REPORT NUMBER: CAL-02-15

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

ISUZU MOTORS LTD.
2002 ISUZU RODEO
MPV

NHTSA NUMBER: M20507

VERIDIAN TEST NUMBER: 8642-NCAP-15

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

May 17, 2002

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
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16. Abstract

A frontal load cell barrier test of a 2002 Isuzu Rodeo MPV was performed at Veridian Engineering crash test facility in Buffalo, New York, on May 17, 2002.

The impact velocity was 56.49 kph and the temperature at the barrier face was 21?C. The maximum post-test vehicle crush was 482 mm. The test vehicle was equipped with 3-point restraint systems, knee bolsters, adjustable head restraints, and airbags at both the driver and right outboard passenger seating positions.

With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements.

ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (061)	906.6	54.8	37.4	5303.2	6289.5
Passenger (064)	502.5	56.0	39.2	3927.5	2002.5

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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.49 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-32005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.49 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.3-km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated December 1999. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion (Partial)"; and FMVSS 301 "Fuel System Integrity" performance. Procedures for receiving, inspection testing and reporting of test results are described in the test procedures and are not repeated in this report.

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

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

Both ATDs were fully instrumented with nine accelerometer array head, chest and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, left and right knee sliders, and lower leg instrumentation. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No.064) were used in two tests previous to this test (M25104 and M20103). Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 198 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Appendix C contains the dummy calibration data and Appendix D contains the transducer calibration dates.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 36 load cells was impacted by a 2002 Isuzu Rodeo MPV at a velocity of 56.49 kph. The test was performed at Veridian Engineering on May 17, 2002. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The occupant data is summarized below.

	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)	Belt Stretch (mm/50 mm)
Driver ATD	906.6	54.8	37.4	5303.2	6289.5	*	*
Passenger ATD	502.5	56.0	39.2	3927.5	2002.5	*	*

*Sensors not used – no available data channels.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum vehicle static crush was 482 mm and both the driver and passenger side doors remained closed and latched during the impact event and were operable after the impact without the use of tools .

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

The 2002 Isuzu Rodeo MPV did not exceed the requirements of FMVSS 208, FMVSS 212, FMVSS 219, and FMVSS 301. Data pertaining to these standards are presented in the data sheets.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No.: M20507 Test Mode: 56.3 kph Frontal Barrier

Test Date: May 17, 2002 Time: 11:55 Temperature: 21 °C

Vehicle Make/Model/Body Style: 2002 Isuzu Rodeo MPV

Vehicle Test Weight: 2112 kg

Vehicle/Barrier Impact Angle: 0 °

Impact Velocity: 56.49 kph

Maximum Static Crush: 482 mm

Vehicle Rebound: 908 mm

DUMMIES:	DRIVER	PASSENGER
Type:	572E	572E
Restraint System:	Seatbelt, Airbag, Knee Bolster and Adjustable Head Restraint	Seatbelt, Airbag, Knee Bolster and Adjustable Head Restraint

Number of Data Channels: 198

Number of Cameras: 1 Real Time

16 High Speed

DOOR OPENING DATA: Closed, latched and operable without tools - Left Front

Closed, latched and operable without tools - Right Front

Front Seat(s) Data:	DRIVER	PASSENGER
Seat Track Failure: (mm of shift)	0	0
Seat Back Failure:	None	None

VISIBLE DUMMY CONTACT POINTS:	DRIVER	PASSENGER
Head:	The face to the center of the airbag, the back of the head to the headrest.	The face to the center of the airbag, the top of the head to the sun visor, the back of the head to the headrest.
Abdomen:	None	None
Chest:	Airbag	Airbag
Knees:	Knee Bolster	Knee Bolster

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2002 Isuzu Rodeo MPV

NHTSA No. : M20507 ; VIN: 4S2DM58W524309877 ; Color: Black

Engine Data: 6 cylinders; - CID; 3.2 Liters; - cc

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

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

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

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

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

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

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

Date Received: 2/27/02 ; Odometer Reading 19 km

Selling Dealer: Ricart Isuzu

& Address: 4255 S. Hamilton Rd. Columbus, OH 43227

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Isuzu Motors Ltd.

Date of Manufacture 9/01

GVWR: 2360 kg; GAWR: 1135 kg FRONT; 1315 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 240 kpa FRONT

240 kpa REAR

Recommended Tire Size: P245/70R16

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

Size of Tires on Test Vehicle: P245/70R16 ; Manufacturer: Bridgestone

Vehicle Capacity Data:

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

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

Vehicle Capacity Weight (VCW) = 528 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 187.8 kg (136.1 kg maximum)

*Tire pressure used for test

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

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

Right Front =	480.0 kg	Right Rear =	430 kg
Left Front =	507.0 kg	Left Rear =	415.0 kg
TOTAL FRONT =	987.0 kg	TOTAL REAR =	845.0 kg

TOTAL DELIVERED WEIGHT = 1832.0 kg

% of Total Front of Vehicle Weight = 53.9% % of Total Rear Weight = 46.1% %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	1832.0	kg
Rated Cargo/Luggage Weight (RCLW) =	136.1	kg (136.1 kg maximum)
Weight of 2 p.572 Dummies @ 76 each =	152	kg
TARGET TEST WEIGHT =	2120.1	kg

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

Right Front =	515.5 kg	Right Rear =	534.5 kg
Left Front =	545.5 kg	Left Rear =	516.5 kg
TOTAL FRONT =	1061.0 kg	TOTAL REAR =	1051.0 kg

TOTAL TEST WEIGHT = 2112.0 kg

% of Total Front Weight = 50.2% % % of Total Rear Weight = 49.8% %

Weight of Ballast Secured in Vehicle Trunk Area = 12 kg

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF 837	LF 852	RR 863	LR 874
FULLY LOADED:	RF 824	LF 837	RR 818	LR 830
AS TESTED:	RF 824	LF 841	RR 824	LR 842

Vehicle's Wheel Base: 2700 mm

Location of Vehicle's C.G.: 1344 mm rearward of front wheel center.

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 71.6 liters

Usable Capacity Figure Furnished by COTR = 71.6 liters

Test Volume Range (92 to 94% of Usable Capacity) = 65.87 to 67.3 liters

ACTUAL TEST VOLUME= 66.2 liters (with entire fuel system filled)

Test Fluid Type: Stoddard Solution ; Spec. Grav. = 0.764

Kinematic Viscosity = 0.96 centistokes; Color = Orange

Type of Fuel Pump: Electric- X ; Mechanical- -

Does Electric Pump operate with ignition switch "ON" & engine "OFF" Yes- - No- X

Details of Fuel System: The tank is located ahead of the rear axle to the left of center; the lines are located inside the left frame rail, the filler neck is located on the left side behind the rear axle.

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°

Test Date: May 17, 2002 Time: 11:55 Temperature: 21 °C

Vehicle NHTSA No.: M20507

Required Impact Velocity Range: 55.5 to 57.1 kph

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

Trap No. 1 = 56.49 kph; Trap No. 2 = 56.49 kph

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

(2) exiting trap = 305 mm

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

Vehicle Length:

Pre-Test	Left =	4453	; C/L =	4508	; Right =	4461
Post-Test	Left =	4014	; C/L =	4208	; Right =	3994
Crush	Left =	439	; C/L =	300	; Right =	467
AVERAGE	=	402	mm			

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

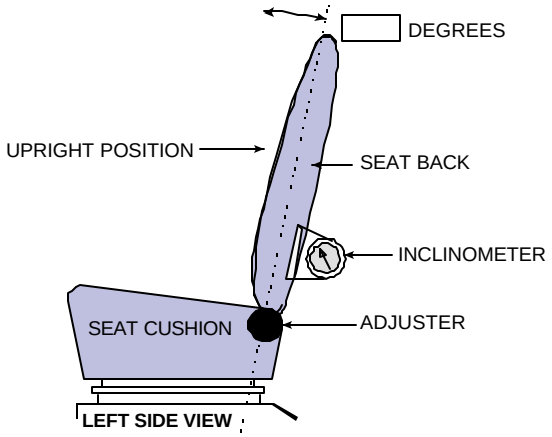
	Left =	918	; C/L =	888	; Right =	917
AVERAGE	=	908	mm			

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2002 Vehicle Model: Isuzu Rodeo Body Style : MPV

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



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 8

Measurement instructions: Release seat back lever until the seatback is in the 5th latch position rearward from the upright position (1).

Seat back angle for passenger's seat: 8

Measurement instructions: Same as the driver's seat

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Position seat at 11th detent forward from rearmost position (1).

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

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 71.6 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 = 71.6 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 67.3 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.

Does not normally operate when electrical system is activated

4. STEERING COLUMN ADJUSTMENTS:

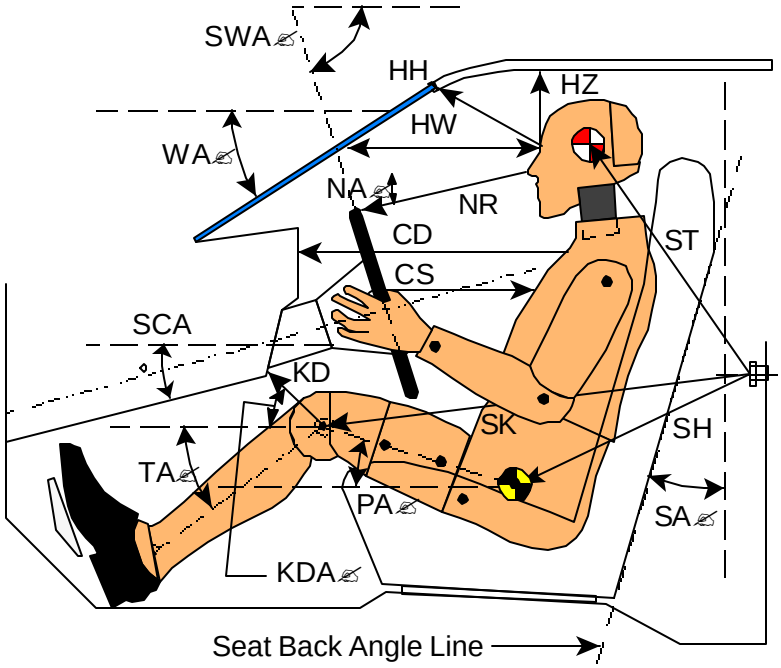
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: The third position upward from the lowest position (1) of 6 positions.

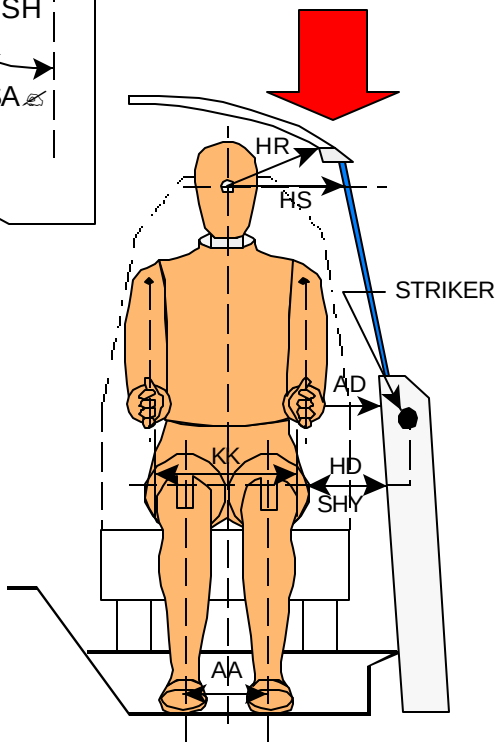
5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Mid-Position (notch 3 of 5 total positions)

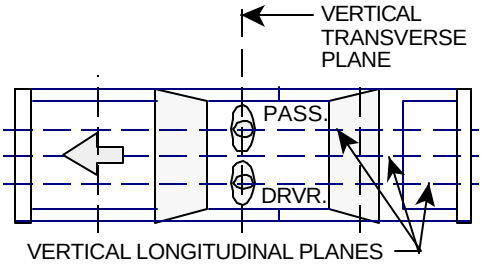
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



AD - Arm to Door
HD - H-Point to Door
HR - Head to Side Header
HS - Head to Side Window
KK - Knee to Knee
AA - Ankle to Ankle
SHY- Striker to H-Point (Y Direction)



CD - Chest to Dash
CS - Steering Wheel to Chest
HH - Head to Header
HW - Head to Windshield
HZ - Head to Roof
KDA - Knee to Dash Angle
KDL - Left Knee to Dash
KDR - Right Knee to Dash
NA - Nose to Rim Angle
NR - Nose to Rim
PA - Pelvic Angle
RA - Rim to Abdomen
SA - Seat Back Angle
SCA - Steering Column Angle
SH - Striker to H-Point
SK - Striker to Knee
ST - Striker to Head
SWA- Steering Wheel Angle
TA - Tibial Angle
WA - Windshield Angle

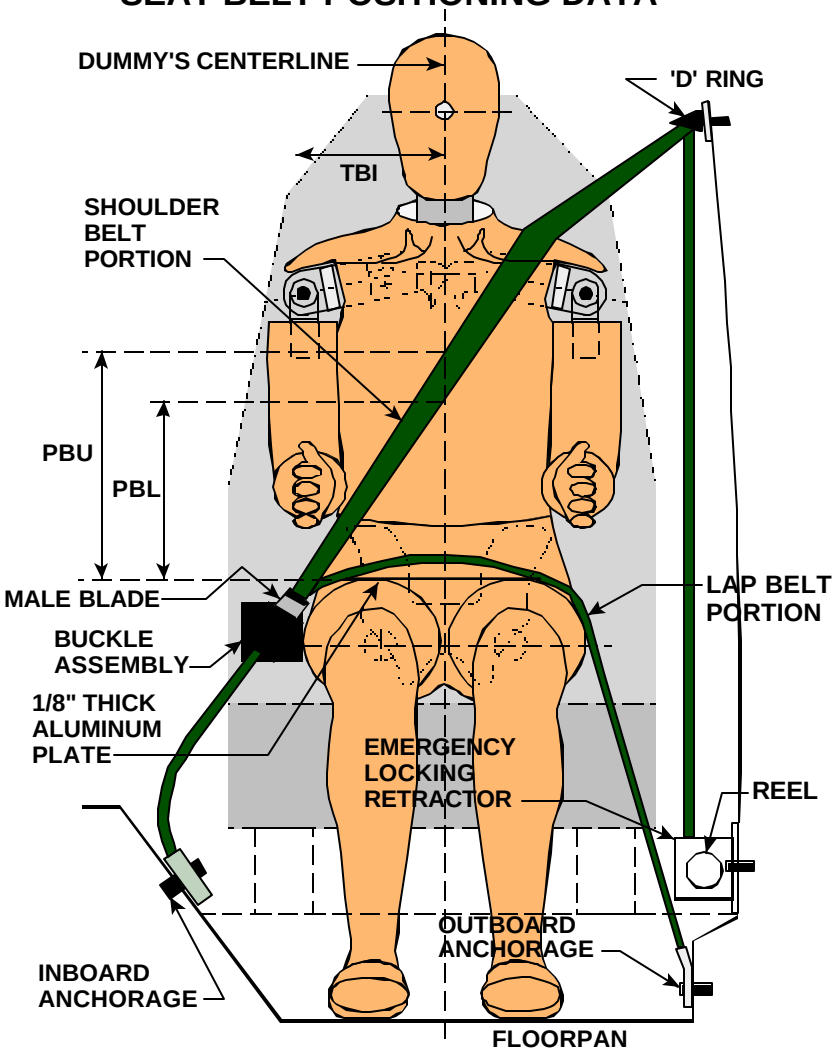


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA^{O}	35 deg.			N/A		
SWA^{O}	65 deg.			N/A		
SCA^{O}	25 deg.			N/A		
SA^{O}	15 deg.			15 deg.		
HZ	178			175		
HH	363			347		
HW	544			537		
HR	179			190		
NR	385	Angle	-15 deg.	N/A		
CD	513			525		
CS	298			N/A		
RA	190			N/A		
KDL	176	Angle (KDA)	37 deg.	168		
KDR	167			166	Angle (KDA)	37 deg.
PA^{O}	22.1 deg.			21.2 deg.		
TA^{O}	42.2 deg.			37.7 deg.		
KK	337			264		
AA	290			250		
ST	605	Angle	12 deg.	615	Angle	17 deg.
SK	660	Angle	90 deg.	665	Angle	86 deg.
SH	300	Angle	109 deg.	303	Angle	106 deg.
SHY	200			210		
HS	312			339		
HD	162			125		
AD	112			102		

Dimensions in millimeters

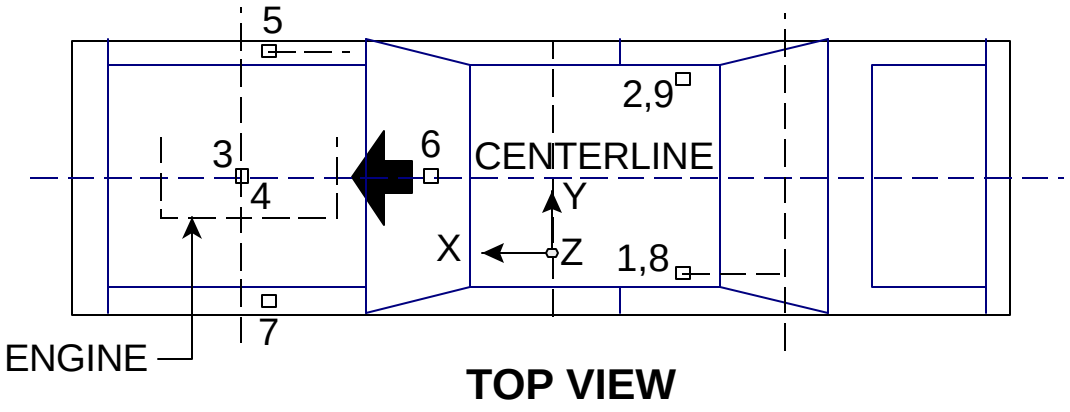
SEAT BELT POSITIONING DATA



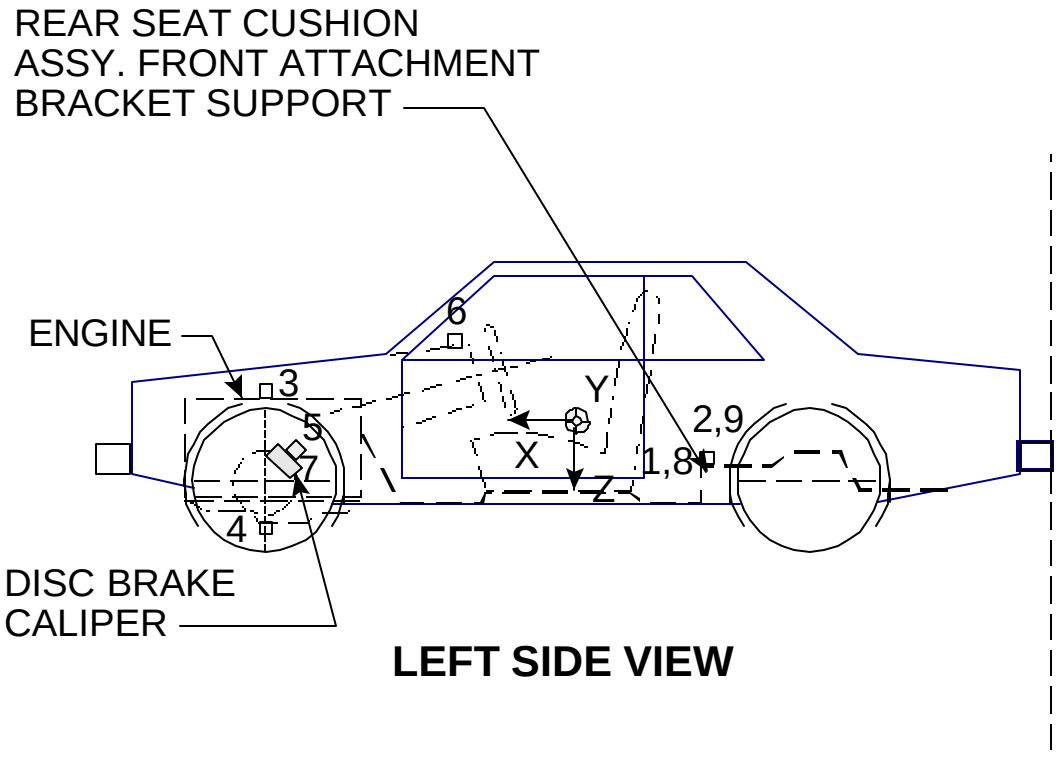
FRONT VIEW OF DUMMY

	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	330	330
PBL-- Top surface of alum. plate to belt lower edge	250	250
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



TOP VIEW



LEFT SIDE VIEW

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

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

LOCATION		PRE-TEST LENGTH (mm)		
		X	Y	Z
1	Left Rear Seat Cross Member X	1910	-517	-539
2	Right Rear Seat Cross Member X	1923	575	-482
3	Top of Engine Block	3872	228	-878
4	Bottom of Engine	3575	-53	-312
5	Disc Brake Caliper @ Right Side	3582	793	-407
6	Instrument Panel	2909	41	-997
7	Disc Brake Caliper @Left Side	3594	-811	-441
8	Left Rear Seat Cross Member Z	1910	-517	-539
9	Right Rear Seat Cross Member Z	1923	575	-482

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Left Rear Seat Cross Member X	3.3	103.5	-45.7	14.5
2	Right Rear Seat Cross Member X	2.8	111.5	-42.9	14.3
3	Top of Engine Block	33.3	46.4	-80.7	33.5
4	Bottom of Engine	49.0	45.9	-80.9	33.9
5	Disc Brake Caliper @ Right Side	13.0	86.9	-110.2	12.0
6	Instrument Panel	8.7	58.7	-65.3	28.9
7	Disc Brake Caliper @Left Side	61.2	19.6	-83.2	12.2
8	Left Rear Seat Cross Member Z	27.6	53.3	-51.2	48.7
9	Right Rear Seat Cross Member Z	31.5	30.2	-55.4	52.9

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2002 Isuzu Rodeo MPV

NHTSA Test No.: M20507 Test Date: May 17, 2002

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	**Unit**	**Pos**	**msec**	**Neg**	**msec**	**Pos**	**msec**	**Neg**	**msec**
Head 9 Array X Arm Y	**g**	5.8	197.1	-24.6	74.8	9.8	56.1	-9.7	127.7
Head 9 Array X Arm Z	**g**	35.9	48.7	-15.9	89.3	49.3	49.8	-6.4	126.1
Head 9 Array Y Arm X	**g**	21.3	196.7	-79.8	72.3	17.5	217.5	-47.7	75.6
Head 9 Array Y Arm Z	**g**	26.2	45.7	-15.7	82.1	33.3	54.3	-1.9	104.3
Head 9 Array Z Arm X	**g**	25.7	193.2	-99.0	71.1	33.4	215.7	-45.2	75.6
Head 9 Array Z Arm Y	**g**	8.3	165.8	-24.2	75.5	17.5	215.0	-11.9	128.5
Head X	**g**	17.8	197.9	-73.9	72.2	34.8	32.8	-49.9	77.5
Head Y	**g**	5.2	155.2	-25.0	81.5	9.0	213.8	-7.6	80.2
Head Z	**g**	26.8	50.4	-13.9	82.4	29.5	54.8	-1.8	121.0
Head Resultant	**g**	75.7	72.4	0.1	-49.8	55.1	79.5	0.0	-46.9
Redundant Head X	**g**	17.9	198.4	-73.1	72.2	2.0	128.3	-30.7	54.4
Redundant Head Y	**g**	4.9	155.2	-25.3	81.5	8.8	213.8	-6.8	125.0
Redundant Head Z	**g**	28.5	51.3	-12.5	82.7	47.5	75.3	-19.7	217.1
Redundant Head Resultant	**g**	75.1	72.2	0.1	-2.3	53.2	79.5	0.1	23.2
Upper Neck Fx	**N**	1216.3	71.7	-163.7	46.1	391.3	59.4	-655.9	116.8
Upper Neck Fy	**N**	140.4	74.6	-88.2	119.9	201.5	53.5	-277.1	119.1
Upper Neck Fz	**N**	1968.5	60.4	-293.9	104.3	1440.7	59.8	-490.3	256.7
Upper Neck F Resultant	**N**	2155.2	67.2	3.7	20.7	1499.1	59.8	3.4	25.4
Upper Neck Mx	**N-m**	16.1	159.1	-19.1	93.2	9.1	96.4	-18.8	128.9
Upper Neck My	**N-m**	72.7	70.4	-18.8	52.1	46.9	125.0	-29.6	259.2
Upper Neck Mz	**N-m**	25.1	99.1	-14.2	156.4	20.3	82.5	-10.8	129.7
Upper Neck M Resultant	**N-m**	74.5	70.5	0.3	23.2	51.0	125.5	0.1	31.0
Chest X	**g**	7.7	160.5	-56.6	76.1	2.9	254.6	-56.8	53.5
Chest Y	**g**	4.5	96.1	-8.7	55.6	6.2	58.3	-5.8	100.1
Chest Z	**g**	16.5	49.6	-10.4	99.3	18.2	40.3	-9.4	108.8
Chest Resultant	**g**	57.0	76.1	0.0	-48.5	58.3	53.4	0.0	-10.7

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

Vehicle Year/Make/Model/Body Style: 2002 Isuzu Rodeo MPV

NHTSA Test No.: M20507 Test Date: May 17, 2002

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	**Unit**	**Pos**	**msec**	**Neg**	**msec**	**Pos**	**msec**	**Neg**	**msec**
Redundant Chest X	**g**	7.8	160.5	-56.7	76.1	2.9	254.5	-57.1	53.6
Redundant Chest Y	**g**	4.4	97.9	-9.1	55.6	6.0	58.4	-5.7	99.9
Redundant Chest Z	**g**	16.5	49.6	-10.1	99.3	17.7	40.3	-9.4	105.7
Redundant Chest Resultant	**g**	57.1	76.1	0.0	-47.3	58.7	53.4	0.0	-38.1
Chest Displacement	**mm**	0.0	11.4	-37.4	66.3	0.0	11.2	-39.2	56.0
Pelvic X	**g**	4.1	123.3	-104.1	42.4	4.9	150.1	-74.6	50.4
Pelvic Y	**g**	7.4	67.6	-18.8	41.6	10.3	59.7	-11.3	84.8
Pelvic Z	**g**	7.7	40.3	-19.2	86.9	7.1	41.2	-23.8	66.8
Pelvic Resultant	**g**	104.2	42.4	0.0	-47.1	75.1	50.4	0.0	-35.4
Left Femur	**N**	278.2	106.0	-5303.2	42.3	610.8	38.0	-3927.5	50.0
Right Femur	**N**	638.2	37.0	-6289.5	41.9	263.2	33.3	-2002.5	49.7
Left Upper Tibia Mx	**N-m**	22.1	188.6	-97.2	39.8	39.7	41.7	-25.6	82.1
Left Upper Tibia My	**N-m**	142.5	44.6	-47.3	34.7	50.6	58.1	-132.5	39.1
Left Lower Tibia Fz	**N**	499.8	61.1	-1335.4	33.2	281.6	44.4	-3640.4	40.6
Left Lower Tibia Mx	**N-m**	73.7	40.0	-28.1	37.0	26.1	41.1	-8.8	47.9
Left Lower Tibi a My	**N-m**	42.5	45.2	-13.4	42.0	122.3	47.0	-99.8	38.5
Right Upper Tibia Mx	**N-m**	55.5	47.7	-12.6	82.7	30.4	50.0	-8.9	137.5
Right Upper Tibia My	**N-m**	30.8	45.0	-93.7	37.8	59.5	48.0	-67.4	38.5
Right Lower Tibia Fz	**N**	89.2	142.3	-1193.7	46.5	175.8	136.5	-1467.2	39.2
Right Lower Tibia Mx	**N-m**	53.6	47.5	-19.0	42.5	17.0	52.9	-2.2	142.5
Right Lower Tibia My	**N-m**	209.2	59.1	-155.9	40.9	62.3	48.3	-35.0	37.4
Left Foot Aft Ax	**g**	14.4	91.1	-99.1	44.8	131.5	47.8	-251.8	40.6
Left Foot Aft Az	**g**	39.1	39.4	-82.7	40.0	61.1	40.3	-125.9	47.3
Left Foot Fore Az	**g**	31.2	20.0	-143.8	42.5	80.5	51.2	-187.1	40.6
Right Foot Aft Ax	**g**	85.7	57.0	-287.2	39.0	15.0	67.7	-73.3	43.9
Right Foot Aft Az	**g**	25.3	58.1	-181.9	40.0	5.5	25.4	-89.8	43.6
Right Foot Fore Az	**g**	301.7	47.0	-539.1	36.9	45.0	25.5	-109.5	43.9

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

Vehicle Year/Make/Model/Body Style: 2002 Isuzu Rodeo MPV

NHTSA Test No.: M20507 Test Date: May 17, 2002

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t_1 (msec)	t_2 (msec)	Average Acceleration t_1 to t_2
Position #1 - Driver	906.6	55.9	87.4	60.8
Position #2 - Passenger	502.5	53.8	89.8	45.5

** HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 36 milliseconds.

	CLIP SUMMARY*			
	CLIP (g's)	t_1 (msec)	t_2 (msec)	CSI
Position #1 - Driver	54.8	74.9	77.9	656.5
Position #2 - Passenger	56.0	51.9	54.9	644.1

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

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

Vehicle Year/Make/Model/Body Style: 2002 Isuzu Rodeo MPV

NHTSA Test No.: M20507 Test Date: May 17, 2002

	HEAD INJURY CRITERIA (HIC) **REDUNDANT**			
	HIC**	t_1 (msec)	t_2 (msec)	Average Acceleration t_1 to t_2
Position #1 - Driver	883.7	55.5	87.3	59.9
Position #2 - Passenger	466.9	53.4	89.4	44.2

** HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 36 milliseconds.

	CLIP SUMMARY* **REDUNDANT**			
	CLIP (g's)	t_1 (msec)	t_2 (msec)	CSI
Position #1 - Driver	55.0	74.9	77.9	657.0
Position #2 - Passenger	56.4	51.9	54.9	654.5

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

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:	Driver	Passenger
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	1770	1770
Shoulder belt length as measured on Part 572 Dummy.	880	880
Lap belt length as measured on Part 572 Dummy.	890	890

_____
Dimensions in millimeters

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

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

Windshield is bonded in place and covered with a 10 mm molding.

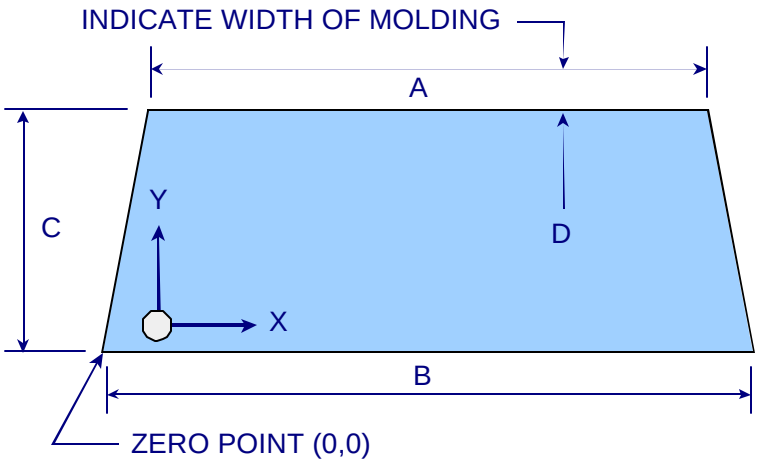
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2020	2020	100.0%
LEFT SIDE	2020	2020	100.0%
TOTAL	4040	4040	100.0%

AREA OF RETENTION FAILURE: None



FRONT VIEW OF WINDSHIELD

DIMENSIONS (mm)	
A	1180
B	1430
C	715
D	10

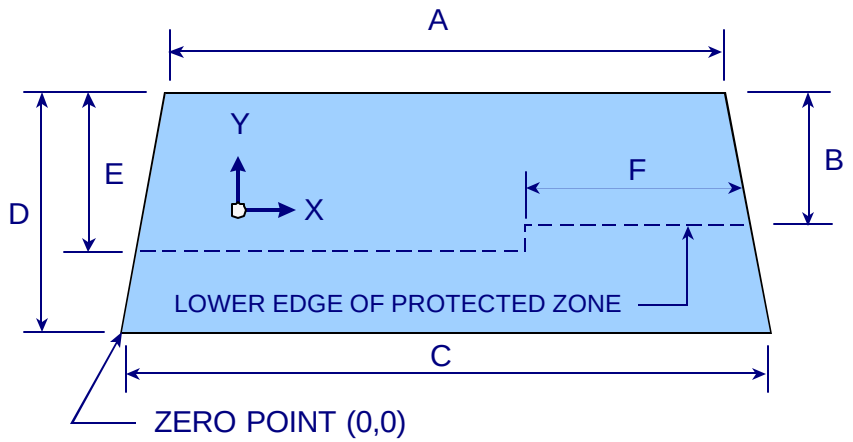
FAILURE DETAILS: None

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

PROTECTED ZONE LOWER EDGE REQUIREMENT:

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

FMVSS 219 TEST DATA:



DIMENSIONS (mm)	
A	1180
B	390
C	1430
D	715
E	425
F	915

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.:	M20507	TEST DATE:	May 17, 2002

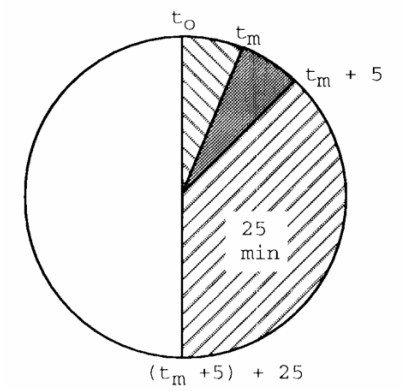
VEHICLE MAKE/MODEL: 2002 Isuzu Rodeo MPV

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

= =

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

FUEL SPILLAGE MEASUREMENT:

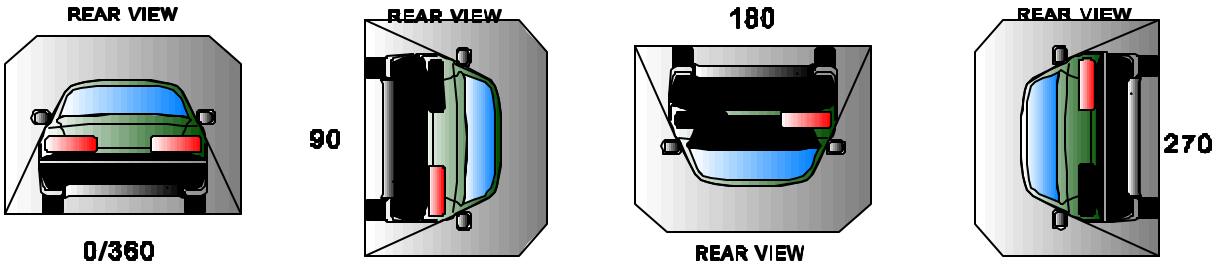


	ACTUAL	MAX ALLOWED
1. From impact until vehicle motion ceases	0	28 g
2. For 5 minute period after vehicle motion ceases	0	141 g
3. For next 25 minutes	0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2002 Isuzu Rodeo MPV NHTSA No.: M20507



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0º - 90º	1	minutes	12	seconds	5	minutes	6	minutes	12	seconds	7	minutes
90º - 180º	1	minutes	08	seconds	5	minutes	6	minutes	8	seconds	7	minutes
180º-270º	1	minutes	02	seconds	5	minutes	6	minutes	2	seconds	7	minutes
270º-360º	1	minutes	08	seconds	5	minutes	6	minutes	8	seconds	7	minutes

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

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

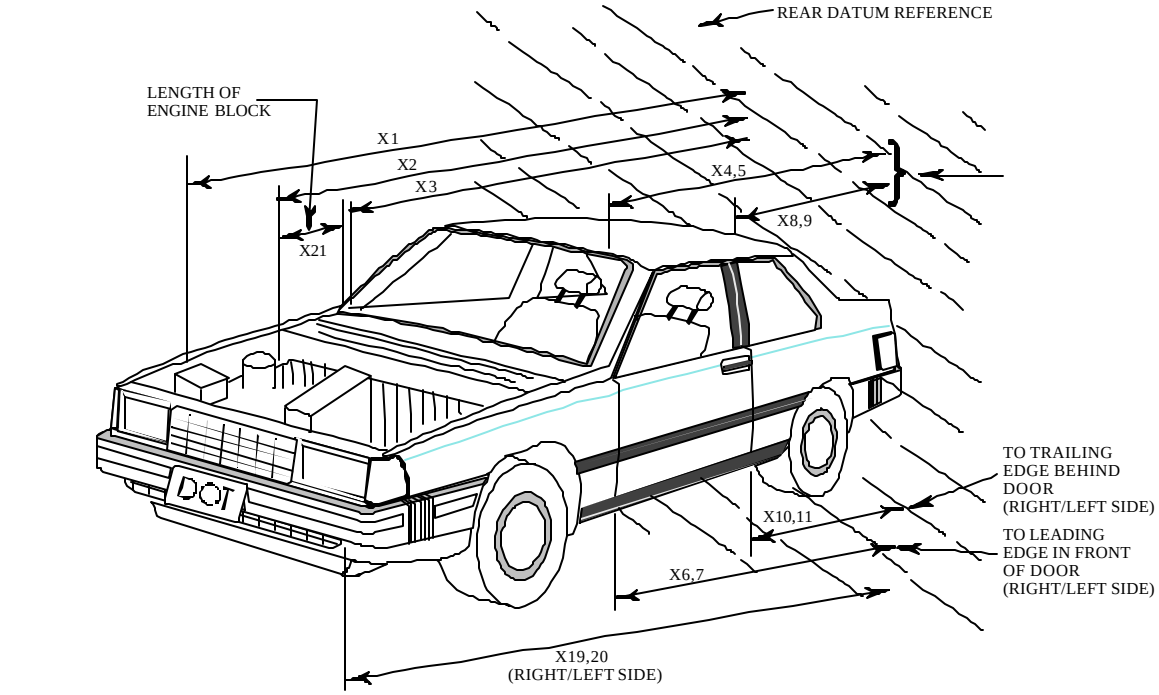
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	N/A
90º - 180º	0	0	0	N/A
180º-270º	0	0	0	N/A
270º-360º	0	0	0	N/A

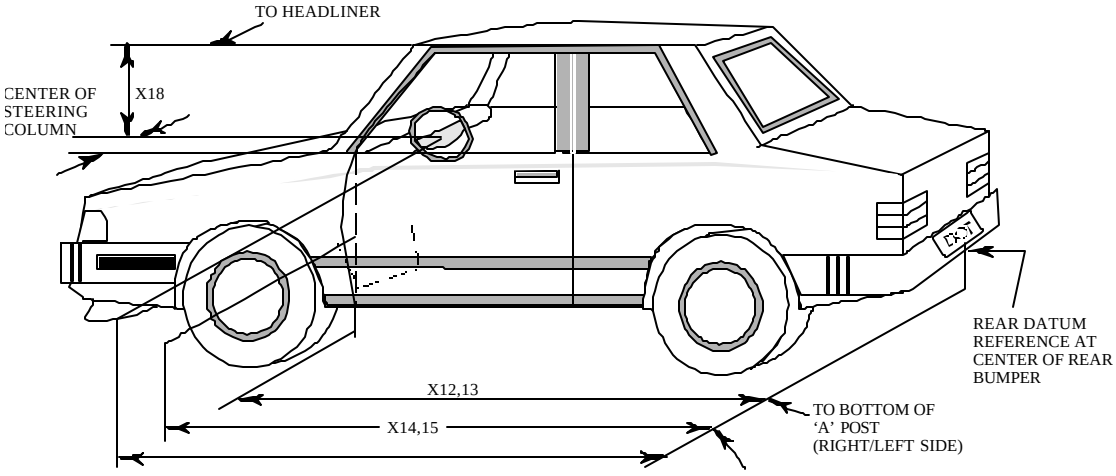
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

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

DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS





DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

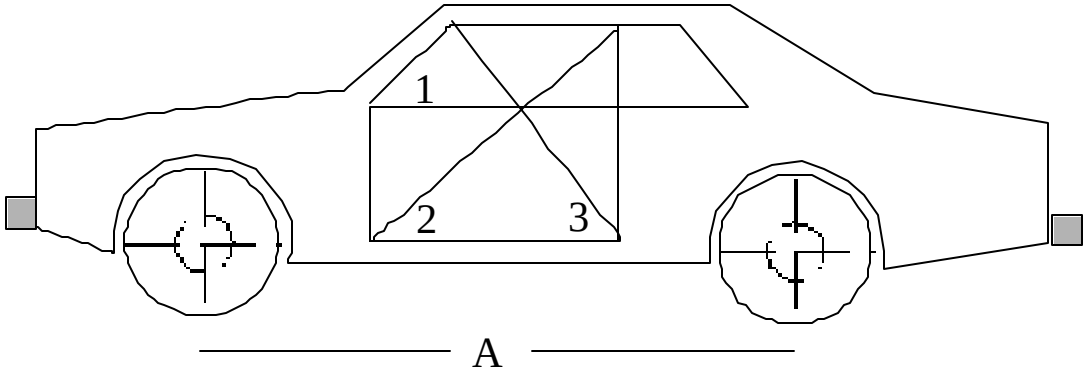
No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4508	4028	480
X2	Rear Surface of Vehicle to Front of Engine	3928	3694	234
X3	Rear Surface of Vehicle to Firewall	3446	3277	169
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3197	3189	8
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3197	3186	11
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3174	3179	-5
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3175	3173	2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2066	2056	10
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2067	2054	13
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2061	2064	-3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2063	2061	2
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3247	3244	3
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3242	3236	6
X14	Rear Surface of Vehicle to Firewall, Right Side	3444	3293	151
X15	Rear Surface of Vehicle to Firewall, Left Side	3436	3343	93
X16	Rear Surface of Vehicle to Steering Column	2741	2696	45
X17	Center of Steering Column to "A" Post	289	257	32
X18	Center of Steering Column to Headliner	440	394	46
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4461	3994	467
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4453	4014	439
X21	Length of Engine Block	426	426	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2924	2912	12
CD	Rear Surface of Vehicle to Center of Dash Panel	2909	2886	23
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2919	2905	14

All Dimensions in mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

VEHICLE INTRUSION MEASUREMENTS

DOOR OPENING WIDTH



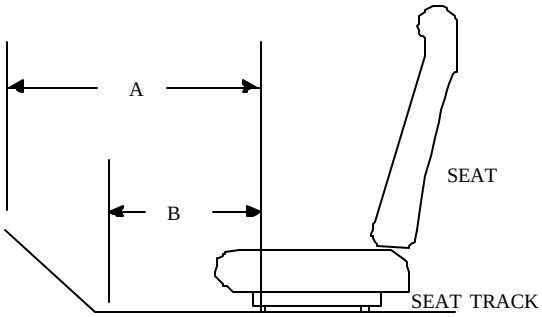
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1042	1487	1101	1041	1487	1097
AFTER TEST	1045	1475	1128	1048	1467	1131
DIFFERENCE	-3	12	-27	-7	20	-34

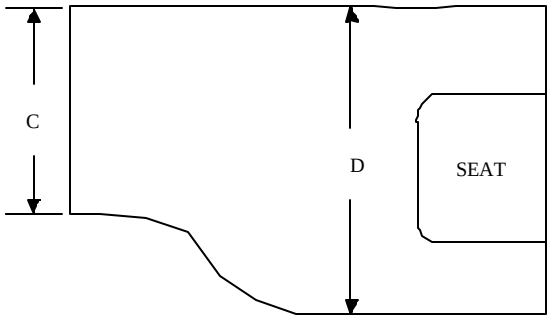
UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2700	2700
AFTER TEST	2642	2629
DIFFERENCE	58	71

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

VEHICLE INTRUSION MEASUREMENTS

STATIC FOOTWELL DEFORMATION





DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	723	644	79
B	482	474	8
C	437	422	15
D	484	483	1

PASSENGER

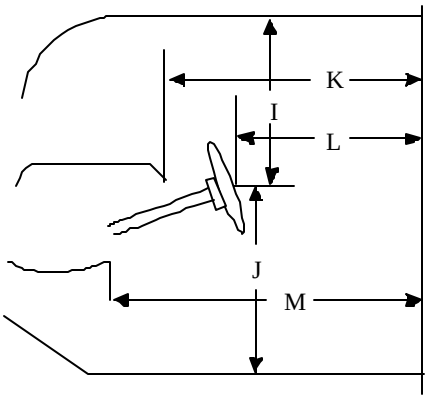
Measurement	Pre-Test	Post-Test	Difference
A	723	633	90
B	498	487	11
C	428	402	26
D	475	465	10

Units = mm

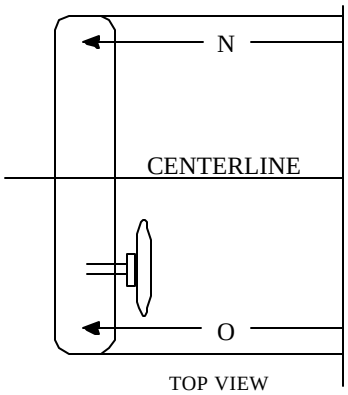
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

VEHICLE INTRUSION MEASUREMENTS

STATIC PASSENGER COMPARTMENT INTRUSION

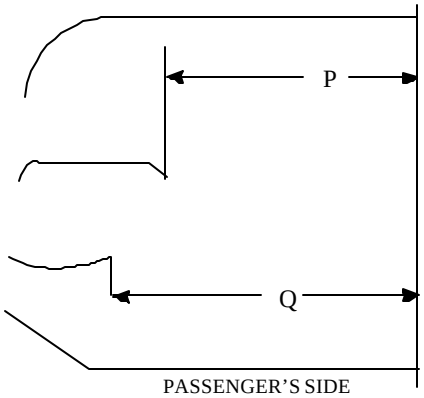


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS FROM C-PILLAR BELT ANCHORAGE



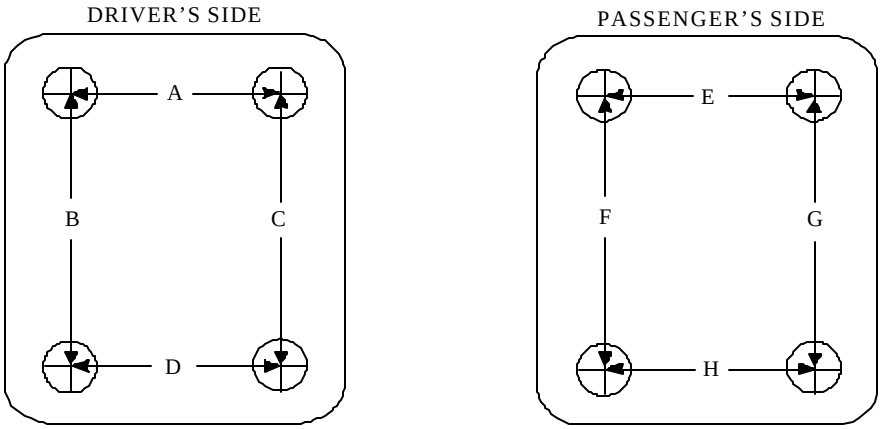
PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	440	394	46
J	611	680	-69
K	1776	1738	38
L	1586	1544	42
M	1806	1790	16
N	1858	1759	99
O	1763	1752	11
P = K (PASS.)	1905	1784	121
Q = M (PASS.)	1942	1824	118

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

FLOORBOARD DEFORMATION



TOP VIEW THROUGH FLOOR PAN

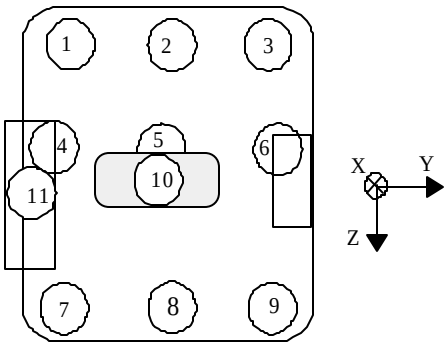
Measurement	Pre-Test	Post-Test	Difference
A	437	422	15
B	427	431	-4
C	336	328	8
D	484	483	1
E	428	402	26
F	456	459	-3
G	424	390	33
H	475	465	10

Units = mm

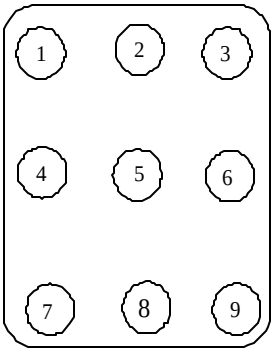
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

TOE-PAN INTRUSION

DRIVER'S SIDE



PASSENGER'S SIDE



Driver Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3346	3314	32	-693	-708	15
2	3394	3312	82	-652	-671	19
3	3354	3261	93	-646	-669	23
4	3296	3281	15	-547	-562	15
5	3307	3268	39	-530	-542	12
6	3258	3231	27	-540	-541	1
7	3149	3141	8	-501	-505	4
8	3154	3141	13	-498	-501	3
9	3112	3101	11	-506	-501	-5
10	3206	3077	129	-647	-694	47
11	3238	3234	4	-603	-628	25

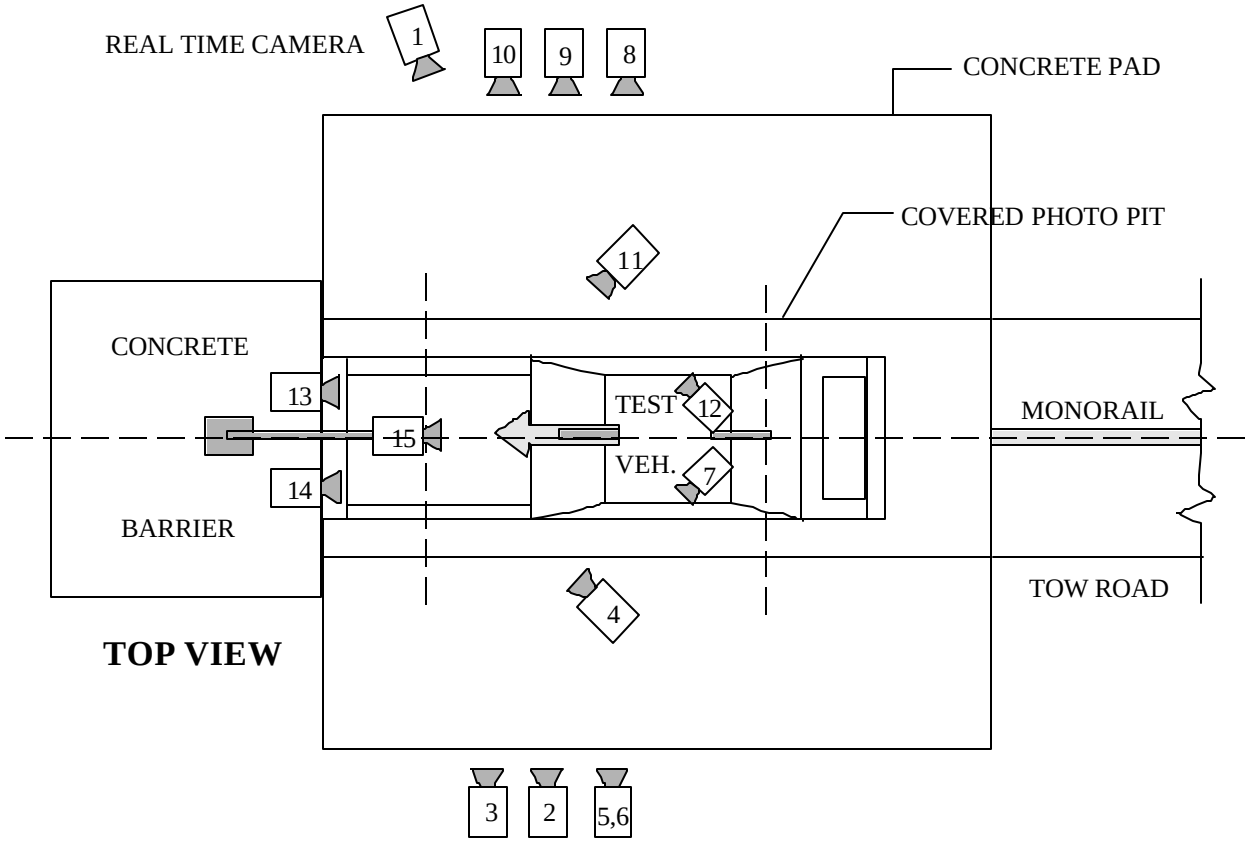
Passenger Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3361	3250	111	-660	-679	19
2	3396	3299	97	-663	-684	21
3	3354	3333	21	-690	-709	19
4	3282	3247	35	-533	-546	13
5	3310	3281	29	-520	-549	29
6	3268	3262	6	-550	-572	22
7	3140	3112	28	-495	-471	-24
8	3171	3153	18	-489	-491	2
9	3127	3121	6	-485	-503	18

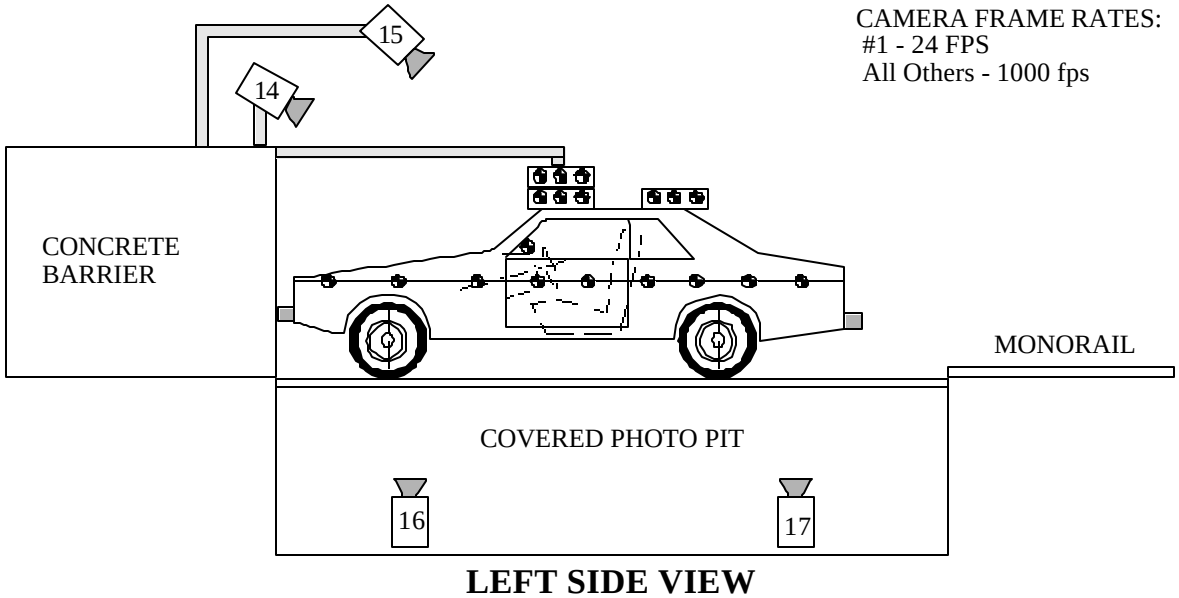
Reference: SAE: X = Rear Bumper (Positive: forward); Z = Ground (Positive: down)

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

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



CAMERA FRAME RATES:
#1 - 24 FPS
All Others - 1000 fps



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

NHTSA Test No.: M20507 Vehicle: 2002 Isuzu Rodeo MPV

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)* X	Y	Z	ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	6622	1690	1076	-2	6230	12.5	1005
3	Left Side View	8171	847	1145	-3	7779	25	950
4	Driver and Interior View	7187	2520	2002	-13	-	25	1040
5	Steering Column (Bottom)	7182	1930	1176	-4	6790	25	1010
6	Steering Column (Top)	7182	1930	1777	-8	6790	25	1010
7	Left Belt	-	-	-	-	-	-	-
8	Overall Right Side	6675	1833	1140	-2	6948	12.5	1005
9	Right Side View	8033	1191	1094	-2	8306	25	1005
10	Right Passenger View	7620	1707	1425	-3	7893	35	1000
11	Passenger and Interior View	7098	2453	1980	-8	-	25	1000
12	Right Belt	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	-40	-	13	1005
14	Driver Front View	620	-92	1987	-34	-	13	1000
15	Windshield View	0	-530	3374	-54	-	13	1000
16	Pit View of Engine	0	615	-3048	90	-	13	1000
17	Pit View of Fuel Tank	0	2360	-3048	90	-	13	1005

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

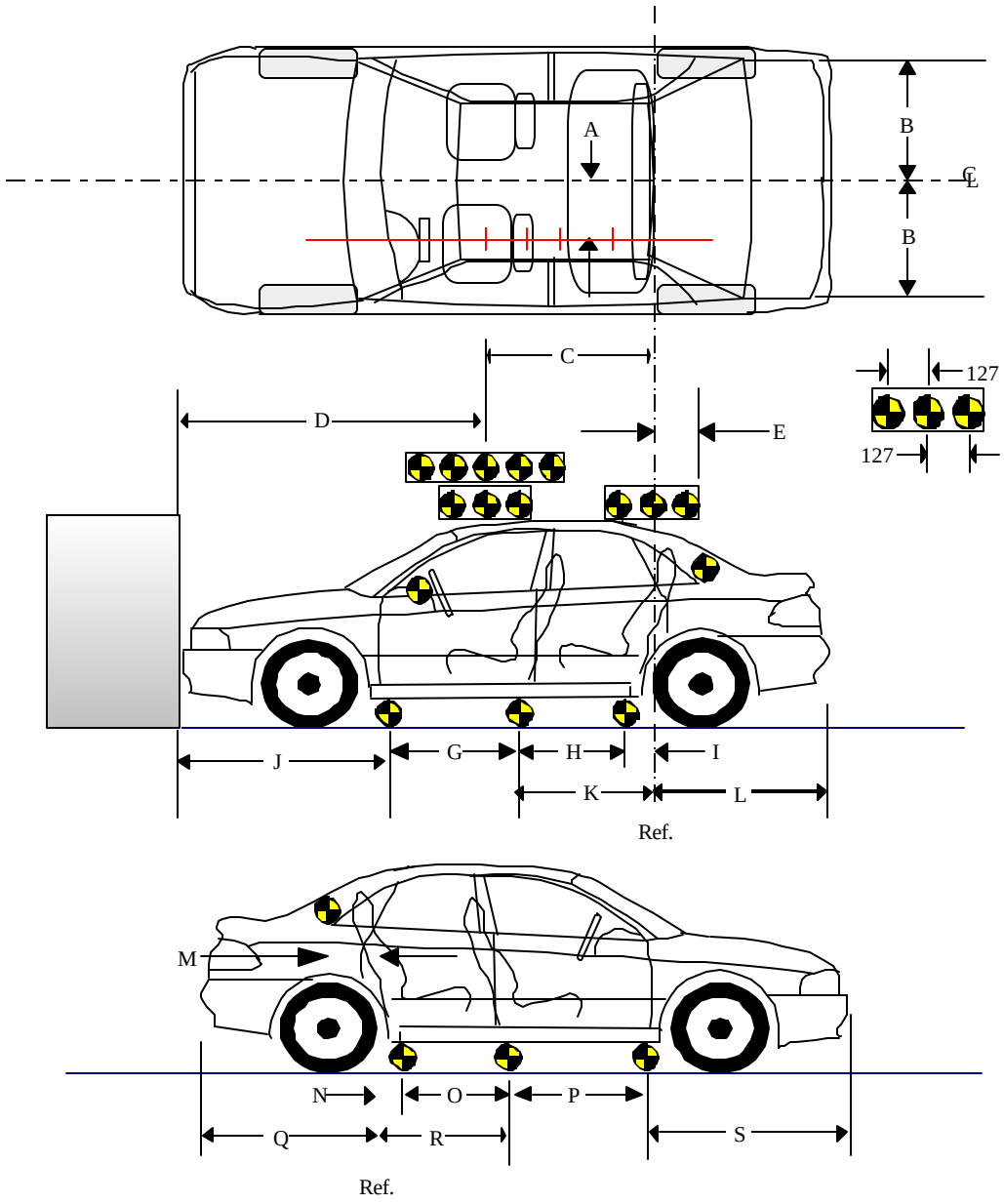
Y = film plane to impact location N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

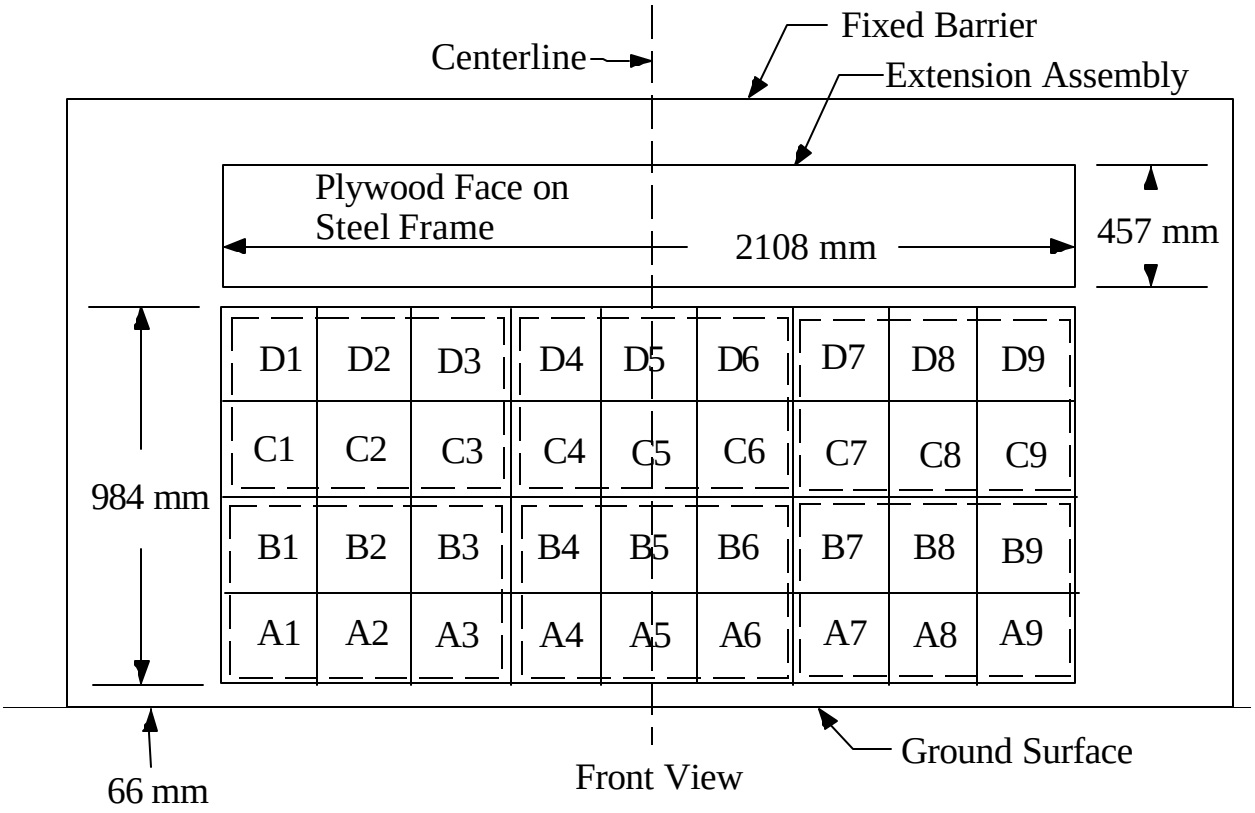
(Dimensions in millimeters)

A	349
B	665
C	1225
D	1915
E	334
F	1516
G	790
H	799
I	192
J	1328
K	991
L	1399
M	301
N	192
O	792
P	796
Q	1396
R	984
S	1332



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.: M20507; Test Date: May 17, 2002; Technician: P. MacDiarmid

Vehicle Model Year/Make/Model: 2002 Isuzu Rodeo MPV

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

B. Size of vent holes: (mm^2) 490.9 -Driver 1256.6 -Passenger

C. Total vent area: (mm^2) 981.8 -Driver 2513.2 -Passenger

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

Driver: 500 -Height; 600 -Width; 300 -Depth

Passenger: 720 -Height; 560 -Width; 750 -Depth

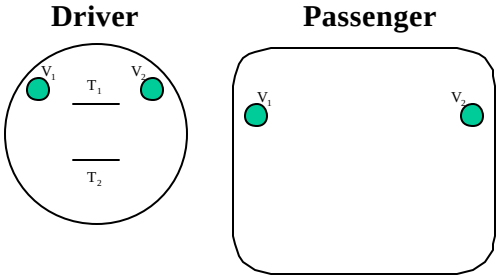
E. Is the air bag tethered?

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

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

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

(Note: Not to scale; V_n = Vent hole$_n$, T_n = Tether$_n$).



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

Driver: Air bag: E5712400-00 T1390120G0401-00

Generator: AB78752NM0804

Passenger: Air bag: -

Generator: AL49932B126515

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA

FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Isuzu Rodeo MPV

NHTSA Test No.: M20507 VIN: 4S2DM58W524309877

Model Year: 2002 Build Date: 9/01 Test Date: May 17, 2002

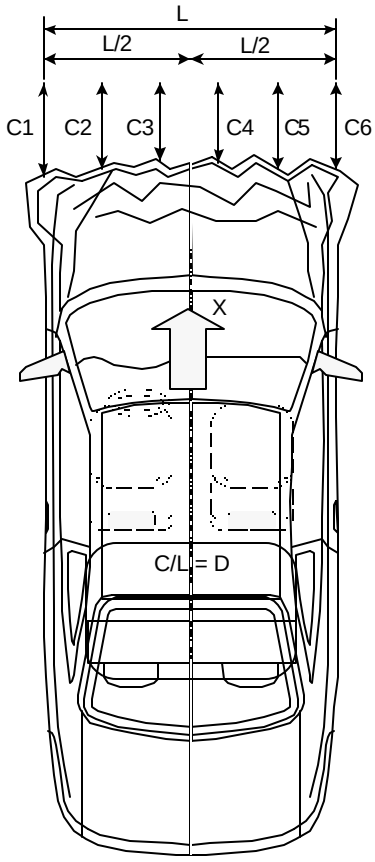
Vehicle Size Category: Special Purpose Test Weight: 2112 kg

Vehicle Wheelbase: 2700 mm; Front Overhang: 782 mm; Overall Width: 1784 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4322	3910	412
C2 =	4454	4017	437
C3 =	4501	4041	460
C4 =	4503	4021	482
C5 =	4468	3994	474
C6 =	4352	3959	393



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1552 mm

L2= 776.0 mm

L5= 310.4 mm

APPENDIX A

PHOTOGRAPHS

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A-5	POST-TEST LEFT SIDE VIEW	A-7
A-6	PRE-TEST RIGHT SIDE VIEW	A-8
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A-38	ROLLOVER VIEW	A-40
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A-40	VEHICLE PLACARD	A-42

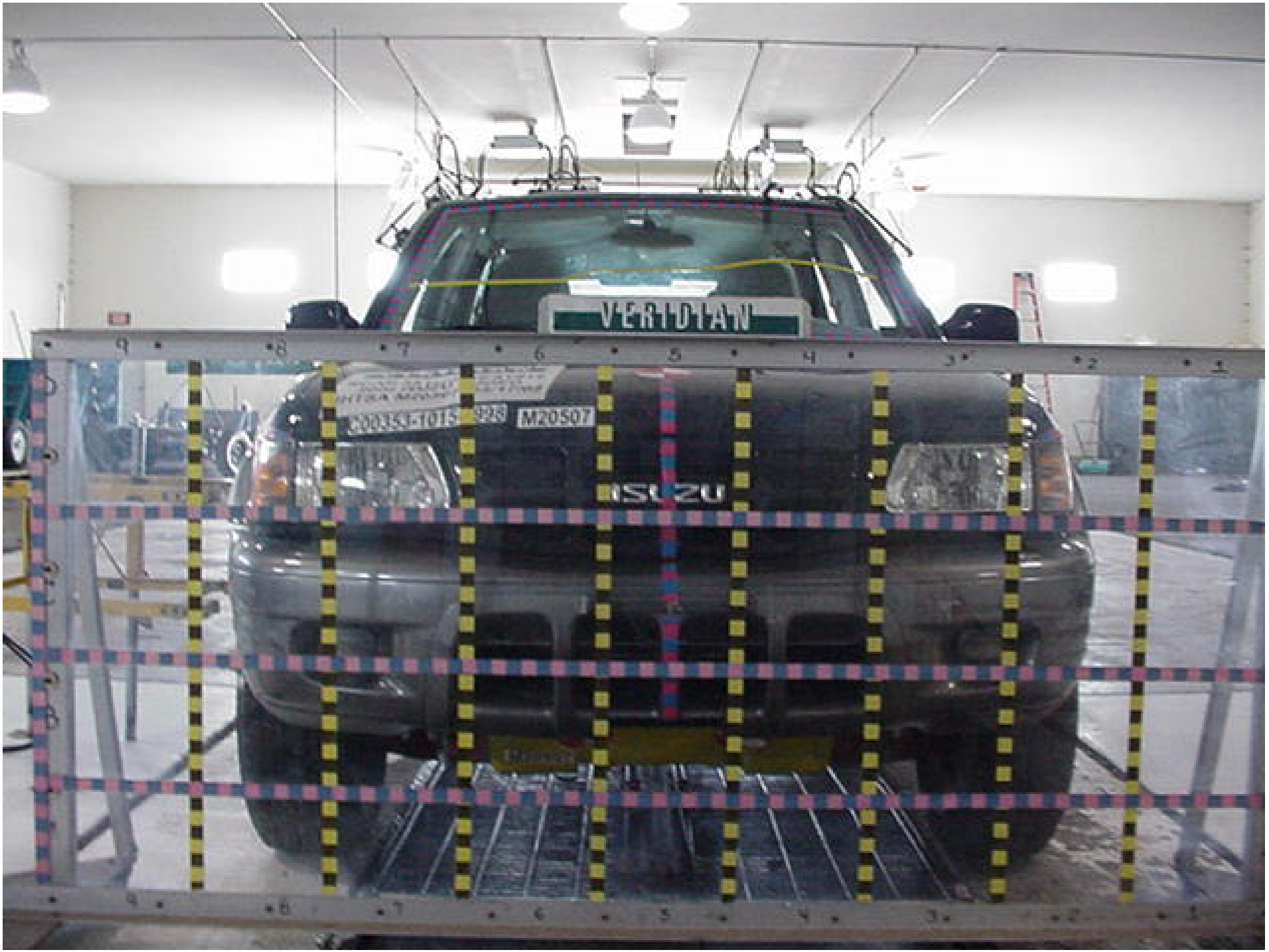


Figure A-1 LOAD CELL LOCATIONS



Figure A-2 PRE-TEST FRONT VIEW



Figure A-3 POST-TEST FRONT VIEW



Figure A-4 PRE-TEST LEFT SIDE VIEW

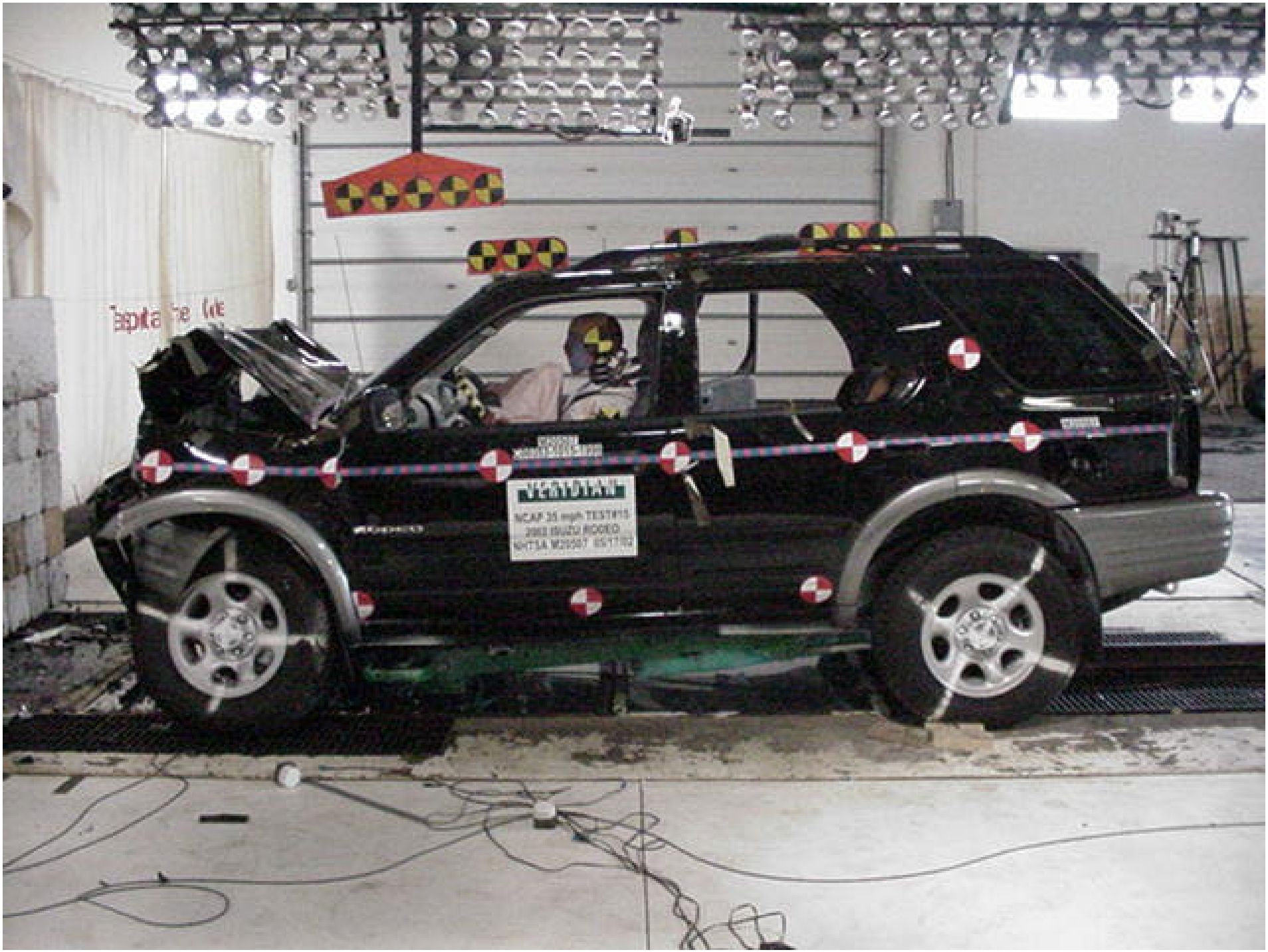


Figure A-5 POST-TEST LEFT SIDE VIEW



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
(left side doors were opened by technicians prior to photograph, doors remained latched and closed during the event, and were operable without the use of tools after the event)



Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW

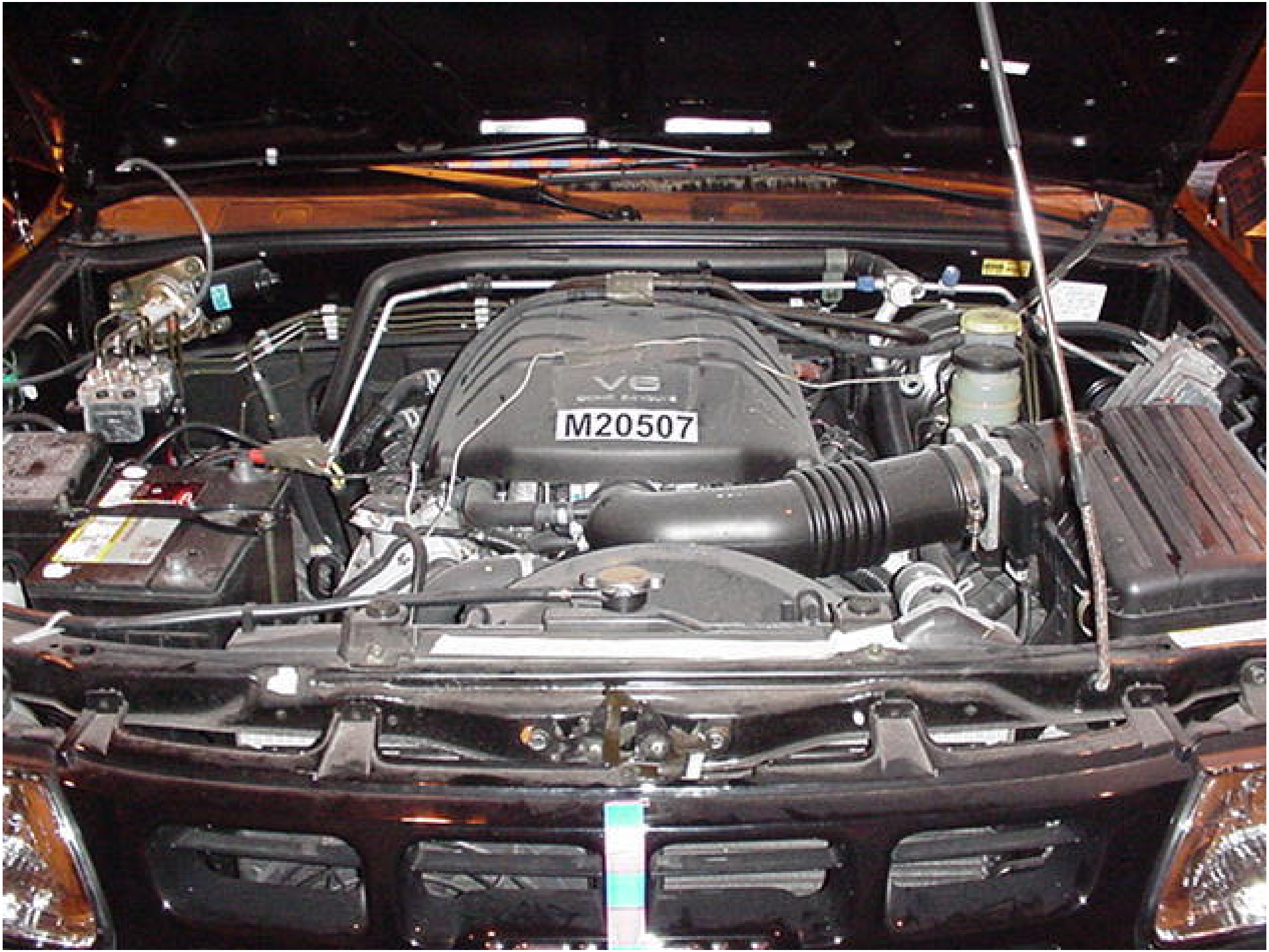


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15 FUEL CAP VIEW



Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

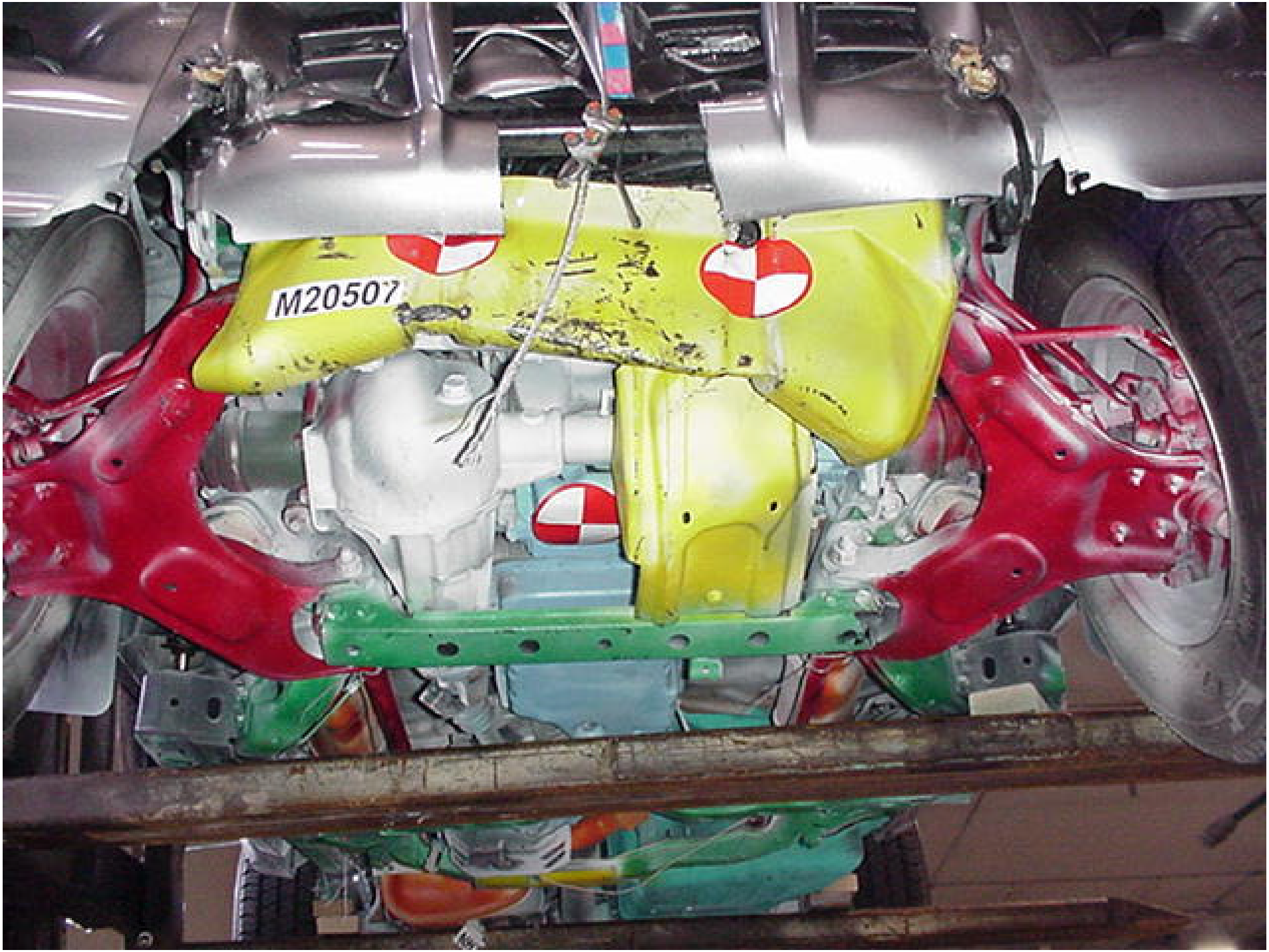


Figure A-17 POST-TEST FRONT UNDERBODY VIEW



Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

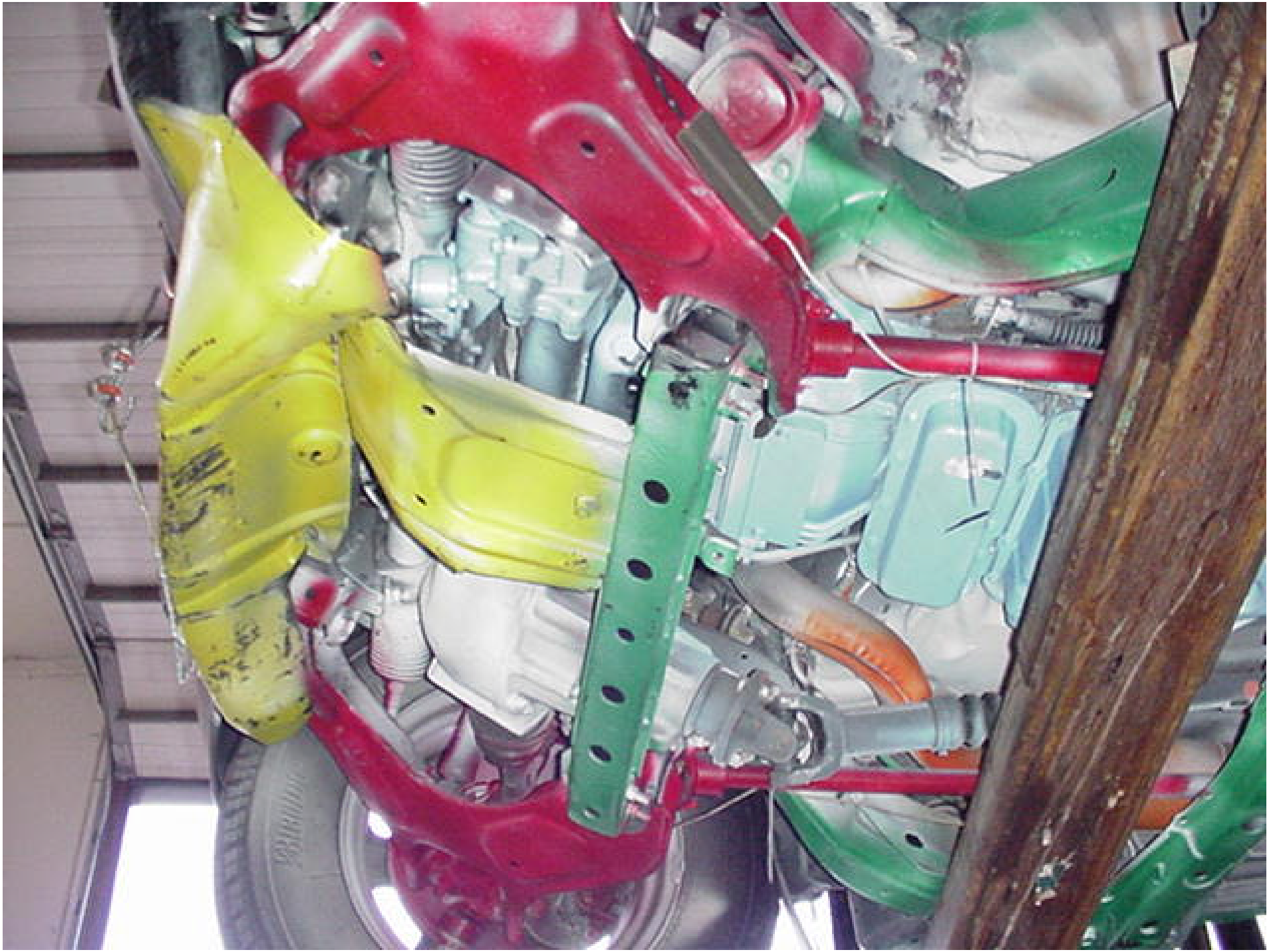


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

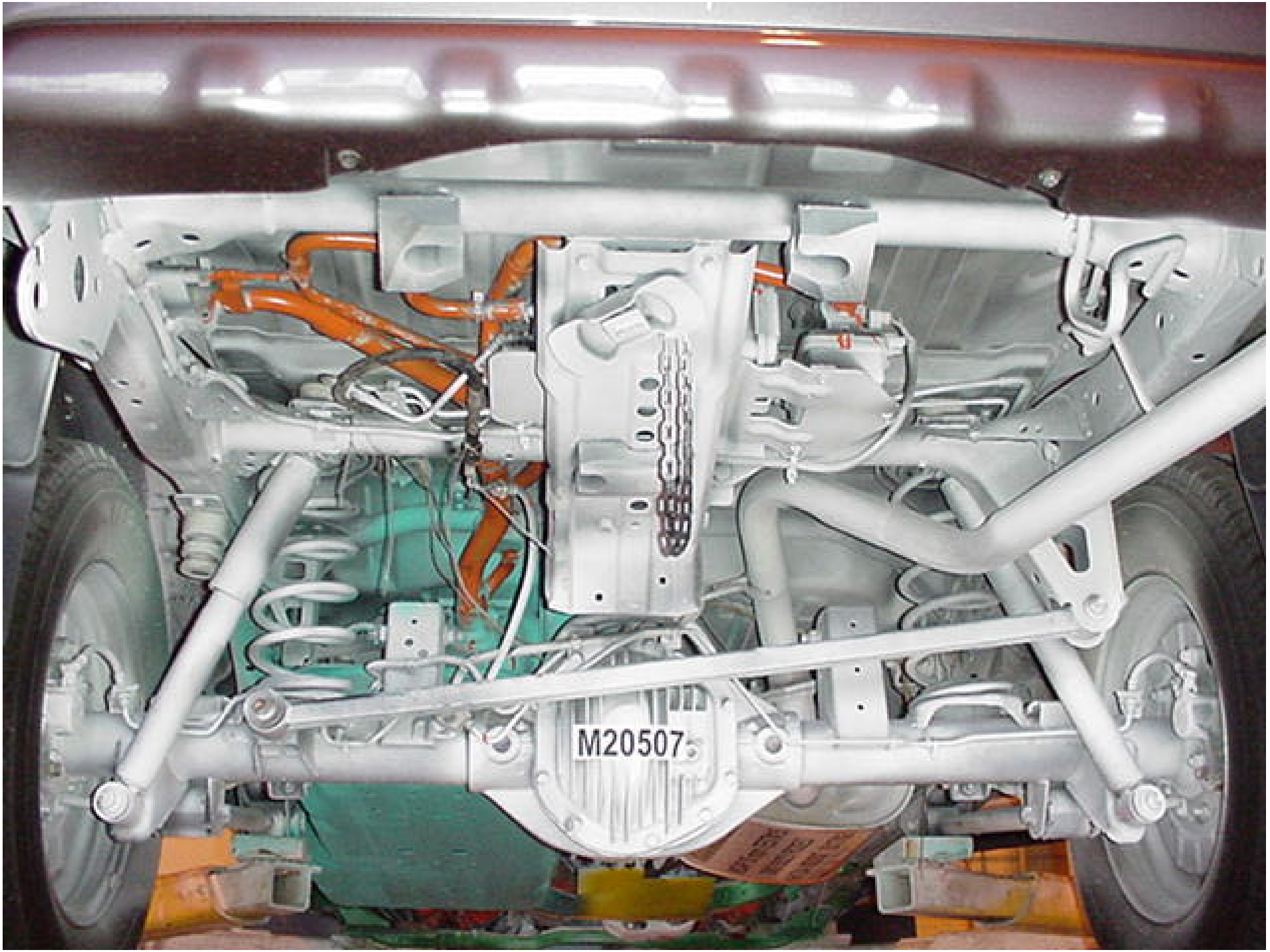


Figure A-20 PRE-TEST REAR UNDERBODY VIEW



Figure A-21 POST-TEST REAR UNDERBODY VIEW

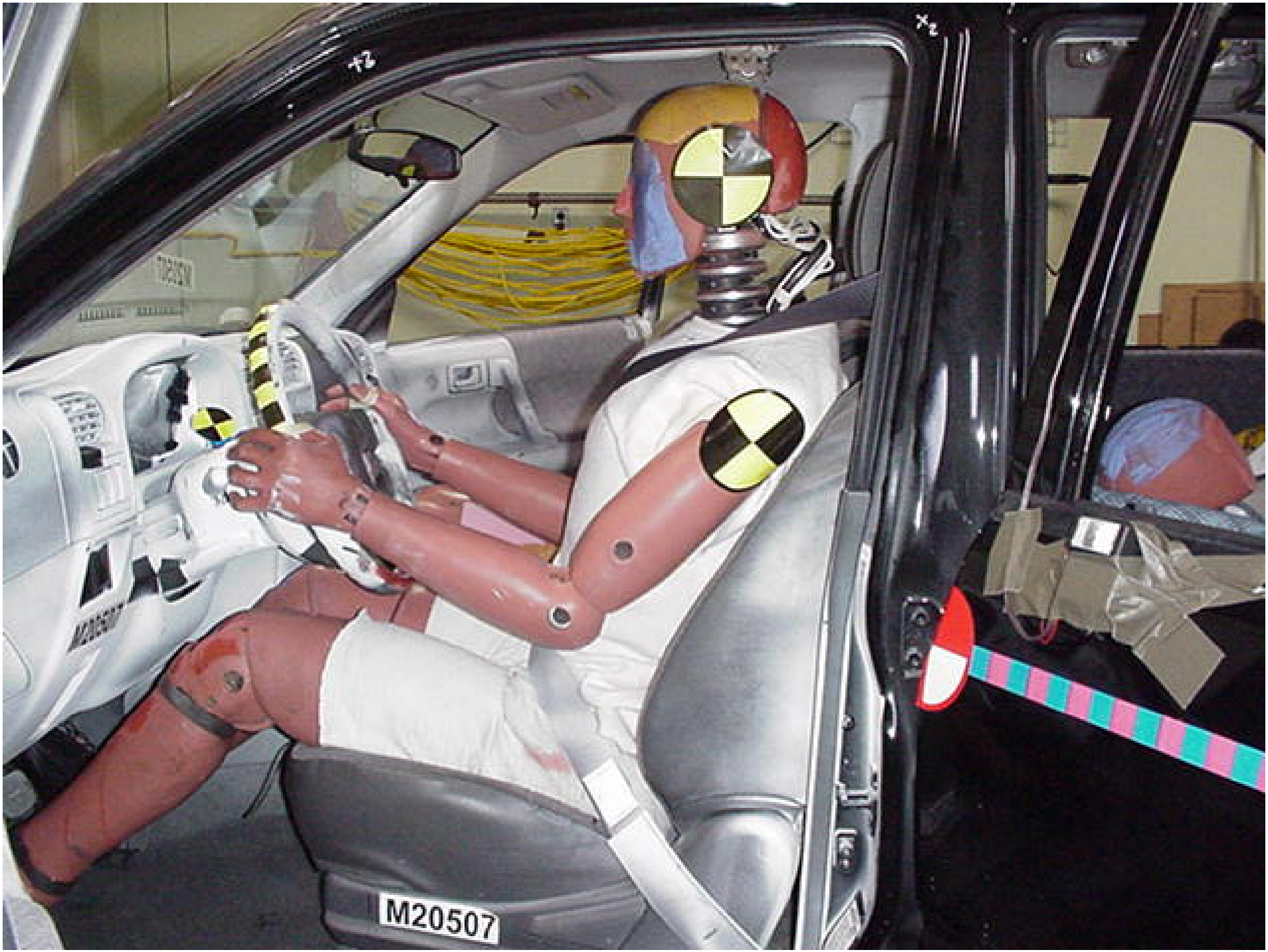


Figure A-22 PRE-TEST DRIVER POSITION VIEW



Figure A-23 POST-TEST DRIVER POSITION VIEW



Figure A-24 PRE-TEST PASSENGER POSITION VIEW

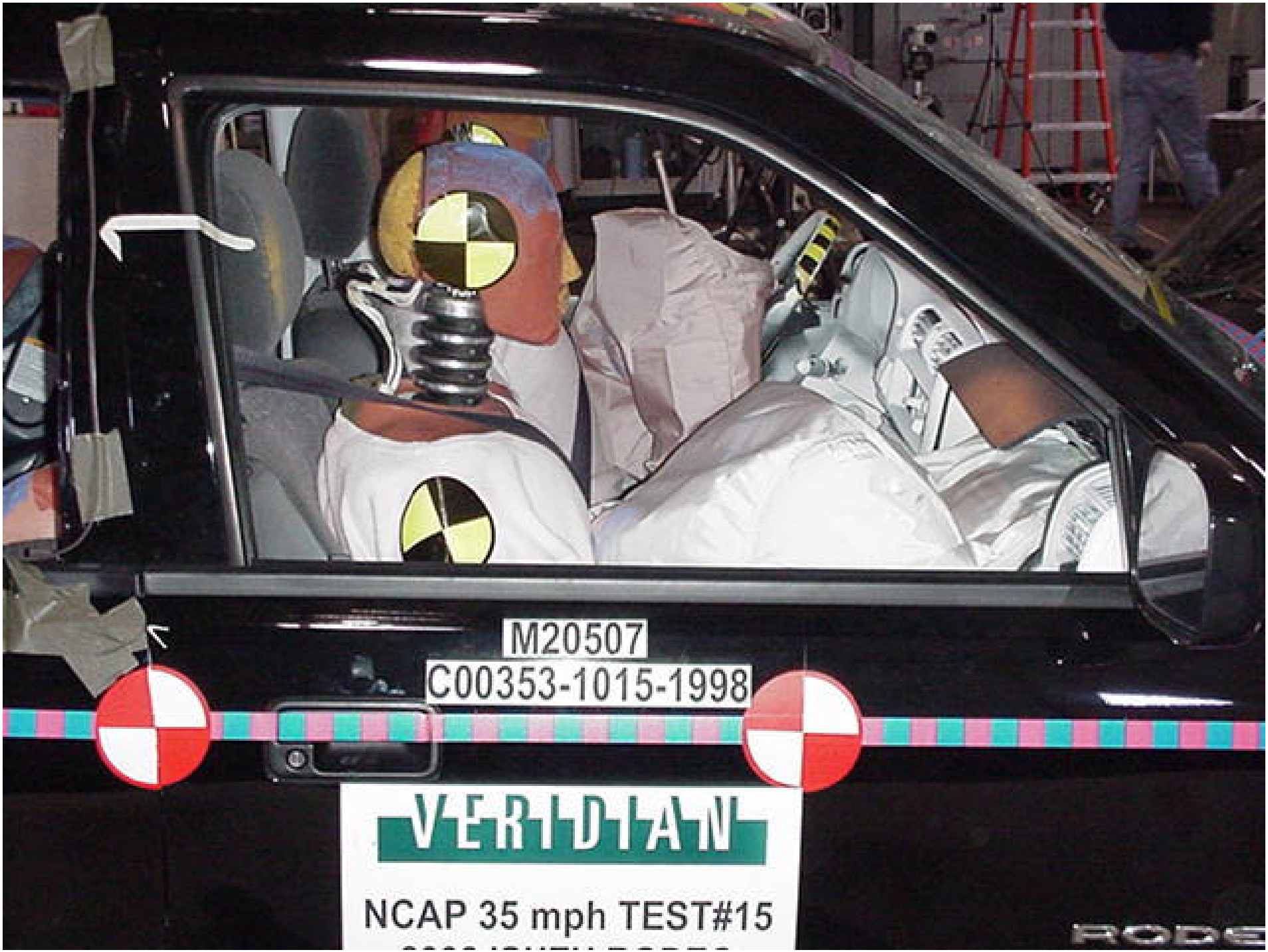


Figure A-25 POST-TEST PASSENGER POSITION VIEW



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

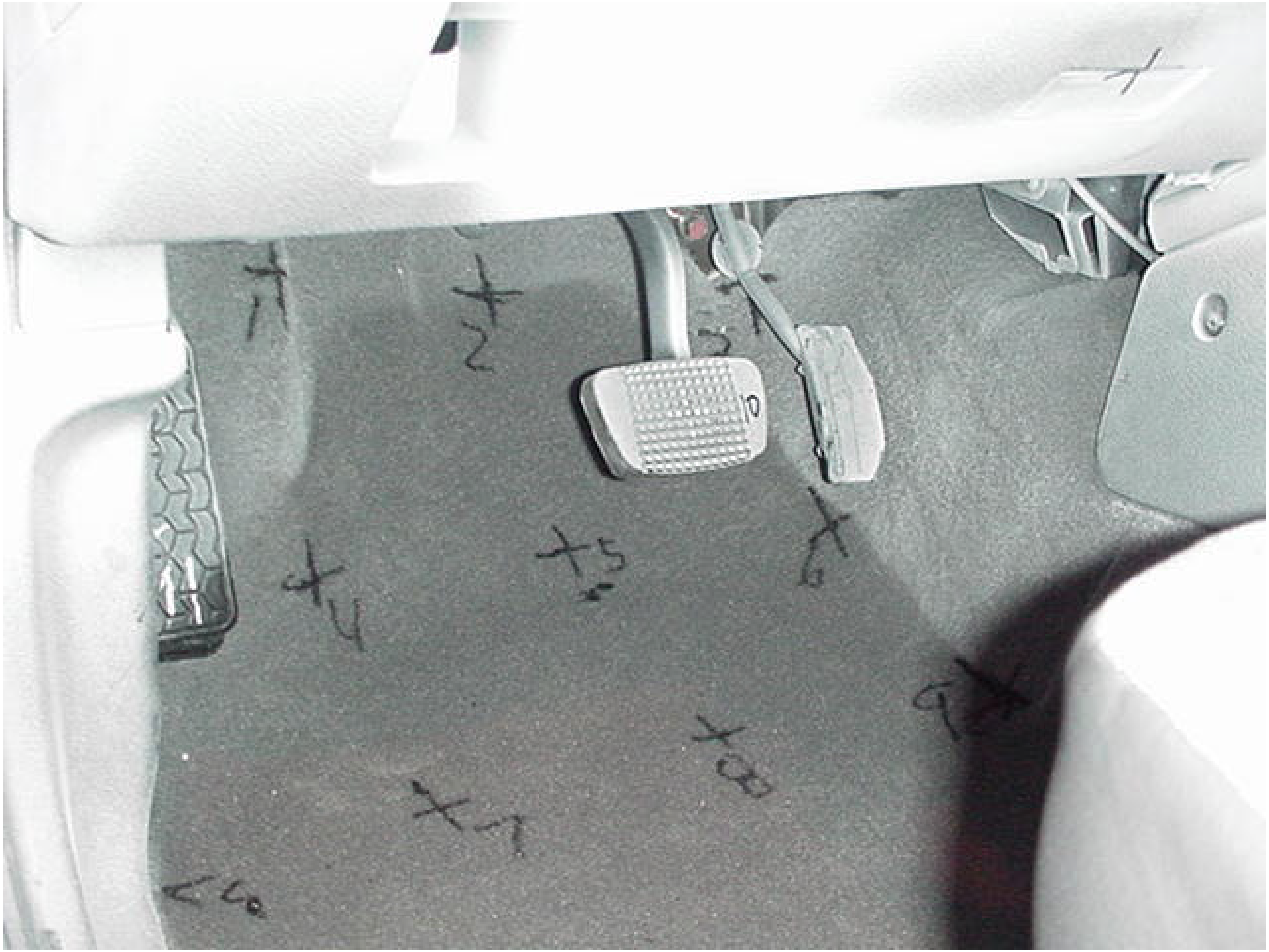


Figure A-34 PRE-TEST DRIVER FLOOR PAN VIEW



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

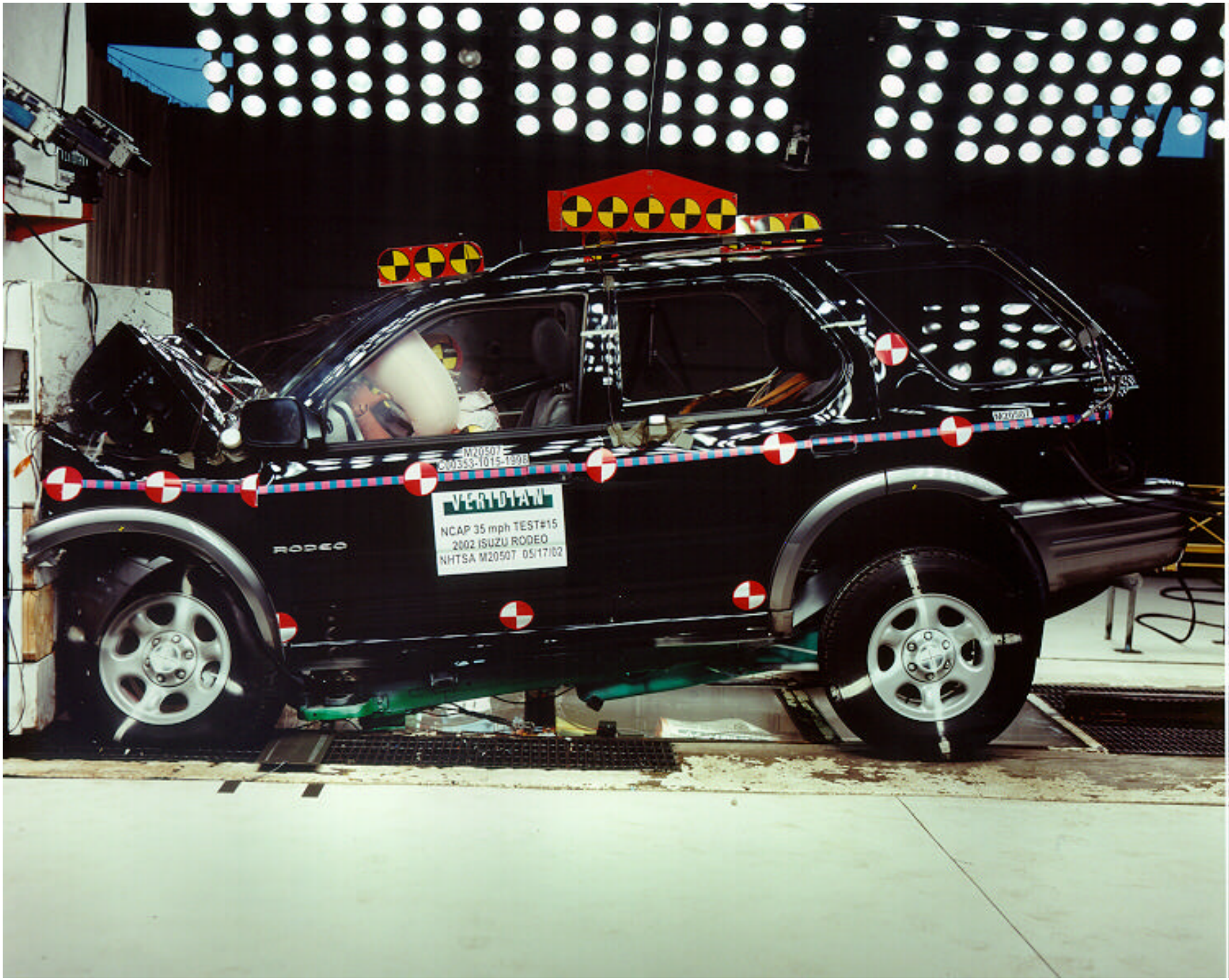


Figure A-39 IMPACT VIEW



Figure A-40 VEHICLE PLACARD

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

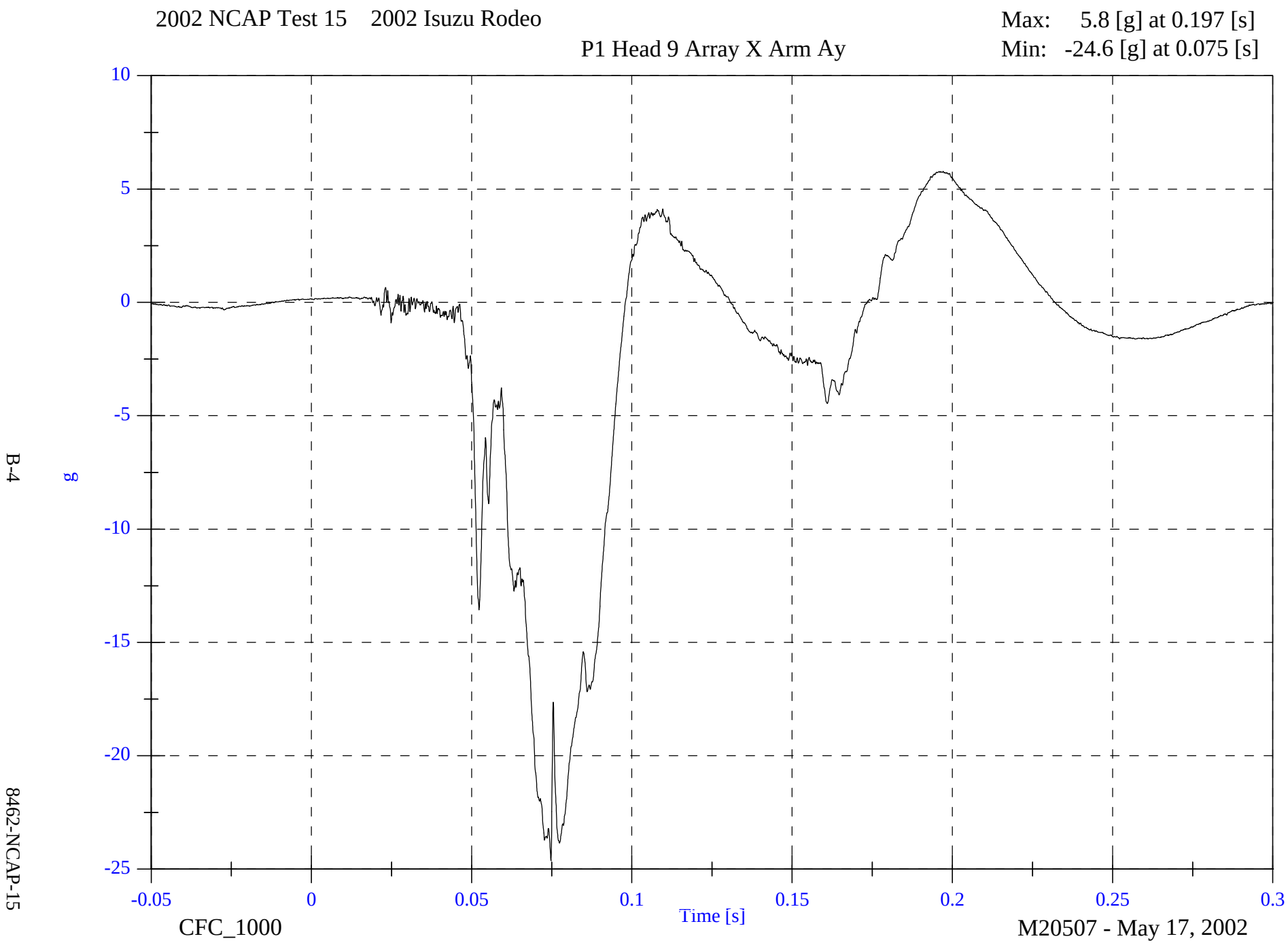
Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers

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

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO.

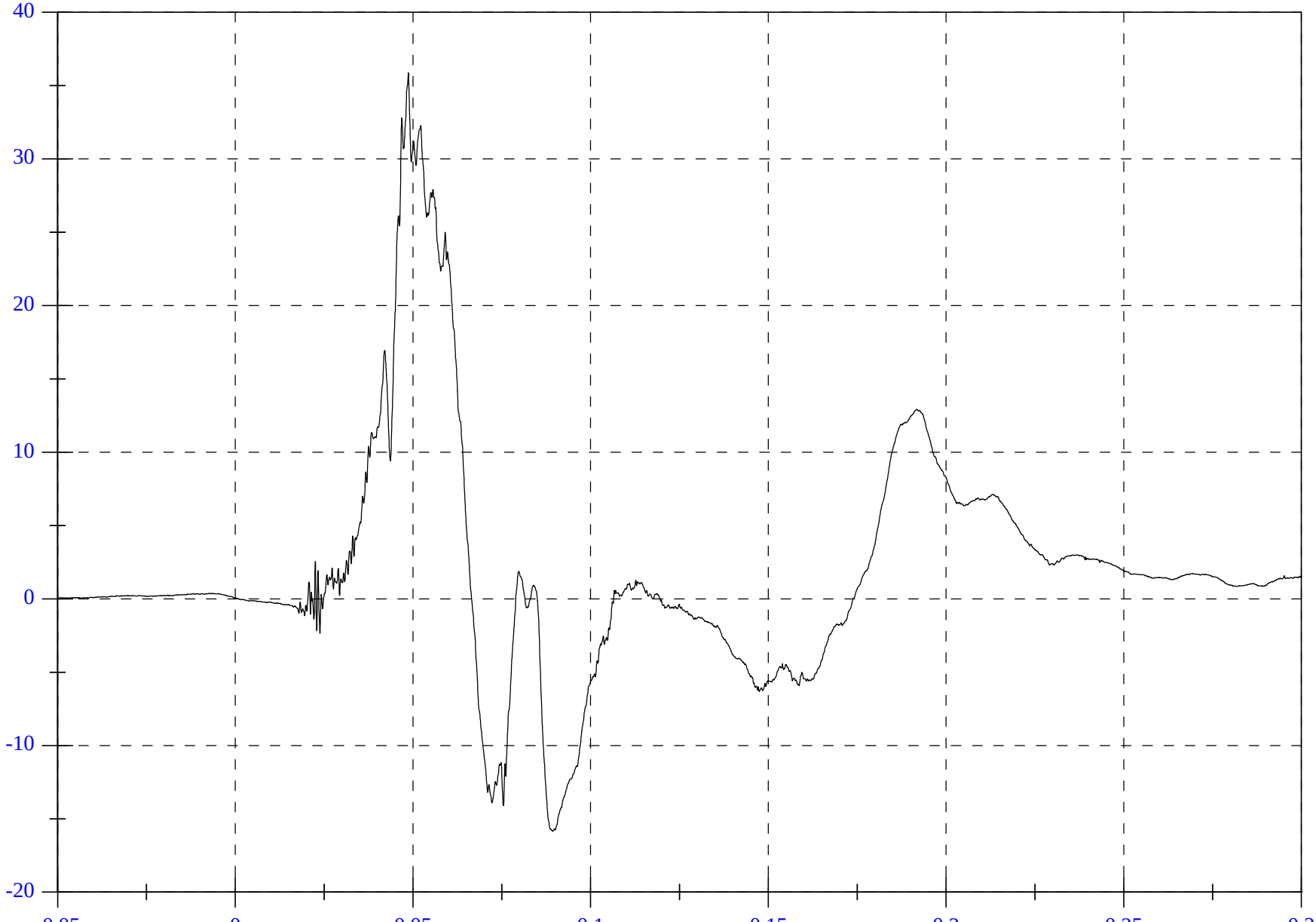
DATA TYPE	**SAE FILTER CLASS (Hz)**
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	60
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180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


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Head 9 Array X Arm Ay
Max: 5.8 [g] at 0.197 [s]
Min: -24.6 [g] at 0.075 [s]
10
5
0
-5
-10
-15
-20
-25
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head 9 Array X Arm Az

Max: 35.9 [g] at 0.049 [s]
Min: -15.9 [g] at 0.089 [s]

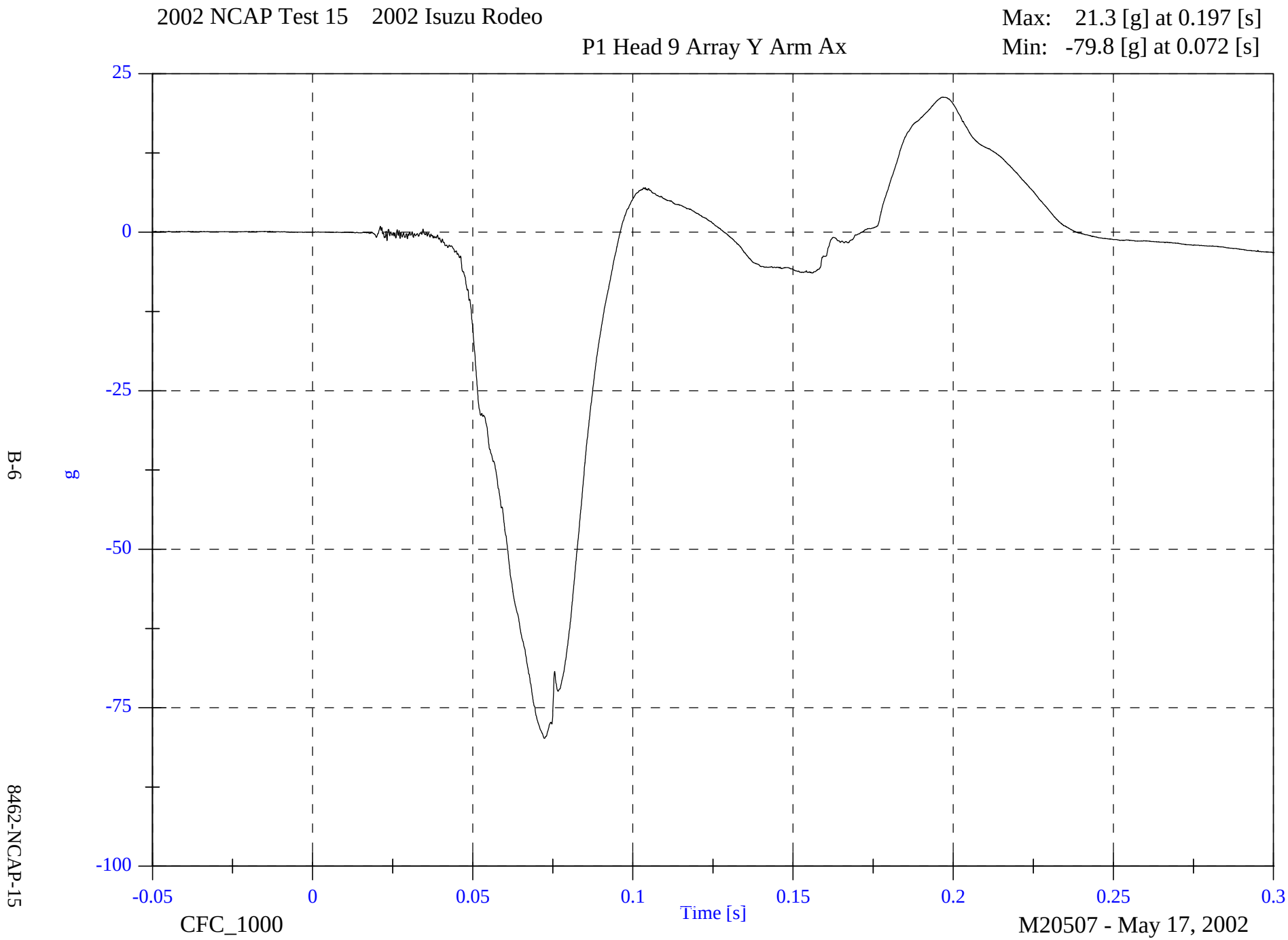


CFC_1000

M20507 - May 17, 2002

B-5

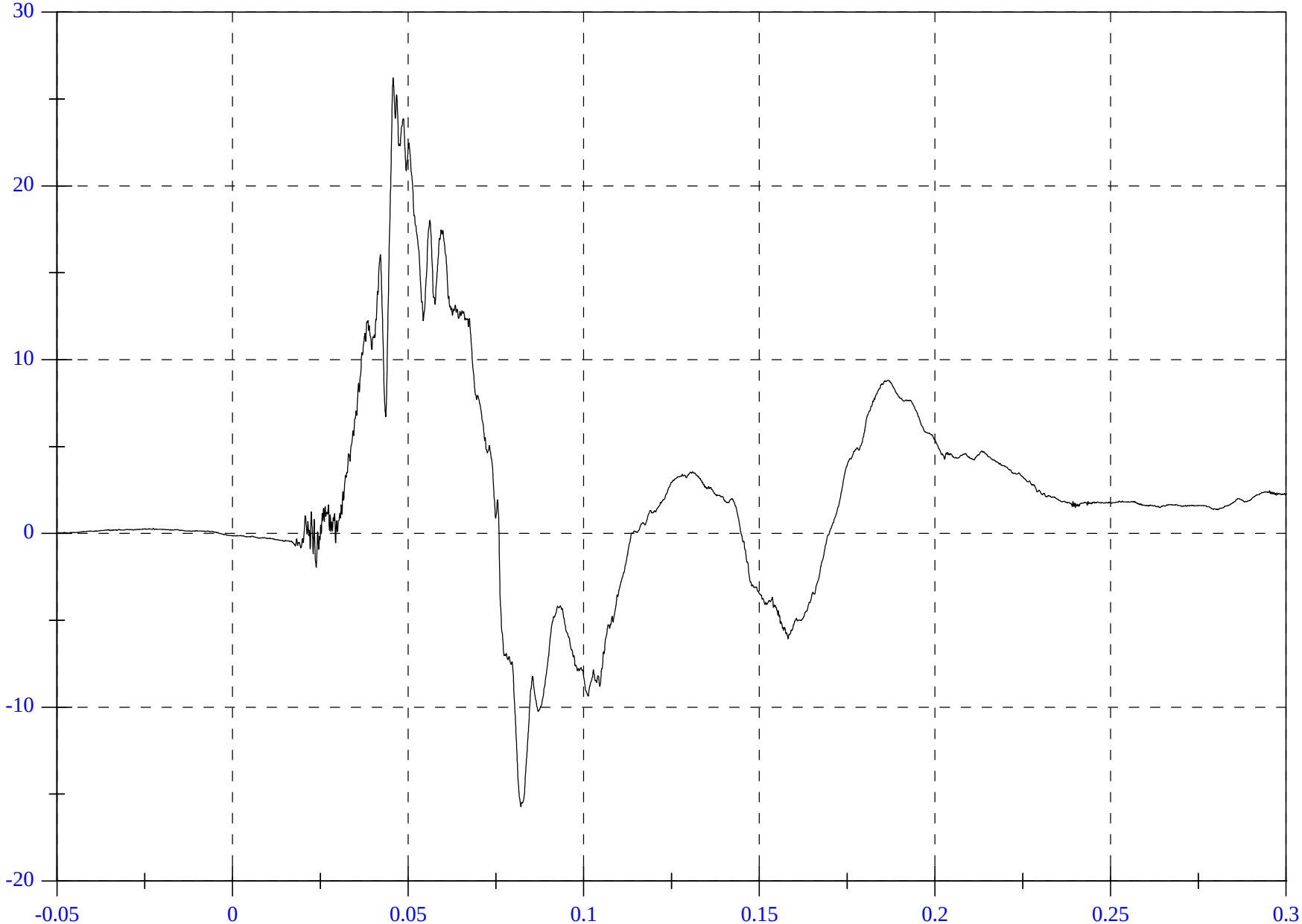
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Head 9 Array Y Arm Ax
Max: 21.3 [g] at 0.197 [s]
Min: -79.8 [g] at 0.072 [s]
25
0
-25
-50
-75
-100
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head 9 Array Y Arm Az

Max: 26.2 [g] at 0.046 [s]
Min: -15.7 [g] at 0.082 [s]

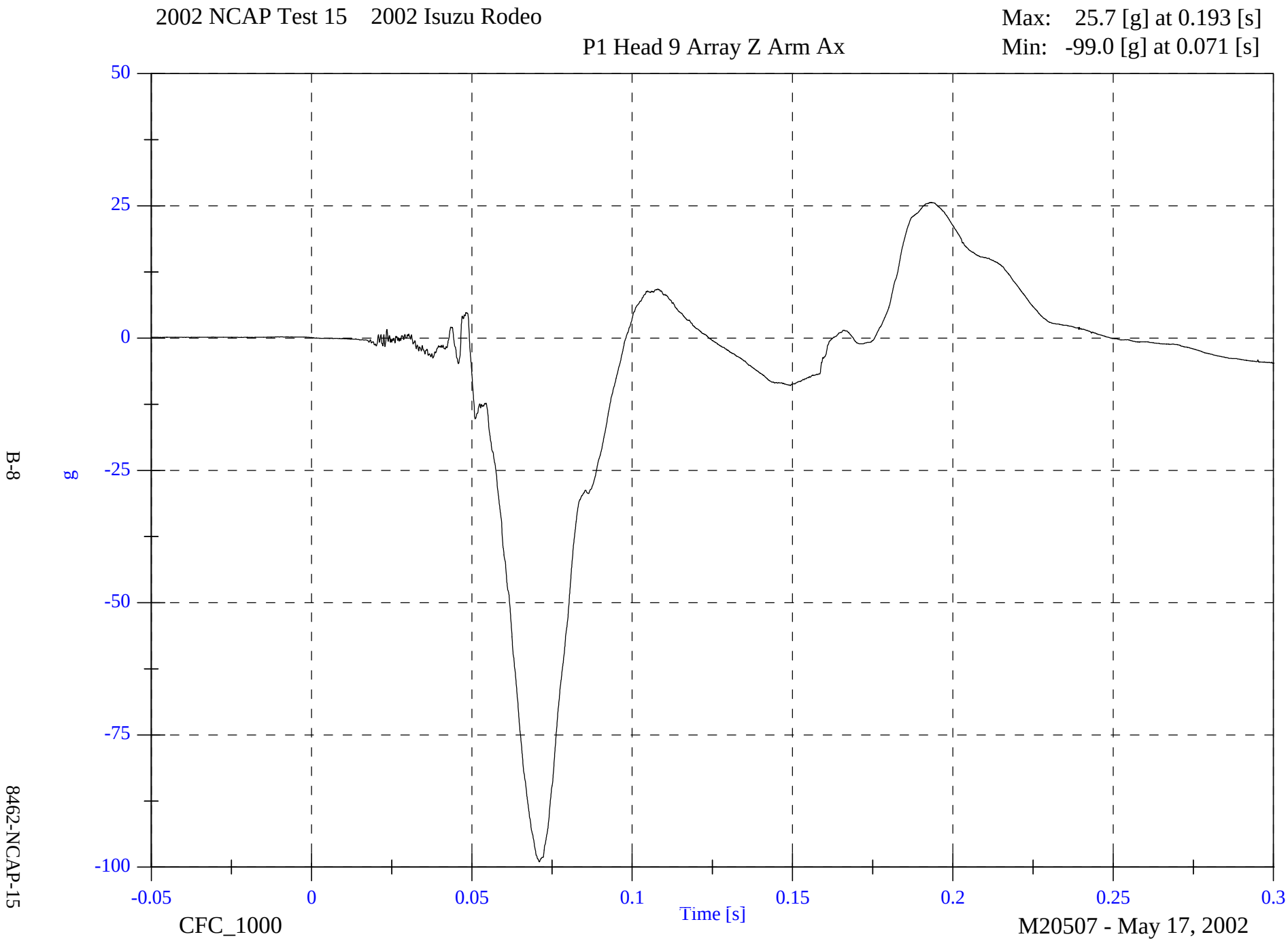


B-7

8462-NCAP-15

CFC_1000

M20507 - May 17, 2002

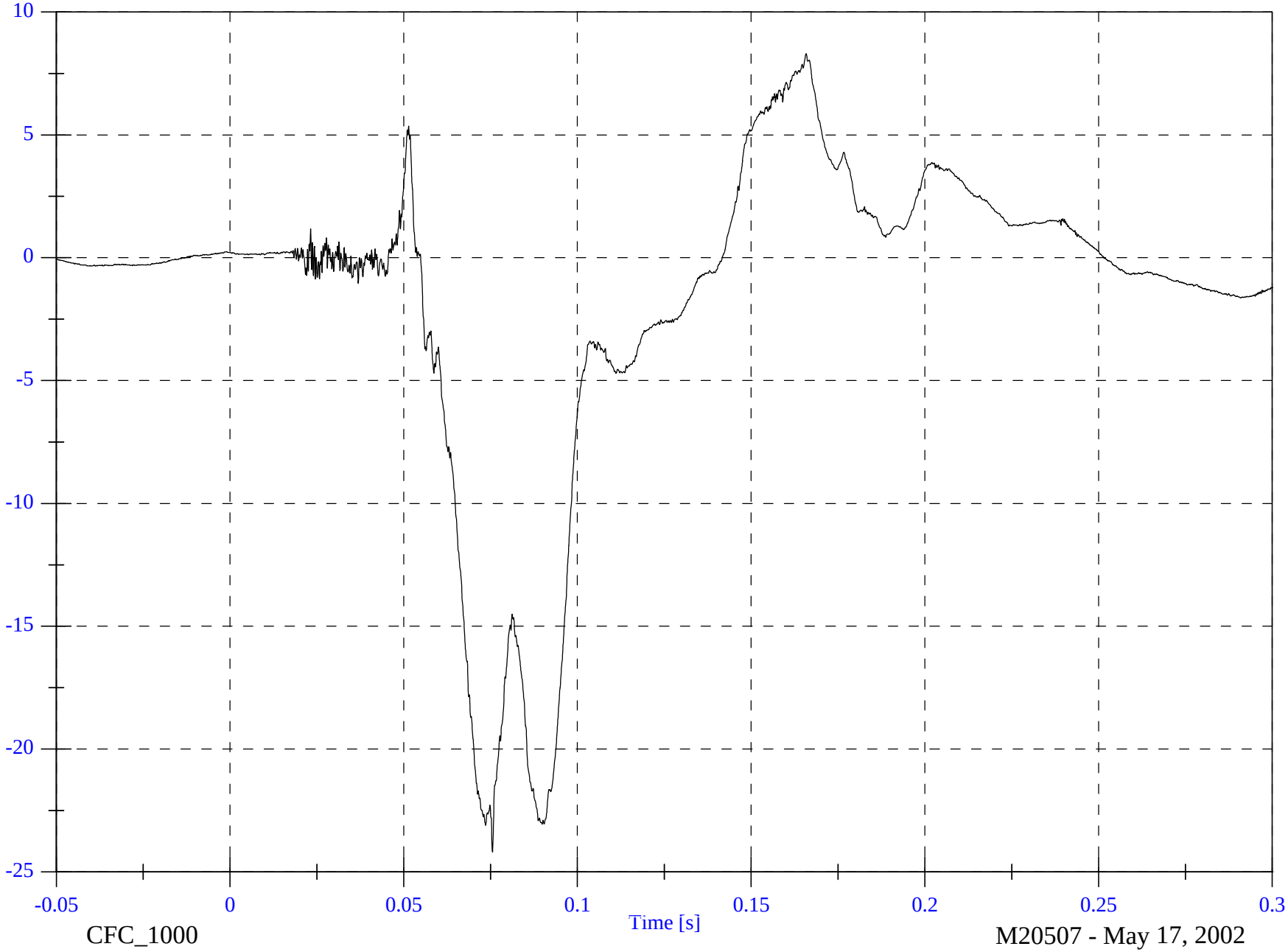

2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Head 9 Array Z Arm Ax
Max: 25.7 [g] at 0.193 [s]
Min: -99.0 [g] at 0.071 [s]
50
25
0
-25
-50
-75
-100
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head 9 Array Z Arm Ay

Max: 8.3 [g] at 0.166 [s]

Min: -24.2 [g] at 0.076 [s]

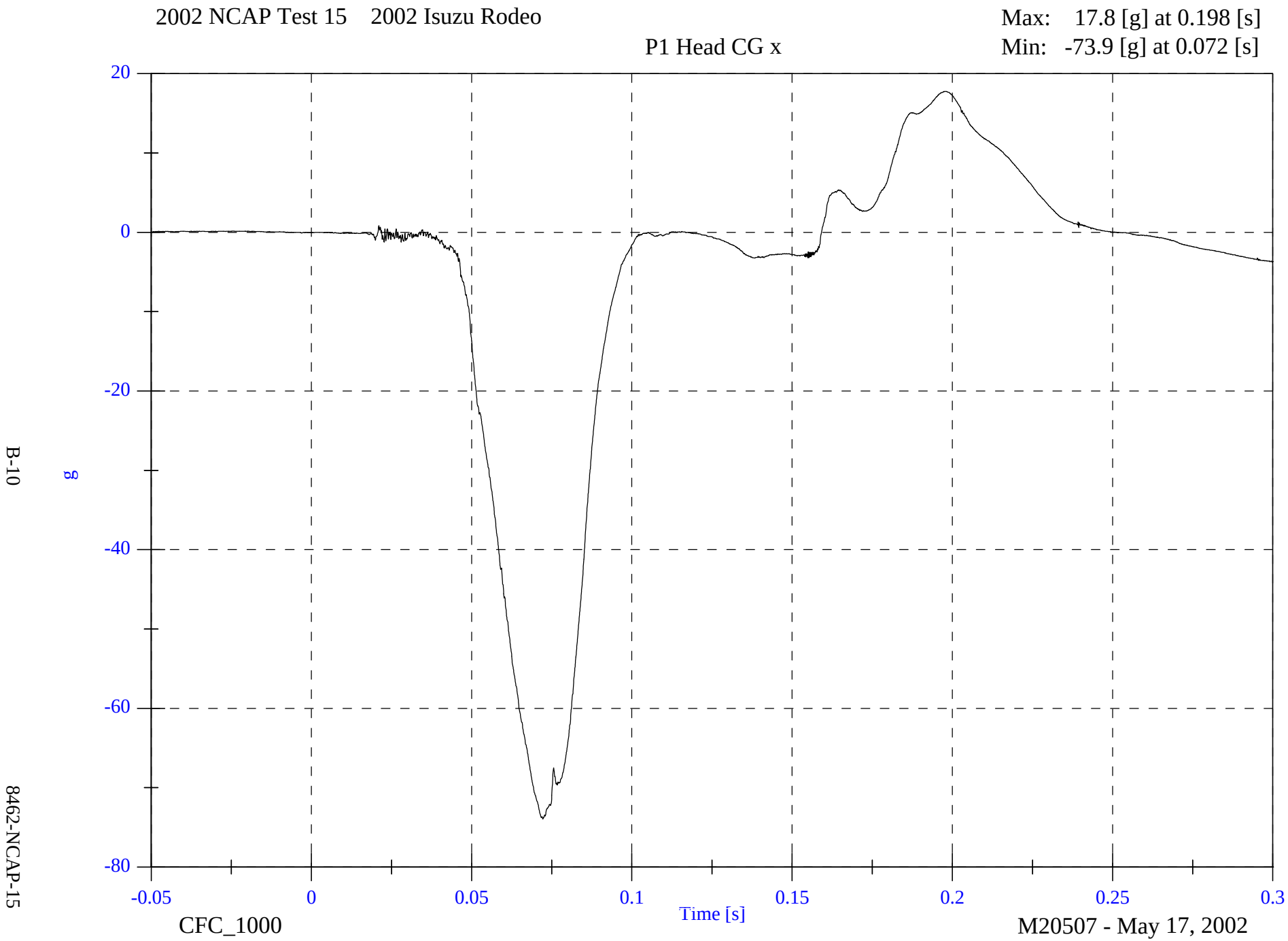


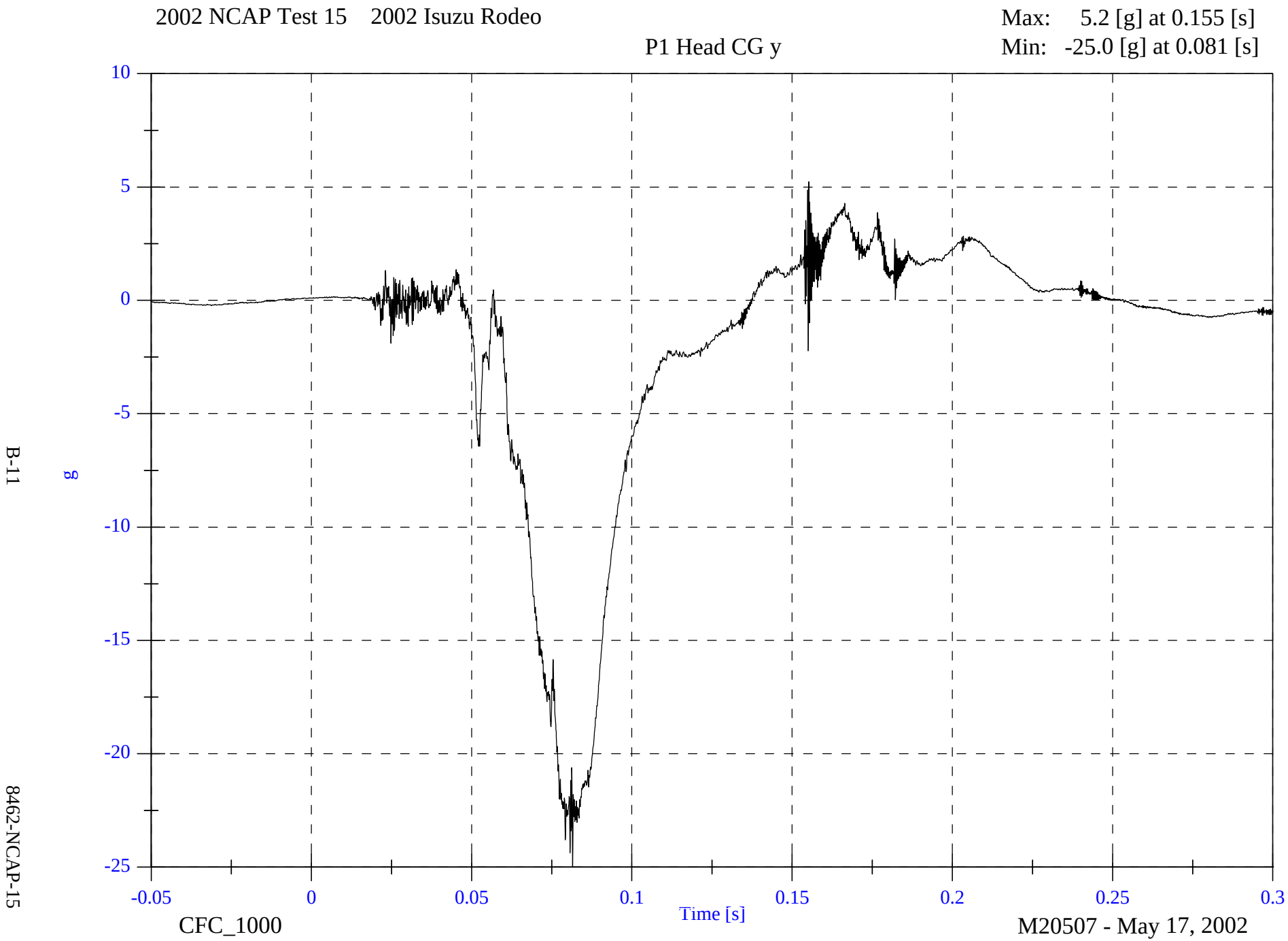
B-9

8462-NCAP-15

CFC_1000

M20507 - May 17, 2002

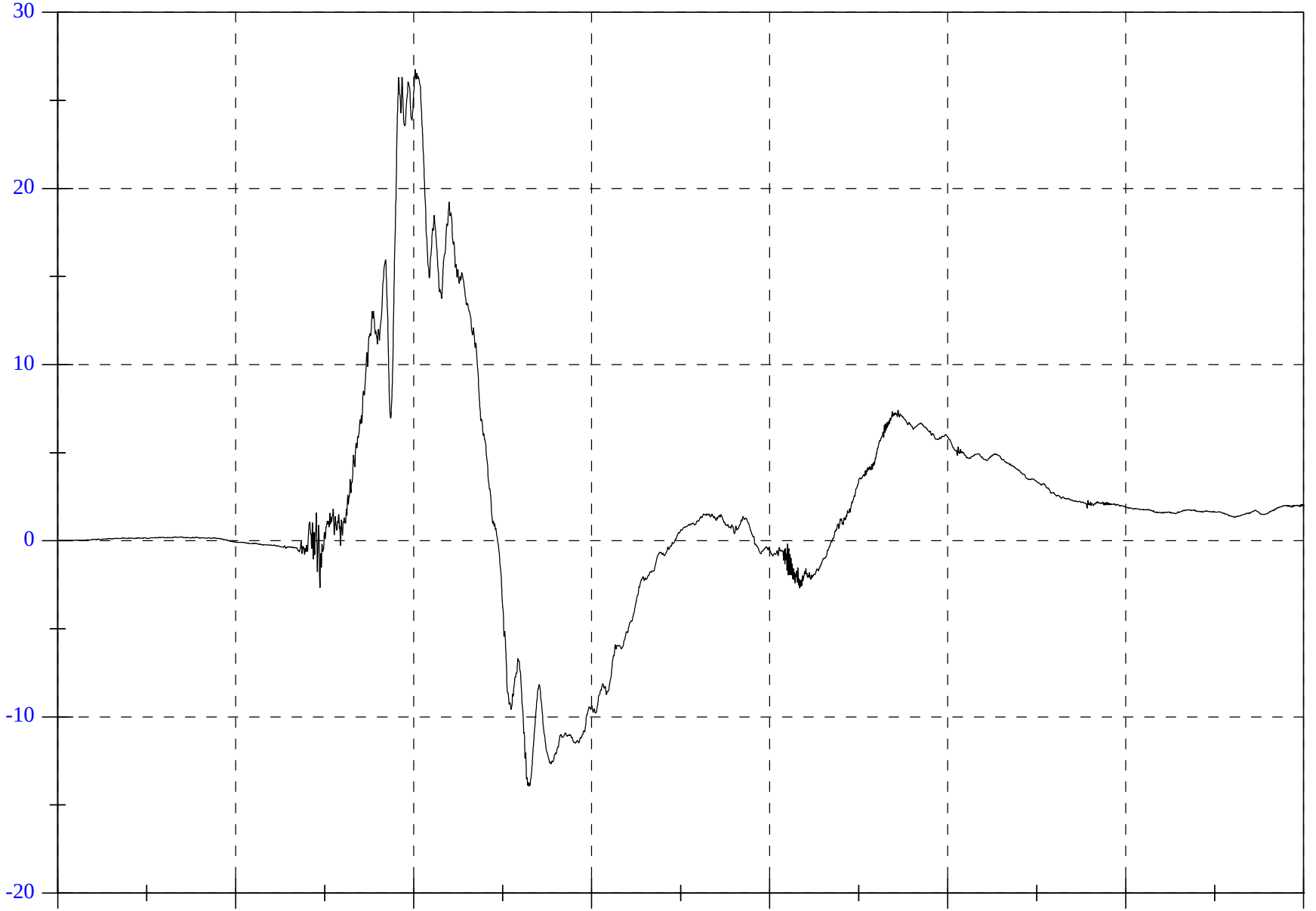

2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Head CG x
Max: 17.8 [g] at 0.198 [s]
Min: -73.9 [g] at 0.072 [s]
20
0
-20
-40
-60
-80
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
B-10
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Head CG y
Max: 5.2 [g] at 0.155 [s]
Min: -25.0 [g] at 0.081 [s]
10
5
0
-5
-10
-15
-20
-25
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head CG z

