V3187

REPORT NUMBER: CAL-00-01

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

SATURN CORPORATION
2000 SATURN LS
4-DOOR SEDAN

NHTSA NUMBER: MY0108

VERIDIAN TEST NUMBER: 8413-39

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

August 31, 1999

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
Mail Code: NPS-10
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FINAL REPORT ACCEPTANCE BY OCS:

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Manager, New Car Assessment Program (NCAP)
NHTSA, Office of Crashworthiness Standards

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15. Supplementary Notes

16. Abstract

A frontal load cell barrier test of a 2000 Saturn LS 4-Door Sedan was performed at Veridian Engineering crash test facility in Buffalo, New York, on August 31, 1999.

The impact velocity was 56.3 kph and the temperature at the barrier face was 21.1°C. The maximum post-test vehicle crush was 575 mm. The test vehicle was equipped with driver and right front passenger 3-point active safety belts and reduced force frontal air bags.

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

ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (061)	439.4	45.1	-31.0	-2617.6	-1912.8
Passenger (064)	453.5	42.4	-30.4	-3523.6	-2882.3

17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)	*18. Distribution Statement* Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, DC 20590

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TABLE OF CONTENTS

SECTION 1

PURPOSE AND SUMMARY OF TEST MY0108

PURPOSE

This 56.3 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-96-D-02010. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.3 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2000 Saturn LS 4-Door Sedan at a velocity of 56.3 kph. The test was performed at Veridian Engineering on August 31, 1999. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head, chest, and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also installed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 064) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 132 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

The driver's HIC was 439.4. The maximum chest deceleration over 3 milliseconds was 45.1 g's and maximum chest deflection was -31.0 mm. Compressive femur loads were -2617.6 Newtons on the left and -1912.8 Newtons on the right.

The right front passenger's HIC was 453.5. Maximum chest deceleration over 3 milliseconds was 42.4 g's and maximum chest deflection was -30.4 mm. Compressive femur loads were -3523.6 Newtons on the left and -2882.3 Newtons on the right.

The position 1 (driver) Left Upper Tibia Mx and Right Foot Aft Az data is invalid. The position 1 torso belt strain gage suffered a cut wire at 230 ms. The position 2 (passenger) Right Lower Tibia Mx data is invalid and the position 1 torso belt strain gage opened intermittently during the event. The left disc brake caliper accelerometer (#7) suffered a cut wire at 54 ms.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. : MY0108 Test Mode : 56.3 kph Frontal Barrier

Test Date : August 31, 1999 Time: 13:50 Temperature : 21.1 °C

Vehicle Make/Model/Body Style : 2000 Saturn LS 4-Door Sedan

Vehicle Test Weight : 1561.5 kg

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 56.3 kph

Maximum Static Crush : 575 mm

Vehicle Rebound : 648 mm

DUMMIES:	DRIVER	PASSENGER
Type :	572E	572E
Restraint System :	Reduced Force Airbag / 3-Point Safety Belt System	Reduced Force Airbag / 3-Point Safety Belt System

Number of Data Channels : 132

Number of Cameras : 1 Real Time

16 High Speed

DOOR OPENING DATA : Closed / Operable - Left Front

Closed / Operable - Right Front

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

VISIBLE DUMMY CONTACT POINTS :	DRIVER	PASSENGER
Head :	Face to upper center of airbag; Back of head to outboard half of head restraint	Face to upper center of airbag; Back of head to inboard half of head restraint
Abdomen :	None	None
Chest	Airbag	Airbag
Knees	Left knee to knee bolster left of steering column; Right knee to knee bolster right of steering column	Left knee to left edge of glove compartment door; Right knee to center of glove compartment door.

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 2000 Saturn LS 4-Door Sedan

NHTSA No. : MY0108 ; VIN: 1G8JS52F4YY601268 ; Color : Dark Blue

Engine Data: 4 cylinders; - CID; 2.2 Liters; - cc

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

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

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

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

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

Date Received : 8/19/1999 ; Odometer Reading 261 km

Selling Dealer : Saturn Vehicle Management

& Address: 100 Saturn Parkway, Spring Hill, TN 37174

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : Saturn Corporation

Date of Manufacture 07/99

GVWR : 1777 kg; GAWR: 894 kg FRONT; 883 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 300 kpa FRONT

300 kpa REAR

Recommended Tire Size : P195/65R15T

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

Size of Tires on Test Vehicle: P195/65R15 ; Manufacturer: Firestone

Vehicle Capacity Data :

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

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

Vehicle Capacity Weight (VCW) = 442.0 kg

No. of Occupants x 68 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 101.8 kg

*Tire pressure used for test

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

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

Right Front =	397.0	kg	Right Rear =	264.5	kg
Left Front =	405.5	kg	Left Rear =	268.0	kg
TOTAL FRONT =	802.5	kg	TOTAL REAR =	532.5	kg

TOTAL DELIVERED WEIGHT = 1335.0 kg

% of Total Front of Vehicle Weight = 60.1 % of Total Rear Weight = 39.9 %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight (UDW) =	1335.0	kg
Rated Cargo/Luggage Weight (RCLW) =	101.8	kg
Weight of 2 p.572 Dummies @ 76 each =	152.0	kg
TARGET TEST WEIGHT =	1588.8	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 75 KG OF CARGO WEIGHT:

Right Front =	432.0	kg	Right Rear =	349.5	kg
Left Front =	425.0	kg	Left Rear =	355.0	kg
TOTAL FRONT =	857.0	kg	TOTAL REAR =	704.5	kg

TOTAL TEST WEIGHT = 1561.5 kg

% of Total Front Weight = 54.9 % % of Total Rear Weight = 45.1 %

Weight of Ballast Secured in Vehicle Trunk Area = 0 kg

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED :	RF	683	LF	682	RR	694	LR	694
FULLY LOADED :	RF	669	LF	666	RR	655	LR	652
AS TESTED :	RF	670	LF	670	RR	657	LR	655

Vehicle's Wheel Base : 2702 mm

Location of Vehicle's C.G. : 1219 mm rearward of front wheel center.

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual = 49.6 liters

Usable Capacity Figure Furnished by COTR = 49.6 liters

Test Volume Range (92 to 94% of Usable Capacity) = 45.6 to 46.6 liters

ACTUAL TEST VOLUME= 46.2 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- X No- -

Details of Fuel System Fuel filler is located aft of rear axle on right rear quarter panel; Fuel tank is located forward of rear wheels below rear seat area; Fuel filler lines run along inboard side of right frame rail.

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°

Test Date : August 31, 1999 Time: 13:50 Temperature: 21.1 °C

Vehicle NHTSA No. : MY0108

Required Impact Velocity Range : 55.5 to 57.1 kph

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

Trap No. 1 = 56.3 kph; Trap No. 2 = 56.3 kph

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

(2) exiting trap = 305 mm

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

Vehicle Length:

Pre-Test	Right =	4697	; C/L =	4826	; Left =	4698
Post-Test	Right =	4271	; C/L =	4274	; Left =	4200
Crush	Right =	426	; C/L =	552	; Left =	498
AVERAGE	=	492	mm			

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

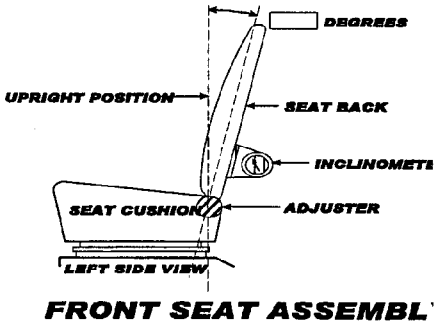
	Right =	623	; C/L =	632	; Left =	689
AVERAGE	=	648	mm			

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2000 Vehicle Model: Saturn LS Body Style : 4-Door Sedan

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



FRONT SEAT ASSEMBL

Seat back angle for driver's seat: 25°

Measurement instructions: Seat back angle is measured by positioning a straight edge along the forward side centerline of the front seat back. The straight edge must span the height of the seat back (not including the head rest). Adjust the seat back so that the angle of the straight edge is 25° back from vertical.

Seat back angle for passenger's seat: 25°

Measurement instructions: Same as driver's seat.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Seat adjuster is placed in its middle position (detent 8, where the forward most detent is 0 and the rear most is 16).

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

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 49.6 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 = 49.6 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 46.2 liters

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

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

When the ignition is turned on without the engine running, the fuel pump operates for 2-3 seconds then shuts off. The fuel pump runs continuously while the engine is operating.

4. STEERING COLUMN ADJUSTMENTS :

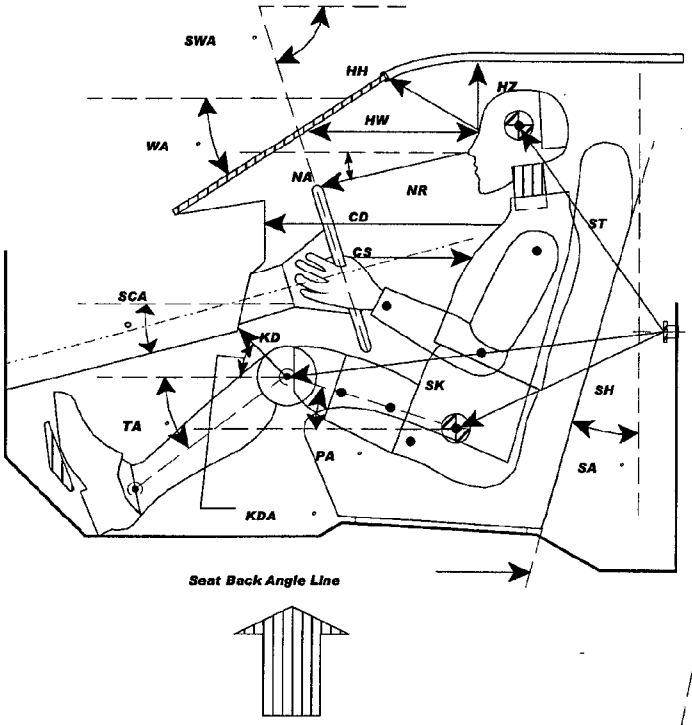
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: The steering column is placed in mid position (detent 2, where the upper most detent is 0 and the lower most detent is 4).

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: The upper anchorage is placed in mid position (detent 2, where the upper most detent is 0 and the lower most detent is 4).

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



AD - Arm to Door

HD - H-Point to Door

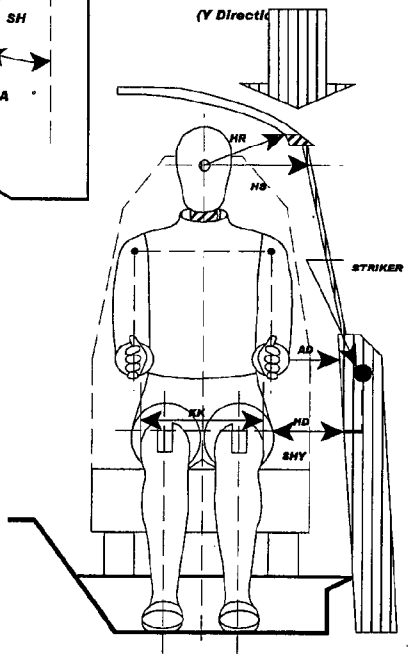
HR - Head to Side Header

HS - Head to Side Window

KK - Knee to Knee

SHY- Striker to H-Point

(Y Directi



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

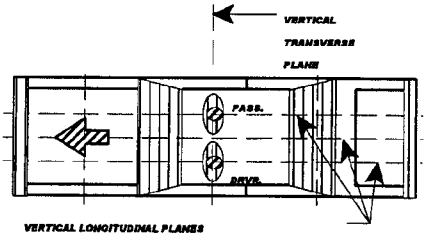
SCA - Steering Column Angle

SH - Striker to H-Point

SK - Striker to Knee

ST - Striker to Head

SWA- Steering Wheel Angle



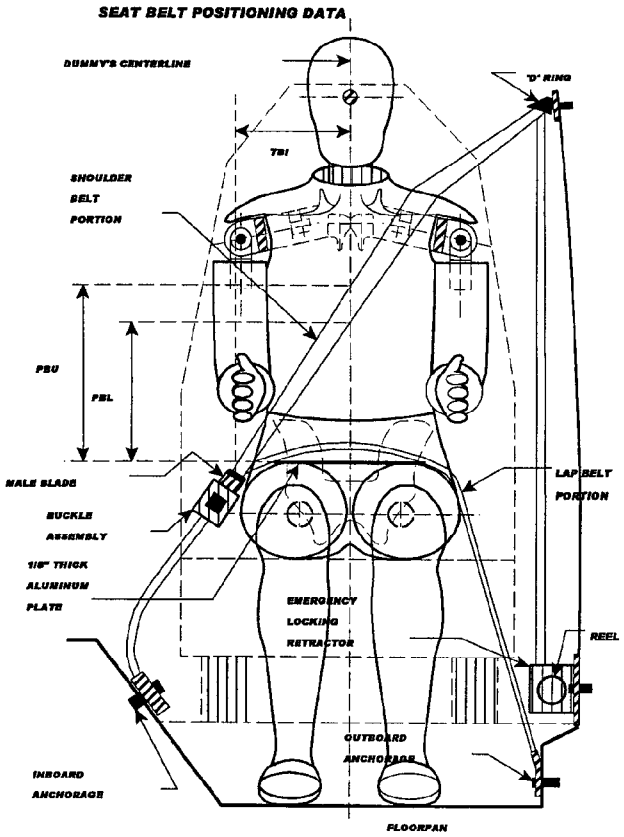
VERTICAL LONGITUDINAL PLANES

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

	DRIVER (Serial #061)			PASS. (Serial # 064)		
WA°	30 deg.			N/A		
SWA°	66 deg.			N/A		
SCA°	24 deg.			N/A		
SA°	25 deg.			25 deg.		
HZ	180			180		
HH	328			312		
HW	540			516		
HR	218			190		
NR	393	Angle	10 deg.	N/A		
CD	518			508		
CS	312			N/A		
RA	195			N/A		
KDL	156	Angle (KDA)	32 deg.	152		
KDR	150			145	Angle (KDA)	32 deg.
PA°	23 deg.			23 deg.		
TA°	38 deg.			38 deg.		
KK	308			270		
ST	485	Angle	9 deg.	481	Angle	10 deg.
SK	598	Angle	96 deg.	602	Angle	94 deg.
SH	268	Angle	125 deg.	266	Angle	124 deg.
SHY	223			216		
HS	325			335		
HD	122			103		
AD	100			110		

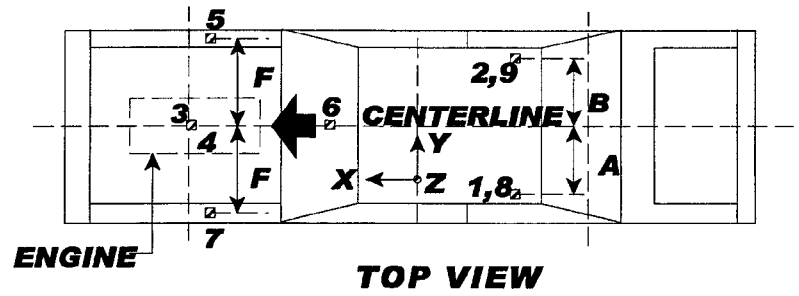
Dimensions in millimeters

DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

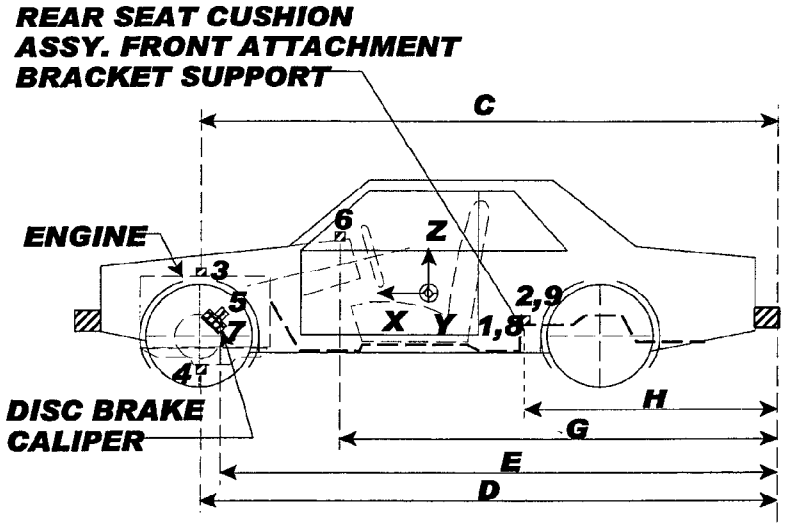


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	330	330
PBL-- Top surface of alum. plate to belt lower edge	245	245
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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

DIMENSION	LENGTH (mm)
	PRE-TEST VALUES
A Left Rear Seat Crossmember Y	-639
B Right Rear Seat Crossmember Y	639
C Top of Engine X	4063
D Bottom of Engine X	3721
E Disc Brake Calipers X	3778
F Disc Brake Calipers Y	±650
G Instrument Panel X	2923
H Rear Seat Crossmembers X	1859

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	5.1	-7.5	-30.0	70.1
2	Rear Seat X-Member @ Right Side	4.7	-7.9	-32.8	77.1
3	Top of Engine Block	42.4	54.9	-125.7	35.4
4	Bottom of Engine	14.3	51.4	-110.5	32.5
5	Disc Brake Caliper @ Right Side	53.1	38.8	-243.0	32.3
6	Instrument Panel	-5.0	97.3	-46.9	65.1
7	Disc Brake Caliper @Left Side	†	†	†	†
8	Rear Seat X-Member @ Left-Redundant	5.2	-7.5	-29.8	70.3
9	Rear Seat X-Member @ Right-Redundant	4.6	-7.9	-32.9	77.1

† Transducer wire was damaged during the impact, data is questionable after 54 ms..

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2000 Saturn LS 4-Door Sedan

NHTSA Test No.: MY0108 Test Date: August 31, 1999

		MAXIMUM VALE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	14.1	219.8	-49.7	85.0	13.2	235.3	-51.8	90.0
Head Y	g	2.3	42.9	-6.3	105.8	7.3	34.9	-11.0	97.9
Head Z	g	13.6	83.5	-4.3	115.4	10.3	69.9	-14.3	107.2
Head Resultant	g	51.5	85.0	0.0	10.2	52.7	90.0	0.0	-57.9
Redundant Head X	g	13.5	226.7	-49.1	85.0	12.8	235.3	-53.0	89.9
Redundant Head Y	g	2.7	67.3	-9.0	93.3	11.2	34.9	-13.8	84.8
Redundant Head Z	g	17.6	56.7	-4.6	115.1	13.3	58.6	-14.8	105.2
Redundant Head Resultant	g	51.7	85.0	0.0	11.7	54.2	89.9	0.0	-48.2
Upper Neck Fx	N	517.4	92.9	-353.9	151.9	289.3	74.1	-165.4	252.7
Upper Neck Fy	N	110.6	168.4	-117.8	123.6	272.7	93.5	-127.2	38.2
Upper Neck Fz	N	1935.0	81.6	-214.8	268.2	1363.0	78.2	-149.6	119.8
Upper Neck F Resultant	N	1968.8	83.5	2.4	-63.3	1394.2	77.4	2.0	-59.1
Upper Neck Mx	N-m	8.9	175.4	-16.0	114.3	11.7	72.6	-14.0	38.8
Upper Neck My	N-m	36.8	146.4	-28.4	249.5	13.3	169.8	-34.7	90.0
Upper Neck Mz	N-m	9.7	126.0	-4.6	174.4	24.4	107.1	-12.6	173.6
Upper Neck M Resultant	N-m	36.8	146.4	0.1	-29.7	38.5	90.2	0.1	-37.9
Chest X	g	4.4	260.0	-44.2	97.4	3.7	231.6	-41.4	84.9
Chest Y	g	2.0	119.6	-8.2	47.6	5.3	90.7	-3.3	80.0
Chest Z	g	13.7	95.8	-6.3	117.9	17.7	91.3	-8.6	118.7
Chest Resultant	g	46.1	97.2	0.0	-56.8	43.3	85.1	0.0	-61.1
Redundant Chest X	g	4.2	260.2	-42.2	97.5	3.6	231.6	-39.7	80.6
Redundant Chest Y	g	3.9	94.6	-4.0	68.5	7.1	90.8	-2.8	114.9
Redundant Chest Z	g	16.2	96.0	-6.1	118.0	18.5	91.3	-7.9	118.3
Redundant Chest Resultant	g	45.1	97.1	0.1	-57.8	41.7	80.5	0.0	-63.6
Chest Displacement	mm	0.1	5.1	-31.0	98.1	0.0	-0.5	-30.4	95.4

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

Vehicle Year/Make/Model/Body Style: 2000 Saturn LS 4-Door Sedan

NHTSA Test No.: MY0108 Test Date: August 31, 1999

		MAXIMUM VALE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Pelvic X	g	1.5	292.6	-53.7	65.3	2.1	284.9	-53.0	62.7
Pelvic Y	g	6.5	100.6	-7.5	53.9	4.4	82.2	-4.6	65.5
Pelvic Z	g	3.9	271.1	-21.2	74.4	3.2	239.7	-16.7	69.2
Pelvic Resultant	g	55.4	65.3	0.0	-57.9	54.2	62.7	0.0	-65.4
Left Femur	N	110.8	186.3	-2617.6	61.9	306.1	231.5	-3523.6	63.5
Right Femur	N	840.1	49.6	-1912.8	60.3	291.3	50.1	-2882.3	62.2
Left Upper Tibia Mx	N-m	†	†	†	†	48.2	75.4	-2.5	149.9
Left Upper Tibia My	N-m	17.4	162.9	-72.3	41.6	32.7	262.6	-95.1	84.0
Left Lower Tibia Fz	N	129.6	158.0	-2621.2	43.4	398.5	256.5	-4039.7	74.4
Left Lower Tibia Mx	N-m	47.5	48.1	-11.0	38.1	8.4	40.5	-39.5	72.1
Left Lower Tibia My	N-m	34.2	95.5	-10.9	499.9	67.0	75.4	-20.2	50.0
Right Upper Tibia Mx	N-m	25.9	78.4	-10.9	98.6	19.7	144.3	-50.1	73.4
Right Upper Tibia My	N-m	15.7	256.7	-130.8	69.1	27.1	135.4	-80.1	37.0
Right Lower Tibia Fz	N	170.2	183.9	-3179.9	66.5	113.3	137.3	-3169.7	38.5
Right Lower Tibia Mx	N-m	36.8	75.2	-9.4	49.5	†	†	†	†
Right Lower Tibia My	N-m	54.2	54.3	-95.2	49.4	38.6	93.8	-14.3	55.3
Left Foot Aft Ax	g	9.9	98.1	-47.3	47.0	14.8	57.7	-56.5	67.0
Left Foot Aft Az	g	6.6	277.3	-44.4	39.8	5.7	83.0	-41.2	36.2
Left Foot Fore Az	g	15.3	20.1	-71.0	39.5	16.1	83.2	-41.9	59.7
Right Foot Aft Ax	g	12.5	66.3	-110.5	49.0	11.7	99.1	-33.9	69.9
Right Foot Aft Az	g	‡	‡	‡	‡	25.5	52.8	-44.2	39.3
Right Foot Fore Az	g	228.9	53.2	-267.7	48.0	20.3	35.8	-55.1	29.0
Lap Belt Load	N	5246.9	67.5	-11.6	440.6	4783.0	71.6	-14.7	417.3
Torso Belt	N	4685.2	97.8	-26.3	220.1	4279.9	93.4	-9.3	354.4

† Transducer was damaged, data is invalid.

‡ Transducer wire was damaged during the impact, data is invalid.

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

Vehicle Year/Make/Model/Body Style: 2000 Saturn LS 4-Door Sedan

NHTSA Test No.: MY0108 Test Date: August 31, 1999

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t_1 (msec)	t_2 (msec)	Average Acceleration t_1 to t_2
Position #1 - Driver	439.4	72.1	108.1	43.1
Position #2 - Passenger	453.5	67.1	103.1	43.7

** 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	45.1	95.8	98.8	433.5
Position #2 - Passenger	42.4	83.4	86.4	401.6

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

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

Vehicle Year/Make/Model/Body Style: 2000 Saturn LS 4-Door Sedan

NHTSA Test No.: MY0108 Test Date: August 31, 1999

	HEAD INJURY CRITERIA (HIC) **REDUNDANT**			
	HIC**	t_1 (msec)	t_2 (msec)	Average Acceleration t_1 to t_2
Position #1 - Driver	430.9	72.4	108.3	42.8
Position #2 - Passenger	467.7	67.2	103.2	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	44.2	95.9	98.9	417.3
Position #2 - Passenger	40.6	89.1	92.1	366.6

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

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:	Driver	Passenger
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	1586	1597
Shoulder belt length as measured on Part 572 Dummy.	864	867
Lap belt length as measured on Part 572 Dummy.	722	730
SHOULDER BELT SPOOL-OFF DATA:		
As determined by film analysis.	216	185
As determined mechanically.	†	†
As determined electronically.	†	†
BELT STRETCH DATA:		
Measured electronically between shoulder belt load cell and the "D" ring.	24 mm/M	21 mm/M
Measured mechanically.	20 mm/M	20 mm/M

Dimensions in millimeters

† Safety belt trim exit was located at the upper D-ring. The was no available mounting location for the mechanical or electronic spool-off measurement.

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

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

Windshield is bonded in place and covered with a 23 mm molding.

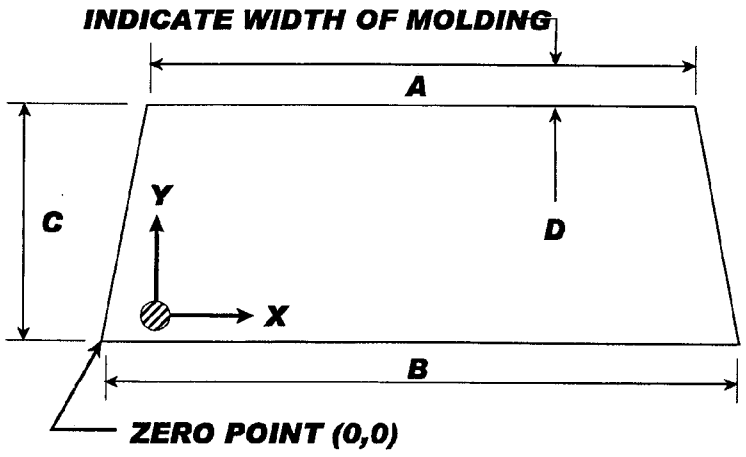
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		
	PRE-TEST (mm)	POST-TEST(mm)	% OF RETENTION
RIGHT SIDE	1993	1993	100
LEFT SIDE	1993	1993	100
TOTAL	3,986	3,986	100

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1146
B	1450
C	695
D	23

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: None

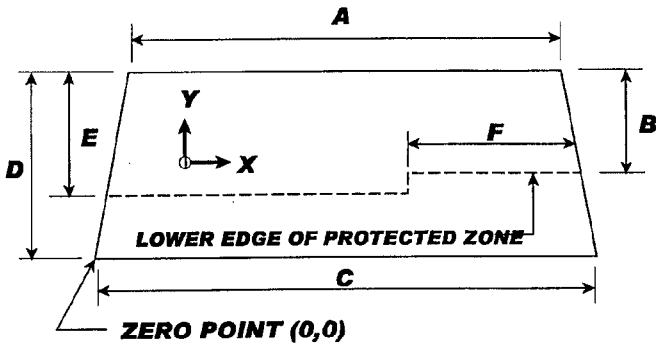
DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

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

FMVSS 219 TEST DATA:

(Dimensions in mm)



FRONT VIEW OF WINDSHIELD

DIMENSIONS	
A	1145
B	405
C	1450
D	695
E	455
F	605

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.: MY0108 TEST DATE: August 31, 1999

VEHICLE MAKE/MODEL: 2000 Saturn LS

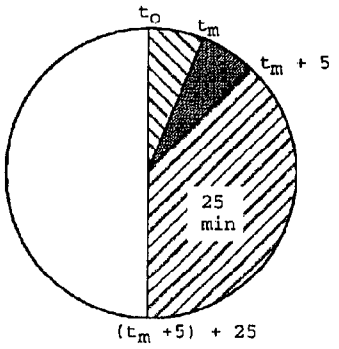
The test vehicle was filled from 92% to 94% of the manufacture's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 anthropomorphic test devices were located at each of the front designated seating positions.

==========

TEST VEHICLE IMPACT TYPE:

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

FUEL SPILLAGE MEASUREMENT:



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

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

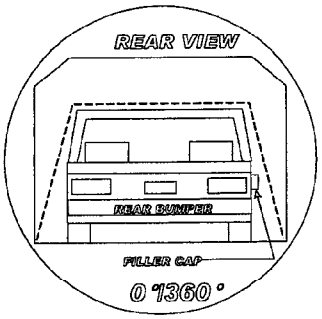
SOLVENT SPILLAGE DETAILS:

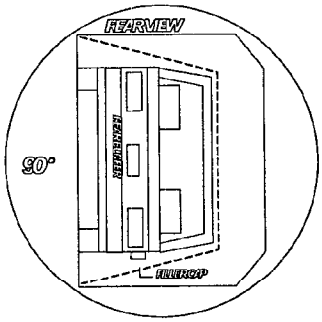
Immediately following the impact several drops of stoddard solvent were observed under the vehicle originating from the front right side of the fuel tank. The amount was not measurable.

DATA SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:
0-90 deg.

NHTSA Test No.:
MY0108





INDETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	9	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	9	seconds
Next whole minute interval	7	minutes	00	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

In excess of 2532 g	In excess of 164 g	In excess of 145 g	N/A

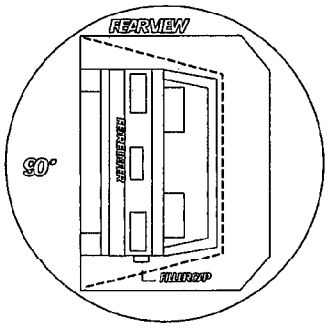
Note: Record spillage for whole minute intervals only as determined above.

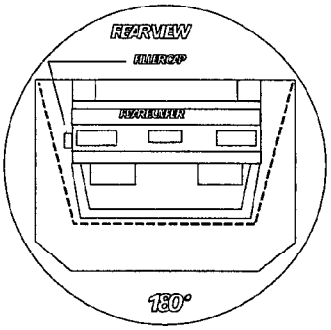
IV. SOLVENT SPILLAGE LOCATION(S): Stoddard solvent began to spill from the vehicle between the right side of the fuel tank and underbody during the 0 to 90 degree rotation and during the 6th and 7th minute hold.

TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
90-180 deg.

NHTSA Test No.:
MY0108





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	-	minutes	-	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	-	minutes	-	seconds
Next whole minute interval	-	minutes	-	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

†	†	†	†

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

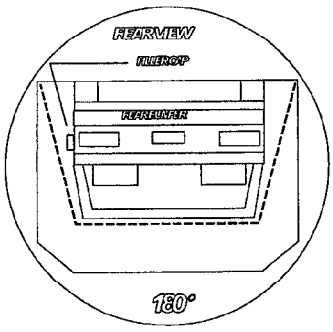
IV. SOLVENT SPILLAGE LOCATION(S):

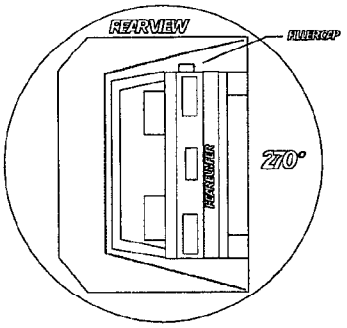
† Solvent spillage exceeded FMVSS 301 limits in all portions of the 0 to 90 degree rollover. The rollover was terminated during the 90 to 180 degree rollover phase to prevent solvent damage to the vehicle instrumentation.

TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
180-270 deg.

NHTSA Test No.:
MY0108





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	-	minutes	-	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	-	minutes	-	seconds
Next whole minute interval	-	minutes	-	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

†	†	†	†

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

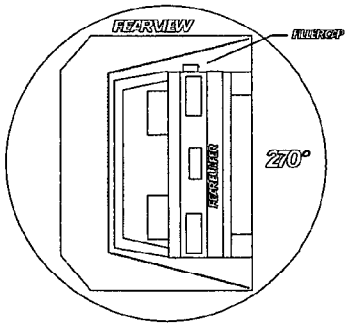
IV. SOLVENT SPILLAGE LOCATION(S):

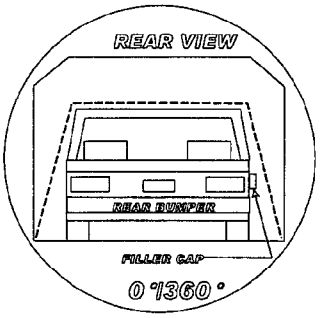
† Solvent spillage exceeded FMVSS 301 limits in all portions of the 0 to 90 degree rollover. The rollover was terminated during the 90 to 180 degree rollover phase to prevent solvent damage to the vehicle instrumentation.

TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
270-360 deg.

NHTSA Test No.:
MY0108





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	-	minutes	-	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	-	minutes	-	seconds
Next whole minute interval	-	minutes	-	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

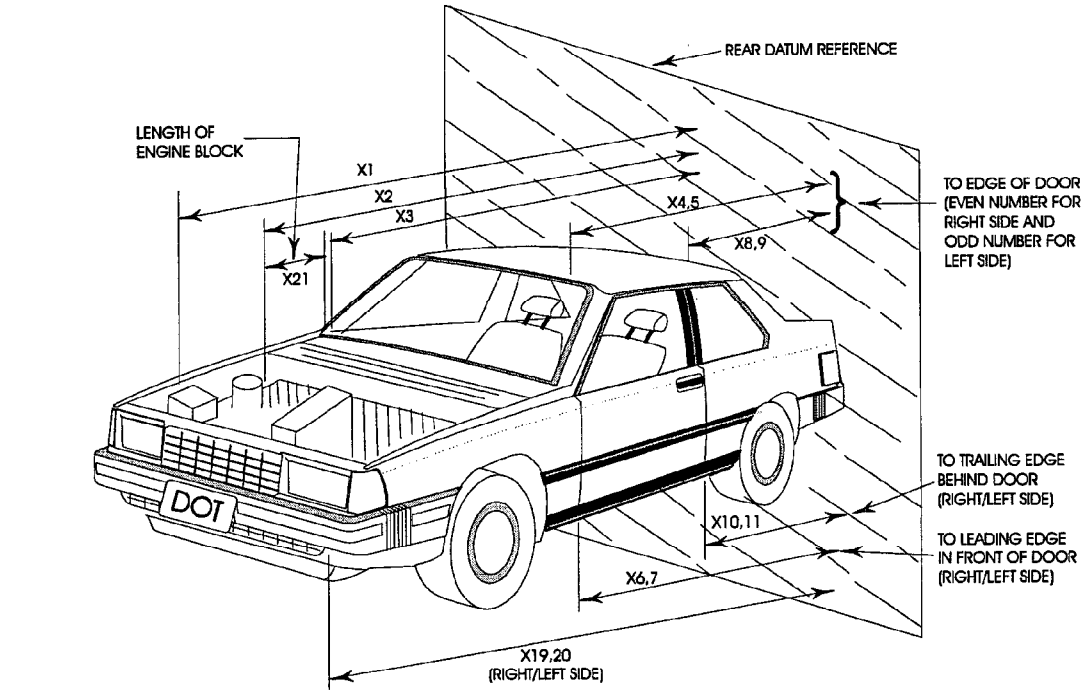
†	†	†	†

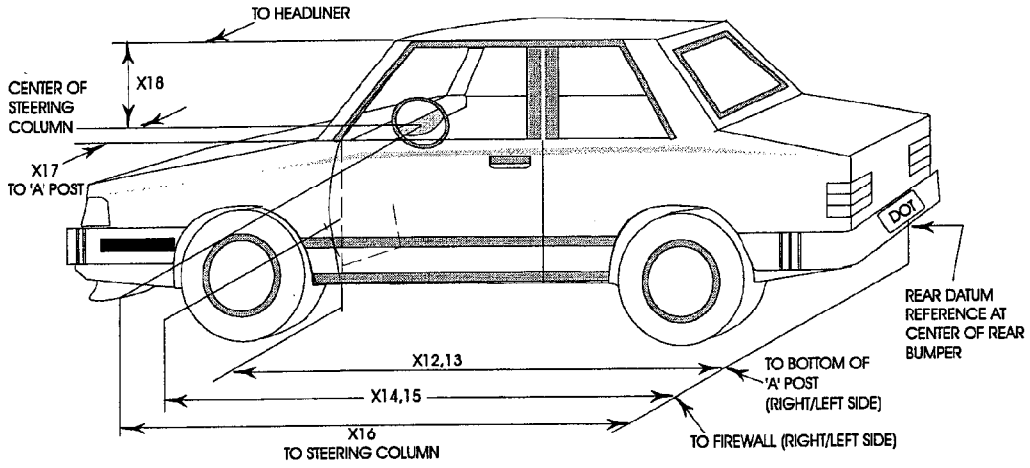
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

† Solvent spillage exceeded FMVSS 301 limits in all portions of the 0 to 90 degree rollover. The rollover was terminated during the 90 to 180 degree rollover phase to prevent solvent damage to the vehicle instrumentation.

TEST VEHICLE MEASUREMENTS





DATA SHEET NO.14 VEHICLE MEASUREMENTS

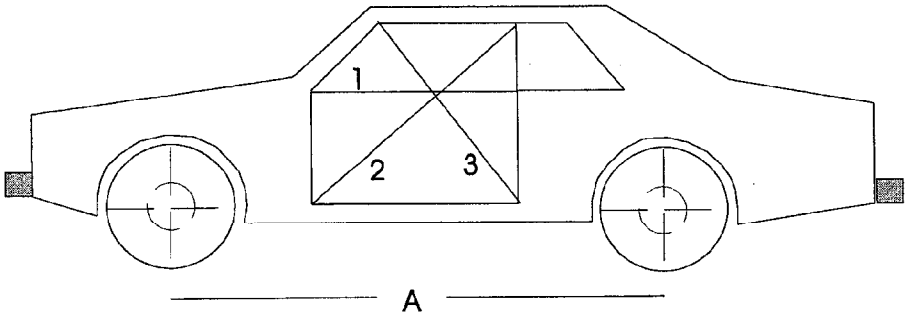
No.		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	4826	4274	552
X2	Rear Surface of Vehicle to Front of Engine	4302	3941	361
X3	Rear Surface of Vehicle to Firewall	3608	3537	71
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3254	3248	6
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3255	3256	-1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3257	3260	-3
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3260	3262	-2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2188	2180	8
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2190	2190	0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2192	2191	1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2196	2200	-4
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3442	3433	9
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3441	3433	8
X14	Rear Surface of Vehicle to Firewall, Right Side	3633	3482	151
X15	Rear Surface of Vehicle to Firewall, Left Side	3624	3506	118
X16	Rear Surface of Vehicle to Steering Column	2792	2815	-23
X17	Center of Steering Column to "A" Post	284	265	19
X18	Center of Steering Column to Headliner	398	362	36
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4697	4271	426
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4698	4200	498
X21	Length of Engine Block	521	521	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2963	2957	6
CD	Rear Surface of Vehicle to Center of Dash Panel	2985	2968	17
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2966	2955	11

All Dimensions in mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

VEHICLE INTRUSION MEASUREMENTS

DOOR OPENING WIDTH



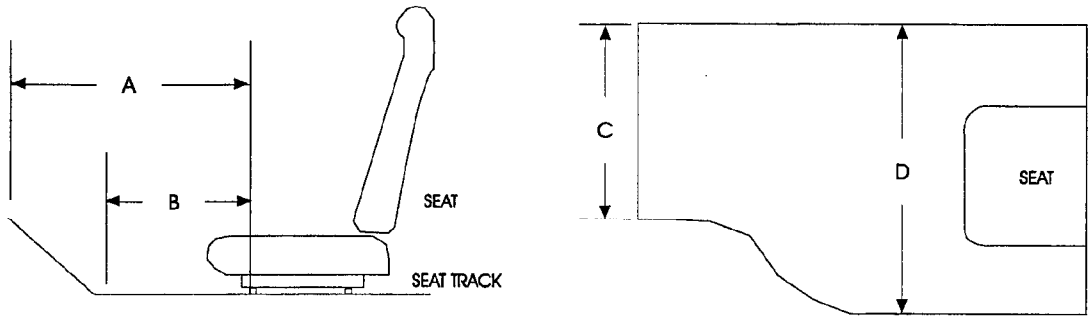
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	948	1404	930	948	1406	928
AFTER TEST	947	1397	946	943	1400	949
DIFFERENCE	1	7	-16	5	6	-21

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2702	2702
AFTER TEST	2551	2552
DIFFERENCE	151	150

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

VEHICLE INTRUSION MEASUREMENTS

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	735	631	104
B	526	508	18
C	494	452	42
D	494	488	6

PASSENGER

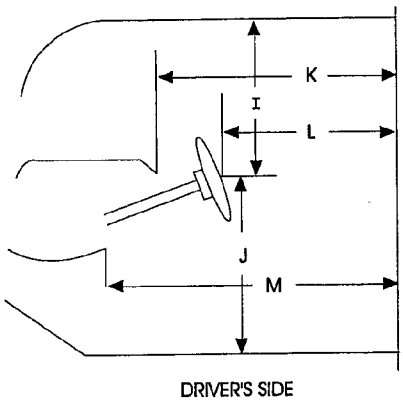
Measurement	Pre-Test	Post-Test	Difference
A	700	595	105
B	541	515	26
C	469	463	6
D	467	470	-3

Units = mm

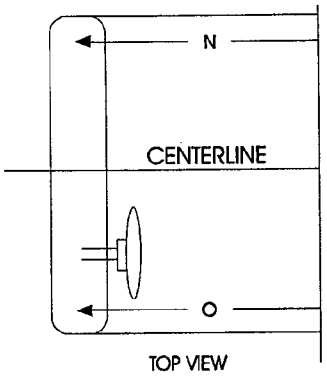
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

VEHICLE INTRUSION MEASUREMENTS

STATIC PASSENGER COMPARTMENT INTRUSION

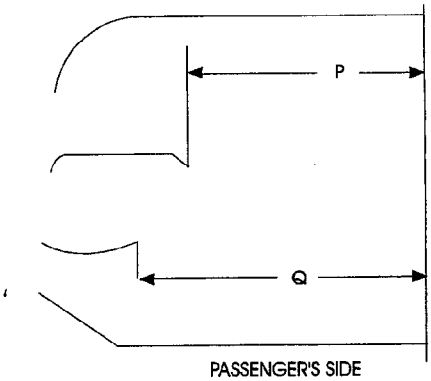


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS FROM C-PILLAR BELT ANCHORAGE



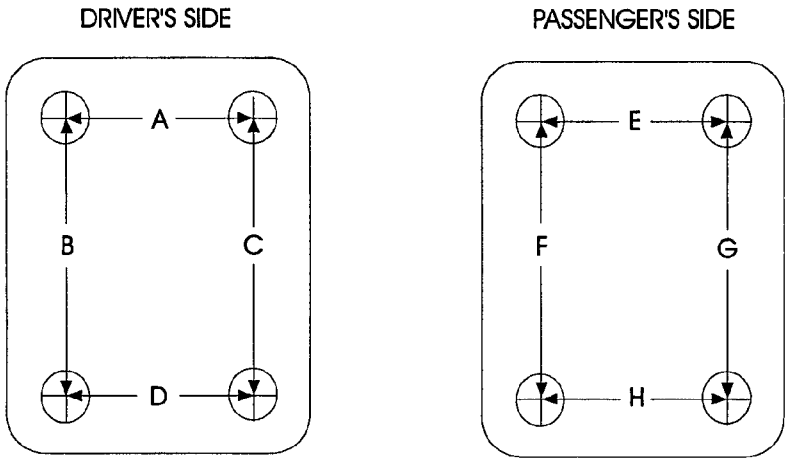
PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	399	365	34
J	639	685	-46
K	1848	1847	1
L	1666	1691	-25
M	1869	1860	9
N	1836	1831	5
O	1840	1833	7
P = K (PASS.)	1841	1831	10
Q = M (PASS.)	1883	1890	-7

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

FLOORBOARD DEFORMATION



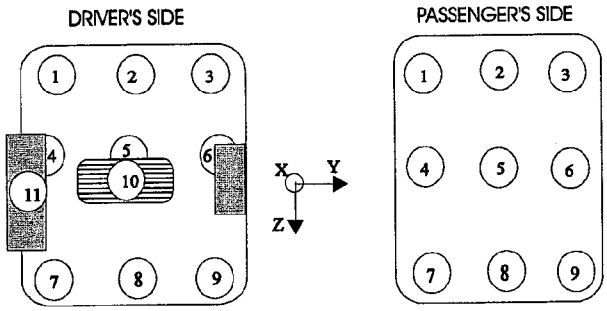
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	340	340	0
B	420	416	4
C	420	416	4
D	330	326	4
E	340	338	2
F	420	415	5
G	420	420	0
H	330	327	3

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

TOE-PAN INTRUSION



Driver Side Floorpan Measurements

Reference: X = Rear Bumper; Z = Ground

Floorpan Location	X Deformation			Z Deformation		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3403	3347	56	-493	-463	-30
2	3488	3379	109	-458	-512	54
3	3471	3368	103	-426	-529	103
4	3355	3322	33	-400	-408	8
5	3403	3354	49	-350	-388	38
6	3417	3332	85	-337	-361	24
7	3285	3272	13	-293	-288	-5
8	3285	3256	29	-275	-305	30
9	3297	3267	30	-264	-264	0
10	3284	3187	97	-428	-459	31
11	-	-	N/A	-	-	N/A

Passenger Side Floorpan Measurements

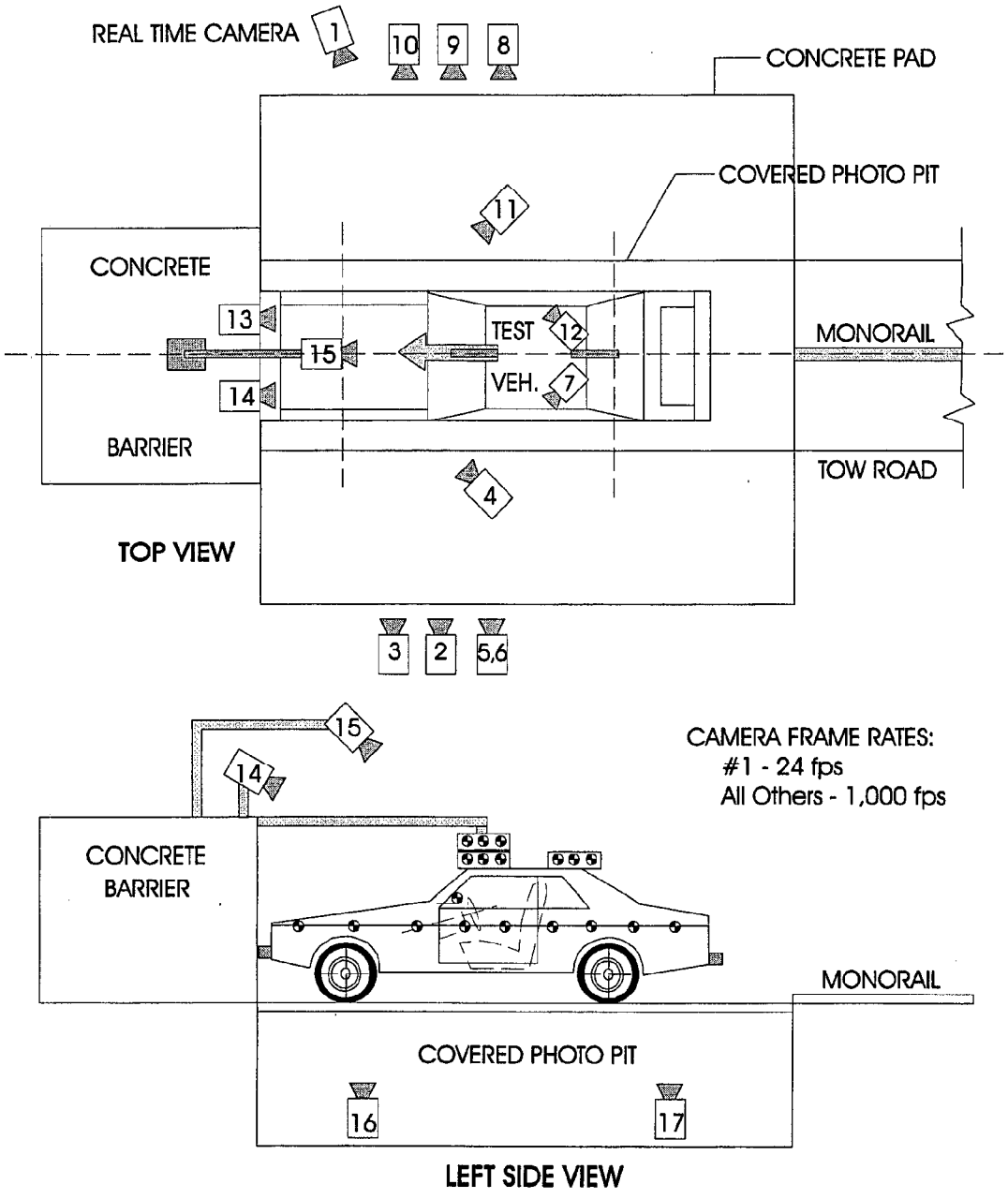
Reference: X = Rear Bumper; Z = Ground

Floorpan Location	X Deformation			Z Deformation		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3449	3327	122	-471	-538	67
2	3440	3339	101	-473	-539	66
3	3397	3339	58	-497	-508	11
4	3372	3363	9	-378	-408	30
5	3364	3336	28	-372	-420	48
6	3340	3327	13	-377	-414	37
7	3283	3275	8	-283	-326	43
8	3287	3277	10	-282	-320	38
9	3290	3294	-4	-279	-307	28

Units in mm

CAMERA POSITIONS FOR FRONTAL IMPACTS

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



DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

NHTSA Test No.: MY0108 Vehicle: 2000 Saturn LS 4-Door Sedan

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	6711	1567	1070	-3	6271	12.5	1000
3	Left Side View	8338	886	1045	-3	7898	25	1000
4	Driver and Interior View	4836	2846	1945	-12	-	25	1045
5	Steering Column (Bottom)	7631	1783	1175	-4	7191	25	1000
6	Steering Column (Top)	7631	1783	1795	-10	7191	25	1000
7	Left Belt	-	-	-	-	-	13	1000
8	Overall Right Side	6746	1911	1040	-5	6306	12.5	1000
9	Right Side View	8398	1374	1059	-2	7958	25	1000
10	Right Passenger View	7631	1996	1085	-3	7191	35	1000
11	Passenger and Interior View	5001	3055	1905	-10	-	25	1005
12	Right Belt	-	-	-	-	-	13	930
13	Passenger Front View	605	-55	1985	-36	-	13	1000
14	Driver Front View	605	-55	1985	-35	-	13	1000
15	Windshield View	0	-673	3560	-48	-	13	1000
16	Pit View of Engine	0	1012	-3048	90	-	13	1045
17	Pit View of Fuel Tank	0	2860	-3048	90	-	13	1000

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

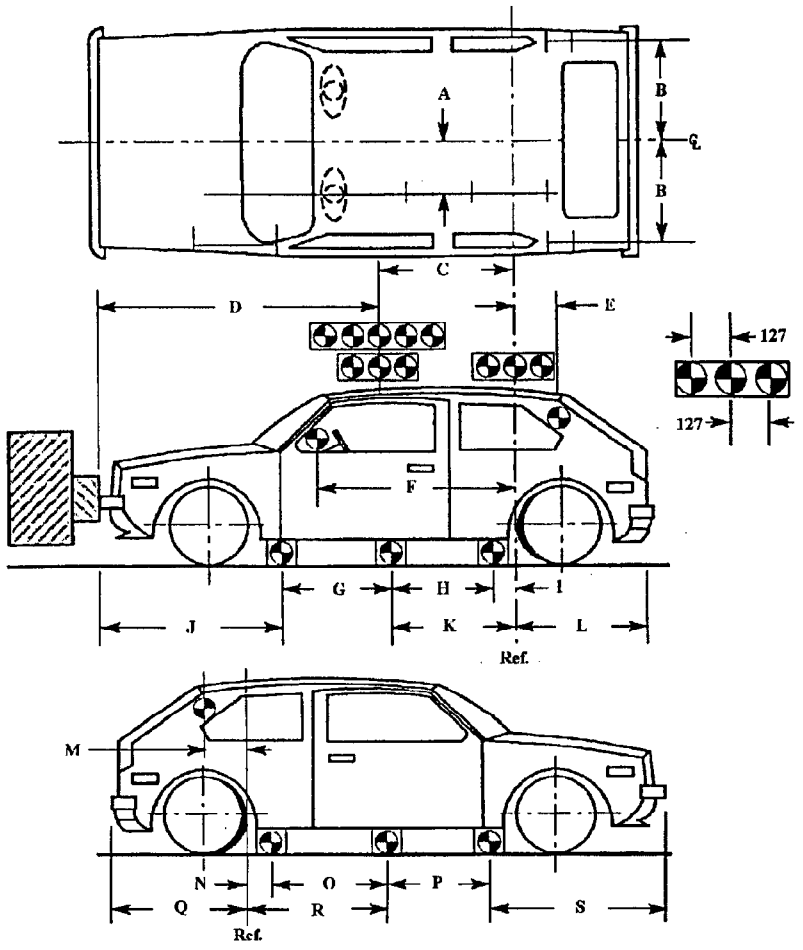
** = referenced to horizontal plane

N.T. indicates No Timing

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

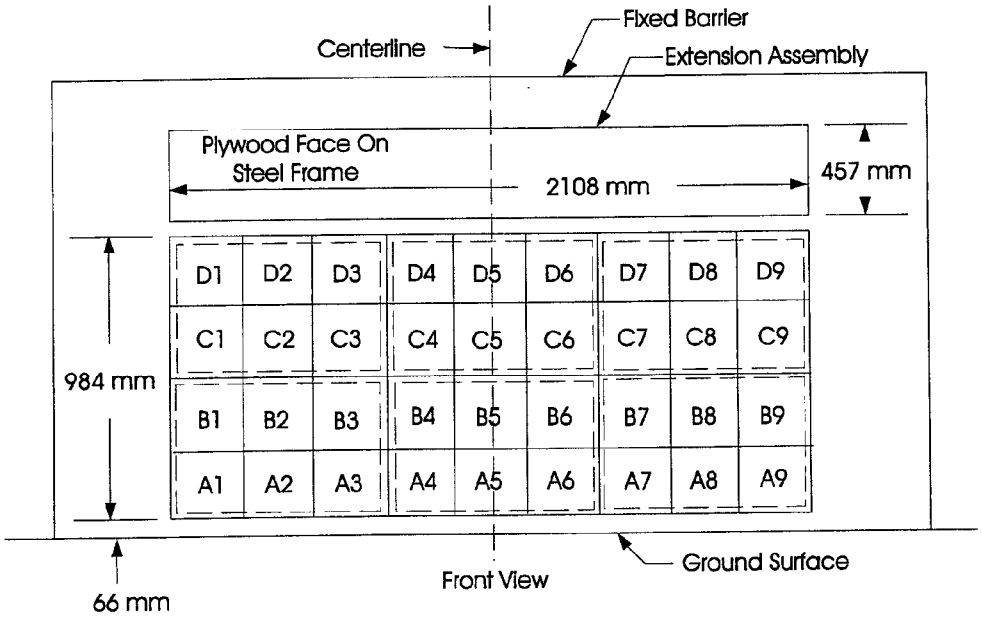
(Dimensions in millimeters)

A	364
B	550
C	914
D	2479
E	308
F	1536
G	896
H	901
I	125
J	1461
K	1026
L	1443
M	313
N	122
O	900
P	899
Q	1438
R	1022
S	1466



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. : MY0108; Test Date: August 31, 1999; Technician: LQV

Vehicle Model Year/Make/Model: 2000 Saturn LS

A. No. of vent holes: 0 -Driver 2 -Passenger

B. Size of vent holes: (mm^2) - -Driver 78.5 -Passenger

C. Total vent area: (mm^2) - -Driver 157.0 -Passenger

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

Driver: - -Length; - -Width; 620 -Diameter

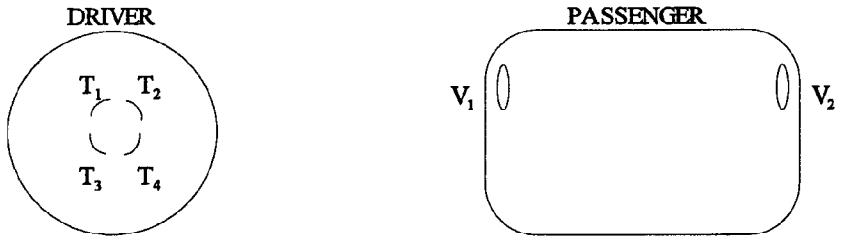
Passenger: 640 -Height; 428 -Width; 398 -Depth

E. Is the air bag tethered?

Driver: X -Yes; - -No; If yes, record length of tether- 230

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: P5201130-00CC04; TMK1028S0353

Generator: GFX K5B 0Q CME; GGK K63 53 AB0

Passenger: Air bag: P520 1600-00BB01; TMK 1148S0428

Generator: AL681318169V0134; GGJ K6J 48 AG1

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA

FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Saturn LS 4-Door Sedan

NHTSA Test No.: MY0108 VIN: 1G8JS52F4YY601268

Model Year: 2000 Build Date: 07/99 Test Date: August 31, 1999

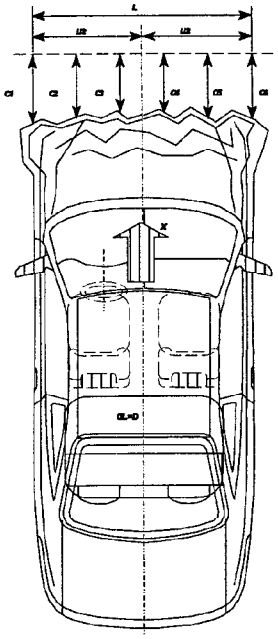
Vehicle Size Category: Mid-Size Passenger Car Test Weight: 1561.5 kg

Vehicle Wheelbase: 2702 mm; Front Overhang: 1461 mm; Overall Width: 1754 mm

Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions;

	PRE	POST	DIFF	
C1 =	4509	4093	-416	mm
C2 =	4758	4198	-560	mm
C3 =	4820	4245	-575	mm
C4 =	4821	4284	-537	mm
C5 =	4759	4280	-479	mm
C6 =	4508	4151	-357	mm



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region:

L1= 1754 mm

L2= 877 mm

L3= 585 mm

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

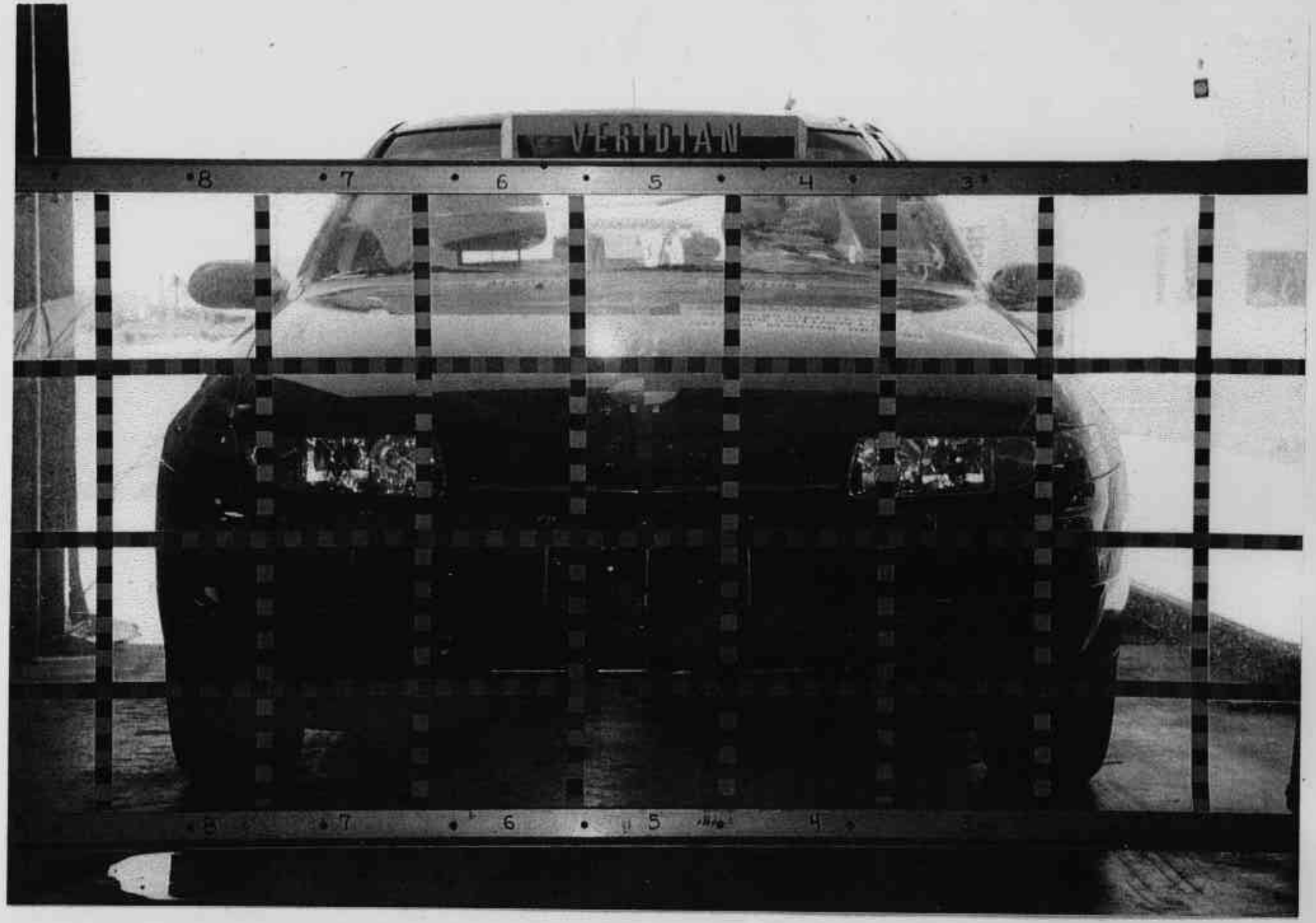


Figure A-1 LOAD CELL LOCATIONS

8413-39

Figure A-2 PRE-TEST FRONT VIEW

Figure A-3 POST-TEST FRONT VIEW

Figure A-4 PRE-TEST LEFT SIDE VIEW

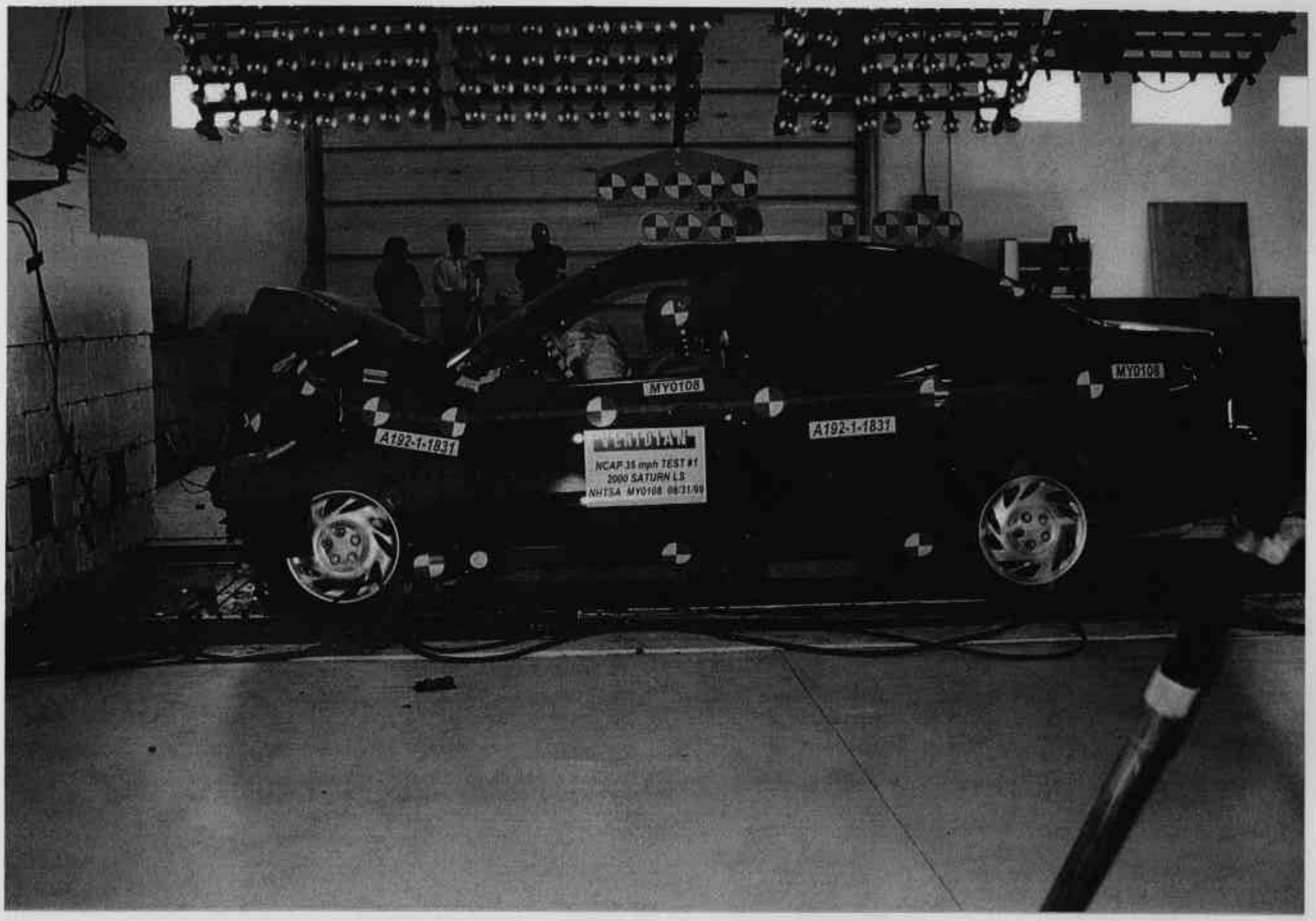


Figure A-5 POST-TEST LEFT SIDE VIEW

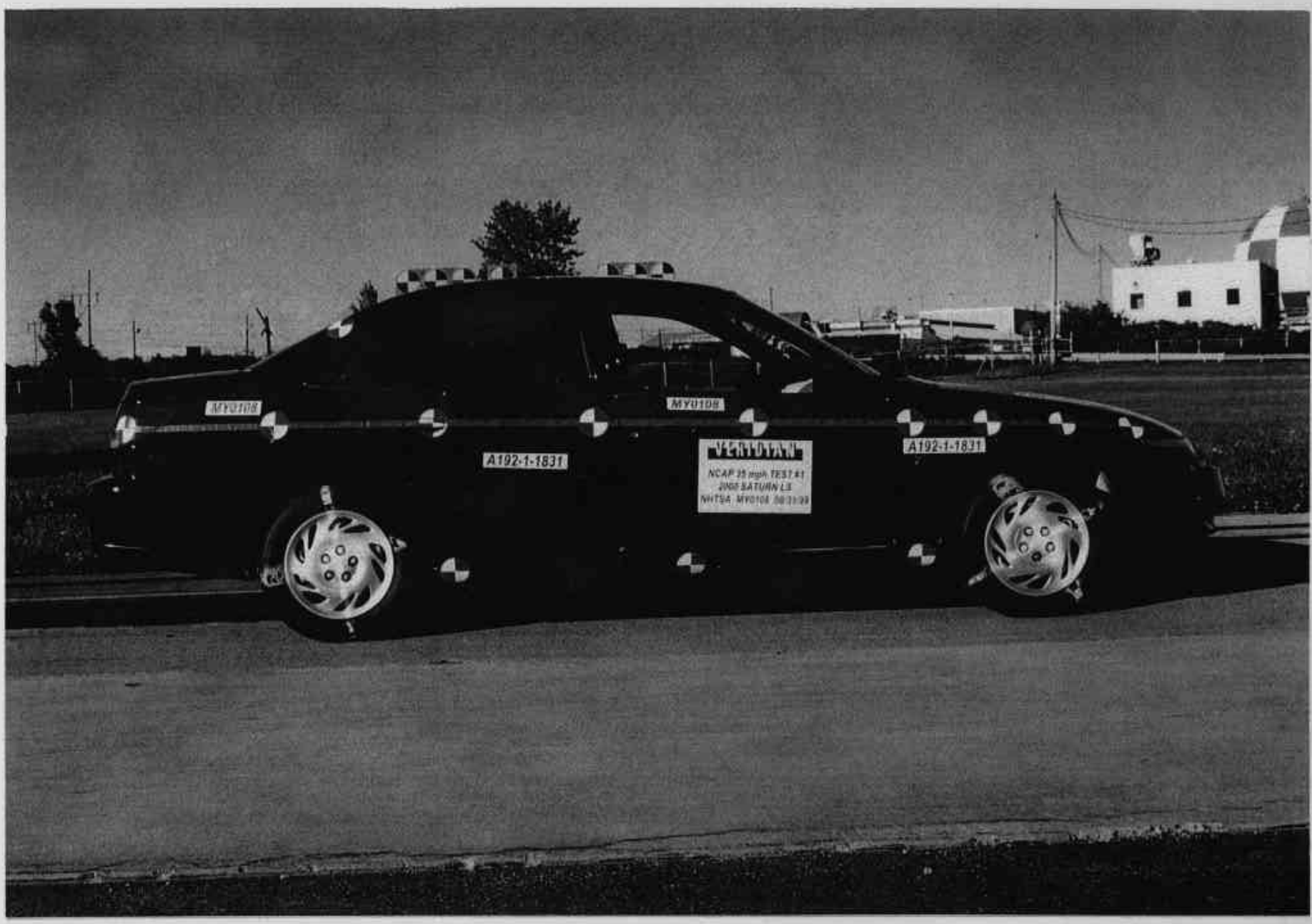


Figure A-6 PRE-TEST RIGHT SIDE VIEW

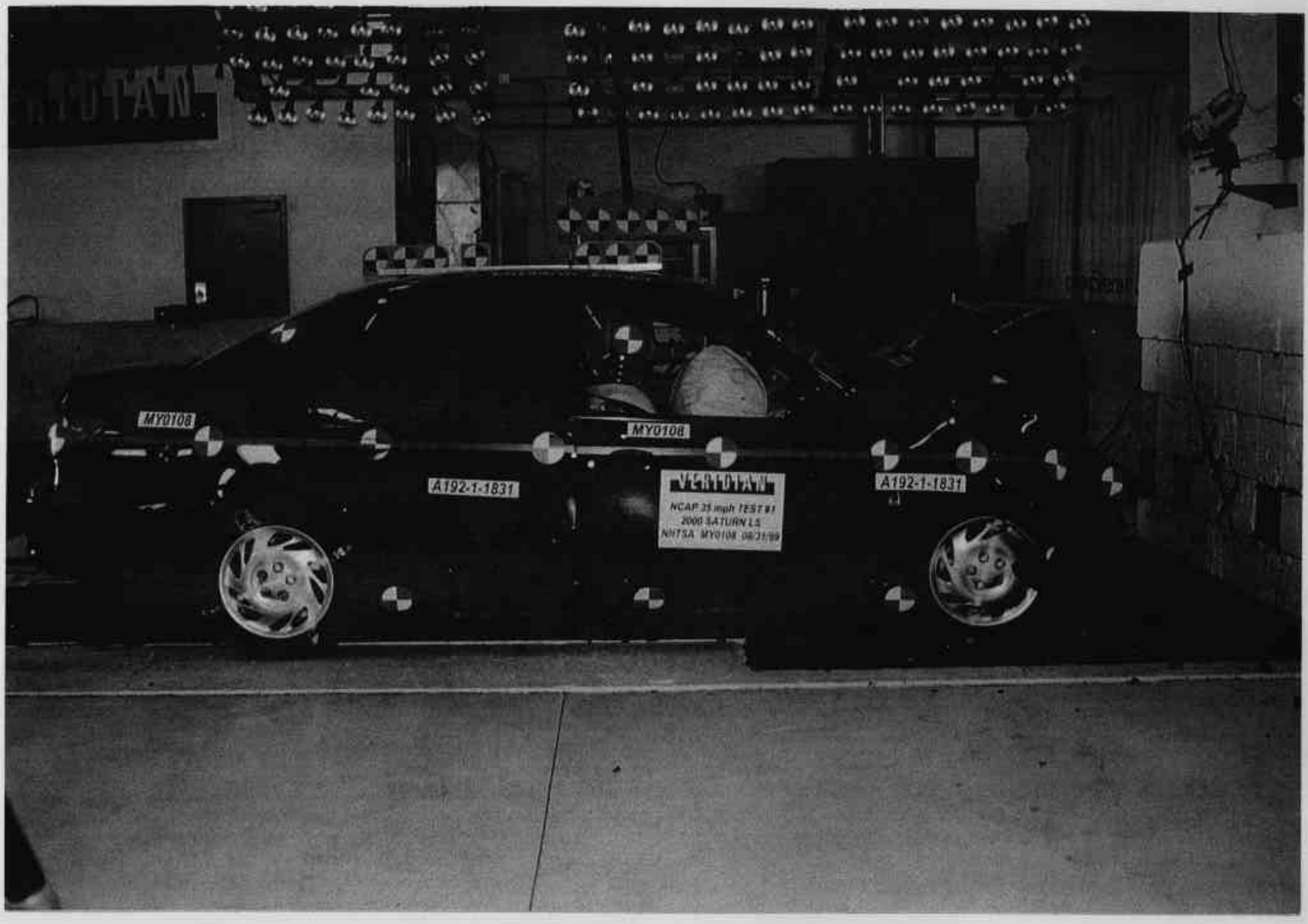


Figure A-7 POST-TEST RIGHT SIDE VIEW

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

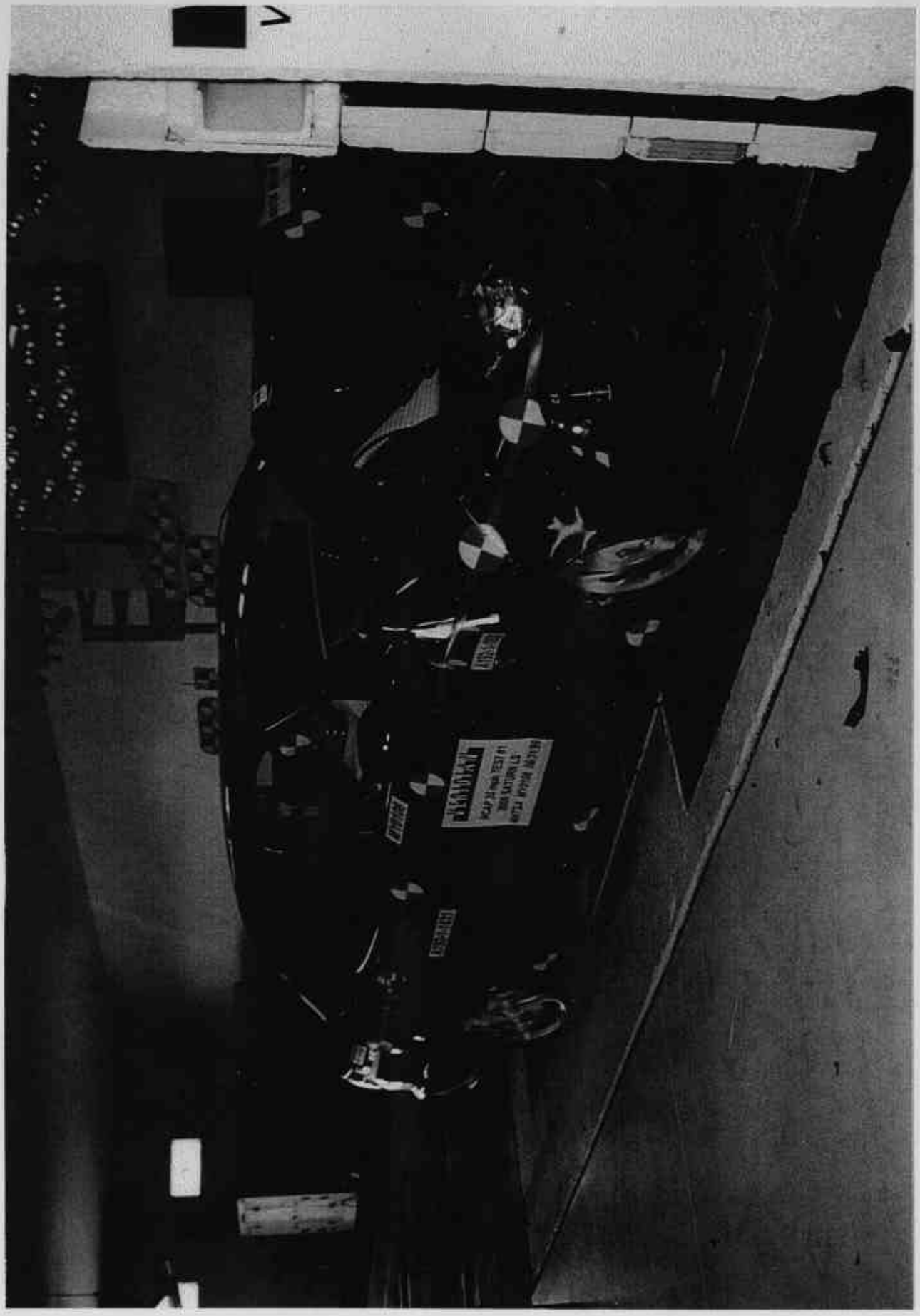


Figure A-9. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

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

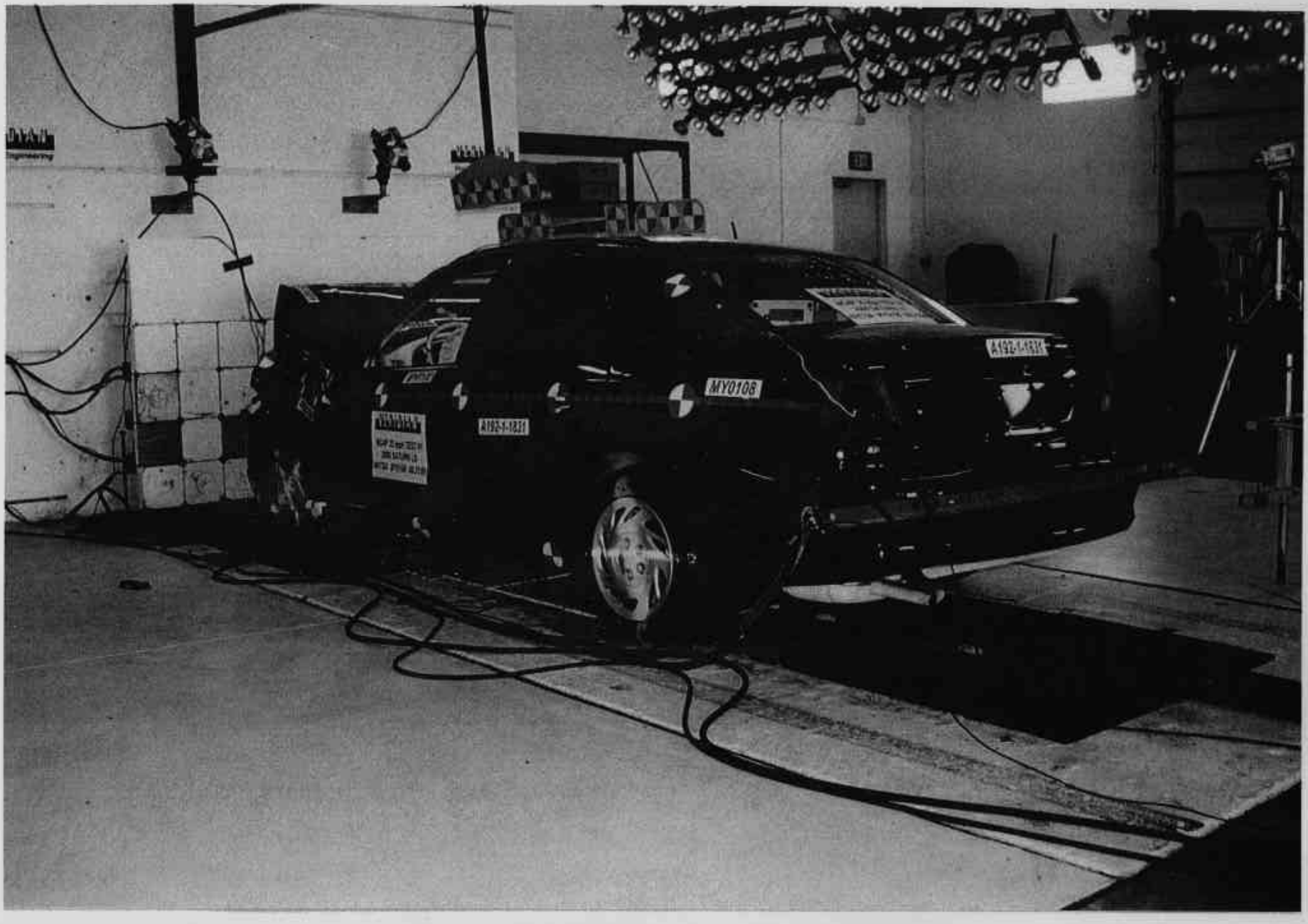


Figure A-11 POST-TEST LEFT REAR THREE-QUARTER VIEW

Figure A-12 PRE-TEST WINDSHIELD VIEW

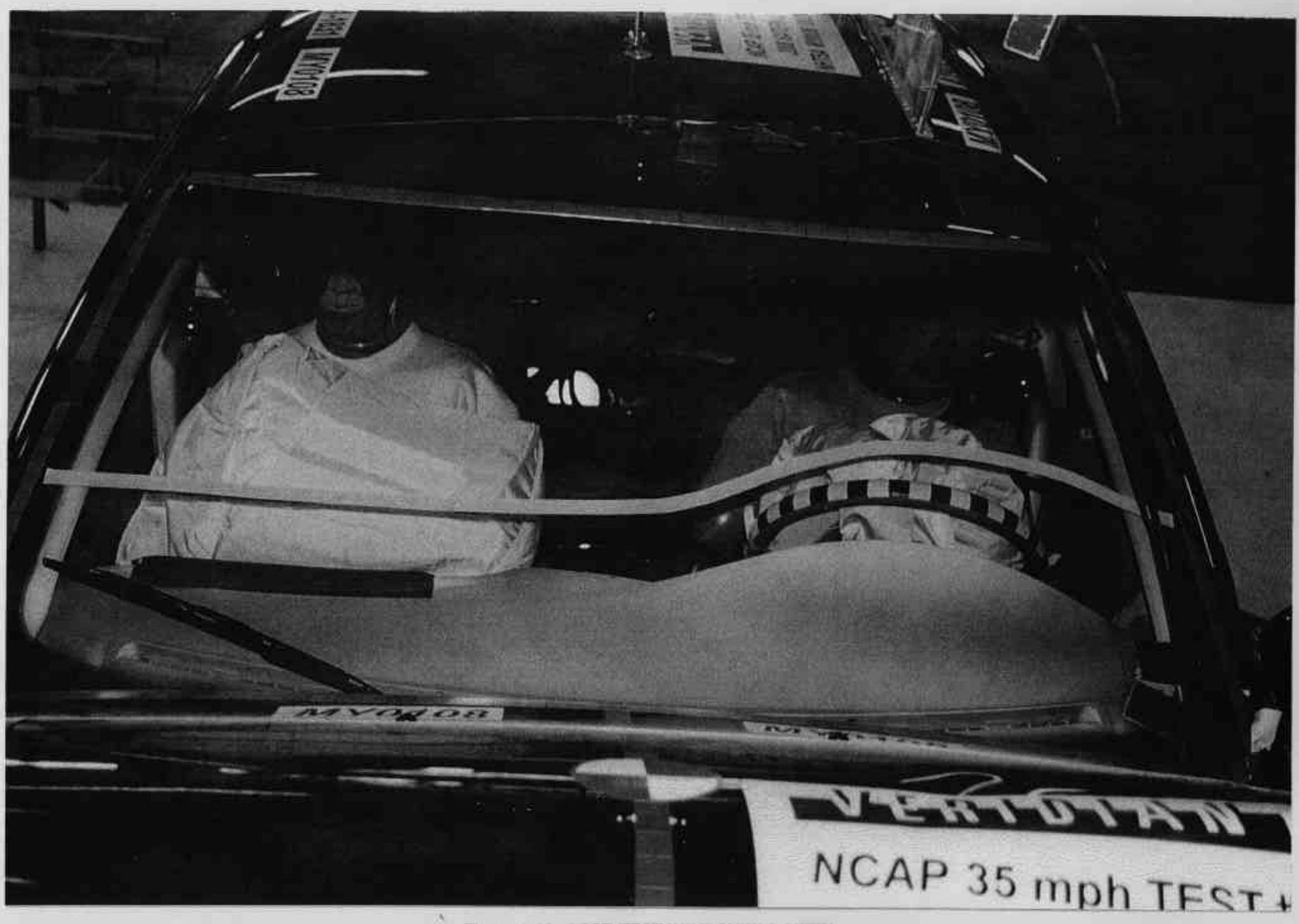


Figure A-13 POST-TEST WINDSHIELD VIEW

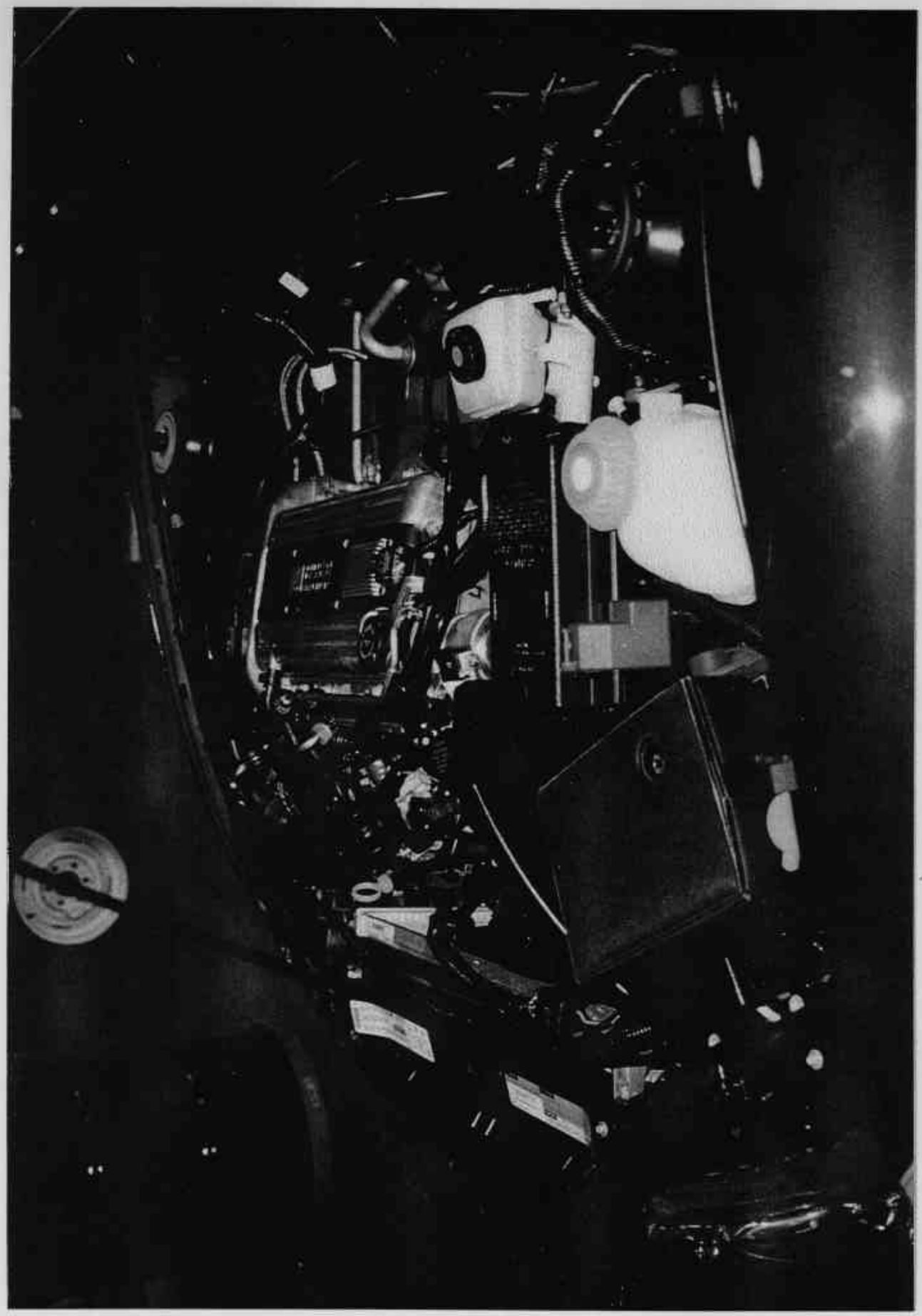


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-15 FUEL CAP VIEW

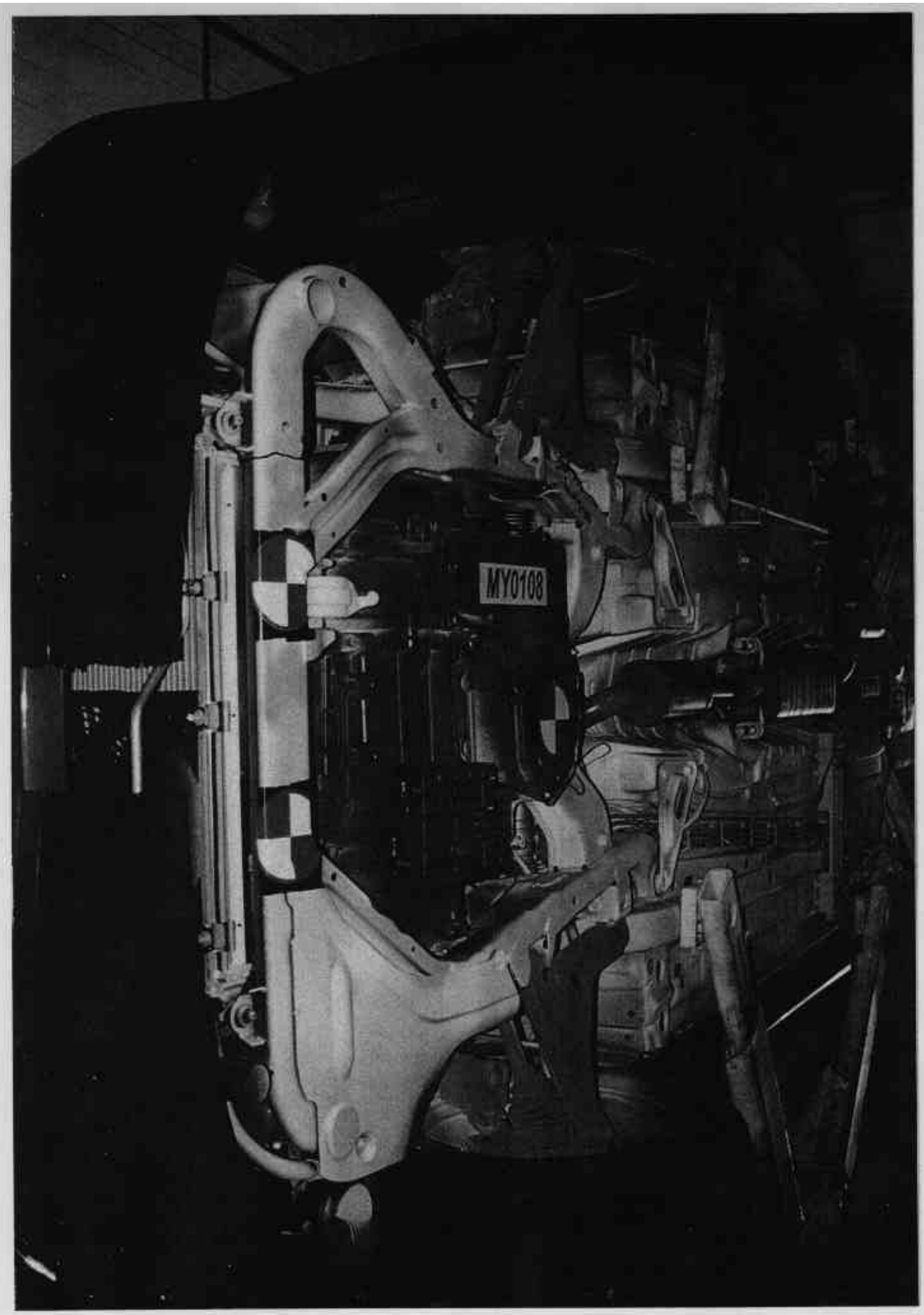


Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

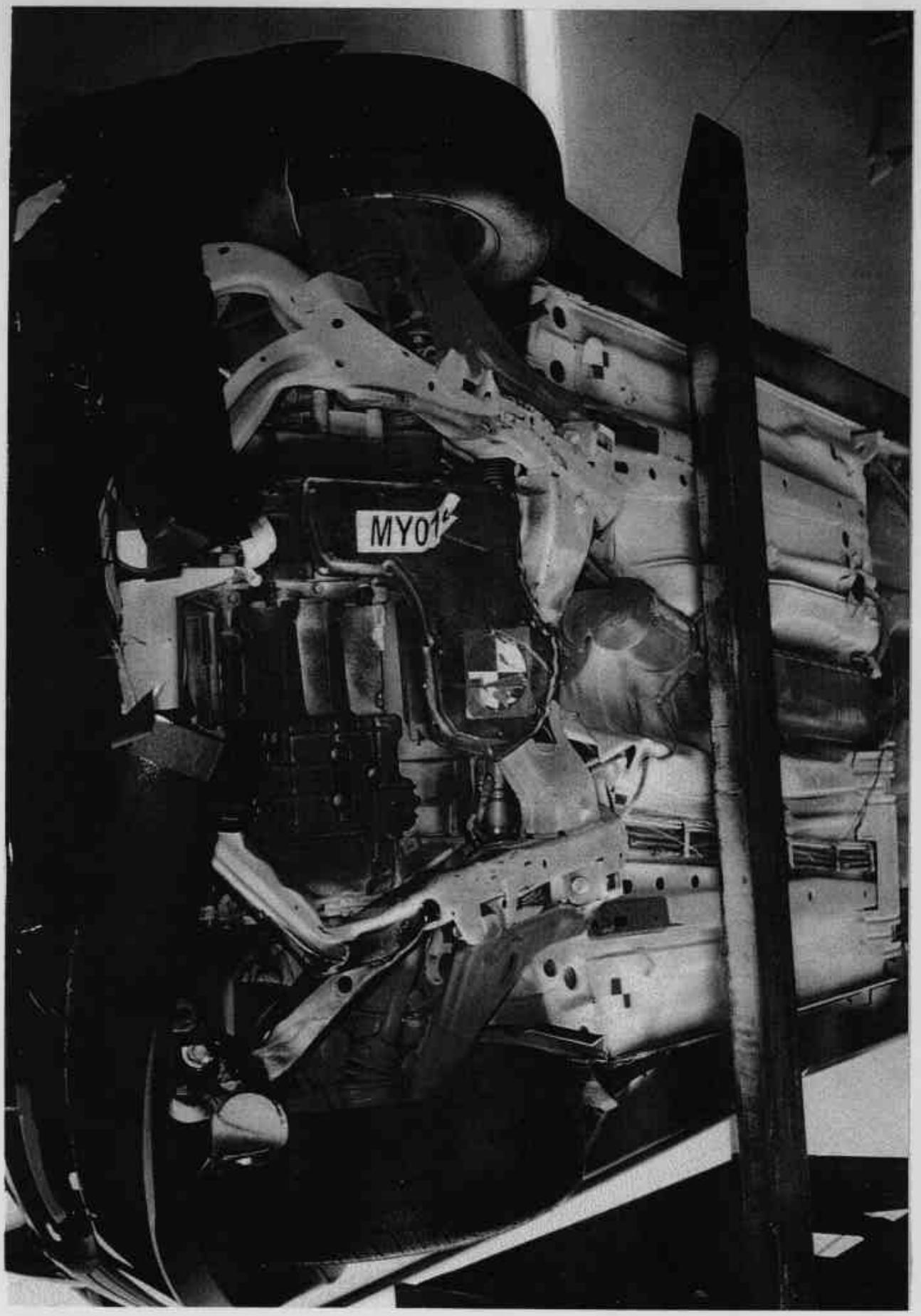


Figure A-17 POST-TEST FRONT UNDERBODY VIEW

Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

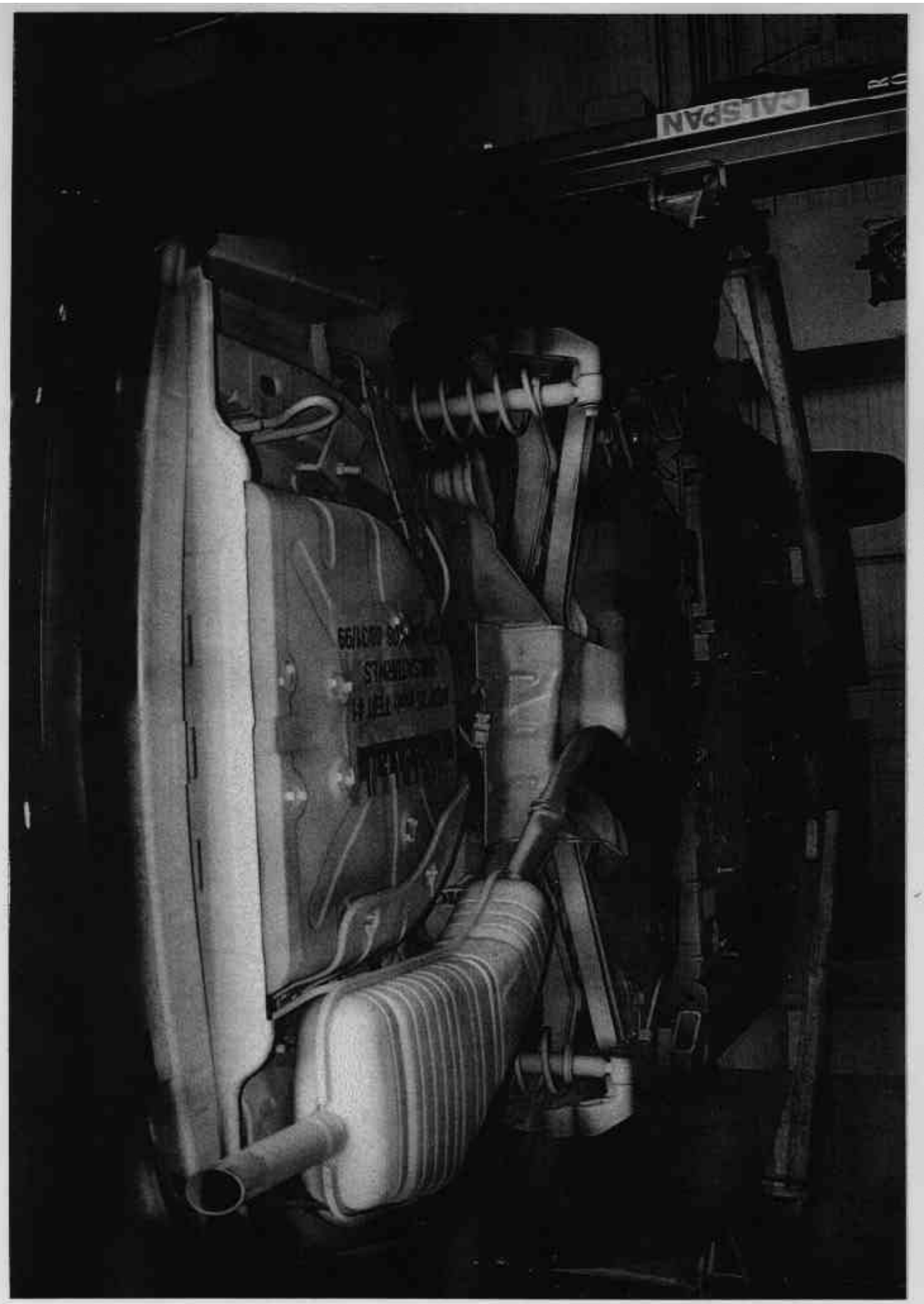


Figure A-20 PRE-TEST REAR UNDERBODY VIEW

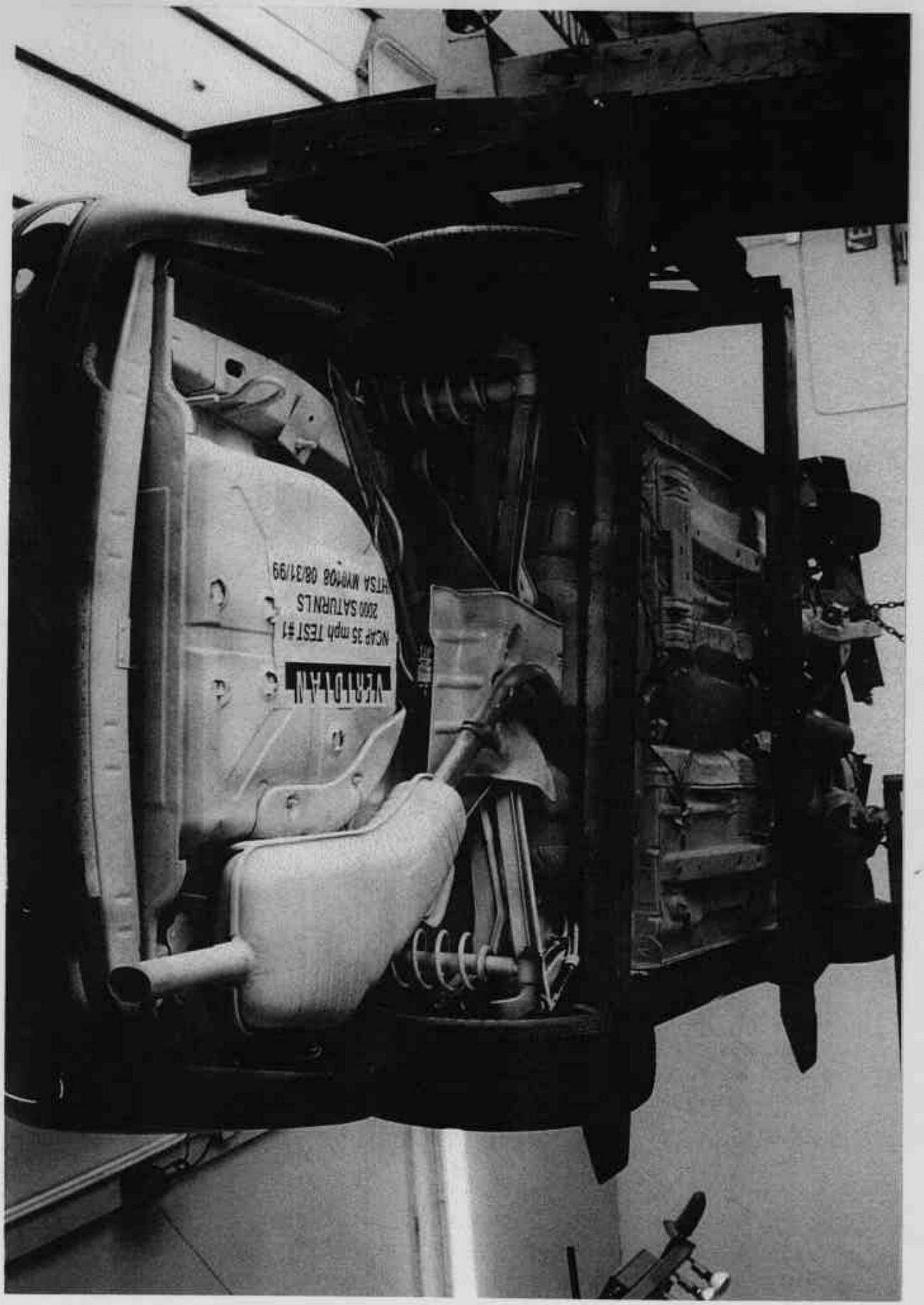


Figure A-21 POST-TEST REAR UNDERBODY VIEW

Figure A-22 PRE-TEST DRIVER POSITION VIEW

8413-39

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

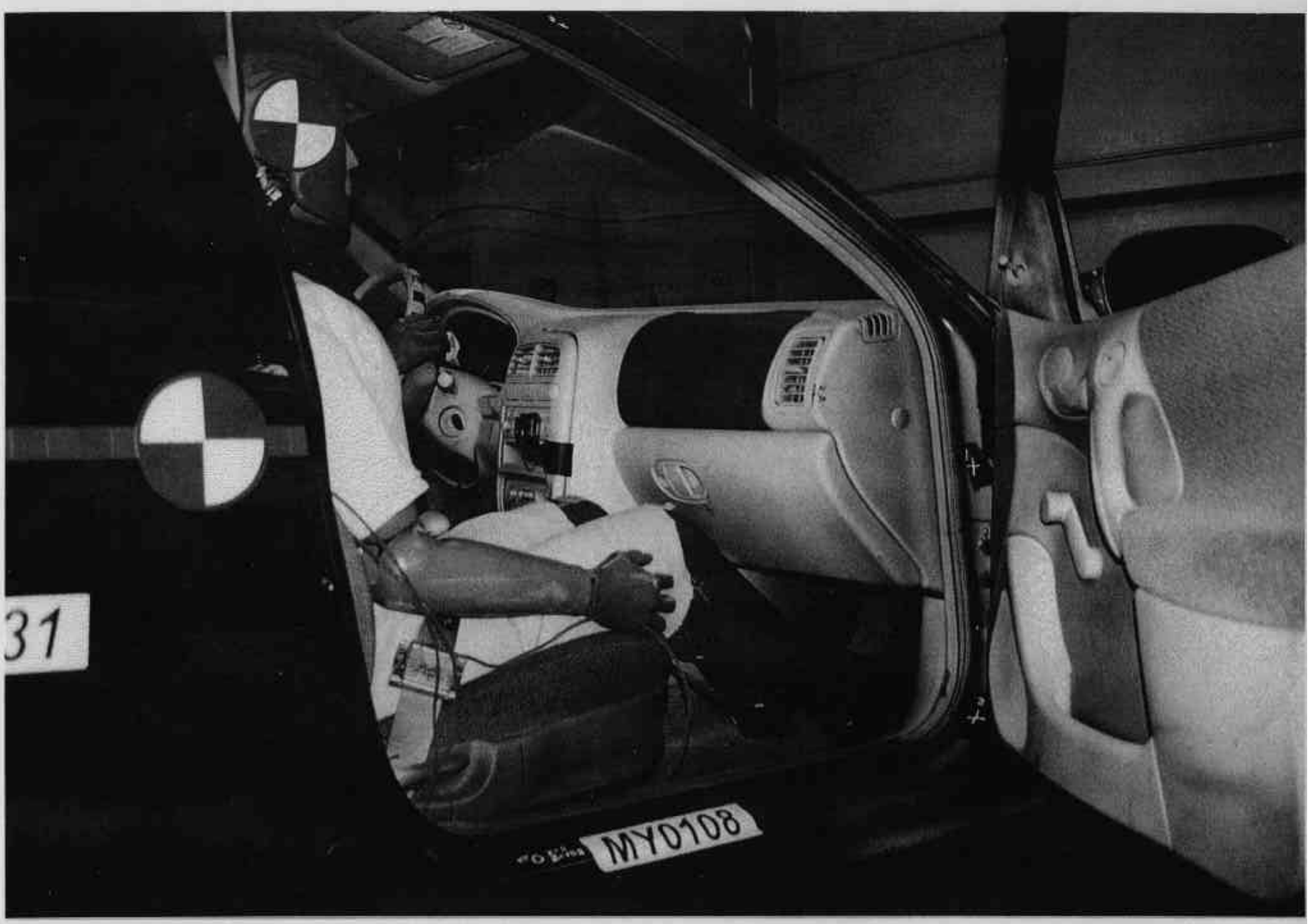


Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW

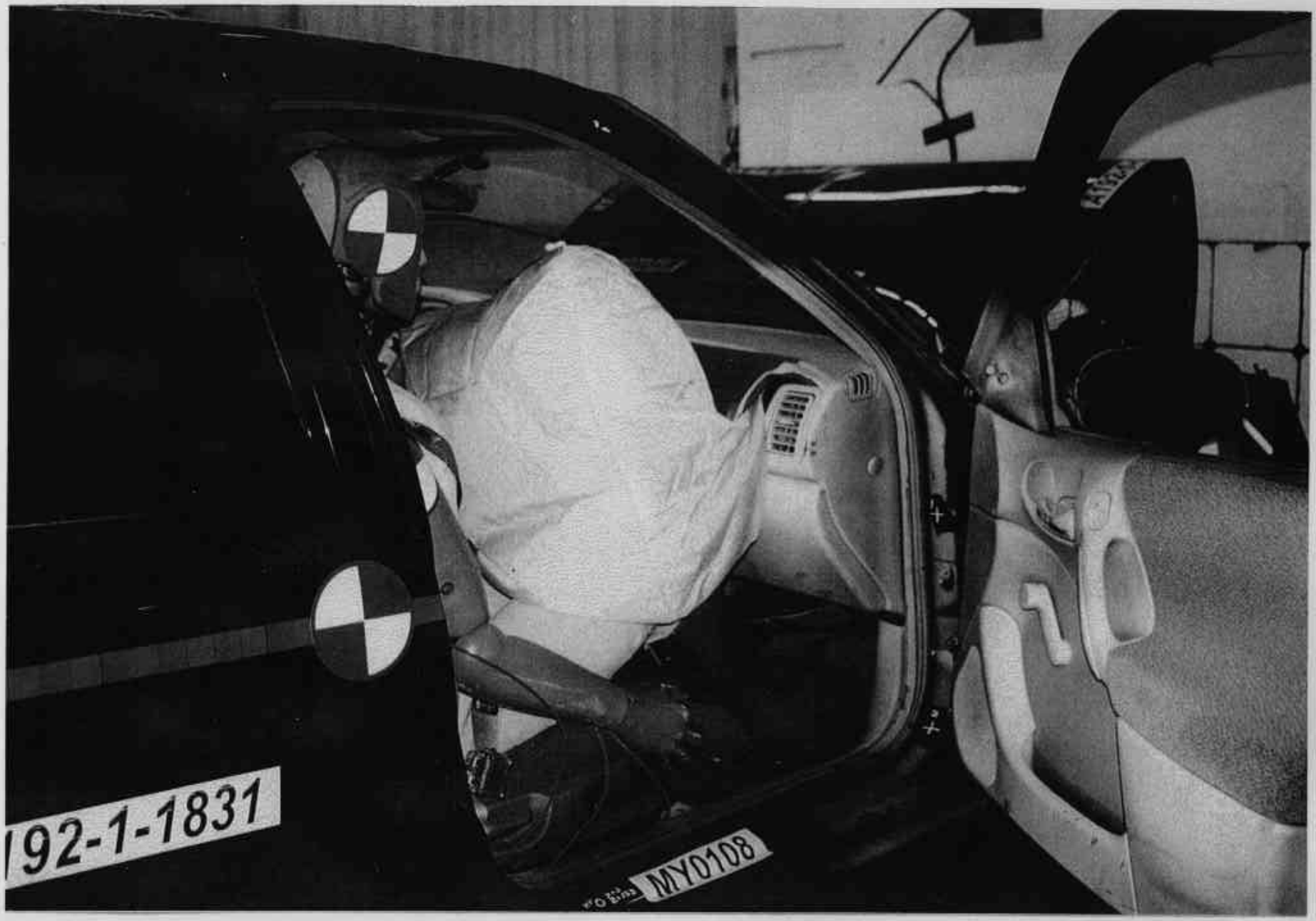


Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

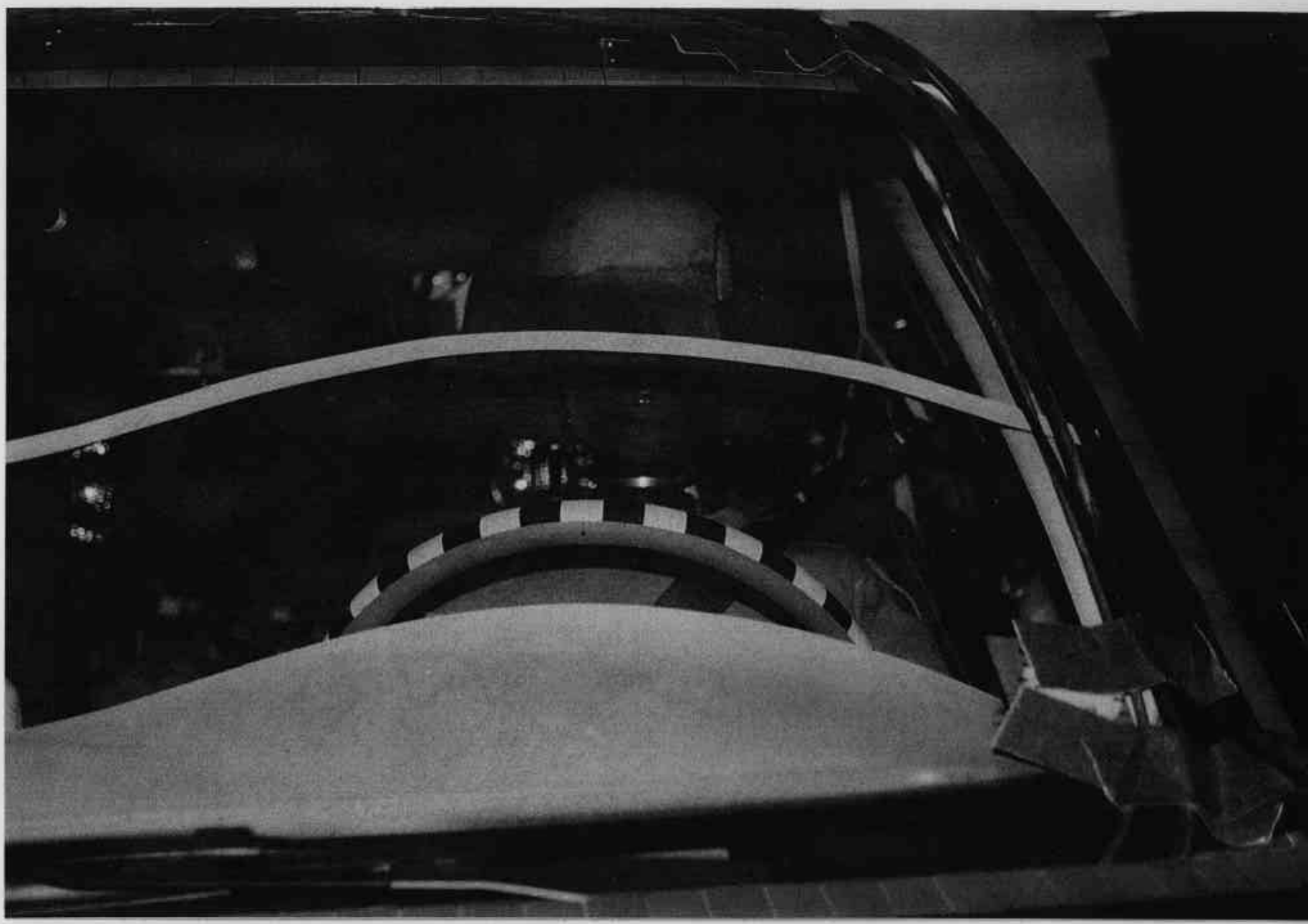


Figure A-30 PRE-TEST DRIVER HEAD LOCATION

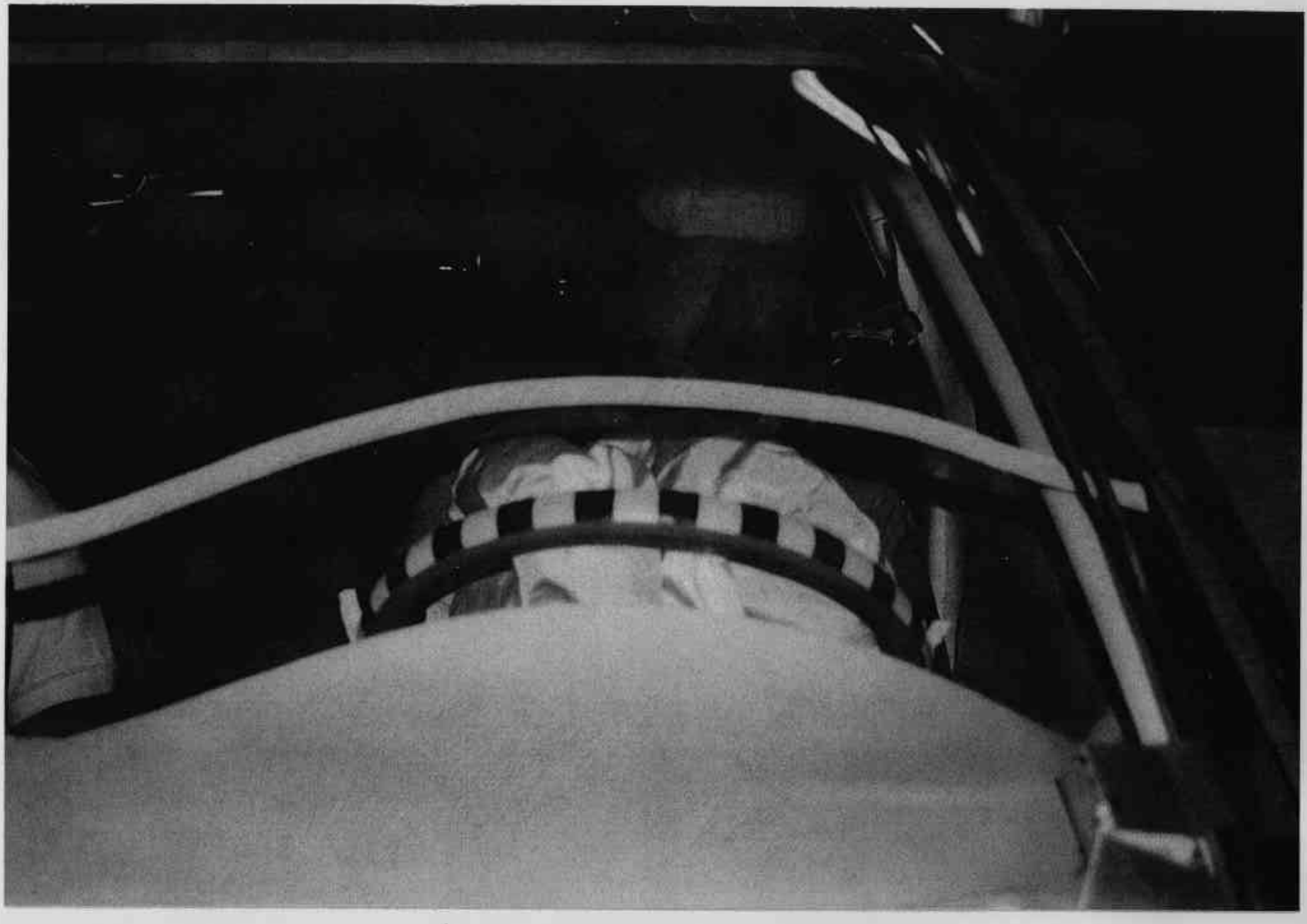


Figure A-31 POST-TEST DRIVER HEAD LOCATION

Figure A-32 PRE-TEST PASSENGER HEAD LOCATION

Figure A-33 POST-TEST PASSENGER HEAD LOCATION

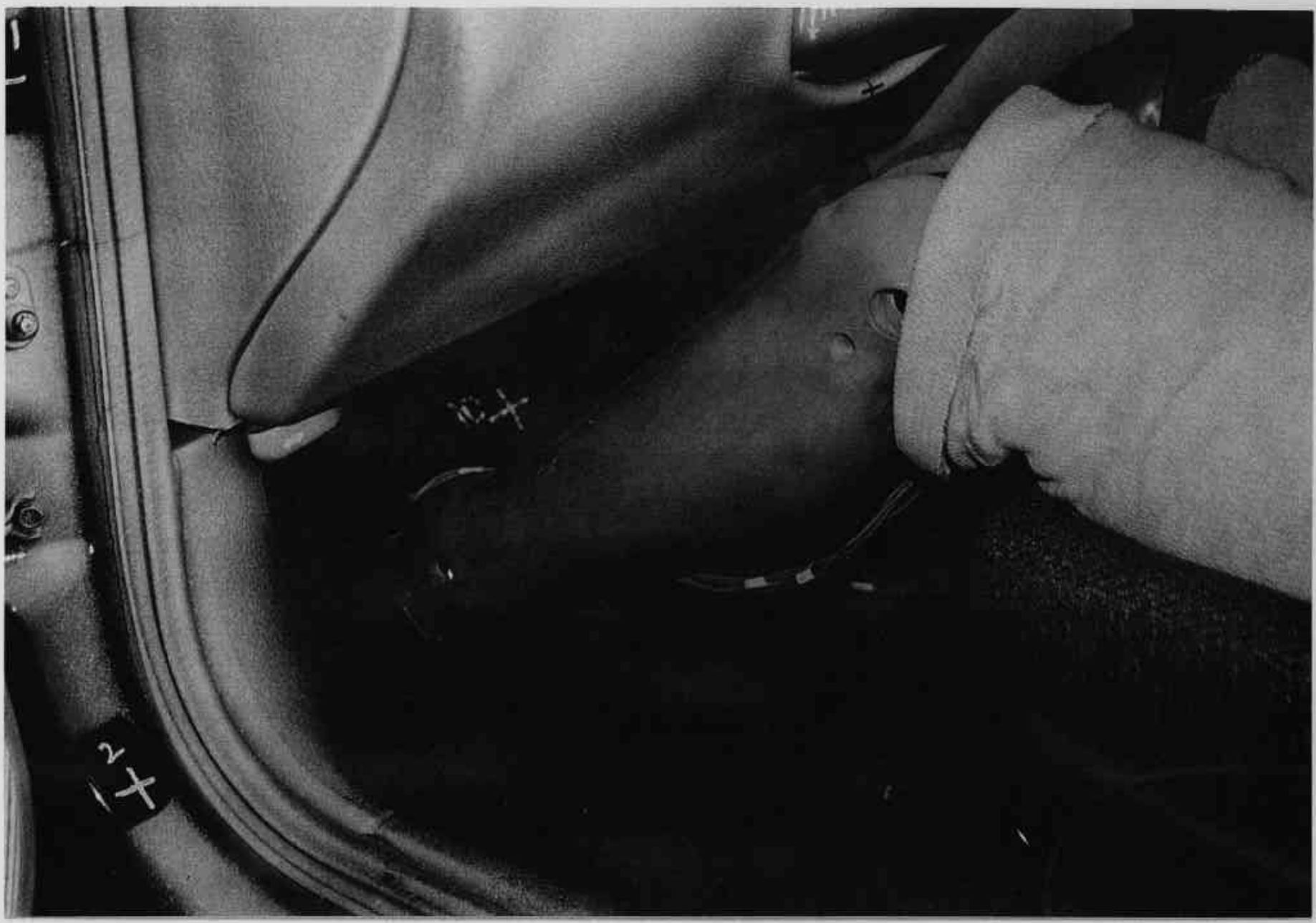


Figure A-34 PRE-TEST DRIVER FLOOR PAN VIEW

Figure A-35 POST-TEST DRIVER FLOOR PAN VIEW

8413-39

Figure A-36 PRE-TEST PASSENGER FLOOR PAN VIEW

Figure A-37 POST-TEST PASSENGER FLOOR PAN VIEW

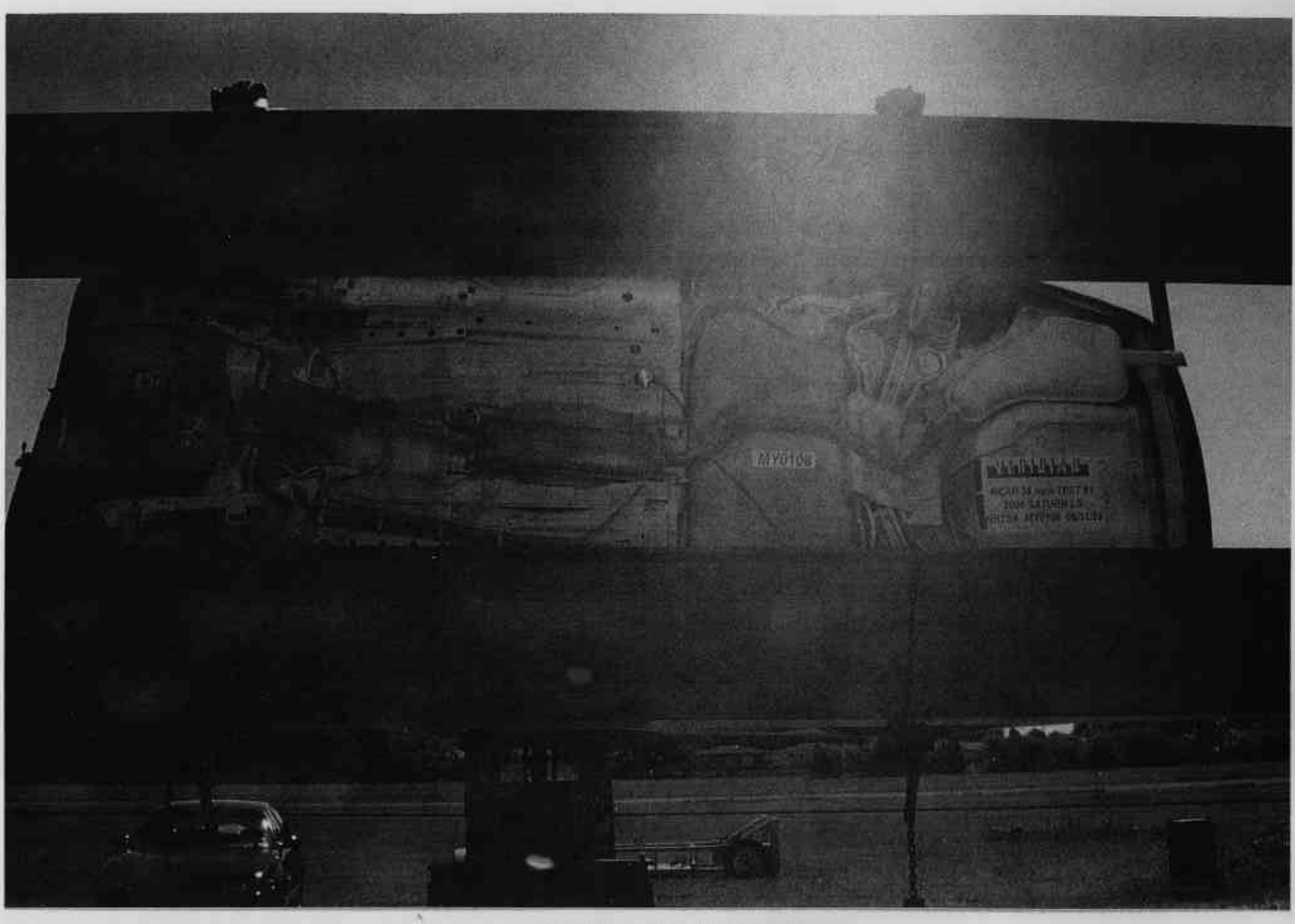


Figure A-38 ROLLOVER VIEW

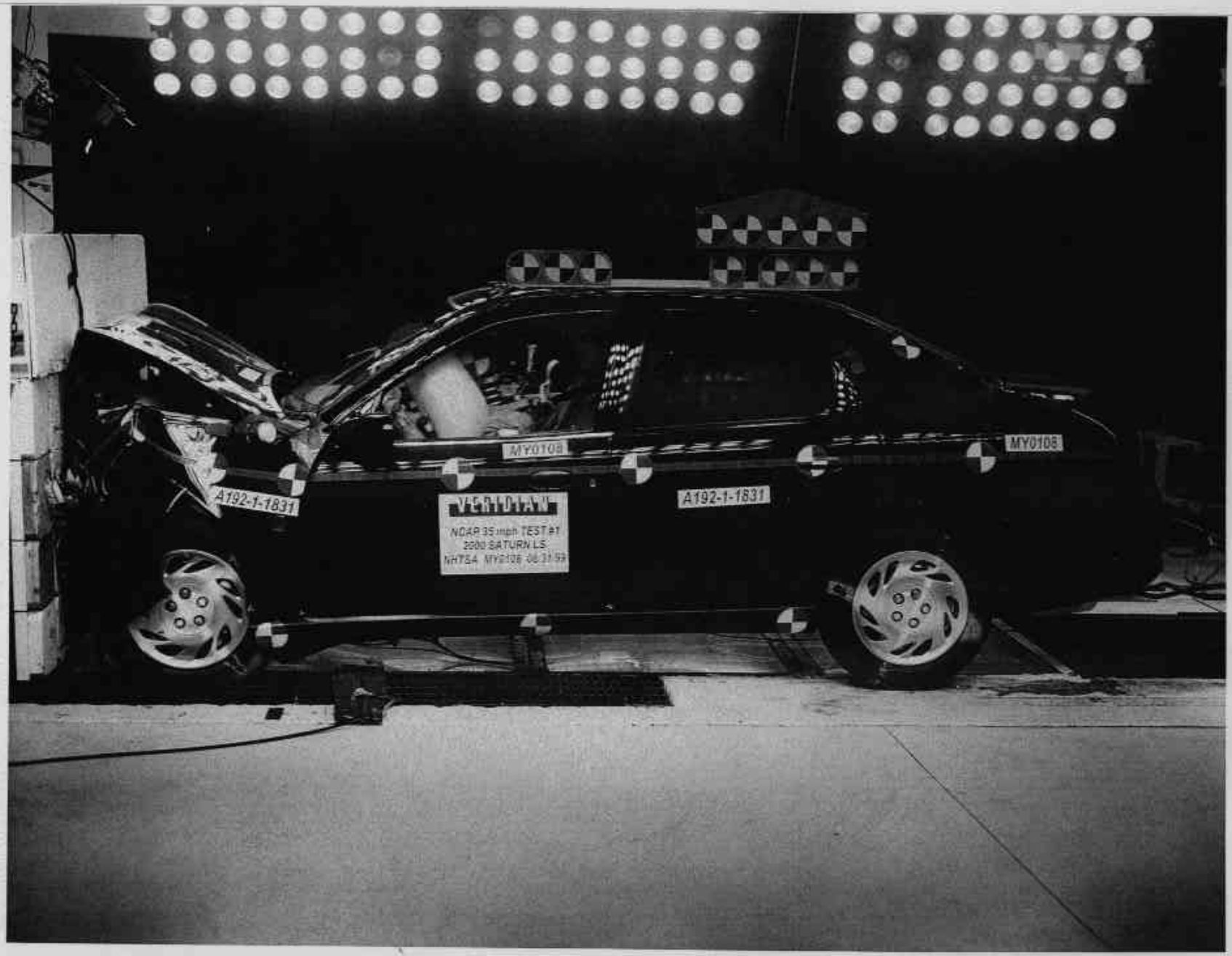


Figure A-39 IMPACT VIEW

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

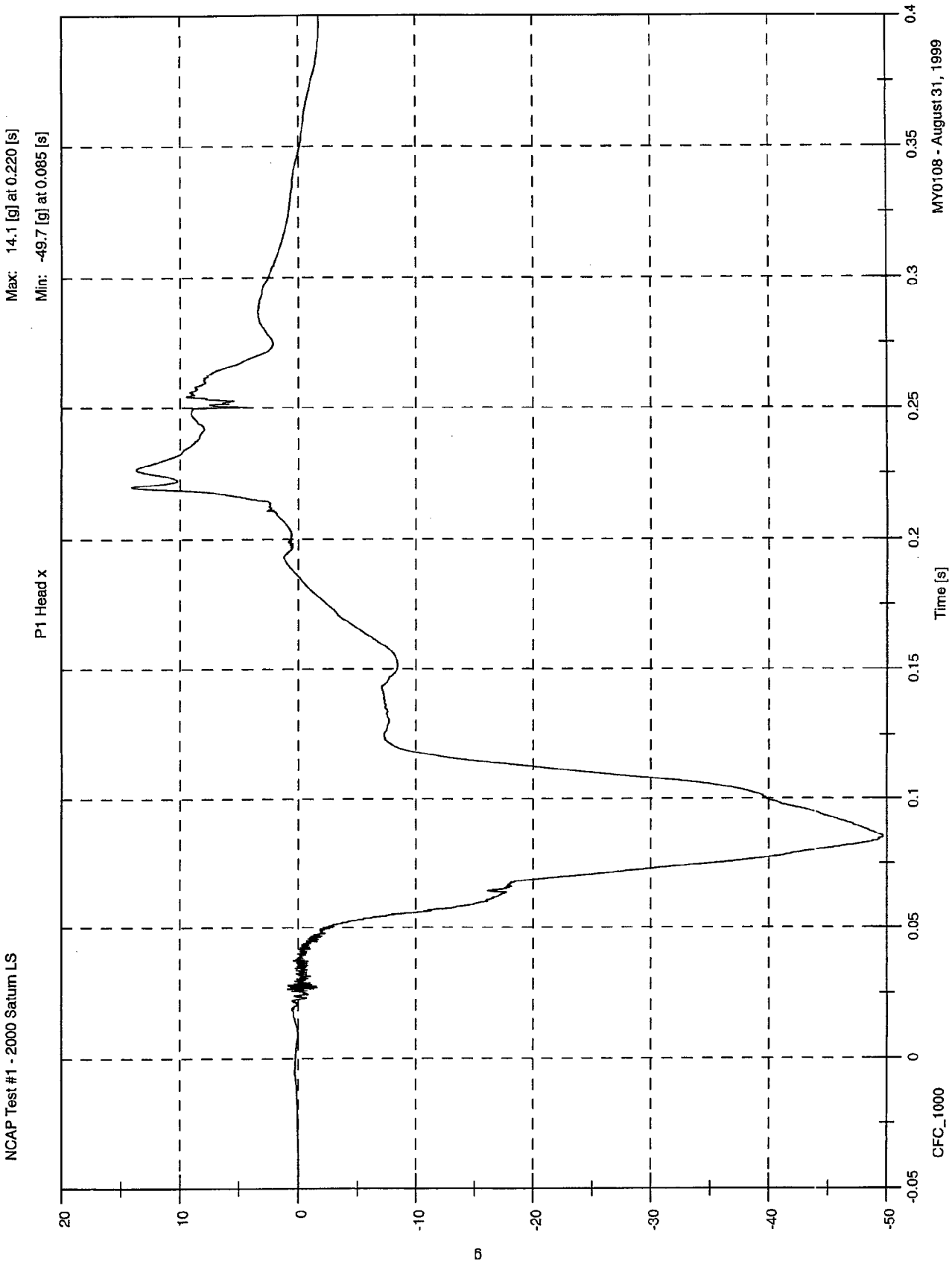
Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers

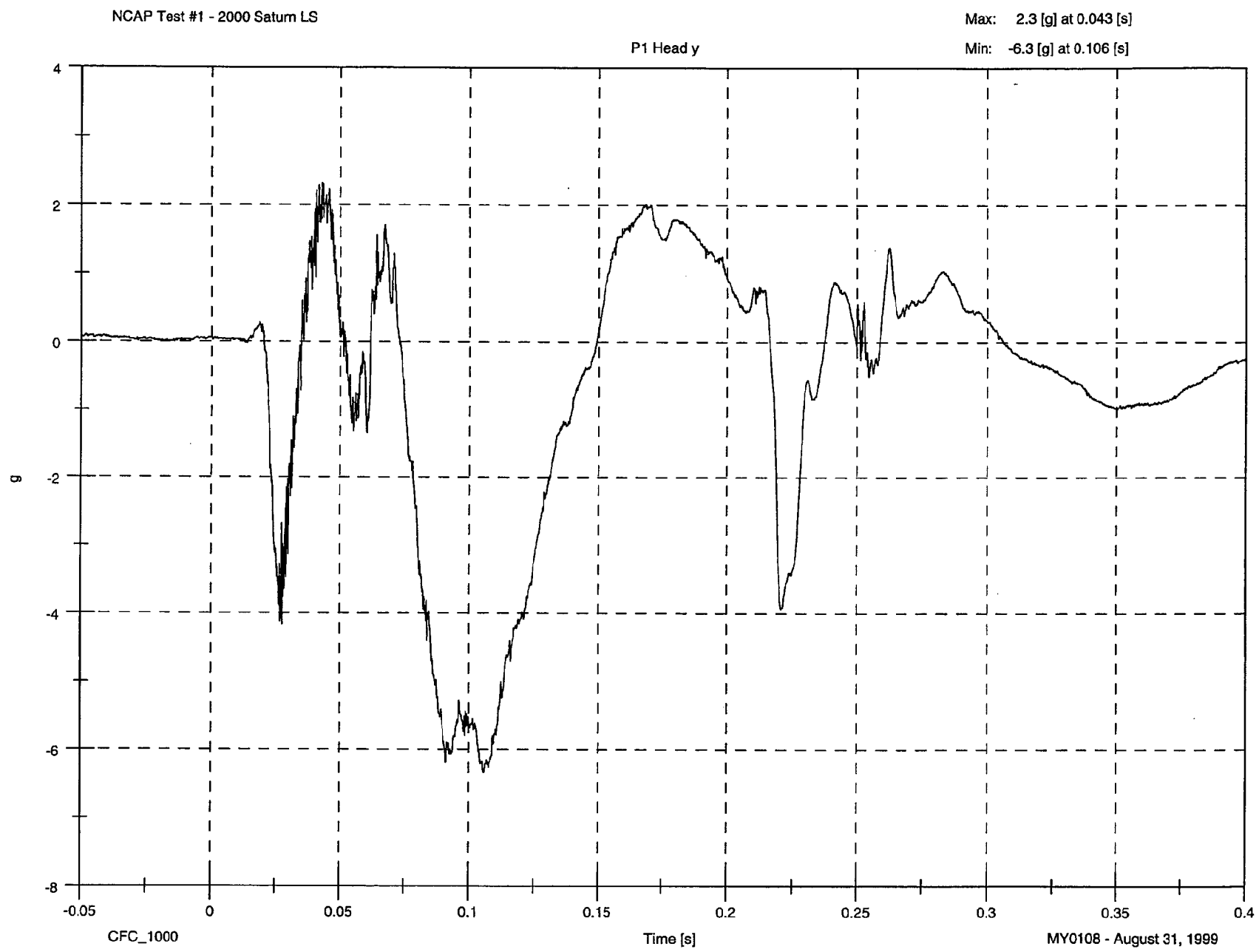
Transducer	SAE Sign Convention (positive unless noted)
Upper Neck Load Cell	Fx Head rearward Fy Head left Fz Neck in tension Mx Left ear to left shoulder My Chin to chest (flexion) Mz Chin to left shoulder (look left)
Chest Displacement Potentiometer	Compression is negative
Pelvic Load Cell (Lower Lumbar)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

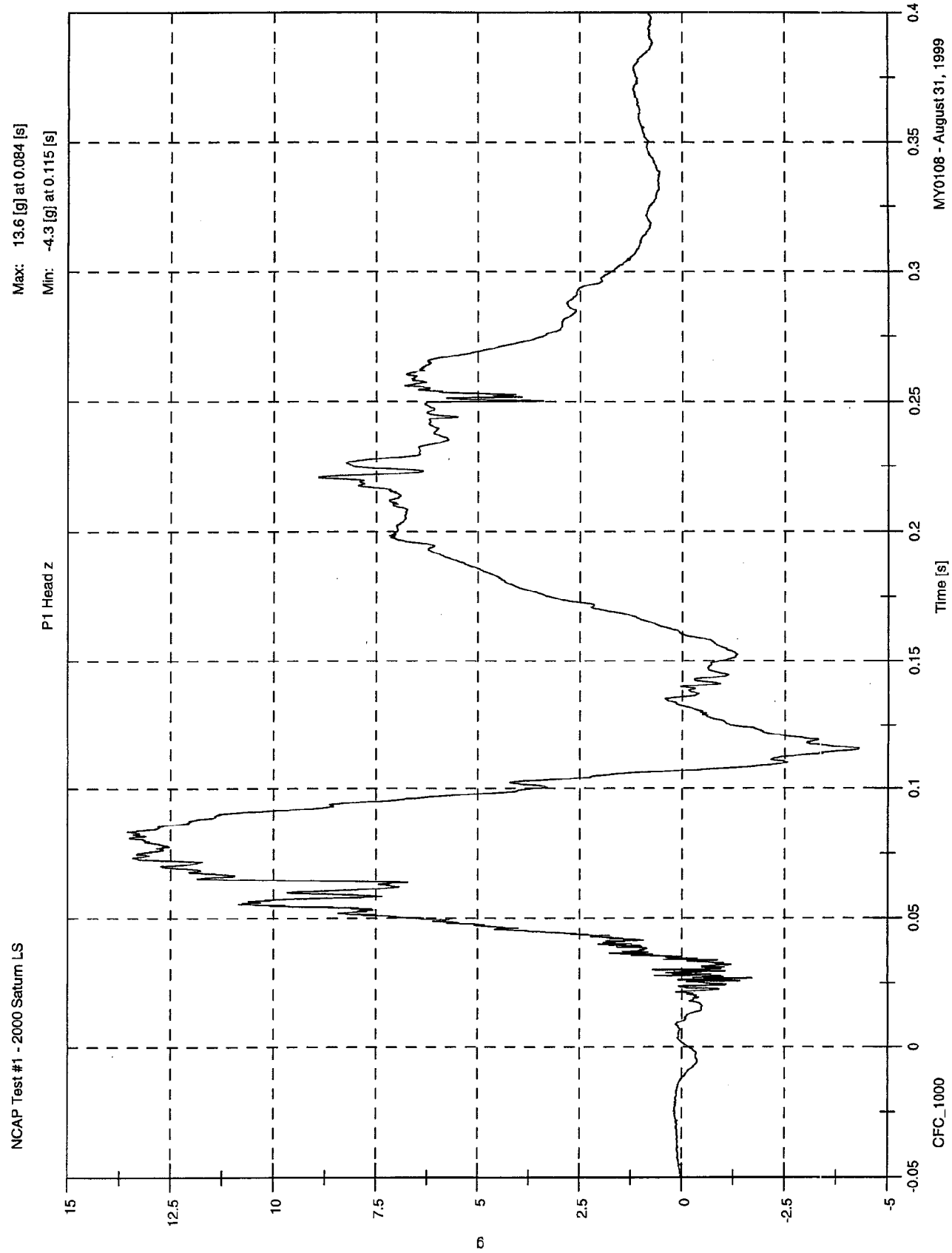
DATA CHANNEL FILTER CLASS SUMMARY

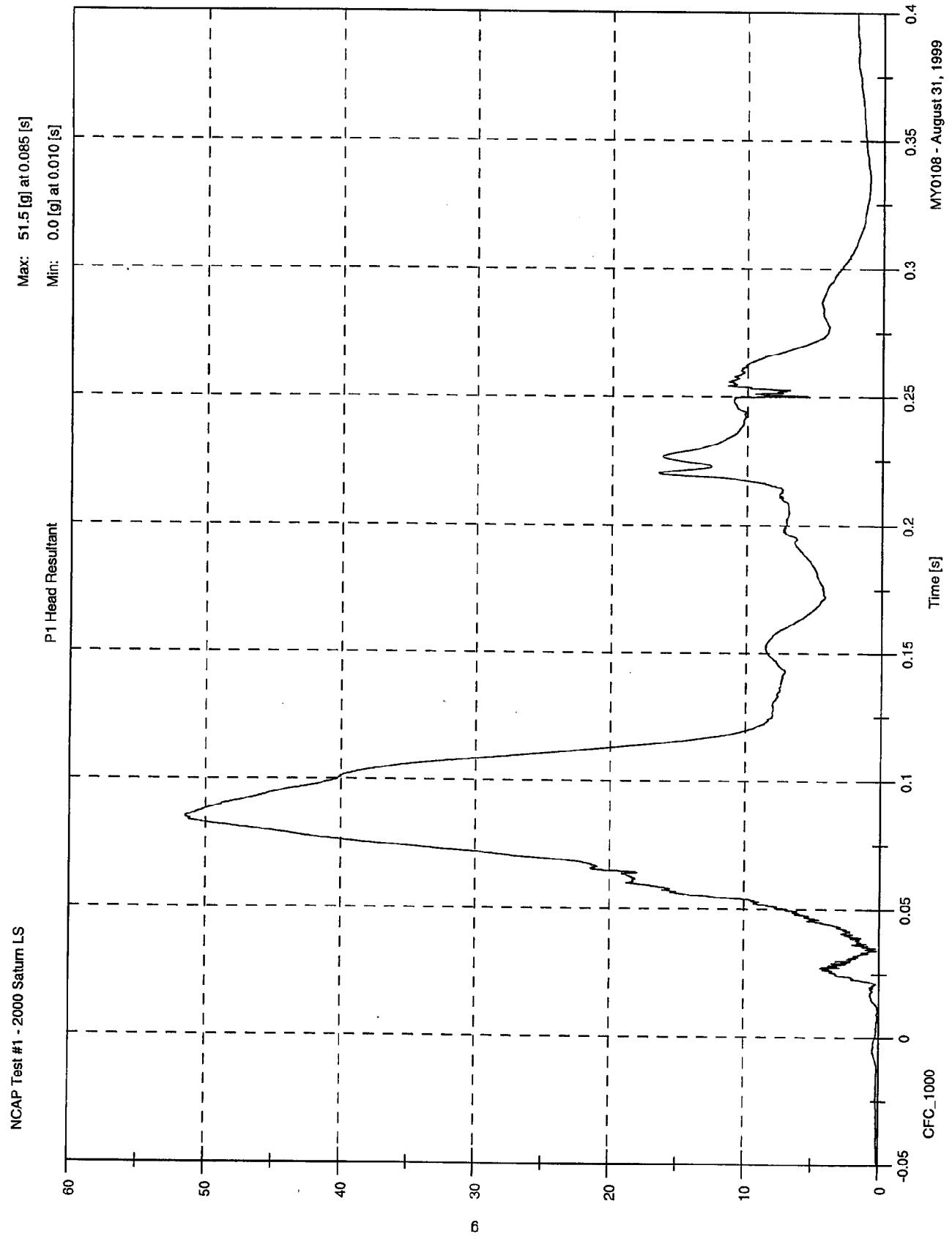
NHTSA TEST NO. MY0108

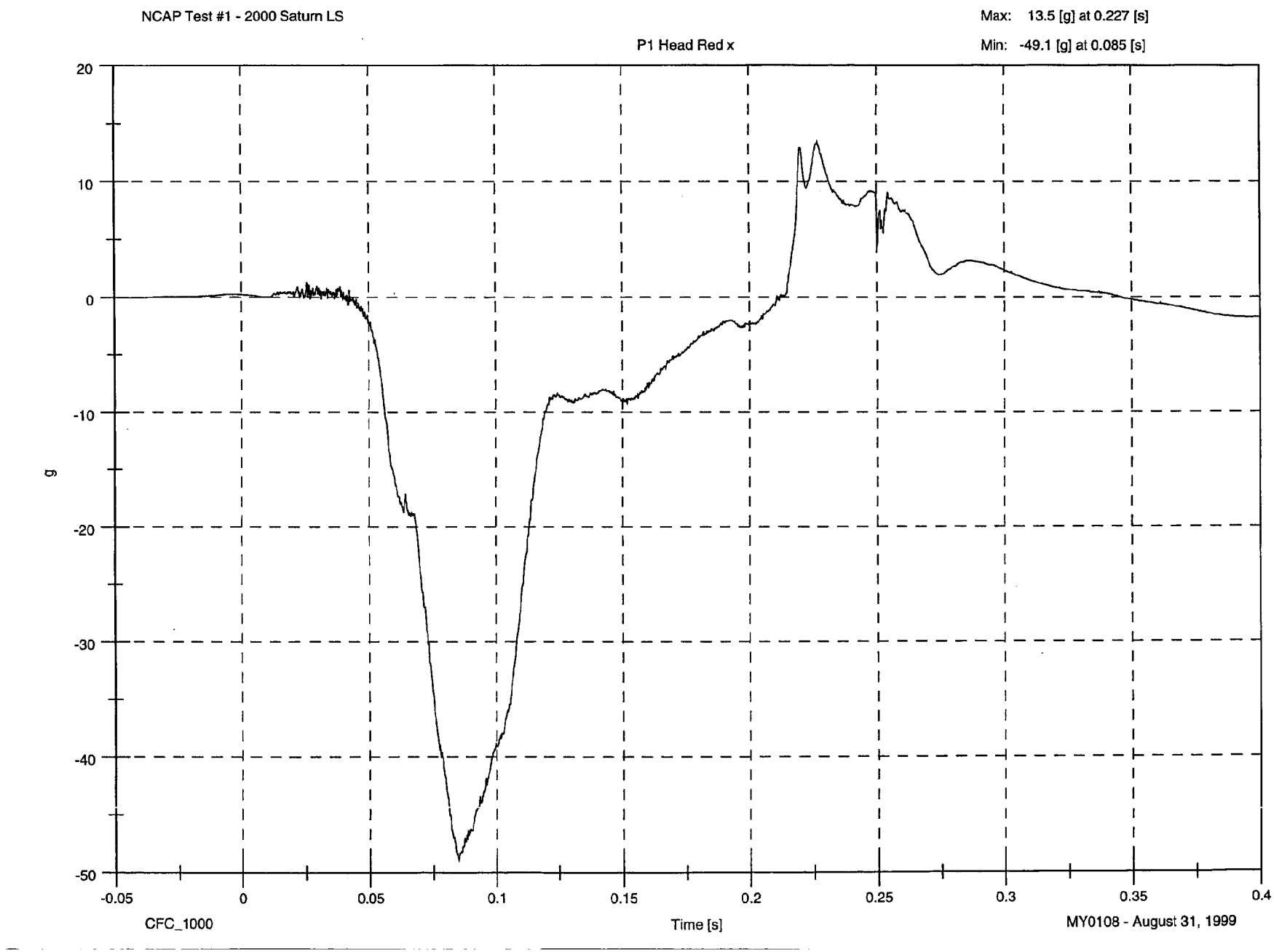
DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	60
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle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

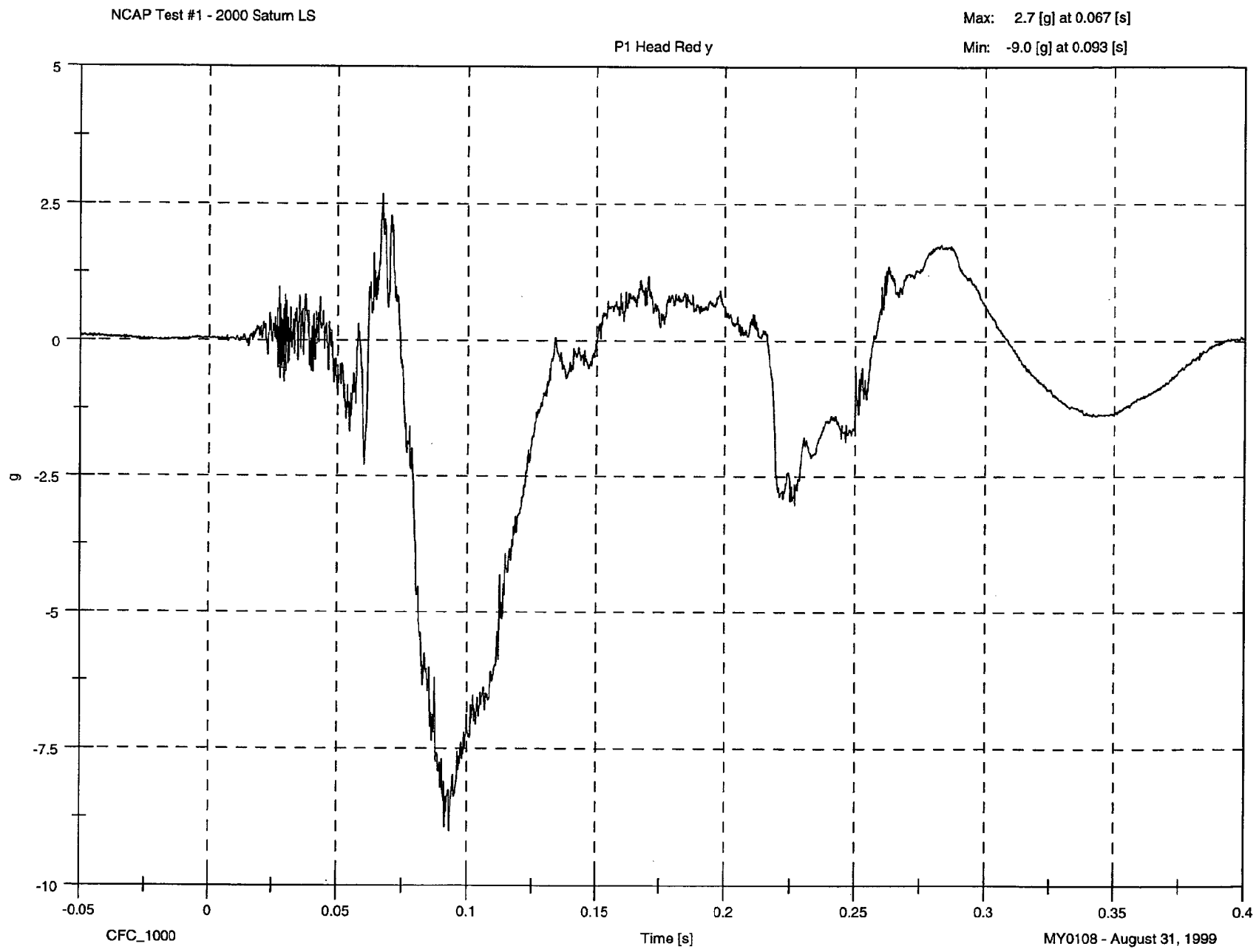

NCAP Test #1 - 2000 Saturn LS
Max: 14.1 [g] at 0.220 [s]
Min: -49.7 [g] at 0.085 [s]
P1 Head x
MY0108 - August 31, 1999
CFC_1000
Time [s]
g
20
10
0
-10
-20
-30
-40
-50
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

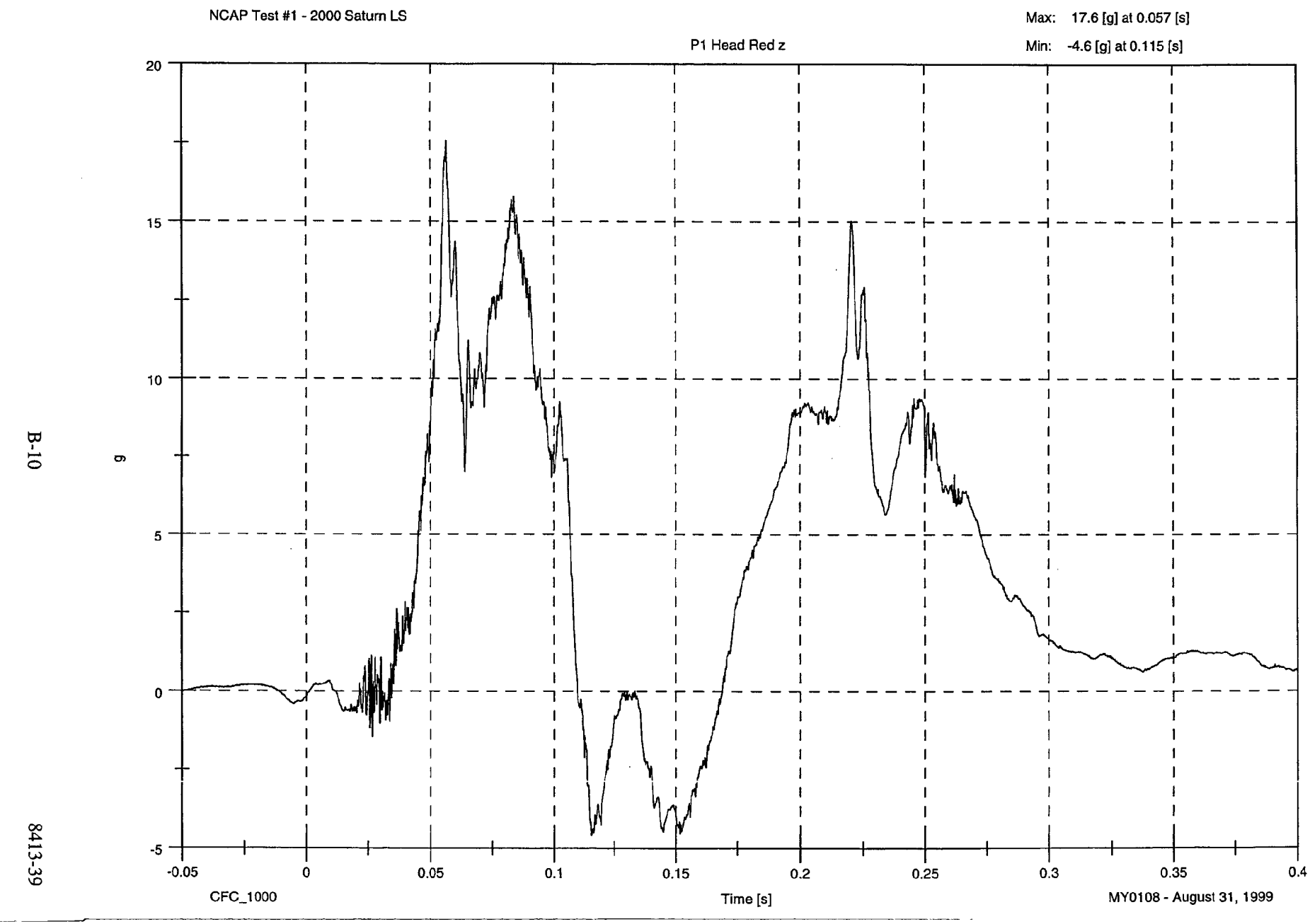

NCAP Test #1 - 2000 Saturn LS
P1 Head y
Max: 2.3 [g] at 0.043 [s]
Min: -6.3 [g] at 0.106 [s]
4
2
0
-2
-4
-6
-8
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

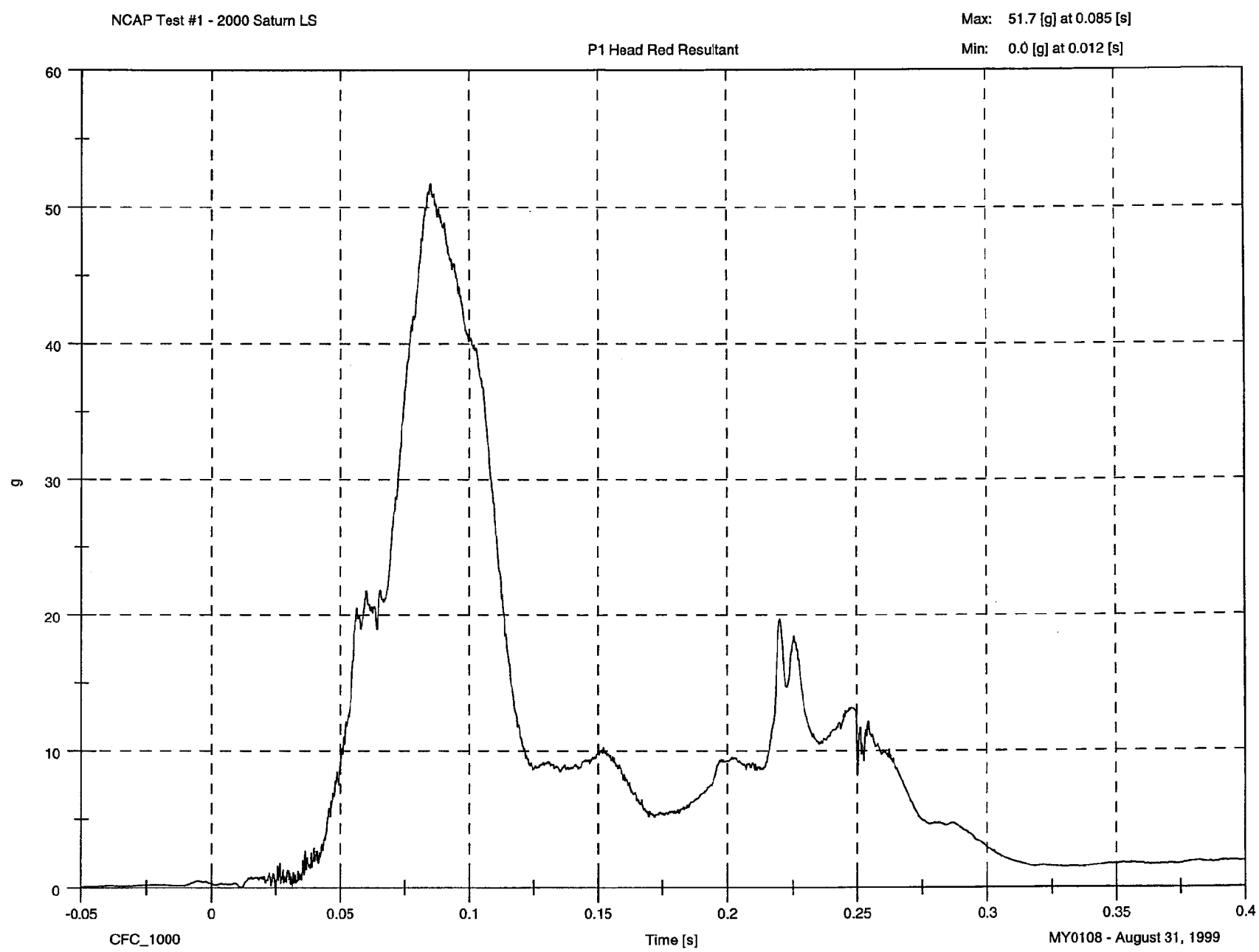

NCAP Test #1 - 2000 Saturn LS
Max: 13.6 [g] at 0.084 [s]
Min: -4.3 [g] at 0.115 [s]
P1 Head z
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
15
12.5
10
7.5
5
2.5
0
-2.5
-5
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

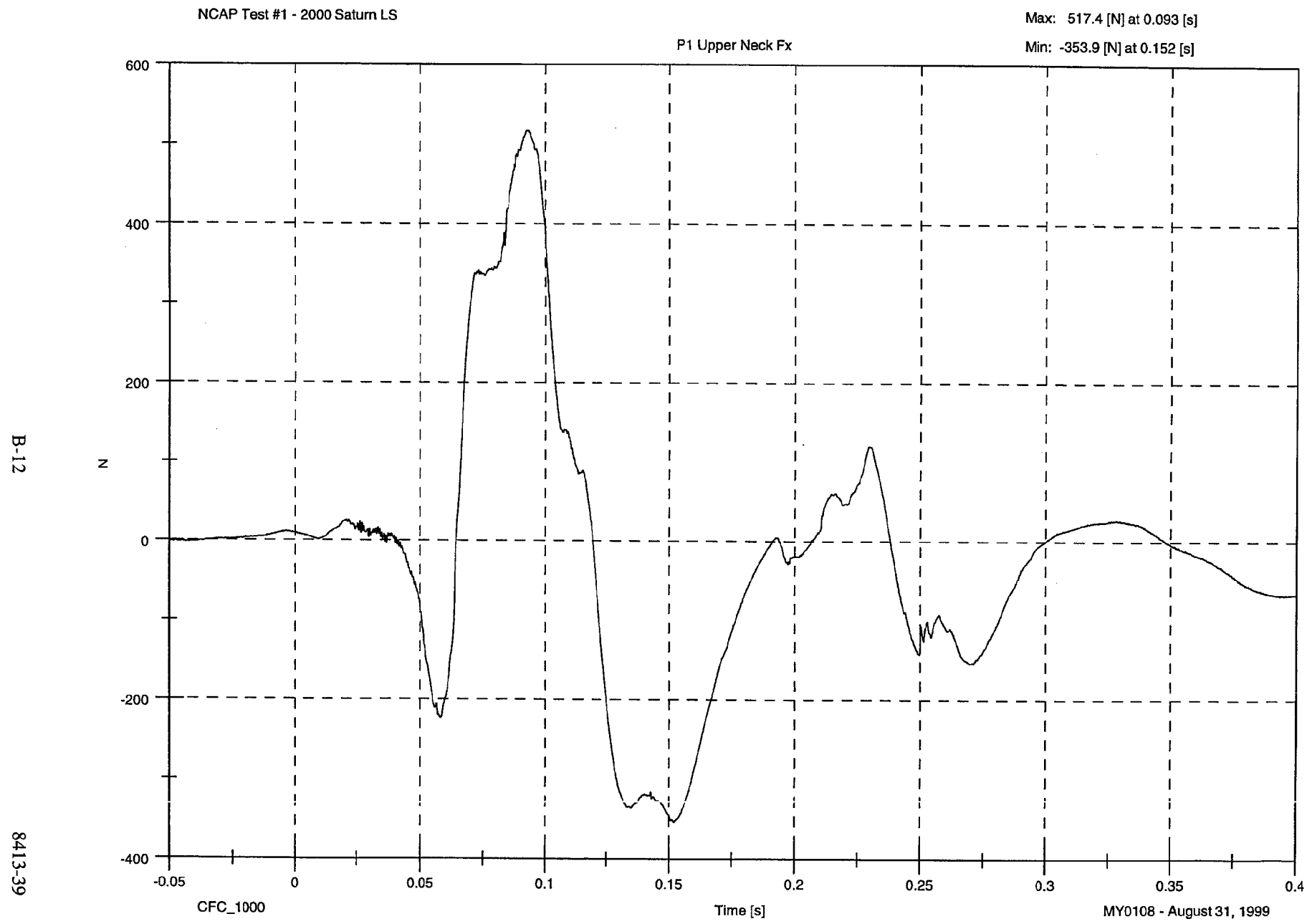

NCAP Test #1 - 2000 Saturn LS
Max: 51.5 [g] at 0.085 [s]
Min: 0.0 [g] at 0.010 [s]
P1 Head Resultant
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
60
50
40
30
20
10
0
-0.05
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

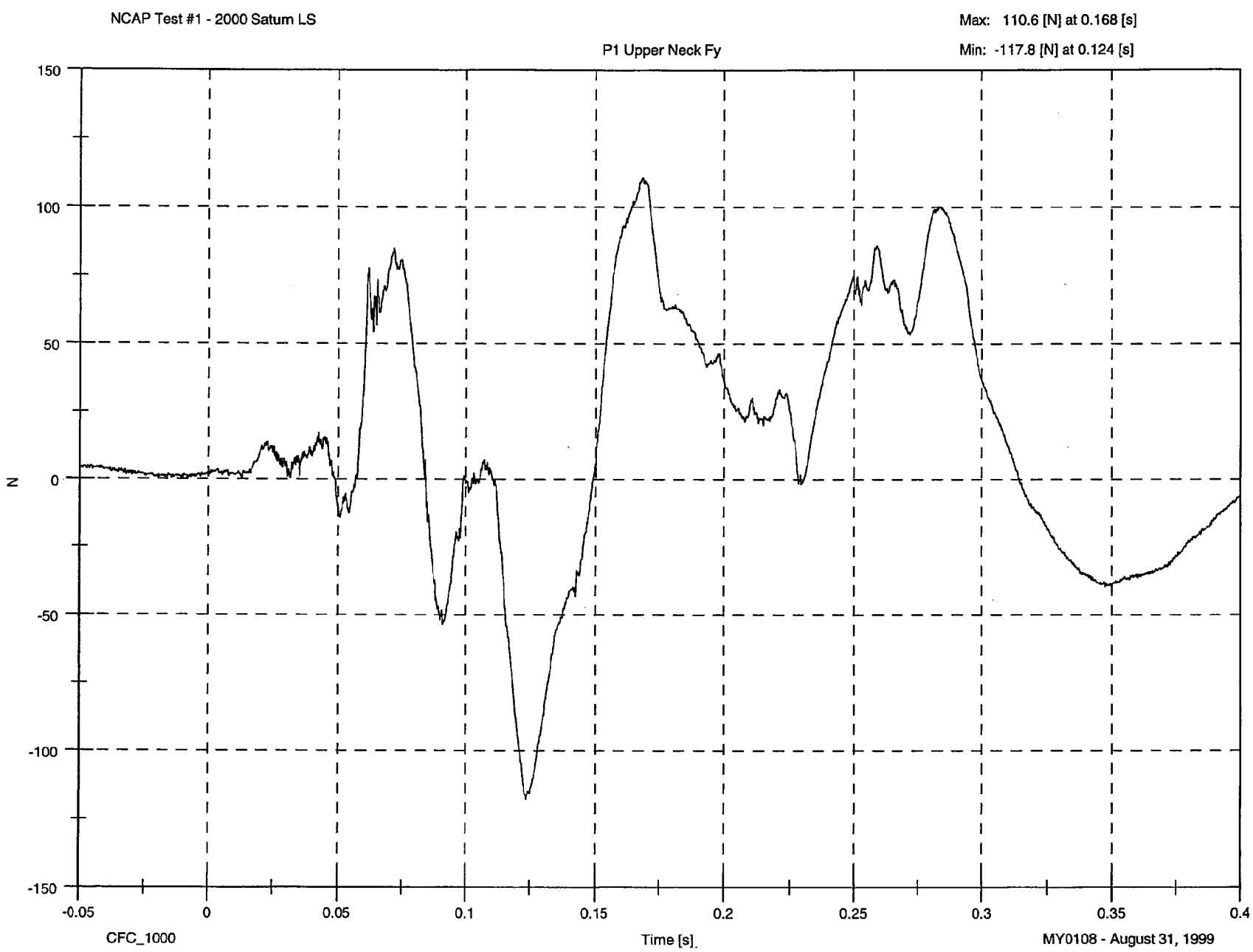

NCAP Test #1 - 2000 Saturn LS
P1 Head Red x
Max: 13.5 [g] at 0.227 [s]
Min: -49.1 [g] at 0.085 [s]
20
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

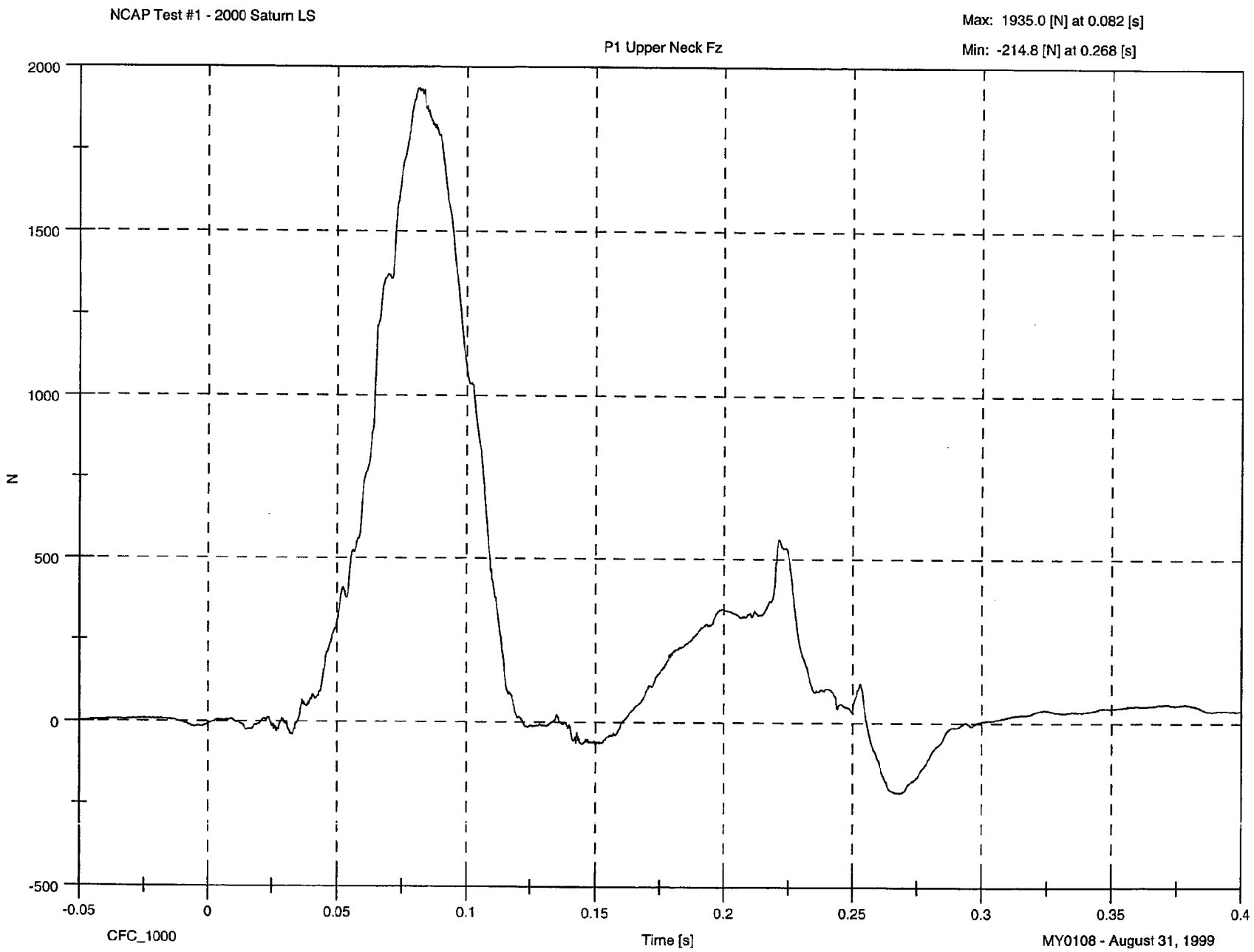

NCAP Test #1 - 2000 Saturn LS
P1 Head Red y
Max: 2.7 [g] at 0.067 [s]
Min: -9.0 [g] at 0.093 [s]
5
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_1000
Time [s]
MY0108 - August 31, 1999

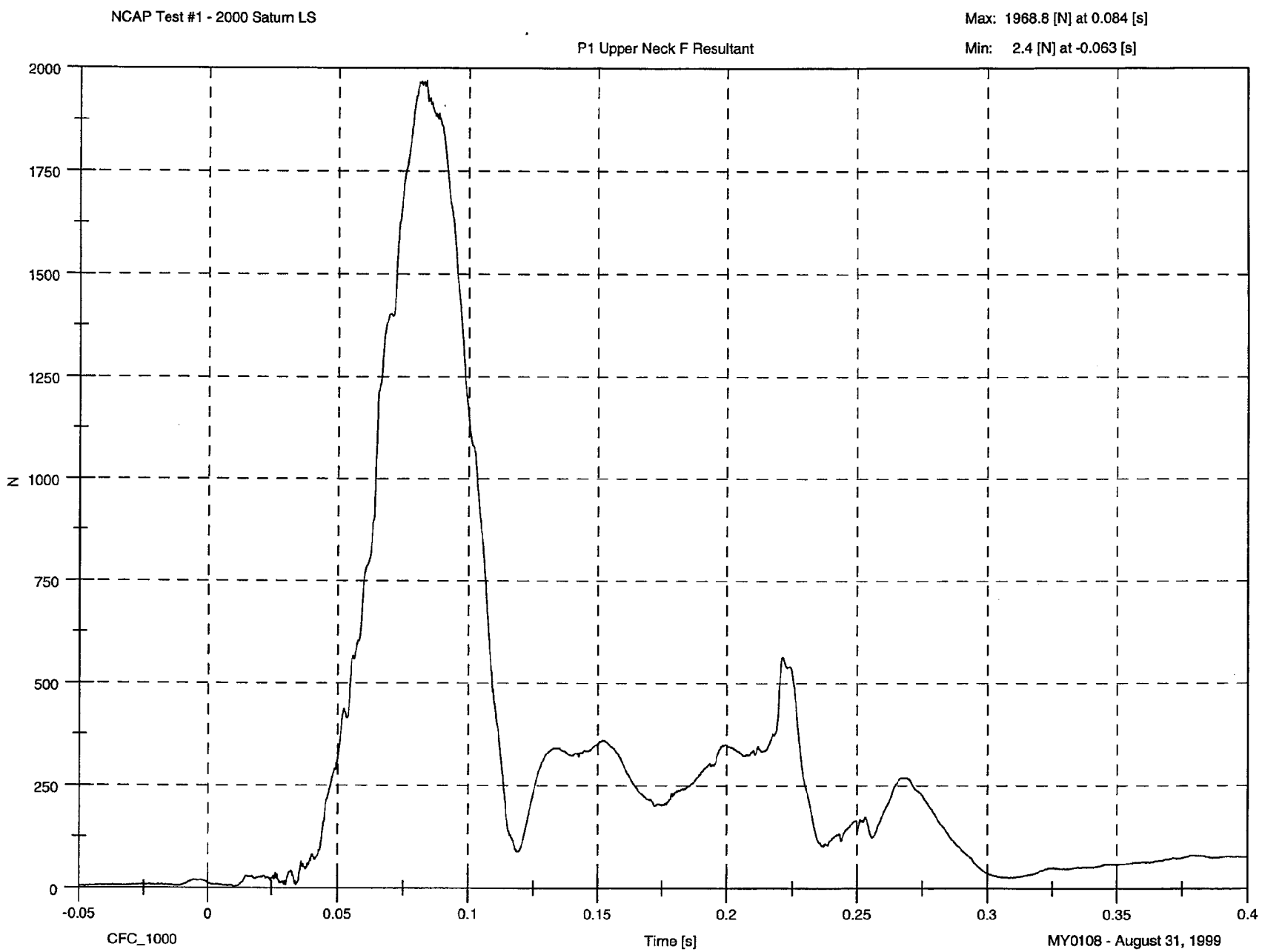

NCAP Test #1 - 2000 Saturn LS
P1 Head Red z
Max: 17.6 [g] at 0.057 [s]
Min: -4.6 [g] at 0.115 [s]
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

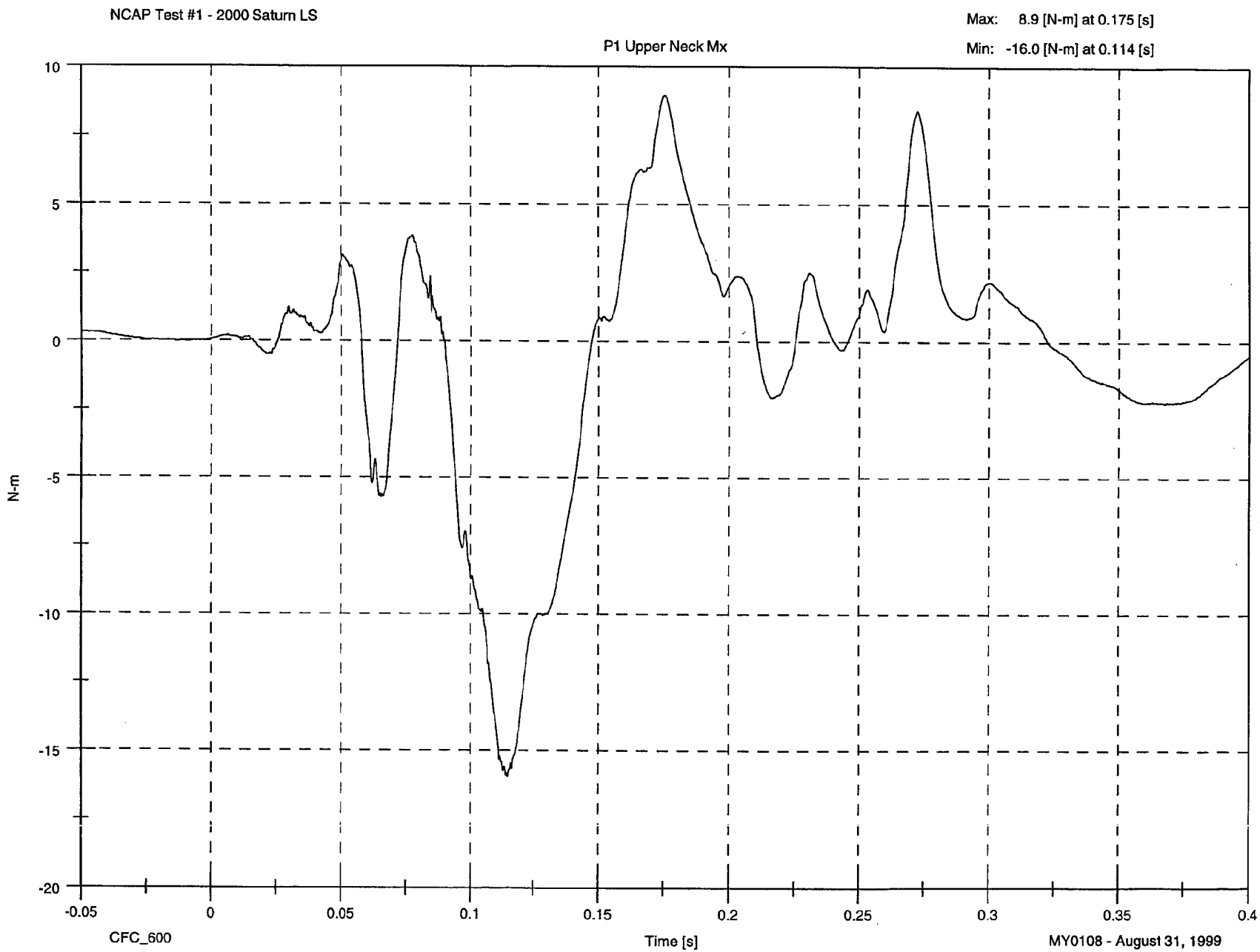

NCAP Test #1 - 2000 Saturn LS
P1 Head Red Resultant
Max: 51.7 [g] at 0.085 [s]
Min: 0.0 [g] at 0.012 [s]
60
50
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

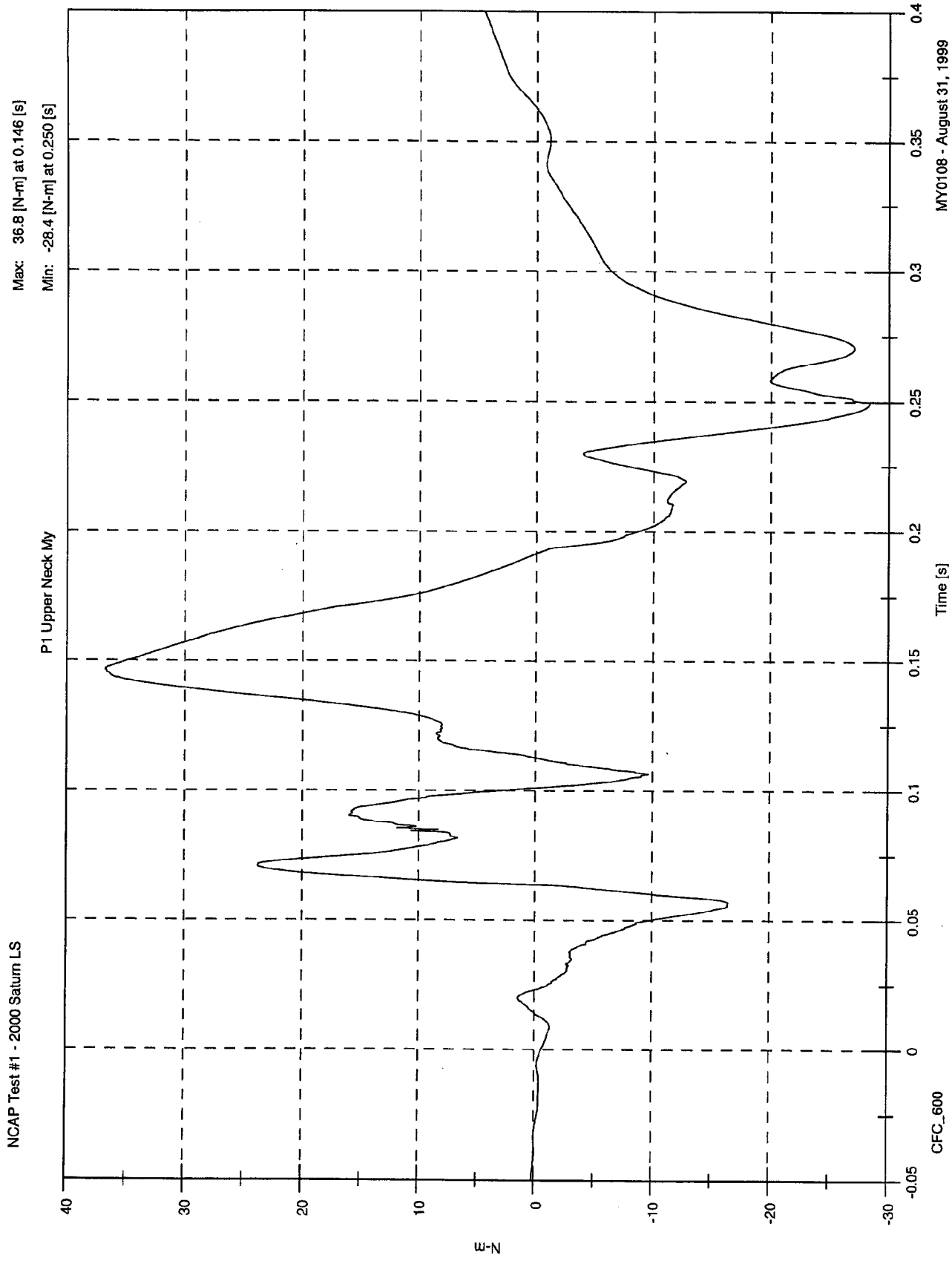

NCAP Test #1 - 2000 Saturn LS
P1 Upper Neck Fx
Max: 517.4 [N] at 0.093 [s]
Min: -353.9 [N] at 0.152 [s]
600
400
200
0
-200
-400
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

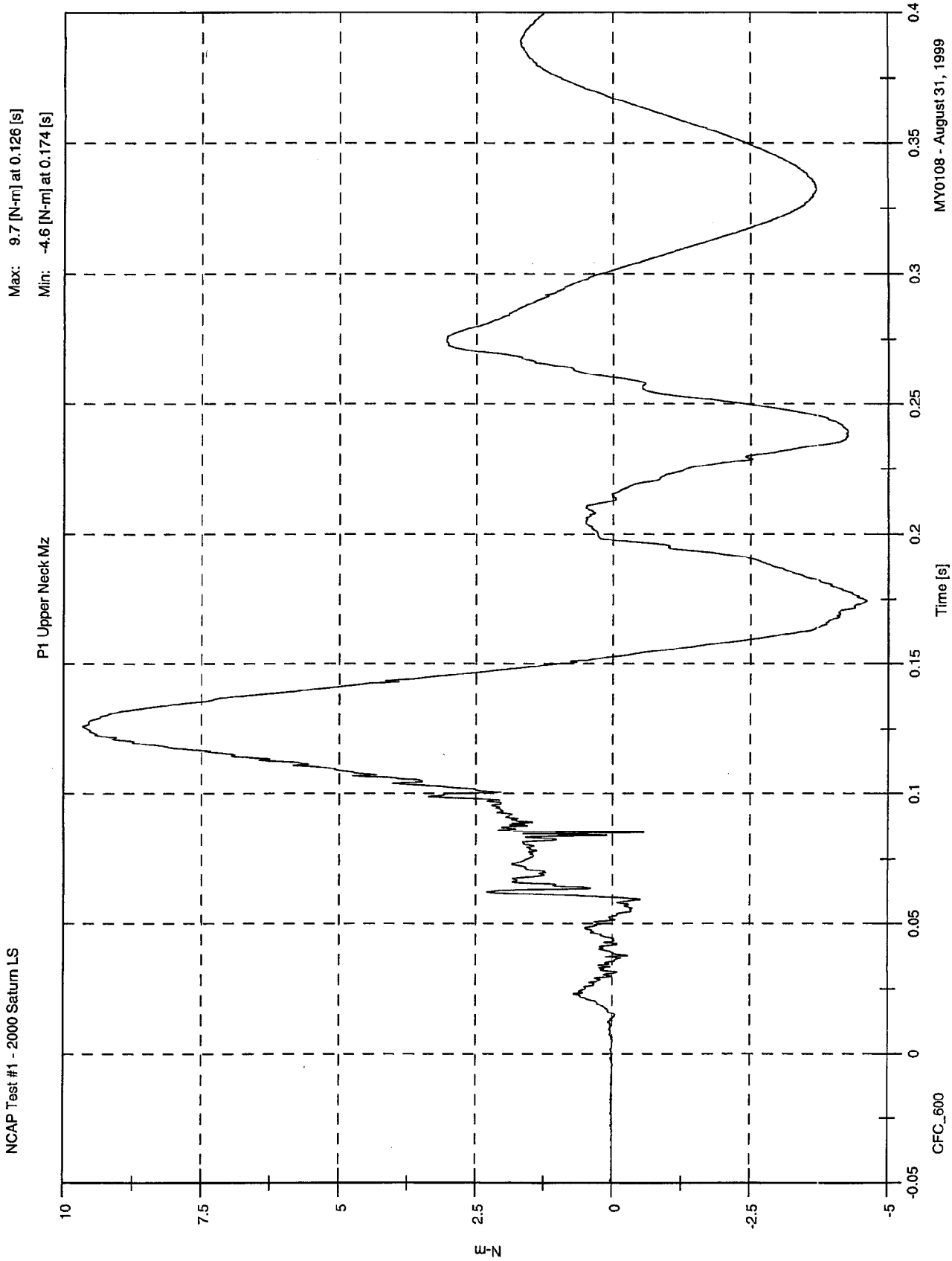

NCAP Test #1 - 2000 Saturn LS
P1 Upper Neck Fy
Max: 110.6 [N] at 0.168 [s]
Min: -117.8 [N] at 0.124 [s]
150
100
50
0
-50
-100
-150
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

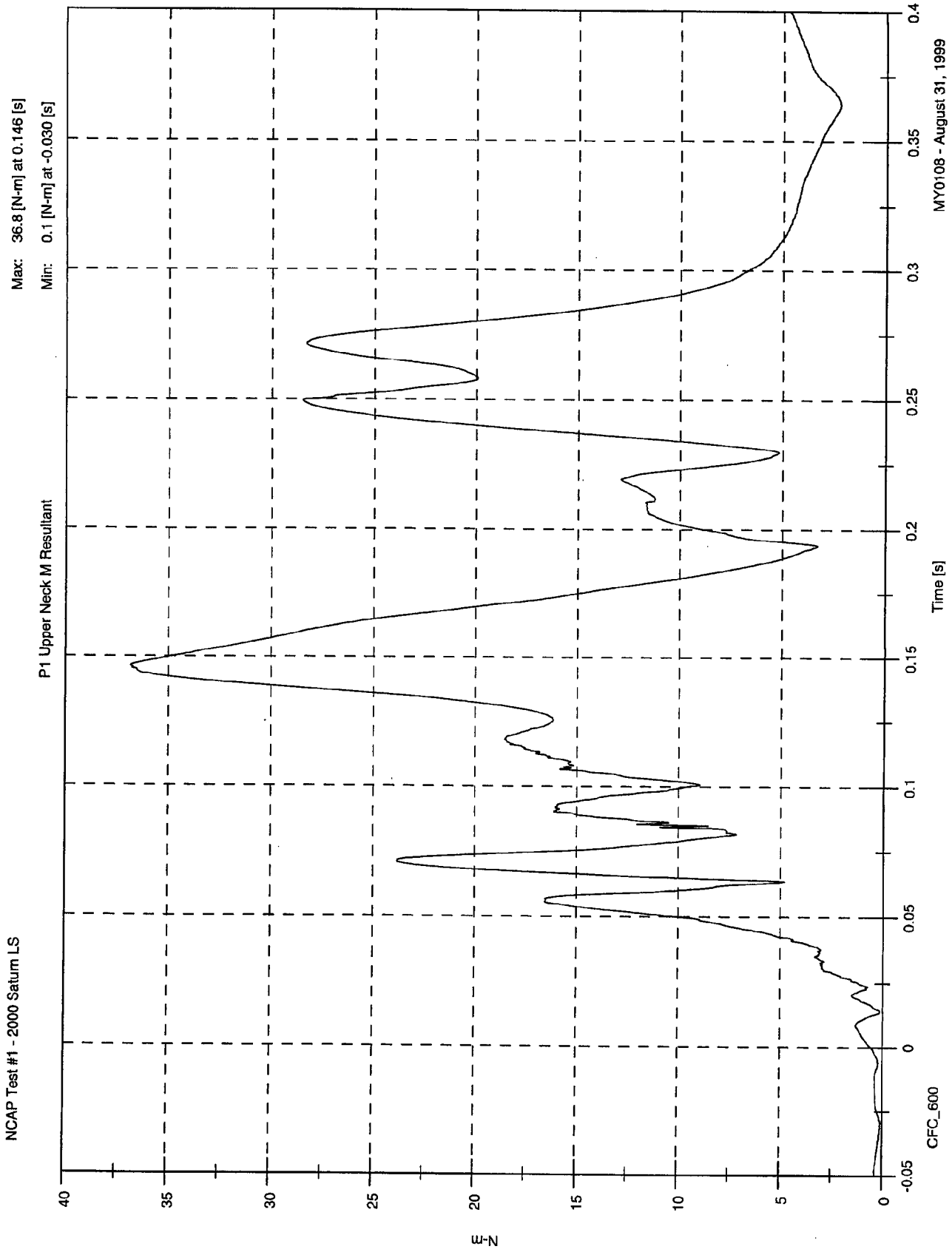

NCAP Test #1 - 2000 Saturn LS
P1 Upper Neck Fz
Max: 1935.0 [N] at 0.082 [s]
Min: -214.8 [N] at 0.268 [s]
2000
1500
1000
500
0
-500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

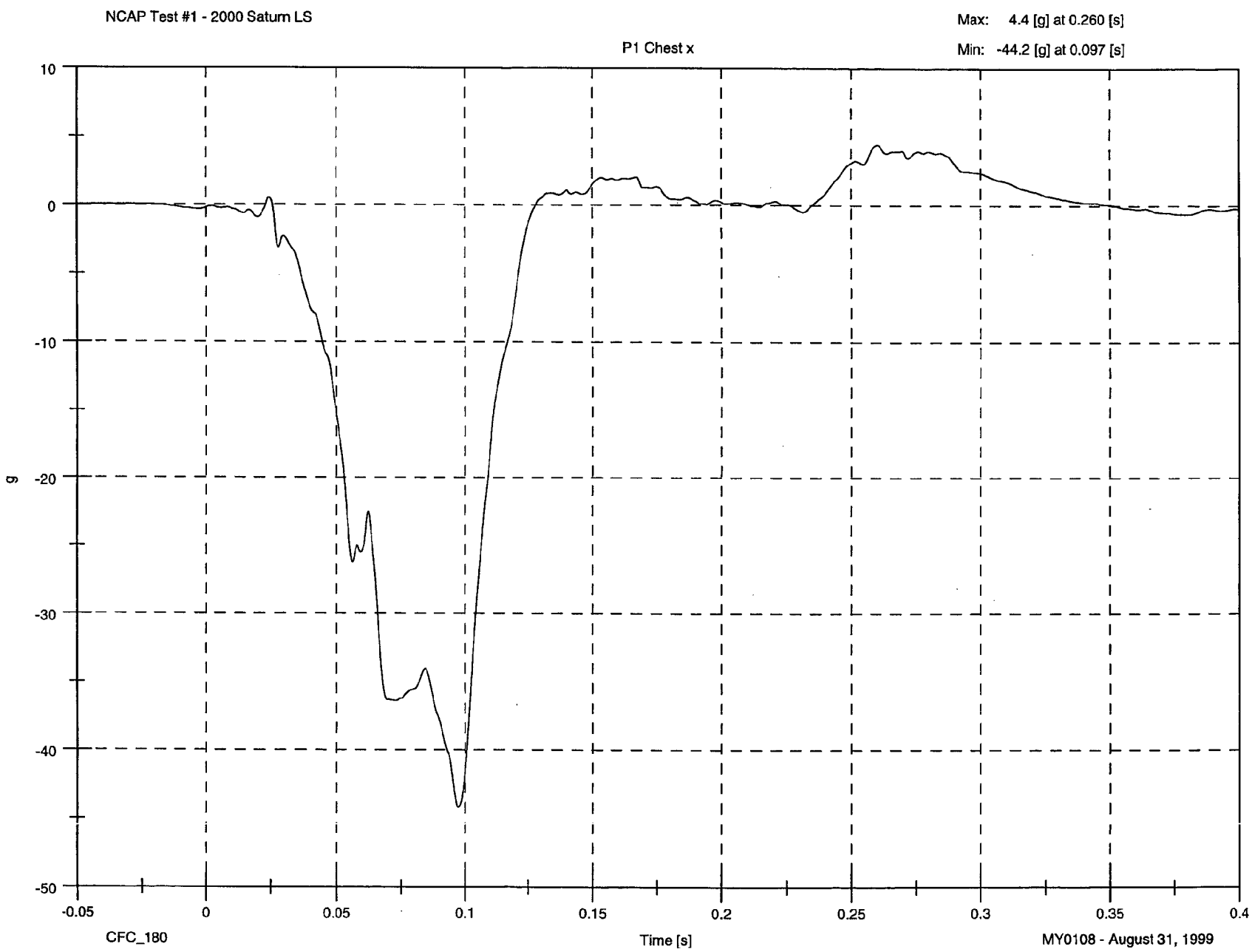

NCAP Test #1 - 2000 Saturn LS
P1 Upper Neck F Resultant
Max: 1968.8 [N] at 0.084 [s]
Min: 2.4 [N] at -0.063 [s]
2000
1750
1500
1250
1000
750
500
250
0
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

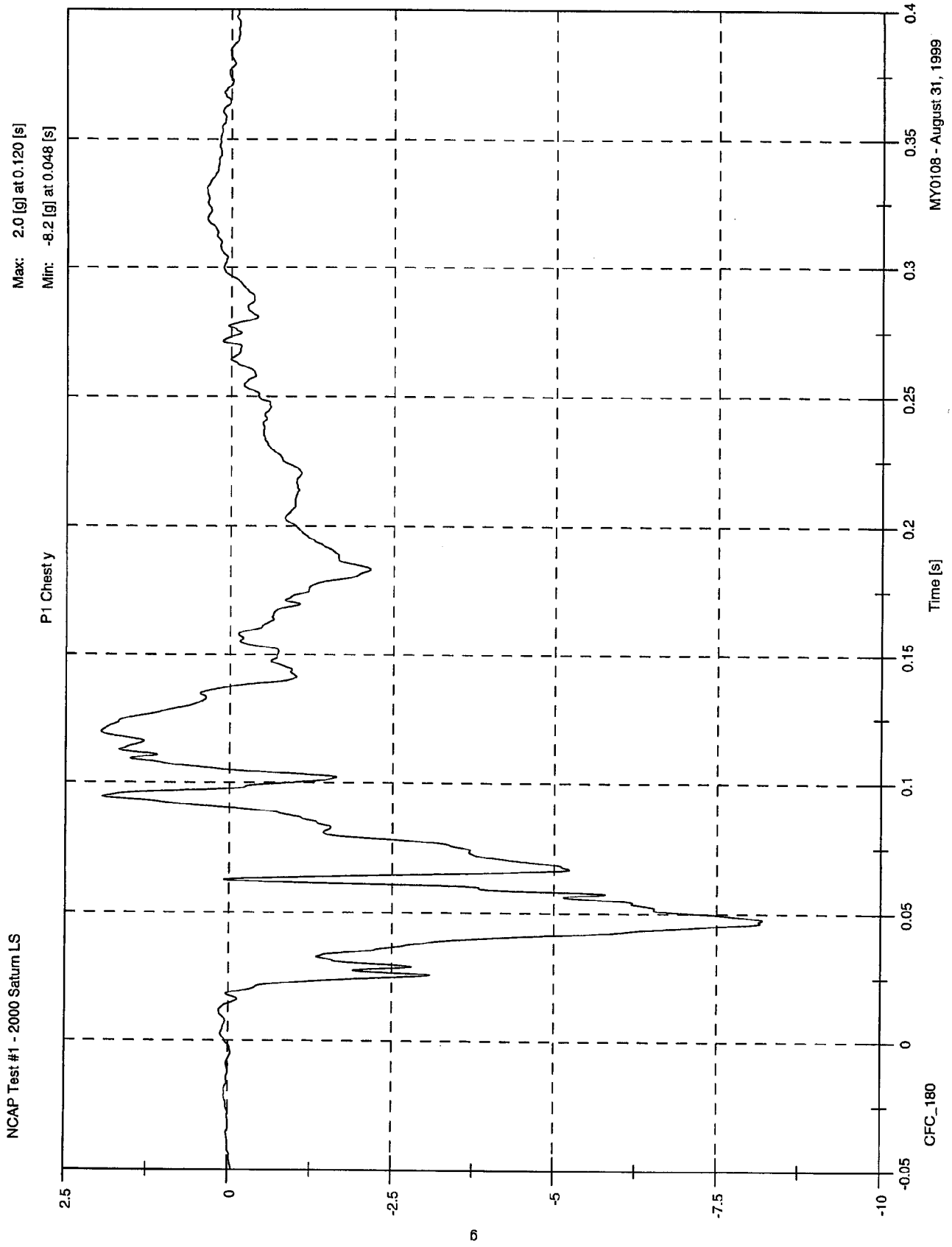

NCAP Test #1 - 2000 Saturn LS
P1 Upper Neck Mx
Max: 8.9 [N-m] at 0.175 [s]
Min: -16.0 [N-m] at 0.114 [s]
10
5
0
-5
-10
-15
-20
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

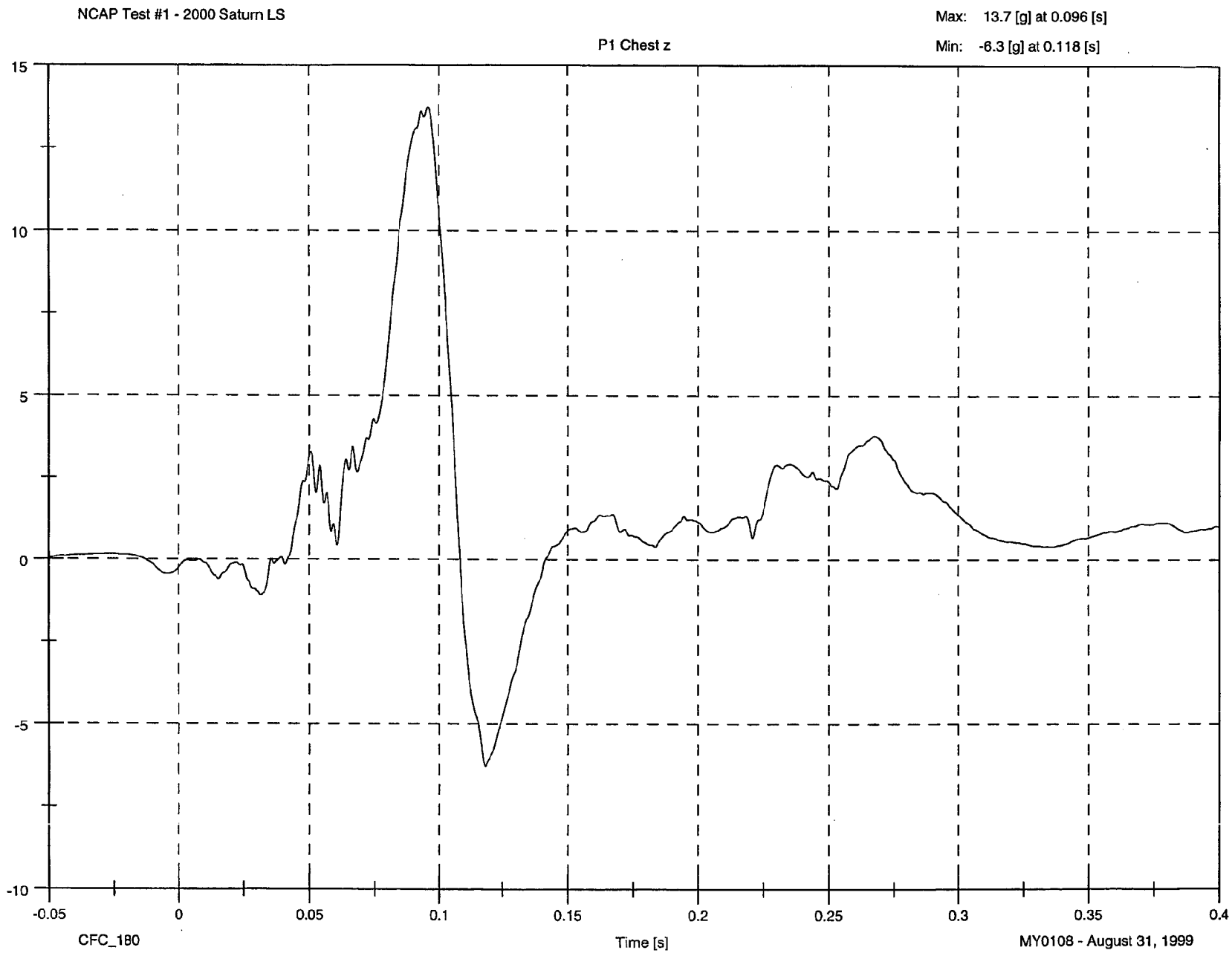

NCAP Test #1 - 2000 Saturn LS
Max: 36.8 [N-m] at 0.146 [s]
Min: -28.4 [N-m] at 0.250 [s]
P1 Upper Neck My
MY0108 - August 31, 1999
CFC_600
N-m
Time [s]
40
30
20
10
0
-10
-20
-30
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

