REPORT NUMBER: CAL-90-N23

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

JEEP EAGLE CORPORATION
1990 CHEROKEE 4-WHEEL DRIVE
4-DOOR M.P.V.

NHTSA NUMBER: ML0303

CALSPAN TEST NUMBER: 7776-23

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June 12, 1990

FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
Office of Market Incentives
400 Seventh Street, S.W.
Room No. 5313 (NRM-20)
Washington, DC 20590

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15. Supplementary Notes

16. Abstract

A frontal load cell barrier test of a 1990 Jeep Cherokee M.P.V. was performed at the Calspan Advanced Technology Center crash test facility in Buffalo, New York on June 12, 1990.

The impact speed was 35.0 mph and the ambient temperature at the barrier face at the time of the impact was 77°F. The maximum post-test vehicle crush was 21.1 inches. The test vehicle was equipped with a 3-point continuous restraint system at each of the front outboard seating positions.

With regard to FMVSS 208 - "Occupant Crash Protection," injury criteria, both the driver and the passenger appear to comply with the head, chest and femur requirements.

17. Key Words	18. Distribution Statement
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PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY 90 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-87-D-02012. 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 30 mph requirements.

The 35 mph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test procedure.

SUMMARY OF TEST NUMBER ML0303

A load cell barrier consisting of 36 load cells was impacted by a 1990 Jeep Cherokee 4-Door M.P.V. at a velocity of 35.0 mph. The test was performed at the Calspan Corporation Advanced Technology Center on June 12, 1990. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 15 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572, 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 and chest triaxial accelerometers and right/left femur load cells. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial No. 45) and the right-front passenger ATD (Serial No. 150) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 81 channels of data were recorded on six 14-channel FM tape recorders. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Channels #72 - Position #1 Upper Neck Fz and channel #81 - Position #2 Upper Neck Mz did not record accurately. Channel #32 - Vehicle Accelerometer #6 did not record accurately. Channel #55 - Load Cell C4 did not record accurately. This load cell was not used in load cell summations.

The driver's head struck the steering wheel rim and hub; the HIC was 942.9. The maximum chest deceleration over 3 milliseconds was 57.8 g's and femur loads were 784.9 and 1277.1 pounds.

The right front passenger's HIC was 840.7 and maximum chest deceleration over 3 milliseconds was 52.0 g's. Femur loads were 1218.3 and 692 pounds.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1990 Jeep Cherokee 4-Wheel Drive M.P.V.

NHTSA No.: ML0303 VIN.: 1J4FJ28L4LL179240

Body Color: Tan Date Of Manufacture: November 1989

Engine: 6 Cylinders; - C.I.D.; 4 Liters; - CC
X Gas; - Diesel; - Turbocharged
X Longitudinal; - Transverse

Transmission: 5 Speed; X Manual; - Automatic; X Overdrive

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

Date Received: 2-1-90 Odometer Reading: 37 miles

- A/C; X P/S; X P/B; - P/wdo.; - Tilt Wheel
- P/seats; - Cruise Control

Type of Occupant Restraint: 3-Point Continuous Loop

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 33 psi, Rear 33 psi

Recommended Tire Size: P195/75R-15

Recommended Cold Tire Pressure: Front 33 psi, Rear 33 psi

Tires on Vehicle: P205/75R-15; Manufacturer: Michelin

Number of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 TOTAL

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

Type of Front Seat Back: - Fixed; X Adj. With X Lever - Rot. Knob

Rated Cargo and Luggage
Weight (RCLW) A-B = 300 lbs.

GVWR 4900 lbs. GAWR: Front 2500 lbs. Rear 2700 lbs.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front = 960 lbs. Right Rear = 700 lbs.

Left Front = 890 lbs. Left Rear = 720 lbs.

TOTAL FRONT WEIGHT = 1850 lbs. (57 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1420 lbs. (43 % of Total Vehicle Weight)

TOTAL DELIVERY WEIGHT = 3270 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (3270 lbs.)

RCLW = VCW - 150 (DSC) = 300 lbs.

Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)

Target Test Weight = 3898 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 302 POUNDS CARGO:

Right Front = 1030 lbs. Right Rear = 930 lbs.

Left Front = 1020 lbs. Left Rear = 920 lbs.

TOTAL FRONT WEIGHT = 2050 lbs. (53 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1850 lbs. (47 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 3900 lbs.

Weight of ballast secured in vehicle trunk area = 50 lbs.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 30.6 LF 30.9 RR 30.1 LR 29.9

Test Attitude: RF 30.2 LF 30.6 RR 27.9 LR 28.5

Wheel Base: 101.3 in.; C.G. = 47.6 in. rearward of front wheel C/L

Remarks: 18.8 gallons of stoddard solution was placed in the fuel tank.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0°

Date of Test: June 12, 1990 Time of Test: 13:50

Ambient Temperature: 77 °F at impact area

Temperature in Occupant Compartment: 70 °F

Windshield Molding Temperature: 70 °F

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: primary = 35.0 mph, secondary = 35.0 mph

Distance From Front Bumper to Barrier Face When

Entering Speed Trap: 52 inches

Exiting Speed Trap: 12 inches

VEHICLE REBOUND AND CRUSH (inches):

Vehicle Length:	Pre-test	= R	164.0	C_L	165.1	L 163.6
	Post-test	= R	145.5	C_L	144.0	L 145.7
	Crush	= R	18.5	C_L	21.1	L 17.9

Distance from front of test vehicle to point of impact:

R 12.6" C_L 12.8" L 12.9"

VISIBLE DUMMY CONTACT POINTS:

	Driver	Passenger
Head	Upper Steering Rim	Dash Panel and Right Knee
Chest	Lower Steering Rim	No Contact
Abdomen	Lower Steering Rim	No Contact
Left Knee	Dash Panel	Dash Panel
Right Knee	Dash Panel	Dash Panel

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	Front		Rear	
	Left	Right	Left	Right
Door Opening	Not operable	Not operable	Not operable	operable

	Front		Rear	
Seat Movement	Left	Right	Left	Right
Seat Back Failure	none	none	-	-
Seat Shift (in.)	0.0	0.0	-	-

Glazing Damage

Backlight/Windshield: Sustained stress cracks, but remained intact.

Occupant and Vehicle Information

I. OMI DATA

1. Dummy Injury Criteria Data Summary
2. Dummy Positioning Data
3. Seat Belt Positioning Data
4. Seat Belt Performance Assessment Data
5. Driver Dummy to Steering Column Dimensions
6. Camera Locations
7. Vehicle Target Locations

II. OVR DATA

1. Load Cell Barrier Data
2. Vehicle Accelerometer Data
3. Test Vehicle Measurements

Table 2

DUMMY INJURY CRITERIA VALUES

NHTSA No.: ML0303 Vehicle: 1990 Jeep Cherokee 4-Wheel Drive M.P.V.

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-183.8	-28.1	41	186.8
Position #2 - Passenger	-102.5	9	58.5	109.8

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	- 71.4	-14.8	24.1	57.8
Position #2 - Passenger	-52.3	10.1	-22.1	52.0

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

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Position #1 - Driver	784.9	1277.1
Position #2 - Passenger	1218.3	692

	MAXIMUM FORCE - SEAT BELT LOADS (lbs.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	1619.1	-	1771.2
Position #2 - Passenger	1702.9	1891.3	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t_1 (SEC)	t_2 (SEC)	Average Acceleration t_1 TO t_2
Position #1 - Driver	942.9	.05482	.09007	59.0
Position #2 - Passenger	840.7	.06817	.10417	55.9

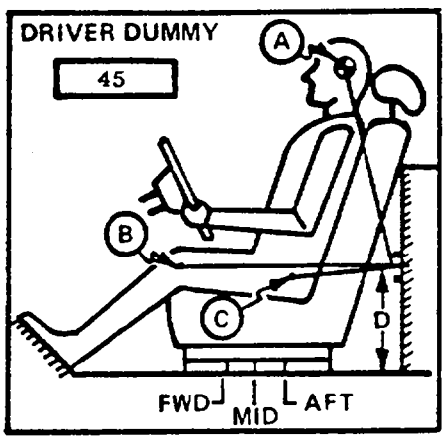
HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 36 milliseconds.

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION

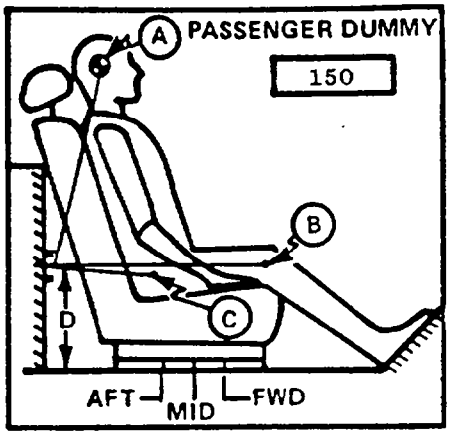
Test No.: ML0303 Vehicle: 1990 Jeep Cherokee 4-Wheel Drive M.P.V.

SEAT TYPE:	ADJUSTER TYPE:	BUCKET SEAT BACK TYPE:
___–___ Bench	___X___ Manual	___–___ Fixed
___X___ Bucket	___–___ Power	___X___ Adjustable Reclining
___–___ Split Bench		

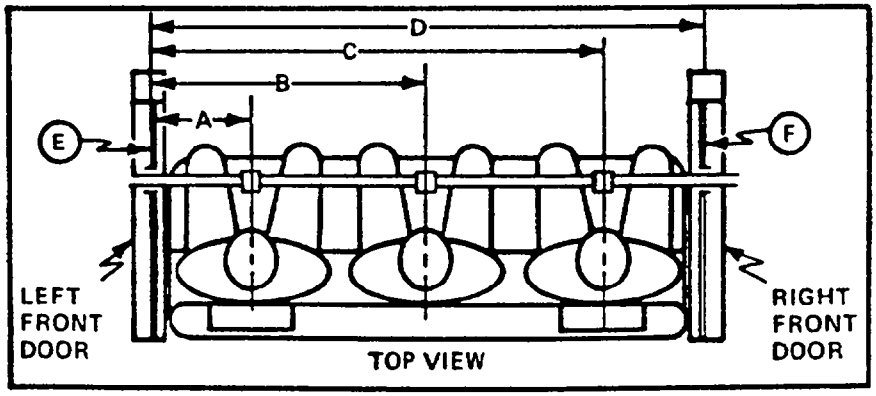


MEASUREMENT LOCATION

A – Head Target
B – Knee Joint
C – Approximate 'H' Point
D – Sill to Reference Point



A =	20.2 in.	8 Degrees	A =	20.5 in.	7 Degrees
B =	23.5 in.	92 Degrees	B =	24.7 in.	92 Degrees
C =	6.3 in.	135 Degrees	C =	5.9 in.	136 Degrees
D =	14.5 in.		D =	14.5 in.	

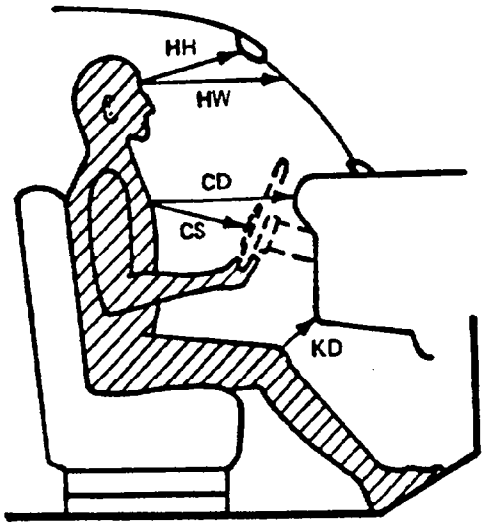


	DUMMY ID	
	45	150
A = Left Door to Driver Centerline		13.1 in.
B = Left Door to Center Passenger Centerline		– in.
C = Left Door to Right Passenger Centerline		42.0 in.
D = Left Door to Right Door		55.5 in.
E,F = Window Glass Height (Right and Left Must Be Equal)		10.0 in.

Figure 2

OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	16.4	16.2
HW	21.4	20.9
CD	21.4	21.9
CS	10.1	–
KDL	3.2	3.9
KDR	3.4	4.3
SA	See Note	See Note
TA	23°	23°



HH = Head to Windshield Header

HW = Head to Windshield

CD = Chest to Dash

CS = Chest to Steering Wheel

KD(L/R) = Knee to Dash (Left/Right)

SA = Seat Back Angle

TA = Torso Angle

HA = Head Target to "A" Pillar

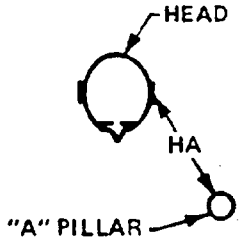
HR = Head to Side Roof

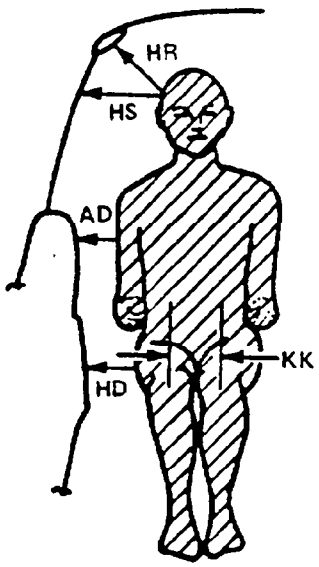
HS = Head to Side Window

AD = Arm to Door

HD = Hip to Door

KK = Knee to Knee



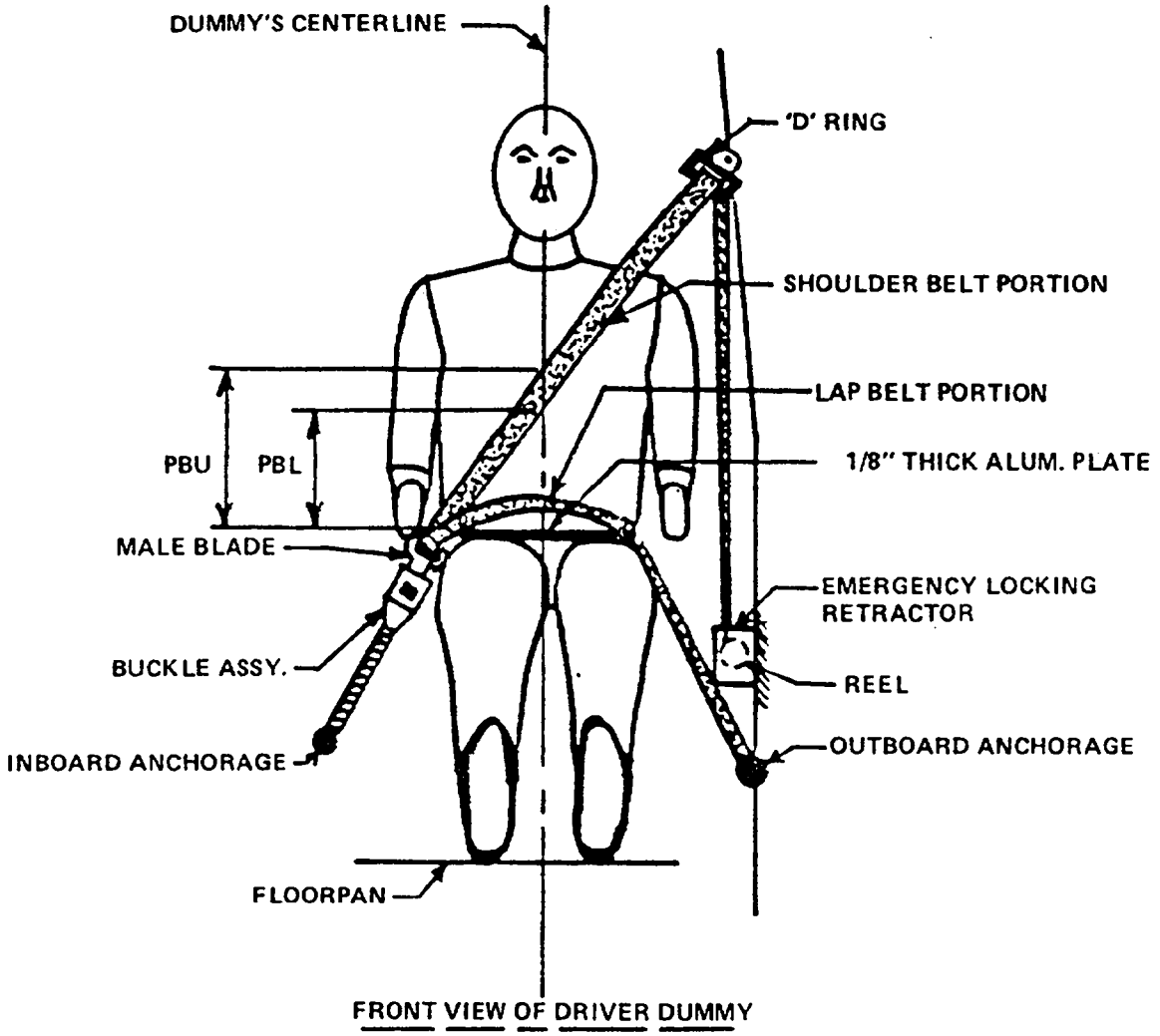


	DRIVER	PASSENGER
HR	8.1	8.6
HS	10.2	10.6
AD	3.6	3.7
HD	6.9	6.5
KK	7.2	7.1
HA	20.2	20.2

Note: Seat angle was positioned as specified by manufacturer.

Figure 3

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
PBU -- Top surface of alum. plate to upper edge	12.8	12.8
PBL -- Top surface of alum. plate to belt lower edge	10.0	10.0
LAP BELT TENSION	2 lbs.	2 lbs.
SHOULDER BELT TENSION	-	-

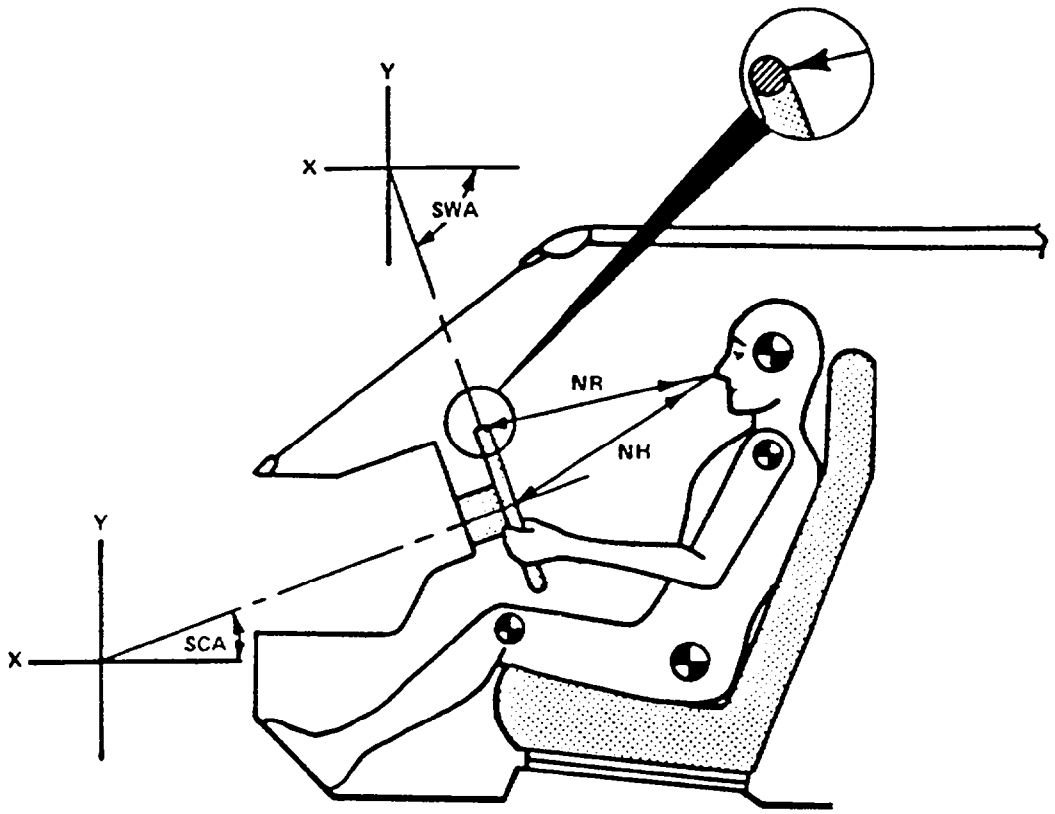
Table 3

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.	82.0"	83.0"
Shoulder belt length as measured on Part 572 Dummy.	31.0"	31.0"
Lap belt length as measured on Part 572 Dummy.	27.0"	28.0"
SHOULDER BELT SPOOL-OFF DATA:		
As determined by film analysis.	2.0"	1.5"
As determined mechanically.	2.0"	1.8"
As determined electronically.	3.5"	2.6"
BELT STRETCH DATA:		
Measured electronically between shoulder belt load cell and the "D" ring.	1.1 in/ft	0.5 in/ft
Measured mechanically	0.5 in/ft	0.5 in/ft

Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



LEFT SIDE VIEW

	MEASUREMENTS	
NR -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	13.8	Inches
NH -- Distance from tip of dummy's nose to center of steering column hub	13.8	Inches
SCA -- Angle of steering column relative to the horizontal X axis	22.0	Degrees
SWA -- Angle of steering wheel relative to the horizontal X axis	-68.0	Degrees

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

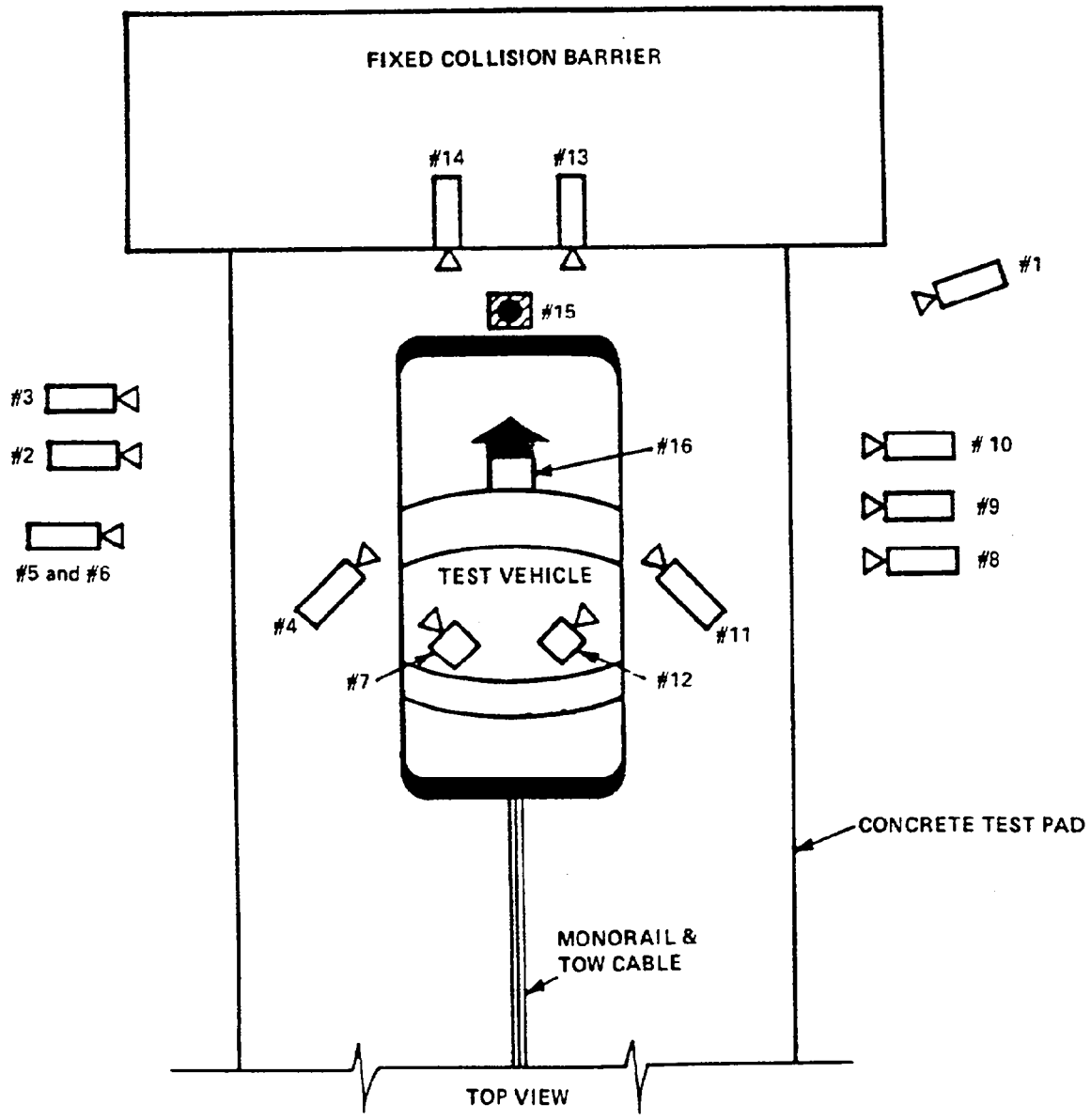


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Table 4

HIGH-SPEED CAMERA LOCATIONS

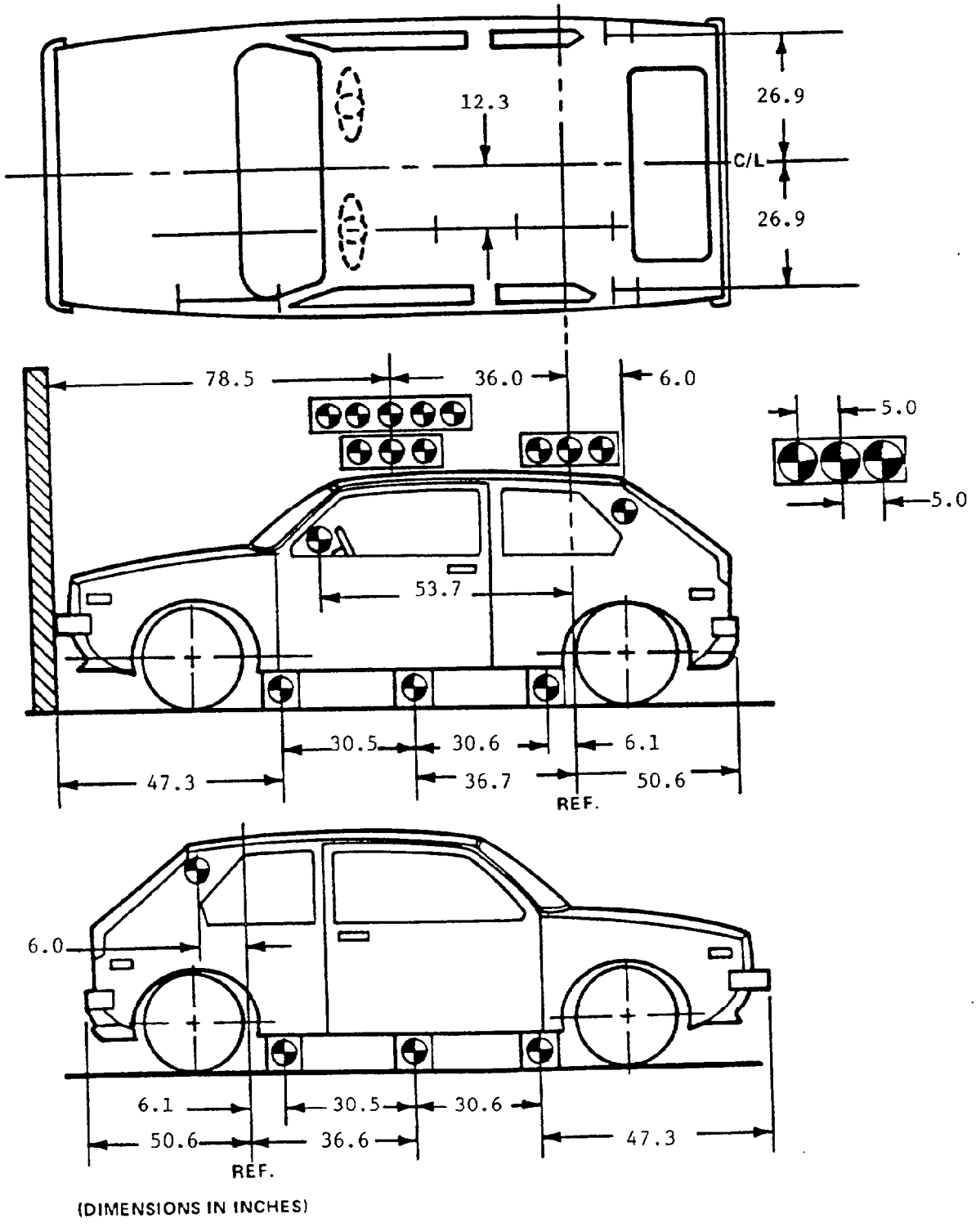
Test No. ML0303 Vehicle: 1990 Jeep Cherokee 4-Wheel Drive M.P.V.

CAMERA NO.	VIEW	CAMERA POSITIONS (in)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEEI (fps
1	Real-Time Camera	–	–	–	–	–	–	24
2	Overall Left Side	271	54	41	-4	199	13	540
3	Left Side View	296	30	41	-4	278	25	540
4	Driver and Interior View	104	97	76	-18	86	13	620
5	Steering Column (Bottom)	277	70	46	-4	259	25	560
6	Steering Column (Top)	277	70	70	-9	259	25	560
7	Left Belt	–	–	–	–	–	8	550
8	Overall Right Side	224	57	42	-3	206	13	790
9	Right Side View	289	38	41	-2	271	25	770
10	Right Passenger View	264	57	58	-4	246	35	695
11	Passenger and Interior View	111	93	72	-18	93	25	655
12	Right Belt	–	–	–	–	–	8	460
13	Passenger Front View	24	-5	73	-38	–	13	530
14	Driver Front View	24	-5	73	-36	–	13	530
15	Windshield View	0	0	126	-45	–	13	500
16	Pit View of Engine	0	32	-120	90	–	13	740

*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plan to ground
** = referenced to horizontal plane

Figure 6

VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

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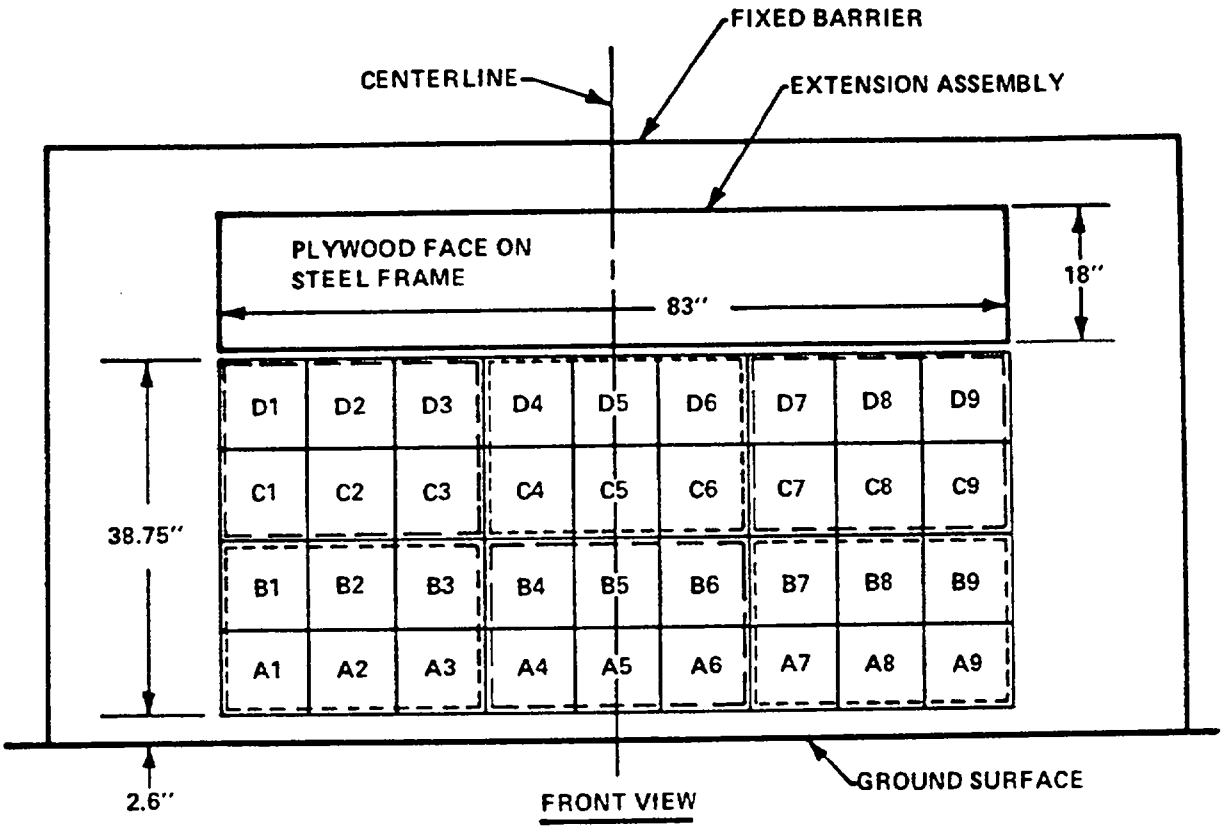
Figure 7

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:

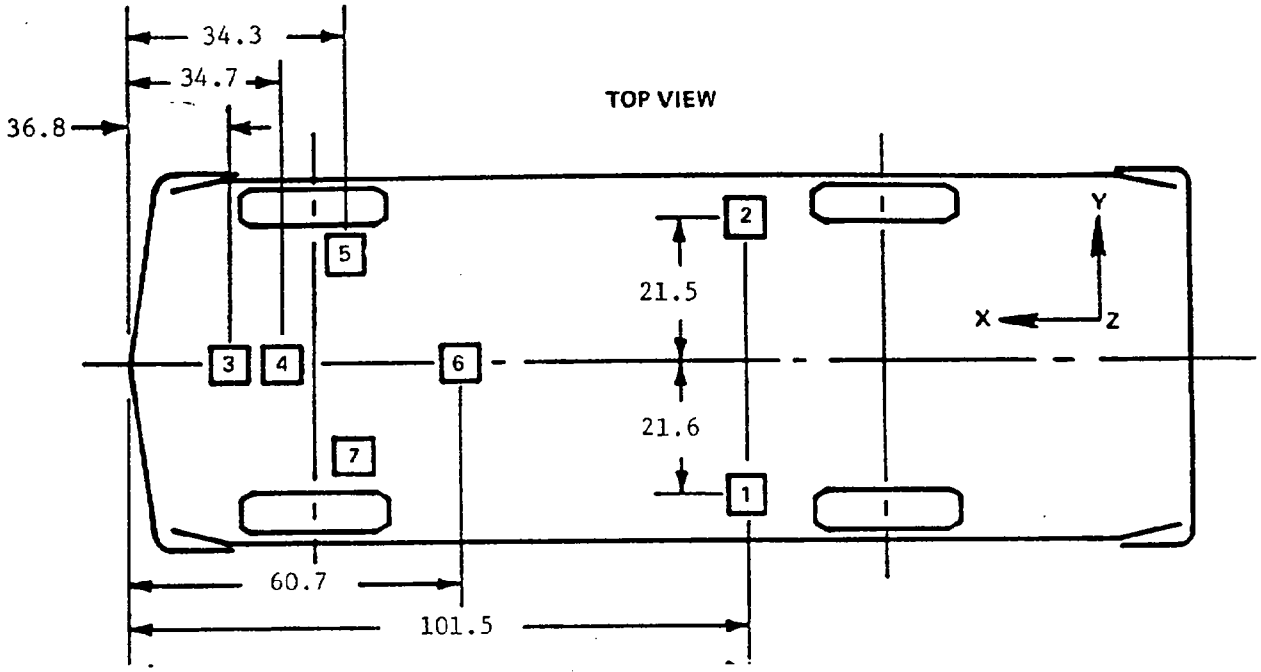
(1) Data from 36 individual load cells

(2) Total or Sum of 36 individual load cells

(3) Data from 6 Groupings shown above (6 cells/group)

Figure 8

VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Left Rear Seat Crossmember	X		
2	Right Rear Seat Crossmember	X		
3	Top of Engine	X		
4	Bottom of Engine	X		
5	Right Disc Brake Caliper	X		
6	Instrument Panel	X		
7	Left Disc Brake Caliper	X		

*The accelerometer pack number can be correlated with the vehicle response data traces found in Appendix B.

Figure 9

TEST VEHICLE MEASUREMENTS

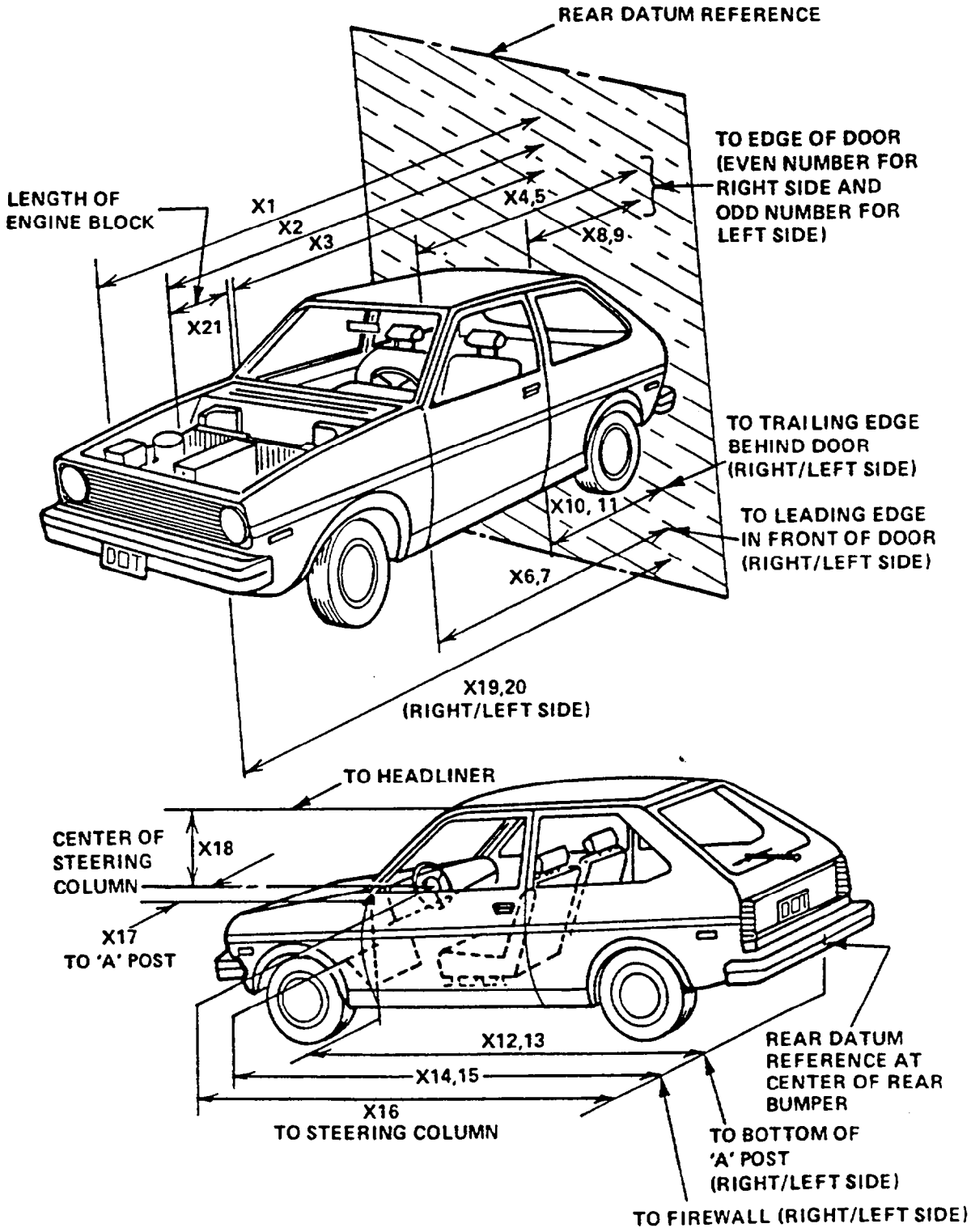


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Table 5

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	165.1	144.0	21.1
X2	Rear Surface of Vehicle to Front of Engine	148.2	136.9	11.3
X3	Rear Surface of Vehicle to Firewall	121.5	115.2	6.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	112.9	113.2	-0.3
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	112.5	113.0	-0.5
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	112.9	111.3	1.6
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	112.3	111.6	0.7
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	73.0	75.4	-2.4
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	72.6	74.5	-1.9
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	74.3	73.2	1.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	73.6	73.3	0.3
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	113.0	110.0	3.0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	112.6	111.8	0.8
X14	Rear Surface of Vehicle to Firewall, Right Side	120.7	119.9	0.8
X15	Rear Surface of Vehicle to Firewall, Left Side	120.2	117.1	3.1
X16	Rear Surface of Vehicle to Steering Column	100.4	93.5	6.9
X17	Center of Steering Column to "A" Post	16.1	12.5	3.6
X18	Center of Steering Column to Headliner	16.8	21.7	-4.9
X19	Rear Surface of Vehicle to Right Side of Front Bumper	164.0	145.5	18.5
X20	Rear Surface of Vehicle to Left Side of Front Bumper	163.6	145.7	17.9
X21	Length of Engine Block	30.0	30.0	0.0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	108.8	108.2	0.6
CD	Rear Surface of Vehicle to Center of Dash Panel	108.5	106.2	2.3
LD	Rear Surface of Vehicle to Left Side of Dash Panel	105.1	104.5	0.6

Appendix A

PHOTOGRAPHS

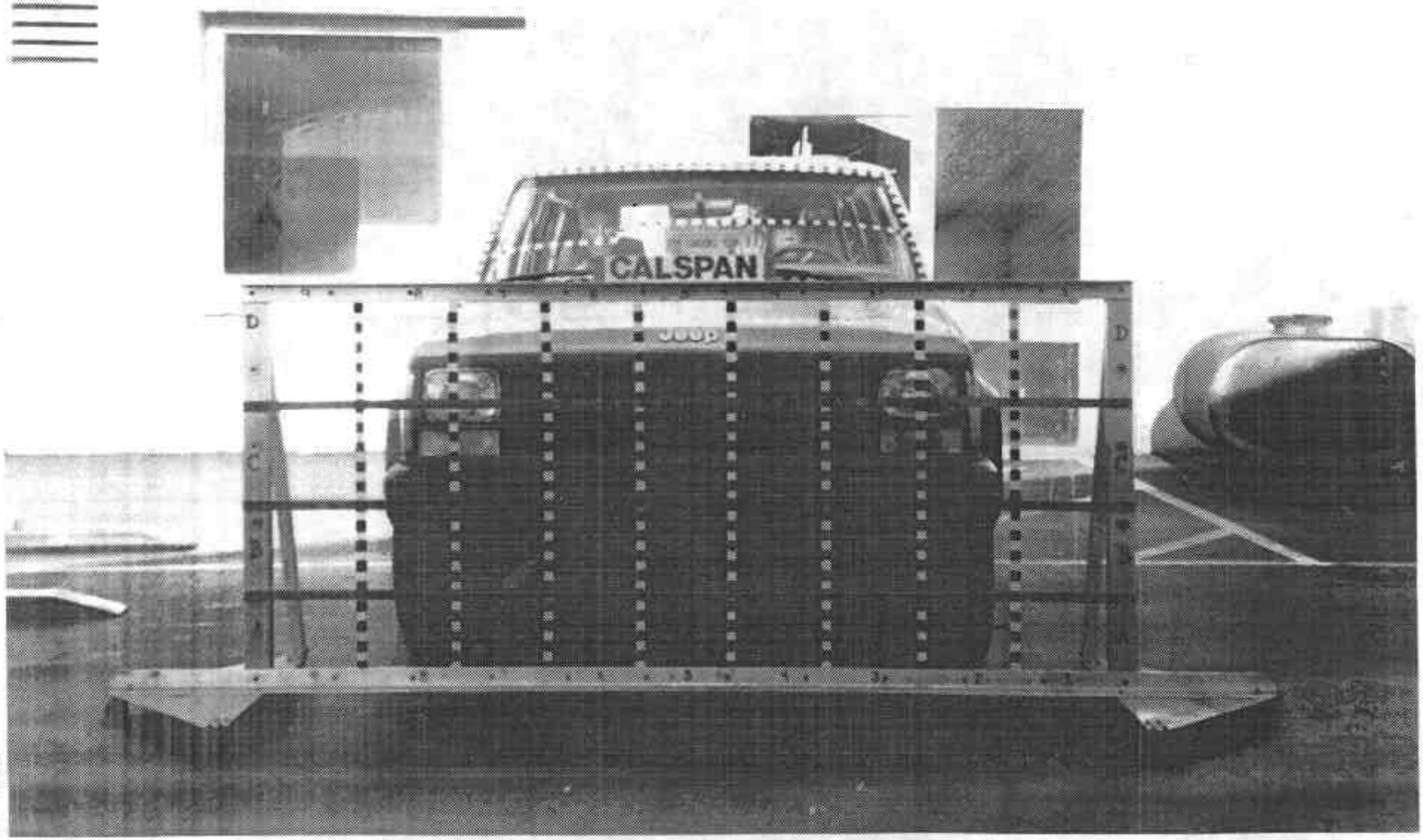

Figure A-1 LOAD CELL LOCATIONS

Figure A-2 PRE-TEST FRONT VIEW

Figure A-3 POST TEST FRONT VIEW

Figure A-4 PRE-TEST LEFT SIDE VIEW

Figure A-5 POST TEST LEFT SIDE VIEW

Figure A-6 PRE-TEST RIGHT SIDE VIEW

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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

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Figure A-13 POST-TEST WINDSHIELD VIEW

