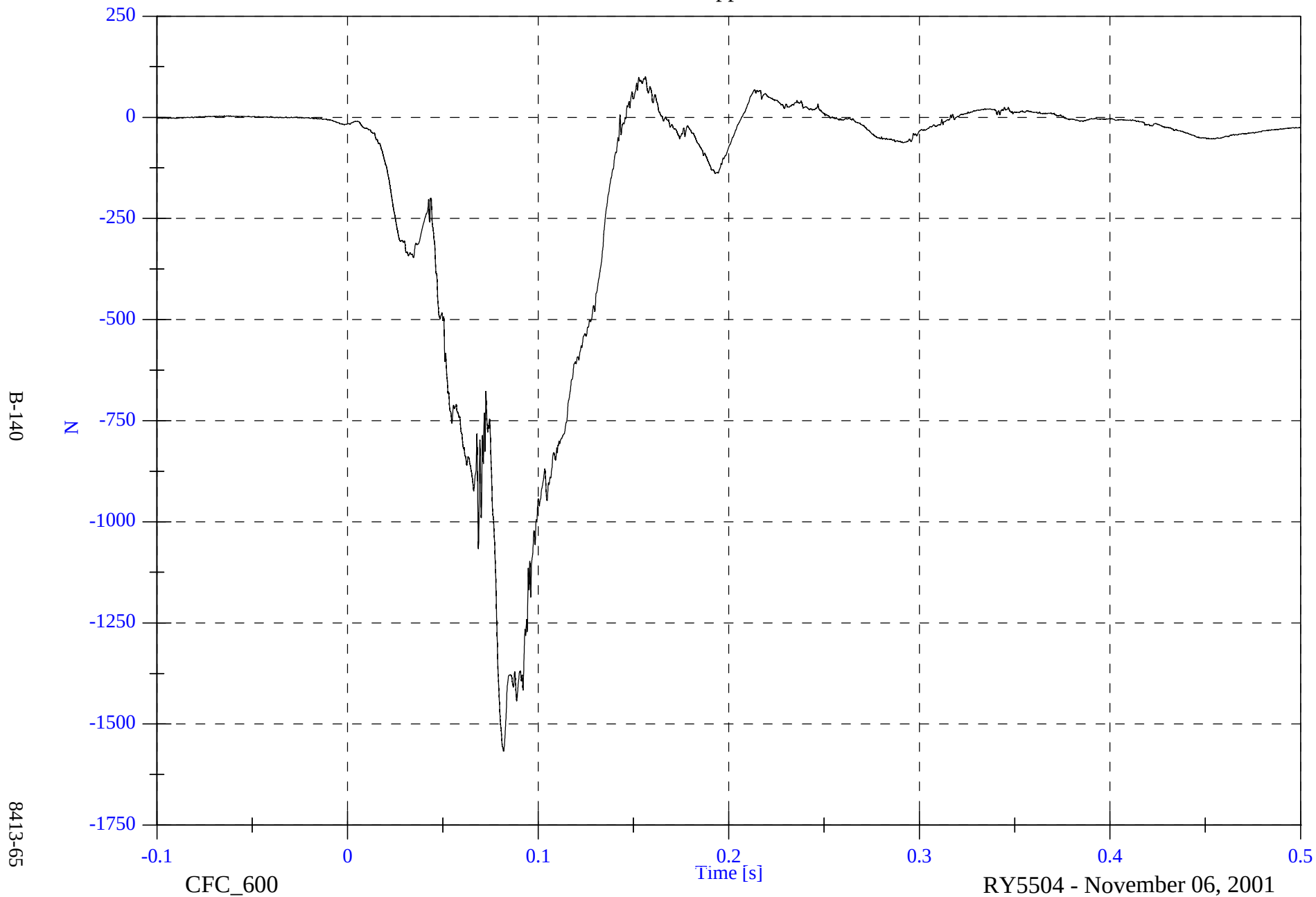


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left UpperTibia Fz

Max: 100.3 [N] at 0.156 [s]

Min: -1567.7 [N] at 0.082 [s]

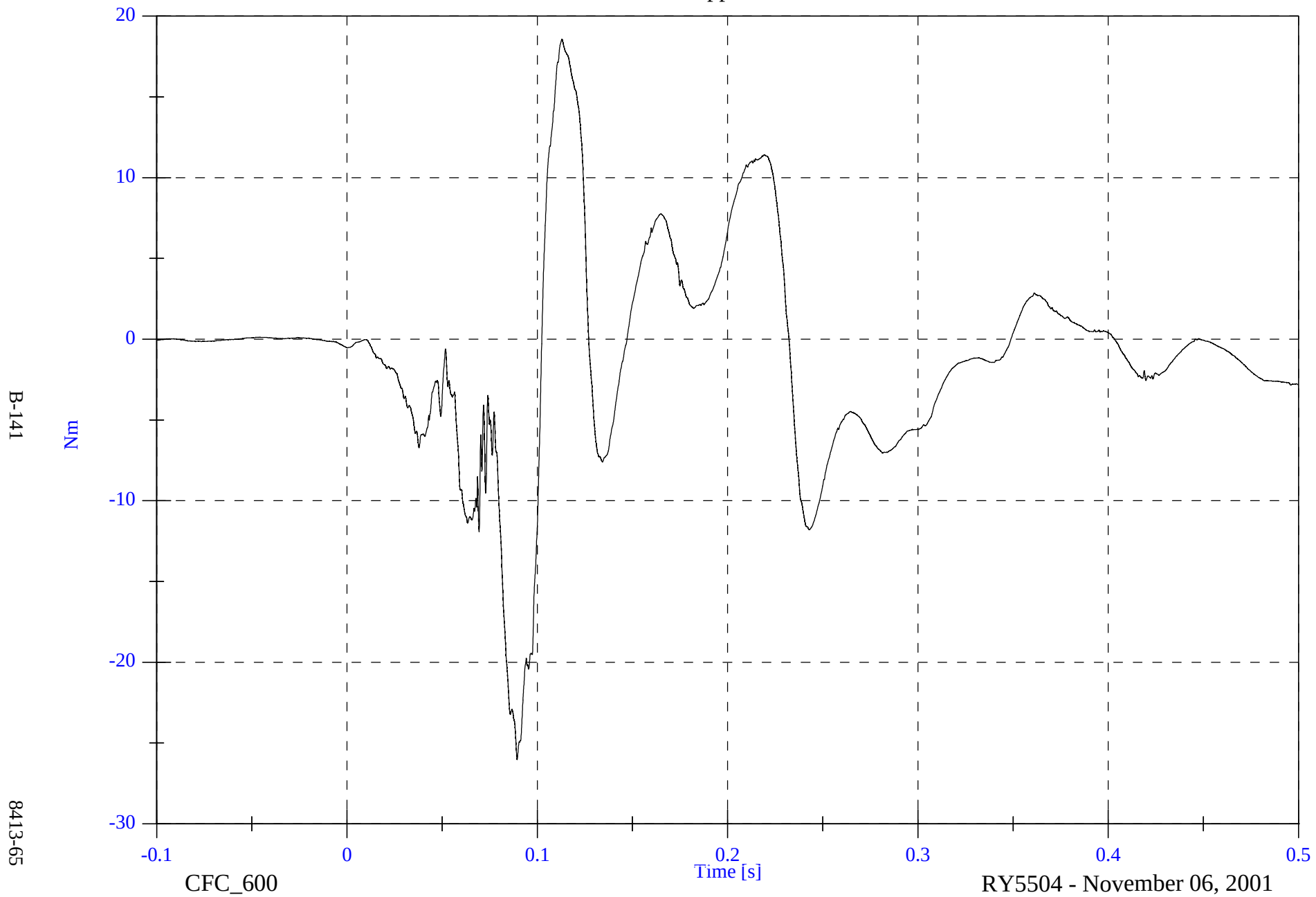


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Upper Tibia Mx

Max: 18.6 [Nm] at 0.113 [s]

Min: -26.0 [Nm] at 0.089 [s]



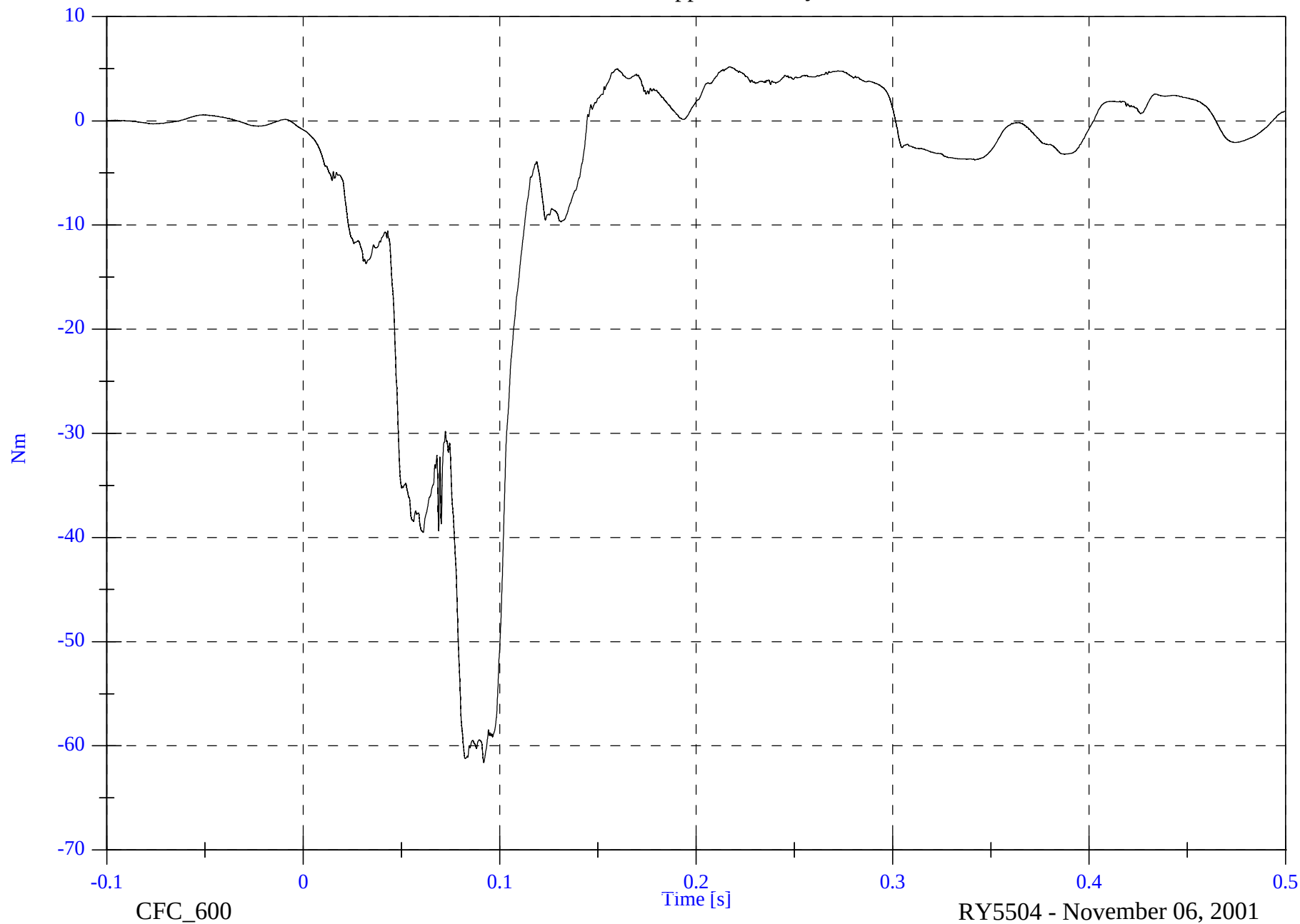


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Upper Tibia My

Max: 5.2 [Nm] at 0.217 [s]

Min: -61.6 [Nm] at 0.092 [s]



B-142

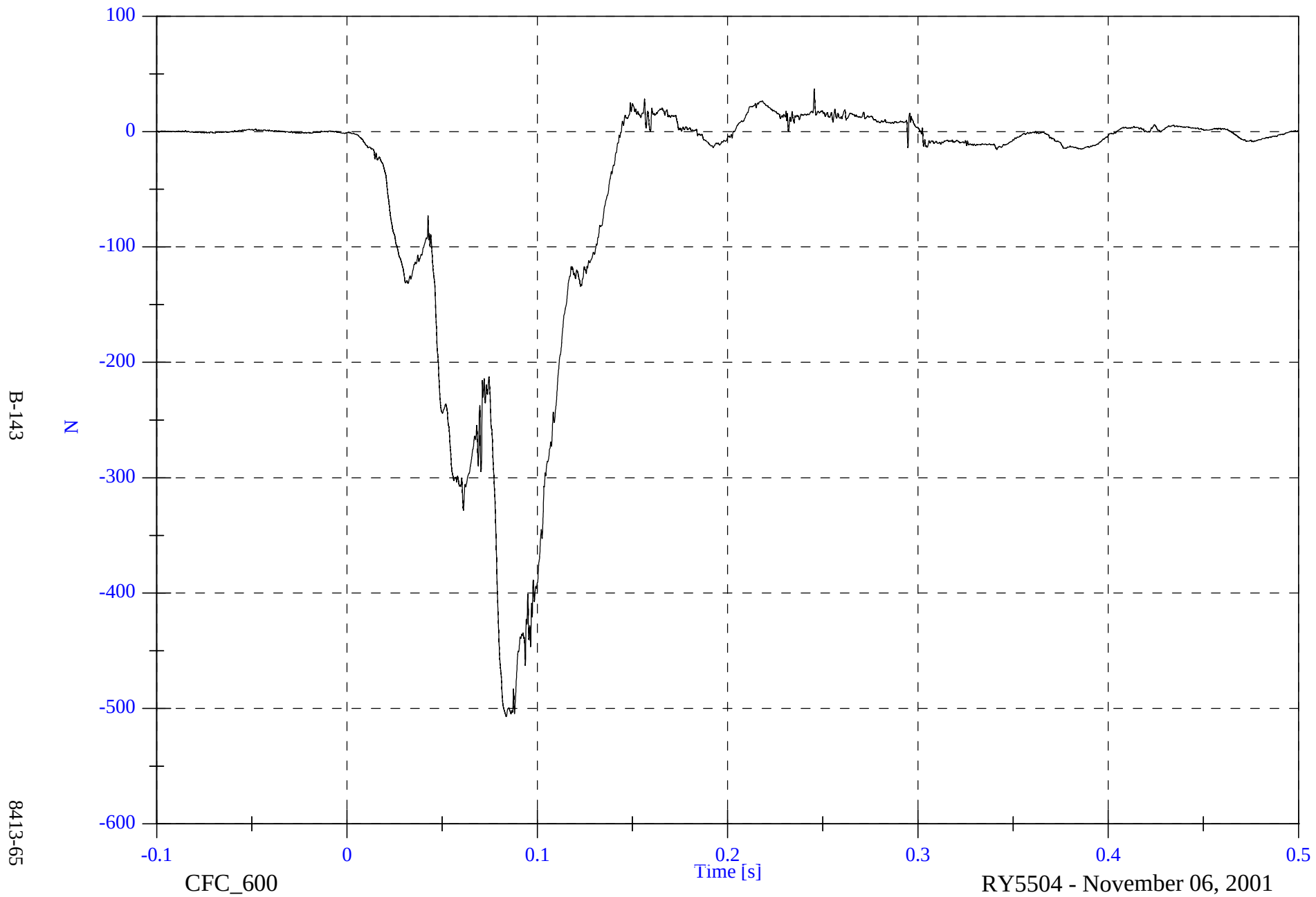
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Lower Tibia Fx

Max: 36.7 [N] at 0.245 [s]

Min: -507.2 [N] at 0.084 [s]

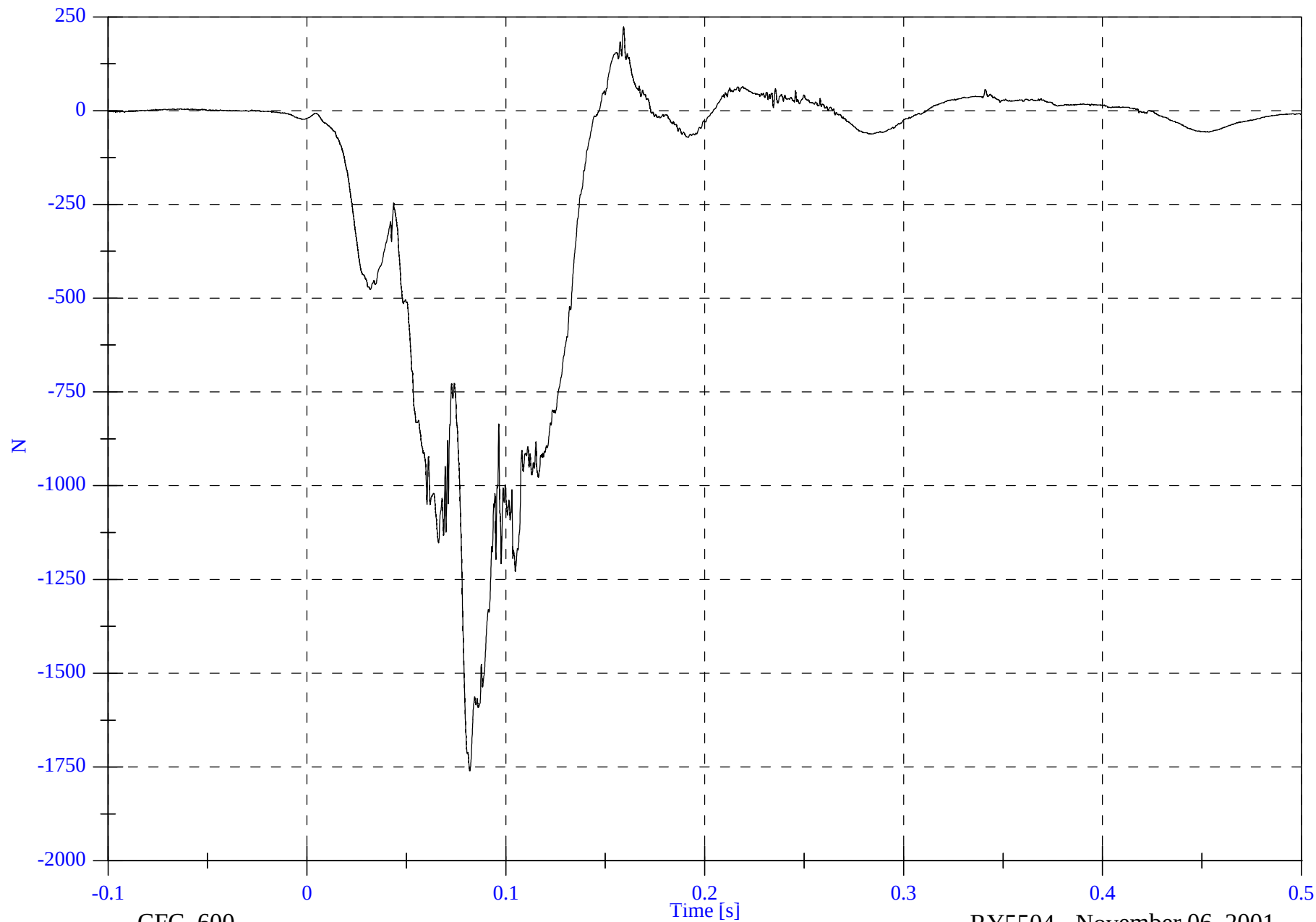


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Max: 223.4 [N] at 0.159 [s]

P2 Left Lower Tibia Fz

Min: -1760.5 [N] at 0.082 [s]



B-144

8413-65

CFC\_600

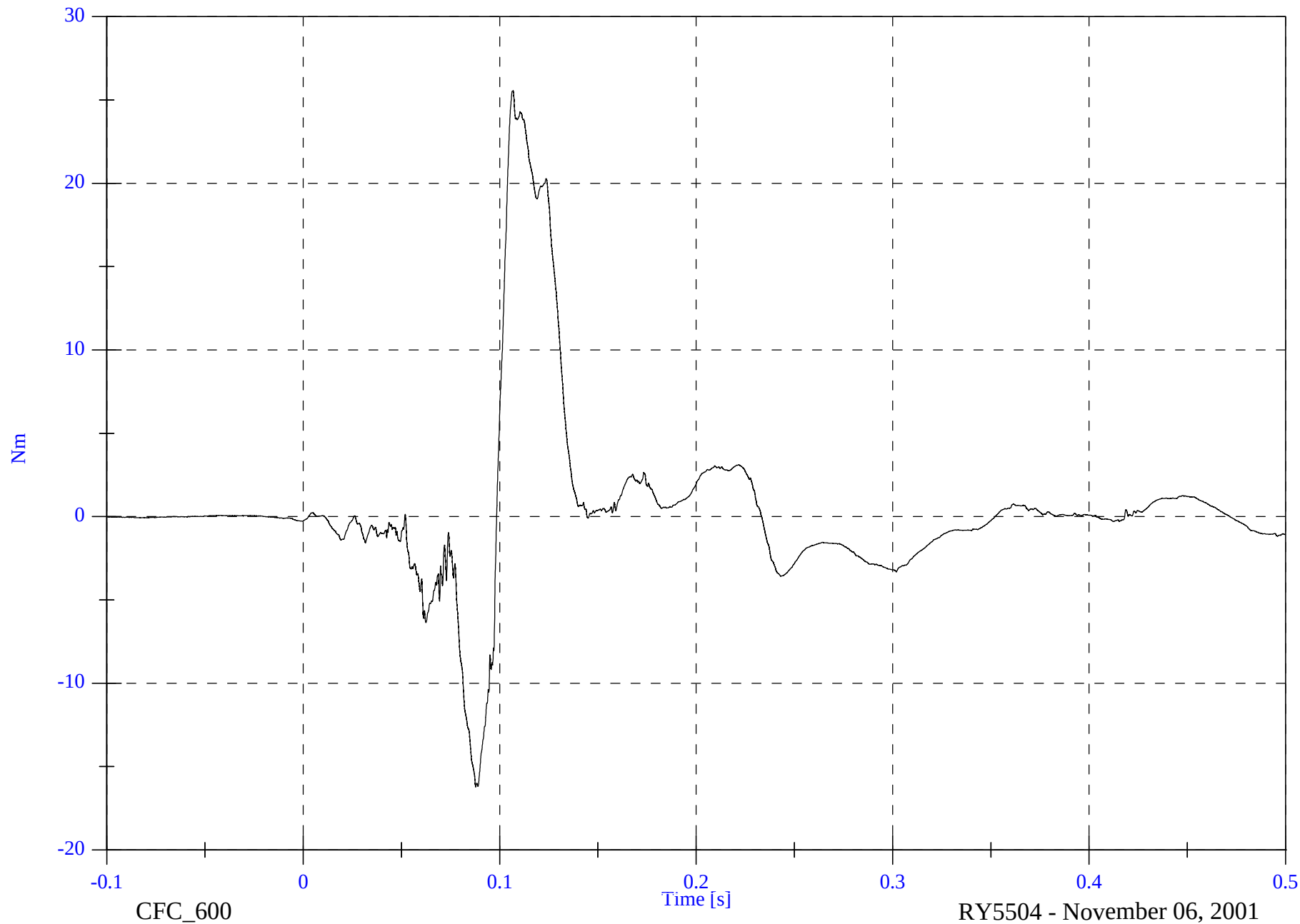
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Lower Tibia Mx

Max: 25.6 [Nm] at 0.107 [s]

Min: -16.2 [Nm] at 0.088 [s]



B-145

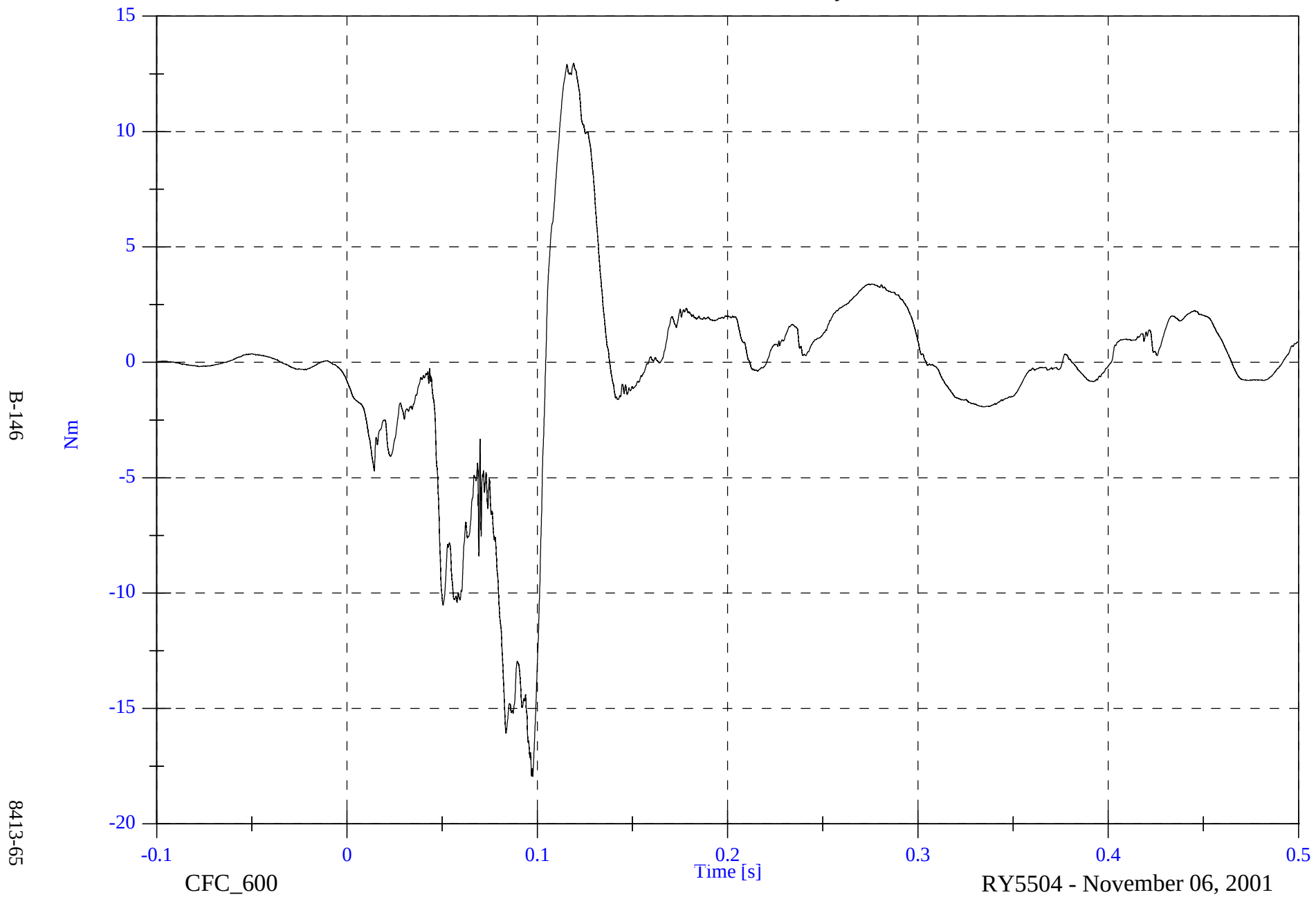
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Lower Tibia My

Max: 13.0 [Nm] at 0.119 [s]

Min: -17.9 [Nm] at 0.098 [s]



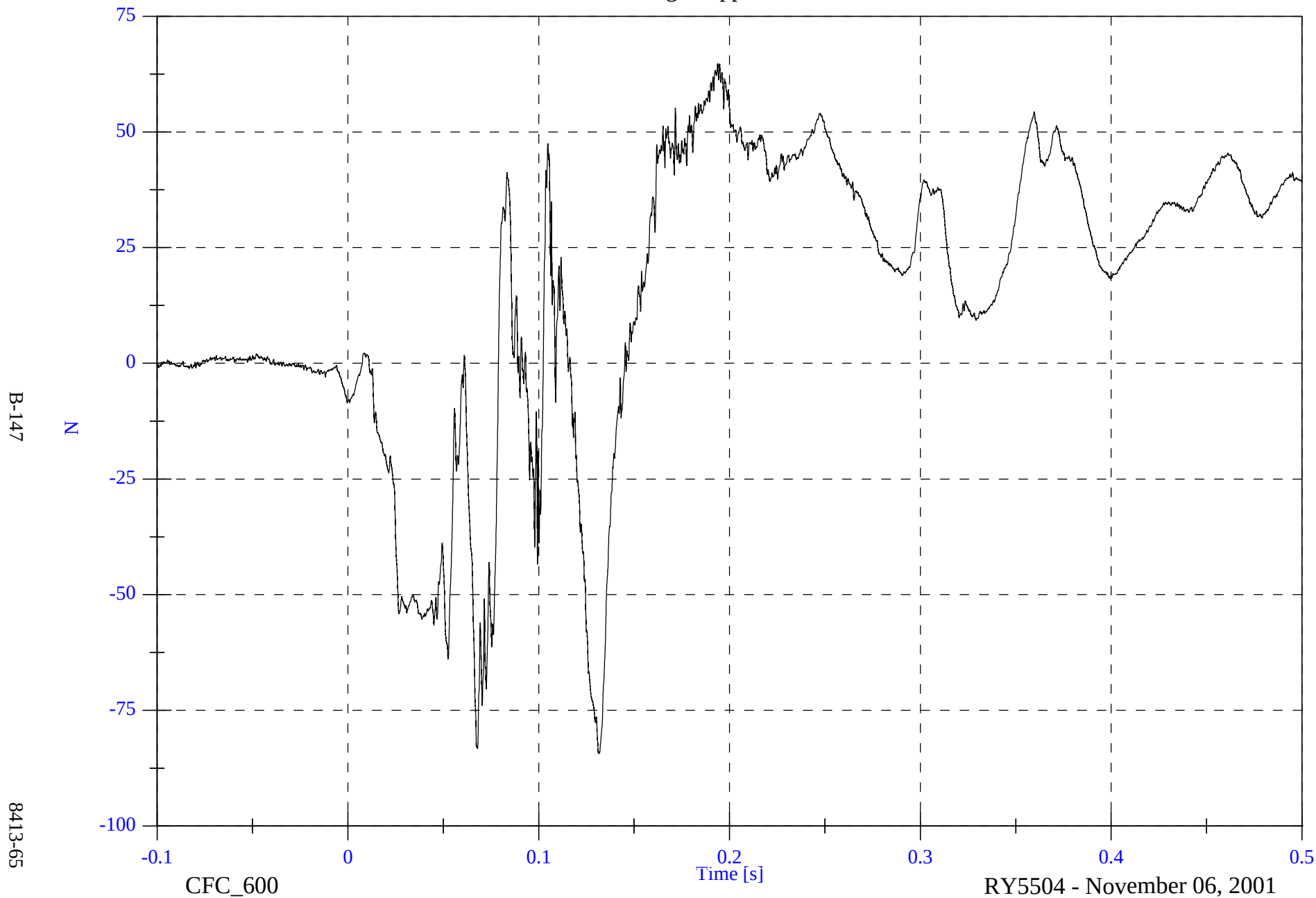


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Upper Tibia Fx

Max: 64.8 [N] at 0.194 [s]

Min: -84.3 [N] at 0.131 [s]

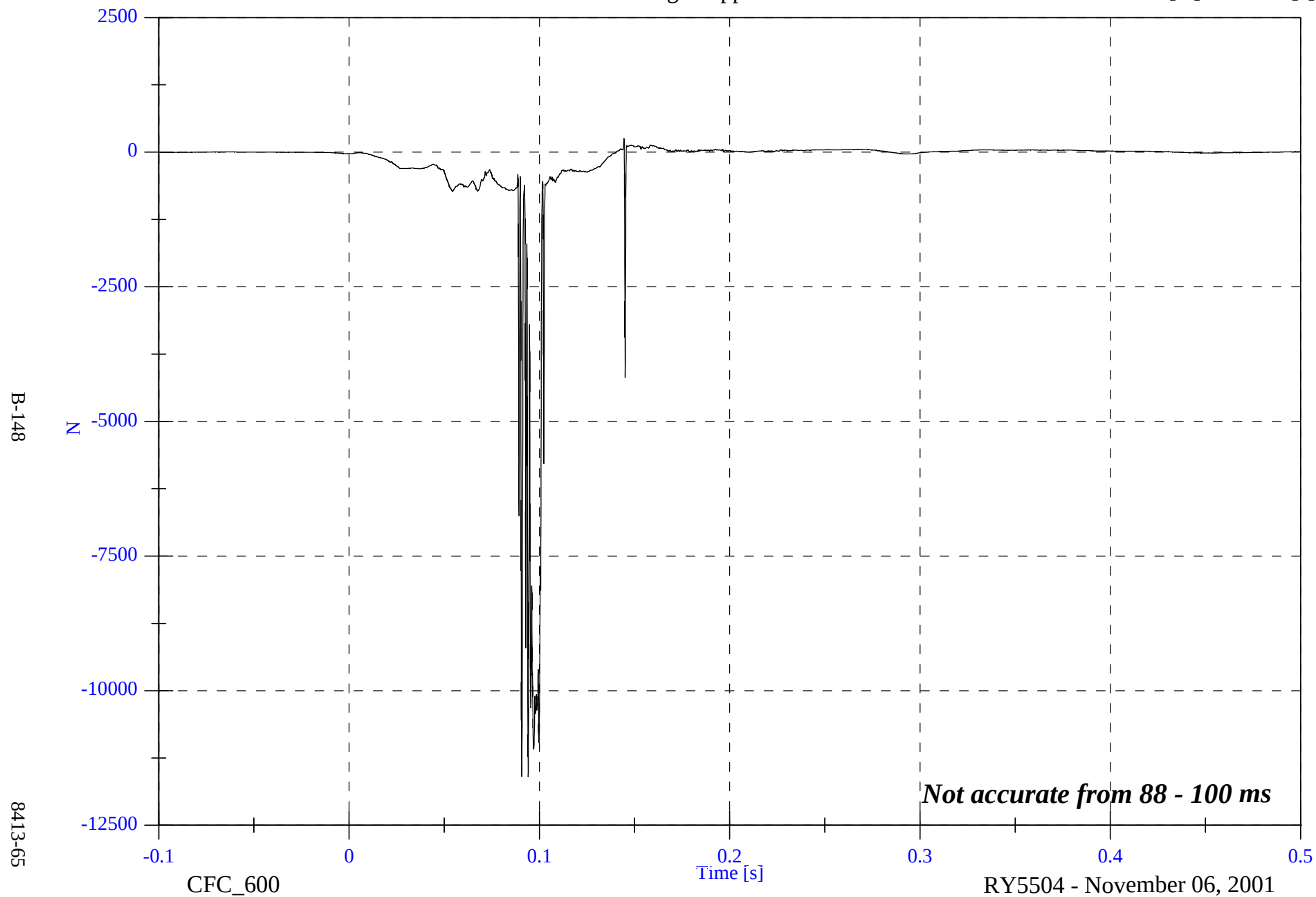


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Upper Tibia Fz

Max: 255.6 [N] at 0.144 [s]

Min: -11601.8 [N] at 0.094 [s]

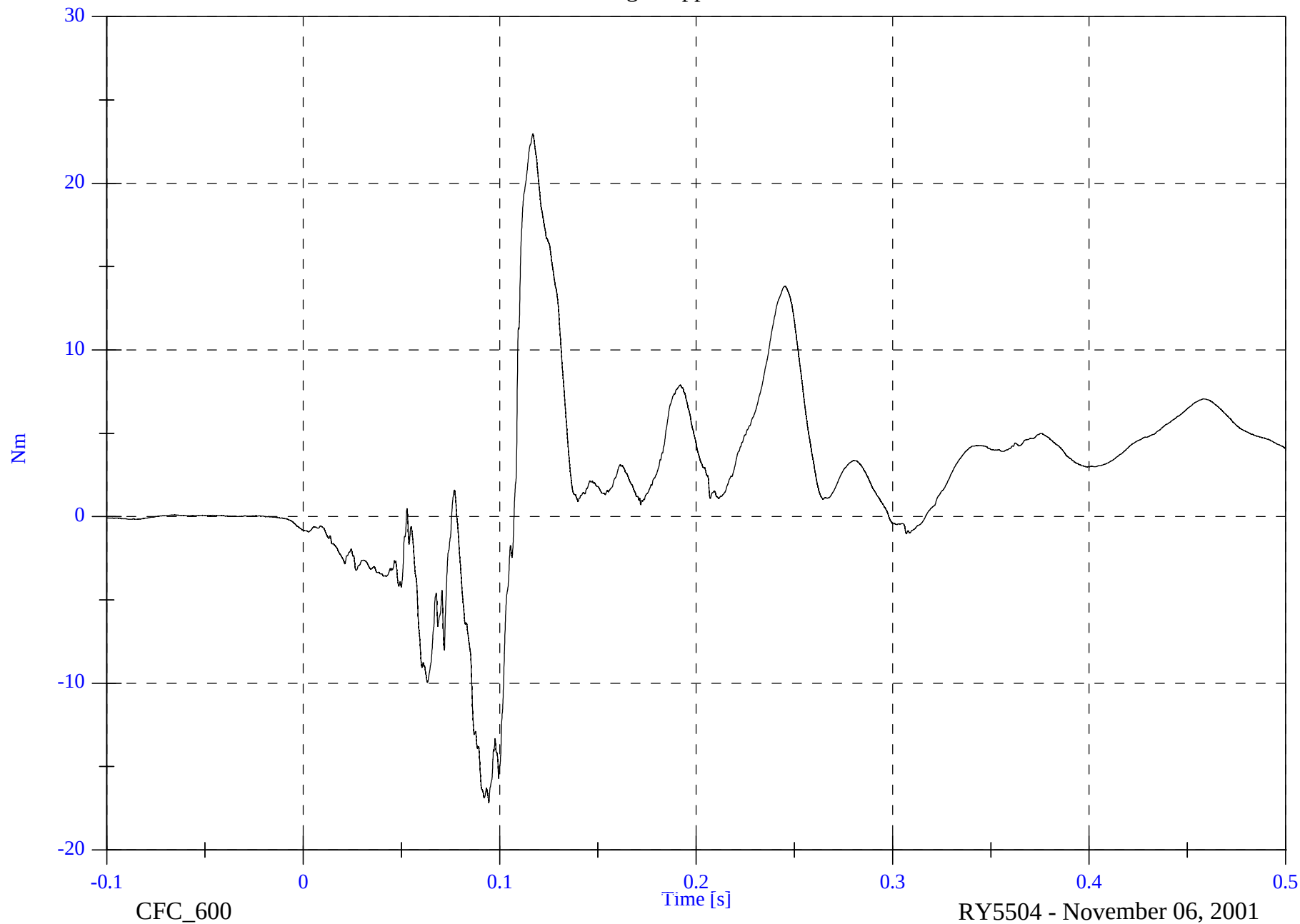


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Upper Tibia Mx

Max: 23.0 [Nm] at 0.117 [s]

Min: -17.2 [Nm] at 0.095 [s]



B-149

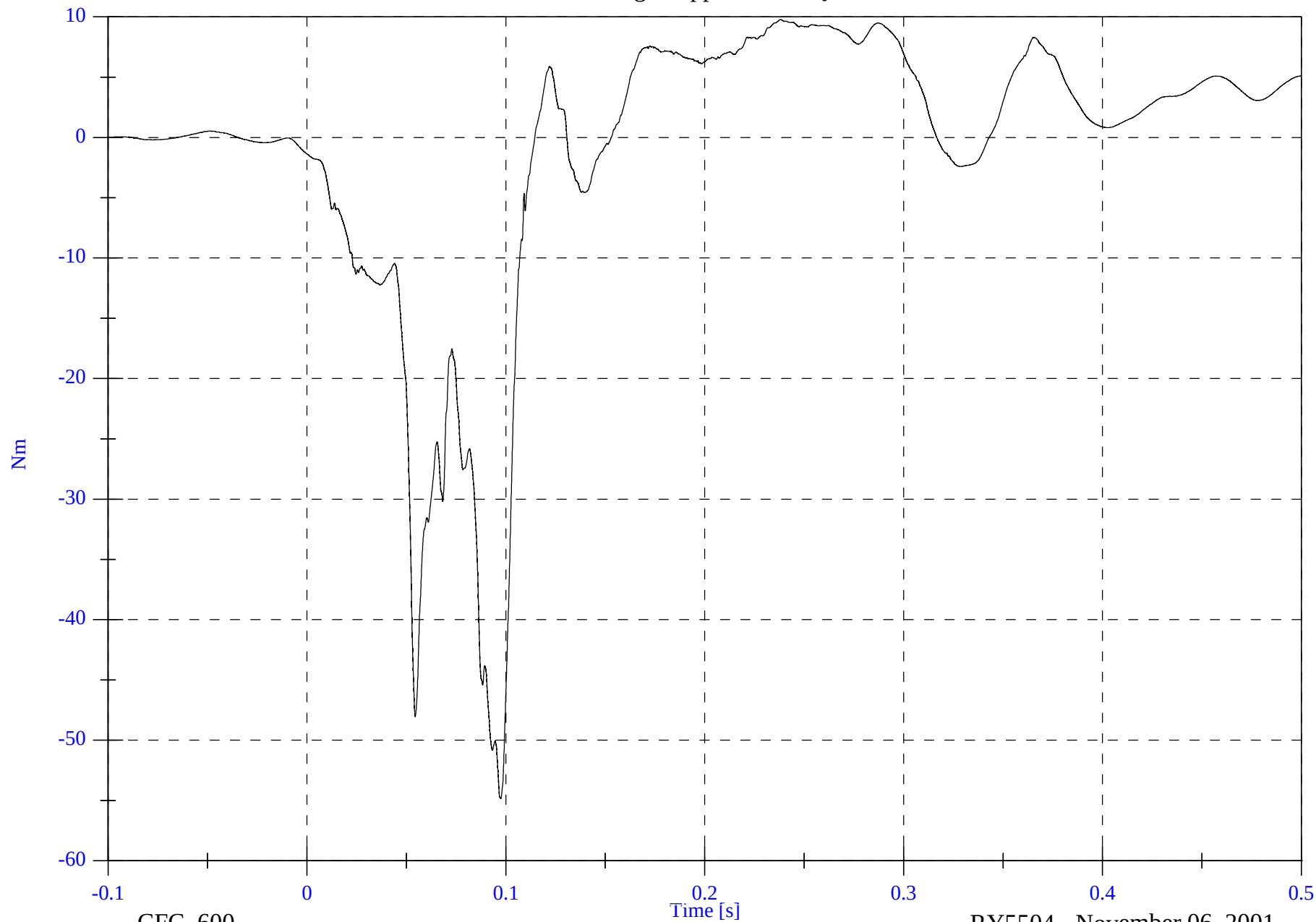
8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Upper Tibia My

Max: 9.8 [Nm] at 0.238 [s]

Min: -54.8 [Nm] at 0.098 [s]



B-150

8413-65

CFC\_600

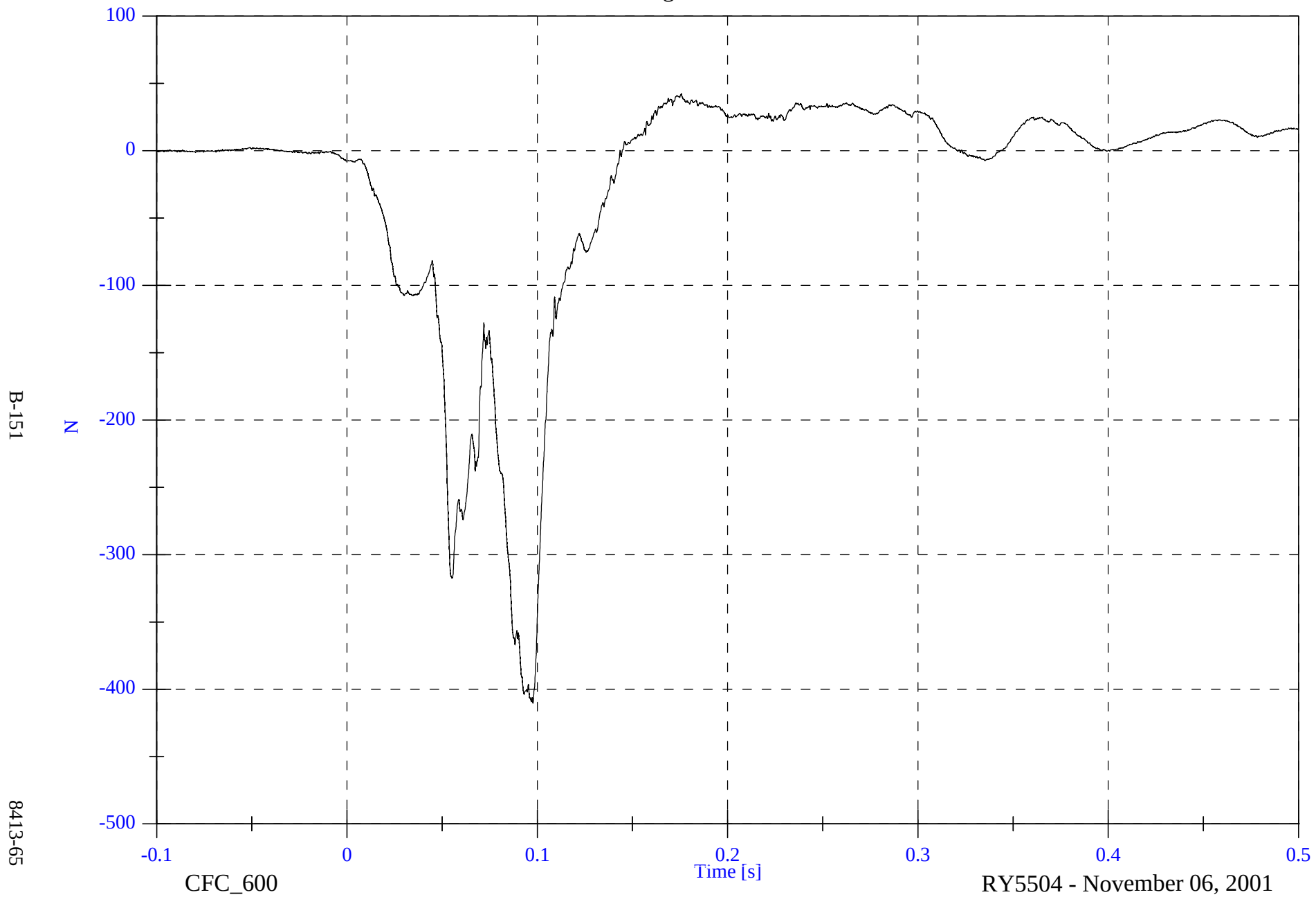
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Lower Tibia Fx

Max: 42.4 [N] at 0.176 [s]

Min: -410.4 [N] at 0.098 [s]



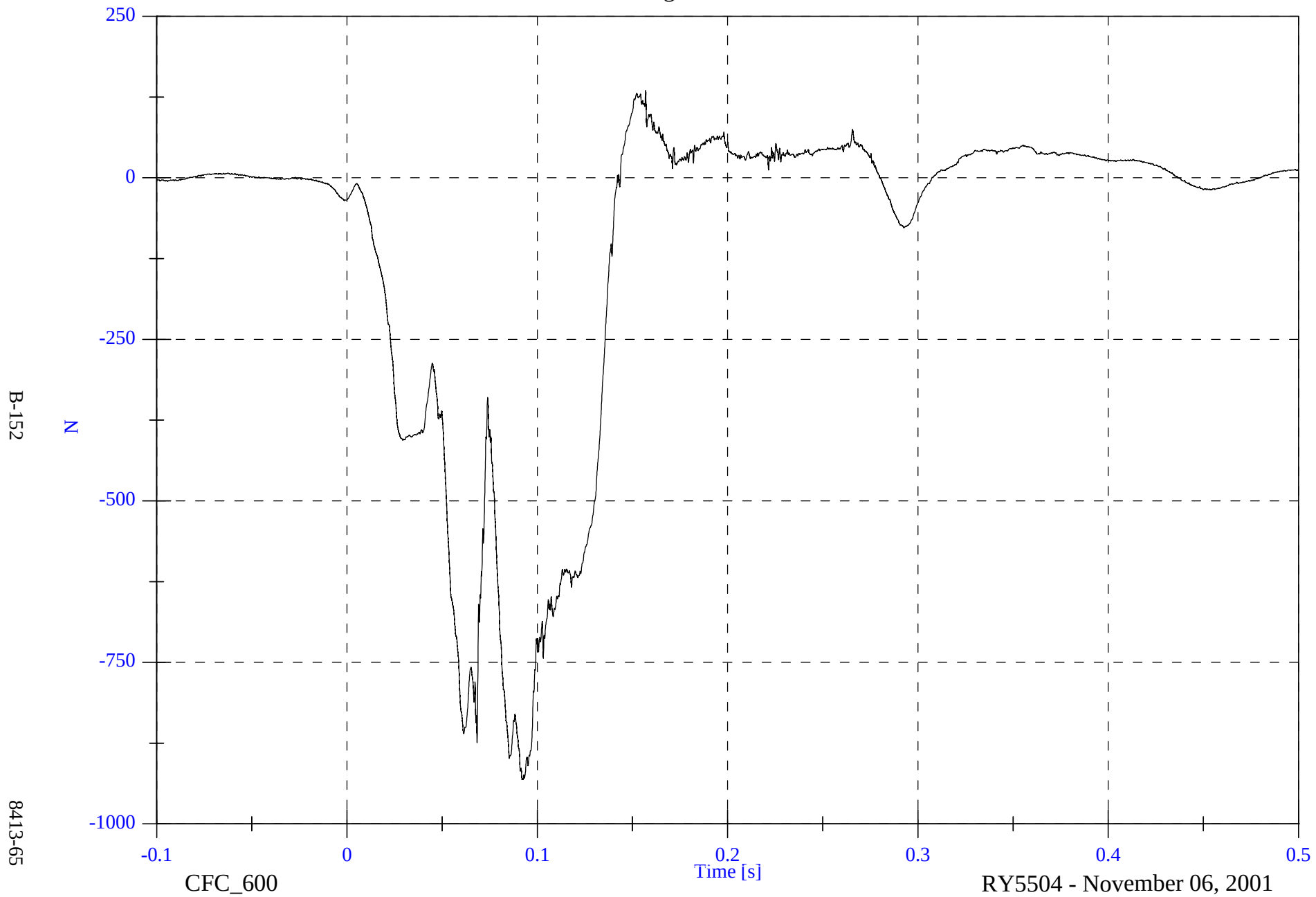


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Max: 135.0 [N] at 0.157 [s]

P2 Right Lower Tibia Fz

Min: -931.4 [N] at 0.092 [s]