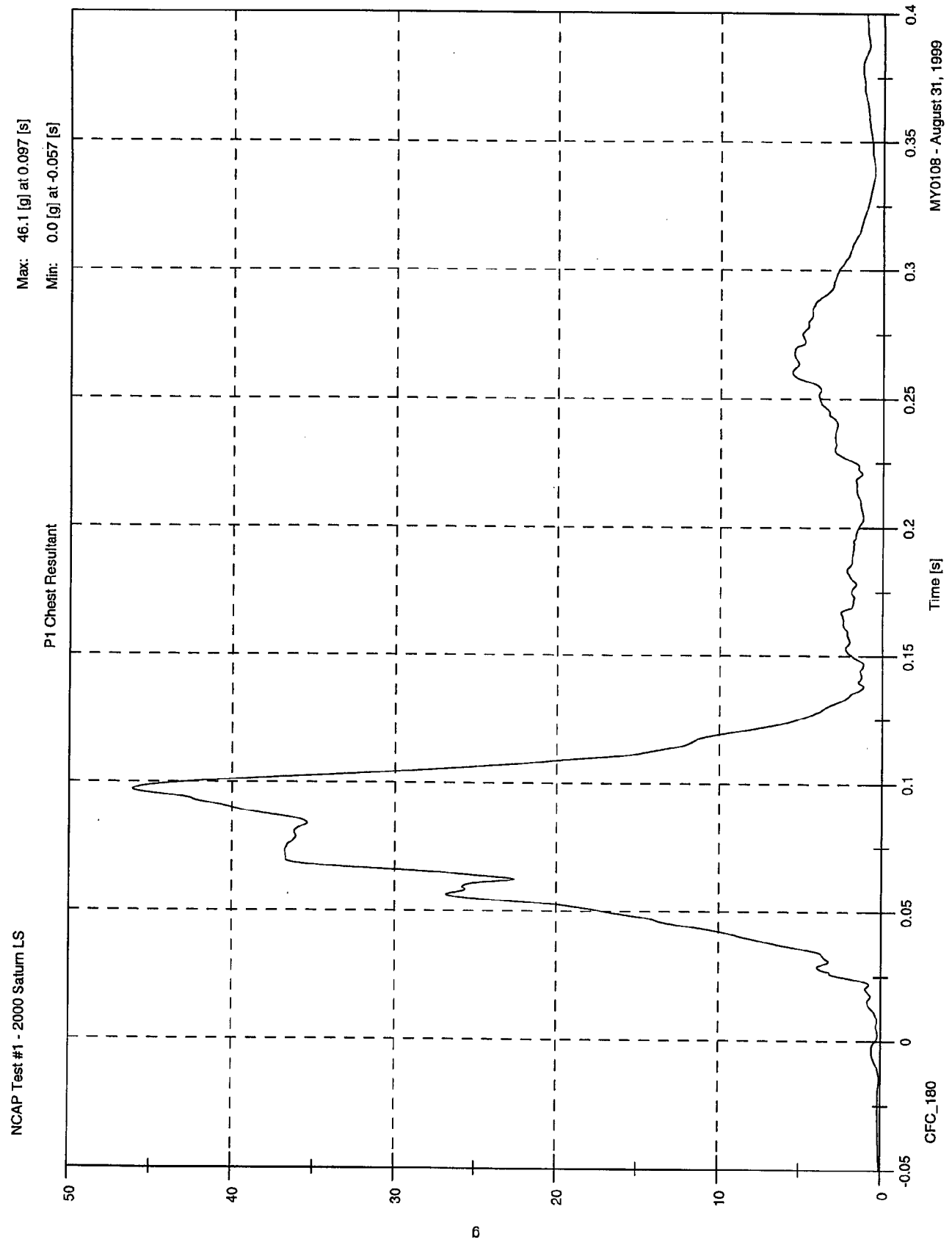

NCAP Test #1 - 2000 Saturn LS
P1 Upper Neck Mz
Max: 9.7 [N-m] at 0.126 [s]
Min: -4.6 [N-m] at 0.174 [s]
MY0108 - August 31, 1999
CFC_600
Time [s]
N-m
10
7.5
5
2.5
0
-2.5
-5
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

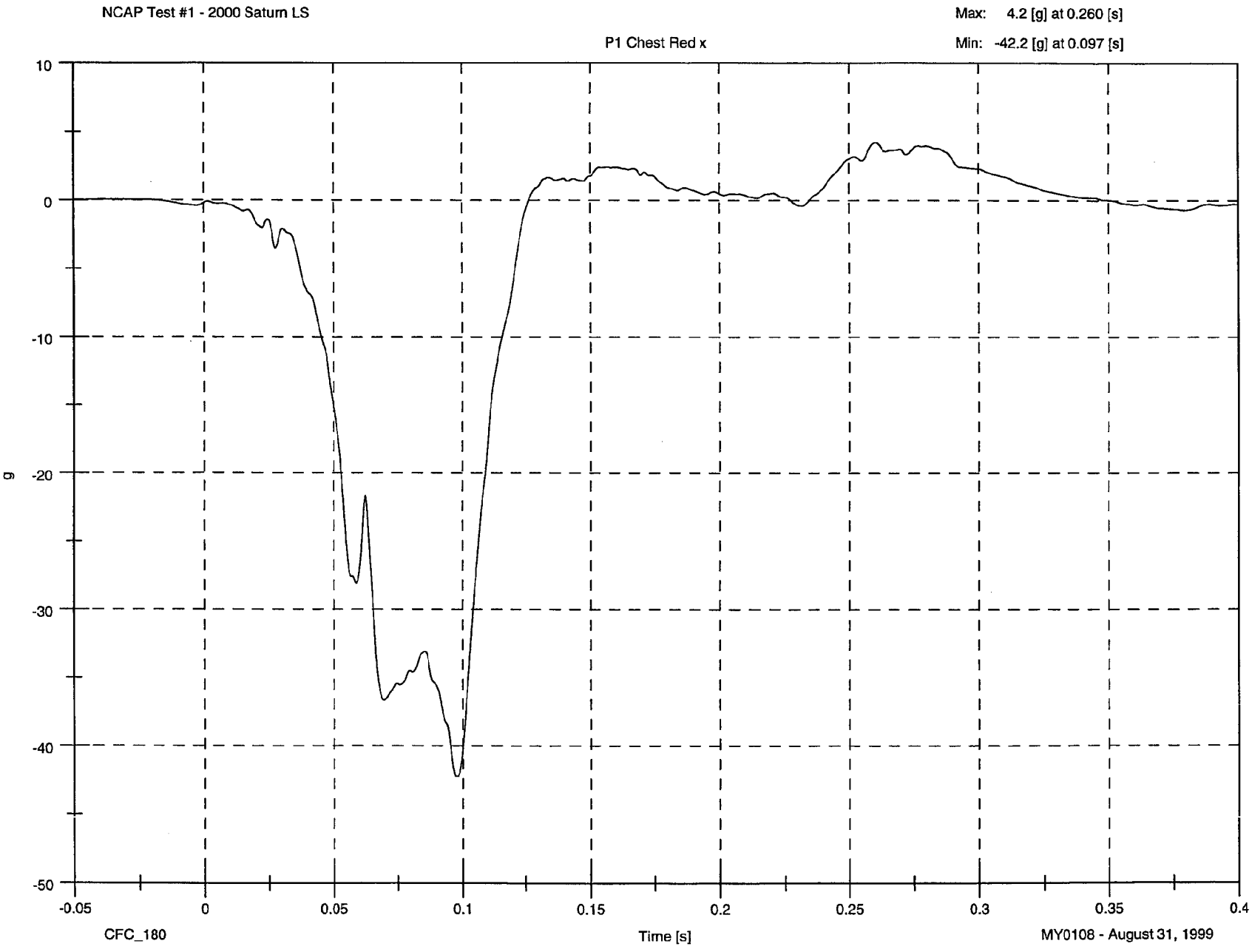

NCAP Test #1 - 2000 Saturn LS
P1 Upper Neck M Resultant
Max: 36.8 [N-m] at 0.146 [s]
Min: 0.1 [N-m] at -0.030 [s]
MY0108 - August 31, 1999
CFC_600
N-m
Time [s]
40
35
30
25
20
15
10
5
0
-0.05
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

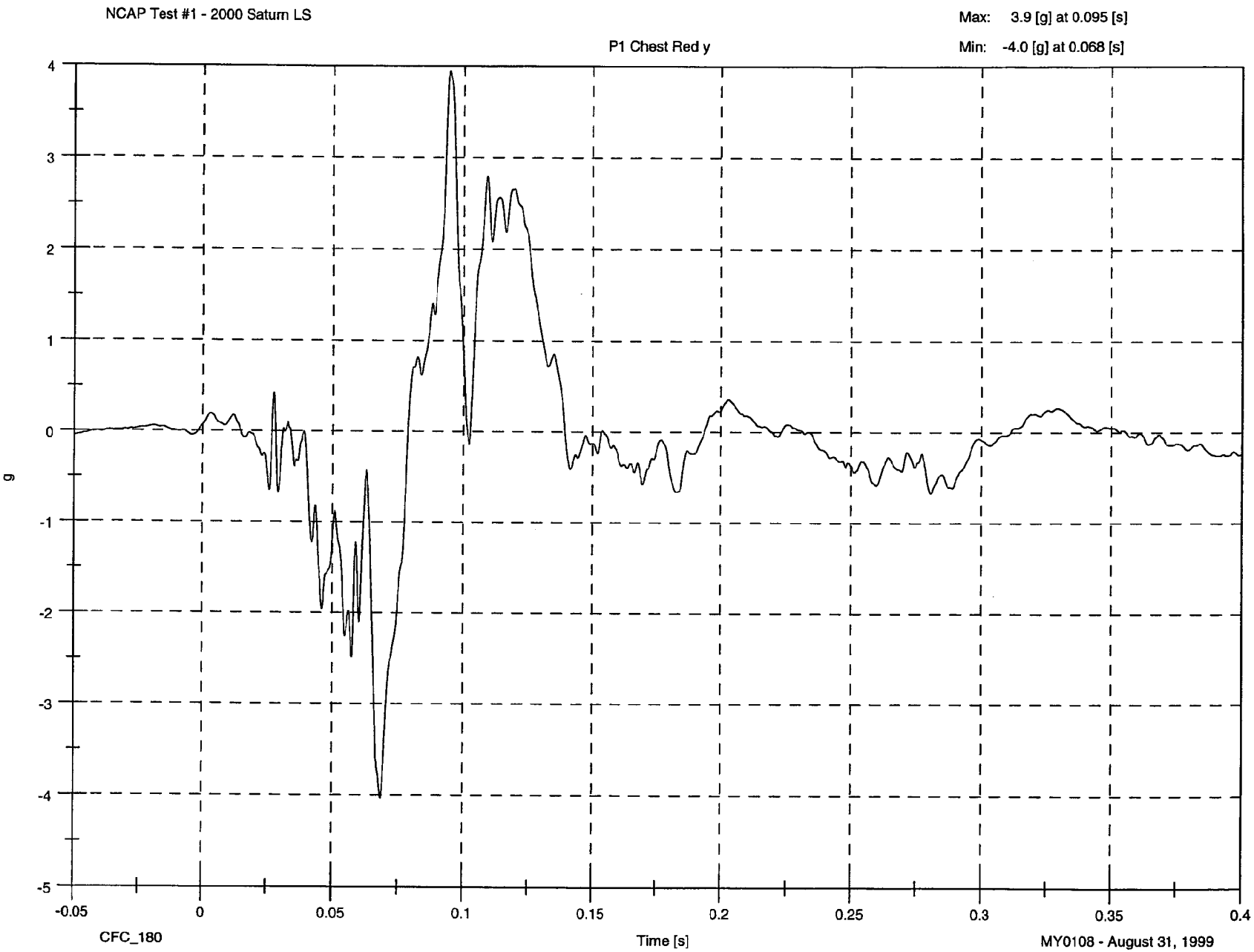

NCAP Test #1 - 2000 Saturn LS
P1 Chest x
Max: 4.4 [g] at 0.260 [s]
Min: -44.2 [g] at 0.097 [s]
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

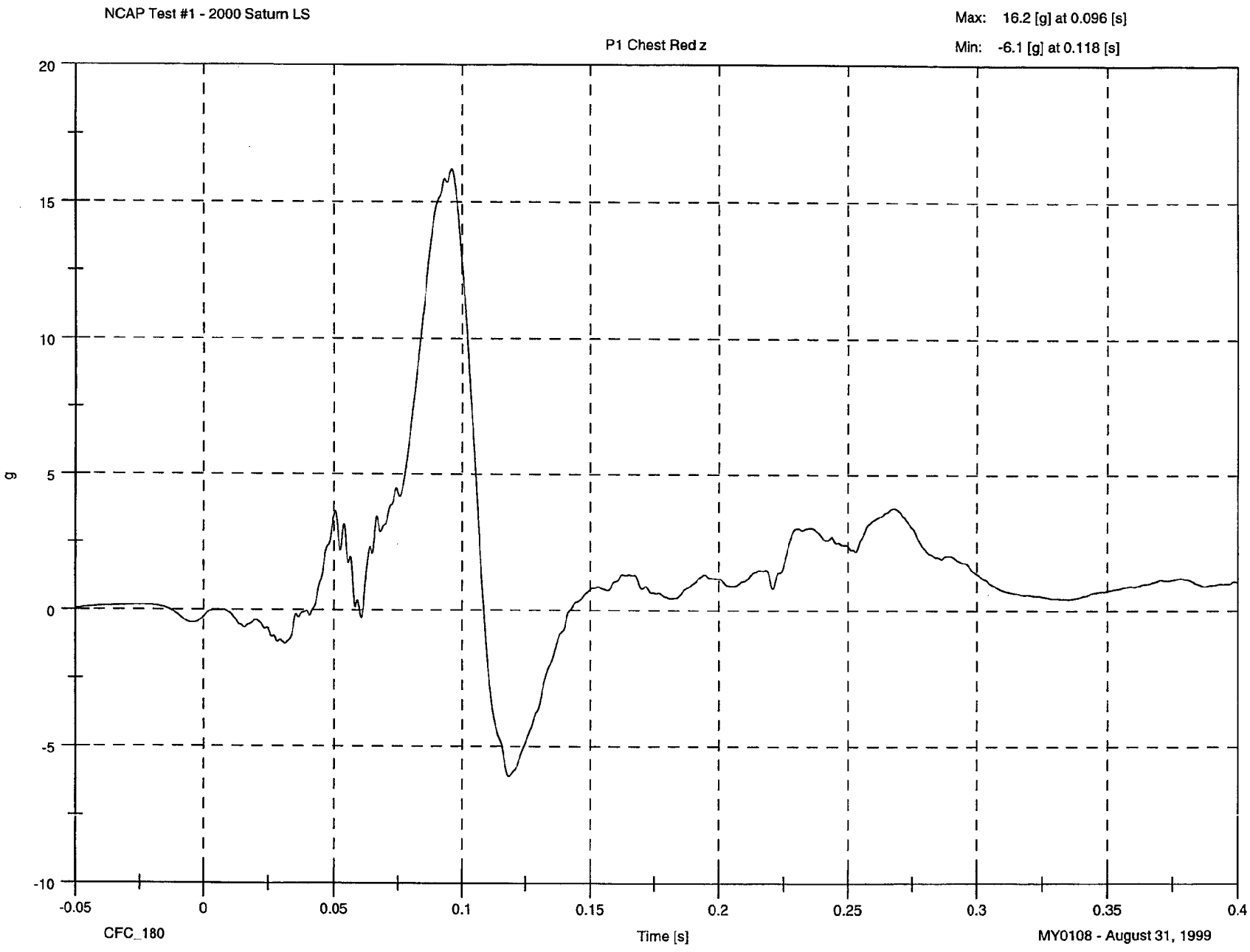

NCAP Test #1 - 2000 Saturn LS
Max: 2.0 [g] at 0.120 [s]
Min: -8.2 [g] at 0.048 [s]
P1 Chest y
MY0108 - August 31, 1999
CFC_180
Time [s]
g
2.5
0
-2.5
-5
-7.5
-10
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

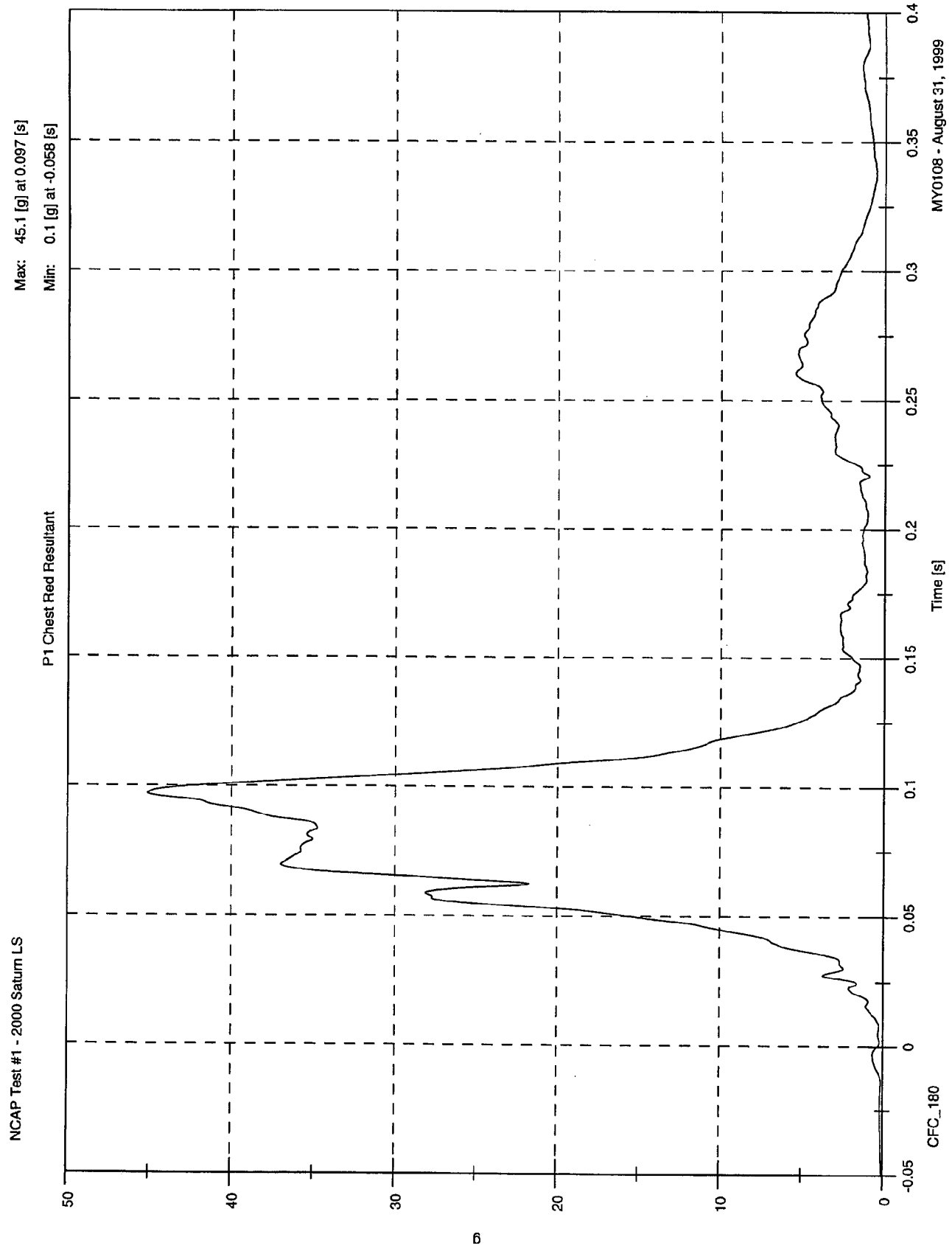

NCAP Test #1 - 2000 Saturn LS
P1 Chest z
Max: 13.7 [g] at 0.096 [s]
Min: -6.3 [g] at 0.118 [s]
15
10
5
0
-5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

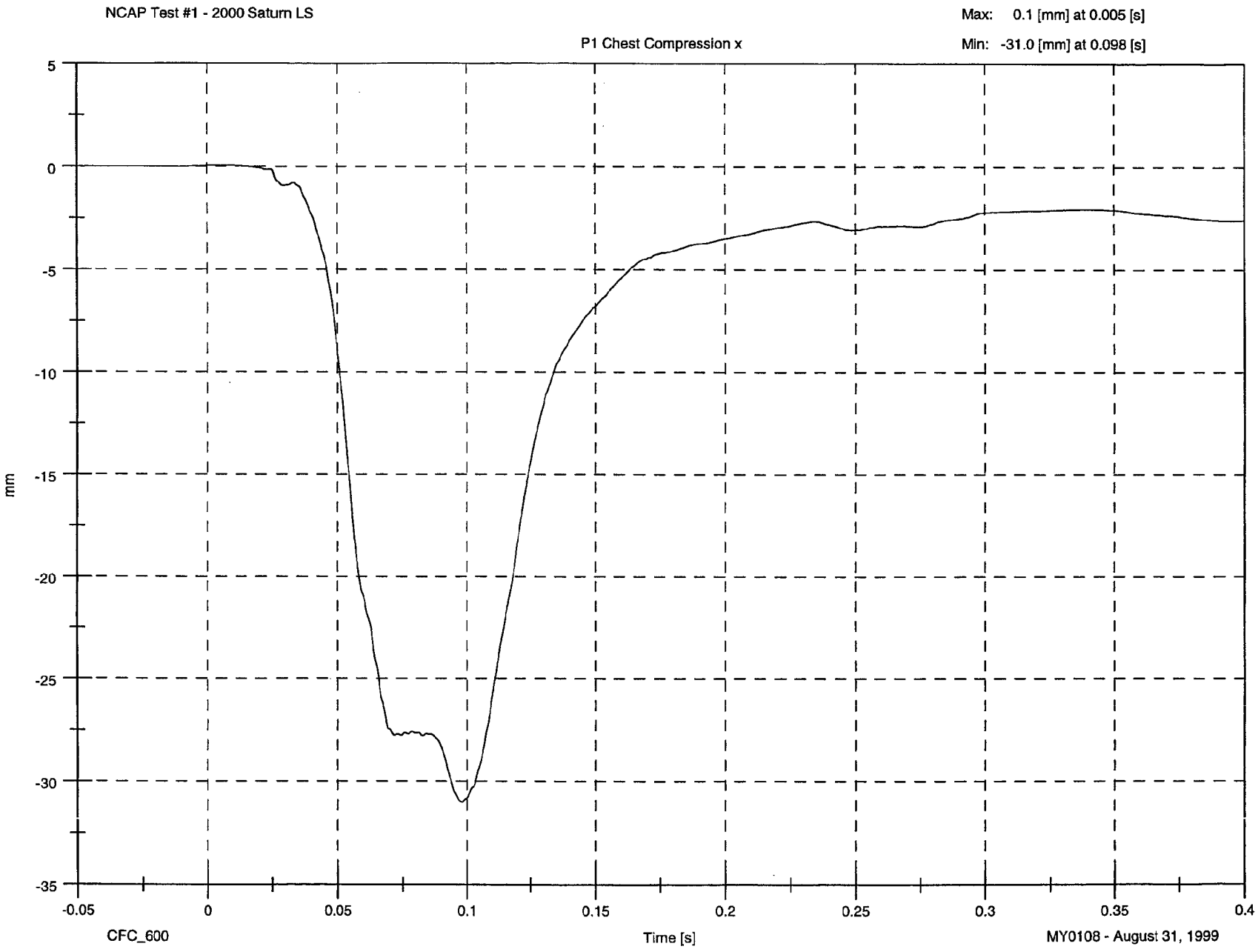

NCAP Test #1 - 2000 Saturn LS
P1 Chest Resultant
Max: 46.1 [g] at 0.097 [s]
Min: 0.0 [g] at -0.057 [s]
MY0108 - August 31, 1999
CFC_180
Time [s]
g
50
40
30
20
10
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

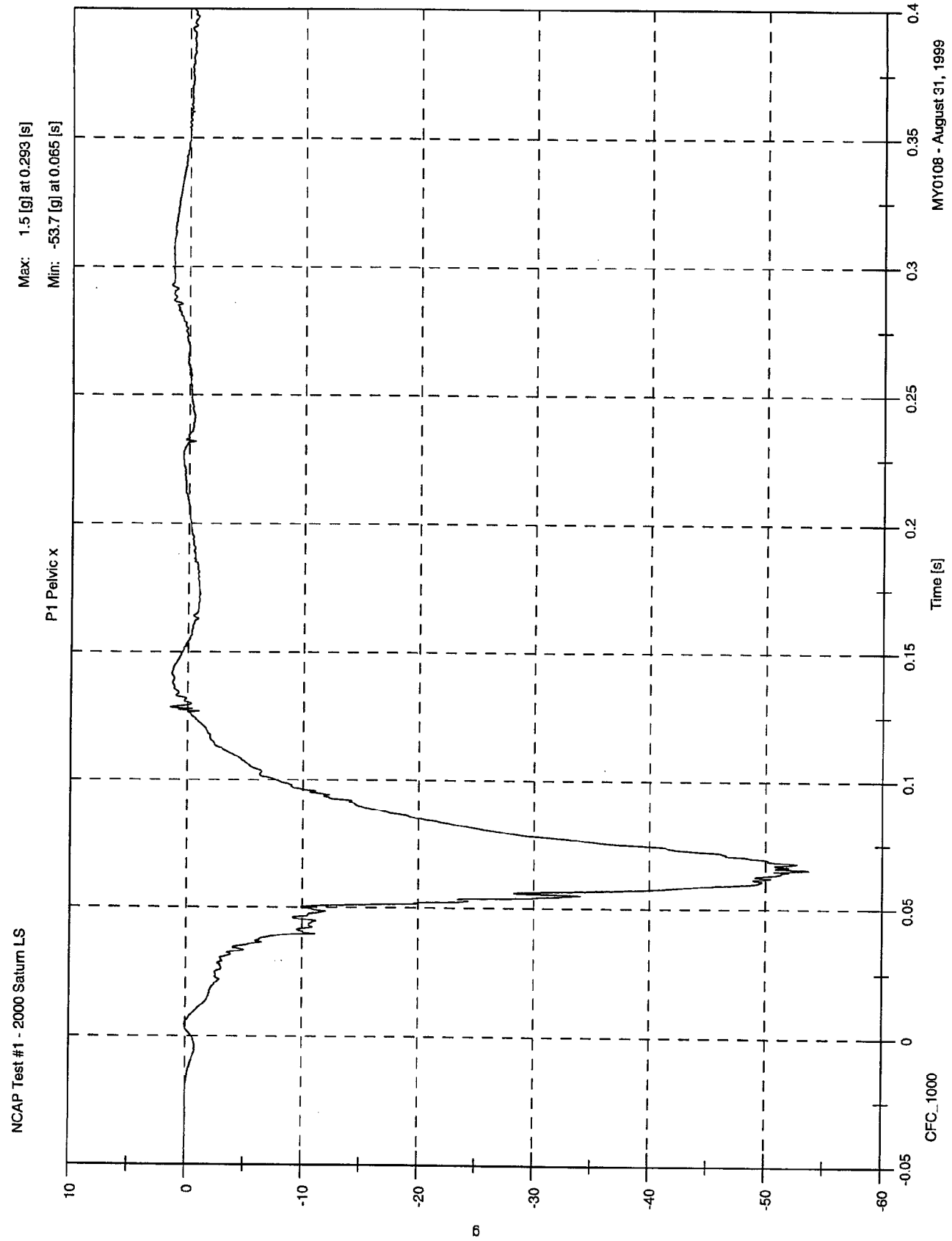

NCAP Test #1 - 2000 Saturn LS
P1 Chest Red x
Max: 4.2 [g] at 0.260 [s]
Min: -42.2 [g] at 0.097 [s]
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

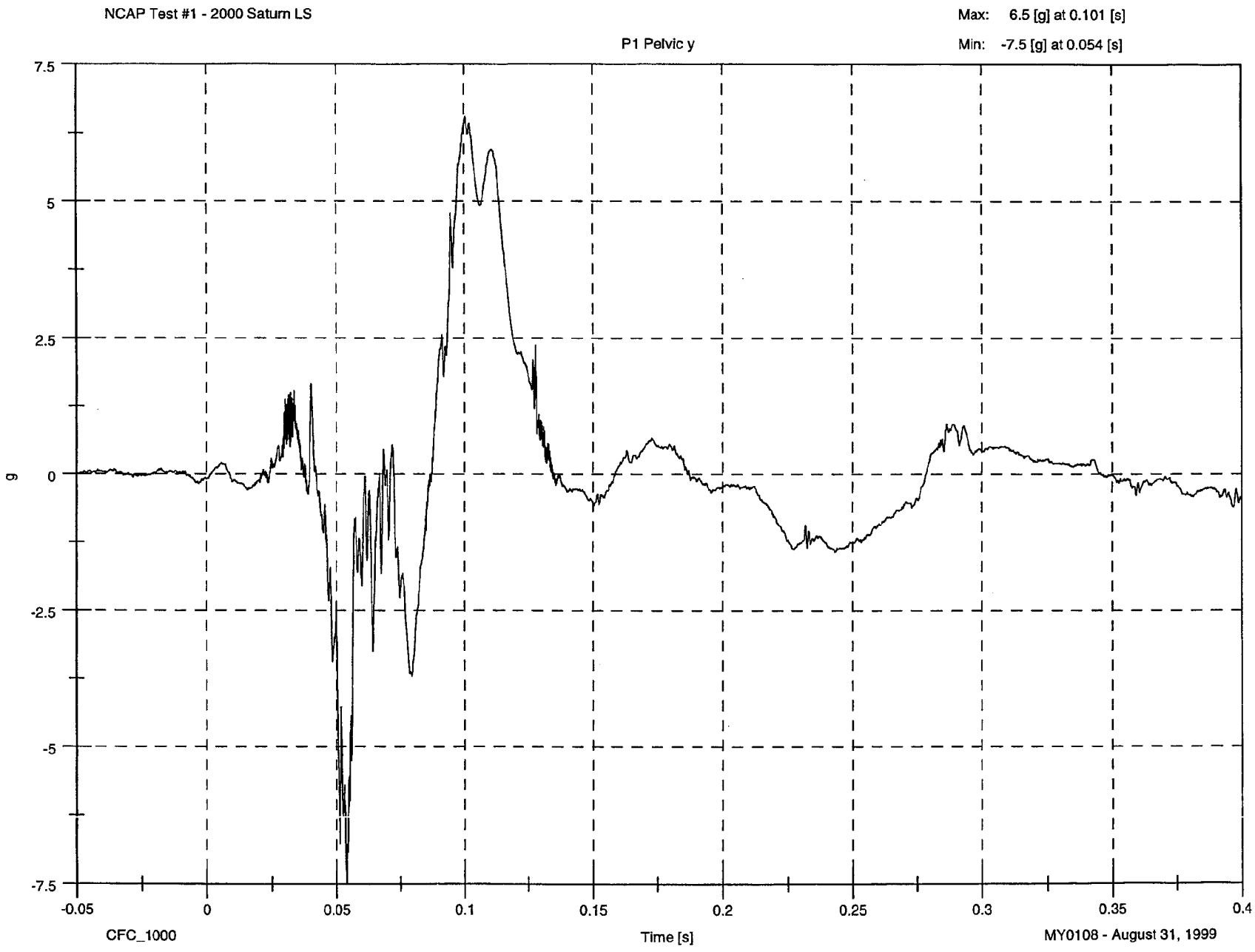

NCAP Test #1 - 2000 Saturn LS
P1 Chest Red y
Max: 3.9 [g] at 0.095 [s]
Min: -4.0 [g] at 0.068 [s]
g
4
3
2
1
0
-1
-2
-3
-4
-5
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

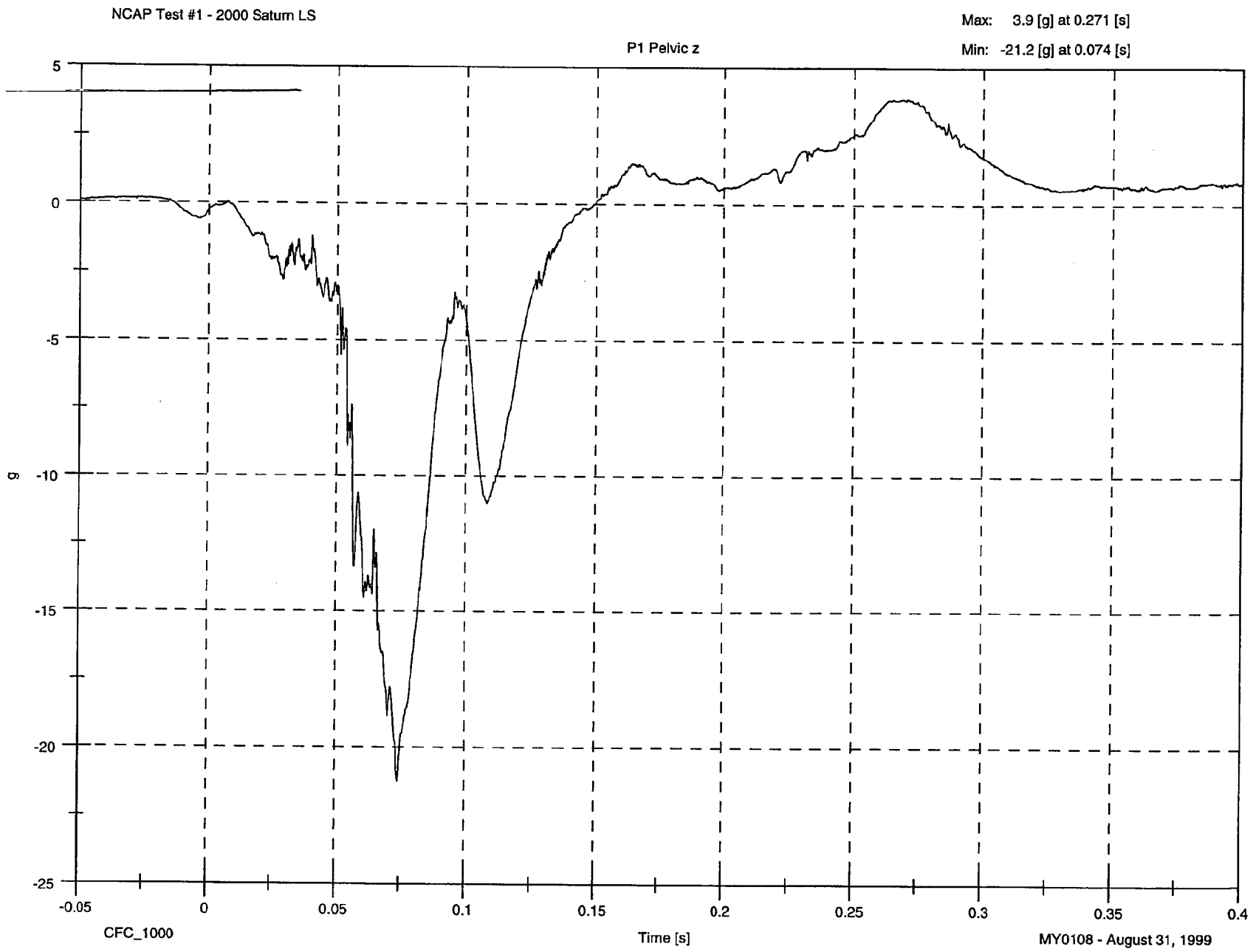

NCAP Test #1 - 2000 Saturn LS
P1 Chest Red z
Max: 16.2 [g] at 0.096 [s]
Min: -6.1 [g] at 0.118 [s]
20
15
10
5
0
-5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_180
Time [s]
MY0108 - August 31, 1999

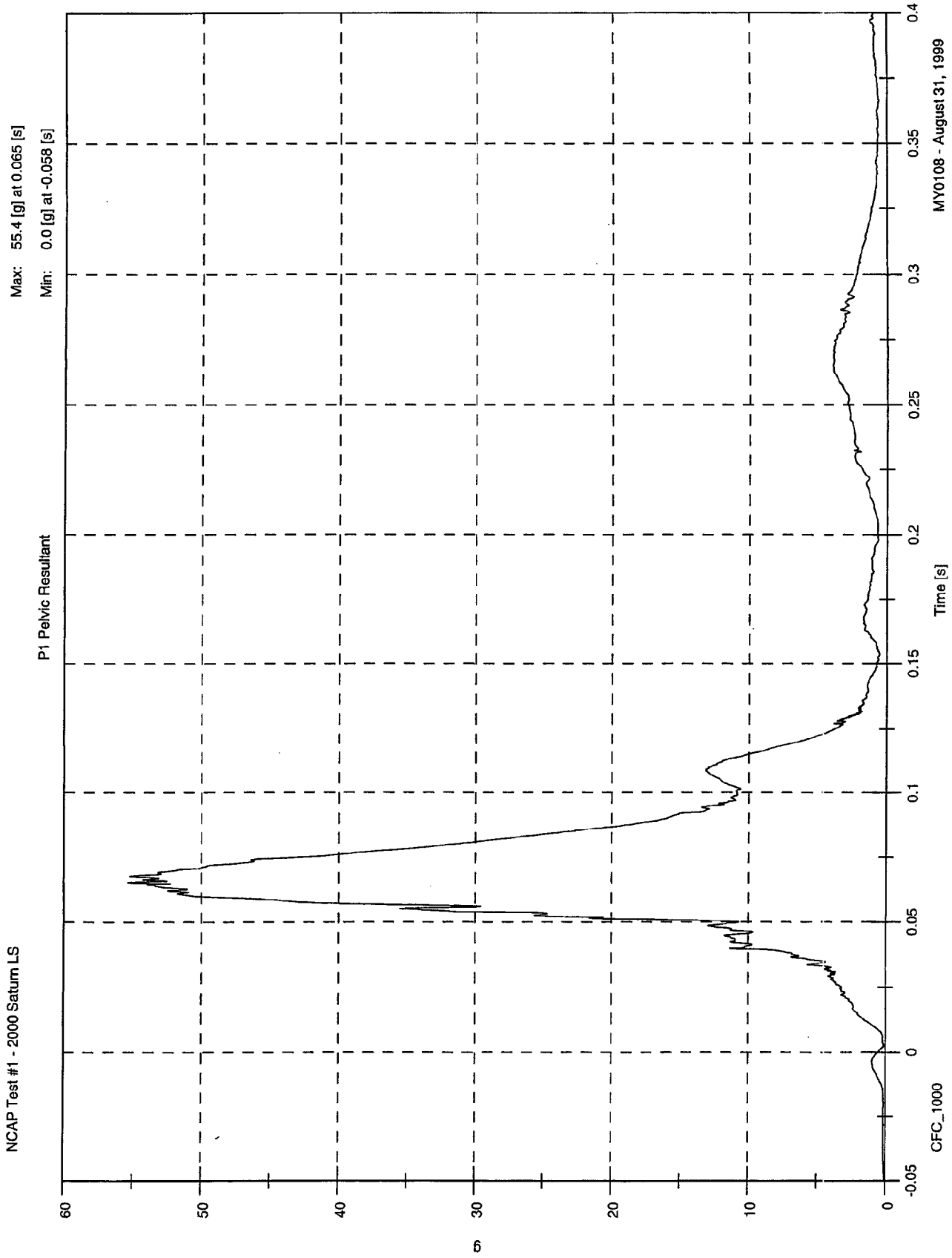

NCAP Test #1 - 2000 Saturn LS
Max: 45.1 [g] at 0.097 [s]
Min: 0.1 [g] at -0.058 [s]
P1 Chest Red Resultant
MY0108 - August 31, 1999
Time [s]
CFC_180
g
50
40
30
20
10
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4


NCAP Test #1 - 2000 Saturn LS
P1 Chest Compression x
Max: 0.1 [mm] at 0.005 [s]
Min: -31.0 [mm] at 0.098 [s]
mm
5
0
-5
-10
-15
-20
-25
-30
-35
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

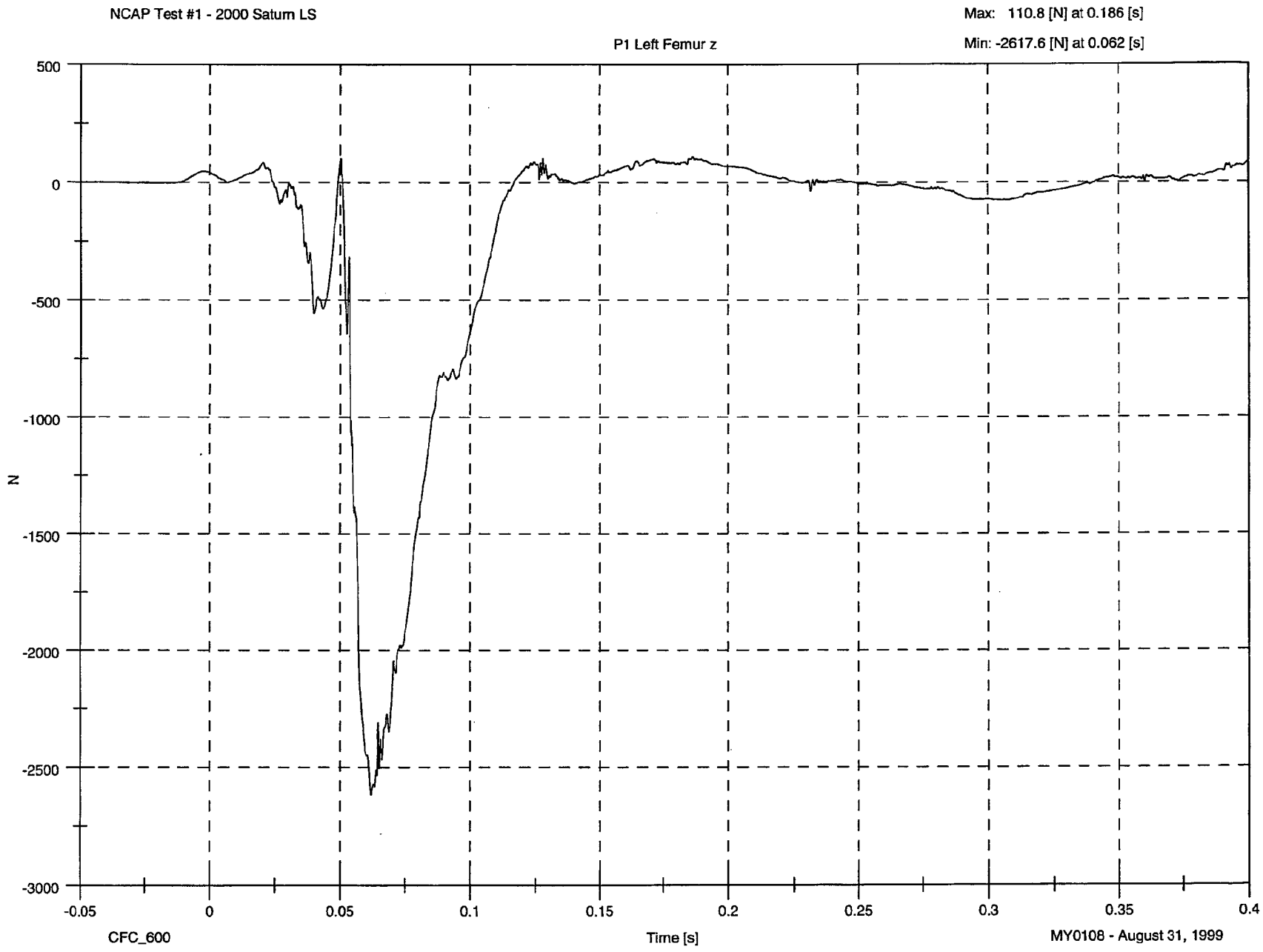

NCAP Test #1 - 2000 Saturn LS
Max: 1.5 [g] at 0.293 [s]
Min: -53.7 [g] at 0.065 [s]
P1 Pelvic x
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
10
0
-10
-20
-30
-40
-50
-60
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

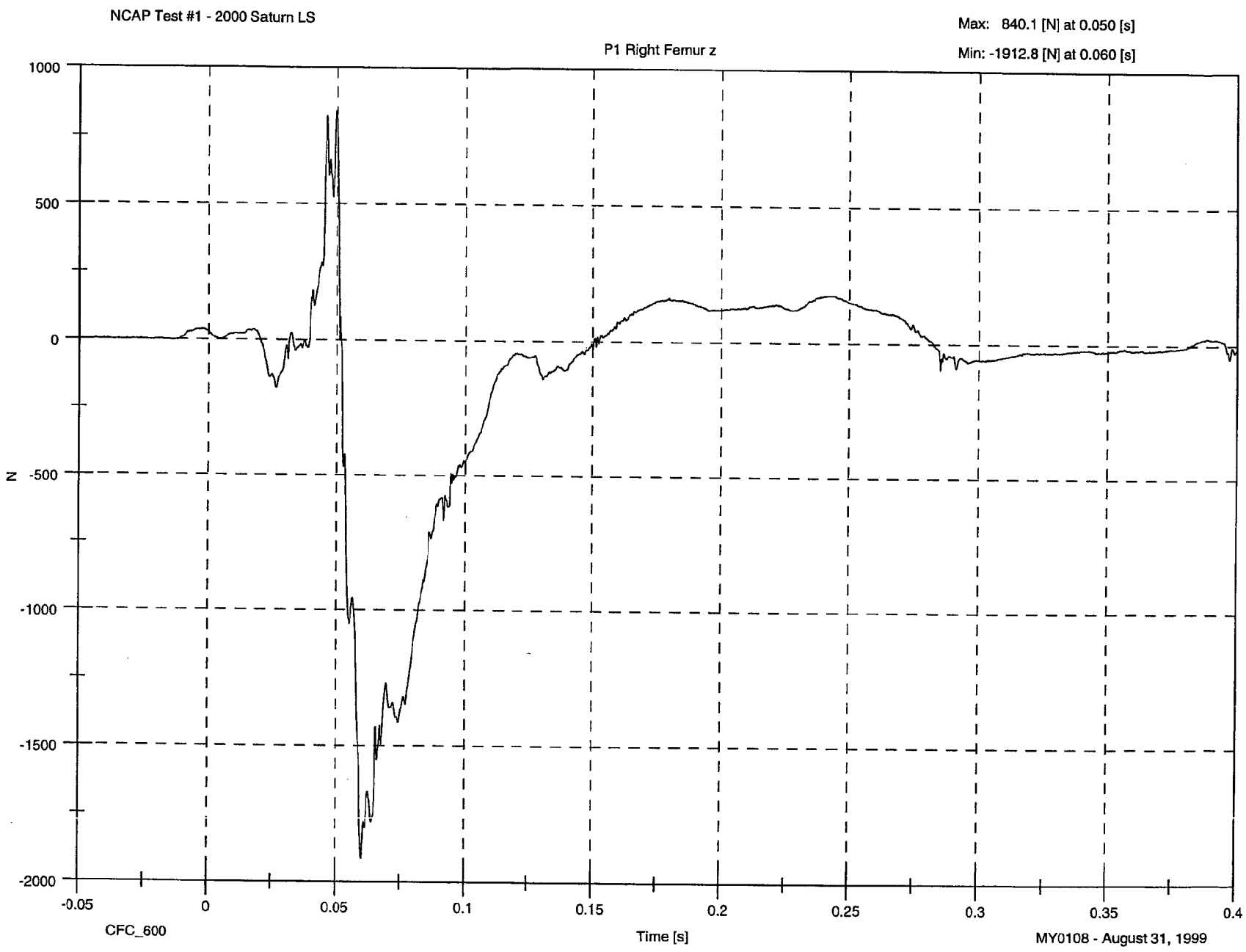

NCAP Test #1 - 2000 Saturn LS
P1 Pelvic y
Max: 6.5 [g] at 0.101 [s]
Min: -7.5 [g] at 0.054 [s]
7.5
5
2.5
0
-2.5
-5
-7.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

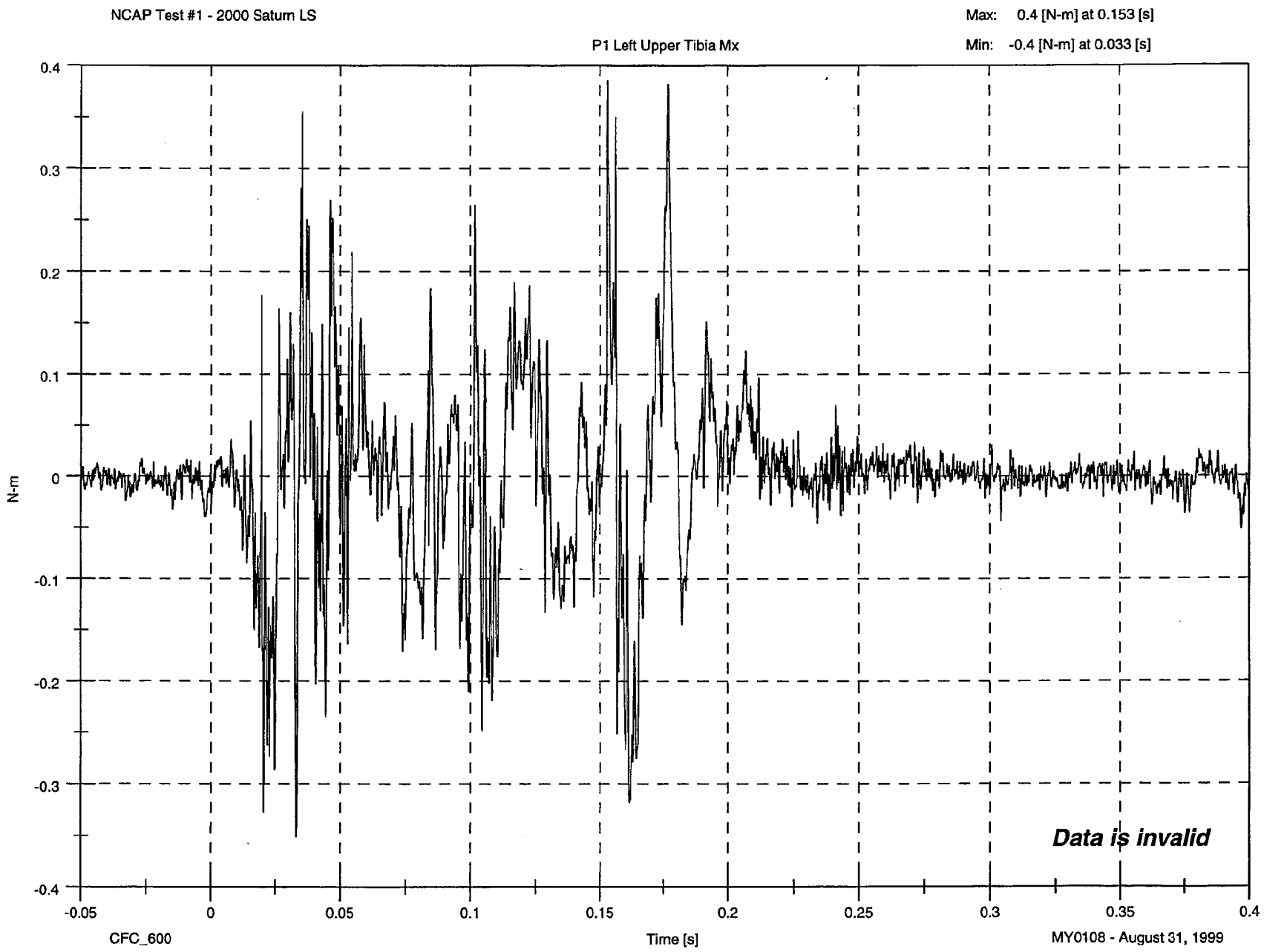

NCAP Test #1 - 2000 Saturn LS
P1 Pelvic z
Max: 3.9 [g] at 0.271 [s]
Min: -21.2 [g] at 0.074 [s]
5
0
-5
-10
-15
-20
-25
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

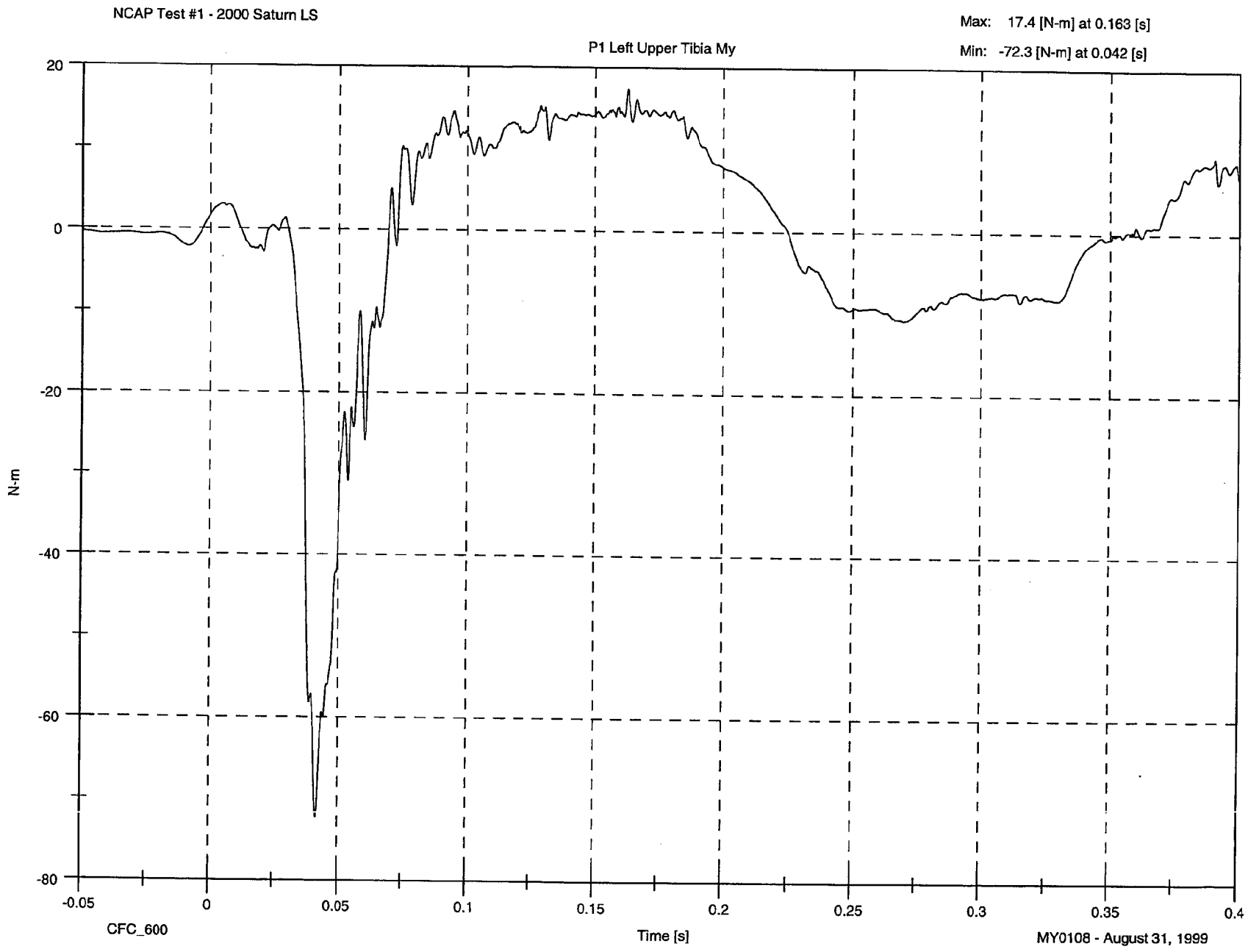

NCAP Test #1 - 2000 Saturn LS
P1 Pelvic Resultant
Max: 55.4 [g] at 0.065 [s]
Min: 0.0 [g] at -0.058 [s]
MY0108 - August 31, 1999
CFC_1000
Time [s]
g
60
50
40
30
20
10
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

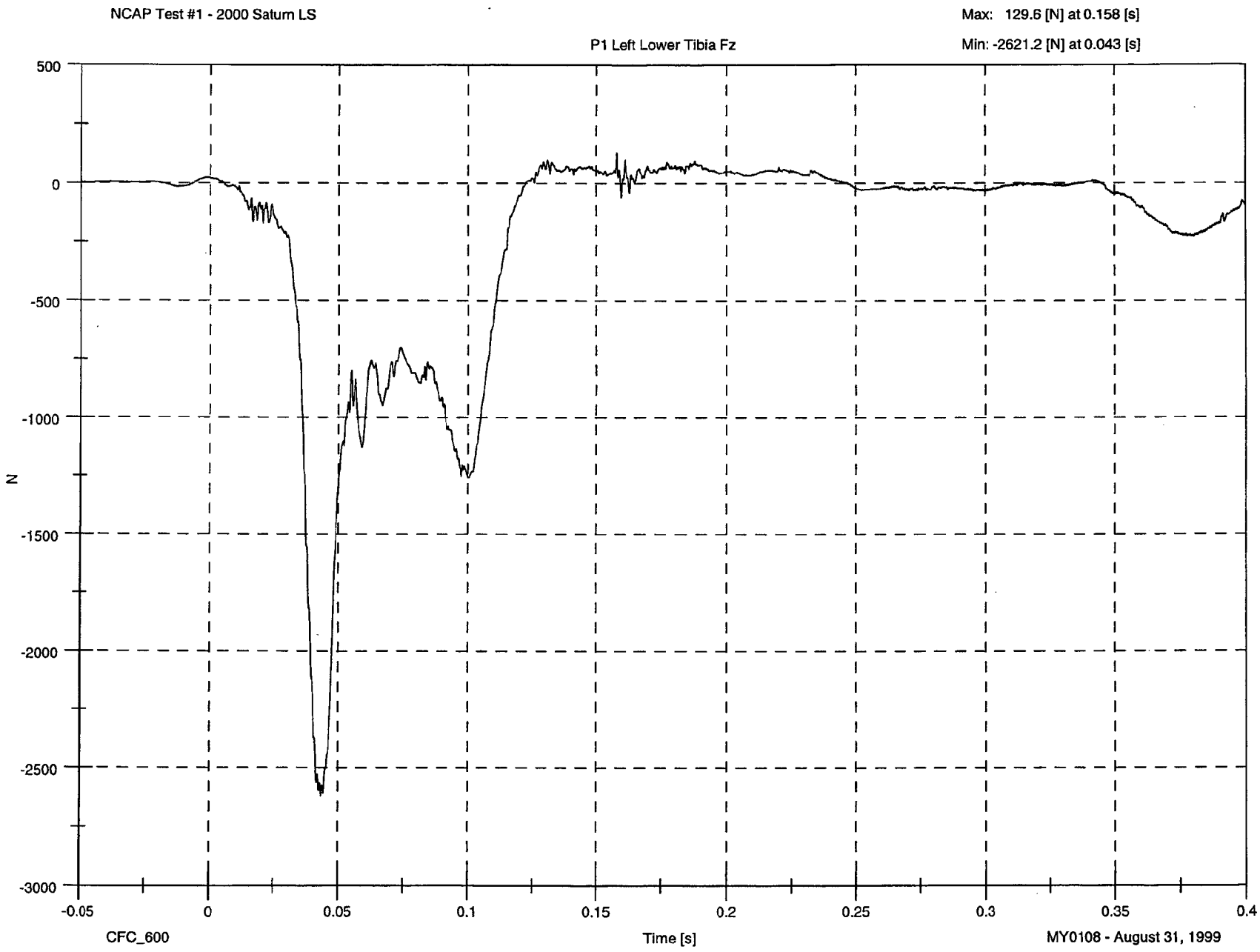
8413-39

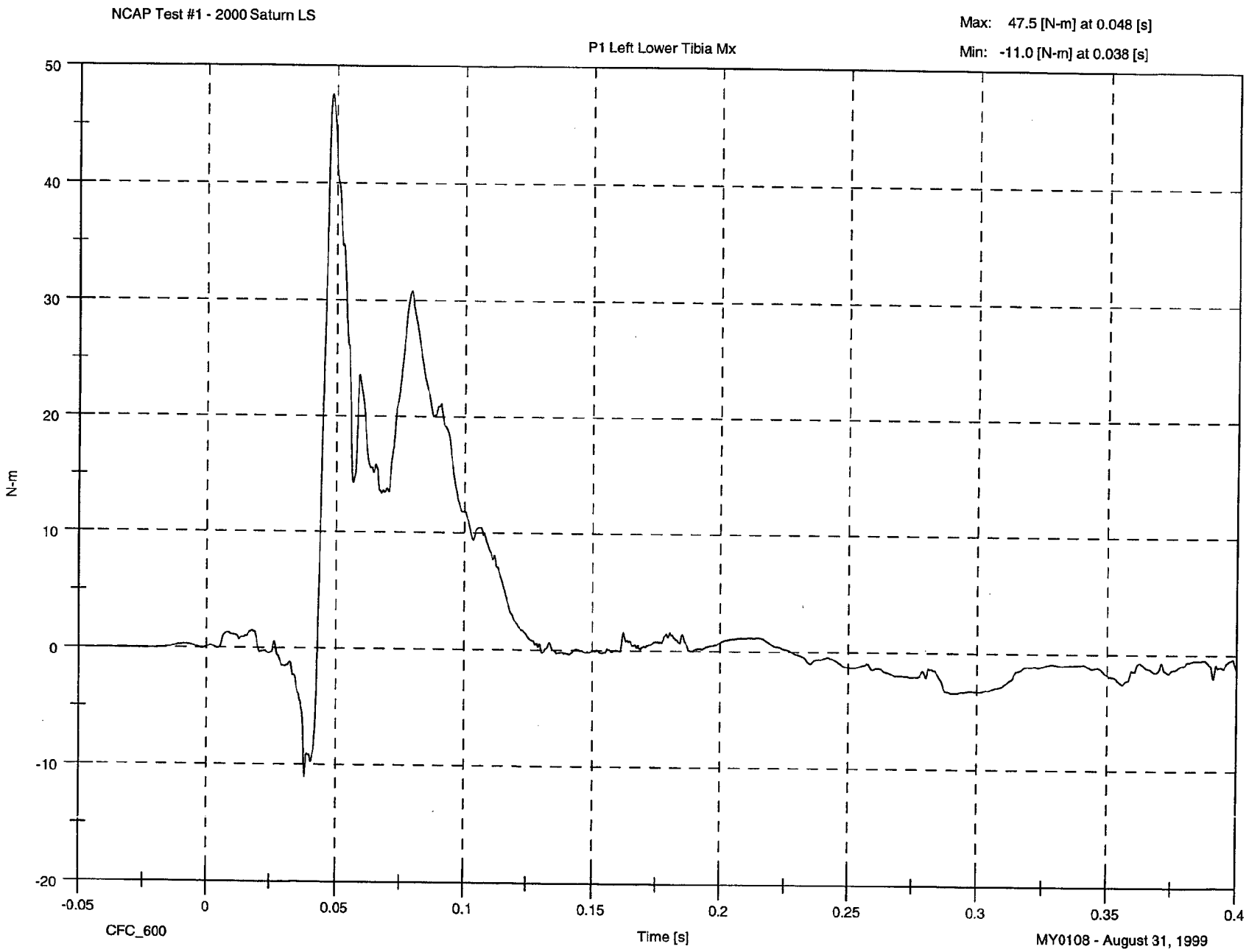

NCAP Test #1 - 2000 Saturn LS
P1 Left Femur z
Max: 110.8 [N] at 0.186 [s]
Min: -2617.6 [N] at 0.062 [s]
500
0
-500
-1000
-1500
-2000
-2500
-3000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_600
Time [s]
MY0108 - August 31, 1999

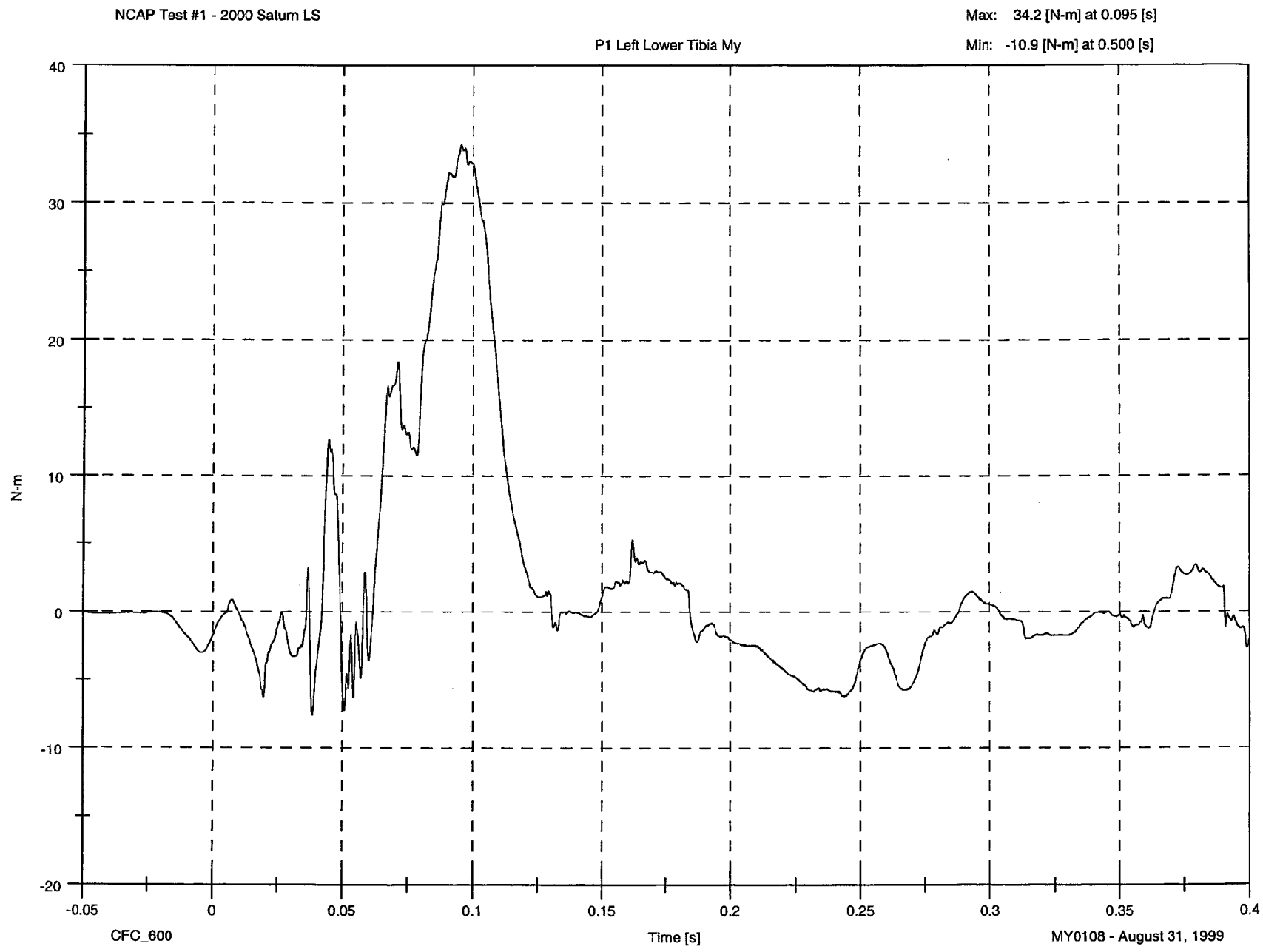

NCAP Test #1 - 2000 Saturn LS
P1 Right Femur z
Max: 840.1 [N] at 0.050 [s]
Min: -1912.8 [N] at 0.060 [s]
1000
500
0
-500
-1000
-1500
-2000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

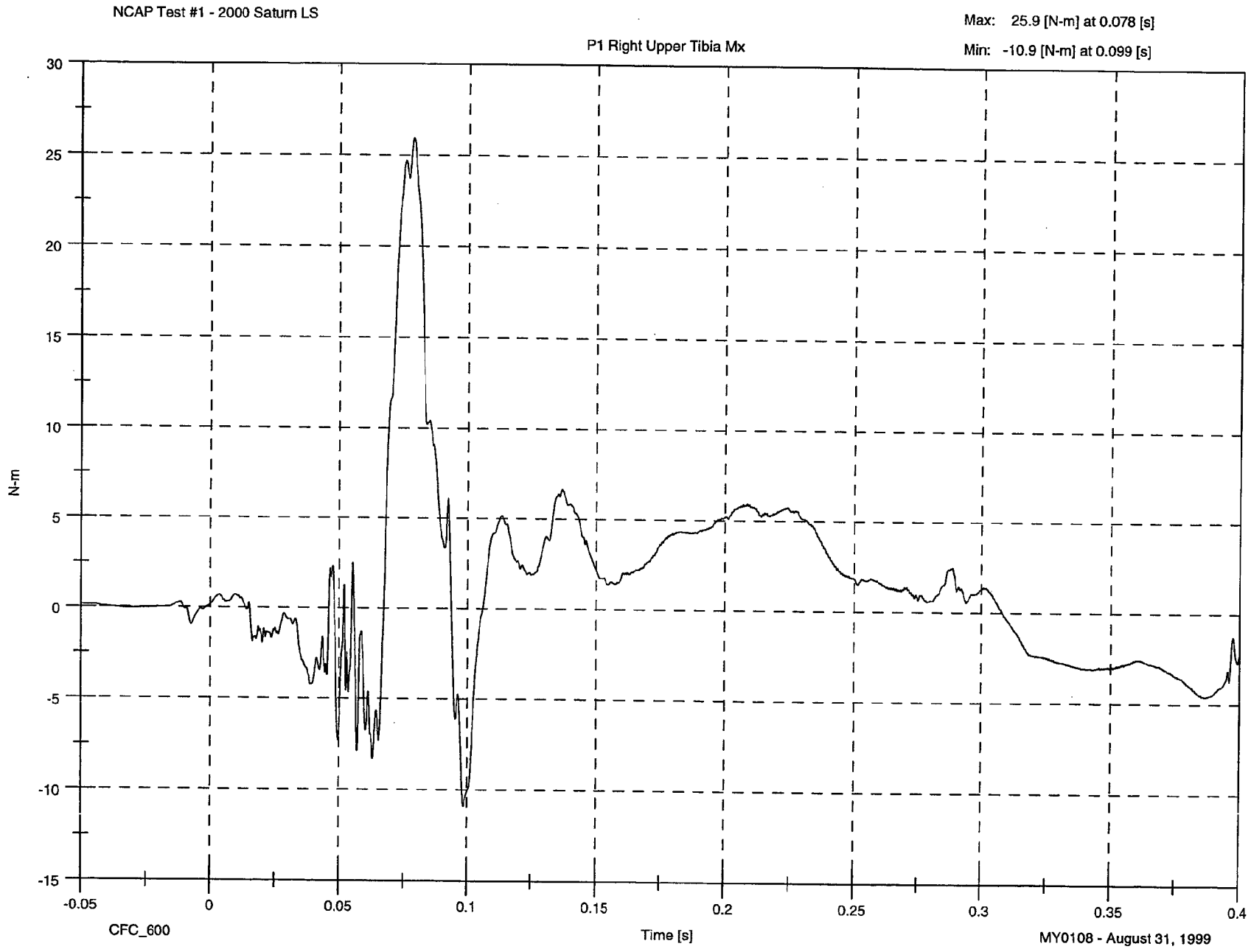

NCAP Test #1 - 2000 Saturn LS
P1 Left Upper Tibia Mx
Max: 0.4 [N-m] at 0.153 [s]
Min: -0.4 [N-m] at 0.033 [s]
N-m
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999
Data is invalid

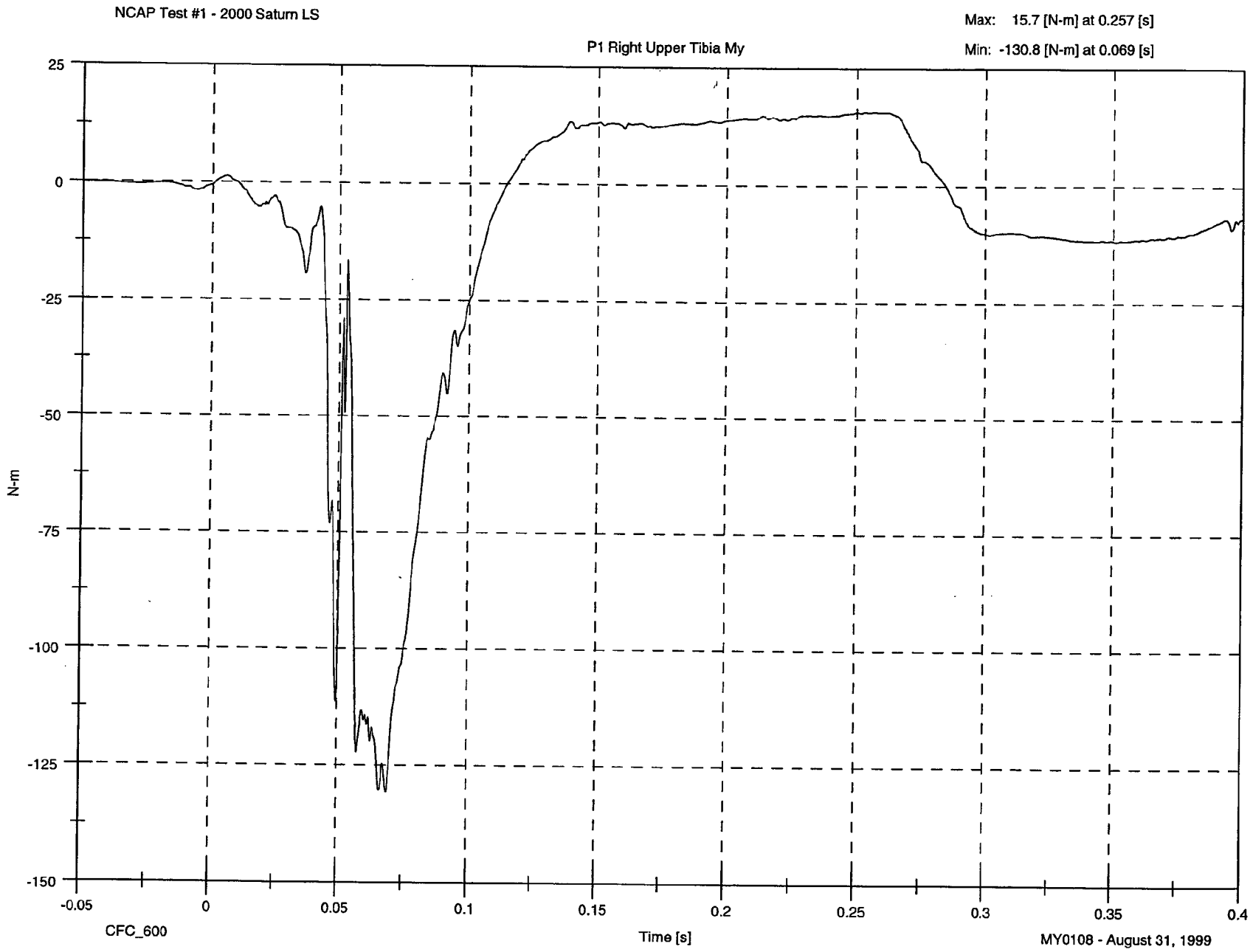

NCAP Test #1 - 2000 Saturn LS
P1 Left Upper Tibia My
Max: 17.4 [N-m] at 0.163 [s]
Min: -72.3 [N-m] at 0.042 [s]
20
0
-20
-40
-60
-80
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

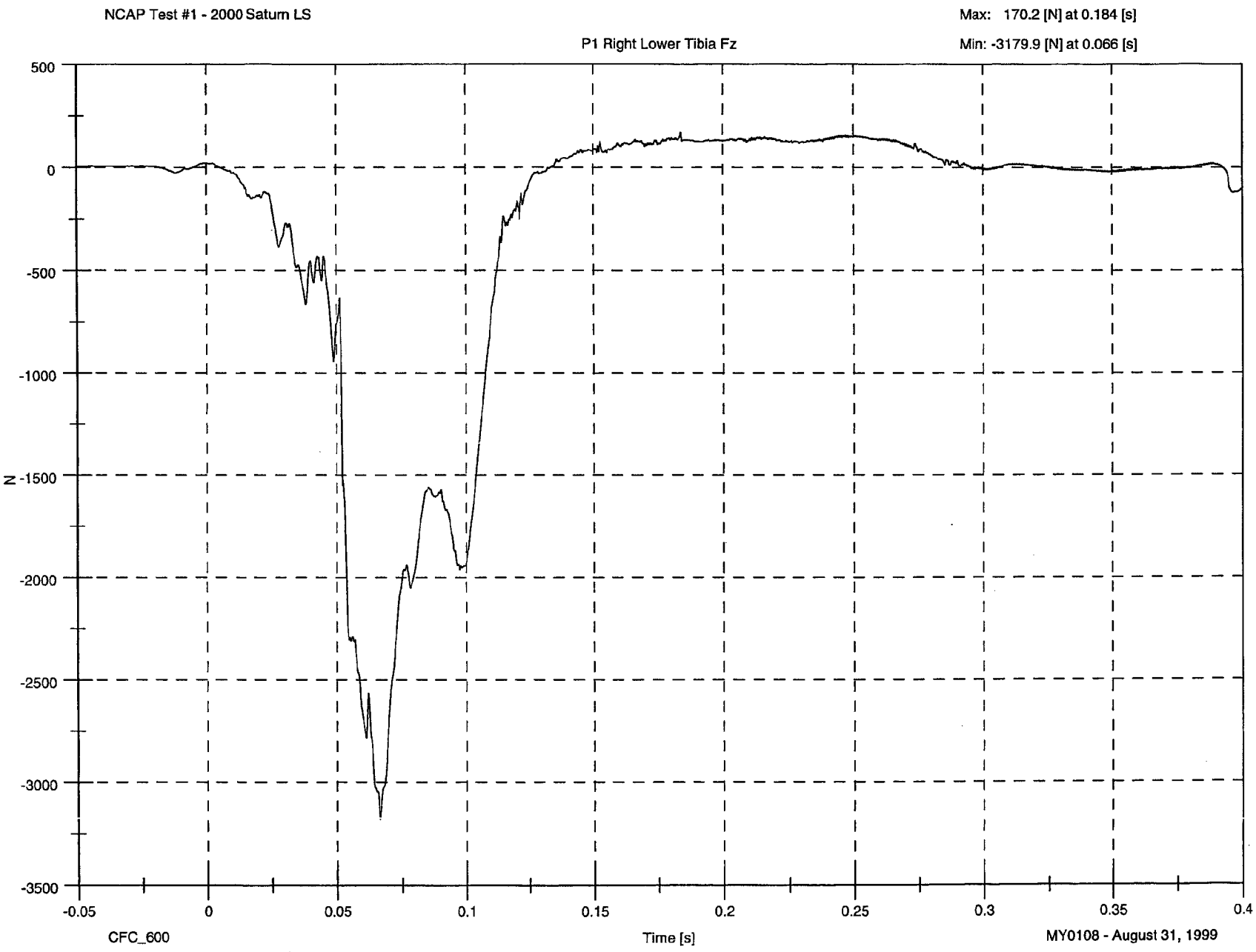

NCAP Test #1 - 2000 Saturn LS
P1 Left Lower Tibia Fz
Max: 129.6 [N] at 0.158 [s]
Min: -2621.2 [N] at 0.043 [s]
500
0
-500
-1000
-1500
-2000
-2500
-3000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_600
Time [s]
MY0108 - August 31, 1999

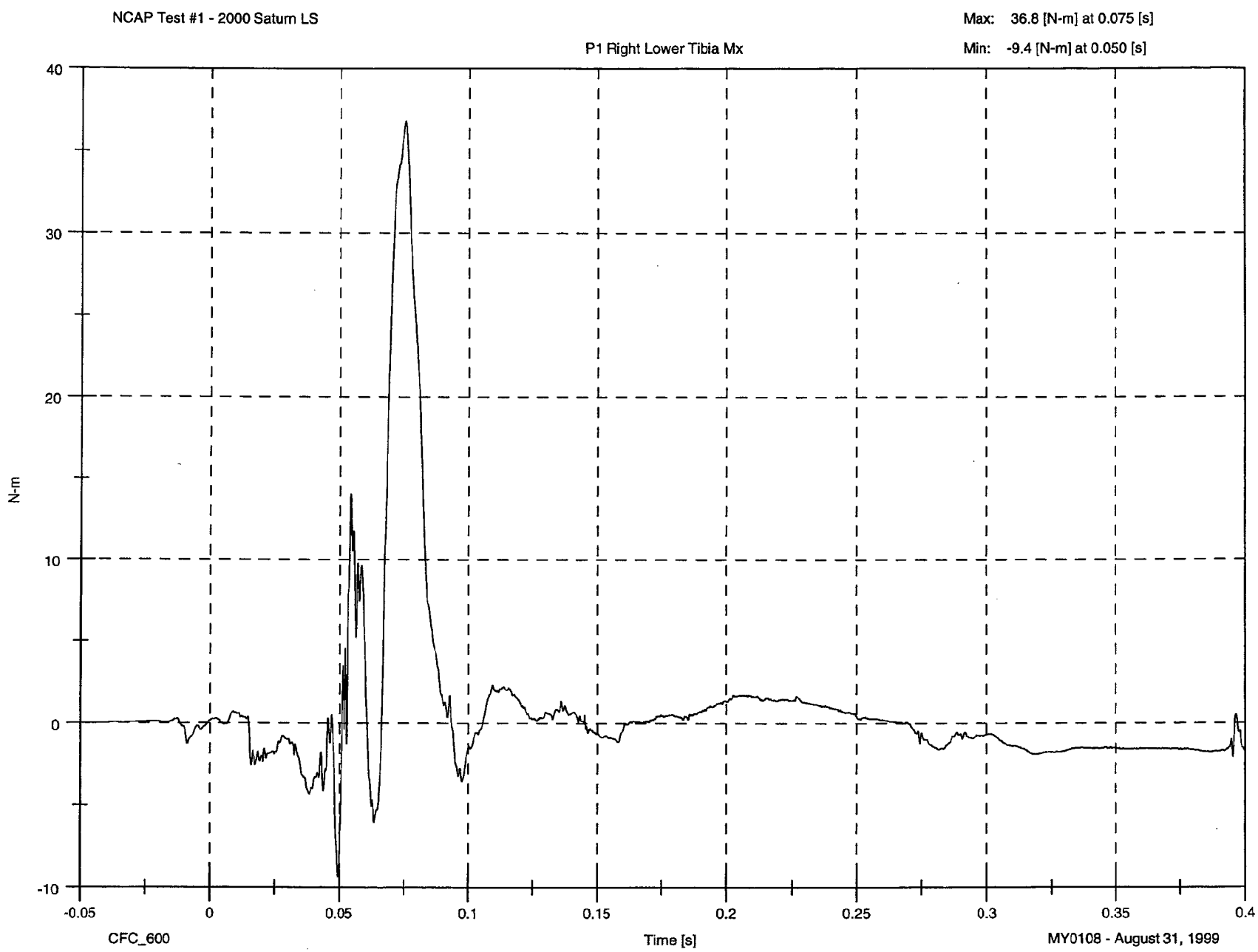

NCAP Test #1 - 2000 Saturn LS
P1 Left Lower Tibia Mx
Max: 47.5 [N-m] at 0.048 [s]
Min: -11.0 [N-m] at 0.038 [s]
N-m
50
40
30
20
10
0
-10
-20
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

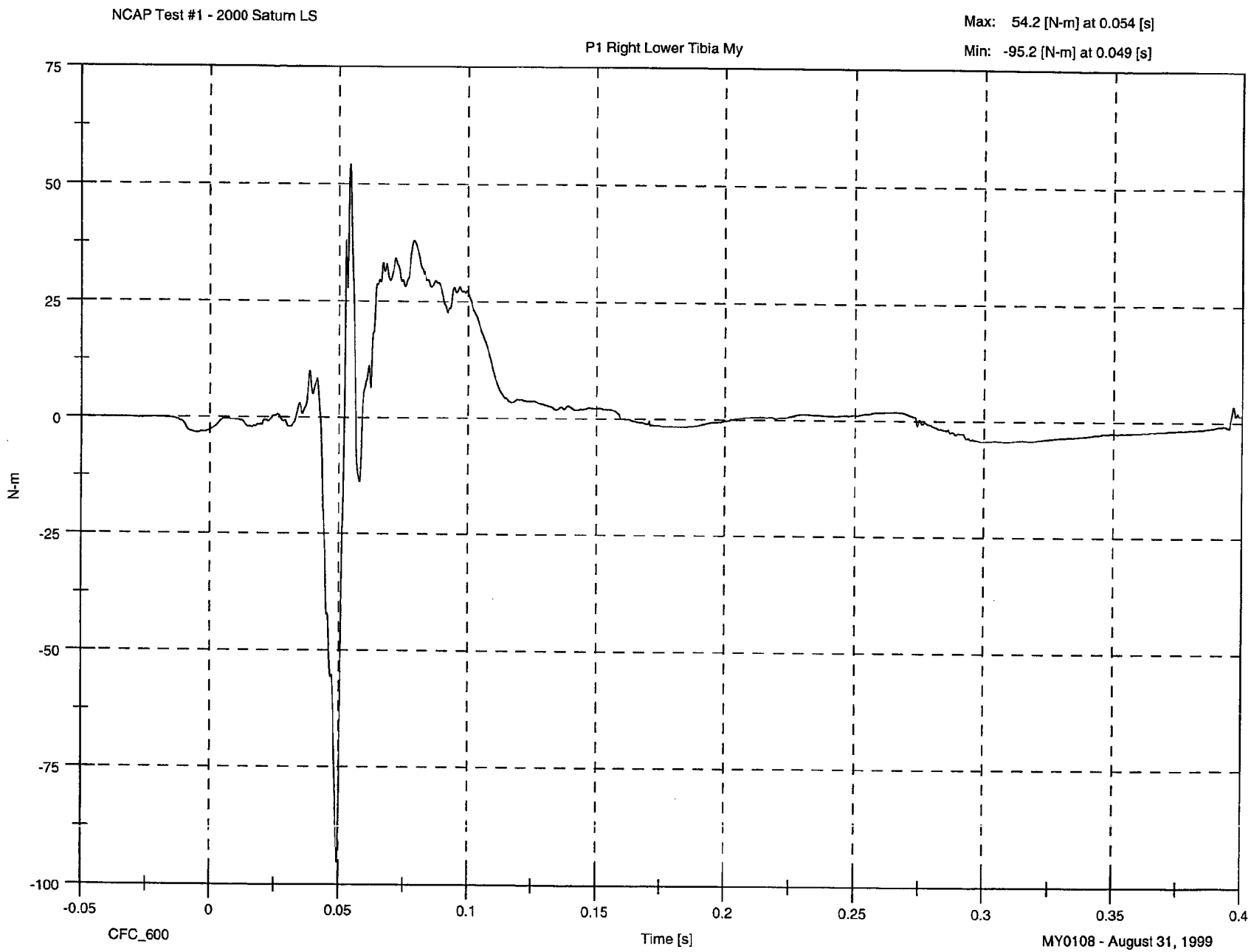

NCAP Test #1 - 2000 Saturn LS
P1 Left Lower Tibia My
Max: 34.2 [N-m] at 0.095 [s]
Min: -10.9 [N-m] at 0.500 [s]
N-m
40
30
20
10
0
-10
-20
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

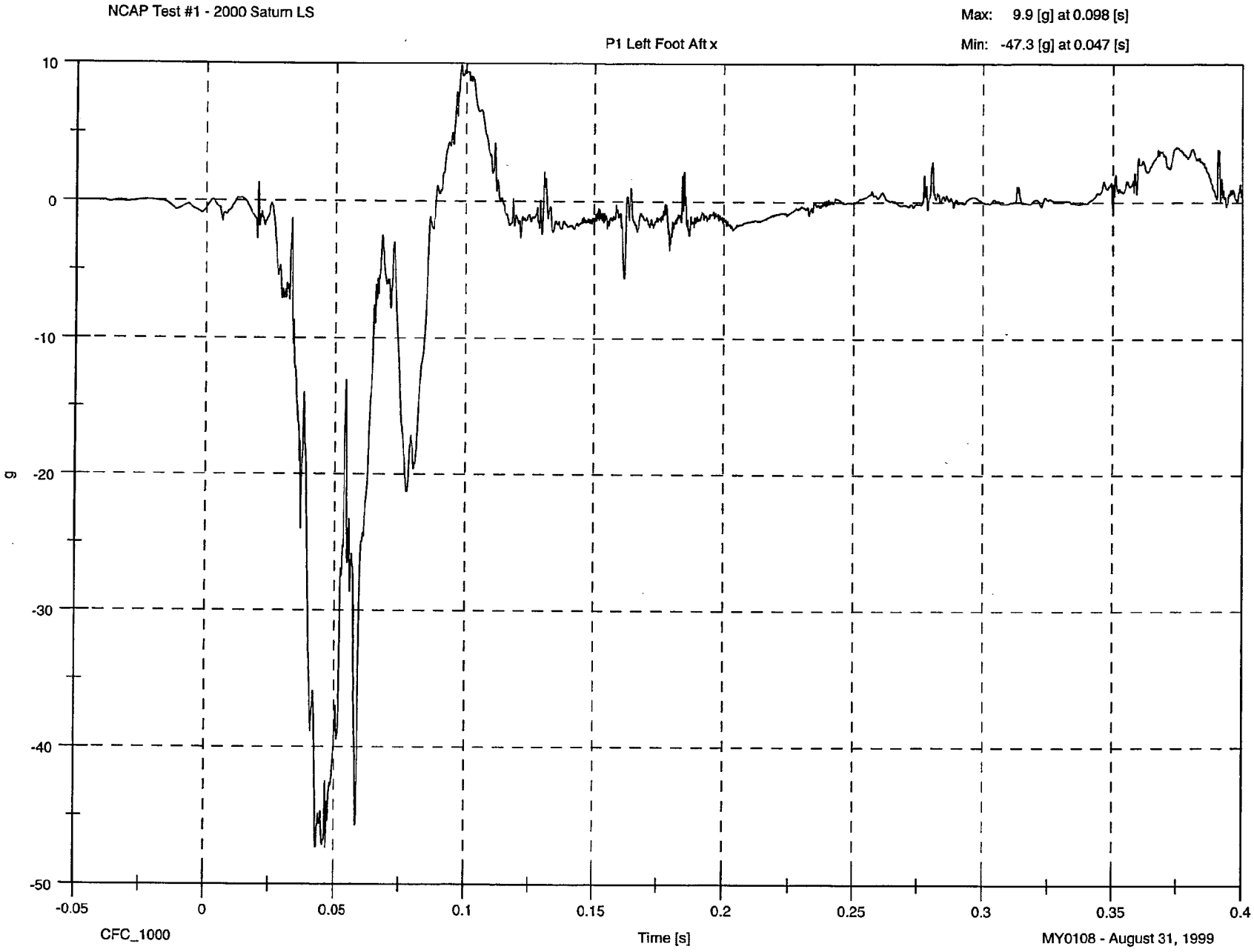

NCAP Test #1 - 2000 Saturn LS
P1 Right Upper Tibia Mx
Max: 25.9 [N-m] at 0.078 [s]
Min: -10.9 [N-m] at 0.099 [s]
N-m
30
25
20
15
10
5
0
-5
-10
-15
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

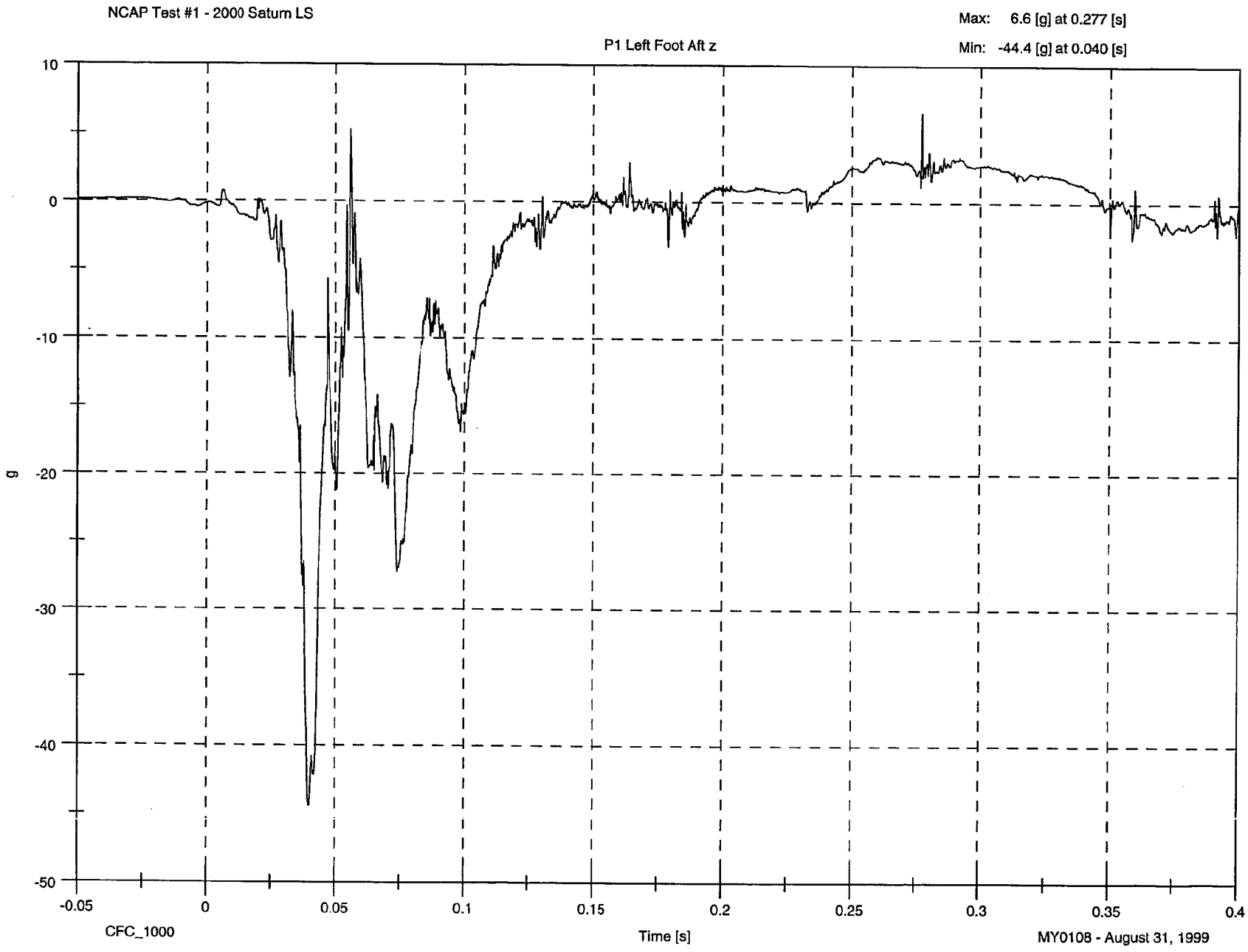

NCAP Test #1 - 2000 Saturn LS
P1 Right Upper Tibia My
Max: 15.7 [N-m] at 0.257 [s]
Min: -130.8 [N-m] at 0.069 [s]
25
0
-25
-50
-75
-100
-125
-150
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_600
Time [s]
MY0108 - August 31, 1999

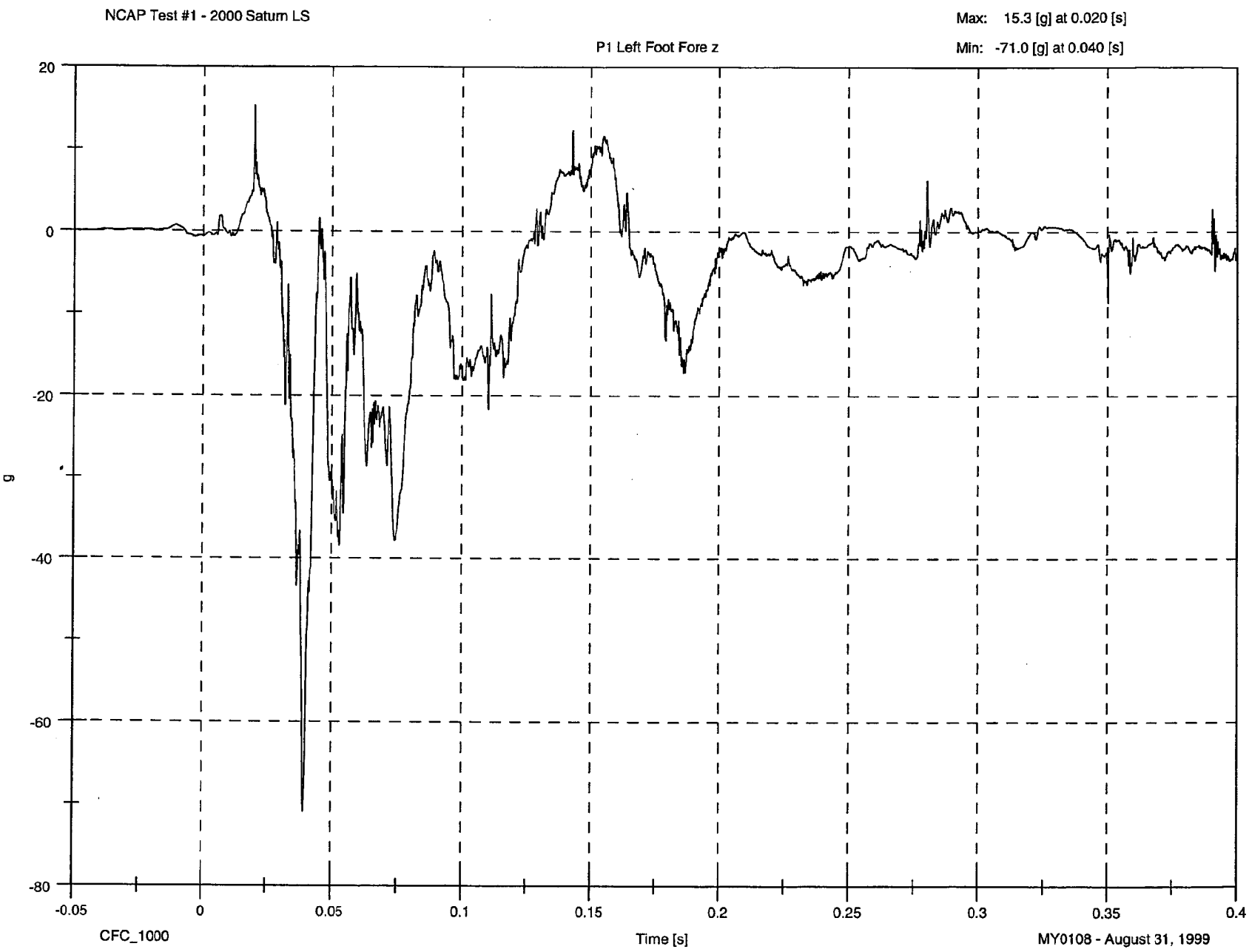

NCAP Test #1 - 2000 Saturn LS
P1 Right Lower Tibia Fz
Max: 170.2 [N] at 0.184 [s]
Min: -3179.9 [N] at 0.066 [s]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