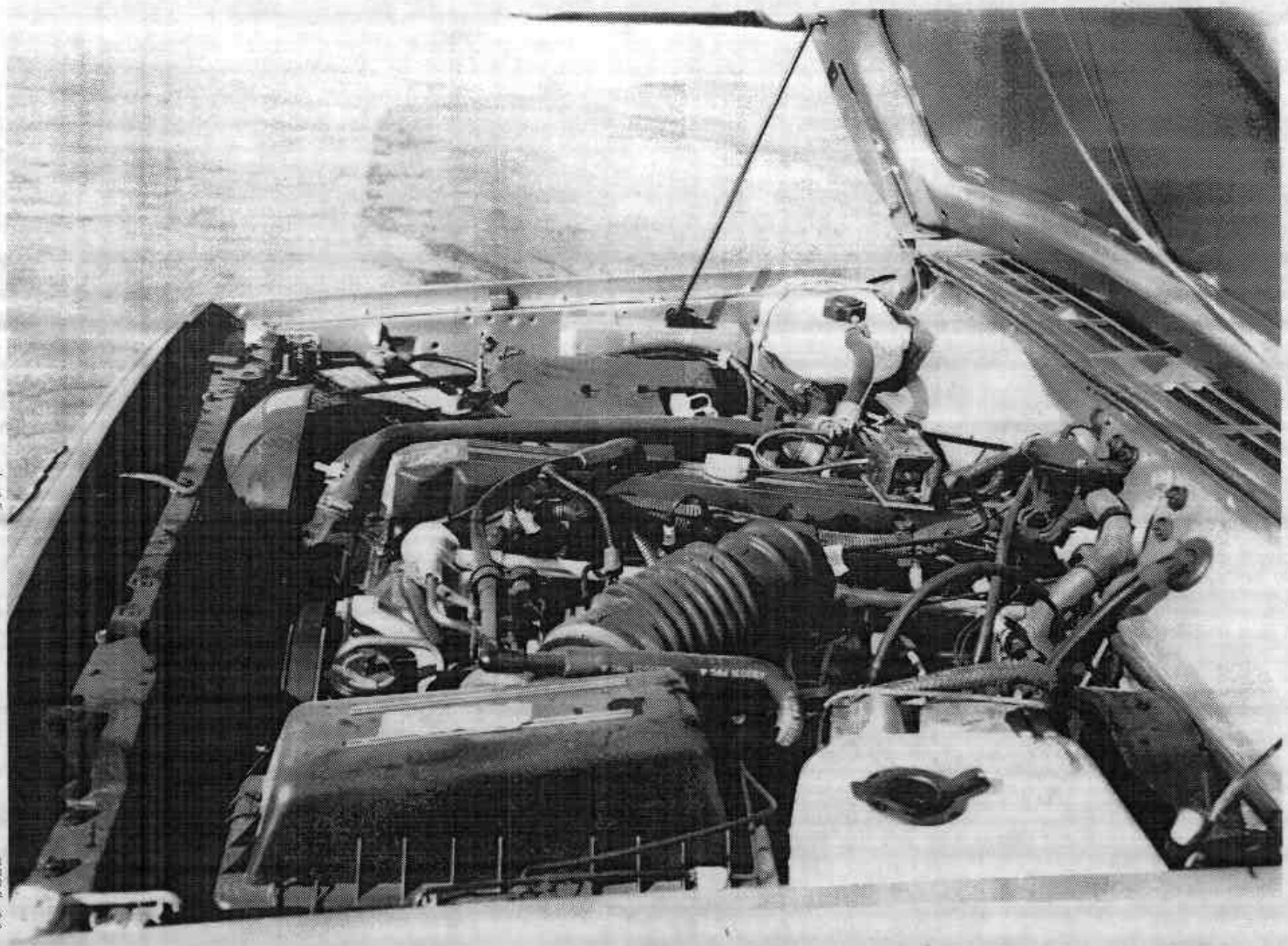


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-15 FUEL CAP VIEW

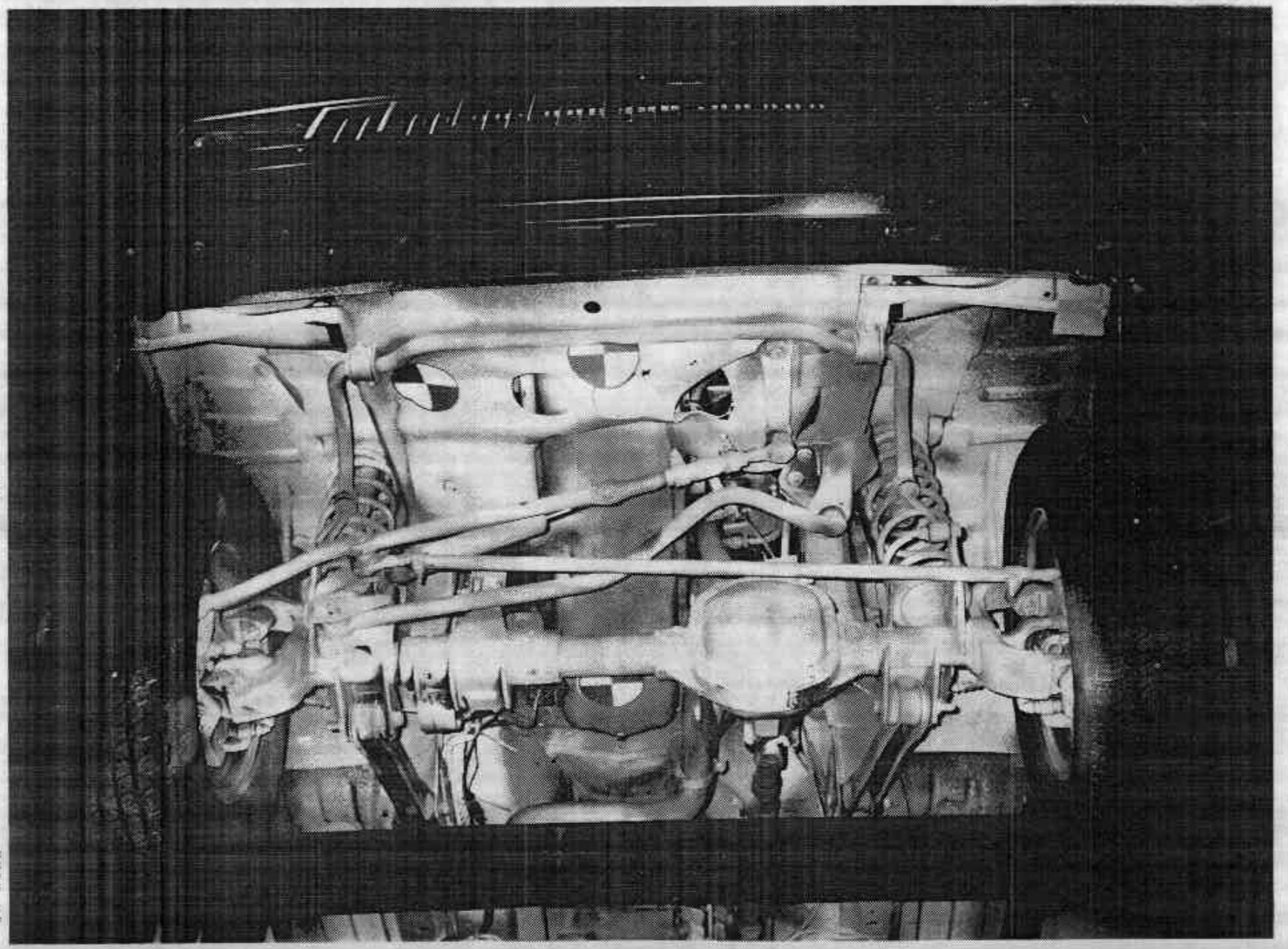


Figure A-10 PRE-TEST FRONT UNDERBODY VIEW

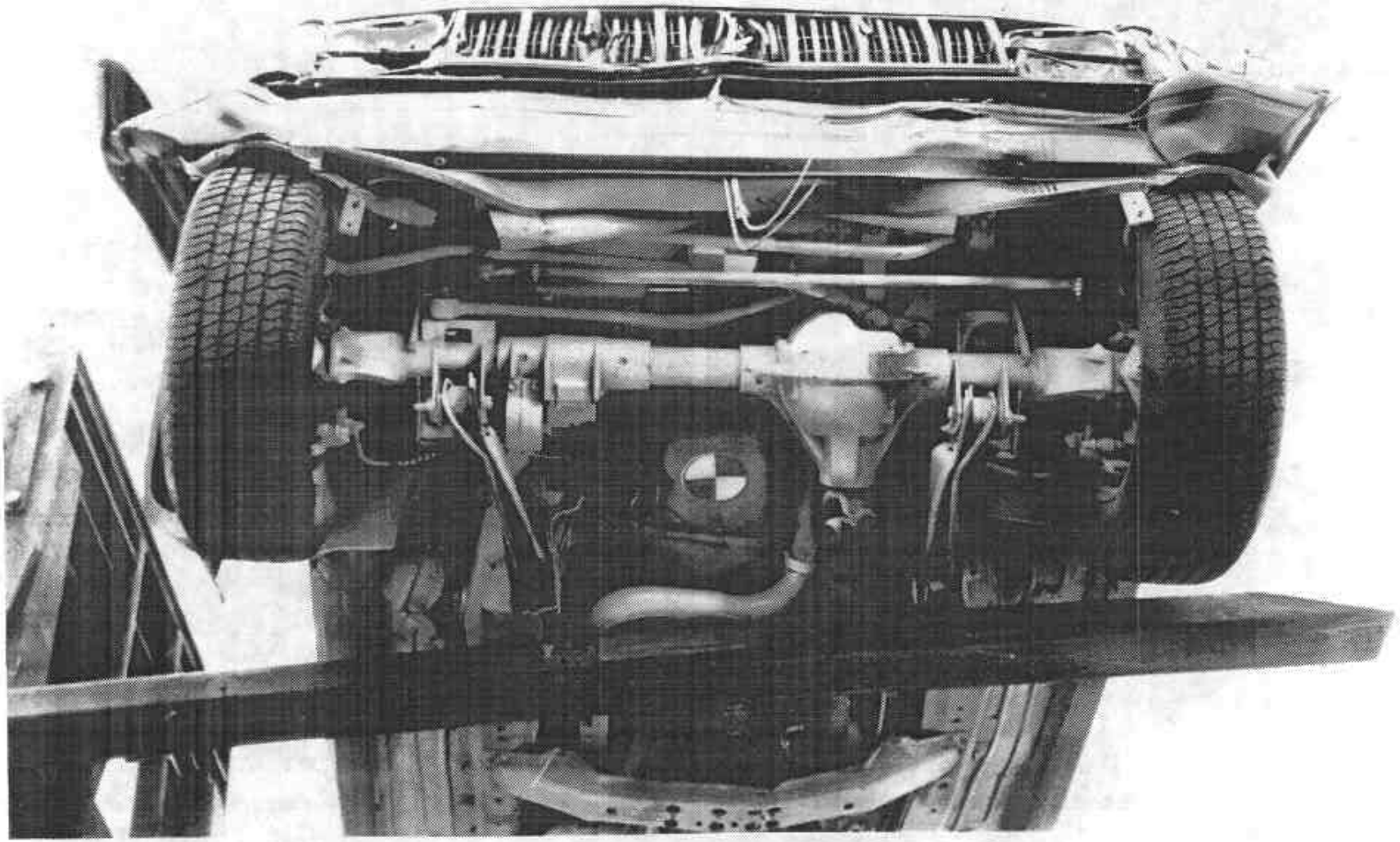


Figure A-17 POST-TEST FRONT UNDERBODY VIEW

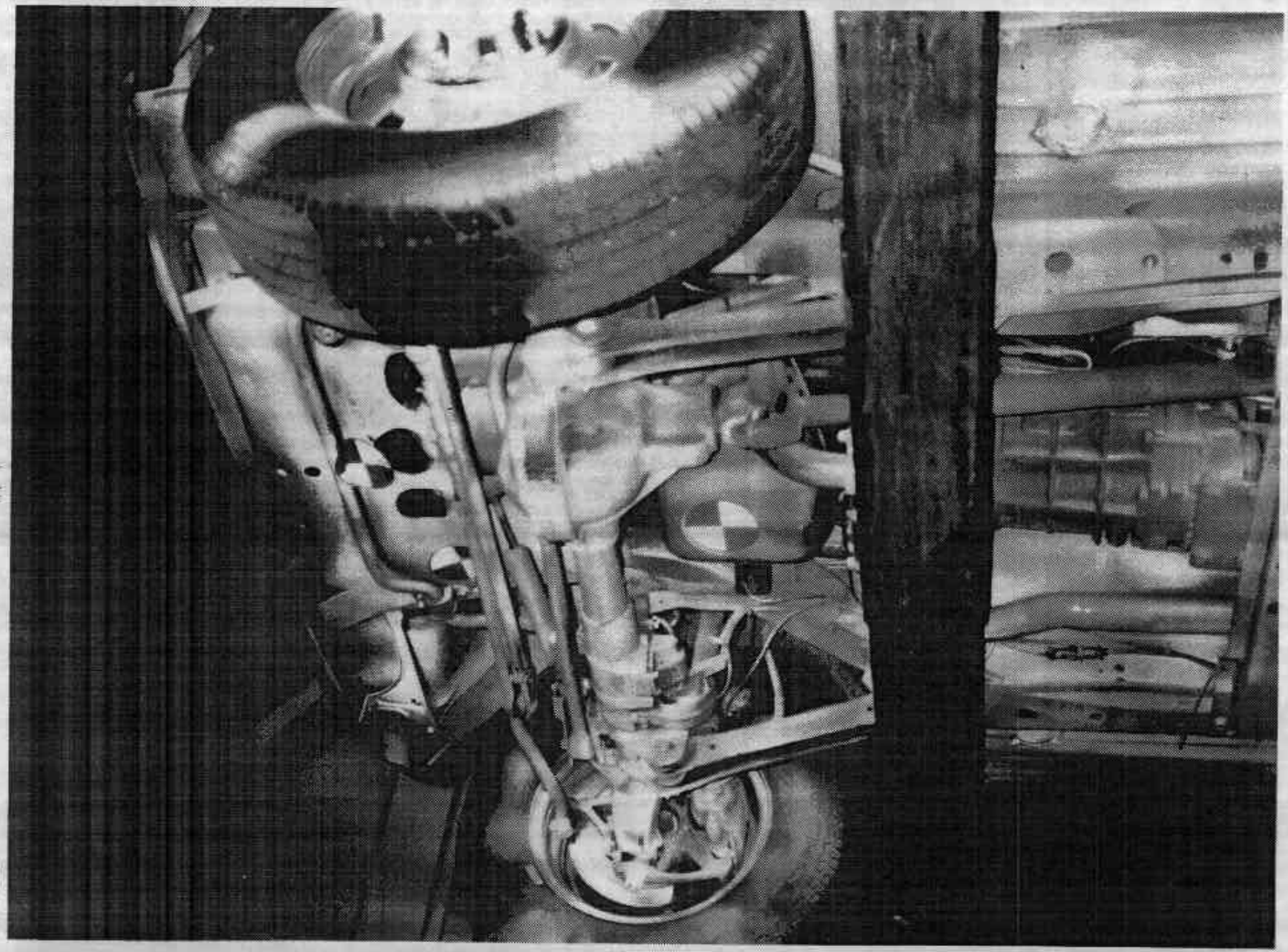


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

7710 23

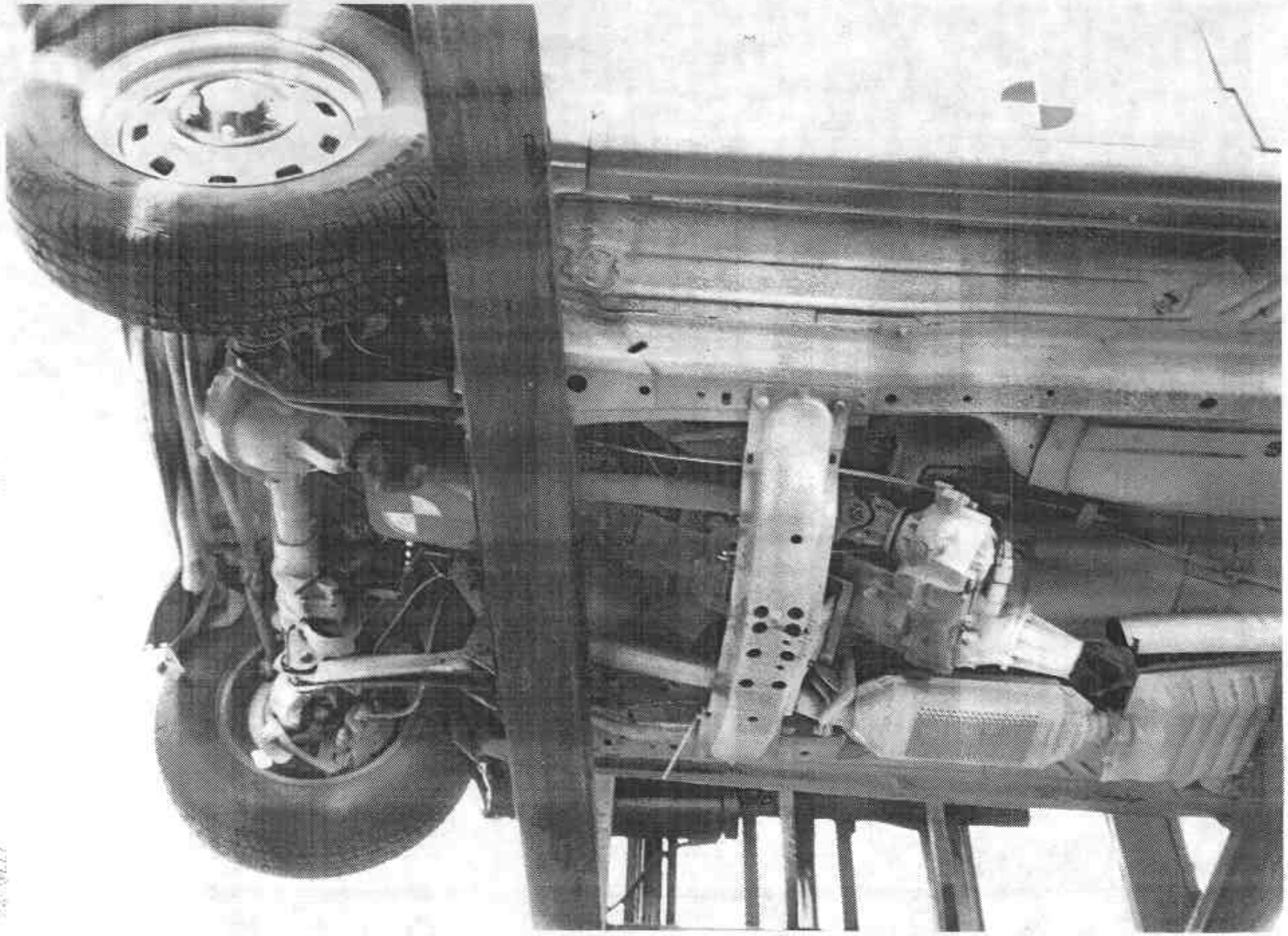


Figure A-19. POST-TEST FRONT SIDE UNDERBODY VIEW

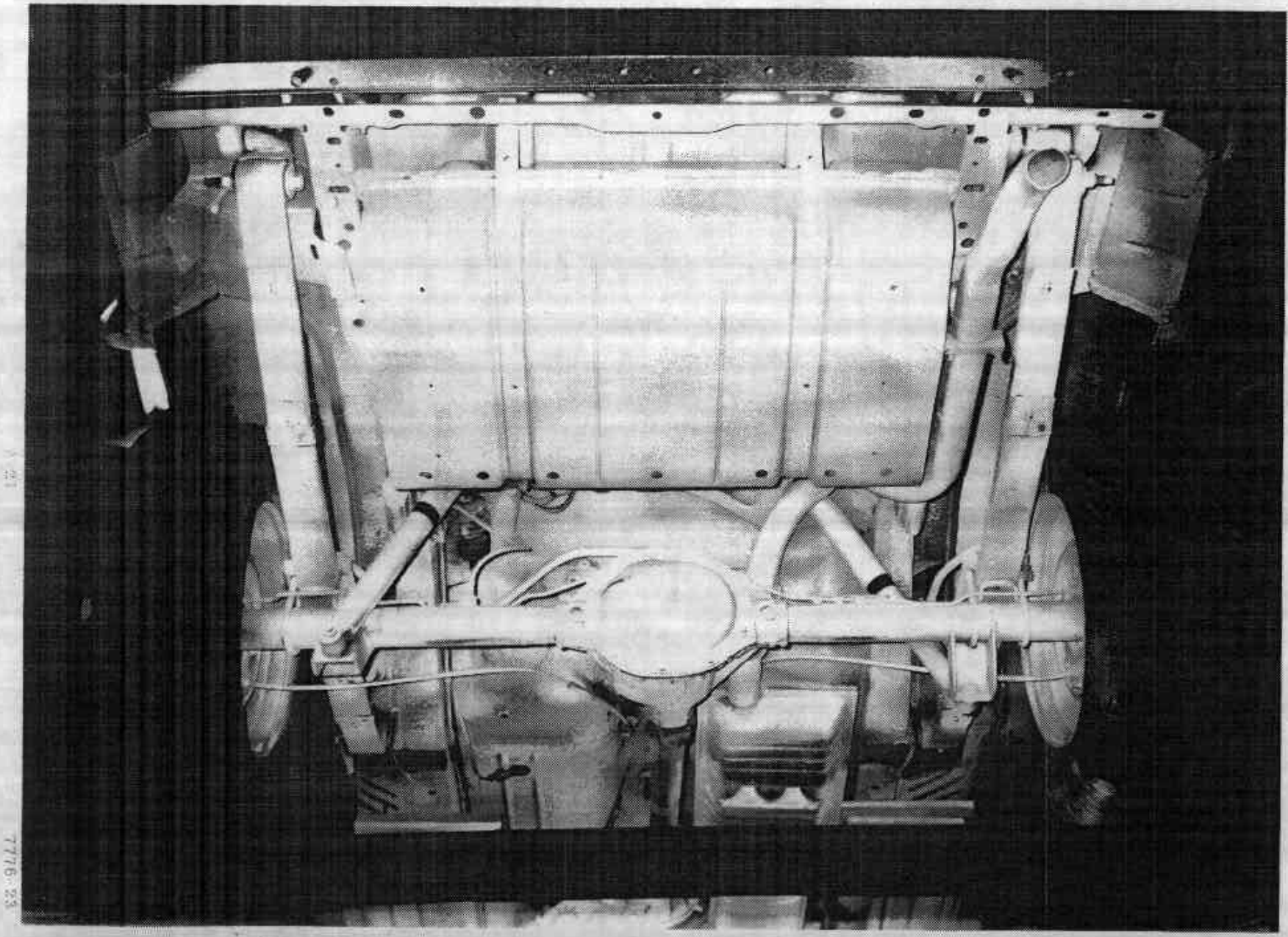


Figure A-20 PRE-TEST REAR UNDERBODY VIEW

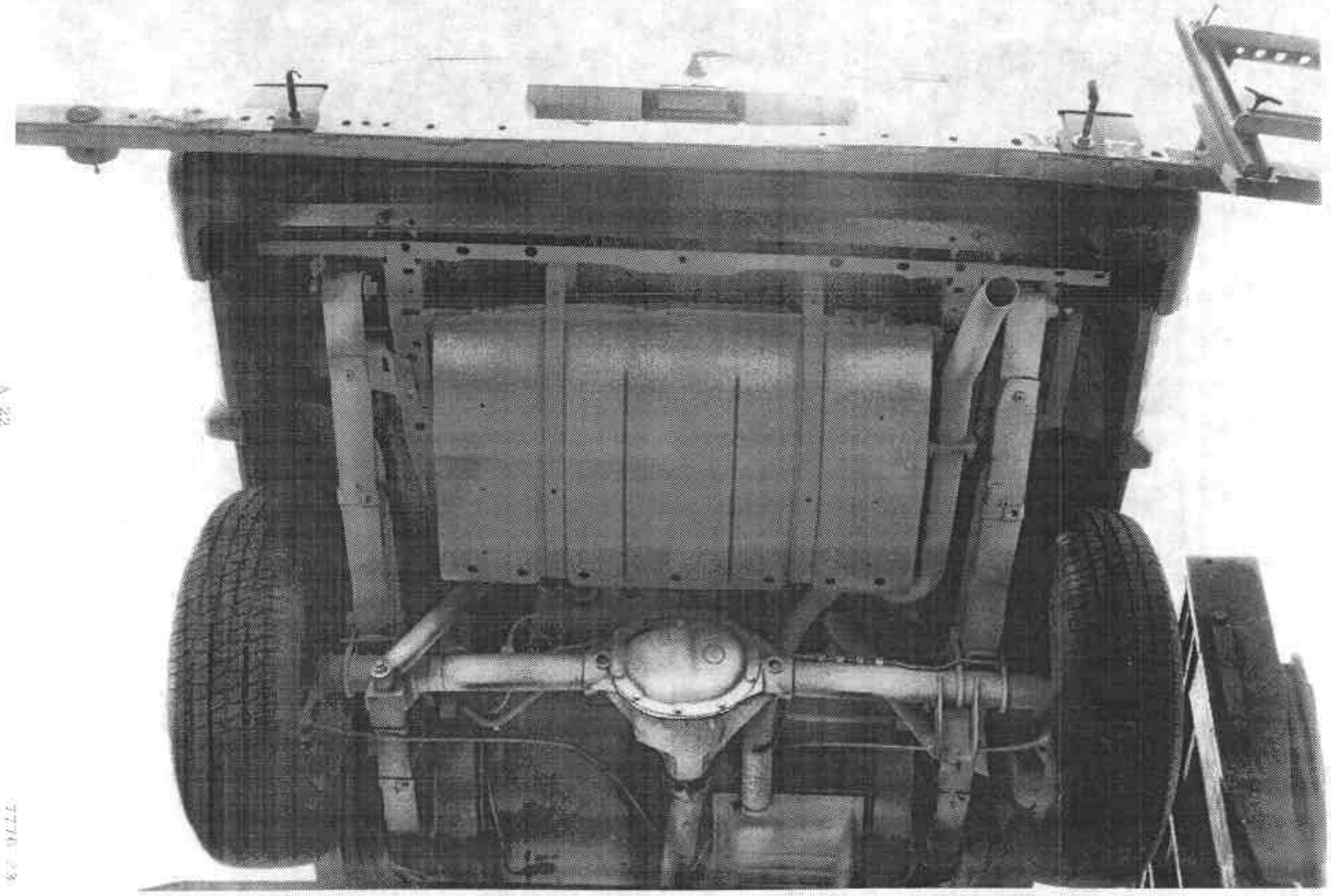


Figure A-21 POST-TEST REAR UNDERBODY VIEW

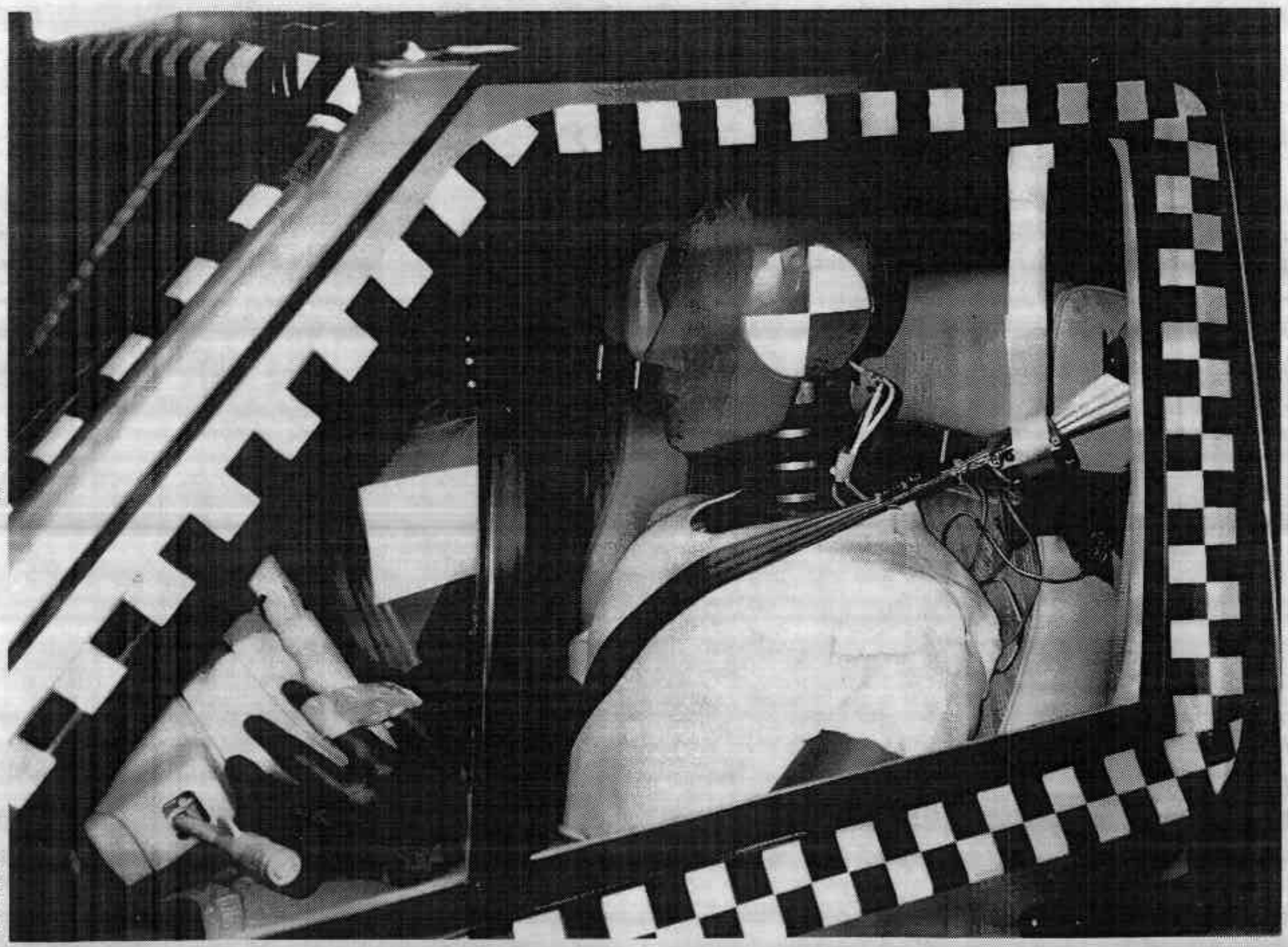


Figure A-22 PRE-TEST DRIVER POSITION VIEW

Figure A-23 POST-TEST DRIVER POSITION VIEW

Figure A-24 PRE-TEST DRIVER HEAD TARGET

Figure A-25 PRE-TEST PASSENGER POSITION VIEW

Figure A-26 POST-TEST PASSENGER POSITION VIEW

Figure A-27 PRE-TEST PASSENGER HEAD TARGET

Figure A-28 PRE-TEST DRIVER AND INTERIOR VIEW

Figure A-29 POST-TEST DRIVER AND INTERIOR VIEW

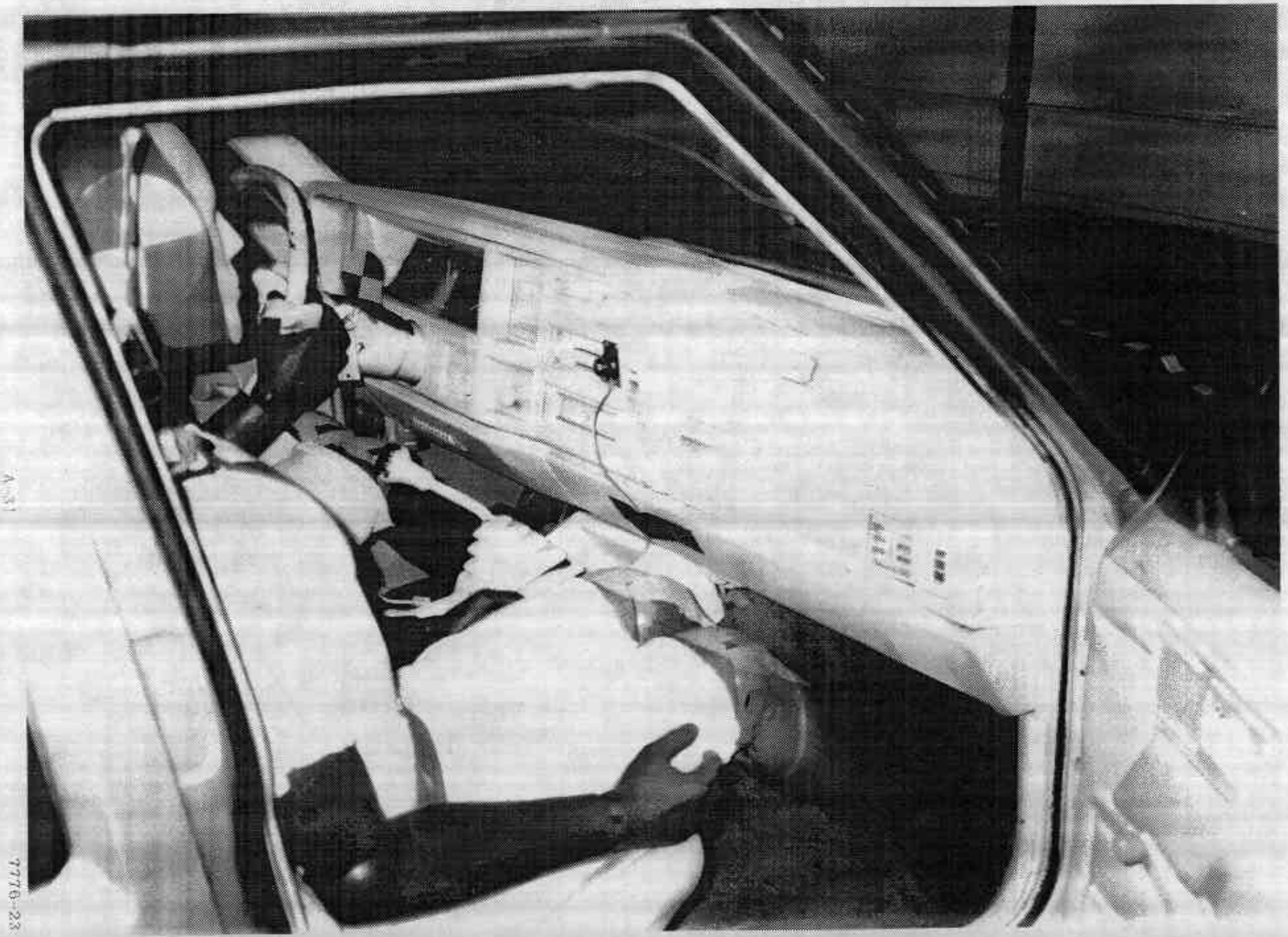


Figure A-30 PRE-TEST PASSENGER AND INTERIOR VIEW

Figure A-31. POST-TEST PASSENGER AND INTERIOR VIEW

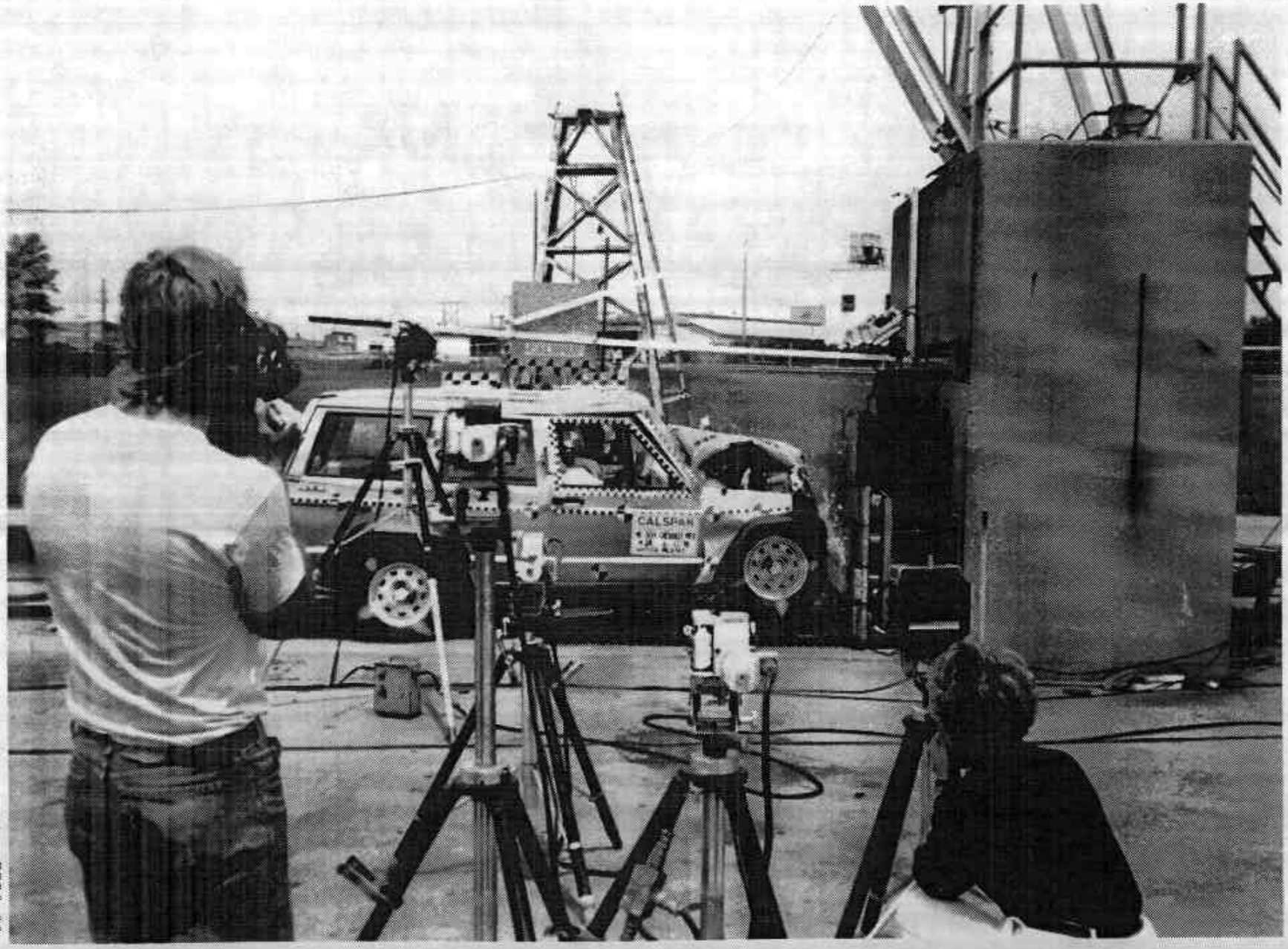


Figure A-32 IMPACT VIEW

7770-23

Appendix B

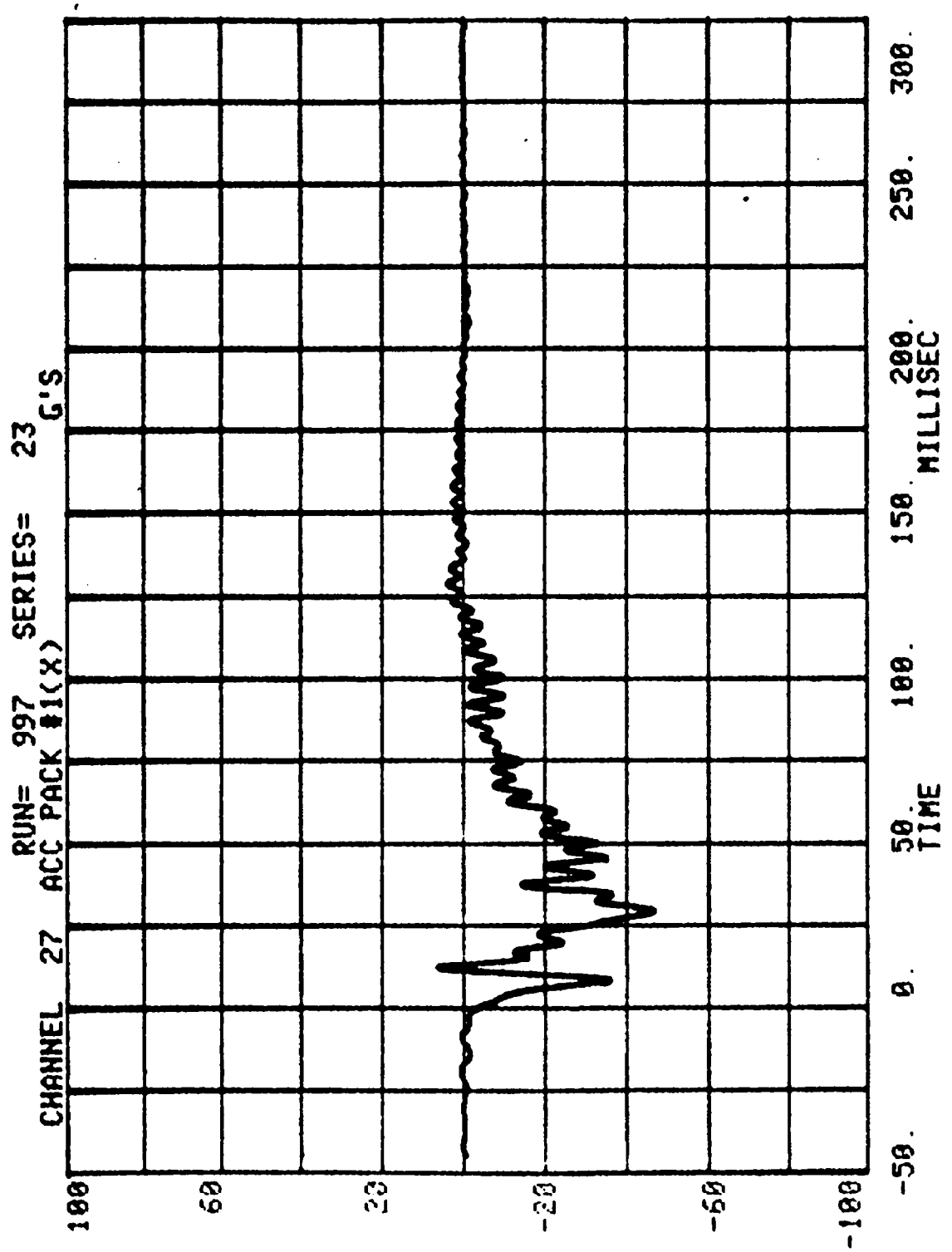
VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

TEST NO. ML0303

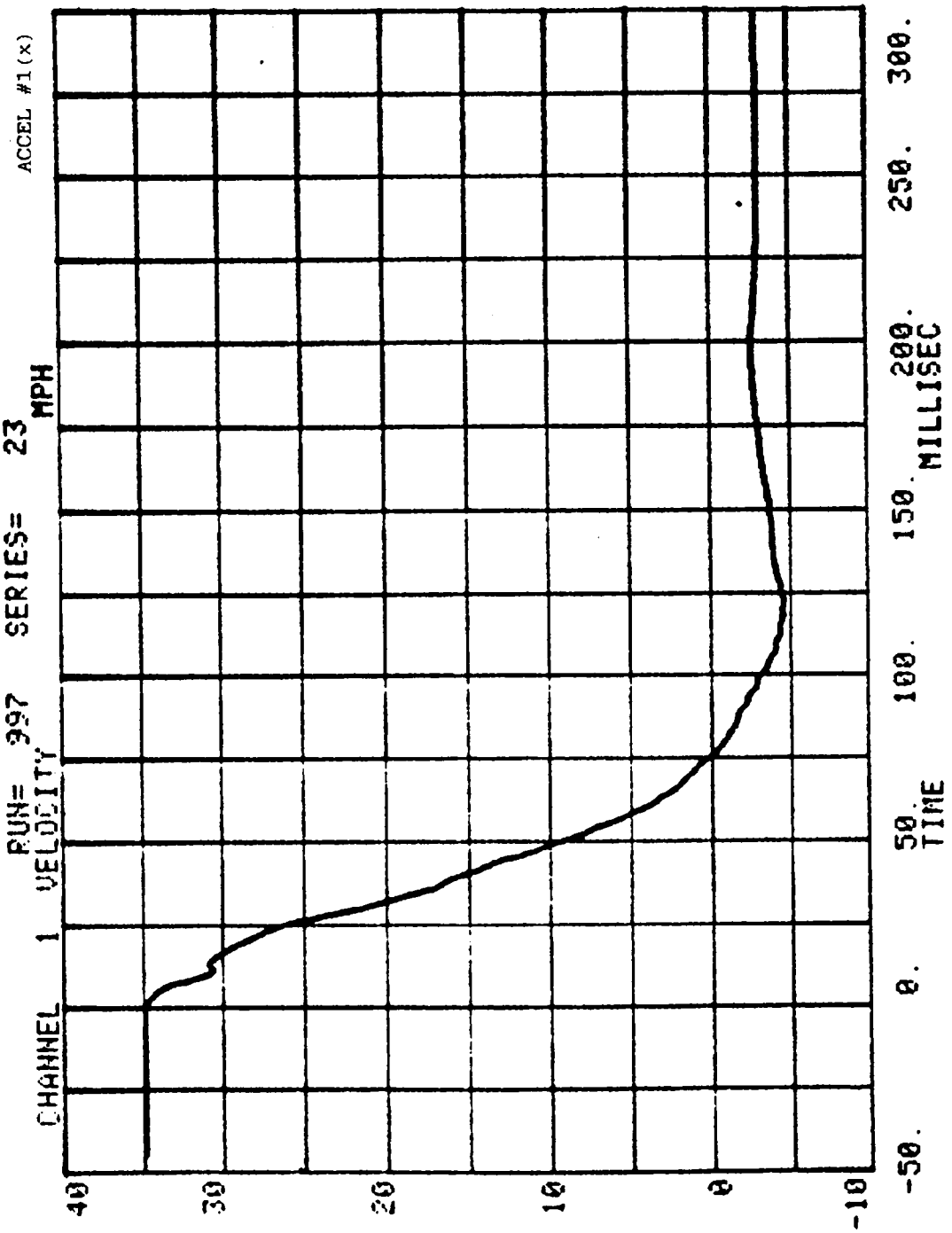
VEHICLE DATA

FILTER CHANNEL CLASS

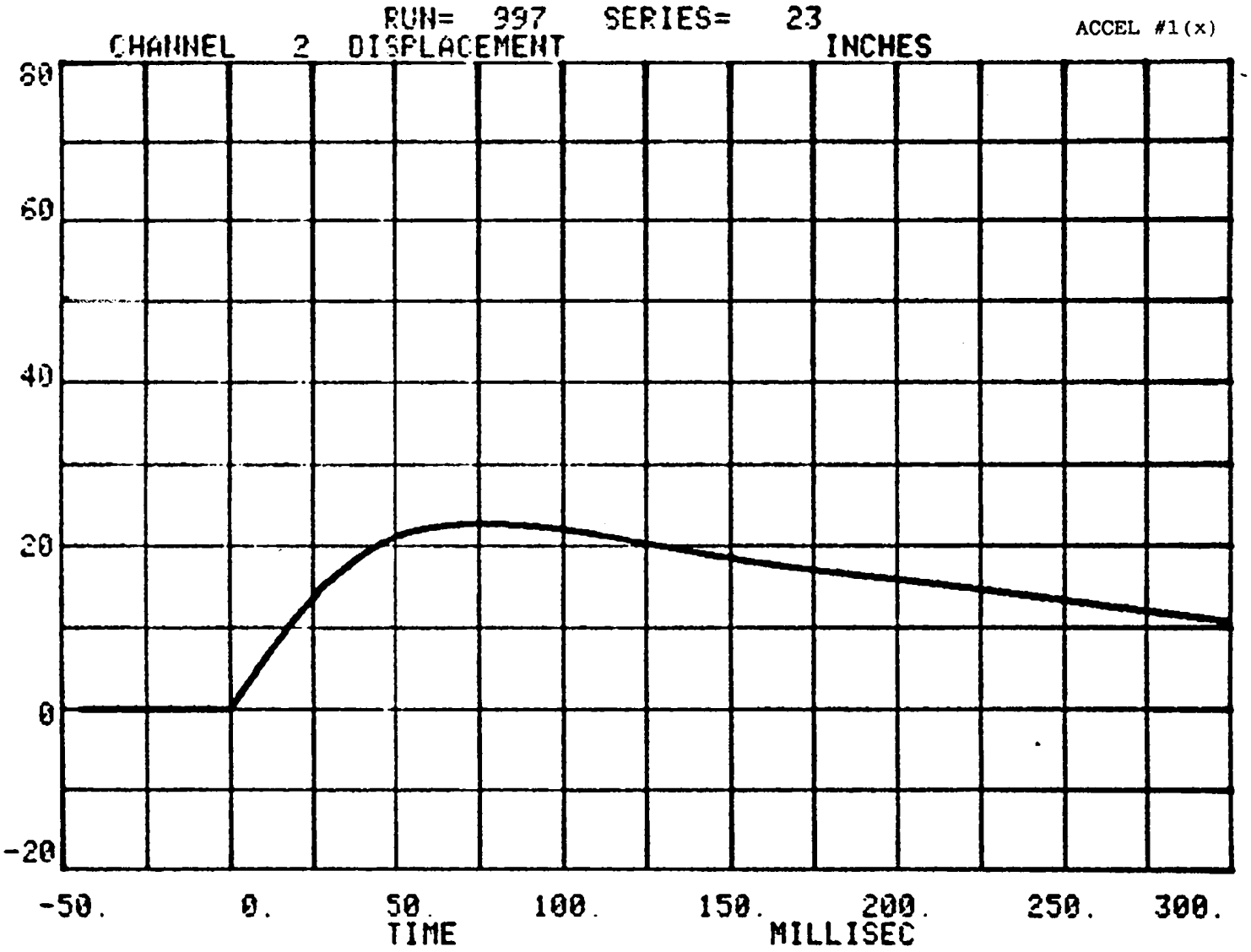
60

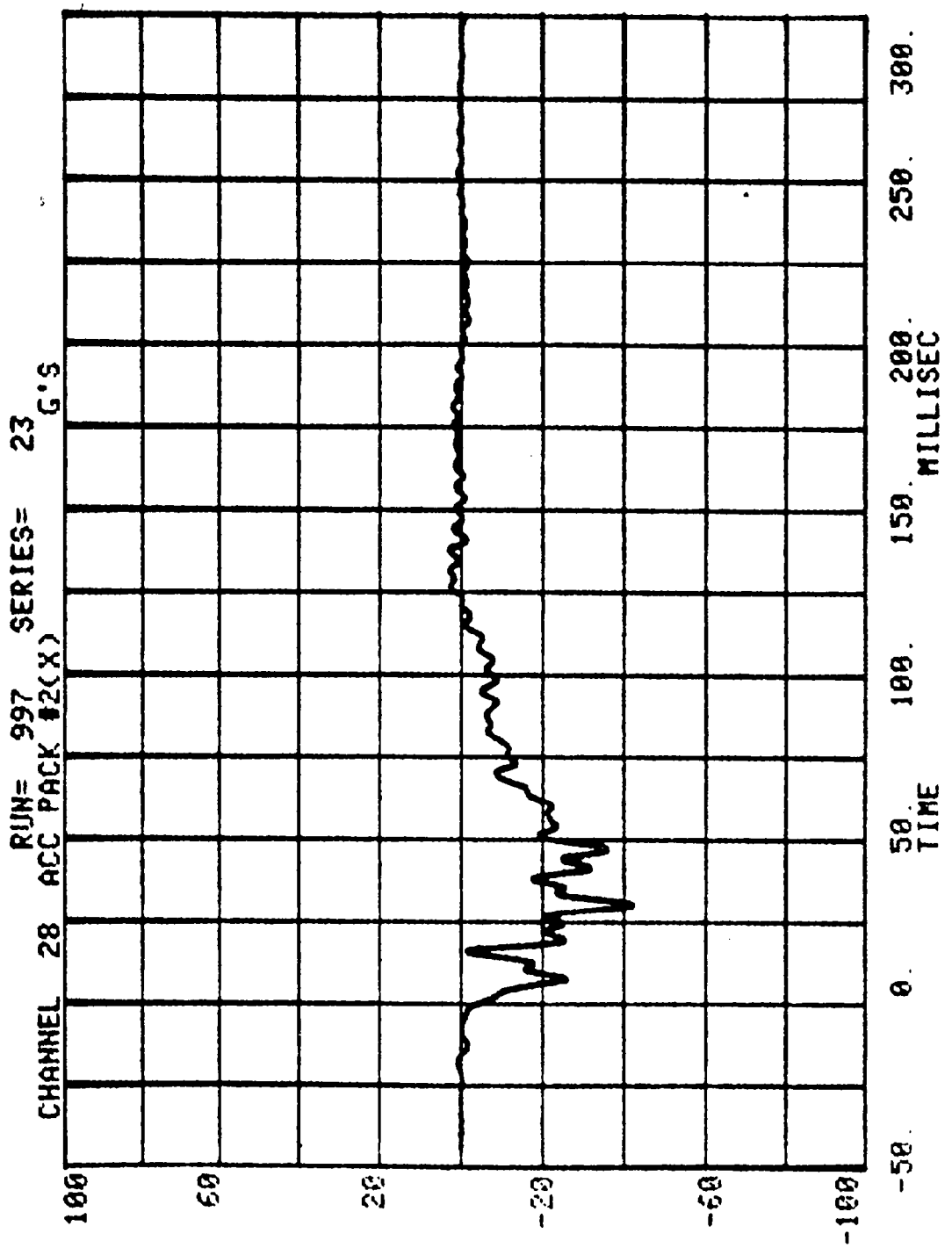

CHANNEL 27 ACC PACK #1(X)
RUN= 997 SERIES= 23
G'S
100
50
23
-23
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