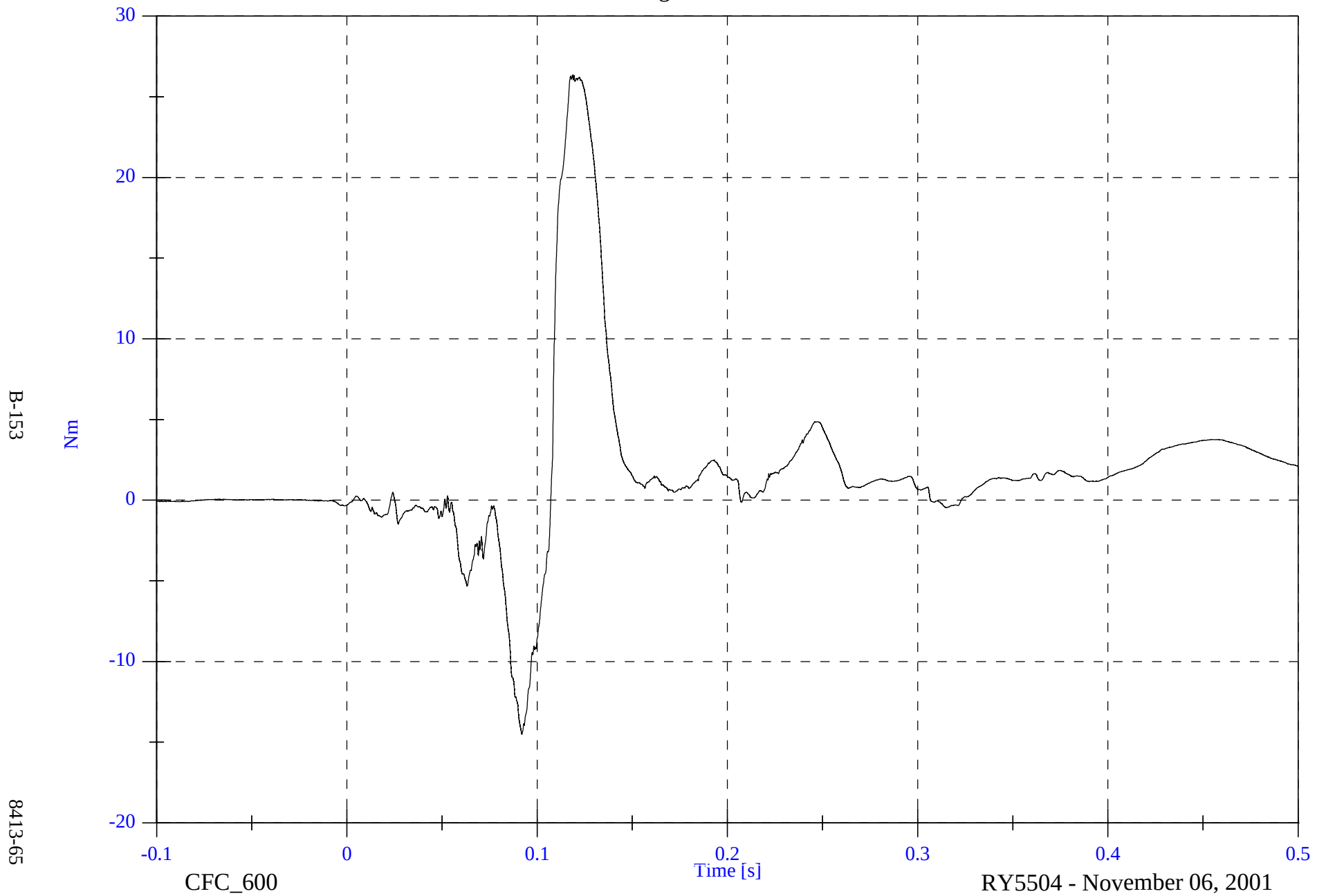


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Lower Tibia Mx

Max: 26.4 [Nm] at 0.119 [s]

Min: -14.5 [Nm] at 0.092 [s]

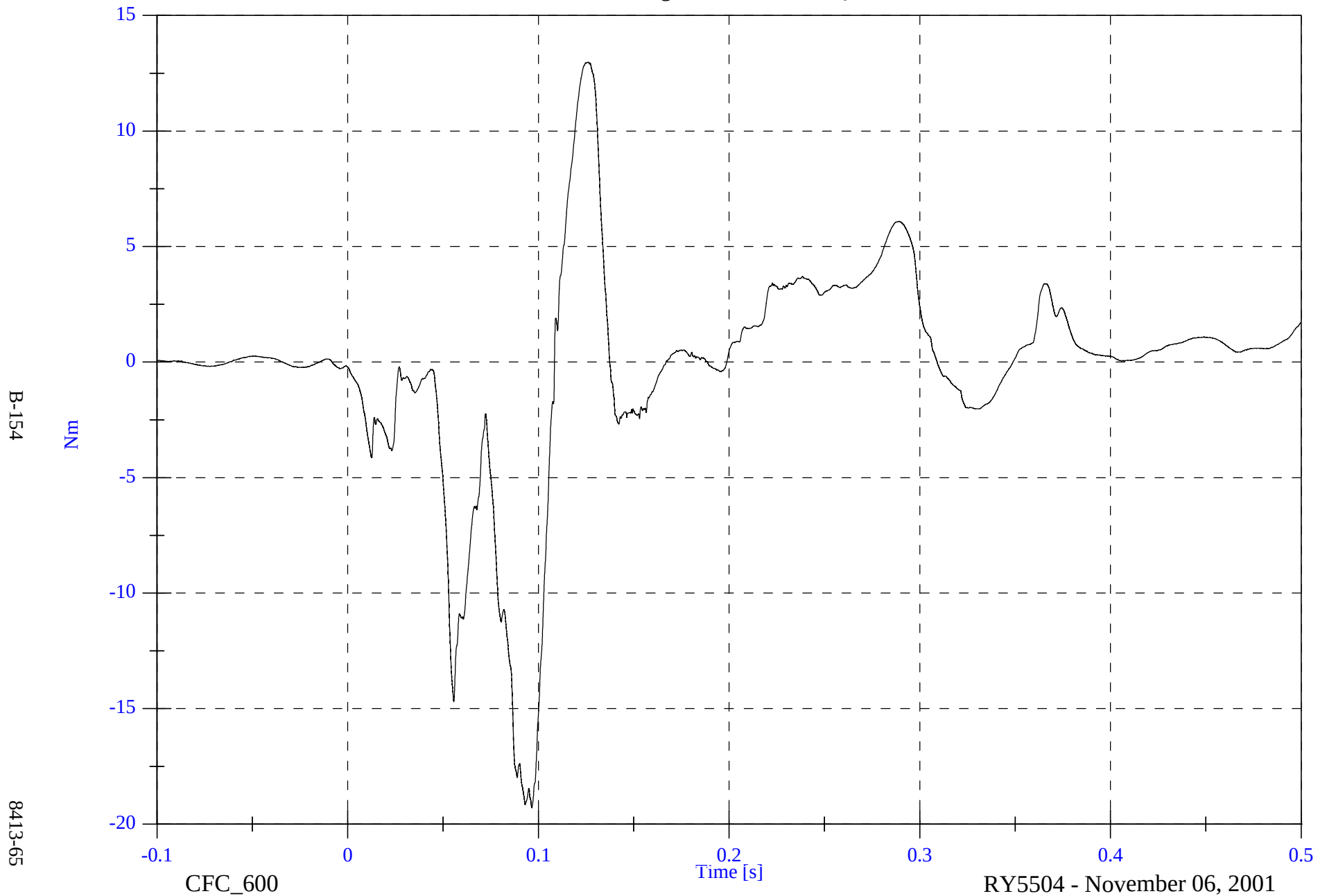


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Lower Tibia My

Max: 13.0 [Nm] at 0.126 [s]

Min: -19.3 [Nm] at 0.097 [s]

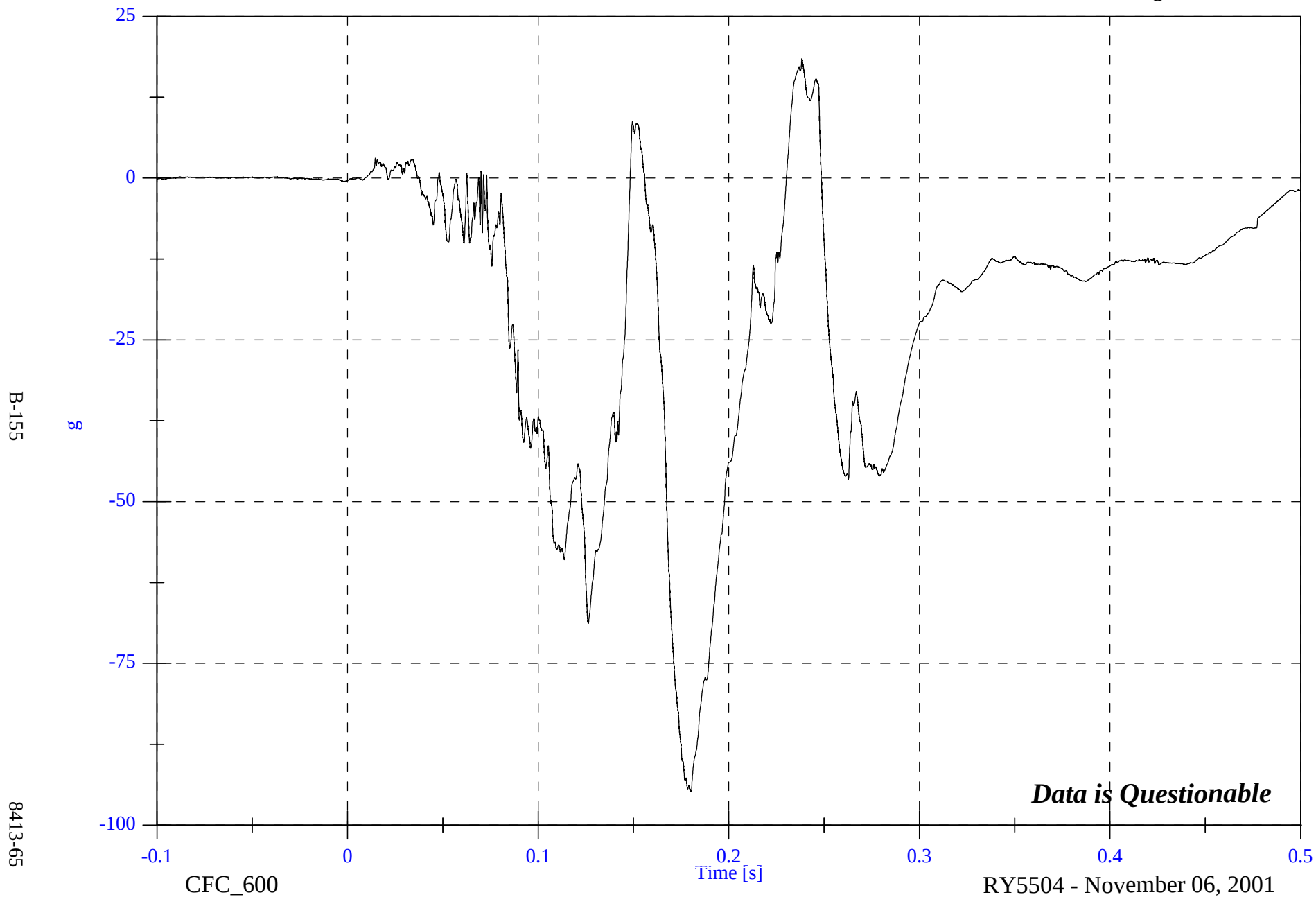


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left ankle Ax

Max: 18.4 [g] at 0.238 [s]

Min: -94.8 [g] at 0.180 [s]

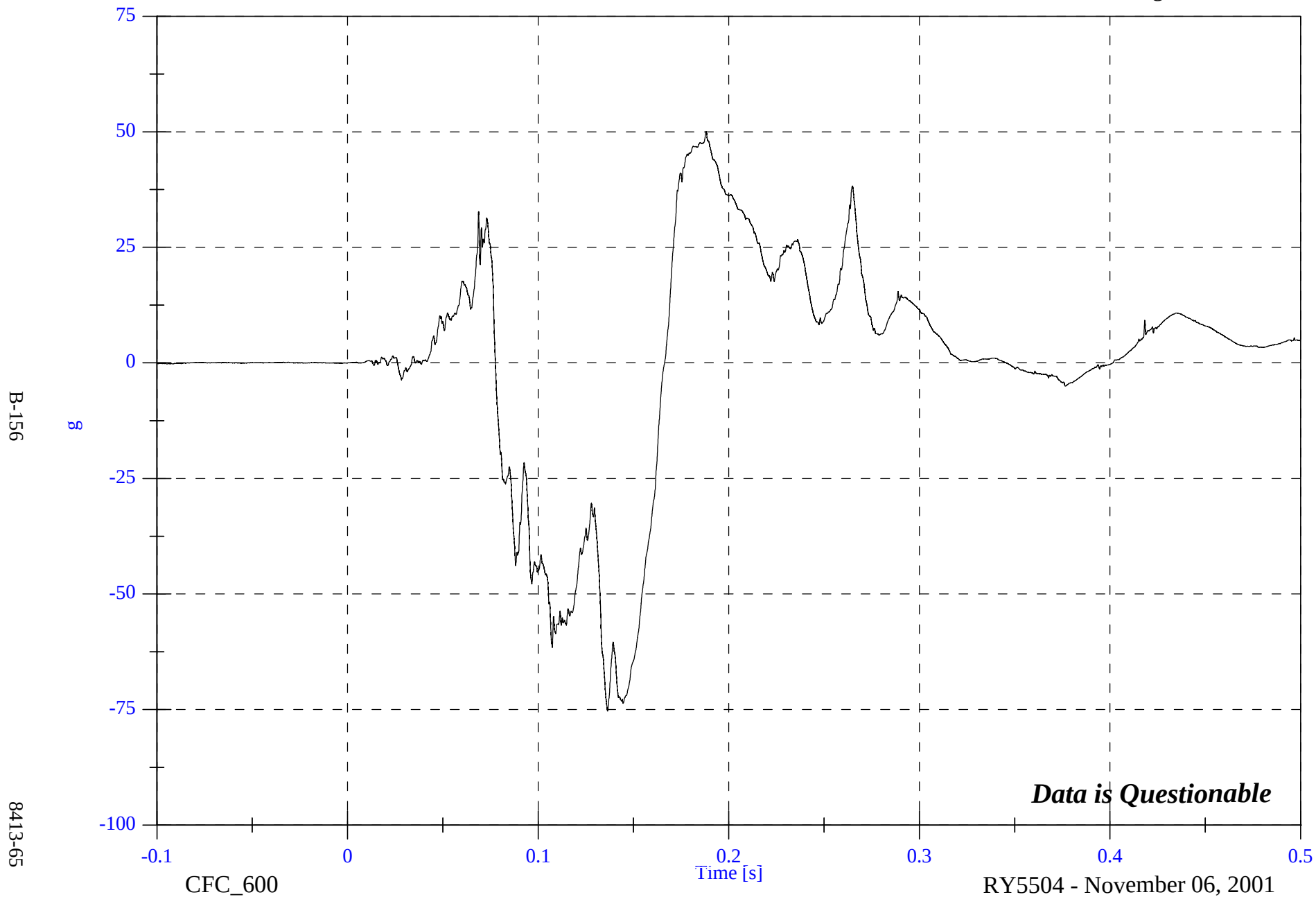


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Ankle Az

Max: 50.1 [g] at 0.188 [s]

Min: -75.3 [g] at 0.136 [s]



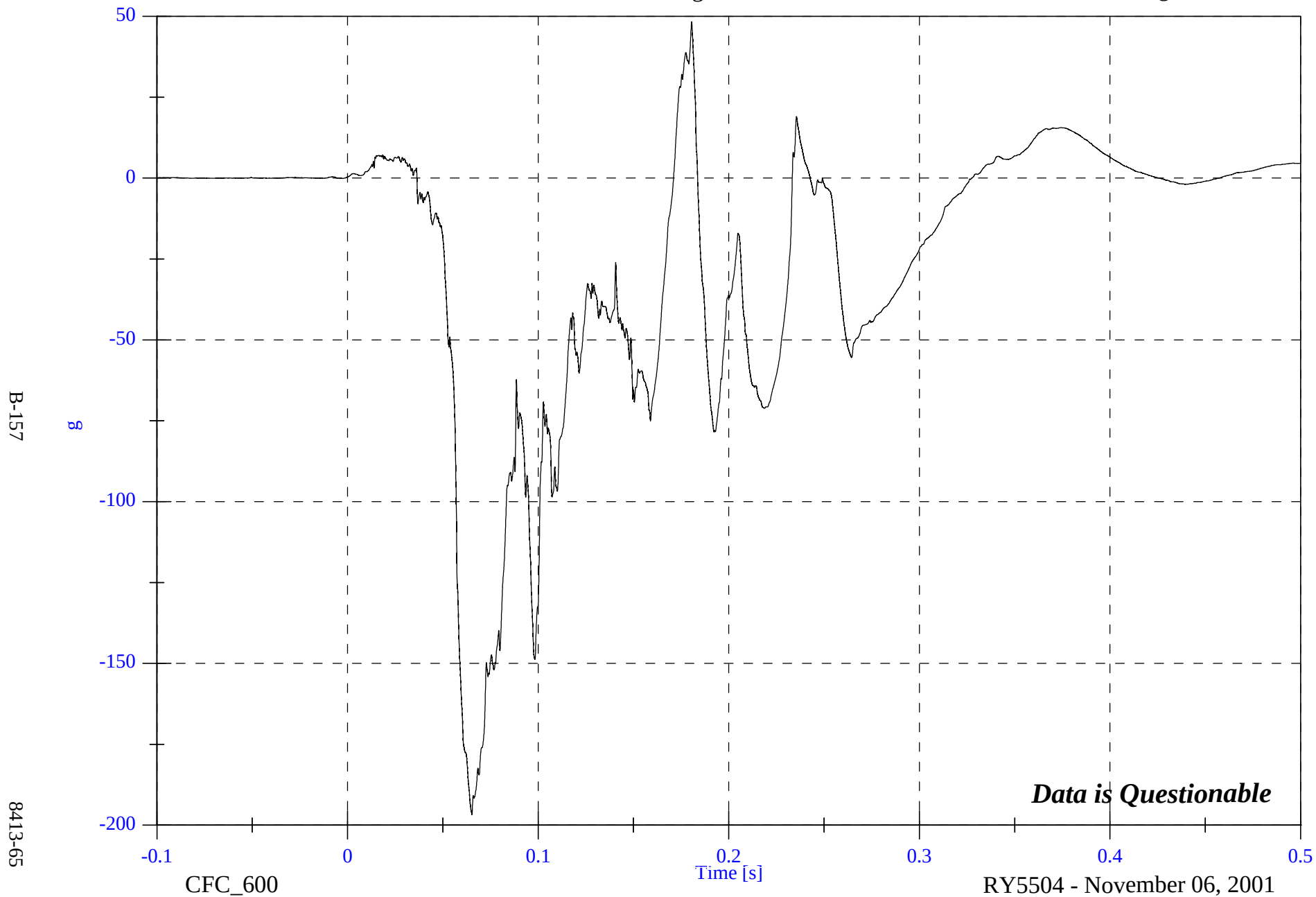


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Ankle Ax

Max: 48.3 [g] at 0.181 [s]

Min: -196.9 [g] at 0.065 [s]

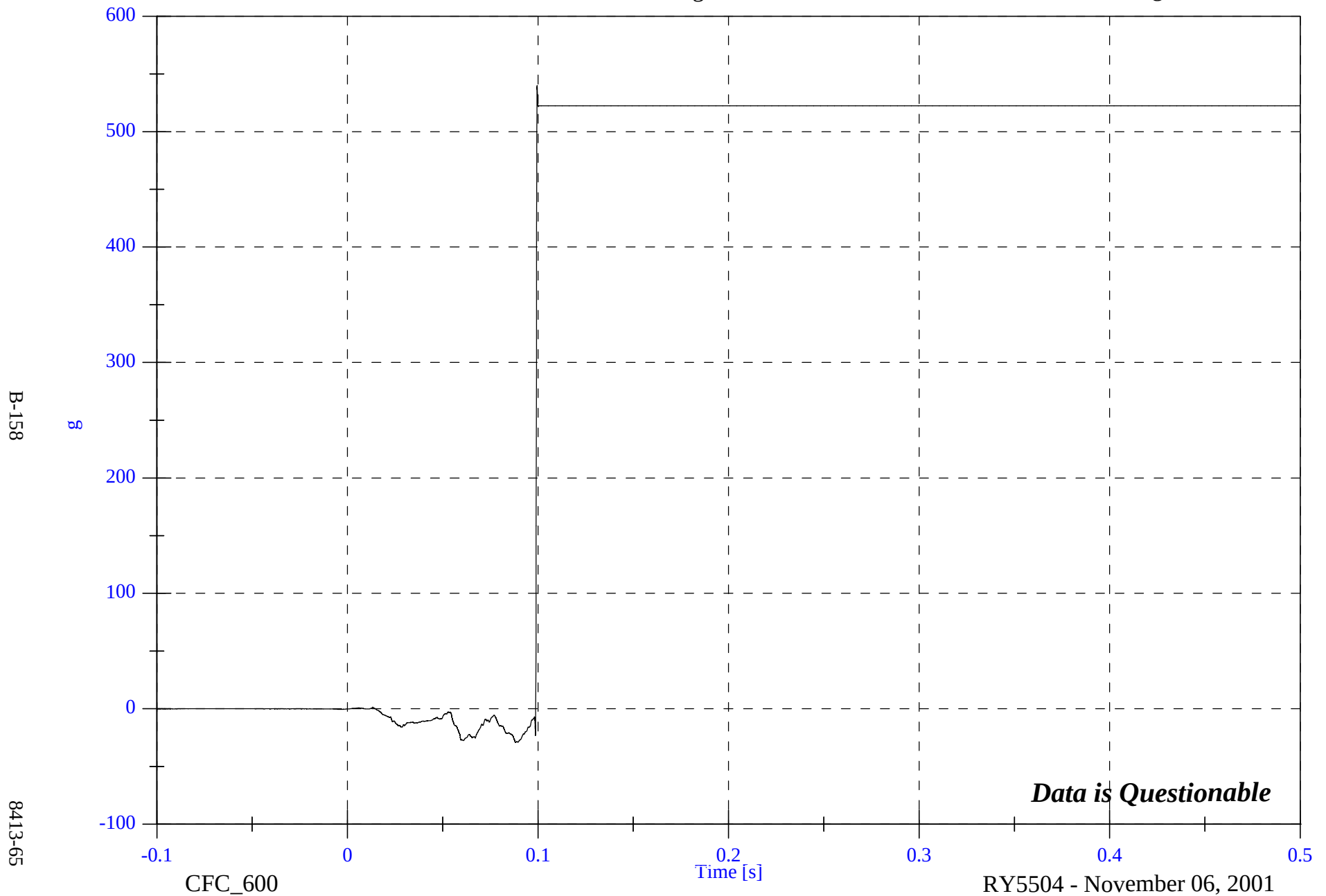


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Ankle Az

Max: 540.0 [g] at 0.100 [s]

Min: -29.0 [g] at 0.088 [s]

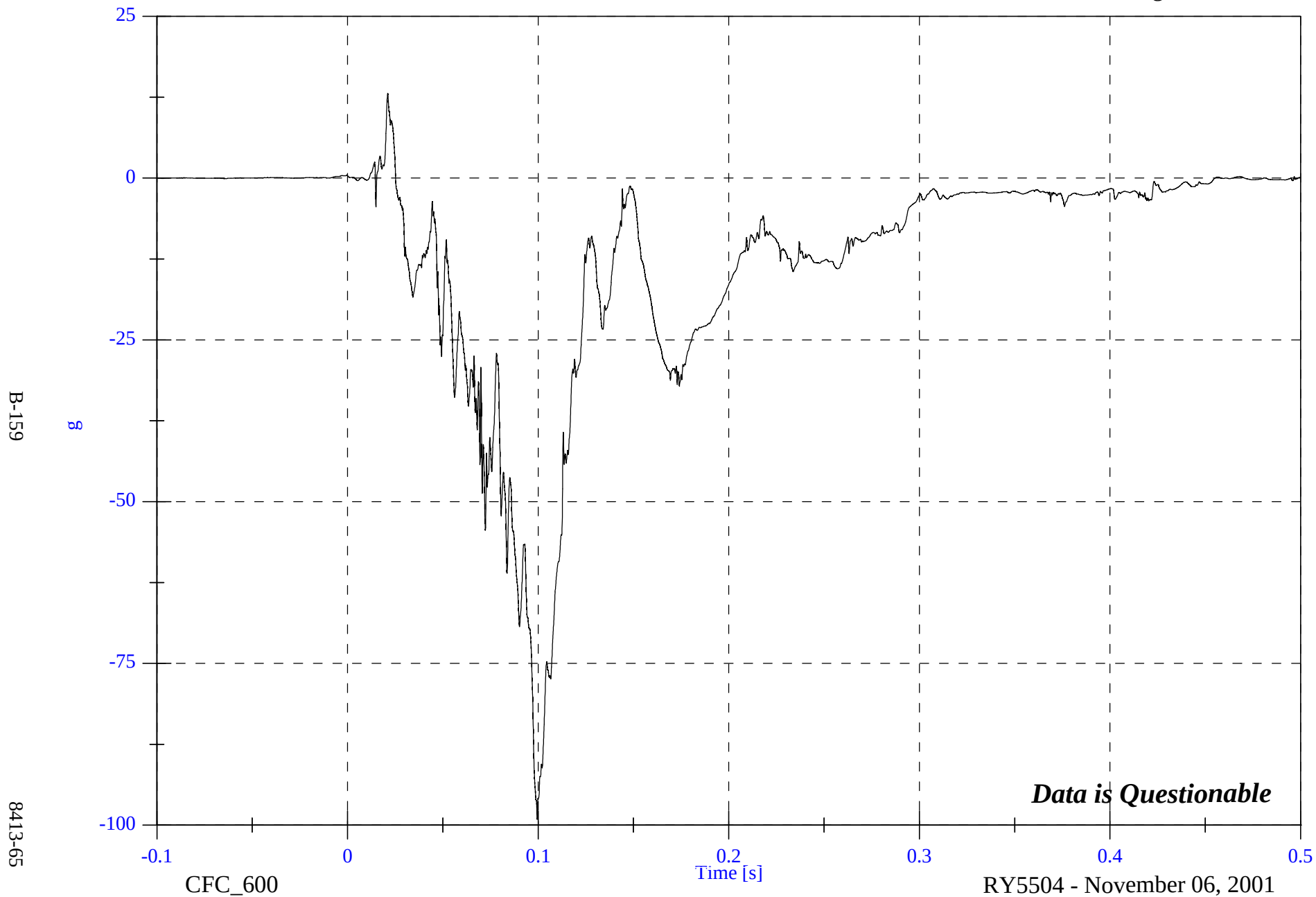


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Left Toe Az

Max: 13.1 [g] at 0.021 [s]

Min: -99.1 [g] at 0.100 [s]

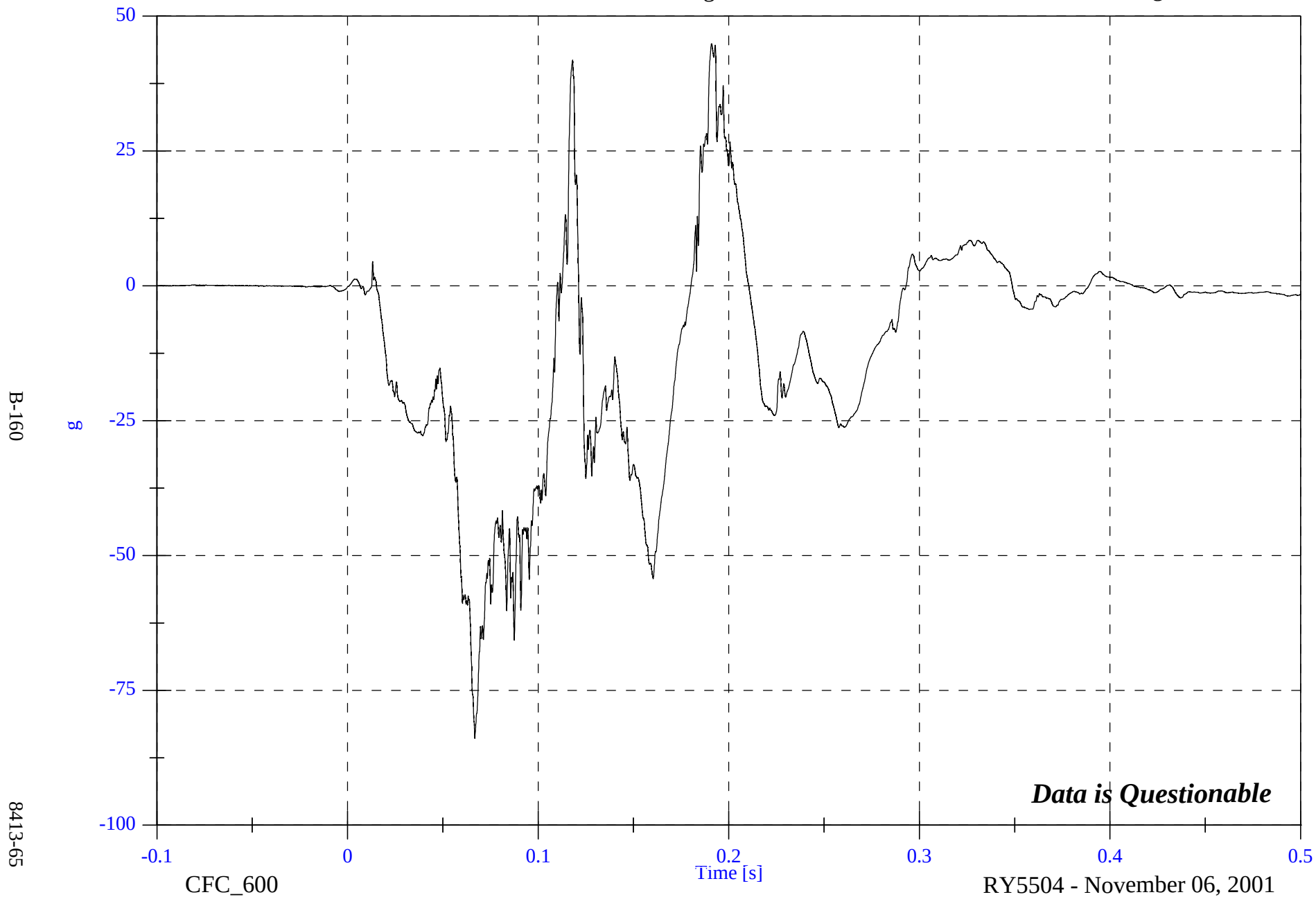


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Right Toe Az

Max: 44.9 [g] at 0.191 [s]

Min: -83.9 [g] at 0.067 [s]

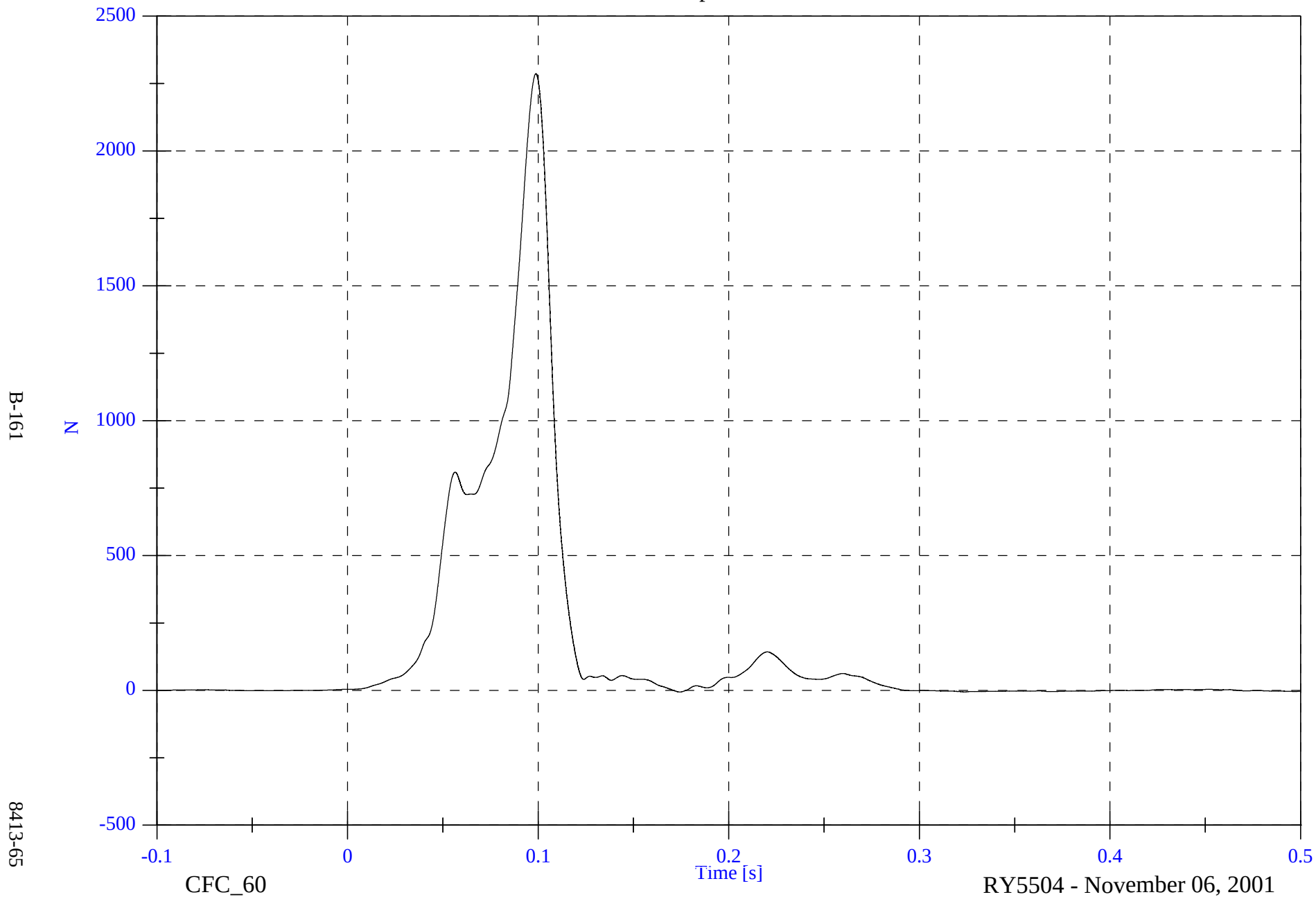


40% Frontal Offset Test #9 - 2000 Subaru Legacy

P2 Lap Belt Force

Max: 2286.9 [N] at 0.099 [s]

Min: -6.0 [N] at 0.174 [s]

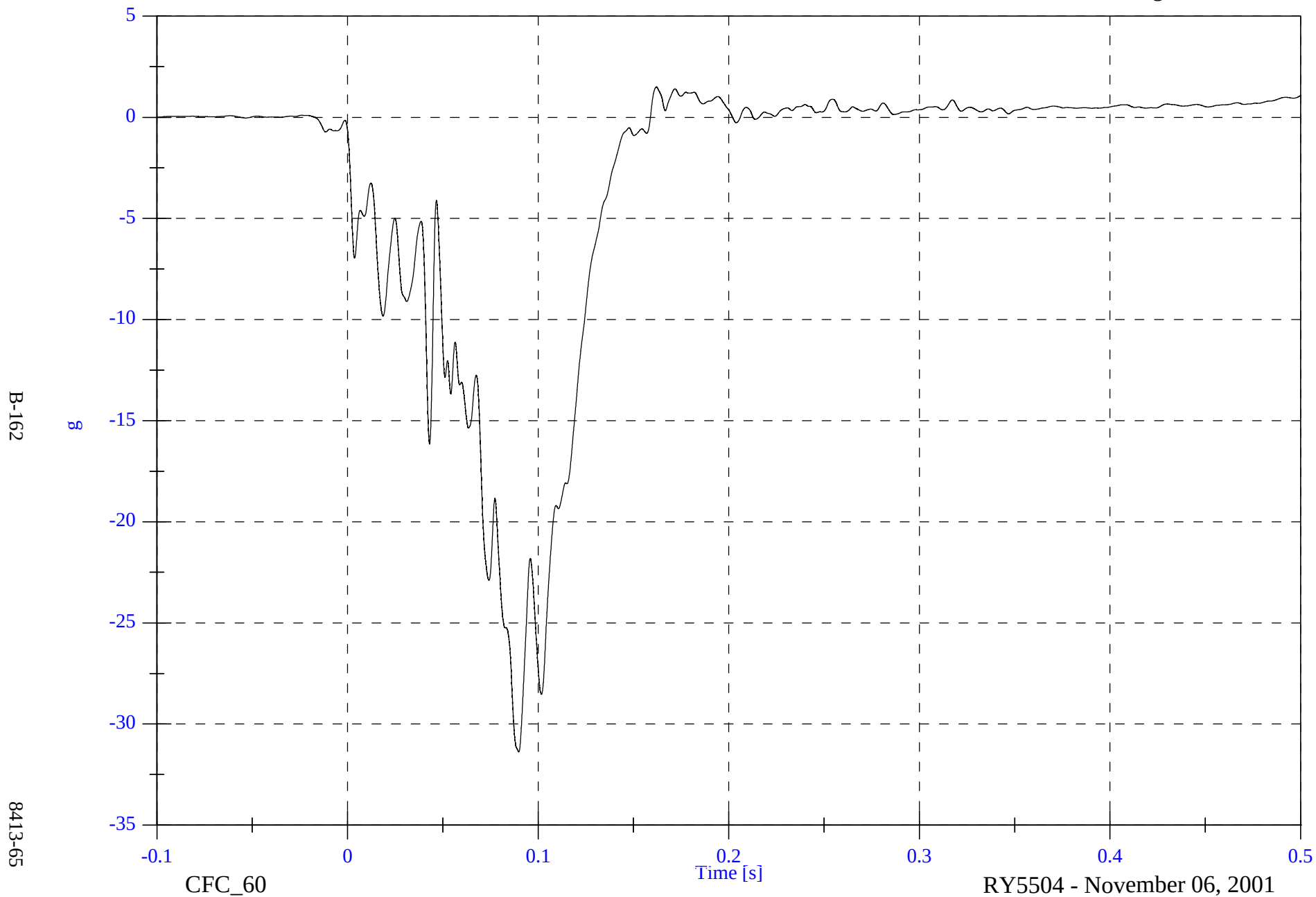


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 1 Rear XMBR Left X

Max: 1.5 [g] at 0.162 [s]

Min: -31.4 [g] at 0.090 [s]



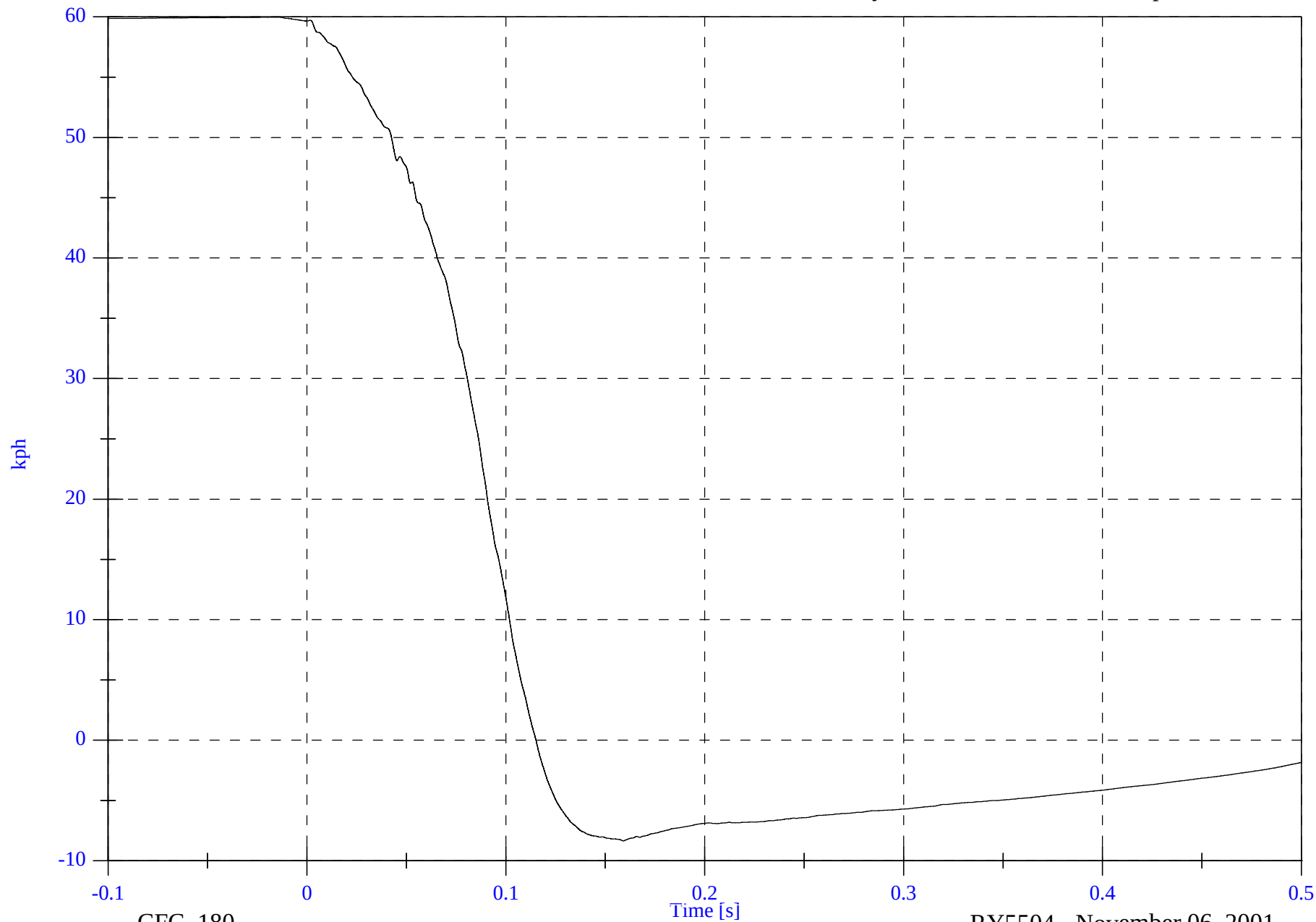


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 1 Rear XMBR Left X Velocity

Max: 60.0 [kph] at -0.018 [s]

Min: -8.4 [kph] at 0.159 [s]



B-163

8413-65

CFC\_180

RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

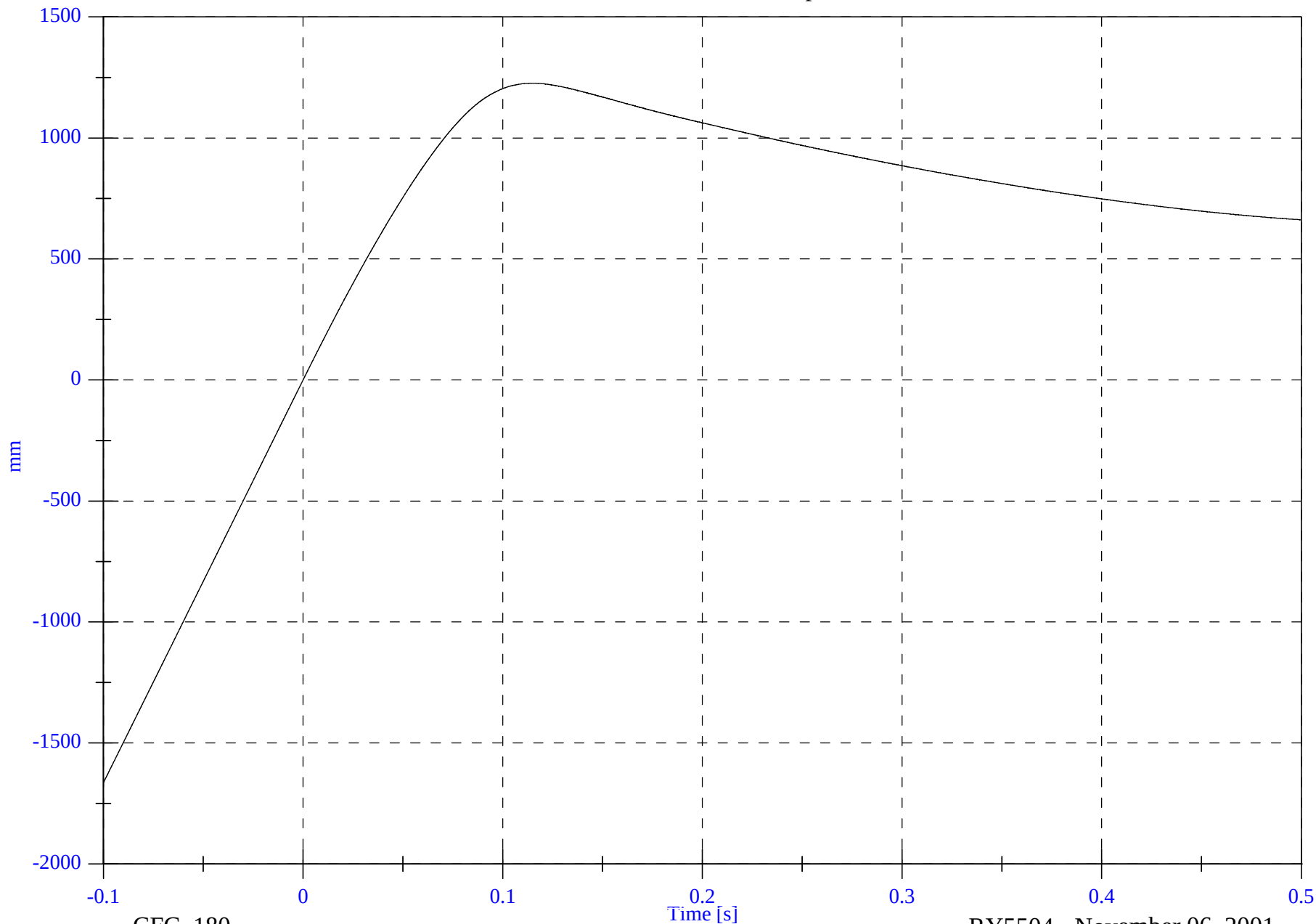
Acc 1 Rear XMBR Left X Displacement

Max: 1226.2 [mm] at 0.115 [s]

Min: -1664.1 [mm] at -0.100 [s]

B-164

8413-65



CFC\_180

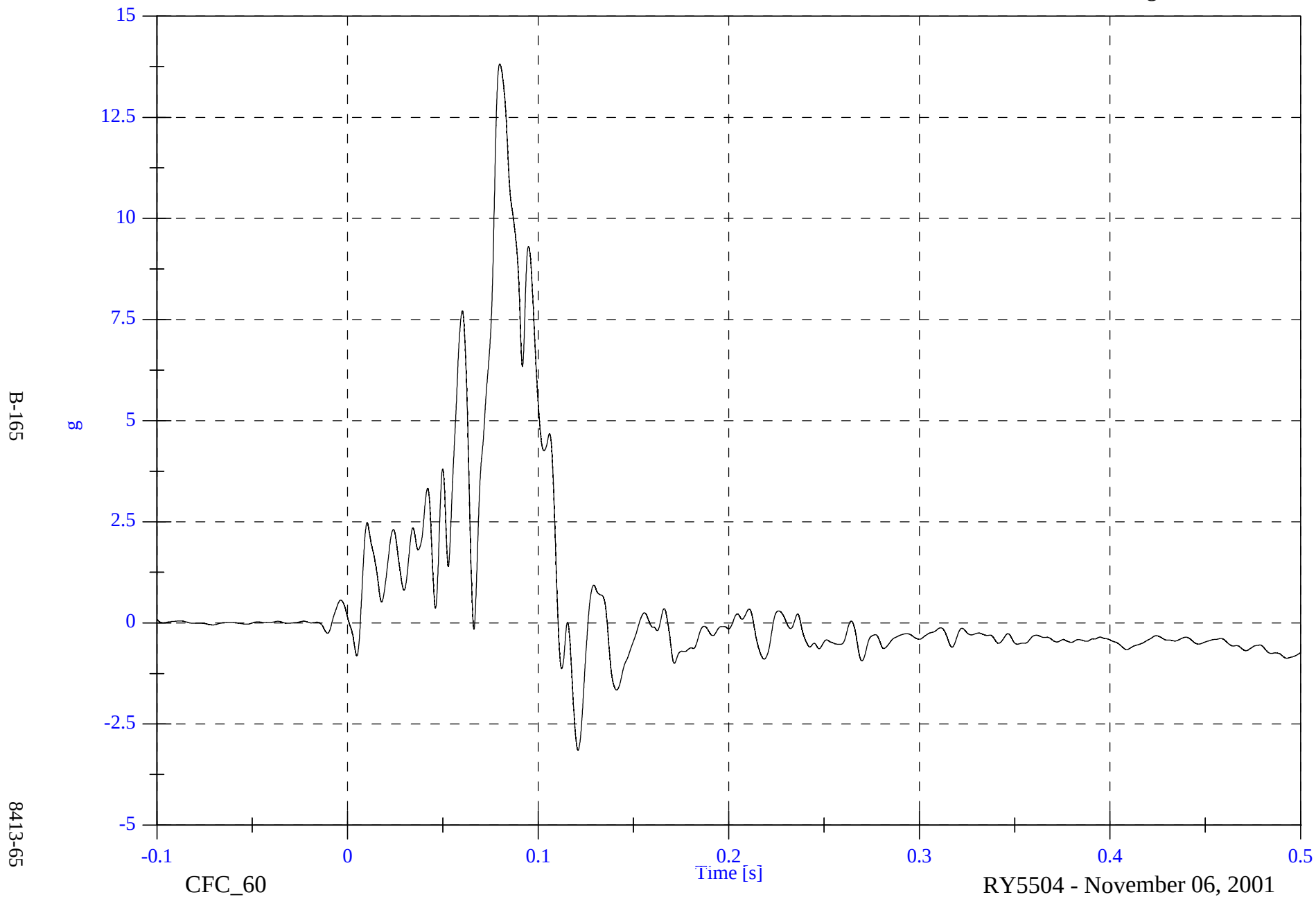
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 2 Rear XMBR Left Y

Max: 13.8 [g] at 0.080 [s]

Min: -3.2 [g] at 0.121 [s]

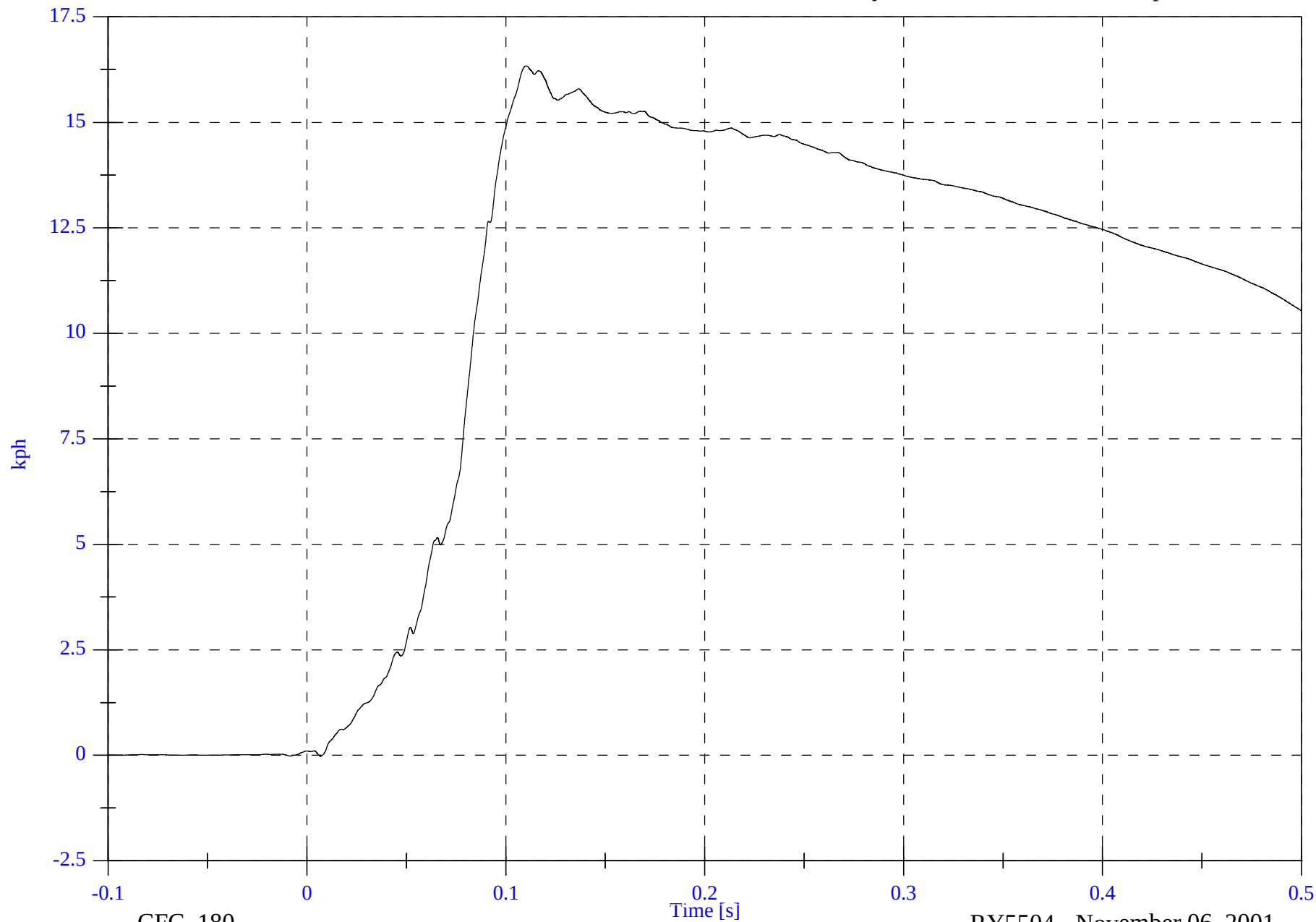


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 2 Rear XMBR Left Y Velocity