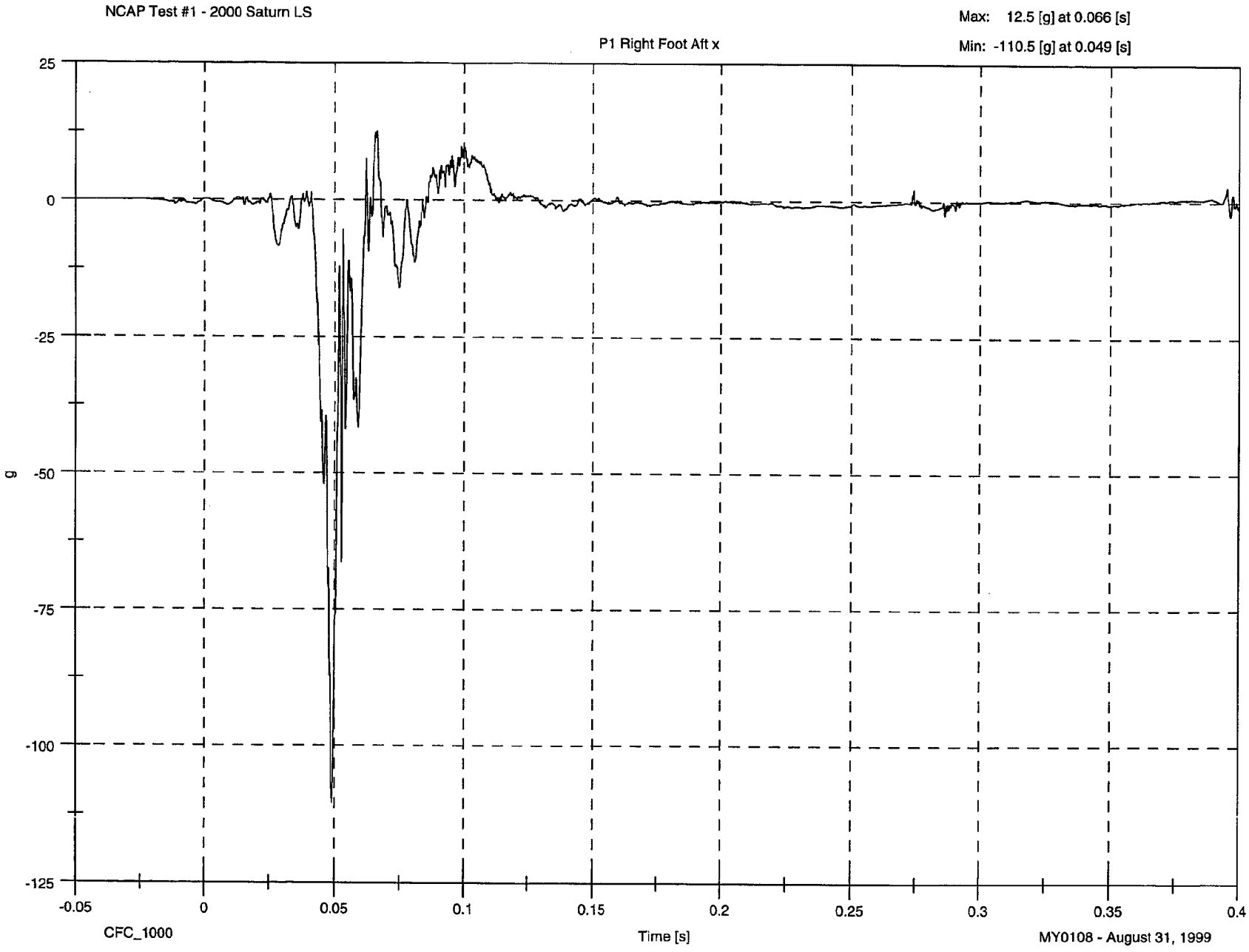

NCAP Test #1 - 2000 Saturn LS
P1 Right Lower Tibia Mx
Max: 36.8 [N-m] at 0.075 [s]
Min: -9.4 [N-m] at 0.050 [s]
N-m
40
30
20
10
0
-10
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

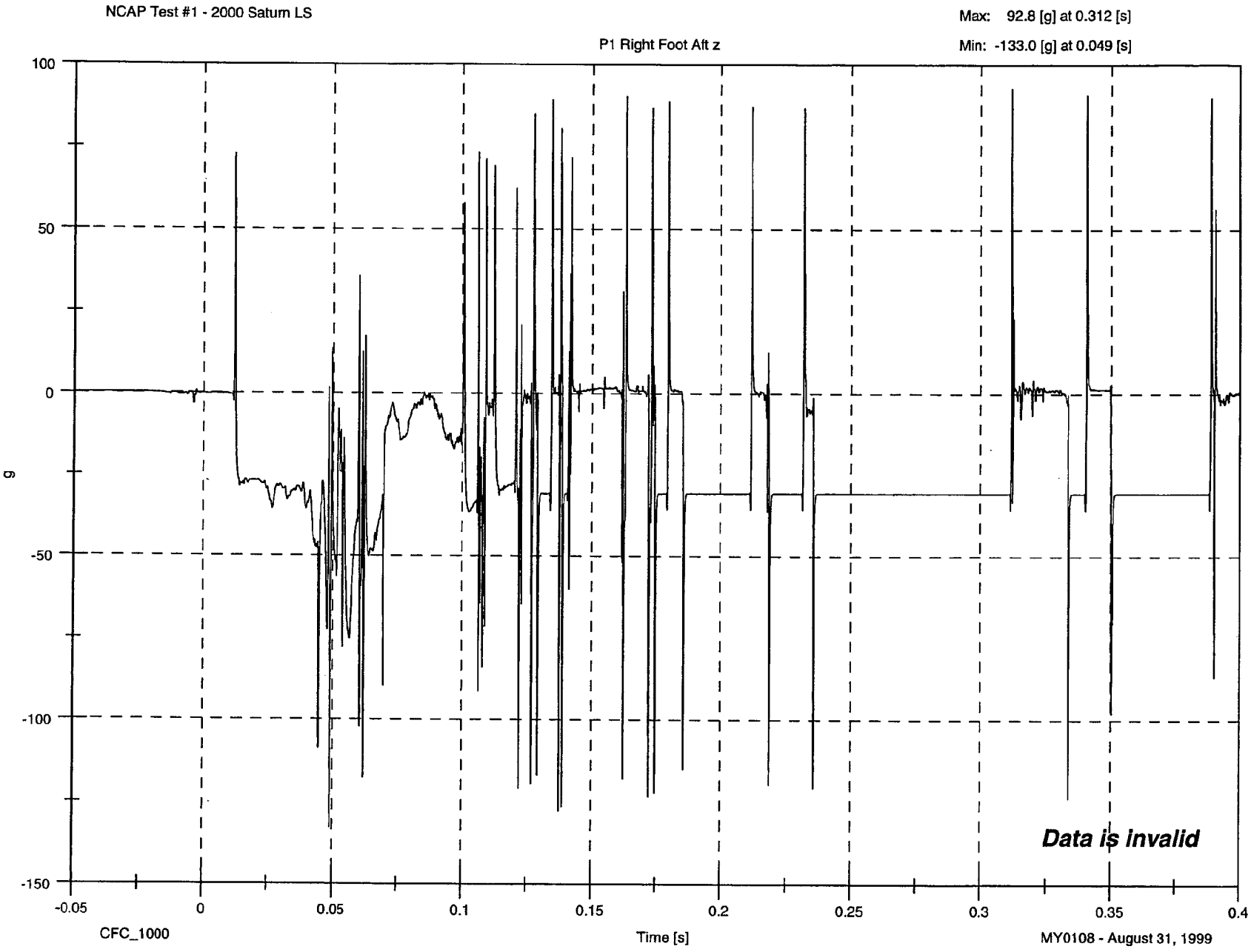

NCAP Test #1 - 2000 Saturn LS
P1 Right Lower Tibia My
Max: 54.2 [N-m] at 0.054 [s]
Min: -95.2 [N-m] at 0.049 [s]
75
50
25
0
-25
-50
-75
-100
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

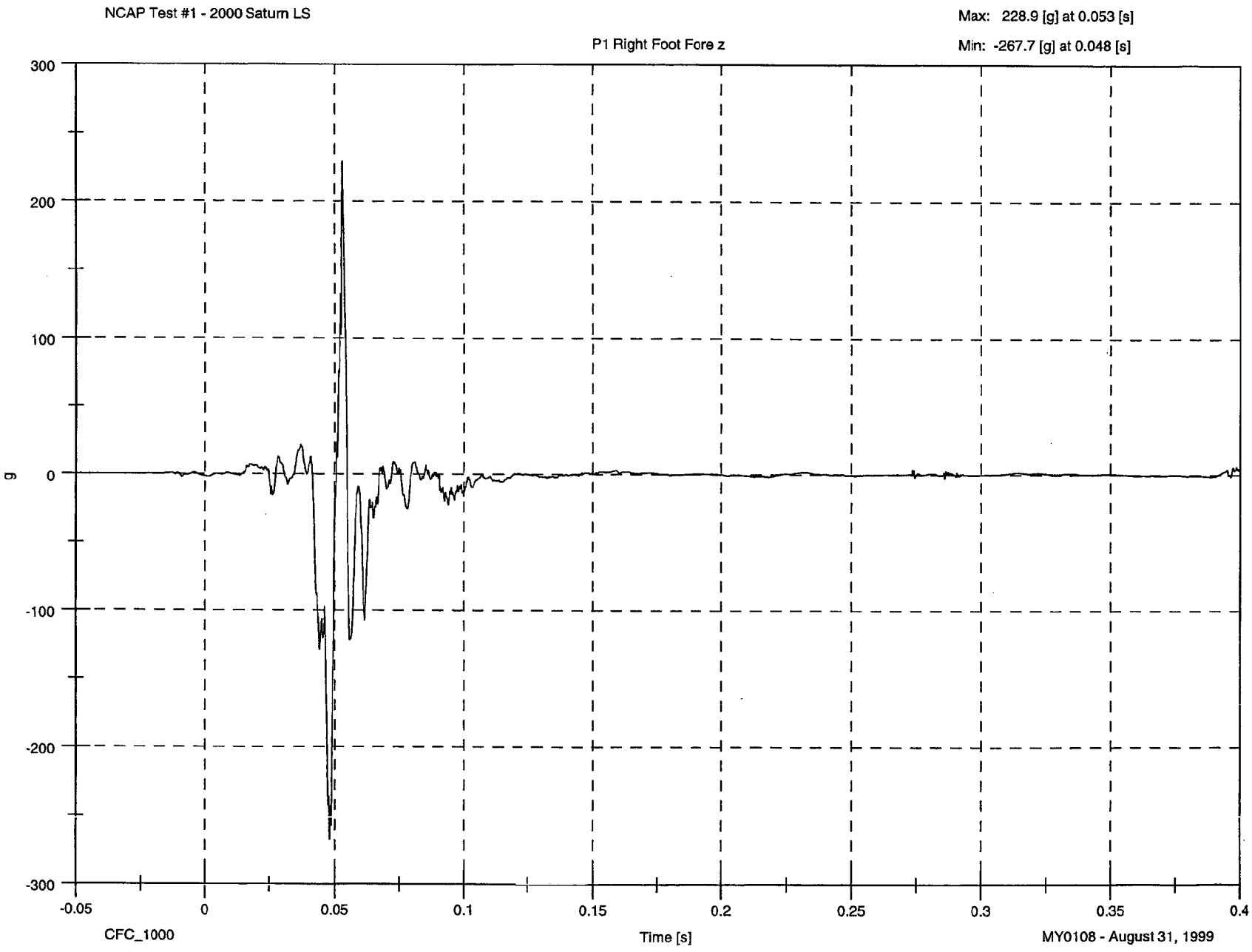

NCAP Test #1 - 2000 Saturn LS
P1 Left Foot Aft x
Max: 9.9 [g] at 0.098 [s]
Min: -47.3 [g] at 0.047 [s]
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

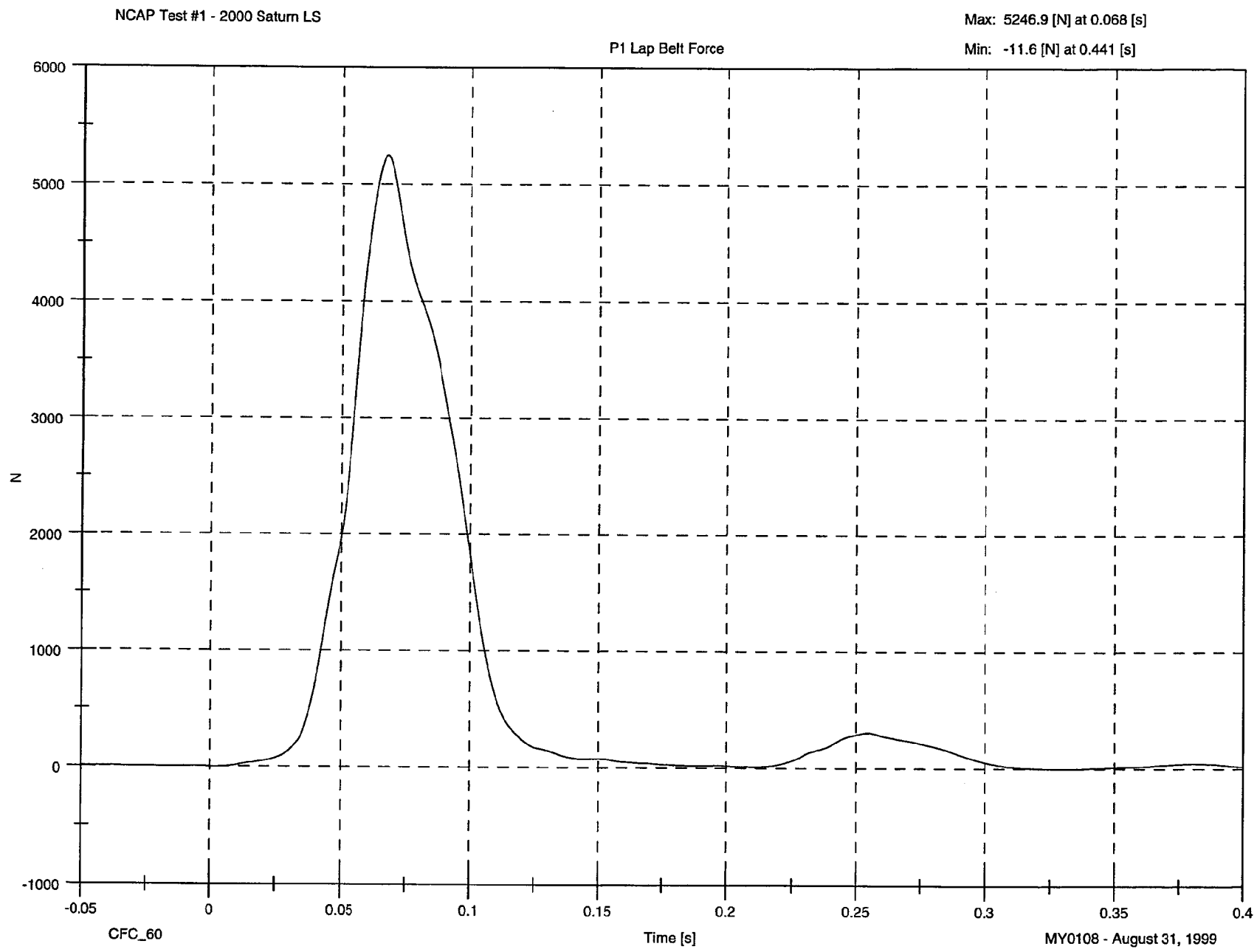

NCAP Test #1 - 2000 Saturn LS
P1 Left Foot Aft z
Max: 6.6 [g] at 0.277 [s]
Min: -44.4 [g] at 0.040 [s]
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

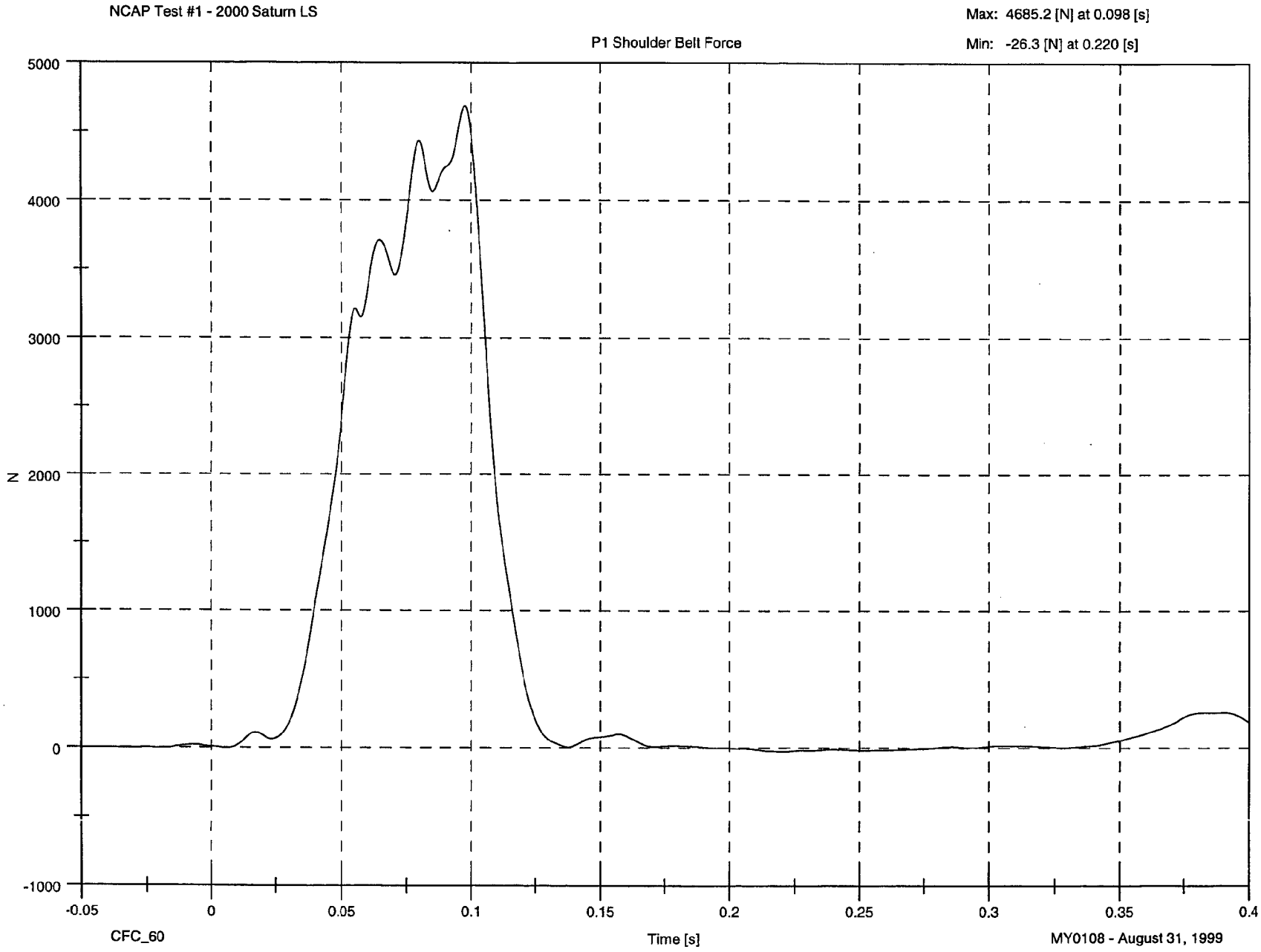

NCAP Test #1 - 2000 Saturn LS
P1 Left Foot Fore z
Max: 15.3 [g] at 0.020 [s]
Min: -71.0 [g] at 0.040 [s]
20
0
-20
-40
-60
-80
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

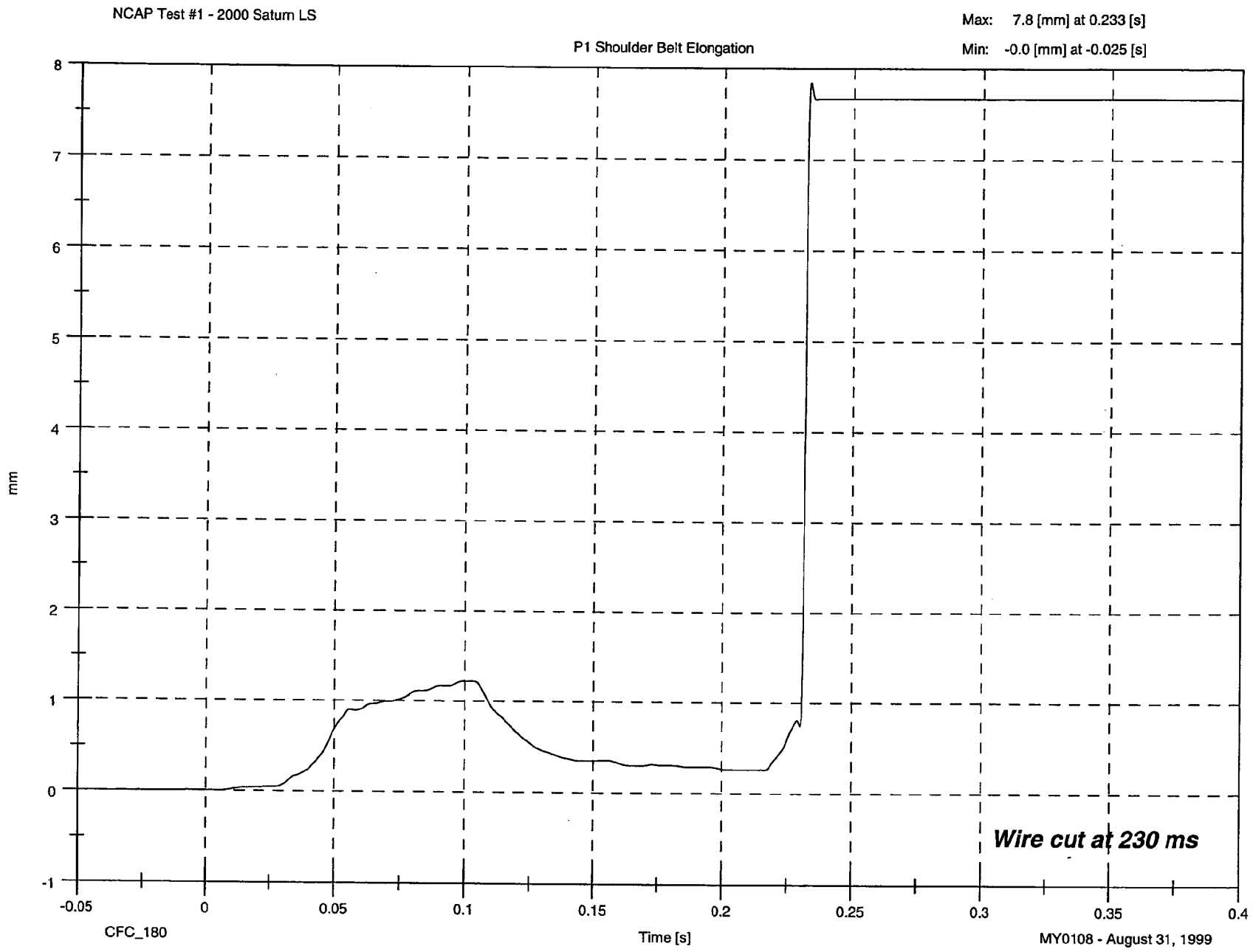

NCAP Test #1 - 2000 Saturn LS
P1 Right Foot Aft x
Max: 12.5 [g] at 0.066 [s]
Min: -110.5 [g] at 0.049 [s]
25
0
-25
-50
-75
-100
-125
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

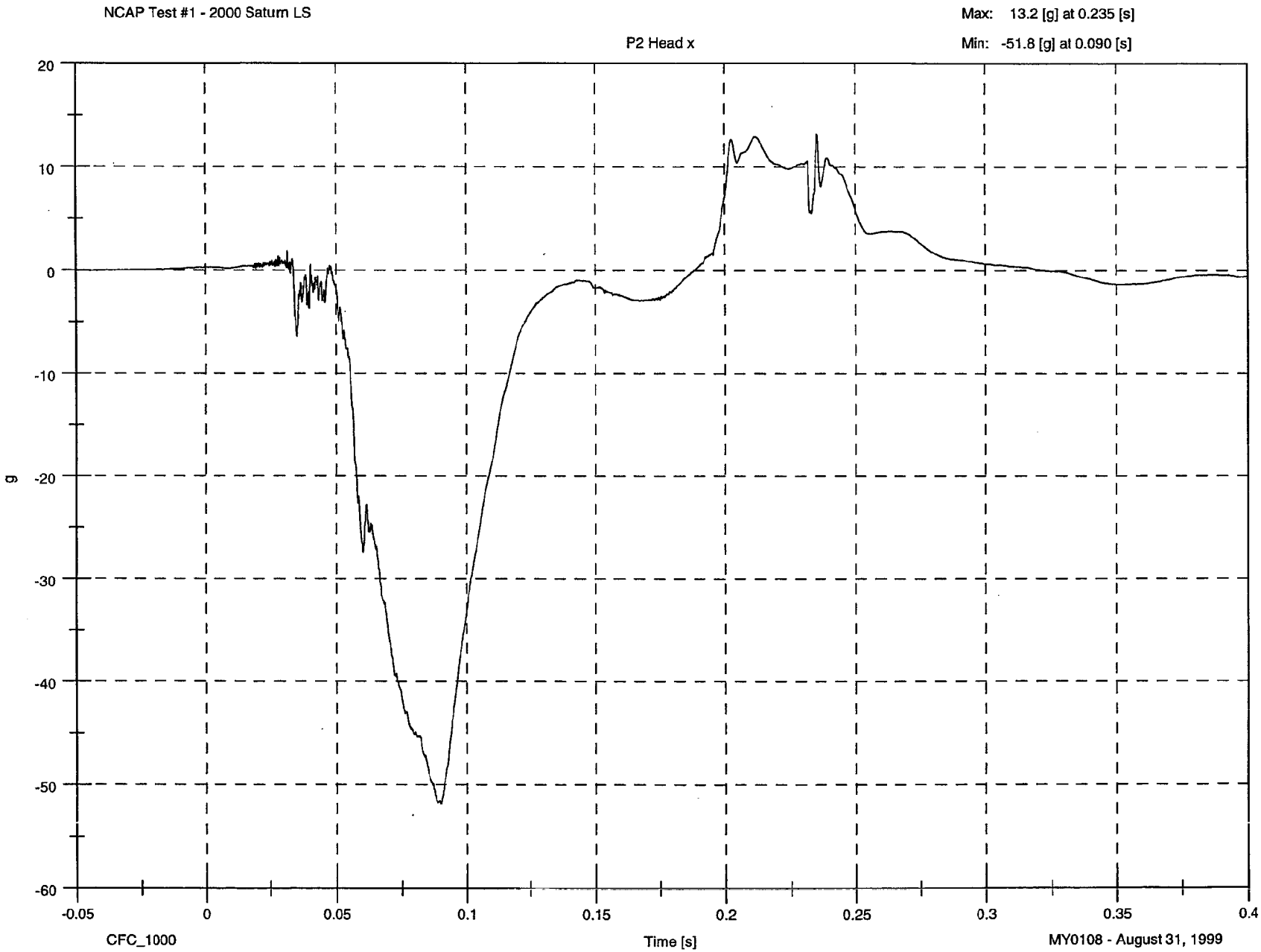

NCAP Test #1 - 2000 Saturn LS
P1 Right Foot Aft z
Max: 92.8 [g] at 0.312 [s]
Min: -133.0 [g] at 0.049 [s]
100
50
0
-50
-100
-150
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999
Data is invalid

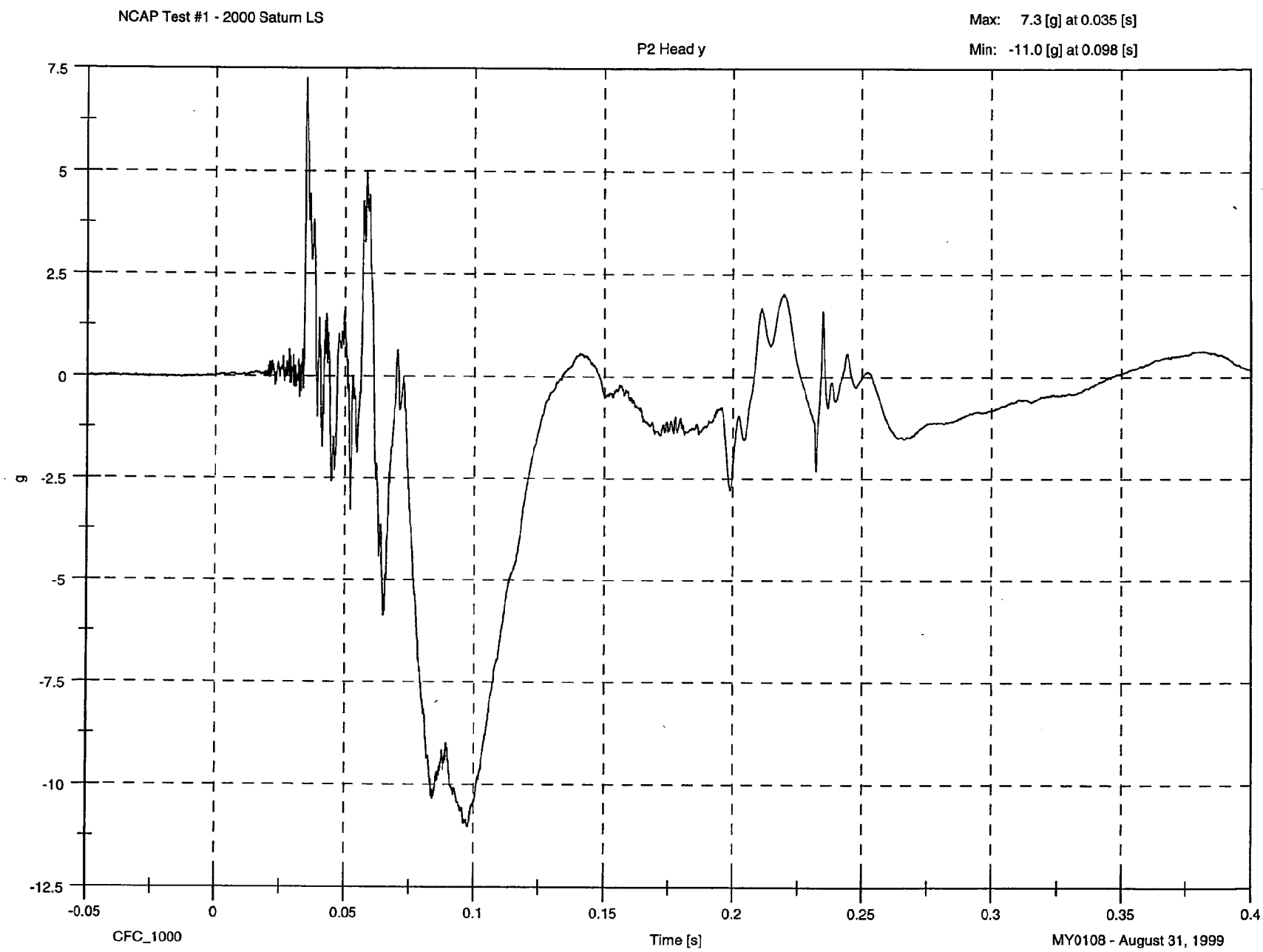

NCAP Test #1 - 2000 Saturn LS
P1 Right Foot Fore z
Max: 228.9 [g] at 0.053 [s]
Min: -267.7 [g] at 0.048 [s]
300
200
100
0
-100
-200
-300
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

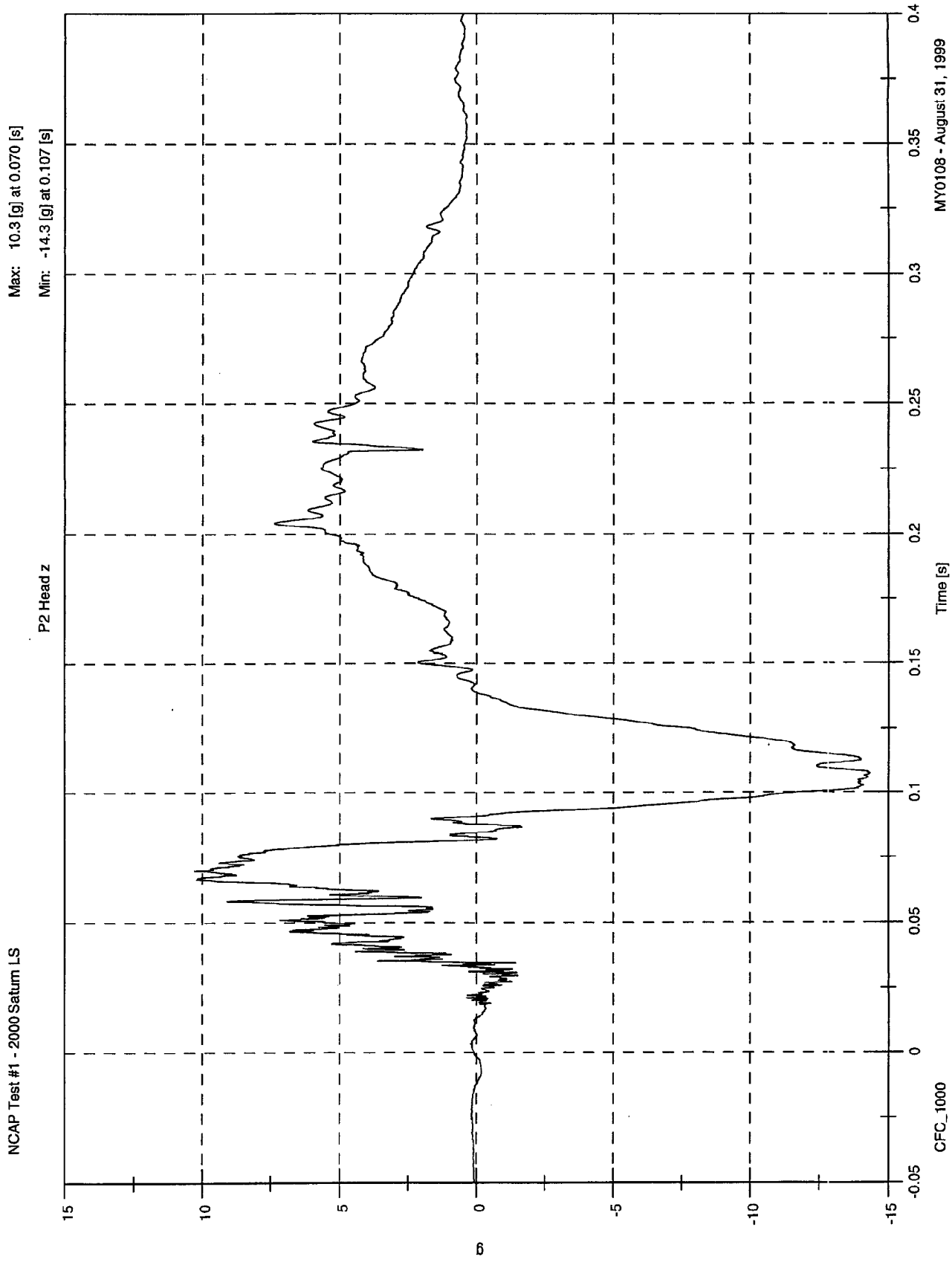

NCAP Test #1 - 2000 Saturn LS
P1 Lap Belt Force
Max: 5246.9 [N] at 0.068 [s]
Min: -11.6 [N] at 0.441 [s]
6000
5000
4000
3000
2000
1000
0
-1000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999

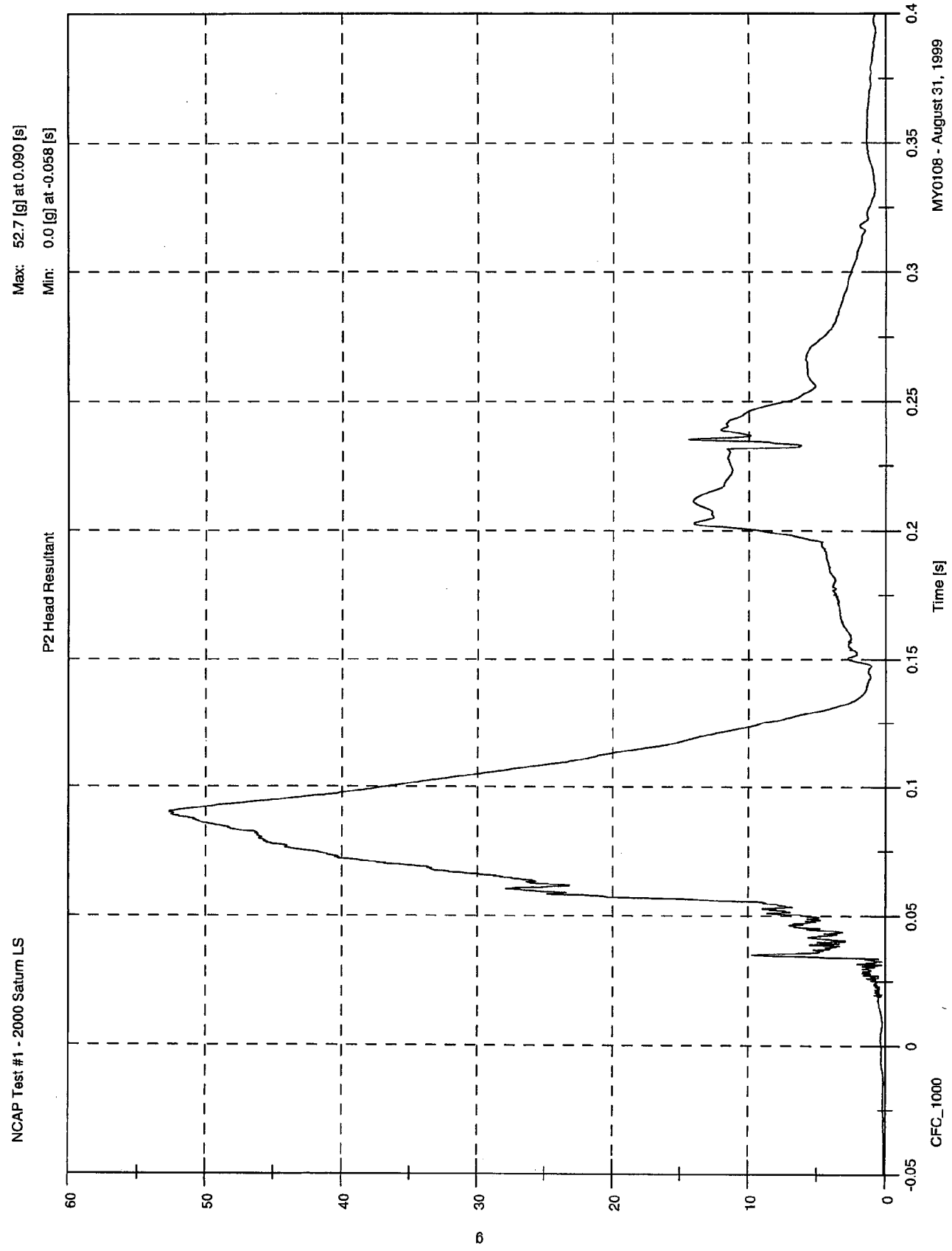

NCAP Test #1 - 2000 Saturn LS
P1 Shoulder Belt Force
Max: 4685.2 [N] at 0.098 [s]
Min: -26.3 [N] at 0.220 [s]
5000
4000
3000
2000
1000
0
-1000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999

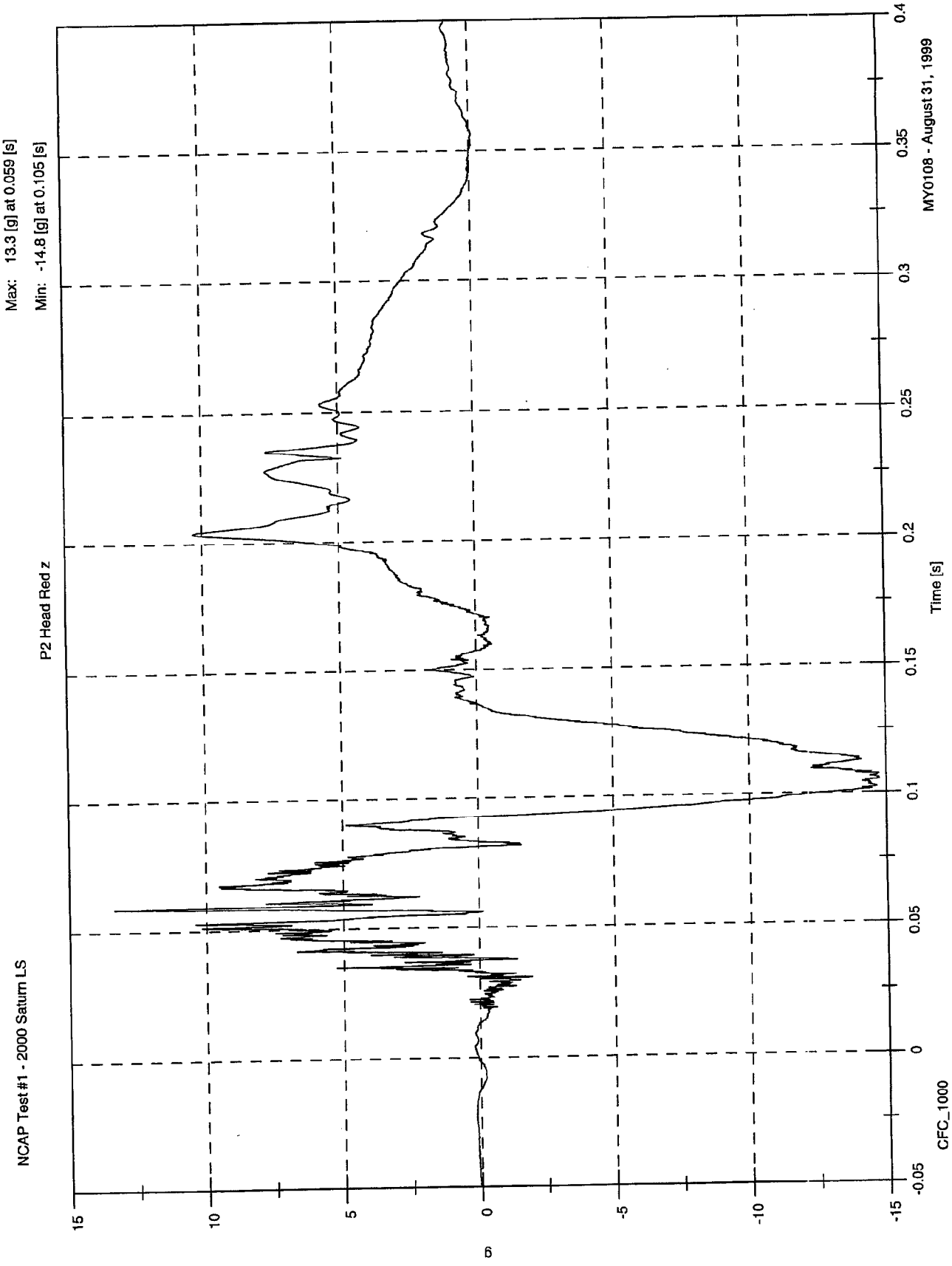

NCAP Test #1 - 2000 Saturn LS
P1 Shoulder Belt Elongation
Max: 7.8 [mm] at 0.233 [s]
Min: -0.0 [mm] at -0.025 [s]
mm
8
7
6
5
4
3
2
1
0
-1
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
Wire cut at 230 ms
CFC_180
MY0108 - August 31, 1999


NCAP Test #1 - 2000 Saturn LS
P2 Head x
Max: 13.2 [g] at 0.235 [s]
Min: -51.8 [g] at 0.090 [s]
20
10
0
-10
-20
-30
-40
-50
-60
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

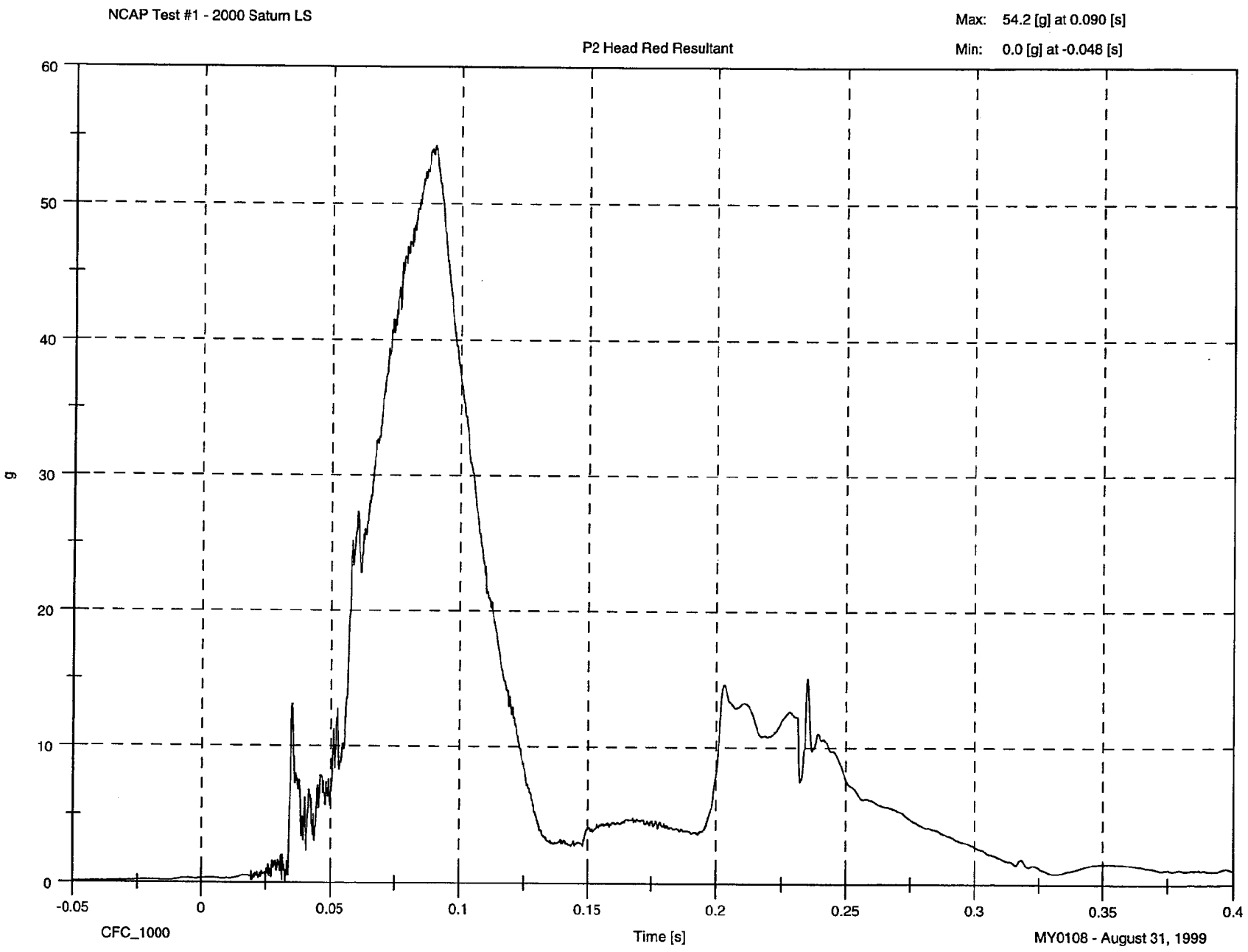

NCAP Test #1 - 2000 Saturn LS
P2 Head y
Max: 7.3 [g] at 0.035 [s]
Min: -11.0 [g] at 0.098 [s]
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

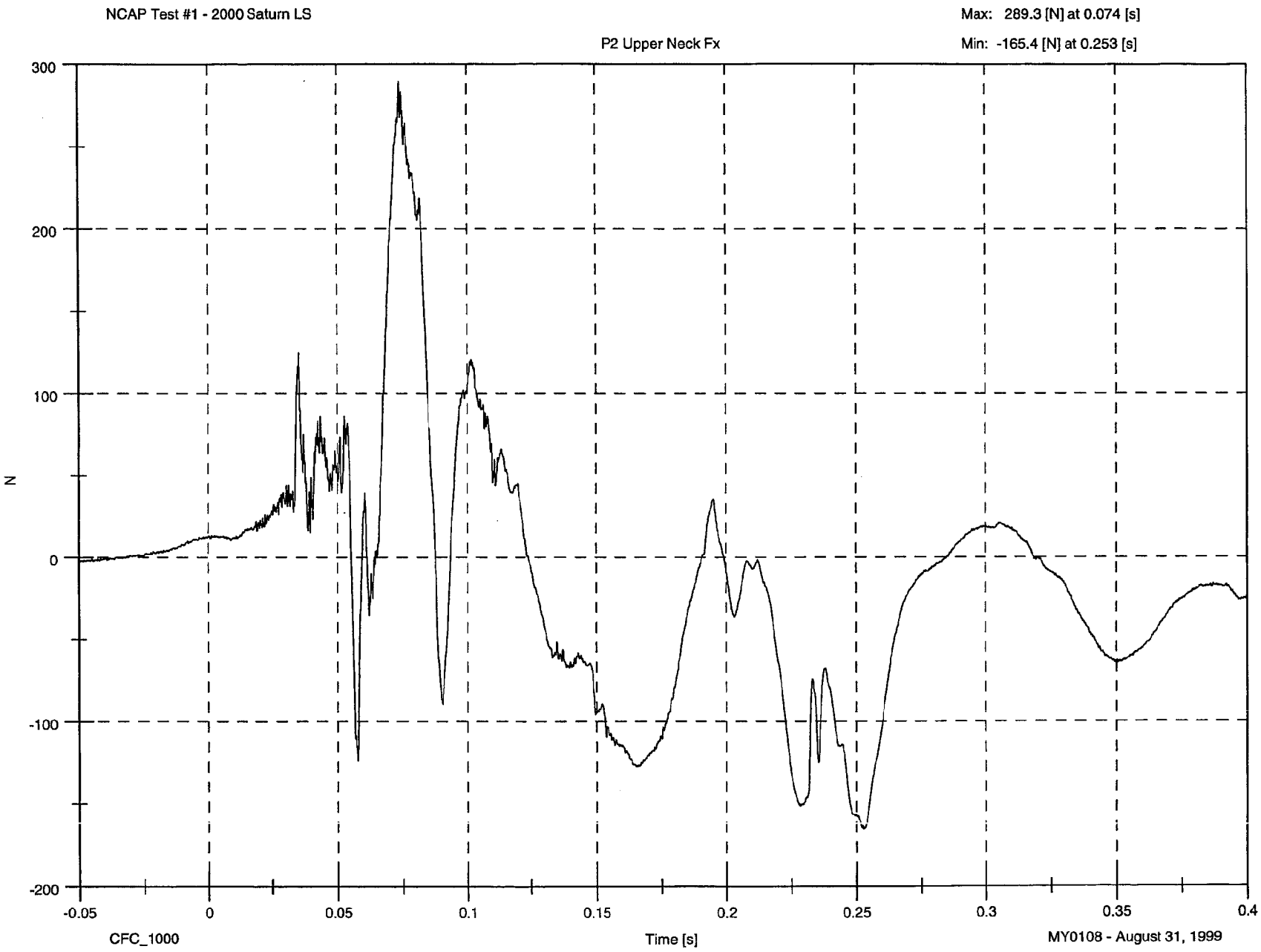

NCAP Test #1 - 2000 Saturn LS
Max: 10.3 [g] at 0.070 [s]
Min: -14.3 [g] at 0.107 [s]
P2 Head z
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
15
10
5
0
-5
-10
-15
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05

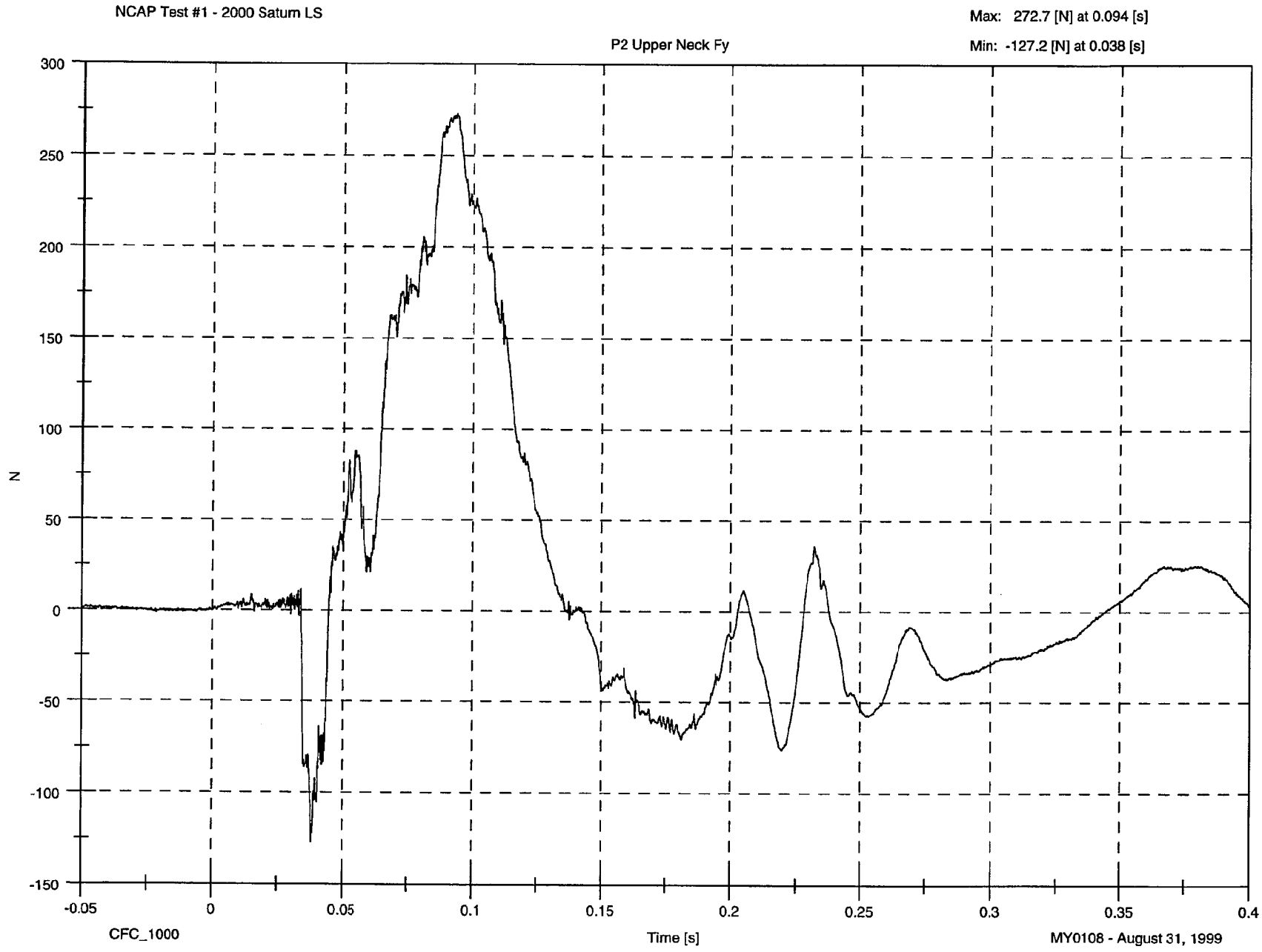

NCAP Test #1 - 2000 Saturn LS
Max: 52.7 [g] at 0.090 [s]
Min: 0.0 [g] at -0.058 [s]
P2 Head Resultant
MY0108 - August 31, 1999
CFC_1000
Time [s]
g
60
50
40
30
20
10
0
-0.05
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

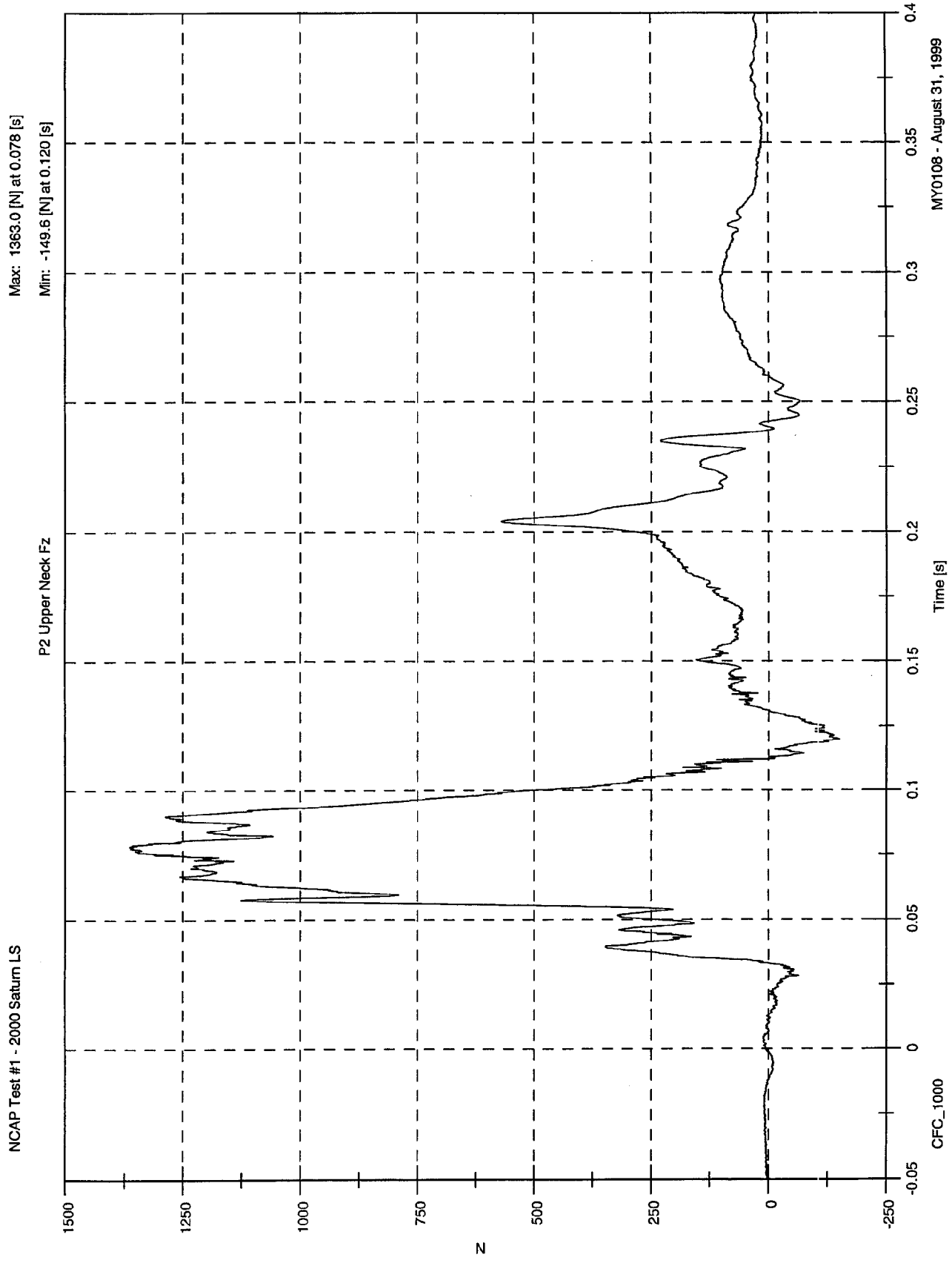

NCAP Test #1 - 2000 Saturn LS
P2 Head Red z
Max: 13.3 [g] at 0.059 [s]
Min: -14.8 [g] at 0.105 [s]
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
15
10
5
0
-5
-10
-15
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

8413-39

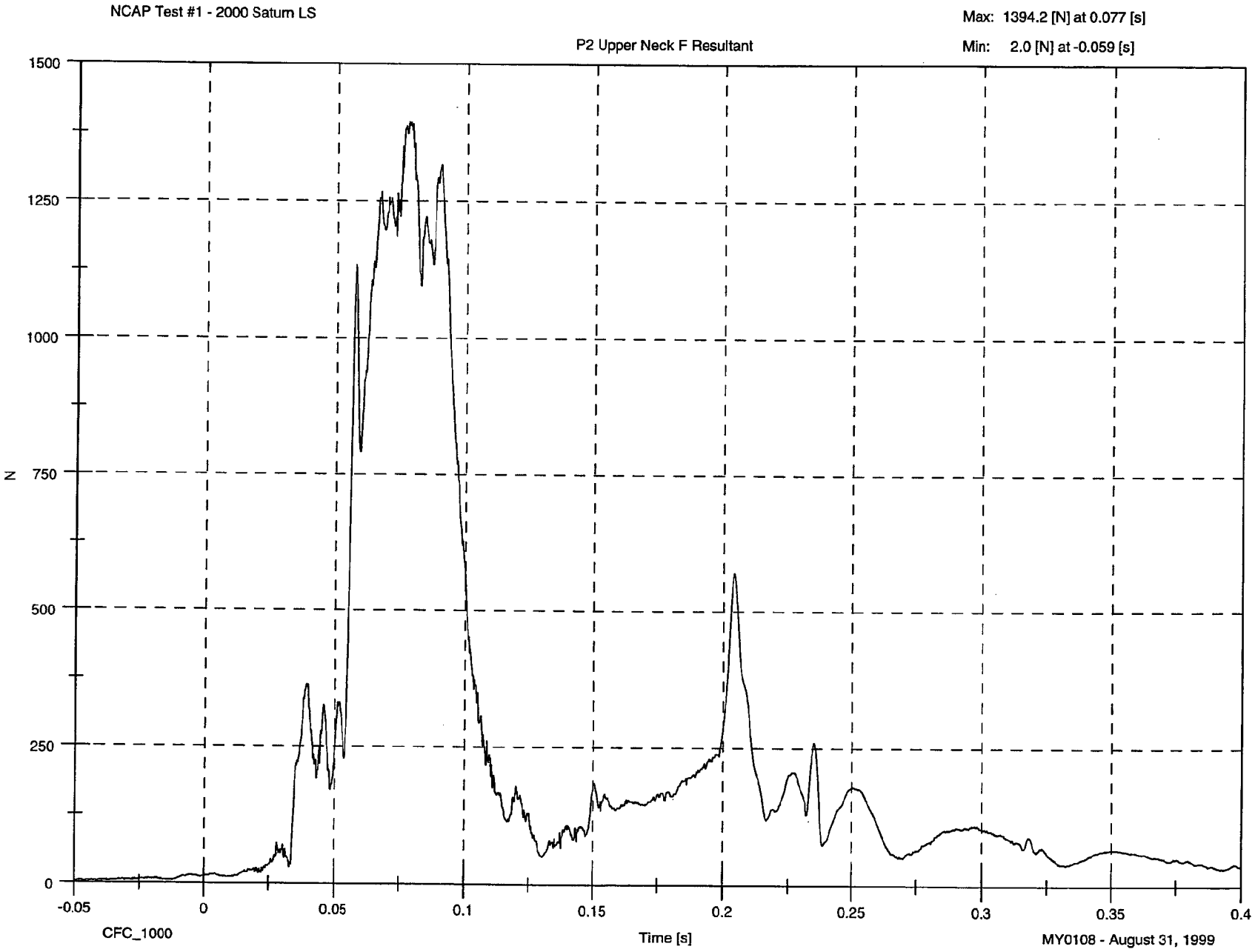

NCAP Test #1 - 2000 Saturn LS
P2 Head Red Resultant
Max: 54.2 [g] at 0.090 [s]
Min: 0.0 [g] at -0.048 [s]
g
60
50
40
30
20
10
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_1000
Time [s]
MY0108 - August 31, 1999

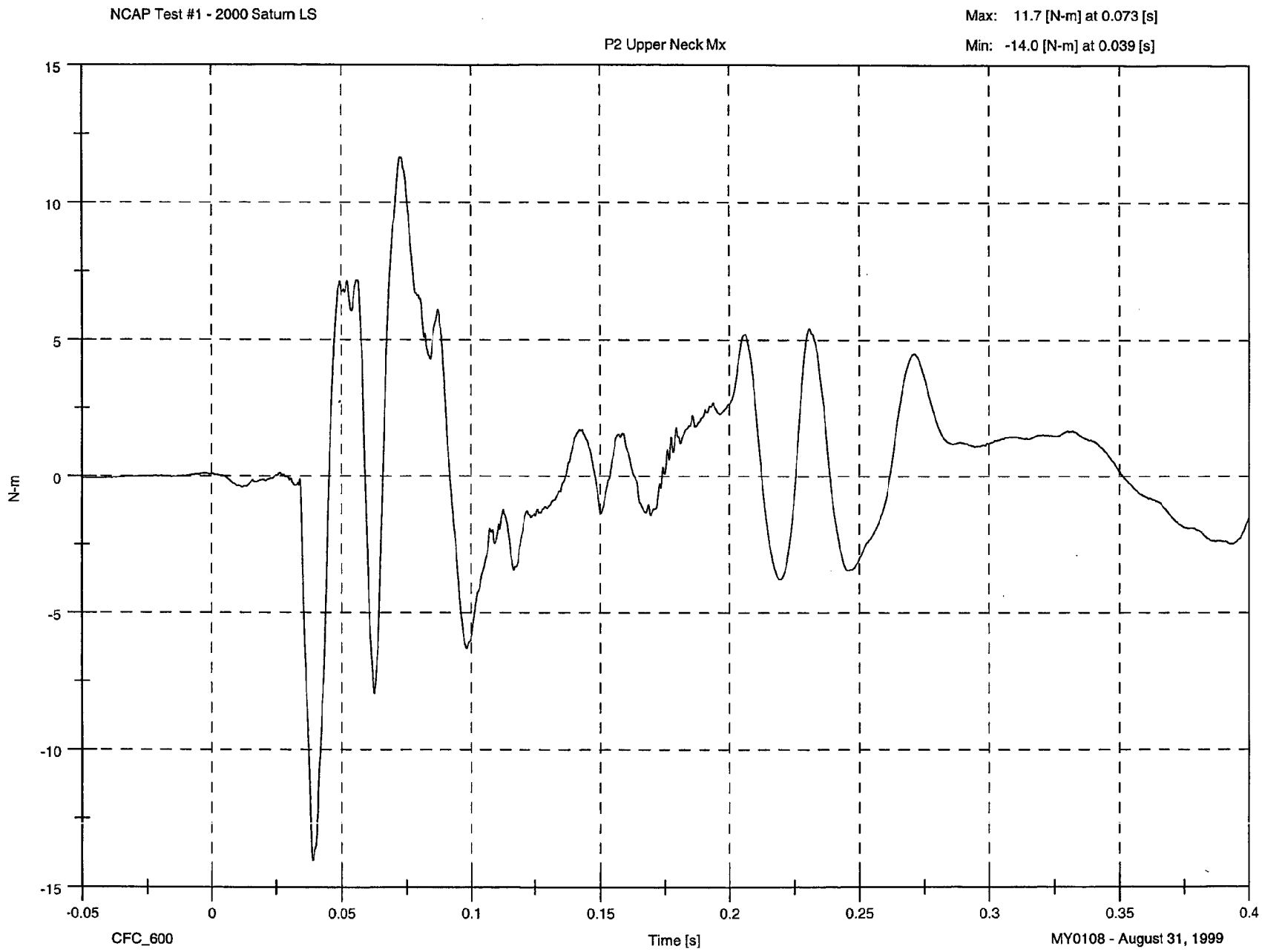

NCAP Test #1 - 2000 Saturn LS
P2 Upper Neck Fx
Max: 289.3 [N] at 0.074 [s]
Min: -165.4 [N] at 0.253 [s]
300
200
100
0
-100
-200
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

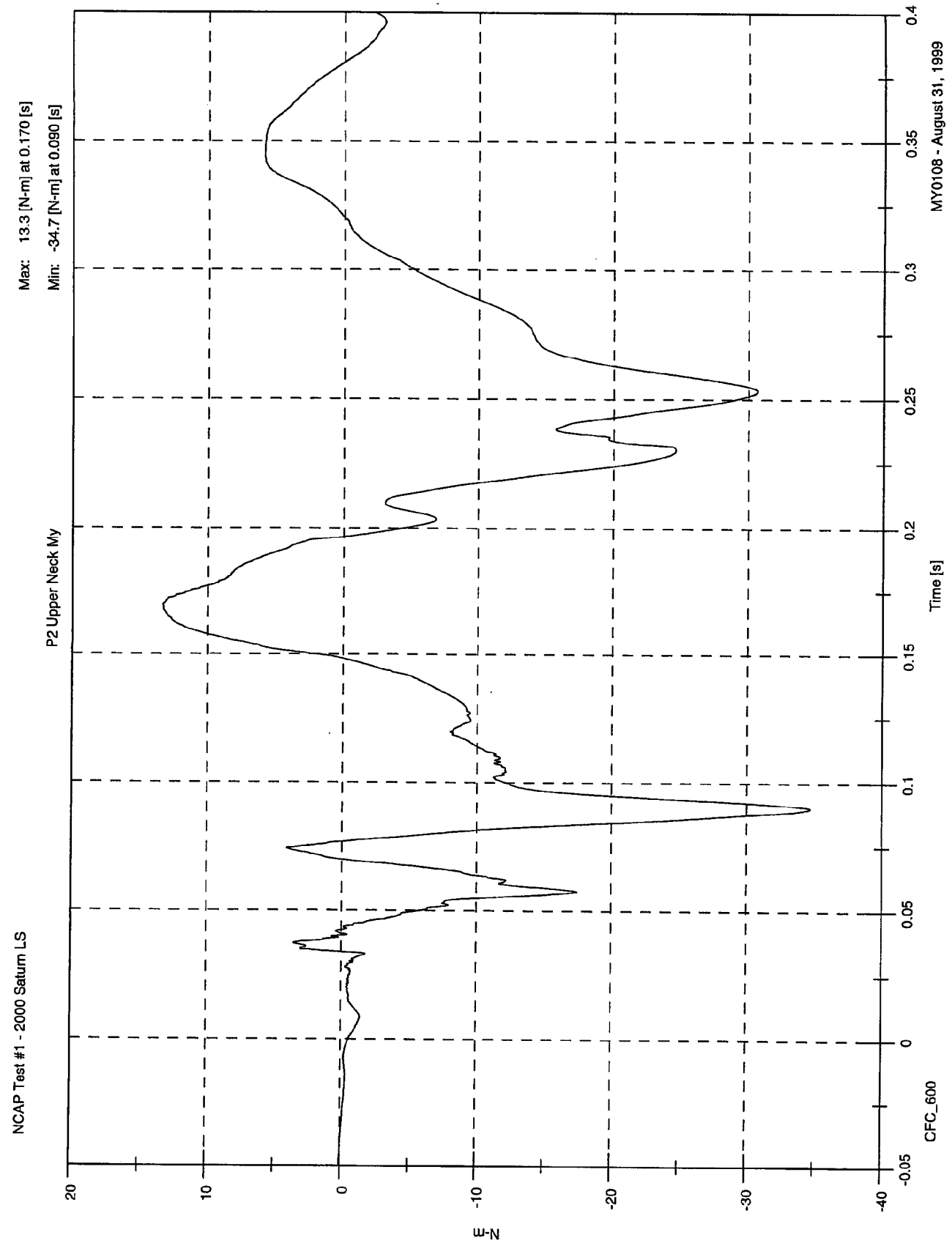

NCAP Test #1 - 2000 Saturn LS
P2 Upper Neck Fy
Max: 272.7 [N] at 0.094 [s]
Min: -127.2 [N] at 0.038 [s]
300
250
200
150
100
50
0
-50
-100
-150
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

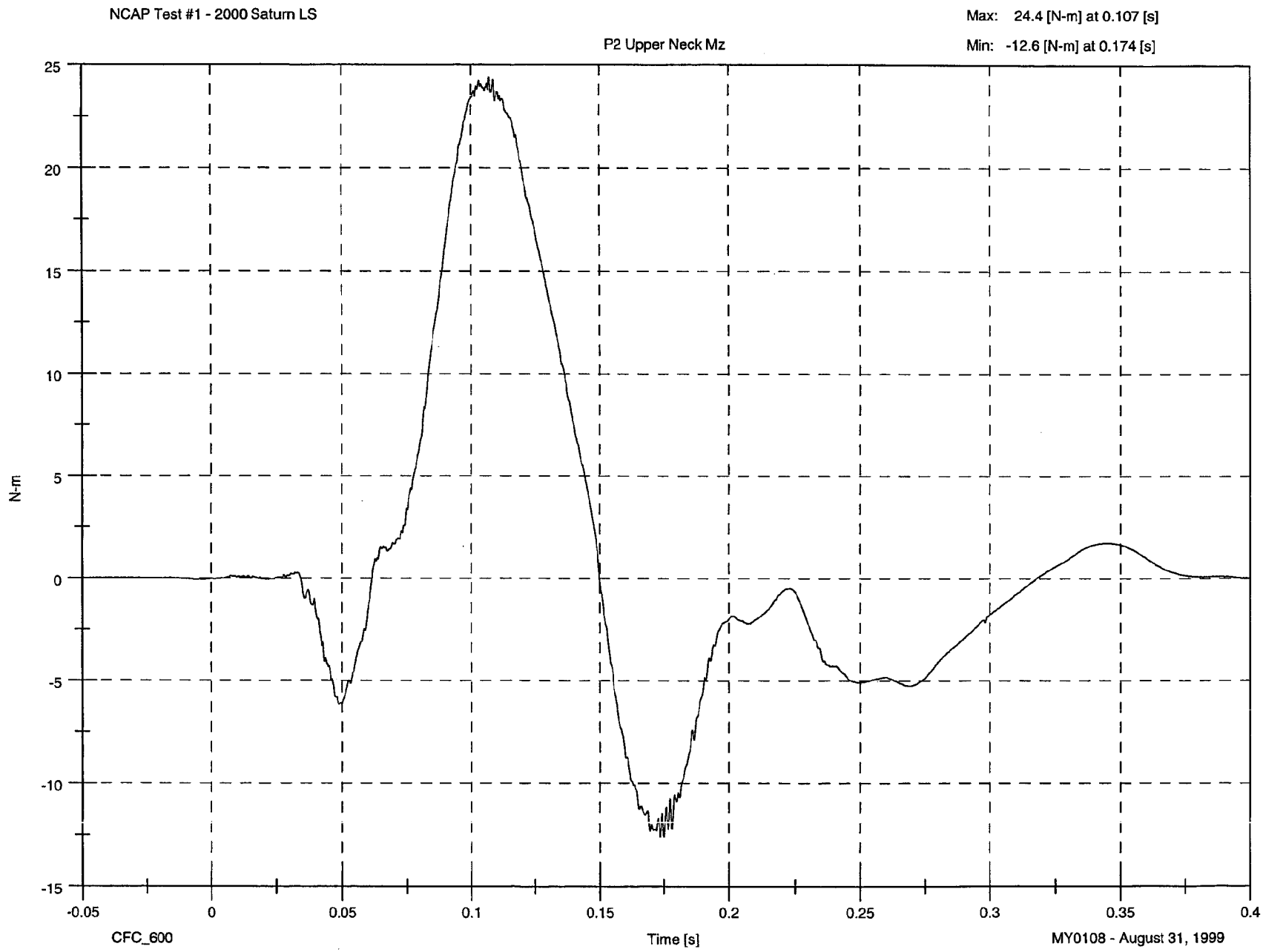

NCAP Test #1 - 2000 Saturn LS
Max: 1363.0 [N] at 0.078 [s]
Min: -149.6 [N] at 0.120 [s]
P2 Upper Neck Fz
N
1500
1250
1000
750
500
250
0
-250
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

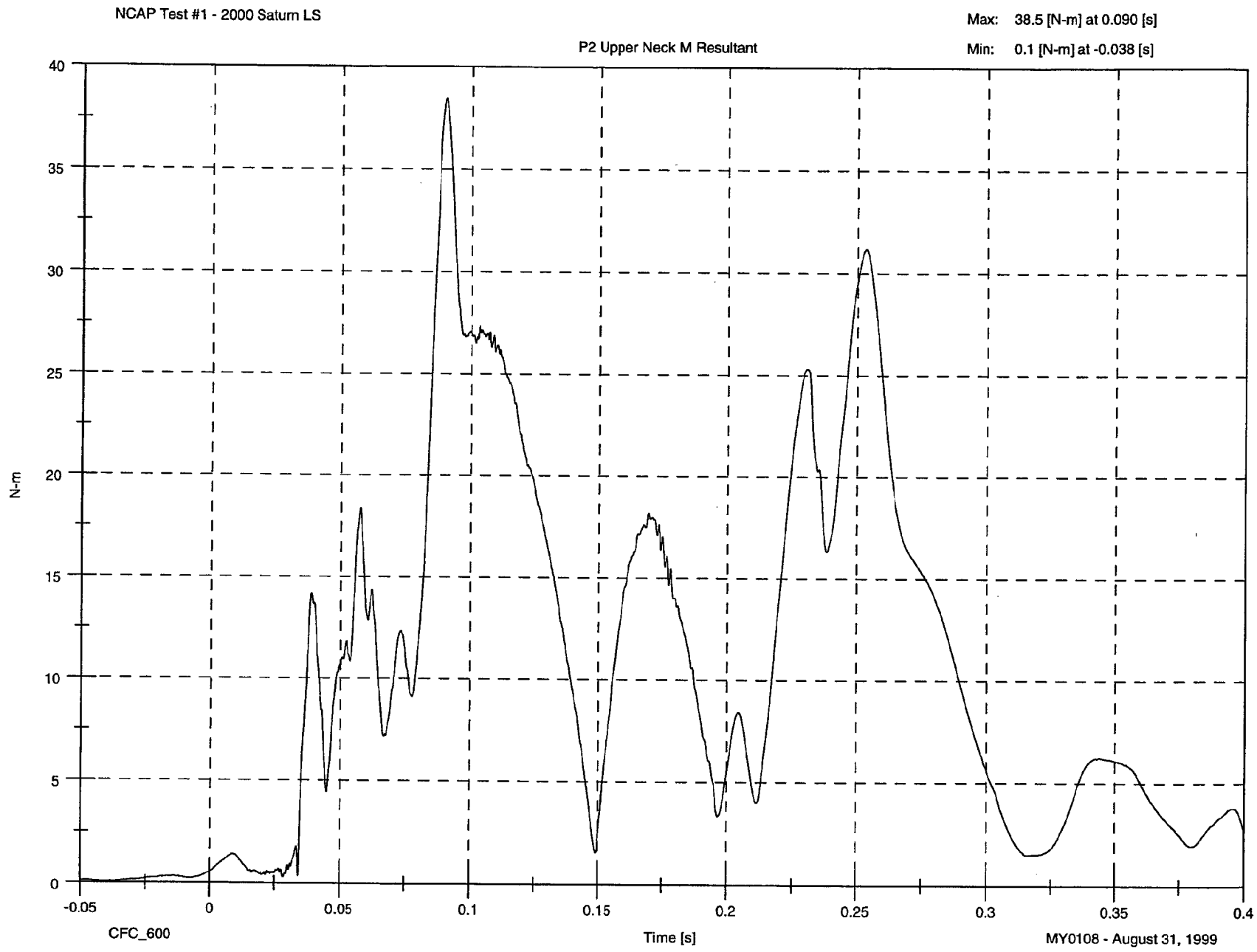
8413-39

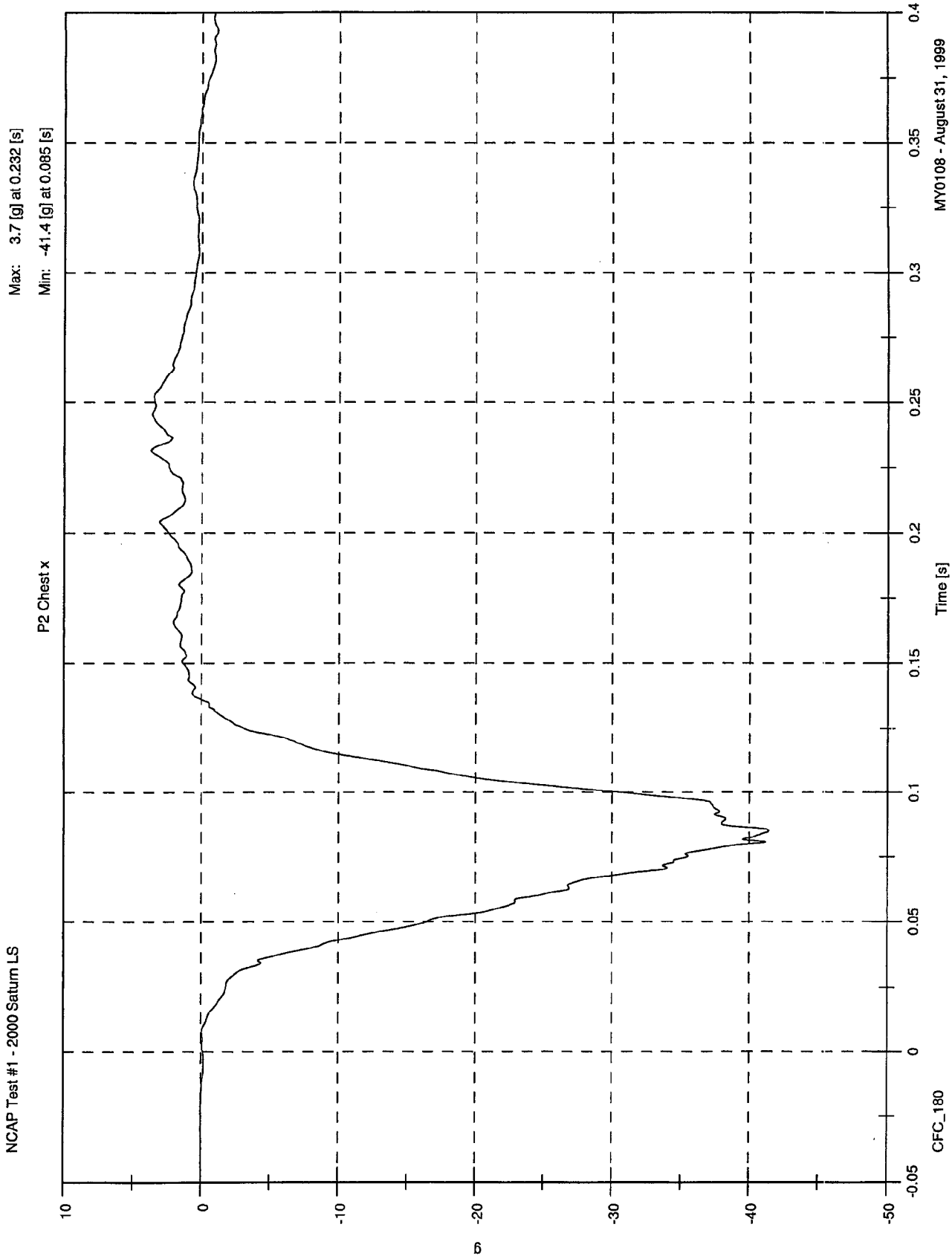

NCAP Test #1 - 2000 Saturn LS
P2 Upper Neck F Resultant
Max: 1394.2 [N] at 0.077 [s]
Min: 2.0 [N] at -0.059 [s]
1500
1250
1000
750
500
250
0
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999


NCAP Test #1 - 2000 Saturn LS
Max: 11.7 [N-m] at 0.073 [s]
P2 Upper Neck Mx
Min: -14.0 [N-m] at 0.039 [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
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

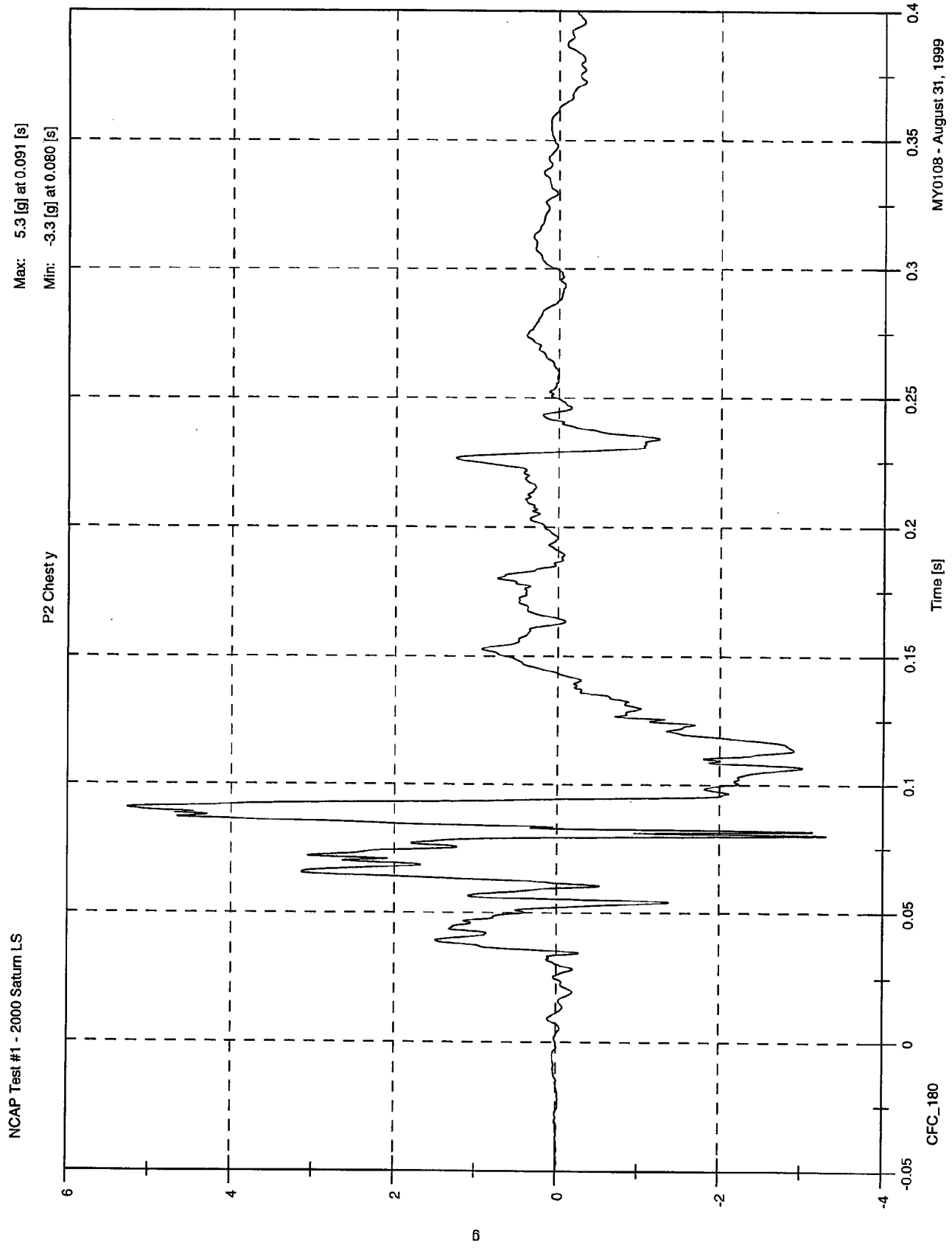

NCAP Test #1 - 2000 Saturn LS
Max: 13.3 [N-m] at 0.170 [s]
Min: -34.7 [N-m] at 0.090 [s]
P2 Upper Neck My
MY0108 - August 31, 1999
CFC_600
N-m
Time [s]
20
10
0
-10
-20
-30
-40
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

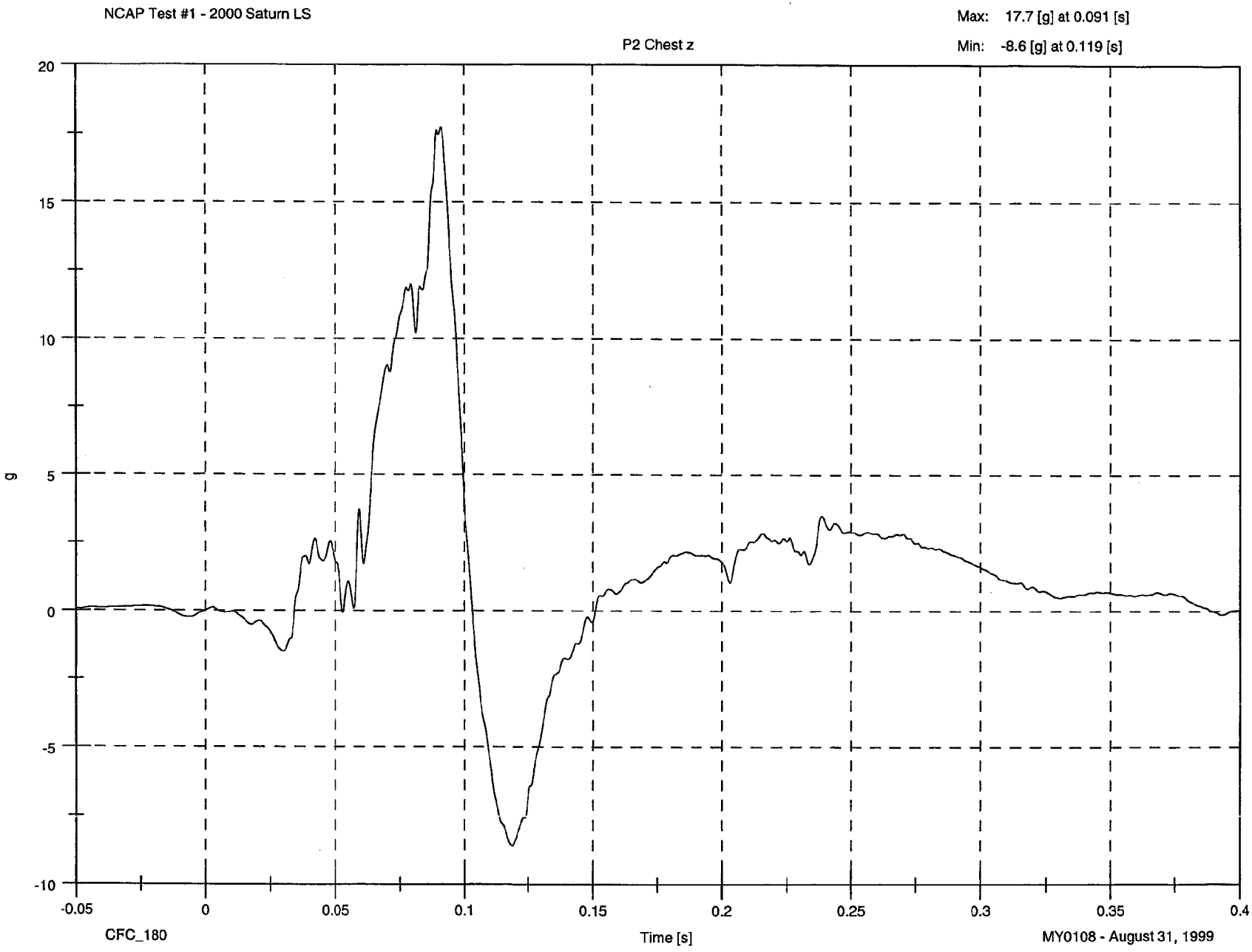

NCAP Test #1 - 2000 Saturn LS
P2 Upper Neck Mz
Max: 24.4 [N-m] at 0.107 [s]
Min: -12.6 [N-m] at 0.174 [s]
N-m
25
20
15
10
5
0
-5
-10
-15
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

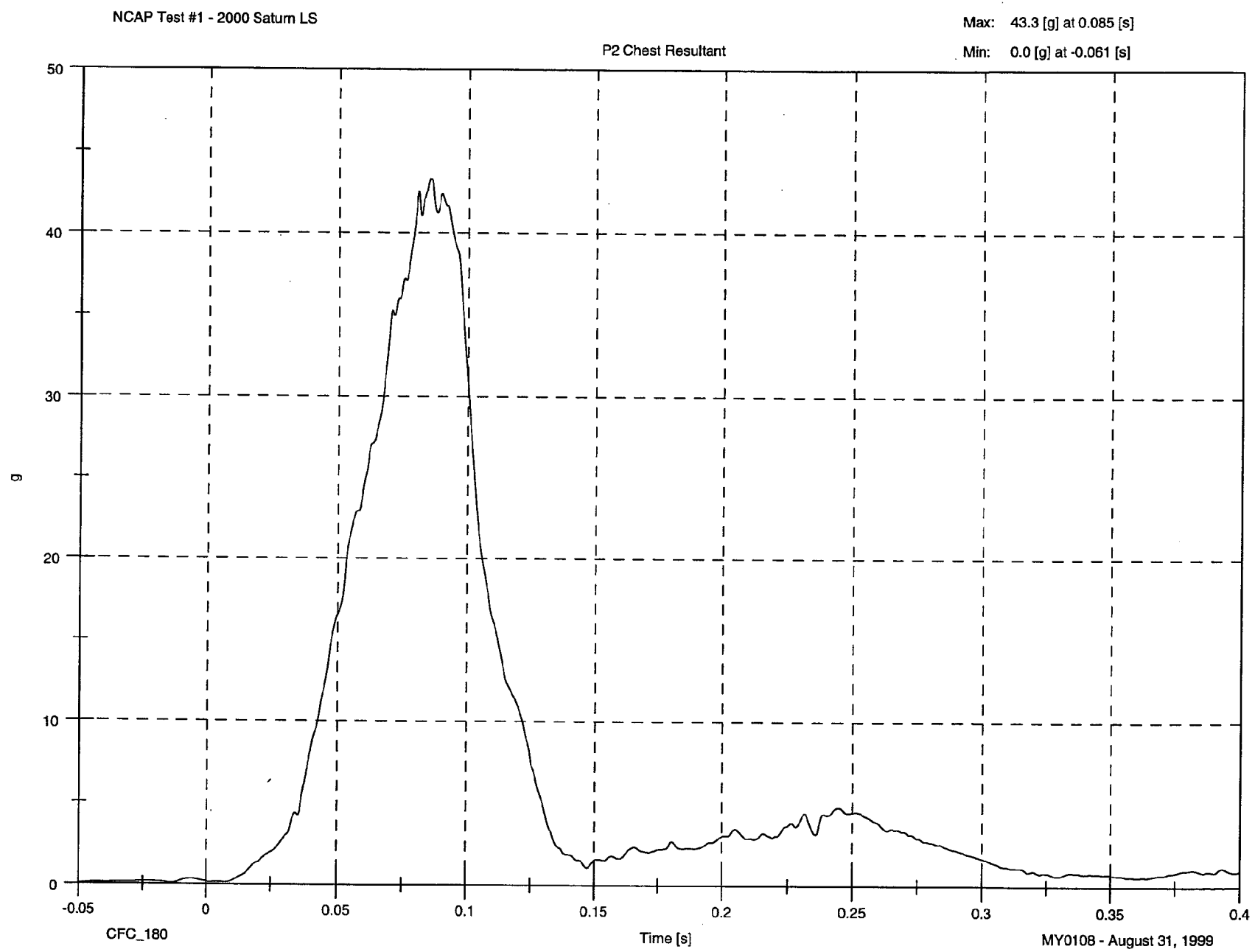

NCAP Test #1 - 2000 Saturn LS
P2 Upper Neck M Resultant
Max: 38.5 [N-m] at 0.090 [s]
Min: 0.1 [N-m] at -0.038 [s]
N-m
40
35
30
25
20
15
10
5
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

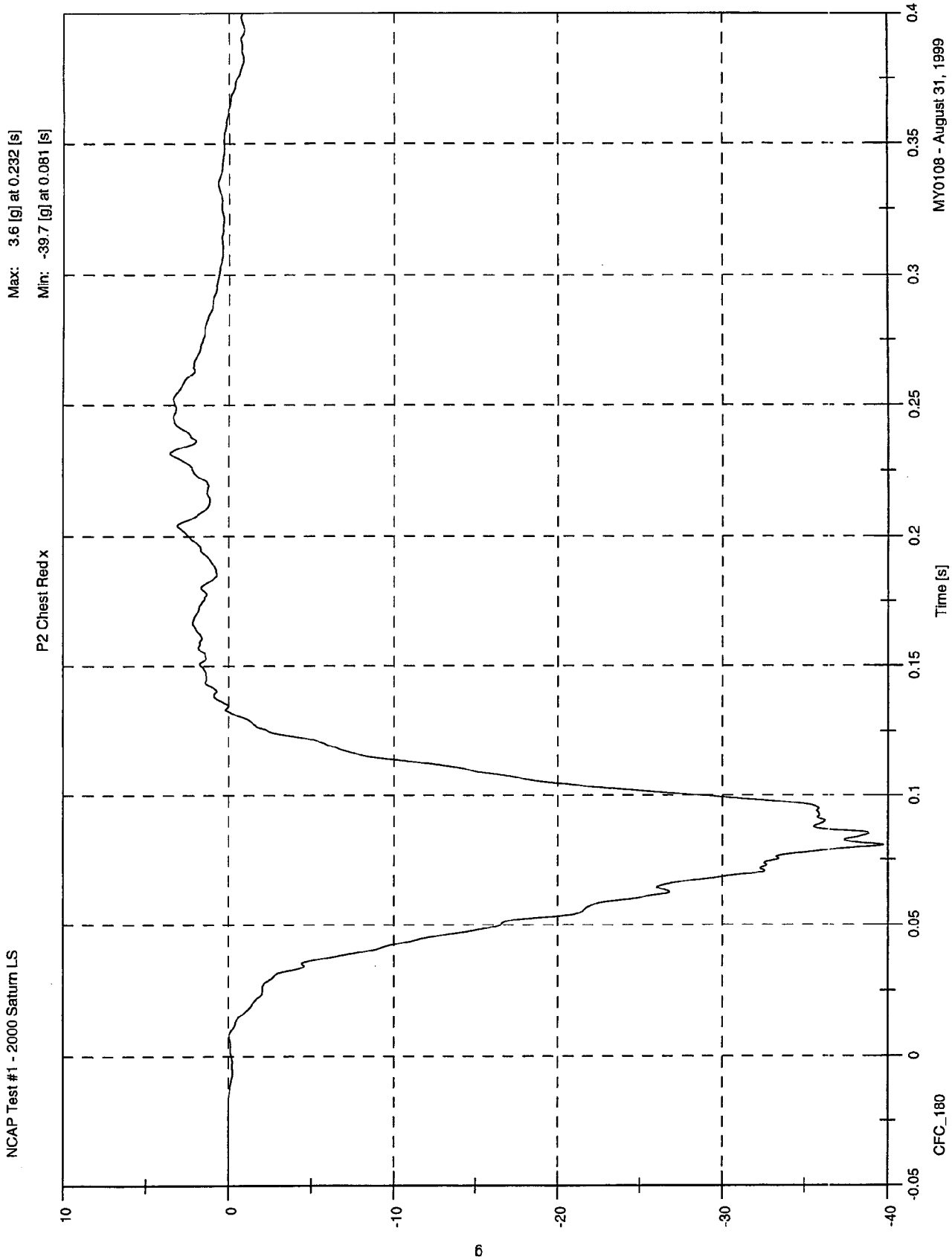

NCAP Test #1 - 2000 Saturn LS
Max: 3.7 [g] at 0.232 [s]
Min: -41.4 [g] at 0.085 [s]
P2 Chest x
MY0108 - August 31, 1999
CFC_180
Time [s]
g
10
0
-10
-20
-30
-40
-50
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