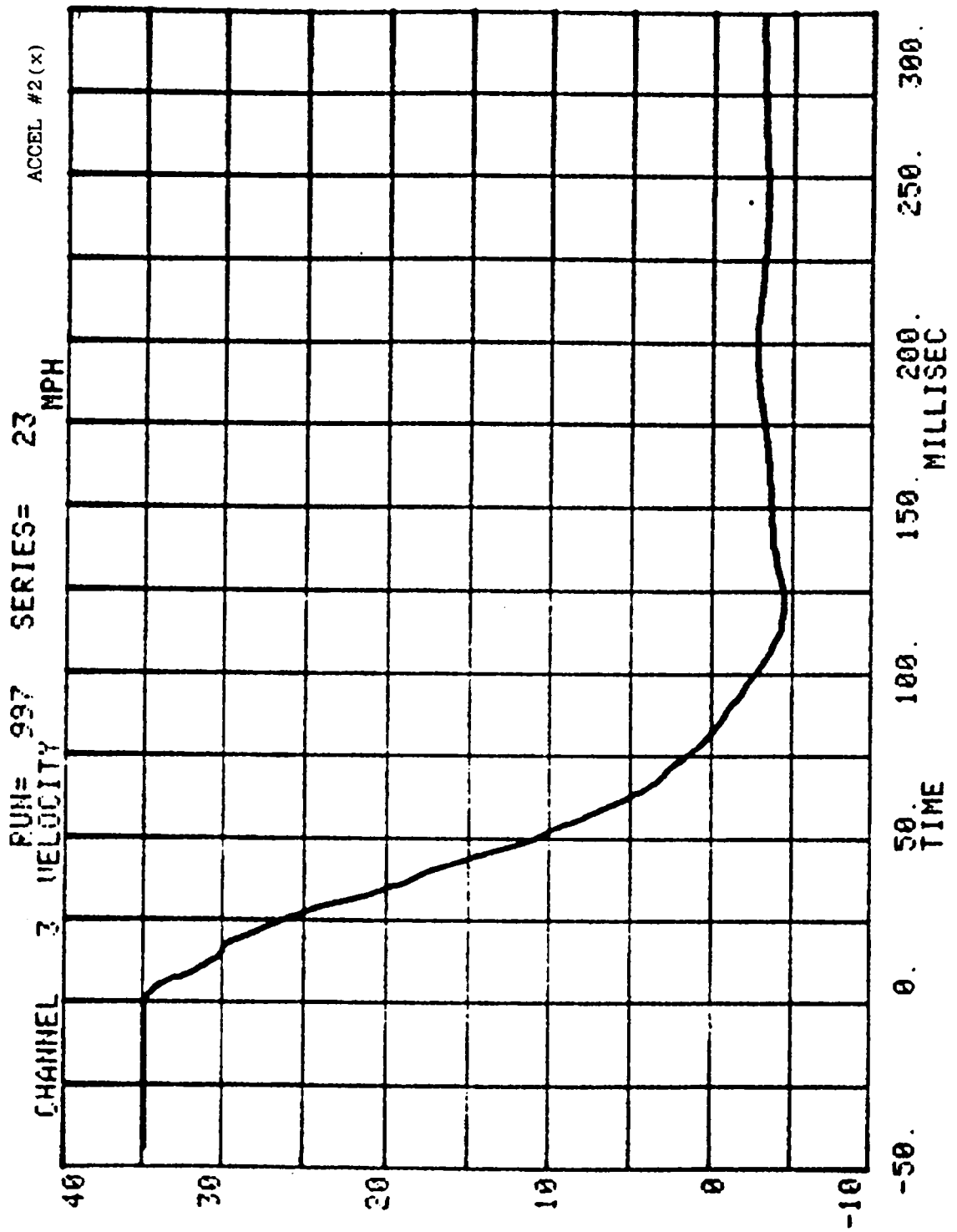

ACCEL #1(x)
CHANNEL 1 VELOCITY
RUN= 997 SERIES= 23 MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

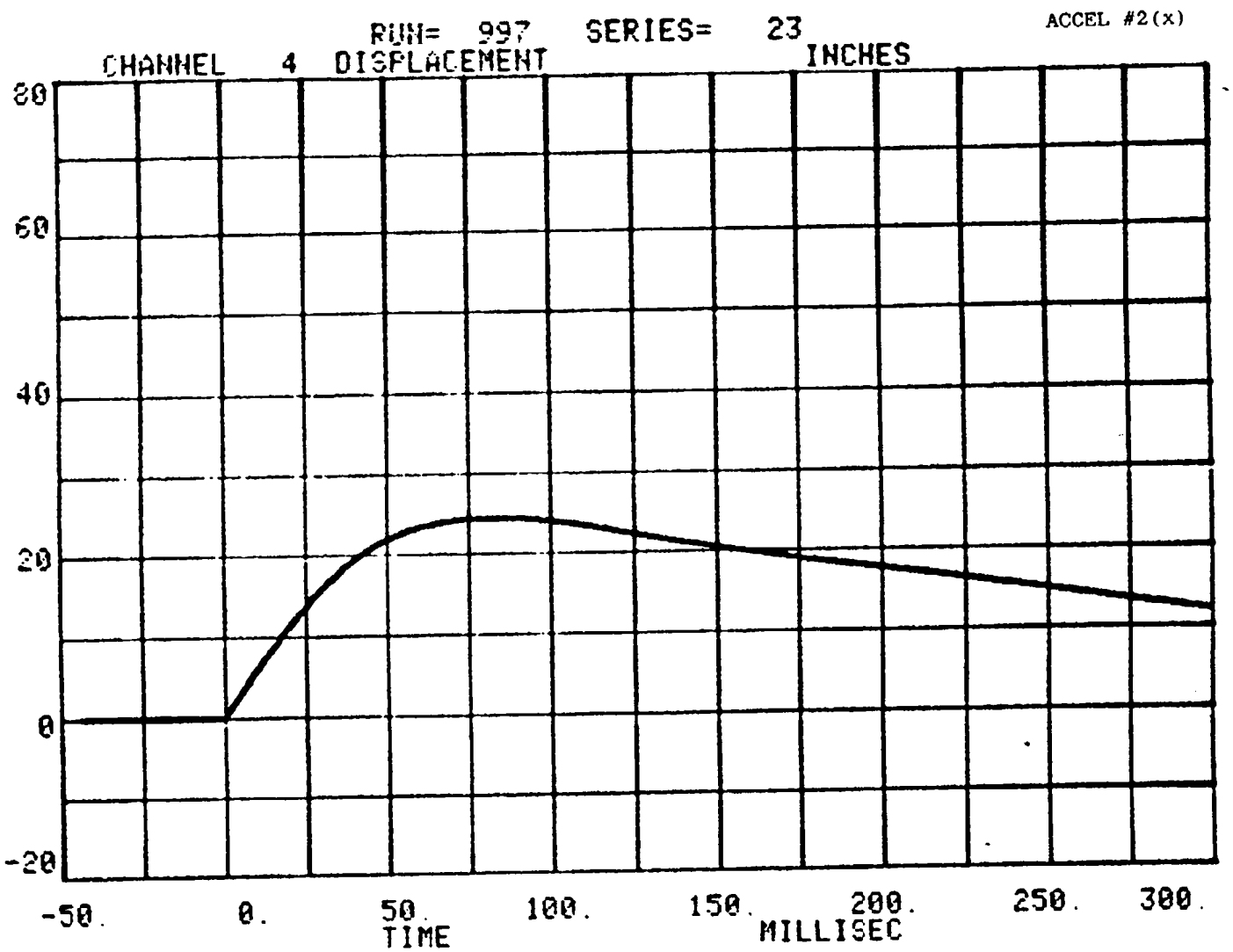
7776-23

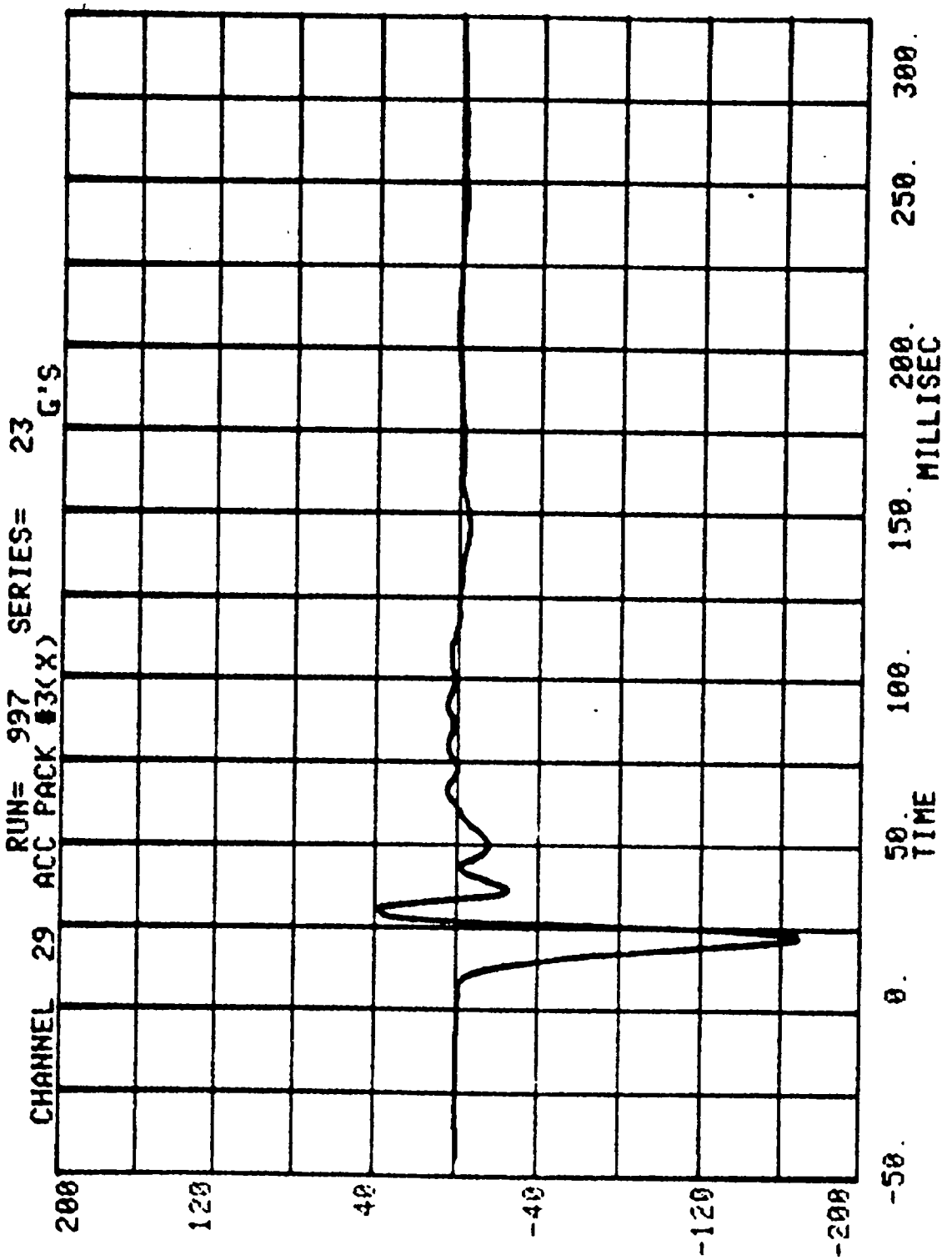

RUN= 397 SERIES= 23
CHANNEL 2 DISPLACEMENT INCHES
ACCEL #1(x)
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC


RUN= 997 SERIES= 23
CHANNEL 28 ACC PACK #2(X)
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

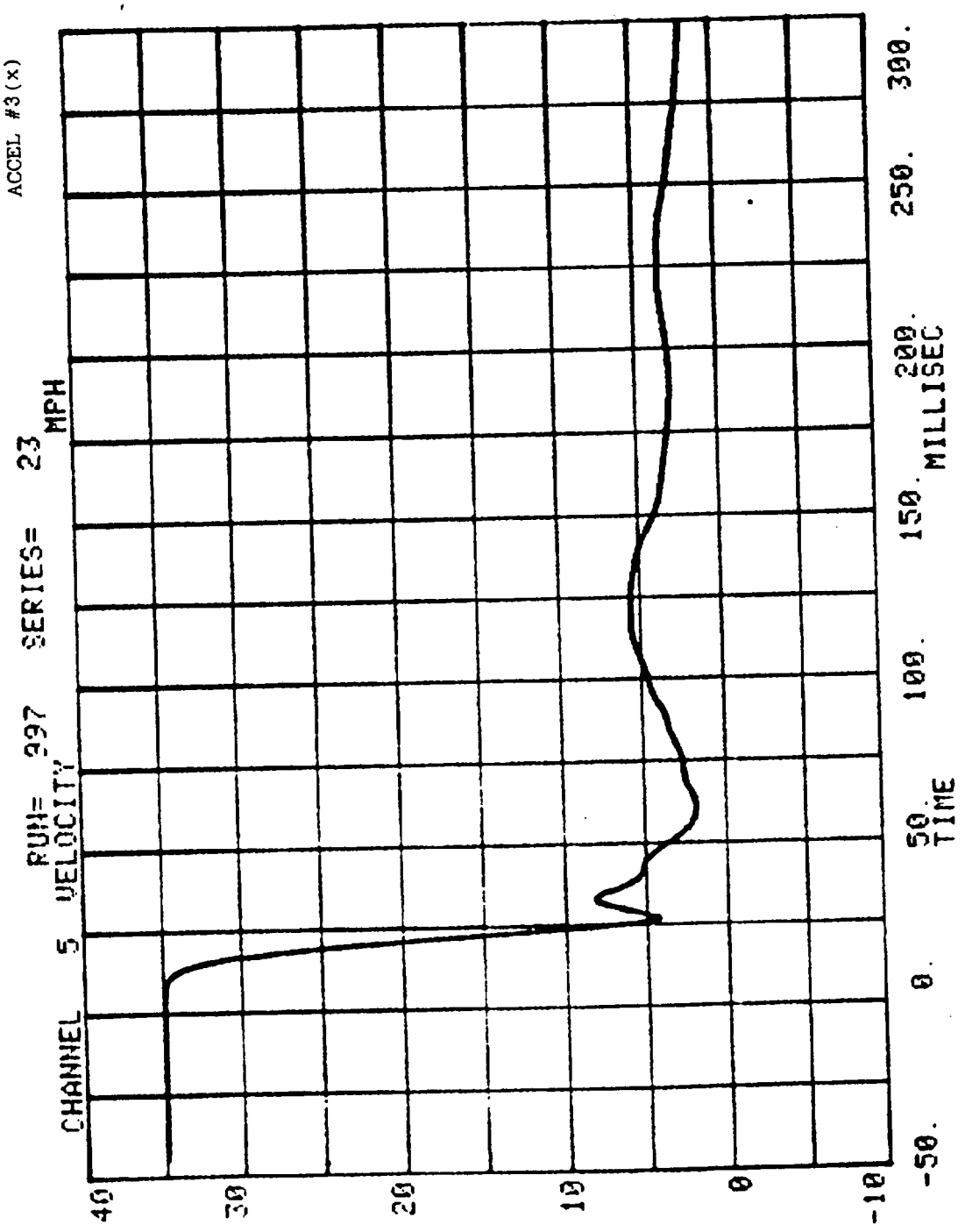
7776-23


ACCEL #2(x)
CHANNEL 3 VELOCITY
RUN= 997 SERIES= 23
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

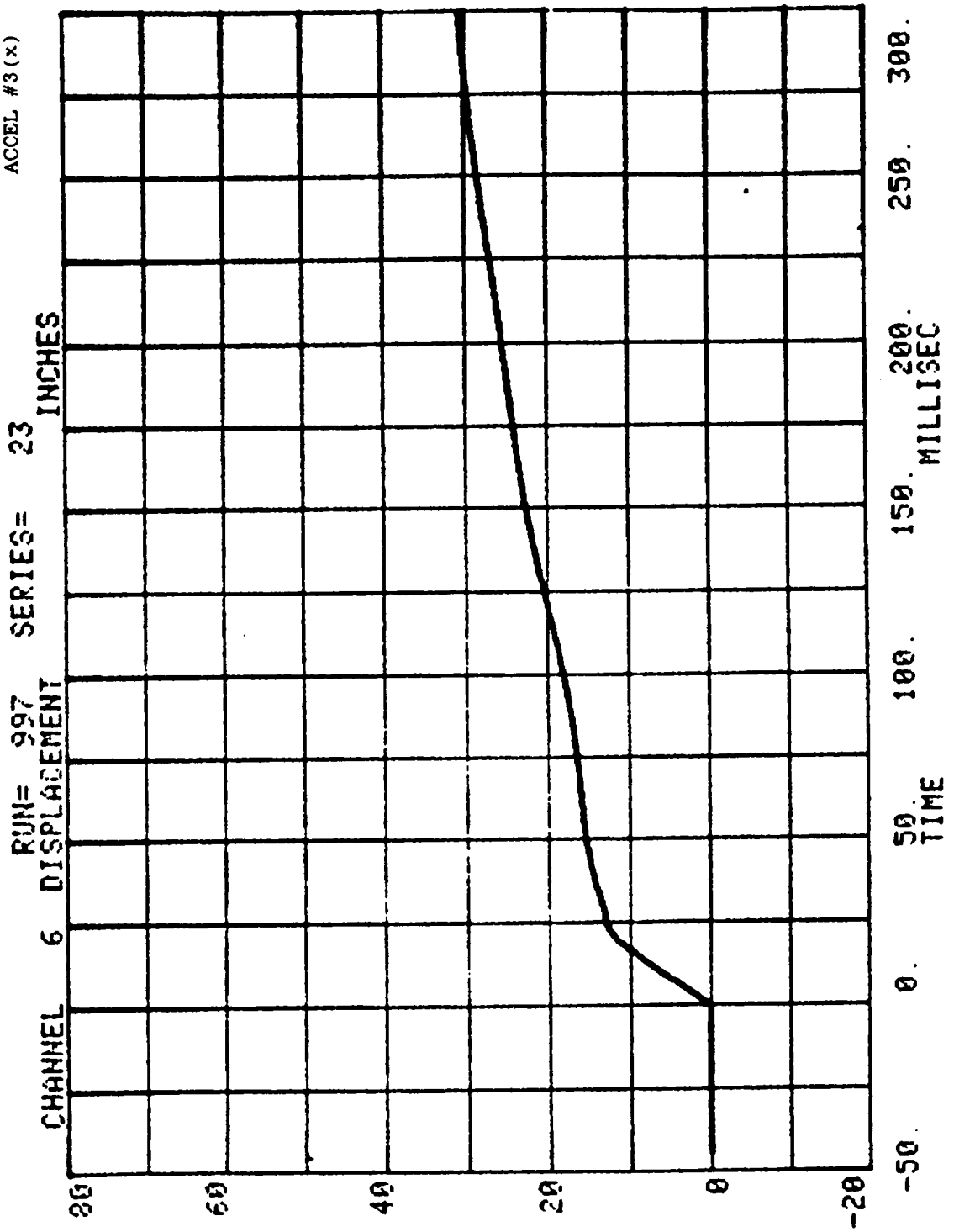

RUN= 997 SERIES= 23
ACCEL #2(x)
CHANNEL 4 DISPLACEMENT
INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 29 ACC PACK #3(X)
RUN= 997 SERIES= 23
G'S
200
120
40
-40
-120
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

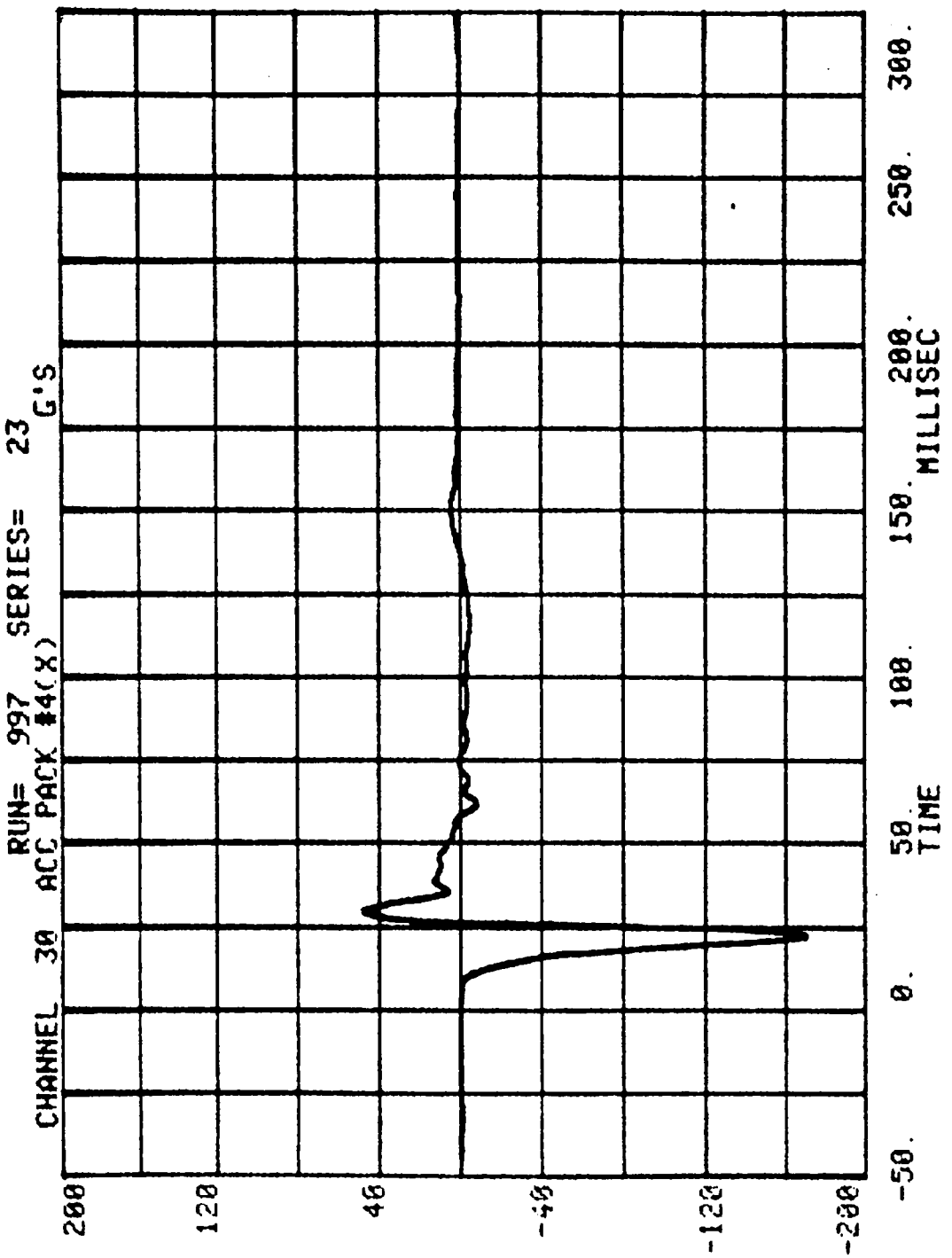
7776-23


ACCEL #3(x)
CHANNEL 5 VELOCITY
RUN= 297 SERIES= 23 MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

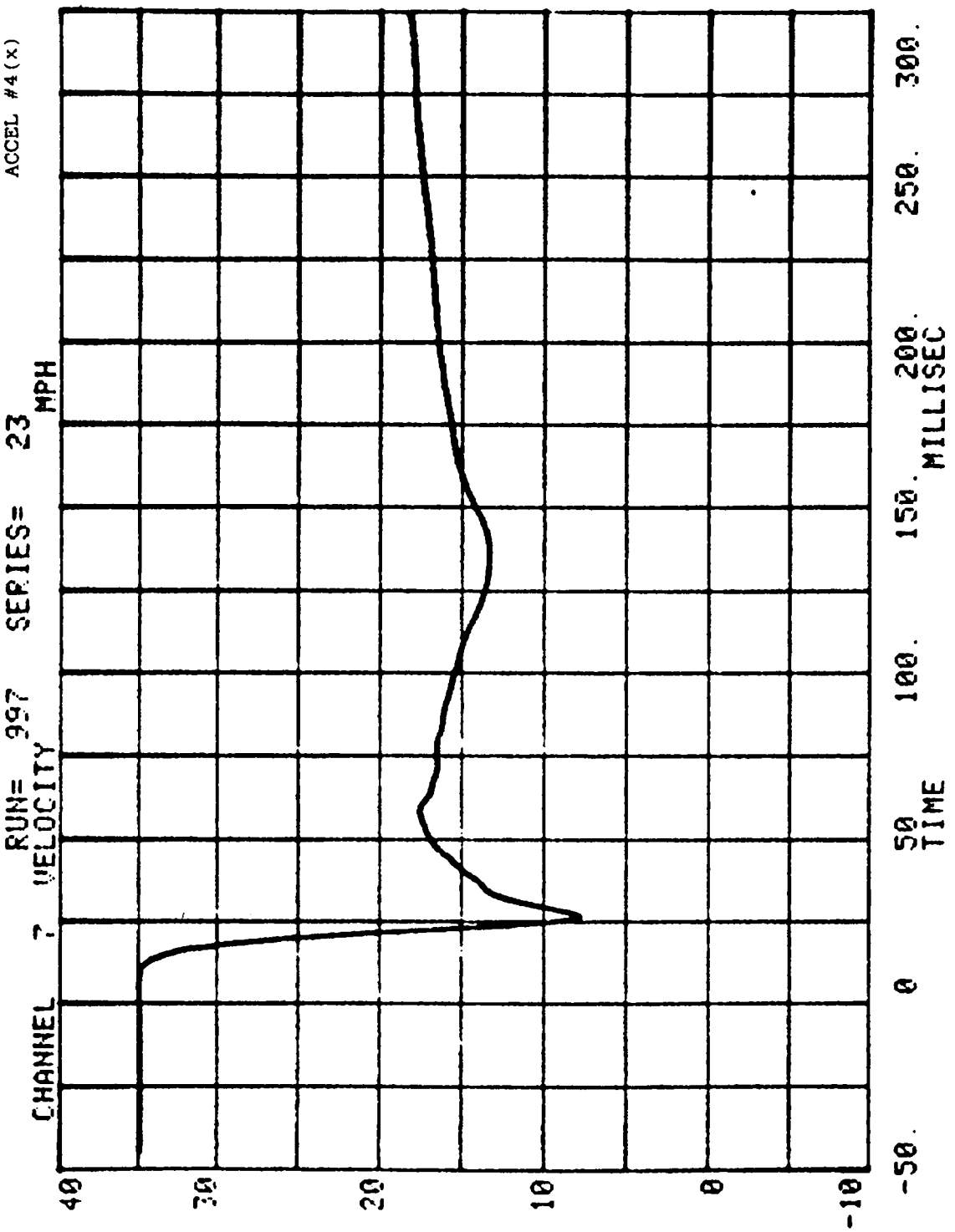
7776-23

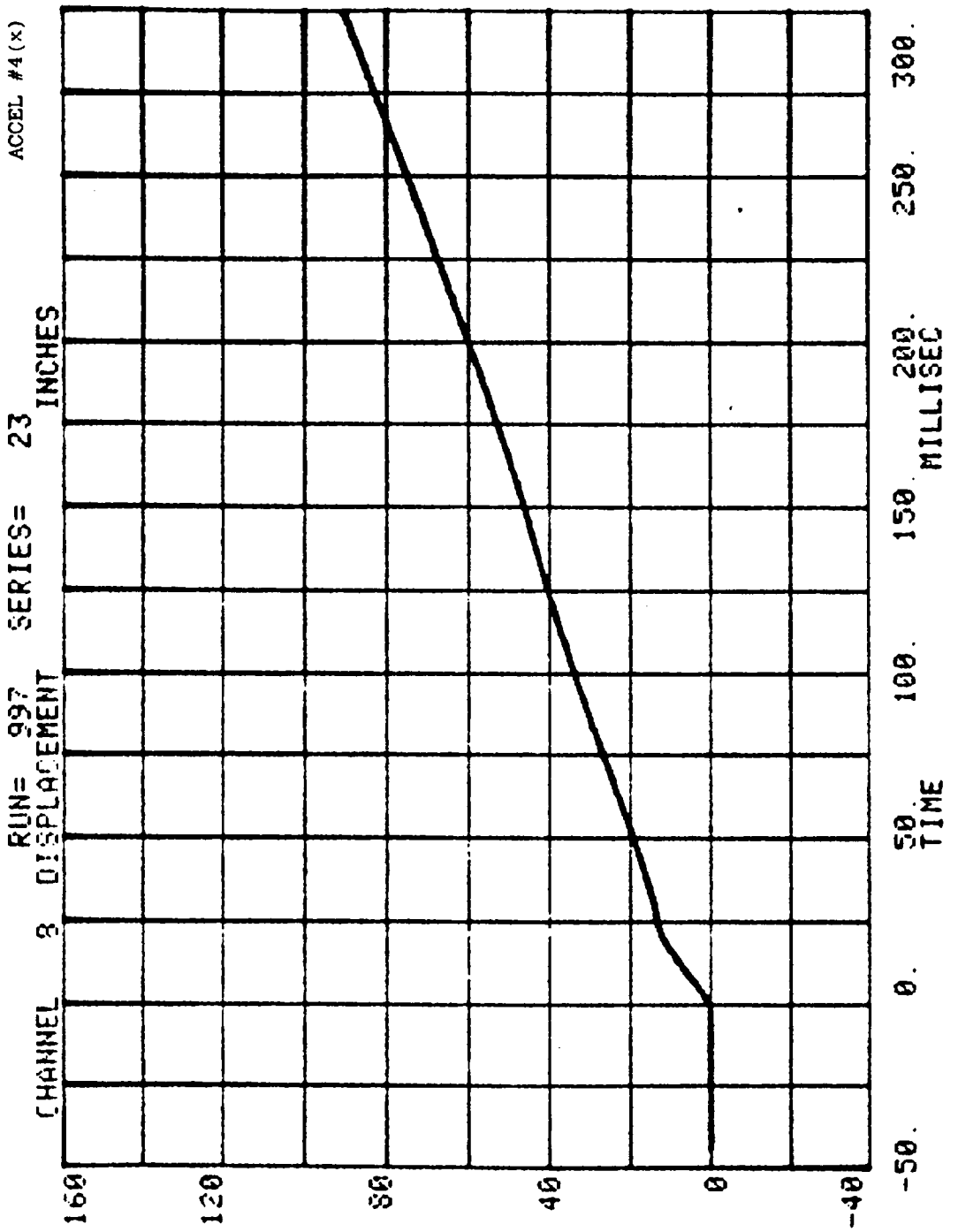

ACCEL #3(x)
CHANNEL 6 DISPLACEMENT
RUN= 997 SERIES= 23
INCHES
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

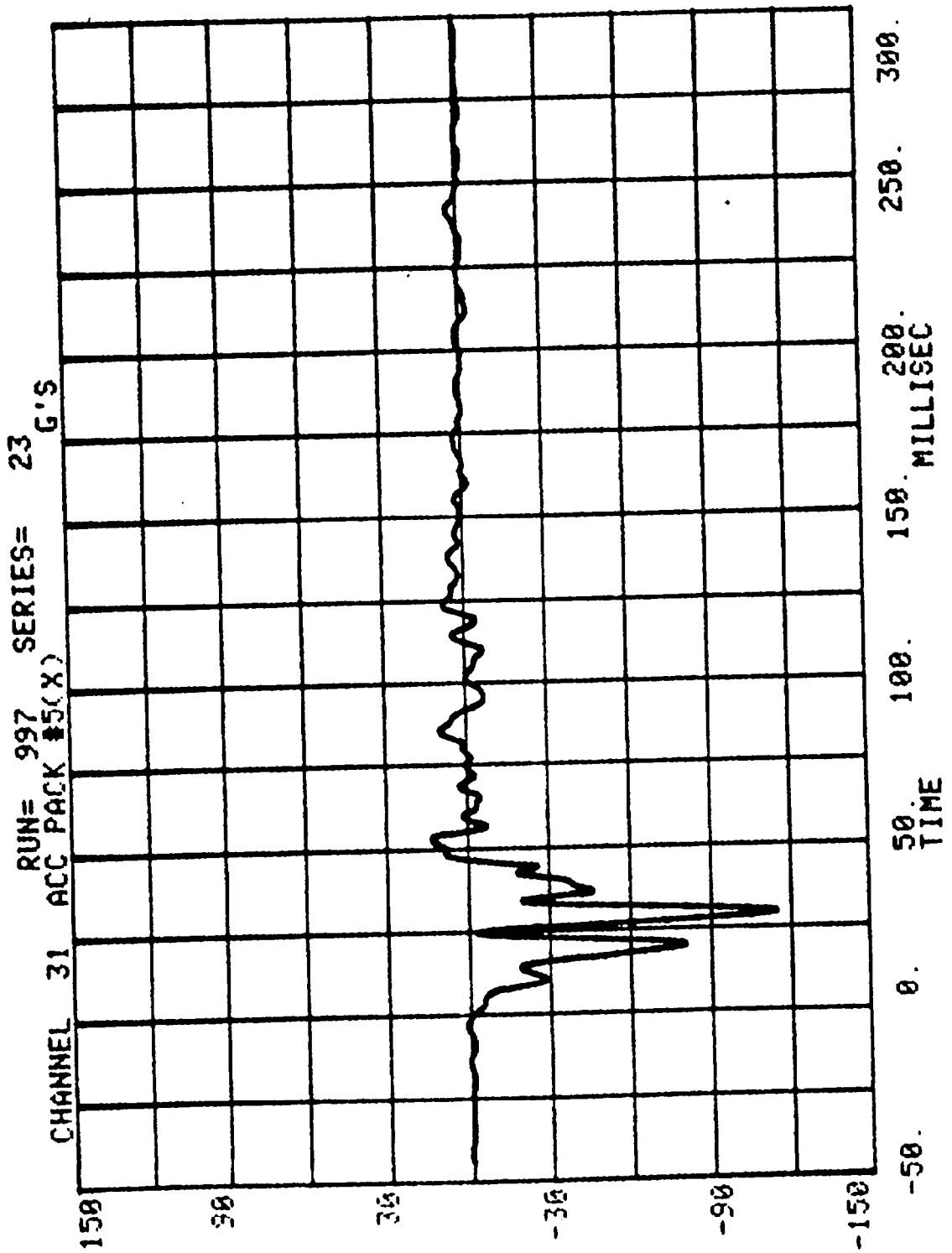

CHANNEL 30 ACC PACK #4(X)
RUN= 997 SERIES= 23
G'S
200
120
40
-40
-120
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

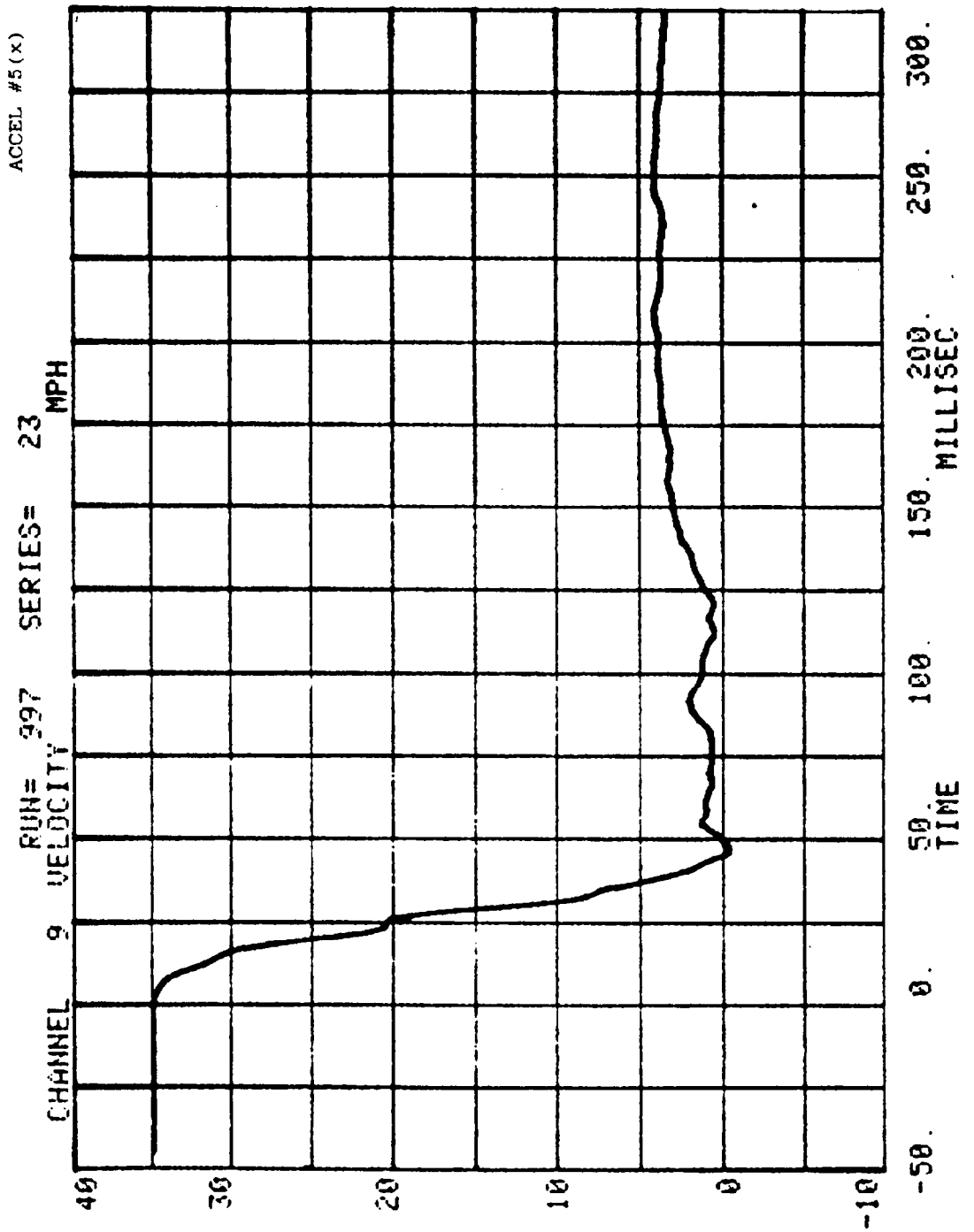

ACCEL #4(X)
CHANNEL 7 VELOCITY
RUN= 997 SERIES= 23
MPH
40
30
20
10
0
-10
-50.
0
50
100.
150.
200.
250.
300.
TIME
MILLISEC


ACCEL #4(x)
CHANNEL 3 DISPLACEMENT
RUN= 997 SERIES= 23
INCHES
160
120
80
40
0
-40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

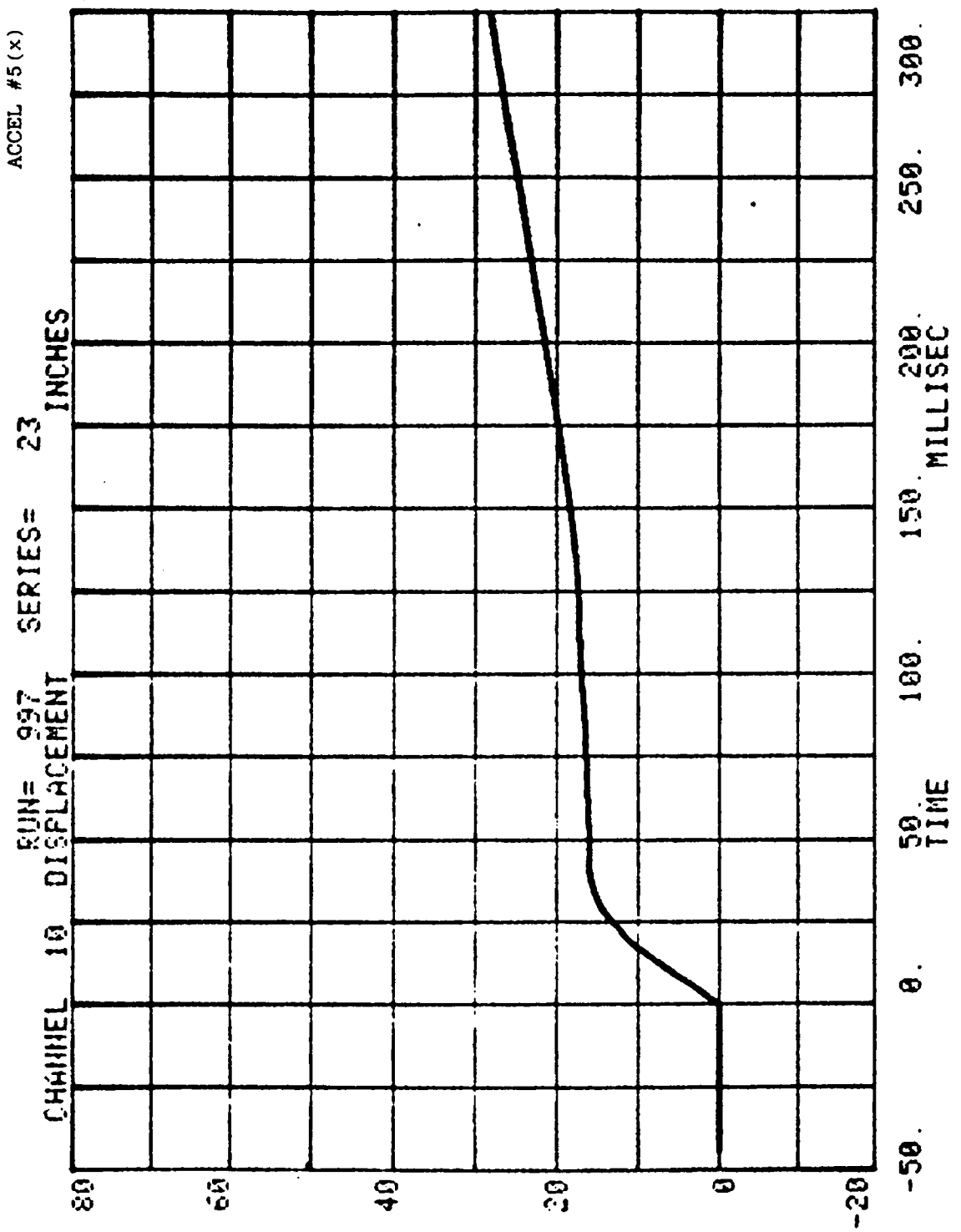
7776-23

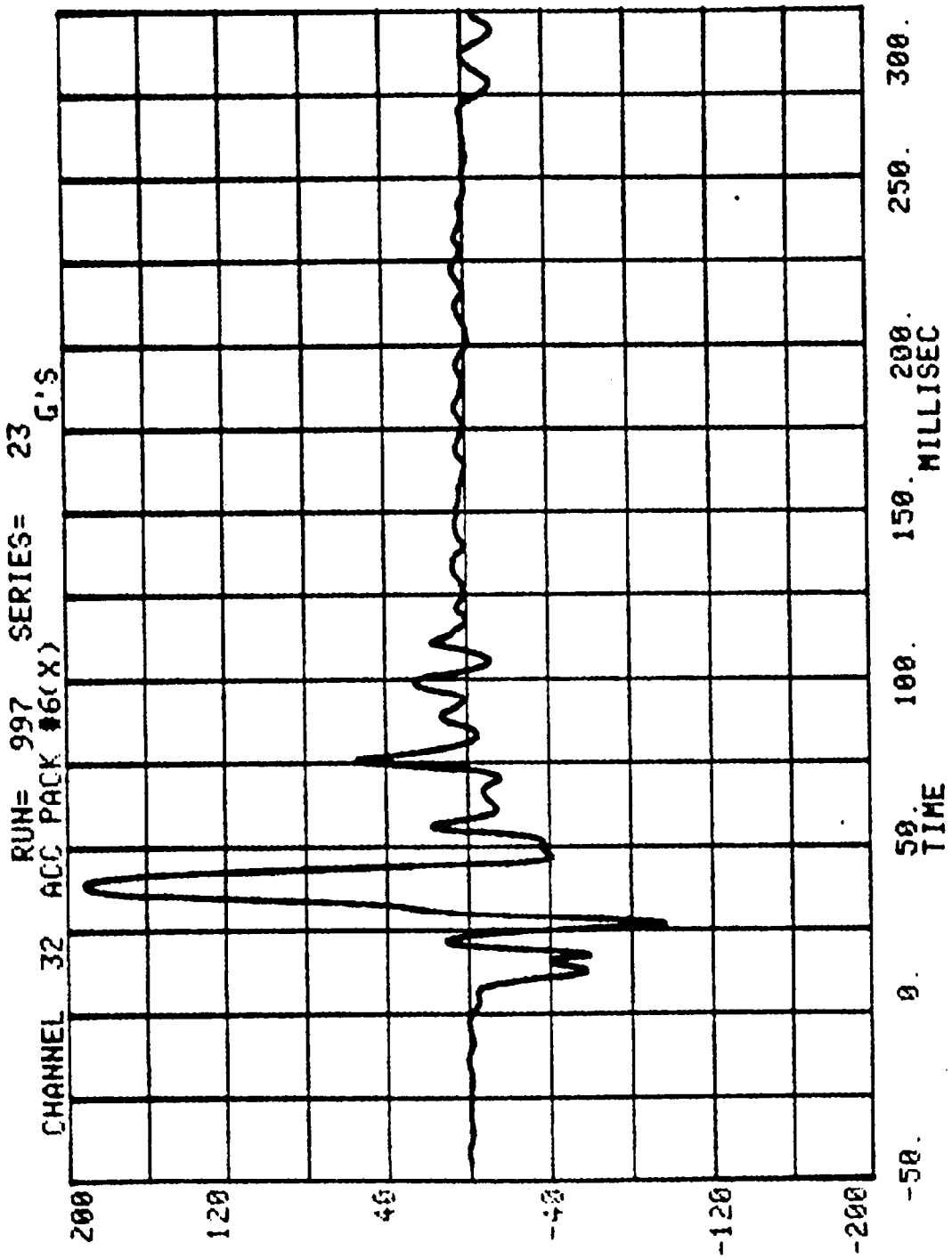

CHANNEL 31 ACC PACK #5(X)
RUN= 997 SERIES= 23
G'S
150
90
30
-30
-90
-150
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

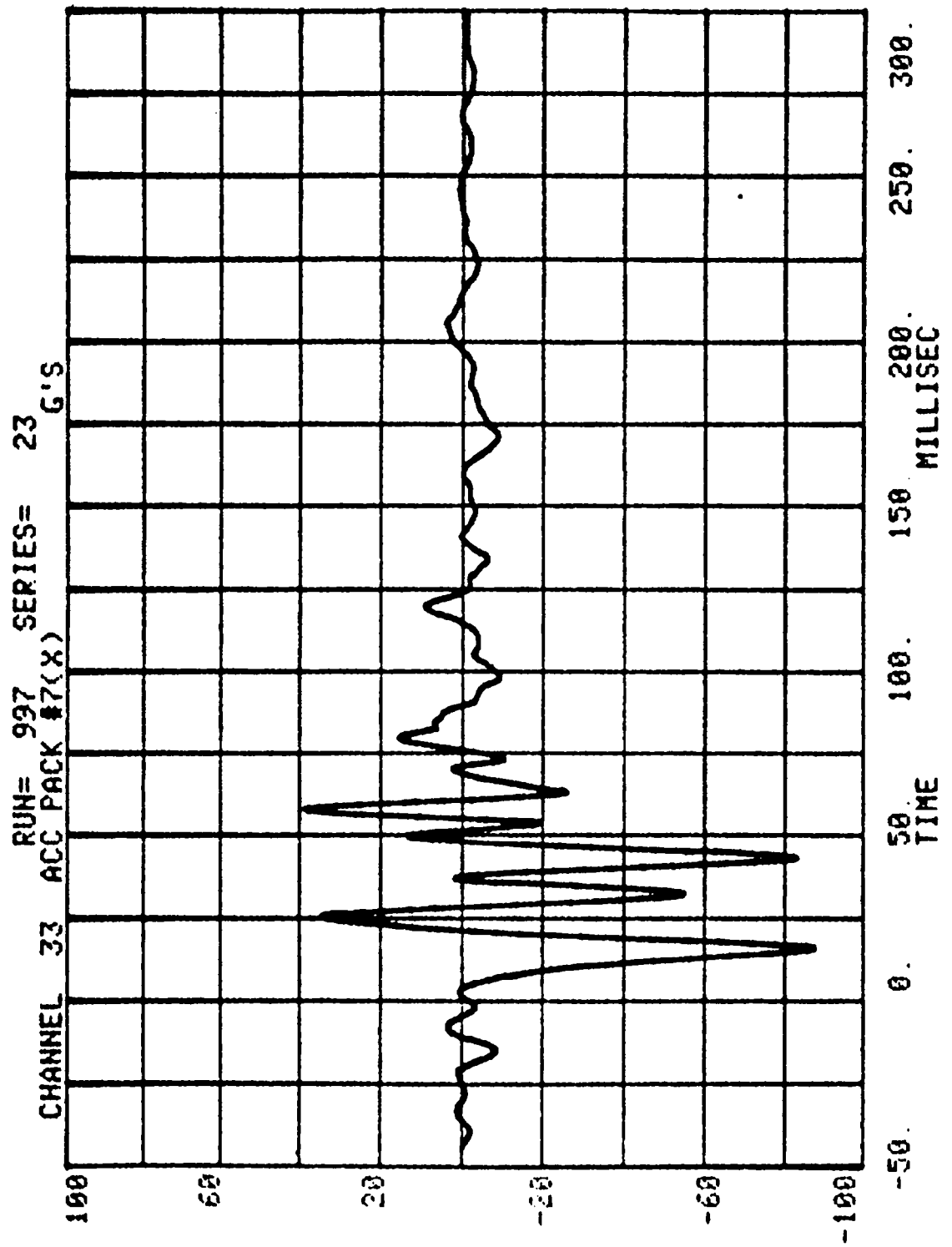

ACCEL #5(x)
CHANNEL 9 VELOCITY
RUN= 997 SERIES= 23 MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