Max: 26.8 [g] at 0.050 [s]
Min: -13.9 [g] at 0.082 [s]



CFC_1000

M20507 - May 17, 2002

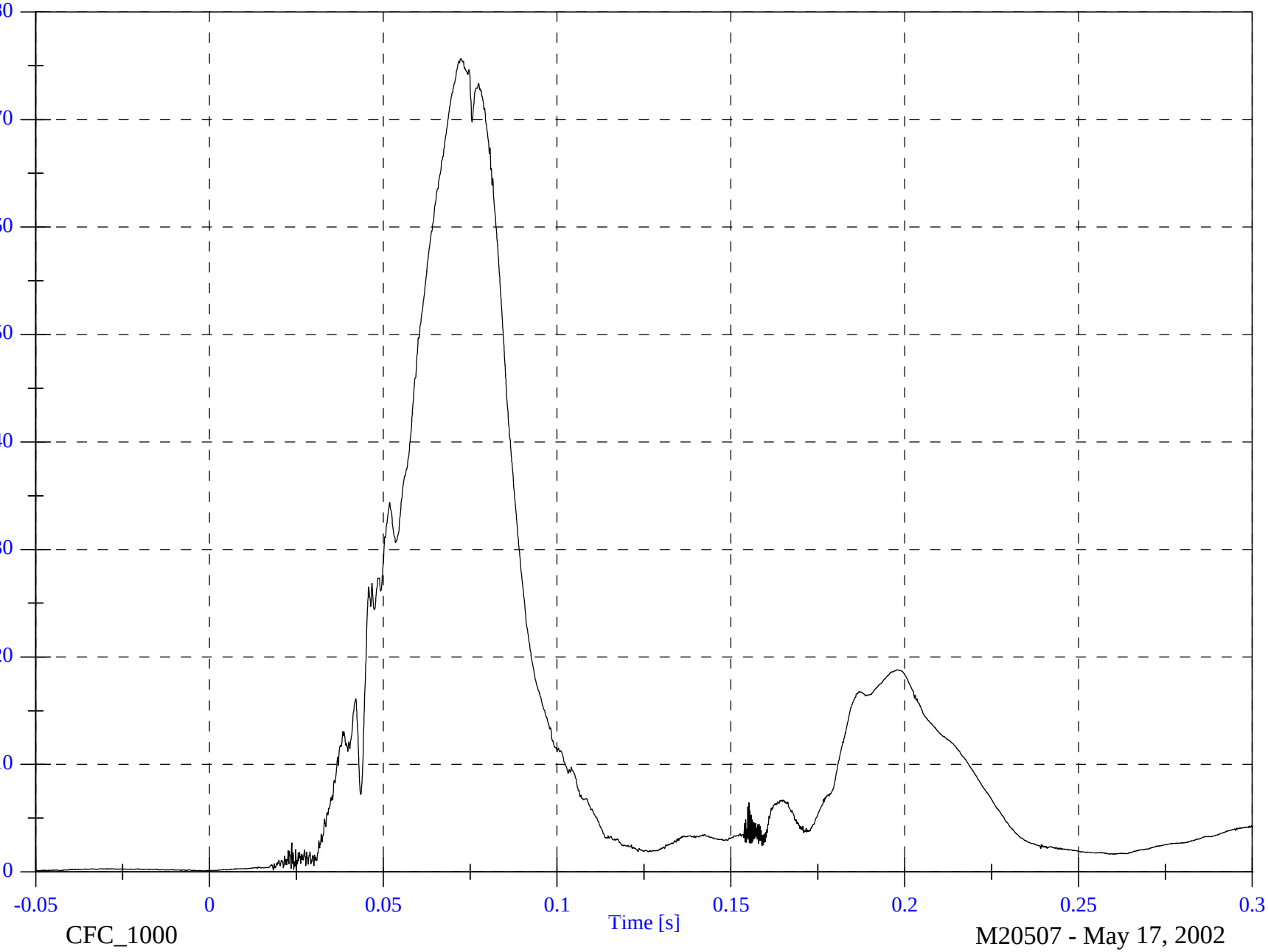
B-12

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head CG Resultant

Max: 75.7 [g] at 0.072 [s]
Min: 0.1 [g] at -0.050 [s]

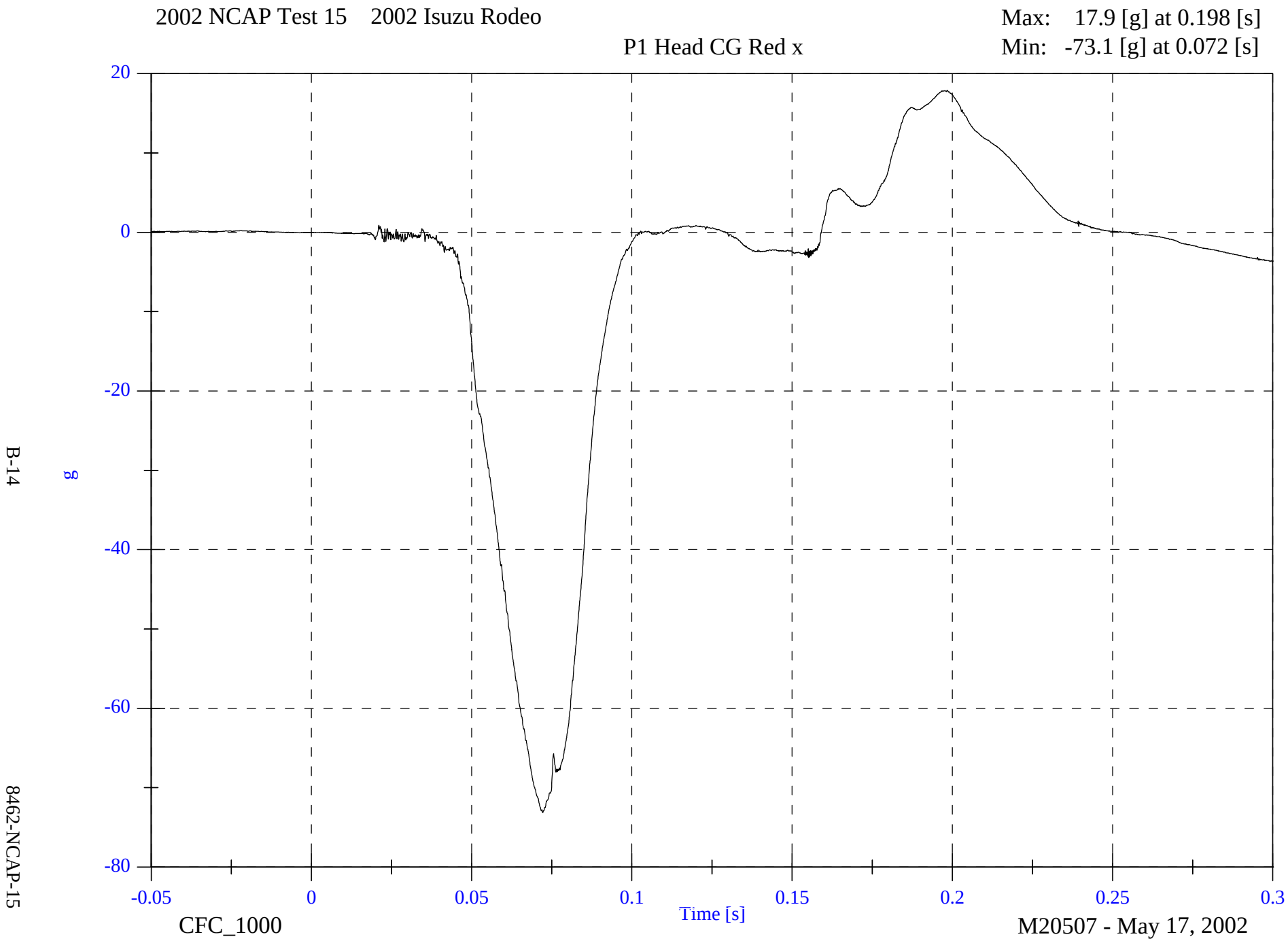


CFC_1000

M20507 - May 17, 2002

B-13

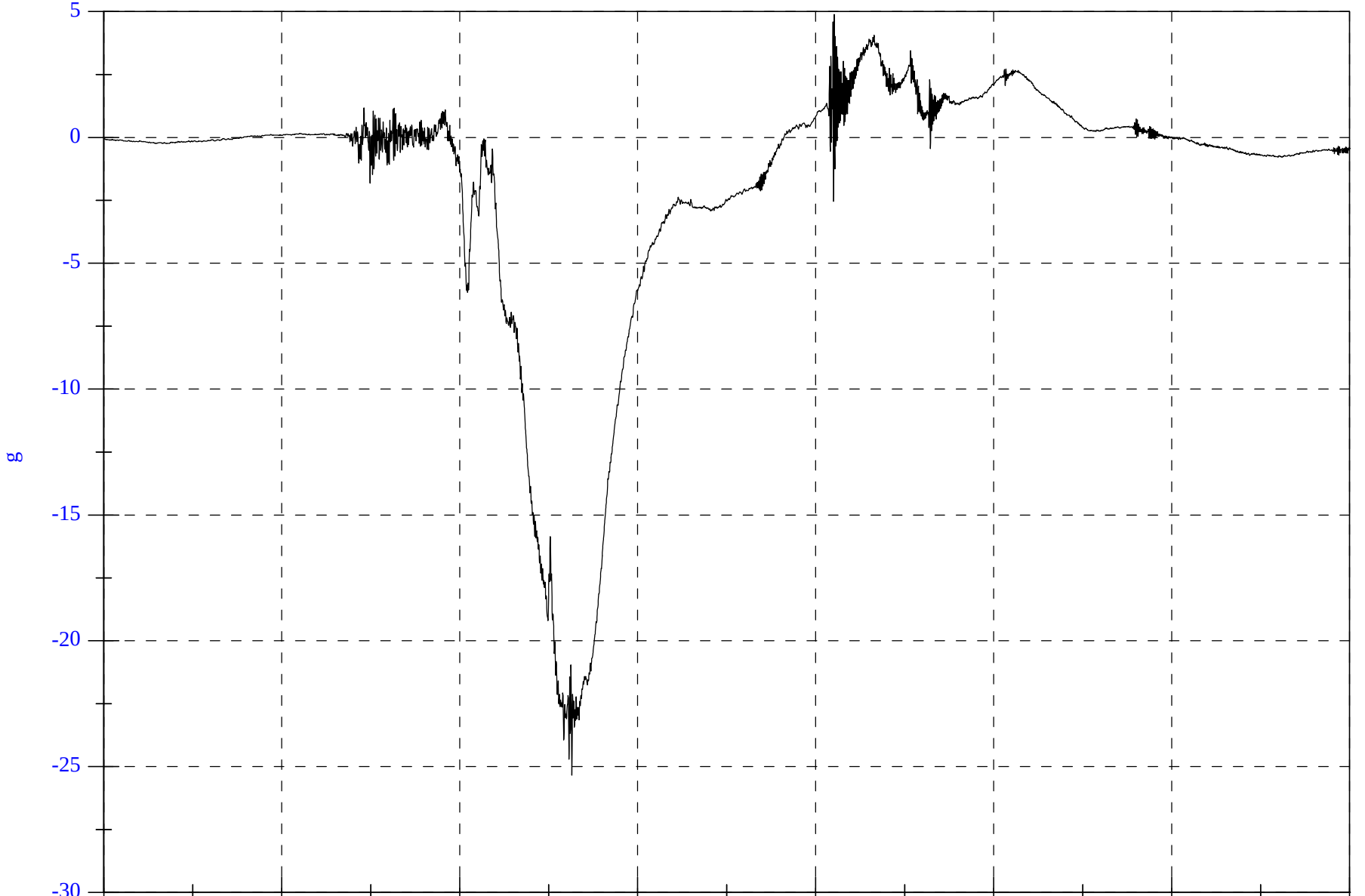
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Head CG Red x
Max: 17.9 [g] at 0.198 [s]
Min: -73.1 [g] at 0.072 [s]
20
0
-20
-40
-60
-80
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
B-14
8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head CG Red y

Max: 4.9 [g] at 0.155 [s]
Min: -25.3 [g] at 0.081 [s]



B-15

8462-NCAP-15

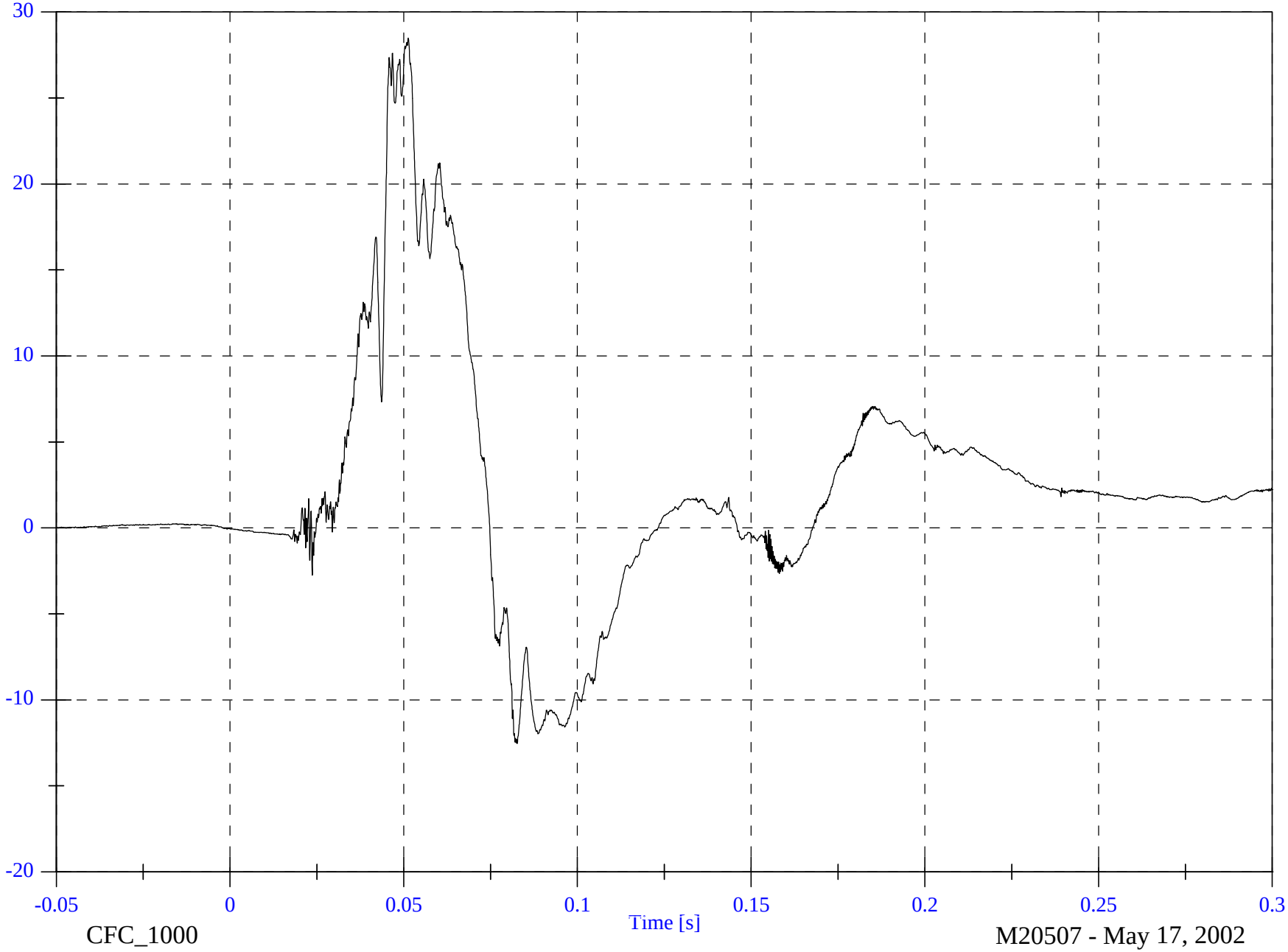
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head CG Red z

Max: 28.5 [g] at 0.051 [s]
Min: -12.5 [g] at 0.083 [s]



B-16

8462-NCAP-15

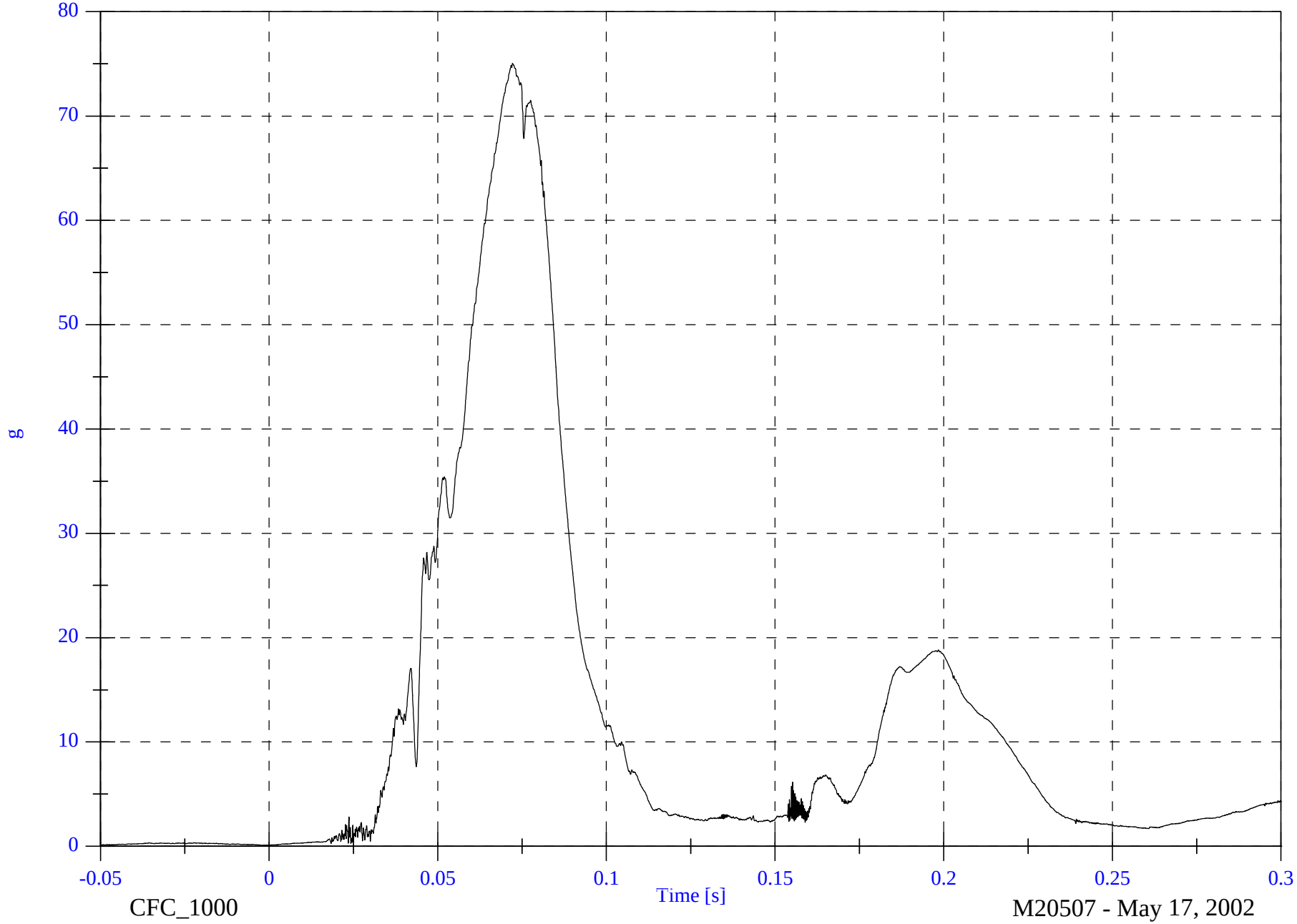
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Head CG Red Resultant

Max: 75.1 [g] at 0.072 [s]
Min: 0.1 [g] at -0.002 [s]

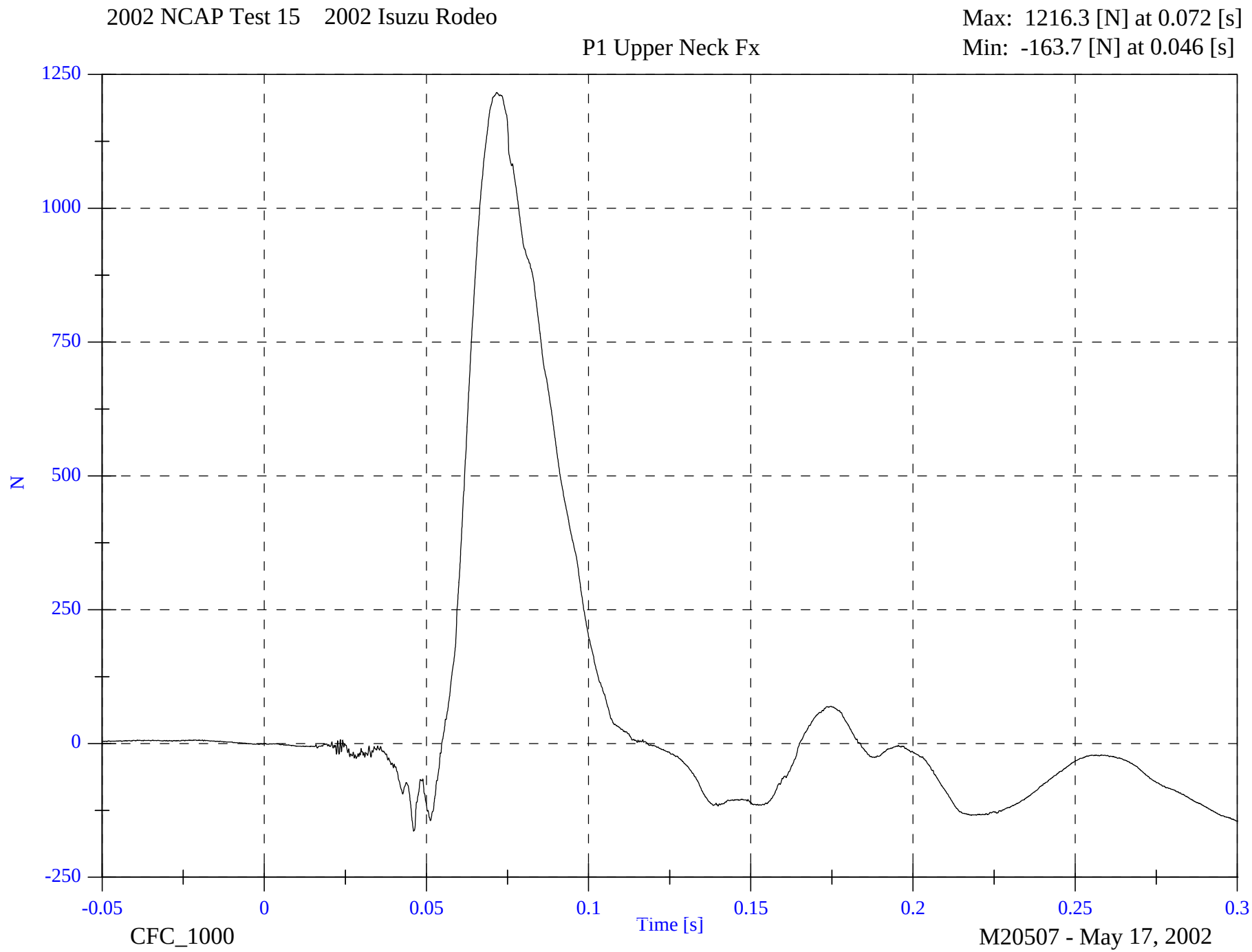


CFC_1000

M20507 - May 17, 2002

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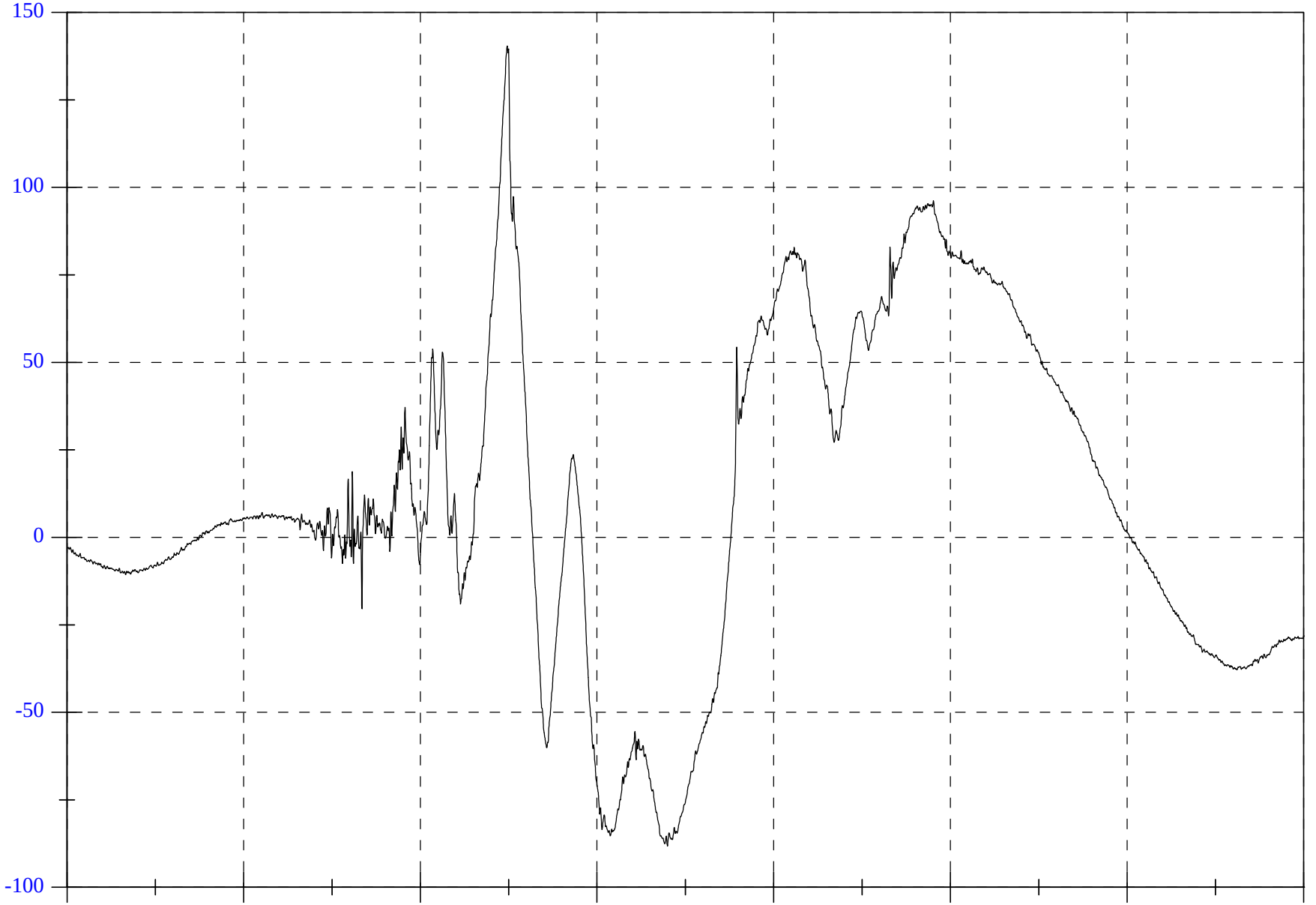
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Upper Neck Fx
Max: 1216.3 [N] at 0.072 [s]
Min: -163.7 [N] at 0.046 [s]
1250
1000
750
500
250
0
-250
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Upper Neck Fy

Max: 140.4 [N] at 0.075 [s]
Min: -88.2 [N] at 0.120 [s]



CFC_1000

M20507 - May 17, 2002

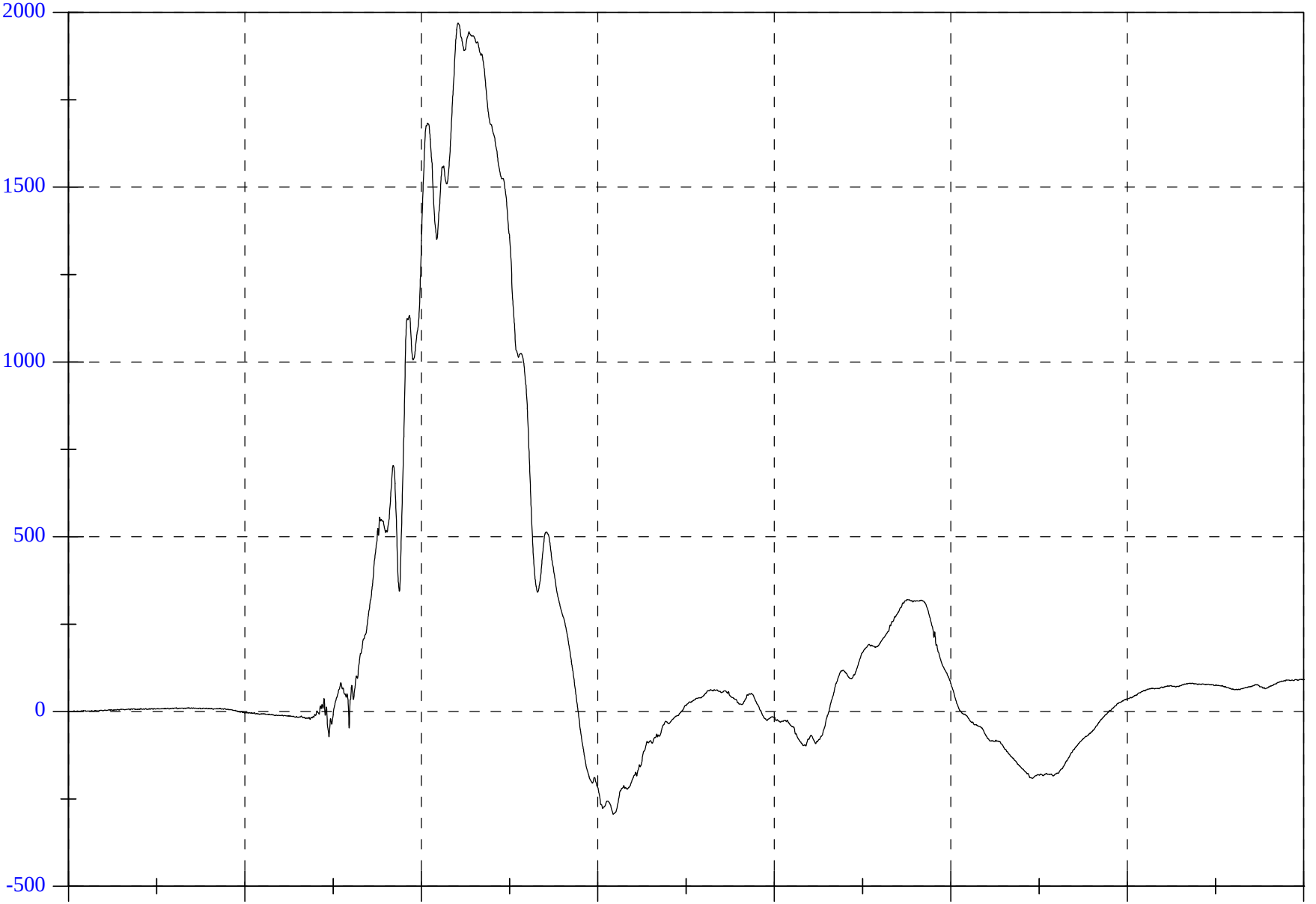
B-19

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Upper Neck Fz

Max: 1968.5 [N] at 0.060 [s]
Min: -293.9 [N] at 0.104 [s]



CFC_1000

M20507 - May 17, 2002

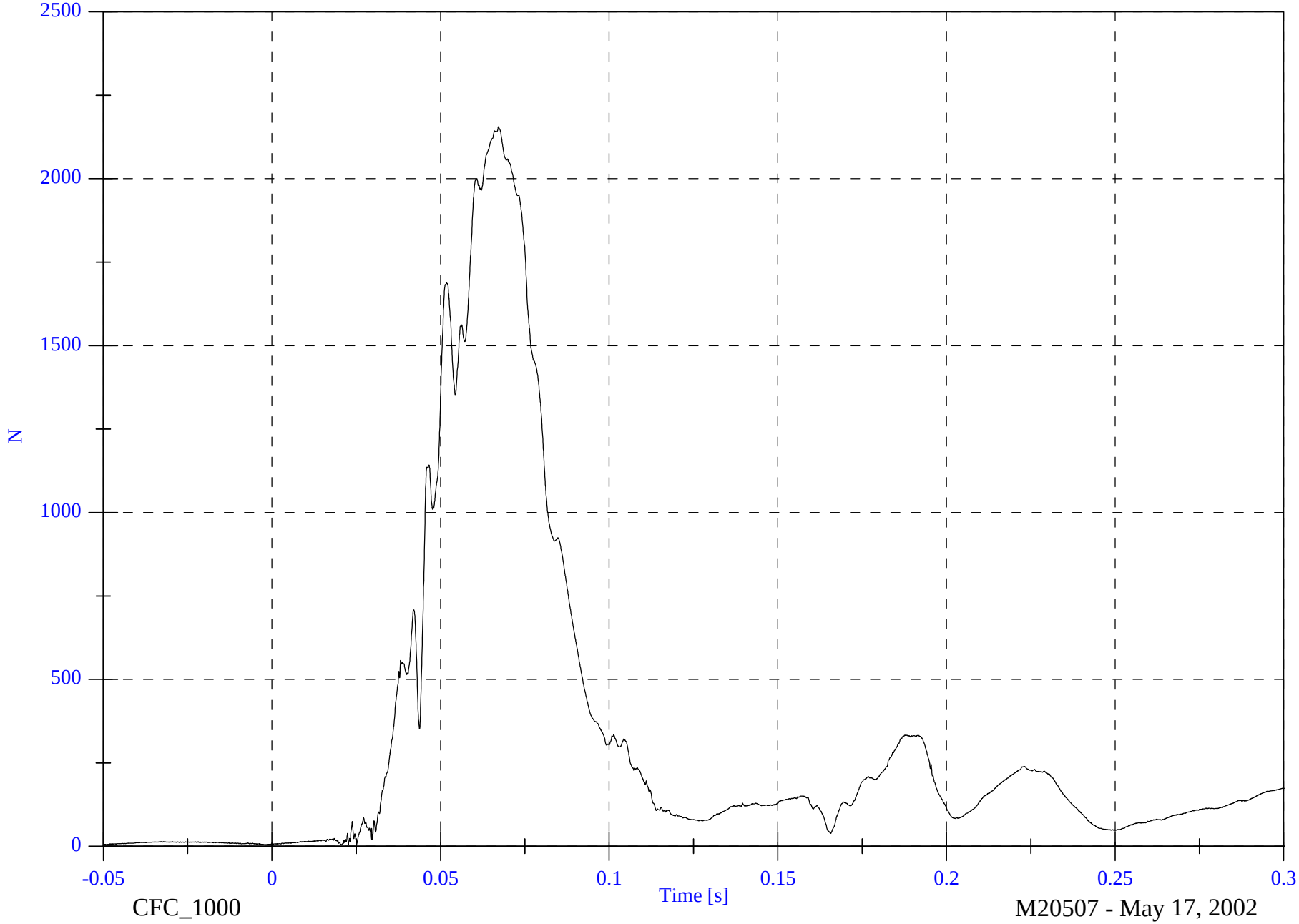
B-20

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Upper Neck F Resultant

Max: 2155.2 [N] at 0.067 [s]
Min: 3.7 [N] at 0.021 [s]



CFC_1000

M20507 - May 17, 2002

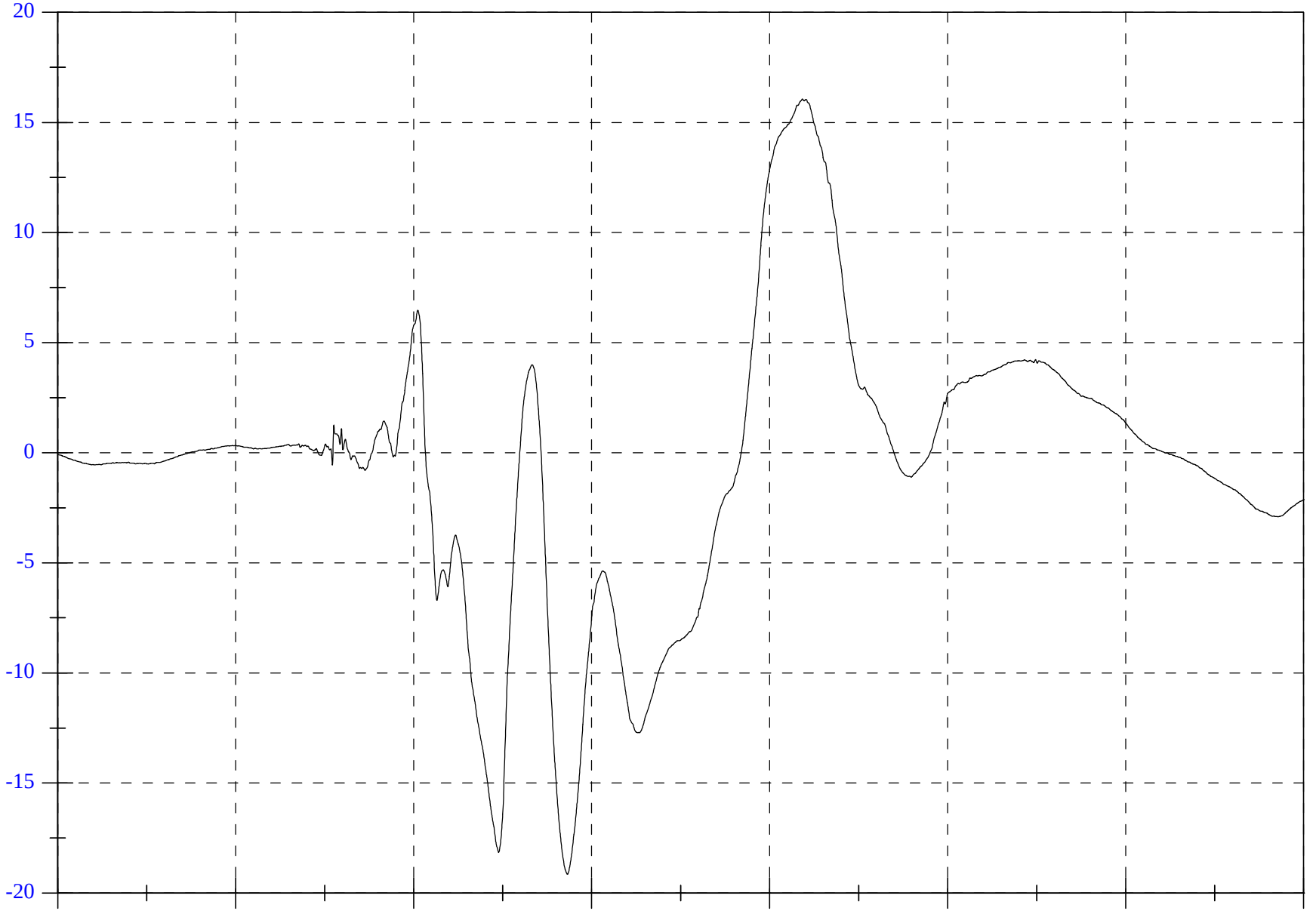
B-21

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Upper Neck Mx

Max: 16.1 [N-m] at 0.159 [s]
Min: -19.1 [N-m] at 0.093 [s]



CFC_600

M20507 - May 17, 2002

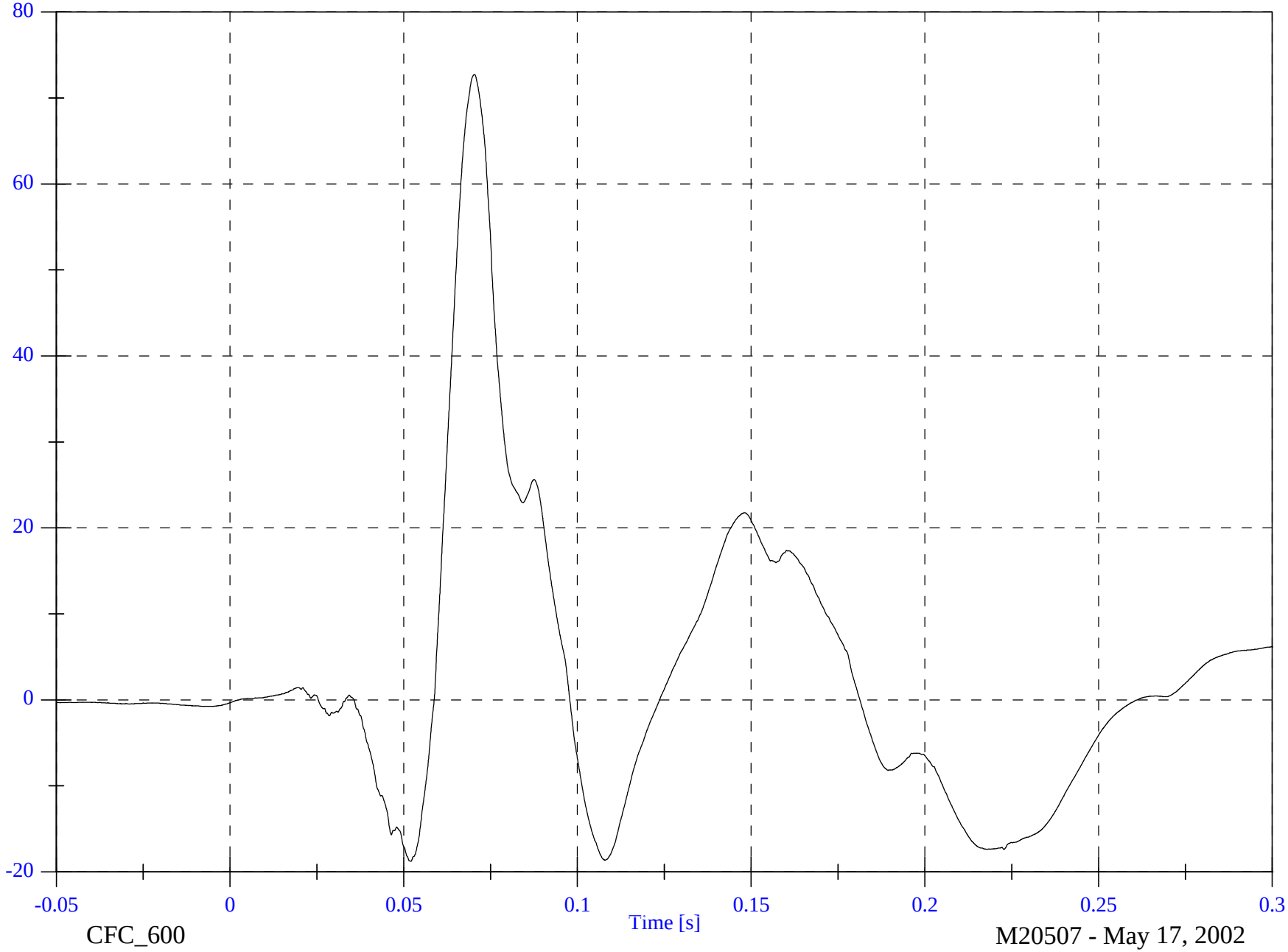
B-22

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Upper Neck My

Max: 72.7 [N-m] at 0.070 [s]
Min: -18.8 [N-m] at 0.052 [s]



CFC_600

M20507 - May 17, 2002

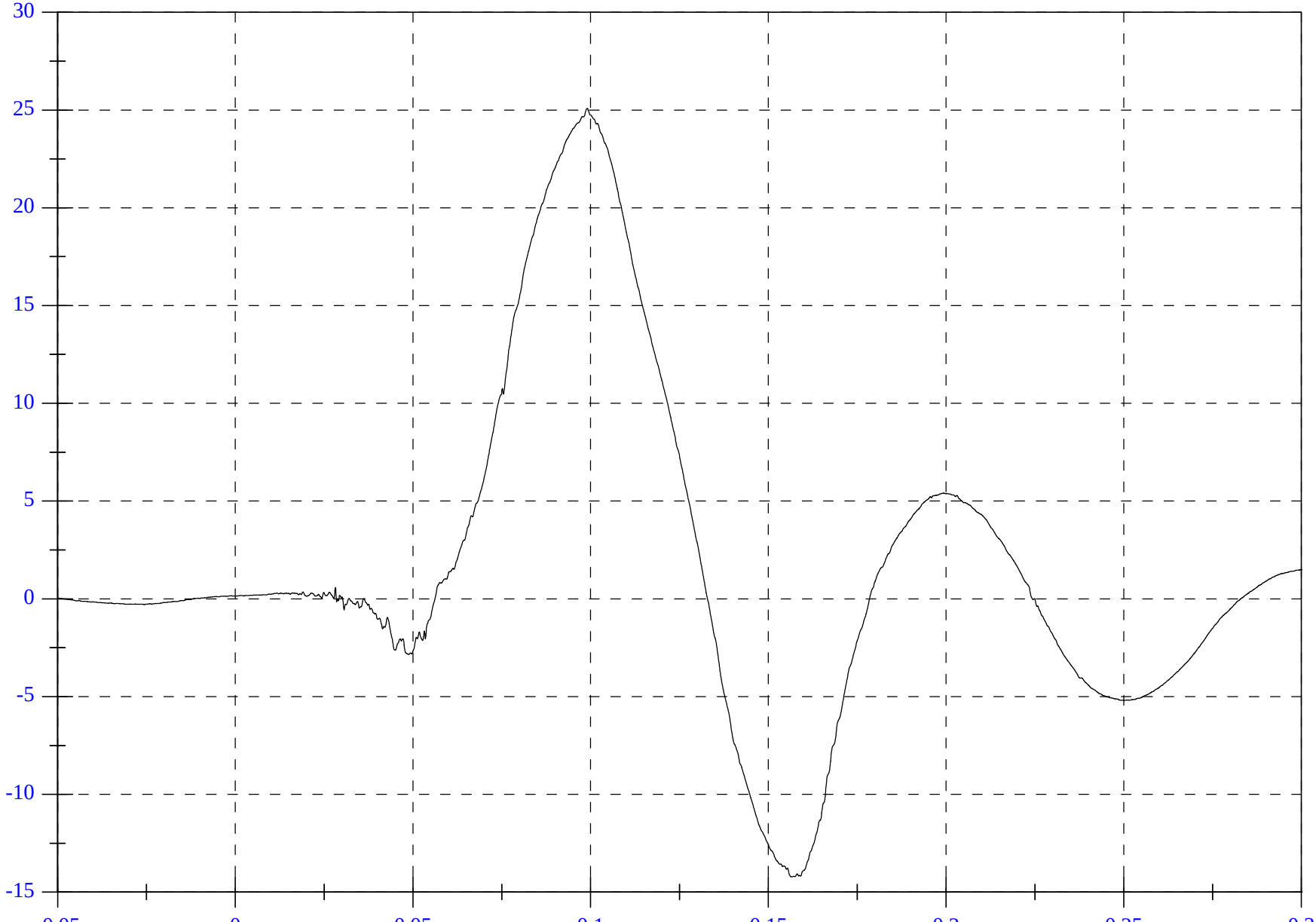
B-23

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Upper Neck Mz

Max: 25.1 [N-m] at 0.099 [s]
Min: -14.2 [N-m] at 0.156 [s]



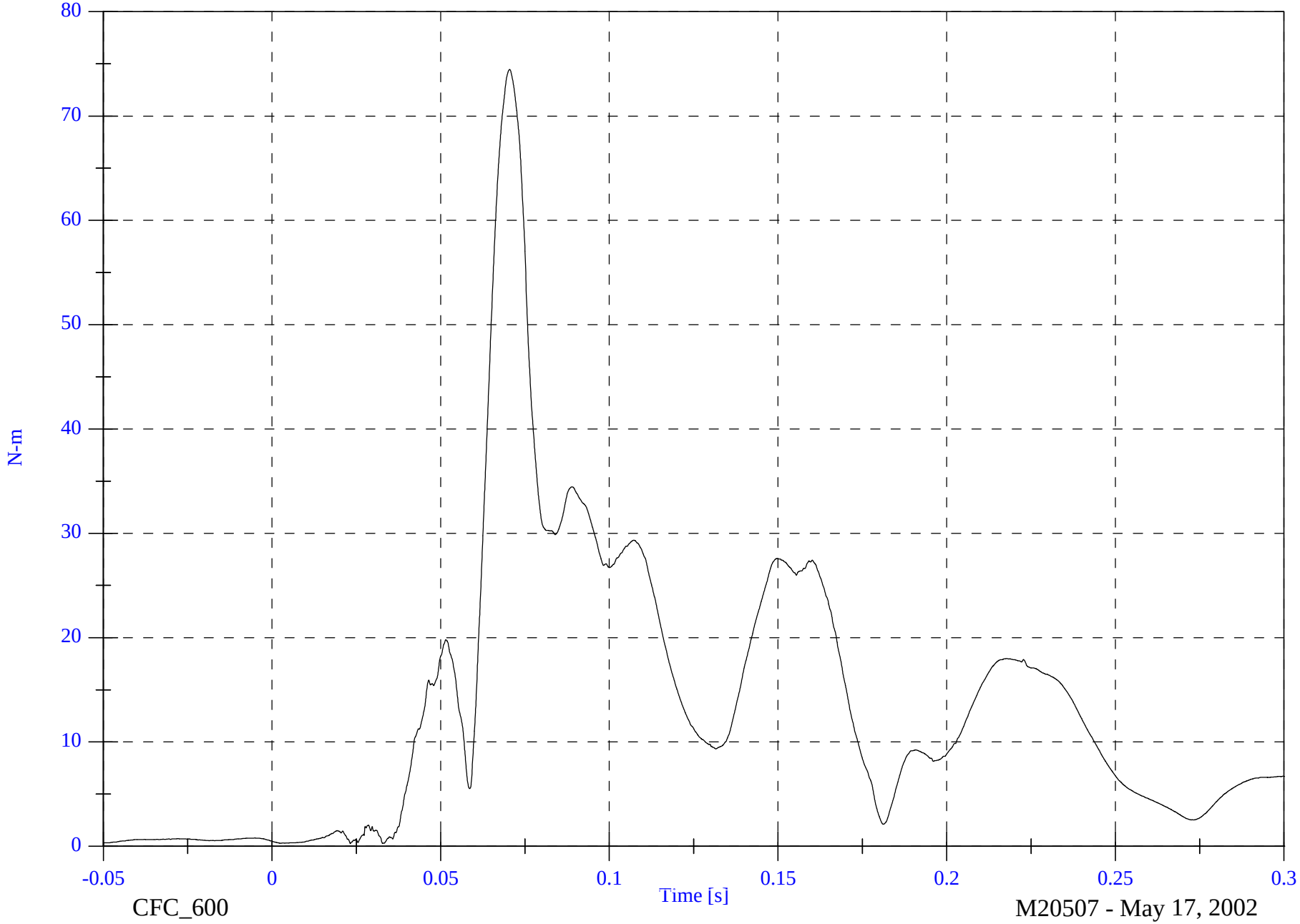
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

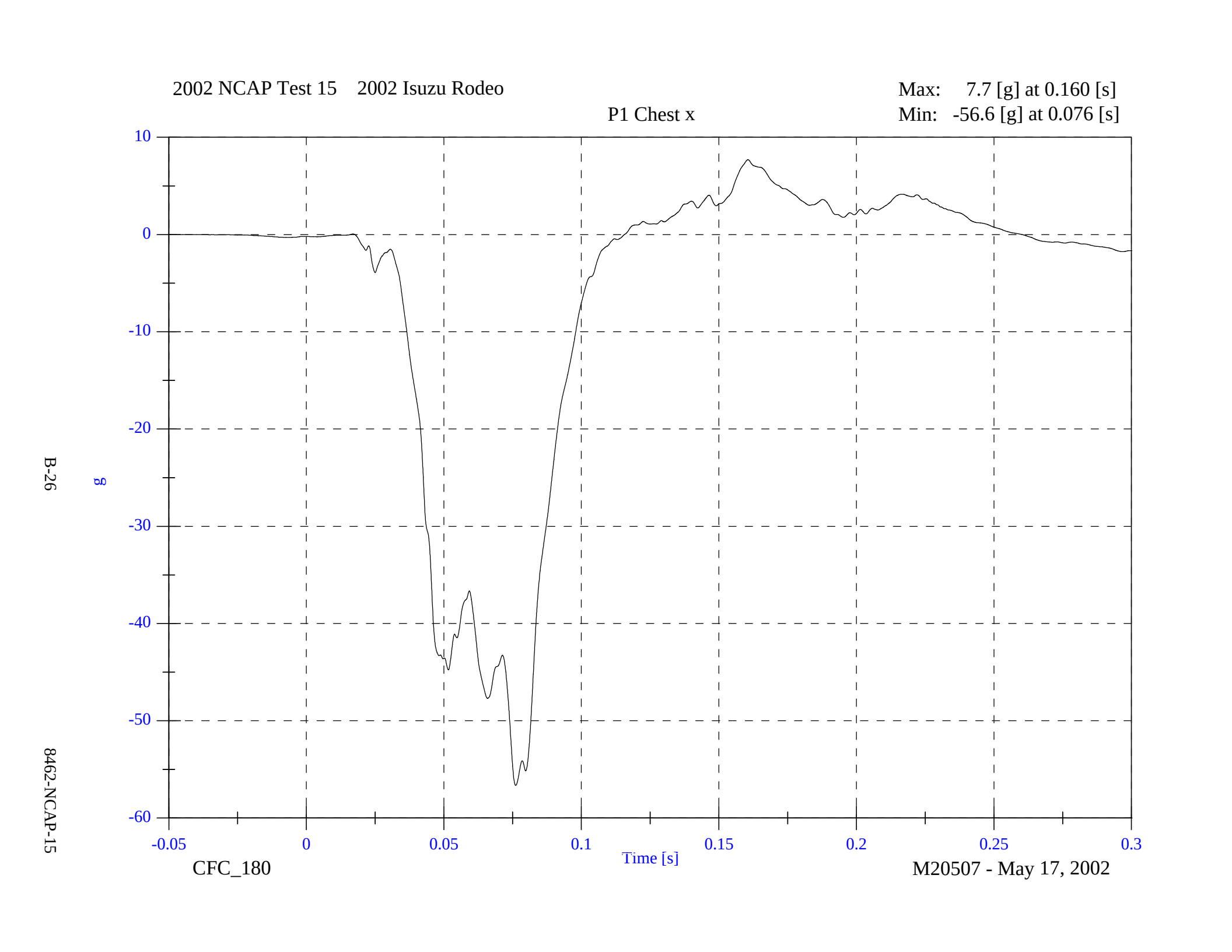
P1 Upper Neck M Resultant

Max: 74.5 [N-m] at 0.070 [s]
Min: 0.3 [N-m] at 0.023 [s]



CFC_600

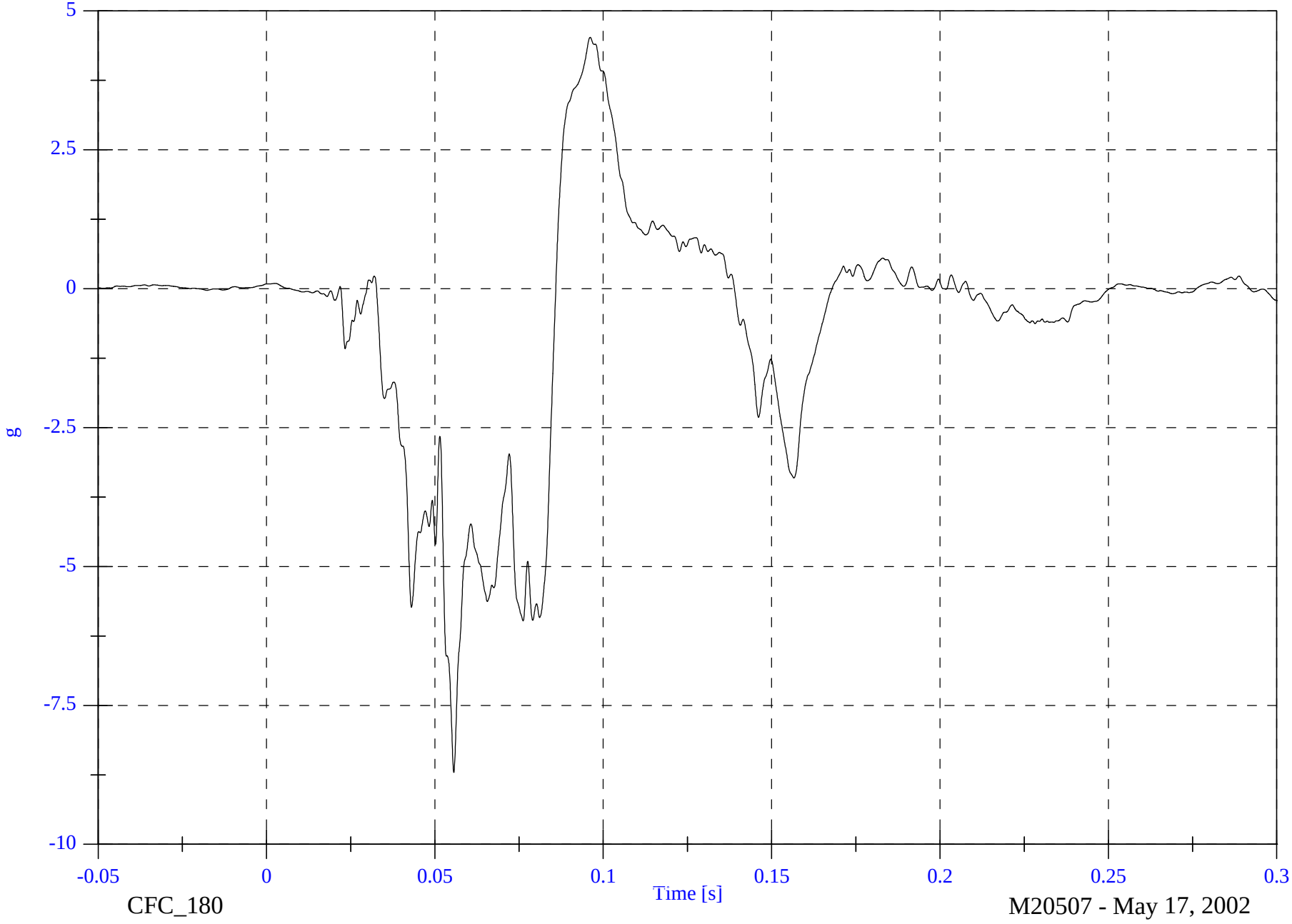
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Chest x
Max: 7.7 [g] at 0.160 [s]
Min: -56.6 [g] at 0.076 [s]
10
0
-10
-20
-30
-40
-50
-60
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
B-26
8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Chest y

Max: 4.5 [g] at 0.096 [s]
Min: -8.7 [g] at 0.056 [s]

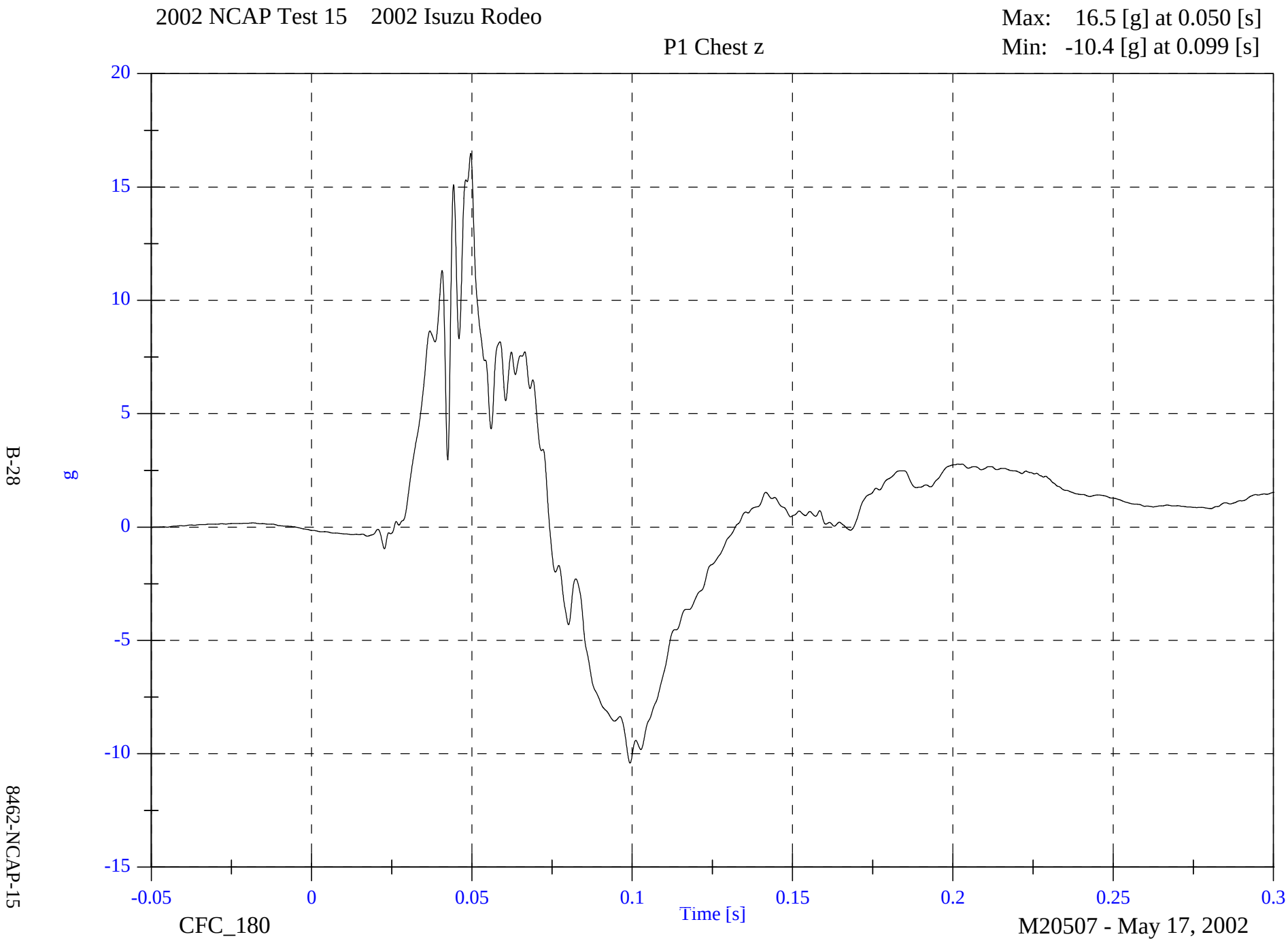


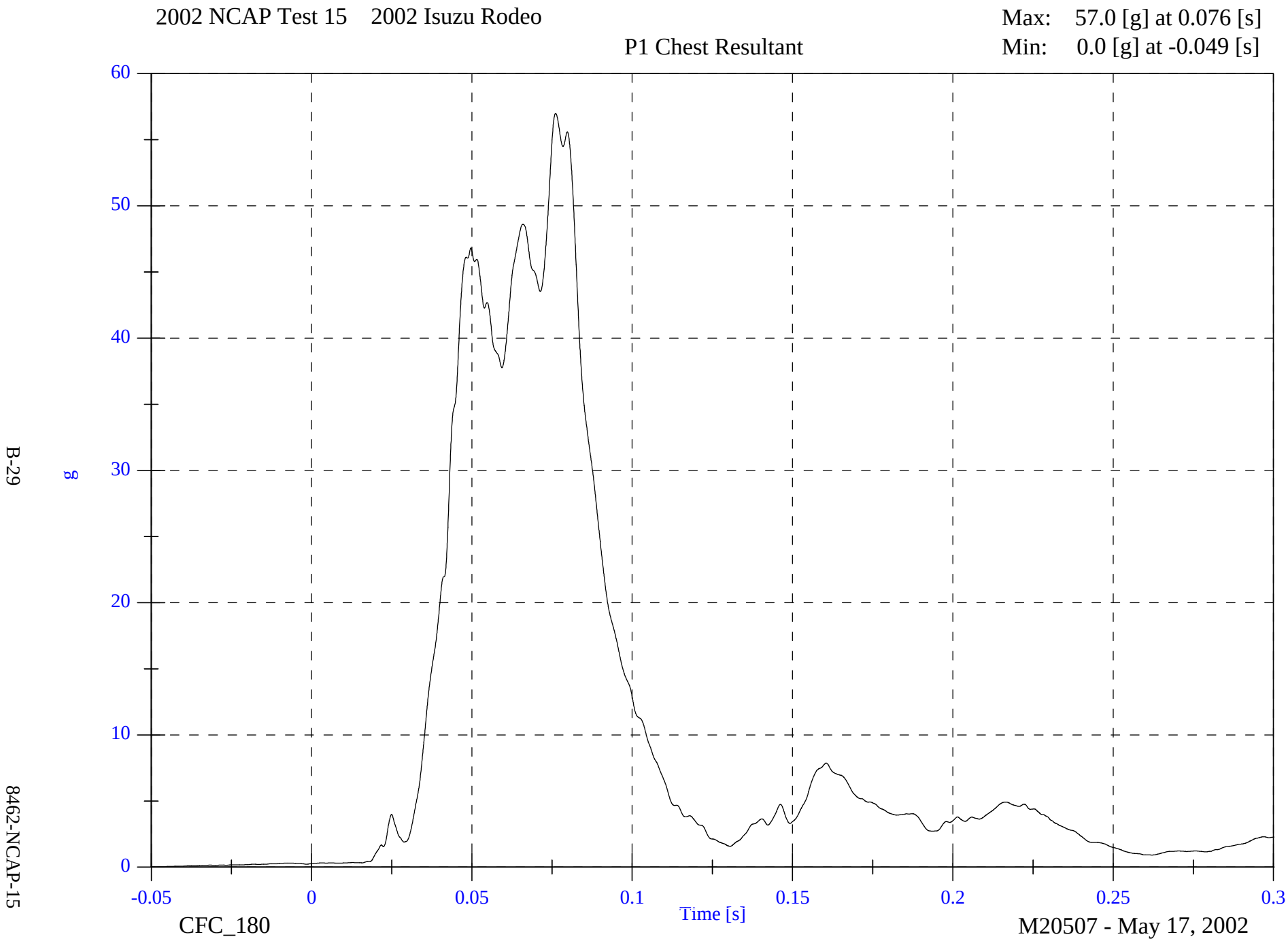
CFC_180

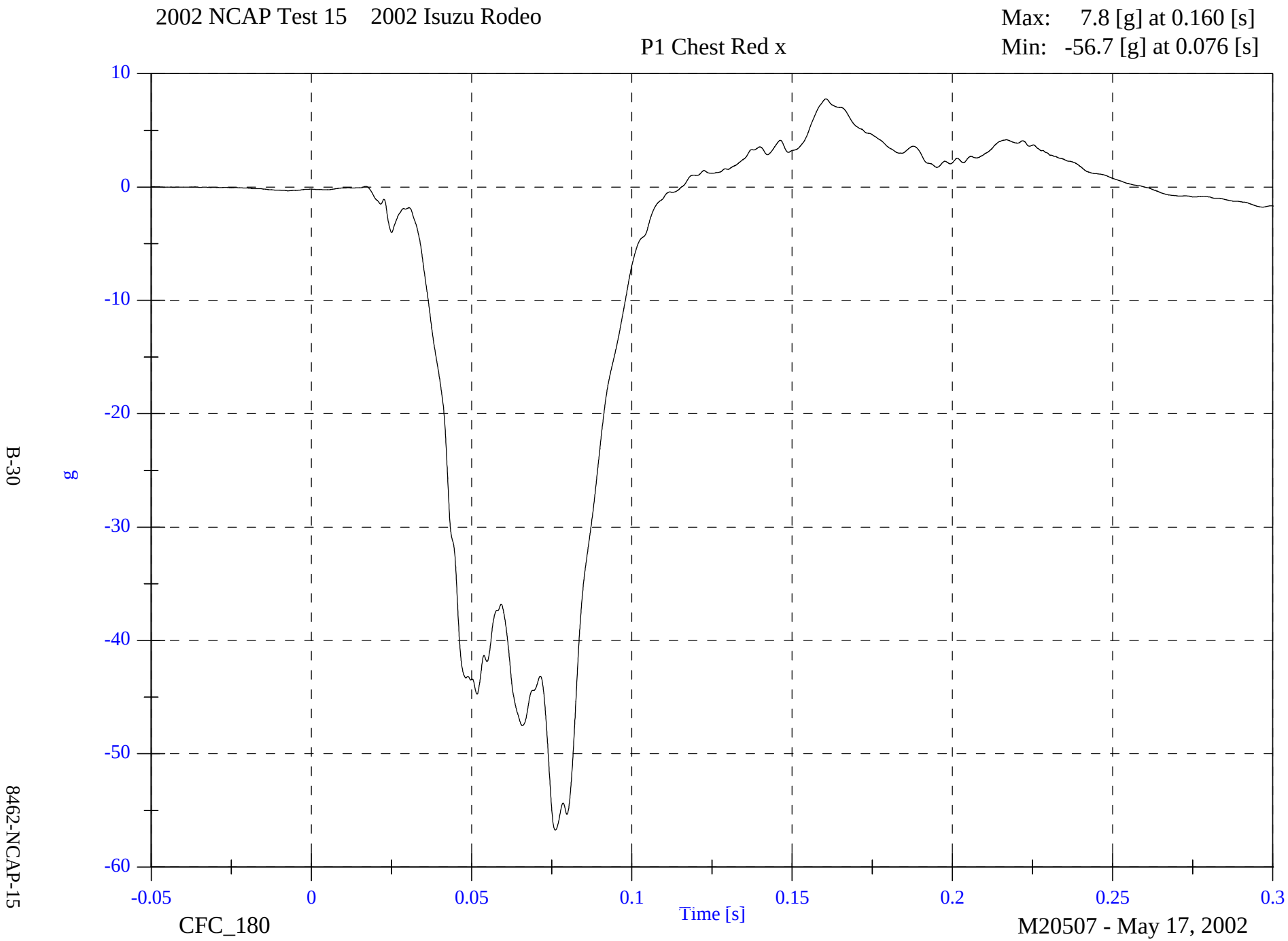
M20507 - May 17, 2002

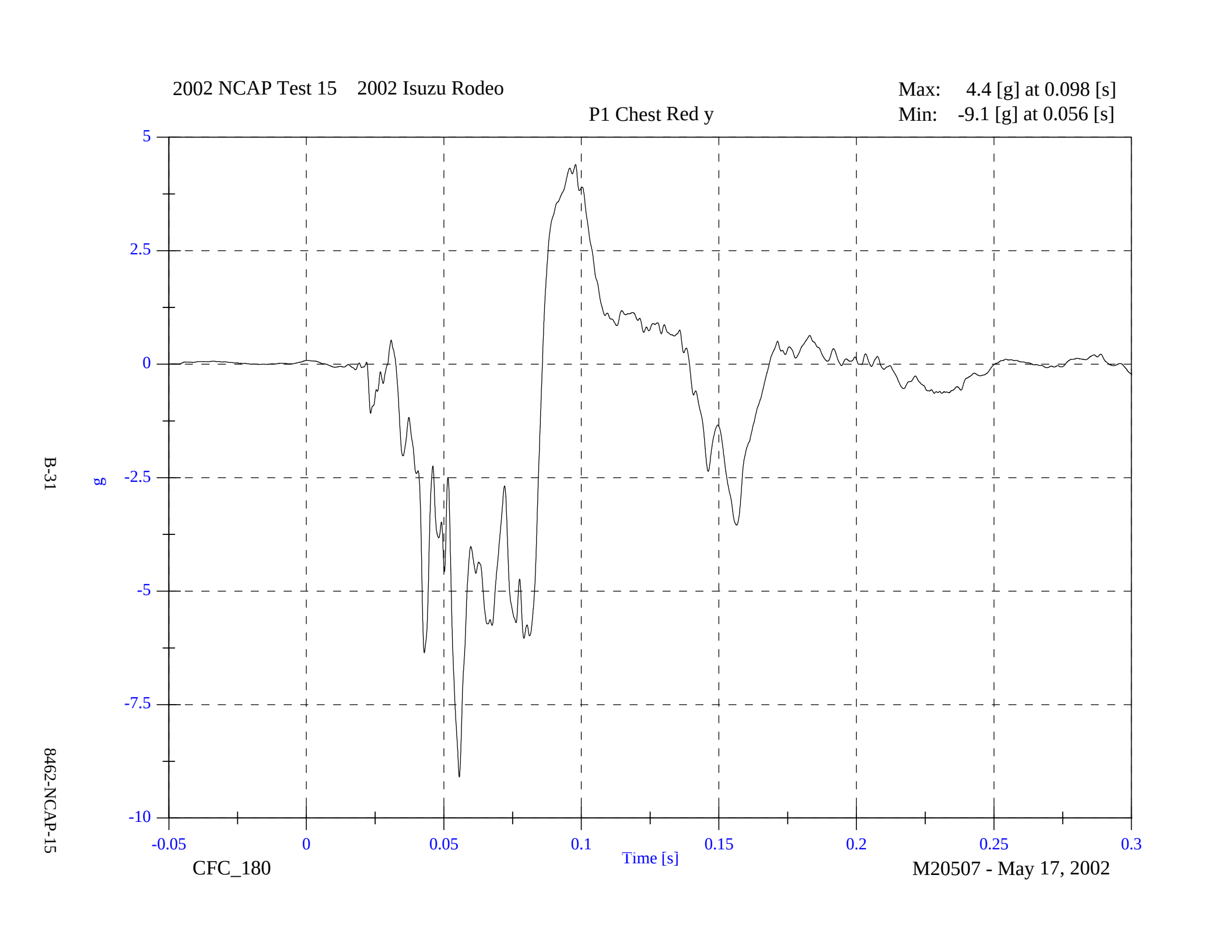
B-27

8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Chest z
Max: 16.5 [g] at 0.050 [s]
Min: -10.4 [g] at 0.099 [s]
20
15
10
5
0
-5
-10
-15
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Chest Resultant
Max: 57.0 [g] at 0.076 [s]
Min: 0.0 [g] at -0.049 [s]
60
50
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002

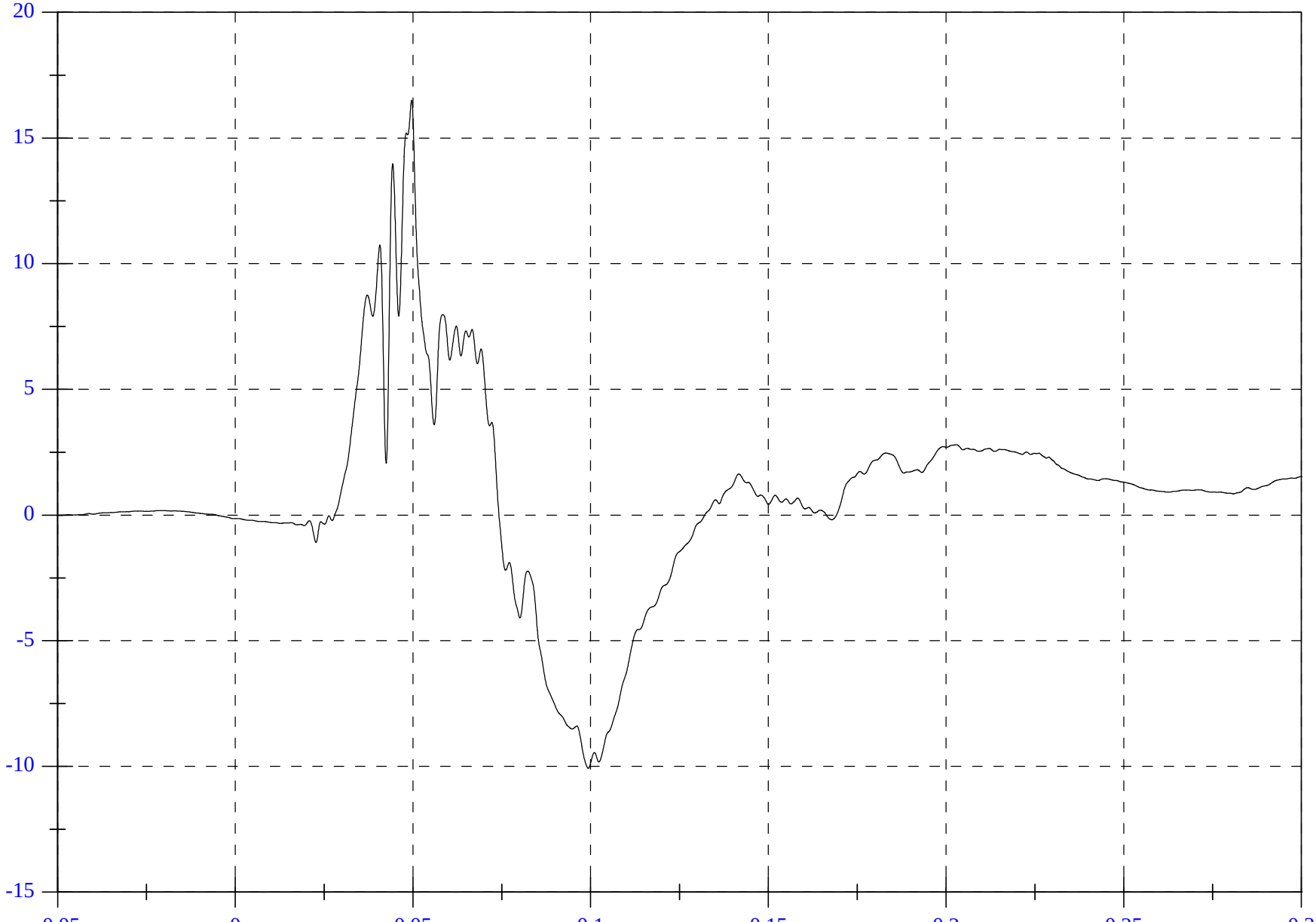

2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Chest Red x
Max: 7.8 [g] at 0.160 [s]
Min: -56.7 [g] at 0.076 [s]
10
0
-10
-20
-30
-40
-50
-60
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
B-30
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Chest Red y
Max: 4.4 [g] at 0.098 [s]
Min: -9.1 [g] at 0.056 [s]
5
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
B-31
8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Chest Red z

Max: 16.5 [g] at 0.050 [s]
Min: -10.1 [g] at 0.099 [s]



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8462-NCAP-15

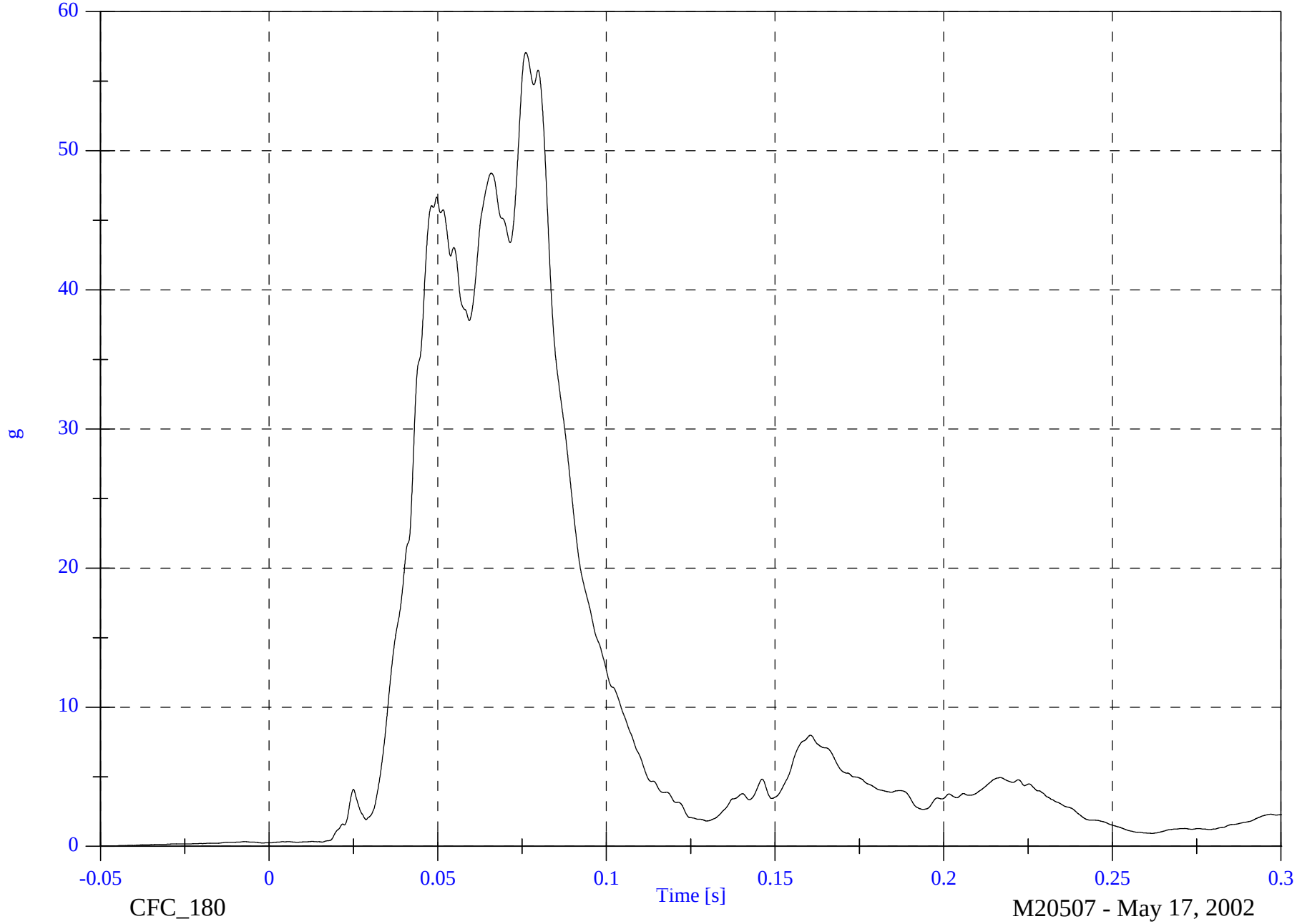
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Chest Red Resultant

Max: 57.1 [g] at 0.076 [s]
Min: 0.0 [g] at -0.047 [s]



CFC_180

M20507 - May 17, 2002

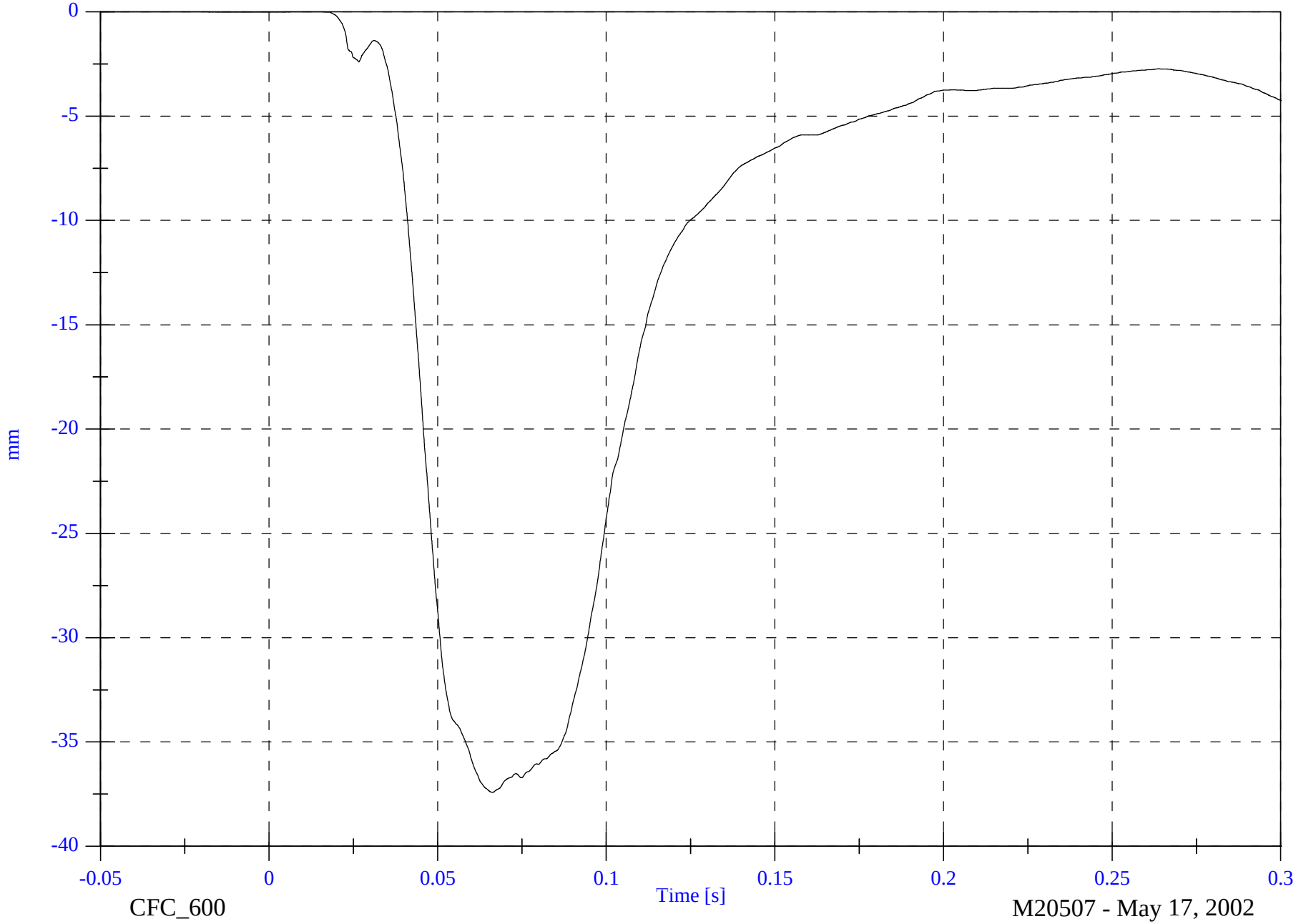
B-33

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

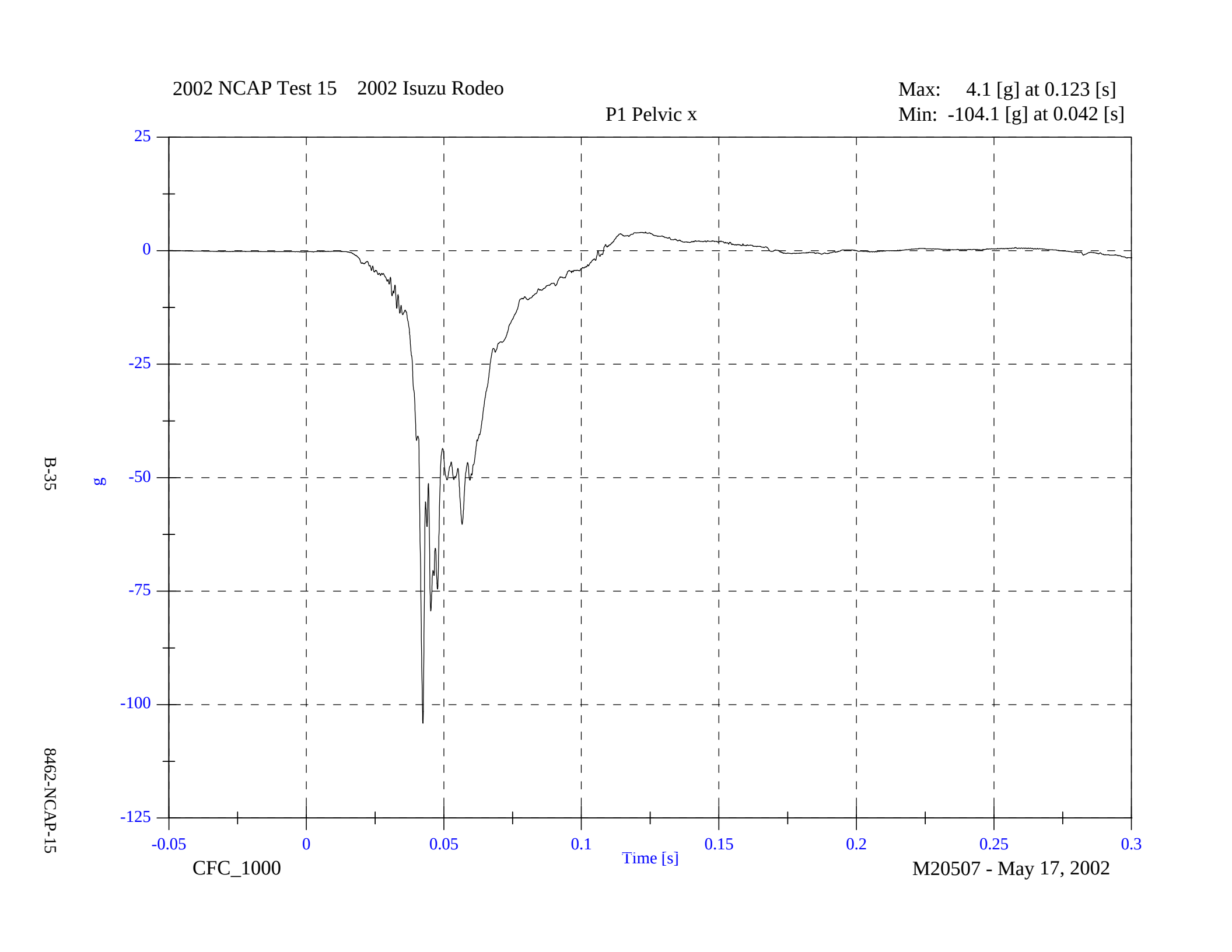
P1 Chest Compression x

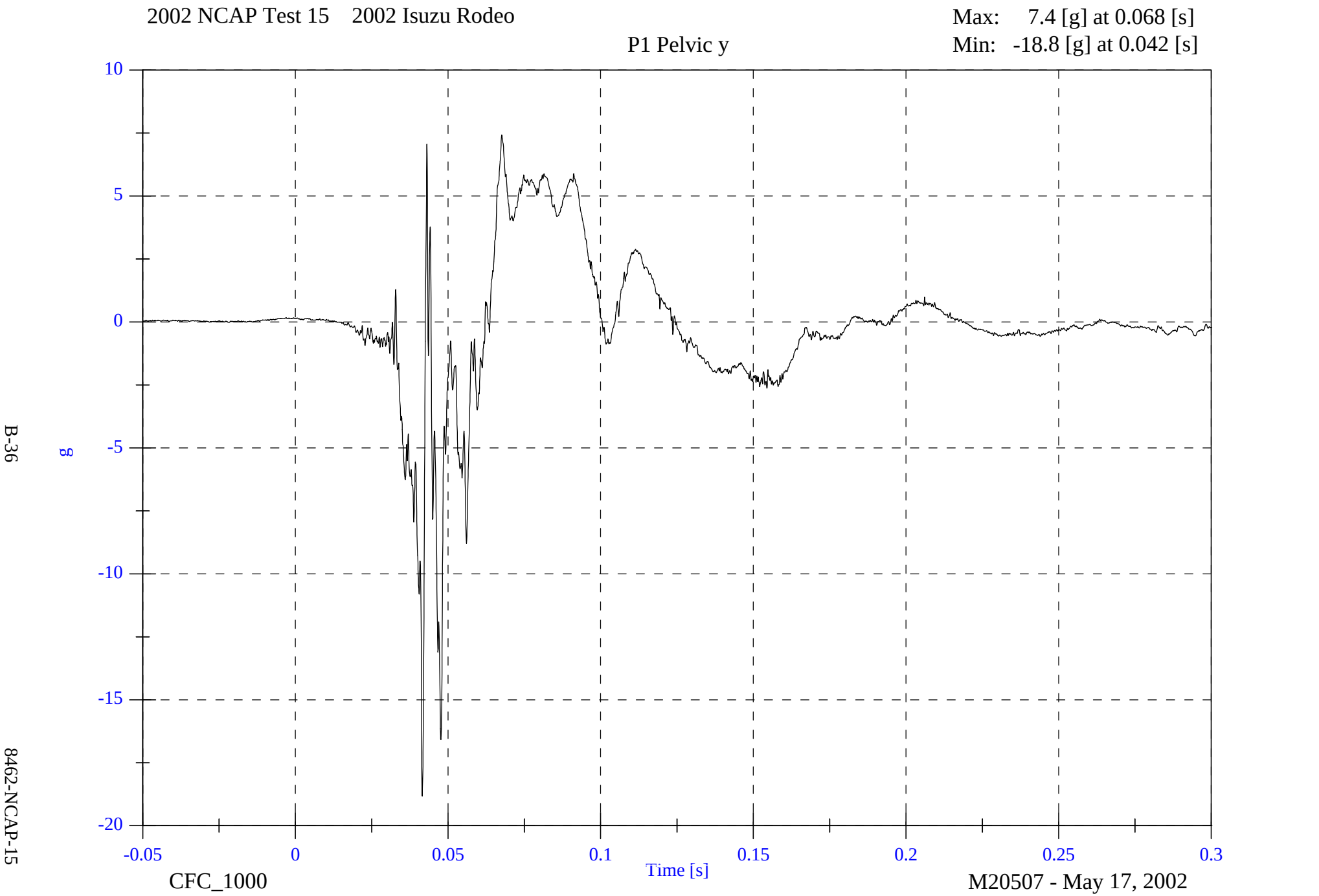
Max: 0.0 [mm] at 0.011 [s]
Min: -37.4 [mm] at 0.066 [s]

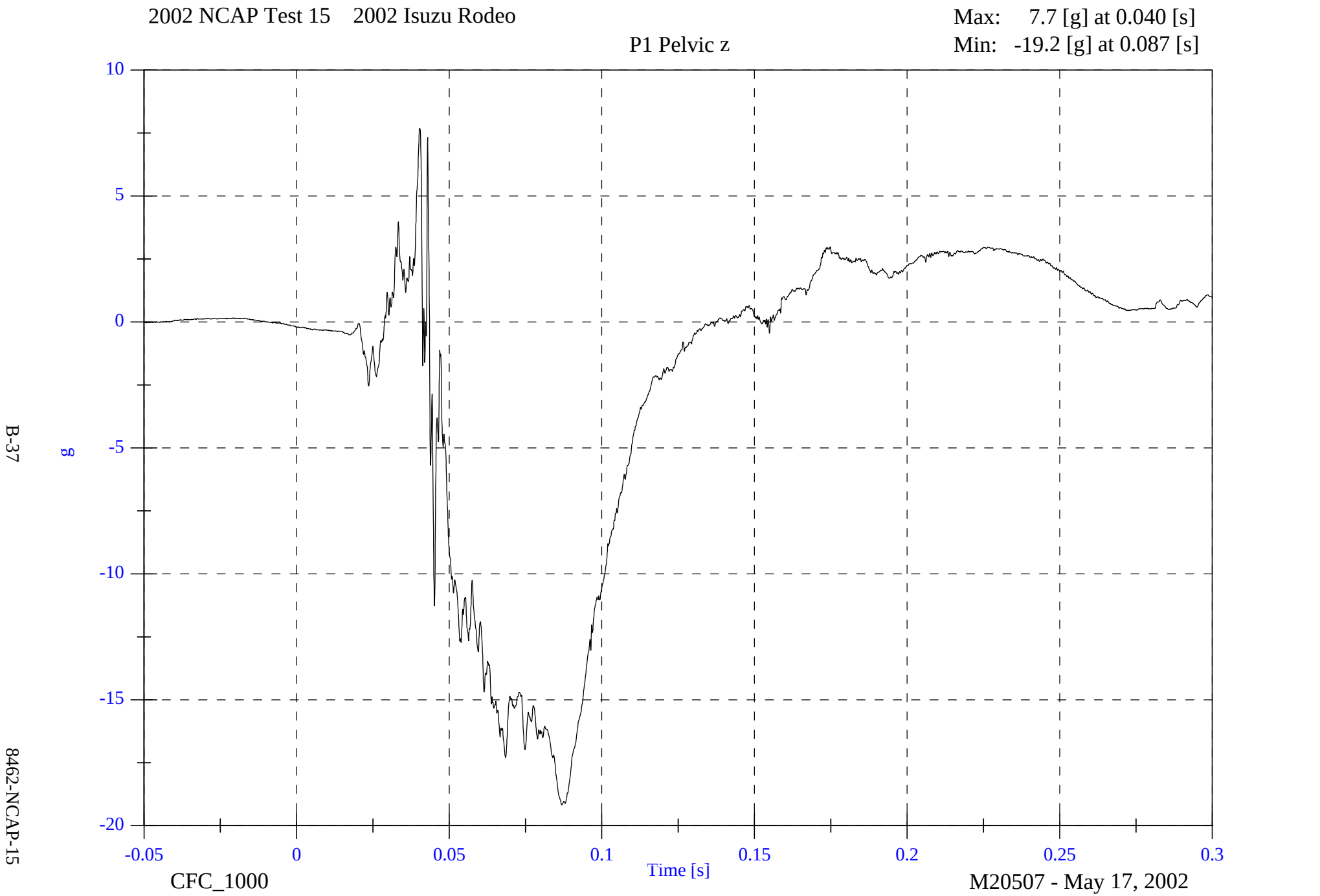


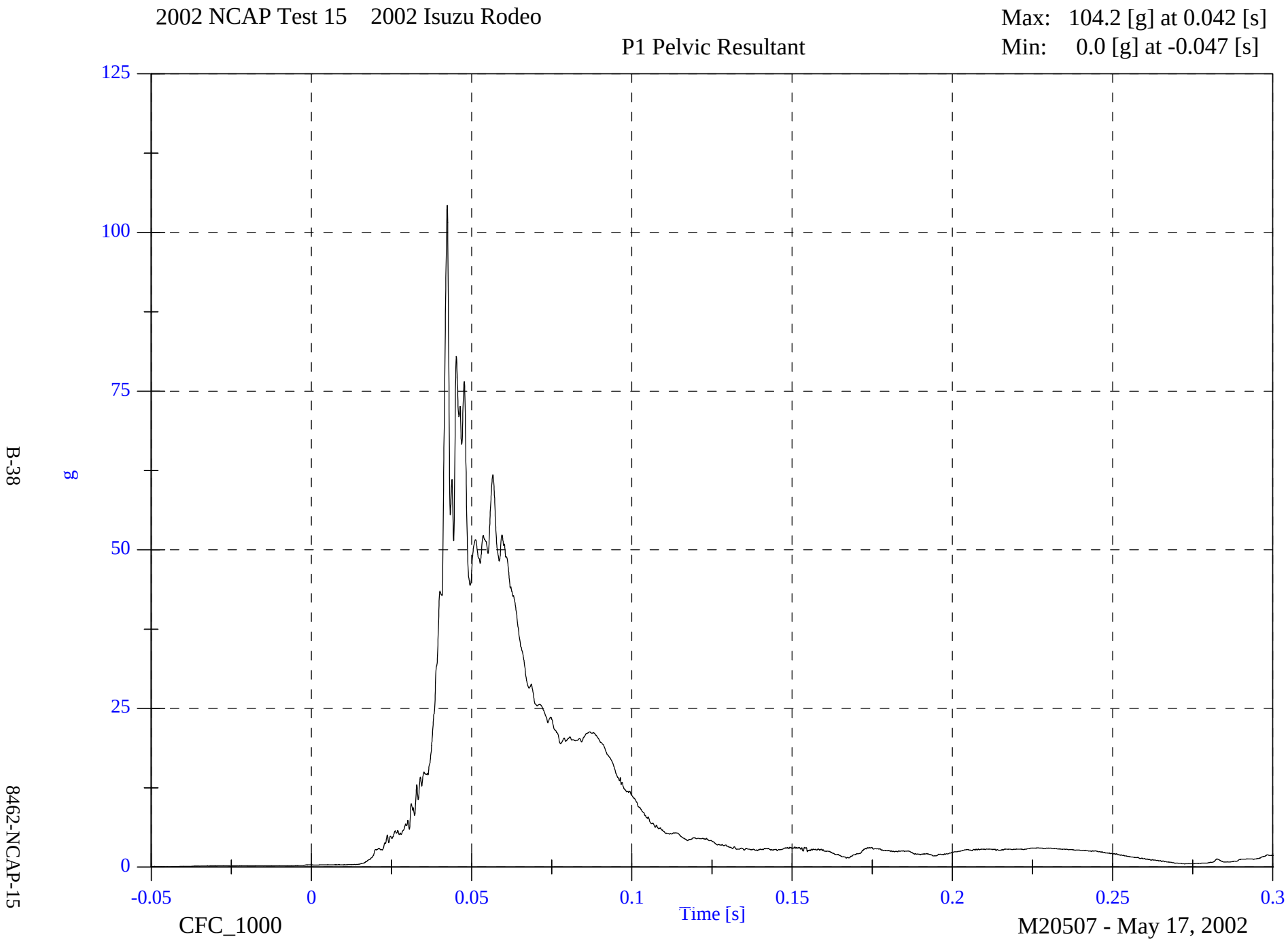
CFC_600

M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Pelvic x
Max: 4.1 [g] at 0.123 [s]
Min: -104.1 [g] at 0.042 [s]
25
0
-25
-50
-75
-100
-125
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
B-35
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Pelvic y
Max: 7.4 [g] at 0.068 [s]
Min: -18.8 [g] at 0.042 [s]
10
5
0
-5
-10
-15
-20
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

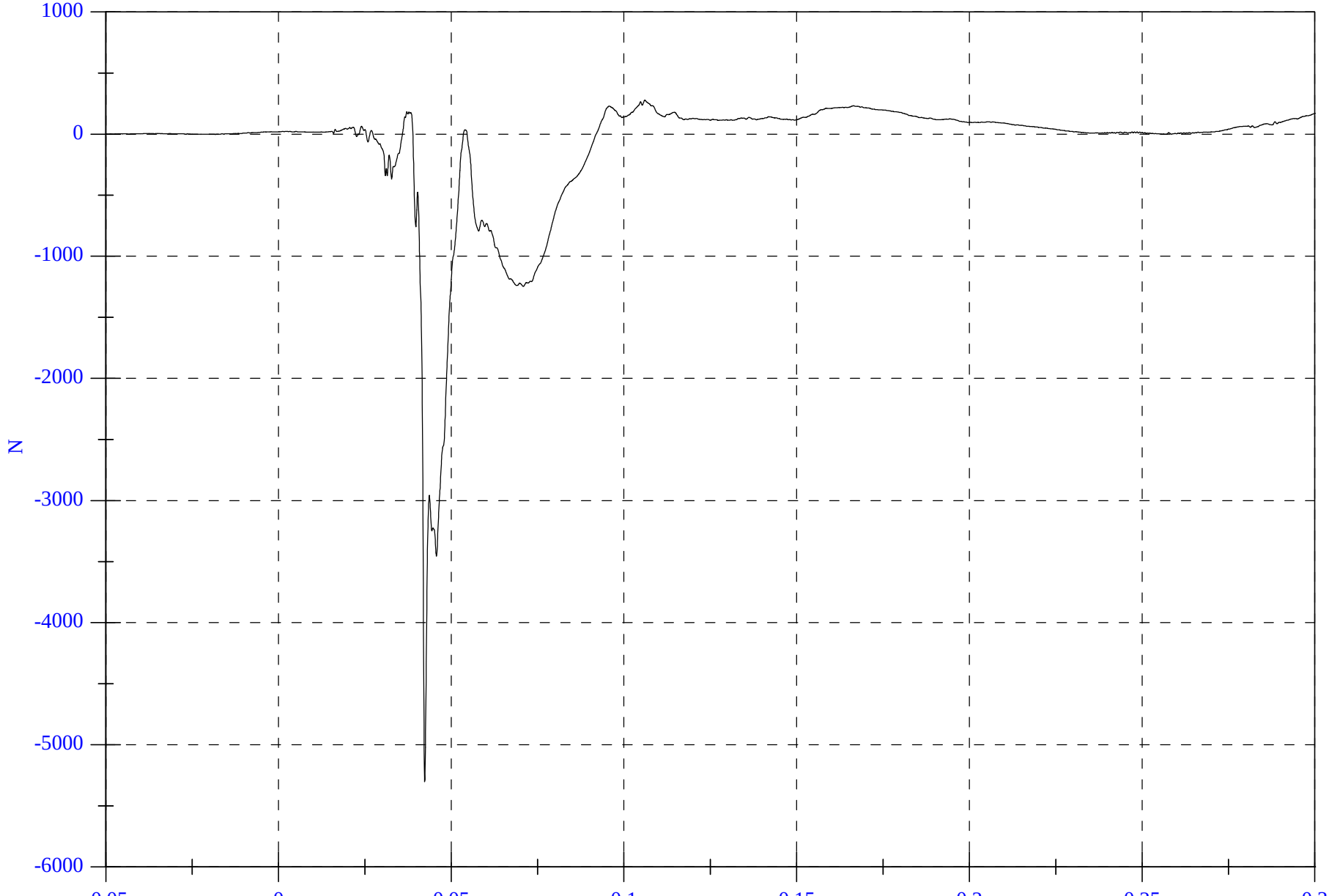

2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Pelvic z
Max: 7.7 [g] at 0.040 [s]
Min: -19.2 [g] at 0.087 [s]
10
5
0
-5
-10
-15
-20
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
B-37
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Pelvic Resultant
Max: 104.2 [g] at 0.042 [s]
Min: 0.0 [g] at -0.047 [s]
125
100
75
50
25
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Left Femur z

Max: 278.2 [N] at 0.106 [s]
Min: -5303.2 [N] at 0.042 [s]



CFC_600

M20507 - May 17, 2002

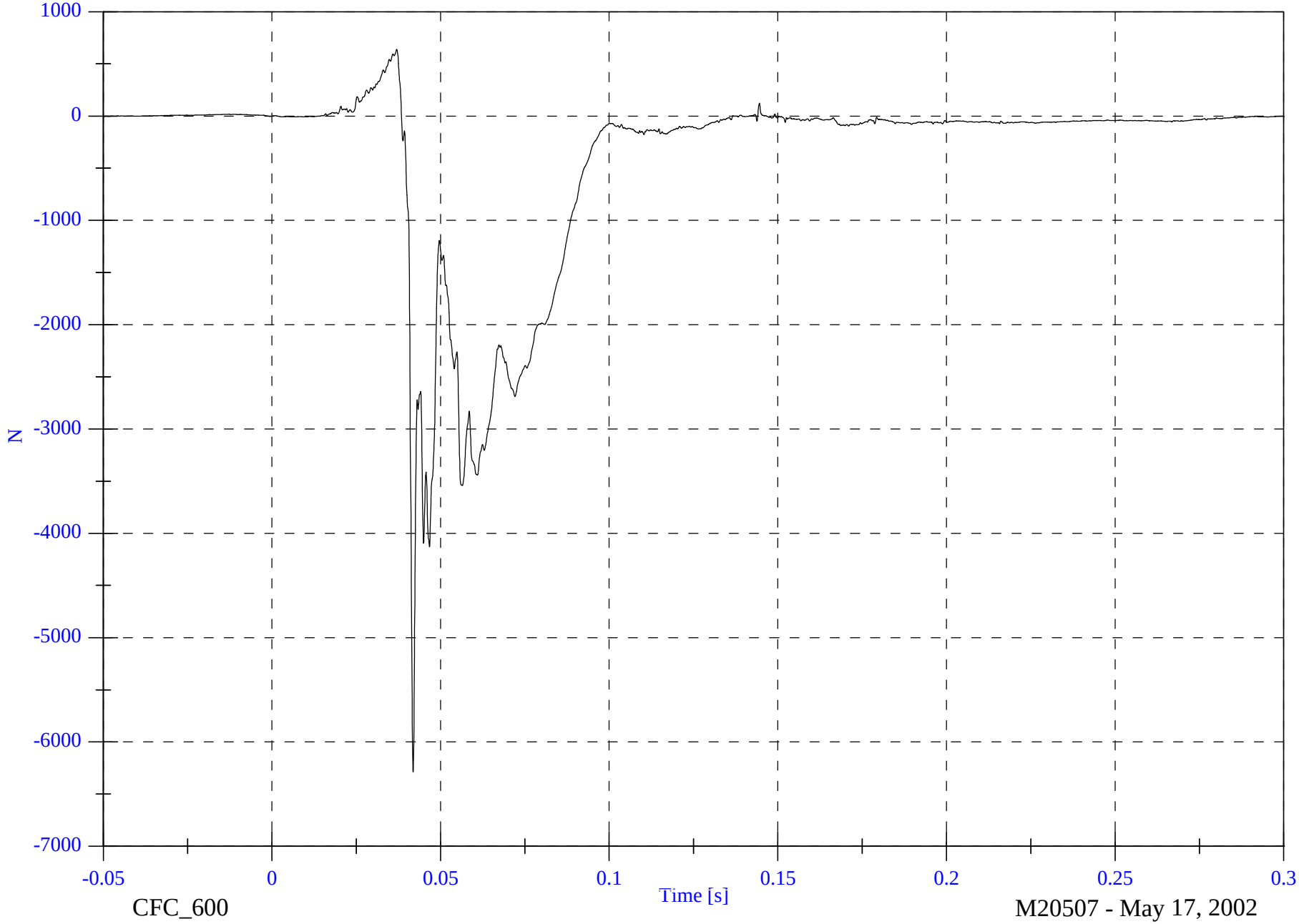
B-39

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Right Femur z

Max: 638.2 [N] at 0.037 [s]
Min: -6289.5 [N] at 0.042 [s]



CFC_600

M20507 - May 17, 2002

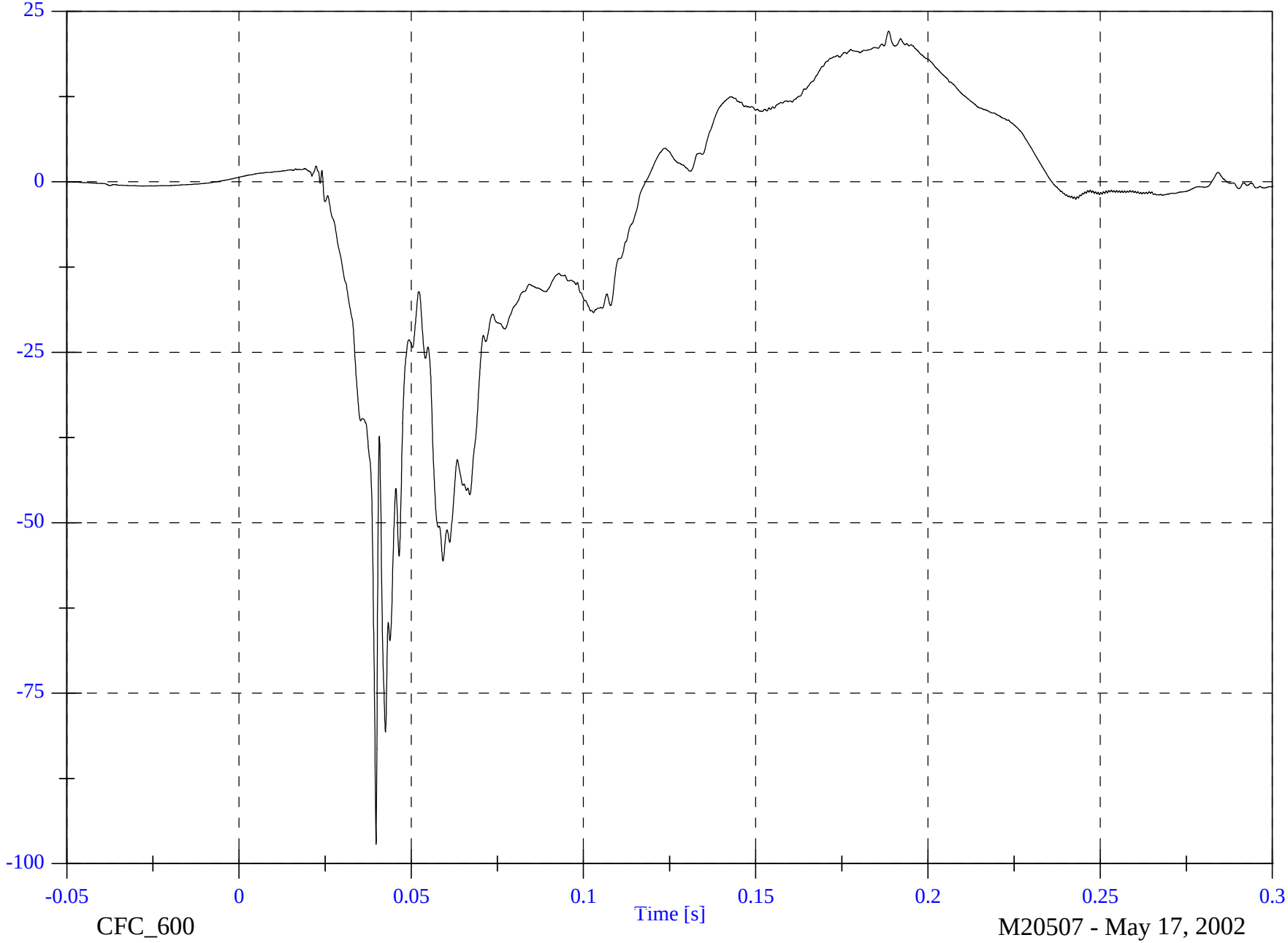
B-40

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Left Upper Tibia Mx

Max: 22.1 [N-m] at 0.189 [s]
Min: -97.2 [N-m] at 0.040 [s]



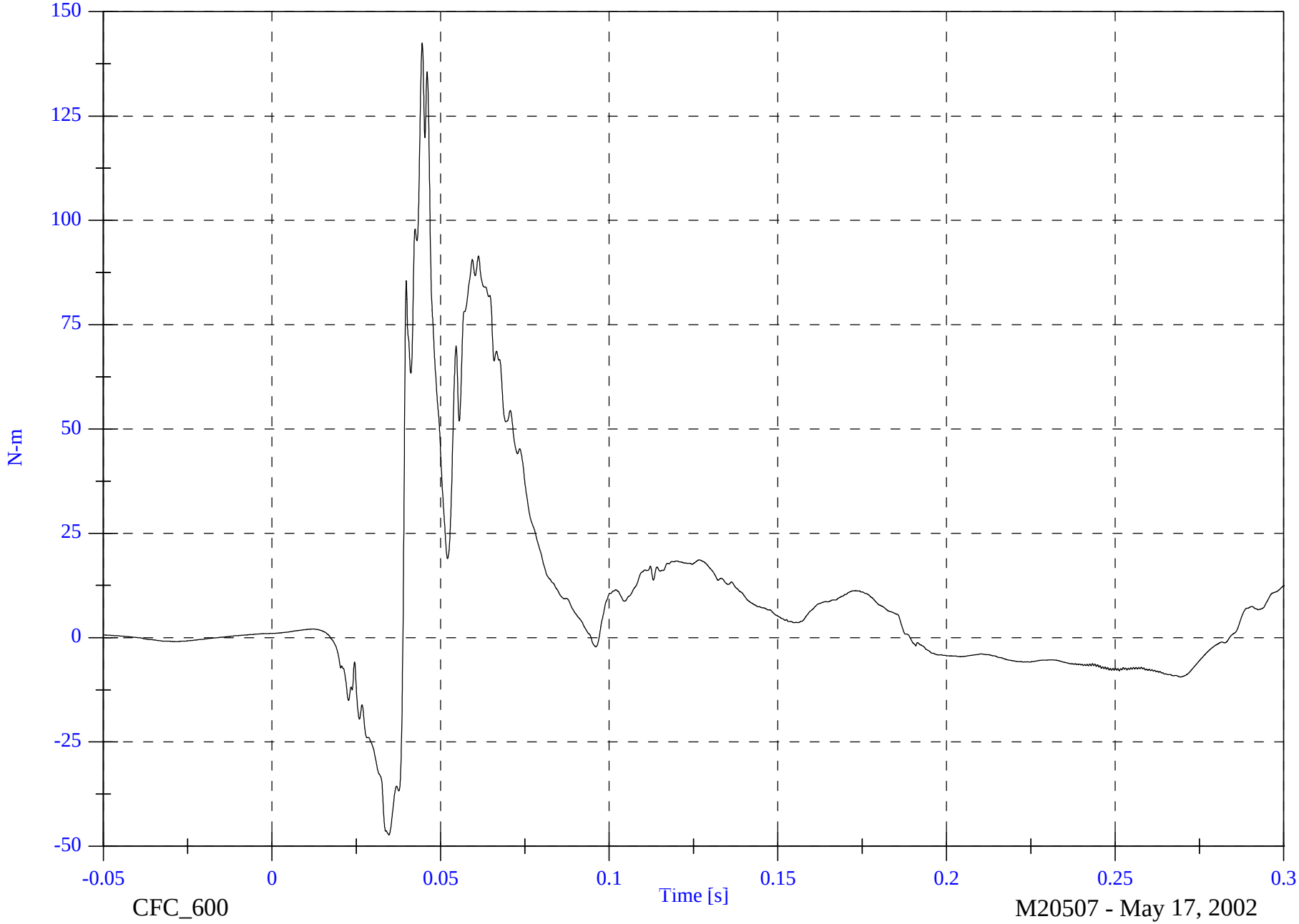
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

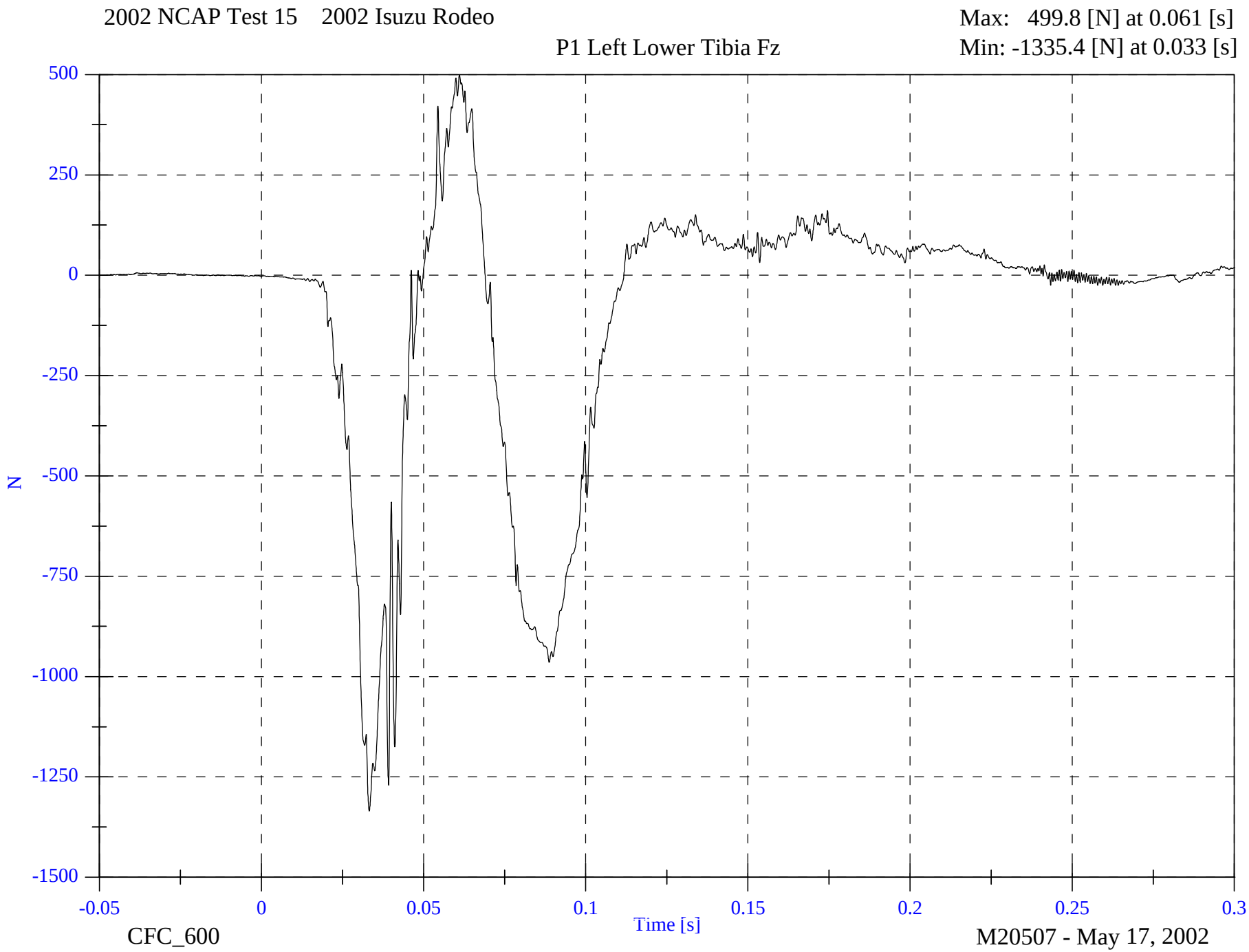
P1 Left Upper Tibia My

Max: 142.5 [N-m] at 0.045 [s]
Min: -47.3 [N-m] at 0.035 [s]



CFC_600

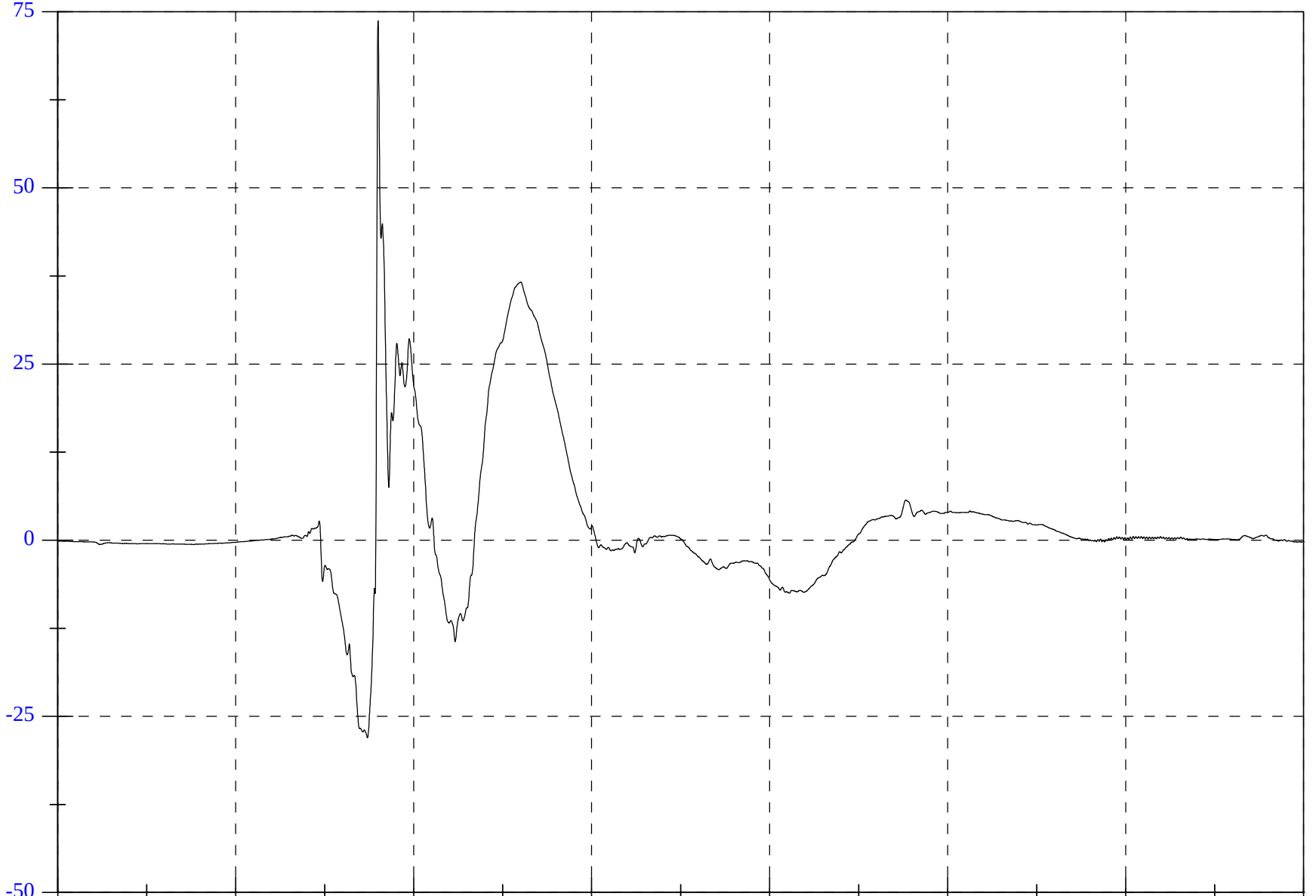
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Left Lower Tibia Fz
Max: 499.8 [N] at 0.061 [s]
Min: -1335.4 [N] at 0.033 [s]
500
250
0
-250
-500
-750
-1000
-1250
-1500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_600
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Left Lower Tibia Mx

Max: 73.7 [N-m] at 0.040 [s]
Min: -28.1 [N-m] at 0.037 [s]



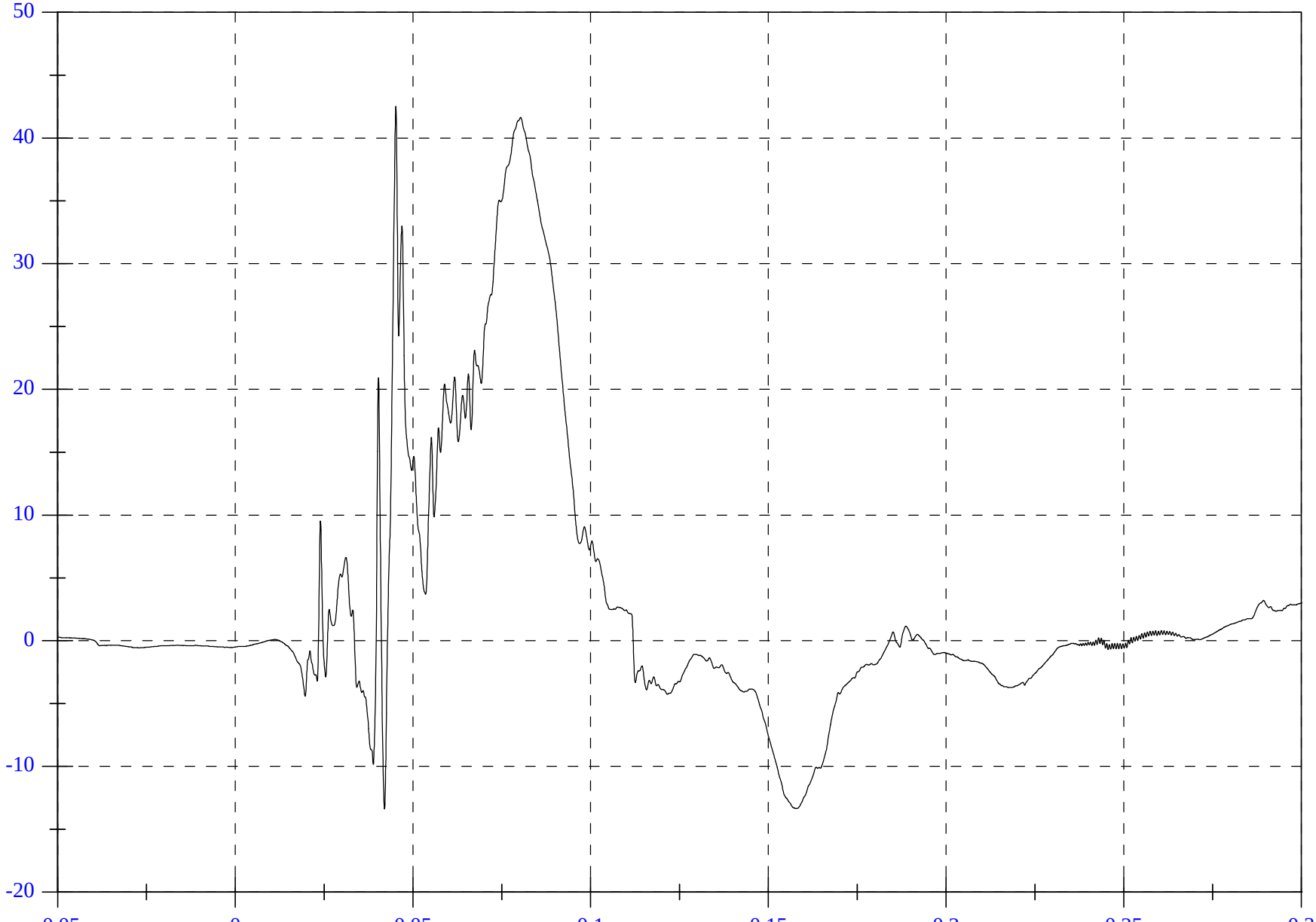
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Left Lower Tibia My

Max: 42.5 [N-m] at 0.045 [s]
Min: -13.4 [N-m] at 0.042 [s]



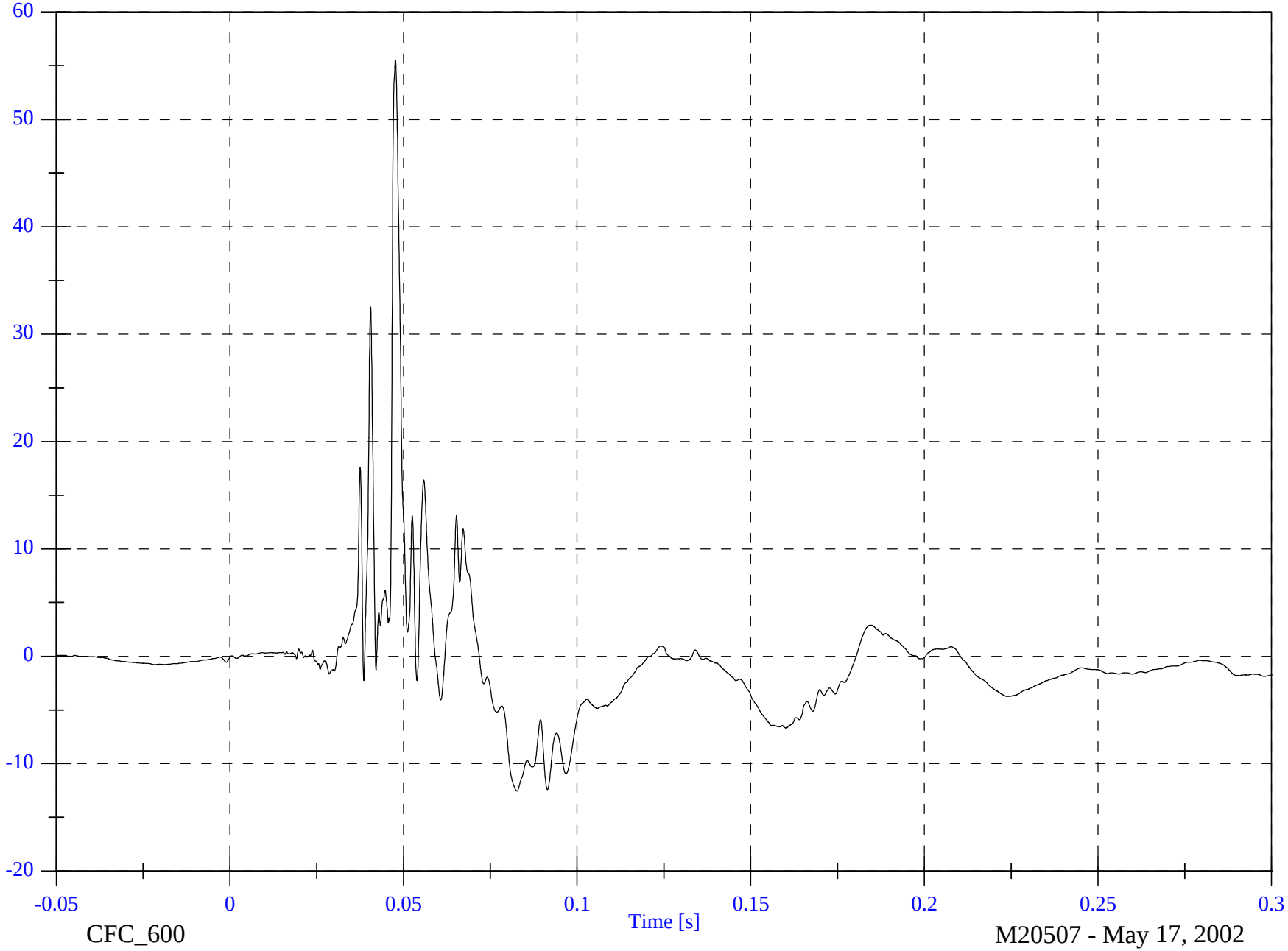
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Right Upper Tibia Mx

Max: 55.5 [N-m] at 0.048 [s]
Min: -12.6 [N-m] at 0.083 [s]



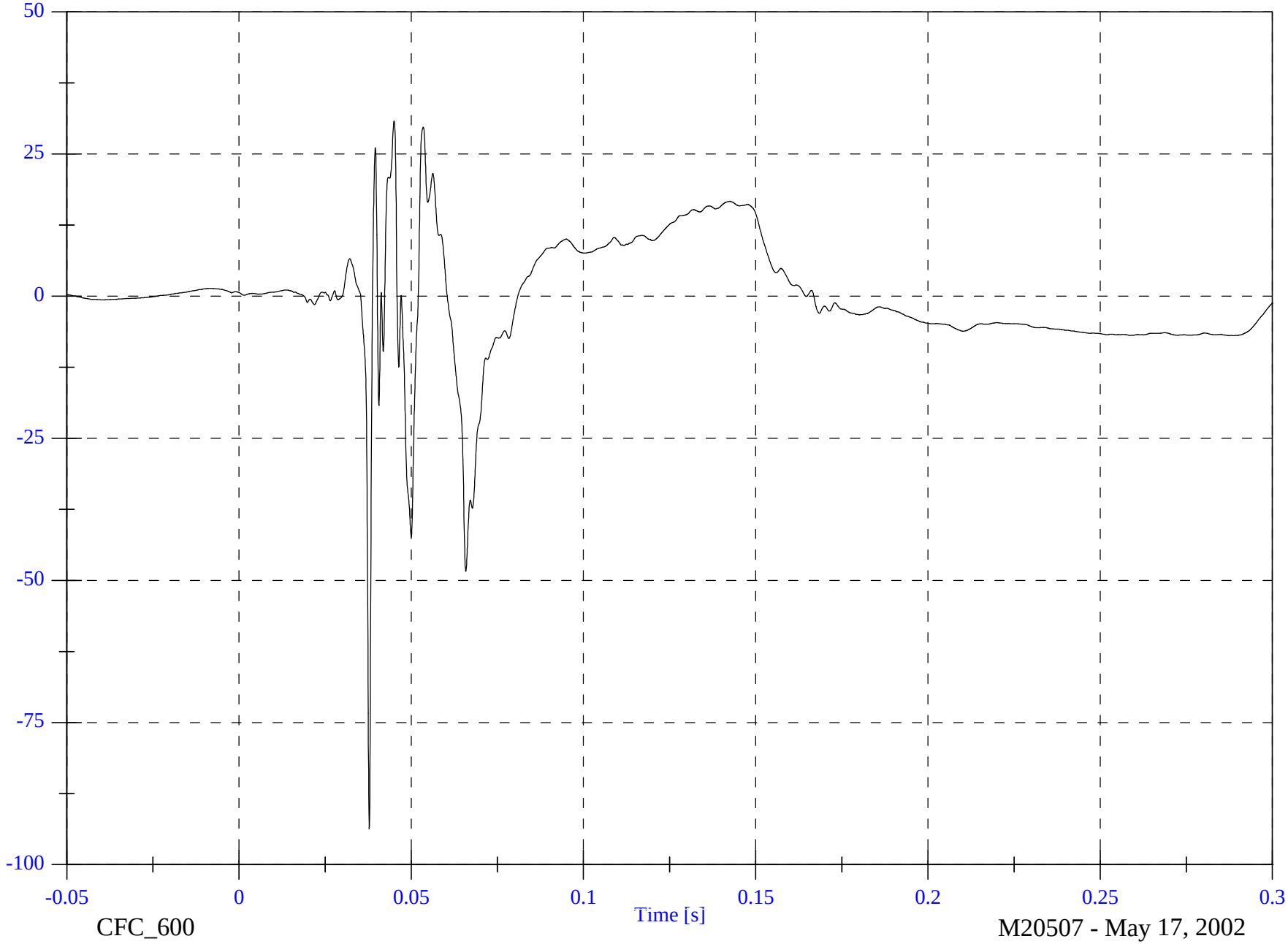
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

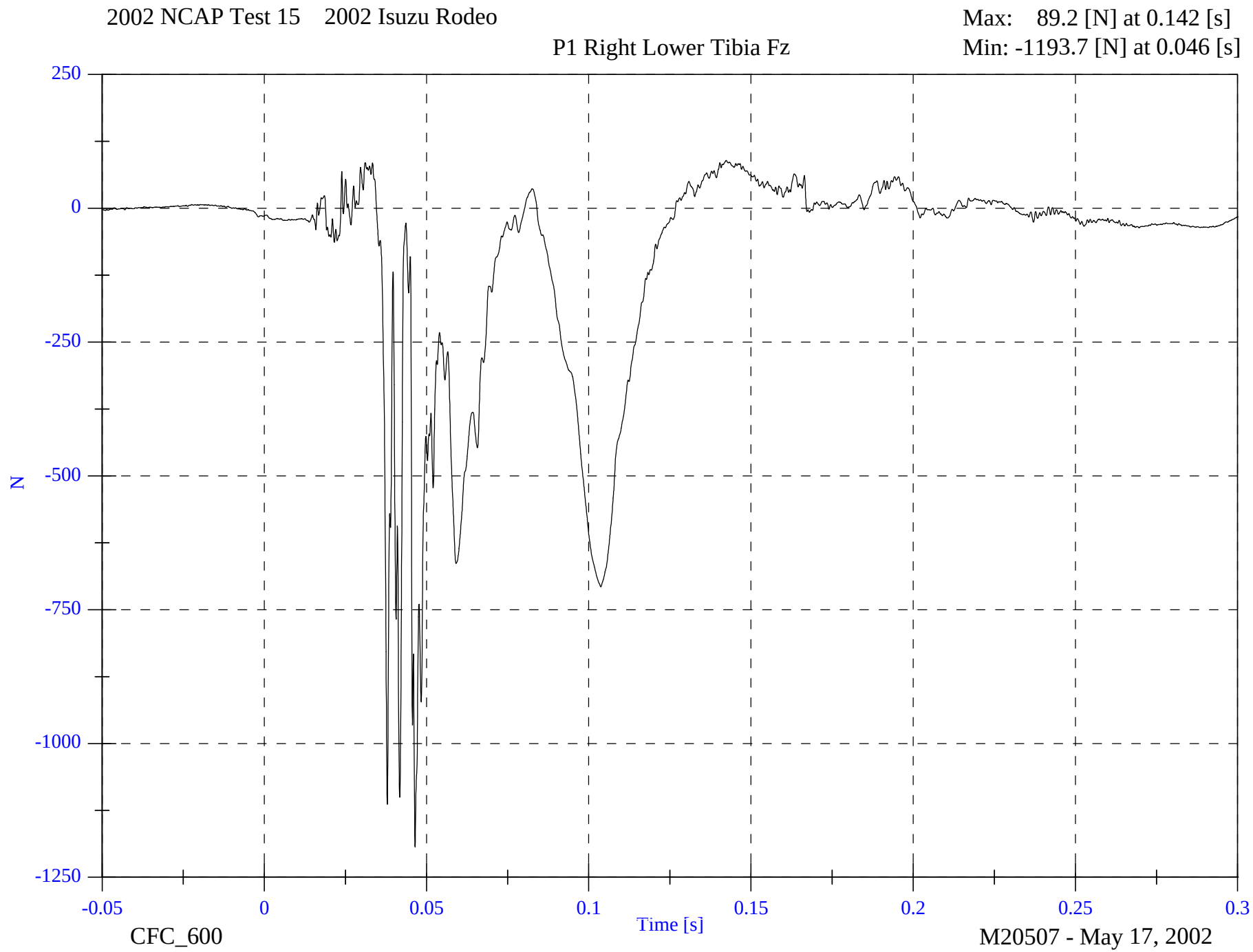
P1 Right Upper Tibia My

Max: 30.8 [N-m] at 0.045 [s]
Min: -93.7 [N-m] at 0.038 [s]



