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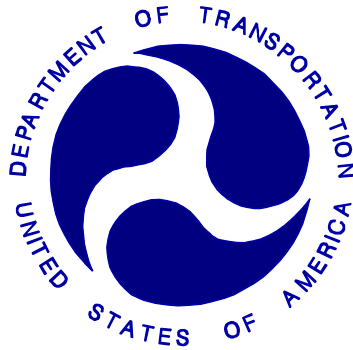
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**TOYOTA MOTOR MANUFACTURING
2001 TOYOTA AVALON
4-DOOR**

NHTSA NUMBER: M15101

VERIDIAN TEST NUMBER: 8602-12

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
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BUFFALO, NEW YORK 14225



January 4, 2001

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
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Manager, New Car Assessment Program (NCAP)
NHTSA, Office of Crashworthiness Standards

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15. <i>Supplementary Notes</i>					
16. <i>Abstract</i> A frontal load cell barrier test of a 2001 Toyota Avalon 4-Door was performed at Veridian Engineering crash test facility in Buffalo, New York, on January 4, 2001. The impact velocity was 56.17 kph and the temperature at the barrier face was 21.1 °C. The maximum post-test vehicle crush was 629 mm. The test vehicle was equipped with 3-point restraint systems with pretensioners, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements.					
ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (150)	868.0	51.1	30.4	4636.4	2265.7
Passenger (245)	577.2	39.1	28.3	3420.4	3052.2
17. <i>Key Words</i> 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)				18. <i>Distribution Statement</i> <u>Copies of this report are available from:</u> NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, DC 20590	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M15101

PURPOSE

This 56.17 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-96-D-02010. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.17 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2001 Toyota Avalon 4-Door at a velocity of 56.17 kph. The test was performed at Veridian Engineering on January 4, 2001. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest, and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap belt to measure dummy pelvic section loading. The driver (position 1) ATD (Serial No. 150) and the right-front passenger (position 2) ATD (Serial No. 245) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 127 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 868.0. The maximum chest deceleration over 3 milliseconds was 51.1 g's and maximum chest deflection was 30.4 mm. Compressive femur loads were 4636.4 Newtons on the left and 2265.7 Newtons on the right.

The right front passenger's HIC was 577.2. Maximum chest deceleration over 3 milliseconds was 39.1 g's and maximum chest deflection was 28.3 mm. Compressive femur loads were 3420.4 Newtons on the left and 3052.2 Newtons on the right.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. : M15101 Test Mode : 56.3 kph Frontal Barrier

Test Date : January 4, 2001 Time: 13:58 Temperature : -3.3 °C

Vehicle Make/Model/Body Style : 2001 Toyota Avalon 4-Door

Vehicle Test Weight : 1764.0 kg

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 56.17 kph

Maximum Static Crush : 629 mm

Vehicle Rebound : 512 mm

DUMMIES:

DRIVER

PASSENGER

Type :

 572E

 572E

Restraint System :

Airbag, 3-Point Active Seat
Belt with Pretensioner, Knee
Bolster

Airbag, 3-Point Active Seat
Belt with Pretensioner, Knee
Bolster

Number of Data Channels : 127

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 :

Face to center of airbag; Back
of head to center of head
restraint

Face to center of airbag; Back
of head to center of head
restraint

Abdomen :

 None

 None

Chest:

 Airbag

 Airbag

Knees:

Left knee to bolster left of
steering column; Right knee to
bolster right of steering column

Left knee to left edge of glove
comp. door; Right knee to
center of glove comp. door

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 2001 Toyota Avalon 4-Door

NHTSA No. : M15101 ; VIN: 4T1BF28B61U115653 ; Color : desert sand mica

Engine Data: 6 cylinders; - CID; 3.0 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; X Front Wheel Drive; - Four Wheel Drive

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

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

Date Received : 12/14/00 ; Odometer Reading 51.5 km

Selling Dealer : Jon Maroone Toyota

& Address: S-4141 Southwestern Blvd., Orchard Park NY 14127

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : Toyota Motor Manufacturing

Date of Manufacture 09/00

GVWR : 2064 kg; GAWR: 1209 kg FRONT; 1209 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 300 kpa FRONT

300 kpa REAR

Recommended Tire Size : P205/65R15 or P205/60R15

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

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

Vehicle Capacity Data :

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

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

Vehicle Capacity Weight (VCW) = 478.0 kg

No. of Occupants x 68 kg = 408.2 kg

Rated Cargo/Luggage Weight (RCLW) = 69.8 kg

*Tire pressure used for test

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

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

Right Front	=	<u>473.0</u>	kg	Right Rear	=	<u>297.5</u>	kg
Left Front	=	<u>470.5</u>	kg	Left Rear	=	<u>306.5</u>	kg
TOTAL FRONT	=	<u>943.5</u>	kg	TOTAL REAR	=	<u>604.0</u>	kg
TOTAL DELIVERED WEIGHT =		<u>1547.5</u>	kg				
% of Total Front of Vehicle Weight =		<u>61.0</u>	% of Total Rear Weight =	<u>39.0</u>	%		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight (UDW)	=	<u>1547.5</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>69.8</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152.0</u>	kg
TARGET TEST WEIGHT	=	<u>1769.3</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 65 KG OF CARGO WEIGHT:

Right Front	=	<u>487.0</u>	kg	Right Rear	=	<u>376.0</u>	kg
Left Front	=	<u>507.5</u>	kg	Left Rear	=	<u>393.5</u>	kg
TOTAL FRONT	=	<u>994.5</u>	kg	TOTAL REAR	=	<u>769.5</u>	kg
TOTAL TEST WEIGHT =		<u>1764.0</u>	kg				
% of Total Front Weight =		<u>56.4</u>	%	% of Total Rear Weight =		<u>43.6</u>	%
Weight of Ballast Secured in Vehicle Trunk Area =		<u>41</u>	kg				
Vehicle Components Removed for Weight Reduction:		<u>None</u>					

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED :	RF	<u>690</u>	LF	<u>695</u>	RR	<u>716</u>	LR	<u>715</u>
FULLY LOADED :	RF	<u>680</u>	LF	<u>684</u>	RR	<u>673</u>	LR	<u>670</u>
AS TESTED :	RF	<u>685</u>	LF	<u>684</u>	RR	<u>673</u>	LR	<u>671</u>
Vehicle's Wheel Base :		<u>2716</u>	mm					
Location of Vehicle's C.G. :		<u>1185</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual	=	<u>70.0</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>70.0</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>64.4</u>	to <u>65.8</u> liters
ACTUAL TEST VOLUME=	<u>64.7</u>	liters (with entire fuel system filled)	
Test Fluid Type:	<u>Stoddard Solution</u>	;	Spec. Grav. = <u>0.764</u>
Kinematic Viscosity =	<u>0.96</u>	centistokes;	Color = <u>Orange</u>
Type of Fuel Pump:	Electric- <u>X</u>	;	Mechanical- <u> </u>
Does Electric Pump operate with ignition switch "ON" & engine "OFF"		Yes- <u>X</u>	No- <u> </u>
Details of Fuel System <u>Fuel Tank: Located on the vehicle underbody forward of the rear axle; Fuel Lines:</u>			
<u>Routed along the inboard side of the left frame rail; Fuel Filler: Located on the left rear quarter panel.</u>			

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°
Test Date : January 4, 2001 Time: 13:58 Temperature: -3.3 °C
Vehicle NHTSA No. : M15101
Required Impact Velocity Range : 55.5 to 57.1 kph

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

Trap No. 1 = 56.17 kph; Trap No. 2 = 56.17 kph
Distance from vehicle to barrier : (1) entering trap = 813 mm
(2) exiting trap = 305 mm

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

Vehicle Length:

Pre-Test Right = 4792 ; C/L = 4877 ; Left = 4791
Post-Test Right = 4215 ; C/L = 4254 ; Left = 4236
Crush Right = 577 ; C/L = 623 ; Left = 555
AVERAGE = 585 mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

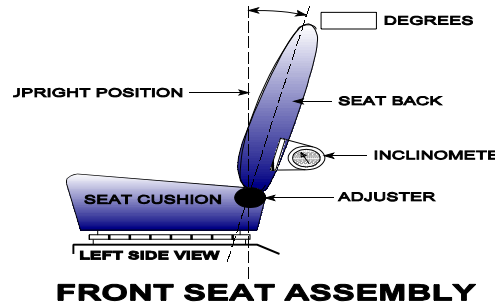
Right = 507 ; C/L = 529 ; Left = 500
AVERAGE = 512 mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2001 Vehicle Model: Toyota Avalon Body Style : 4-Door

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: 17 degrees

Measurement instructions: Recline seat back 6 degrees from its most upright position.

Seat back angle for passenger's seat: 17 degrees

Measurement instructions: Recline seat back 6 degrees from its most upright position.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Place seat in mid-fore/aft travel position.

Positioning of the passenger's seat: Place seat in mid-fore/aft travel position.

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 70.0 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 = 70.0 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 64.7 liters

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

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

The fuel pump operates briefly when the ignition is placed in the run position and the vehicle is not started. The fuel pump operates continuously while the vehicle's engine is running.

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

4. STEERING COLUMN ADJUSTMENTS :

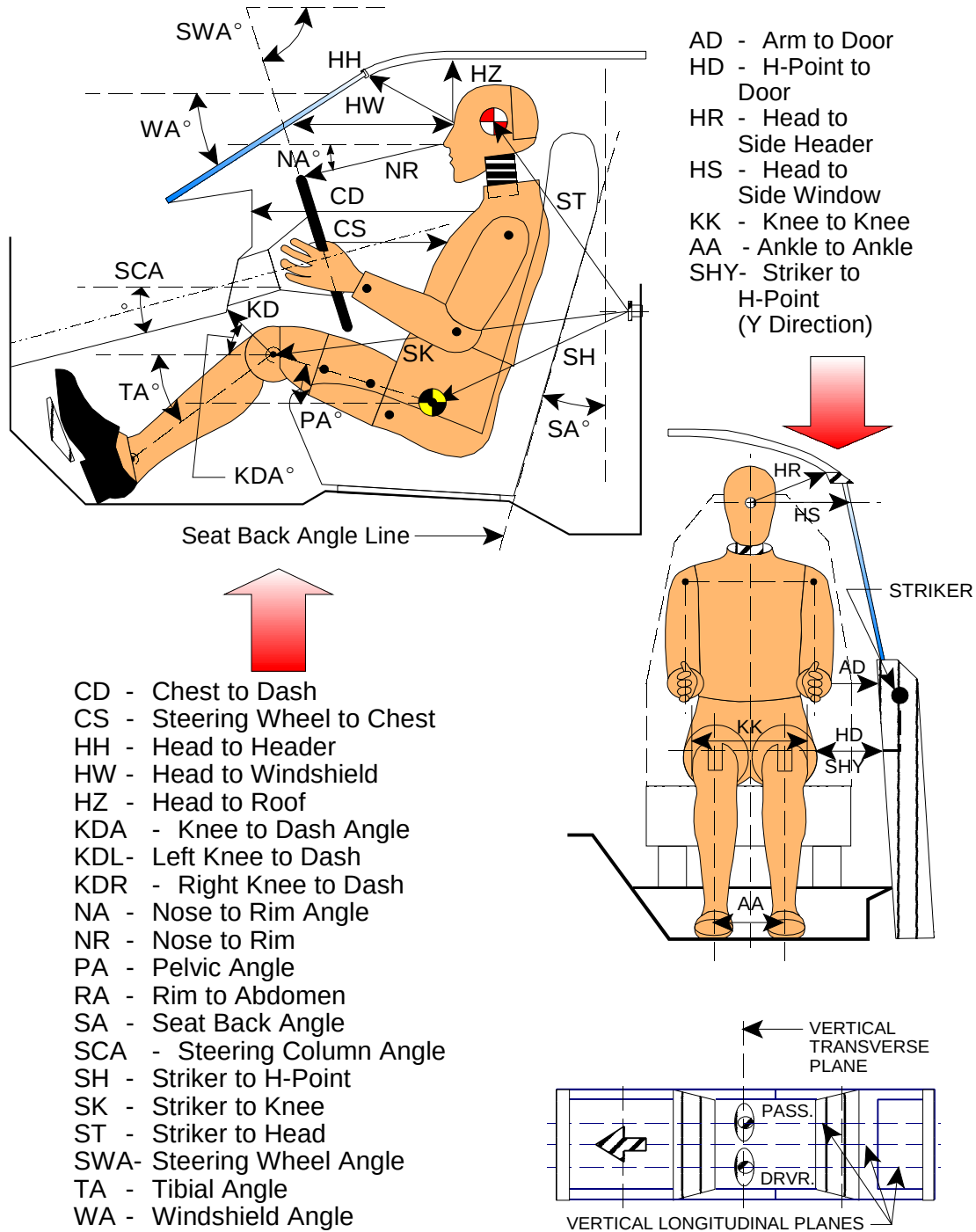
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: Place in mid-position (detent 2, where the most upright detent is defined as detent 0). The steering wheel angle read 27 degrees from vertical with the vehicle sills level.

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Mid-position (detent 2, where the most upright detent is defined as detent 0)

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

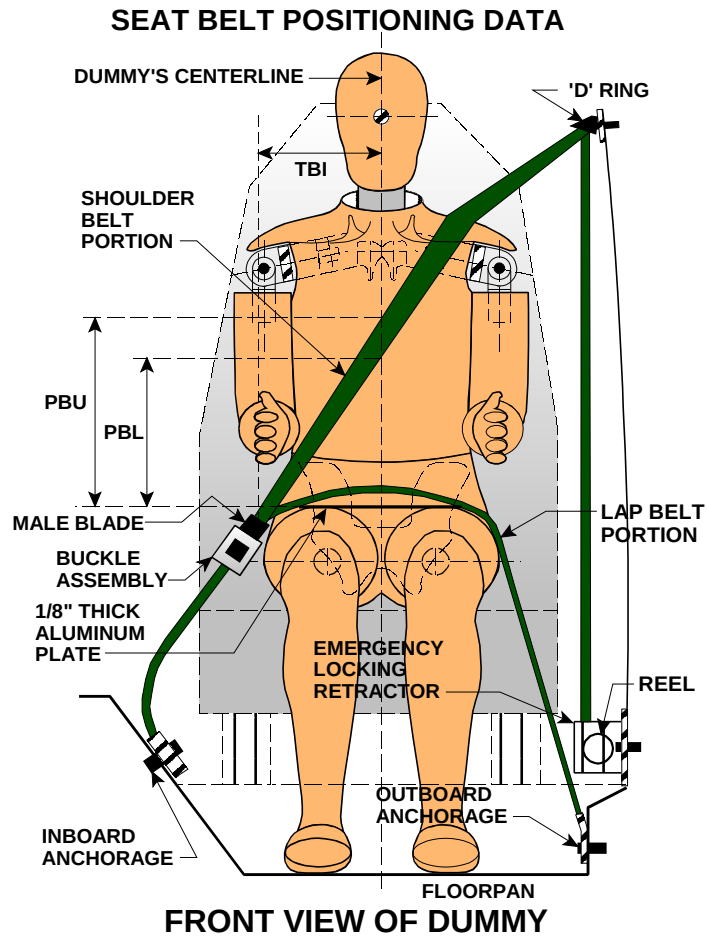


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #150)			PASS. (Serial # 245)		
WA ^o	31 deg.			N/A		
SWA ^o	63 deg.			N/A		
SCA ^o	27 deg.			N/A		
SA ^o	17 deg.			17 deg.		
HZ	225			200		
HH	372			360		
HW	660			644		
HR	242			233 (to grab handle)		
NR	432	Angle	9 deg.	N/A		
CD	696			557		
CS	339			N/A		
RA	205			N/A		
KDL	173	Angle (KDA)	32 deg.	160		
KDR	173			159	Angle (KDA)	28 deg.
PA ^o	24.8 deg.			24.9 deg.		
TA ^o	39.5 deg.			43.6 deg.		
KK	330			268		
AA	320			228		
ST	430	Angle	4 deg.	416	Angle	8 deg.
SK	601	Angle	101 deg.	602	Angle	98 deg.
SH	293	Angle	133 deg.	281	Angle	129 deg.
SHY	257			238		
HS	384			377		
HD	173			162		
AD	127			140		

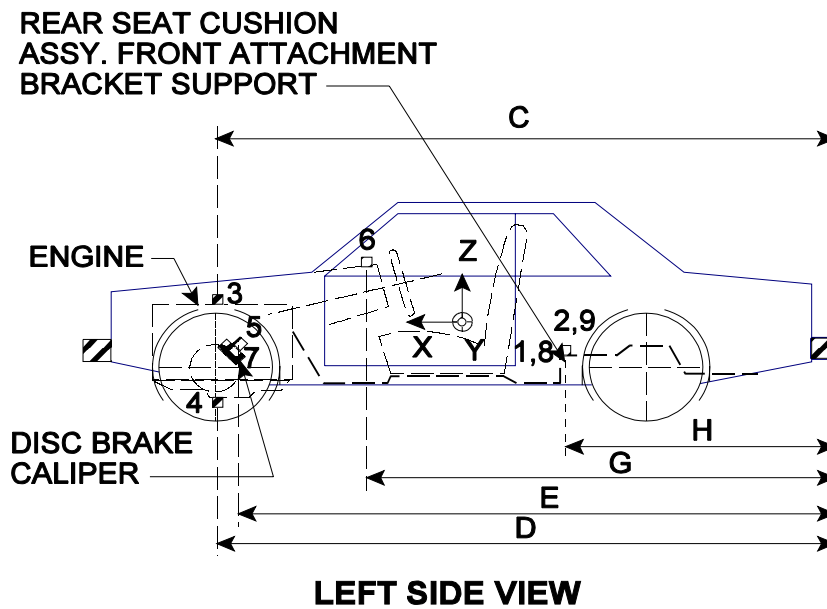
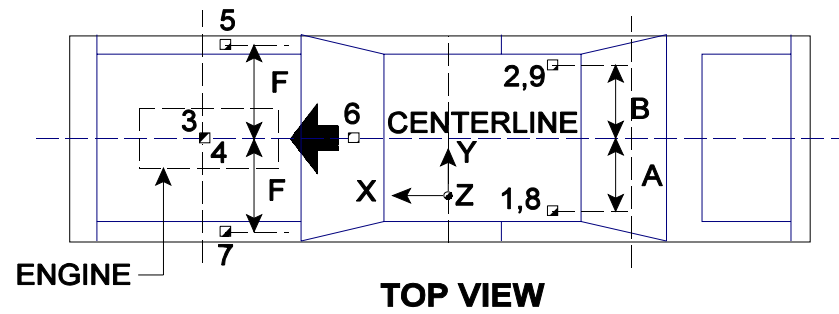
Dimensions in millimeters

DATA SHEET NO. 6 SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	316	322
PBL-- Top surface of alum. plate to belt lower edge	241	245
<u>LAP BELT TENSION</u>	10 N	10 N
<u>SHOULDER BELT TENSION</u>	Retractor	Retractor

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



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

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

DIMENSION	PRE-TEST LENGTH (mm)
A Left Rear Seat Crossmember Y	-323
B Right Rear Seat Crossmember Y	+323
C Top of Engine X	4127
D Bottom of Engine X	4182
E Disc Brake Calipers X	3822
F Disc Brake Calipers Y	±675
G Instrument Panel X	3046
H Rear Seat Crossmembers X	1930

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	2.2	-17.3	-31.0	36.9
2	Rear Seat X-Member @ Right Side	2.1	-17.2	-29.0	41.7
3	Top of Engine Block	†	-	-132.4	29.9
4	Bottom of Engine	19.5	42.7	-137.0	27.4
5	Disc Brake Caliper @ Right Side	77.8	67.6	-103.3	49.7
6	Instrument Panel	31.9	57.2	-81.1	44.0
7	Disc Brake Caliper @ Left Side	45.4	71.7	-91.3	50.9
8	Rear Seat X-Member @ Left-Redundant	2.2	-17.4	-29.9	37.1
9	Rear Seat X-Member @ Right-Redundant	2.2	-17.2	-28.6	41.4

† Transducer wire was damaged at 38 milliseconds, data after this time is invalid.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2001 Toyota Avalon 4-Door

NHTSA Test No.: M15101 Test Date: January 4, 2001

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	16.7	215.2	-82.5	75.3	21.2	227.5	-57.8	80.5
Head Y	g	4.1	27.1	-12.3	80.1	10.7	70.1	-6.0	98.6
Head Z	g	16.0	60.9	-1.3	88.2	16.7	70.4	-12.1	93.3
Head Resultant	g	83.0	75.3	-	-	59.0	80.5	-	-
Redundant Head X	g	17.0	215.6	-83.6	74.3	21.1	227.2	-59.2	79.1
Redundant Head Y	g	4.4	27.1	-12.3	80.0	11.3	71.8	-4.7	95.5
Redundant Head Z	g	16.1	60.9	-1.6	85.7	17.9	66.5	-10.8	92.8
Redundant Head Resultant	g	84.2	74.4	-	-	61.0	79.1	-	-
Upper Neck Fx	N	738.8	77.8	-427.2	53.1	686.1	87.6	-199.7	246.4
Upper Neck Fy	N	188.4	92.5	-68.6	51.9	80.0	48.1	-131.7	97.6
Upper Neck Fz	N	1415.1	65.6	-48.6	243.1	1079.1	62.6	-382.3	255.0
Upper Neck F Resultant	N	1485.0	65.7	-	-	1083.7	62.6	-	-
Upper Neck Mx	N-m	5.6	141.0	-12.8	59.1	9.4	95.2	-7.8	131.1
Upper Neck My	N-m	34.4	67.7	-25.9	97.8	25.9	85.8	-25.1	98.2
Upper Neck Mz	N-m	18.6	102.0	-12.7	156.9	8.2	113.2	-3.8	178.4
Upper Neck M Resultant	N-m	35.7	68.1	-	-	26.3	98.1	-	-
Chest X	g	5.6	176.9	-52.1	78.6	5.6	247.3	-39.5	73.6
Chest Y	g	1.8	53.6	-4.5	77.3	2.6	83.4	-2.7	66.9
Chest Z	g	3.8	219.6	-4.2	57.4	8.7	80.2	-1.7	52.9
Chest Resultant	g	52.3	78.5	-	-	39.8	73.6	-	-
Redundant Chest X	g	5.5	177.1	-52.3	78.7	5.7	247.3	-39.7	74.1
Redundant Chest Y	g	2.1	61.5	-4.5	77.5	2.0	82.9	-3.1	66.7
Redundant Chest Z	g	3.8	219.4	-4.3	57.3	8.6	80.6	-2.1	53.3
Redundant Chest Resultant	g	52.5	78.7	-	-	39.9	74.1	-	-
Chest Displacement	mm	0.0	-12.0	-30.4	81.7	0.0	-35.8	-28.3	98.4

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

Vehicle Year/Make/Model/Body Style: 2001 Toyota Avalon 4-Door

NHTSA Test No.: M15101 Test Date: January 4, 2001

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Pelvic X	g	3.3	125.3	-64.0	56.7	5.0	125.0	-58.6	58.7
Pelvic Y	g	14.2	56.1	-6.9	42.3	6.3	93.4	-6.2	70.6
Pelvic Z	g	3.9	220.9	-28.0	64.6	3.0	251.3	-24.7	74.1
Pelvic Resultant	g	68.2	56.7	-	-	62.0	58.7	-	-
Left Femur	N	895.9	47.7	-4636.4	57.3	250.3	45.3	-3420.4	58.2
Right Femur	N	951.3	50.8	-2265.7	58.0	620.5	45.1	-3052.2	52.9
Left Upper Tibia Mx	N-m	12.6	208.7	-34.1	57.0	16.3	100.0	-30.5	58.4
Left Upper Tibia My	N-m	18.6	139.6	-121.5	56.6	7.9	138.2	-129.3	49.9
Left Lower Tibia Fz	N	75.1	177.0	-3093.1	29.2	219.2	134.4	-2884.3	35.1
Left Lower Tibia Mx	N-m	17.8	63.9	-5.5	82.8	6.9	27.4	-48.6	57.5
Left Lower Tibia My	N-m	47.4	79.0	-47.4	50.6	80.3	66.8	-50.0	49.3
Right Upper Tibia Mx	N-m	40.5	57.0	-27.6	39.0	18.1	77.3	-39.6	55.6
Right Upper Tibia My	N-m	23.3	125.2	-148.4	42.3	15.6	139.0	-156.3	56.9
Right Lower Tibia Fz	N	203.8	177.4	-4796.0	41.9	69.2	141.4	-2957.0	31.1
Right Lower Tibia Mx	N-m	77.6	40.9	-11.9	36.5	32.0	69.0	-20.8	55.7
Right Lower Tibia My	N-m	36.9	77.8	-40.0	48.7	78.6	69.0	-59.1	56.9
Left Foot Aft Ax	g	21.8	33.0	-74.9	52.0	49.0	61.7	-157.4	47.7
Left Foot Aft Az	g	8.8	73.1	-53.1	28.1	42.4	64.6	-67.9	47.1
Left Foot Fore Az	g	29.9	72.4	-77.7	51.2	89.1	66.5	-93.2	47.2
Right Foot Aft Ax	g	17.4	33.6	-91.6	44.2	31.0	71.1	-116.6	54.9
Right Foot Aft Az	g	13.1	67.9	-76.2	40.4	21.0	67.7	-68.3	55.2
Right Foot Fore Az	g	85.2	45.0	-149.2	34.3	53.3	69.1	-86.5	42.7
Lap Belt Load	N	5243.9	58.1	-20.2	154.1	5152.5	64.2	-3.9	226.0
Torso Belt †	N	-	-	-	-	-	-	-	-

† Seat belts were equipped with pretensioning retractors. Transducers were not installed to prevent interference with the pretensioning system.

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

Vehicle Year/Make/Model/Body Style: 2001 Toyota Avalon 4-Door

NHTSA Test No.: M15101 Test Date: January 4, 2001

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	868.0	59.3	86.2	63.7
Position #2 - Passenger	577.2	63.2	99.2	48.1

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

CLIP SUMMARY*				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	51.1	77.1	80.1	469.8
Position #2 - Passenger	39.1	72.6	75.6	339.3

* 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: 2001 Toyota Avalon 4-Door

NHTSA Test No.: M15101 Test Date: January 4, 2001

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	895.2	59.4	86.1	64.6
Position #2 - Passenger	579.3	63.3	99.3	48.2

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

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	51.4	77.1	80.1	469.0
Position #2 - Passenger	38.8	72.6	75.6	345.2

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

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>1763</u>	<u>1742</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>910</u>	<u>902</u>
Lap belt length as measured on Part 572 Dummy.	<u>853</u>	<u>840</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.	<u>†</u>	<u>†</u>
As determined mechanically.	<u>††</u>	<u>††</u>
As determined electronically.	<u>††</u>	<u>††</u>

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	<u>††</u>	<u>††</u>
Measured mechanically.	<u>22 mm/M</u>	<u>22 mm/M</u>

Dimensions in millimeters

- † Seat belt cameras were not installed. The seat belt from the retractor to the D-ring was hidden beneath the B-pillar trim and was not visible from the rear occupant compartment.
- †† Seat belt was equipped with pretensioning retractors. These transducers were not installed to prevent interference with the pretensioning system.

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

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

Windshield is bonded in place and covered with a 14 mm molding.

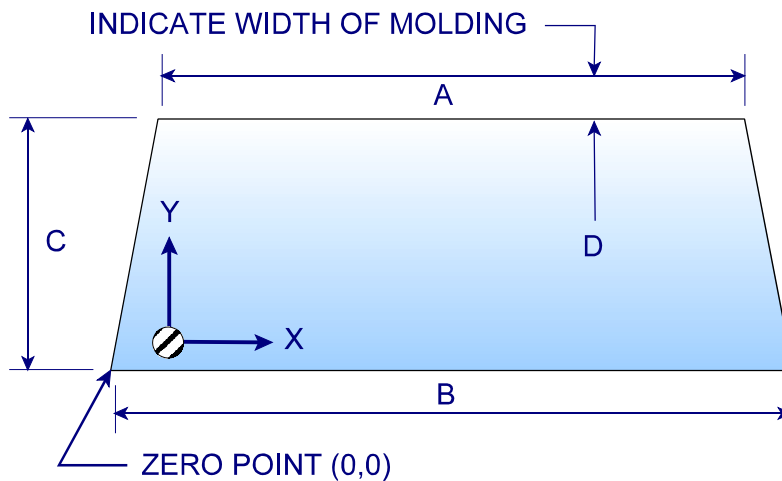
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST(mm)	
RIGHT SIDE	2145	2145	100
LEFT SIDE	2145	2145	100
TOTAL	4290	4290	100

AREA OF RETENTION FAILURE: None



DIMENSIONS (mm)	
A	1270
B	1500
C	760
D	14

FRONT VIEW OF WINDSHIELD

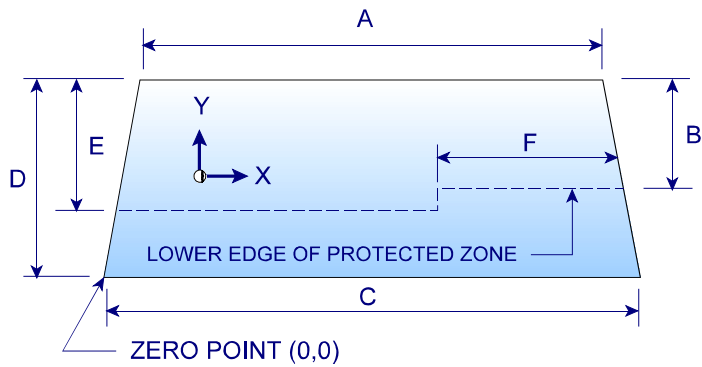
FAILURE DETAILS:

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

PROTECTED ZONE LOWER EDGE REQUIREMENT:

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

FMVSS 219 TEST DATA:



DIMENSIONS (mm)	
A	1270
B	435
C	1500
D	760
E	435
F	1450

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

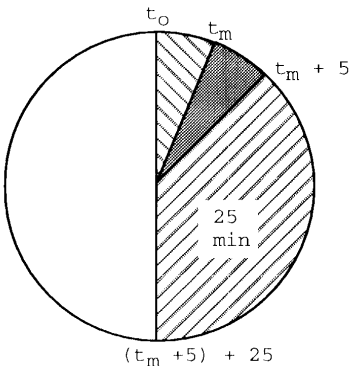
NHTSA TEST No.: M15101 TEST DATE: January 4, 2001
VEHICLE MAKE/MODEL: 2001 Toyota Avalon

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

=====

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

FUEL SPILLAGE MEASUREMENT:



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

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

SOLVENT SPILLAGE DETAILS:

None

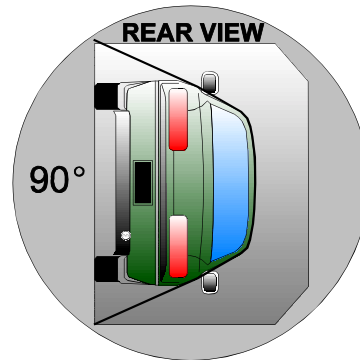
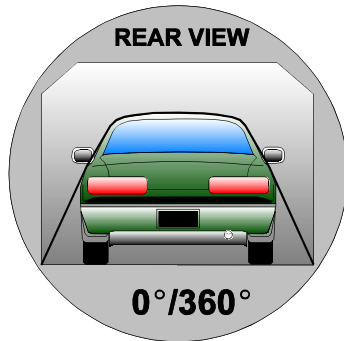
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Vehicle: 2001 Toyota Avalon

NHTSA No. M15101

0 - 90 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

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

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

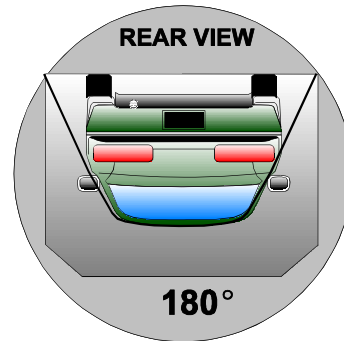
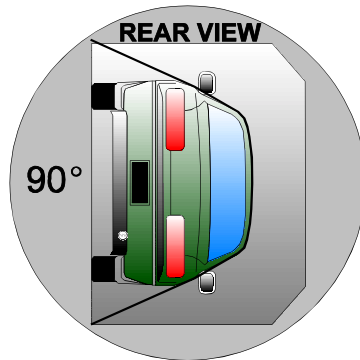
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Toyota Avalon

NHTSA No. M15101

90 - 180 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>10</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>10</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

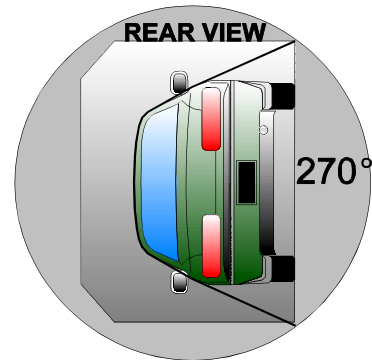
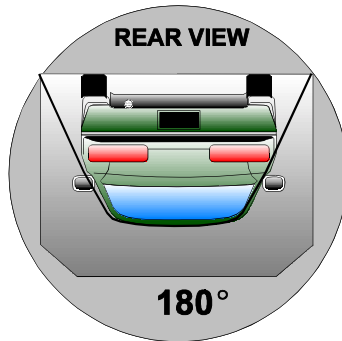
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Toyota Avalon

NHTSA No. M15101

180 - 270 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>2</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>2</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

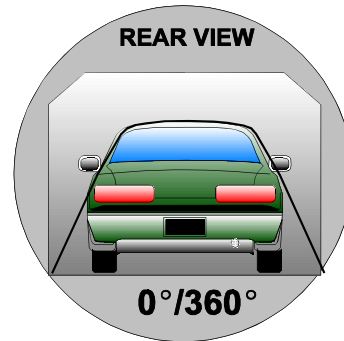
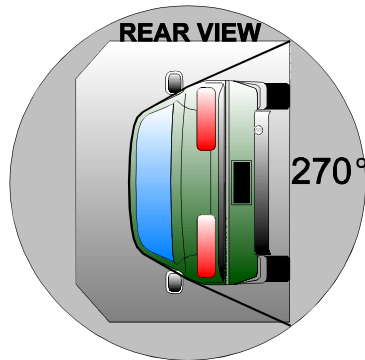
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Toyota Avalon

NHTSA No. M15101

270 - 360 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>10</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>10</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

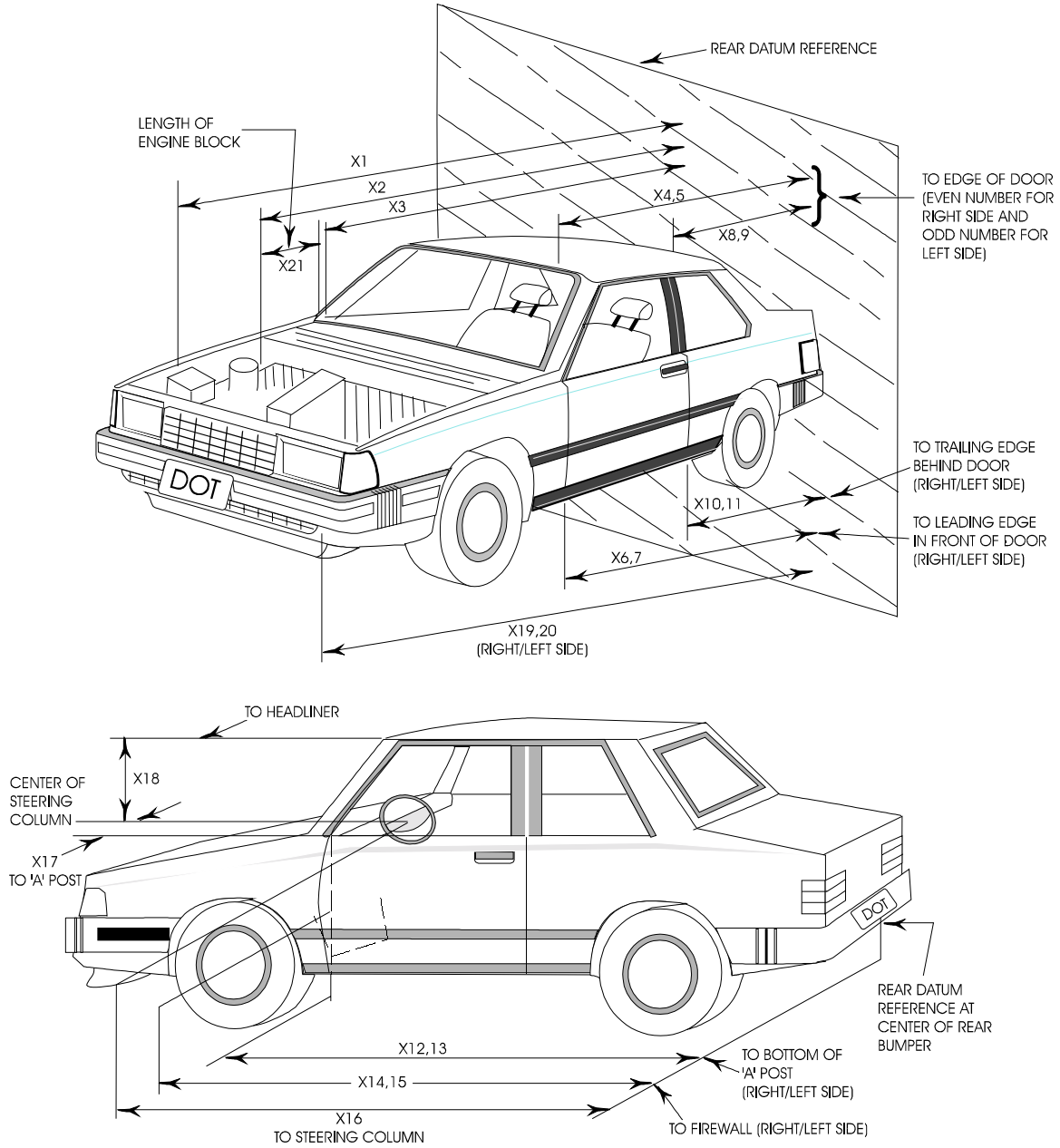
0 g	0 g	0 g	N/A
-----	-----	-----	-----

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS

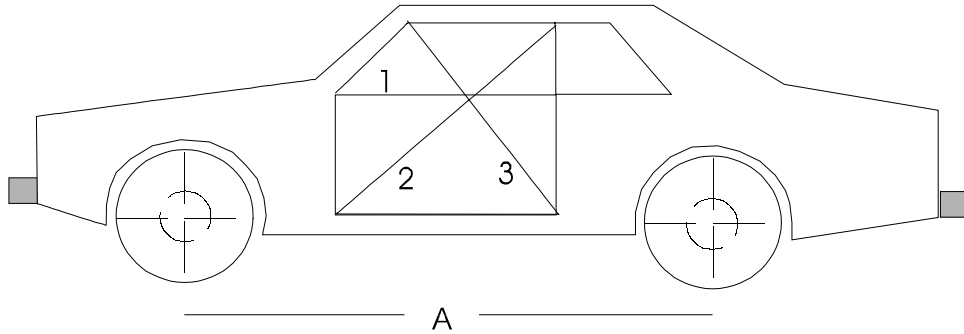


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4877	4254	623
X2	Rear Surface of Vehicle to Front of Engine	4292	4112	180
X3	Rear Surface of Vehicle to Firewall	3697	3526	171
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3429	3419	10
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3430	3437	-7
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3382	3370	12
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3380	3379	1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2296	2284	12
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2297	2299	-2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2266	2253	13
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2272	2262	10
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3507	3492	15
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3502	3505	-3
X14	Rear Surface of Vehicle to Firewall, Right Side	3708	3625	83
X15	Rear Surface of Vehicle to Firewall, Left Side	3688	3639	49
X16	Rear Surface of Vehicle to Steering Column	2931	2927	4
X17	Center of Steering Column to "A" Post	303	287	16
X18	Center of Steering Column to Headliner	420	416	4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4792	4215	577
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4791	4236	555
X21	Length of Engine Block	507	507	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3080	3069	11
CD	Rear Surface of Vehicle to Center of Dash Panel	3307	3297	10
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3078	3076	2

All Dimensions in mm

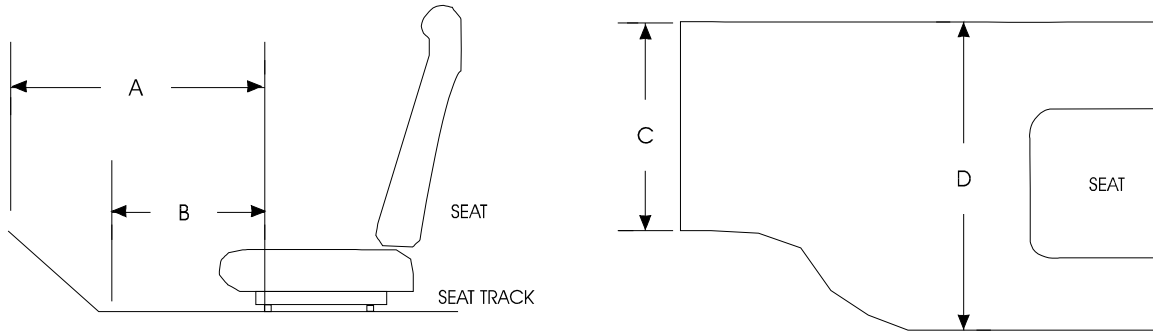
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1045	1439	957	1054	1448	963
AFTER TEST	1042	1452	964	1040	1445	965
DIFFERENCE	3	-13	-7	14	3	-2

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2716	2715
AFTER TEST	2624	2590
DIFFERENCE	92	125

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



DRIVER

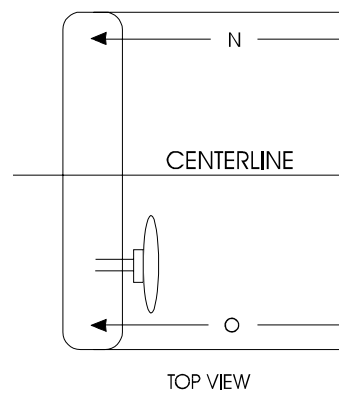
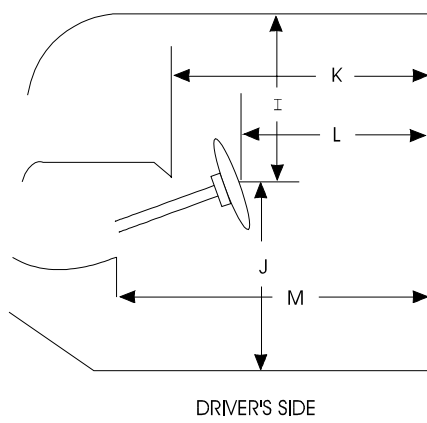
Measurement	Pre-Test	Post-Test	Difference
A	756	674	82
B	561	497	64
C	482	441	41
D	501	495	6

PASSENGER

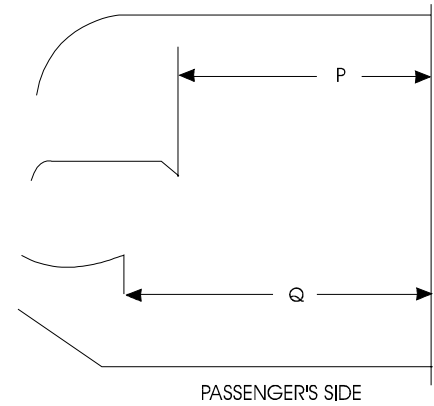
Measurement	Pre-Test	Post-Test	Difference
A	760	627	133
B	582	483	99
C	456	442	14
D	504	499	5

Units = mm

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



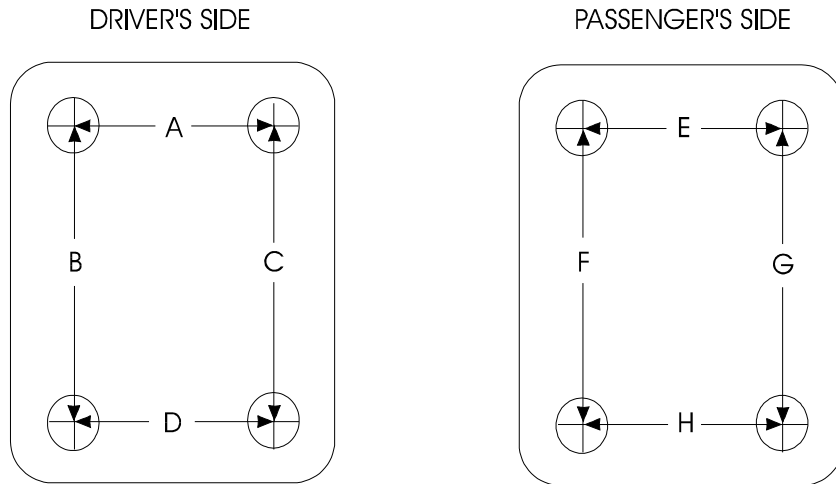
MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



Measurement	Pre-Test	Post-Test	Difference
I	420	416	4
J	672	710	-38
K	2072	2058	14
L	1732	1719	13
M	1923	1895	28
N	1879	1874	5
O	1879	1868	11
P = K (PASS.)	1926	1919	7
Q = M (PASS.)	1974	1958	16

Units = mm

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

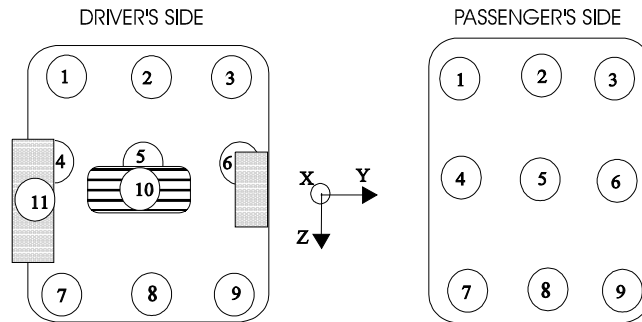


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	400	372	28
B	500	498	2
C	500	477	23
D	400	400	0
E	400	372	28
F	500	459	41
G	500	500	0
H	400	400	0

Units = mm

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



Driver Side Floorpan Measurements

Floorpan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3569	3490	79	-482	-473	-9
2	3596	3502	94	-472	-456	-16
3	3606	3506	100	-464	-439	-25
4	3524	3445	79	-341	-347	6
5	3525	3428	97	-342	-337	-5
6	3525	3408	117	-324	-320	-4
7	3414	3362	52	-241	-226	-15
8	3401	3326	75	-248	-240	-8
9	3403	3336	67	-241	-216	-25
10	3418	3356	62	-431	-421	-10
11	3450	3392	58	-335	-316	-19

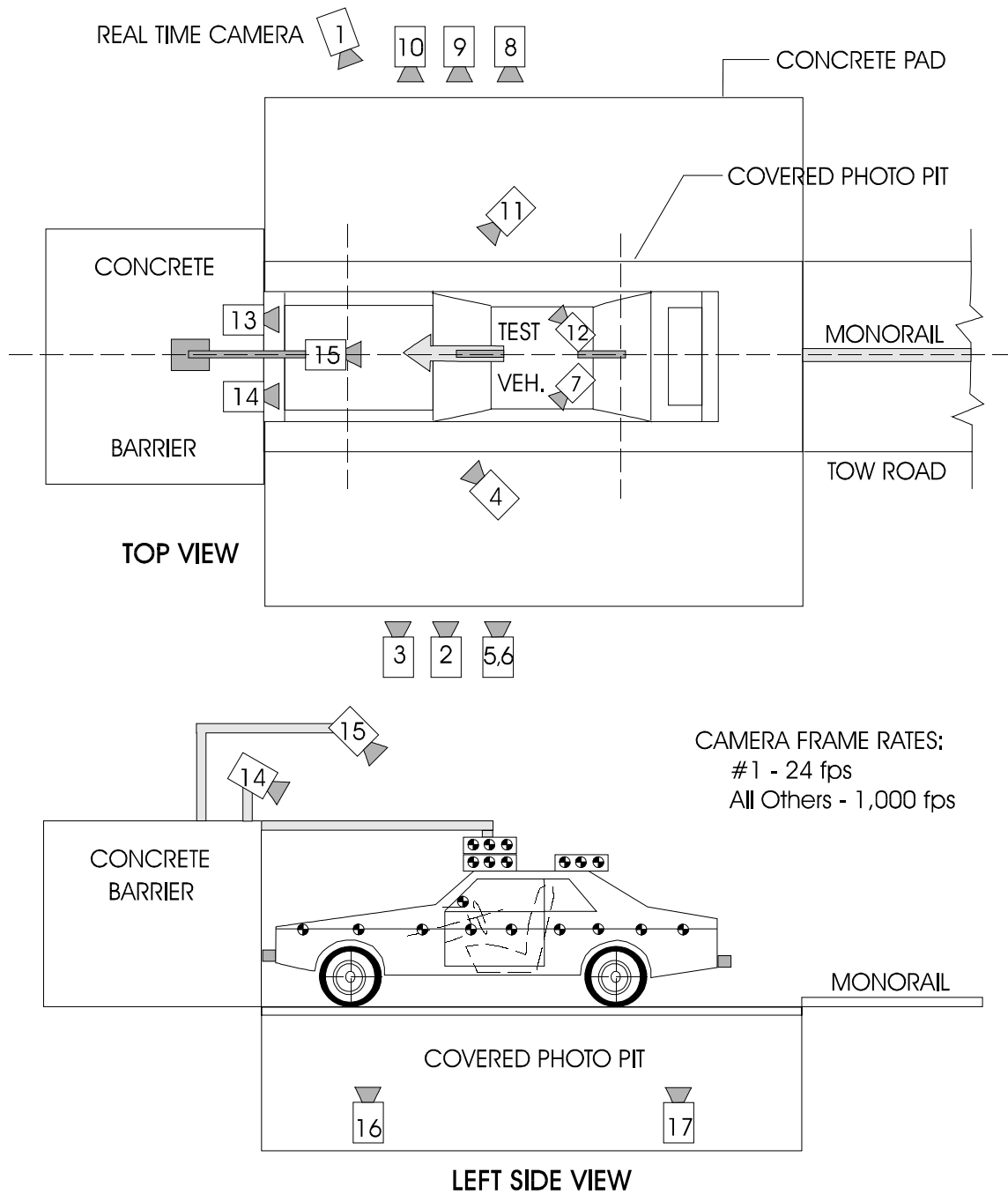
Passenger Side Floorpan Measurements

Floorpan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3605	3410	195	-428	-455	27
2	3591	3448	143	-407	-458	51
3	3550	3433	117	-428	-471	43
4	3466	3381	85	-319	-346	27
5	3506	3380	126	-327	-356	29
6	3511	3374	137	-337	-365	28
7	3409	3308	101	-254	-275	21
8	3413	3304	109	-248	-266	18
9	3411	3364	47	-253	-249	-4

Reference: X = Rear Bumper; Z = Ground

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

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



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

NHTSA Test No.: M15101 Vehicle: 2001 Toyota Avalon 4-Door

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	6891	1583	1075	-2.3	6454	12.5	1000
3	Left Side View	8570	995	1102	-2.1	8133	25	1025
4	Driver and Interior View	7241	2633	1940	-9.1	-	35	1055
5	Steering Column (Bottom)	7672	1867	1165	-2.6	7235	25	1010
6	Steering Column (Top)	7672	1867	1780	-7.9	7235	25	1020
7 †	Left Belt	-	-	-	-	-	-	-
8	Overall Right Side	6899	2019	1104	-1.9	6462	12.5	1015
9	Right Side View	8018	1243	1115	-2.6	7581	25	1010
10	Right Passenger View	8100	1858	1367	-3.0	7663	35	1015
11	Passenger and Interior View	7371	2910	1956	-8.2	-	35	1005
12 †	Right Belt	-	-	-	-	-	-	-
13	Passenger Front View	605	-55	1985	-35.3	-	13	1030
14	Driver Front View	605	-55	1985	-35.0	-	13	1010
15	Windshield View	0	-673	3560	-51.6	-	13	1005
16	Pit View of Engine	0	645	-3048	90.0	-	13	1005
17	Pit View of Fuel Tank	0	2745	-3048	90.0	-	13	1055

*X = film plane to monorail centerline

** = referenced to horizontal plane

Y = film plane to impact location

N.T. indicates No Timing

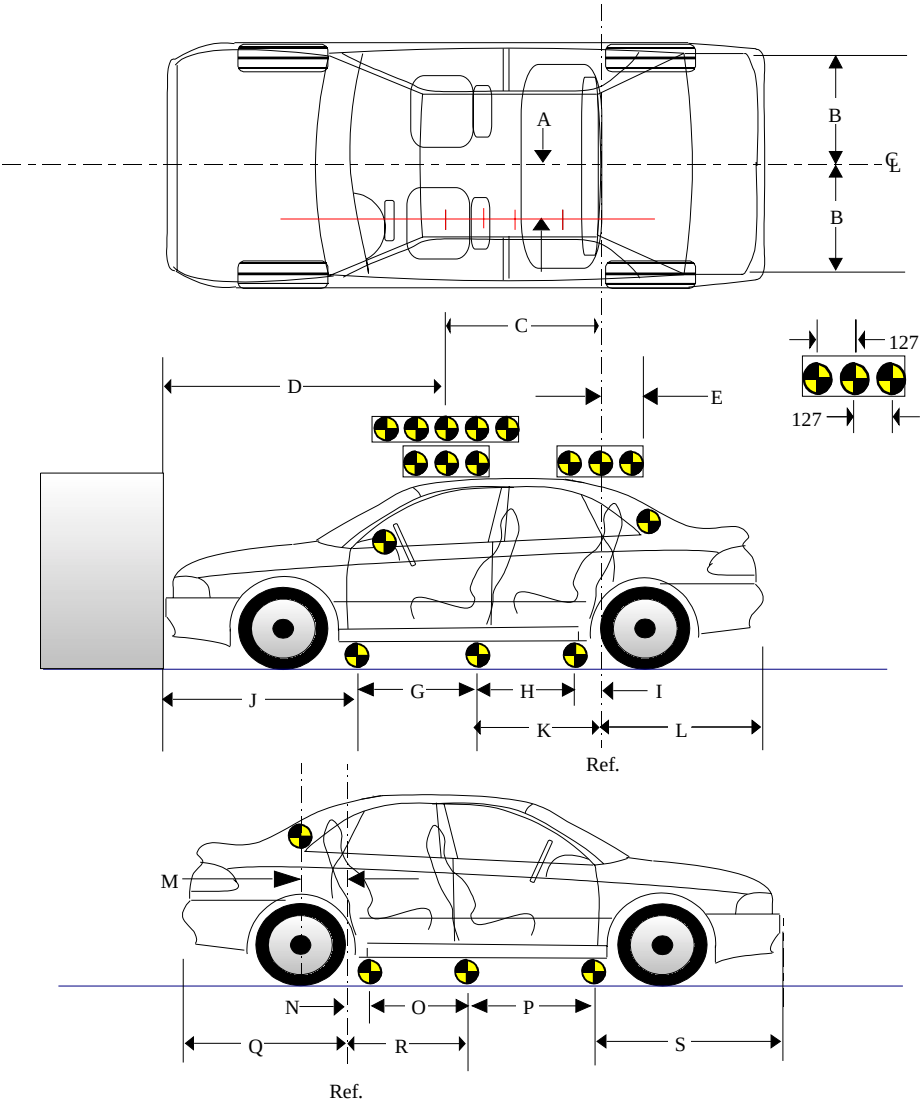
Z = film plane to ground

† Seat belt was not clearly visible from the rear occupant compartment, camera was not installed.

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

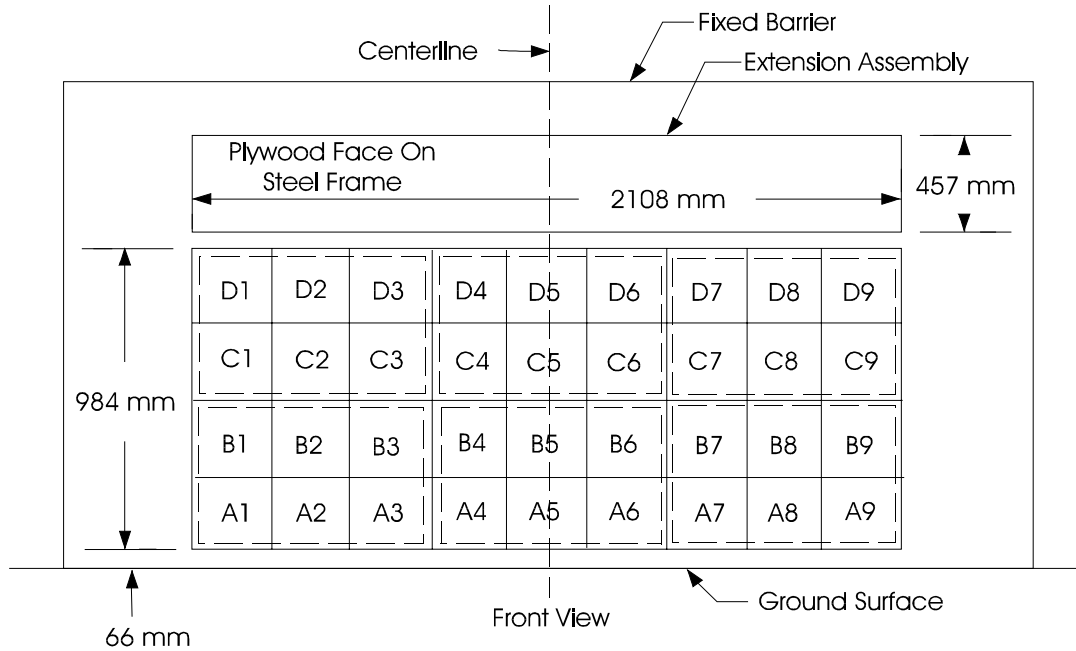
(Dimensions in millimeters)

A	361
B	704
C	1213
D	2167
E	298
F	1593
G	933
H	915
I	111
J	1417
K	1026
L	1501
M	296
N	98
O	920
P	939
Q	1510
R	1018
S	1409



DATA SHEET NO. 17 LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
 4 Rows
 9 Columns
 6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

The following data is presented in Appendix B:

- (1) Data from 36 individual load cells
- (2) Total or Sum of 36 individual load cells
- (3) Data from 6 Groupings shown above (6 cells/group)

DATA SHEET NO. 18 POST TEST AIR BAG DATA

NHTSA No. : M15101; Test Date: January 4, 2001; Technician: Lawrence Q. Valvo

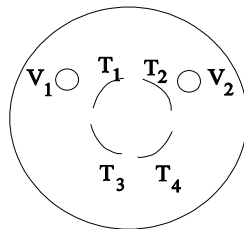
Vehicle Model Year/Make/Model: 2001 Toyota Avalon

- A. No. of vent holes: 2 -Driver 2 -Passenger
- B. Size of vent holes: (mm²) 962 -Driver 707 -Passenger
- C. Total vent area: (mm²) 1924 -Driver 1414 -Passenger
- D. Deflated air bag length and width dimensions or, if round, diameter. (mm)
- Driver: - -Length; 670 -Diameter; 280 -Depth
- Passenger: 605 -Height; 520 -Width; 535 -Depth
- E. Is the air bag tethered?
- Driver: X -Yes; - -No; If yes, record length of tether- 225
- Passenger: - -Yes; X -No; If yes, record length of tether- -

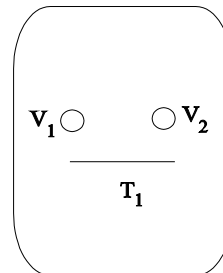
Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

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

Driver



Passenger



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

Driver: Air bag: 45165-07020-0A; 0006752; E240; 09/08/00

Generator: *TAT L8N 1N BPF*; *207323800A21*

Passenger: Air bag: *T1JC237N10249*; 30316736B

Generator: 303114471C; C24313500MF3 73960-07030-00; 0957

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

Vehicle Make/Model/Body Style: Toyota Avalon 4-Door

NHTSA Test No.: M15101 VIN: 4T1BF28B61U115653

Model Year: 2001 Build Date: 09/00 Test Date: January 4, 2001

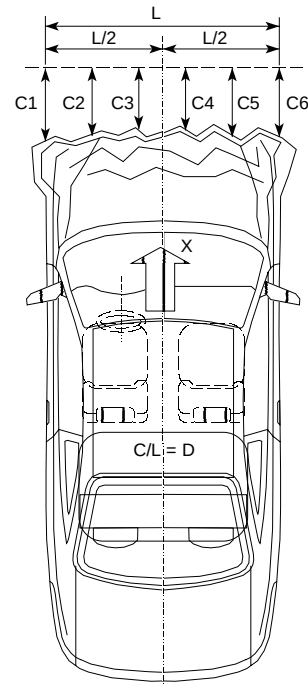
Vehicle Size Category: Large Test Weight: 1764.0 kg

Vehicle Wheelbase: 2716 mm; Front Overhang: 980 mm; Overall Width: 1820 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

	PRE	POST	DIFF	
C1 =	4688	4273	415	mm
C2 =	4840	4221	619	mm
C3 =	4873	4256	617	mm
C4 =	4871	4250	621	mm
C5 =	4839	4210	629	mm
C6 =	4686	4247	439	mm



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1485 mm
 L2= 743 mm
 L5= 297 mm

APPENDIX A
PHOTOGRAPHS

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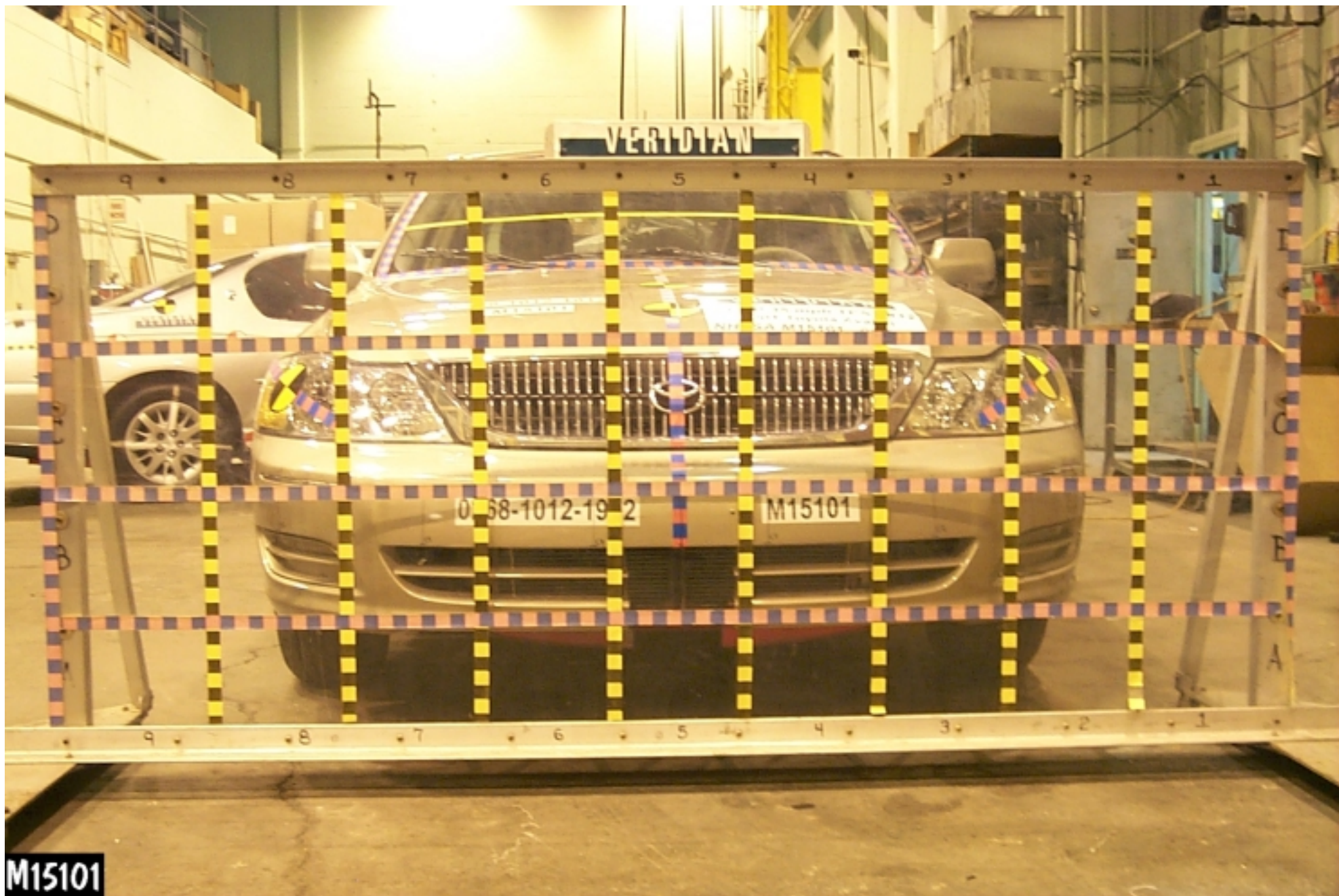


Figure A-1: LOAD CELL LOCATIONS.



Figure A-2: PRE-TEST FRONT VIEW



Figure A-3: POST-TEST FRONT VIEW.



Figure A-4: PRE-TEST LEFT SIDE VIEW

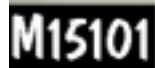


Figure A-5: POST-TEST LEFT SIDE VIEW



Figure A-6: PRE-TEST RIGHT SIDE VIEW



Figure A-7: POST-TEST RIGHT SIDE VIEW



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



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



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



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



Figure A-12: PRE-TEST WINDSHIELD VIEW



Figure A-13: POST-TEST WINDSHIELD VIEW



Figure A-14: PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15: FUEL CAP VIEW

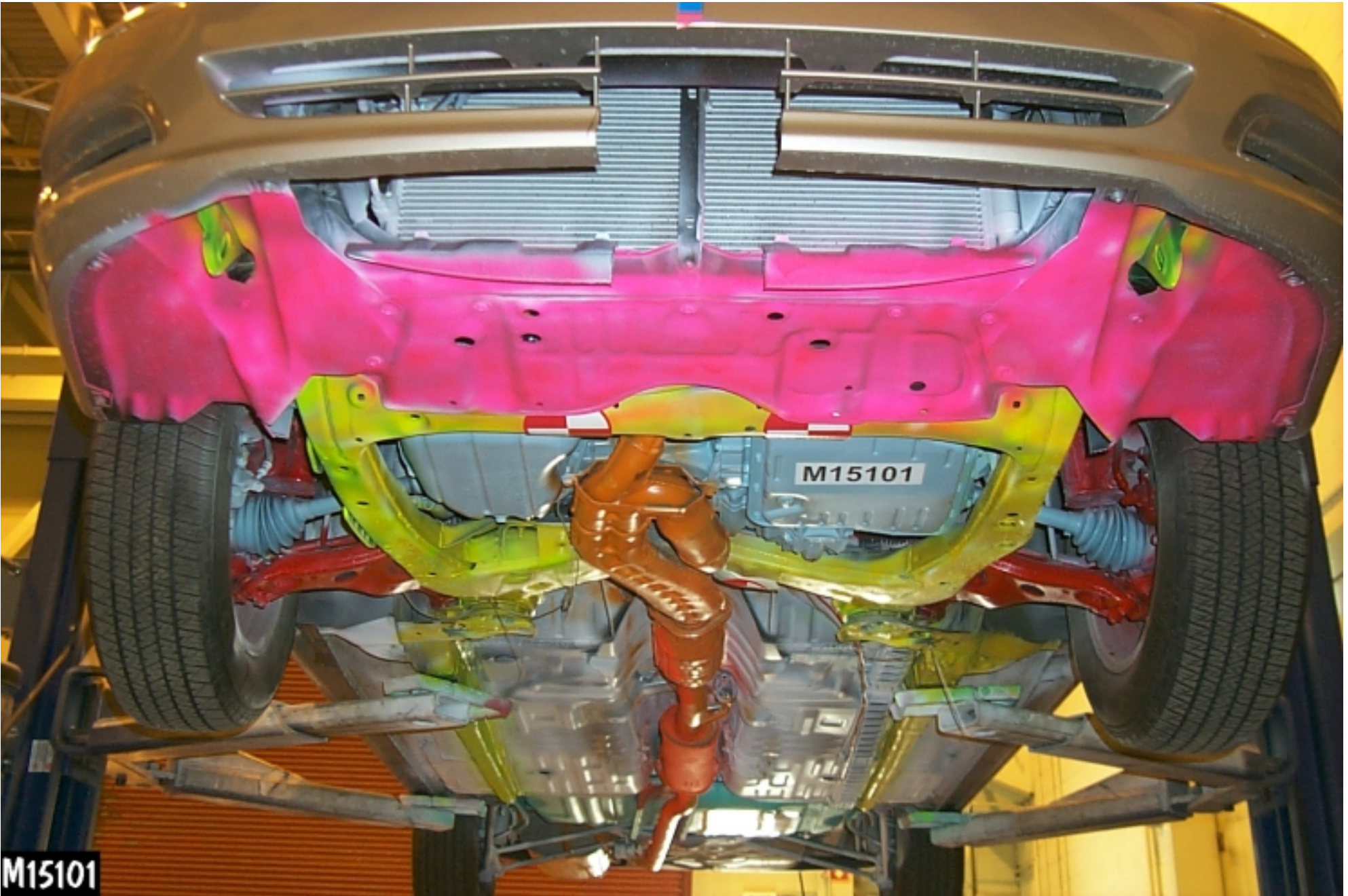


Figure A-16: PRE-TEST FRONT UNDERBODY VIEW

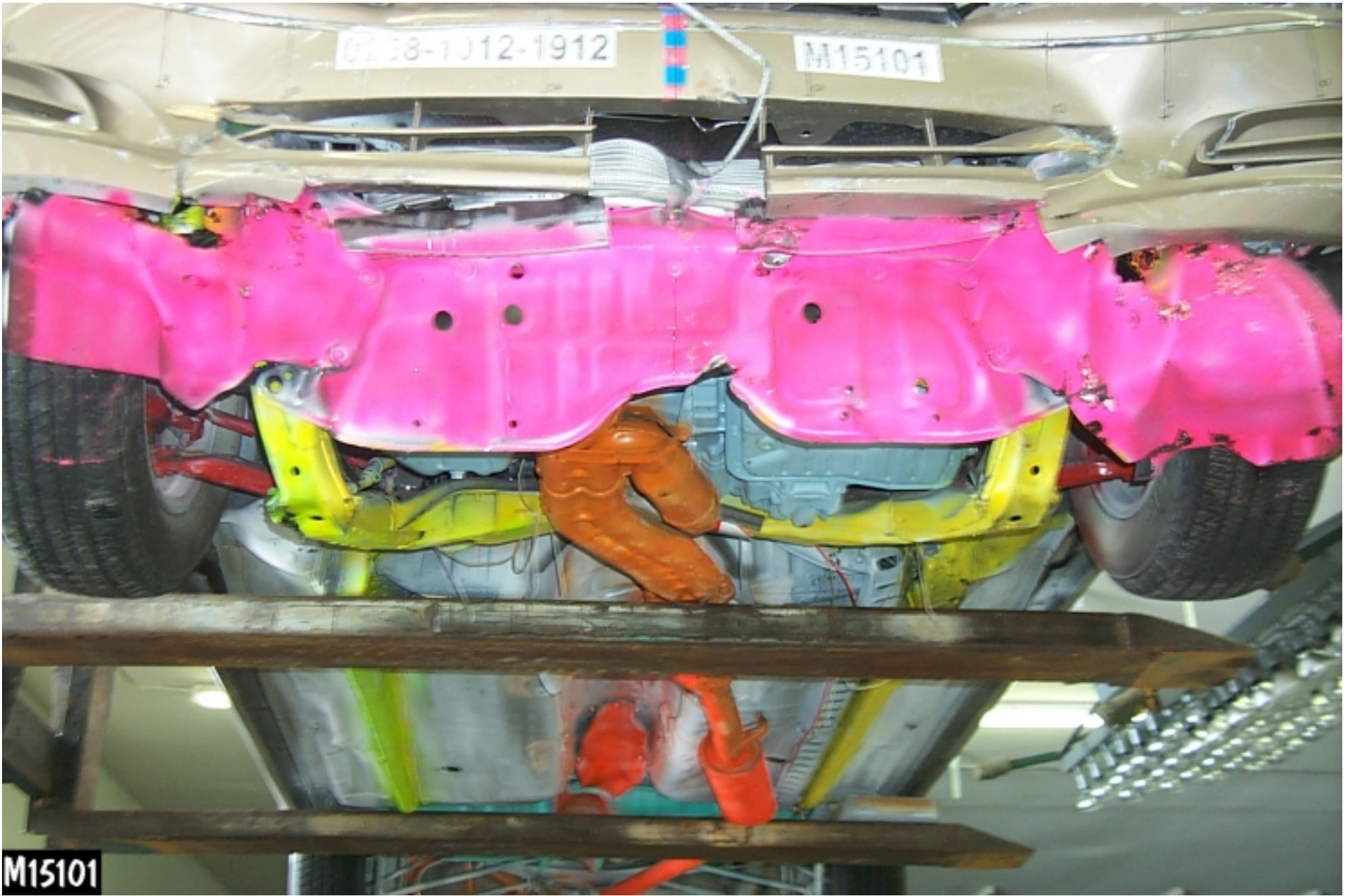


Figure A-17: POST-TEST FRONT UNDERBODY VIEW



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



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



Figure A-20: PRE-TEST REAR UNDERBODY VIEW



Figure A-21: POST-TEST REAR UNDERBODY VIEW



Figure A-22: PRE-TEST DRIVER POSITION VIEW



Figure A-23: POST-TEST DRIVER POSITION VIEW



Figure A-24: PRE-TEST PASSENGER POSITION VIEW



Figure A-25: POST-TEST PASSENGER POSITION VIEW



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



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



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



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



Figure A-30: PRE-TEST DRIVER HEAD LOCATION



Figure A-31: POST-TEST DRIVER HEAD LOCATION



Figure A-32: PRE-TEST PASSENGER HEAD LOCATION



Figure A-33: POST-TEST PASSENGER HEAD LOCATION



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



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



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



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



Figure A-38: ROLLOVER VIEW



Figure A-39: IMPACT VIEW

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

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

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

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO. M15101

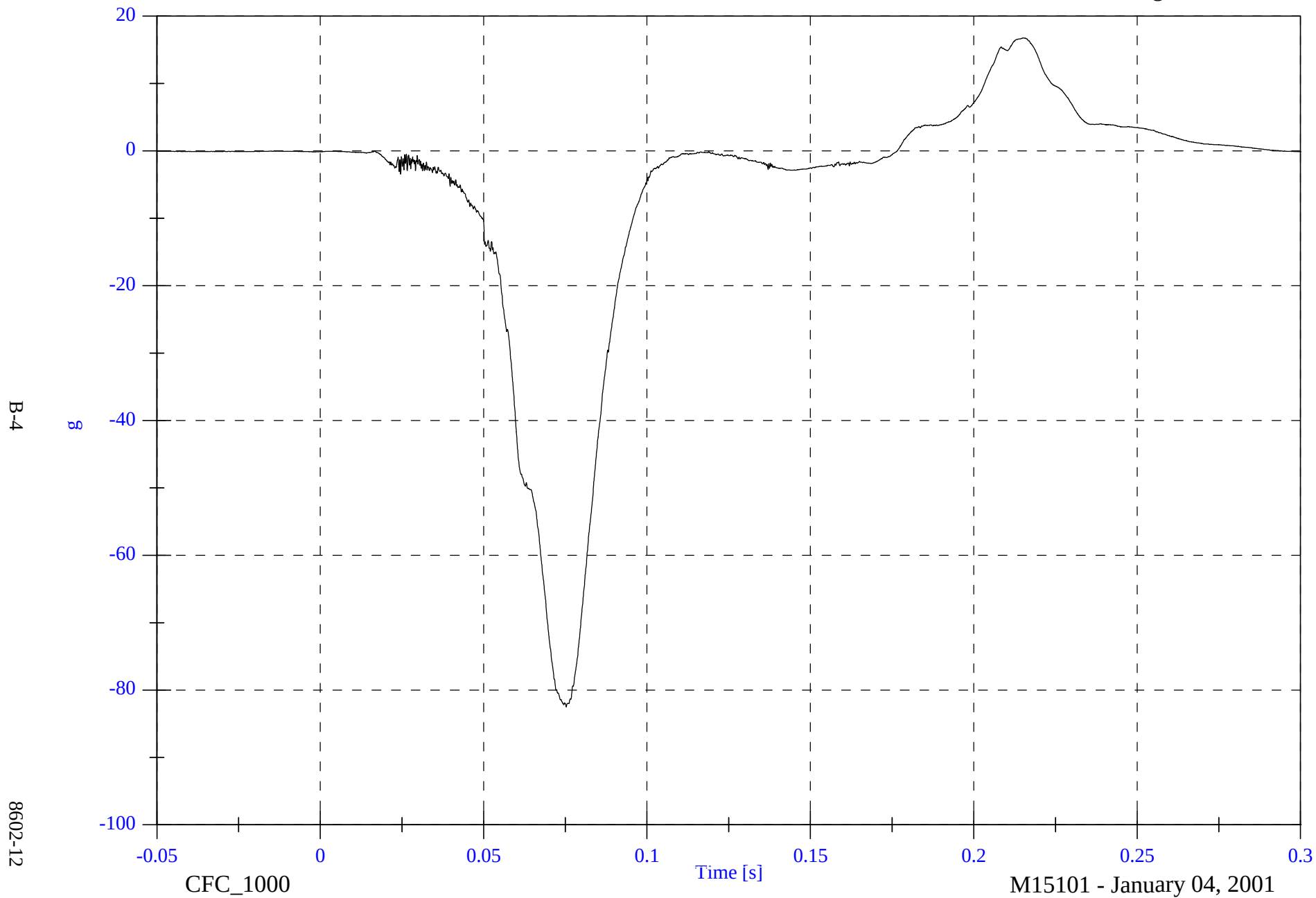
DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	60
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle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

NCAP Test 12 - 2001 Toyota Avalon

P1 Head x

Max: 16.7 [g] at 0.215 [s]

Min: -82.5 [g] at 0.075 [s]

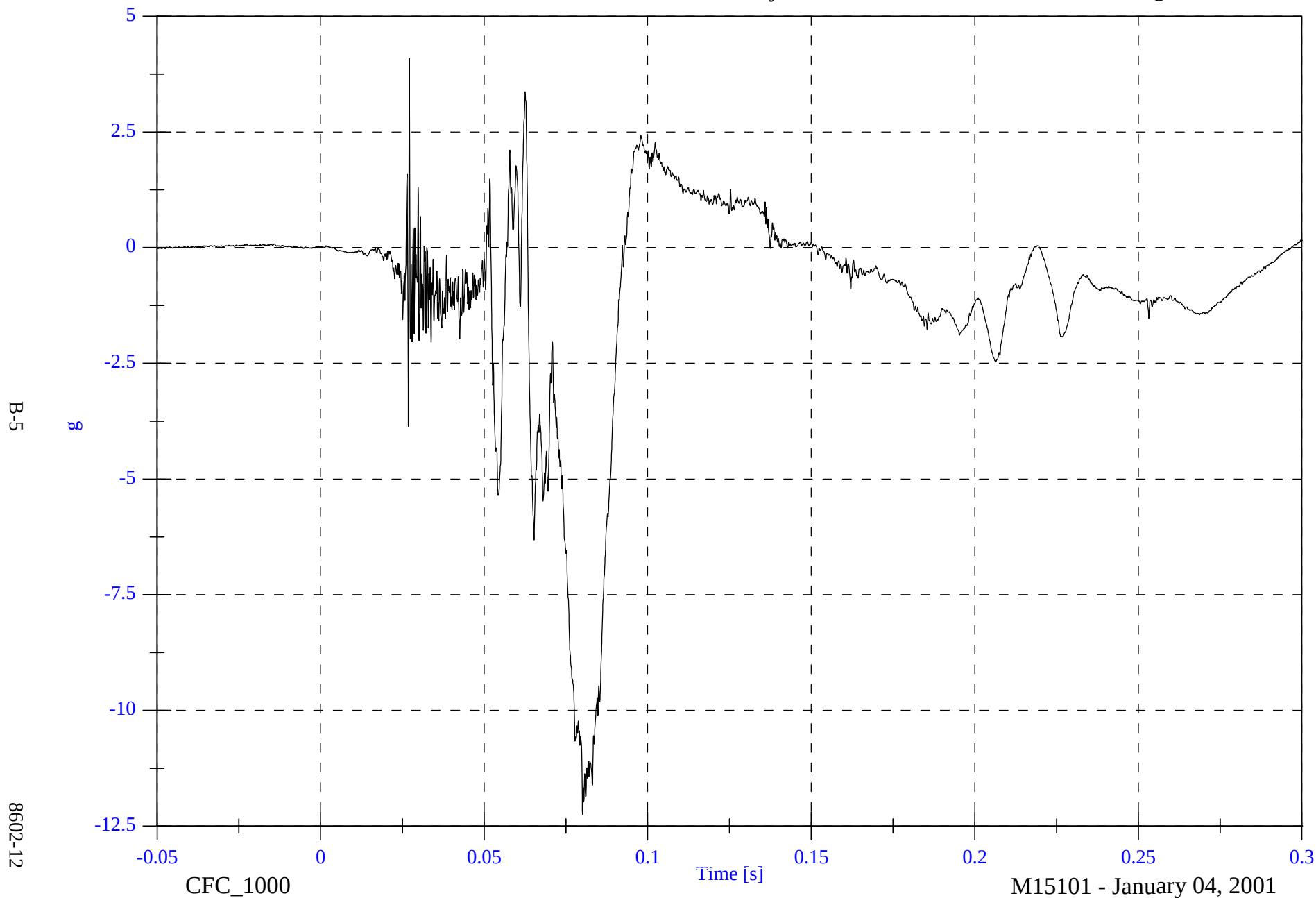


NCAP Test 12 - 2001 Toyota Avalon

P1 Head y

Max: 4.1 [g] at 0.027 [s]

Min: -12.3 [g] at 0.080 [s]



NCAP Test 12 - 2001 Toyota Avalon

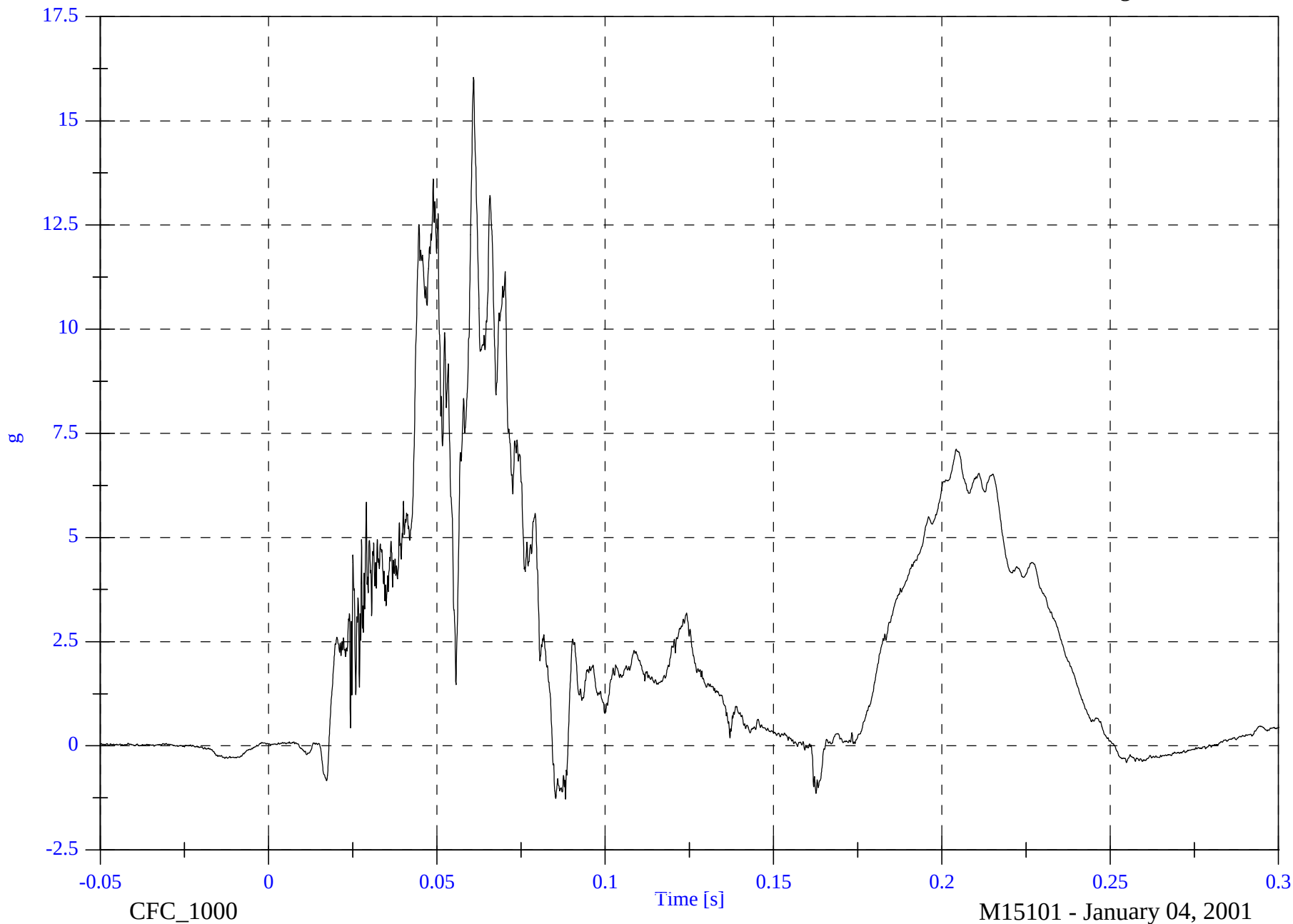
P1 Head z

Max: 16.0 [g] at 0.061 [s]

Min: -1.3 [g] at 0.088 [s]

B-6

8602-12

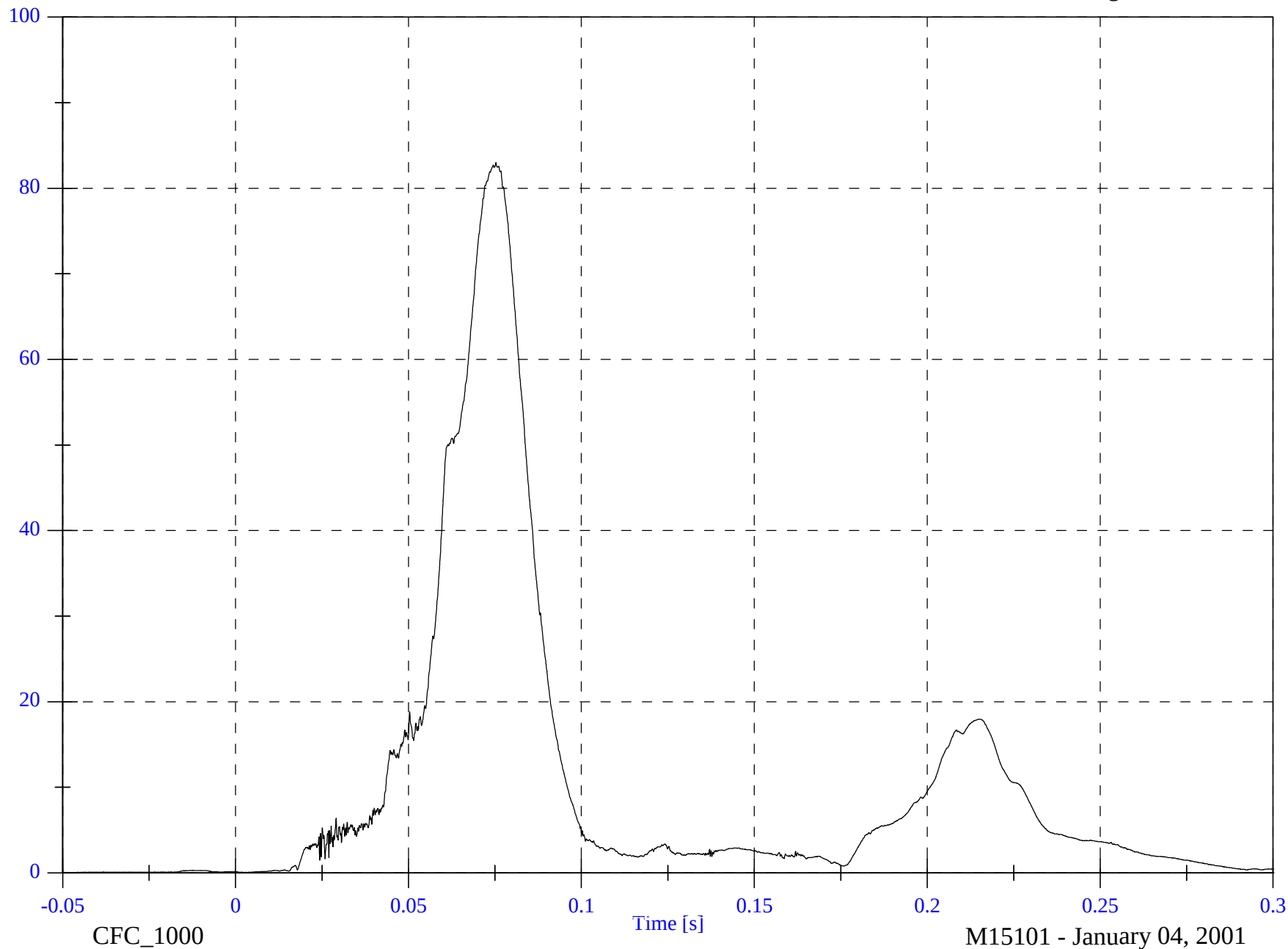


NCAP Test 12 - 2001 Toyota Avalon

P1 Head Resultant

Max: 83.0 [g] at 0.075 [s]

Min: 0.0 [g] at 0.003 [s]



B-7

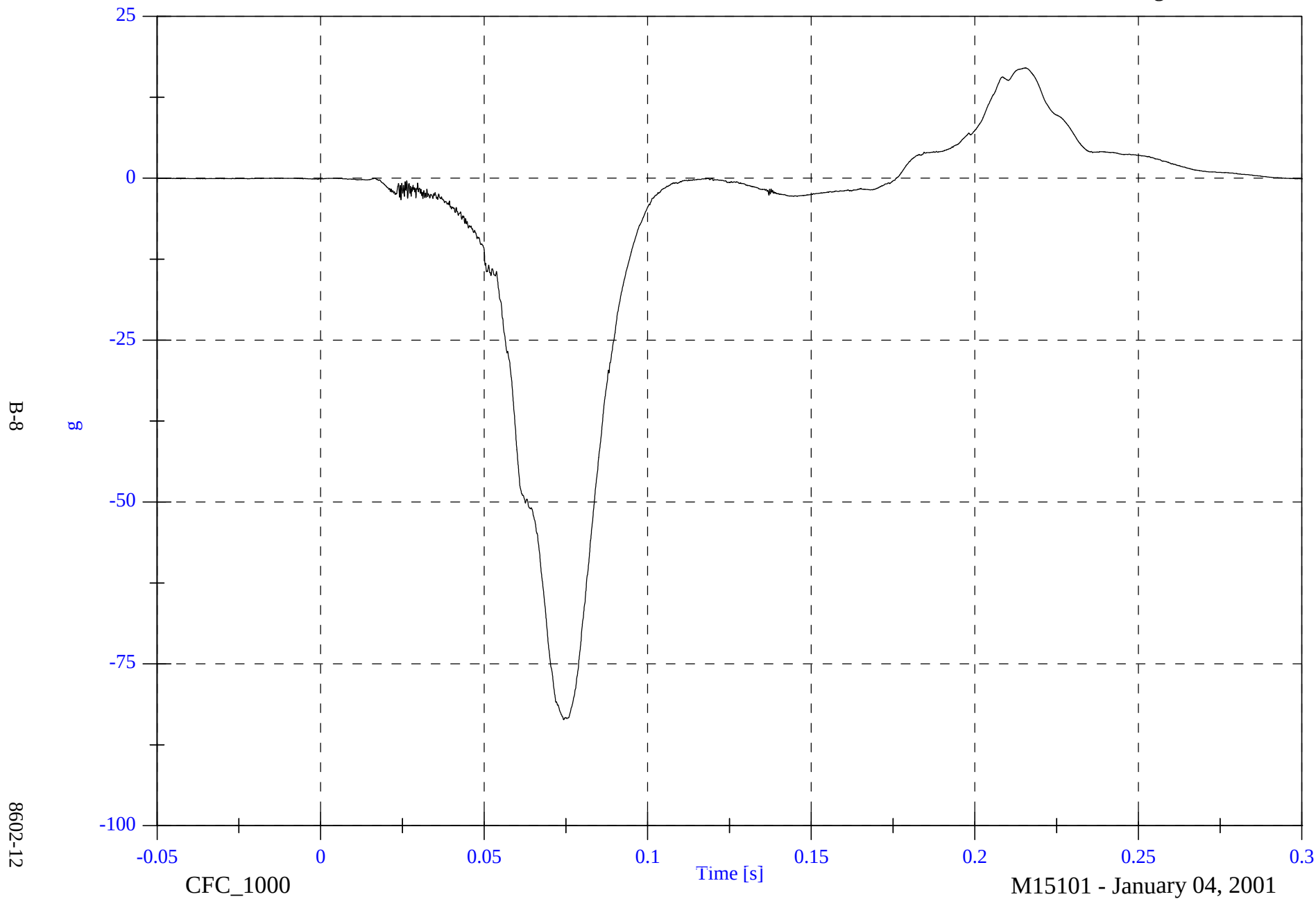
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Head Red x