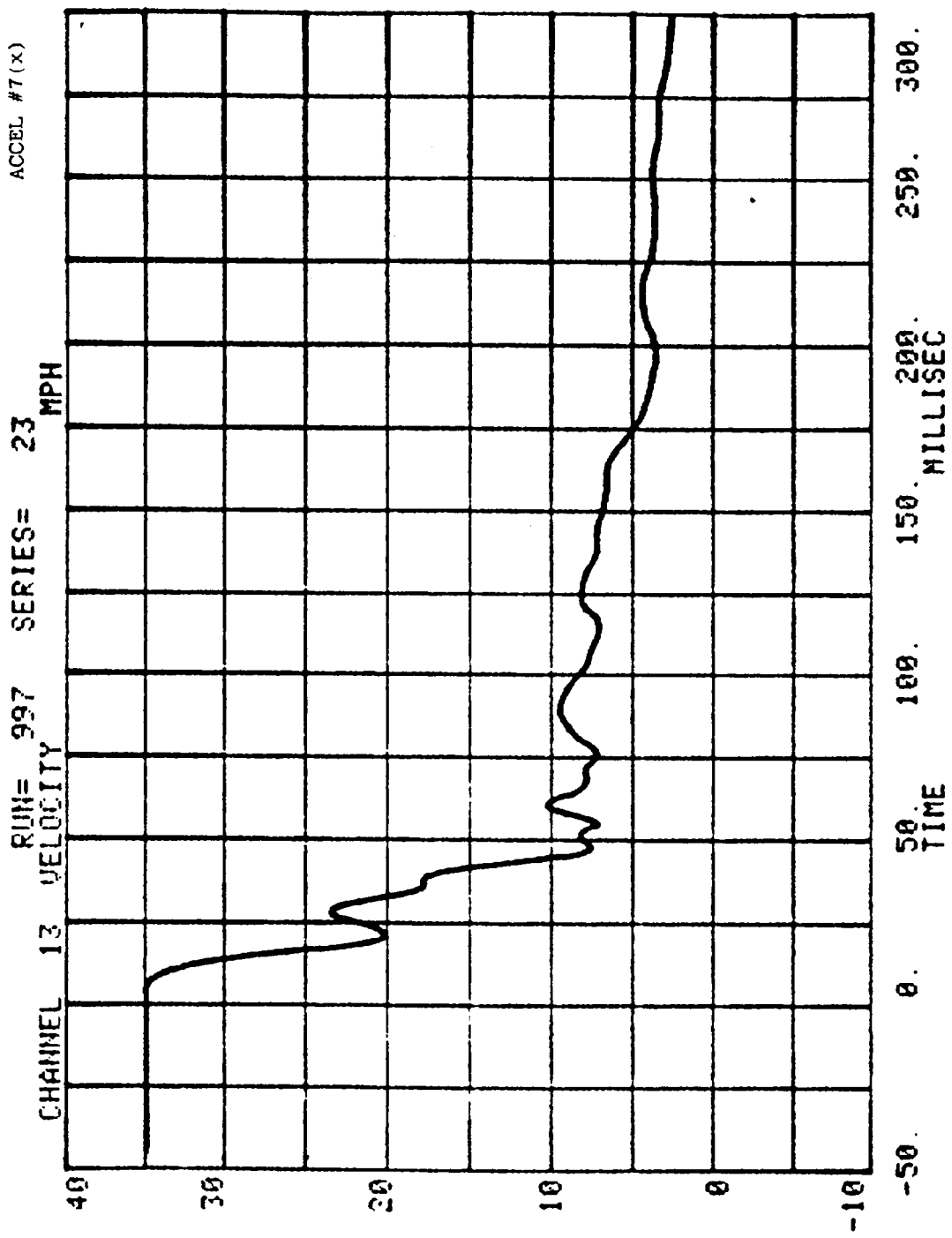

ACCEL #5(x)
CHANNEL 10 DISPLACEMENT
RUN= 997 SERIES= 23
INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 32 ACC PACK #6(X)
RUN= 997 SERIES= 23
G'S
200
120
40
-40
-120
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

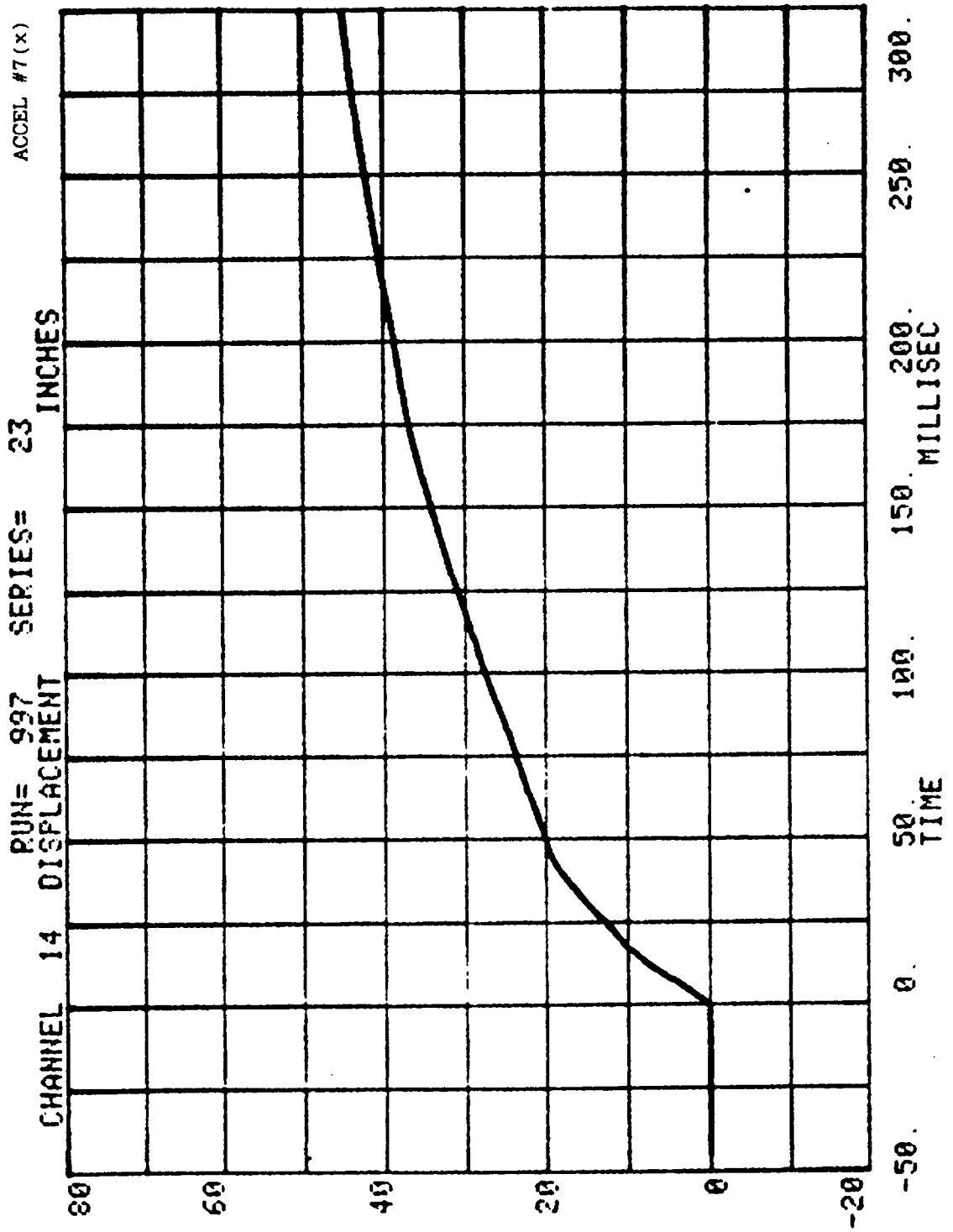
7776-23


CHANNEL 33 ACC PACK #7(X) RUN= 997 SERIES= 23
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150
200.
250.
300.
TIME
MILLISEC

7776-23


ACCEL #7(X)
CHANNEL 13 VELOCITY
RUN= 997 SERIES= 23 MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

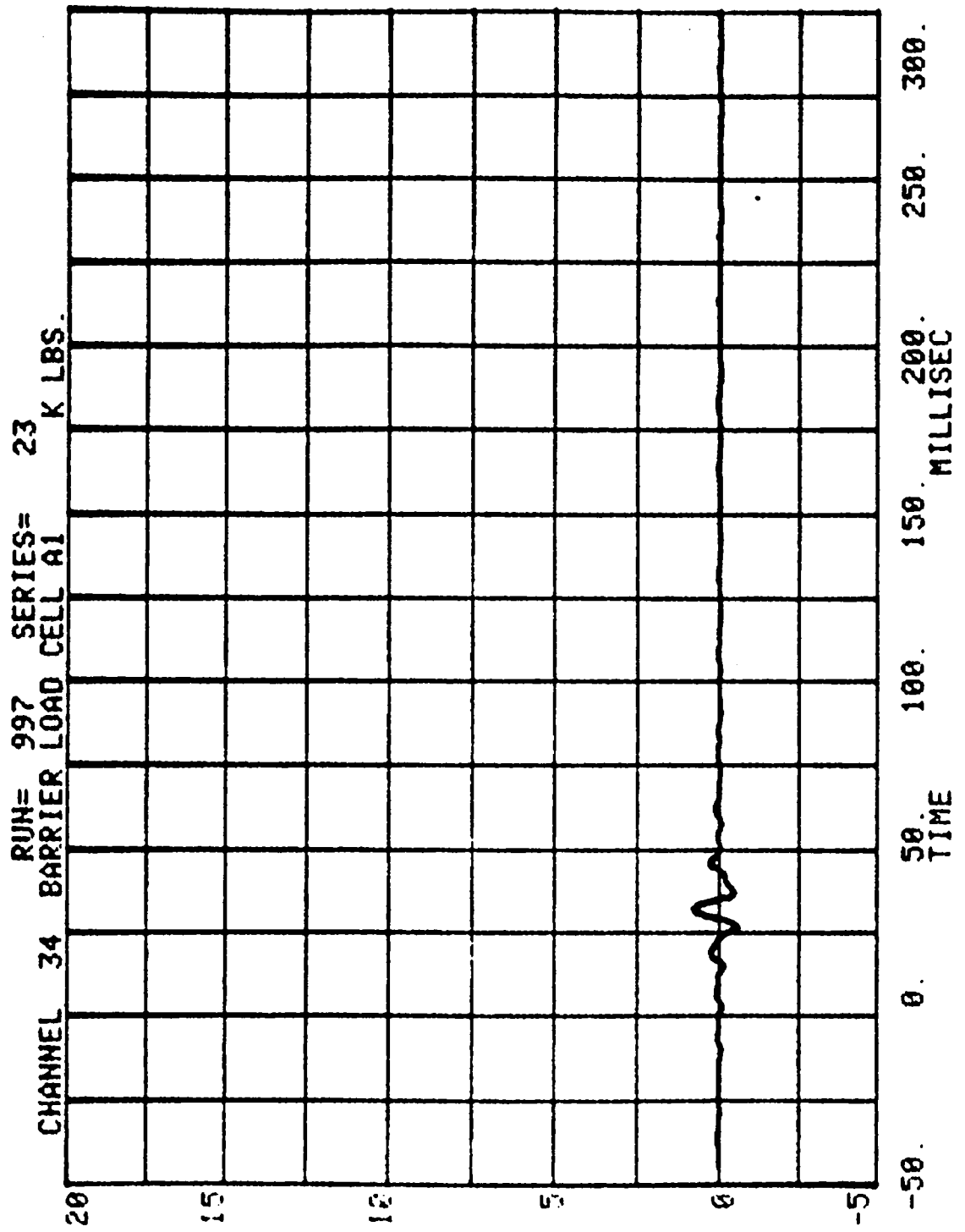

ACCEL #7(X)
CHANNEL 14 DISPLACEMENT
RUN= 997 SERIES= 23
INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

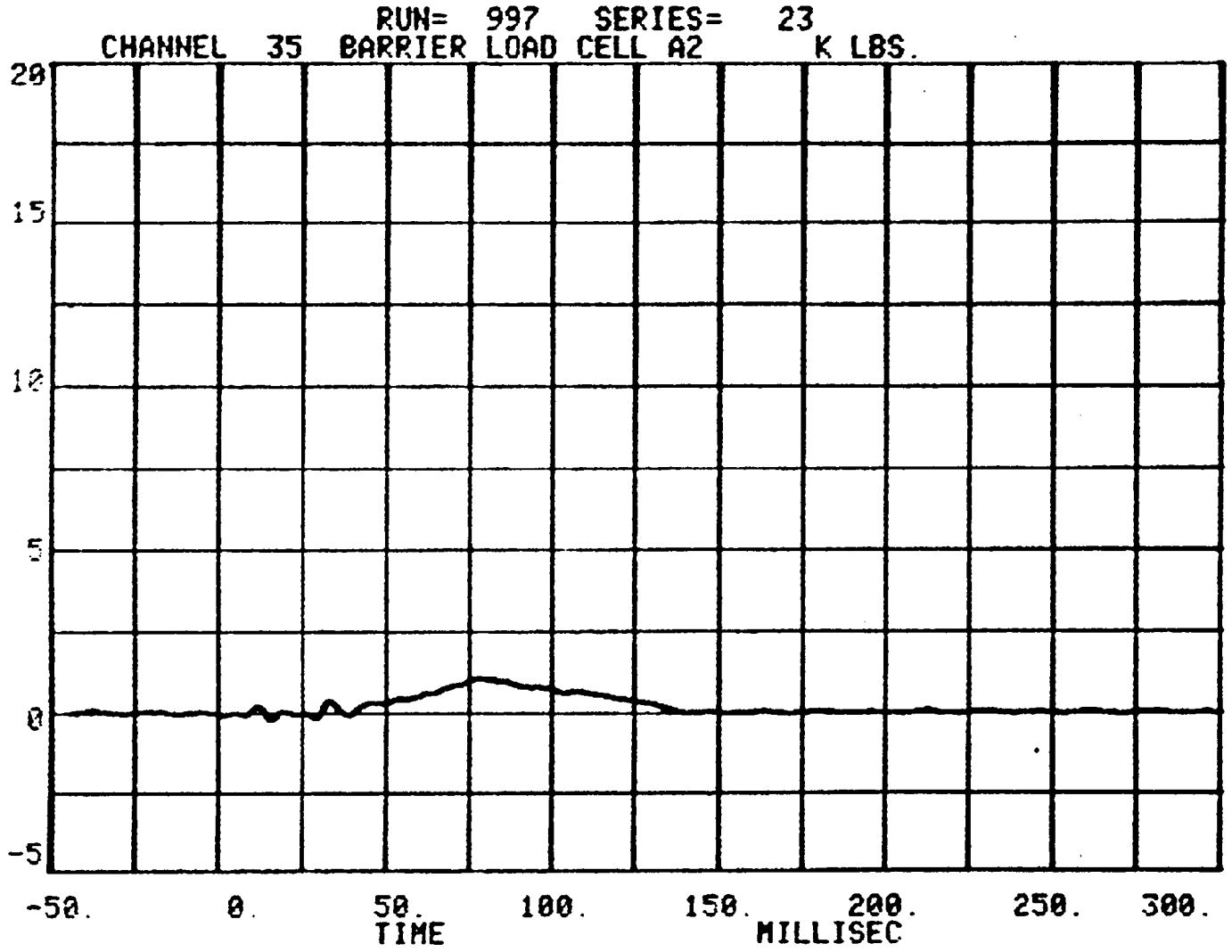
TEST NO. ML0303

LOAD CELL BARRIER DATA

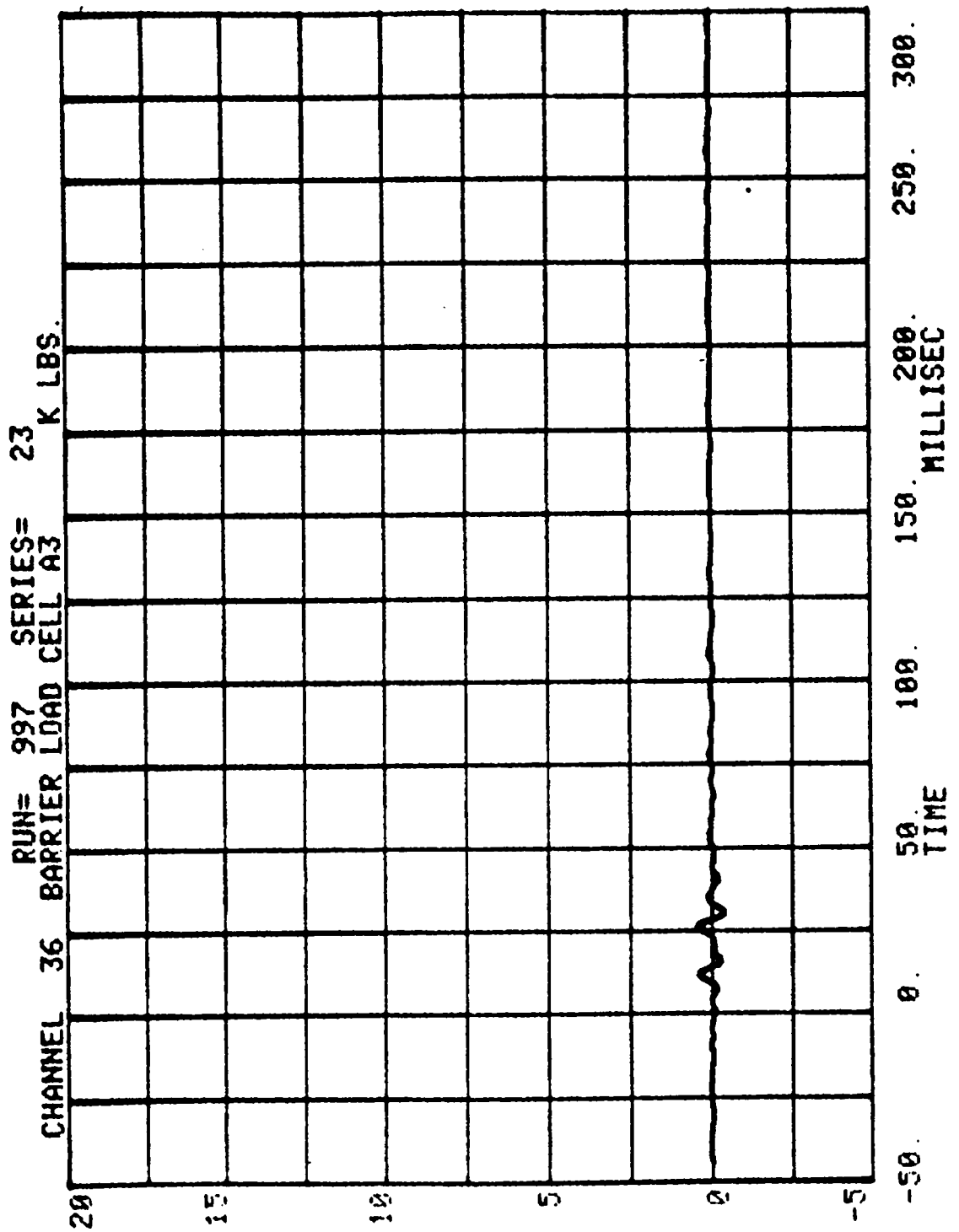
FILTER CHANNEL CLASS

60

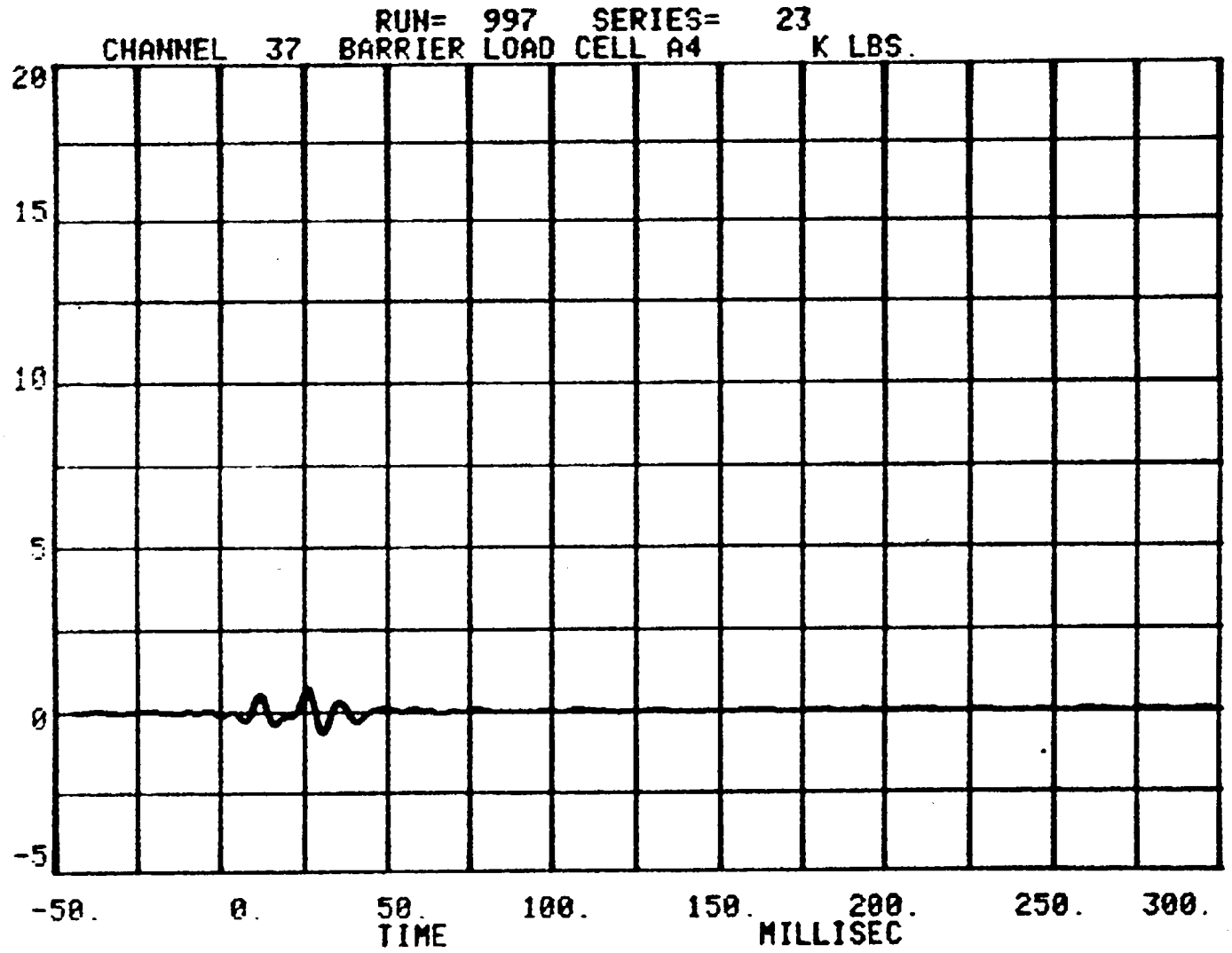

CHANNEL 34 BARRIER LOAD CELL A1
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 997 SERIES= 23
CHANNEL 35 BARRIER LOAD CELL A2 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

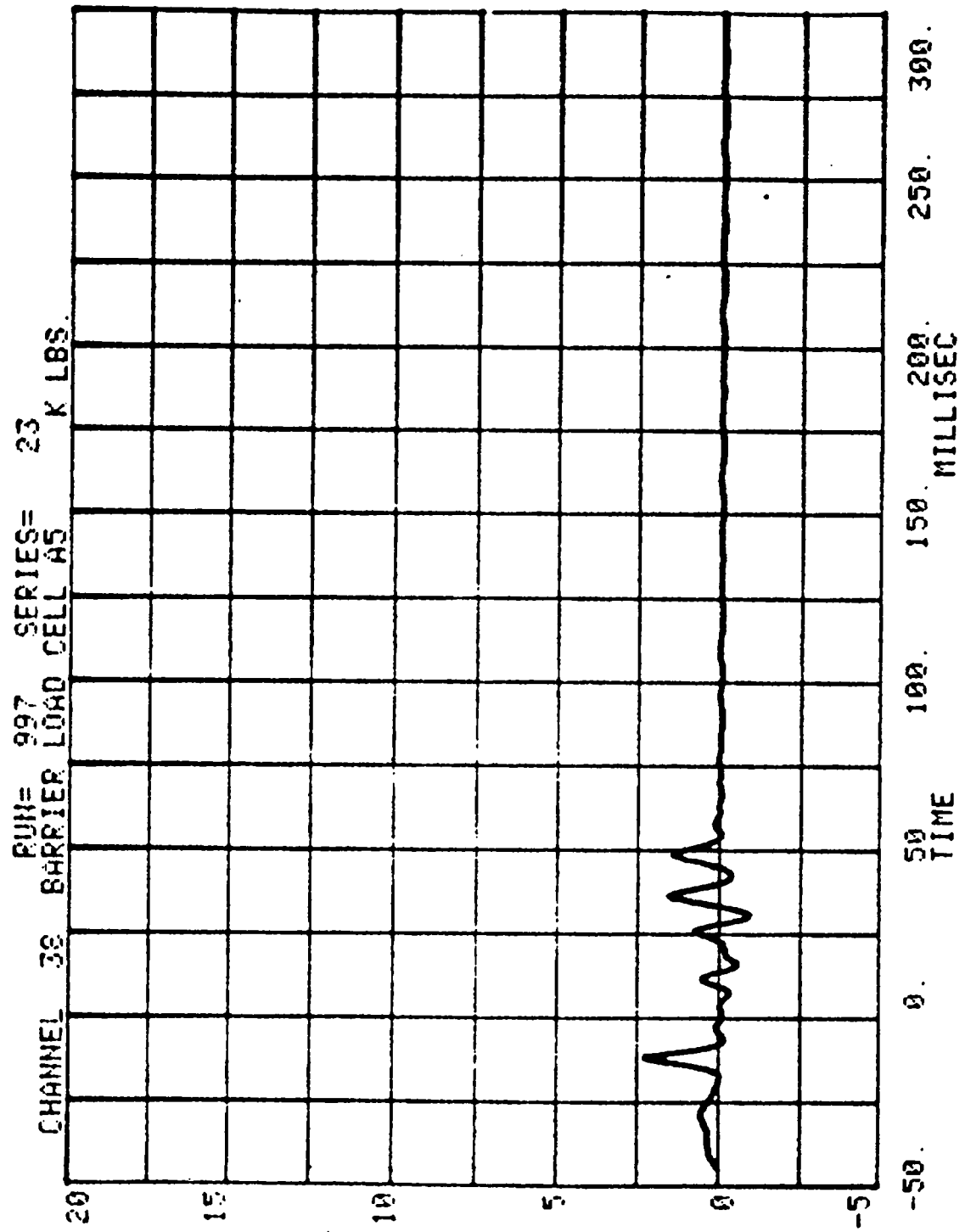
7776-23


CHANNEL 36 BARRIER LOAD CELL A3
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

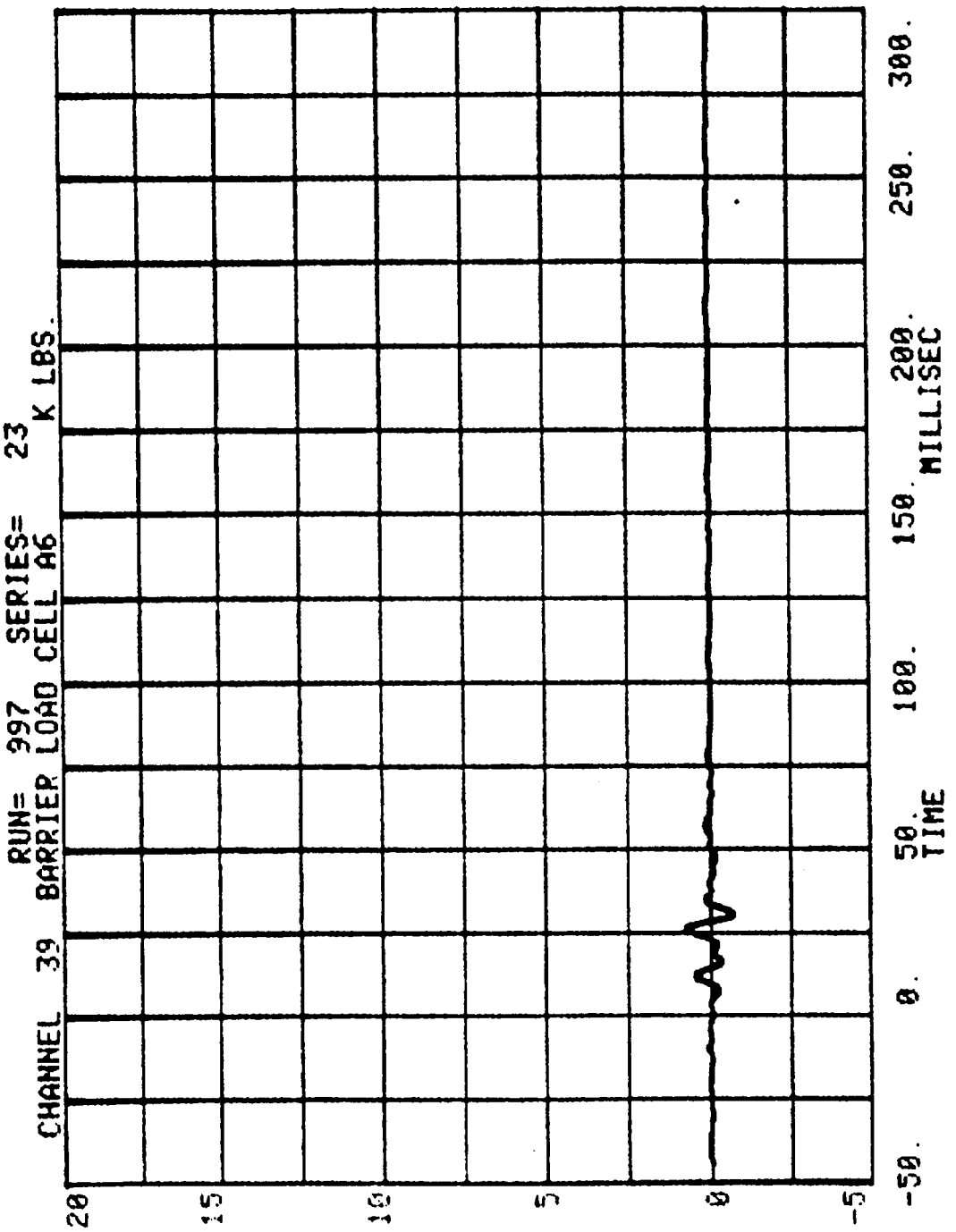
7776-23


RUN= 997 SERIES= 23
CHANNEL 37 BARRIER LOAD CELL A4 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

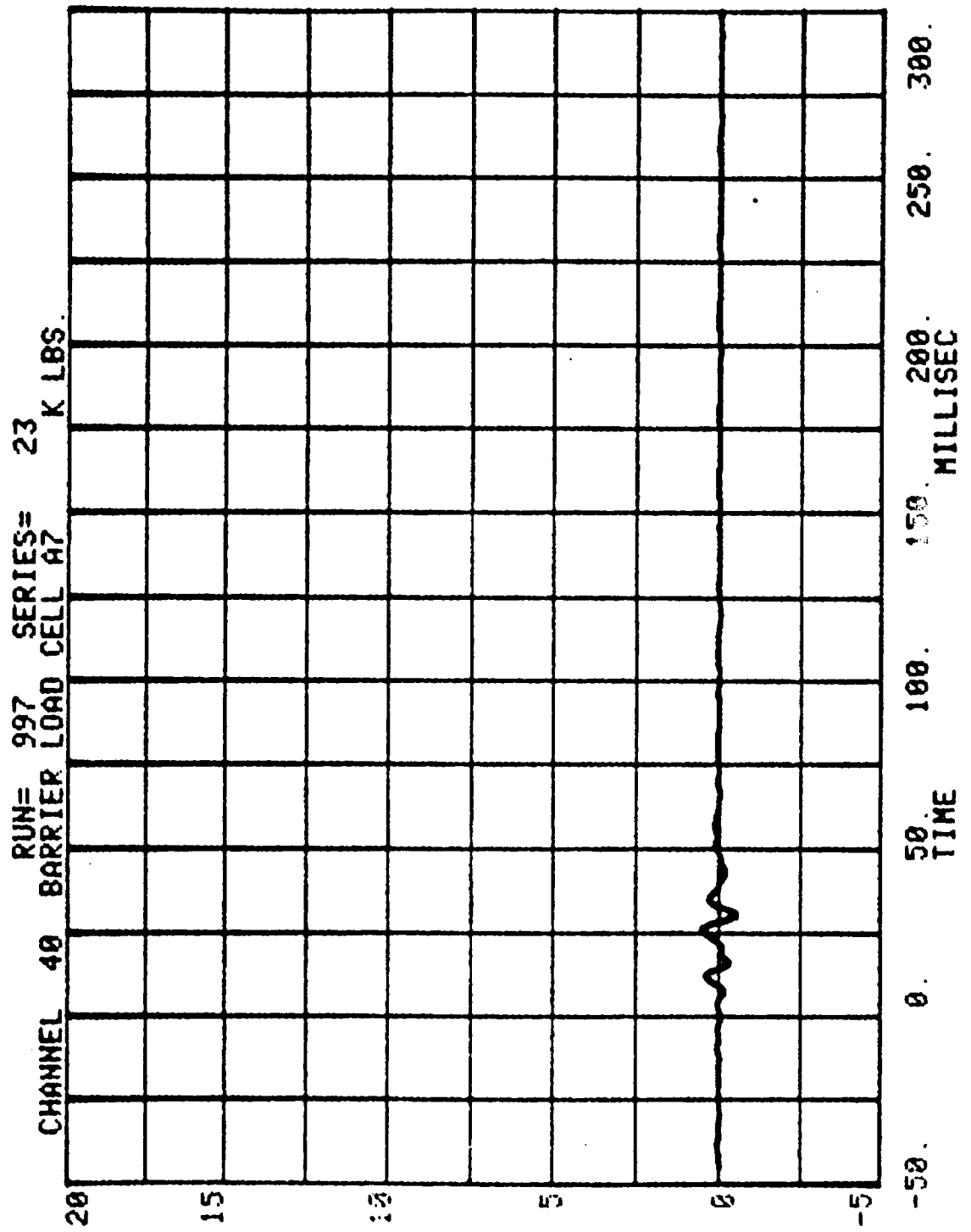
7776-23

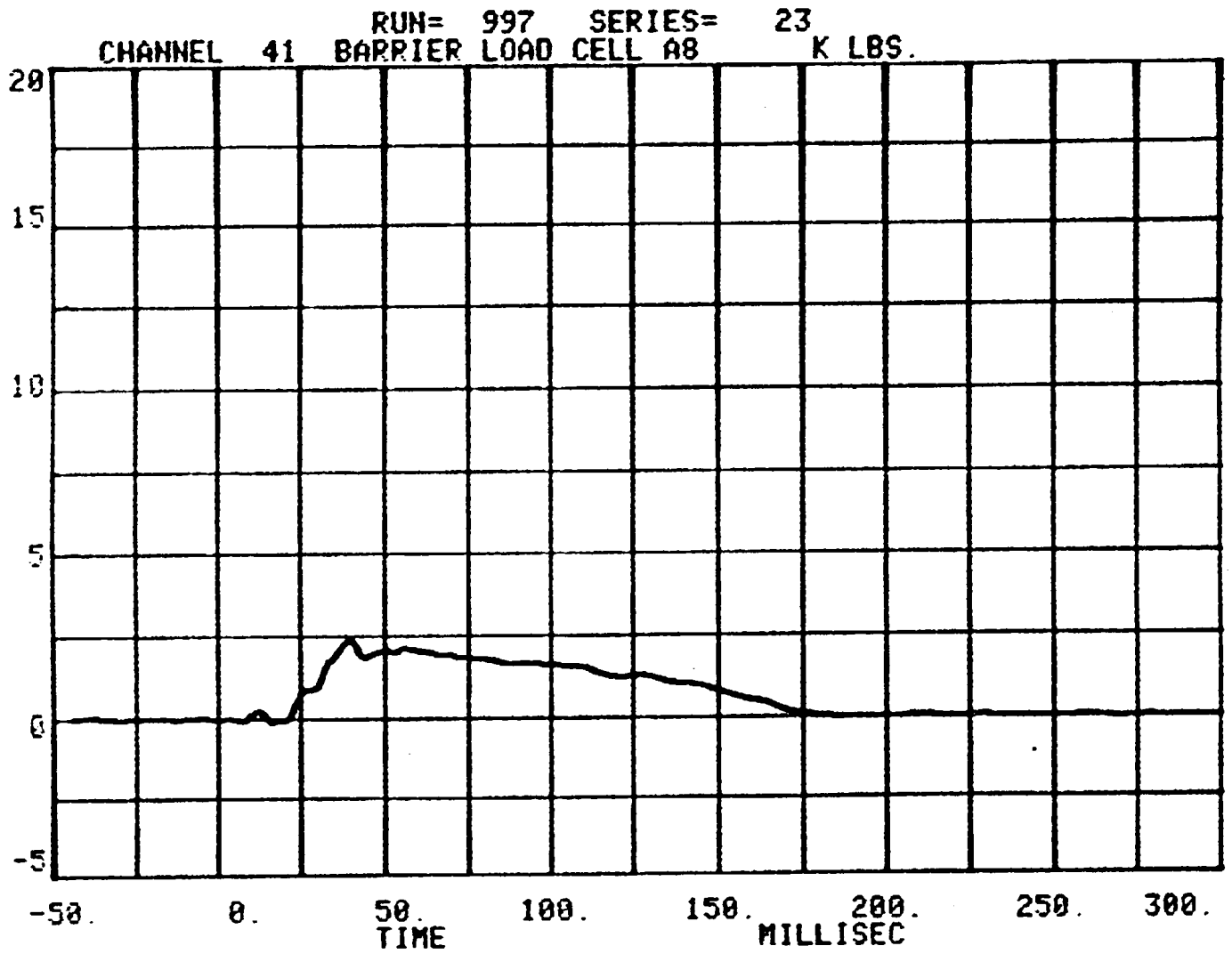

CHANNEL 33 BARRIER LOAD CELL AS
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50
TIME
100.
150.
200.
MILLISEC
250.
300.

7776-23

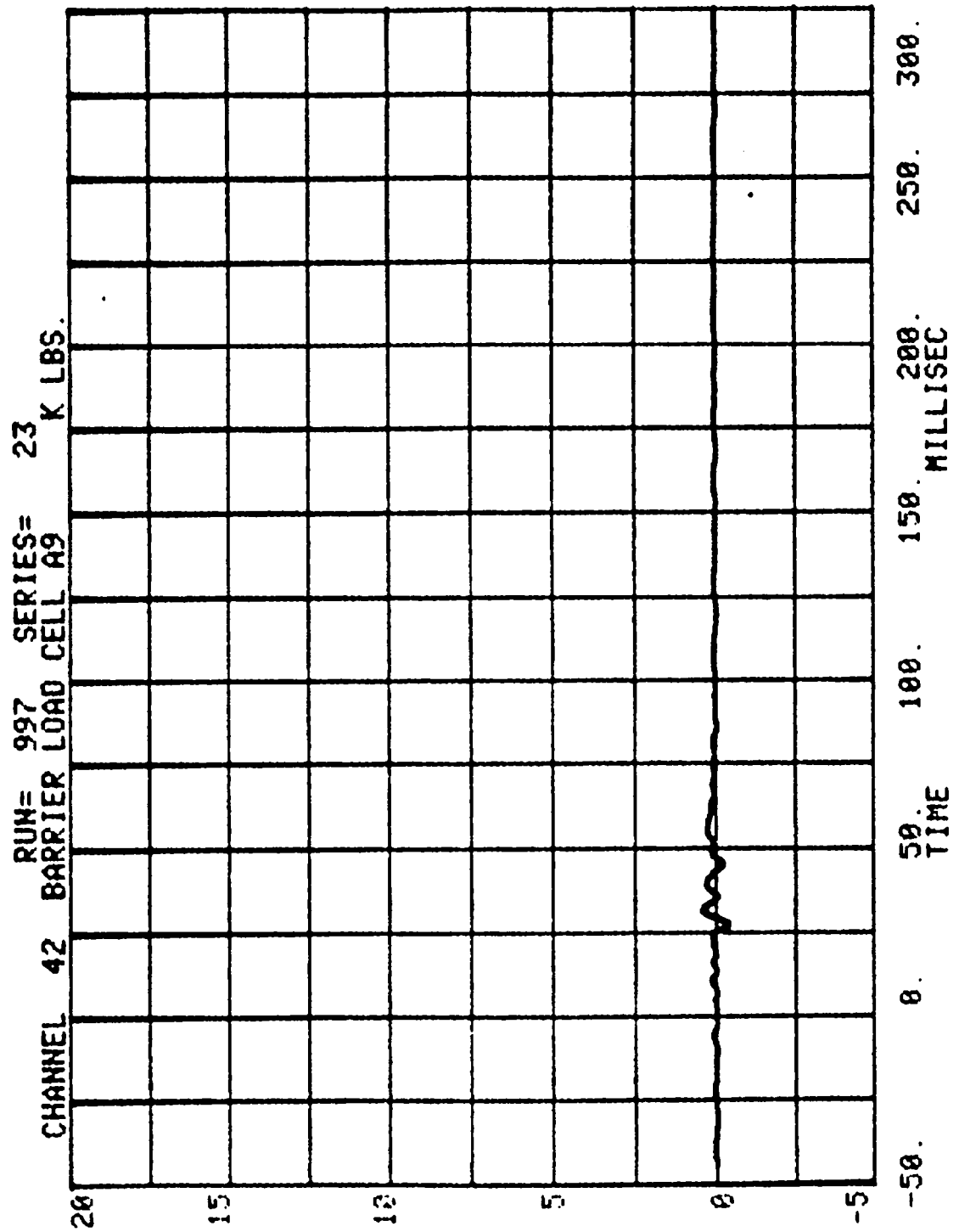

CHANNEL 39
RUN= 997
BARRIER LOAD CELL
SERIES= 23
A6
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

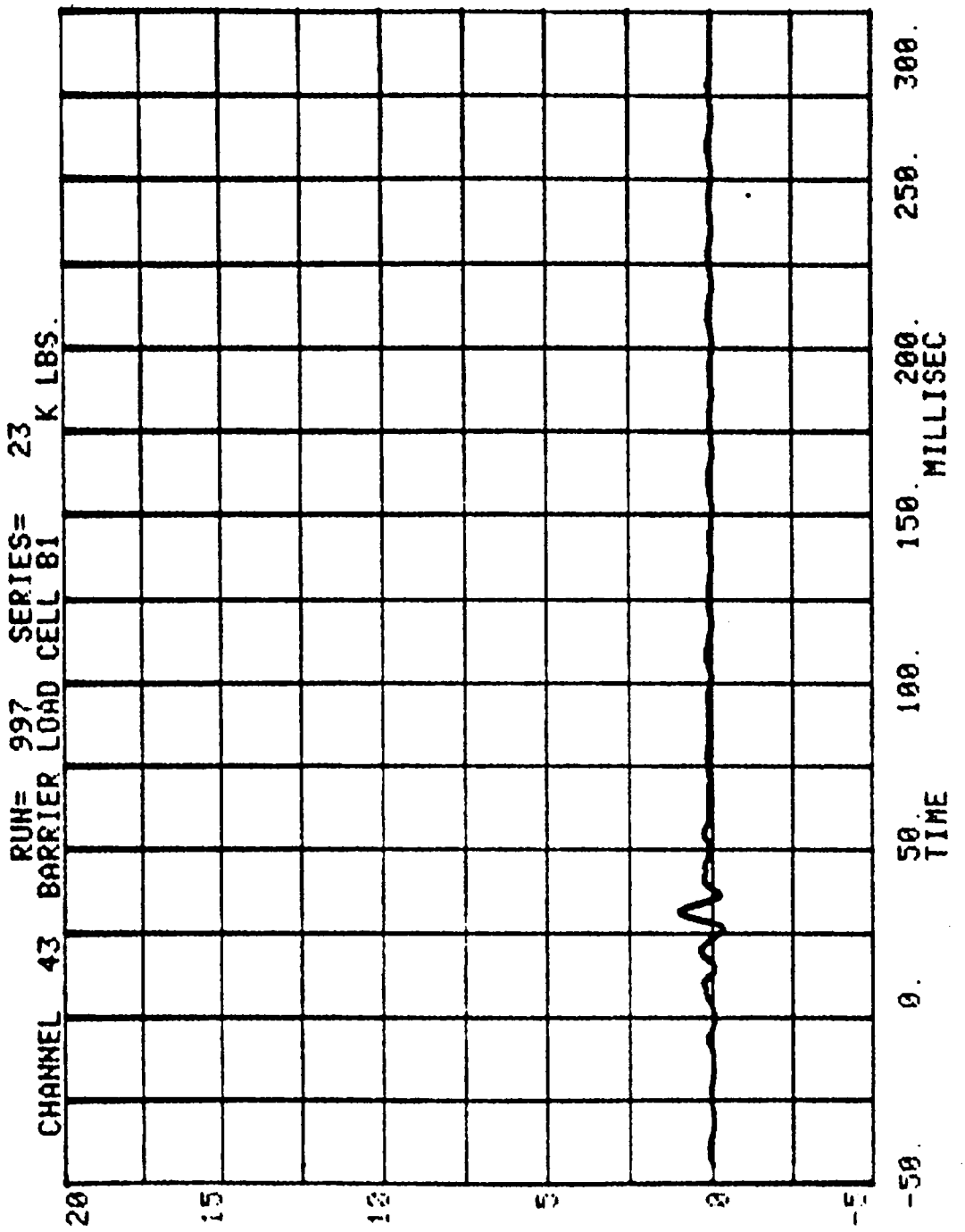

CHANNEL 40 BARRIER LOAD CELL A7
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

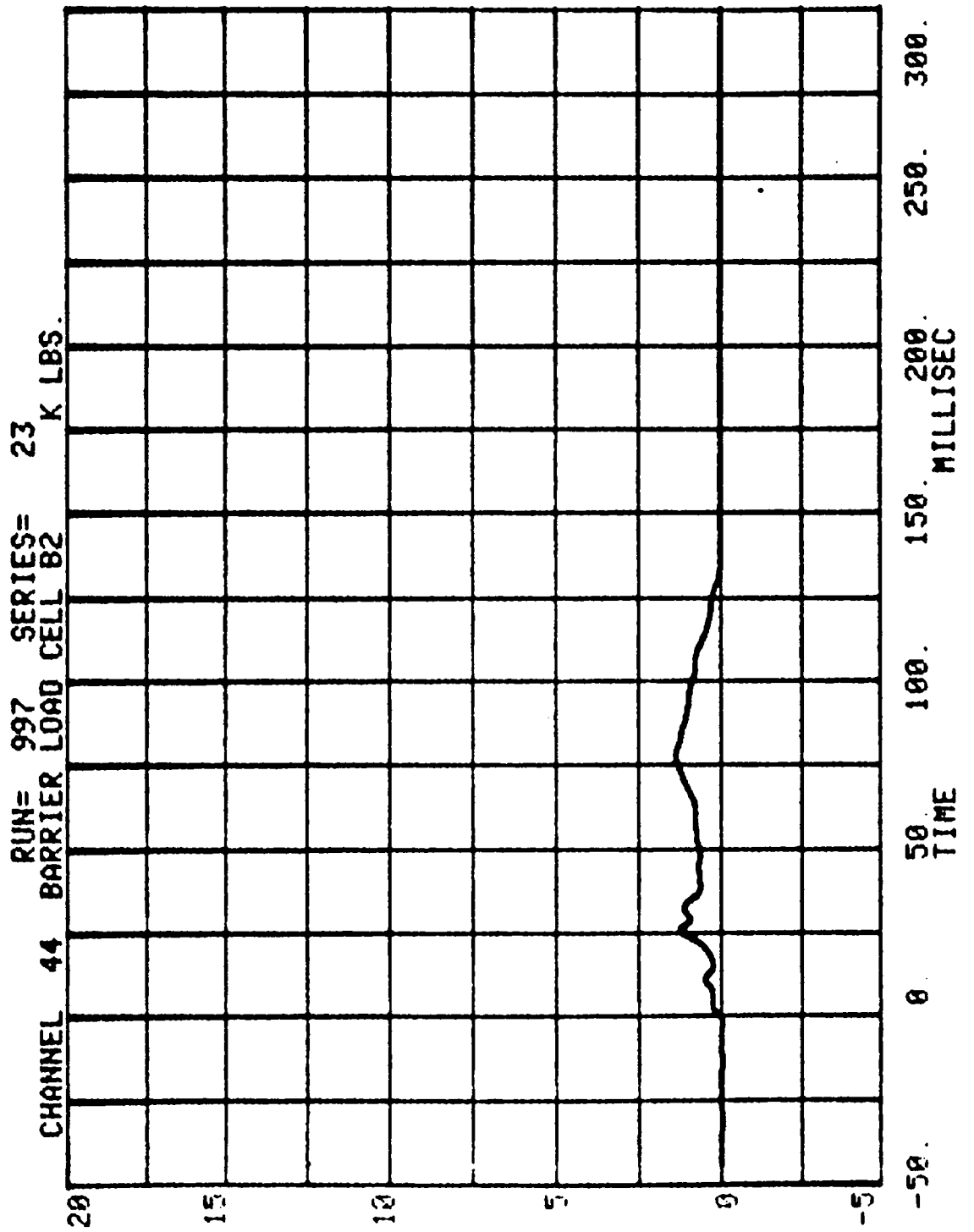

RUN= 997 SERIES= 23
CHANNEL 41 BARRIER LOAD CELL A8 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