Max: 16.3 [kph] at 0.110 [s]

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



B-166

8413-65

CFC\_180

RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

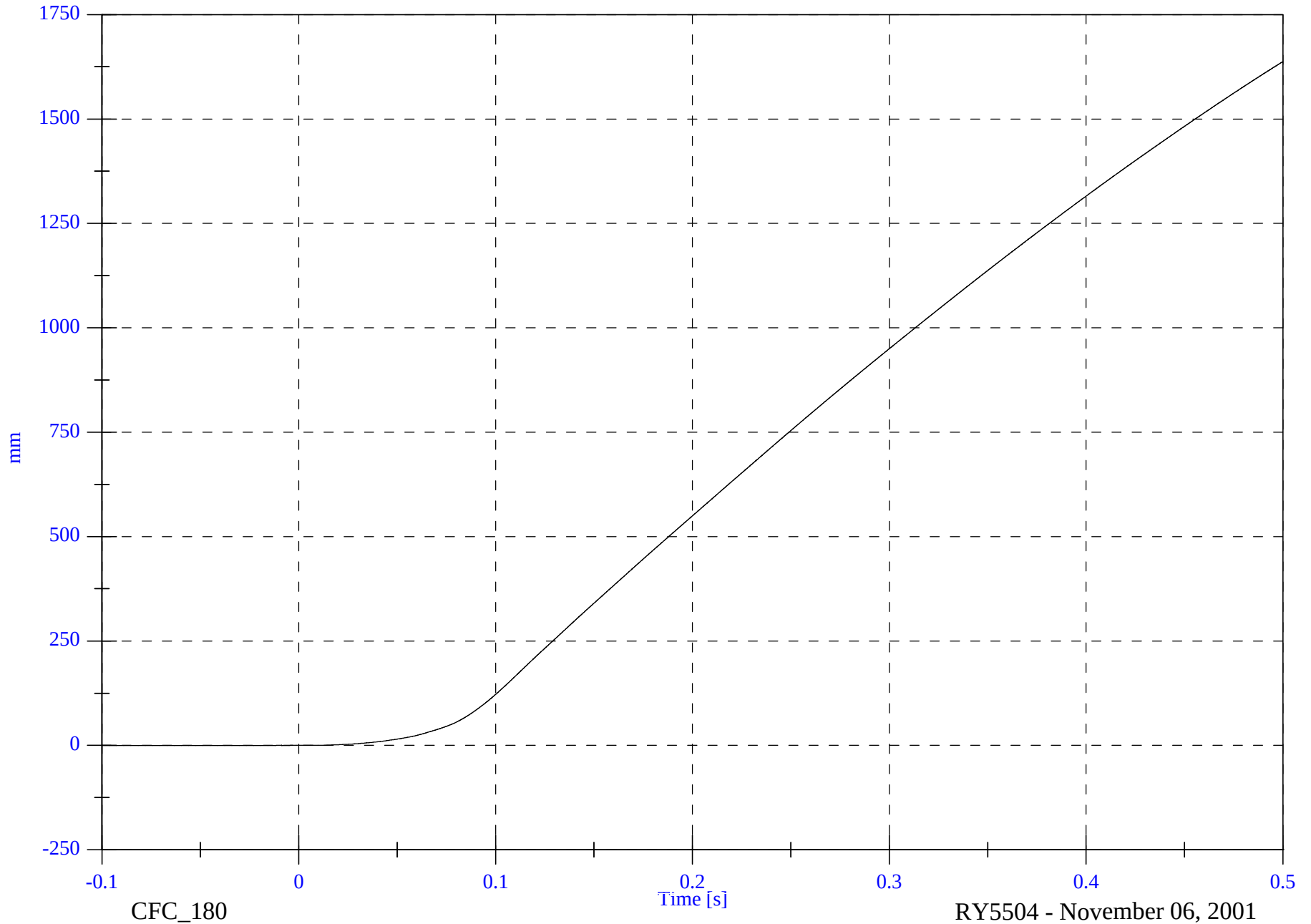
Acc 2 Rear XMBR Left Y Displacement

Max: 1637.3 [mm] at 0.500 [s]

Min: -0.3 [mm] at -0.100 [s]

B-167

8413-65



CFC\_180

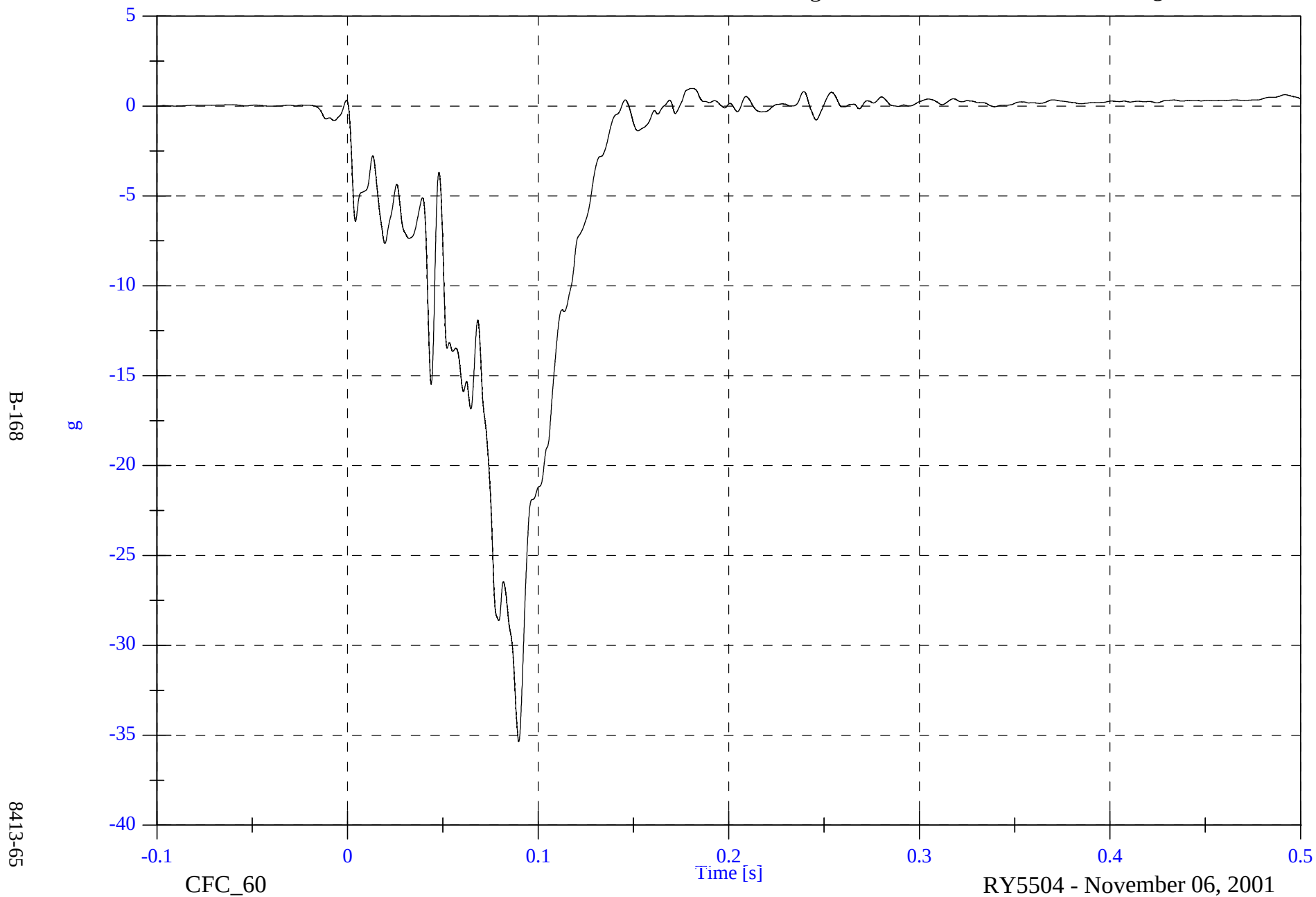
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 3 Rear XMBR Right X

Max: 1.0 [g] at 0.181 [s]

Min: -35.4 [g] at 0.090 [s]



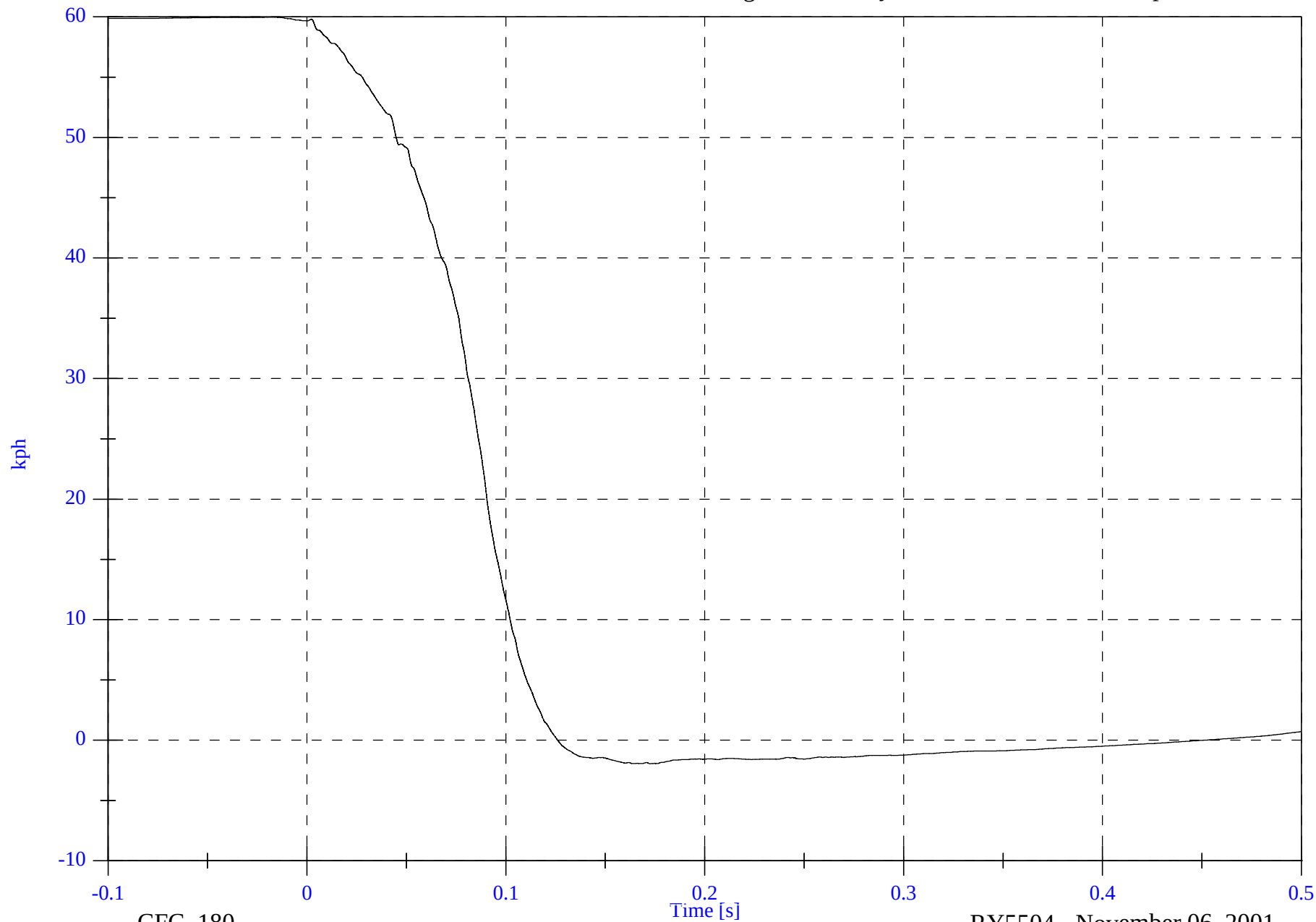


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 3 Rear XMBR Right X Velocity

Max: 60.0 [kph] at -0.018 [s]

Min: -1.9 [kph] at 0.173 [s]



B-169

8413-65

CFC\_180

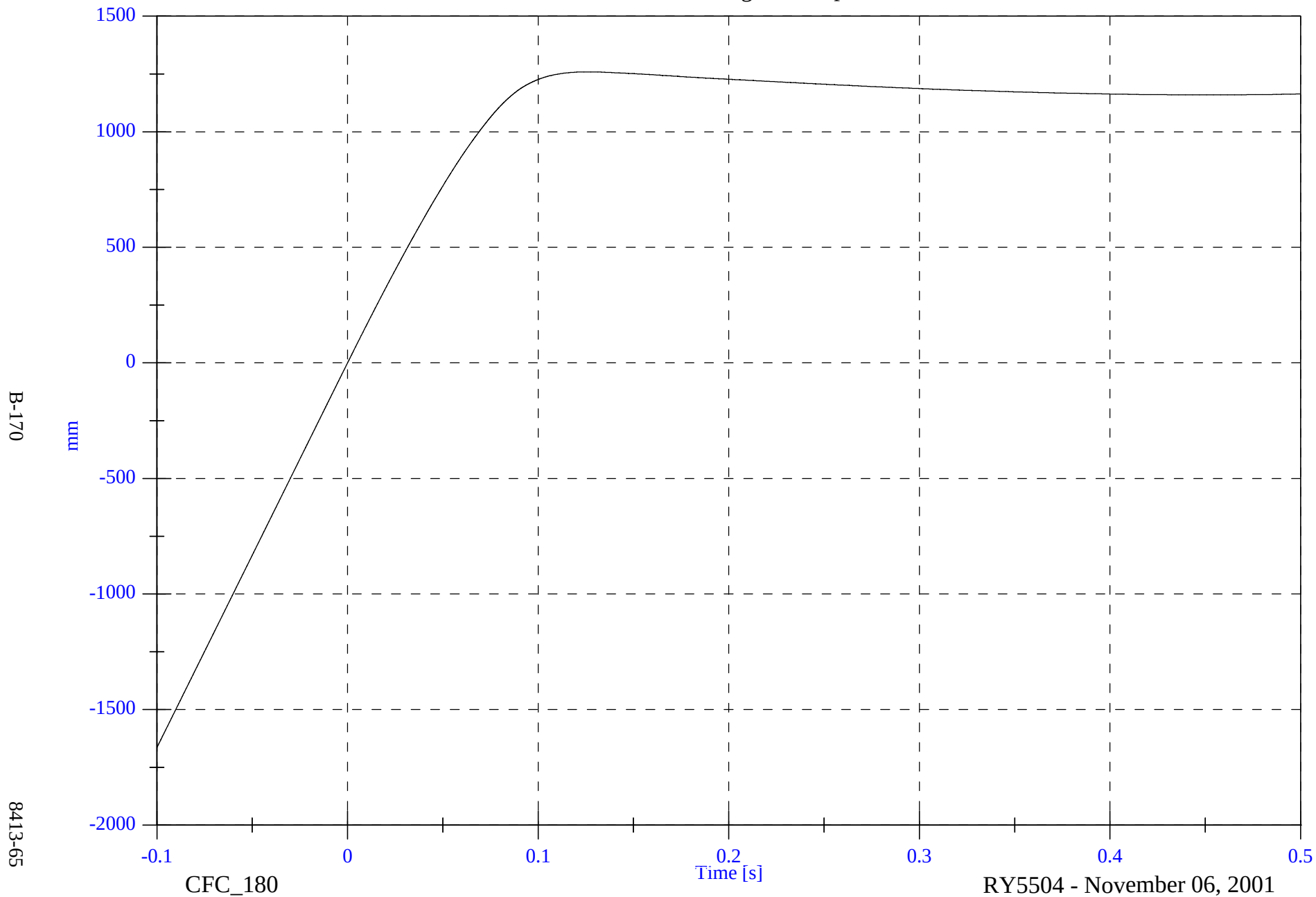
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 3 Rear XMBR Right X Displacement

Max: 1259.1 [mm] at 0.126 [s]

Min: -1664.0 [mm] at -0.100 [s]

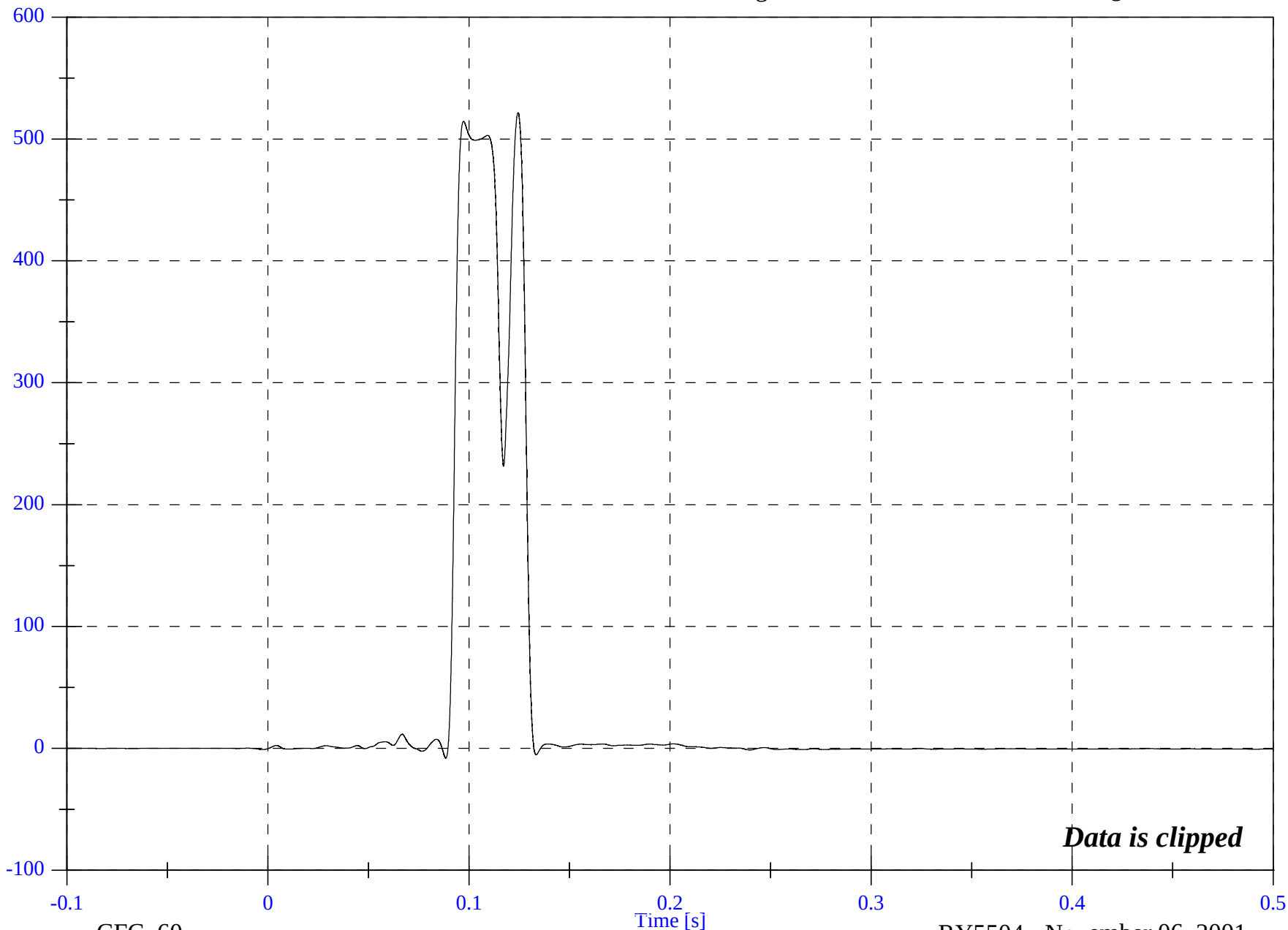


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 4 Rear XMBR Right Y

Max: 521.6 [g] at 0.124 [s]

Min: -8.0 [g] at 0.088 [s]



B-171

8413-65

CFC\_60

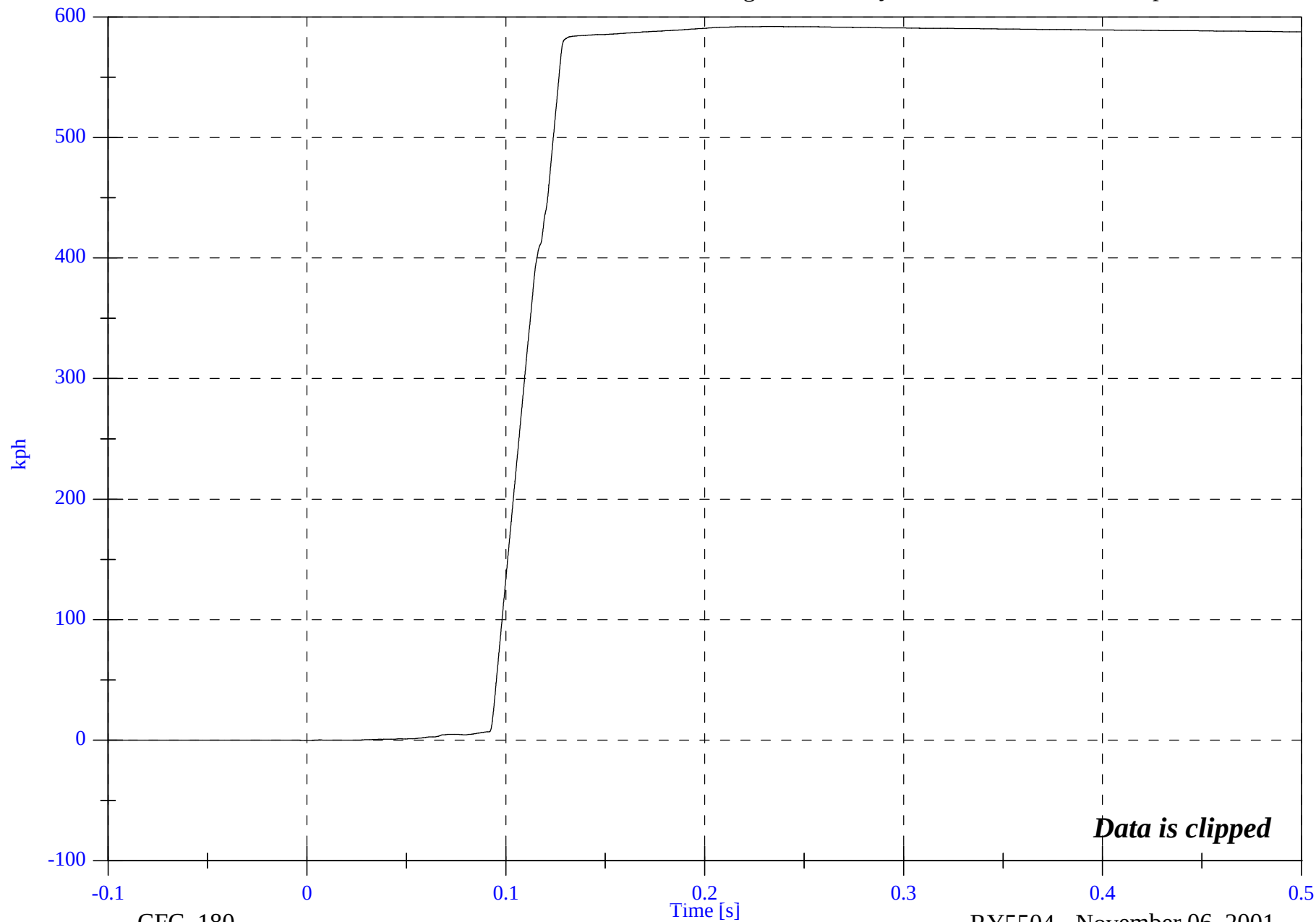
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 4 Rear XMBR Right Y Velocity

Max: 592.1 [kph] at 0.237 [s]

Min: -0.1 [kph] at 0.001 [s]



B-172

8413-65

CFC\_180

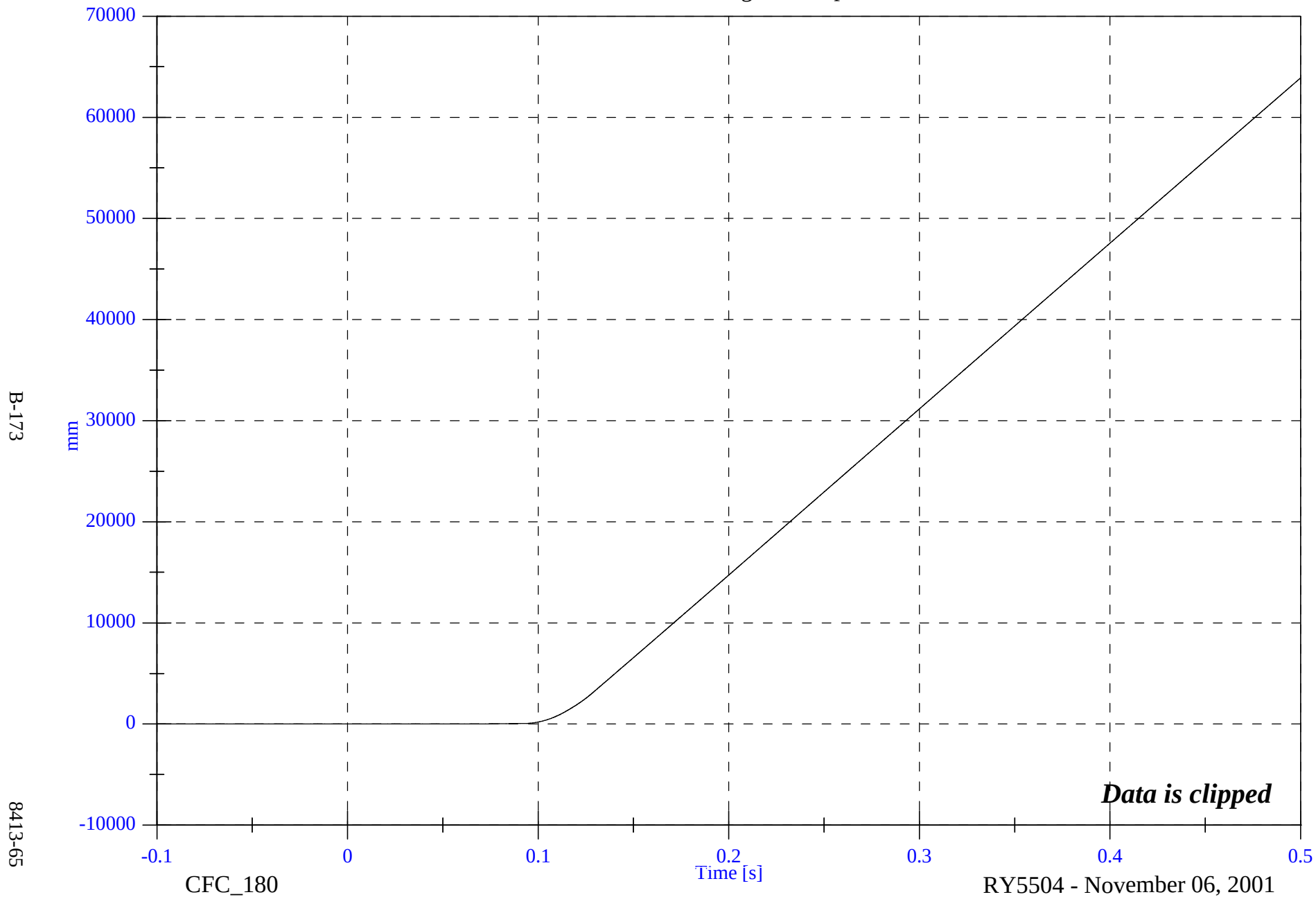
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 4 Rear XMBR Right Y Displacement

Max: 63885.9 [mm] at 0.500 [s]

Min: -0.1 [mm] at 0.004 [s]

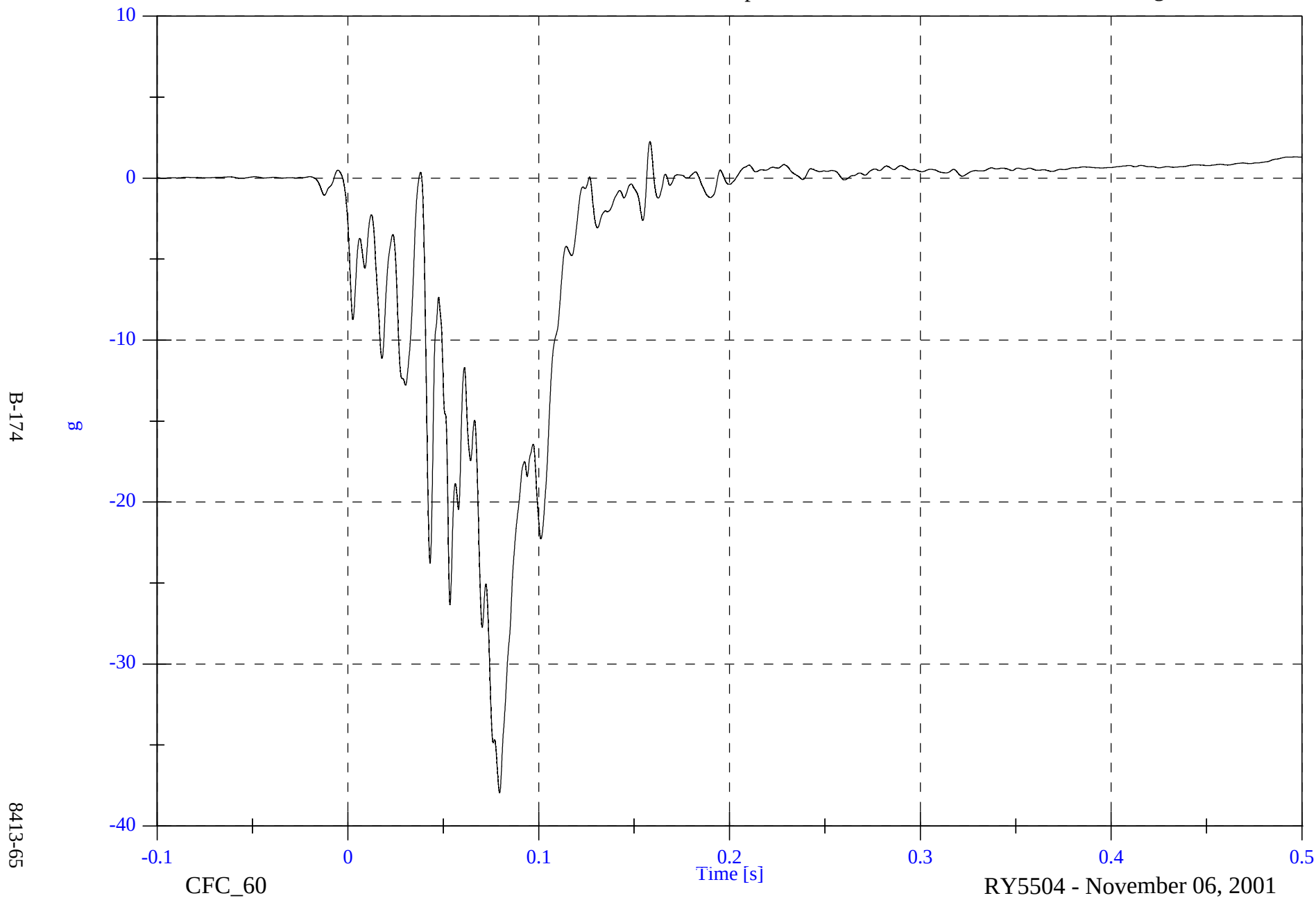


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 5 P1 Toepan Left X

Max: 2.3 [g] at 0.158 [s]

Min: -38.0 [g] at 0.080 [s]



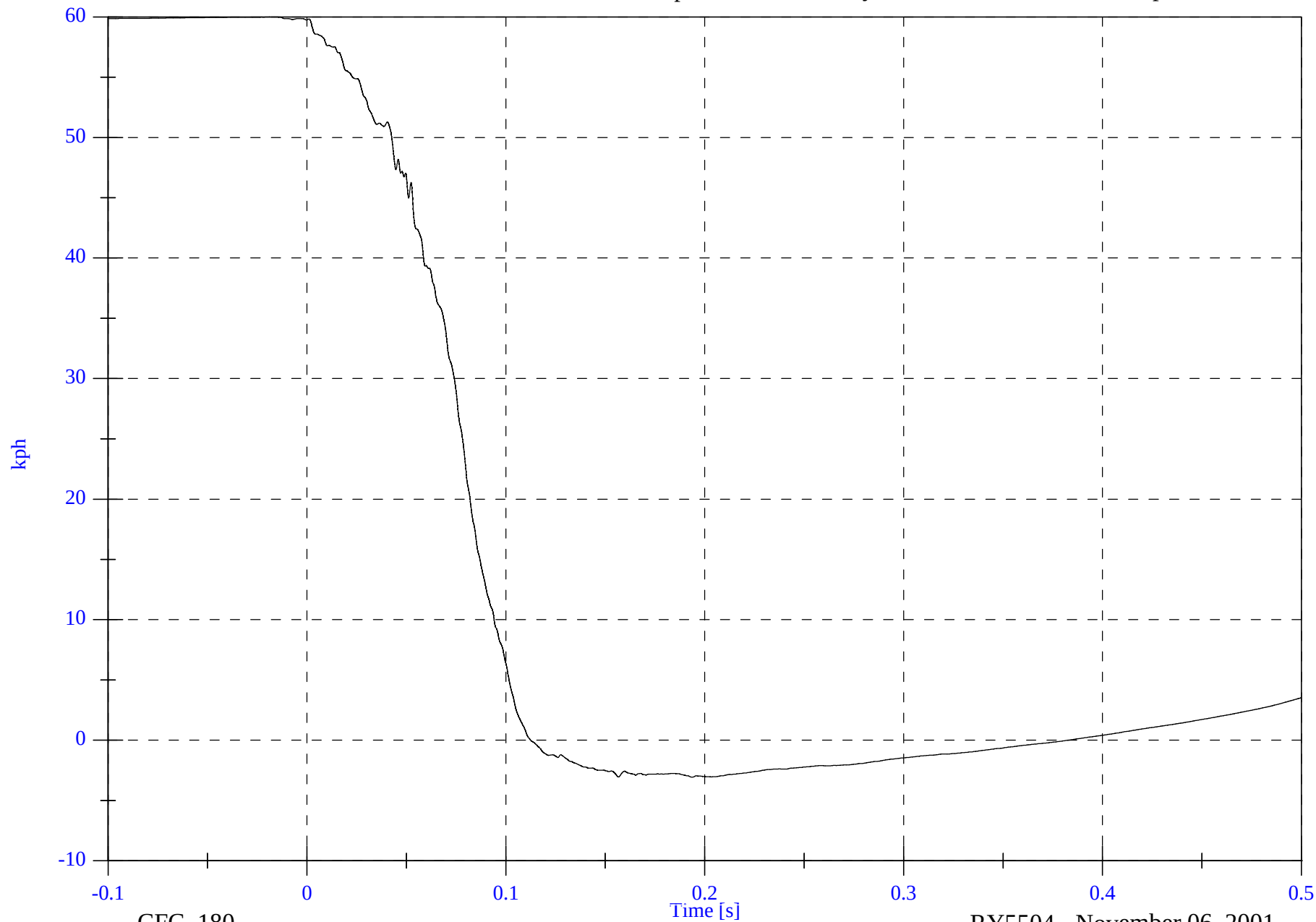


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 5 P1 Toe Pan Left X Velocity

Max: 60.0 [kph] at -0.019 [s]

Min: -3.1 [kph] at 0.194 [s]



B-175

8413-65

CFC\_180

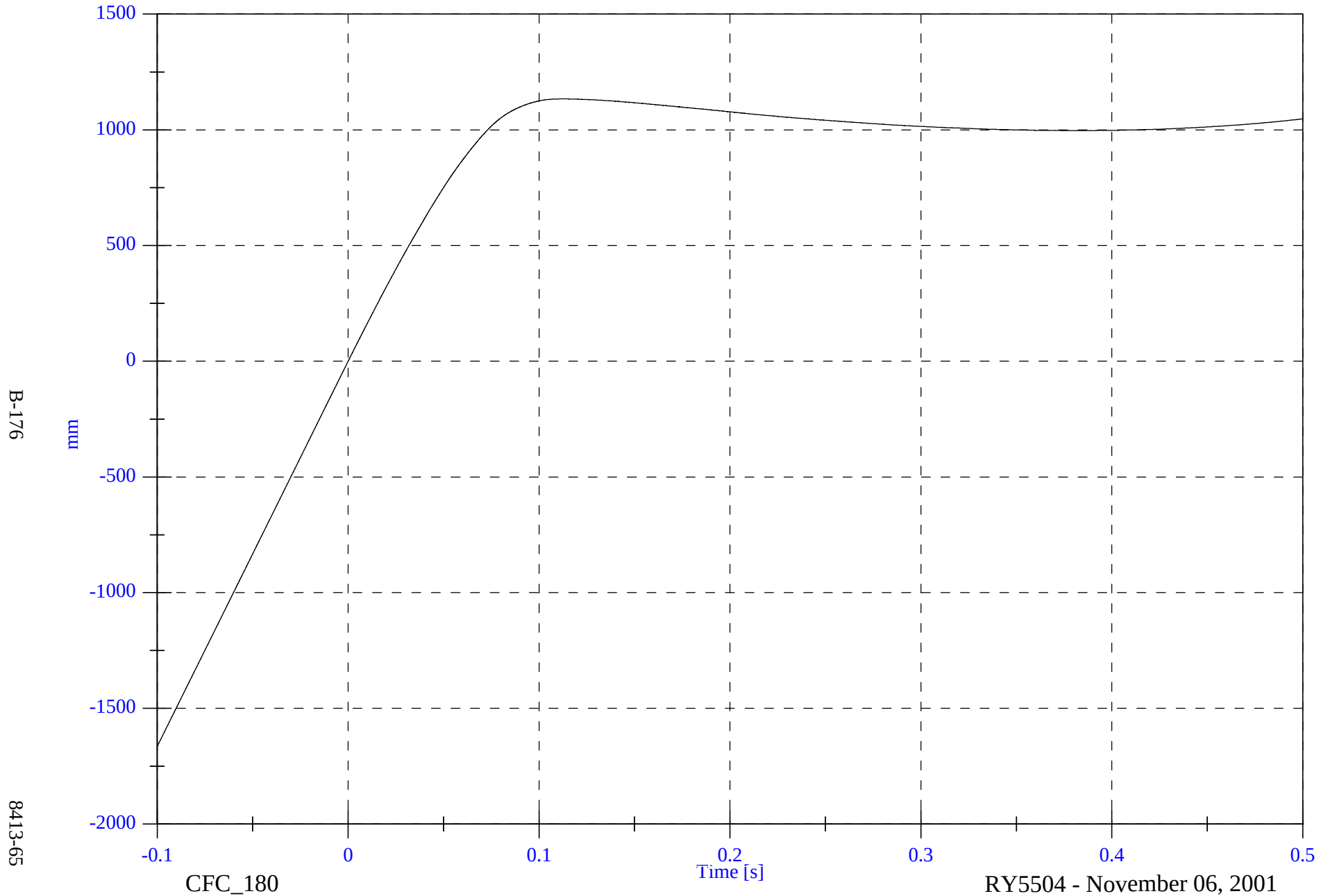
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 5 P1 Toe pan Left X Displacement

Max: 1133.8 [mm] at 0.112 [s]

Min: -1664.5 [mm] at -0.100 [s]

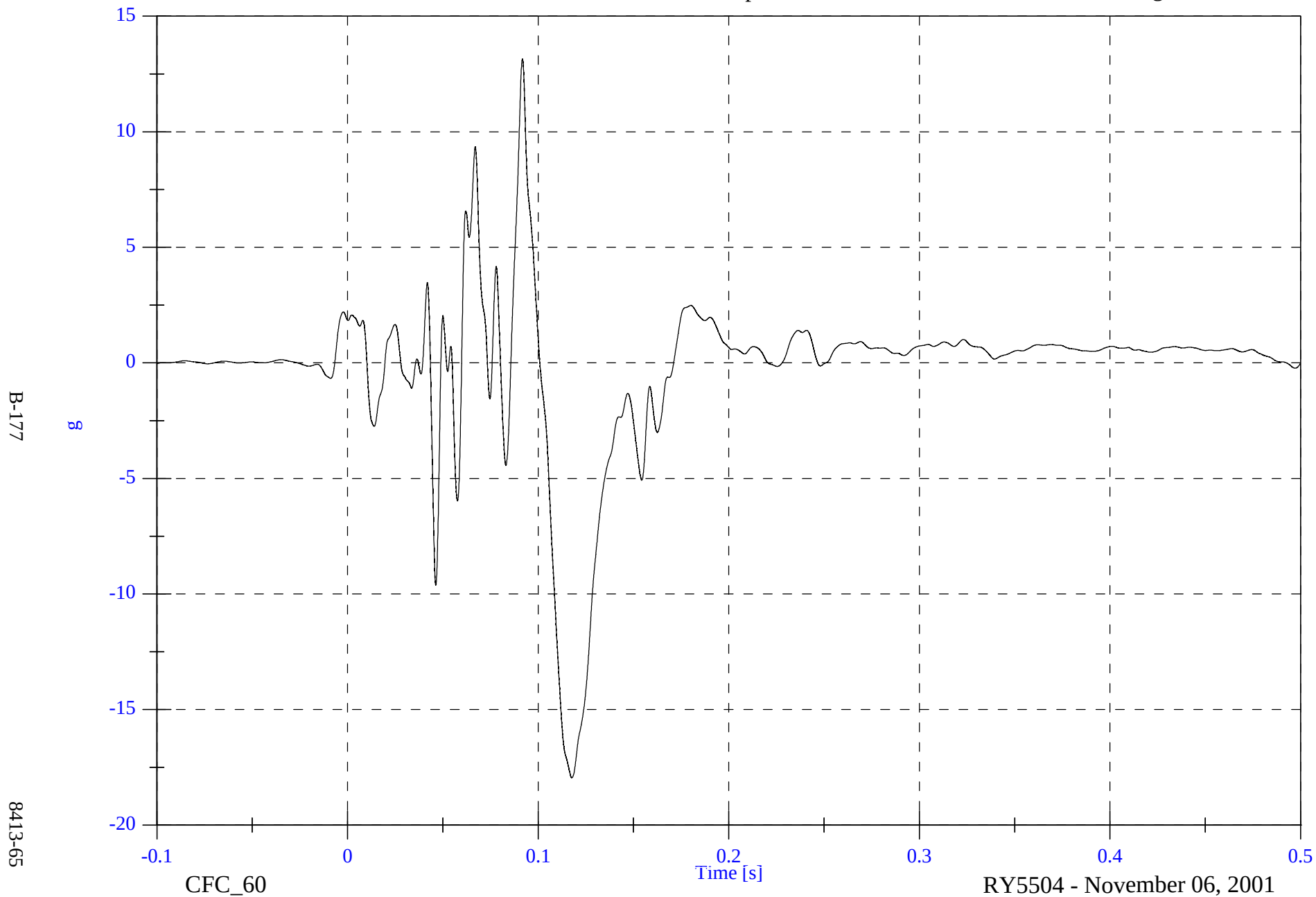


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 6 P1 Toepan Left Z

Max: 13.2 [g] at 0.092 [s]

Min: -18.0 [g] at 0.118 [s]

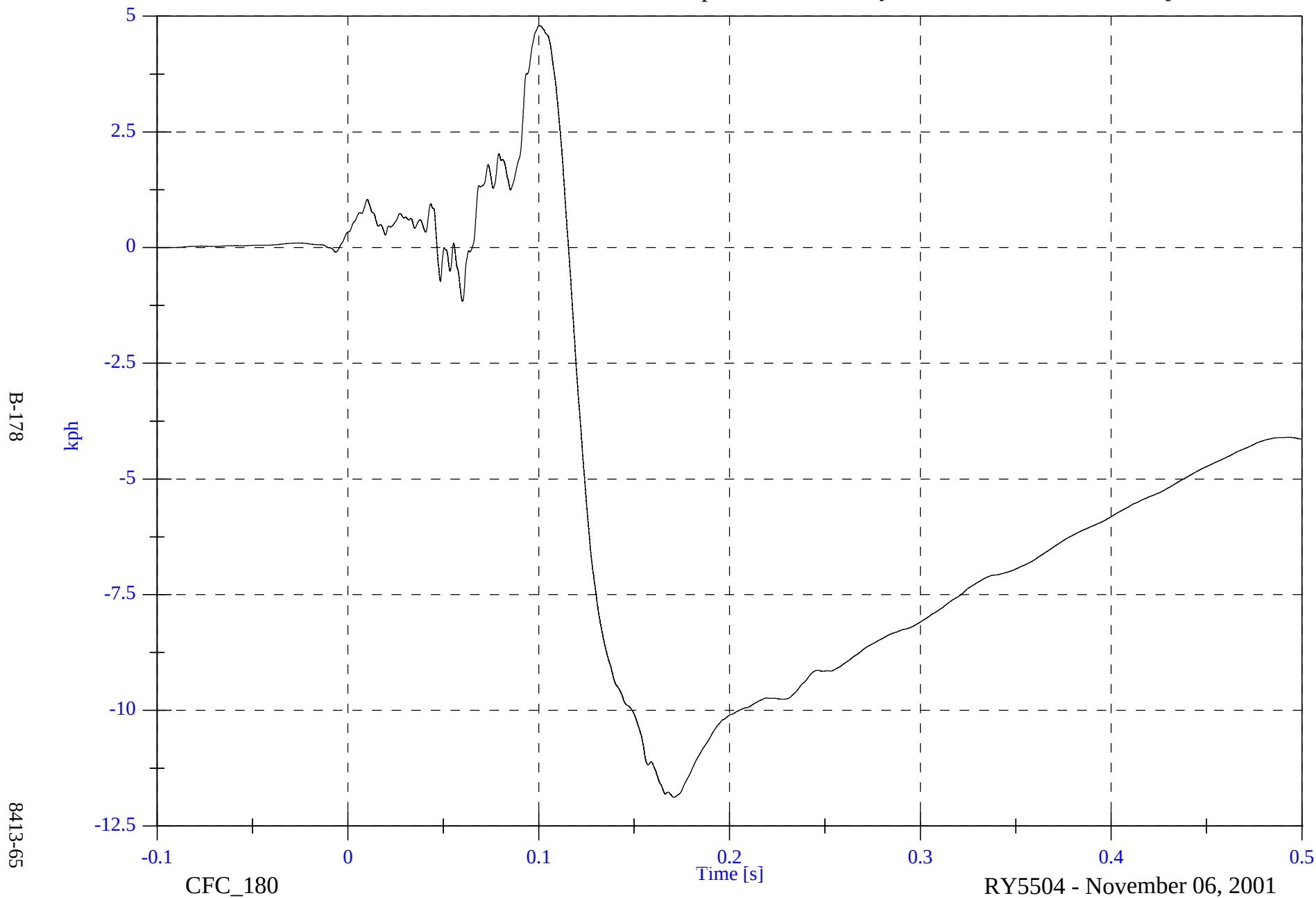


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 6 P1 Toepan Left Z Velocity

Max: 4.8 [kph] at 0.100 [s]

Min: -11.9 [kph] at 0.171 [s]

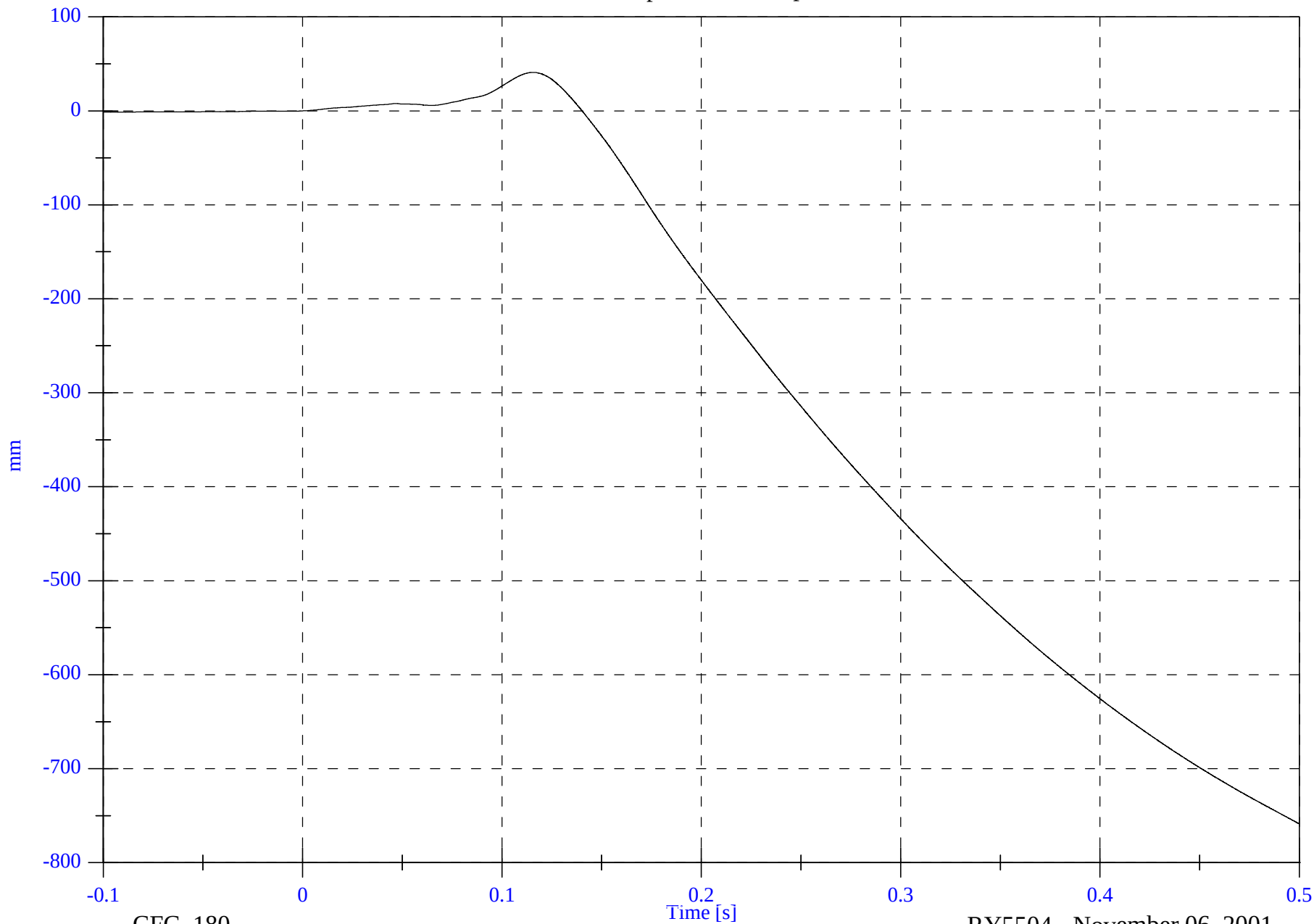


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 6 P1 Toe pan Left Z Displacement