Max: 17.0 [g] at 0.216 [s]

Min: -83.6 [g] at 0.074 [s]

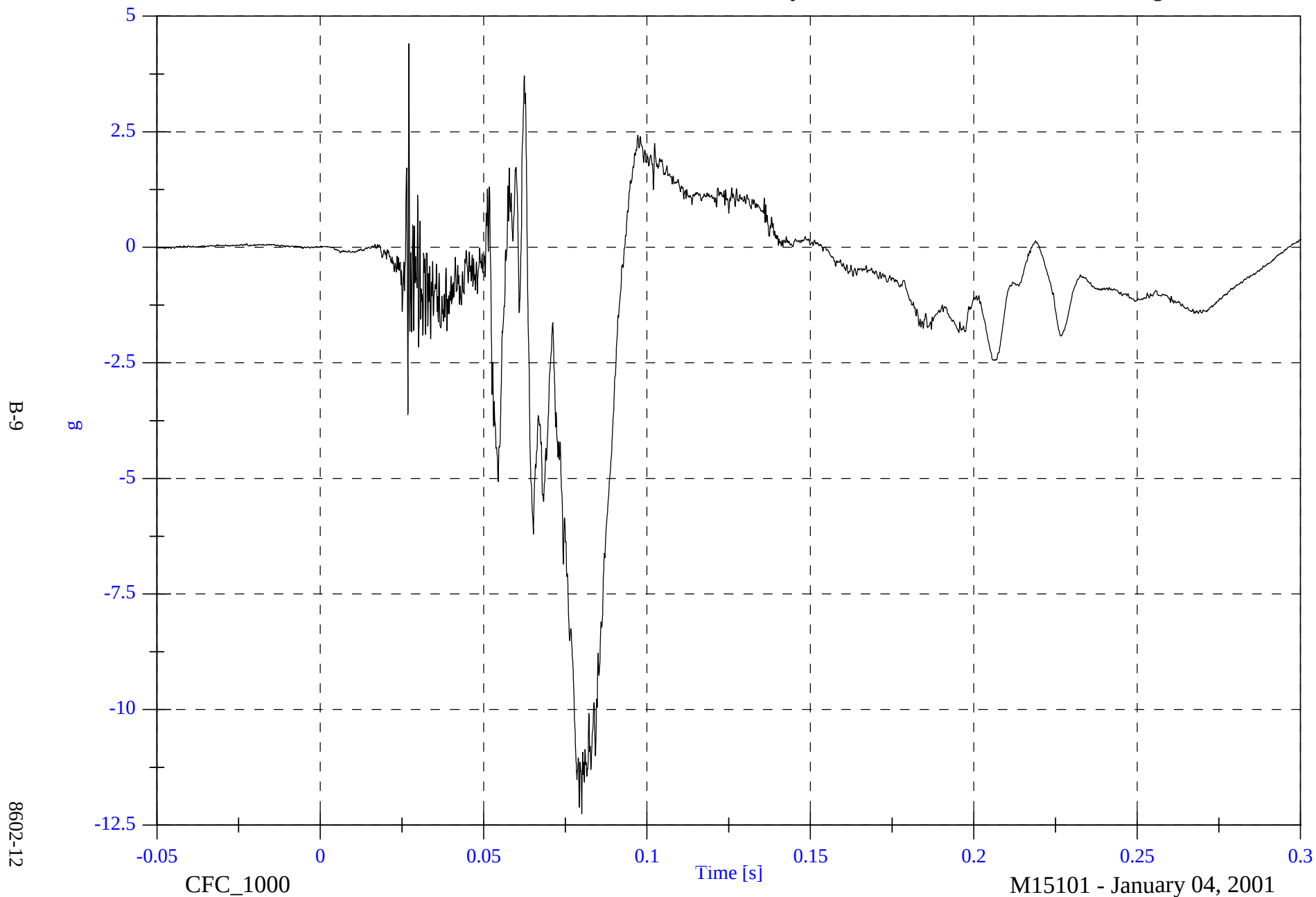


NCAP Test 12 - 2001 Toyota Avalon

P1 Head Red y

Max: 4.4 [g] at 0.027 [s]

Min: -12.3 [g] at 0.080 [s]

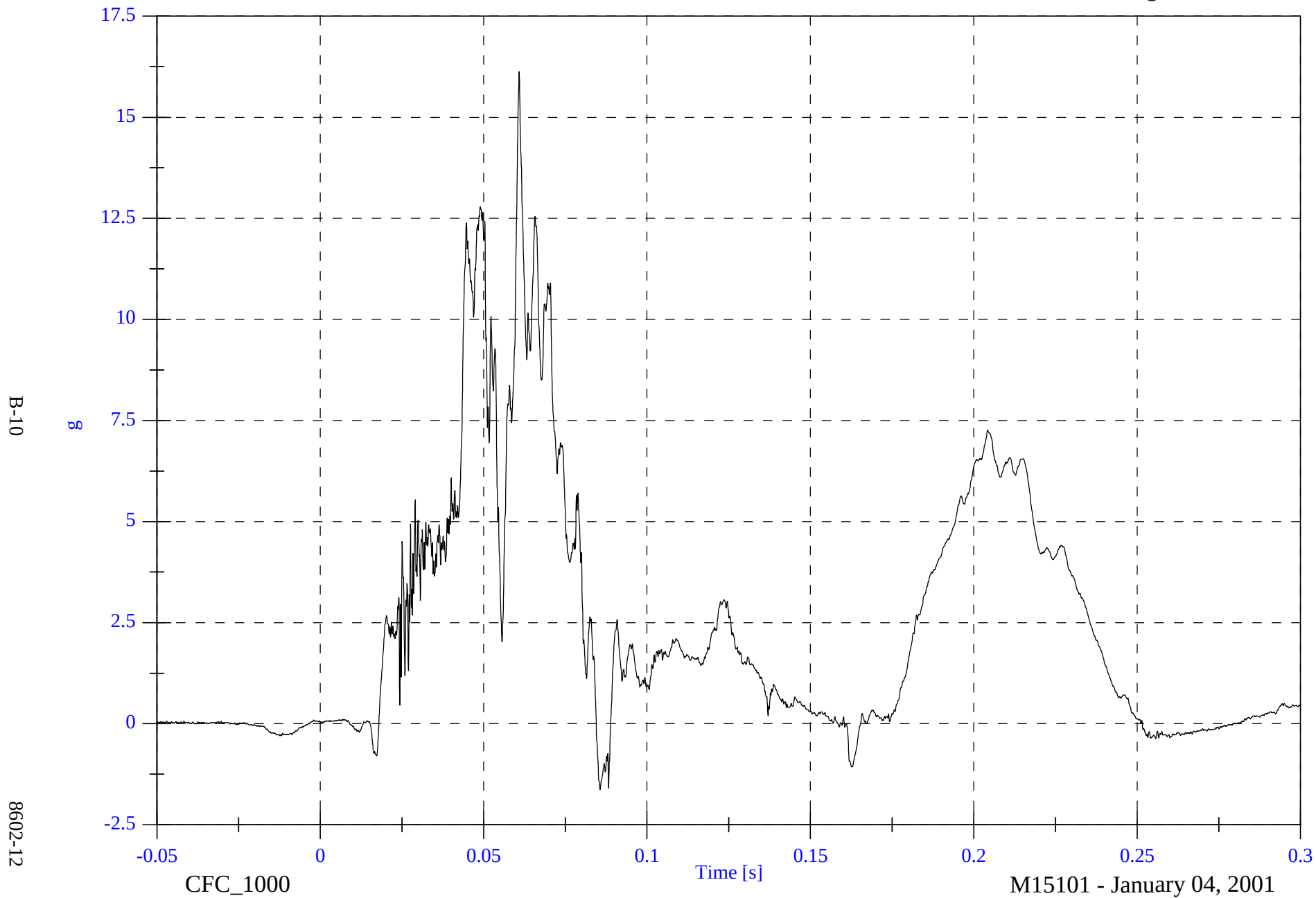


NCAP Test 12 - 2001 Toyota Avalon

P1 Head Red z

Max: 16.1 [g] at 0.061 [s]

Min: -1.6 [g] at 0.086 [s]



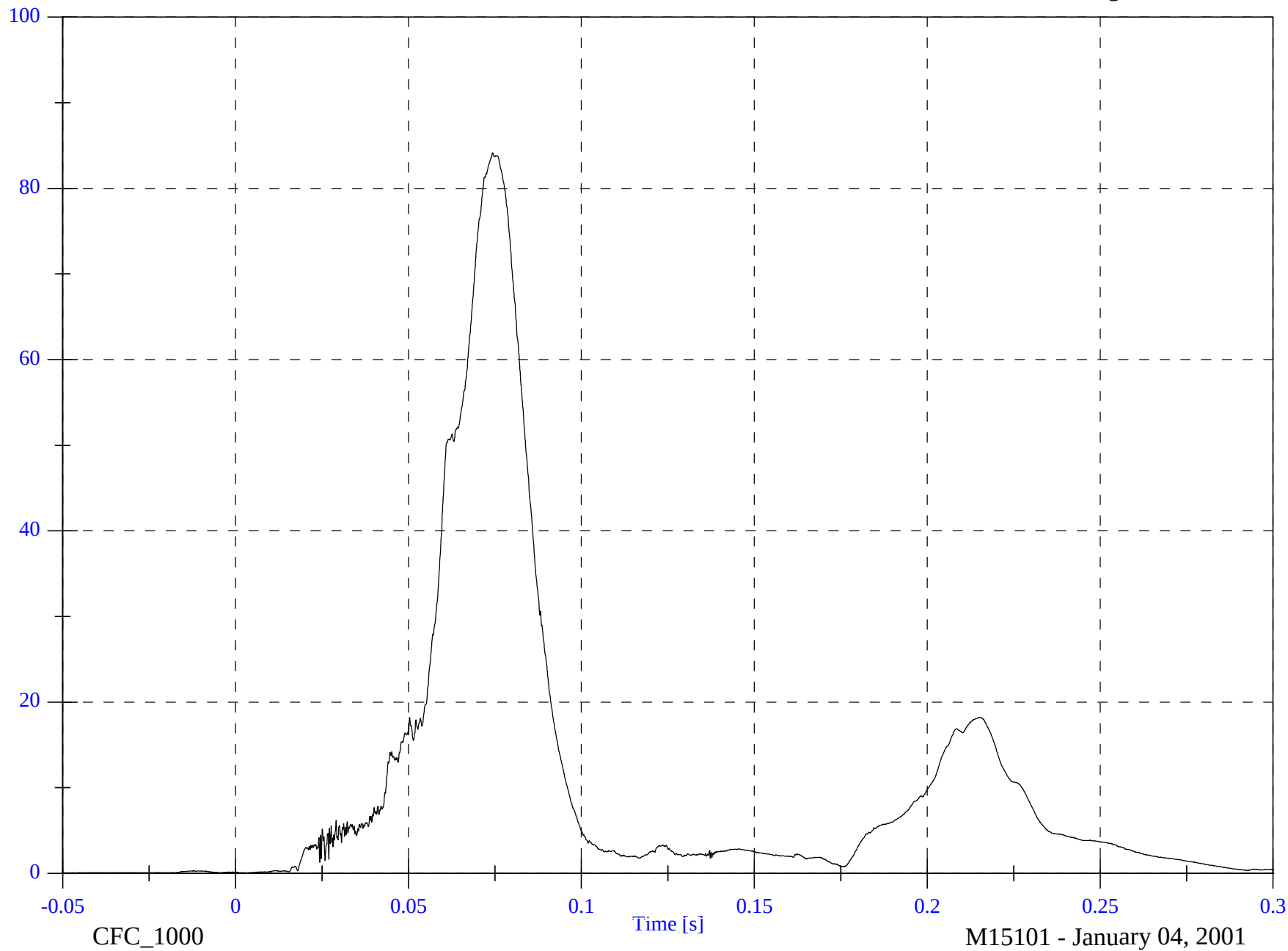
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Head Red Resultant

Max: 84.2 [g] at 0.074 [s]

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



B-11

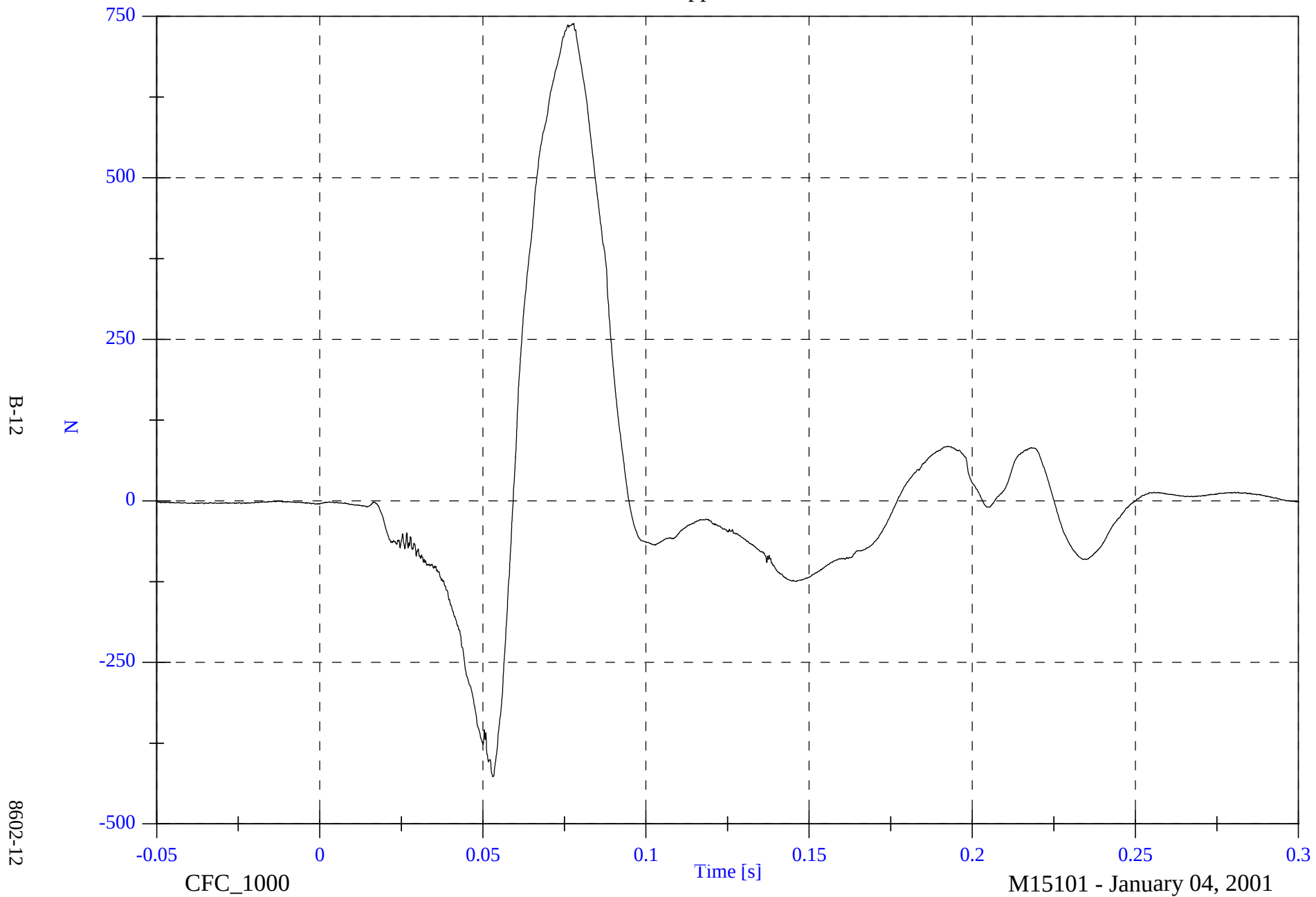
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Upper Neck Fx

Max: 738.8 [N] at 0.078 [s]

Min: -427.2 [N] at 0.053 [s]

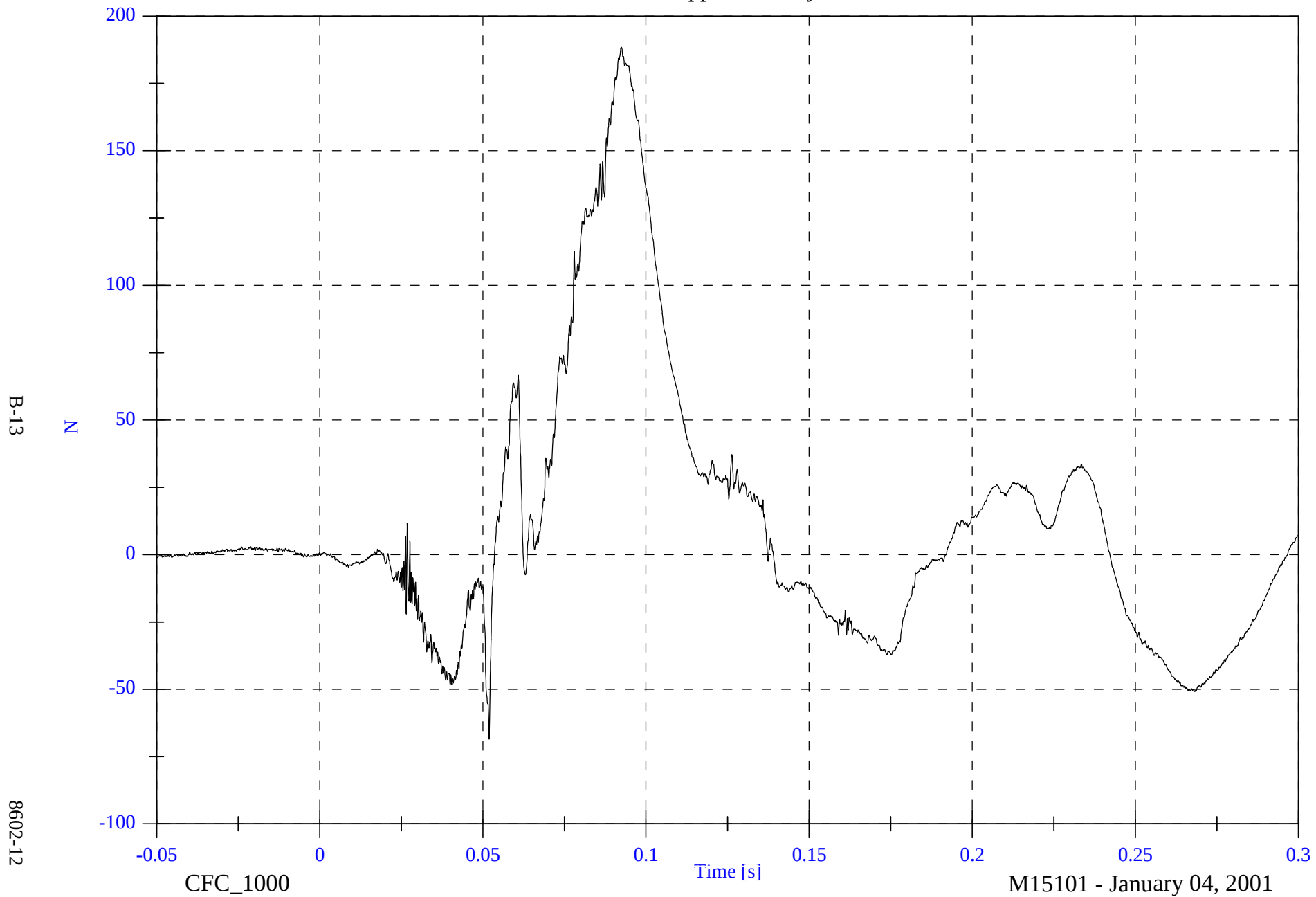


NCAP Test 12 - 2001 Toyota Avalon

P1 Upper Neck Fy

Max: 188.4 [N] at 0.092 [s]

Min: -68.6 [N] at 0.052 [s]

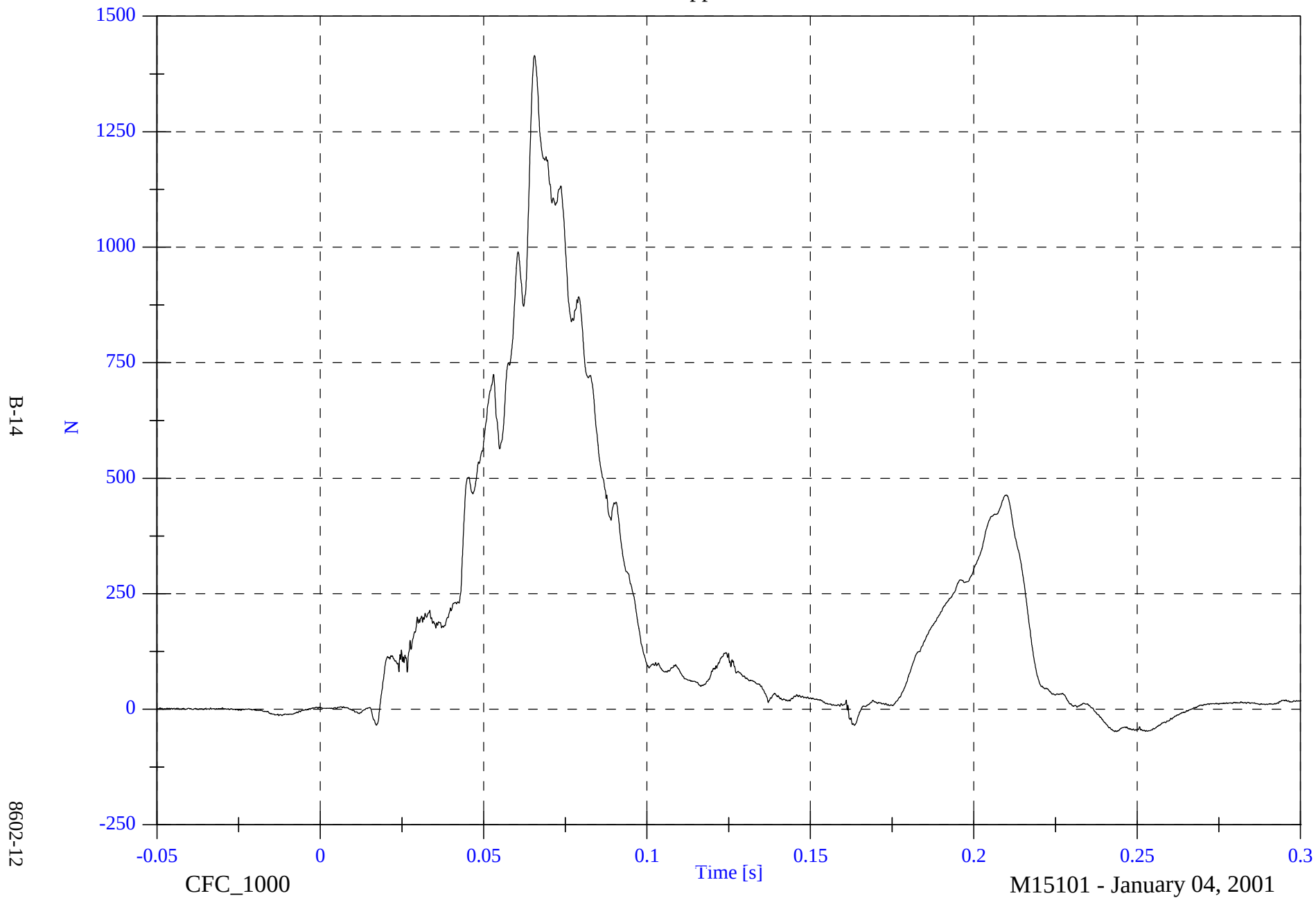


NCAP Test 12 - 2001 Toyota Avalon

P1 Upper Neck Fz

Max: 1415.1 [N] at 0.066 [s]

Min: -48.6 [N] at 0.243 [s]



NCAP Test 12 - 2001 Toyota Avalon

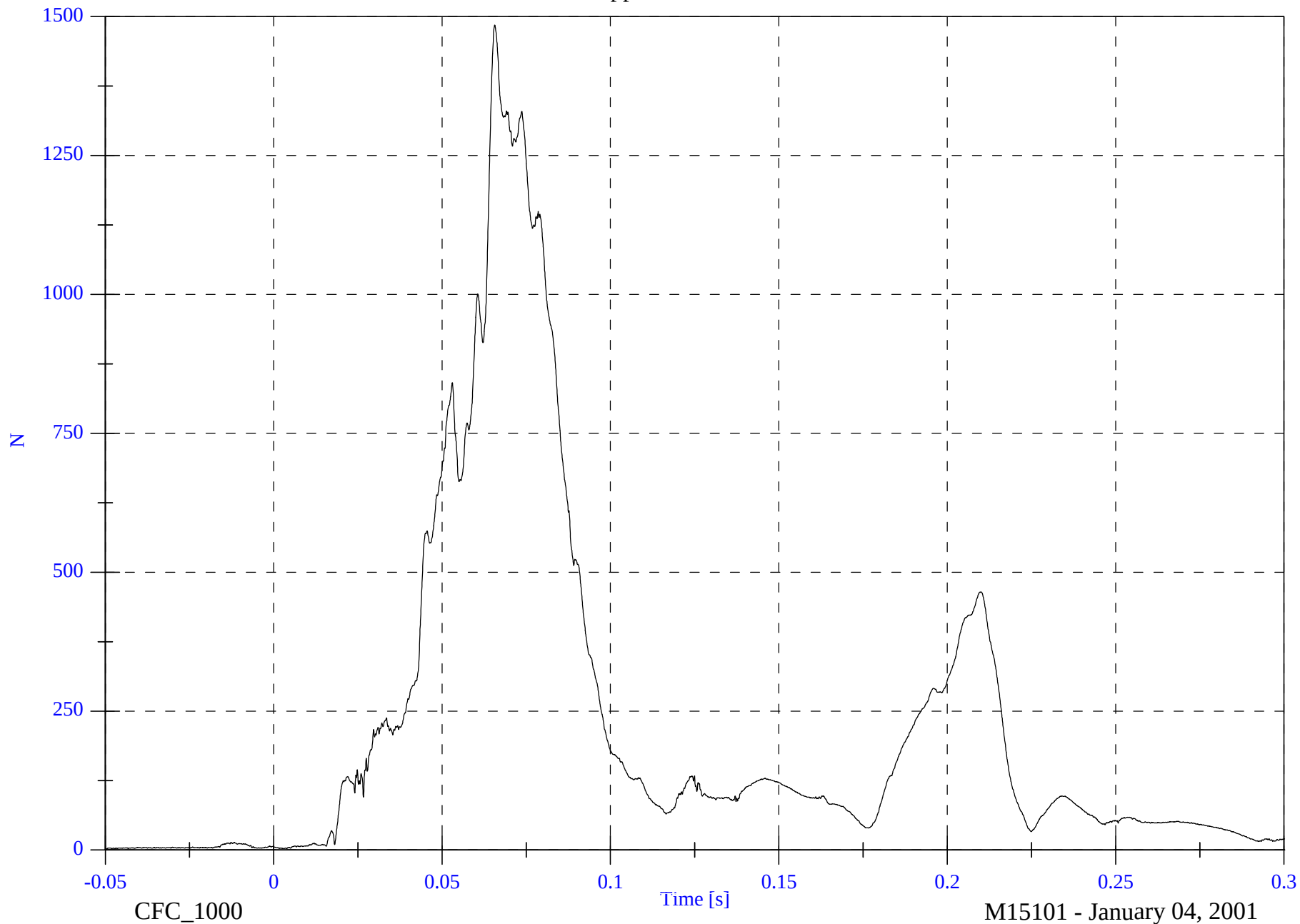
P1 Upper Neck F Resultant

Max: 1485.0 [N] at 0.066 [s]

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

B-15

8602-12

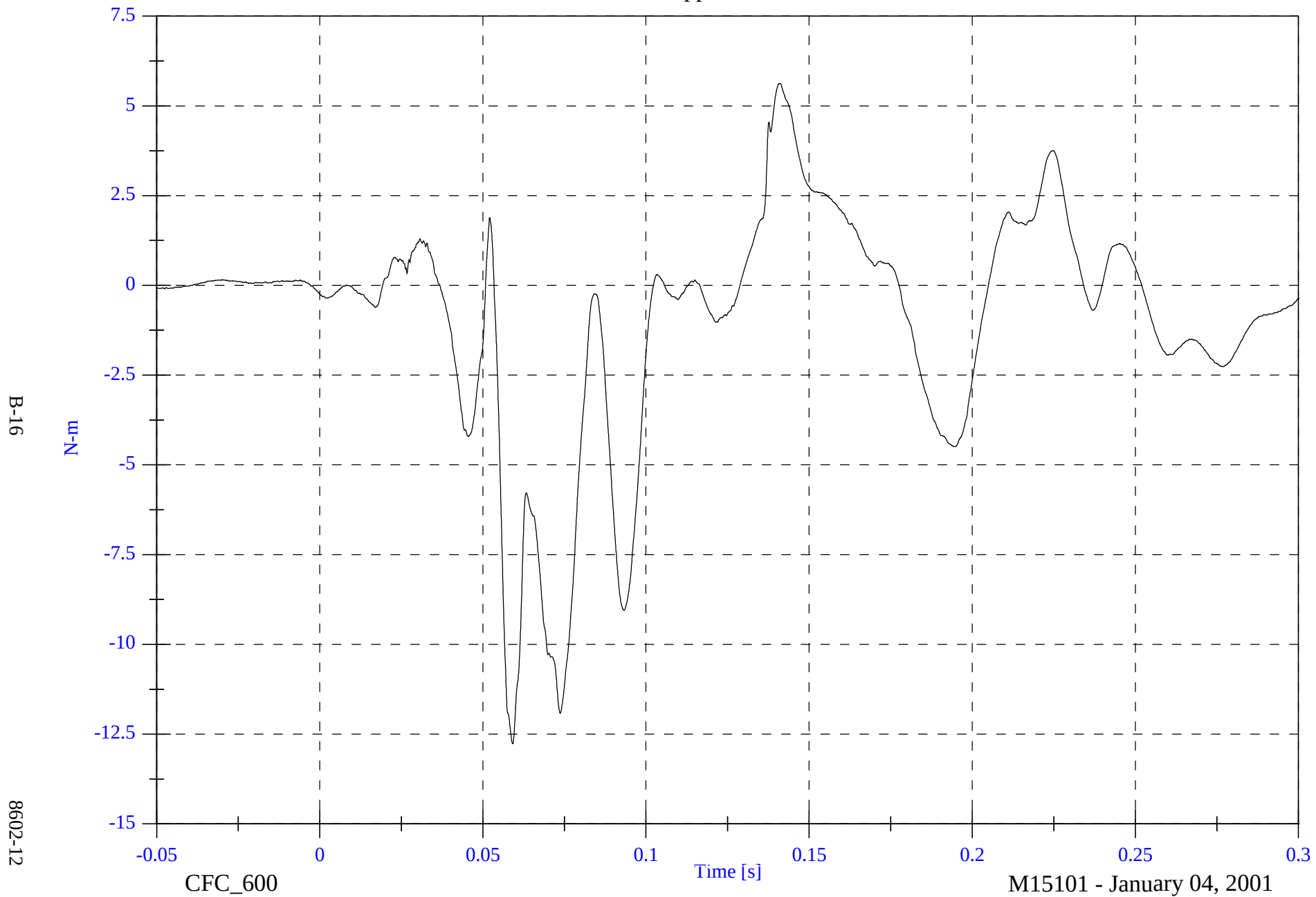


NCAP Test 12 - 2001 Toyota Avalon

P1 Upper Neck Mx

Max: 5.6 [N-m] at 0.141 [s]

Min: -12.8 [N-m] at 0.059 [s]



NCAP Test 12 - 2001 Toyota Avalon

P1 Upper Neck My

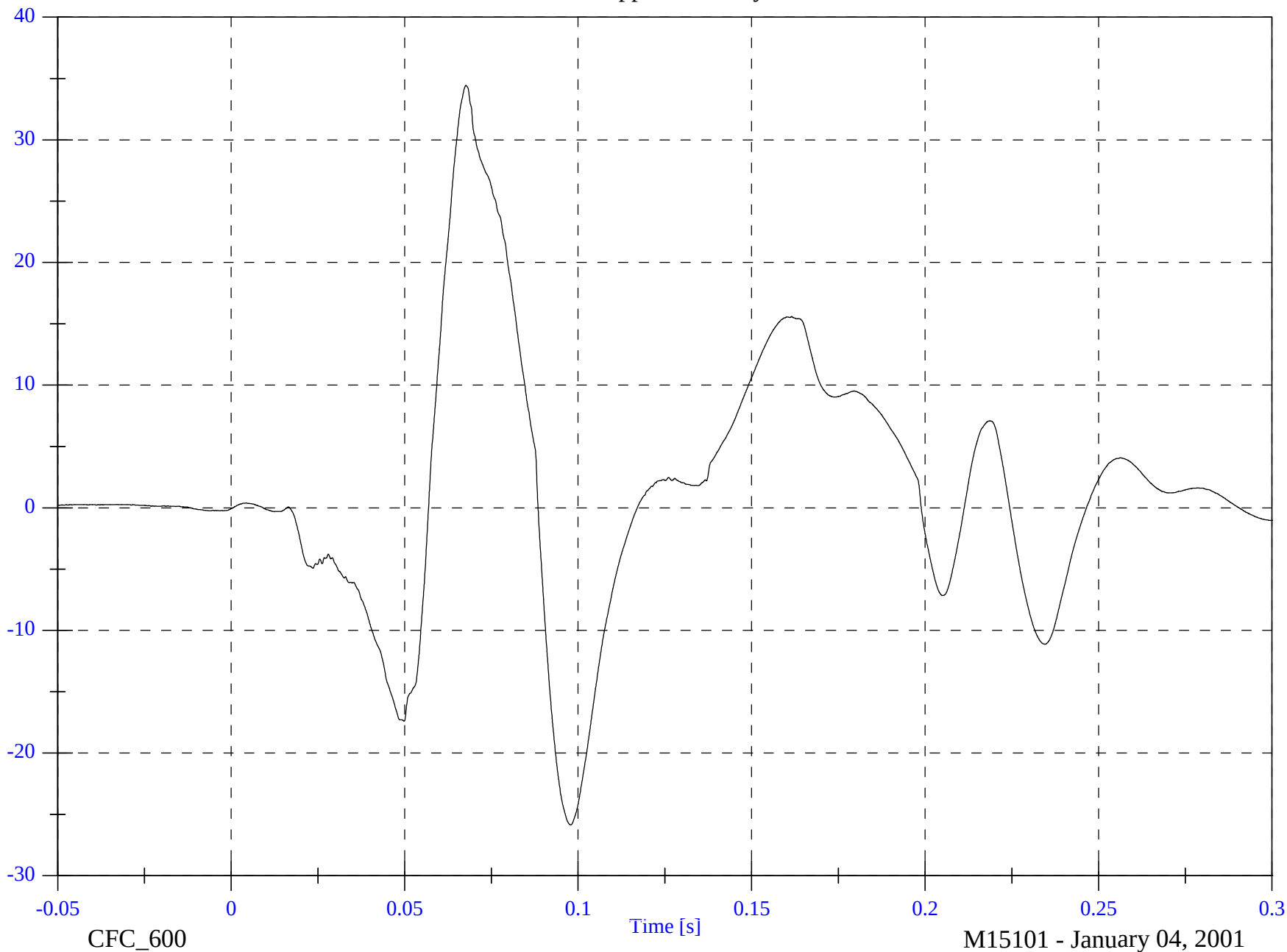
Max: 34.4 [N-m] at 0.068 [s]

Min: -25.9 [N-m] at 0.098 [s]

B-17

N-m

8602-12

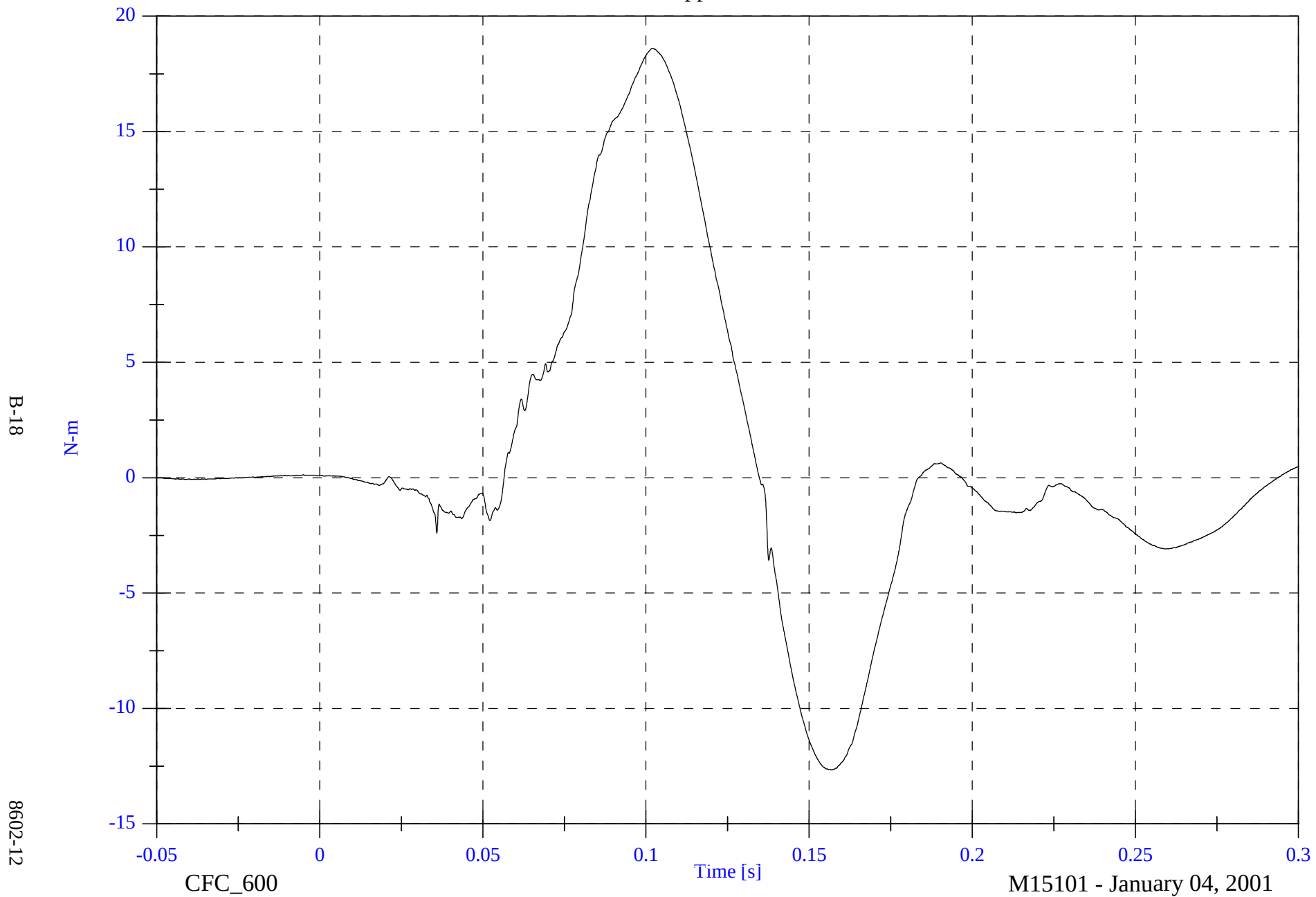


NCAP Test 12 - 2001 Toyota Avalon

P1 Upper Neck Mz

Max: 18.6 [N-m] at 0.102 [s]

Min: -12.7 [N-m] at 0.157 [s]

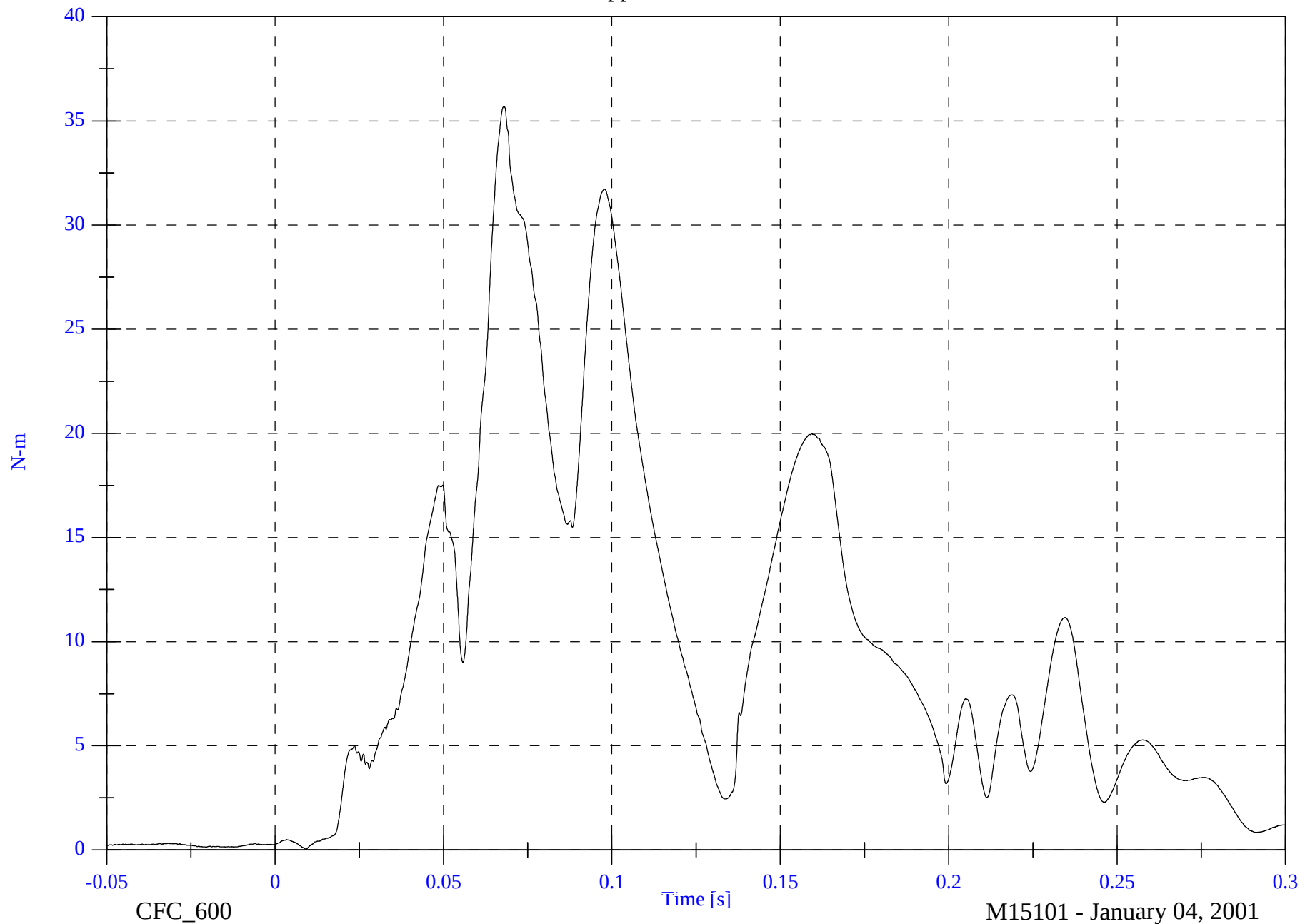


NCAP Test 12 - 2001 Toyota Avalon

P1 Upper Neck M Resultant

Max: 35.7 [N-m] at 0.068 [s]

Min: 0.0 [N-m] at 0.009 [s]



B-19

8602-12

NCAP Test 12 - 2001 Toyota Avalon

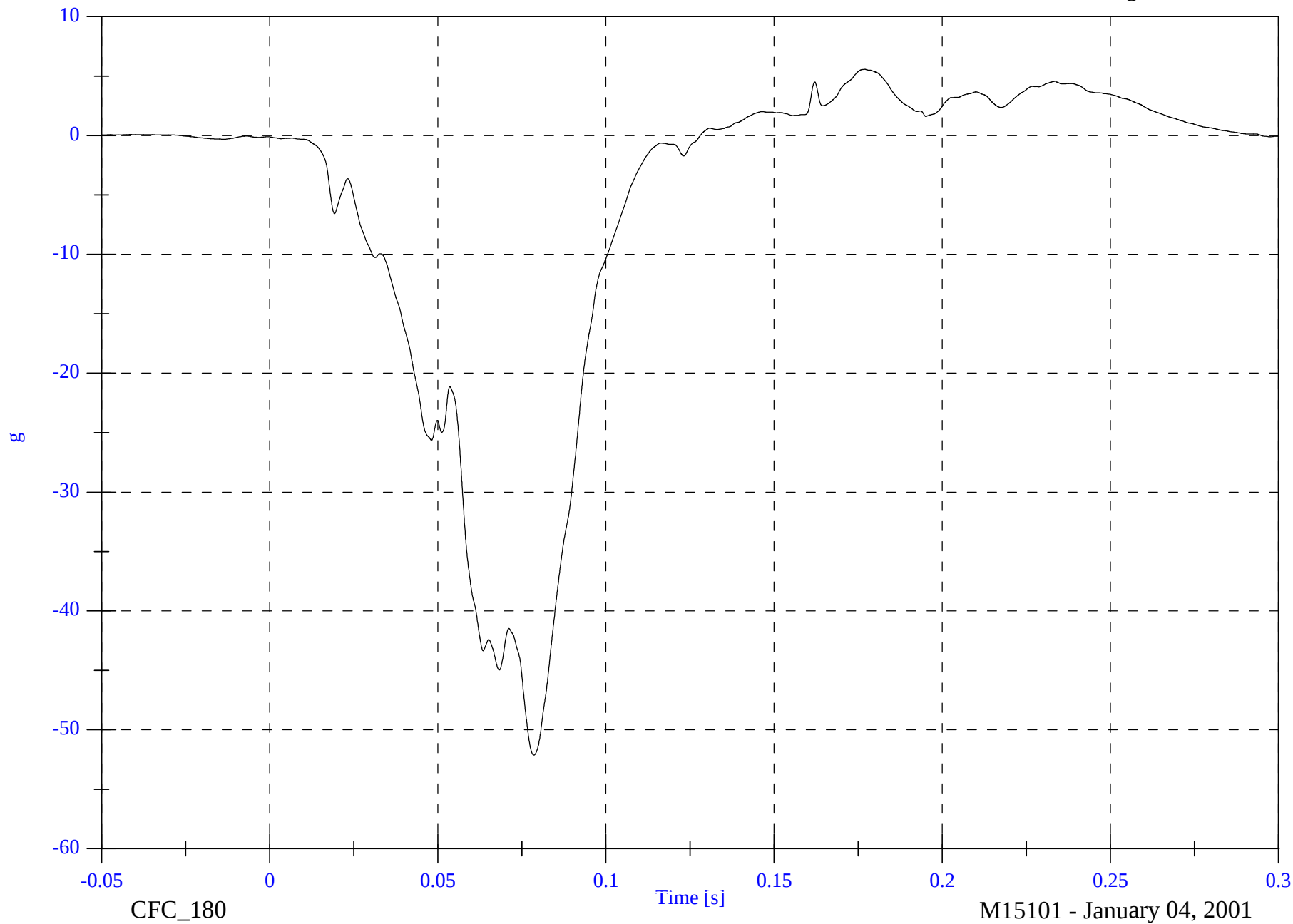
P1 Chest x

Max: 5.6 [g] at 0.177 [s]

Min: -52.1 [g] at 0.079 [s]

B-20

8602-12

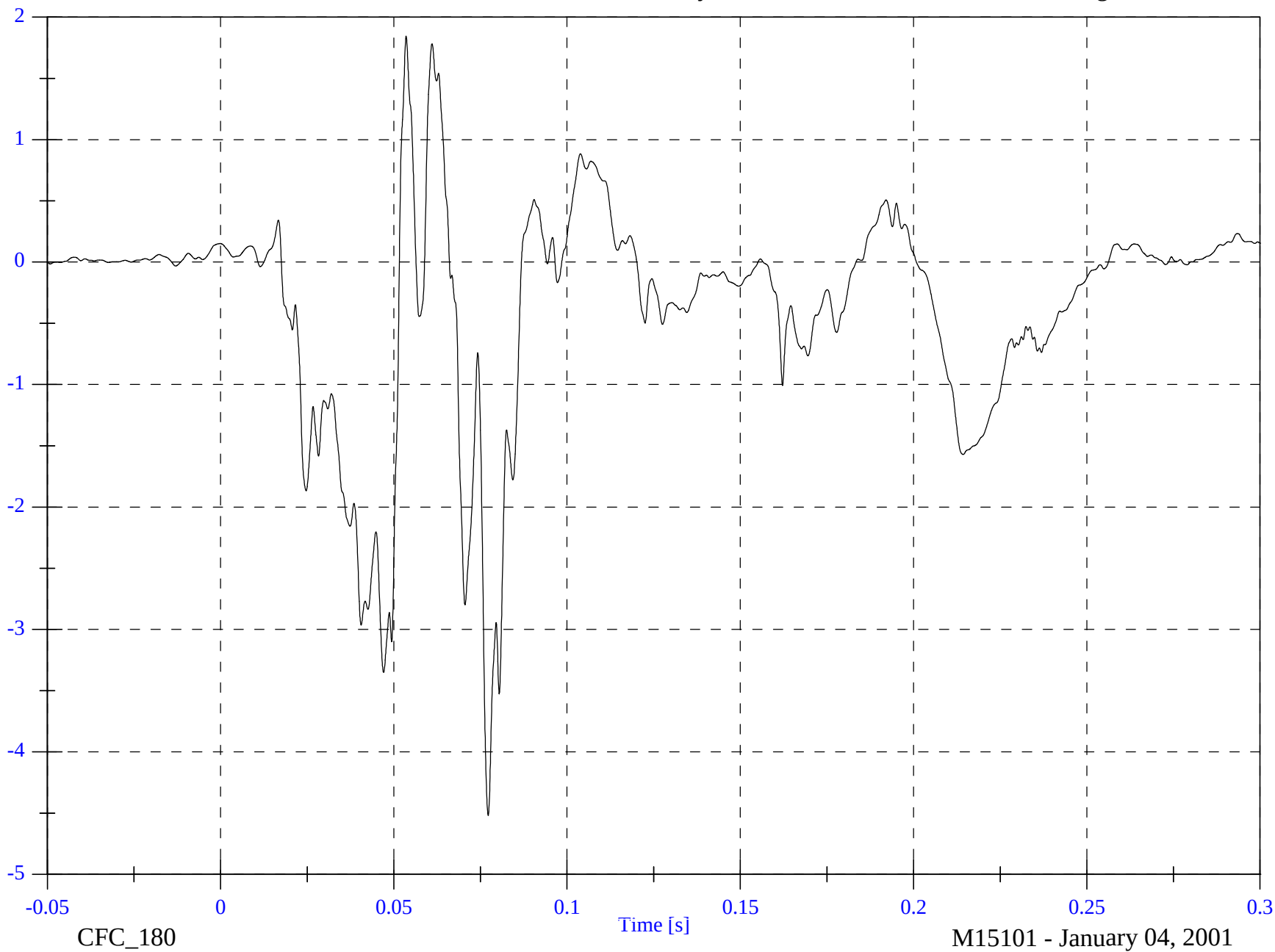


NCAP Test 12 - 2001 Toyota Avalon

P1 Chest y

Max: 1.8 [g] at 0.054 [s]

Min: -4.5 [g] at 0.077 [s]



B-21

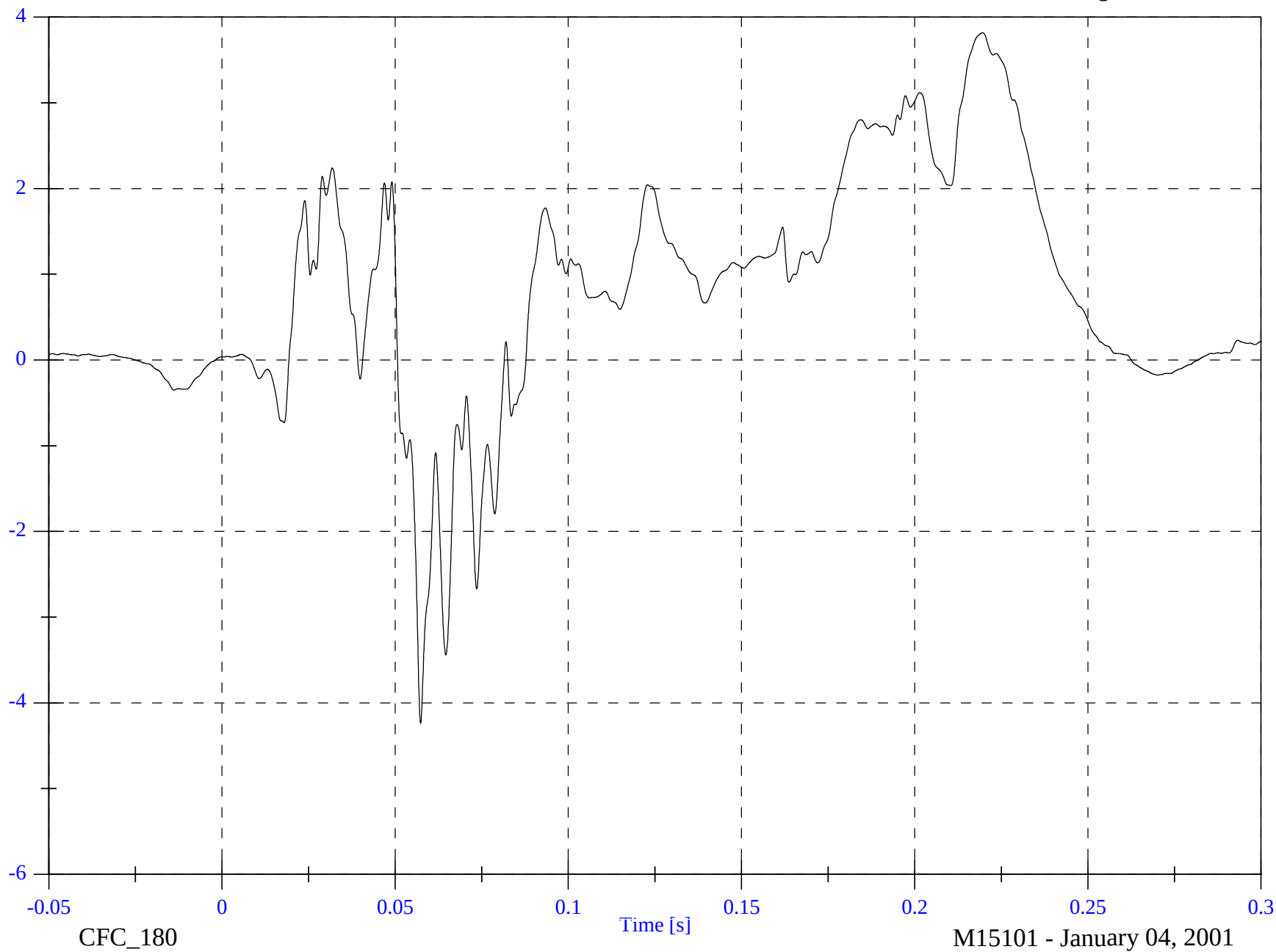
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Chest z

Max: 3.8 [g] at 0.220 [s]

Min: -4.2 [g] at 0.057 [s]



B-22

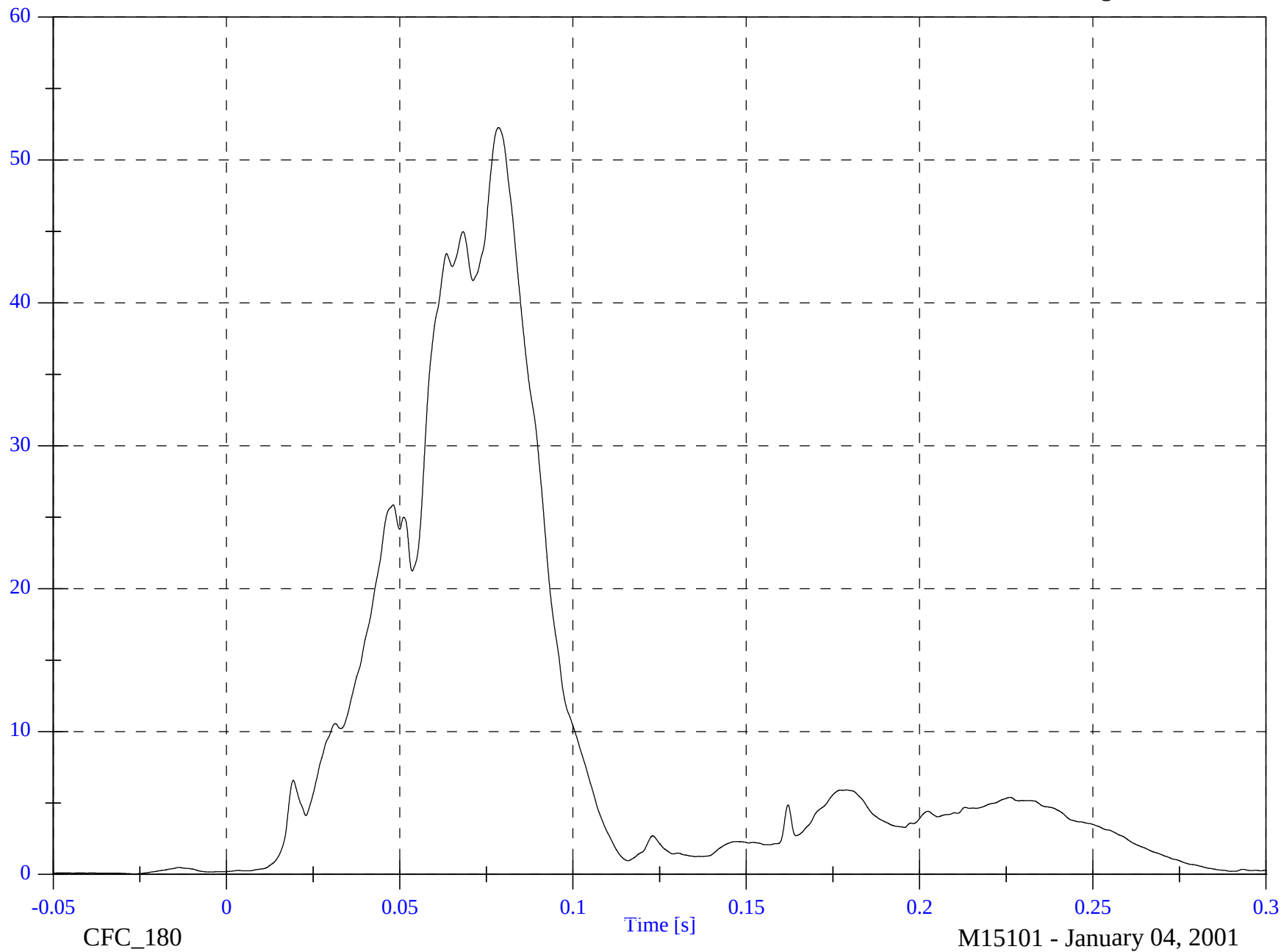
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Chest Resultant

Max: 52.3 [g] at 0.079 [s]

Min: 0.0 [g] at -0.026 [s]



B-23

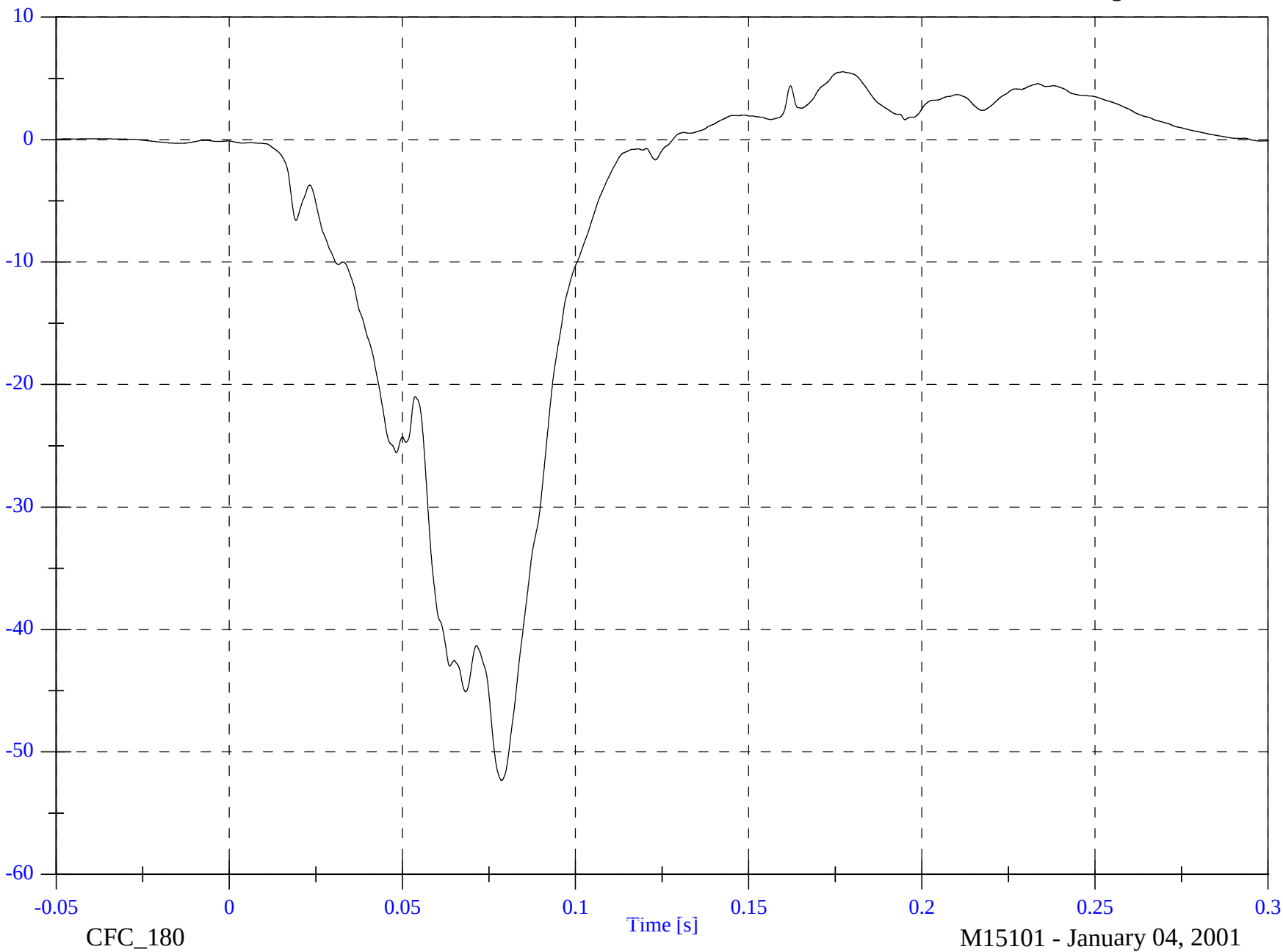
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Chest Red x

Max: 5.5 [g] at 0.177 [s]

Min: -52.3 [g] at 0.079 [s]



B-24

8602-12

NCAP Test 12 - 2001 Toyota Avalon

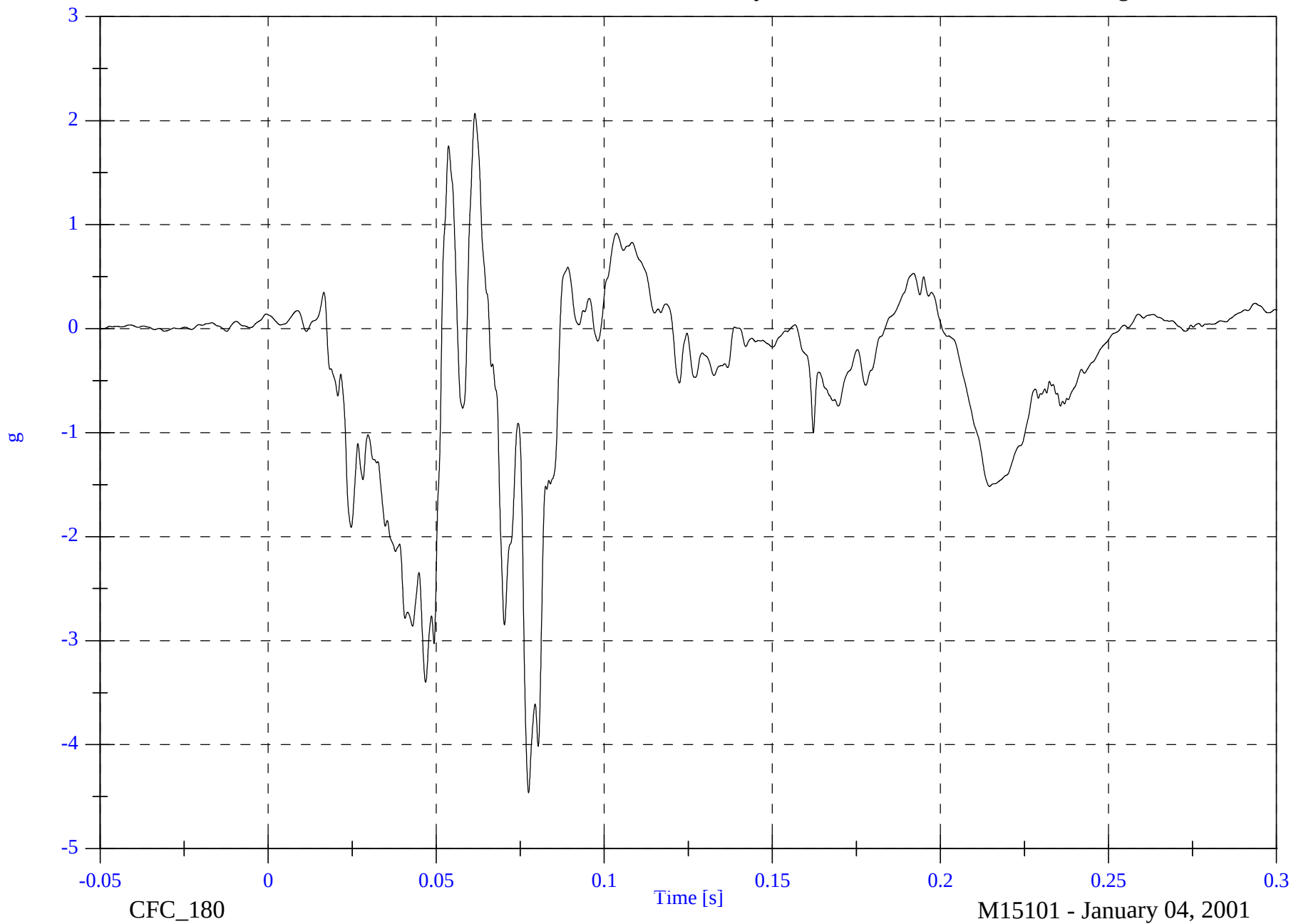
P1 Chest Red y

Max: 2.1 [g] at 0.062 [s]

Min: -4.5 [g] at 0.077 [s]

B-25

8602-12

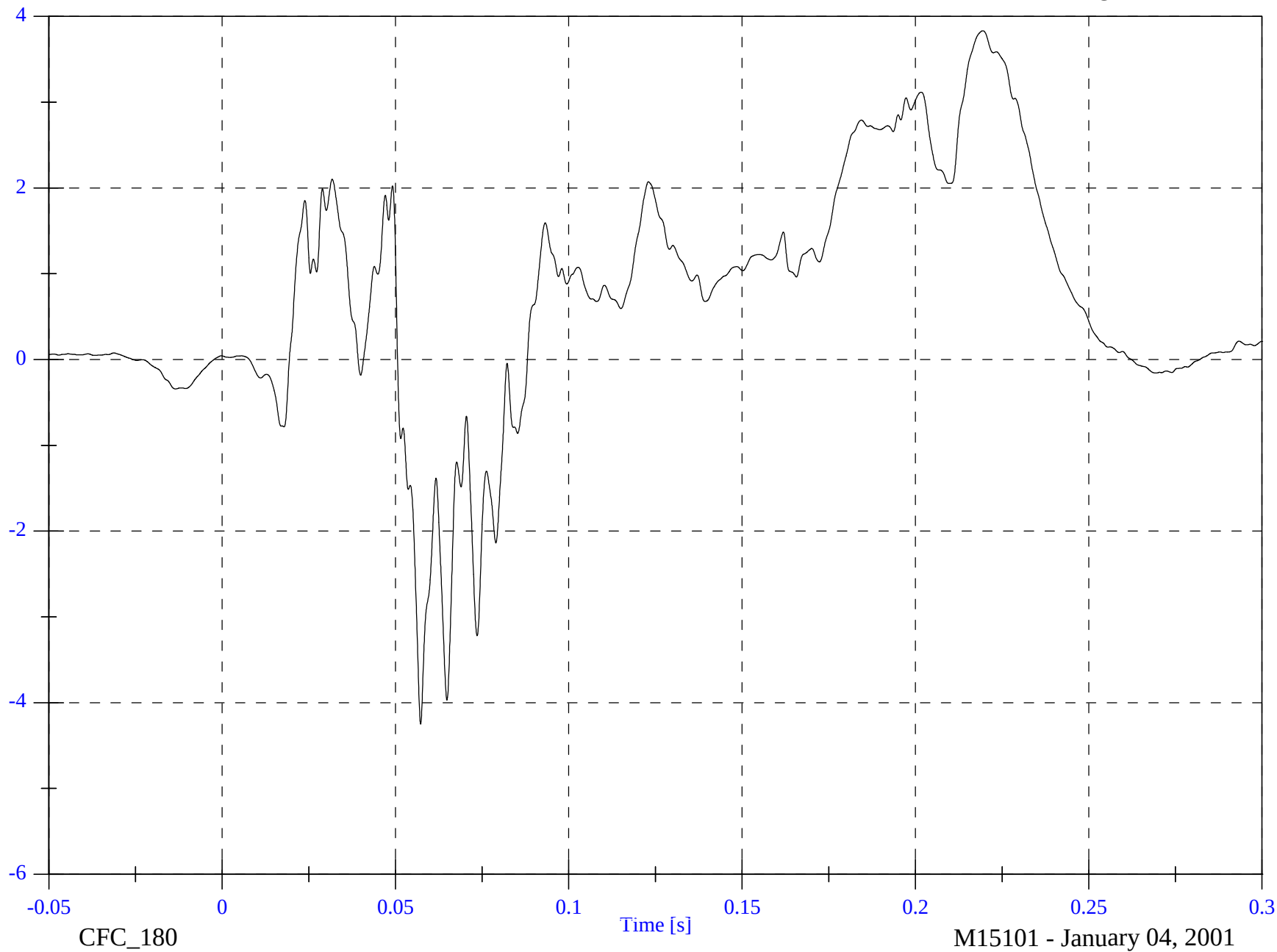


NCAP Test 12 - 2001 Toyota Avalon

P1 Chest Red z

Max: 3.8 [g] at 0.219 [s]

Min: -4.3 [g] at 0.057 [s]



B-26

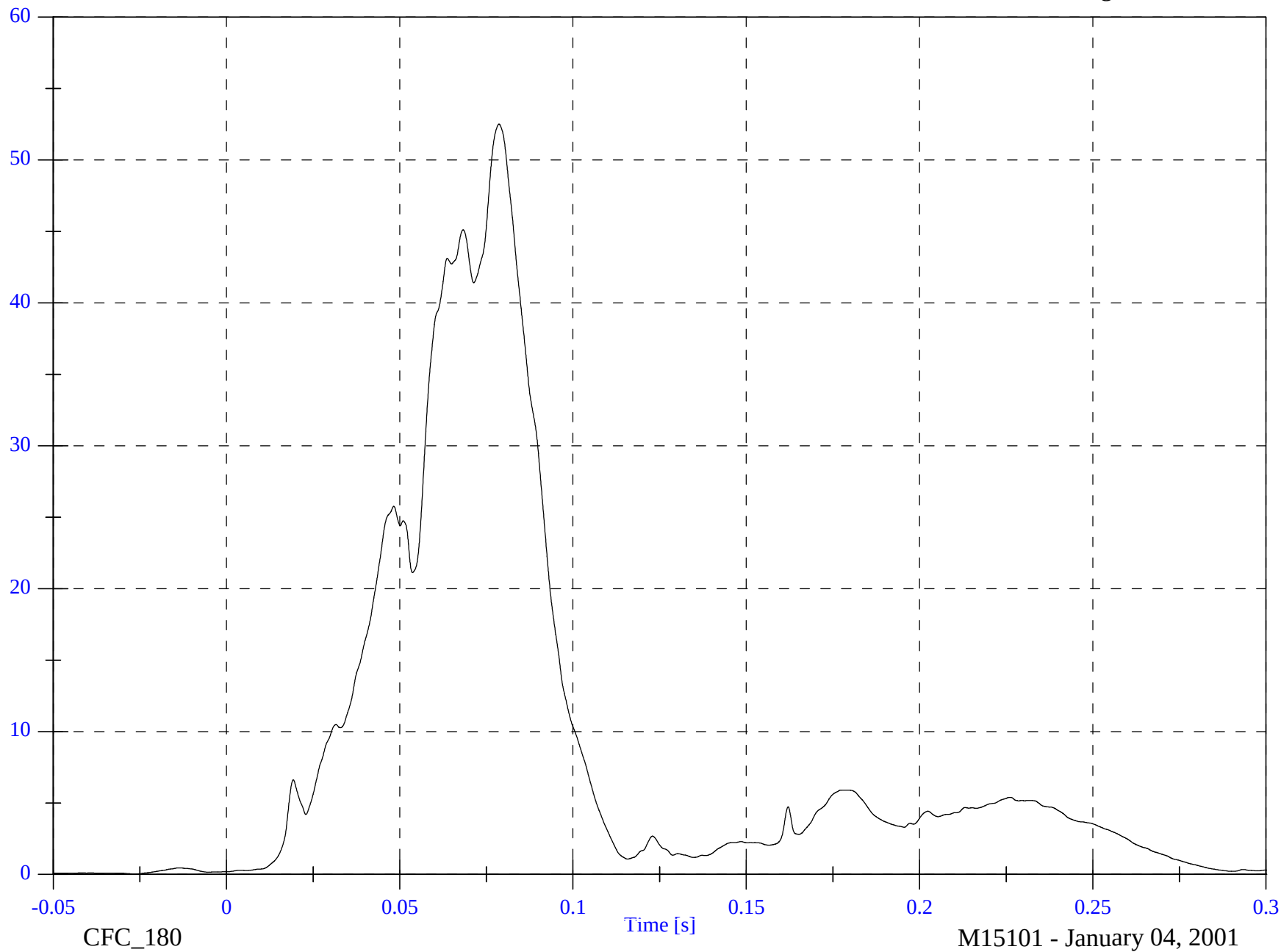
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Chest Red Resultant

Max: 52.5 [g] at 0.079 [s]

Min: 0.0 [g] at -0.026 [s]



B-27

8602-12

NCAP Test 12 - 2001 Toyota Avalon

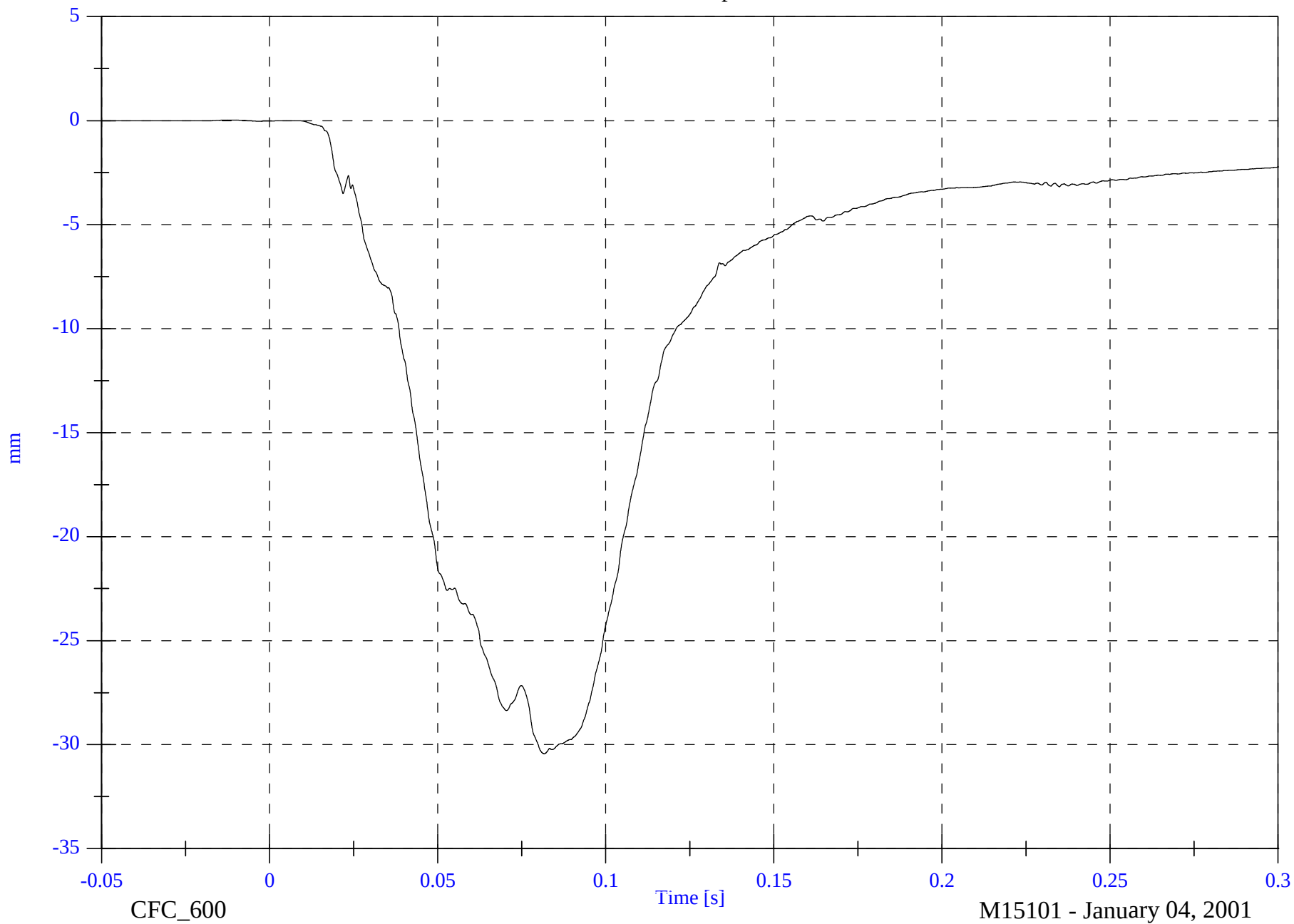
P1 Chest Compression

Max: 0.0 [mm] at -0.012 [s]

Min: -30.4 [mm] at 0.082 [s]

B-28

8602-12

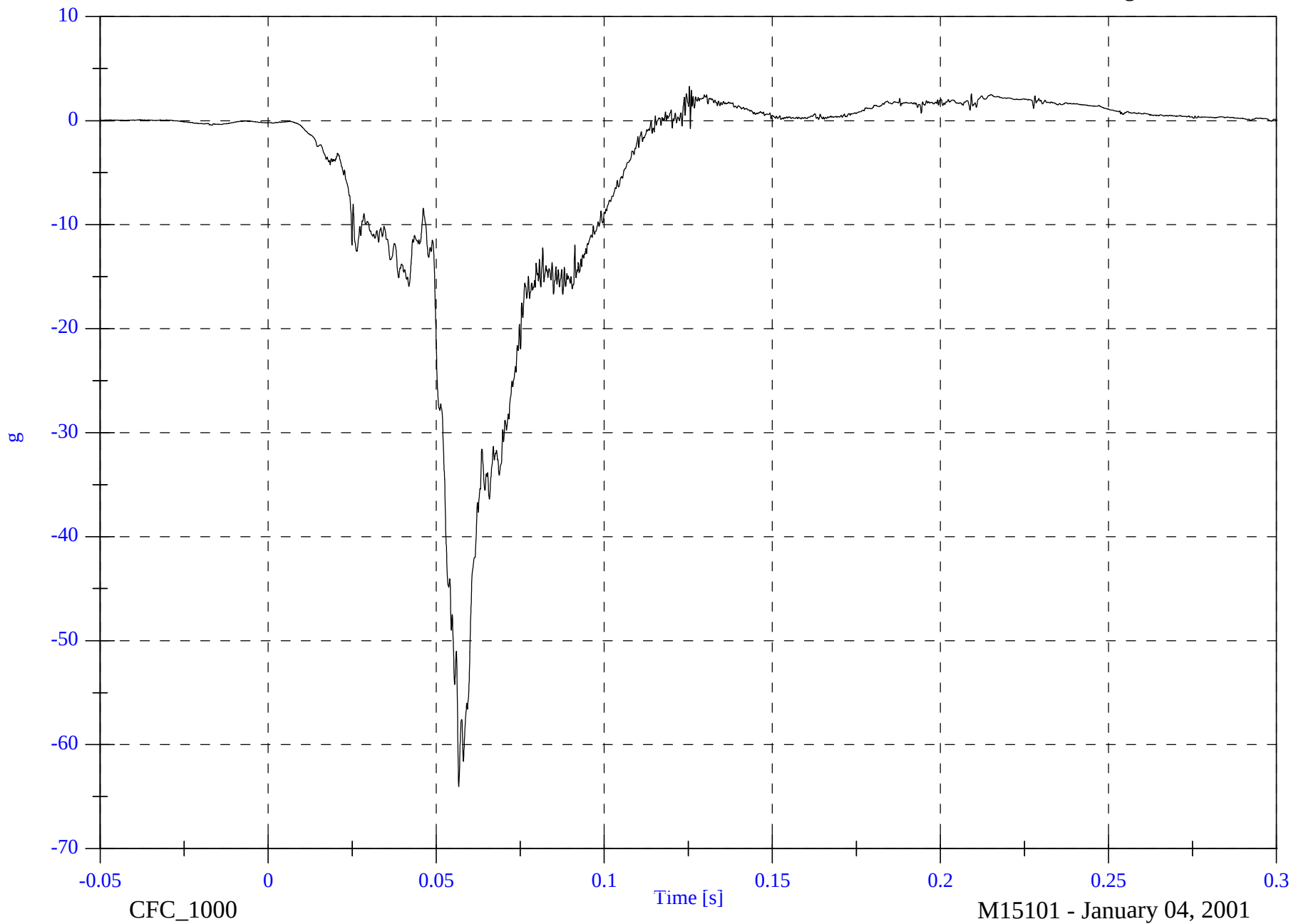


NCAP Test 12 - 2001 Toyota Avalon

P1 Pelvic x

Max: 3.3 [g] at 0.125 [s]

Min: -64.0 [g] at 0.057 [s]



B-29

8602-12

NCAP Test 12 - 2001 Toyota Avalon

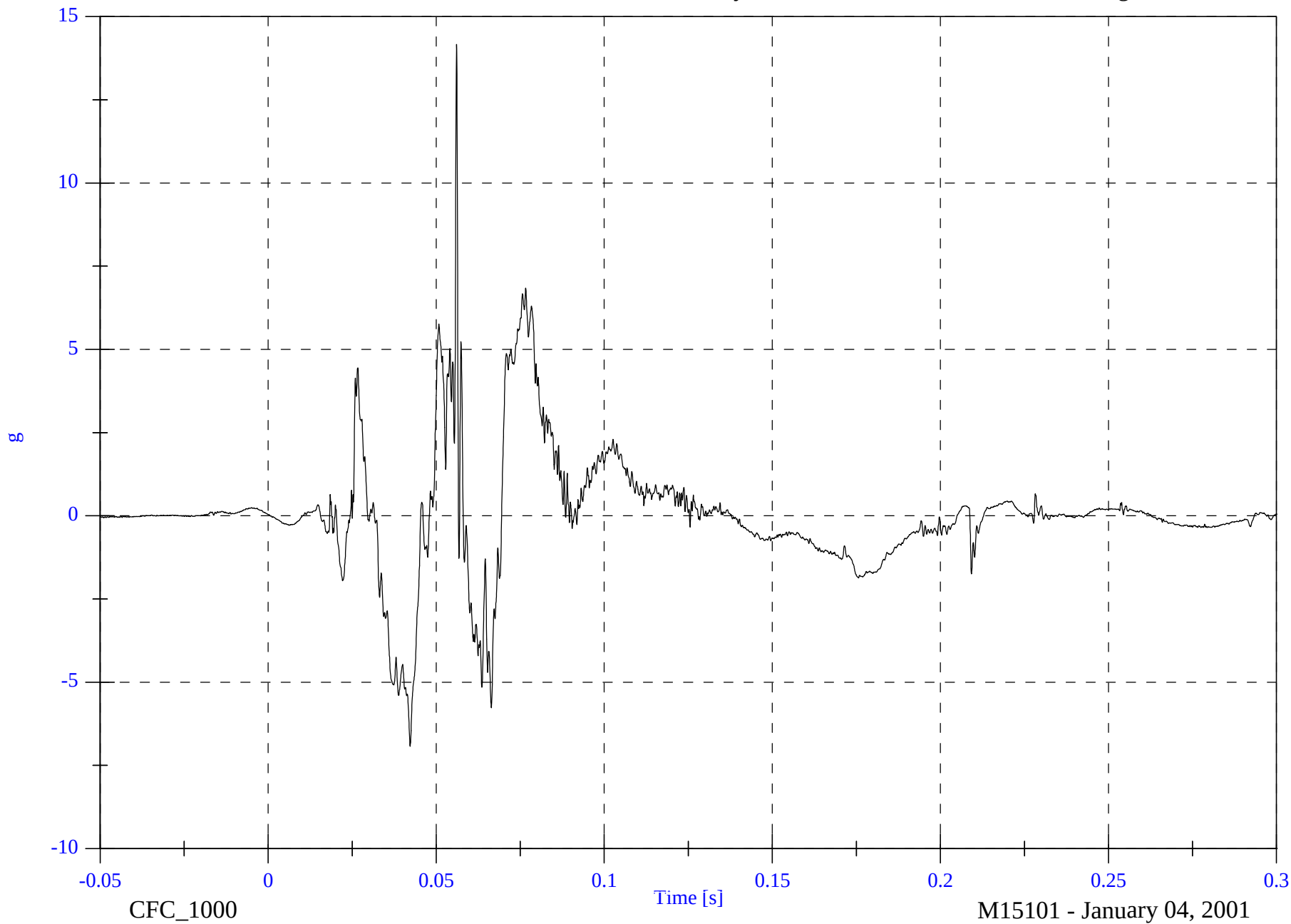
P1 Pelvic y

Max: 14.2 [g] at 0.056 [s]

Min: -6.9 [g] at 0.042 [s]

B-30

8602-12



NCAP Test 12 - 2001 Toyota Avalon

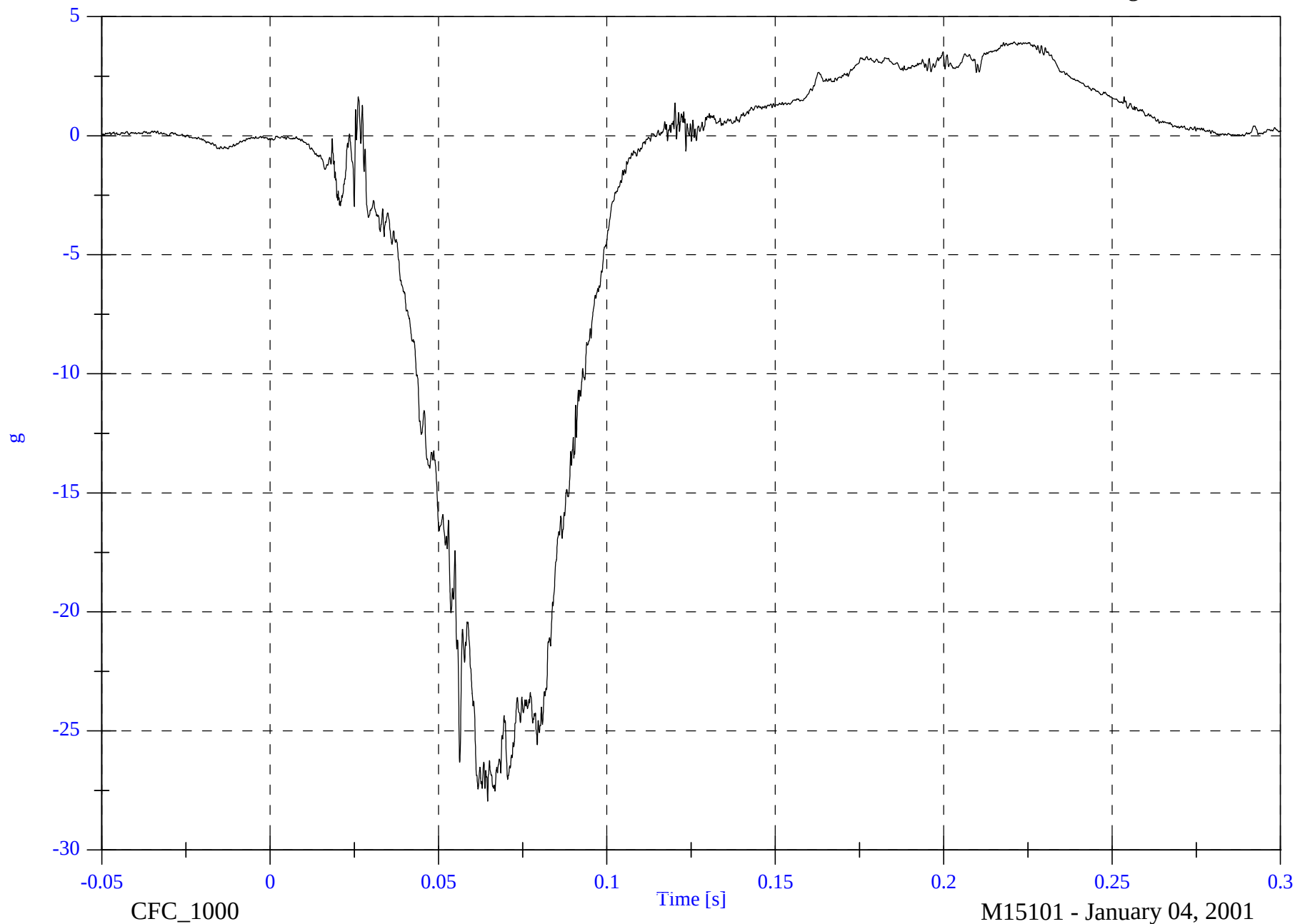
P1 Pelvic z

Max: 3.9 [g] at 0.221 [s]

Min: -28.0 [g] at 0.065 [s]