CFC_600

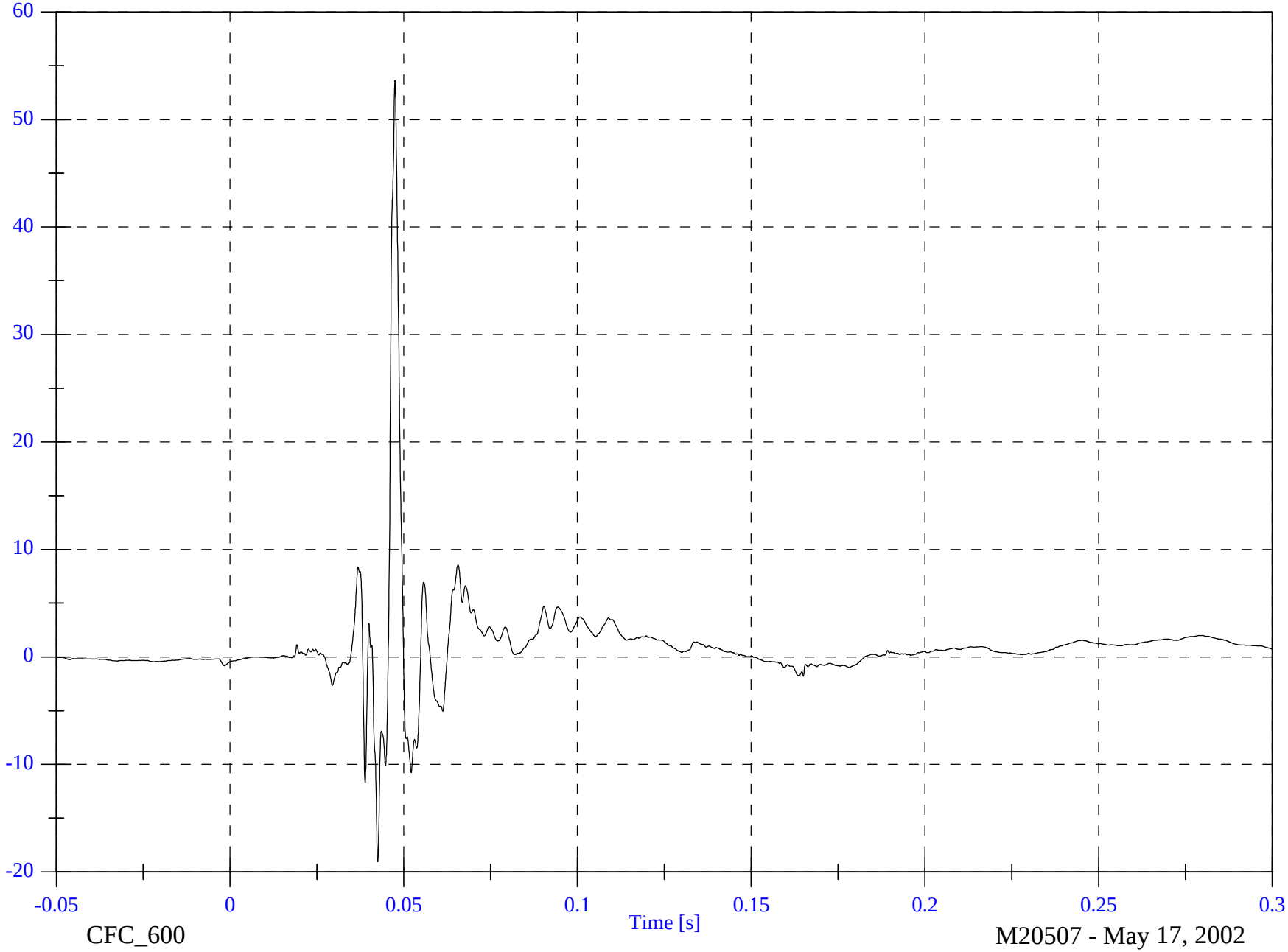
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Right Lower Tibia Fz
Max: 89.2 [N] at 0.142 [s]
Min: -1193.7 [N] at 0.046 [s]
250
0
-250
-500
-750
-1000
-1250
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_600
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Right Lower Tibia Mx

Max: 53.6 [N-m] at 0.047 [s]
Min: -19.0 [N-m] at 0.043 [s]



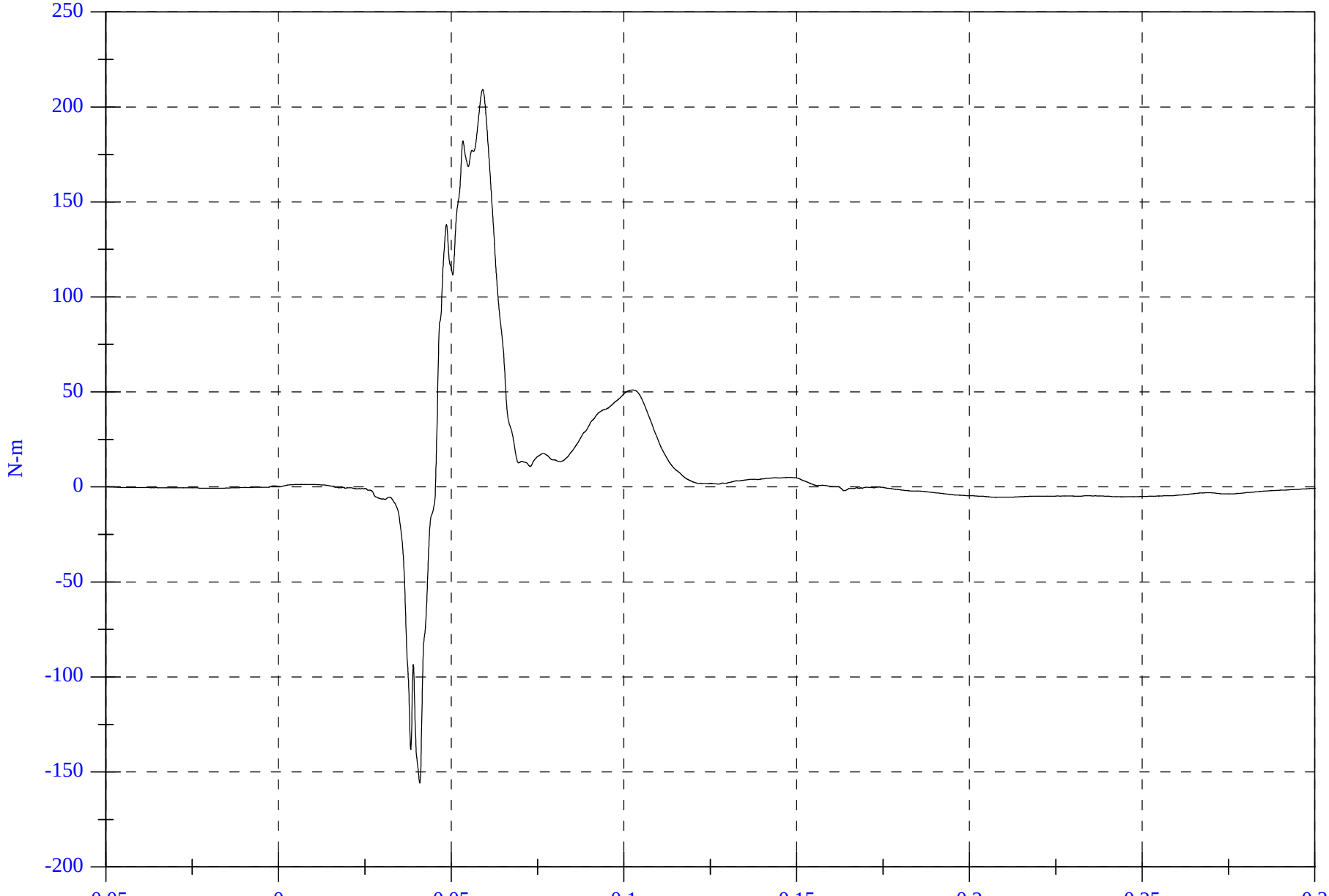
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Right Lower Tibia My

Max: 209.2 [N-m] at 0.059 [s]
Min: -155.9 [N-m] at 0.041 [s]



CFC_600

M20507 - May 17, 2002

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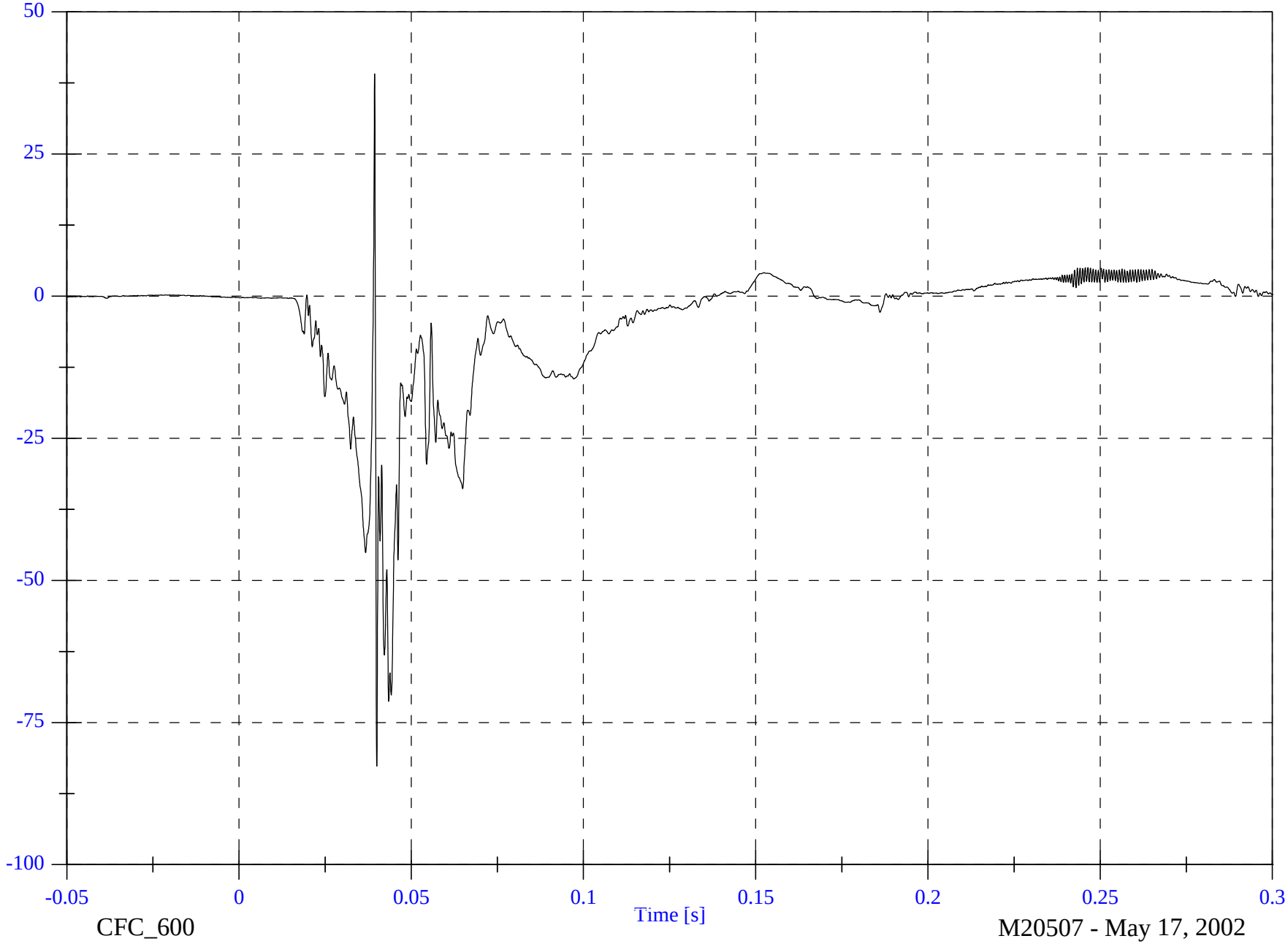
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Left Foot Aft x
Max: 14.4 [g] at 0.091 [s]
Min: -99.1 [g] at 0.045 [s]
25
0
-25
-50
-75
-100
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_600
M20507 - May 17, 2002
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8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Left Foot Aft z

Max: 39.1 [g] at 0.039 [s]
Min: -82.7 [g] at 0.040 [s]



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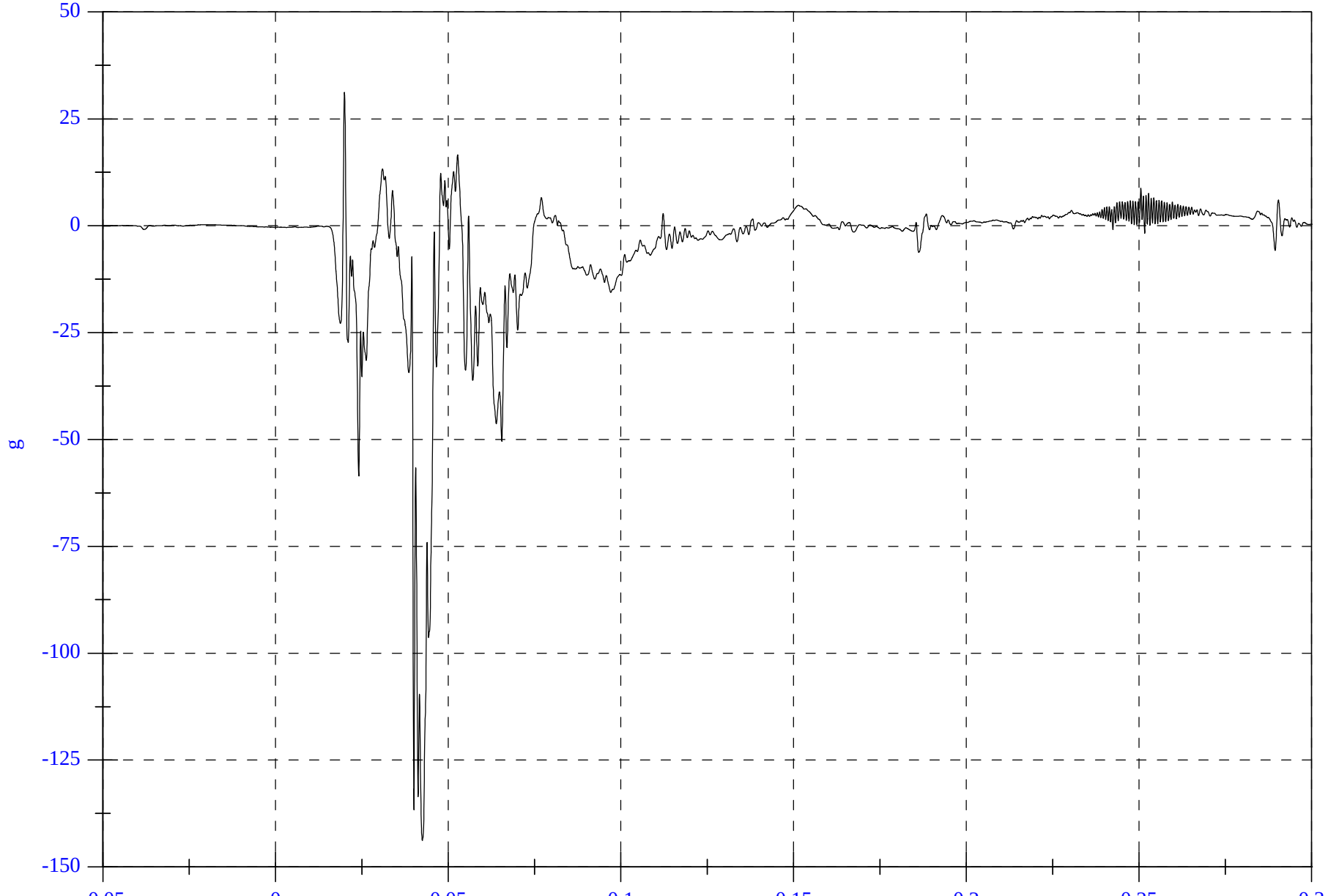
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Left Foot Fore z

Max: 31.2 [g] at 0.020 [s]
Min: -143.8 [g] at 0.042 [s]

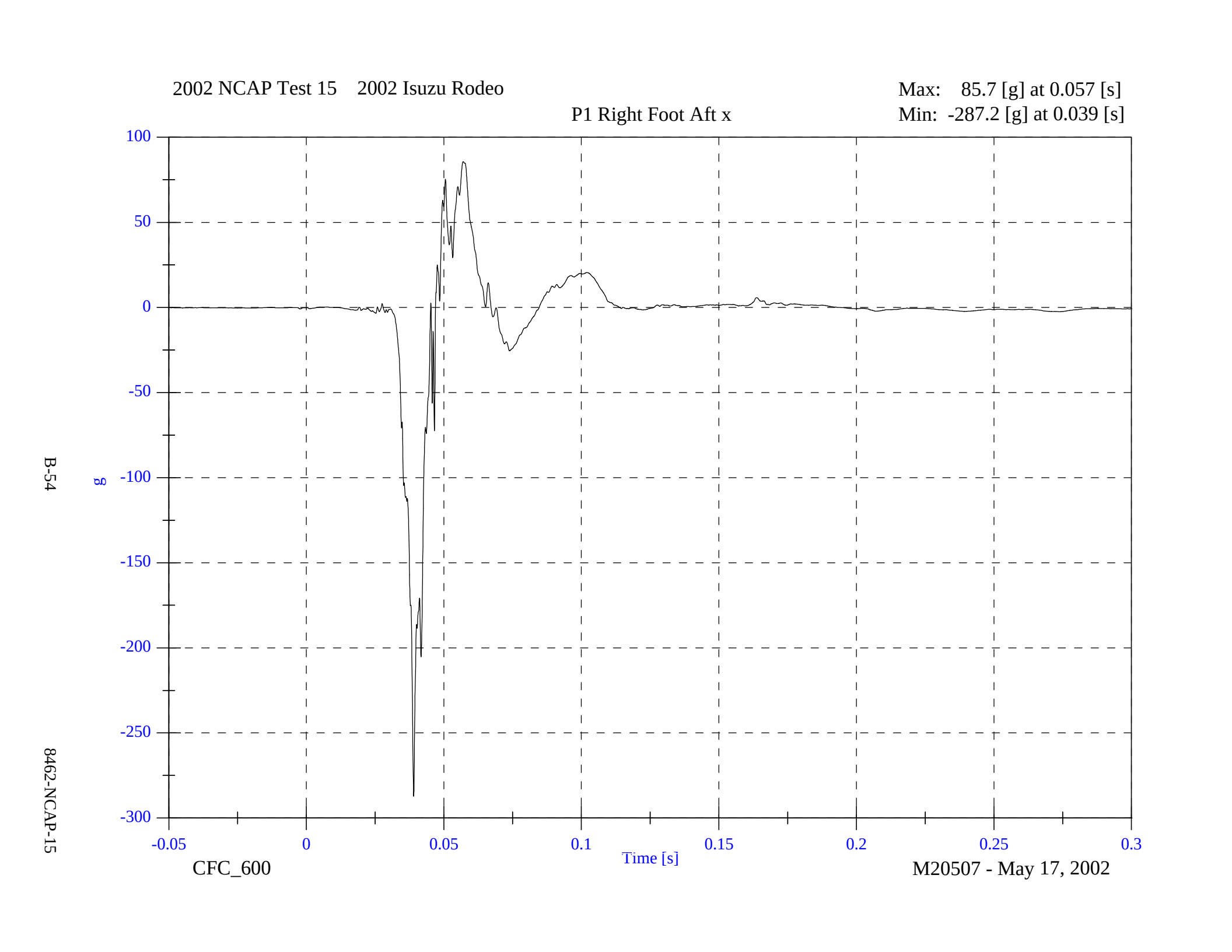


CFC_600

M20507 - May 17, 2002

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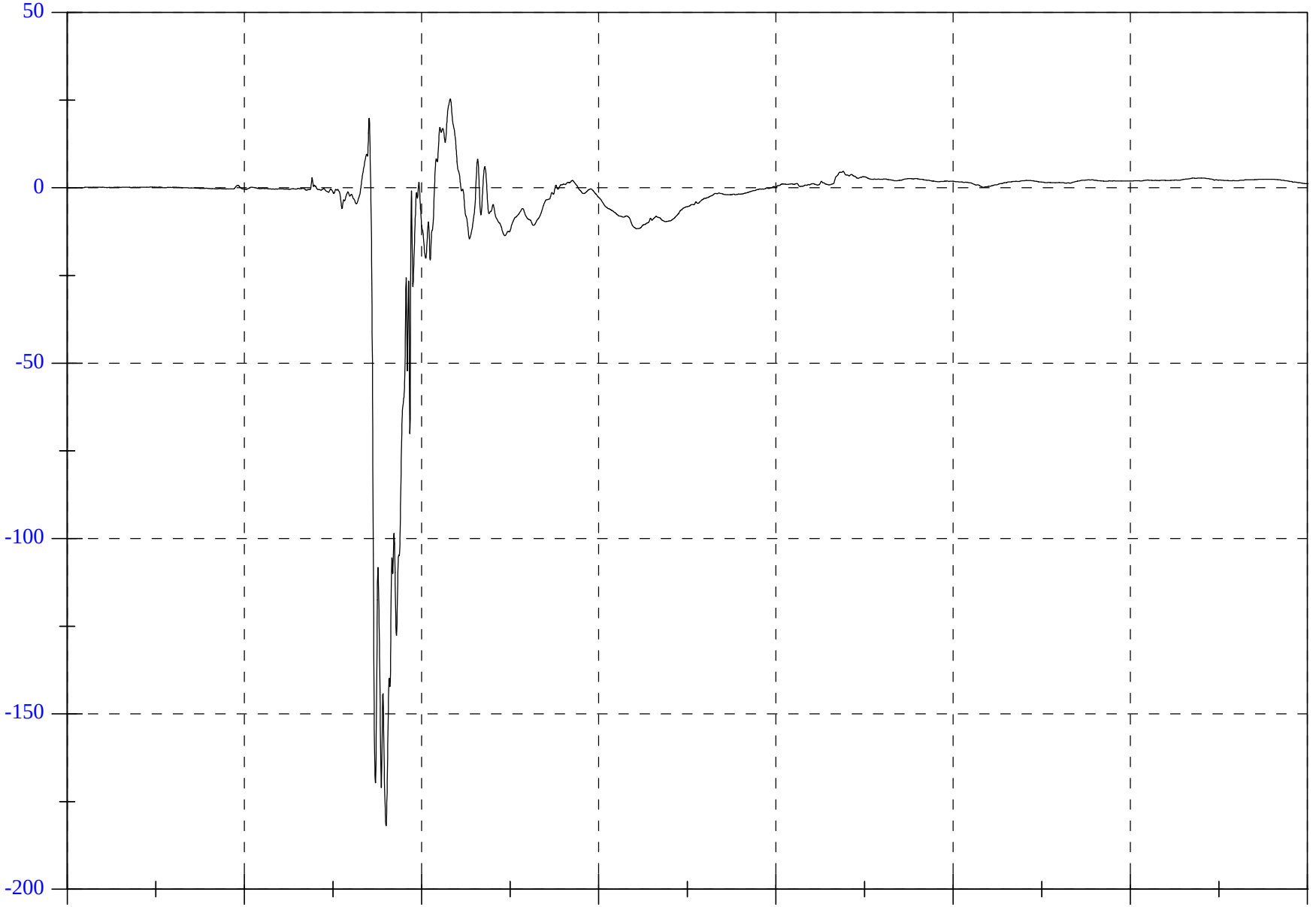
8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P1 Right Foot Aft x
Max: 85.7 [g] at 0.057 [s]
Min: -287.2 [g] at 0.039 [s]
100
50
0
-50
-100
-150
-200
-250
-300
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_600
M20507 - May 17, 2002
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8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Right Foot Aft z

Max: 25.3 [g] at 0.058 [s]
Min: -181.9 [g] at 0.040 [s]



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8462-NCAP-15

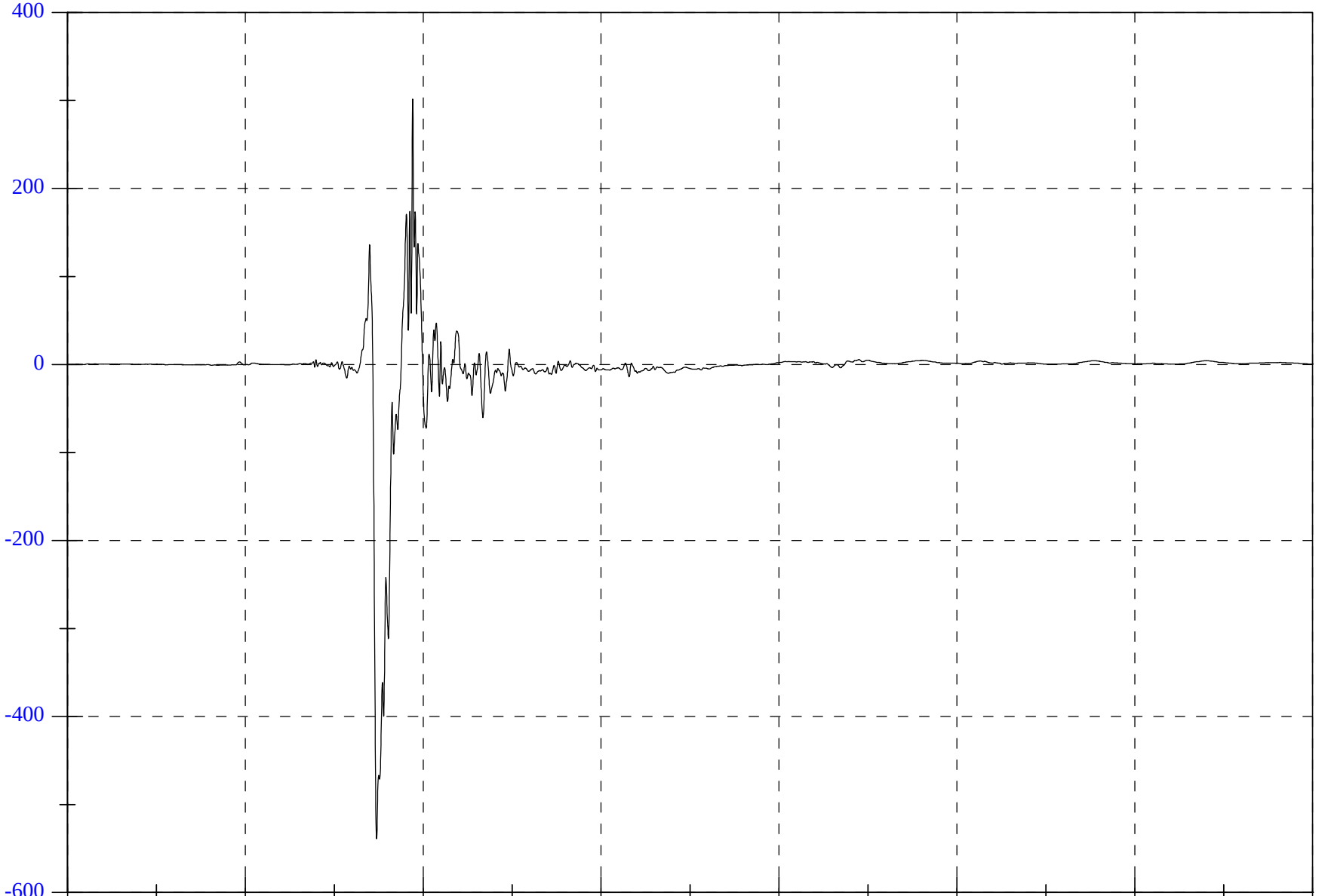
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P1 Right Foot Fore z

Max: 301.7 [g] at 0.047 [s]
Min: -539.1 [g] at 0.037 [s]

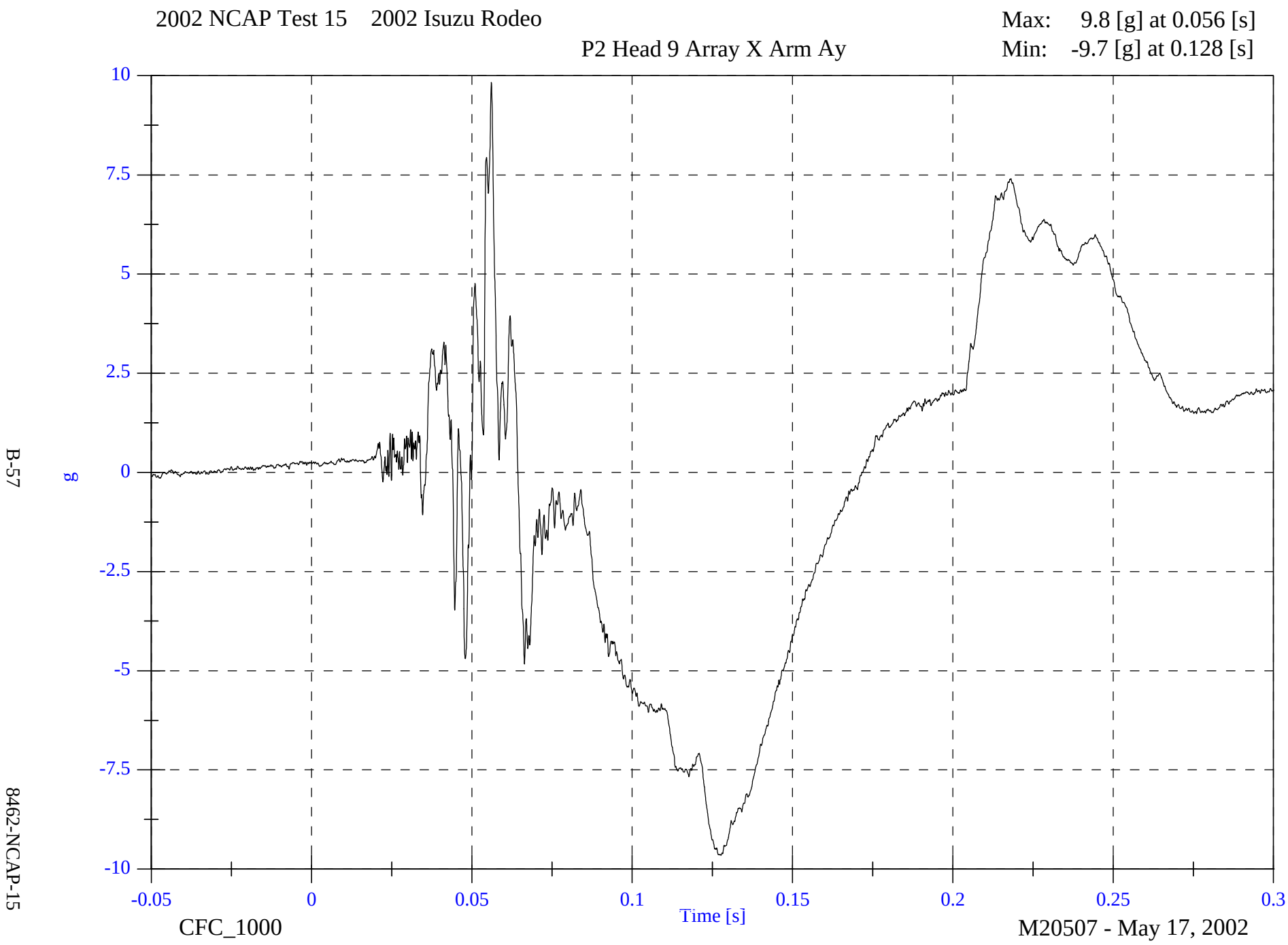


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8462-NCAP-15

CFC_600

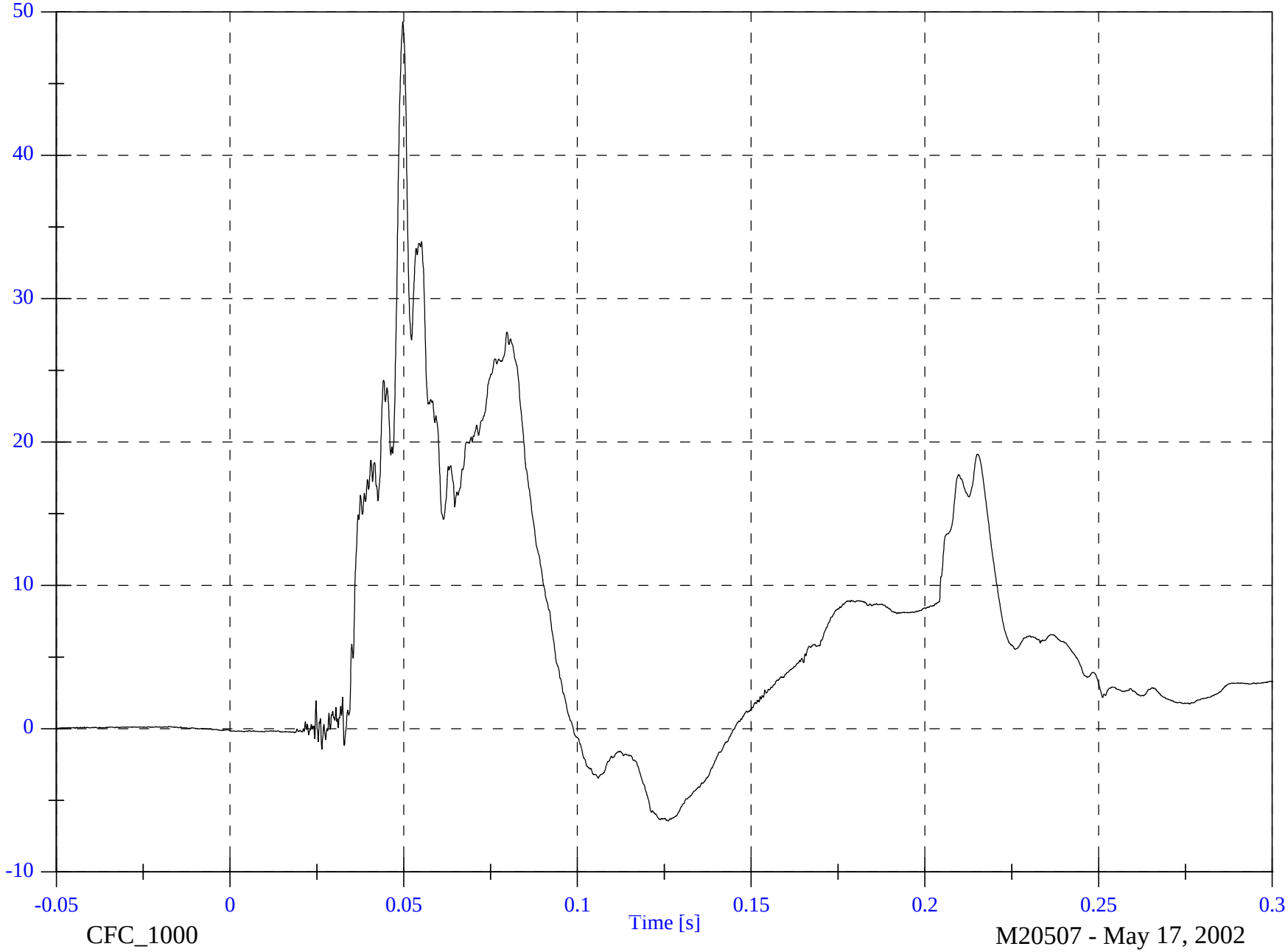
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Head 9 Array X Arm Ay
Max: 9.8 [g] at 0.056 [s]
Min: -9.7 [g] at 0.128 [s]
10
7.5
5
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
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2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Head 9 Array X Arm Az

Max: 49.3 [g] at 0.050 [s]
Min: -6.4 [g] at 0.126 [s]

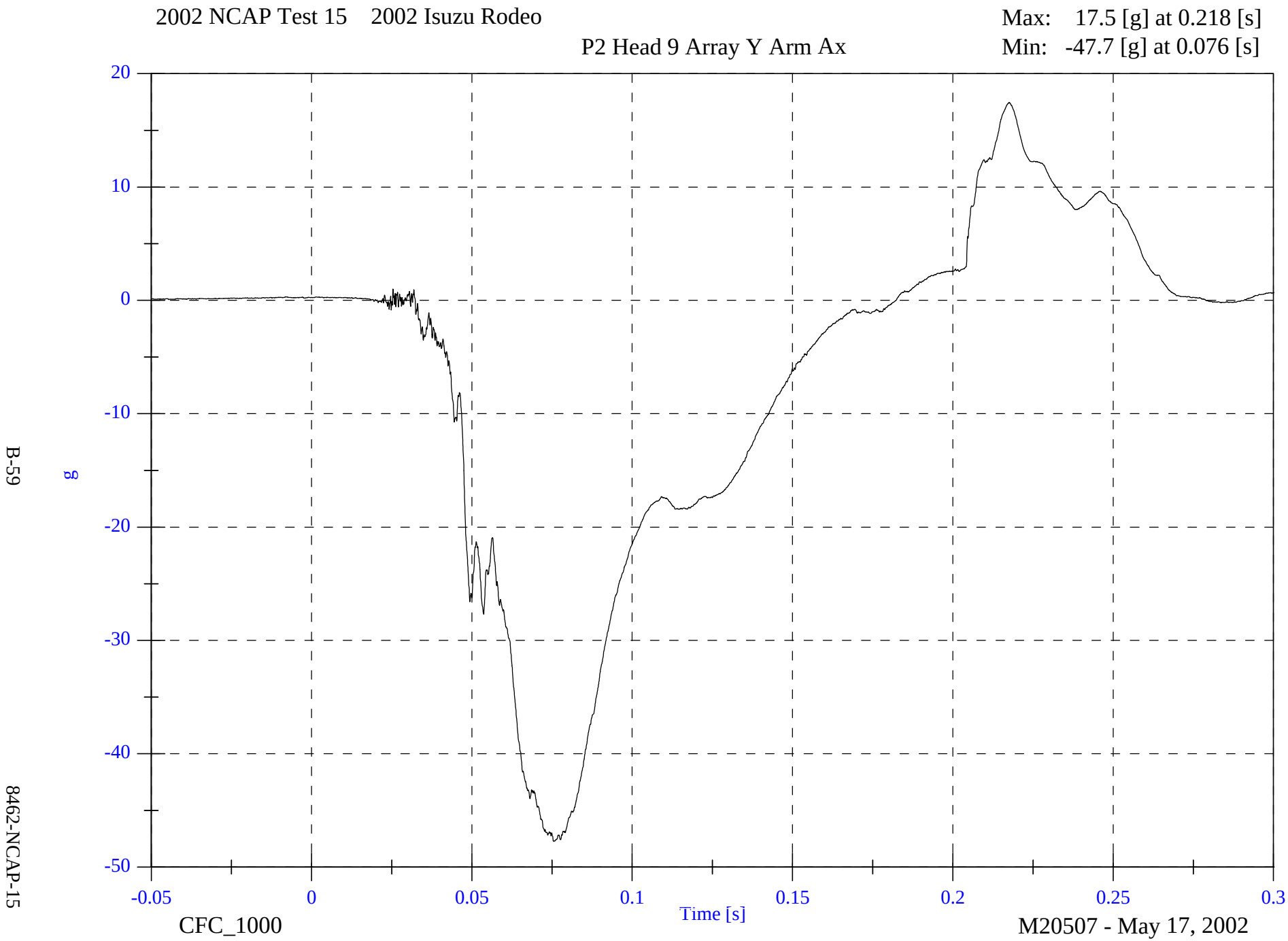


CFC_1000

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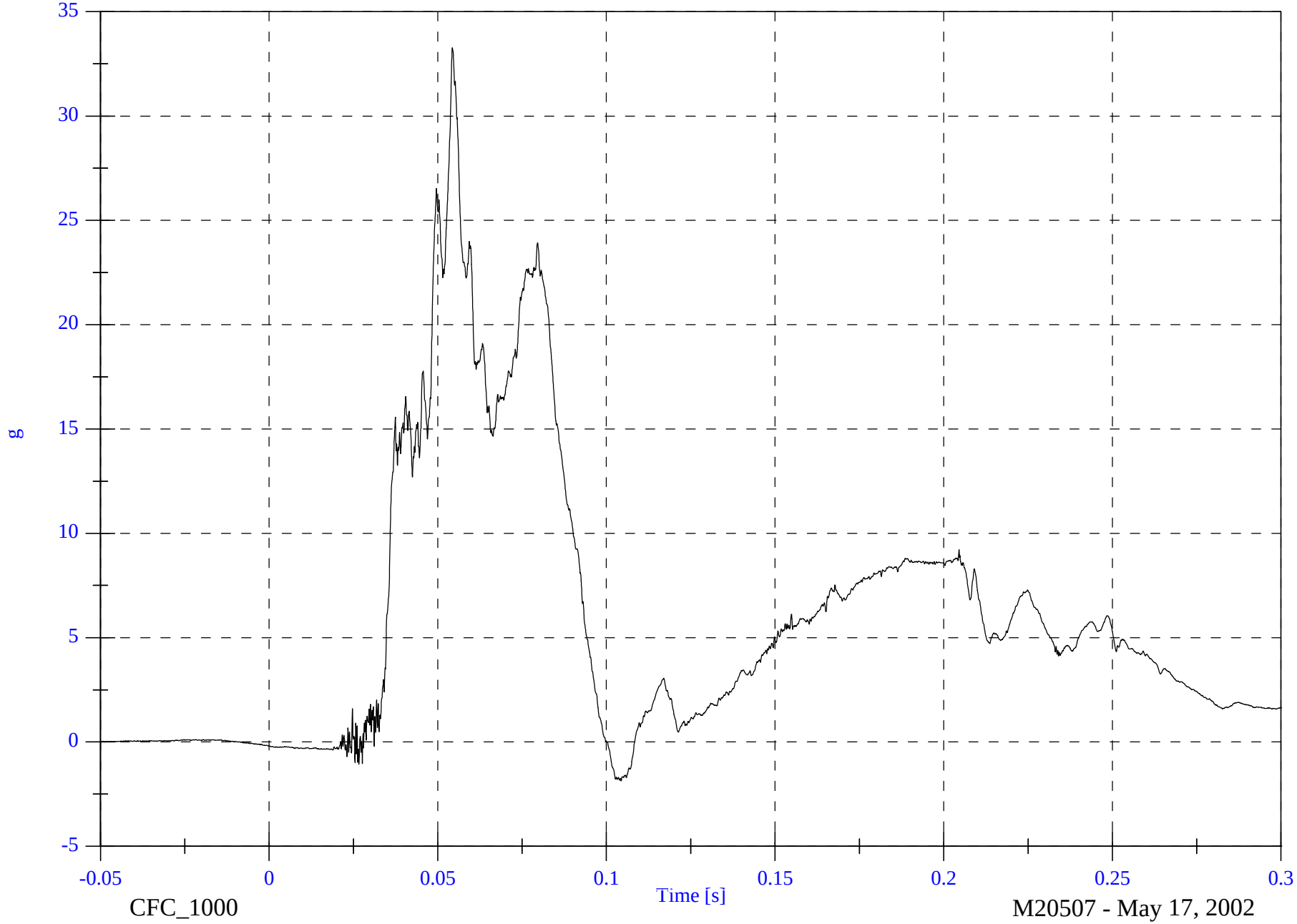

2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Head 9 Array Y Arm Ax
Max: 17.5 [g] at 0.218 [s]
Min: -47.7 [g] at 0.076 [s]
20
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
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2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Head 9 Array Y Arm Az

Max: 33.3 [g] at 0.054 [s]

Min: -1.9 [g] at 0.104 [s]



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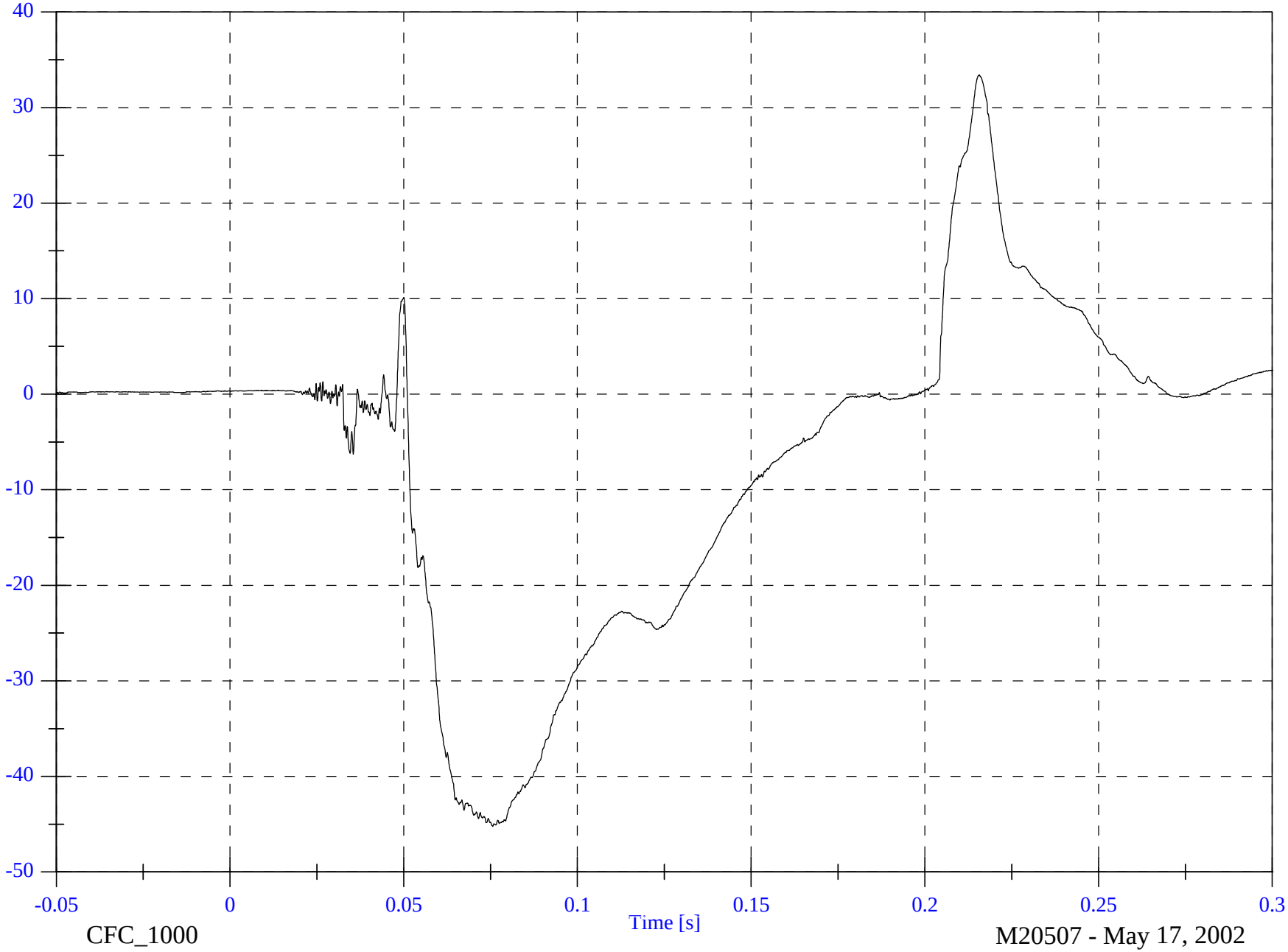
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Head 9 Array Z Arm Ax

Max: 33.4 [g] at 0.216 [s]
Min: -45.2 [g] at 0.076 [s]

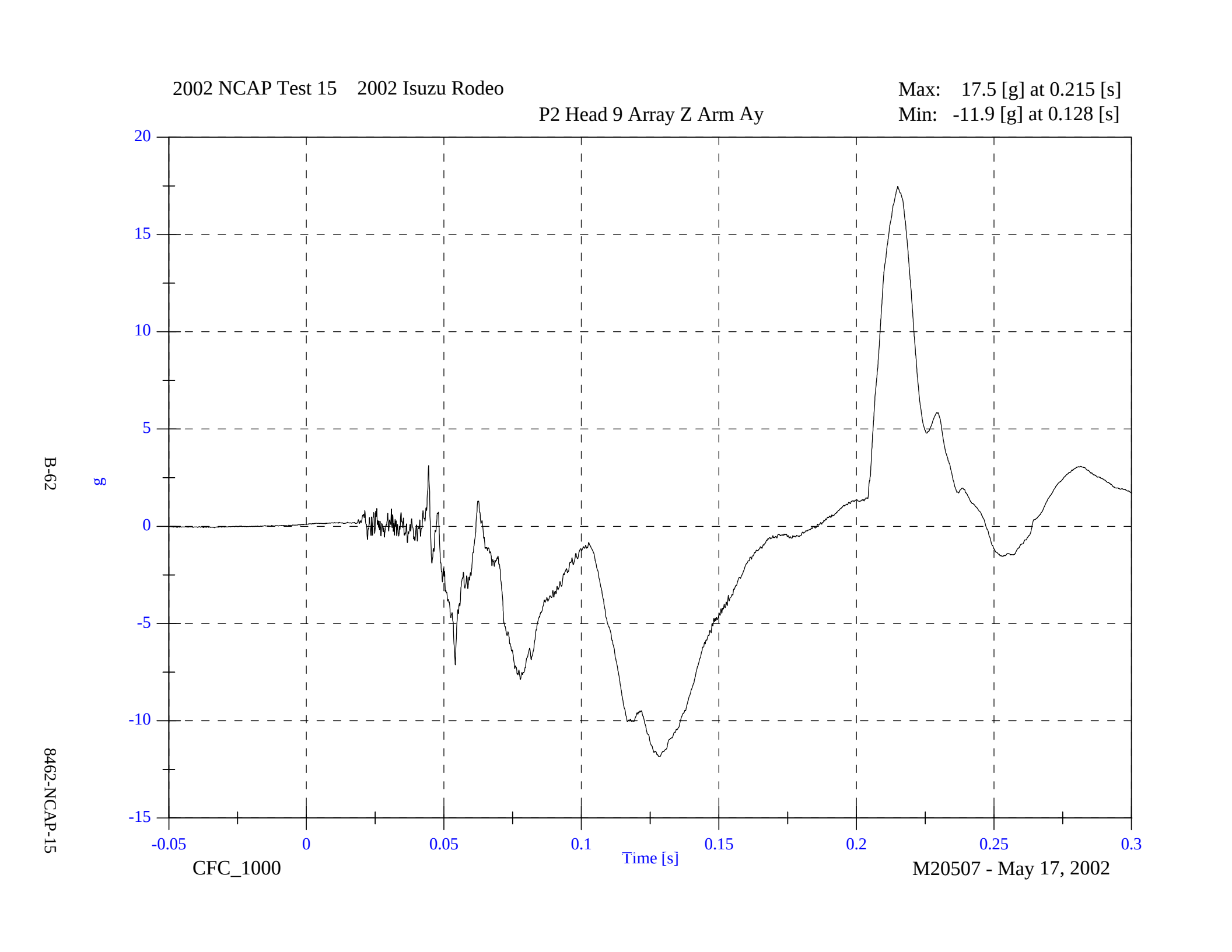


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CFC_1000

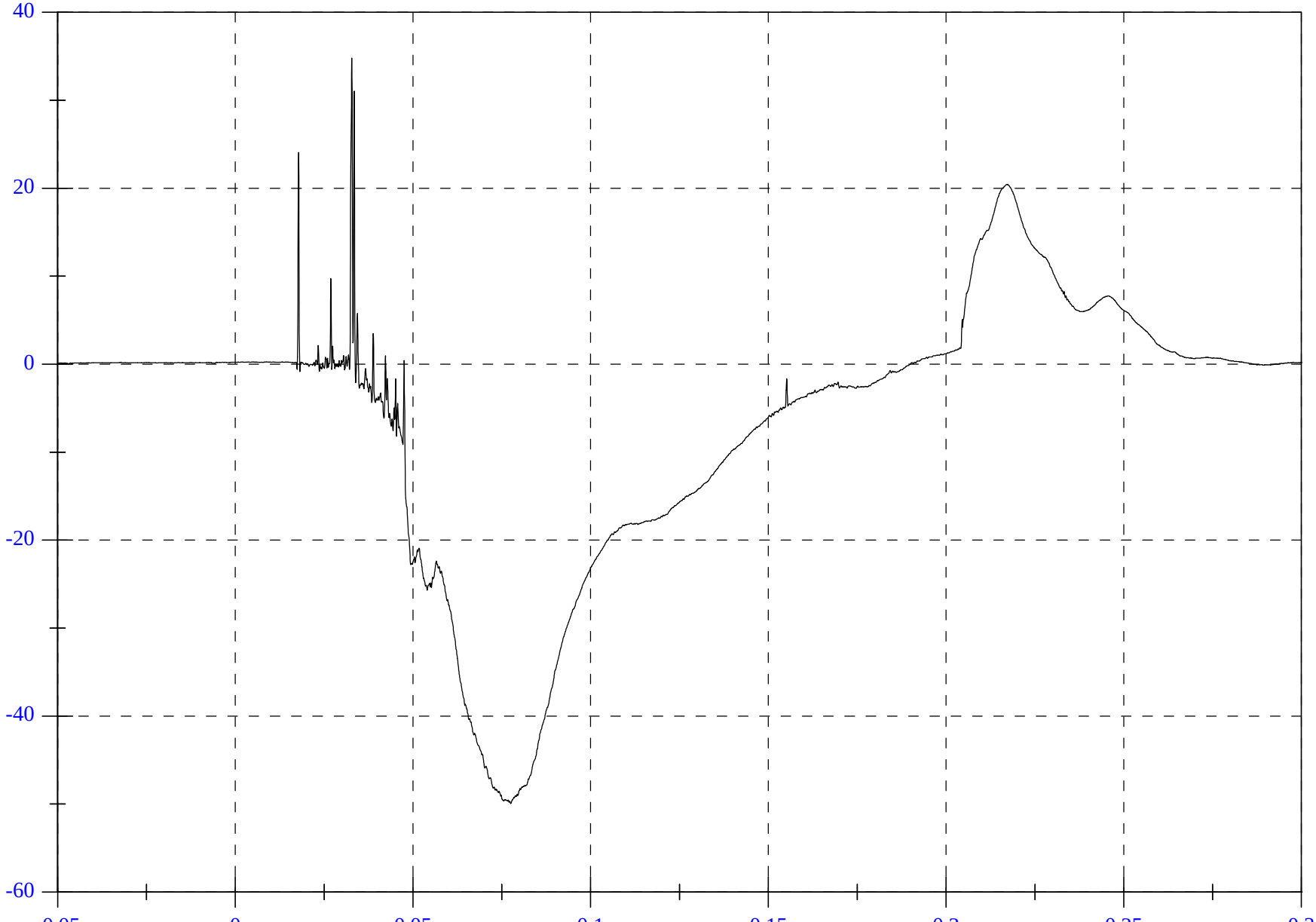
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Head 9 Array Z Arm Ay
Max: 17.5 [g] at 0.215 [s]
Min: -11.9 [g] at 0.128 [s]
20
15
10
5
0
-5
-10
-15
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
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2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Head CG x

Max: 34.8 [g] at 0.033 [s]
Min: -49.9 [g] at 0.078 [s]

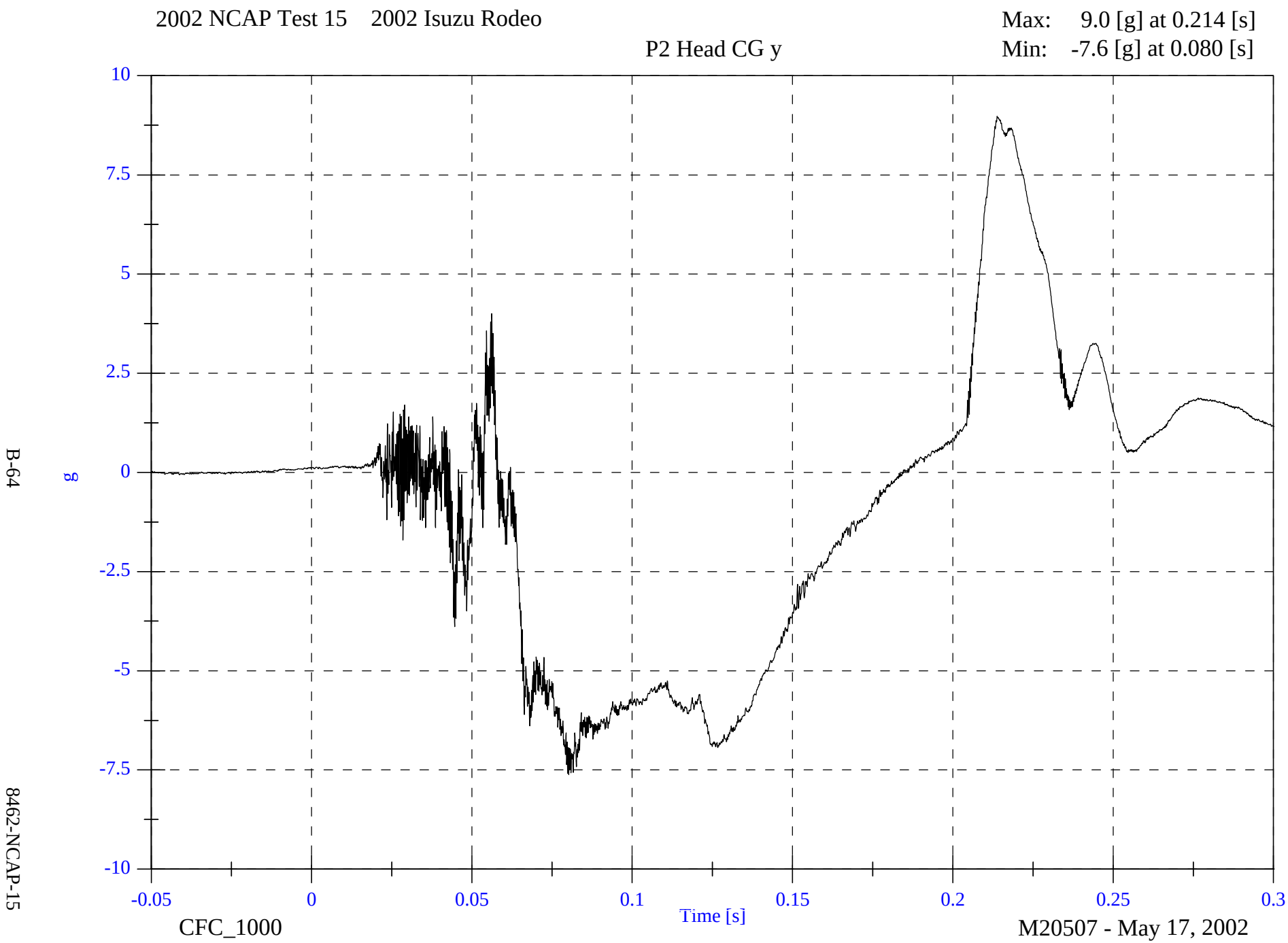


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CFC_1000

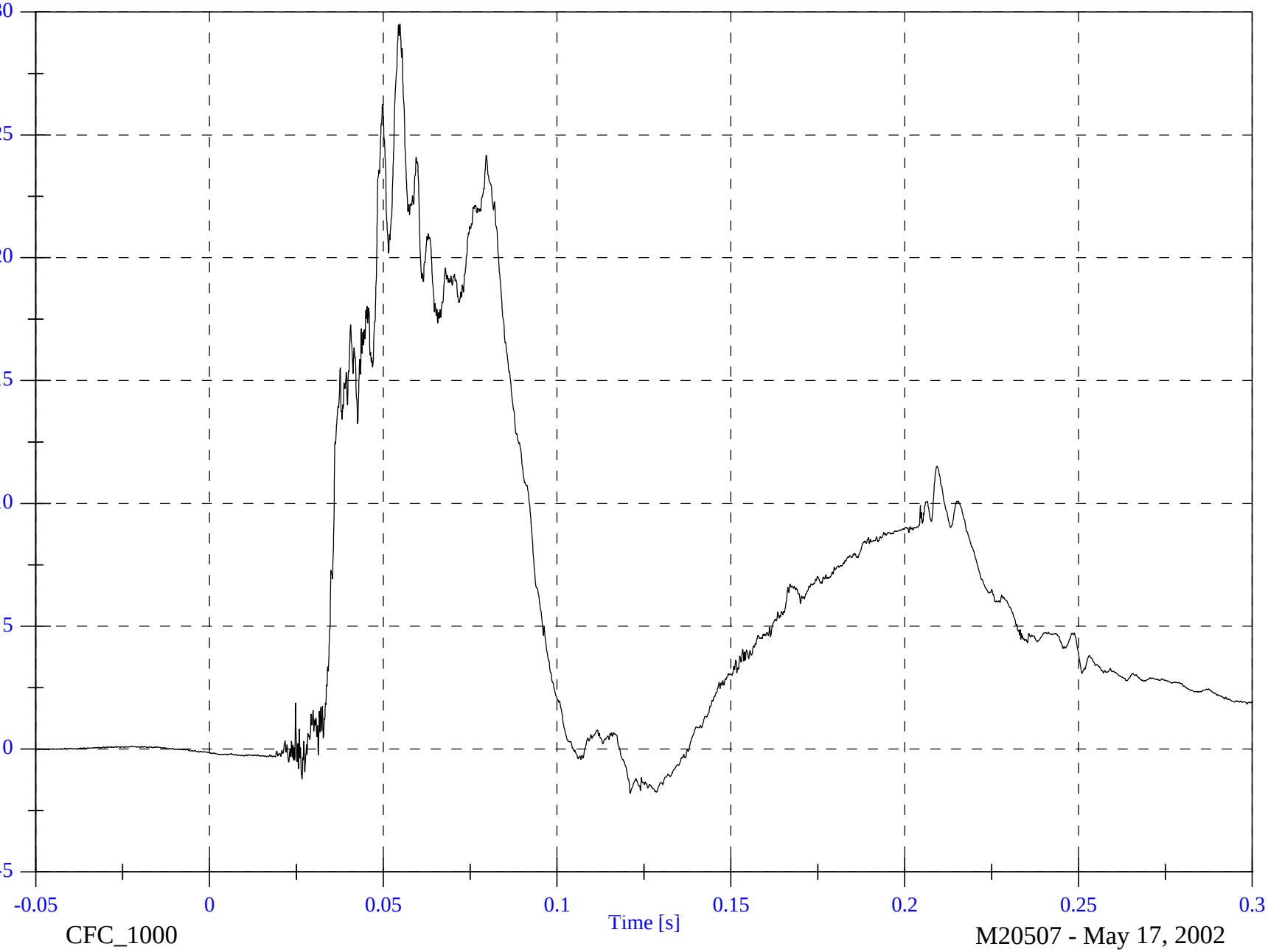
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Head CG y
Max: 9.0 [g] at 0.214 [s]
Min: -7.6 [g] at 0.080 [s]
10
7.5
5
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Head CG z

Max: 29.5 [g] at 0.055 [s]
Min: -1.8 [g] at 0.121 [s]

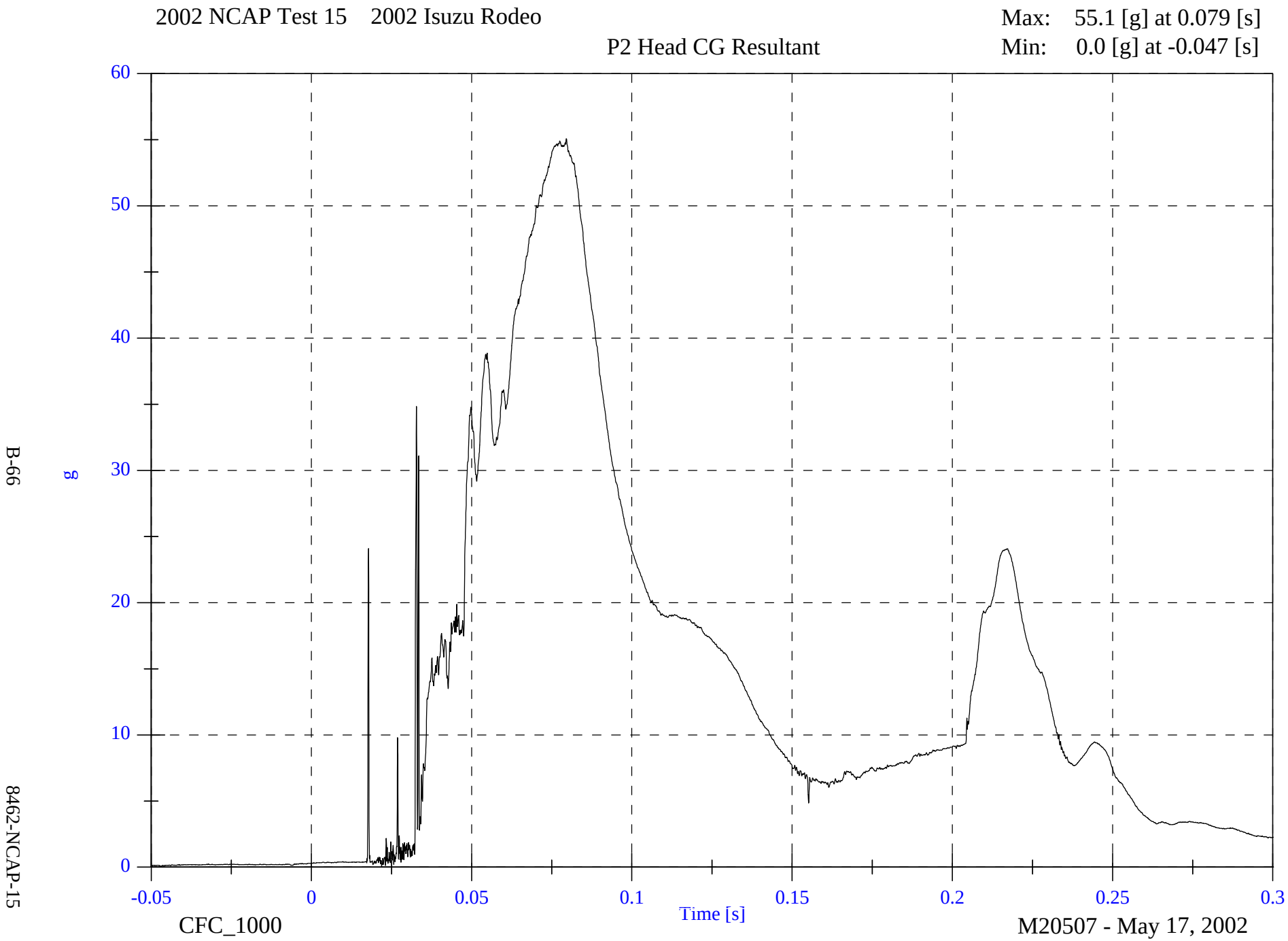


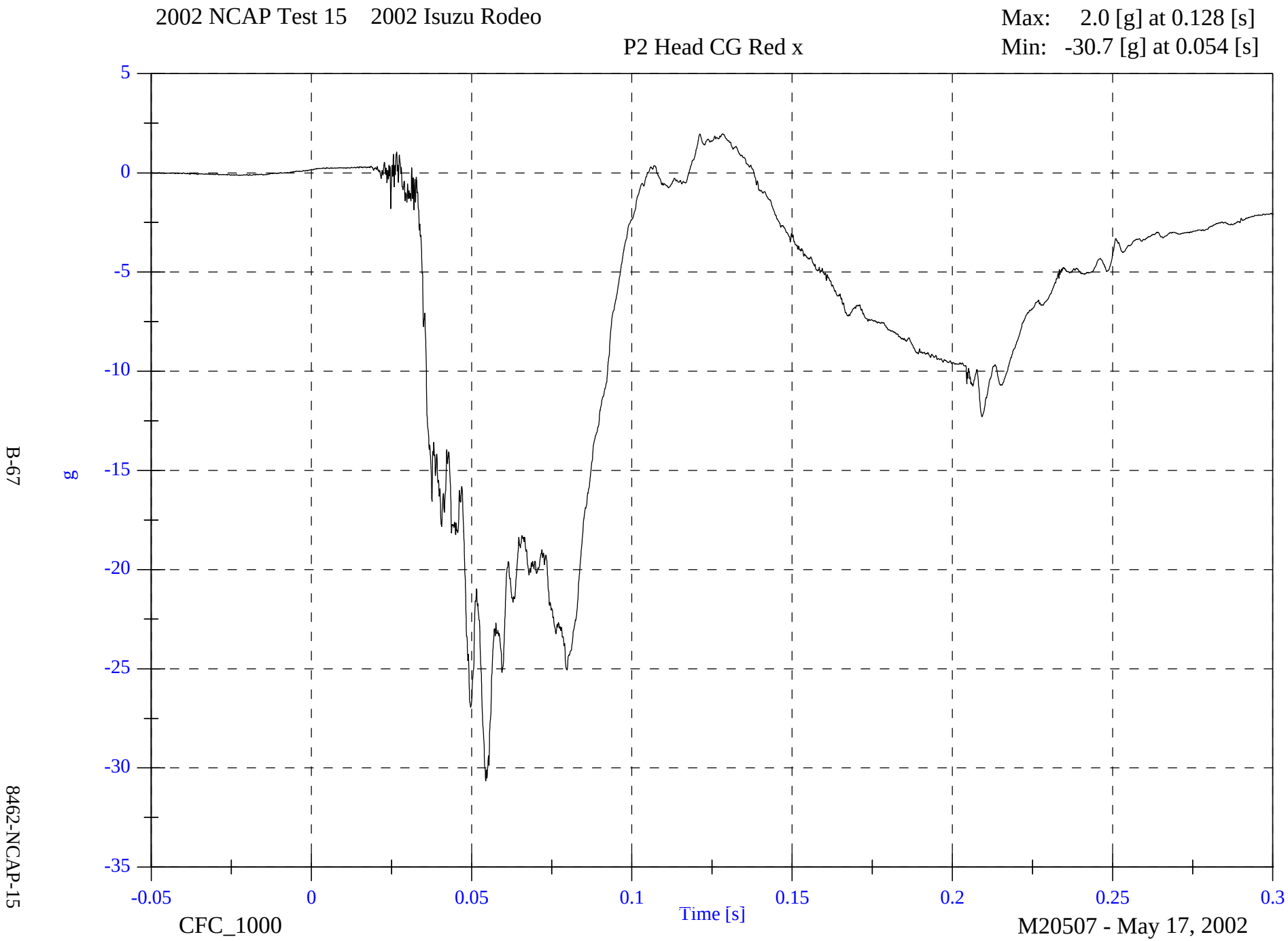
B-65

8462-NCAP-15

CFC_1000

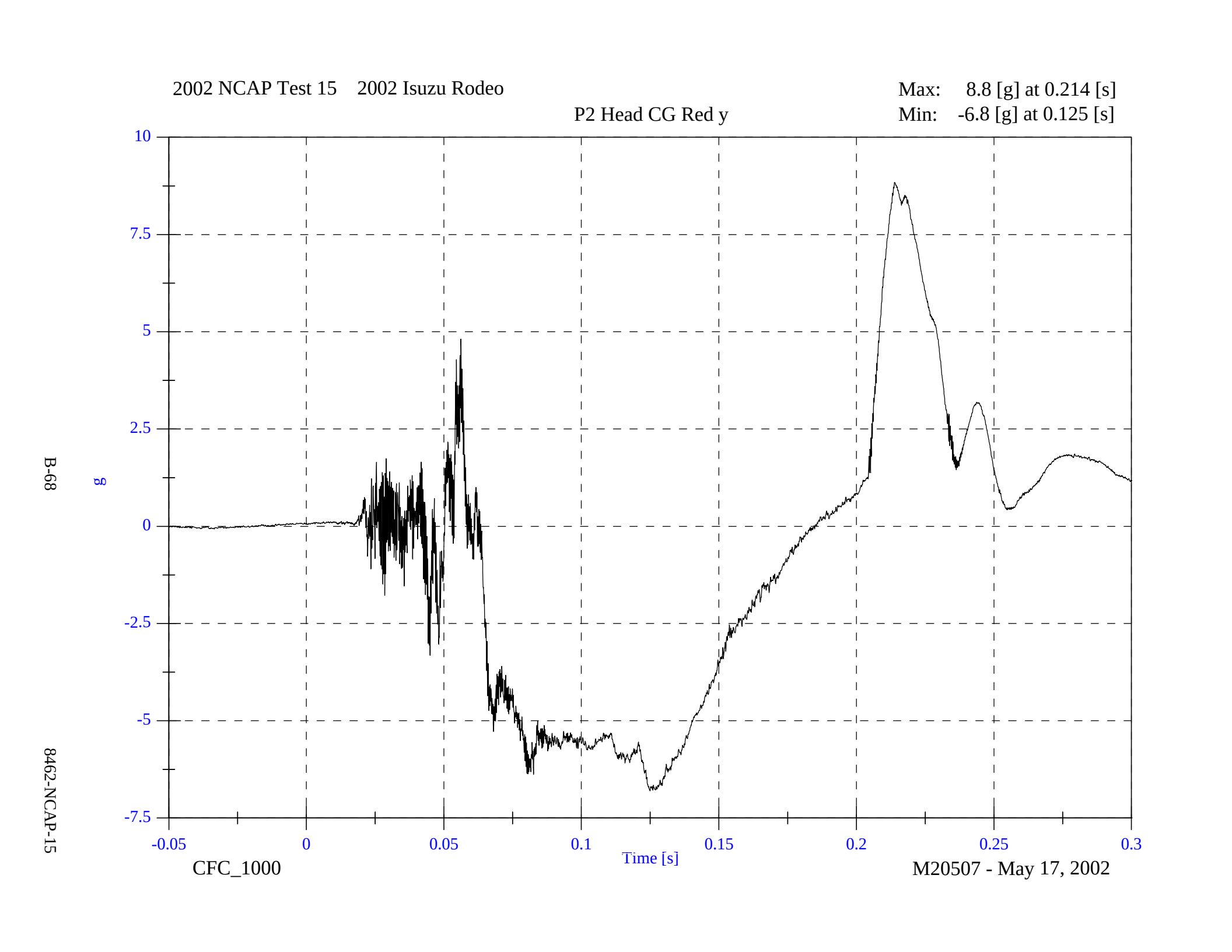
M20507 - May 17, 2002

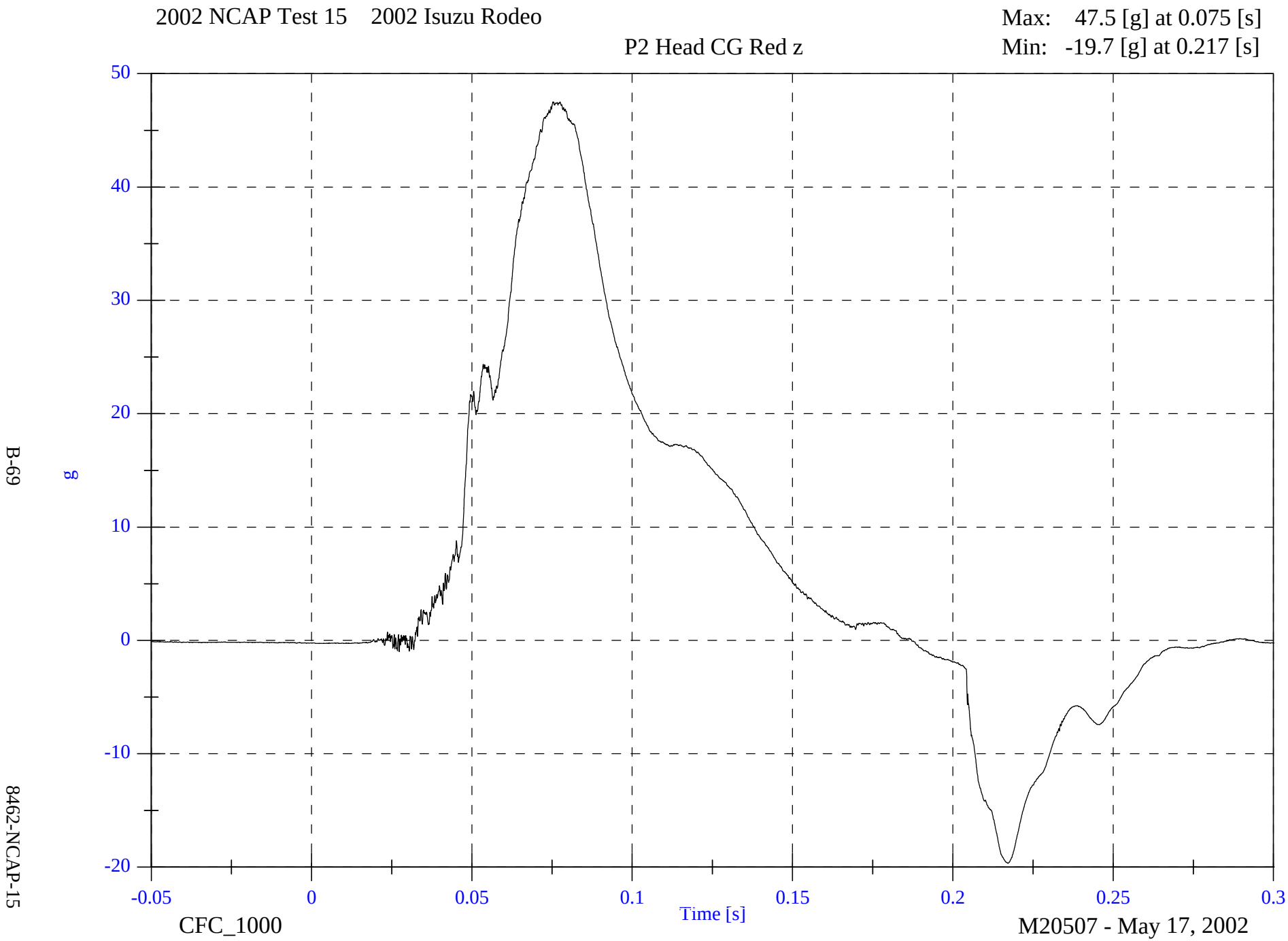

2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Head CG Resultant
Max: 55.1 [g] at 0.079 [s]
Min: 0.0 [g] at -0.047 [s]
60
50
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002



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2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Head CG Red y
Max: 8.8 [g] at 0.214 [s]
Min: -6.8 [g] at 0.125 [s]
10
7.5
5
2.5
0
-2.5
-5
-7.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
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CFC_1000
M20507 - May 17, 2002

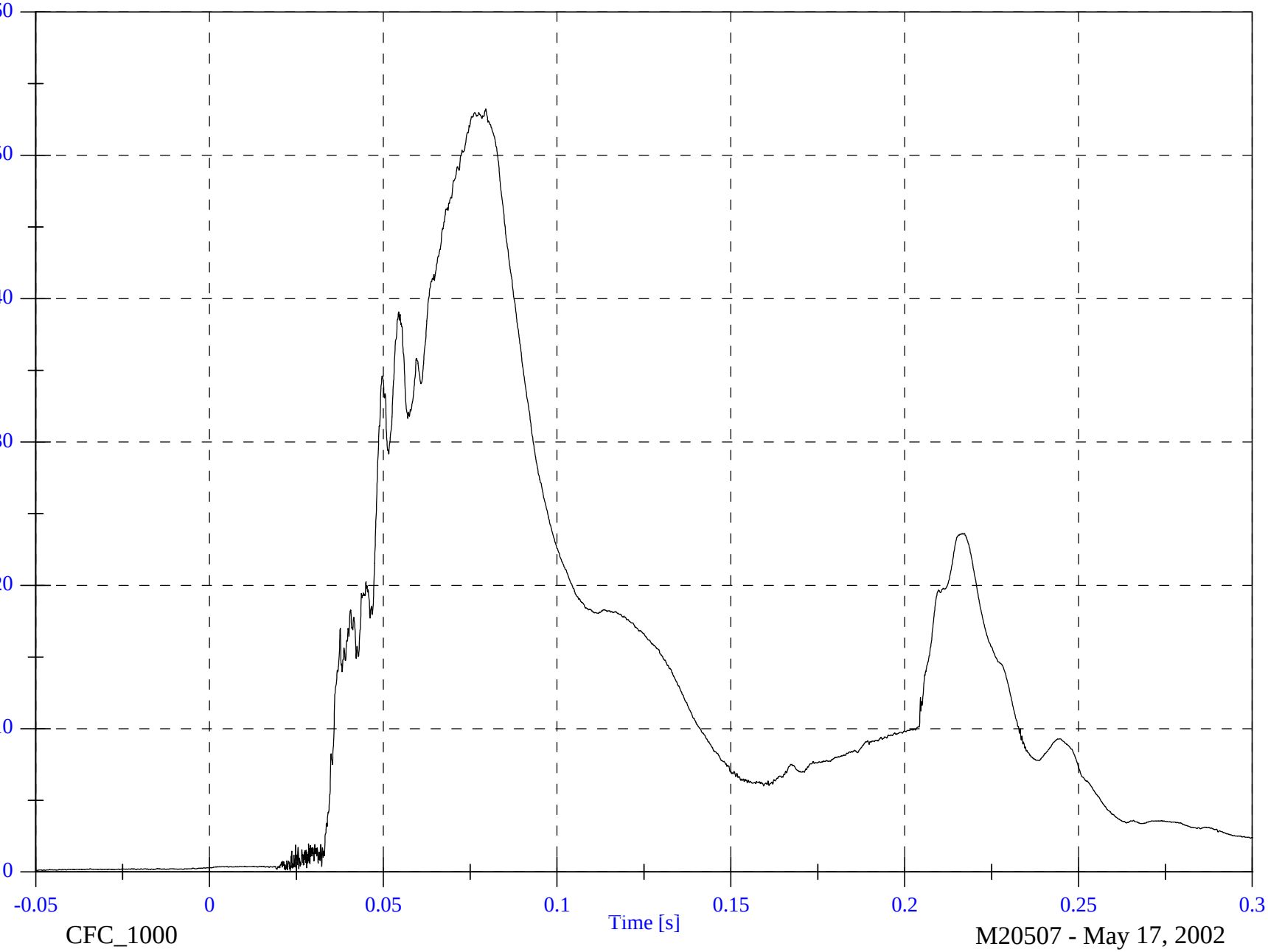

2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Head CG Red z
Max: 47.5 [g] at 0.075 [s]
Min: -19.7 [g] at 0.217 [s]
50
40
30
20
10
0
-10
-20
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
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2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Head CG Red Resultant

Max: 53.2 [g] at 0.079 [s]

Min: 0.1 [g] at 0.023 [s]



CFC_1000

M20507 - May 17, 2002

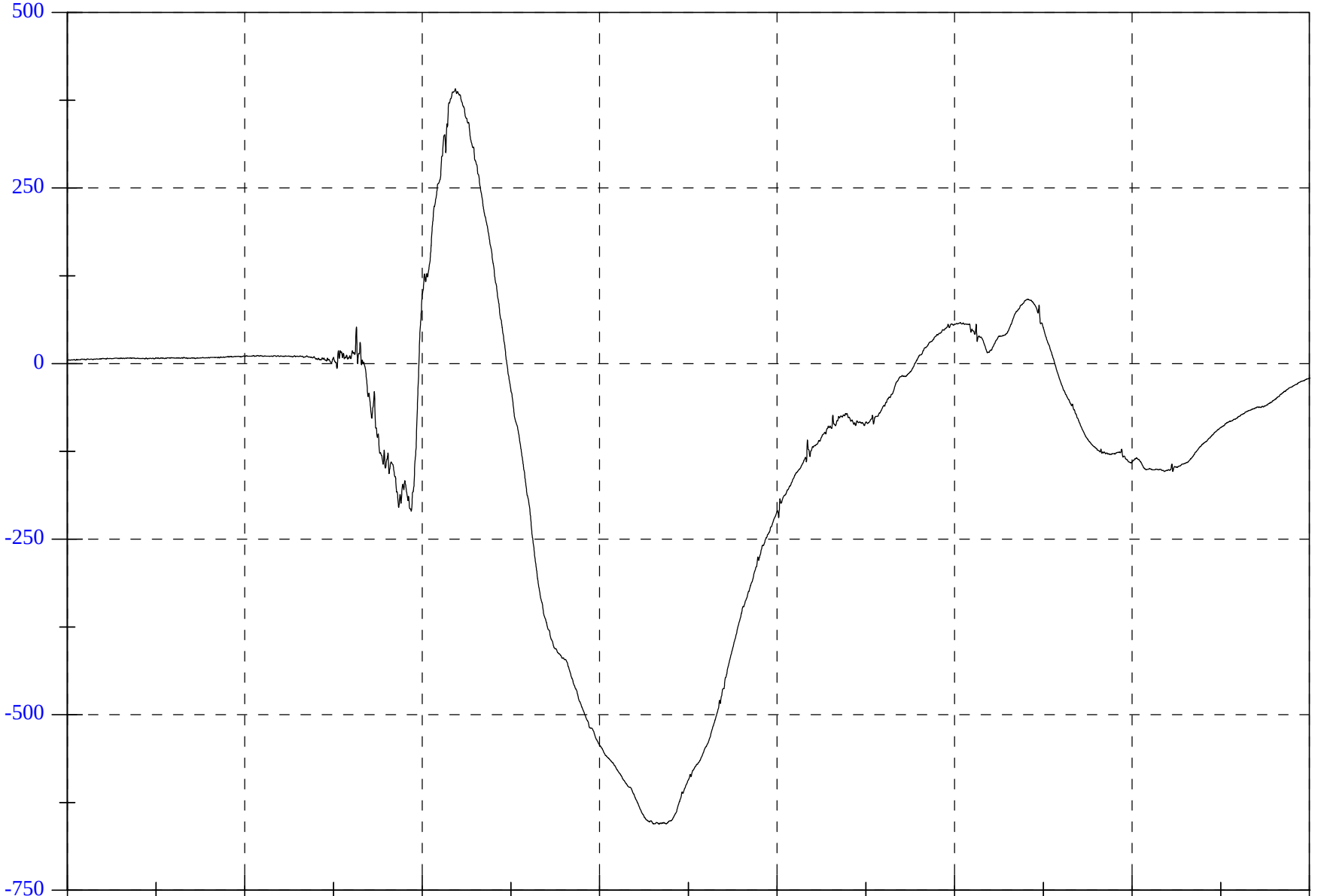
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2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Upper Neck Fx

Max: 391.3 [N] at 0.059 [s]
Min: -655.9 [N] at 0.117 [s]



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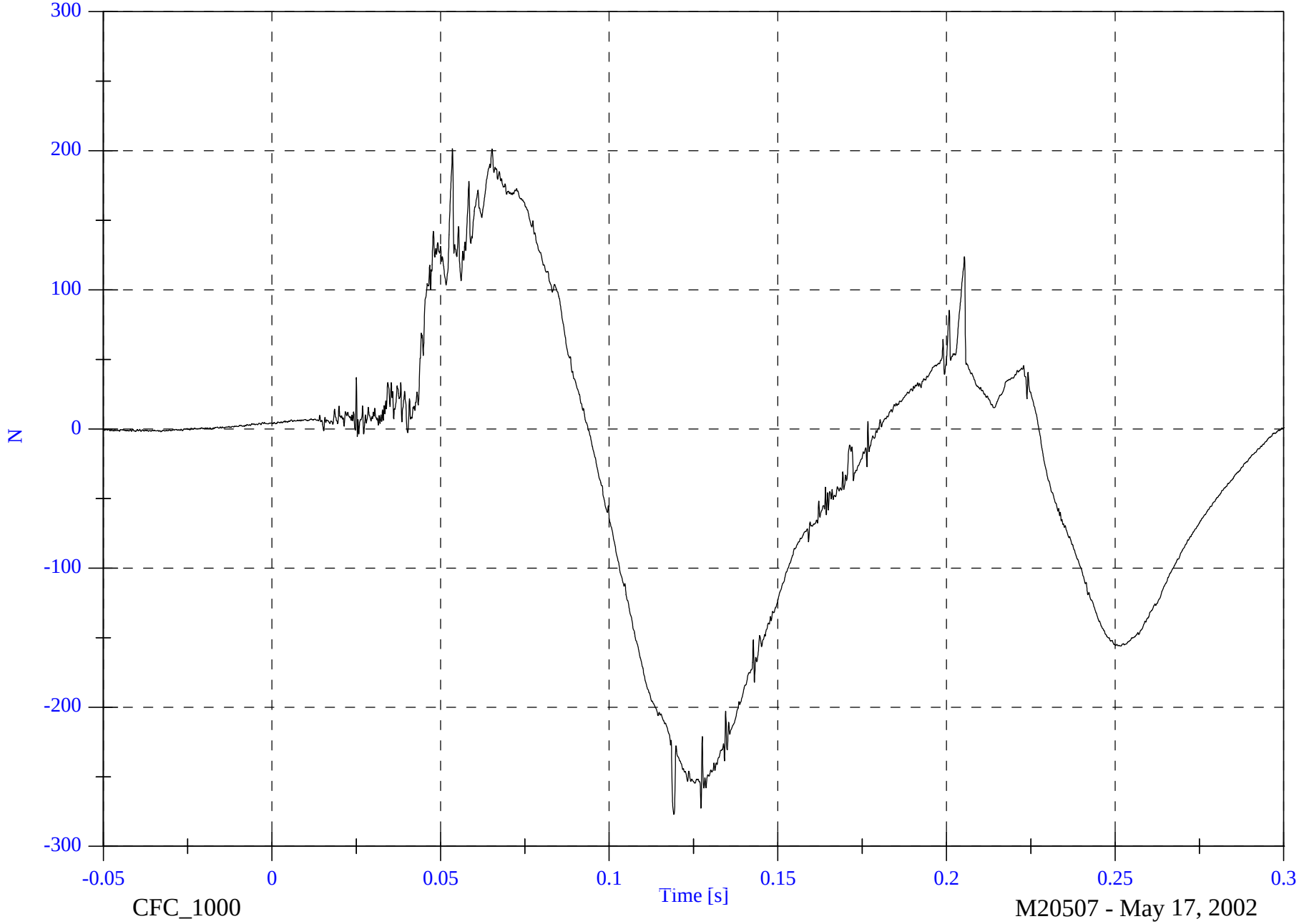
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Upper Neck Fy

Max: 201.5 [N] at 0.054 [s]
Min: -277.1 [N] at 0.119 [s]

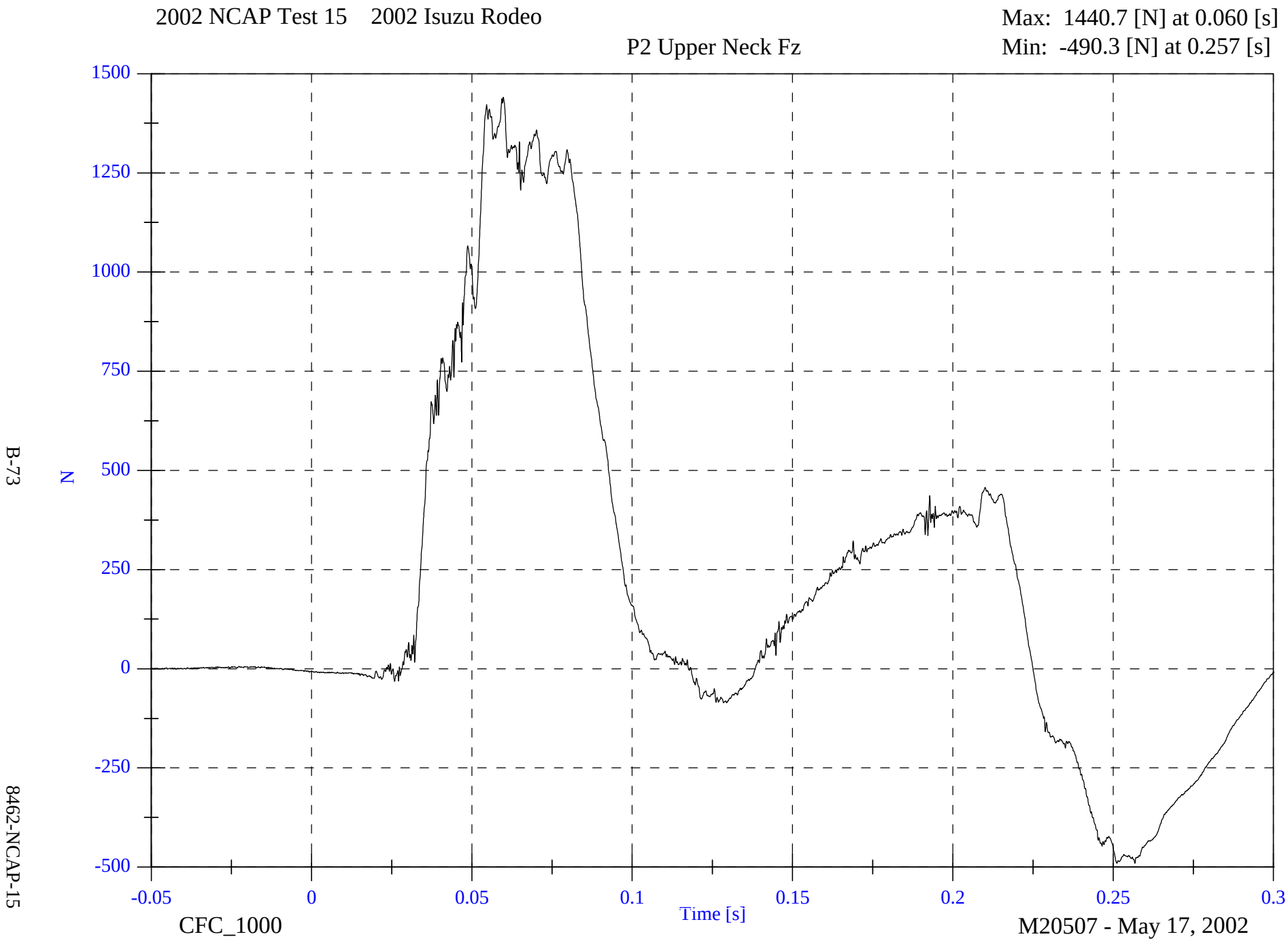


CFC_1000

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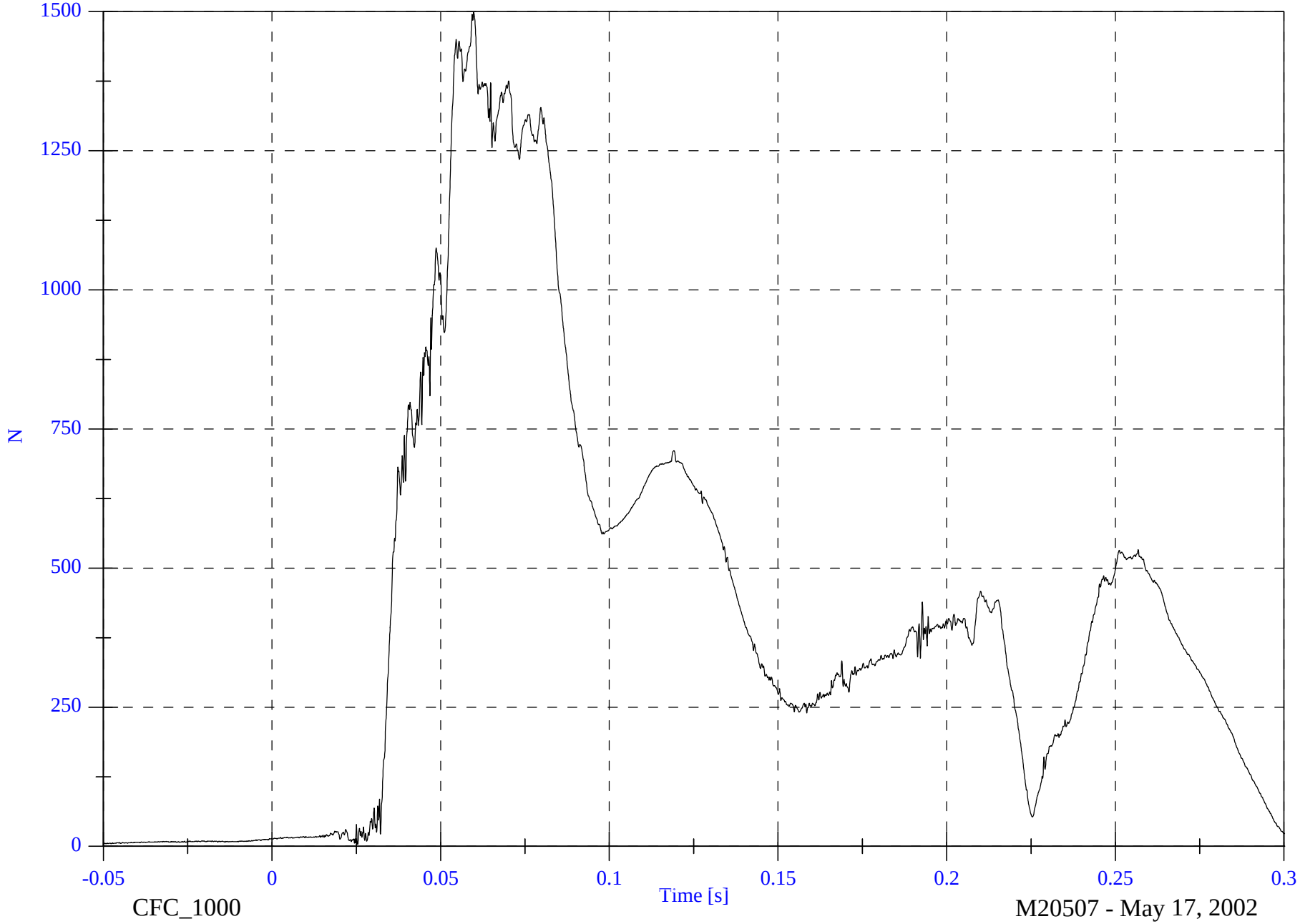
8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Upper Neck F Resultant

Max: 1499.1 [N] at 0.060 [s]

Min: 3.4 [N] at 0.025 [s]



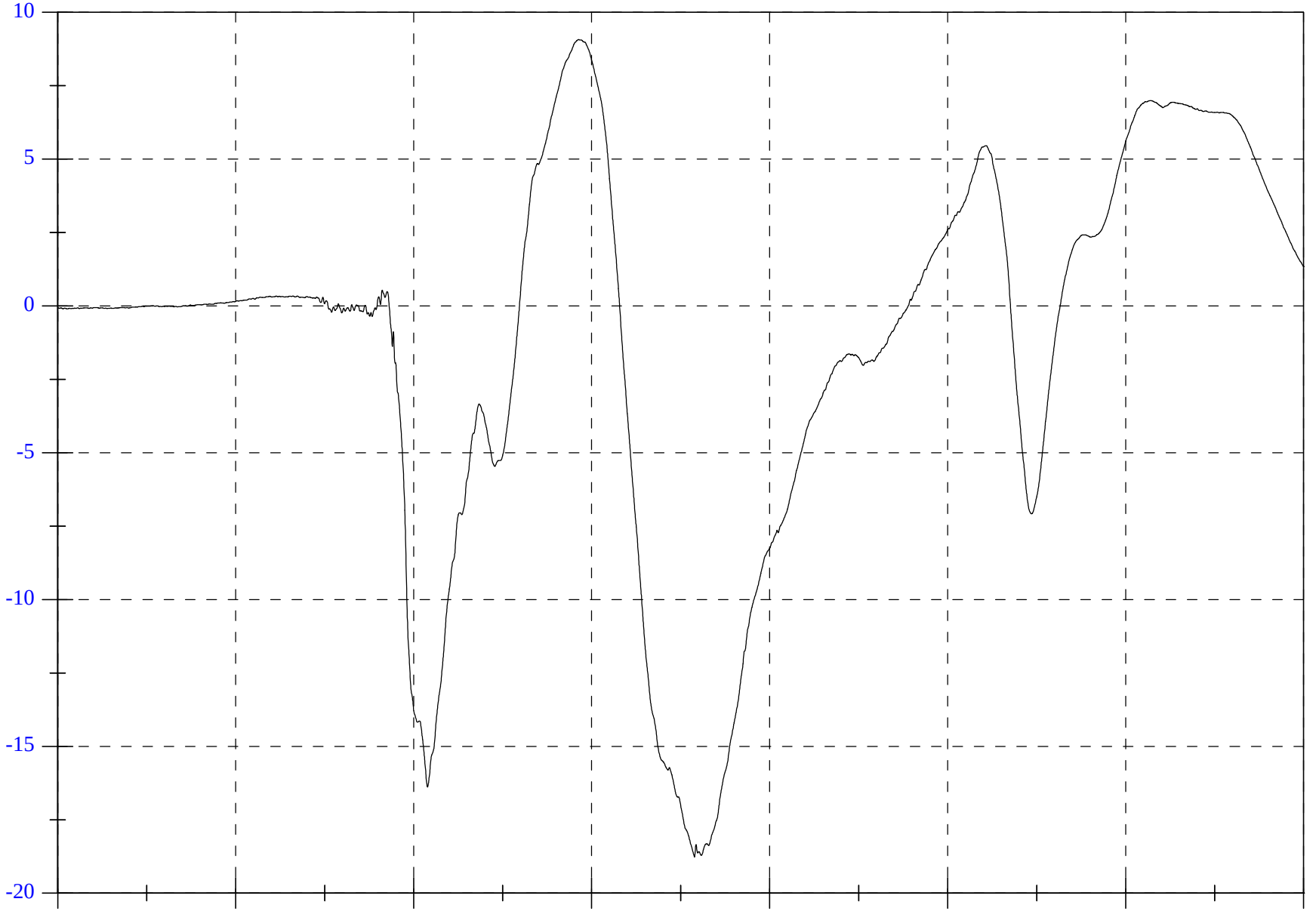
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Upper Neck Mx

Max: 9.1 [N-m] at 0.096 [s]
Min: -18.8 [N-m] at 0.129 [s]



CFC_600

M20507 - May 17, 2002

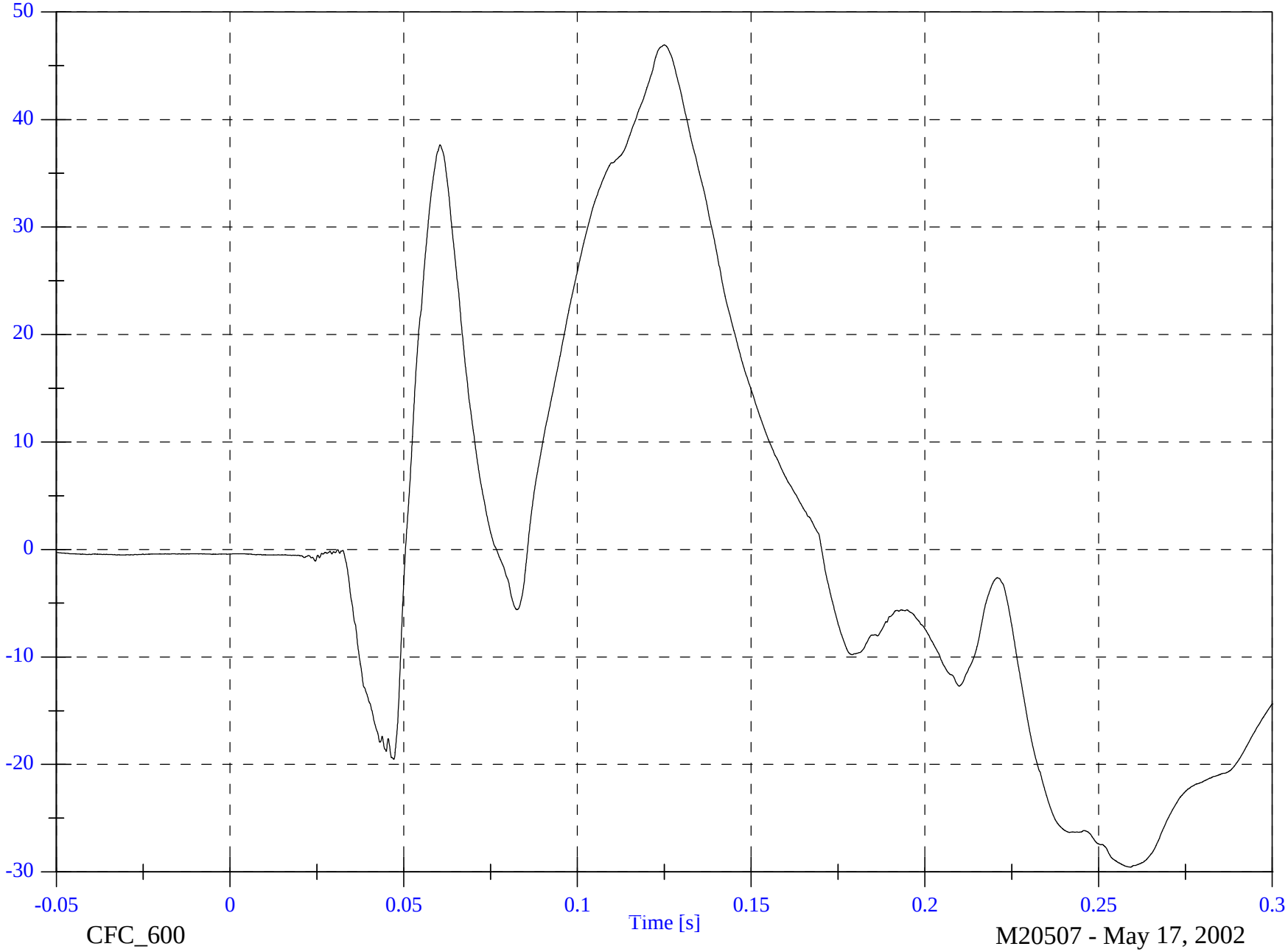
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8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Upper Neck My

Max: 46.9 [N-m] at 0.125 [s]
Min: -29.6 [N-m] at 0.259 [s]



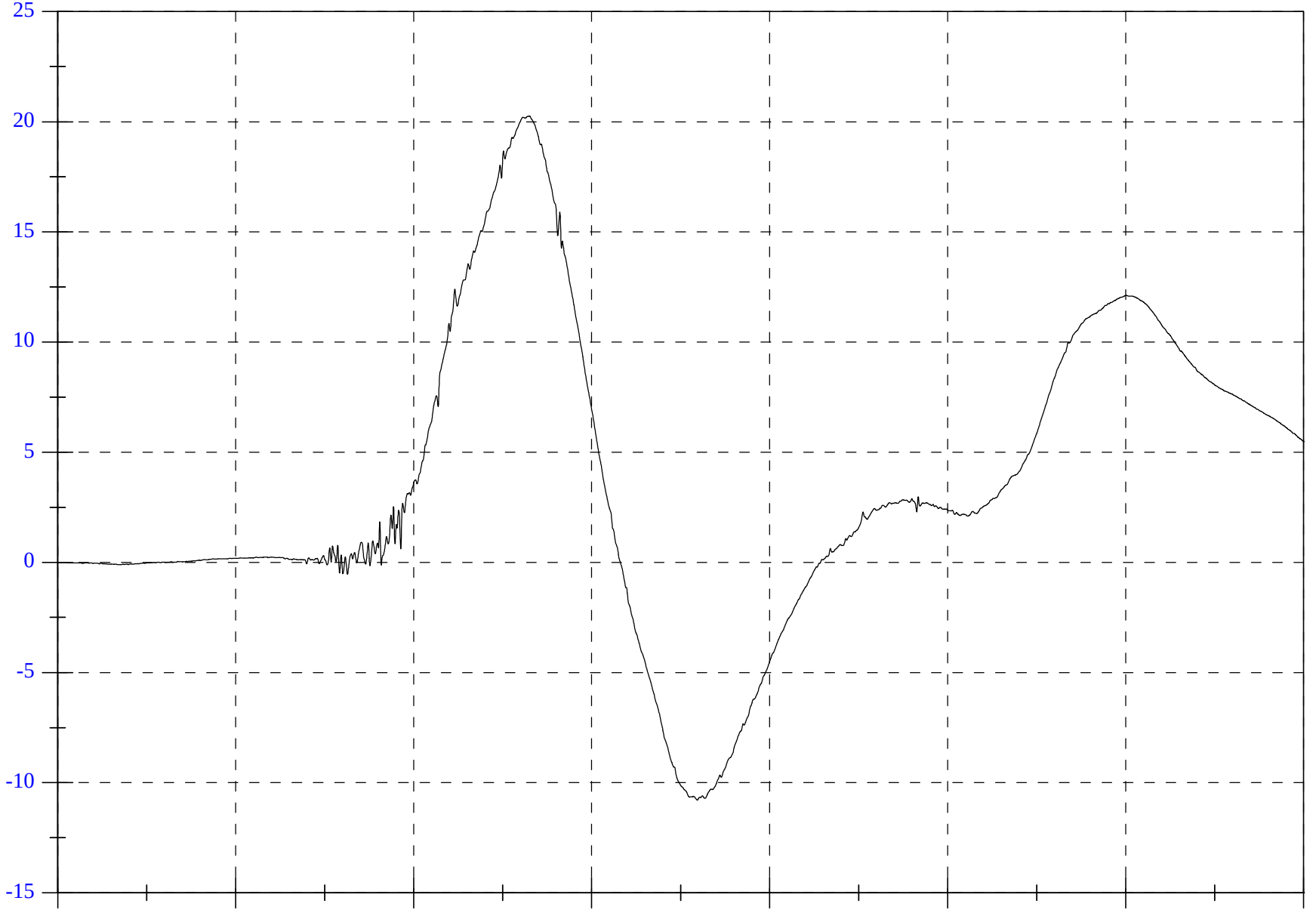
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Upper Neck Mz

Max: 20.3 [N-m] at 0.082 [s]
Min: -10.8 [N-m] at 0.130 [s]



CFC_600

M20507 - May 17, 2002

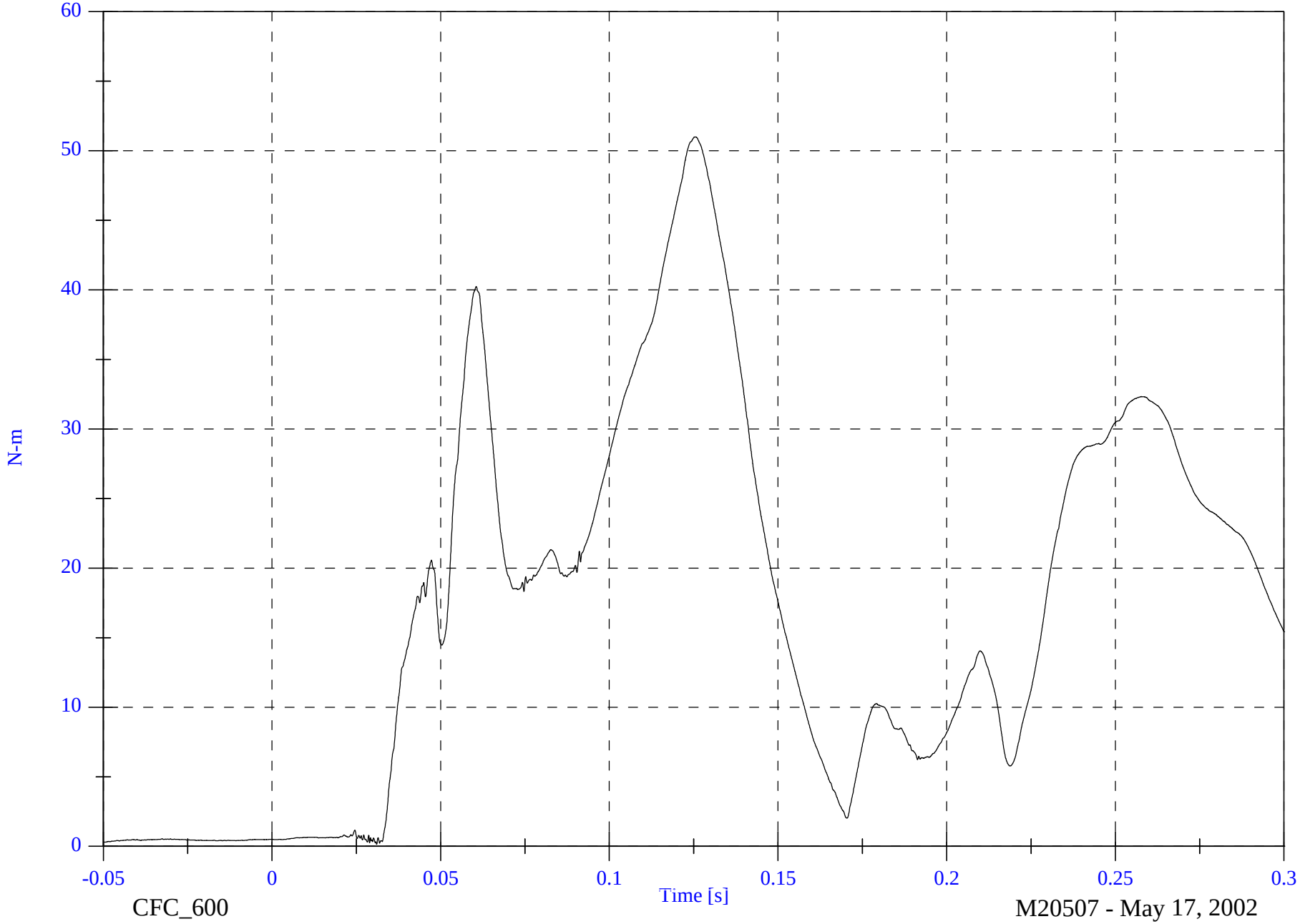
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2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Upper Neck M Resultant

Max: 51.0 [N-m] at 0.126 [s]
Min: 0.1 [N-m] at 0.031 [s]



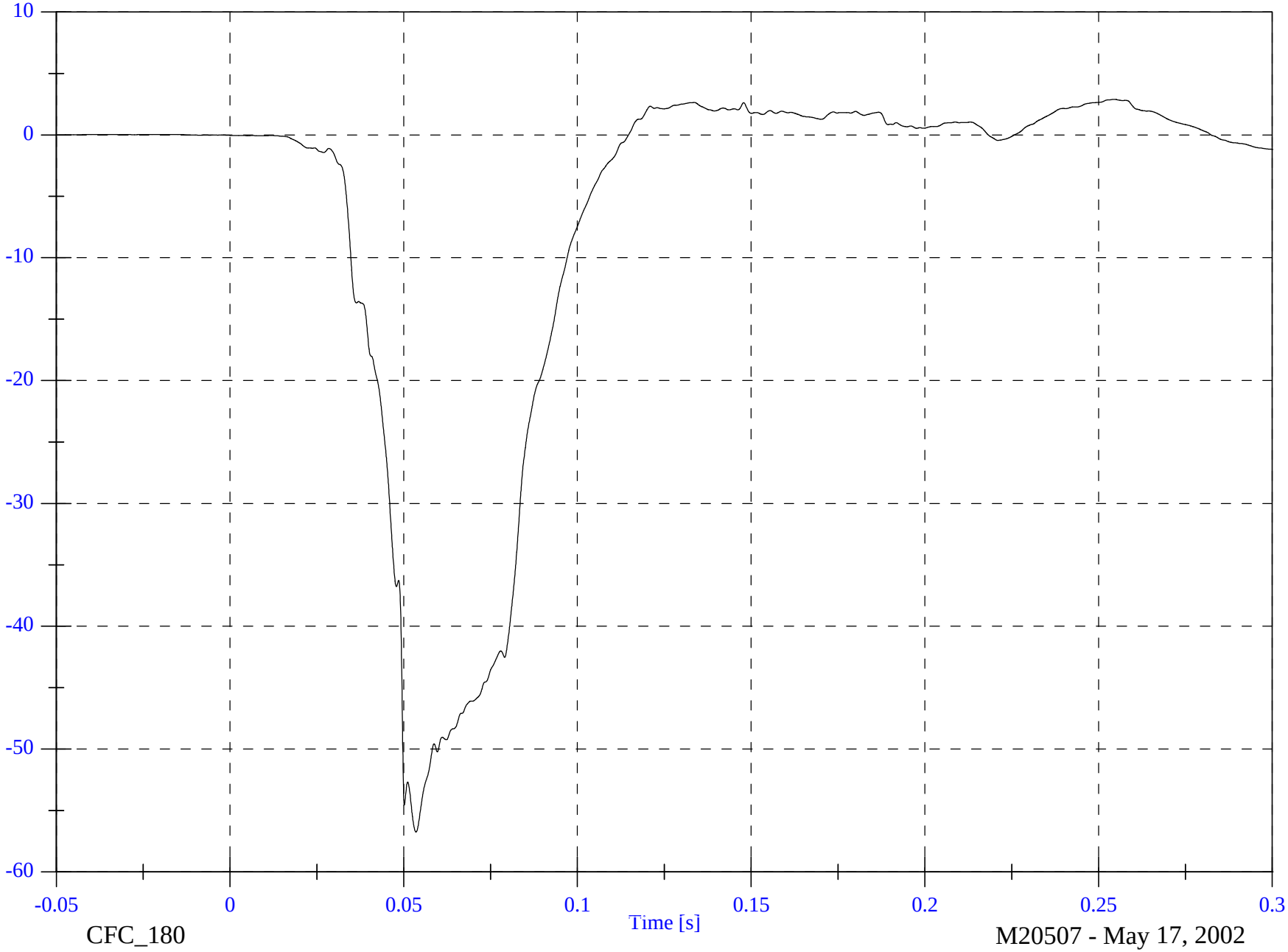
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest x

Max: 2.9 [g] at 0.255 [s]
Min: -56.8 [g] at 0.054 [s]



B-79

8462-NCAP-15

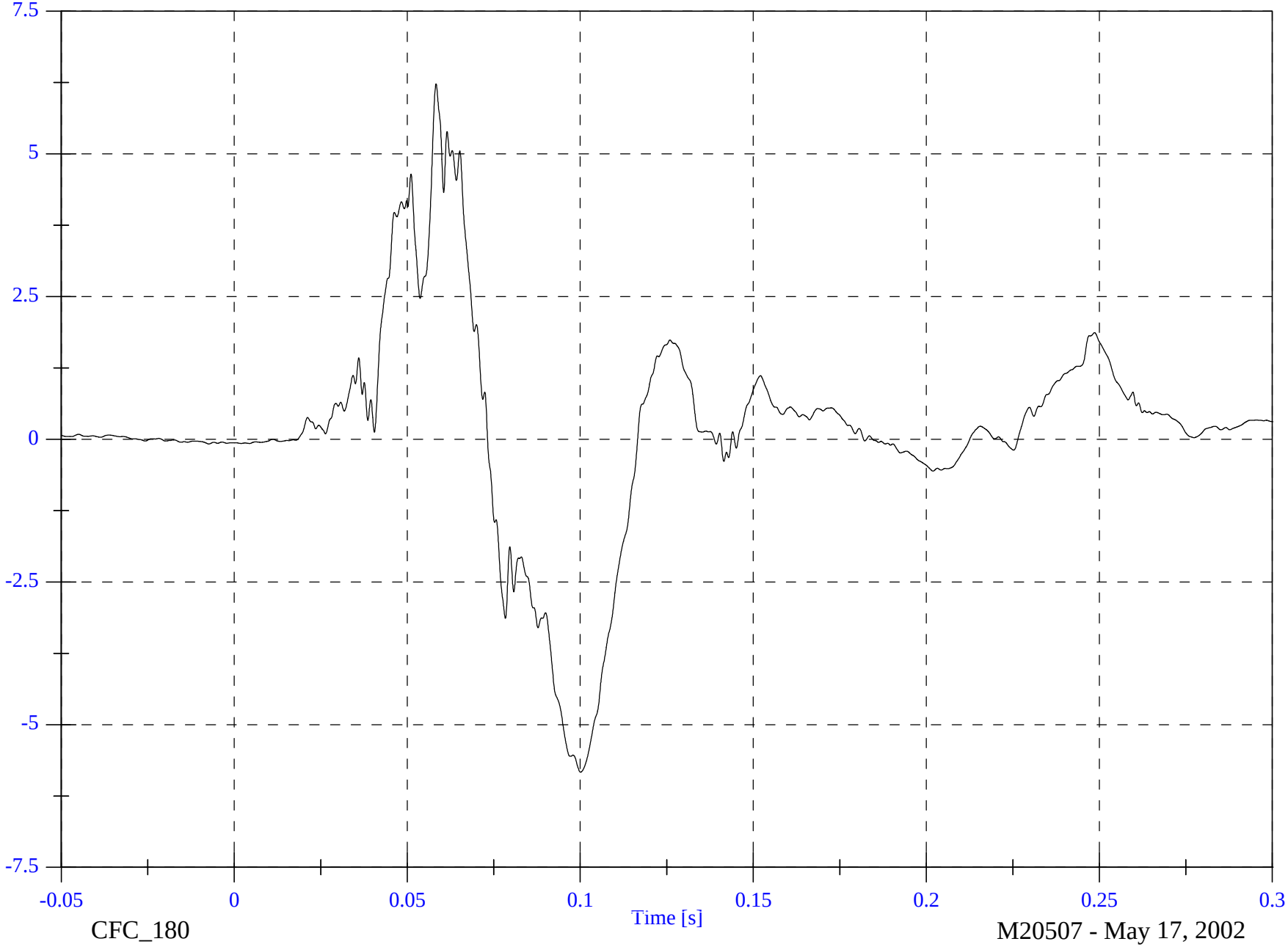
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest y

Max: 6.2 [g] at 0.058 [s]
Min: -5.8 [g] at 0.100 [s]



B-80

8462-NCAP-15

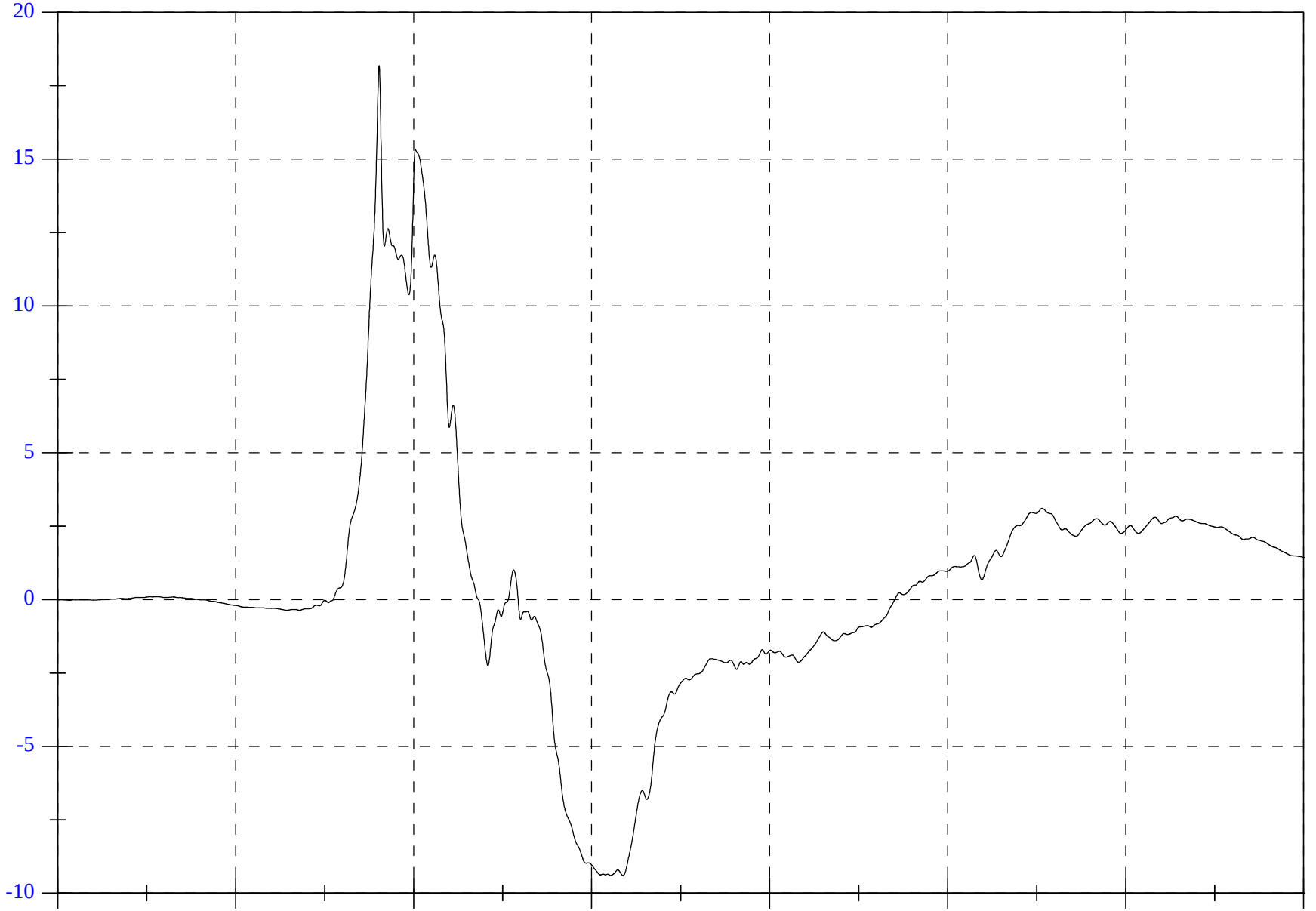
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest z

Max: 18.2 [g] at 0.040 [s]
Min: -9.4 [g] at 0.109 [s]



B-81

8462-NCAP-15

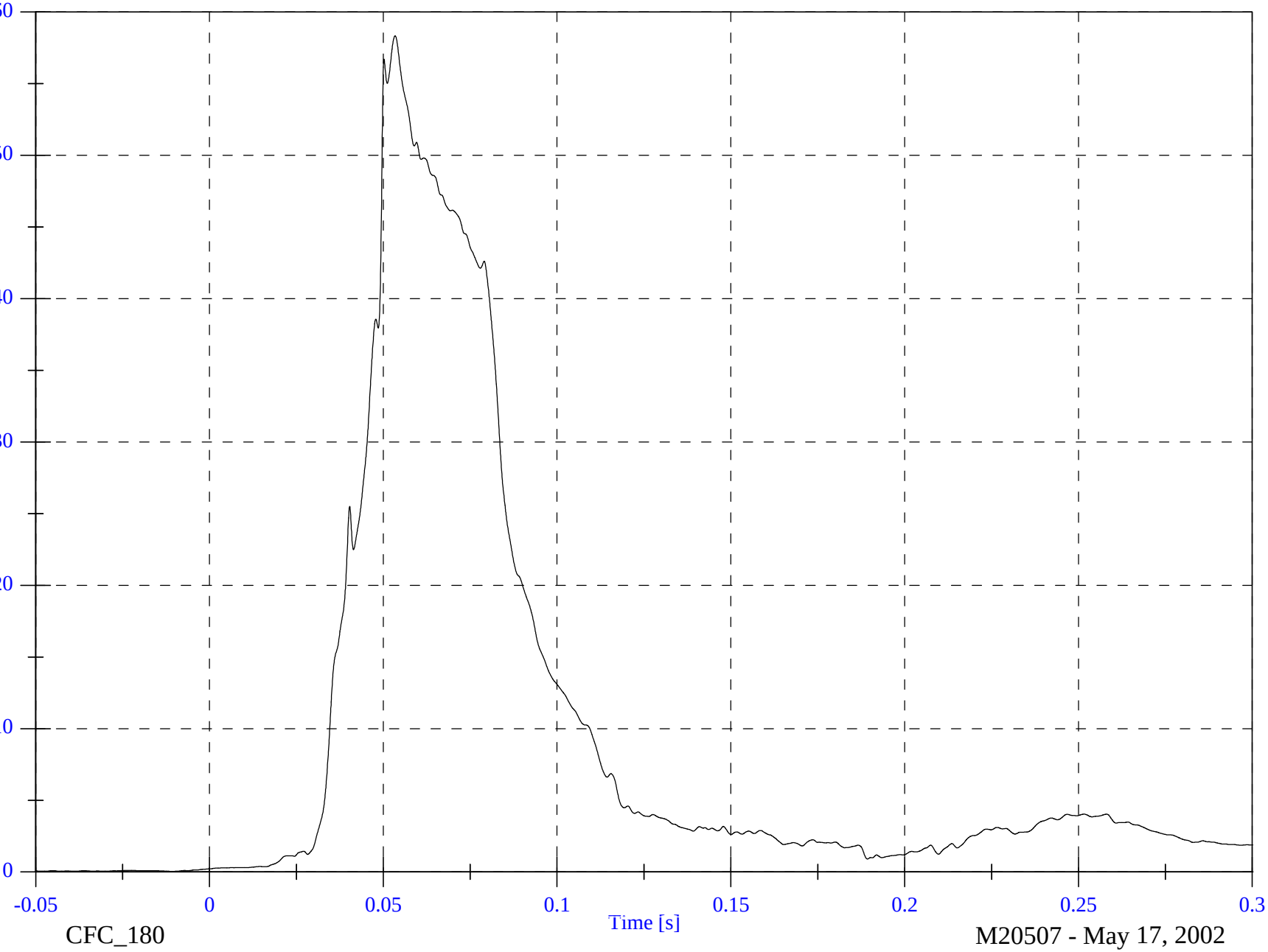
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest Resultant

Max: 58.3 [g] at 0.053 [s]
Min: 0.0 [g] at -0.011 [s]



B-82

8462-NCAP-15

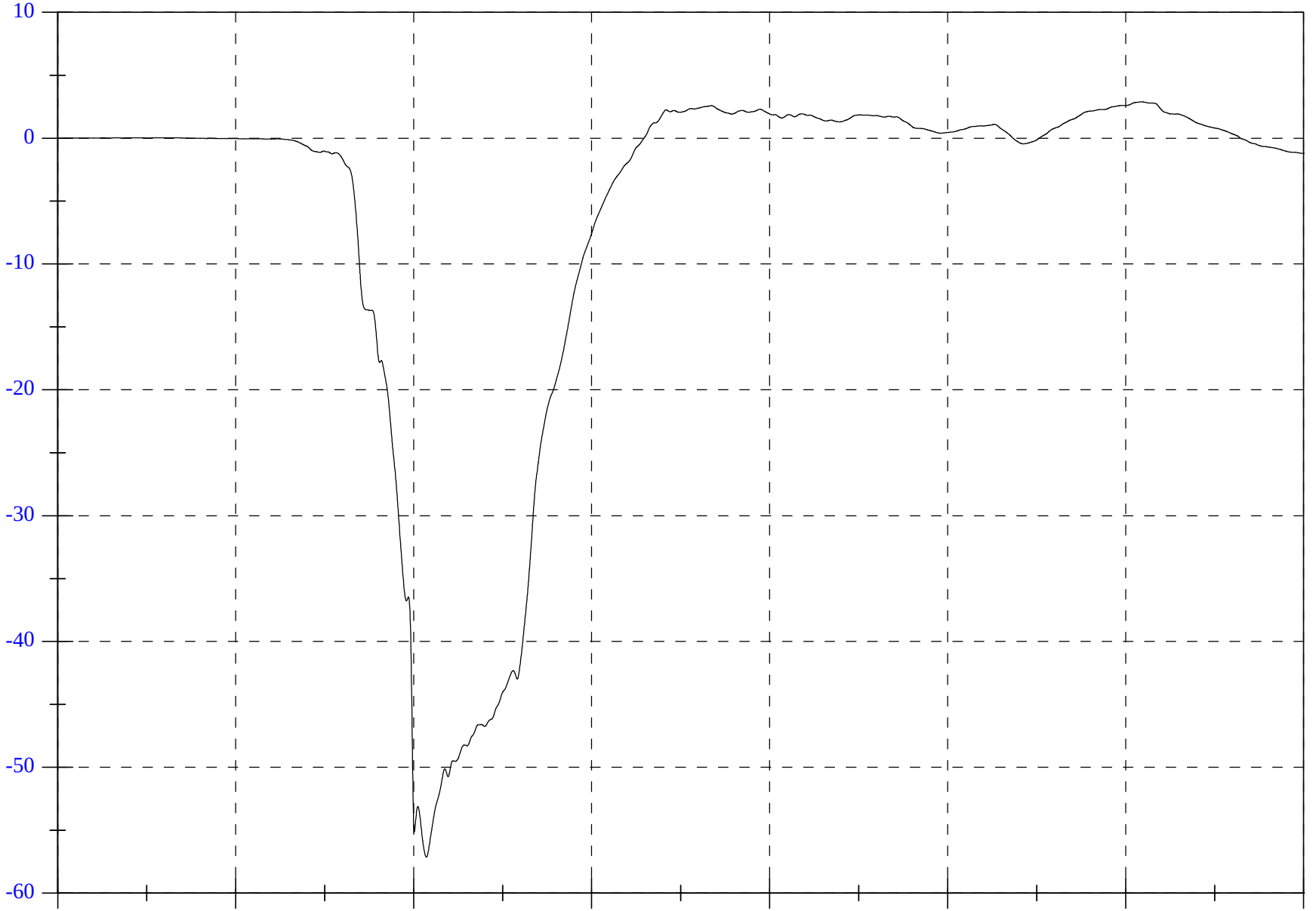
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest Red x

Max: 2.9 [g] at 0.254 [s]
Min: -57.1 [g] at 0.054 [s]

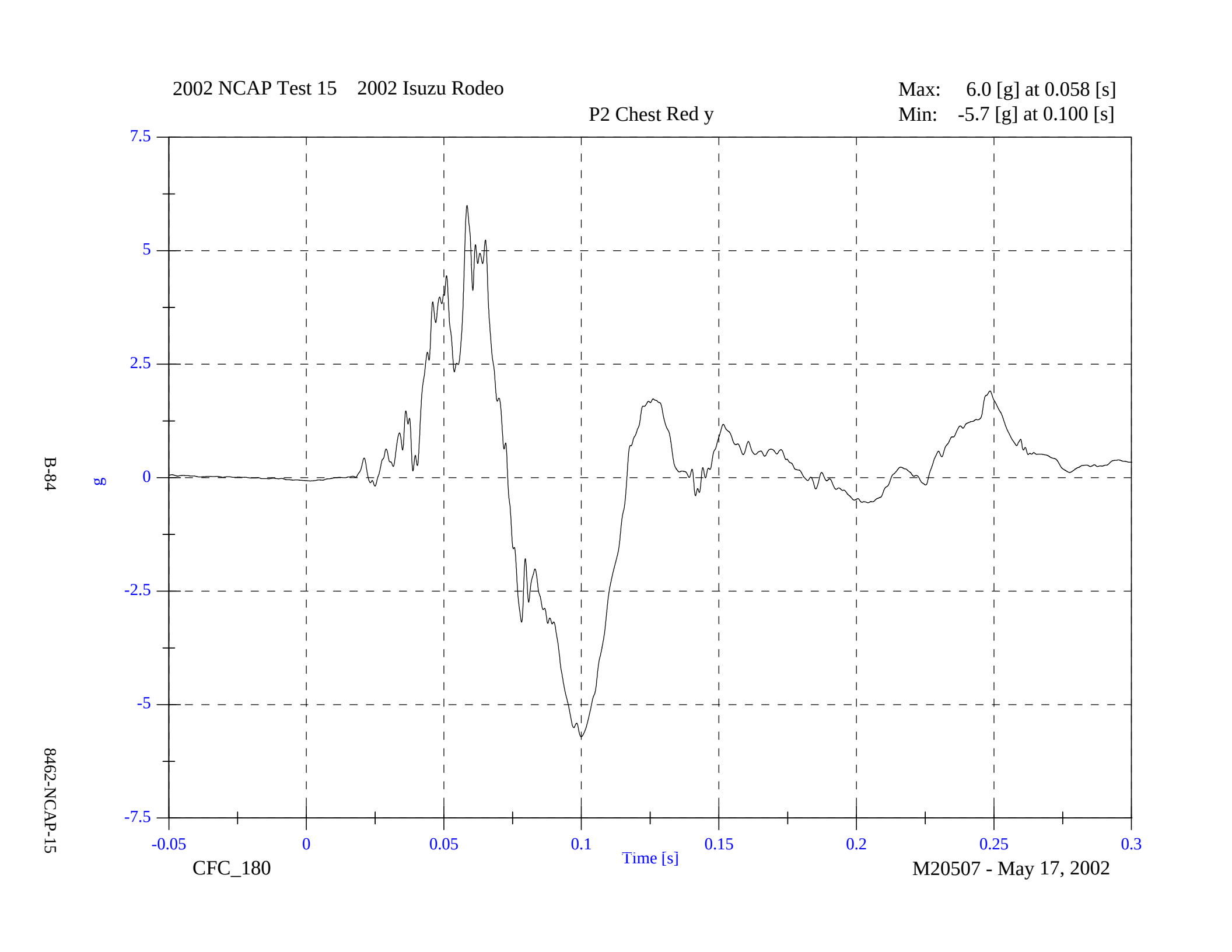


B-83

8462-NCAP-15

CFC_180

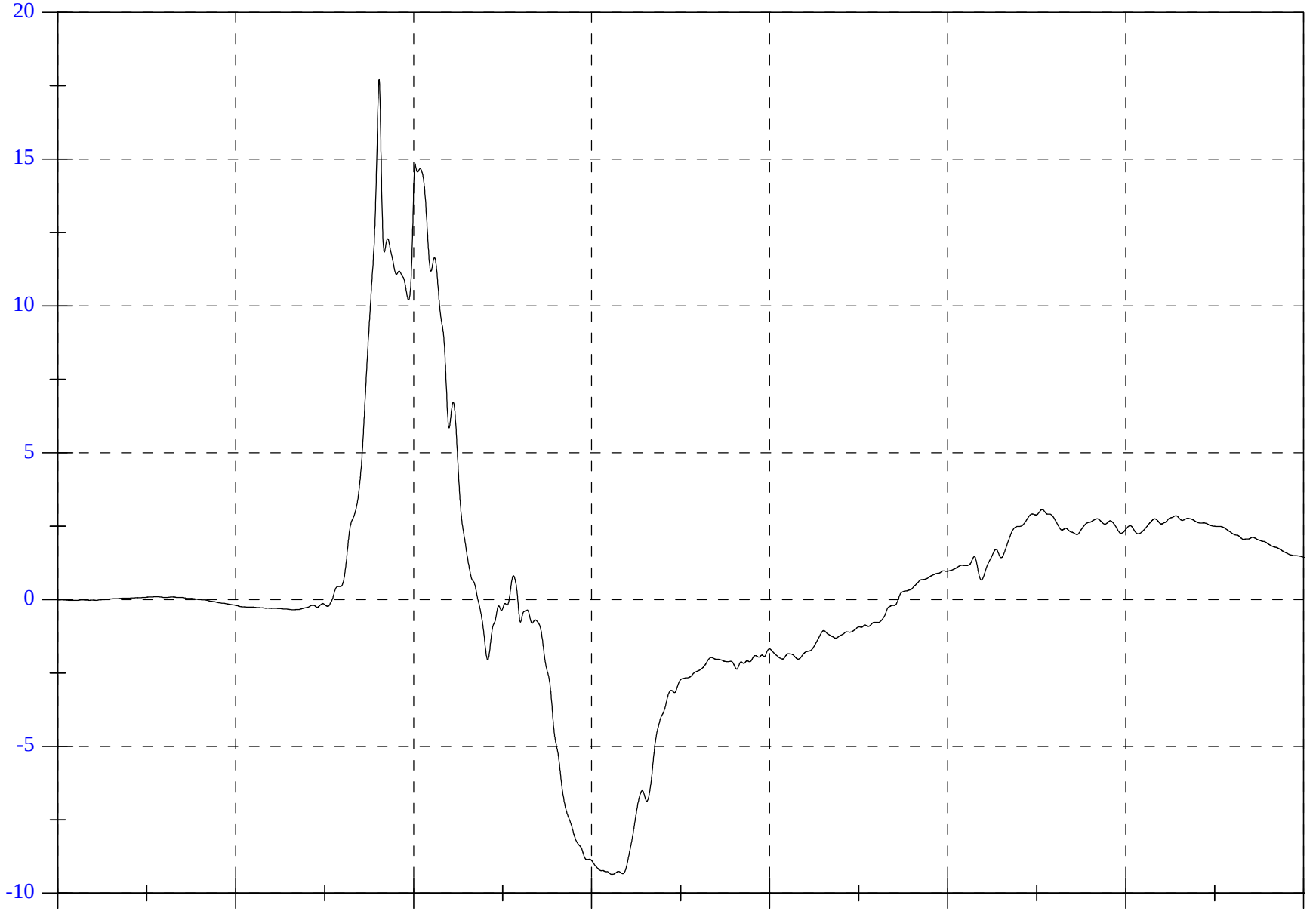
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Chest Red y
Max: 6.0 [g] at 0.058 [s]
Min: -5.7 [g] at 0.100 [s]
7.5
5
2.5
0
-2.5
-5
-7.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
B-84
8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest Red z