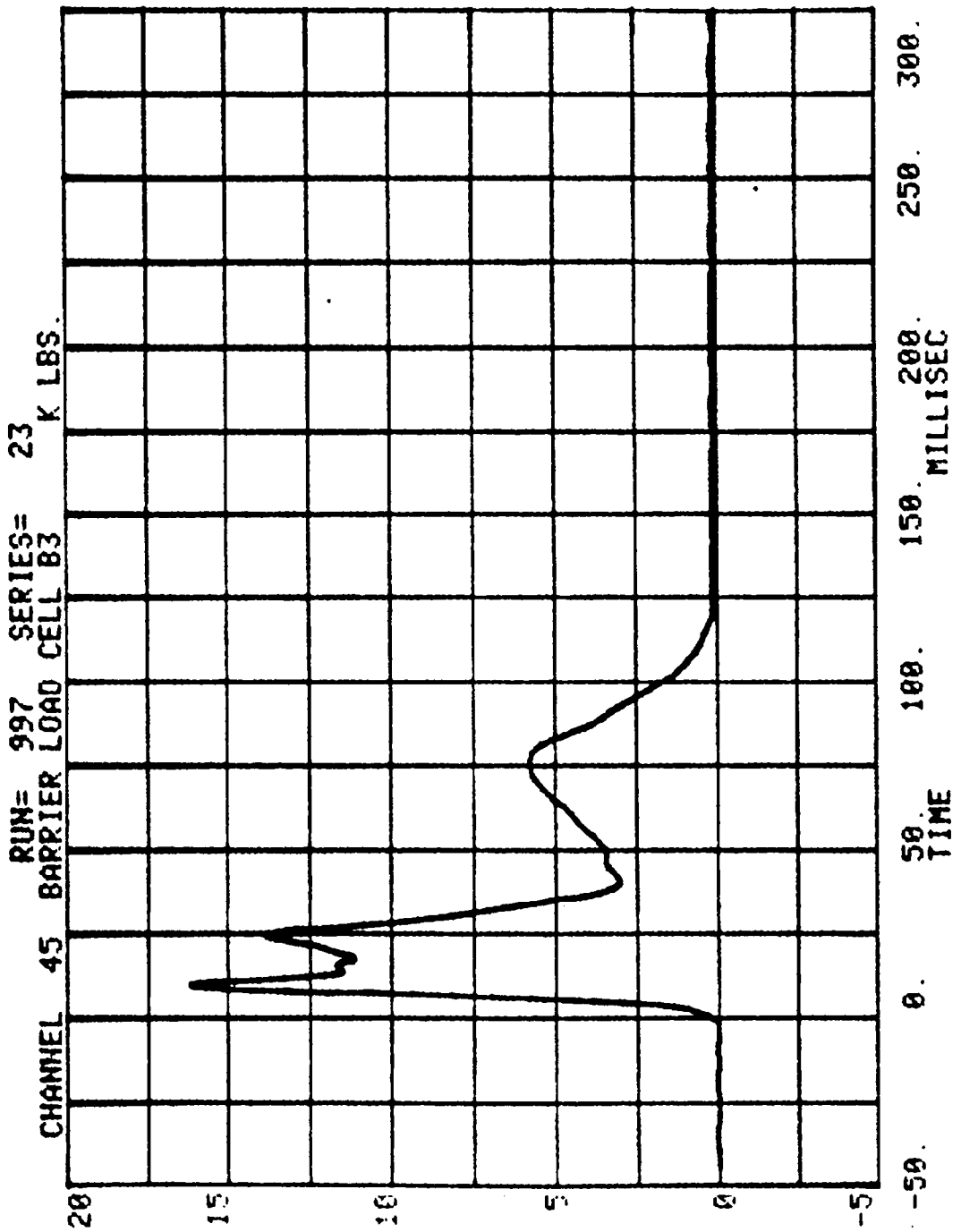

CHANNEL 42 BARRIER LOAD CELL A9
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

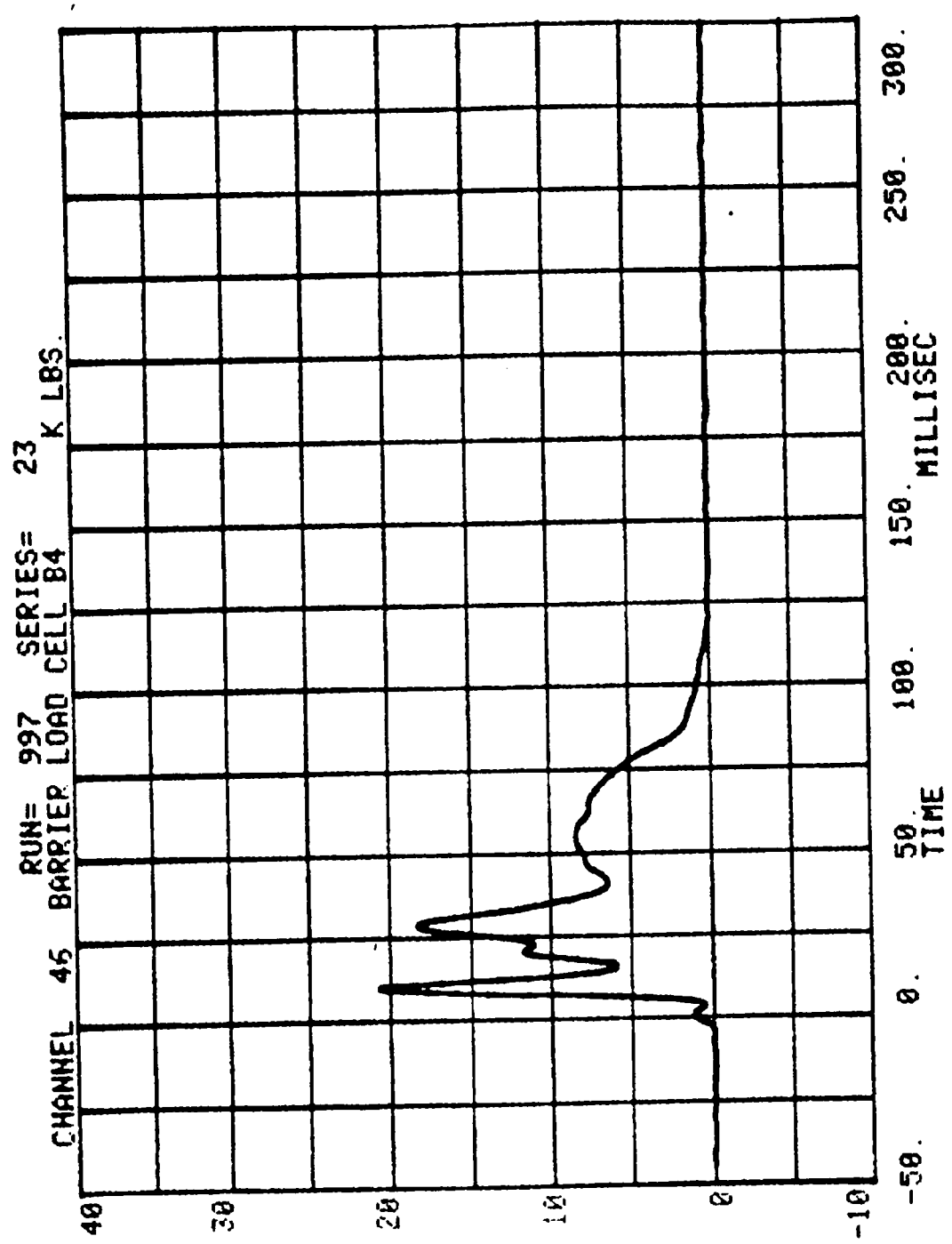
7776-23


CHANNEL 43
RUN= 997 SERIES= 23
BARRIER LOAD CELL B1
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

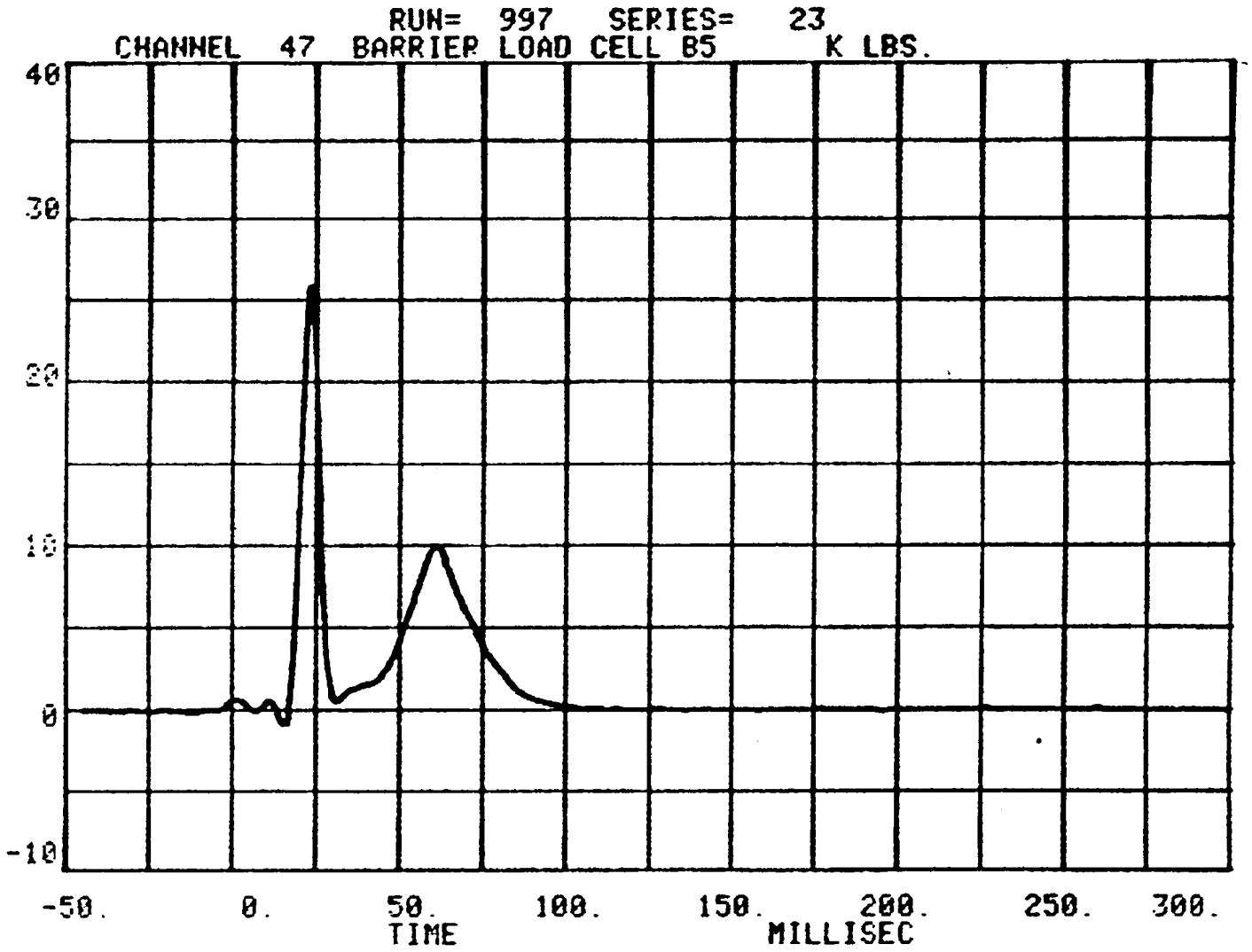

CHANNEL 44 RUN= 997 SERIES= 23
BARRIER LOAD CELL B2
K LBS.
20
15
10
5
0
-5
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

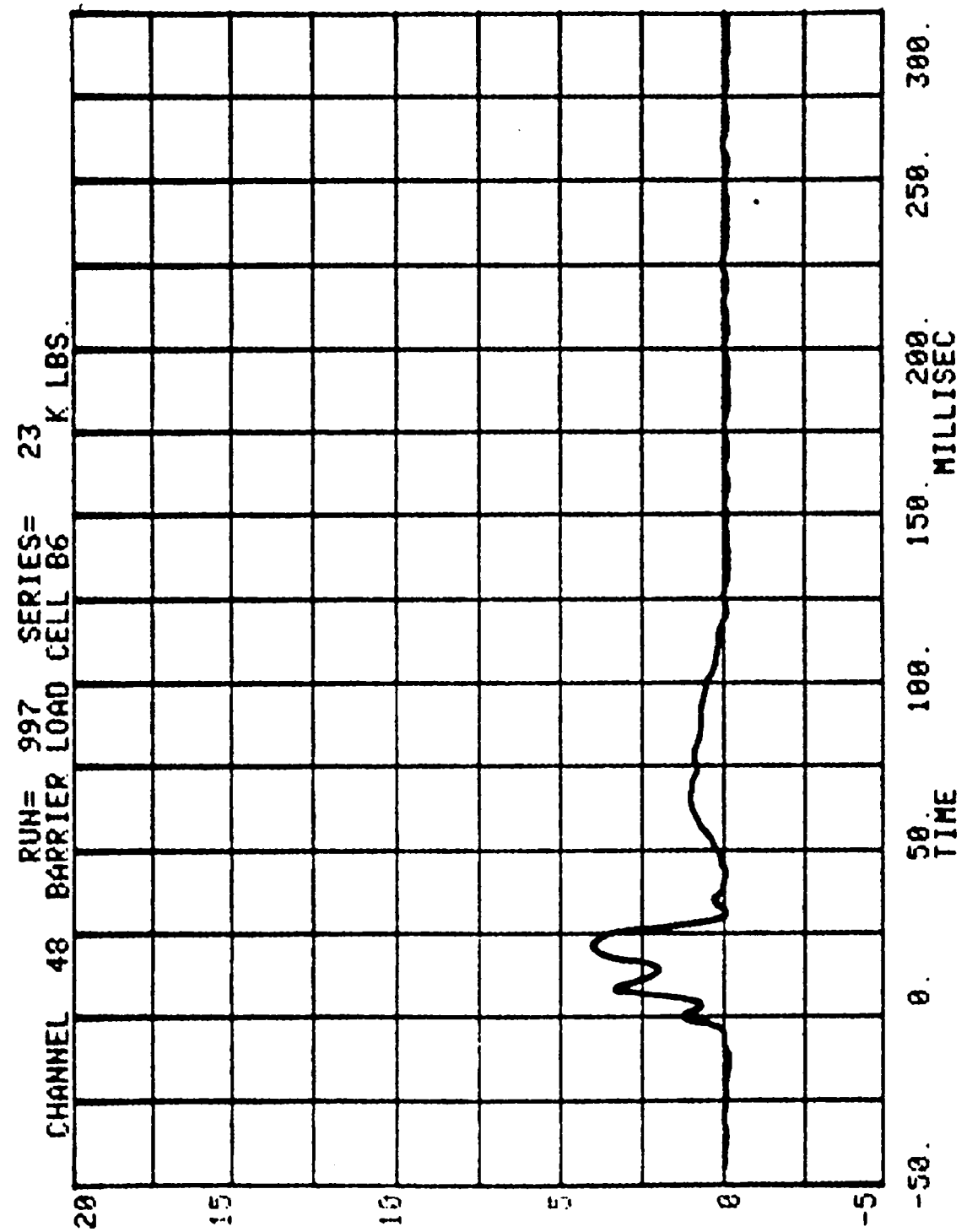
7776-23


CHANNEL 45 BARRIER LOAD CELL B3
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

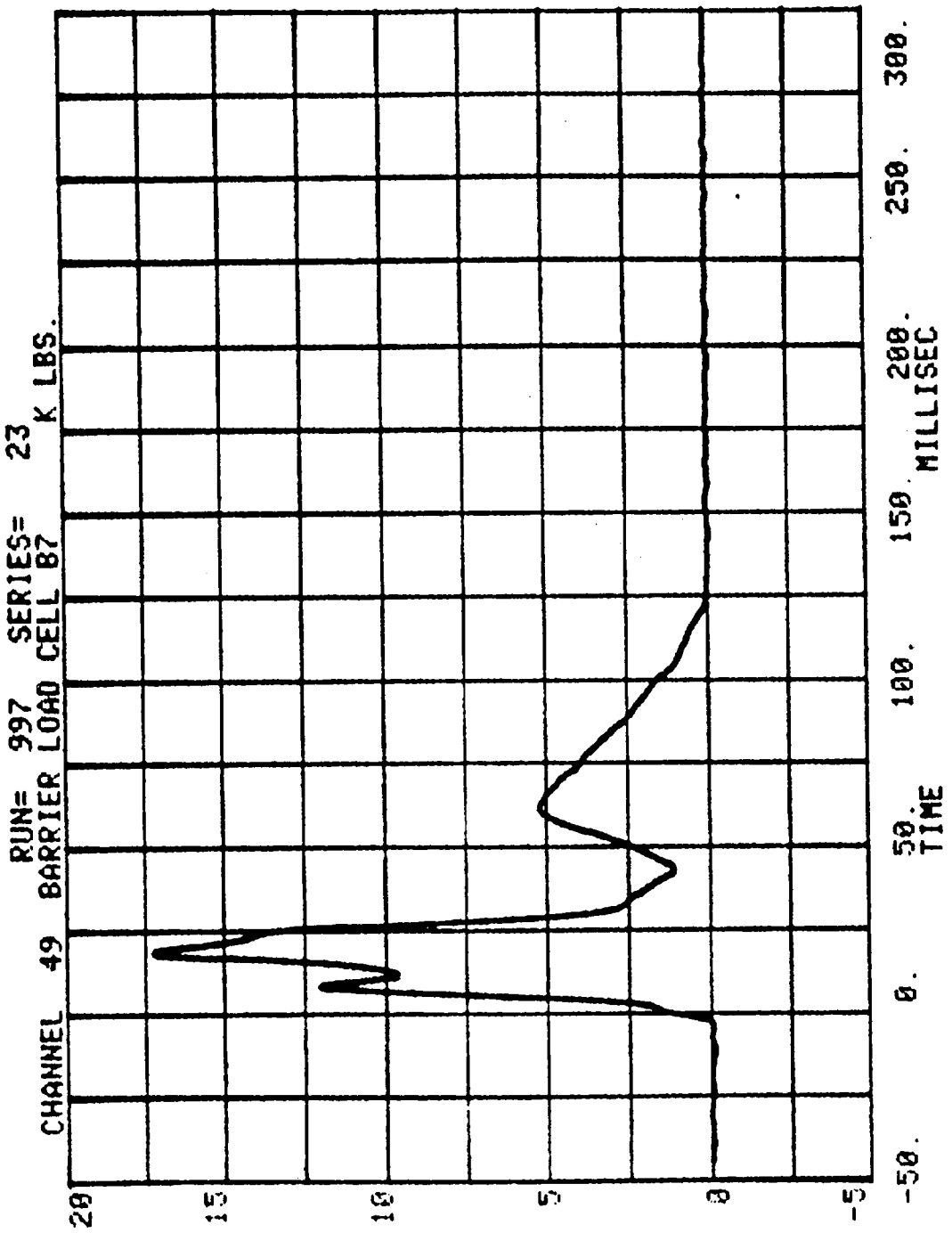

CHANNEL 45 BARRIER LOAD CELL B4
RUN= 997 SERIES= 23 K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

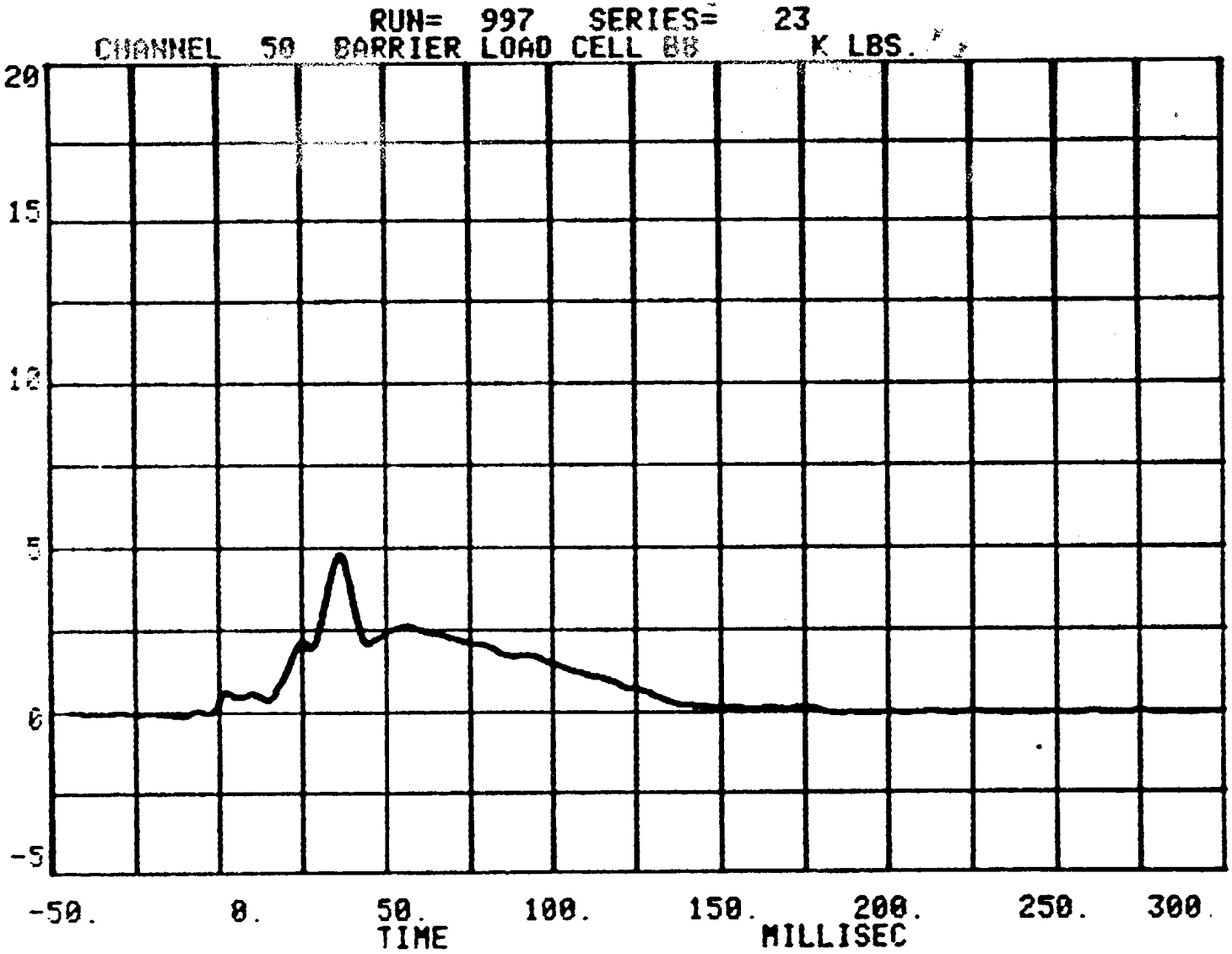
7776-23

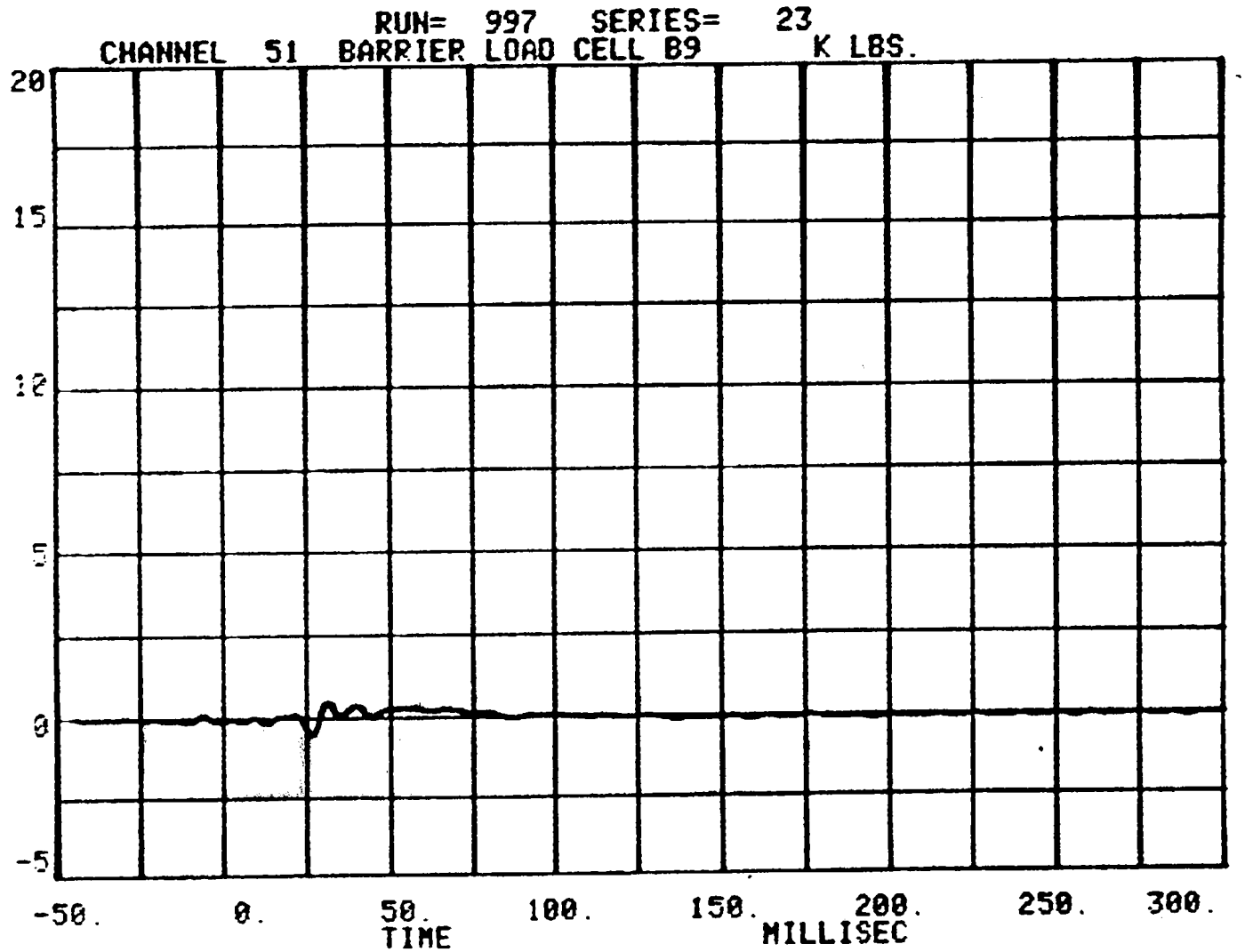

RUN= 997 SERIES= 23
CHANNEL 47 BARRIER LOAD CELL B5 K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 48 BARRIER LOAD CELL B6
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

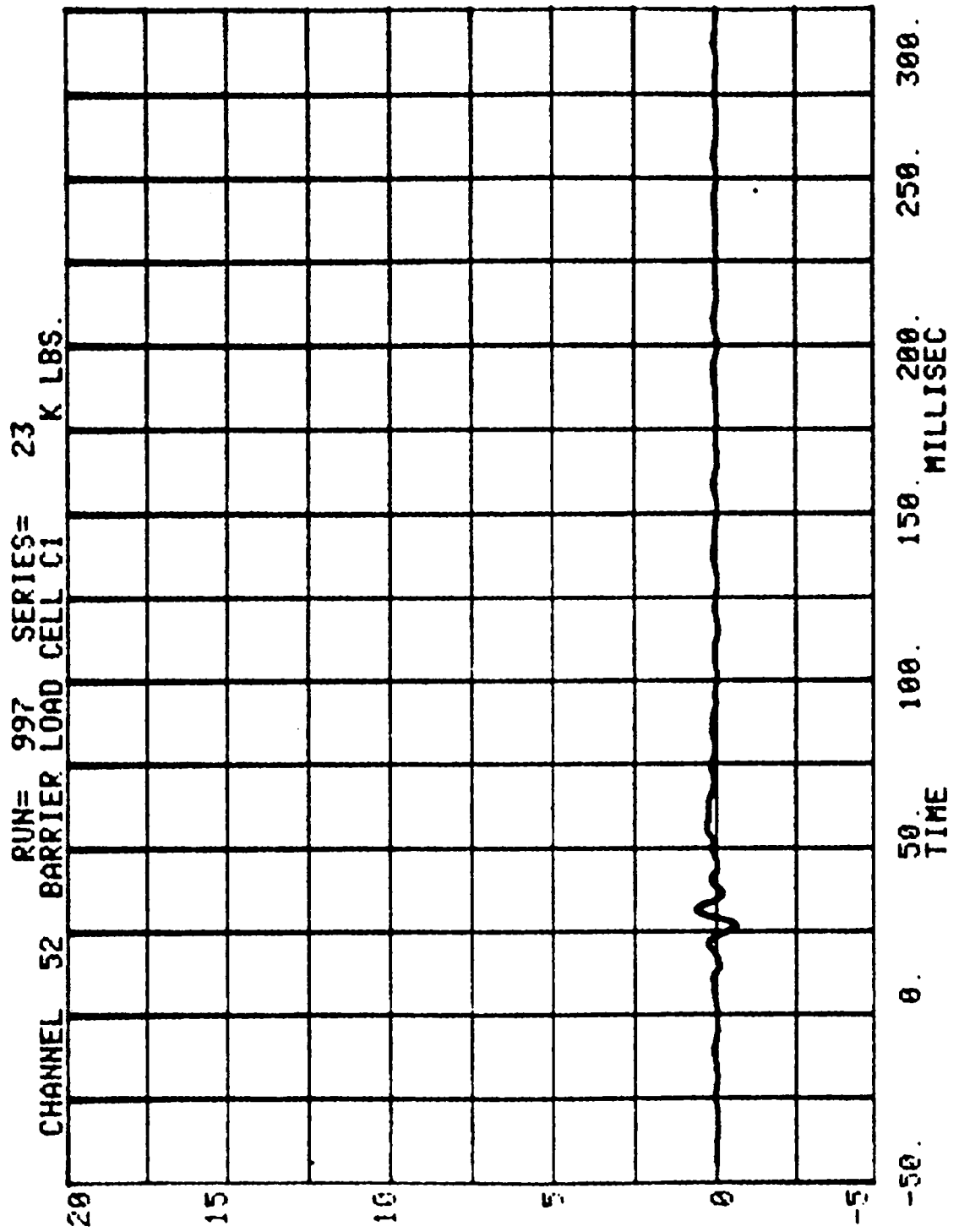
7776-23

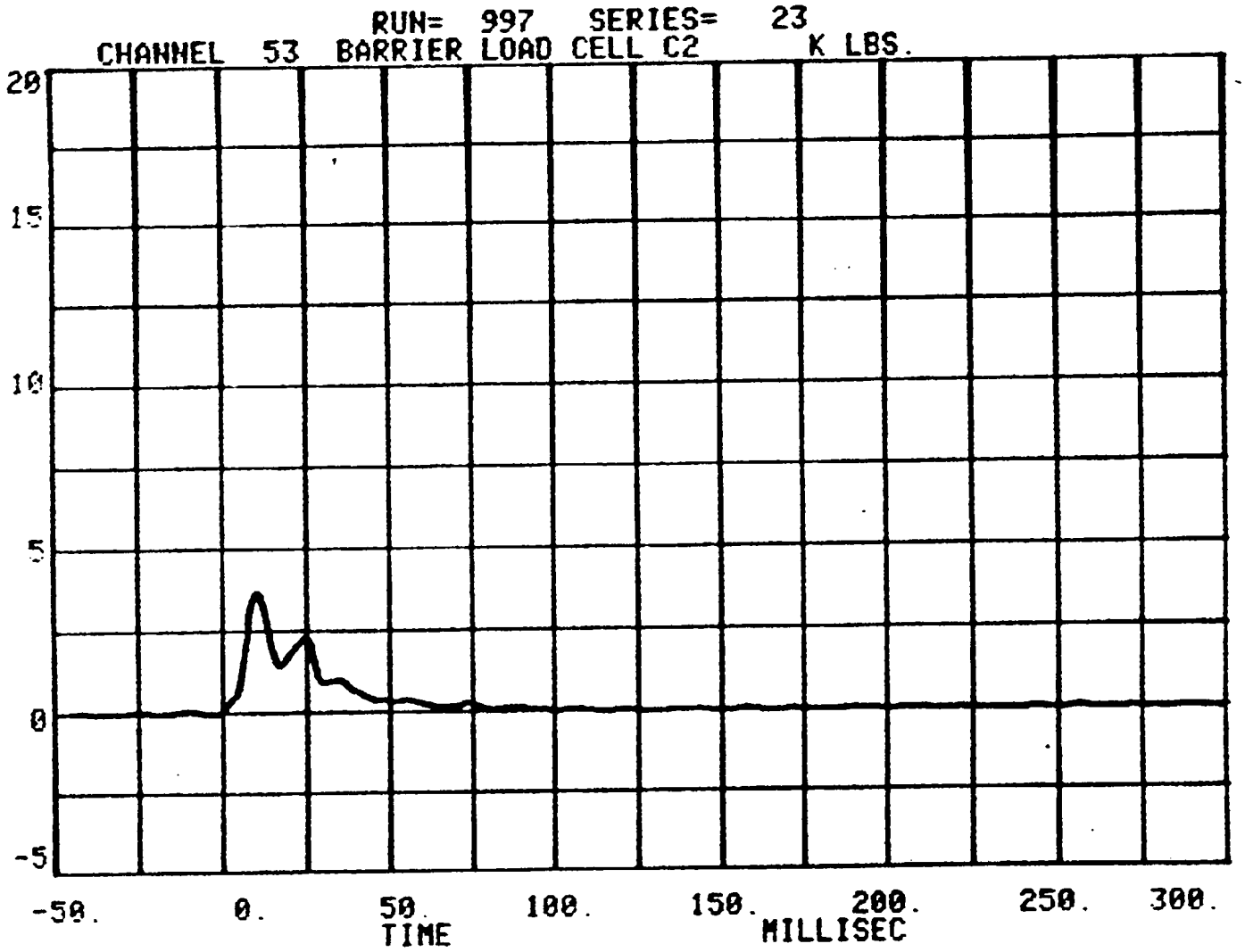

CHANNEL 49 BARRIER LOAD CELL B7
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 997 SERIES= 23
CHANNEL 50 BARRIER LOAD CELL 88 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

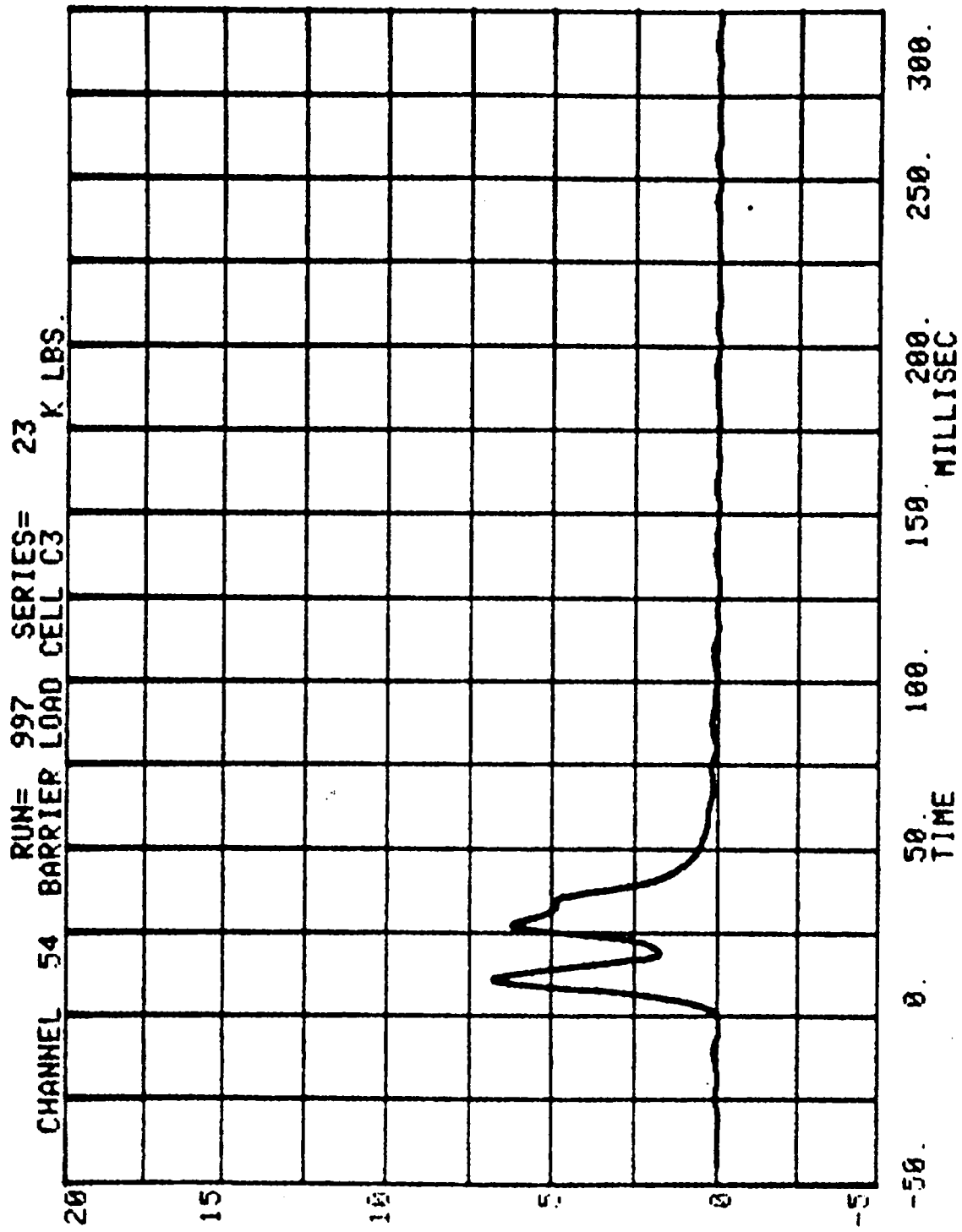

RUN= 997 SERIES= 23
CHANNEL 51 BARRIER LOAD CELL B9 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

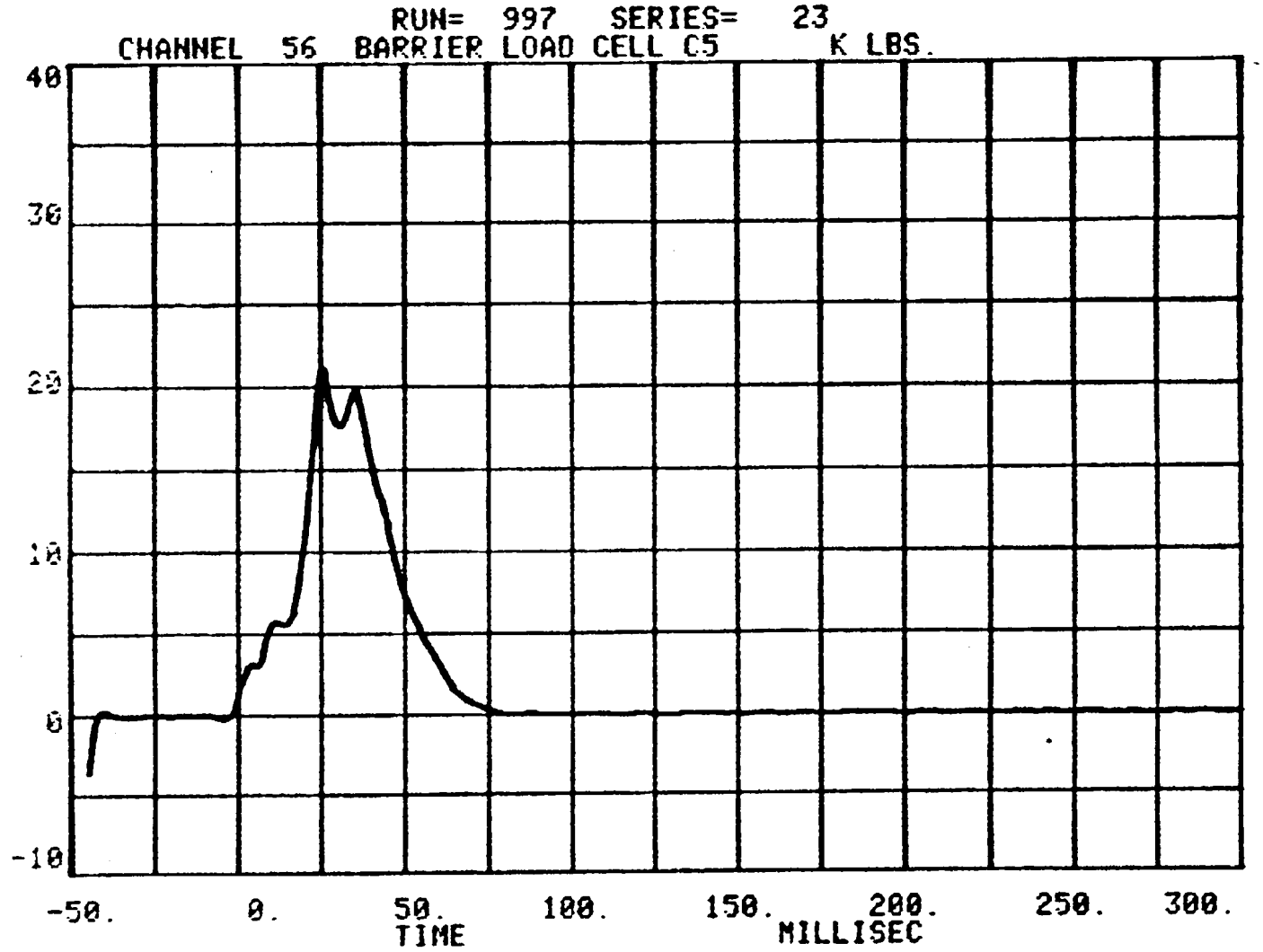

CHANNEL 52 BARRIER LOAD CELL C1
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 997 SERIES= 23
CHANNEL 53 BARRIER LOAD CELL C2
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

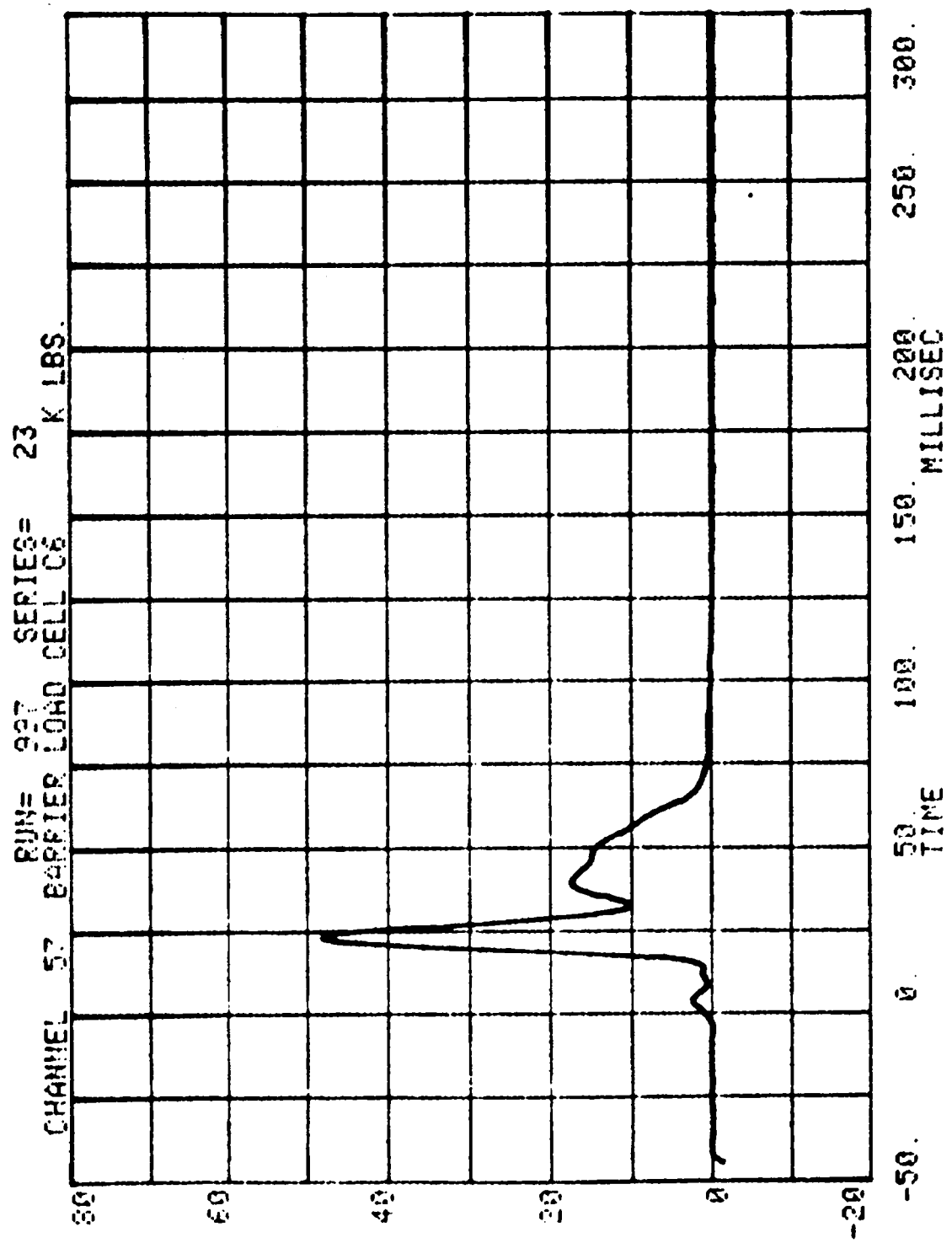
7776-23

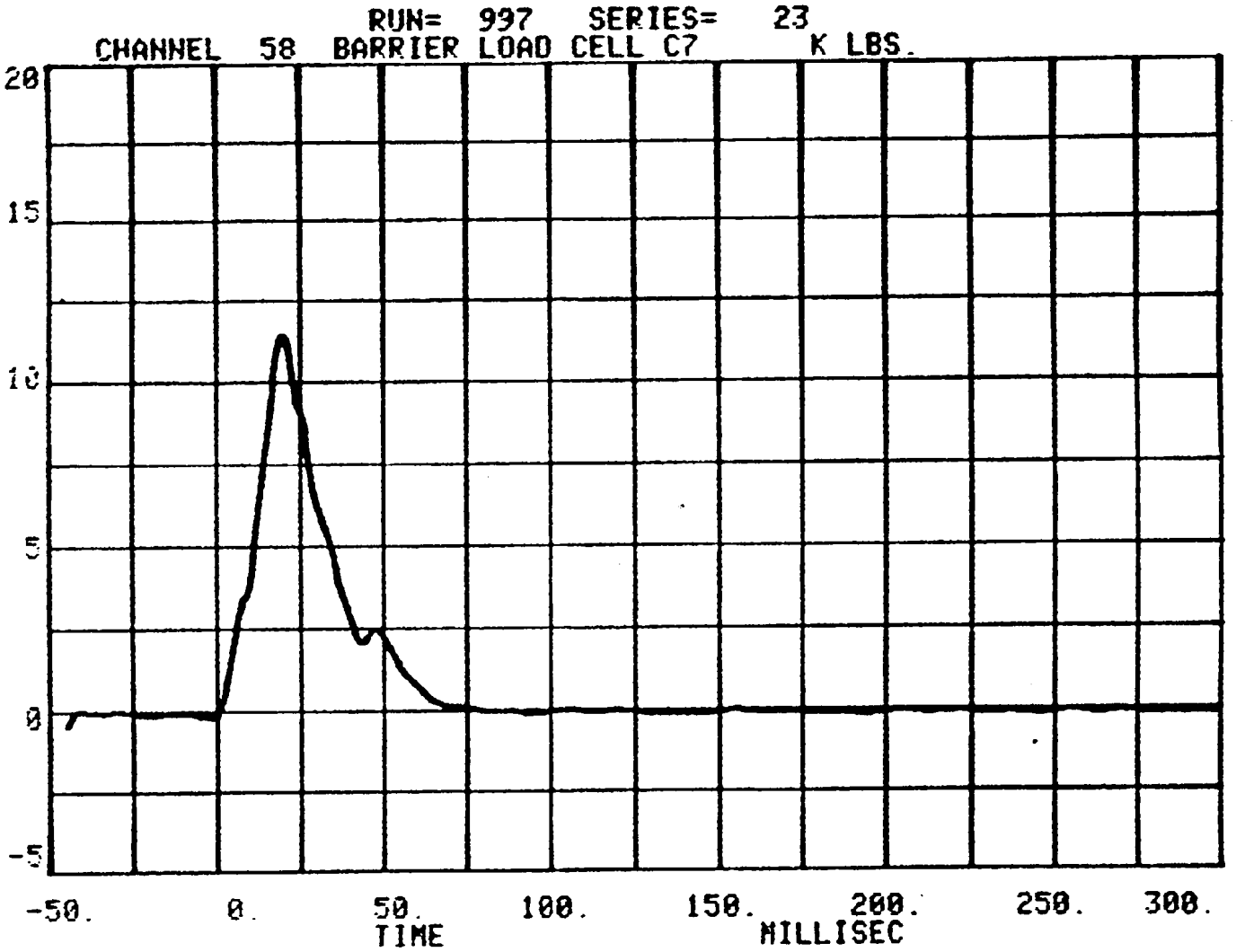

CHANNEL 54 RUN= 997 SERIES= 23
BARRIER LOAD CELL C3
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