B-31

8602-12

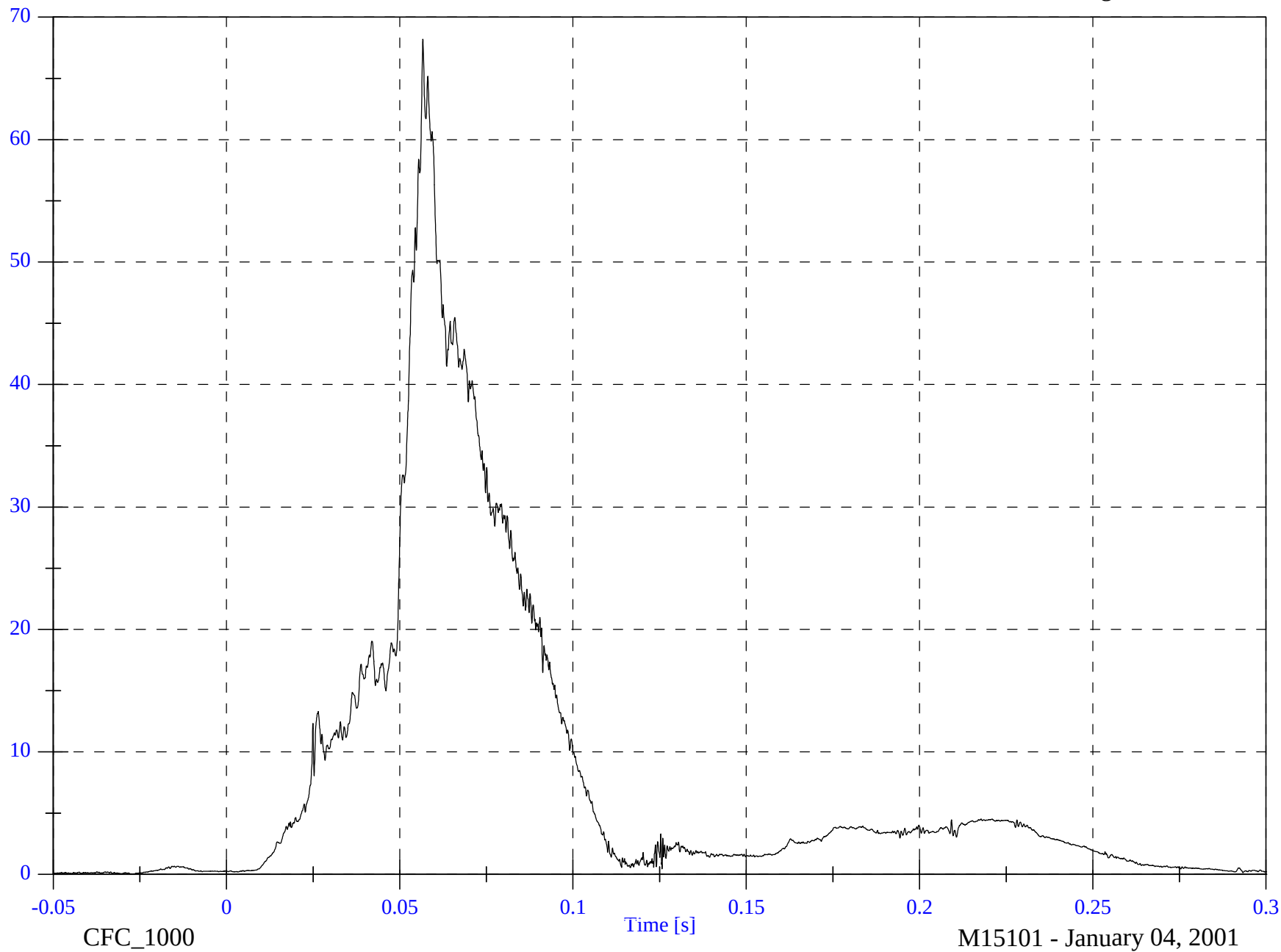


NCAP Test 12 - 2001 Toyota Avalon

P1 Pelvic Resultant

Max: 68.2 [g] at 0.057 [s]

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



B-32

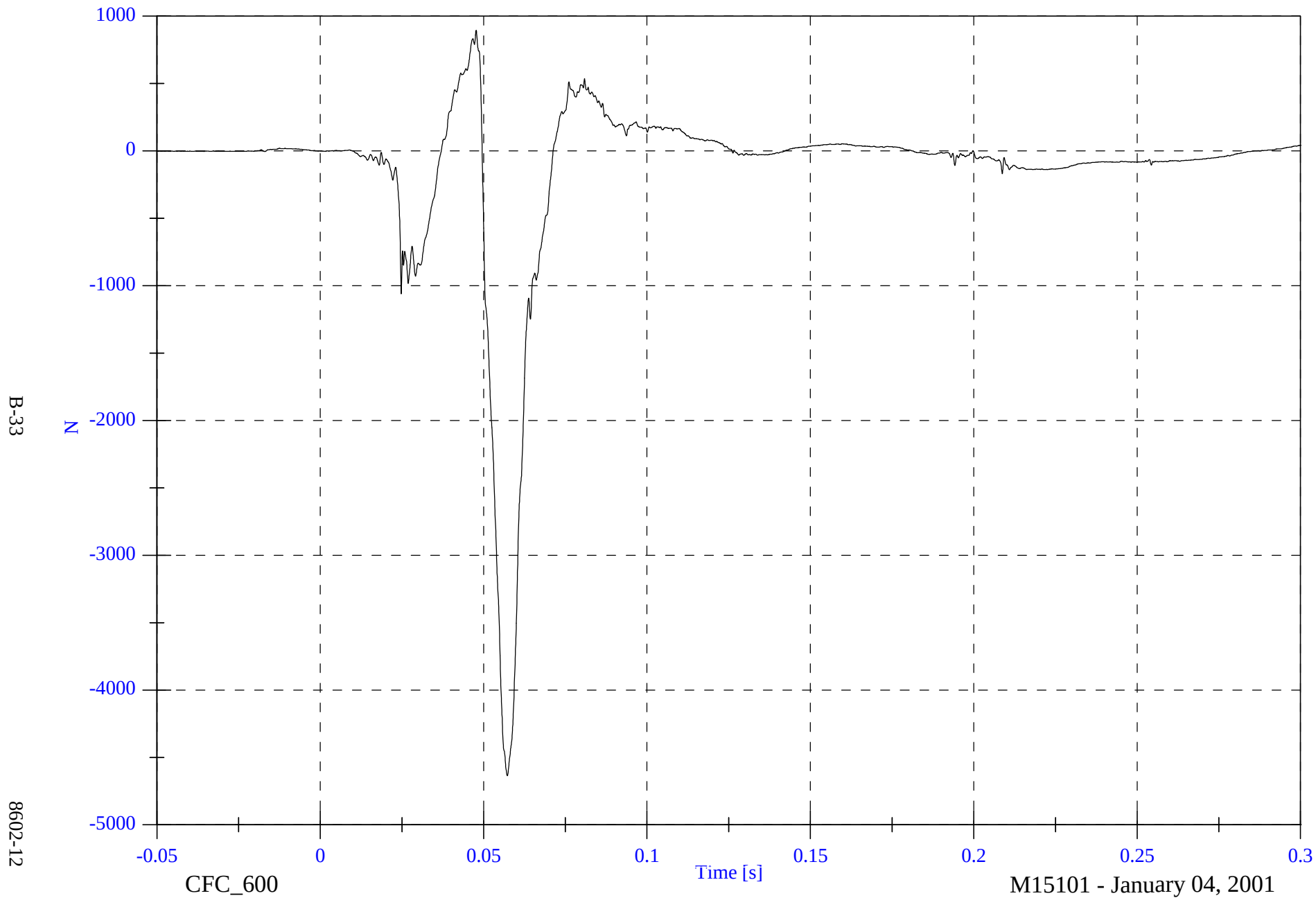
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Left Femur

Max: 895.9 [N] at 0.048 [s]

Min: -4636.4 [N] at 0.057 [s]



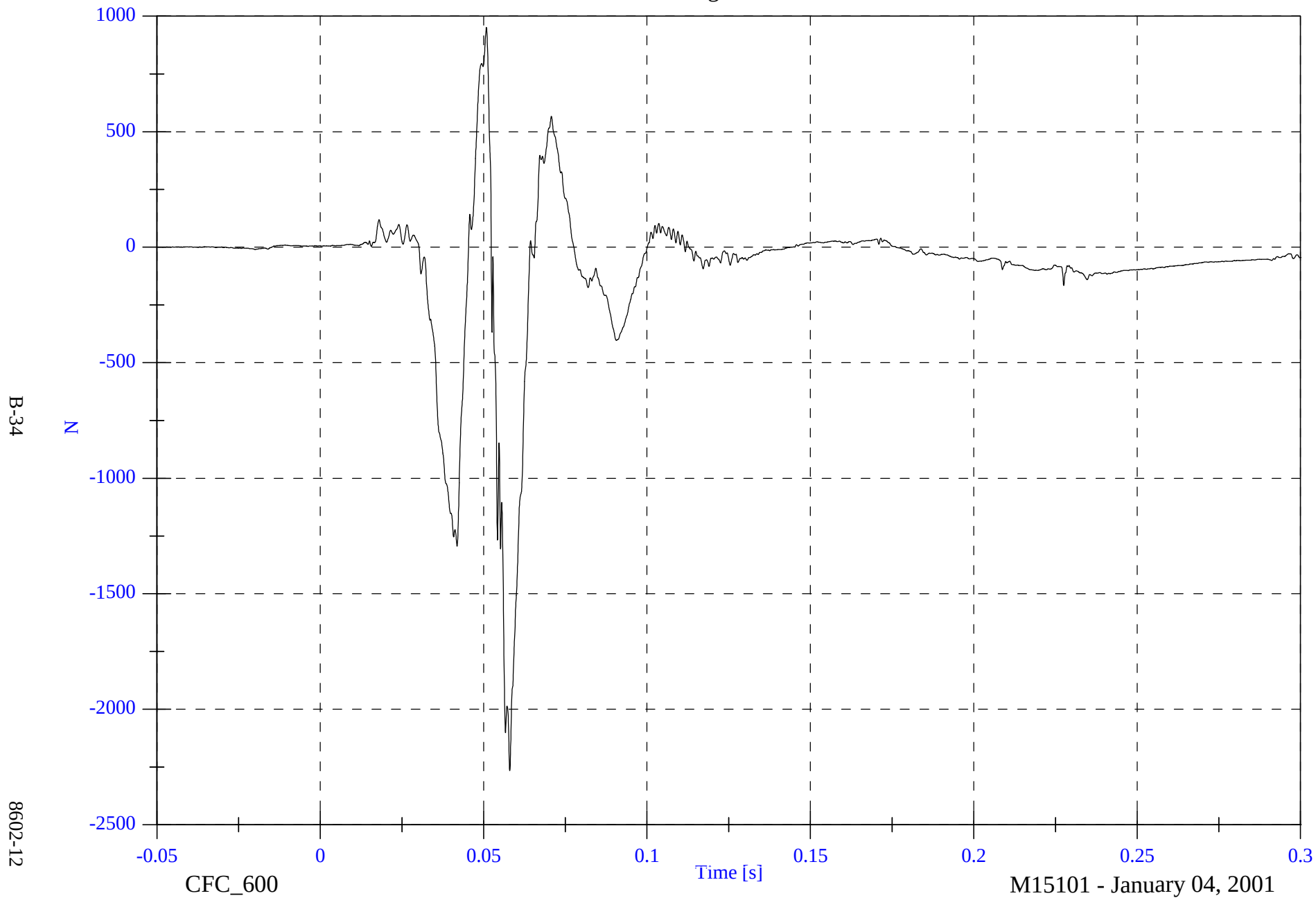
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Femur

Max: 951.3 [N] at 0.051 [s]

Min: -2265.7 [N] at 0.058 [s]

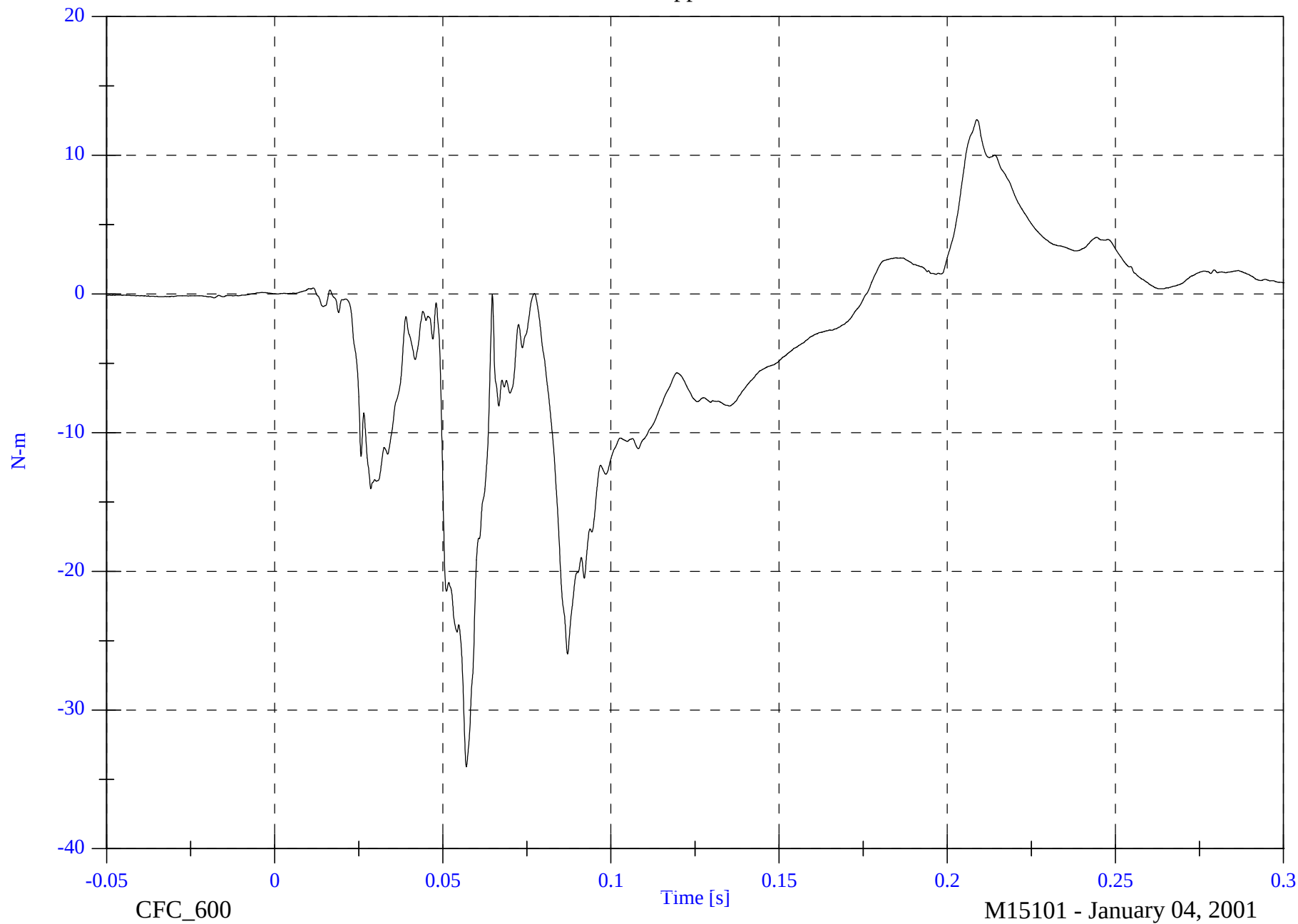


NCAP Test 12 - 2001 Toyota Avalon

P1 Left Upper Tibia Mx

Max: 12.6 [N-m] at 0.209 [s]

Min: -34.1 [N-m] at 0.057 [s]



B-35

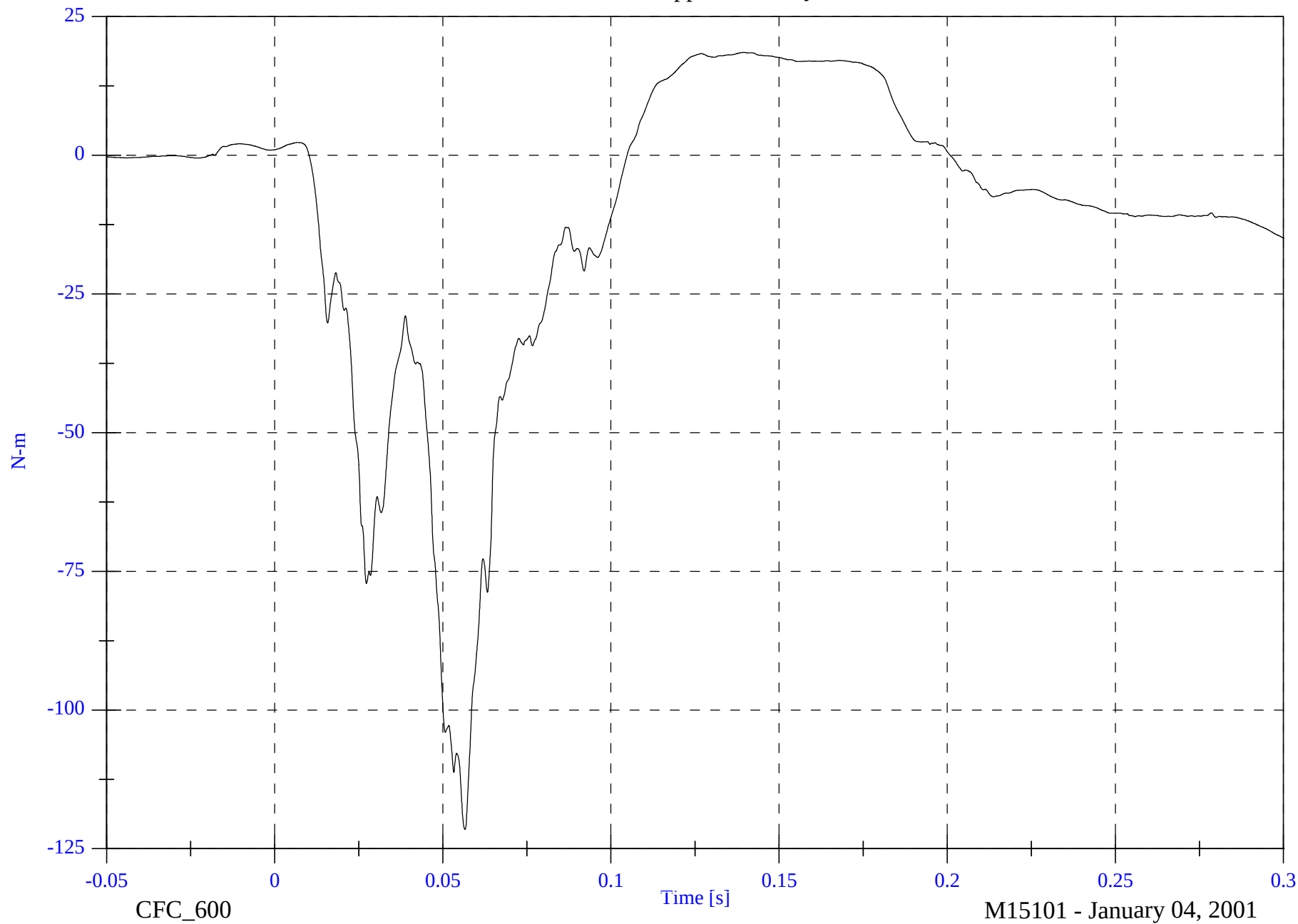
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Left Upper Tibia My

Max: 18.6 [N-m] at 0.140 [s]

Min: -121.5 [N-m] at 0.057 [s]



B-36

8602-12

CFC_600

Time [s]

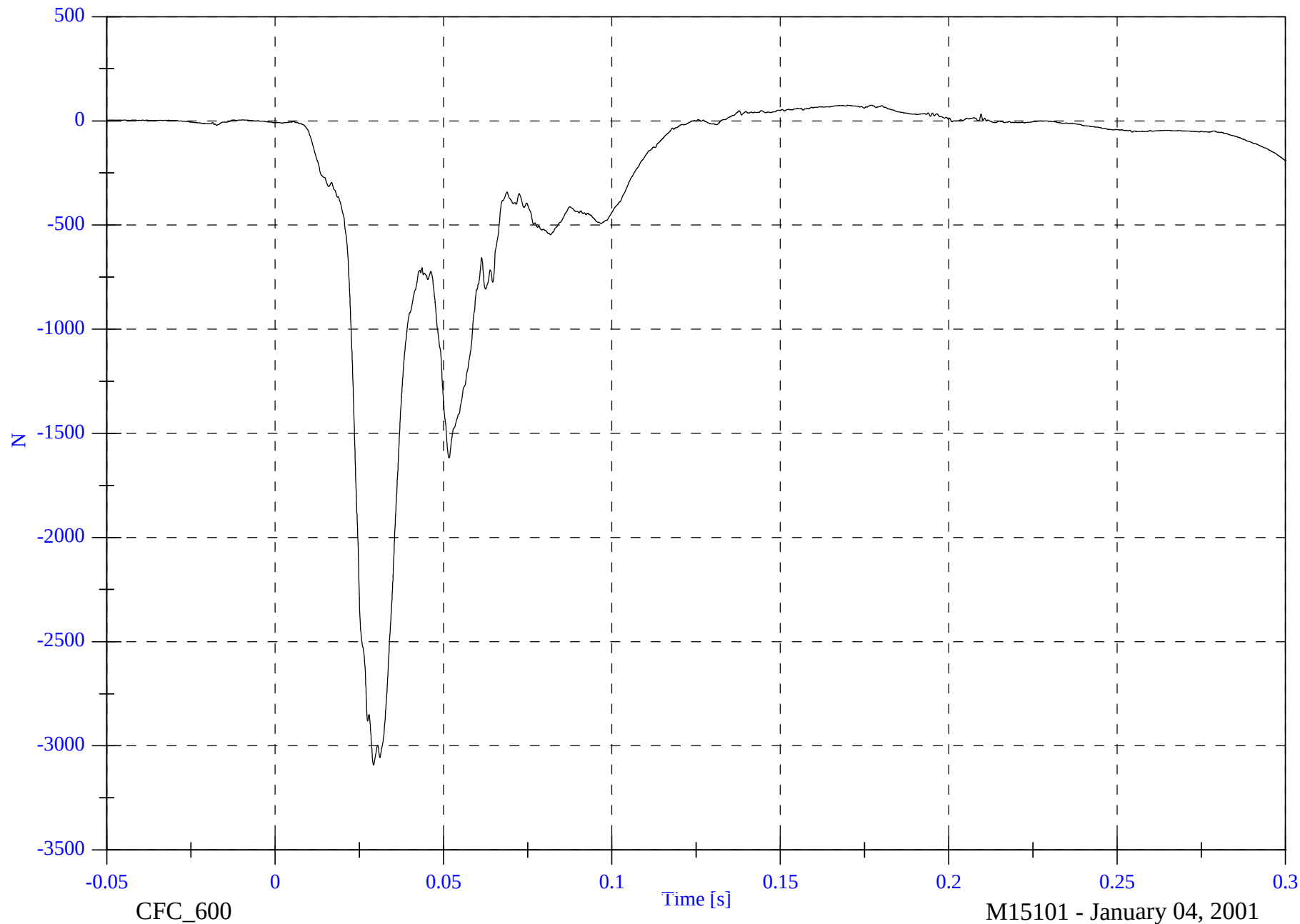
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P1 Left Lower Tibia Fz

Max: 75.1 [N] at 0.177 [s]

Min: -3093.1 [N] at 0.029 [s]



B-37

8602-12

CFC_600

Time [s]

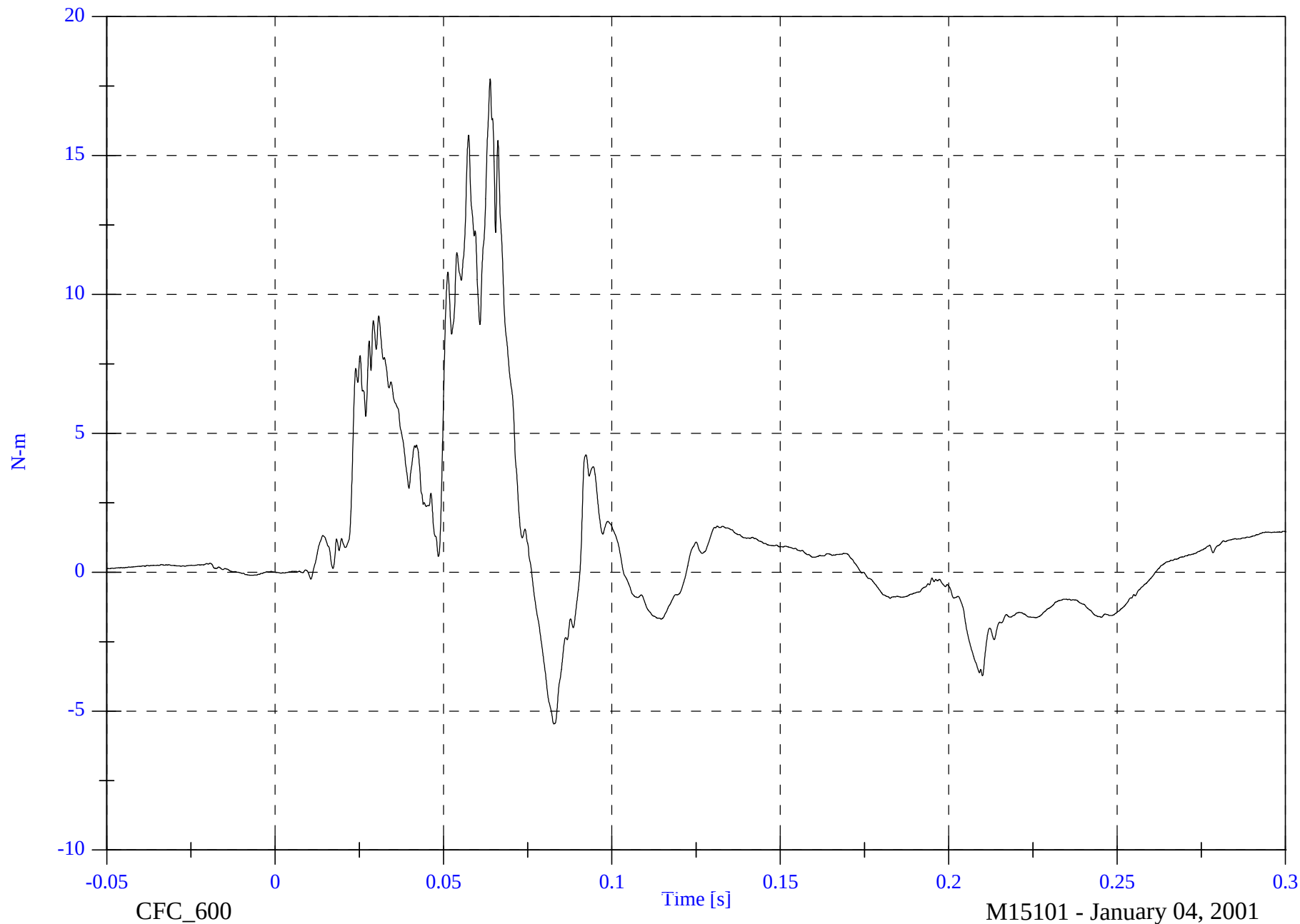
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P1 Left Lower Tibia Mx

Max: 17.8 [N-m] at 0.064 [s]

Min: -5.5 [N-m] at 0.083 [s]



B-38

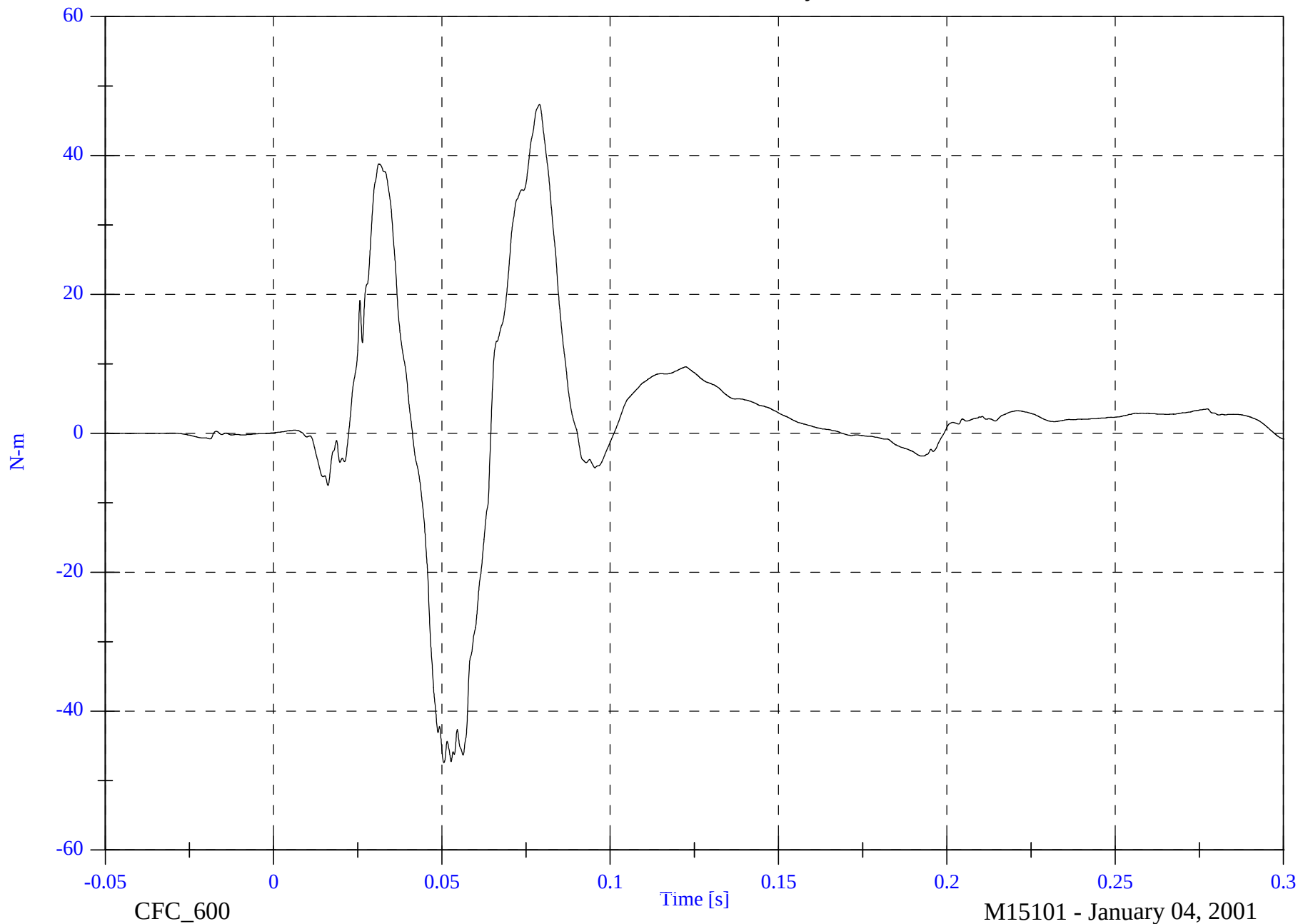
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Left Lower Tibia My

Max: 47.4 [N-m] at 0.079 [s]

Min: -47.4 [N-m] at 0.051 [s]



B-39

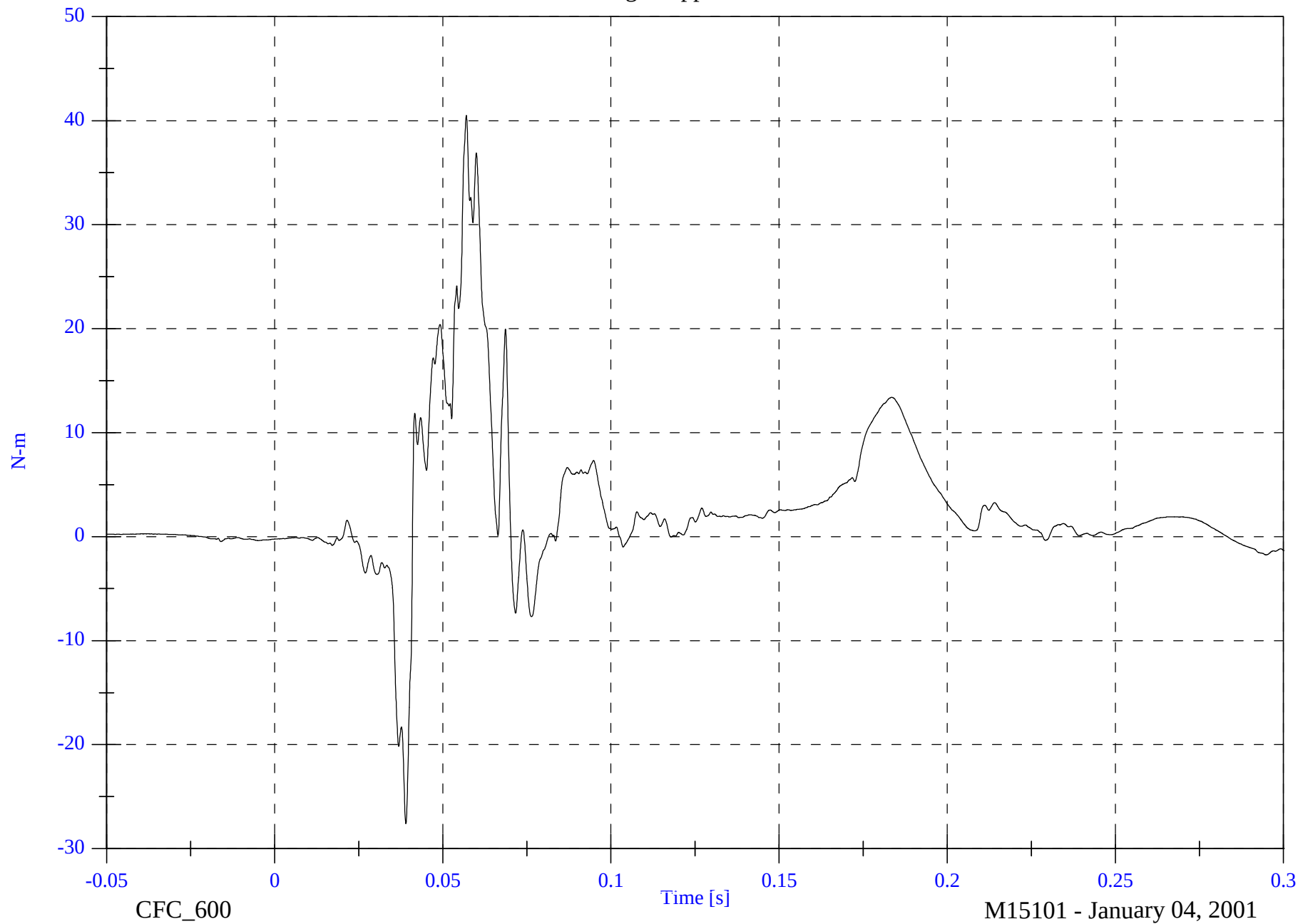
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Upper Tibia Mx

Max: 40.5 [N-m] at 0.057 [s]

Min: -27.6 [N-m] at 0.039 [s]



B-40

8602-12

CFC_600

Time [s]

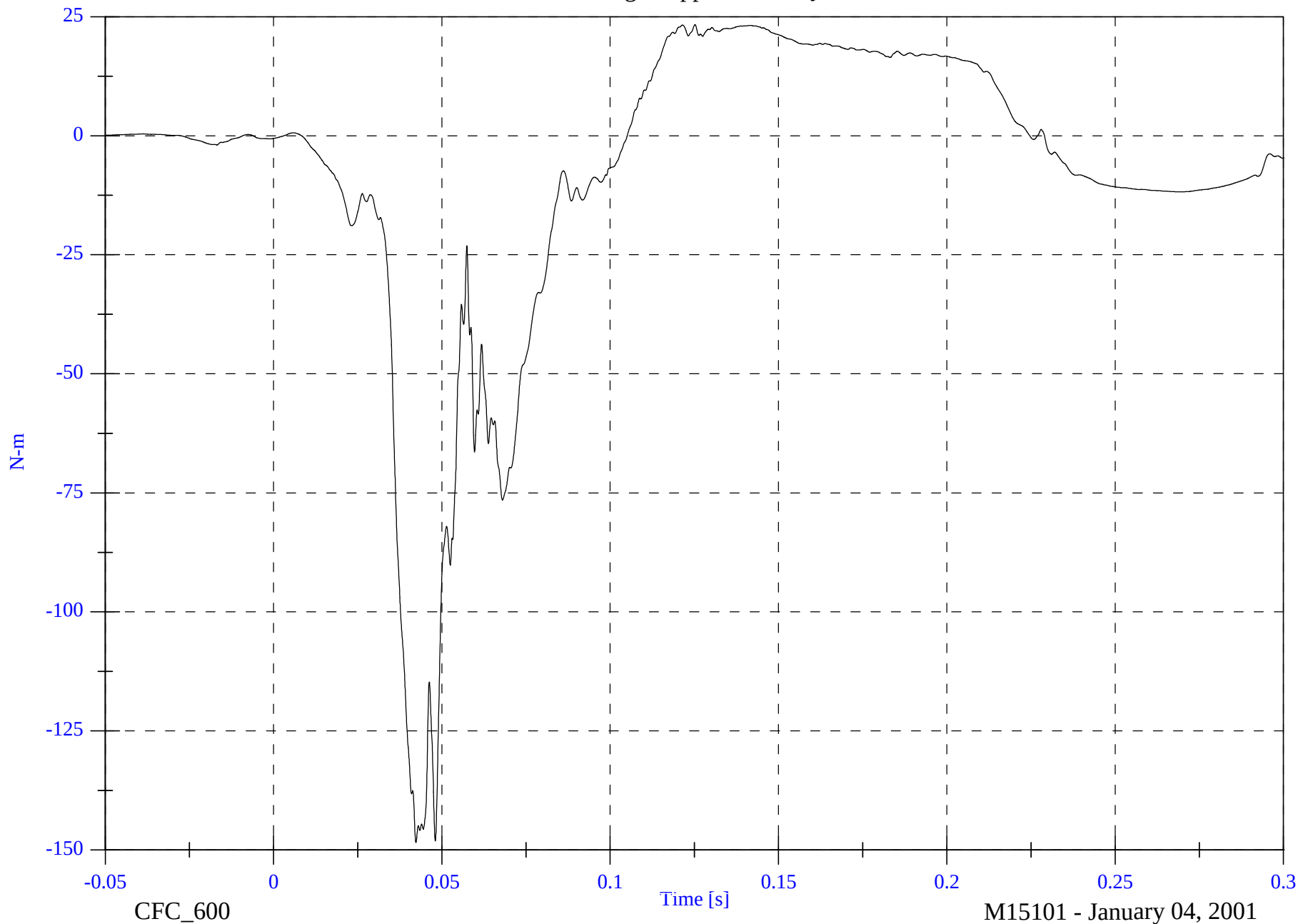
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Upper Tibia My

Max: 23.3 [N-m] at 0.125 [s]

Min: -148.4 [N-m] at 0.042 [s]



B-41

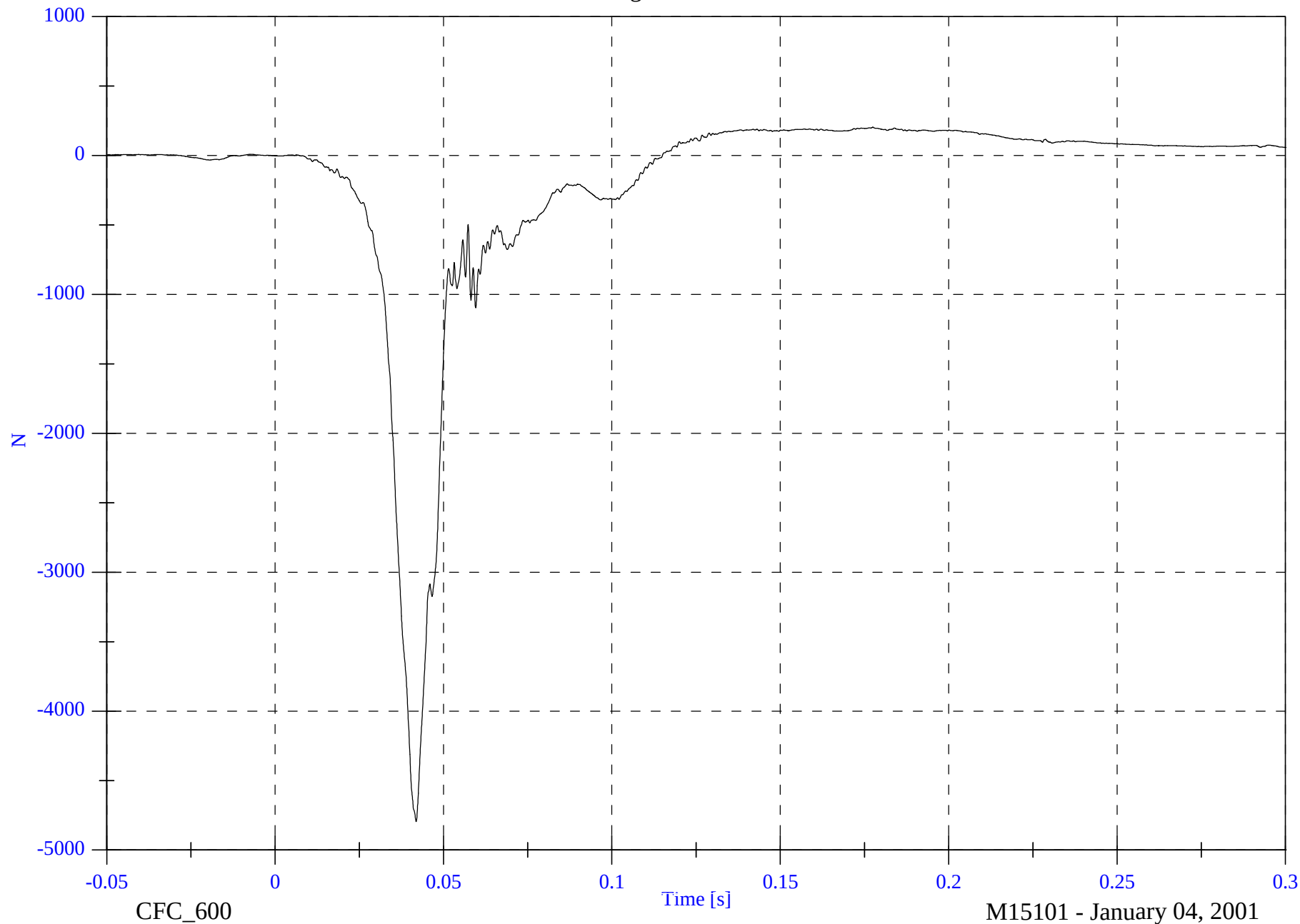
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Lower Tibia Fz

Max: 203.8 [N] at 0.177 [s]

Min: -4796.0 [N] at 0.042 [s]



B-42

8602-12

CFC_600

Time [s]

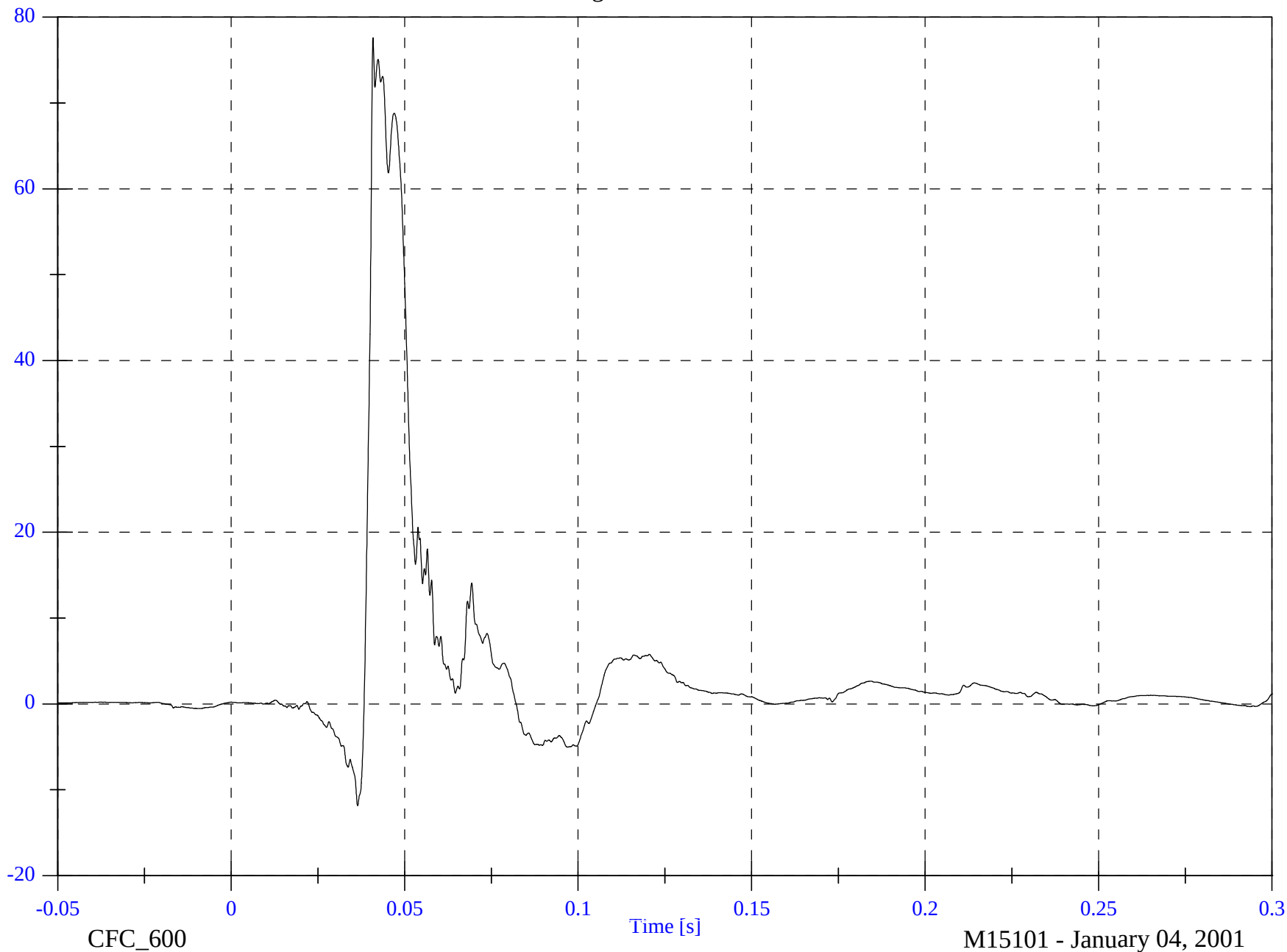
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Lower Tibia Mx

Max: 77.6 [N-m] at 0.041 [s]

Min: -11.9 [N-m] at 0.036 [s]



B-43

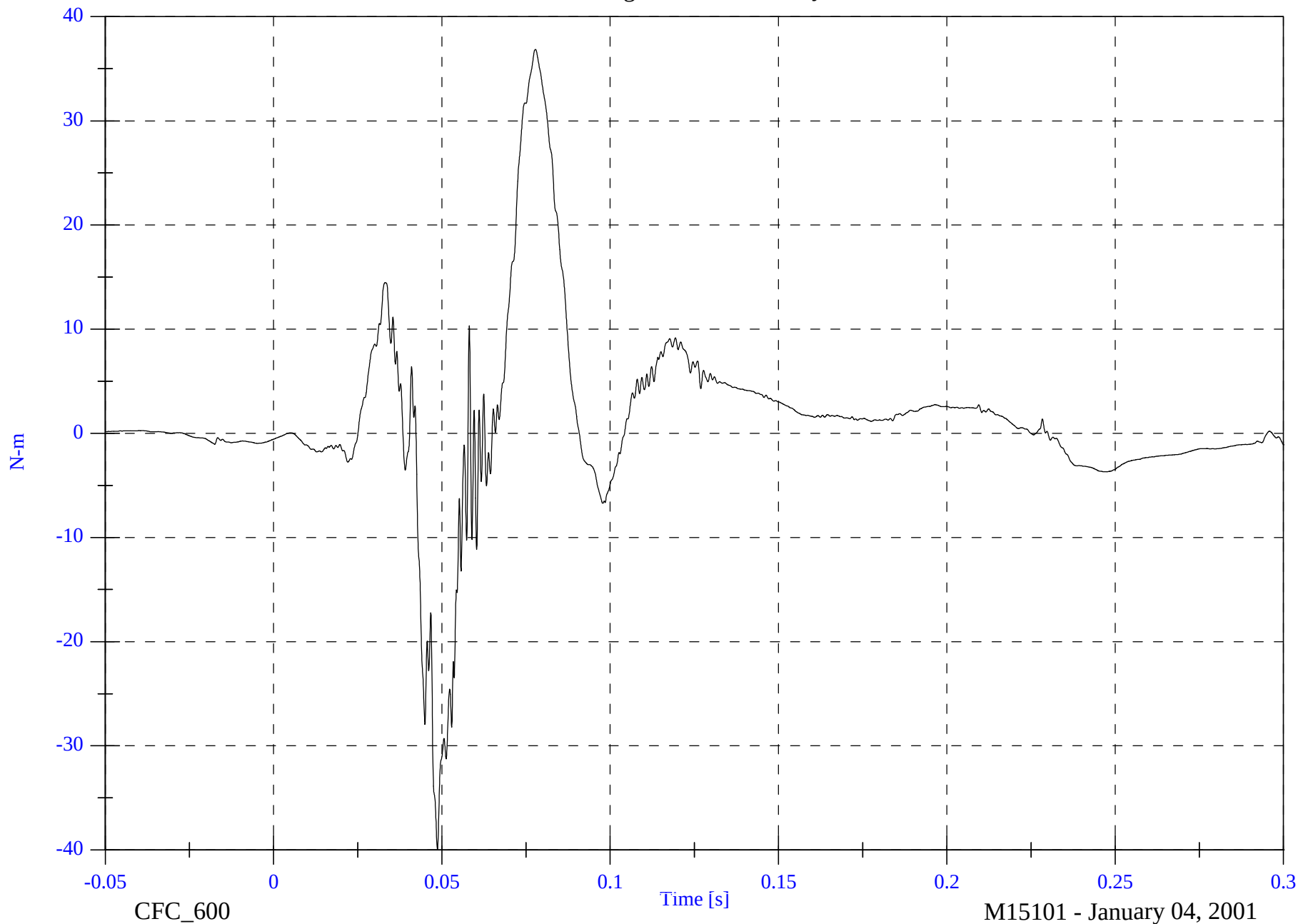
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Lower Tibia My

Max: 36.9 [N-m] at 0.078 [s]

Min: -40.0 [N-m] at 0.049 [s]



B-44

8602-12

NCAP Test 12 - 2001 Toyota Avalon

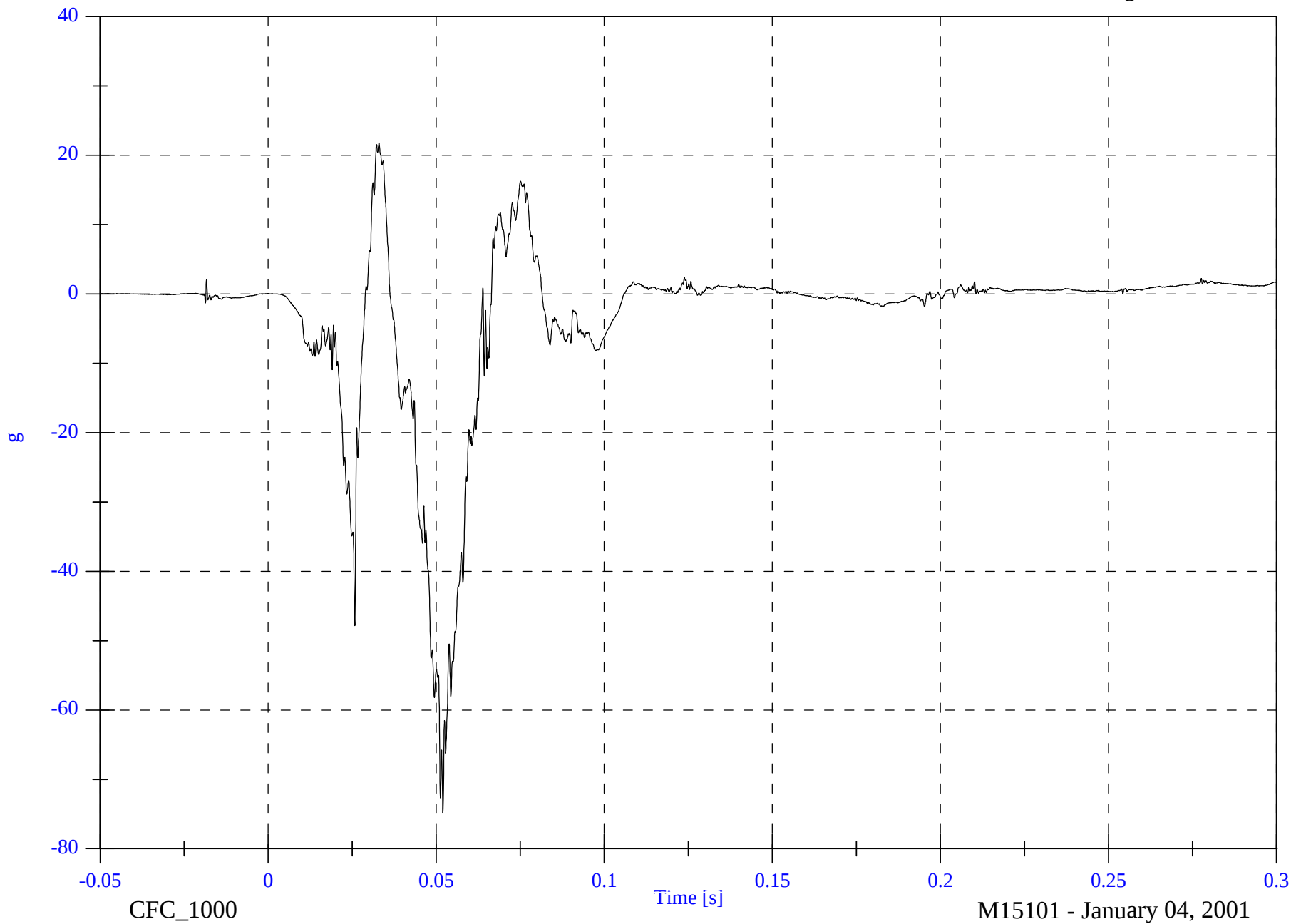
P1 Left Foot Aft x

Max: 21.8 [g] at 0.033 [s]

Min: -74.9 [g] at 0.052 [s]

B-45

8602-12

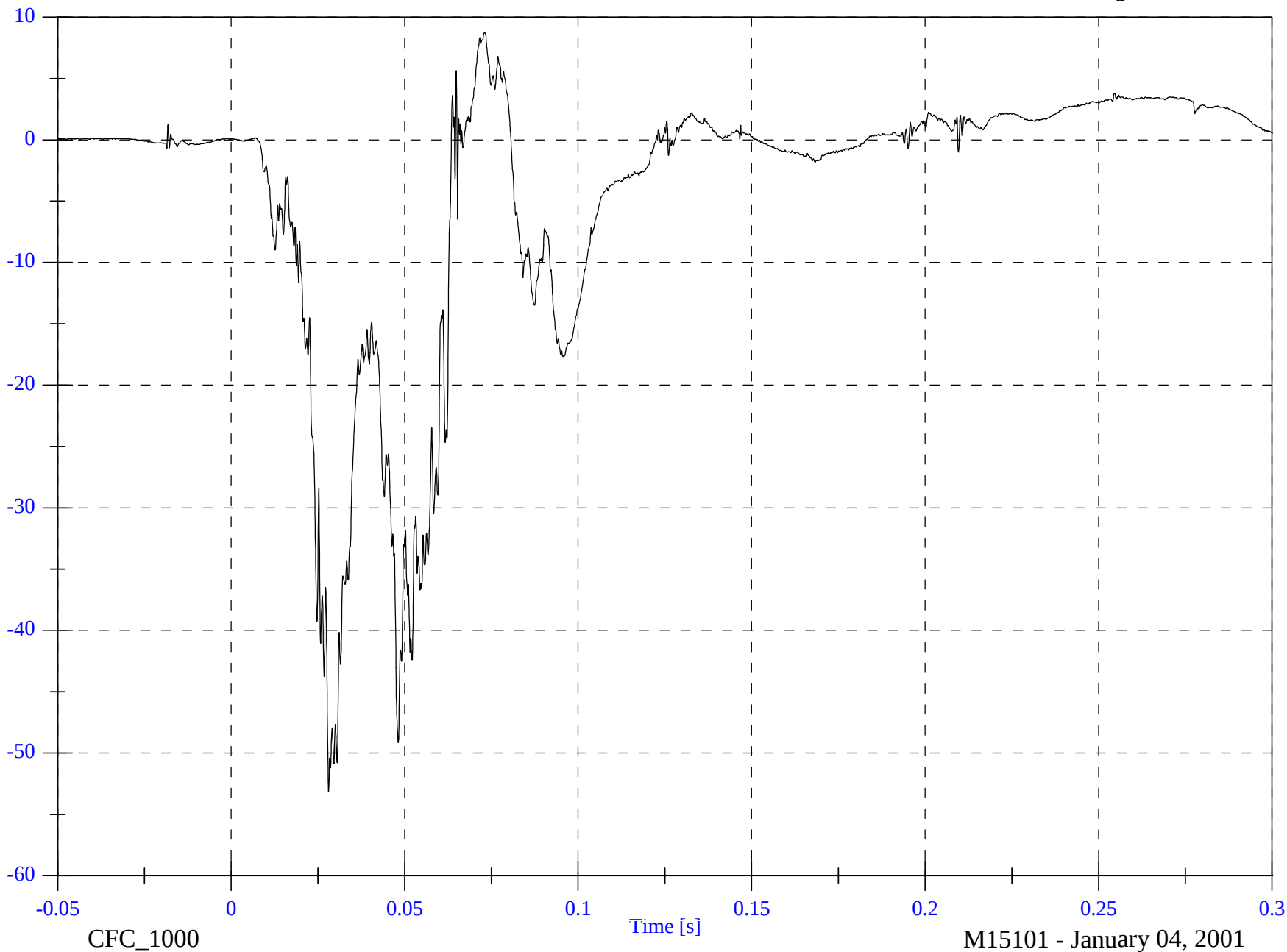


NCAP Test 12 - 2001 Toyota Avalon

P1 Left Foot Aft z

Max: 8.8 [g] at 0.073 [s]

Min: -53.1 [g] at 0.028 [s]



B-46

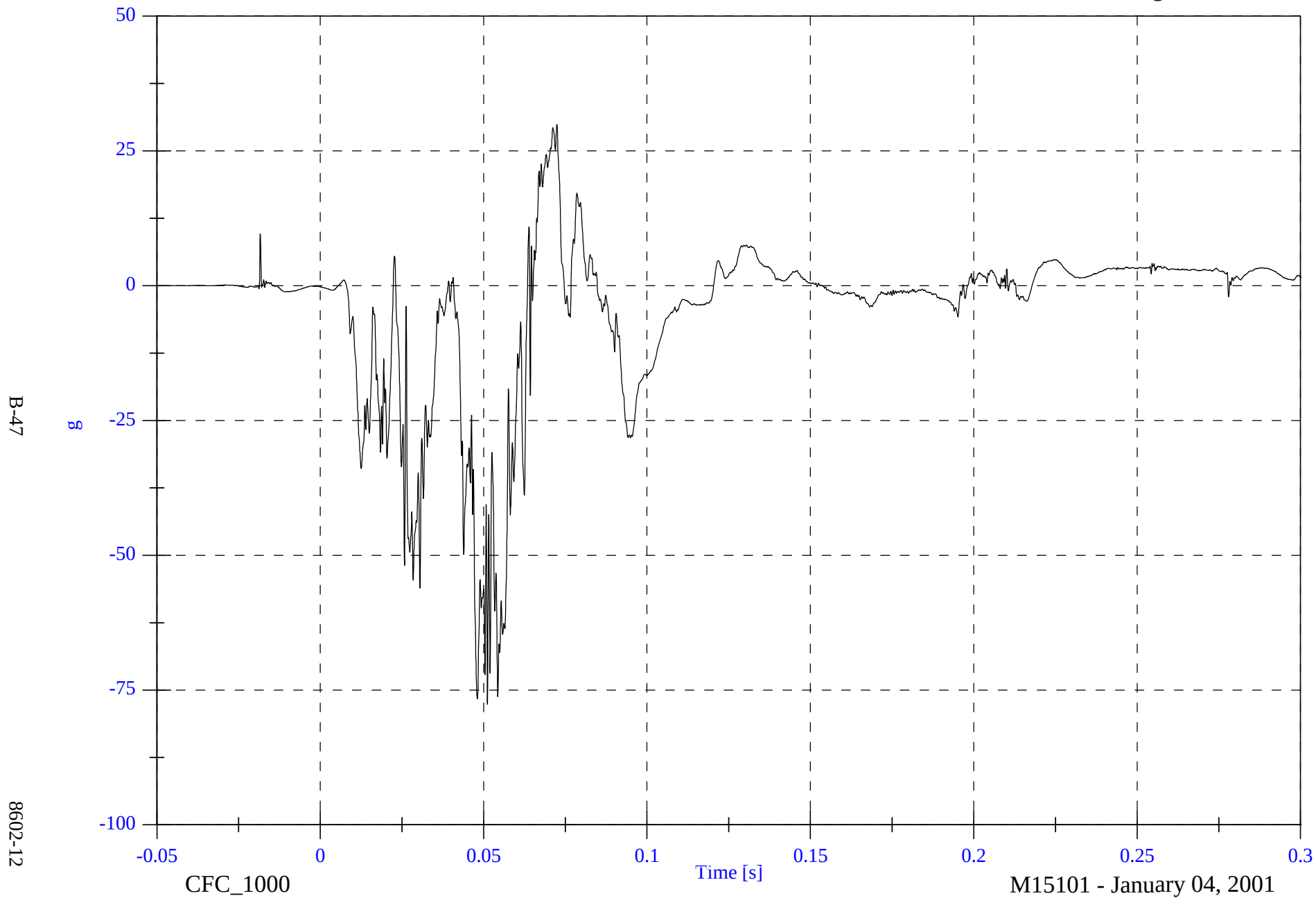
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Left Foot Fore z

Max: 29.9 [g] at 0.072 [s]

Min: -77.7 [g] at 0.051 [s]



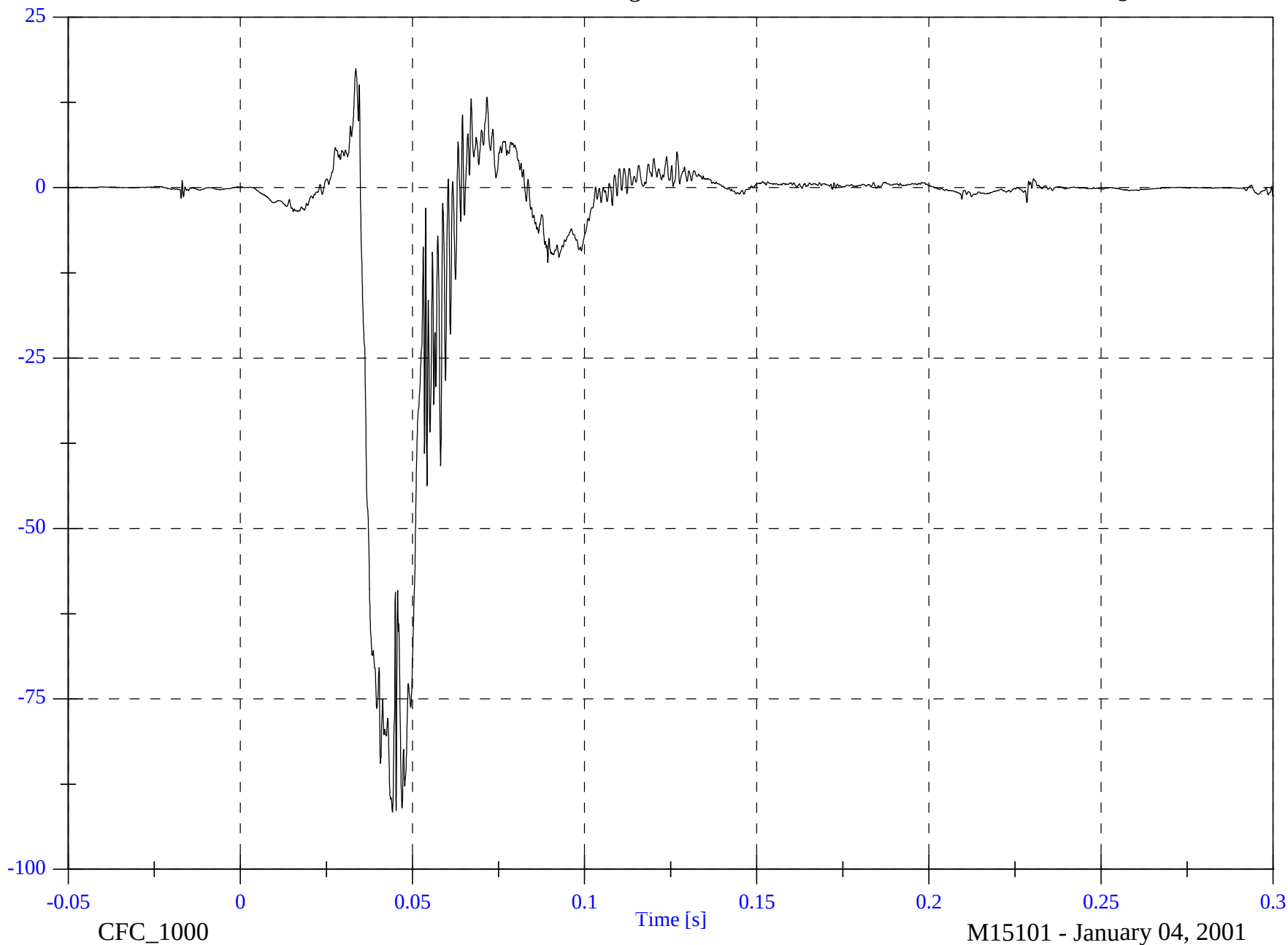
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Foot Aft x

Max: 17.4 [g] at 0.034 [s]

Min: -91.6 [g] at 0.044 [s]



B-48

8602-12

CFC_1000

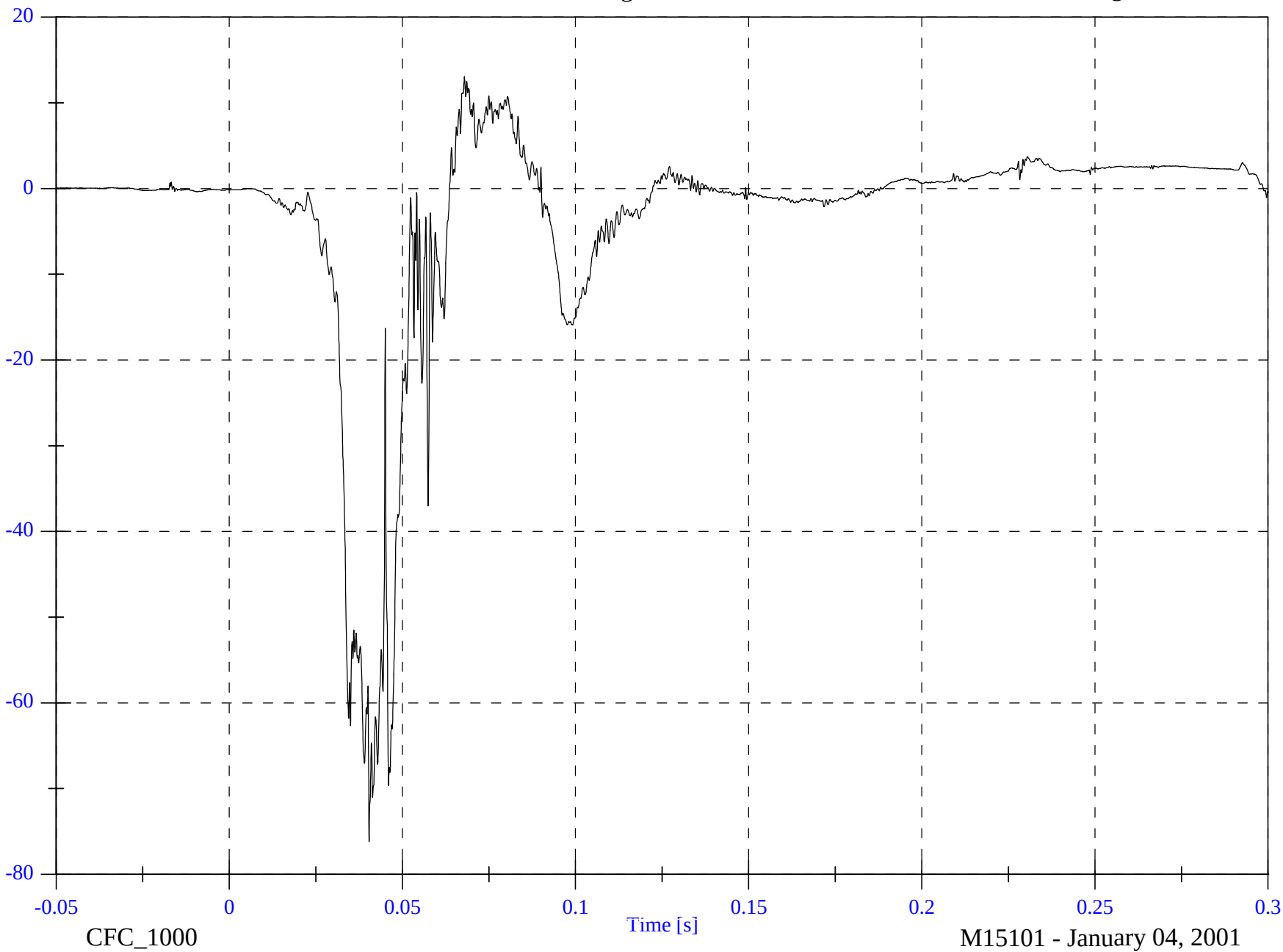
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Foot Aft z

Max: 13.1 [g] at 0.068 [s]

Min: -76.2 [g] at 0.040 [s]



B-49

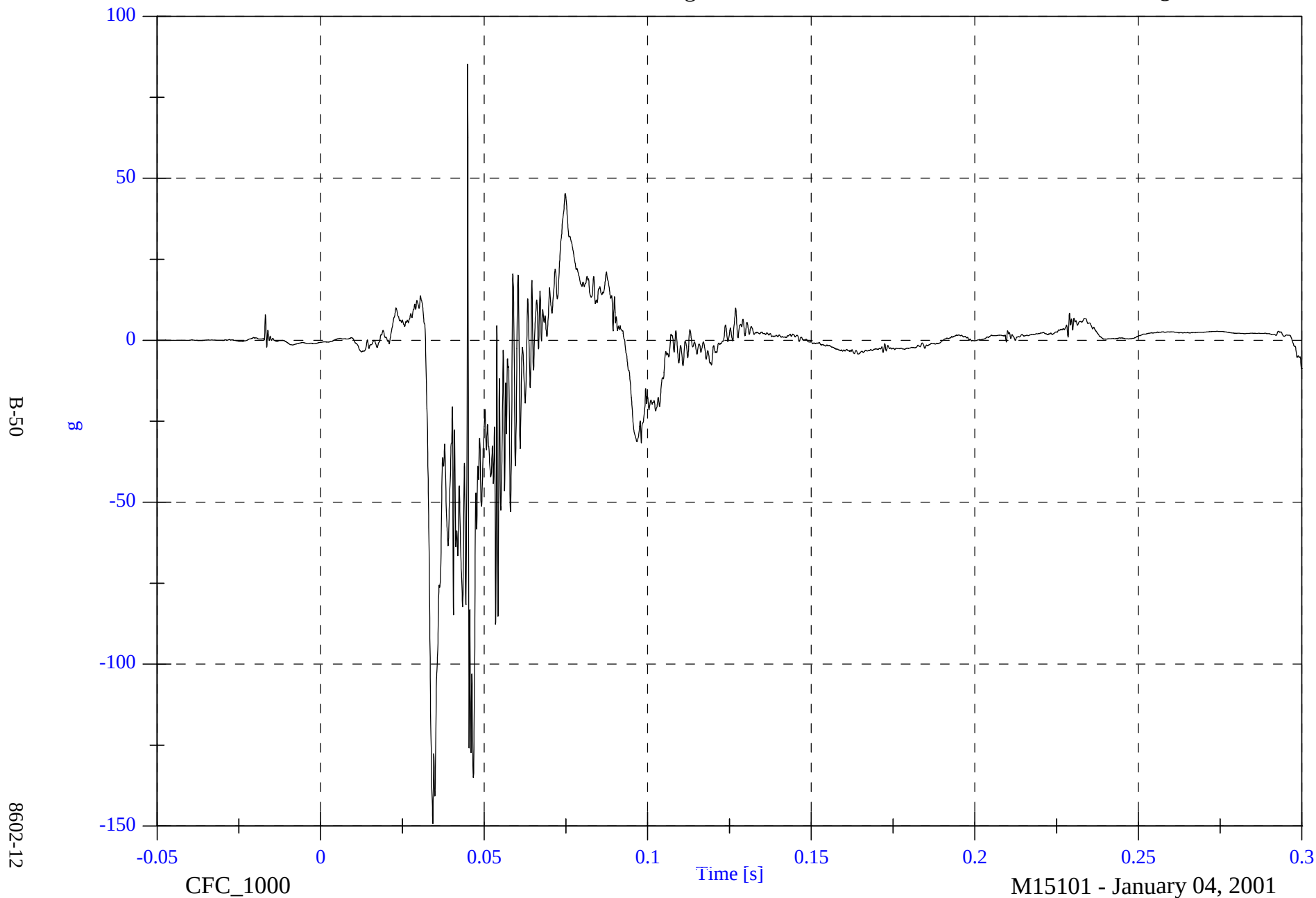
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P1 Right Foot Fore z

Max: 85.2 [g] at 0.045 [s]

Min: -149.2 [g] at 0.034 [s]

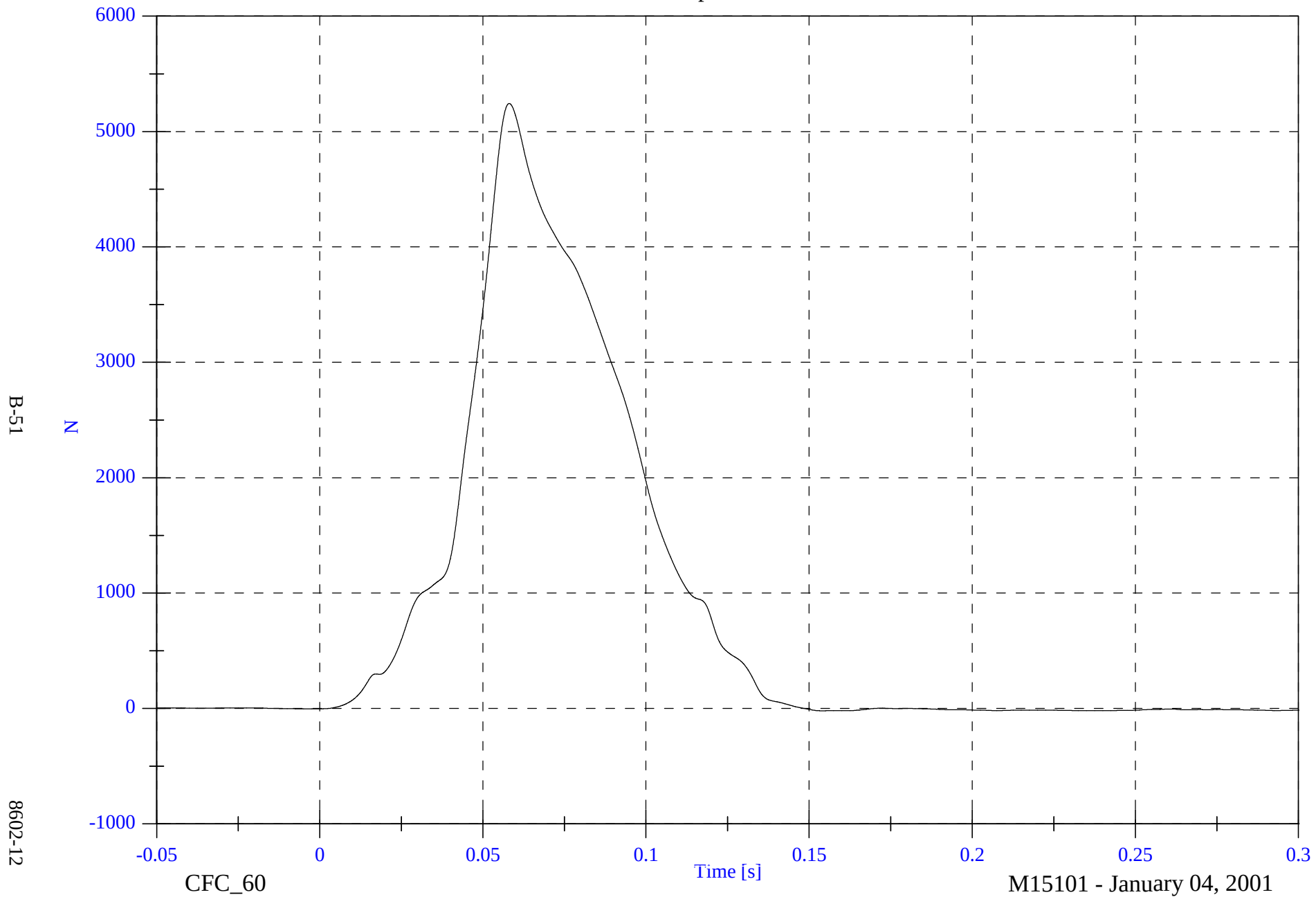


NCAP Test 12 - 2001 Toyota Avalon

P1 Lap Belt Force

Max: 5243.9 [N] at 0.058 [s]

Min: -20.2 [N] at 0.154 [s]



NCAP Test 12 - 2001 Toyota Avalon

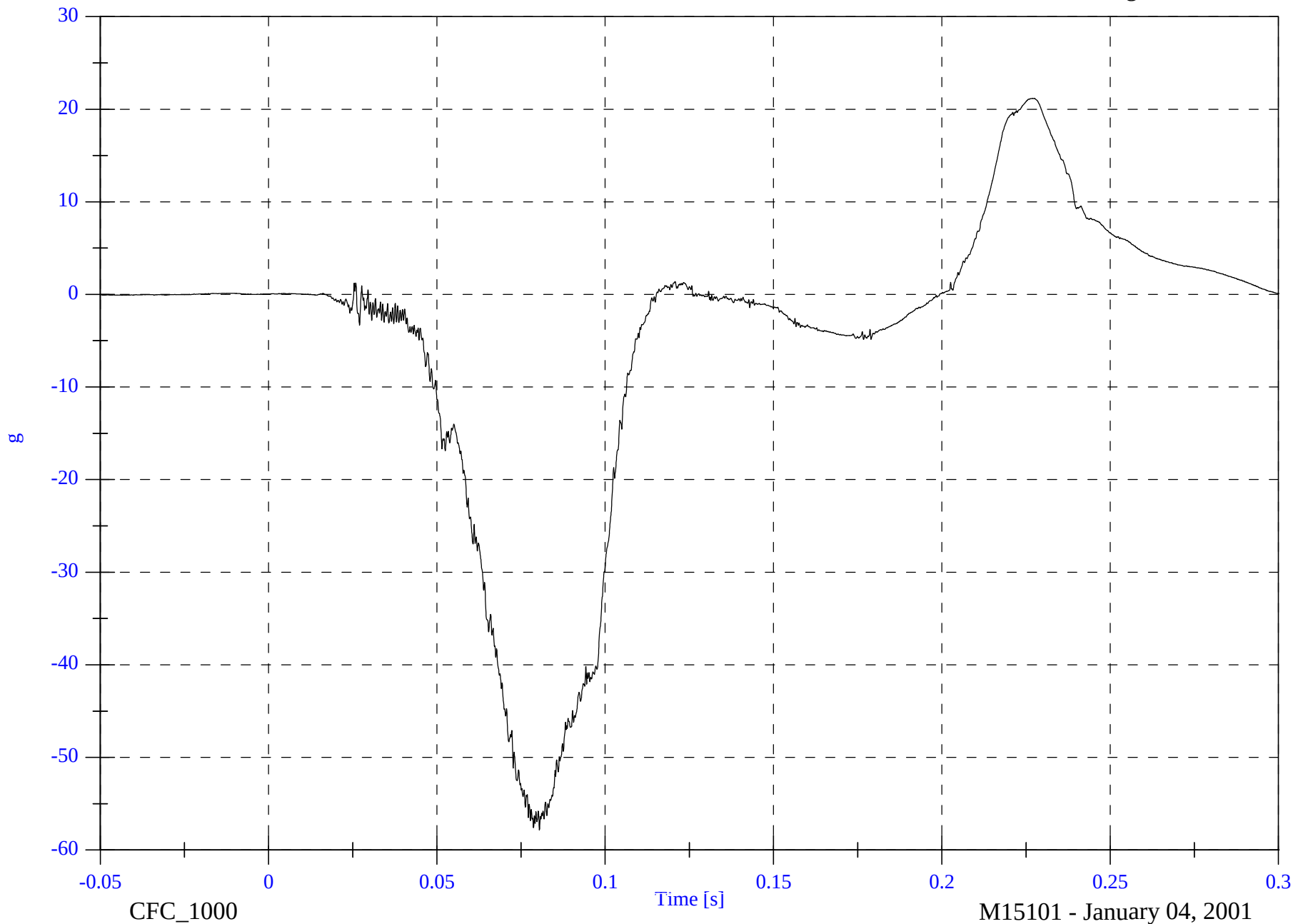
P2 Head x

Max: 21.2 [g] at 0.227 [s]

Min: -57.8 [g] at 0.080 [s]

B-52

8602-12



NCAP Test 12 - 2001 Toyota Avalon

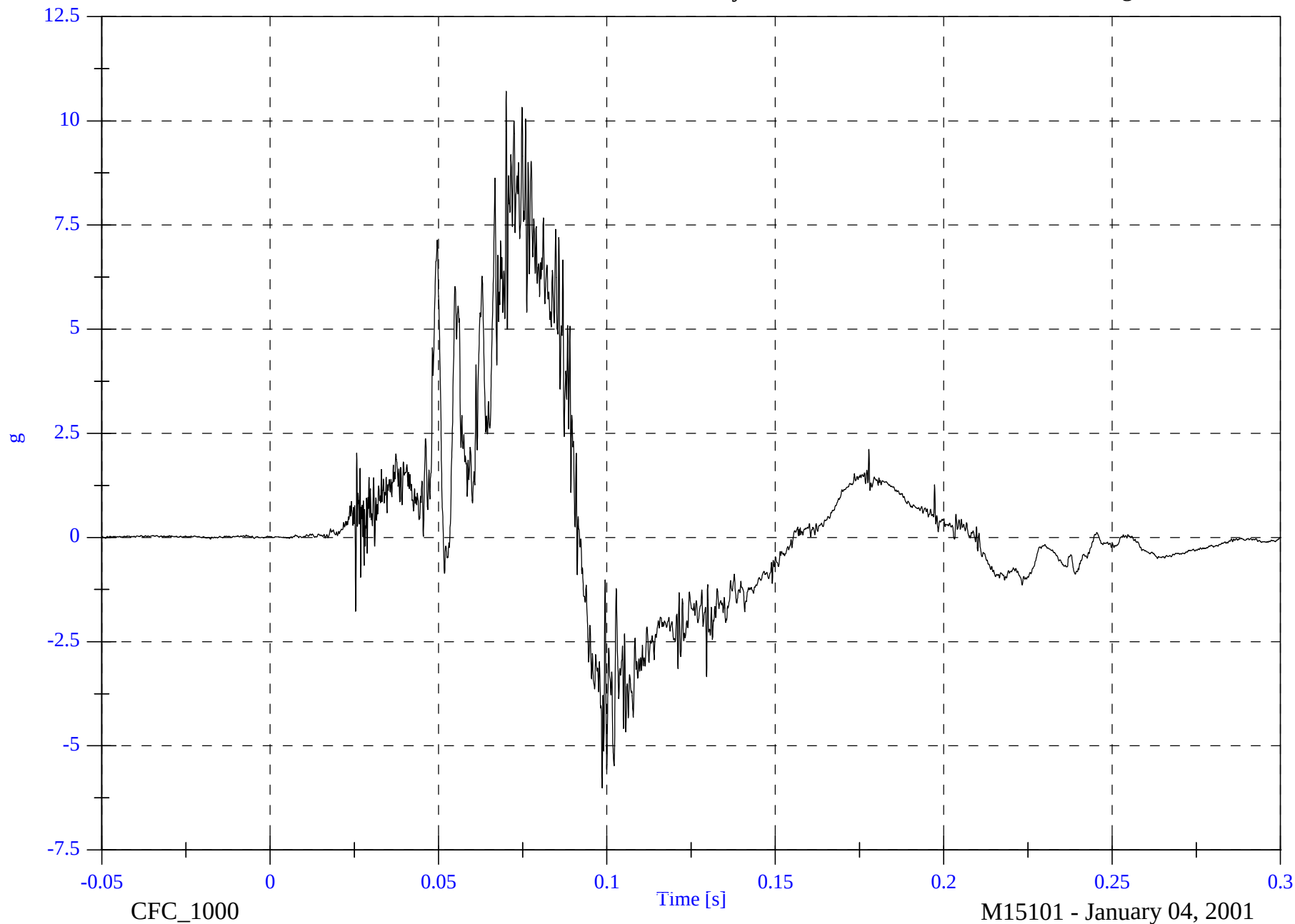
P2 Head y

Max: 10.7 [g] at 0.070 [s]

Min: -6.0 [g] at 0.099 [s]

B-53

8602-12



NCAP Test 12 - 2001 Toyota Avalon

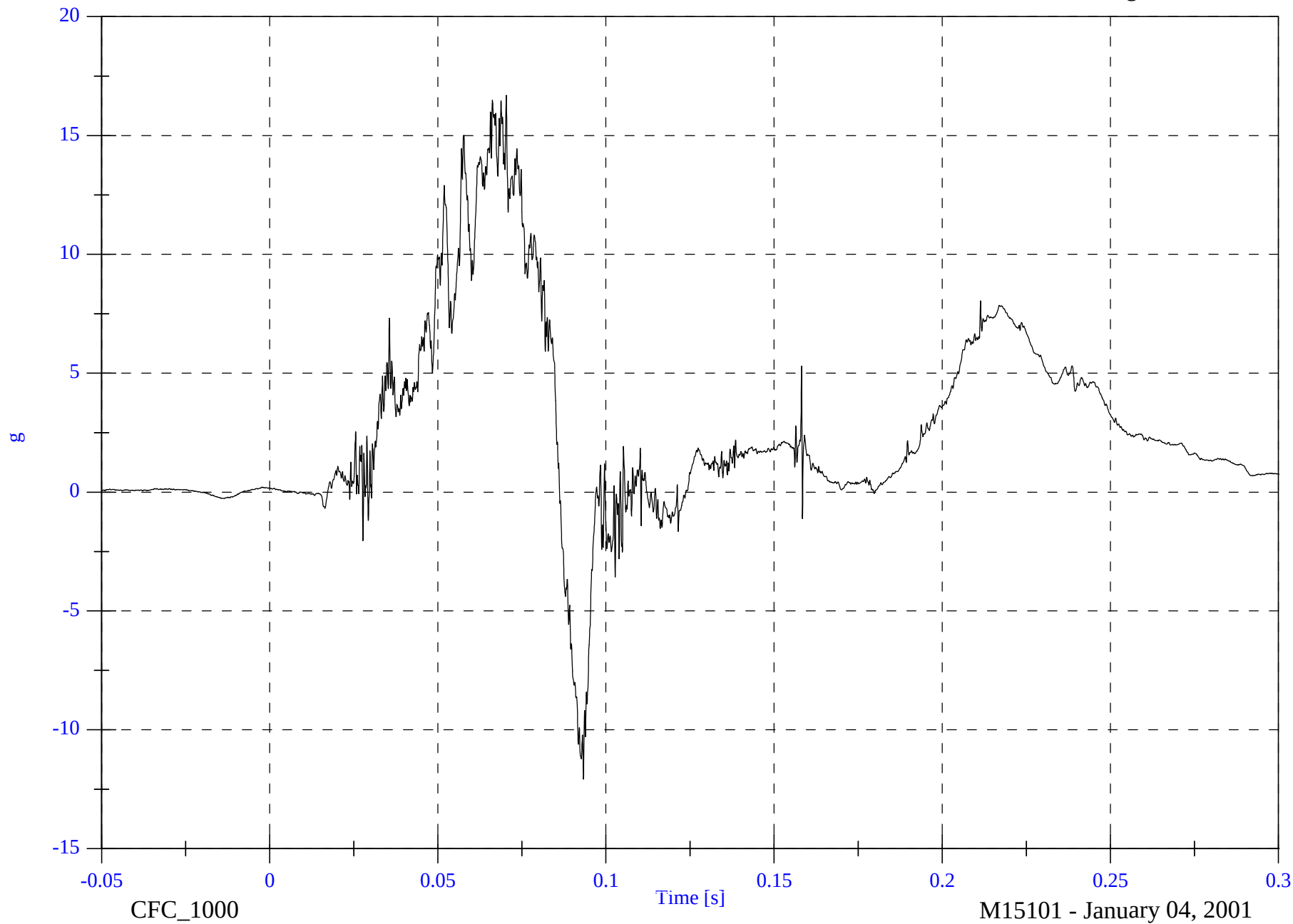
P2 Head z

Max: 16.7 [g] at 0.070 [s]

Min: -12.1 [g] at 0.093 [s]

B-54

8602-12

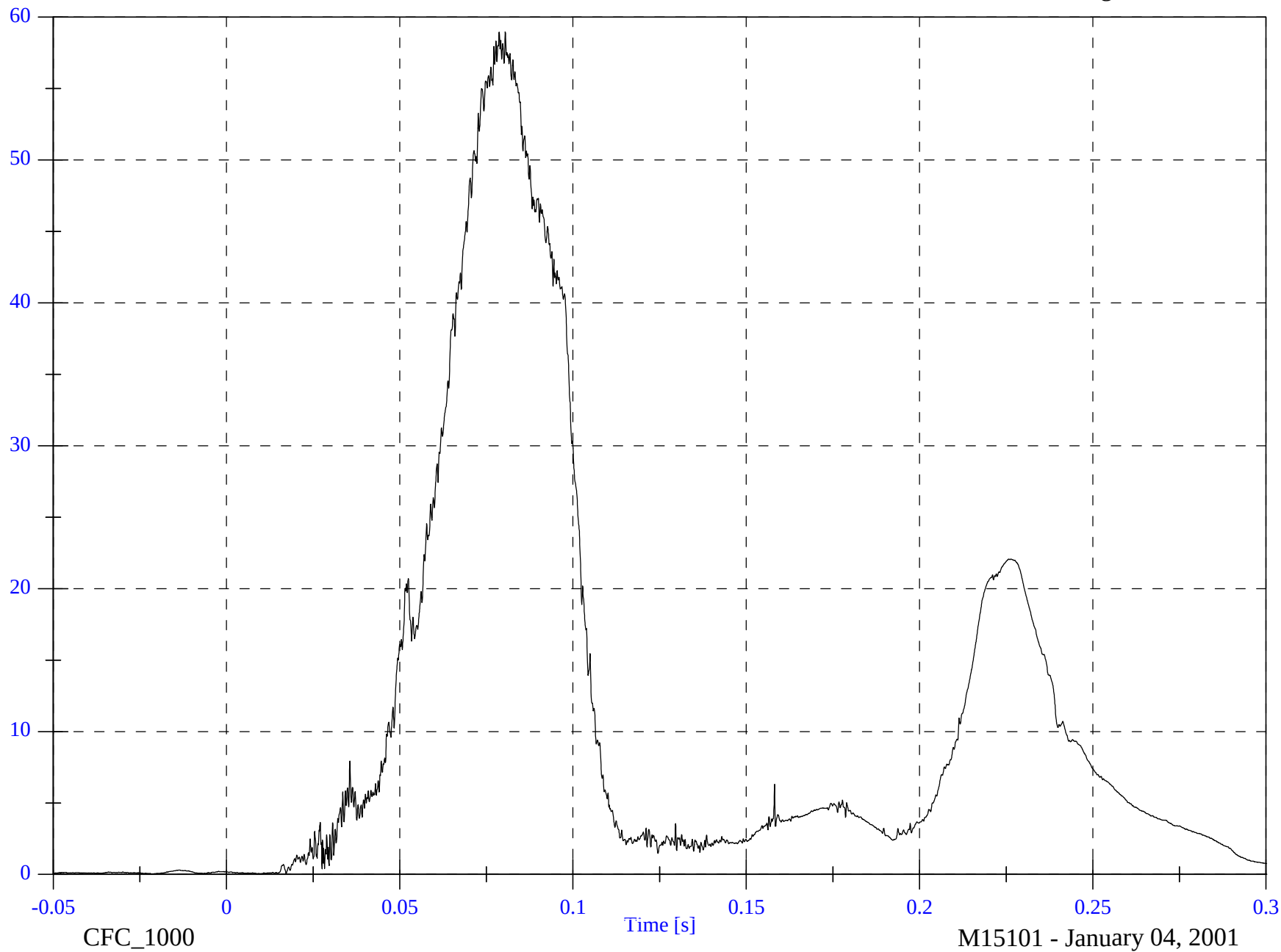


NCAP Test 12 - 2001 Toyota Avalon

P2 Head Resultant

Max: 59.0 [g] at 0.080 [s]