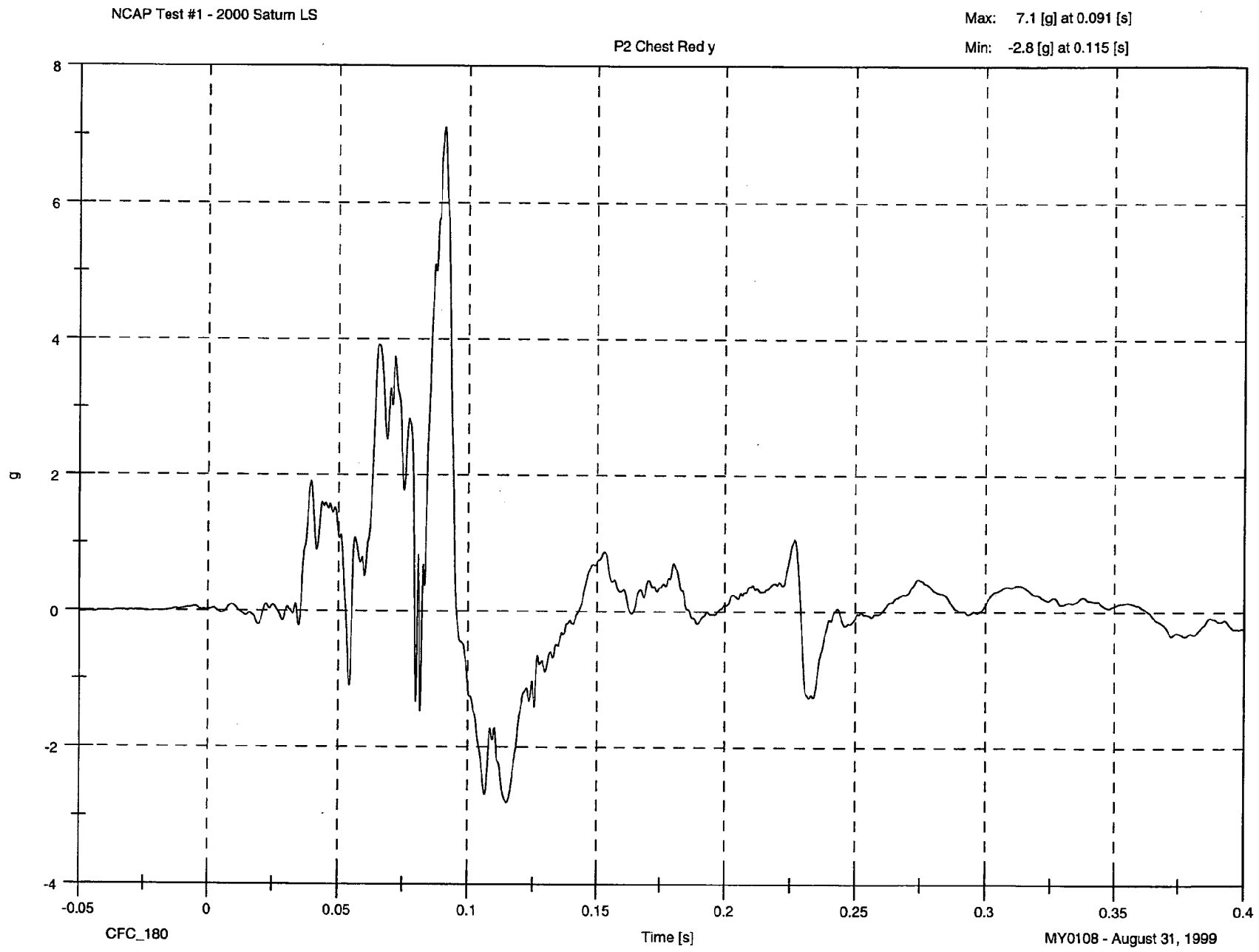
8413-39

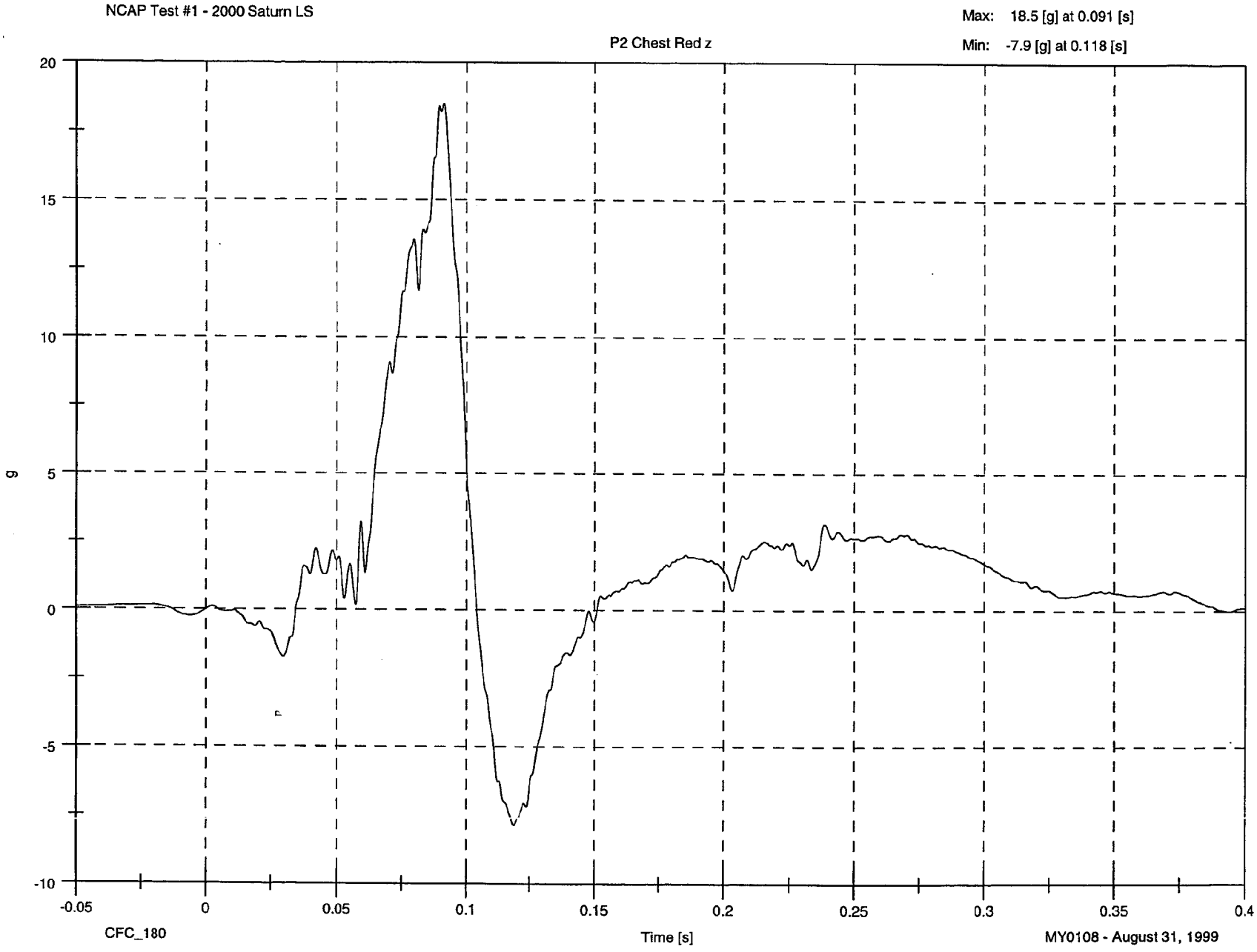

NCAP Test #1 - 2000 Saturn LS
Max: 5.3 [g] at 0.091 [s]
Min: -3.3 [g] at 0.080 [s]
P2 Chest y
MY0108 - August 31, 1999
Time [s]
CFC_180
g
6
4
2
0
-2
-4
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

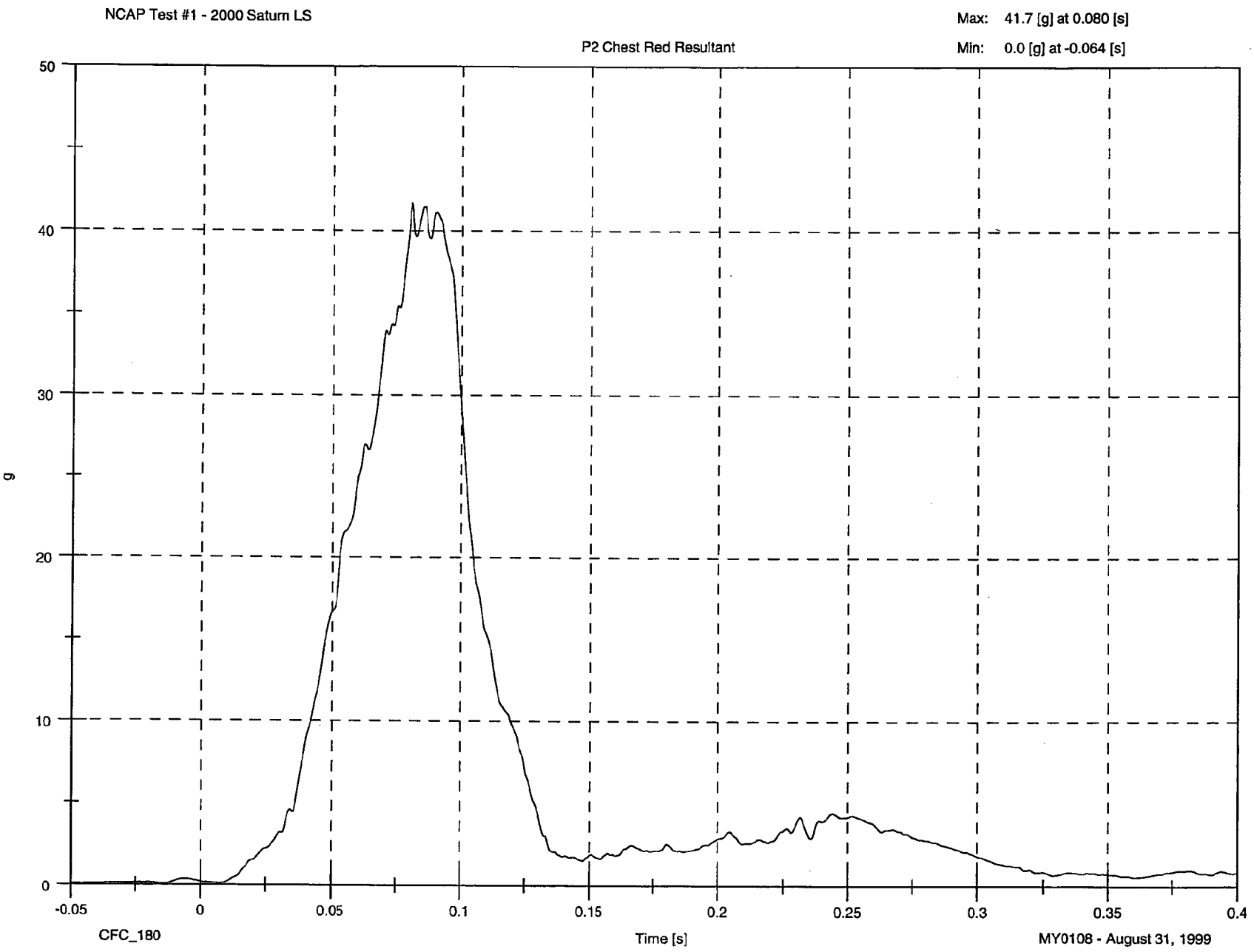

NCAP Test #1 - 2000 Saturn LS
P2 Chest z
Max: 17.7 [g] at 0.091 [s]
Min: -8.6 [g] at 0.119 [s]
20
15
10
5
0
-5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_180
Time [s]
MY0108 - August 31, 1999

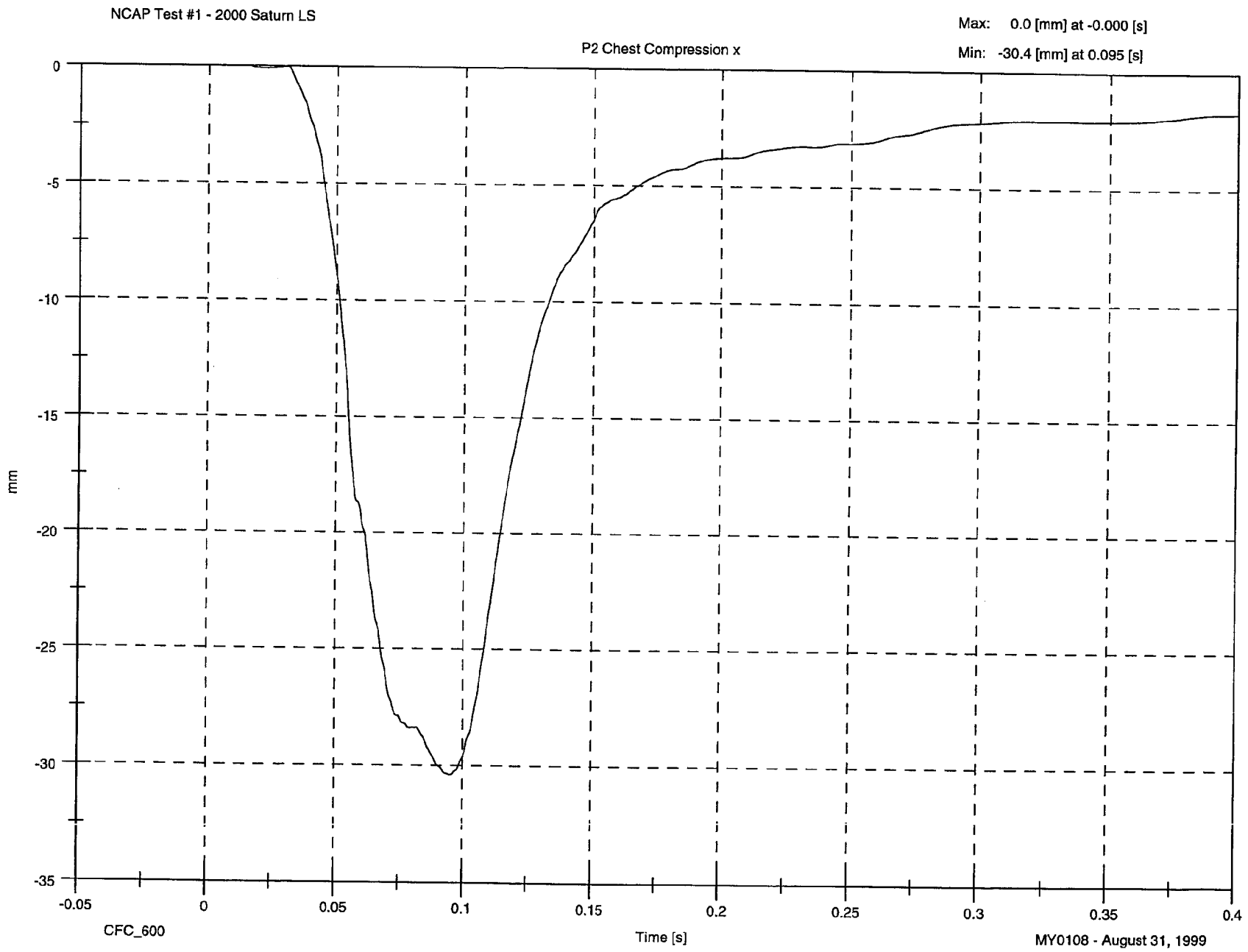

NCAP Test #1 - 2000 Saturn LS
P2 Chest Resultant
Max: 43.3 [g] at 0.085 [s]
Min: 0.0 [g] at -0.061 [s]
50
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

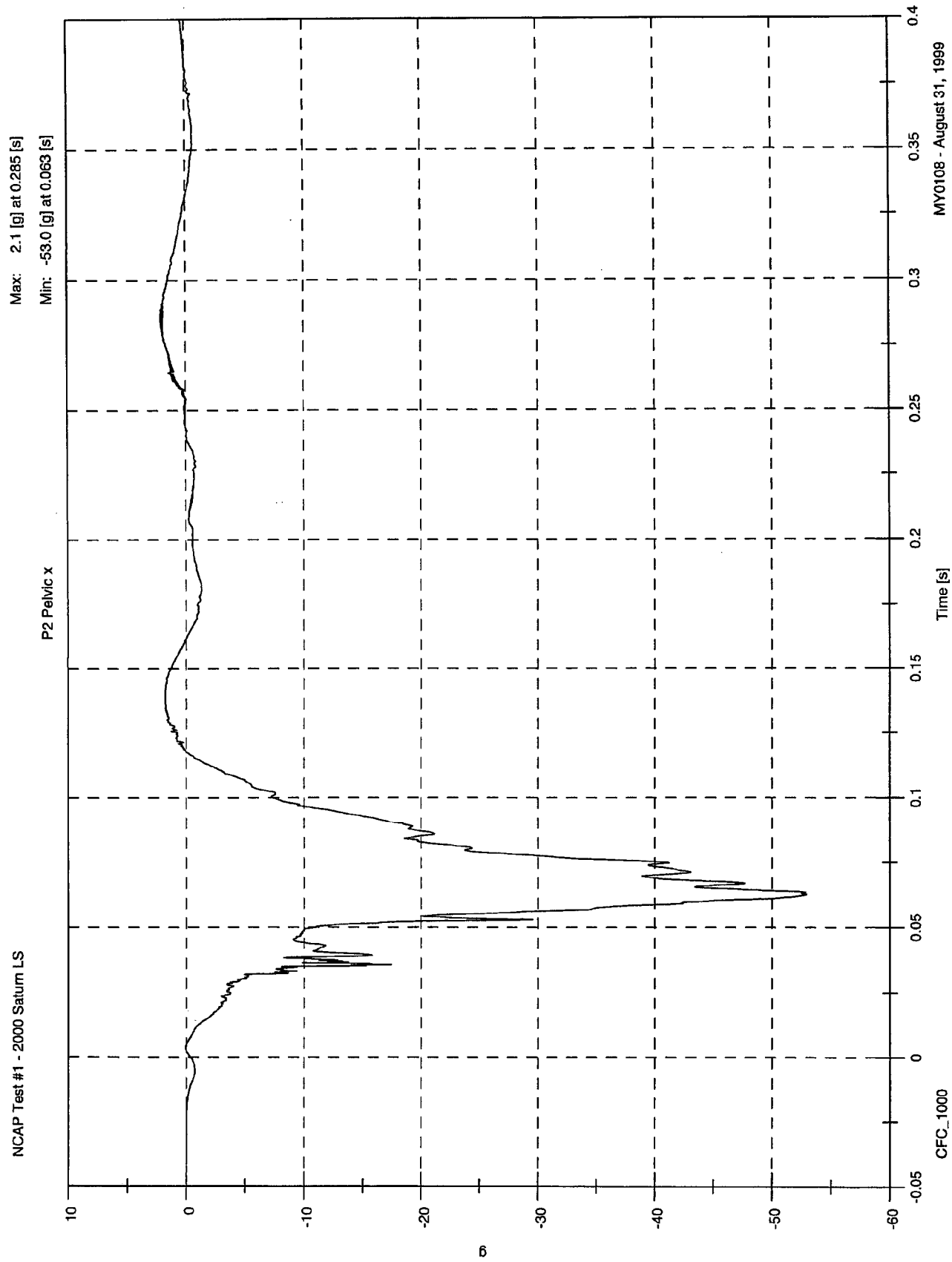

NCAP Test #1 - 2000 Saturn LS
Max: 3.6 [g] at 0.232 [s]
Min: -39.7 [g] at 0.081 [s]
P2 Chest Red x
MY0108 - August 31, 1999
Time [s]
CFC_180
10
0
-10
-20
-30
-40
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05

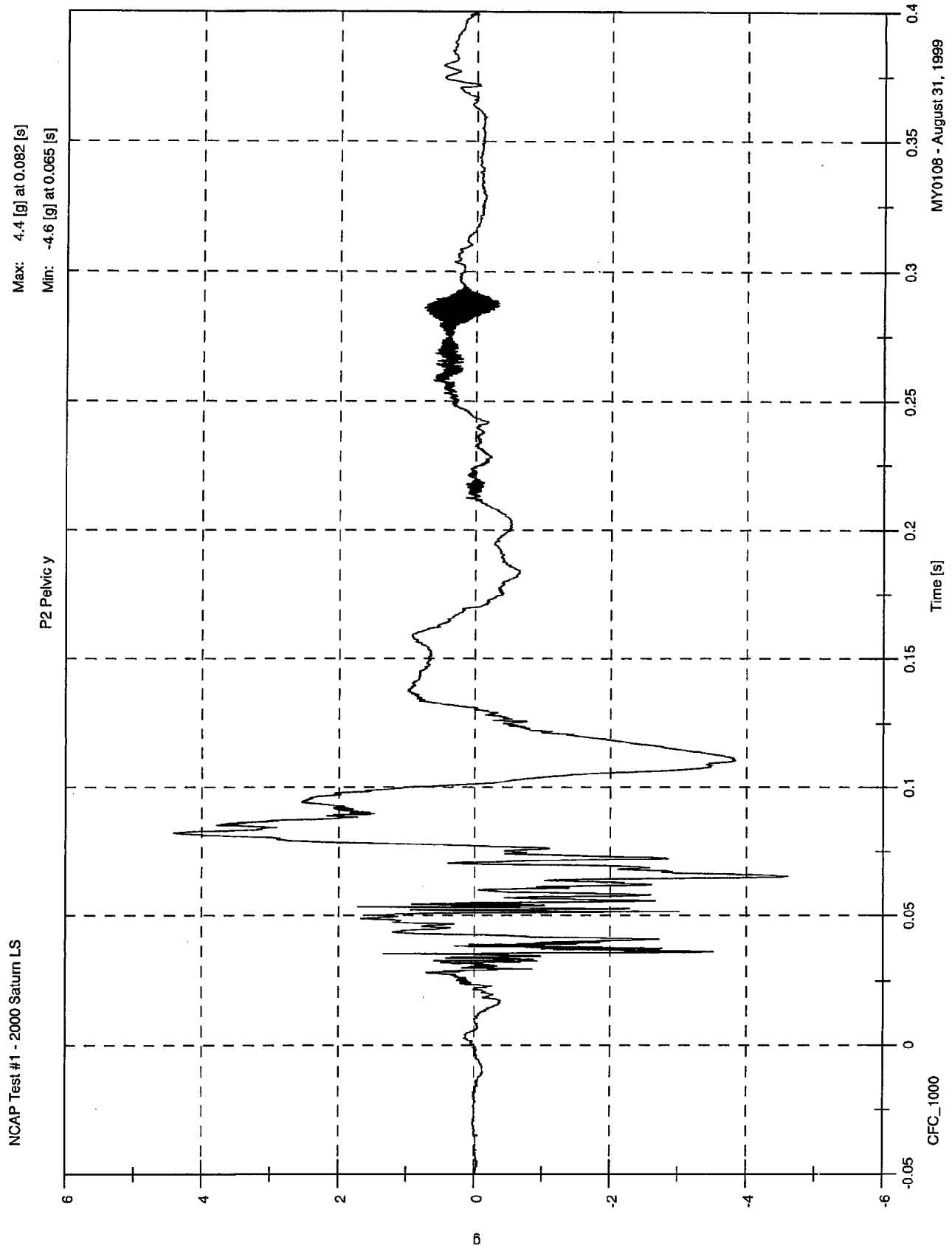

NCAP Test #1 - 2000 Saturn LS
P2 Chest Rsd y
Max: 7.1 [g] at 0.091 [s]
Min: -2.8 [g] at 0.115 [s]
8
6
4
2
0
-2
-4
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

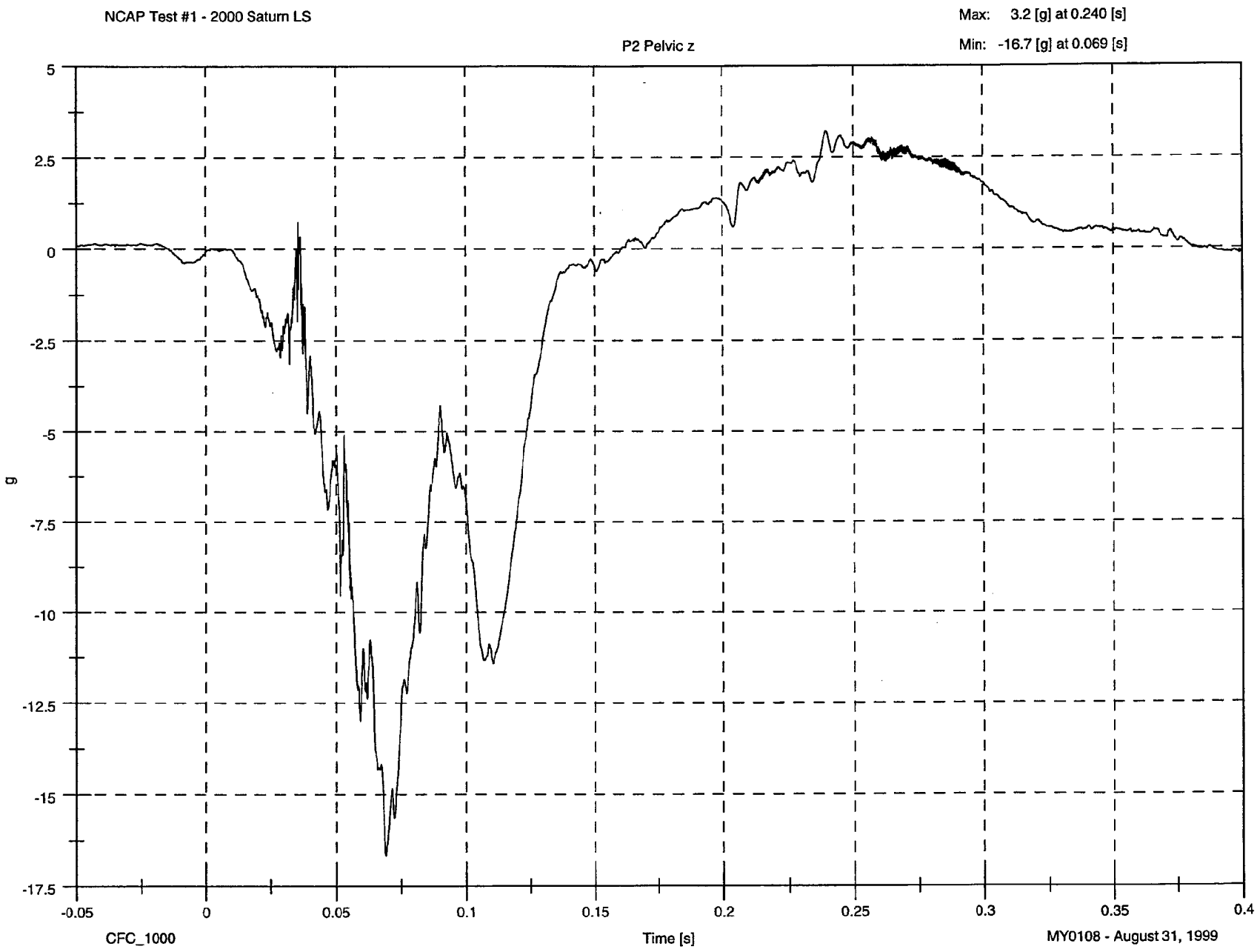

NCAP Test #1 - 2000 Saturn LS
P2 Chest Red z
Max: 18.5 [g] at 0.091 [s]
Min: -7.9 [g] at 0.118 [s]
20
15
10
5
0
-5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

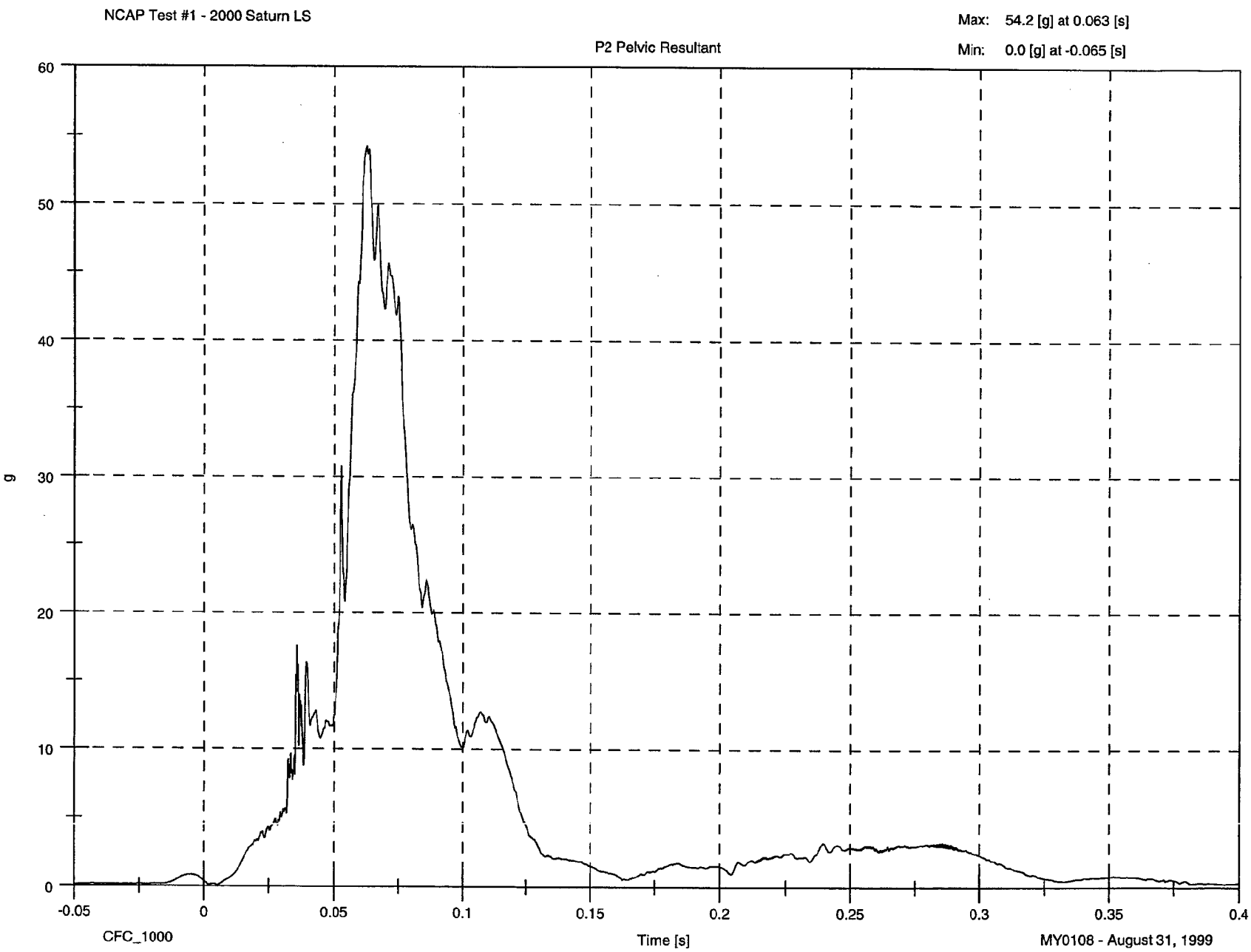

NCAP Test #1 - 2000 Saturn LS
P2 Chest Red Resultant
Max: 41.7 [g] at 0.080 [s]
Min: 0.0 [g] at -0.064 [s]
50
40
30
20
10
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

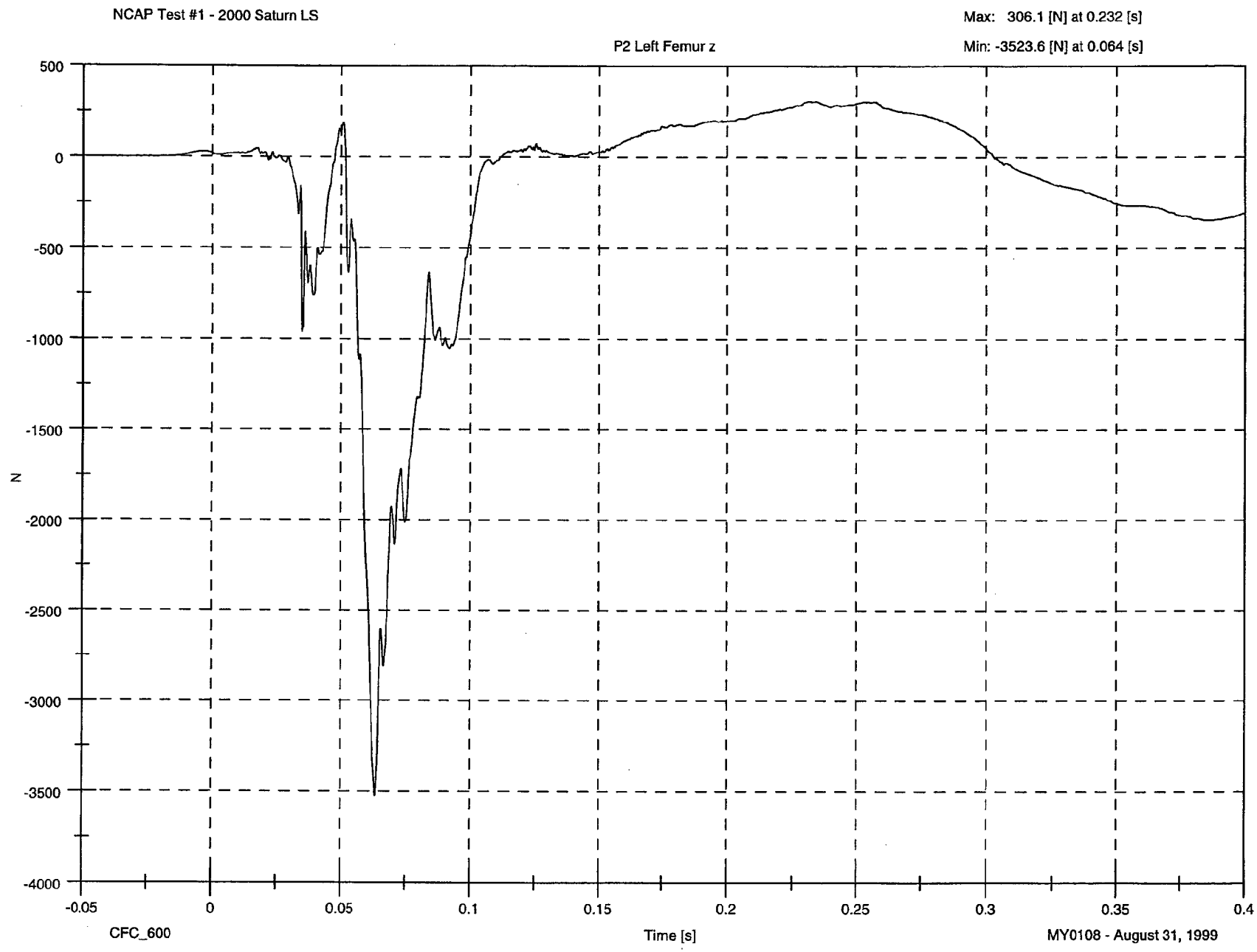

NCAP Test #1 - 2000 Saturn LS
P2 Chest Compression x
Max: 0.0 [mm] at -0.000 [s]
Min: -30.4 [mm] at 0.095 [s]
mm
0
-5
-10
-15
-20
-25
-30
-35
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

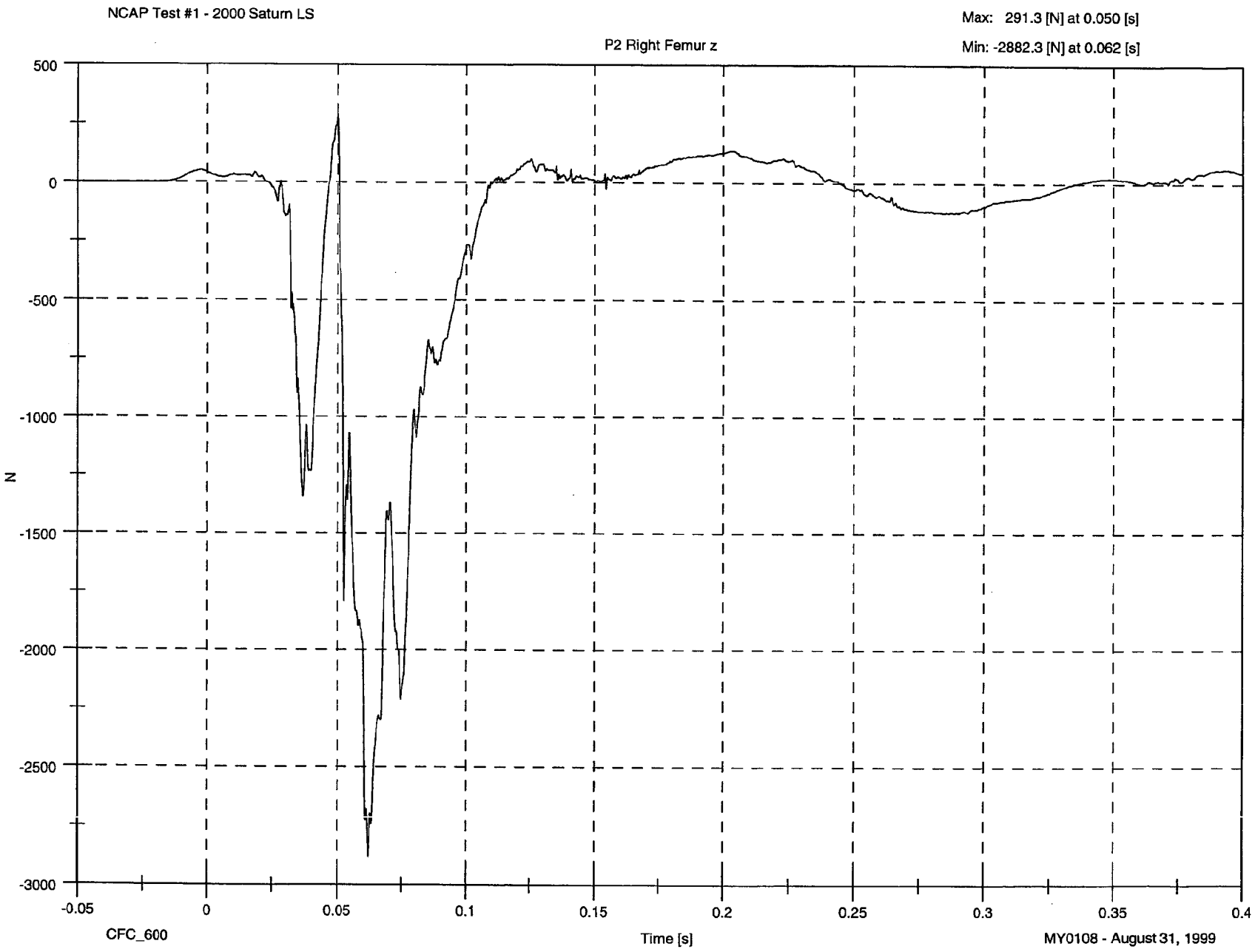

NCAP Test #1 - 2000 Saturn LS
Max: 2.1 [g] at 0.285 [s]
Min: -53.0 [g] at 0.063 [s]
P2 Pelvic x
MY0108 - August 31, 1999
CFC_1000
Time [s]
g
10
0
-10
-20
-30
-40
-50
-60
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

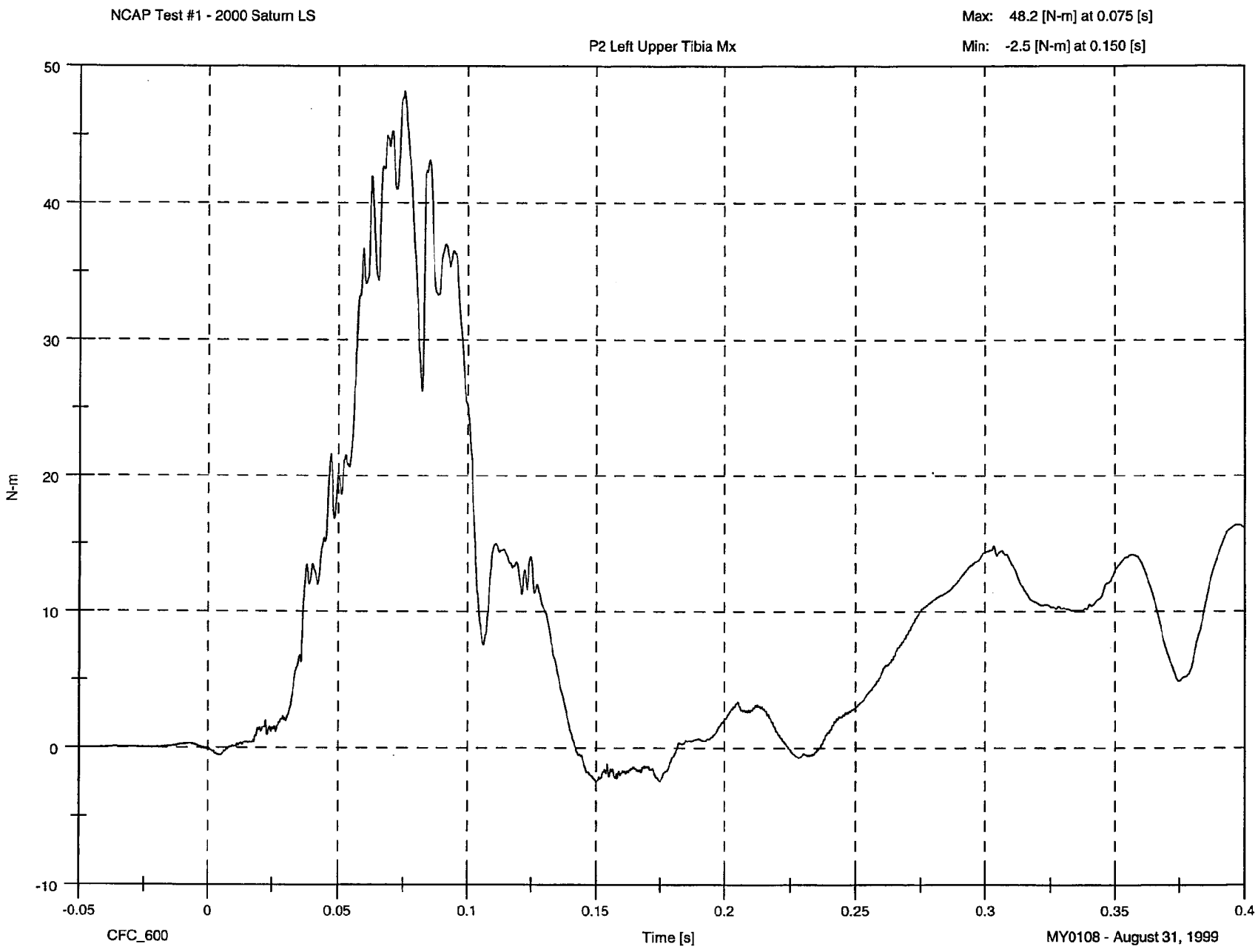

NCAP Test #1 - 2000 Saturn LS
Max: 4.4 [g] at 0.082 [s]
Min: -4.6 [g] at 0.065 [s]
P2 Pelvic y
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
6
4
2
0
-2
-4
-6
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

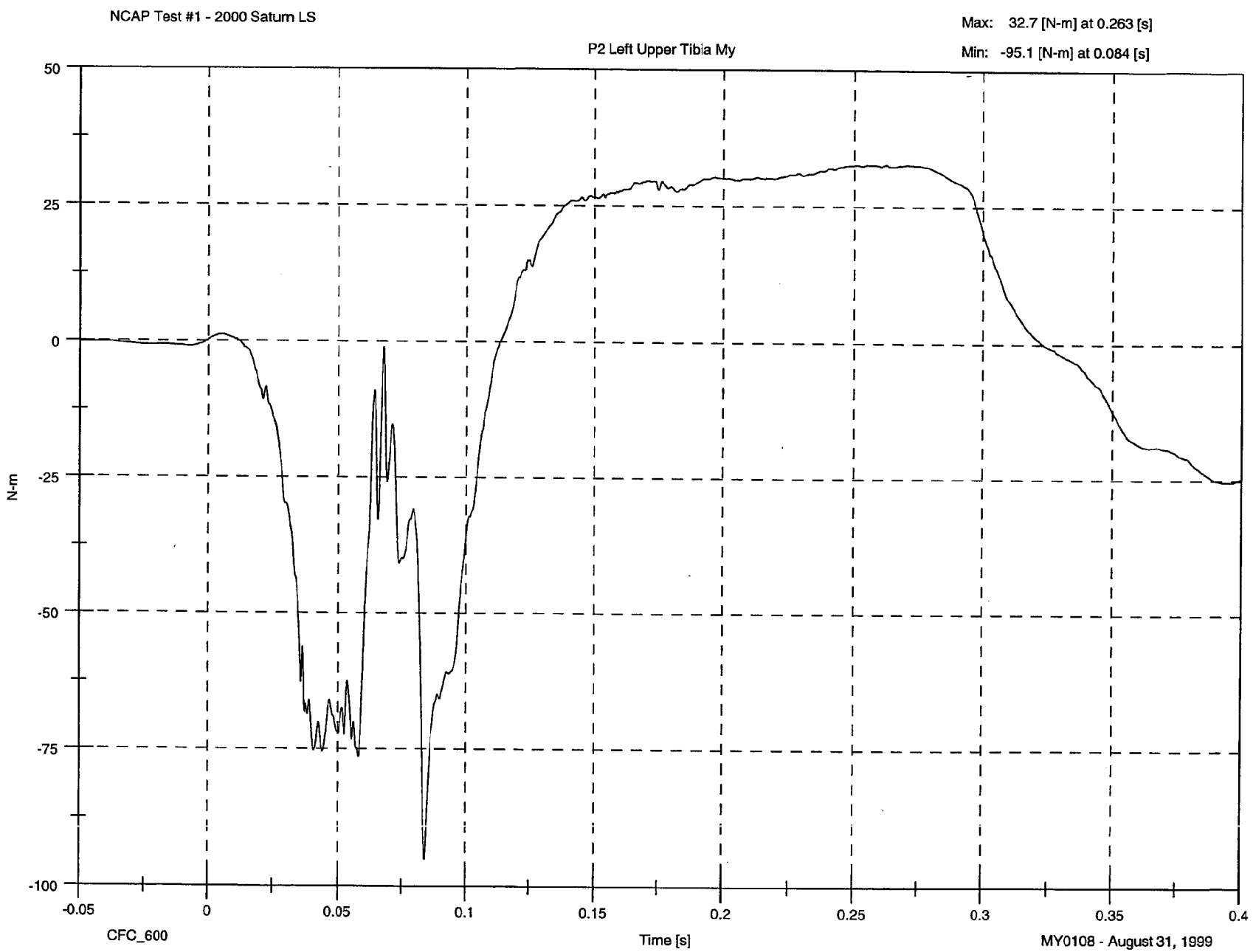

NCAP Test #1 - 2000 Saturn LS
P2 Pelvic z
Max: 3.2 [g] at 0.240 [s]
Min: -16.7 [g] at 0.069 [s]
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-15
-17.5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_1000
Time [s]
MY0108 - August 31, 1999

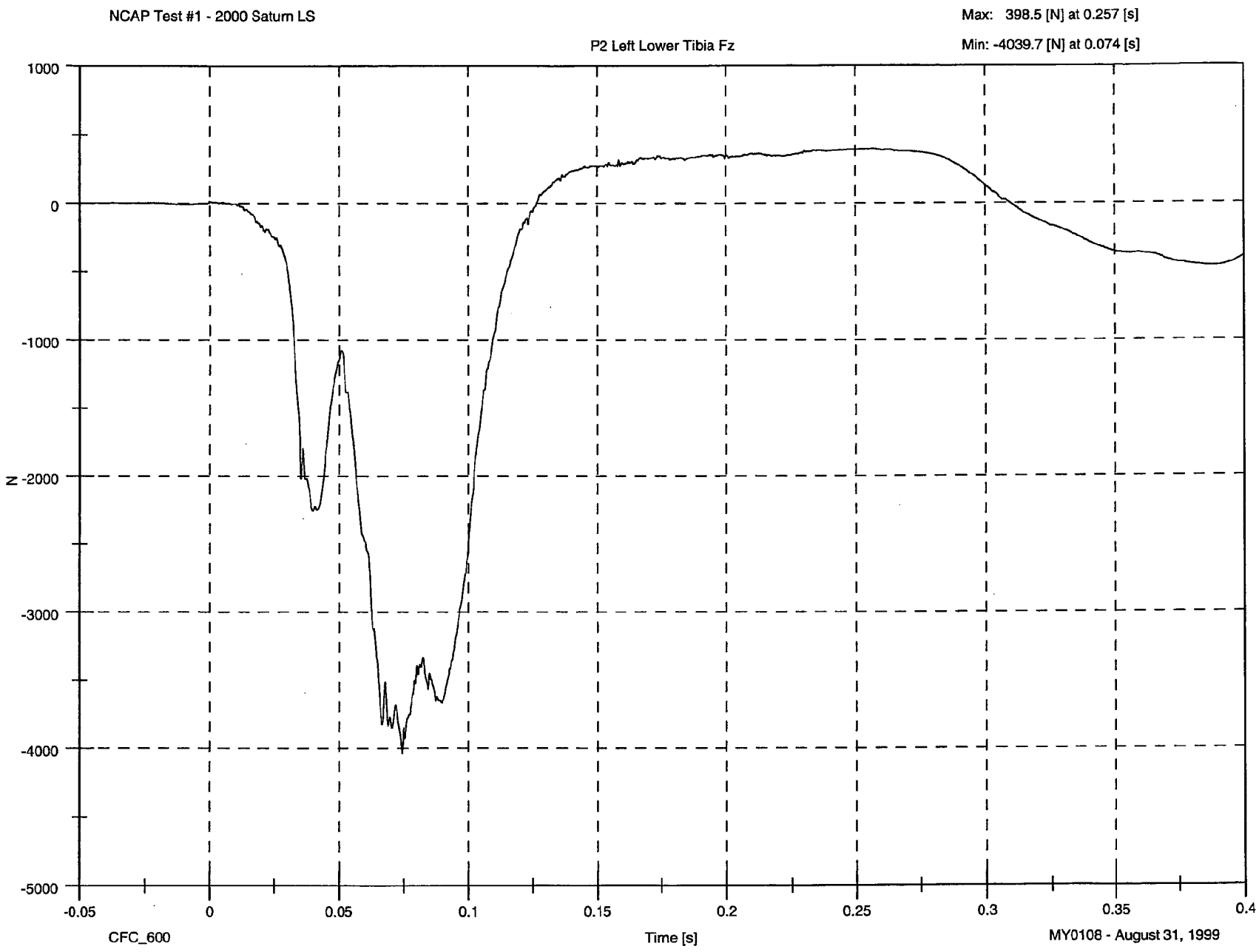

NCAP Test #1 - 2000 Saturn LS
P2 Pelvic Resultant
Max: 54.2 [g] at 0.063 [s]
Min: 0.0 [g] at -0.065 [s]
g
60
50
40
30
20
10
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

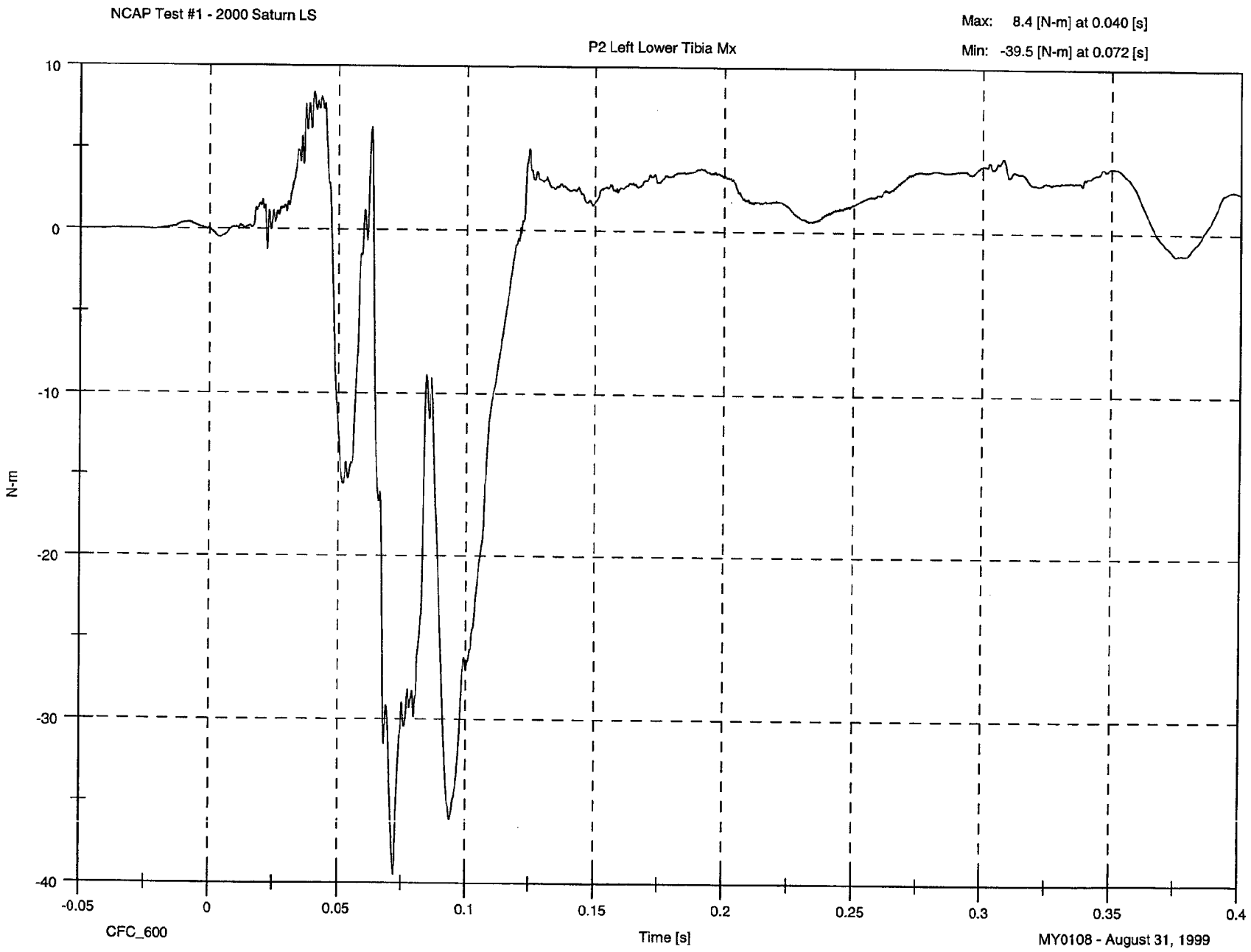

NCAP Test #1 - 2000 Saturn LS
P2 Left Femur z
Max: 306.1 [N] at 0.232 [s]
Min: -3523.6 [N] at 0.064 [s]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

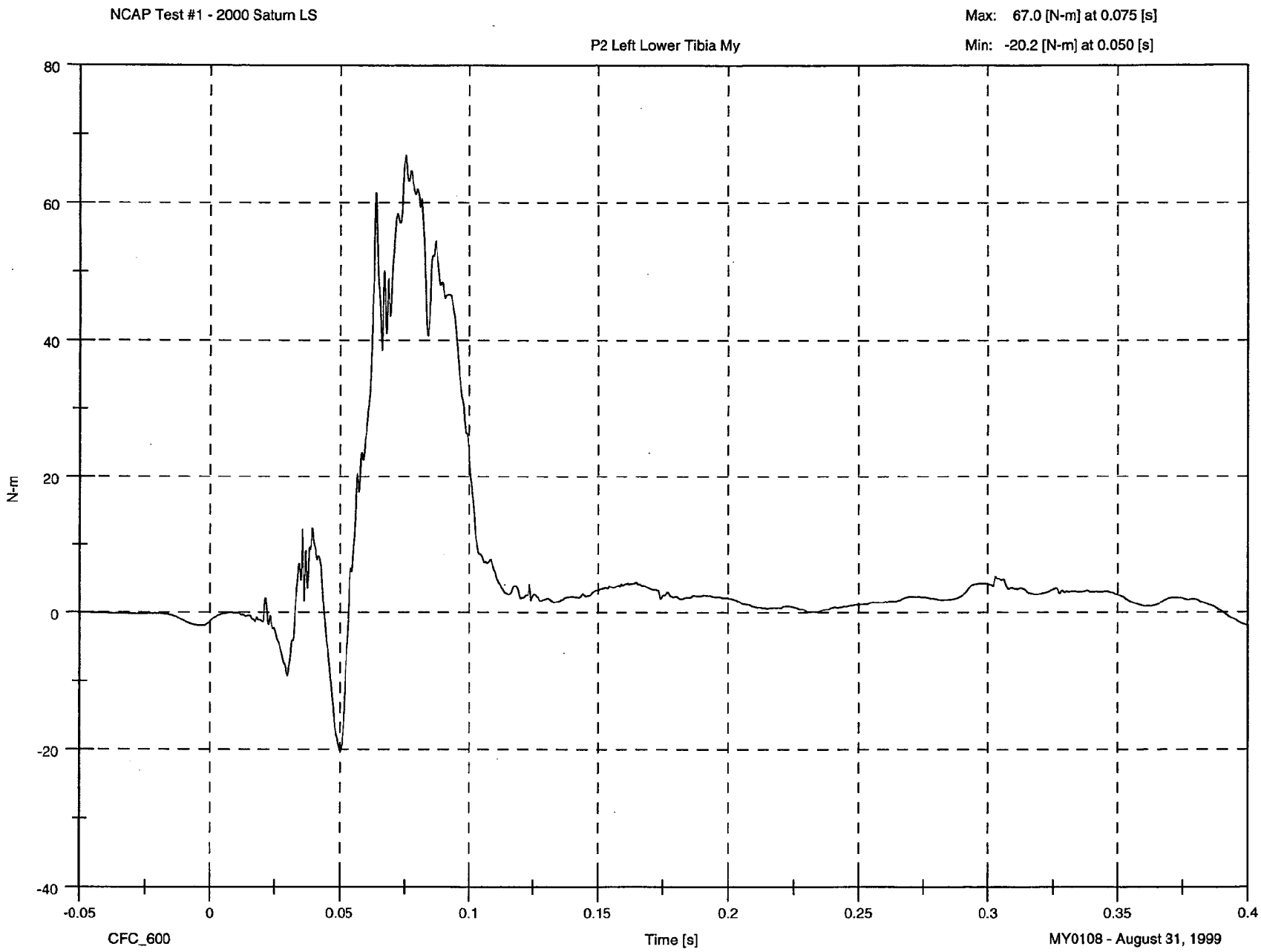

NCAP Test #1 - 2000 Saturn LS
P2 Right Femur z
Max: 291.3 [N] at 0.050 [s]
Min: -2882.3 [N] at 0.062 [s]
500
0
-500
-1000
-1500
-2000
-2500
-3000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

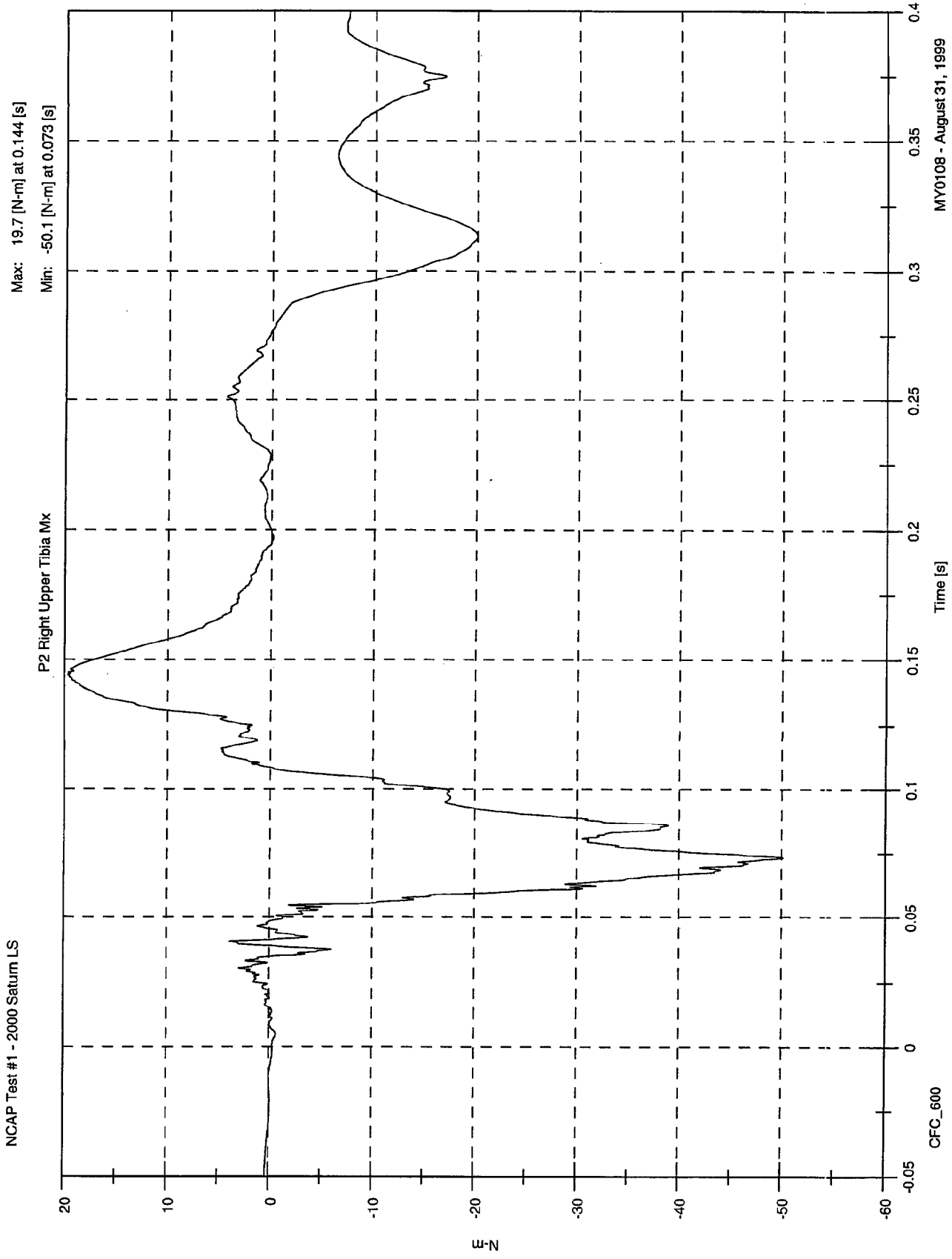

NCAP Test #1 - 2000 Saturn LS
P2 Left Upper Tibia Mx
Max: 48.2 [N-m] at 0.075 [s]
Min: -2.5 [N-m] at 0.150 [s]
N-m
50
40
30
20
10
0
-10
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

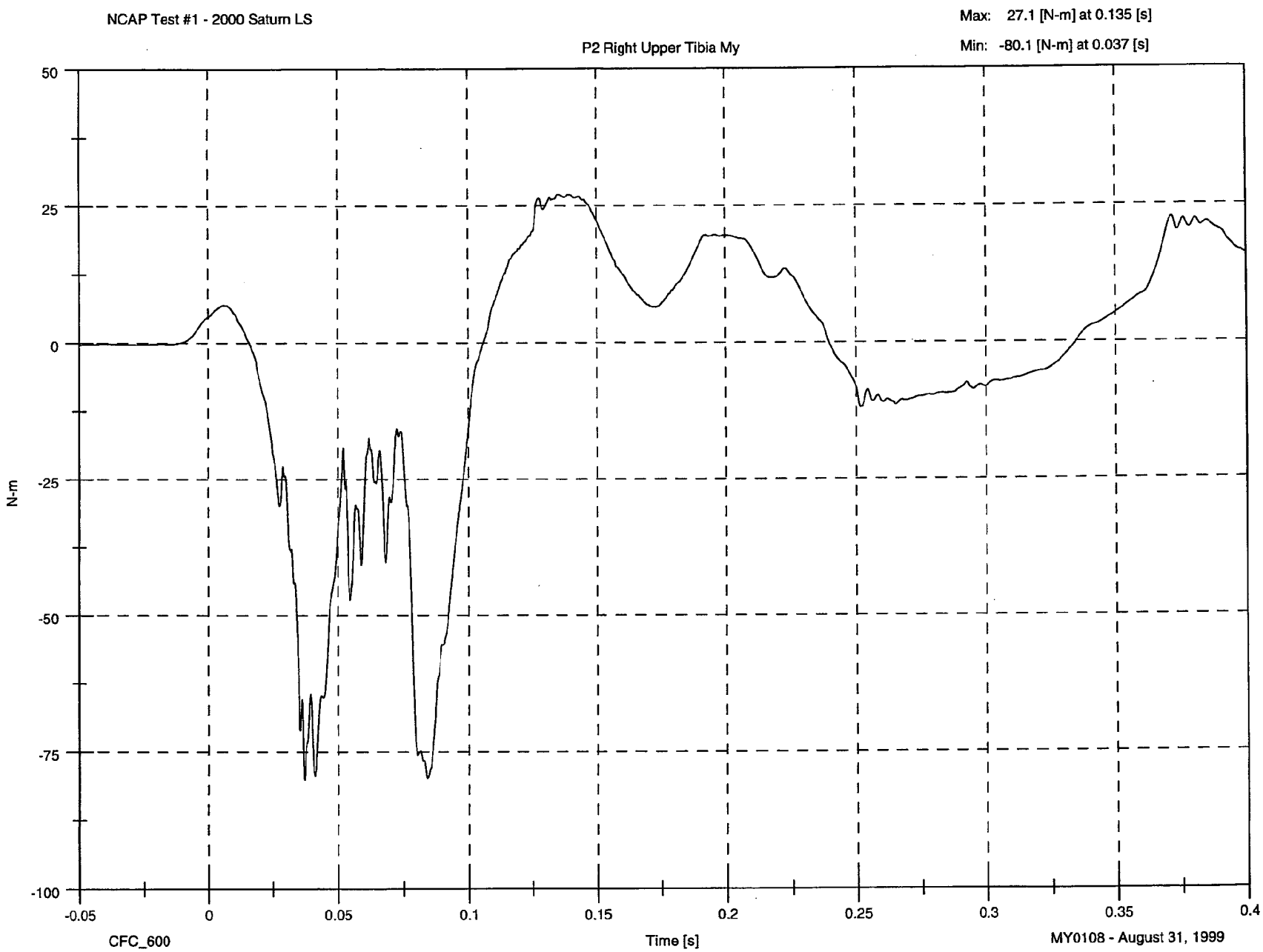

NCAP Test #1 - 2000 Saturn LS
P2 Left Upper Tibia My
Max: 32.7 [N-m] at 0.263 [s]
Min: -95.1 [N-m] at 0.084 [s]
50
25
0
-25
-50
-75
-100
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

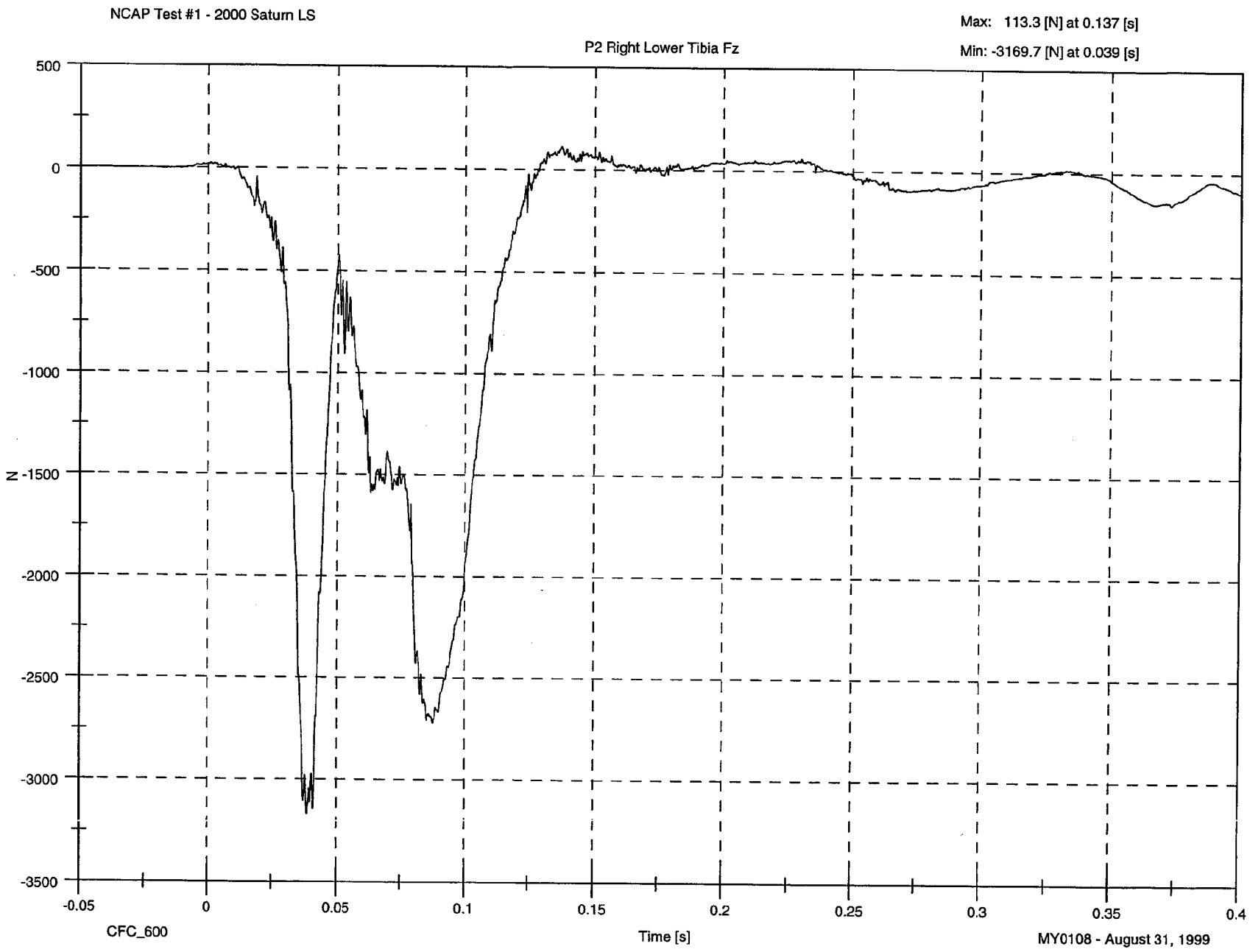

NCAP Test #1 - 2000 Saturn LS
Max: 398.5 [N] at 0.257 [s]
P2 Left Lower Tibia Fz
Min: -4039.7 [N] at 0.074 [s]
1000
0
-1000
-2000
-3000
-4000
-5000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_600
Time [s]
MY0108 - August 31, 1999

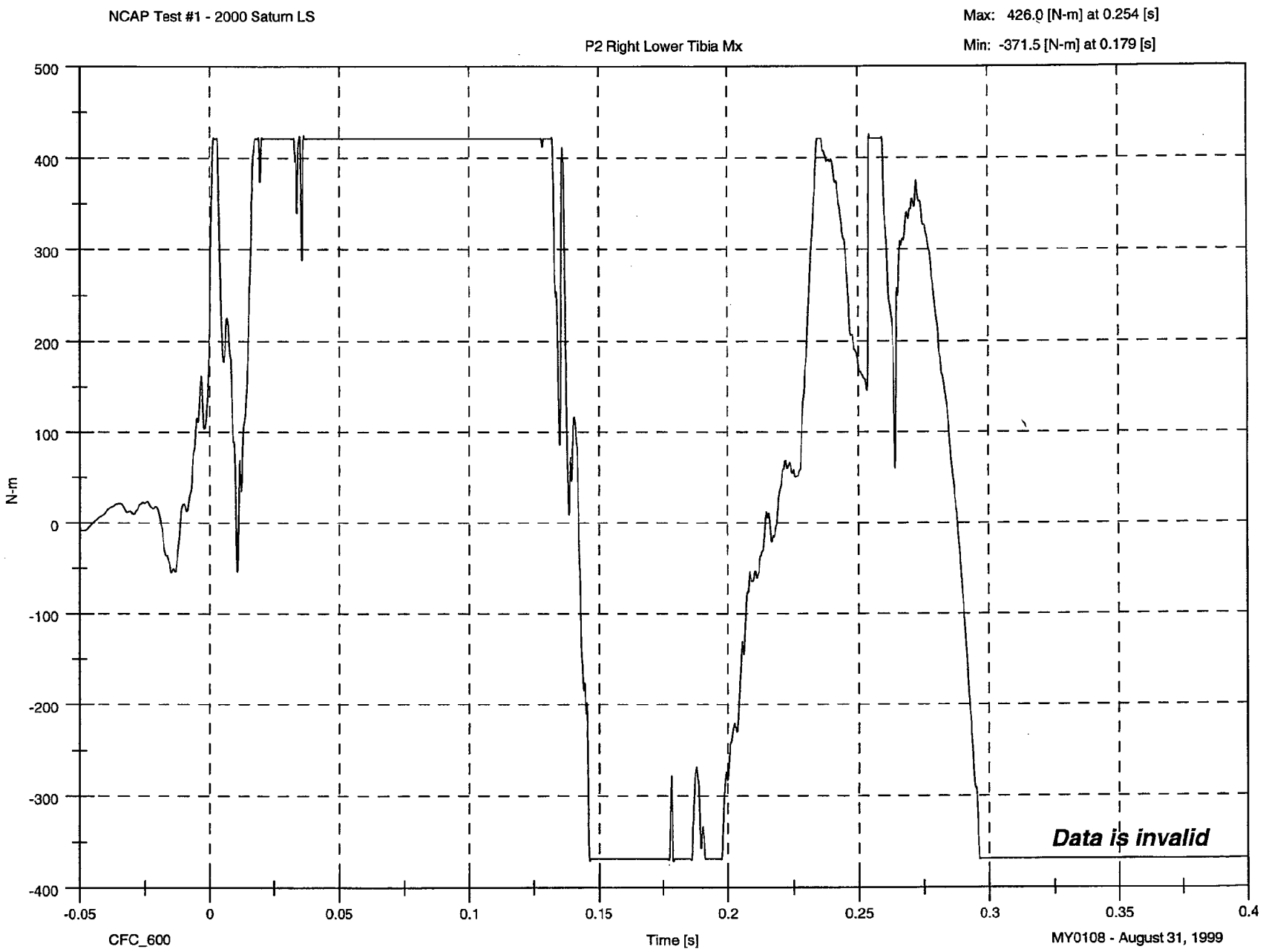

NCAP Test #1 - 2000 Saturn LS
P2 Left Lower Tibia Mx
Max: 8.4 [N-m] at 0.040 [s]
Min: -39.5 [N-m] at 0.072 [s]
10
0
-10
-20
-30
-40
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

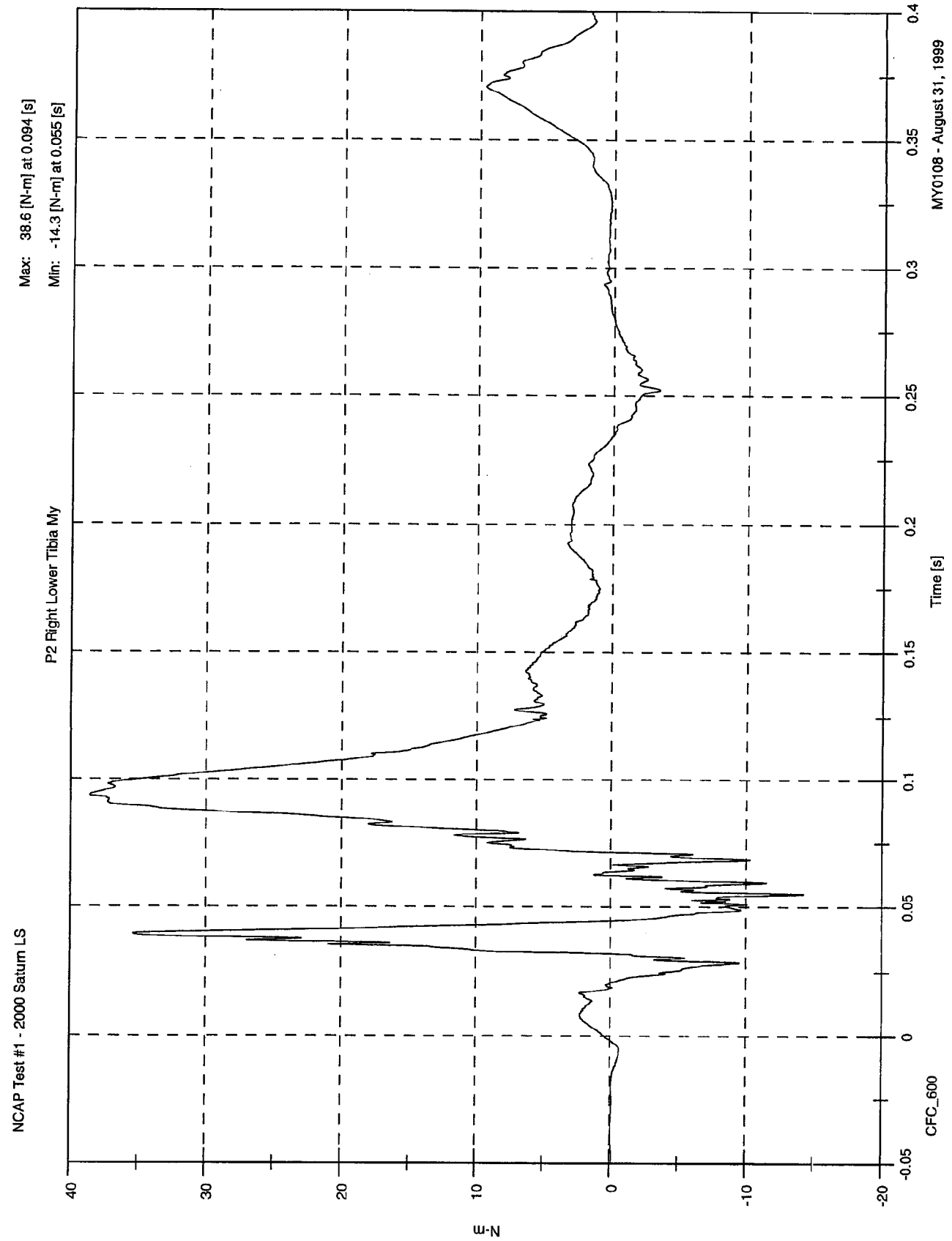

NCAP Test #1 - 2000 Saturn LS
P2 Left Lower Tibia My
Max: 67.0 [N-m] at 0.075 [s]
Min: -20.2 [N-m] at 0.050 [s]
80
60
40
20
0
-20
-40
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_600
Time [s]
MY0108 - August 31, 1999

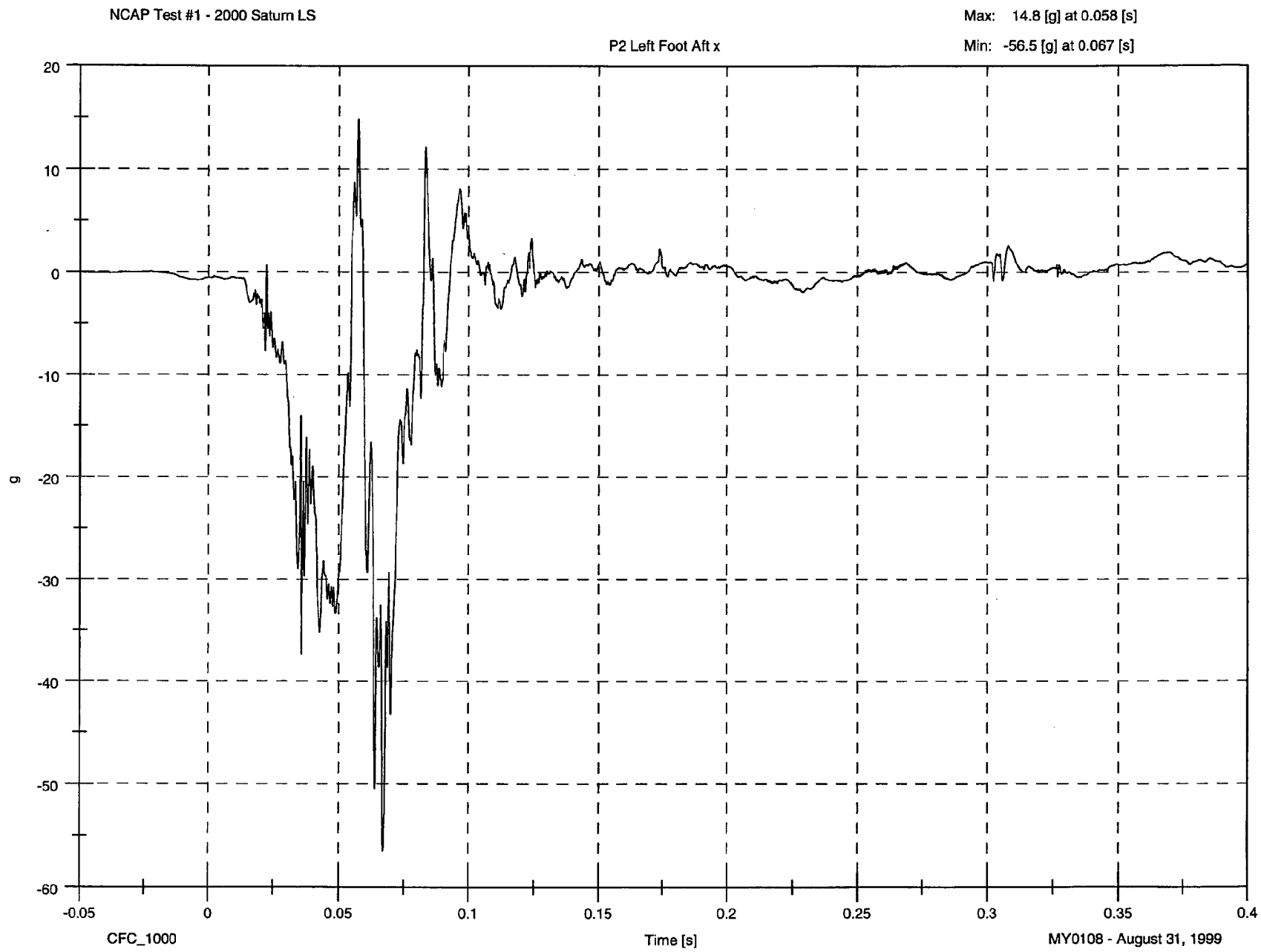

NCAP Test #1 - 2000 Saturn LS
Max: 19.7 [N-m] at 0.144 [s]
Min: -50.1 [N-m] at 0.073 [s]
P2 Right Upper Tibia Mx
MY0108 - August 31, 1999
Time [s]
CFC_600
N-m
20
10
0
-10
-20
-30
-40
-50
-60
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

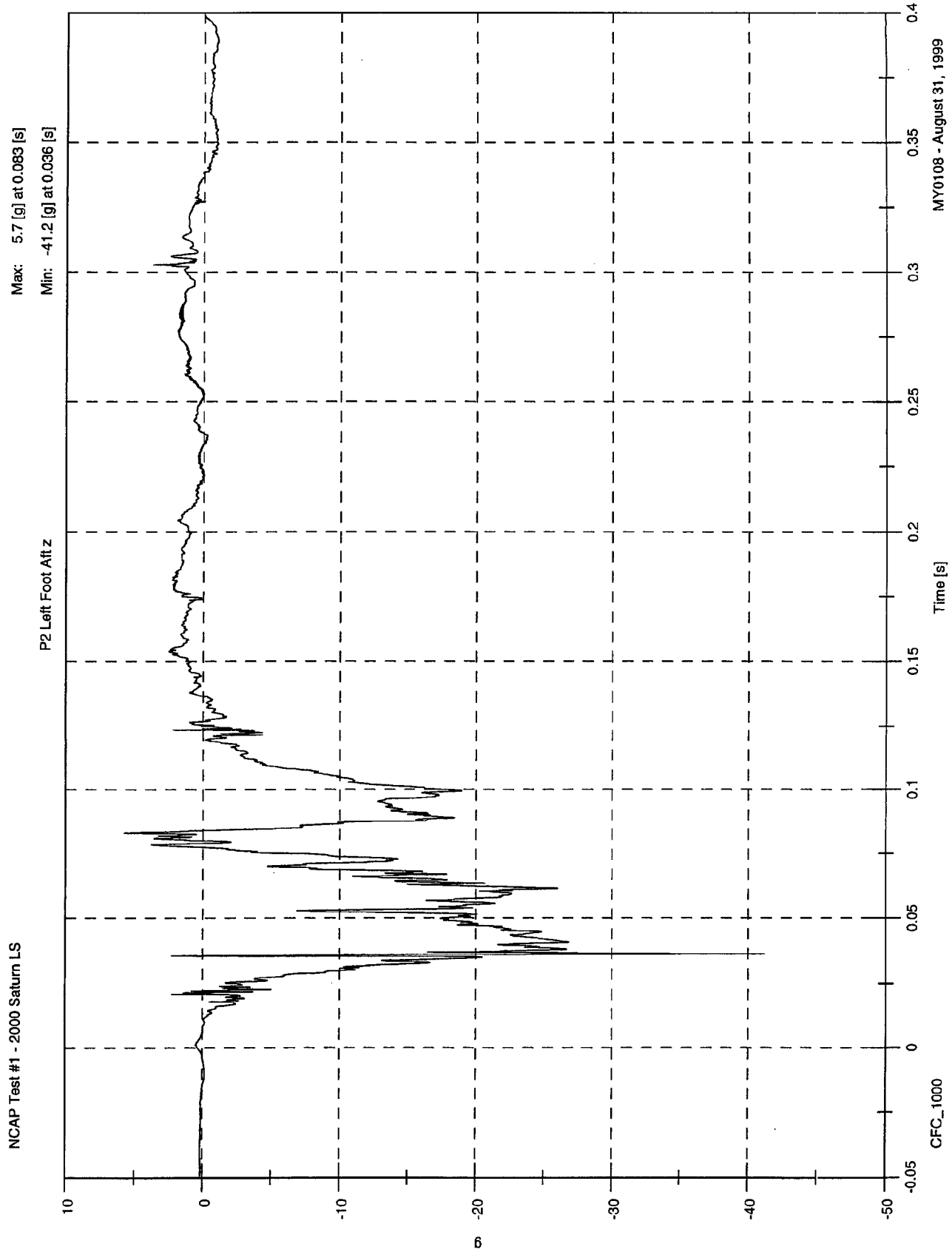

NCAP Test #1 - 2000 Saturn LS
Max: 27.1 [N-m] at 0.135 [s]
P2 Right Upper Tibia My
Min: -80.1 [N-m] at 0.037 [s]
50
25
0
-25
-50
-75
-100
N-m
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

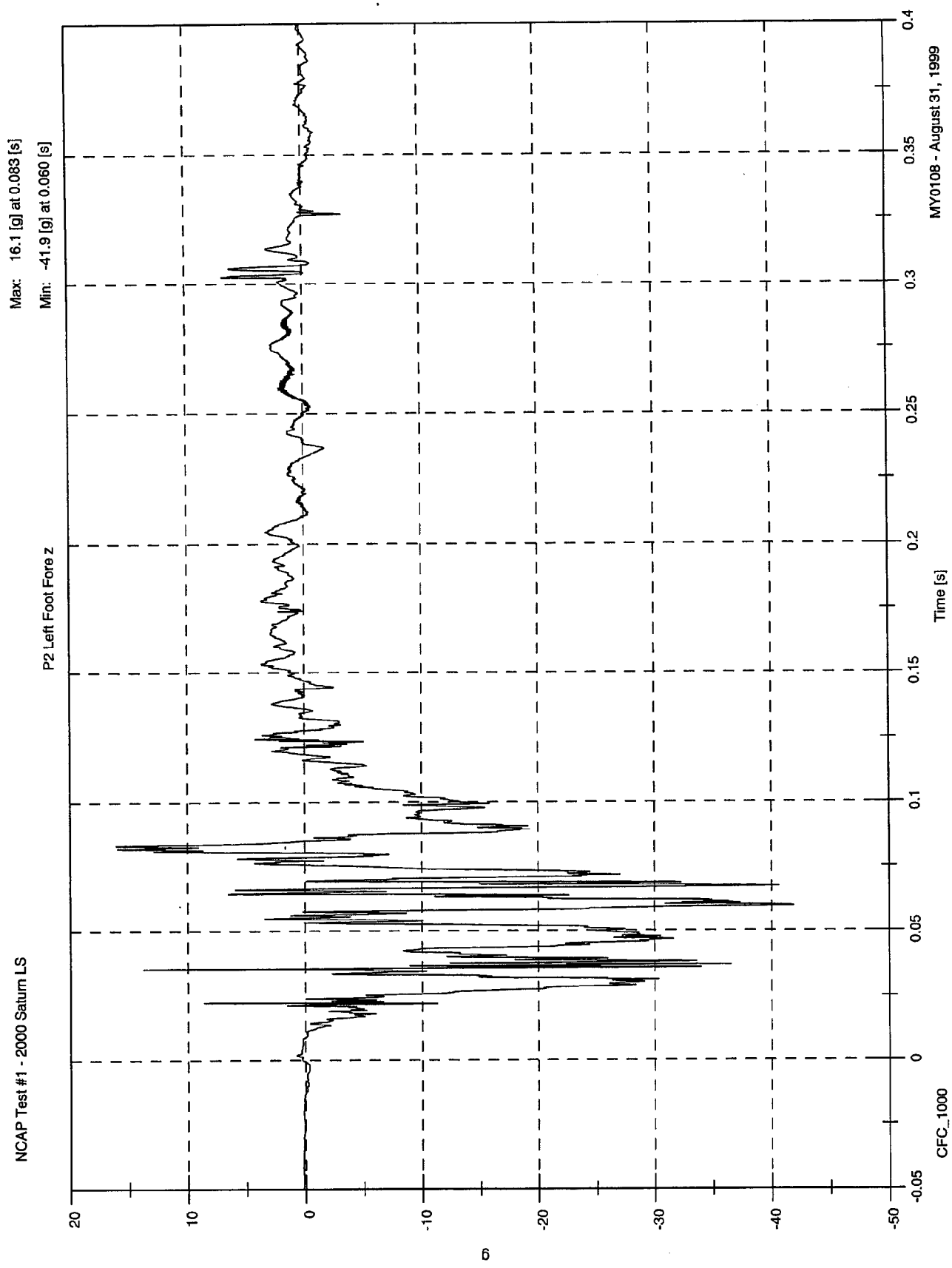

NCAP Test #1 - 2000 Saturn LS
P2 Right Lower Tibia Fz
Max: 113.3 [N] at 0.137 [s]
Min: -3169.7 [N] at 0.039 [s]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999

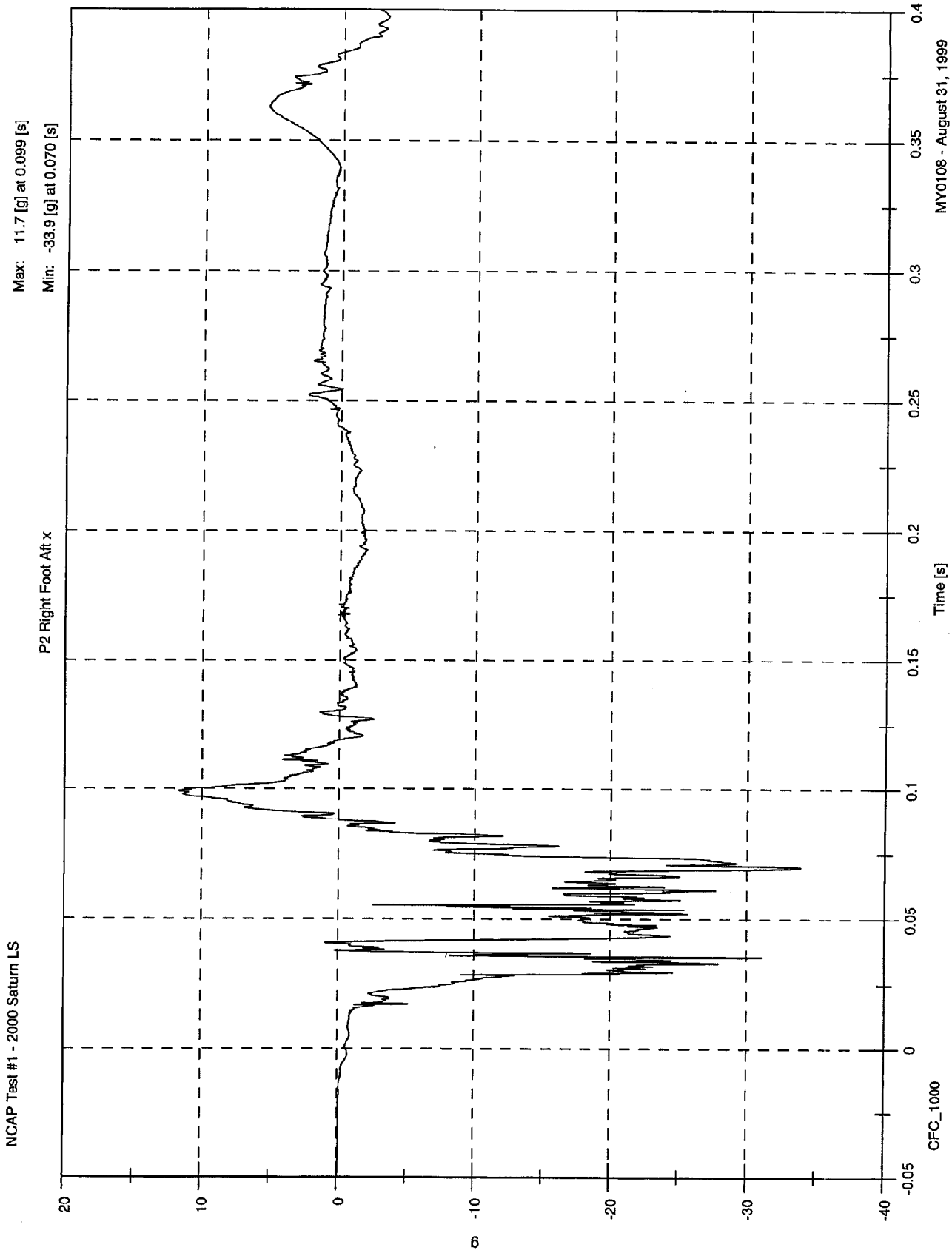

NCAP Test #1 - 2000 Saturn LS
P2 Right Lower Tibia Mx
Max: 426.0 [N-m] at 0.254 [s]
Min: -371.5 [N-m] at 0.179 [s]
N-m
500
400
300
200
100
0
-100
-200
-300
-400
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
MY0108 - August 31, 1999
Data is invalid

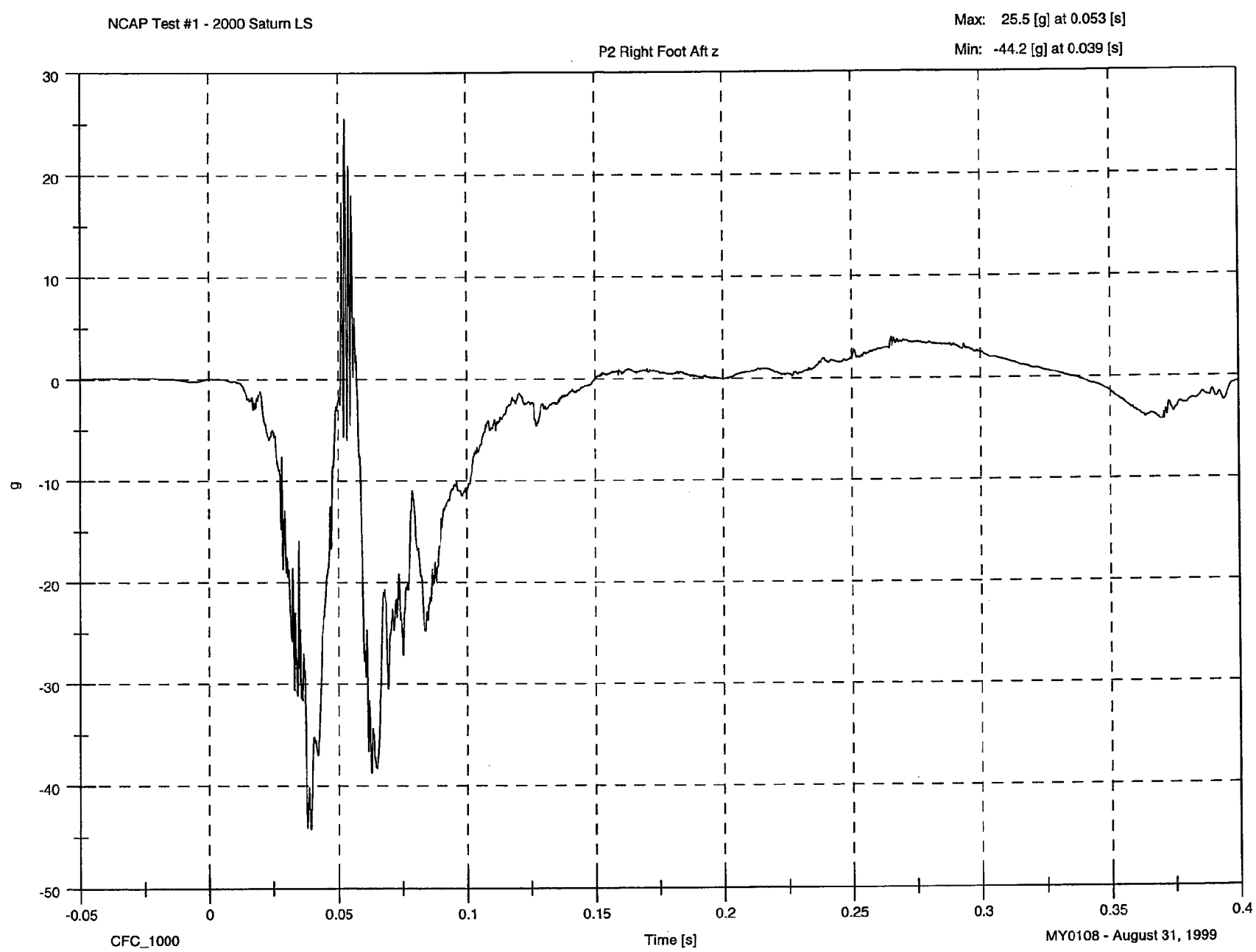

NCAP Test #1 - 2000 Saturn LS
P2 Right Lower Tibia My
Max: 38.6 [N-m] at 0.094 [s]
Min: -14.3 [N-m] at 0.055 [s]
MY0108 - August 31, 1999
CFC_600
N-m
Time [s]
40
30
20
10
0
-10
-20
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

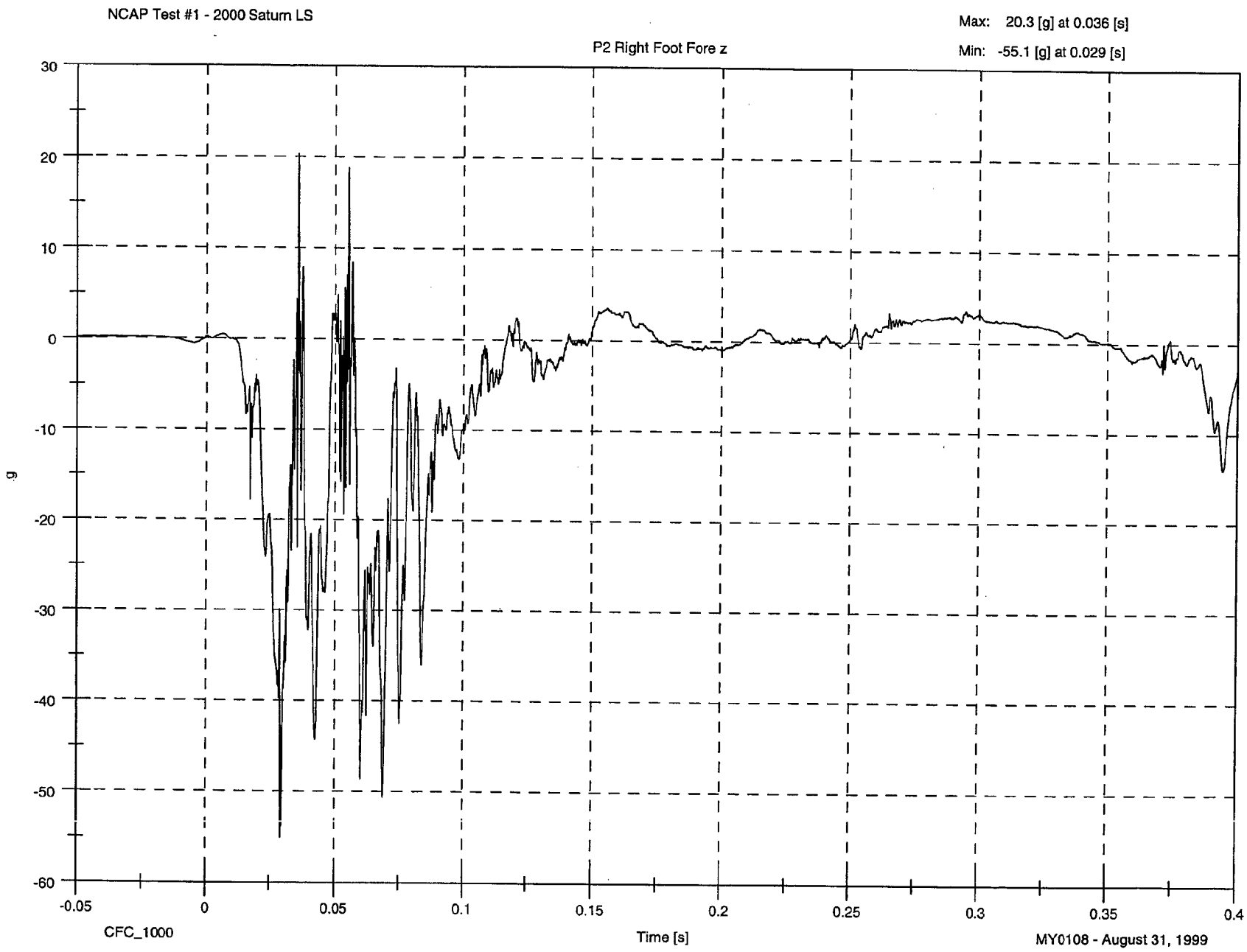

NCAP Test #1 - 2000 Saturn LS
Max: 14.8 [g] at 0.058 [s]
P2 Left Foot Aft x
Min: -56.5 [g] at 0.067 [s]
20
10
0
-10
-20
-30
-40
-50
-60
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

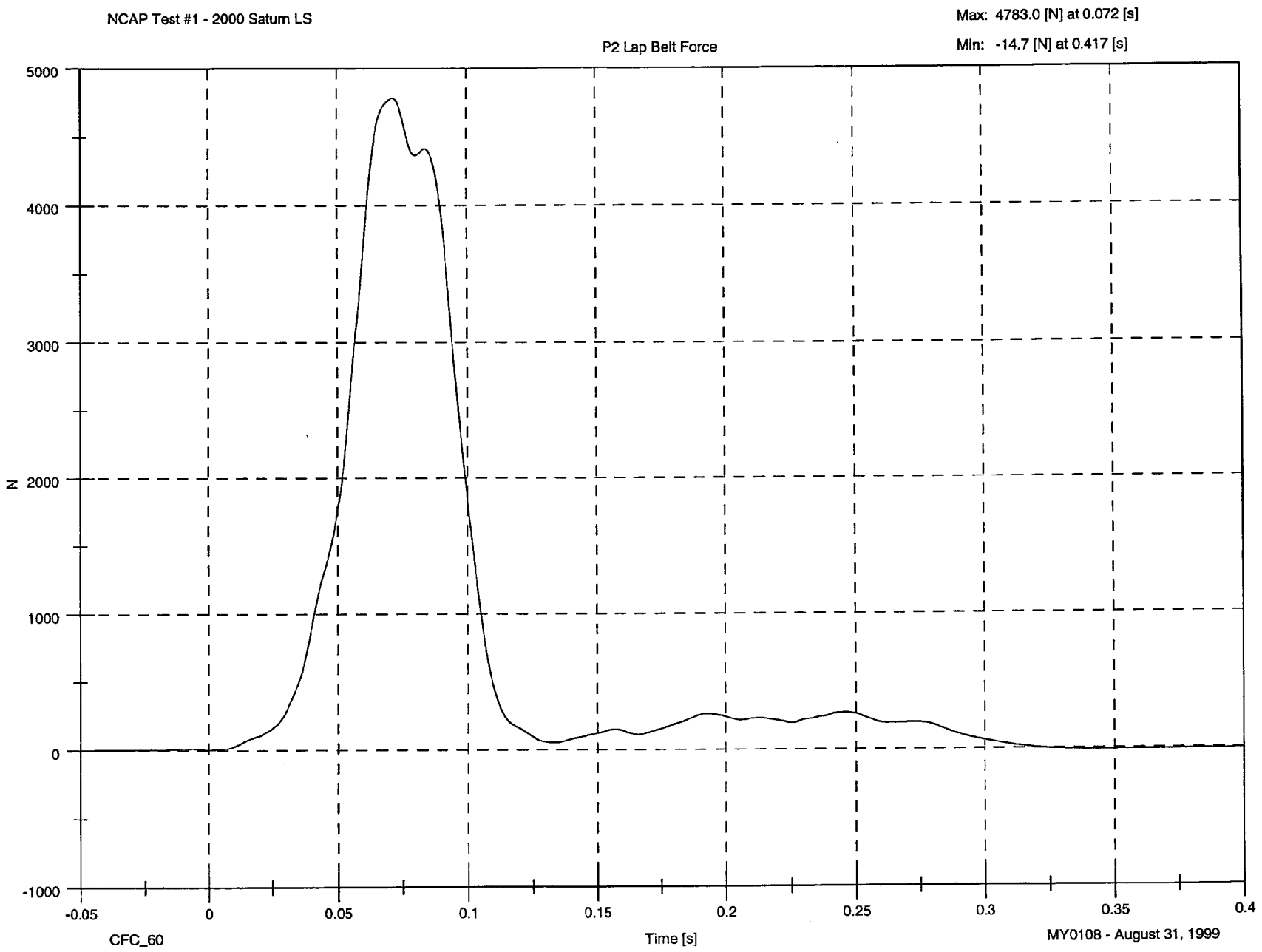

NCAP Test #1 - 2000 Saturn LS
Max: 5.7 [g] at 0.083 [s]
Min: -41.2 [g] at 0.036 [s]
P2 Left Foot Aft z
MY0108 - August 31, 1999
CFC_1000
Time [s]
g
10
0
-10
-20
-30
-40
-50
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