Max: 41.0 [mm] at 0.116 [s]

Min: -758.7 [mm] at 0.500 [s]



B-179

8413-65

CFC\_180

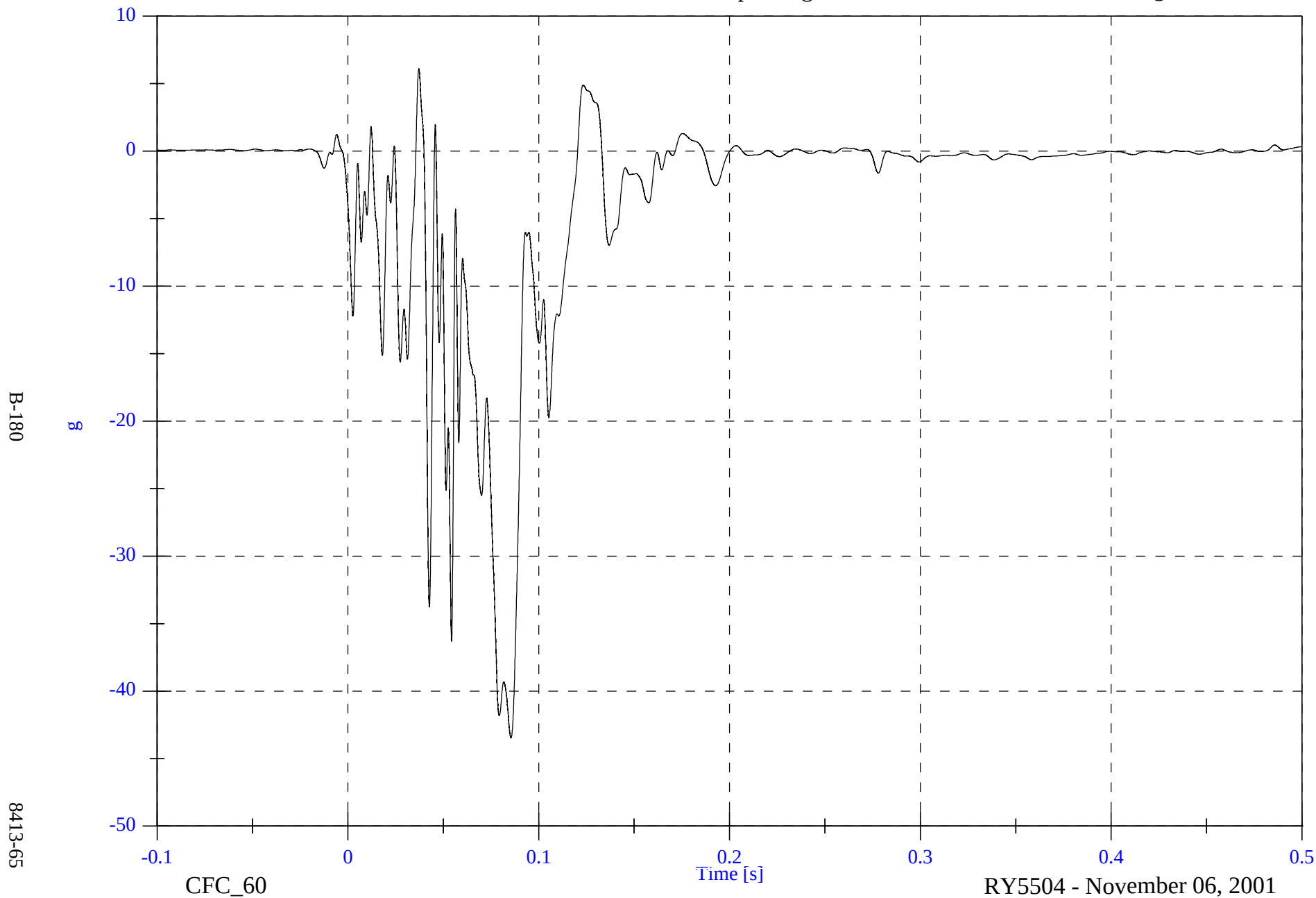
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 7 P1 Toepan Right X

Max: 6.1 [g] at 0.037 [s]

Min: -43.5 [g] at 0.085 [s]



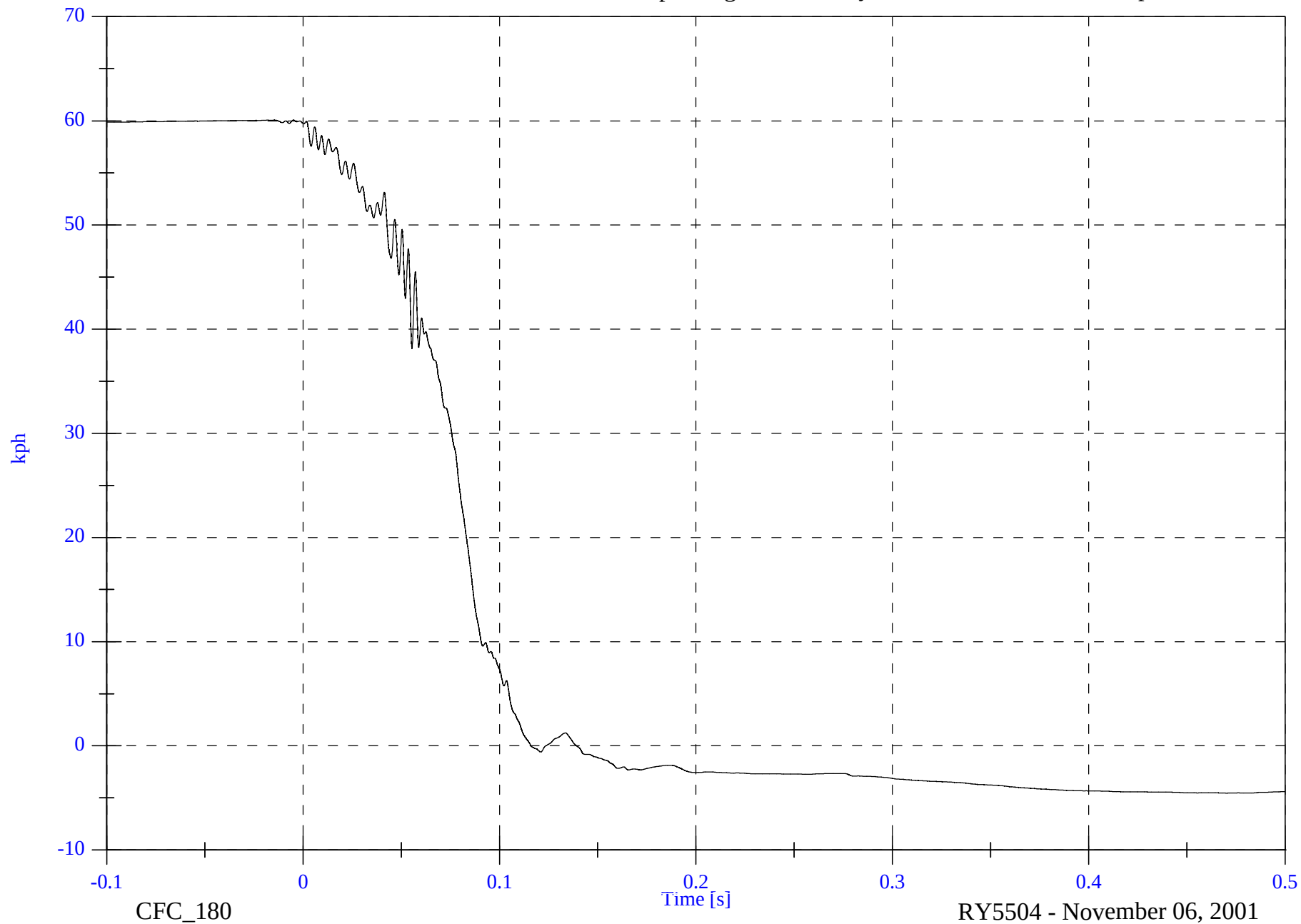


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 7 P1 Toepan Right X Velocity

Max: 60.1 [kph] at -0.005 [s]

Min: -4.5 [kph] at 0.470 [s]



B-181

8413-65

CFC\_180

RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

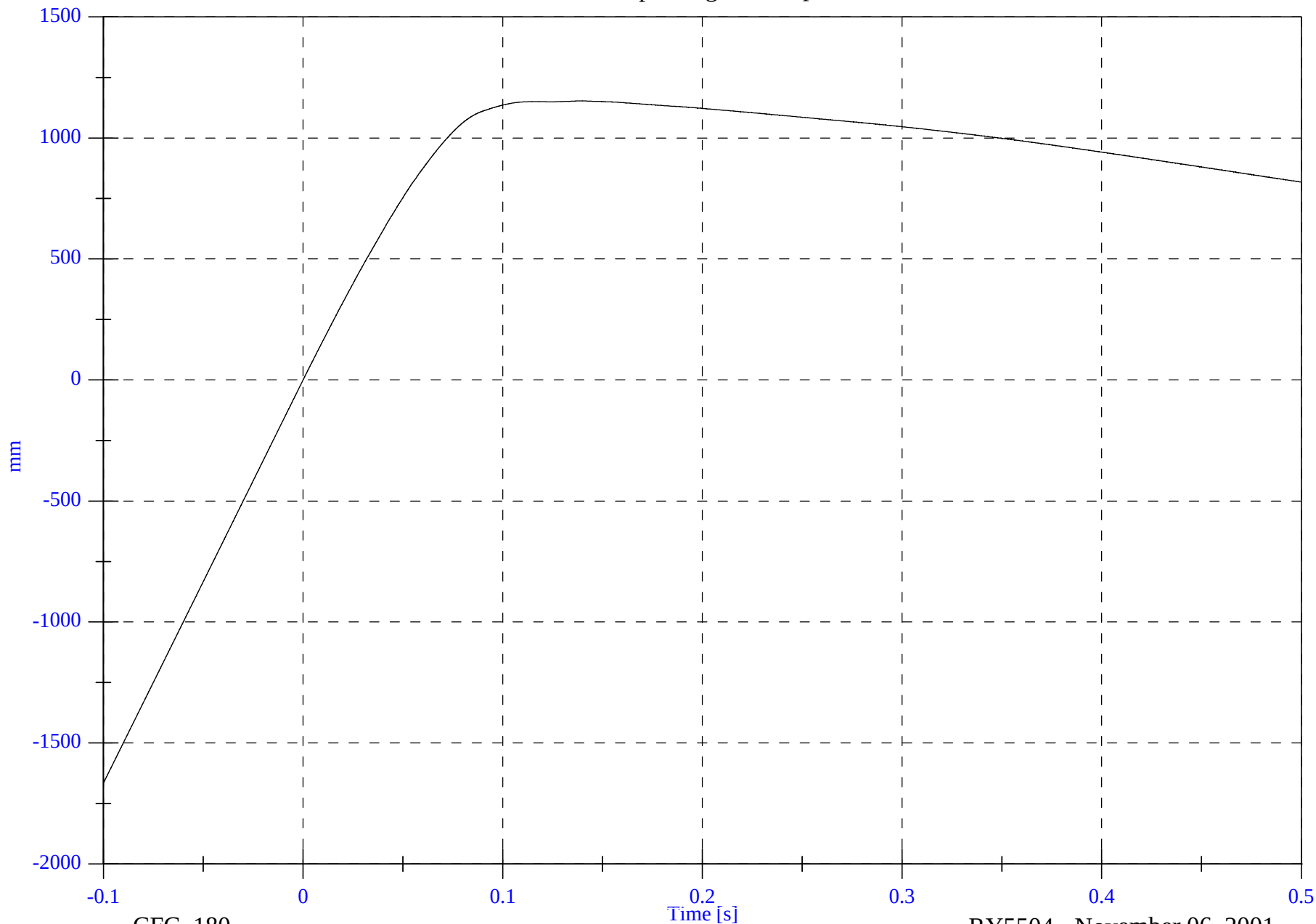
Acc 7 P1 Toe pan Right X Displacement

Max: 1152.6 [mm] at 0.139 [s]

Min: -1665.6 [mm] at -0.100 [s]

B-182

8413-65



CFC\_180

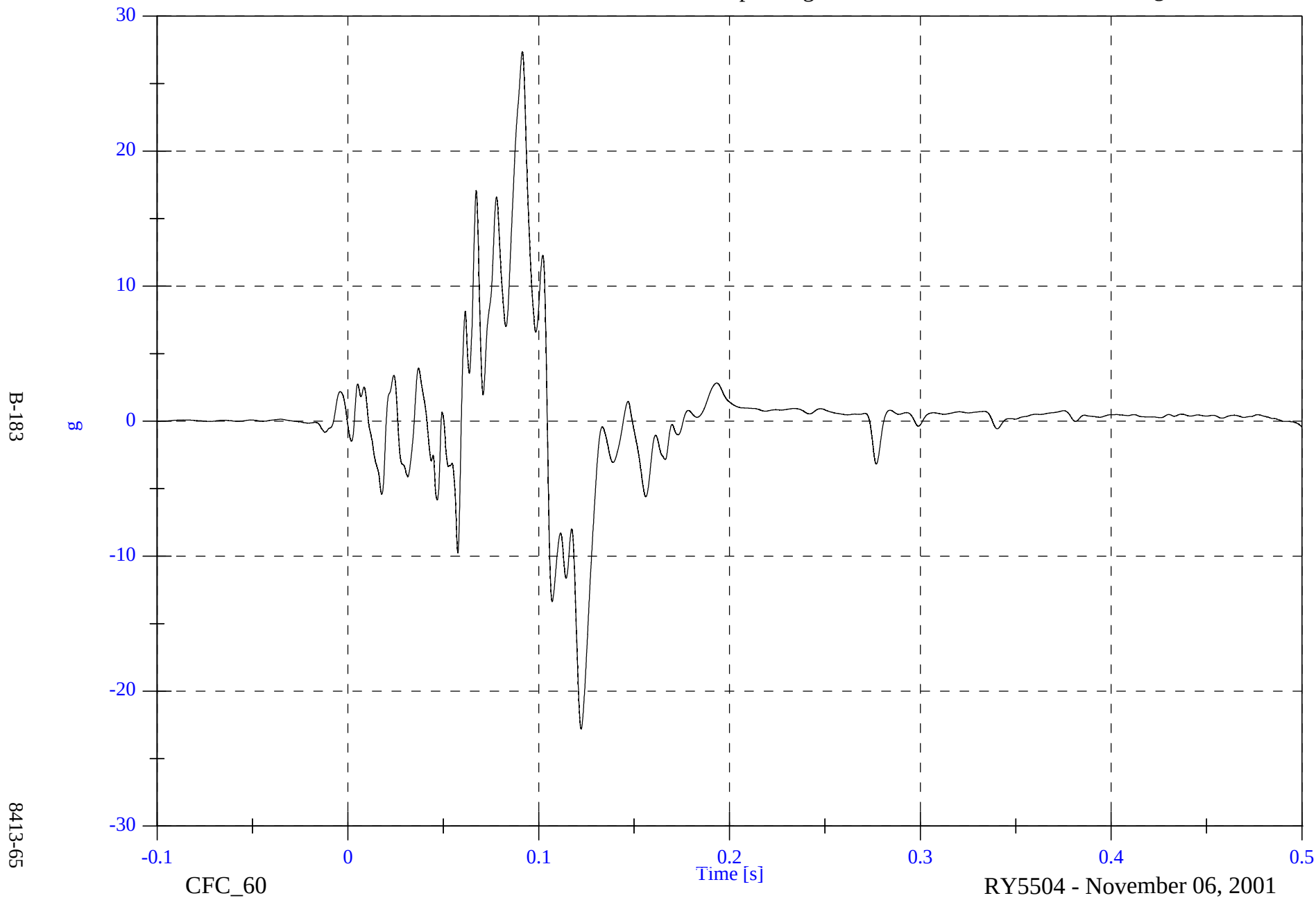
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 8 P1 Toepan Right Z

Max: 27.4 [g] at 0.091 [s]

Min: -22.8 [g] at 0.122 [s]



40% Frontal Offset Test #9 - 2000 Subaru Legacy

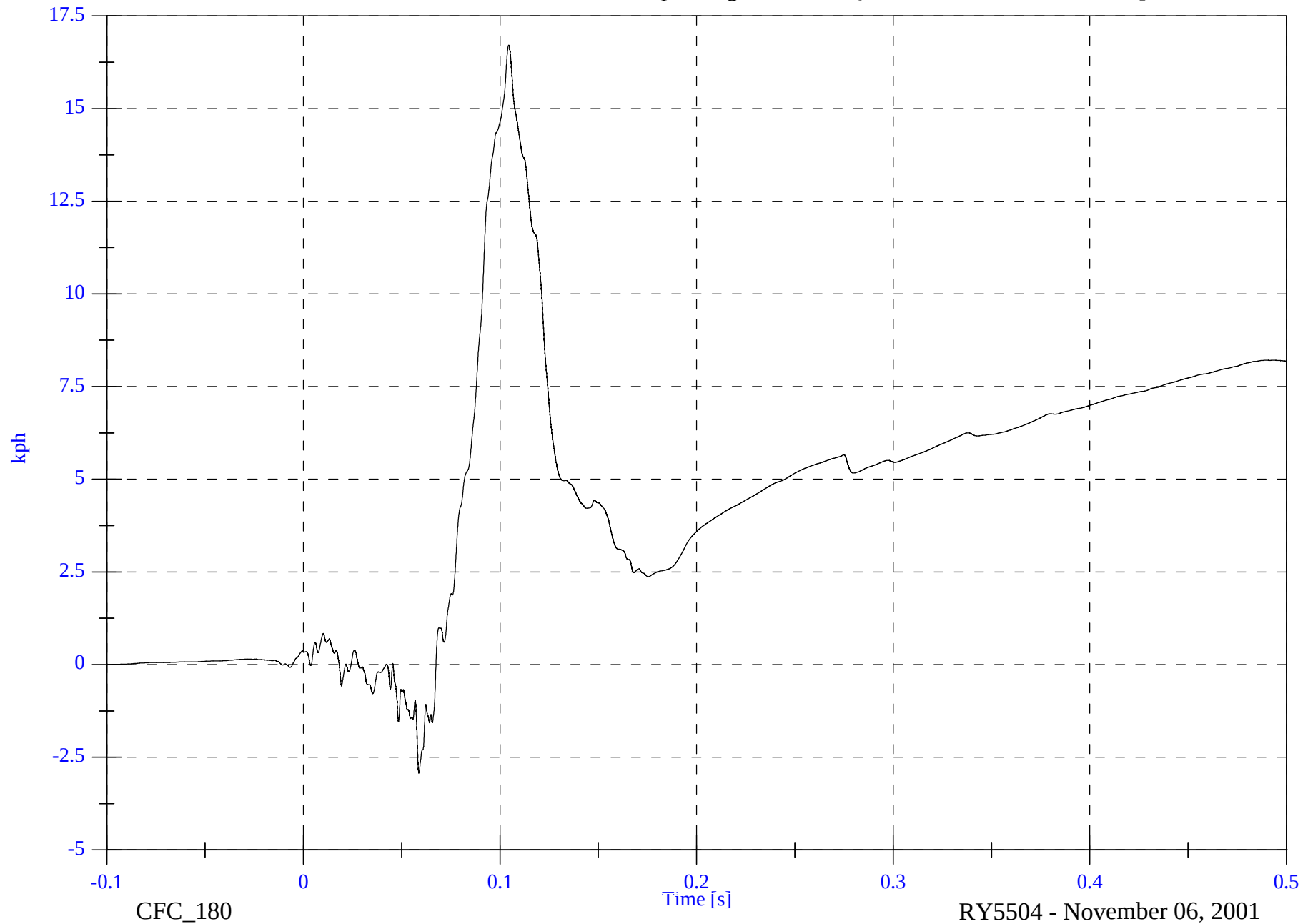
Acc 8 P1 Toe Pan Right Z Velocity

Max: 16.7 [kph] at 0.104 [s]

Min: -2.9 [kph] at 0.059 [s]

B-184

8413-65



40% Frontal Offset Test #9 - 2000 Subaru Legacy

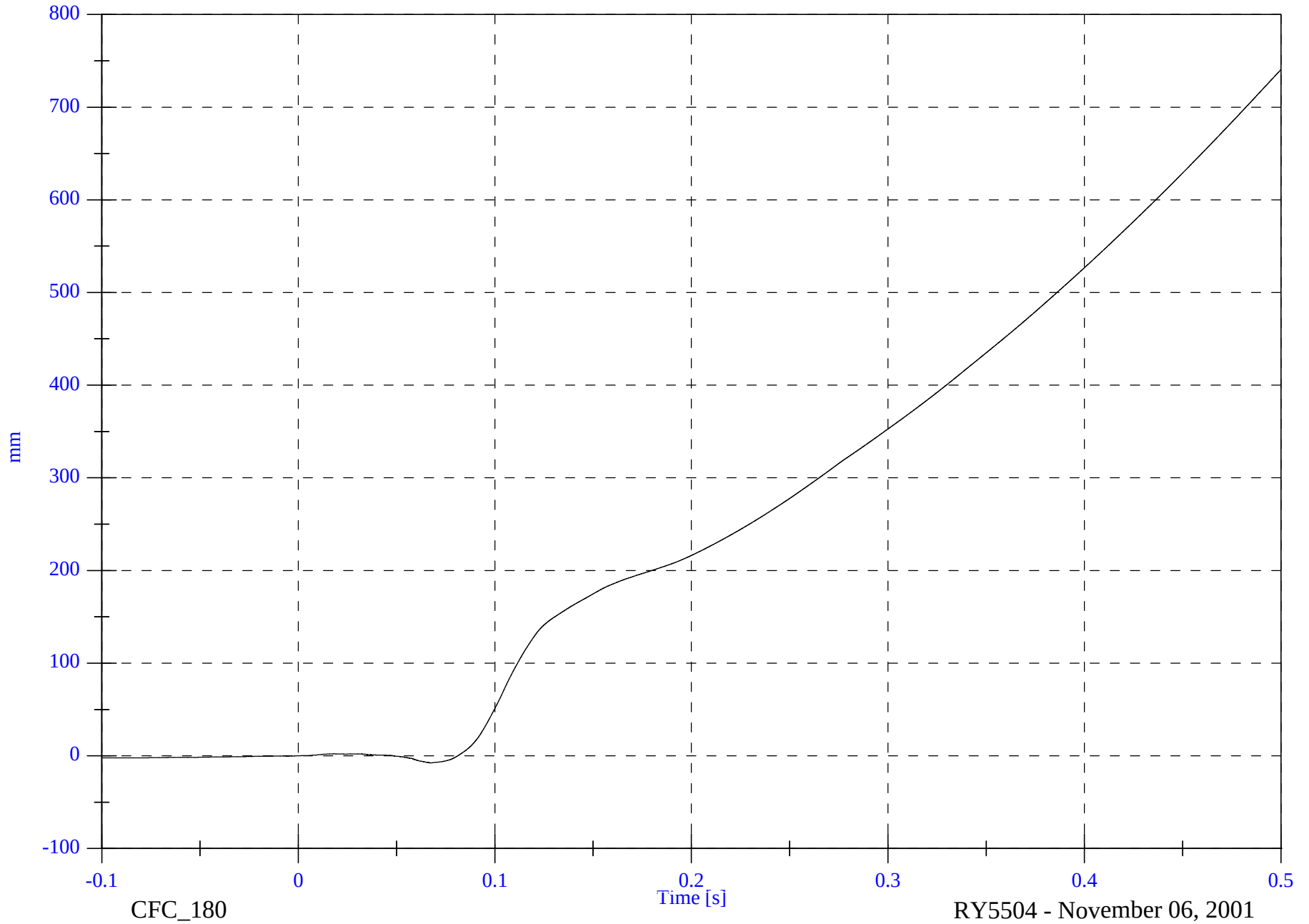
Acc 8 P1 Toepan Right Z Displacement

Max: 740.5 [mm] at 0.500 [s]

Min: -7.6 [mm] at 0.067 [s]

B-185

8413-65

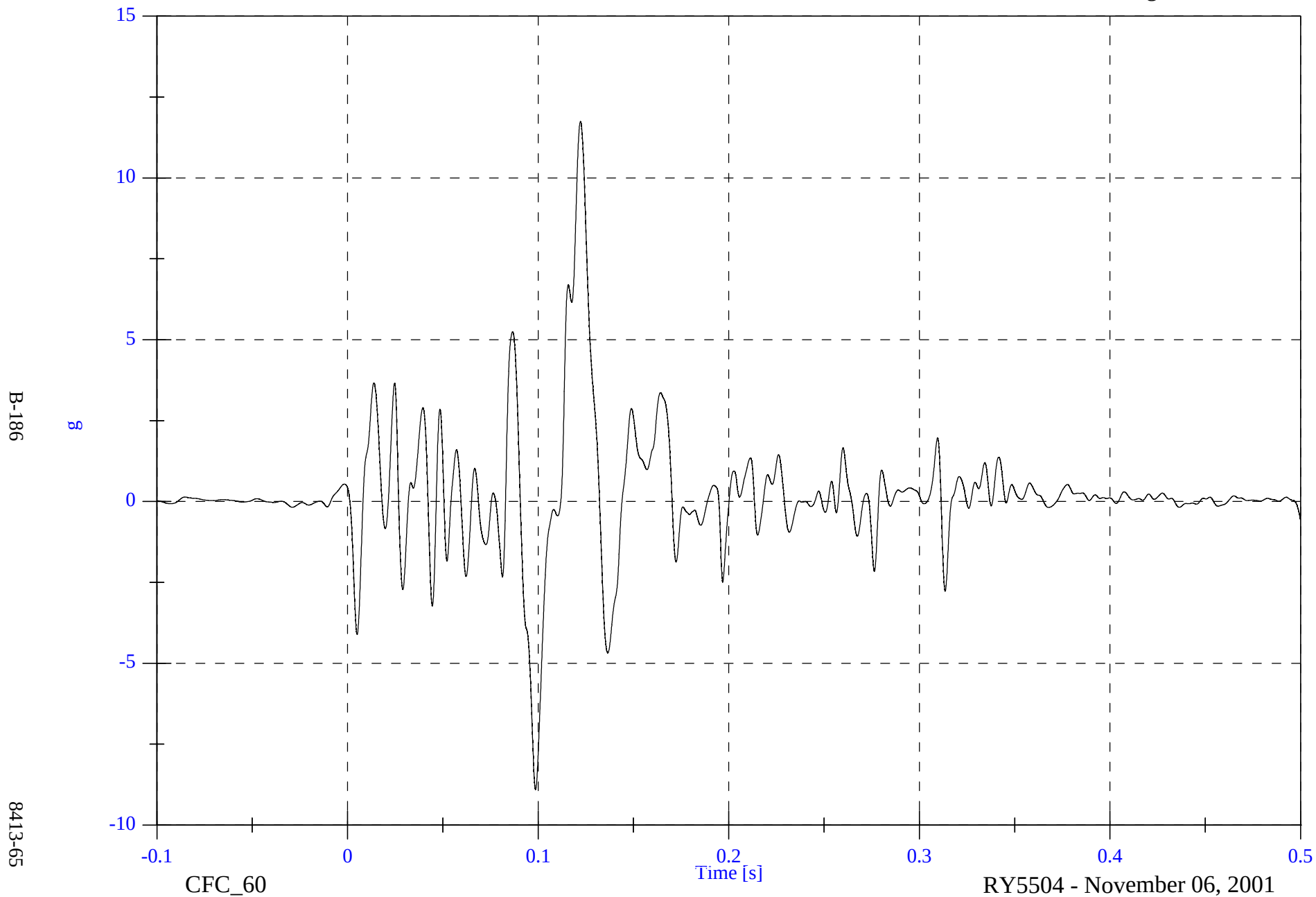


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 9 Trunk Z

Max: 11.7 [g] at 0.122 [s]

Min: -8.9 [g] at 0.099 [s]



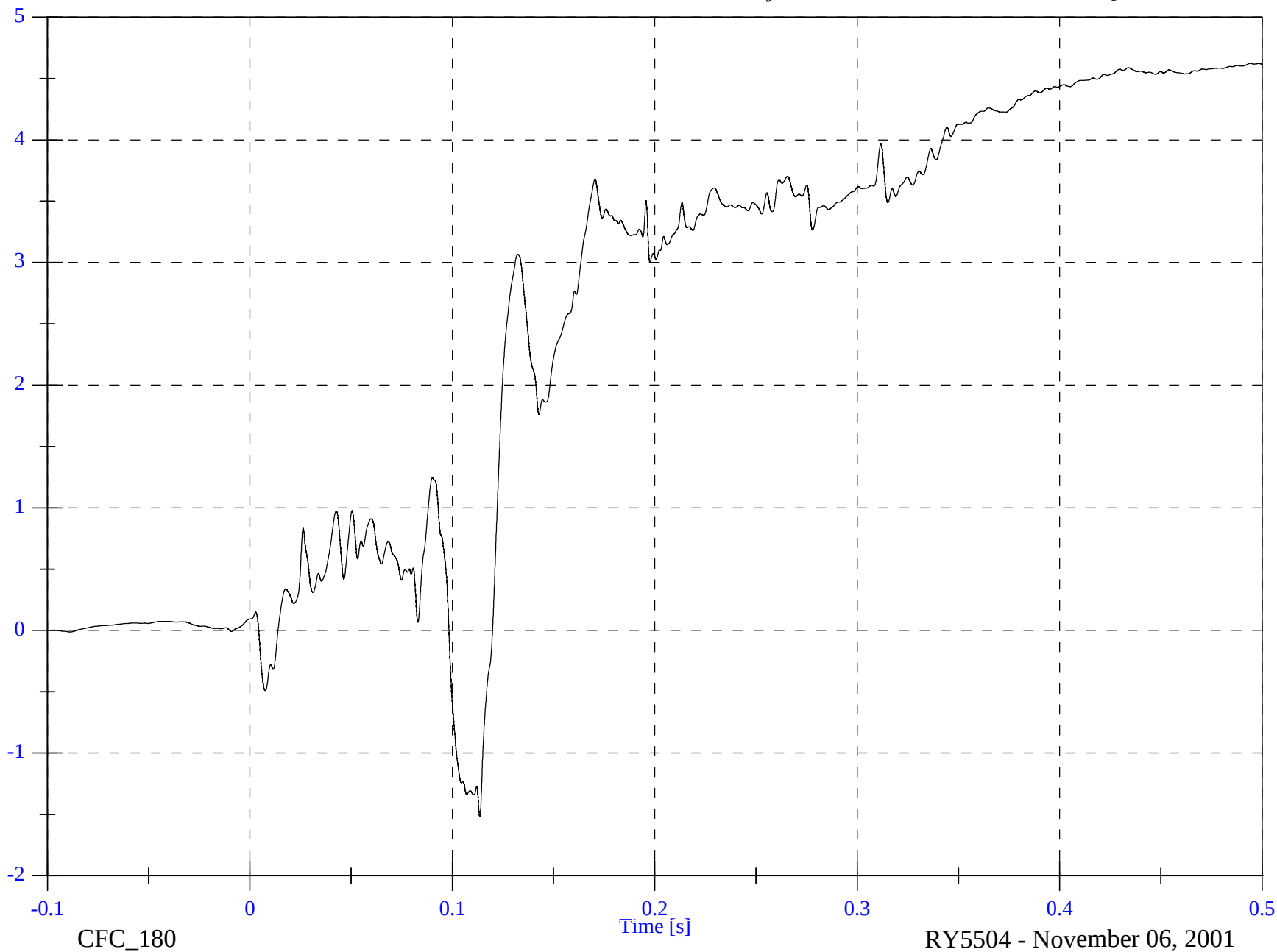


40% Frontal Offset Test #9 - 2000 Subaru Legacy

Acc 9 Trunk Z Velocity

Max: 4.6 [kph] at 0.494 [s]

Min: -1.5 [kph] at 0.114 [s]



B-187

8413-65

40% Frontal Offset Test #9 - 2000 Subaru Legacy

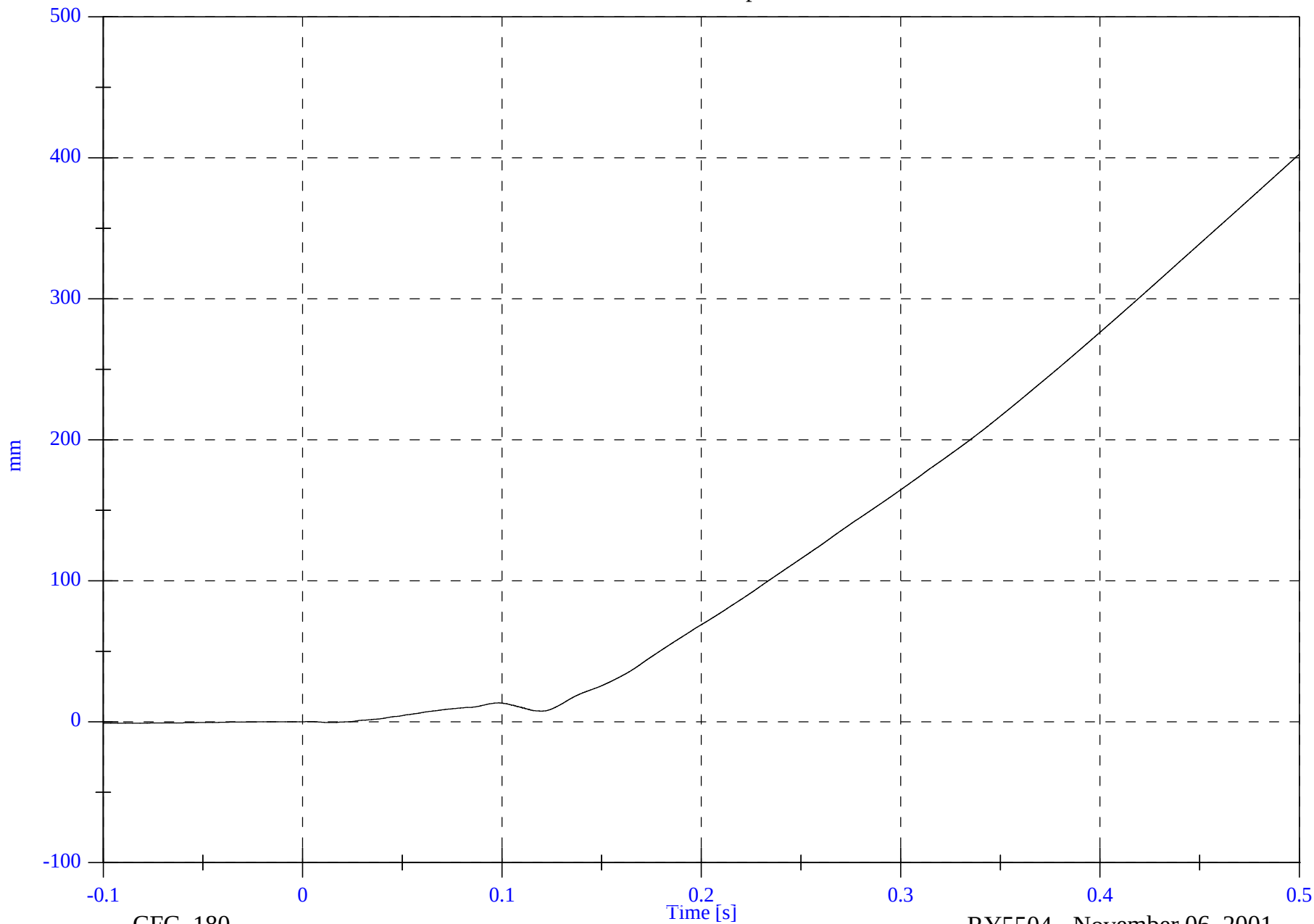
Acc 9 Trunk Z Displacement

Max: 402.6 [mm] at 0.500 [s]

Min: -1.1 [mm] at -0.086 [s]

B-188

8413-65



CFC\_180

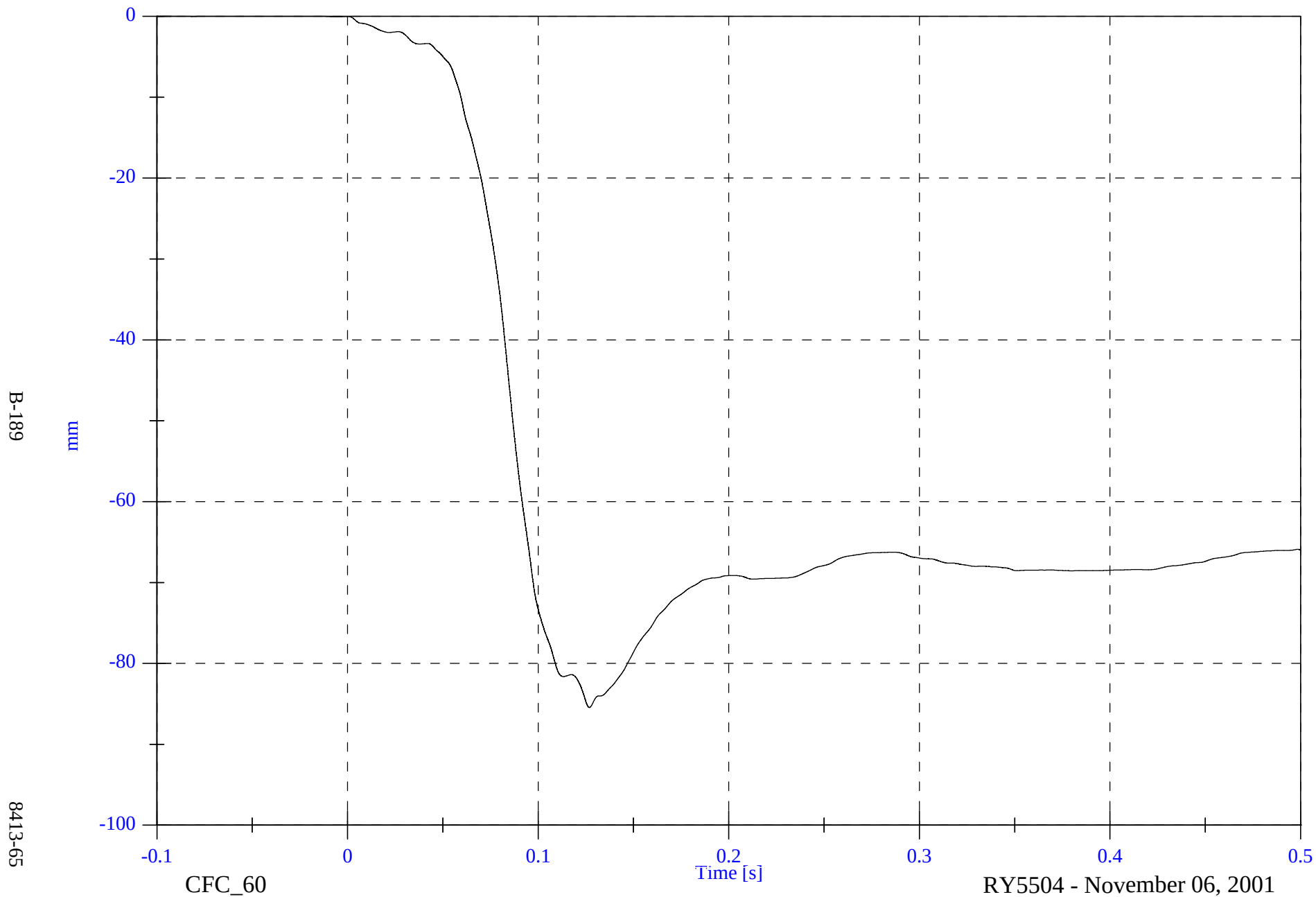
RY5504 - November 06, 2001

40% Frontal Offset Test #9 - 2000 Subaru Legacy

Toe Pan Movement

Max: 0.0 [mm] at -0.056 [s]

Min: -85.5 [mm] at 0.127 [s]

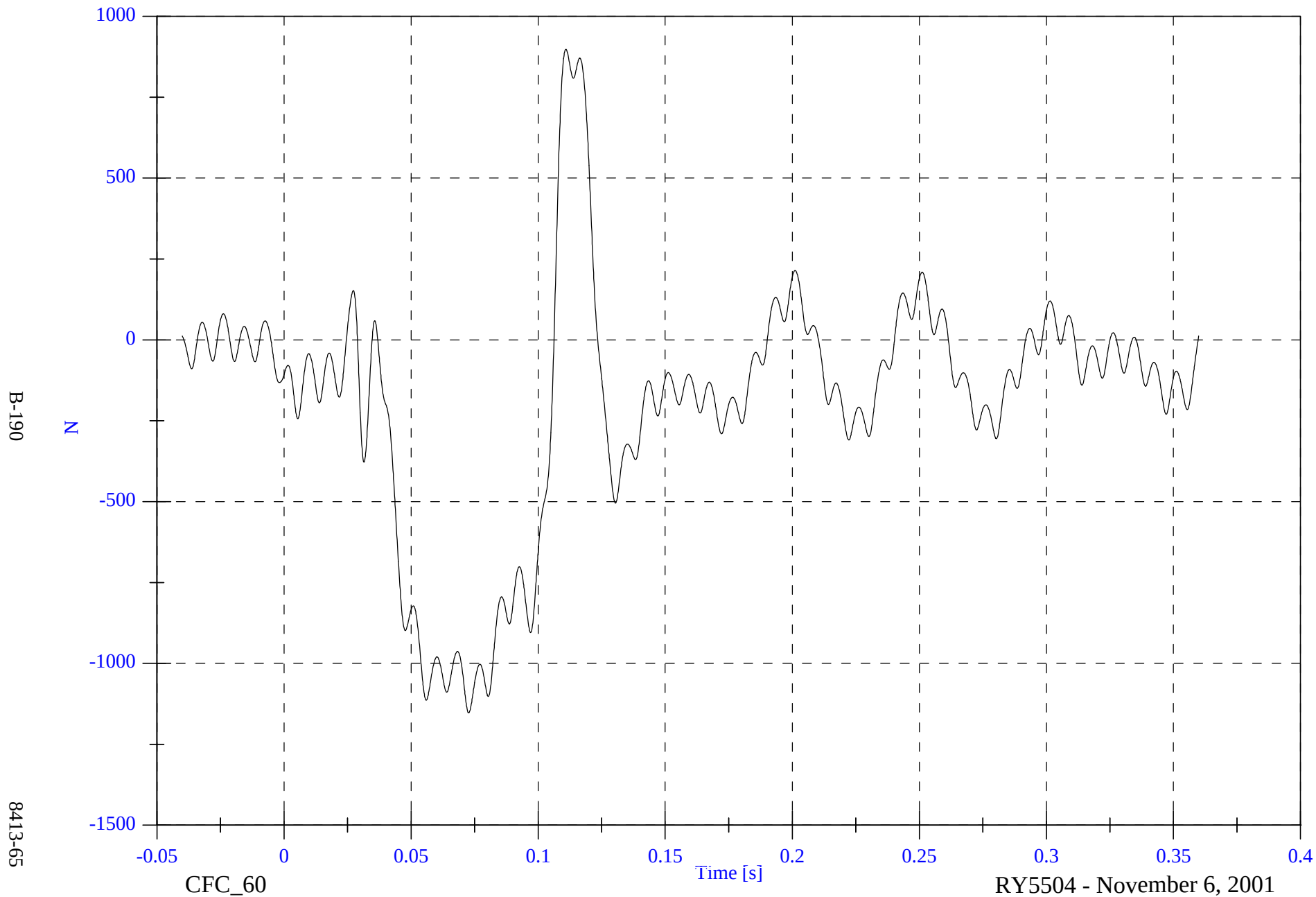


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E2 FY

Max: 897.6 [N] at 0.111 [s]

Min: -1153.3 [N] at 0.073 [s]

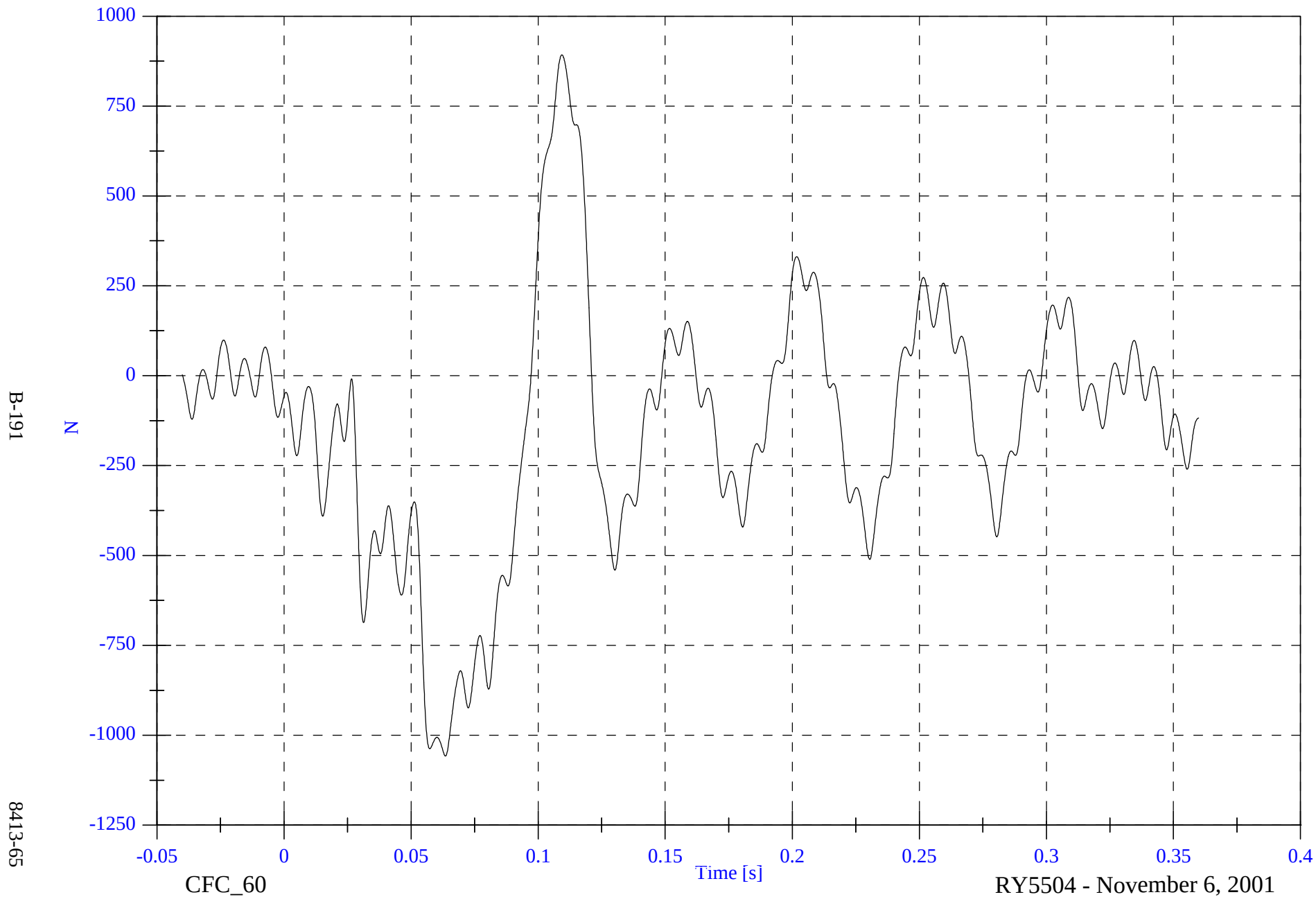


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E3 FY

Max: 892.4 [N] at 0.109 [s]

Min: -1057.9 [N] at 0.063 [s]

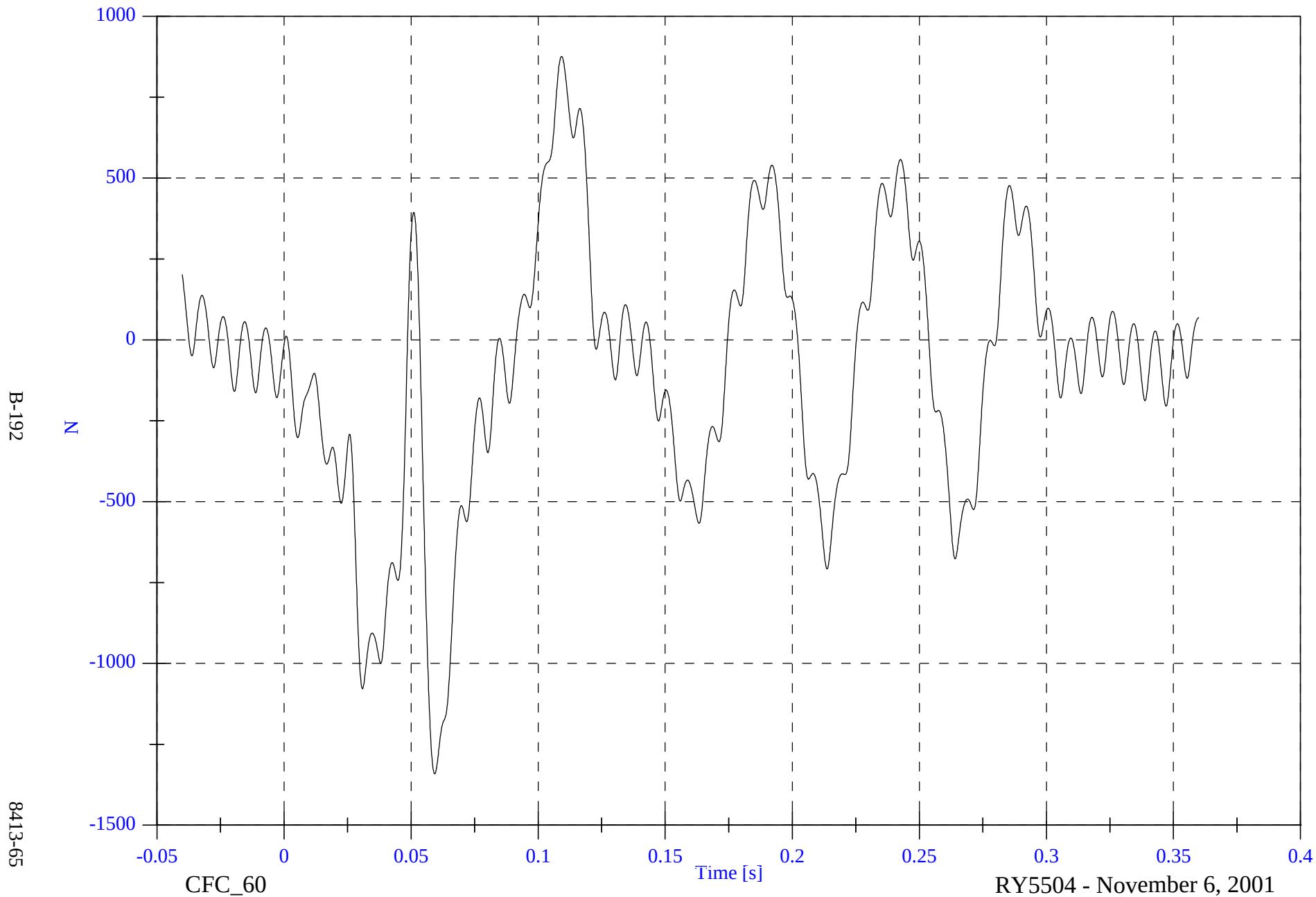


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E4 FY

Max: 876.0 [N] at 0.109 [s]

Min: -1341.5 [N] at 0.059 [s]