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



B-55

8602-12

NCAP Test 12 - 2001 Toyota Avalon

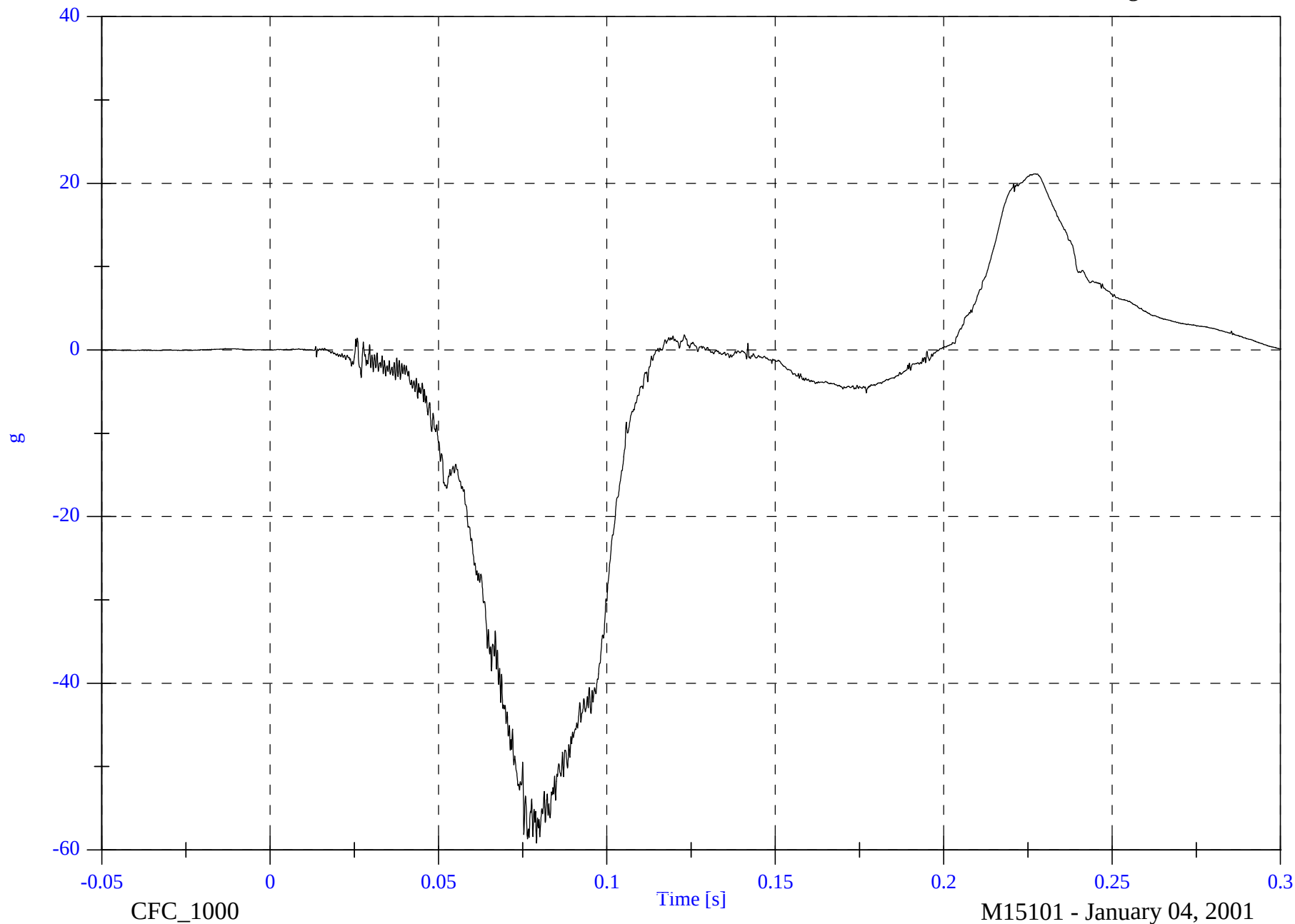
P2 Head Red x

Max: 21.1 [g] at 0.227 [s]

Min: -59.2 [g] at 0.079 [s]

B-56

8602-12

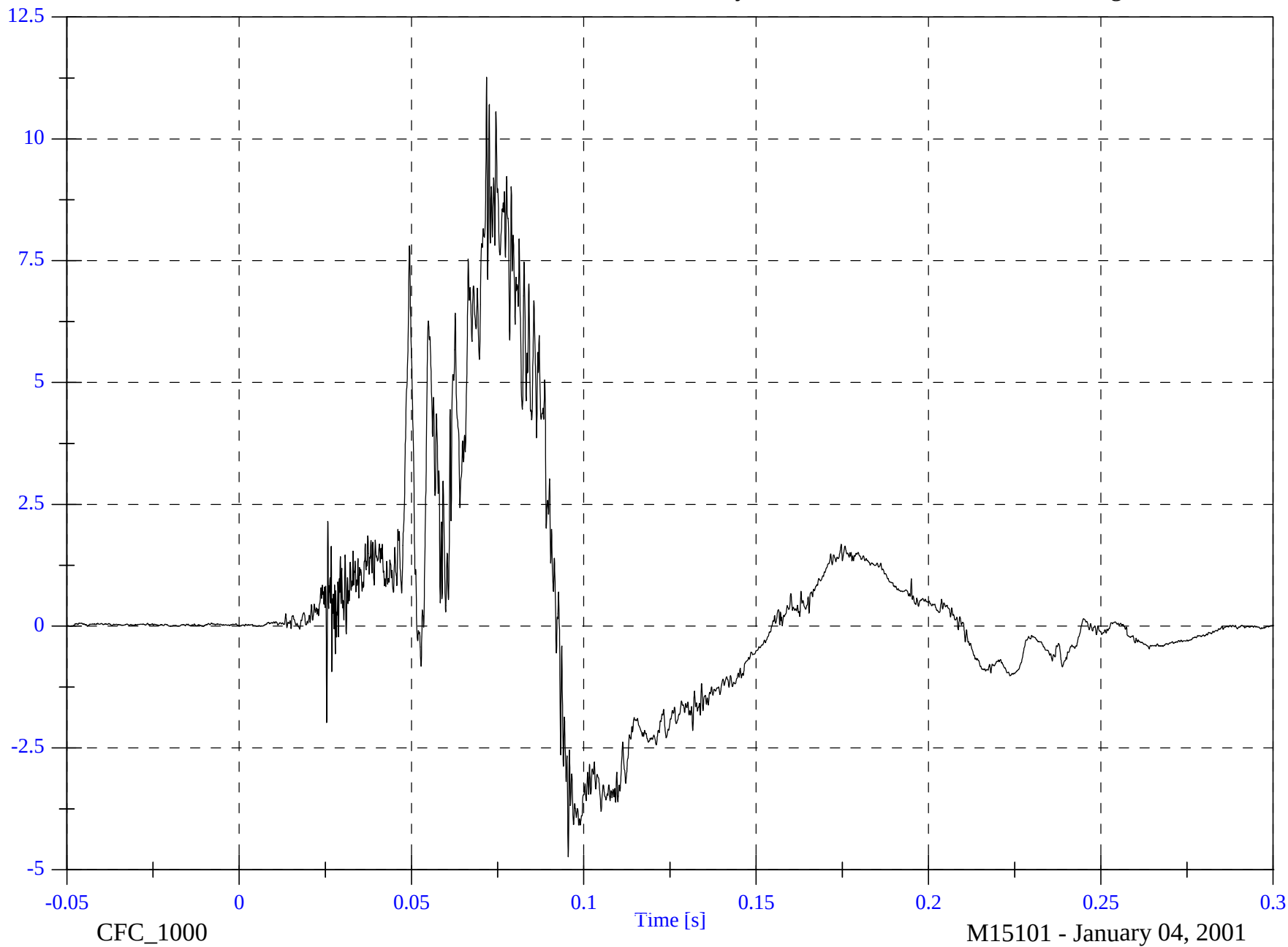


NCAP Test 12 - 2001 Toyota Avalon

P2 Head Red y

Max: 11.3 [g] at 0.072 [s]

Min: -4.7 [g] at 0.096 [s]



B-57

8602-12

CFC_1000

Time [s]

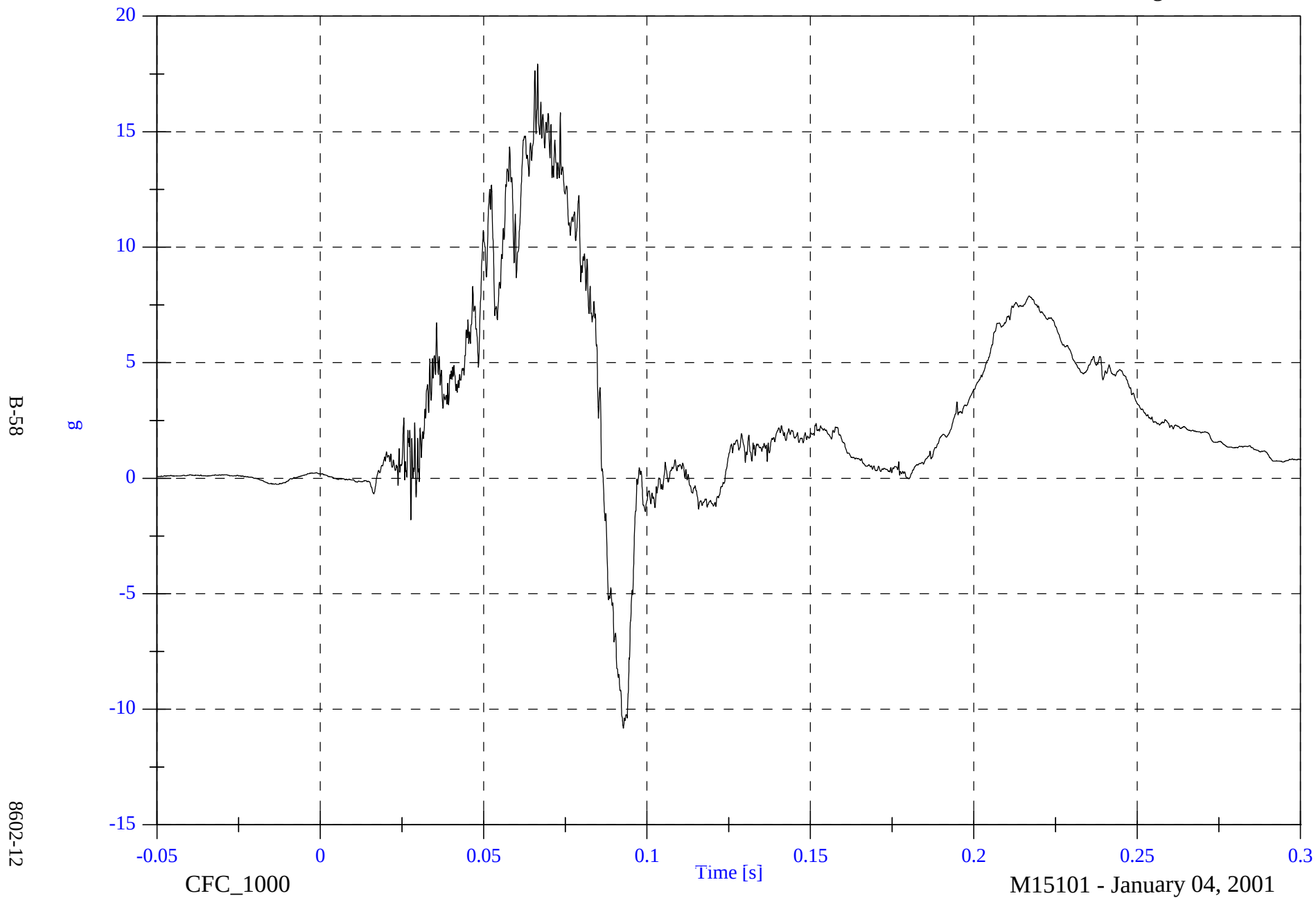
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Head Red z

Max: 17.9 [g] at 0.067 [s]

Min: -10.8 [g] at 0.093 [s]

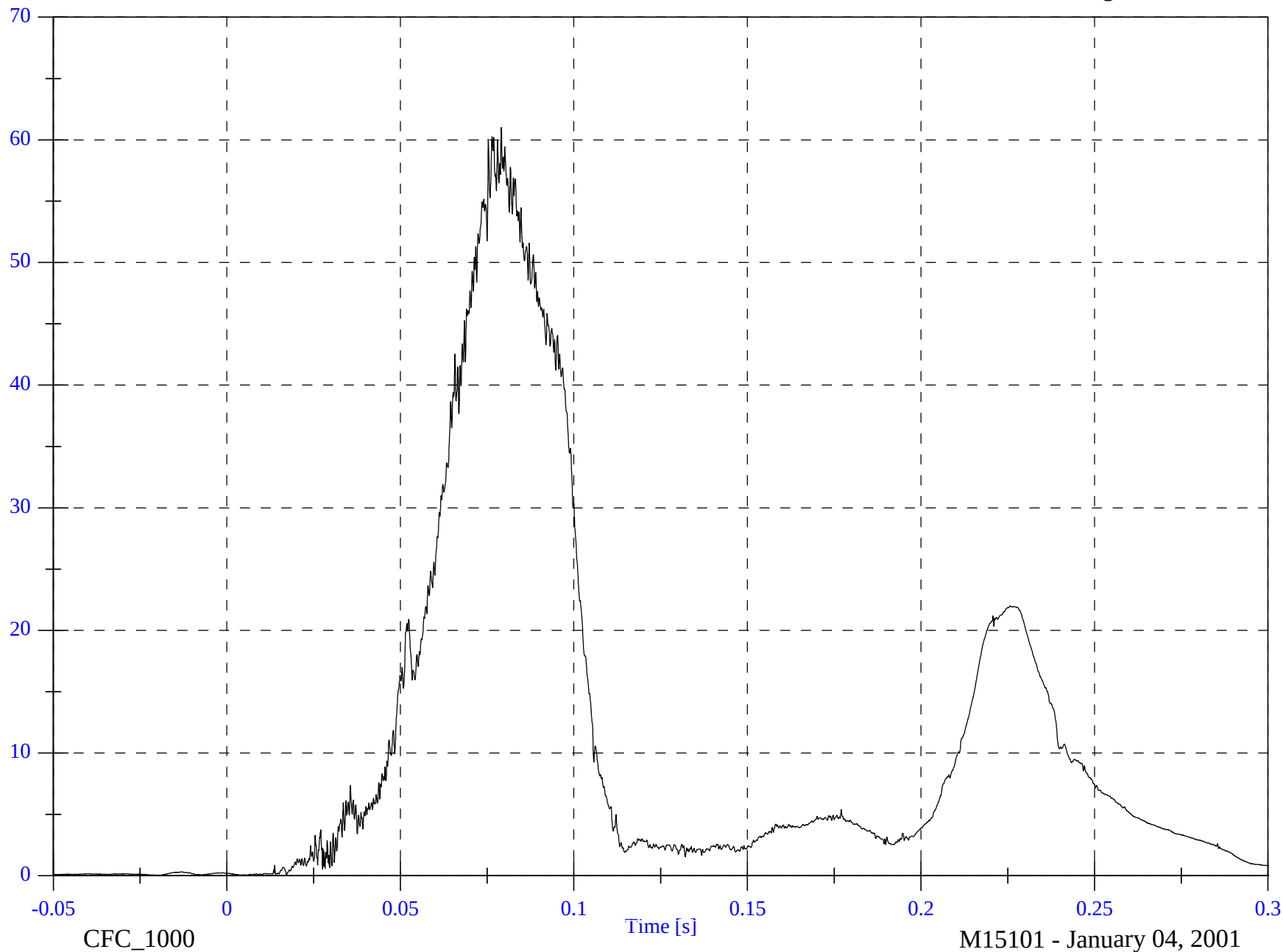


NCAP Test 12 - 2001 Toyota Avalon

P2 Head Red Resultant

Max: 61.0 [g] at 0.079 [s]

Min: 0.0 [g] at -0.020 [s]



B-59

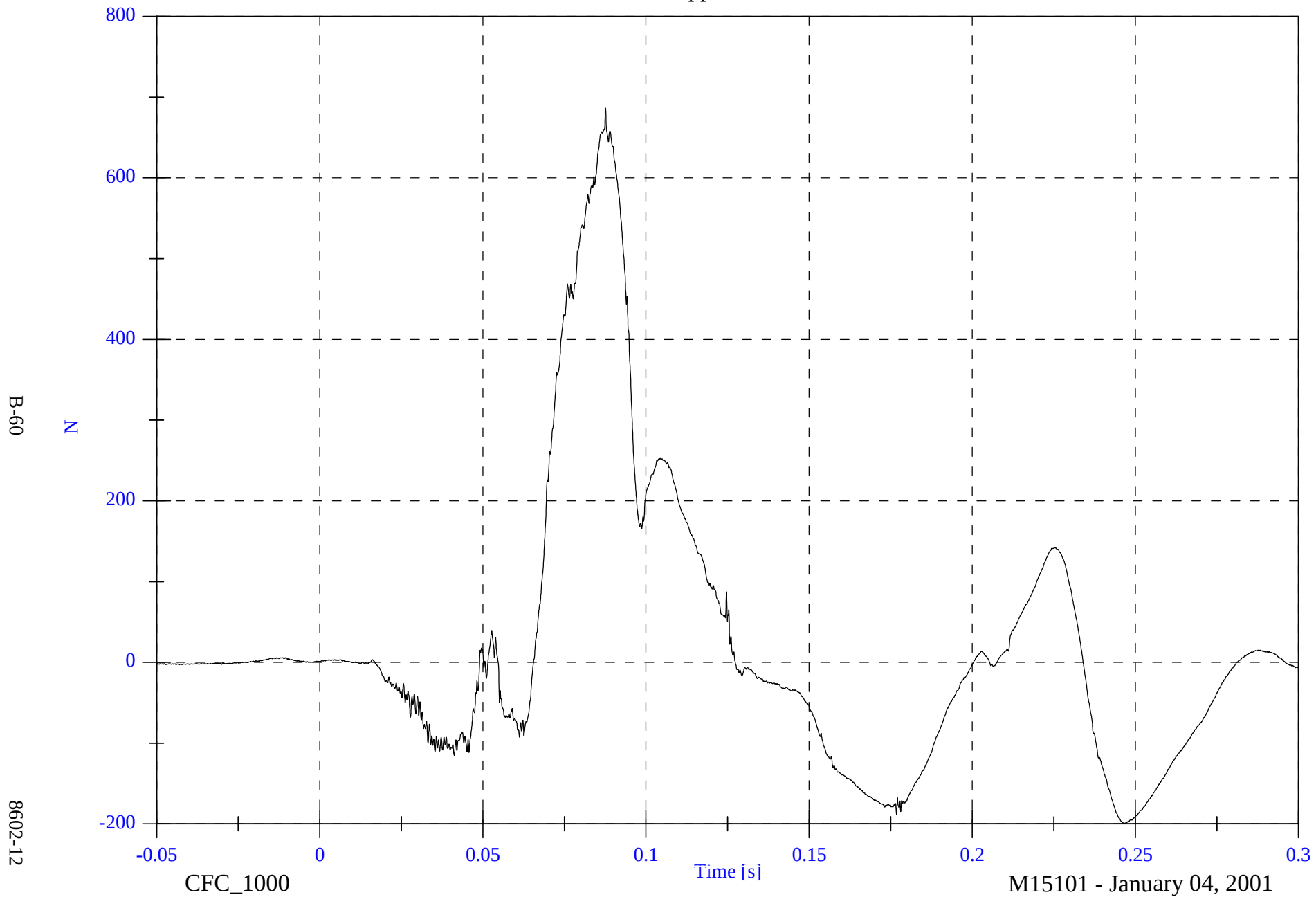
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck Fx

Max: 686.1 [N] at 0.088 [s]

Min: -199.7 [N] at 0.246 [s]

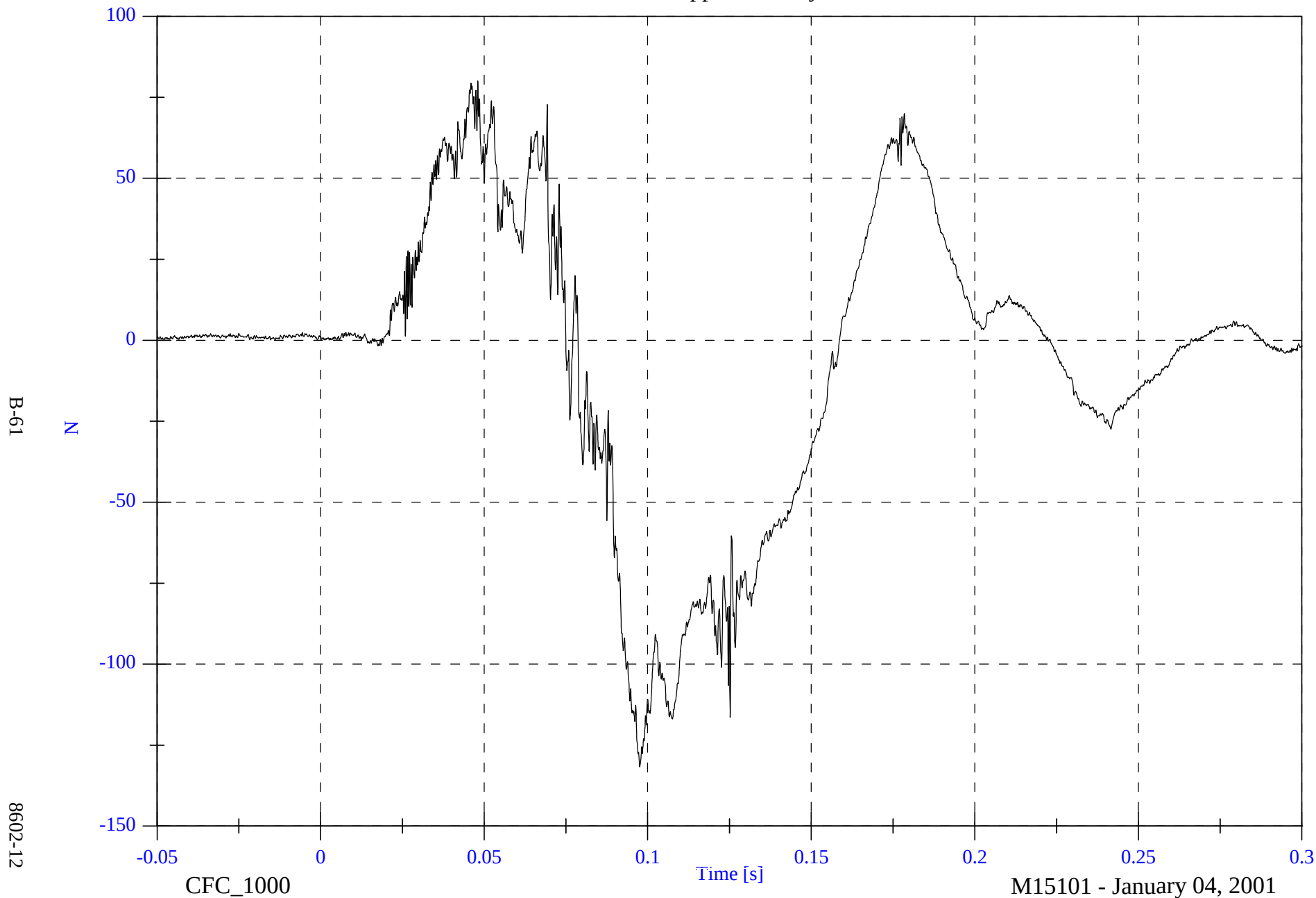


NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck Fy

Max: 80.0 [N] at 0.048 [s]

Min: -131.7 [N] at 0.098 [s]

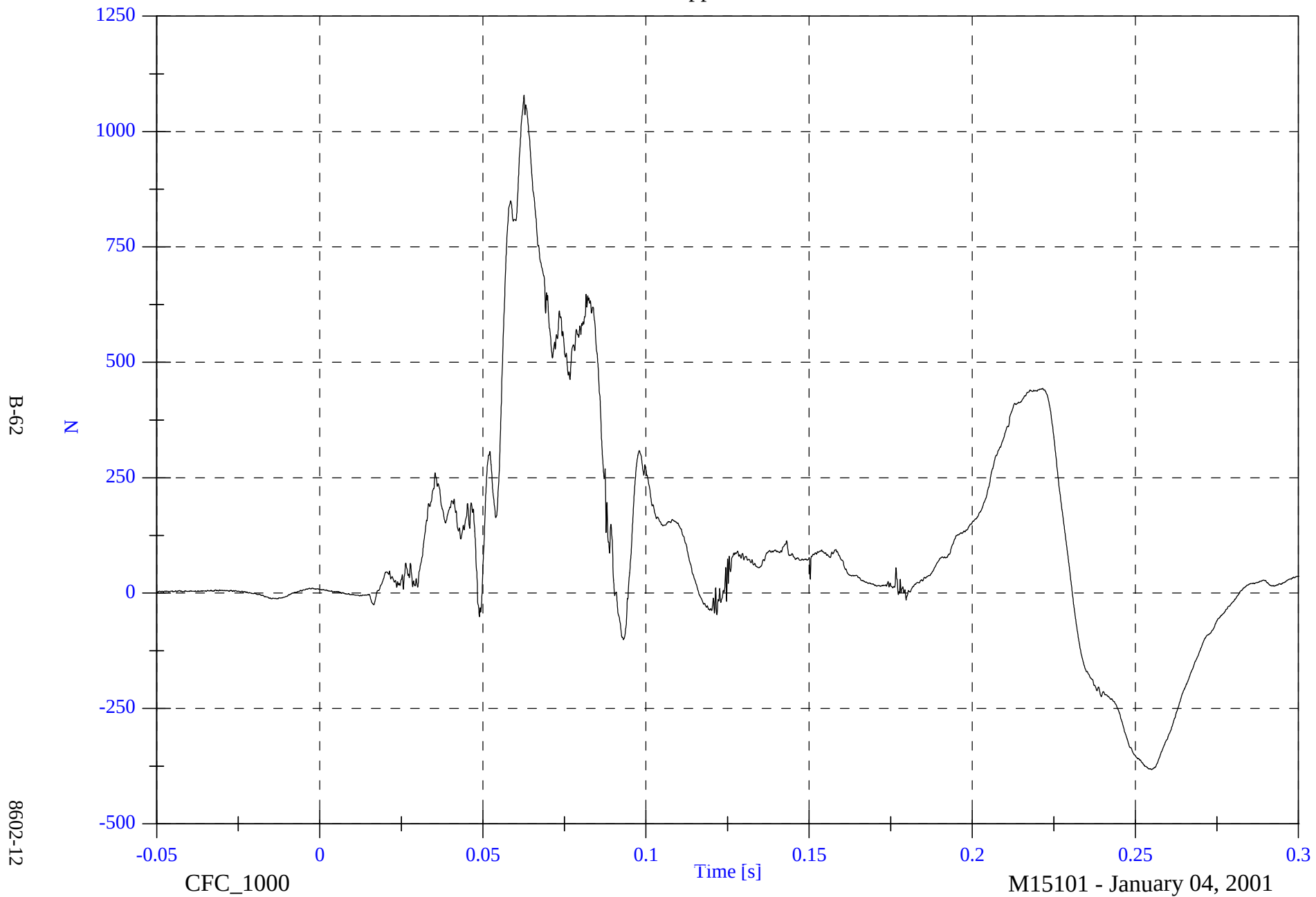


NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck Fz

Max: 1079.1 [N] at 0.063 [s]

Min: -382.3 [N] at 0.255 [s]



NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck F Resultant

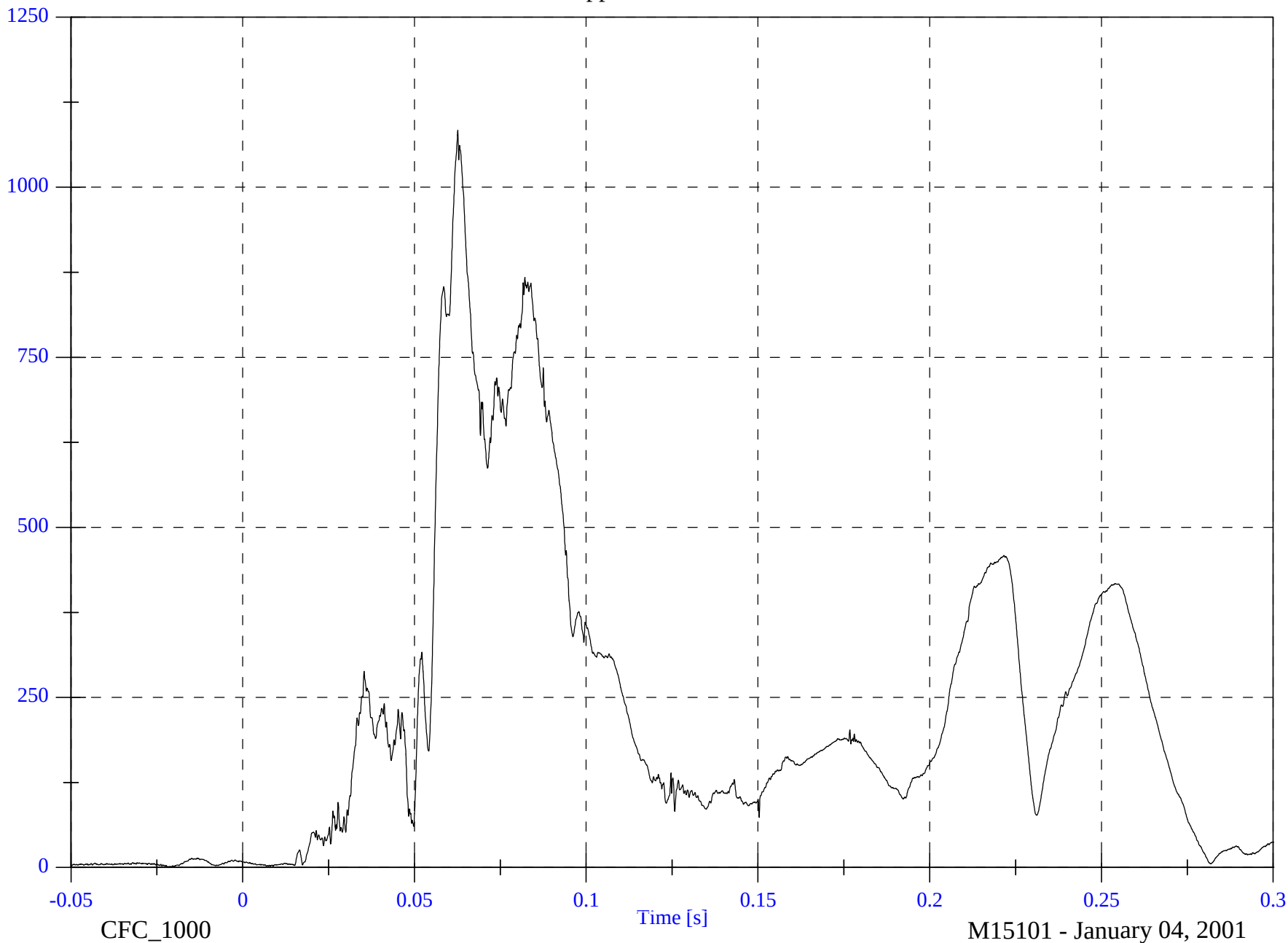
Max: 1083.7 [N] at 0.063 [s]

Min: 0.5 [N] at -0.022 [s]

B-63

N

8602-12

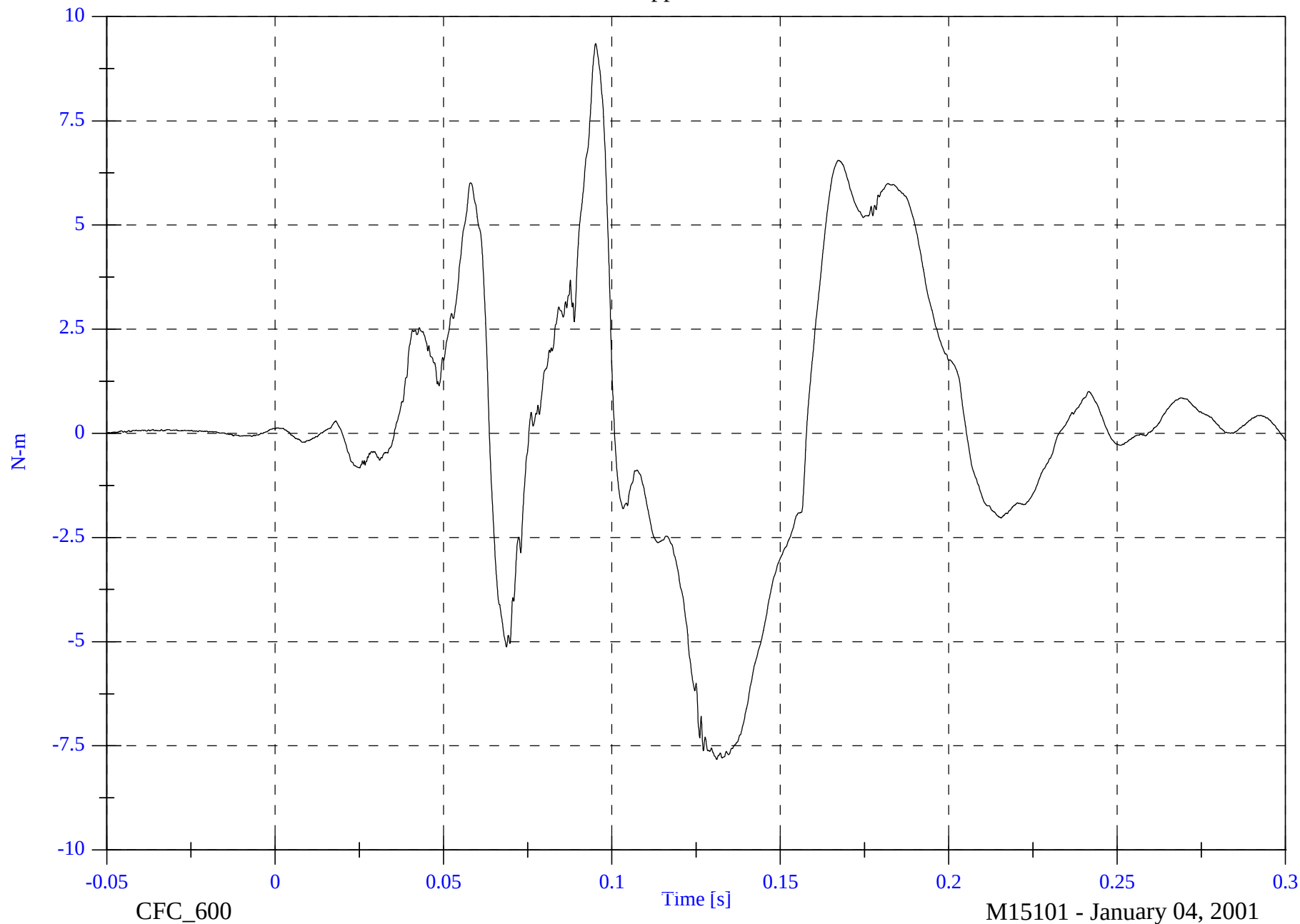


NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck Mx

Max: 9.4 [N-m] at 0.095 [s]

Min: -7.8 [N-m] at 0.131 [s]



B-64

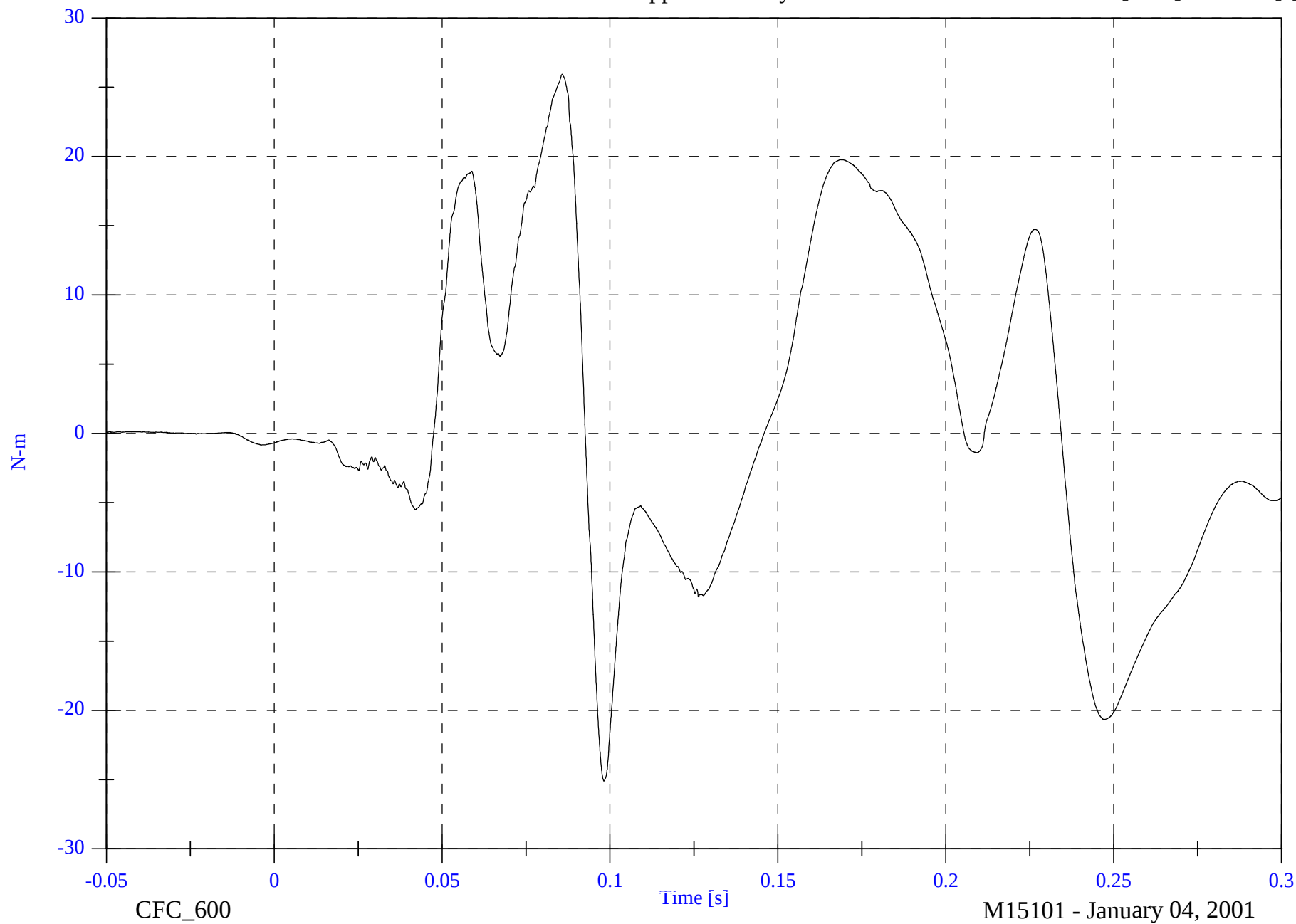
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck My

Max: 25.9 [N-m] at 0.086 [s]

Min: -25.1 [N-m] at 0.098 [s]



B-65

8602-12

CFC_600

Time [s]

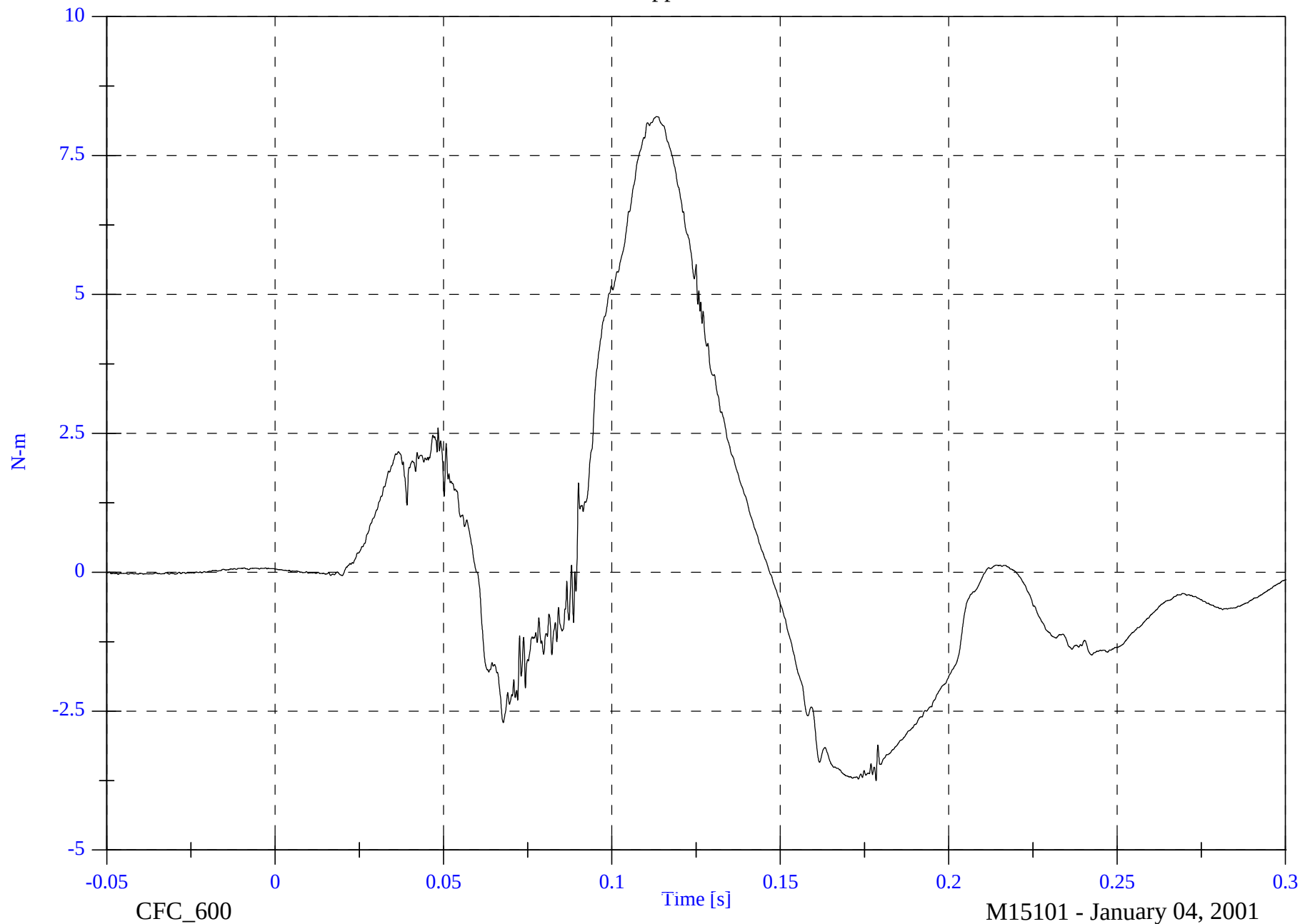
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck Mz

Max: 8.2 [N-m] at 0.113 [s]

Min: -3.8 [N-m] at 0.178 [s]



B-66

8602-12

CFC_600

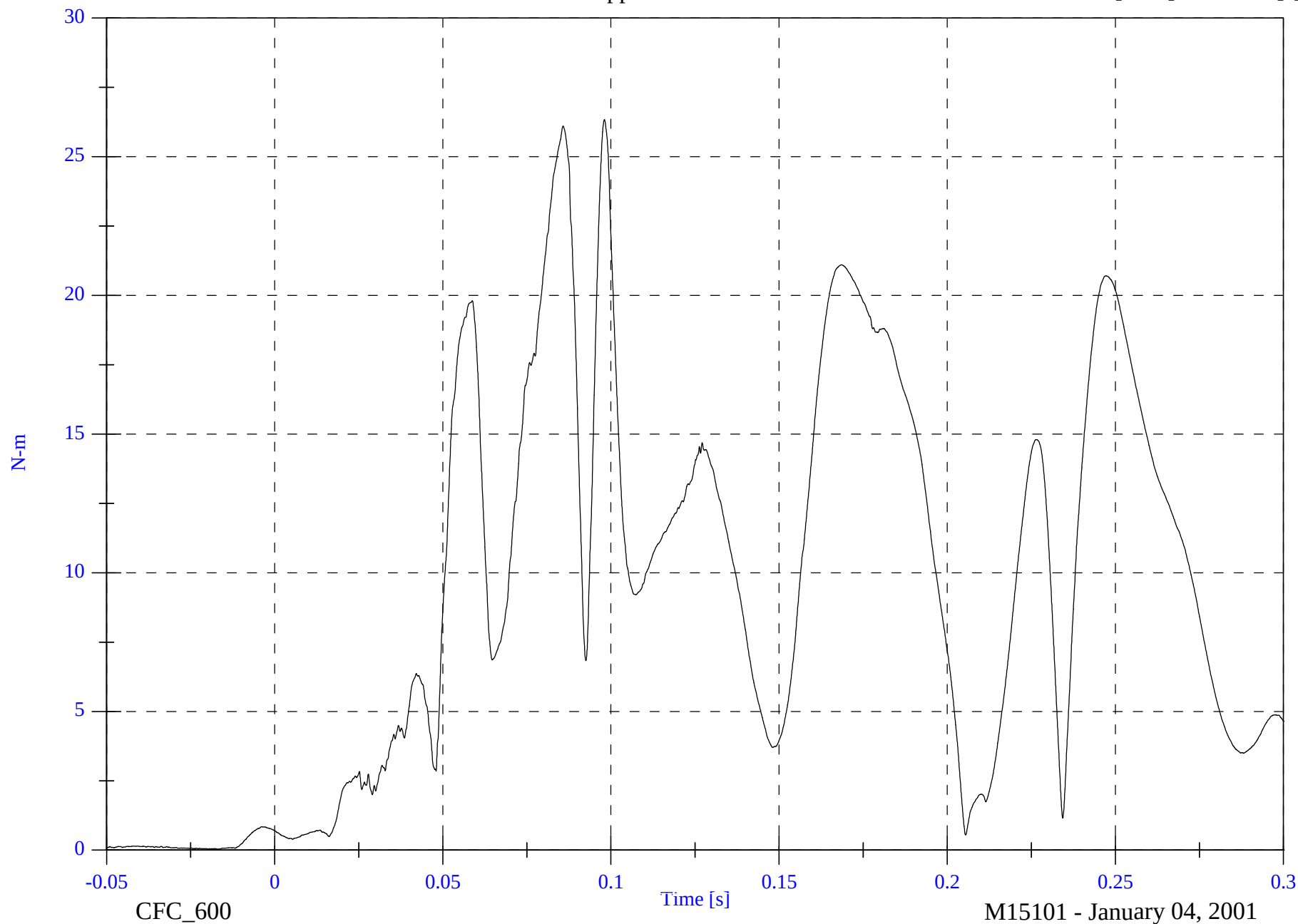
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Upper Neck M Resultant

Max: 26.3 [N-m] at 0.098 [s]

Min: 0.0 [N-m] at -0.017 [s]



B-67

8602-12

NCAP Test 12 - 2001 Toyota Avalon

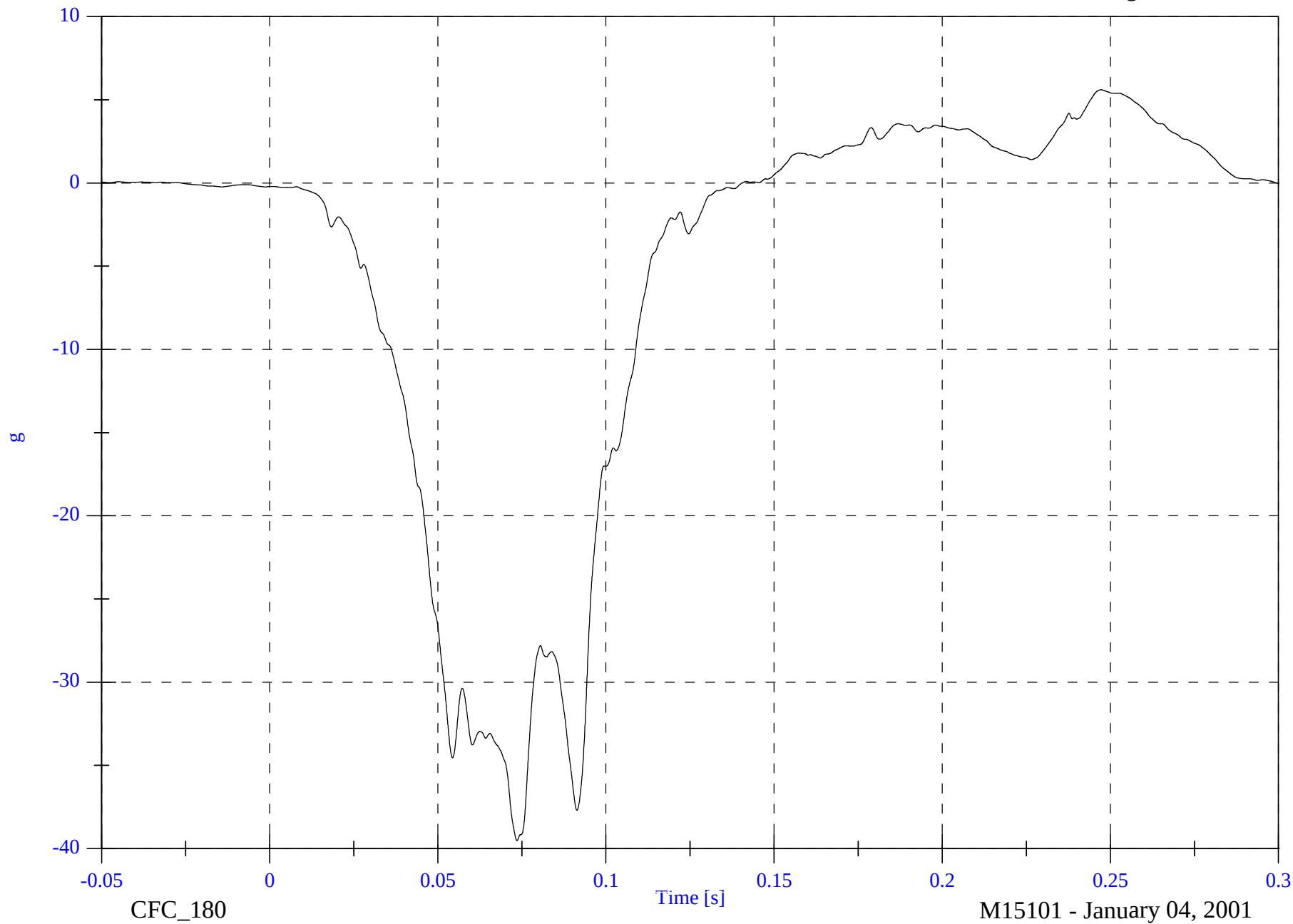
P2 Chest x

Max: 5.6 [g] at 0.247 [s]

Min: -39.5 [g] at 0.074 [s]

B-68

8602-12

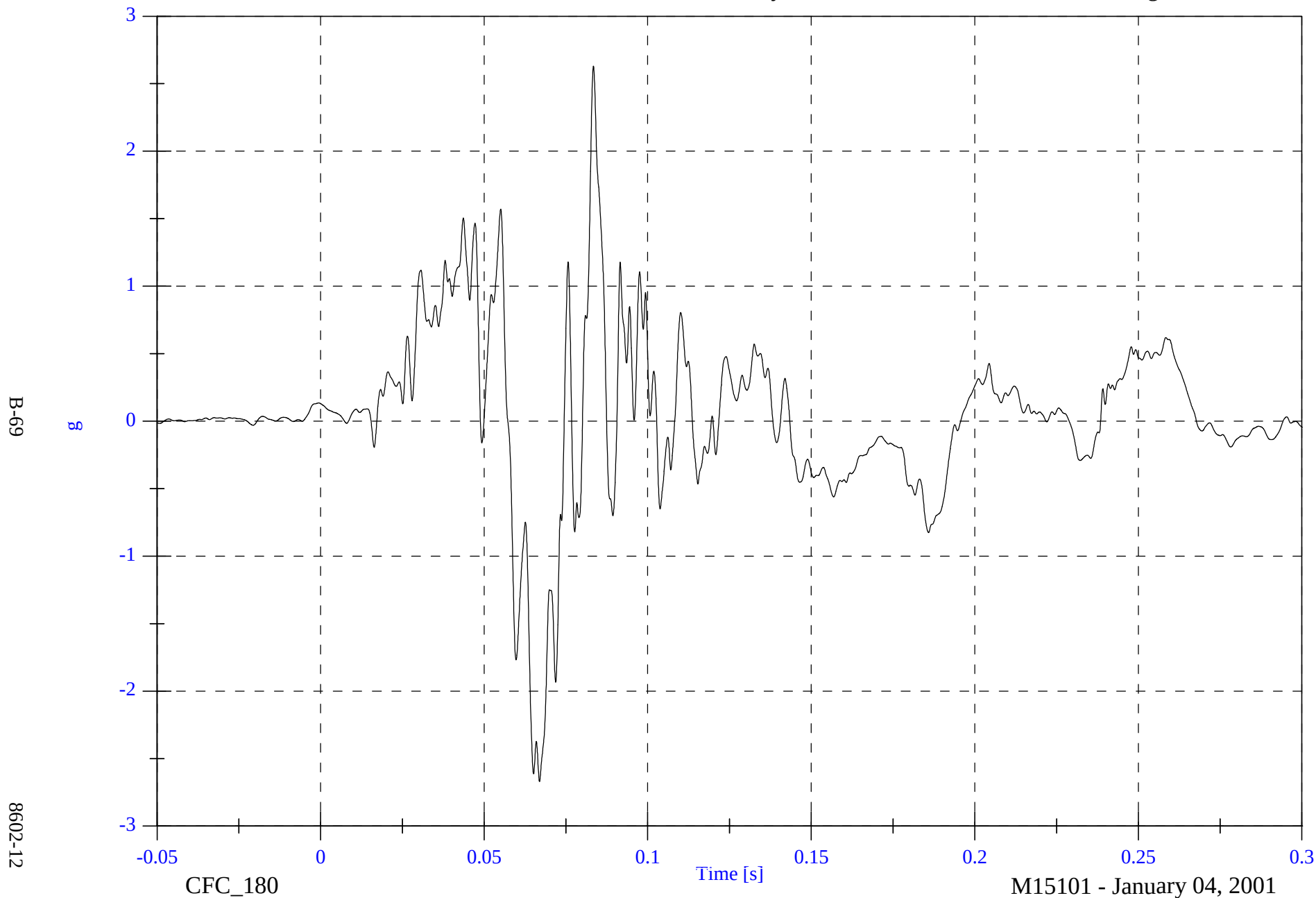


NCAP Test 12 - 2001 Toyota Avalon

P2 Chest y

Max: 2.6 [g] at 0.083 [s]

Min: -2.7 [g] at 0.067 [s]

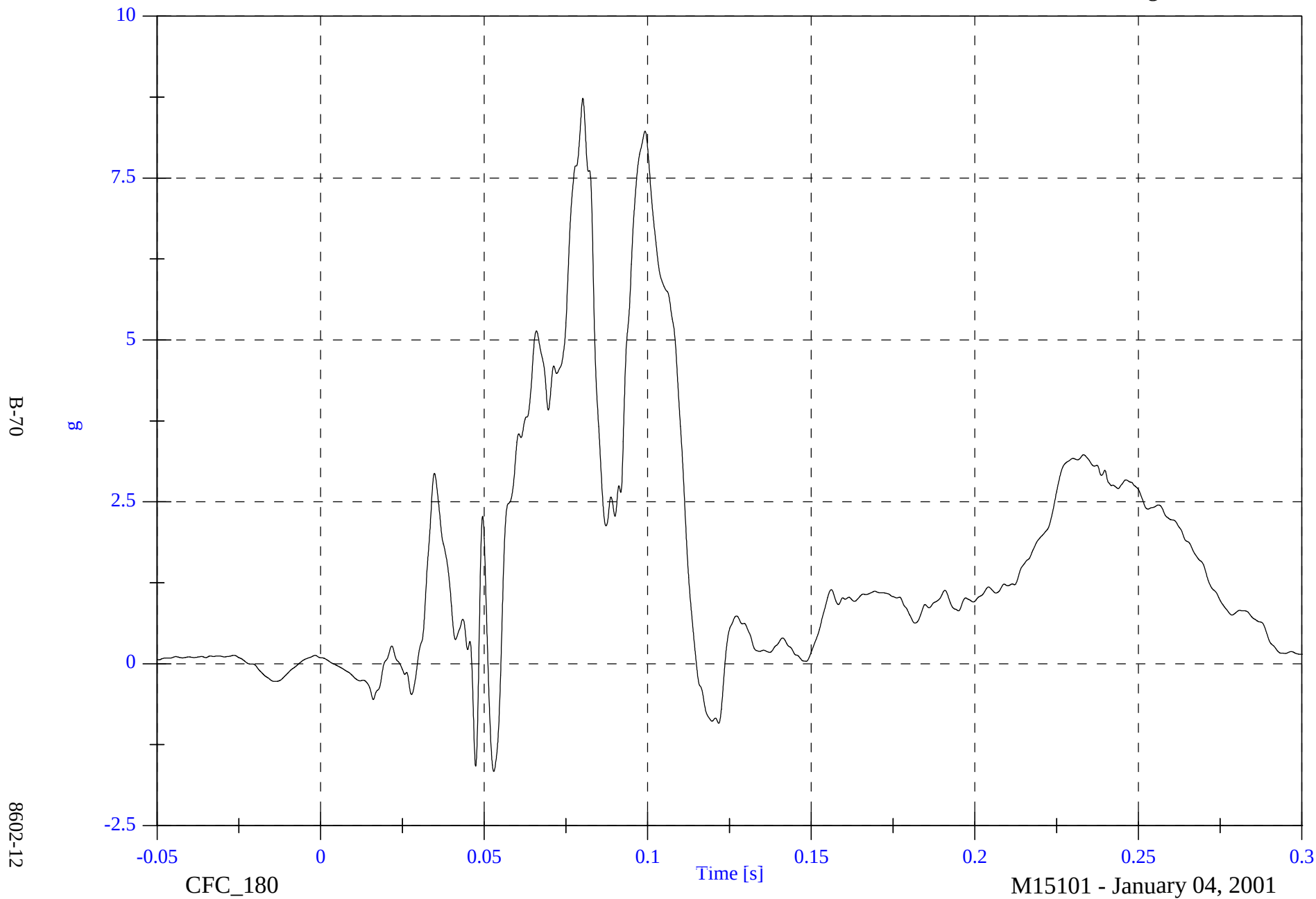


NCAP Test 12 - 2001 Toyota Avalon

P2 Chest z

Max: 8.7 [g] at 0.080 [s]

Min: -1.7 [g] at 0.053 [s]

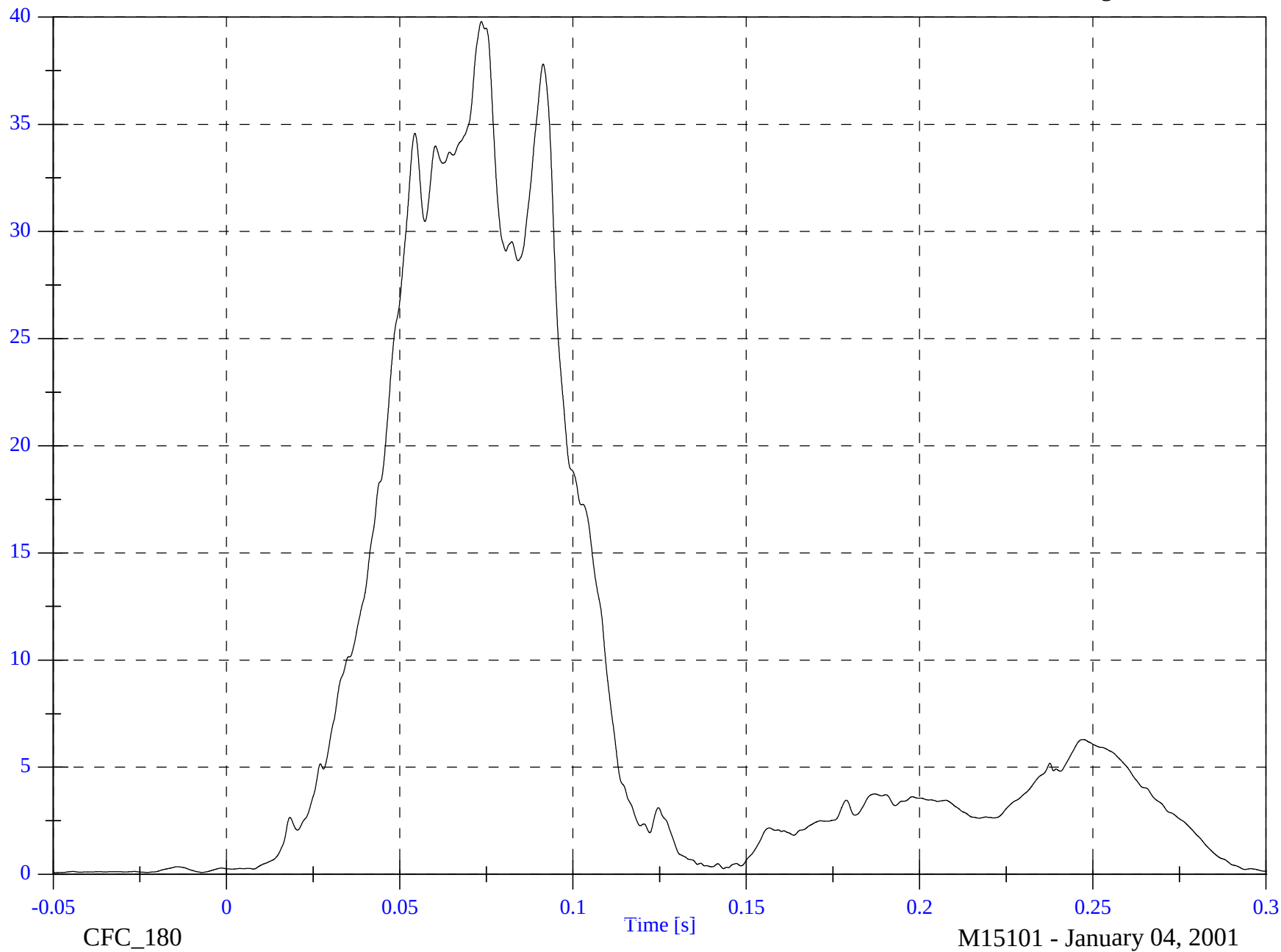


NCAP Test 12 - 2001 Toyota Avalon

P2 Chest Resultant

Max: 39.8 [g] at 0.074 [s]

Min: 0.1 [g] at -0.049 [s]



B-71

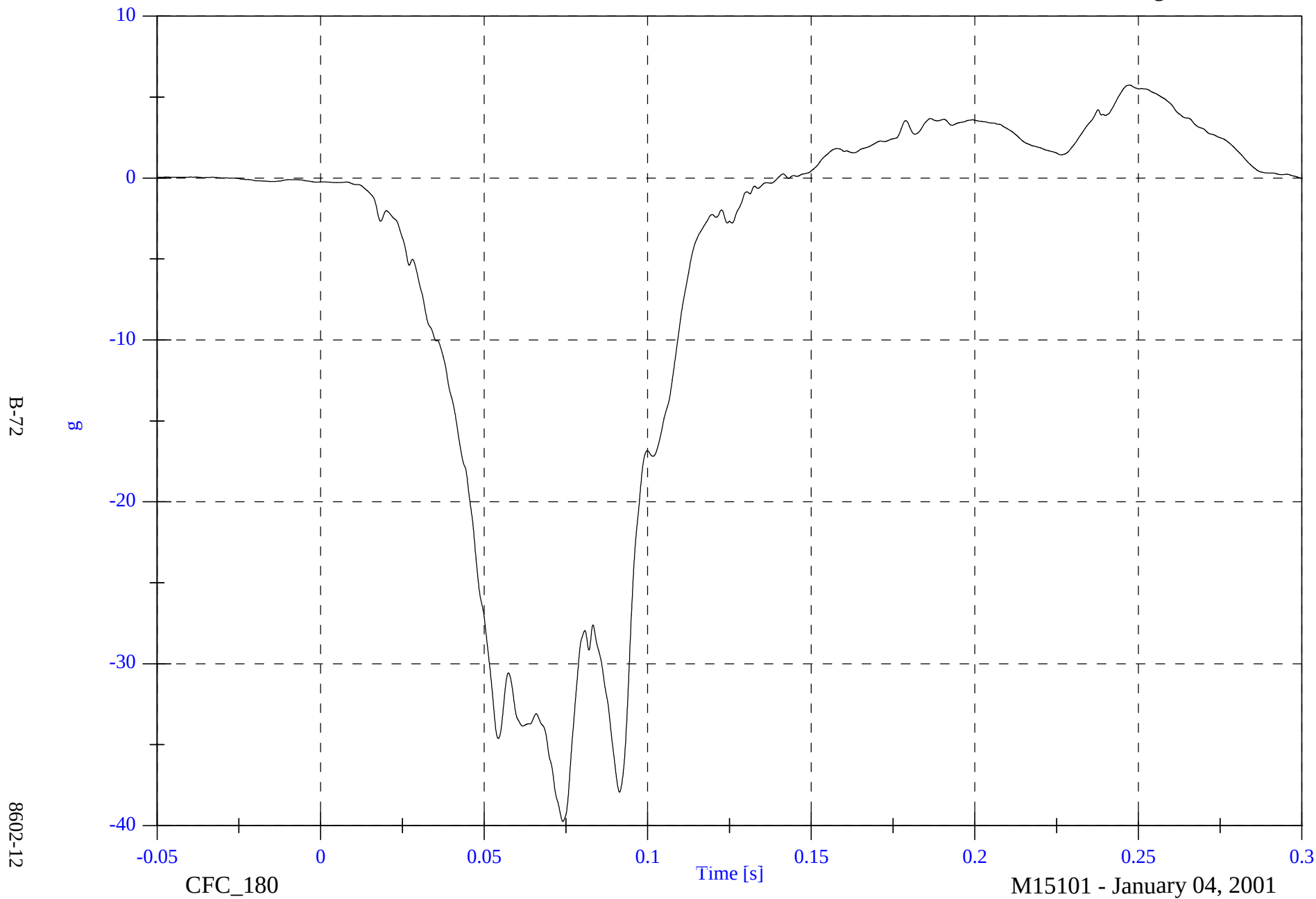
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P2 Chest Red x

Max: 5.7 [g] at 0.247 [s]

Min: -39.7 [g] at 0.074 [s]

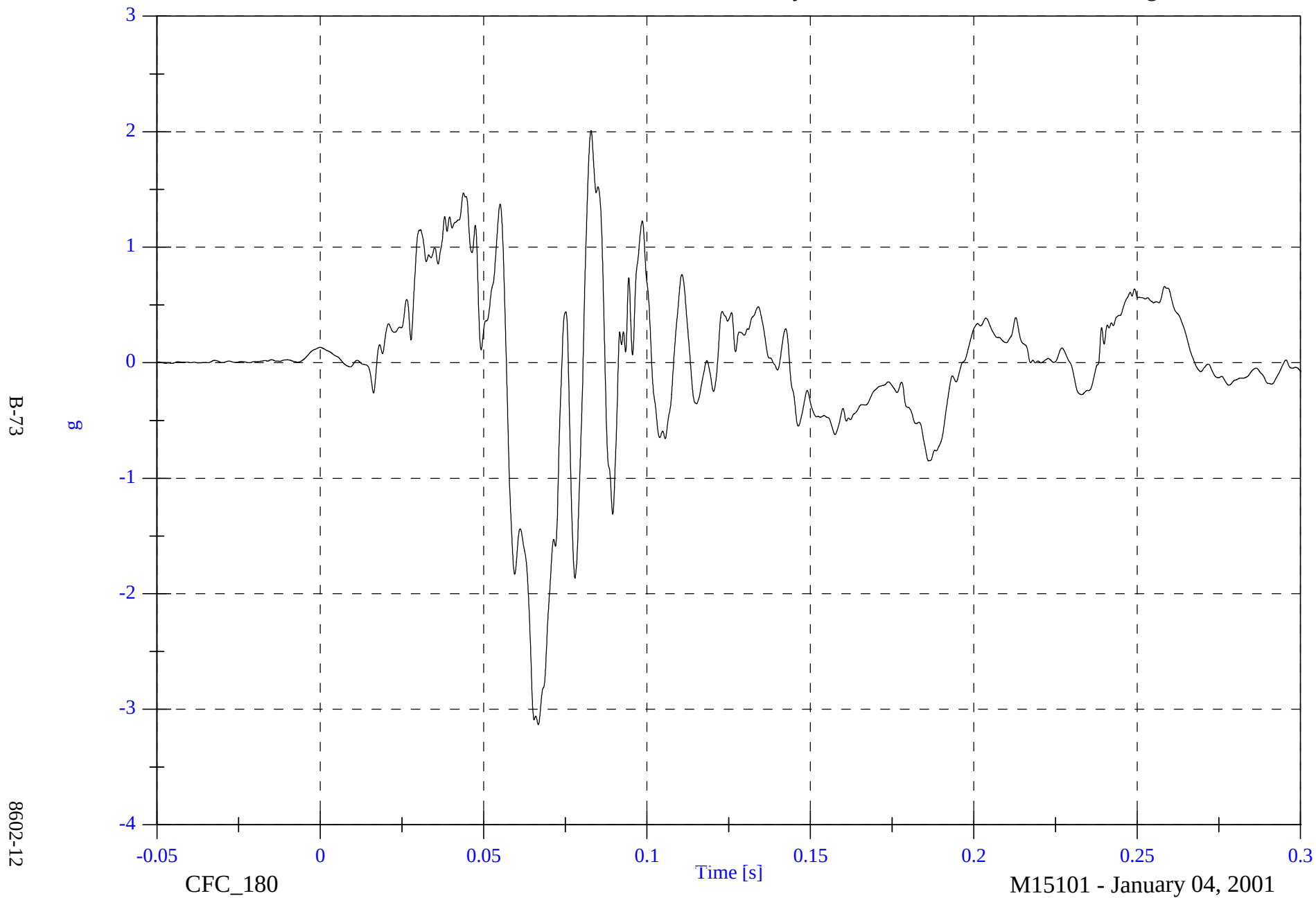


NCAP Test 12 - 2001 Toyota Avalon

P2 Chest Red y

Max: 2.0 [g] at 0.083 [s]

Min: -3.1 [g] at 0.067 [s]



NCAP Test 12 - 2001 Toyota Avalon

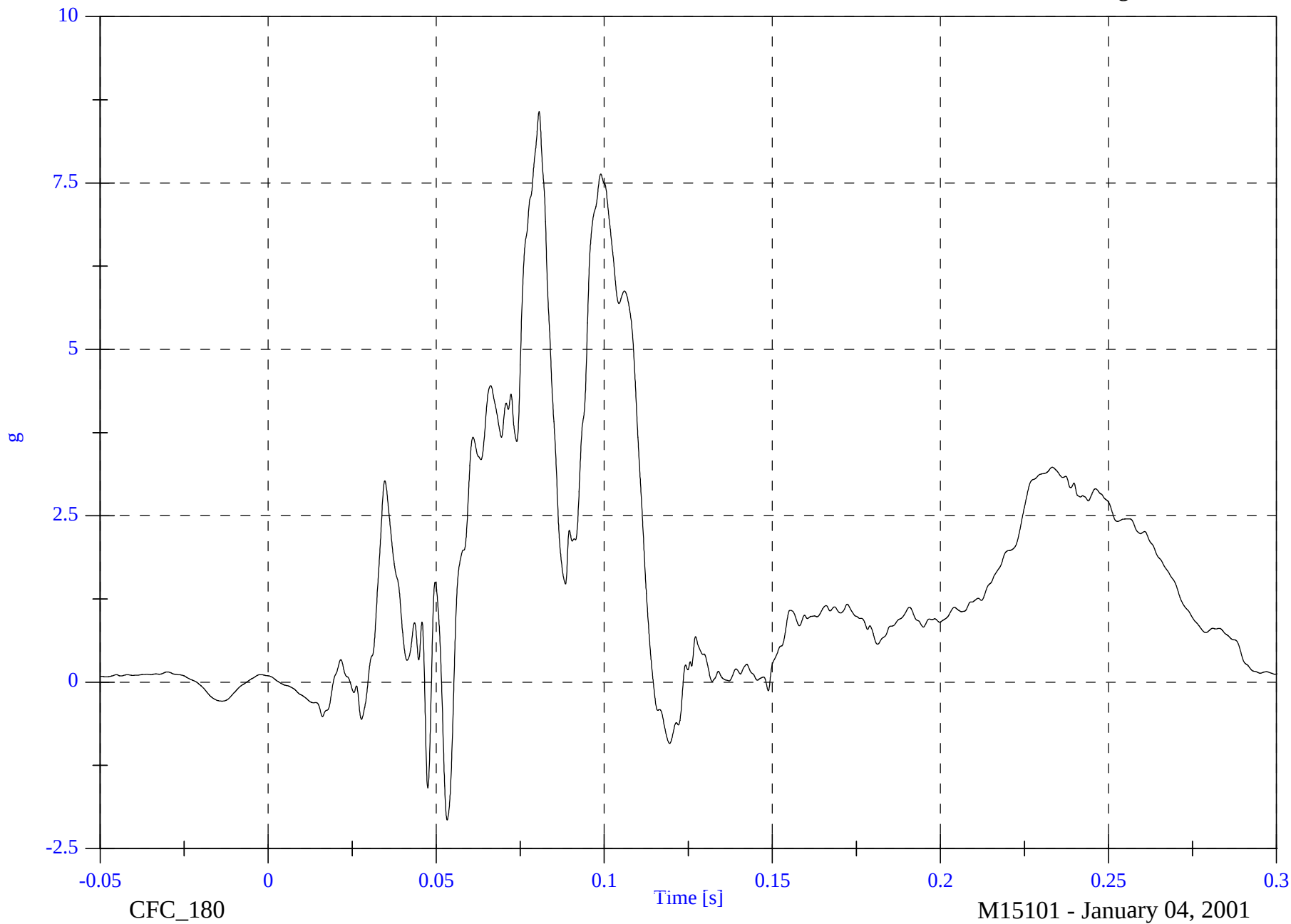
P2 Chest Red z

Max: 8.6 [g] at 0.081 [s]

Min: -2.1 [g] at 0.053 [s]

B-74

8602-12

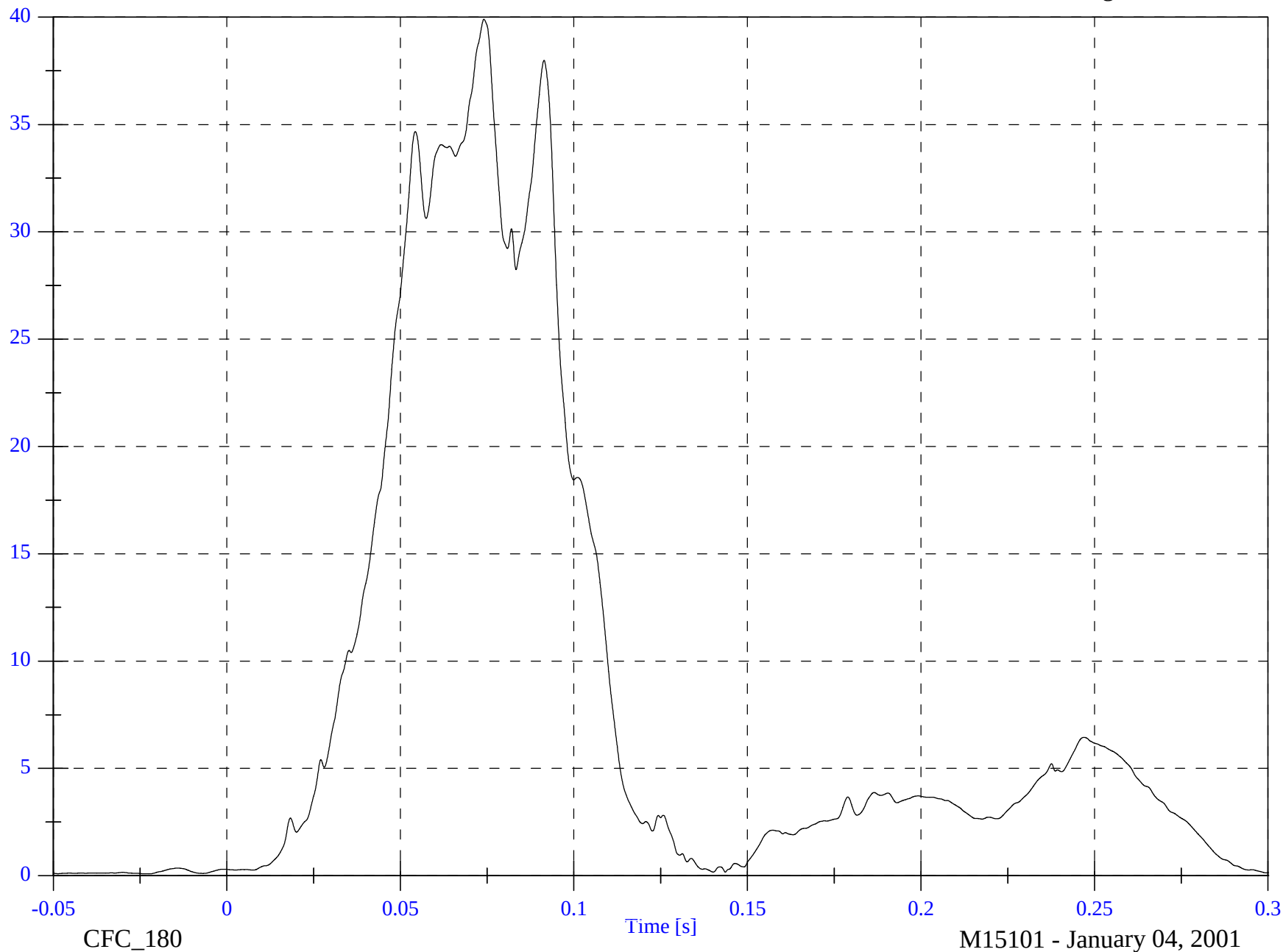


NCAP Test 12 - 2001 Toyota Avalon

P2 Chest Red Resultant

Max: 39.9 [g] at 0.074 [s]

Min: 0.1 [g] at -0.023 [s]



B-75

8602-12

NCAP Test 12 - 2001 Toyota Avalon

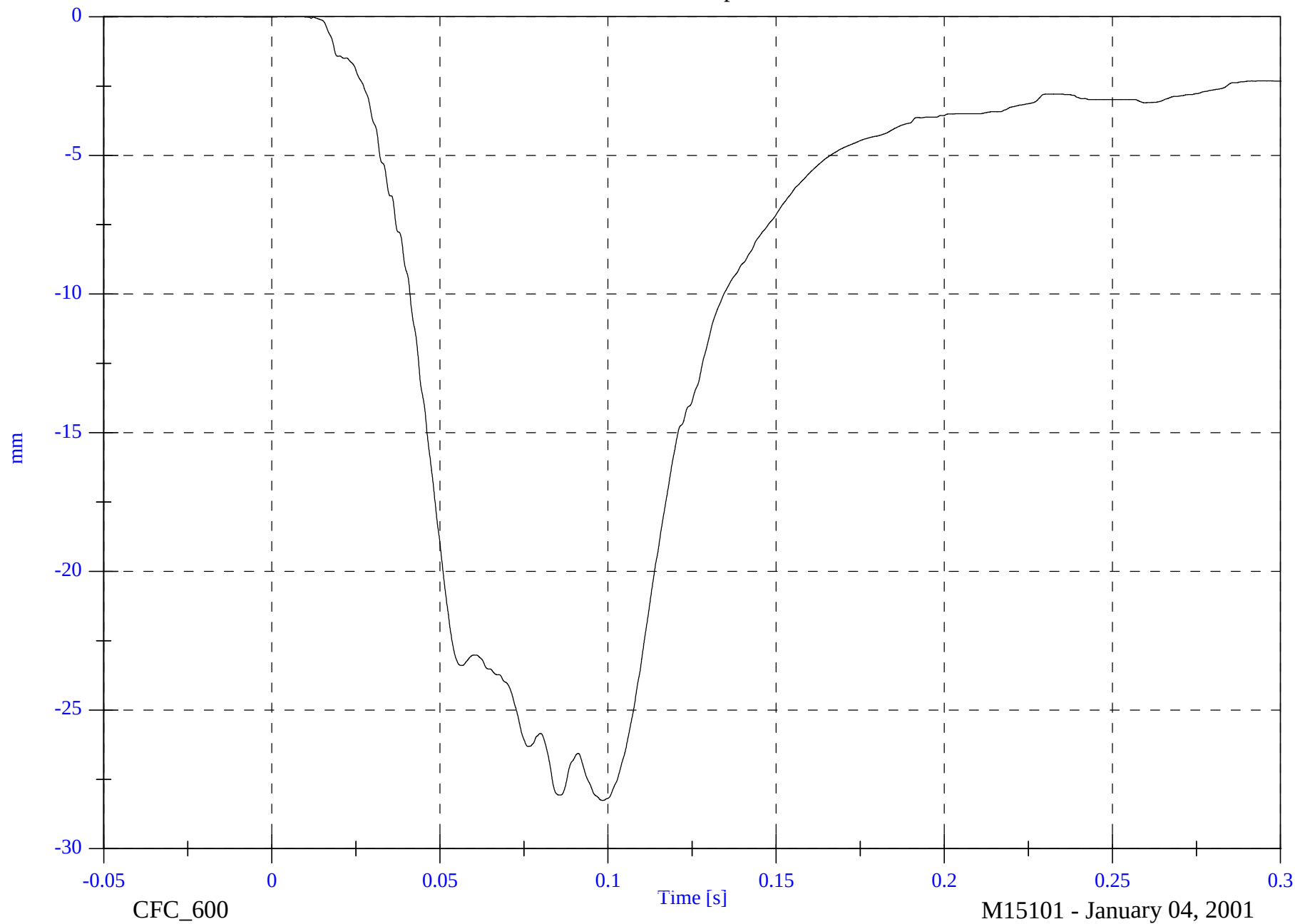
P2 Chest Compression

Max: 0.0 [mm] at -0.036 [s]

Min: -28.3 [mm] at 0.098 [s]

B-76

8602-12

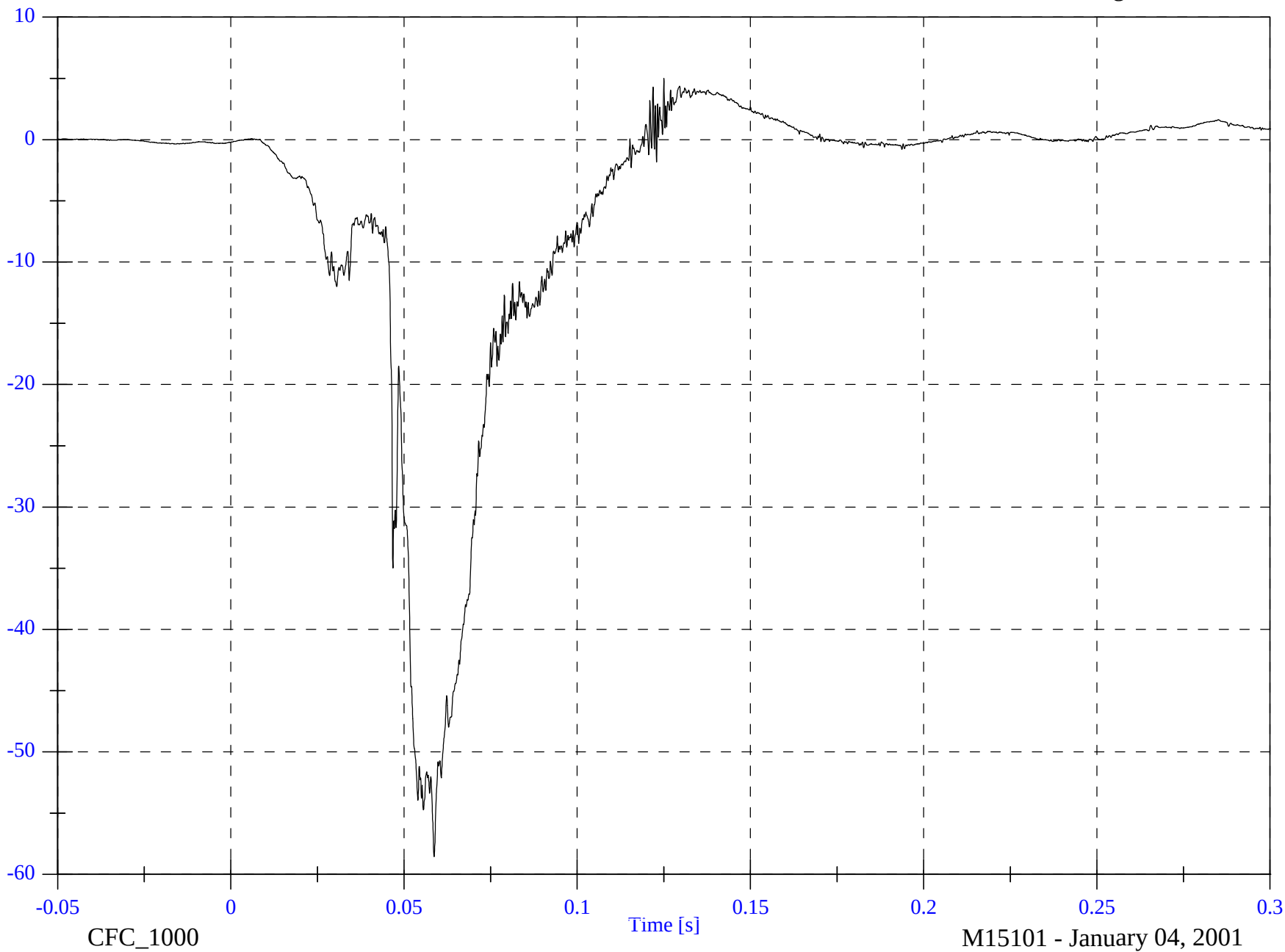


NCAP Test 12 - 2001 Toyota Avalon

P2 Pelvic x

Max: 5.0 [g] at 0.125 [s]

Min: -58.6 [g] at 0.059 [s]



B-77

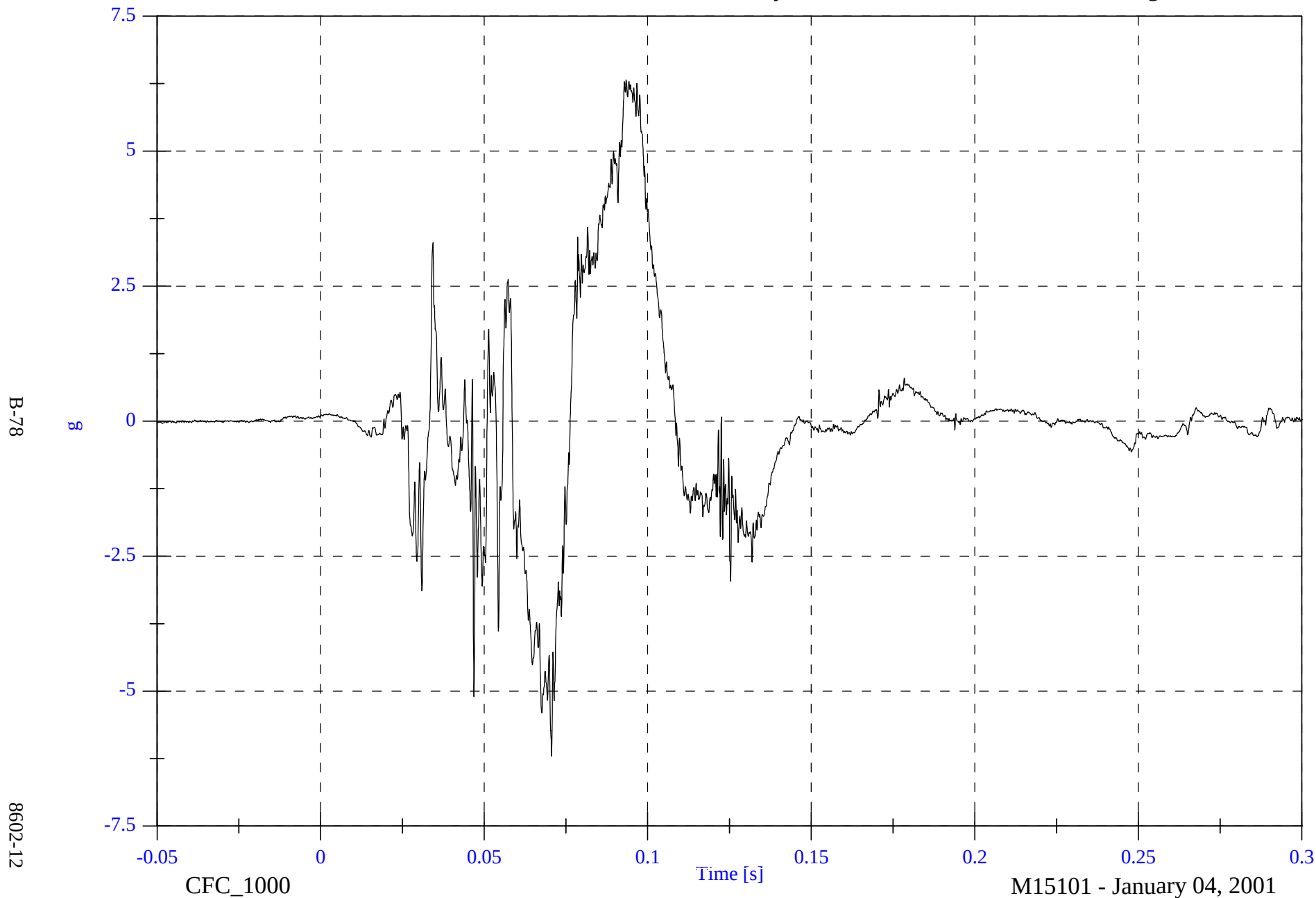
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P2 Pelvic y

Max: 6.3 [g] at 0.093 [s]

Min: -6.2 [g] at 0.071 [s]

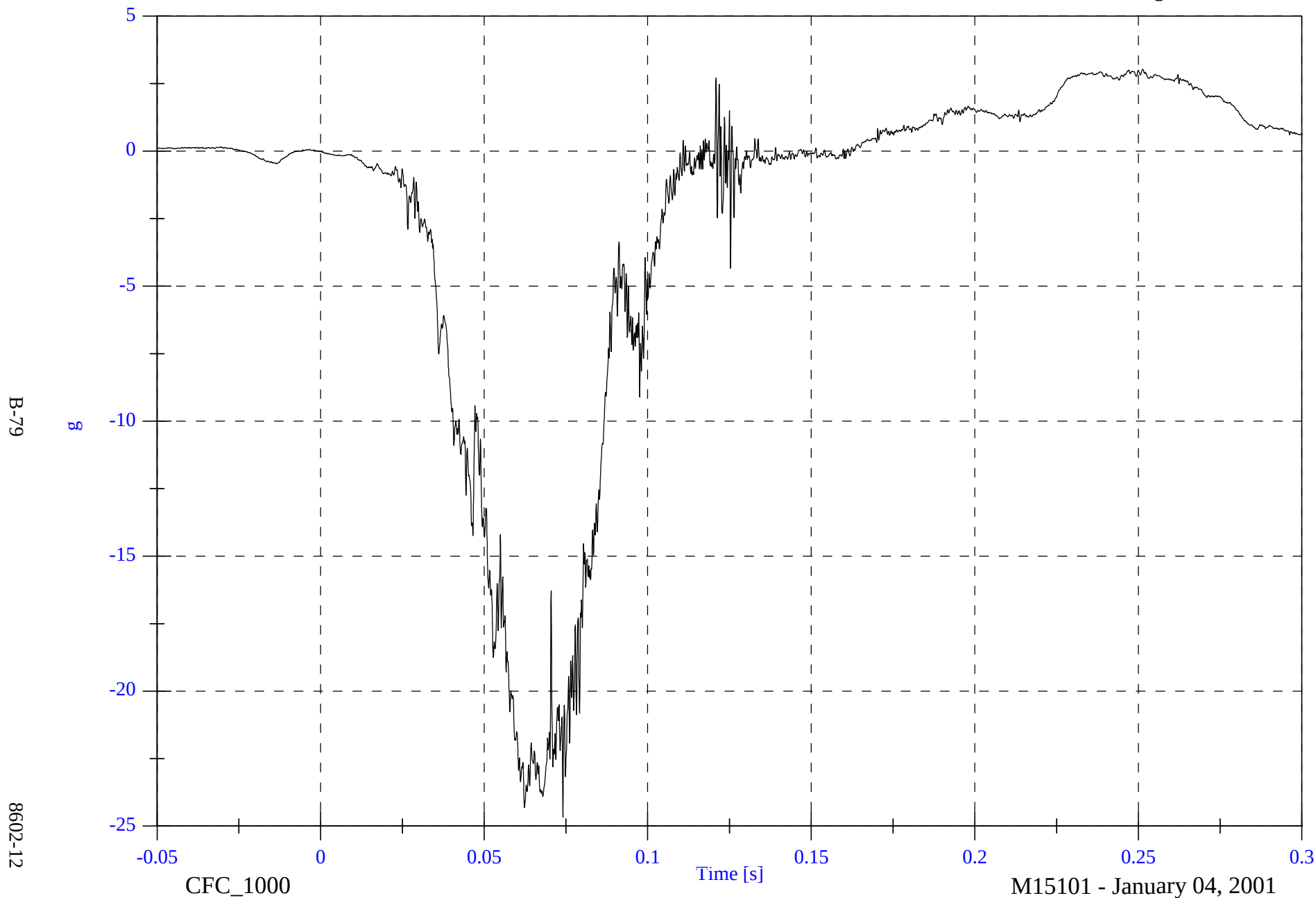


NCAP Test 12 - 2001 Toyota Avalon

Max: 3.0 [g] at 0.251 [s]