Max: 17.7 [g] at 0.040 [s]
Min: -9.4 [g] at 0.106 [s]



B-85

8462-NCAP-15

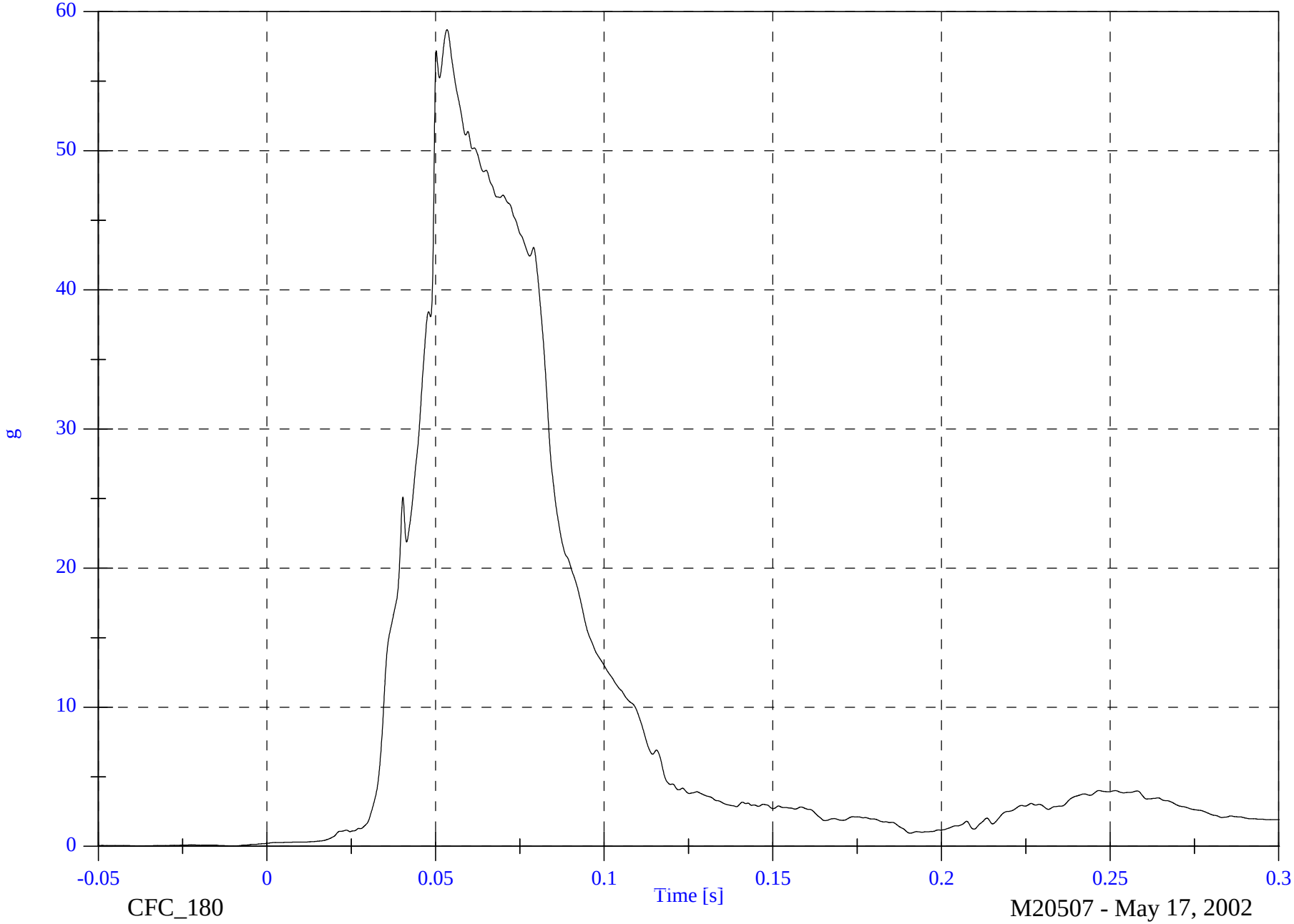
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest Red Resultant

Max: 58.7 [g] at 0.053 [s]
Min: 0.0 [g] at -0.038 [s]



B-86

8462-NCAP-15

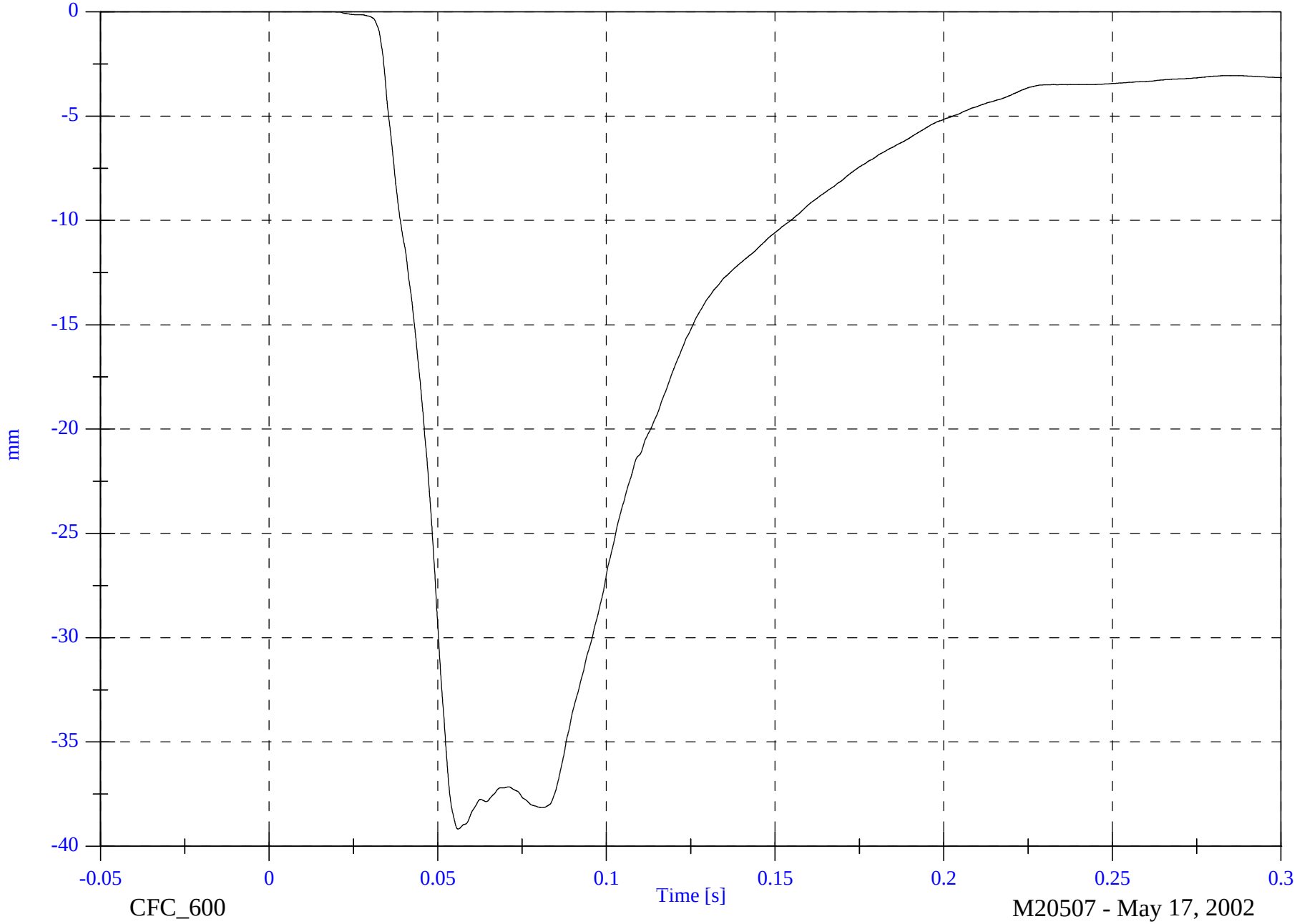
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Chest Compression x

Max: 0.0 [mm] at 0.011 [s]
Min: -39.2 [mm] at 0.056 [s]



CFC_600

M20507 - May 17, 2002

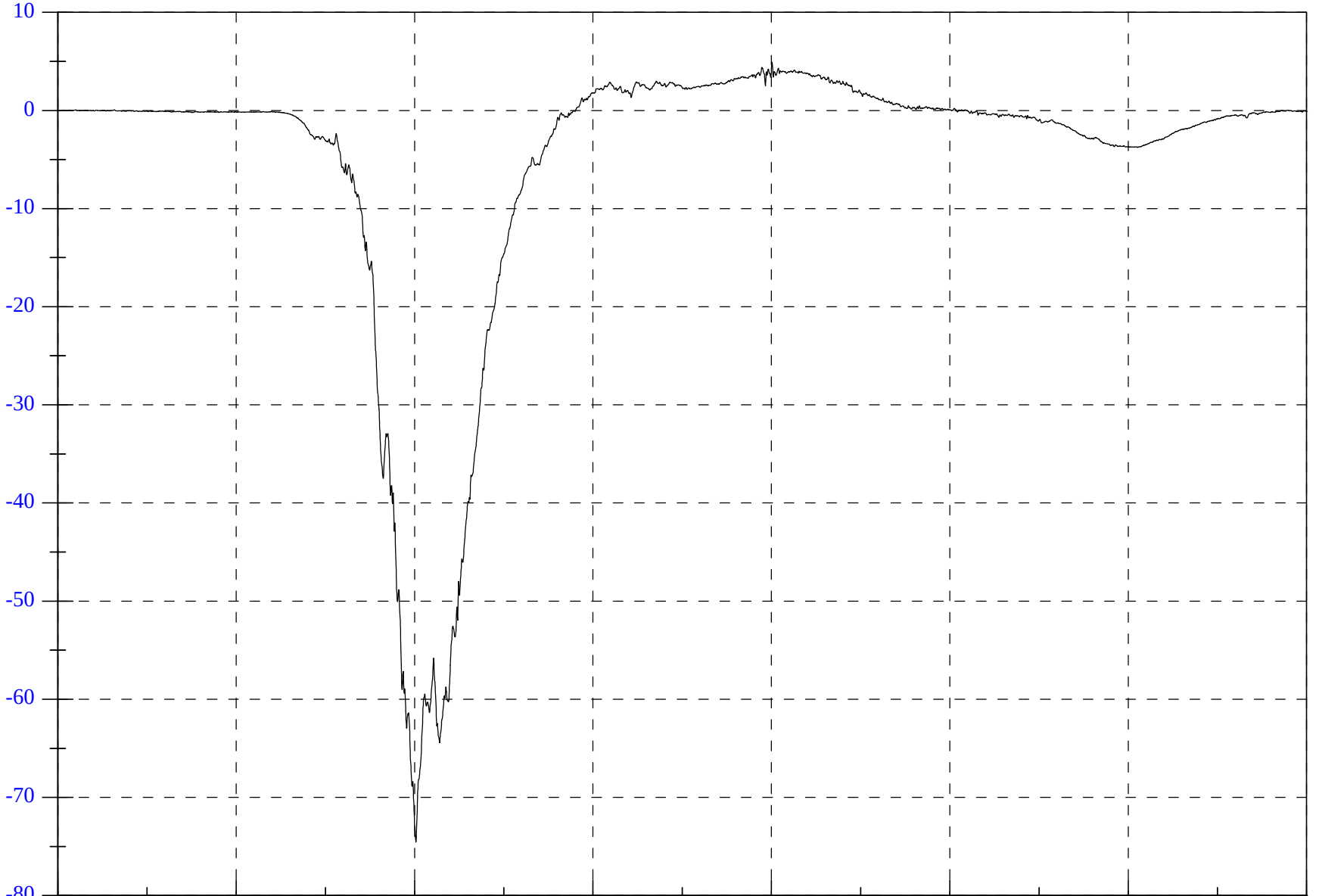
B-87

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Pelvic x

Max: 4.9 [g] at 0.150 [s]
Min: -74.6 [g] at 0.050 [s]



CFC_1000

M20507 - May 17, 2002

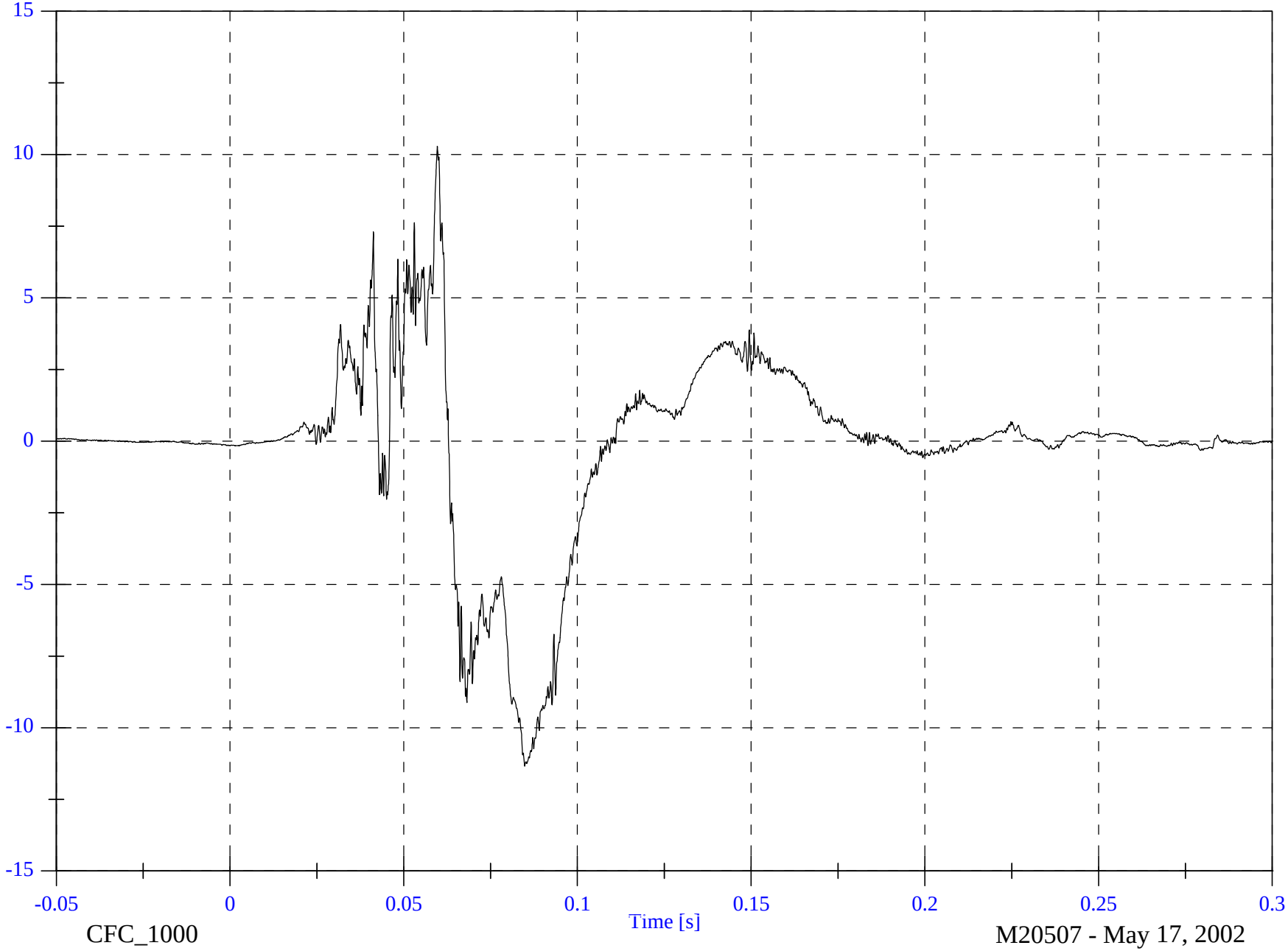
B-88

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Pelvic y

Max: 10.3 [g] at 0.060 [s]
Min: -11.3 [g] at 0.085 [s]



B-89

8462-NCAP-15

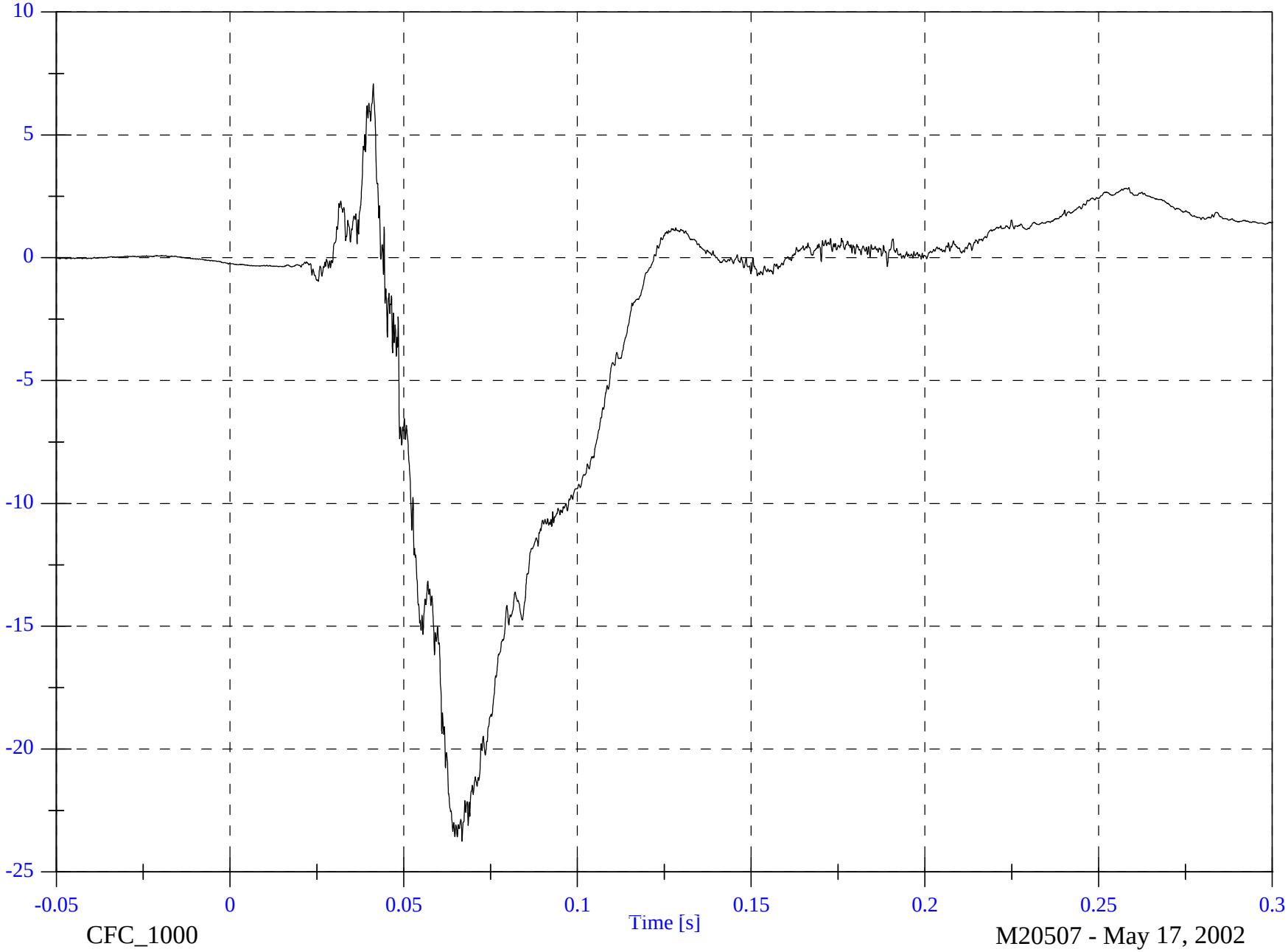
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Pelvic z

Max: 7.1 [g] at 0.041 [s]
Min: -23.8 [g] at 0.067 [s]



B-90

8462-NCAP-15

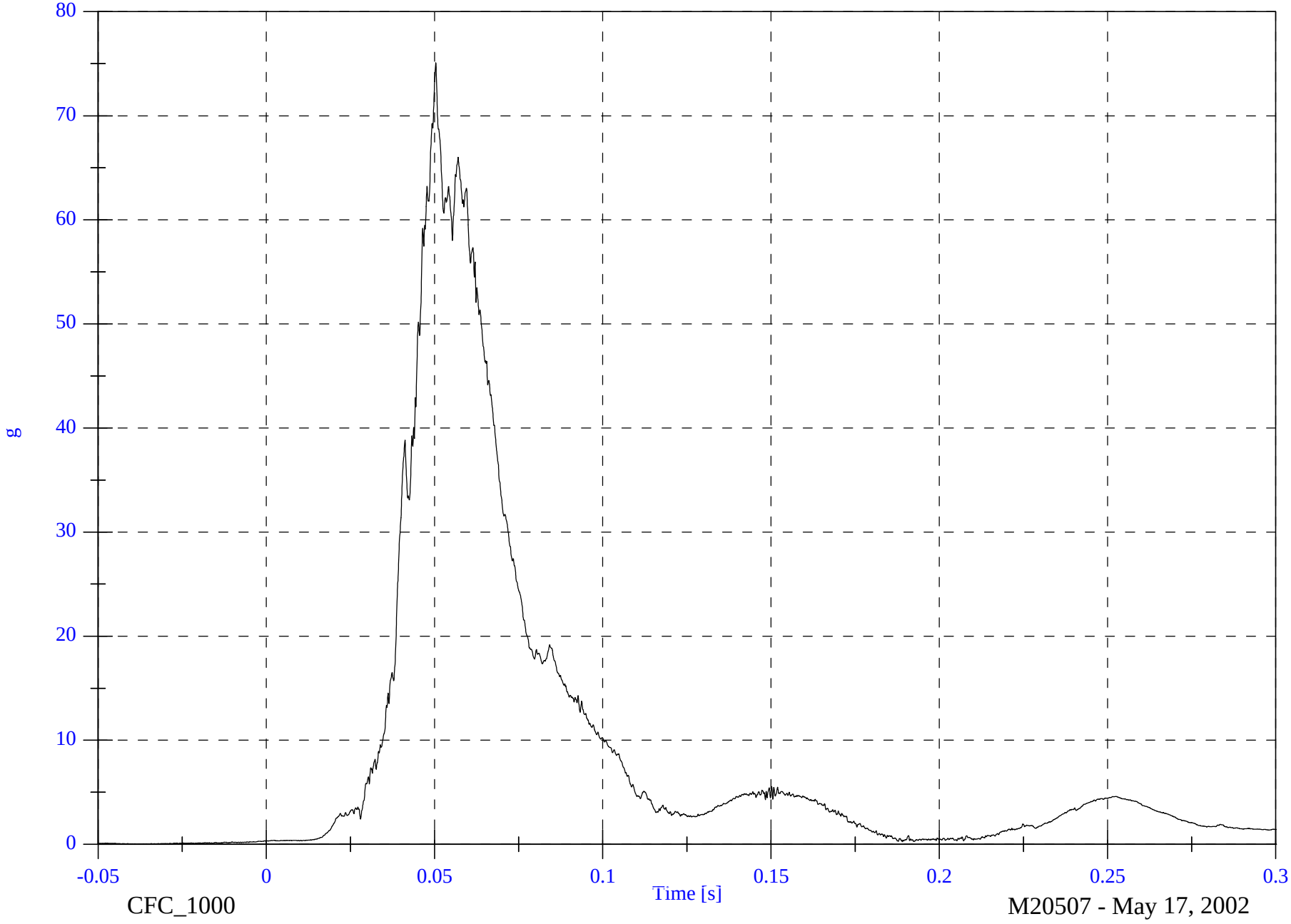
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Pelvic Resultant

Max: 75.1 [g] at 0.050 [s]
Min: 0.0 [g] at -0.035 [s]



CFC_1000

M20507 - May 17, 2002

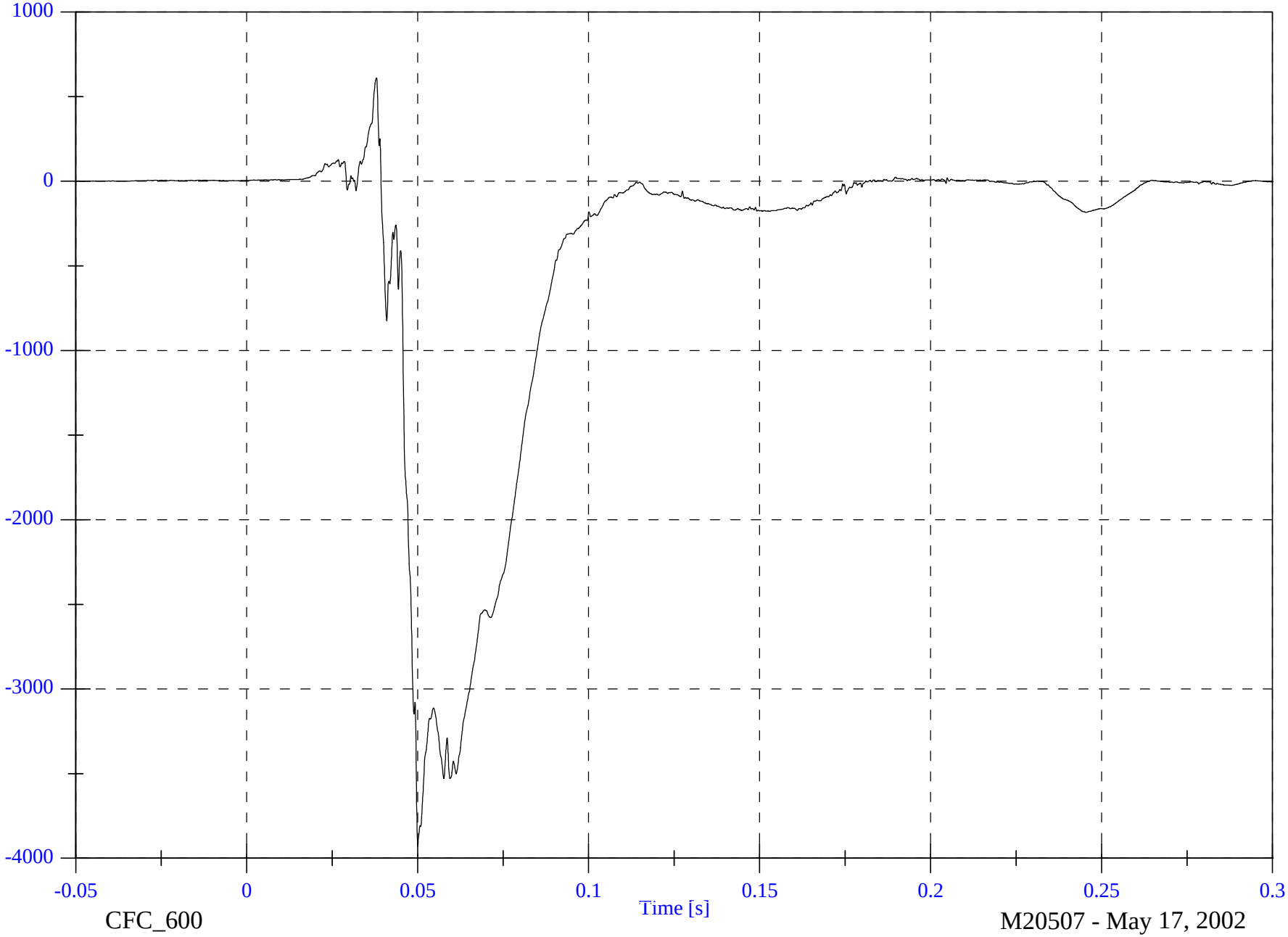
B-91

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Femur z

Max: 610.8 [N] at 0.038 [s]
Min: -3927.5 [N] at 0.050 [s]



B-92

8462-NCAP-15

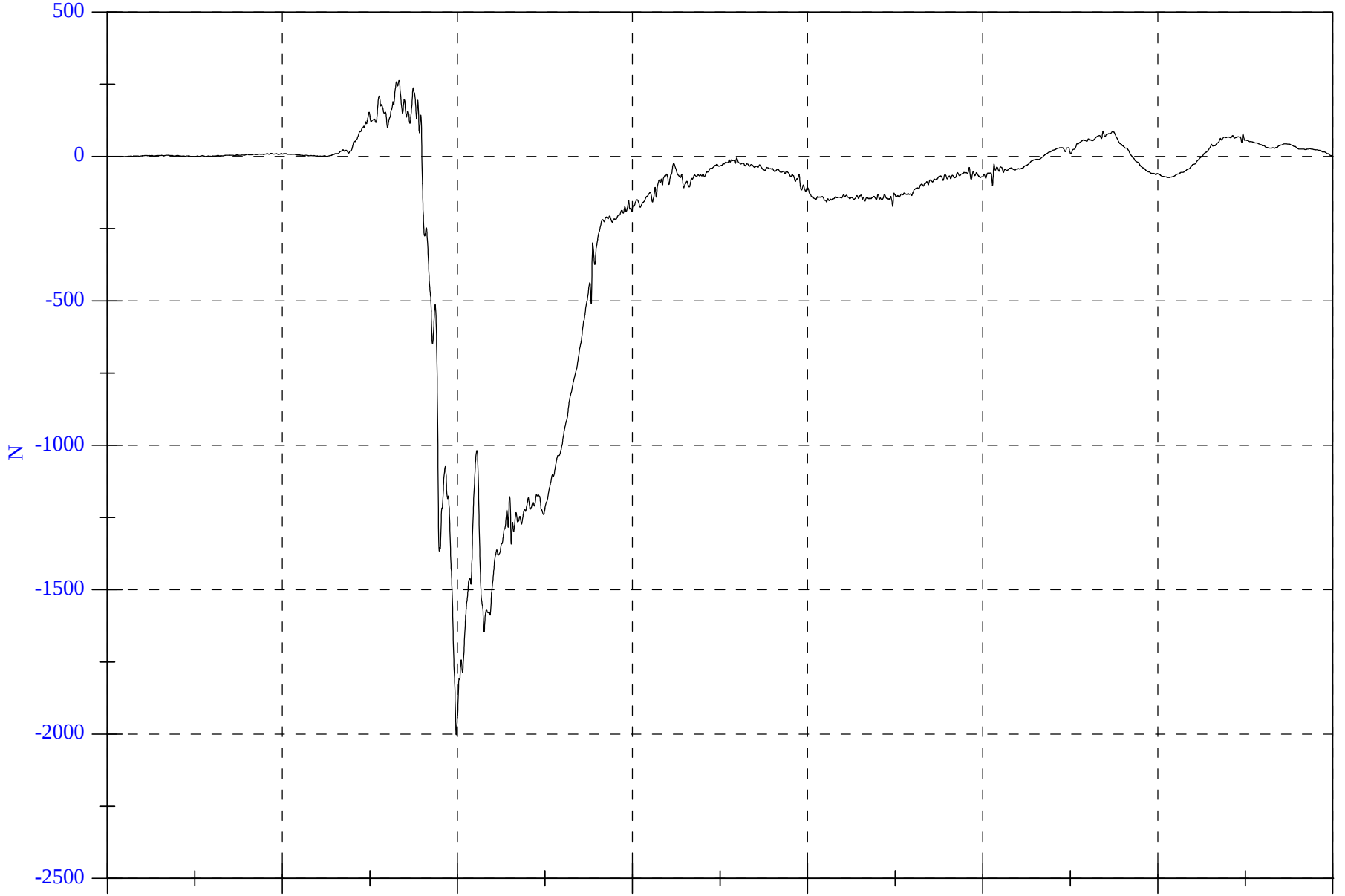
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Femur z

Max: 263.2 [N] at 0.033 [s]
Min: -2002.5 [N] at 0.050 [s]



B-93

8462-NCAP-15

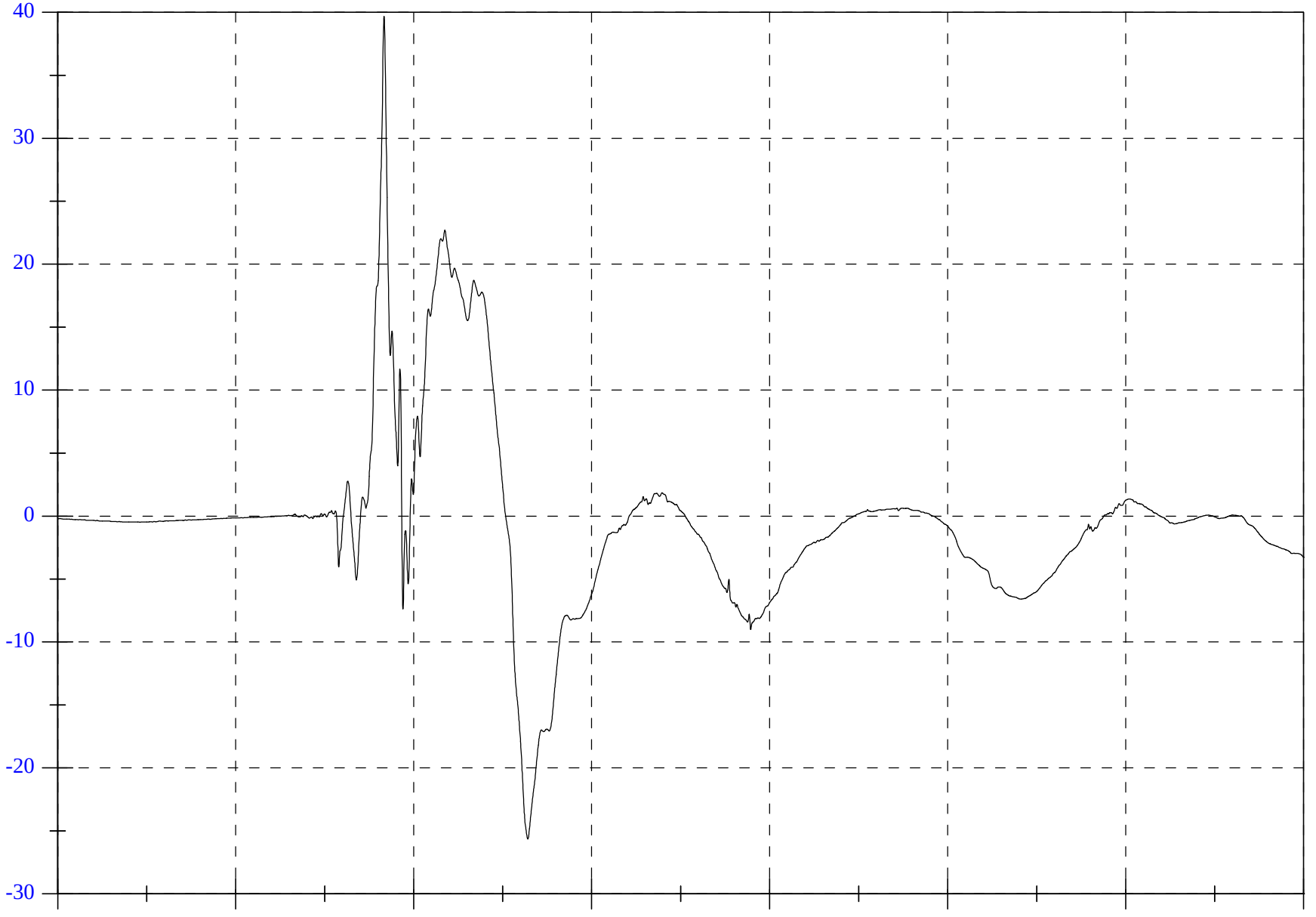
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Upper Tibia Mx

Max: 39.7 [N-m] at 0.042 [s]
Min: -25.6 [N-m] at 0.082 [s]



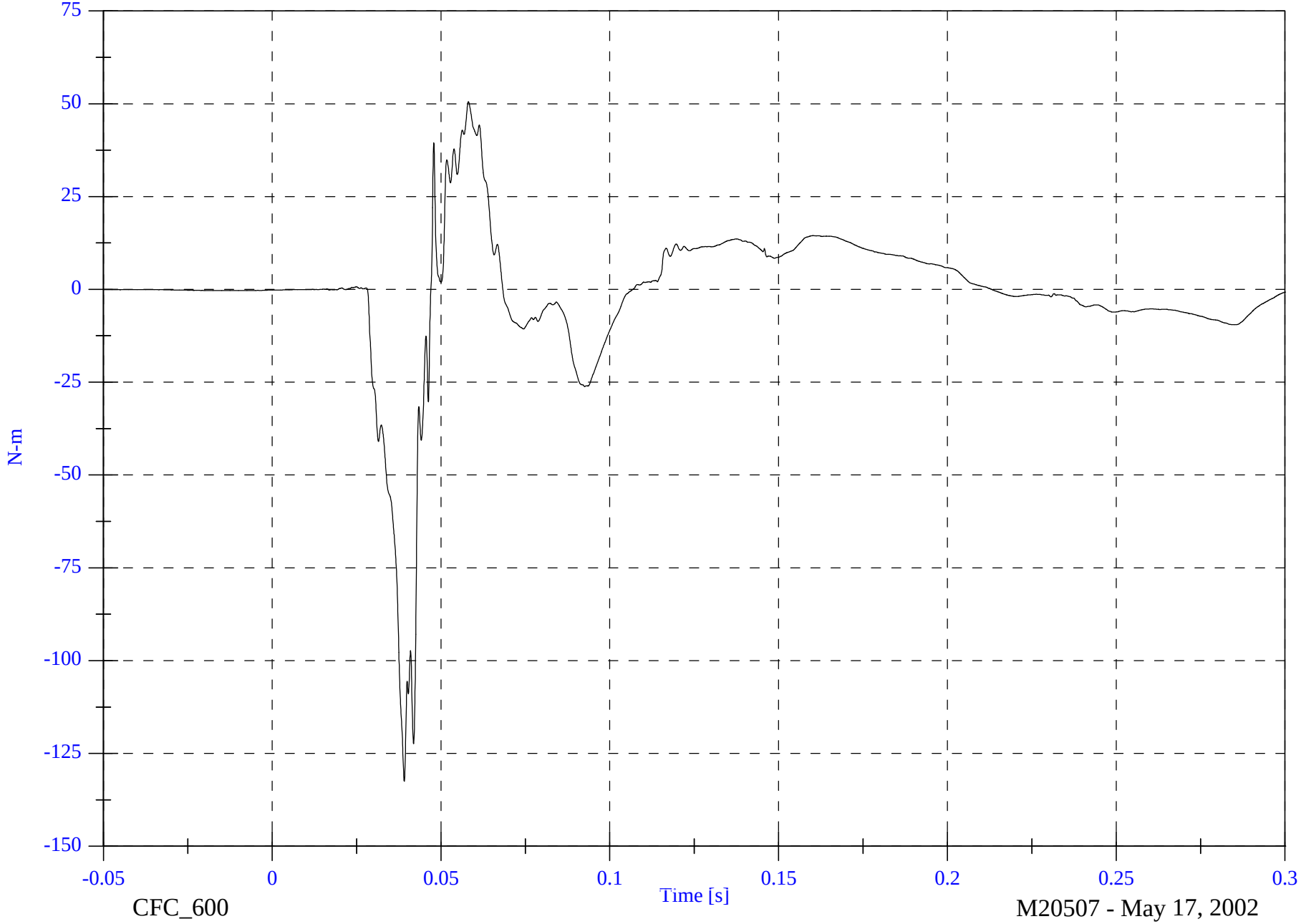
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Upper Tibia My

Max: 50.6 [N-m] at 0.058 [s]
Min: -132.5 [N-m] at 0.039 [s]



B-95

8462-NCAP-15

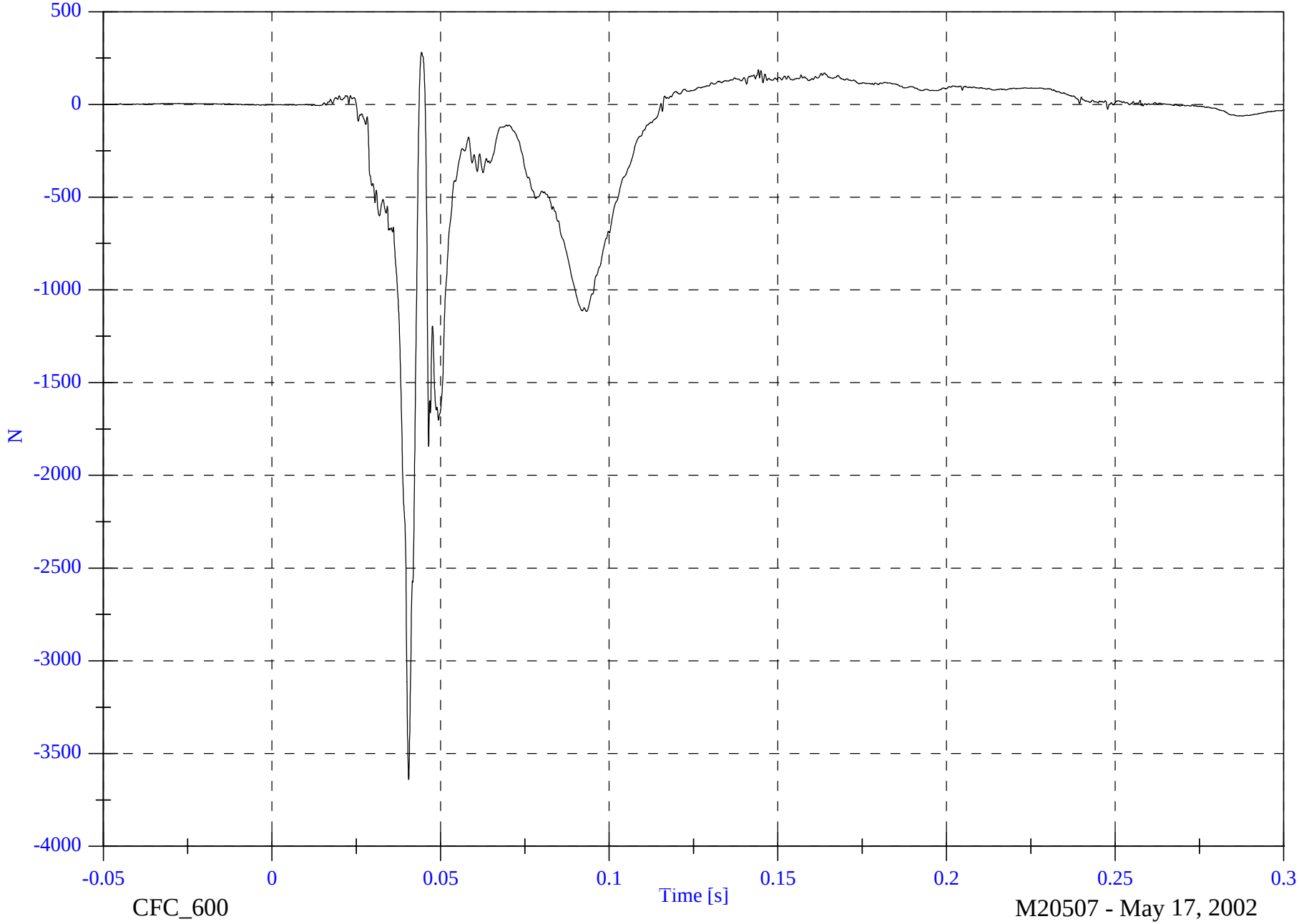
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Lower Tibia Fz

Max: 281.6 [N] at 0.044 [s]
Min: -3640.4 [N] at 0.041 [s]



CFC_600

M20507 - May 17, 2002

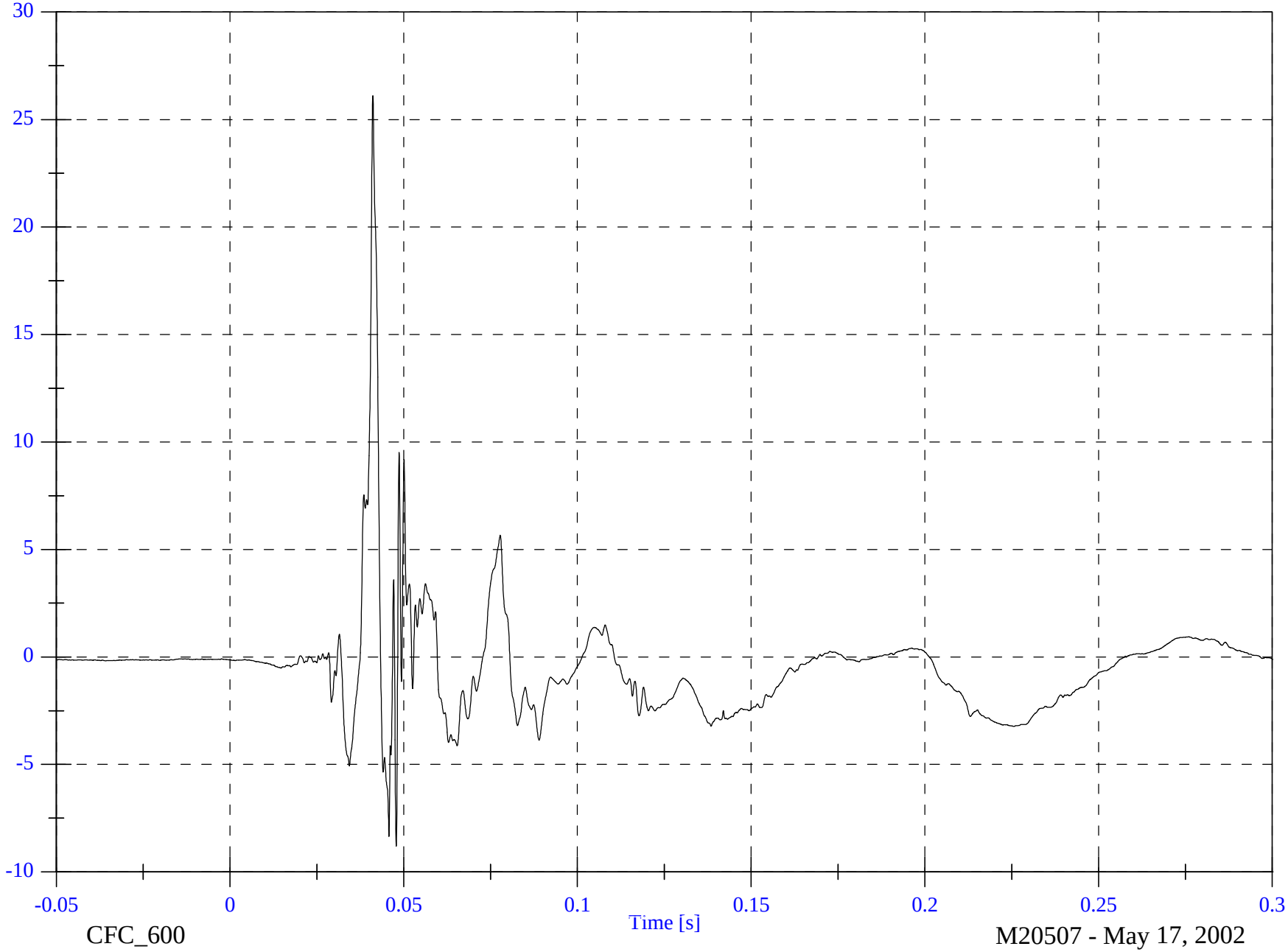
B-96

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Lower Tibia Mx

Max: 26.1 [N-m] at 0.041 [s]
Min: -8.8 [N-m] at 0.048 [s]



CFC_600

M20507 - May 17, 2002

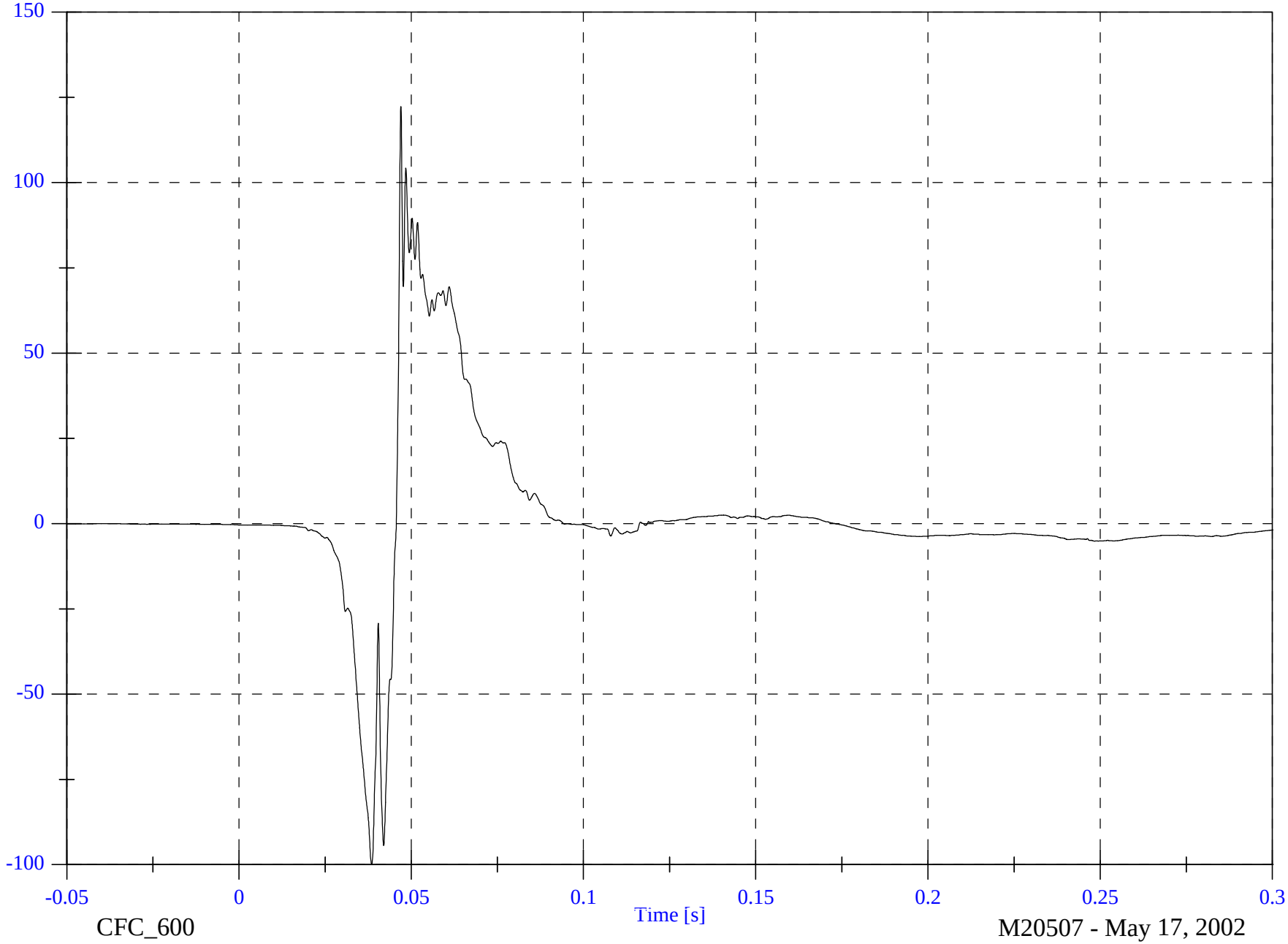
B-97

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Lower Tibia My

Max: 122.3 [N-m] at 0.047 [s]
Min: -99.8 [N-m] at 0.038 [s]



CFC_600

M20507 - May 17, 2002

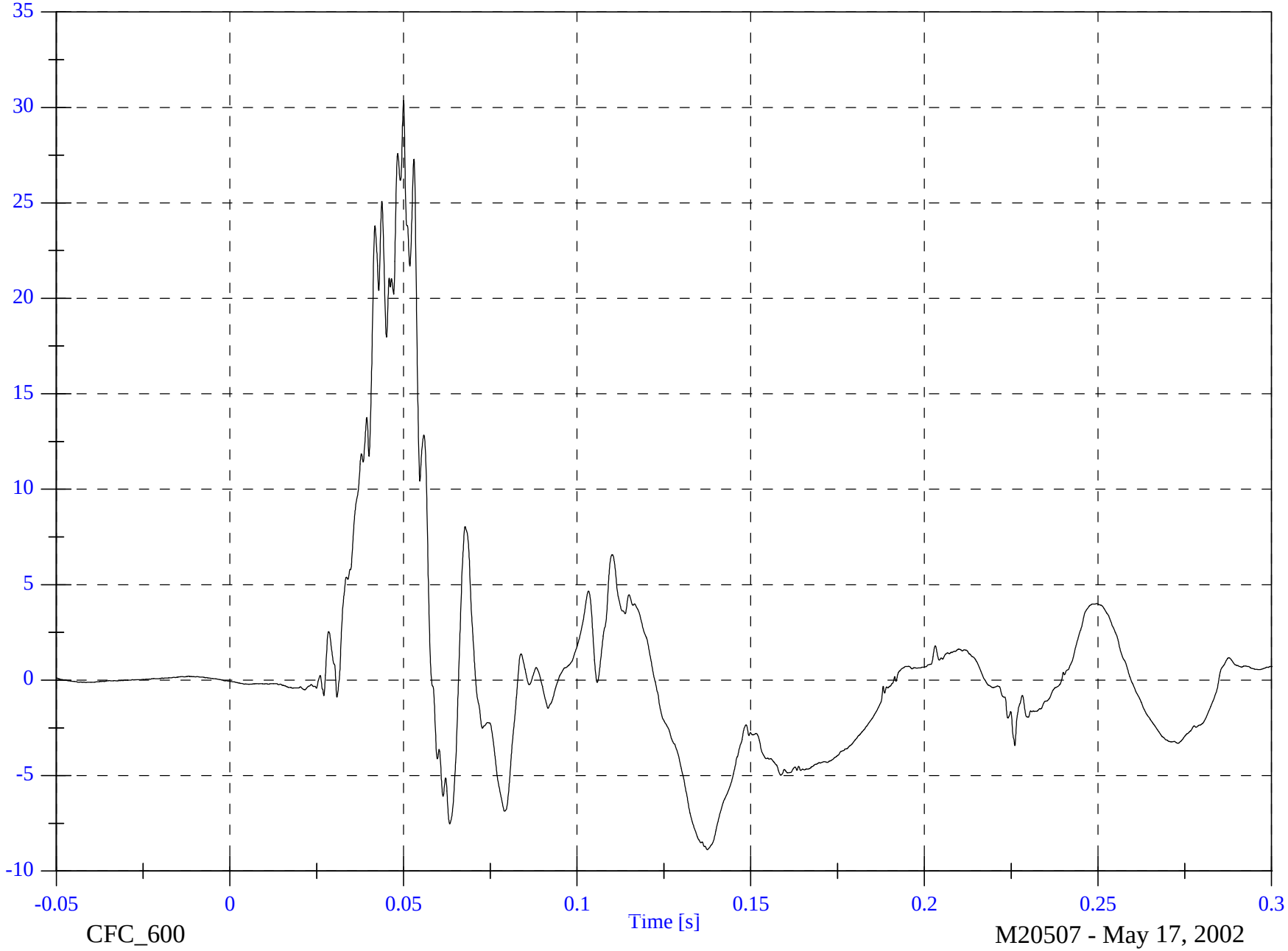
B-98

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Upper Tibia Mx

Max: 30.4 [N-m] at 0.050 [s]
Min: -8.9 [N-m] at 0.137 [s]



B-99

8462-NCAP-15

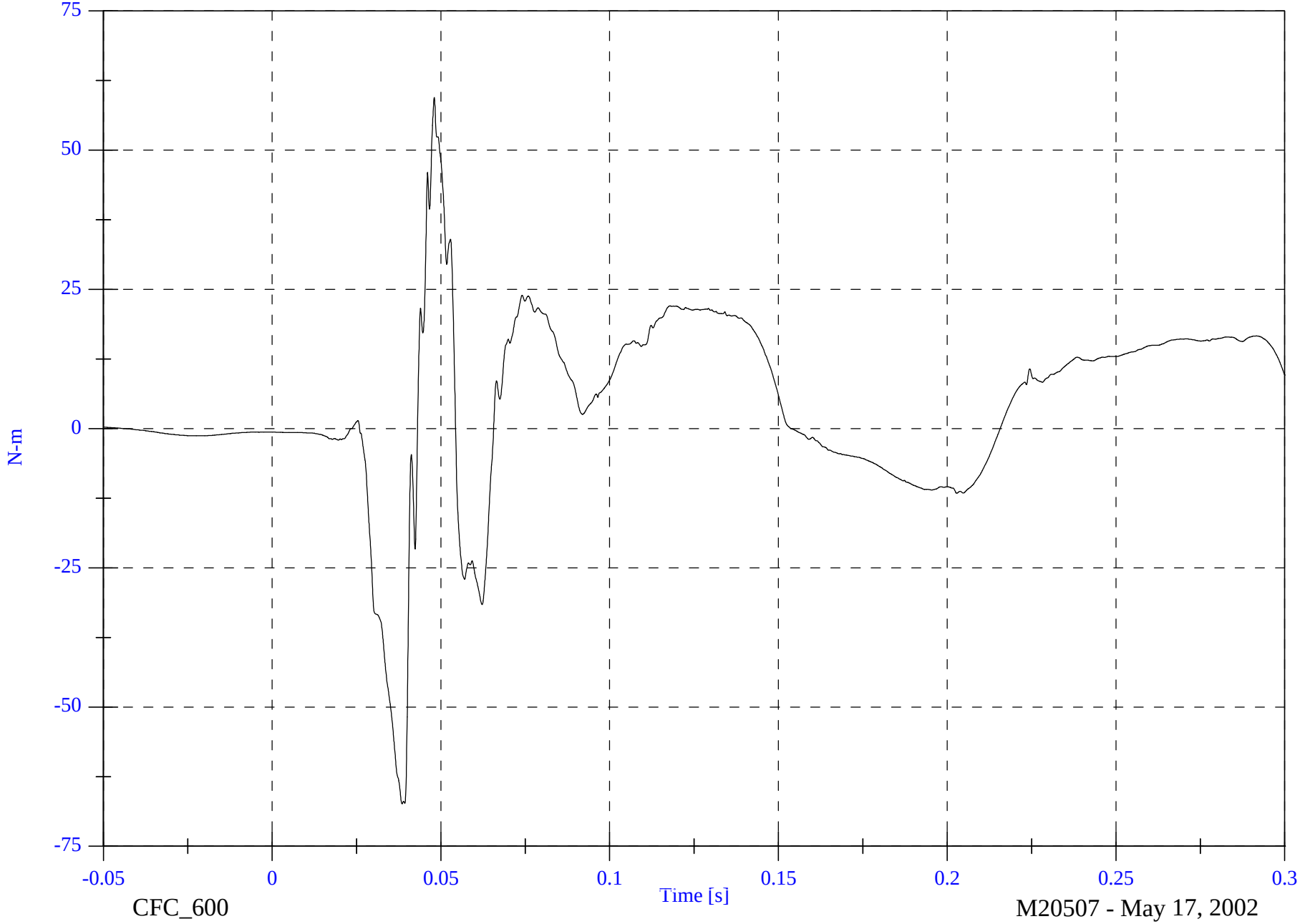
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Upper Tibia My

Max: 59.5 [N-m] at 0.048 [s]
Min: -67.4 [N-m] at 0.038 [s]



B-100

8462-NCAP-15

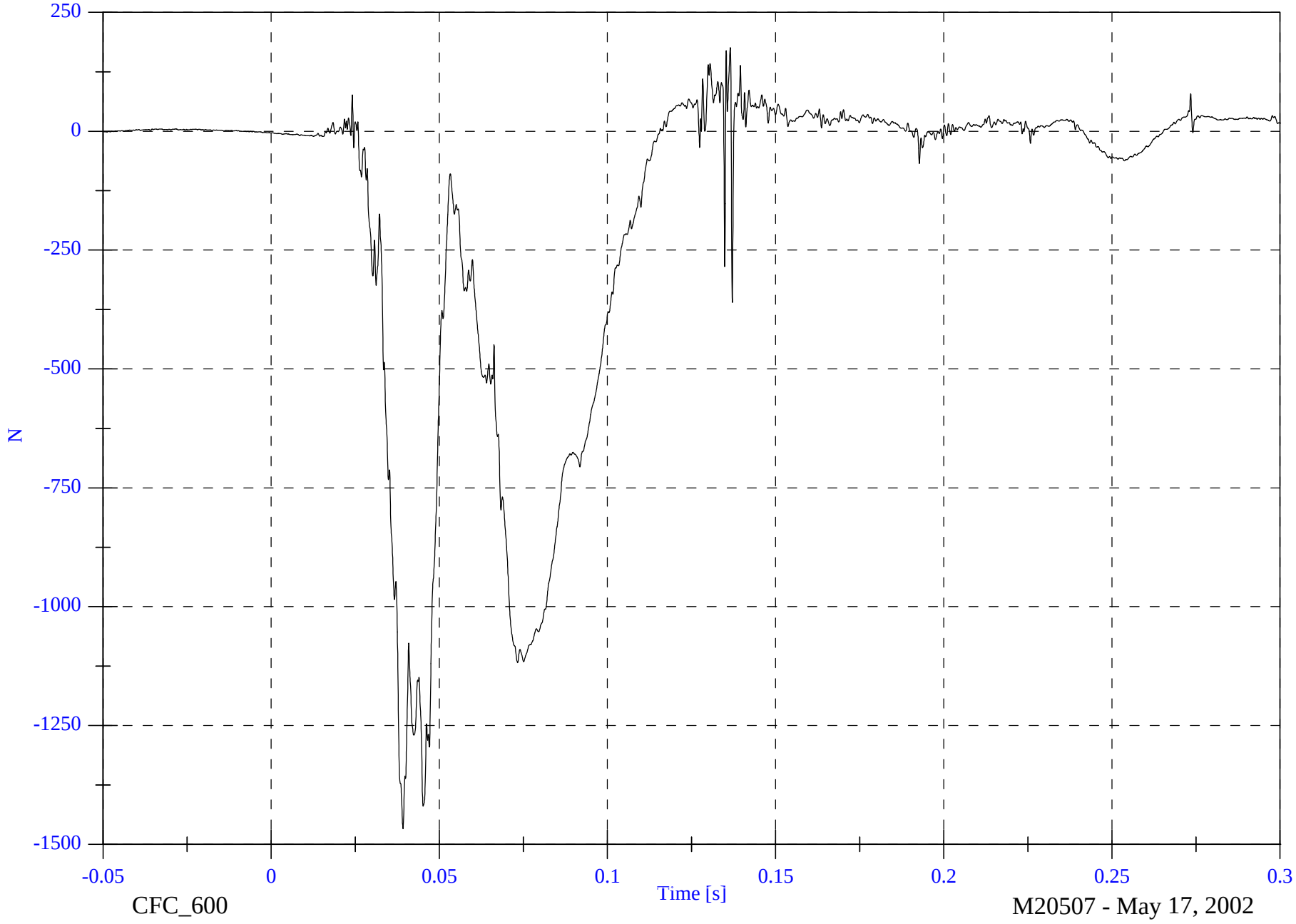
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Lower Tibia Fz

Max: 175.8 [N] at 0.136 [s]
Min: -1467.2 [N] at 0.039 [s]



B-101

8462-NCAP-15

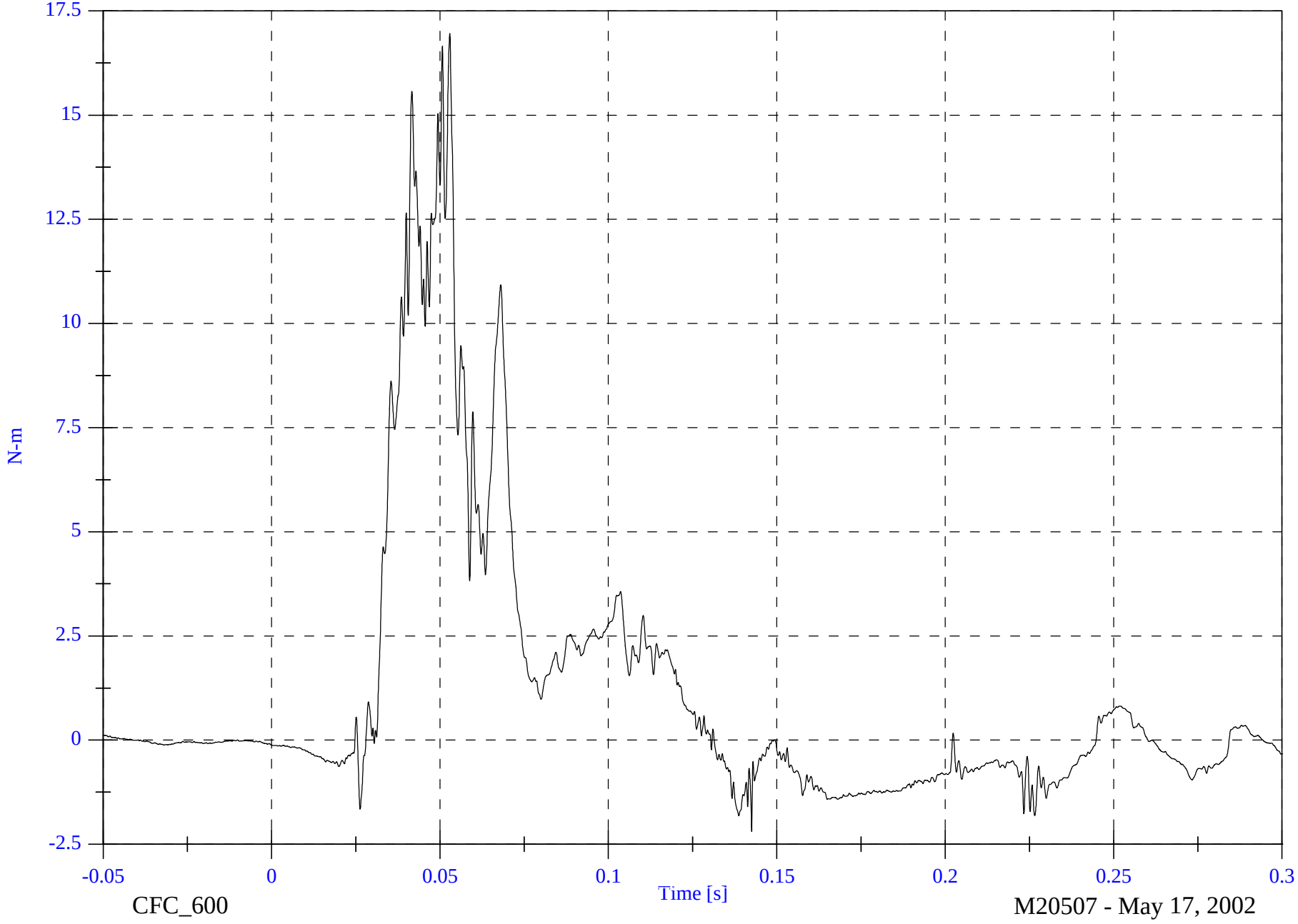
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Lower Tibia Mx

Max: 17.0 [N-m] at 0.053 [s]
Min: -2.2 [N-m] at 0.142 [s]



CFC_600

M20507 - May 17, 2002

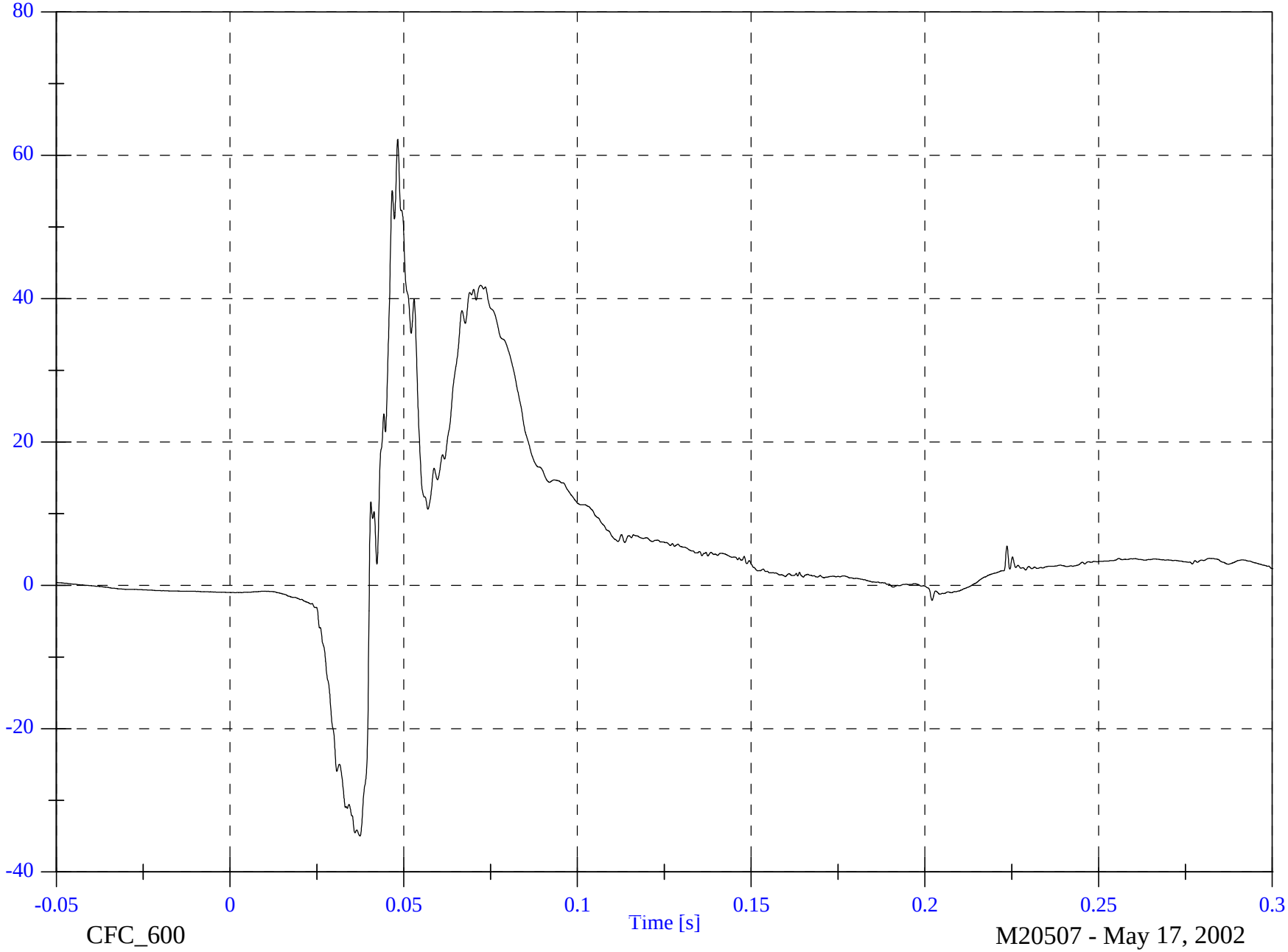
B-102

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Lower Tibia My

Max: 62.3 [N-m] at 0.048 [s]
Min: -35.0 [N-m] at 0.037 [s]



B-103

8462-NCAP-15

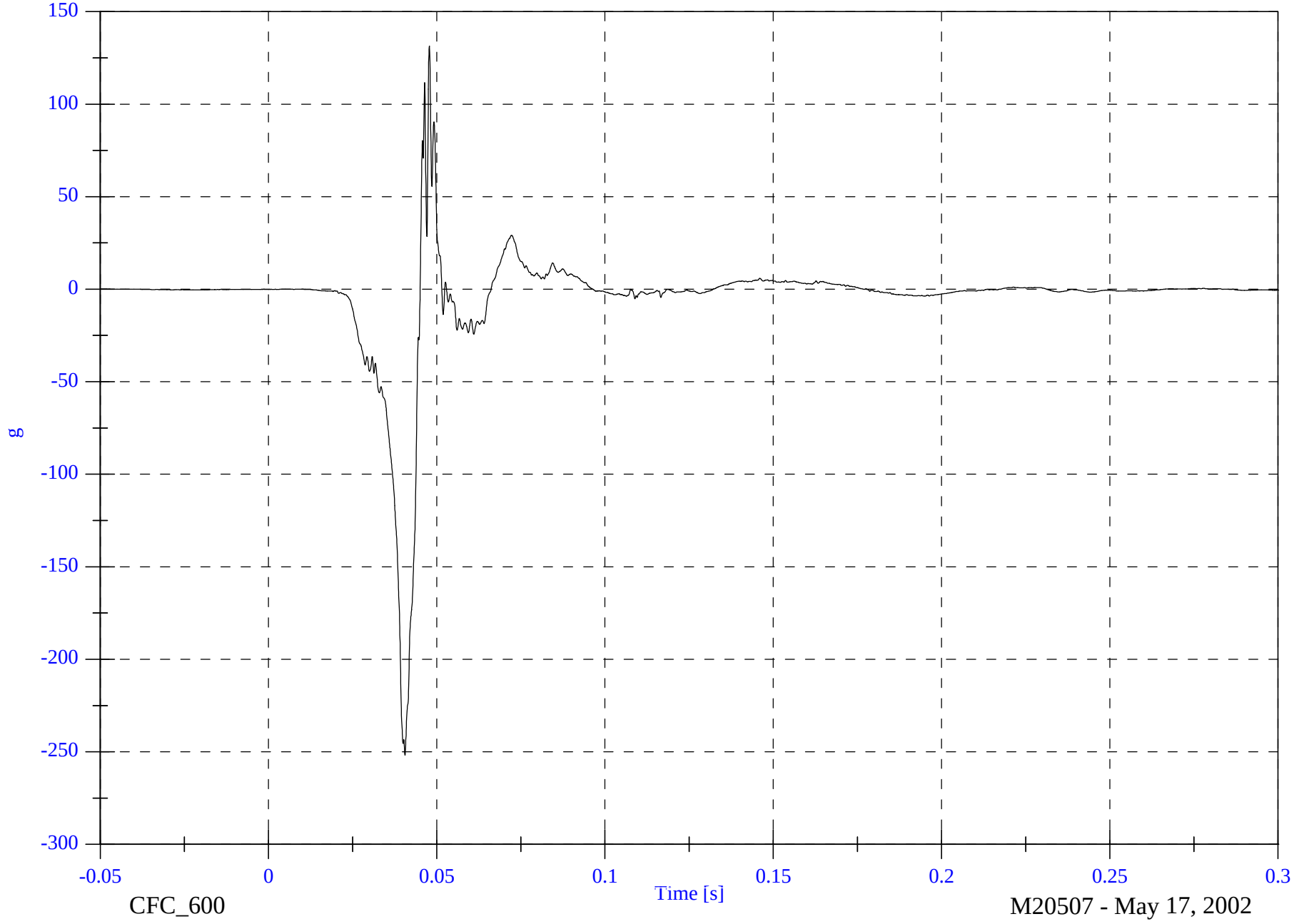
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Foot Aft x

Max: 131.5 [g] at 0.048 [s]
Min: -251.8 [g] at 0.041 [s]



CFC_600

M20507 - May 17, 2002

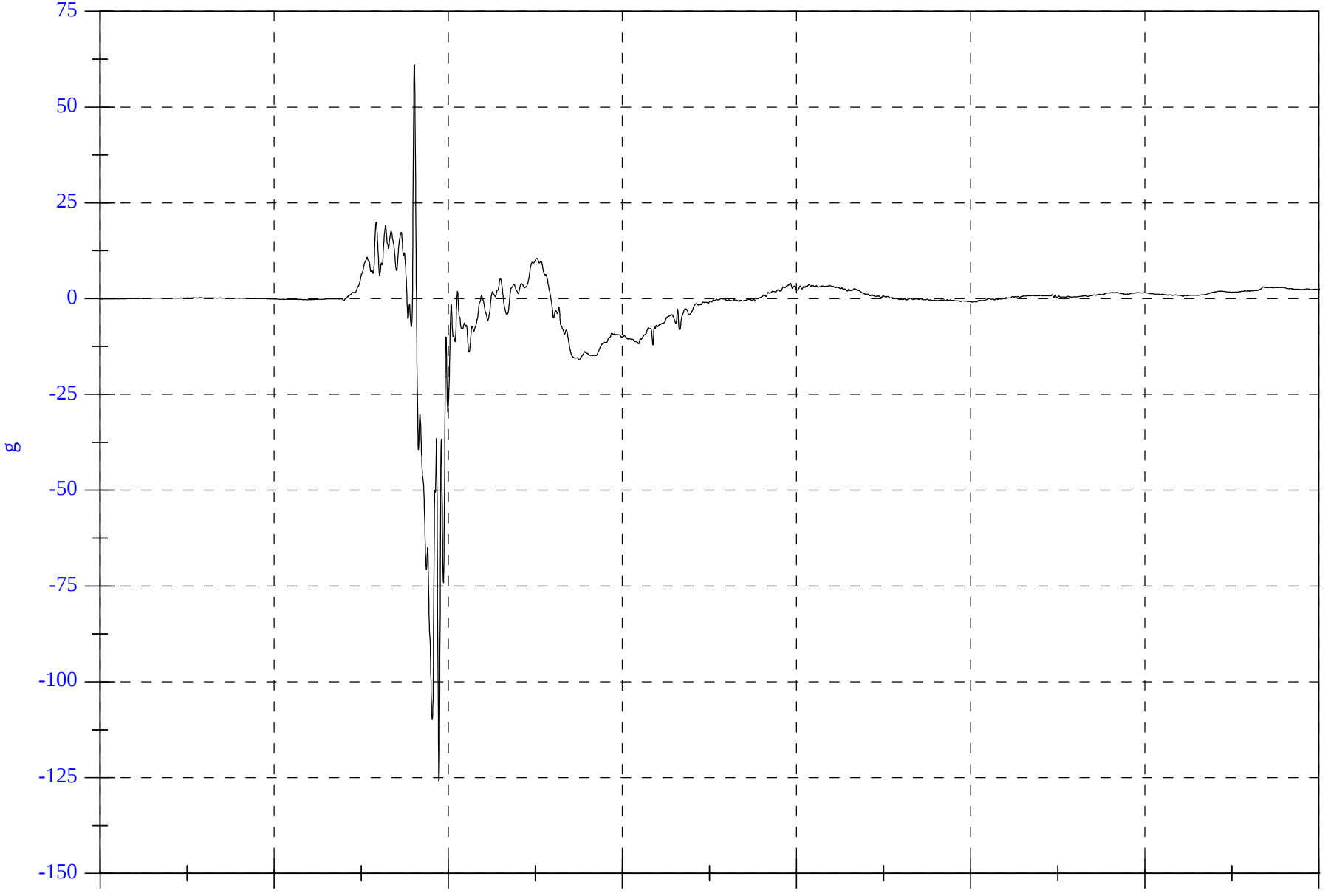
B-104

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Left Foot Aft z

Max: 61.1 [g] at 0.040 [s]
Min: -125.9 [g] at 0.047 [s]

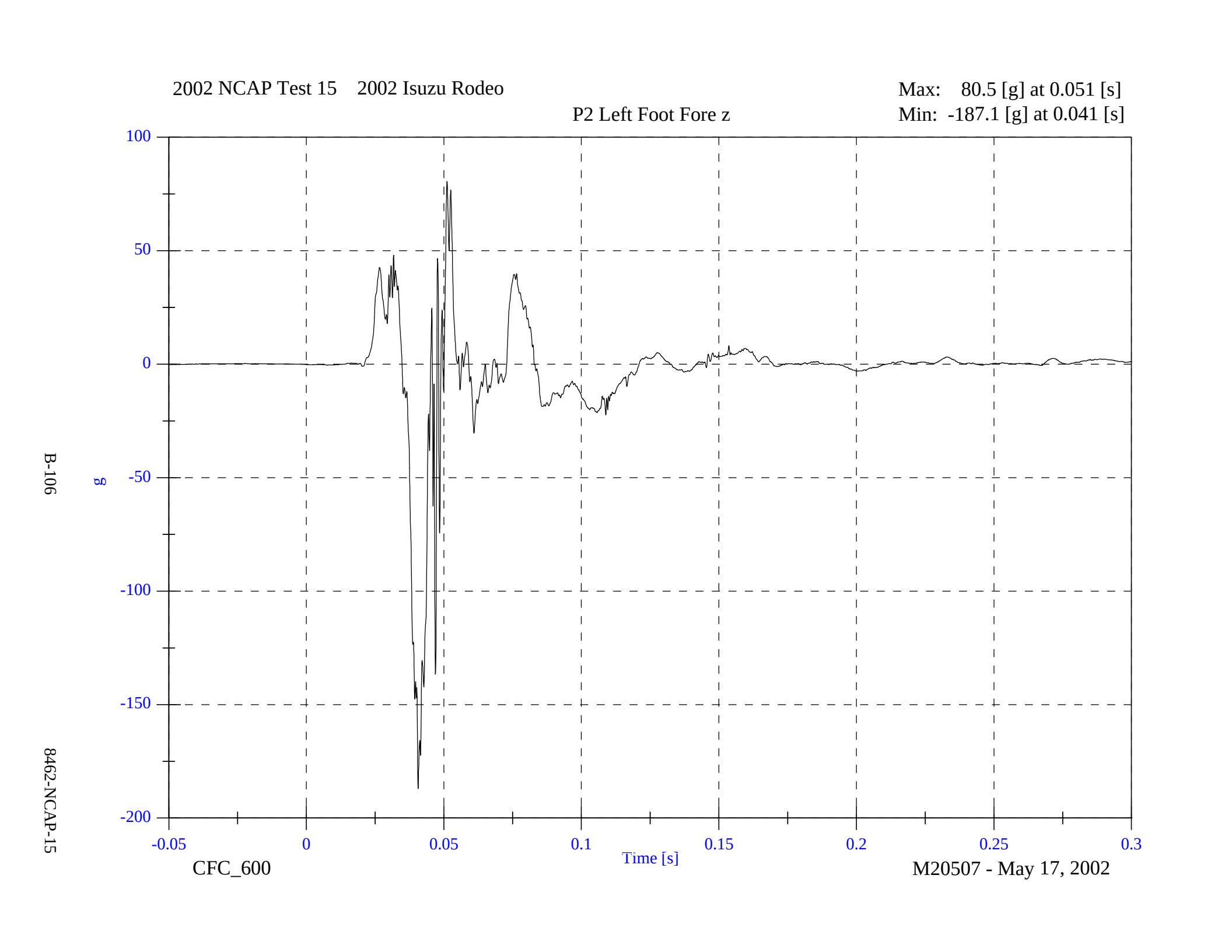


B-105

8462-NCAP-15

CFC_600

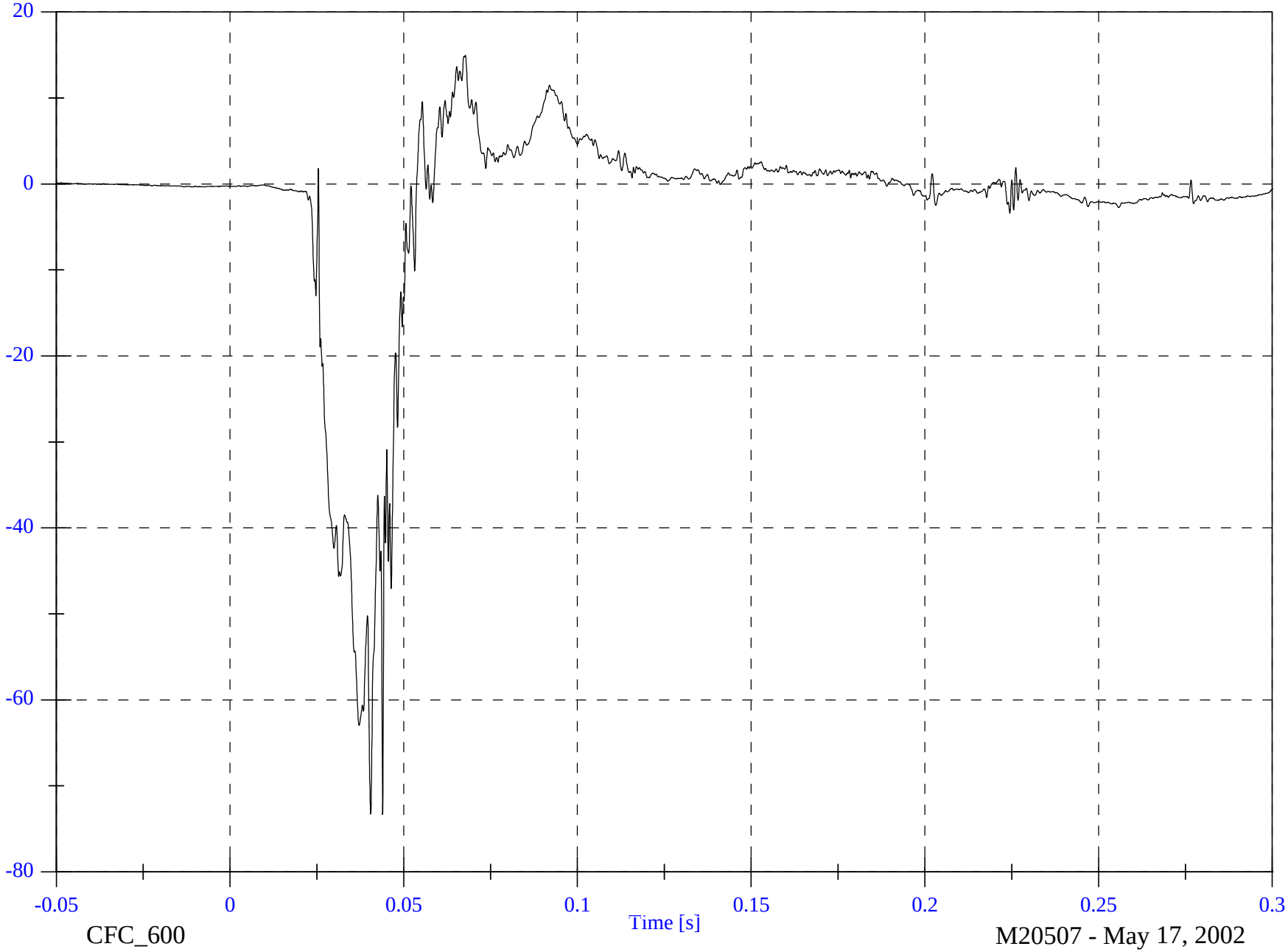
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P2 Left Foot Fore z
Max: 80.5 [g] at 0.051 [s]
Min: -187.1 [g] at 0.041 [s]
100
50
0
-50
-100
-150
-200
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_600
M20507 - May 17, 2002
B-106
8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Foot Aft x

Max: 15.0 [g] at 0.068 [s]
Min: -73.3 [g] at 0.044 [s]



B-107

8462-NCAP-15

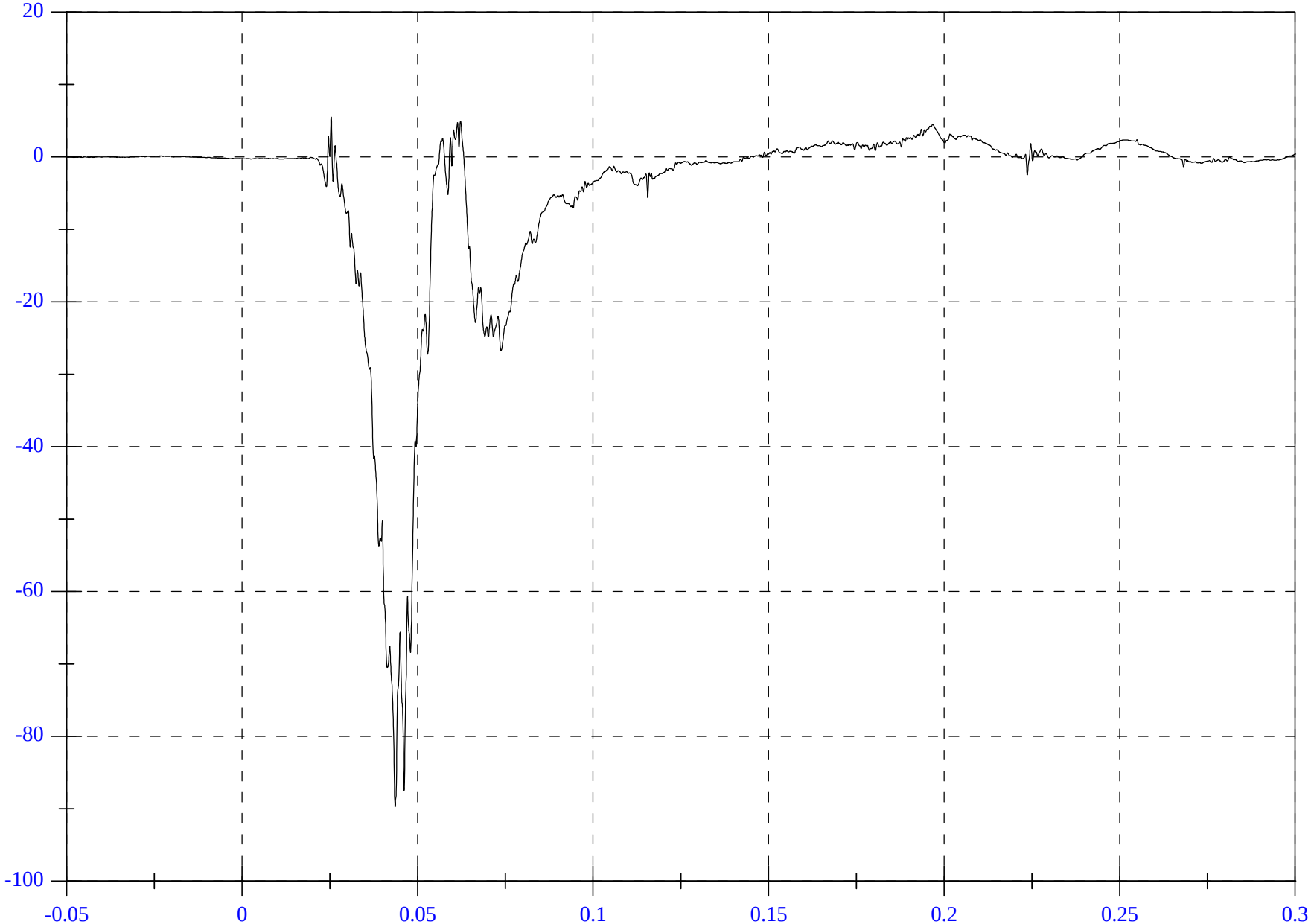
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Foot Aft z

Max: 5.5 [g] at 0.025 [s]
Min: -89.8 [g] at 0.044 [s]



B-108

8462-NCAP-15

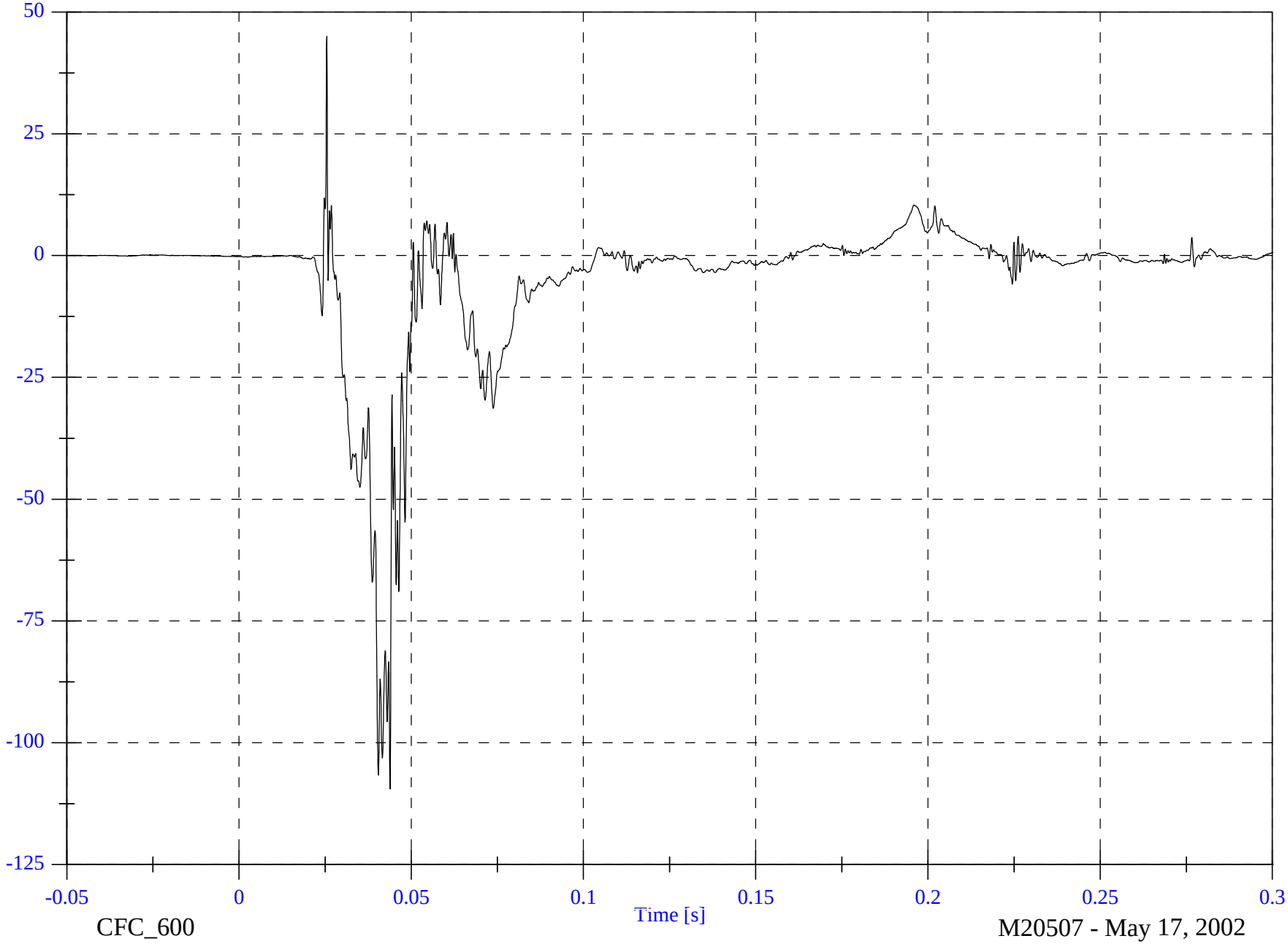
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P2 Right Foot Fore z

Max: 45.0 [g] at 0.025 [s]
Min: -109.5 [g] at 0.044 [s]



B-109

8462-NCAP-15

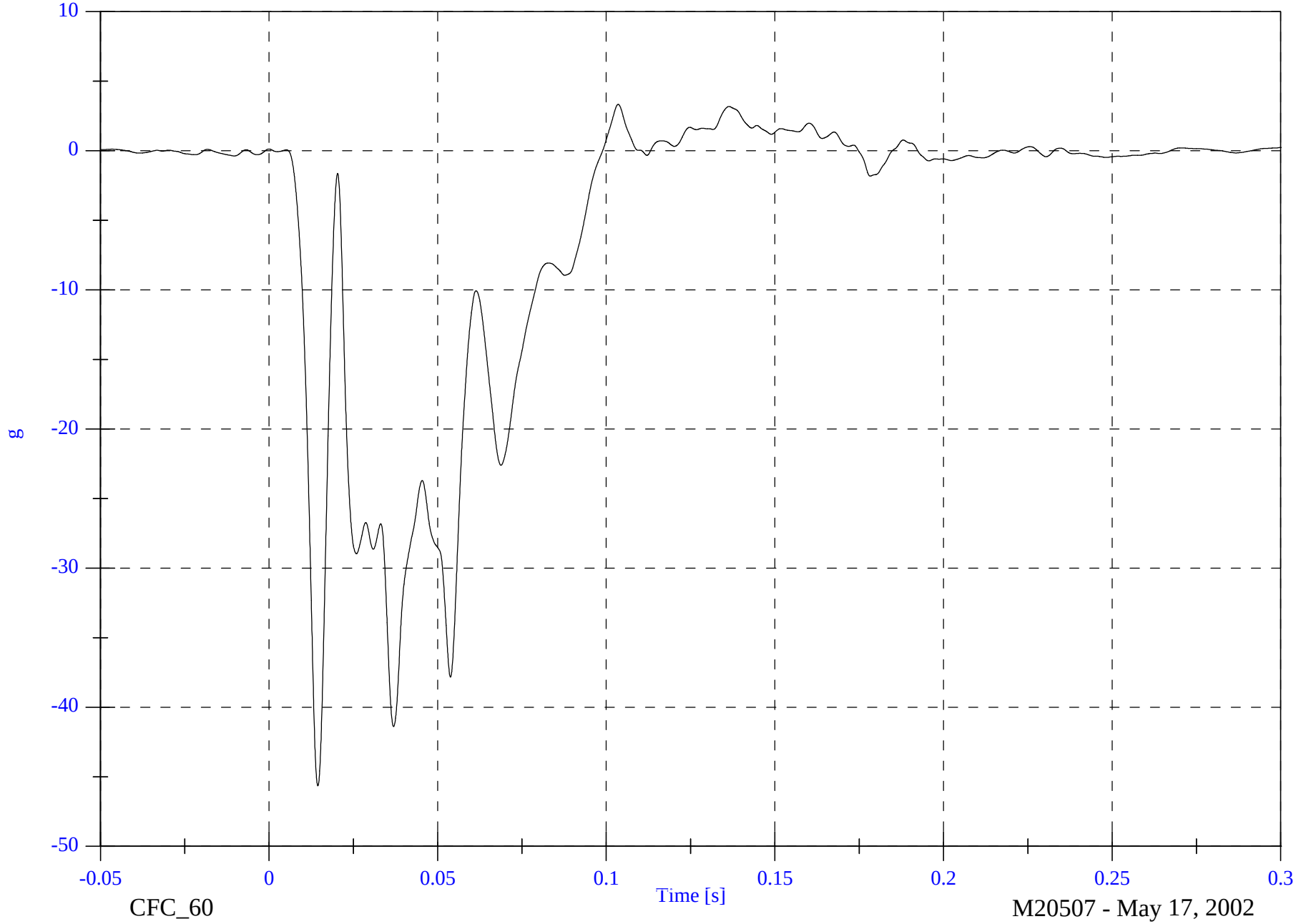
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Rear #1x

Max: 3.3 [g] at 0.104 [s]
Min: -45.7 [g] at 0.014 [s]



B-110

8462-NCAP-15

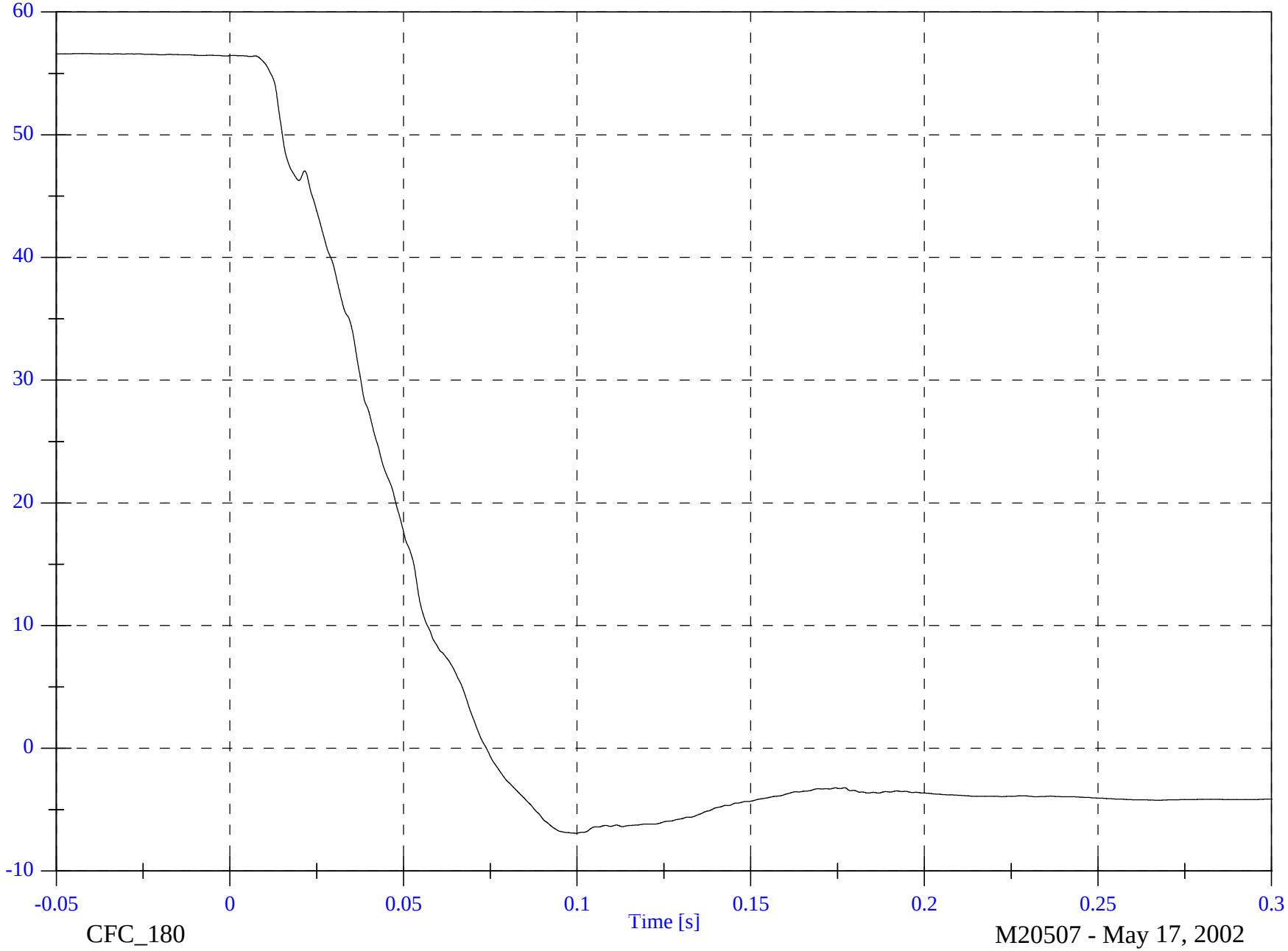
CFC_60

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Rear #1x Velocity

Max: 56.6 [kph] at -0.041 [s]
Min: -6.9 [kph] at 0.100 [s]



B-111

8462-NCAP-15

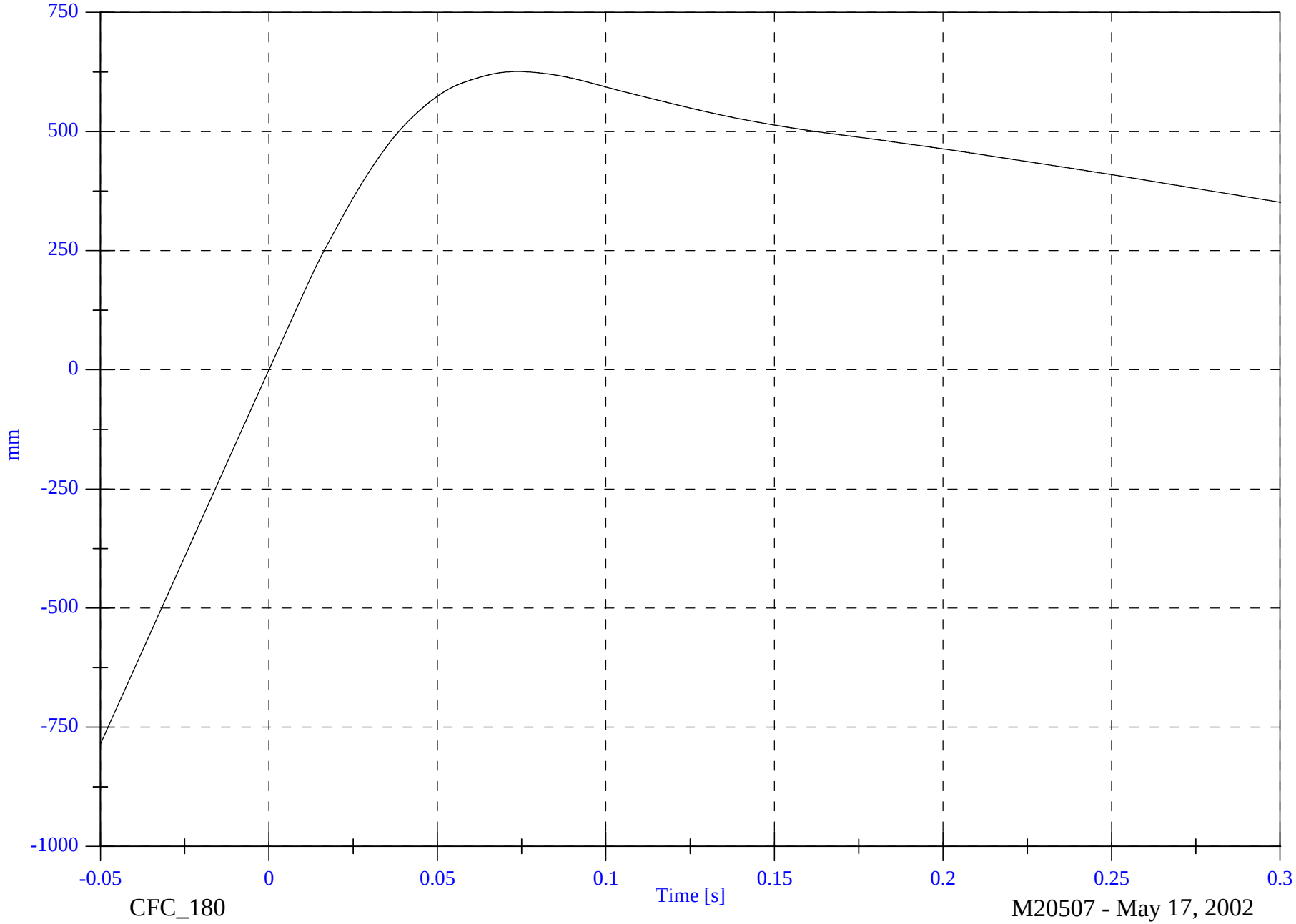
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Rear #1x Displacement

Max: 625.8 [mm] at 0.074 [s]
Min: -785.4 [mm] at -0.050 [s]



B-112

8462-NCAP-15

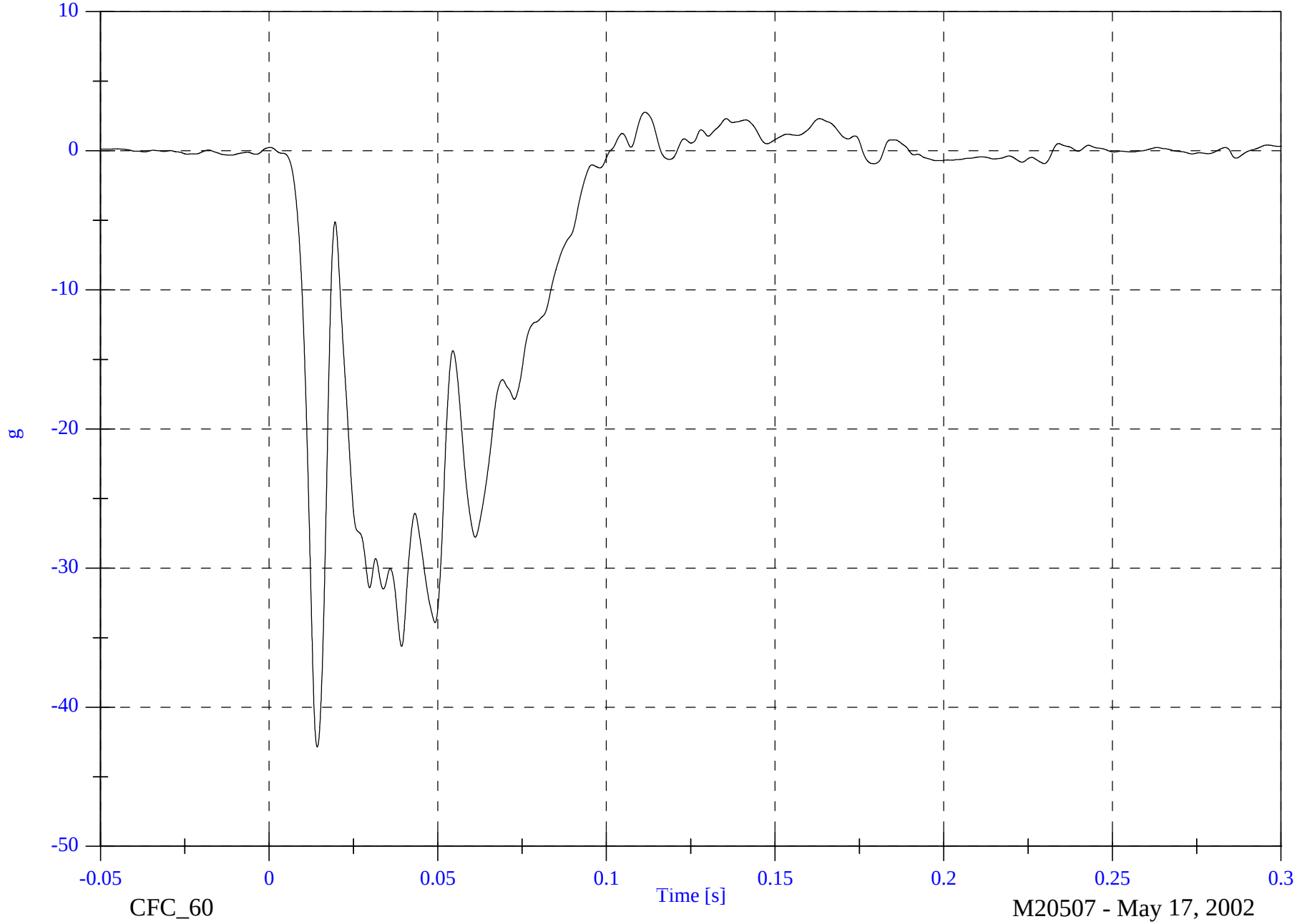
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Rear #2x

Max: 2.8 [g] at 0.111 [s]
Min: -42.9 [g] at 0.014 [s]



B-113

8462-NCAP-15

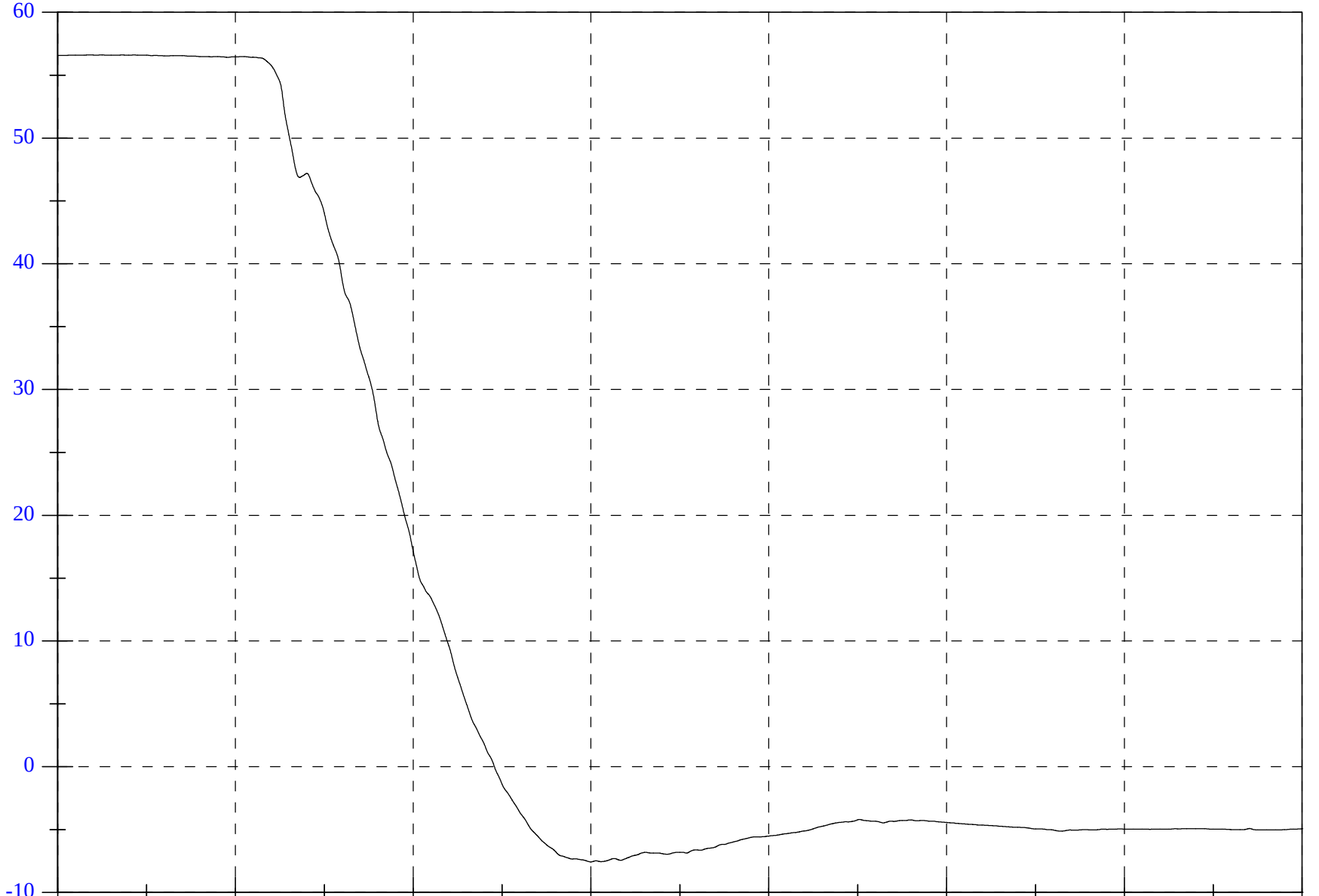
CFC_60

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Rear #2x Velocity

Max: 56.6 [kph] at -0.038 [s]
Min: -7.6 [kph] at 0.100 [s]



CFC_180

M20507 - May 17, 2002

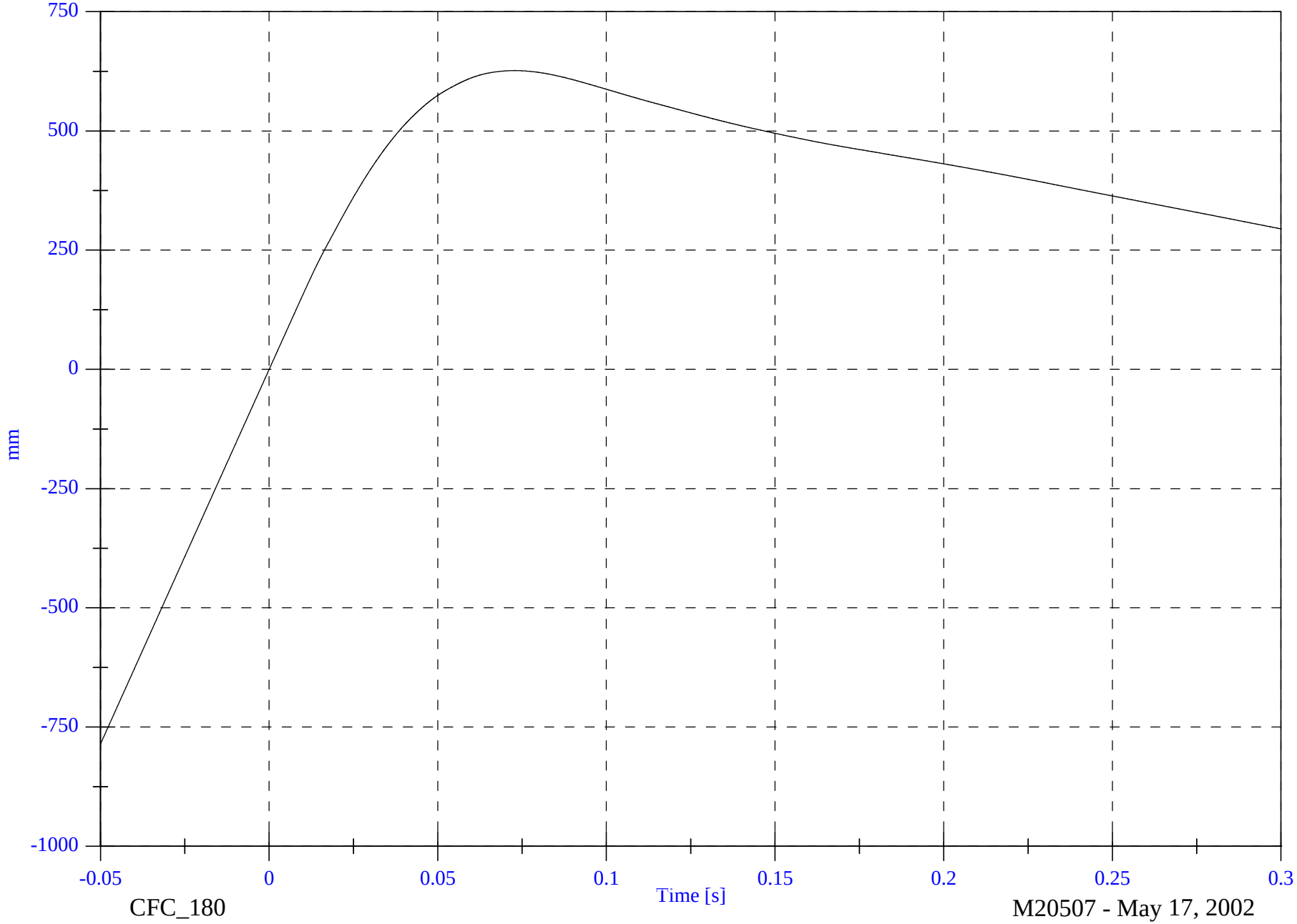
B-114

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Rear #2x Displacement

Max: 626.6 [mm] at 0.073 [s]
Min: -785.5 [mm] at -0.050 [s]



B-115

8462-NCAP-15

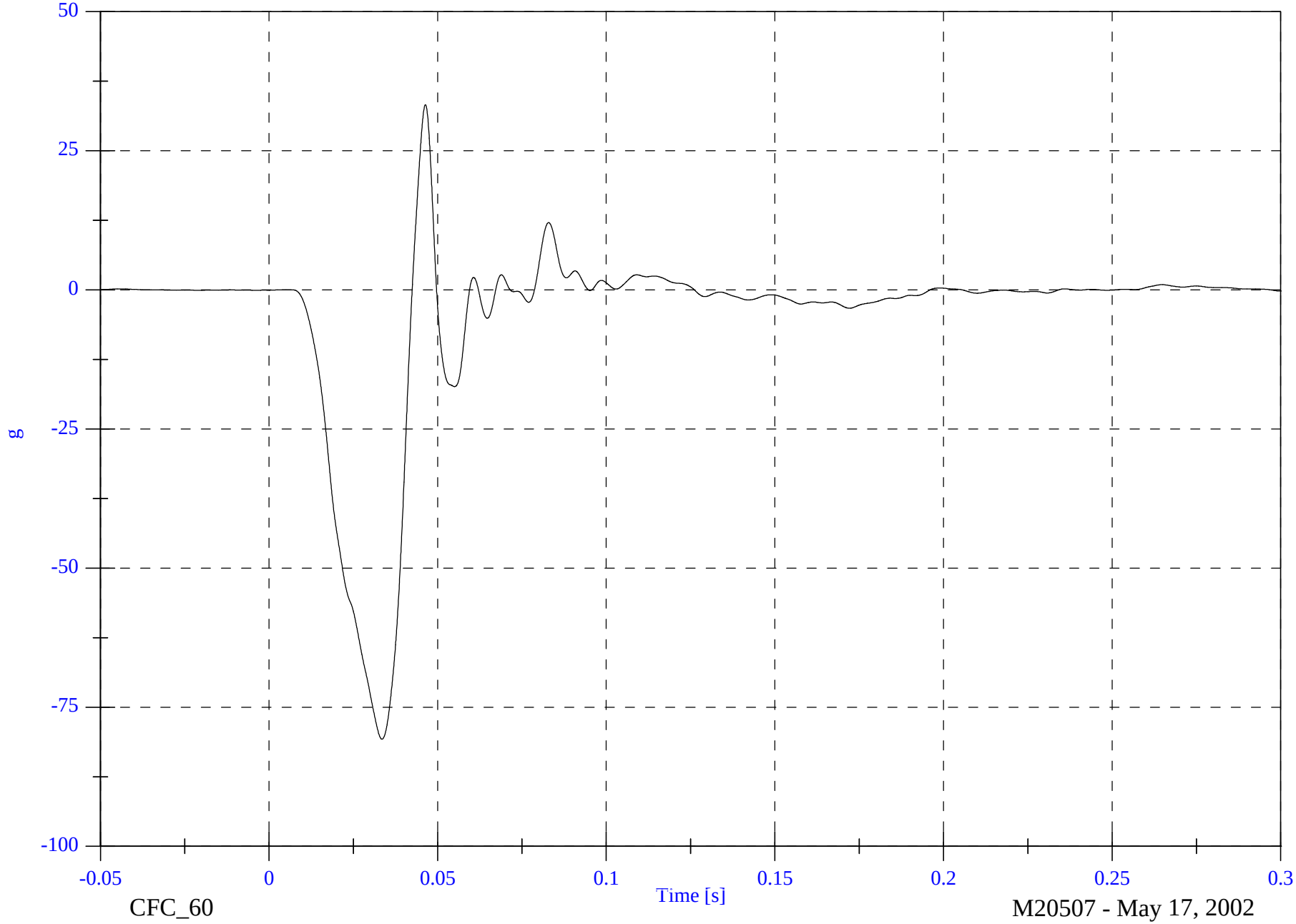
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Engine Top #3x

Max: 33.3 [g] at 0.046 [s]
Min: -80.7 [g] at 0.033 [s]



B-116

8462-NCAP-15

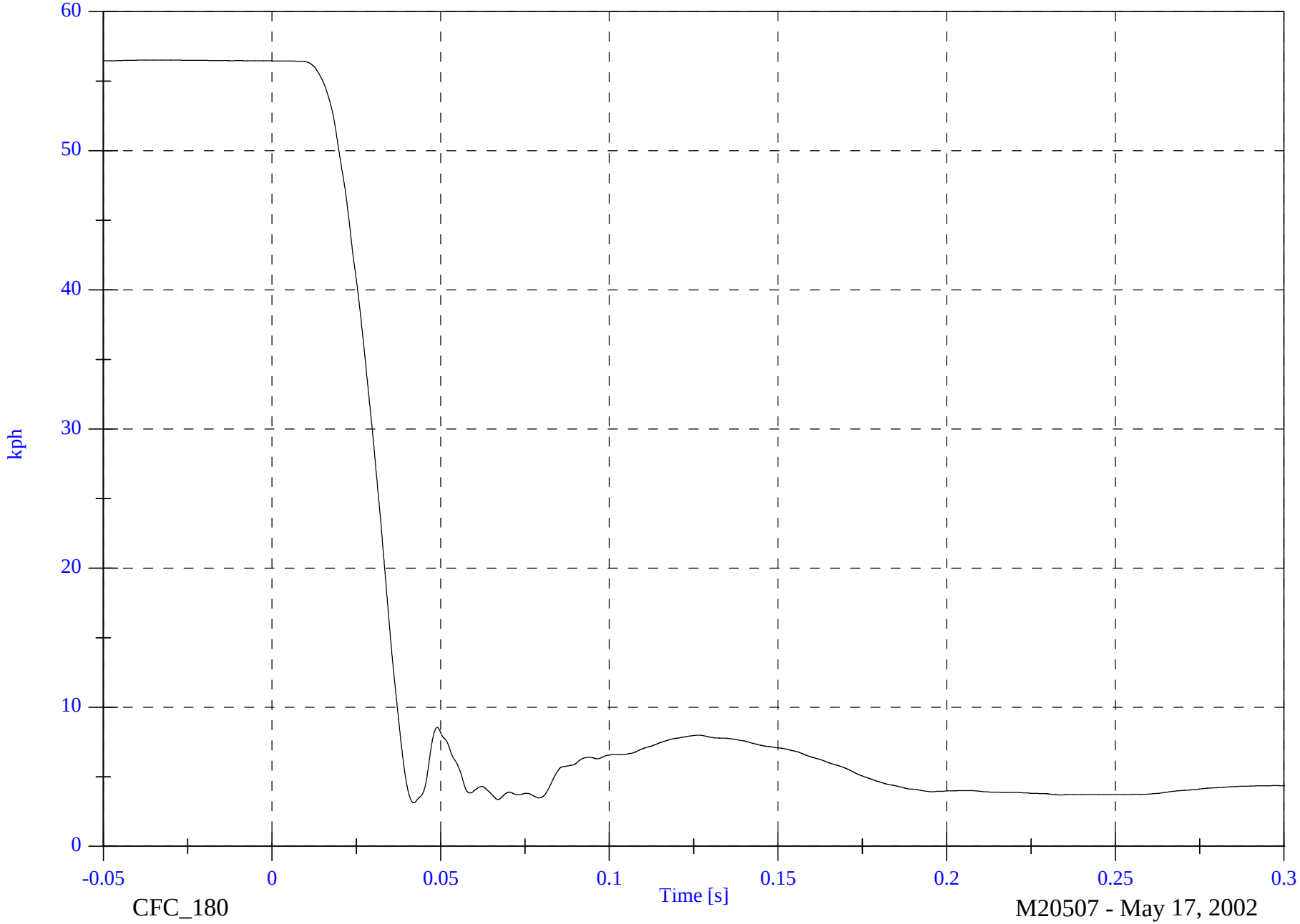
CFC_60

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Engine Top #3x Velocity

Max: 56.5 [kph] at -0.031 [s]
Min: 3.1 [kph] at 0.042 [s]



B-117

8462-NCAP-15

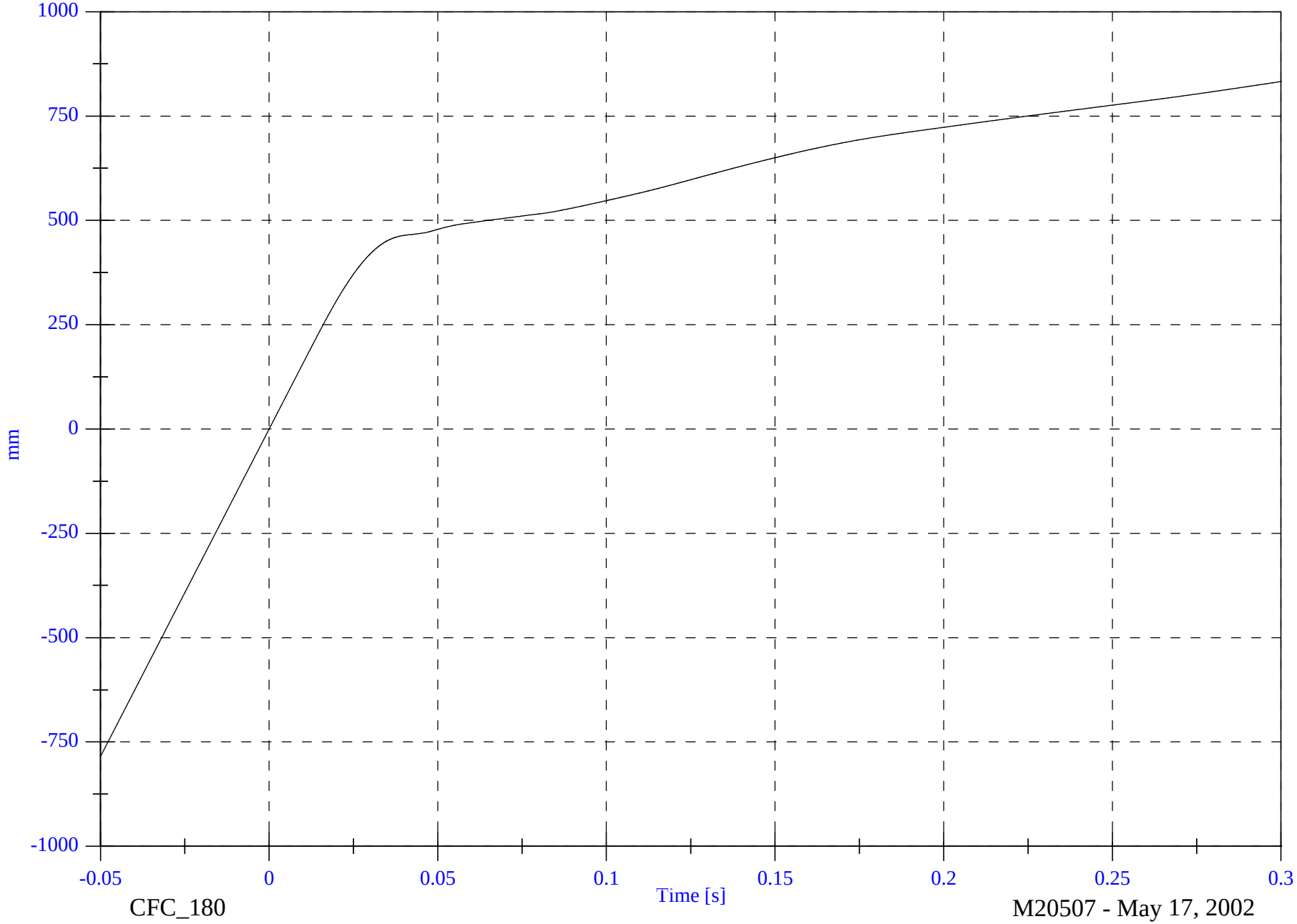
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Engine Top #3x Displacement

Max: 832.6 [mm] at 0.300 [s]
Min: -784.7 [mm] at -0.050 [s]



B-118

8462-NCAP-15

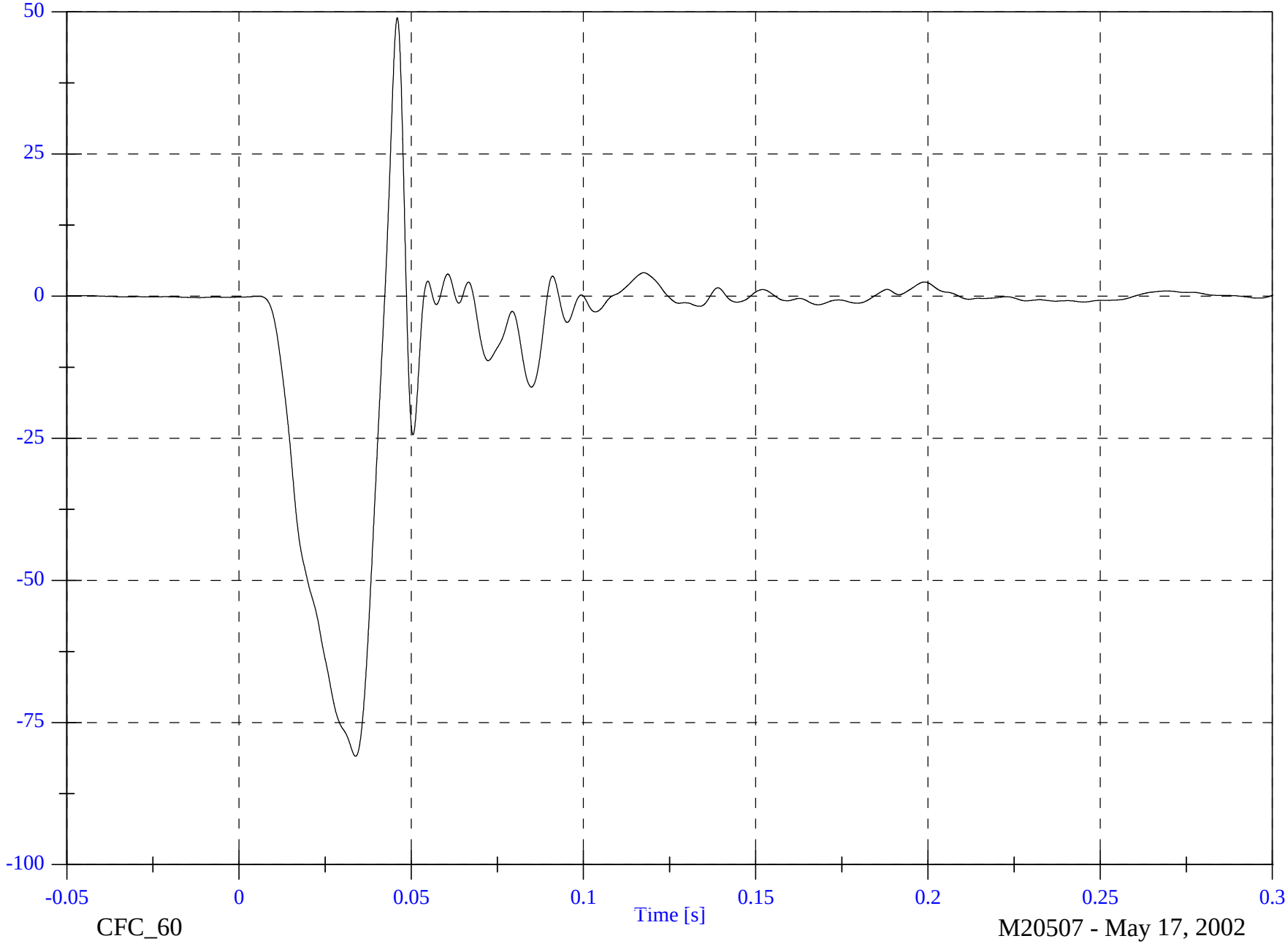
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Engine Bottom #4x

Max: 49.0 [g] at 0.046 [s]
Min: -80.9 [g] at 0.034 [s]



B-119

8462-NCAP-15

CFC_60

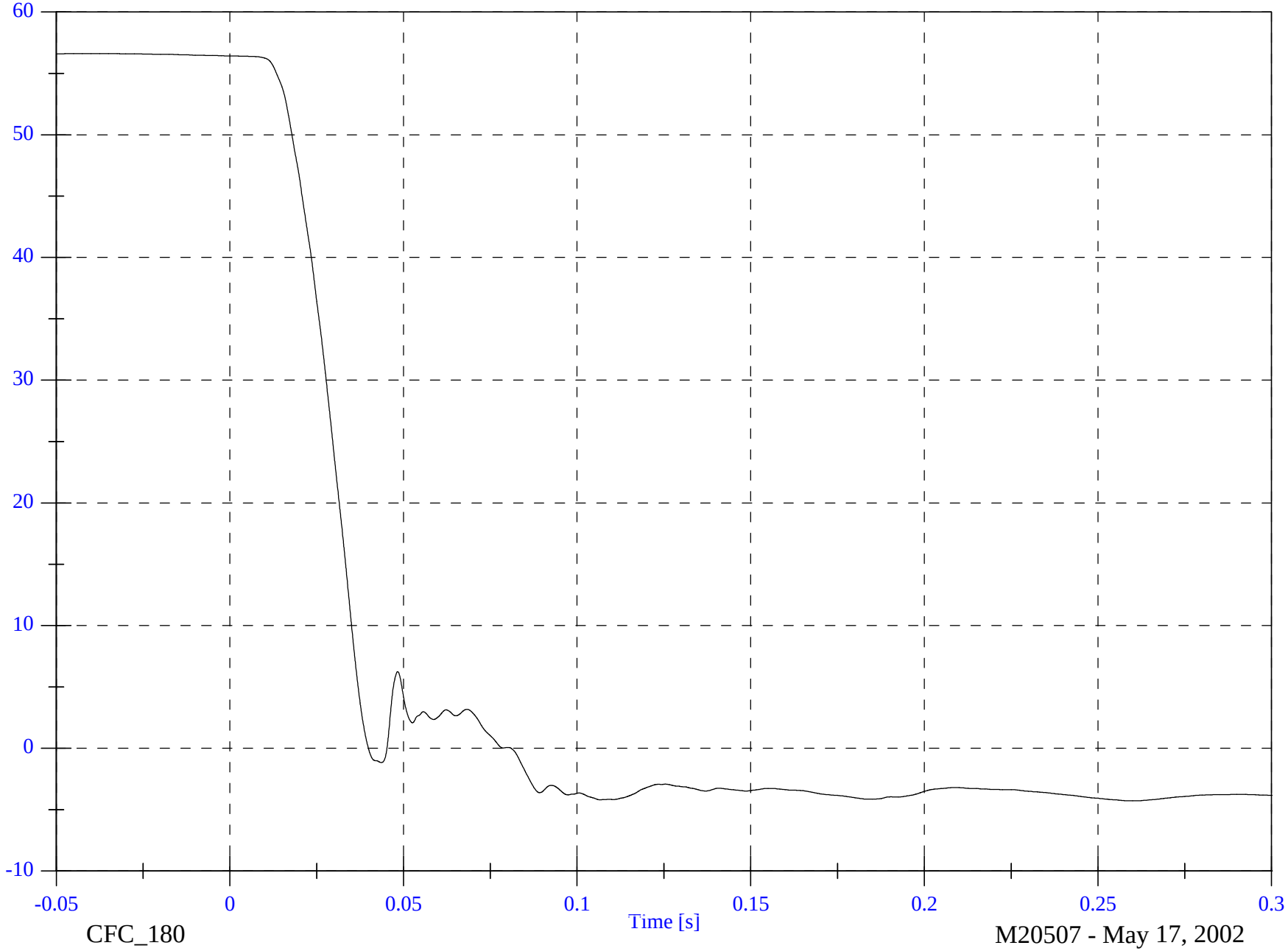
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Max: 56.6 [kph] at -0.040 [s]

Engine Bottom #4x Velocity

Min: -4.3 [kph] at 0.259 [s]