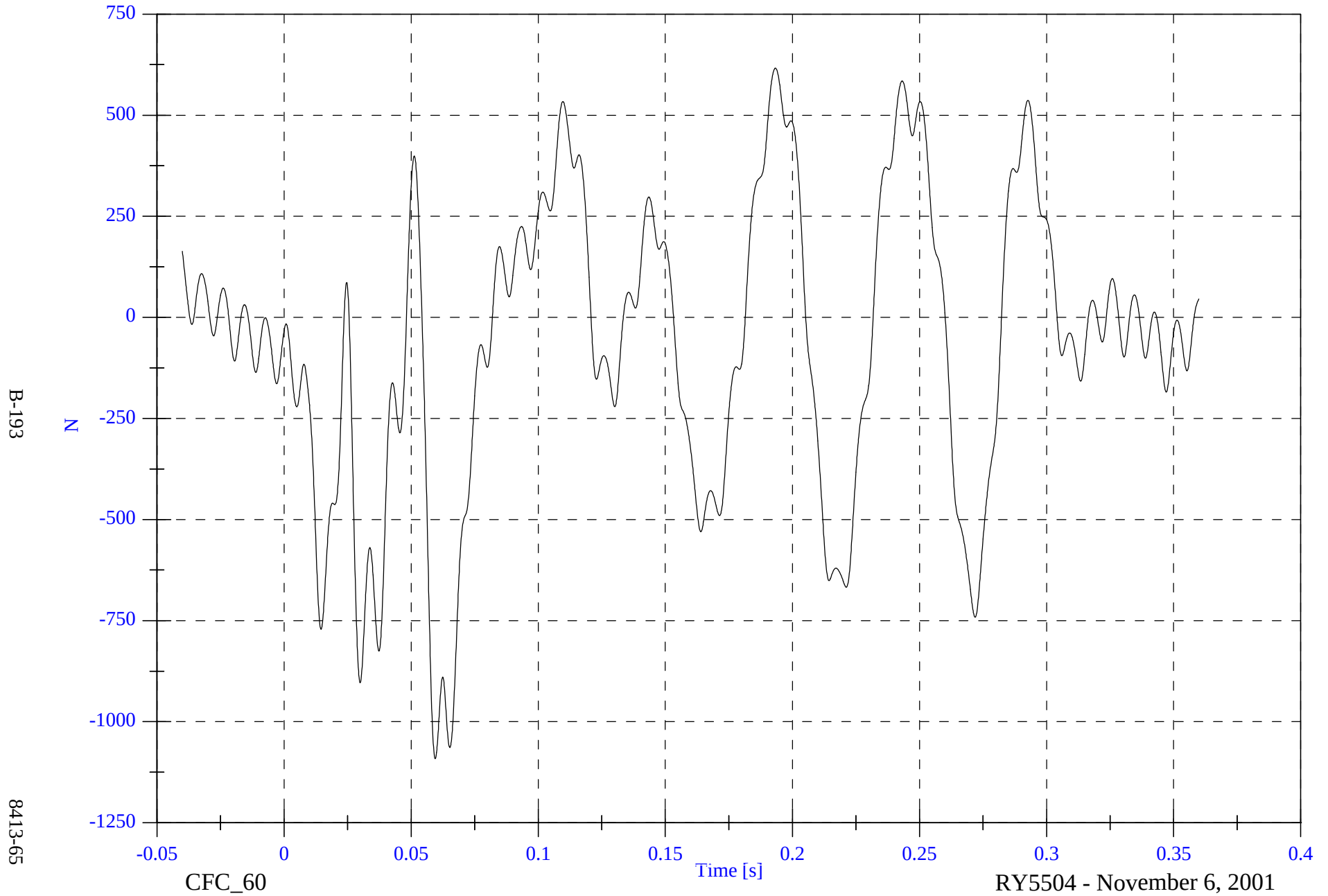


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E5 FY

Max: 616.4 [N] at 0.193 [s]

Min: -1091.5 [N] at 0.059 [s]

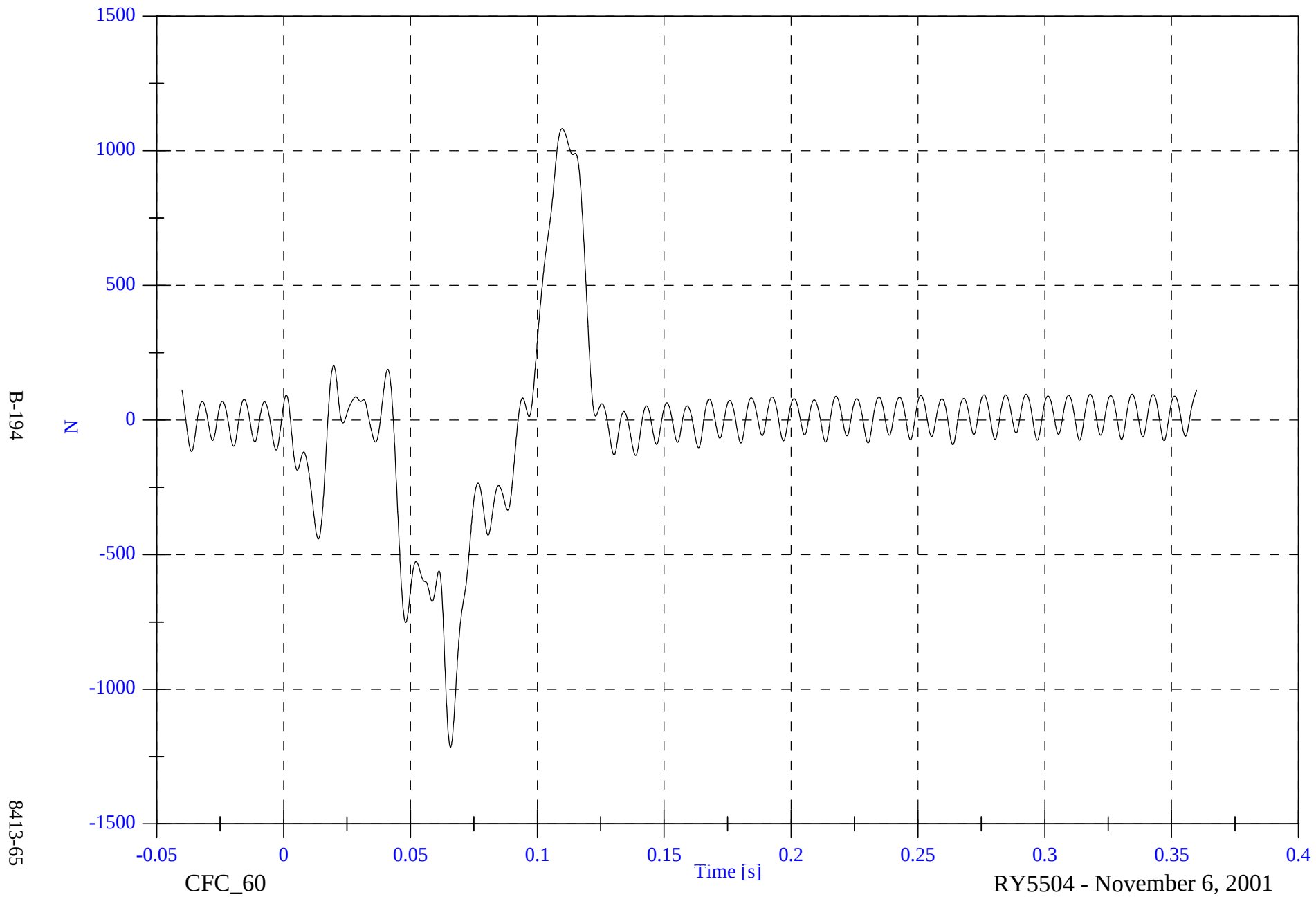


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E6 FY

Max: 1082.1 [N] at 0.110 [s]

Min: -1215.4 [N] at 0.066 [s]



40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E1 FX

Max: 421.4 [N] at 0.243 [s]

Min: -5500.8 [N] at 0.058 [s]

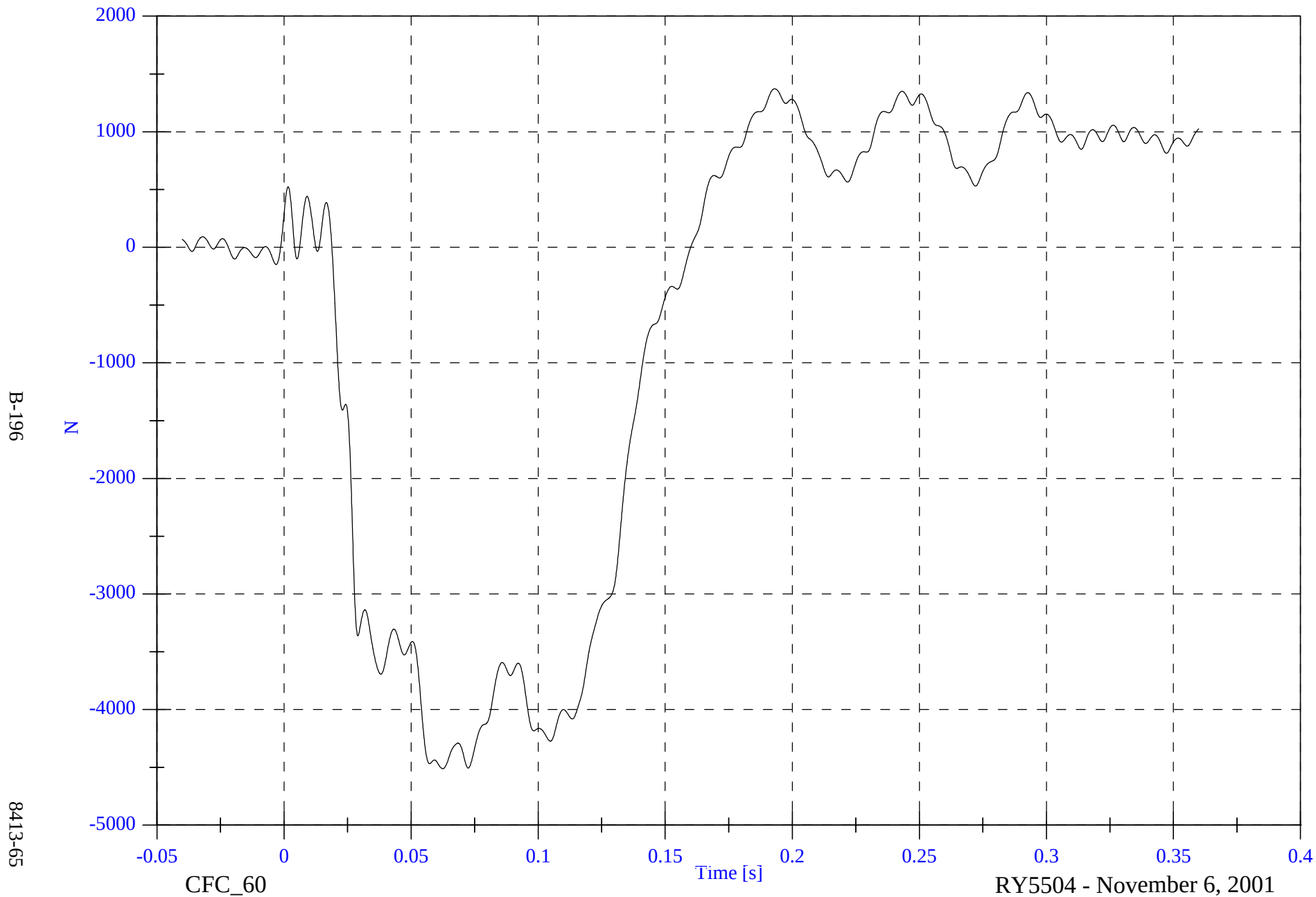


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E2 FX

Max: 1372.6 [N] at 0.193 [s]

Min: -4511.7 [N] at 0.062 [s]

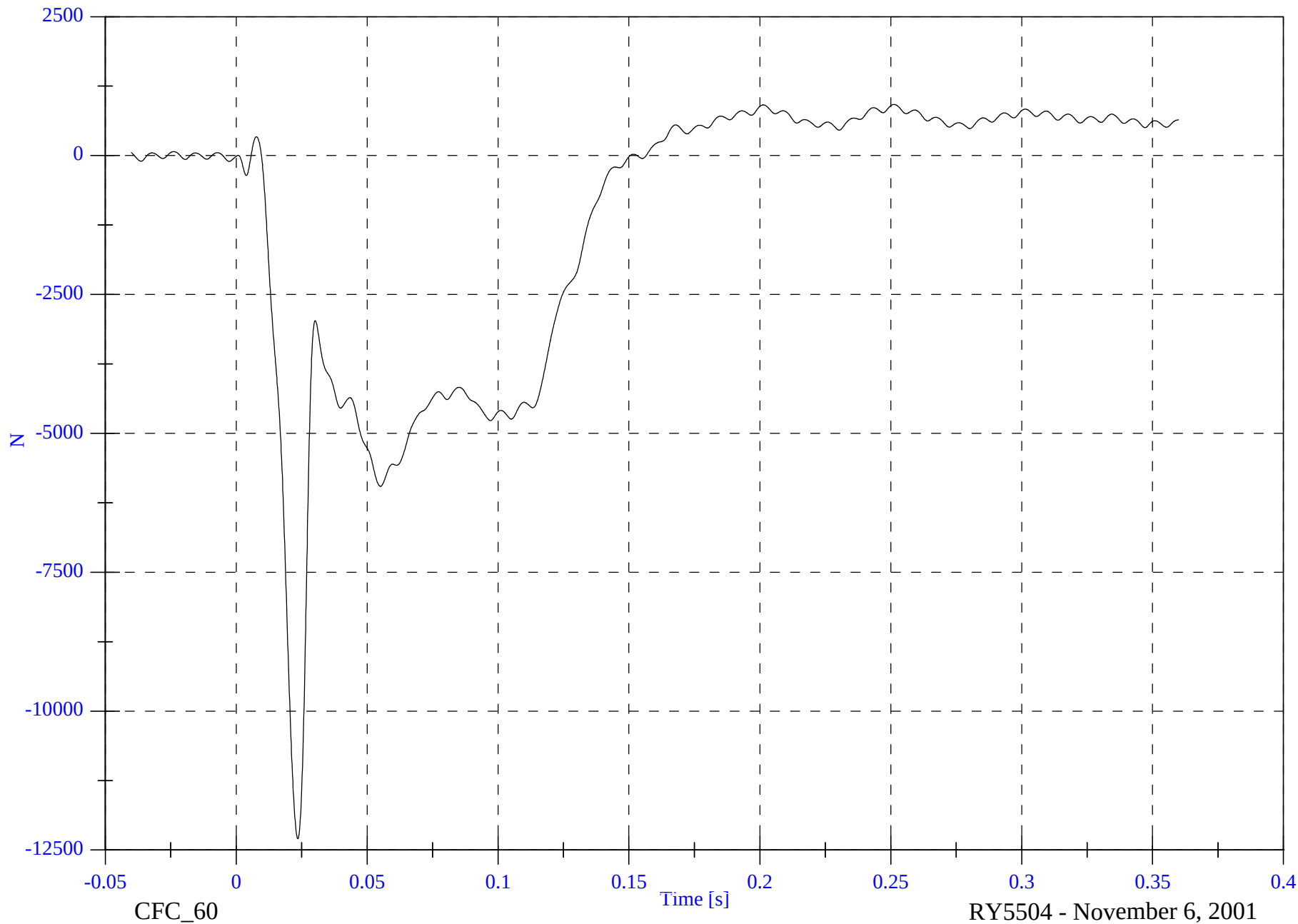


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E3 FX

Max: 919.8 [N] at 0.251 [s]

Min: -12299.7 [N] at 0.023 [s]



B-197

8413-65

CFC\_60

Time [s]

RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E4 FX

Max: 862.8 [N] at 0.202 [s]

Min: -8281.5 [N] at 0.024 [s]



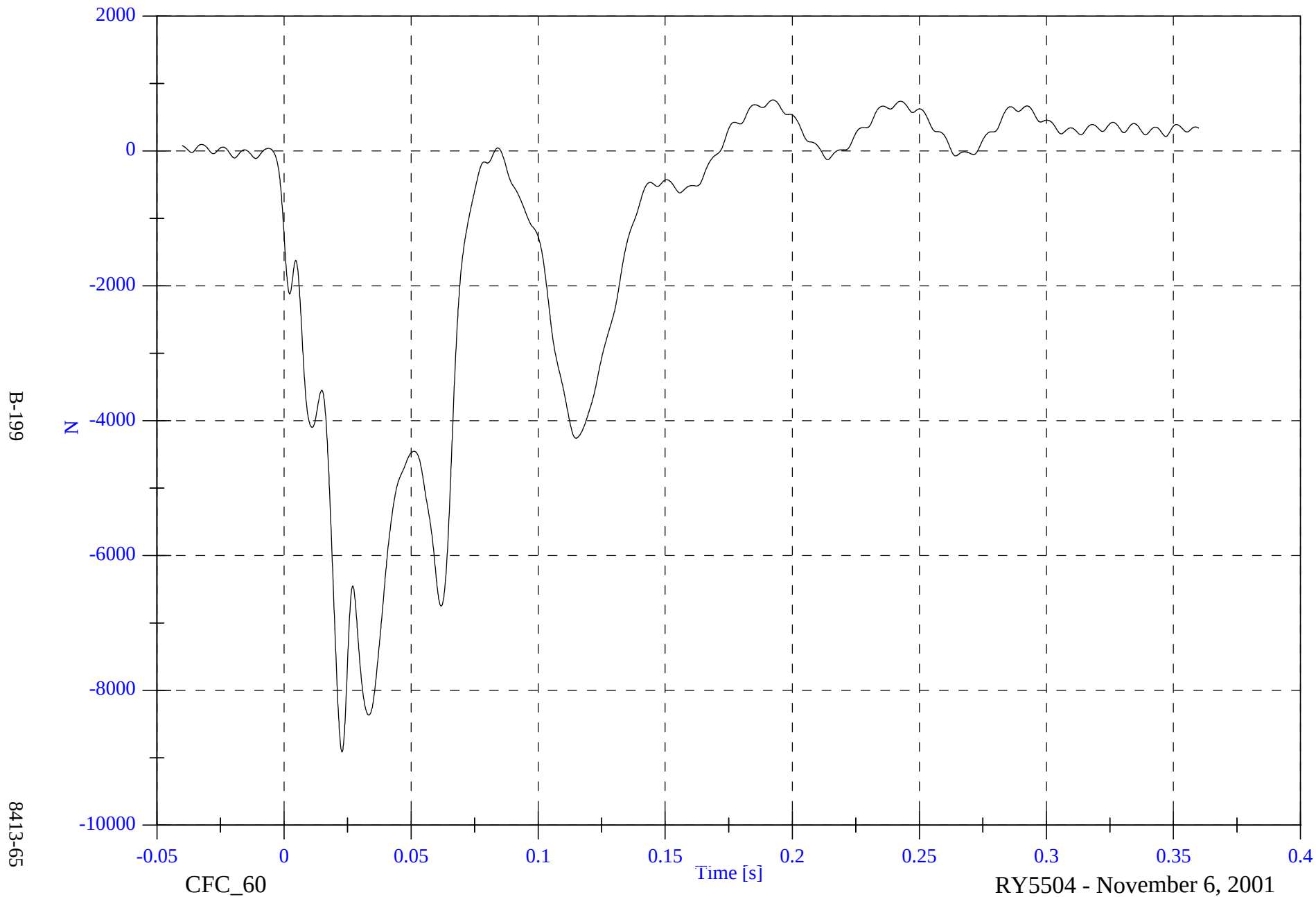


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E5 FX

Max: 757.8 [N] at 0.192 [s]

Min: -8915.8 [N] at 0.023 [s]

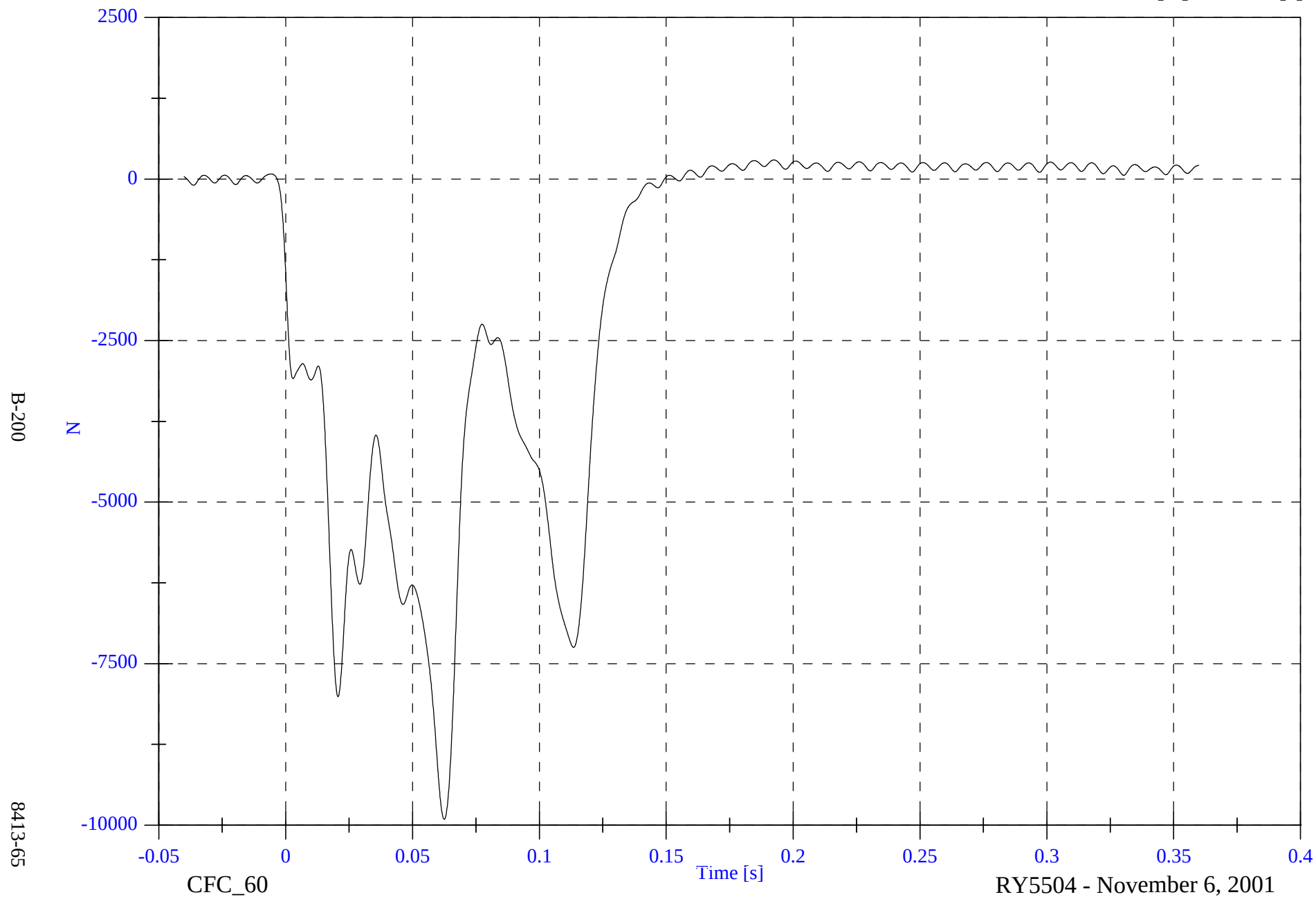


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell E6 FX

Max: 297.1 [N] at 0.192 [s]

Min: -9909.4 [N] at 0.062 [s]



40% Frontal Offset Test #9 - 1998 Subaru Legacy

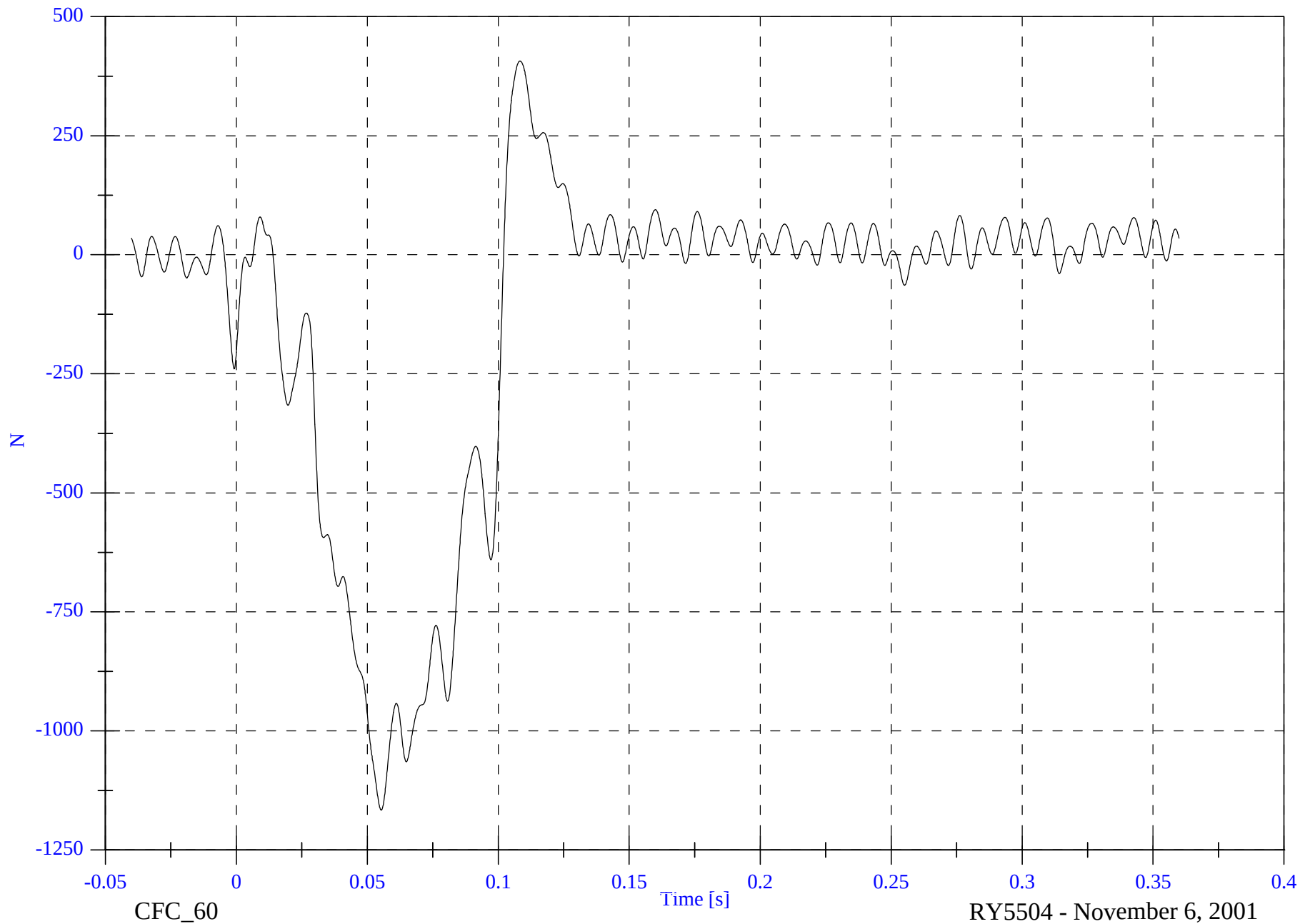
Barrier Load Cell D2 FY

Max: 406.9 [N] at 0.108 [s]

Min: -1166.4 [N] at 0.055 [s]

B-201

8413-65

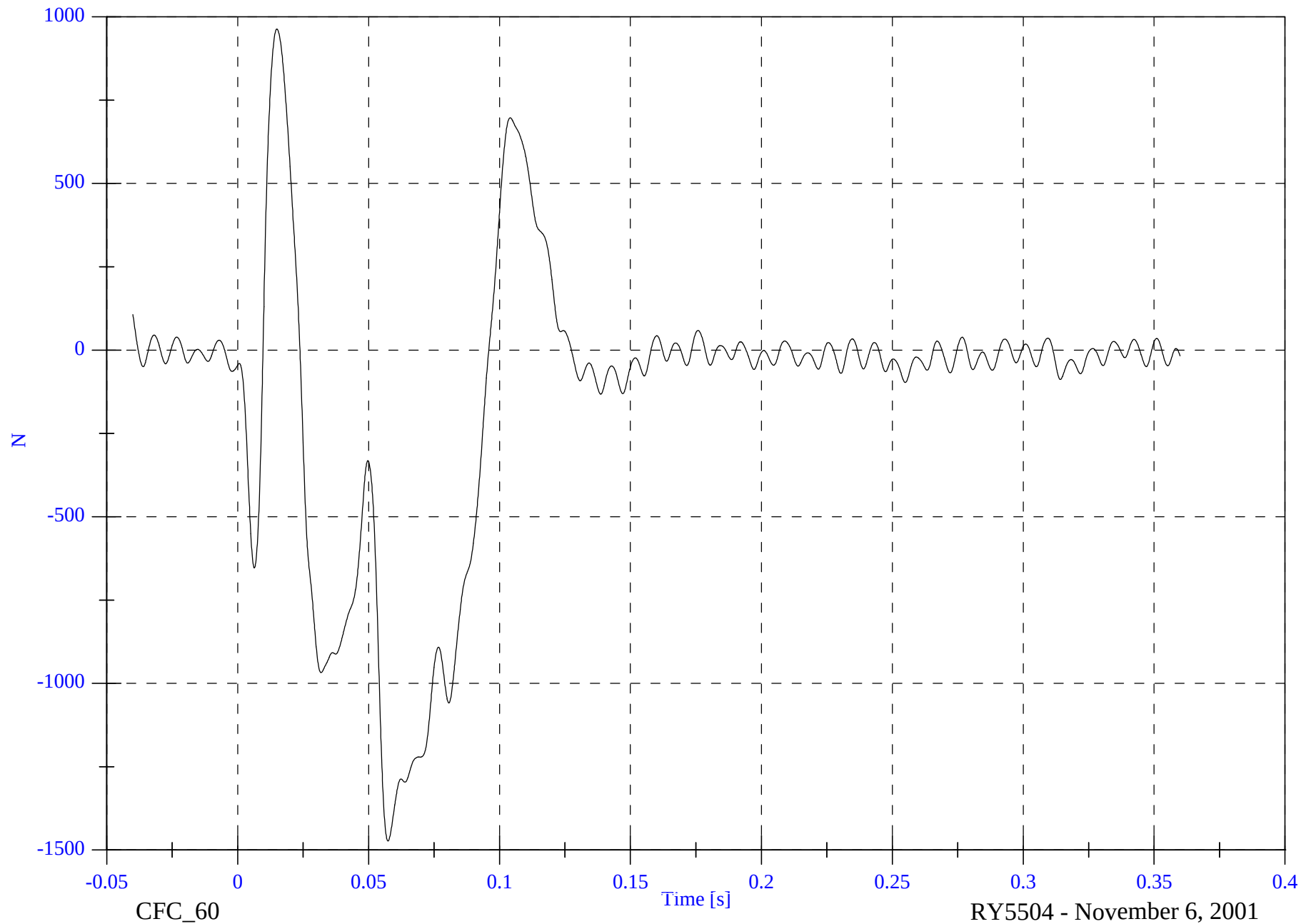


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D3 FY

Max: 962.9 [N] at 0.015 [s]

Min: -1473.4 [N] at 0.057 [s]



B-202

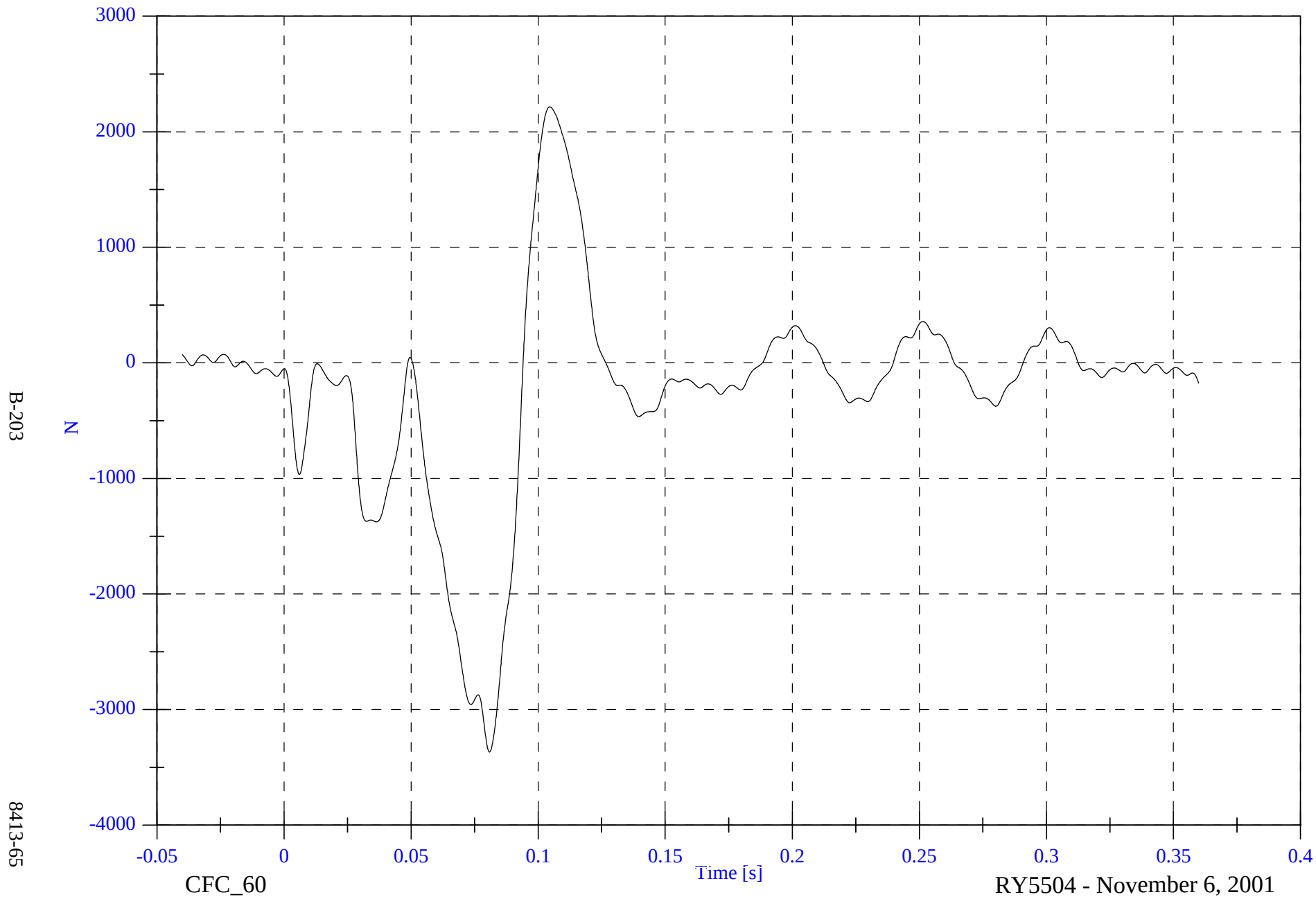
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D4 FY

Max: 2215.3 [N] at 0.104 [s]

Min: -3367.8 [N] at 0.081 [s]

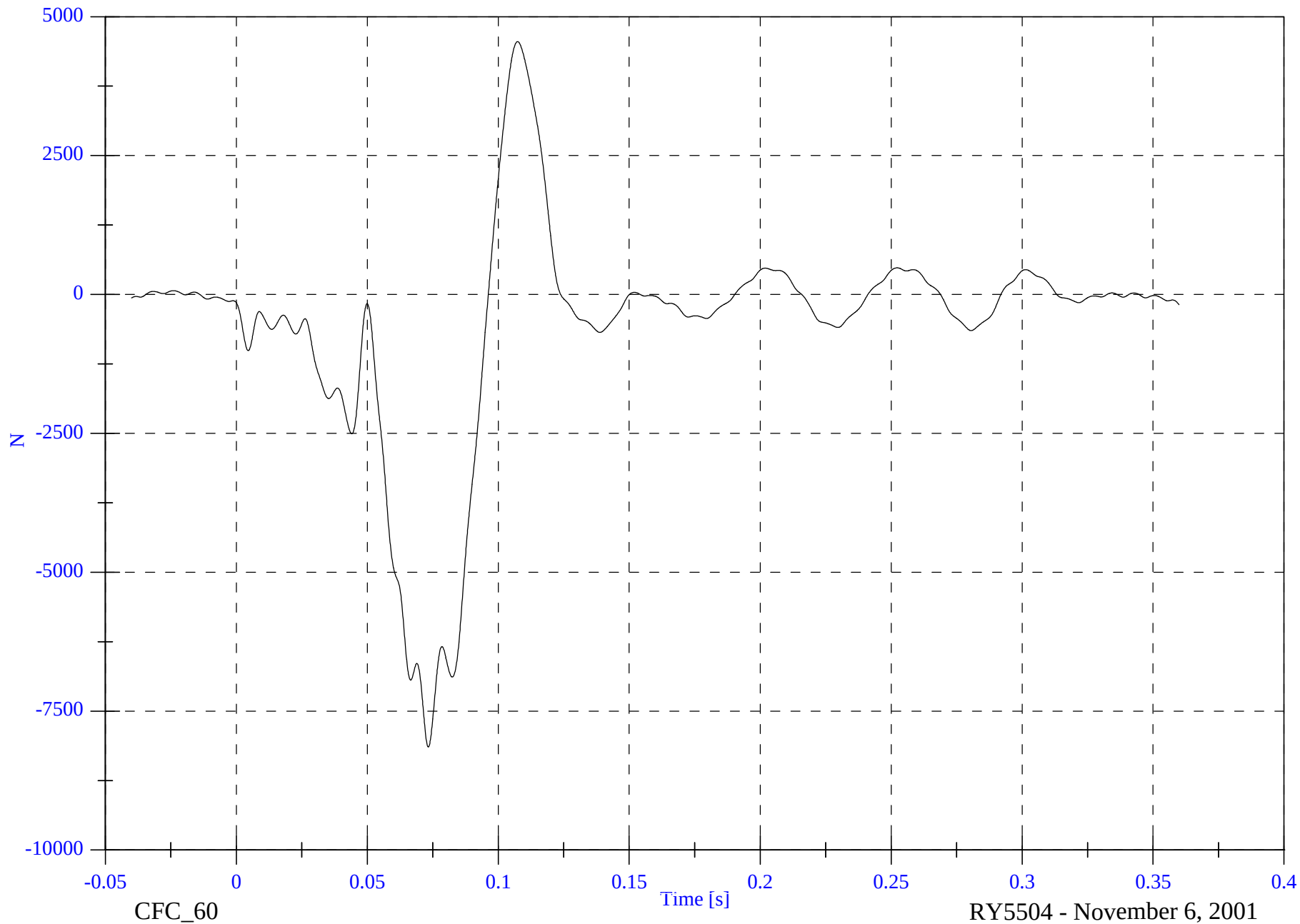


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D5 FY

Max: 4552.6 [N] at 0.107 [s]

Min: -8148.2 [N] at 0.073 [s]



B-204

8413-65

CFC\_60

Time [s]

RY5504 - November 6, 2001

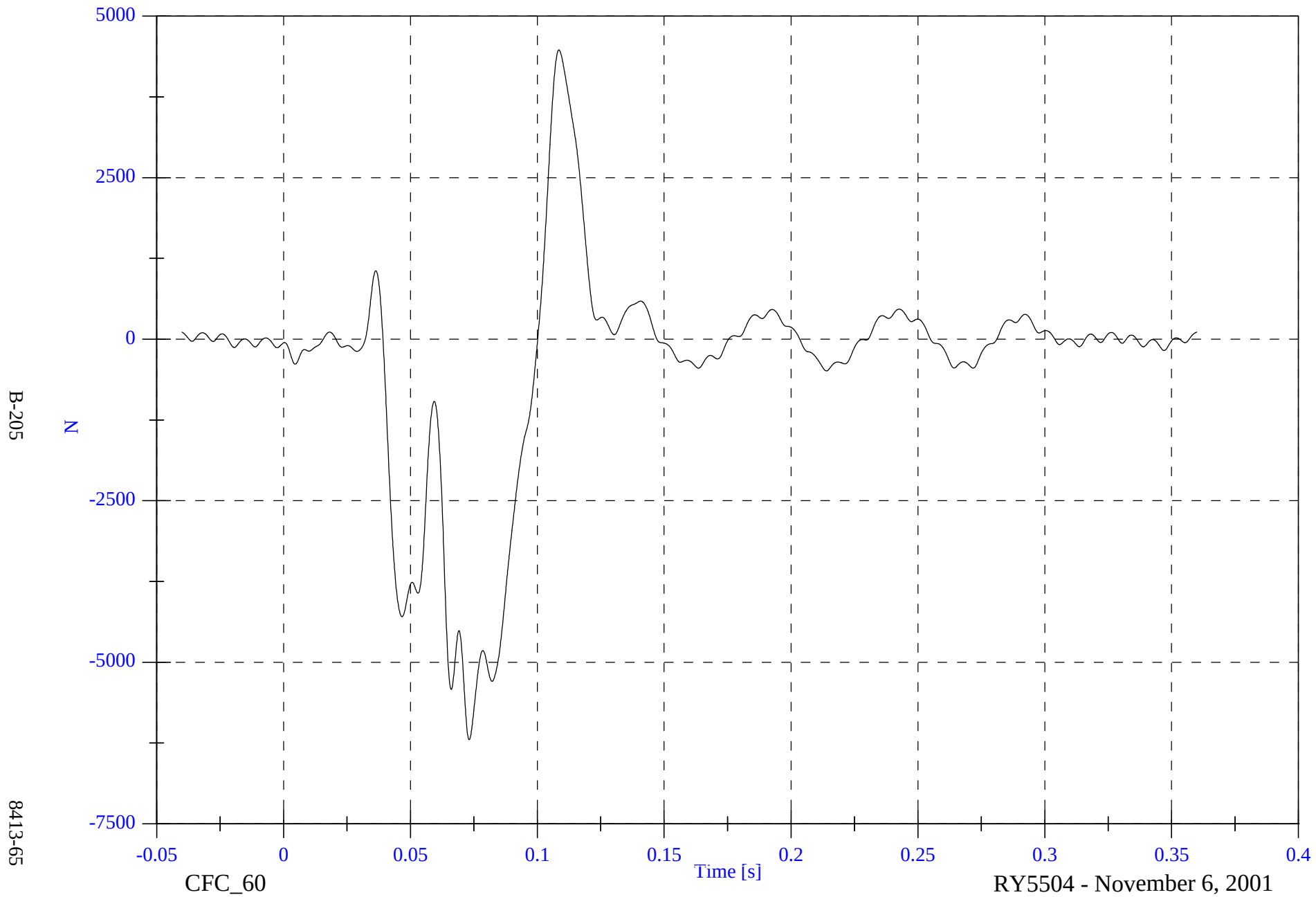


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D6 FY

Max: 4477.2 [N] at 0.108 [s]

Min: -6197.8 [N] at 0.073 [s]

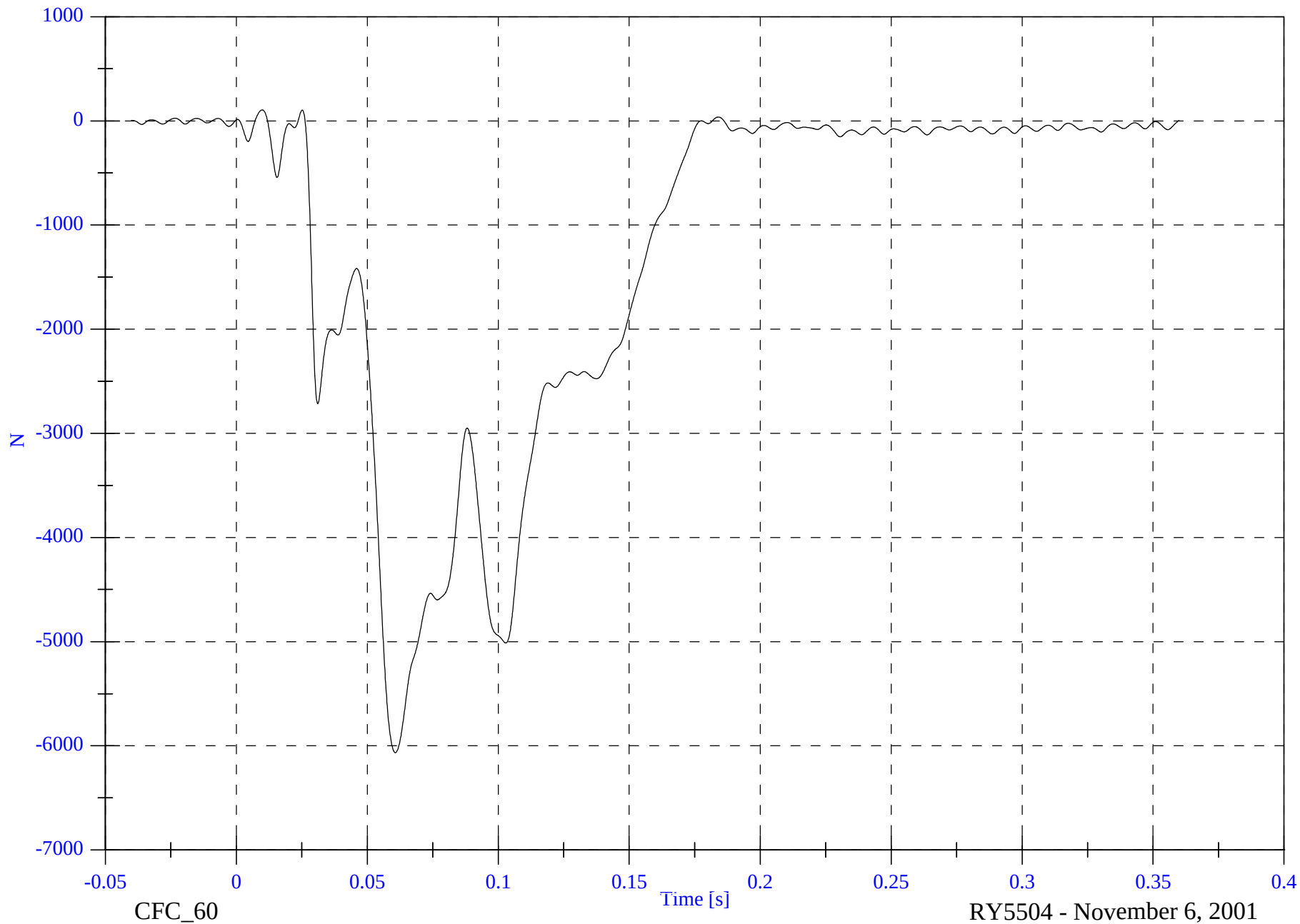


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D1 FX

Max: 105.4 [N] at 0.010 [s]

Min: -6066.1 [N] at 0.061 [s]

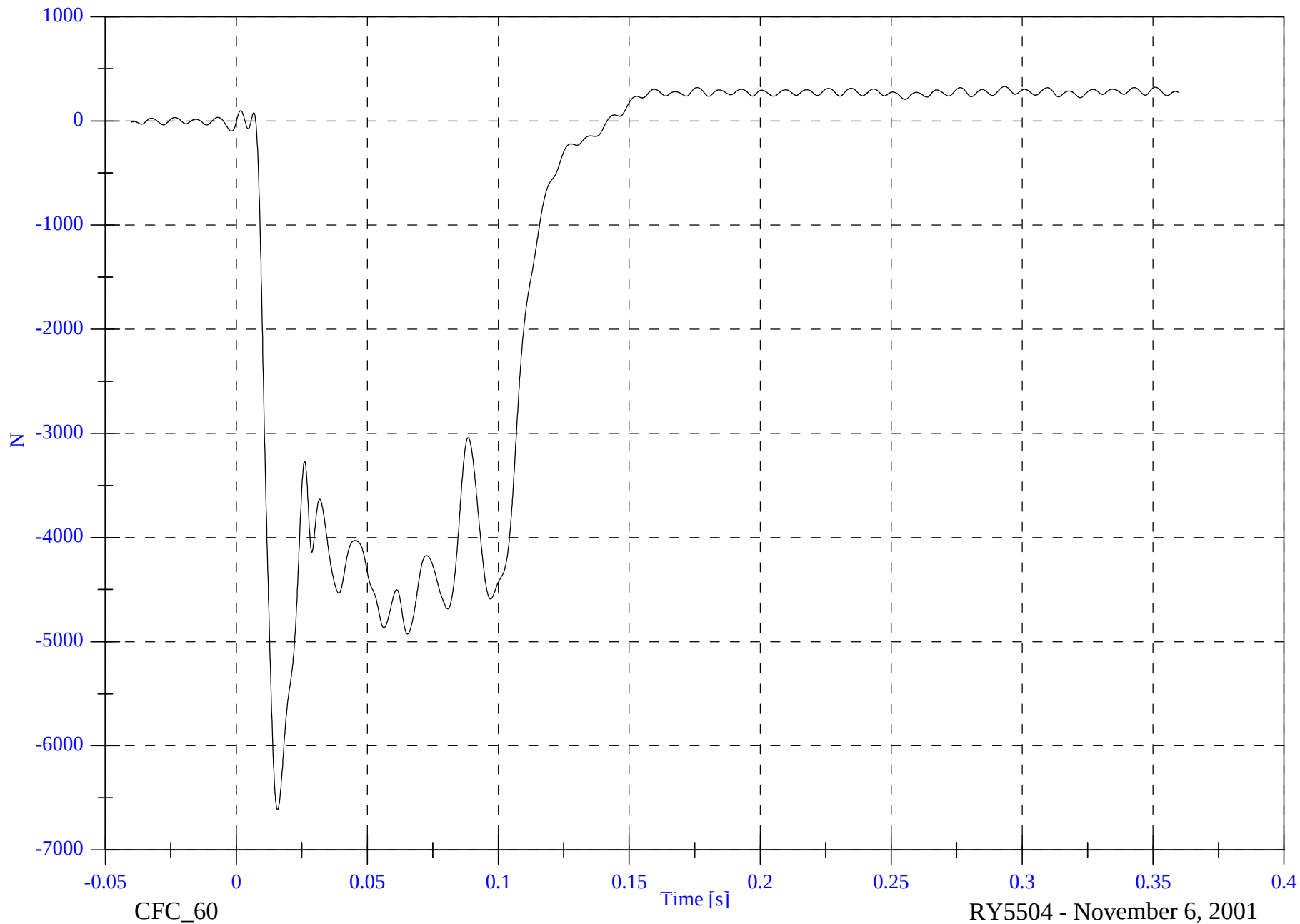


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D2 FX

Max: 330.0 [N] at 0.293 [s]

Min: -6613.6 [N] at 0.016 [s]



B-207

8413-65

CFC\_60

Time [s]