Min: -24.7 [g] at 0.074 [s]

P2 Pelvic z



NCAP Test 12 - 2001 Toyota Avalon

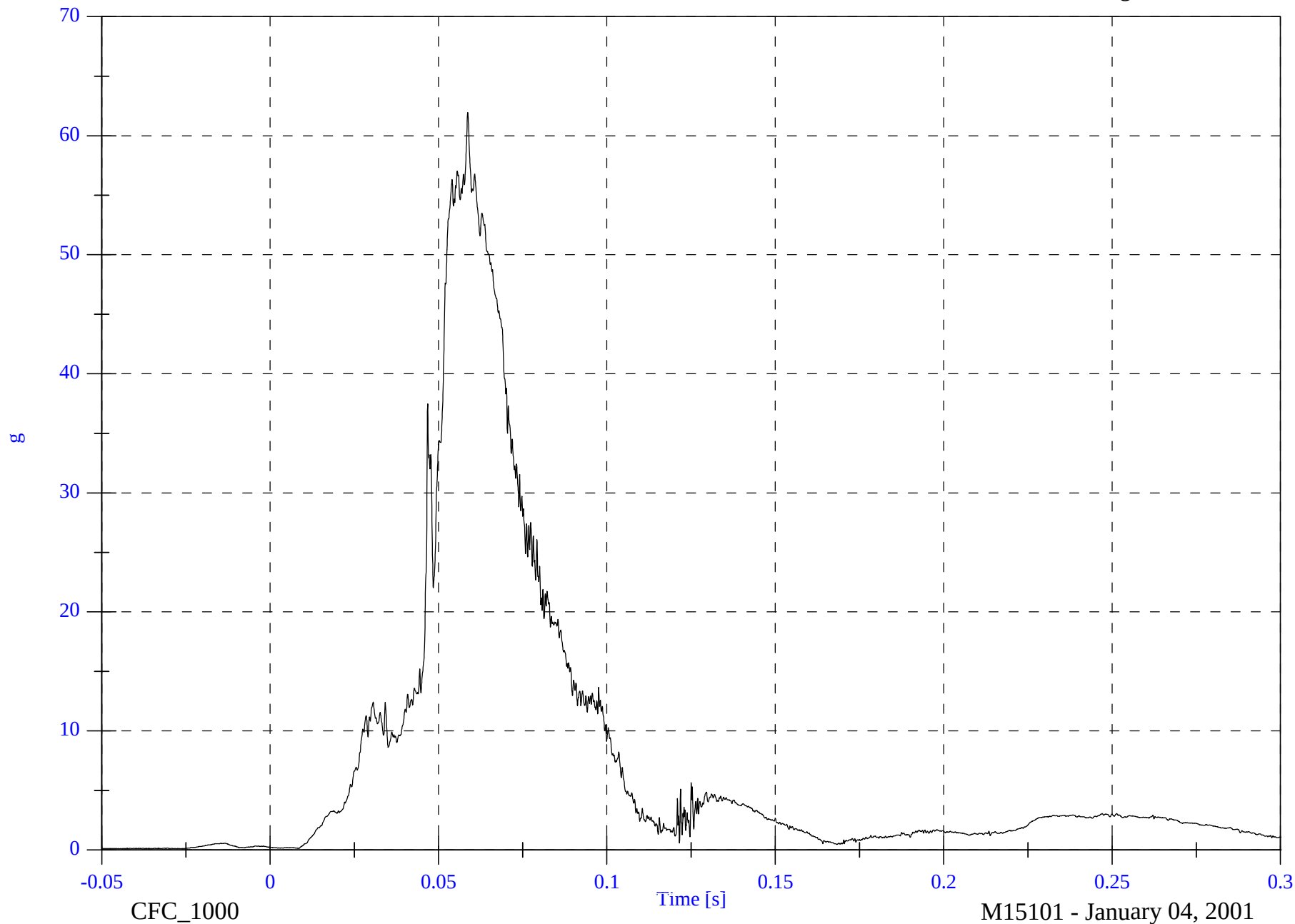
P2 Pelvic Resultant

Max: 62.0 [g] at 0.059 [s]

Min: 0.1 [g] at -0.045 [s]

B-80

8602-12

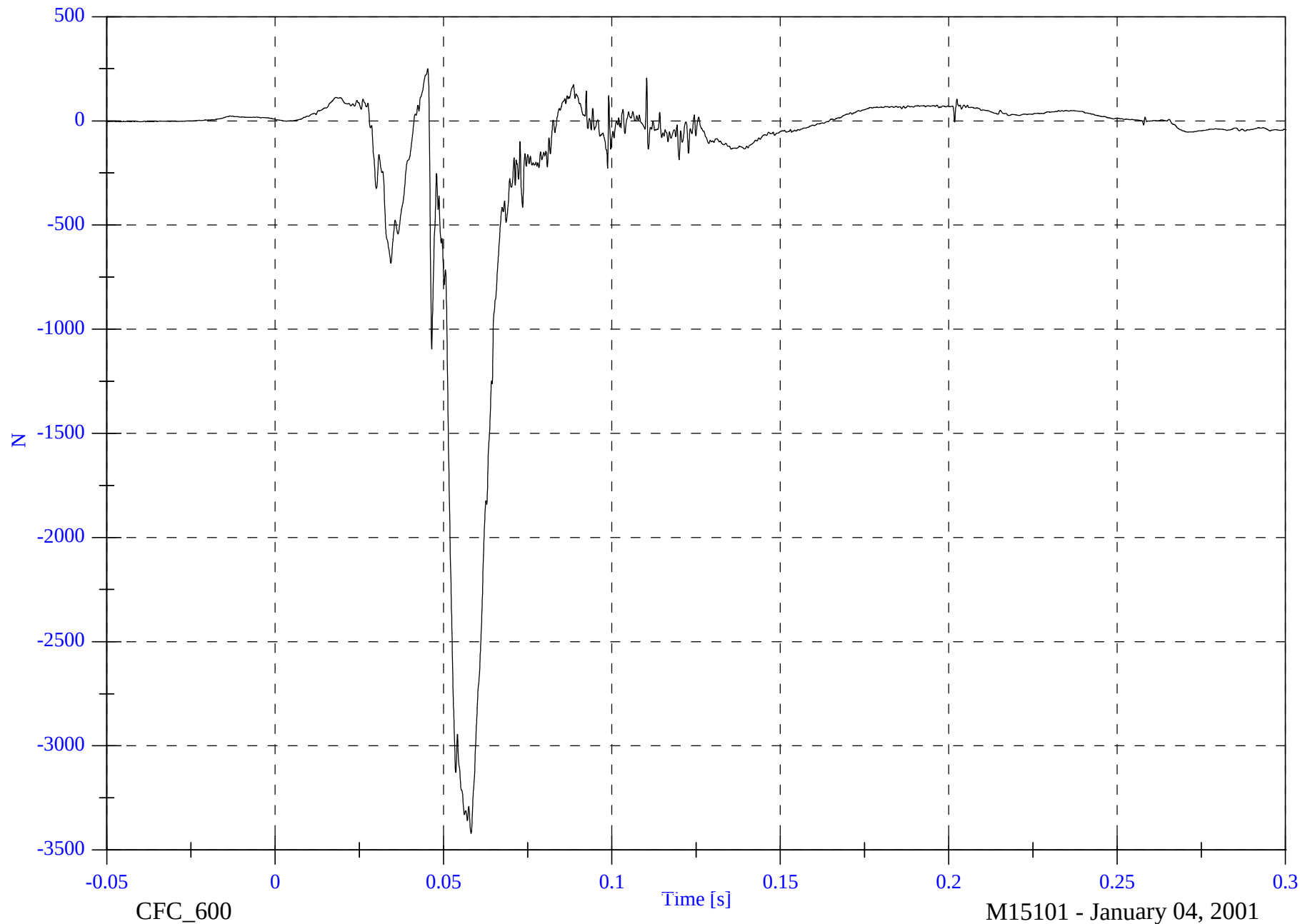


NCAP Test 12 - 2001 Toyota Avalon

P2 Left Femur

Max: 250.3 [N] at 0.045 [s]

Min: -3420.4 [N] at 0.058 [s]



B-81

8602-12

CFC_600

Time [s]

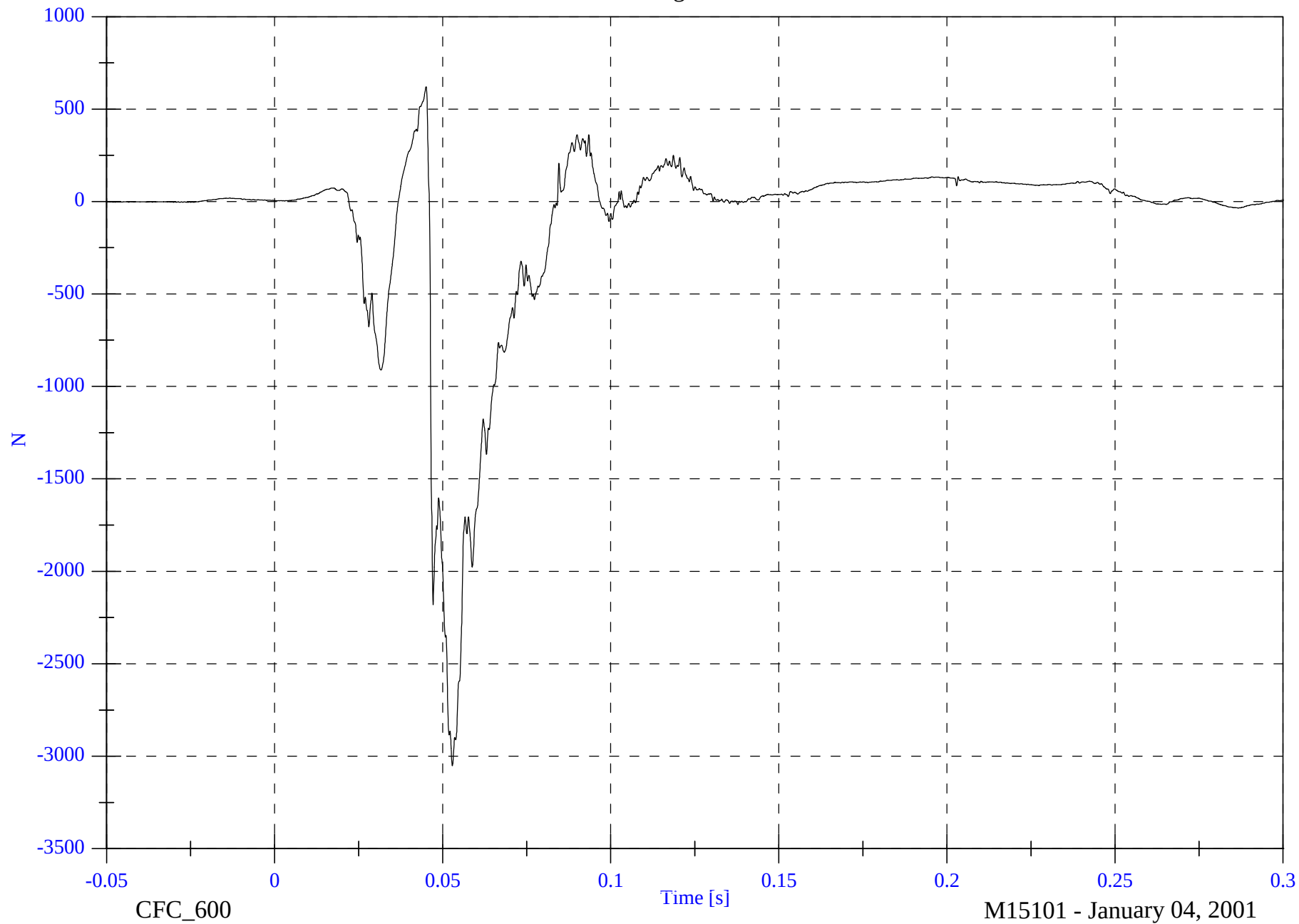
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Right Femur

Max: 620.5 [N] at 0.045 [s]

Min: -3052.2 [N] at 0.053 [s]



B-82

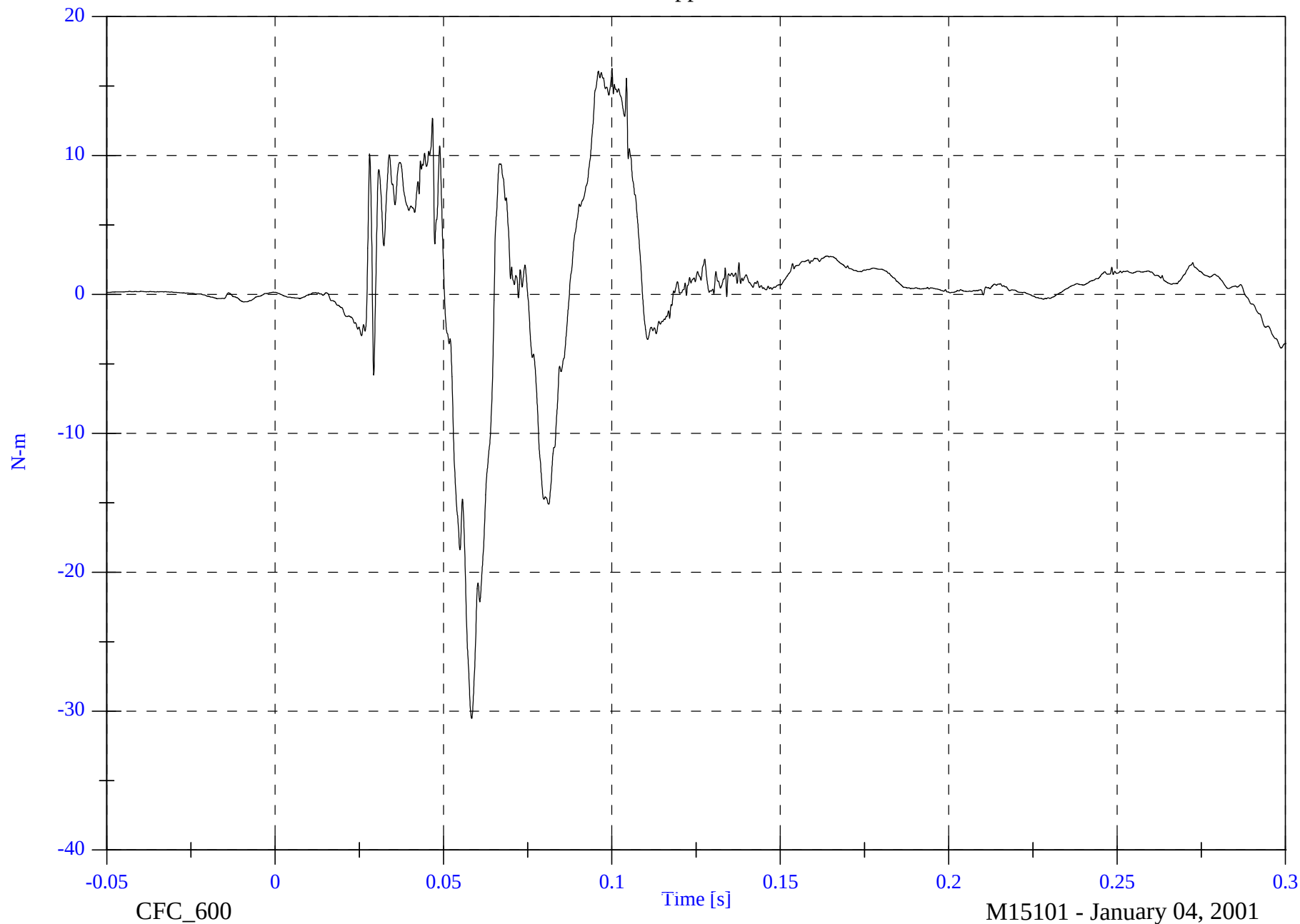
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P2 Left Upper Tibia Mx

Max: 16.3 [N-m] at 0.100 [s]

Min: -30.5 [N-m] at 0.058 [s]



B-83

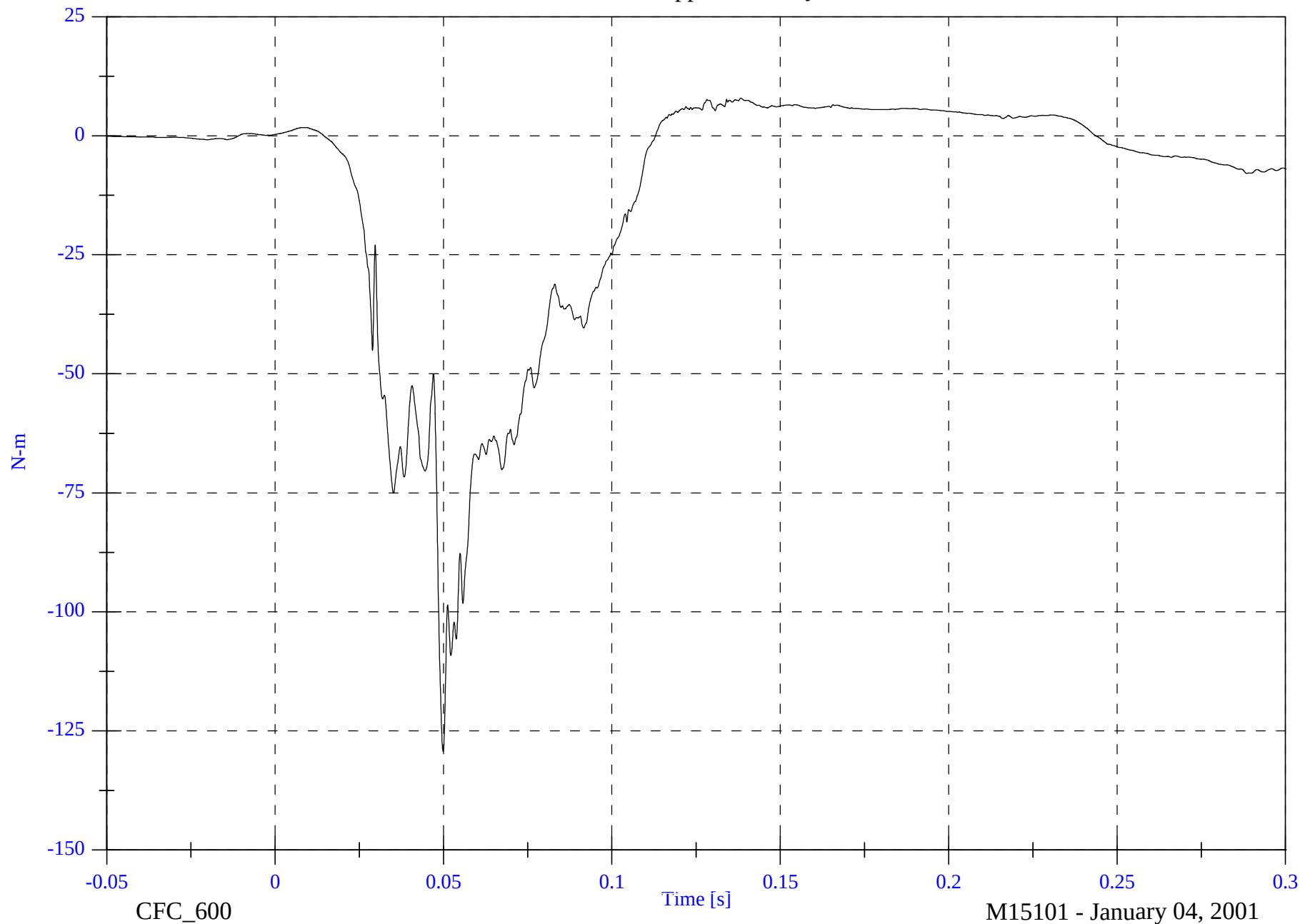
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P2 Left Upper Tibia My

Max: 7.9 [N-m] at 0.138 [s]

Min: -129.3 [N-m] at 0.050 [s]



B-84

8602-12

CFC_600

Time [s]

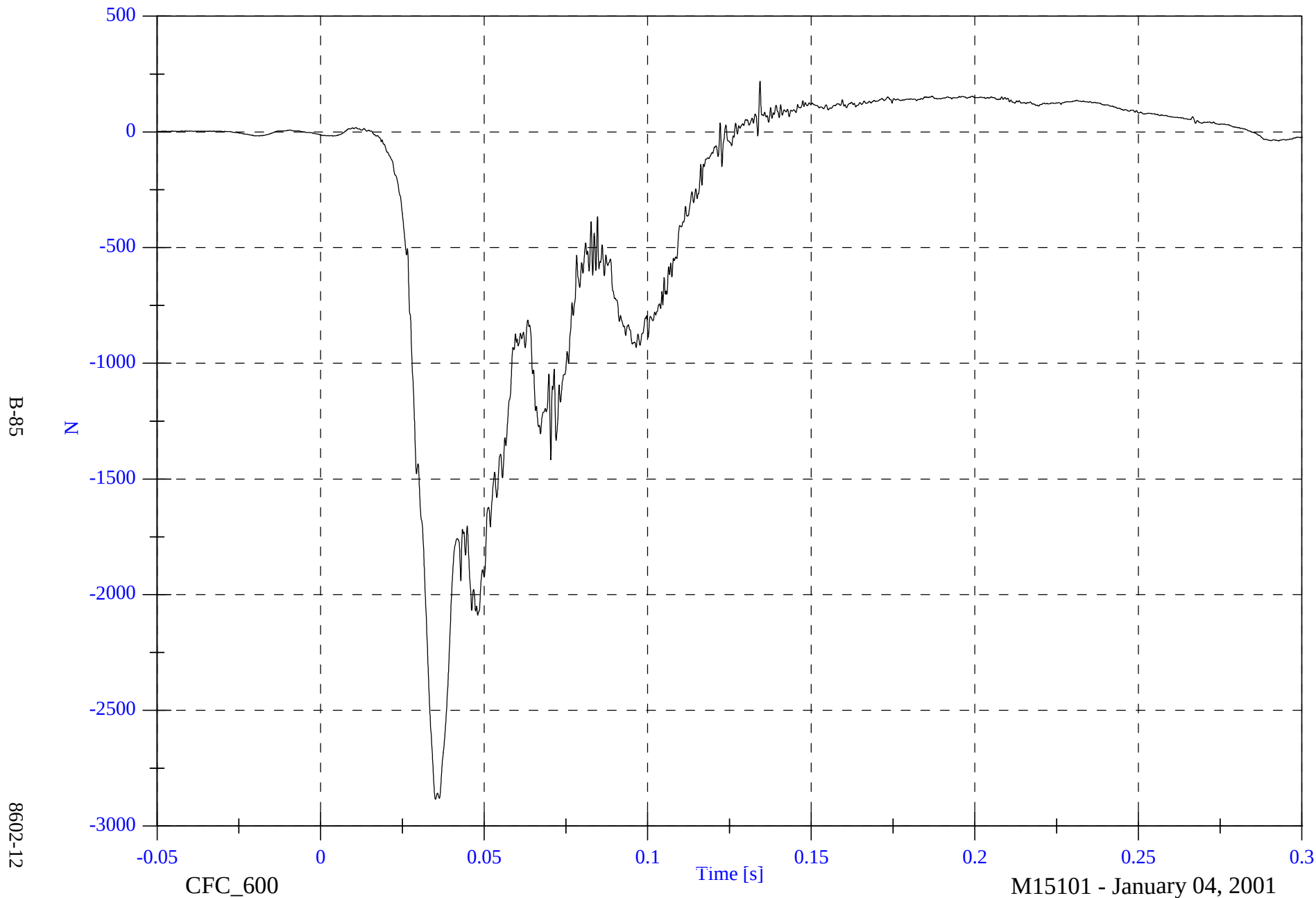
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Left Lower Tibia Fz

Max: 219.2 [N] at 0.134 [s]

Min: -2884.3 [N] at 0.035 [s]

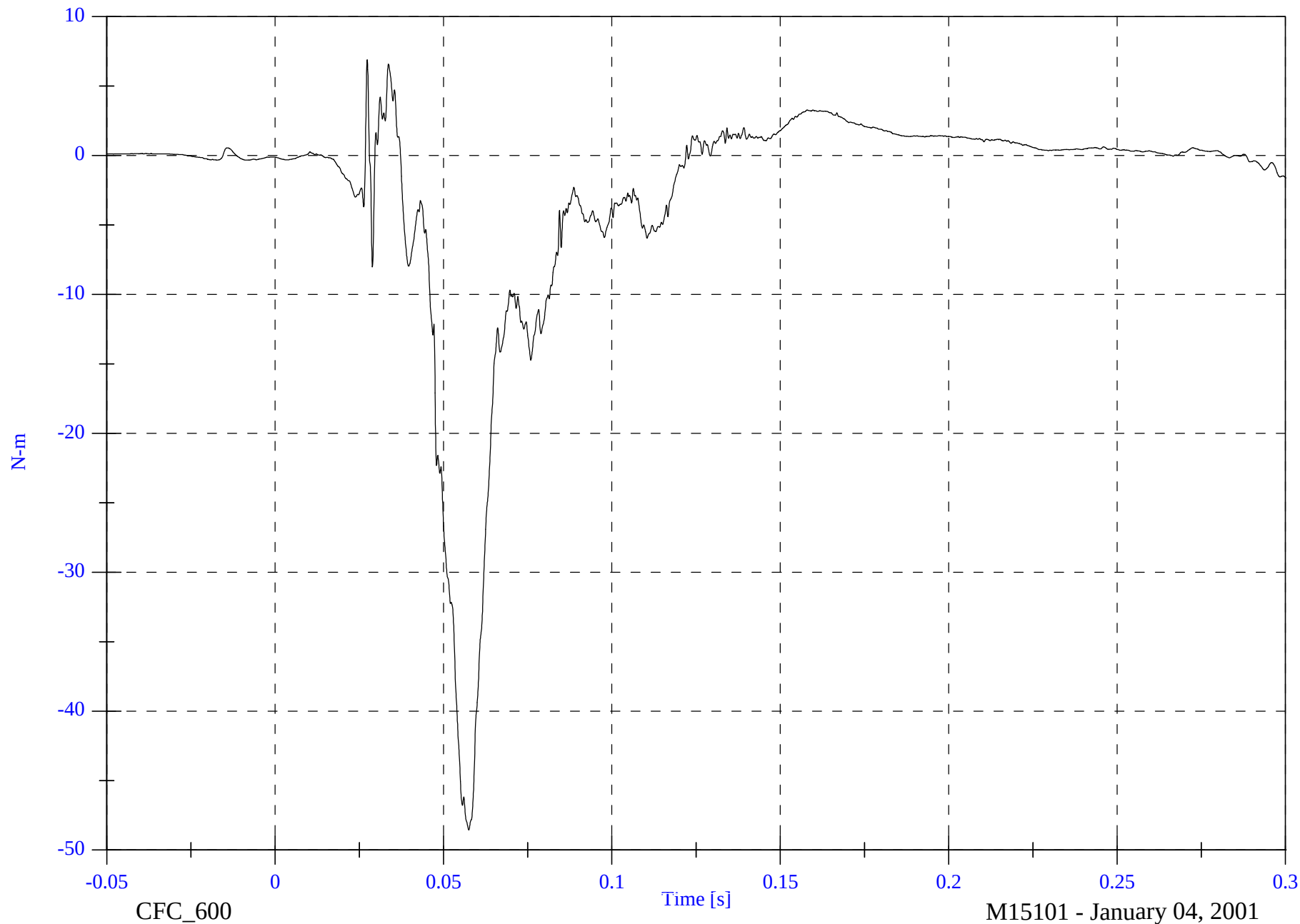


NCAP Test 12 - 2001 Toyota Avalon

P2 Left Lower Tibia Mx

Max: 6.9 [N-m] at 0.027 [s]

Min: -48.6 [N-m] at 0.058 [s]



B-86

8602-12

CFC_600

Time [s]

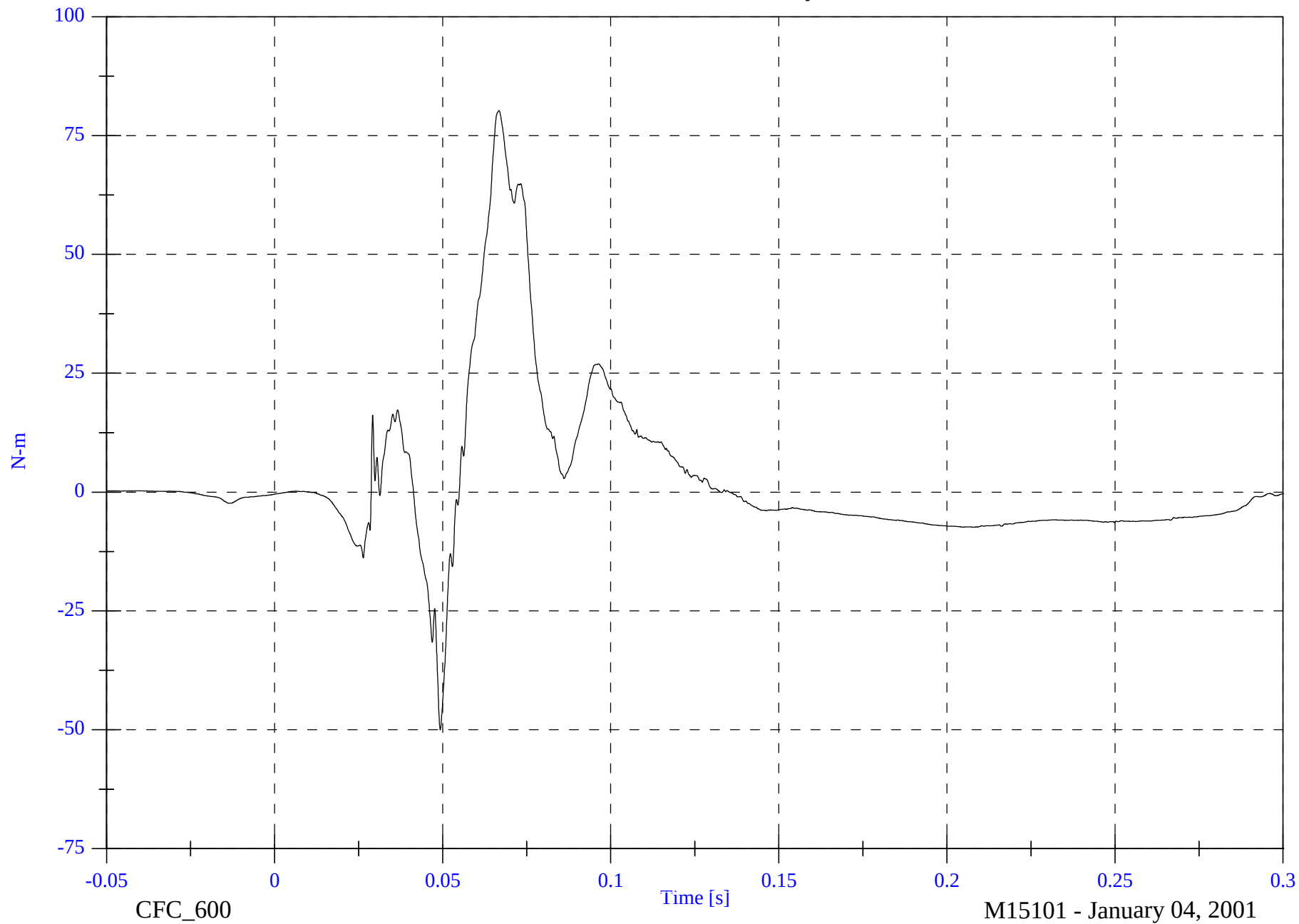
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Left Lower Tibia My

Max: 80.3 [N-m] at 0.067 [s]

Min: -50.0 [N-m] at 0.049 [s]



B-87

8602-12

CFC_600

Time [s]

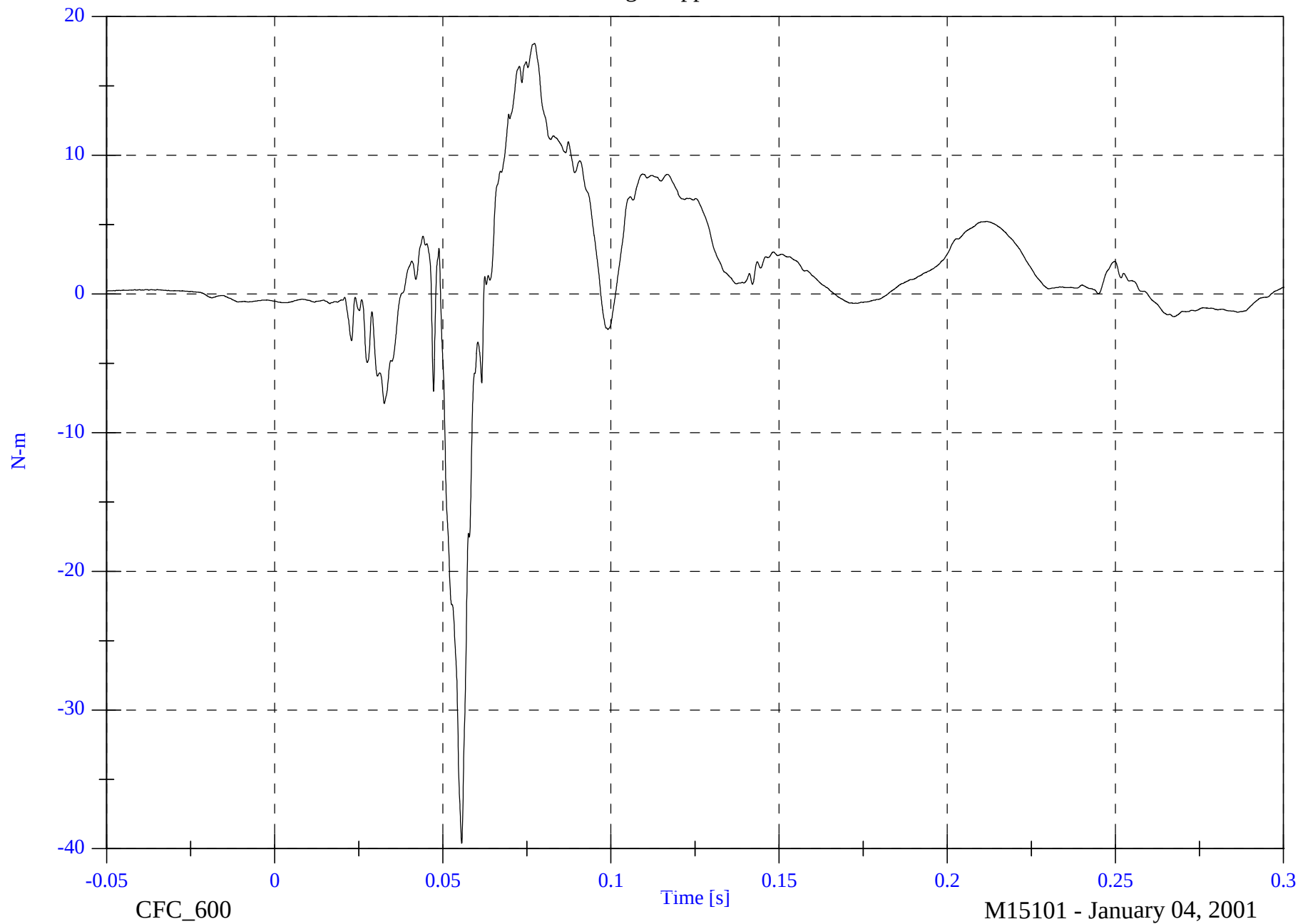
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Right Upper Tibia Mx

Max: 18.1 [N-m] at 0.077 [s]

Min: -39.6 [N-m] at 0.056 [s]



B-88

8602-12

CFC_600

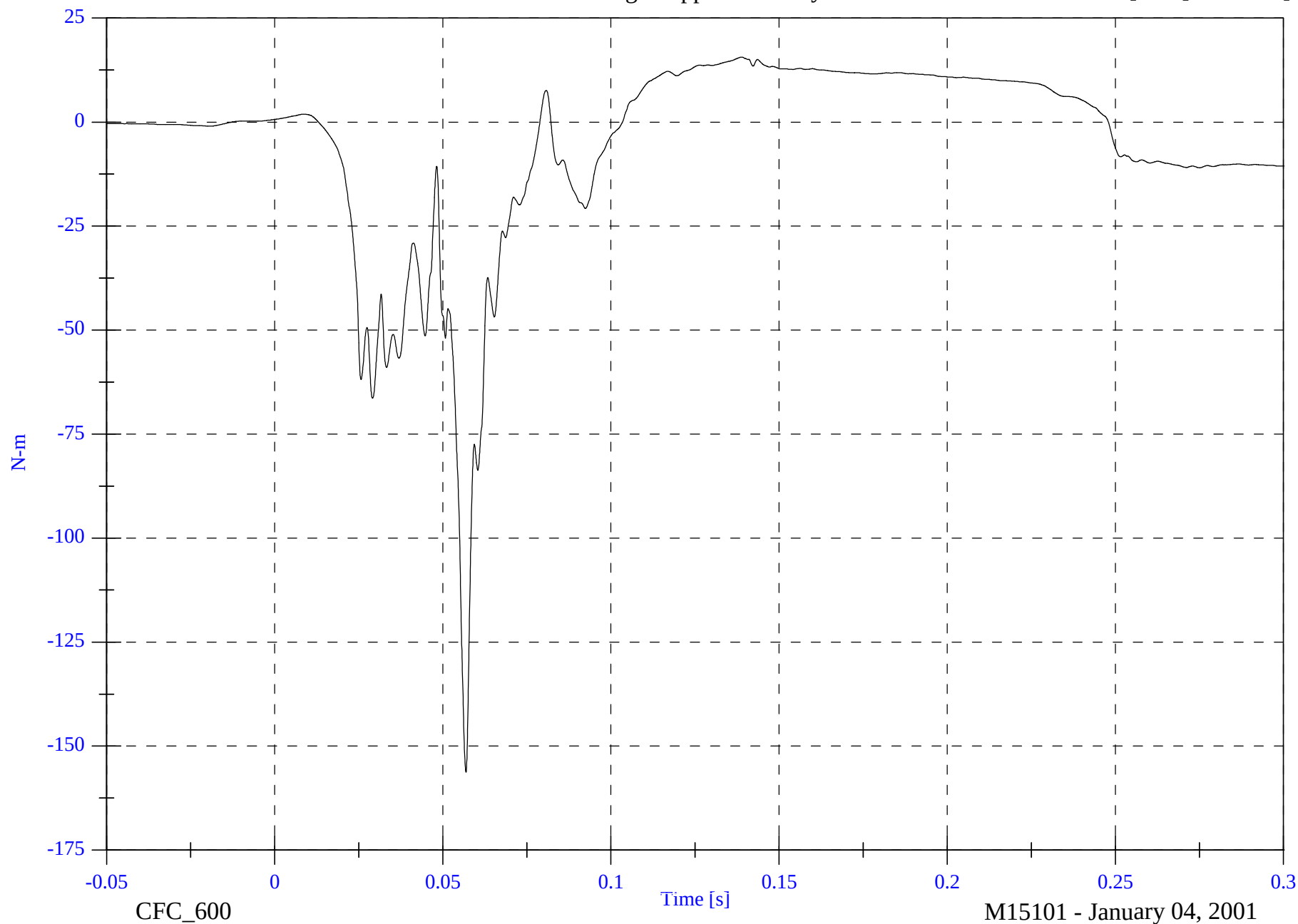
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Right Upper Tibia My

Max: 15.6 [N-m] at 0.139 [s]

Min: -156.3 [N-m] at 0.057 [s]



B-89

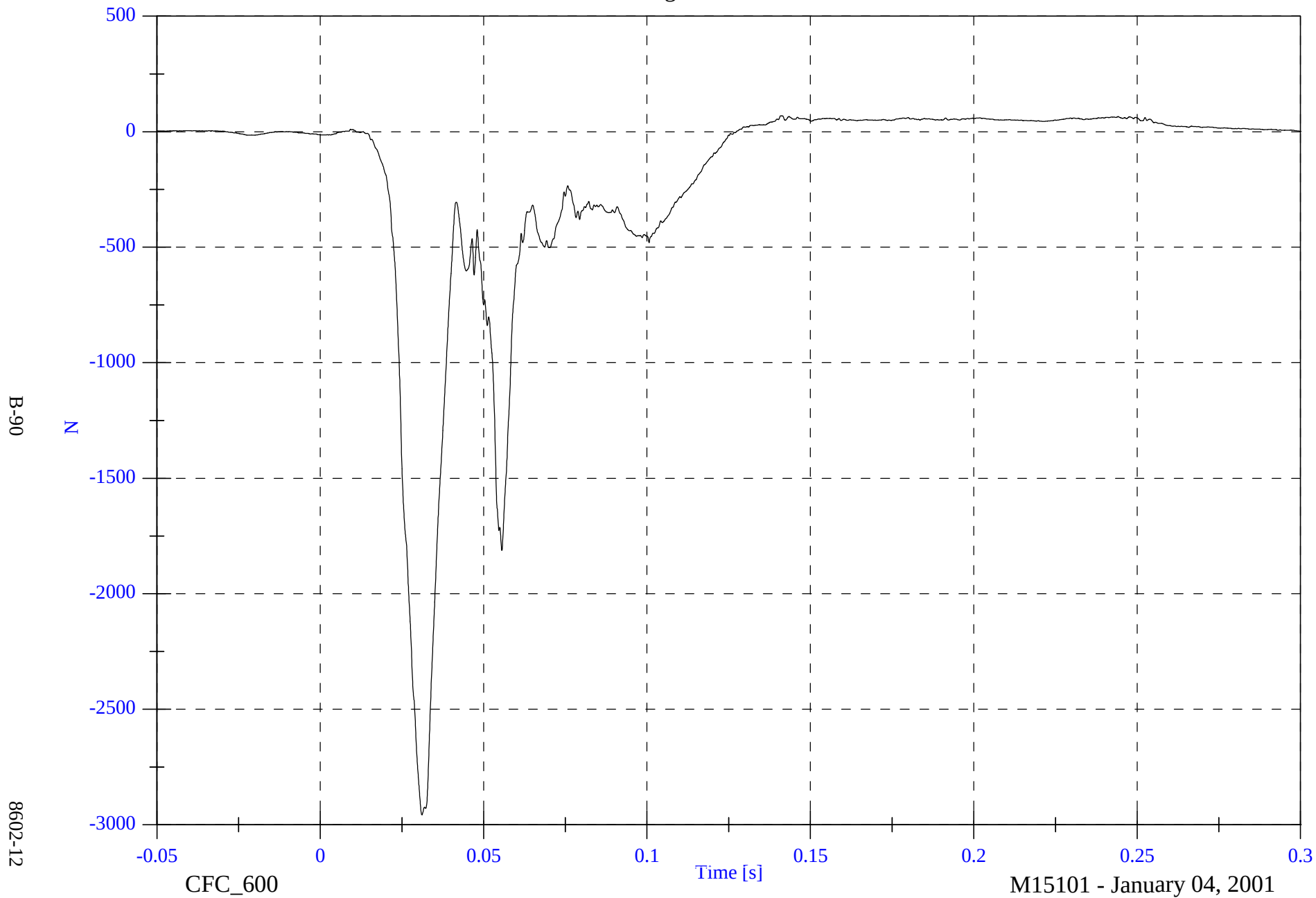
8602-12

NCAP Test 12 - 2001 Toyota Avalon

P2 Right Lower Tibia Fz

Max: 69.2 [N] at 0.141 [s]

Min: -2957.0 [N] at 0.031 [s]



NCAP Test 12 - 2001 Toyota Avalon

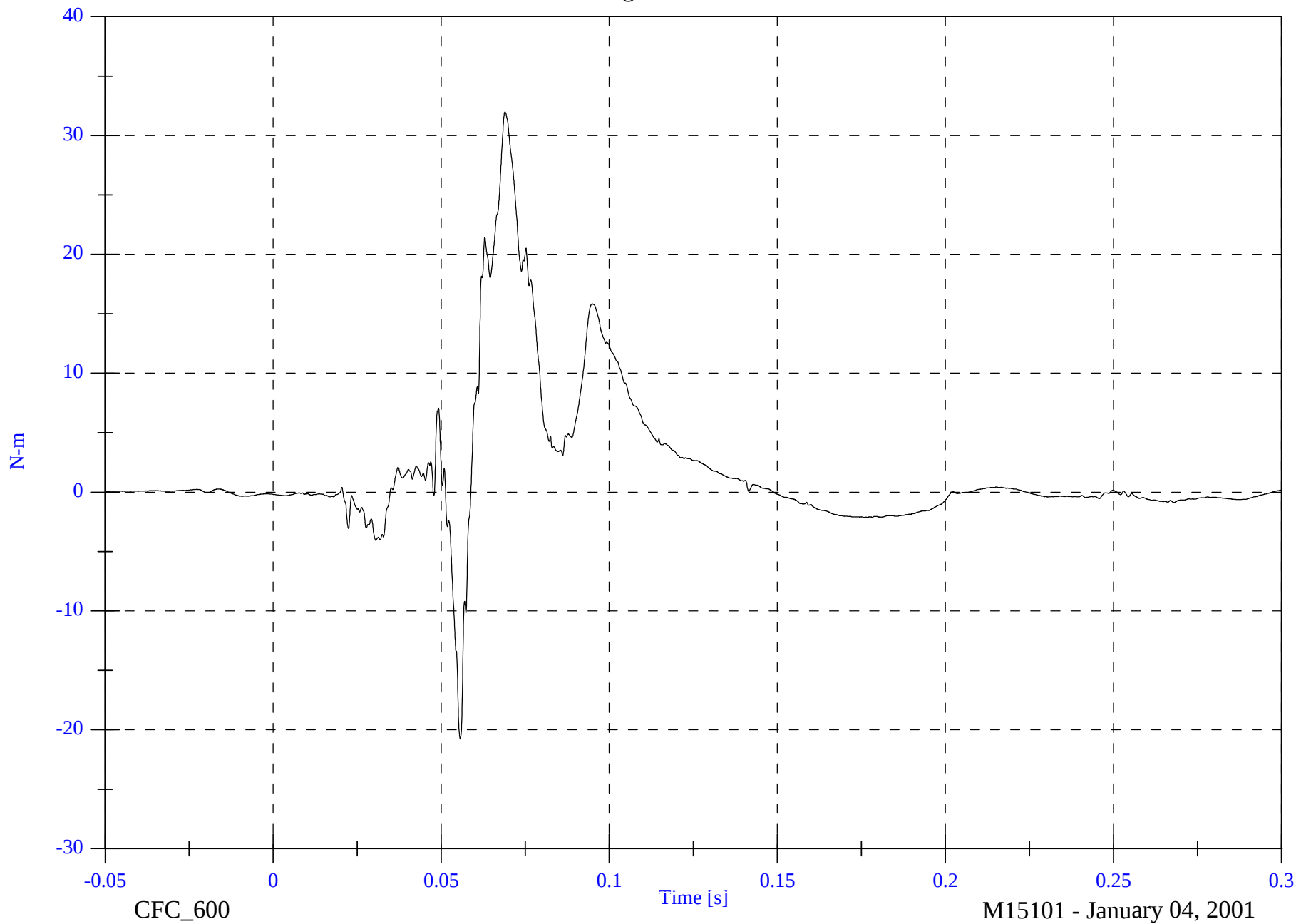
P2 Right Lower Tibia Mx

Max: 32.0 [N-m] at 0.069 [s]

Min: -20.8 [N-m] at 0.056 [s]

B-91

8602-12

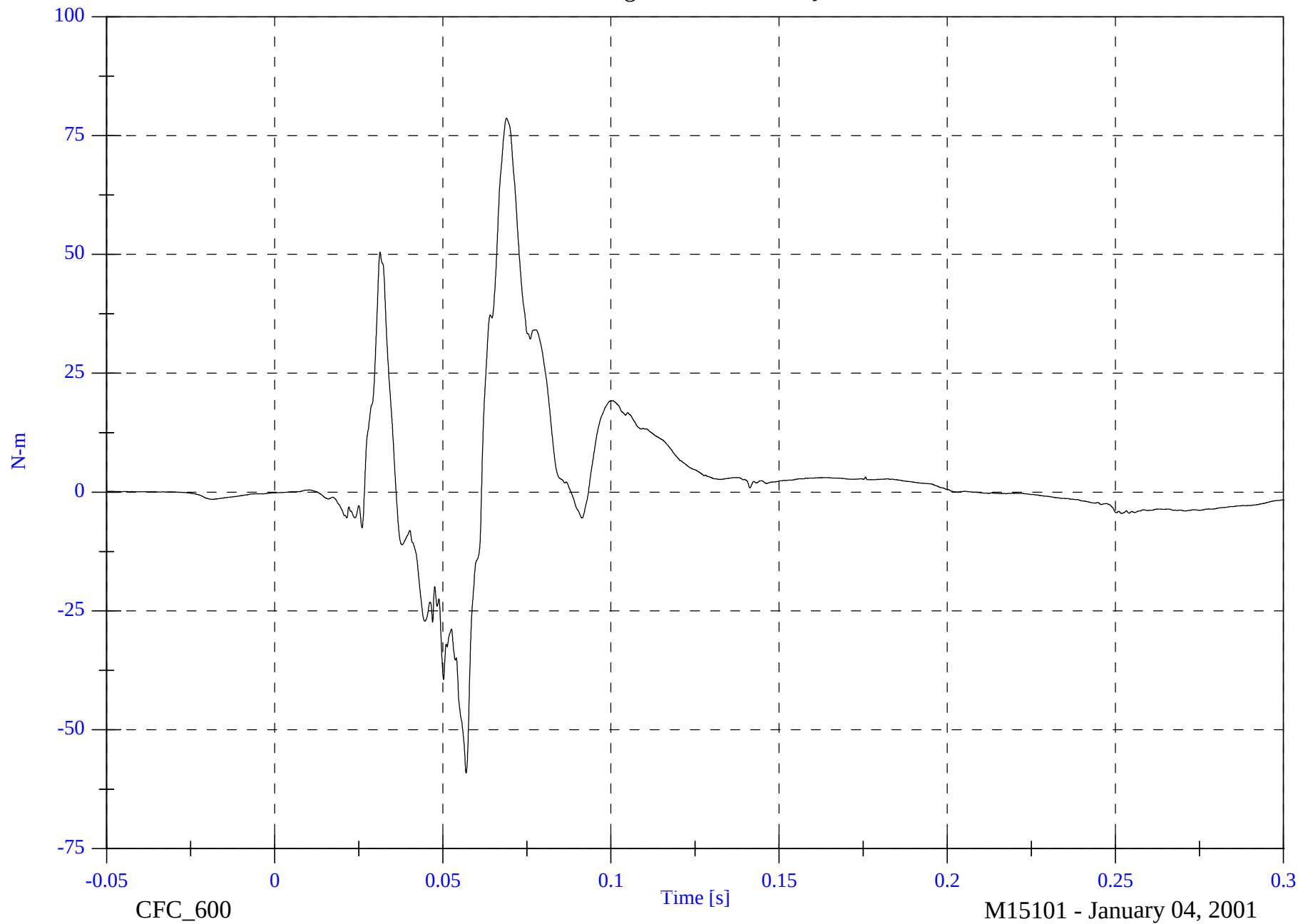


NCAP Test 12 - 2001 Toyota Avalon

P2 Right Lower Tibia My

Max: 78.6 [N-m] at 0.069 [s]

Min: -59.1 [N-m] at 0.057 [s]



B-92

8602-12

CFC_600

Time [s]

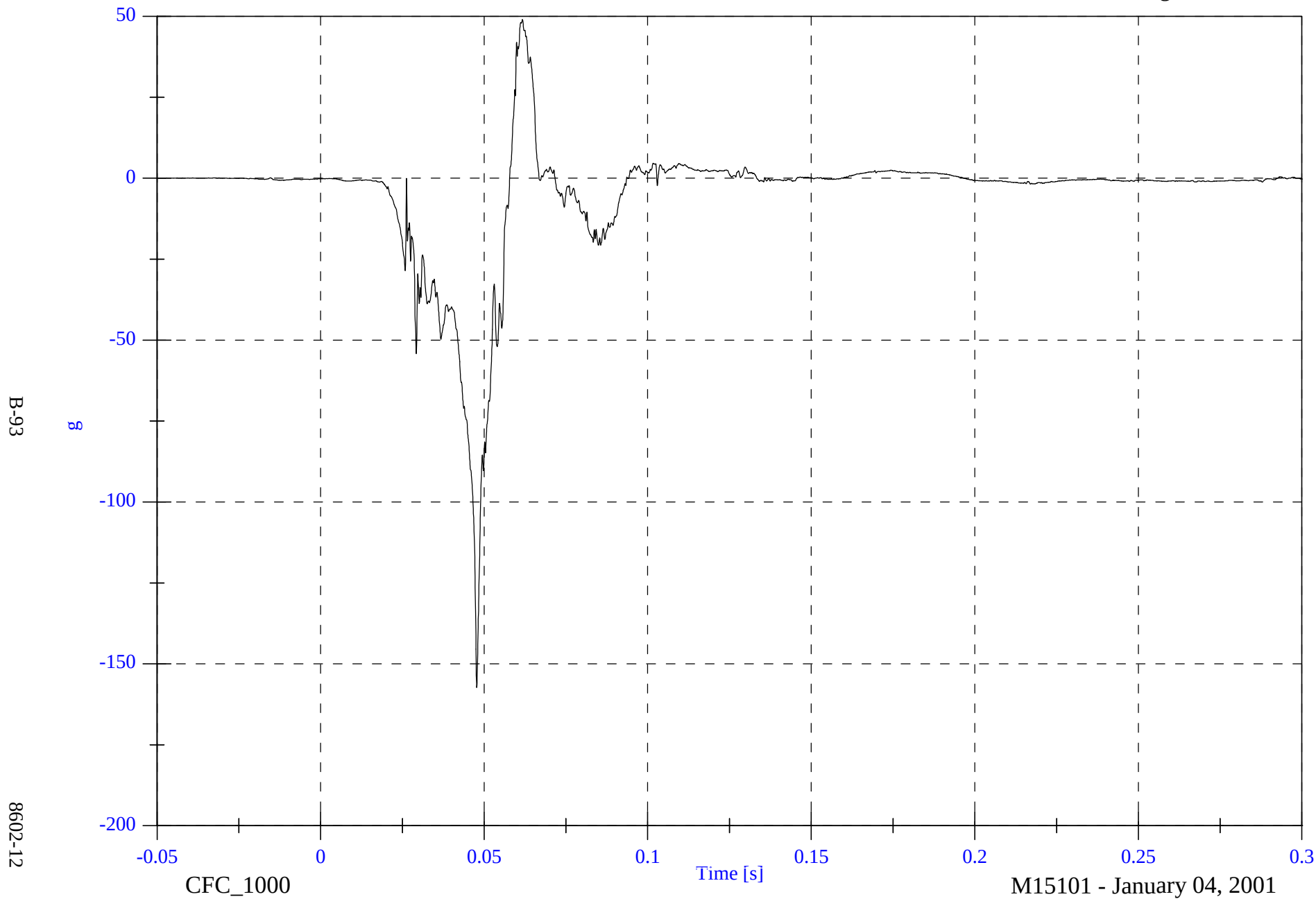
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

P2 Left Foot Aft x

Max: 49.0 [g] at 0.062 [s]

Min: -157.4 [g] at 0.048 [s]



NCAP Test 12 - 2001 Toyota Avalon

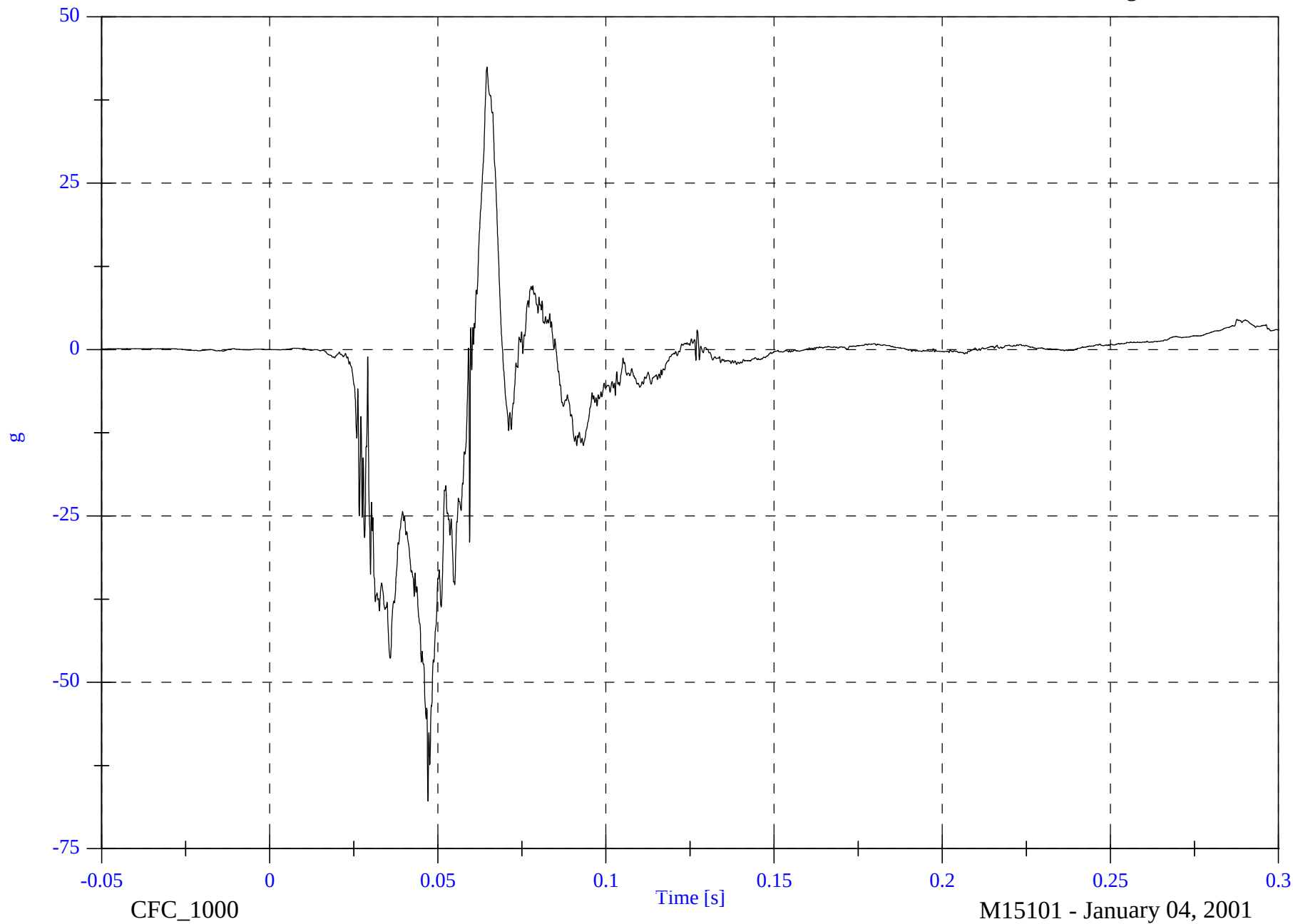
P2 Left Foot Aft z

Max: 42.4 [g] at 0.065 [s]

Min: -67.9 [g] at 0.047 [s]

B-94

8602-12

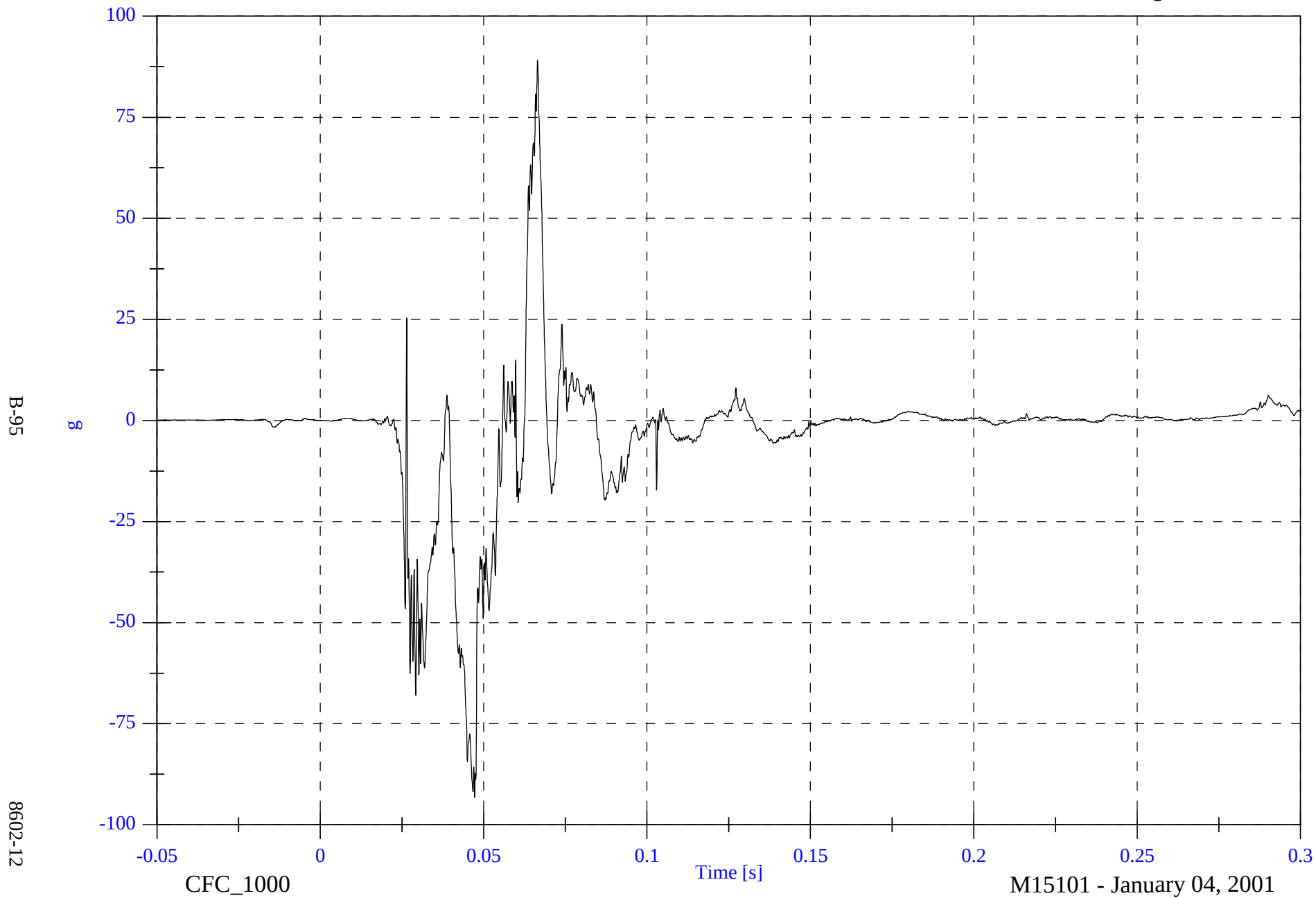


NCAP Test 12 - 2001 Toyota Avalon

P2 Left Foot Fore z

Max: 89.1 [g] at 0.067 [s]

Min: -93.2 [g] at 0.047 [s]

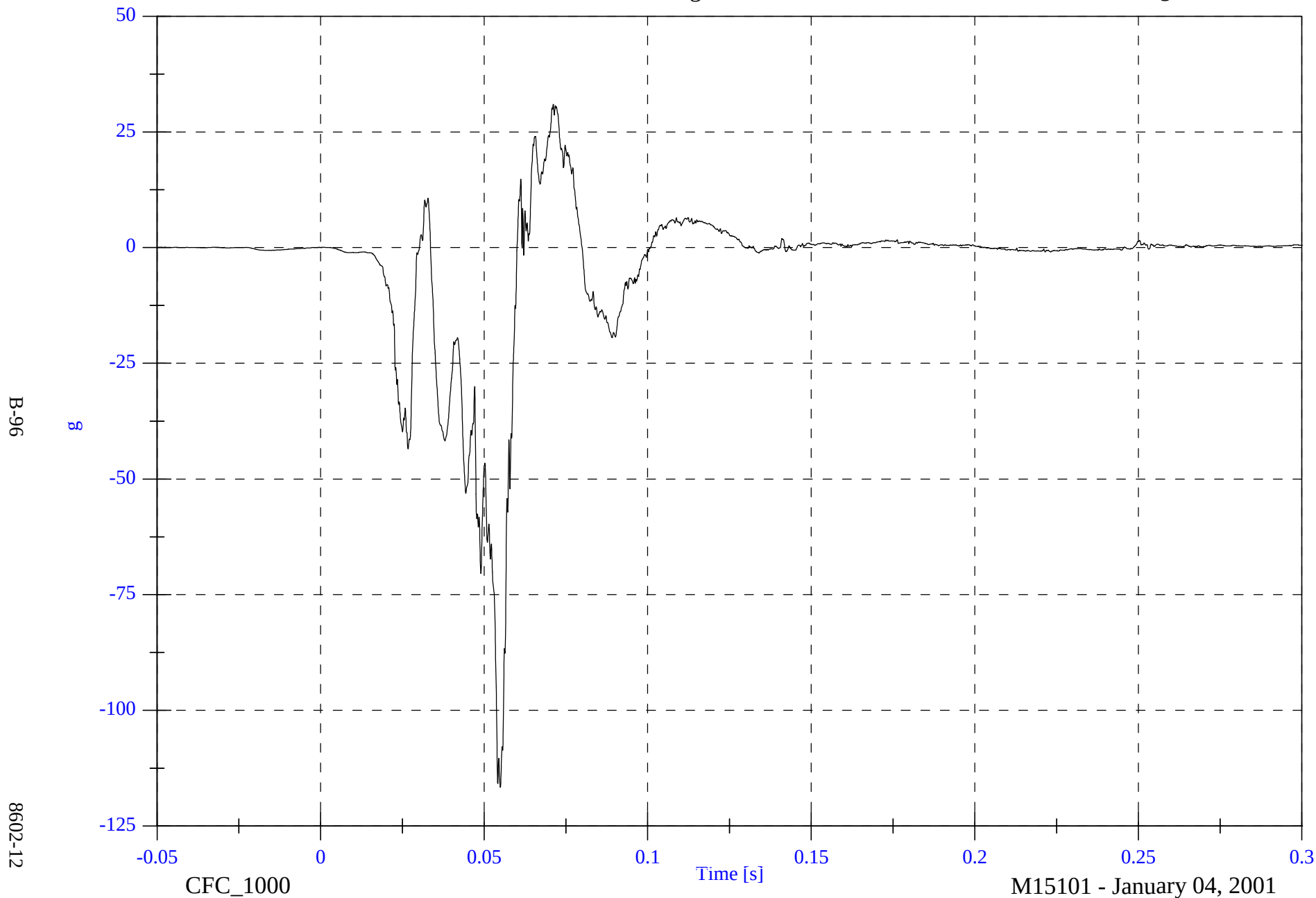


NCAP Test 12 - 2001 Toyota Avalon

P2 Right Foot Aft x

Max: 31.0 [g] at 0.071 [s]

Min: -116.6 [g] at 0.055 [s]

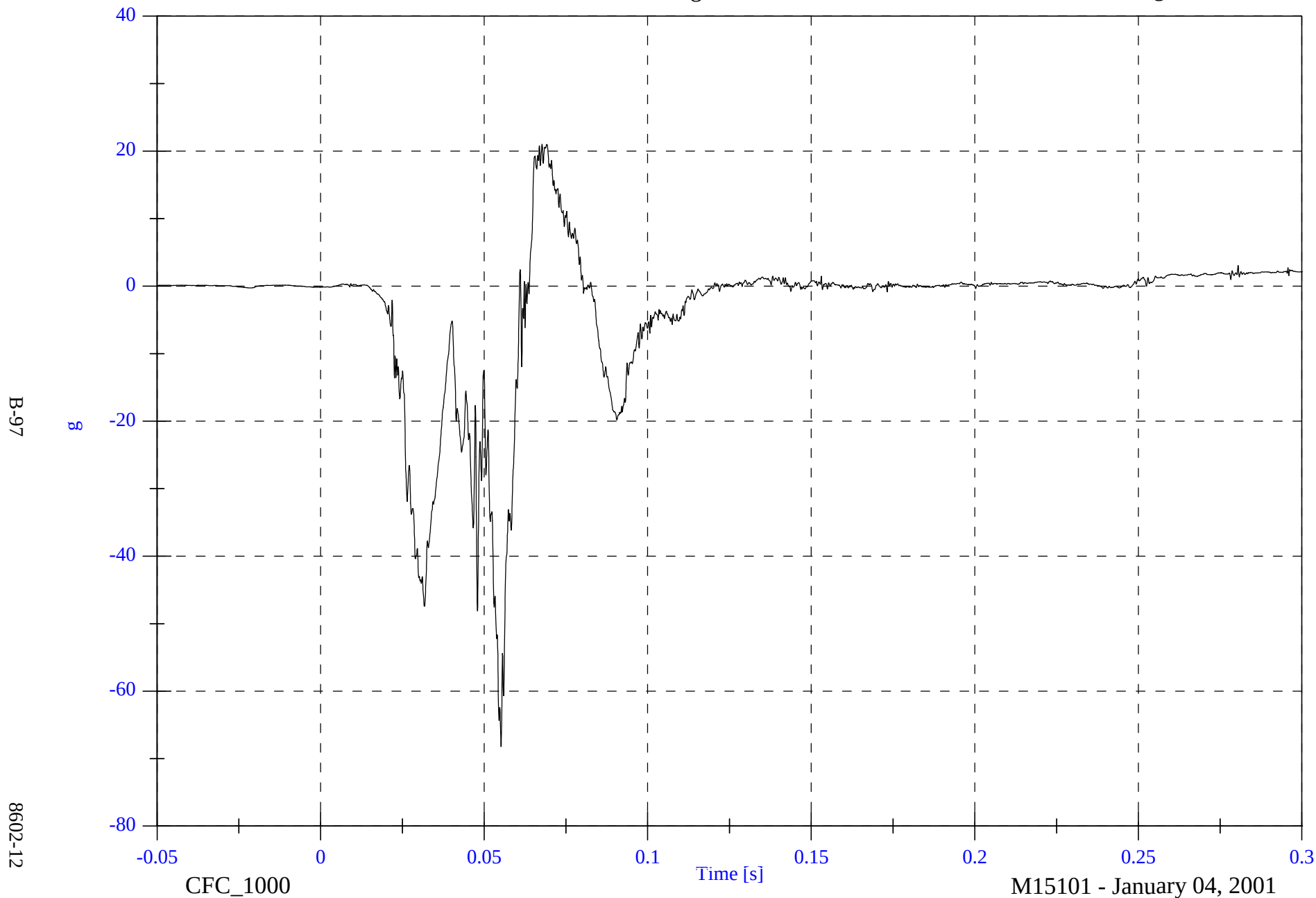


NCAP Test 12 - 2001 Toyota Avalon

P2 Right Foot Aft z

Max: 21.0 [g] at 0.068 [s]

Min: -68.3 [g] at 0.055 [s]

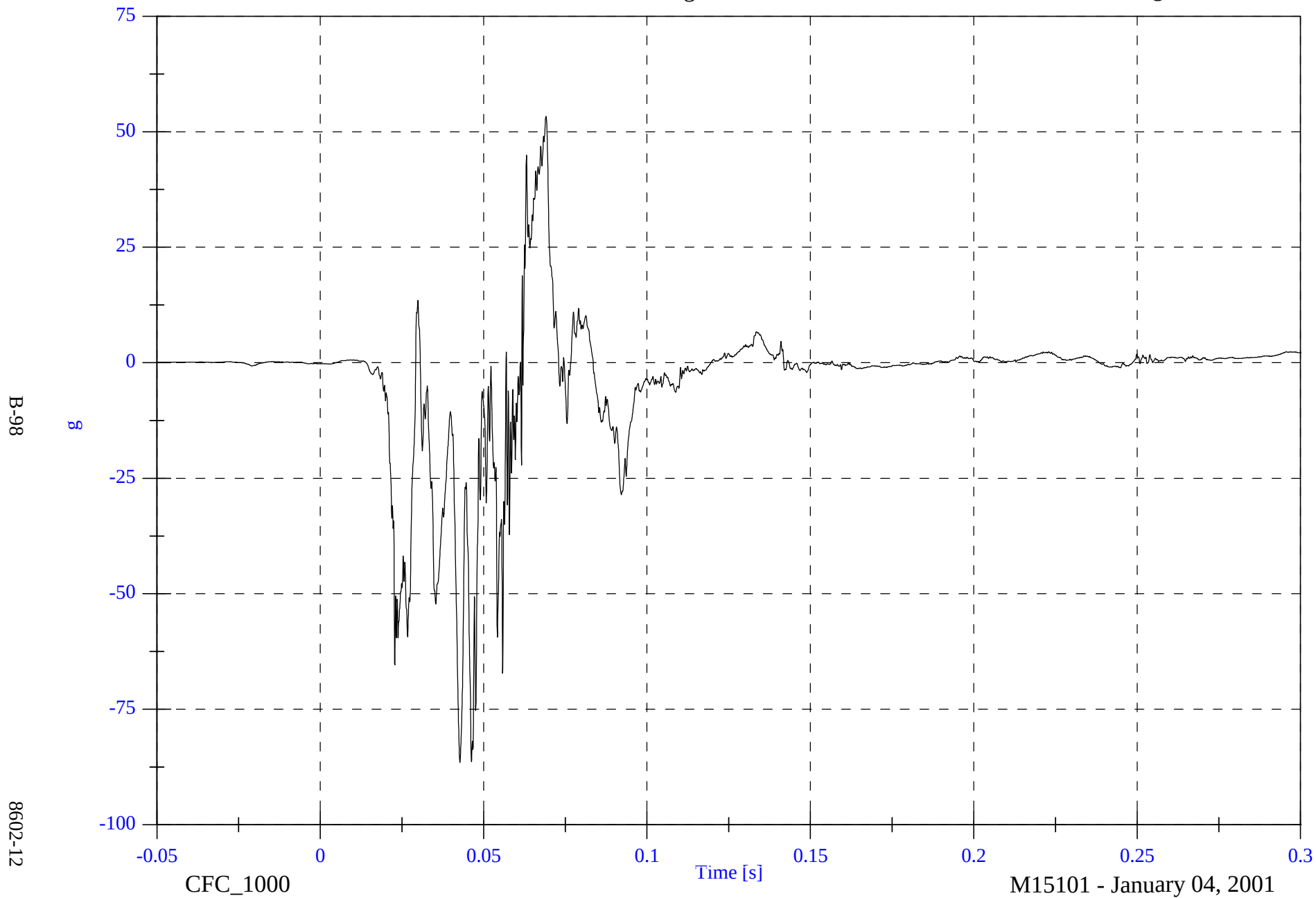


NCAP Test 12 - 2001 Toyota Avalon

P2 Right Foot Fore z

Max: 53.3 [g] at 0.069 [s]

Min: -86.5 [g] at 0.043 [s]

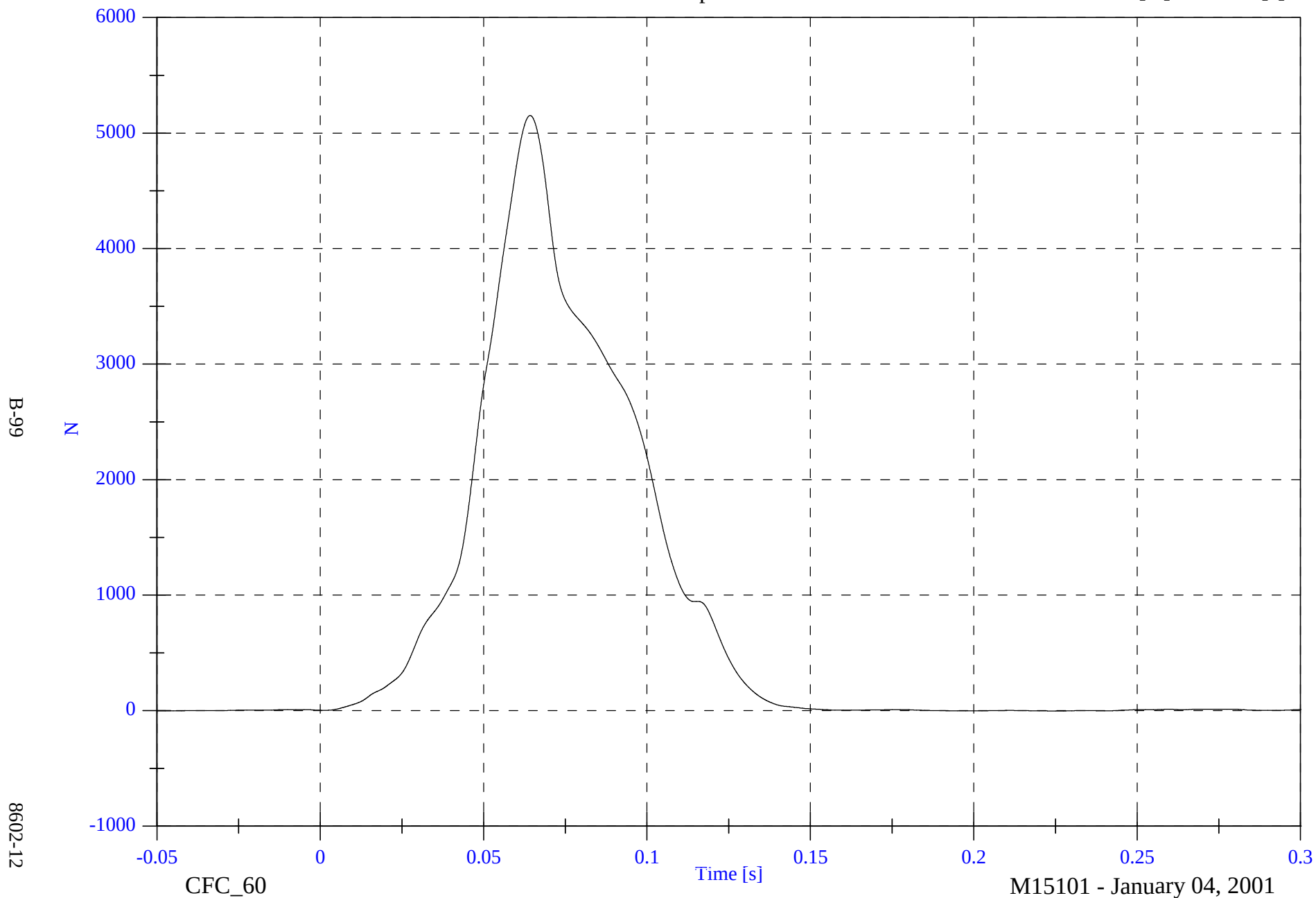


NCAP Test 12 - 2001 Toyota Avalon

P2 Lap Belt Force

Max: 5152.5 [N] at 0.064 [s]

Min: -3.9 [N] at 0.226 [s]

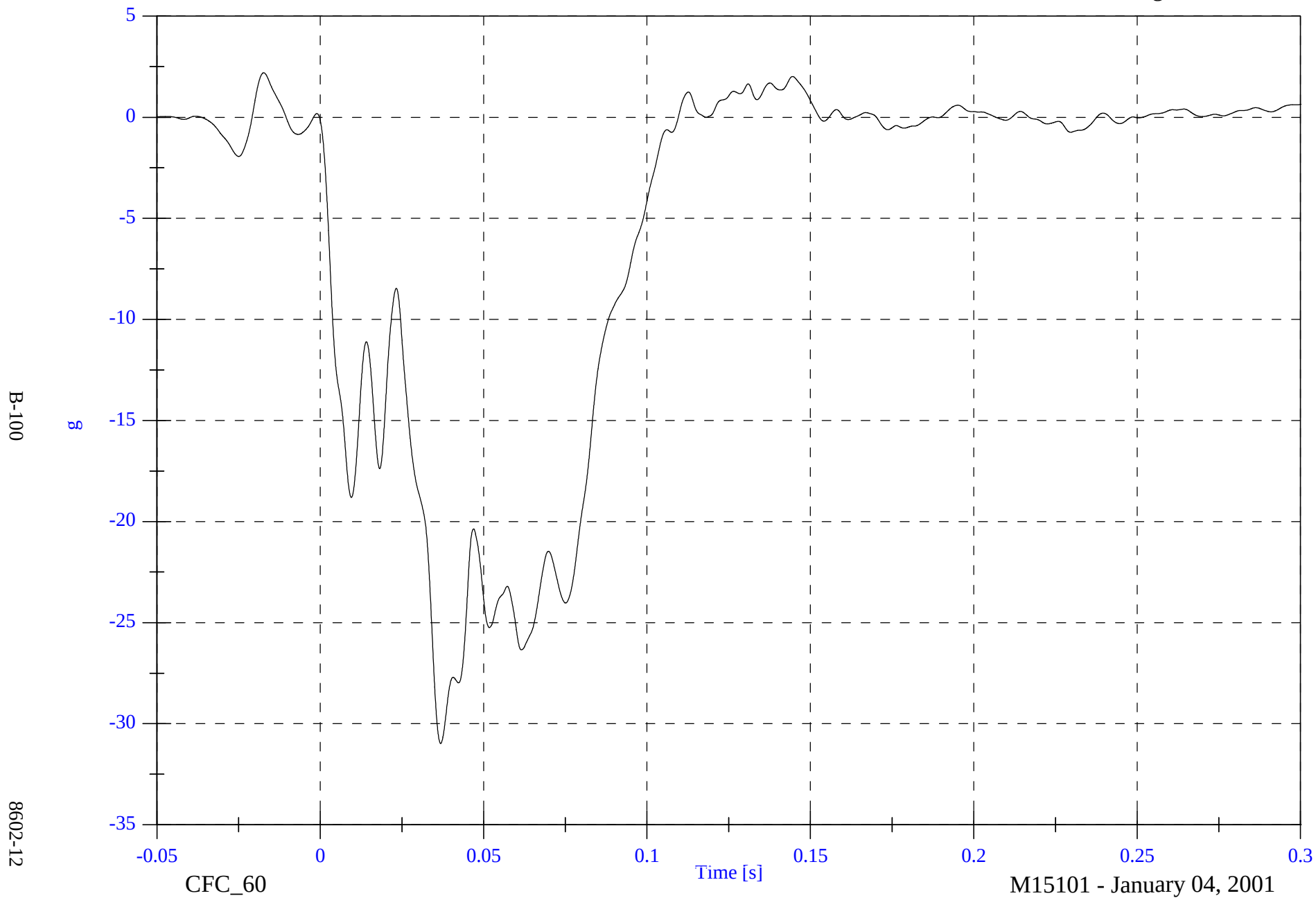


NCAP Test 12 - 2001 Toyota Avalon

Left Rear #1x

Max: 2.2 [g] at -0.017 [s]

Min: -31.0 [g] at 0.037 [s]

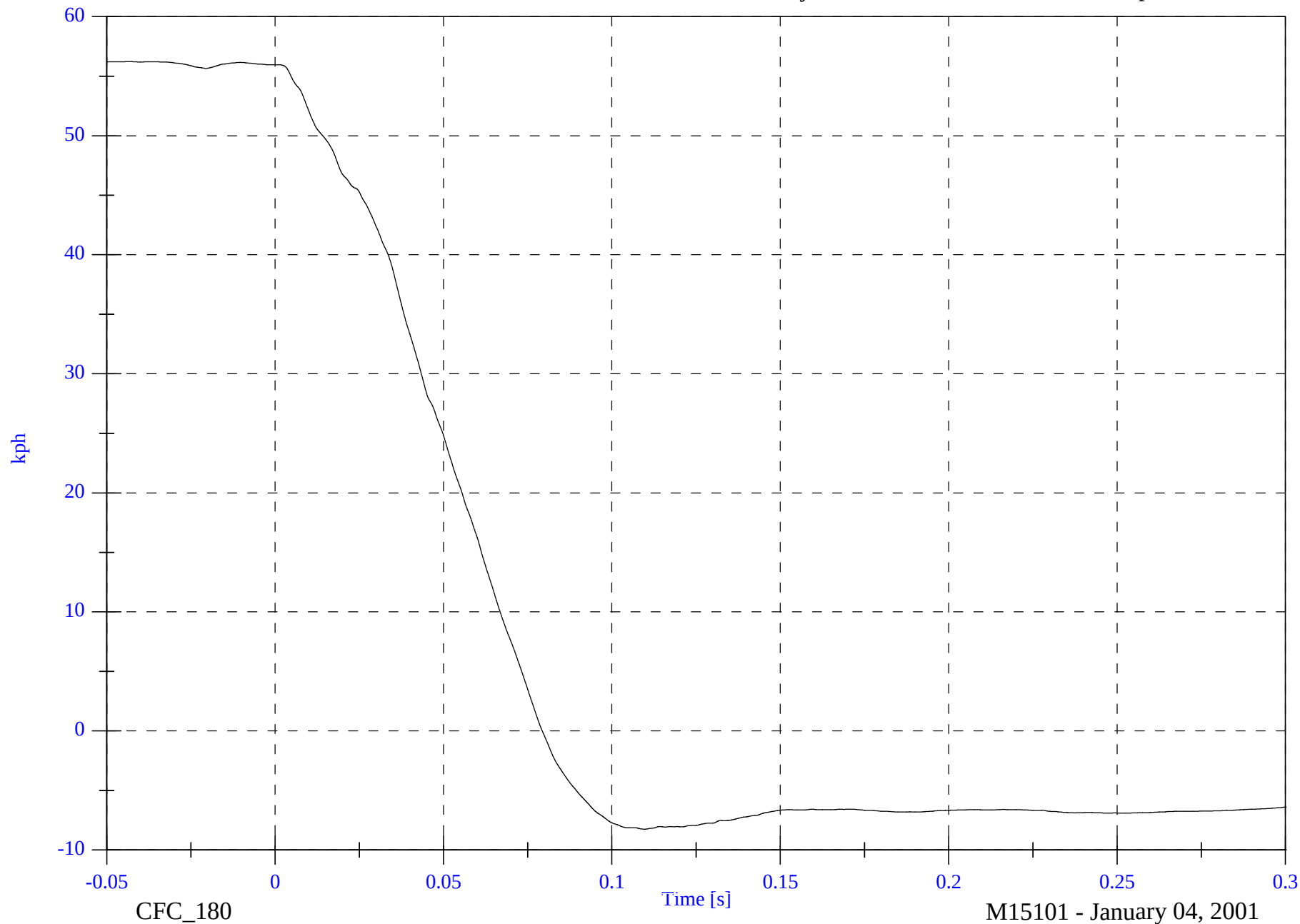


NCAP Test 12 - 2001 Toyota Avalon

Left Rear #1x Velocity

Max: 56.2 [kph] at -0.043 [s]

Min: -8.3 [kph] at 0.110 [s]



B-101

8602-12

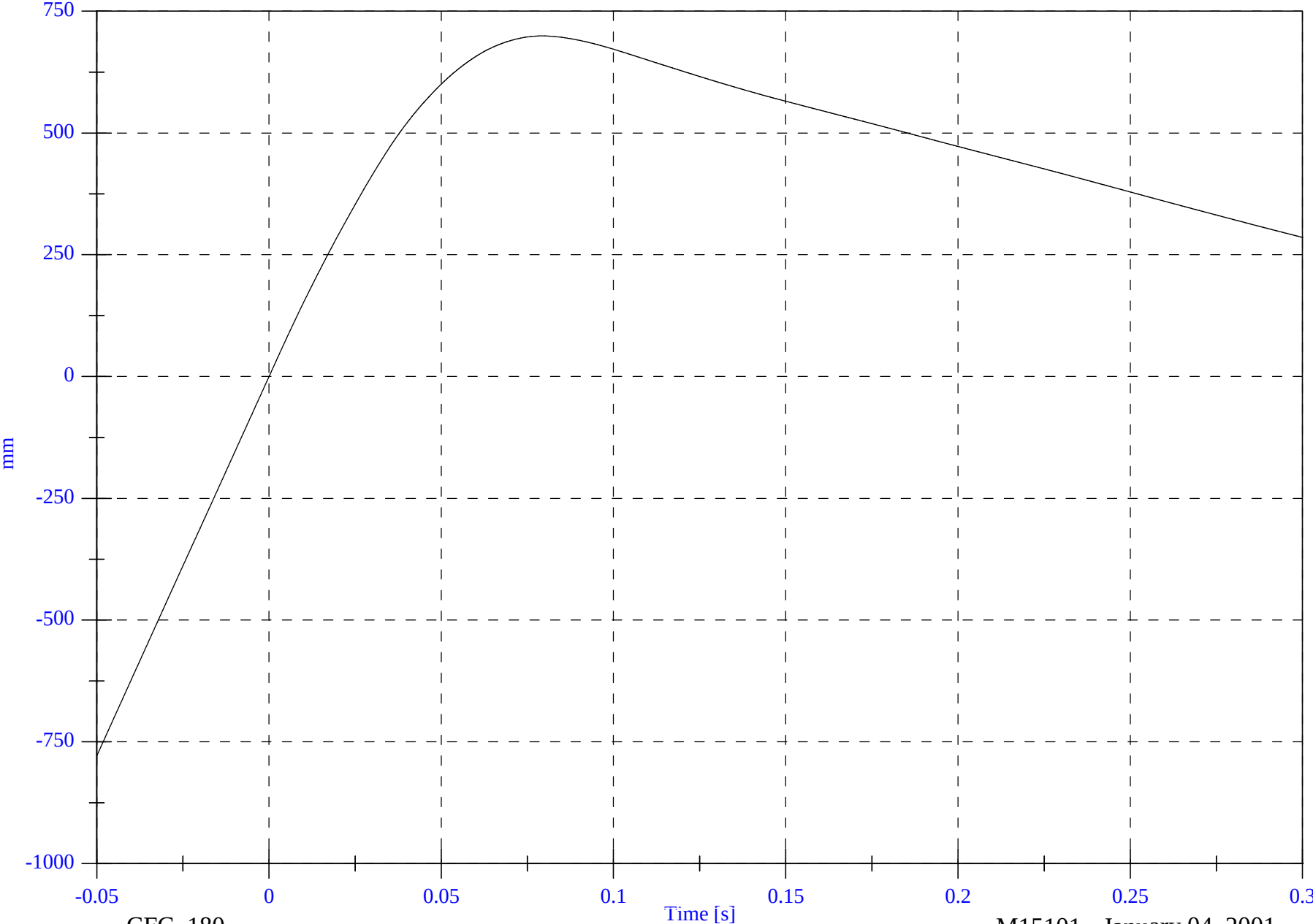
CFC_180

Time [s]

M15101 - January 04, 2001

B-102

8602-12

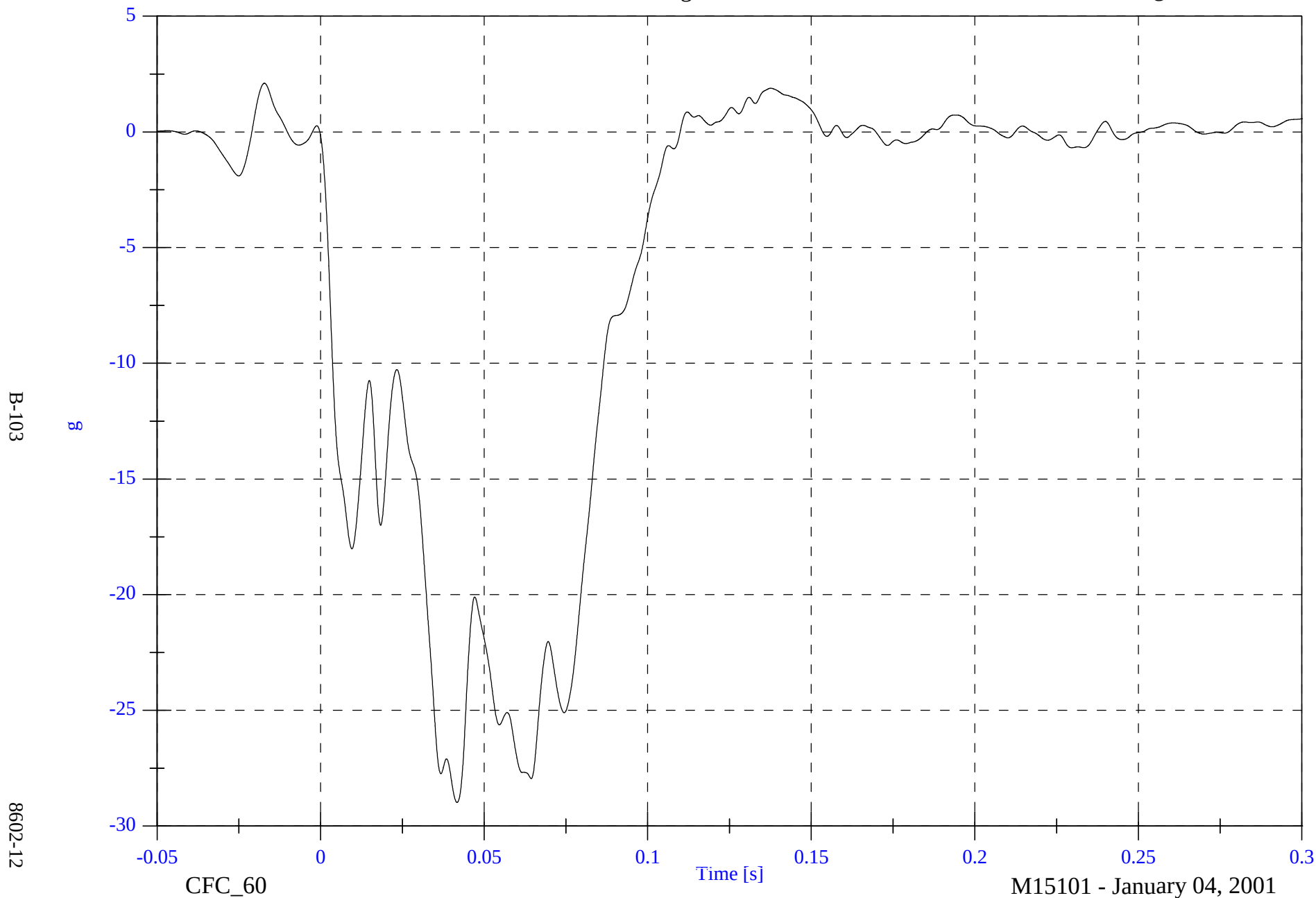


NCAP Test 12 - 2001 Toyota Avalon

Right Rear #2x

Max: 2.1 [g] at -0.017 [s]