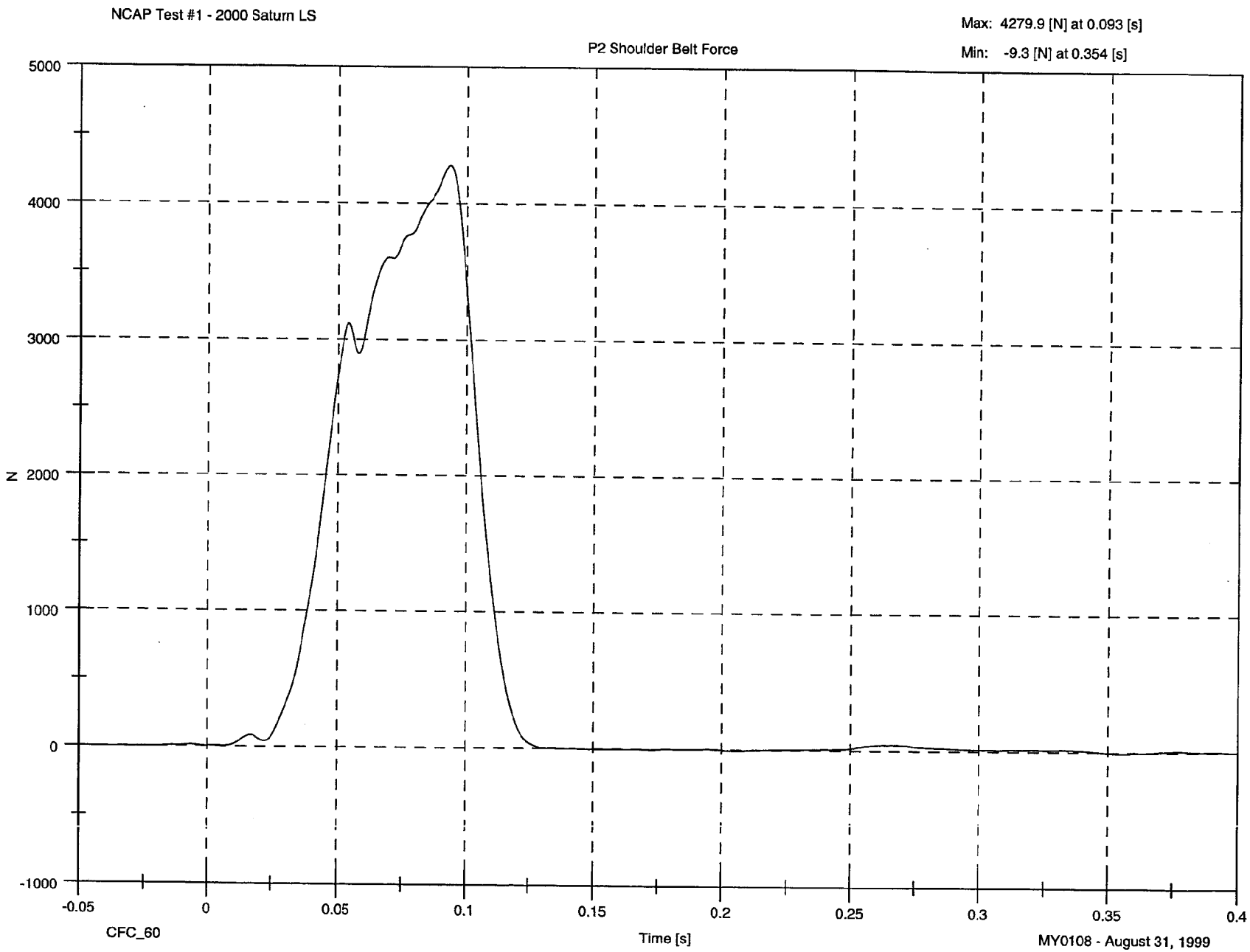

NCAP Test #1 - 2000 Saturn LS
Max: 16.1 [g] at 0.083 [s]
Min: -41.9 [g] at 0.060 [s]
P2 Left Foot Fore z
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
20
10
0
-10
-20
-30
-40
-50
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05

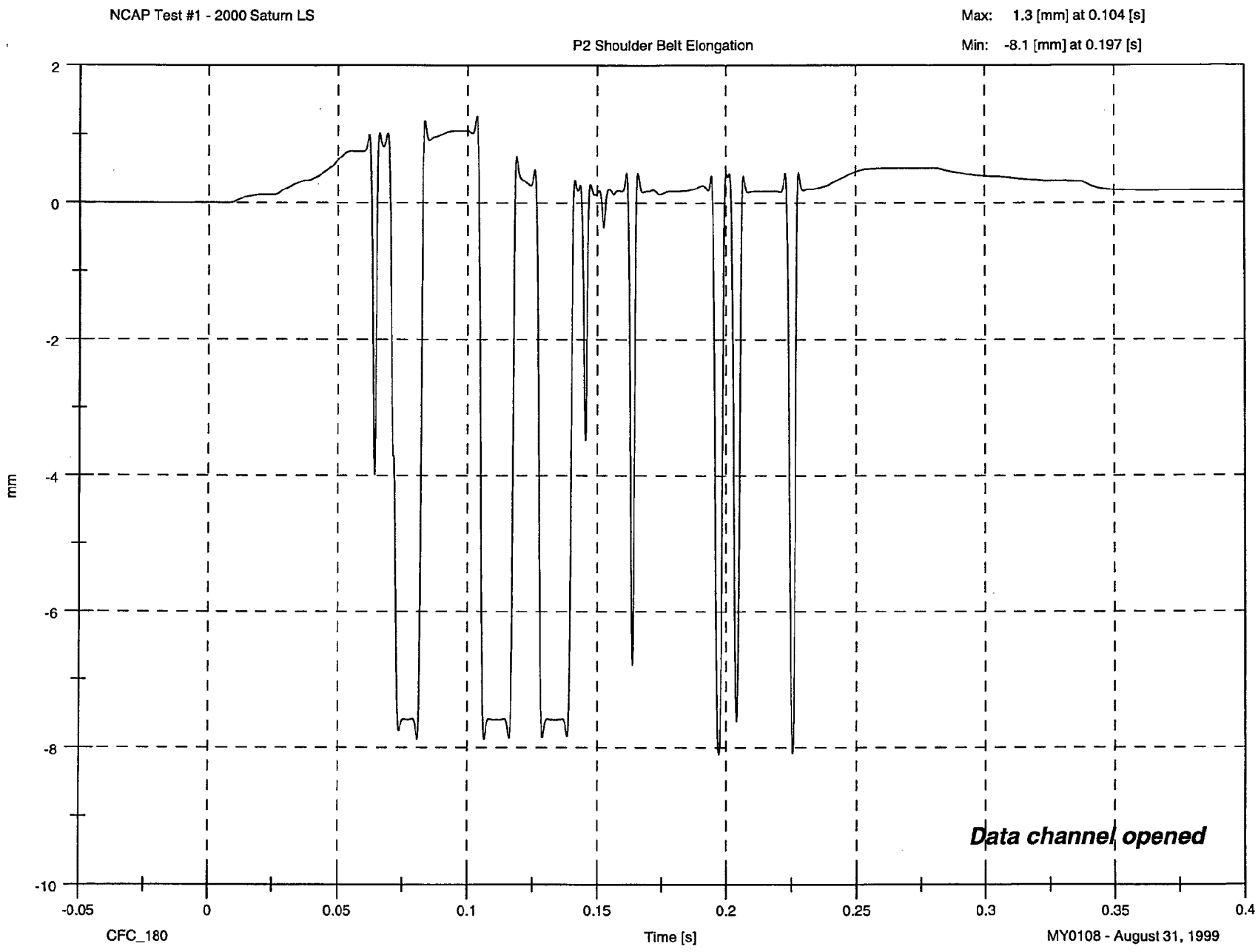

NCAP Test #1 - 2000 Saturn LS
Max: 11.7 [g] at 0.099 [s]
Min: -33.9 [g] at 0.070 [s]
P2 Right Foot Aft x
MY0108 - August 31, 1999
Time [s]
CFC_1000
g
20
10
0
-10
-20
-30
-40
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

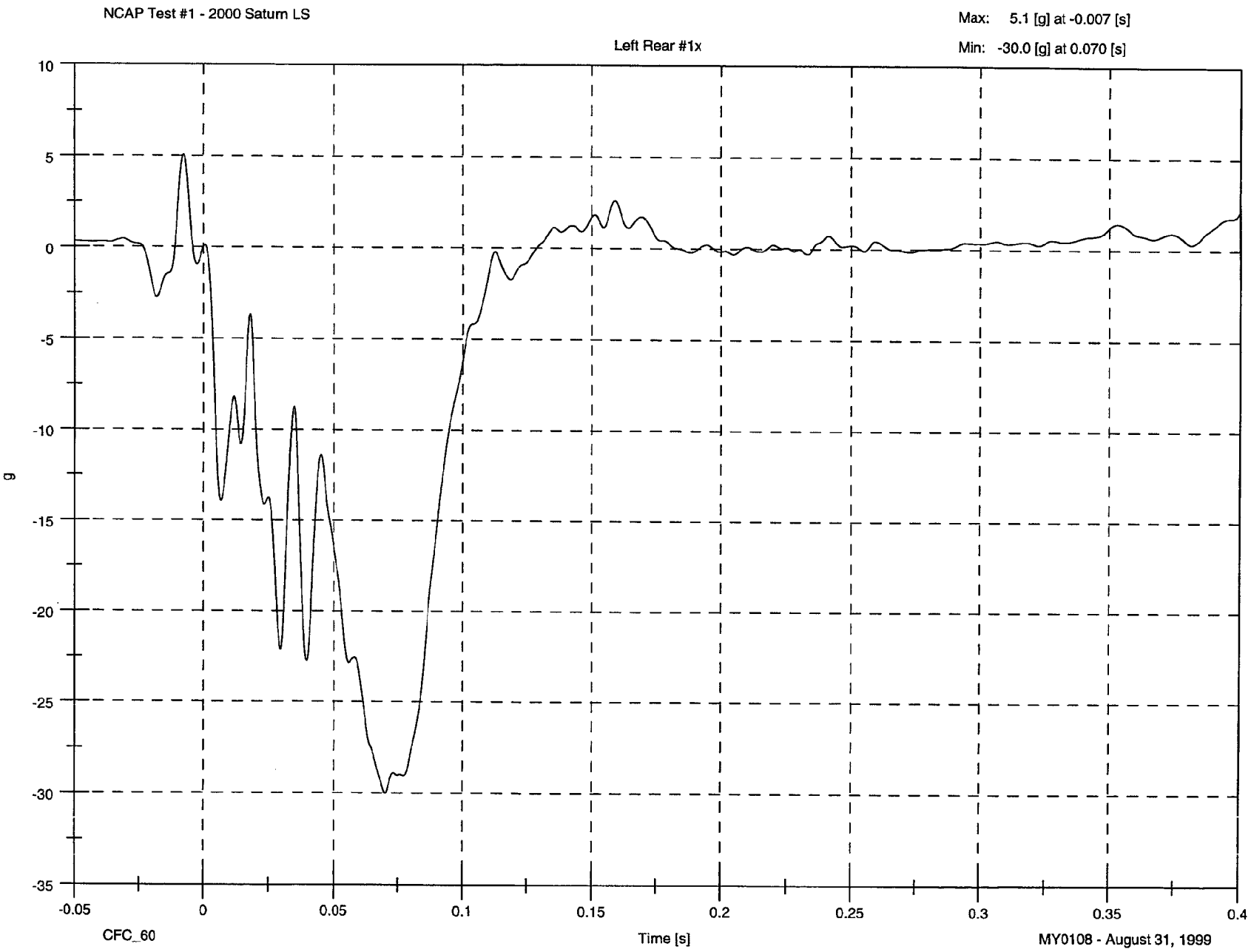

NCAP Test #1 - 2000 Saturn LS
P2 Right Foot Aft z
Max: 25.5 [g] at 0.053 [s]
Min: -44.2 [g] at 0.039 [s]
30
20
10
0
-10
-20
-30
-40
-50
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

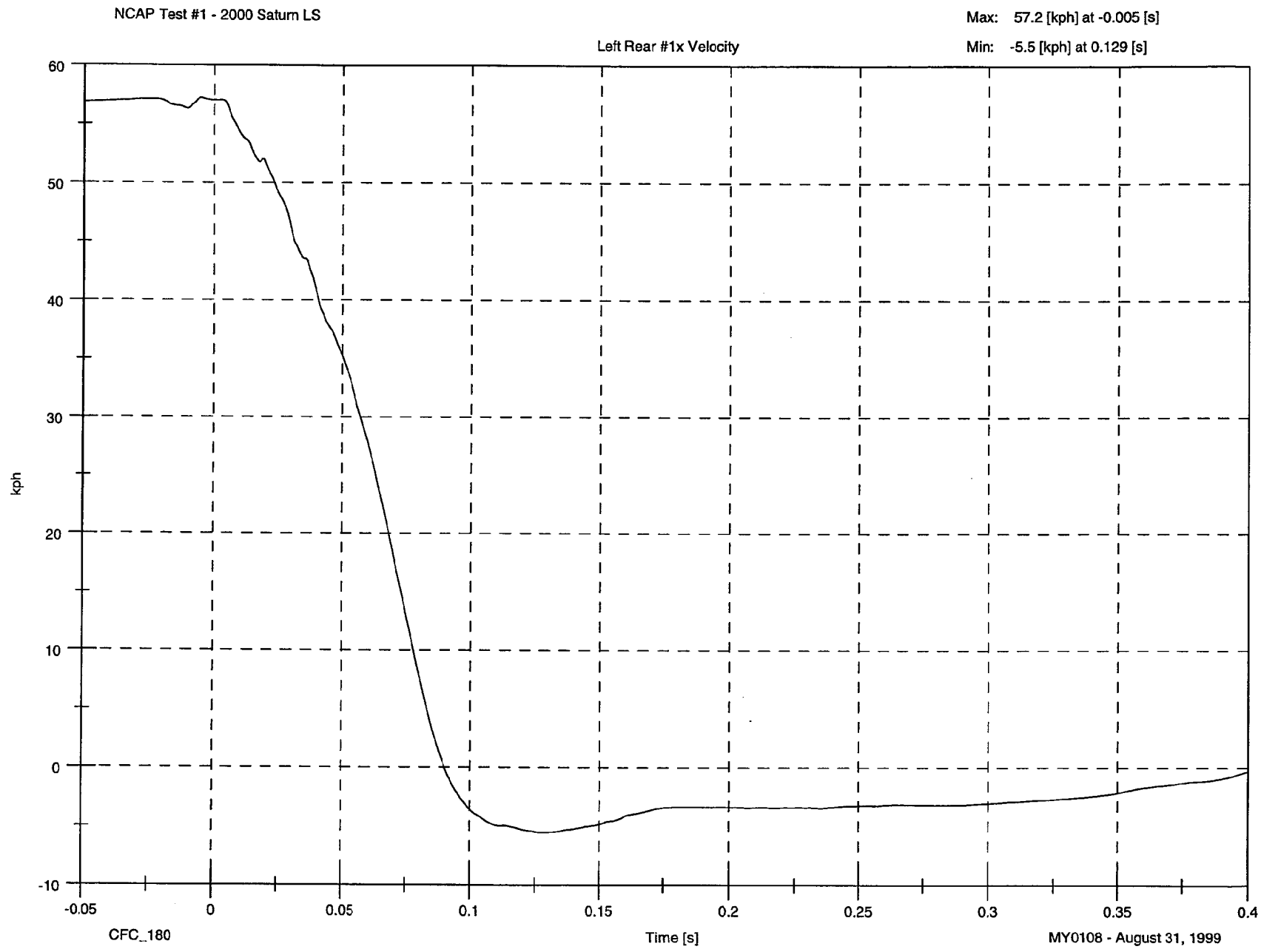

NCAP Test #1 - 2000 Saturn LS
P2 Right Foot Fore z
Max: 20.3 [g] at 0.036 [s]
Min: -55.1 [g] at 0.029 [s]
30
20
10
0
-10
-20
-30
-40
-50
-60
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
MY0108 - August 31, 1999

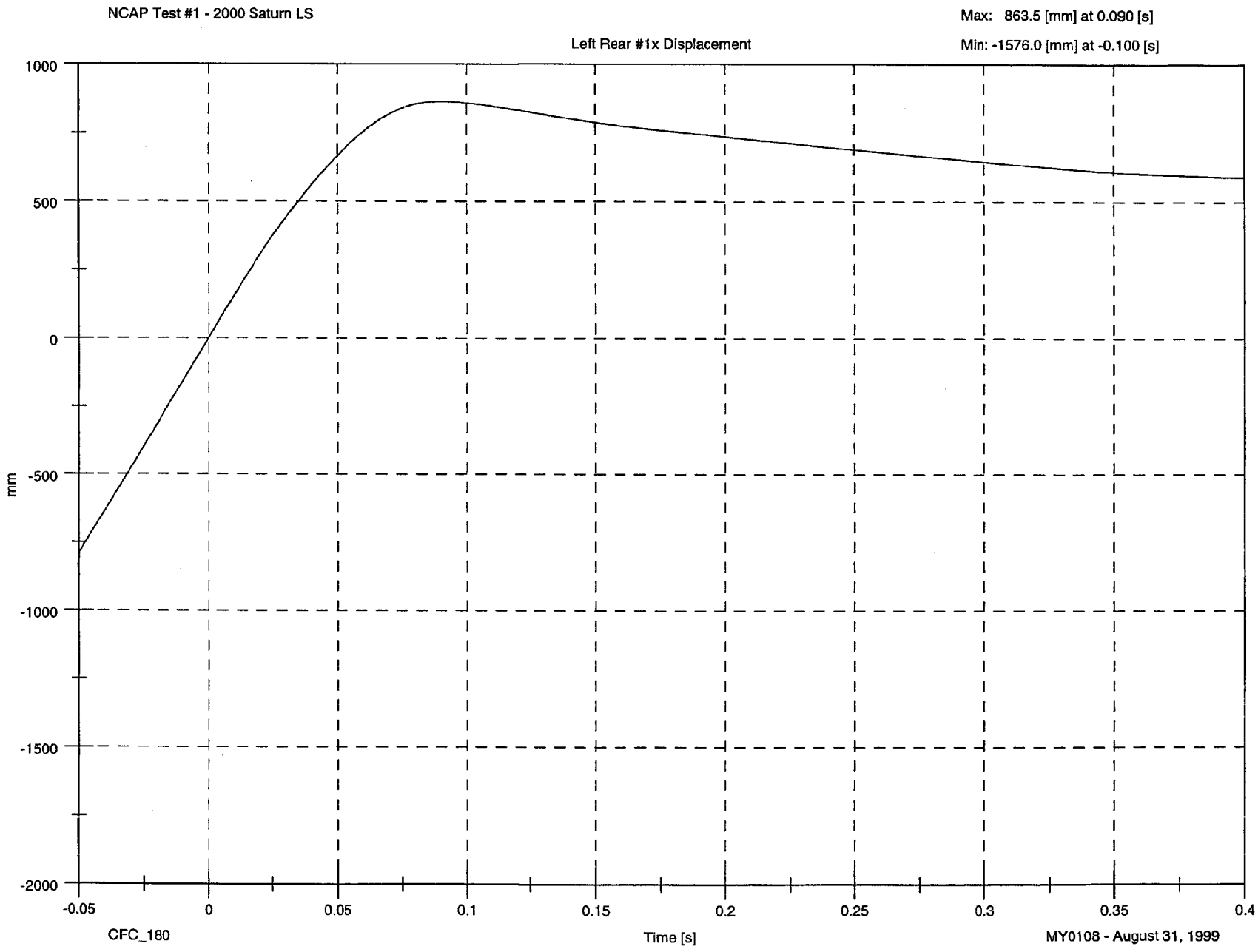

NCAP Test #1 - 2000 Saturn LS
P2 Lap Belt Force
Max: 4783.0 [N] at 0.072 [s]
Min: -14.7 [N] at 0.417 [s]
5000
4000
3000
2000
1000
0
-1000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999

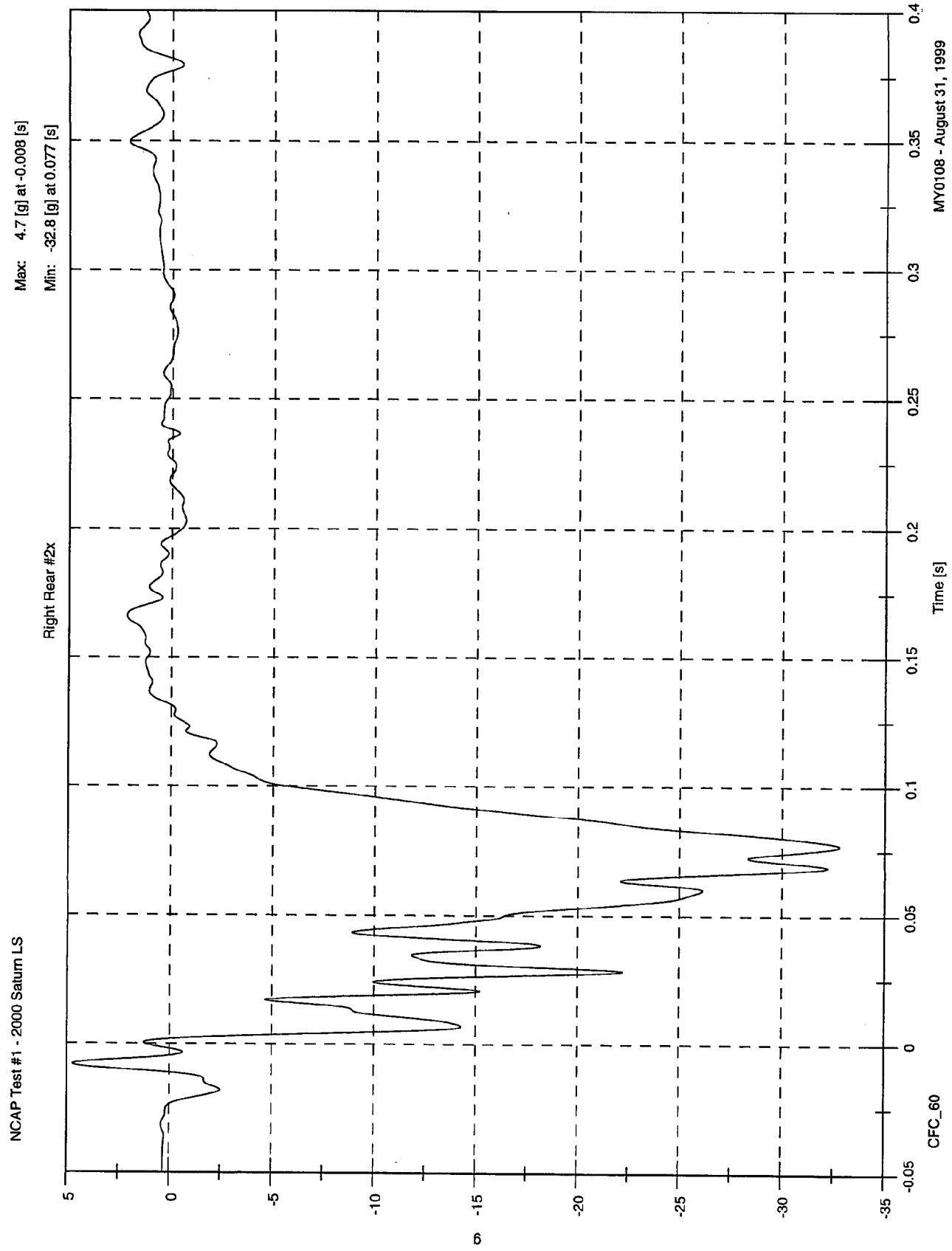

NCAP Test #1 - 2000 Saturn LS
P2 Shoulder Belt Force
Max: 4279.9 [N] at 0.093 [s]
Min: -9.3 [N] at 0.354 [s]
5000
4000
3000
2000
1000
0
-1000
N
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999

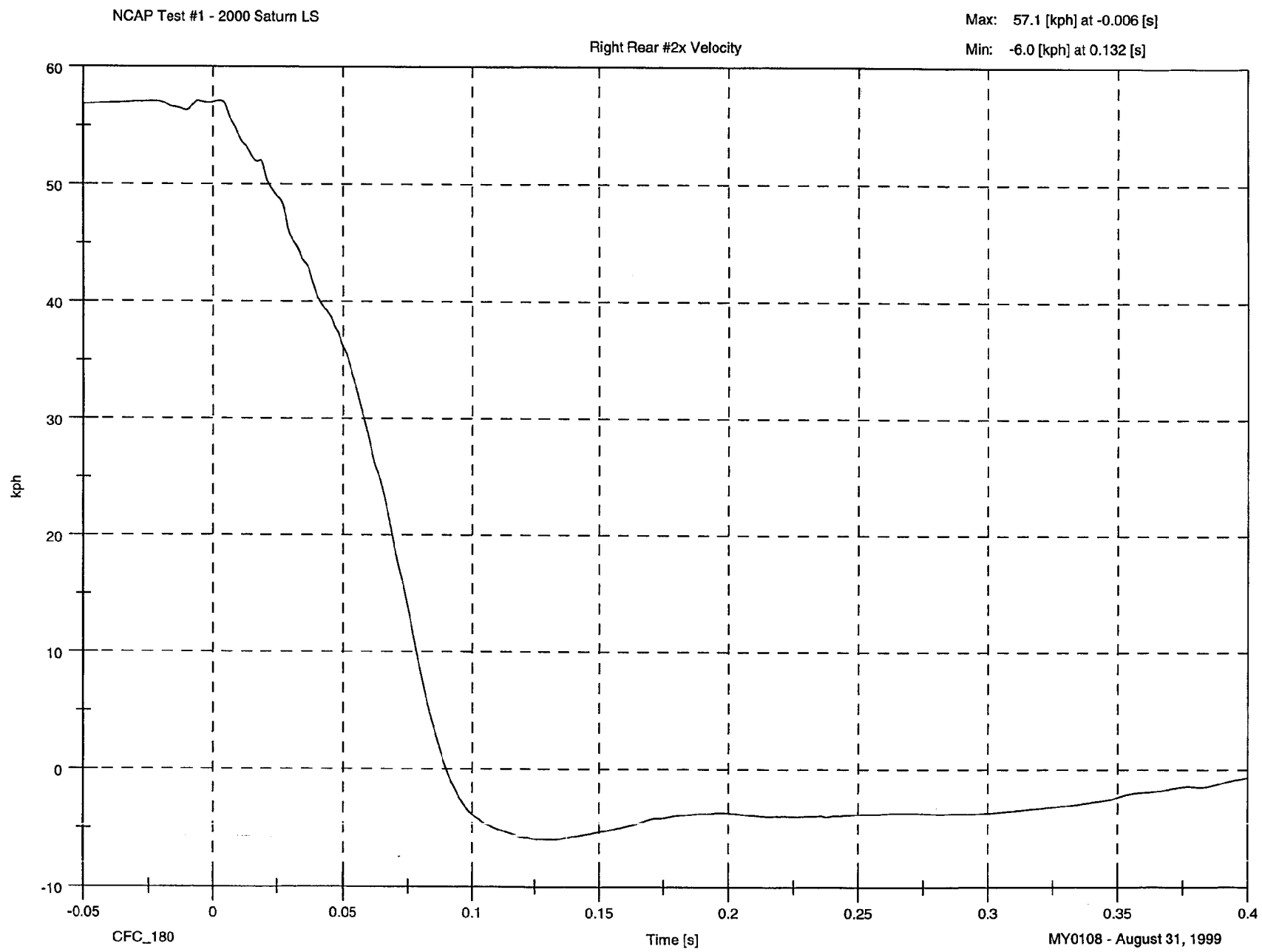

NCAP Test #1 - 2000 Saturn LS
P2 Shoulder Belt Elongation
Max: 1.3 [mm] at 0.104 [s]
Min: -8.1 [mm] at 0.197 [s]
mm
2
0
-2
-4
-6
-8
-10
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999
Data channel opened

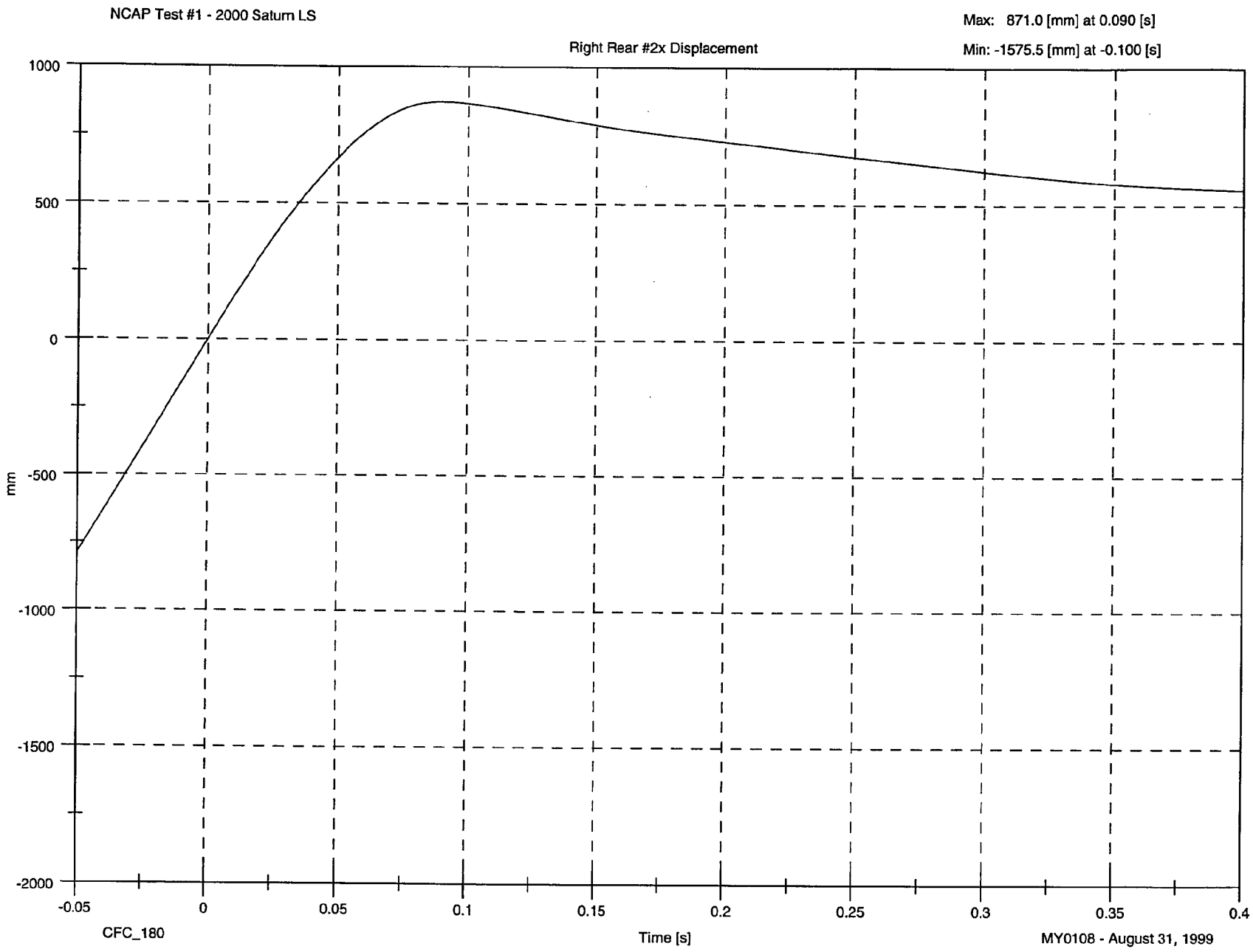

NCAP Test #1 - 2000 Saturn LS
Left Rear #1x
Max: 5.1 [g] at -0.007 [s]
Min: -30.0 [g] at 0.070 [s]
10
5
0
-5
-10
-15
-20
-25
-30
-35
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999

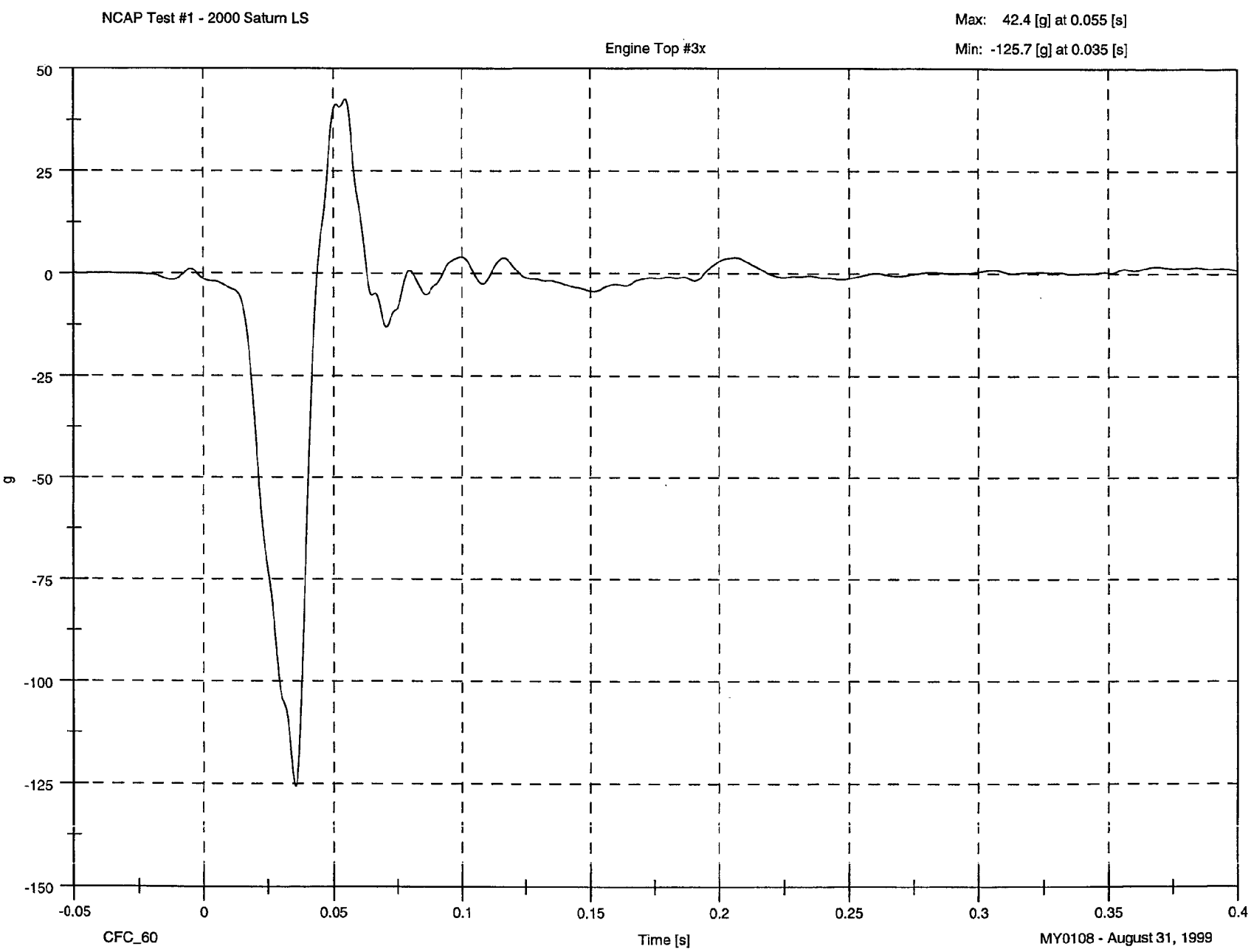

NCAP Test #1 - 2000 Saturn LS
Left Rear #1x Velocity
Max: 57.2 [kph] at -0.005 [s]
Min: -5.5 [kph] at 0.129 [s]
60
50
40
30
20
10
0
-10
kph
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

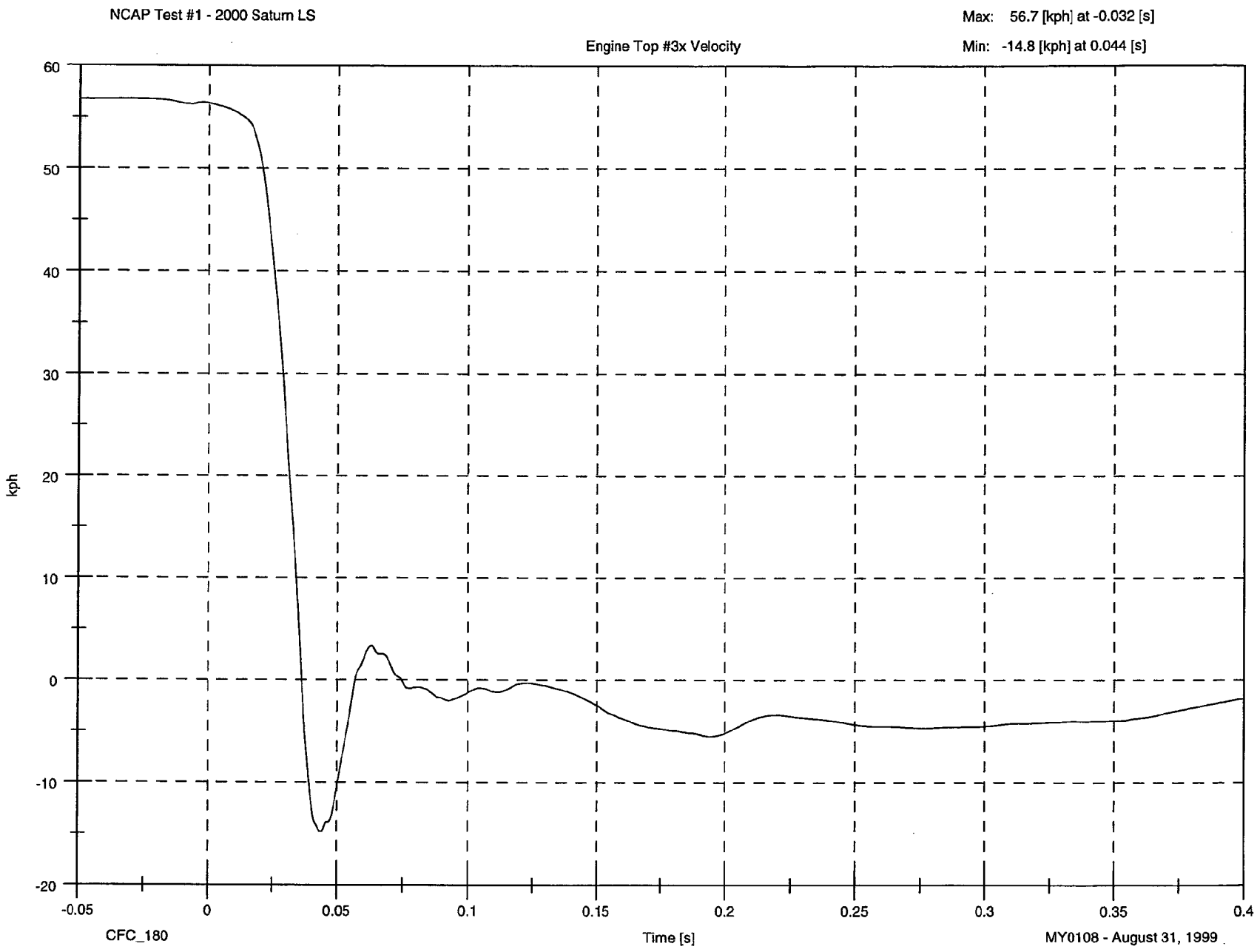

NCAP Test #1 - 2000 Saturn LS
Max: 863.5 [mm] at 0.090 [s]
Left Rear #1x Displacement
Min: -1576.0 [mm] at -0.100 [s]
1000
500
0
-500
-1000
-1500
-2000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_180
Time [s]
MY0108 - August 31, 1999

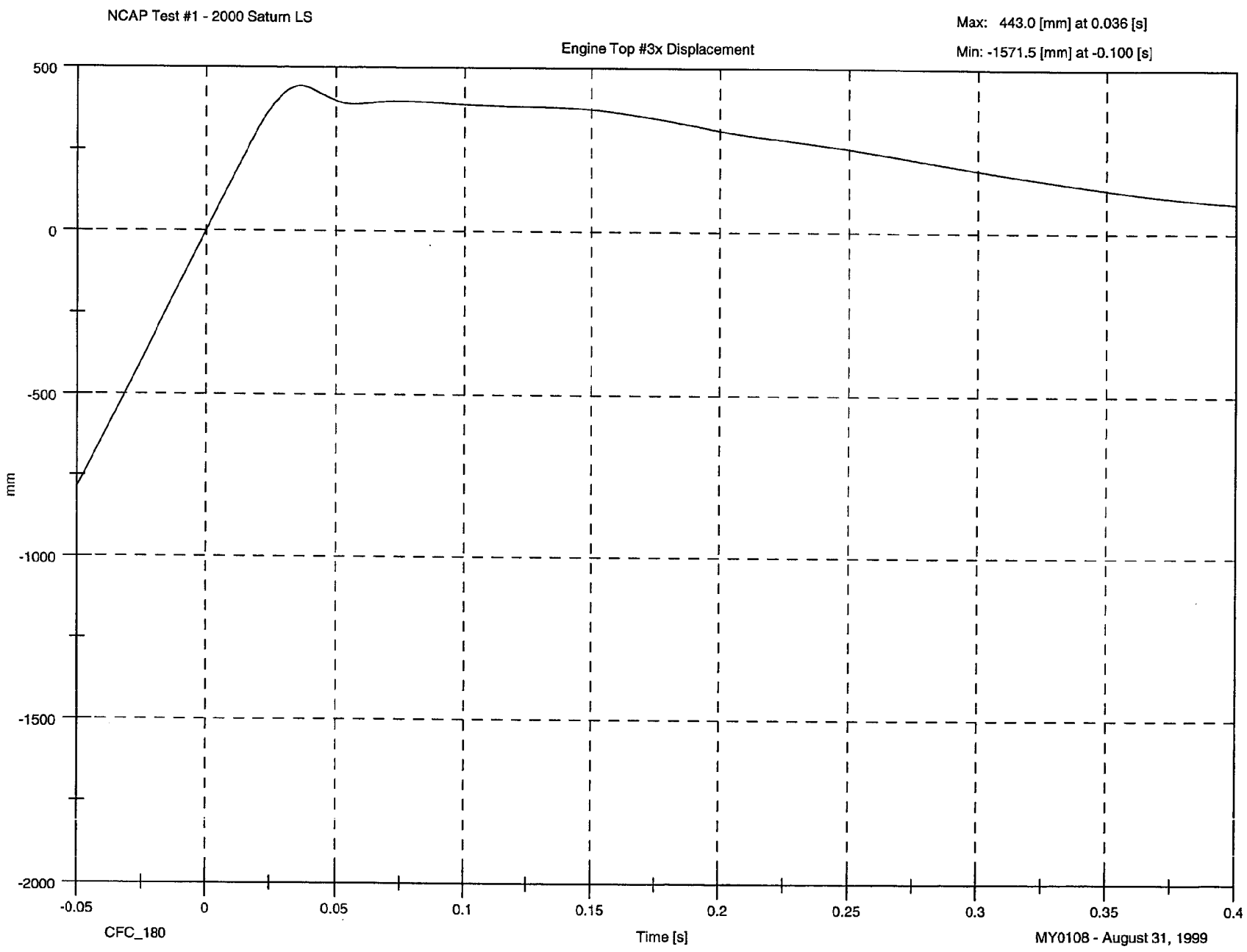

NCAP Test #1 - 2000 Saturn LS
Max: 4.7 [g] at -0.008 [s]
Min: -32.8 [g] at 0.077 [s]
Right Rear #2x
MY0108 - August 31, 1999
Time [s]
CFC_60
g
5
0
-5
-10
-15
-20
-25
-30
-35
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

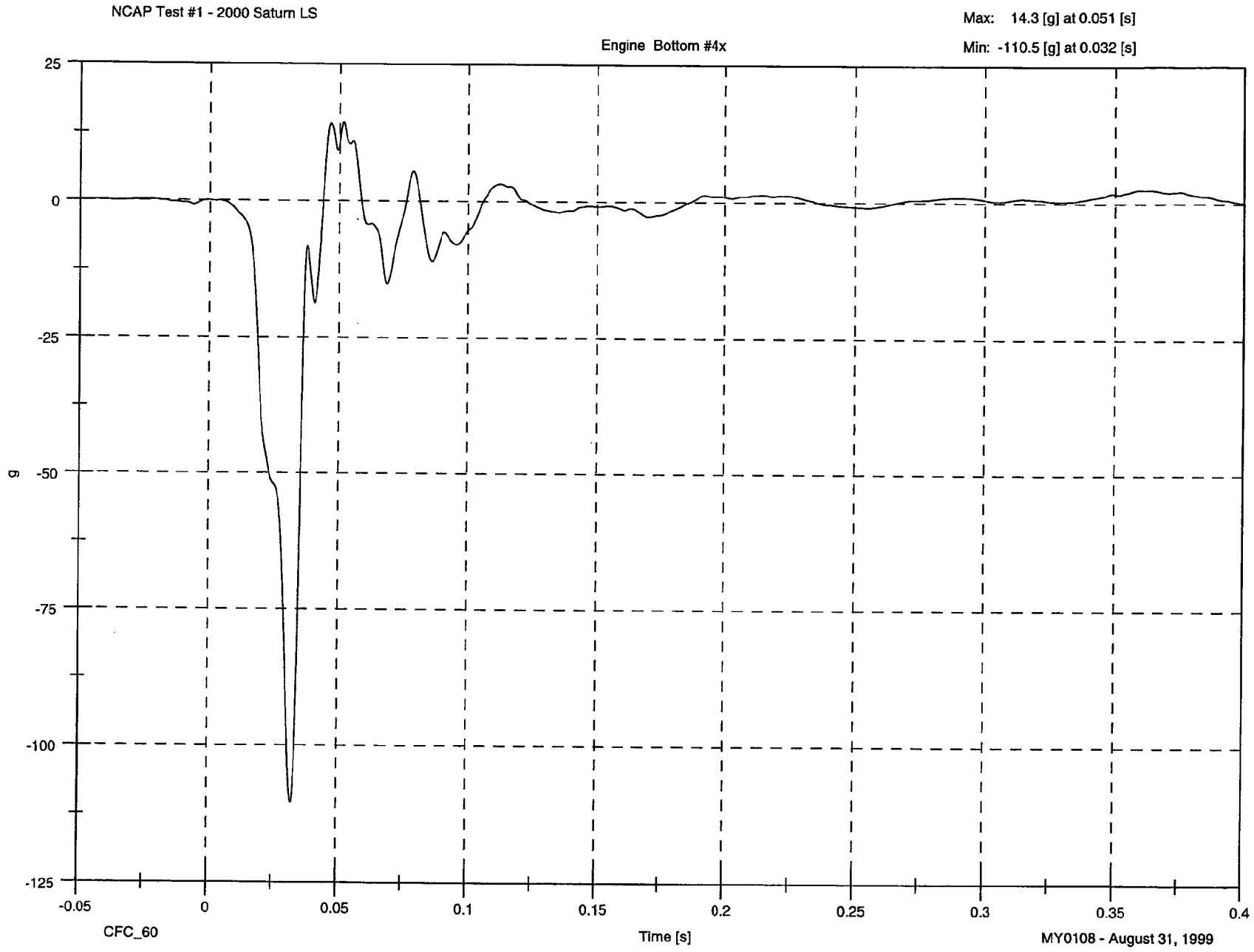

NCAP Test #1 - 2000 Saturn LS
Right Rear #2x Velocity
Max: 57.1 [kph] at -0.006 [s]
Min: -6.0 [kph] at 0.132 [s]
kph
60
50
40
30
20
10
0
-10
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

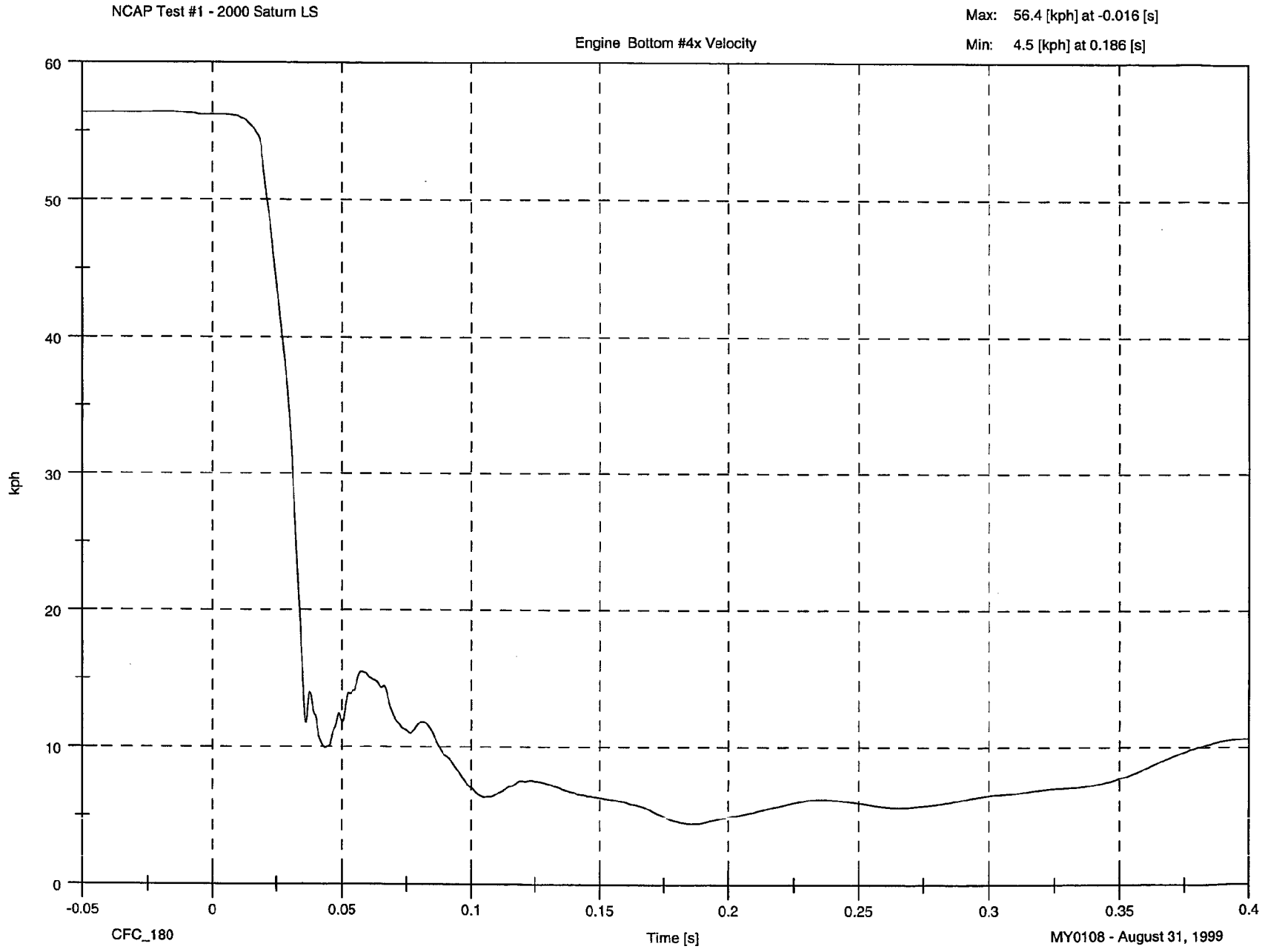

NCAP Test #1 - 2000 Saturn LS
Right Rear #2x Displacement
Max: 871.0 [mm] at 0.090 [s]
Min: -1575.5 [mm] at -0.100 [s]
1000
500
0
-500
-1000
-1500
-2000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

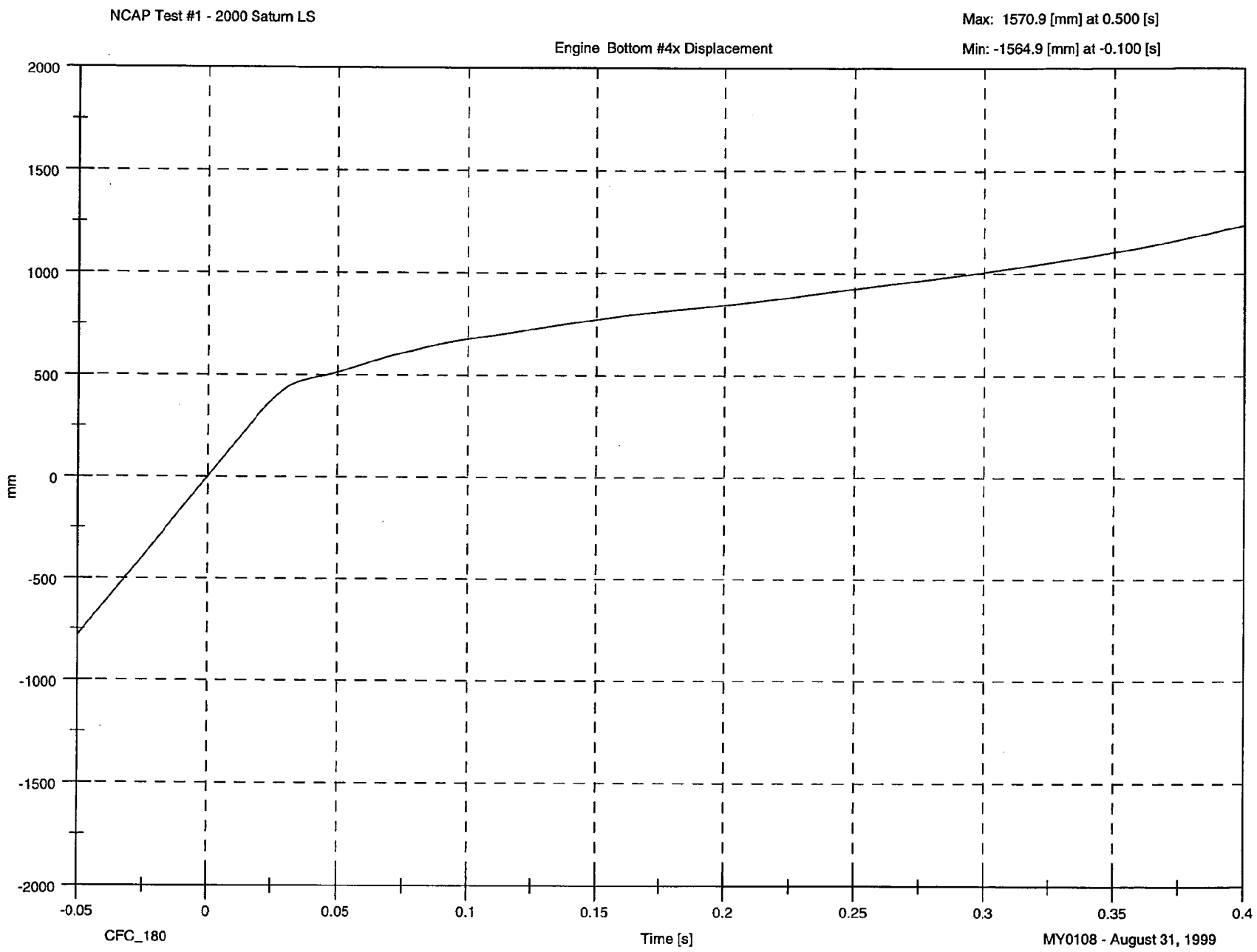

NCAP Test #1 - 2000 Saturn LS
Max: 42.4 [g] at 0.055 [s]
Engine Top #3x
Min: -125.7 [g] at 0.035 [s]
50
25
0
-25
-50
-75
-100
-125
-150
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_60
Time [s]
MY0108 - August 31, 1999

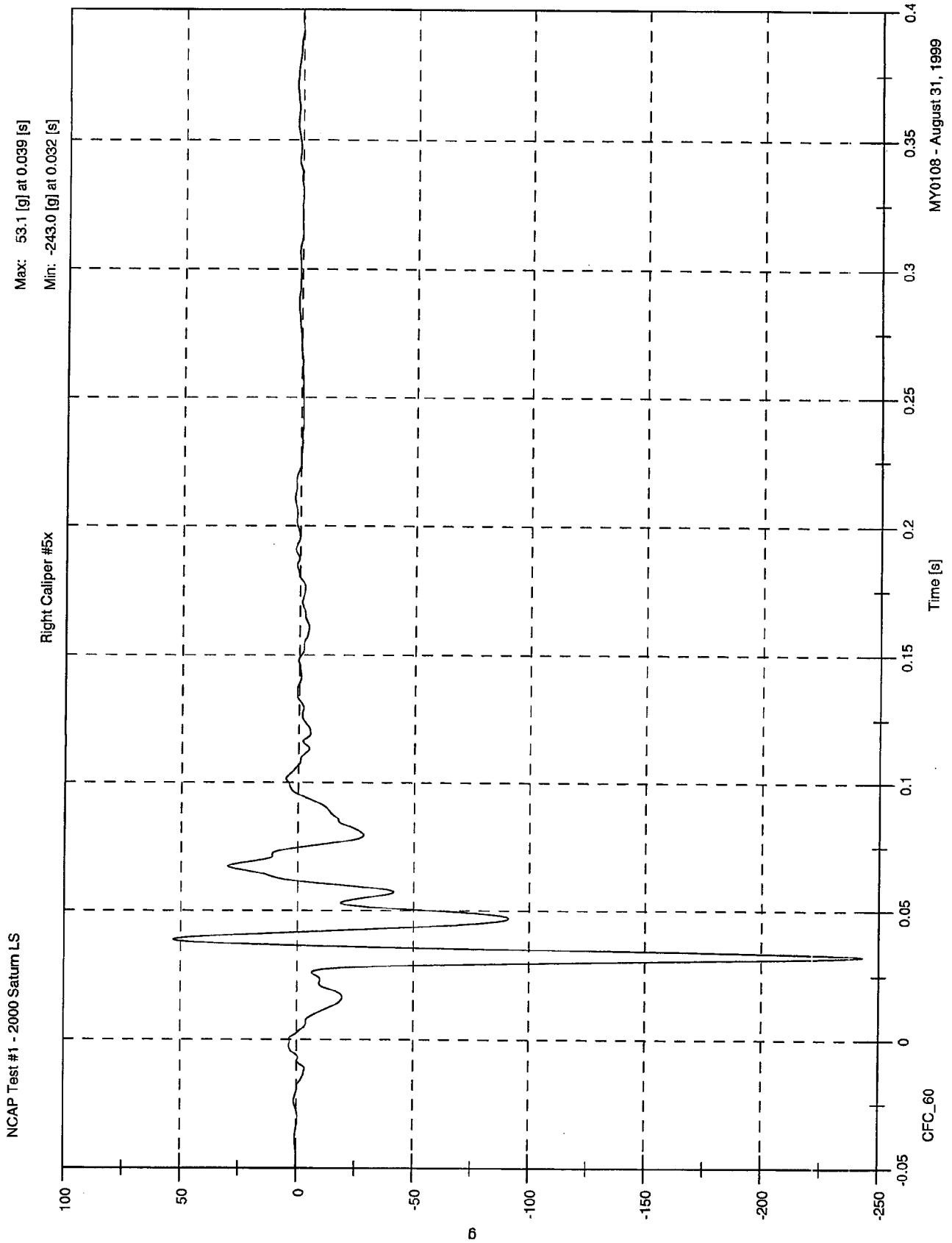

NCAP Test #1 - 2000 Saturn LS
Engine Top #3x Velocity
Max: 56.7 [kph] at -0.032 [s]
Min: -14.8 [kph] at 0.044 [s]
kph
60
50
40
30
20
10
0
-10
-20
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

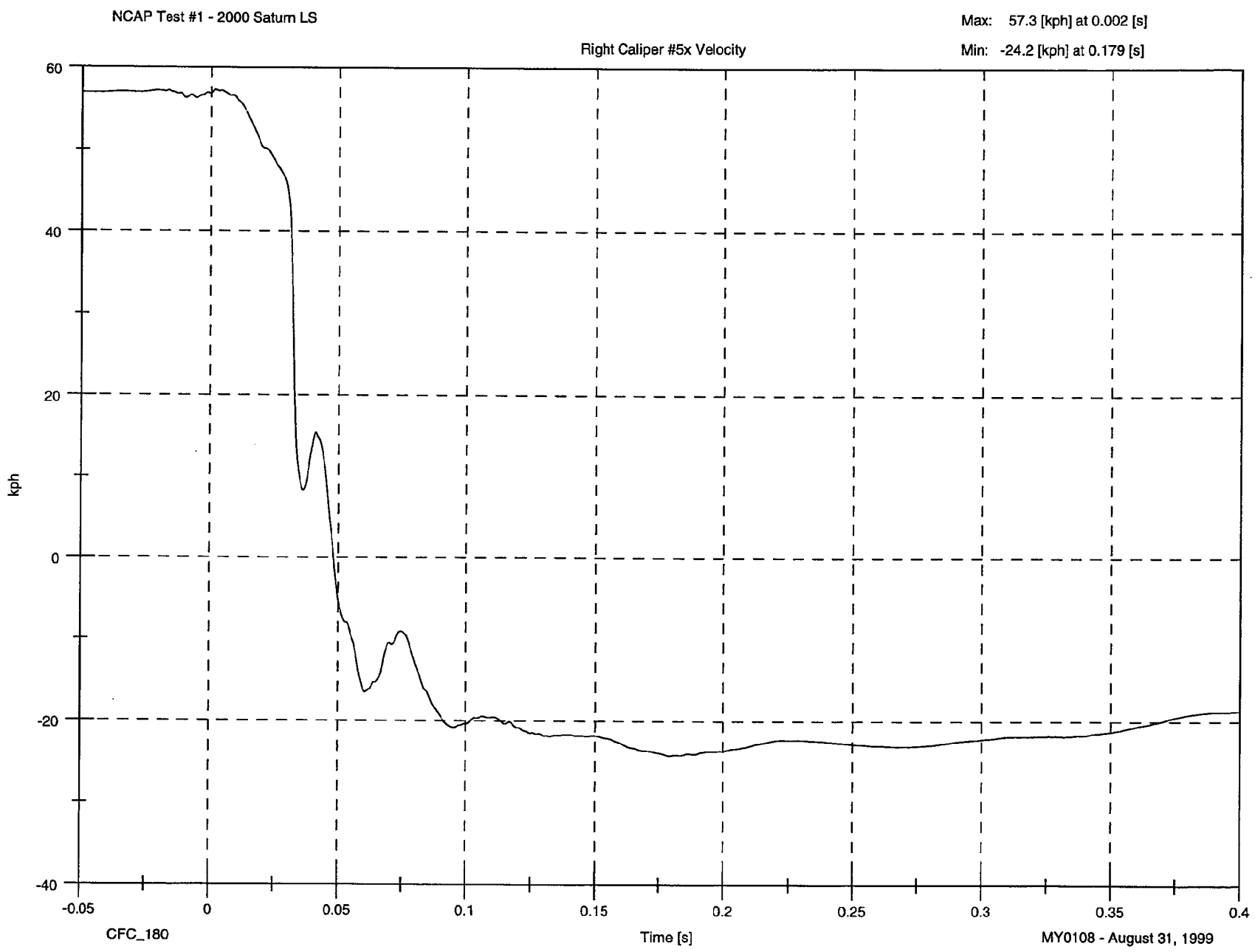

NCAP Test #1 - 2000 Saturn LS
Engine Top #3x Displacement
Max: 443.0 [mm] at 0.036 [s]
Min: -1571.5 [mm] at -0.100 [s]
500
0
-500
-1000
-1500
-2000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999


NCAP Test #1 - 2000 Saturn LS
Engine Bottom #4x
Max: 14.3 [g] at 0.051 [s]
Min: -110.5 [g] at 0.032 [s]
25
0
-25
-50
-75
-100
-125
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999


NCAP Test #1 - 2000 Saturn LS
Engine Bottom #4x Velocity
Max: 56.4 [kph] at -0.016 [s]
Min: 4.5 [kph] at 0.186 [s]
kph
60
50
40
30
20
10
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999


NCAP Test #1 - 2000 Saturn LS
Engine Bottom #4x Displacement
Max: 1570.9 [mm] at 0.500 [s]
Min: -1564.9 [mm] at -0.100 [s]
2000
1500
1000
500
0
-500
-1000
-1500
-2000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999


NCAP Test #1 - 2000 Saturn LS
Max: 53.1 [g] at 0.039 [s]
Min: -243.0 [g] at 0.032 [s]
Right Caliper #5x
MY0108 - August 31, 1999
Time [s]
CFC_60
g
100
50
0
-50
-100
-150
-200
-250
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4


NCAP Test #1 - 2000 Saturn LS
Right Caliper #5x Velocity
Max: 57.3 [kph] at 0.002 [s]
Min: -24.2 [kph] at 0.179 [s]
60
40
20
0
-20
-40
kph
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

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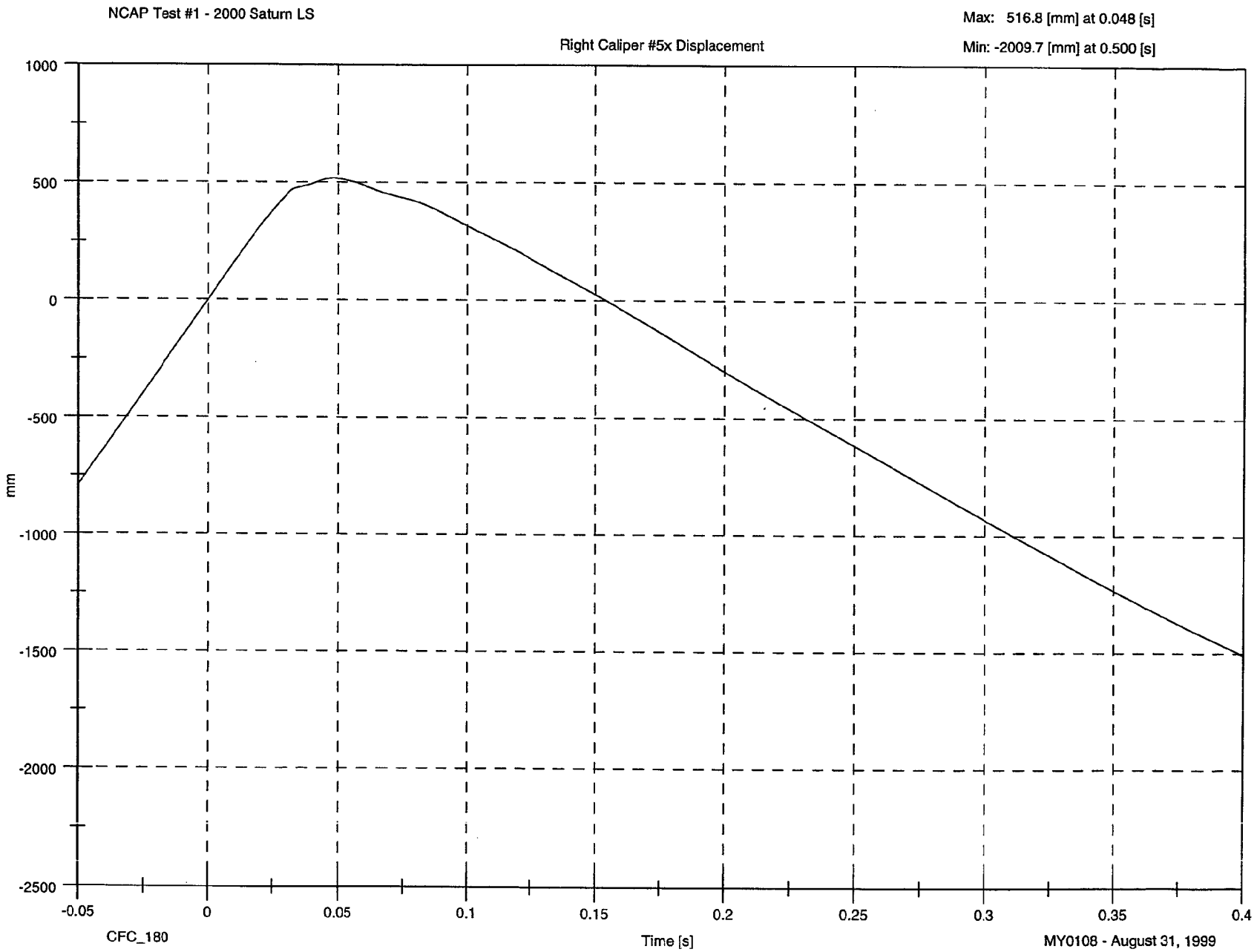
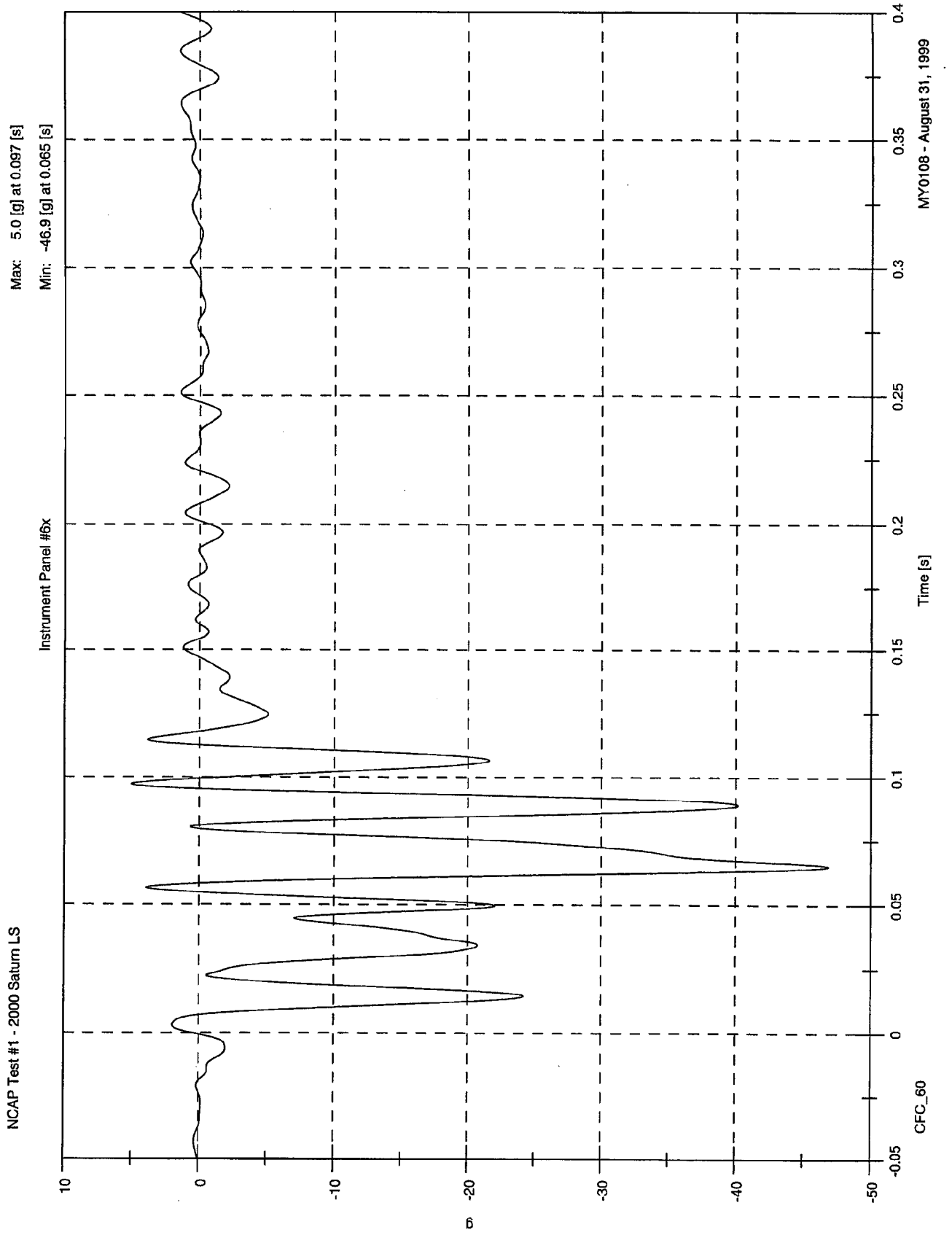
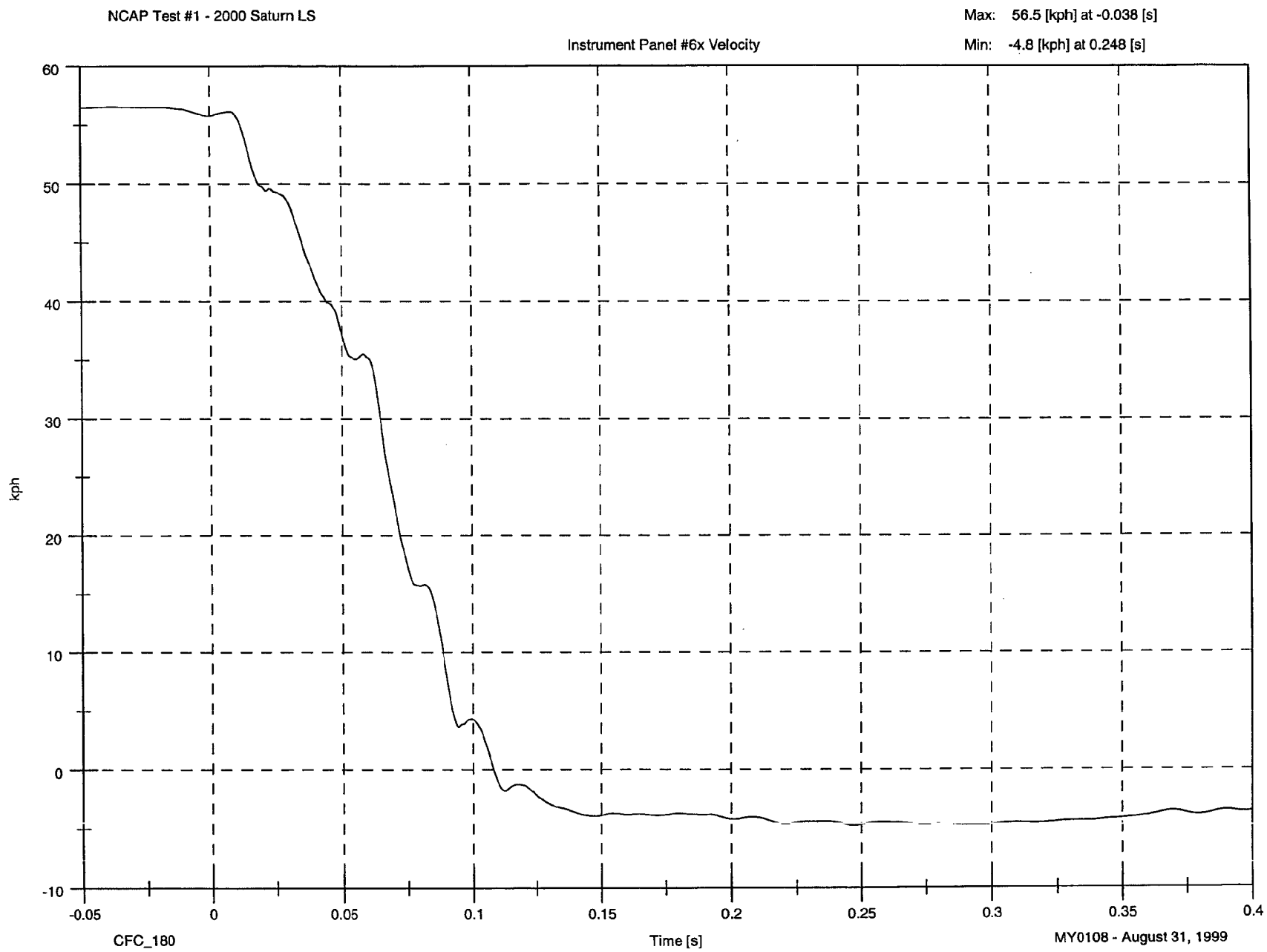
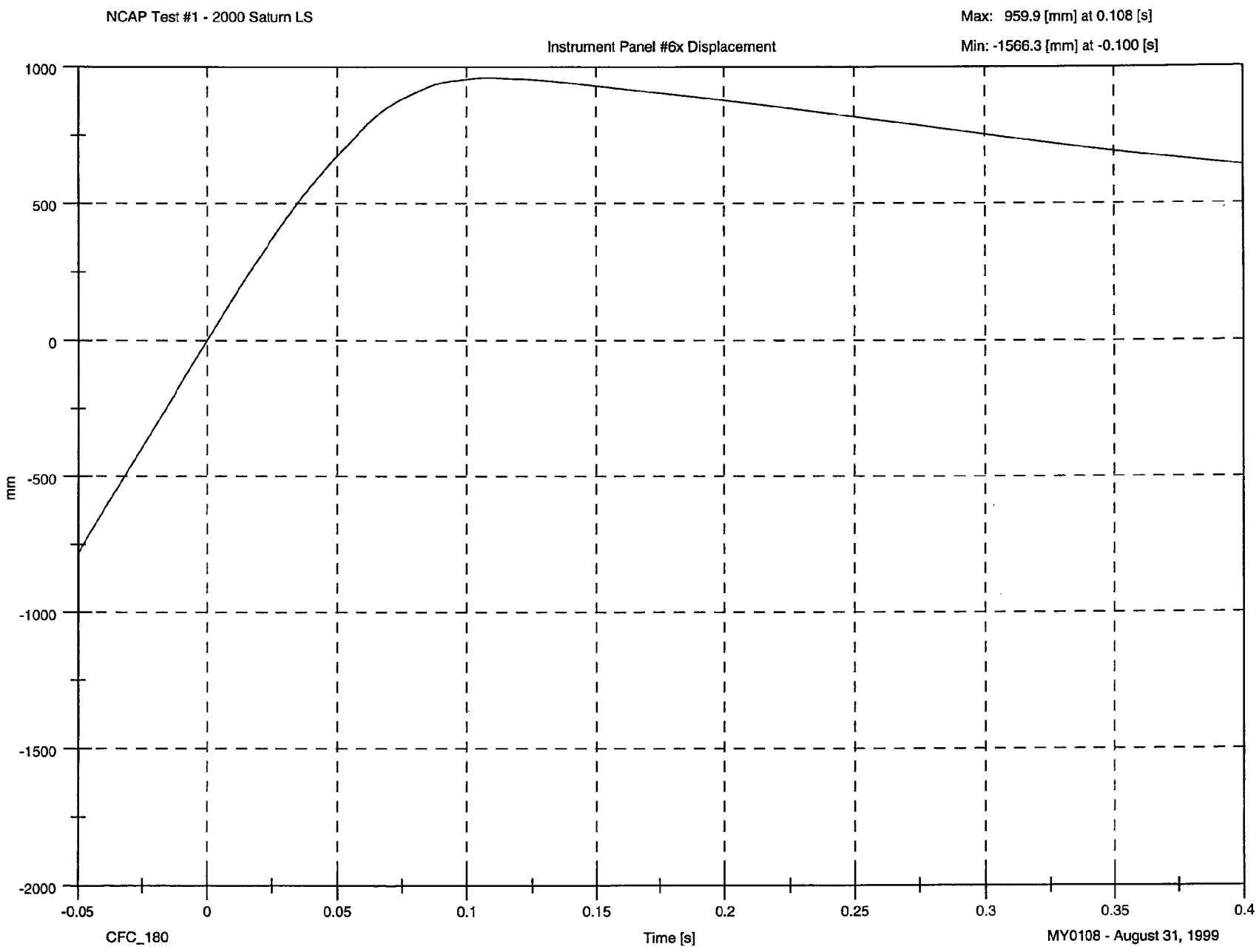
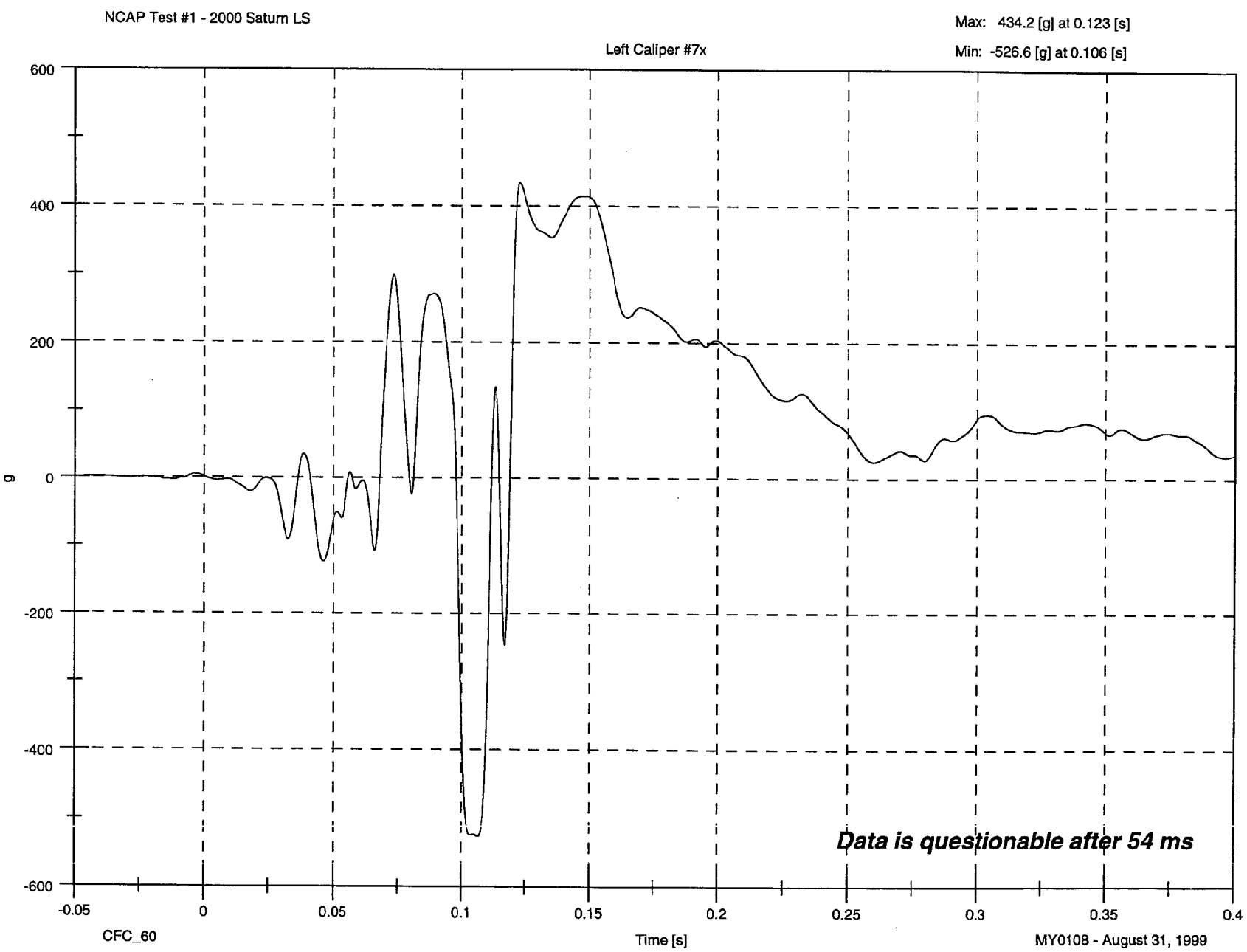
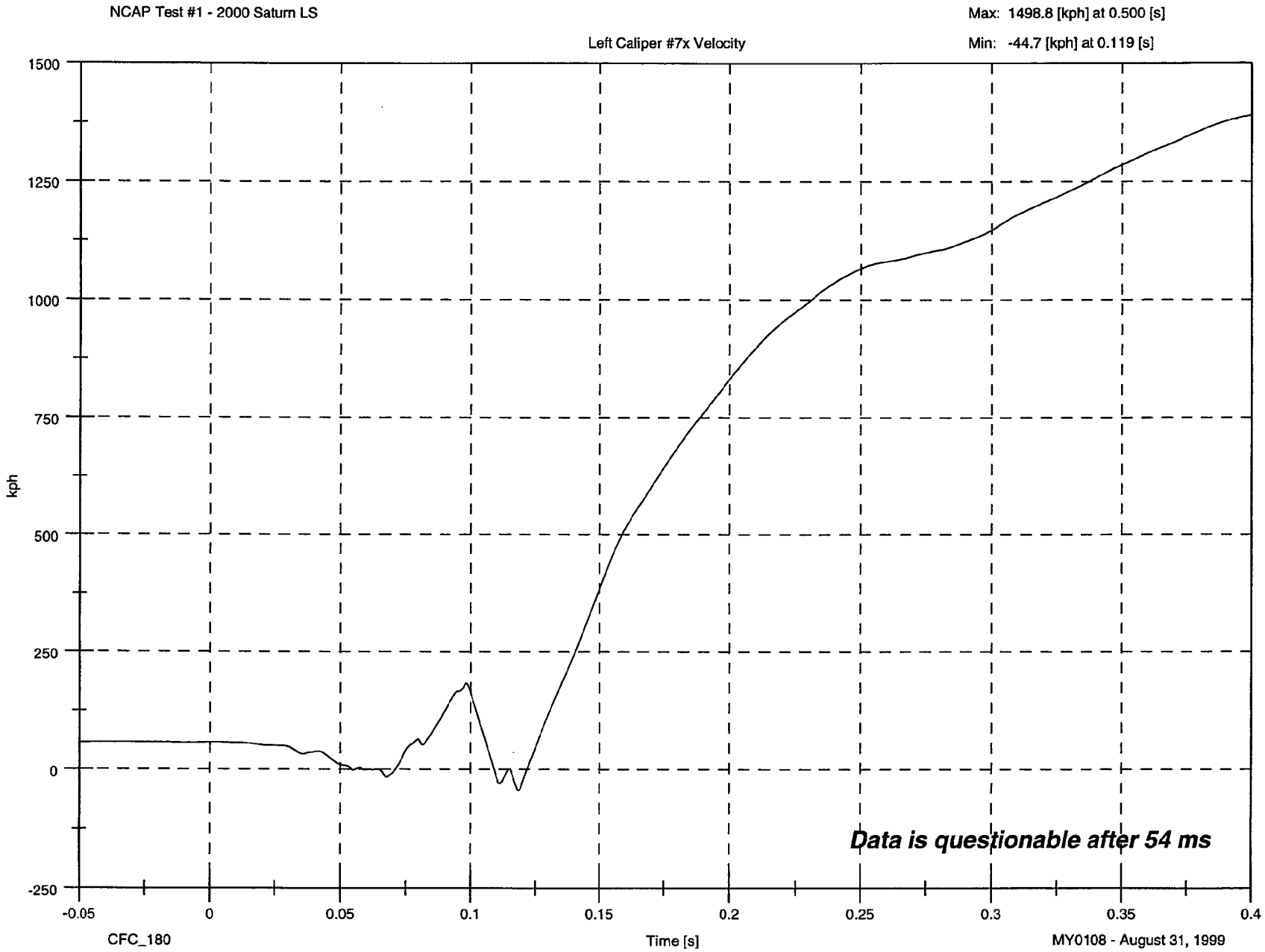

NCAP Test #1 - 2000 Saturn LS
Right Caliper #5x Displacement
Max: 516.8 [mm] at 0.048 [s]
Min: -2009.7 [mm] at 0.500 [s]
1000
500
0
-500
-1000
-1500
-2000
-2500
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

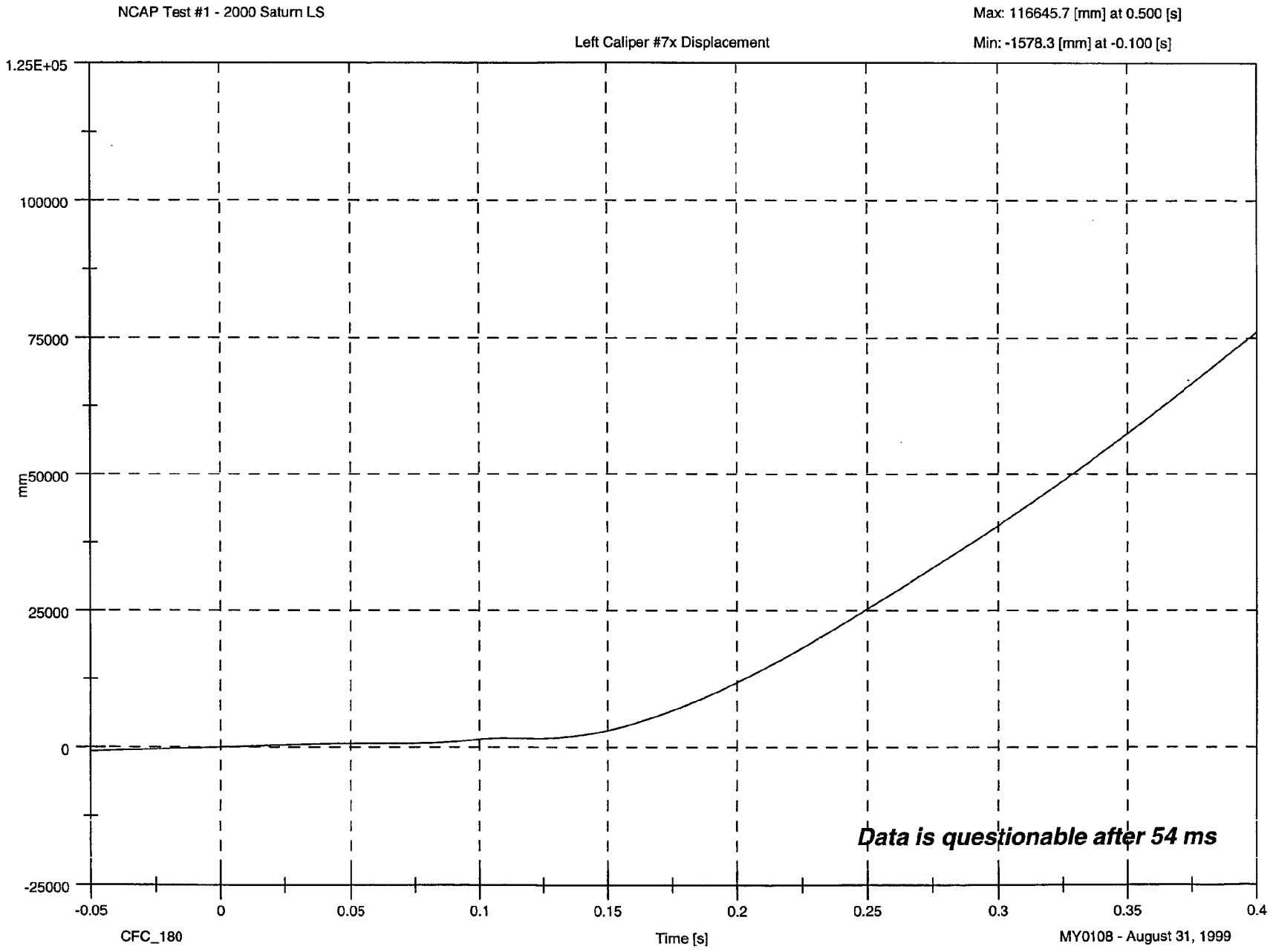

NCAP Test #1 - 2000 Saturn LS
Max: 5.0 [g] at 0.097 [s]
Min: -46.9 [g] at 0.065 [s]
Instrument Panel #6x
MY0108 - August 31, 1999
CFC_60
Time [s]
g
10
0
-10
-20
-30
-40
-50
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

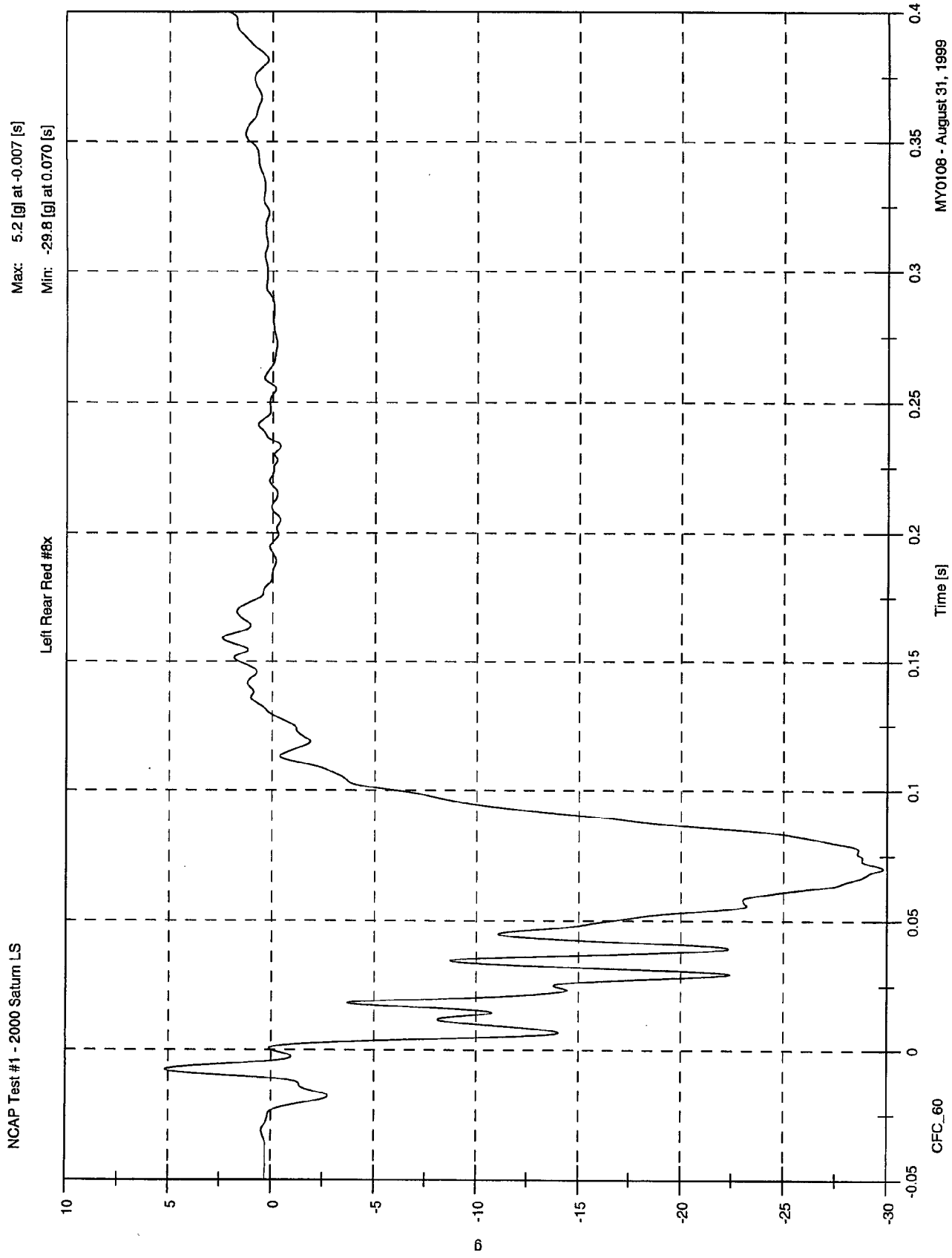

NCAP Test #1 - 2000 Saturn LS
Instrument Panel #6x Velocity
Max: 56.5 [kph] at -0.038 [s]
Min: -4.8 [kph] at 0.248 [s]
kph
60
50
40
30
20
10
0
-10
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

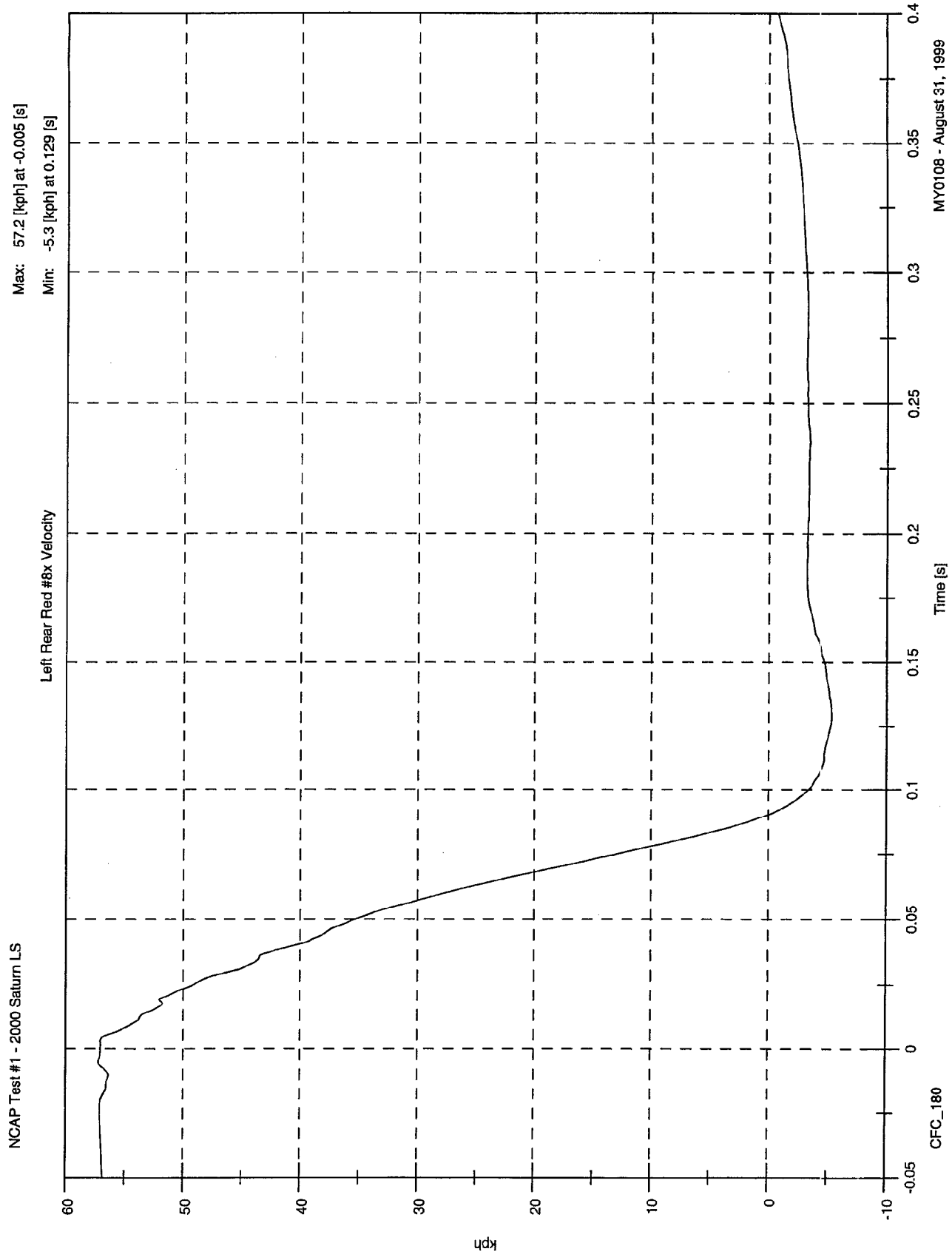

NCAP Test #1 - 2000 Saturn LS
Max: 959.9 [mm] at 0.108 [s]
Instrument Panel #6x Displacement
Min: -1566.3 [mm] at -0.100 [s]
1000
500
0
-500
-1000
-1500
-2000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_180
Time [s]
MY0108 - August 31, 1999