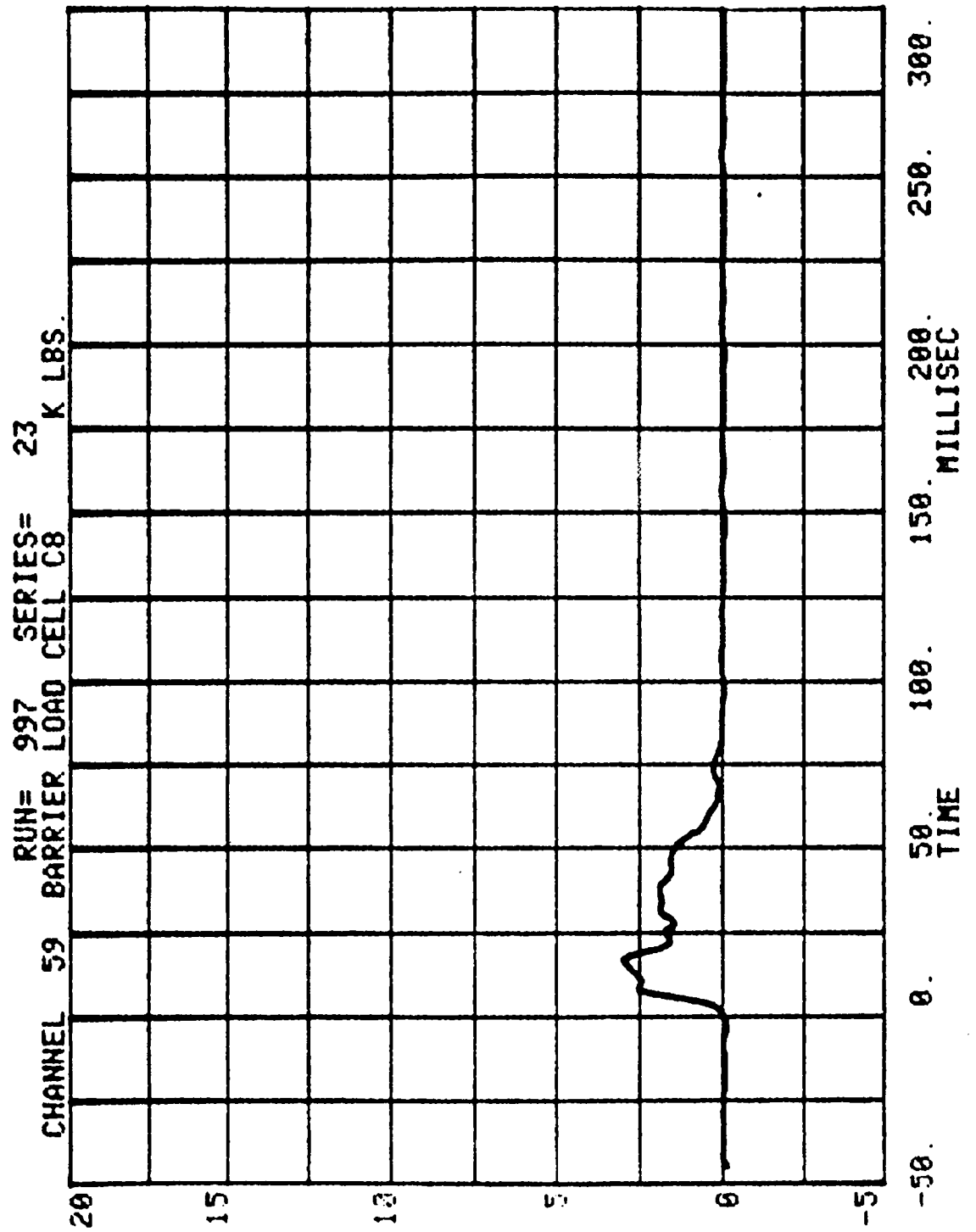

RUN= 997 SERIES= 23
CHANNEL 56 BARRIER LOAD CELL C5 K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

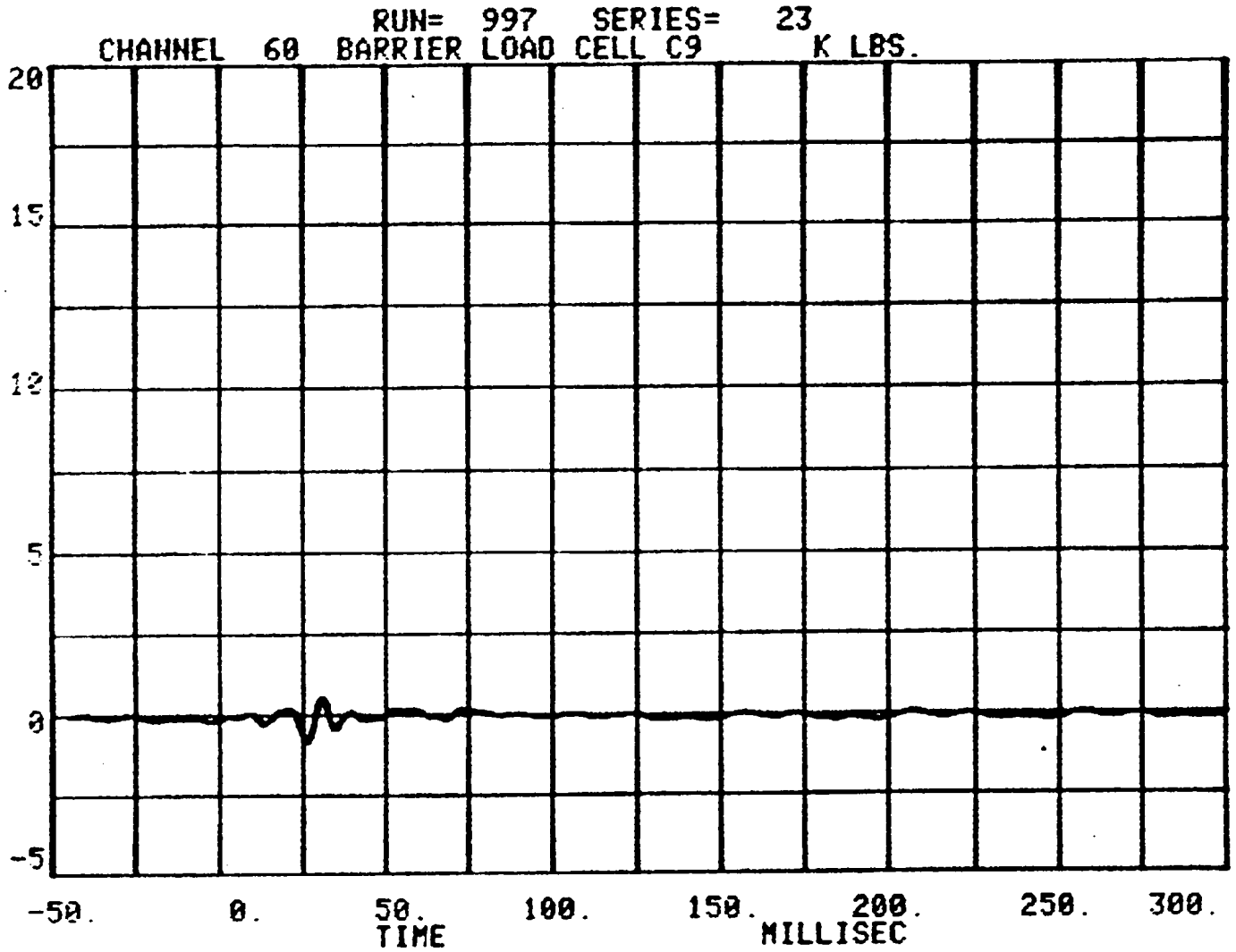
7776-23


CHANNEL 57 BARRIER LOAD CELL C6
RUN= 927 SERIES= 23
K LBS.
80
60
40
20
0
-20
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

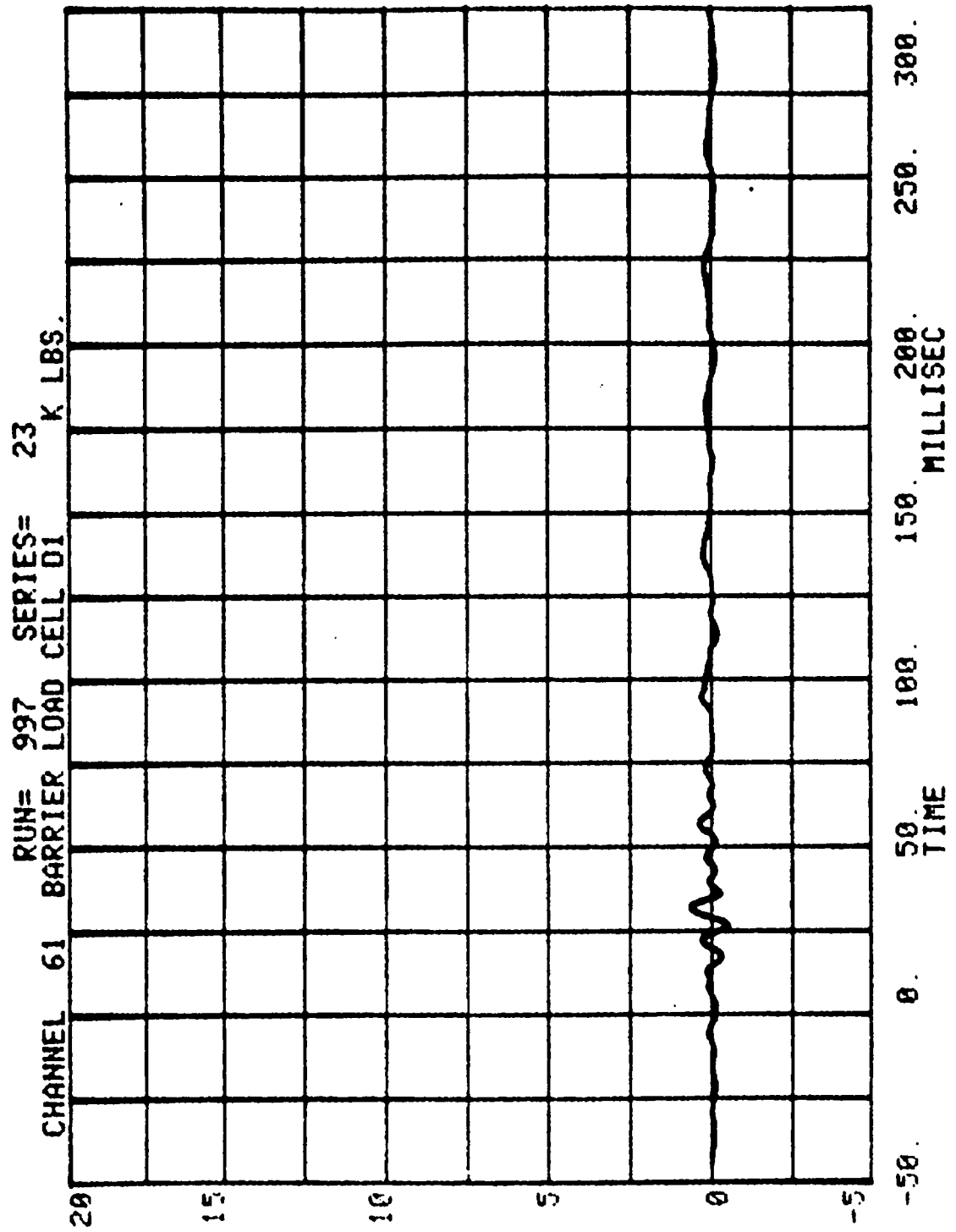

RUN= 997 SERIES= 23
CHANNEL 58 BARRIER LOAD CELL C7 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

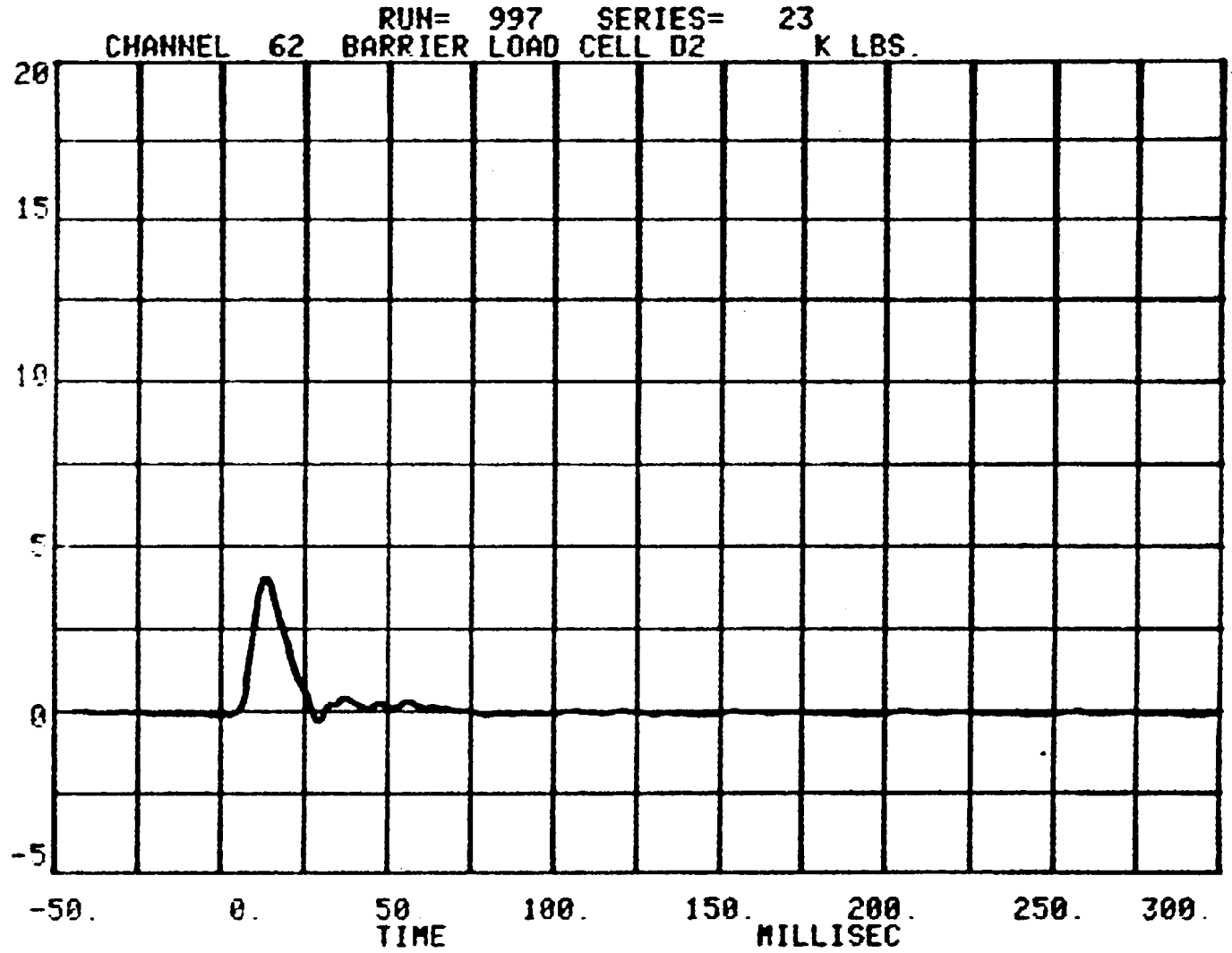
7776-23


CHANNEL 59 BARRIER LOAD CELL C8
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

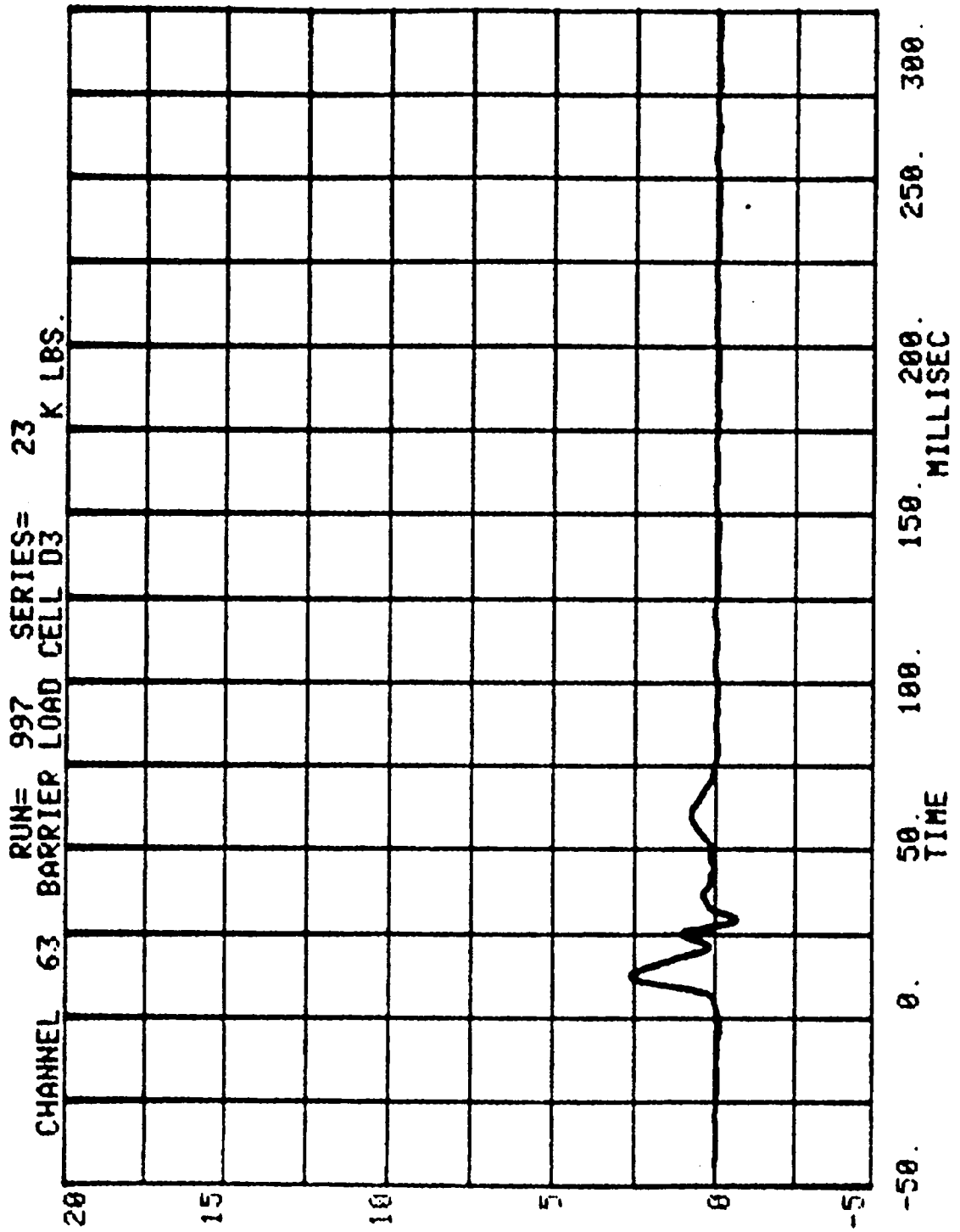

RUN= 997 SERIES= 23
CHANNEL 60 BARRIER LOAD CELL C9 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

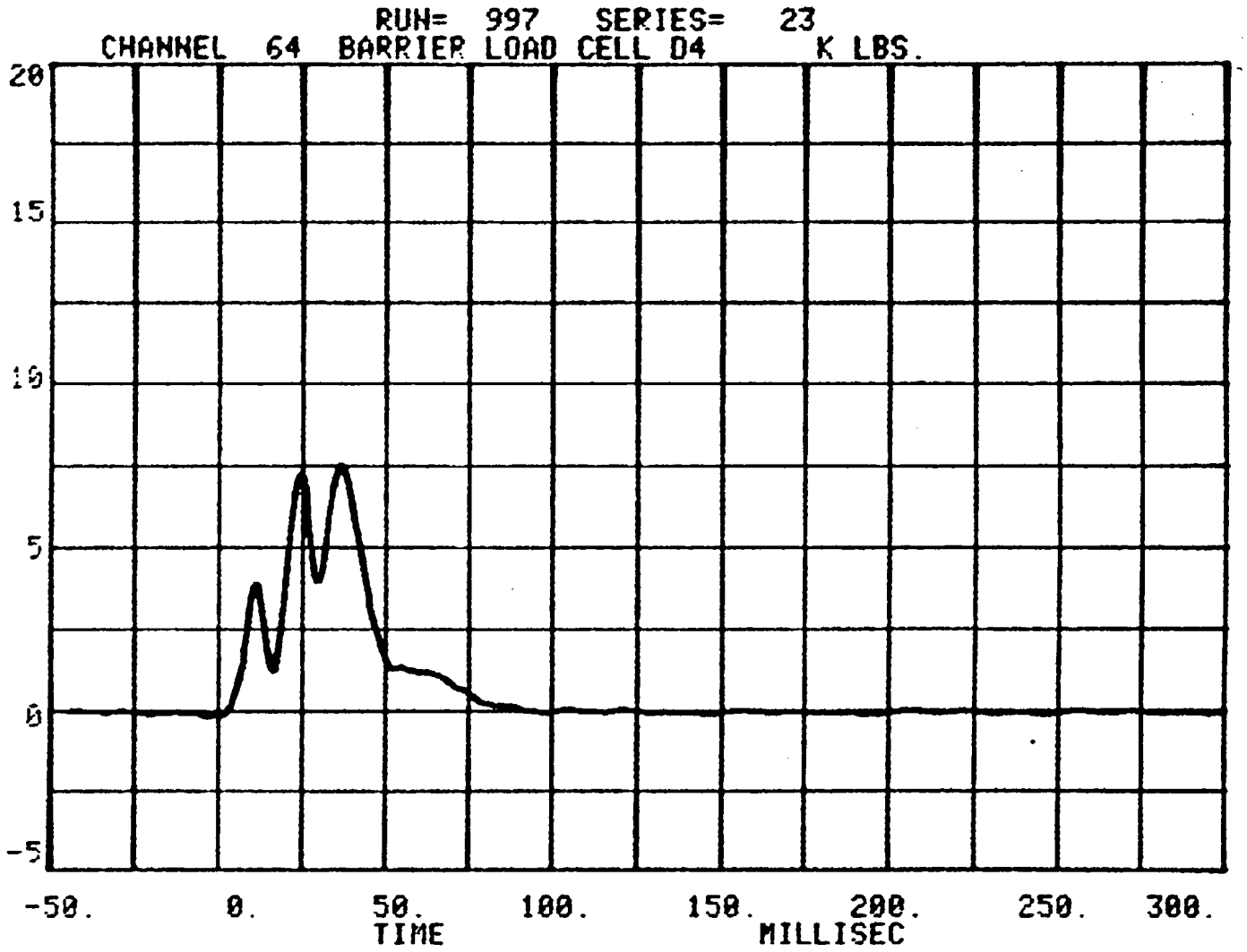
7776-23

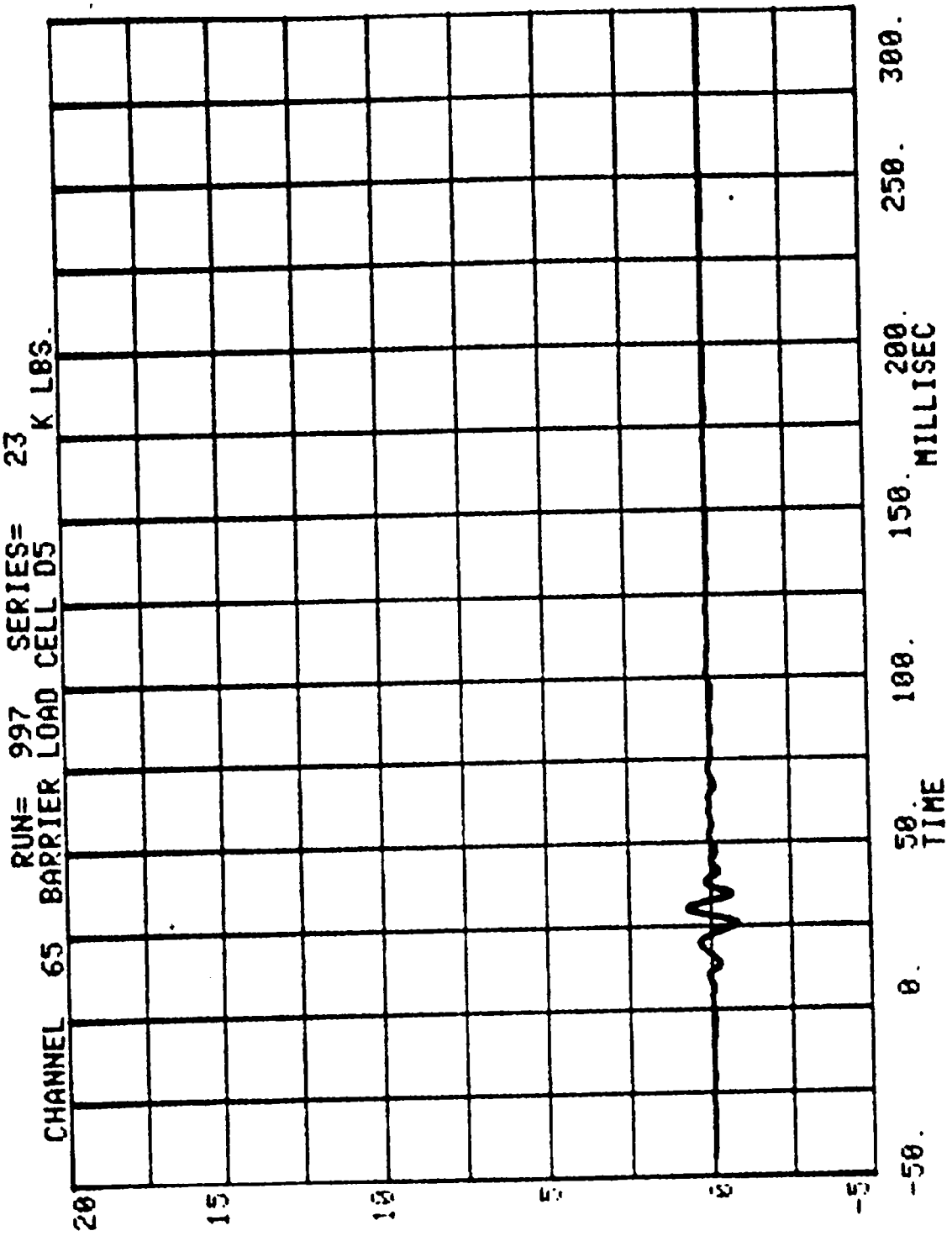

CHANNEL 61 BARRIER LOAD CELL 01
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 997 SERIES= 23
CHANNEL 62 BARRIER LOAD CELL D2 K LBS.
20
15
10
5
0
-5
-50.
0.
50
100.
150.
200.
250.
300.
TIME
MILLISEC

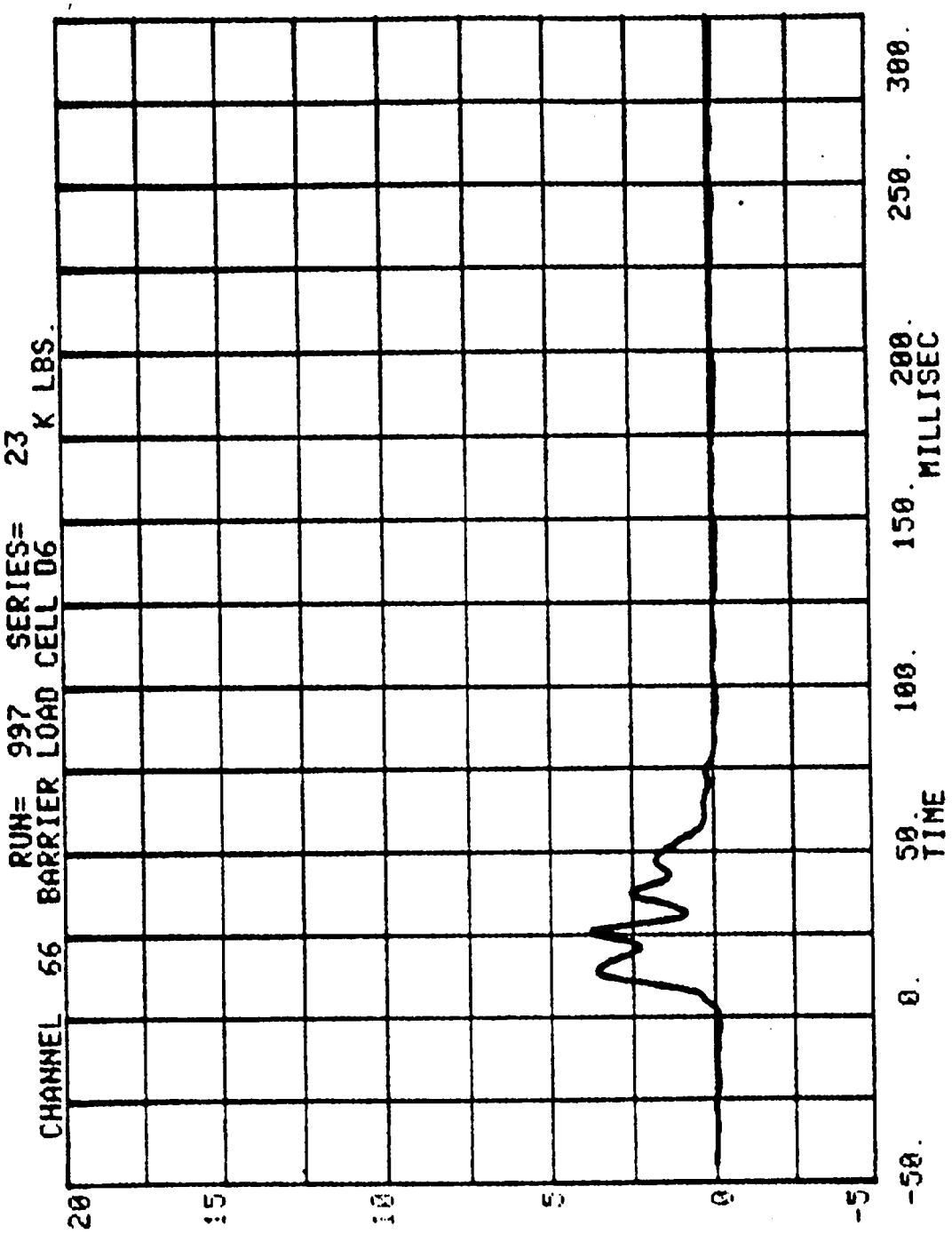
7776-23


CHANNEL 63 BARRIER LOAD CELL D3
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

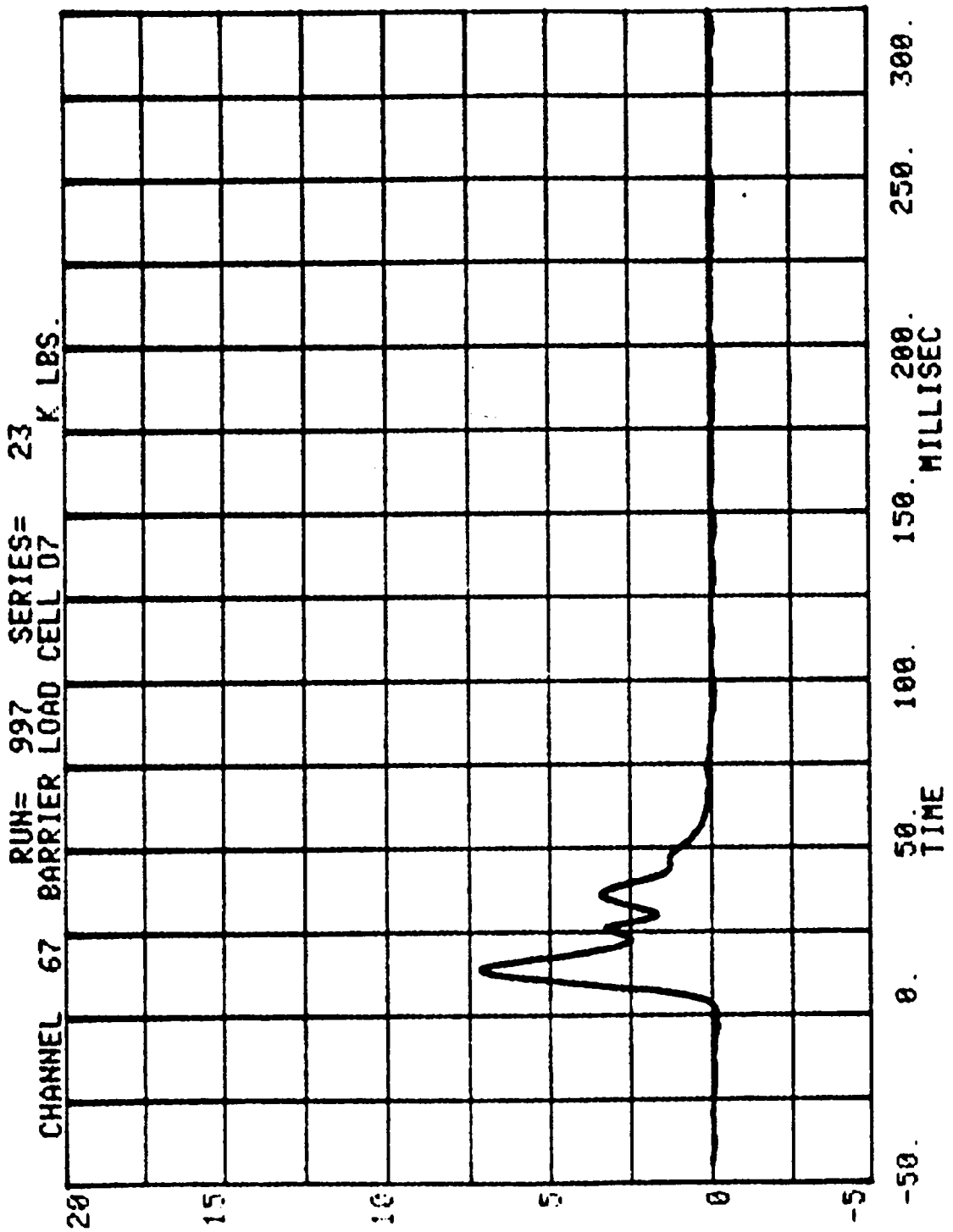

RUN= 997 SERIES= 23
CHANNEL 64 BARRIER LOAD CELL D4 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 65 BARRIER LOAD CELL D5
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

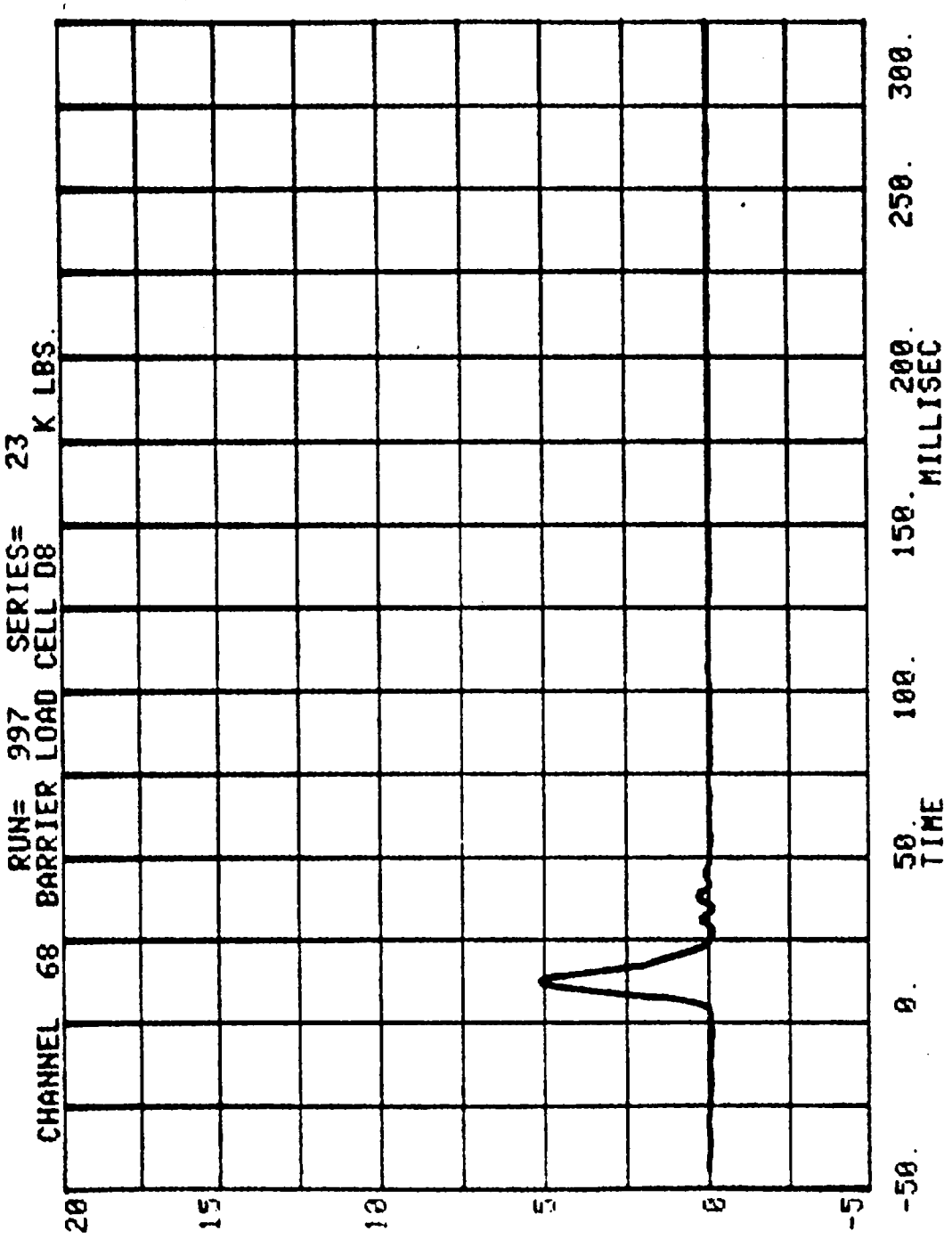
7776-23


CHANNEL 66
RUN= 997
BARRIER LOAD CELL 06
SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

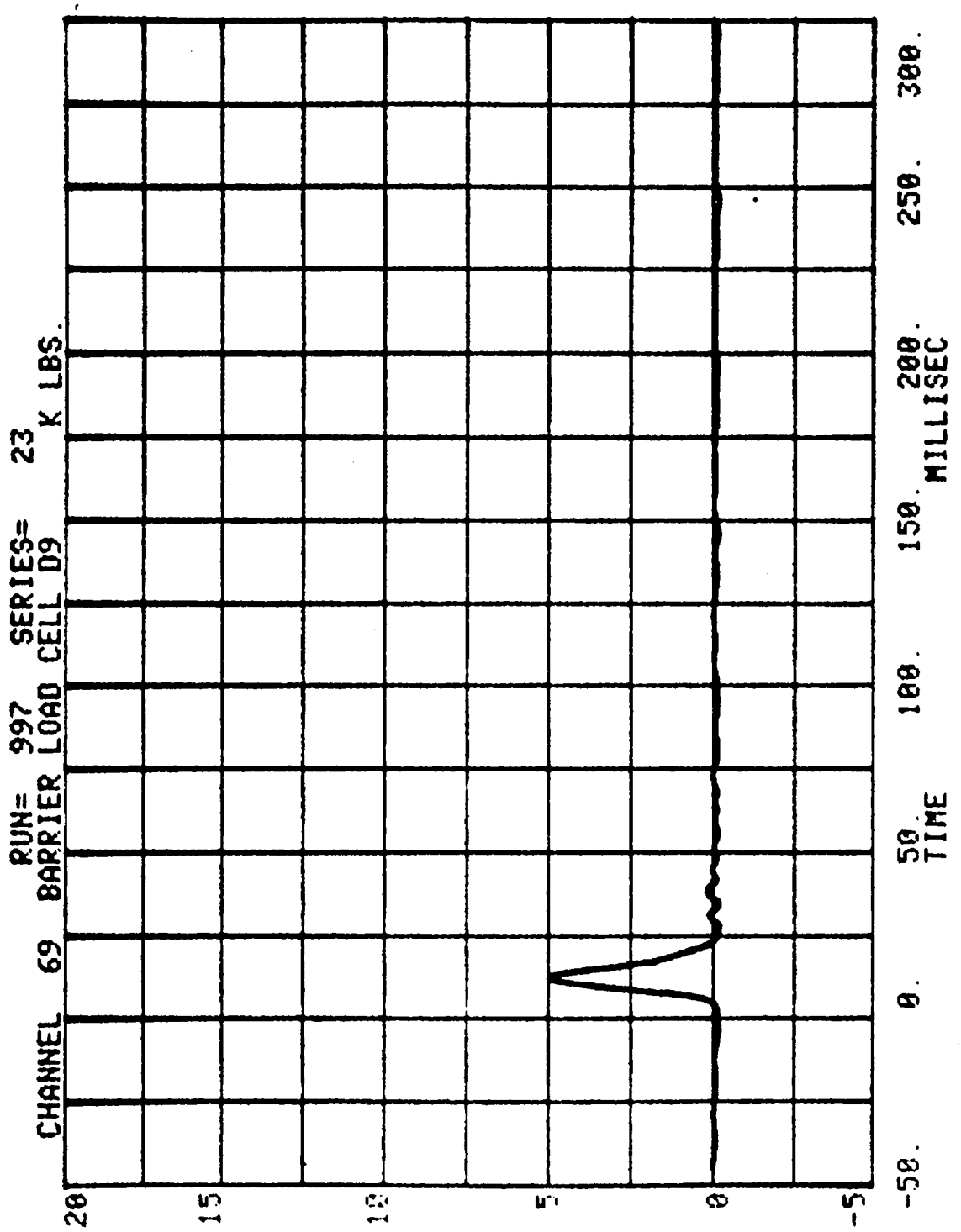
7776-23


CHANNEL 67 BARRIER LOAD CELL 07
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23


CHANNEL 68 BARRIER LOAD CELL D8
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

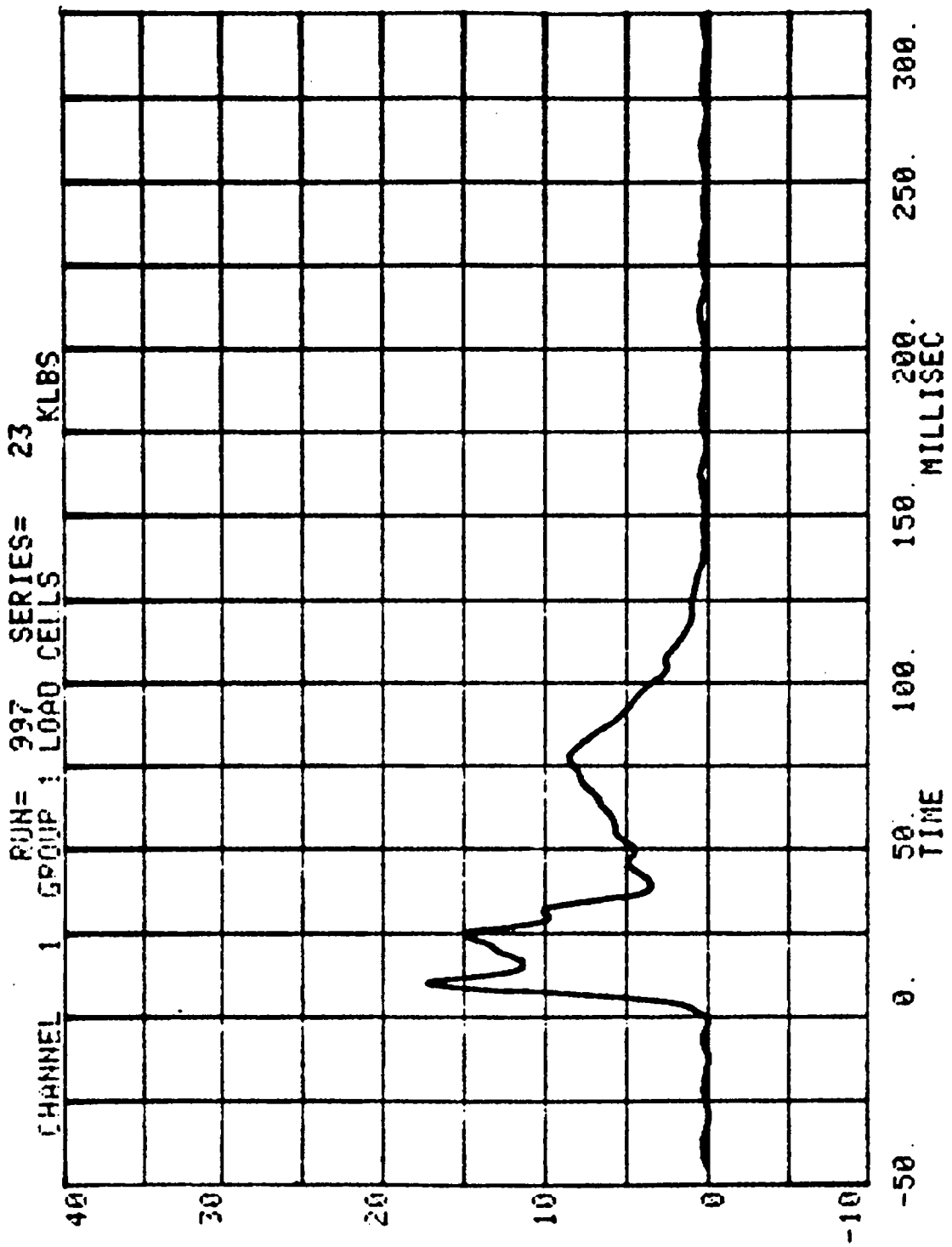
7776-23

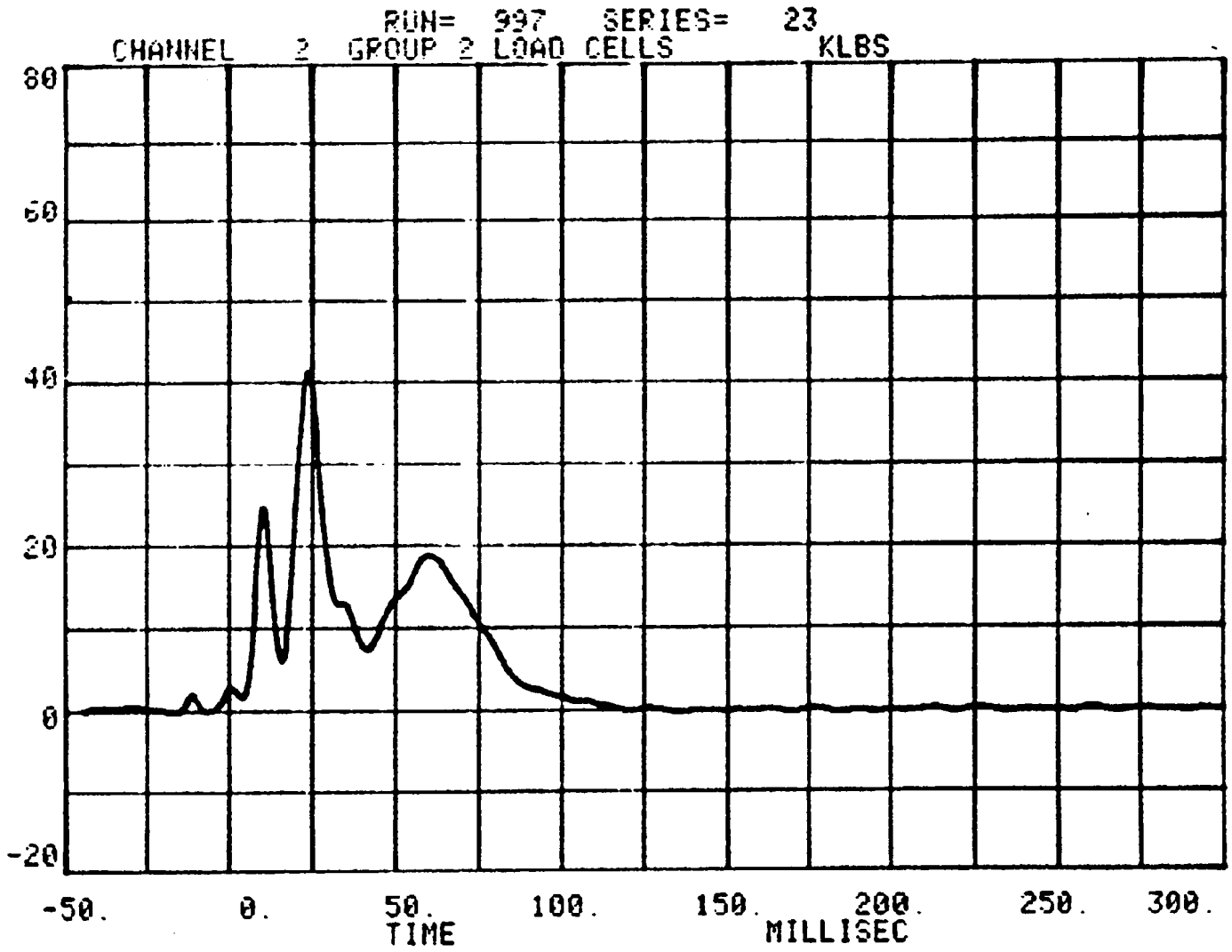

CHANNEL 69 BARRIER LOAD CELL D9
RUN= 997 SERIES= 23
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

NCAP #23

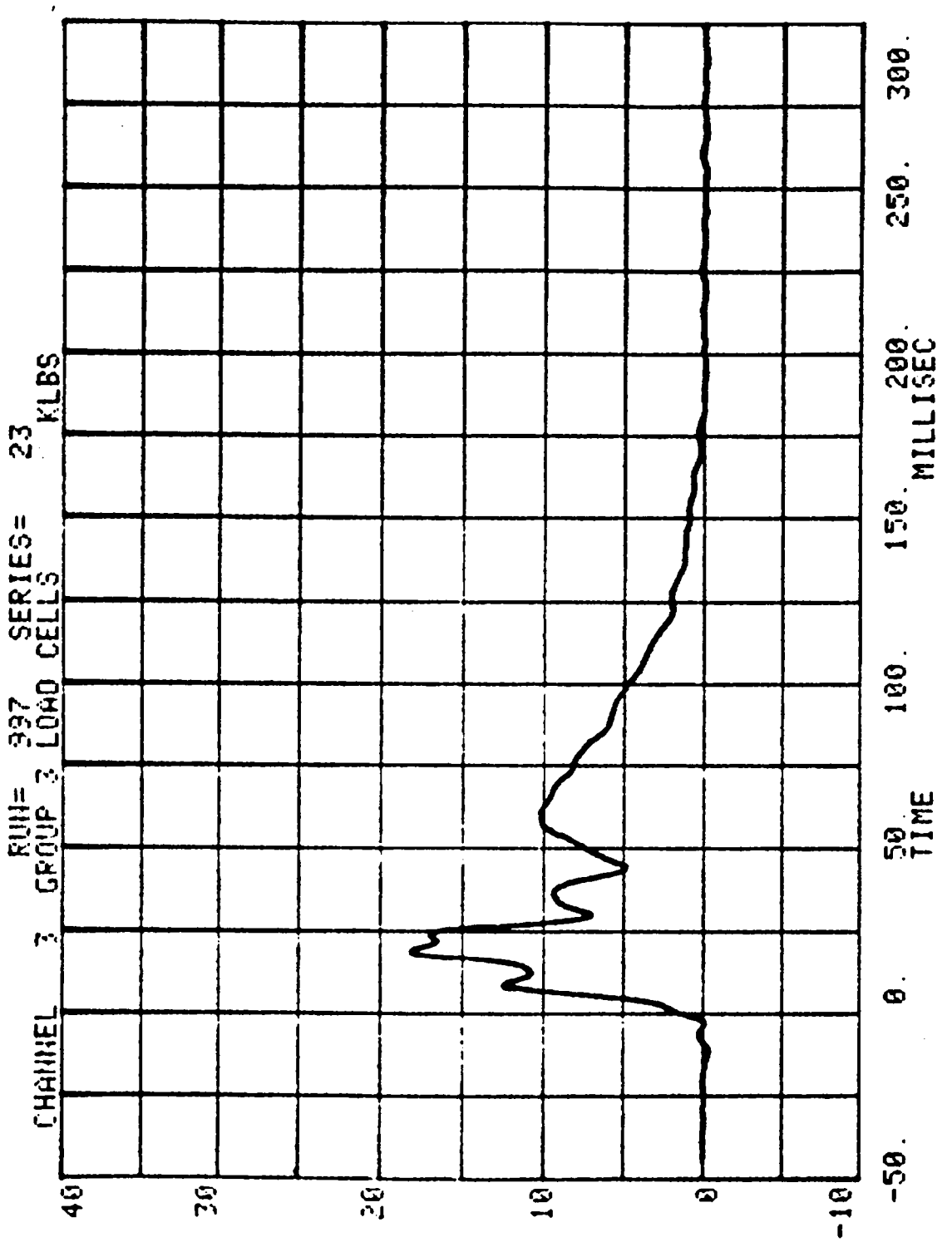
RUN # 997 SERIES # 23

CHAN	TITLE	MINIMUM/MAXIMUM	AT	TIME
1	GROUP 1 LOAD CELLS	-.053 KLBS		-12.15 MS.
		17.234 KLBS		10.12 MS.
2	GROUP 2 LOAD CELLS	-.294 KLBS		136.58 MS.
		41.468 KLBS		27.62 MS.
3	GROUP 3 LOAD CELLS	-.323 KLBS		-11.40 MS.
		18.193 KLBS		19.90 MS.
4	GROUP 4 LOAD CELLS	-.363 KLBS		-1.65 MS.
		16.771 KLBS		11.62 MS.
5	GROUP 5 LOAD CELLS	-5.089 KLBS		-45.00 MS.
		77.136 KLBS		24.07 MS.
6	GROUP 6 LOAD CELLS	-.845 KLBS		-3.23 MS.
		26.169 KLBS		13.42 MS.
7	TOTAL LOAD CELL SUM	-6.484 KLBS		-45.00 MS.
		171.080 KLBS		24.00 MS.