B-120

8462-NCAP-15

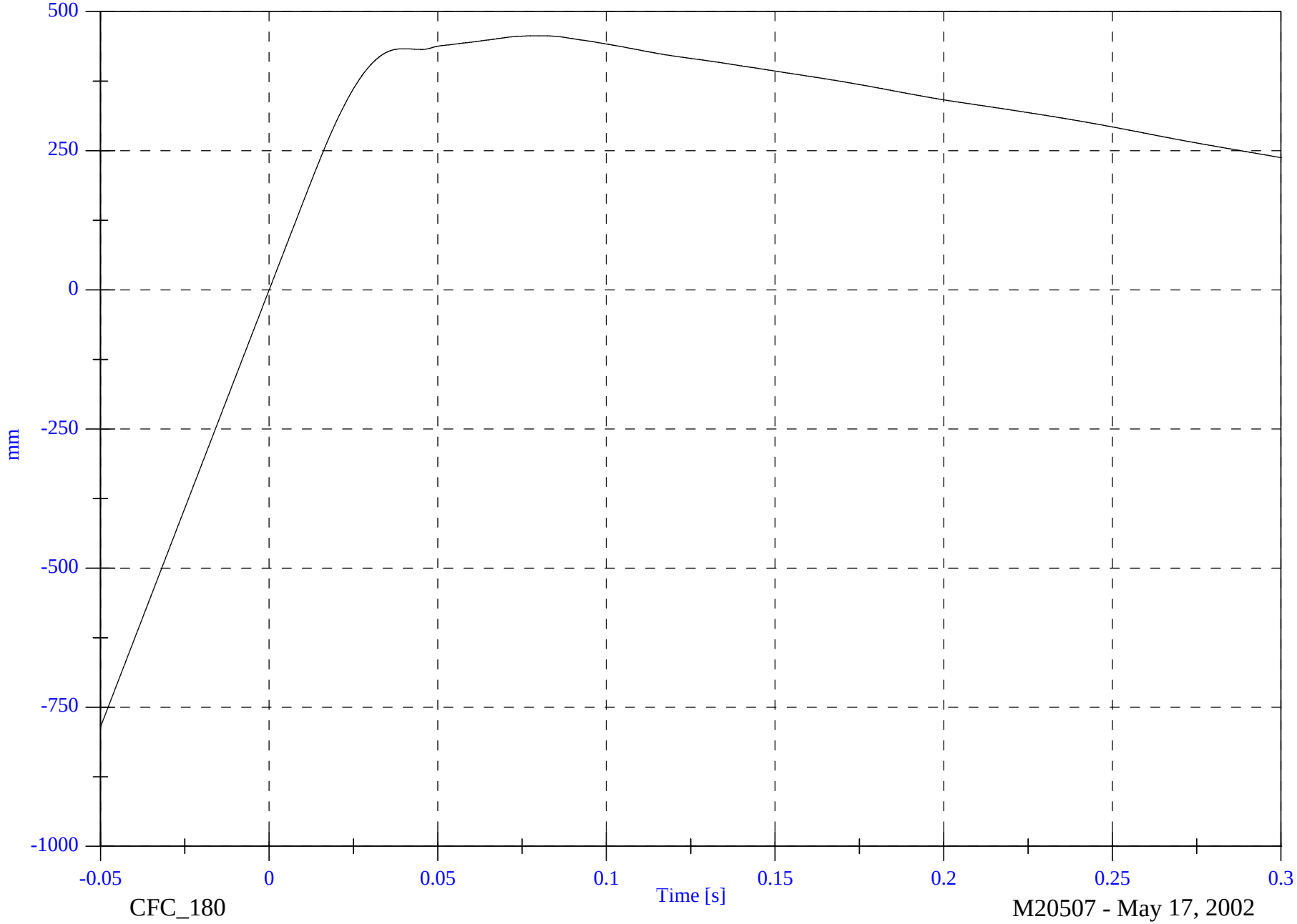
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Engine Bottom #4x Displacement

Max: 456.6 [mm] at 0.081 [s]
Min: -785.5 [mm] at -0.050 [s]



B-121

8462-NCAP-15

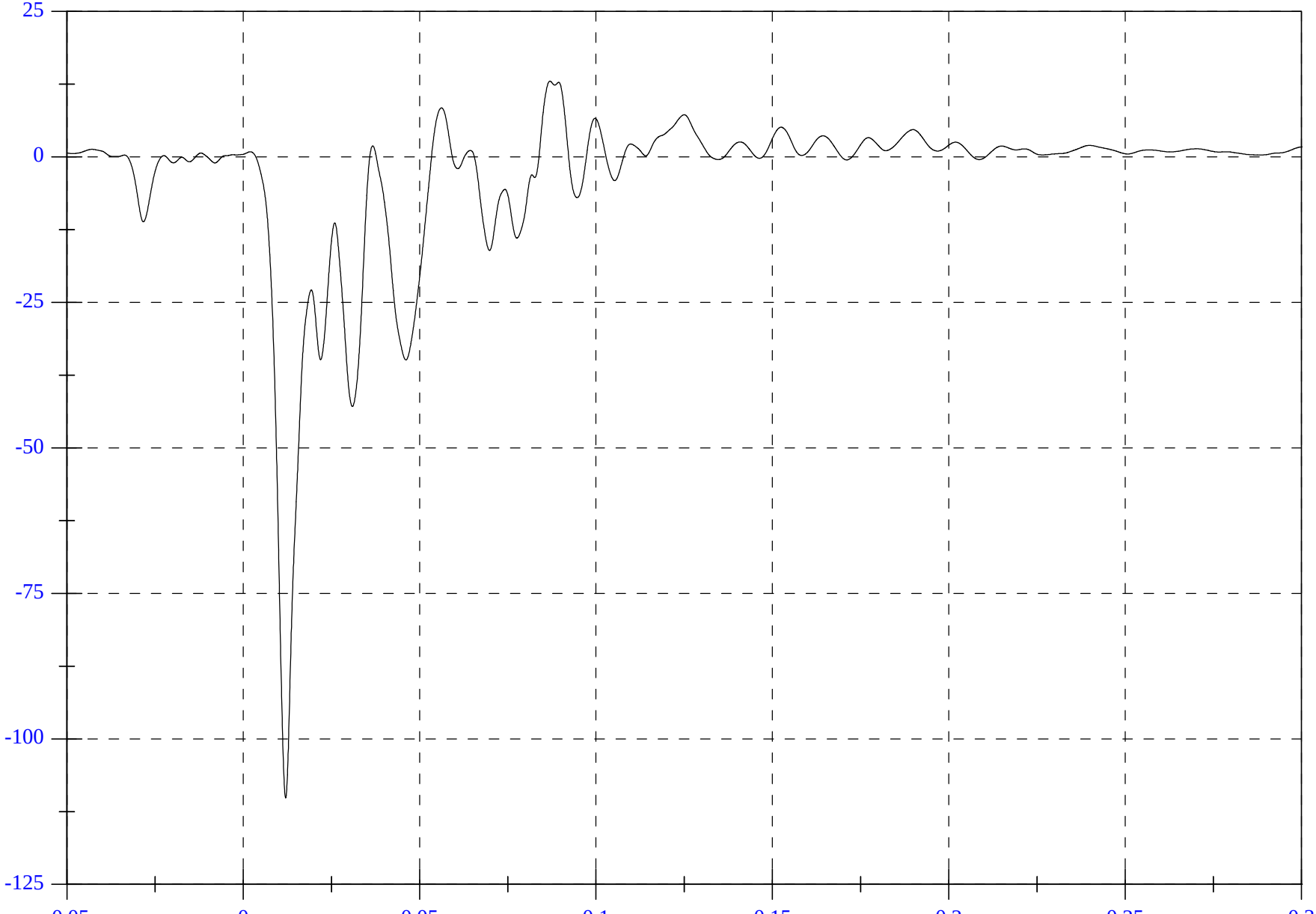
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Caliper #5x

Max: 13.0 [g] at 0.087 [s]
Min: -110.2 [g] at 0.012 [s]



B-122

8462-NCAP-15

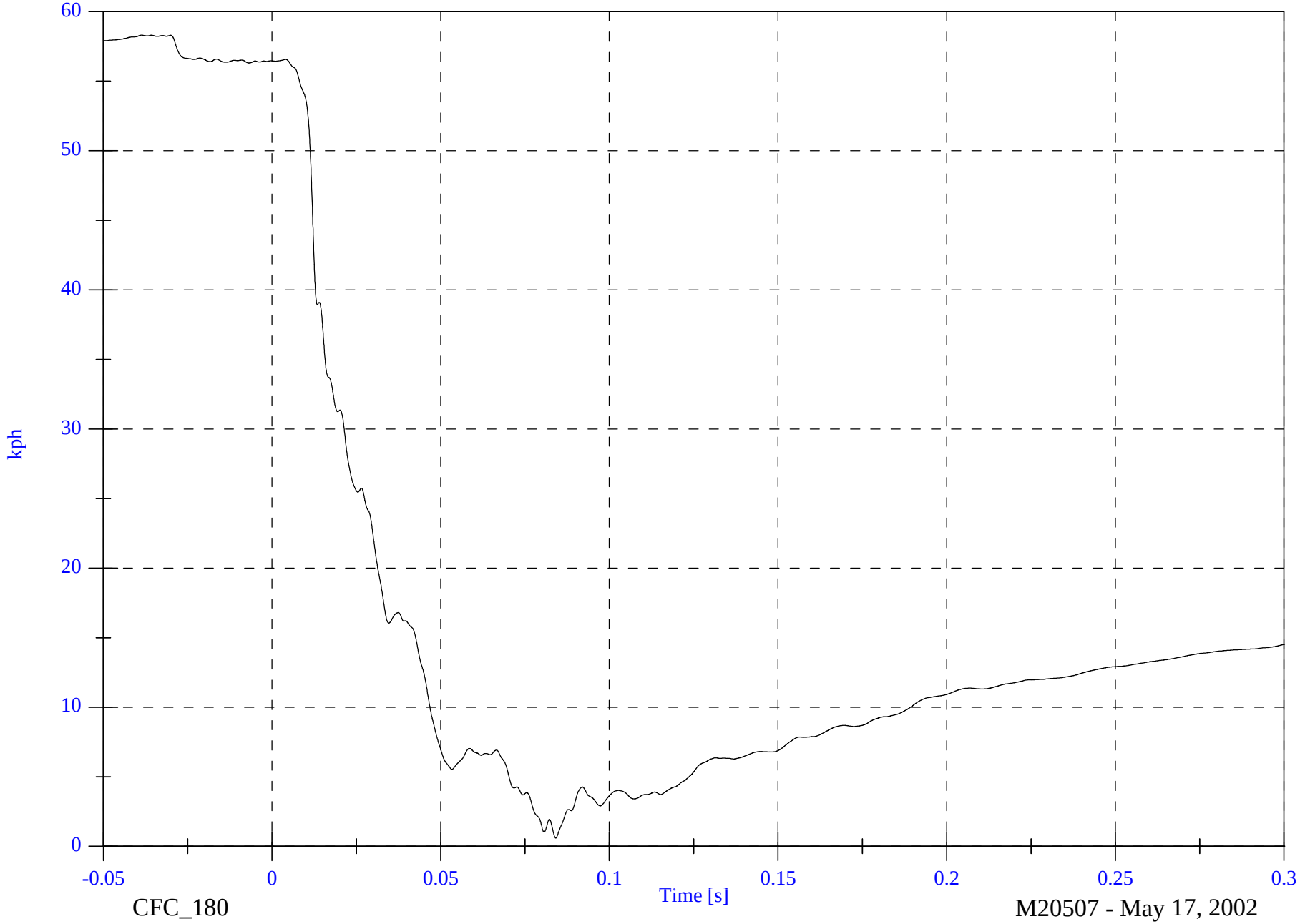
CFC_60

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Caliper #5x Velocity

Max: 58.3 [kph] at -0.039 [s]
Min: 0.6 [kph] at 0.084 [s]



B-123

8462-NCAP-15

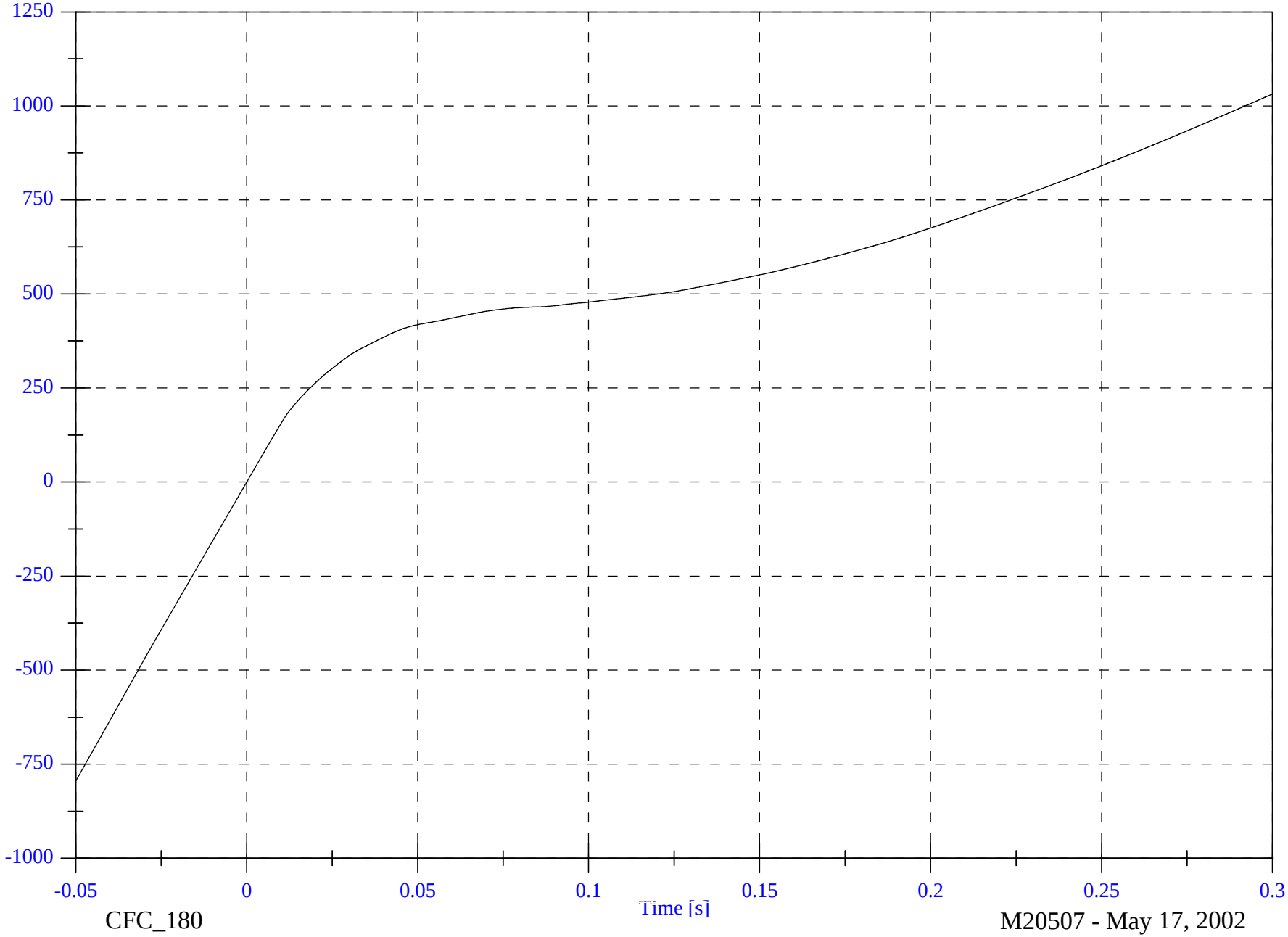
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Caliper #5x Displacement

Max: 1031.7 [mm] at 0.300 [s]
Min: -794.8 [mm] at -0.050 [s]



B-124

8462-NCAP-15

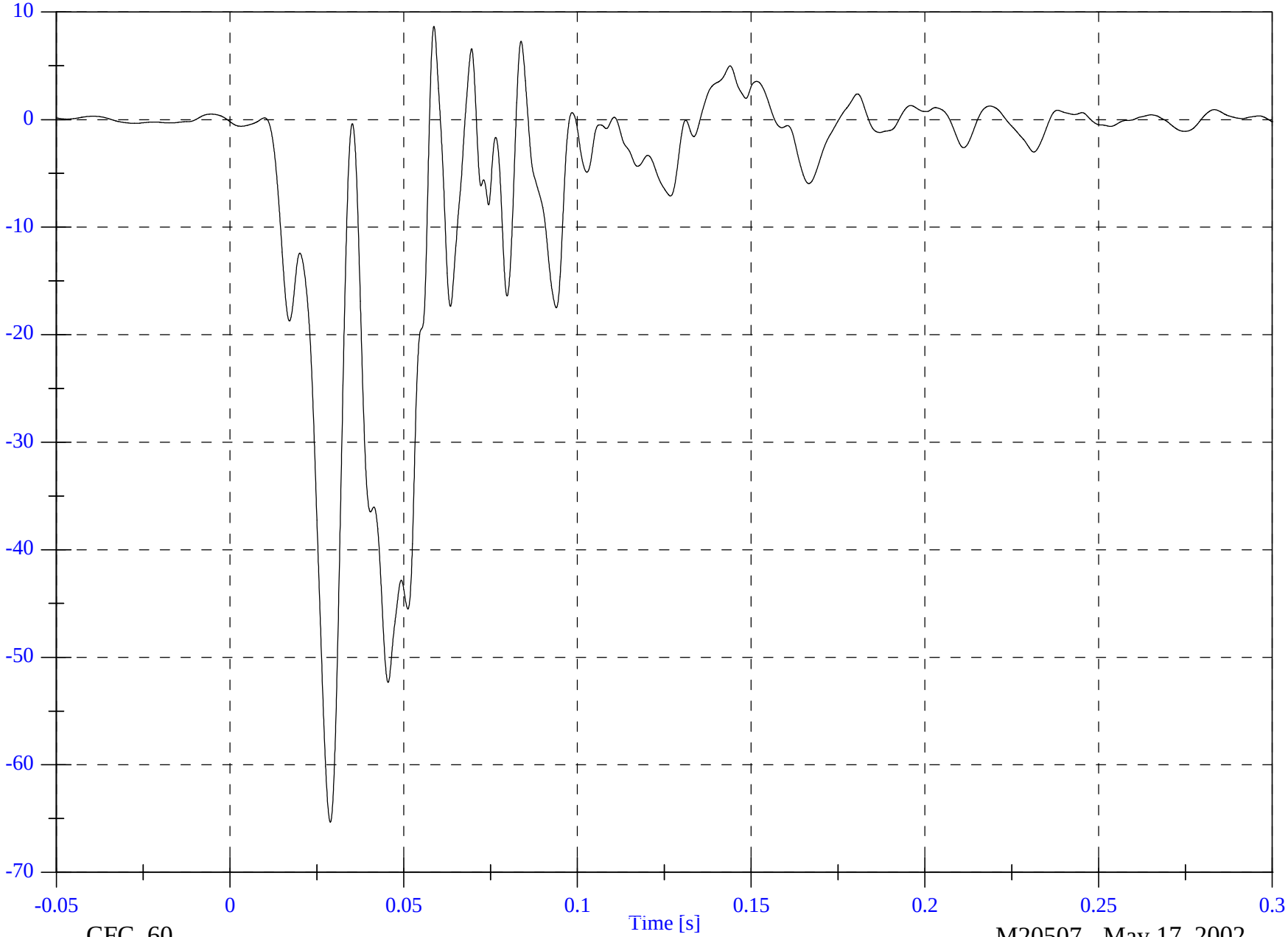
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Instrument Panel #6x

Max: 8.7 [g] at 0.059 [s]
Min: -65.3 [g] at 0.029 [s]



B-125

8462-NCAP-15

CFC_60

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Instrument Panel #6x Velocity

Max: 56.7 [kph] at -0.034 [s]
Min: -2.4 [kph] at 0.135 [s]



B-126

8462-NCAP-15

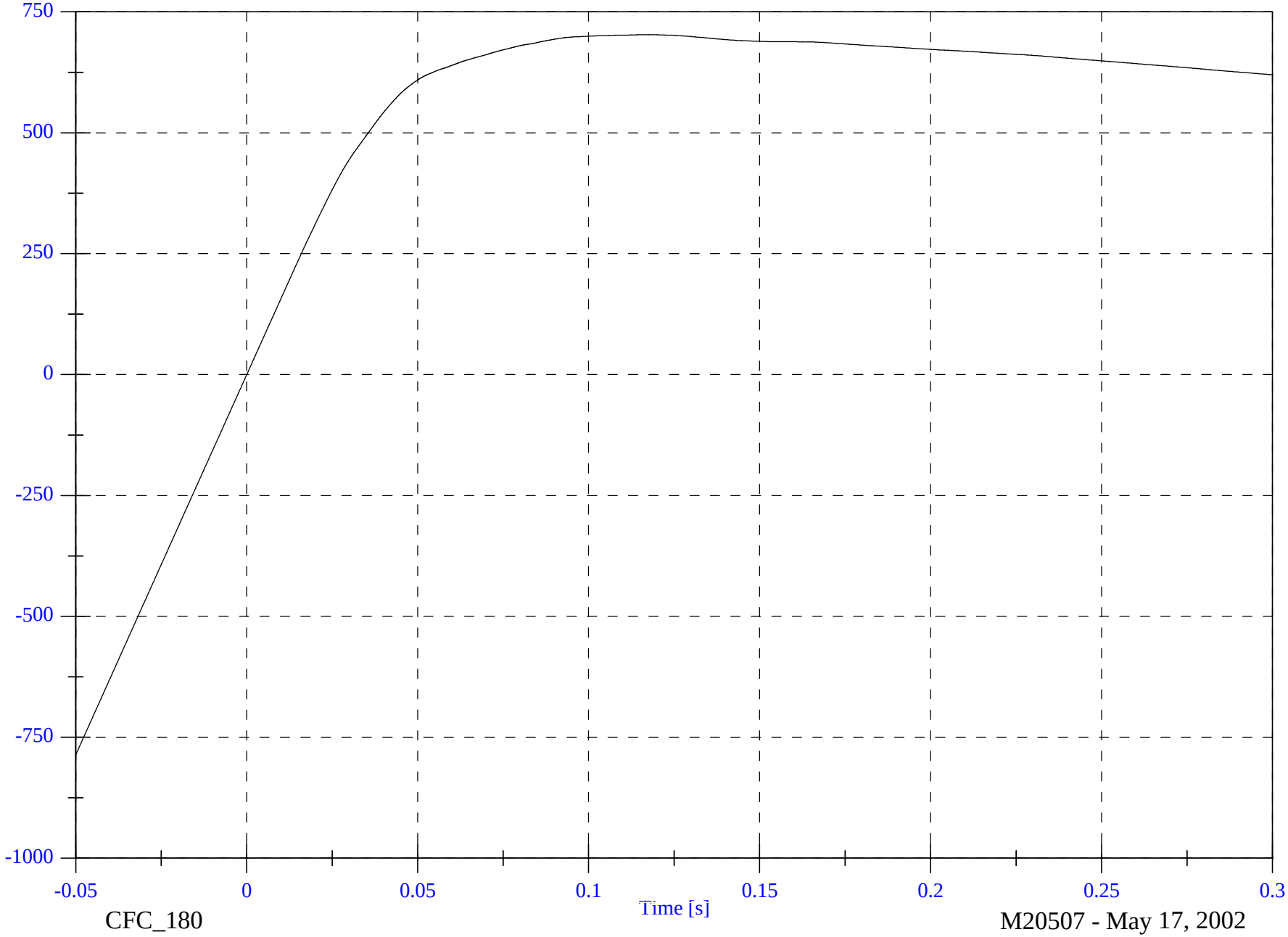
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Instrument Panel #6x Displacement

Max: 702.6 [mm] at 0.117 [s]
Min: -786.1 [mm] at -0.050 [s]



B-127

8462-NCAP-15

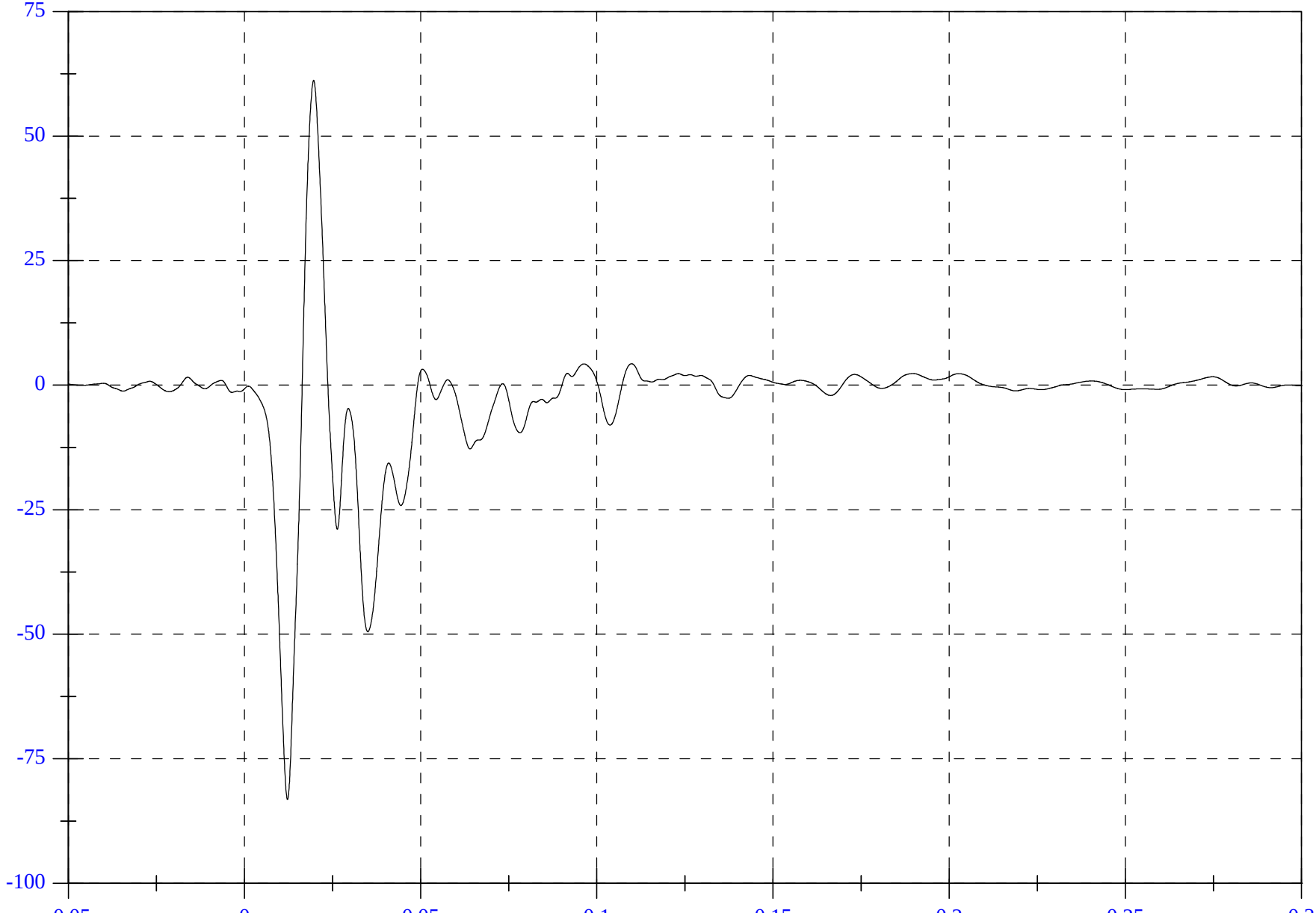
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Caliper #7x

Max: 61.2 [g] at 0.020 [s]
Min: -83.2 [g] at 0.012 [s]



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8462-NCAP-15

CFC_60

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Caliper #7x Velocity

Max: 56.8 [kph] at -0.039 [s]
Min: 23.2 [kph] at 0.107 [s]



B-129

8462-NCAP-15

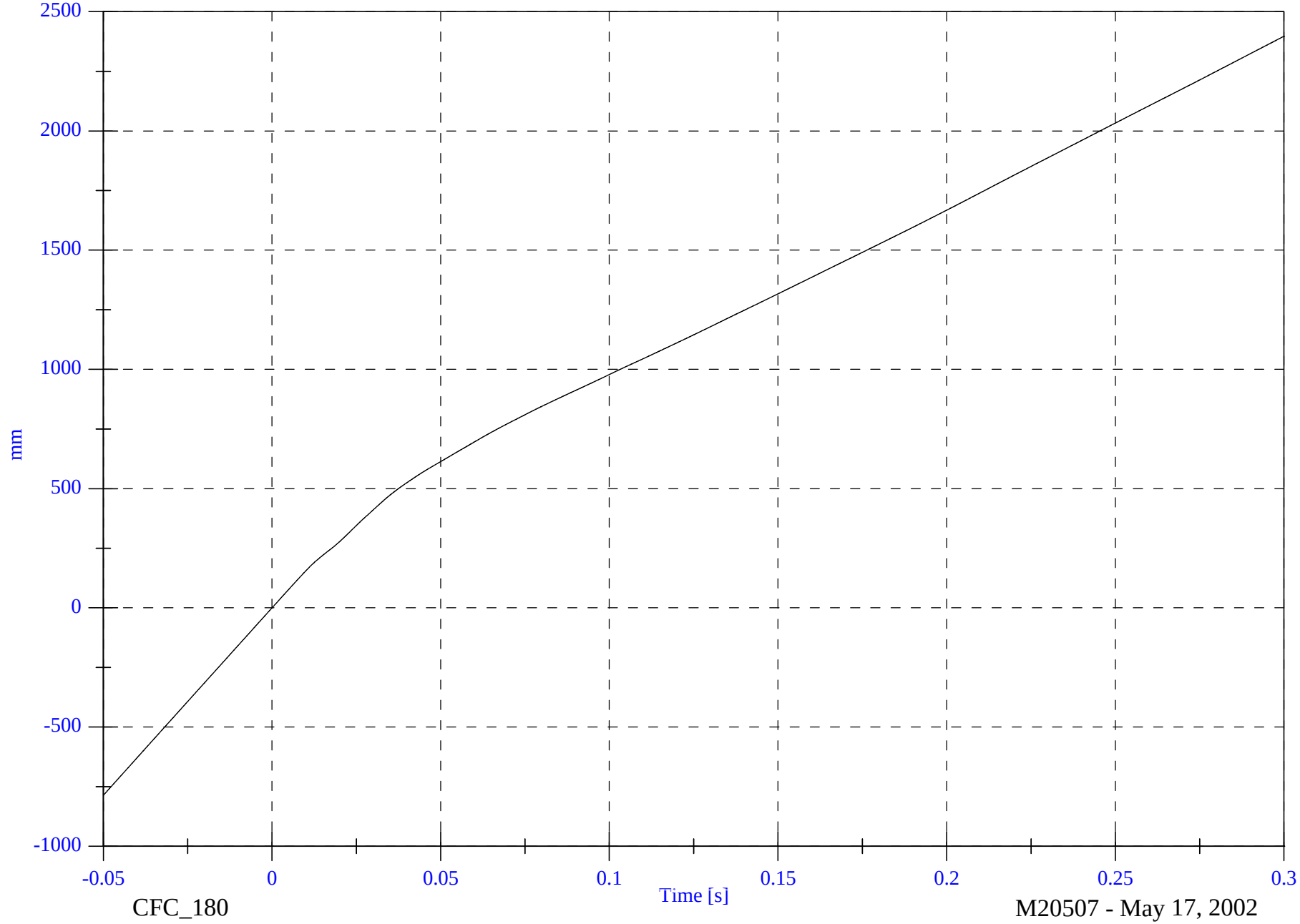
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Caliper #7x Displacement

Max: 2397.0 [mm] at 0.300 [s]
Min: -786.1 [mm] at -0.050 [s]



B-130

8462-NCAP-15

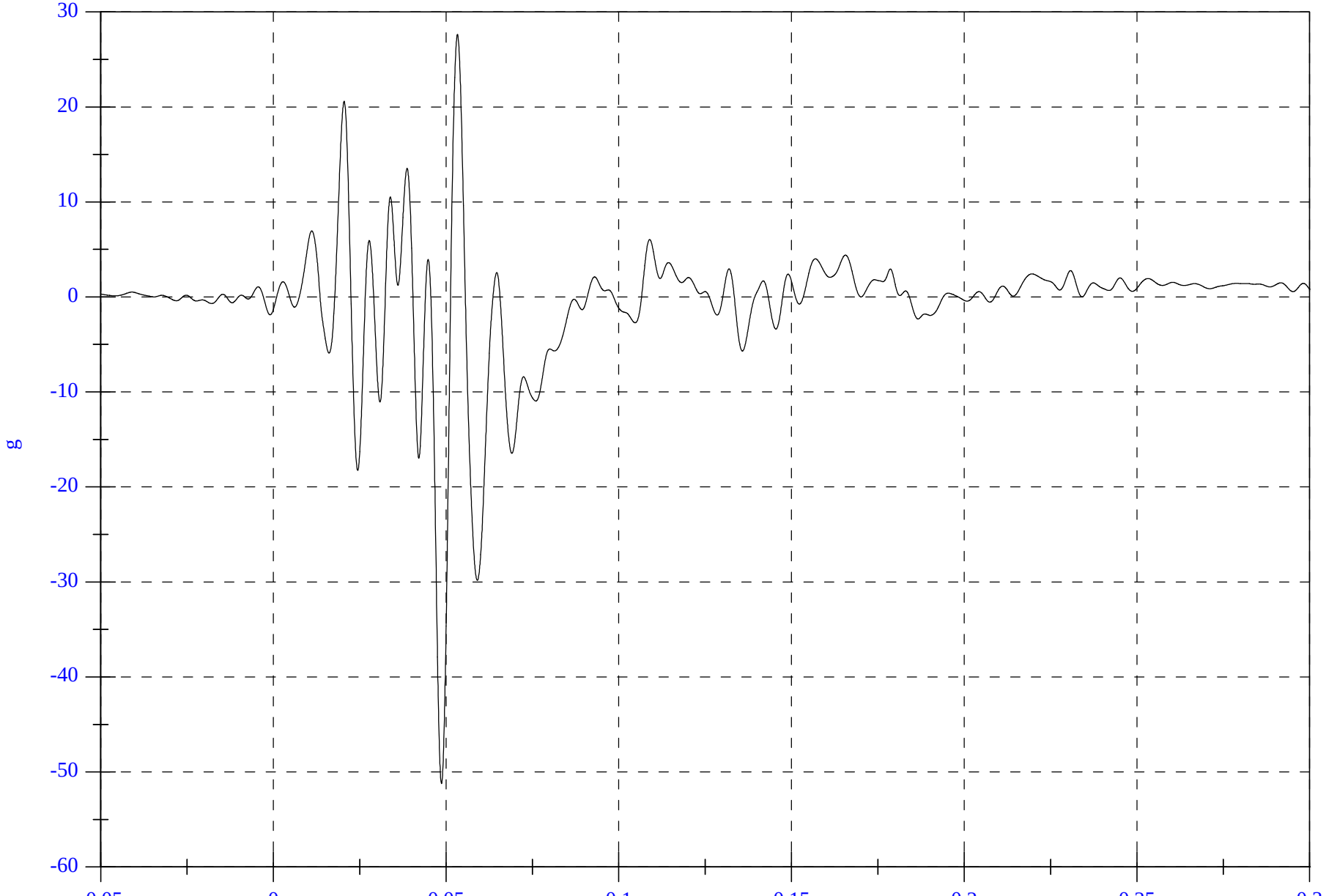
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Rear #8z

Max: 27.6 [g] at 0.053 [s]
Min: -51.2 [g] at 0.049 [s]



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8462-NCAP-15

CFC_60

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Rear #8z Velocity

Max: 3.4 [kph] at 0.041 [s]
Min: -13.6 [kph] at 0.107 [s]



B-132

8462-NCAP-15

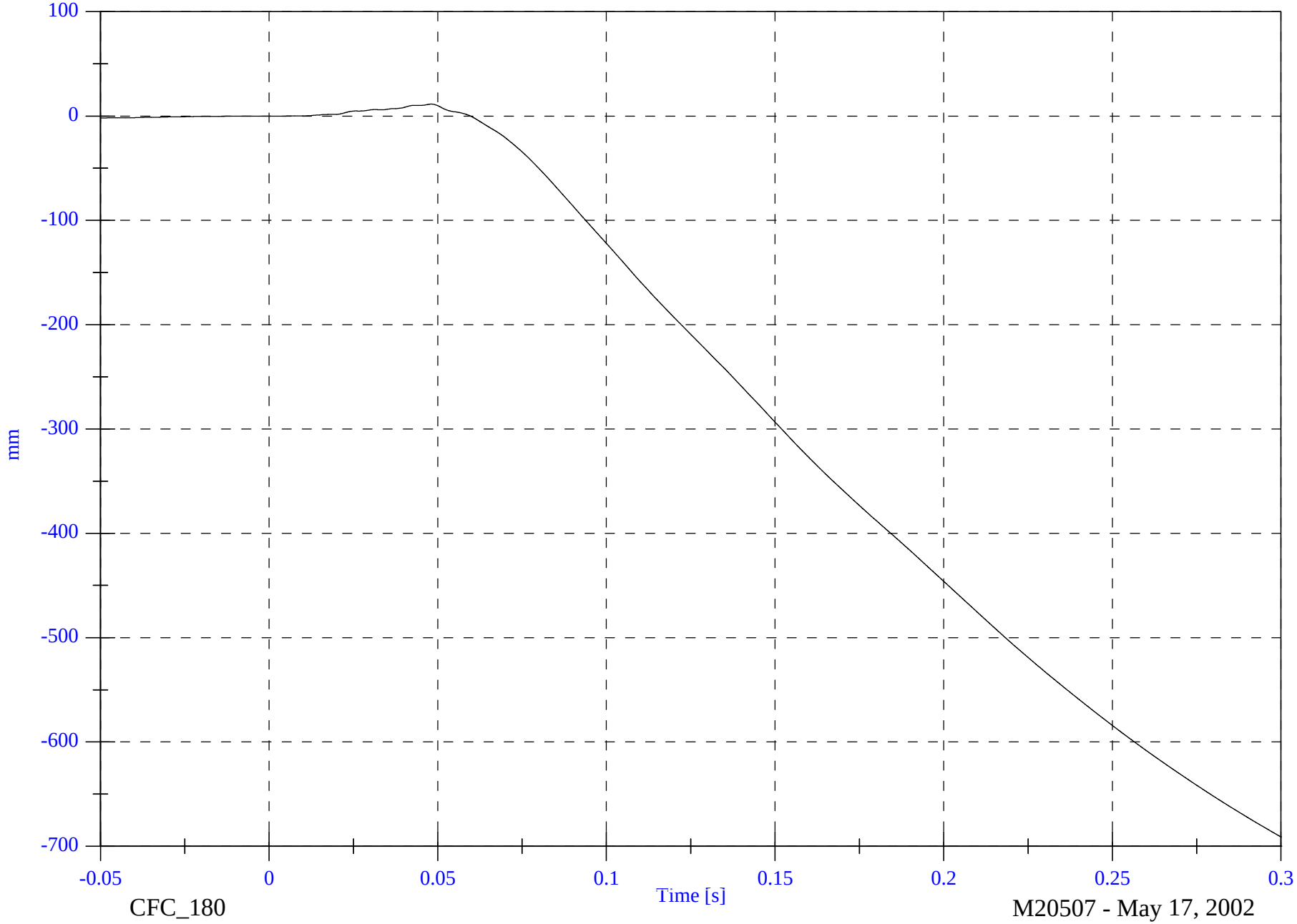
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Left Rear #8z Displacement

Max: 11.5 [mm] at 0.048 [s]
Min: -691.0 [mm] at 0.300 [s]



B-133

8462-NCAP-15

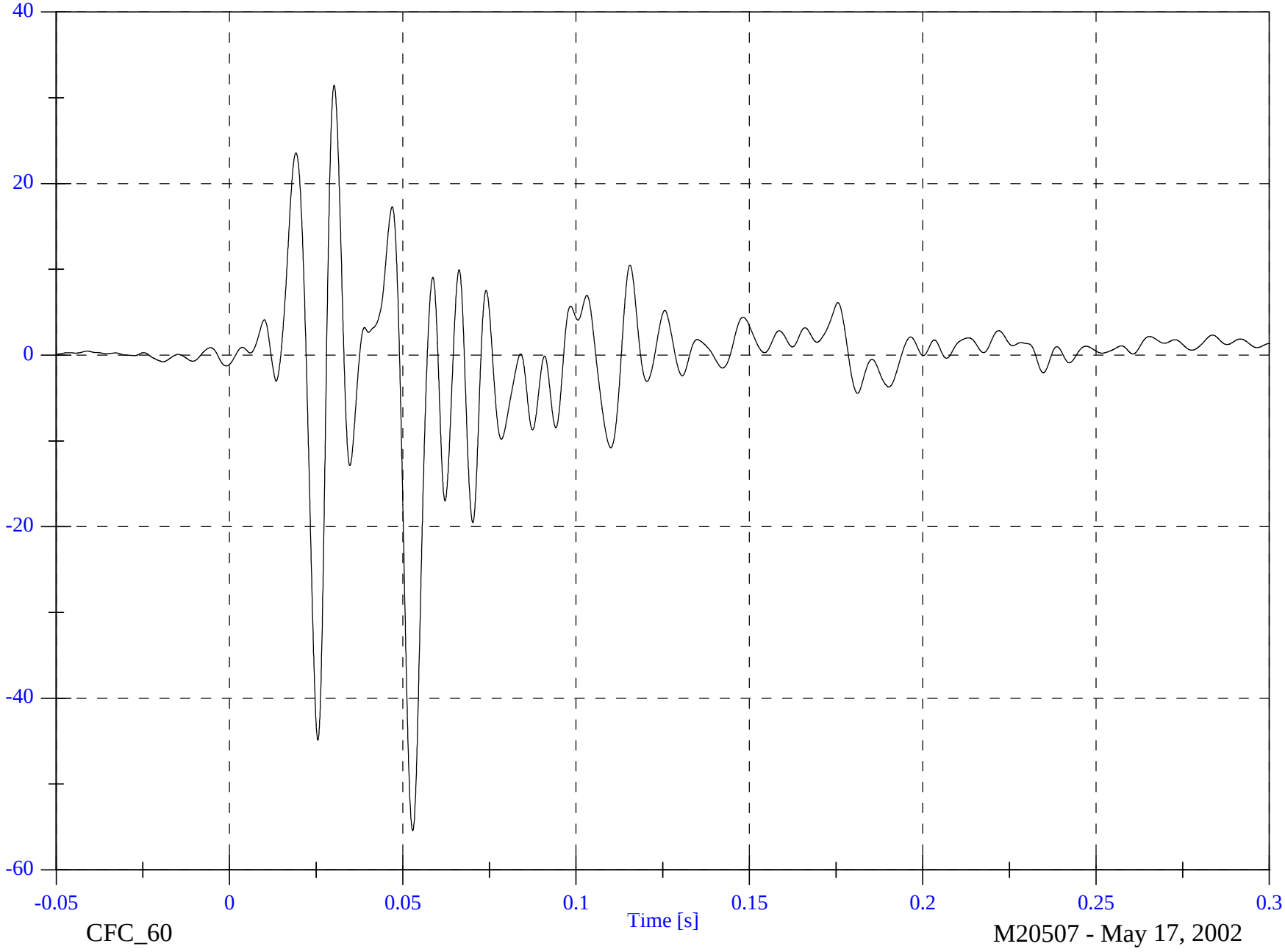
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Rear #9z

Max: 31.5 [g] at 0.030 [s]
Min: -55.4 [g] at 0.053 [s]



CFC_60

M20507 - May 17, 2002

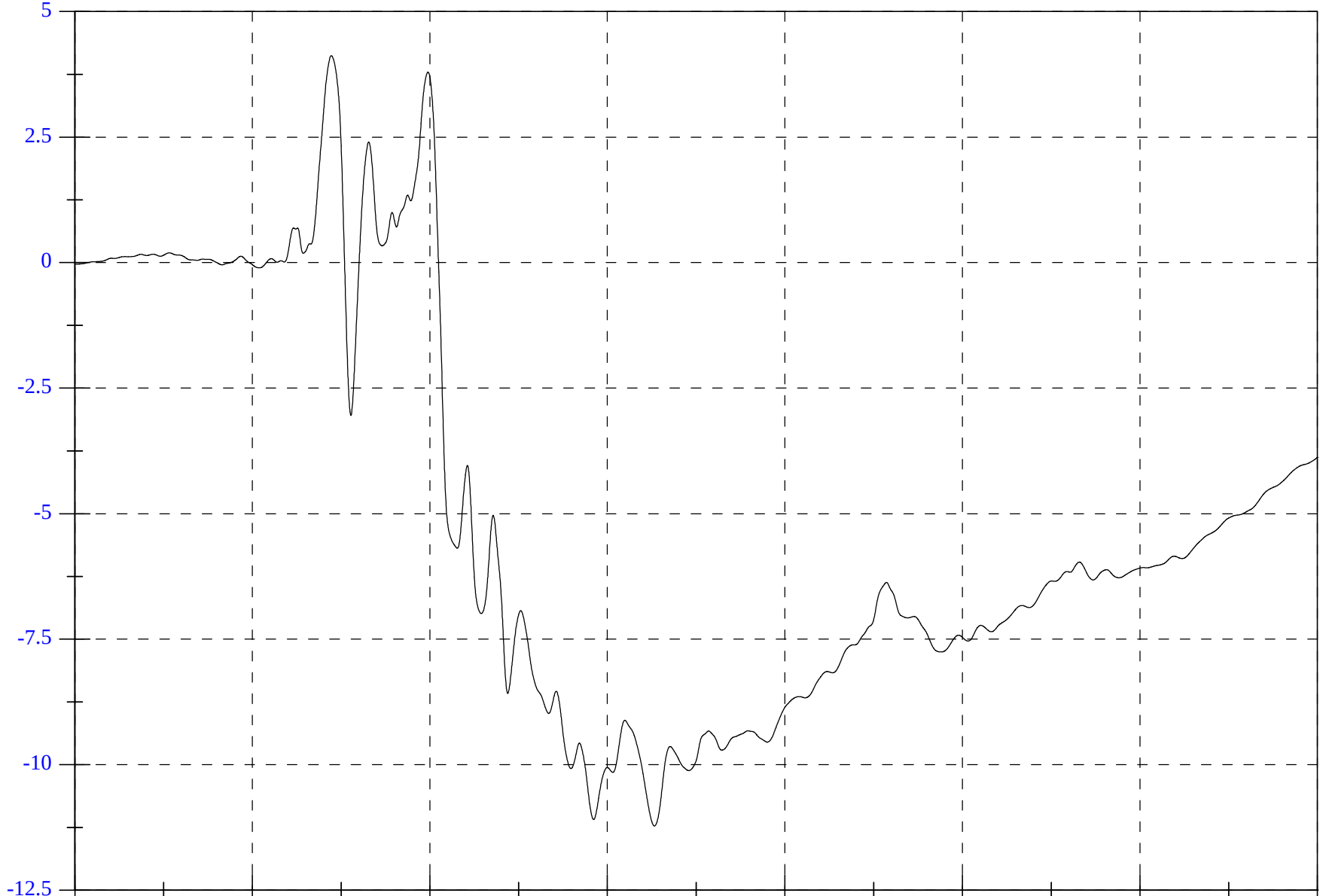
B-134

8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Rear #9z Velocity

Max: 4.1 [kph] at 0.022 [s]
Min: -11.2 [kph] at 0.113 [s]



B-135

8462-NCAP-15

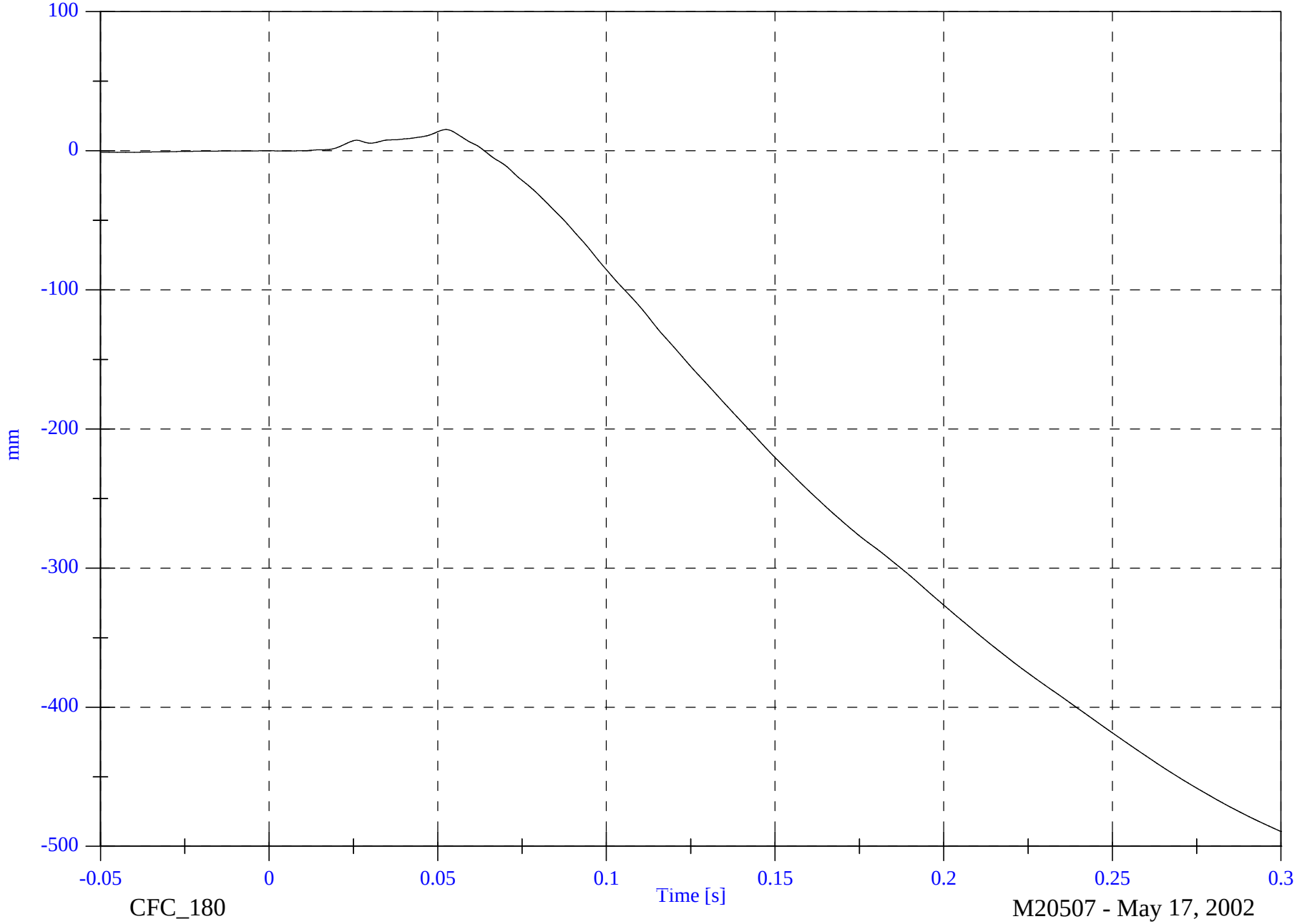
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

Right Rear #9z Displacement

Max: 15.3 [mm] at 0.052 [s]
Min: -489.4 [mm] at 0.300 [s]



CFC_180

M20507 - May 17, 2002

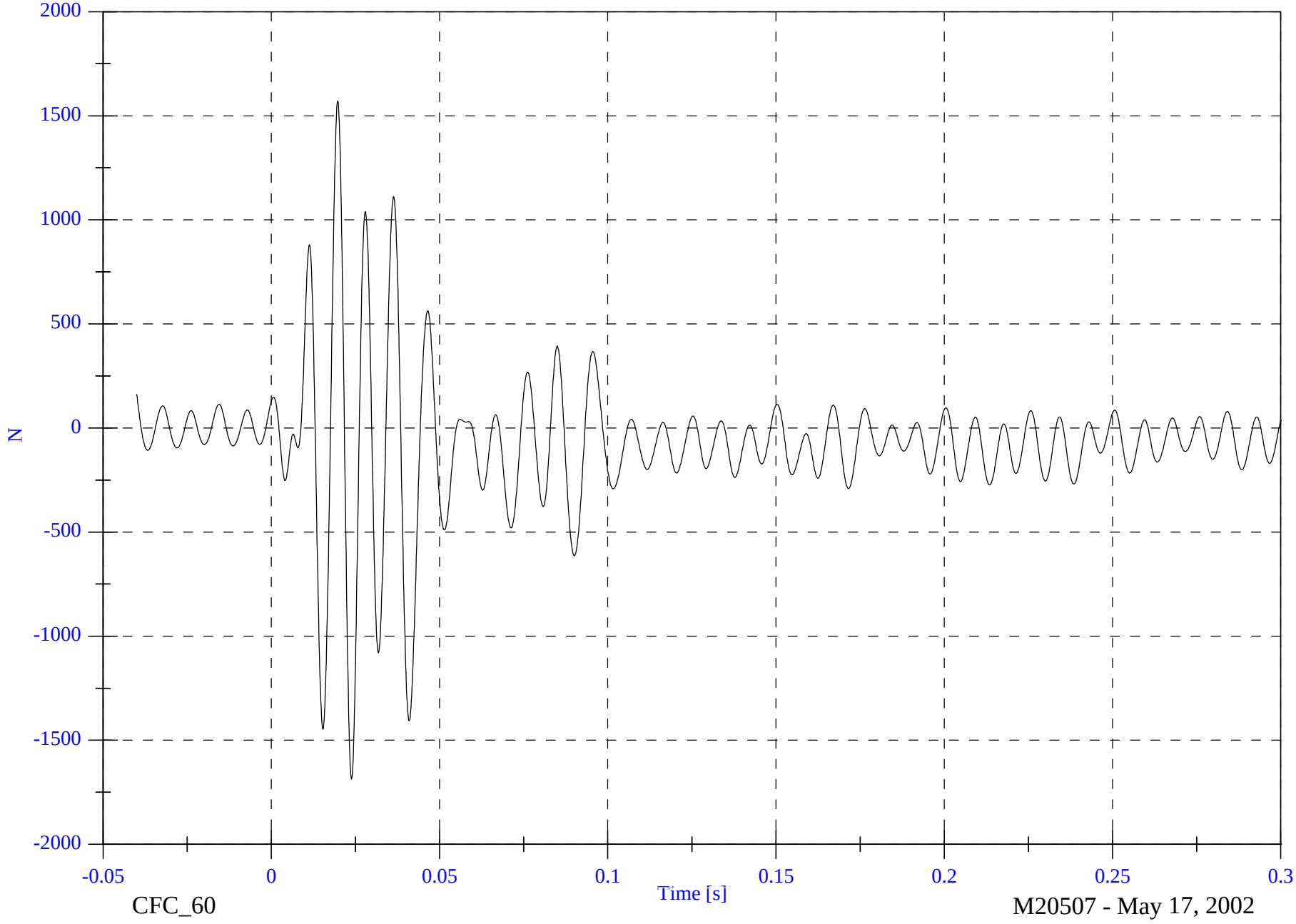
B-136

8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell A1 Fx

Max: 1571.9 [N] at 0.020 [s]
Min: -1687.2 [N] at 0.024 [s]



CFC_60

M20507 - May 17, 2002

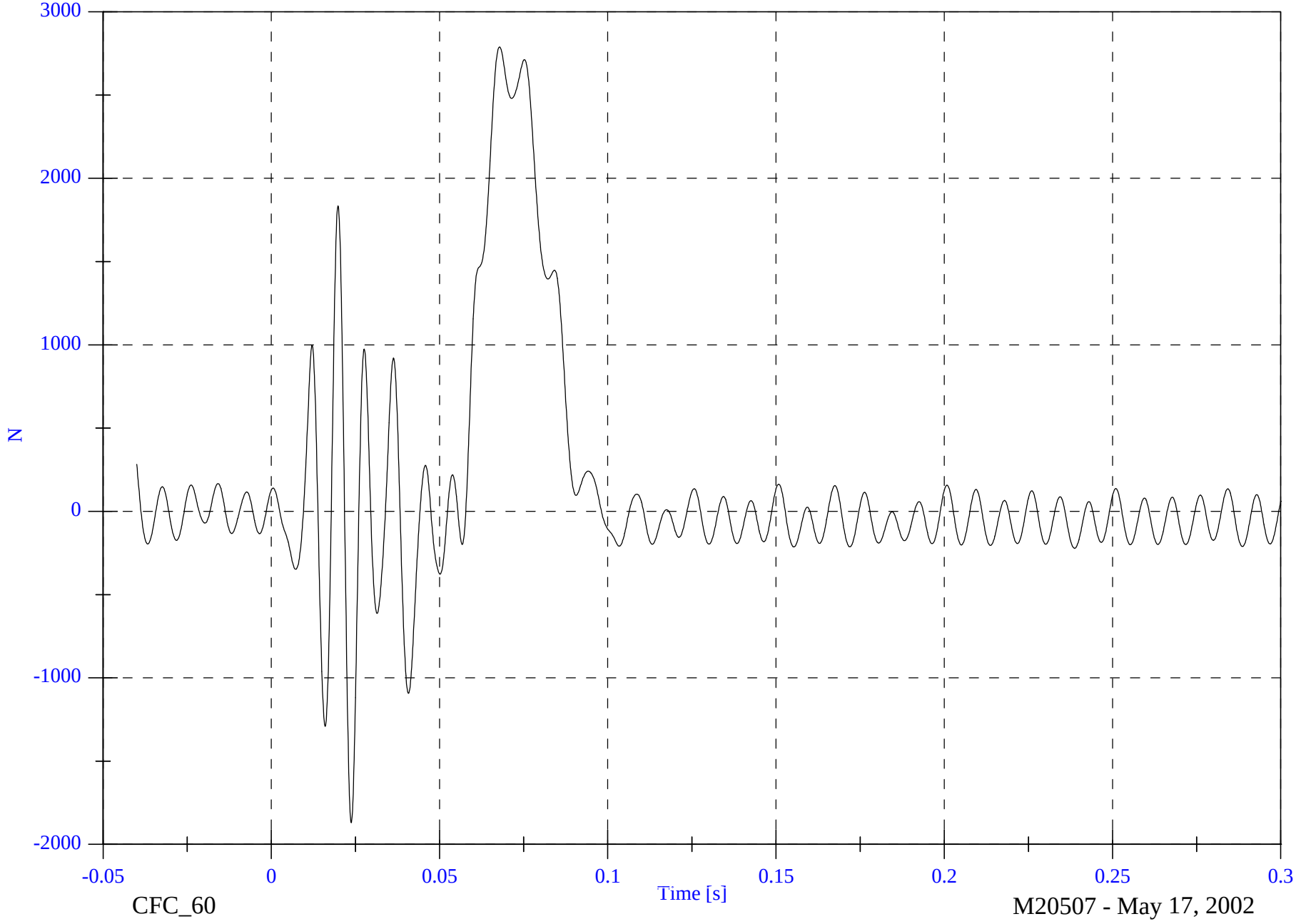
B-137

8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell A2 Fx

Max: 2788.3 [N] at 0.068 [s]
Min: -1870.9 [N] at 0.024 [s]

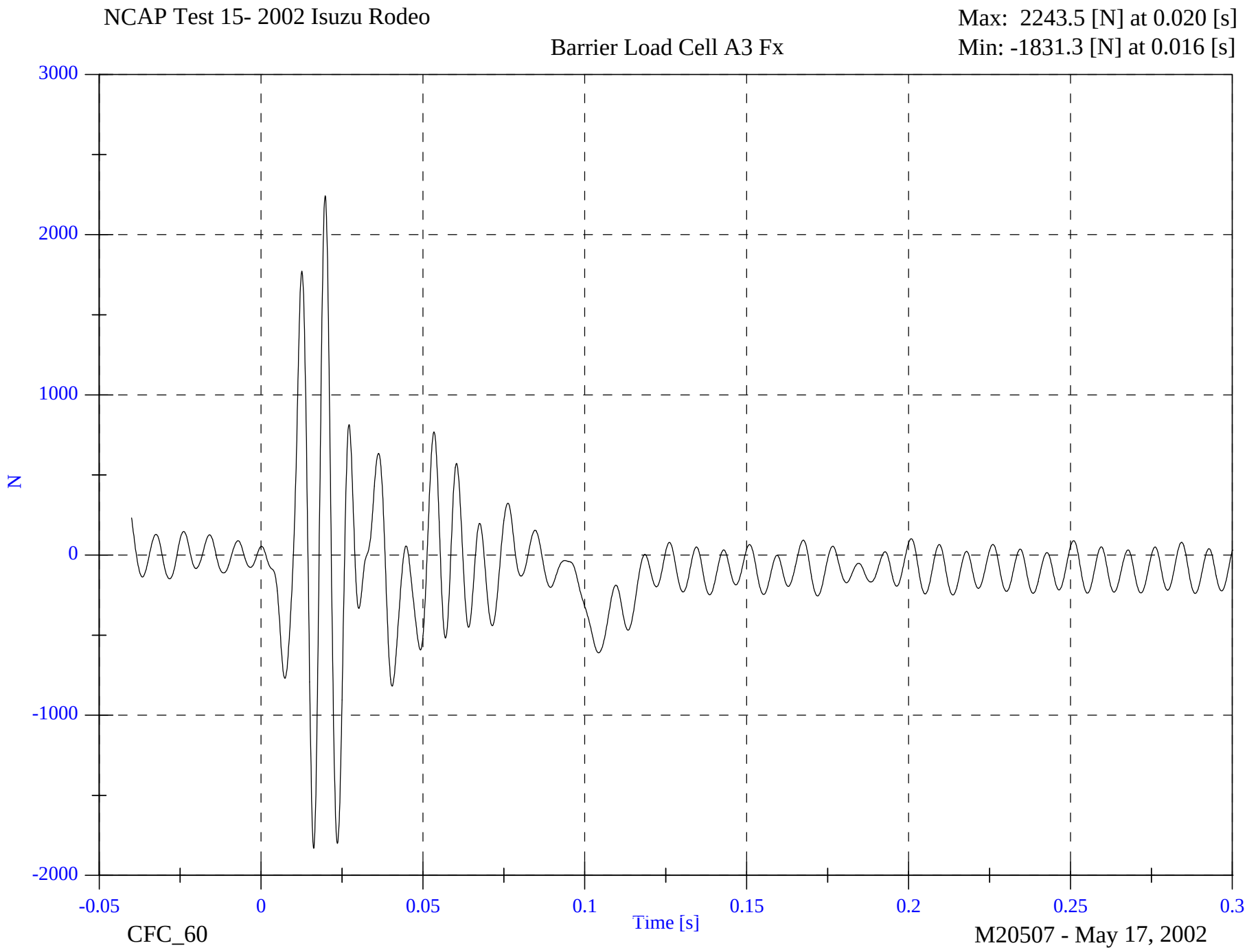


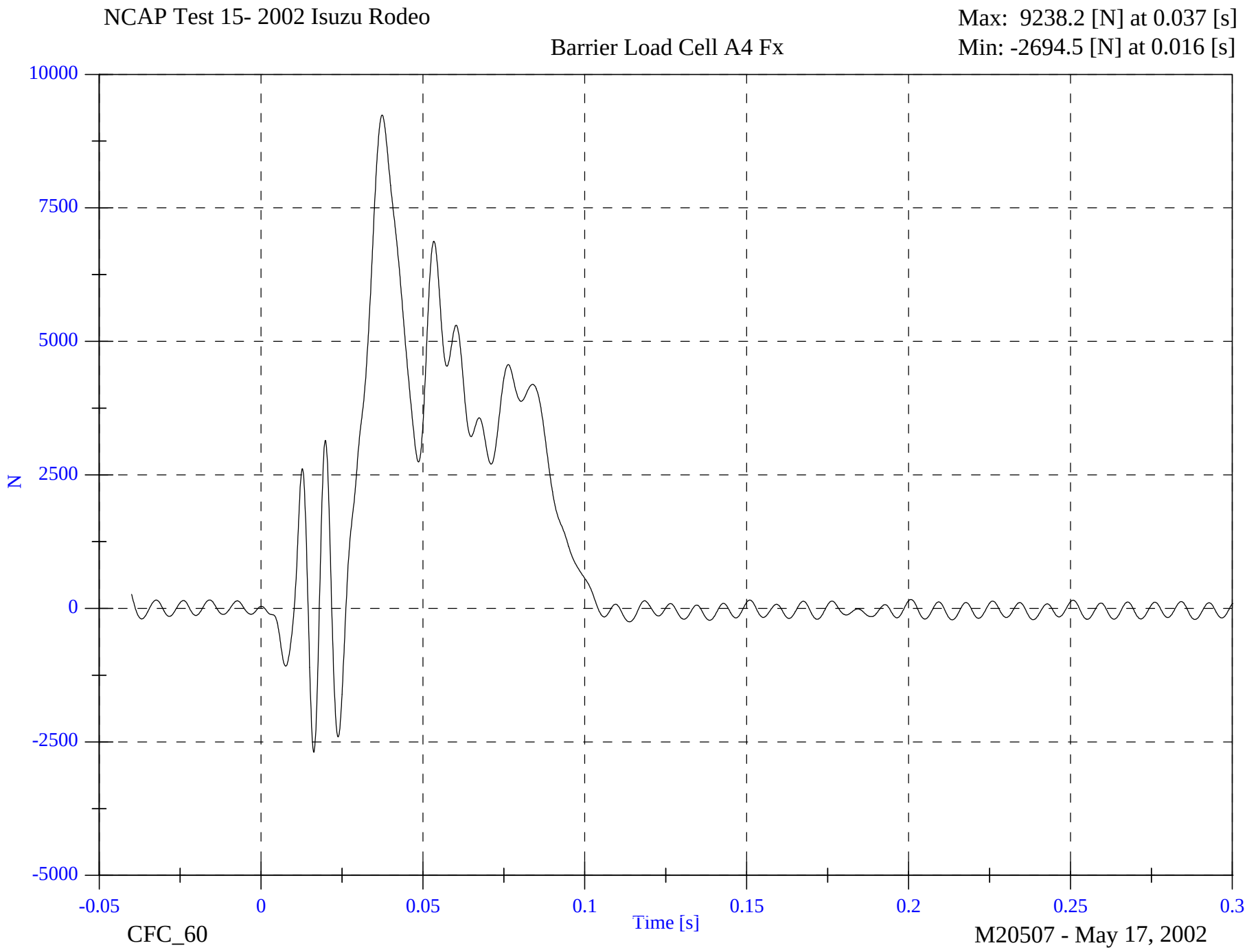
B-138

8462-NCAP-15

CFC_60

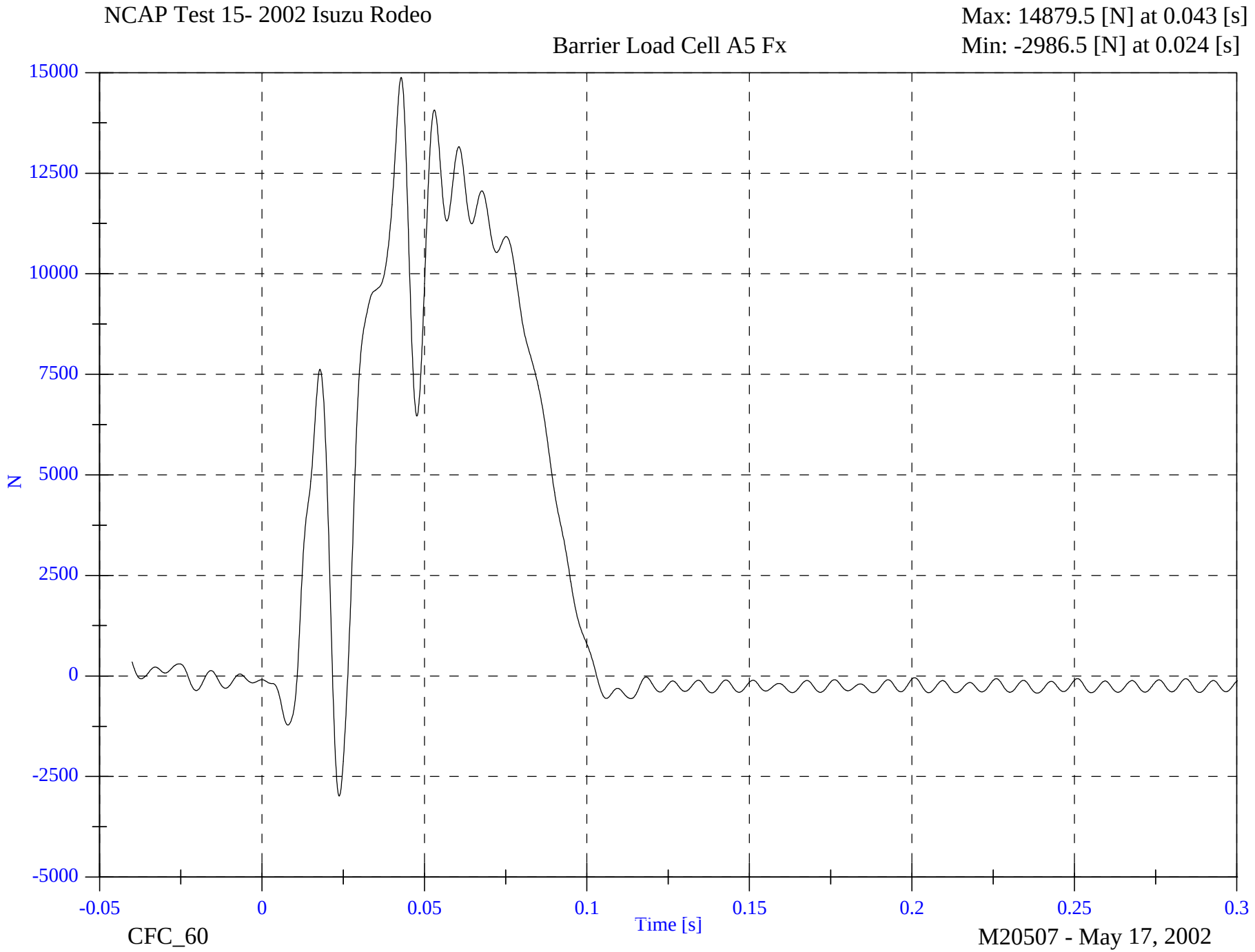
M20507 - May 17, 2002


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell A3 Fx
Max: 2243.5 [N] at 0.020 [s]
Min: -1831.3 [N] at 0.016 [s]
3000
2000
1000
0
-1000
-2000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002



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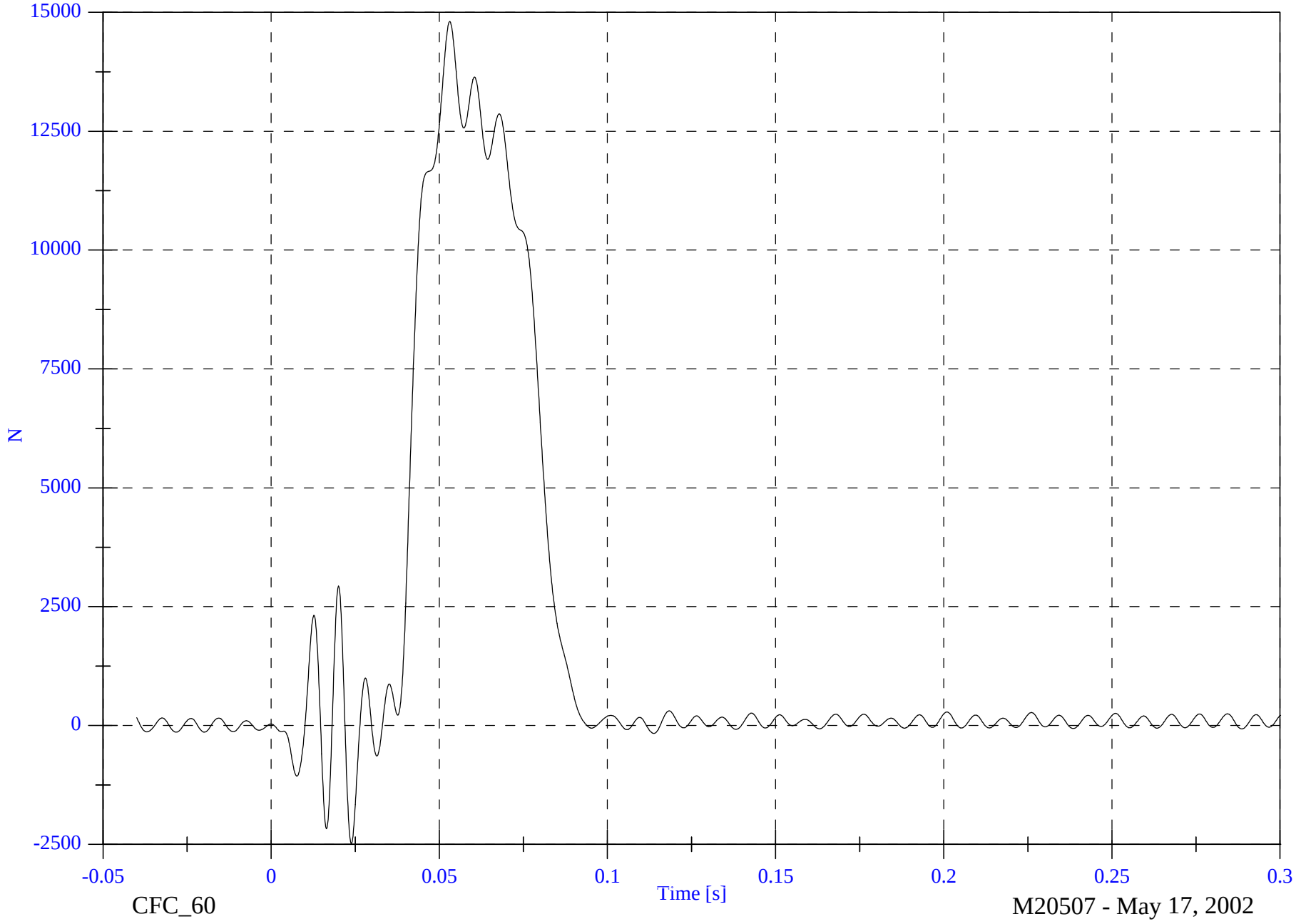
8462-NCAP-15


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell A5 Fx
Max: 14879.5 [N] at 0.043 [s]
Min: -2986.5 [N] at 0.024 [s]
15000
12500
10000
7500
5000
2500
0
-2500
-5000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell A6 Fx

Max: 14809.6 [N] at 0.053 [s]
Min: -2483.5 [N] at 0.024 [s]

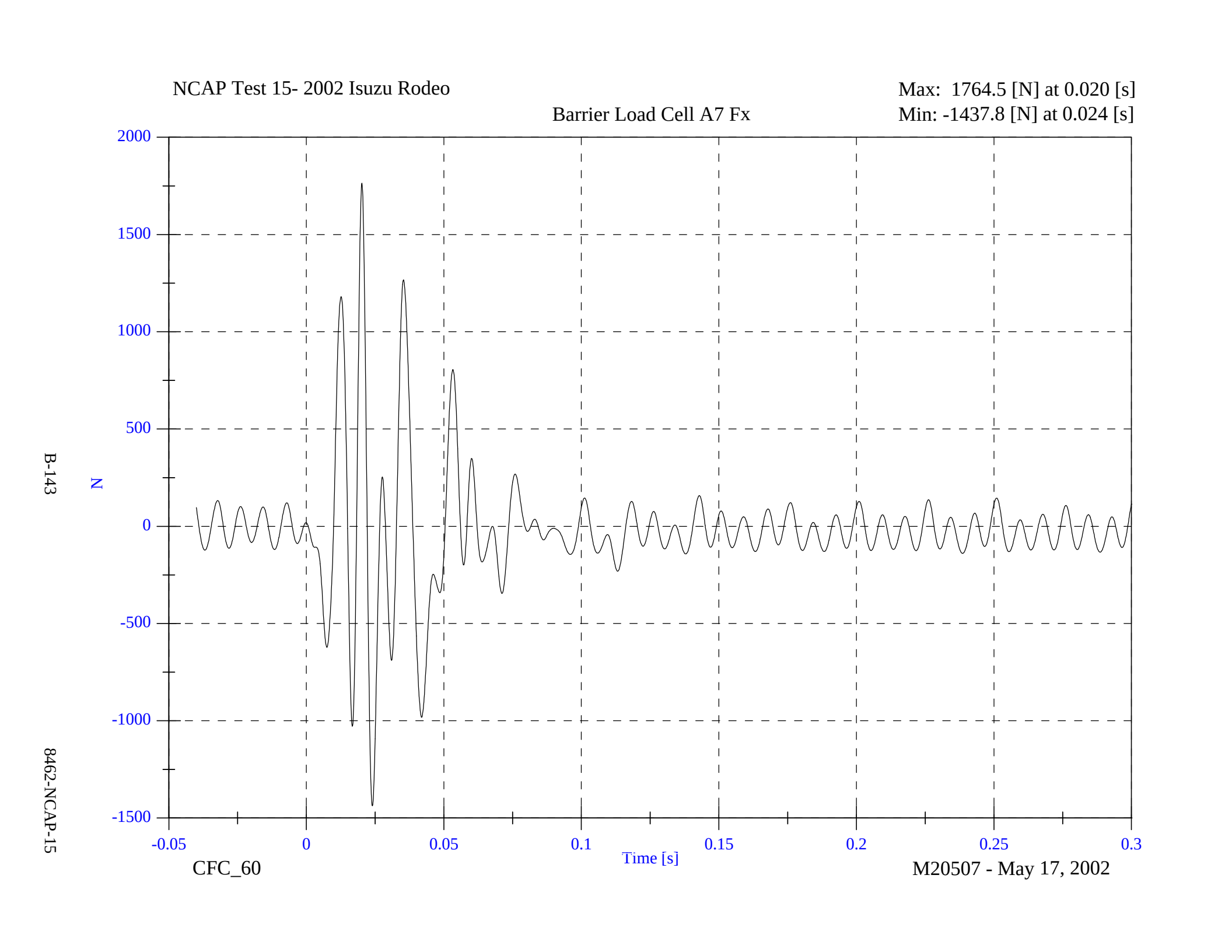


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8462-NCAP-15

CFC_60

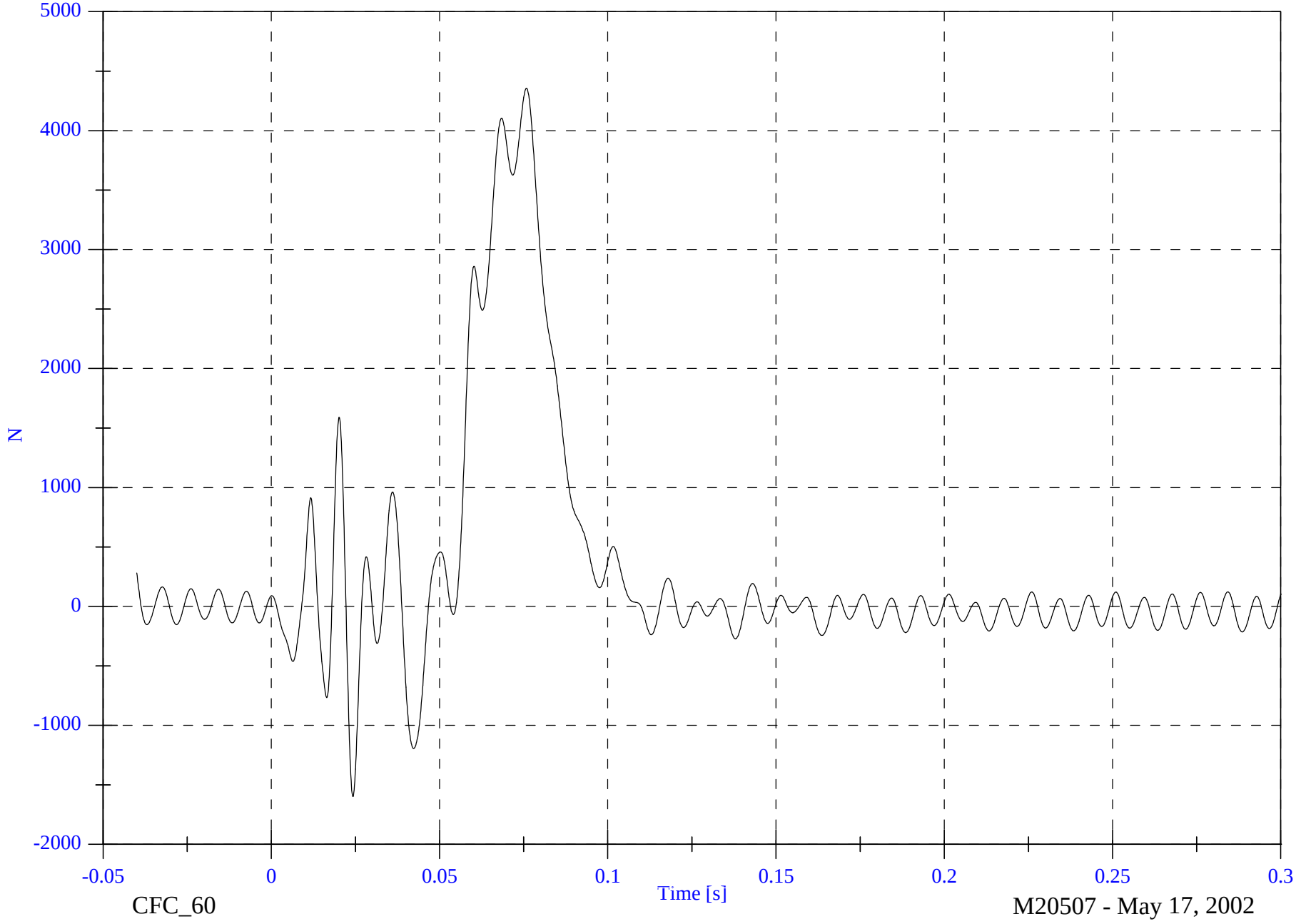
M20507 - May 17, 2002


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell A7 Fx
Max: 1764.5 [N] at 0.020 [s]
Min: -1437.8 [N] at 0.024 [s]
2000
1500
1000
500
0
-500
-1000
-1500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
B-143
8462-NCAP-15
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell A8 Fx

Max: 4356.7 [N] at 0.076 [s]
Min: -1598.3 [N] at 0.024 [s]

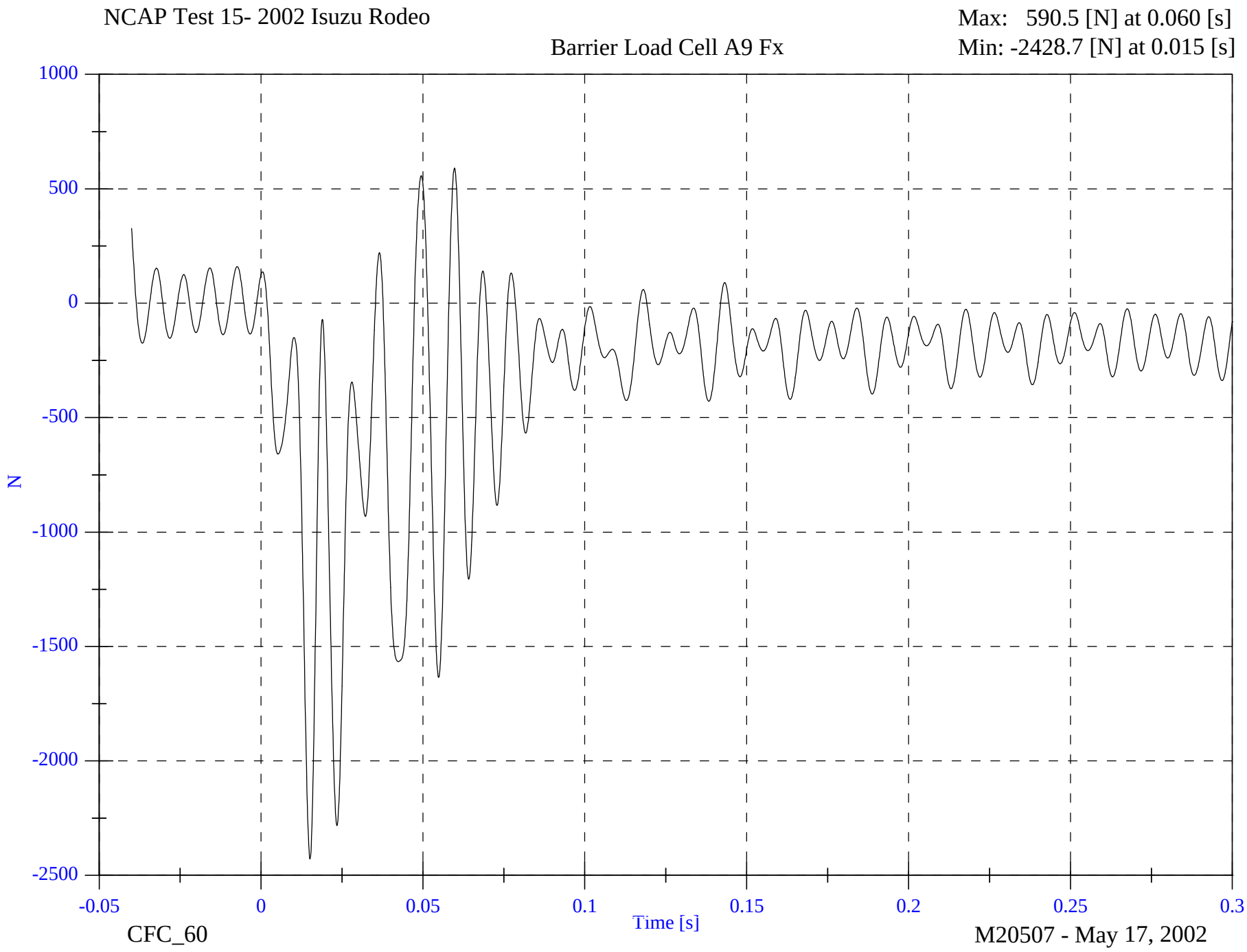


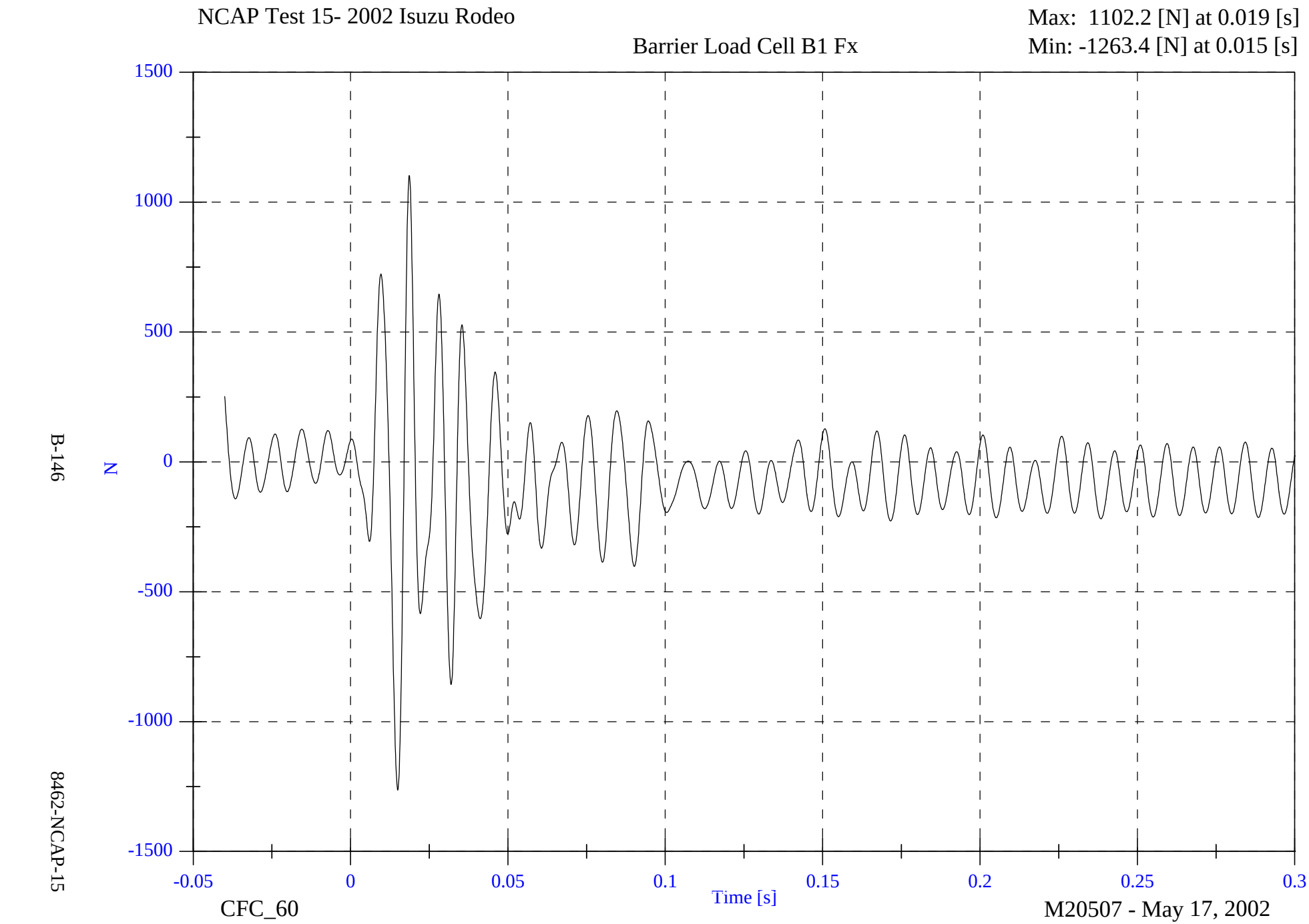
B-144

8462-NCAP-15

CFC_60

M20507 - May 17, 2002

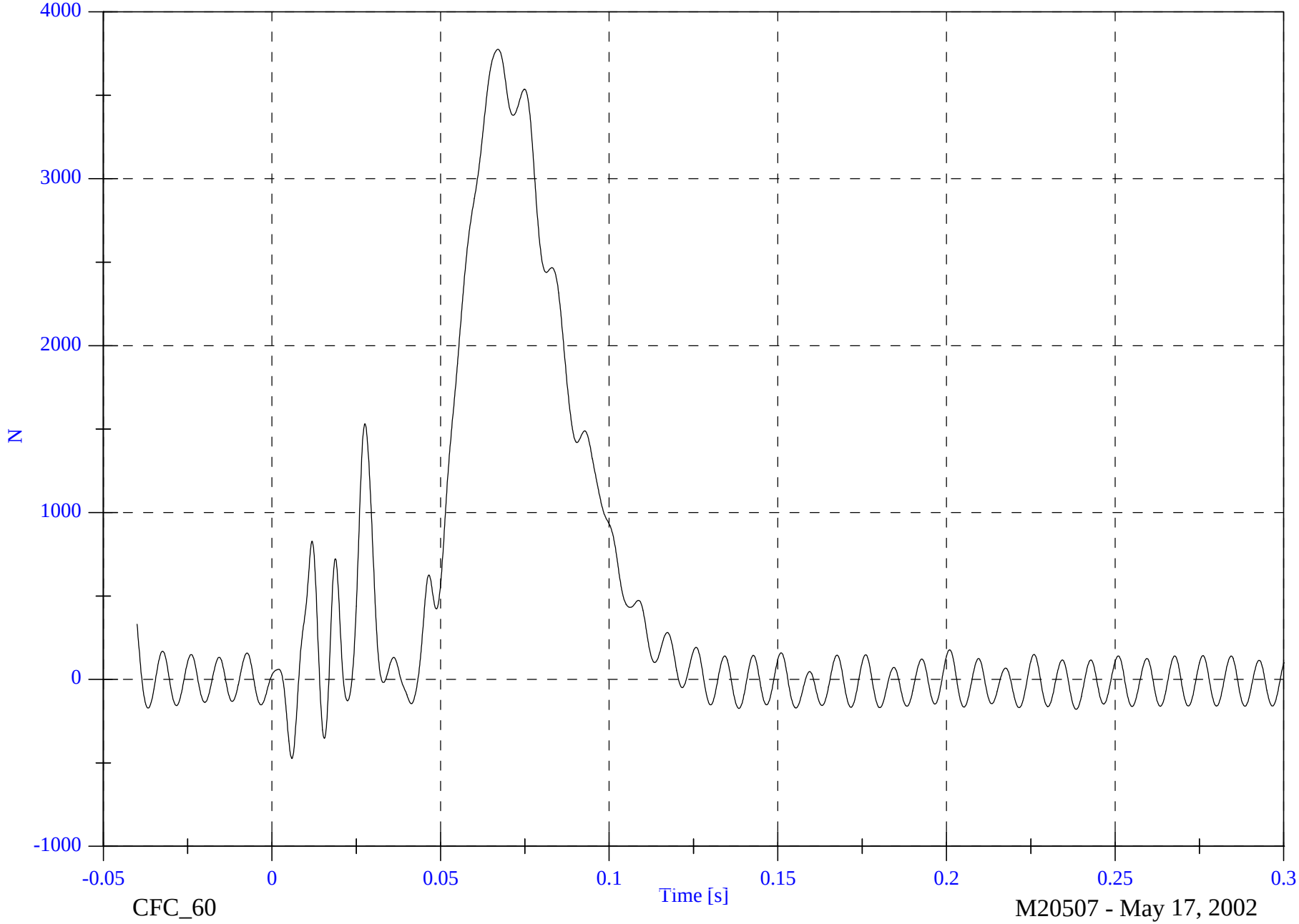

NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell A9 Fx
Max: 590.5 [N] at 0.060 [s]
Min: -2428.7 [N] at 0.015 [s]
1000
500
0
-500
-1000
-1500
-2000
-2500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell B1 Fx
Max: 1102.2 [N] at 0.019 [s]
Min: -1263.4 [N] at 0.015 [s]
1500
1000
500
0
-500
-1000
-1500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell B2 Fx

Max: 3774.3 [N] at 0.067 [s]
Min: -474.5 [N] at 0.006 [s]

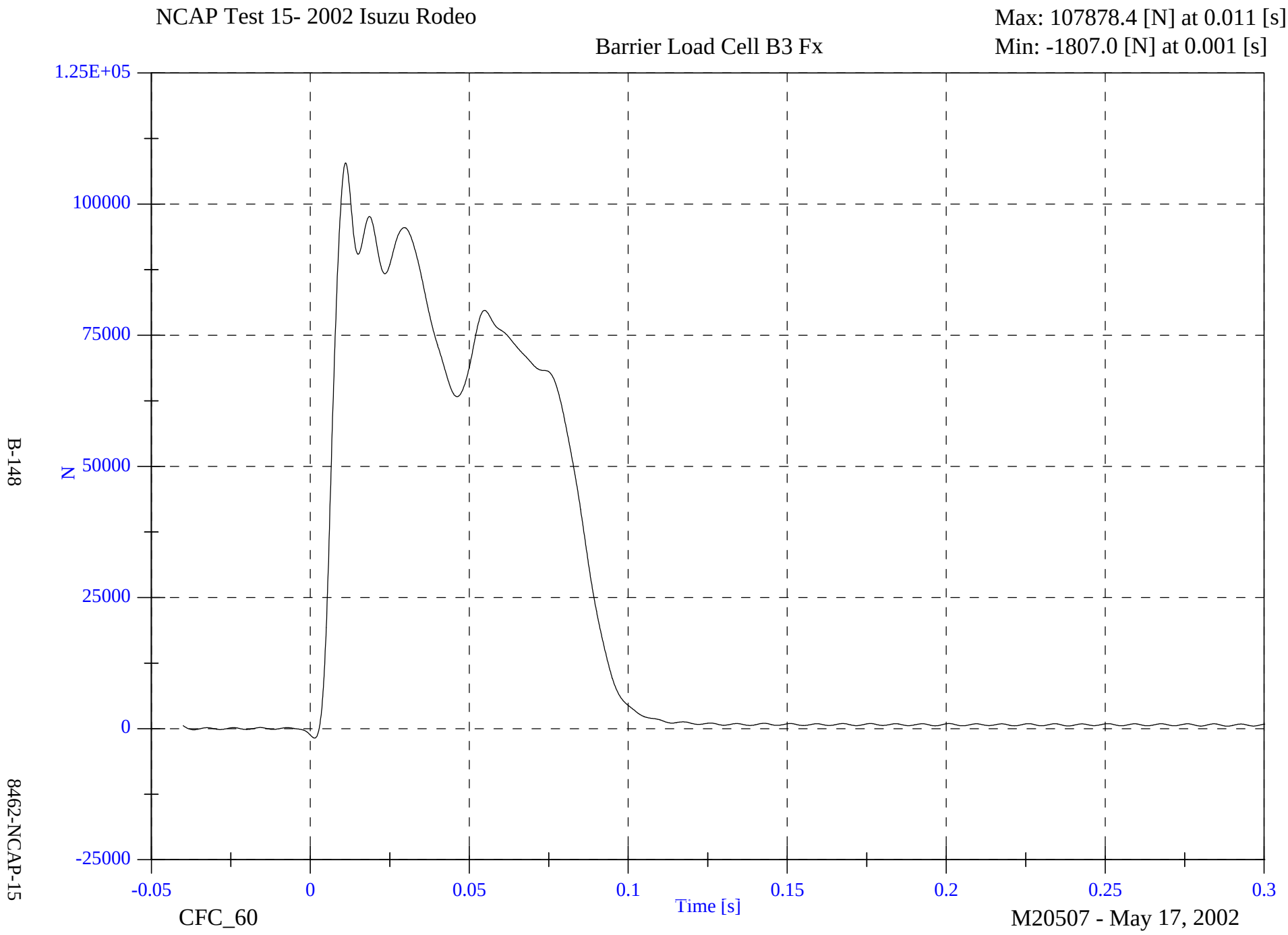


CFC_60

M20507 - May 17, 2002

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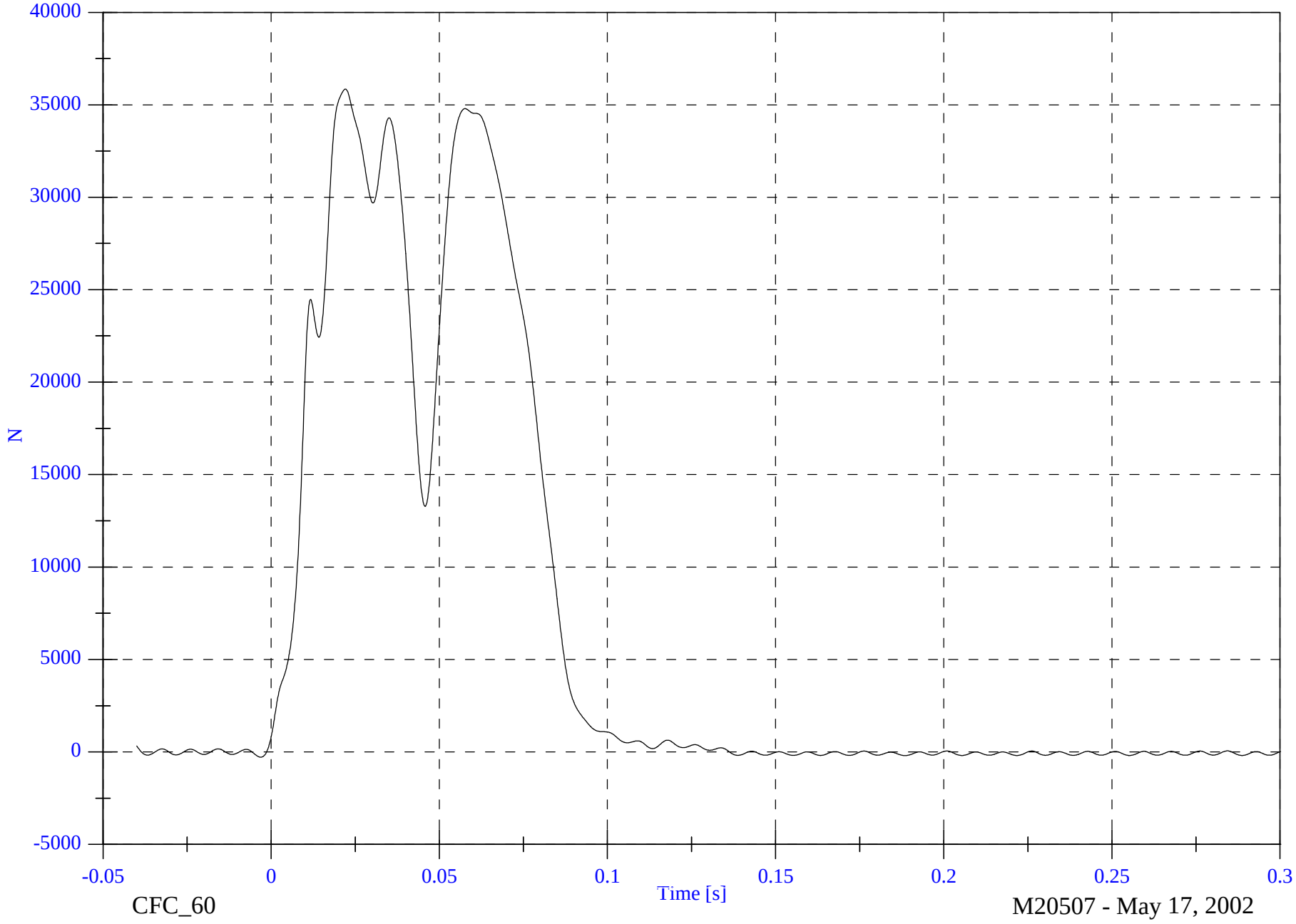
8462-NCAP-15


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell B3 Fx
Max: 107878.4 [N] at 0.011 [s]
Min: -1807.0 [N] at 0.001 [s]
1.25E+05
100000
75000
50000
25000
0
-25000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
B-148
8462-NCAP-15
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell B4 Fx

Max: 35849.8 [N] at 0.022 [s]
Min: -283.1 [N] at -0.003 [s]



CFC_60

M20507 - May 17, 2002

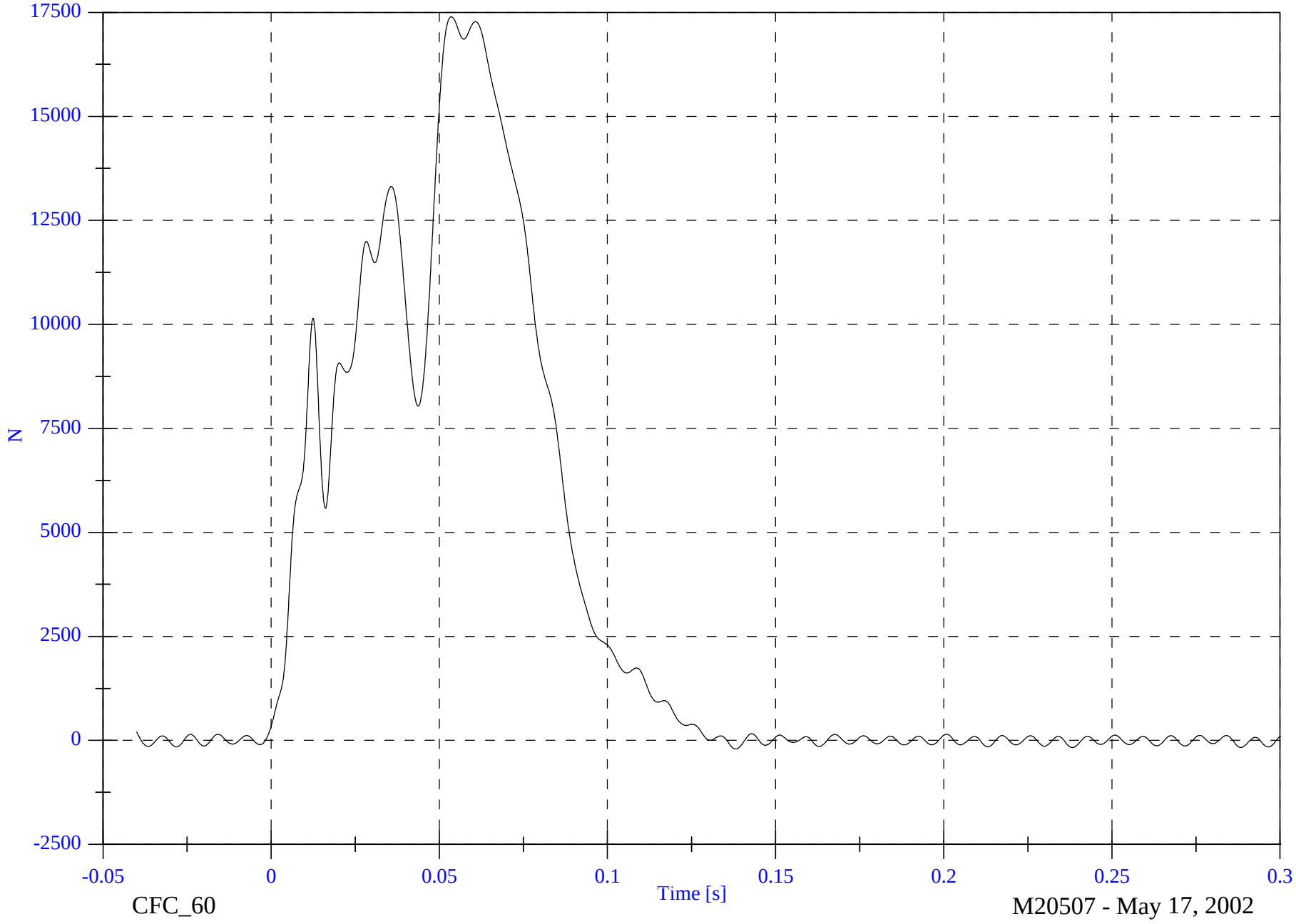
B-149

8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell B5 Fx

Max: 17394.3 [N] at 0.054 [s]
Min: -207.4 [N] at 0.138 [s]



B-150

8462-NCAP-15

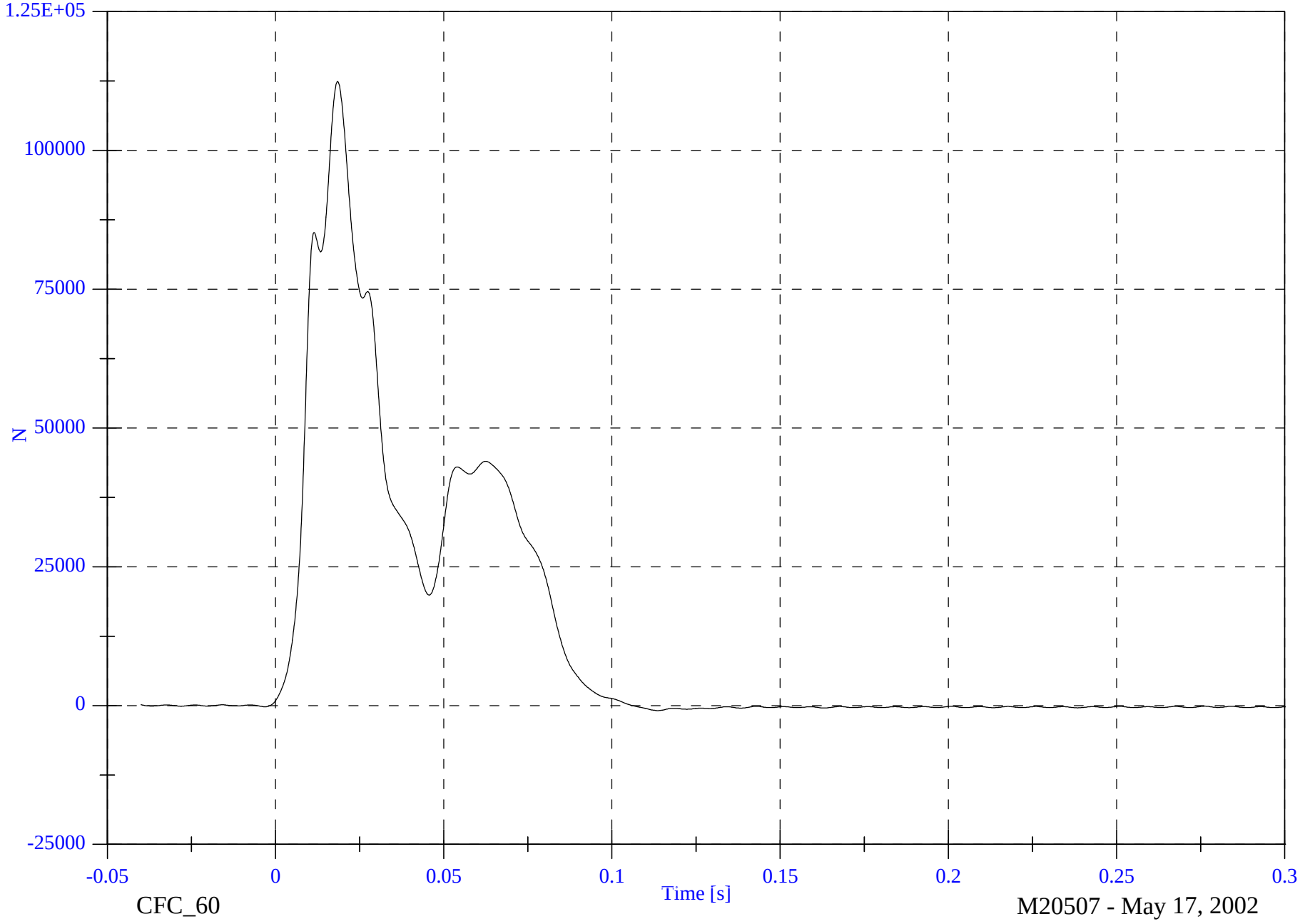
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell B6 Fx

Max: 112423.0 [N] at 0.018 [s]
Min: -906.6 [N] at 0.114 [s]



B-151

8462-NCAP-15

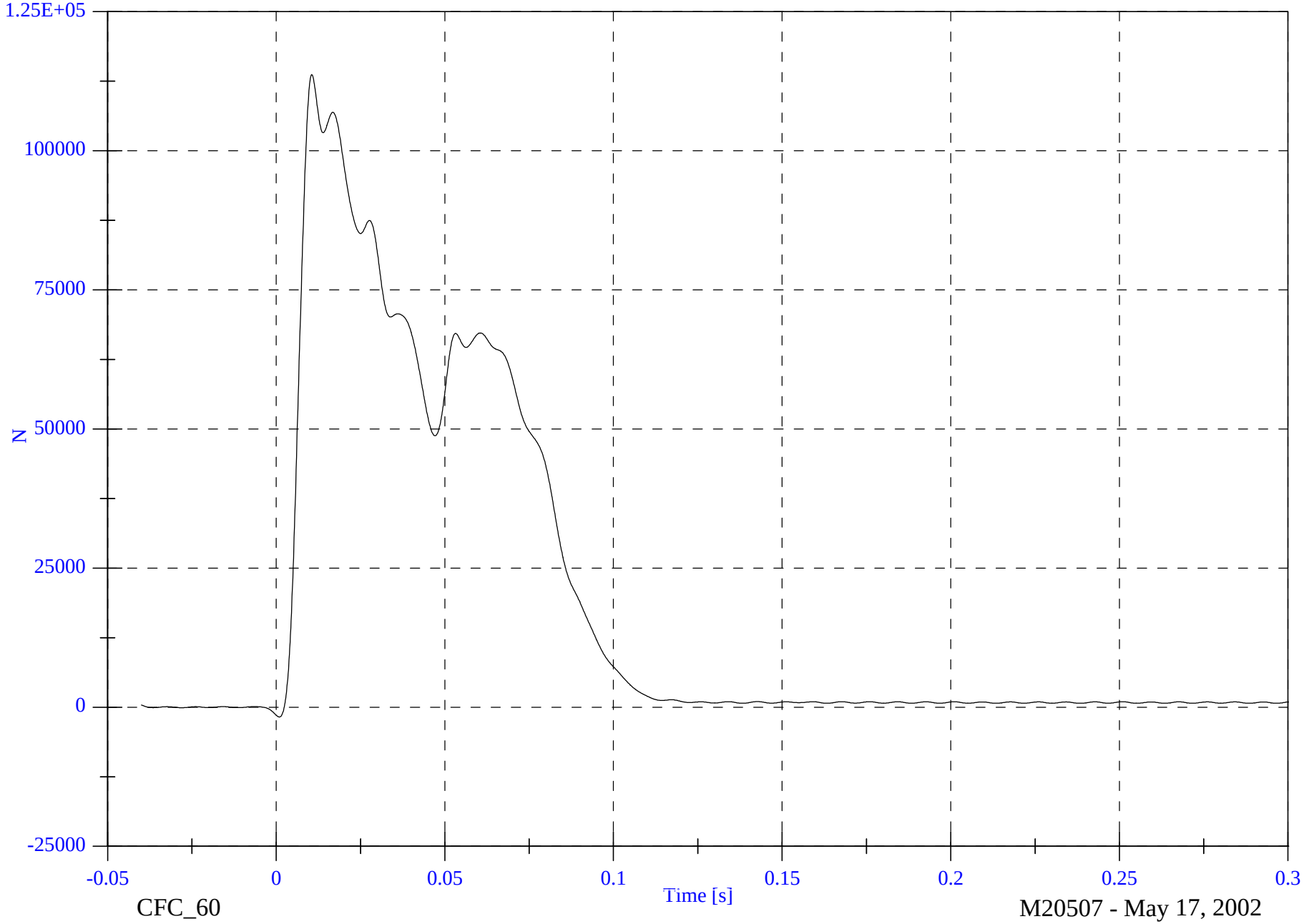
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell B7 Fx

Max: 113693.0 [N] at 0.010 [s]
Min: -1759.5 [N] at 0.001 [s]



B-152

8462-NCAP-15

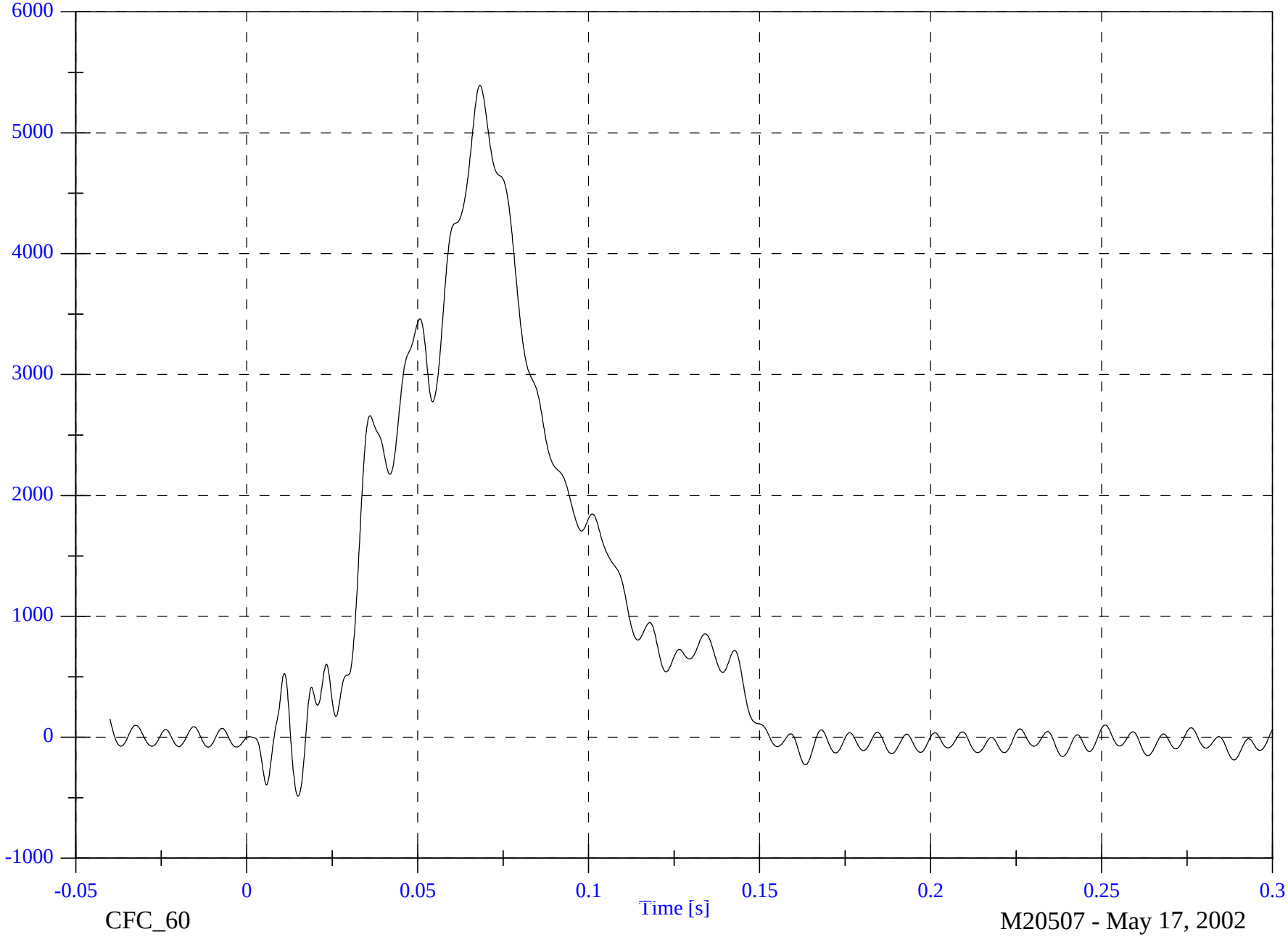
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell B8 Fx

Max: 5392.6 [N] at 0.068 [s]
Min: -486.6 [N] at 0.015 [s]

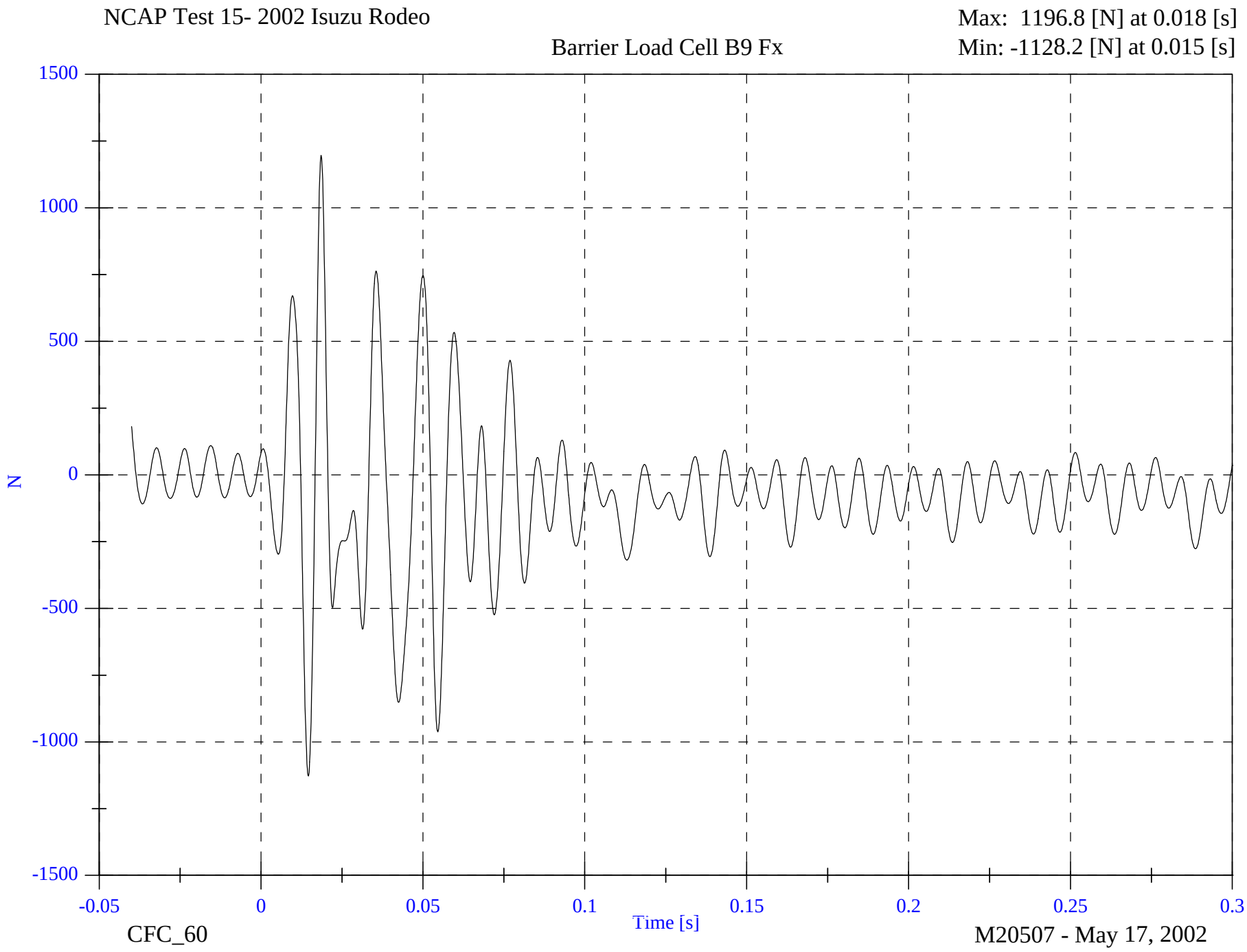


B-153

8462-NCAP-15

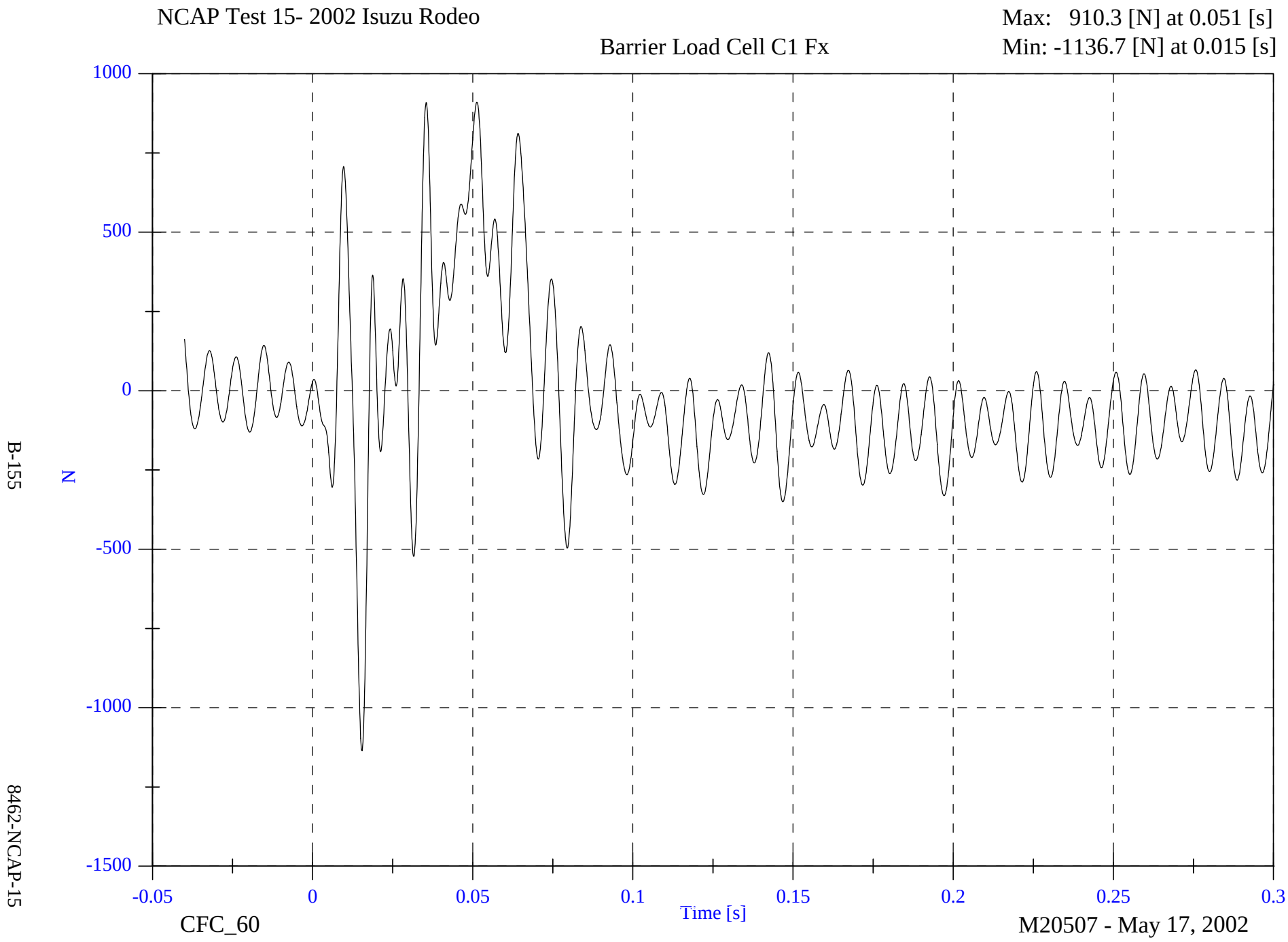
CFC_60

M20507 - May 17, 2002



B-154

8462-NCAP-15



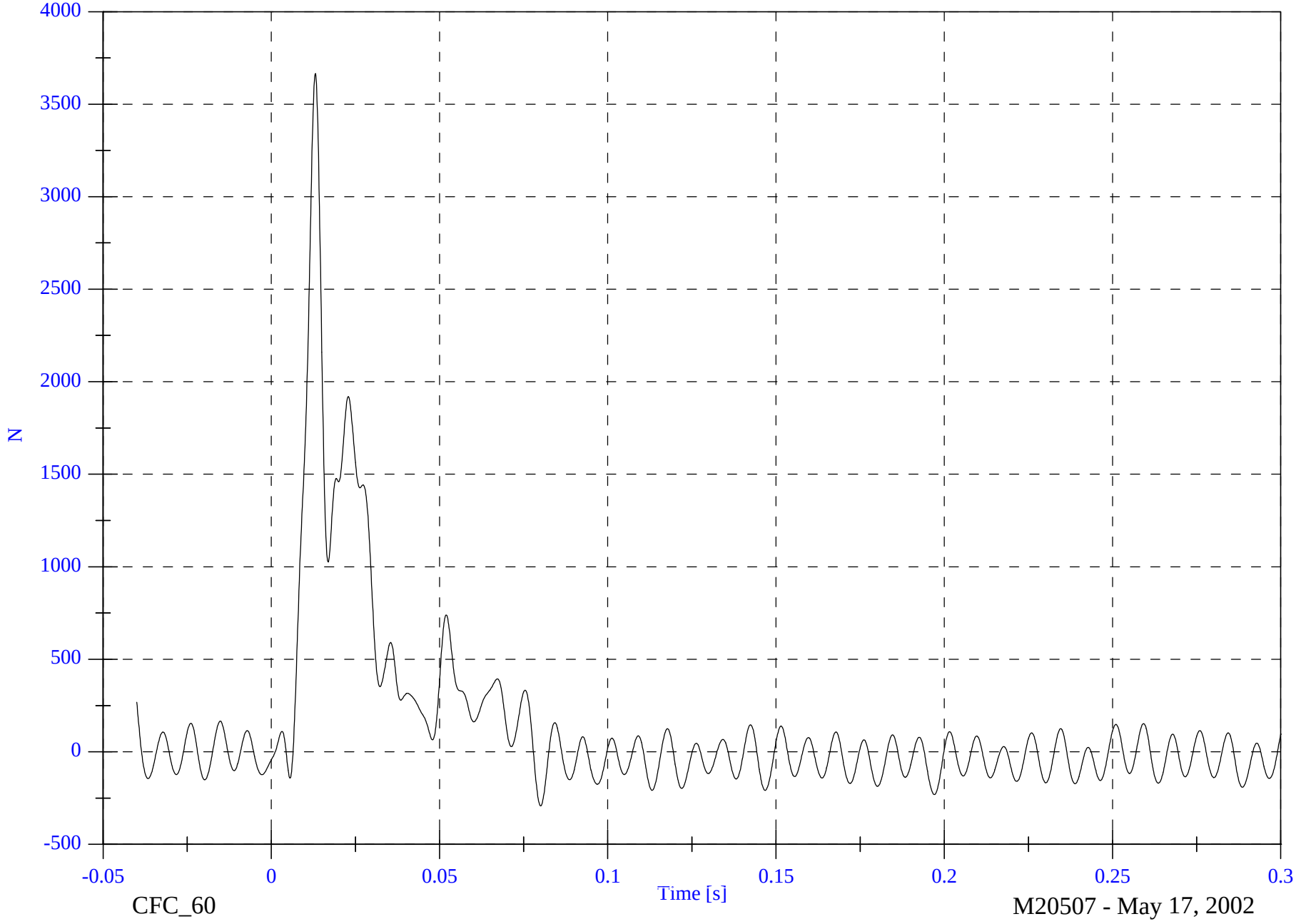
B-155

8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell C2 Fx

Max: 3665.5 [N] at 0.013 [s]
Min: -292.6 [N] at 0.080 [s]



B-156

8462-NCAP-15

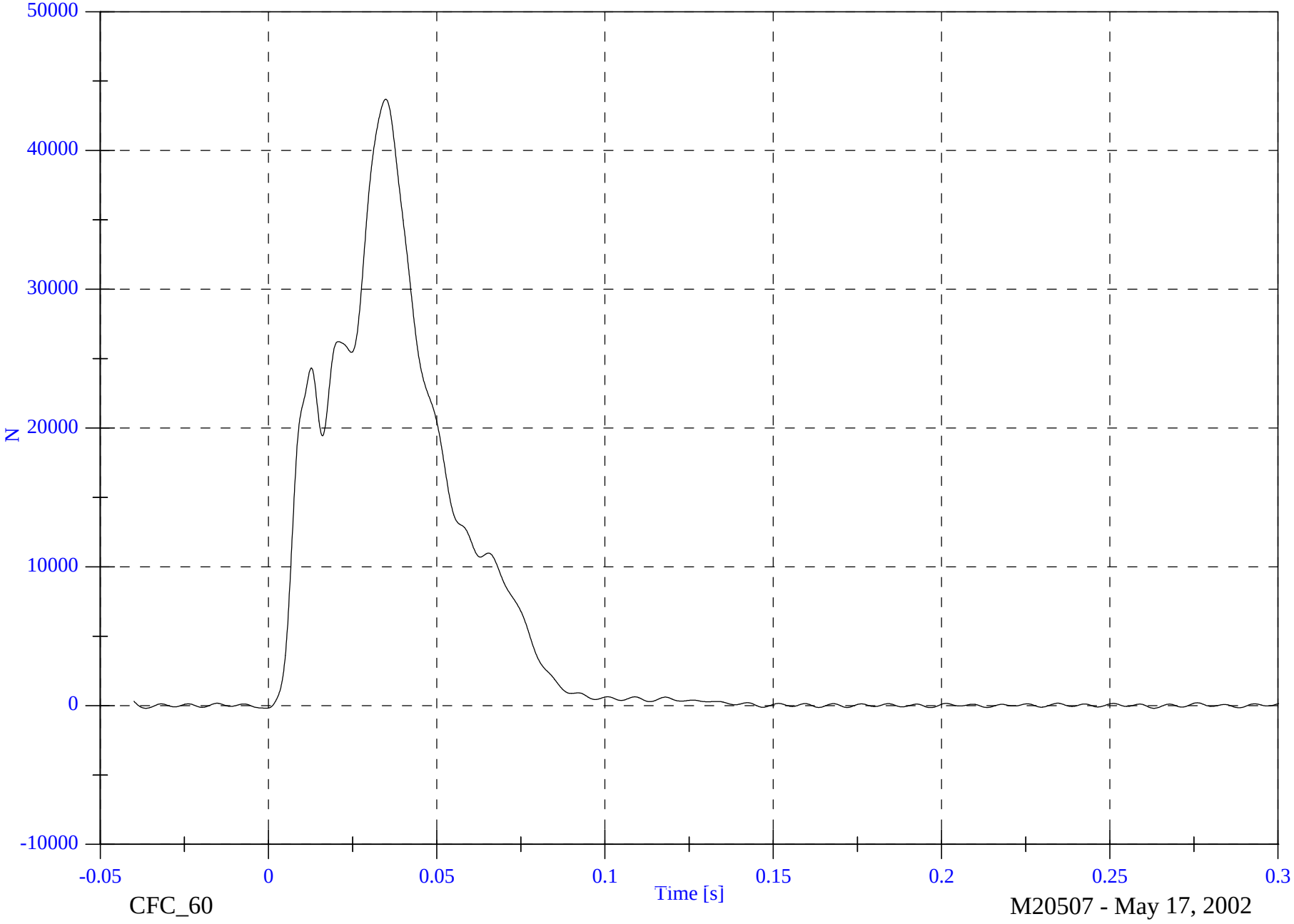
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell C3 Fx

Max: 43694.6 [N] at 0.035 [s]
Min: -196.0 [N] at 0.263 [s]



B-157

8462-NCAP-15

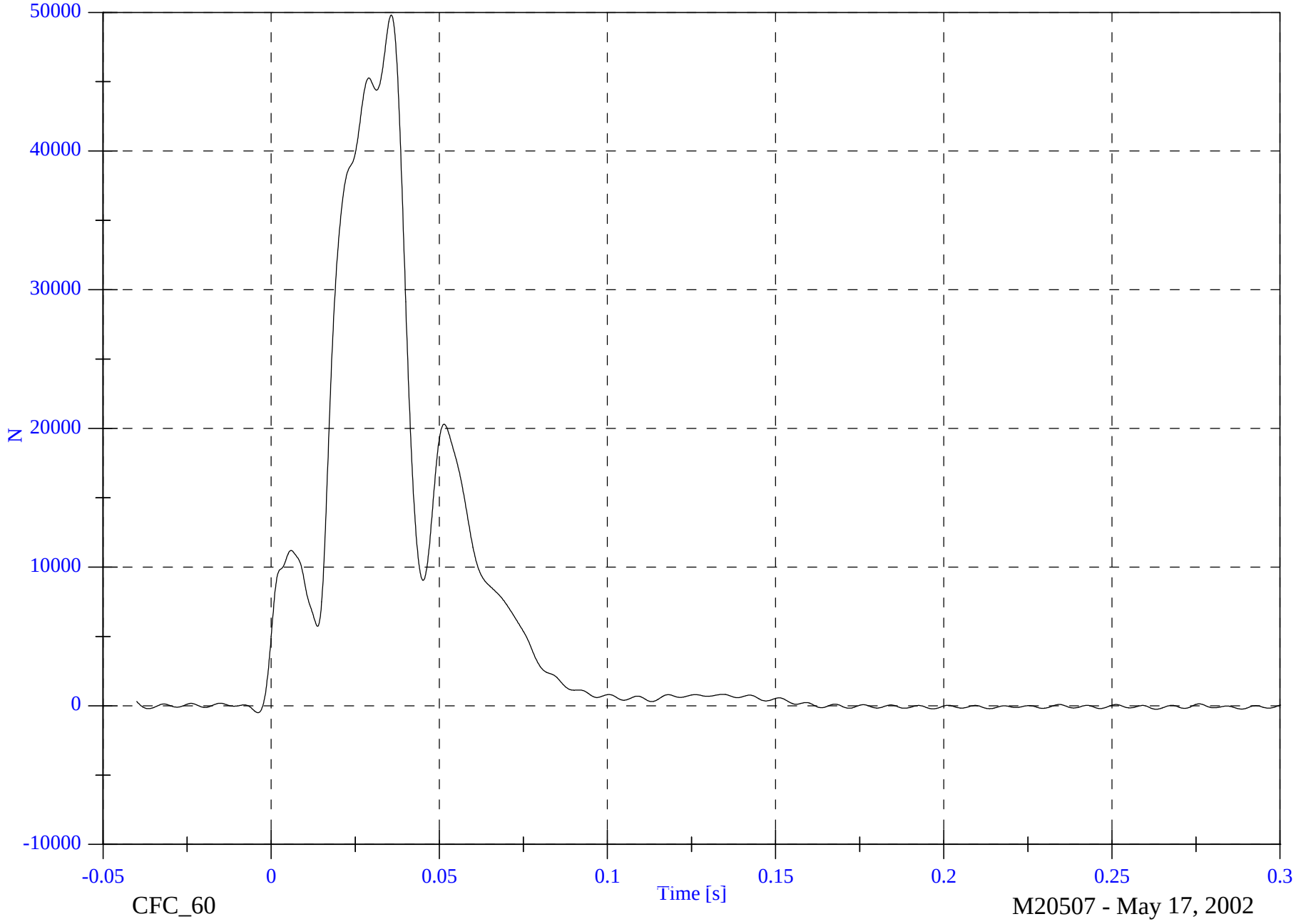
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell C4 Fx

Max: 49804.2 [N] at 0.036 [s]
Min: -502.5 [N] at -0.004 [s]

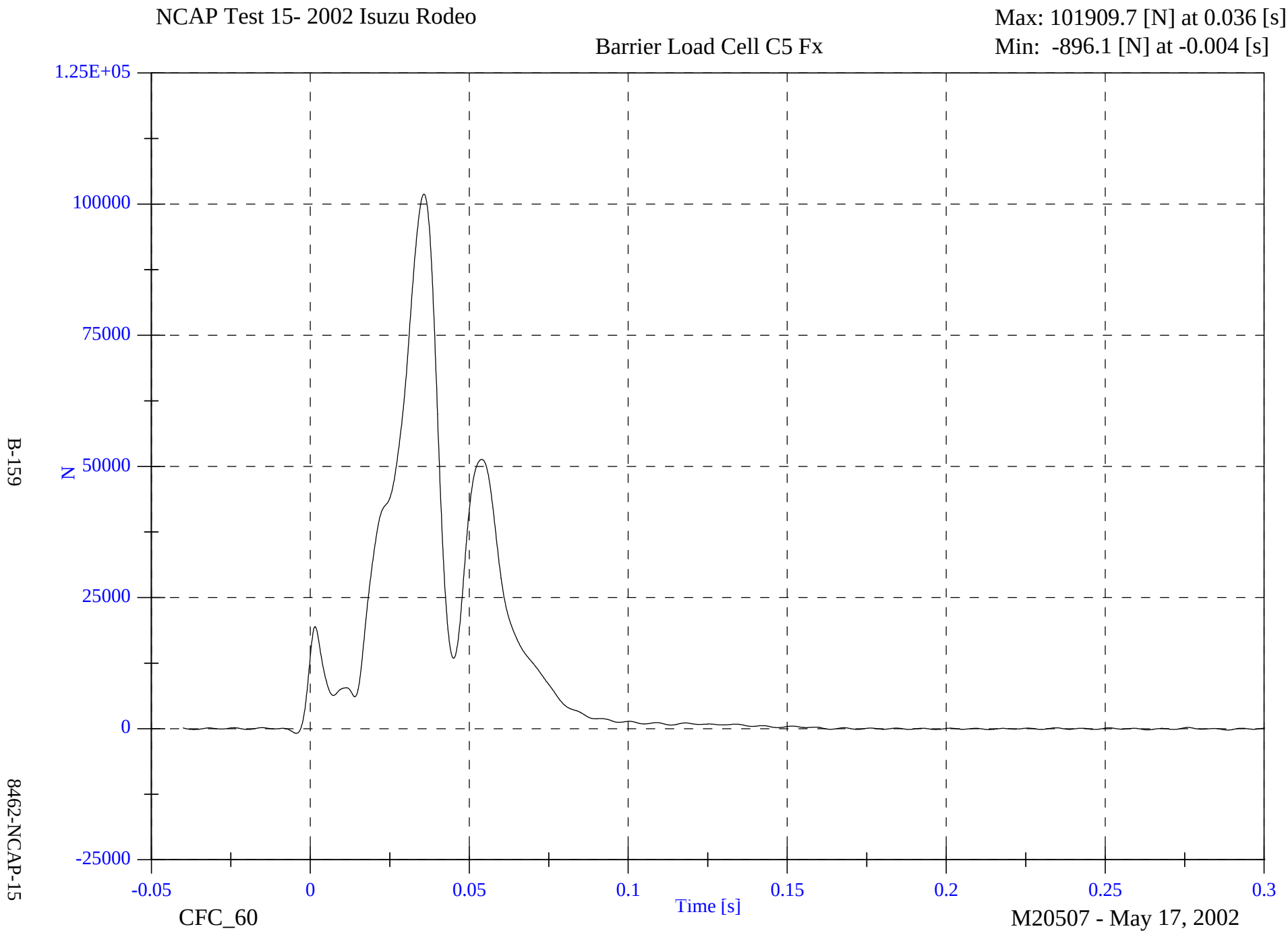


B-158

8462-NCAP-15

CFC_60

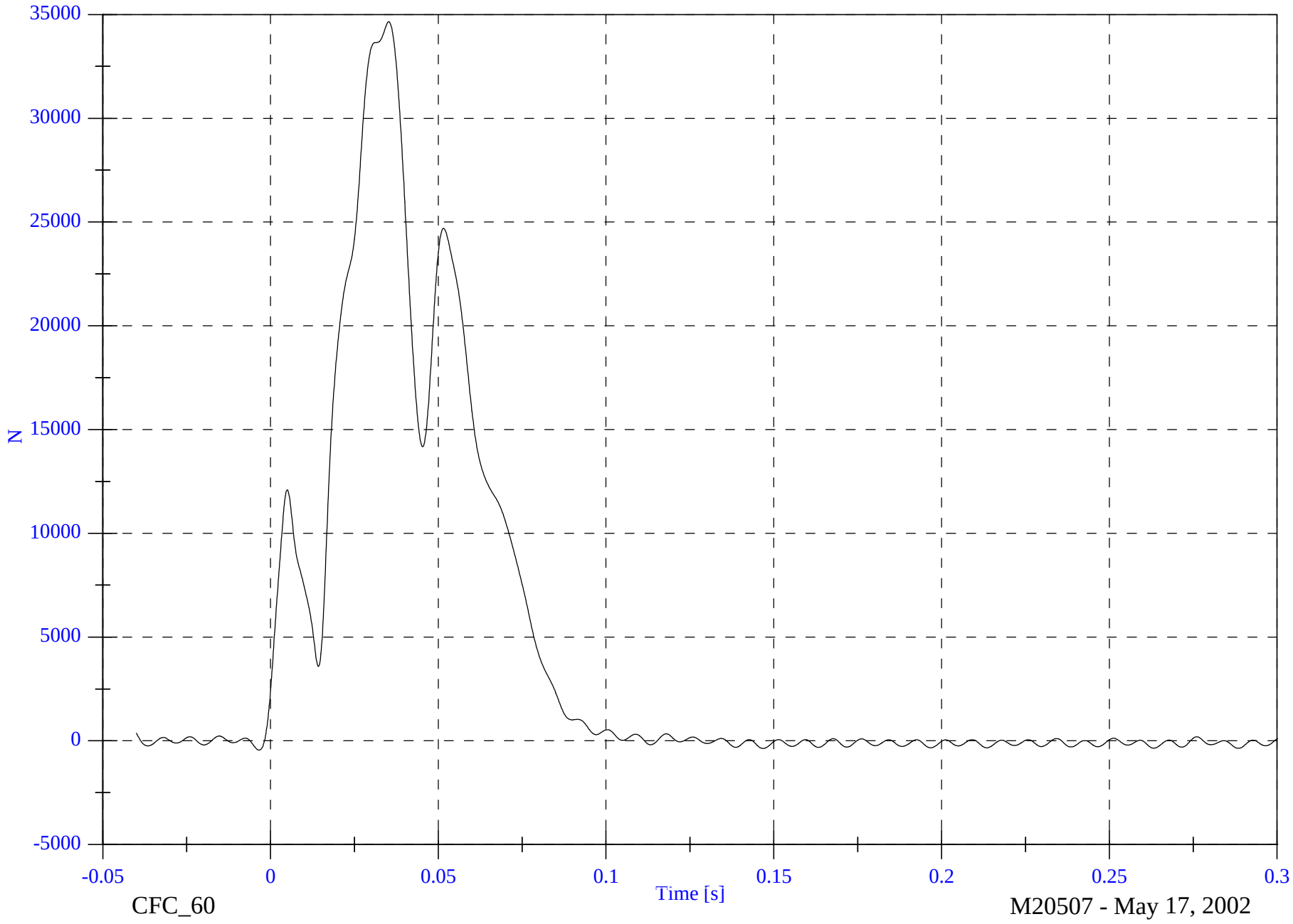
M20507 - May 17, 2002


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell C5 Fx
Max: 101909.7 [N] at 0.036 [s]
Min: -896.1 [N] at -0.004 [s]
1.25E+05
100000
75000
50000
25000
0
-25000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
B-159
8462-NCAP-15
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell C6 Fx