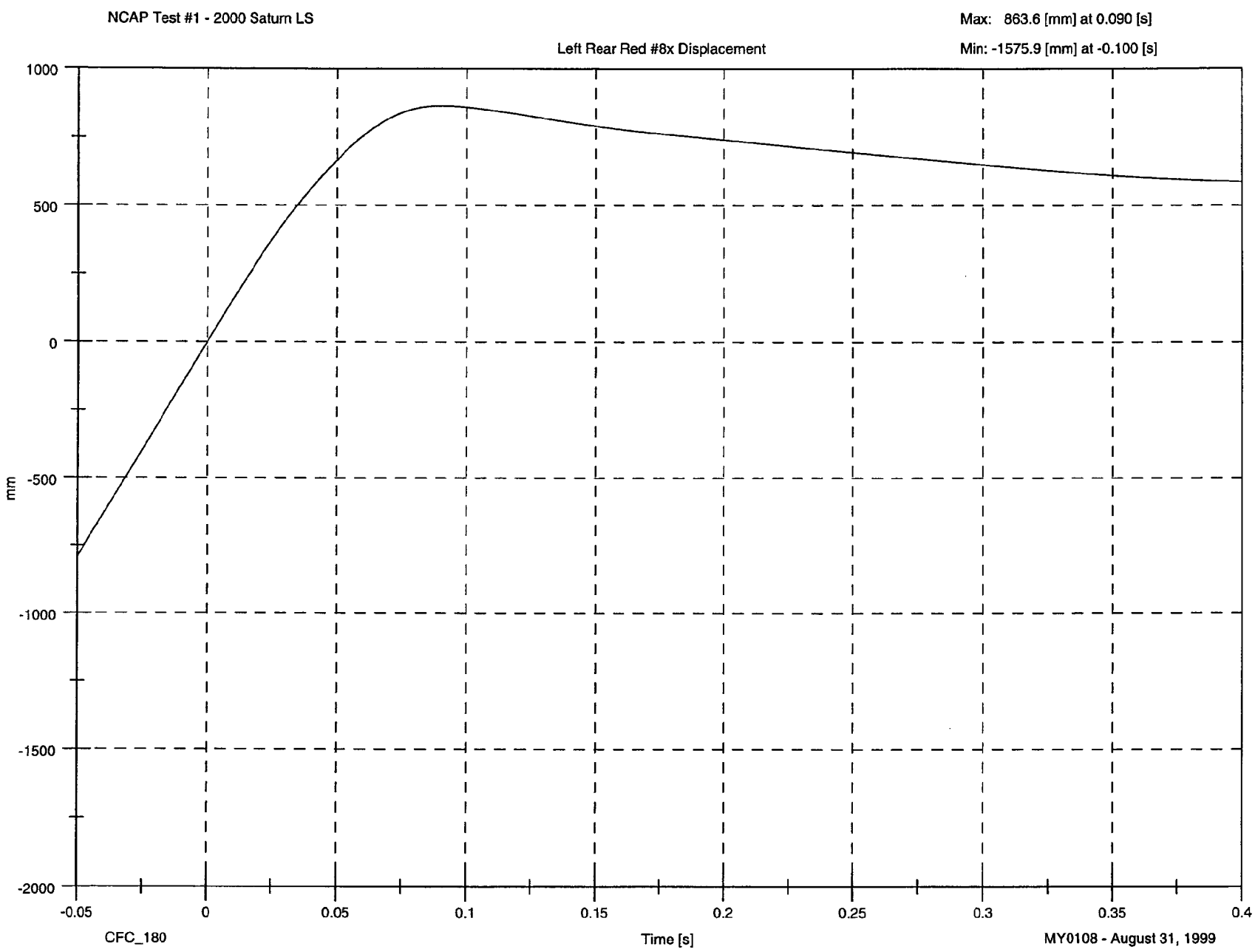

NCAP Test #1 - 2000 Saturn LS
Left Caliper #7x
Max: 434.2 [g] at 0.123 [s]
Min: -526.6 [g] at 0.106 [s]
600
400
200
0
-200
-400
-600
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999
Data is questionable after 54 ms

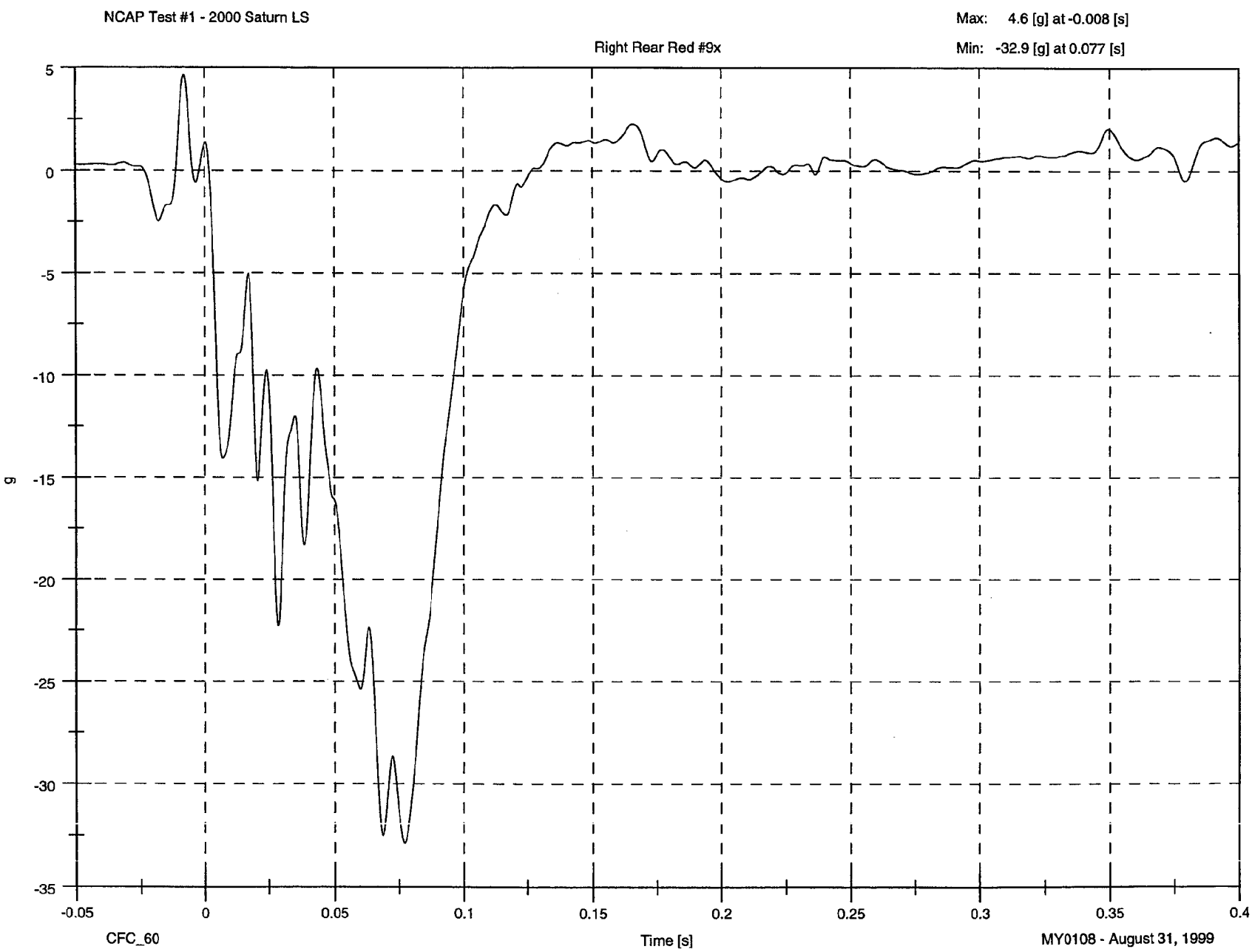

NCAP Test #1 - 2000 Saturn LS
Left Caliper #7x Velocity
Max: 1498.8 [kph] at 0.500 [s]
Min: -44.7 [kph] at 0.119 [s]
1500
1250
1000
750
500
250
0
-250
kph
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999
Data is questionable after 54 ms

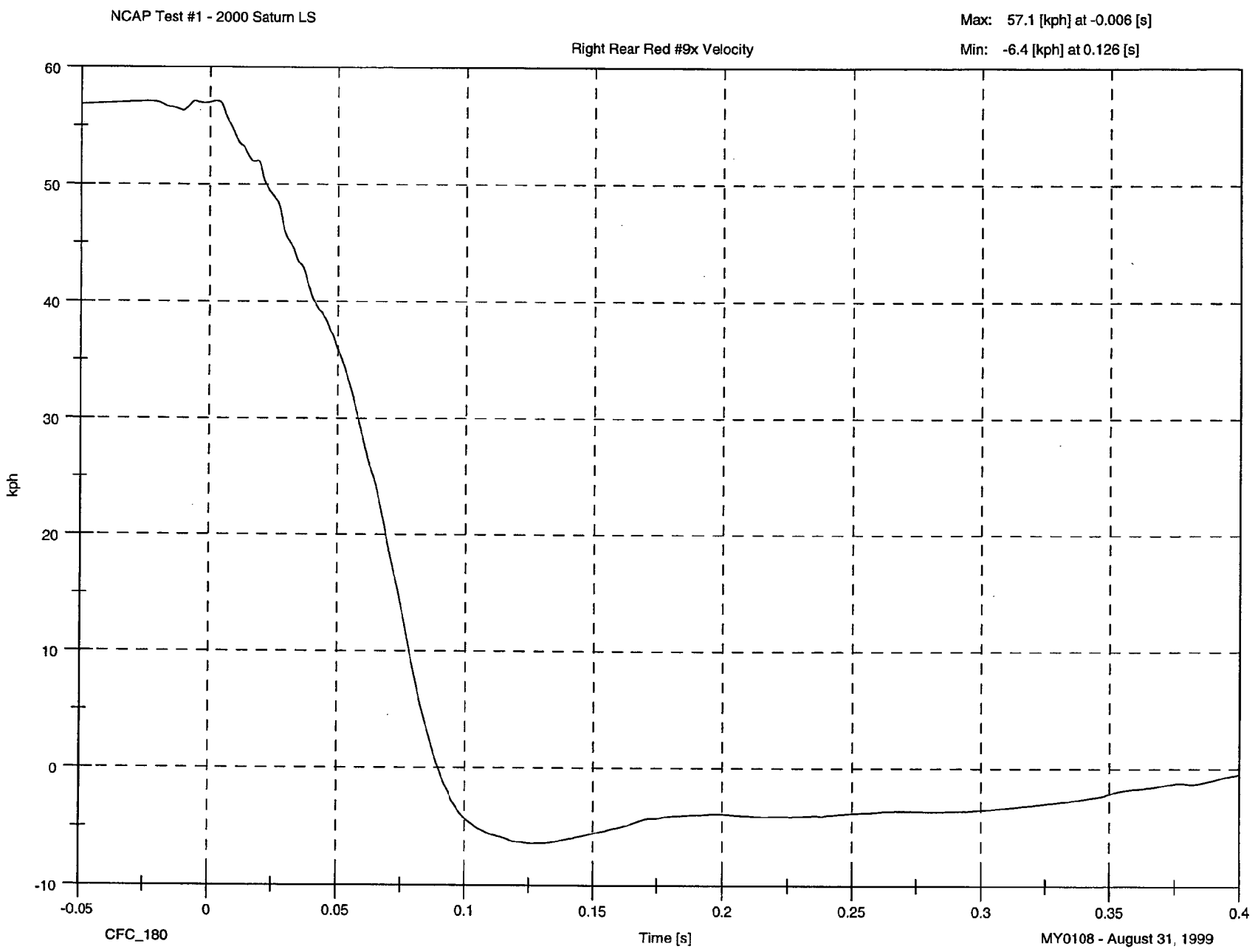

NCAP Test #1 - 2000 Saturn LS
Left Caliper #7x Displacement
Max: 116645.7 [mm] at 0.500 [s]
Min: -1578.3 [mm] at -0.100 [s]
1.25E+05
100000
75000
50000
25000
0
-25000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999
Data is questionable after 54 ms

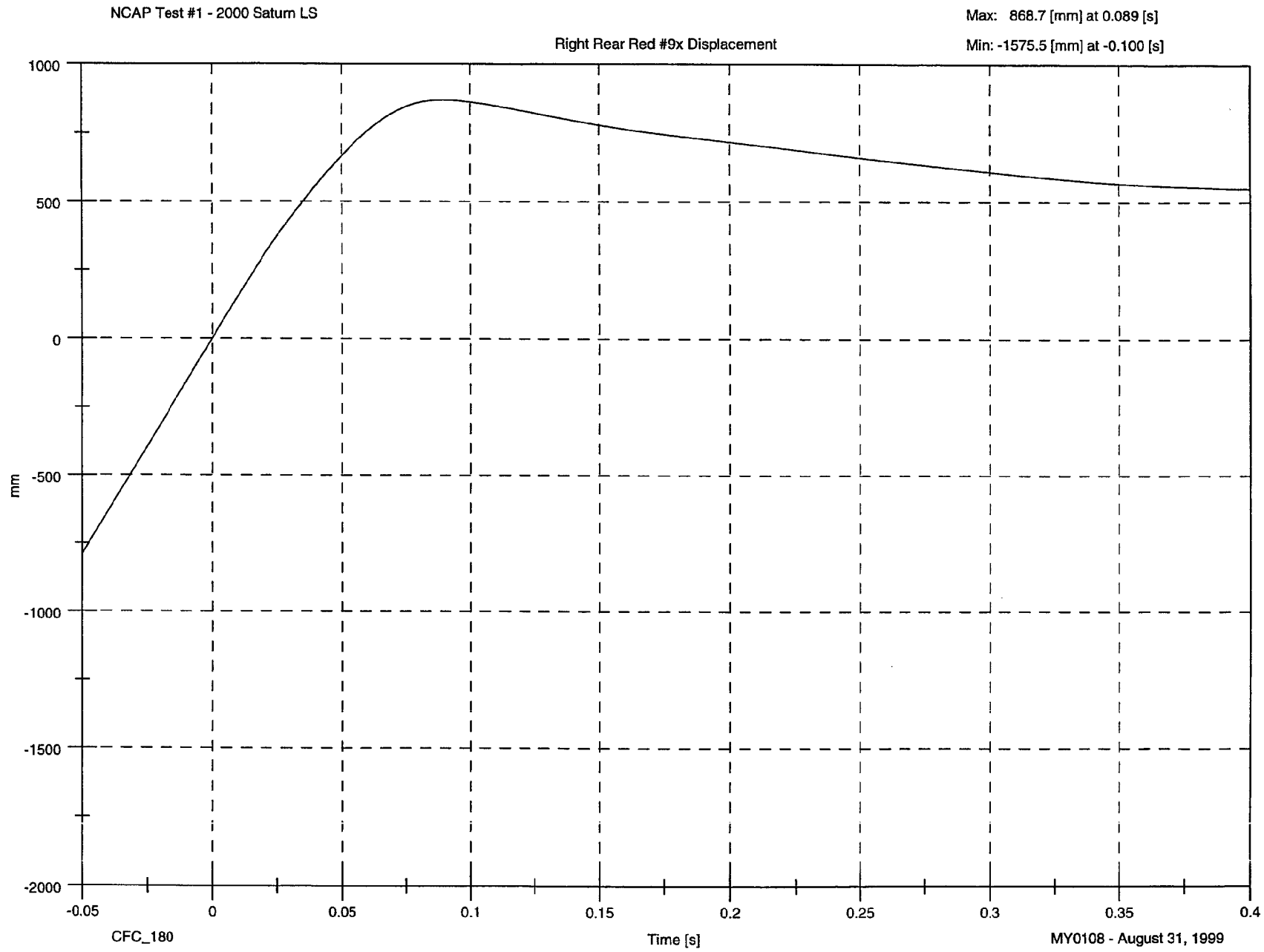

NCAP Test #1 - 2000 Saturn LS
Left Rear Red #8x
Max: 5.2 [g] at -0.007 [s]
Min: -29.8 [g] at 0.070 [s]
MY0108 - August 31, 1999
CFC_60
Time [s]
g
10
5
0
-5
-10
-15
-20
-25
-30
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

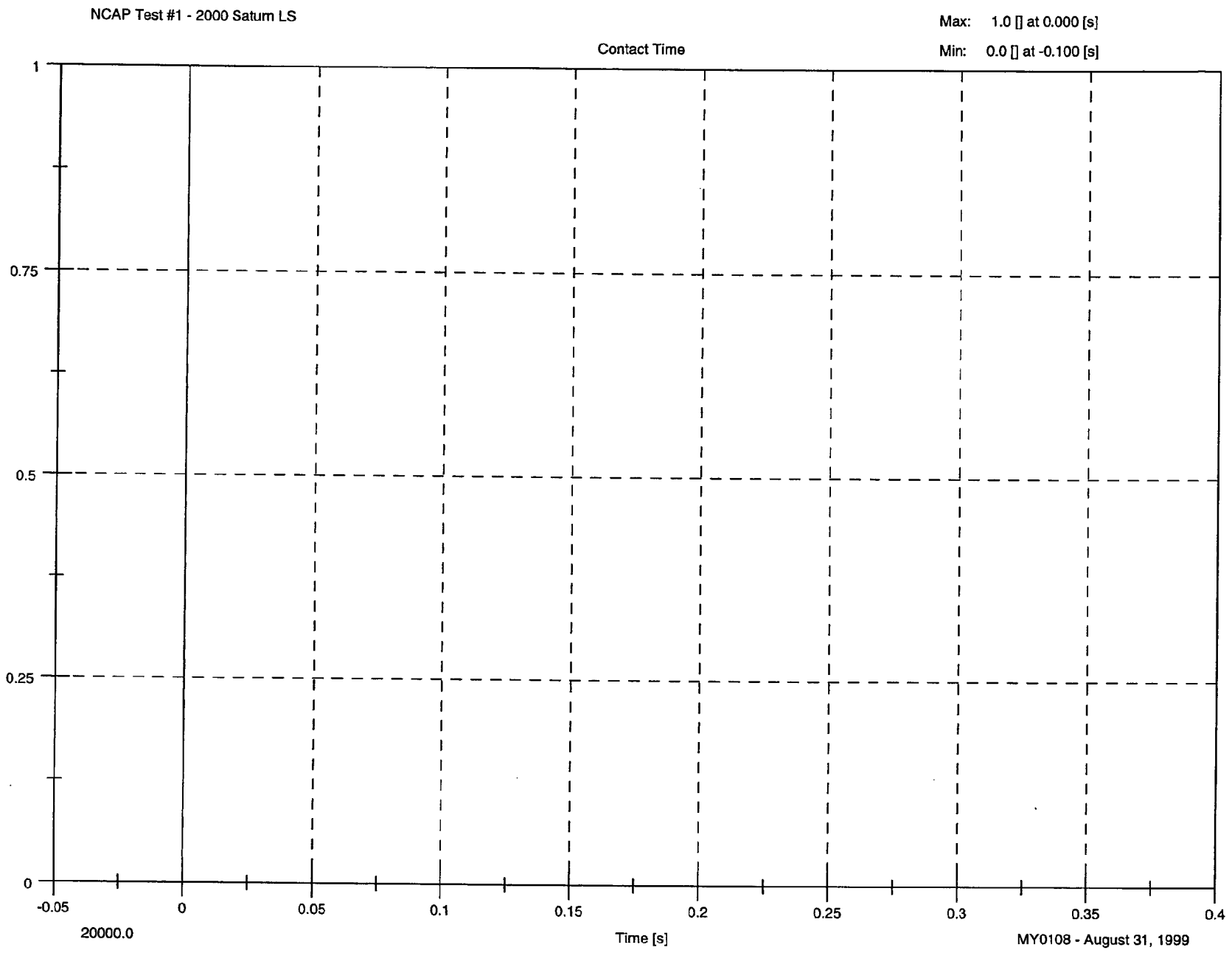

NCAP Test #1 - 2000 Saturn LS
Left Rear Red #8x Velocity
Max: 57.2 [kph] at -0.005 [s]
Min: -5.3 [kph] at 0.129 [s]
MY0108 - August 31, 1999
CFC_180
Time [s]
kph
60
50
40
30
20
10
0
-10
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

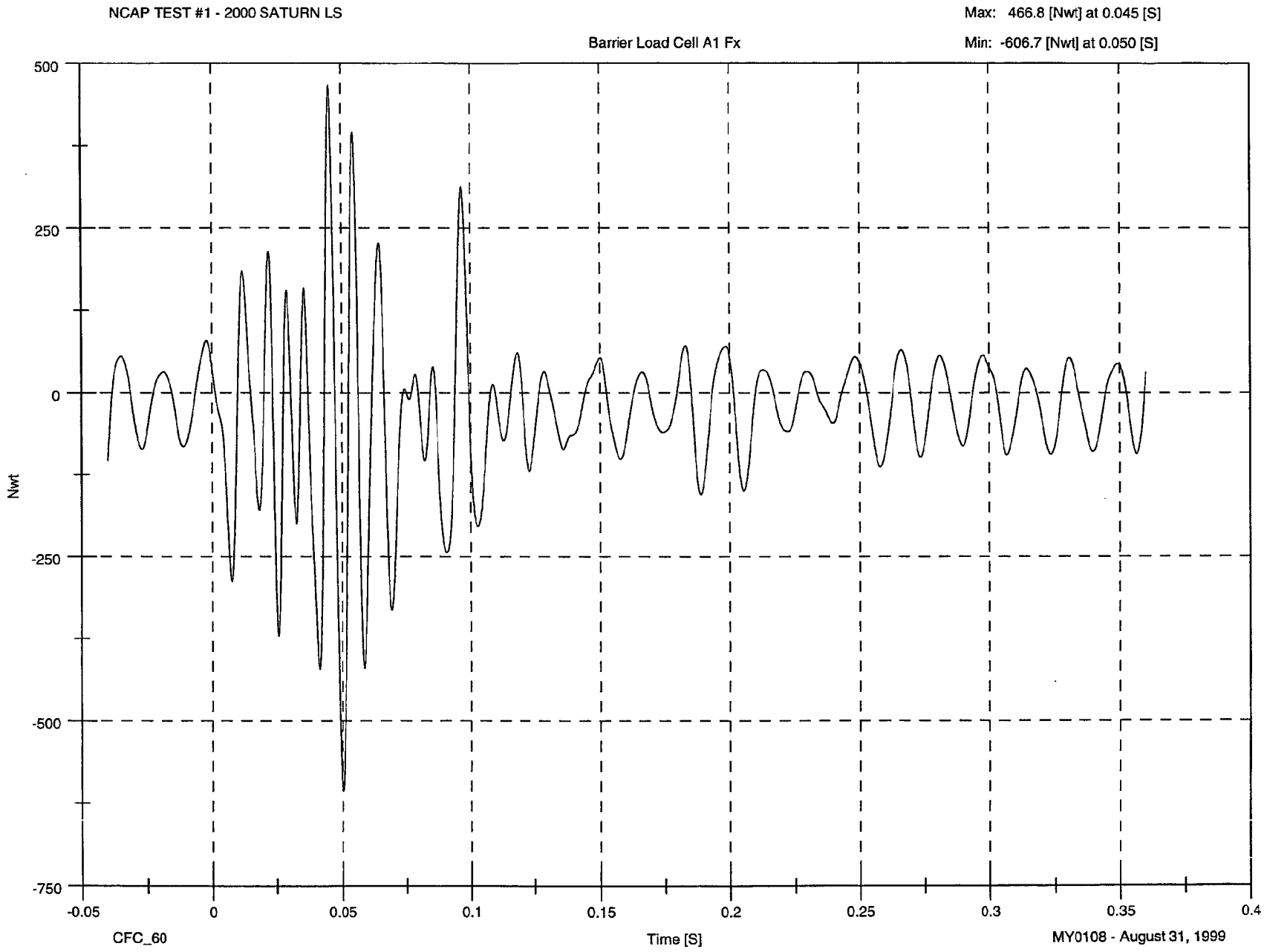

NCAP Test #1 - 2000 Saturn LS
Max: 863.6 [mm] at 0.090 [s]
Left Rear Red #8x Displacement
Min: -1575.9 [mm] at -0.100 [s]
1000
500
0
-500
-1000
-1500
-2000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_180
Time [s]
MY0108 - August 31, 1999

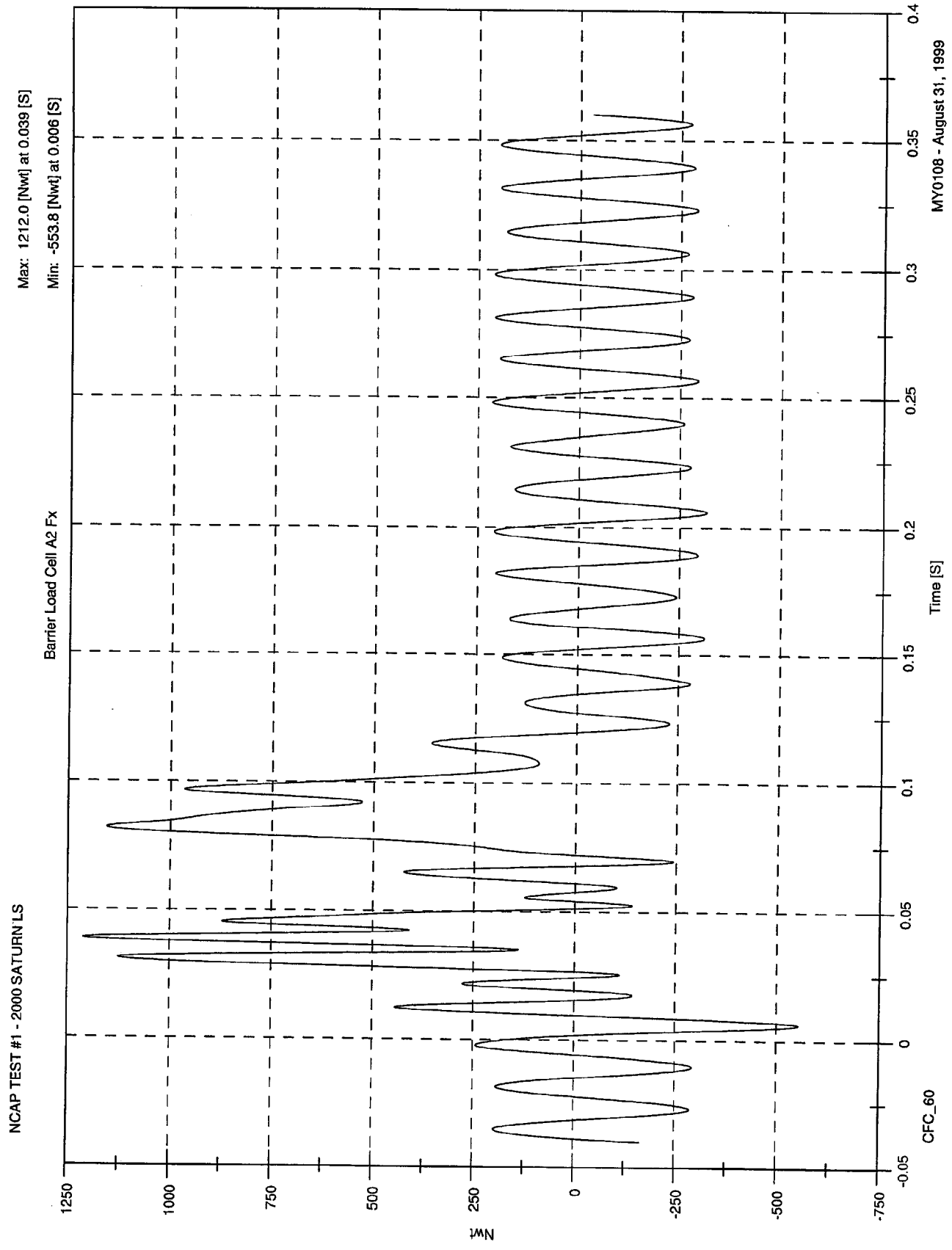

NCAP Test #1 - 2000 Saturn LS
Right Rear Red #9x
Max: 4.6 [g] at -0.008 [s]
Min: -32.9 [g] at 0.077 [s]
5
0
-5
-10
-15
-20
-25
-30
-35
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
MY0108 - August 31, 1999


NCAP Test #1 - 2000 Saturn LS
Right Rear Red #9x Velocity
Max: 57.1 [kph] at -0.006 [s]
Min: -6.4 [kph] at 0.126 [s]
60
50
40
30
20
10
0
-10
kph
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
MY0108 - August 31, 1999

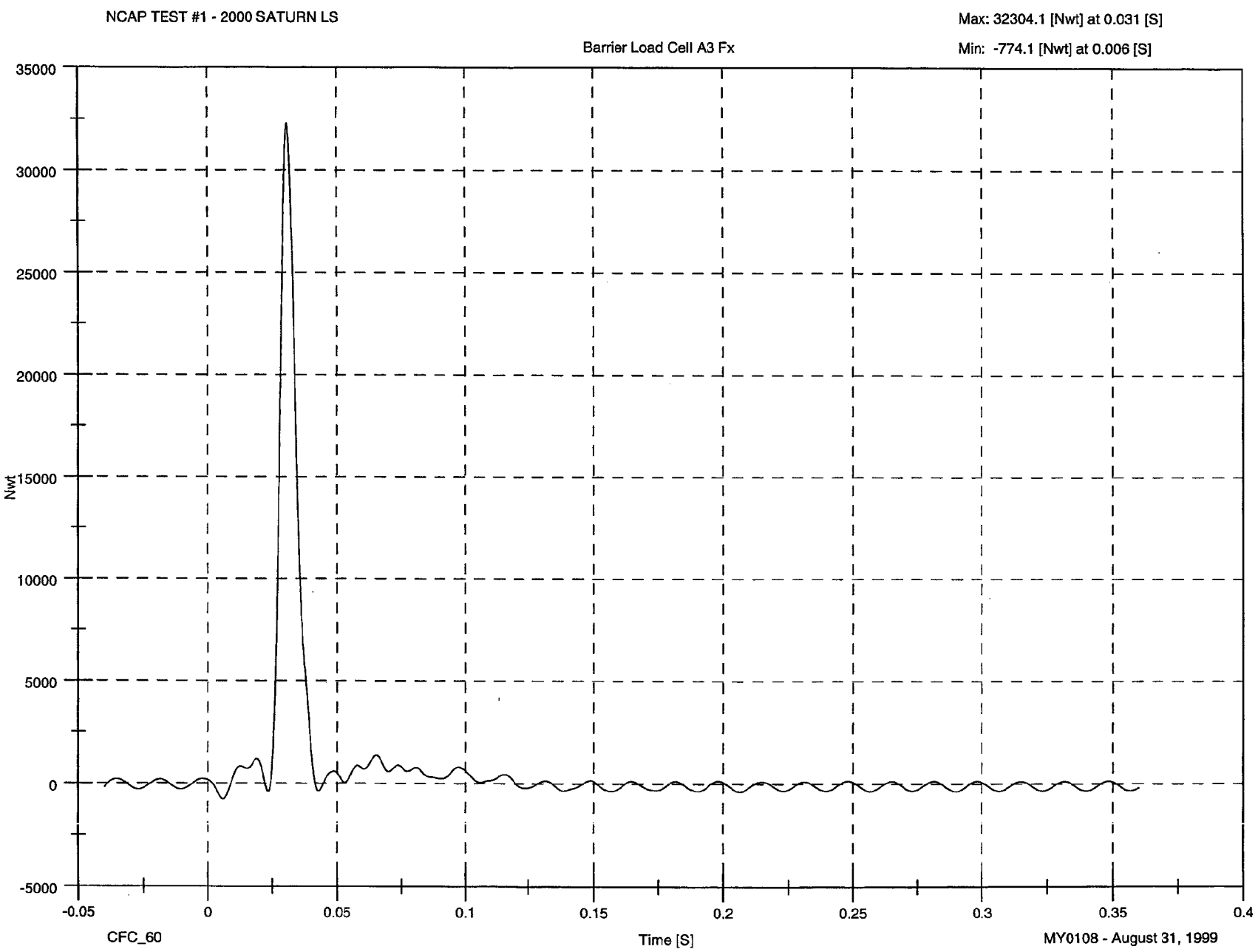

NCAP Test #1 - 2000 Saturn LS
Max: 868.7 [mm] at 0.089 [s]
Right Rear Red #9x Displacement
Min: -1575.5 [mm] at -0.100 [s]
1000
500
0
-500
-1000
-1500
-2000
mm
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_180
Time [s]
MY0108 - August 31, 1999

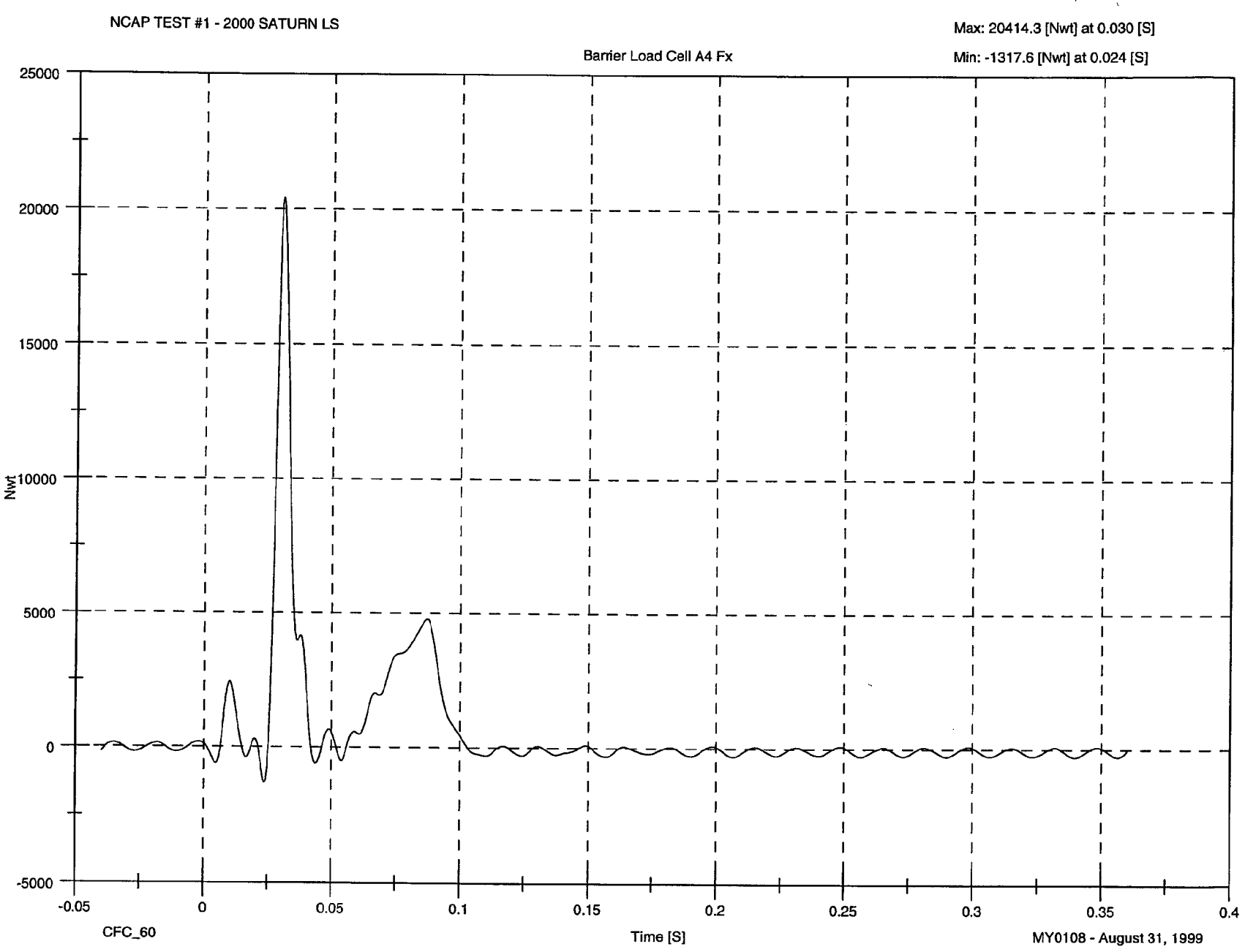

NCAP Test #1 - 2000 Saturn LS
Max: 1.0 [] at 0.000 [s]
Contact Time
Min: 0.0 [] at -0.100 [s]
1
0.75
0.5
0.25
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
20000.0
Time [s]
MY0108 - August 31, 1999

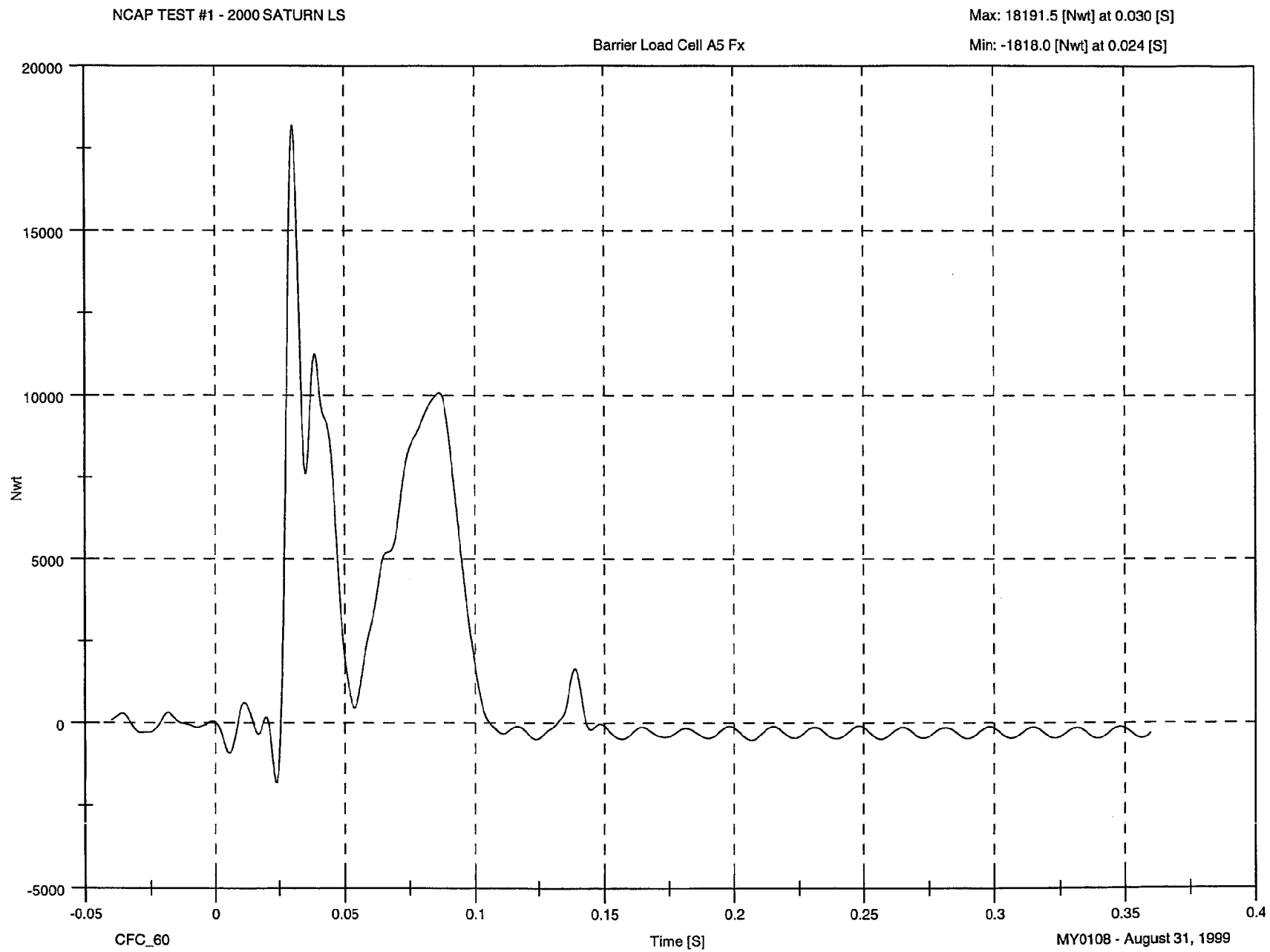

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell A1 Fx
Max: 466.8 [Nwt] at 0.045 [S]
Min: -606.7 [Nwt] at 0.050 [S]
500
250
0
-250
-500
-750
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

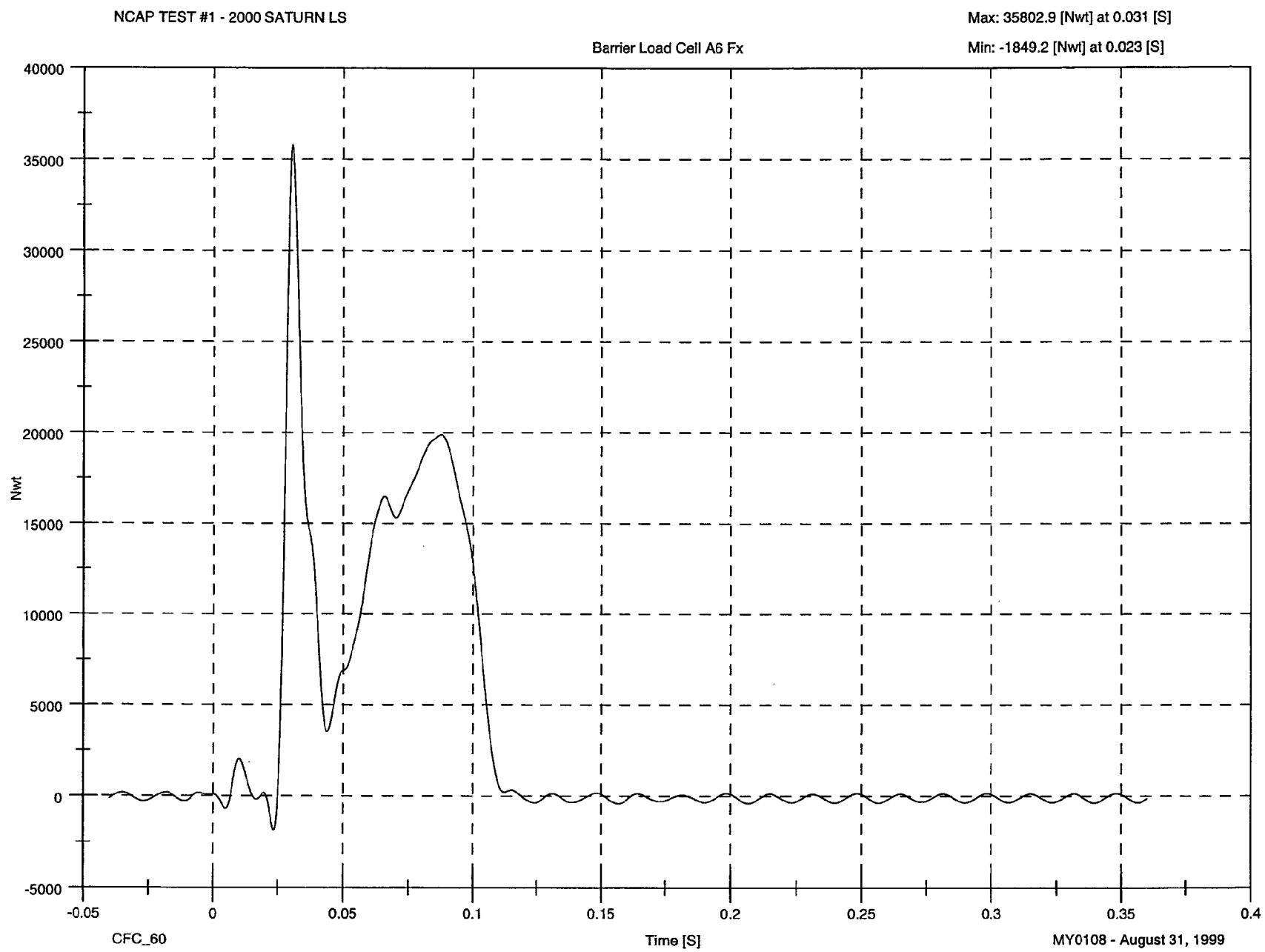

NCAP TEST #1 - 2000 SATURN LS
Max: 1212.0 [Nwt] at 0.039 [S]
Min: -553.8 [Nwt] at 0.006 [S]
Barrier Load Cell A2 Fx
MY0108 - August 31, 1999
CFC_60
Time [S]
Nwt
1250
1000
750
500
250
0
-250
-500
-750
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

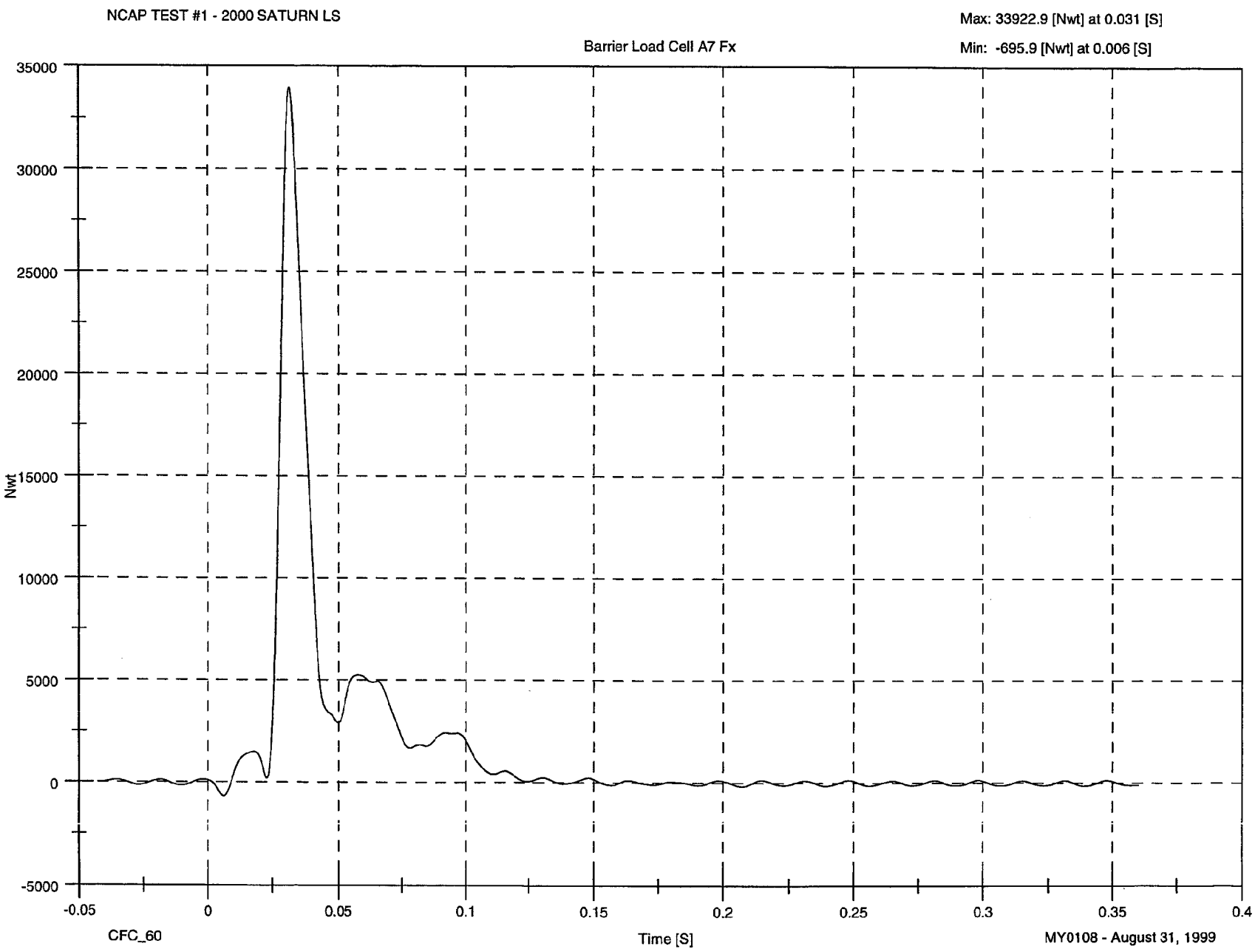
8413-39

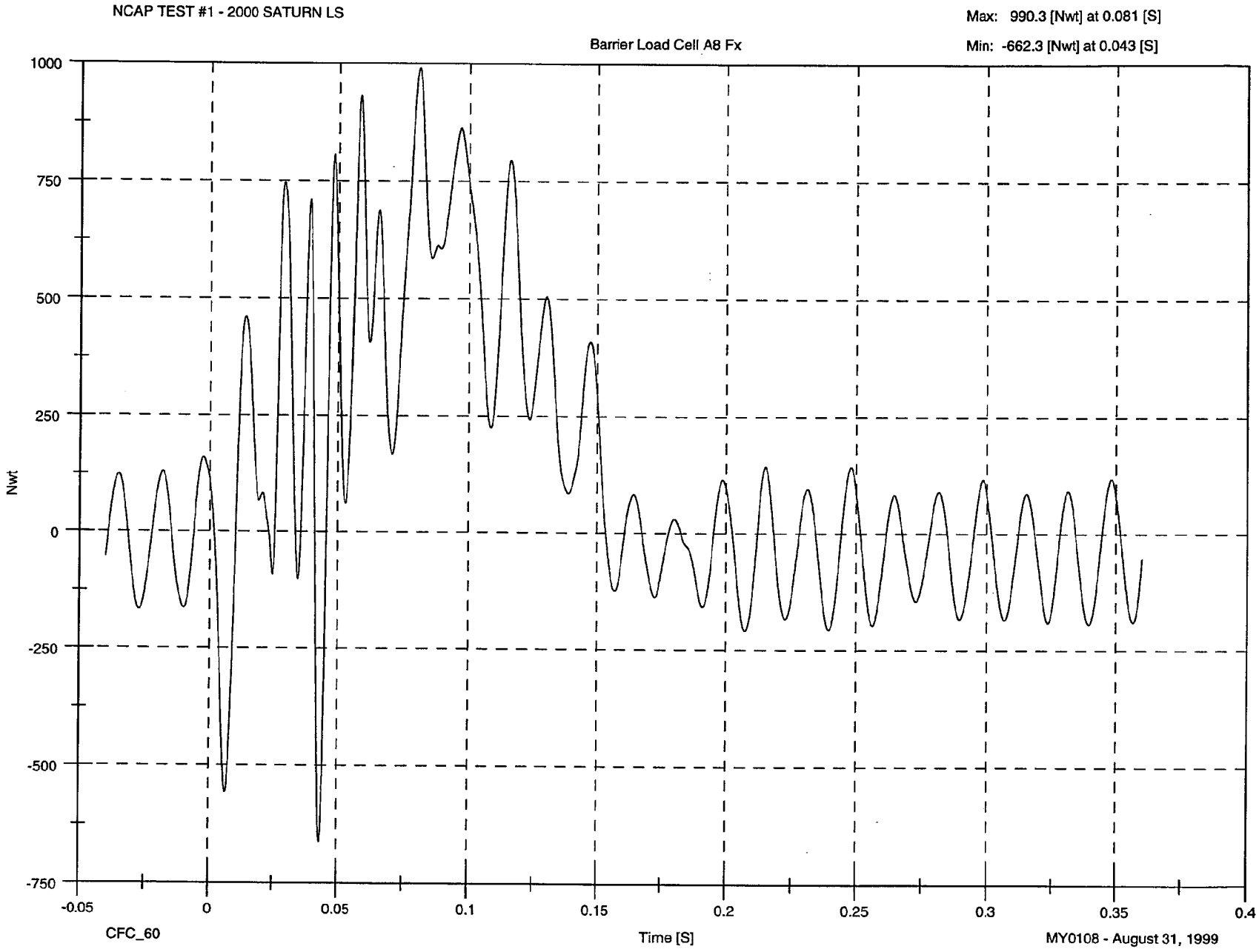

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell A3 Fx
Max: 32304.1 [Nwt] at 0.031 [S]
Min: -774.1 [Nwt] at 0.006 [S]
35000
30000
25000
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

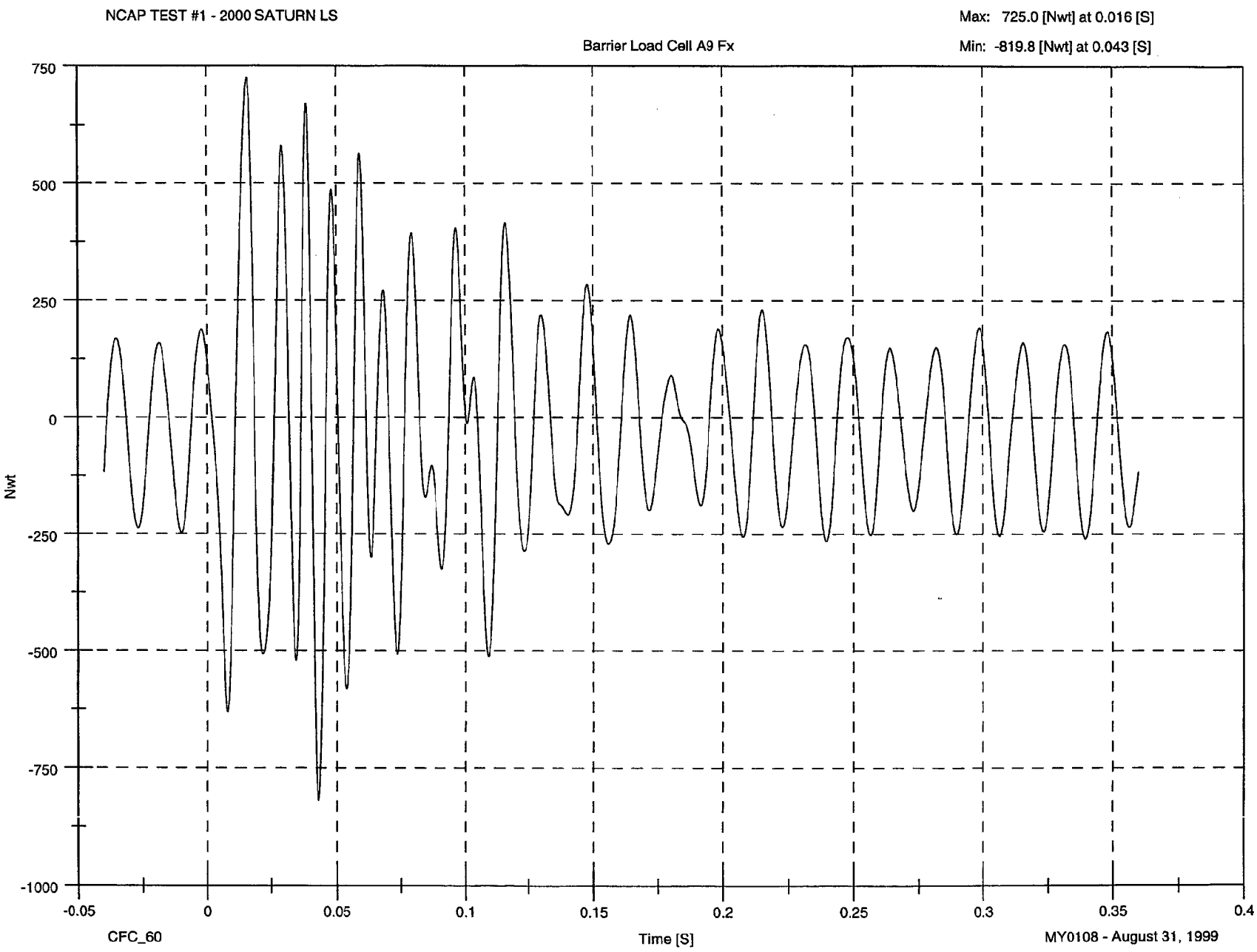

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell A4 Fx
Max: 20414.3 [Nwt] at 0.030 [S]
Min: -1317.6 [Nwt] at 0.024 [S]
25000
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

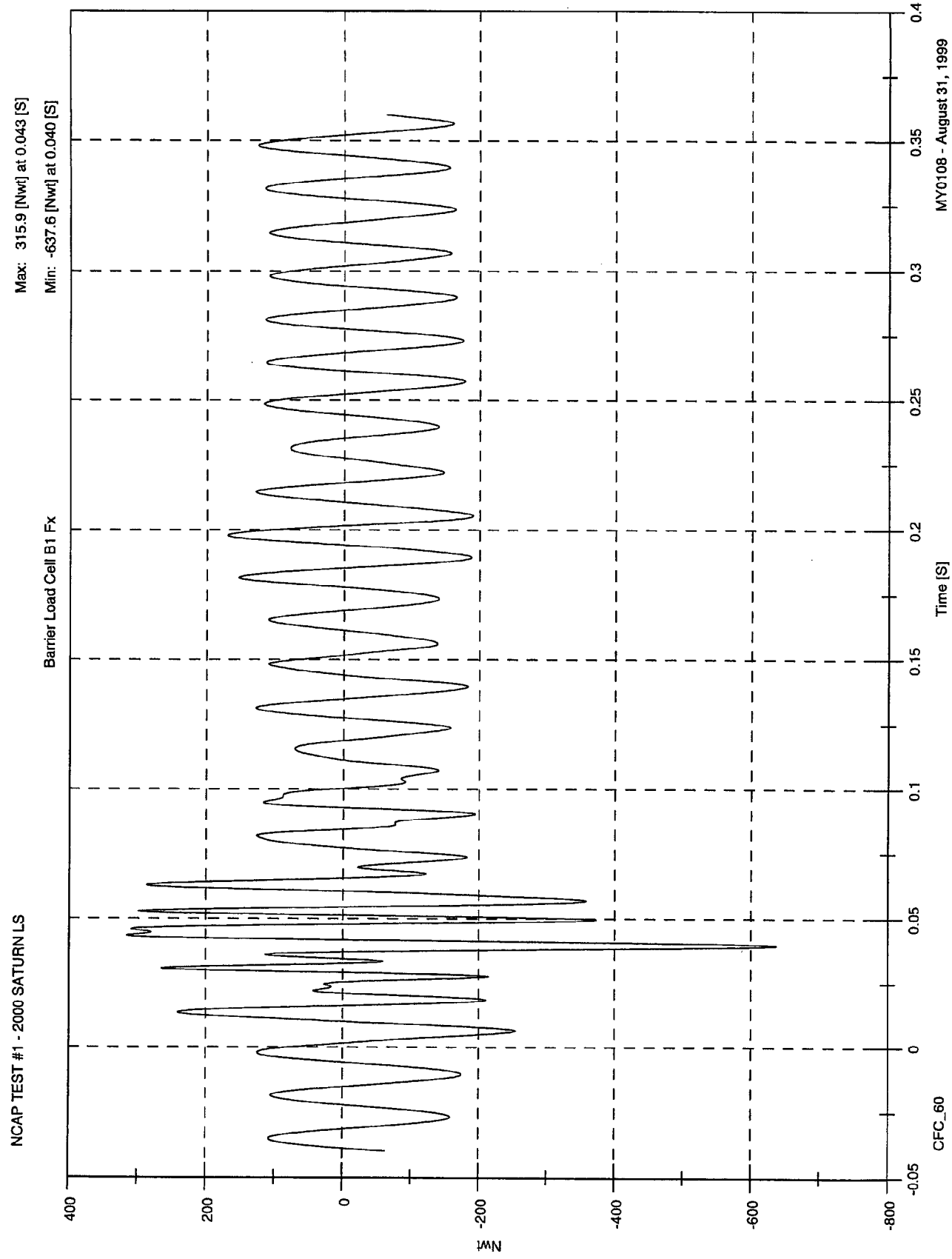

NCAP TEST #1 - 2000 SATURN LS
Max: 18191.5 [Nwt] at 0.030 [S]
Barrier Load Cell A5 Fx
Min: -1818.0 [Nwt] at 0.024 [S]
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_60
Time [S]
MY0108 - August 31, 1999

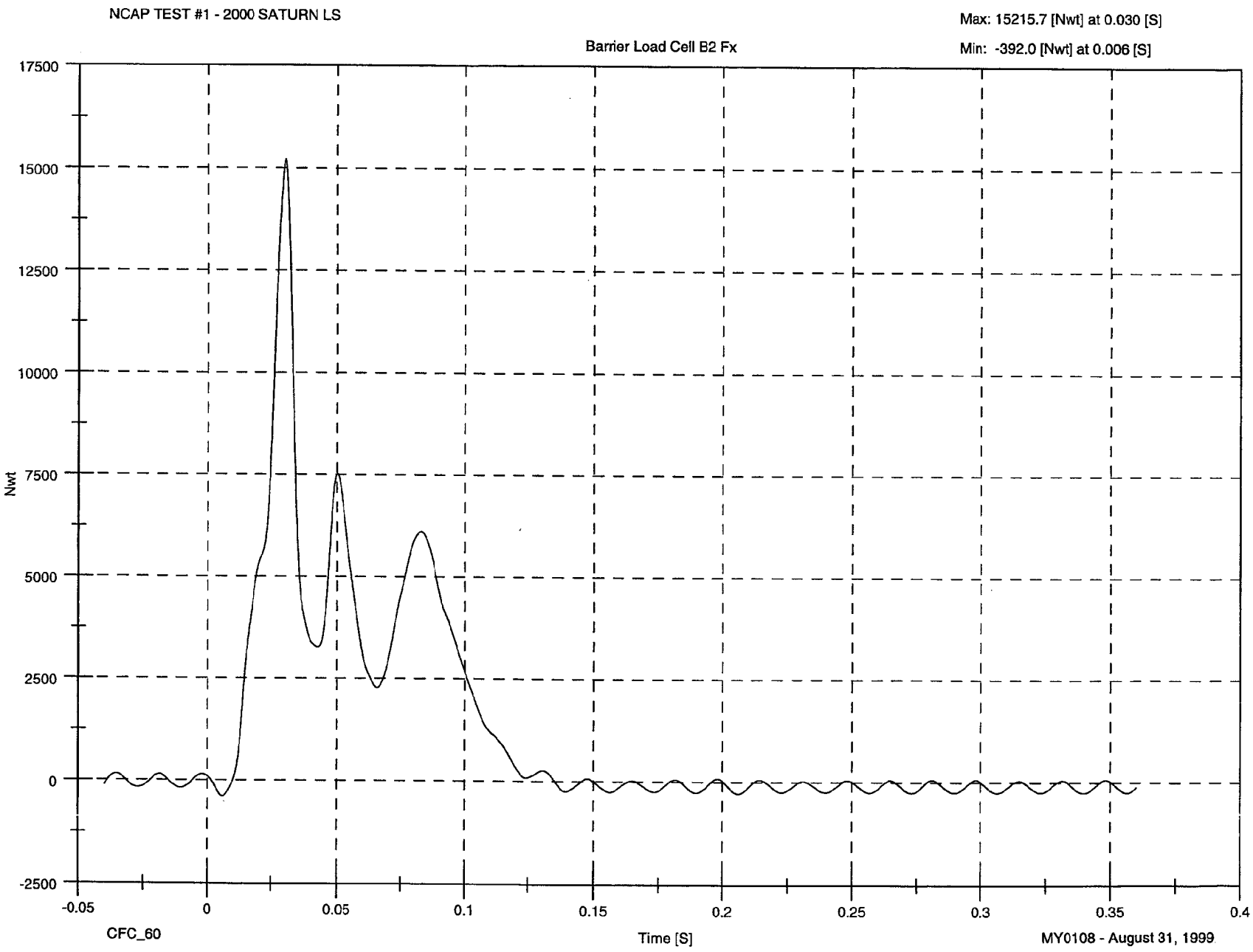

NCAP TEST #1 - 2000 SATURN LS
Max: 35802.9 [Nwt] at 0.031 [S]
Barrier Load Cell A6 Fx
Min: -1849.2 [Nwt] at 0.023 [S]
40000
35000
30000
25000
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_60
Time [S]
MY0108 - August 31, 1999

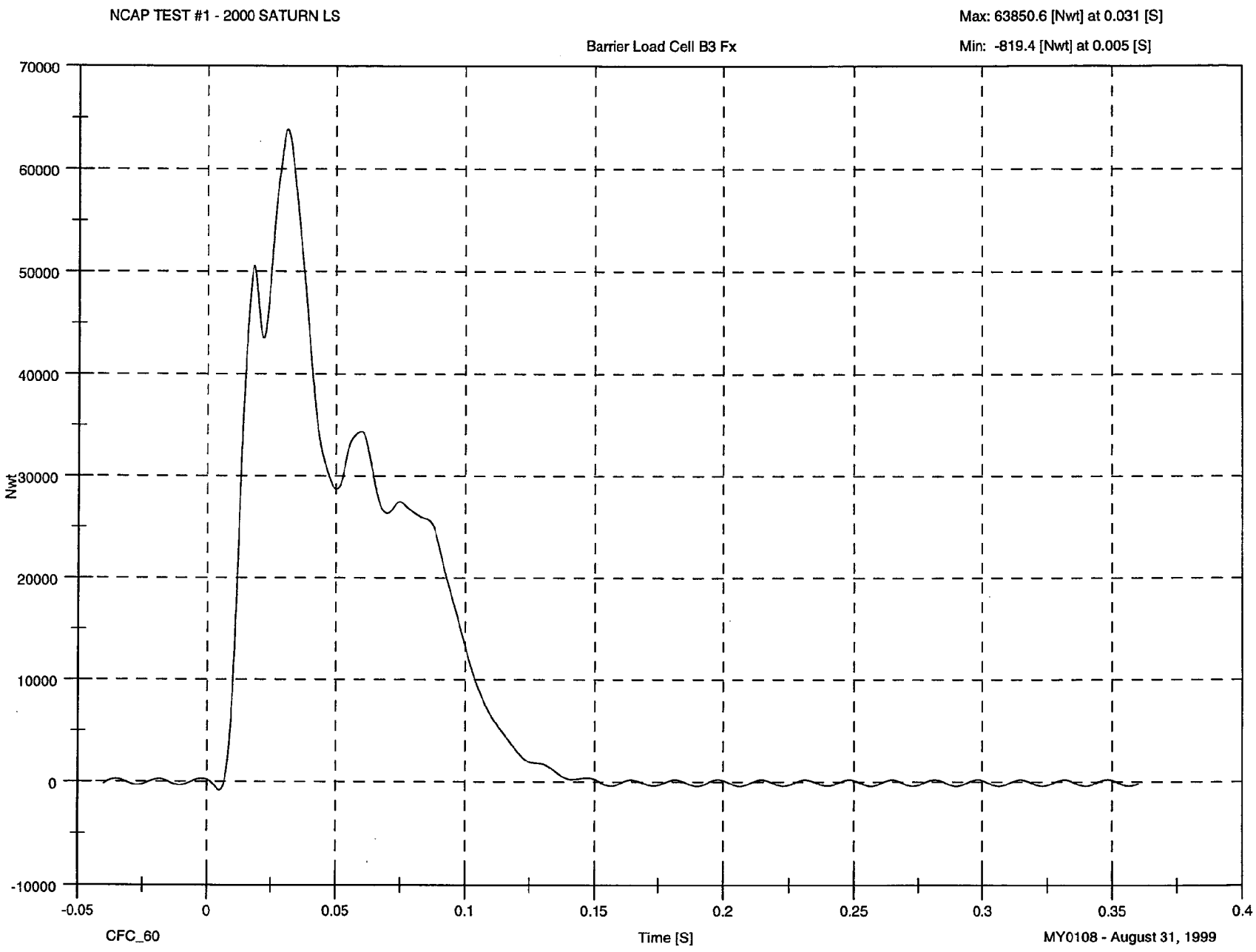

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell A7 Fx
Max: 33922.9 [Nwt] at 0.031 [S]
Min: -695.9 [Nwt] at 0.006 [S]
35000
30000
25000
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

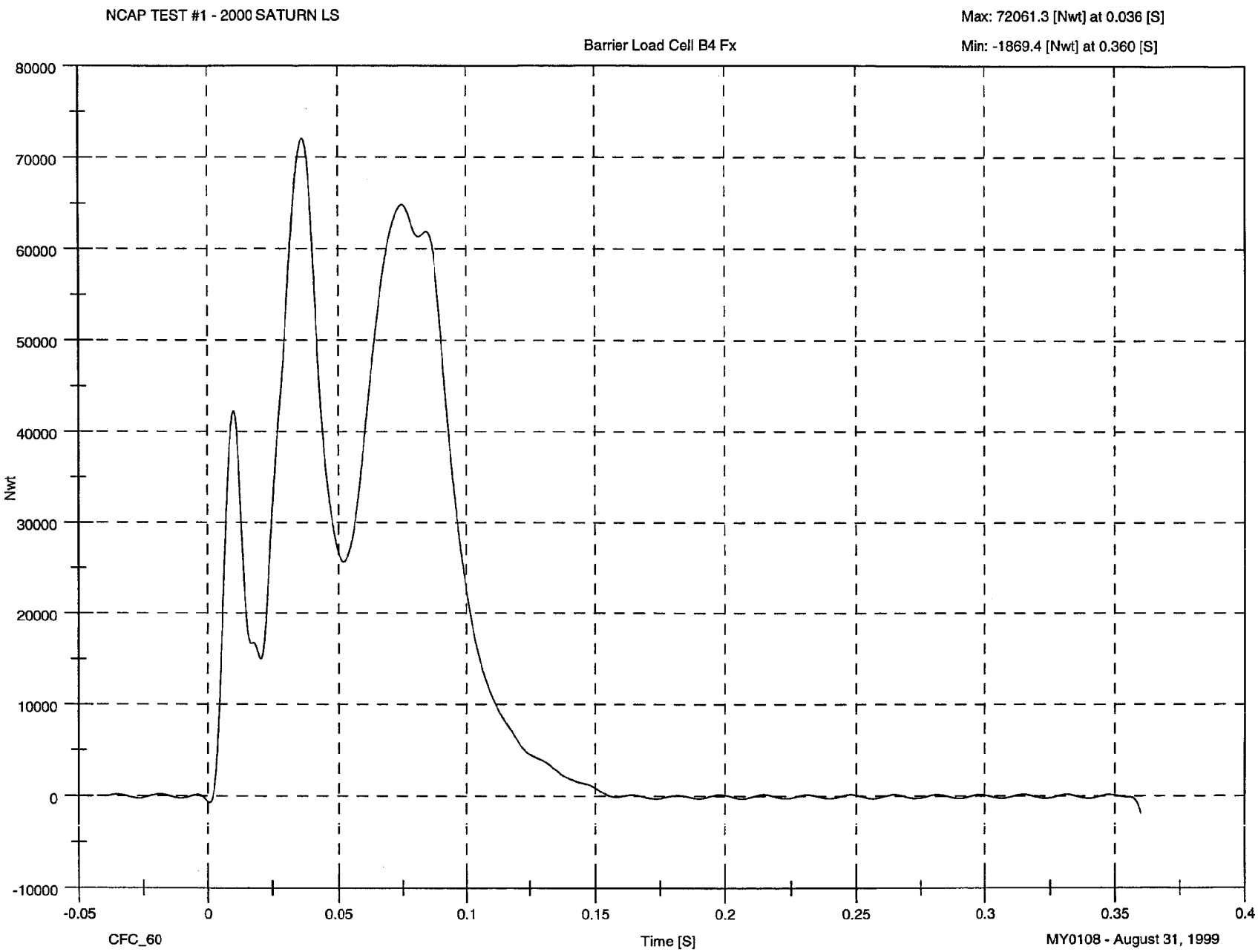

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell A8 Fx
Max: 990.3 [Nwt] at 0.081 [S]
Min: -662.3 [Nwt] at 0.043 [S]
1000
750
500
250
0
-250
-500
-750
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

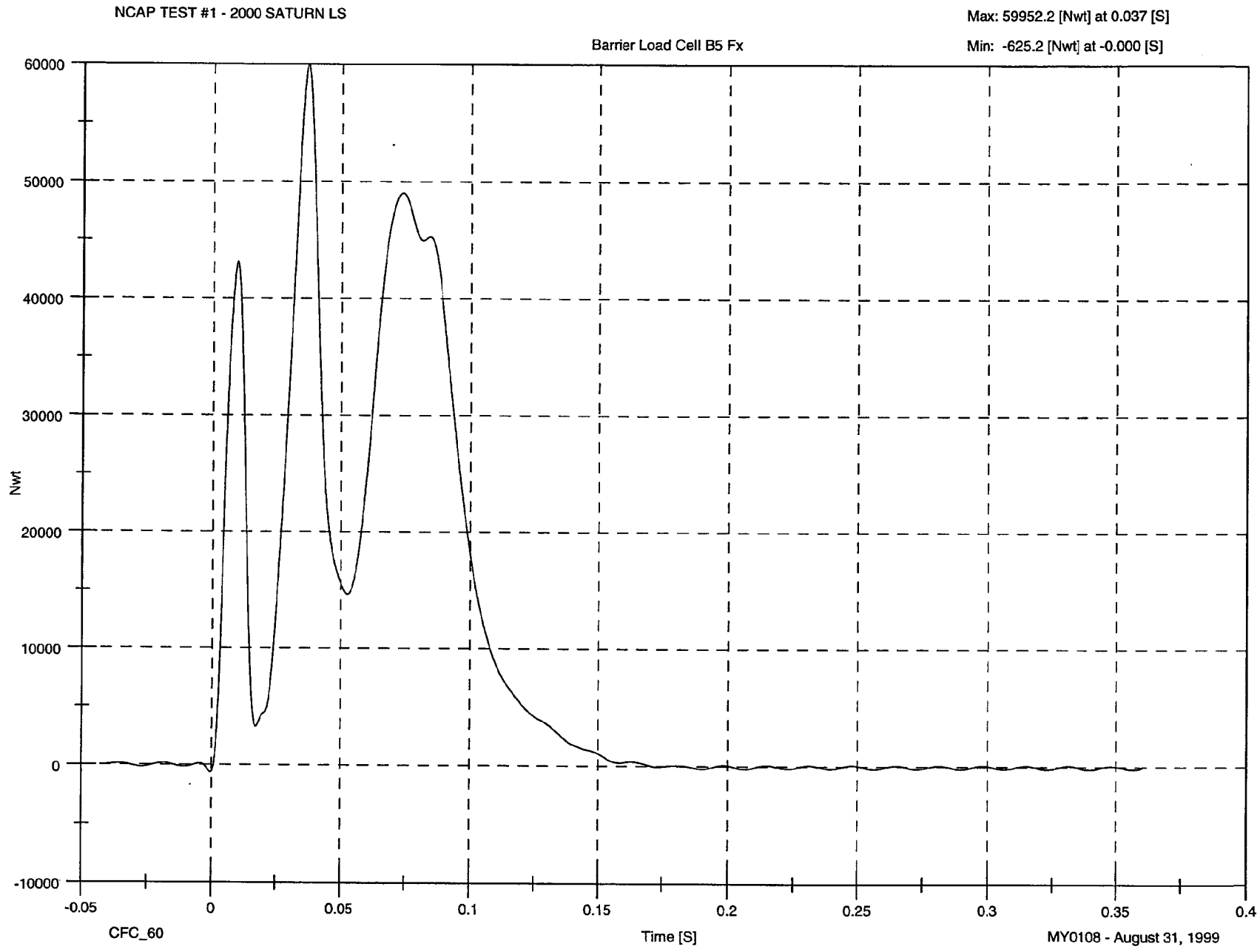

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell A9 Fx
Max: 725.0 [Nwt] at 0.016 [S]
Min: -819.8 [Nwt] at 0.043 [S]
750
500
250
0
-250
-500
-750
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

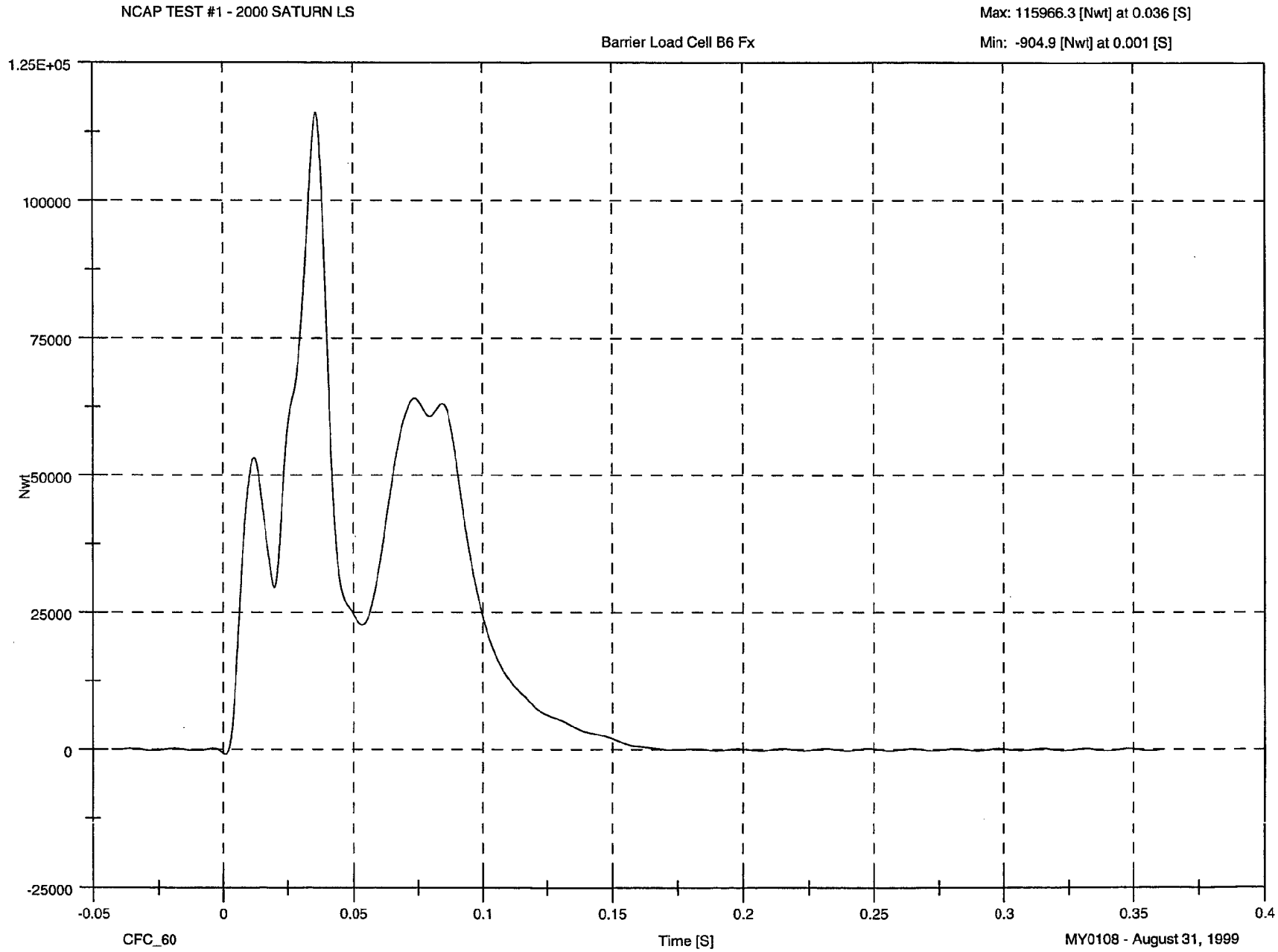

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell B1 Fx
Max: 315.9 [Nwt] at 0.043 [S]
Min: -637.6 [Nwt] at 0.040 [S]
MY0108 - August 31, 1999
Nwt
Time [S]
CFC_60
400
200
0
-200
-400
-600
-800
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

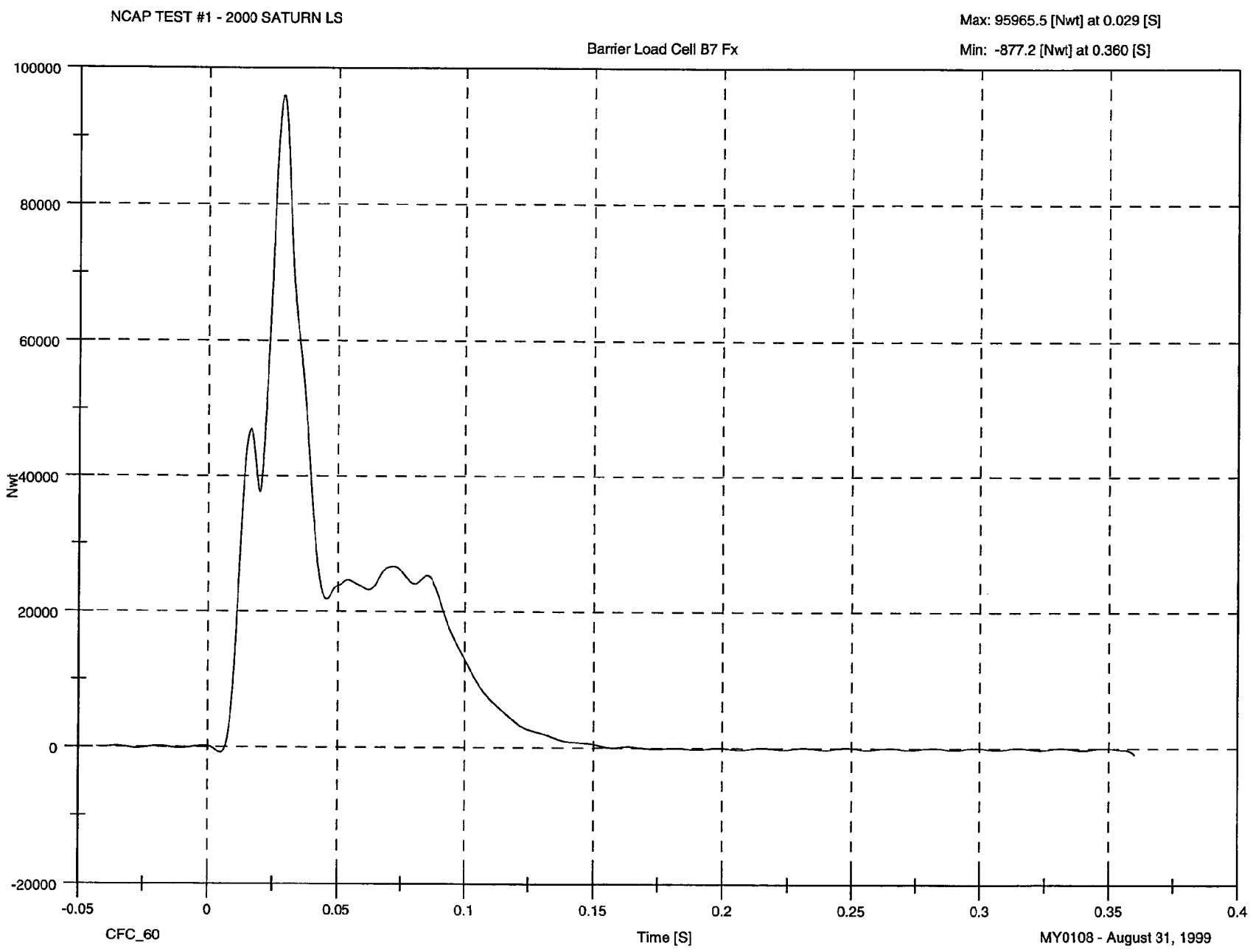

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell B2 Fx
Max: 15215.7 [Nwt] at 0.030 [S]
Min: -392.0 [Nwt] at 0.006 [S]
17500
15000
12500
10000
7500
5000
2500
0
-2500
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

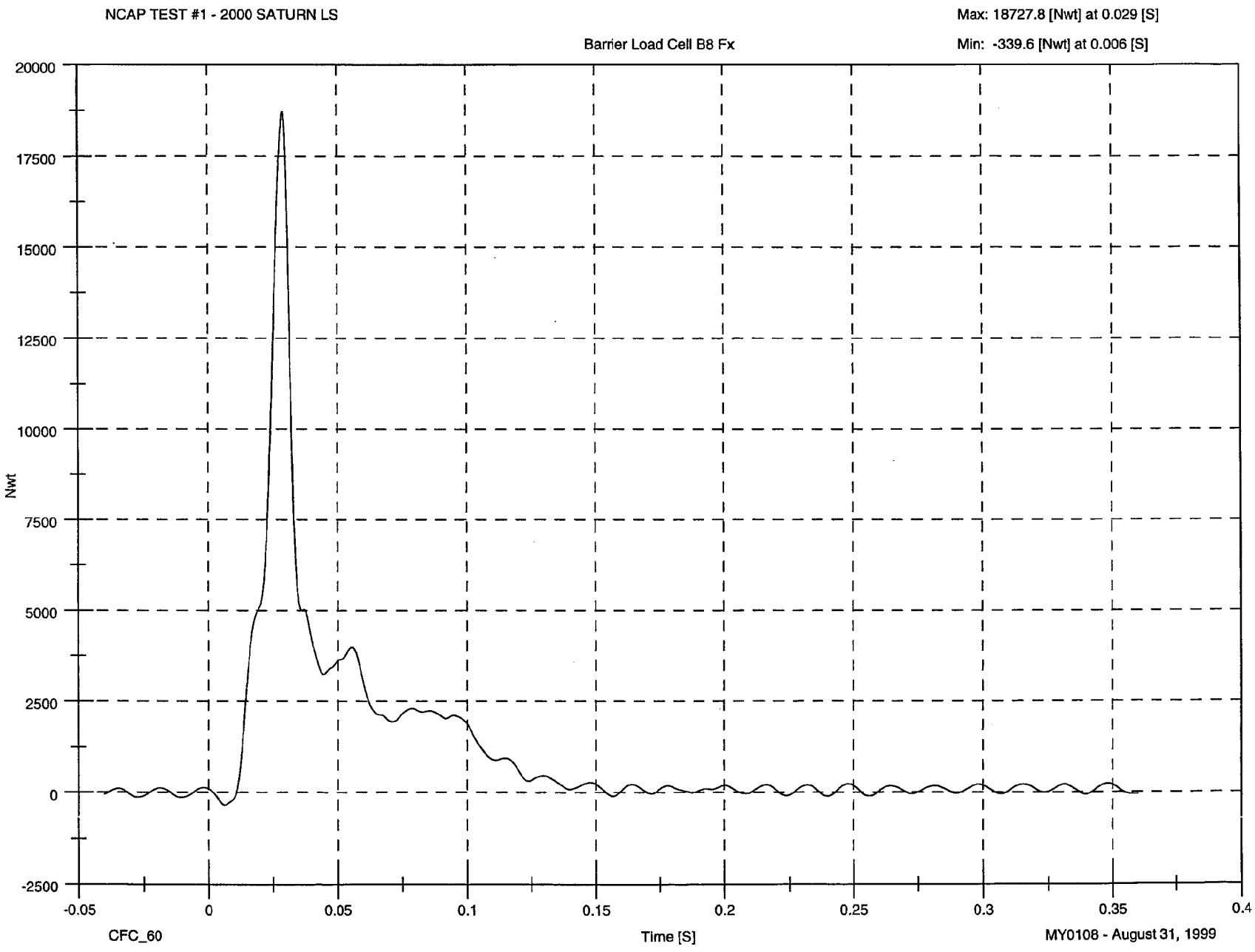

NCAP TEST #1 - 2000 SATURN LS
Max: 63850.6 [Nwt] at 0.031 [S]
Barrier Load Cell B3 Fx
Min: -819.4 [Nwt] at 0.005 [S]
70000
60000
50000
40000
30000
20000
10000
0
-10000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_60
Time [S]
MY0108 - August 31, 1999

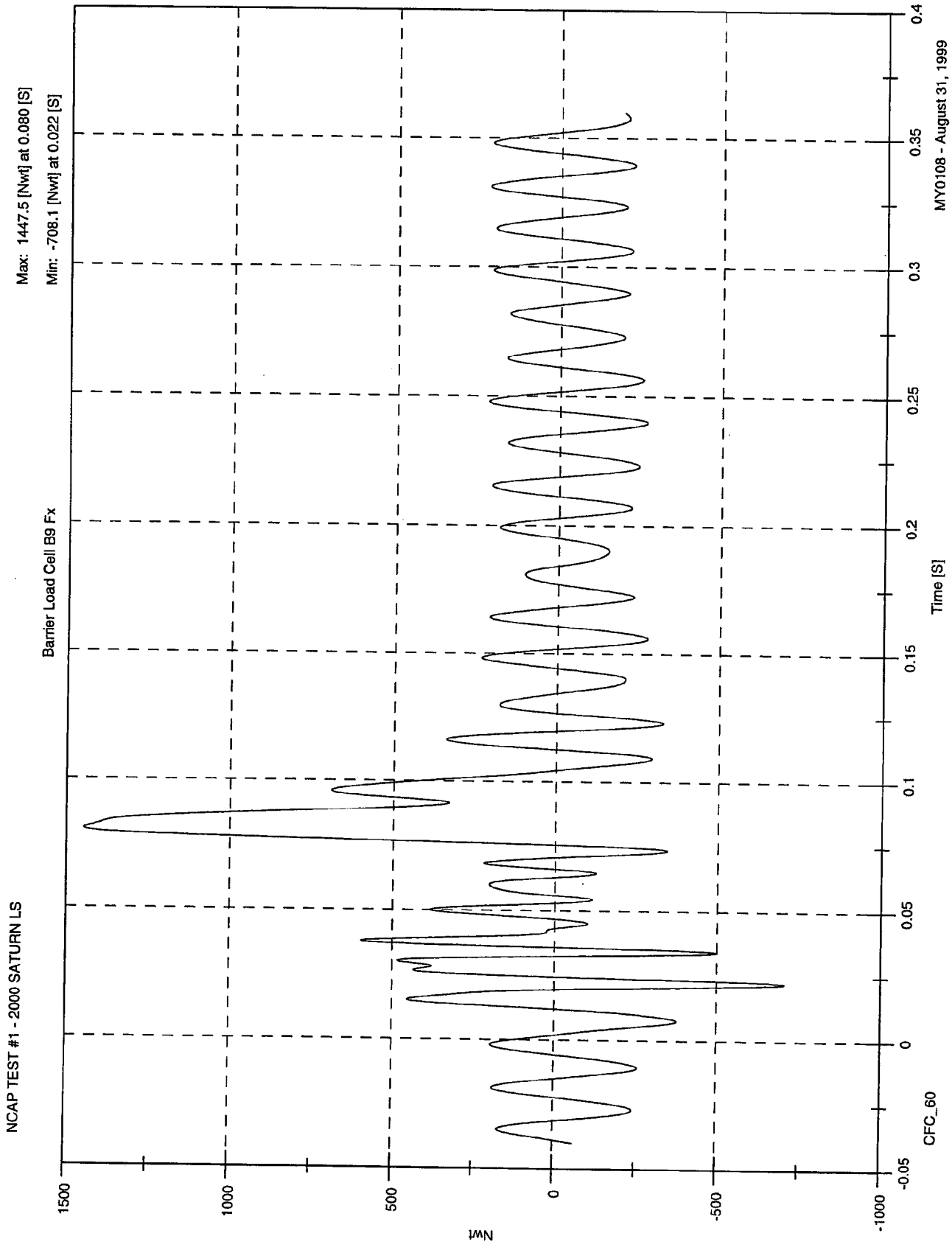

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell B4 Fx
Max: 72061.3 [Nwt] at 0.036 [S]
Min: -1869.4 [Nwt] at 0.360 [S]
80000
70000
60000
50000
40000
30000
20000
10000
0
-10000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell B5 Fx
Max: 59952.2 [Nwt] at 0.037 [S]
Min: -625.2 [Nwt] at -0.000 [S]
60000
50000
40000
30000
20000
10000
0
-10000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

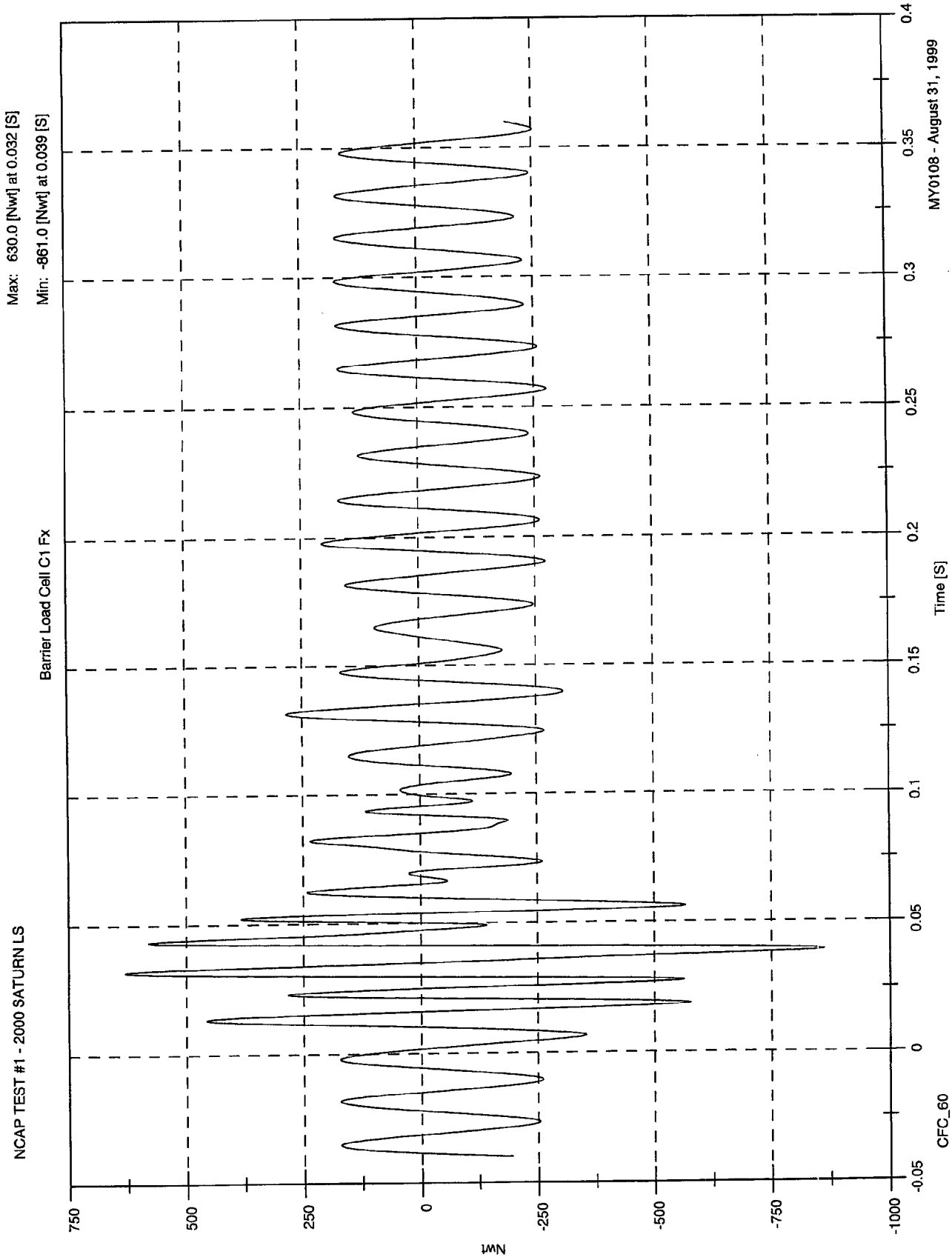

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell B6 Fx
Max: 115966.3 [Nwt] at 0.036 [S]
Min: -904.9 [Nwt] at 0.001 [S]
1.25E+05
100000
75000
50000
25000
0
-25000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell B7 Fx
Max: 95965.5 [Nwt] at 0.029 [S]
Min: -877.2 [Nwt] at 0.360 [S]
100000
80000
60000
40000
20000
0
-20000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

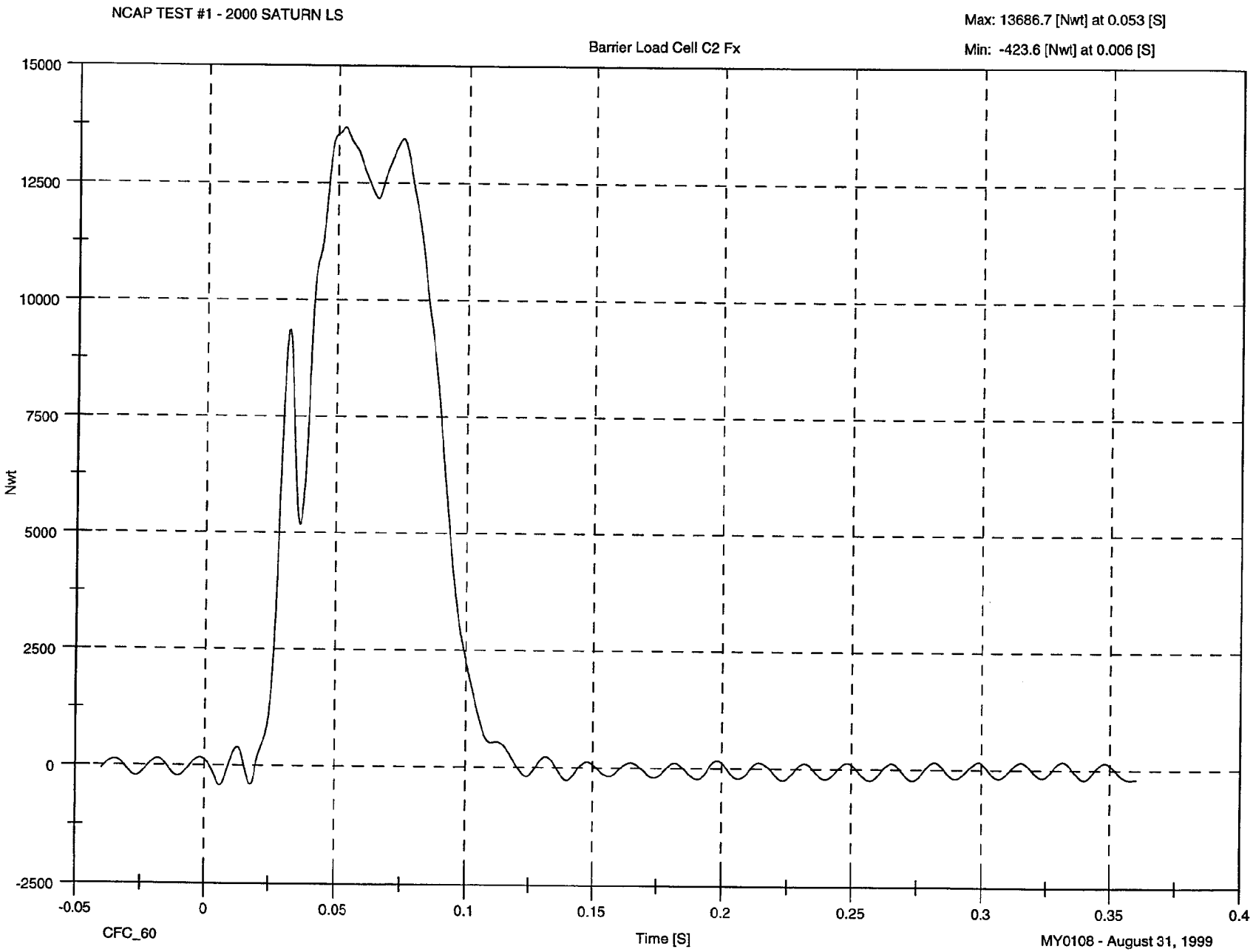

NCAP TEST #1 - 2000 SATURN LS
Max: 18727.8 [Nwt] at 0.029 [S]
Barrier Load Cell B8 Fx
Min: -339.6 [Nwt] at 0.006 [S]
20000
17500
15000
12500
10000
7500
5000
2500
0
-2500
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_60
Time [S]
MY0108 - August 31, 1999

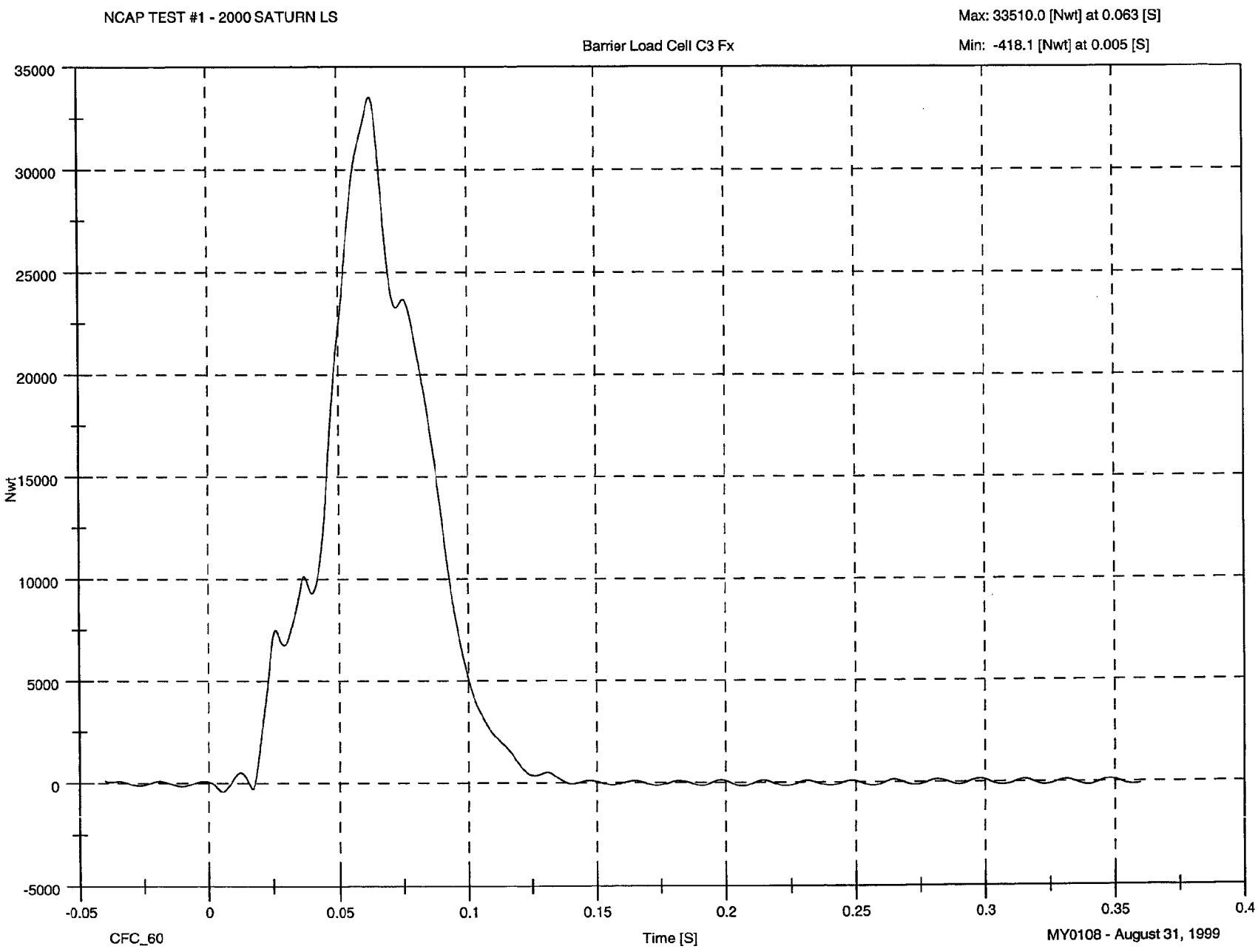

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell B9 Fx
Max: 1447.5 [Nwt] at 0.080 [S]
Min: -708.1 [Nwt] at 0.022 [S]
MY0108 - August 31, 1999
Nwt
1500
1000
500
0
-500
-1000
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
Time [S]
CFC_60