Min: -29.0 [g] at 0.042 [s]

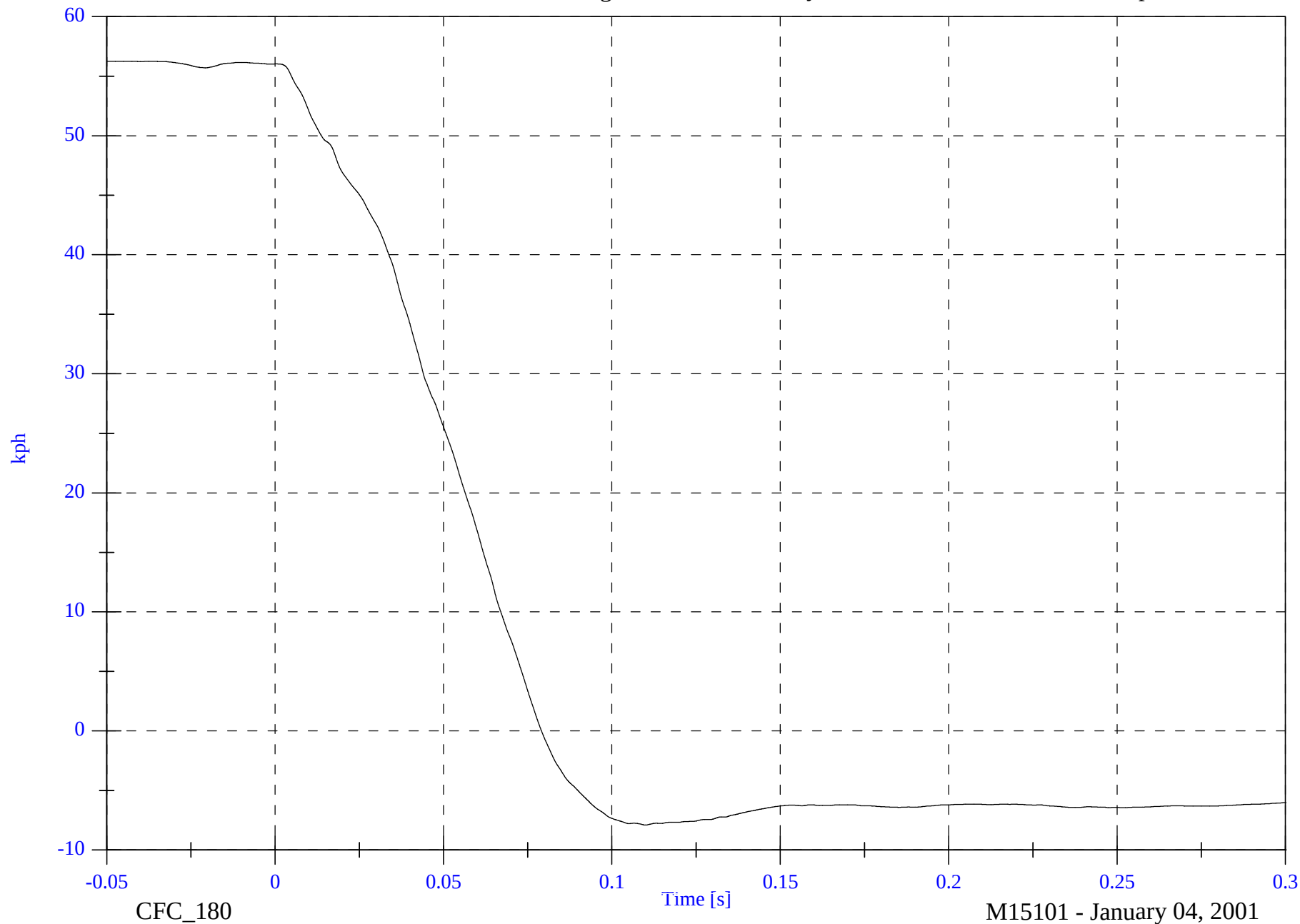


NCAP Test 12 - 2001 Toyota Avalon

Max: 56.3 [kph] at -0.043 [s]

Right Rear #2x Velocity

Min: -7.9 [kph] at 0.110 [s]



B-104

8602-12

NCAP Test 12 - 2001 Toyota Avalon

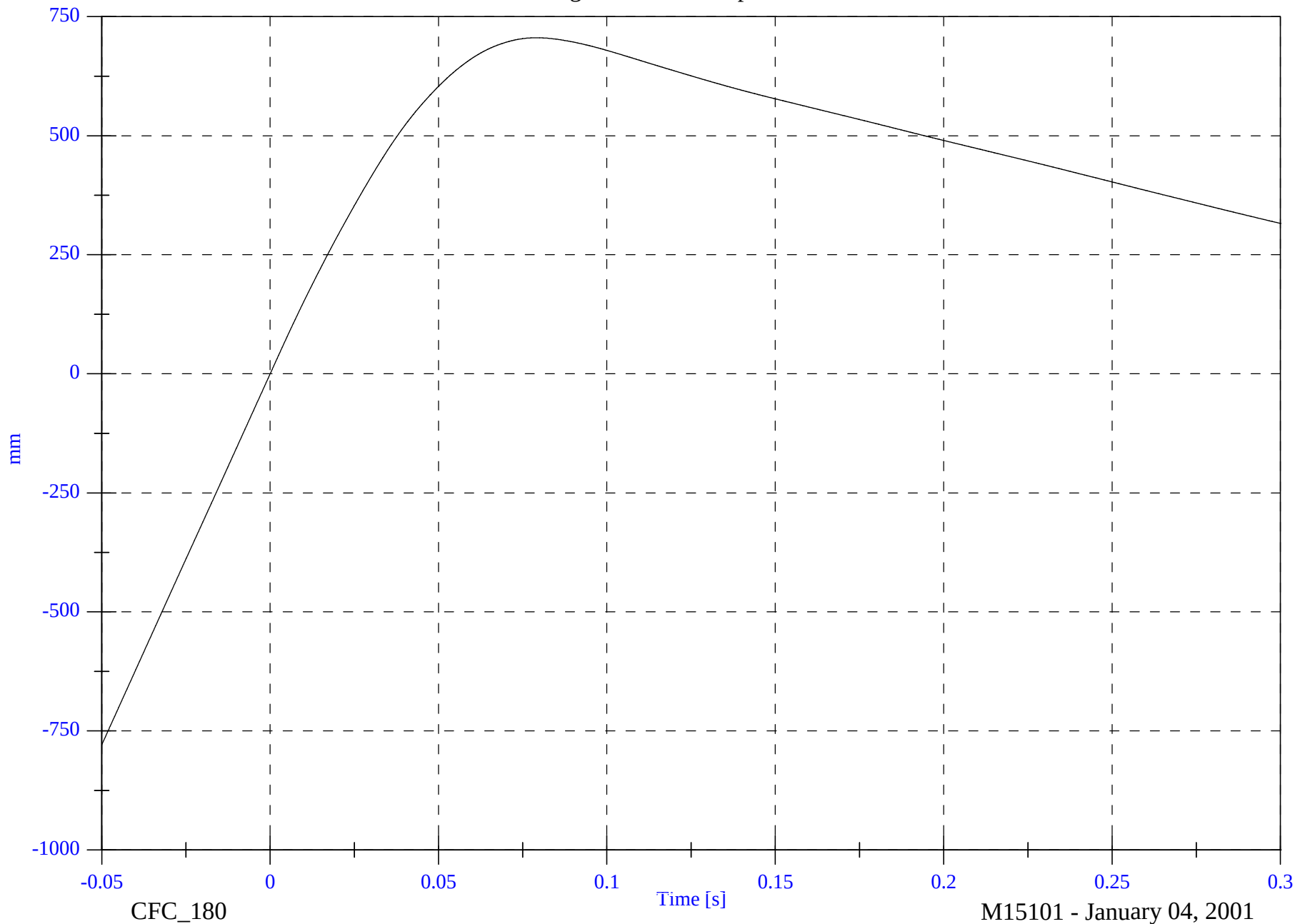
Right Rear #2x Displacement

Max: 705.8 [mm] at 0.079 [s]

Min: -779.1 [mm] at -0.050 [s]

B-105

8602-12



NCAP Test 12 - 2001 Toyota Avalon

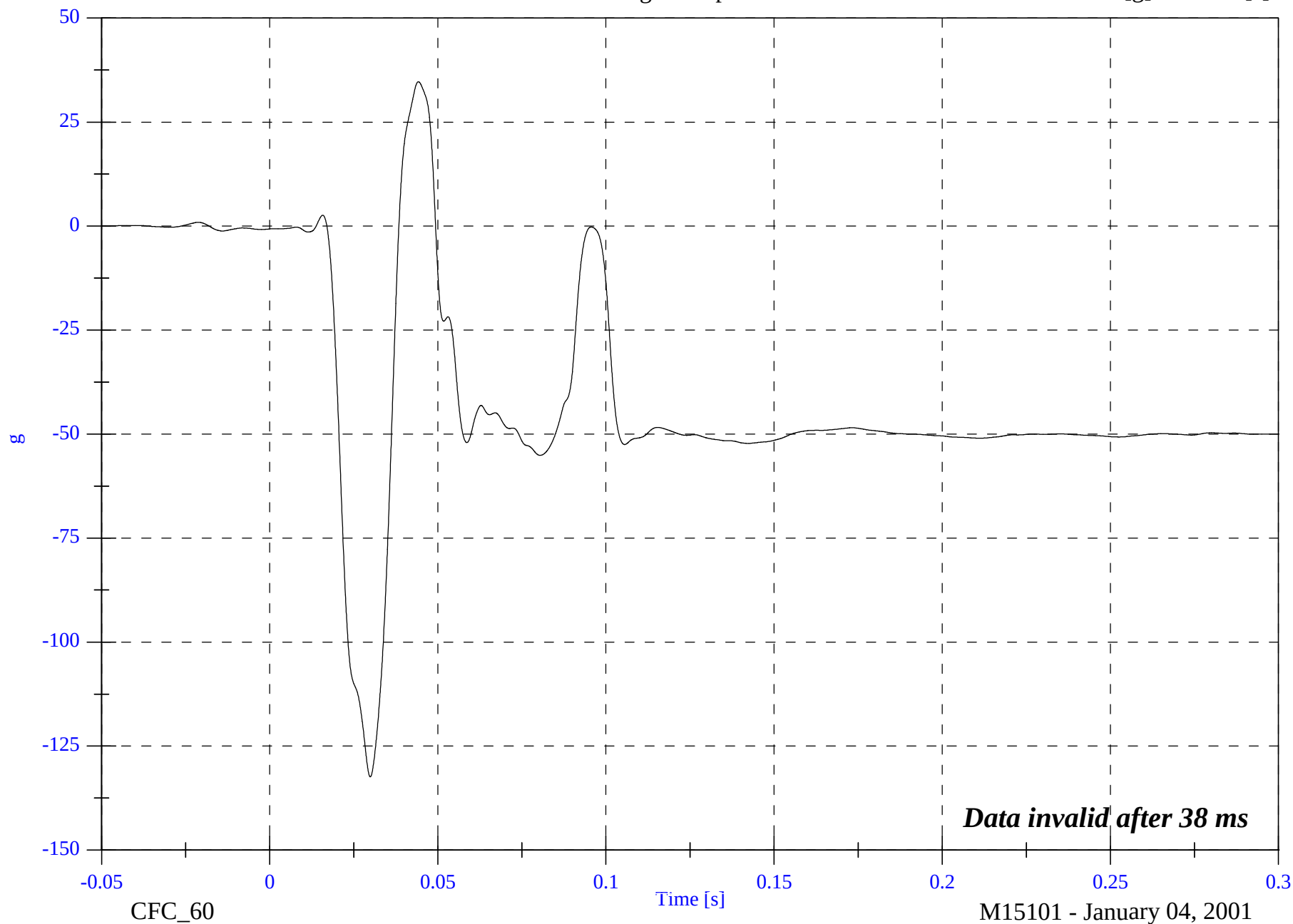
Engine Top #3x

Max: 34.7 [g] at 0.044 [s]

Min: -132.4 [g] at 0.030 [s]

B-106

8602-12

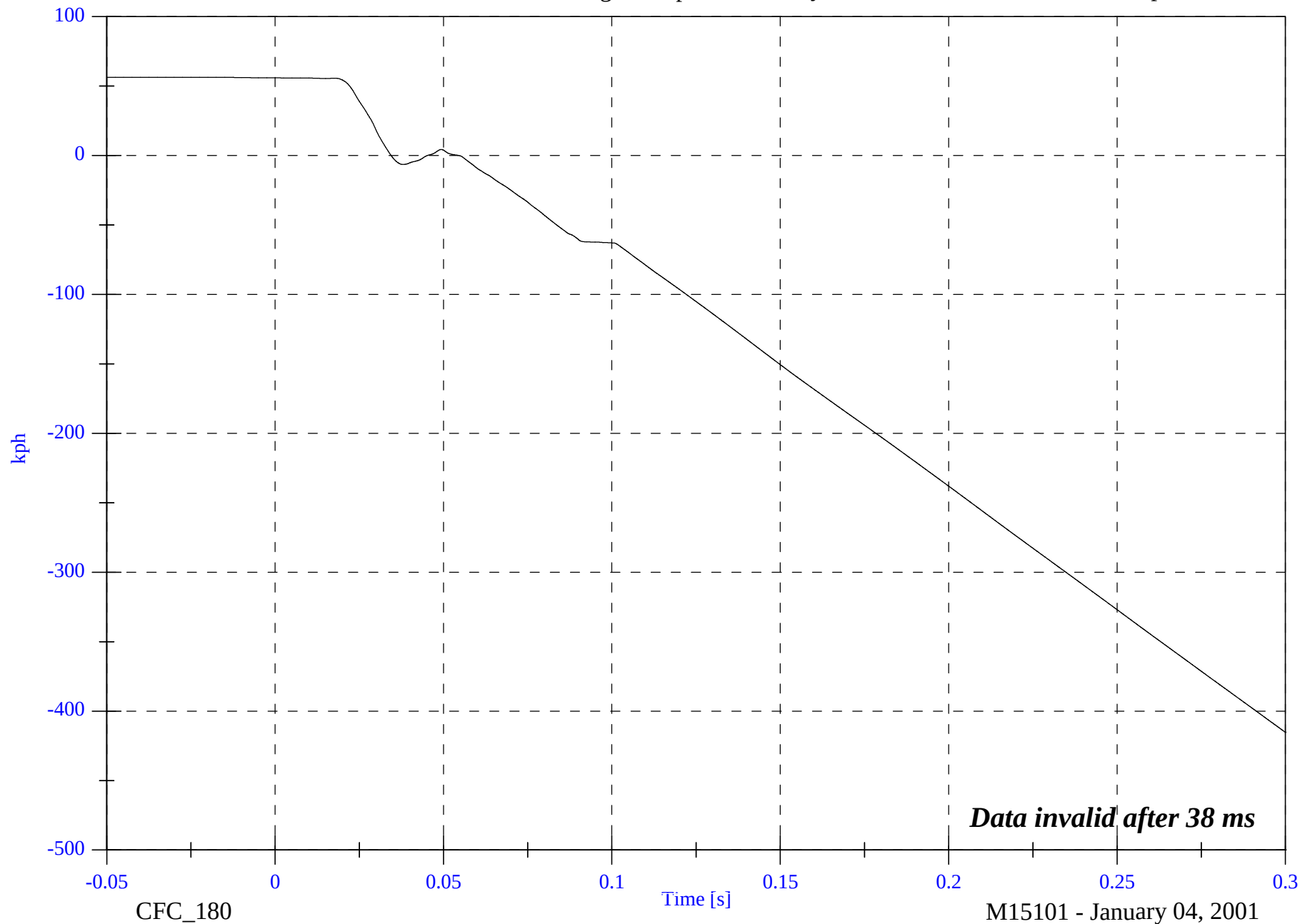


NCAP Test 12 - 2001 Toyota Avalon

Engine Top #3x Velocity

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

Min: -415.3 [kph] at 0.300 [s]



B-107

8602-12

CFC_180

Time [s]

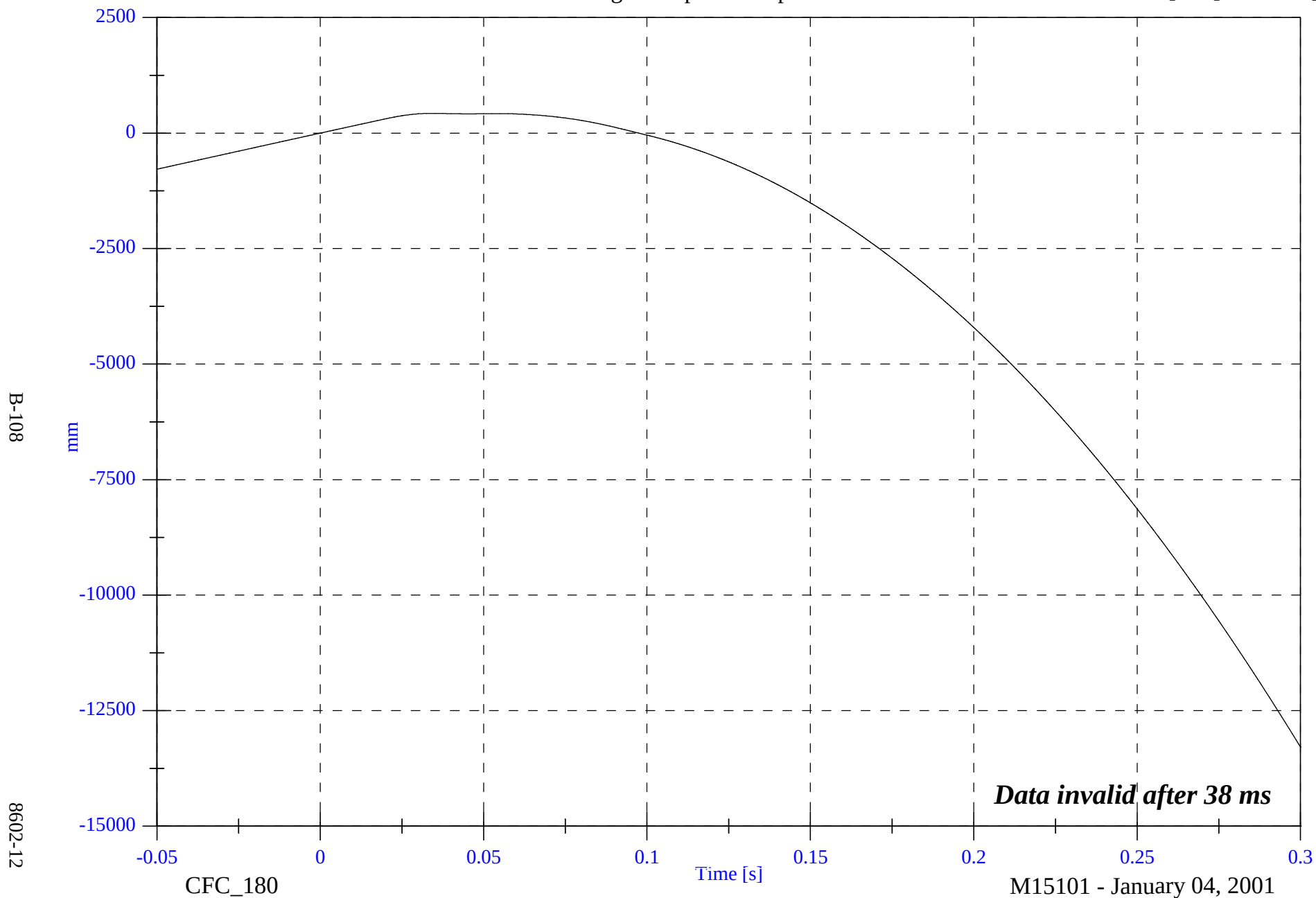
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Engine Top #3x Displacement

Max: 427.4 [mm] at 0.034 [s]

Min: -13284.5 [mm] at 0.300 [s]

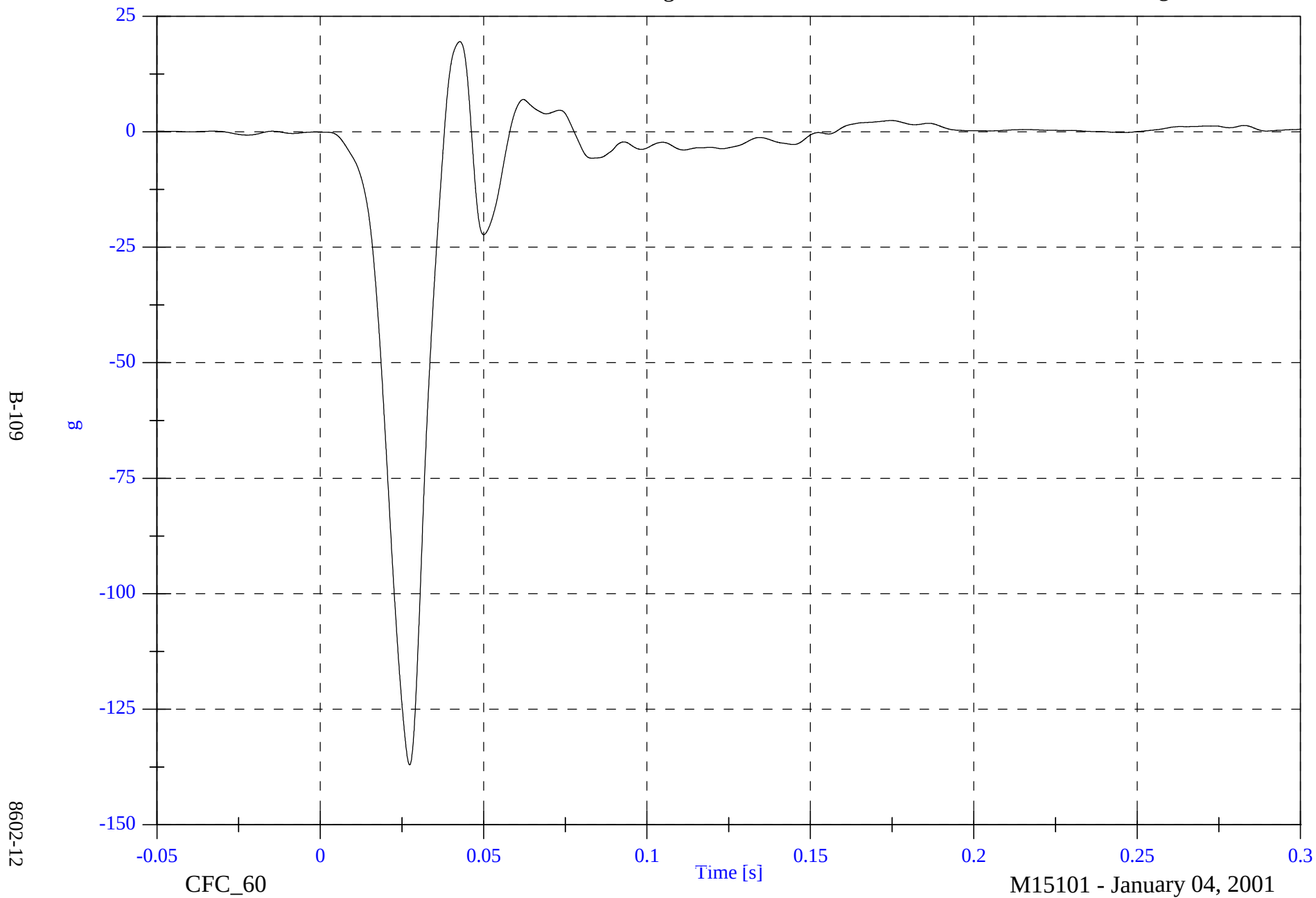


NCAP Test 12 - 2001 Toyota Avalon

Engine Bottom #4x

Max: 19.5 [g] at 0.043 [s]

Min: -137.0 [g] at 0.027 [s]

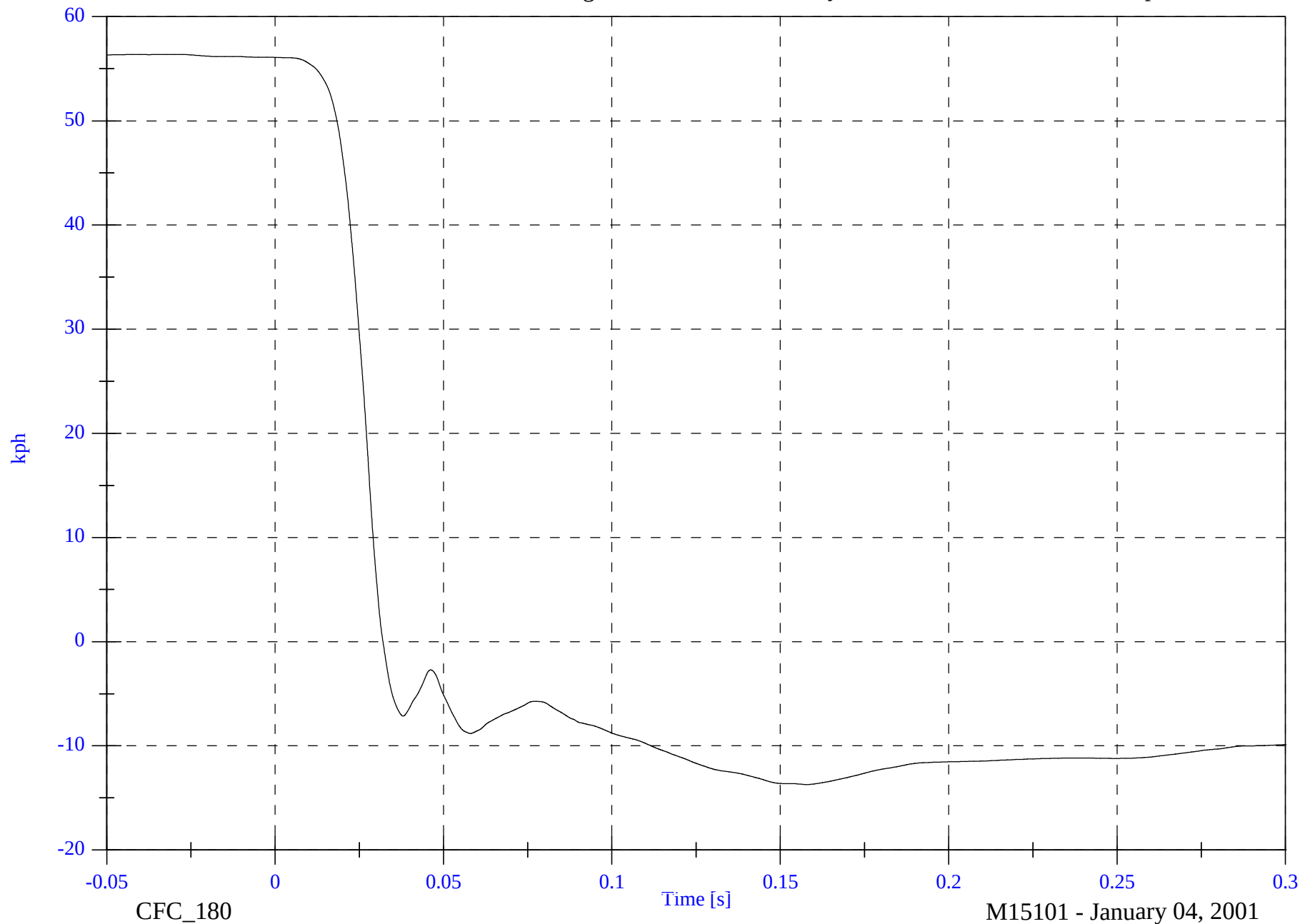


NCAP Test 12 - 2001 Toyota Avalon

Engine Bottom #4x Velocity

Max: 56.4 [kph] at -0.030 [s]

Min: -13.7 [kph] at 0.158 [s]



B-110

8602-12

CFC_180

Time [s]

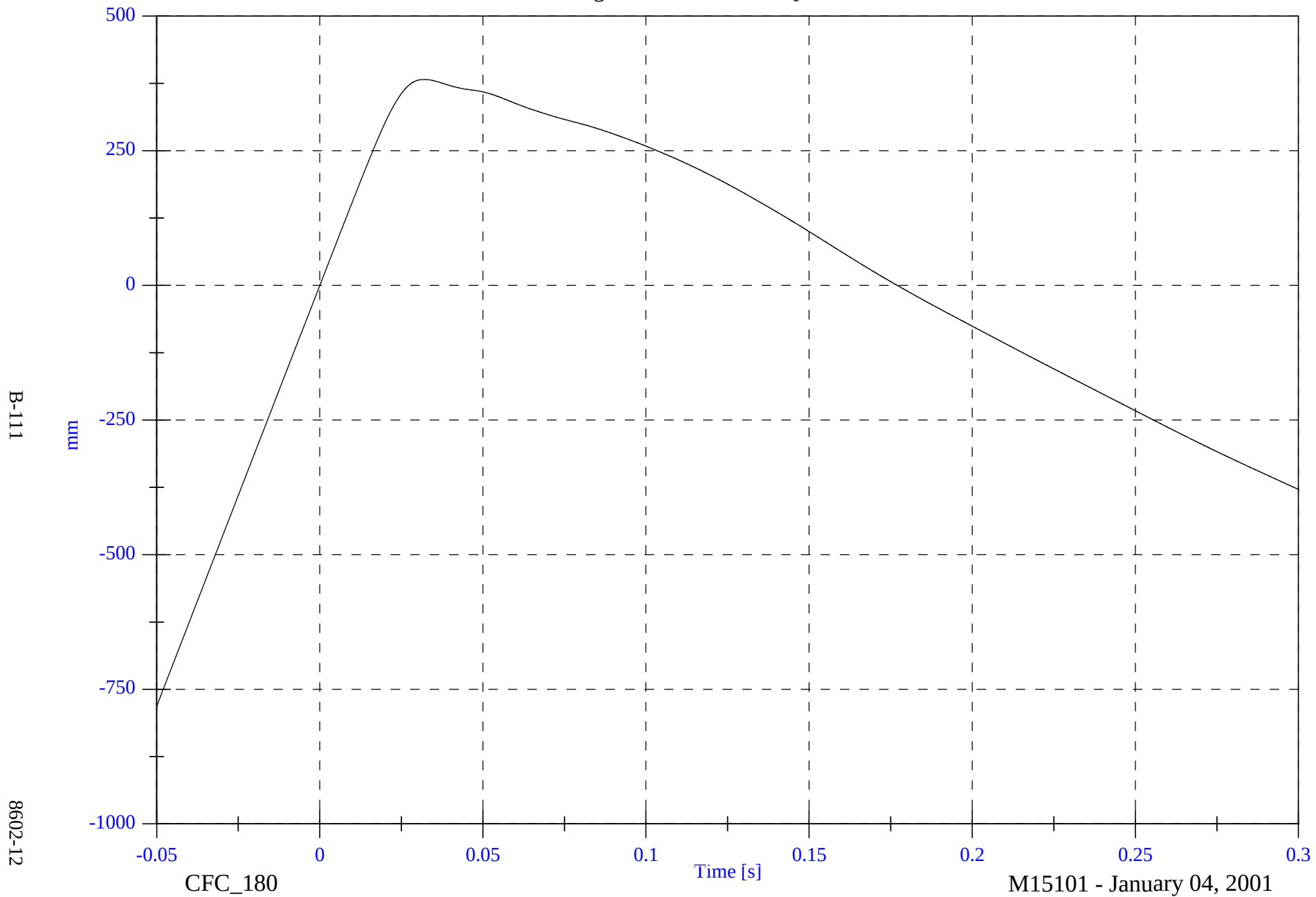
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Engine Bottom #4x Displacement

Max: 382.5 [mm] at 0.032 [s]

Min: -781.4 [mm] at -0.050 [s]



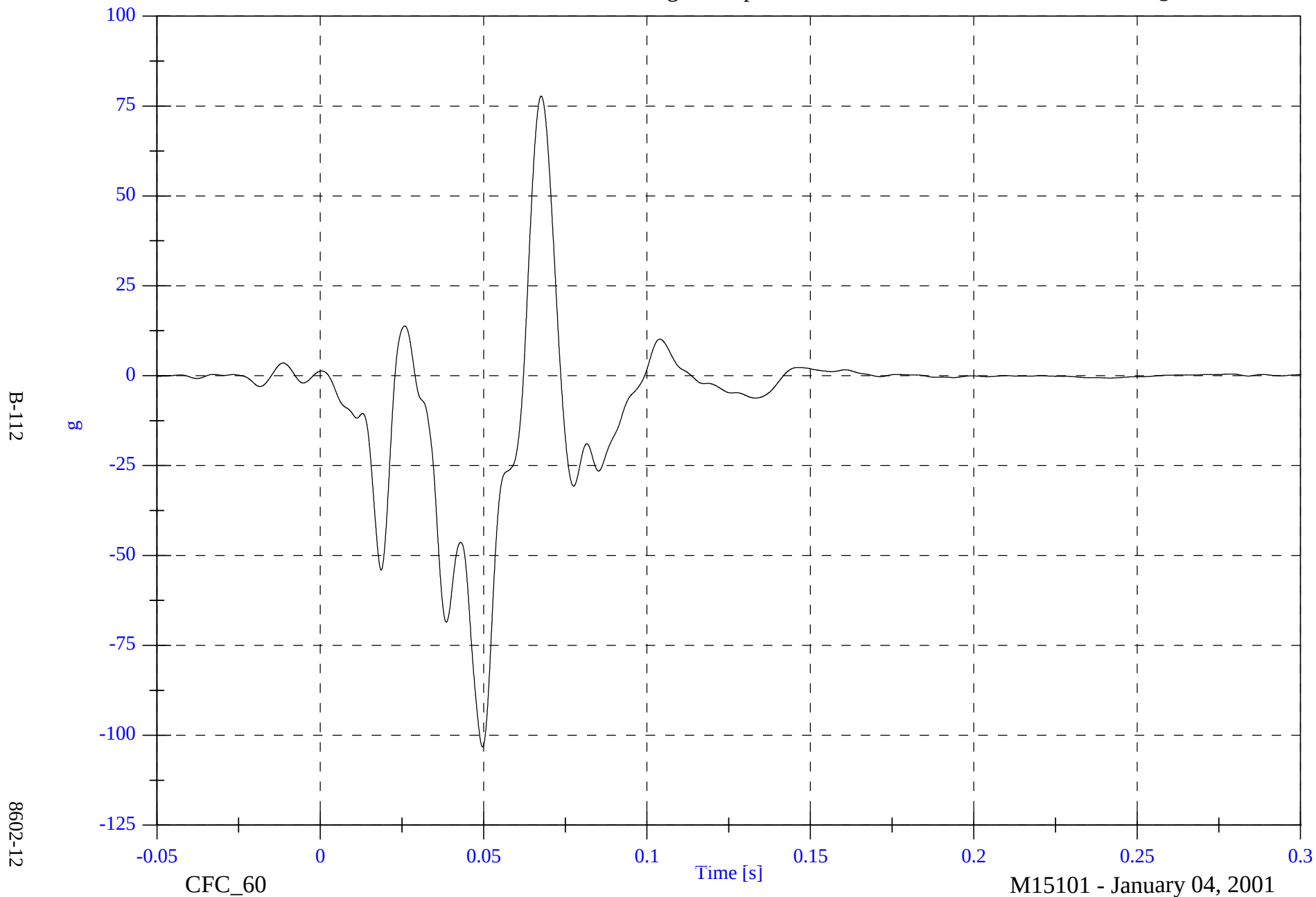
8602-12

NCAP Test 12 - 2001 Toyota Avalon

Right Caliper #5x

Max: 77.8 [g] at 0.068 [s]

Min: -103.3 [g] at 0.050 [s]

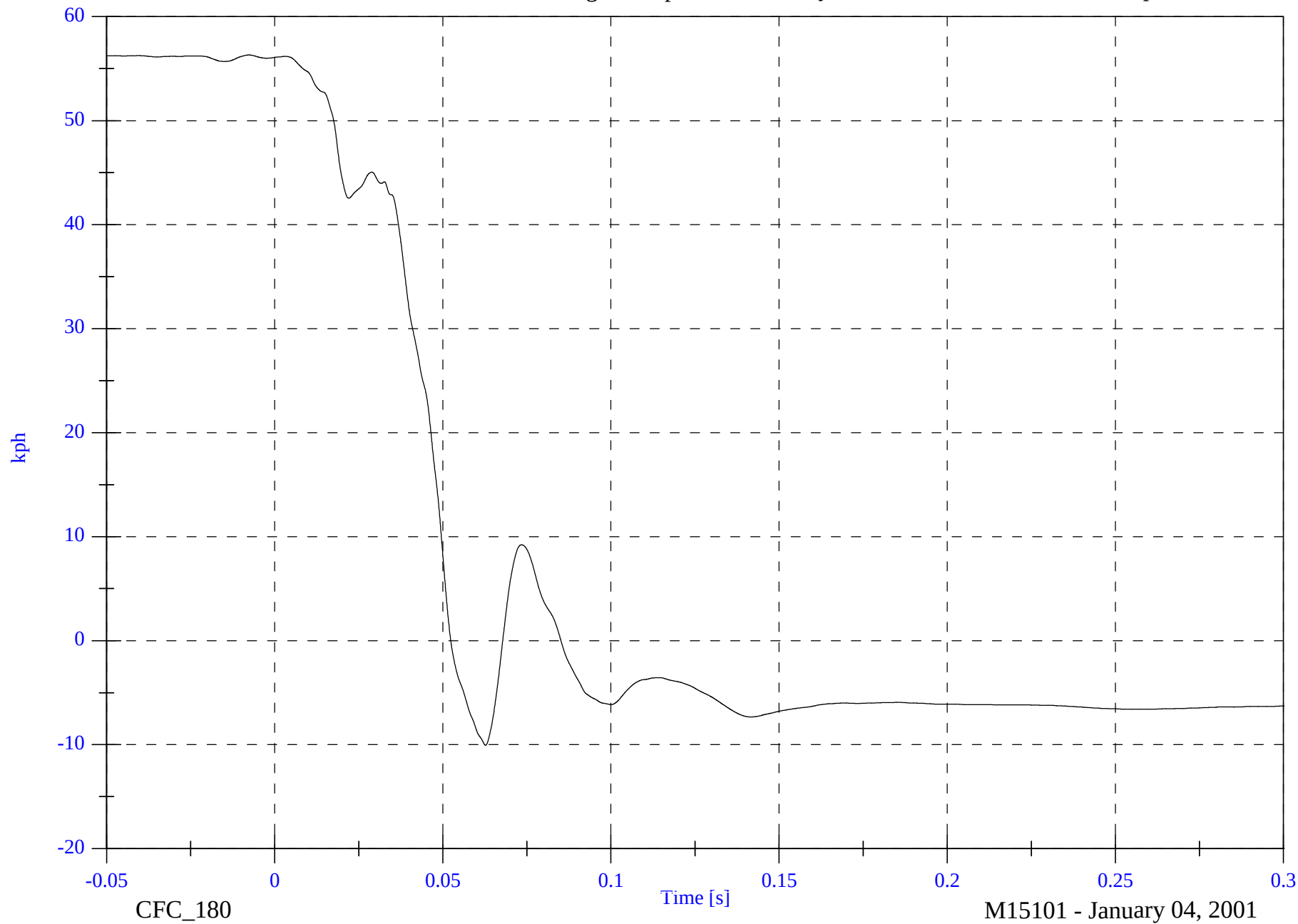


NCAP Test 12 - 2001 Toyota Avalon

Right Caliper #5x Velocity

Max: 56.3 [kph] at -0.008 [s]

Min: -10.1 [kph] at 0.063 [s]



B-113

8602-12

CFC_180

Time [s]

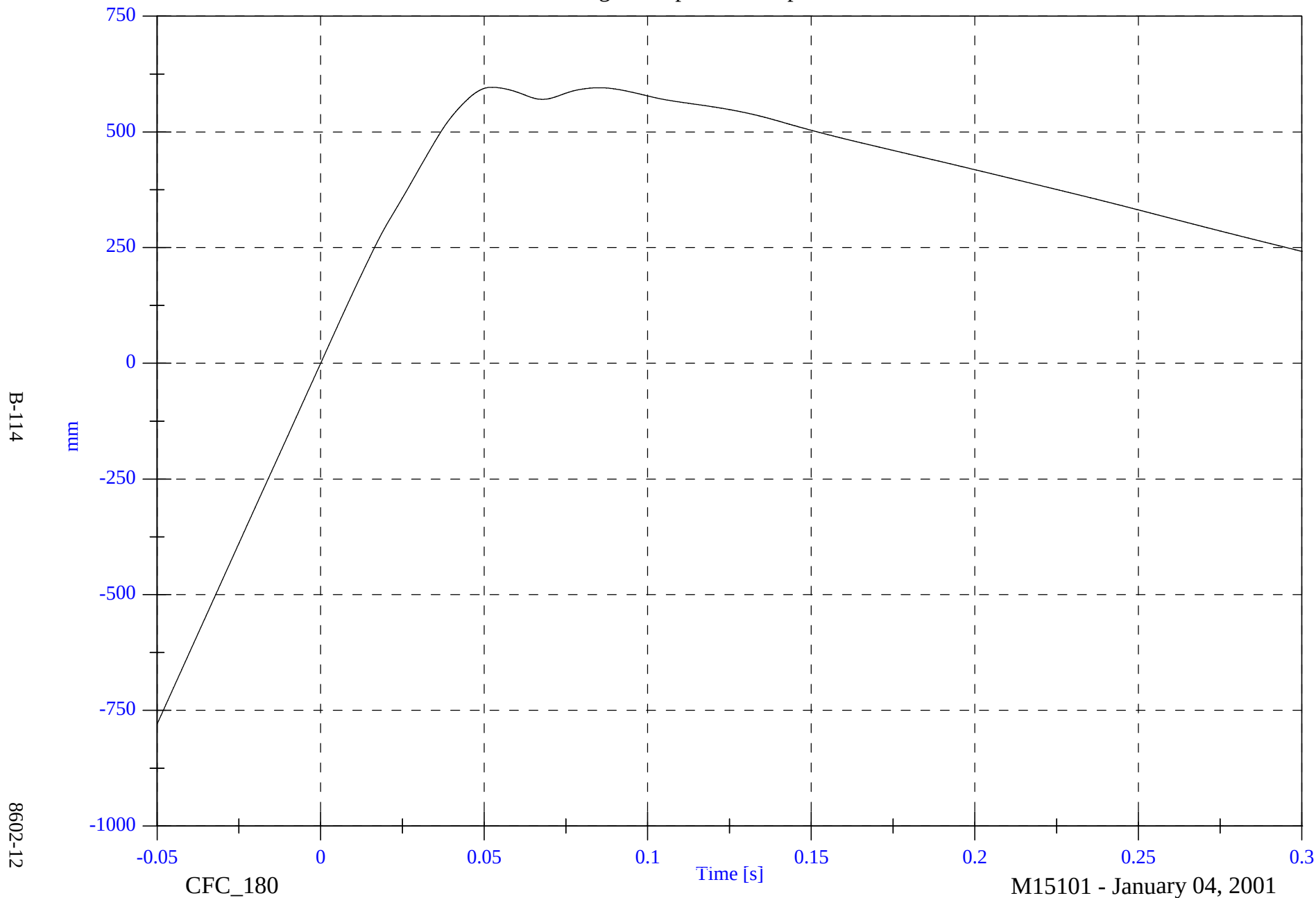
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Right Caliper #5x Displacement

Max: 596.5 [mm] at 0.052 [s]

Min: -779.5 [mm] at -0.050 [s]

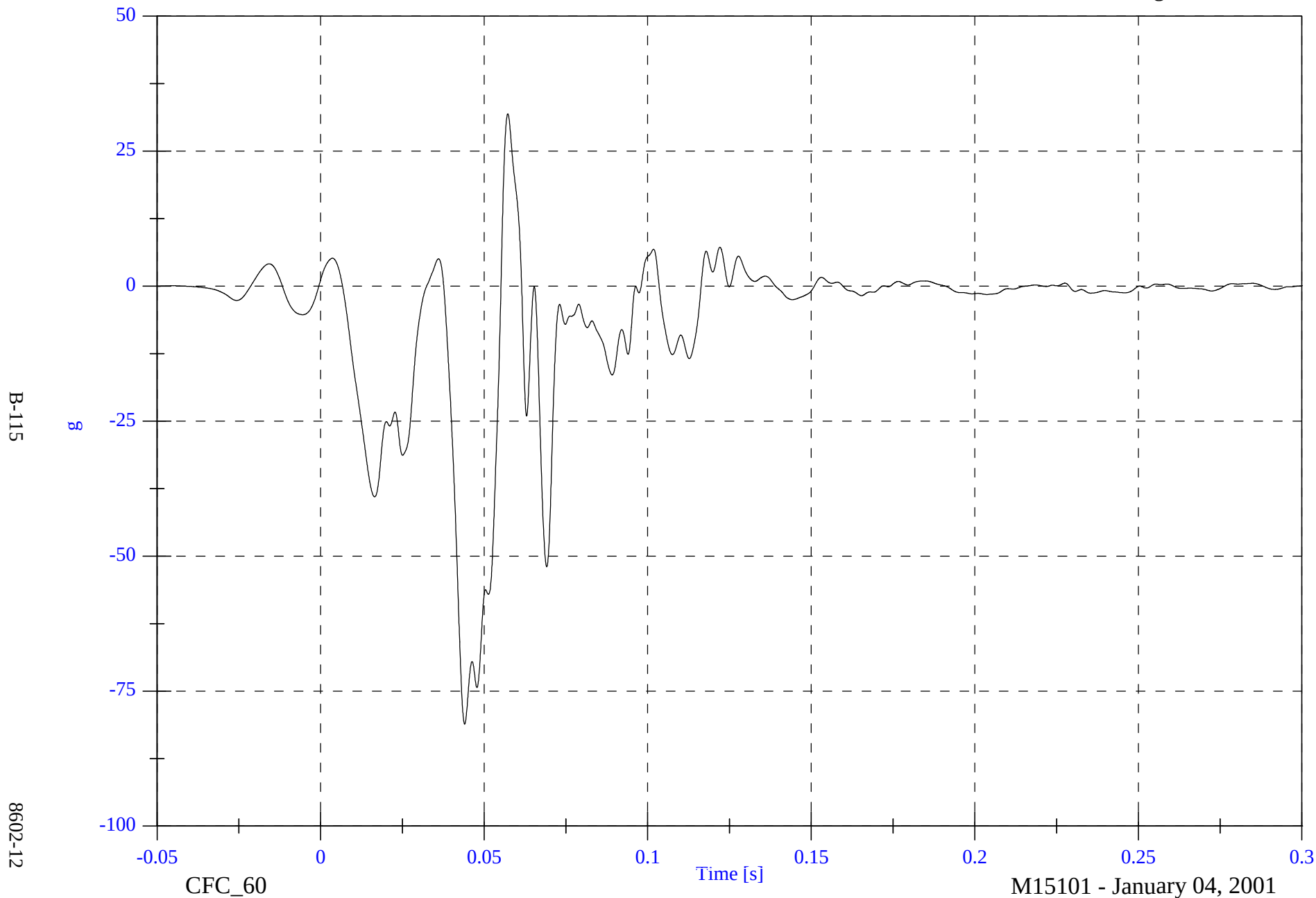


NCAP Test 12 - 2001 Toyota Avalon

Instrument Panel #6x

Max: 31.9 [g] at 0.057 [s]

Min: -81.1 [g] at 0.044 [s]



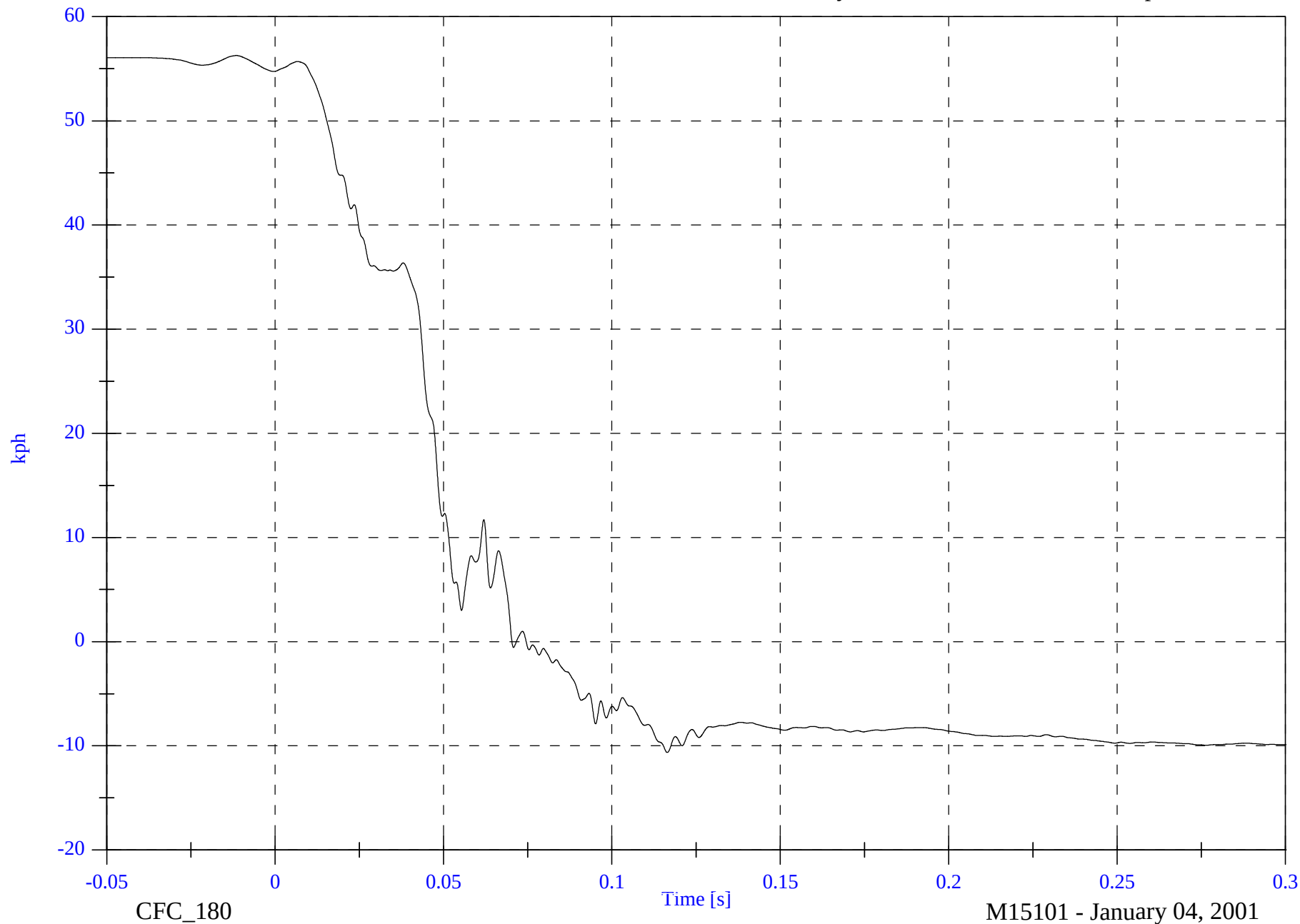
8602-12

NCAP Test 12 - 2001 Toyota Avalon

Instrument Panel #6x Velocity

Max: 56.3 [kph] at -0.012 [s]

Min: -10.6 [kph] at 0.116 [s]



B-116

8602-12

CFC_180

Time [s]

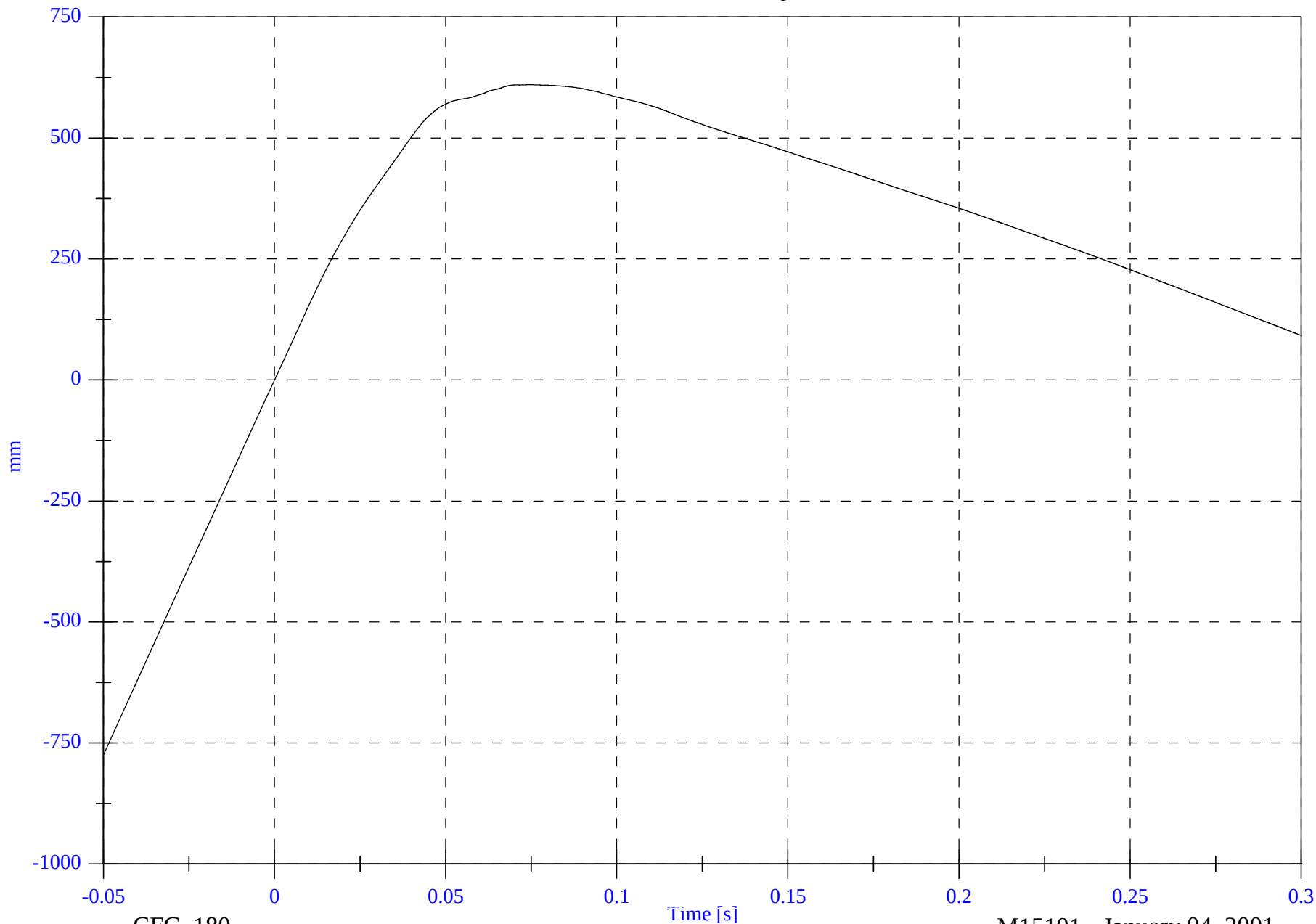
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Instrument Panel #6x Displacement

Max: 610.1 [mm] at 0.075 [s]

Min: -774.8 [mm] at -0.050 [s]



B-117

8602-12

CFC_180

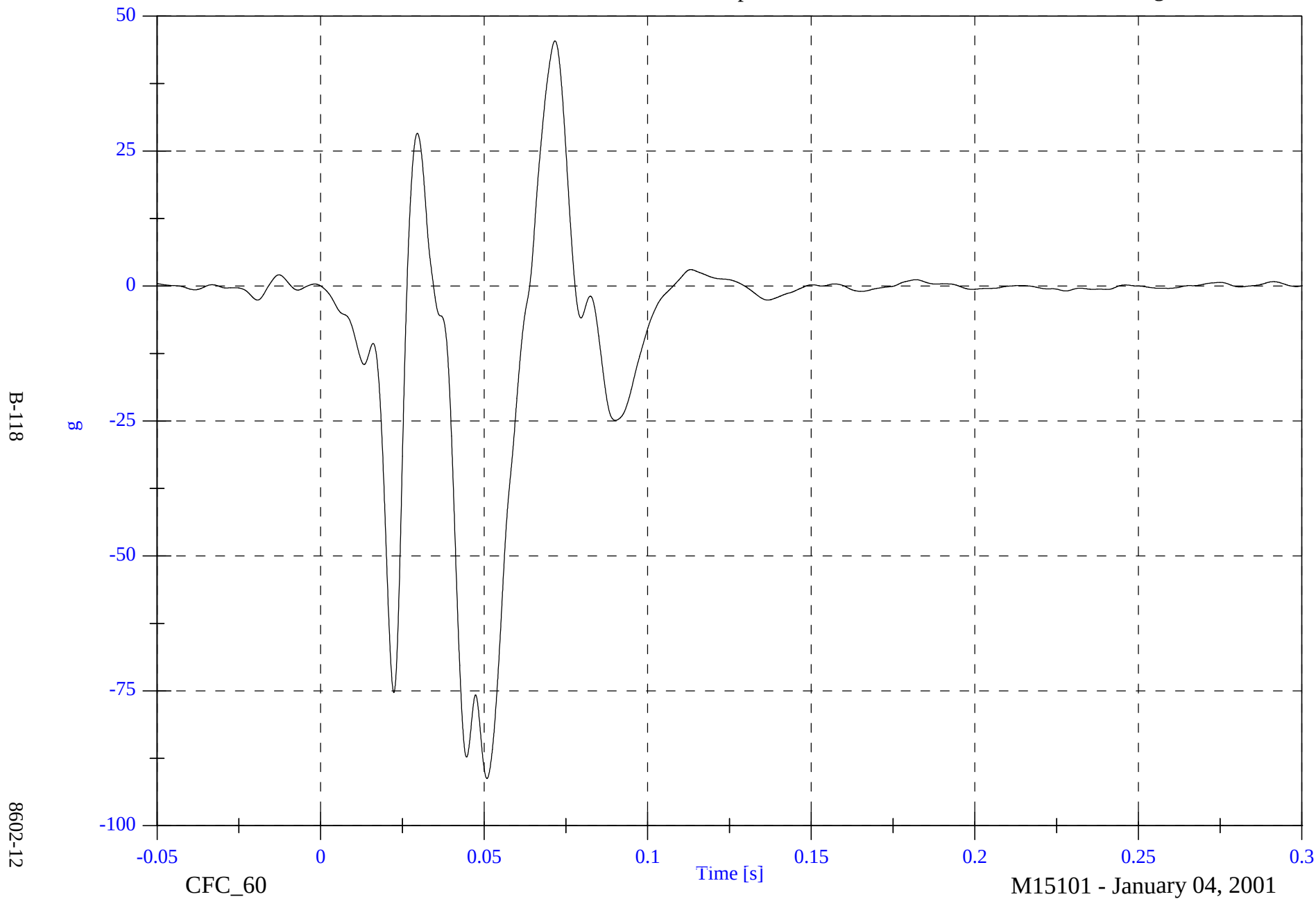
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Left Caliper #7x

Max: 45.4 [g] at 0.072 [s]

Min: -91.3 [g] at 0.051 [s]

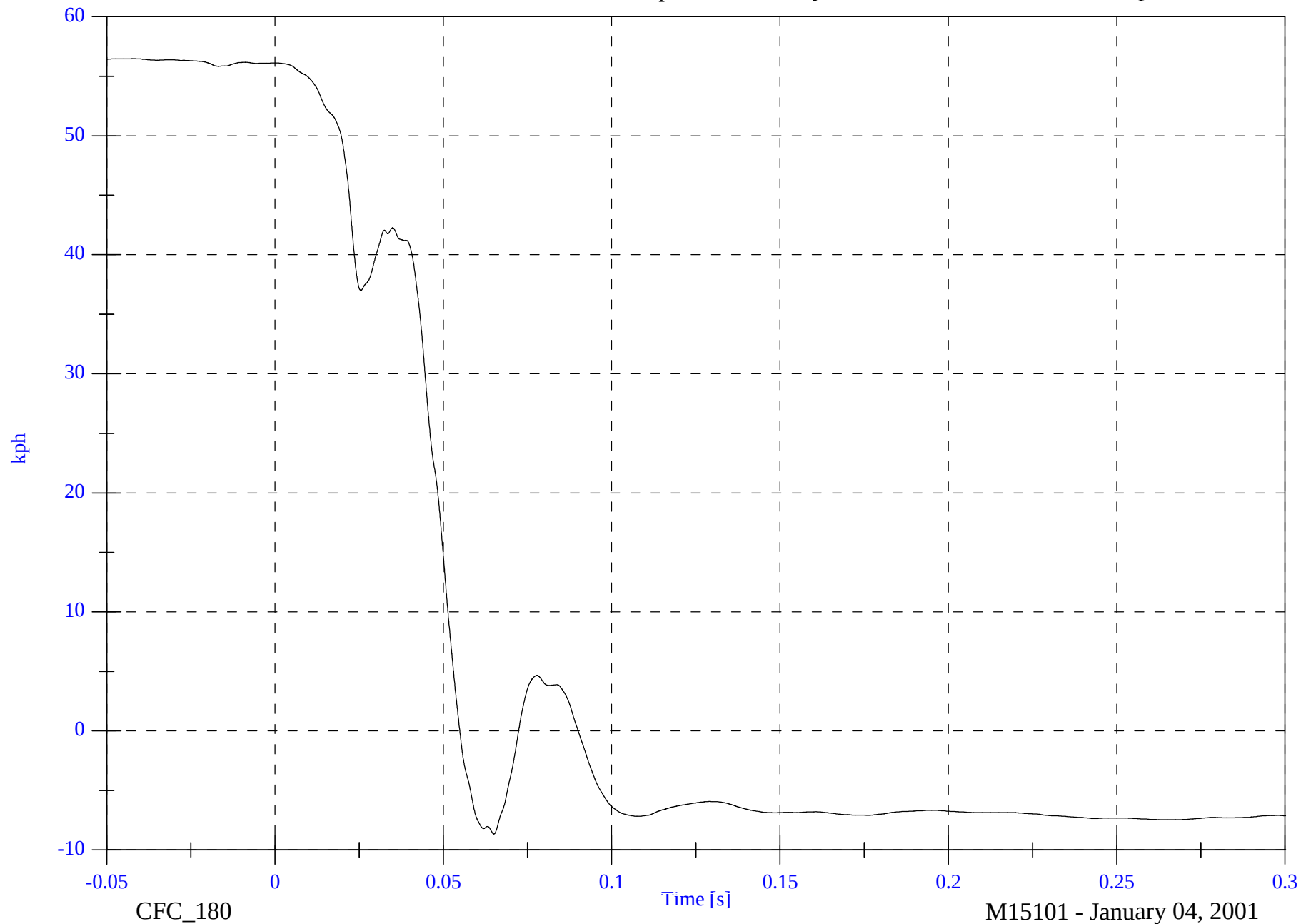


NCAP Test 12 - 2001 Toyota Avalon

Left Caliper #7x Velocity

Max: 56.5 [kph] at -0.042 [s]

Min: -8.7 [kph] at 0.065 [s]



B-119

8602-12

CFC_180

Time [s]

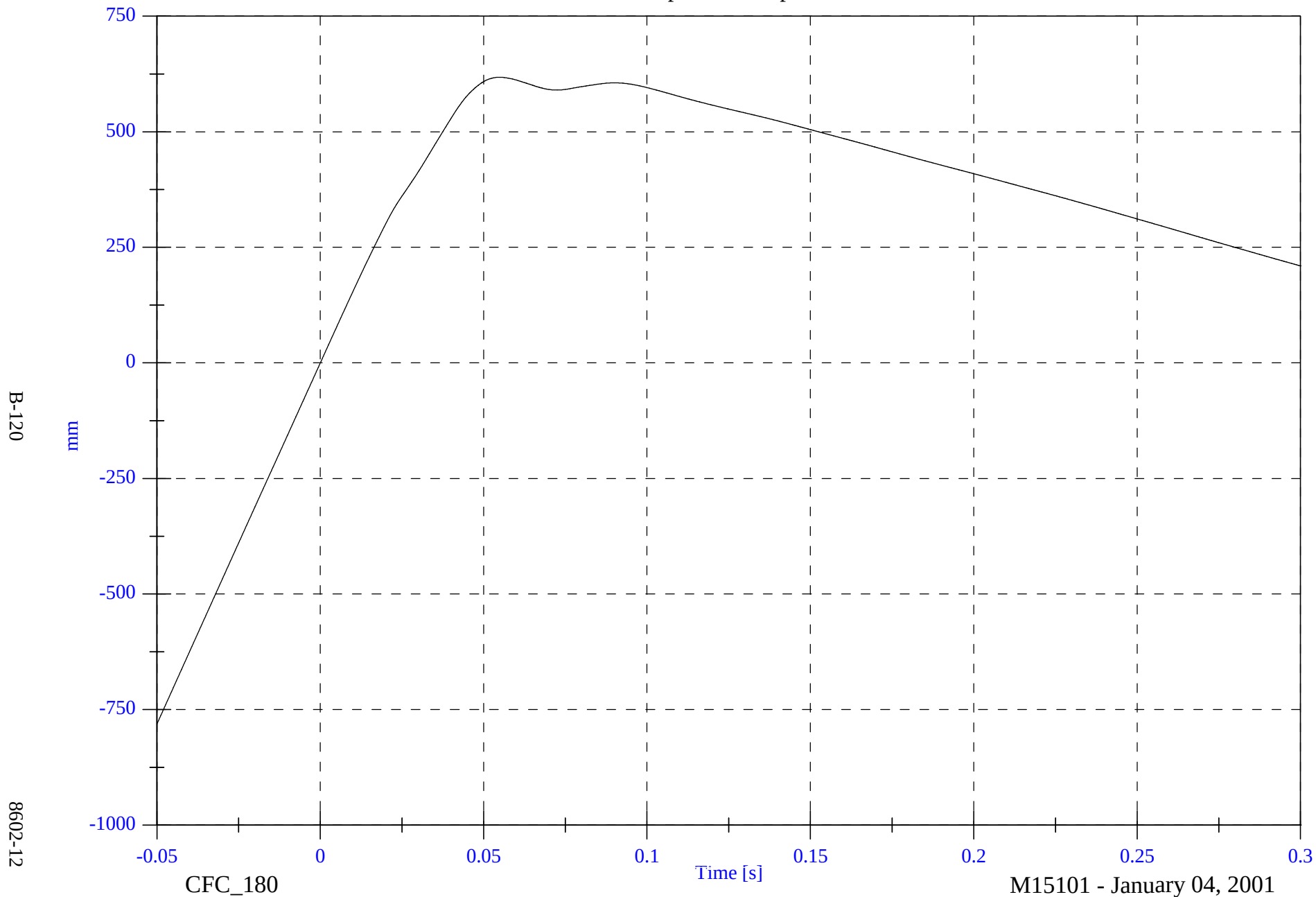
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Left Caliper #7x Displacement

Max: 617.9 [mm] at 0.055 [s]

Min: -781.2 [mm] at -0.050 [s]

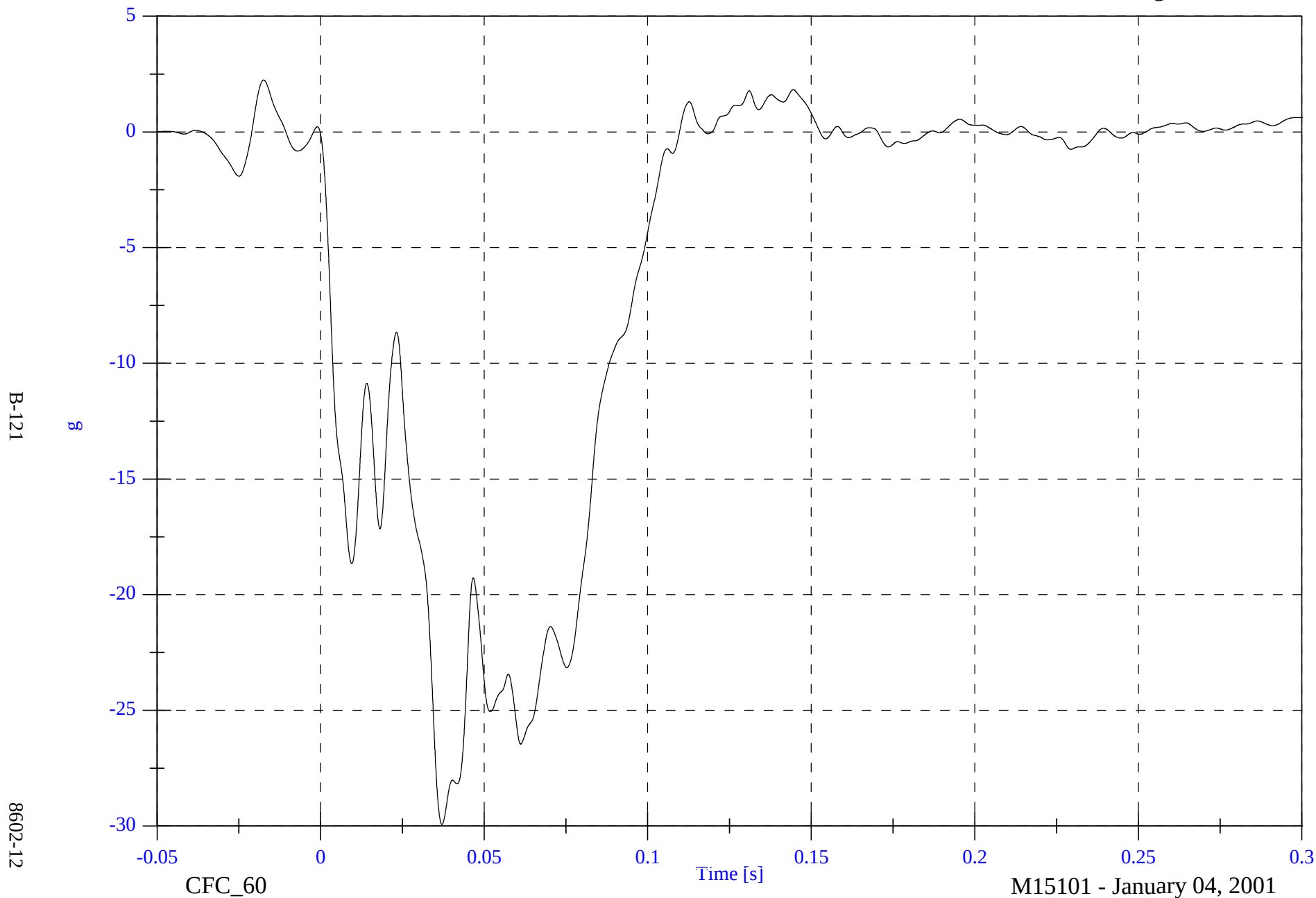


NCAP Test 12 - 2001 Toyota Avalon

Left Rear Red #8x

Max: 2.2 [g] at -0.017 [s]

Min: -29.9 [g] at 0.037 [s]

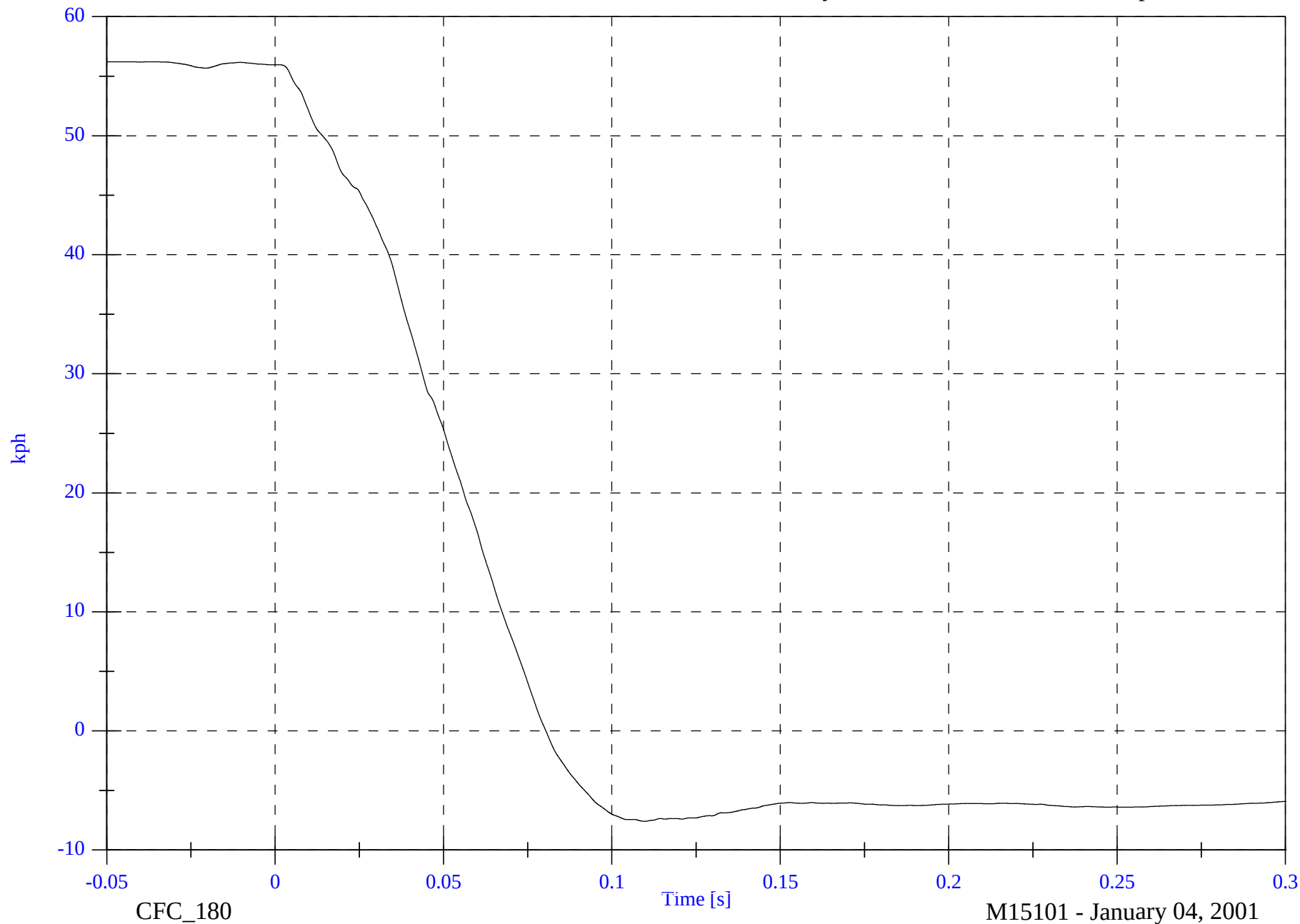


NCAP Test 12 - 2001 Toyota Avalon

Left Rear Red #8x Velocity

Max: 56.2 [kph] at -0.043 [s]

Min: -7.6 [kph] at 0.110 [s]



B-122

8602-12

CFC_180

Time [s]

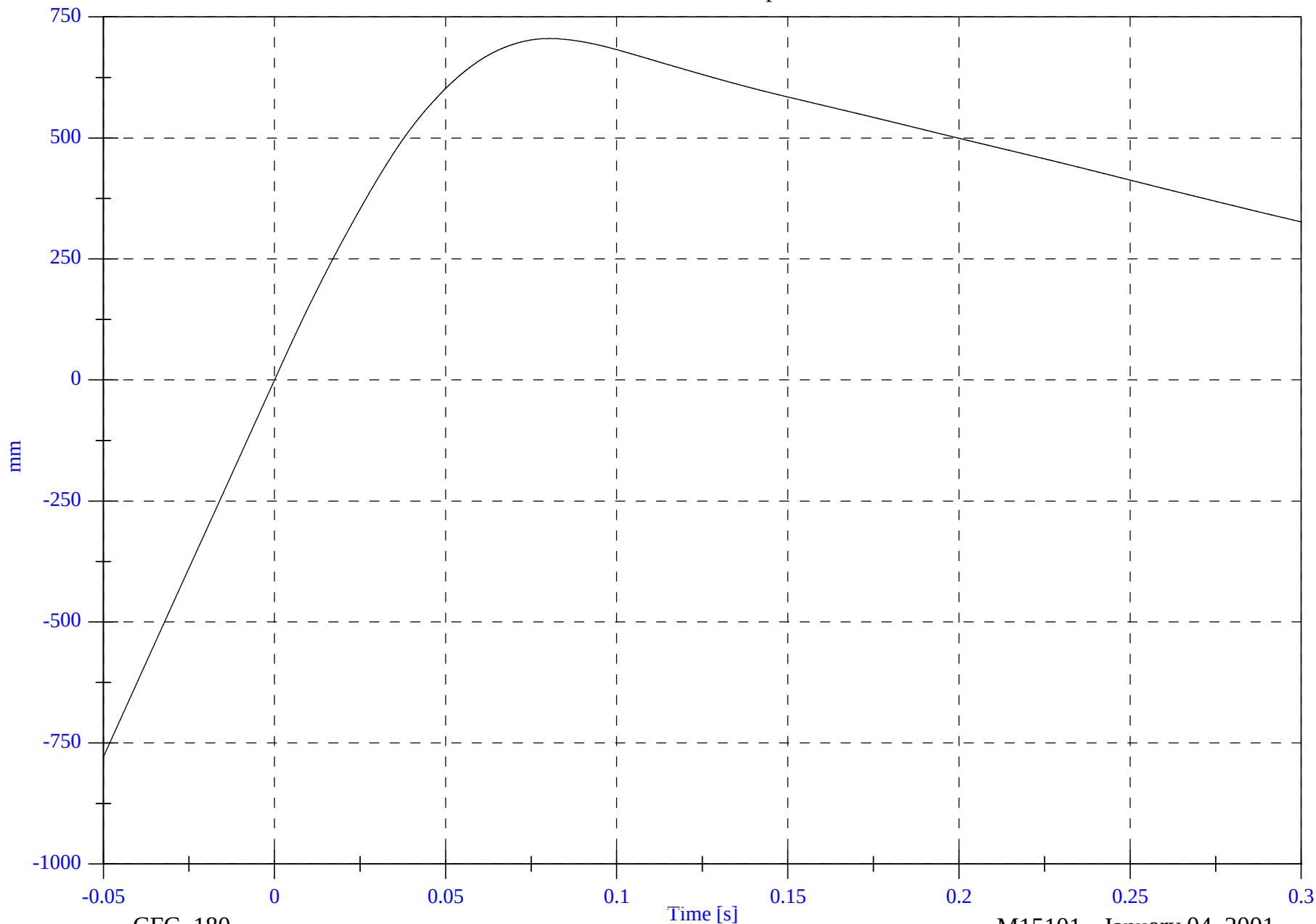
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Left Rear Red #8x Displacement

Max: 705.4 [mm] at 0.080 [s]

Min: -778.7 [mm] at -0.050 [s]



B-123

8602-12

CFC_180

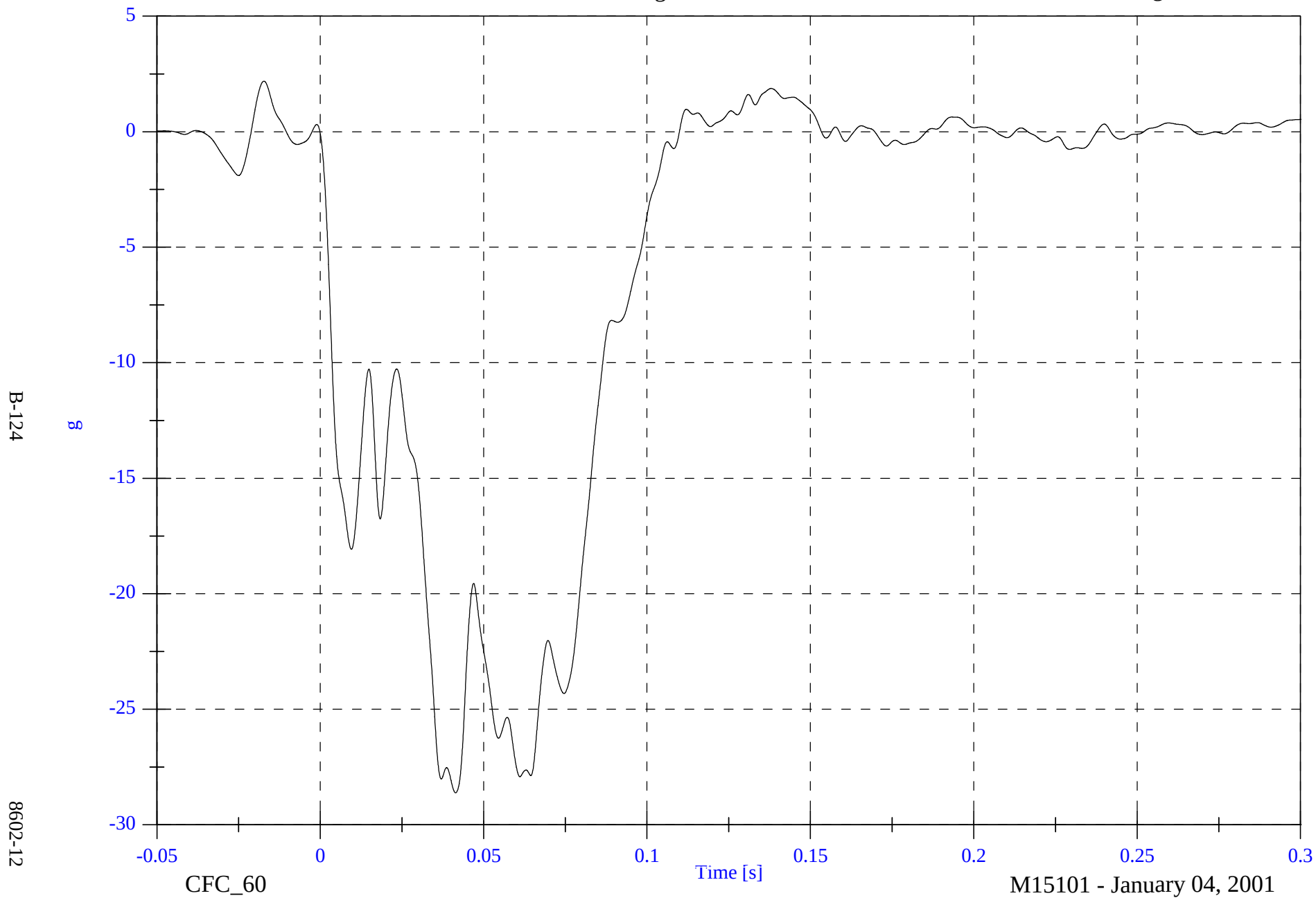
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Right Rear Red #9x

Max: 2.2 [g] at -0.017 [s]

Min: -28.6 [g] at 0.041 [s]

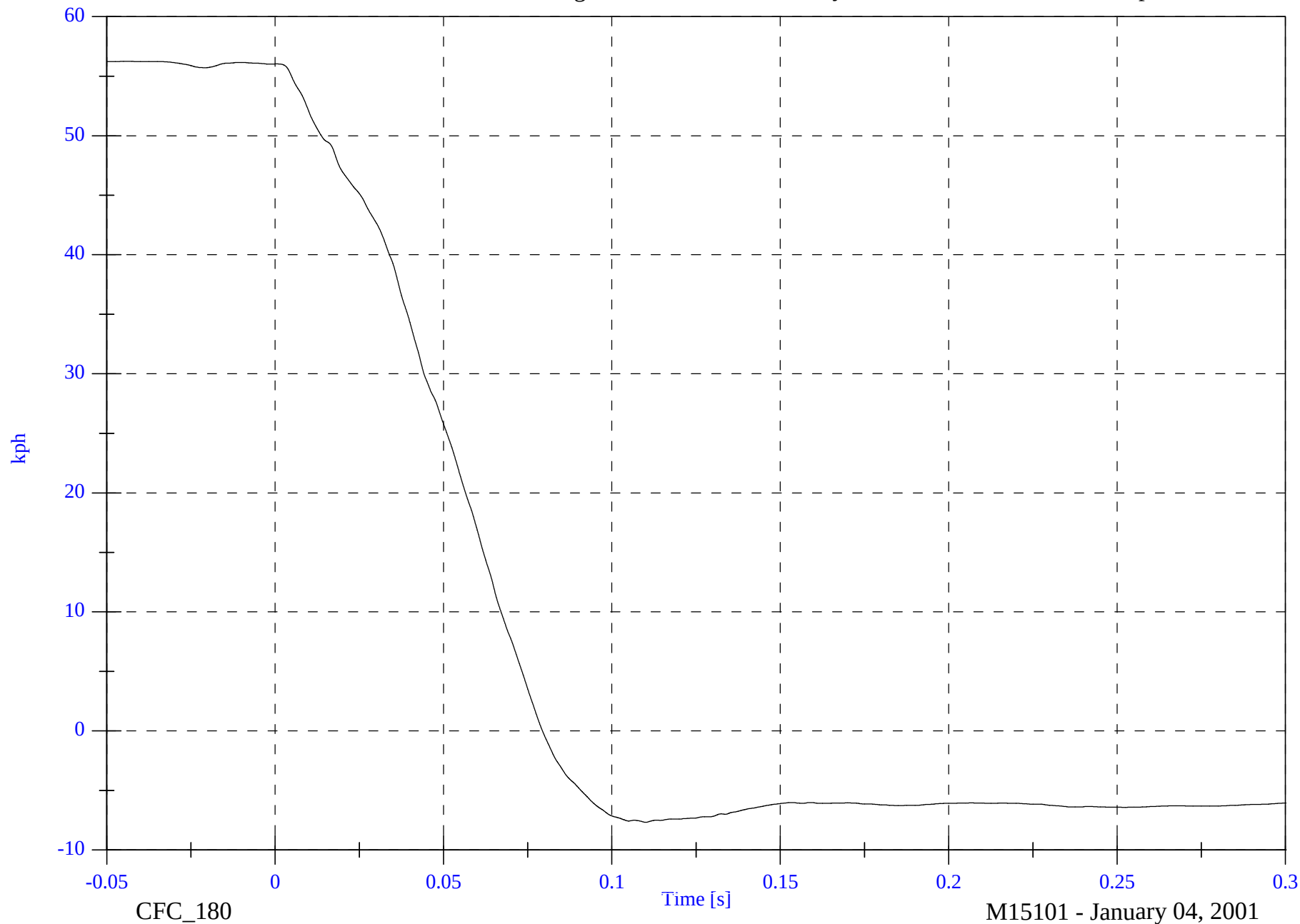


NCAP Test 12 - 2001 Toyota Avalon

Right Rear Red #9x Velocity

Max: 56.2 [kph] at -0.043 [s]

Min: -7.7 [kph] at 0.110 [s]



B-125

8602-12

CFC_180

Time [s]

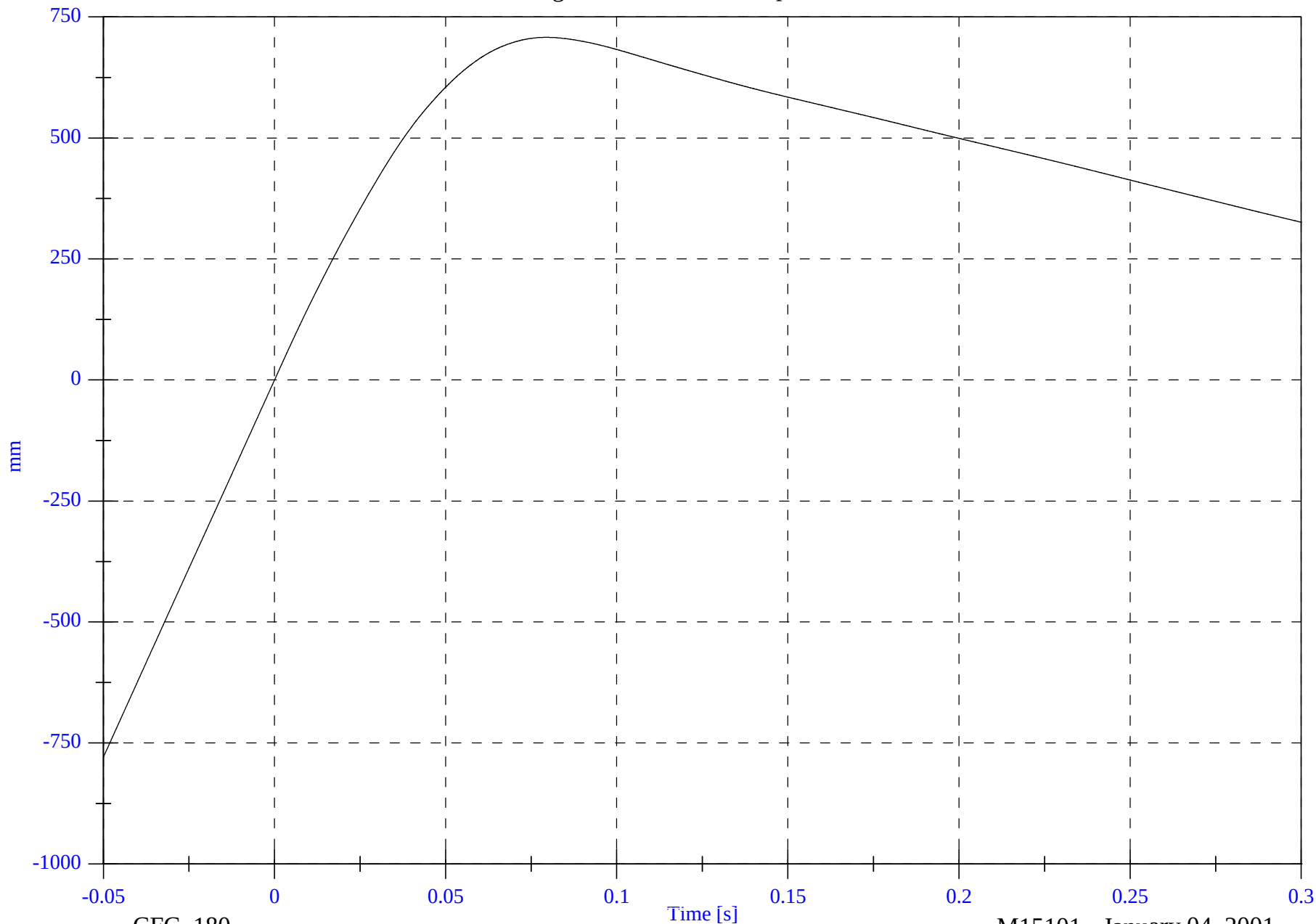
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Right Rear Red #9x Displacement

Max: 707.9 [mm] at 0.079 [s]

Min: -779.0 [mm] at -0.050 [s]