Max: 34650.7 [N] at 0.035 [s]
Min: -450.9 [N] at -0.003 [s]

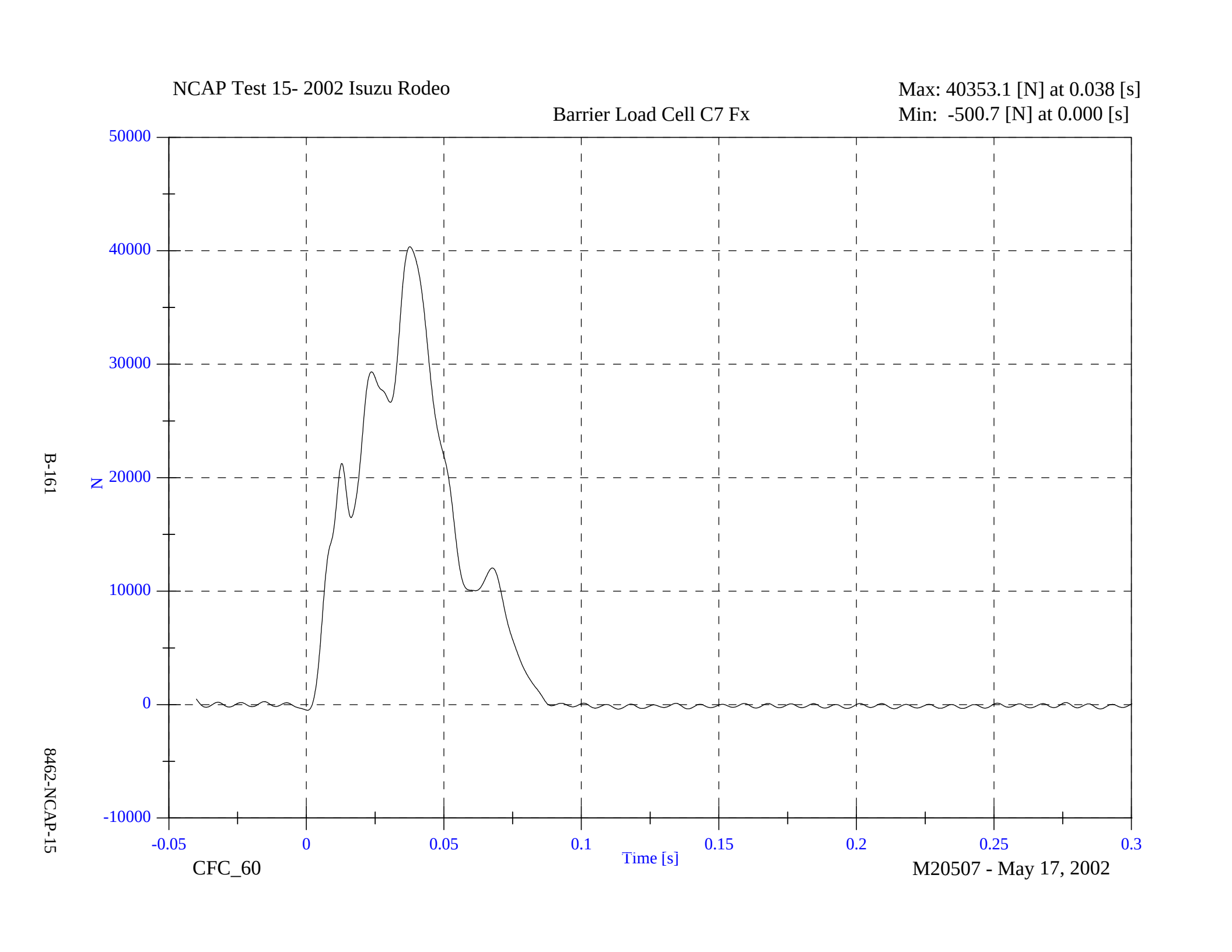


B-160

8462-NCAP-15

CFC_60

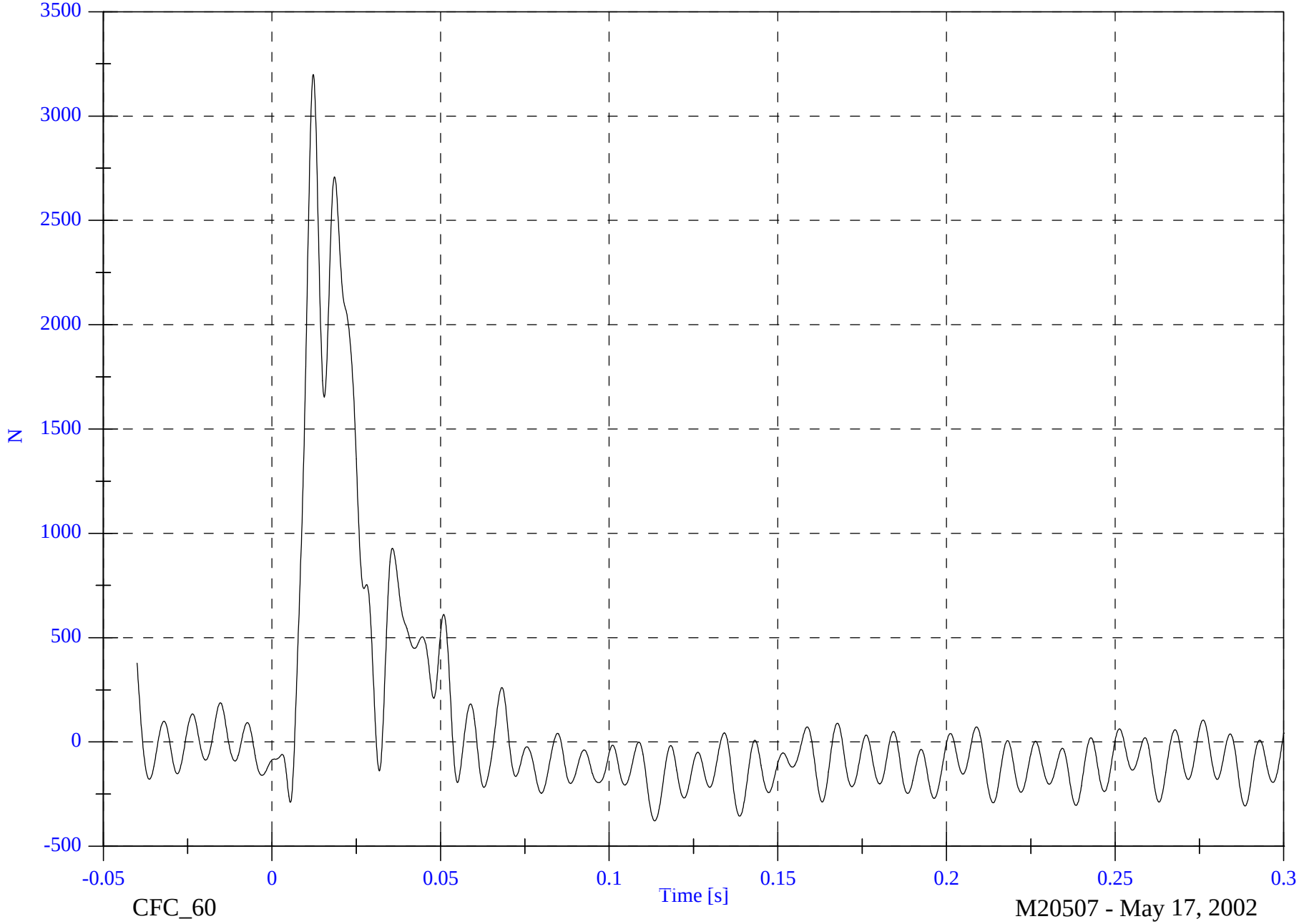
M20507 - May 17, 2002


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell C7 Fx
Max: 40353.1 [N] at 0.038 [s]
Min: -500.7 [N] at 0.000 [s]
50000
40000
30000
20000
10000
0
-10000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
B-161
8462-NCAP-15
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell C8 Fx

Max: 3198.5 [N] at 0.012 [s]
Min: -378.0 [N] at 0.113 [s]

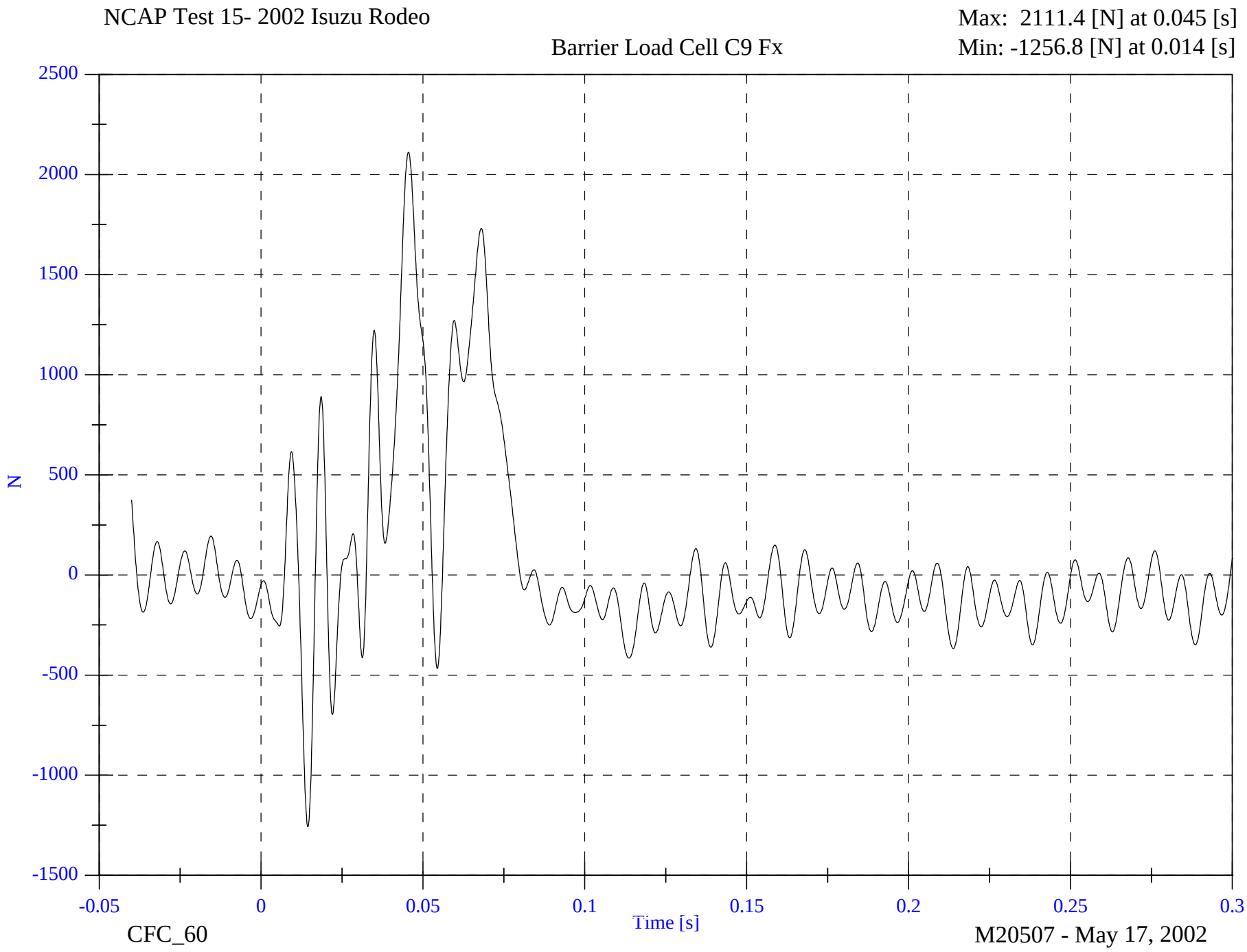


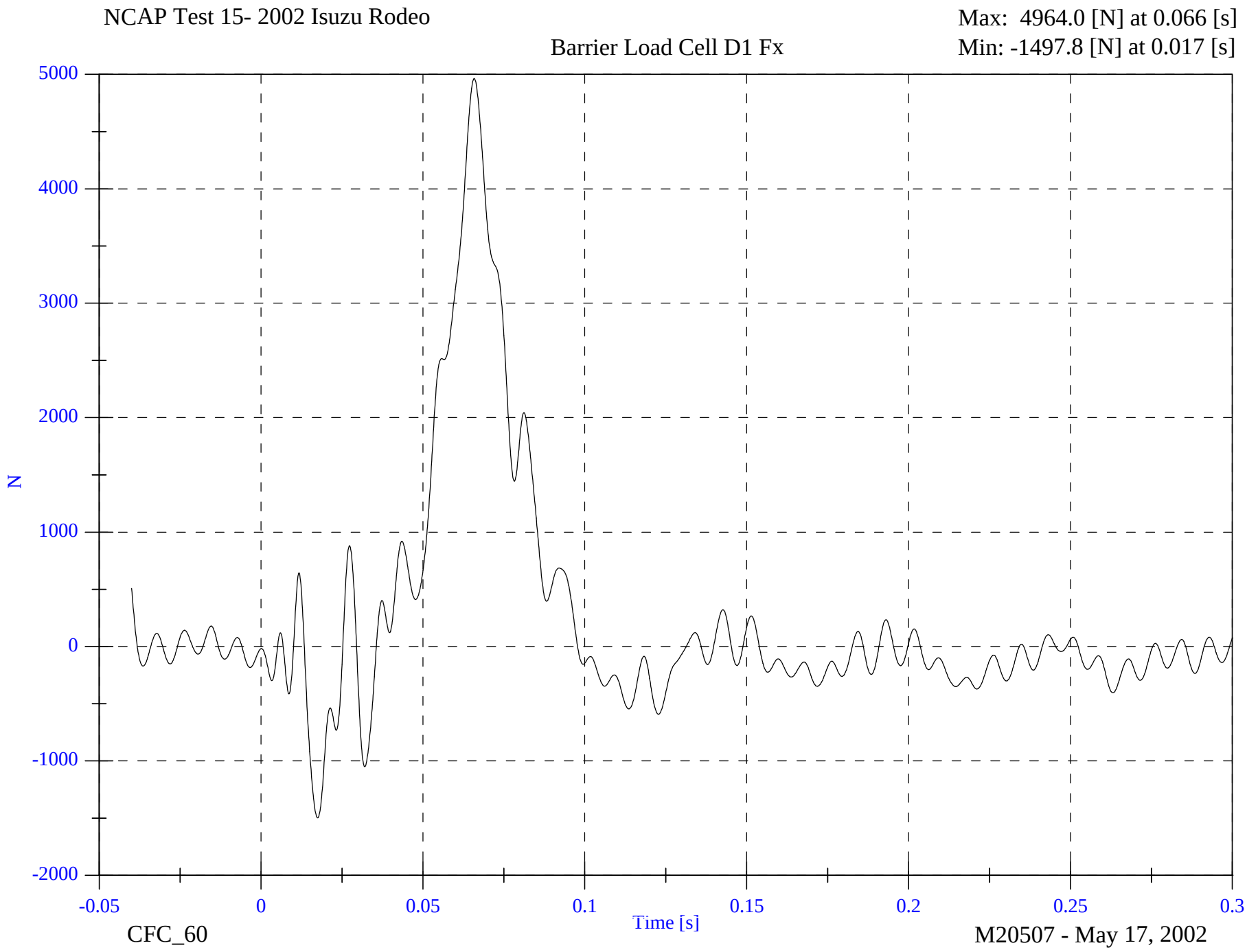
B-162

8462-NCAP-15

CFC_60

M20507 - May 17, 2002

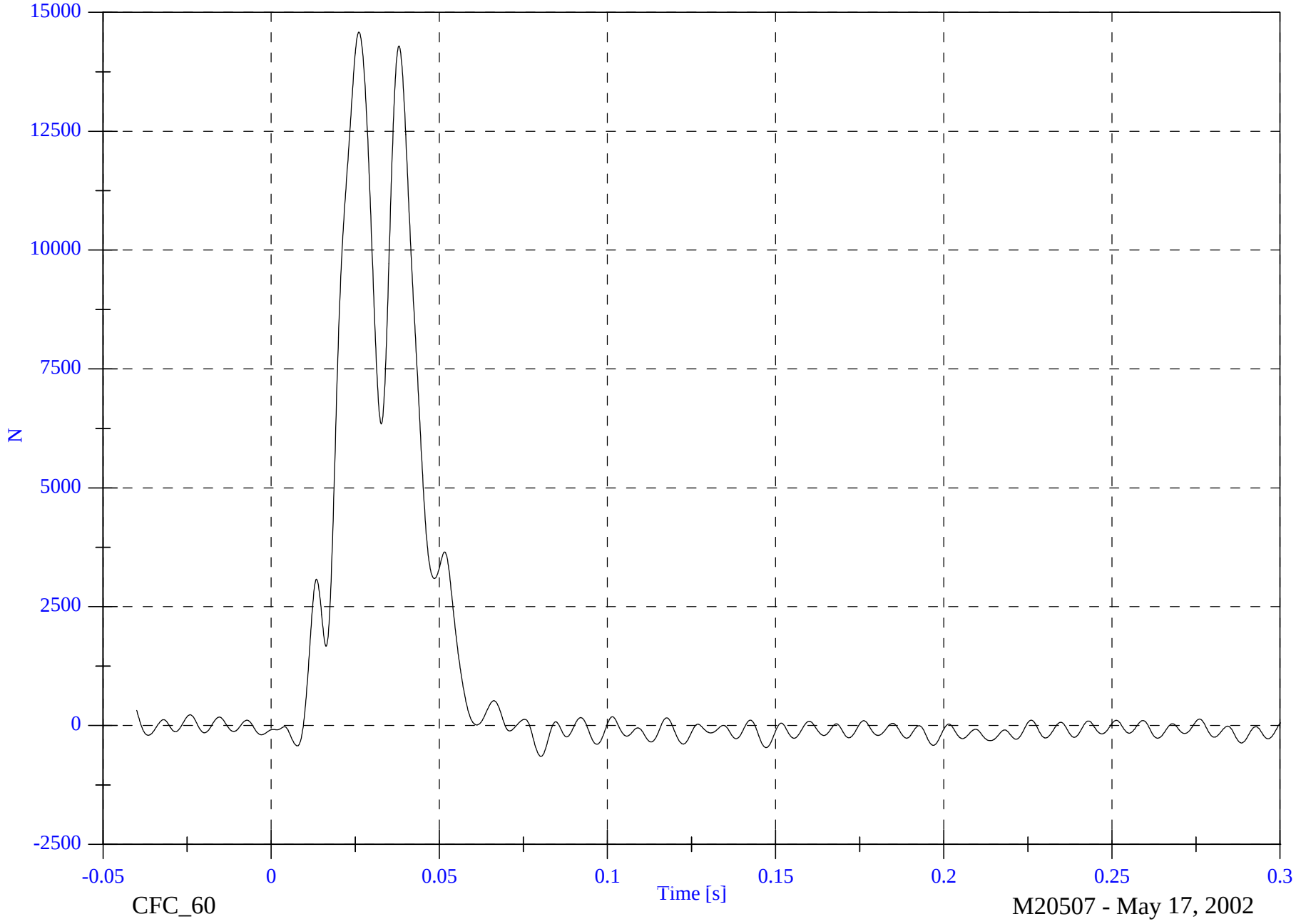

NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell C9 Fx
Max: 2111.4 [N] at 0.045 [s]
Min: -1256.8 [N] at 0.014 [s]
2500
2000
1500
1000
500
0
-500
-1000
-1500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell D1 Fx
Max: 4964.0 [N] at 0.066 [s]
Min: -1497.8 [N] at 0.017 [s]
5000
4000
3000
2000
1000
0
-1000
-2000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell D2 Fx

Max: 14586.4 [N] at 0.026 [s]
Min: -649.5 [N] at 0.080 [s]

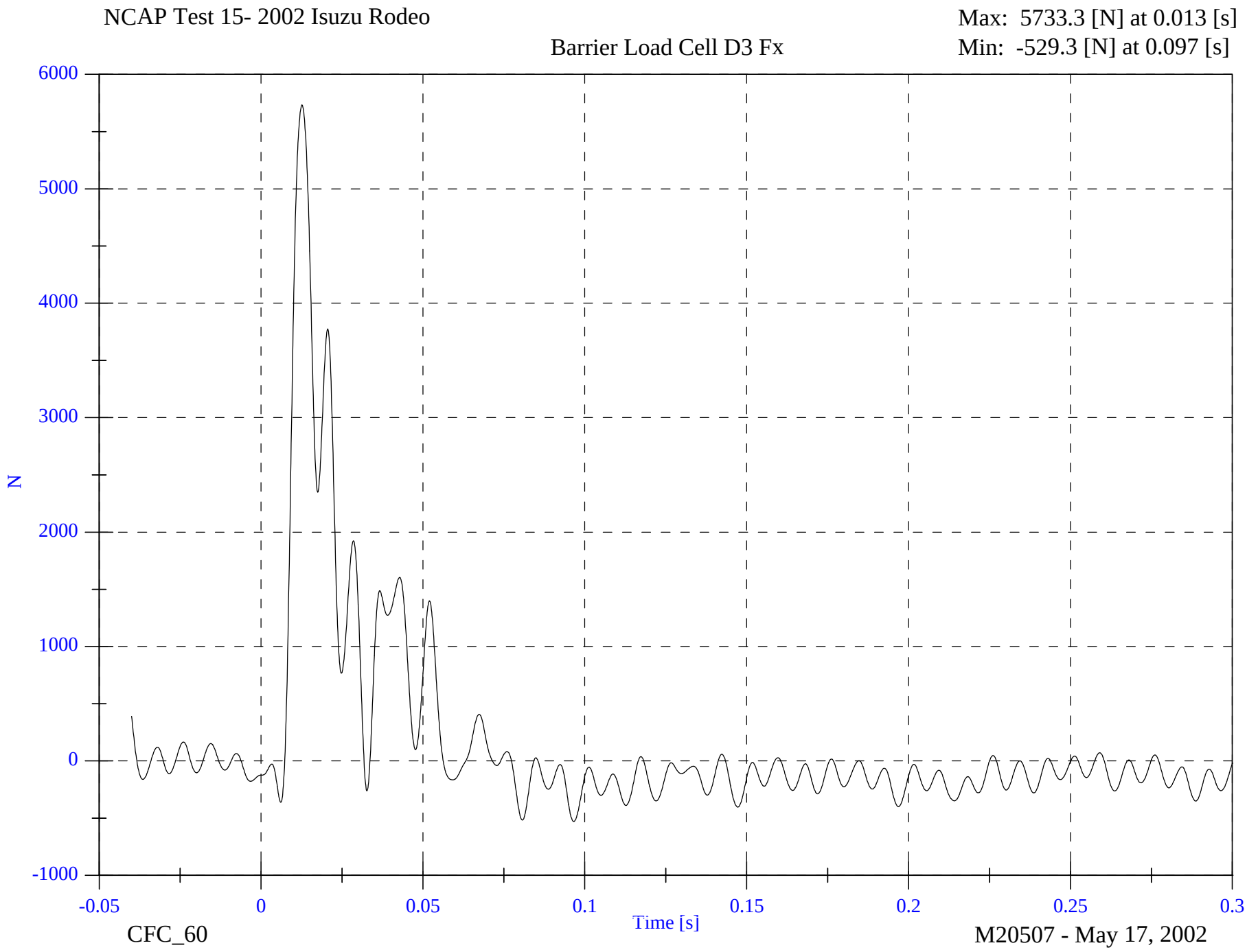


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8462-NCAP-15

CFC_60

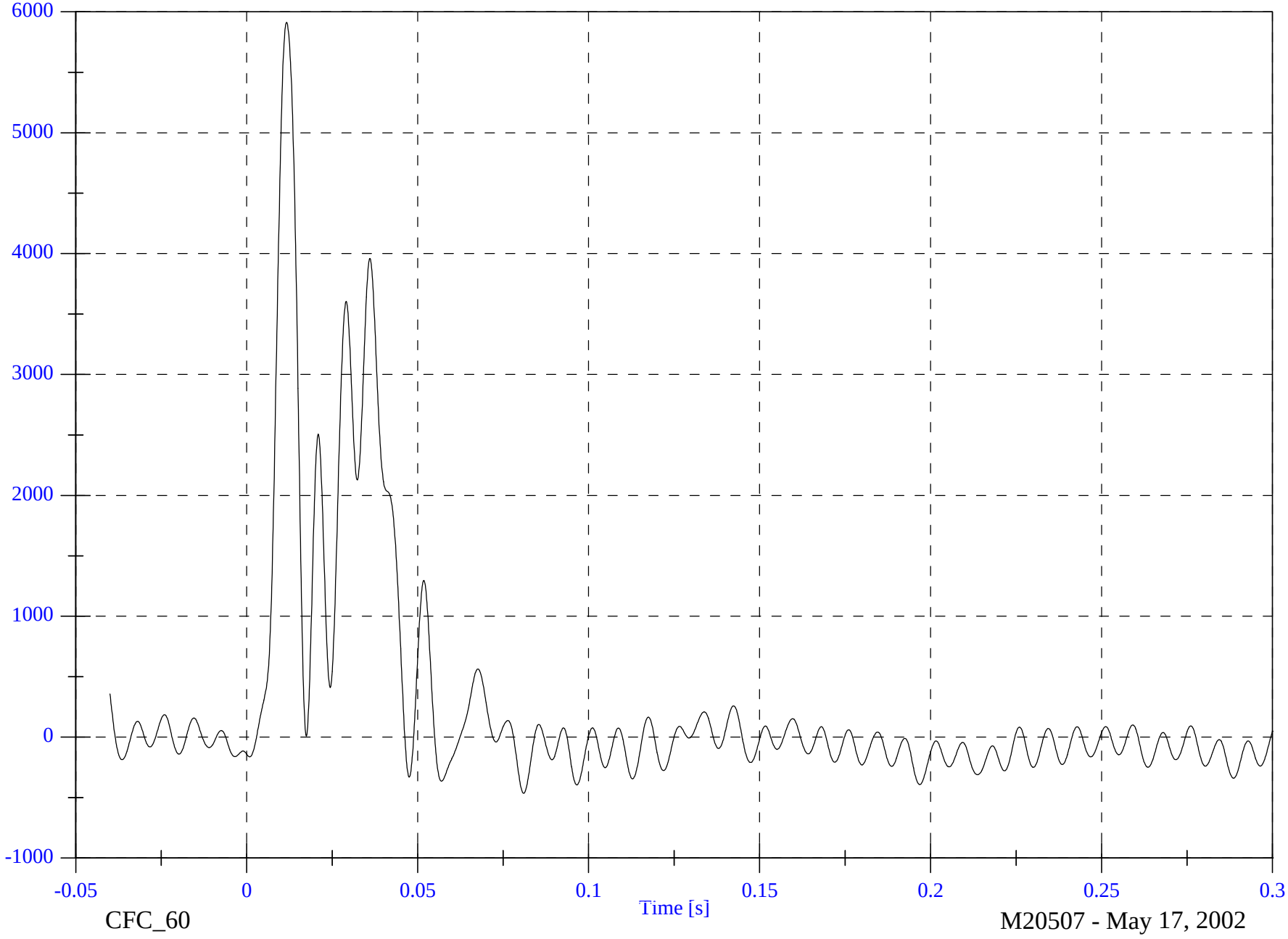
M20507 - May 17, 2002


NCAP Test 15- 2002 Isuzu Rodeo
Barrier Load Cell D3 Fx
Max: 5733.3 [N] at 0.013 [s]
Min: -529.3 [N] at 0.097 [s]
6000
5000
4000
3000
2000
1000
0
-1000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell D4 Fx

Max: 5913.5 [N] at 0.012 [s]
Min: -464.7 [N] at 0.081 [s]



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8462-NCAP-15

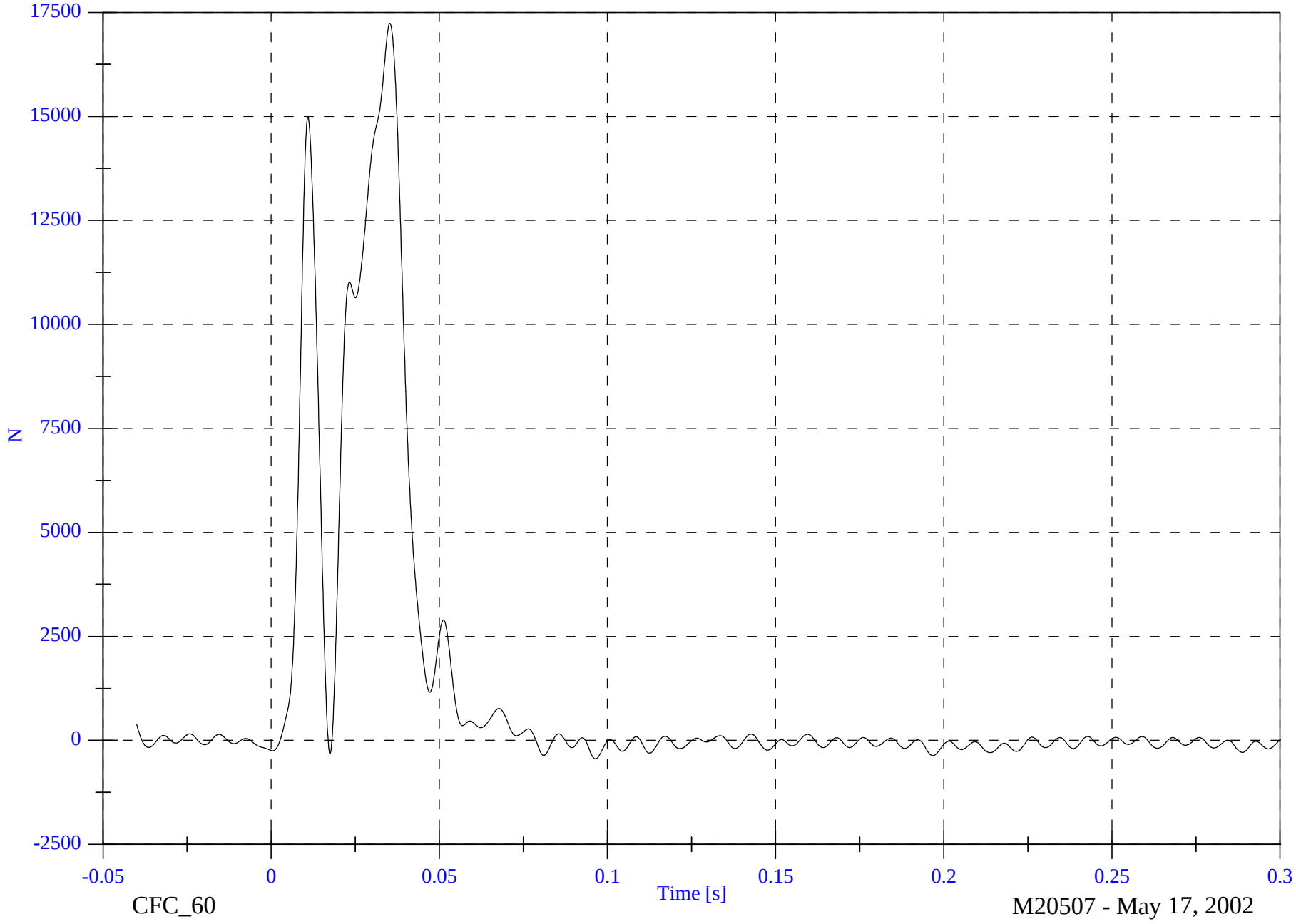
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell D5 Fx

Max: 17242.3 [N] at 0.035 [s]
Min: -446.1 [N] at 0.096 [s]

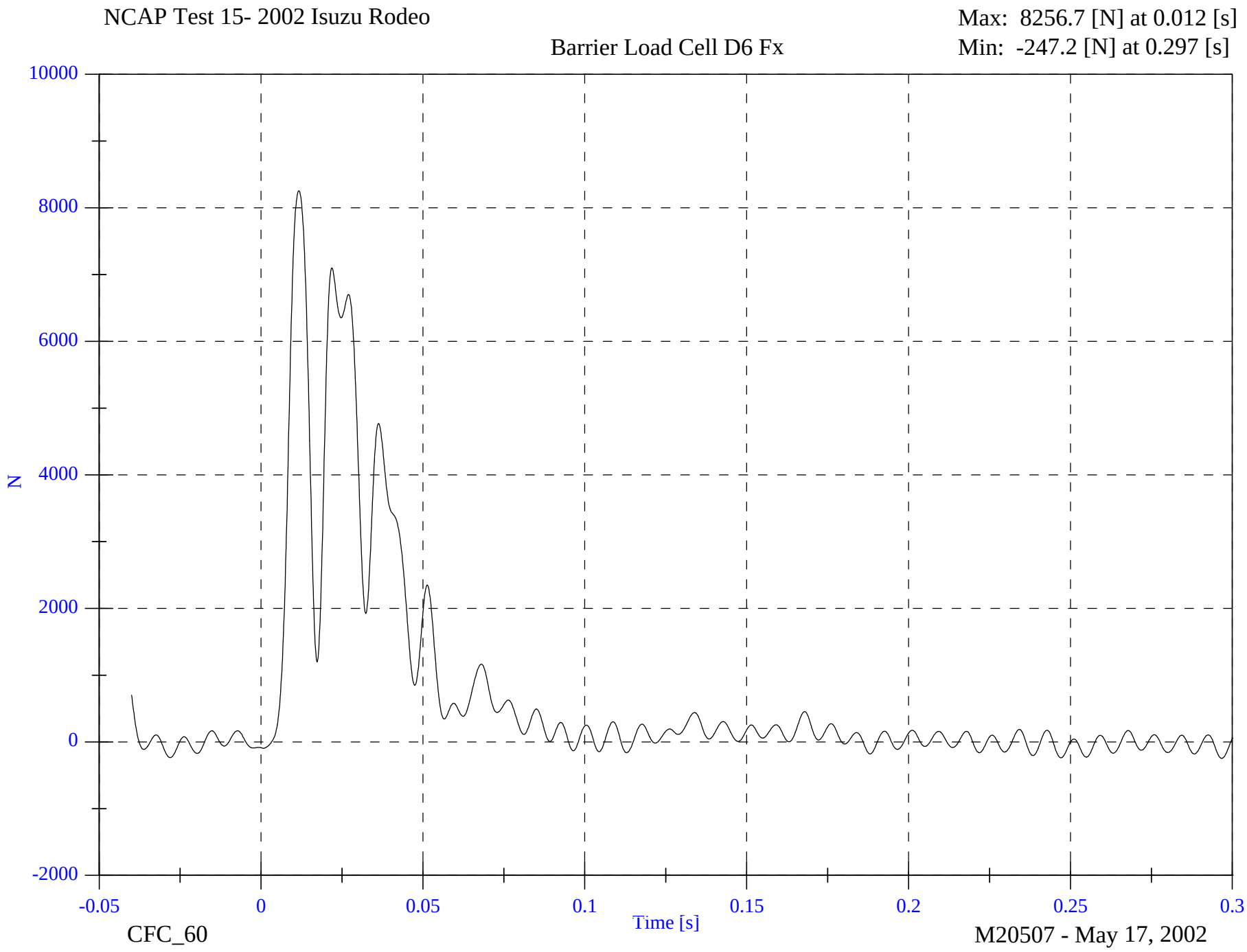


B-168

8462-NCAP-15

CFC_60

M20507 - May 17, 2002



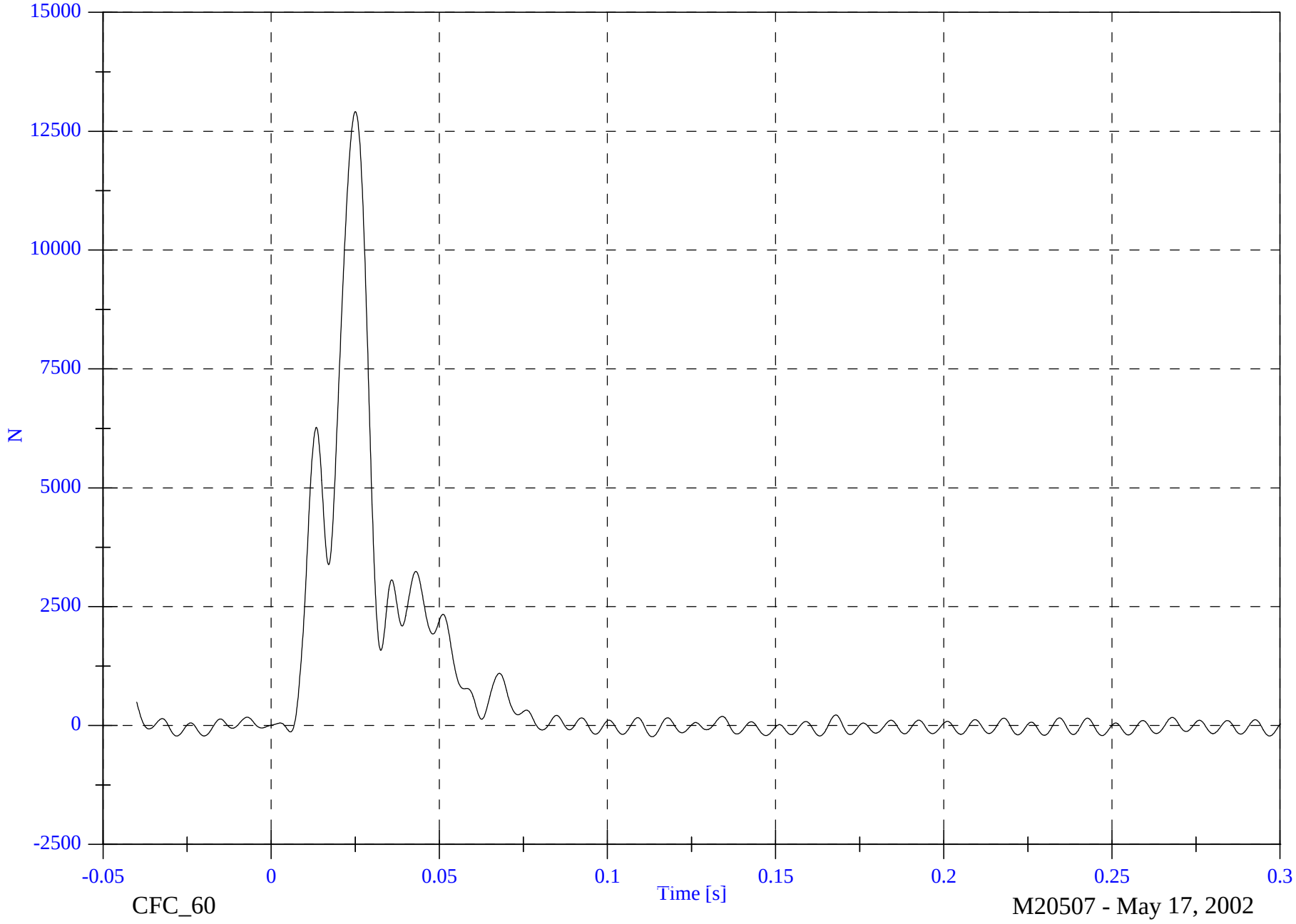
B-169

8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell D7 Fx

Max: 12912.9 [N] at 0.025 [s]
Min: -236.7 [N] at 0.113 [s]



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8462-NCAP-15

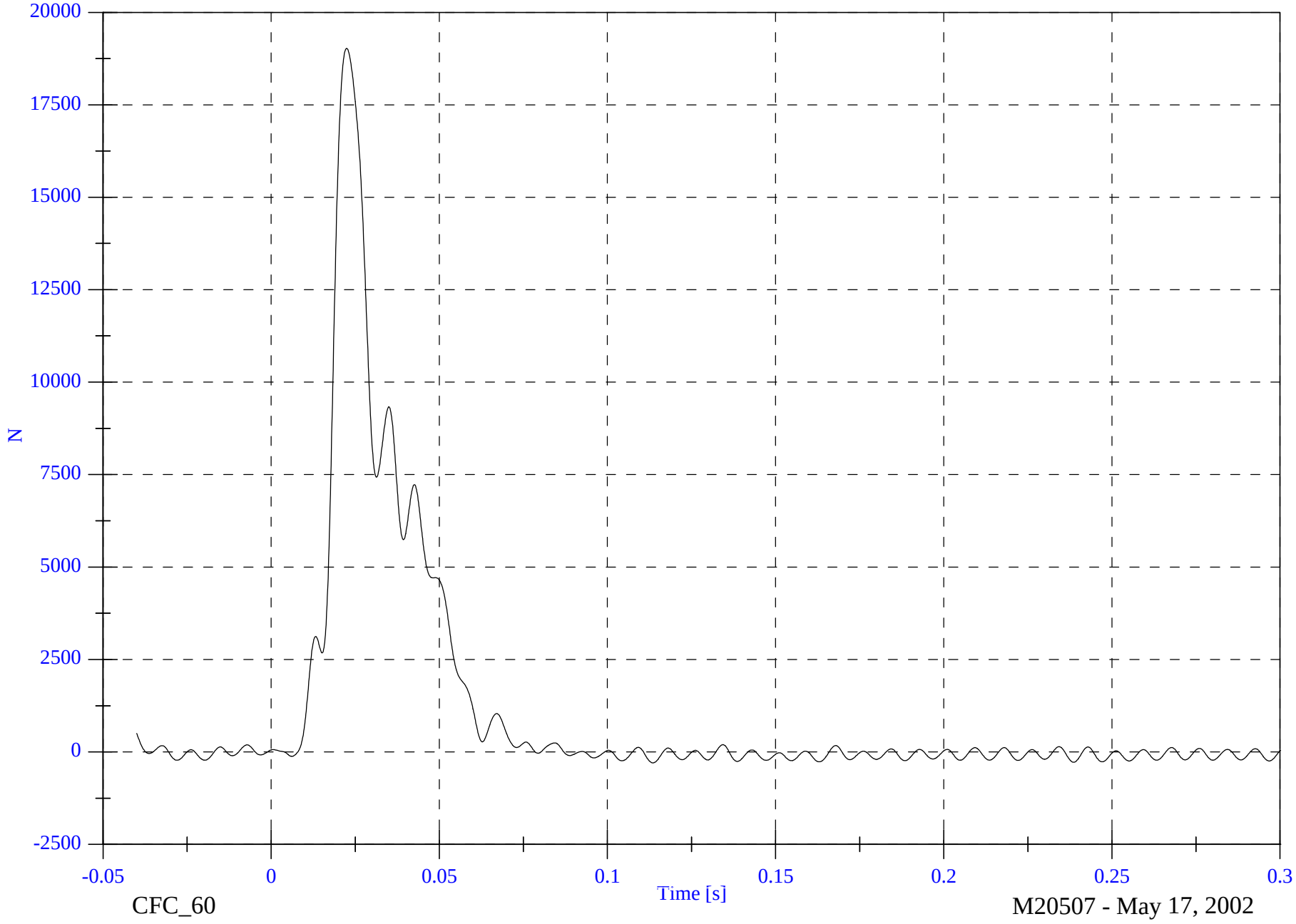
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Barrier Load Cell D8 Fx

Max: 19026.2 [N] at 0.022 [s]
Min: -296.1 [N] at 0.113 [s]

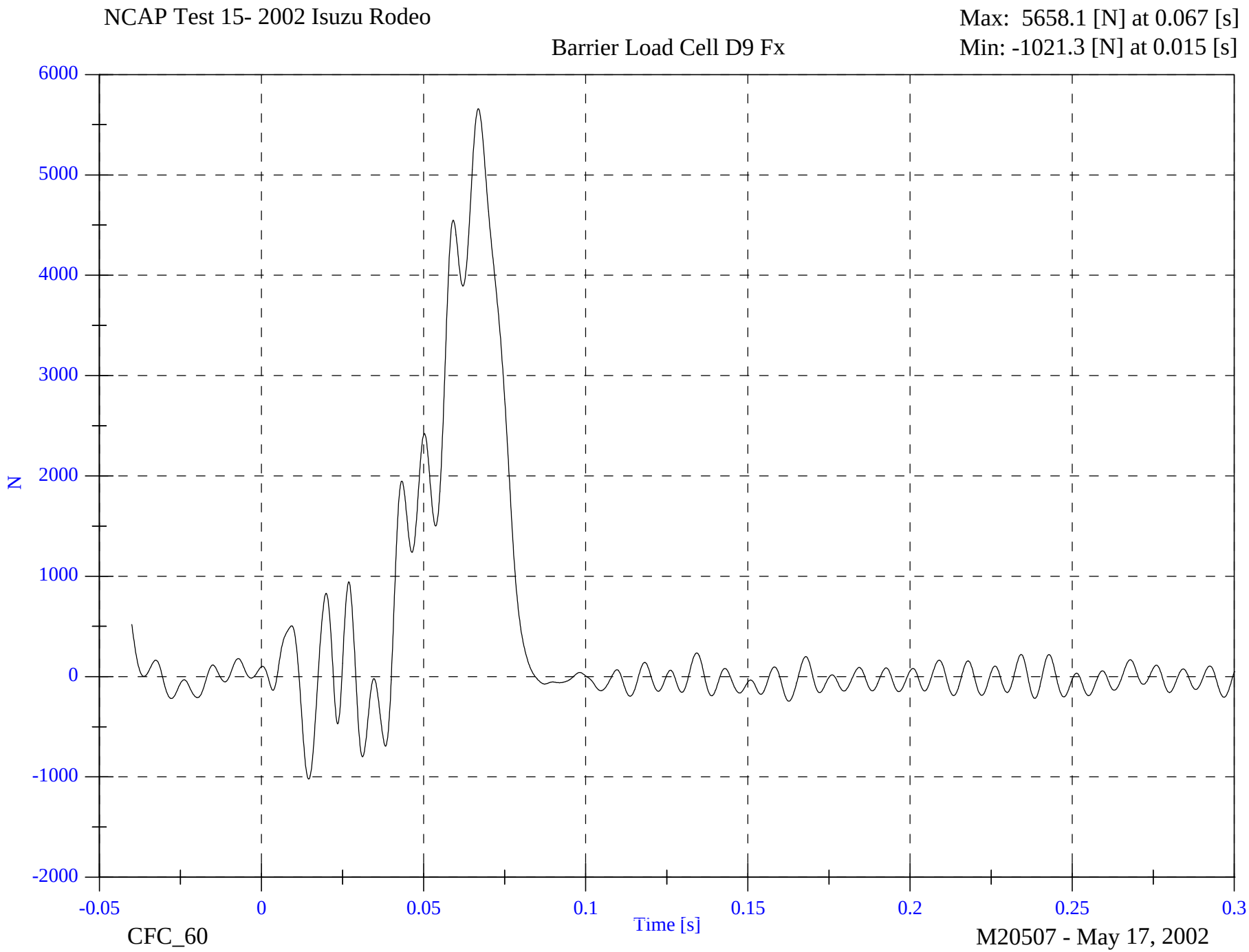


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8462-NCAP-15

CFC_60

M20507 - May 17, 2002



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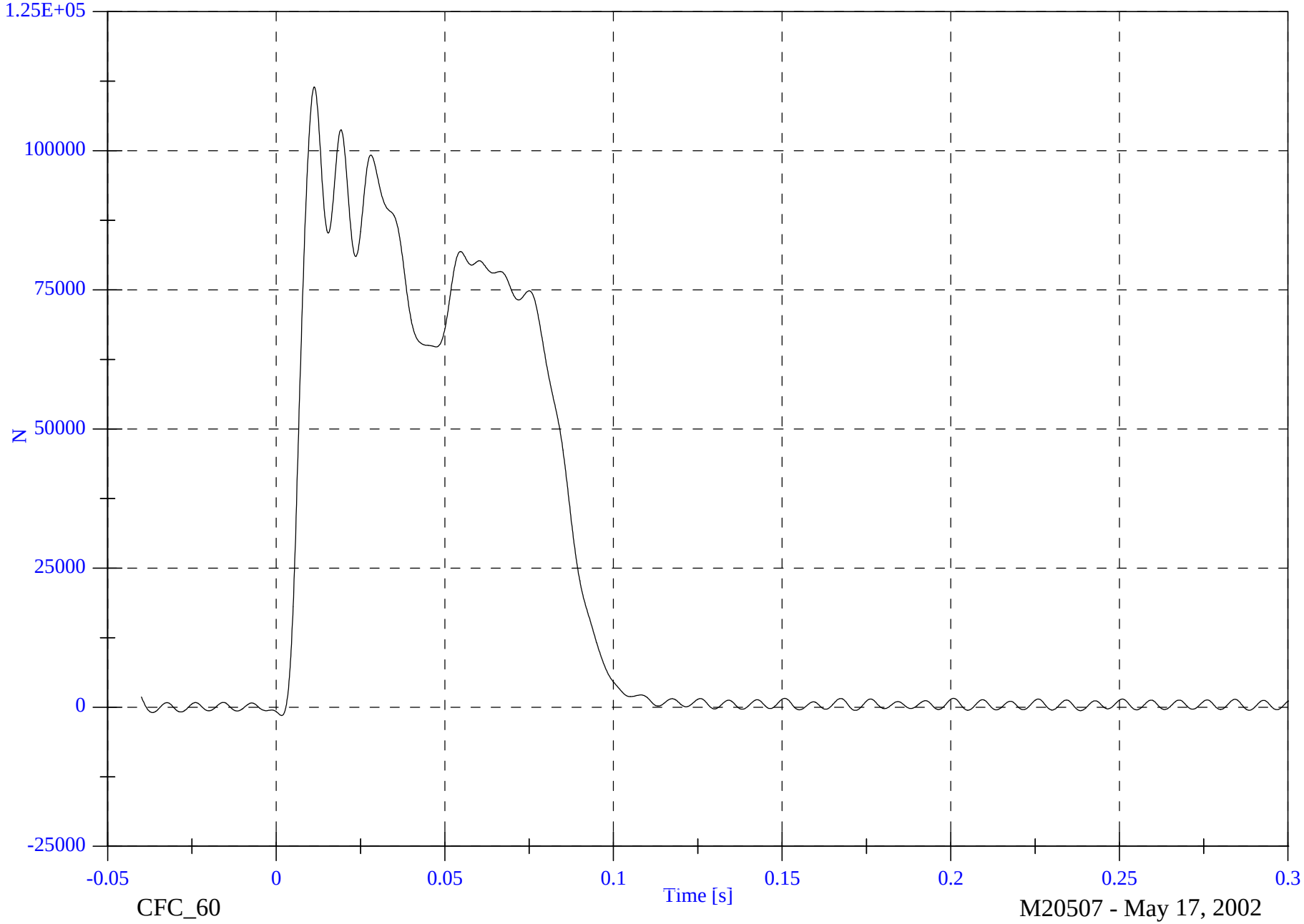
8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

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

Max: 111486.2 [N] at 0.011 [s]

Min: -1490.5 [N] at 0.002 [s]



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8462-NCAP-15

CFC_60

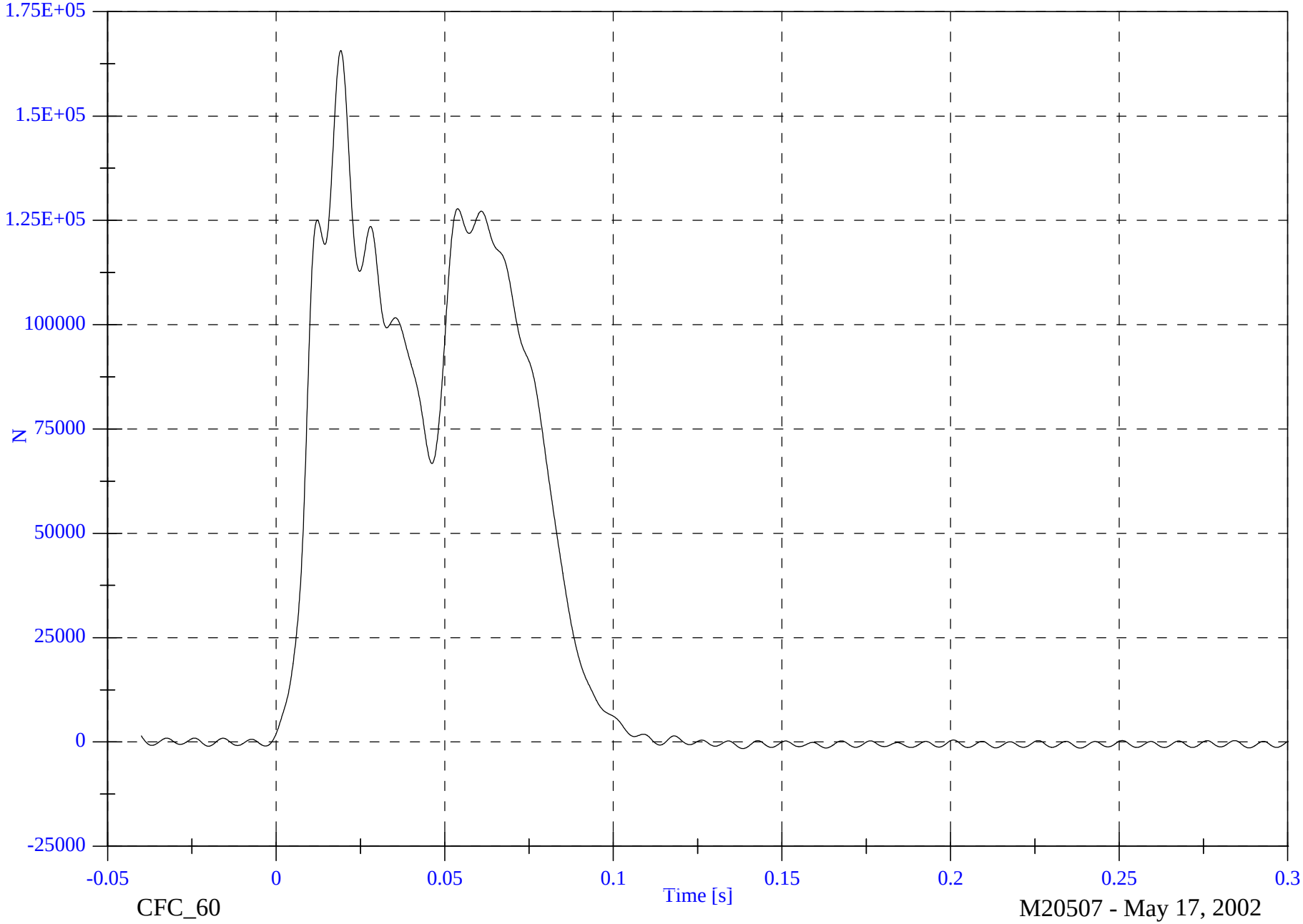
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

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

Max: 165714.5 [N] at 0.019 [s]

Min: -1574.0 [N] at 0.138 [s]

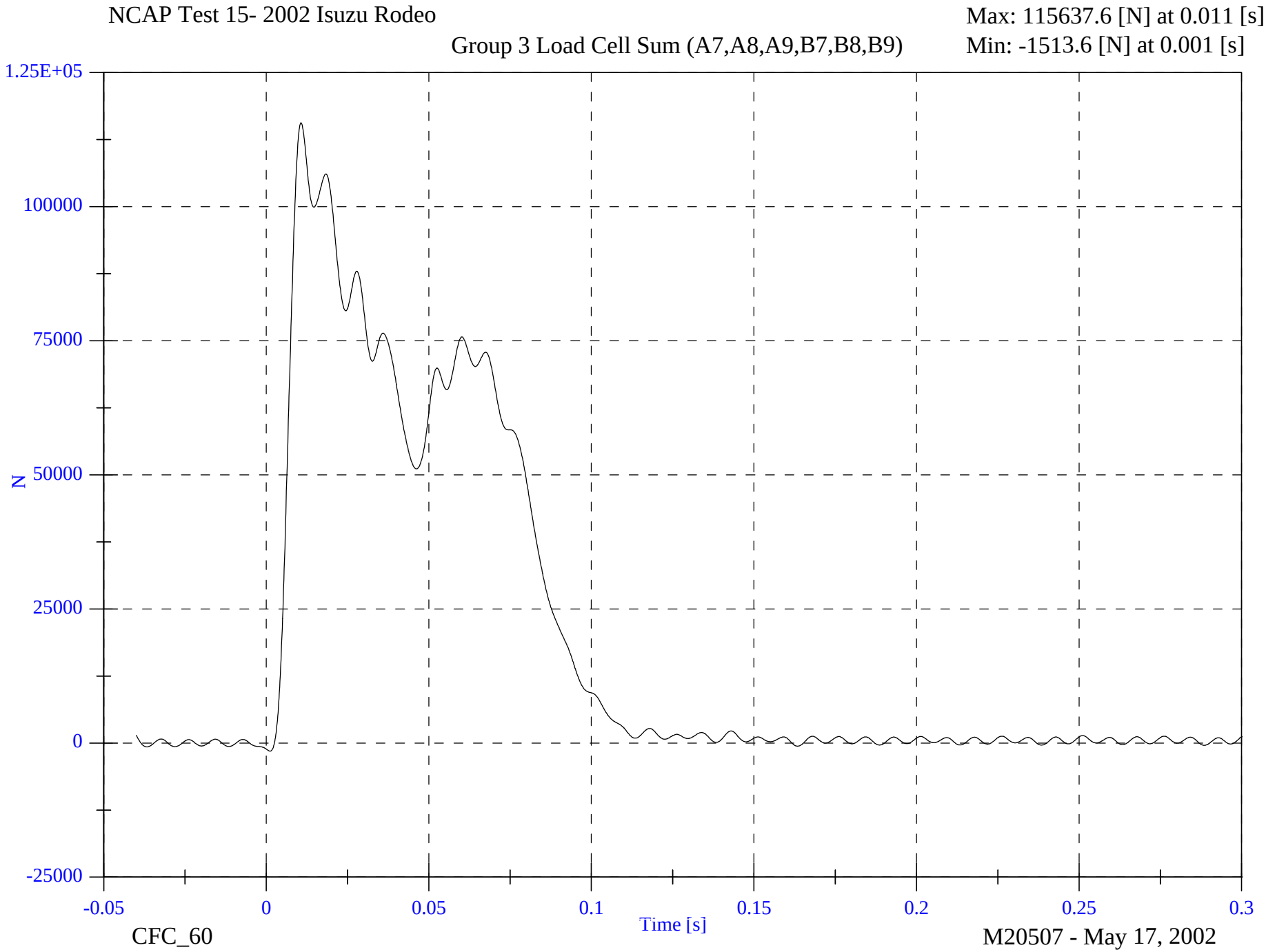


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8462-NCAP-15

CFC_60

M20507 - May 17, 2002

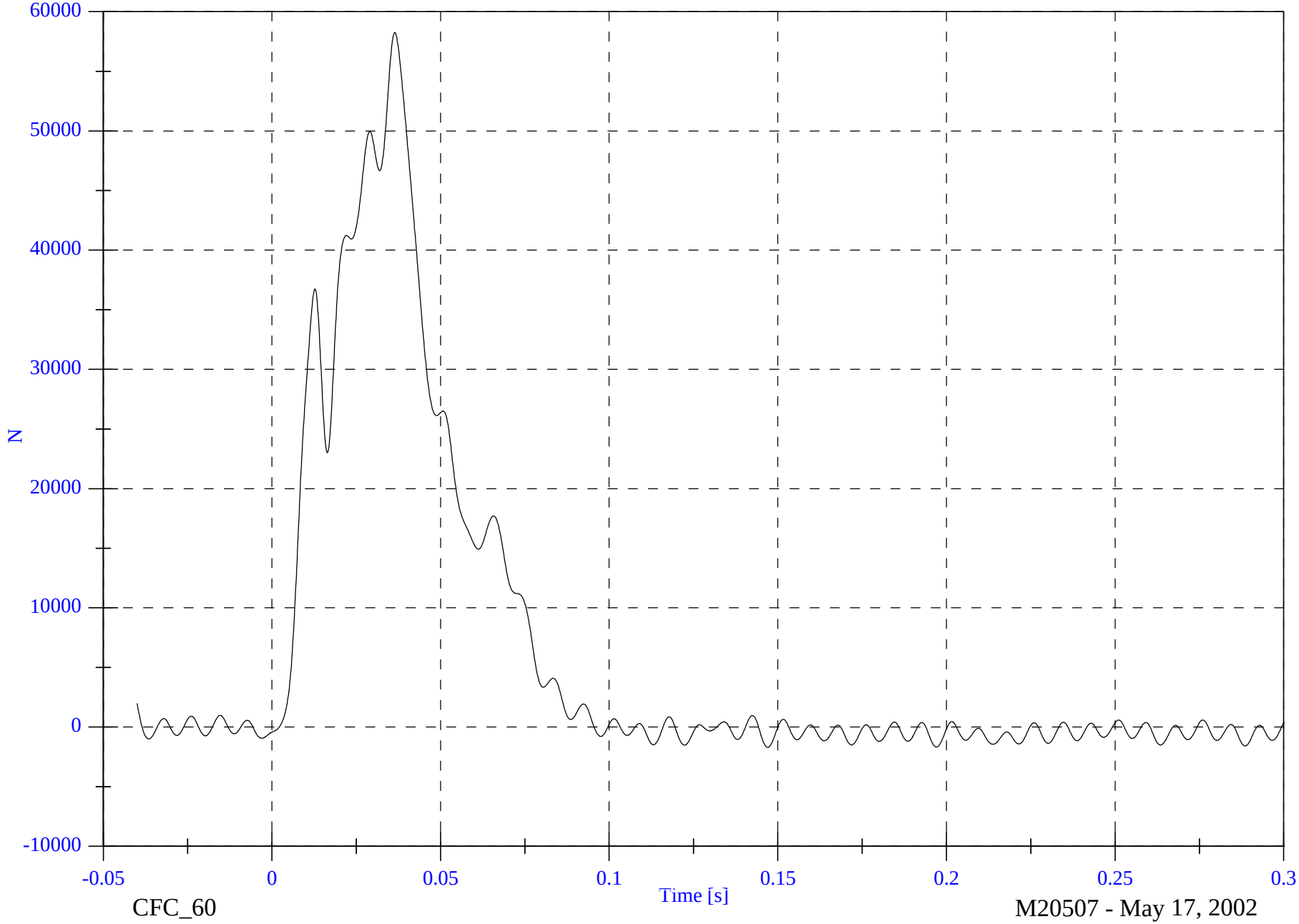

NCAP Test 15- 2002 Isuzu Rodeo
Group 3 Load Cell Sum (A7,A8,A9,B7,B8,B9)
Max: 115637.6 [N] at 0.011 [s]
Min: -1513.6 [N] at 0.001 [s]
1.25E+05
100000
75000
50000
25000
0
-25000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002
B-175
8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

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

Max: 58255.0 [N] at 0.036 [s]

Min: -1704.2 [N] at 0.147 [s]



CFC_60

M20507 - May 17, 2002

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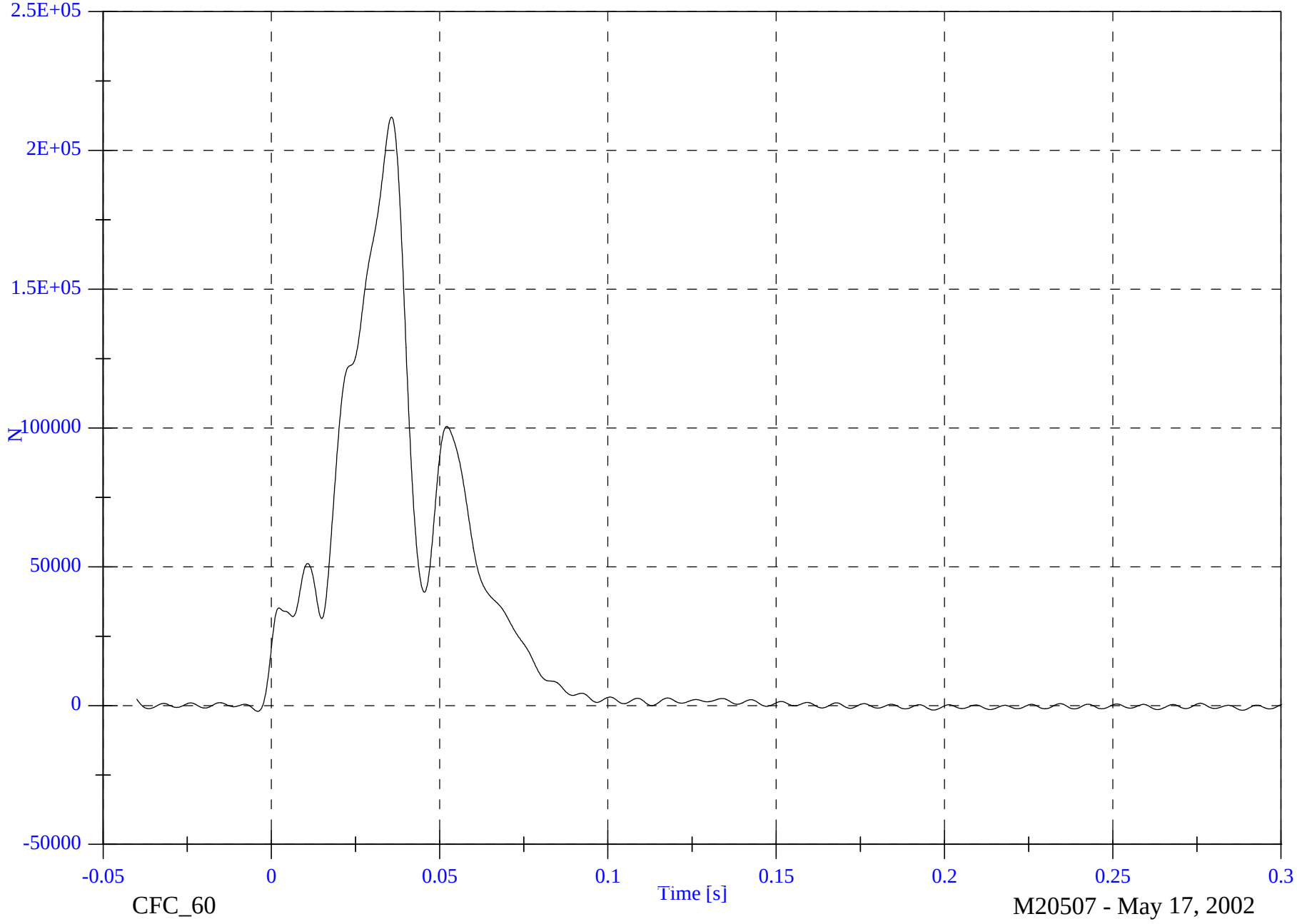
8462-NCAP-15

NCAP Test 15- 2002 Isuzu Rodeo

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

Max: 212019.5 [N] at 0.036 [s]

Min: -2085.3 [N] at -0.004 [s]



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8462-NCAP-15

CFC_60

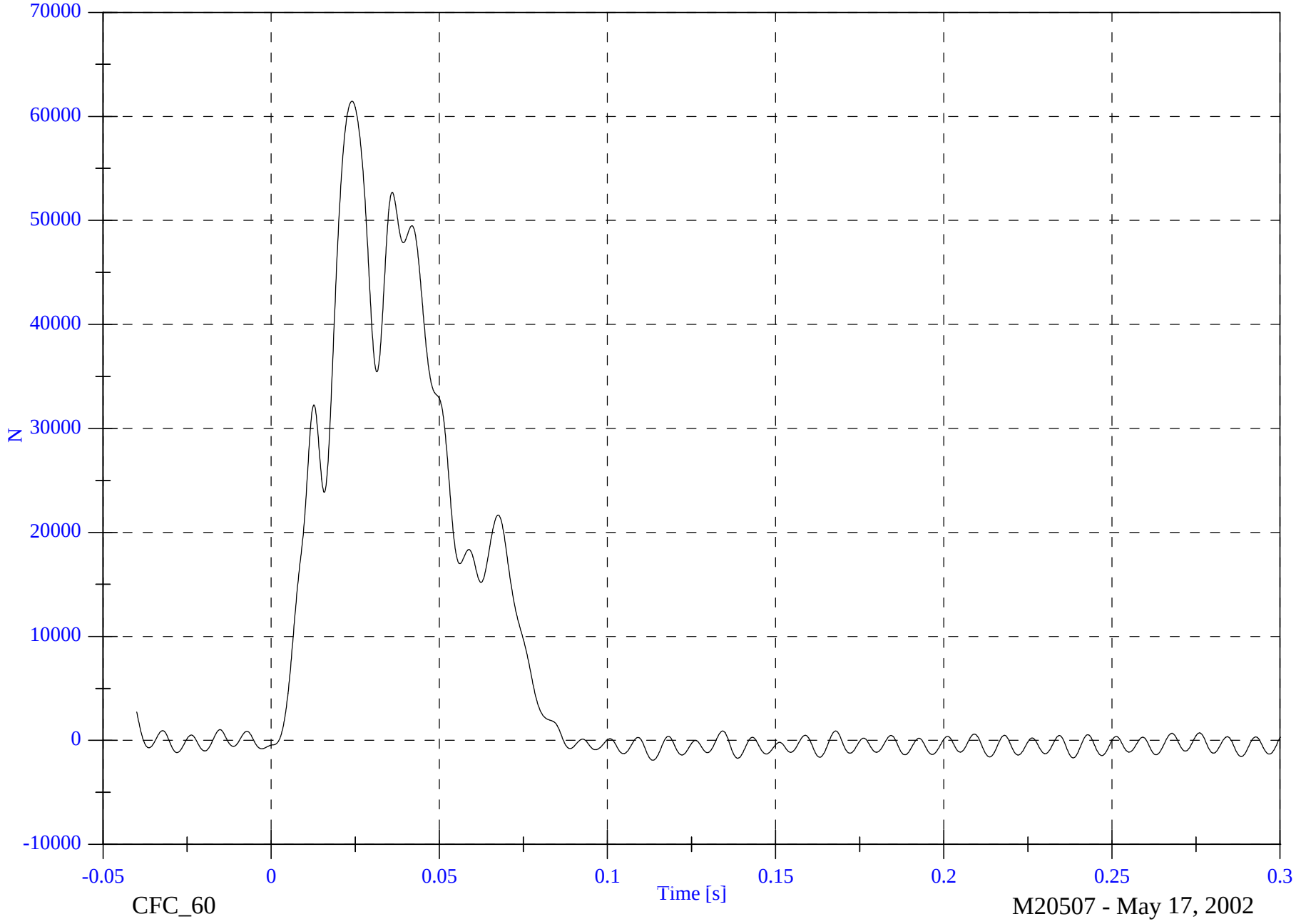
M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

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

Max: 61454.4 [N] at 0.024 [s]

Min: -1916.0 [N] at 0.113 [s]



B-178

8462-NCAP-15

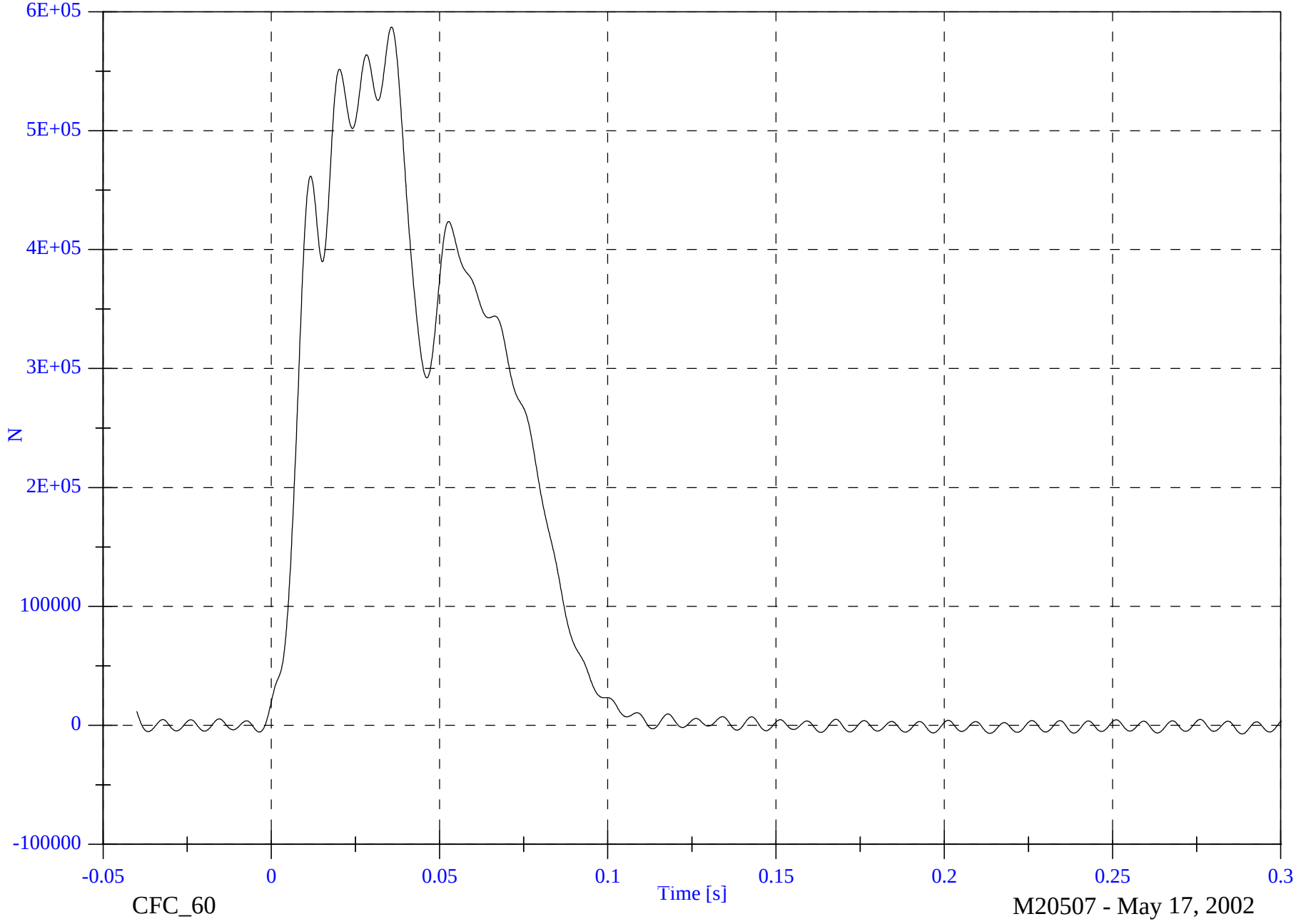
CFC_60

M20507 - May 17, 2002

NCAP Test 15- 2002 Isuzu Rodeo

Total Load Cell Sum (All 6 Groups)

Max: 587105.4 [N] at 0.036 [s]
Min: -7220.7 [N] at 0.288 [s]



CFC_60

M20507 - May 17, 2002

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8462-NCAP-15

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.

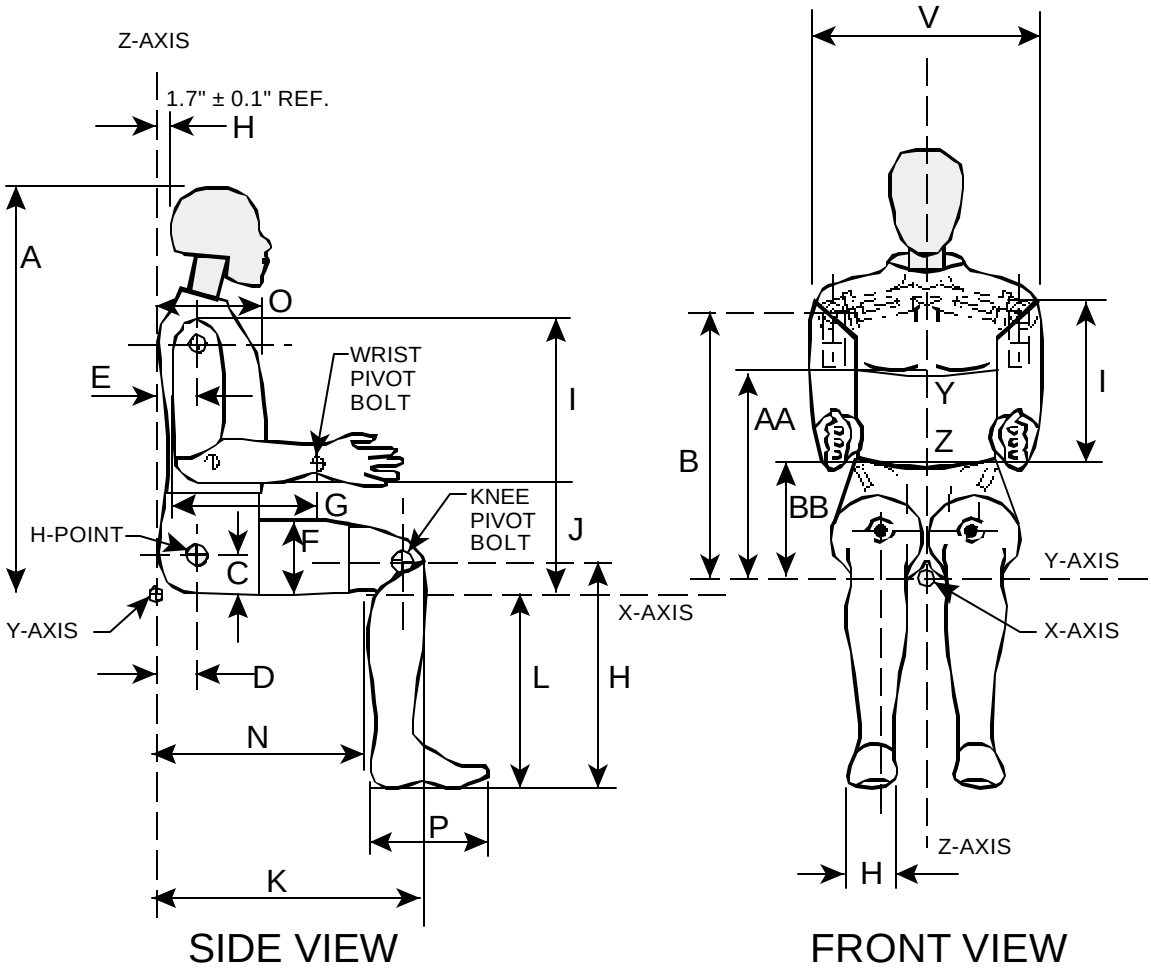
Dummy serial numbers and certification dates are:

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

Electronic Test Equipment

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

EXTERNAL DIMENSIONS SPECIFICATIONS



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

PART 572E
HEAD DROP TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061
Sequential Test Number	1
Date	5/2/02
Workfile	061Flx

6 Axis Neck Transducer

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	061
Sequential Test Number	1
Date	5/15/02
Workfile	061T

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	71
Relative Humidity	10% - 70%	39
Pendulum Velocity	21.6 - 22.4 Ft/s	22.06
Maximum Deflection	2.50 - 2.86 in	2.55
Maximum Resistive Force	1160 - 1325 Lbs	1319.87
Internal Hysteresis	69 - 85 %	78.11

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

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

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			40
Location for Chest Circumference	AA	16.9 -17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.6
Chest Depth	O	8.4 - 9.0 in	8.5
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.1
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.5
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.1
Elbow Rest Height	J	7.5 - 8.3 in	7.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.4
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number	064
Sequential Test Number	1
Date	4/30/02
Workfile	064H

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064
Sequential Test Number	1
Date	5/01/02
Workfile	064Flx

6 Axis Neck Transducer

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

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

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			40
Location for Chest Circumference	AA	16.9 -17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.8
Chest Depth	O	8.4 - 9.0 in	8.6
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.3
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.4
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.3
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician: B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENTRAN	AC-01G18-F06	21-Jan-02	27-Jul-02
	X Arm Z	ENTRAN	AC-00L13-F39	22-Jan-02	28-Jul-02
	Y Arm X	ENTRAN	AC-00L13-F14	21-Jan-02	27-Jul-02
	Y Arm Z	ENTRAN	AC-01G18-F16	22-Jan-02	28-Jul-02
	Z Arm X	ENTRAN	AC-00L13-F72	21-Jan-02	27-Jul-02
	Z Arm Y	ENTRAN	AC-01G18-F12	21-Jan-02	27-Jul-02
Head	X	ENTRAN	AC-00L13-F04	22-Jan-02	28-Jul-02
	Y	ENTRAN	AC-01G18-F15	21-Jan-02	27-Jul-02
	Z	ENTRAN	AC-01G18-F14	22-Jan-02	28-Jul-02
Head	X (R)	ENTRAN	AC-01G18-F20	21-Jan-02	27-Jul-02
	Y (R)	ENTRAN	AC-01G18-F05	22-Jan-02	28-Jul-02
	Z (R)	ENDEVCO	AC-P18532	27-Feb-02	27-Aug-02
Neck Load Cell	X	DENTON	LC-205Fx	22-Jan-02	28-Jul-02
	Y	DENTON	LC-205Fy	22-Jan-02	28-Jul-02
	Z	DENTON	LC-205Fz	22-Jan-02	28-Jul-02
Neck Moment	X	DENTON	LC-205Mx	22-Jan-02	28-Jul-02
	Y	DENTON	LC-205My	22-Jan-02	28-Jul-02
	Z	DENTON	LC-205Mz	22-Jan-02	28-Jul-02
Chest	X	ENDEVCO	AC-P21373	14-Mar-02	14-Sep-02
	Y	ENDEVCO	AC-P22639	14-Mar-02	14-Sep-02
	Z	ENDEVCO	AC-P21297	14-Mar-02	14-Sep-02
Chest	X (R)	ENDEVCO	AC-P21171	14-Mar-02	14-Sep-02
	Y (R)	ENDEVCO	AC-P23136	14-Mar-02	14-Sep-02
	Z (R)	ENDEVCO	AC-P23128	14-Mar-02	14-Sep-02
Chest Deflection	X	SERVO	DS-061	14-Mar-02	14-Sep-02
Pelvic	X	ENDEVCO	AC-P21441	14-Mar-02	14-Sep-02
	Y	ENDEVCO	AC-P19246	14-Mar-02	14-Sep-02
	Z	ENDEVCO	AC-P21516	14-Mar-02	14-Sep-02

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-659	12-Feb-02	18-Aug-02
Right Femur Load Cell	Fz	GSE	LC-723	12-Feb-02	18-Aug-02
Left Upper Tibia	Mx	DENTON	LC-016Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-016My	08-Apr-02	08-Oct-02
Left Lower Tibia	Fz	DENTON	LC-123Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-123Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-123My	08-Apr-02	08-Oct-02
Right Upper Tibia	Mx	DENTON	LC-023Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-023My	08-Apr-02	08-Oct-02
Right Lower Tibia	Fz	DENTON	LC-111Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-111Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-111My	08-Apr-02	08-Oct-02
Left Foot Rear	X	ENDEVCO	AC-P19343	04-Apr-02	04-Oct-02
	Z	ENDEVCO	AC-P16583	04-Apr-02	04-Oct-02
Left Foot Front	Z	ENDEVCO	AC-P18525	27-Feb-02	27-Aug-02
Right Foot Rear	X	ENDEVCO	AC-P18628	04-Apr-02	04-Oct-02
	Z	ENDEVCO	AC-P18741	04-Apr-02	04-Oct-02
Right Foot Front	Z	ENDEVCO	AC-P23276	25-Apr-02	25-Oct-02

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENTRAN	AC-01G18-F08	22-Jan-02	28-Jul-02
	X Arm Z	ENTRAN	AC-00L20-A13	22-Jan-02	28-Jul-02
	Y Arm X	ENTRAN	AC-00L20-A08	21-Jan-02	27-Jul-02
	Y Arm Z	ENTRAN	AC-01G18-F13	22-Jan-02	28-Jul-02
	Z Arm X	ENTRAN	AC-01J02-F18	22-Jan-02	28-Jul-02
	Z Arm Y	ENTRAN	AC-01G25-N11	21-Jan-02	27-Jul-02
Head	X	ENTRAN	AC-01G18-F18	22-Jan-02	28-Jul-02
	Y	ENTRAN	AC-01G18-F07	21-Jan-02	27-Jul-02
	Z	ENTRAN	AC-01G18-F10	21-Jan-02	27-Jul-02
Head	X (R)	ENTRAN	AC-01J02-F09	21-Jan-02	27-Jul-02
	Y (R)	ENTRAN	AC-01G18-F03	22-Jan-02	28-Jul-02
	Z (R)	ENTRAN	AC-01G18-F09	22-Jan-02	28-Jul-02
Neck Load Cell	X	DENTON	LC-440Fx	22-Jan-02	28-Jul-02
	Y	DENTON	LC-440Fy	22-Jan-02	28-Jul-02
	Z	DENTON	LC-440Fz	22-Jan-02	28-Jul-02
Neck Moment	X	DENTON	LC-440Mx	22-Jan-02	28-Jul-02
	Y	DENTON	LC-440My	22-Jan-02	28-Jul-02
	Z	DENTON	LC-440Mz	22-Jan-02	28-Jul-02
Chest	X	ENDEVCO	AC-P23155	15-Mar-02	15-Sep-02
	Y	ENDEVCO	AC-P23358	15-Mar-02	15-Sep-02
	Z	ENDEVCO	AC-P23282	15-Mar-02	15-Sep-02
Chest	X (R)	ENDEVCO	AC-P21484	15-Mar-02	15-Sep-02
	Y (R)	ENDEVCO	AC-P16951	15-Mar-02	15-Sep-02
	Z (R)	ENDEVCO	AC-P21399	15-Mar-02	15-Sep-02
Chest Deflection	X	SERVO	DS-064	20-Mar-02	20-Sep-02
Pelvic	X	ENDEVCO	AC-P23174	15-Mar-02	15-Sep-02
	Y	ENDEVCO	AC-P23164	15-Mar-02	15-Sep-02
	Z	ENDEVCO	AC-P23137	15-Mar-02	15-Sep-02

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-954	12-Feb-02	18-Aug-02
Right Femur Load Cell	Fz	GSE	LC-955	12-Feb-02	18-Aug-02
Left Upper Tibia	Mx	DENTON	LC-045Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-045My	08-Apr-02	08-Oct-02
Left Lower Tibia	Fz	DENTON	LC-125Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-125Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-125My	08-Apr-02	08-Oct-02
Right Upper Tibia	Mx	DENTON	LC-038Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-038My	08-Apr-02	08-Oct-02
Right Lower Tibia	Fz	DENTON	LC-124Fz	08-Apr-02	08-Oct-02
	Mx	DENTON	LC-124Mx	08-Apr-02	08-Oct-02
	My	DENTON	LC-124My	08-Apr-02	08-Oct-02
Left Foot Rear	X	ENDEVCO	AC-J30491	21-Mar-02	27-Sep-02
	Z	ENDEVCO	AC-J31026	21-Mar-02	27-Sep-02
Left Foot Front	Z	ENDEVCO	AC-J32831	21-Mar-02	27-Sep-02
Right Foot Rear	X	ENDEVCO	AC-J33376	21-Mar-02	27-Sep-02
	Z	ENDEVCO	AC-J32832	21-Mar-02	27-Sep-02
Right Foot Front	Z	ENDEVCO	AC-J31095	21-Mar-02	27-Sep-02

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	AC-X86	25-Apr-02	25-Oct-02
Right Rear Seat Crossmember X	ICS	AC-X83	15-Jan-02	15-Jul-02
Top of Engine	ENDEVCO	AC-J32787	14-Feb-02	14-Aug-02
Bottom of Engine	ENDEVCO	AC-J32098	14-Feb-02	14-Aug-02
Right Disc Brake Caliper	ENDEVCO	AC-J31050	14-Feb-02	14-Aug-02
Instrument Panel	ENDEVCO	AC-J32383	14-Feb-02	14-Aug-02
Left Disc Brake Caliper	ENDEVCO	AC-P16665	15-Jan-02	15-Jul-02
Left Seat Rear Crossmember Z	ICS	AC-Y13	11-Feb-02	17-Aug-02
Right Seat Rear Crossmember Z	ICS	AC-D82	04-Apr-02	04-Oct-02

REPORT NUMBER: CAL-02-15

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

SAFETYFIRST FORERUNNER LATCH
GRACO SNUGRIDE LATCH WITH NO BASE

NHTSA NUMBER: M20507

VERIDIAN ENGINEERING TEST NUMBER: 8642-NCAP-15

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

May 17, 2002

FINAL REPORT

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

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-01-D-32005. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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Acceptance Date: _____

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. SNCAP-CAL-02-15	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of Safetyfirst Forerunner LATCH NHTSA No.: M20507		5. Report Date May 17, 2002 6. Performing Organization Code CAL	
7. Author(s) Patrick G. MacDiarmid, Jr., Project Engineer David J. Travale, Program Manager		8. Performing Organization Report No. 8642-NCAP-15	
9. Performing Organization Name and Address Veridian Engineering Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225		10. Work Unit No. 11. Contract or Grant No. DTNH22-01-D-32005	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NPS-10 400 Seventh SW, Room 5313 Washington, D.C. 20590		13. Type of Report and Period Covered Final Report, May 2002 14. Sponsoring Agency Code NPS-10	
15. Supplementary Notes			
16. Abstract A frontal load cell barrier test was conducted on the subject CRS Safetyfirst Forerunner LATCH and GRACO Snugride LATCH with no base in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at the Veridian Engineering Crash Test Facility in Buffalo, New York, on May 17, 2002.			
17. Key Words New Car Assessment Program (NCAP)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division Room 5108 (NAD-52) 400 Seventh St., S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 ATTN: Robert Hornicle	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M20507

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

The 56.49 kph NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

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

The right rear (Position 3) child dummy (serial no. 090) and left rear (Position 4) child dummy (serial no. 017) were calibrated previous to this test. Child dummy certification information is found in section 5.

The right rear child dummy's HIC was 243.2, maximum chest deceleration over 3 ms was 46.4 g's. The left rear child dummy's HIC was 187.1, maximum chest deceleration over 3 ms was 43.2 g's.

The Position 4 CRABI exceeded the manufacturer's recommended weight for the child restraint (CRS). The NHTSA COTR and CRS manufacturer were informed of the test condition prior to the impact. At the request of the COTR, the vehicle was tested in this configuration.

SECTION 2

DATA SHEET NO. 1

CRASH TEST SUMMARY

TEST DUMMY INFORMATION:

DESCRIPTION	Position #3 CRS	Position #4 CRS
ATD Type/Serial No.	CRABI/090	CRABI /017
Restraint System:	Safetyfirst Forerunner LATCH	GRACO Snugride LATCH with no base

Number of Data Channels 76

Number of Cameras: 1 Real Time

2 High Speed

POST TEST DOOR OPENING

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, Latched and Operable w/o tools	Closed, Latched and Operable w/o tools
Right Side Doors	Closed, Latched and Operable w/o tools	Closed, Latched and Operable w/o tools
Hatch/Other Door	NA	Closed, Latched and Operable w/o tools

POST TEST SEAT DATA

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

VISIBLE DUMMY CONTACT POINTS

	Position #3 CRS	Position #4 CRS
Head Contact:	None	The top of the head to P1 seatback
Upper Torso Contact:	None	None
Lower Torso Contact:	None	None
Left Knee Contact:	None	None
Right Knee Contact:	None	None

DATA SHEET NO. 2

CRS PARAMETER DATA

CRS: Safetyfirst Forerunner LATCH/GRACO Snugride LATCH with no base NHTSA No. M20507

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 1832 kg (A)

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

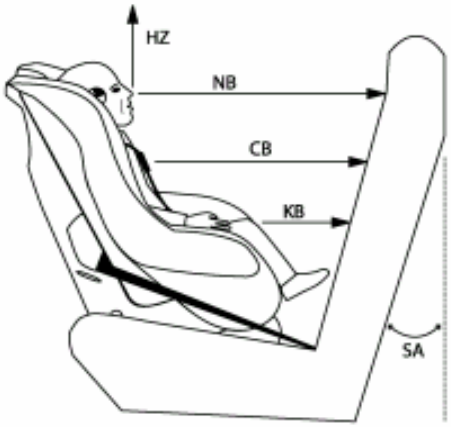
Left Front	=	545.5	kg	Left Rear	=	516.5	kg
Right Front	=	515.5	kg	Right Rear	=	534.5	kg
TOTAL FRONT	=	1061.0	kg	TOTAL REAR	=	1051.0	kg
TOTAL TEST WEIGHT	=	2112.0	kg				

DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE

CRS: Safetyfirst Forerunner LATCH/GRACO Snugride LATCH with no base NHTSA No. M20507

Dummy Measurements for Rear-facing CRS Passengers



X—Z View

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

Measurement	Pre-Test (mm)		Post Test (mm)	
	P3 CRS (090)	P4 CRS (017)	P3 CRS (090)	P4 CRS (017)
SA	18º	18º	18º	18º
HZ	501	483	558	481
NB	540	508	523	285
CB	424	364	434	311
KB – LEFT	227	154	241	228
KB – RIGHT	248	165	241	212

All dimensions in mm (unless noted)
P3 – Right Rear Passenger (CRS #1)
P4 – Left Rear Passenger (CRS #2)

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES

CRS: Safetyfirst Forerunner LATCH/GRACO Snugride LATCH with no base NHTSA No. M20507

		MAXIMUM VALUE							
		Position #3				Position #4			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	50.6	80.3	-5.9	263.2	24.3	110.8	-2.2	223.9
Head Y	g	3.2	111.8	-4.2	80.8	8.3	121.5	-1.4	173.7
Head Z	g	51.2	43.8	-0.4	149.2	44.9	84.8	-15.2	123.8
Head Resultant	g	53.6	80.3	0.1	-35.1	49.1	84.4	0.0	-49.3
Redundant Head Z	g	53.1	38.4	-1.1	149.4	46.1	71.6	-13.8	124.1
Upper Neck Fx	N	108.1	83.6	-395.4	45.9	39.6	122.8	-464.2	83.9
Upper Neck Fy	N	72.4	111.3	-40.0	80.3	47.7	134.0	-47.8	85.3
Upper Neck Fz	N	1411.8	47.5	-17.1	148.7	1233.6	83.2	-211.0	125.8
Upper Neck F Resultant	N	1463.2	46.9	1.7	-33.5	1318.5	83.2	1.1	-47.7
Upper Neck Mx	N-m	1.6	80.7	-1.3	299.9	1.8	88.2	-1.8	131.8
Upper Neck My	N-m	5.3	275.7	-12.0	44.6	3.1	127.0	-6.7	82.9
Upper Neck Mz	N-m	1.2	122.8	-0.6	189.9	1.6	131.6	-0.9	261.6
Upper Neck M Resultant	N-m	12.0	44.6	0.0	-40.7	6.9	82.8	0.0	-41.2
Lower Neck Fx	N	452.0	81.1	-133.8	215.5	239.8	84.1	-89.6	48.8
Lower Neck Fy	N	19.8	288.9	-87.3	79.1	84.5	77.5	-12.1	118.0
Lower Neck Fz	N	1569.0	47.2	-20.9	148.5	1419.8	83.5	-269.6	125.0
Lower Neck F Resultant	N	1587.0	47.3	0.3	-5.4	1441.1	83.5	0.8	-49.8
Lower Neck Mx	N-m	3.2	111.7	-3.5	79.4	3.4	75.7	-1.8	239.9
Lower Neck My	N-m	12.5	242.2	-14.9	81.0	3.9	49.1	-6.9	84.2
Lower Neck Mz	N-m	1.4	119.0	-0.3	294.8	1.7	69.5	-0.6	246.6
Lower Neck M Resultant	N-m	15.4	80.8	0.1	-12.8	7.4	83.3	0.0	-44.5
Chest X	g	43.9	64.5	-6.6	206.0	35.9	89.8	-3.1	206.8
Chest Y	g	4.9	89.5	-6.1	76.6	6.6	66.6	-4.5	70.7
Chest Z	g	39.3	42.9	-3.2	79.4	30.7	70.4	-14.6	114.9
Chest Resultant	g	47.9	64.2	0.1	-4.7	44.1	86.7	0.0	-46.4
Lumbar Fx	N	43.5	79.5	-120.3	49.4	32.2	118.1	-89.0	66.6
Lumbar Fy	N	46.7	37.6	-18.9	265.4	23.7	97.6	-20.3	132.8
Lumbar Fz	N	274.7	49.9	-104.6	259.5	192.8	64.9	-17.2	120.5
Lumbar F Resultant	N	300.5	49.9	0.2	-5.0	210.2	64.9	0.1	-46.6
Lumbar Mx	N-m	1.7	150.7	-0.6	108.6	1.0	105.3	-1.5	41.6
Lumbar My	N-m	4.2	47.0	-0.8	79.5	3.9	81.3	-2.7	120.6
Lumbar Mz	N-m	0.4	94.9	-0.8	74.5	0.9	44.7	-0.9	76.6
Lumbar M Resultant	N-m	4.2	47.0	0.0	-27.1	4.0	81.3	0.0	-50.0
Pelvic X	g	33.4	74.5	-6.4	170.3	28.9	81.2	-2.2	247.2
Pelvic Y	g	5.8	97.1	-7.1	78.4	6.8	61.9	-3.8	100.1
Pelvic Z	g	49.5	43.6	-3.2	258.5	45.7	71.2	-10.4	114.7
Pelvic Resultant	g	54.4	36.8	0.1	-32.5	50.7	81.7	0.1	-50.0

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: Safetyfirst Forerunner LATCH/GRACO Snugride LATCH with no base NHTSA No. M20507

	HEAD INJURY CRITERIA (HIC15)			
	HIC**	t_1 (msec)	t_2 (msec)	Average Acceleration (g's) t_1 to t_2
Position #3 - Right	243.2	36.6	51.6	48.3
Position #4 - Left	187.1	73.7	88.7	43.5

** HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 15 milliseconds.

	CLIP SUMMARY*			
	CLIP (g's)	t_1 (msec)	t_2 (msec)	CSI
Position #3 - Right	46.4	62.8	65.8	522.7
Position #4 - Left	43.2	85.8	88.8	445.8

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

Position 3 Neck Injury Summary (CRABI– In Position)

Nij V10	Nij	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
Ntf	0.6	80.2	765.3	68.7	3.5
Nte	1.5	46.4	1403.5	-392.7	-9.3
Ncf	0.0	147.8	-15.3	-35.3	0.4
Nce	0.0	-34.5	-1.6	-1.4	0.0

Peak Tension (CFC1000) 1412.59 N **Peak Compression (CFC1000) 18.39 N**

Critical Values

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

Condyle Offset -0.0058

Position 4 Neck Injury Summary (CRABI – In Position)

Nij V10	Nij	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
Ntf	0.1	30.7	85.7	-12.5	0.0
Nte	1.1	83.0	1233.2	-463.9	-4.0
Ncf	0.2	125.8	-210.7	38.2	2.9
Nce	0.1	182.5	-33.9	-77.7	-1.8

Peak Tension (CFC1000) 1234.85 N **Peak Compression (CFC1000) 211.71 N**

Critical Values

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

Condyle Offset -0.0058

DATA SHEET NO. 5

CRS PERFORMANCE DATA

CRS: Safetyfirst Forerunner LATCH/GRACO Snugride LATCH with no base NHTSA No. M20507

		MAXIMUM VALUE			
DESCRIPTION	**Unit**	**Positive**	**Time (ms)**	**Negative**	**Time (ms)**
P4 CRS X	**g**	6.6	116.3	-48.9	82.3
P4 CRS Y	**g**	16.9	65.5	-18.7	115.5
P4 CRS Z	**g**	11.5	42.4	-14.9	64.3
P4 CRS Resultant	**g**	50.4	65.3	0.0	-24.2

DATA SHEET NO. 5

CRS PERFORMANCE DATA (CONTINUED)

CRS: Safetyfirst Forerunner LATCH/GRACO Snugride LATCH with no base NHTSA No. M20507

POSITION #3 CRS POST-TEST INSPECTION (Model No. 02-925-BRD)

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

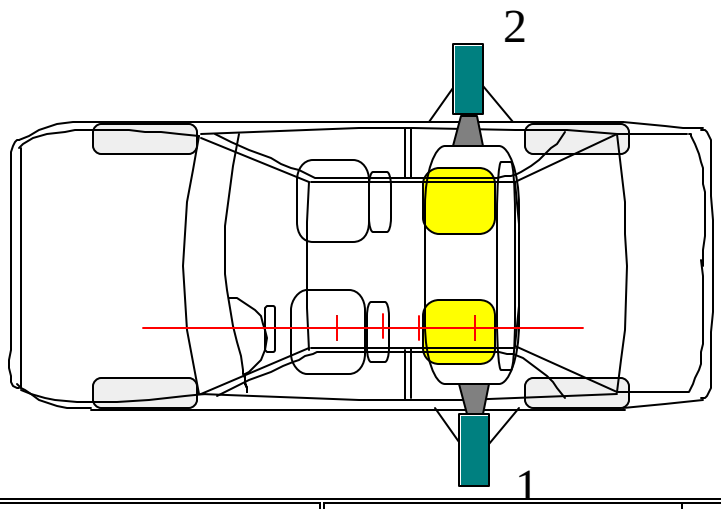
POSITION #4 CRS POST-TEST INSPECTION (Model No. 8446VIN)

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

DATA SHEET NO. 6

CRS CAMERA DATA

CRS: Safetyfirst Forerunner LATCH/GRACO Snugride LATCH with no base NHTSA No. M20507



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	2952	2859	2527	-23	25	500
2	Right side CRS lateral view	2955	2612	2534	-23	25	500

* Reference (from point of impact); all measurements accurate to within ±6 mm.
X = + Forward
Y = + To Right
Z = + Down

SECTION 3

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



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



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



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



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



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



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



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



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

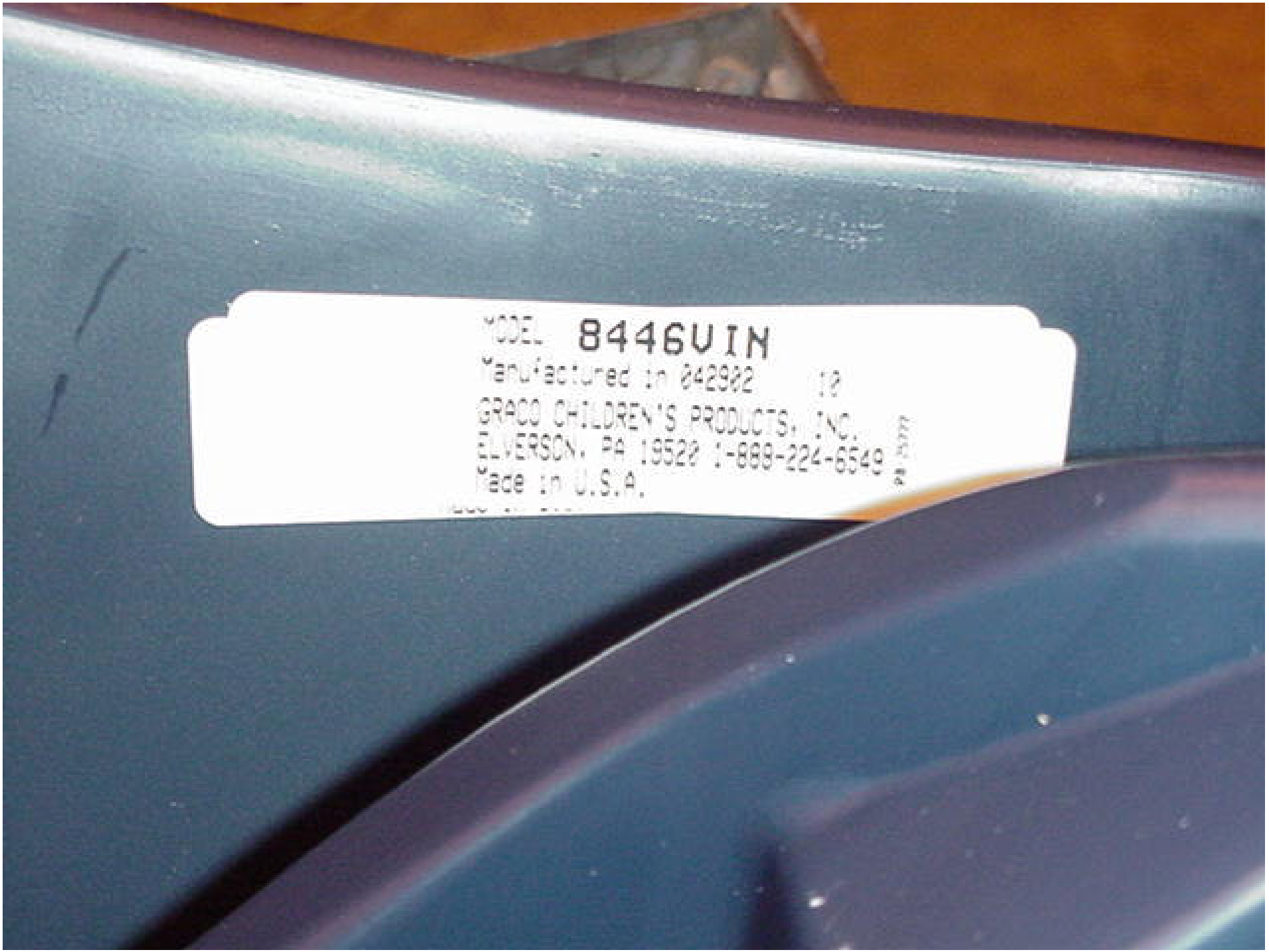


Figure 3-10 CLOSE-UP VIEW OF POSITION 4 CRS LABEL



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



Figure 3-27 PRE-TEST POSITION 3 REAR VIEW



Figure 3-28 POST-TEST POSITION 3 REAR VIEW



Figure 3-29 PRE-TEST POSITION 4 REAR VIEW



Figure 3-30 POST-TEST POSITION 4 REAR VIEW

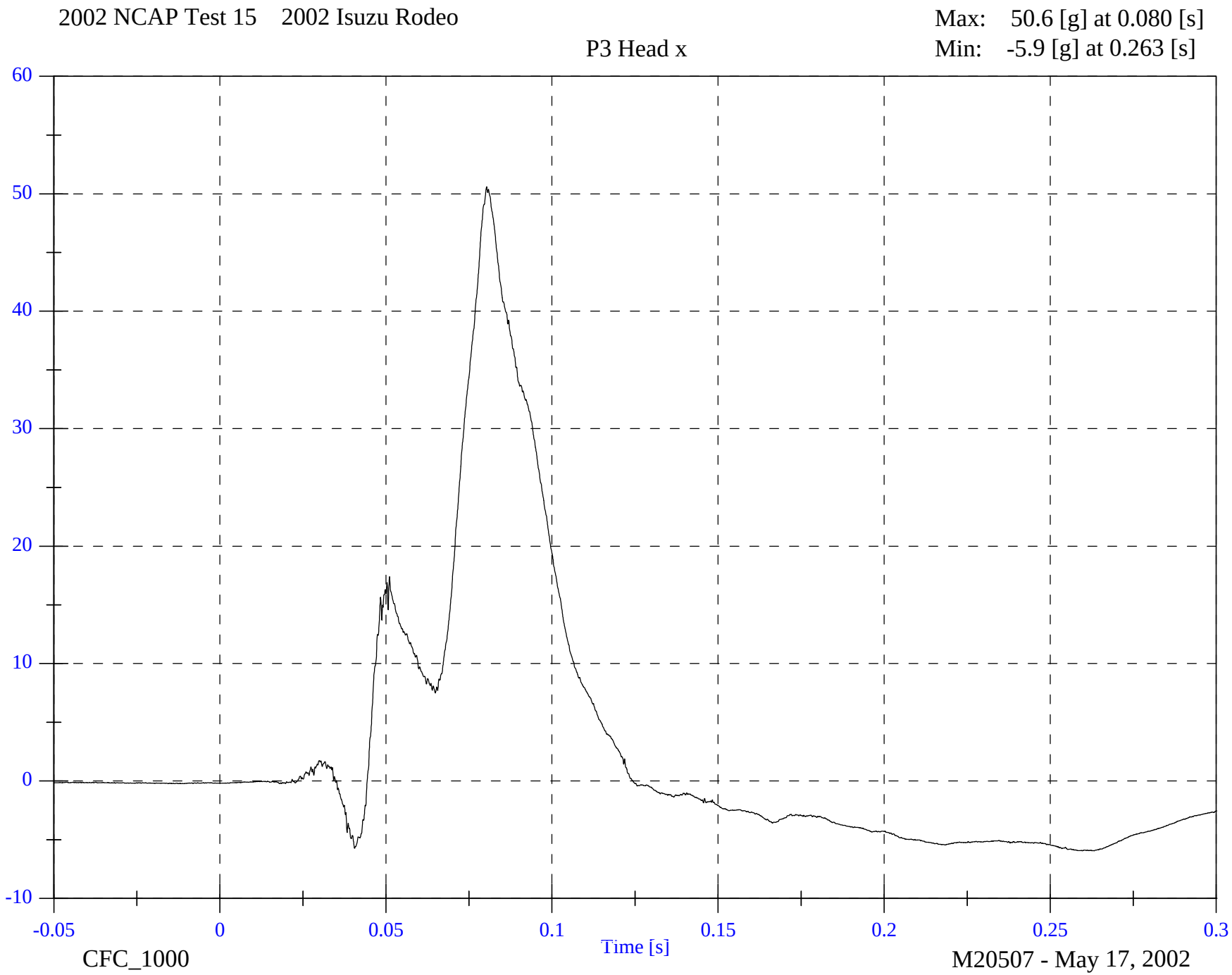
SECTION 4

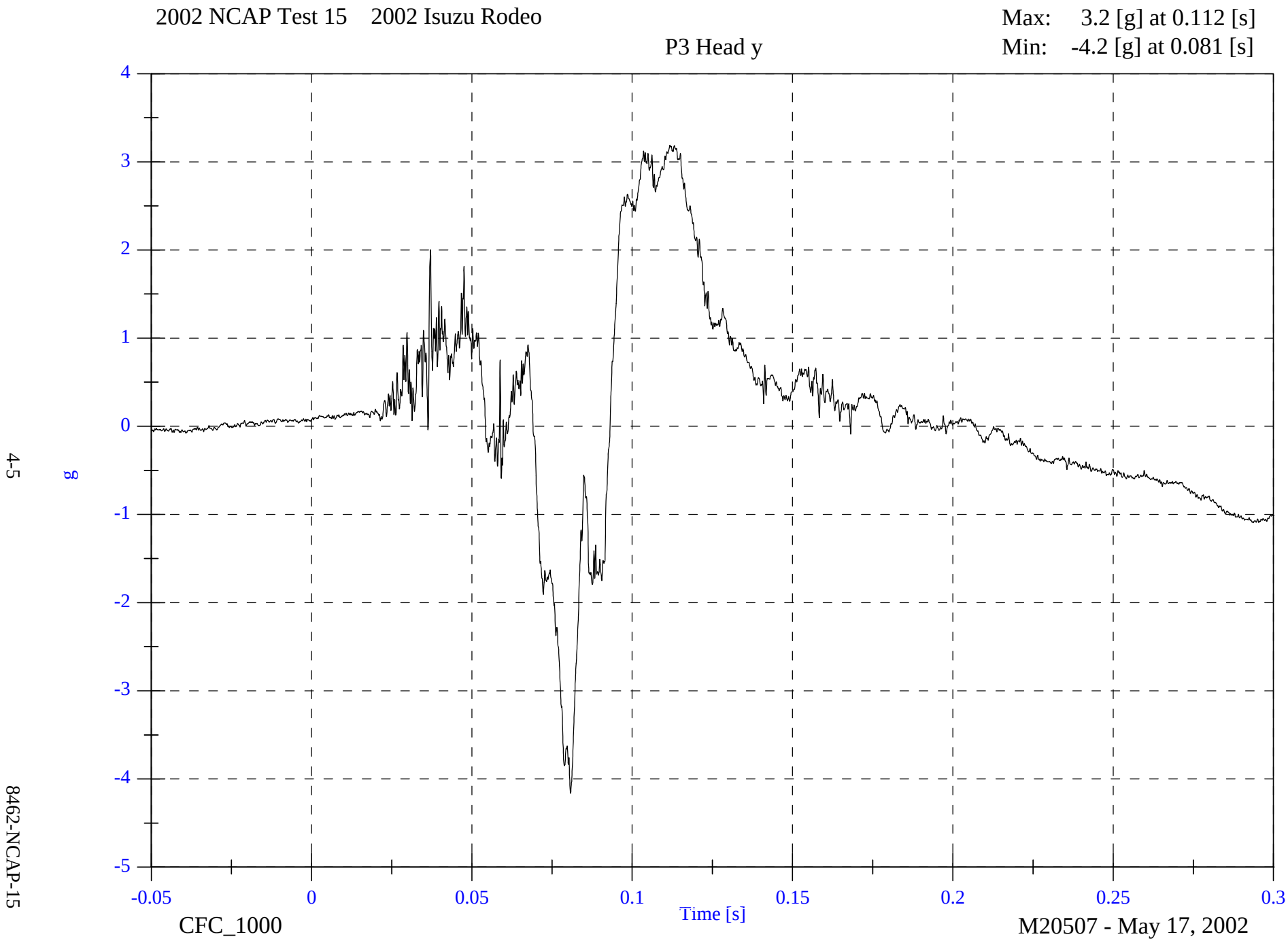
CHILD DUMMY RESPONSE AND CRS DATA TRACES

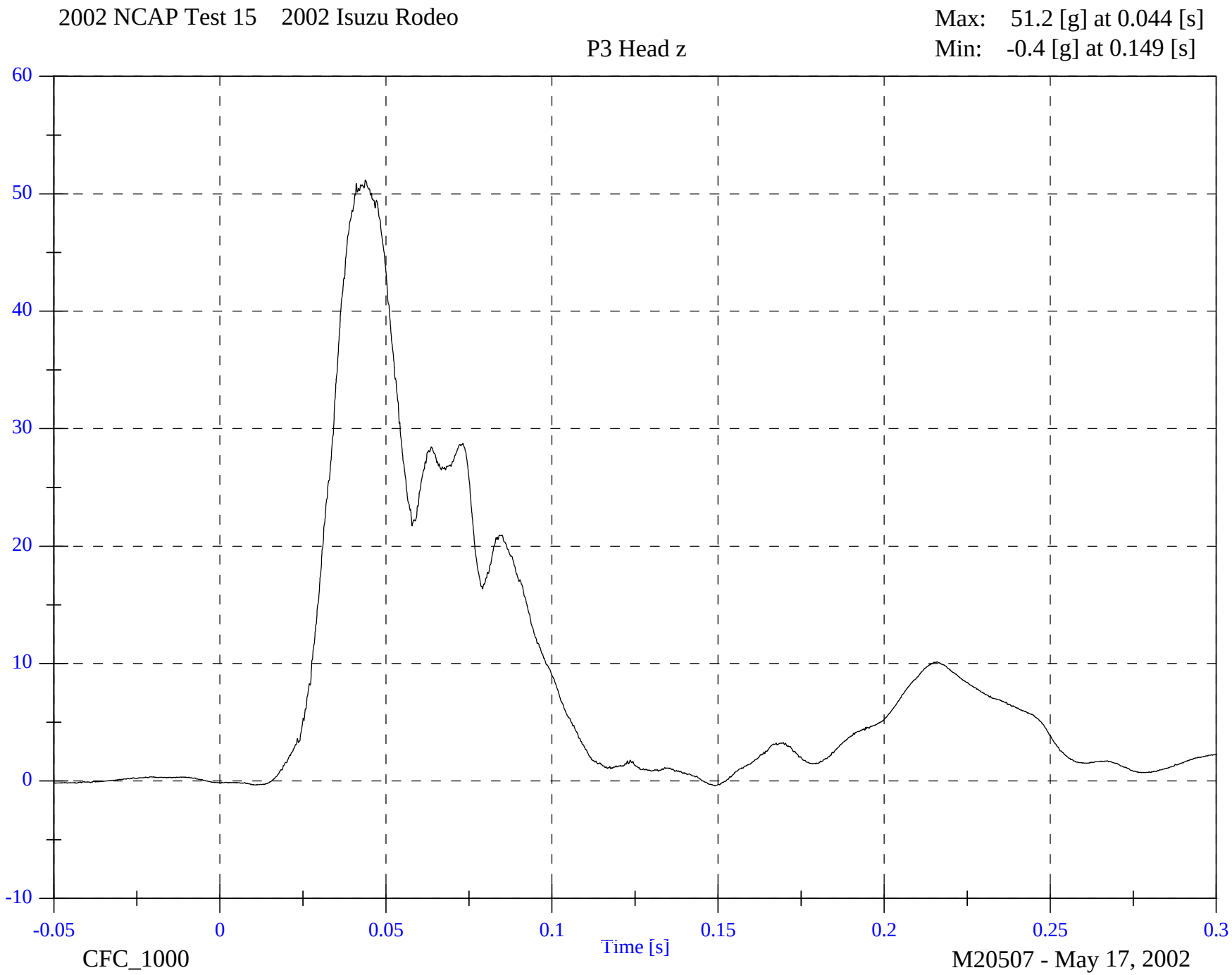
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2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Head x
Max: 50.6 [g] at 0.080 [s]
Min: -5.9 [g] at 0.263 [s]
60
50
40
30
20
10
0
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

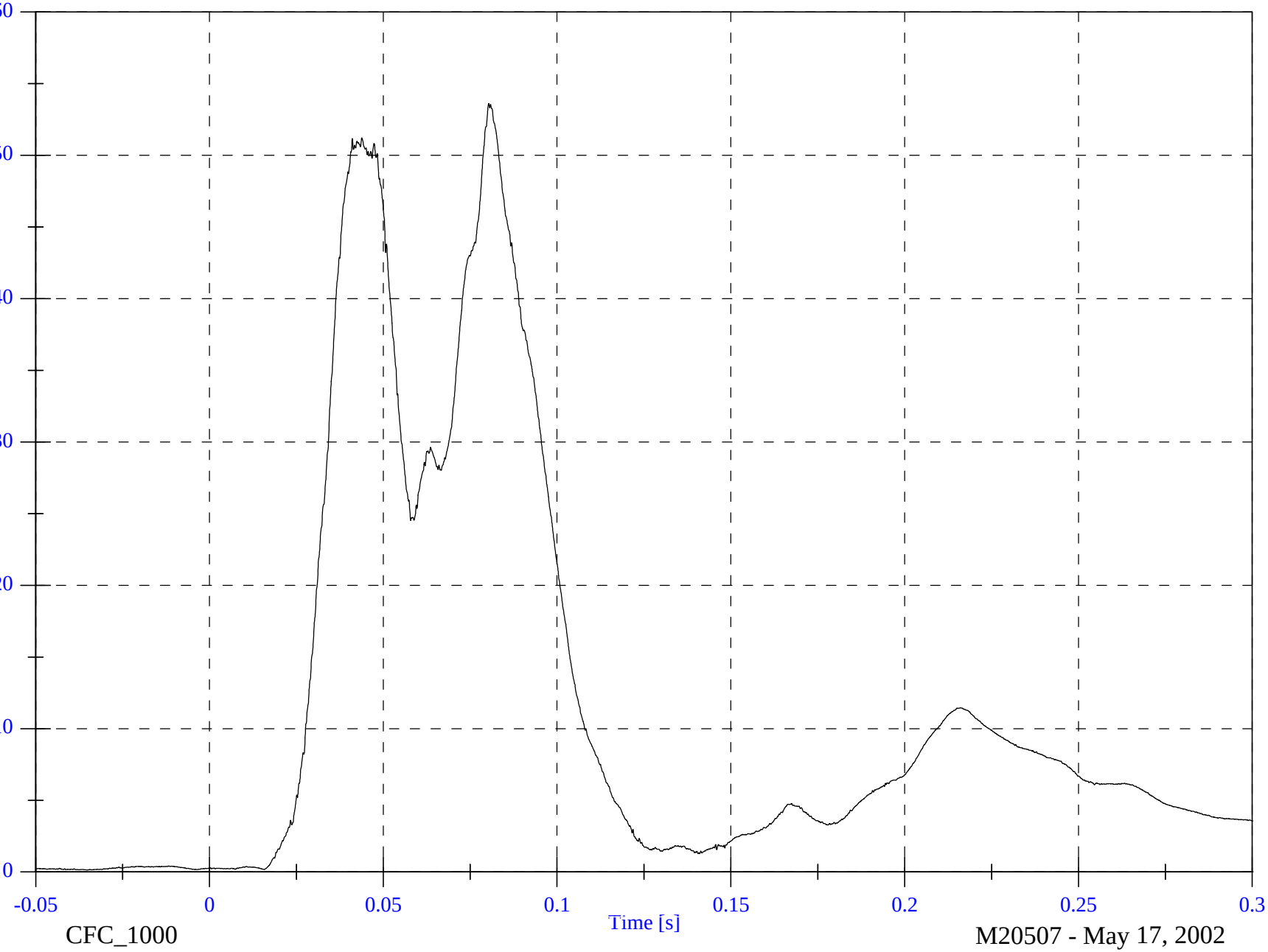

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Head y
Max: 3.2 [g] at 0.112 [s]
Min: -4.2 [g] at 0.081 [s]
4
3
2
1
0
-1
-2
-3
-4
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Head z
Max: 51.2 [g] at 0.044 [s]
Min: -0.4 [g] at 0.149 [s]
60
50
40
30
20
10
0
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Head Resultant

Max: 53.6 [g] at 0.080 [s]
Min: 0.1 [g] at -0.035 [s]



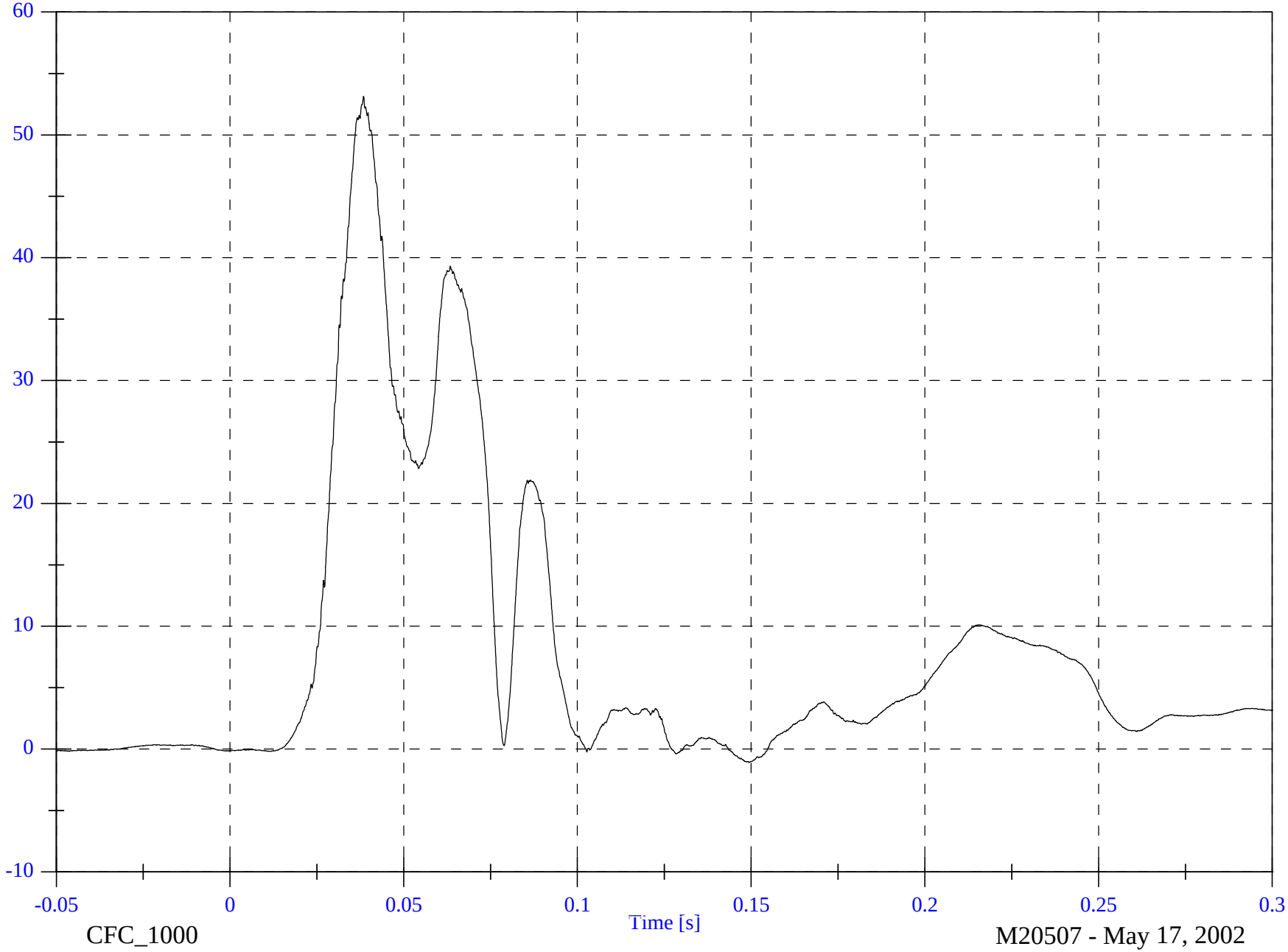
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

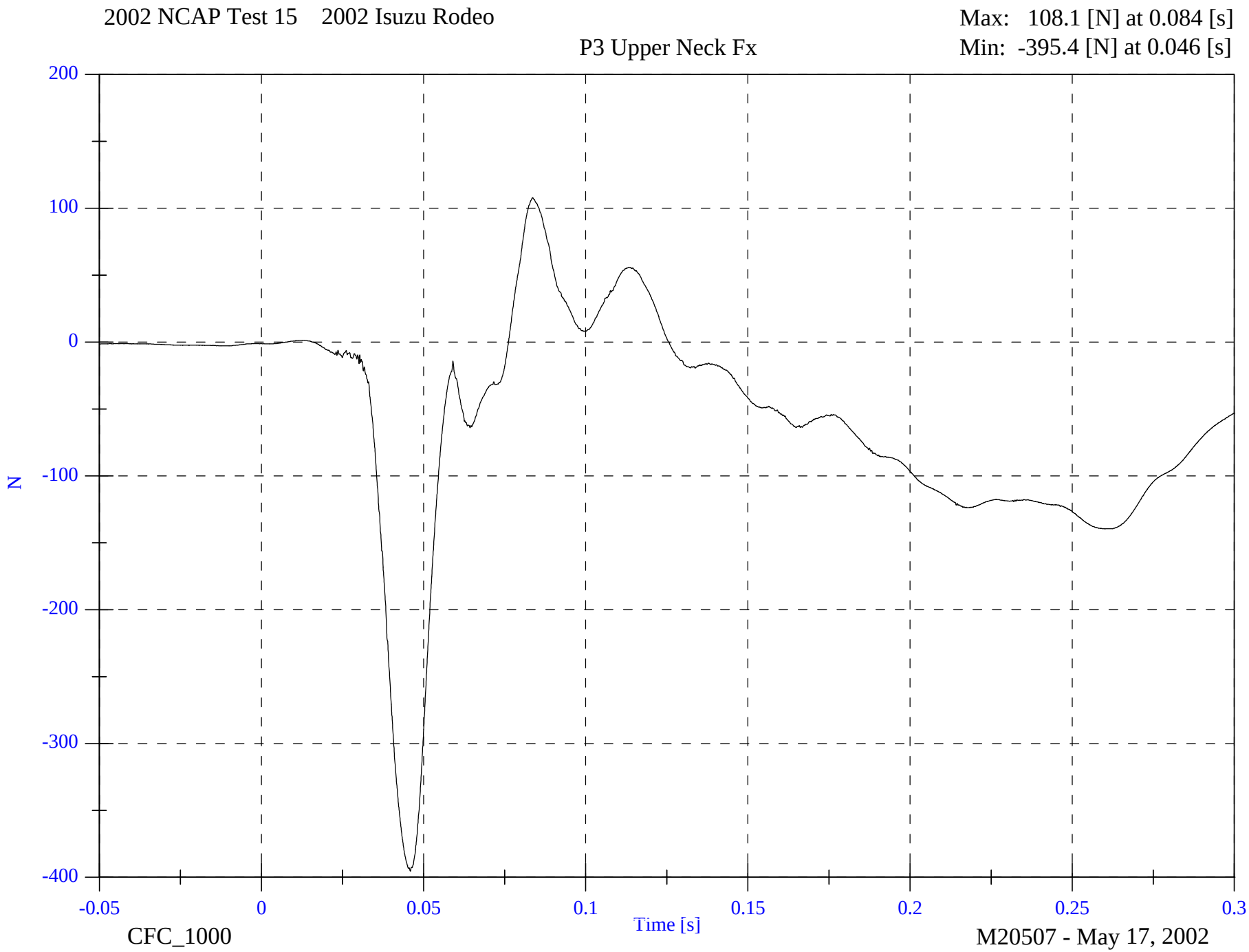
P3 Head Red z

Max: 53.1 [g] at 0.038 [s]
Min: -1.1 [g] at 0.149 [s]



CFC_1000

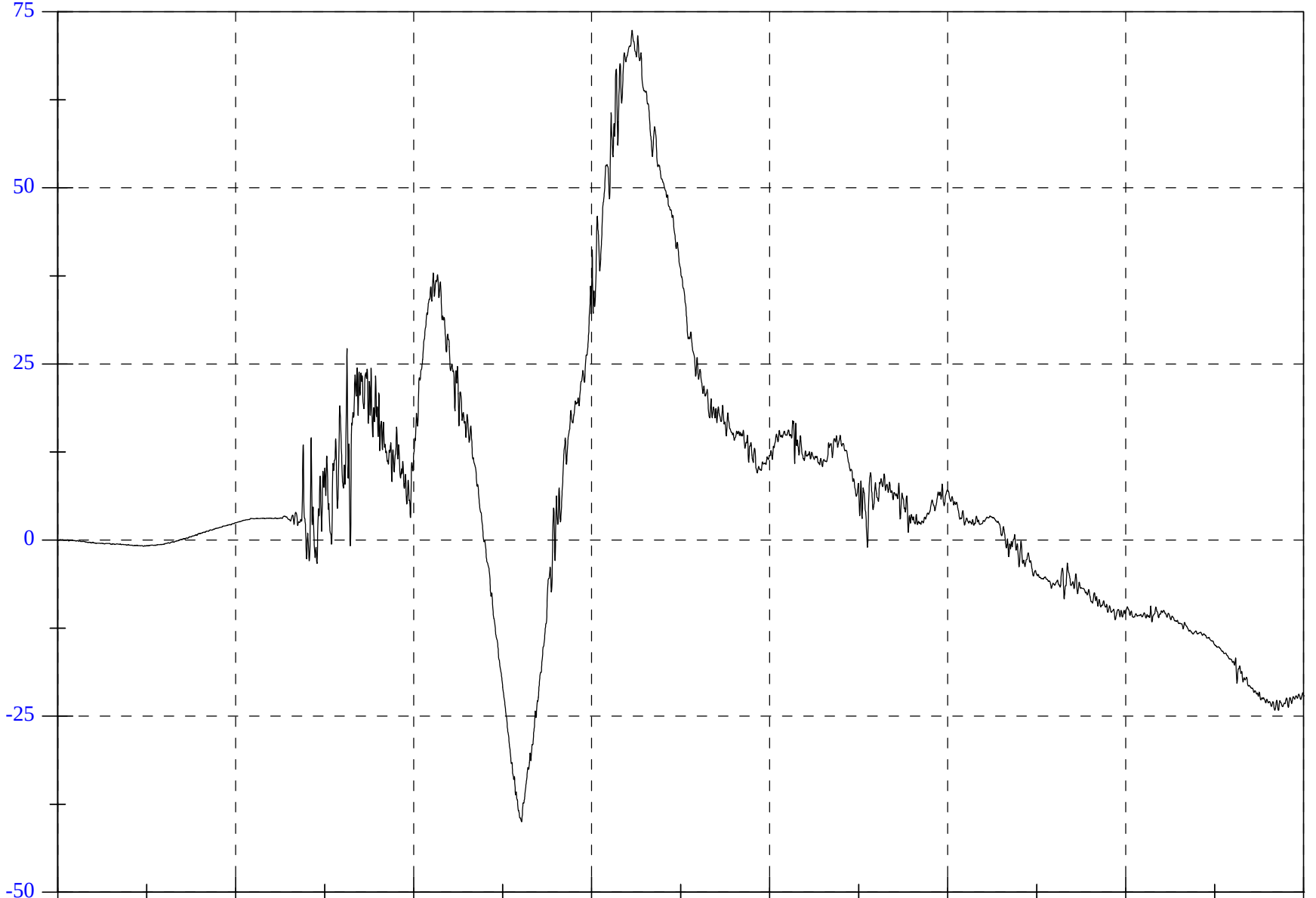
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Upper Neck Fx
Max: 108.1 [N] at 0.084 [s]
Min: -395.4 [N] at 0.046 [s]
200
100
0
-100
-200
-300
-400
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Upper Neck Fy

Max: 72.4 [N] at 0.111 [s]
Min: -40.0 [N] at 0.080 [s]