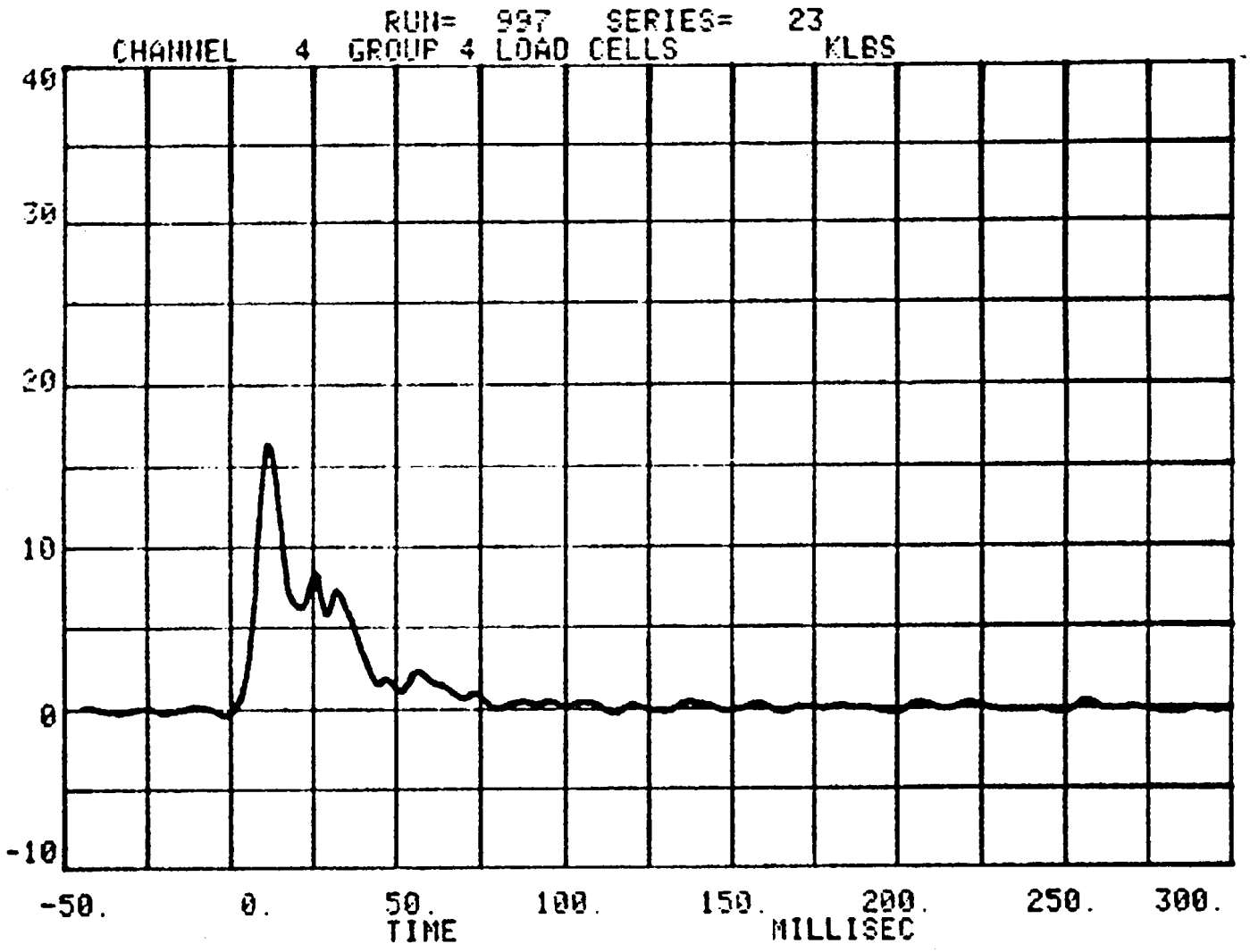

CHANNEL 1 GROUP 1 LOAD CELLS
RUN= 997 SERIES= 23
KLBS
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

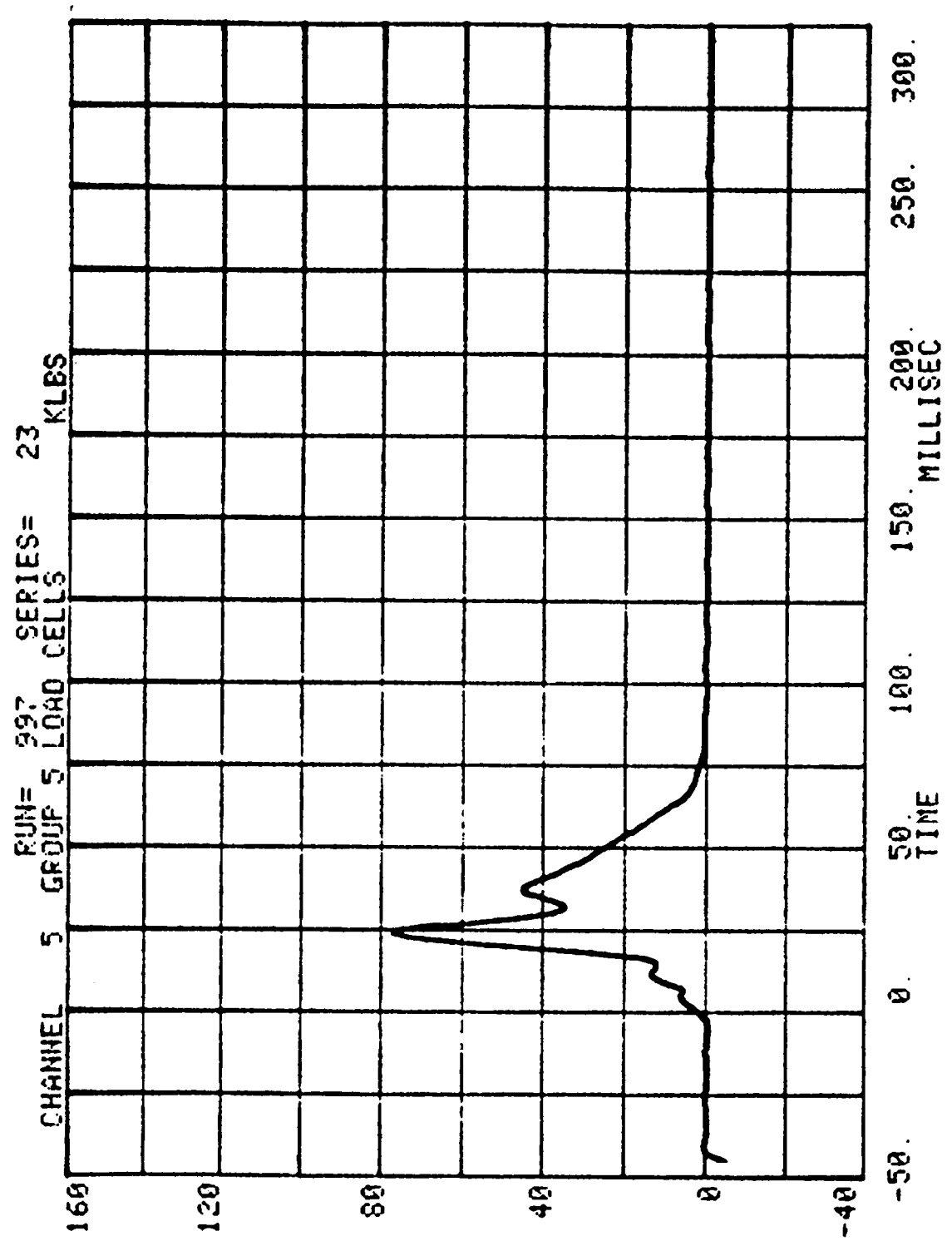

RUN= 997 SERIES= 23
CHANNEL 2 GROUP 2 LOAD CELLS KLBS
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

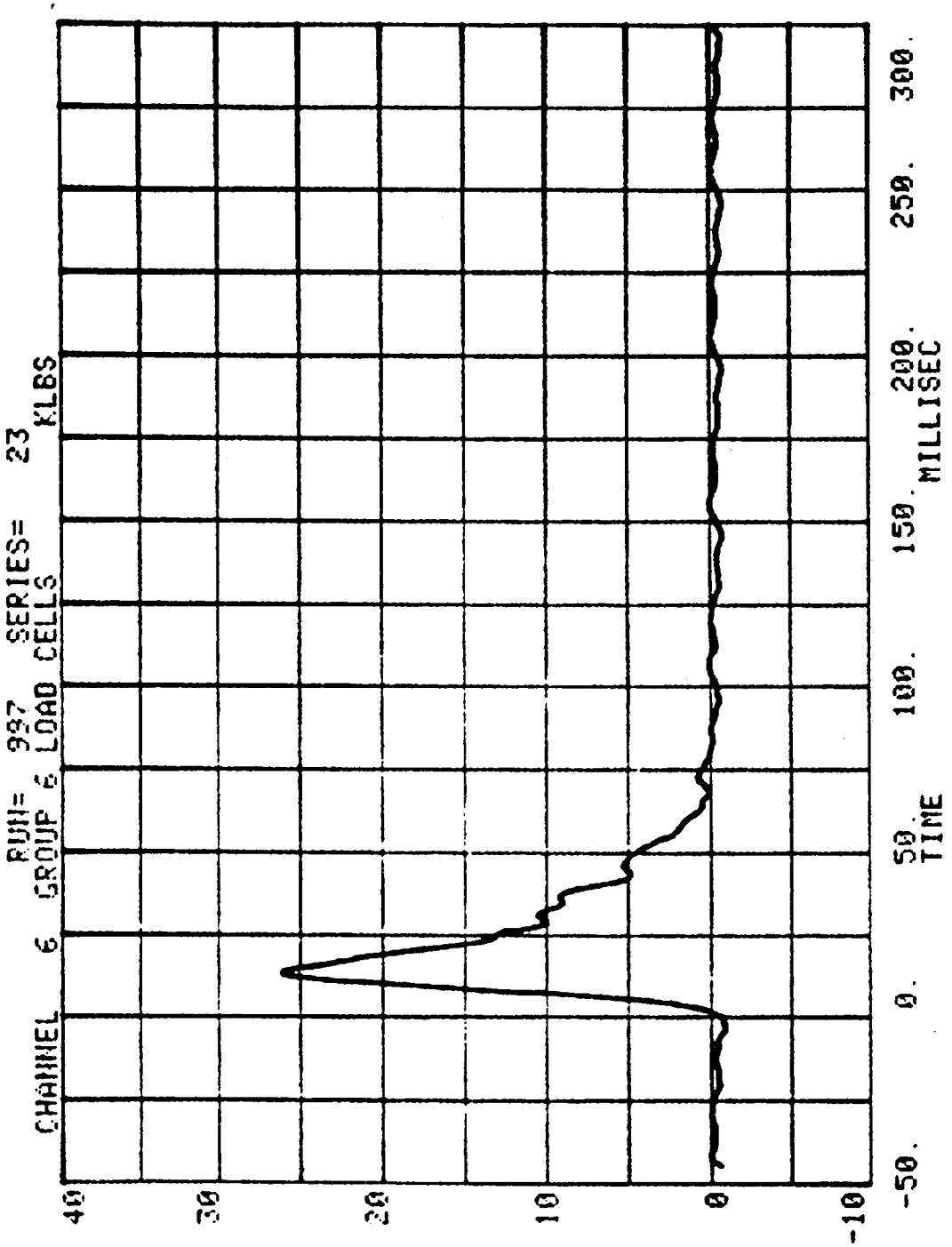

CHANNEL 3 GROUP 3 LOAD CELLS
RUN= 397 SERIES= 23
KLBS
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

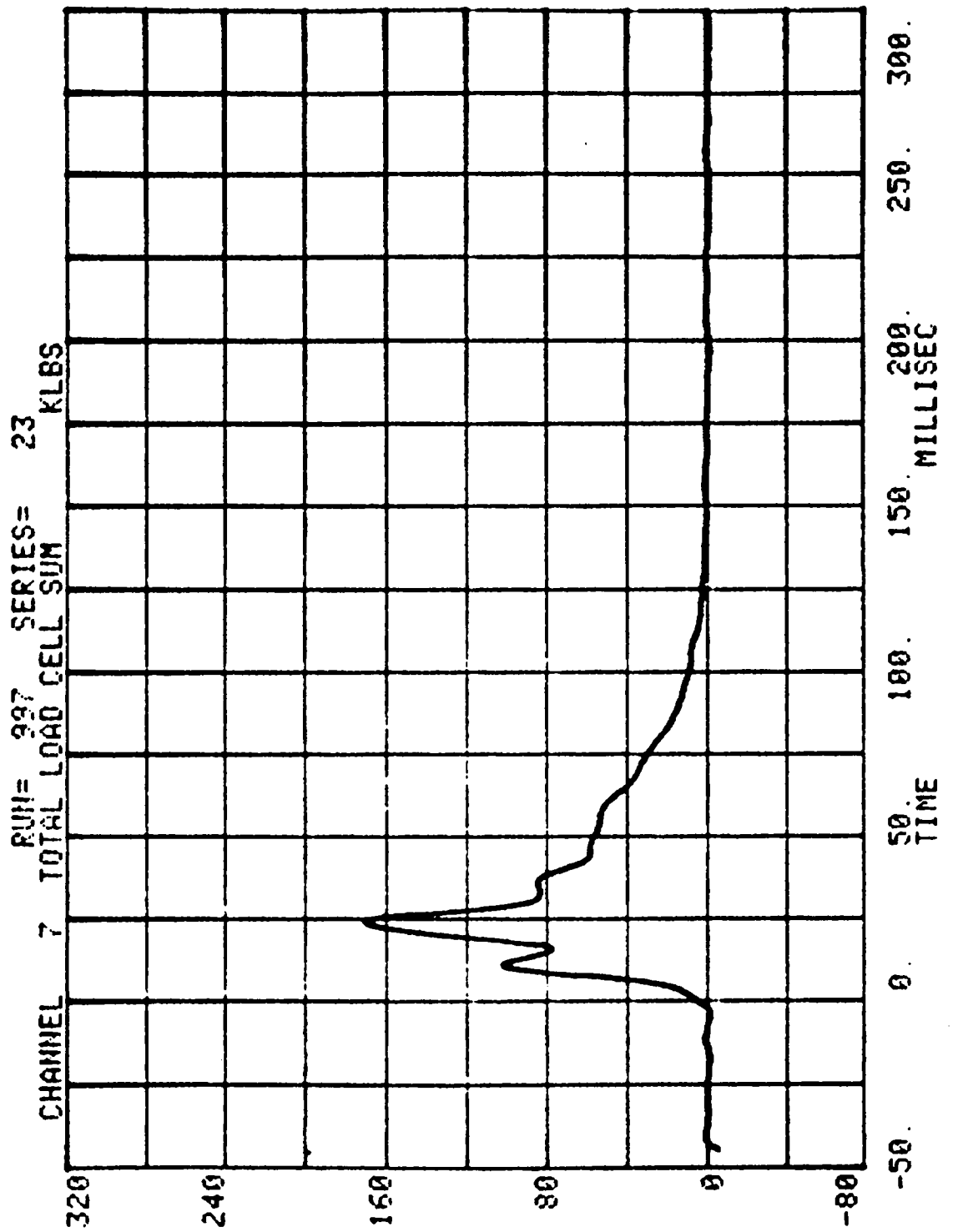

RUN= 997 SERIES= 23
CHANNEL 4 GROUP 4 LOAD CELLS KLBS
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 5 GROUP 5 LOAD CELLS
RUN= 997. SERIES= 23
KLBS
160
120
80
40
0
-40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23


CHANNEL 6
GROUP 6 LOAD CELLS
RUN= 937 SERIES= 23
KLBS
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23


CHANNEL 7 TOTAL LOAD CELL SUM
RUN= 997 SERIES= 23
KLBS
320
240
160
80
0
-80
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

TEST NO. ML0303

DUMMY DATA

CLASS	FILTER CHANNEL
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600
Belt Loads	60

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

NCAP #23

RUN= 397

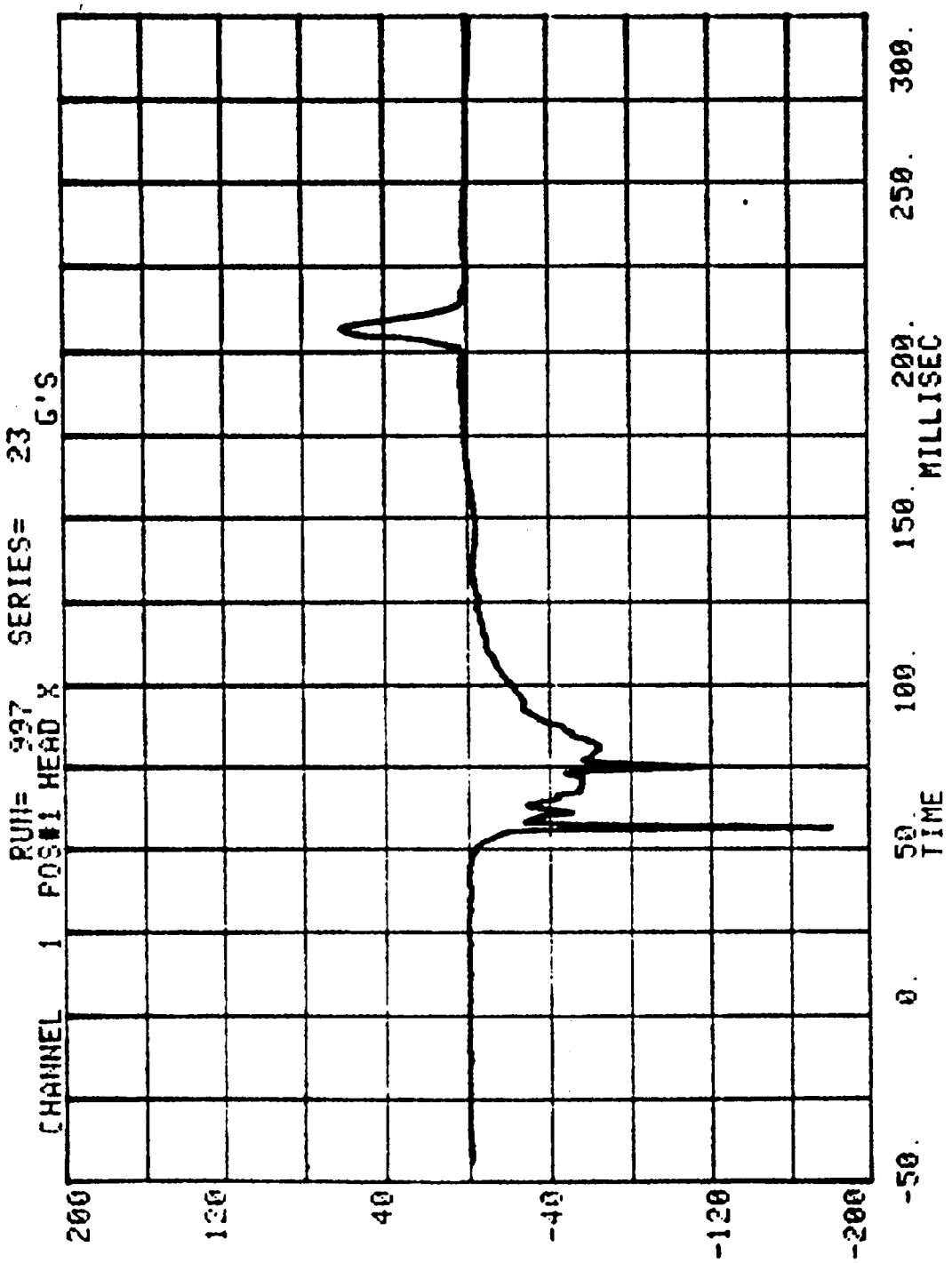
POS#1 HEAD RESULTANT

HIC= 942.9 FROM T1= .05482 TO T2= 09007

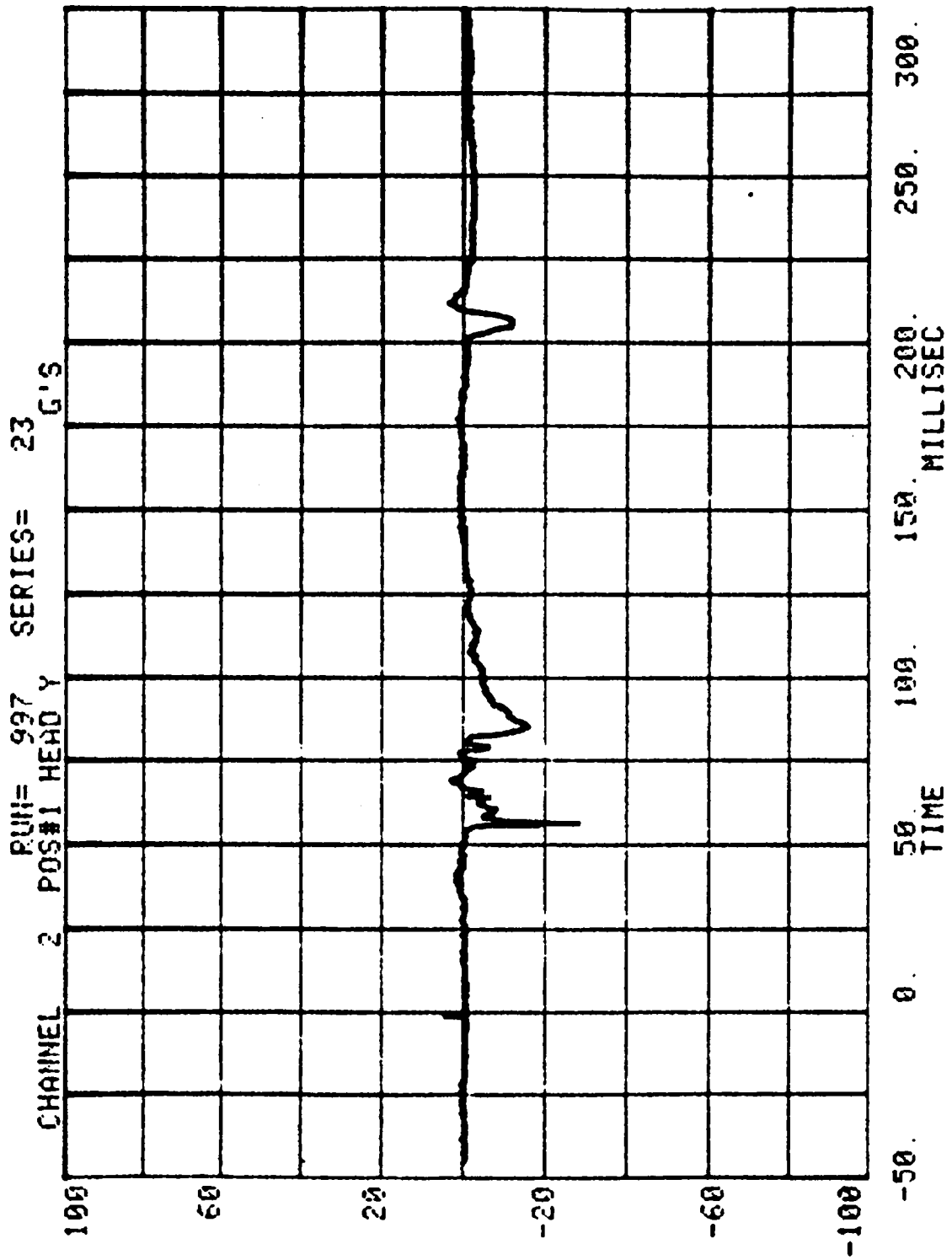
AVERAGE ACCELERATION BETWEEN T1 AND T2= 59 0G'S

EVENT TIME= 300.0 MSEC

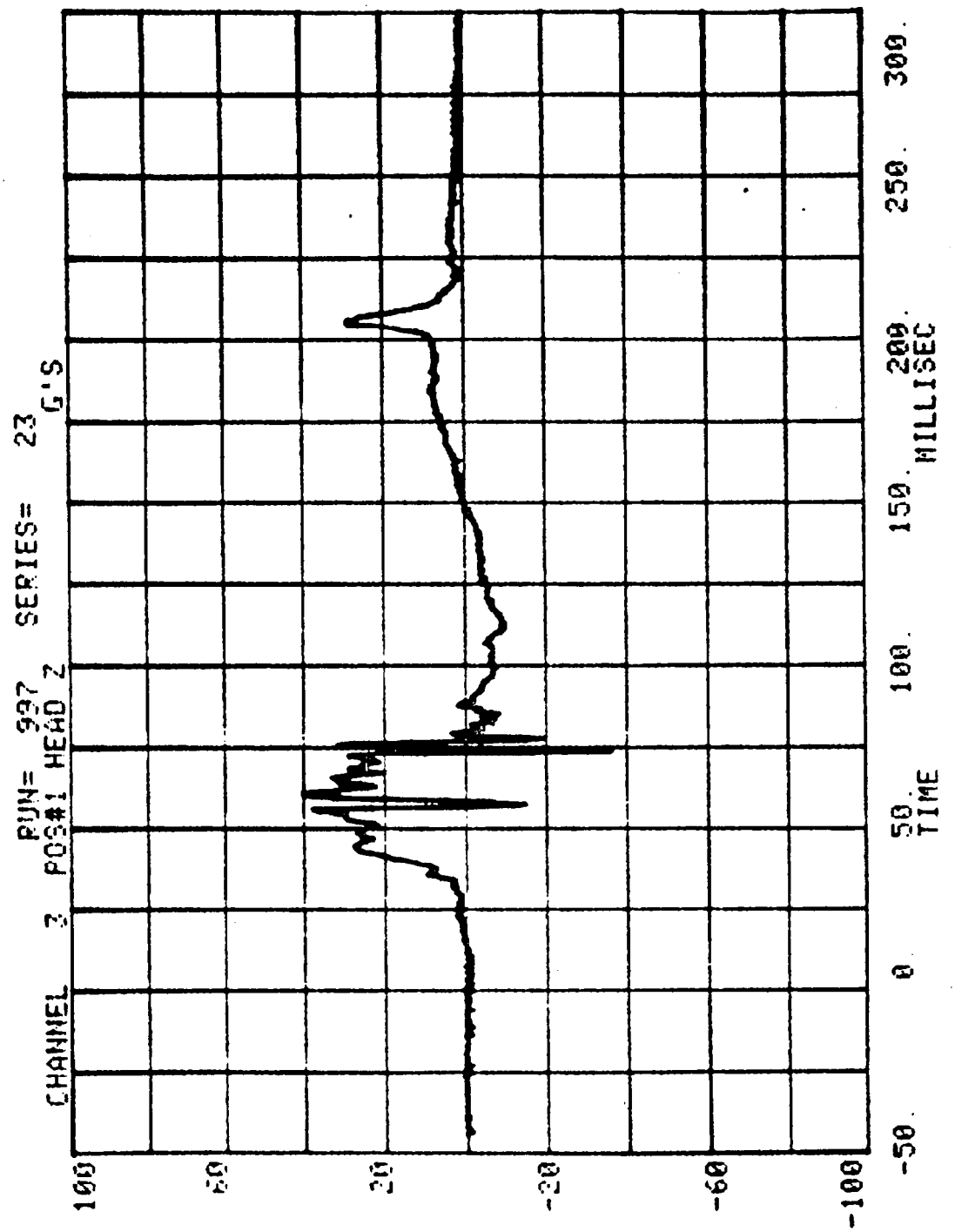
SEVERITY INDEX=1506.3


CHANNEL 1 POS#1 HEAD X
RUN= 997 SERIES= 23
G'S
200
120
40
-40
-120
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

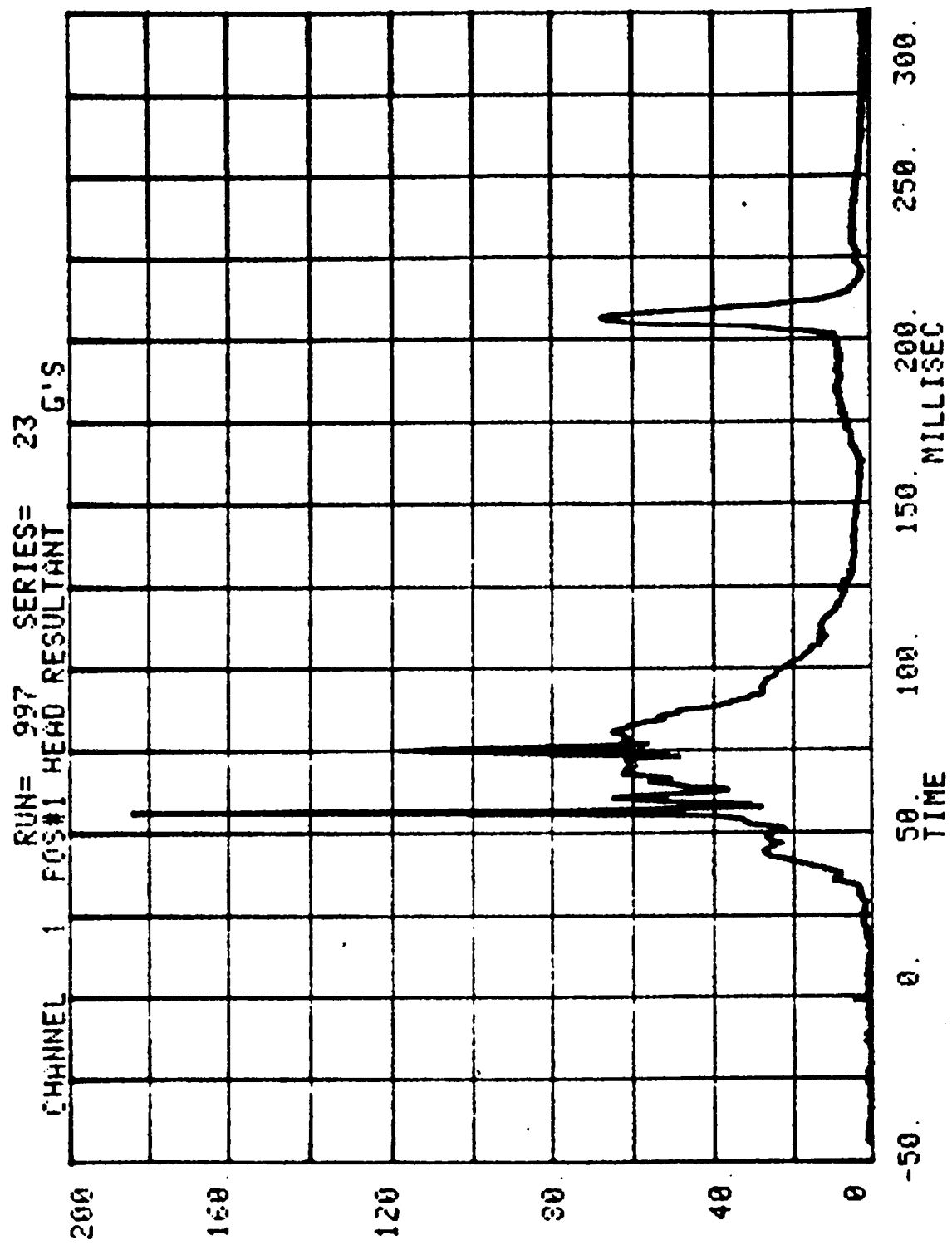
7776-23


CHANNEL 2 POS#1 HEAD Y
RUN= 997 SERIES= 23
G'S
100
50
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

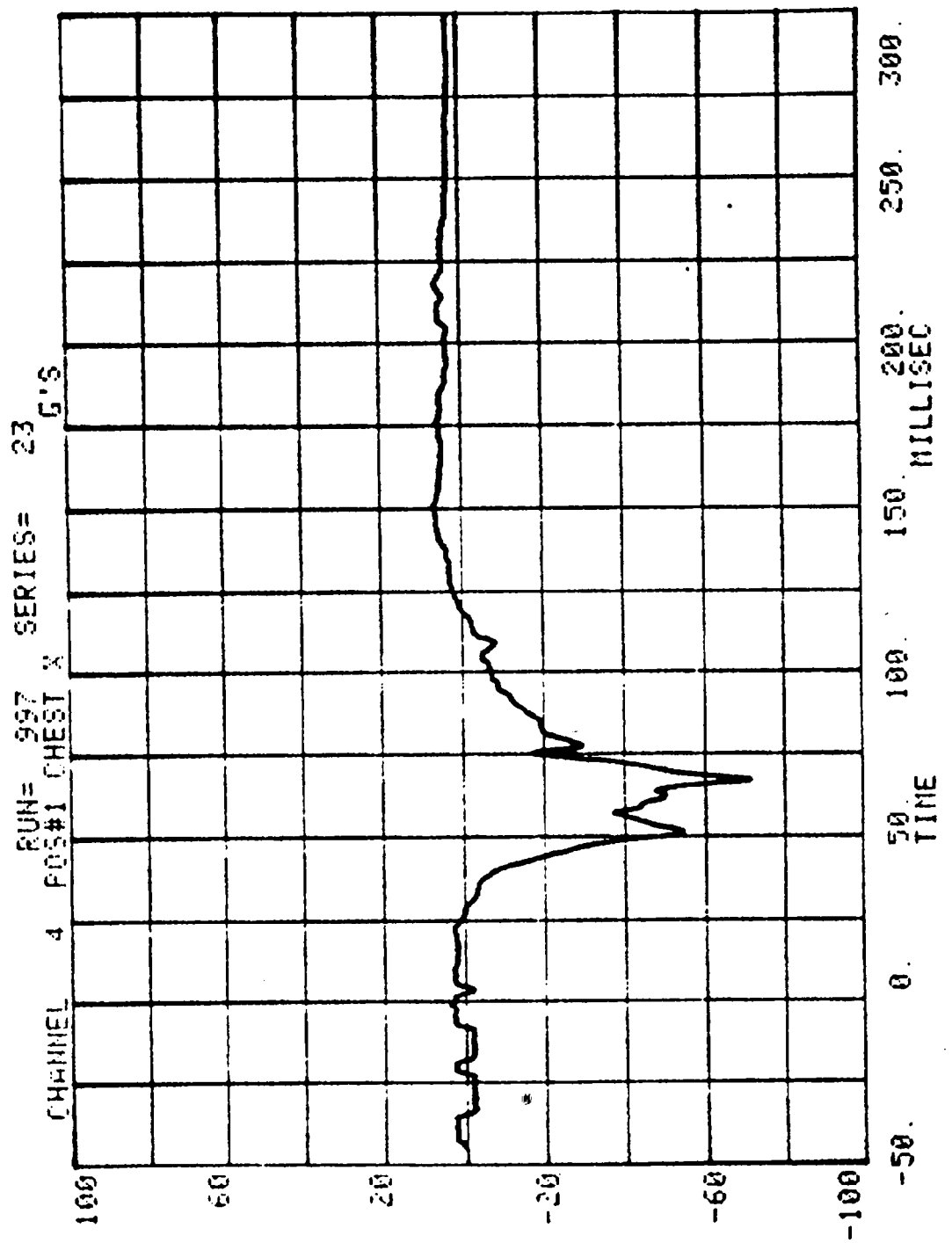
7776-23

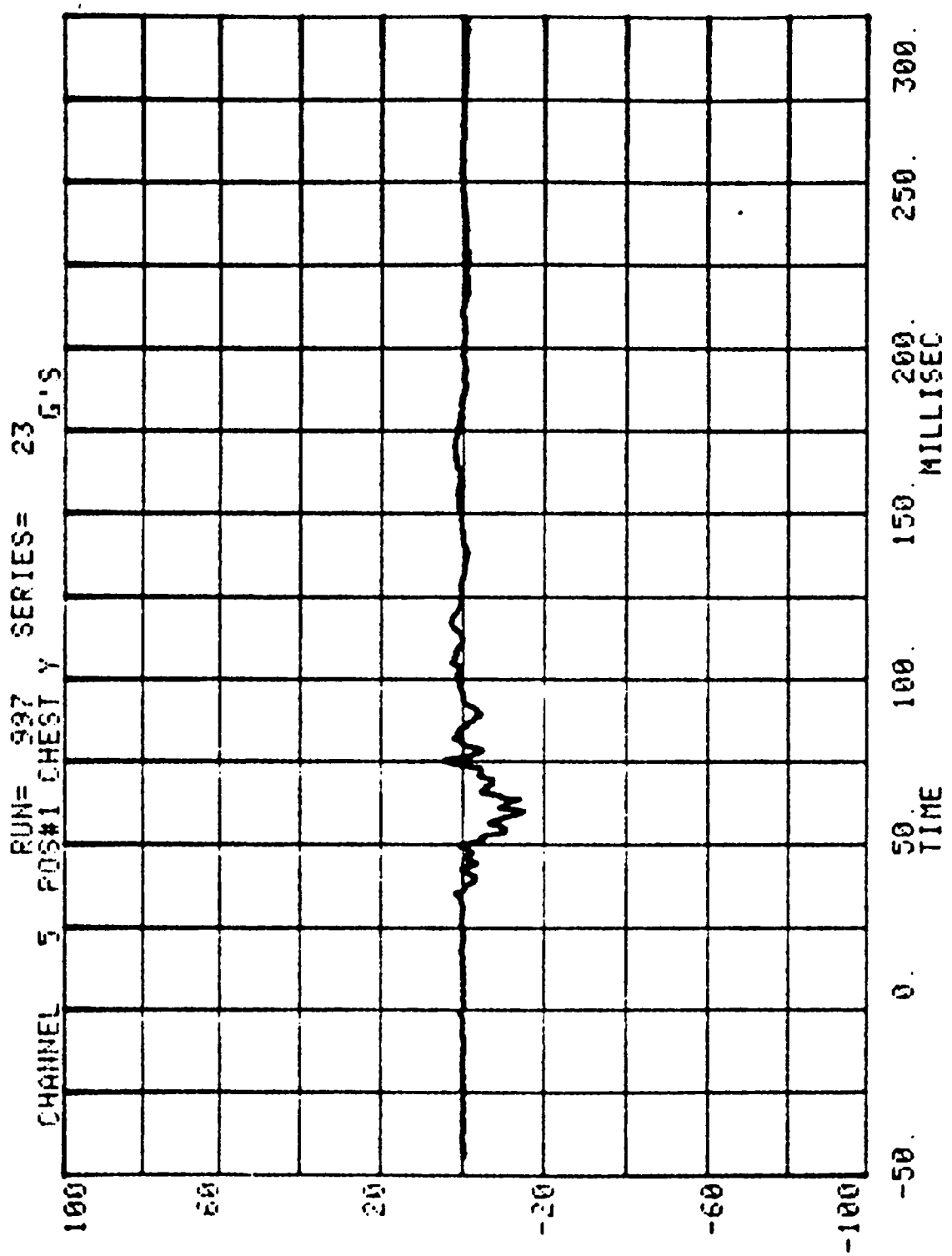

CHANNEL 3 POS#1 HEAD Z
RUN= 937 SERIES= 23
G'S
100
50
20
-20
-60
-100
-50
0
50
TIME
100
150
200
250
300
MILLISEC

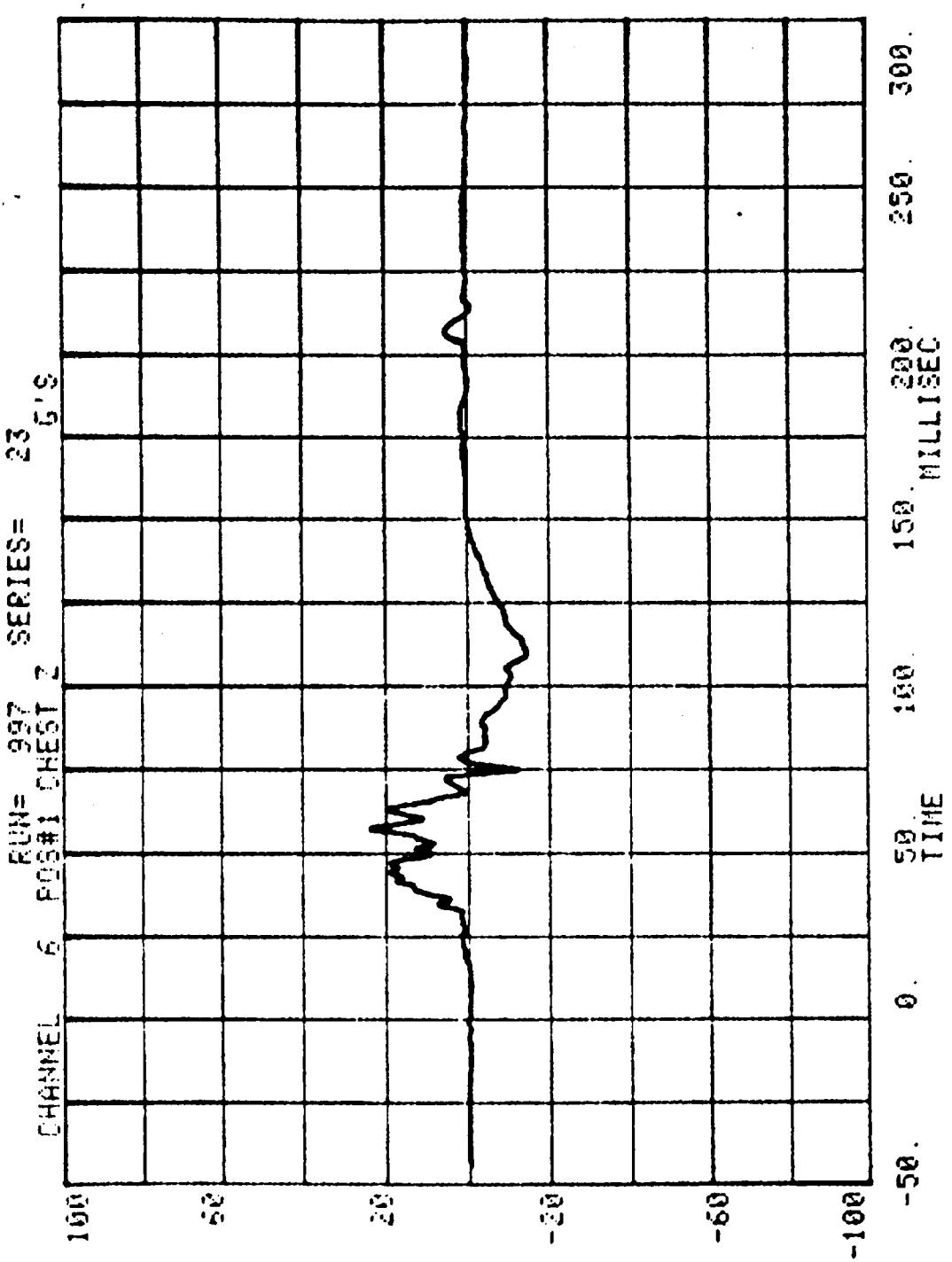
7776-23

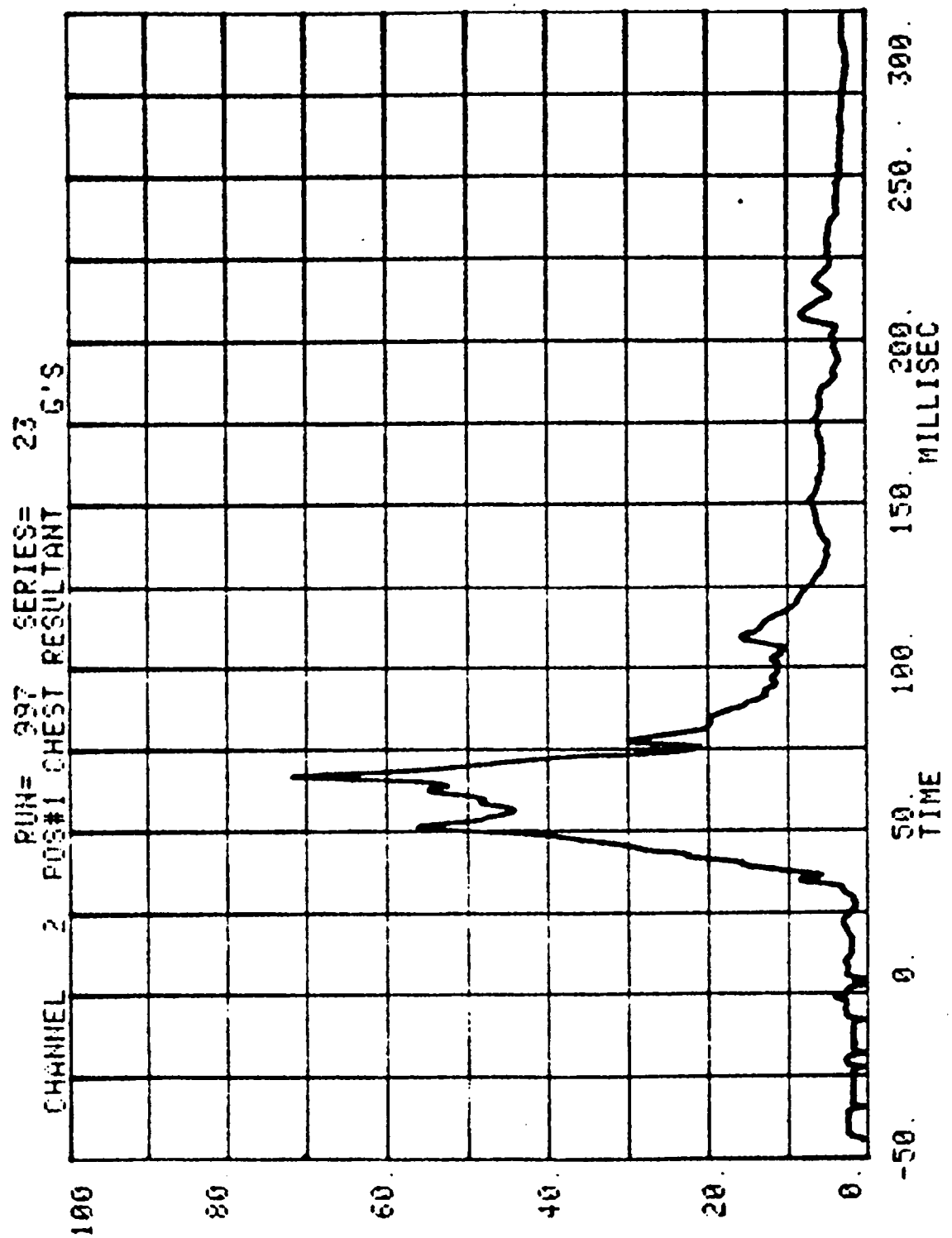

CHANNEL 1 FDS#1 HEAD RESULTANT
RUN= 997 SERIES= 23
G'S
200
160
120
80
40
0
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