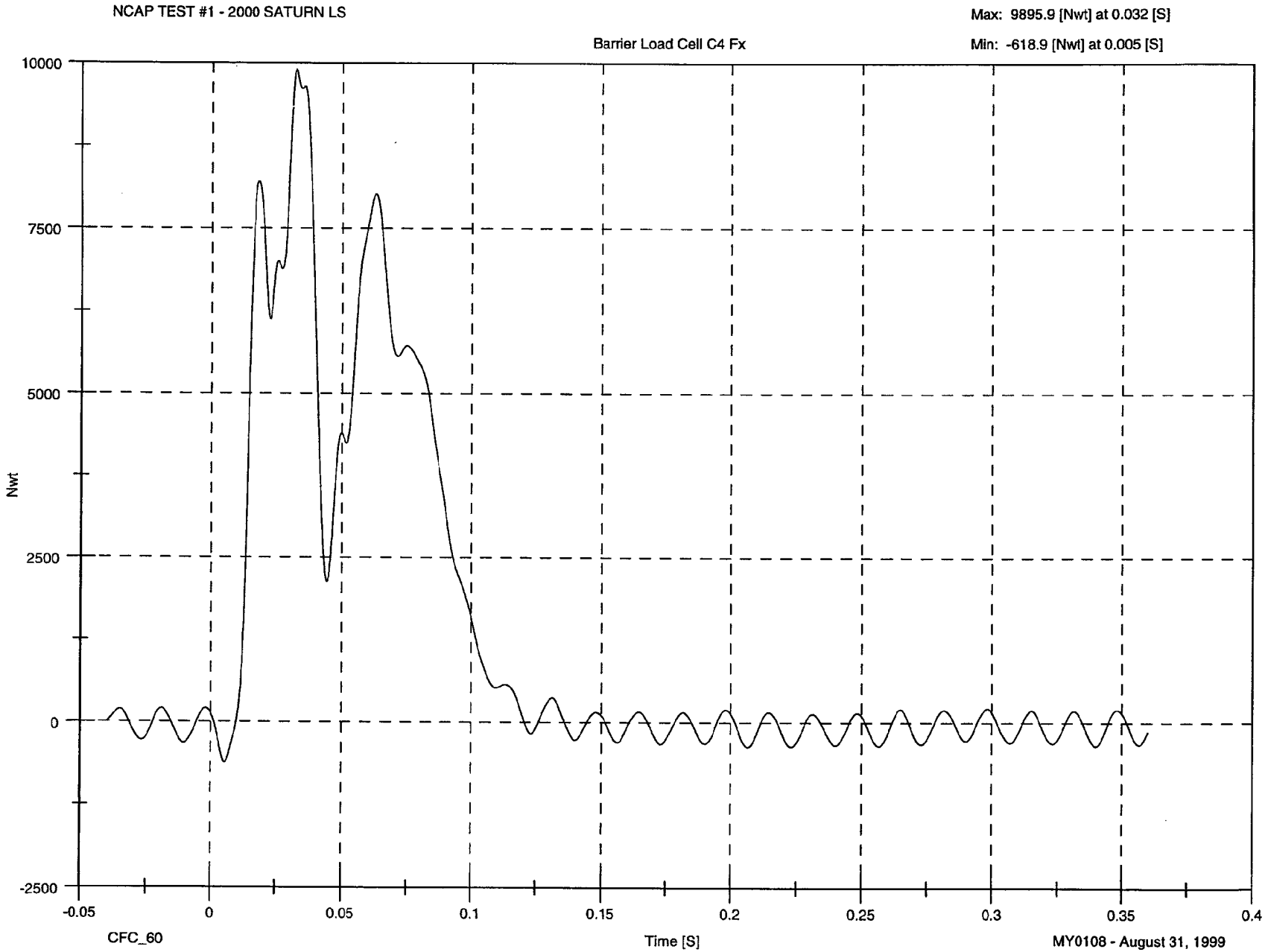
8413-39

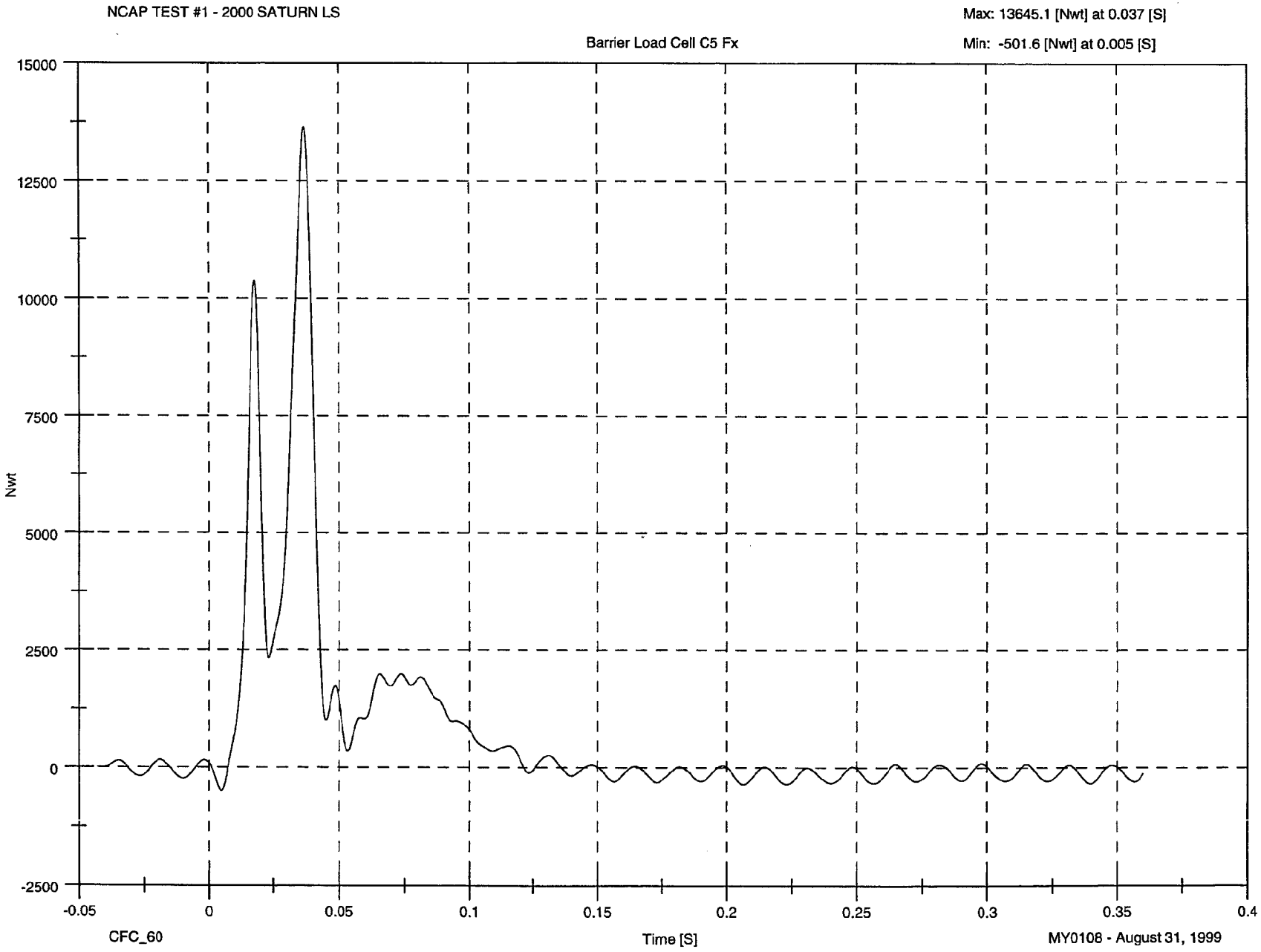

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C1 Fx
Max: 630.0 [Nwt] at 0.032 [S]
Min: -861.0 [Nwt] at 0.039 [S]
MY0108 - August 31, 1999
CFC_60
Nwt
Time [S]
750
500
250
0
-250
-500
-750
-1000
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

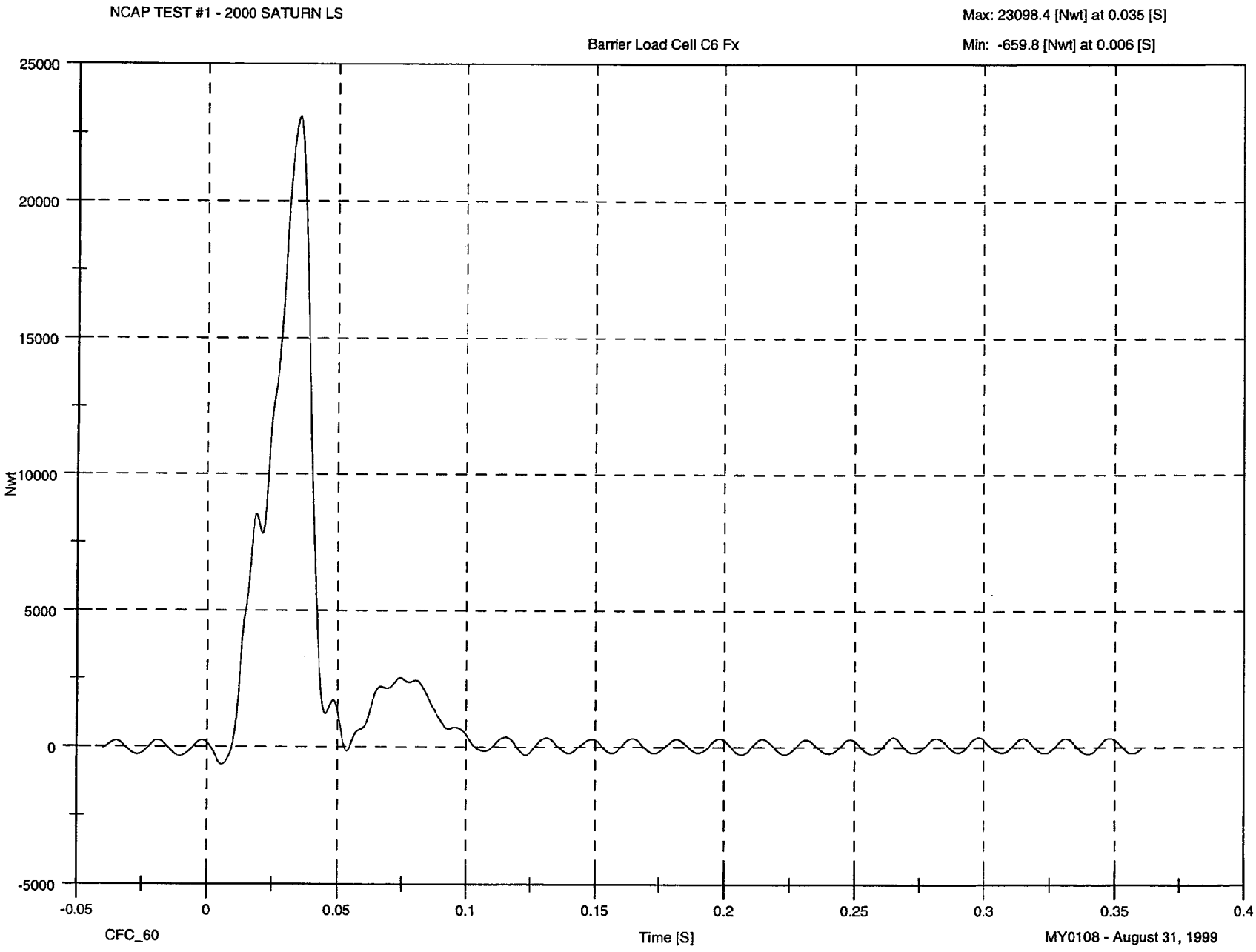
8413-39

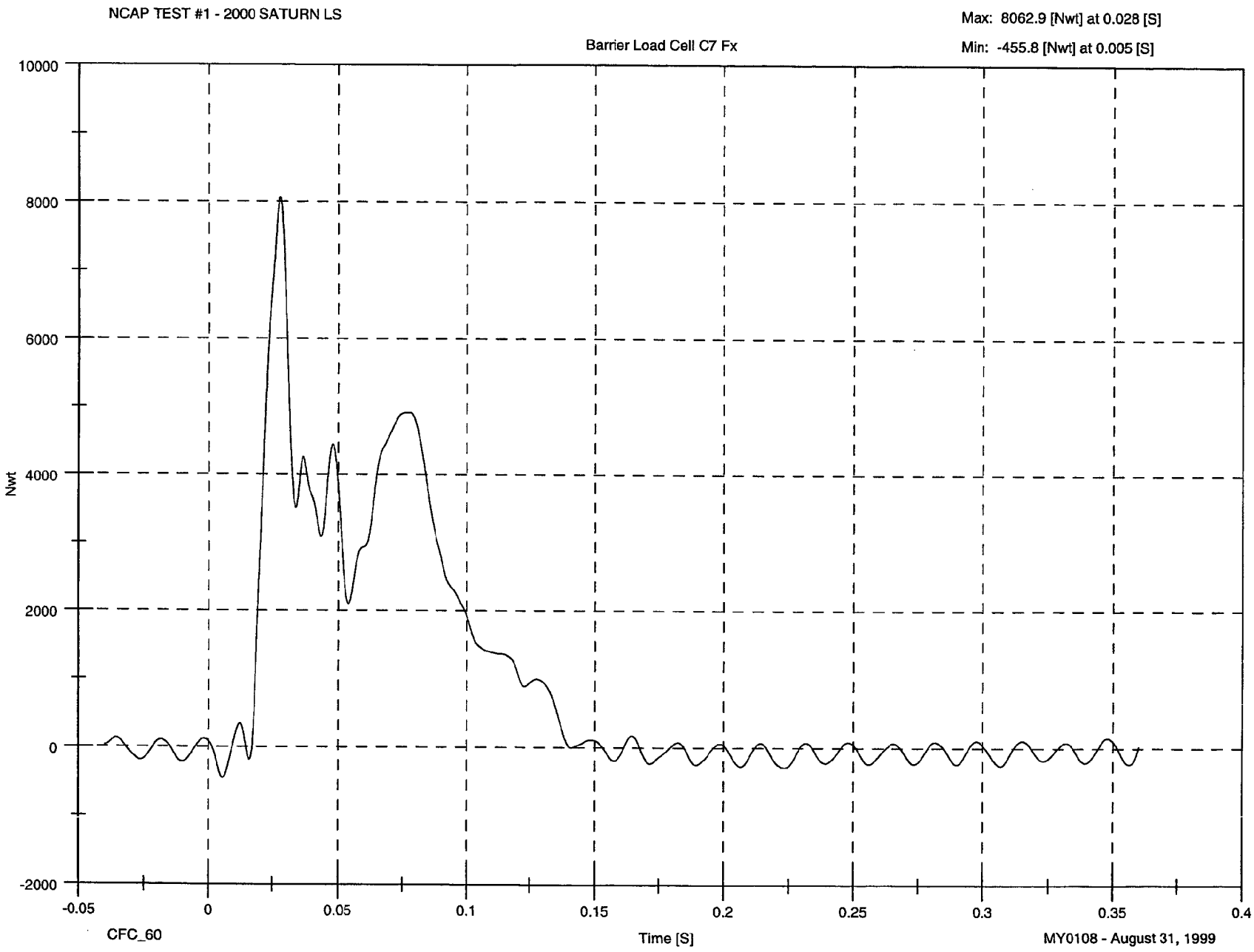

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C2 Fx
Max: 13686.7 [Nwt] at 0.053 [S]
Min: -423.6 [Nwt] at 0.006 [S]
15000
12500
10000
7500
5000
2500
0
-2500
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

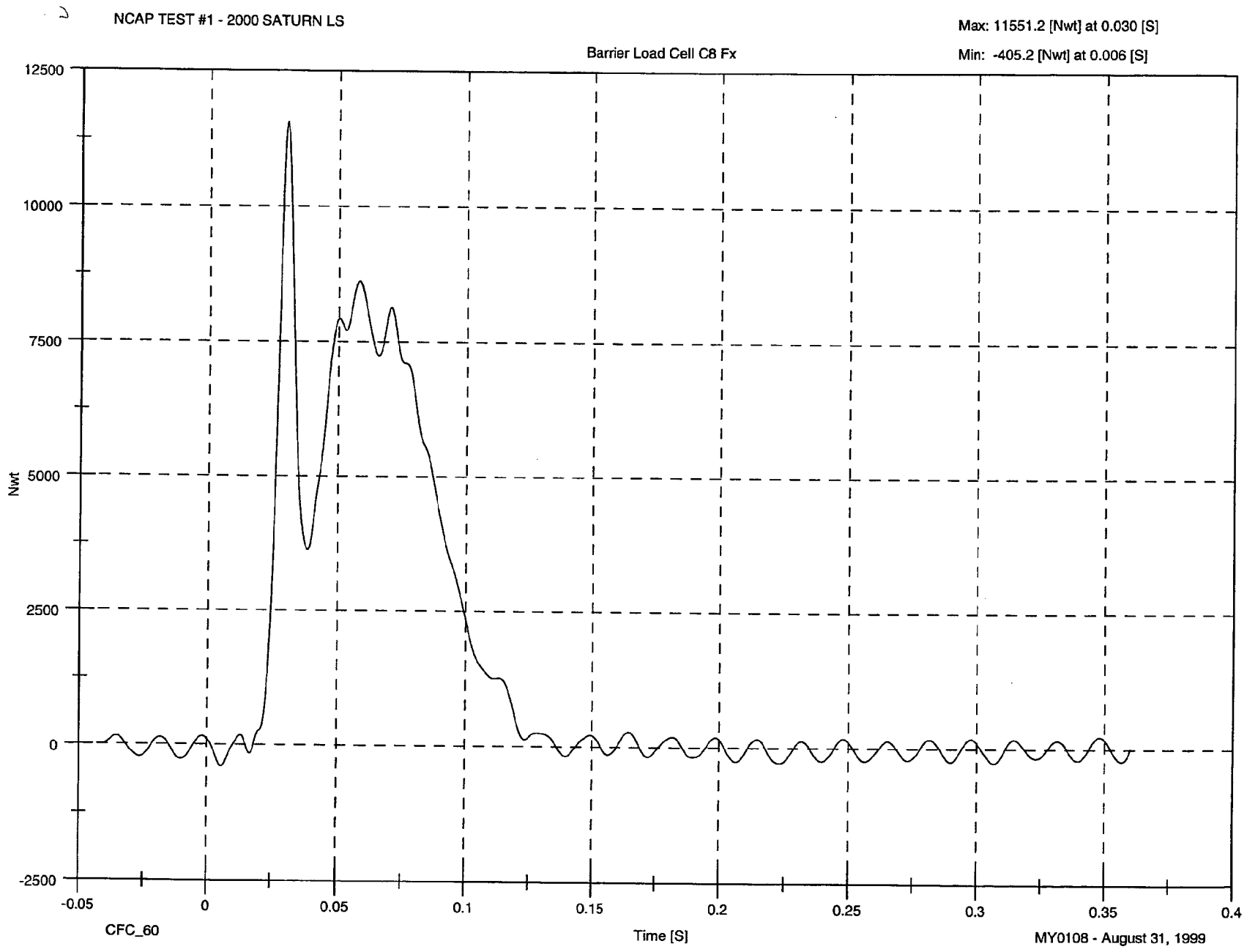

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C3 Fx
Max: 33510.0 [Nwt] at 0.063 [S]
Min: -418.1 [Nwt] at 0.005 [S]
35000
30000
25000
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

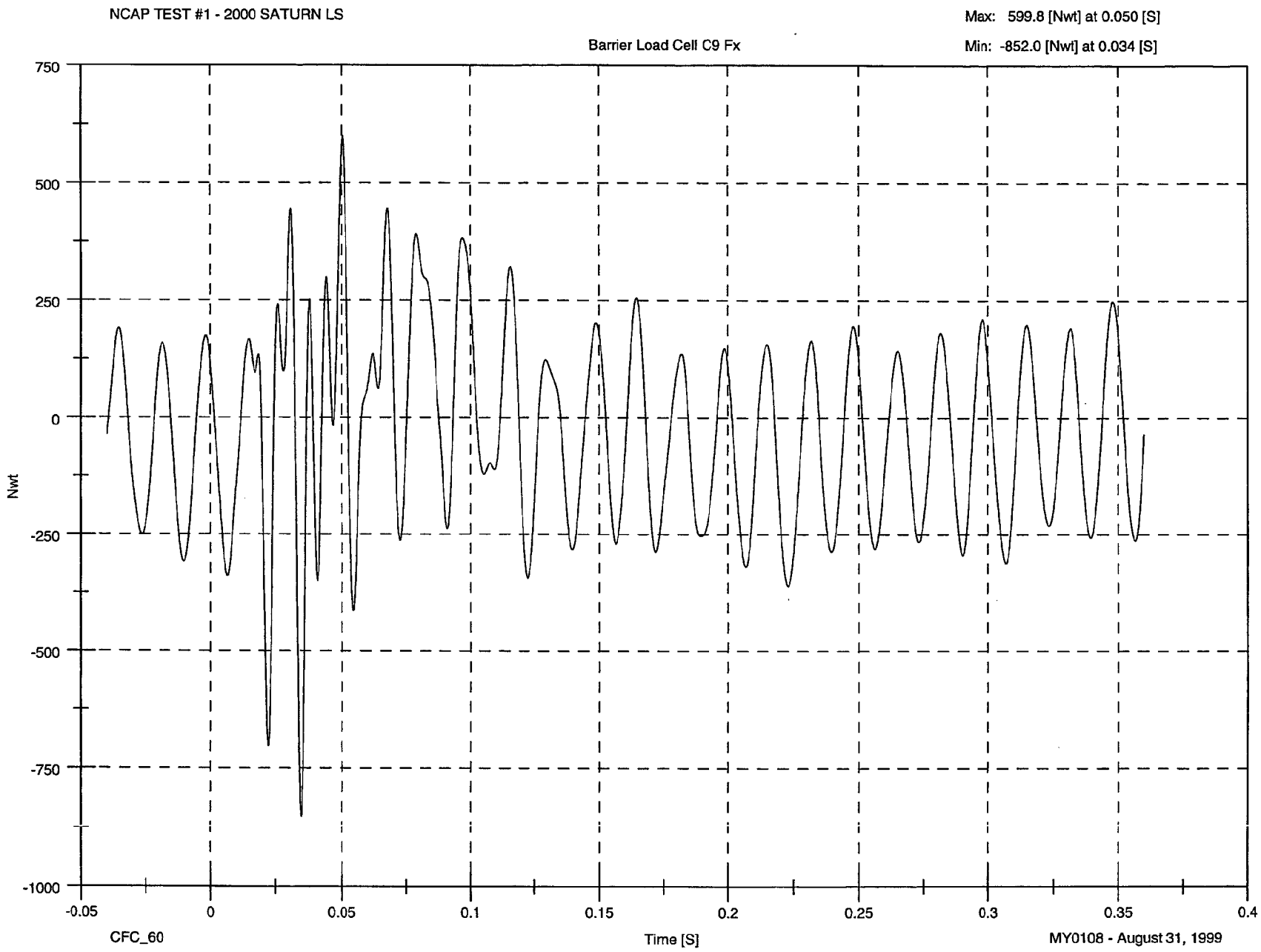

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C4 Fx
Max: 9895.9 [Nwt] at 0.032 [S]
Min: -618.9 [Nwt] at 0.005 [S]
10000
7500
5000
2500
0
-2500
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

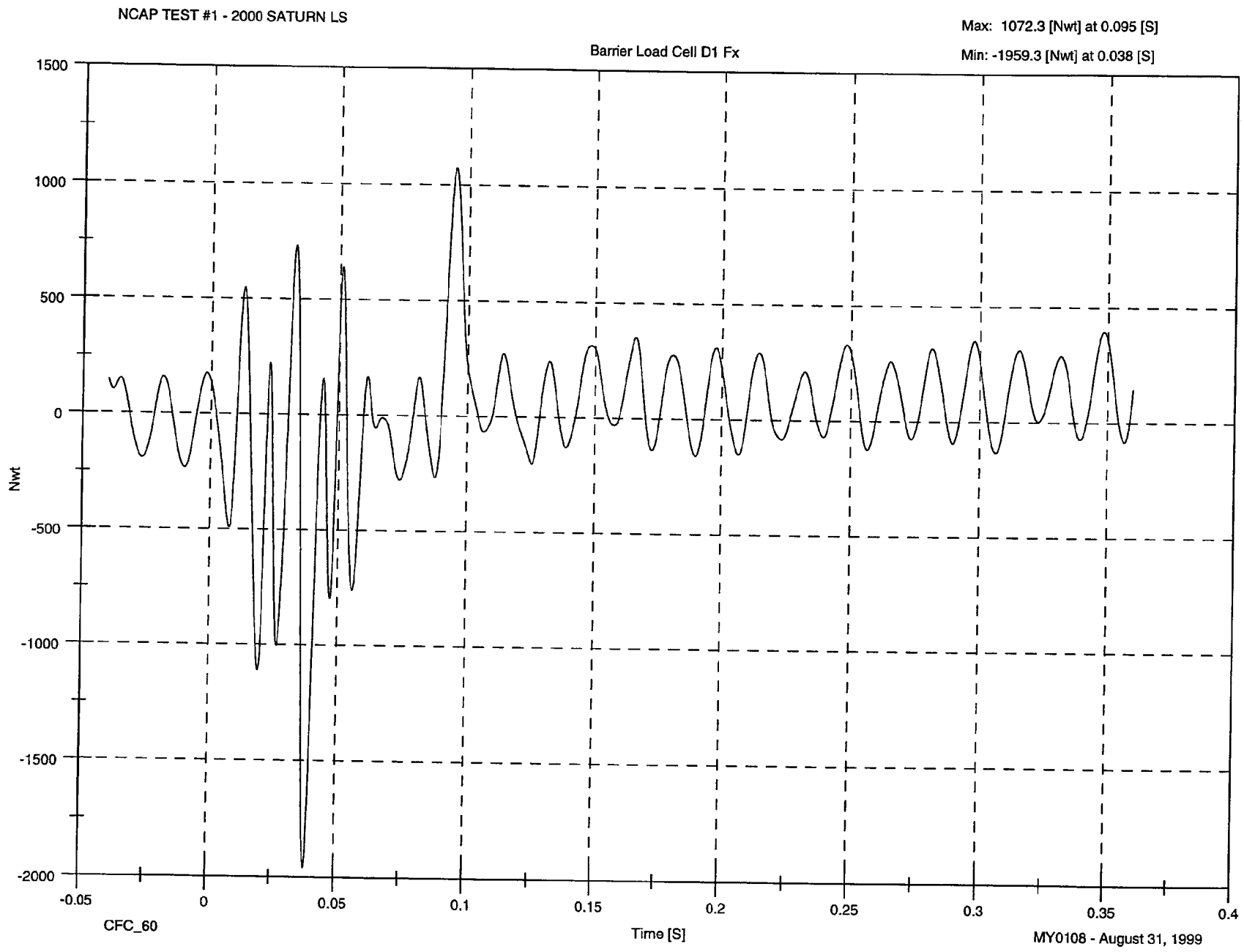

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C5 Fx
Max: 13645.1 [Nwt] at 0.037 [S]
Min: -501.6 [Nwt] at 0.005 [S]
15000
12500
10000
7500
5000
2500
0
-2500
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

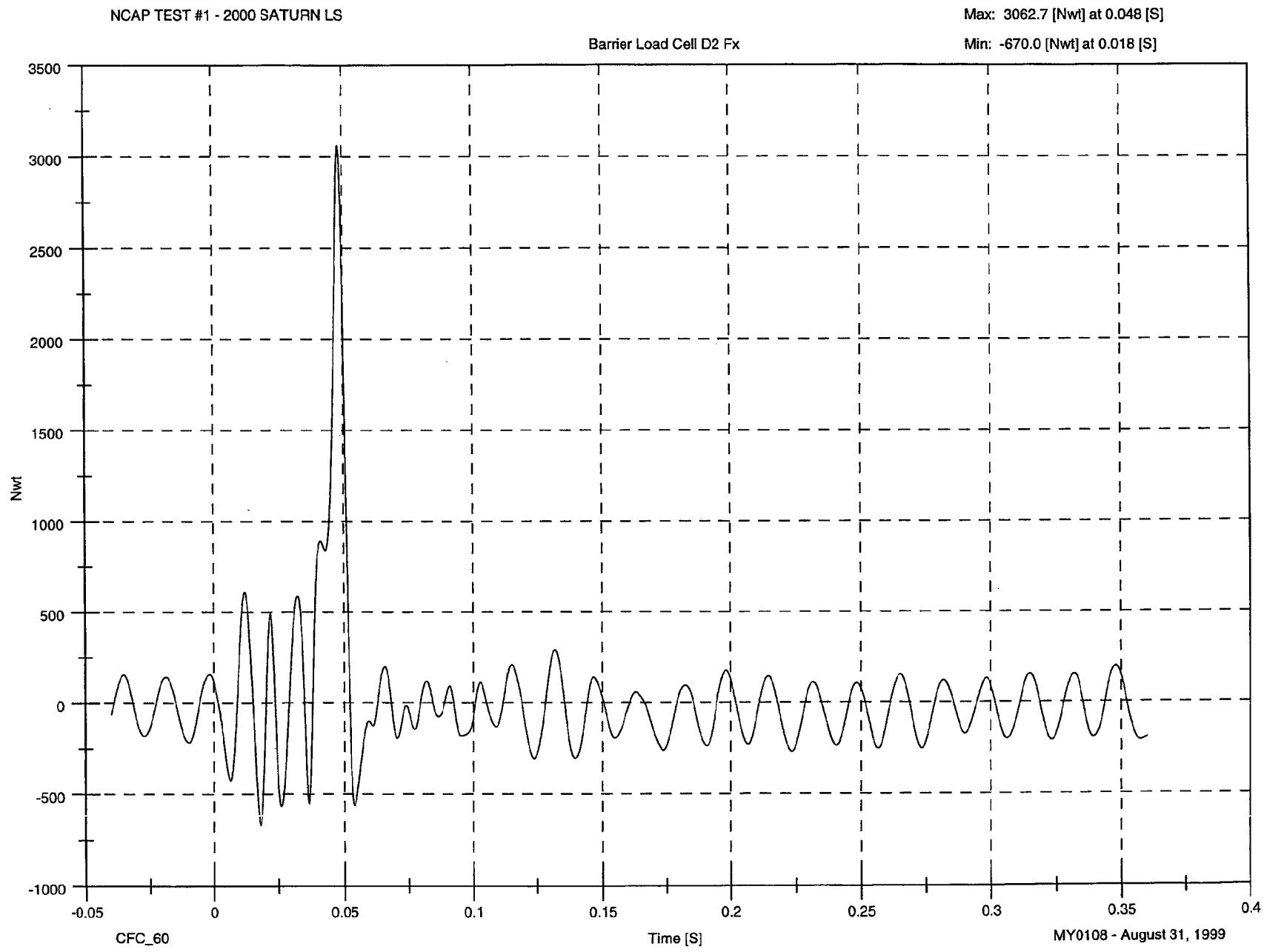

NCAP TEST #1 - 2000 SATURN LS
Max: 23098.4 [Nwt] at 0.035 [S]
Barrier Load Cell C6 Fx
Min: -659.8 [Nwt] at 0.006 [S]
25000
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_60
Time [S]
MY0108 - August 31, 1999

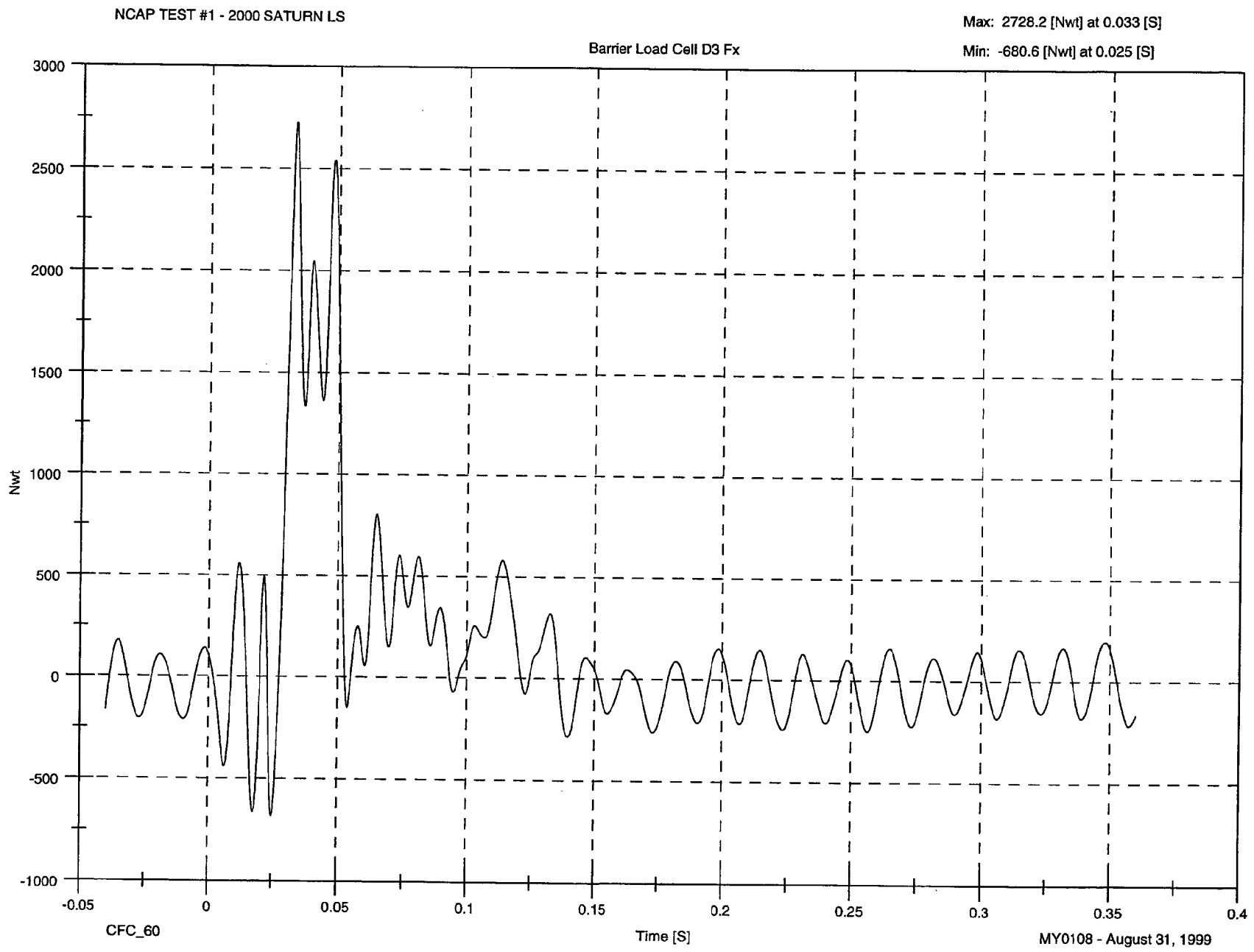

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C7 Fx
Max: 8062.9 [Nwt] at 0.028 [S]
Min: -455.8 [Nwt] at 0.005 [S]
10000
8000
6000
4000
2000
0
-2000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

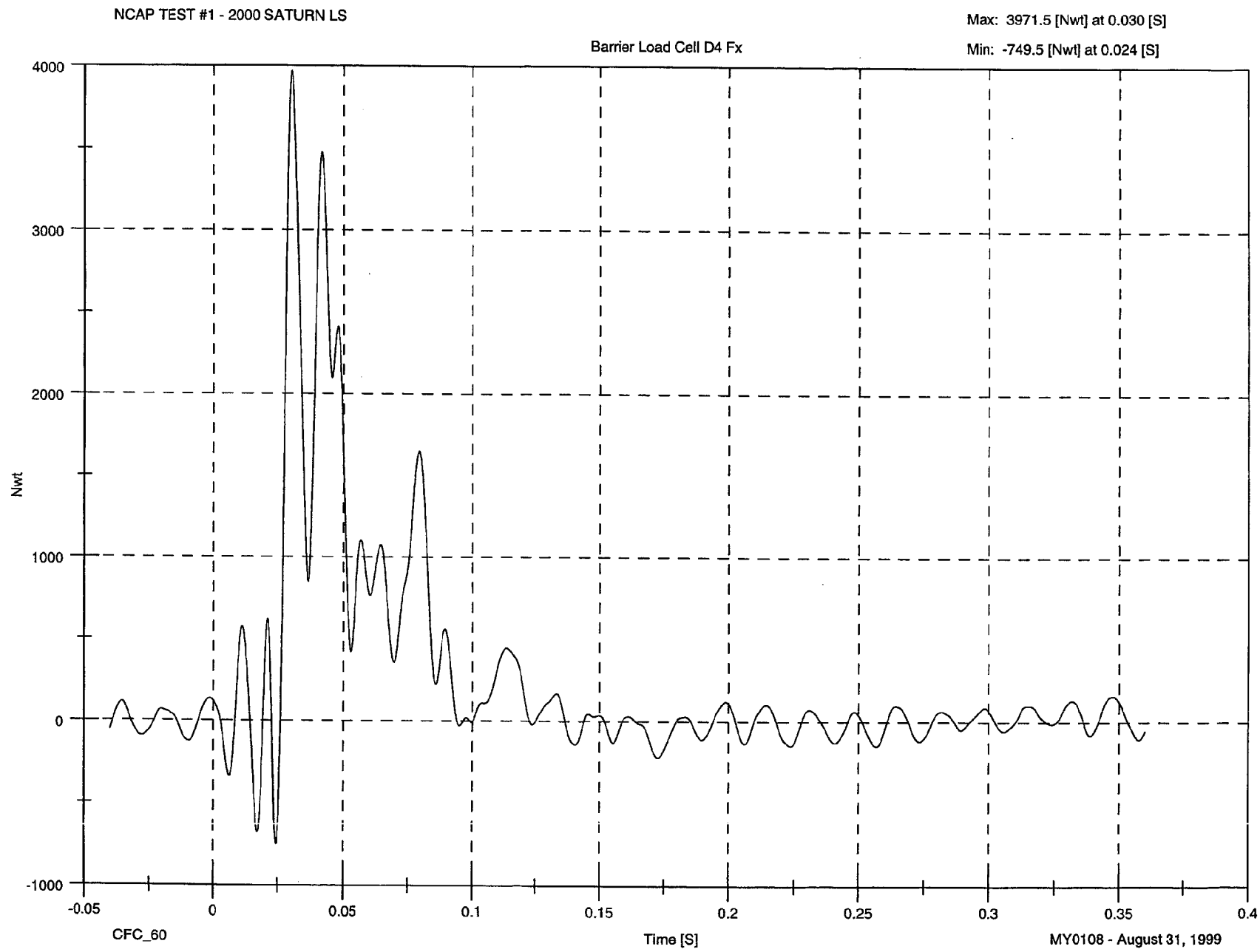

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C8 Fx
Max: 11551.2 [Nwt] at 0.030 [S]
Min: -405.2 [Nwt] at 0.006 [S]
12500
10000
7500
5000
2500
0
-2500
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

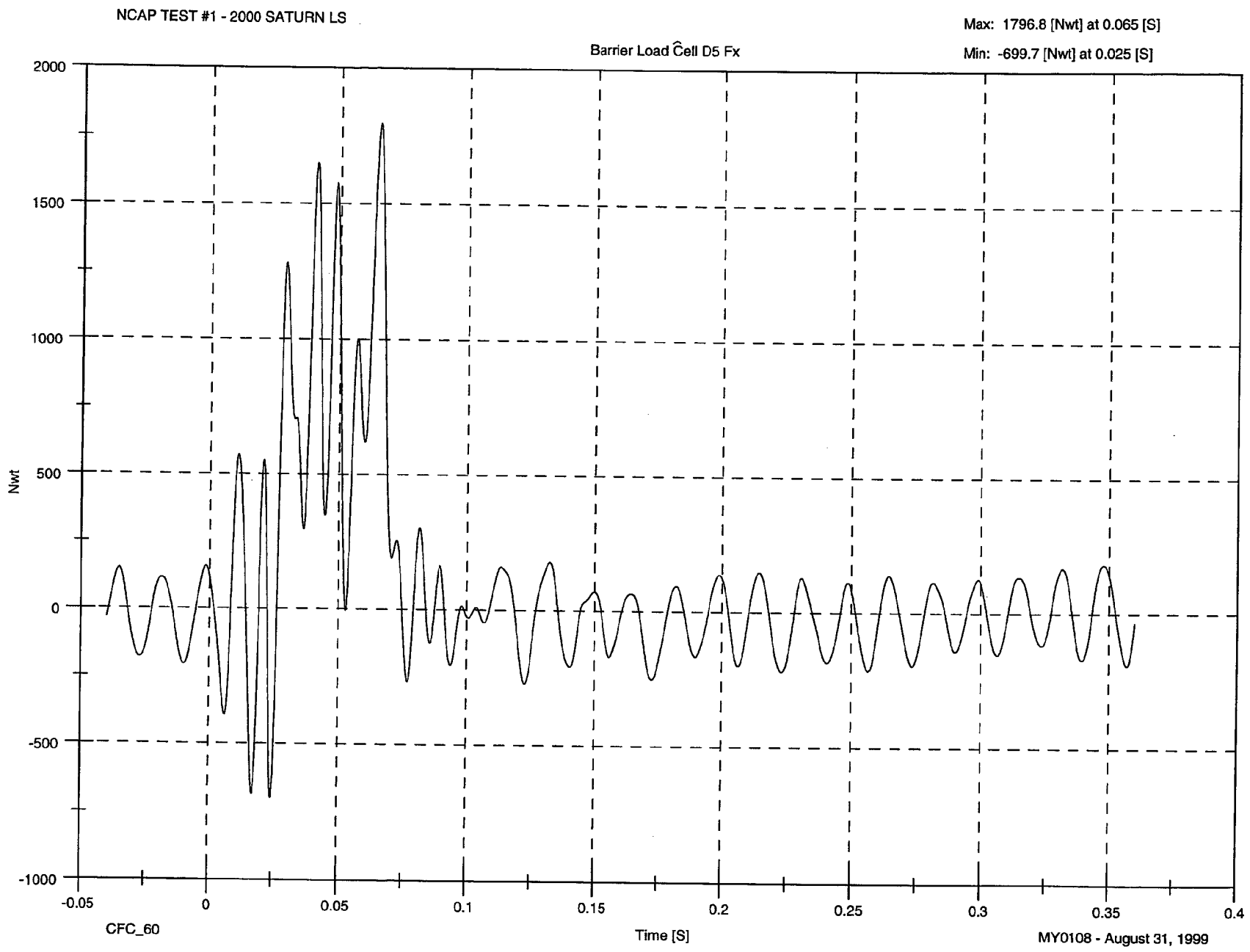

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell C9 Fx
Max: 599.8 [Nwt] at 0.050 [S]
Min: -852.0 [Nwt] at 0.034 [S]
750
500
250
0
-250
-500
-750
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

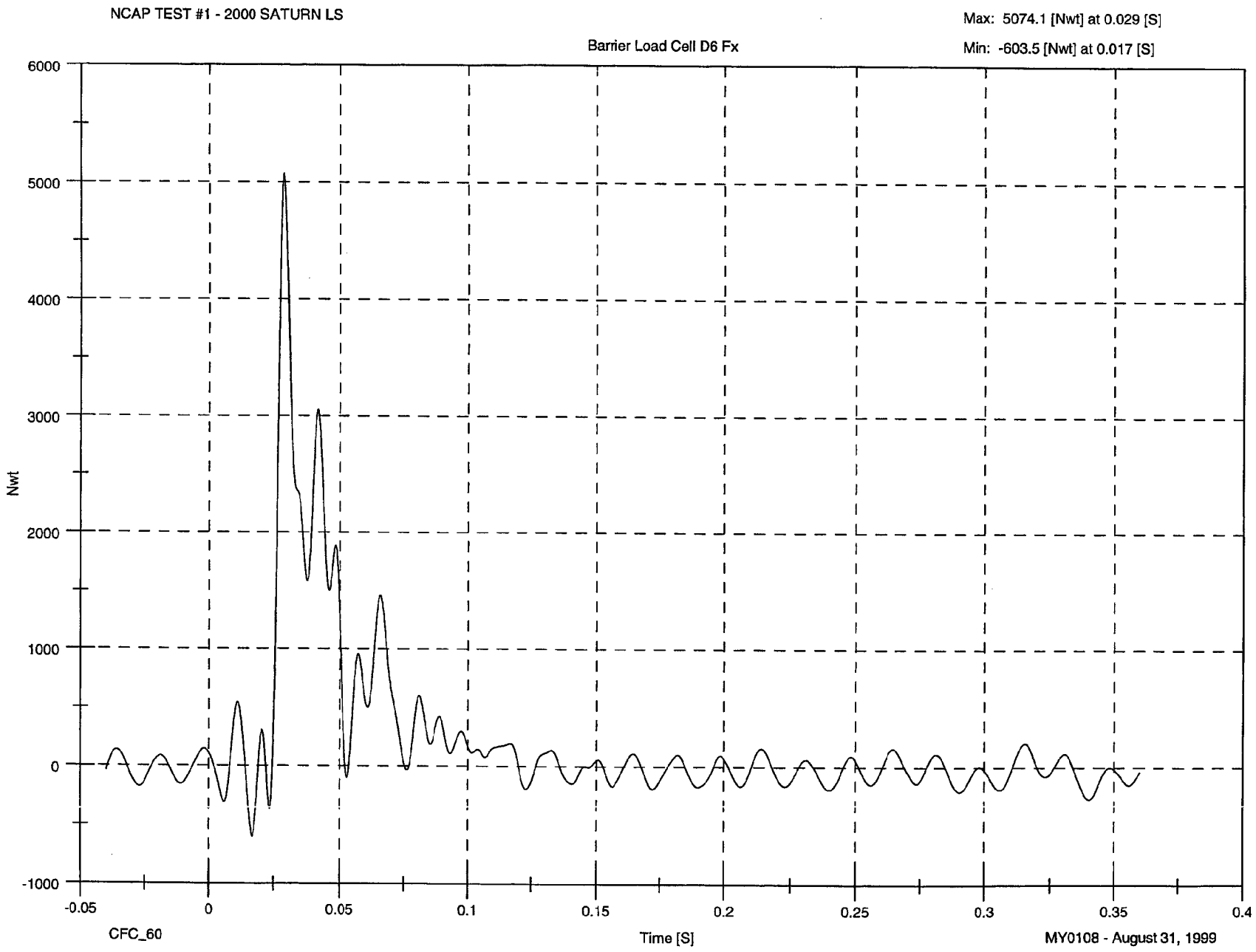

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D1 Fx
Max: 1072.3 [Nwt] at 0.095 [S]
Min: -1959.3 [Nwt] at 0.038 [S]
1500
1000
500
0
-500
-1000
-1500
-2000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

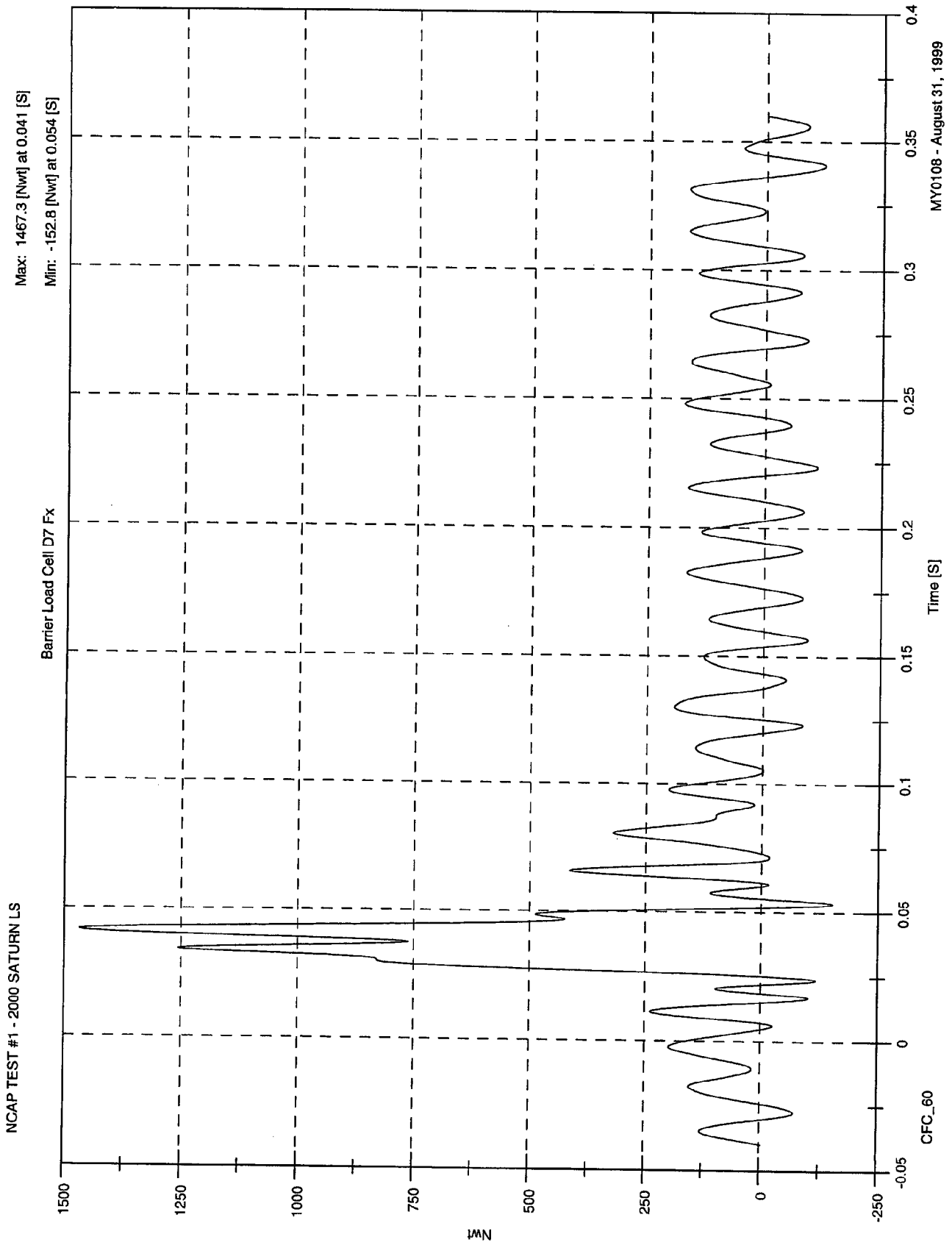

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D2 Fx
Max: 3062.7 [Nwt] at 0.048 [S]
Min: -670.0 [Nwt] at 0.018 [S]
3500
3000
2500
2000
1500
1000
500
0
-500
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D3 Fx
Max: 2728.2 [Nwt] at 0.033 [S]
Min: -680.6 [Nwt] at 0.025 [S]
3000
2500
2000
1500
1000
500
0
-500
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

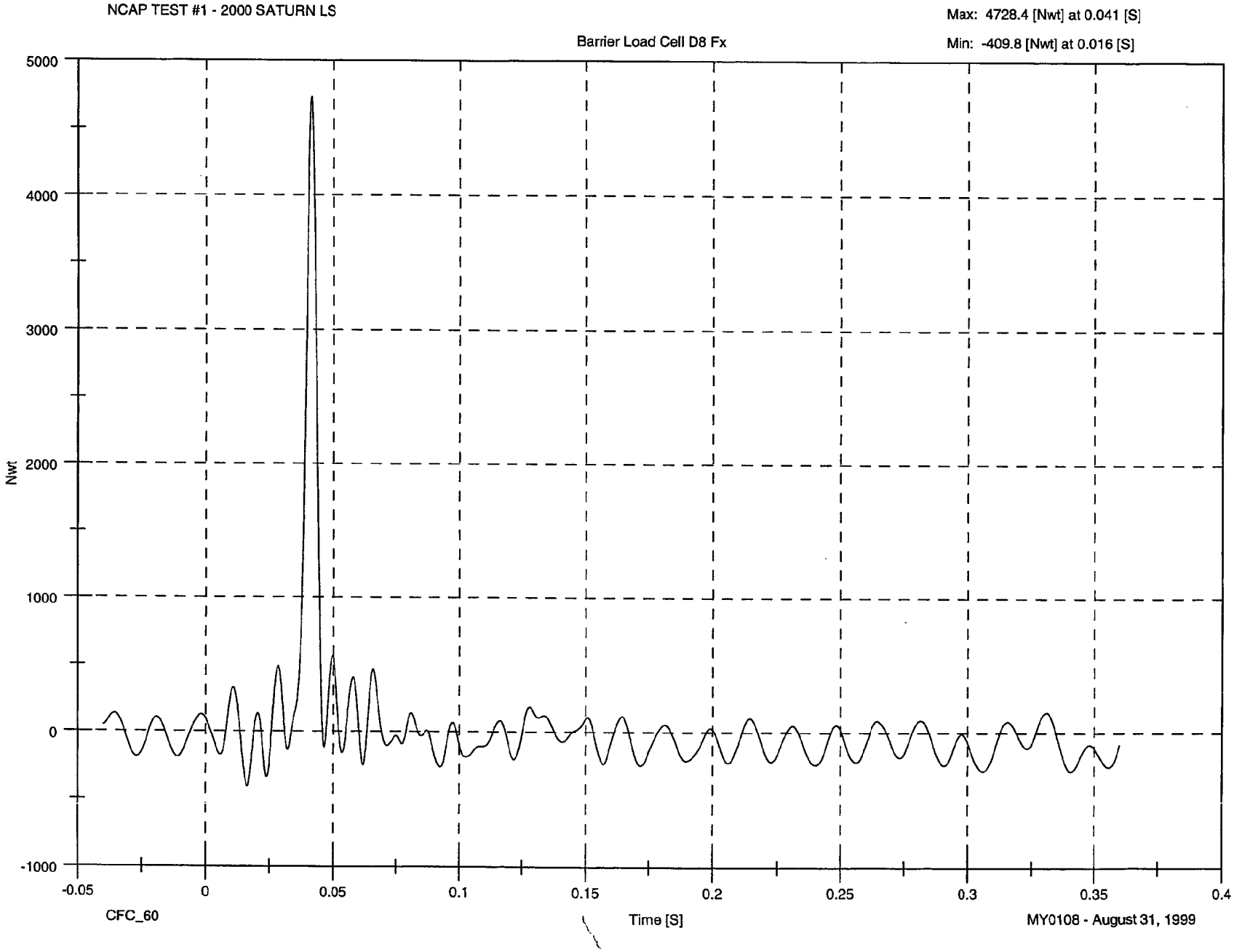

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D4 Fx
Max: 3971.5 [Nwt] at 0.030 [S]
Min: -749.5 [Nwt] at 0.024 [S]
4000
3000
2000
1000
0
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

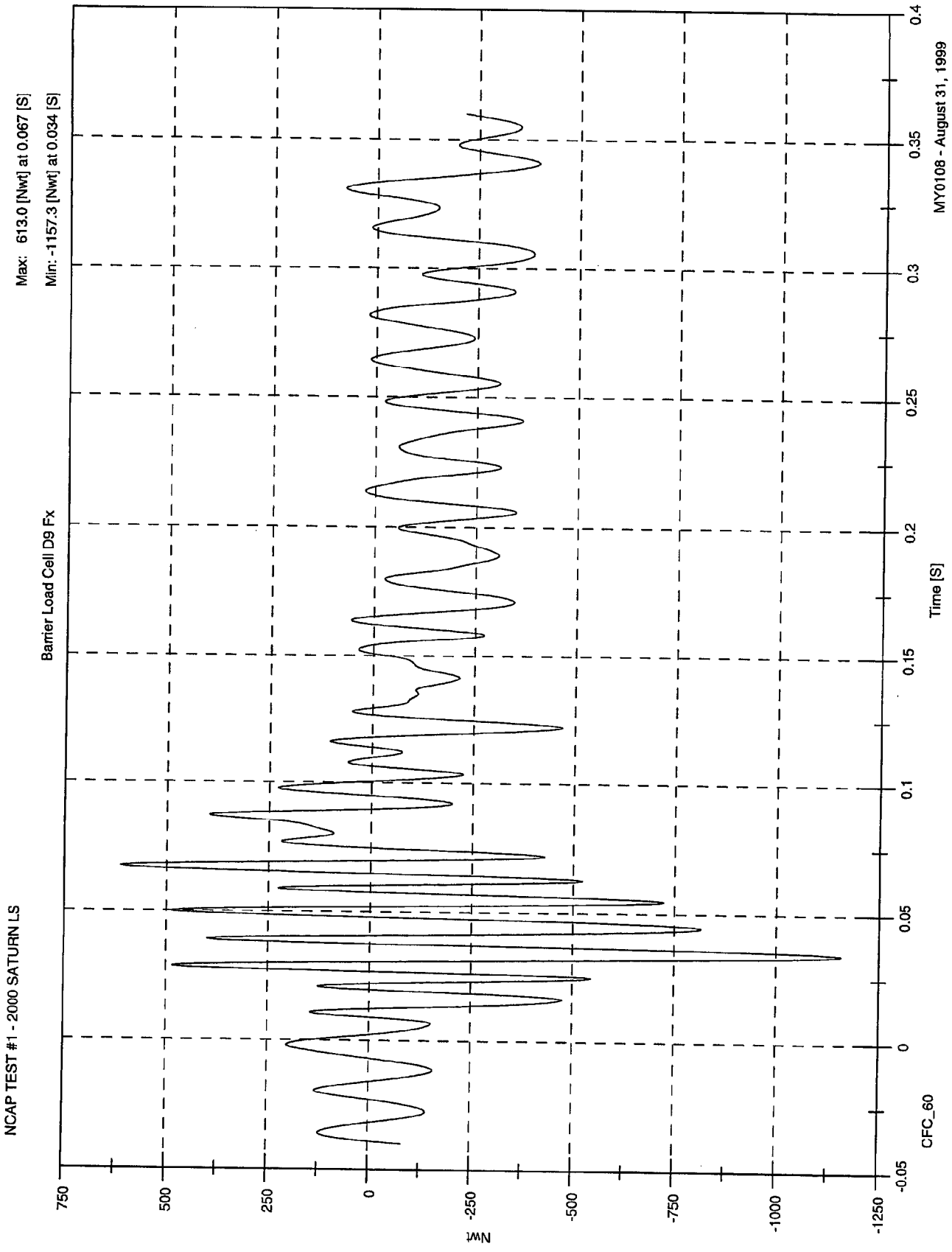

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D5 Fx
Max: 1796.8 [Nwt] at 0.065 [S]
Min: -699.7 [Nwt] at 0.025 [S]
2000
1500
1000
500
0
-500
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D6 Fx
Max: 5074.1 [Nwt] at 0.029 [S]
Min: -603.5 [Nwt] at 0.017 [S]
6000
5000
4000
3000
2000
1000
0
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

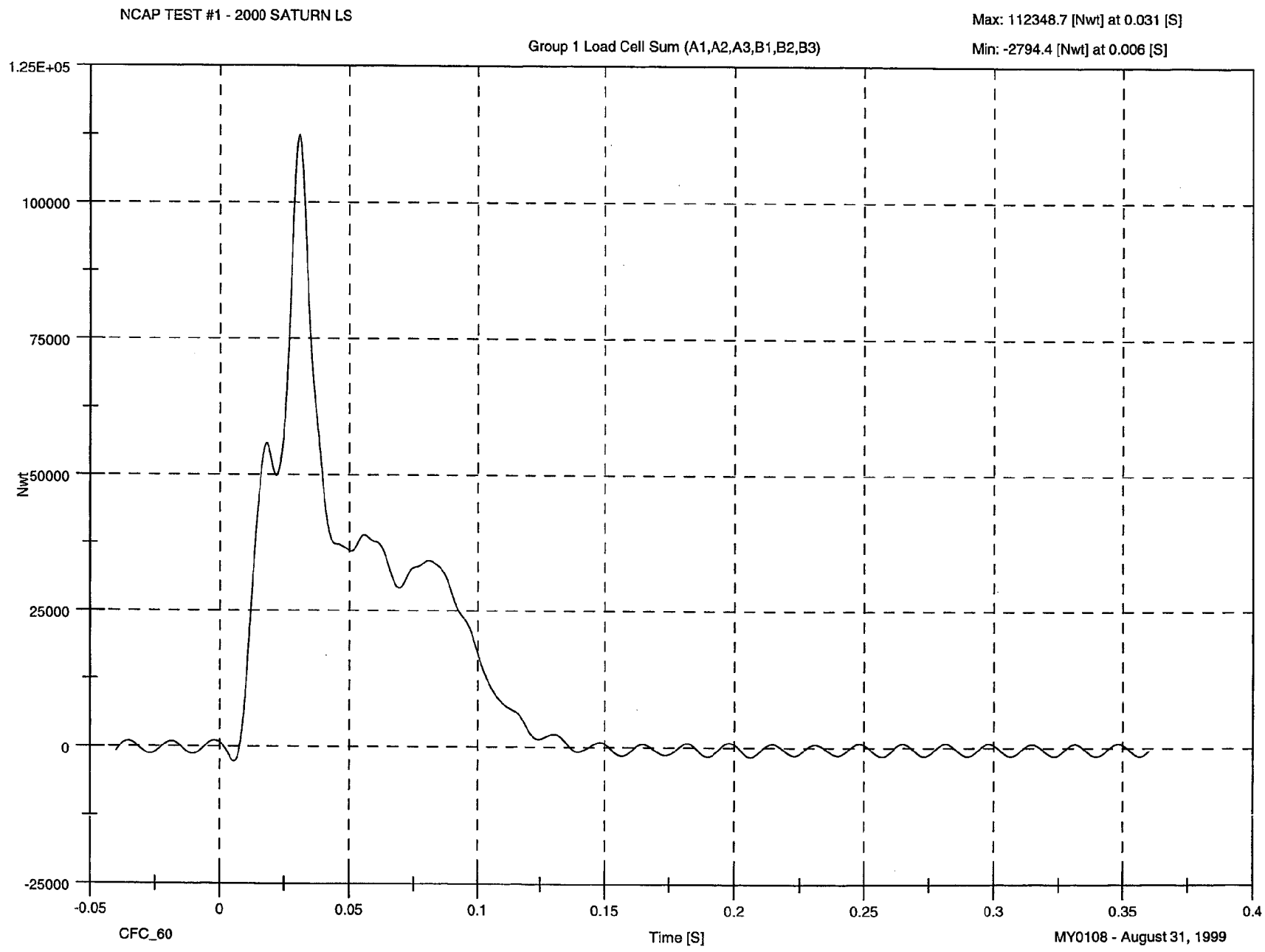

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D7 Fx
Max: 1467.3 [Nwt] at 0.041 [S]
Min: -152.8 [Nwt] at 0.054 [S]
MY0108 - August 31, 1999
CFC_60
Time [S]
Nwt
1500
1250
1000
750
500
250
0
-250
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

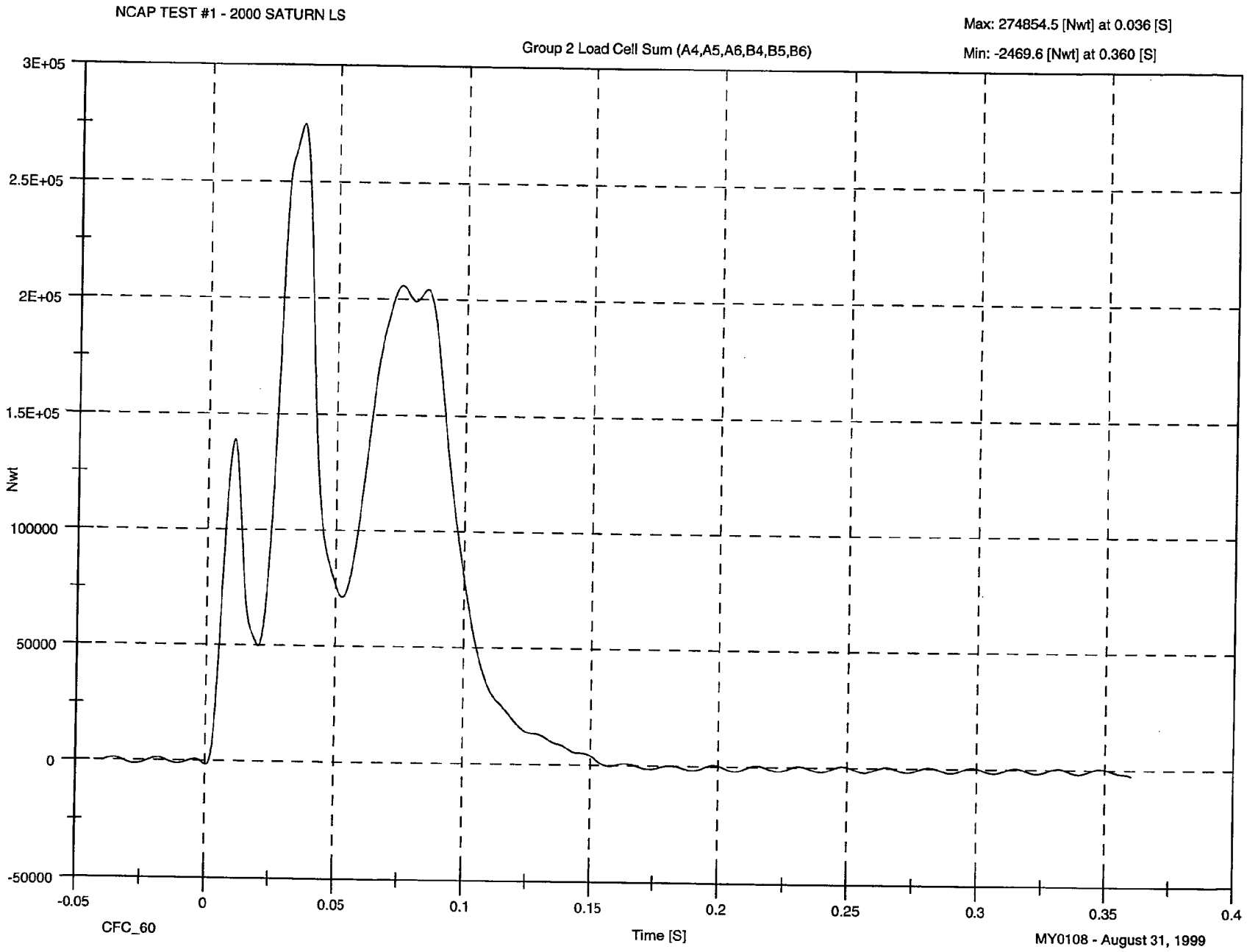
8413-39

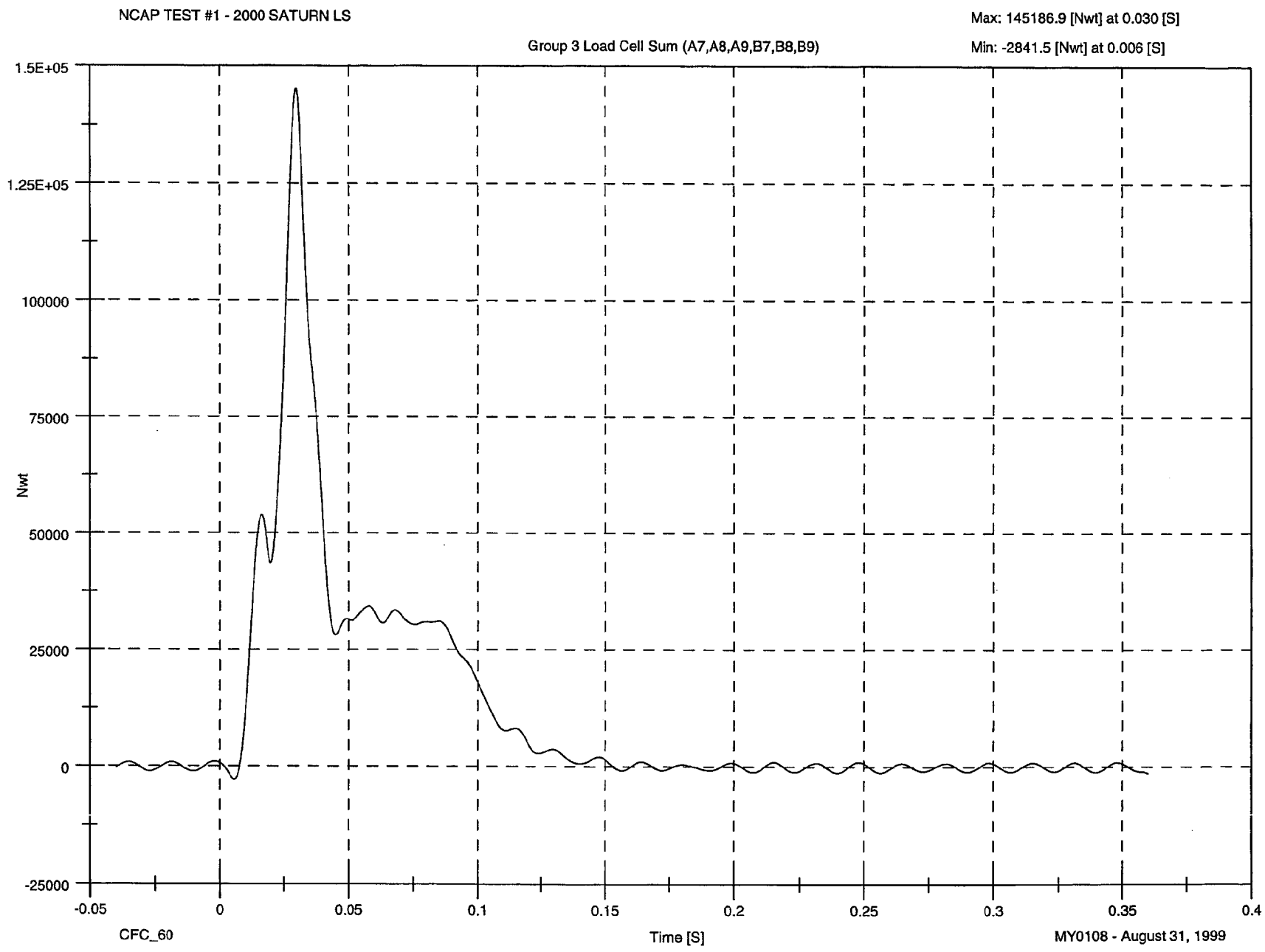

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D8 Fx
Max: 4728.4 [Nwt] at 0.041 [S]
Min: -409.8 [Nwt] at 0.016 [S]
5000
4000
3000
2000
1000
0
-1000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

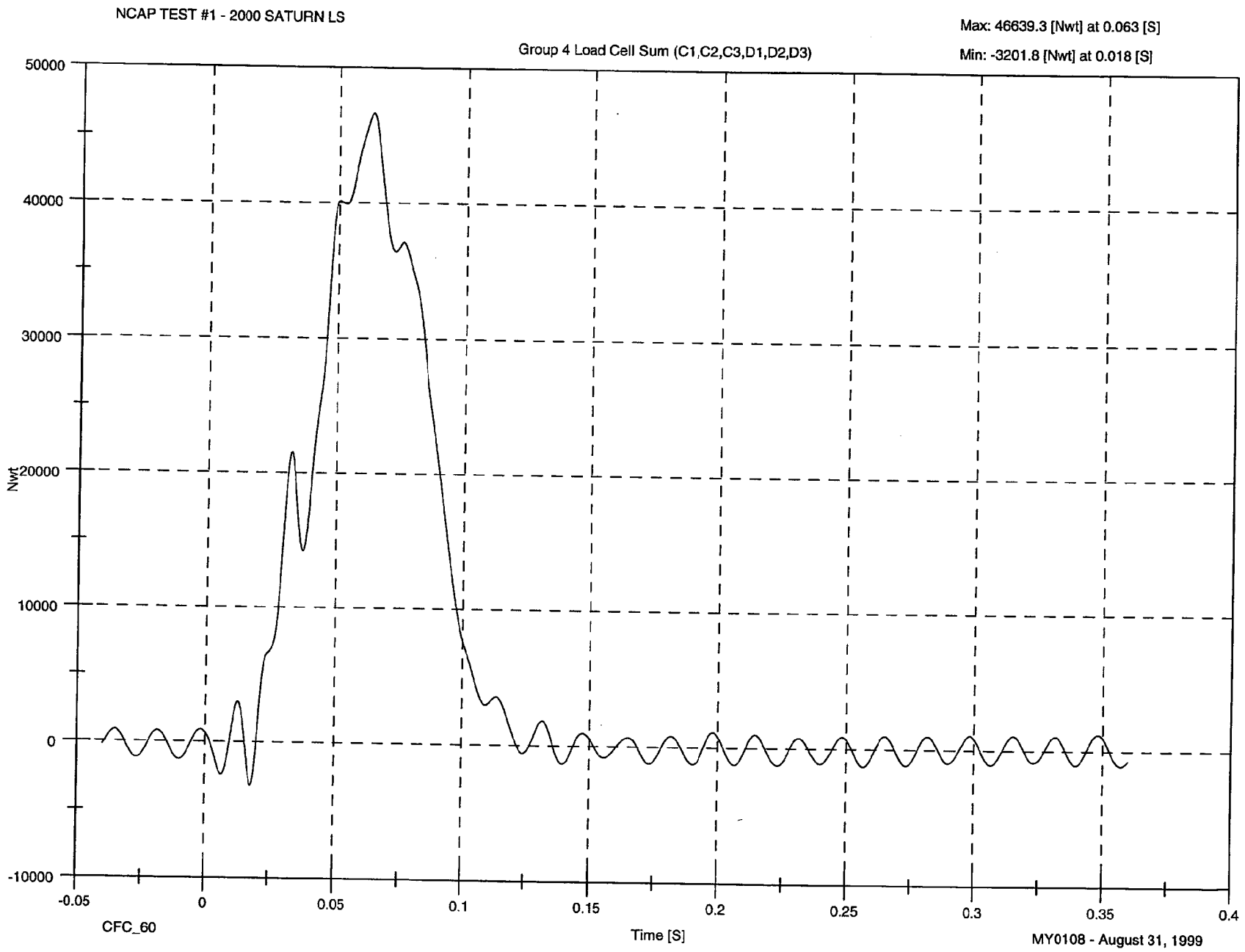

NCAP TEST #1 - 2000 SATURN LS
Barrier Load Cell D9 Fx
Max: 613.0 [Nwt] at 0.067 [S]
Min: -1157.3 [Nwt] at 0.034 [S]
MY0108 - August 31, 1999
CFC_60
Time [S]
Nwt
750
500
250
0
-250
-500
-750
-1000
-1250
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

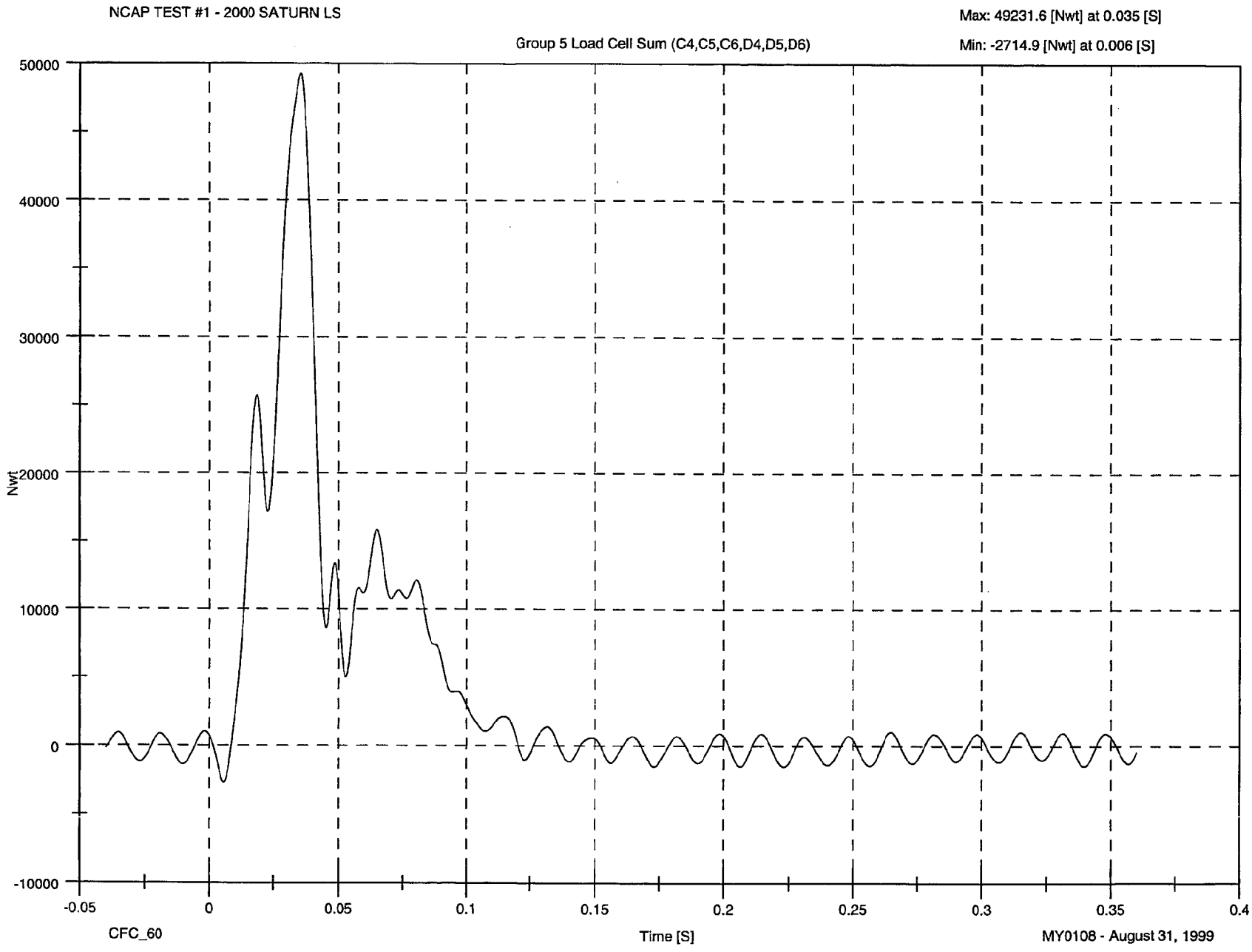
8413-39

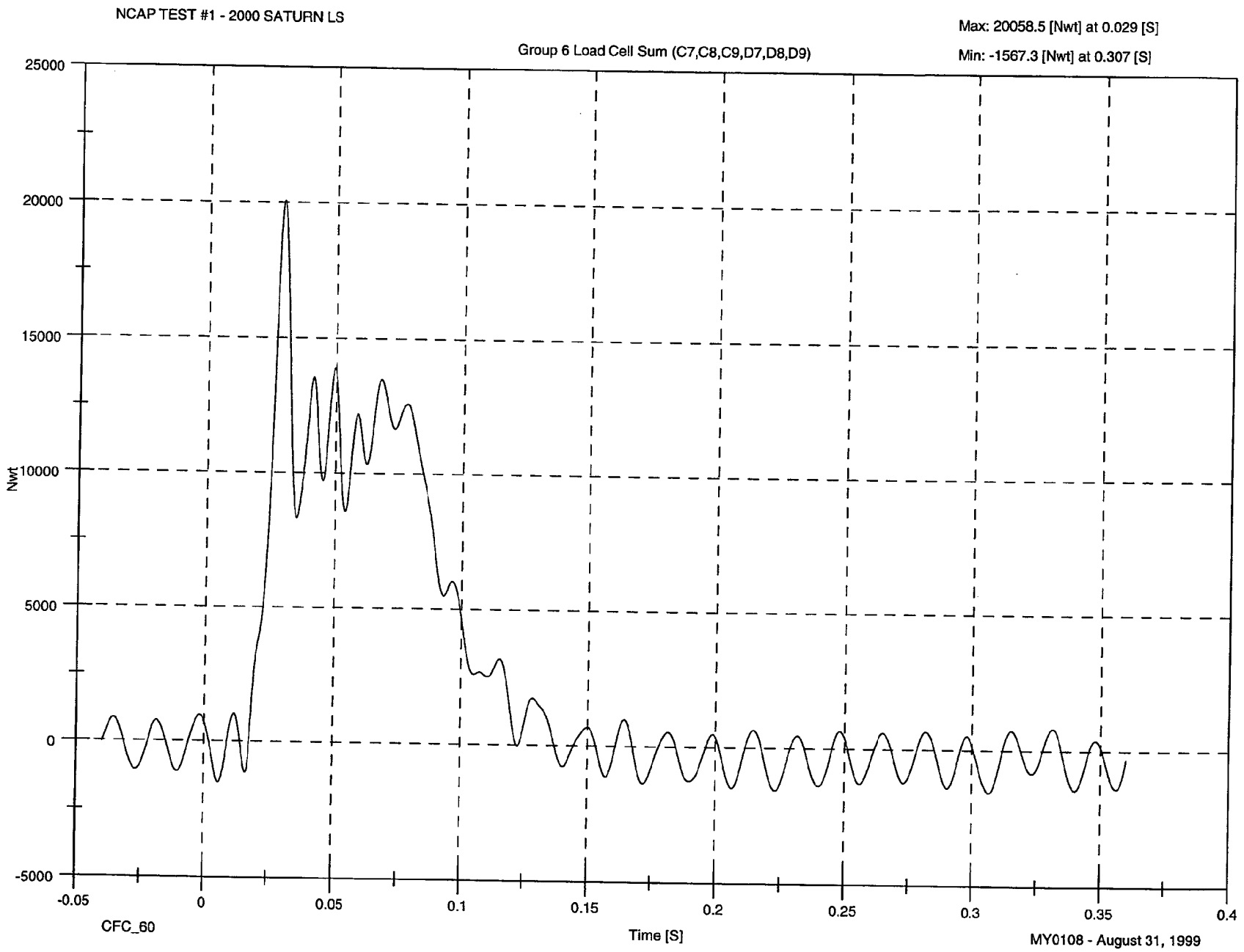

NCAP TEST #1 - 2000 SATURN LS
Group 1 Load Cell Sum (A1,A2,A3,B1,B2,B3)
Max: 112348.7 [Nwt] at 0.031 [S]
Min: -2794.4 [Nwt] at 0.006 [S]
1.25E+05
100000
75000
50000
25000
0
-25000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999

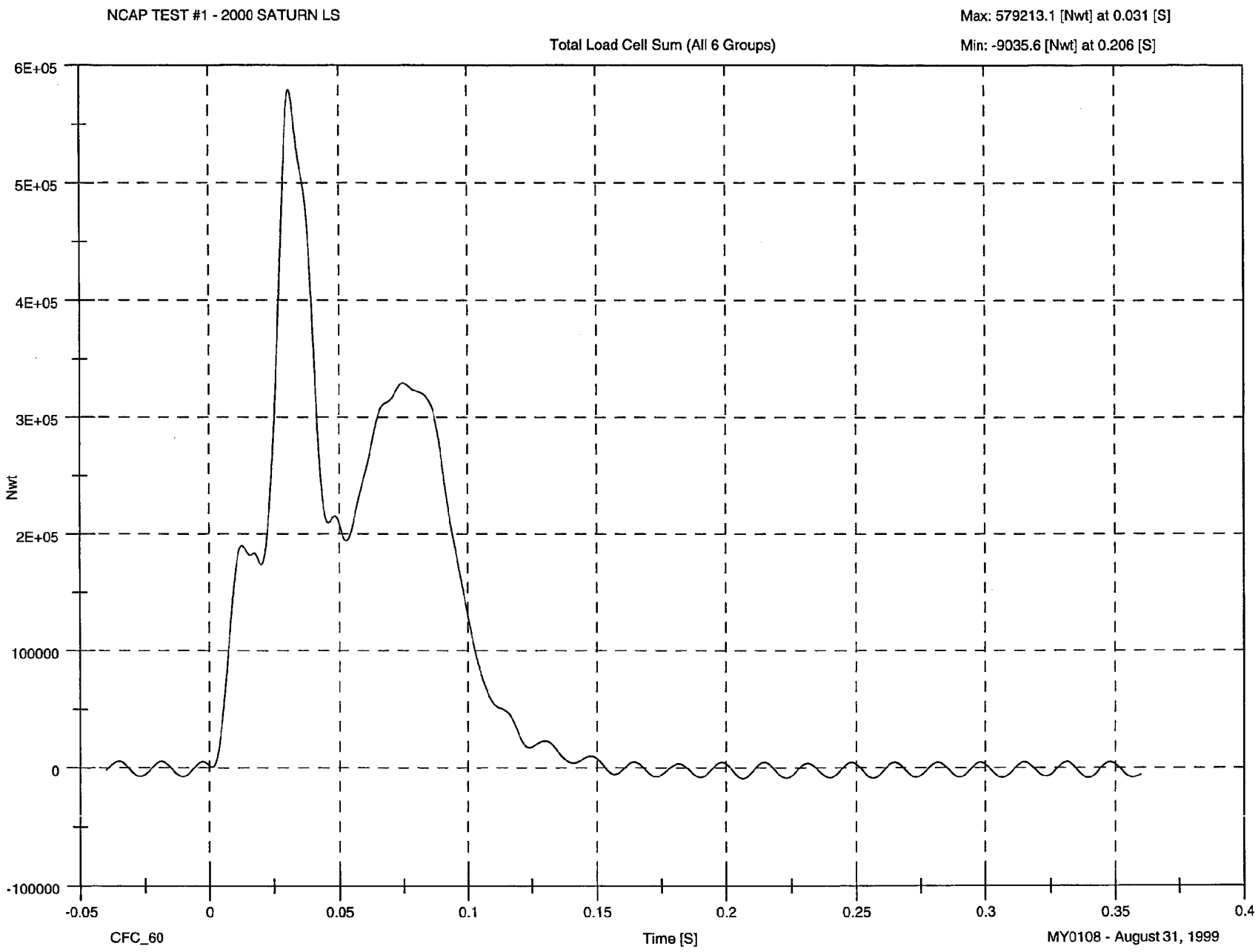

NCAP TEST #1 - 2000 SATURN LS
Group 2 Load Cell Sum (A4,A5,A6,B4,B5,B6)
Max: 274854.5 [Nwt] at 0.036 [S]
Min: -2469.6 [Nwt] at 0.360 [S]
3E+05
2.5E+05
2E+05
1.5E+05
100000
50000
0
-50000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Group 3 Load Cell Sum (A7,A8,A9,B7,B8,B9)
Max: 145186.9 [Nwt] at 0.030 [S]
Min: -2841.5 [Nwt] at 0.006 [S]
1.5E+05
1.25E+05
100000
75000
50000
25000
0
-25000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Group 4 Load Cell Sum (C1,C2,C3,D1,D2,D3)
Max: 46639.3 [Nwt] at 0.063 [S]
Min: -3201.8 [Nwt] at 0.018 [S]
50000
40000
30000
20000
10000
0
-10000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Group 5 Load Cell Sum (C4,C5,C6,D4,D5,D6)
Max: 49231.6 [Nwt] at 0.035 [S]
Min: -2714.9 [Nwt] at 0.006 [S]
50000
40000
30000
20000
10000
0
-10000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Group 6 Load Cell Sum (C7,C8,C9,D7,D8,D9)
Max: 20058.5 [Nwt] at 0.029 [S]
Min: -1567.3 [Nwt] at 0.307 [S]
25000
20000
15000
10000
5000
0
-5000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [S]
CFC_60
MY0108 - August 31, 1999


NCAP TEST #1 - 2000 SATURN LS
Max: 579213.1 [Nwt] at 0.031 [S]
Total Load Cell Sum (All 6 Groups)
Min: -9035.6 [Nwt] at 0.206 [S]
6E+05
5E+05
4E+05
3E+05
2E+05
100000
0
-100000
Nwt
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
CFC_60
Time [S]
MY0108 - August 31, 1999

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.

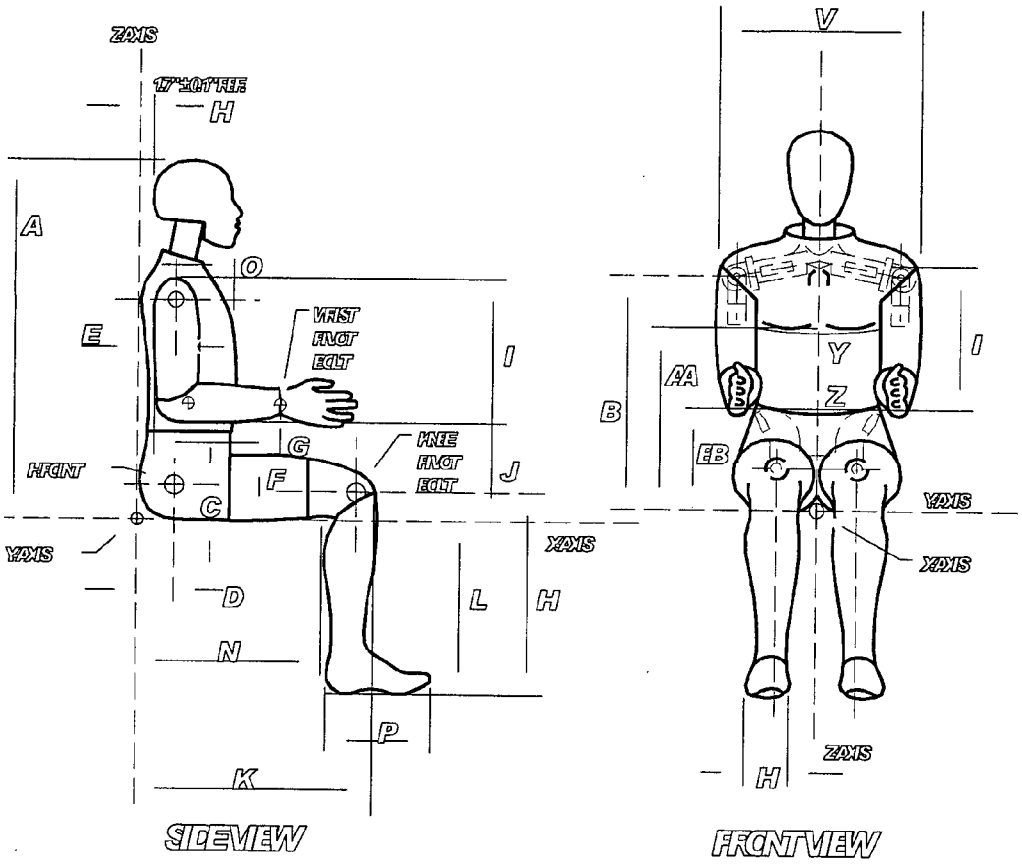
Dummy serial numbers and certification dates are:

Position No./Location	Serial No.	Completion Date
#1/Driver	061	August 18, 1999
#2/Right Front Passenger	064	August 18, 1999

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 free erect seated position. The curved lumbar does not allow the Hybrid III to take position in a perfect erect attitude. (REF. S572.3(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number	061
Sequential Test Number	4
Date	August 11, 1999
Workfile	061499.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	31
Peak Resultant Acceleration	225-275 G's	251.9
Peak Lateral Acceleration	15 G's Max	10.5
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061
Sequential Test Number	4
Date	August 11, 1999
Workfile	061499.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	32
Impact Velocity		22.60 - 23.40 Ft/s	22.67
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	24.45
	20 ms	17.60 - 22.60 G's	19.66
	30 ms	12.50 - 18.50 G's	15.42
Max Pendulum G's Above 30 ms		29 G's Max	15.42
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	39.00
D Plane Rotation	Max	64 - 78 Deg	72.51
	Time	57 - 64 ms	61.63
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	71.30
	Time	47 - 58 ms	53.50
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	120.63
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	103.25

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	4	
Date	August 11, 1999	6 Axis Neck Transducer
Workfile	061499.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	31
Impact Velocity		19.50 - 20.30 Ft/s	19.79
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.30
	20 ms	14.00 - 19.00 G's	16.53
	30 ms	11.00 - 16.00 G's	13.66
Max Pendulum G's Above 30 ms		22 G's Max	13.66
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	43.13
D Plane Rotation	Max	81 - 106 Deg	98.78
	Time	72 - 82 ms	73.63
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-57.85
	Time	65 - 79 ms	67.25
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	148.00
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	137.13

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	061
Sequential Test Number	4
Date	August 17, 1999
Workfile	061499.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	32
Pendulum Velocity	21.6 - 22.4 Ft/s	21.89
Maximum Deflection	2.50 - 2.86 in	2.70
Maximum Resistive Force	1160 - 1325 Lbs	1164.78
Internal Hysteresis	69 - 85 %	79.14

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	061
Sequential Test Number	4
Date	August 18, 1999
Workfile	061499.lf/rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	29
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1152
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	29
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1148

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number	061
Sequential Test Number	4
Date	August 16, 1999

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			32
Location for Chest Circumference	AA	16.9 -17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.4
Waist Circumference	Z	32.9 - 34.1 in	33.4
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	23.3
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	13.3
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	4
Date	August 11, 1999
Workfile	064499.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	31
Peak Resultant Acceleration	225-275 G's	265.1
Peak Lateral Acceleration	15 G's Max	3.5
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064
Sequential Test Number	4
Date	August 11, 1999
Workfile	064499.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	31
Impact Velocity		22.60 - 23.40 Ft/s	22.73
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	24.52
	20 ms	17.60 - 22.60 G's	20.77
	30 ms	12.50 - 18.50 G's	14.73
Max Pendulum G's Above 30 ms		29 G's Max	14.73
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.50
D Plane Rotation	Max	64 - 78 Deg	71.04
	Time	57 - 64 ms	57.50
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	76.47
	Time	47 - 58 ms	53.00
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.50
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.38

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	4	
Date	August 11, 1999	6 Axis Neck Transducer
Workfile	064499.nex	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	31
Impact Velocity		19.50 - 20.30 Ft/s	19.74
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.32
	20 ms	14.00 - 19.00 G's	17.64
	30 ms	11.00 - 16.00 G's	14.04
Max Pendulum G's Above 30 ms		22 G's Max	14.04
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	40.75
D Plane Rotation	Max	81 - 106 Deg	95.31
	Time	72 - 82 ms	72.13
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-54.19
	Time	65 - 79 ms	69.25
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	149.00
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	135.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	064
Sequential Test Number	4
Date	August 17, 1999
Workfile	064499.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	32
Pendulum Velocity	21.6 - 22.4 Ft/s	22.05
Maximum Deflection	2.50 - 2.86 in	2.62
Maximum Resistive Force	1160 - 1325 Lbs	1260.60
Internal Hysteresis	69 - 85 %	80.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	064
Sequential Test Number	4
Date	August 18, 1999
Workfile	064499.lf/rf

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	29
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1091.0
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	29
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1169.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 4
Date August 16, 1999

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			32
Location for Chest Circumference	AA	16.9 -17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	38.8
Waist Circumference	Z	32.9 - 34.1 in	33.3
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

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-AL553	6/99	12/99
	Y	ENDEVCO	AC-A83G	6/99	12/99
	Z	ENDEVCO	AC-C14901	6/99	12/99
Head	X (R)	ENDEVCO	AC-A13939	6/99	12/99
	Y (R)	ENDEVCO	AC-A14181	6/99	12/99
	Z (R)	ENDEVCO	AC-A14124	6/99	12/99
Neck Load Cell	X	DENTON	LC-205Fx	8/99	2/00
	Y	DENTON	LC-205Fy	8/99	2/00
	Z	DENTON	LC-205Fz	8/99	2/00
Neck Moment	X	DENTON	LC-205Mx	8/99	2/00
	Y	DENTON	LC-205My	8/99	2/00
	Z	DENTON	LC-205Mz	8/99	2/00
Chest	X	ENDEVCO	AC-FP90	6/99	12/99
	Y	ENDEVCO	AC-A26A	6/99	12/99
	Z	ENDEVCO	AC-AL6H7	6/99	12/99
Chest	X (R)	ENDEVCO	AC-B11407	6/99	12/99
	Y (R)	ENDEVCO	AC-B11408	6/99	12/99
	Z (R)	ENDEVCO	AC-B10827	6/99	12/99
Chest Deflection Gauge		SERVO	DS-061	8/99	2/00
Hybrid III Use Only					
Pelvic	X	ENDEVCO	AC-ADMB8	6/99	12/99
	Y	ENDEVCO	AC-ADL44	6/99	12/99
	Z	ENDEVCO	AC-ACT12	6/99	12/99

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-418	3/99	9/99
Right Femur Load Cell		GSE	LC-420	3/99	9/99
Left Upper Tibia	Mx	DENTON	LC-045Mx	3/99	9/99
	My	DENTON	LC-045My	3/99	9/99
Left Lower Tibia	Fz	DENTON	LC-125Fz	3/99	9/99
	Mx	DENTON	LC-125Mx	3/99	9/99
	My	DENTON	LC-125My	3/99	9/99
Right Upper Tibia	Mx	DENTON	LC-038Mx	3/99	9/99
	My	DENTON	LC-038My	3/99	9/99
Right Lower Tibia	Fz	DENTON	LC-124Fz	3/99	9/99
	Mx	DENTON	LC-124Mx	3/99	9/99
	My	DENTON	LC-124My	3/99	9/99
Left Foot Front	Z	ENDEVCO	AC-A12776	6/99	12/99
Left Foot Rear	X	ENDEVCO	AC-A13565	6/99	12/99
	Z	ENDEVCO	AC-BB51	5/99	11/99
Right Foot Front	Z	ENDEVCO	AC-A13926	6/99	12/99
Right Foot Rear	X	ENDEVCO	AC-A14342	6/99	12/99
	Z	ENDEVCO	AC-A14246	6/99	12/99
Lap Belt Load Cells		LEBOW	LC-706	3/99	9/99
Shoulder Belt Load Cells		LEBOW	LC-707	3/99	9/99
Spool-Out Potentiometer		-	-	-	-
Belt Stretch Transducer		CAL	DS-E3	8/99	2/00

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-AD4A9	7/99	1/00
	Y	ENDEVCO	AC-AE8T7	7/99	1/00
	Z	ENDEVCO	AC-AF5R1	7/99	1/00
Head	X (R)	ENDEVCO	AC-A13924	7/99	1/00
	Y (R)	ENDEVCO	AC-A13827	7/99	1/00
	Z (R)	ENDEVCO	AC-A13921	7/99	1/00
Neck Load Cell	X	DENTON	LC-440Fx	8/99	2/00
	Y	DENTON	LC-440FY	8/99	2/00
	Z	DENTON	LC-440FZ	8/99	2/00
Neck Moment	X	DENTON	LC-440MX	8/99	2/00
	Y	DENTON	LC-440MY	8/99	2/00
	Z	DENTON	LC-440MZ	8/99	2/00
Chest	X	ENDEVCO	AC-A08A	7/99	1/00
	Y	ENDEVCO	AC-ADL42	7/99	1/00
	Z	ENDEVCO	AC-A28F	7/99	1/00
Chest	X (R)	ENDEVCO	AC-A14077	7/99	1/00
	Y (R)	ENDEVCO	AC-A13882	7/99	1/00
	Z (R)	ENDEVCO	AC-ACCW0	7/99	1/00
Chest Deflection Gauge		SERVO	DS-064	8/99	2/00
Hybrid III Use Only					
Pelvic	X	ENDEVCO	AC-AF480	7/99	1/00
	Y	ENDEVCO	AC-AC2M6	7/99	1/00
	Z	ENDEVCO	AC-AF5C1	7/99	1/00

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell		GSE	LC-954	3/99	9/99
Right Femur Load Cell		GSE	LC-955	3/99	9/99
Left Upper Tibia	Mx	DENTON	LC-016Mx	3/99	9/99
	My	DENTON	LC-016My	3/99	9/99
Left Lower Tibia	Fz	DENTON	LC-123Fz	3/99	9/99
	Mx	DENTON	LC-123Mx	3/99	9/99
	My	DENTON	LC-123My	3/99	9/99
Right Upper Tibia	Mx	DENTON	LC-015Mx	3/99	9/99
	My	DENTON	LC-015My	3/99	9/99
Right Lower Tibia	Fz	DENTON	LC-122Fz	3/99	9/99
	Mx	DENTON	LC-122Mx	3/99	9/99
	My	DENTON	LC-122My	3/99	9/99
Left Foot Front	Z	ENDEVCO	AC-A13498	6/99	12/99
Left Foot Rear	X	ENDEVCO	AC-A13492	6/99	12/99
	Z	ENDEVCO	AC-A13513	6/99	12/99
Right Foot Front	Z	ENDEVCO	AC-A14312	6/99	12/99
Right Foot Rear	X	ENDEVCO	AC-A14372	6/99	12/99
	Z	ENDEVCO	AC-A13506	6/99	12/99
Lap Belt Load Cells		LEBOW	LC-711	3/99	9/99
Shoulder Belt Load Cells		LEBOW	LC-712	3/99	9/99
Spool-Out Potentiometer		-	-	-	-
Belt Stretch Transducer		CAL	DS-E6	8/99	2/00

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember	ICS	AC-X92	5/99	11/99
Right Rear Seat Crossmember	ICS	AC-D74	7/99	1/00
Top of Engine	ICS	AC-D87	1/99	7/99
Bottom of Engine	ENDEVCO	AC-J18570	6/99	12/99
Right Disc Brake Caliper	ENDEVCO	AC-APBD9	3/99	9/99
Instrument Panel	ENDEVCO	AC-BA80	5/99	11/99
Left Disc Brake Caliper	ENDEVCO	AC-APBD7	4/99	10/99
Left Seat Rear Crossmember (R)	ICS	AC-D85	7/99	1/00
Right Seat Rear Crossmember (R)	ICS	AC-Y17	5/99	11/99