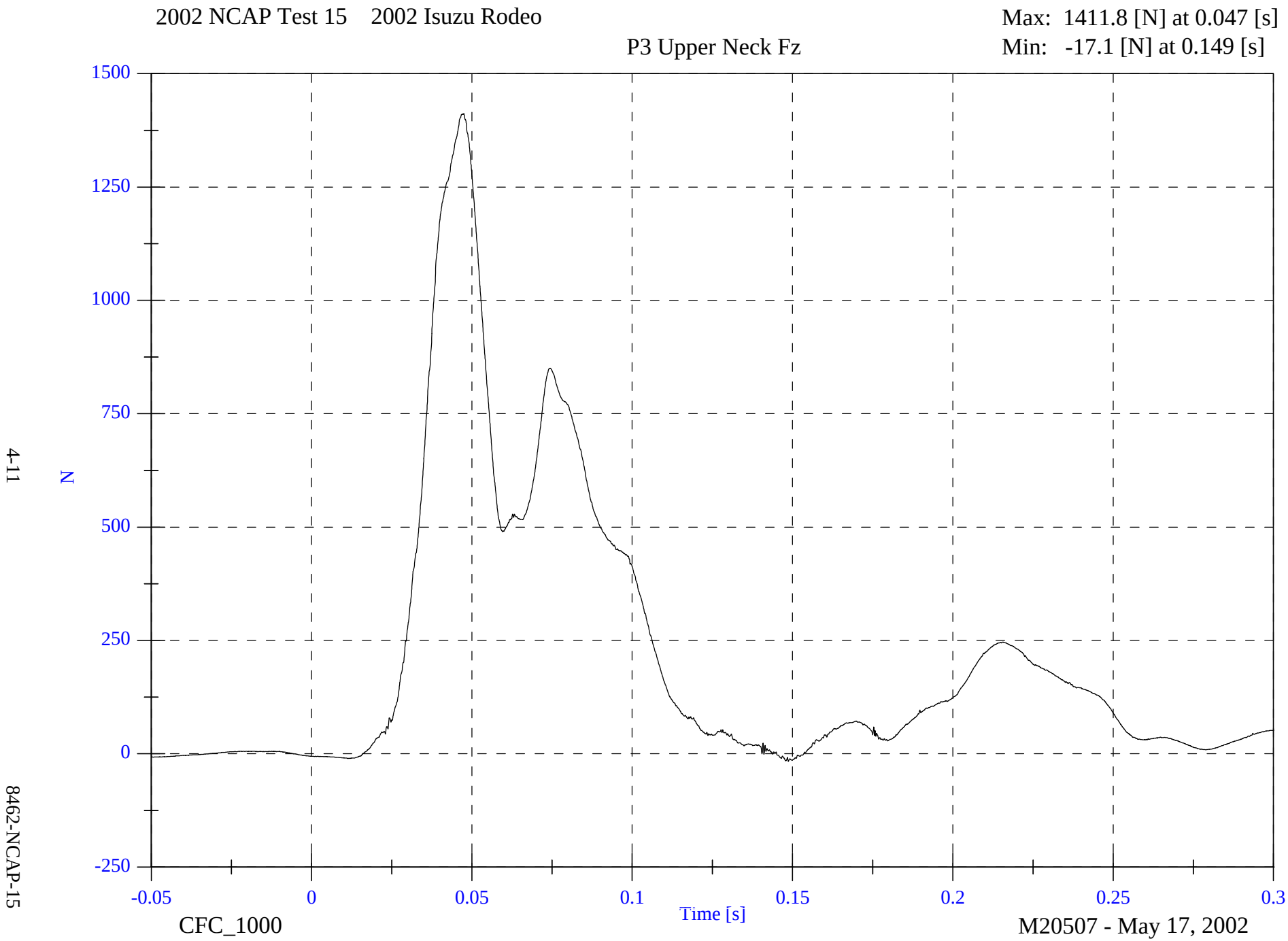


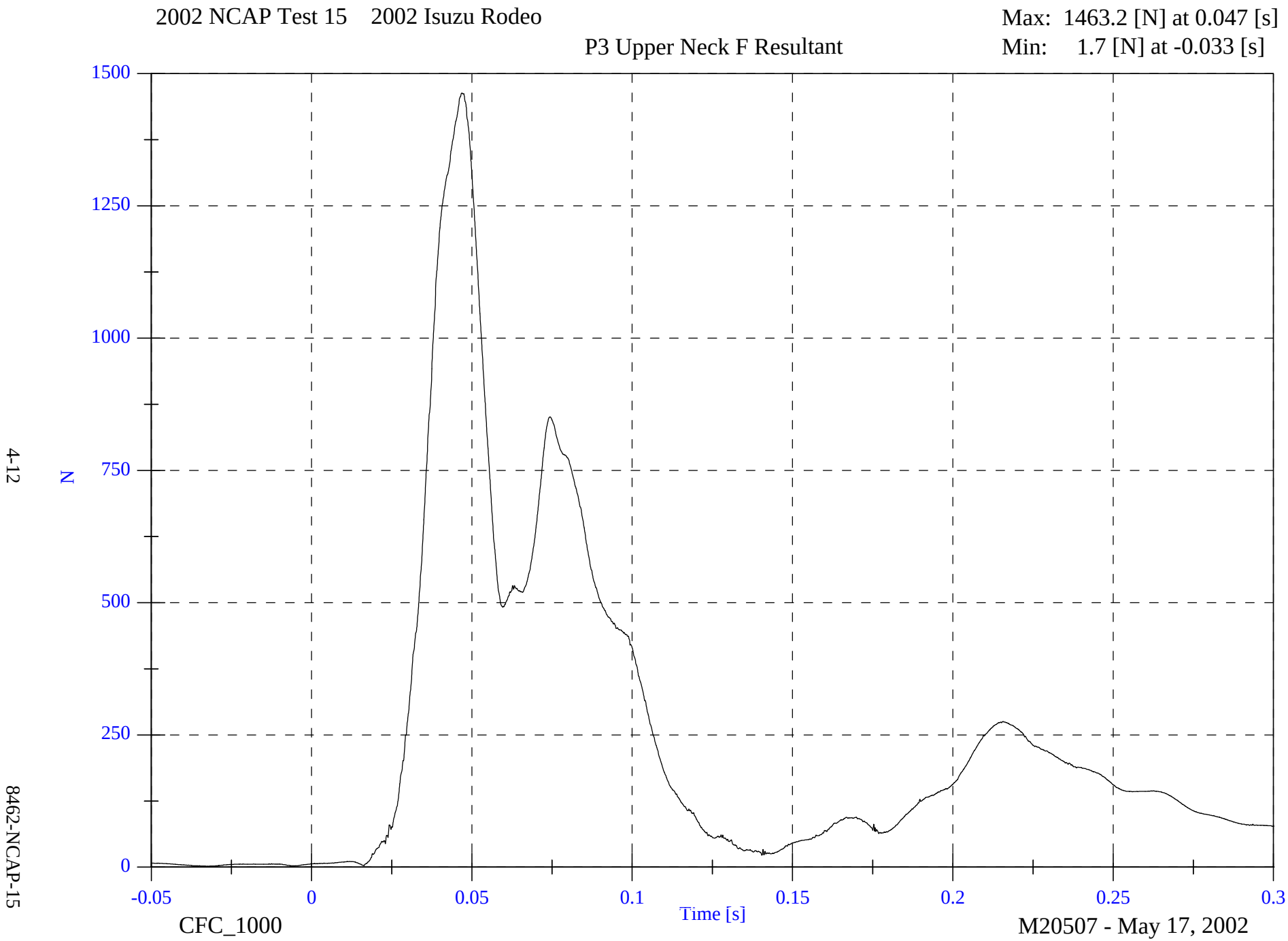
CFC_1000

M20507 - May 17, 2002

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8462-NCAP-15

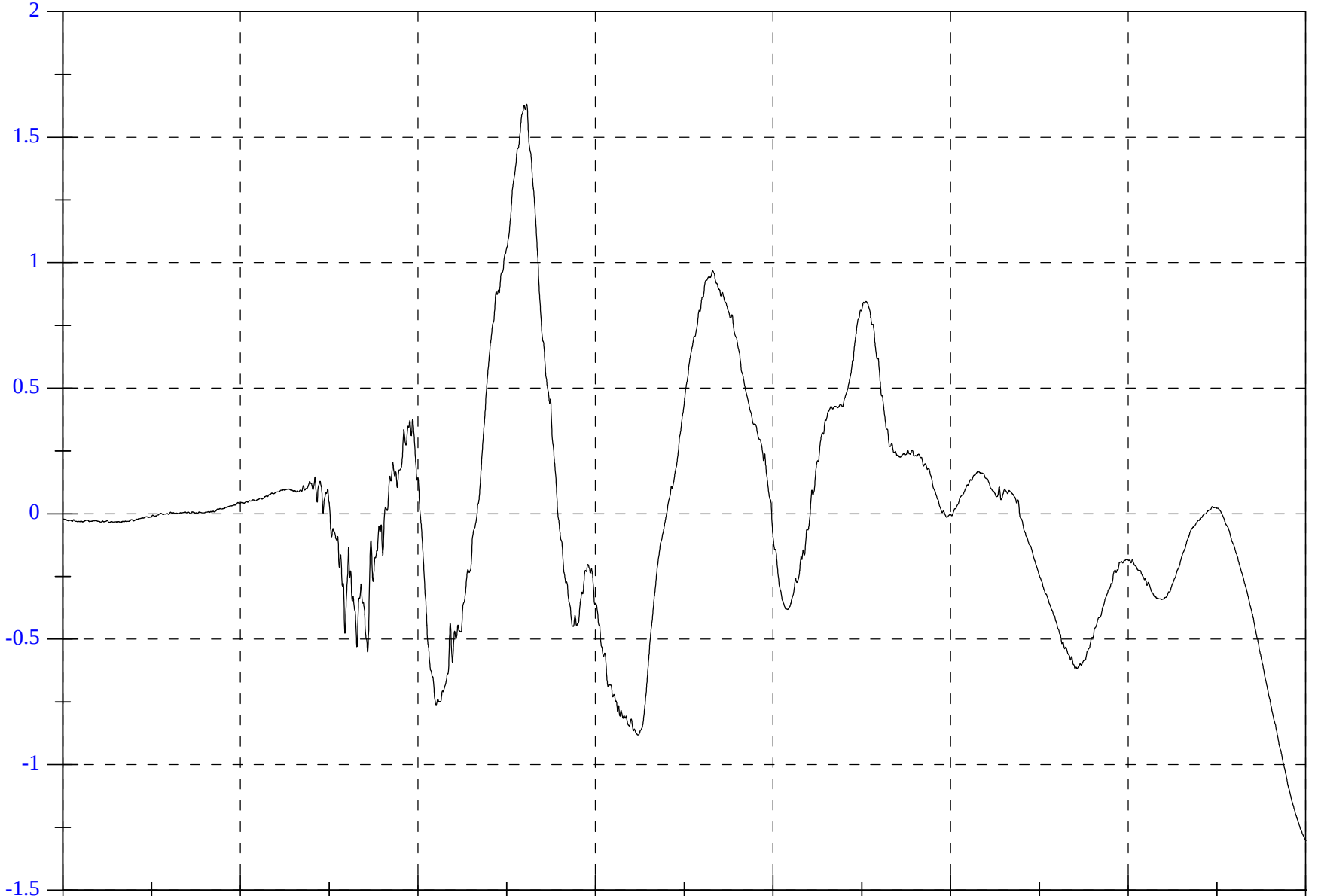

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Upper Neck Fz
Max: 1411.8 [N] at 0.047 [s]
Min: -17.1 [N] at 0.149 [s]
1500
1250
1000
750
500
250
0
-250
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Upper Neck F Resultant
Max: 1463.2 [N] at 0.047 [s]
Min: 1.7 [N] at -0.033 [s]
1500
1250
1000
750
500
250
0
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Upper Neck Mx

Max: 1.6 [N-m] at 0.081 [s]
Min: -1.3 [N-m] at 0.300 [s]



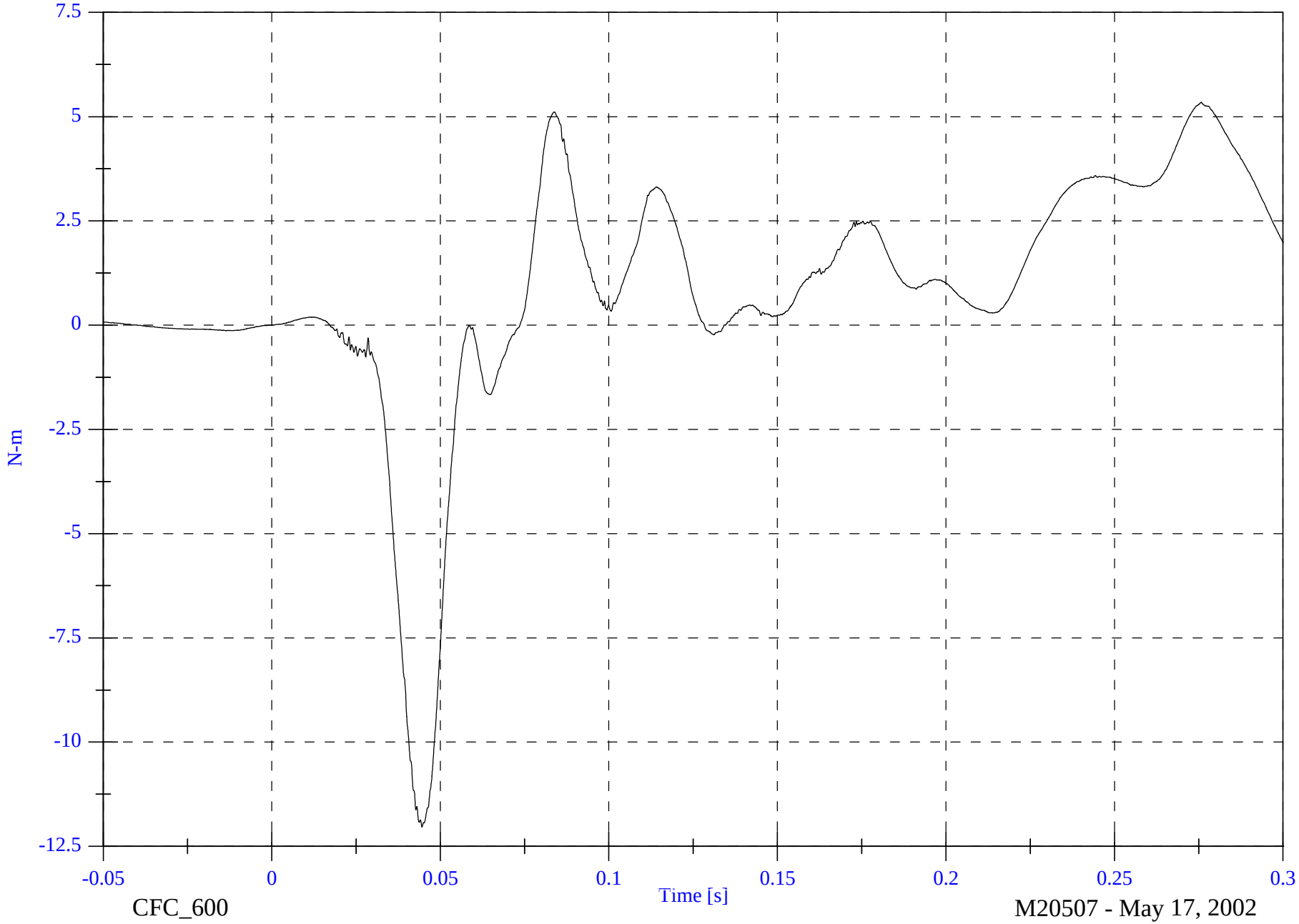
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Upper Neck My

Max: 5.3 [N-m] at 0.276 [s]
Min: -12.0 [N-m] at 0.045 [s]



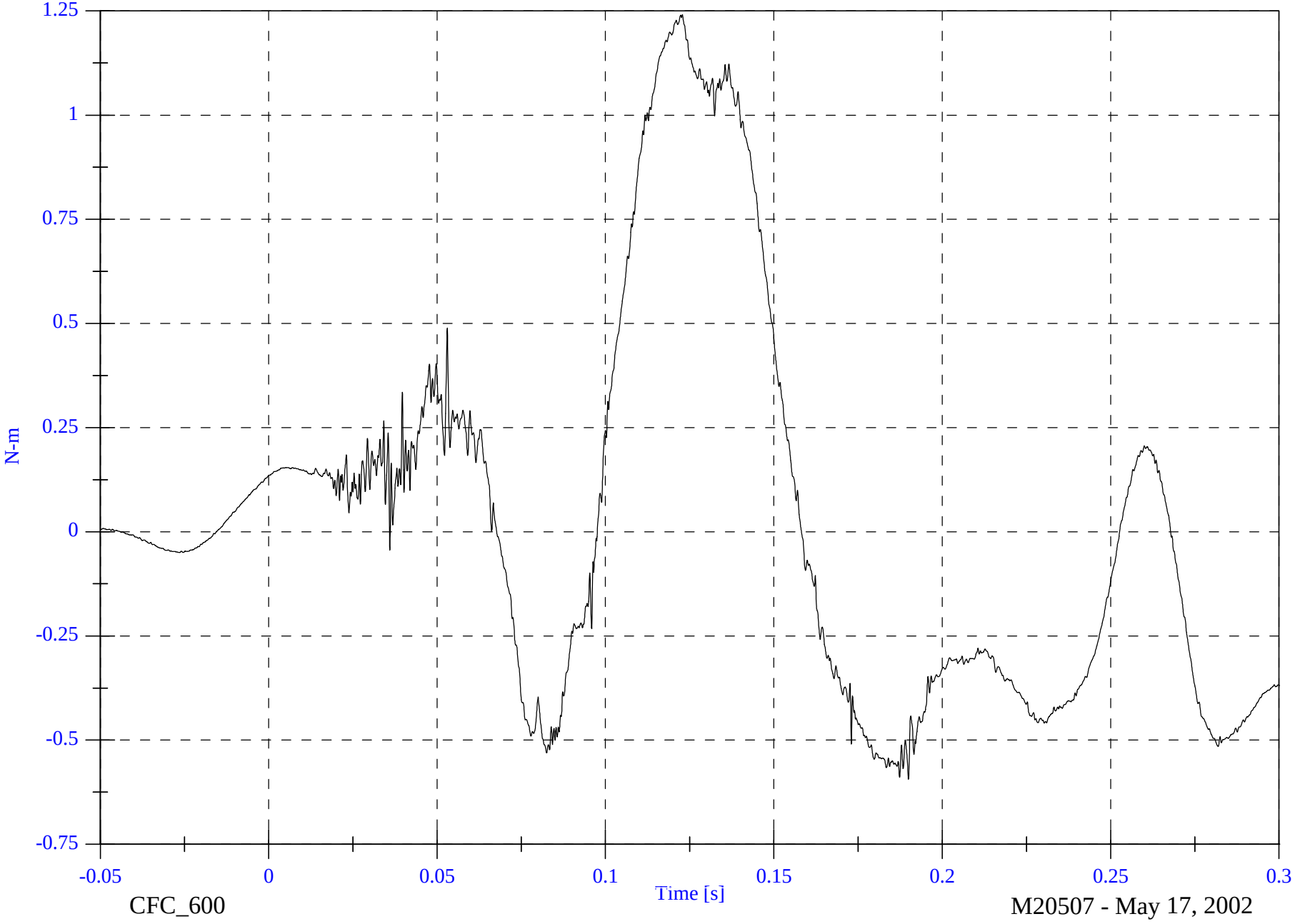
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Upper Neck Mz

Max: 1.2 [N-m] at 0.123 [s]
Min: -0.6 [N-m] at 0.190 [s]



CFC_600

M20507 - May 17, 2002

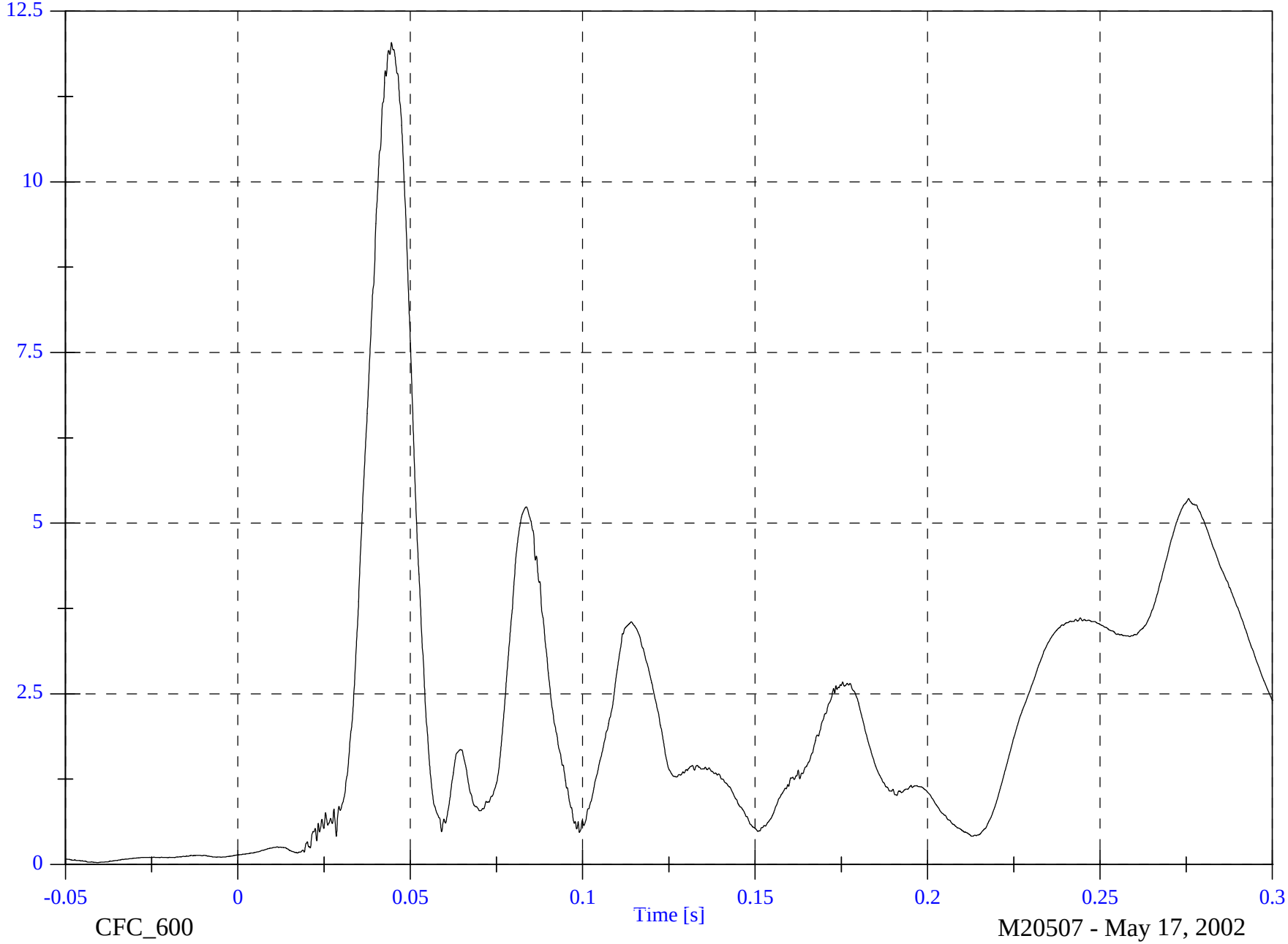
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2002 NCAP Test 15 2002 Isuzu Rodeo

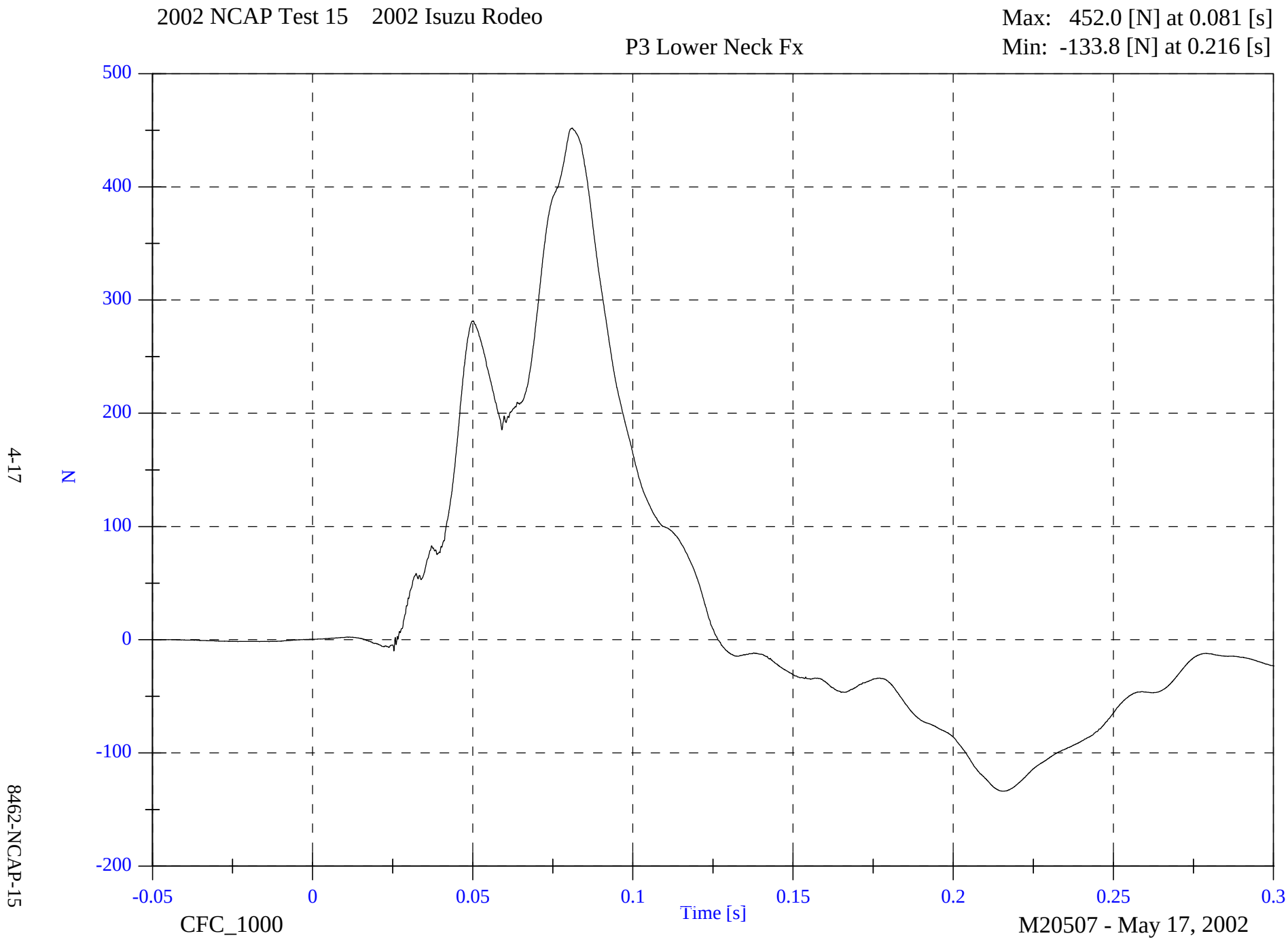
P3 Upper Neck M Resultant

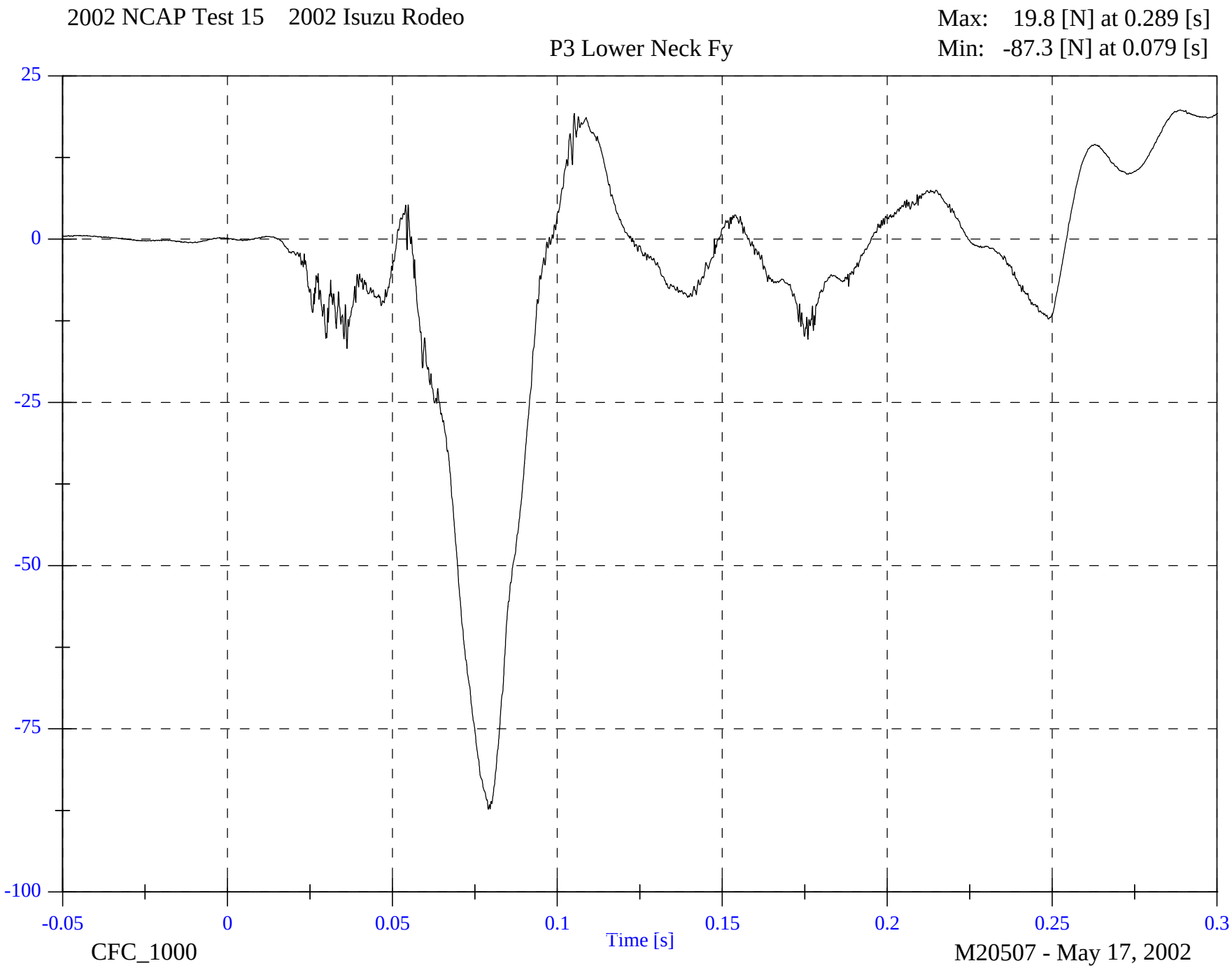
Max: 12.0 [N-m] at 0.045 [s]
Min: 0.0 [N-m] at -0.041 [s]



CFC_600

M20507 - May 17, 2002

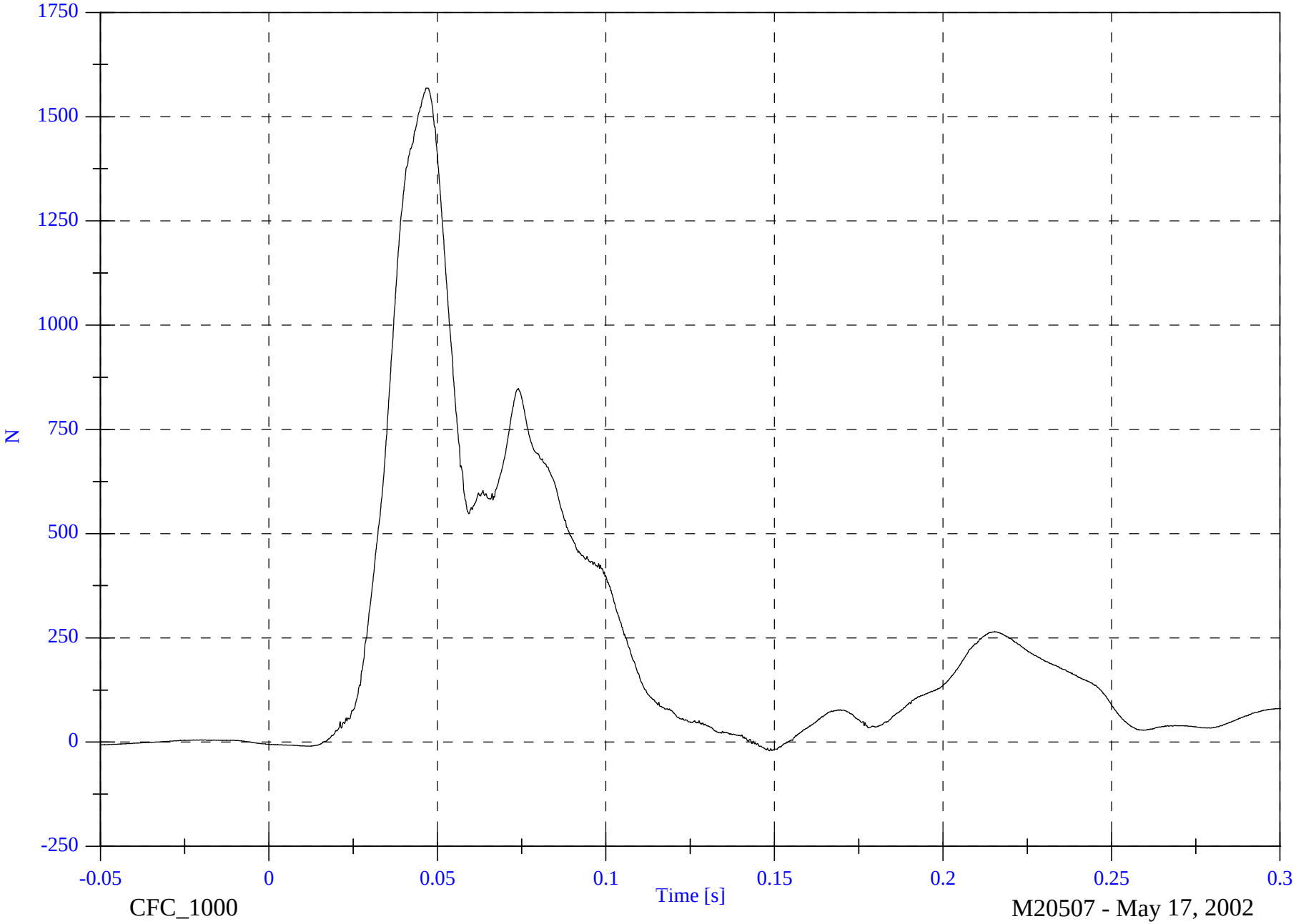

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Lower Neck Fx
Max: 452.0 [N] at 0.081 [s]
Min: -133.8 [N] at 0.216 [s]
500
400
300
200
100
0
-100
-200
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Lower Neck Fy
Max: 19.8 [N] at 0.289 [s]
Min: -87.3 [N] at 0.079 [s]
25
0
-25
-50
-75
-100
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lower Neck Fz

Max: 1569.0 [N] at 0.047 [s]
Min: -20.9 [N] at 0.148 [s]



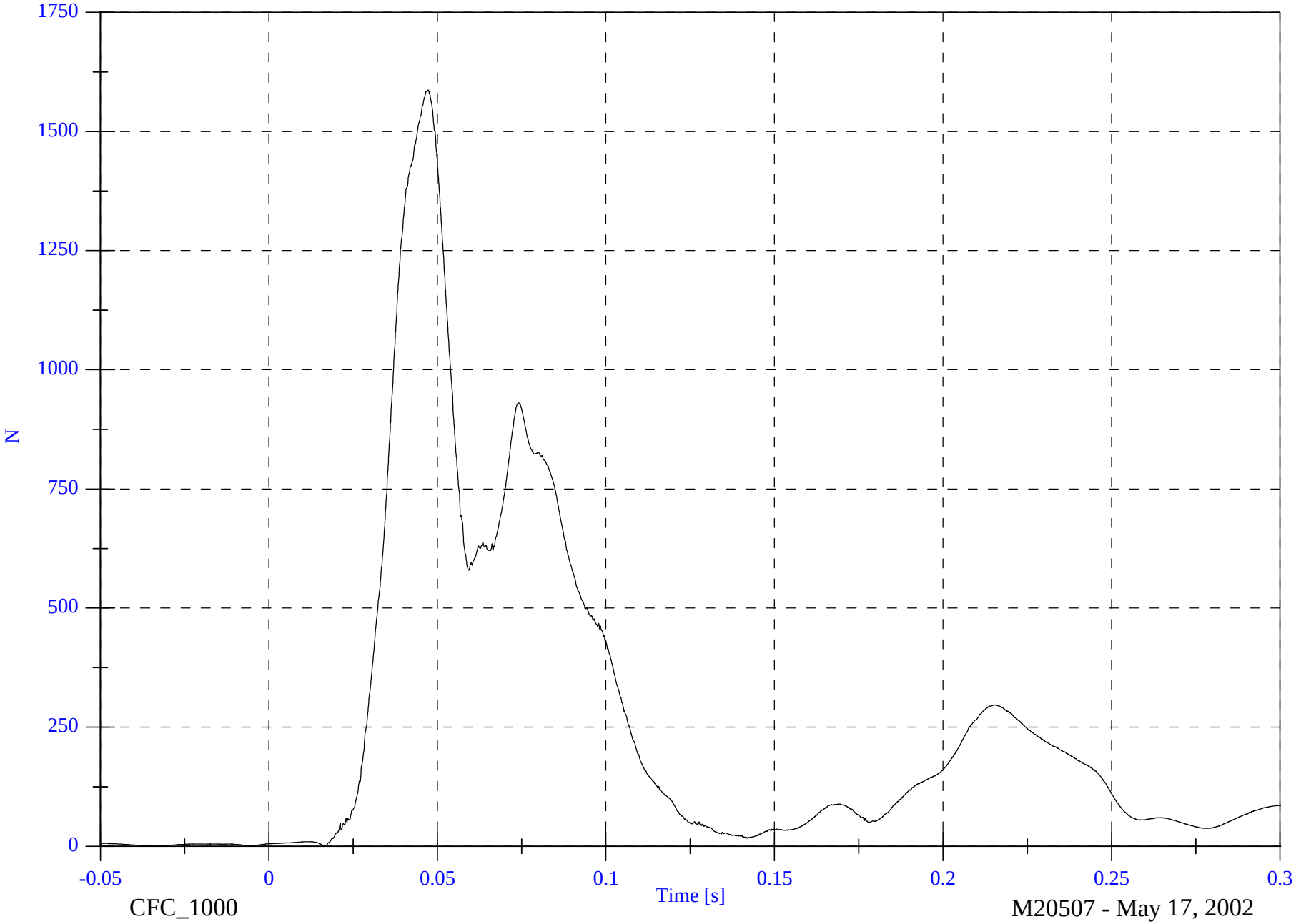
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lower Neck F Resultant

Max: 1587.0 [N] at 0.047 [s]
Min: 0.3 [N] at -0.005 [s]



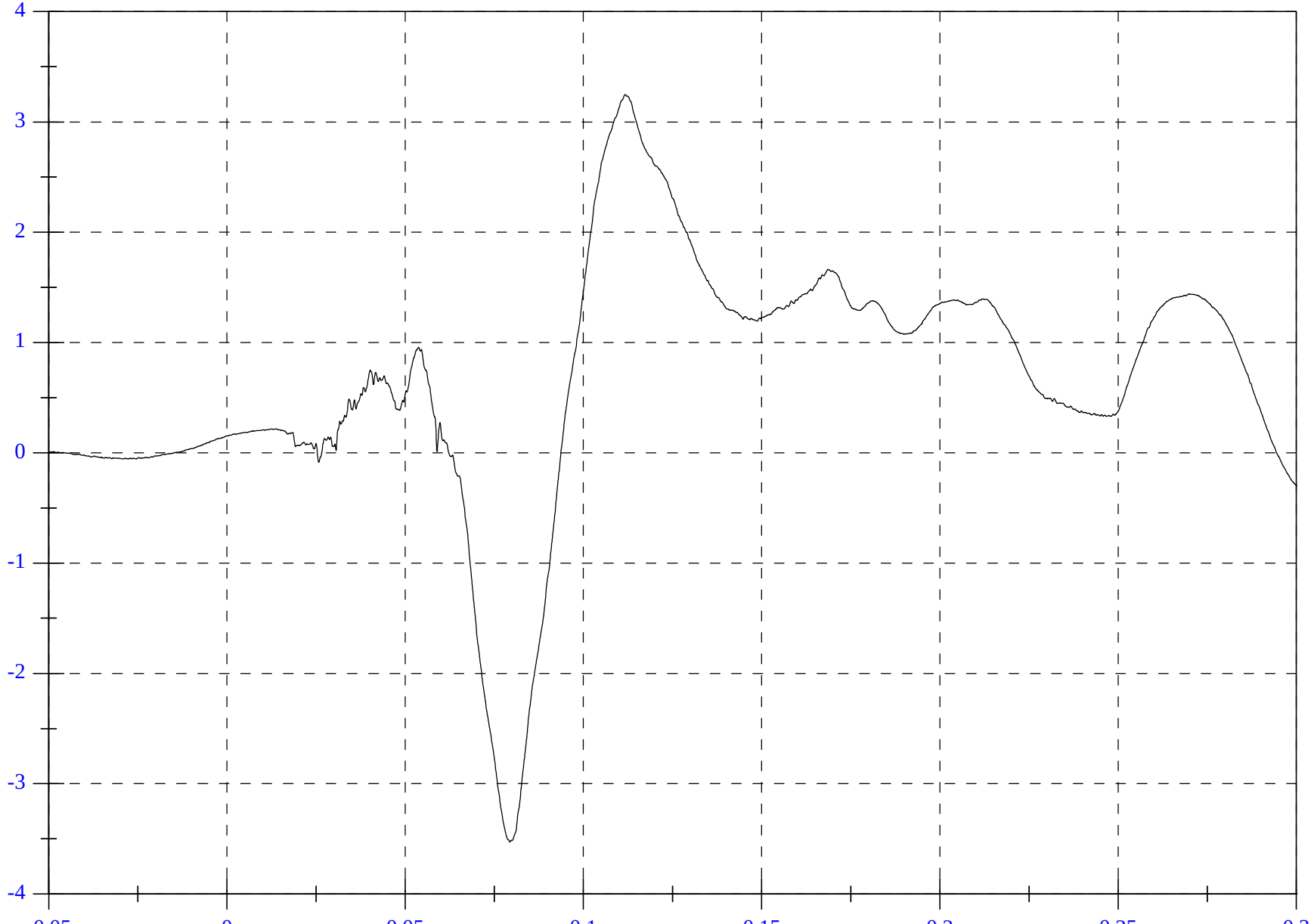
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

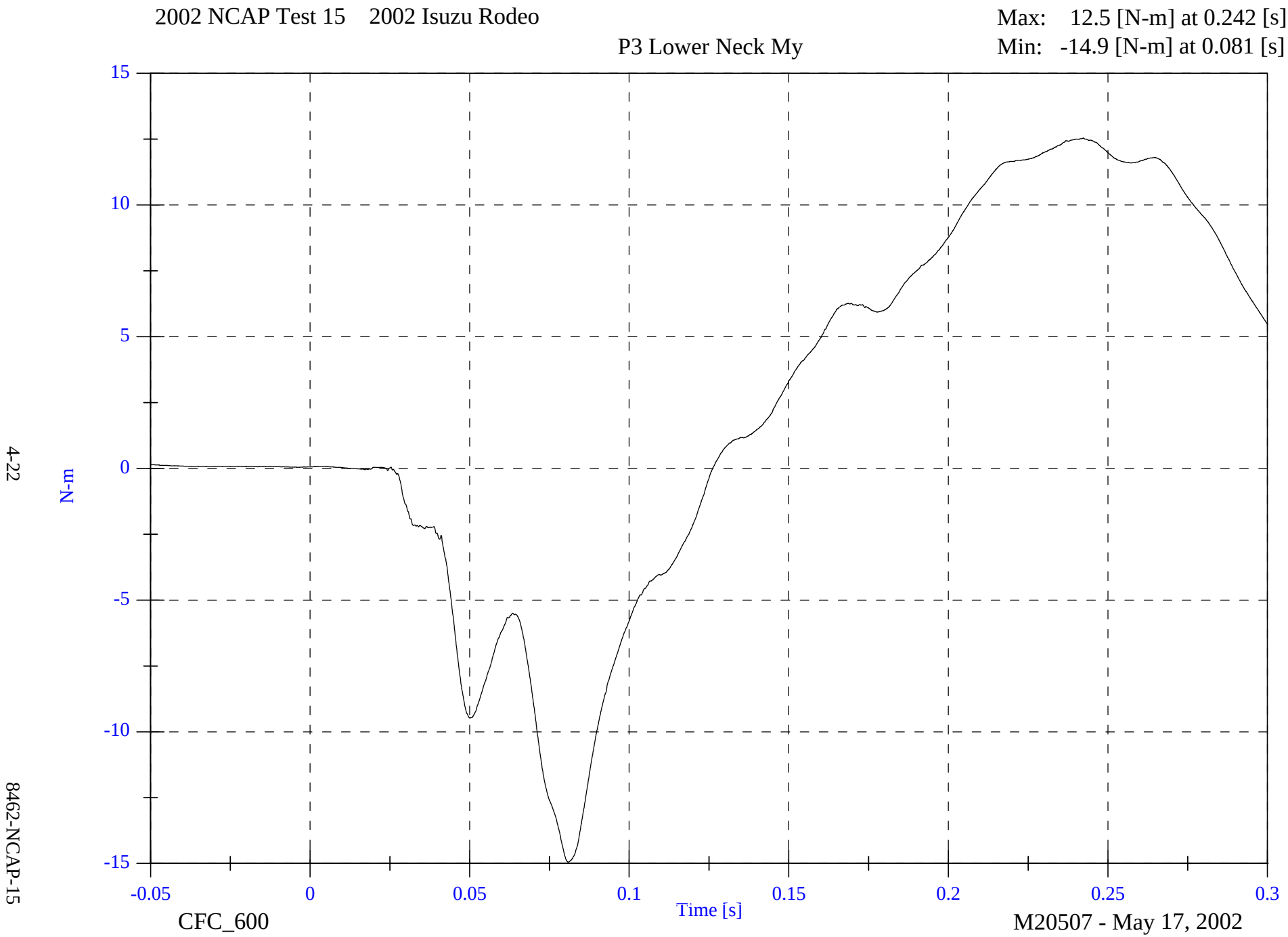
P3 Lower Neck Mx

Max: 3.2 [N-m] at 0.112 [s]
Min: -3.5 [N-m] at 0.079 [s]



CFC_600

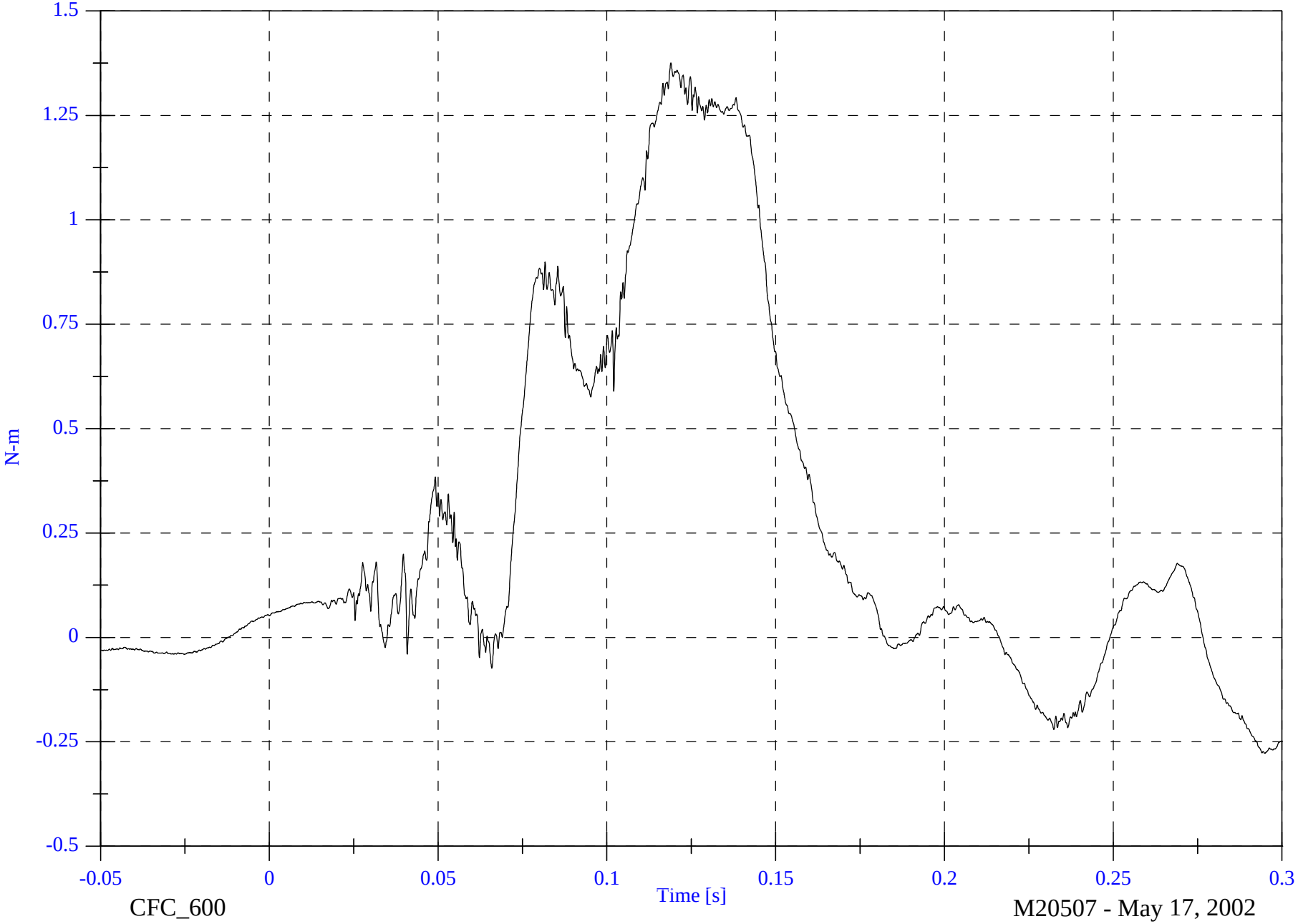
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Lower Neck My
Max: 12.5 [N-m] at 0.242 [s]
Min: -14.9 [N-m] at 0.081 [s]
15
10
5
0
-5
-10
-15
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_600
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lower Neck Mz

Max: 1.4 [N-m] at 0.119 [s]
Min: -0.3 [N-m] at 0.295 [s]



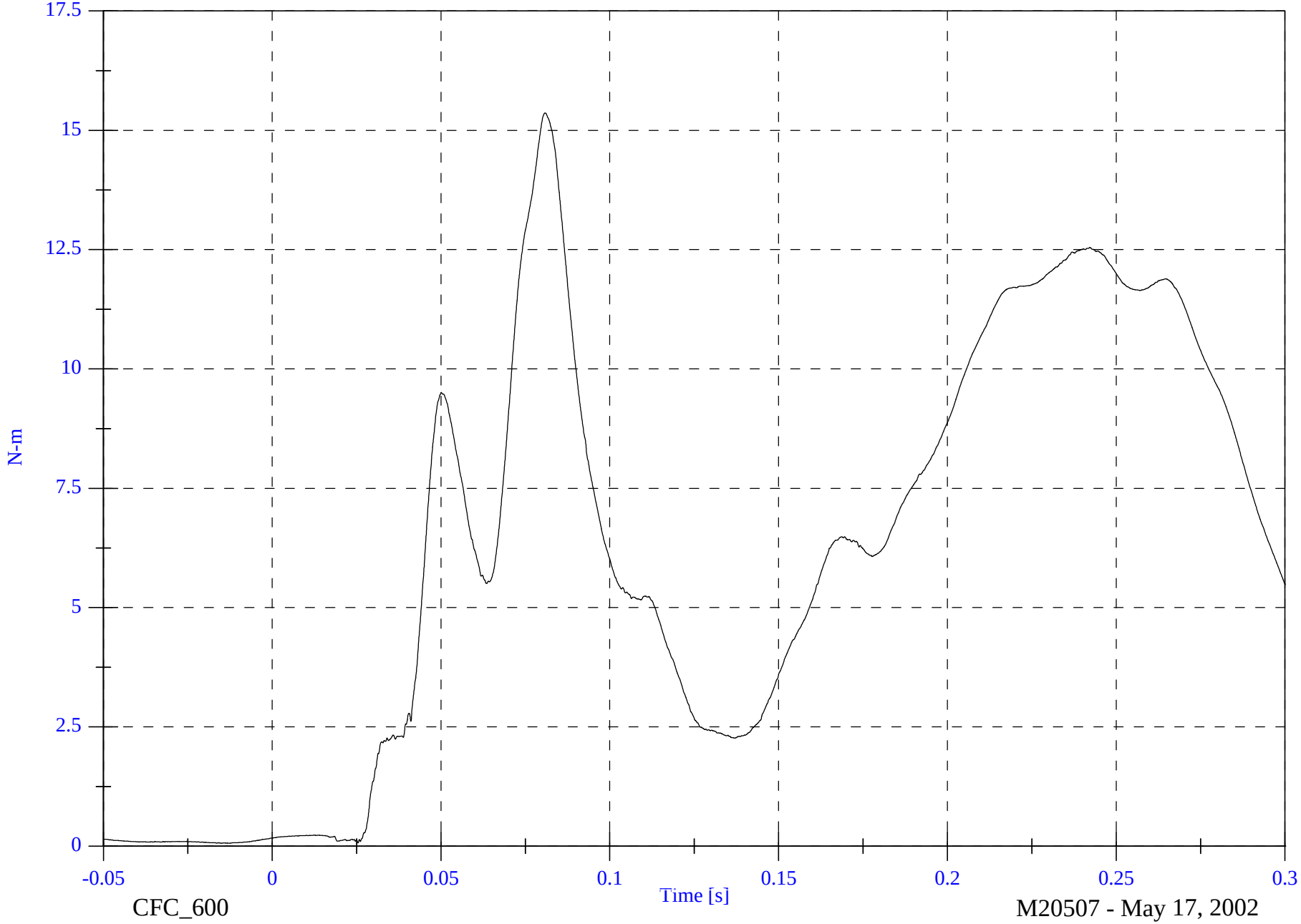
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

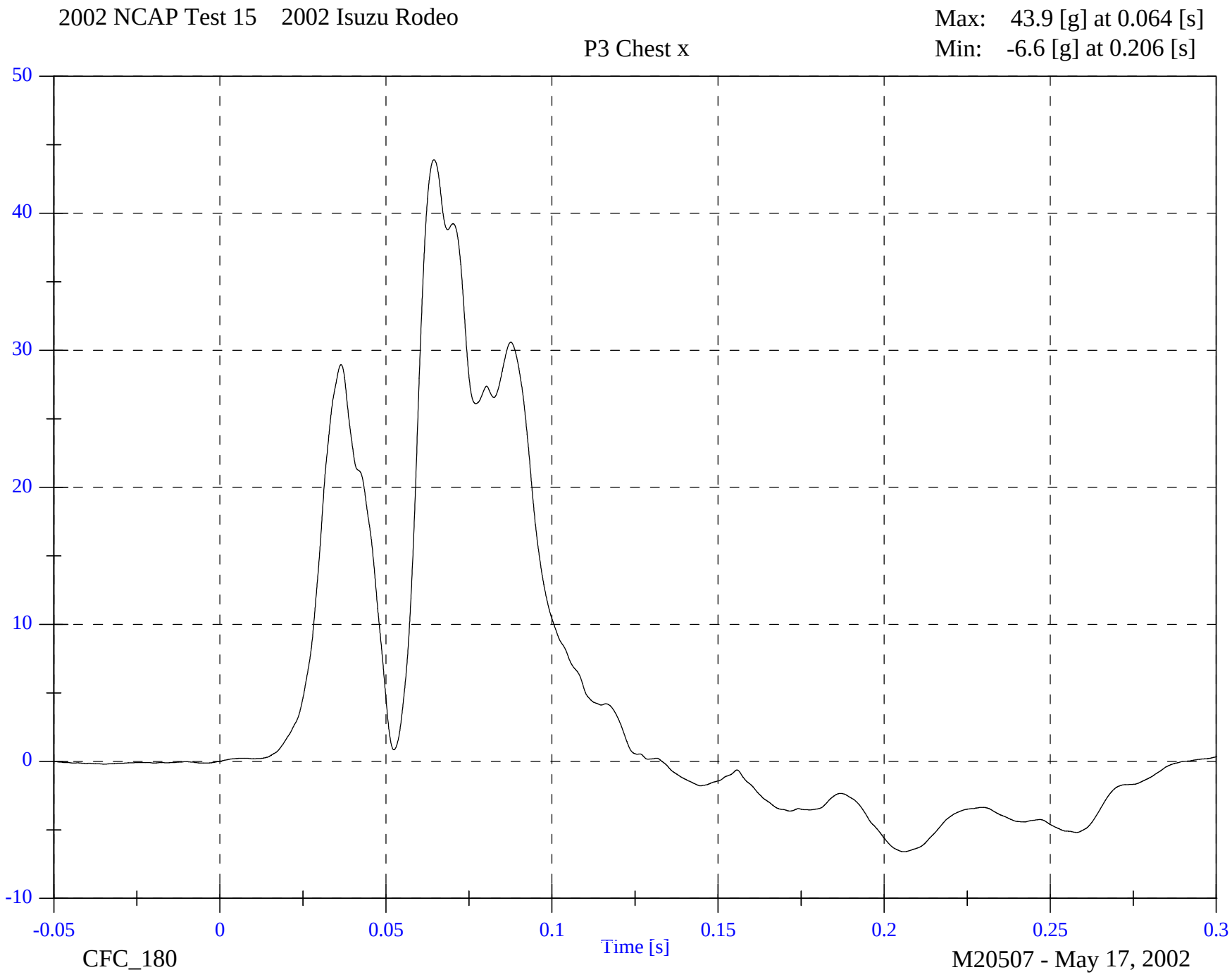
P3 Lower Neck M Resultant

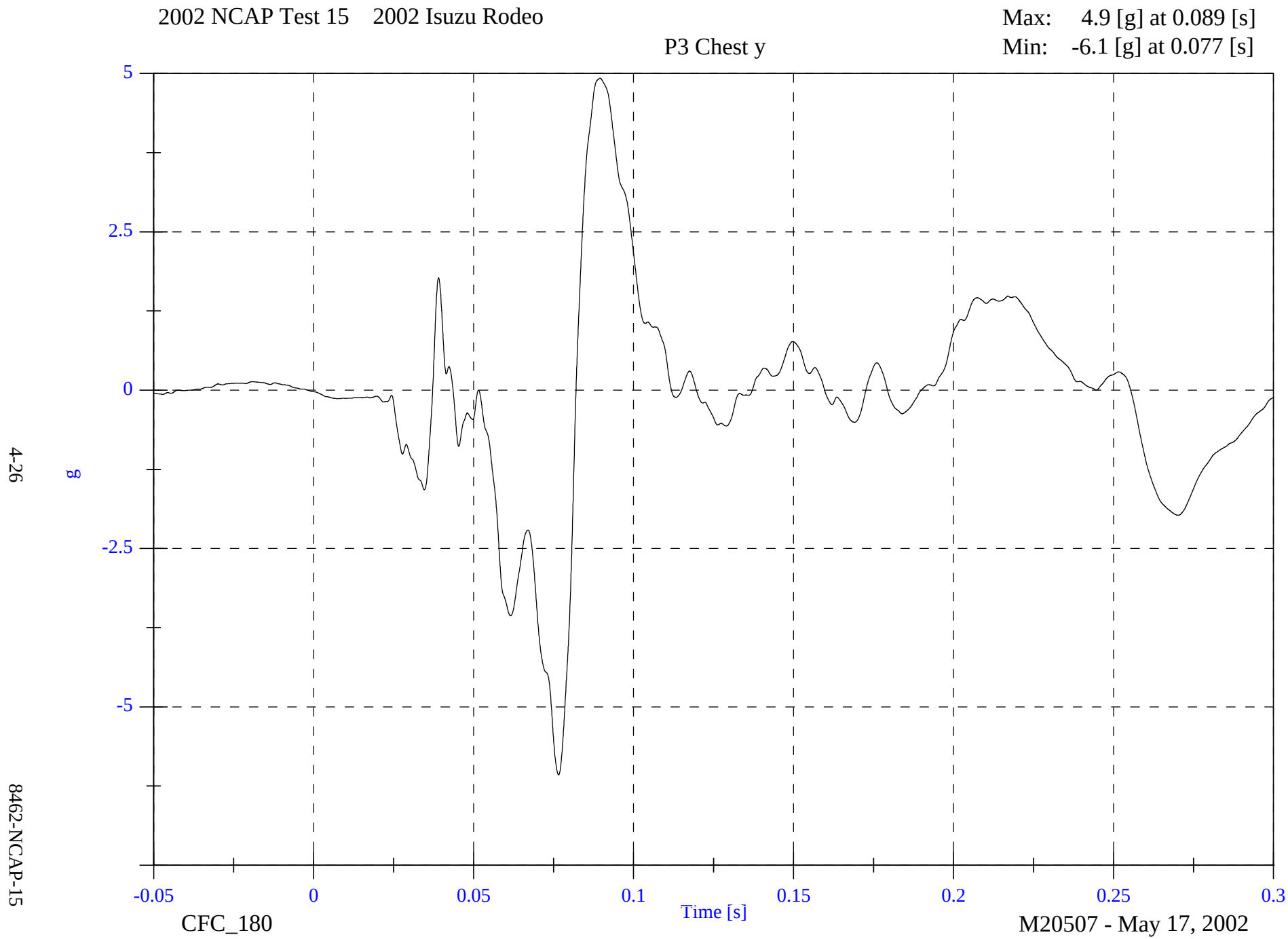
Max: 15.4 [N-m] at 0.081 [s]
Min: 0.1 [N-m] at -0.013 [s]

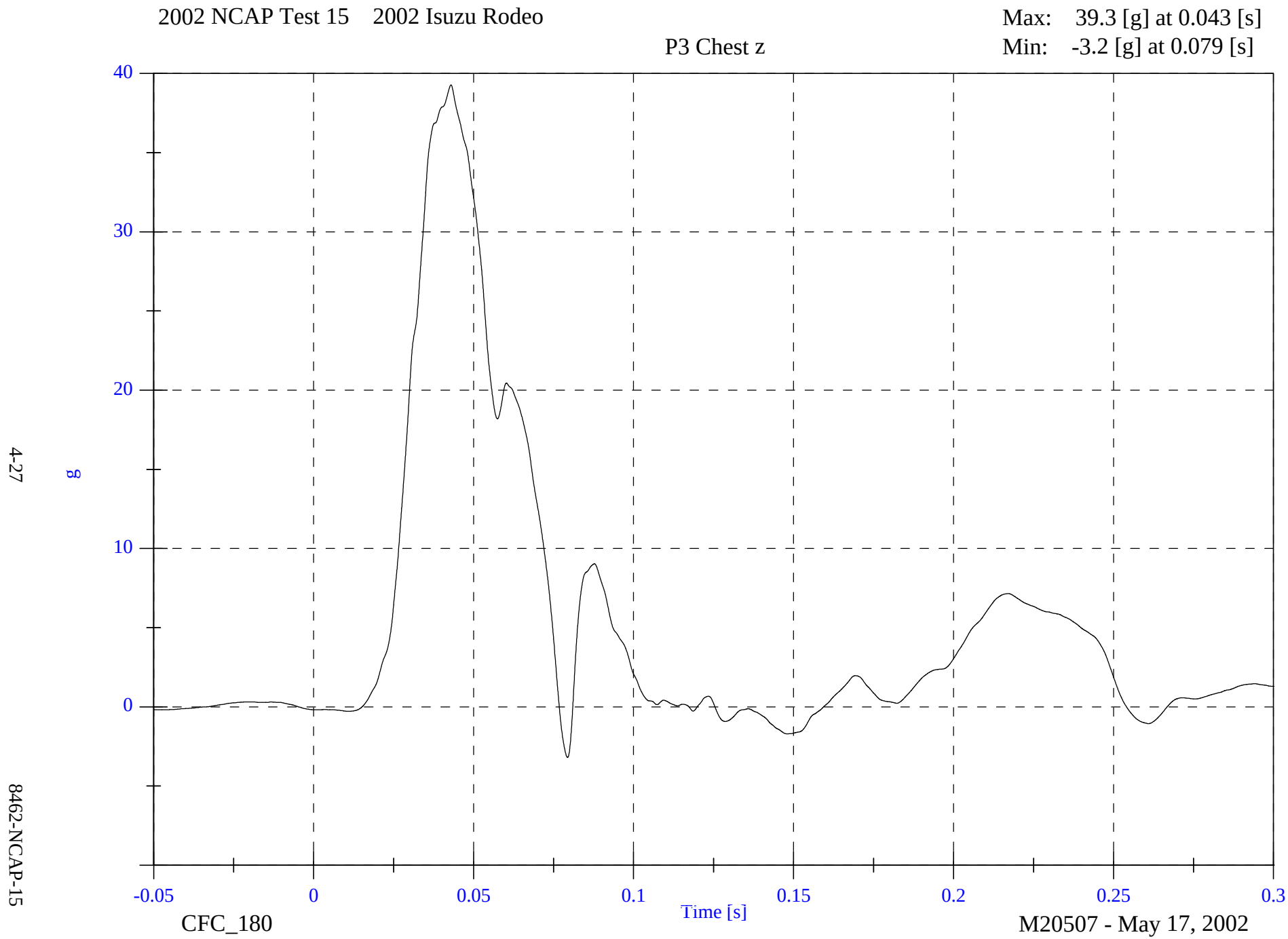


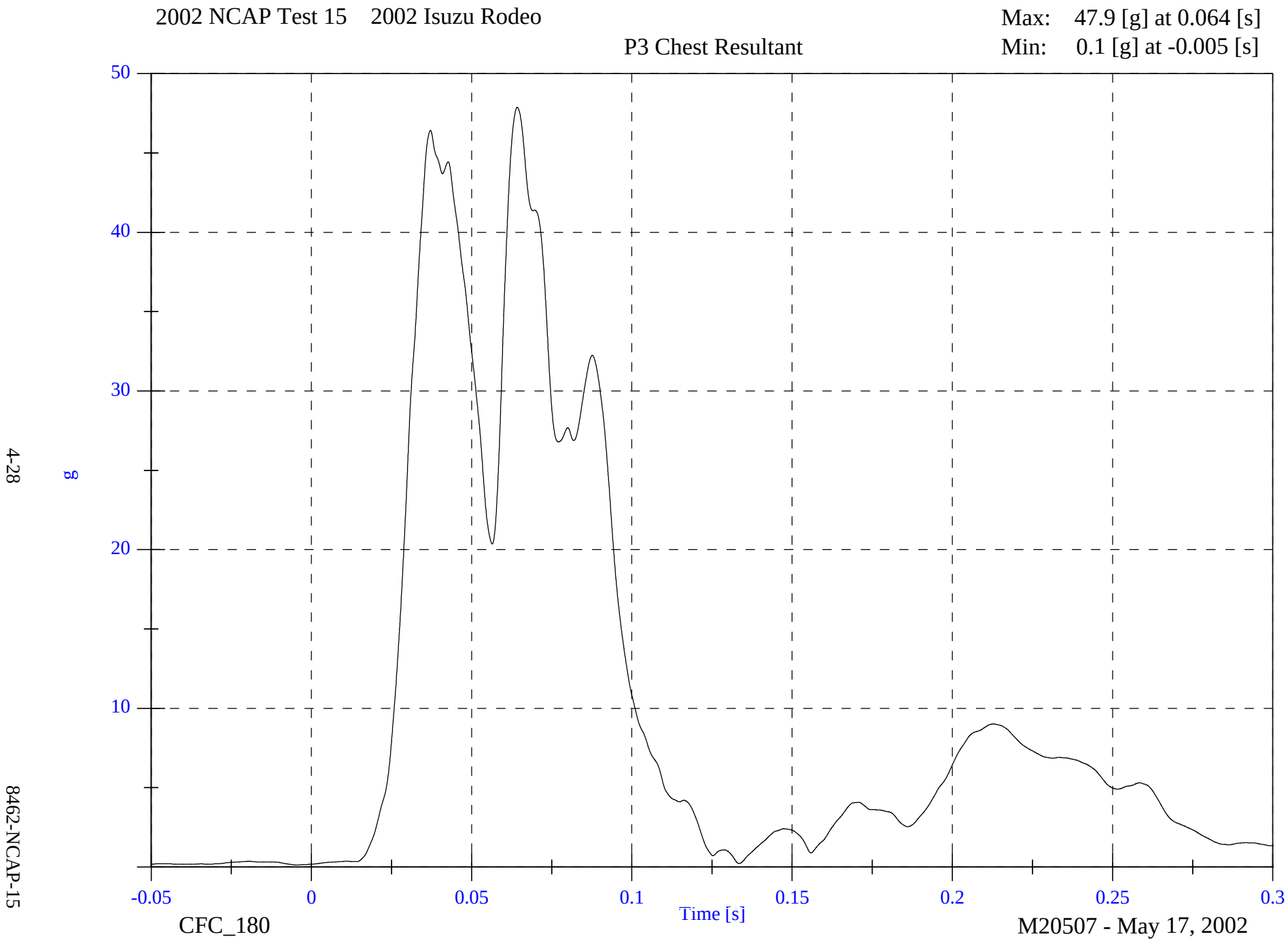
CFC_600

M20507 - May 17, 2002

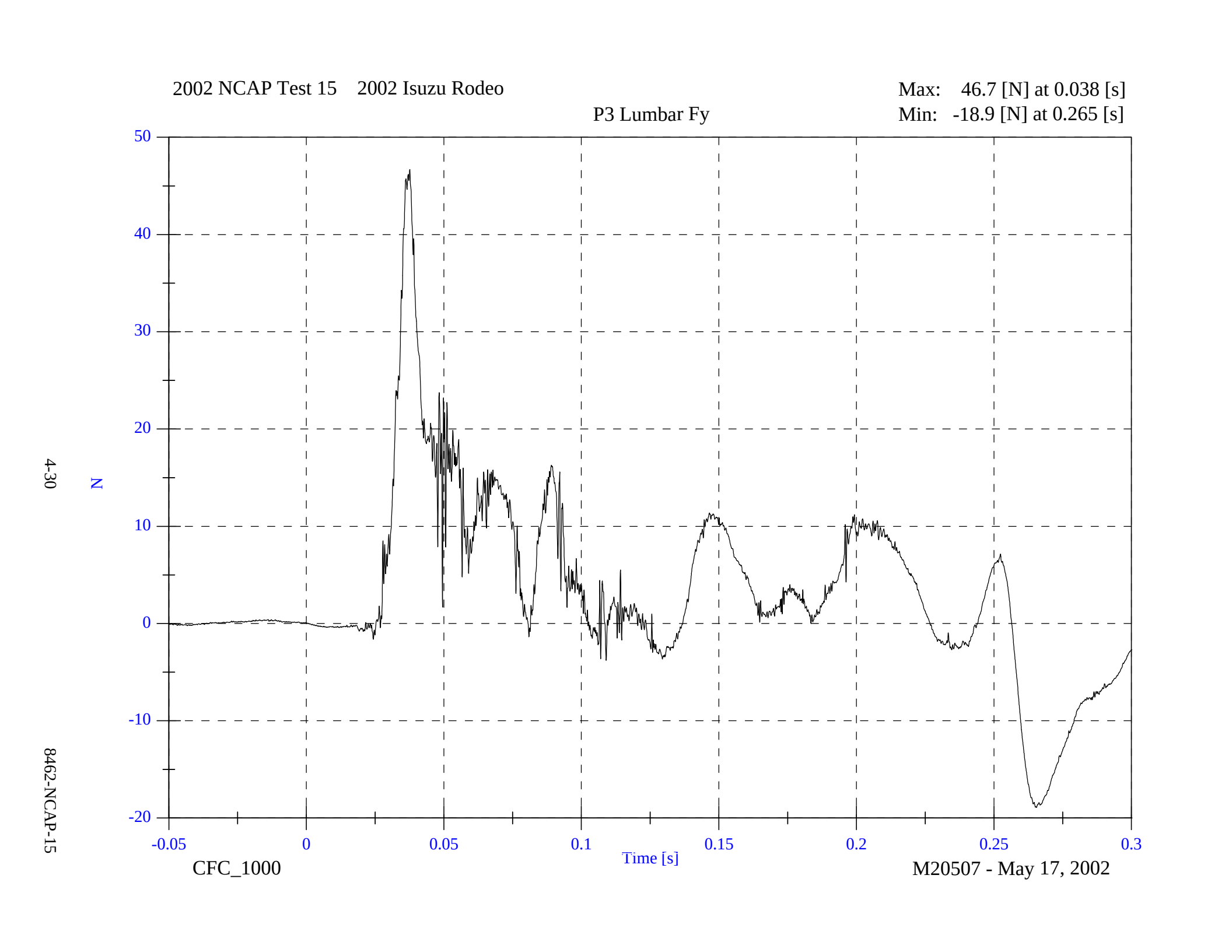

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Chest x
Max: 43.9 [g] at 0.064 [s]
Min: -6.6 [g] at 0.206 [s]
50
40
30
20
10
0
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002

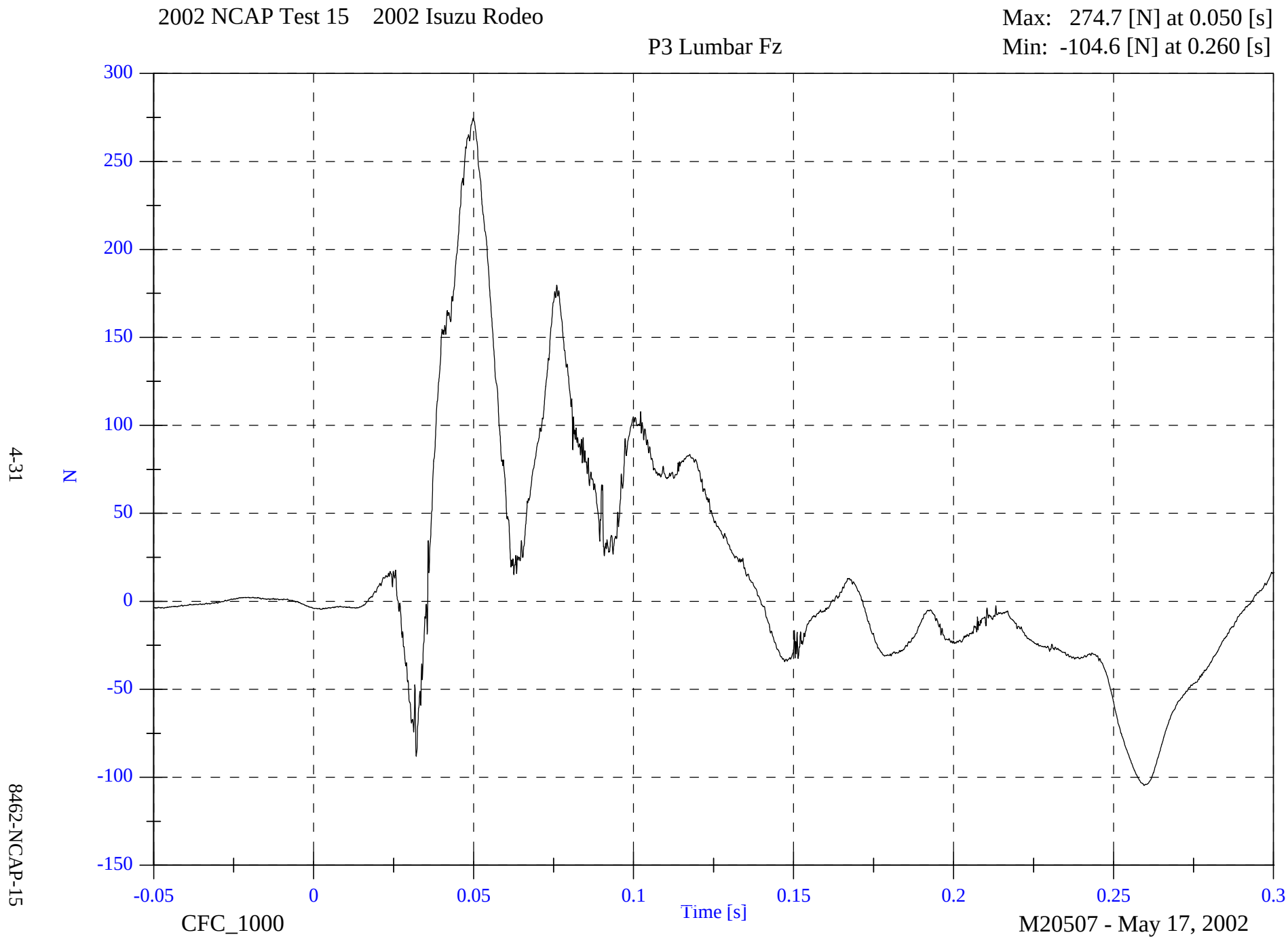

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Chest y
Max: 4.9 [g] at 0.089 [s]
Min: -6.1 [g] at 0.077 [s]
5
2.5
0
-2.5
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
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2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Chest z
Max: 39.3 [g] at 0.043 [s]
Min: -3.2 [g] at 0.079 [s]
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
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2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Chest Resultant
Max: 47.9 [g] at 0.064 [s]
Min: 0.1 [g] at -0.005 [s]
50
40
30
20
10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
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8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Lumbar Fx
Max: 43.5 [N] at 0.079 [s]
Min: -120.3 [N] at 0.049 [s]
50
25
0
-25
-50
-75
-100
-125
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

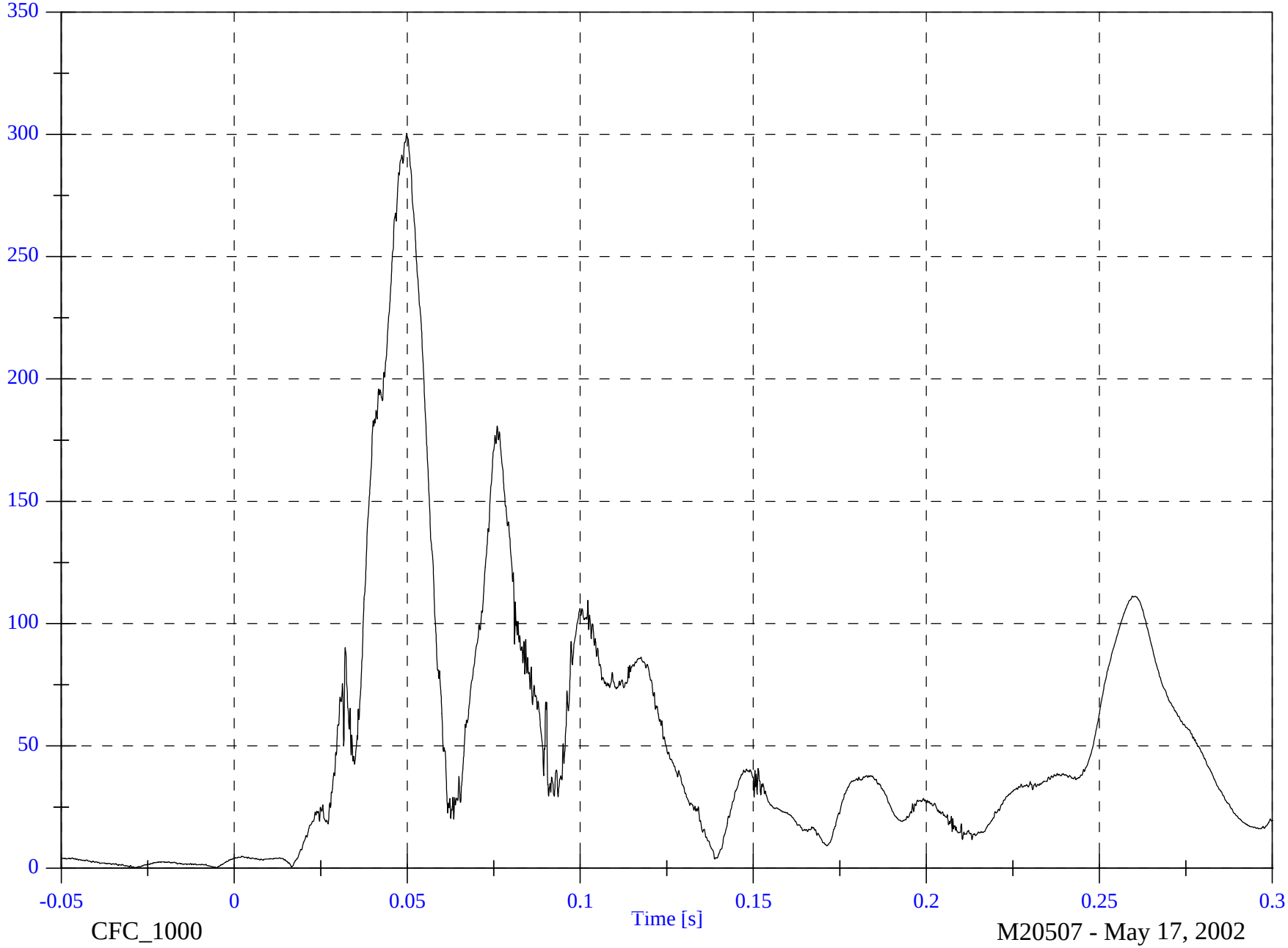

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Lumbar Fy
Max: 46.7 [N] at 0.038 [s]
Min: -18.9 [N] at 0.265 [s]
50
40
30
20
10
0
-10
-20
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
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8462-NCAP-15


2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Lumbar Fz
Max: 274.7 [N] at 0.050 [s]
Min: -104.6 [N] at 0.260 [s]
300
250
200
150
100
50
0
-50
-100
-150
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lumbar F Resultant

Max: 300.5 [N] at 0.050 [s]
Min: 0.2 [N] at -0.005 [s]



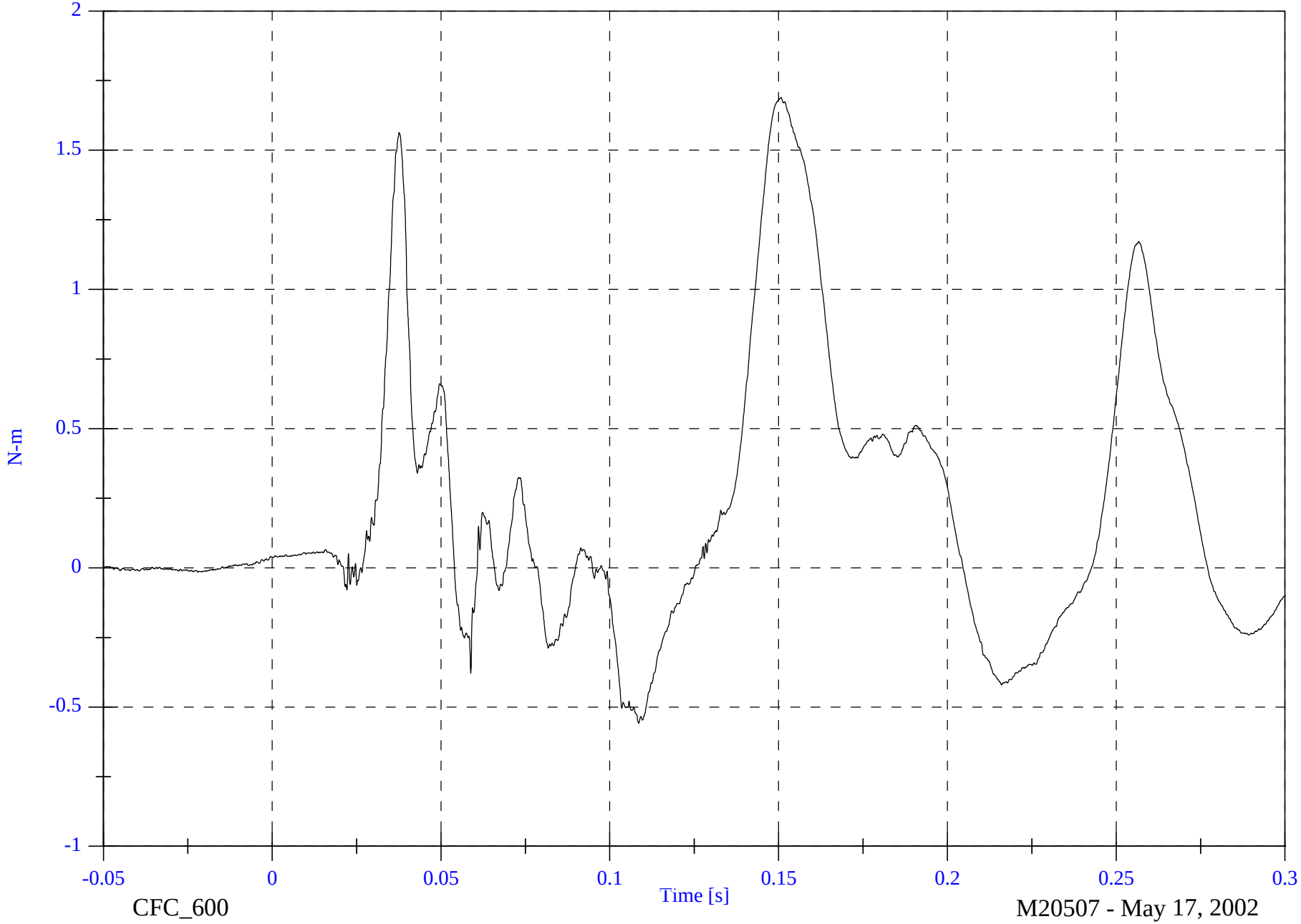
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lumbar Mx

Max: 1.7 [N-m] at 0.151 [s]
Min: -0.6 [N-m] at 0.109 [s]



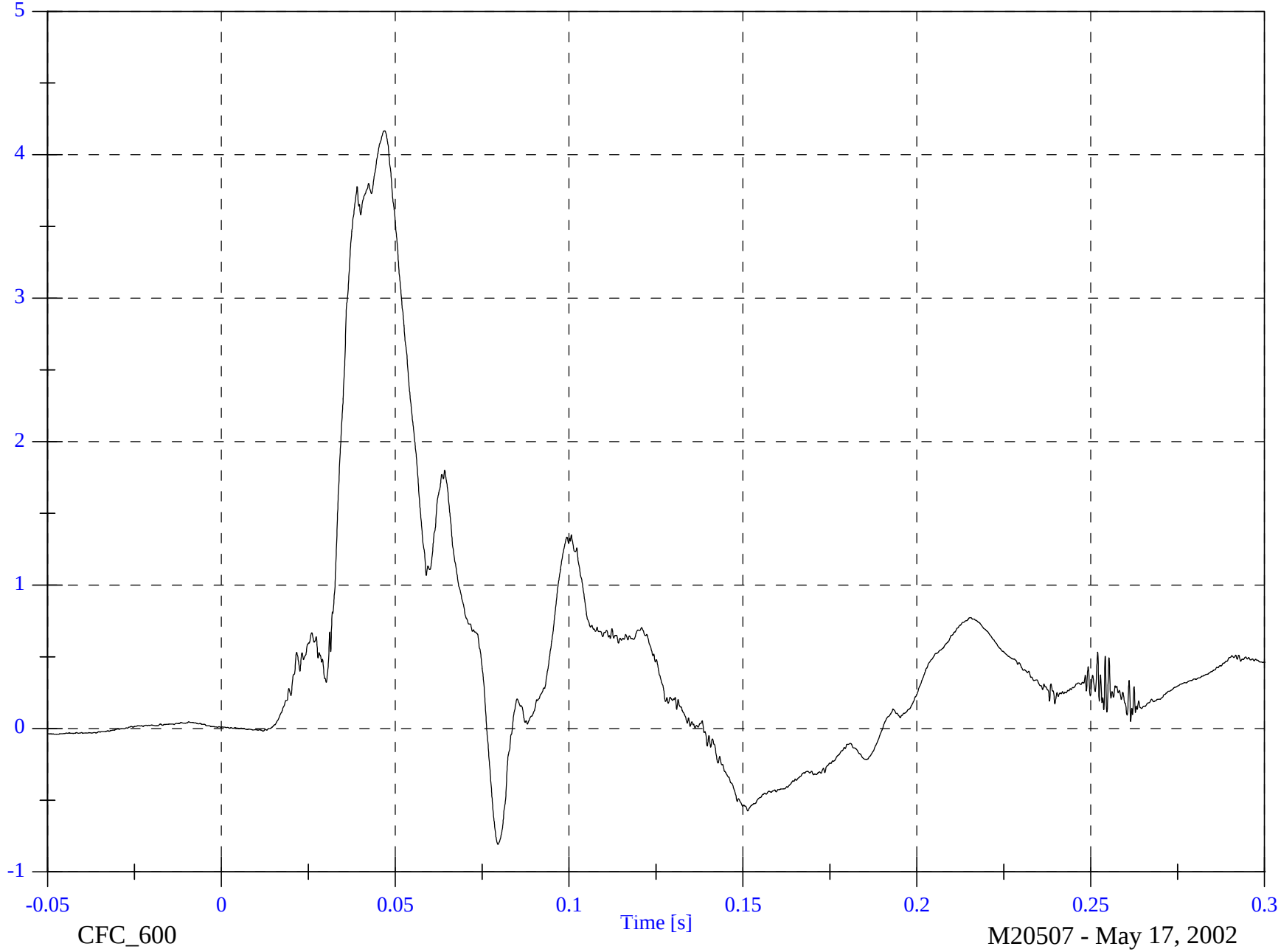
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lumbar My

Max: 4.2 [N-m] at 0.047 [s]
Min: -0.8 [N-m] at 0.079 [s]



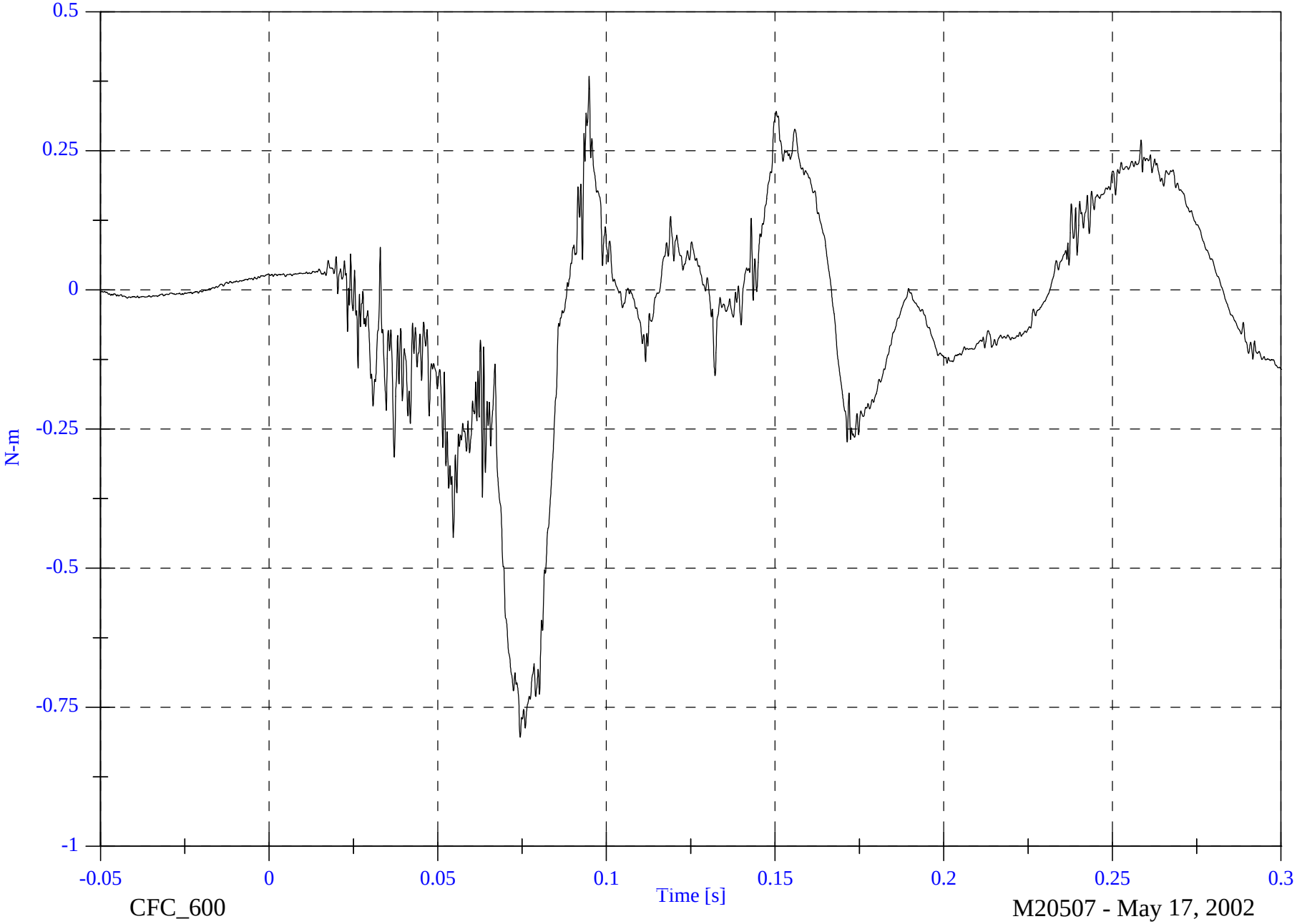
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lumbar Mz

Max: 0.4 [N-m] at 0.095 [s]
Min: -0.8 [N-m] at 0.074 [s]



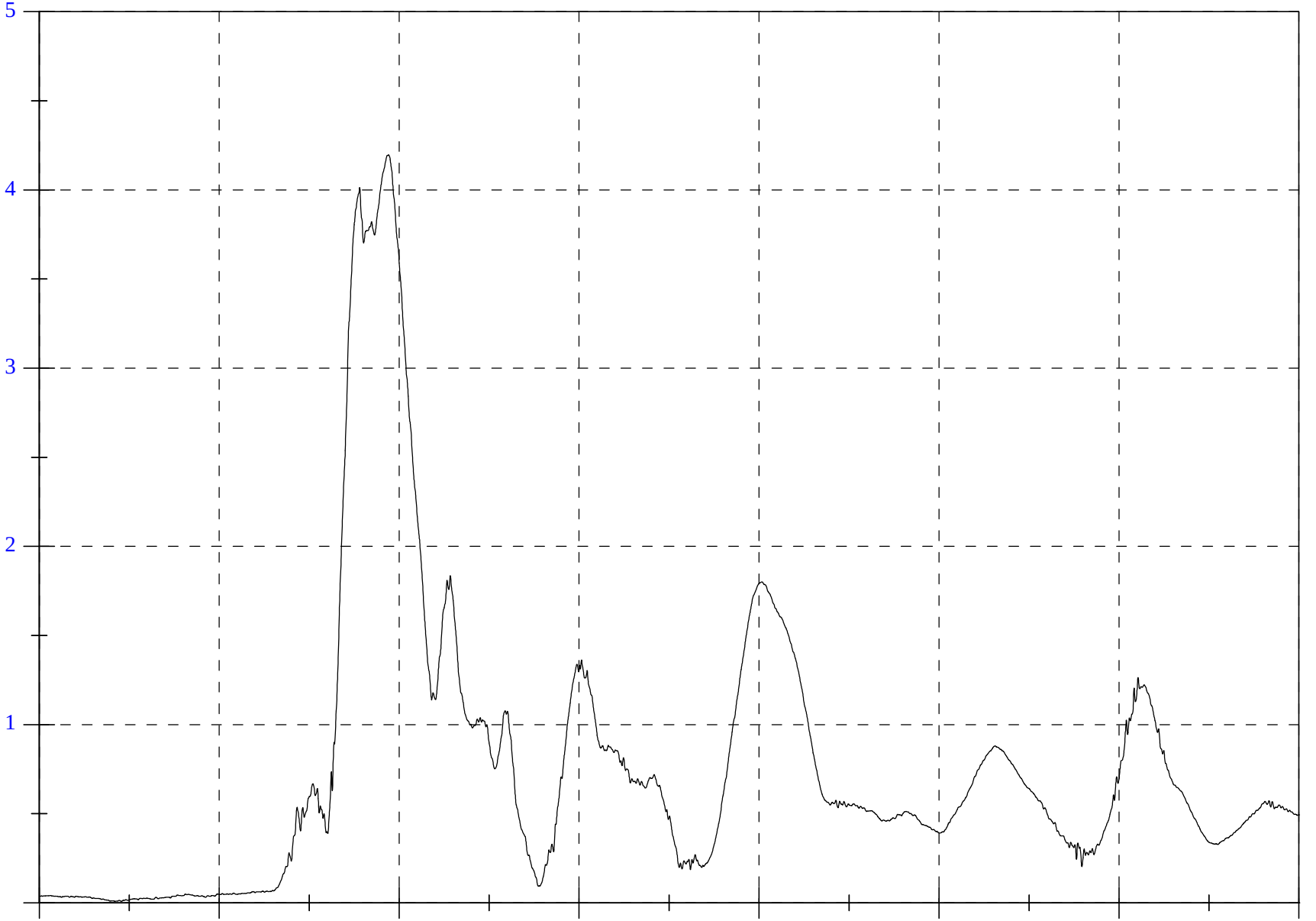
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P3 Lumbar M Resultant

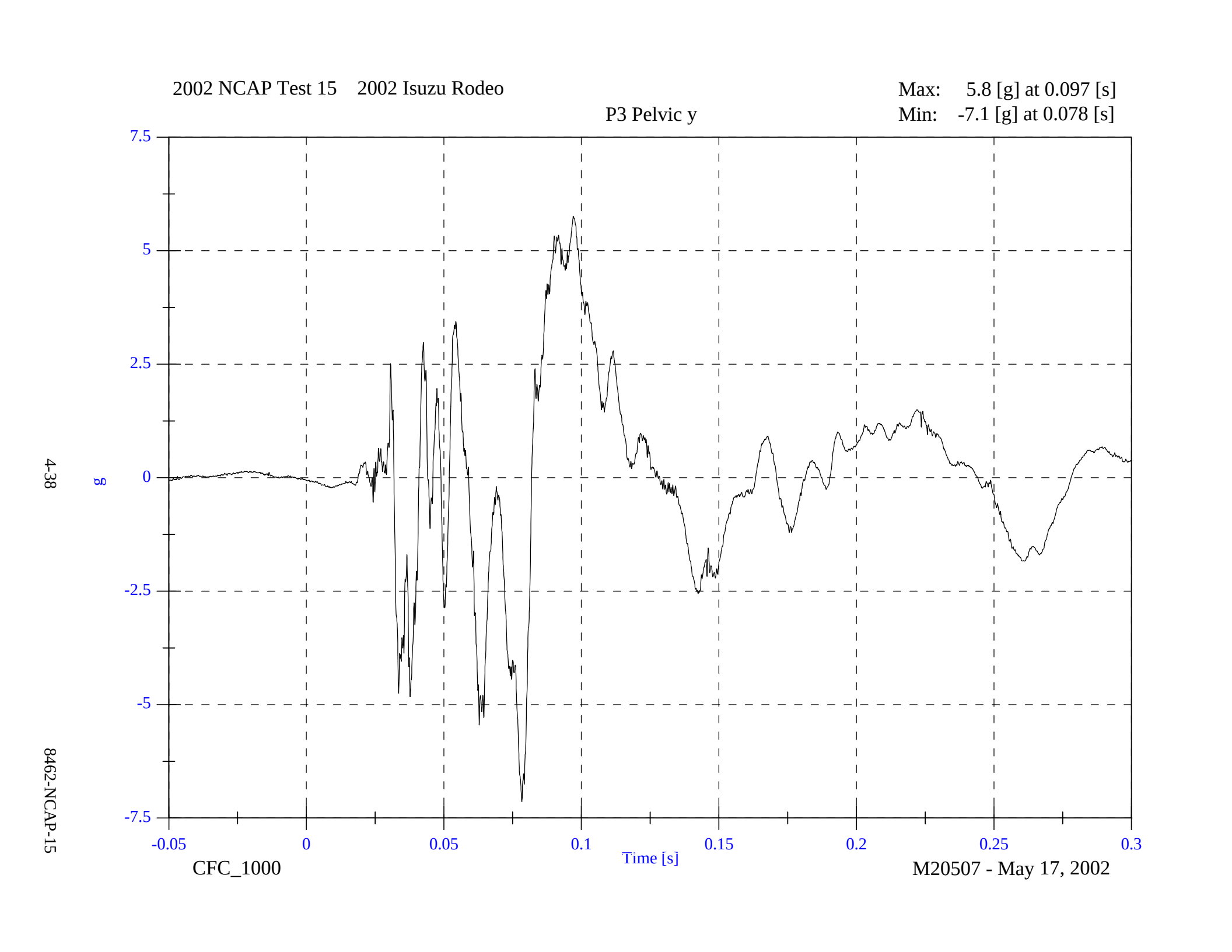
Max: 4.2 [N-m] at 0.047 [s]
Min: 0.0 [N-m] at -0.027 [s]

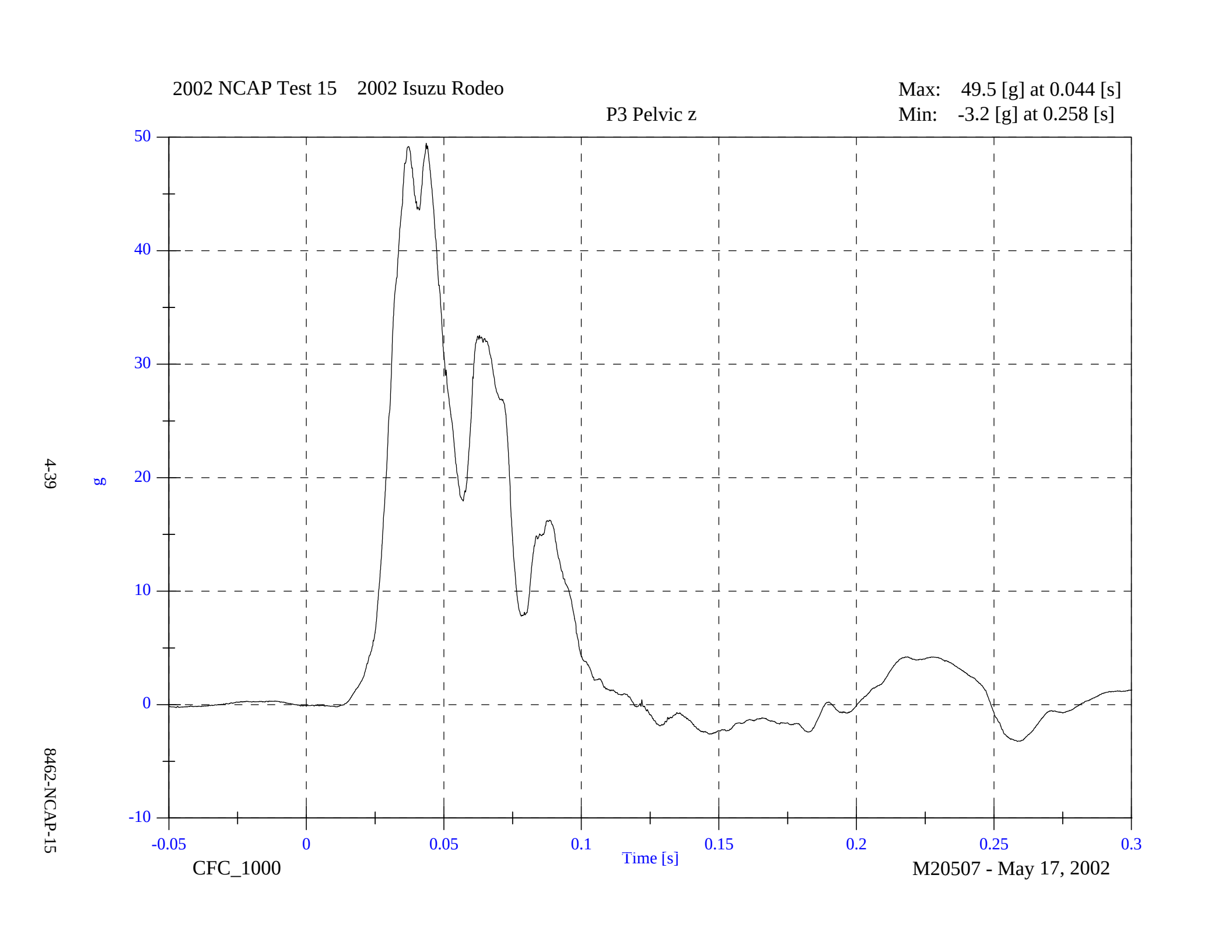


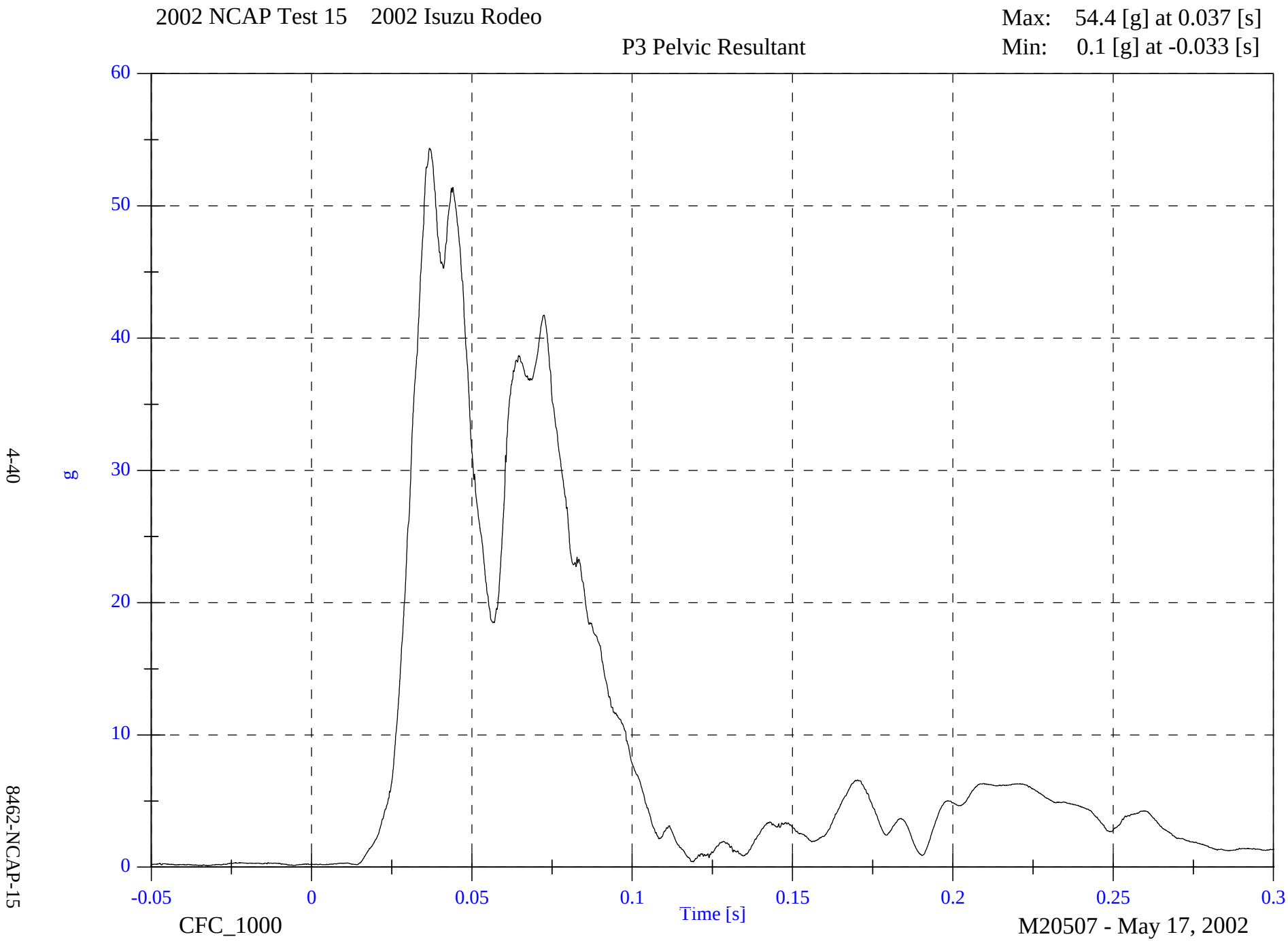
CFC_600

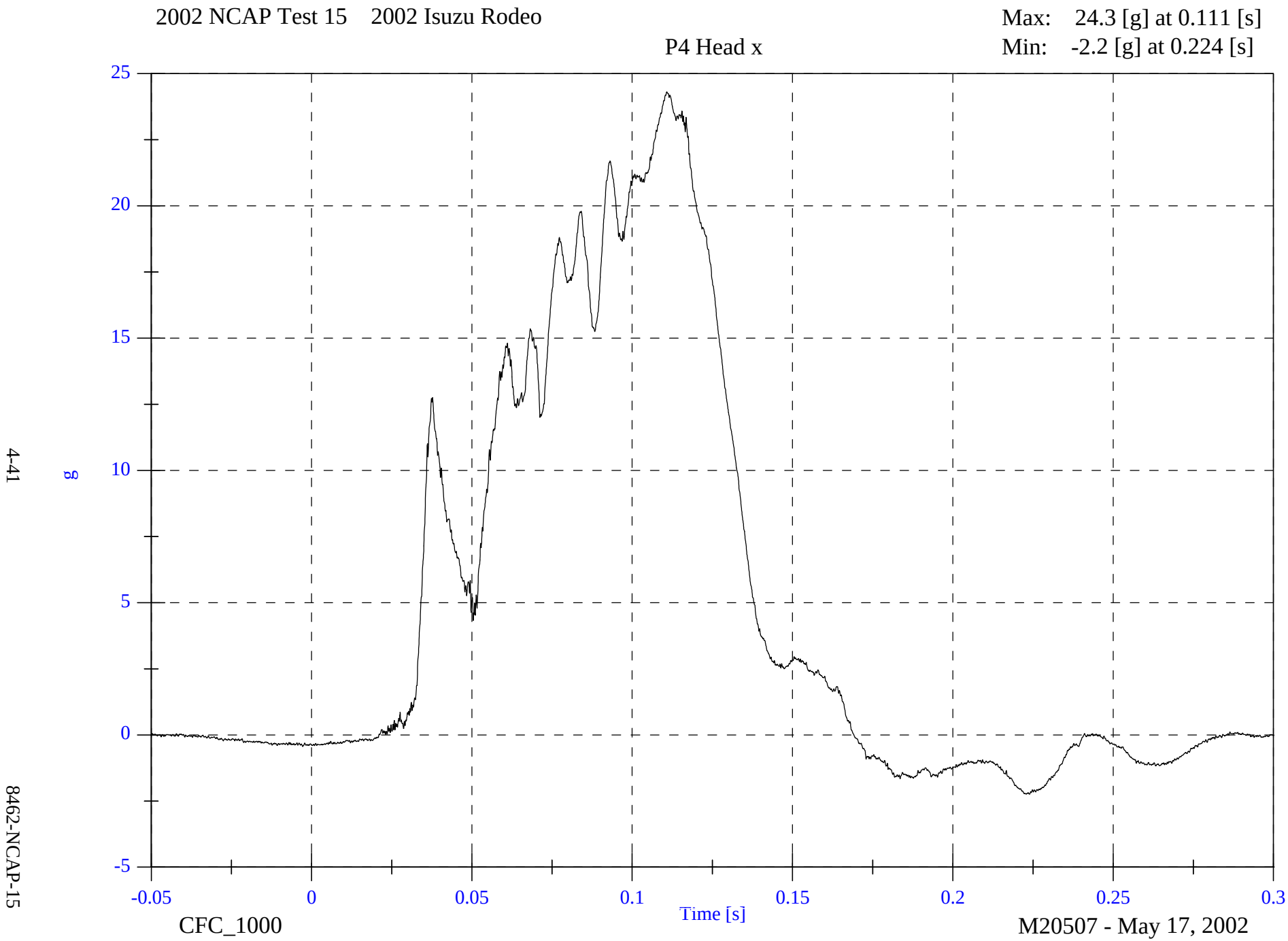
M20507 - May 17, 2002

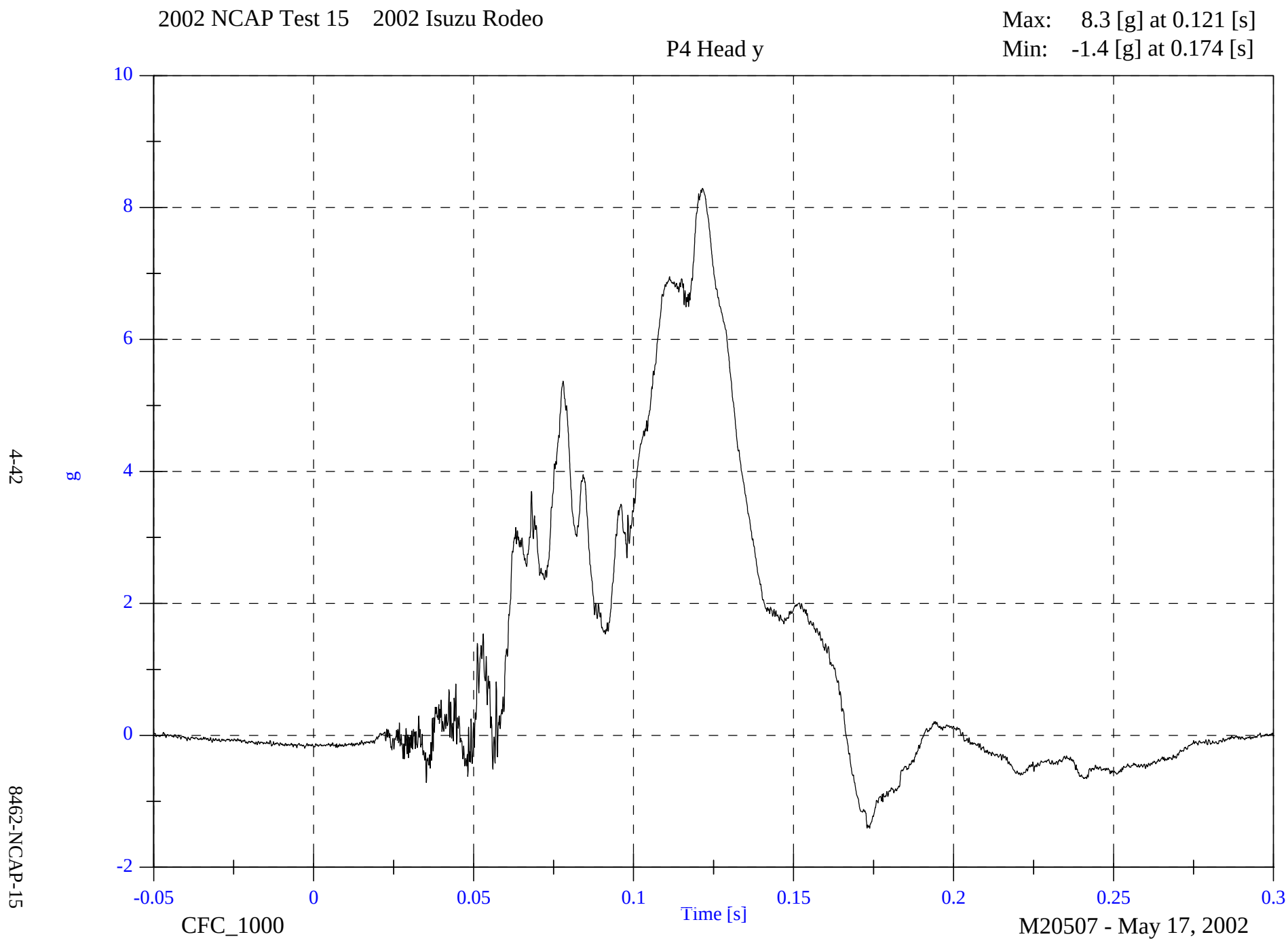

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Pelvic x
Max: 33.4 [g] at 0.075 [s]
Min: -6.4 [g] at 0.170 [s]
35
30
25
20
15
10
5
0
-5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

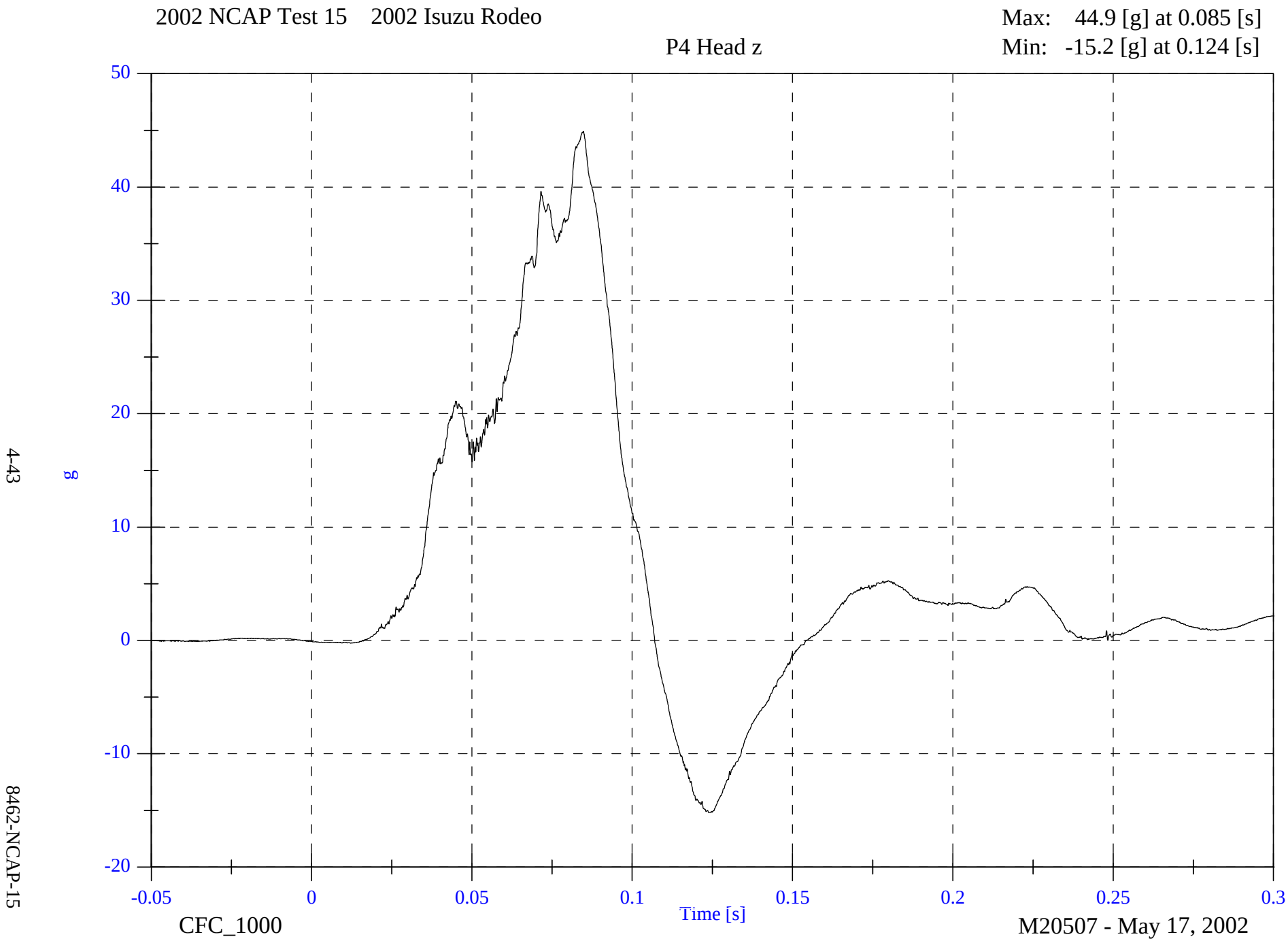

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Pelvic y
Max: 5.8 [g] at 0.097 [s]
Min: -7.1 [g] at 0.078 [s]
7.5
5
2.5
0
-2.5
-5
-7.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
4-38
8462-NCAP-15

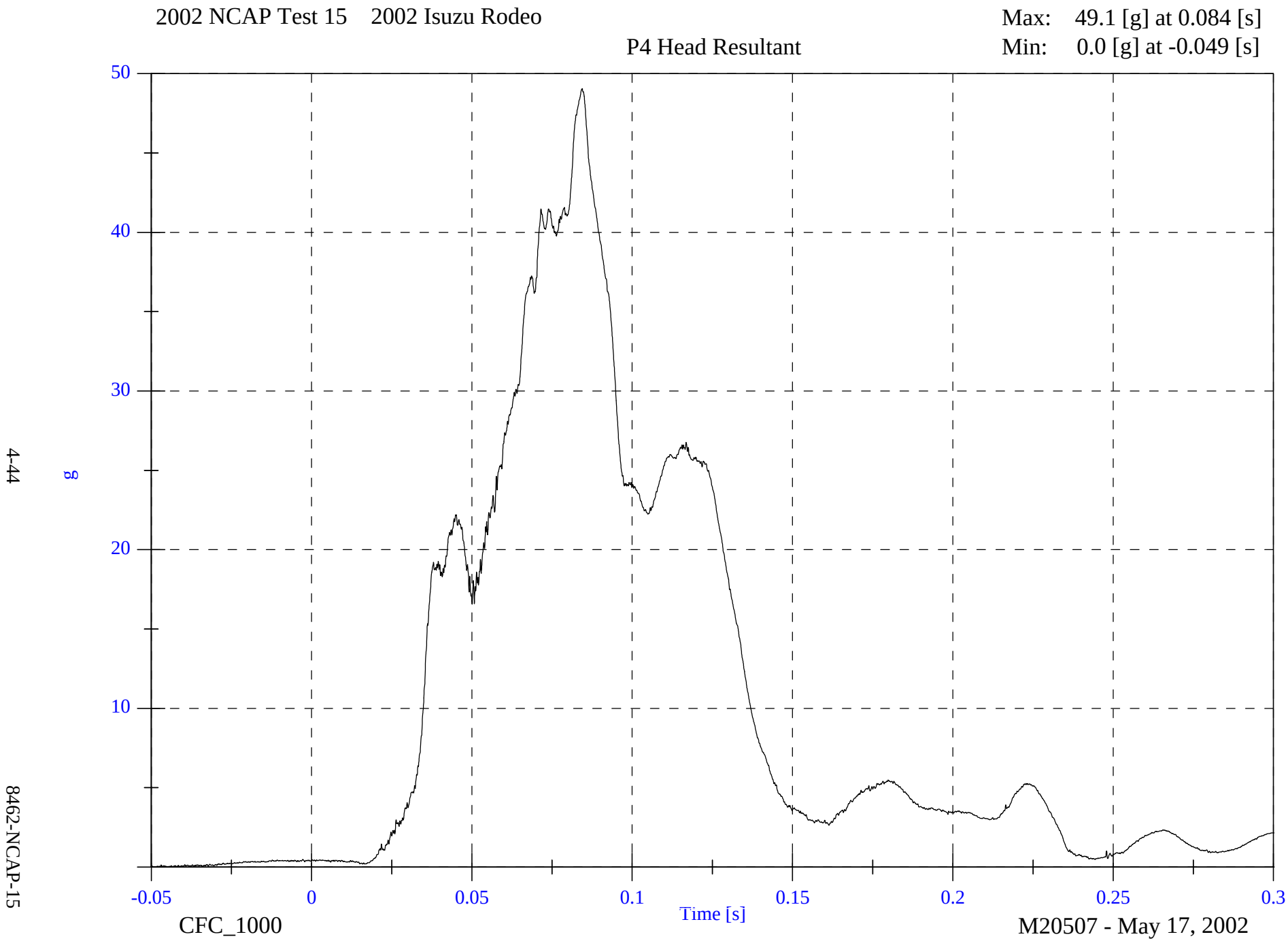

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Pelvic z
Max: 49.5 [g] at 0.044 [s]
Min: -3.2 [g] at 0.258 [s]
50
40
30
20
10
0
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002
4-39
8462-NCAP-15

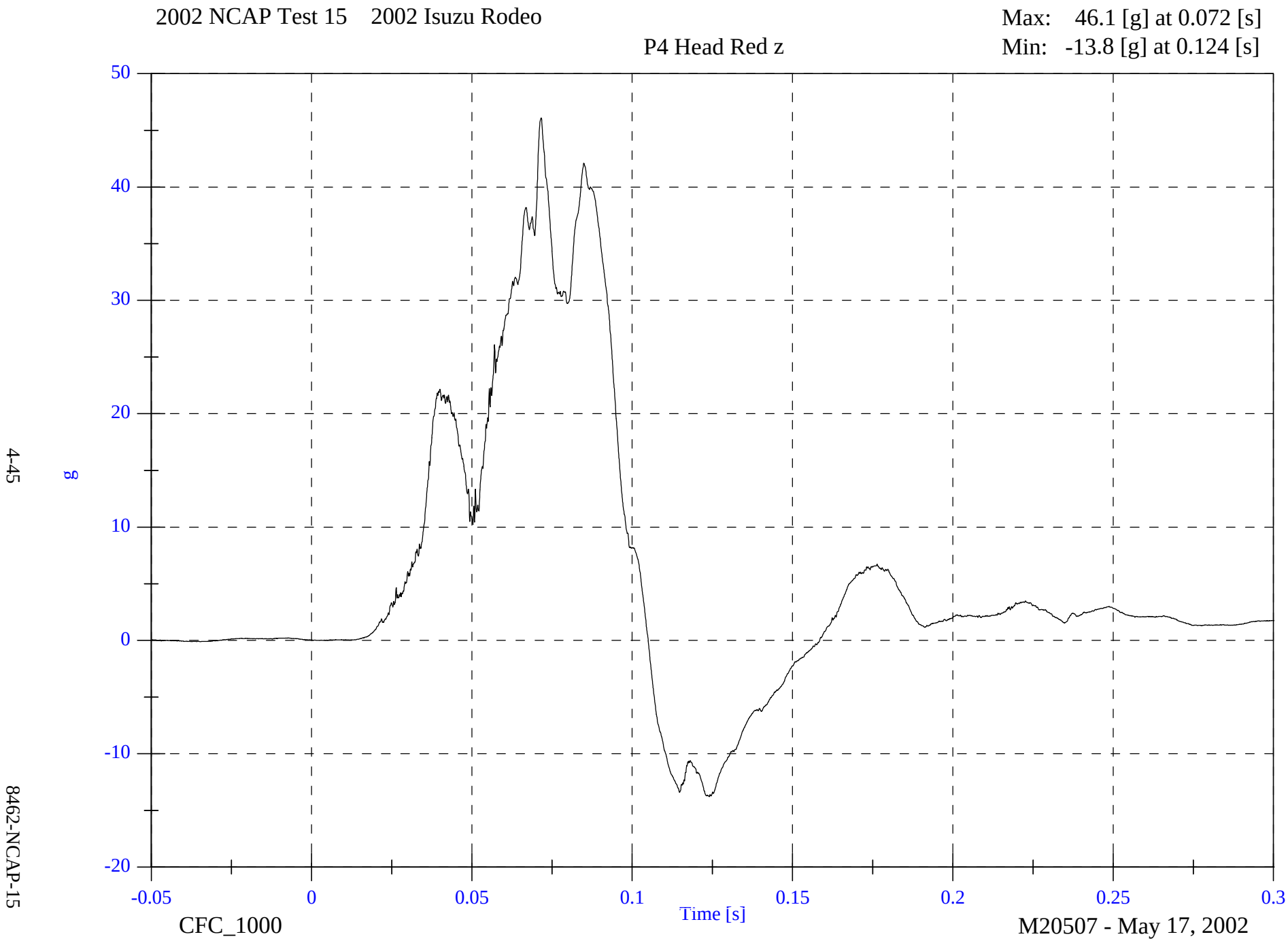

2002 NCAP Test 15 2002 Isuzu Rodeo
P3 Pelvic Resultant
Max: 54.4 [g] at 0.037 [s]
Min: 0.1 [g] at -0.033 [s]
60
50
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

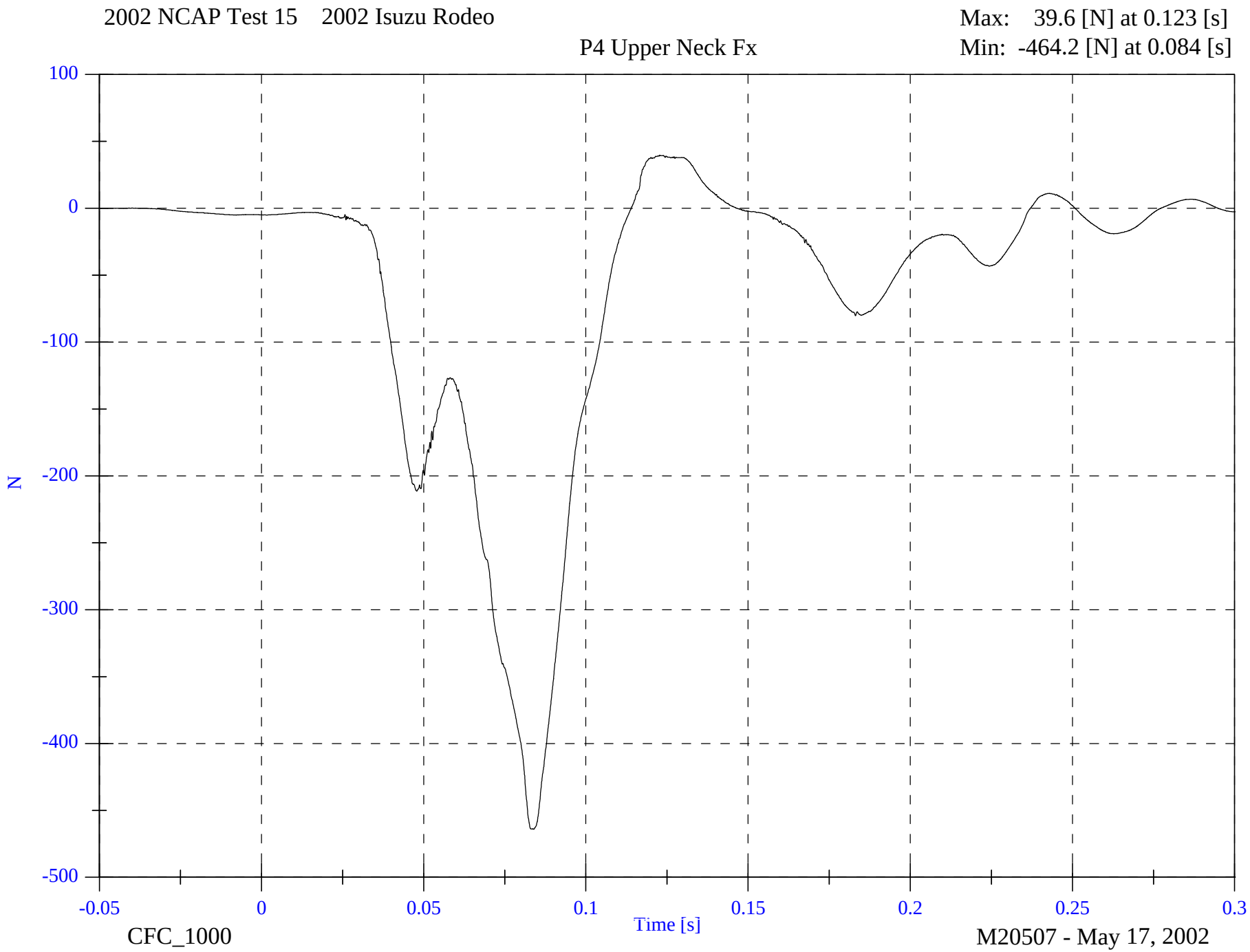

2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Head x
Max: 24.3 [g] at 0.111 [s]
Min: -2.2 [g] at 0.224 [s]
25
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Head y
Max: 8.3 [g] at 0.121 [s]
Min: -1.4 [g] at 0.174 [s]
10
8
6
4
2
0
-2
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Head z
Max: 44.9 [g] at 0.085 [s]
Min: -15.2 [g] at 0.124 [s]
50
40
30
20
10
0
-10
-20
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Head Resultant
Max: 49.1 [g] at 0.084 [s]
Min: 0.0 [g] at -0.049 [s]
50
40
30
20
10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

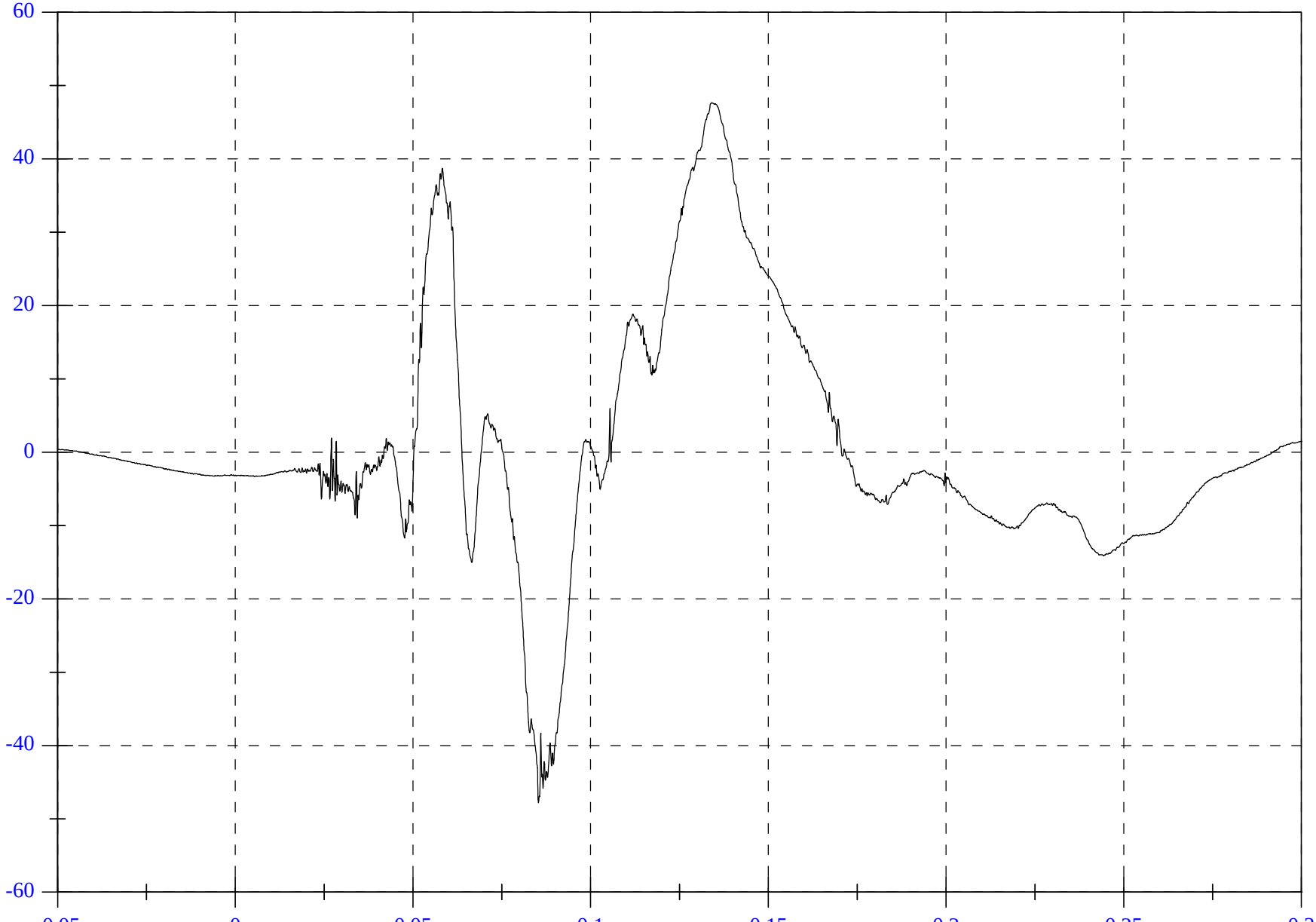

2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Head Red z
Max: 46.1 [g] at 0.072 [s]
Min: -13.8 [g] at 0.124 [s]
50
40
30
20
10
0
-10
-20
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Upper Neck Fx
Max: 39.6 [N] at 0.123 [s]
Min: -464.2 [N] at 0.084 [s]
100
0
-100
-200
-300
-400
-500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

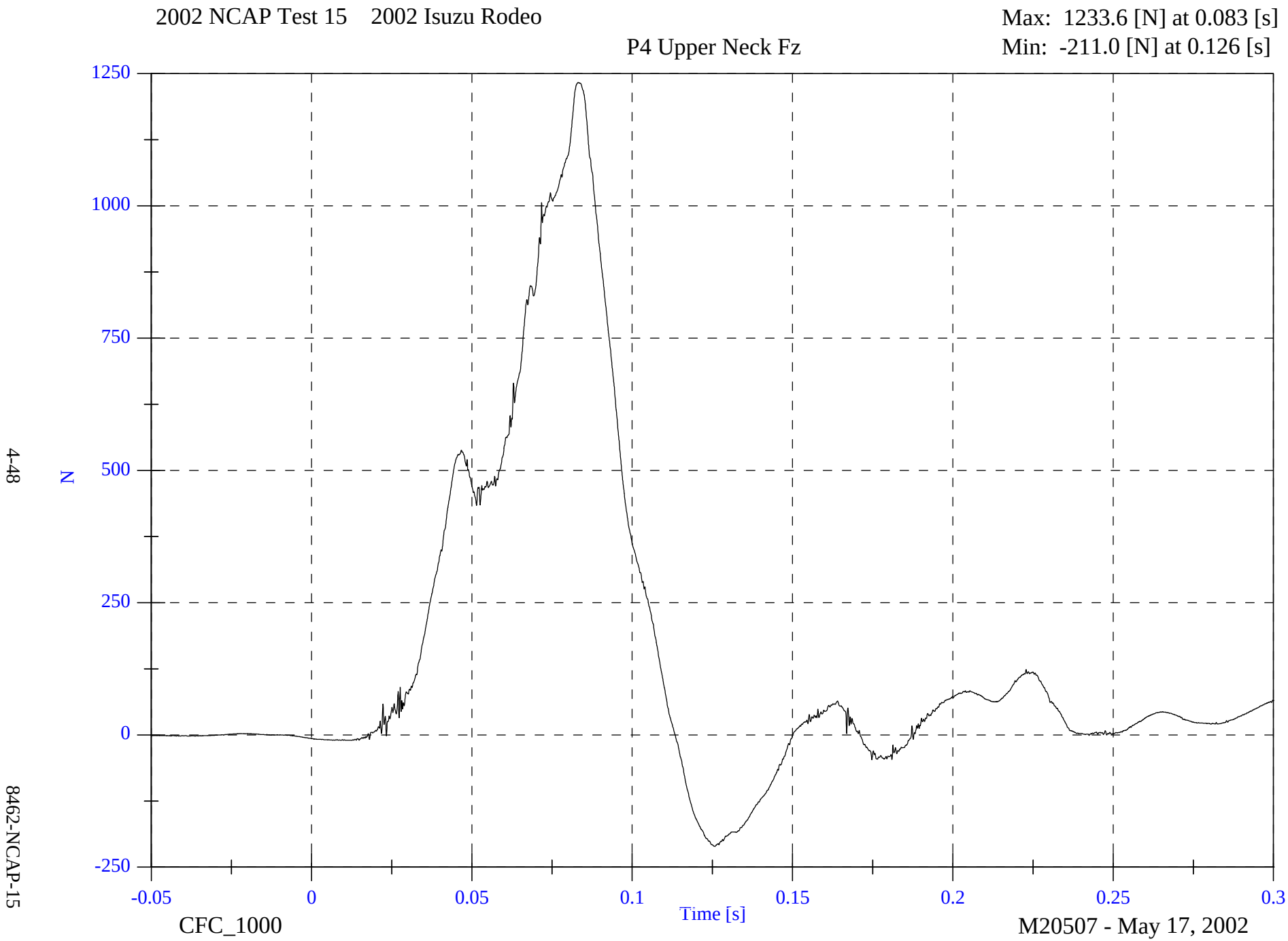
P4 Upper Neck Fy

Max: 47.7 [N] at 0.134 [s]
Min: -47.8 [N] at 0.085 [s]



CFC_1000

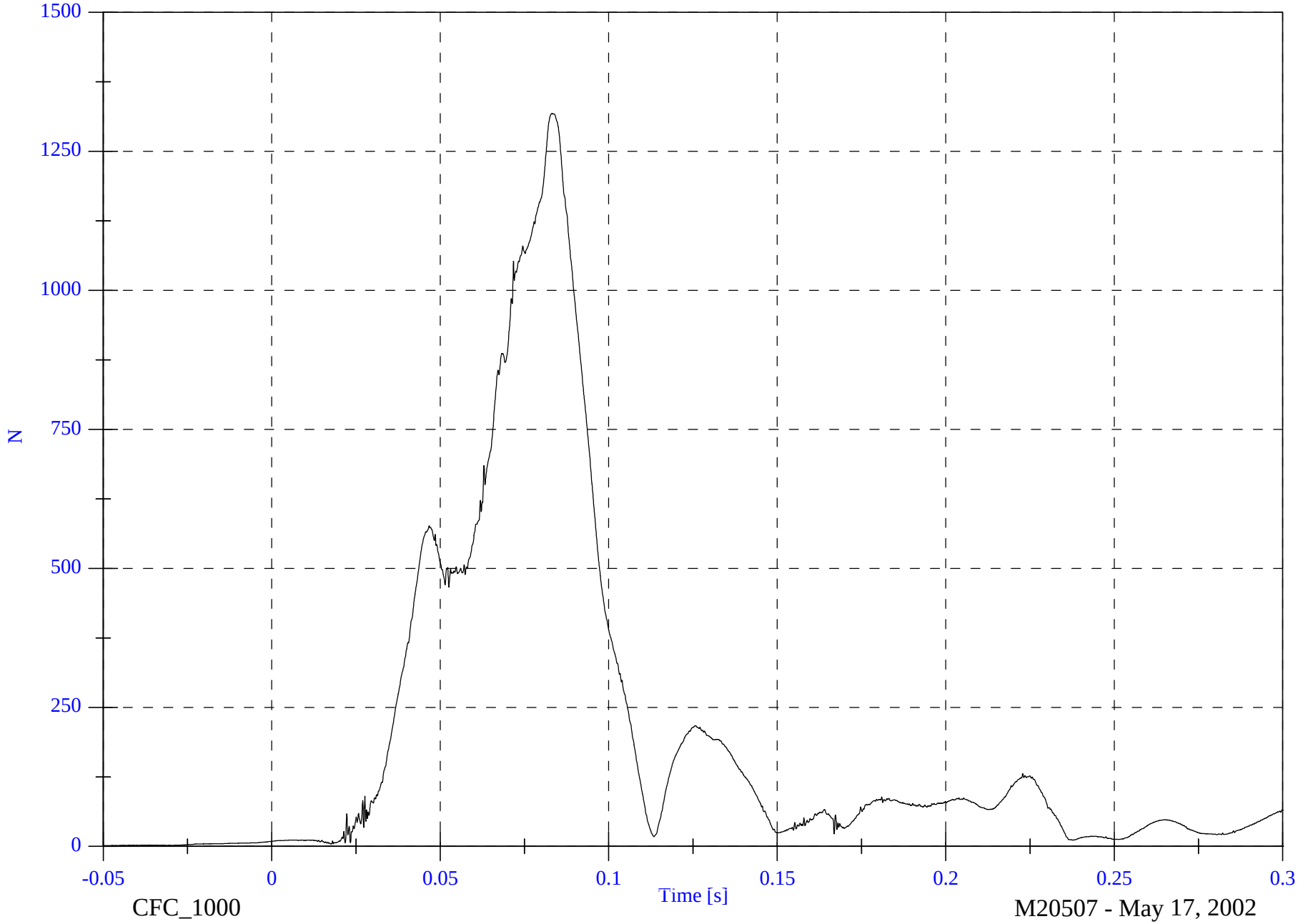
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Upper Neck Fz
Max: 1233.6 [N] at 0.083 [s]
Min: -211.0 [N] at 0.126 [s]
1250
1000
750
500
250
0
-250
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Upper Neck F Resultant