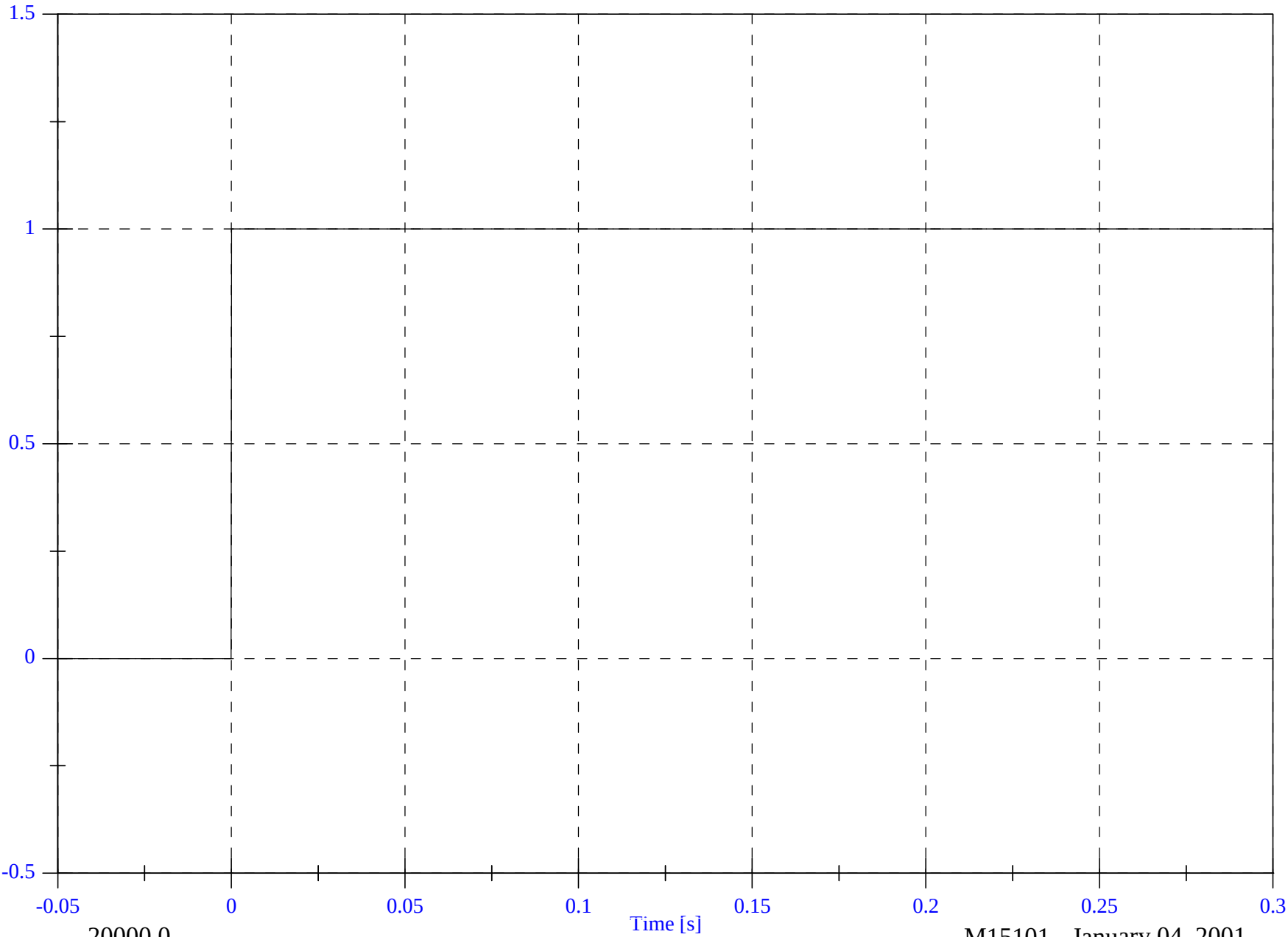
B-126

8602-12

CFC_180

M15101 - January 04, 2001

Contact Time

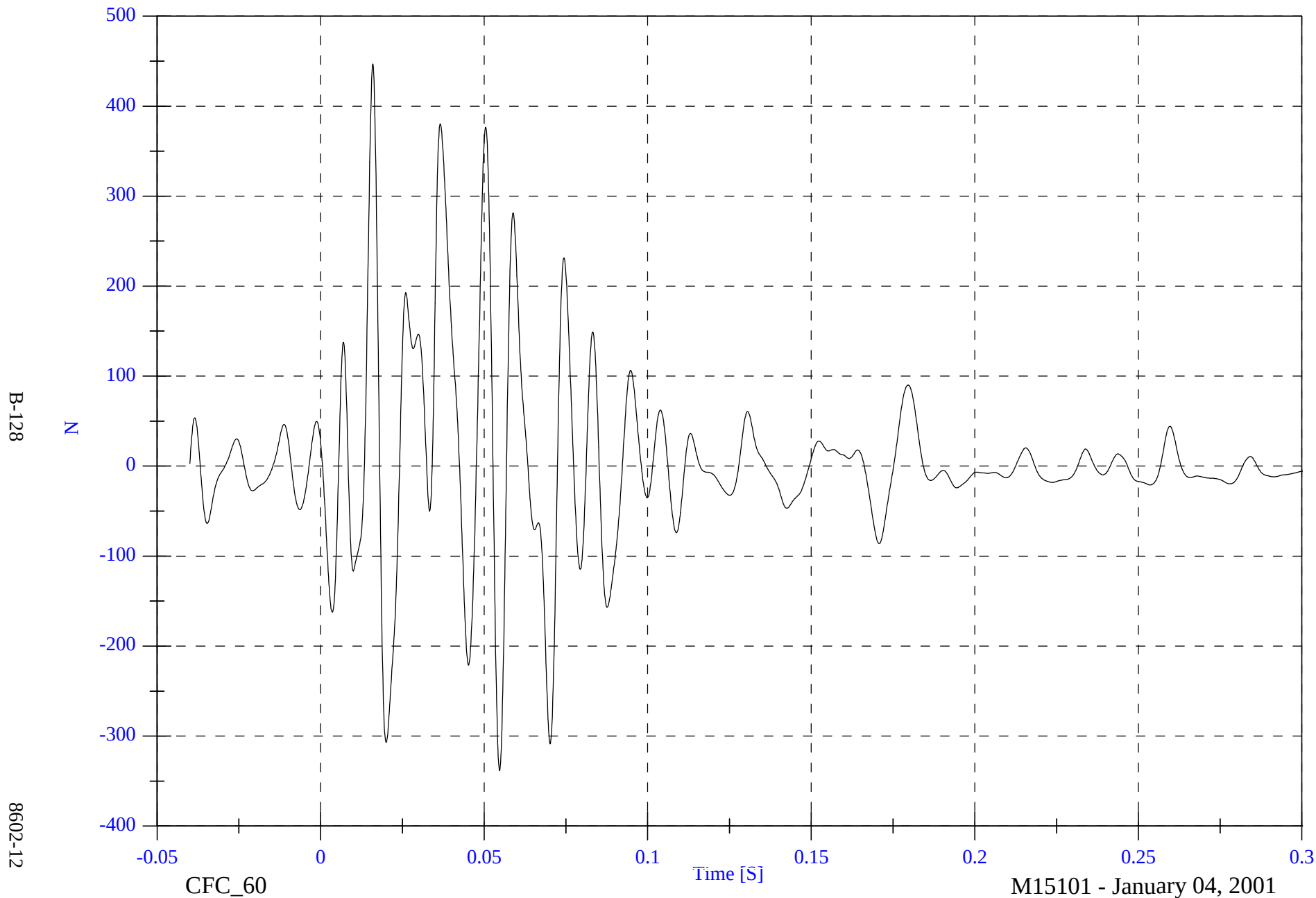


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A1 Fx

Max: 447.1 [N] at 0.016 [S]

Min: -338.4 [N] at 0.055 [S]

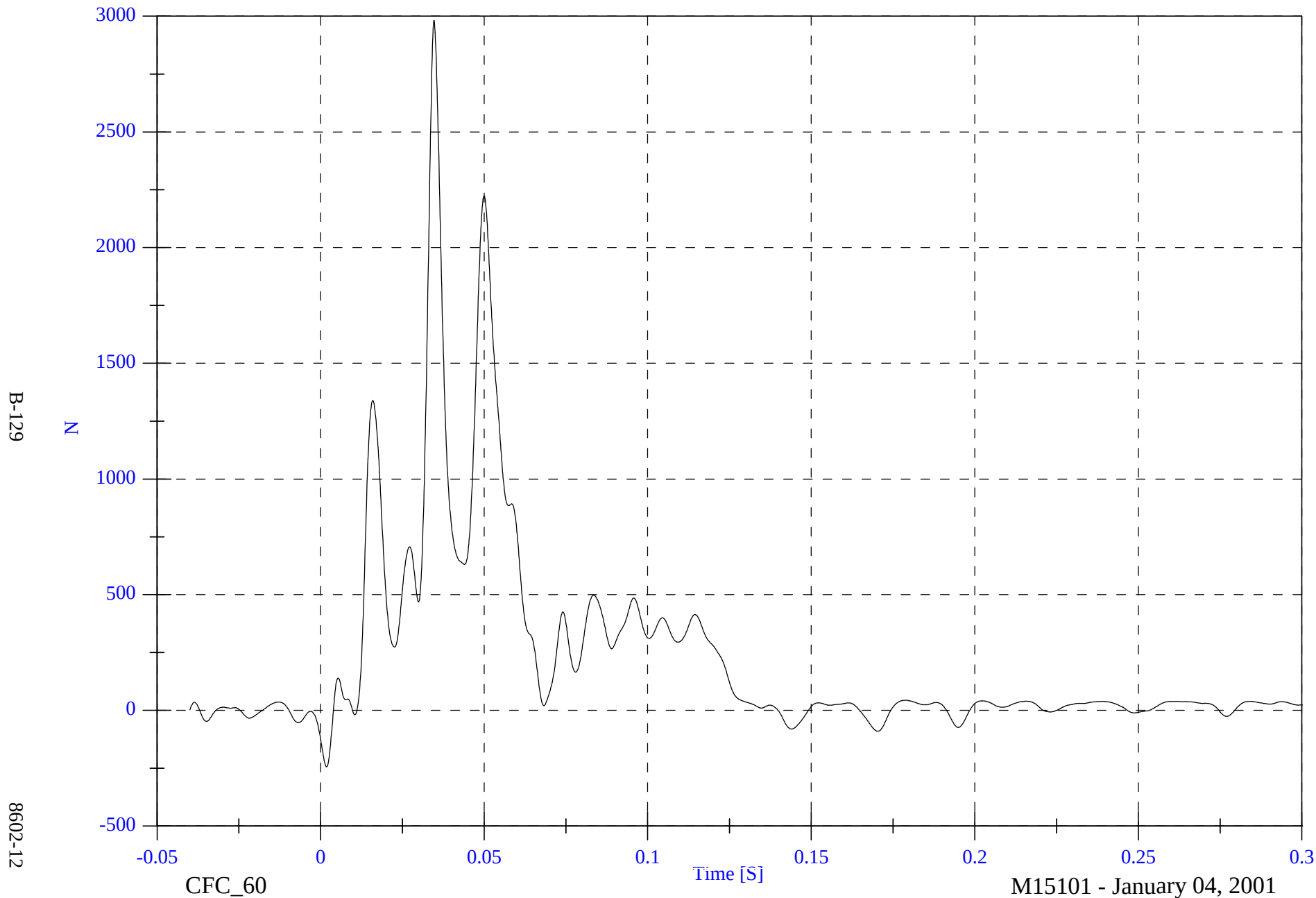


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A2 Fx

Max: 2981.5 [N] at 0.035 [S]

Min: -244.4 [N] at 0.002 [S]

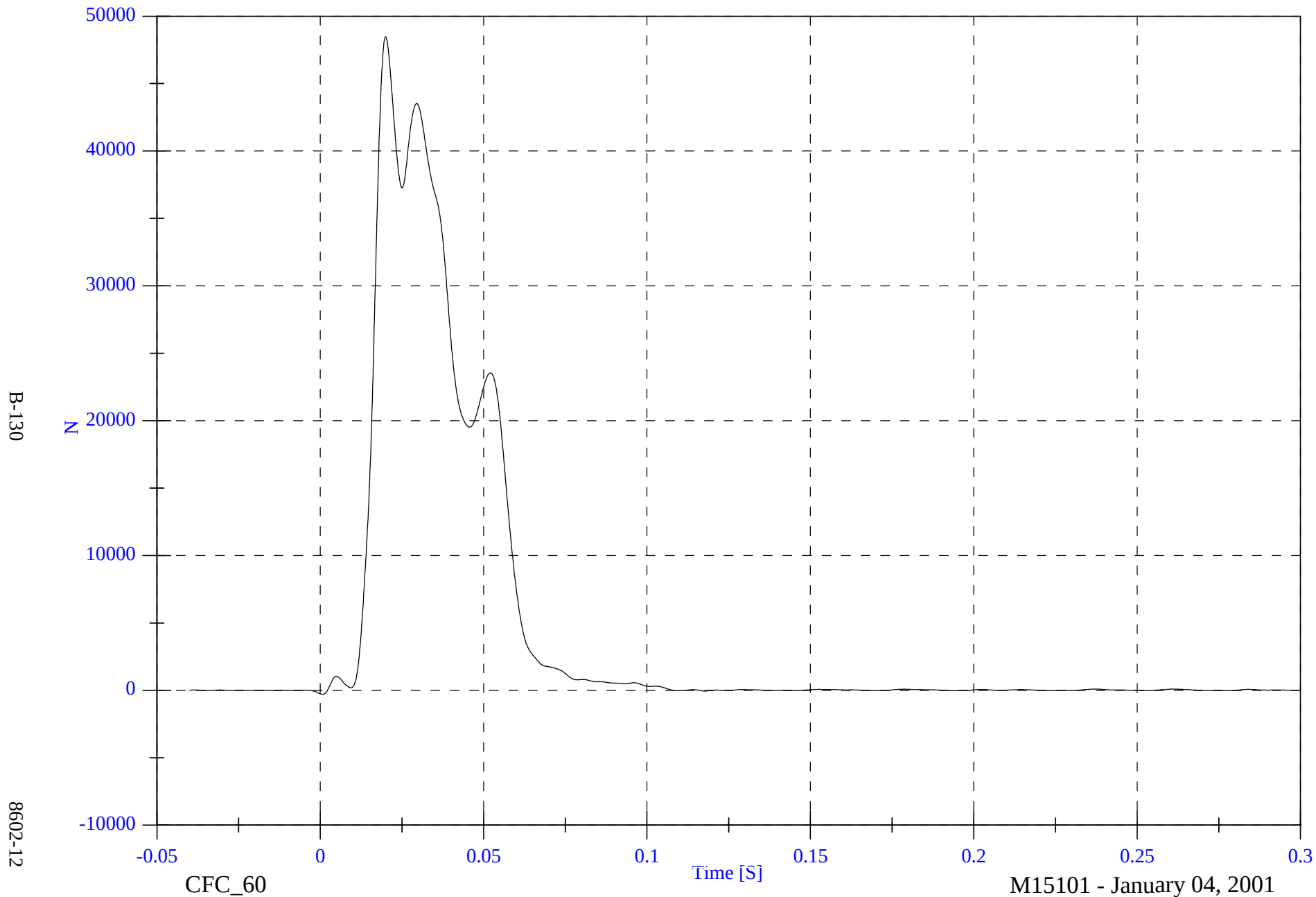


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A3 Fx

Max: 48476.0 [N] at 0.020 [S]

Min: -294.0 [N] at 0.001 [S]

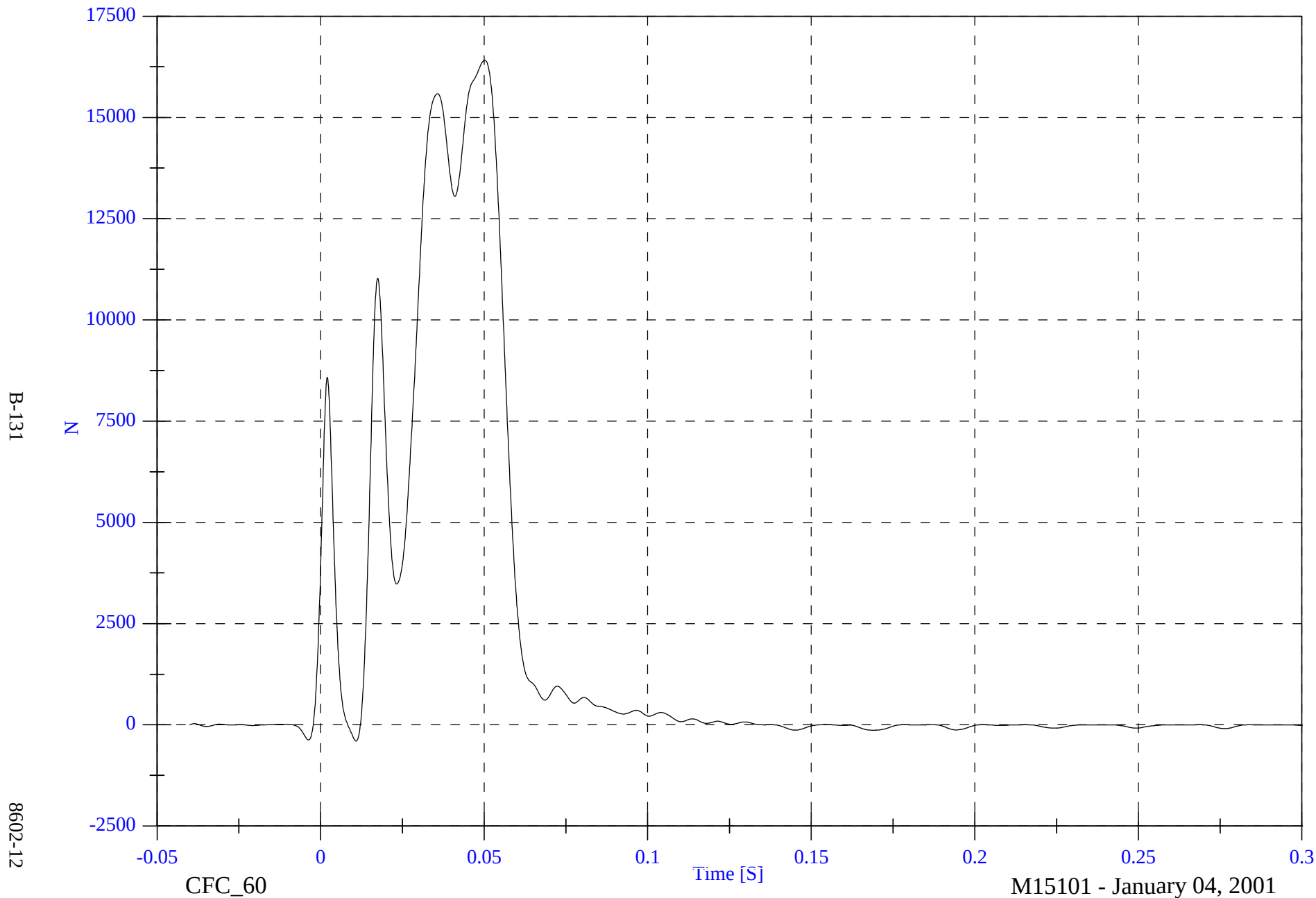


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A4 Fx

Max: 16411.9 [N] at 0.050 [S]

Min: -401.1 [N] at 0.011 [S]

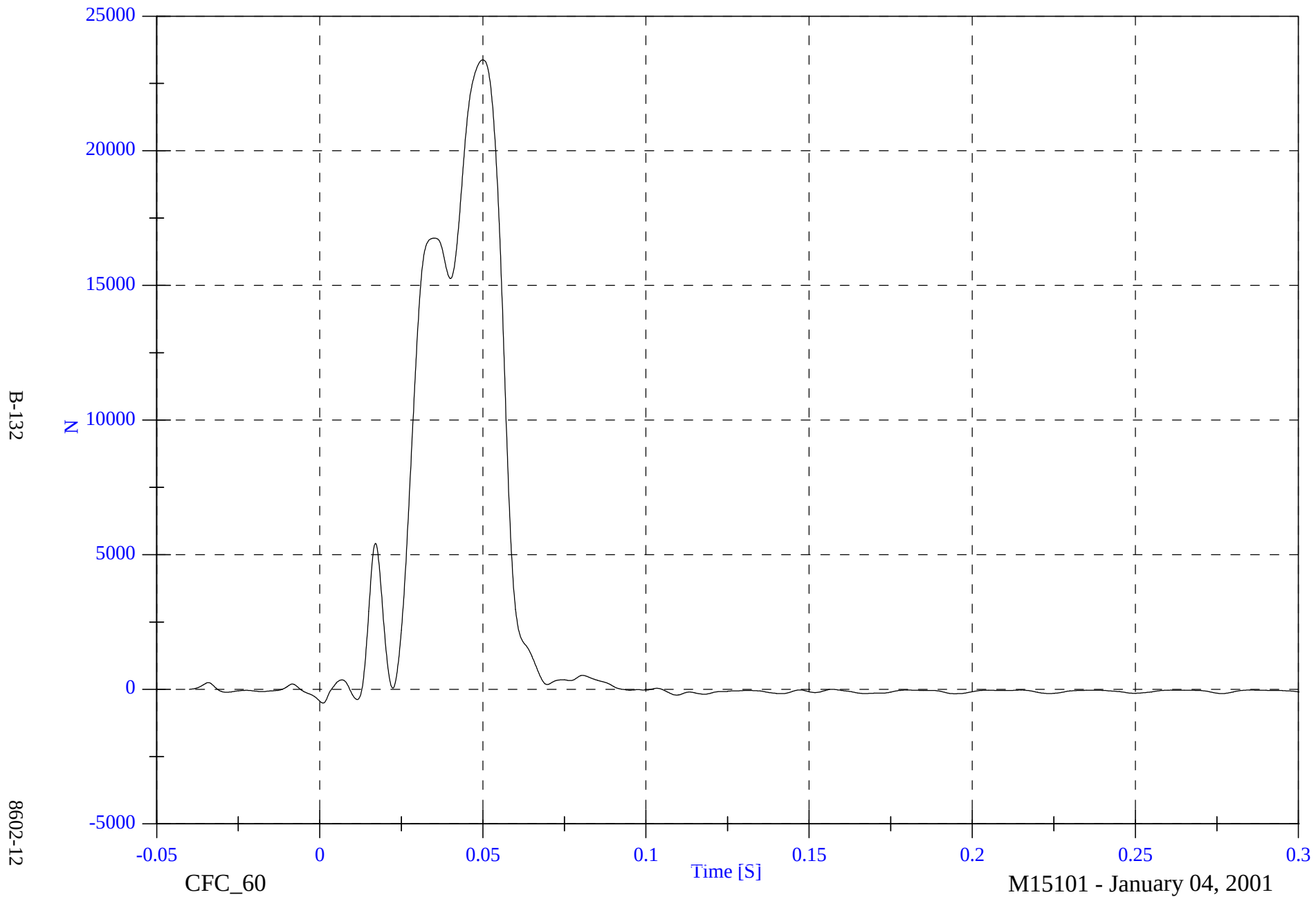


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A5 Fx

Max: 23376.0 [N] at 0.050 [S]

Min: -514.0 [N] at 0.001 [S]

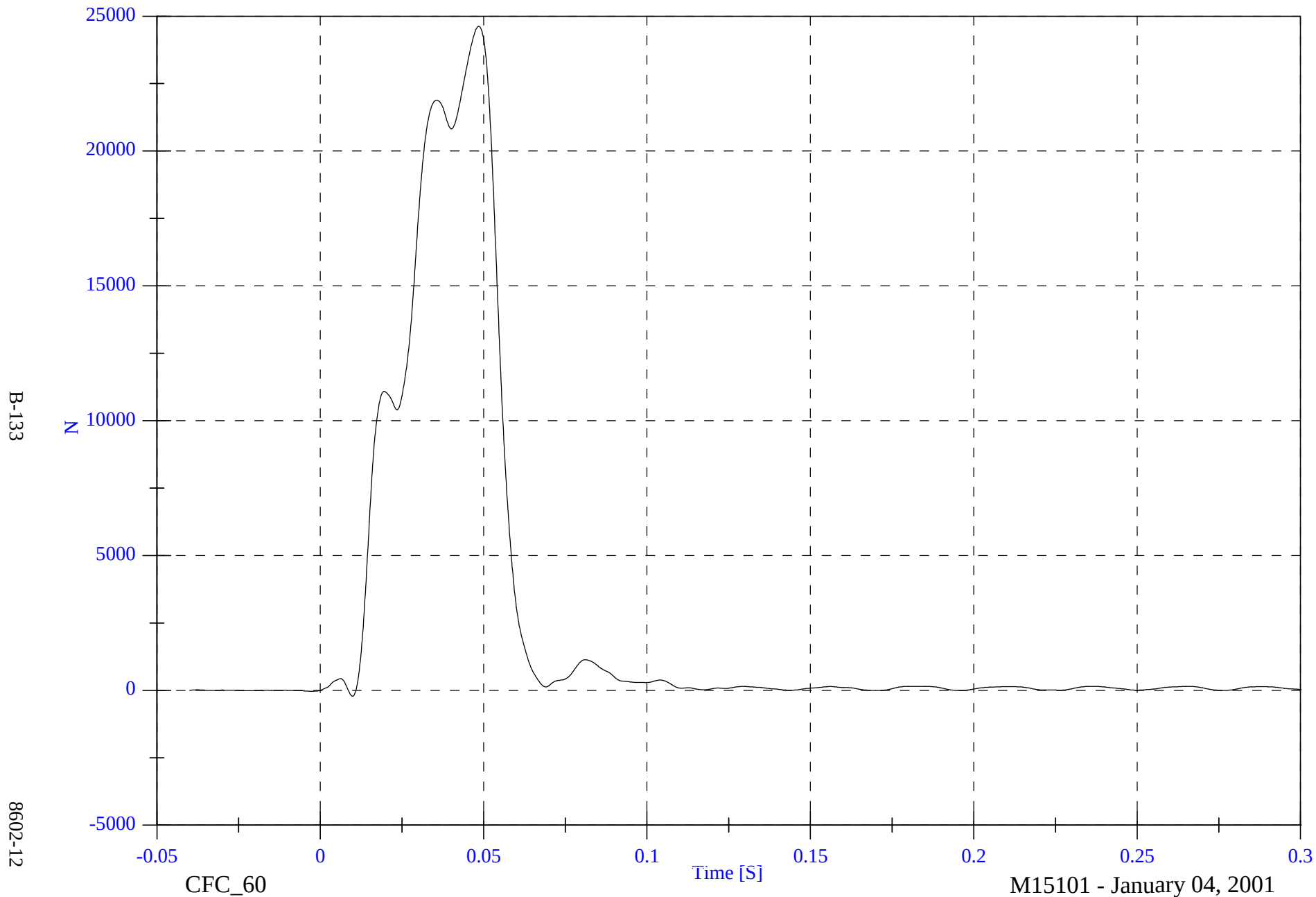


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A6 Fx

Max: 24626.4 [N] at 0.048 [S]

Min: -221.3 [N] at 0.010 [S]

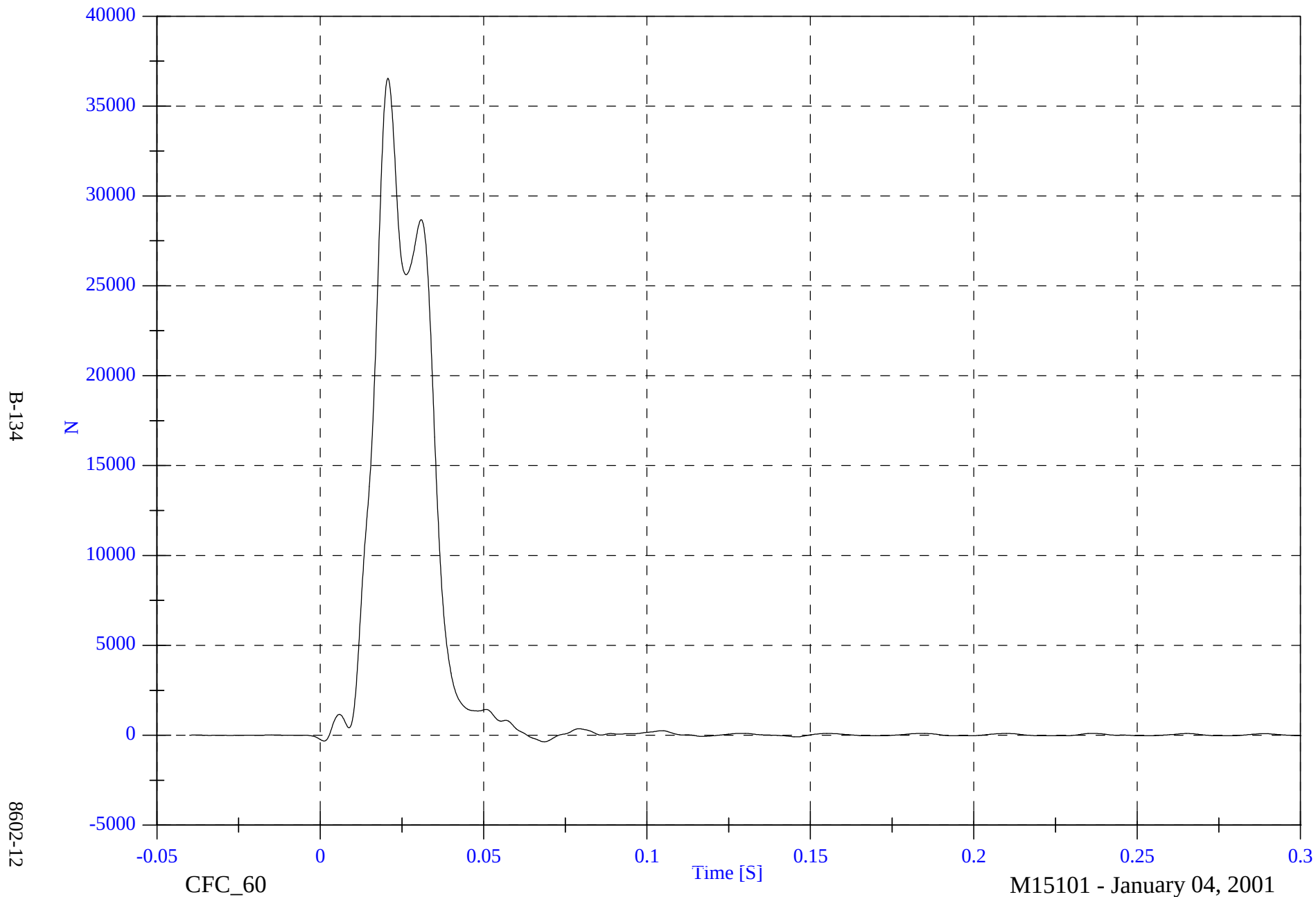


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A7 Fx

Max: 36547.8 [N] at 0.021 [S]

Min: -367.8 [N] at 0.068 [S]

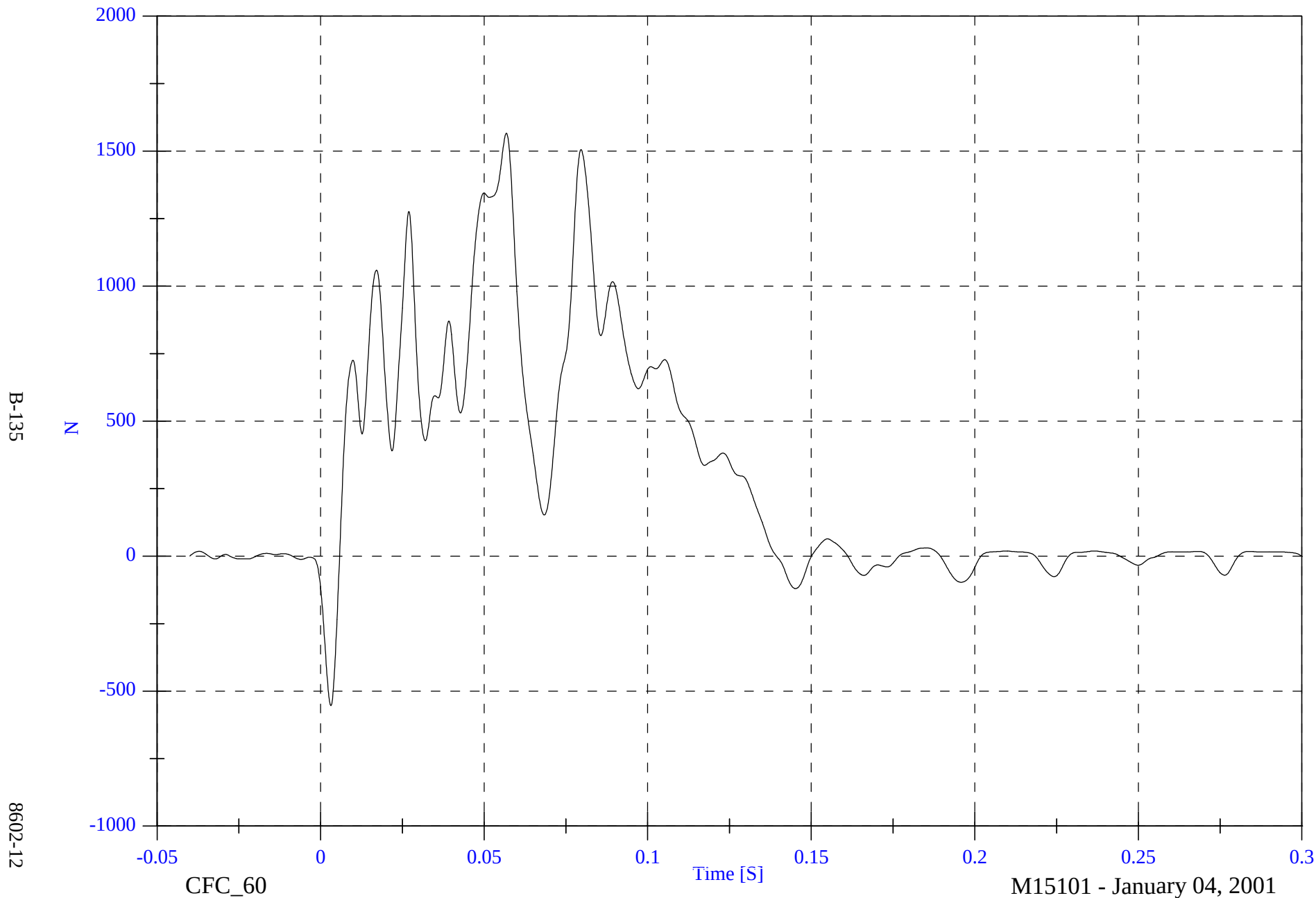


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A8 Fx

Max: 1566.7 [N] at 0.057 [S]

Min: -554.4 [N] at 0.003 [S]

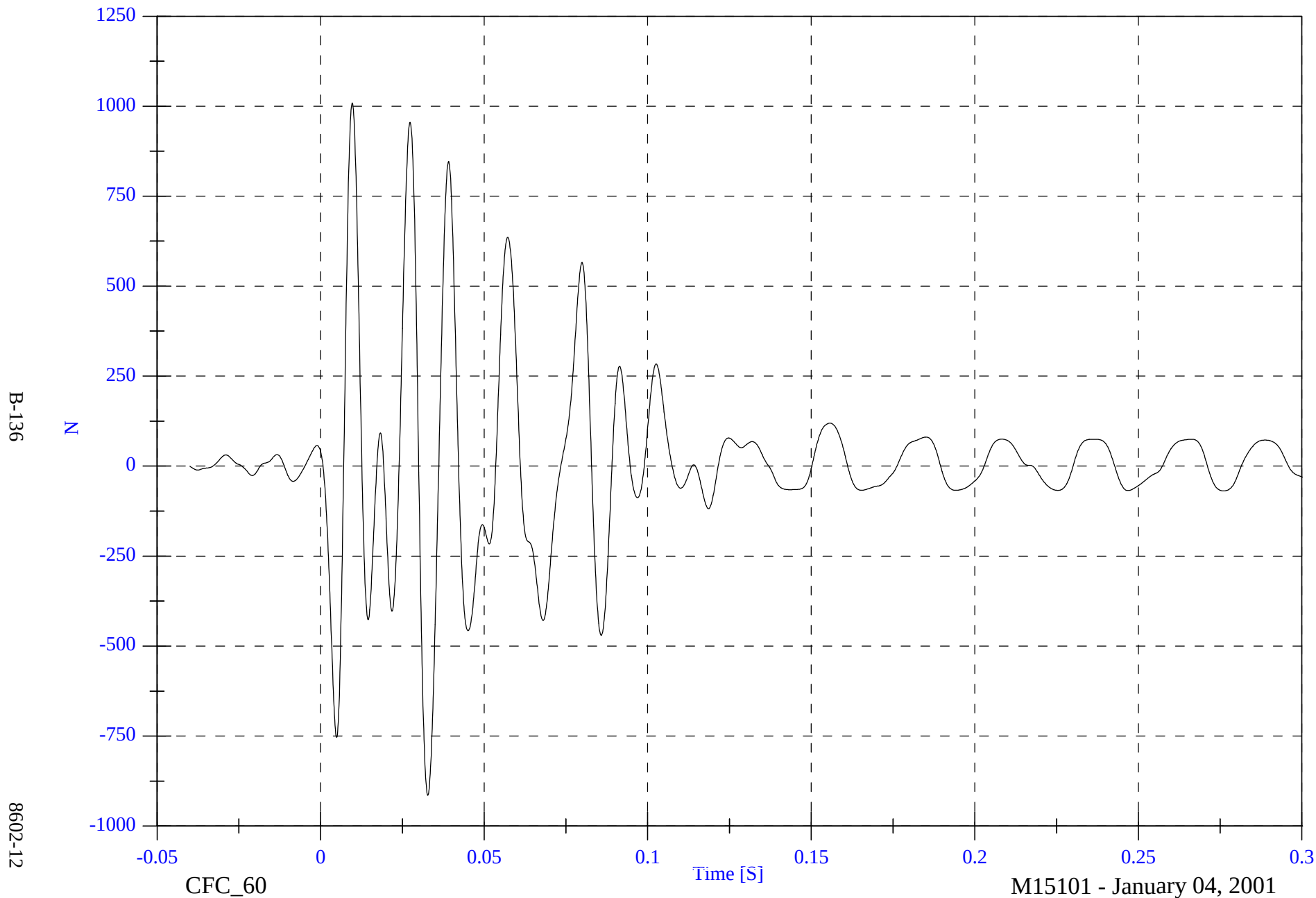


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell A9 Fx

Max: 1009.3 [N] at 0.010 [S]

Min: -914.8 [N] at 0.033 [S]

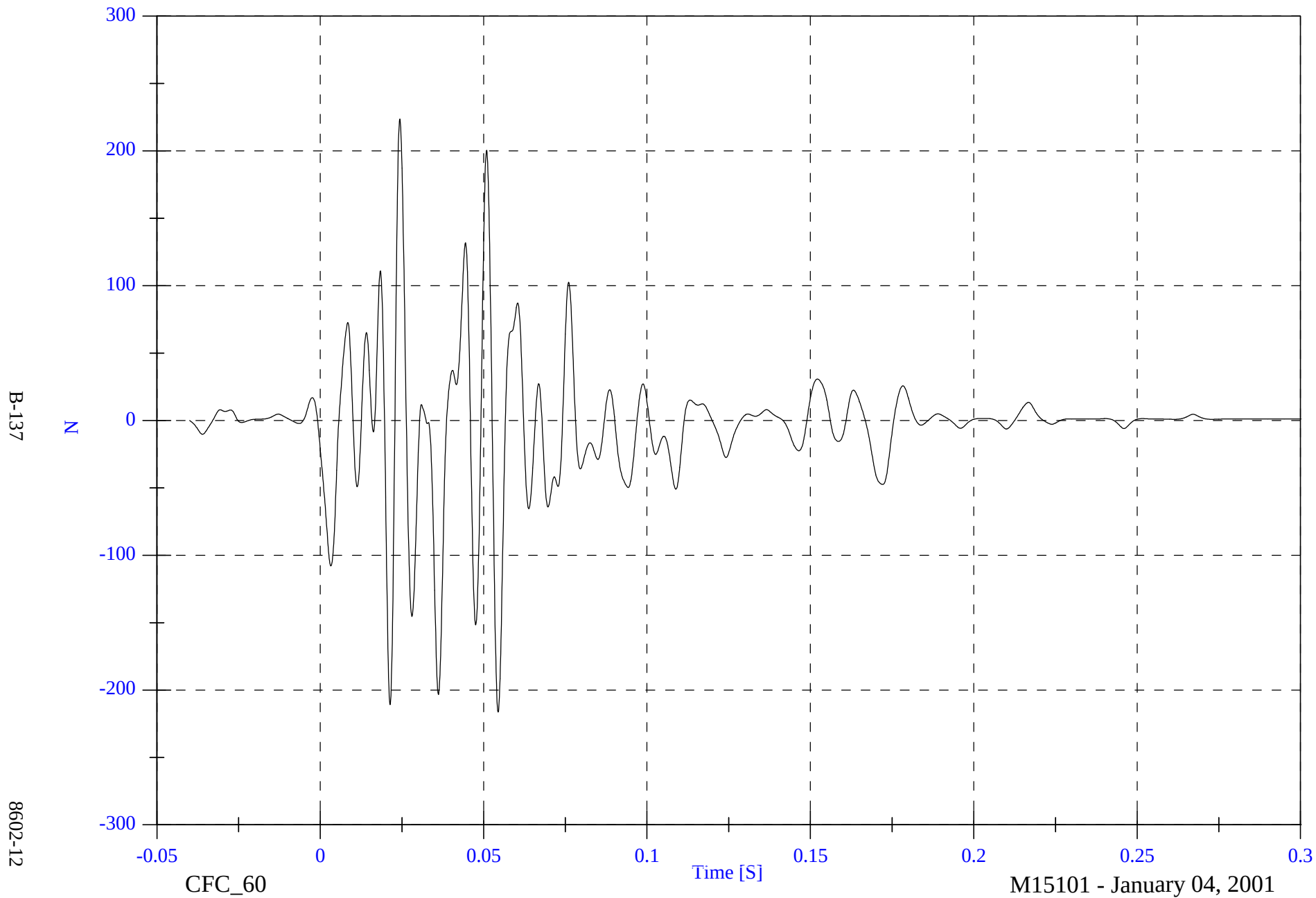


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B1 Fx

Max: 223.8 [N] at 0.024 [S]

Min: -216.4 [N] at 0.054 [S]

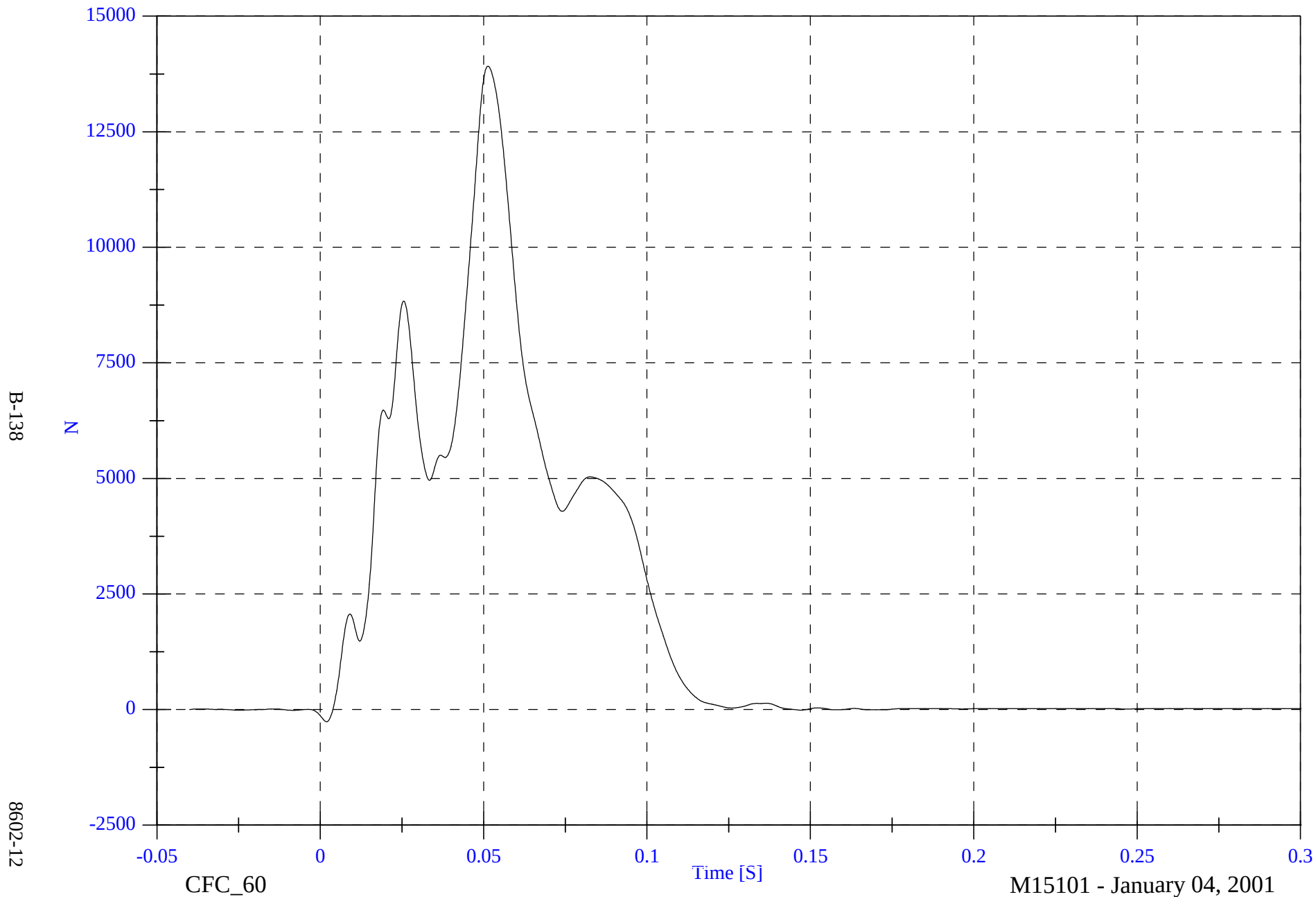


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B2 Fx

Max: 13920.0 [N] at 0.051 [S]

Min: -263.8 [N] at 0.002 [S]

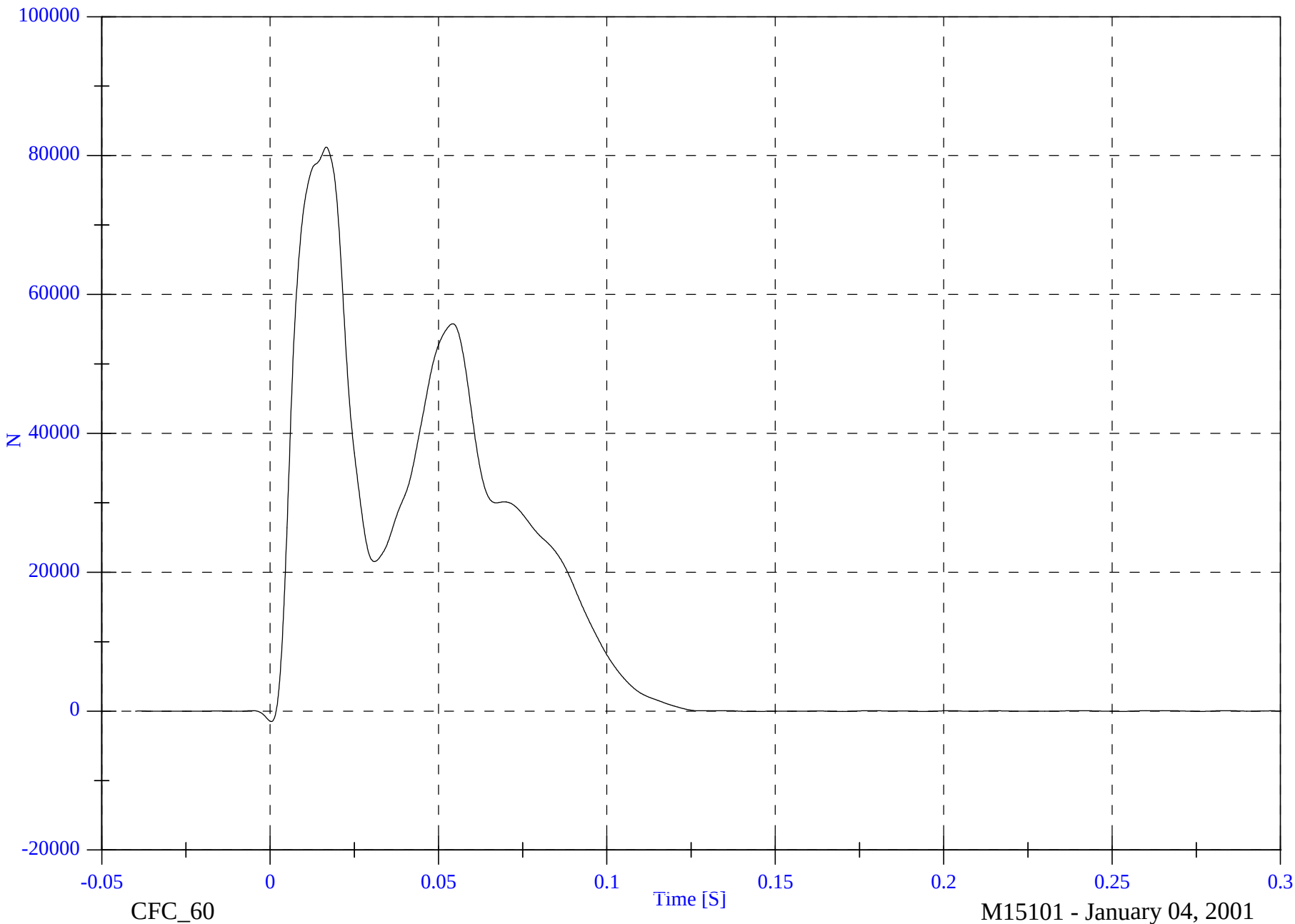


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B3 Fx

Max: 81217.6 [N] at 0.017 [S]

Min: -1508.1 [N] at 0.000 [S]



B-139

8602-12

CFC_60

Time [S]

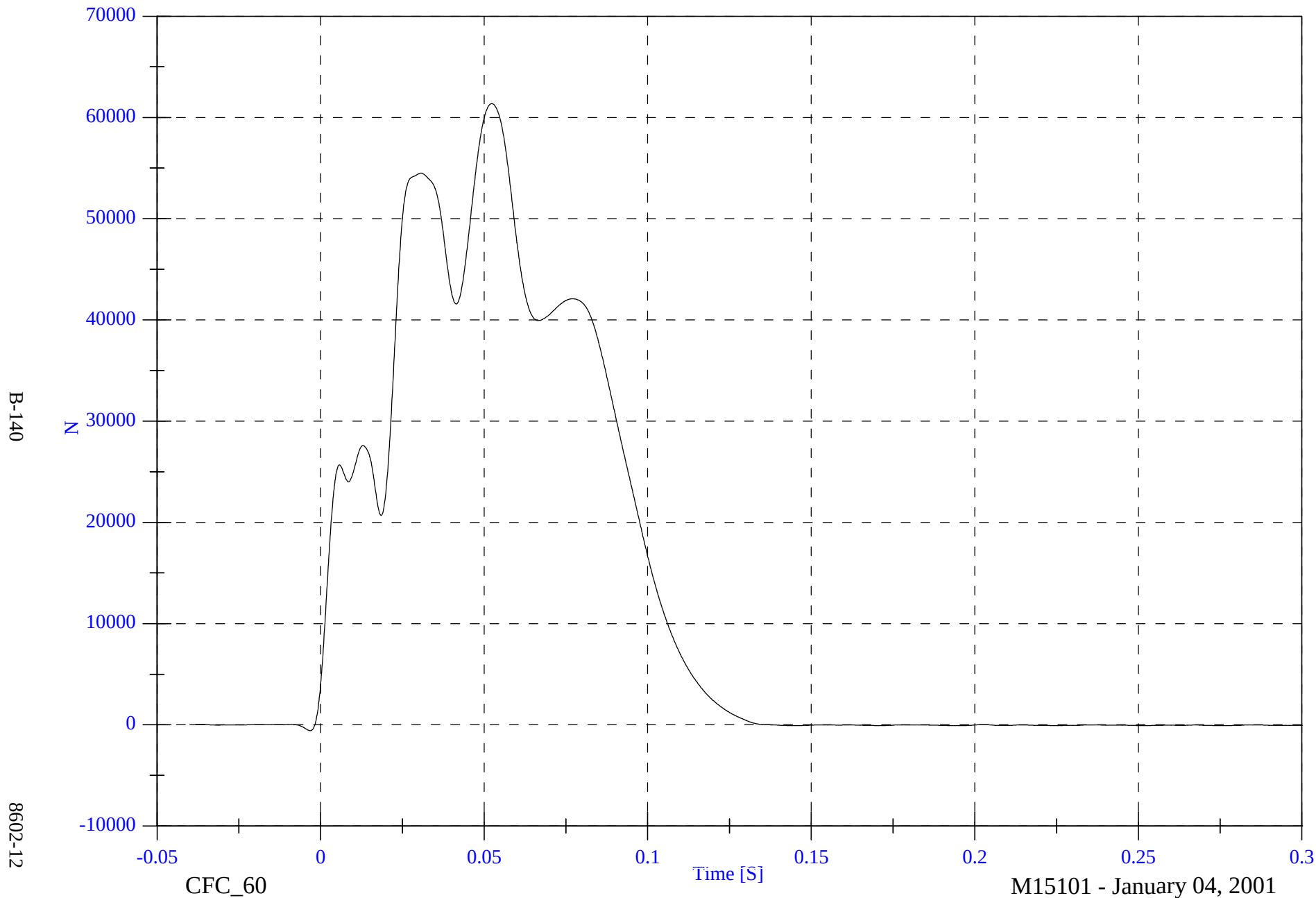
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B4 Fx

Max: 61364.8 [N] at 0.052 [S]

Min: -578.0 [N] at -0.003 [S]

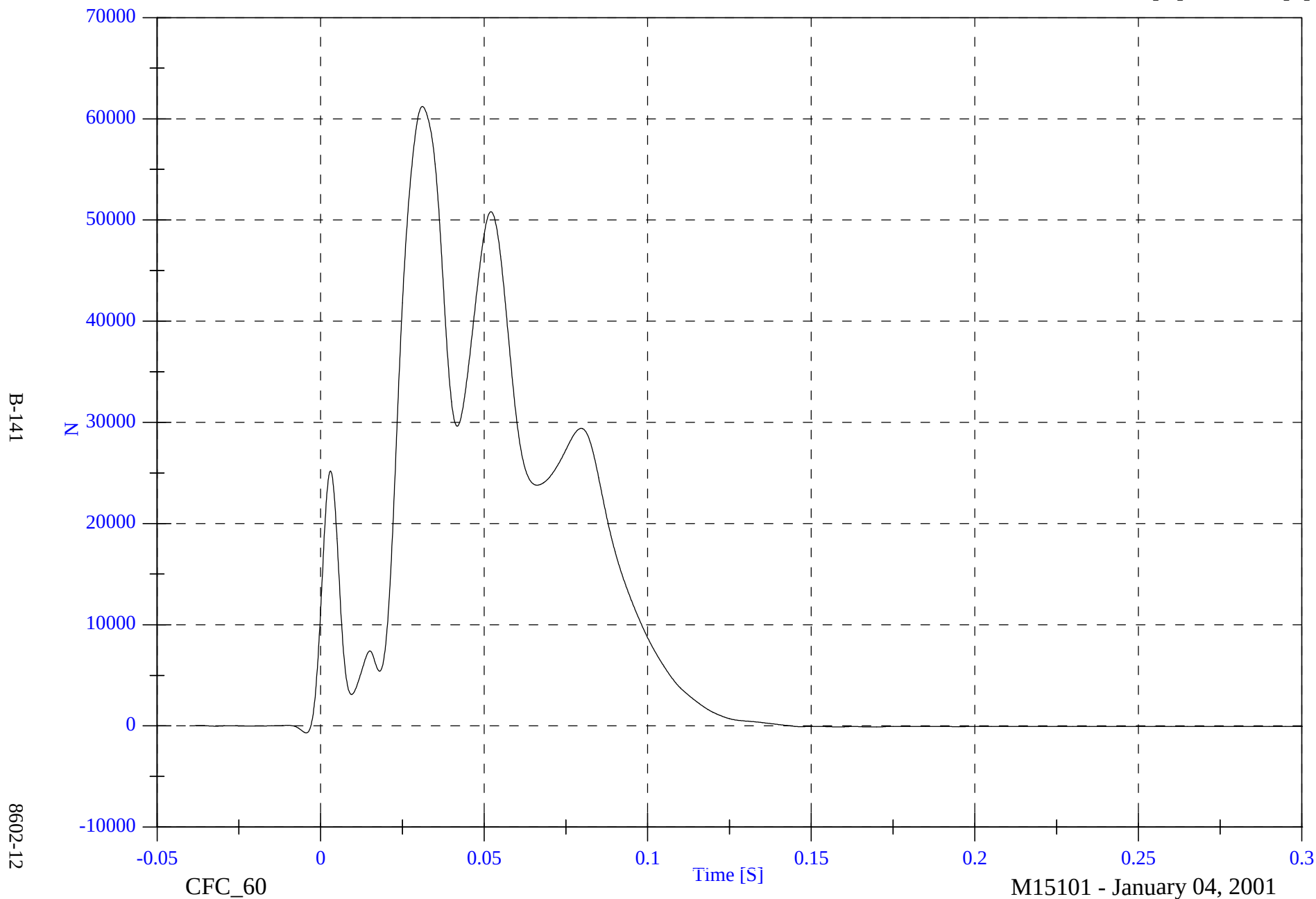


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B5 Fx

Max: 61223.3 [N] at 0.031 [S]

Min: -693.4 [N] at -0.004 [S]

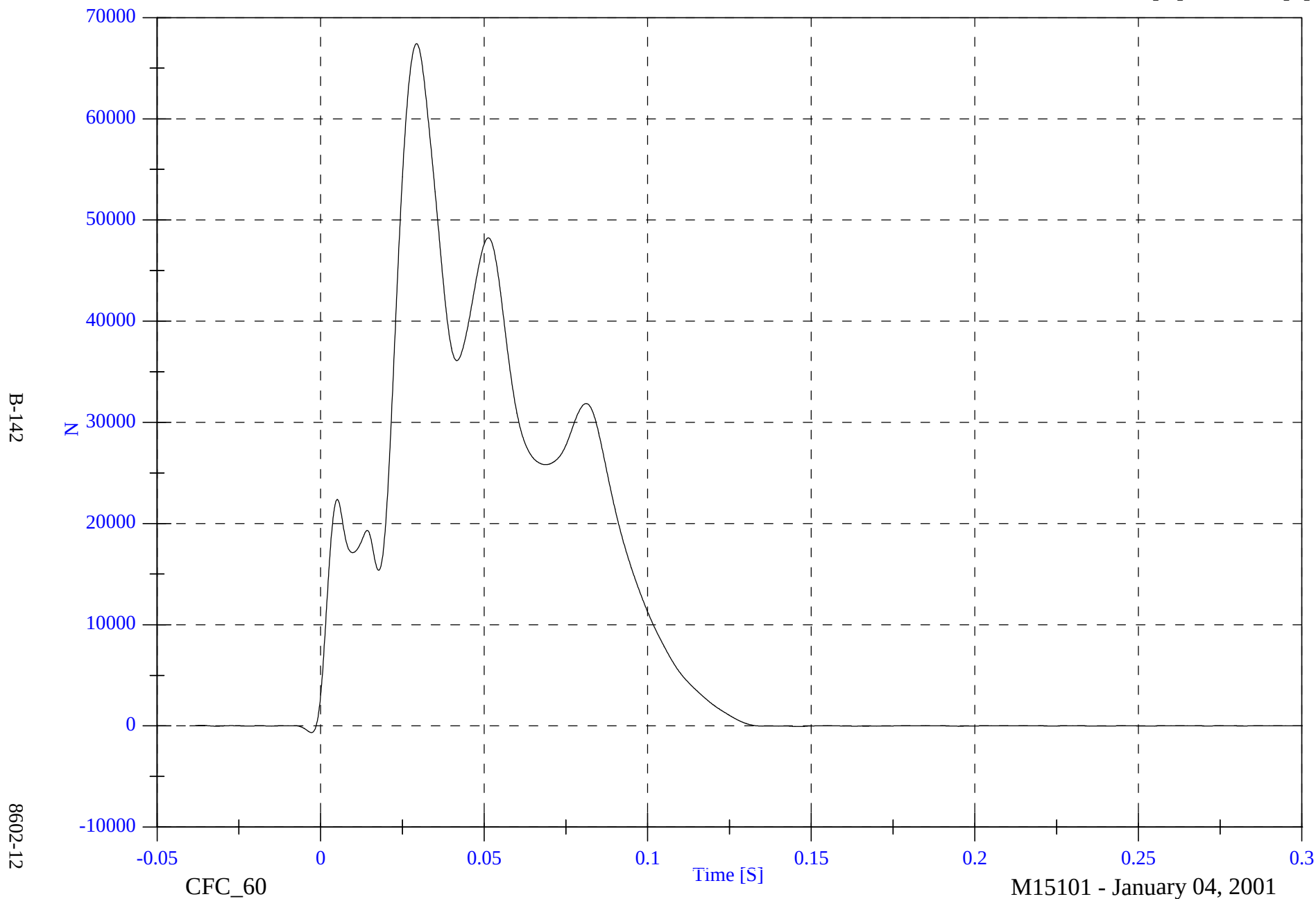


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B6 Fx

Max: 67425.8 [N] at 0.029 [S]

Min: -660.2 [N] at -0.003 [S]

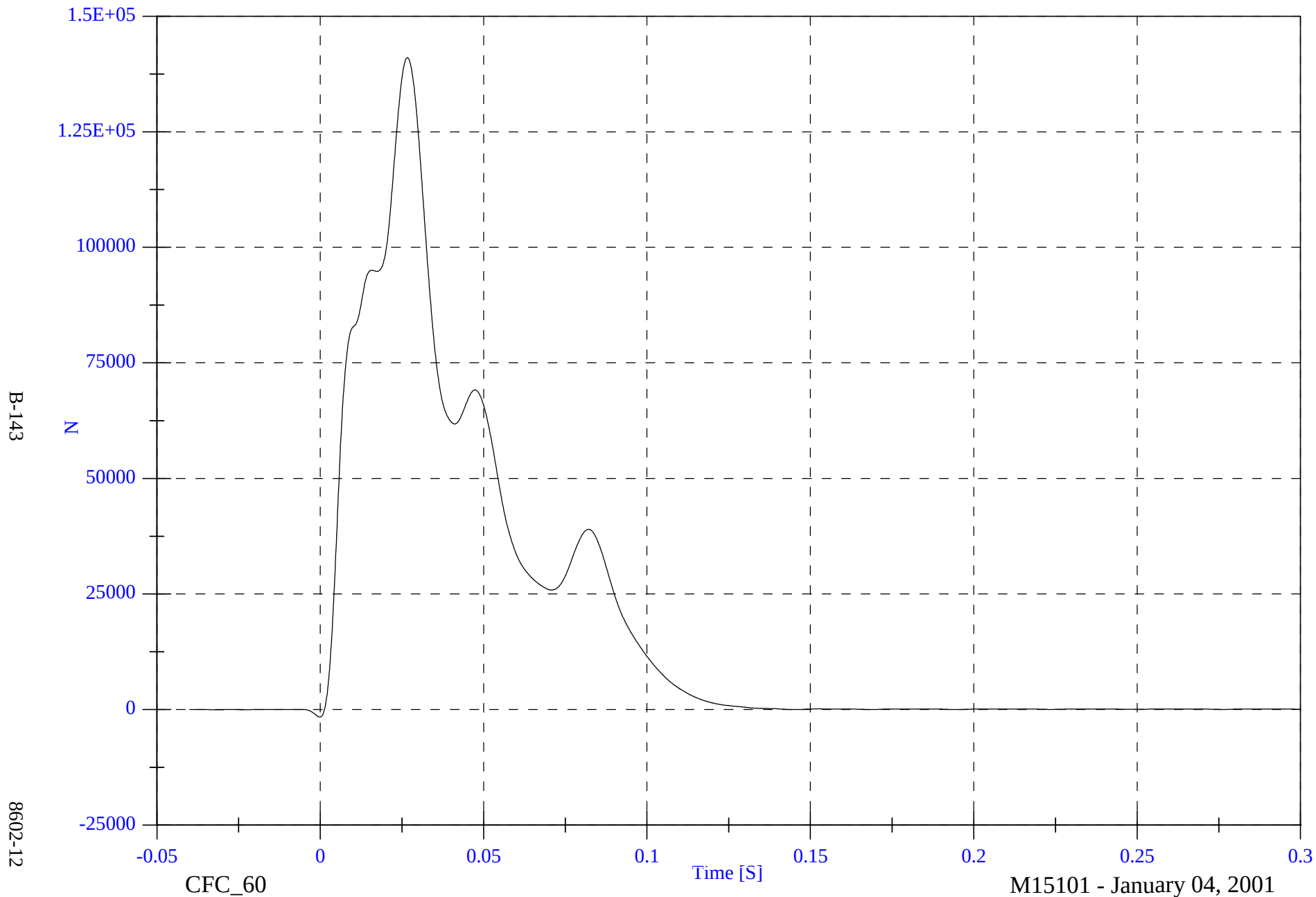


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B7 Fx

Max: 141037.1 [N] at 0.027 [S]

Min: -1607.3 [N] at -0.000 [S]

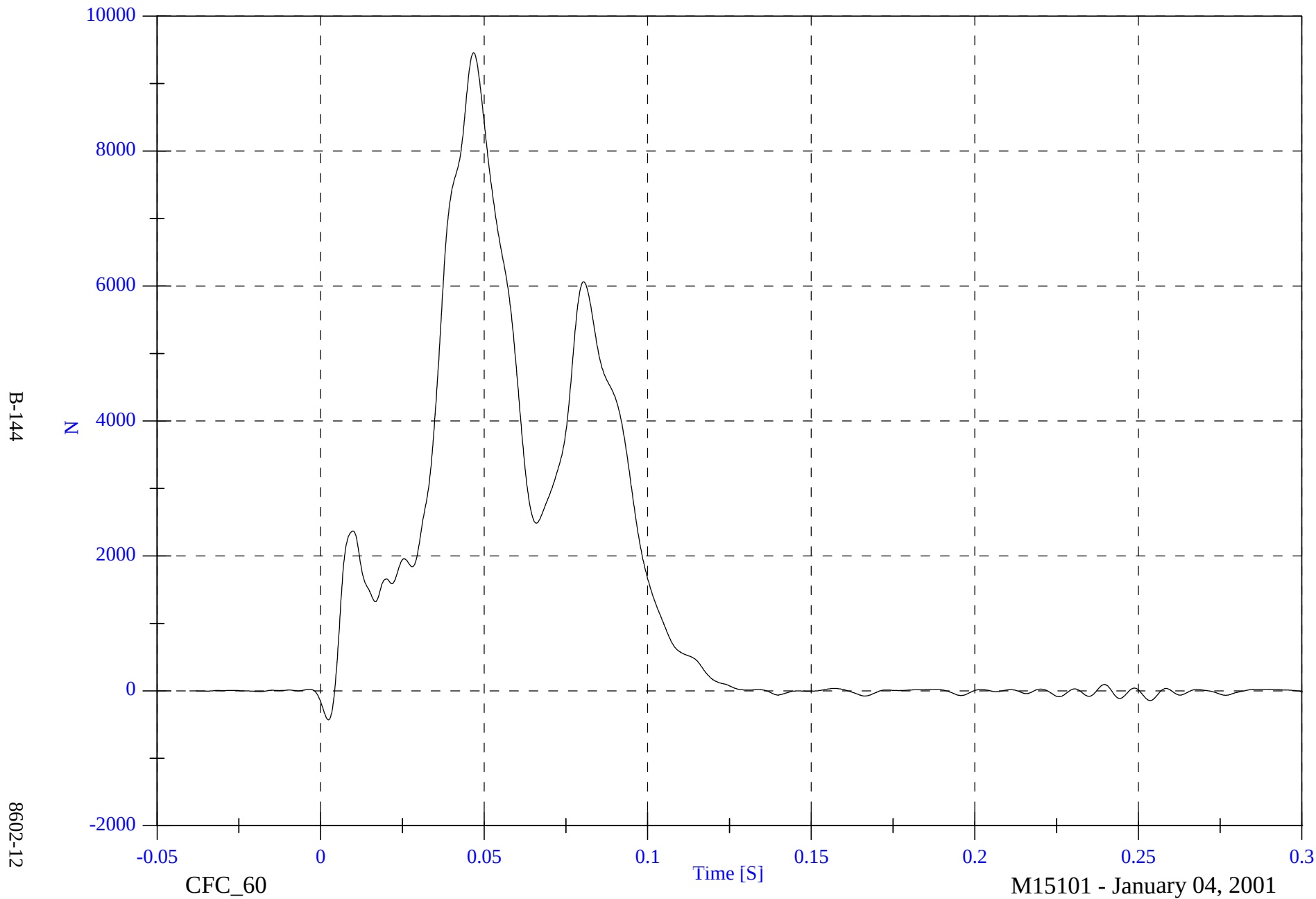


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B8 Fx

Max: 9458.1 [N] at 0.047 [S]

Min: -431.9 [N] at 0.002 [S]

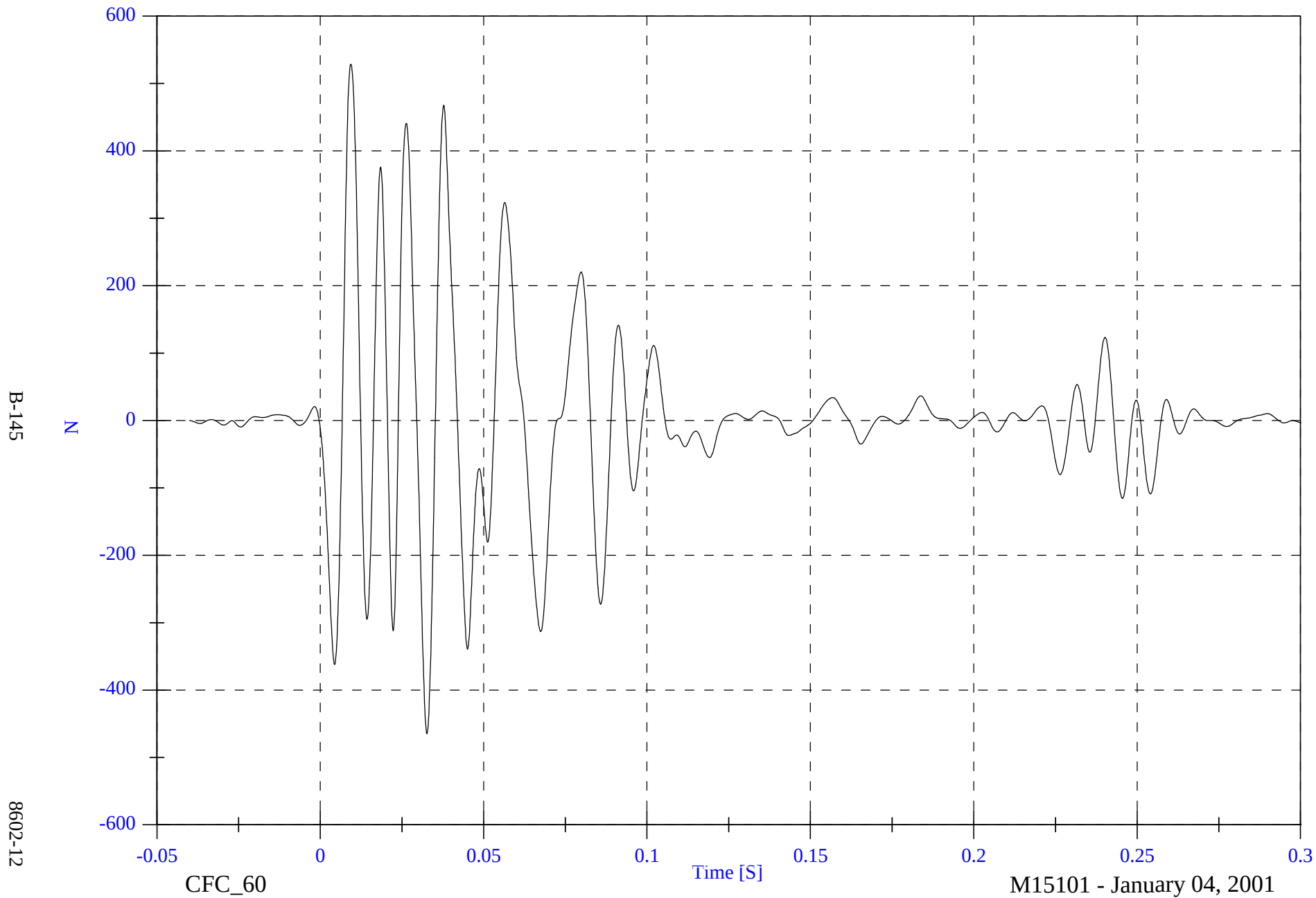


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell B9 Fx

Max: 528.9 [N] at 0.009 [S]

Min: -465.1 [N] at 0.033 [S]



NCAP Test 12 - 2001 Toyota Avalon

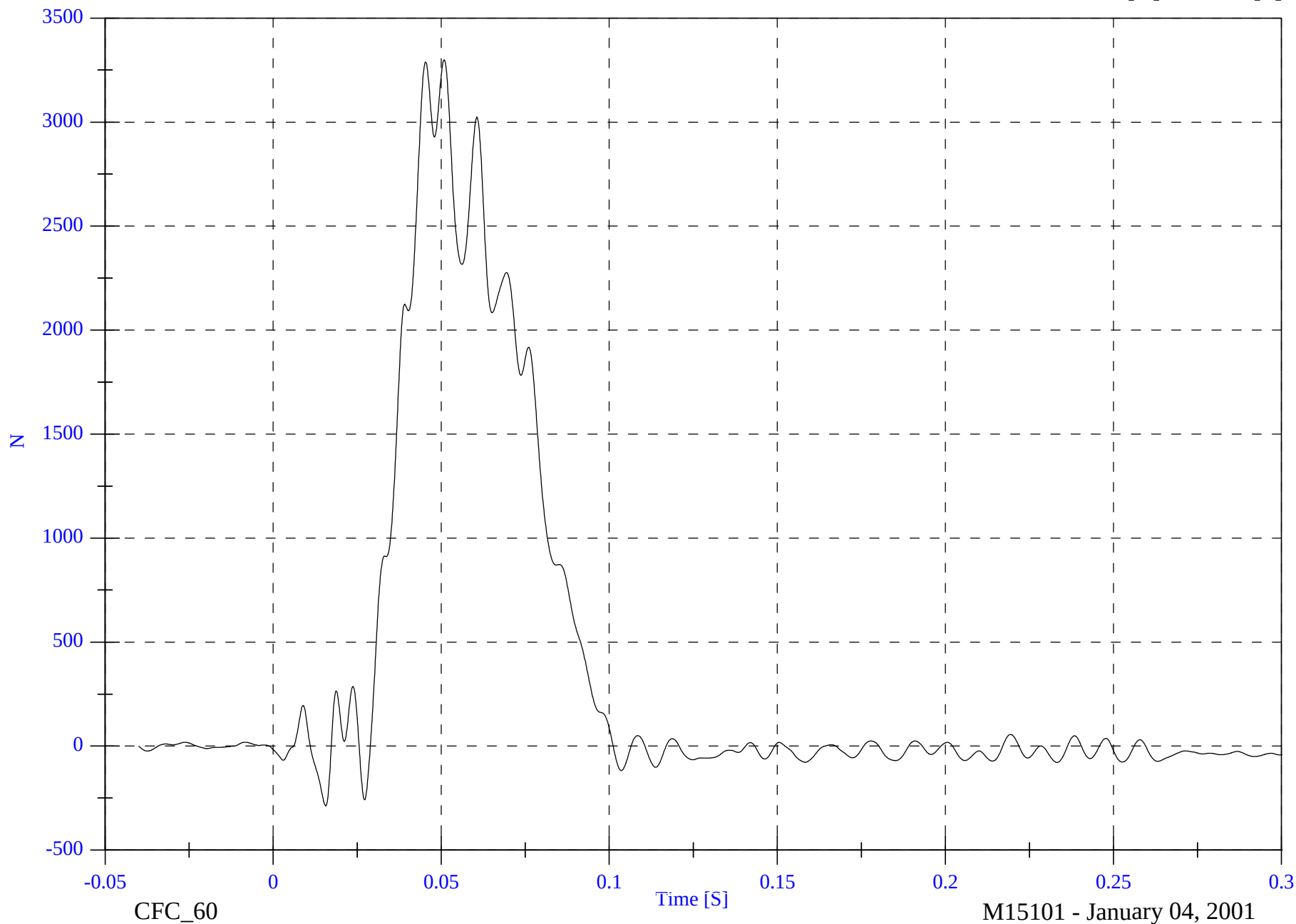
Barrier Load Cell C1 Fx

Max: 3299.3 [N] at 0.051 [S]

Min: -287.6 [N] at 0.016 [S]

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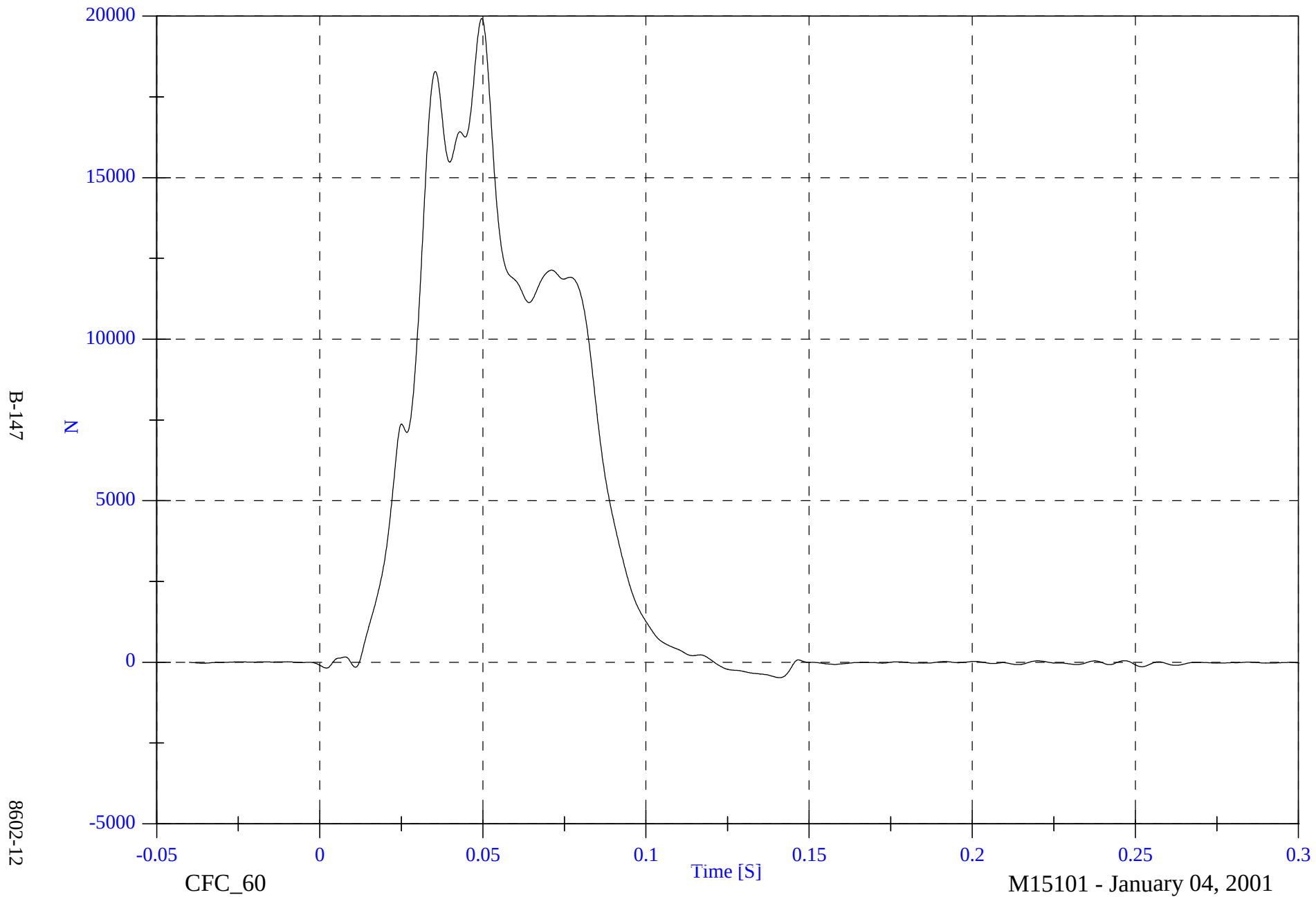


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C2 Fx

Max: 19928.6 [N] at 0.050 [S]

Min: -476.3 [N] at 0.141 [S]

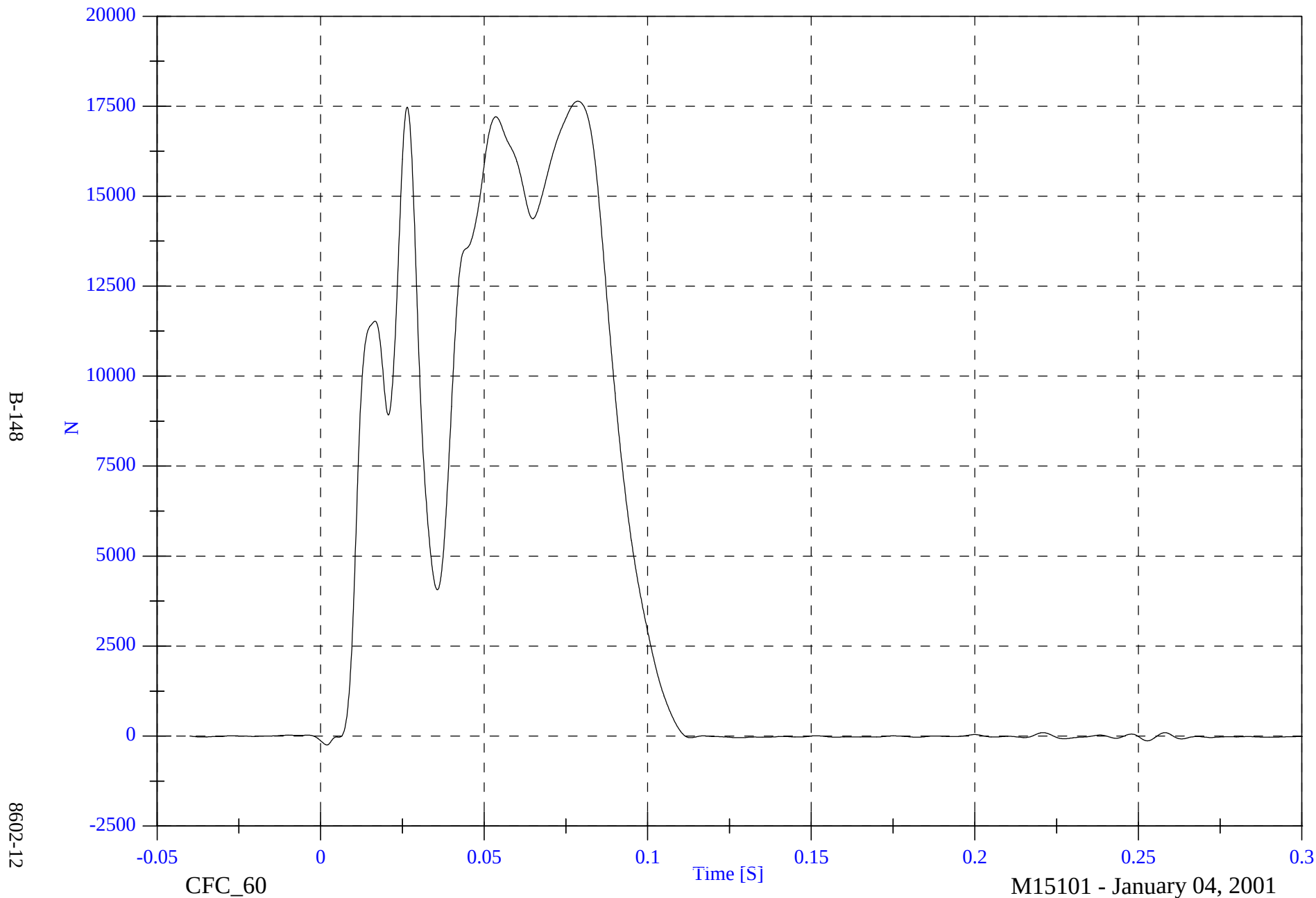


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C3 Fx

Max: 17637.7 [N] at 0.079 [S]

Min: -245.9 [N] at 0.002 [S]

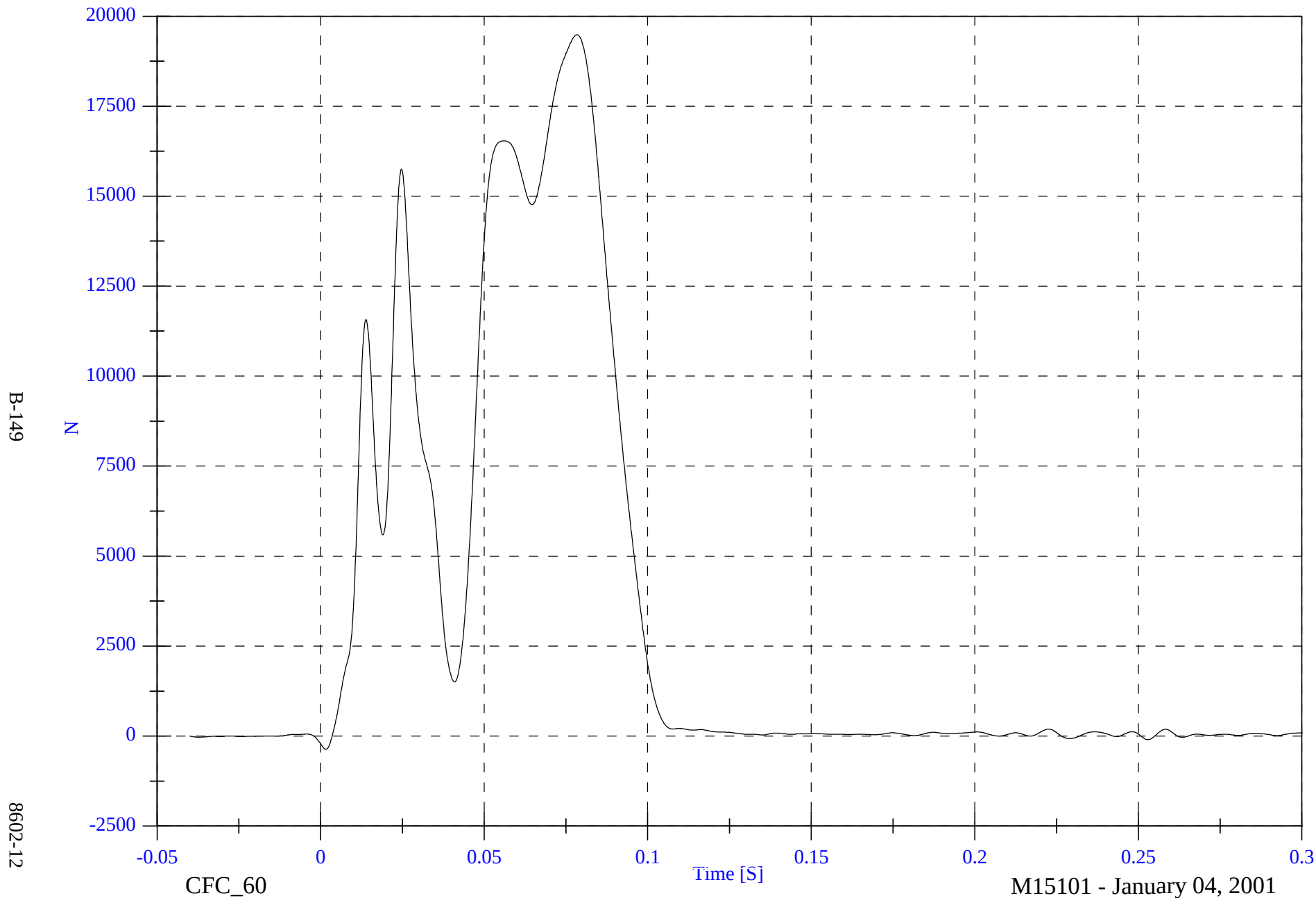


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C4 Fx

Max: 19483.2 [N] at 0.078 [S]

Min: -366.1 [N] at 0.002 [S]

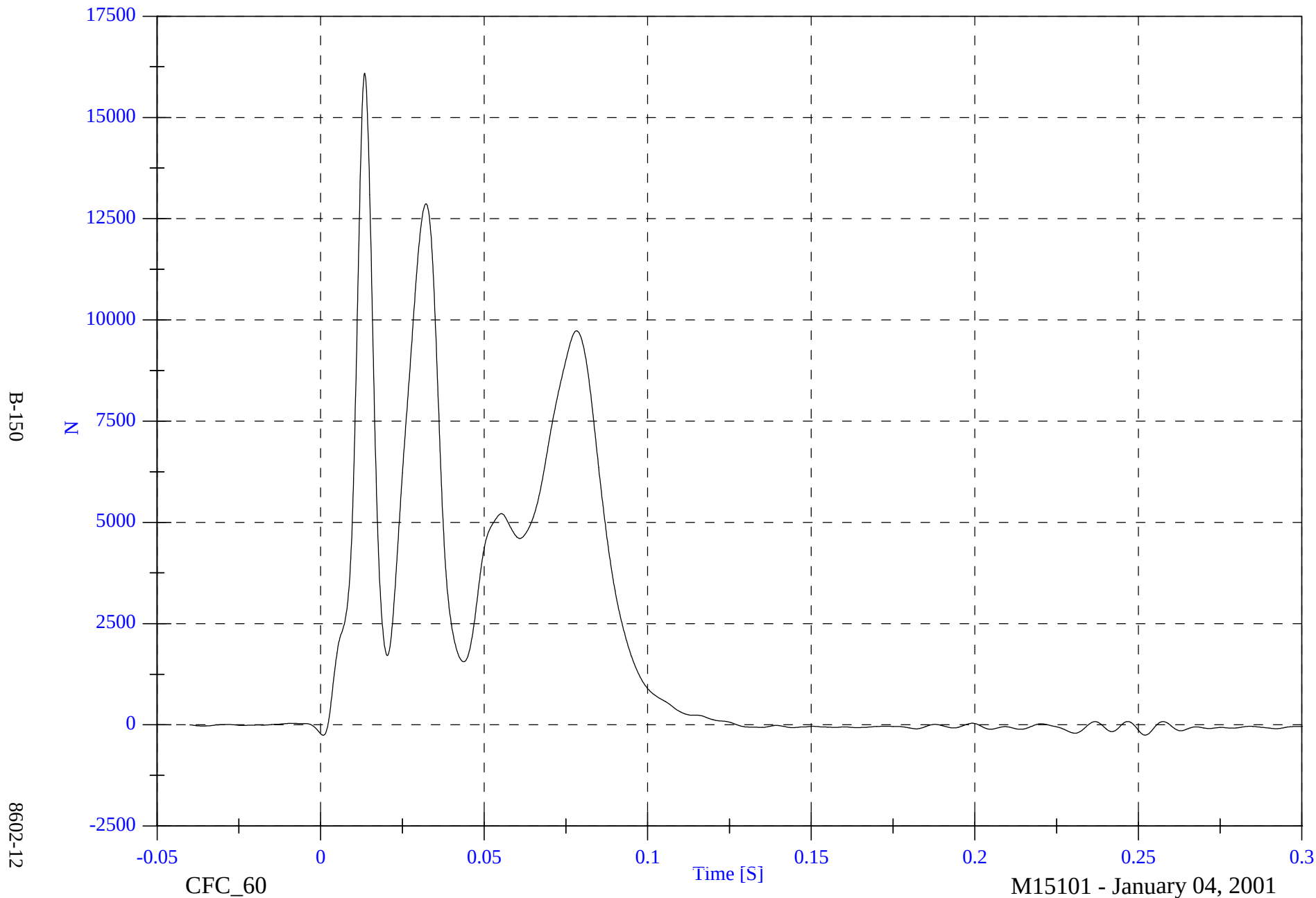


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C5 Fx

Max: 16092.0 [N] at 0.013 [S]

Min: -257.4 [N] at 0.001 [S]