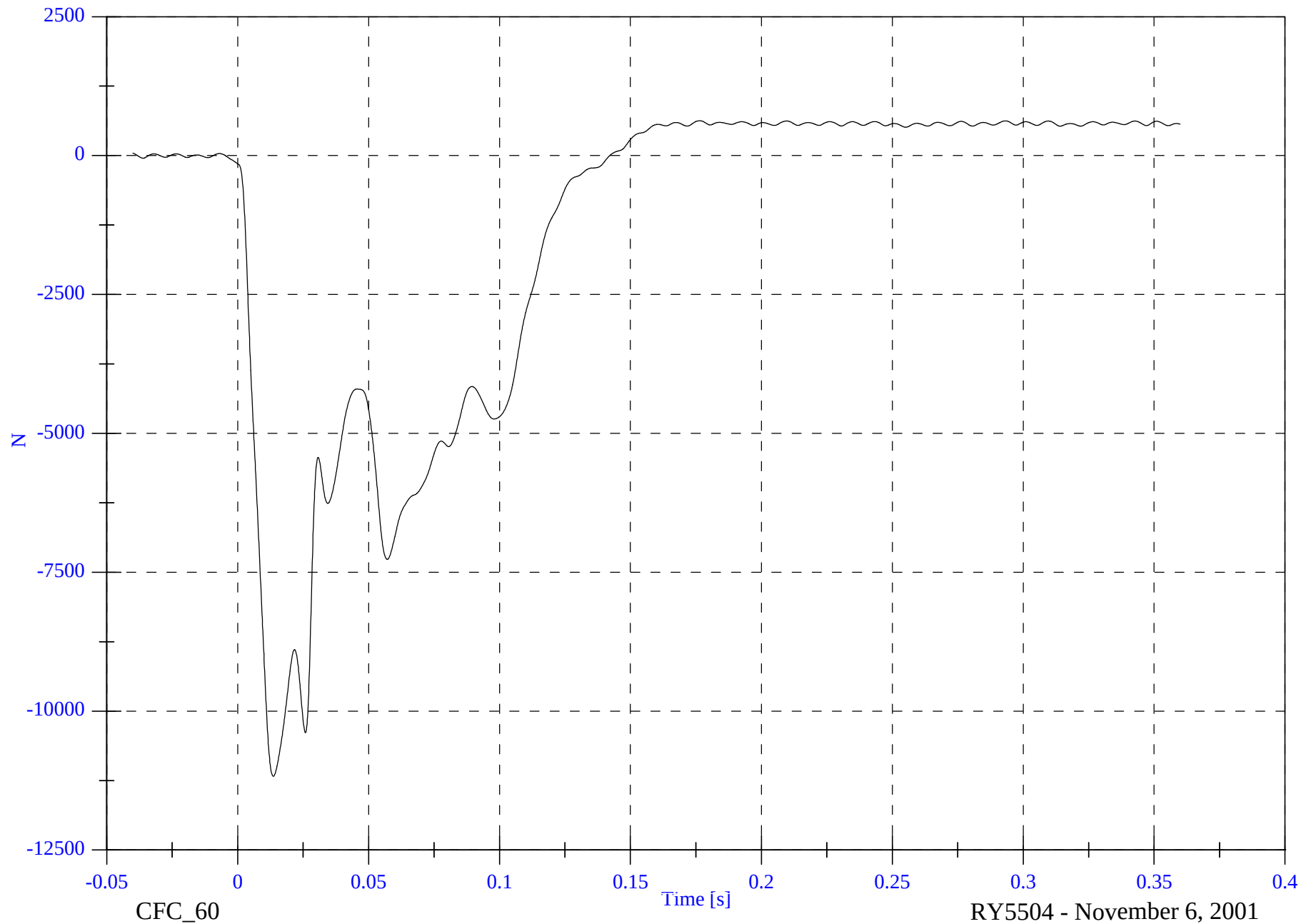
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D3 FX

Max: 627.7 [N] at 0.176 [s]

Min: -11172.7 [N] at 0.014 [s]



B-208

8413-65

CFC\_60

Time [s]

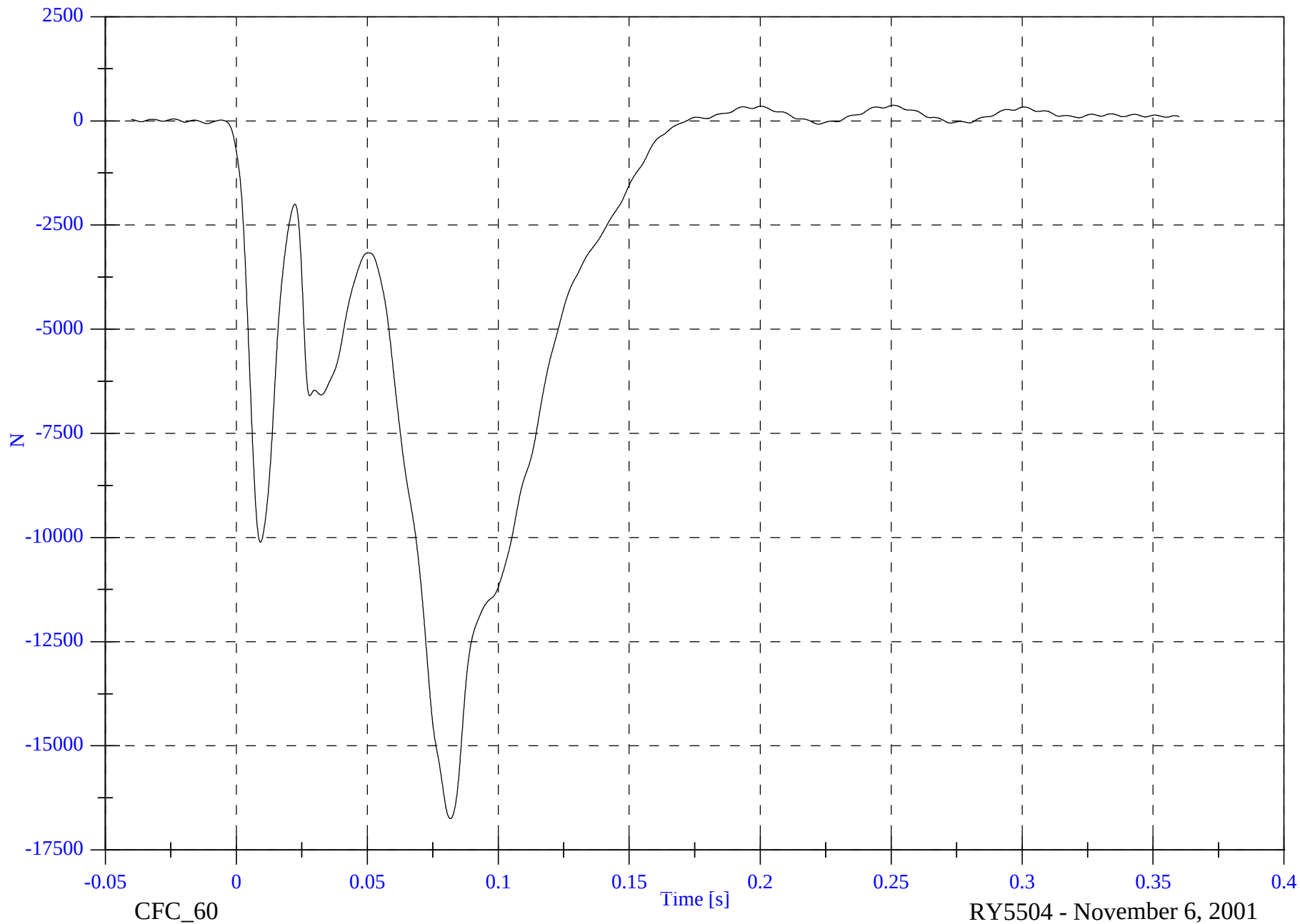
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D4 FX

Max: 372.8 [N] at 0.251 [s]

Min: -16748.5 [N] at 0.082 [s]



B-209

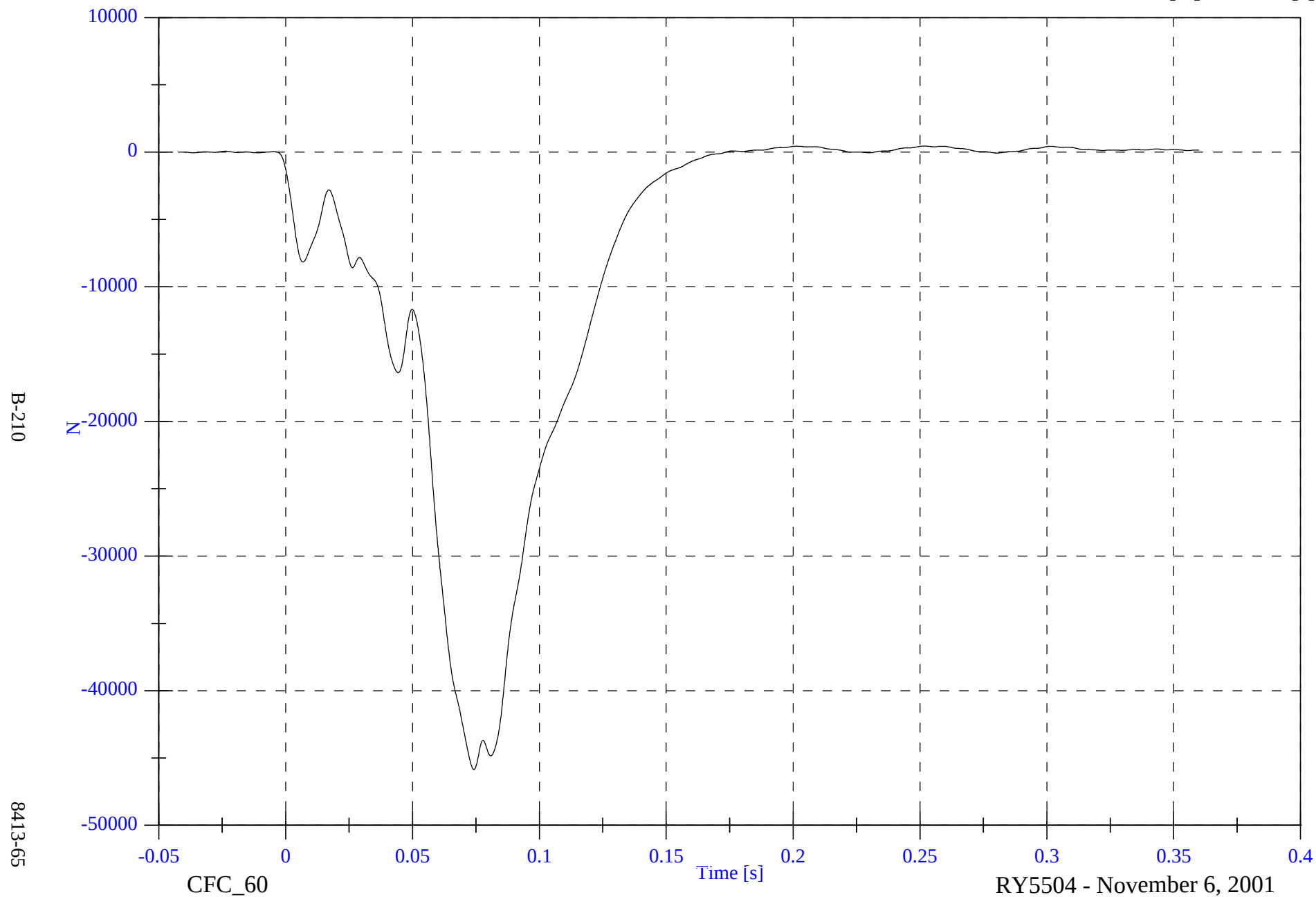
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D5 FX

Max: 452.3 [N] at 0.252 [s]

Min: -45862.7 [N] at 0.074 [s]



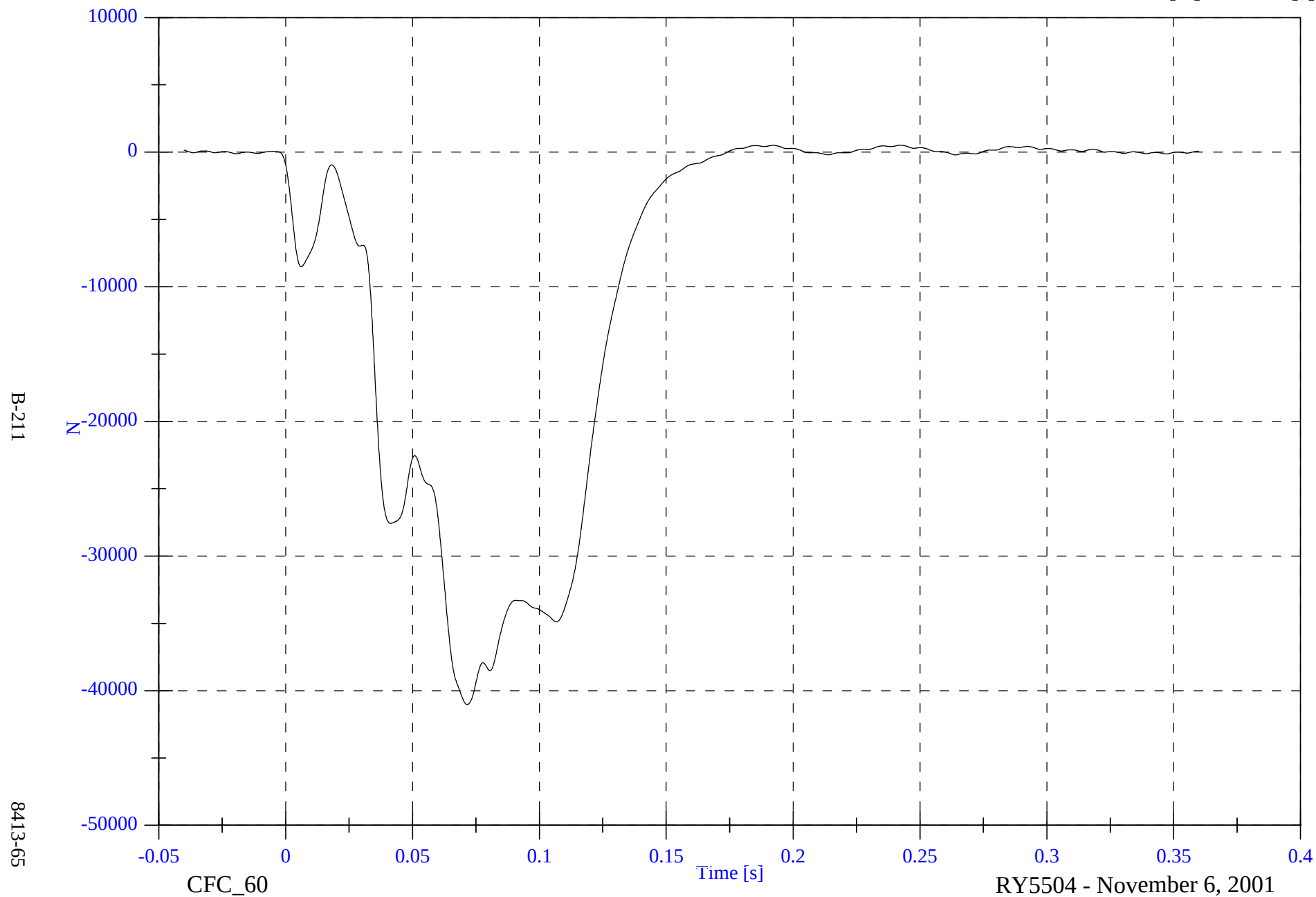


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell D6 FX

Max: 516.1 [N] at 0.242 [s]

Min: -41033.5 [N] at 0.071 [s]

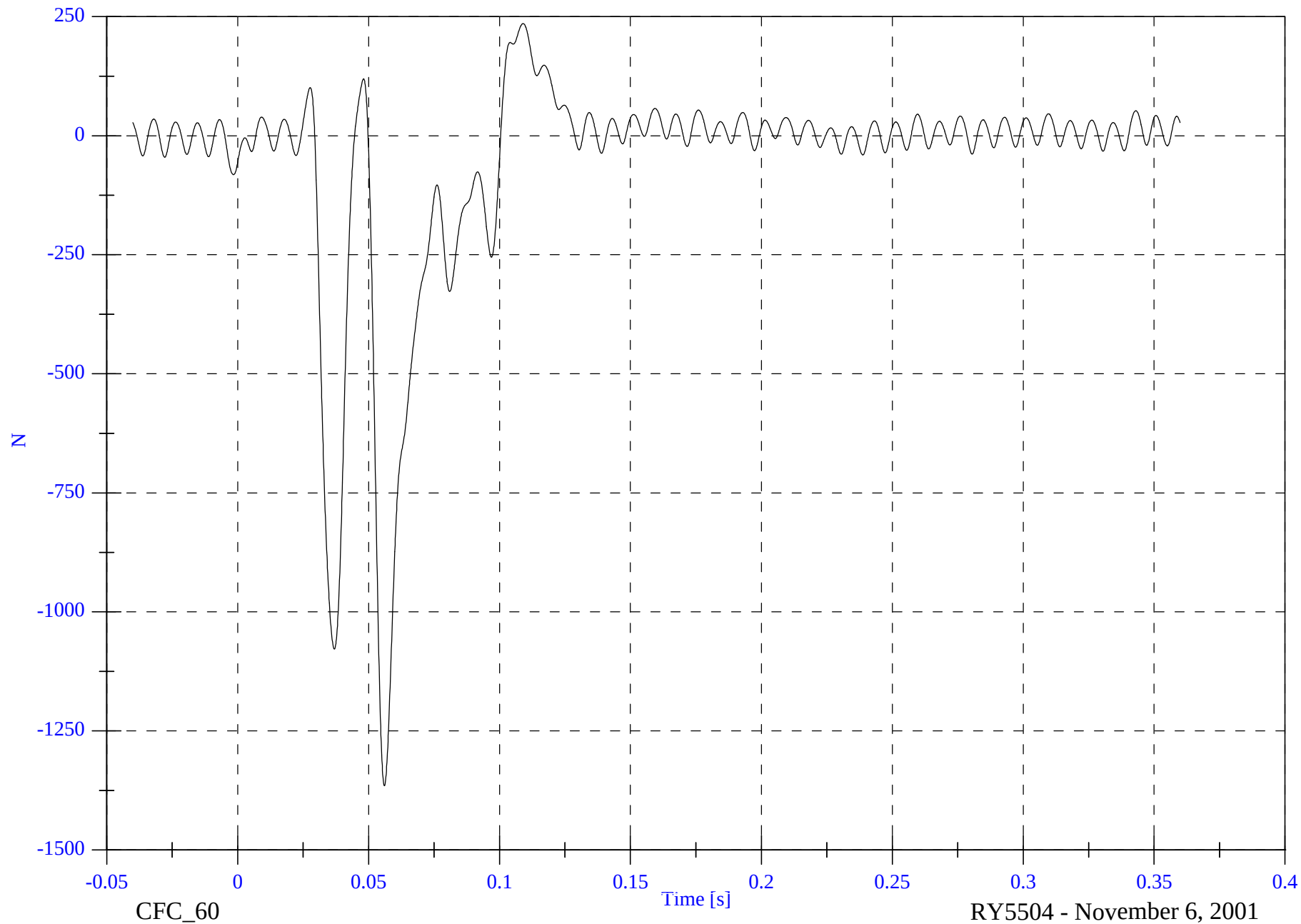


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C2 FY

Max: 235.4 [N] at 0.109 [s]

Min: -1365.2 [N] at 0.056 [s]



B-212

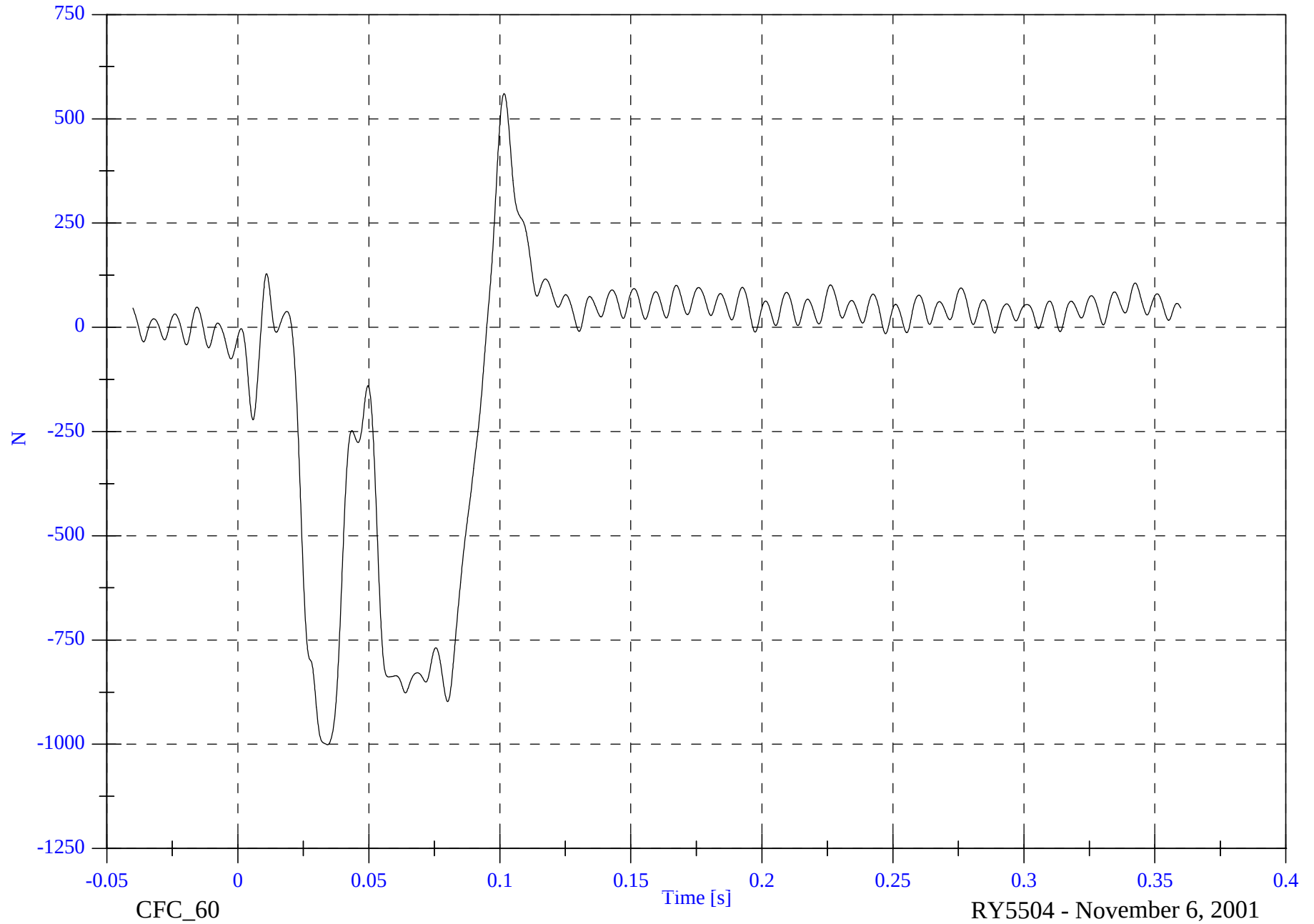
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C3 FY

Max: 560.4 [N] at 0.102 [s]

Min: -1001.2 [N] at 0.034 [s]

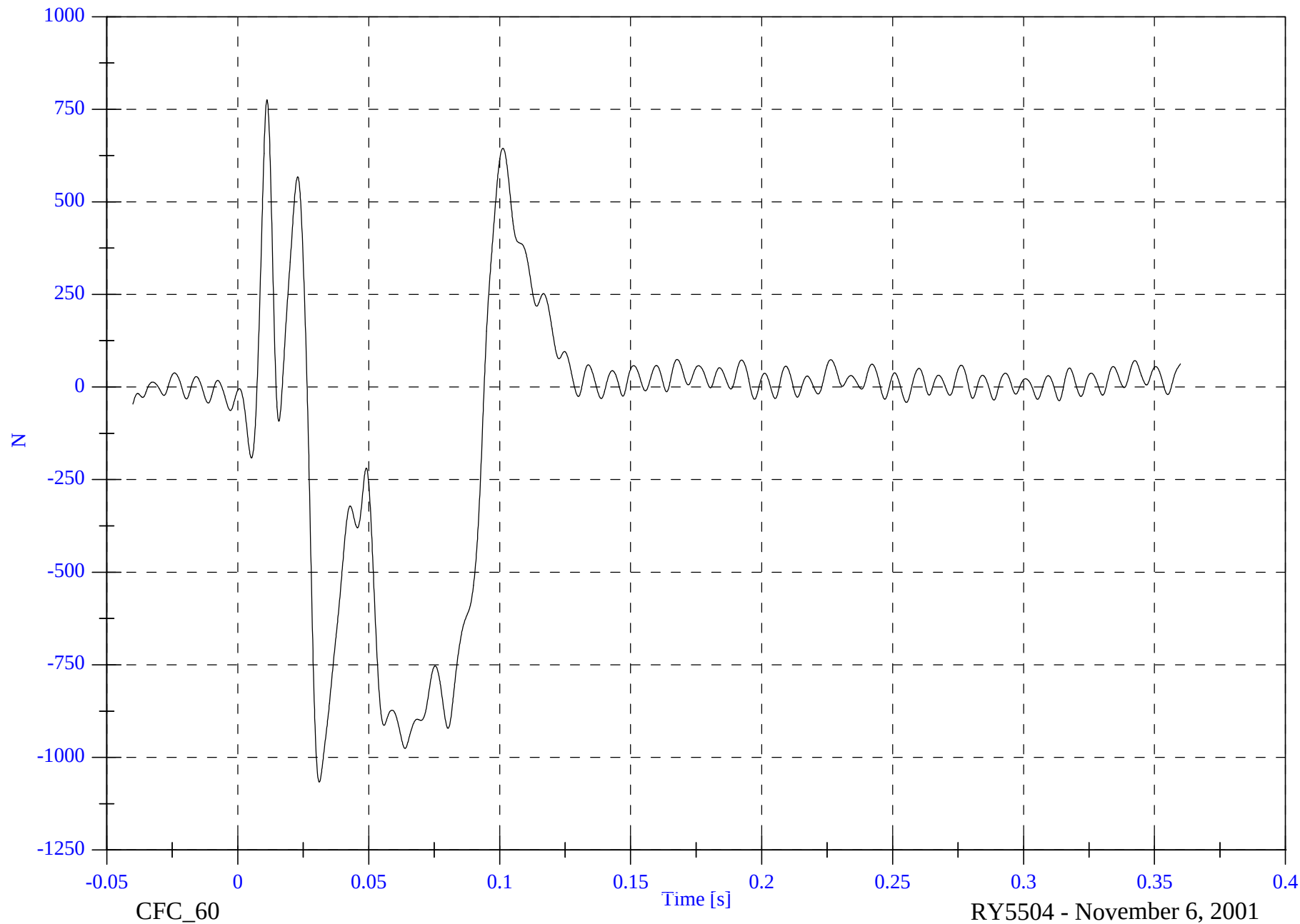


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C4 FY

Max: 775.7 [N] at 0.011 [s]

Min: -1067.0 [N] at 0.031 [s]



B-214

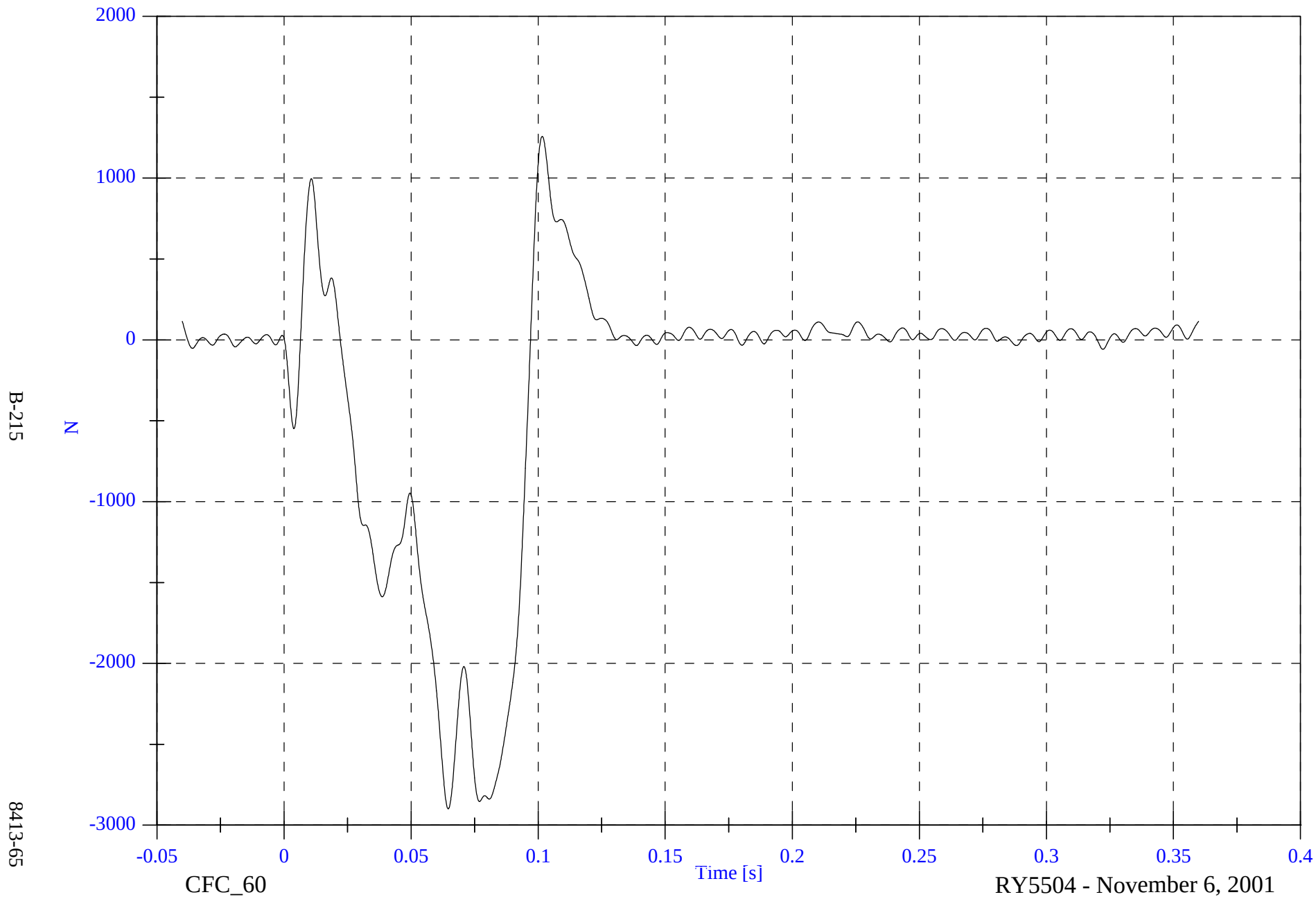
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C5 FY

Max: 1257.5 [N] at 0.102 [s]

Min: -2900.1 [N] at 0.065 [s]

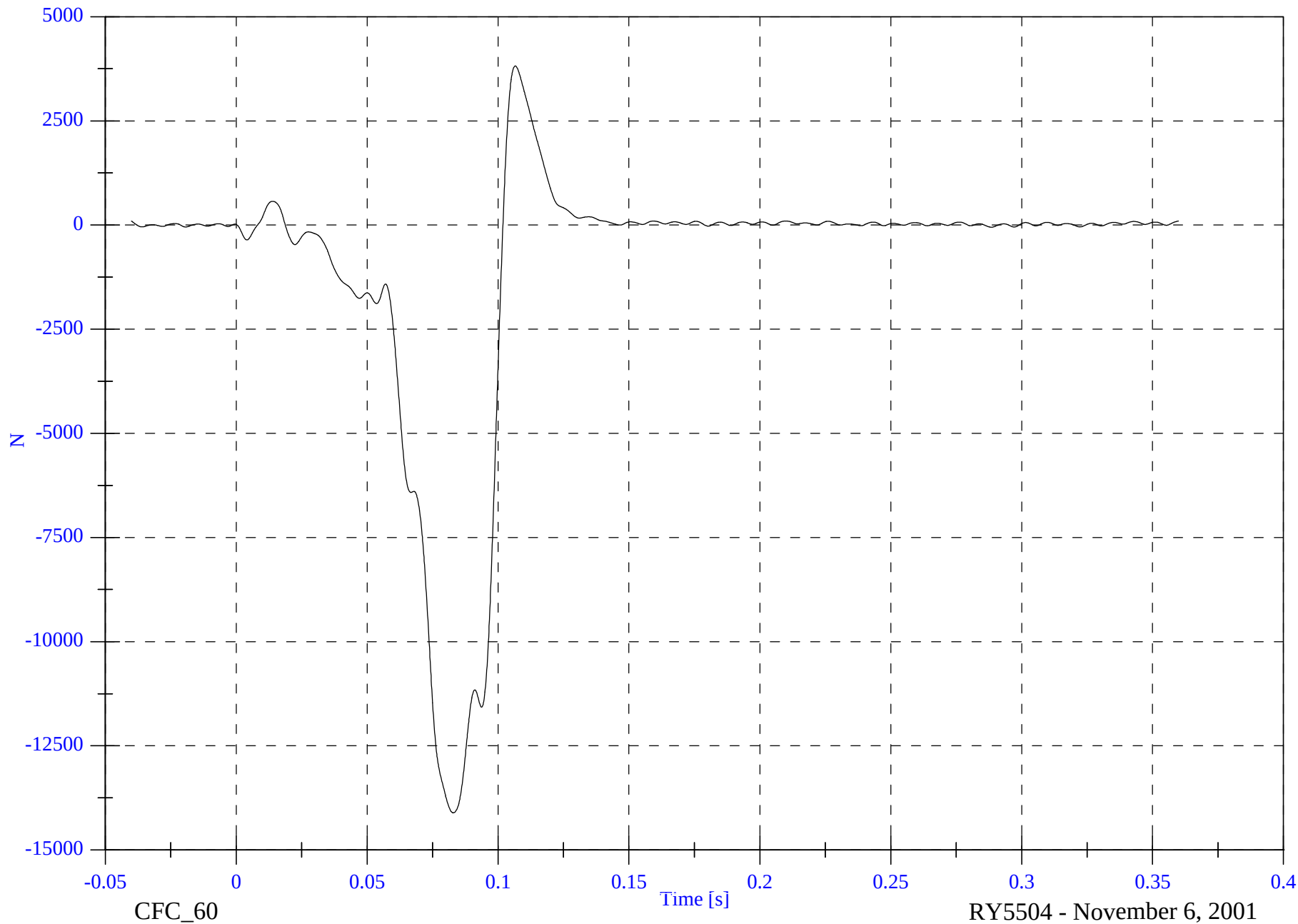


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C6 FY

Max: 3816.0 [N] at 0.107 [s]

Min: -14109.6 [N] at 0.083 [s]



B-216

8413-65

CFC\_60

Time [s]

RY5504 - November 6, 2001

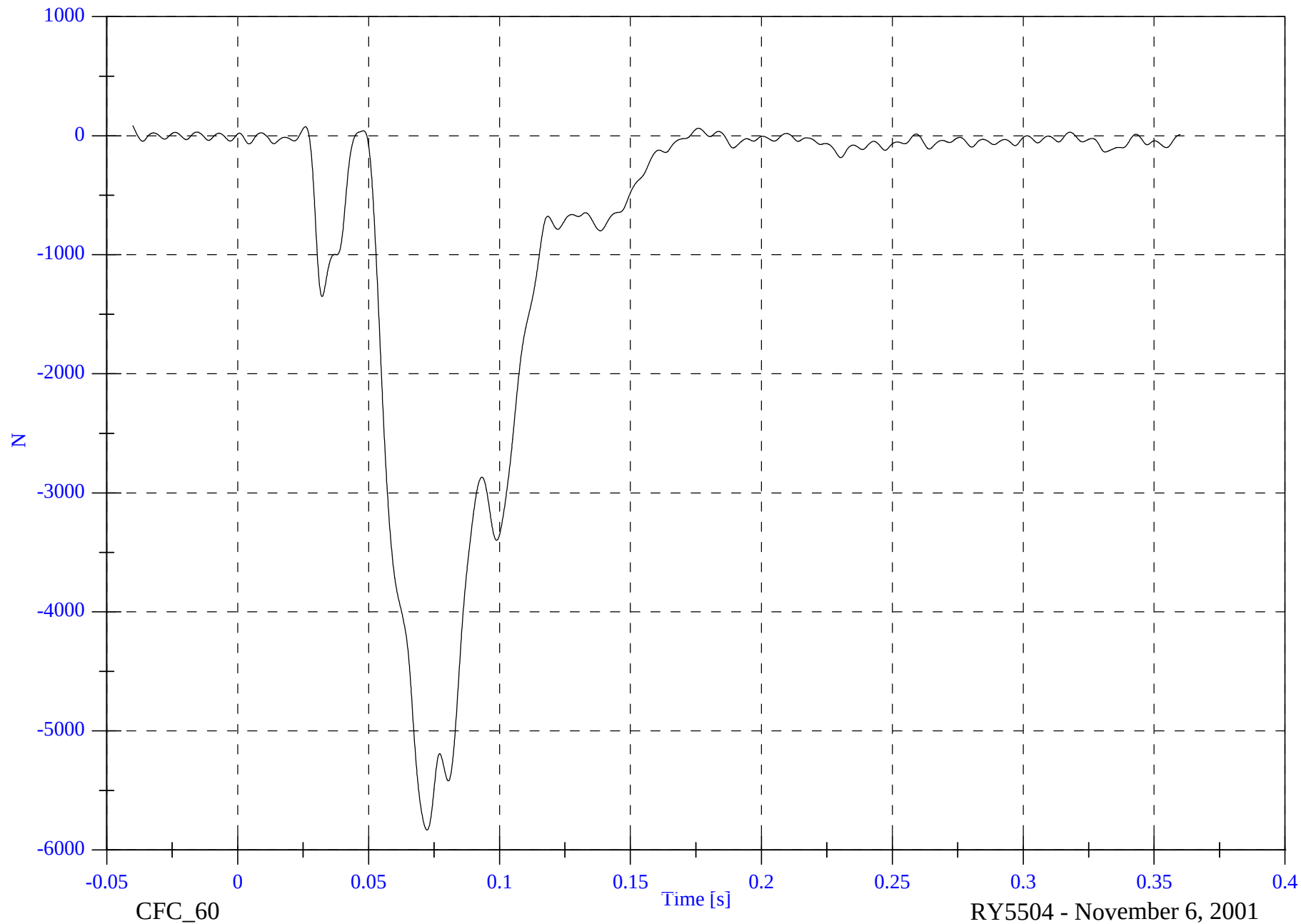


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C1 FX

Max: 83.4 [N] at -0.040 [s]

Min: -5832.6 [N] at 0.072 [s]

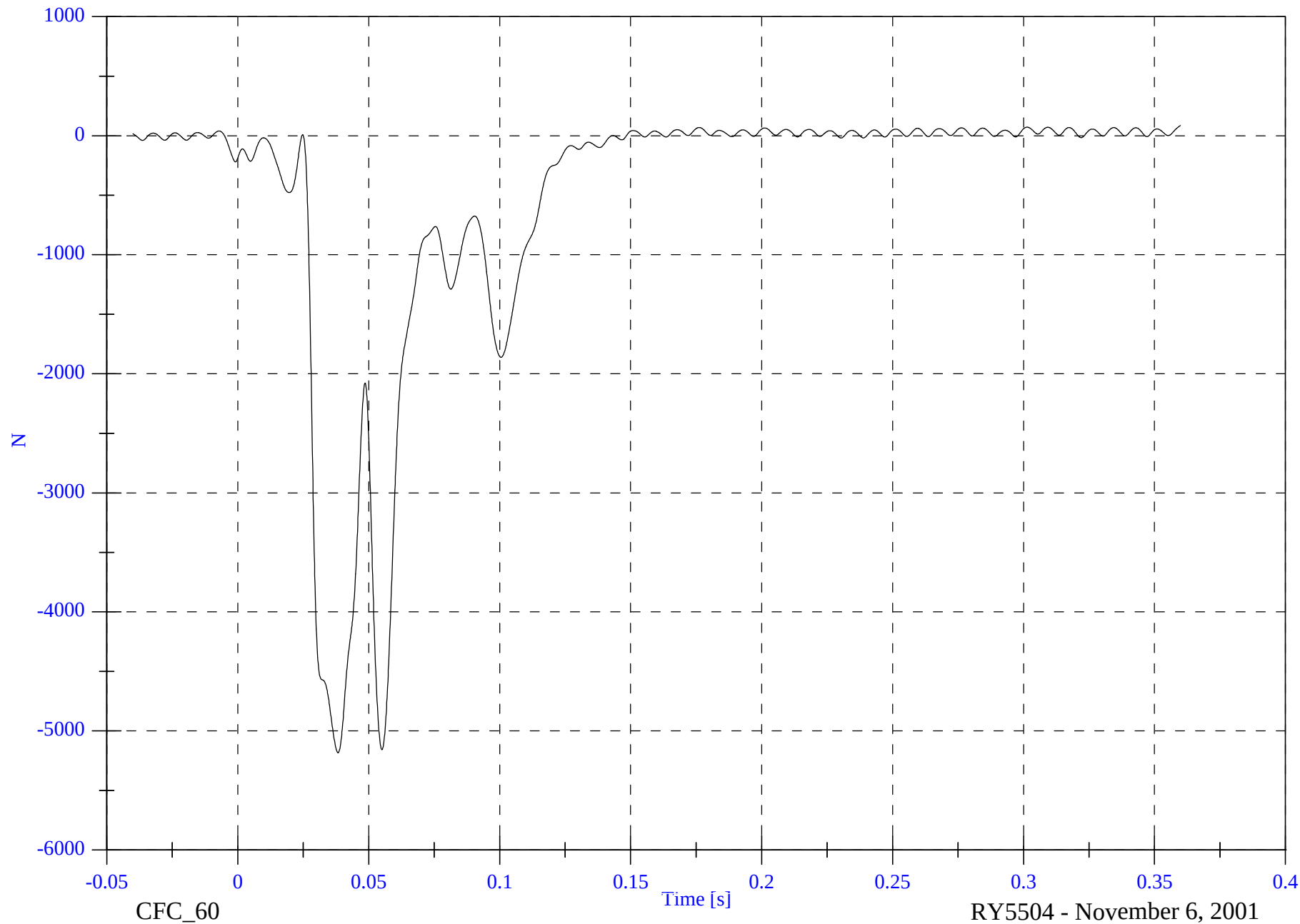


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C2 FX

Max: 86.0 [N] at 0.360 [s]

Min: -5183.3 [N] at 0.038 [s]



B-218

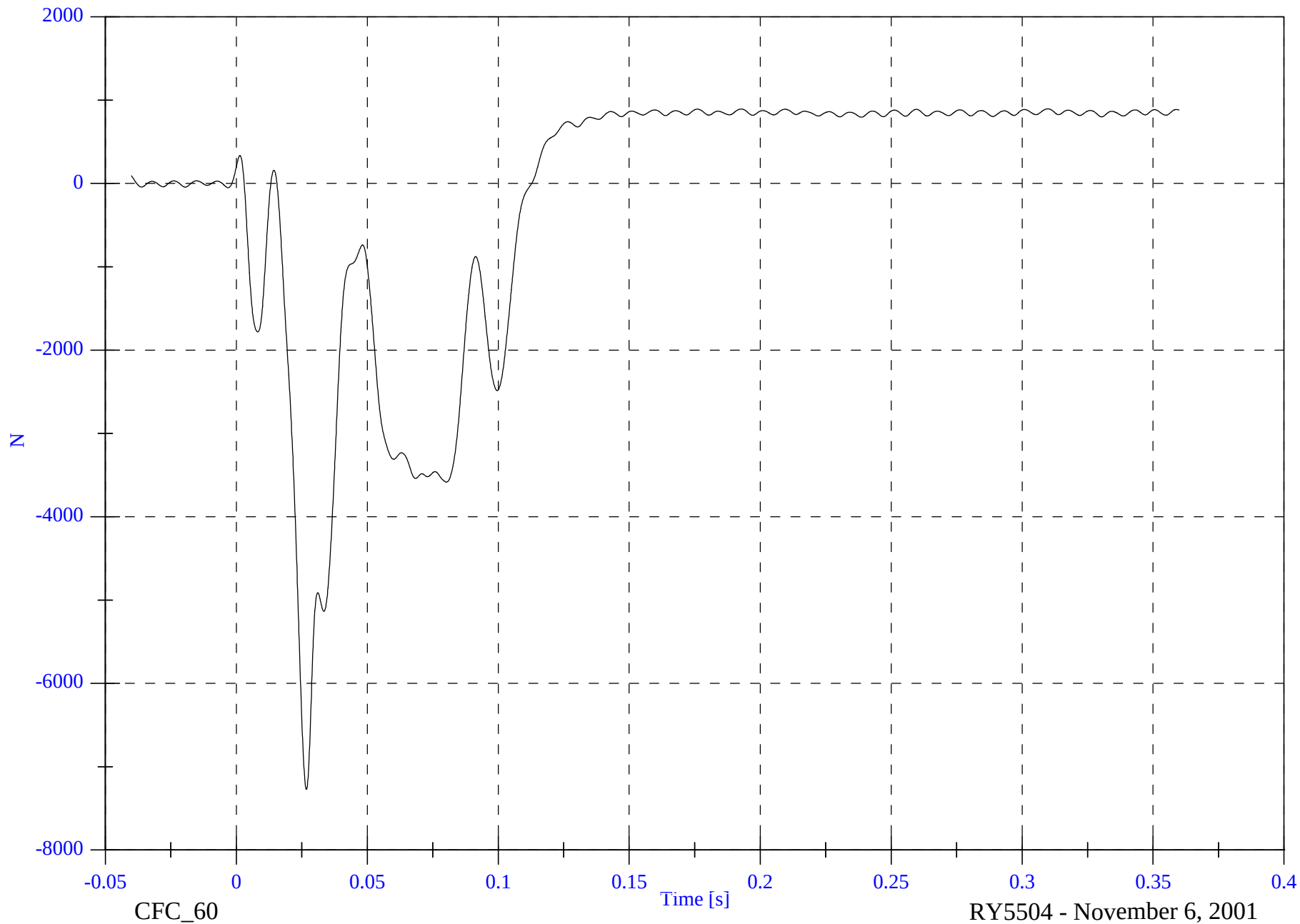
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C3 FX

Max: 894.0 [N] at 0.310 [s]

Min: -7273.1 [N] at 0.027 [s]



B-219

8413-65

CFC\_60

Time [s]

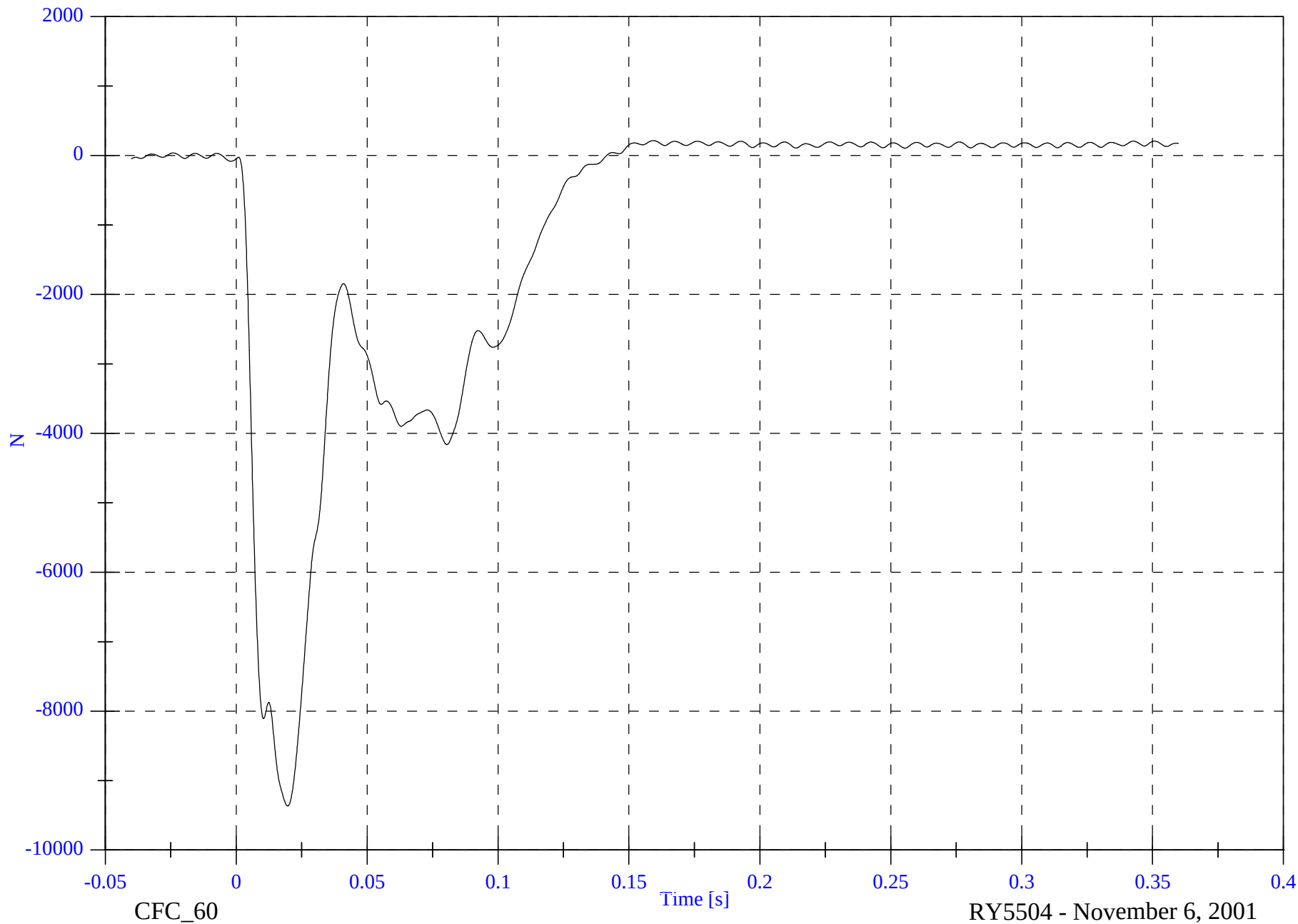
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C4 FX

Max: 215.3 [N] at 0.159 [s]

Min: -9366.7 [N] at 0.020 [s]



B-220

8413-65

CFC\_60

Time [s]

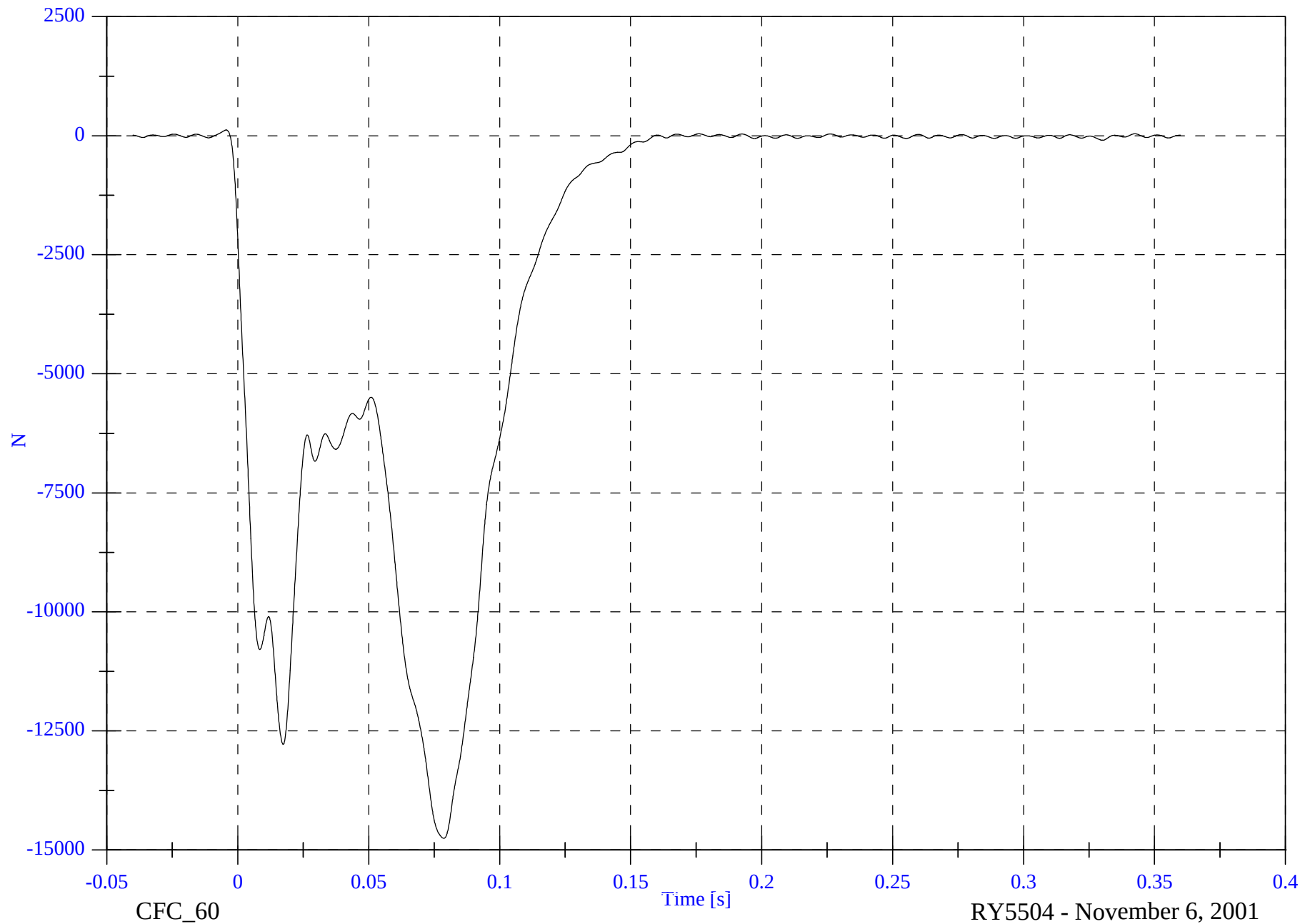
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C5 FX