Max: 1318.5 [N] at 0.083 [s]
Min: 1.1 [N] at -0.048 [s]



CFC_1000

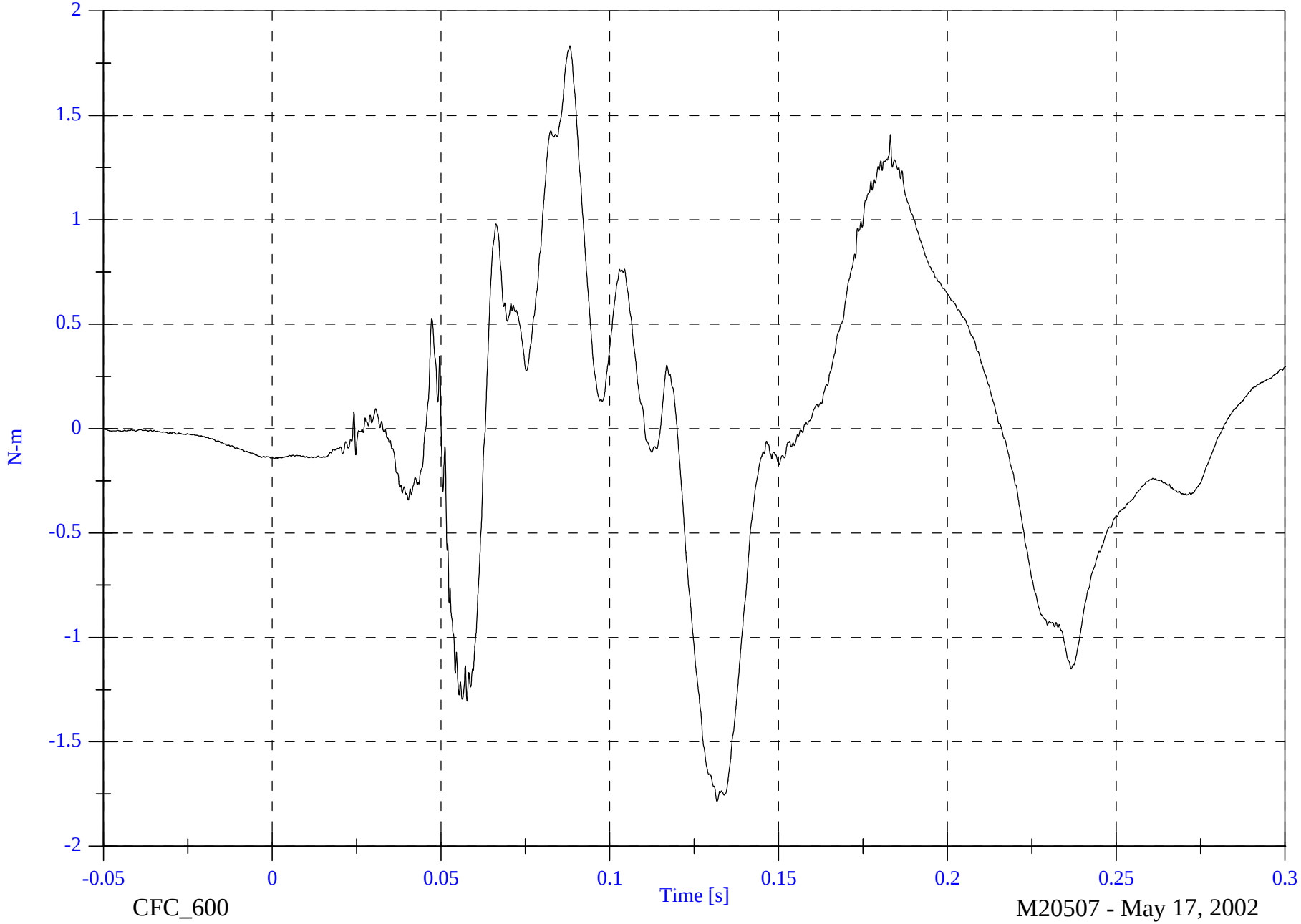
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Upper Neck Mx

Max: 1.8 [N-m] at 0.088 [s]

Min: -1.8 [N-m] at 0.132 [s]



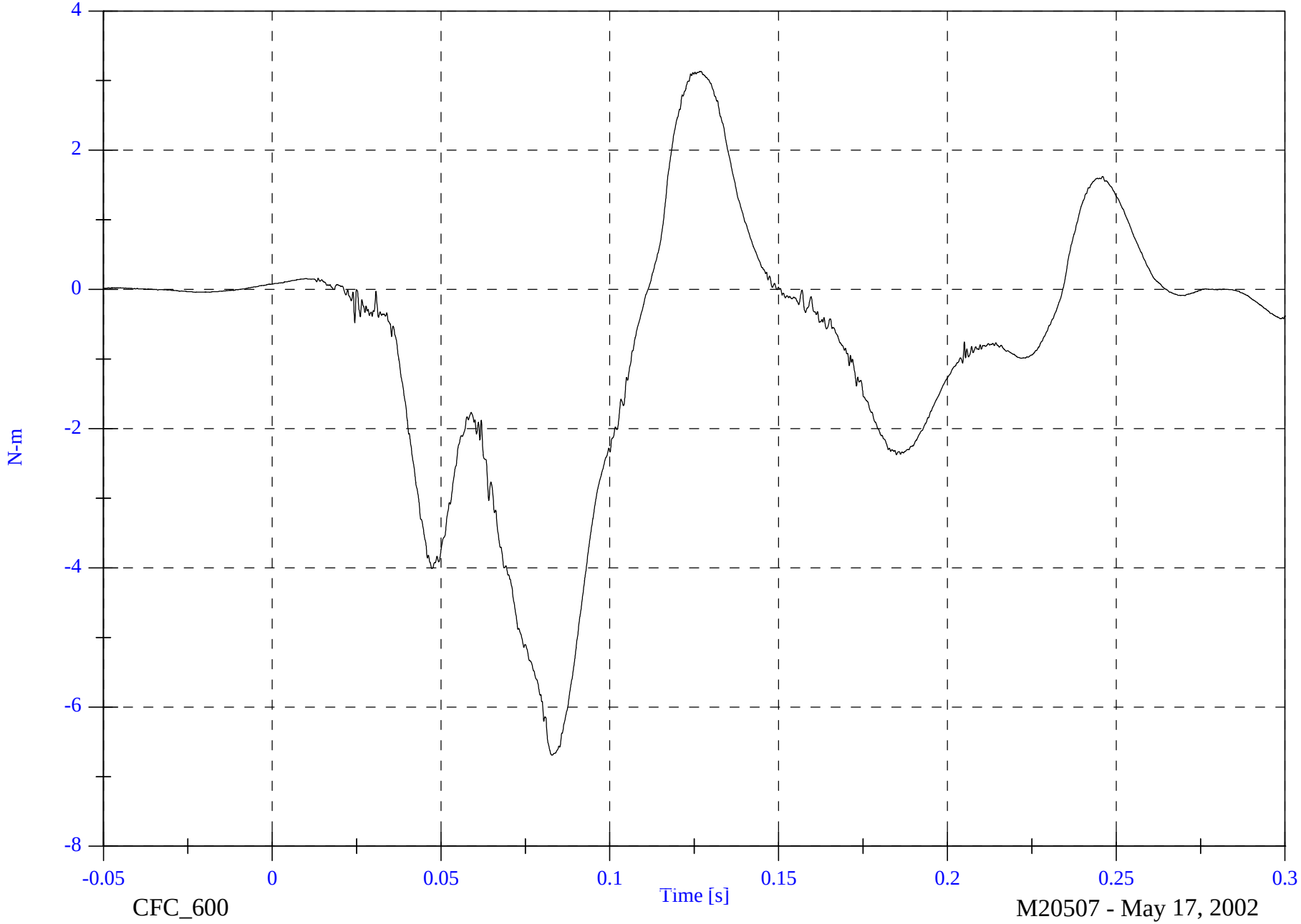
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Upper Neck My

Max: 3.1 [N-m] at 0.127 [s]
Min: -6.7 [N-m] at 0.083 [s]



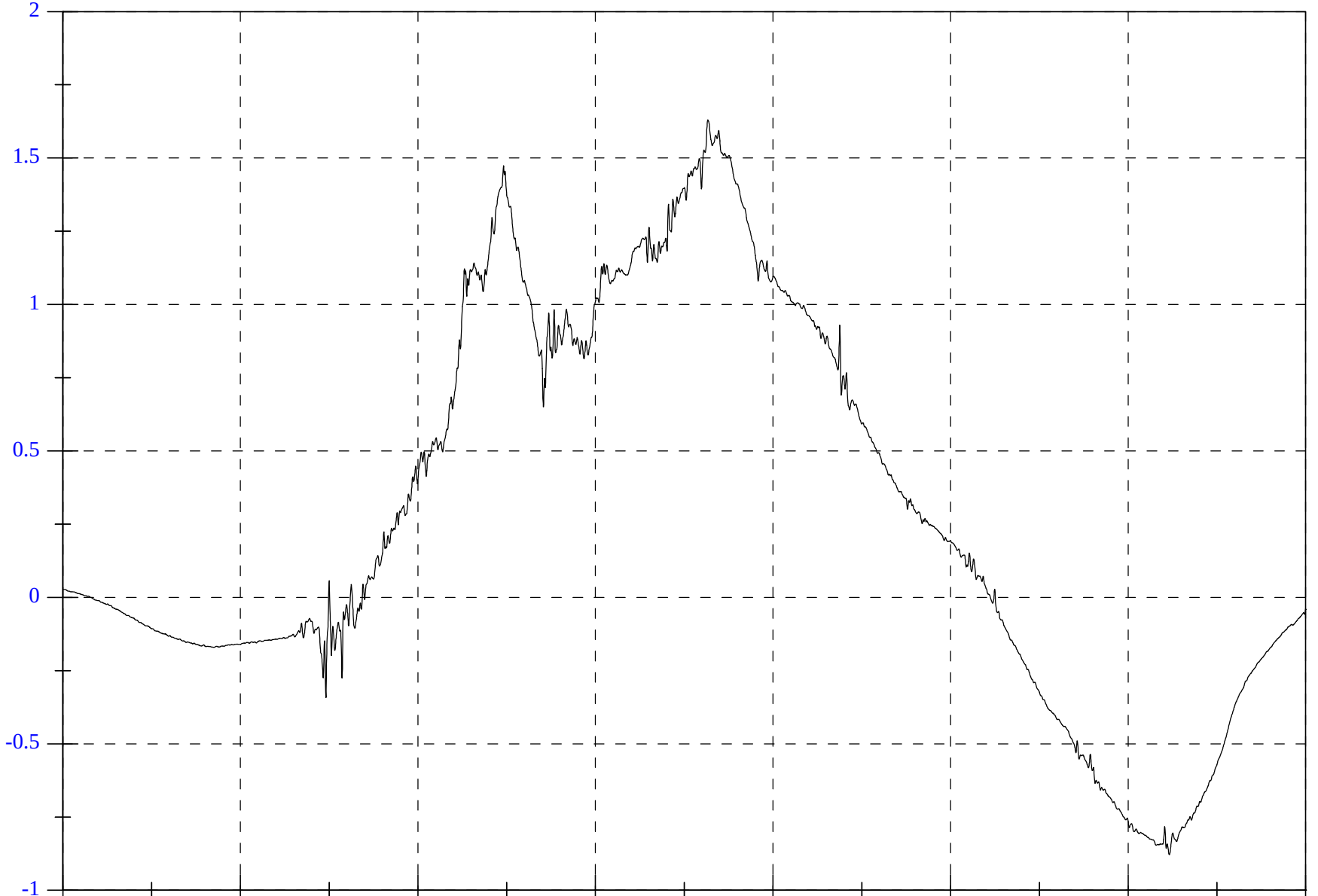
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Upper Neck Mz

Max: 1.6 [N-m] at 0.132 [s]
Min: -0.9 [N-m] at 0.262 [s]



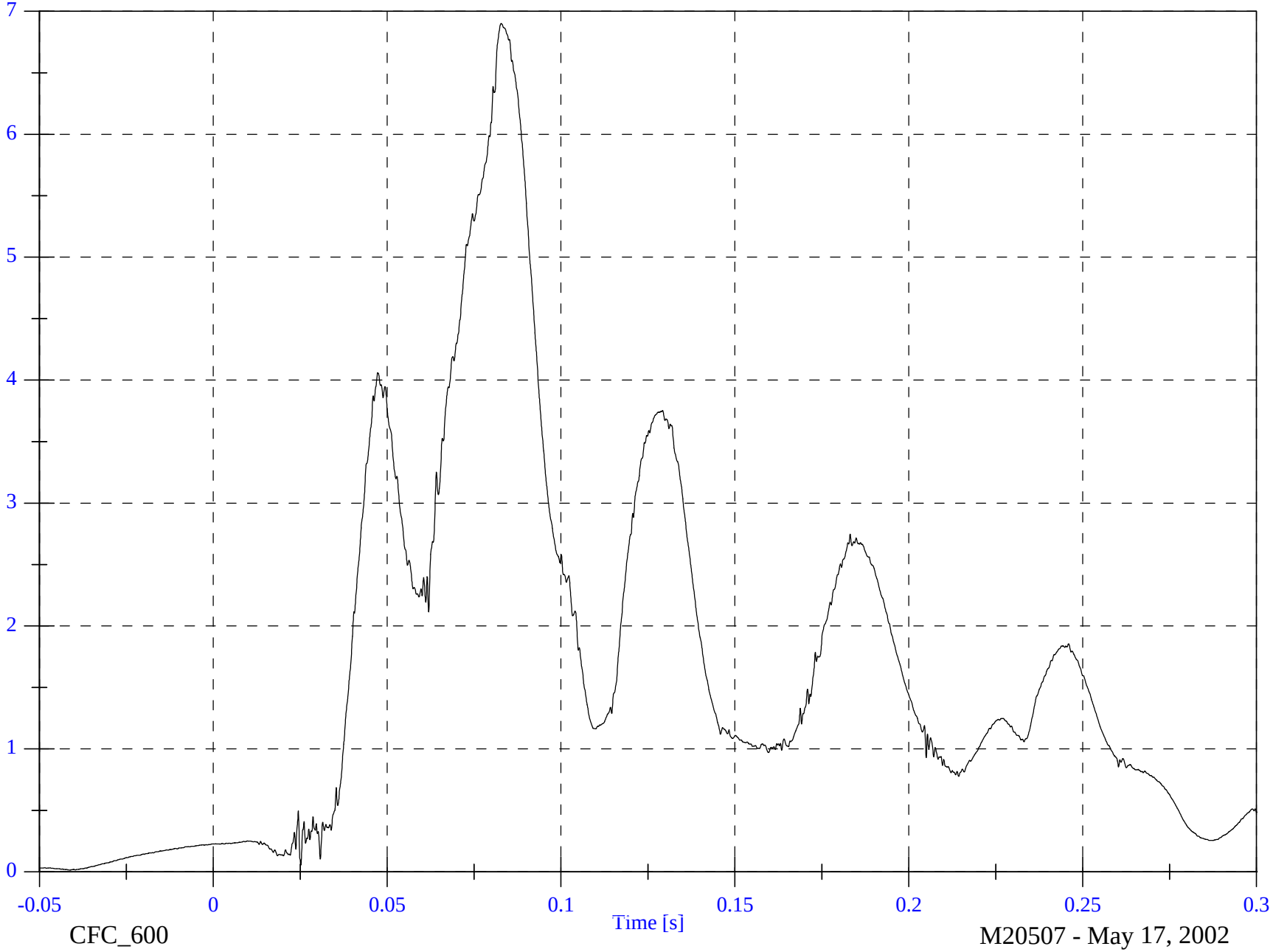
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Upper Neck M Resultant

Max: 6.9 [N-m] at 0.083 [s]
Min: 0.0 [N-m] at -0.041 [s]



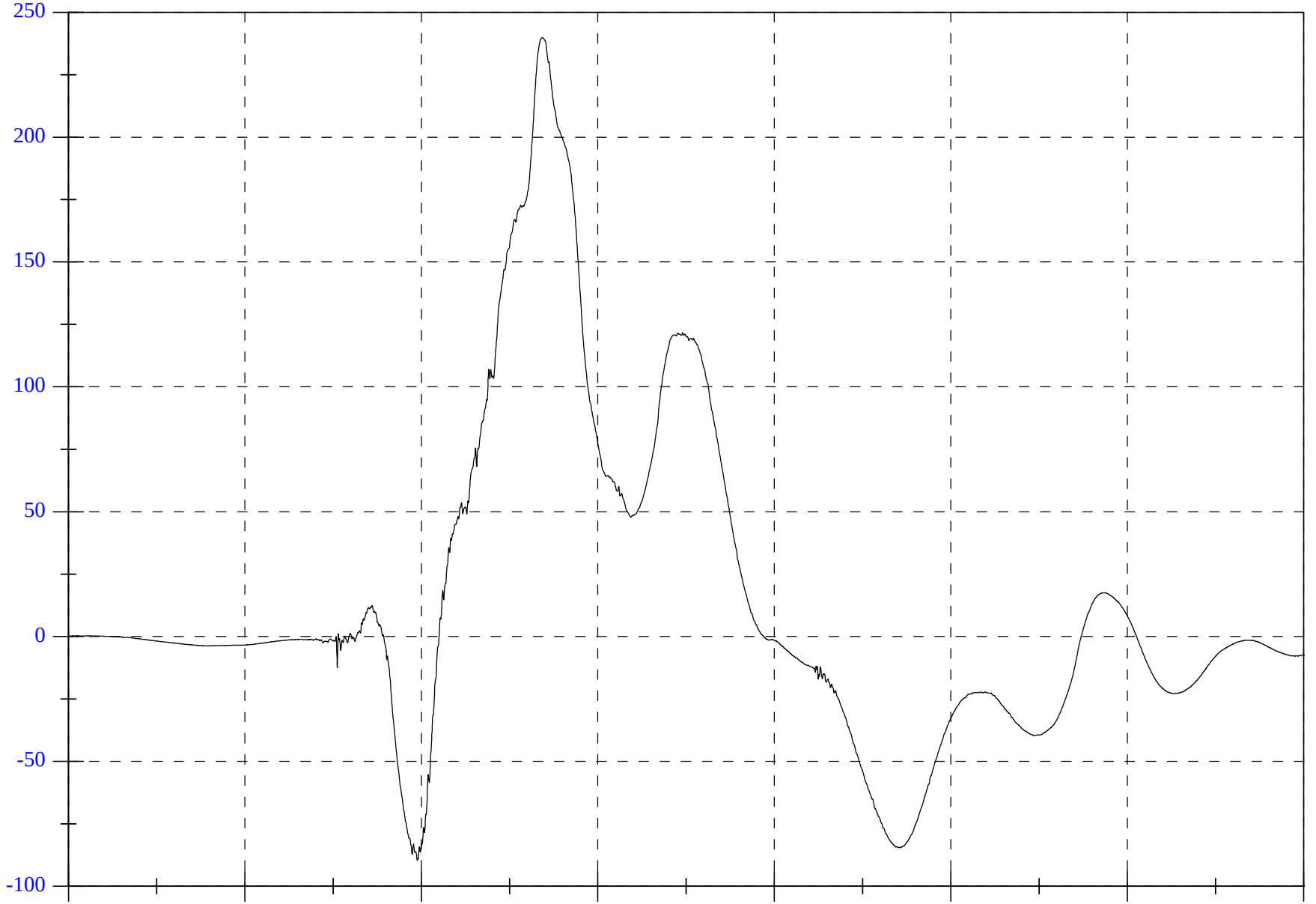
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

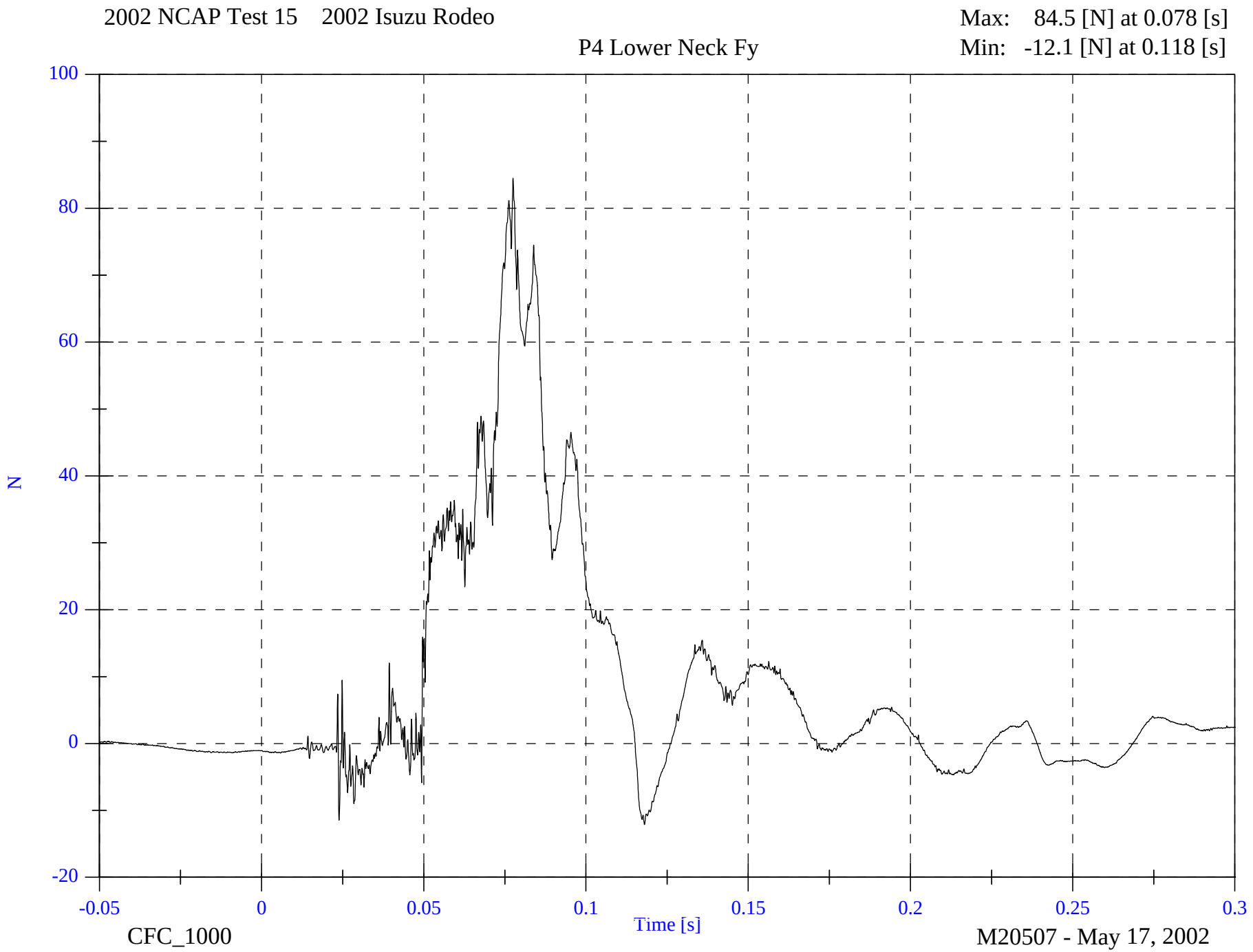
P4 Lower Neck Fx

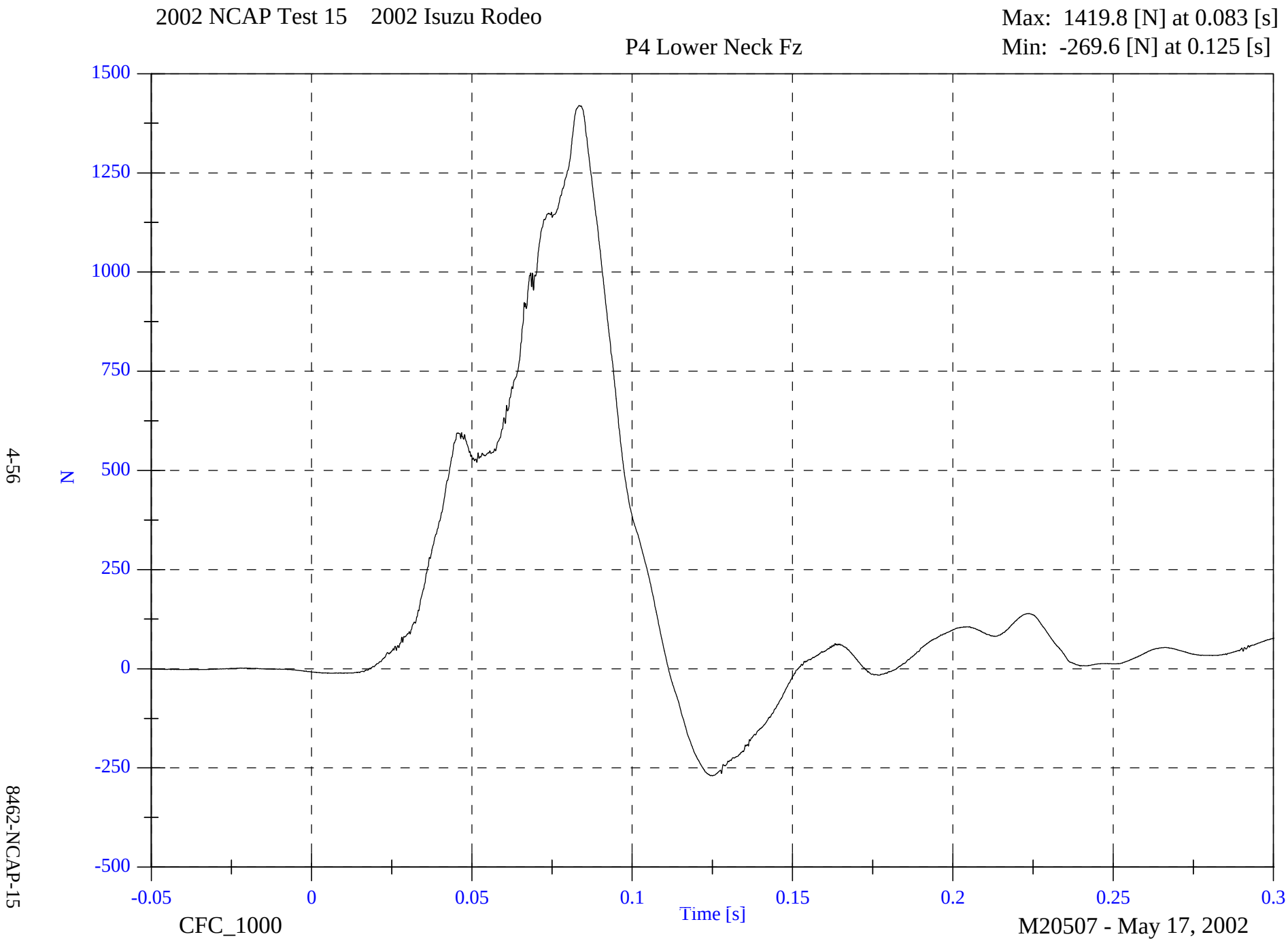
Max: 239.8 [N] at 0.084 [s]
Min: -89.6 [N] at 0.049 [s]

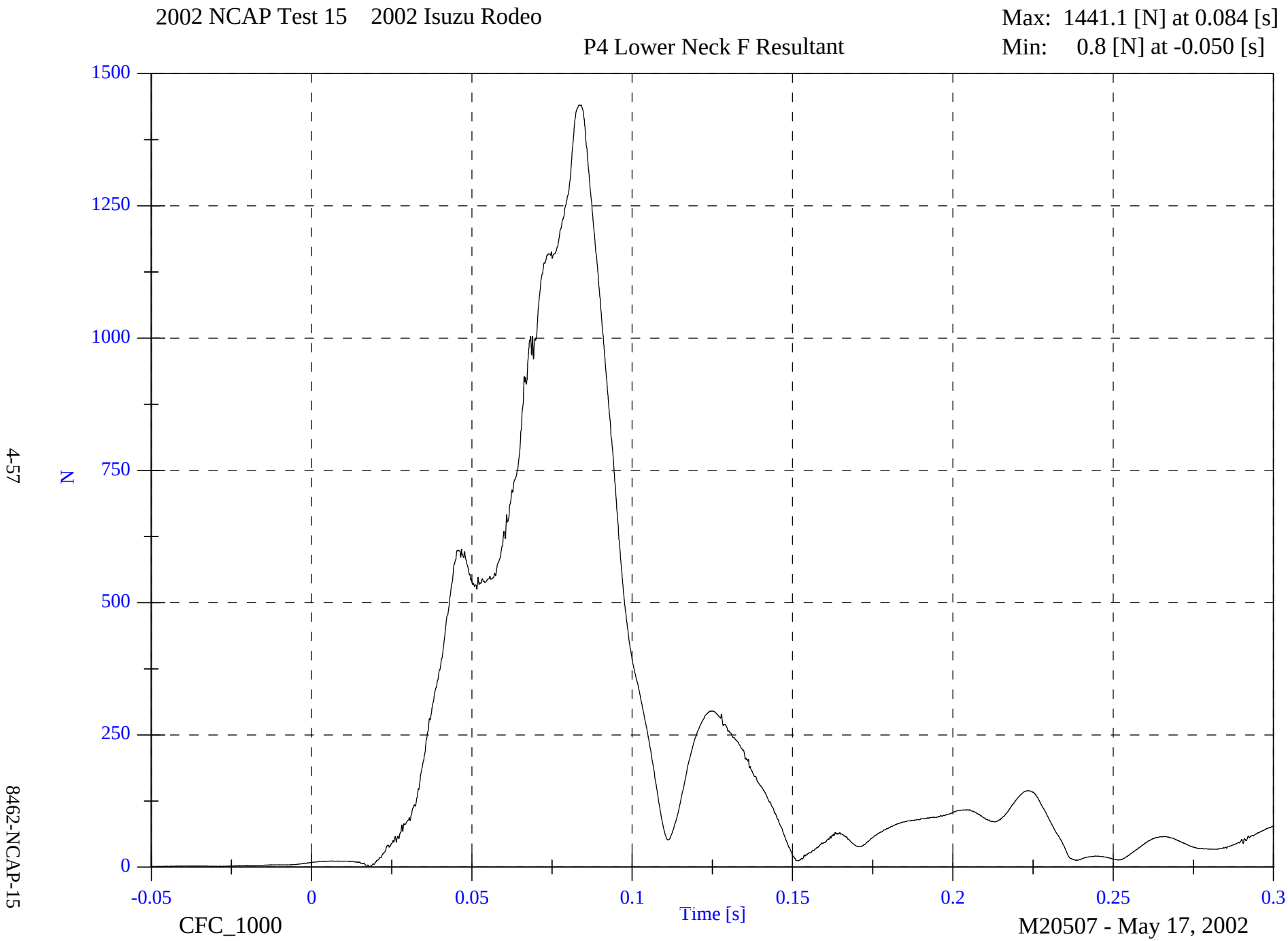


CFC_1000

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2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Lower Neck Fy
Max: 84.5 [N] at 0.078 [s]
Min: -12.1 [N] at 0.118 [s]
100
80
60
40
20
0
-20
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

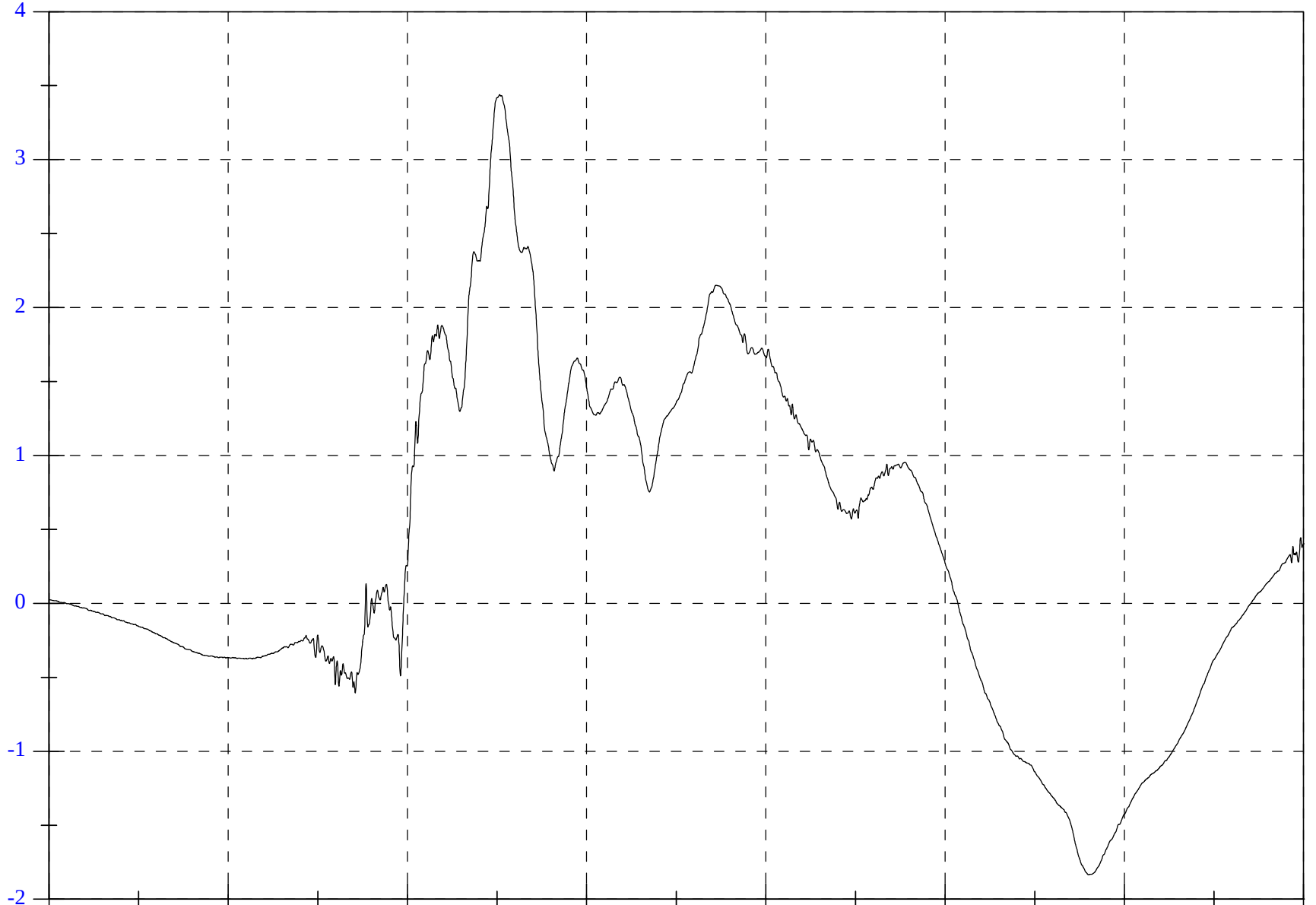

2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Lower Neck Fz
Max: 1419.8 [N] at 0.083 [s]
Min: -269.6 [N] at 0.125 [s]
1500
1250
1000
750
500
250
0
-250
-500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Lower Neck F Resultant
Max: 1441.1 [N] at 0.084 [s]
Min: 0.8 [N] at -0.050 [s]
1500
1250
1000
750
500
250
0
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lower Neck Mx

Max: 3.4 [N-m] at 0.076 [s]
Min: -1.8 [N-m] at 0.240 [s]



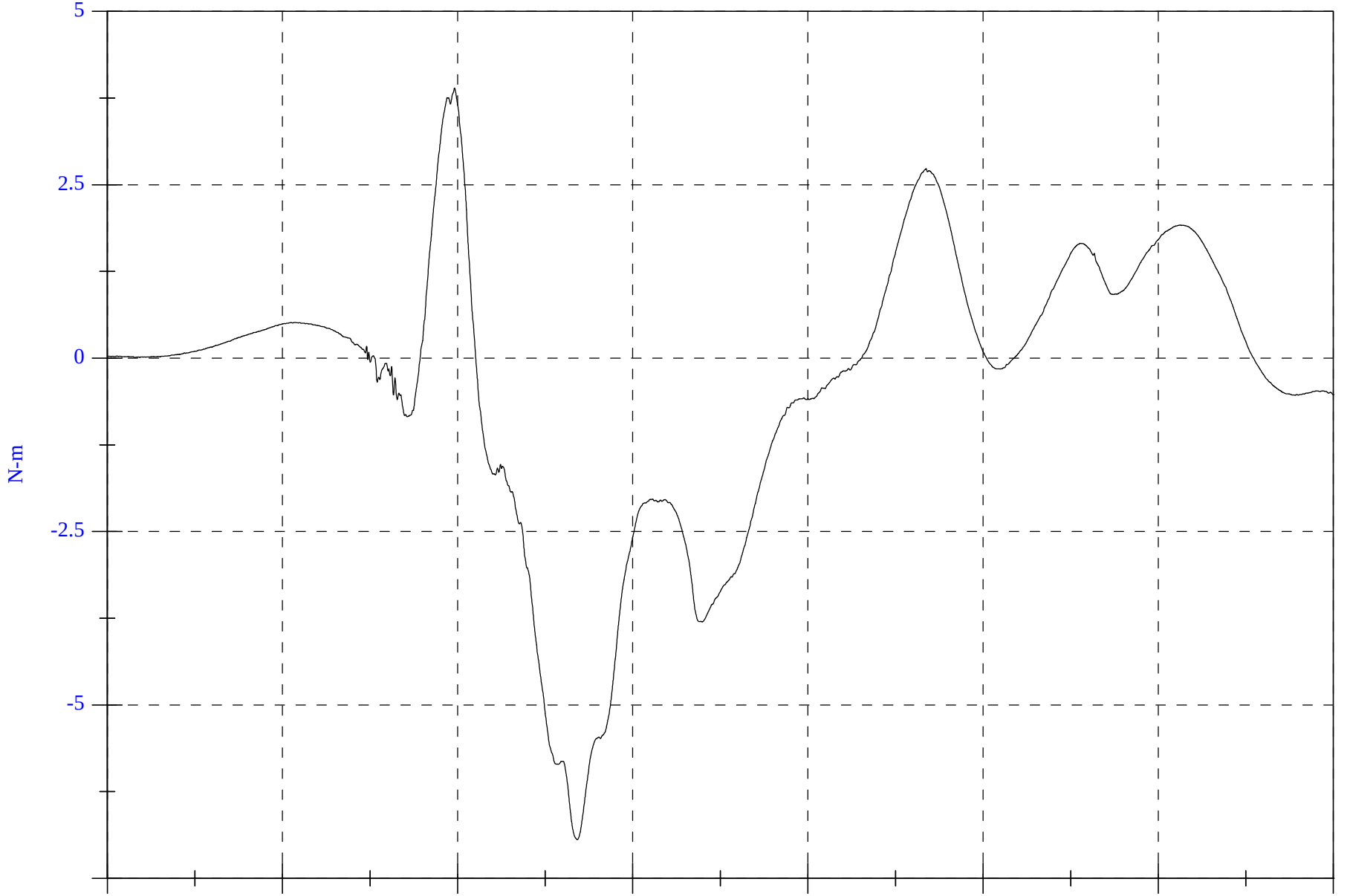
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lower Neck My

Max: 3.9 [N-m] at 0.049 [s]
Min: -6.9 [N-m] at 0.084 [s]



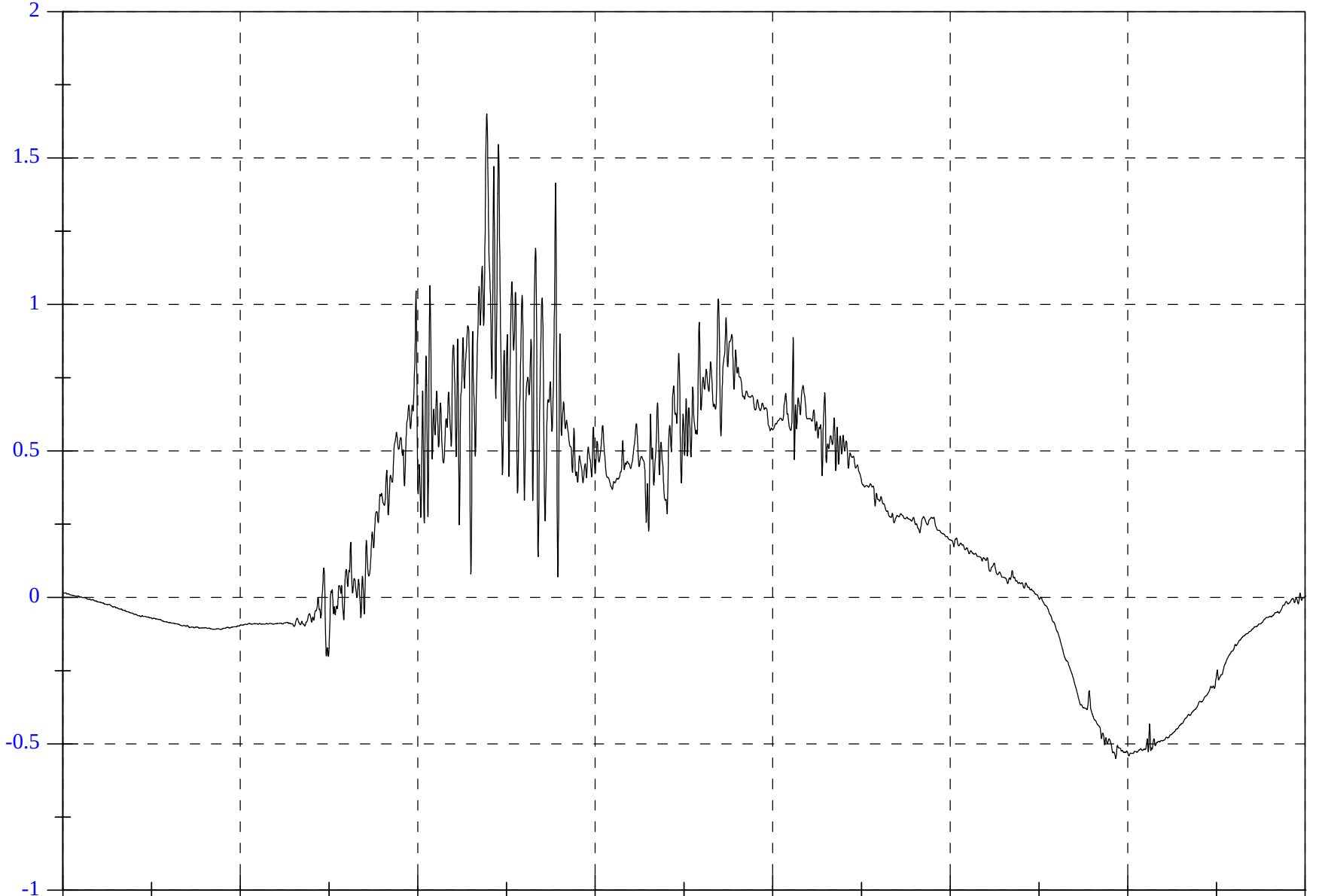
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lower Neck Mz

Max: 1.7 [N-m] at 0.069 [s]
Min: -0.6 [N-m] at 0.247 [s]



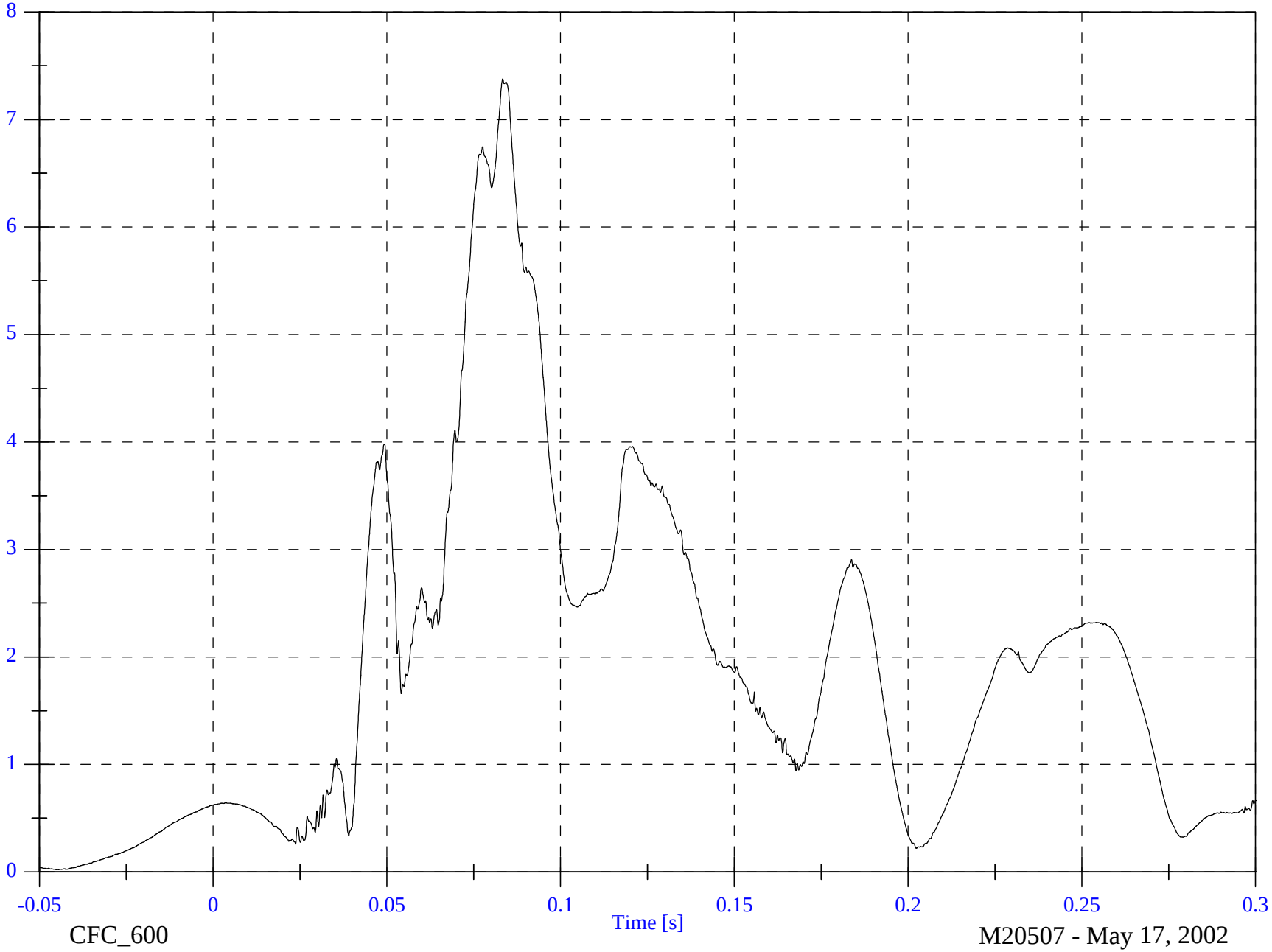
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

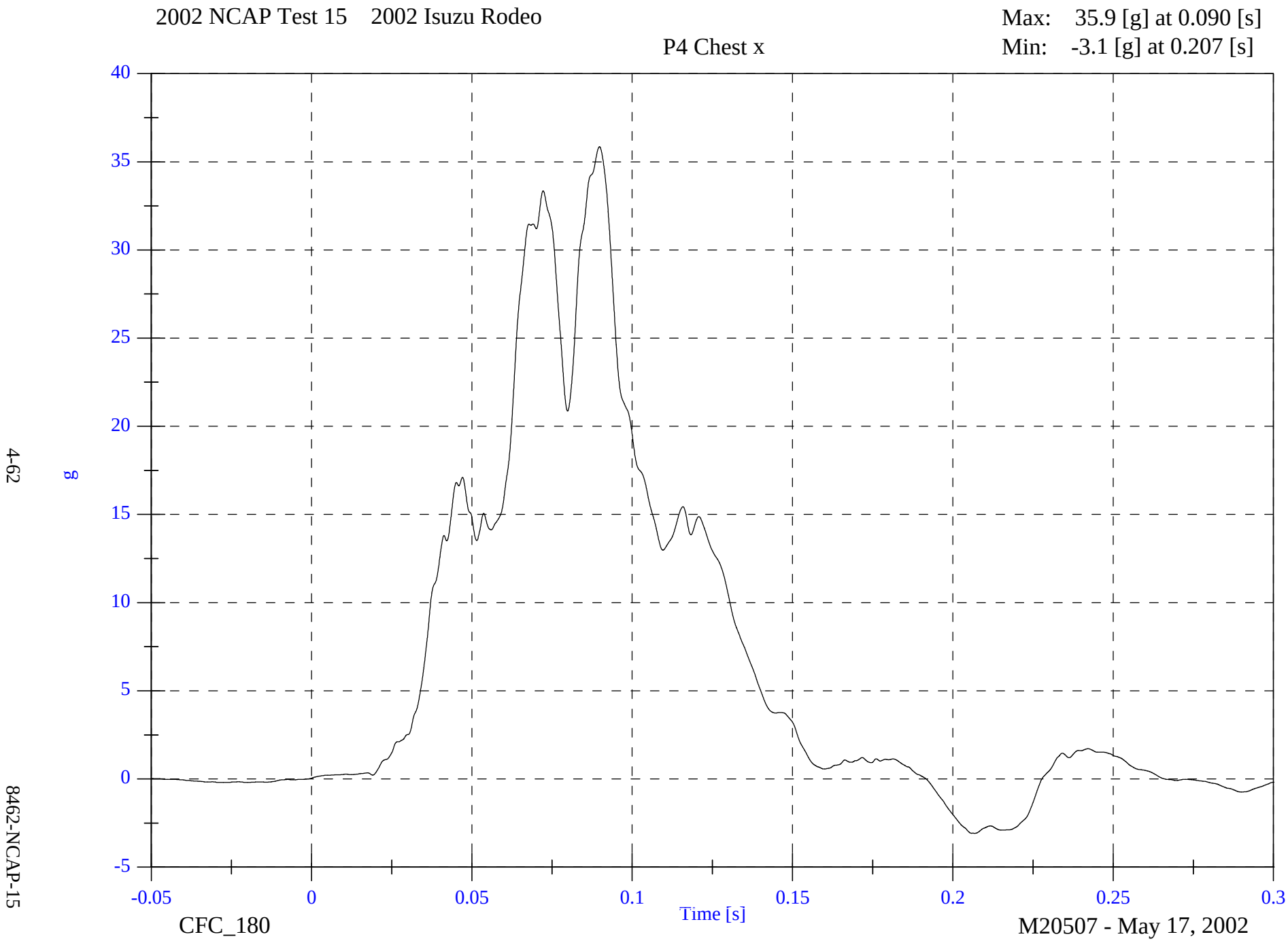
P4 Lower Neck M Resultant

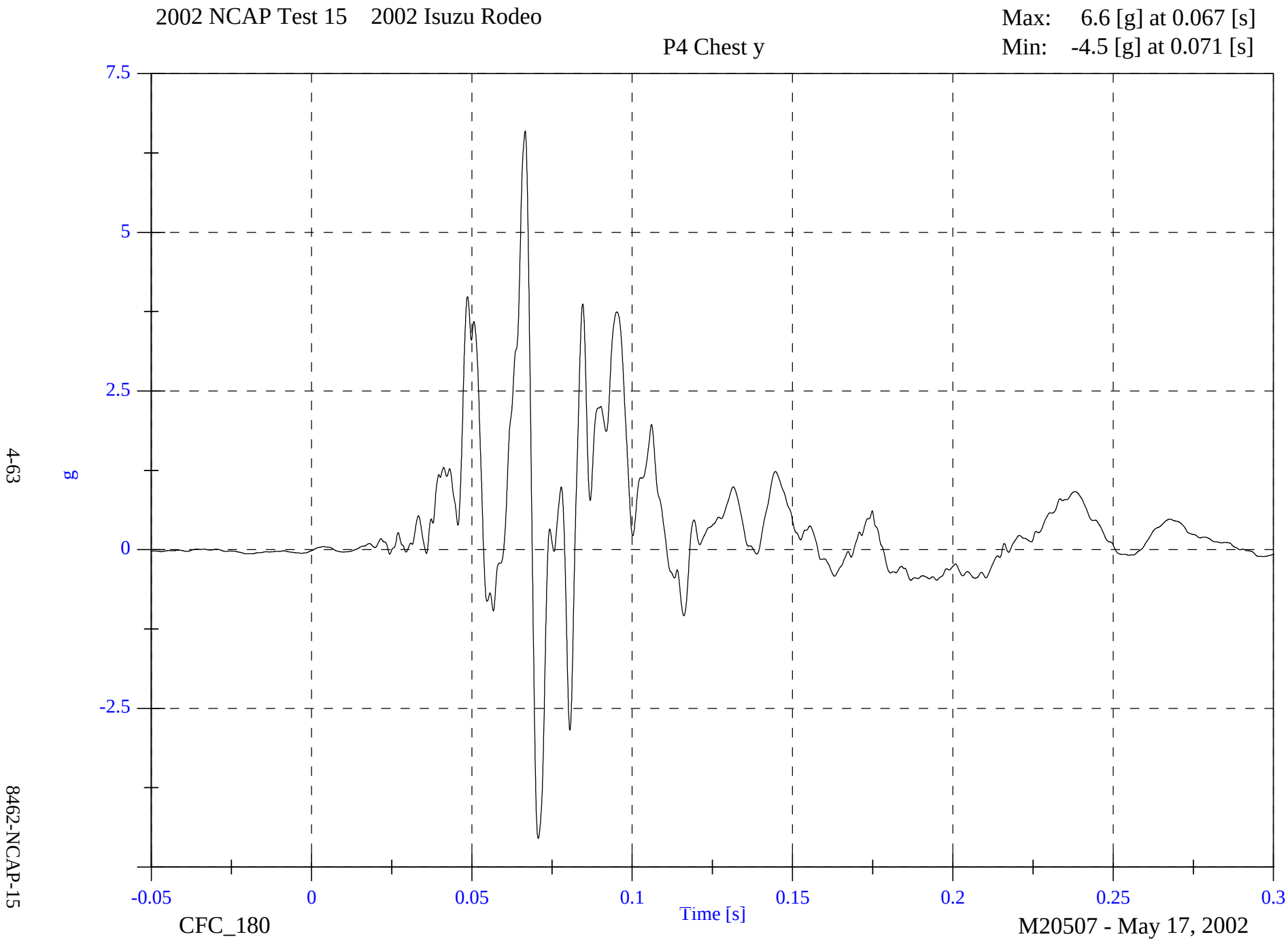
Max: 7.4 [N-m] at 0.083 [s]
Min: 0.0 [N-m] at -0.045 [s]

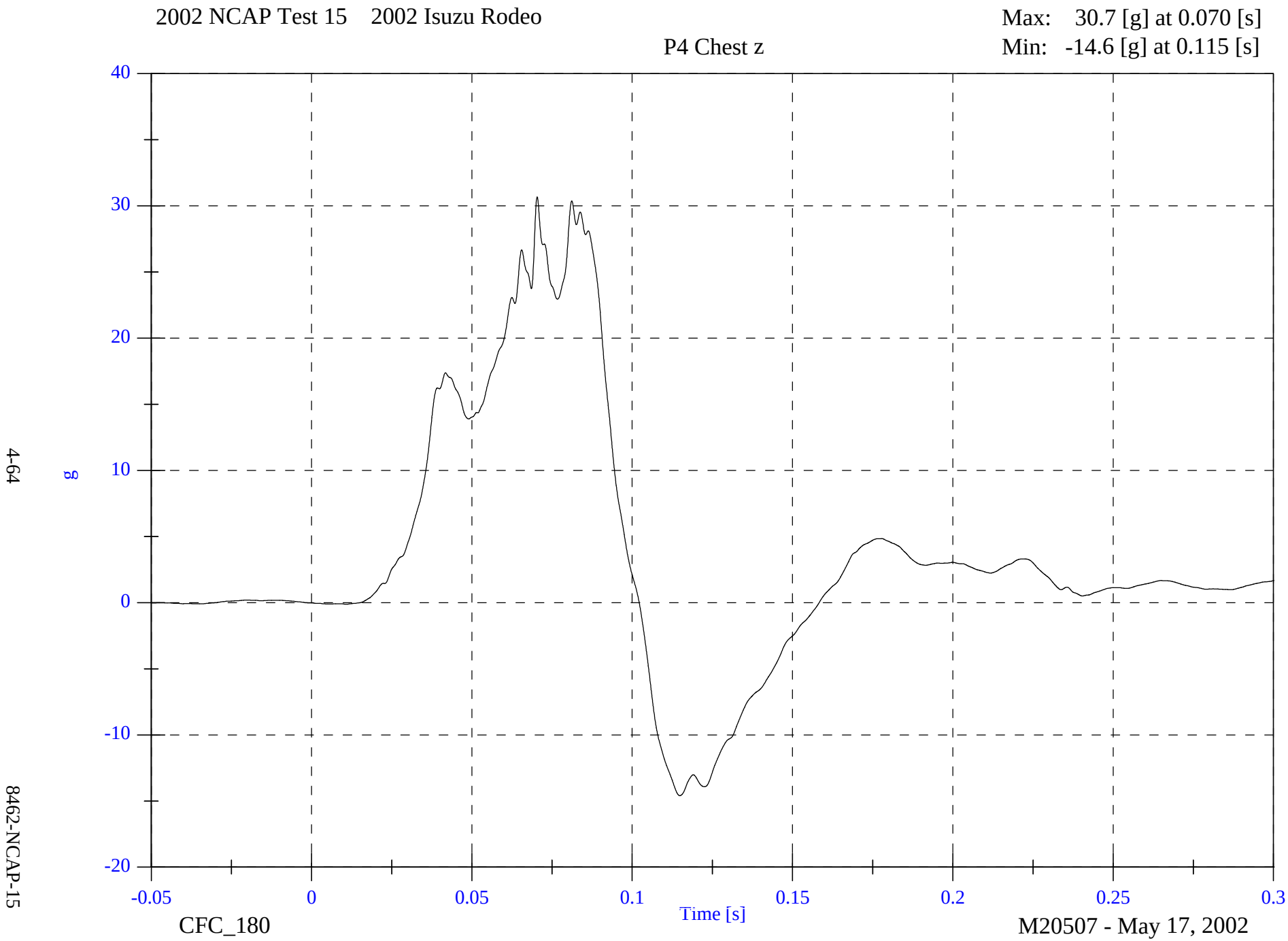


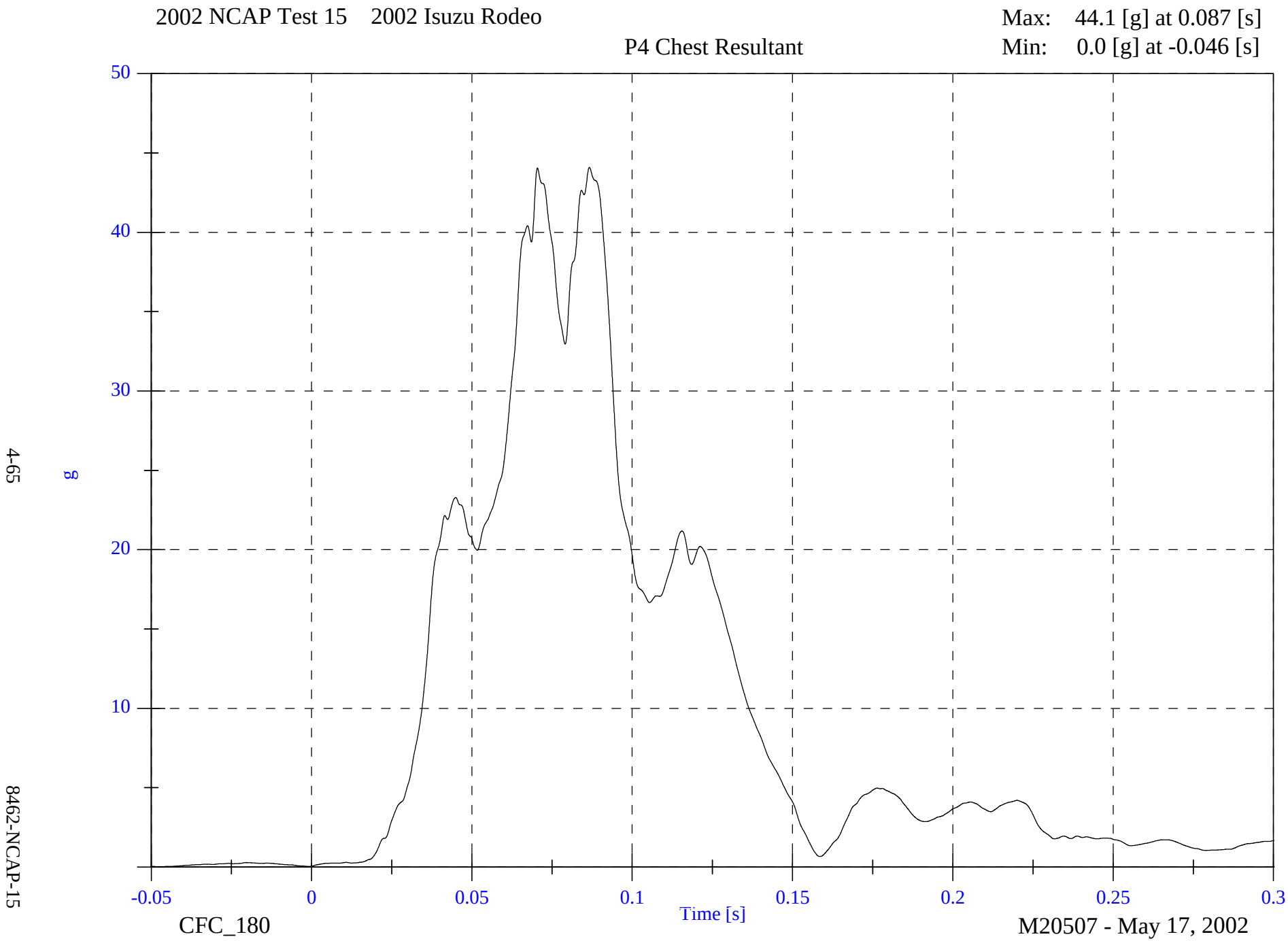
CFC_600

M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Chest x
Max: 35.9 [g] at 0.090 [s]
Min: -3.1 [g] at 0.207 [s]
40
35
30
25
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Chest y
Max: 6.6 [g] at 0.067 [s]
Min: -4.5 [g] at 0.071 [s]
7.5
5
2.5
0
-2.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002

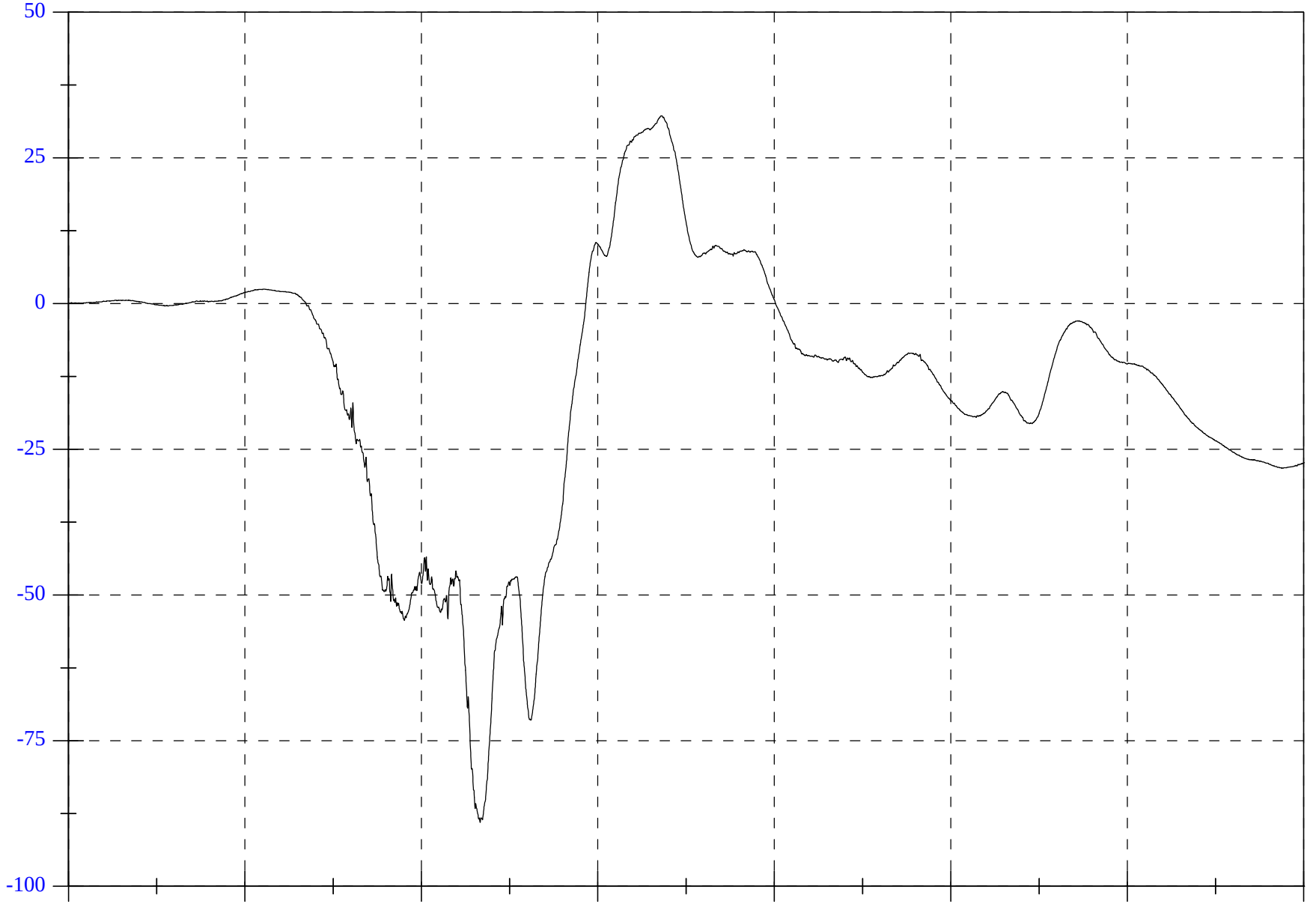

2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Chest z
Max: 30.7 [g] at 0.070 [s]
Min: -14.6 [g] at 0.115 [s]
40
30
20
10
0
-10
-20
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Chest Resultant
Max: 44.1 [g] at 0.087 [s]
Min: 0.0 [g] at -0.046 [s]
50
40
30
20
10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_180
M20507 - May 17, 2002
4-65
8462-NCAP-15

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lumbar Fx

Max: 32.2 [N] at 0.118 [s]
Min: -89.0 [N] at 0.067 [s]



CFC_1000

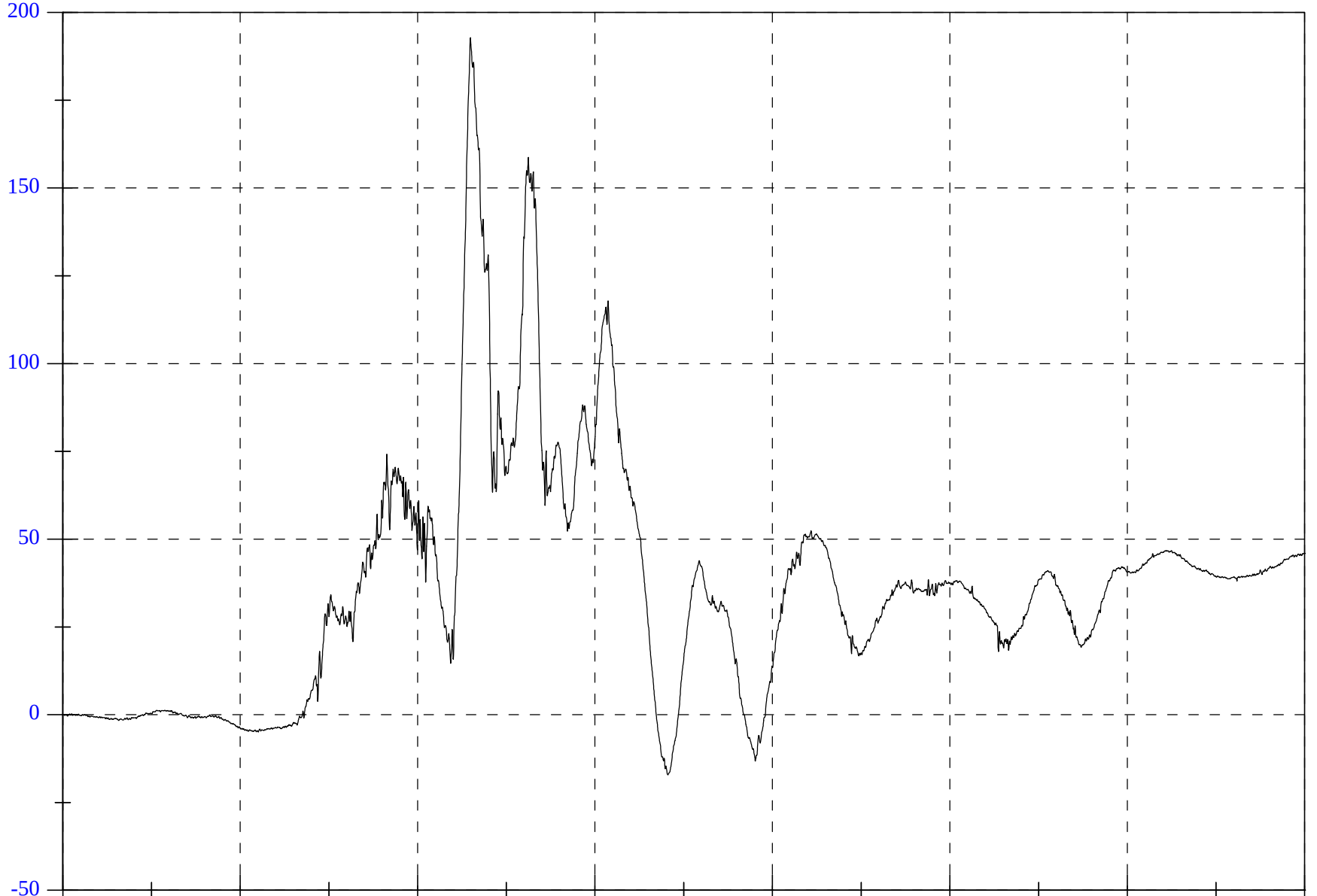
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Lumbar Fy
Max: 23.7 [N] at 0.098 [s]
Min: -20.3 [N] at 0.133 [s]
30
20
10
0
-10
-20
-30
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lumbar Fz

Max: 192.8 [N] at 0.065 [s]
Min: -17.2 [N] at 0.120 [s]



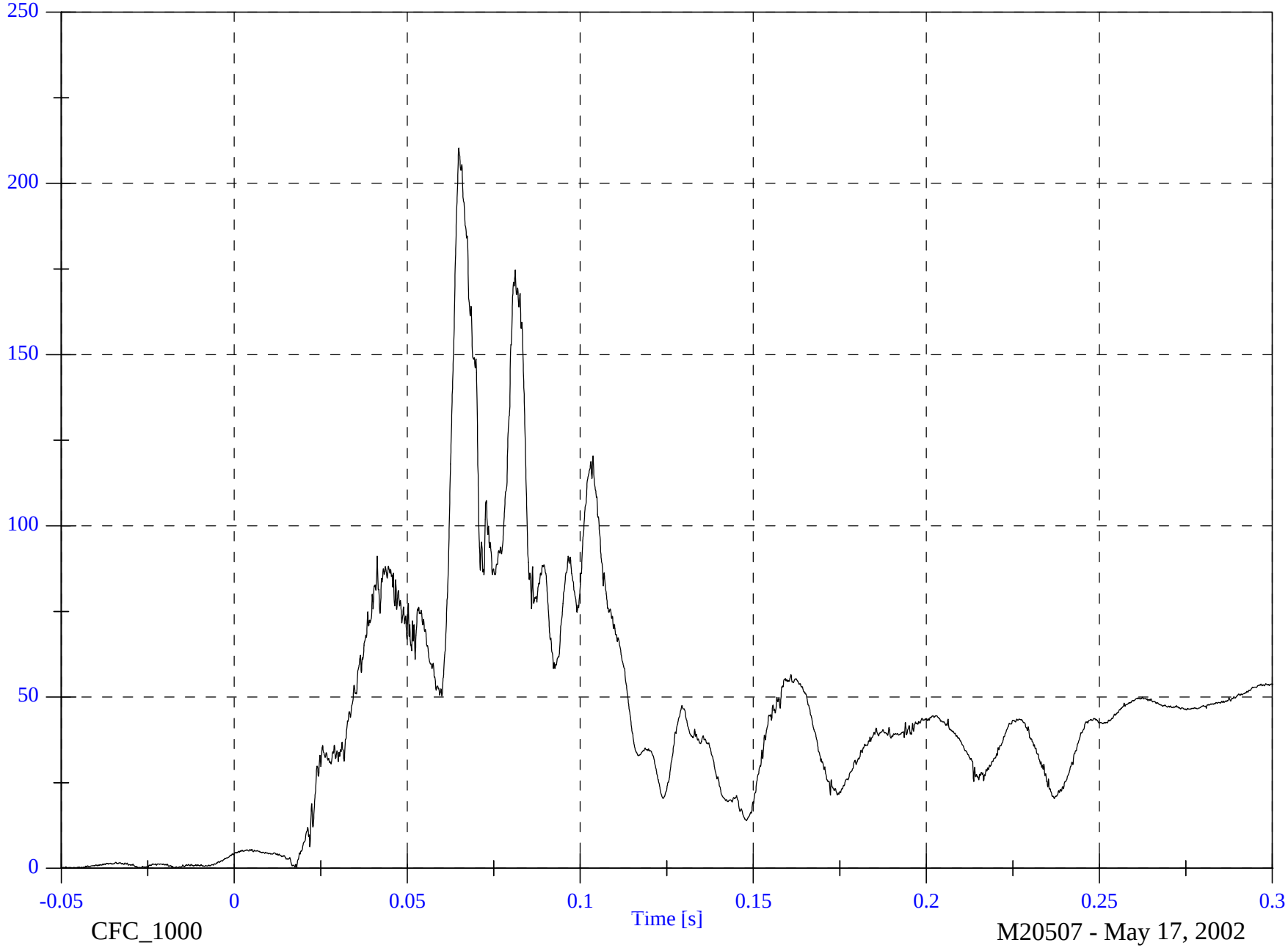
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lumbar F Resultant

Max: 210.2 [N] at 0.065 [s]
Min: 0.1 [N] at -0.047 [s]



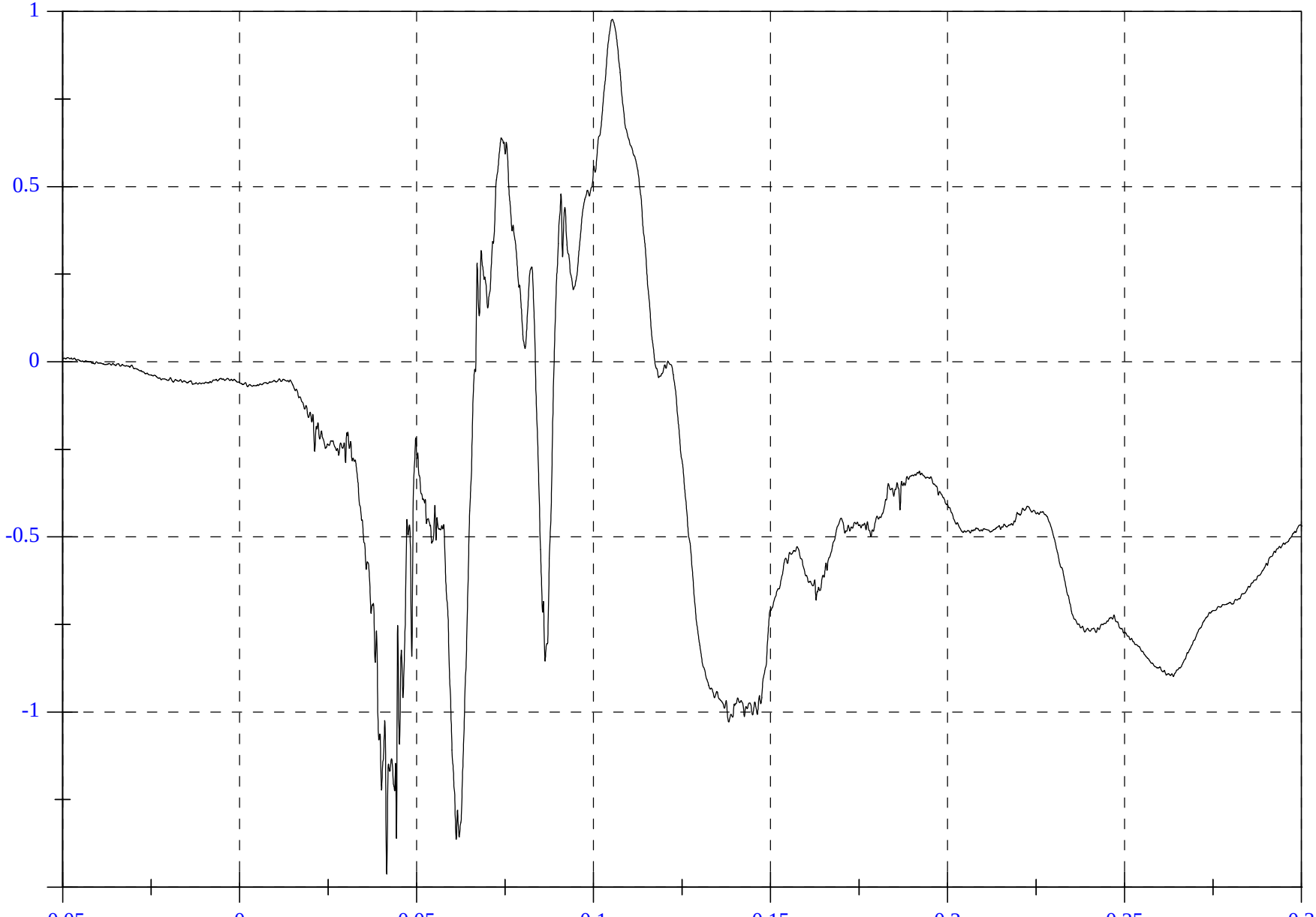
CFC_1000

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lumbar Mx

Max: 1.0 [N-m] at 0.105 [s]
Min: -1.5 [N-m] at 0.042 [s]



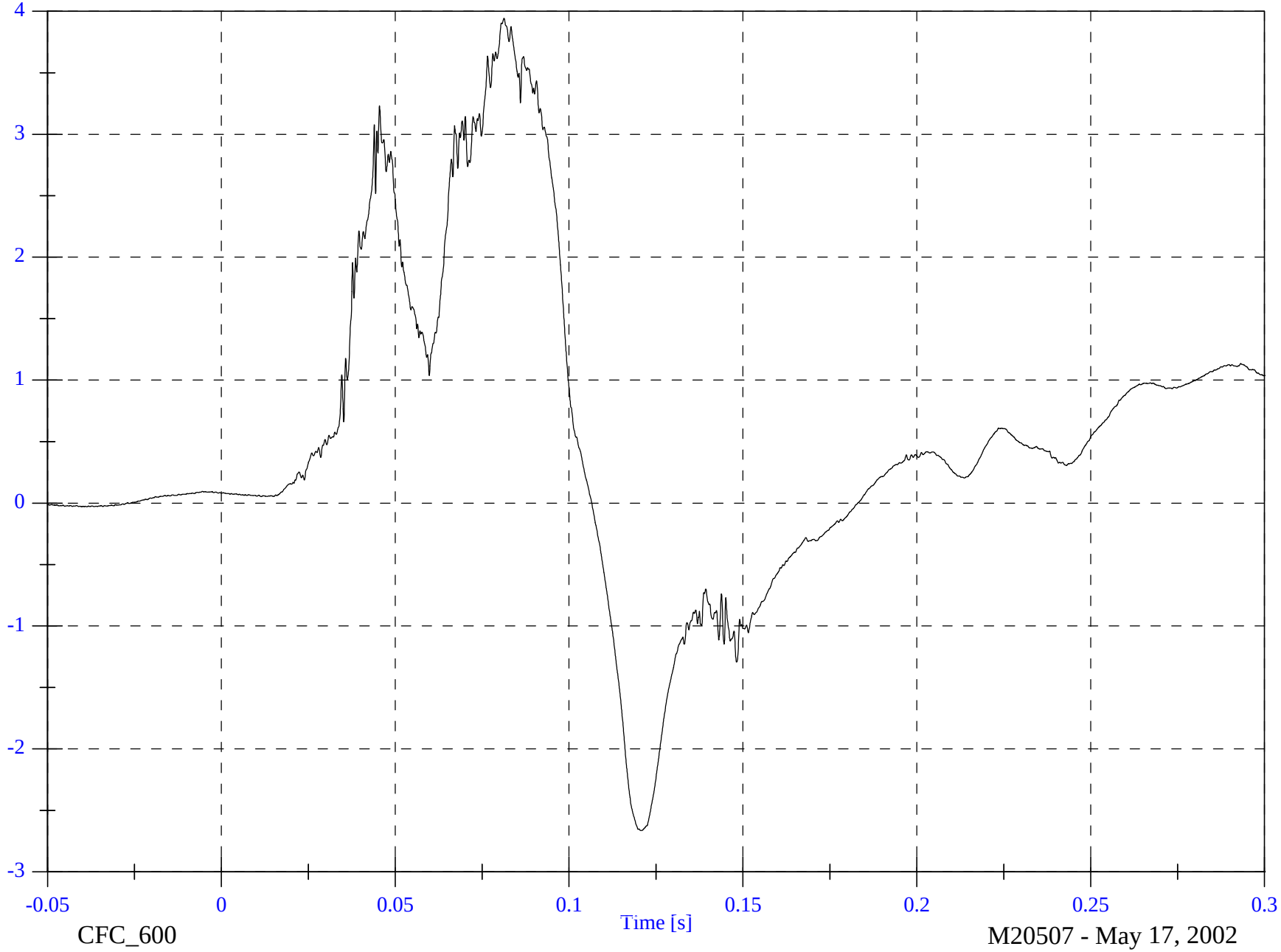
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lumbar My

Max: 3.9 [N-m] at 0.081 [s]
Min: -2.7 [N-m] at 0.121 [s]



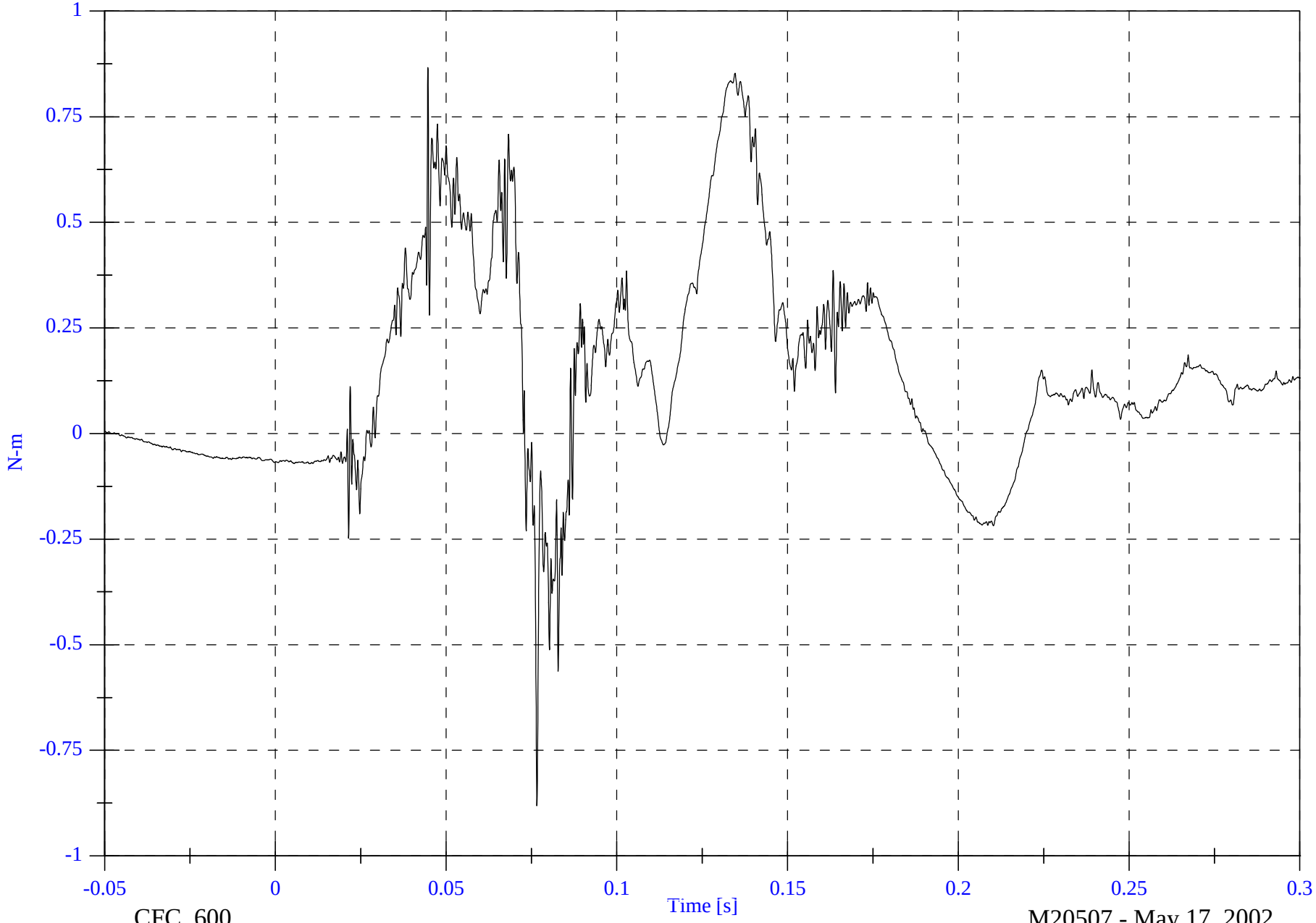
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Lumbar Mz

Max: 0.9 [N-m] at 0.045 [s]
Min: -0.9 [N-m] at 0.077 [s]



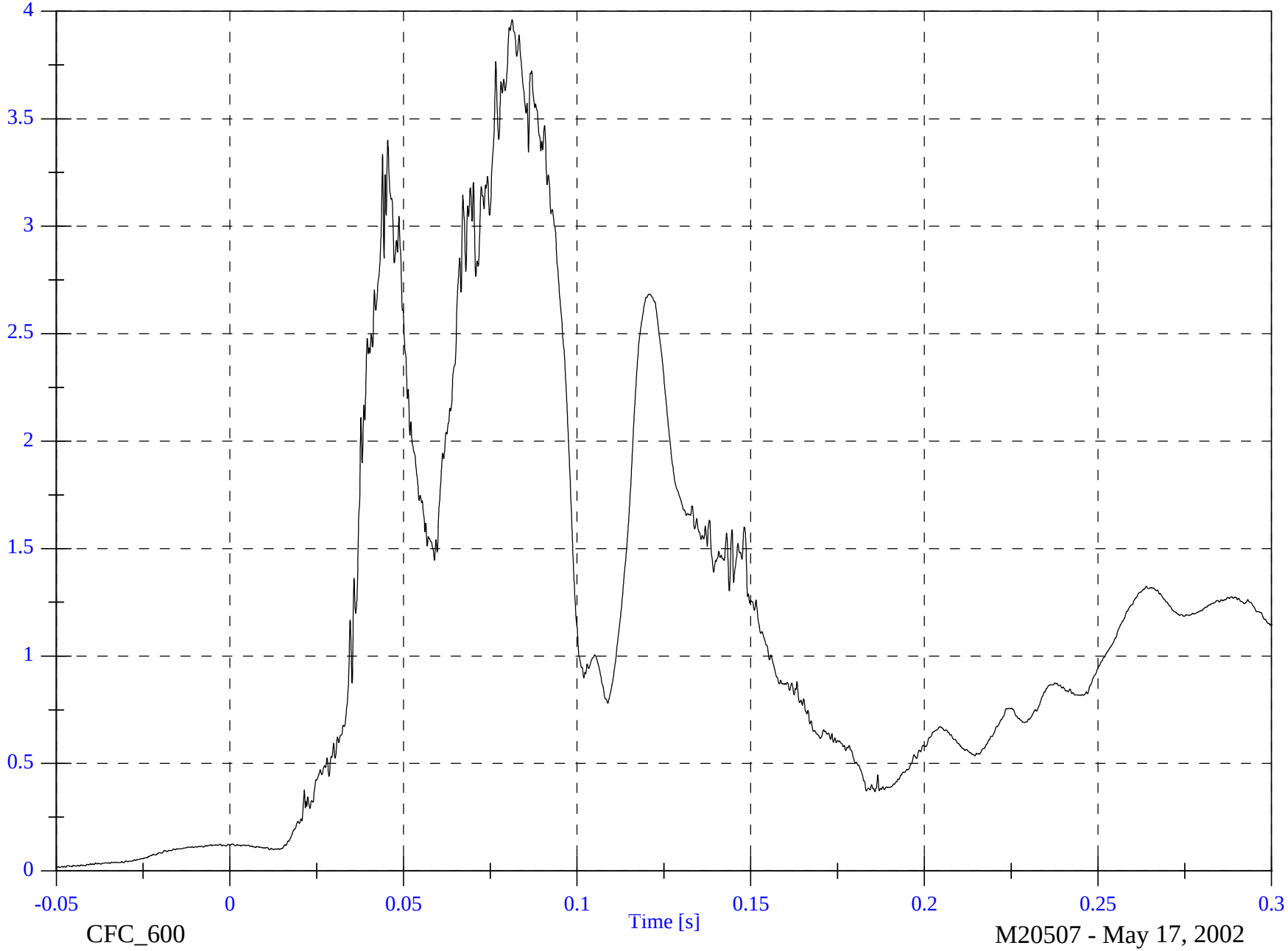
CFC_600

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

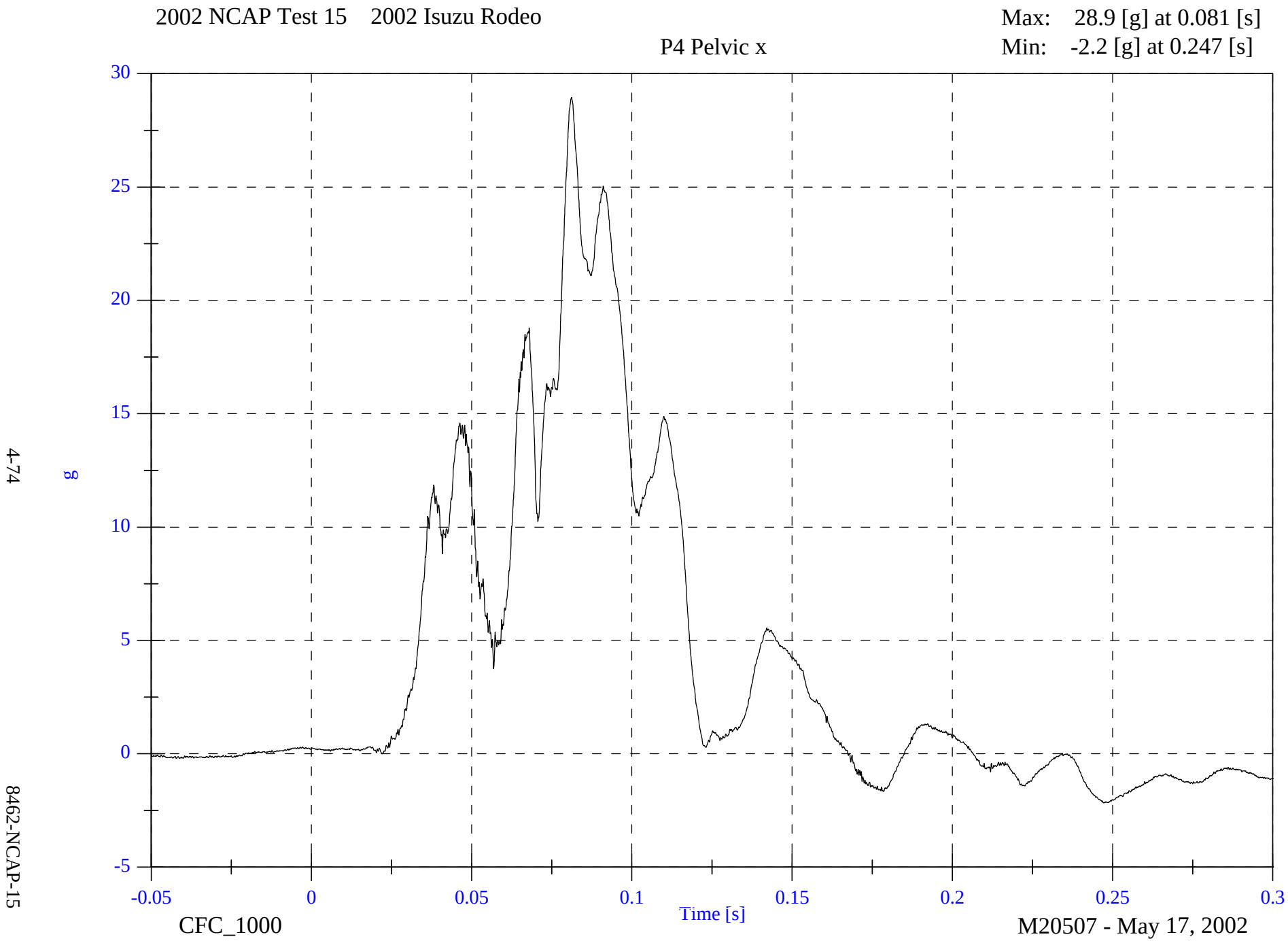
P4 Lumbar M Resultant

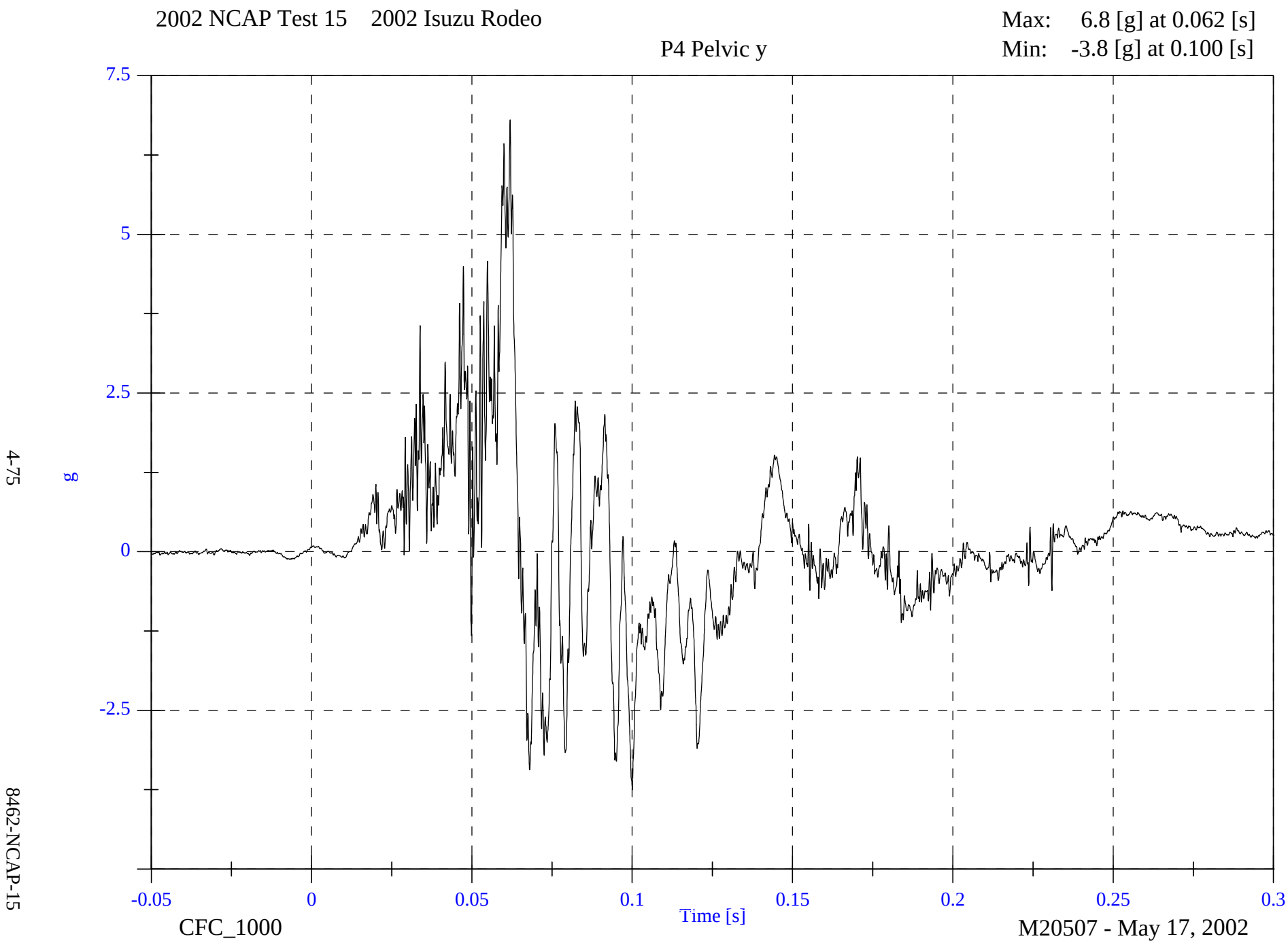
Max: 4.0 [N-m] at 0.081 [s]
Min: 0.0 [N-m] at -0.050 [s]



CFC_600

M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Pelvic x
Max: 28.9 [g] at 0.081 [s]
Min: -2.2 [g] at 0.247 [s]
30
25
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Pelvic y
Max: 6.8 [g] at 0.062 [s]
Min: -3.8 [g] at 0.100 [s]
7.5
5
2.5
0
-2.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Pelvic z

Max: 45.7 [g] at 0.071 [s]
Min: -10.4 [g] at 0.115 [s]

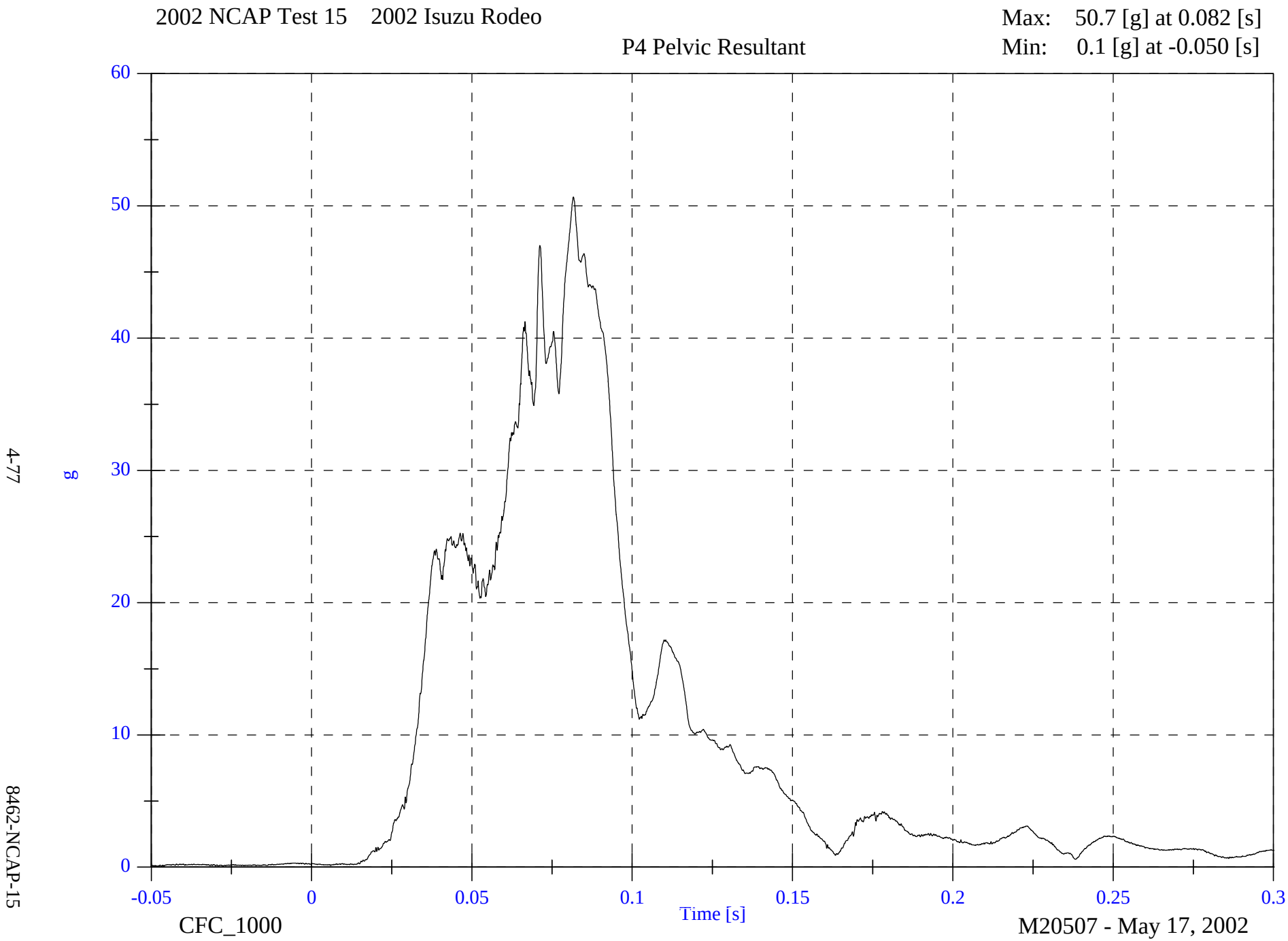


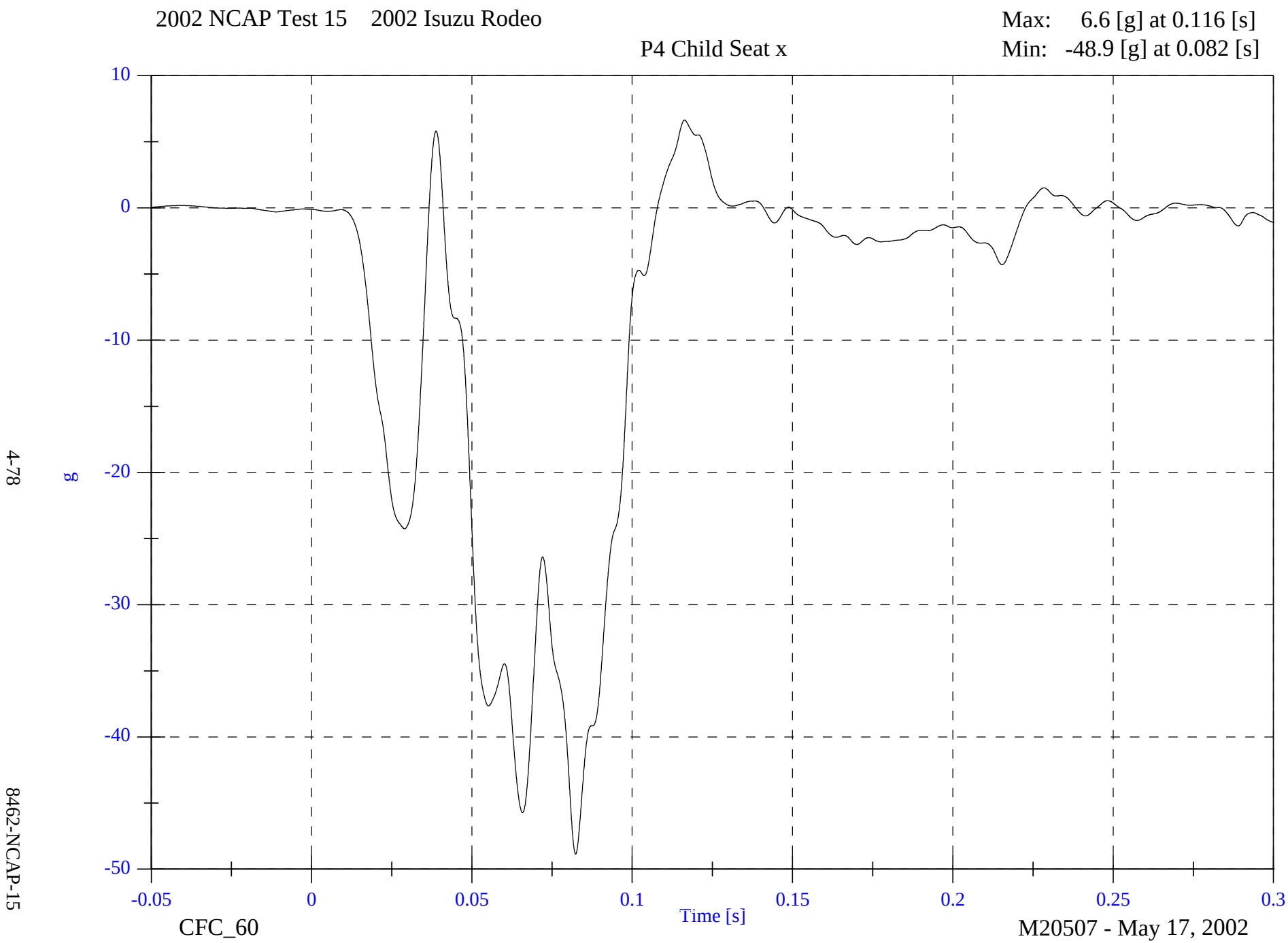
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CFC_1000

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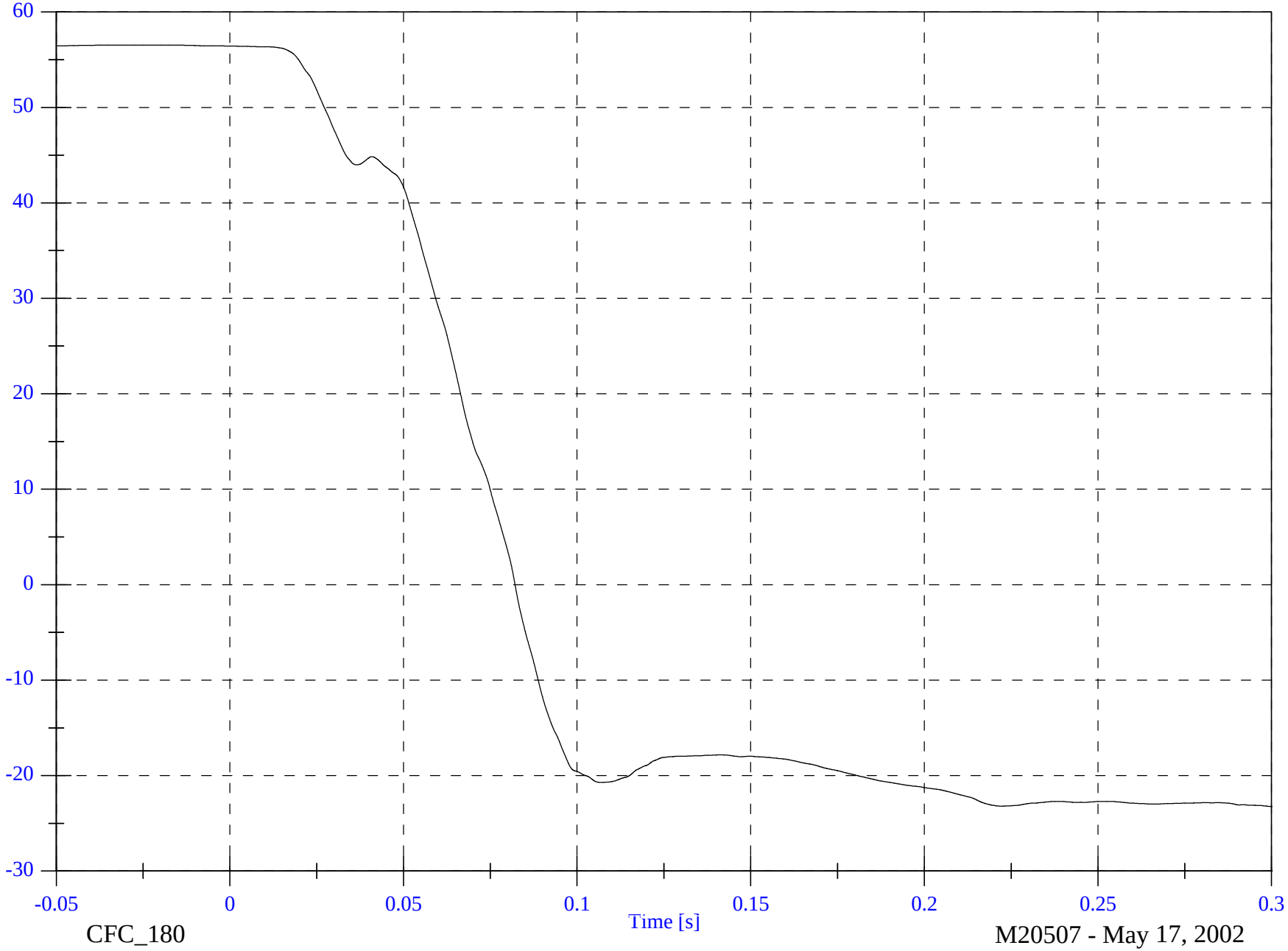

2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Pelvic Resultant
Max: 50.7 [g] at 0.082 [s]
Min: 0.1 [g] at -0.050 [s]
60
50
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_1000
M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Child Seat x
Max: 6.6 [g] at 0.116 [s]
Min: -48.9 [g] at 0.082 [s]
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Child Seat x Velocity

Max: 56.6 [kph] at -0.030 [s]
Min: -23.3 [kph] at 0.300 [s]



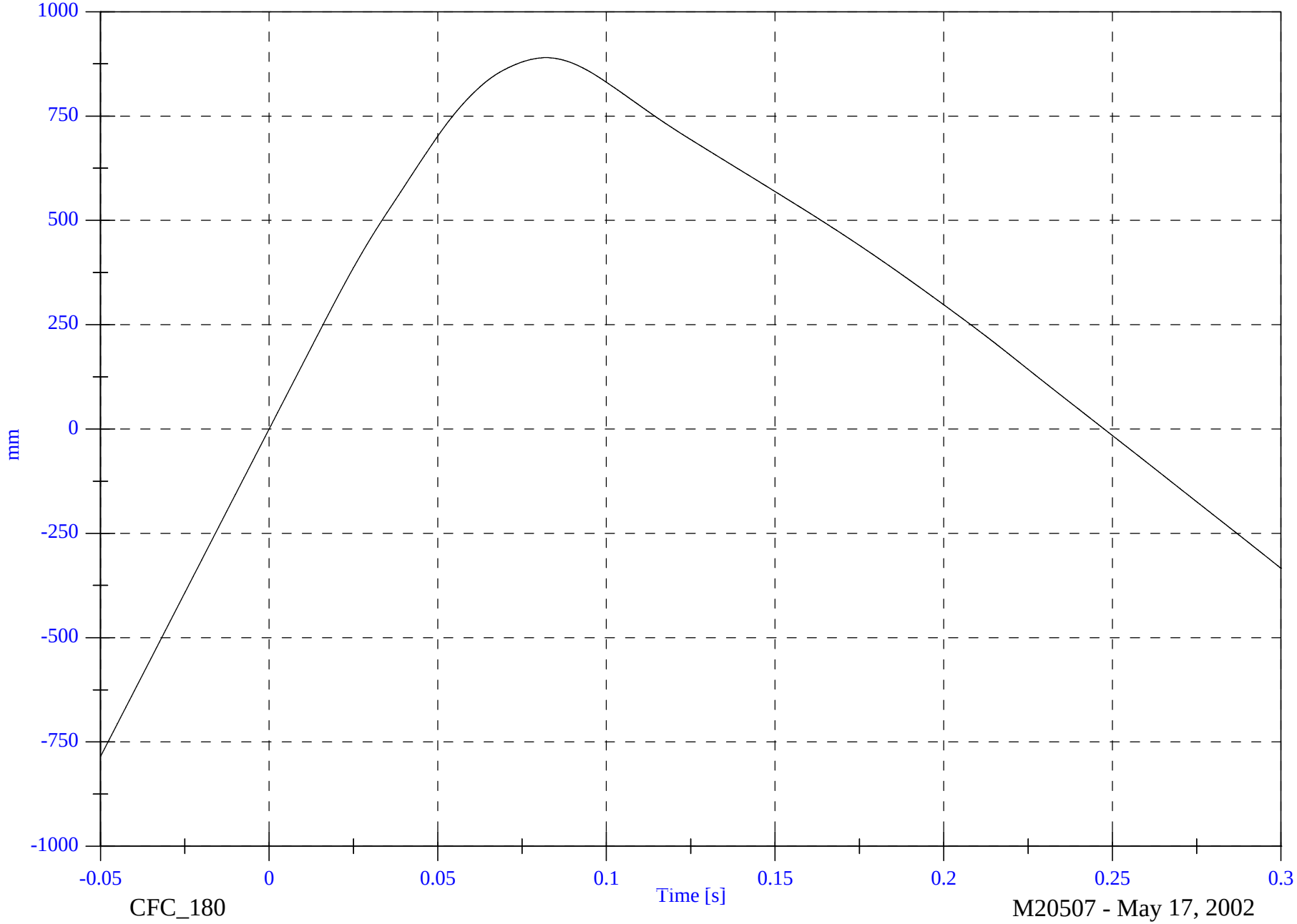
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Child Seat x Displacement

Max: 890.0 [mm] at 0.082 [s]
Min: -784.9 [mm] at -0.050 [s]



CFC_180

M20507 - May 17, 2002

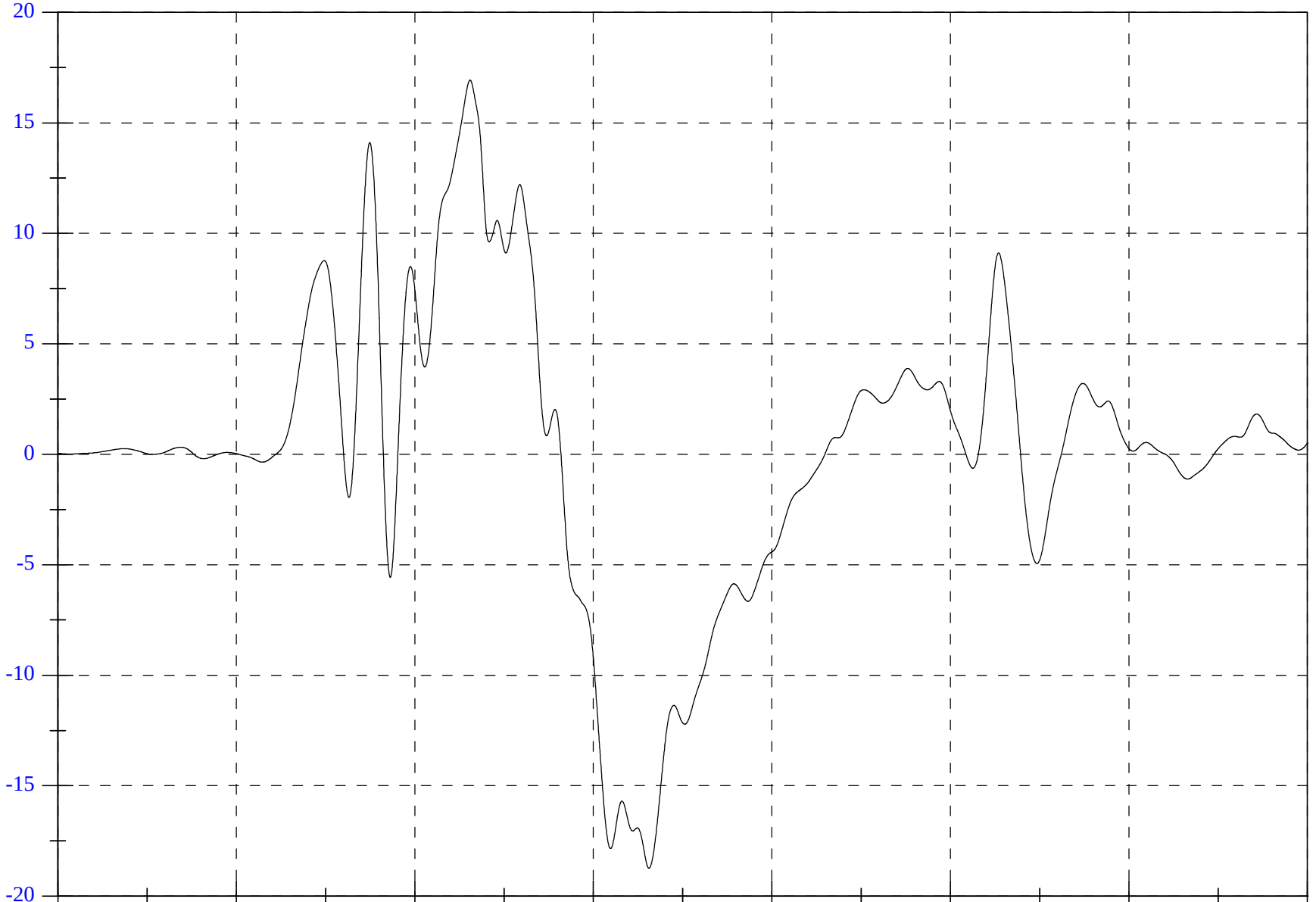
4-80

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2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Child Seat y

Max: 16.9 [g] at 0.065 [s]
Min: -18.7 [g] at 0.116 [s]



CFC_60

M20507 - May 17, 2002

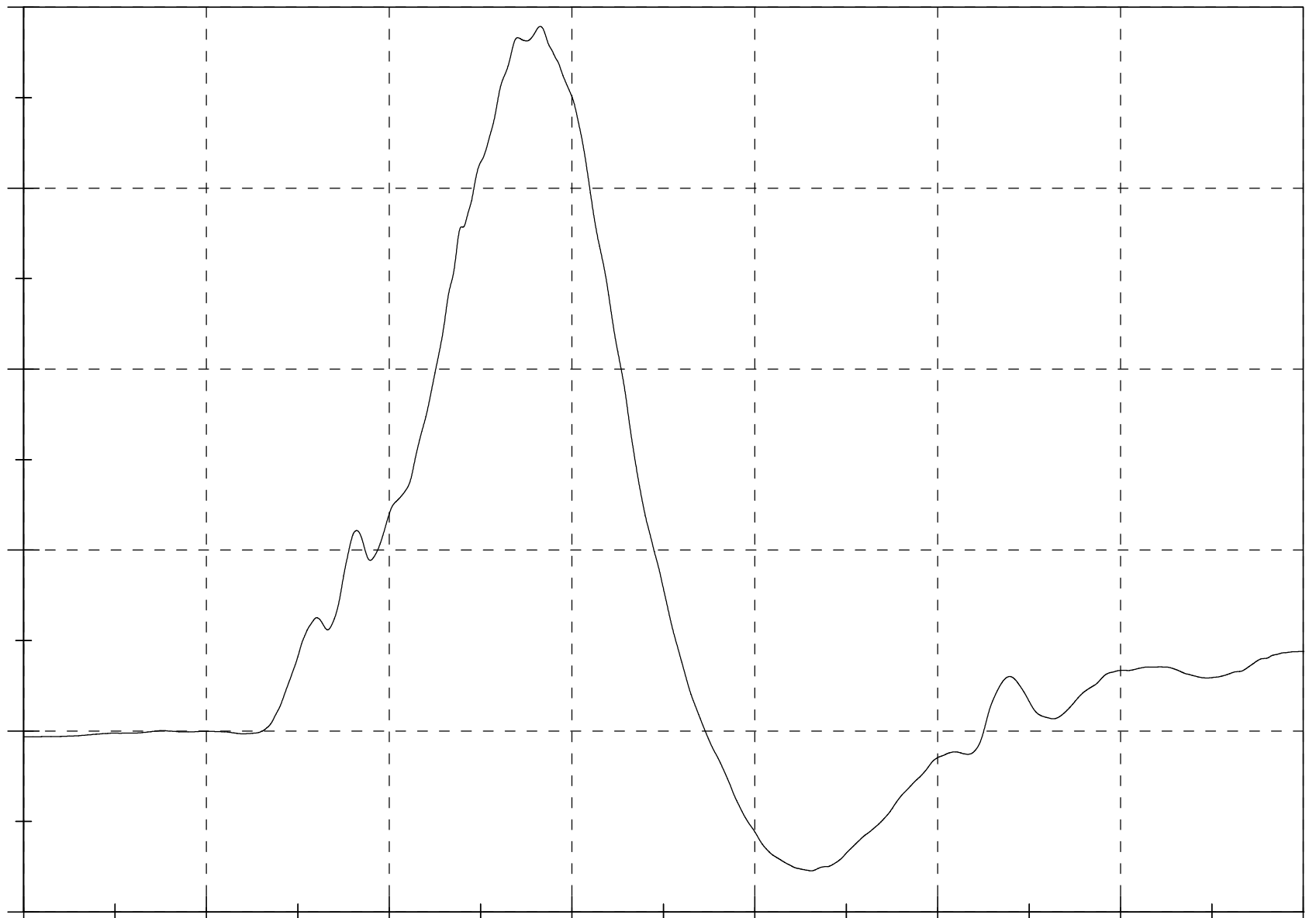
4-81

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2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Child Seat y Velocity

Max: 19.5 [kph] at 0.091 [s]
Min: -3.9 [kph] at 0.165 [s]



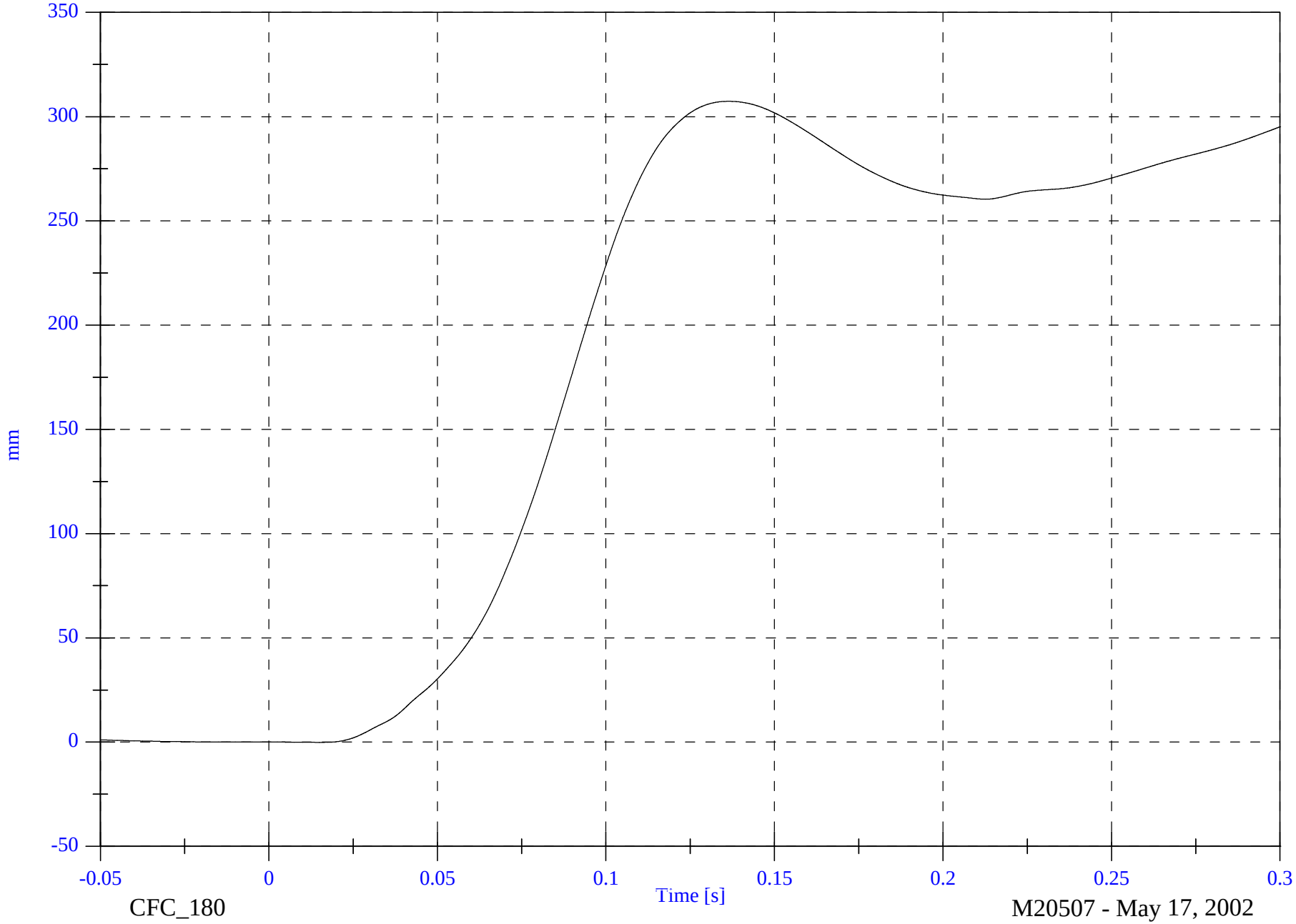
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

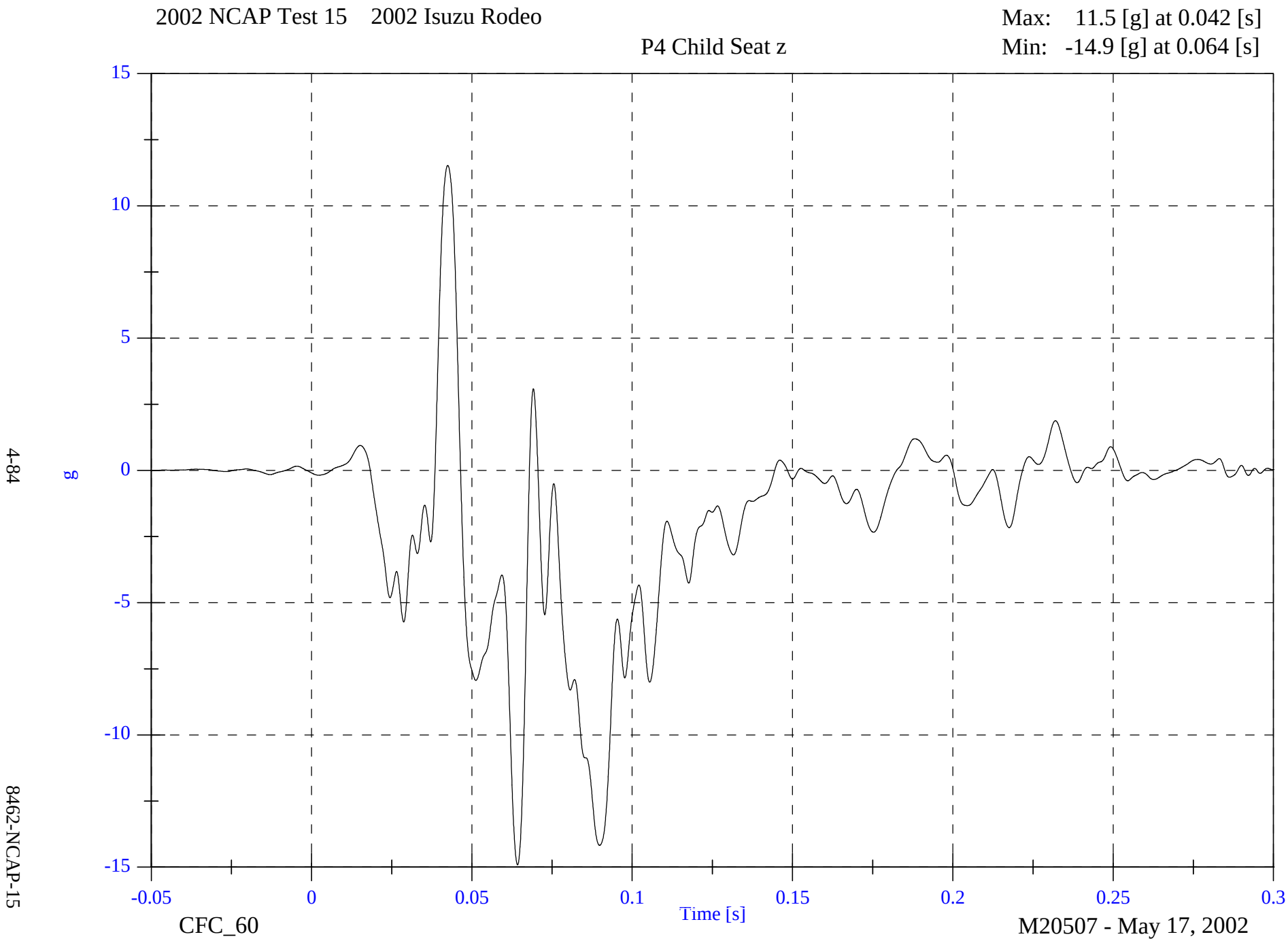
P4 Child Seat y Displacement

Max: 307.4 [mm] at 0.136 [s]
Min: -0.2 [mm] at 0.015 [s]



CFC_180

M20507 - May 17, 2002


2002 NCAP Test 15 2002 Isuzu Rodeo
P4 Child Seat z
Max: 11.5 [g] at 0.042 [s]
Min: -14.9 [g] at 0.064 [s]
15
10
5
0
-5
-10
-15
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
Time [s]
CFC_60
M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Child Seat z Velocity

Max: 0.3 [kph] at 0.046 [s]
Min: -19.0 [kph] at 0.222 [s]



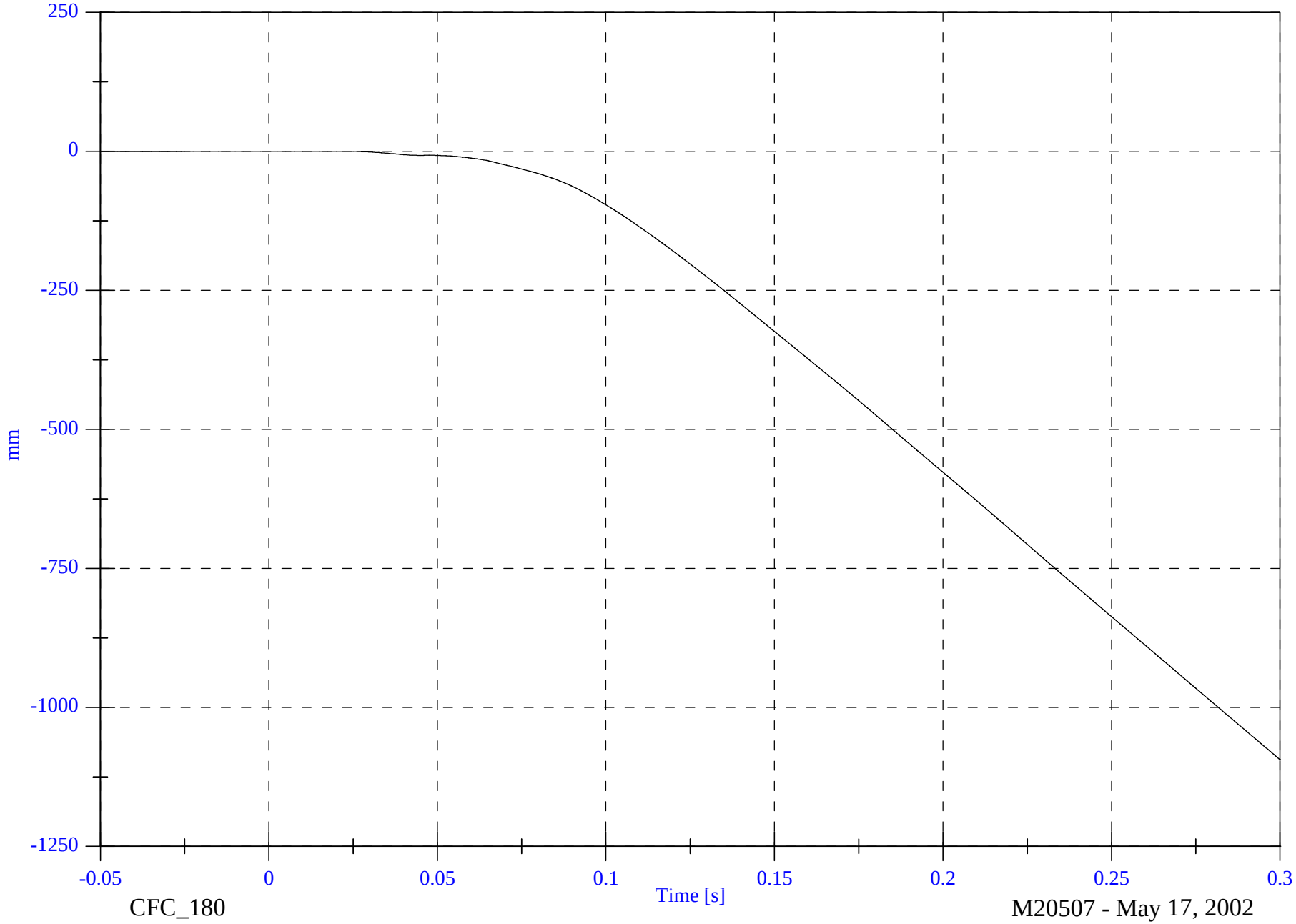
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Child Seat z Displacement

Max: 0.3 [mm] at 0.021 [s]
Min: -1094.0 [mm] at 0.300 [s]



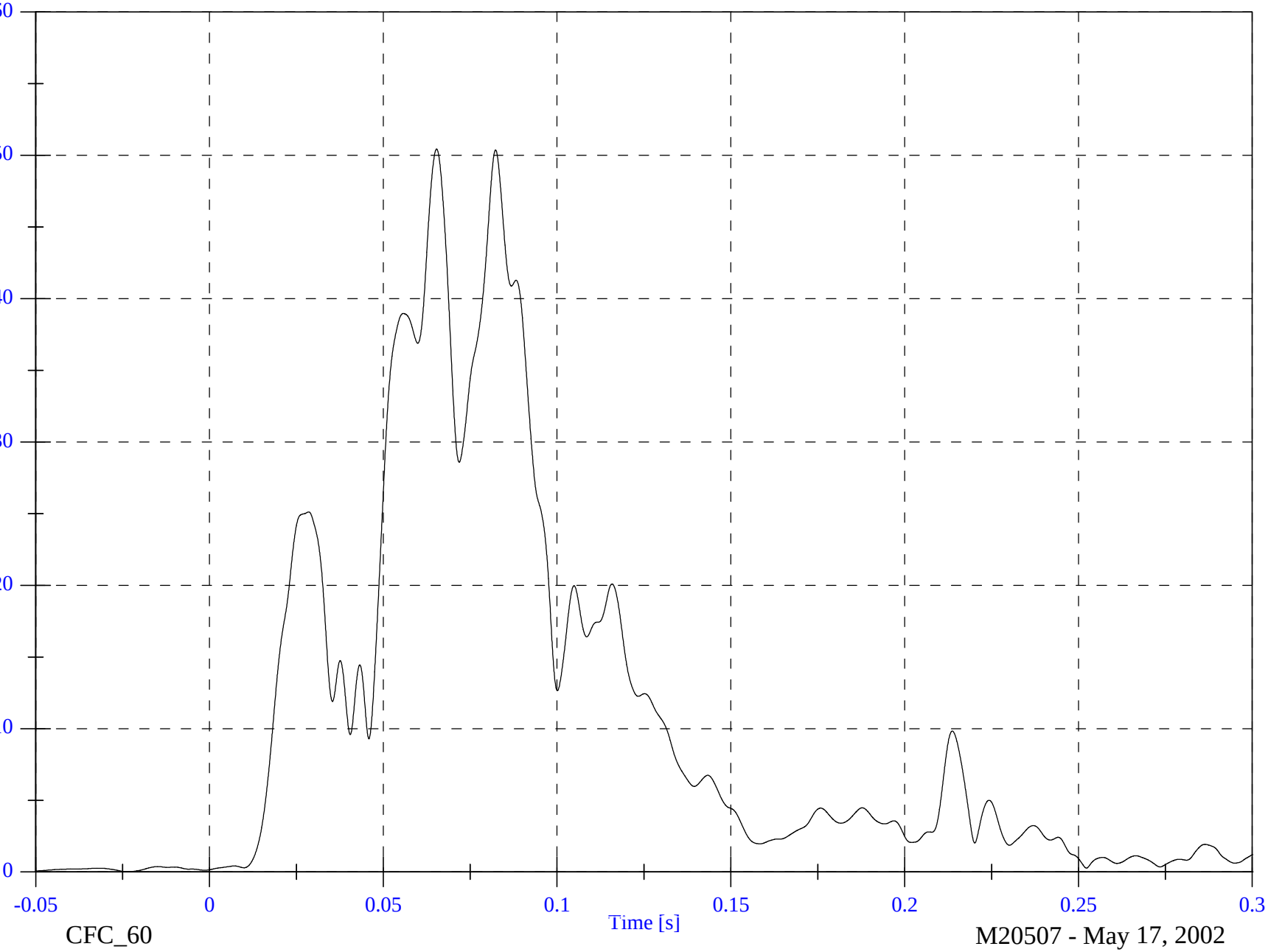
CFC_180

M20507 - May 17, 2002

2002 NCAP Test 15 2002 Isuzu Rodeo

P4 Child Seat Resultant

Max: 50.4 [g] at 0.065 [s]
Min: 0.0 [g] at -0.024 [s]



CFC_60

M20507 - May 17, 2002

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SECTION 5

CHILD DUMMY CALIBRATION INFORMATION

Child ATDs certified by VRTC prior to test program
Certification details and data traces can be found in bound report

SECTION 6

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

P572C INSTRUMENTATION

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

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

P572C INSTRUMENTATION

	POSITION #4 (LEFT) SERIAL NO.: 017		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P16194	ENDEVCO	14-Jan-02
HEAD AY	AC-P16428	ENDEVCO	14-Jan-02
HEAD AZ	AC-P16517	ENDEVCO	14-Jan-02
HEAD RAZ	AC-99H30-Z07	ENTRAN	14-Jan-02
UPPER NECK FX	LC-277-FX	DENTON	14-Jan-02
UPPER NECK FY	LC-277-FY	DENTON	14-Jan-02
UPPER NECK FZ	LC-277-FZ	DENTON	14-Jan-02
UPPER NECK MX	LC-277-MX	DENTON	14-Jan-02
UPPER NECK MY	LC-277-MY	DENTON	14-Jan-02
UPPER NECK MZ	LC-277-MZ	DENTON	14-Jan-02
LOWER NECK FX	LC-280-FX	DENTON	15-Jan-02
LOWER NECK FY	LC-280-FY	DENTON	16-Jan-02
LOWER NECK FZ	LC-280-FZ	DENTON	15-Jan-02
LOWER NECK MX	LC-280-MX	DENTON	15-Jan-02
LOWER NECK MY	LC-280-MY	DENTON	15-Jan-02
LOWER NECK MZ	LC-280-MZ	DENTON	15-Jan-02
CHEST AX	AC-J27467	ENDEVCO	14-Jan-02
CHEST AY	AC-AJ4Y5	ENDEVCO	14-Jan-02
CHEST AZ	AC-P17559	ENDEVCO	14-Jan-02
PELVIS AX	LC-283-FX	DENTON	16-Jan-02
PELVIS AY	LC-283-FY	DENTON	16-Jan-02
PELVIS AZ	LC-283-FZ	DENTON	16-Jan-02
LUMBAR FX	LC-283-MX	DENTON	16-Jan-02
LUMBAR FY	LC-283-MY	DENTON	16-Jan-02
LUMBAR FZ	LC-283-MZ	DENTON	16-Jan-02
LUMBAR MX	AC-P15856	ENDEVCO	14-Jan-02
LUMBAR MY	AC-J27496	ENDEVCO	14-Jan-02
LUMBAR MZ	AC-P15638	ENDEVCO	14-Jan-02

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE AND MDB INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
P4 CRS (X)	AC-P17237	ENDEVCO	27-Feb-02
P4 CRS (Y)	AC-P15747	ENDEVCO	27-Feb-02
P4 CRS (Z)	AC-P14438	ENDEVCO	27-Feb-02

REMARKS: None