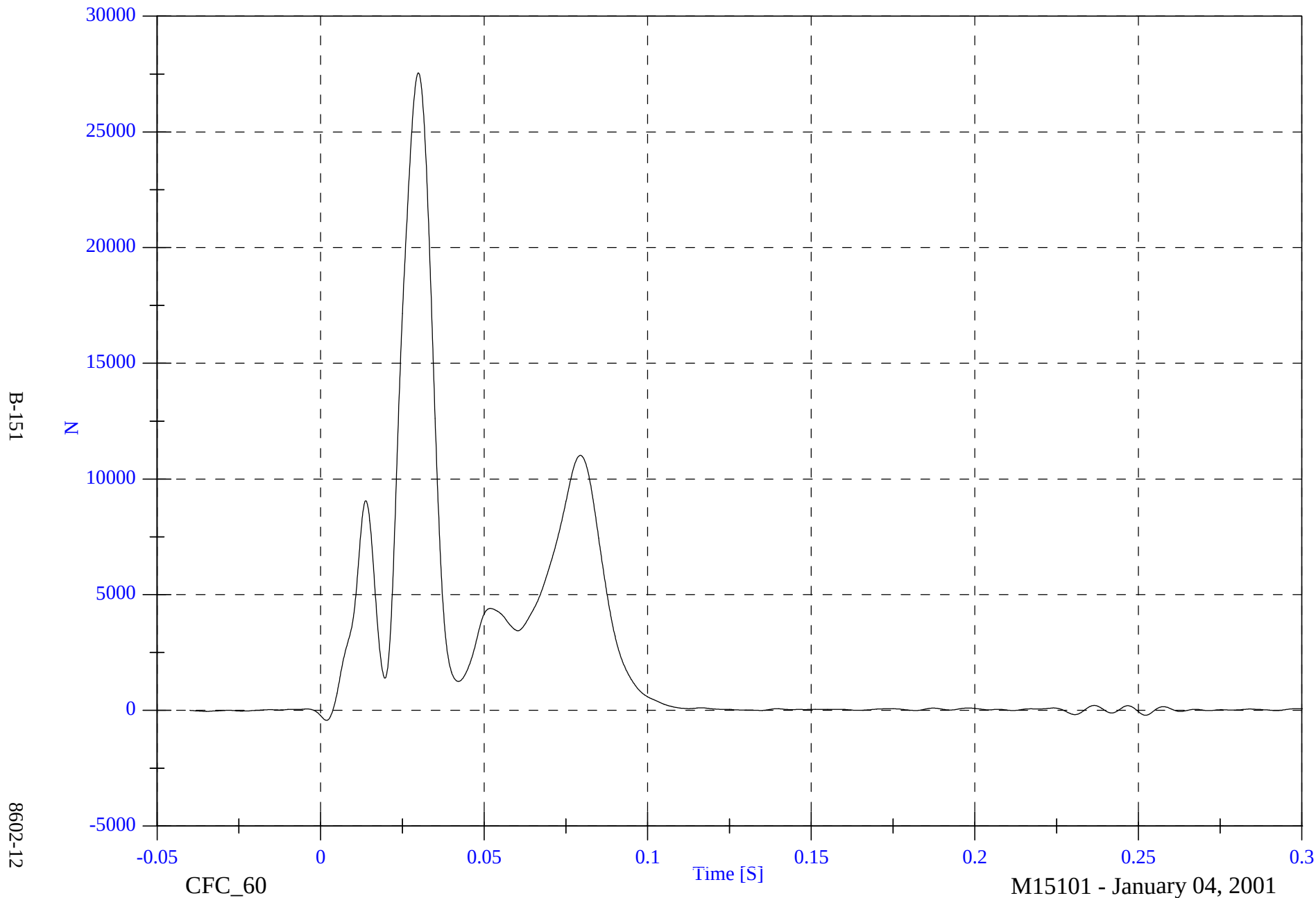


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C6 Fx

Max: 27549.9 [N] at 0.030 [S]

Min: -432.2 [N] at 0.002 [S]

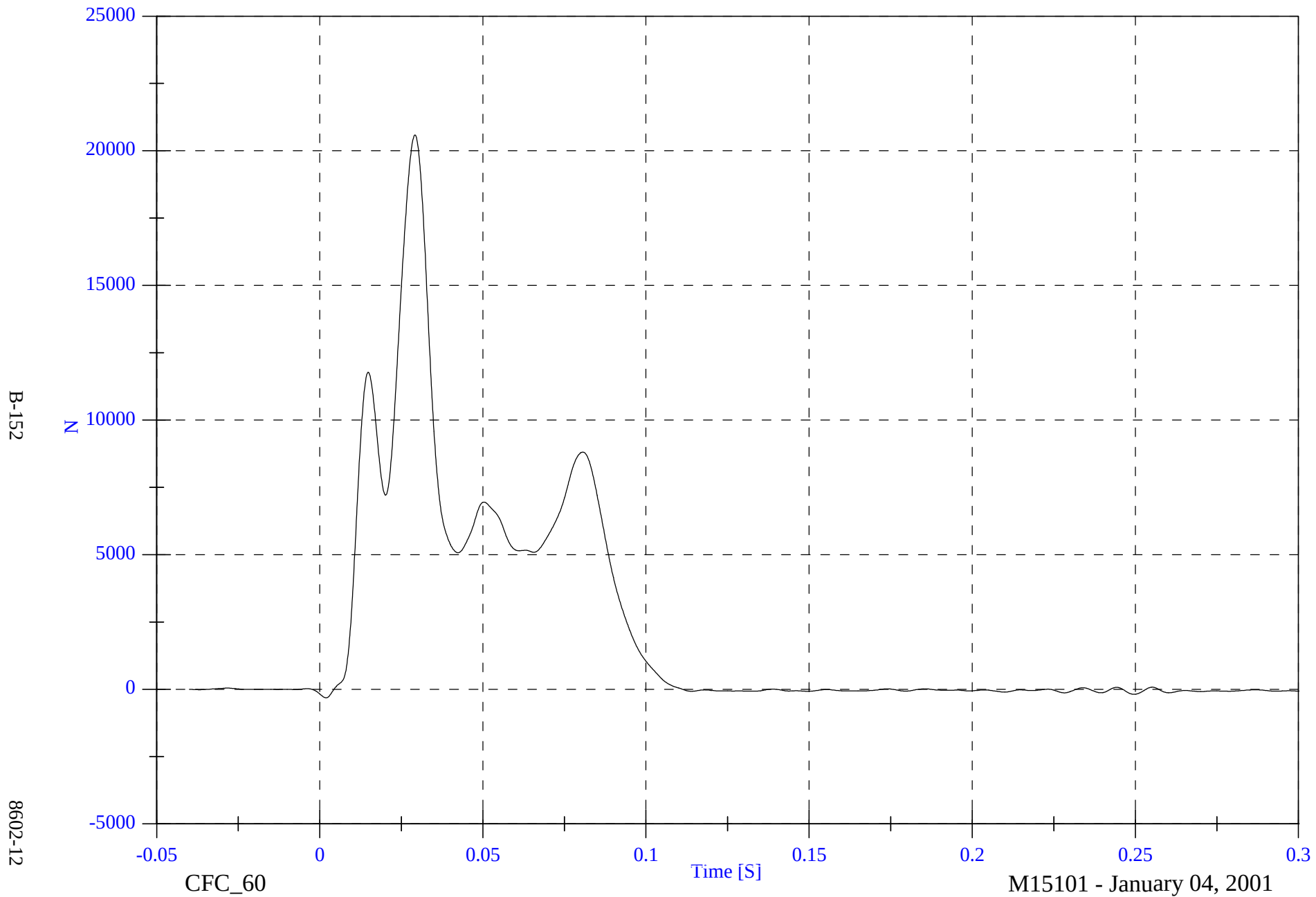


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C7 Fx

Max: 20588.4 [N] at 0.029 [S]

Min: -319.0 [N] at 0.002 [S]

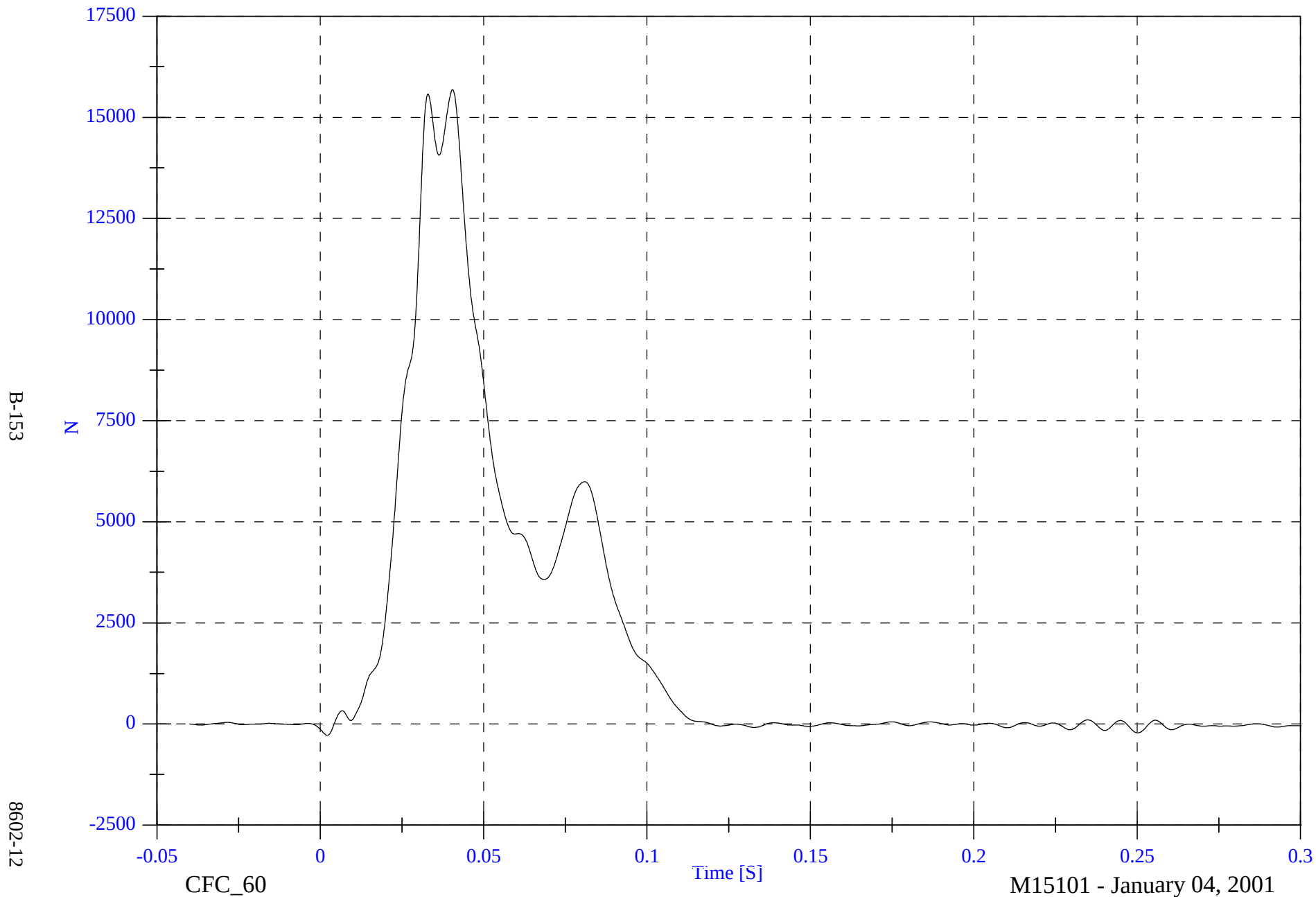


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C8 Fx

Max: 15682.8 [N] at 0.040 [S]

Min: -278.0 [N] at 0.002 [S]

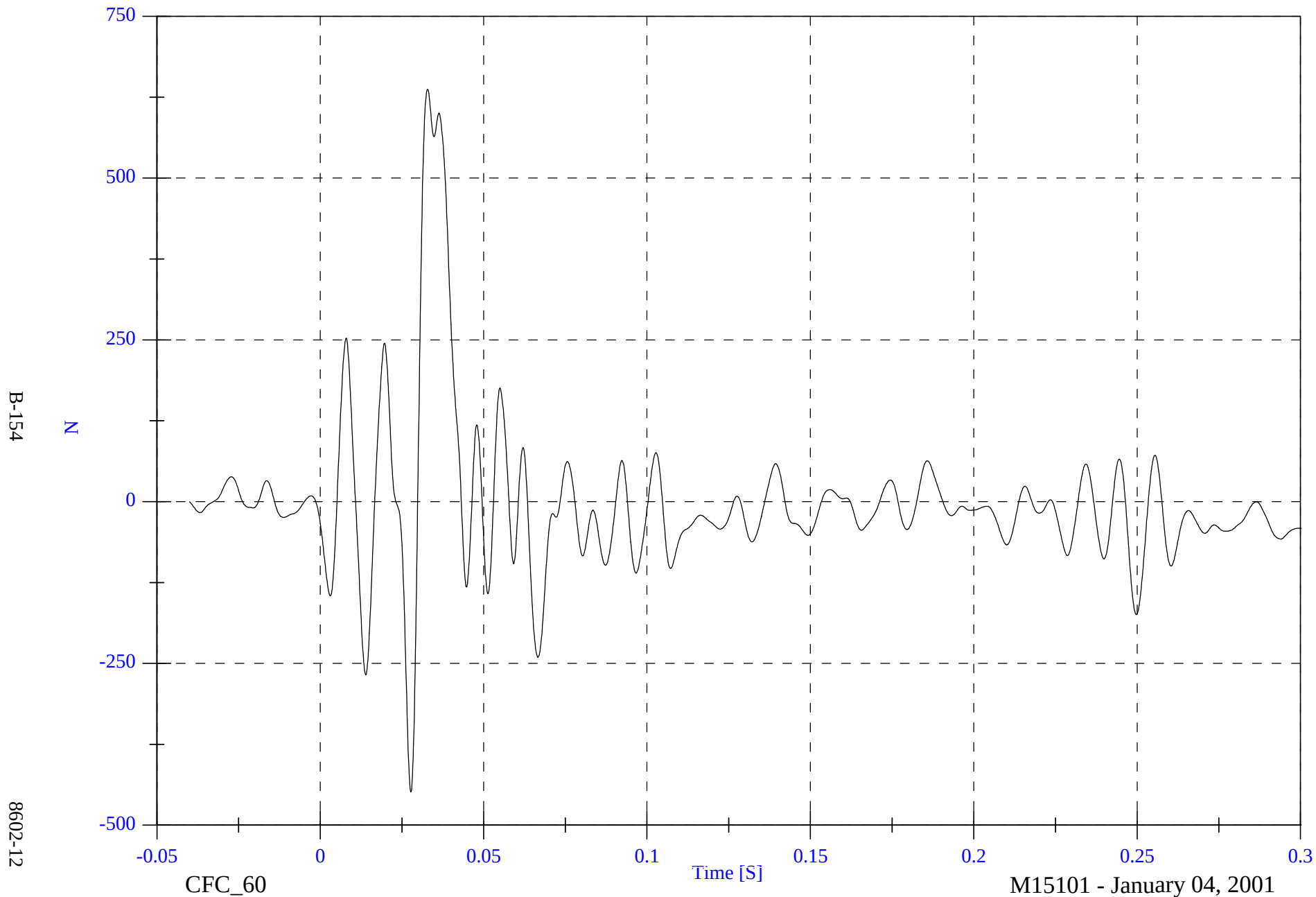


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell C9 Fx

Max: 637.0 [N] at 0.033 [S]

Min: -448.9 [N] at 0.028 [S]

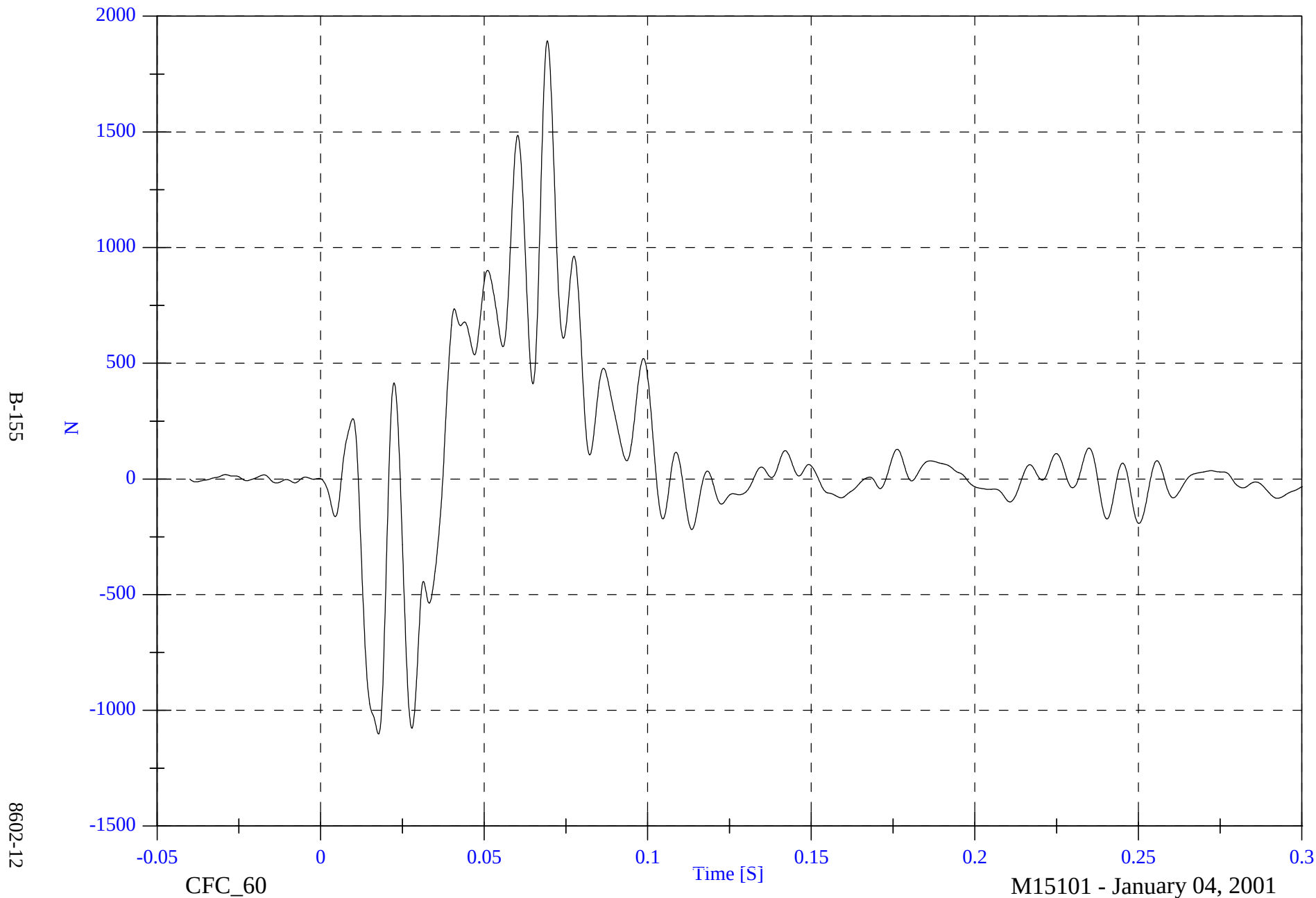


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D1 Fx

Max: 1893.7 [N] at 0.069 [S]

Min: -1102.7 [N] at 0.018 [S]

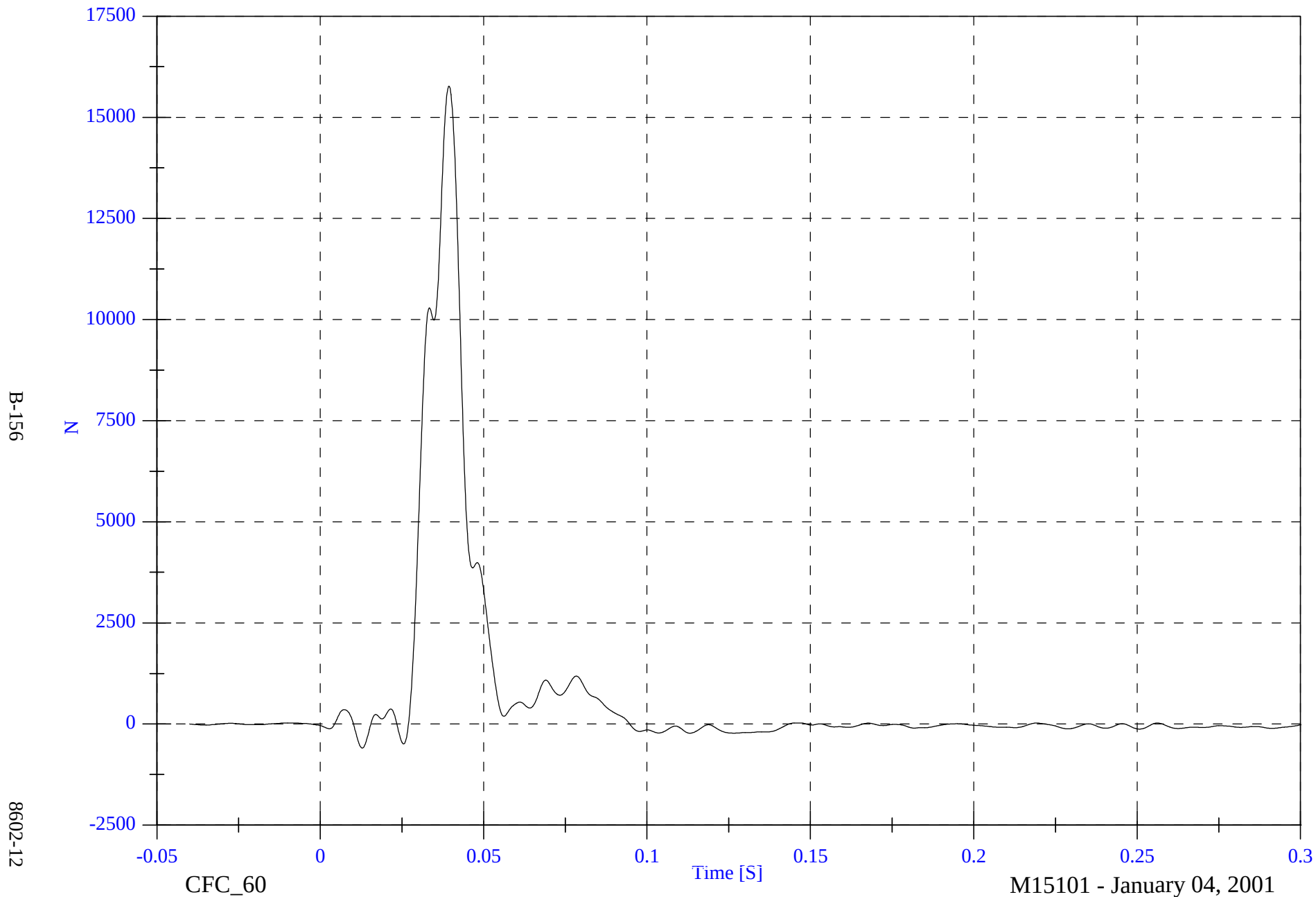


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D2 Fx

Max: 15773.6 [N] at 0.039 [S]

Min: -594.1 [N] at 0.013 [S]

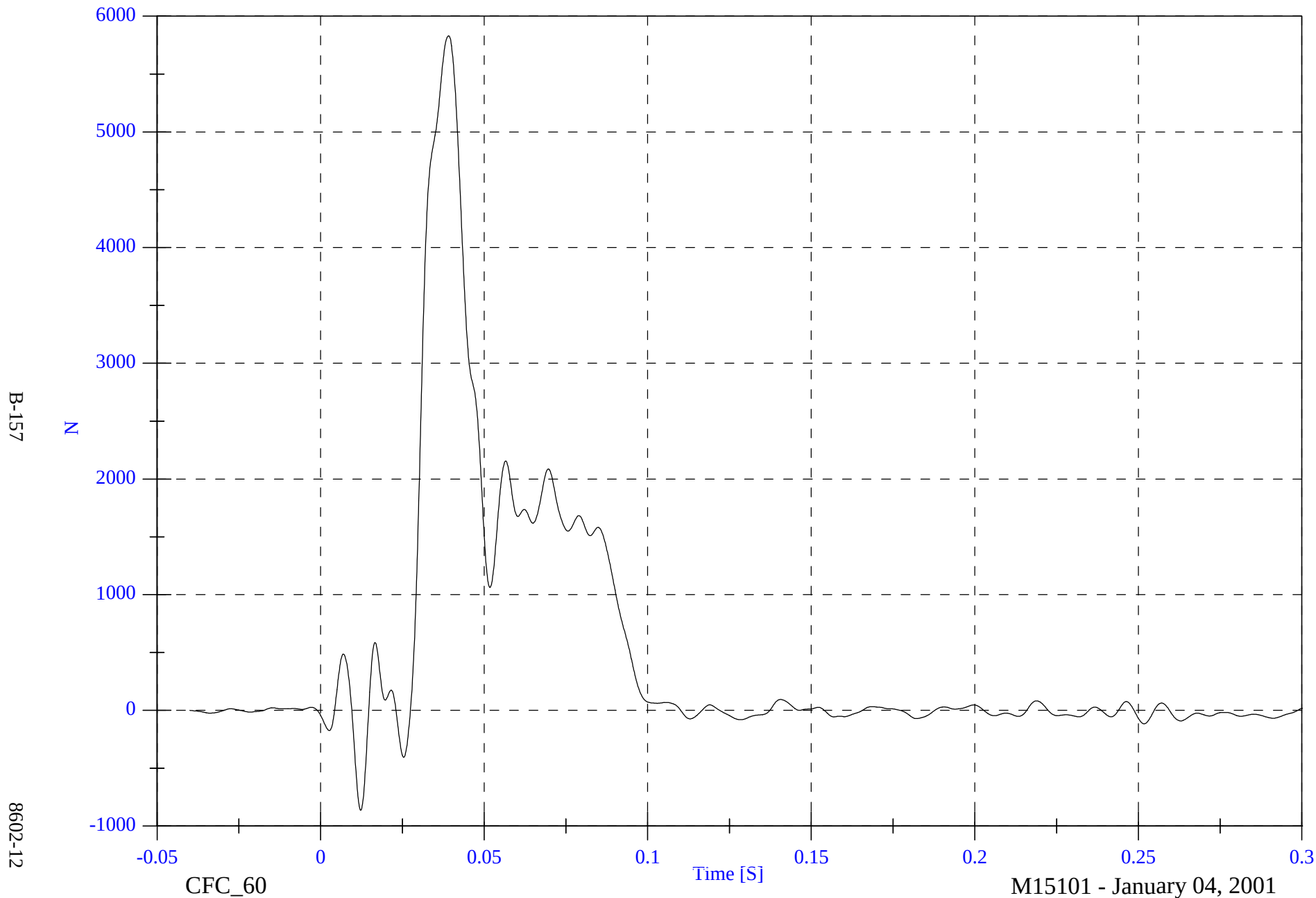


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D3 Fx

Max: 5830.7 [N] at 0.039 [S]

Min: -863.4 [N] at 0.012 [S]

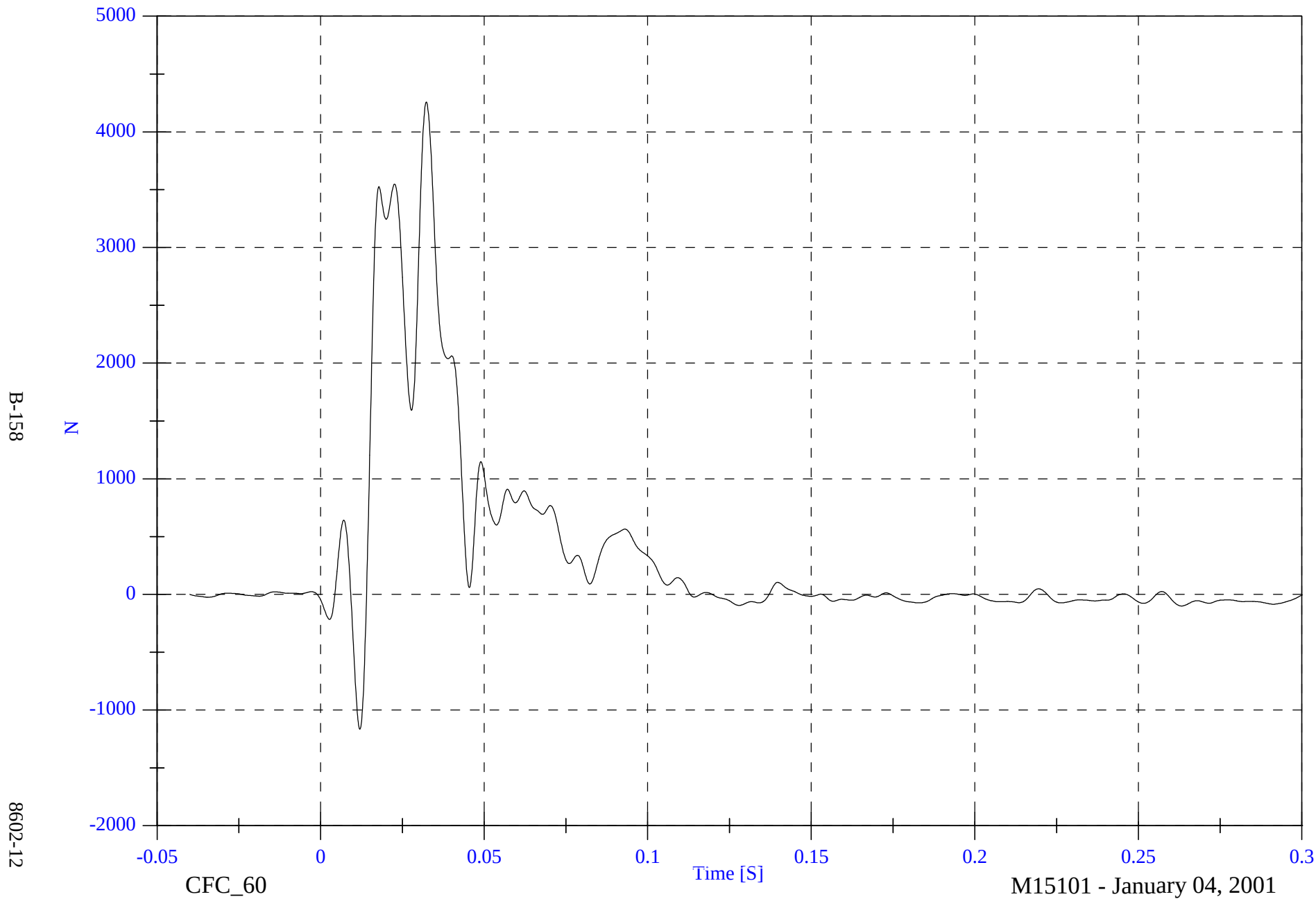


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D4 Fx

Max: 4257.8 [N] at 0.032 [S]

Min: -1166.9 [N] at 0.012 [S]

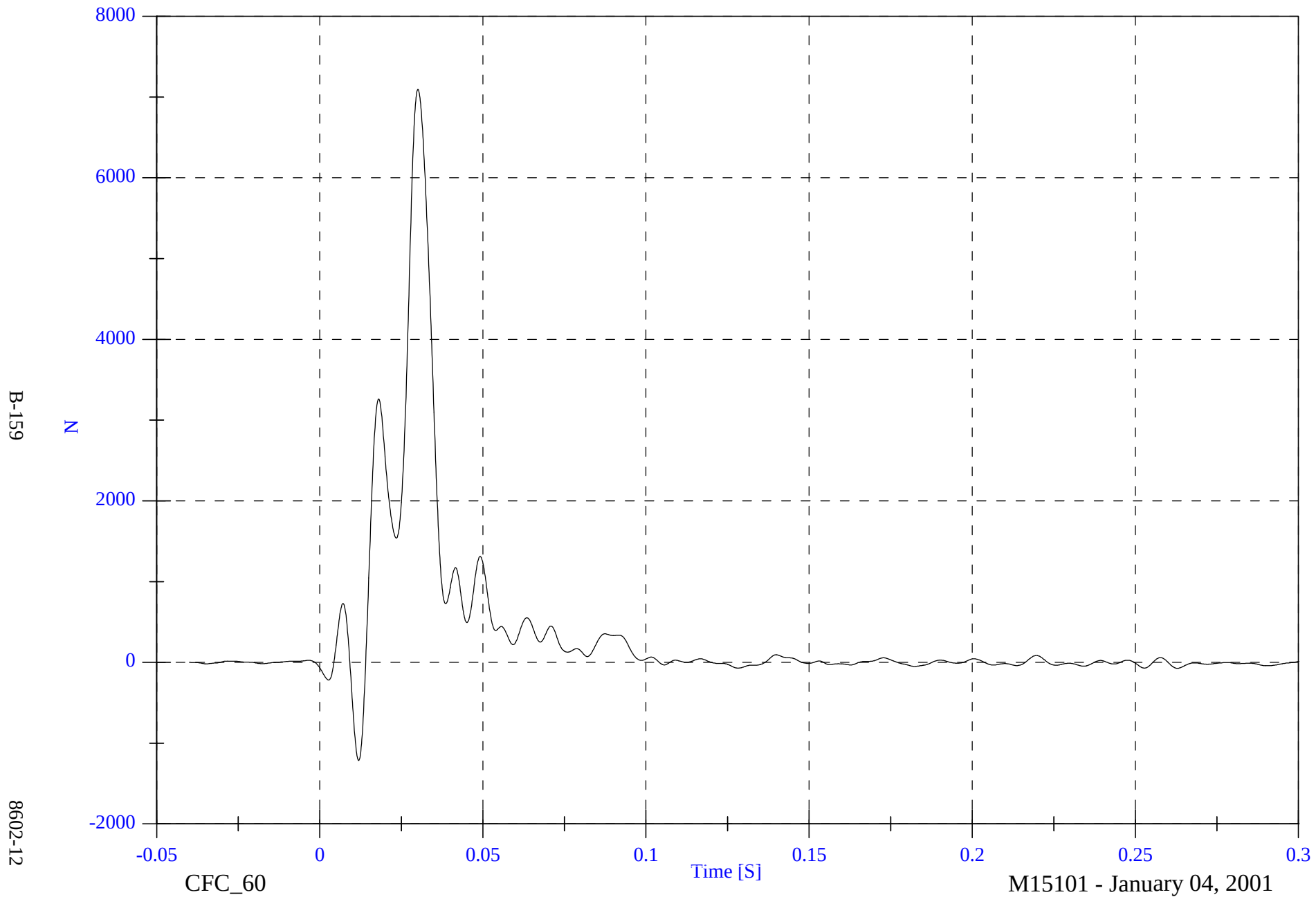


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D5 Fx

Max: 7092.1 [N] at 0.030 [S]

Min: -1216.6 [N] at 0.012 [S]

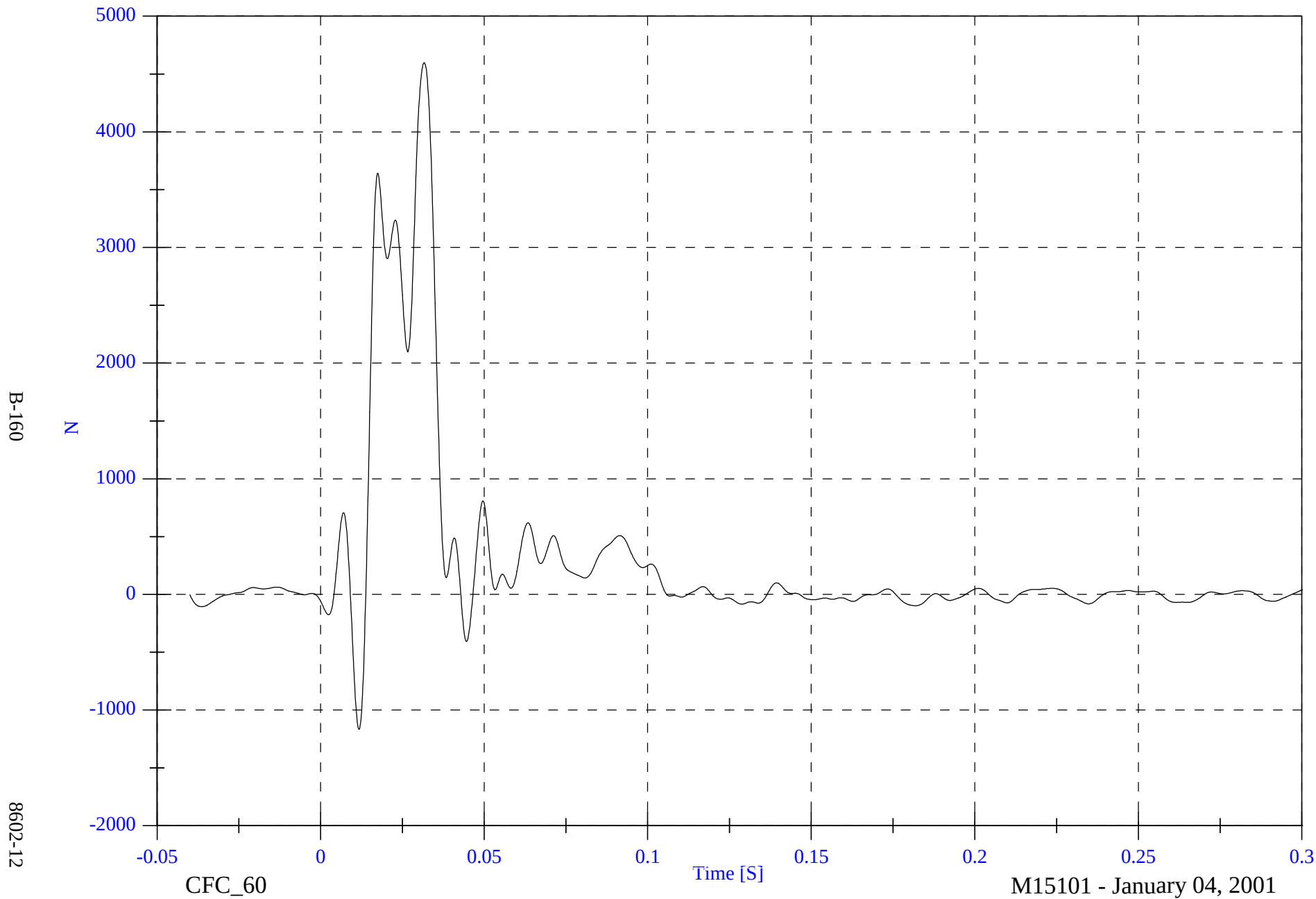


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D6 Fx

Max: 4597.5 [N] at 0.032 [S]

Min: -1167.2 [N] at 0.012 [S]

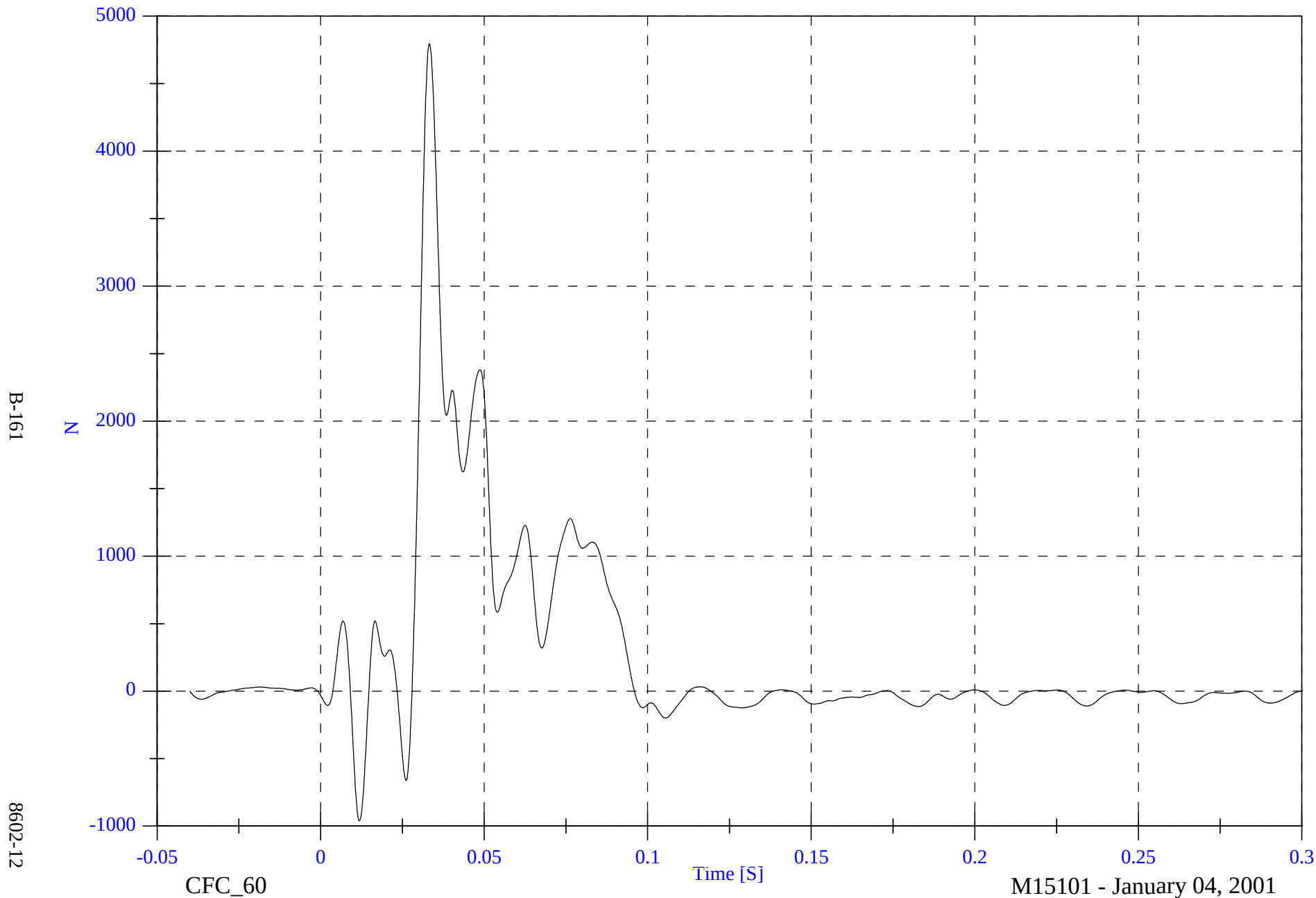


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D7 Fx

Max: 4797.0 [N] at 0.033 [S]

Min: -960.7 [N] at 0.012 [S]

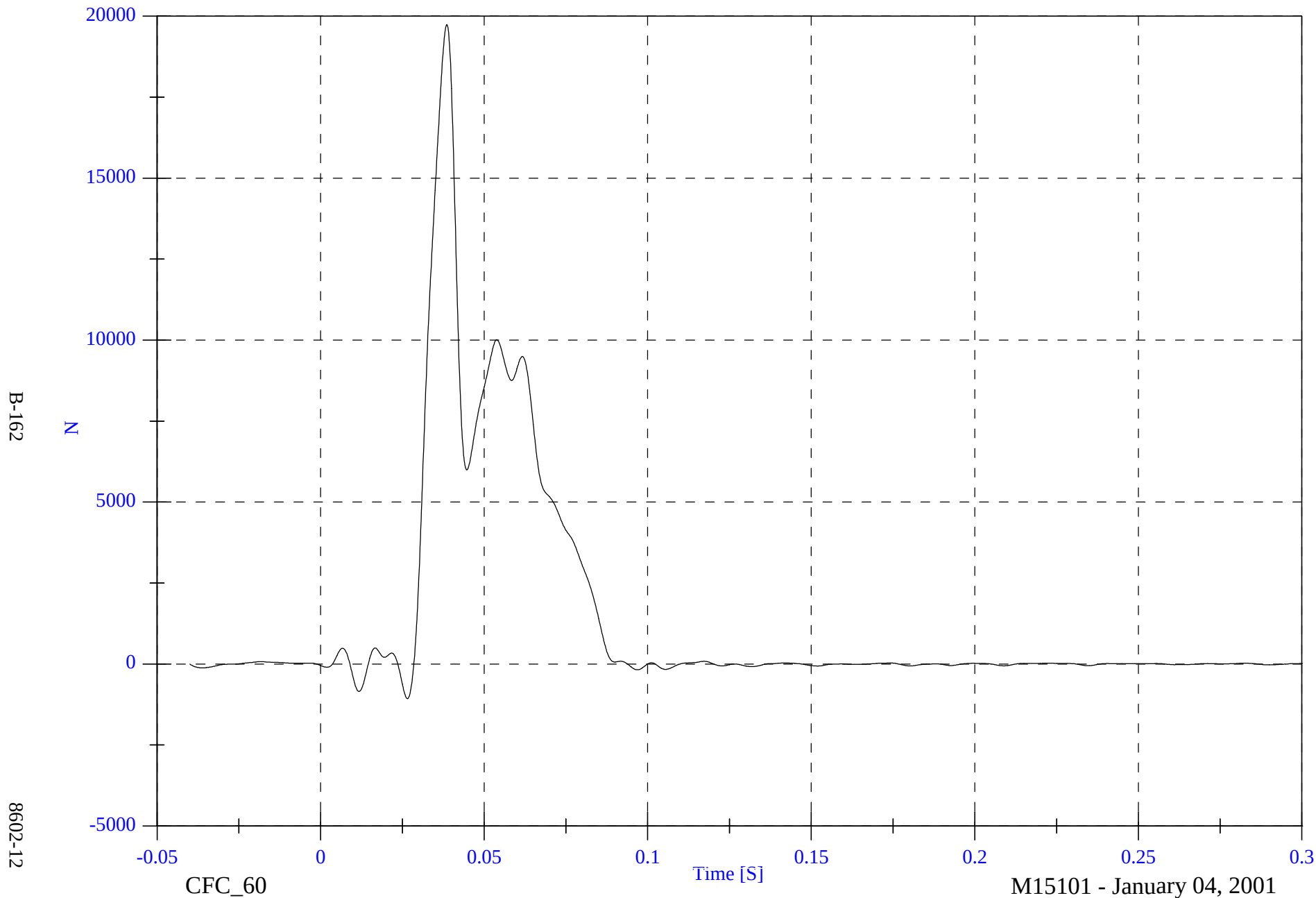


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D8 Fx

Max: 19740.7 [N] at 0.039 [S]

Min: -1069.0 [N] at 0.026 [S]

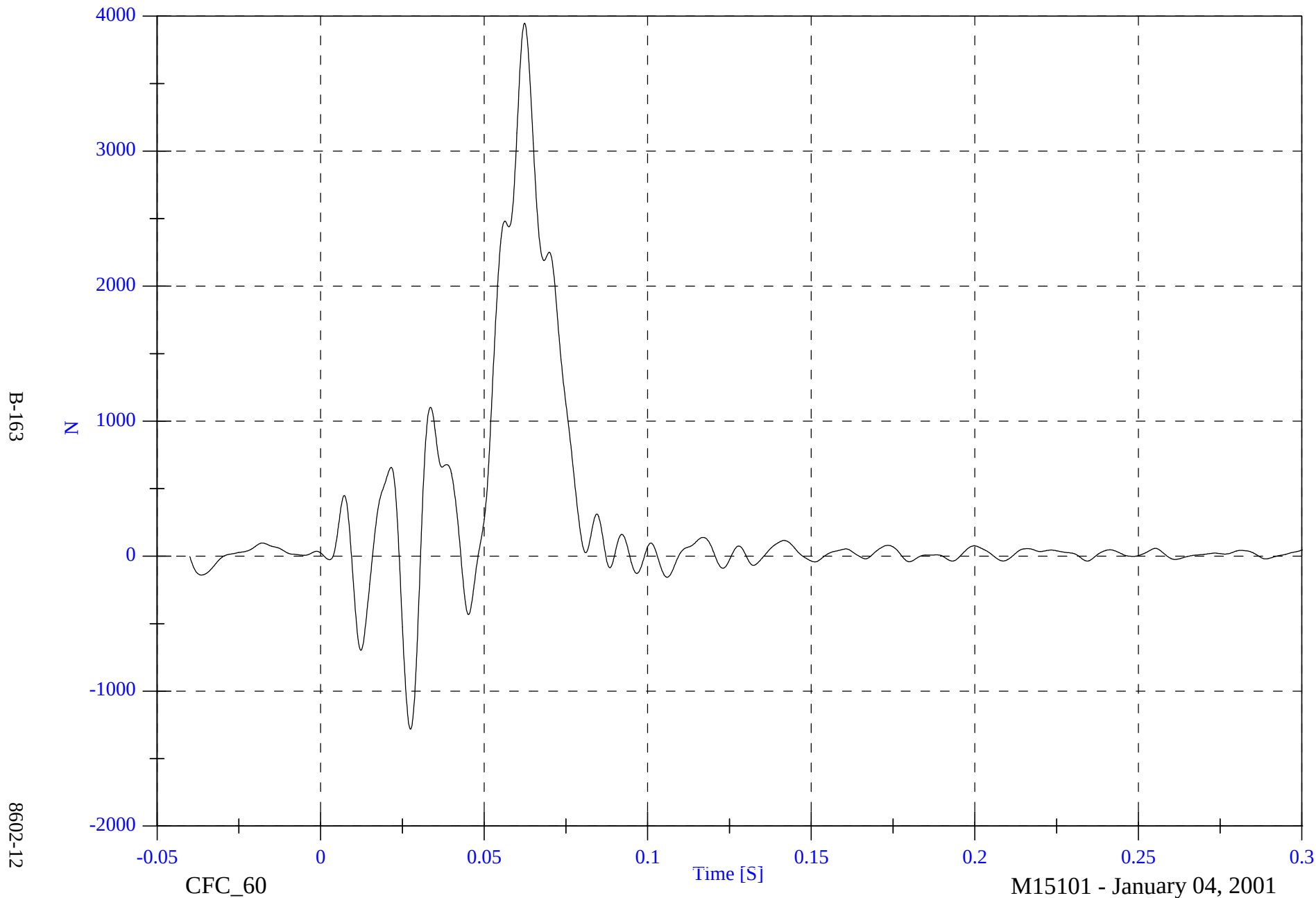


NCAP Test 12 - 2001 Toyota Avalon

Barrier Load Cell D9 Fx

Max: 3947.6 [N] at 0.062 [S]

Min: -1282.9 [N] at 0.027 [S]

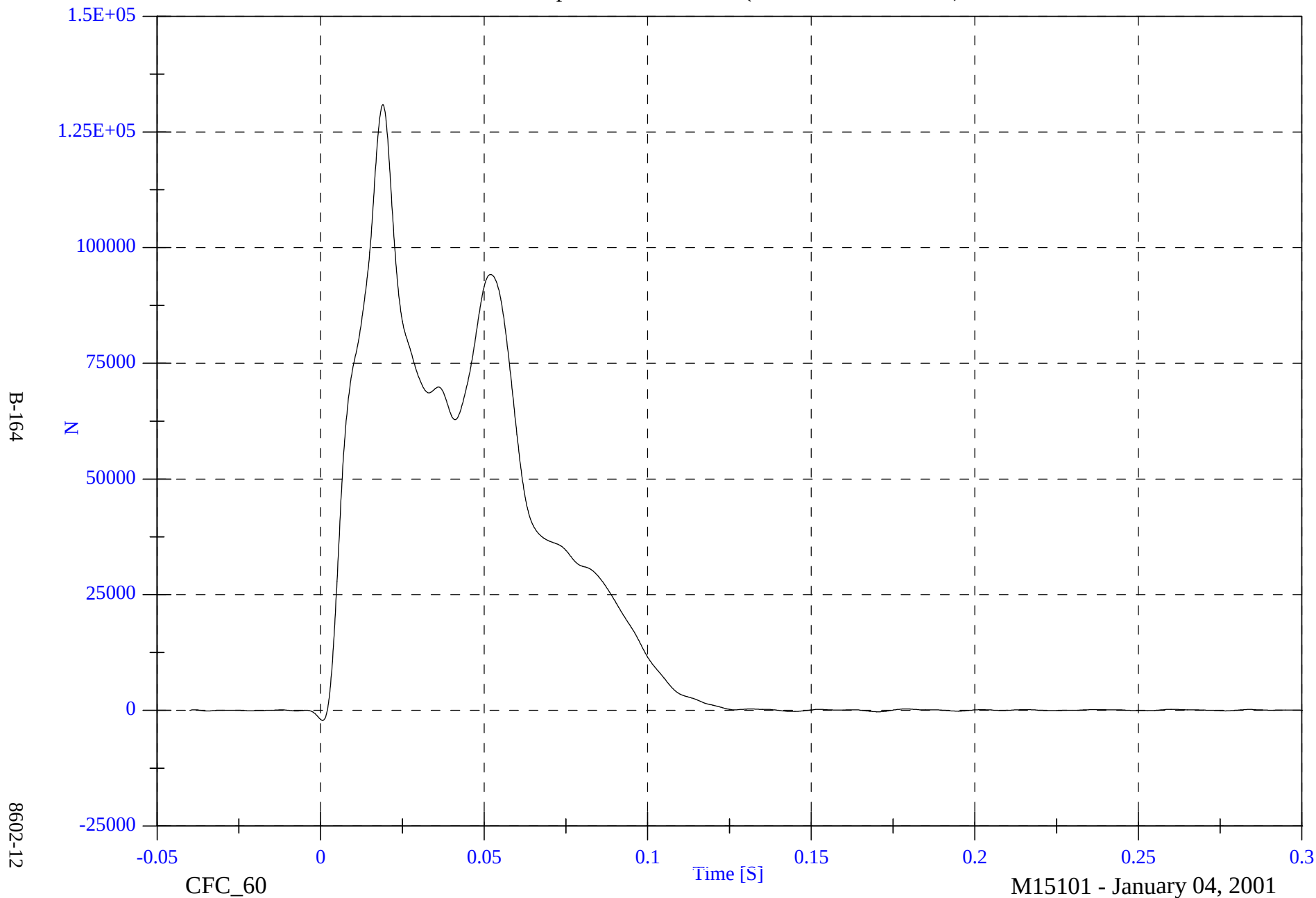


NCAP Test 12 - 2001 Toyota Avalon

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

Max: 130900.9 [N] at 0.019 [S]

Min: -2173.4 [N] at 0.001 [S]

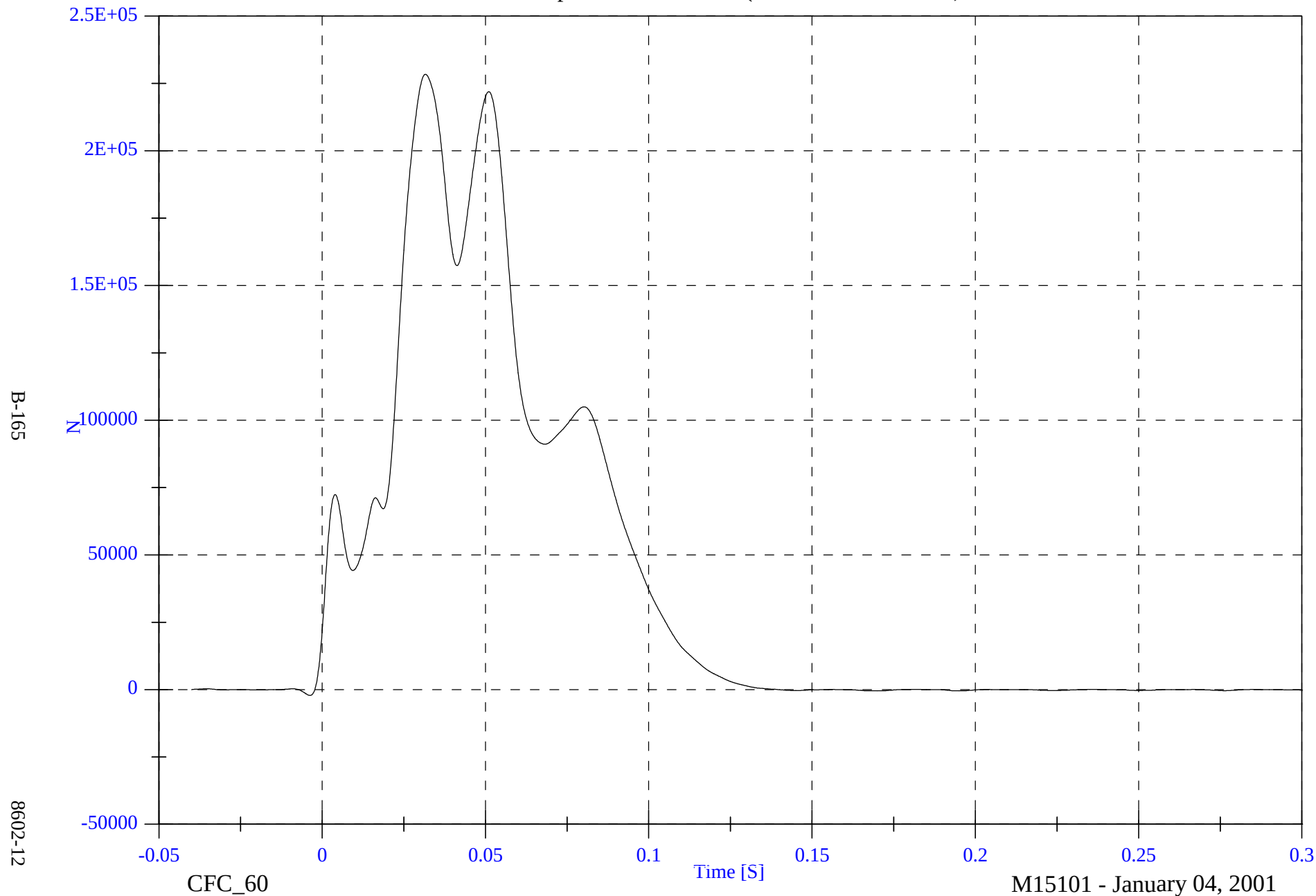


NCAP Test 12 - 2001 Toyota Avalon

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

Max: 228423.5 [N] at 0.032 [S]

Min: -2200.9 [N] at -0.004 [S]

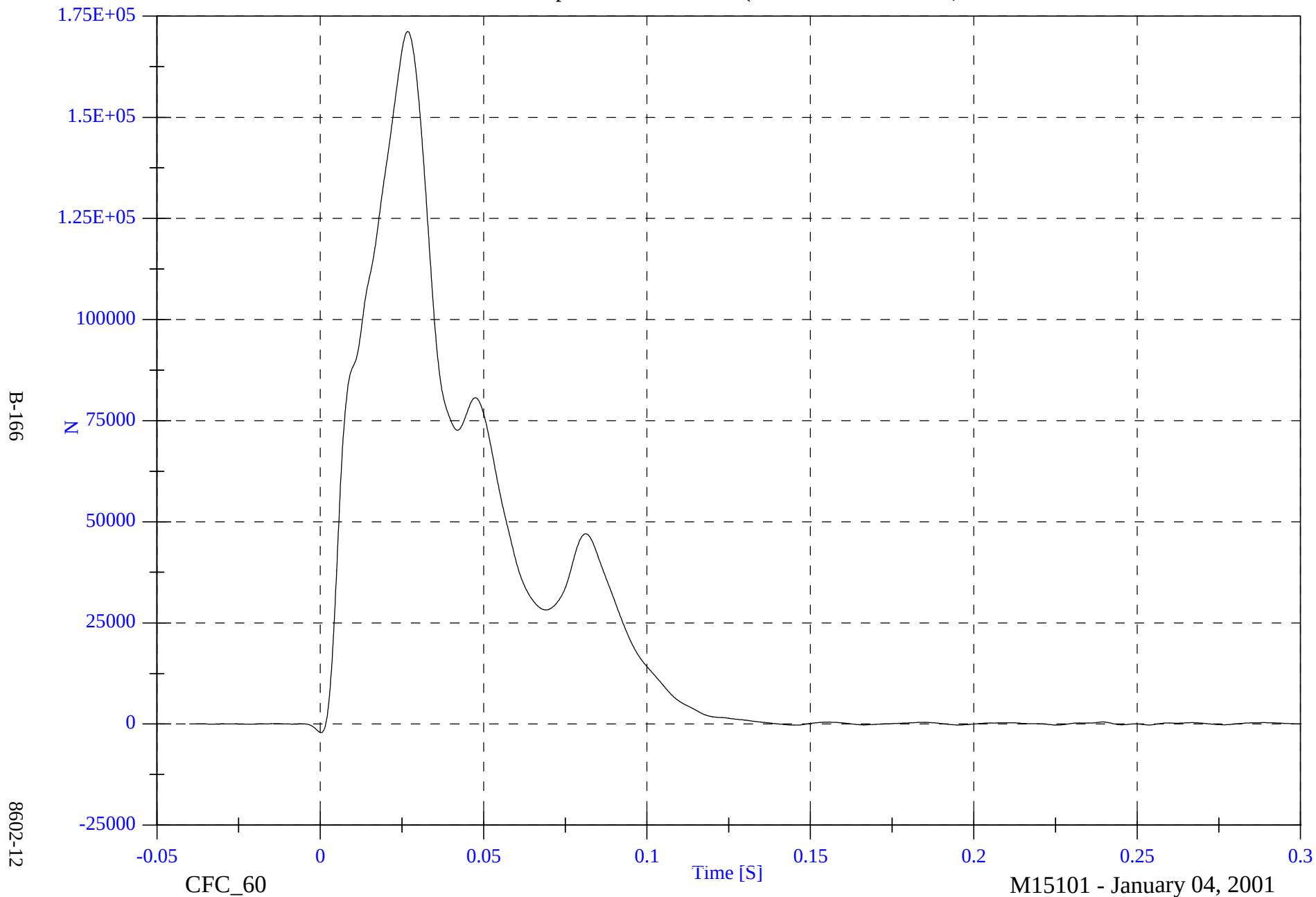


NCAP Test 12 - 2001 Toyota Avalon

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

Max: 171221.9 [N] at 0.027 [S]

Min: -2124.9 [N] at 0.000 [S]

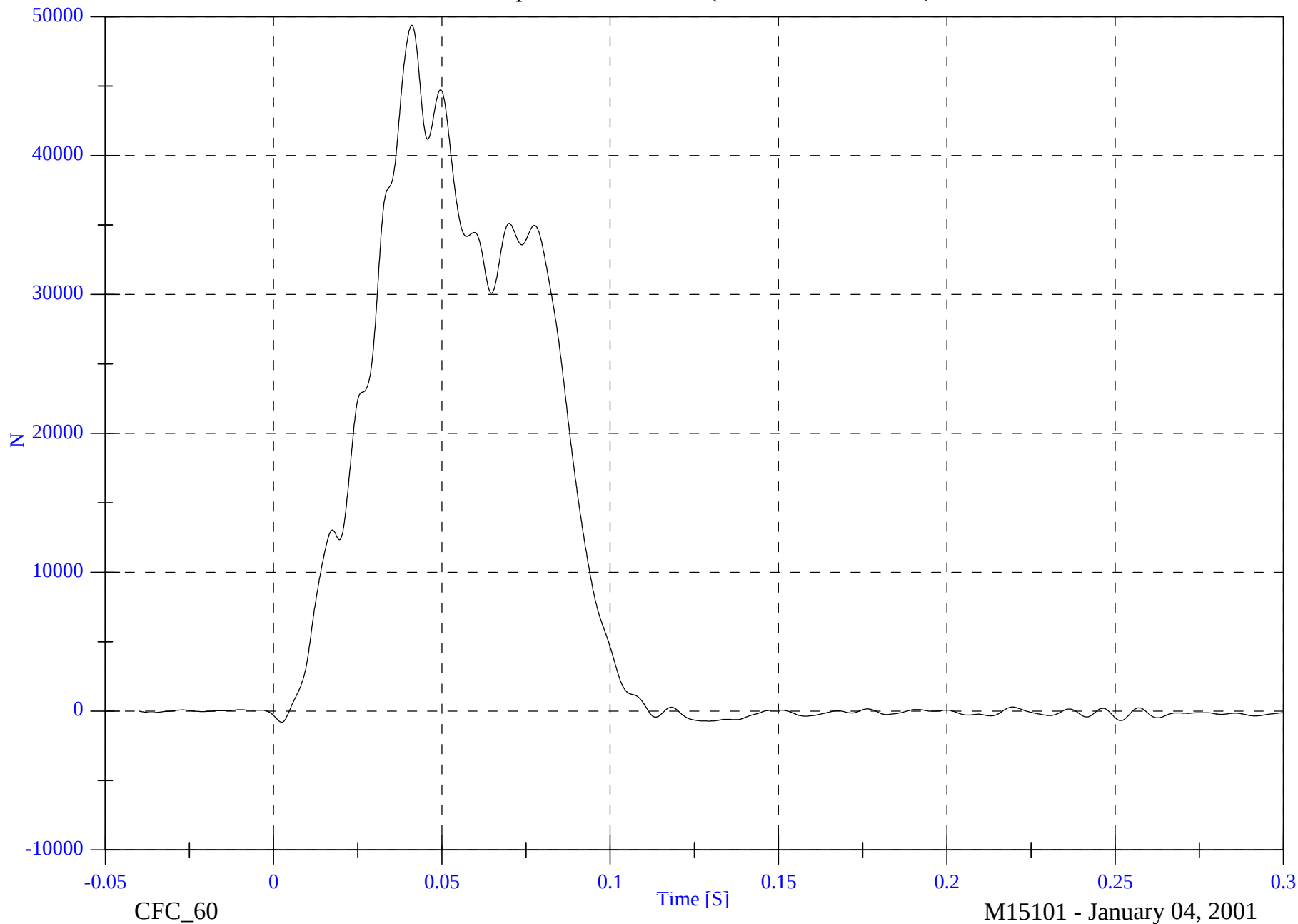


NCAP Test 12 - 2001 Toyota Avalon

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

Max: 49378.0 [N] at 0.041 [S]

Min: -808.7 [N] at 0.002 [S]



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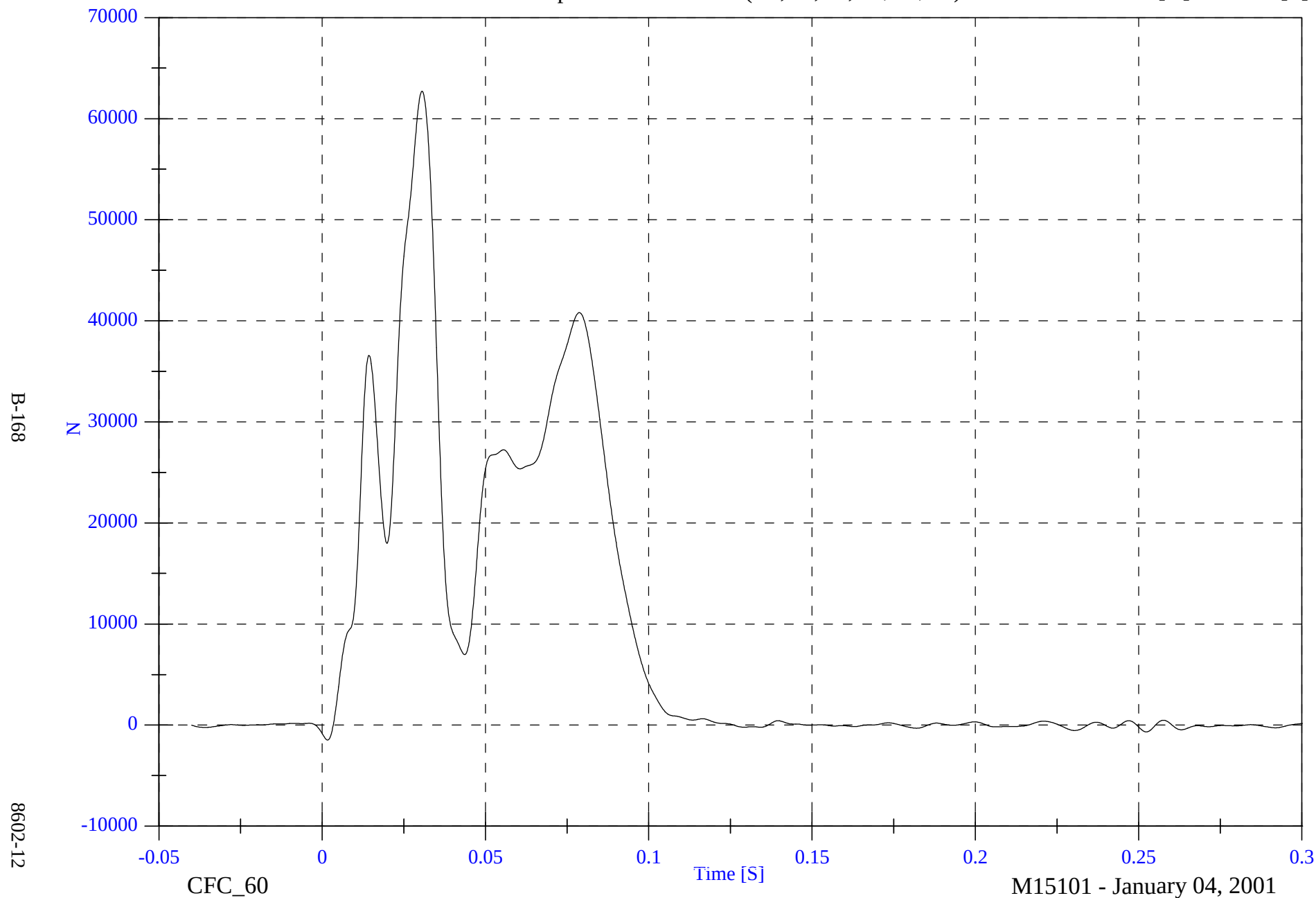
M15101 - January 04, 2001

NCAP Test 12 - 2001 Toyota Avalon

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

Max: 62718.7 [N] at 0.031 [S]

Min: -1479.6 [N] at 0.002 [S]

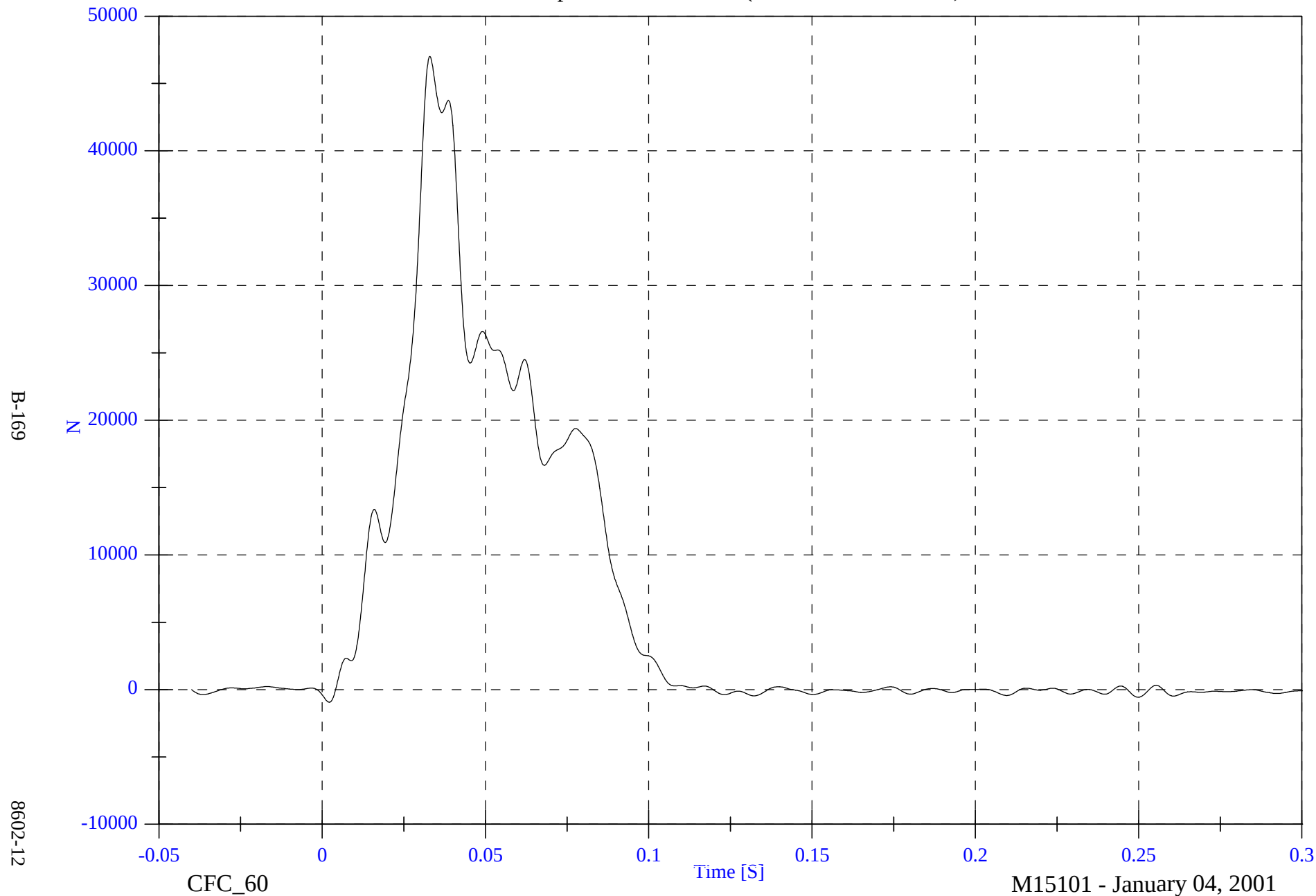


NCAP Test 12 - 2001 Toyota Avalon

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

Max: 47007.8 [N] at 0.033 [S]

Min: -945.8 [N] at 0.002 [S]

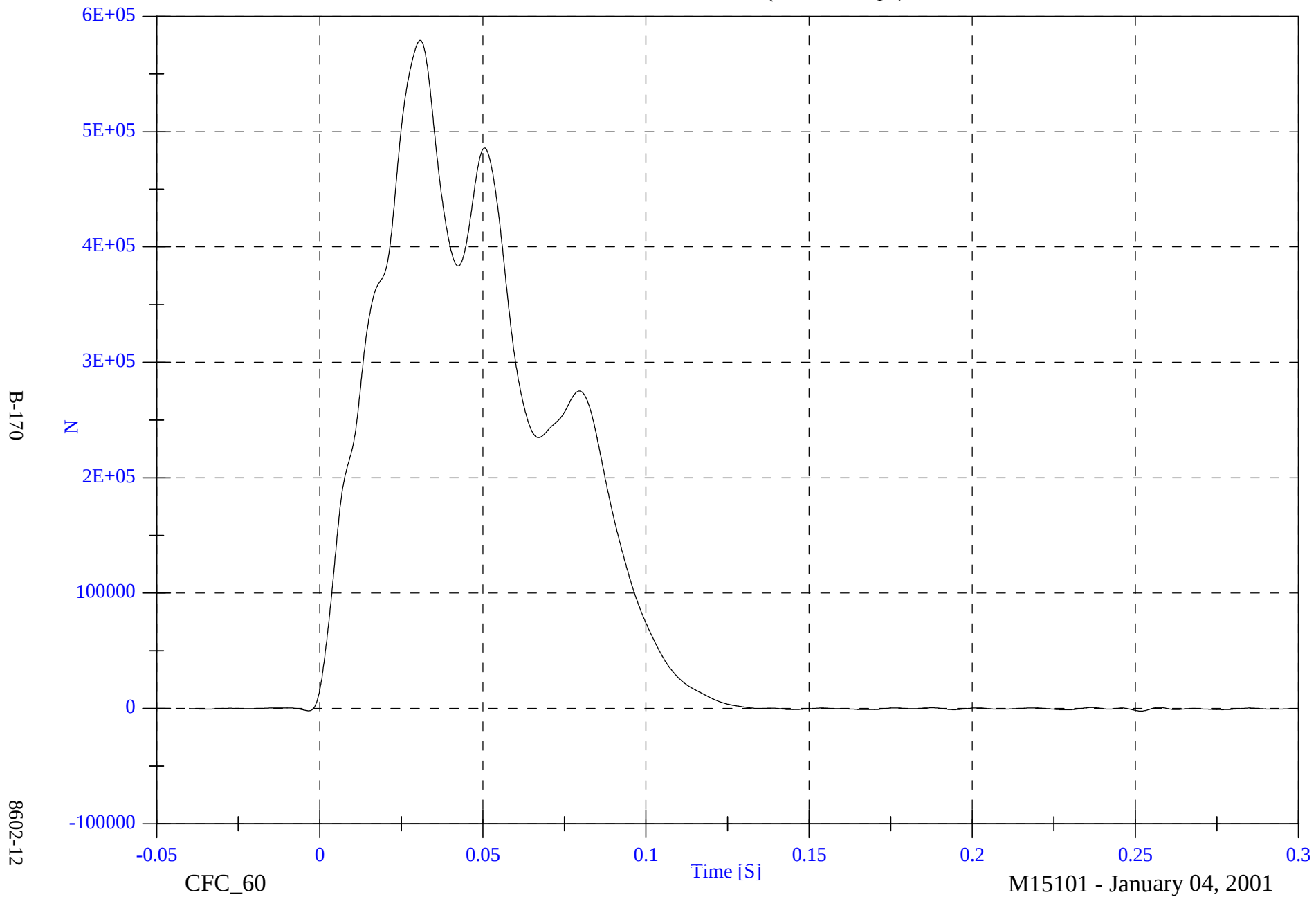


NCAP Test 12 - 2001 Toyota Avalon

Total Load Cell Sum (All 6 Groups)

Max: 579049.6 [N] at 0.031 [S]

Min: -2203.6 [N] at 0.252 [S]



APPENDIX C

PART 572B/E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA SHEETS

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Veridian Engineering. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

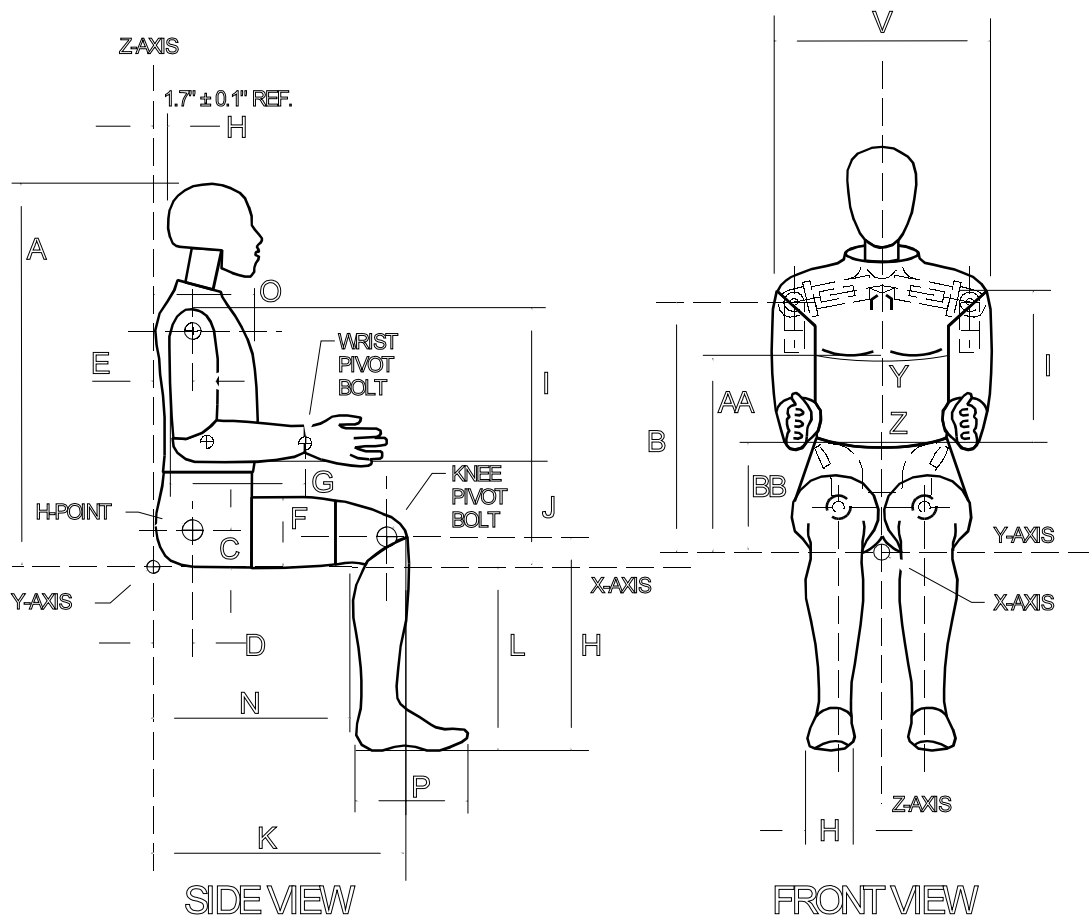
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	150	12/12/00
#2/Right Front Passenger	245	12/13/00

Electronic Test Equipment

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

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



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

PART 572E
HEAD DROP TEST

Dummy Serial Number 150
Sequential Test Number 4.3
Date 12/12/2000
Workfile 150400.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	71.0
Relative Humidity	10% - 70%	31.0
Peak Resultant Acceleration	225-275 G's	226.06
Peak Lateral Acceleration	15 G's Max	2.95
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	150	
Sequential Test Number	4.3	
Date	12/11/2000	6 Axis Neck Transducer
Workfile	150400.nfl	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71.0
Relative Humidity		10% - 70%	32.0
Impact Velocity		22.60 - 23.40 Ft/s	22.70
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.62
	20 ms	17.60 - 22.60 G's	19.14
	30 ms	12.50 - 18.50 G's	14.80
Max Pendulum G's Above 30 ms		29 G's Max	14.80
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.00
D Plane Rotation	Max	64 - 78 Deg	76.10
	Time	57 - 64 ms	57.12
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	76.53
	Time	47 - 58 ms	53.62
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	125.50
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	102.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	150	
Sequential Test Number	4.3	
Date	12/11/2000	6 Axis Neck Transducer
Workfile	150400.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71.0
Relative Humidity		10% - 70%	32.0
Impact Velocity		19.50 - 20.30 Ft/s	19.50
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.83
	20 ms	14.00 - 19.00 G's	16.02
	30 ms	11.00 - 16.00 G's	13.03
Max Pendulum G's Above 30 ms		22 G's Max	13.03
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.00
D Plane Rotation	Max	81 - 106 Deg	100.06
	Time	72 - 82 ms	76.25
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-51.42
	Time	65 - 79 ms	72.38
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	155.75
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	141.12

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 150
Sequential Test Number 4.3
Date 12/13/2000
Workfile 150400.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	32.0
Pendulum Velocity	21.6 - 22.4 Ft/s	21.7
Maximum Deflection	2.50 - 2.86 in	2.52
Maximum Resistive Force	1160 - 1325 Lbs	1225.25
Internal Hysteresis	69 - 85 %	73.05

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 150
Sequential Test Number 4.3
Date 12/14/2000
Workfile 150400.lf / 150400.rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	71.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1206.14
RIGHT KNEE		
Temperature	66 - 78 Deg F	71.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1206.74

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 150
Sequential Test Number 4.3
Date 12/12/2000

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			71
Relative Humidity			32
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	34.0
Chest Depth	O	8.4 - 9.0 in	8.5
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	5.7
Buttock Knee Length	K	22.8 - 23.8 in	23.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.5
Popliteal Height	L	16.9 - 17.9 in	17.8
Knee Pivot Height	M	19.1 - 19.7 in	19.6
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.2
Elbow Rest Height	J	7.5 - 8.3 in	8.1
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.5

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 245
Sequential Test Number 6.3
Date 12/12/2000
Workfile 245600.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	71.0
Relative Humidity	10% - 70%	31.0
Peak Resultant Acceleration	225-275 G's	243.45
Peak Lateral Acceleration	15 G's Max	10.89
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	245	
Sequential Test Number	6.3	
Date	12/14/2000	6 Axis Neck Transducer
Workfile	245600.nfl	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71.0
Relative Humidity		10% - 70%	31.0
Impact Velocity		22.60 - 23.40 Ft/s	22.69
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.61
	20 ms	17.60 - 22.60 G's	19.38
	30 ms	12.50 - 18.50 G's	15.68
Max Pendulum G's Above 30 ms		29 G's Max	15.68
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	39.88
D Plane Rotation	Max	64 - 78 Deg	70.47
	Time	57 - 64 ms	58.38
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	73.51
	Time	47 - 58 ms	53.12
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	122.38
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	100.75

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	245	
Sequential Test Number	6.3	
Date	12/14/00	6 Axis Neck Transducer
Workfile	245600.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	71.0
Relative Humidity		10% - 70%	31.0
Impact Velocity		19.50 - 20.30 Ft/s	19.67
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.26
	20 ms	14.00 - 19.00 G's	16.71
	30 ms	11.00 - 16.00 G's	14.43
Max Pendulum G's Above 30 ms		22 G's Max	14.43
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.62
D Plane Rotation	Max	81 - 106 Deg	101.48
	Time	72 - 82 ms	77.38
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-49.41
	Time	65 - 79 ms	72.75
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	155.62
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	144.50

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 245
Sequential Test Number 6.3
Date 12/13/2000
Workfile 245600.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	31.0
Pendulum Velocity	21.6 - 22.4 Ft/s	21.9
Maximum Deflection	2.50 - 2.86 in	2.55
Maximum Resistive Force	1160 - 1325 Lbs	1256.31
Internal Hysteresis	69 - 85 %	73.01

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 245
Sequential Test Number 6.3
Date 12/14/2000
Workfile 245600.lf / 245600.rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	71.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1230.02
RIGHT KNEE		
Temperature	66 - 78 Deg F	71.0
Relative Humidity	10% - 70%	32.0
Probe Velocity	6.8 - 7.0 Ft/s	7.0
Peak Knee Impact Force	1060 - 1300 Lbs	1278.31

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 245
Sequential Test Number 6.3
Date 12/13/2000

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			30
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.1
Waist Circumference	Z	32.9 - 34.1 in	33.7
Chest Depth	O	8.4 - 9.0 in	8.5
H-Point Height	C	3.3 - 3.5 in	3.2
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.3
Popliteal Height	L	16.9 - 17.9 in	17.5
Knee Pivot Height	M	19.1 - 19.7 in	19.2
Foot Length	P	9.9 - 10.5 in	10.2
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.2
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician: B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-P16832	9/20/00	3/21/01
	Y	ENDEVCO	AC-P16591	9/20/00	3/21/01
	Z	ENDEVCO	AC-P17154	9/21/00	3/22/01
Head	X (R)	ENDEVCO	AC-P17141	9/20/00	3/21/01
	Y (R)	ENDEVCO	AC-P17242	9/20/00	3/21/01
	Z (R)	ENDEVCO	AC-P17265	9/20/00	3/21/01
Neck Load Cell	X	DENTON	LC-269FX	11/16/00	5/17/01
	Y	DENTON	LC-269FY	11/16/00	5/17/01
	Z	DENTON	LC-269FZ	11/16/00	5/17/01
Neck Moment	X	DENTON	LC-269MX	11/16/00	5/17/01
	Y	DENTON	LC-269MY	11/16/00	5/17/01
	Z	DENTON	LC-269MZ	11/16/00	5/17/01
Chest	X	ENDEVCO	AC-P17235	9/15/00	3/16/01
	Y	ENDEVCO	AC-P14393	9/20/00	3/21/01
	Z	ENDEVCO	AC-P17285	9/20/00	3/21/01
Chest	X (R)	ENDEVCO	AC-P16863	9/13/00	3/14/01
	Y (R)	ENDEVCO	AC-P17248	9/20/00	3/21/01
	Z (R)	ENDEVCO	AC-P17283	9/20/00	3/21/01
Chest Deflection Gauge		SERVO	DS-150	11/16/00	5/17/01
Hybrid III Use Only					
Pelvic	X	ENDEVCO	AC-J30041	8/4/00	2/2/01
	Y	ENDEVCO	AC-P13355	11/16/00	5/17/01
	Z	ENDEVCO	AC-P13329	11/16/00	5/17/01

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-418	11/20/00	5/21/01
Right Femur Load Cell		GSE	LC-420	11/20/00	5/21/01
Left Upper Tibia	Mx	DENTON	LC-045MX	11/4/00	5/5/01
	My	DENTON	LC-045MY	11/4/00	5/5/01
Left Lower Tibia	Fz	DENTON	LC-125FZ	11/4/00	5/5/01
	Mx	DENTON	LC-125MX	11/4/00	5/5/01
	My	DENTON	LC-125MY	11/4/00	5/5/01
Right Upper Tibia	Mx	DENTON	LC-038MX	11/9/00	5/10/01
	My	DENTON	LC-038MY	11/9/00	5/10/01
Right Lower Tibia	Fz	DENTON	LC-124FZ	11/9/00	5/10/01
	Mx	DENTON	LC-124MX	11/9/00	5/10/01
	My	DENTON	LC-124MY	11/9/00	5/10/01
Left Foot Rear	X	ENDEVCO	AC-P16951	10/2/00	4/2/01
	Z	ENDEVCO	AC-P17152	10/2/00	4/2/01
Left Foot Front	Z	ENDEVCO	AC-P16975	10/2/00	4/2/01
Right Foot Rear	X	ENDEVCO	AC-J31042	11/7/00	5/8/01
	Z	ENDEVCO	AC-J32176	11/7/00	5/8/01
Right Foot Front	Z	ENDEVCO	AC-J31009	11/8/00	5/9/01
Lap Belt Load Cells		LEBOW	LC-706	12/1/00	6/1/01
Shoulder Belt Load Cells		-	-	-	-
Spool-Out Potentiometer		-	-	-	-
Belt Stretch Transducer		-	-	-	-

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 245)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-J32184	12/4/00	6/4/01
	Y	ENDEVCO	AC-J32185	12/4/00	6/4/01
	Z	ENDEVCO	AC-J31011	12/4/00	6/4/01
Head	X (R)	ENDEVCO	AC-J31020	12/4/00	6/4/01
	Y (R)	ENDEVCO	AC-J31101	12/4/00	6/4/01
	Z (R)	ENDEVCO	AC-J31059	12/4/00	6/4/01
Neck Load Cell	X	DENTON	LC-076FX	8/28/00	2/26/01
	Y	DENTON	LC-076FY	8/28/00	2/26/01
	Z	DENTON	LC-076FZ	8/28/00	2/26/01
Neck Moment	X	DENTON	LC-076MX	8/28/00	2/26/01
	Y	DENTON	LC-076MY	8/28/00	2/26/01
	Z	DENTON	LC-076MZ	8/28/00	2/26/01
Chest	X	ENDEVCO	AC-J34019	12/4/00	6/4/01
	Y	ENDEVCO	AC-J33018	12/4/00	6/4/01
	Z	ENDEVCO	AC-J32783	12/4/00	6/4/01
Chest	X (R)	ENDEVCO	AC-J31066	12/4/00	6/4/01
	Y (R)	ENDEVCO	AC-P16979	9/15/00	3/16/01
	Z (R)	ENDEVCO	AC-J31022	12/4/00	6/4/01
Chest Deflection Gauge Hybrid III Use Only		SERVO	DS-245	12/5/00	6/5/01
Pelvic	X	ENDEVCO	AC-J31034	12/3/00	6/3/01
	Y	ENDEVCO	AC-P17258	9/15/00	3/16/01
	Z	ENDEVCO	AC-J31010	12/3/00	6/3/01

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 245)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-551	11/20/00	5/21/01
Right Femur Load Cell		GSE	LC-951	11/20/00	5/21/01
Left Upper Tibia	Mx	DENTON	LC-016MX	11/9/00	5/10/01
	My	DENTON	LC-016MY	11/9/00	5/10/01
Left Lower Tibia	Fz	DENTON	LC-123FZ	11/9/00	5/10/01
	Mx	DENTON	LC-123MX	11/9/00	5/10/01
	My	DENTON	LC-123MY	11/9/00	5/10/01
Right Upper Tibia	Mx	DENTON	LC-023MX	11/9/00	5/10/01
	My	DENTON	LC-023MY	11/9/00	5/10/01
Right Lower Tibia	Fz	DENTON	LC-111FZ	11/9/00	5/10/01
	Mx	DENTON	LC-111MX	11/9/00	5/10/01
	My	DENTON	LC-111MY	11/9/00	5/10/01
Left Foot Rear	X	ENDEVCO	AC-APA30	7/16/00	1/14/01
	Z	ENDEVCO	AC-J31026	9/21/00	3/22/01
Left Foot Front	Z	ENDEVCO	AC-J32831	7/16/00	1/14/01
Right Foot Rear	X	ENDEVCO	AC-J32832	7/14/00	1/12/01
	Z	ENDEVCO	AC-J33376	7/16/00	1/14/01
Right Foot Front	Z	ENDEVCO	AC-J18400	9/28/00	3/29/01
Lap Belt Load Cells		LEBOW	LC-711	12/1/00	6/1/01
Shoulder Belt Load Cells		-	-	-	-
Spool-Out Potentiometer		-	-	-	-
Belt Stretch Transducer		-	-	-	-

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember	ICS	AC-D61	8/14/00	2/12/01
Right Rear Seat Crossmember	ICS	AC-Y17	8/25/00	2/23/01
Top of Engine	ENDEVCO	AC-A14131	11/27/00	5/28/01
Bottom of Engine	ENDEVCO	AC-AA35	12/10/00	6/10/01
Right Disc Brake Caliper	ENDEVCO	AC-APBB6	12/10/00	6/10/01
Instrument Panel	ENDEVCO	AC-A14124	8/7/00	2/5/01
Left Disc Brake Caliper	ENDEVCO	AC-AP1A2	12/10/00	6/10/01
Left Seat Rear Crossmember (R)	ICS	AC-D29	8/14/00	2/12/01
Right Seat Rear Crossmember (R)	ICS	AC-X88	8/14/00	2/12/01