Max: 120.0 [N] at -0.004 [s]

Min: -14756.6 [N] at 0.079 [s]



B-221

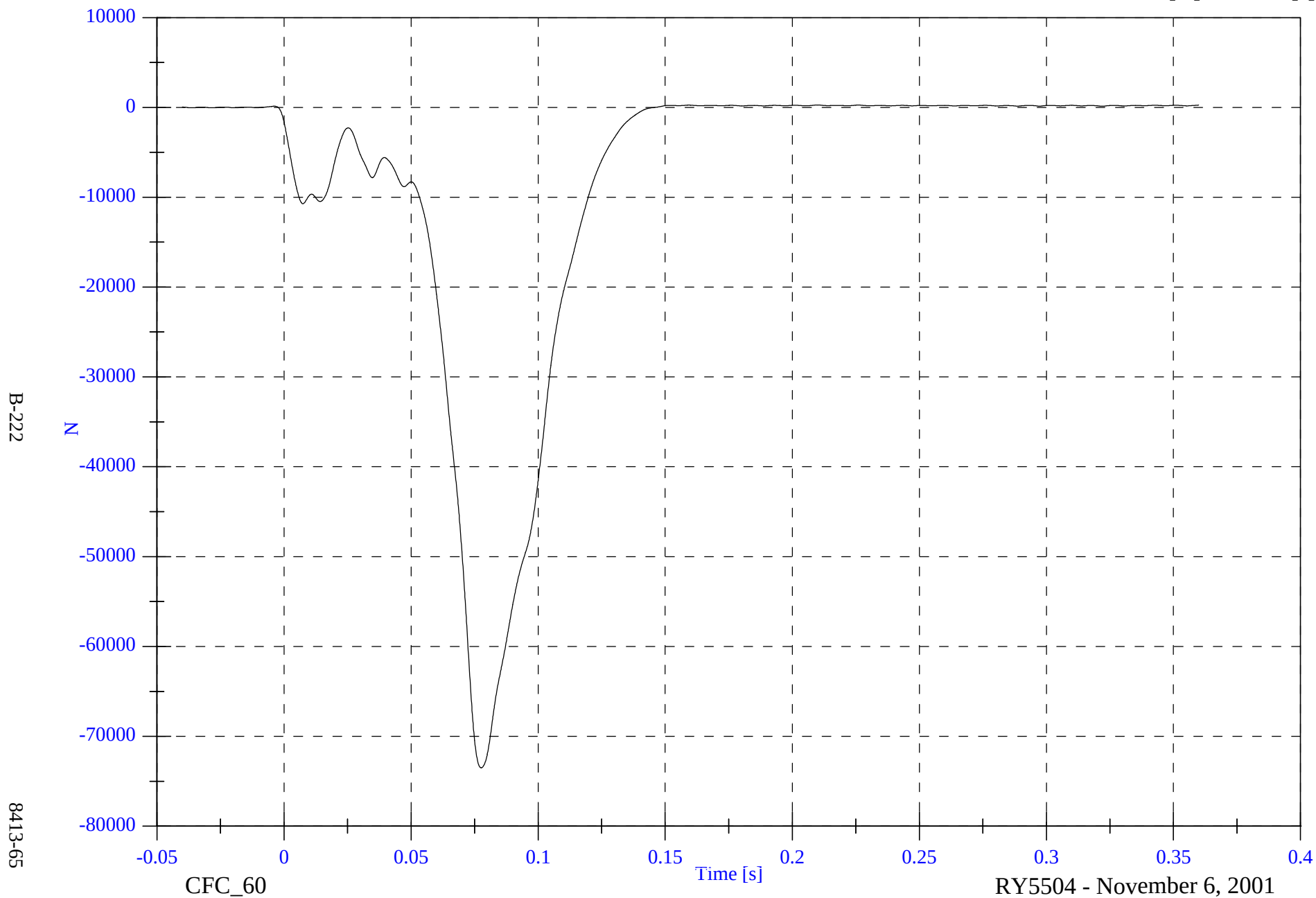
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell C6 FX

Max: 259.6 [N] at 0.210 [s]

Min: -73511.6 [N] at 0.078 [s]

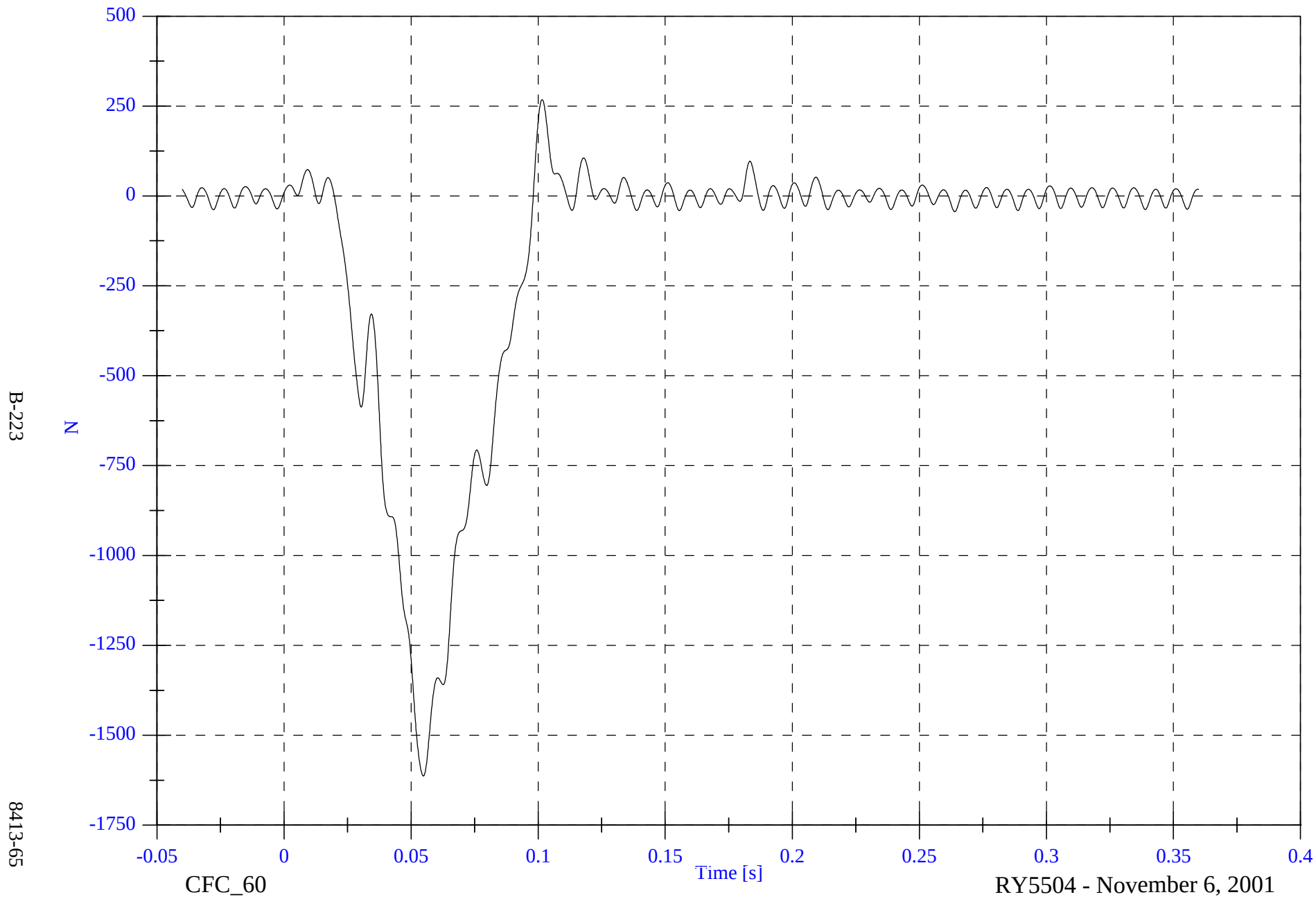


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B3 FY

Max: 268.0 [N] at 0.102 [s]

Min: -1613.3 [N] at 0.055 [s]



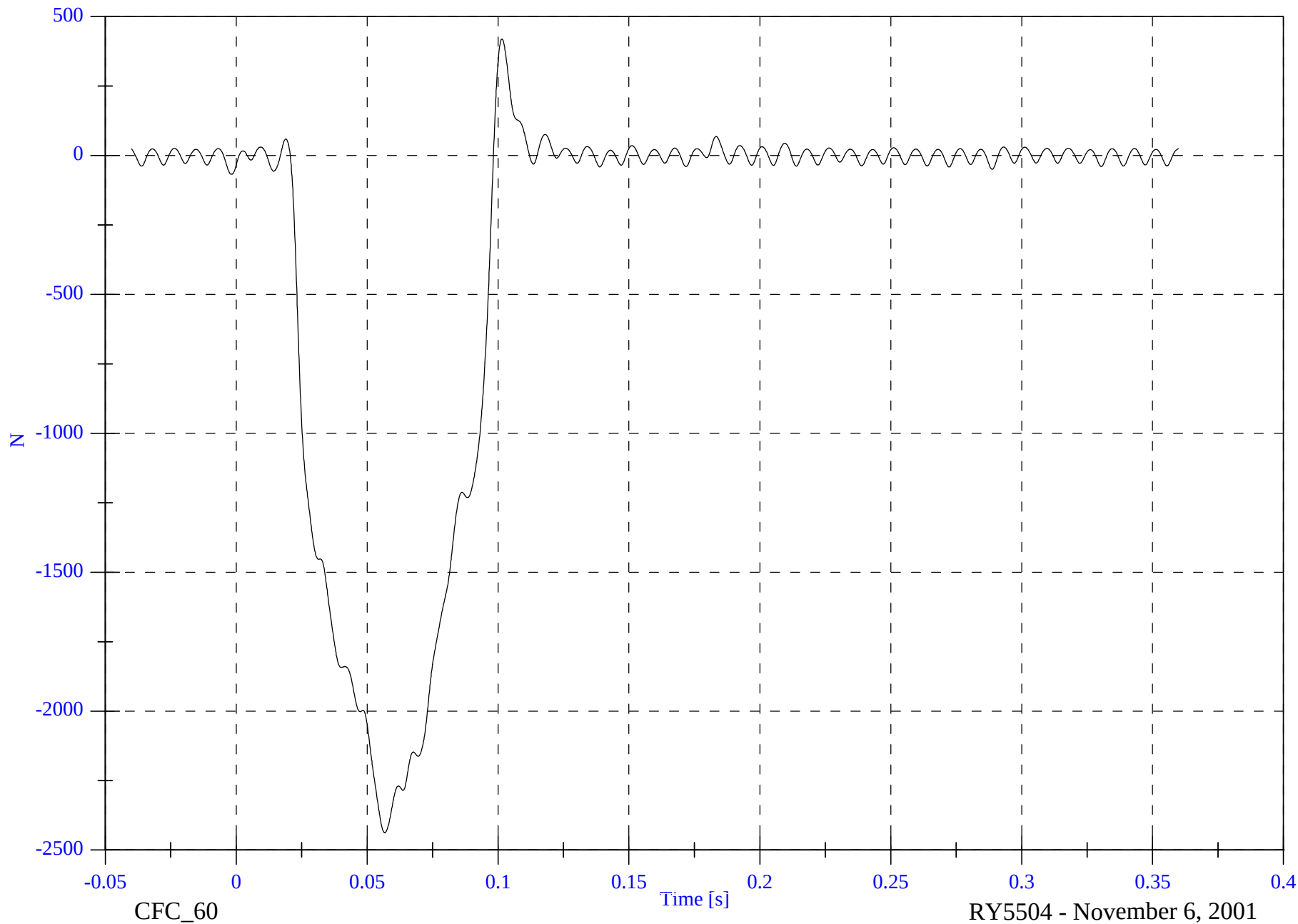


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B4 FY

Max: 419.6 [N] at 0.101 [s]

Min: -2437.7 [N] at 0.057 [s]



B-224

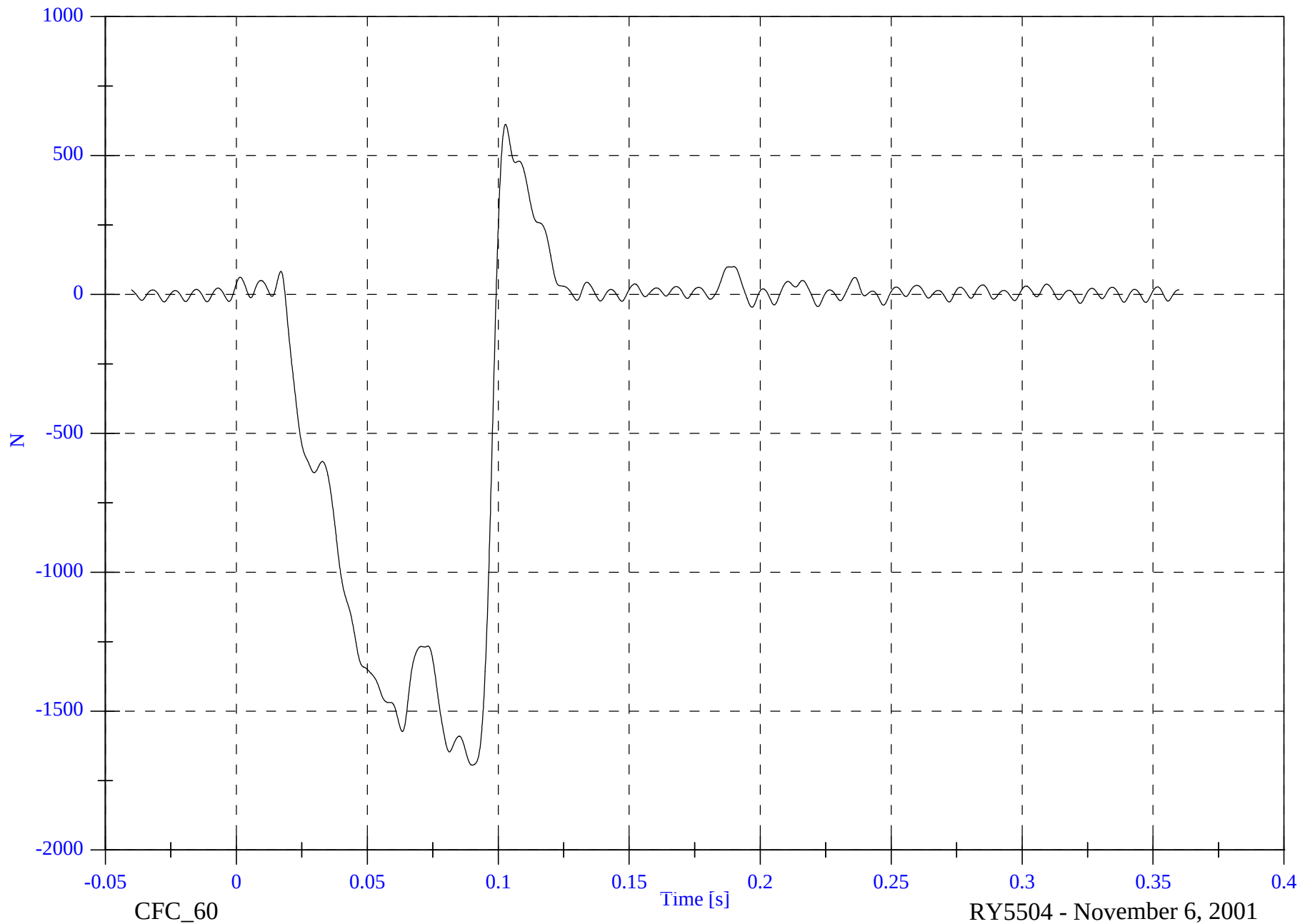
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B5 FY

Max: 612.4 [N] at 0.103 [s]

Min: -1694.6 [N] at 0.090 [s]

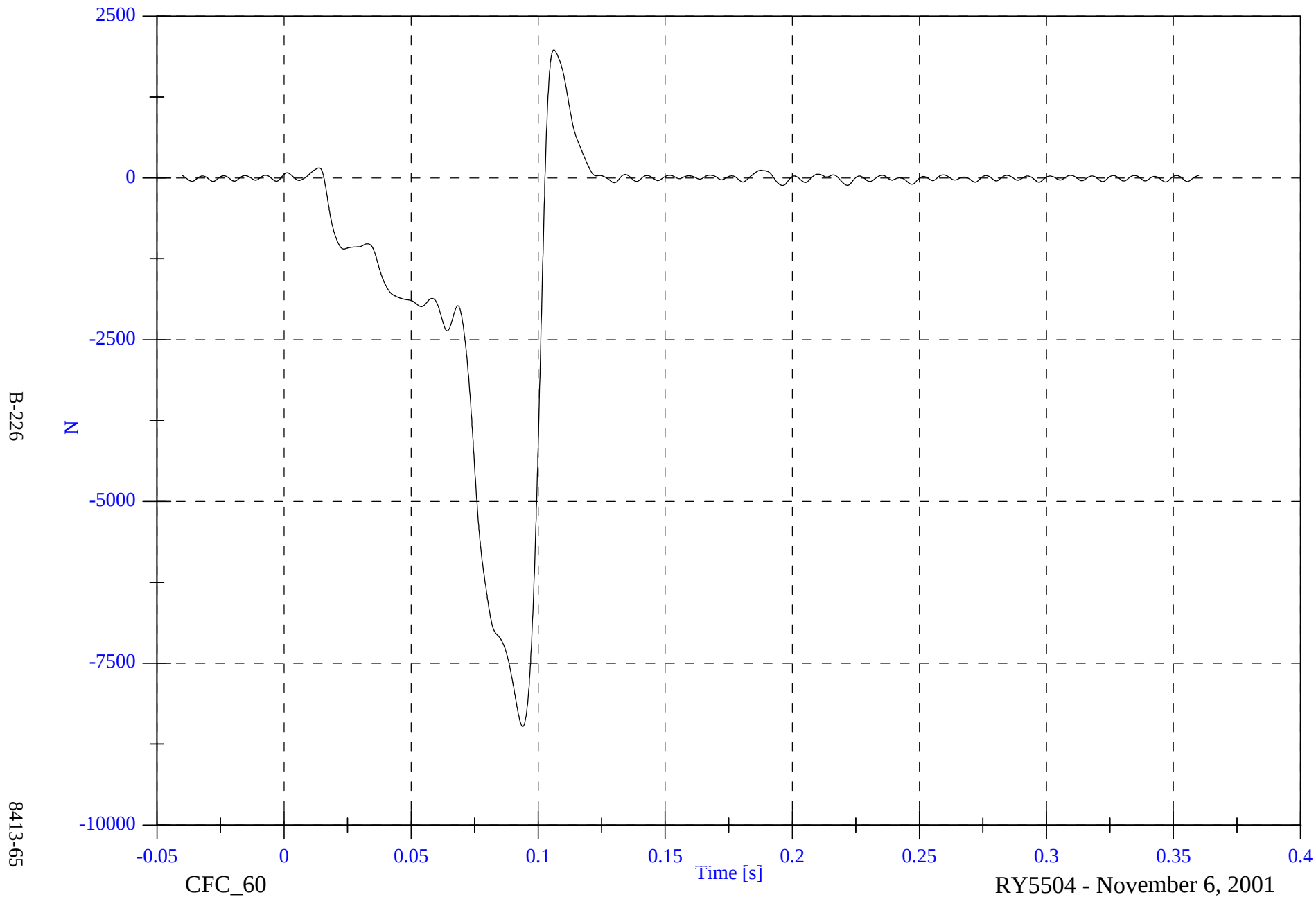


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B6 FY

Max: 1978.7 [N] at 0.106 [s]

Min: -8478.8 [N] at 0.094 [s]

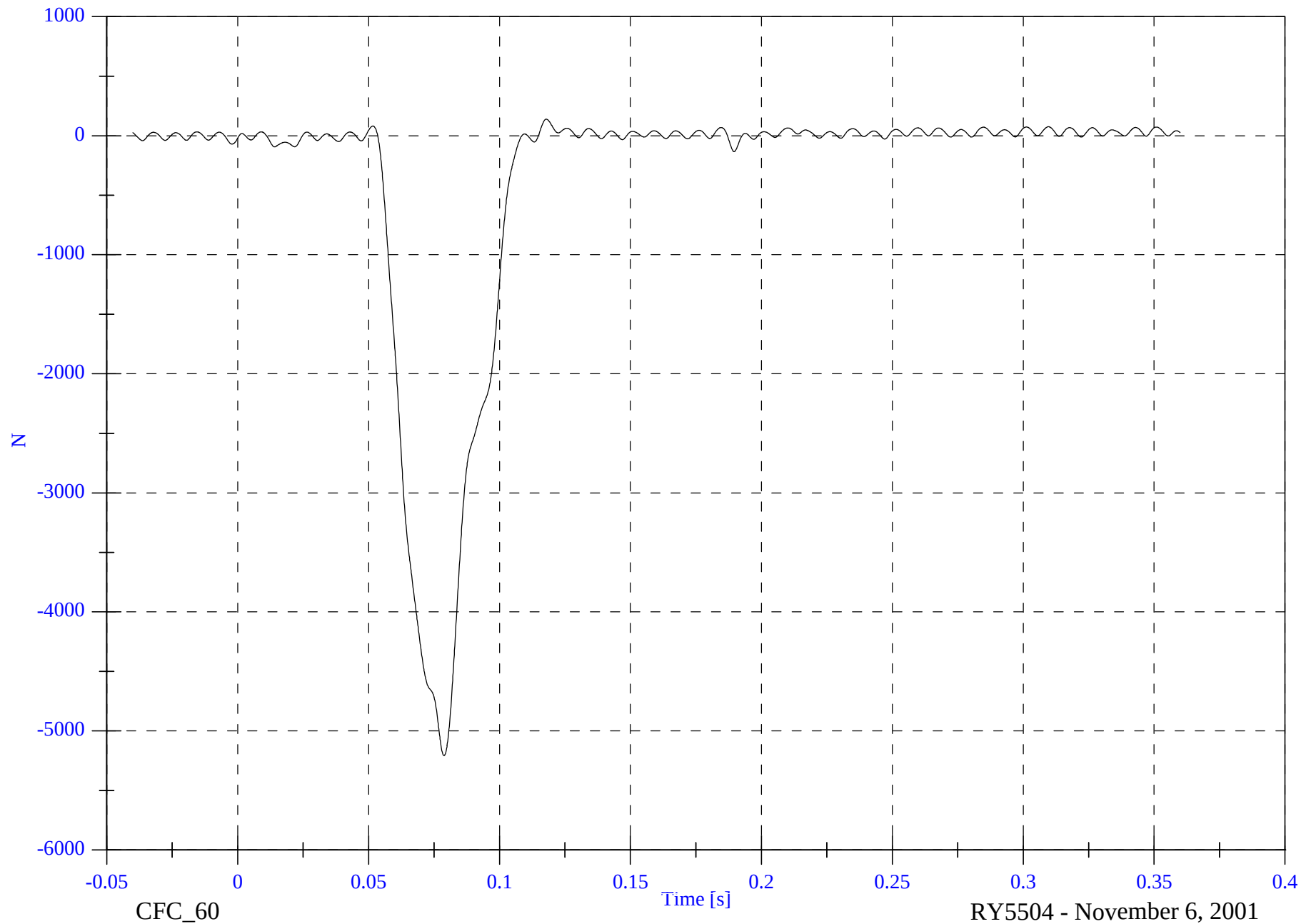


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B1 FX

Max: 139.4 [N] at 0.118 [s]

Min: -5207.7 [N] at 0.079 [s]



B-227

8413-65

CFC\_60

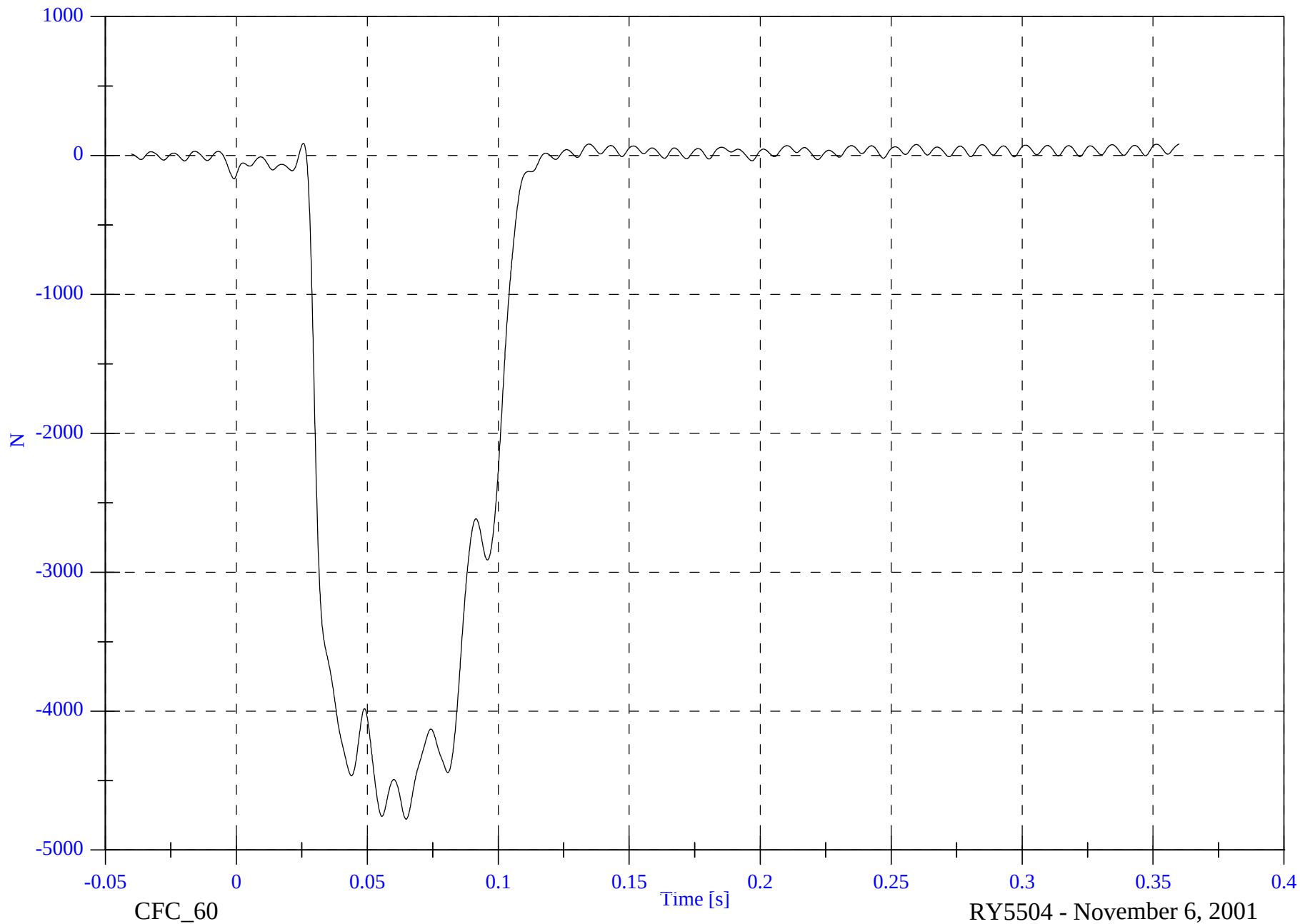
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B2 FX

Max: 87.8 [N] at 0.026 [s]

Min: -4778.2 [N] at 0.065 [s]



B-228

8413-65

CFC\_60

Time [s]

RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B3 FX

Max: 210.5 [N] at 0.118 [s]

Min: -5268.0 [N] at 0.049 [s]

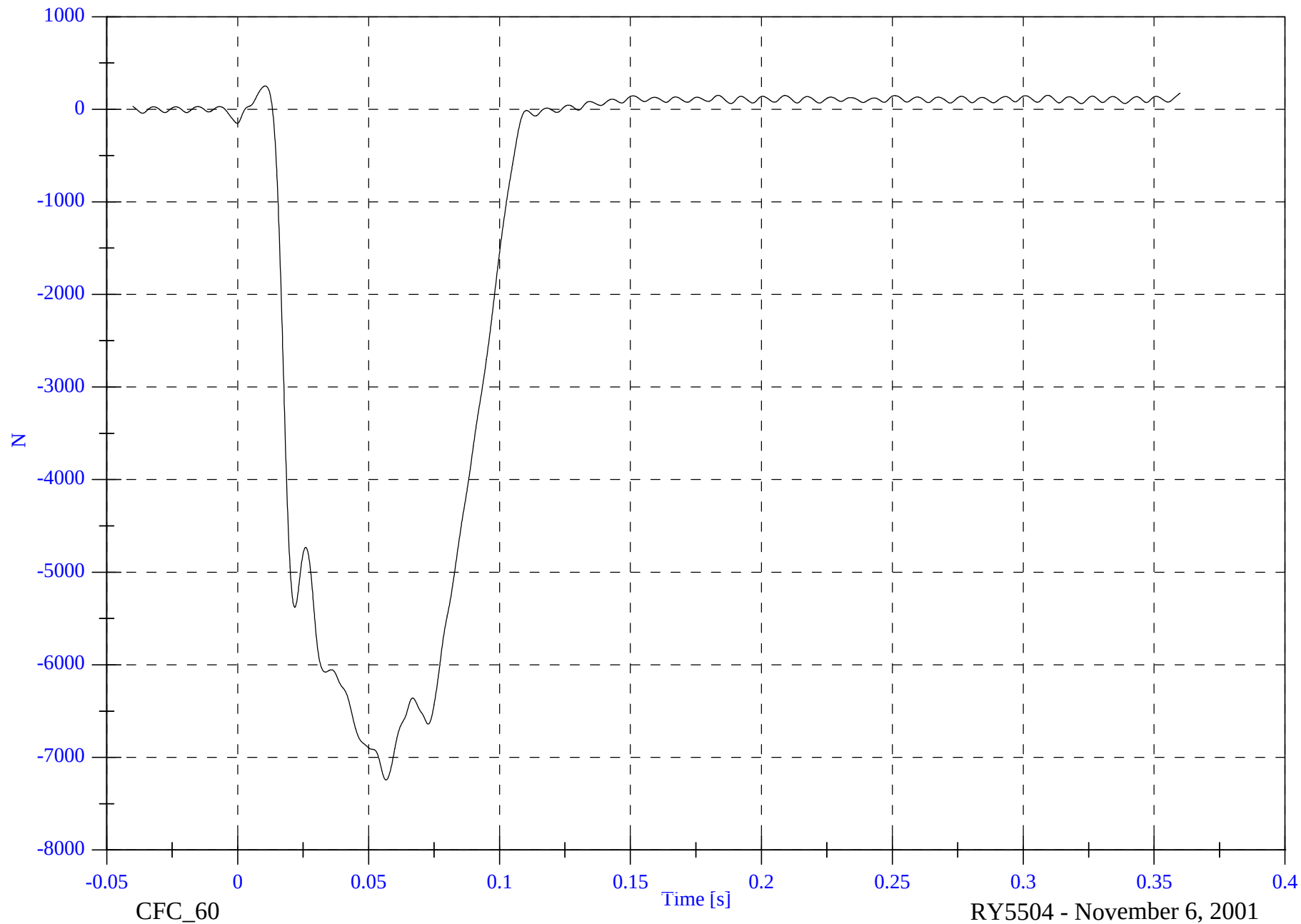


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B4 FX

Max: 251.6 [N] at 0.010 [s]

Min: -7244.0 [N] at 0.057 [s]



B-230

8413-65

CFC\_60

Time [s]

RY5504 - November 6, 2001

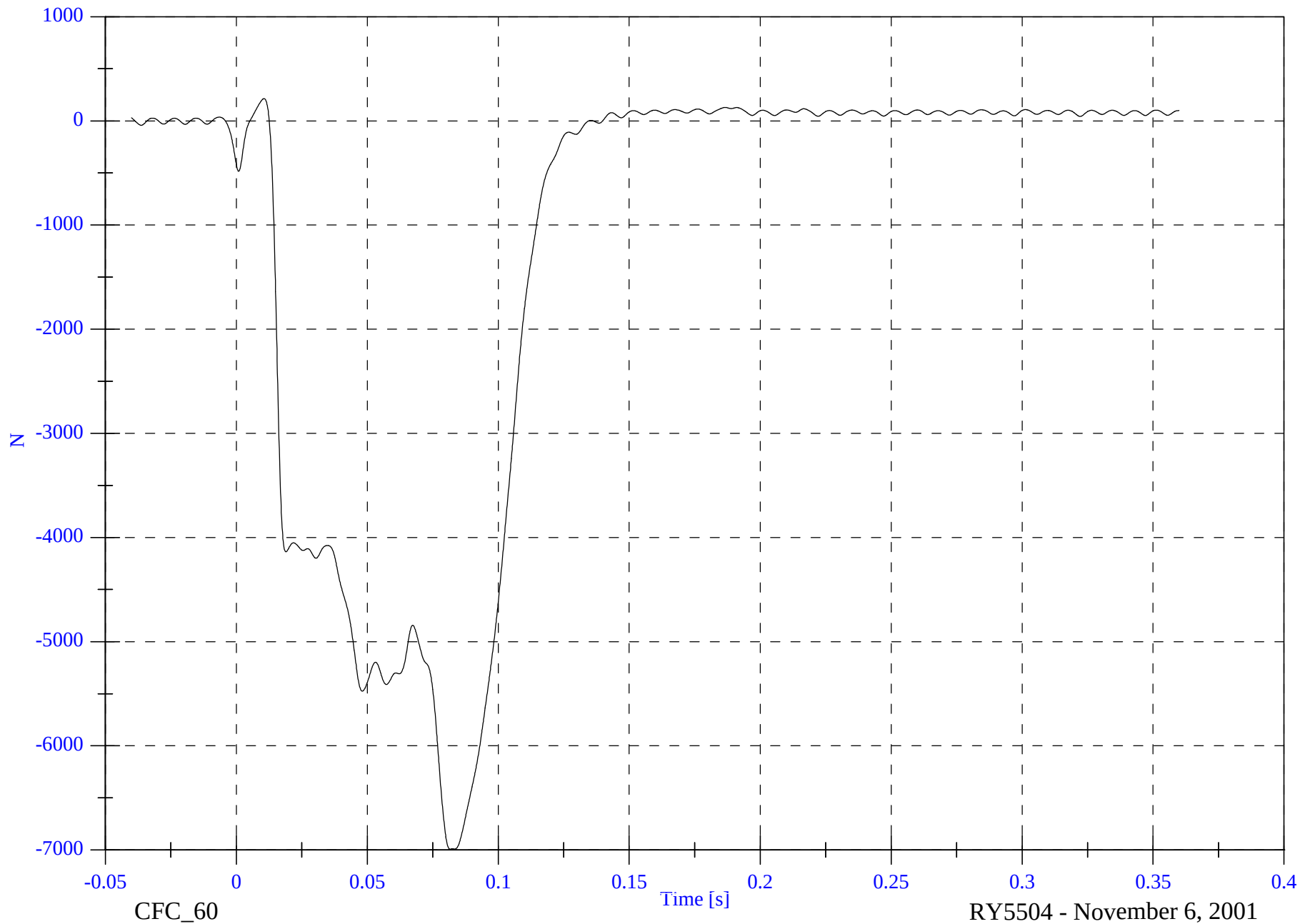


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B5 FX

Max: 213.7 [N] at 0.011 [s]

Min: -6992.7 [N] at 0.082 [s]



B-231

8413-65

CFC\_60

Time [s]

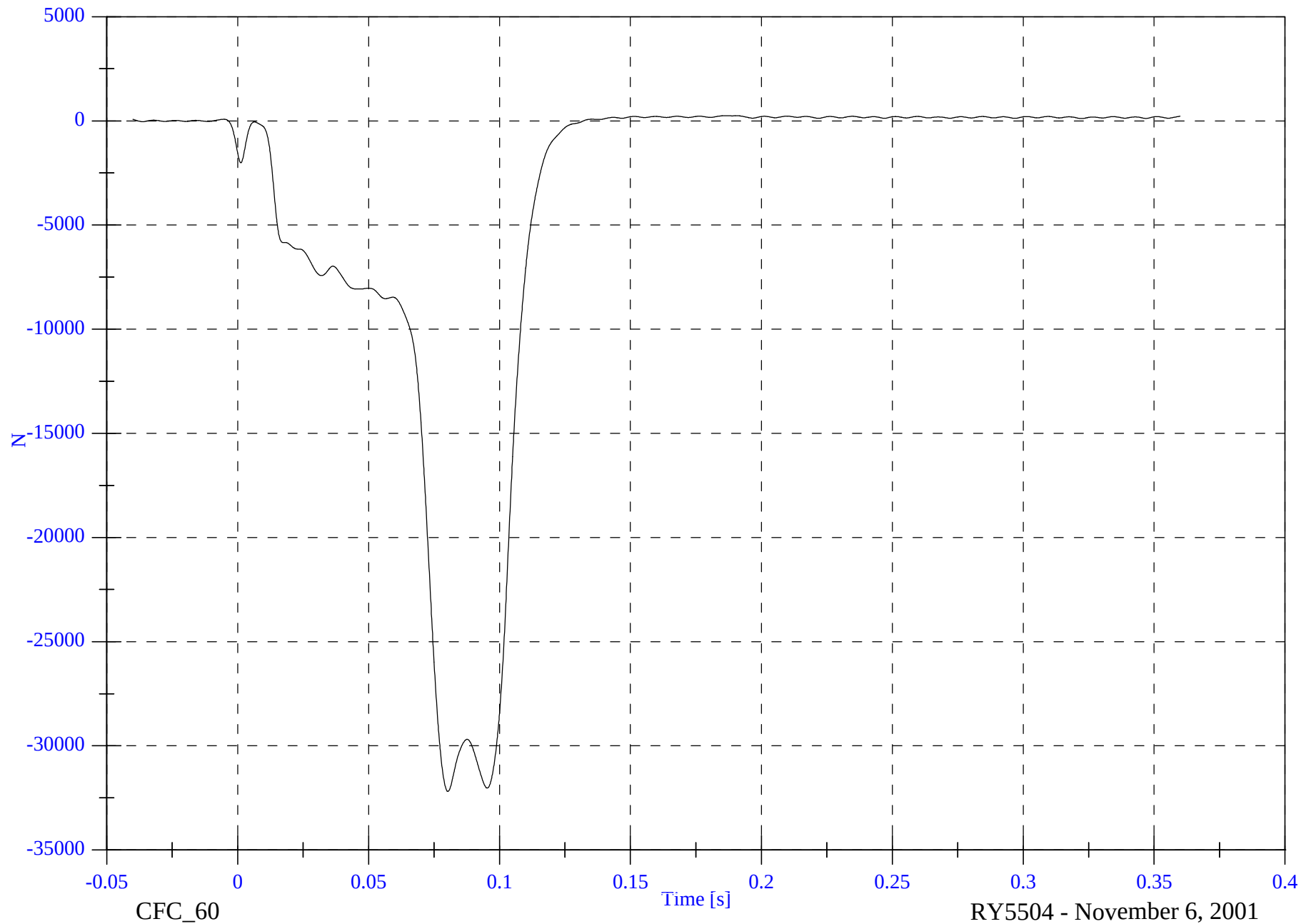
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell B6 FX

Max: 248.2 [N] at 0.186 [s]

Min: -32191.3 [N] at 0.080 [s]



B-232

8413-65

CFC\_60

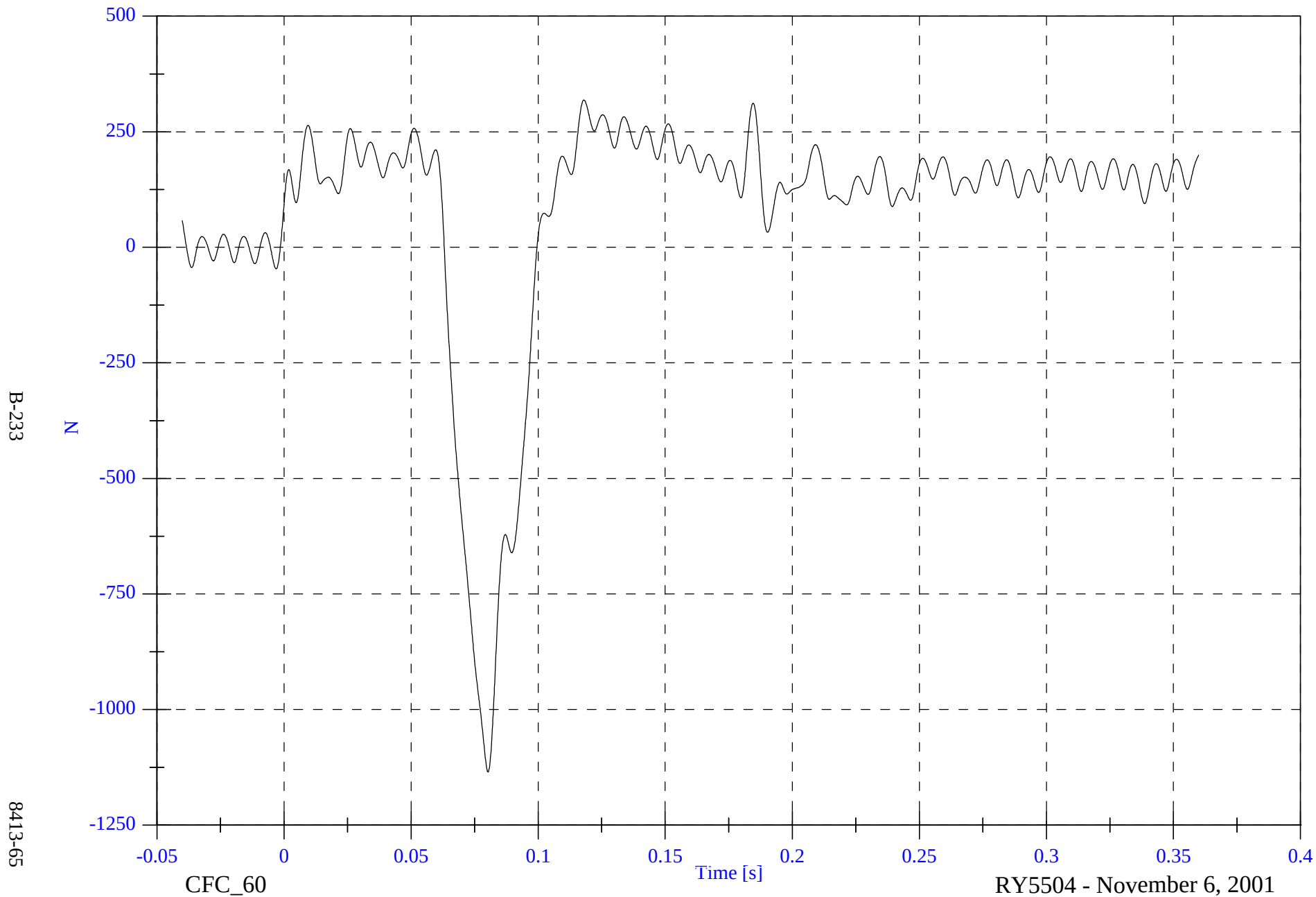
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell A1 FX

Max: 318.7 [N] at 0.118 [s]

Min: -1135.2 [N] at 0.080 [s]

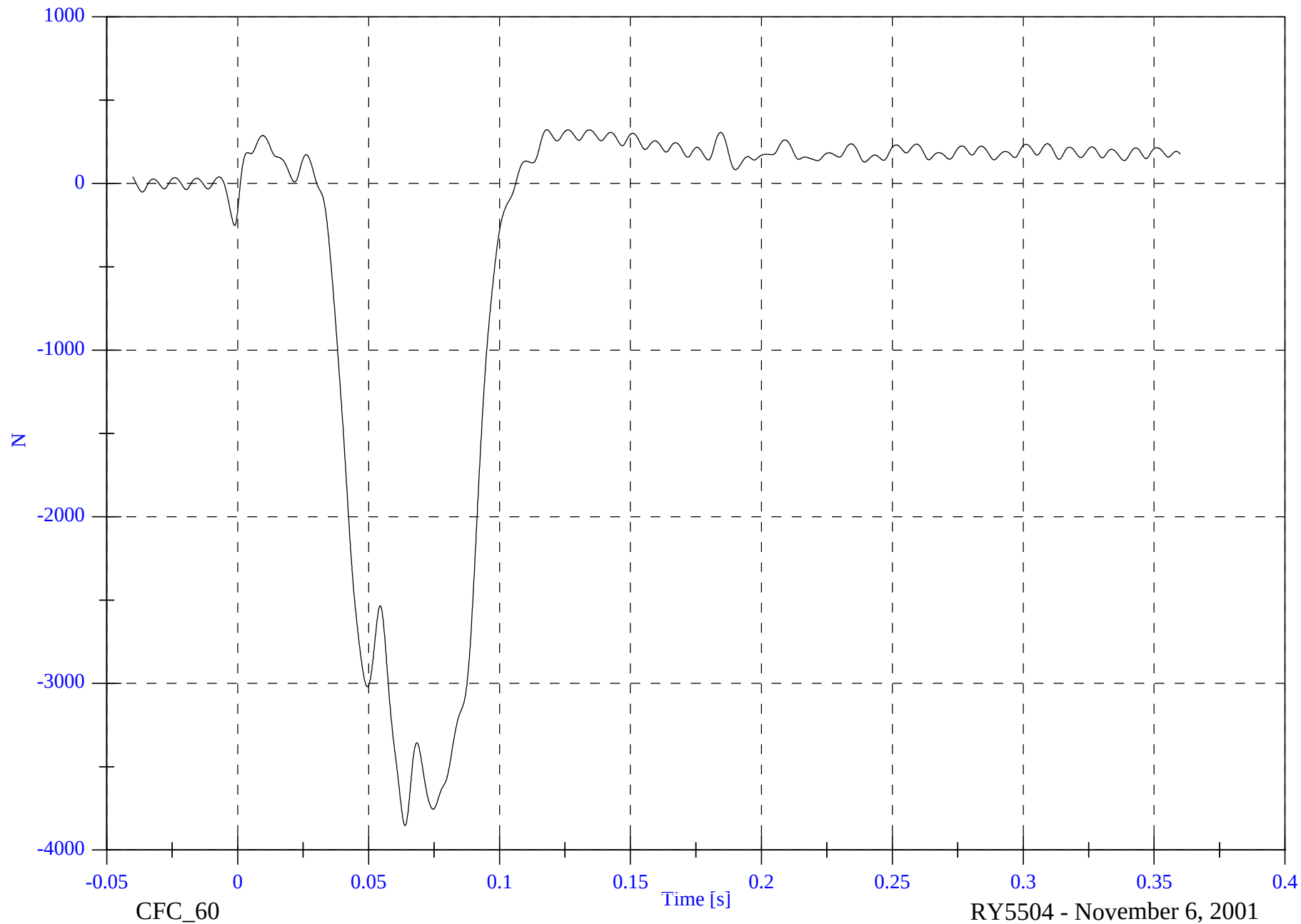


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell A2 FX

Max: 321.5 [N] at 0.118 [s]

Min: -3854.0 [N] at 0.064 [s]



B-234

8413-65

CFC\_60

Time [s]

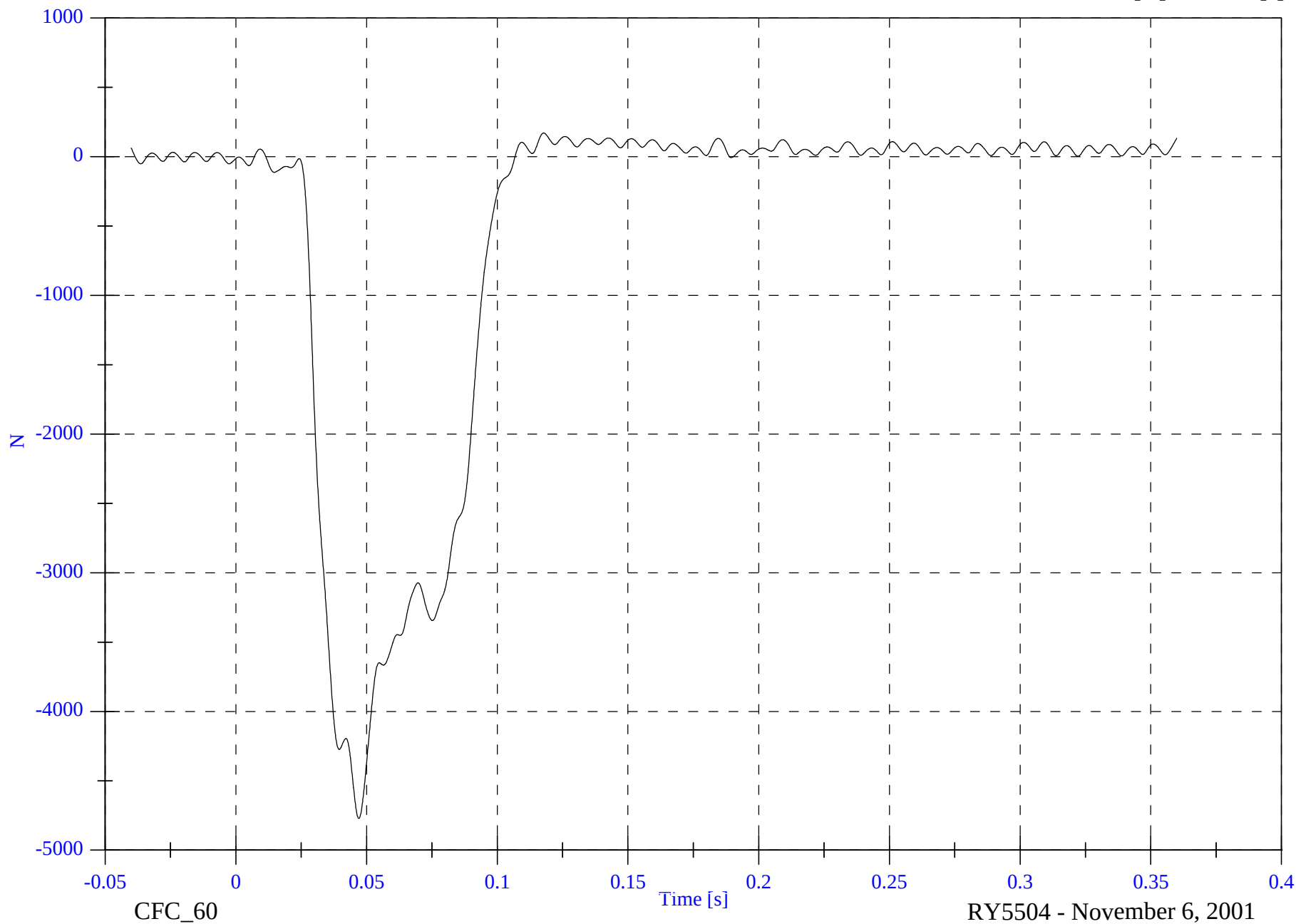
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell A3 FX

Max: 171.6 [N] at 0.118 [s]

Min: -4772.0 [N] at 0.047 [s]



B-235

8413-65

CFC\_60

Time [s]

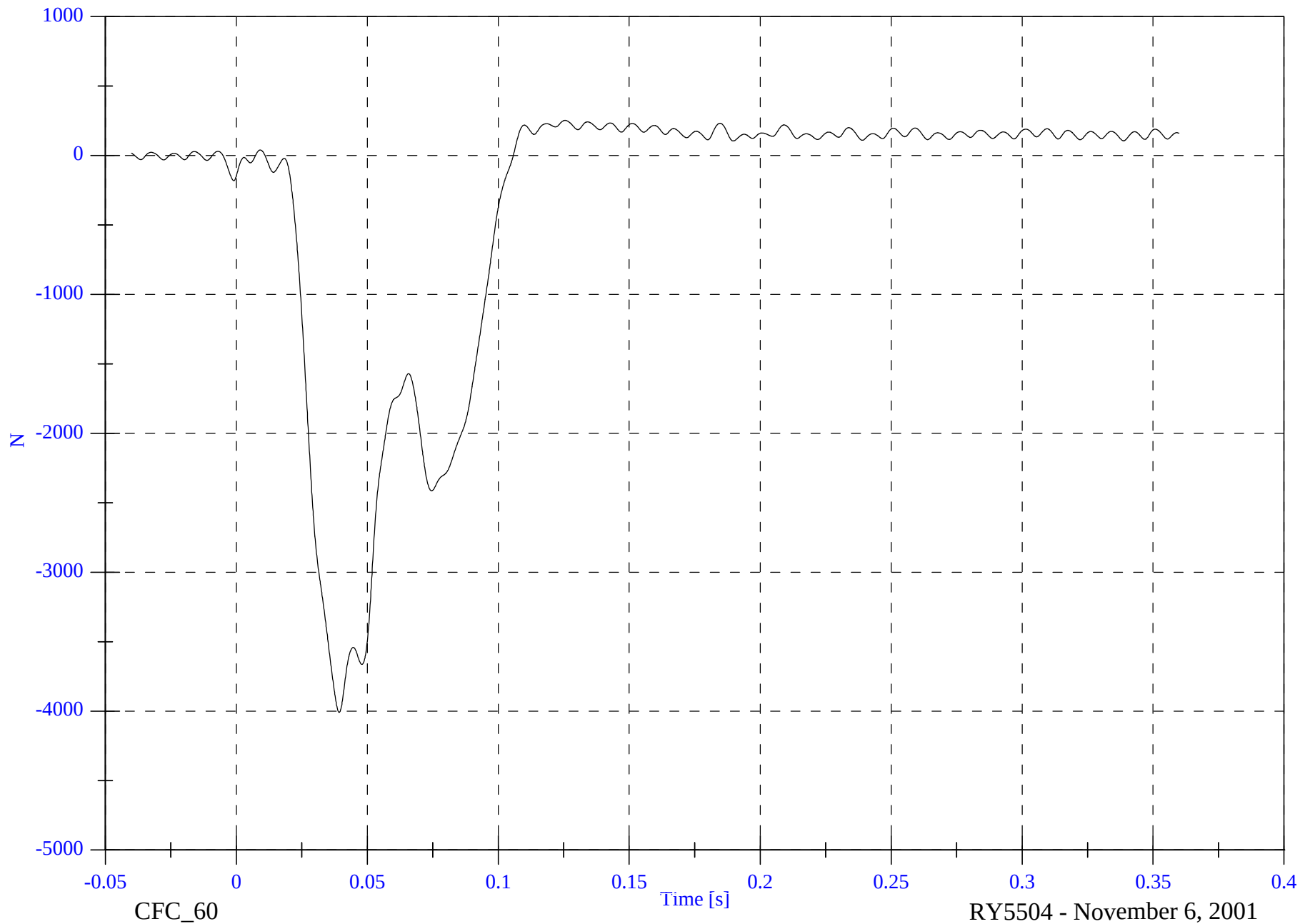
RY5504 - November 6, 2001

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell A4 FX

Max: 253.5 [N] at 0.125 [s]

Min: -4009.9 [N] at 0.039 [s]



B-236

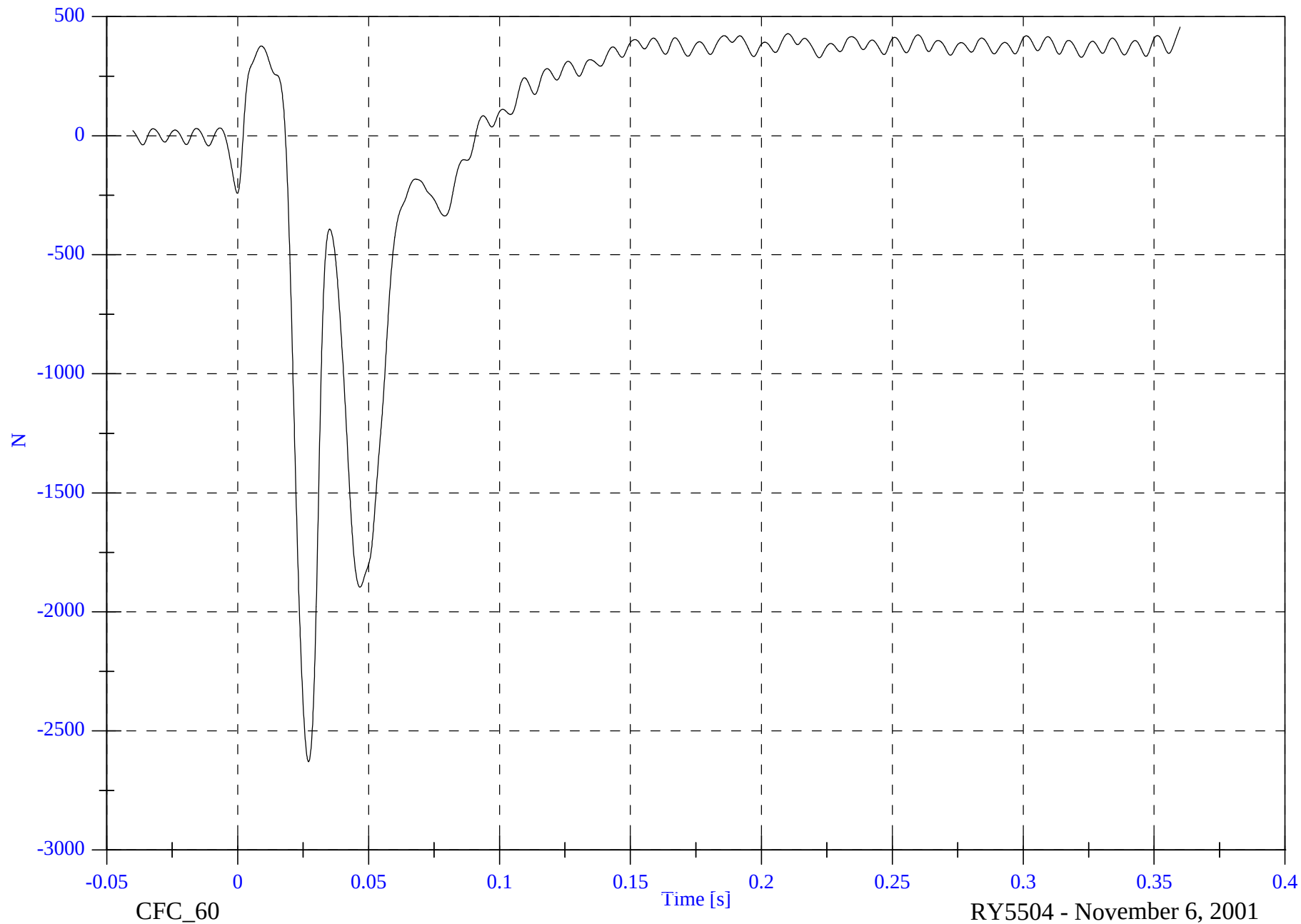
8413-65

40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell A5 FX

Max: 455.8 [N] at 0.360 [s]

Min: -2629.3 [N] at 0.027 [s]



B-237

8413-65

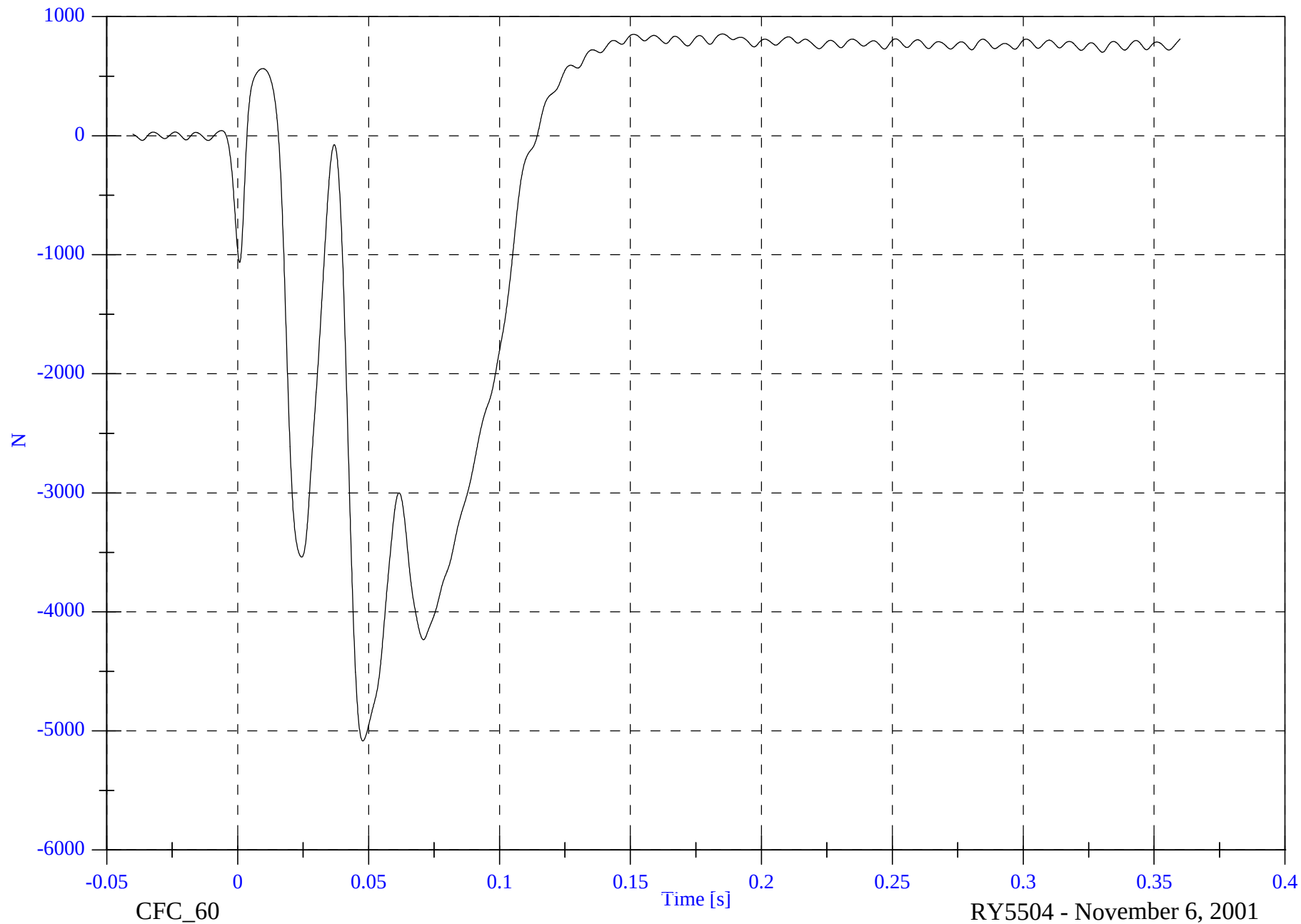


40% Frontal Offset Test #9 - 1998 Subaru Legacy

Barrier Load Cell A6 FX

Max: 854.9 [N] at 0.185 [s]

Min: -5084.3 [N] at 0.048 [s]



B-238

8413-65

## **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:

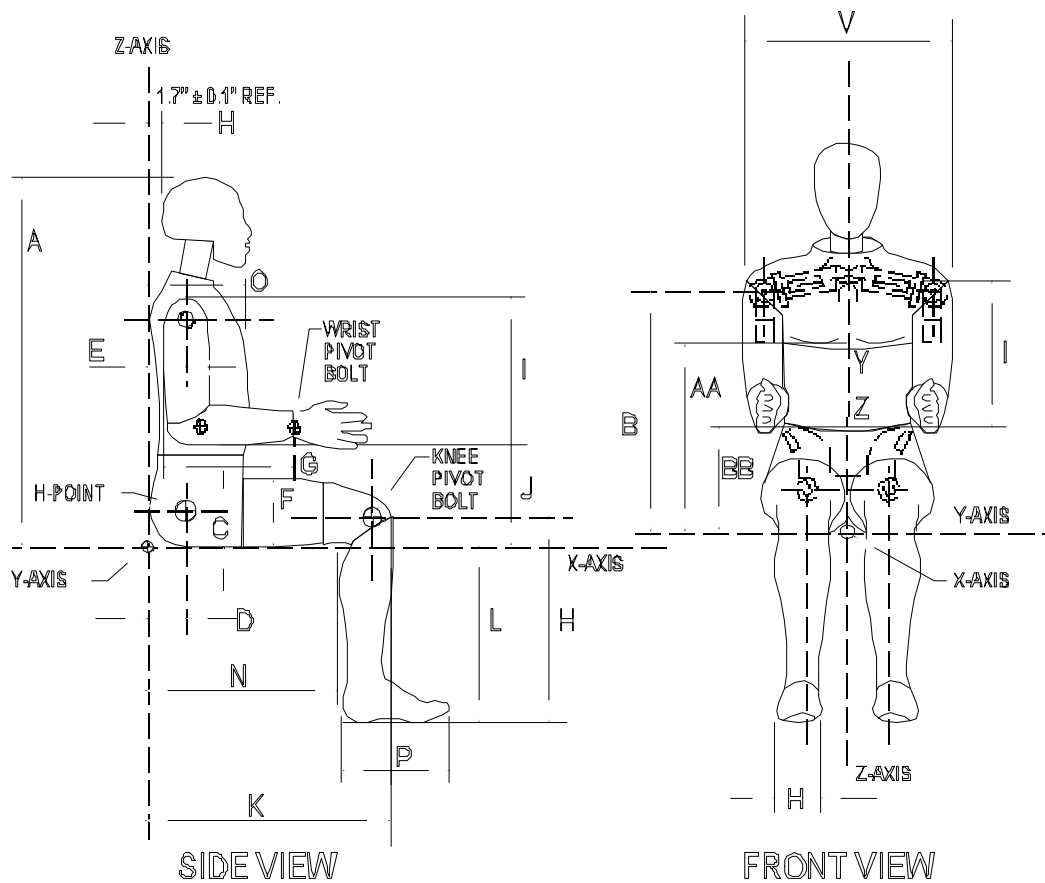
| <u>Position No./Location</u> | <u>Serial No.</u> | <u>Completion Date</u> |
|------------------------------|-------------------|------------------------|
| #1/Driver                    | 416               | October 15, 2001       |
| #2/Right Front Passenger     | 421               | October 13, 2001       |

#### 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 572O  
HEAD DROP TEST

Dummy Serial Number                      416

Sequential Test Number                      1

Date                                              October 12, 2001

Workfile                                              416C12HD1

| TEST PARAMETER                  | SPECIFICATION   | TEST RESULTS |
|---------------------------------|-----------------|--------------|
| Temperature                     | 18.9-25.6 Deg C | 21.7         |
| Relative Humidity               | 10% - 70%       | 60.0         |
| Peak Resultant Acceleration     | 250-300 G's     | 274.54       |
| Peak Lateral Acceleration       | 15 G's Max      | 0.95         |
| Is Acceleration Curve Unimodal? | YES             | YES          |

Remarks:

Laboratory Technician:                      B. Swiecicki

PART 572O  
NECK FLEXION TEST

|                        |                         |                        |
|------------------------|-------------------------|------------------------|
| Dummy Serial Number    | <u>416</u>              |                        |
| Sequential Test Number | <u>1</u>                |                        |
| Date                   | <u>October 13, 2001</u> | 6 Axis Neck Transducer |
| Workfile               | <u>416C12NF3</u>        |                        |

| TEST PARAMETER                            |       | SPECIFICATION   | TEST RESULTS |
|-------------------------------------------|-------|-----------------|--------------|
| Temperature                               |       | 20.6-22.2 Deg C | 21.7         |
| Relative Humidity                         |       | 10% - 70%       | 61.0         |
| Impact Velocity                           |       | 6.89 - 7.13 m/s | 6.99         |
| Integrated                                | 10 ms | 2.0 – 2.5 m/s   | 2.34         |
| Pendulum                                  | 20 ms | 4.0 – 5.0 m/s   | 4.82         |
| Velocity                                  | 30 ms | 5.8 – 7.0 m/s   | 6.98         |
| Peak D-Plane Rotation                     |       | 77 – 91 Deg     | 83.34        |
| Peak Moment During Rotation Interval      |       | 69 – 83 Nm      | 80.17        |
| Positive Moment Decay Time to 10 Nm Level |       | 80- 100 ms      | 87.20        |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572O  
NECK EXTENSION TEST

|                        |                         |                        |
|------------------------|-------------------------|------------------------|
| Dummy Serial Number    | <u>416</u>              |                        |
| Sequential Test Number | <u>1</u>                |                        |
| Date                   | <u>October 15, 2001</u> | 6 Axis Neck Transducer |
| Workfile               | <u>416C12NE2</u>        |                        |

| TEST PARAMETER                             |       | SPECIFICATION   | TEST RESULTS |
|--------------------------------------------|-------|-----------------|--------------|
| Temperature                                |       | 20.6-22.2 Deg C | 21.7         |
| Relative Humidity                          |       | 10% - 70%       | 41.0         |
| Impact Velocity                            |       | 5.95 – 6.19 m/s | 6.14         |
| Integrated                                 | 10 ms | 1.5 – 1.9 m/s   | 1.77         |
| Pendulum                                   | 20 ms | 3.1 – 3.9 m/s   | 3.52         |
| Velocity                                   | 30 ms | 4.6 – 5.6 m/s   | 5.18         |
| Peak D-Plane Rotation                      |       | 99 – 114 Deg    | 105.74       |
| Peak Moment During Rotation Interval       |       | -53 - -65 Nm    | -59.35       |
| Positive Moment Decay Time to -10 Nm Level |       | 94 - 114 ms     | 103.36       |

Remarks:

Laboratory Technician: B. Swiecicki



PART 572O  
THORAX IMPACT TEST

|                        |                         |
|------------------------|-------------------------|
| Dummy Serial Number    | <u>416</u>              |
| Sequential Test Number | <u>1</u>                |
| Date                   | <u>October 15, 2001</u> |
| Workfile               | <u>416C12TH1</u>        |

| TEST PARAMETER                           | SPECIFICATION     | TEST RESULTS |
|------------------------------------------|-------------------|--------------|
| Temperature                              | 20.6 – 22.2 Deg C | 21.7         |
| Relative Humidity                        | 10% - 70%         | 41.0         |
| Pendulum Velocity                        | 6.59 – 6.83 m/s   | 6.65         |
| Maximum Deflection                       | 50 – 58 mm        | 56.6         |
| Maximum Resistive Force                  | 3900 – 4400 N     | 4380.0       |
| Internal Hysteresis                      | 69 - 85 %         | 73.9         |
| Peak Force During 18 to 50 mm Deflection | = 105%            | 94           |

Remarks:

|                        |                     |
|------------------------|---------------------|
| Laboratory Technician: | <u>B. Swiecicki</u> |
|------------------------|---------------------|

## PART 572O

### KNEE IMPACT TEST

|                        |                            |
|------------------------|----------------------------|
| Dummy Serial Number    | <b>416</b>                 |
| Sequential Test Number | <b>1</b>                   |
| Date                   | <b>October 12, 2001</b>    |
| Workfile               | <b>416C12LK1/416C12RK1</b> |

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS |
|------------------------|-------------------|--------------|
| LEFT KNEE              |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 63.0         |
| Probe Velocity         | 2.07 – 2.13 m/s   | 2.10         |
| Peak Knee Impact Force | 3450 – 4060 N     | 3984.3       |
| RIGHT KNEE             |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 62.0         |
| Probe Velocity         | 2.07 – 2.13 m/s   | 2.10         |
| Peak Knee Impact Force | 3450 – 4060 N     | 3784.0       |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572O  
KNEE SLIDER TEST

|                        |                            |
|------------------------|----------------------------|
| Dummy Serial Number    | <u>416</u>                 |
| Sequential Test Number | <u>1</u>                   |
| Date                   | <u>October 12, 2001</u>    |
| Workfile               | <u>416C12LS1/416C12RS1</u> |

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS |
|------------------------|-------------------|--------------|
| <b>LEFT KNEE</b>       |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 60.0         |
| Pendulum Velocity      | 2.70 – 2.80 m/s   | 2.70         |
| Peak Displacement      | 12.7 – 15.5 mm    | 14.3         |
| <b>RIGHT KNEE</b>      |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 65.0         |
| Probe Velocity         | 2.70 – 2.80 m/s   | 2.70         |
| Peak Knee Impact Force | 12.7 – 15.5 mm    | 14.3         |

Remarks:

|                        |                     |
|------------------------|---------------------|
| Laboratory Technician: | <u>B. Swiecicki</u> |
|------------------------|---------------------|

PART 572O  
EXTERNAL DIMENSIONS

Dummy Serial Number                      416  
Sequential Test Number                      1  
Date                                              October 15, 2001

| TEST PARAMETER                    |    | SPECIFICATION    | TEST RESULTS |
|-----------------------------------|----|------------------|--------------|
| Total Sitting Height              | A  | 774.7 – 800.1 mm | 782.32       |
| Shoulder Pivot Height             | B  | 431.8 – 457.2 mm | 447.04       |
| H-Point Height                    | C  | 81.3 – 86.3 mm   | 83.82        |
| H-Point from Backline             | D  | 144.8 – 149.8 mm | 149.86       |
| Shoulder Pivot from Backline      | E  | 68.6 – 83.8 mm   | 73.66        |
| Thigh Clearance                   | F  | 119.4 – 134.6 mm | 129.54       |
| Back of Elbow to Wrist Pivot      | G  | 243.9 – 259.1 mm | 256.54       |
| Skull Cap to Backline             | H  | 40.7 – 45.7 mm   | 45.72        |
| Shoulder - Elbow Length           | I  | 276.8 – 297.2 mm | 294.64       |
| Elbow Rest Height                 | J  | 182.8 – 203.2 mm | 190.5        |
| Buttock Knee Length               | K  | 520.7 – 546.1 mm | 546.1        |
| Popliteal Height                  | L  | 355.6 – 376 mm   | 373.38       |
| Knee Pivot Height                 | M  | 393.7 – 419.1 mm | 403.86       |
| Buttock Popliteal Length          | N  | 414 – 439.4 mm   | 419.1        |
| Chest Depth                       | O  | 175.3 – 190.5 mm | 185.42       |
| Foot Length                       | P  | 218.5 – 233.7 mm | 228.6        |
| Buttock to Knee Pivot Length      | R  | 457.2 – 482.6 mm | 467.36       |
| Head Breadth                      | S  | 137.1 – 147.3 mm | 142.24       |
| Head Depth                        | T  | 177.8 – 188 mm   | 185.42       |
| Hip Breadth                       | U  | 299.7 – 314.9 mm | 307.34       |
| Shoulder Breadth                  | V  | 350.5 – 365.7 mm | 353.06       |
| Foot Breadth                      | W  | 78.8 – 94 mm     | 88.9         |
| Head Circumference                | X  | 528.3 – 548.7 mm | 538.48       |
| Chest Circumference (With Jacket) | Y  | 850.9 – 881.3 mm | 863.6        |
| Waist Circumference               | Z  | 759.5 – 789.9 mm | 777.24       |
| Location for Chest Circumference  | AA | 299.7 – 309.9 mm | 304.8        |
| Location for Waist Circumference  | BB | 160 – 170.2 mm   | 165.1        |

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572O  
HEAD DROP TEST

|                        |                         |
|------------------------|-------------------------|
| Dummy Serial Number    | <u>421</u>              |
| Sequential Test Number | <u>1</u>                |
| Date                   | <u>October 12, 2001</u> |
| Workfile               | <u>421C05HD1</u>        |

| TEST PARAMETER                  | SPECIFICATION   | TEST RESULTS |
|---------------------------------|-----------------|--------------|
| Temperature                     | 18.9-25.6 Deg C | 21.7         |
| Relative Humidity               | 10% - 70%       | 64.0         |
| Peak Resultant Acceleration     | 250-300 G's     | 264.91       |
| Peak Lateral Acceleration       | 15 G's Max      | 6.46         |
| Is Acceleration Curve Unimodal? | YES             | YES          |

Remarks:

|                        |                     |
|------------------------|---------------------|
| Laboratory Technician: | <u>B. Swiecicki</u> |
|------------------------|---------------------|

PART 572O  
NECK FLEXION TEST

|                        |                         |                        |
|------------------------|-------------------------|------------------------|
| Dummy Serial Number    | <u>421</u>              |                        |
| Sequential Test Number | <u>1</u>                |                        |
| Date                   | <u>October 12, 2001</u> | 6 Axis Neck Transducer |
| Workfile               | <u>421C05NF2</u>        |                        |

| TEST PARAMETER                            |       | SPECIFICATION   | TEST RESULTS |
|-------------------------------------------|-------|-----------------|--------------|
| Temperature                               |       | 20.6-22.2 Deg C | 21.7         |
| Relative Humidity                         |       | 10% - 70%       | 64.0         |
| Impact Velocity                           |       | 6.89 - 7.13 m/s | 7.12         |
| Integrated                                | 10 ms | 2.0 – 2.5 m/s   | 2.30         |
| Pendulum                                  | 20 ms | 4.0 – 5.0 m/s   | 4.63         |
| Velocity                                  | 30 ms | 5.8 – 7.0 m/s   | 6.85         |
| Peak D-Plane Rotation                     |       | 77 – 91 Deg     | 85.82        |
| Peak Moment During Rotation Interval      |       | 69 – 83 Nm      | 78.19        |
| Positive Moment Decay Time to 10 Nm Level |       | 80- 100 ms      | 89.92        |

Remarks:

Laboratory Technician: B. Swiecicki

PART 5720  
NECK EXTENSION TEST

|                        |                         |                        |
|------------------------|-------------------------|------------------------|
| Dummy Serial Number    | <u>421</u>              |                        |
| Sequential Test Number | <u>1</u>                |                        |
| Date                   | <u>October 13, 2001</u> | 6 Axis Neck Transducer |
| Workfile               | <u>421C05NE3</u>        |                        |

| TEST PARAMETER                             |       | SPECIFICATION   | TEST RESULTS |
|--------------------------------------------|-------|-----------------|--------------|
| Temperature                                |       | 20.6-22.2 Deg C | 21.7         |
| Relative Humidity                          |       | 10% - 70%       | 65.0         |
| Impact Velocity                            |       | 5.95 – 6.19 m/s | 6.16         |
| Integrated                                 | 10 ms | 1.5 – 1.9 m/s   | 1.71         |
| Pendulum                                   | 20 ms | 3.1 – 3.9 m/s   | 3.48         |
| Velocity                                   | 30 ms | 4.6 – 5.6 m/s   | 5.21         |
| Peak D-Plane Rotation                      |       | 99 – 114 Deg    | 107.28       |
| Peak Moment During Rotation Interval       |       | -53 - -65 Nm    | -62.12       |
| Positive Moment Decay Time to -10 Nm Level |       | 94 - 114 ms     | 103.36       |

Remarks:

Laboratory Technician: B. Swiecicki



PART 572O  
THORAX IMPACT TEST

|                        |                         |
|------------------------|-------------------------|
| Dummy Serial Number    | <u>421</u>              |
| Sequential Test Number | <u>1</u>                |
| Date                   | <u>October 15, 2001</u> |
| Workfile               | <u>421C05TH2</u>        |

| TEST PARAMETER                           | SPECIFICATION     | TEST RESULTS |
|------------------------------------------|-------------------|--------------|
| Temperature                              | 20.6 – 22.2 Deg C | 21.7         |
| Relative Humidity                        | 10% - 70%         | 41.0         |
| Pendulum Velocity                        | 6.59 – 6.83 m/s   | 6.80         |
| Maximum Deflection                       | 50 – 58 mm        | 51.3         |
| Maximum Resistive Force                  | 3900 – 4400 N     | 4179         |
| Internal Hysteresis                      | 69 - 85 %         | 73.1         |
| Peak Force During 18 to 50 mm Deflection | = 105%            | 102          |

Remarks:

|                        |                     |
|------------------------|---------------------|
| Laboratory Technician: | <u>B. Swiecicki</u> |
|------------------------|---------------------|

PART 572O  
KNEE IMPACT TEST

Dummy Serial Number                      421

Sequential Test Number                      1

Date                                              October 12, 2001

Workfile                                              421C05LK1/421C05RK1

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS |
|------------------------|-------------------|--------------|
| <b>LEFT KNEE</b>       |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 62.0         |
| Probe Velocity         | 2.07 – 2.13 m/s   | 2.09         |
| Peak Knee Impact Force | 3450 – 4060 N     | 4052.6       |
| <b>RIGHT KNEE</b>      |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 61.0         |
| Probe Velocity         | 2.07 – 2.13 m/s   | 2.13         |
| Peak Knee Impact Force | 3450 – 4060 N     | 4057.2       |

Remarks:

Laboratory Technician:                      B. Swiecicki

PART 572O  
KNEE SLIDER TEST

|                        |                            |
|------------------------|----------------------------|
| Dummy Serial Number    | <u>421</u>                 |
| Sequential Test Number | <u>1</u>                   |
| Date                   | <u>October 12, 2001</u>    |
| Workfile               | <u>421C05LS1/421C05RS1</u> |

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS |
|------------------------|-------------------|--------------|
| <b>LEFT KNEE</b>       |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 65.0         |
| Pendulum Velocity      | 2.70 – 2.80 m/s   | 2.70         |
| Peak Displacement      | 12.7 – 15.5 mm    | 14.4         |
| <b>RIGHT KNEE</b>      |                   |              |
| Temperature            | 18.9 – 25.6 Deg C | 21.7         |
| Relative Humidity      | 10% - 70%         | 68.0         |
| Probe Velocity         | 2.70 – 2.80 m/s   | 2.70         |
| Peak Knee Impact Force | 12.7 – 15.5 mm    | 14.5         |

Remarks:

|                        |                     |
|------------------------|---------------------|
| Laboratory Technician: | <u>B. Swiecicki</u> |
|------------------------|---------------------|

PART 572O  
EXTERNAL DIMENSIONS

Dummy Serial Number            421  
Sequential Test Number        1  
Date                                    October 13, 2001

| TEST PARAMETER                    |    | SPECIFICATION    | TEST RESULTS |
|-----------------------------------|----|------------------|--------------|
| Total Sitting Height              | A  | 774.7 – 800.1 mm | 784.86       |
| Shoulder Pivot Height             | B  | 431.8 – 457.2 mm | 447.04       |
| H-Point Height                    | C  | 81.3 – 86.3 mm   | 83.82        |
| H-Point from Backline             | D  | 144.8 – 149.8 mm | 144.78       |
| Shoulder Pivot from Backline      | E  | 68.6 – 83.8 mm   | 73.66        |
| Thigh Clearance                   | F  | 119.4 – 134.6 mm | 134.62       |
| Back of Elbow to Wrist Pivot      | G  | 243.9 – 259.1 mm | 256.54       |
| Skull Cap to Backline             | H  | 40.7 – 45.7 mm   | 45.72        |
| Shoulder - Elbow Length           | I  | 276.8 – 297.2 mm | 281.94       |
| Elbow Rest Height                 | J  | 182.8 – 203.2 mm | 185.42       |
| Buttock Knee Length               | K  | 520.7 – 546.1 mm | 535.94       |
| Popliteal Height                  | L  | 355.6 – 376 mm   | 373.38       |
| Knee Pivot Height                 | M  | 393.7 – 419.1 mm | 408.94       |
| Buttock Popliteal Length          | N  | 414 – 439.4 mm   | 429.26       |
| Chest Depth                       | O  | 175.3 – 190.5 mm | 180.34       |
| Foot Length                       | P  | 218.5 – 233.7 mm | 228.6        |
| Buttock to Knee Pivot Length      | R  | 457.2 – 482.6 mm | 469.9        |
| Head Breadth                      | S  | 137.1 – 147.3 mm | 142.24       |
| Head Depth                        | T  | 177.8 – 188 mm   | 185.42       |
| Hip Breadth                       | U  | 299.7 – 314.9 mm | 307.34       |
| Shoulder Breadth                  | V  | 350.5 – 365.7 mm | 353.06       |
| Foot Breadth                      | W  | 78.8 – 94 mm     | 88.9         |
| Head Circumference                | X  | 528.3 – 548.7 mm | 546.1        |
| Chest Circumference (With Jacket) | Y  | 850.9 – 881.3 mm | 871.22       |
| Waist Circumference               | Z  | 759.5 – 789.9 mm | 764.54       |
| Location for Chest Circumference  | AA | 299.7 – 309.9 mm | 304.8        |
| Location for Waist Circumference  | BB | 160 – 170.2 mm   | 165.1        |

Remarks:

Laboratory Technician:

B. Swiecicki

## **APPENDIX D**

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

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
( 6 Month Calibration Minimum )

| DRIVER DUMMY (S/N 416) |       | Manufacturer | Serial #     | Calibration |           |
|------------------------|-------|--------------|--------------|-------------|-----------|
|                        |       |              |              | Last        | Next      |
| Head X Arm             | Y     | ENTRAN       | AC-99102-F15 | 05-Oct-01   | 05-Apr-02 |
|                        | Z     | ENTRAN       | AC-99108-F29 | 05-Oct-01   | 05-Apr-02 |
| Head Y Arm             | X     | ENTRAN       | AC-99102-F12 | 05-Oct-01   | 05-Apr-02 |
|                        | Z     | ENTRAN       | AC-99102-F06 | 05-Oct-01   | 05-Apr-02 |
| Head Z Arm             | X     | ENTRAN       | AC-99H30-Z03 | 05-Oct-01   | 05-Apr-02 |
|                        | Y     | ENTRAN       | AC-99108-F28 | 05-Oct-01   | 05-Apr-02 |
| Head CG                | X     | ENTRAN       | AC-98G18-F18 | 05-Oct-01   | 05-Apr-02 |
|                        | Y     | ENTRAN       | AC-99H30-Z05 | 05-Oct-01   | 05-Apr-02 |
|                        | Z     | ENTRAN       | AC-99102-F09 | 05-Oct-01   | 05-Apr-02 |
| Head CG                | X (R) | ENTRAN       | AC-00L13-F03 | 05-Oct-01   | 05-Apr-02 |
|                        | Y (R) | ENTRAN       | AC-99H30-Z08 | 05-Oct-01   | 05-Apr-02 |
|                        | Z (R) | ENTRAN       | AC-99H30-Z04 | 05-Oct-01   | 05-Apr-02 |
| Neck Load Cell         | X     | DENTON       | LC-852FX     | 05-Oct-01   | 05-Apr-02 |
|                        | Y     | DENTON       | LC-852FY     | 05-Oct-01   | 05-Apr-02 |
|                        | Z     | DENTON       | LC-852FZ     | 05-Oct-01   | 05-Apr-02 |
| Neck Moment            | X     | DENTON       | LC-852MX     | 05-Oct-01   | 05-Apr-02 |
|                        | Y     | DENTON       | LC-852MY     | 05-Oct-01   | 05-Apr-02 |
|                        | Z     | DENTON       | LC-852MZ     | 05-Oct-01   | 05-Apr-02 |
| Chest                  | X     | ENTRAN       | AC-01G19-F01 | 08-Oct-01   | 08-Apr-02 |
|                        | Y     | ENDEVCO      | AC-P15321    | 05-Oct-01   | 05-Apr-02 |
|                        | Z     | ENDEVCO      | AC-P17743    | 05-Oct-01   | 05-Apr-02 |
| Chest                  | X (R) | ENTRAN       | AC-99H30-Z07 | 05-Oct-01   | 05-Apr-02 |
|                        | Y (R) | ENDEVCO      | AC-P15334    | 05-Oct-01   | 05-Apr-02 |
|                        | Z (R) | ENTRAN       | AC-99G29-Q13 | 05-Oct-01   | 05-Apr-02 |
| Chest Deflection Gauge |       | SERVO        | DS-421       | 10-Oct-01   | 08-Apr-02 |
| Pelvic                 | X     | ENTRAN       | AC-99108-F26 | 05-Oct-01   | 05-Apr-02 |
|                        | Y     | ENTRAN       | AC-99H30-Z02 | 05-Oct-01   | 05-Apr-02 |
|                        | Z     | ENTRAN       | AC-99108-F30 | 12-Apr-01   | 12-Oct-01 |

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
( 6 Month Calibration Minimum )

| DRIVER DUMMY (S/N 416) |    | Manufacturer     | Serial #     | Calibration |           |
|------------------------|----|------------------|--------------|-------------|-----------|
|                        |    |                  |              | Last        | Next      |
| Left Femur Load        | X  | DENTON           | LC-383Fx     | 24-May-01   | 24-May-01 |
|                        | Y  | DENTON           | LC-383Fy     | 24-May-01   | 24-May-01 |
|                        | Z  | DENTON           | LC-383Fz     | 24-May-01   | 24-May-01 |
| Left Femur Moment      | X  | DENTON           | LC-383Mx     | 24-May-01   | 24-May-01 |
|                        | Y  | DENTON           | LC-383My     | 24-May-01   | 24-May-01 |
|                        | Z  | DENTON           | LC-383Mz     | 24-May-01   | 24-May-01 |
| Right Femur Load       | X  | DENTON           | LC-376Fx     | 24-May-01   | 24-May-01 |
|                        | Y  | DENTON           | LC-376Fy     | 24-May-01   | 24-May-01 |
|                        | Z  | DENTON           | LC-376Fz     | 24-May-01   | 24-May-01 |
| Right Femur Moment     | X  | DENTON           | LC-376Mx     | 24-May-01   | 24-May-01 |
|                        | Y  | DENTON           | LC-376My     | 24-May-01   | 24-May-01 |
|                        | Z  | DENTON           | LC-376Mz     | 24-May-01   | 24-May-01 |
| Left Knee Shear Dx     |    | SpaceAge Control | DS-15021     | 09-Oct-01   | 09-Oct-01 |
| Right Knee Shear Dx    |    | SpaceAge Control | DS-14949     | 11-Oct-01   | 11-Oct-01 |
| Left Upper Tibia       | Fx | DENTON           | LC-263-UTLFX | 09-Oct-01   | 09-Oct-01 |
|                        | Fz | DENTON           | LC-263-UTLFZ | 09-Oct-01   | 09-Oct-01 |
|                        | Mx | DENTON           | LC-263-UTLMX | 09-Oct-01   | 09-Oct-01 |
|                        | My | DENTON           | LC-263-UTLMY | 09-Oct-01   | 09-Oct-01 |
| Left Lower Tibia       | Fx | DENTON           | LC-174-LTLFX | 09-Oct-01   | 09-Oct-01 |
|                        | Fz | DENTON           | LC-174-LTLFZ | 09-Oct-01   | 09-Oct-01 |
|                        | Mx | DENTON           | LC-174-LTLMX | 09-Oct-01   | 09-Oct-01 |
|                        | My | DENTON           | LC-174-LTLMY | 09-Oct-01   | 09-Oct-01 |
| Right Upper Tibia      | Fx | DENTON           | LC-264-UTRFX | 09-Oct-01   | 09-Oct-01 |
|                        | Fz | DENTON           | LC-264-UTRFZ | 09-Oct-01   | 09-Oct-01 |
|                        | Mx | DENTON           | LC-264-UTRMX | 09-Oct-01   | 09-Oct-01 |
|                        | My | DENTON           | LC-264-UTRMY | 09-Oct-01   | 09-Oct-01 |



INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
( 6 Month Calibration Minimum )

| DRIVER DUMMY (S/N 416) |    | Manufacturer | Serial #     | Calibration |           |
|------------------------|----|--------------|--------------|-------------|-----------|
|                        |    |              |              | Last        | Next      |
| Right Lower Tibia      | Fx | DENTON       | LC-177-LTRFX | 09-Oct-01   | 09-Oct-01 |
|                        | Fz | DENTON       | LC-177-LTRFZ | 09-Oct-01   | 09-Oct-01 |
|                        | Mx | DENTON       | LC-177-LTRMX | 09-Oct-01   | 09-Oct-01 |
|                        | My | DENTON       | LC-177-LTRMY | 09-Oct-01   | 09-Oct-01 |
| Left Ankle             | X  | ENDEVCO      | AC-J27467    | 10-Oct-01   | 10-Oct-01 |
|                        | Z  | ENDEVCO      | AC-J27490    | 10-Oct-01   | 10-Oct-01 |
| Right Ankle            | X  | ENDEVCO      | AC-AJ4Y5     | 10-Oct-01   | 10-Oct-01 |
|                        | Z  | ENDEVCO      | AC-J27496    | 10-Oct-01   | 10-Oct-01 |
| Left Toe               | Az | ENDEVCO      | AC-J13739    | 10-Oct-01   | 10-Oct-01 |
| Right Toe              | Az | ENDEVCO      | AC-AJ5R6     | 10-Oct-01   | 10-Oct-01 |
| Lap Belt Load Cell     |    | LEBOW        | LC-706       | 24-Jul-01   | 24-Jul-01 |

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
( 6 Month Calibration Minimum )

| PASSENGER DUMMY (S/N 421) |       | Manufacturer | Serial #     | Calibration |           |
|---------------------------|-------|--------------|--------------|-------------|-----------|
|                           |       |              |              | Last        | Next      |
| Head X Arm                | Y     | ENTRAN       | AC-98H14-K20 | 05-Oct-01   | 05-Apr-02 |
|                           | Z     | ENDEVCO      | AC-P23142    | 24-Sep-01   | 24-Mar-02 |
| Head Y Arm                | X     | ENTRAN       | AC-98H10-F10 | 08-Oct-01   | 08-Apr-02 |
|                           | Z     | ENDEVCO      | AC-P23303    | 05-Oct-01   | 05-Apr-02 |
| Head Z Arm                | X     | ENDEVCO      | AC-P23340    | 01-Oct-01   | 01-May-02 |
|                           | Y     | ENDEVCO      | AC-P19216    | 04-Sep-01   | 04-Mar-02 |
| Head CG                   | X     | ENTRAN       | AC-98H13-F01 | 08-Oct-01   | 08-Apr-02 |
|                           | Y     | ENTRAN       | AC-98H10-F12 | 08-Oct-01   | 08-Apr-02 |
|                           | Z     | ENTRAN       | AC-99H12-F30 | 08-Oct-01   | 08-Apr-02 |
| Head CG                   | X (R) | ENTRAN       | AC-99H12-F06 | 08-Oct-01   | 08-Apr-02 |
|                           | Y (R) | ENTRAN       | AC-98H13-F04 | 08-Oct-01   | 08-Apr-02 |
|                           | Z (R) | ENDEVCO      | AC-P17535    | 04-Sep-01   | 04-Mar-02 |
| Neck Load Cell            | X     | DENTON       | LC-1039Fx    | 24-May-01   | 24-Nov-01 |
|                           | Y     | DENTON       | LC-1039Fy    | 24-May-01   | 24-Nov-01 |
|                           | Z     | DENTON       | LC-1039Fz    | 24-May-01   | 24-Nov-01 |
| Neck Moment               | X     | DENTON       | LC-1039Mx    | 24-May-01   | 24-Nov-01 |
|                           | Y     | DENTON       | LC-1039My    | 24-May-01   | 24-Nov-01 |
|                           | Z     | DENTON       | LC-1039Mz    | 24-May-01   | 24-Nov-01 |
| Chest                     | X     | ENTRAN       | AC-99H12-F15 | 05-Oct-01   | 05-Apr-02 |
|                           | Y     | ENDEVCO      | AC-AAMD5     | 05-Oct-01   | 05-Apr-02 |
|                           | Z     | ENTRAN       | AC-99H12-F08 | 05-Oct-01   | 05-Apr-02 |
| Chest                     | X (R) | ENDEVCO      | AC-J19868    | 05-Oct-01   | 05-Apr-02 |
|                           | Y (R) | ENDEVCO      | AC-AJ7R1     | 05-Oct-01   | 05-Apr-02 |
|                           | Z (R) | ENDEVCO      | AC-DC33J     | 05-Oct-01   | 05-Apr-02 |
| Chest Deflection Gauge    |       | SERVO        | DS-416       | 12-Oct-01   | 12-Apr-02 |
| Pelvic                    | X     | ENDEVCO      | AC-J19547    | 05-Oct-01   | 05-Apr-02 |
|                           | Y     | ENDEVCO      | AC-J27079    | 12-Sep-00   | 12-Mar-01 |
|                           | Z     | ENDEVCO      | AC-ADAT0     | 05-Oct-01   | 05-Apr-02 |

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
( 6 Month Calibration Minimum )

| PASSENGER DUMMY (S/N 421) |    | Manufacturer     | Serial # | Calibration |           |
|---------------------------|----|------------------|----------|-------------|-----------|
|                           |    |                  |          | Last        | Next      |
| Left Femur Load           | X  | FTSS             | LC-111Fx | 06-Feb-01   | 06-Feb-01 |
|                           | Y  | FTSS             | LC-111Fy | 06-Feb-01   | 06-Feb-01 |
|                           | Z  | FTSS             | LC-111Fz | 06-Feb-01   | 06-Feb-01 |
| L. Femur Moment           | X  | FTSS             | LC-111Mx | 06-Feb-01   | 06-Feb-01 |
|                           | Y  | FTSS             | LC-111My | 06-Feb-01   | 06-Feb-01 |
|                           | Z  | FTSS             | LC-111Mz | 06-Feb-01   | 06-Feb-01 |
| Right Femur Load          | X  | FTSS             | LC-112Fx | 06-Feb-01   | 06-Feb-01 |
|                           | Y  | FTSS             | LC-112Fy | 06-Feb-01   | 06-Feb-01 |
|                           | Z  | FTSS             | LC-112Fz | 06-Feb-01   | 06-Feb-01 |
| R. Femur Moment           | X  | FTSS             | LC-112Mx | 06-Feb-01   | 06-Feb-01 |
|                           | Y  | FTSS             | LC-112My | 06-Feb-01   | 06-Feb-01 |
|                           | Z  | FTSS             | LC-112Mz | 06-Feb-01   | 06-Feb-01 |
| Left Knee Shear Dx        |    | SpaceAge Control | DS-13742 | 09-Oct-01   | 09-Oct-01 |
| Right Knee Shear Dx       |    | SpaceAge Control | DS-18127 | 10-Oct-01   | 10-Oct-01 |
| Left Upper Tibia          | Fx | DENTON           | LC-265Fx | 01-Feb-01   | 01-Feb-01 |
|                           | Fz | DENTON           | LC-265Fz | 01-Feb-01   | 01-Feb-01 |
|                           | Mx | DENTON           | LC-265Mx | 01-Feb-01   | 01-Feb-01 |
|                           | My | DENTON           | LC-265My | 01-Feb-01   | 01-Feb-01 |
| Left Lower Tibia          | Fx | DENTON           | LC-178Fx | 01-Feb-01   | 01-Feb-01 |
|                           | Fz | DENTON           | LC-178Fz | 01-Feb-01   | 01-Feb-01 |
|                           | Mx | DENTON           | LC-178Mx | 01-Feb-01   | 01-Feb-01 |
|                           | My | DENTON           | LC-178My | 01-Feb-01   | 01-Feb-01 |
| Right Upper Tibia         | Fx | DENTON           | LC-266Fx | 02-Feb-01   | 02-Feb-01 |
|                           | Fz | DENTON           | LC-266Fz | 02-Feb-01   | 02-Feb-01 |
|                           | Mx | DENTON           | LC-266Mx | 02-Feb-01   | 02-Feb-01 |
|                           | My | DENTON           | LC-266My | 02-Feb-01   | 02-Feb-01 |

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
( 6 Month Calibration Minimum )

| PASSENGER DUMMY (S/N 421) |    | Manufacturer | Serial #  | Calibration |           |
|---------------------------|----|--------------|-----------|-------------|-----------|
|                           |    |              |           | Last        | Next      |
| Right Lower Tibia         | Fx | DENTON       | LC-179Fx  | 02-Feb-01   | 02-Feb-01 |
|                           | Fz | DENTON       | LC-179Fz  | 02-Feb-01   | 02-Feb-01 |
|                           | Mx | DENTON       | LC-179Mx  | 02-Feb-01   | 02-Feb-01 |
|                           | My | DENTON       | LC-179My  | 02-Feb-01   | 02-Feb-01 |
| Left Ankle                | X  | ENDEVCO      | AC-J18059 | 10-Oct-01   | 10-Oct-01 |
|                           | Z  | ENDEVCO      | AC-J20014 | 10-Oct-01   | 10-Oct-01 |
| Right Ankle               | X  | ENDEVCO      | AC-AC9F9  | 10-Oct-01   | 10-Oct-01 |
|                           | Z  | ENDEVCO      | AC-J18738 | 10-Oct-01   | 10-Oct-01 |
| Left Toe                  | Az | ENDEVCO      | AC-J26976 | 10-Oct-01   | 10-Oct-01 |
| Right Toe                 | Az | ENDEVCO      | AC-AAKC3  | 10-Oct-01   | 10-Oct-01 |
| Lap Belt Load Cell        |    | LEBOW        | LC-711    | 24-Jul-01   | 24-Jul-01 |

# INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

( 6 Month Calibration Minimum )

|                               | Manufacturer | Serial # | Calibration |           |
|-------------------------------|--------------|----------|-------------|-----------|
|                               |              |          | Last        | Next      |
| Left Seat Rear Crossmember X  | ICS          | D41      | 25-Sep-01   | 25-Mar-02 |
| Left Seat Rear Crossmember Y  | ICS          | D31      | 25-Sep-01   | 25-Mar-02 |
| Right Seat Rear Crossmember X | ICS          | Y17      | 18-Oct-01   | 18-Apr-02 |
| Right Rear Seat Crossmember Y | ICS          | D32      | 15-Aug-01   | 15-Feb-02 |
| Driver Left Side Toepan X     | ENDEVCO      | J31042   | 21-Sep-01   | 21-Mar-02 |
| Driver Left Side Toepan Z     | ENDEVCO      | J31009   | 21-Sep-01   | 21-Mar-02 |
| Driver Right Side Toepan X    | ENDEVCO      | ACC06    | 25-Sep-01   | 25-Mar-02 |
| Driver Right Side Toepan Z    | ENDEVCO      | J32176   | 21-Sep-01   | 21-Mar-02 |
| Trunk Z                       | ENDEVCO      | AP1A2    | 29-Aug-01   | 28-Feb-02 |
| Driver Toepan X               | MAGNETEK     | M27      | 22-Jun-01   | 22-Dec-01 |