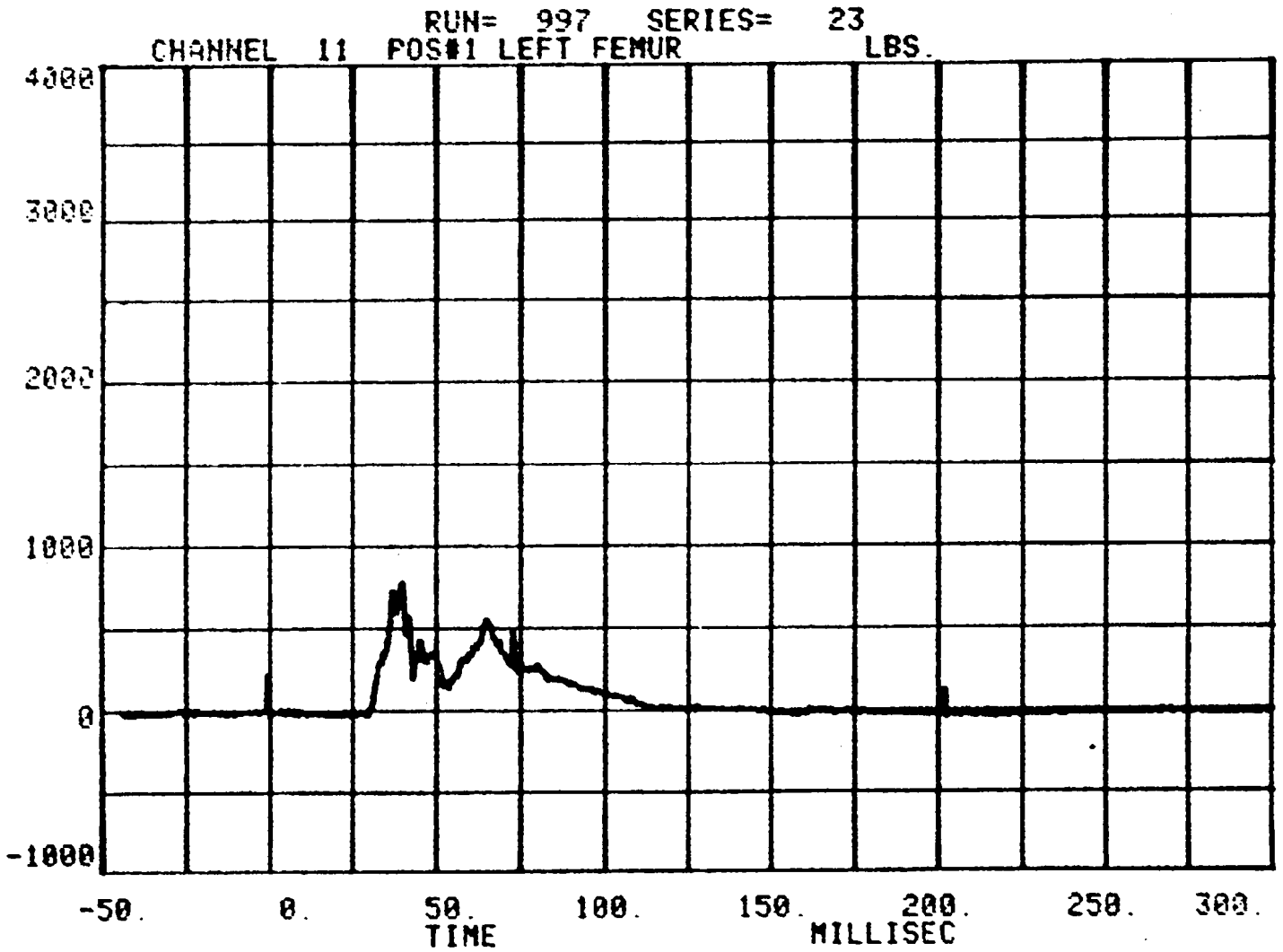
7776-23

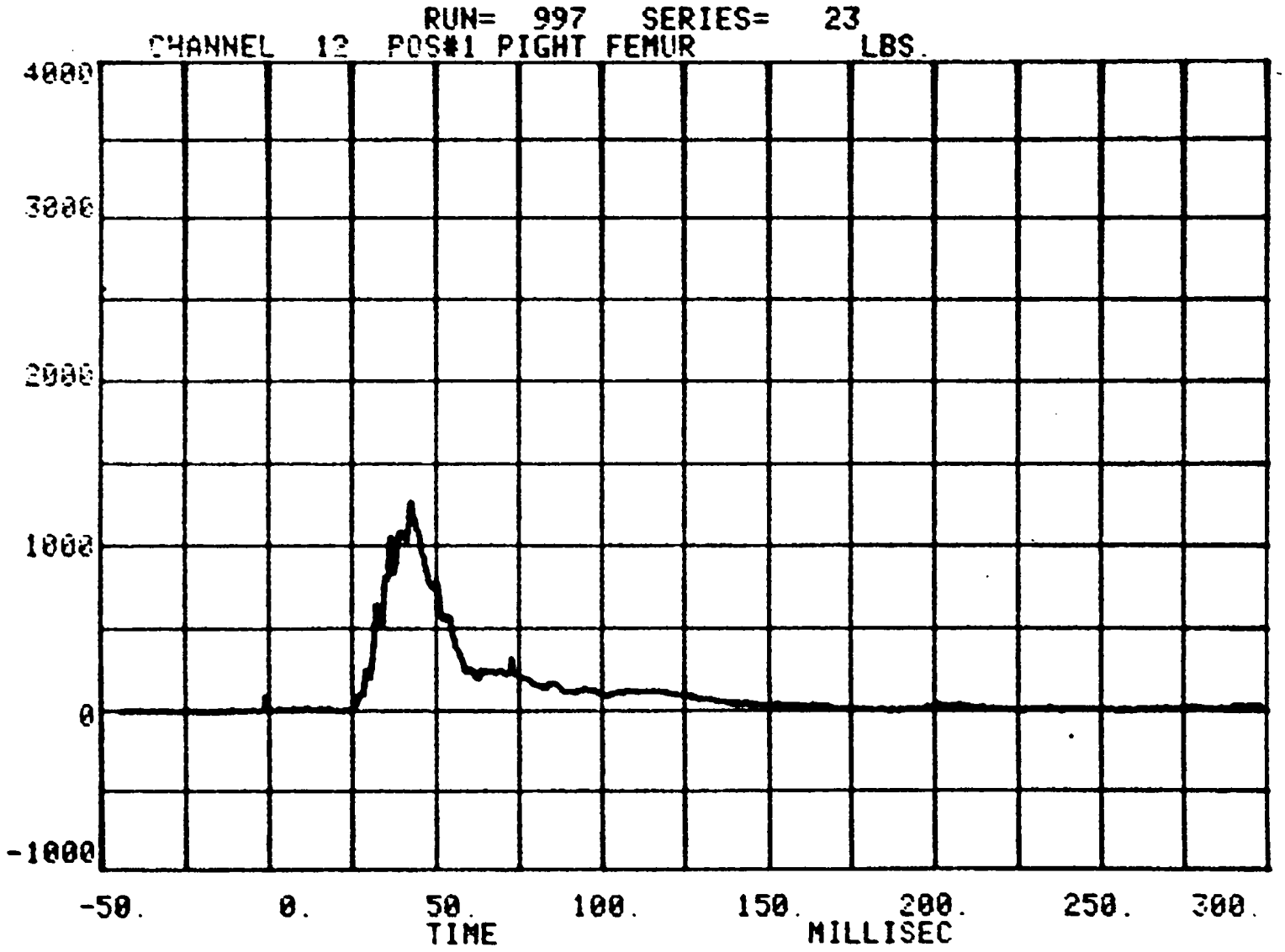

CHANNEL 4 POS#1 CHEST X
RUN= 997 SERIES= 23
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

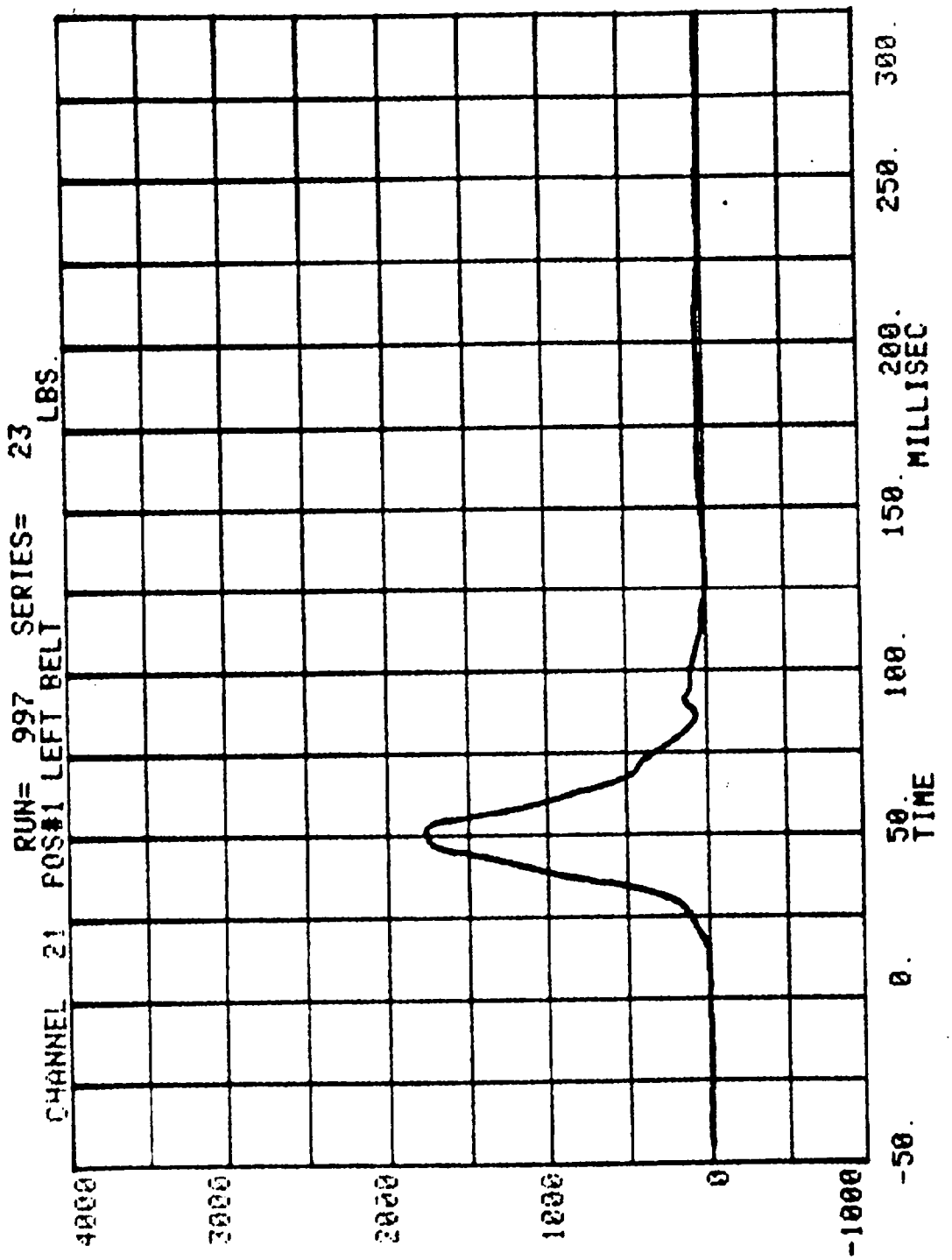

CHANNEL 5 POS#1 CHEST Y
RUN= 997 SERIES= 23
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
TIME
100.
150.
200.
250.
300.
MILLISEC

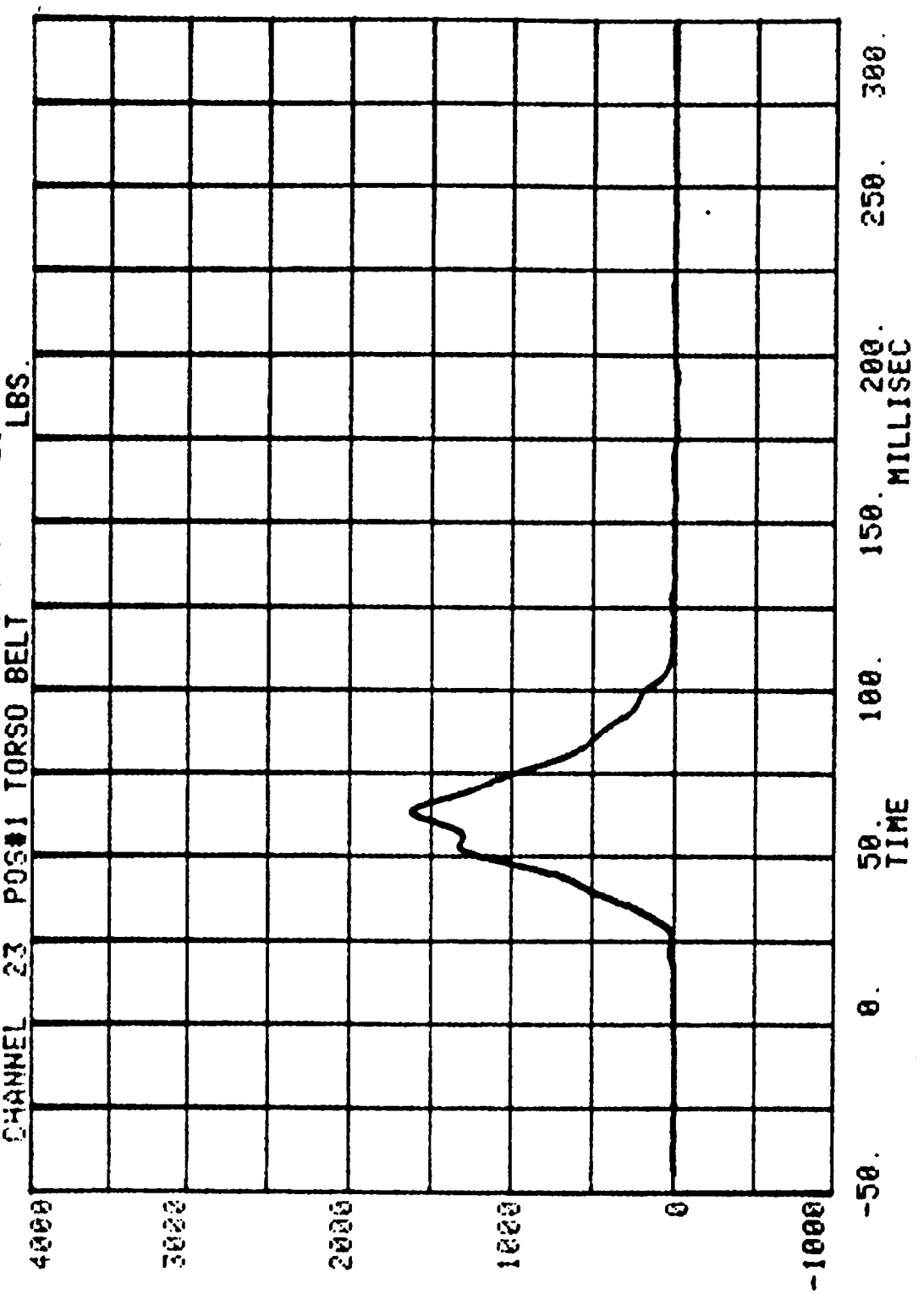

CHANNEL 6 POS#1 CHEST Z
RUN= 997 SERIES= 23
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 2 POS#1 CHEST RESULTANT
RUN= 997 SERIES= 23
G'S
100
80
60
40
20
0
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

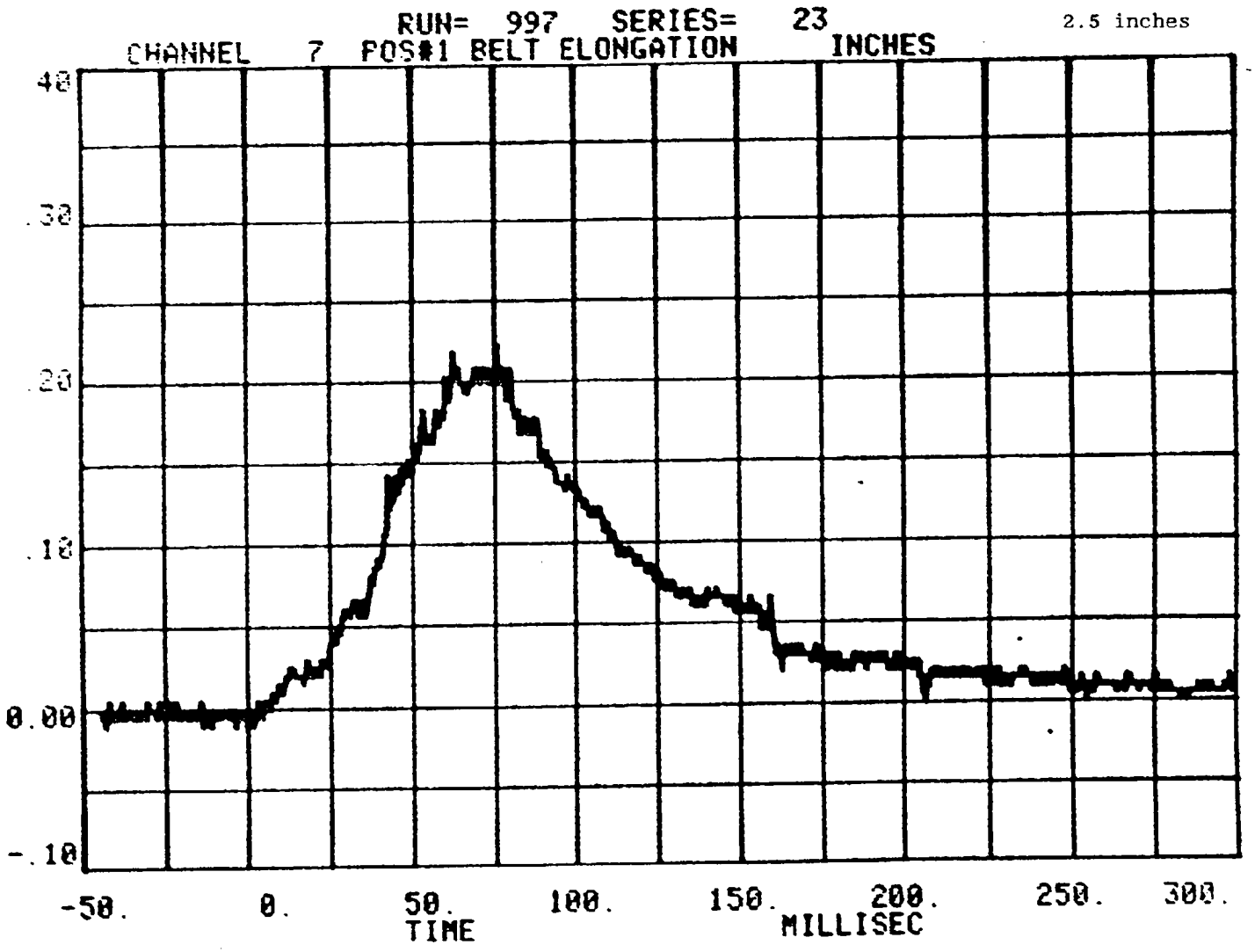

RUN= 997 SERIES= 23
CHANNEL 11 POS#1 LEFT FEMUR LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

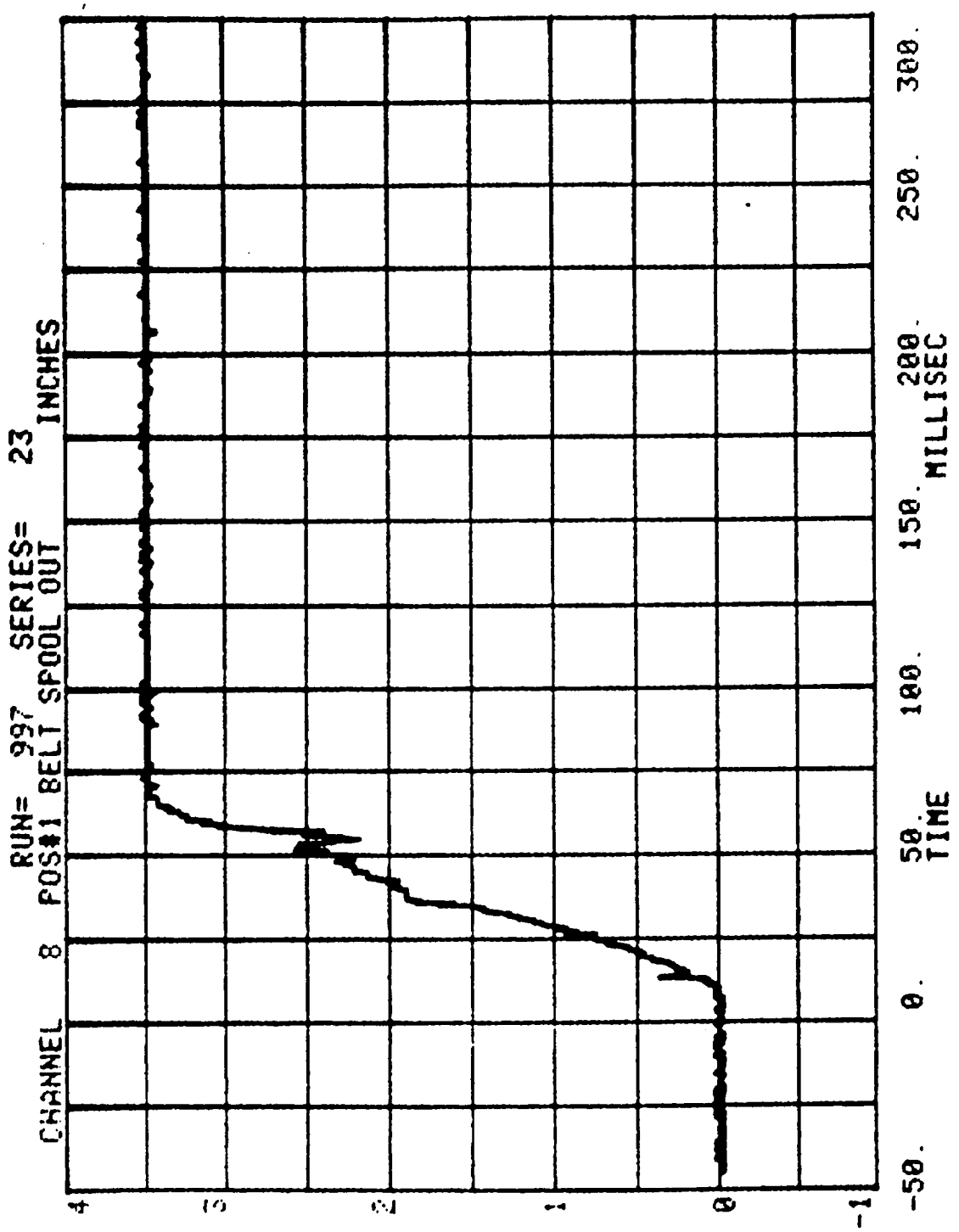

RUN= 997 SERIES= 23
CHANNEL 12 POS#1 RIGHT FEMUR LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

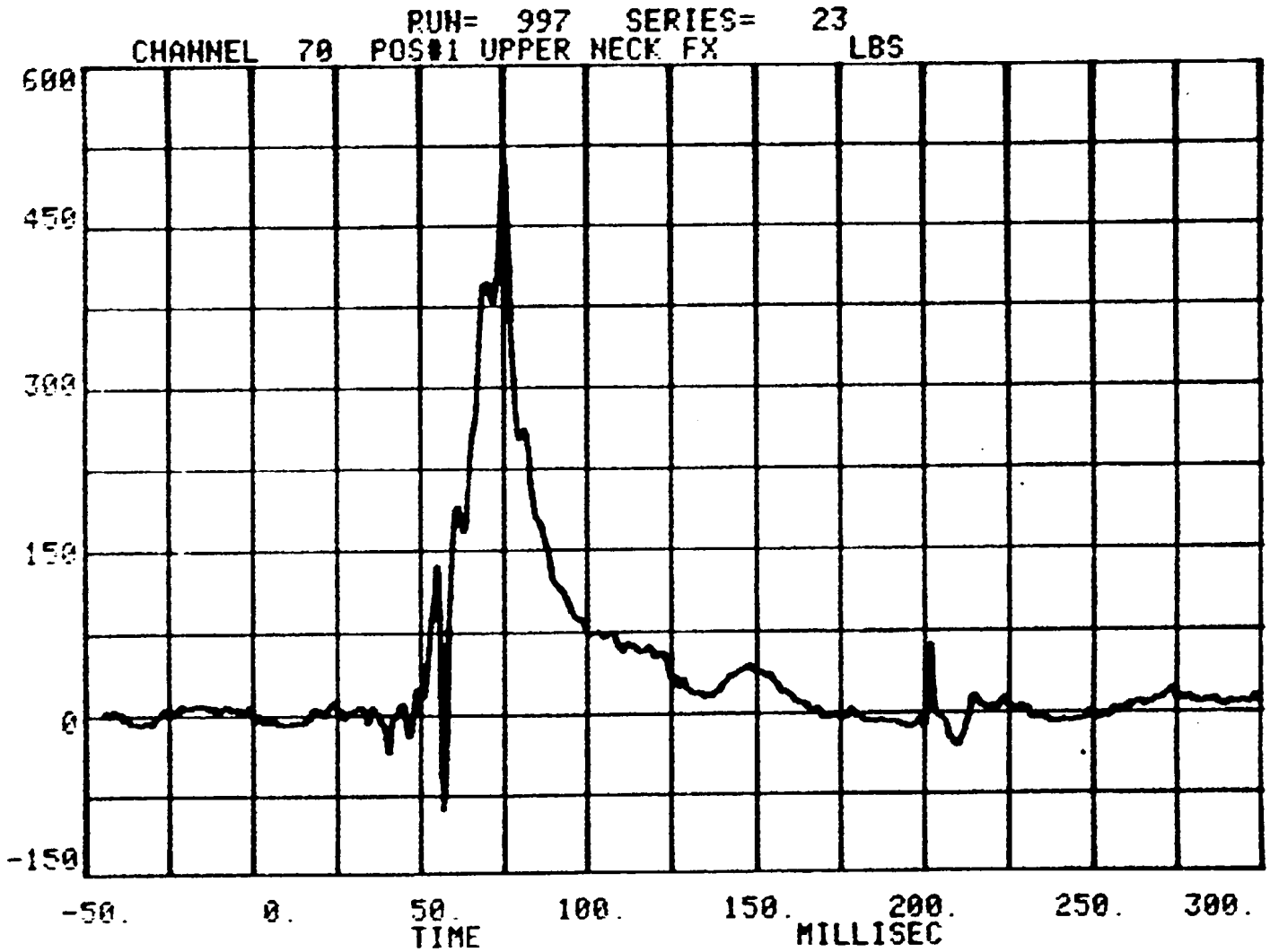

CHANNEL 21 POS#1 LEFT BELT
RUN= 997 SERIES= 23
LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

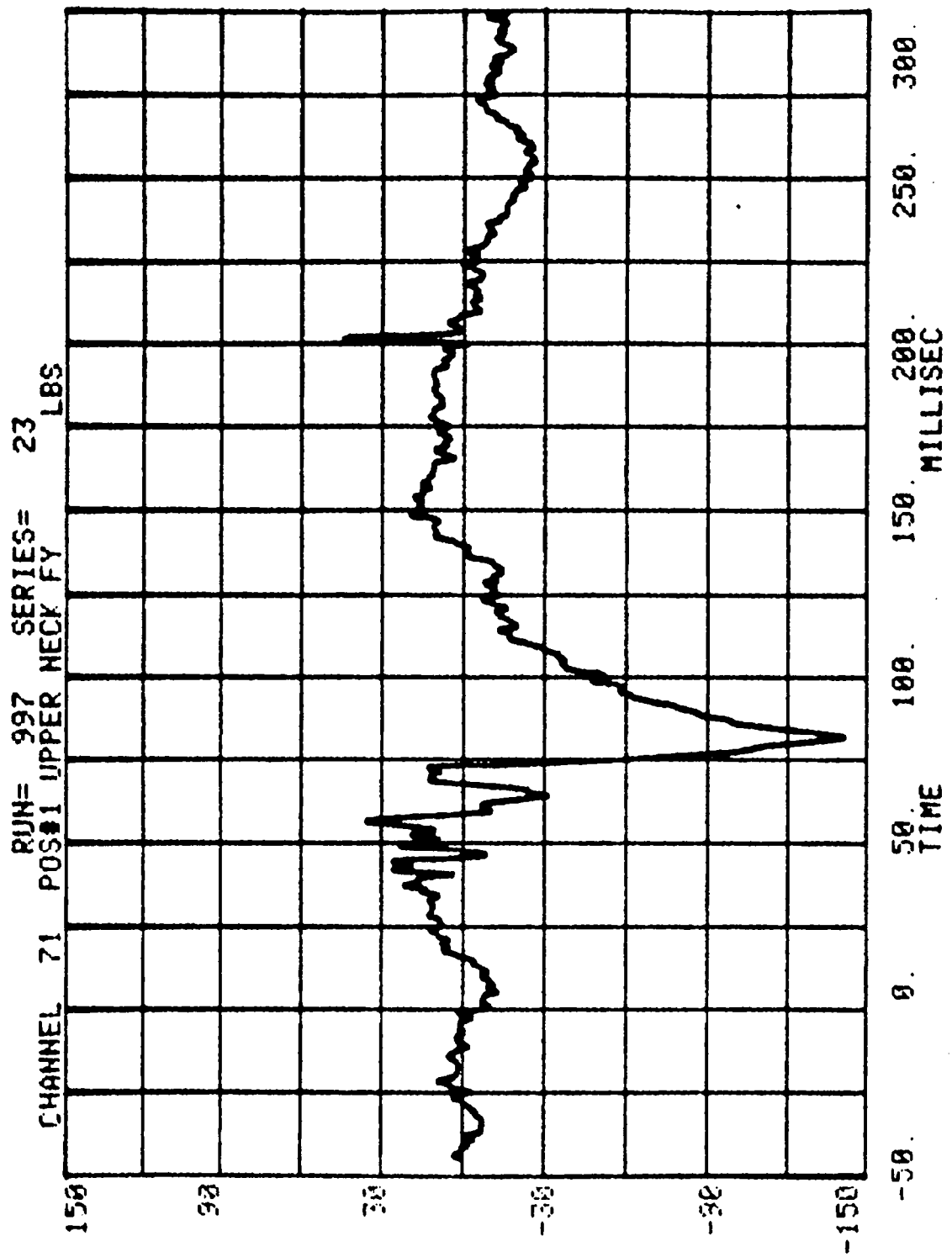

CHANNEL 23
RUN= 997 SERIES= 23
POS#1 TORSO BELT
LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

Measured over
2.5 inches

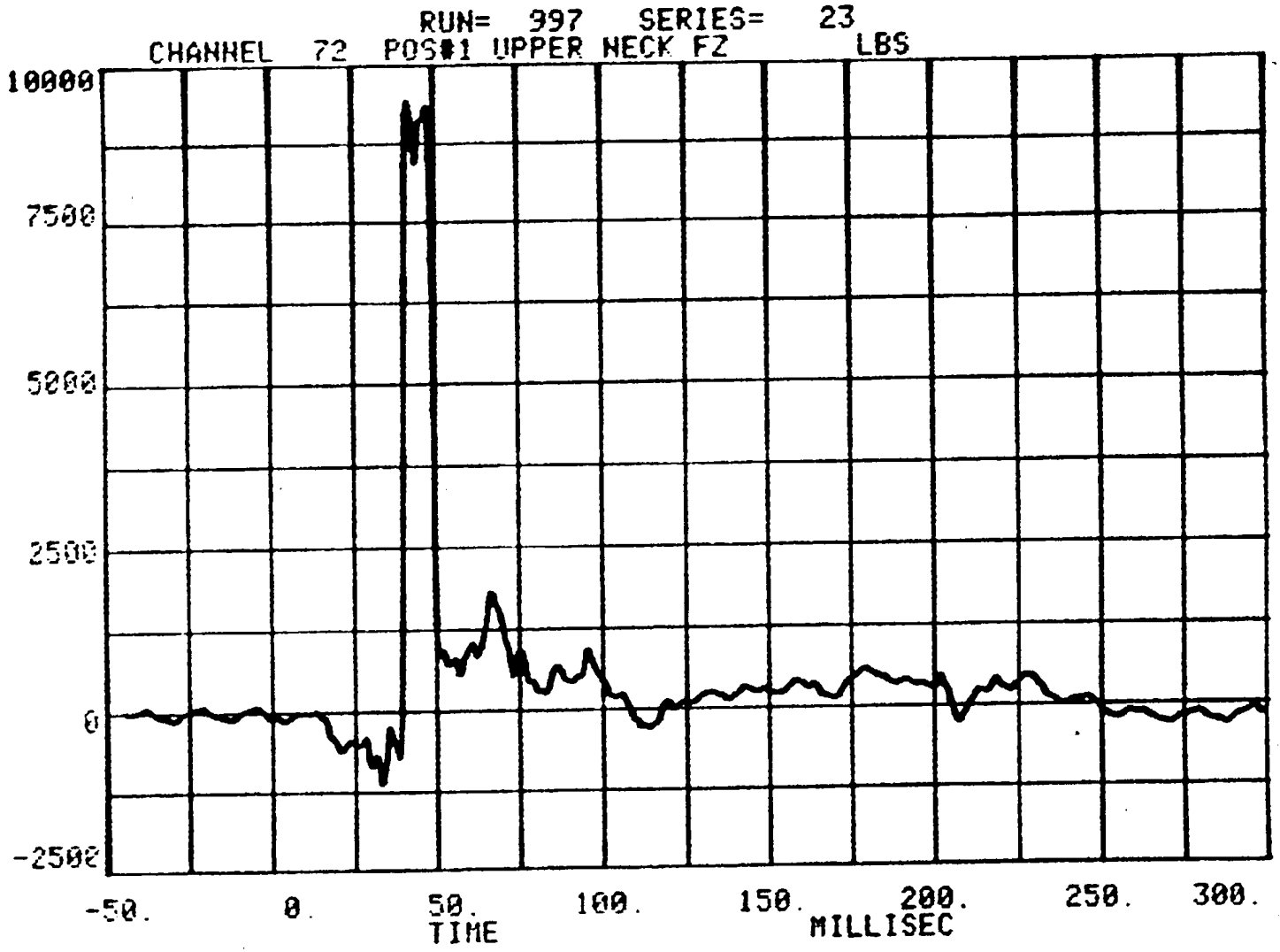


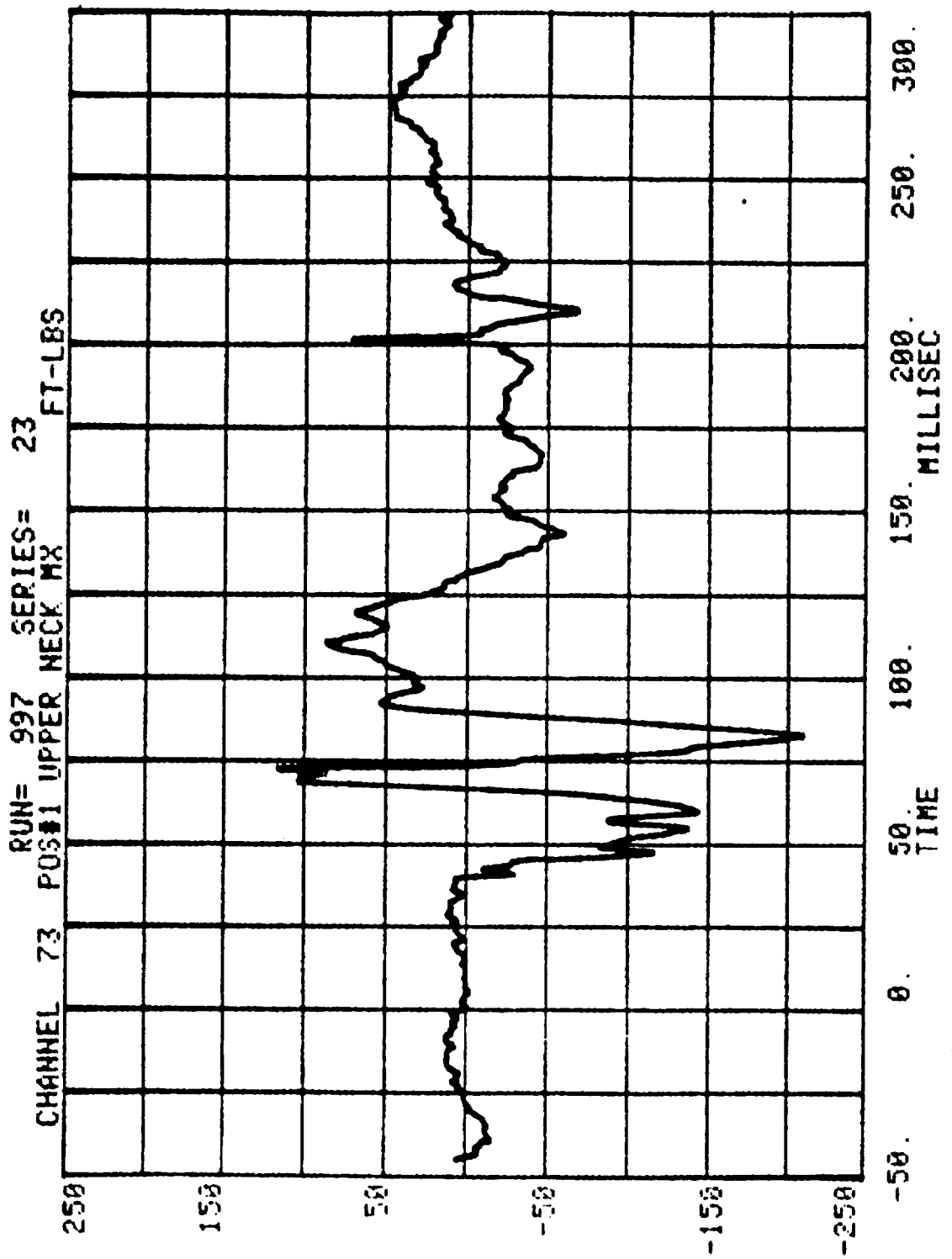

CHANNEL 8 POS#1 BELT SPOOL OUT
RUN= 997 SERIES= 23
INCHES
4
0
-1
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 997 SERIES= 23
CHANNEL 70 POS#1 UPPER NECK FX LBS
600
450
300
150
0
-150
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

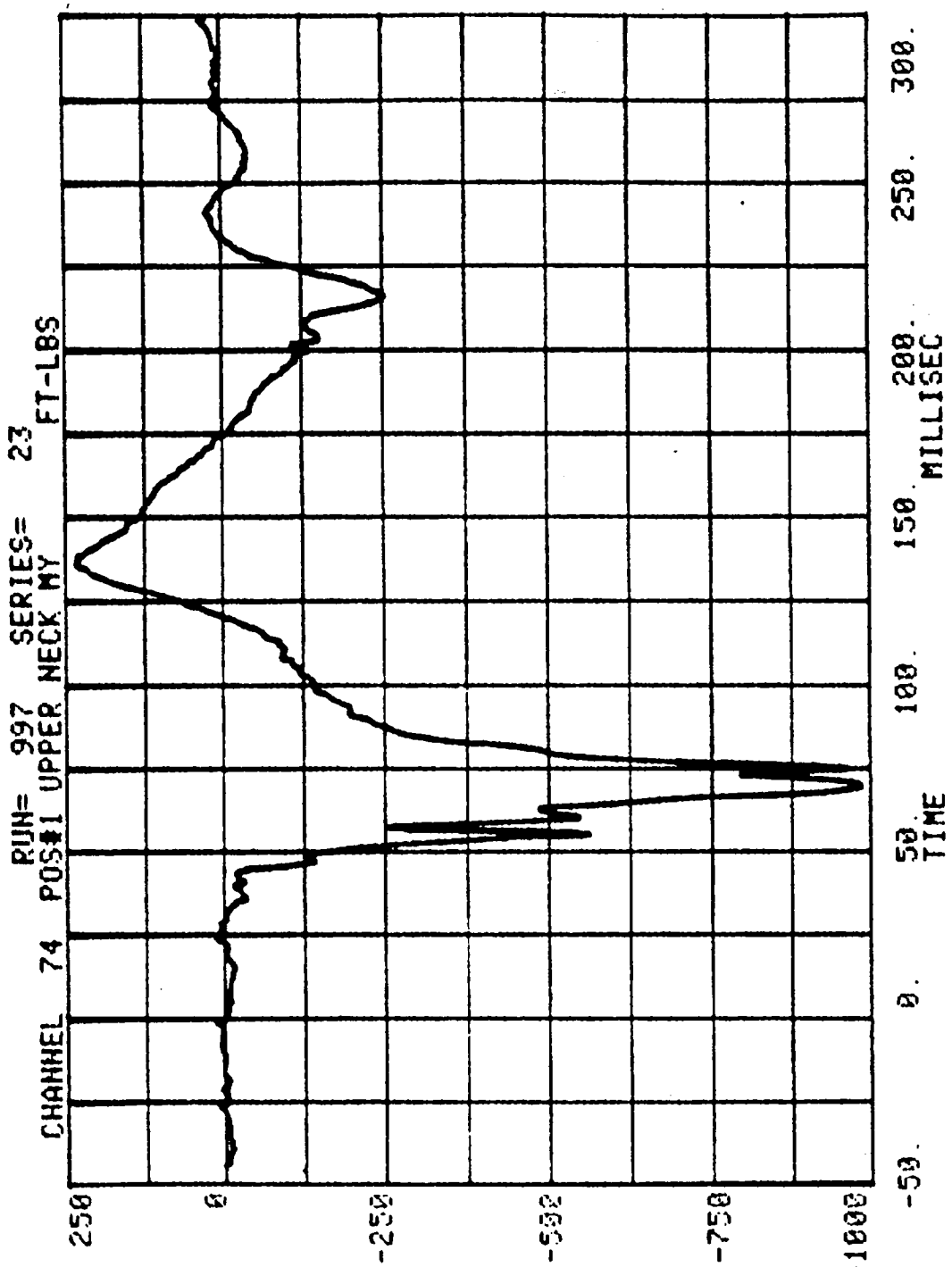

CHANNEL 71 POS#1 UPPER NECK FY
RUN= 997 SERIES= 23
LBS
150
90
30
-30
-90
-150
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

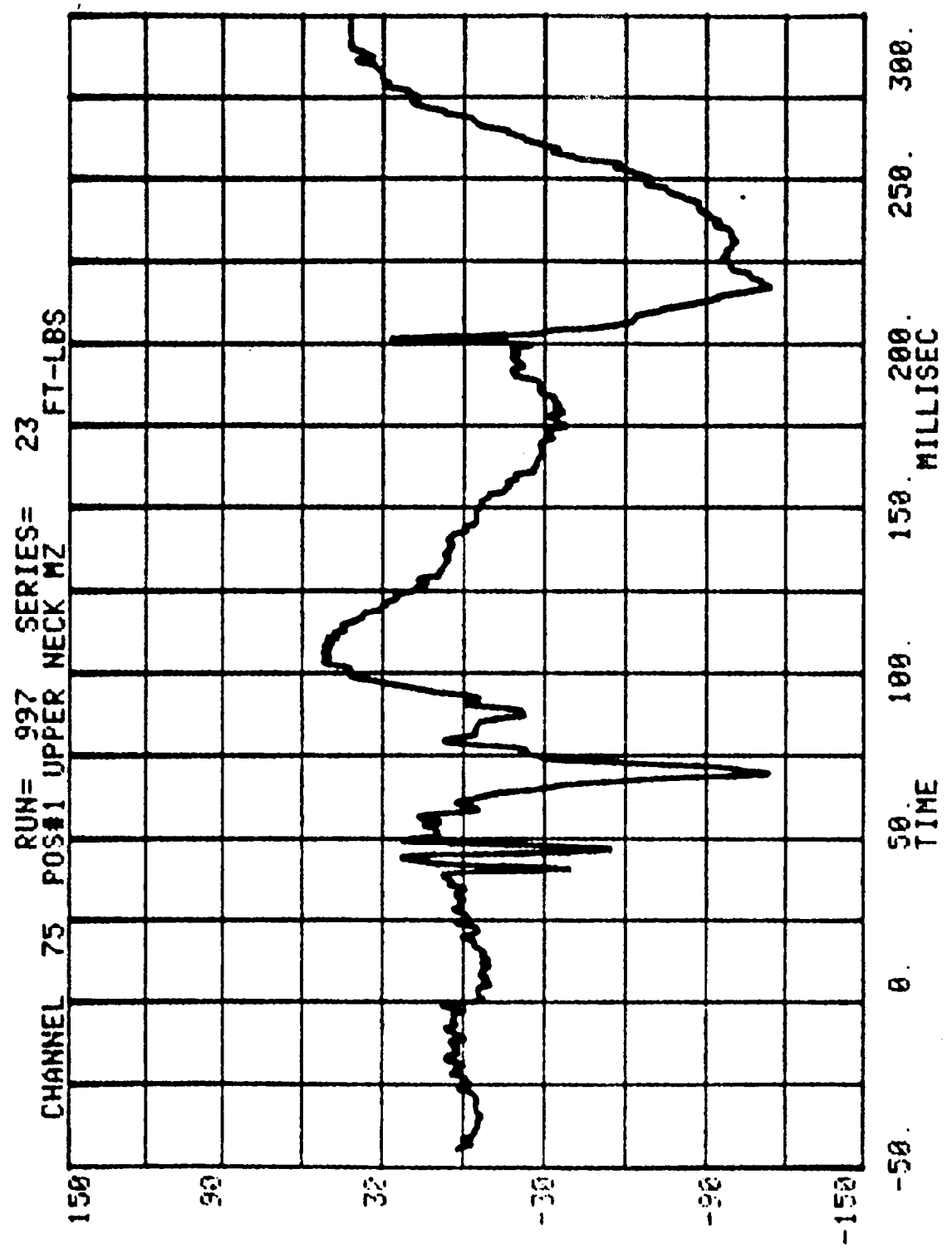

RUN= 397 SERIES= 23
CHANNEL 72 POS#1 UPPER NECK FZ LBS
10000
7500
5000
2500
0
-2500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 73 POS#1 UPPER NECK MX
RUN= 997 SERIES= 23
FT-LBS
250
150
50
-50
-150
-250
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

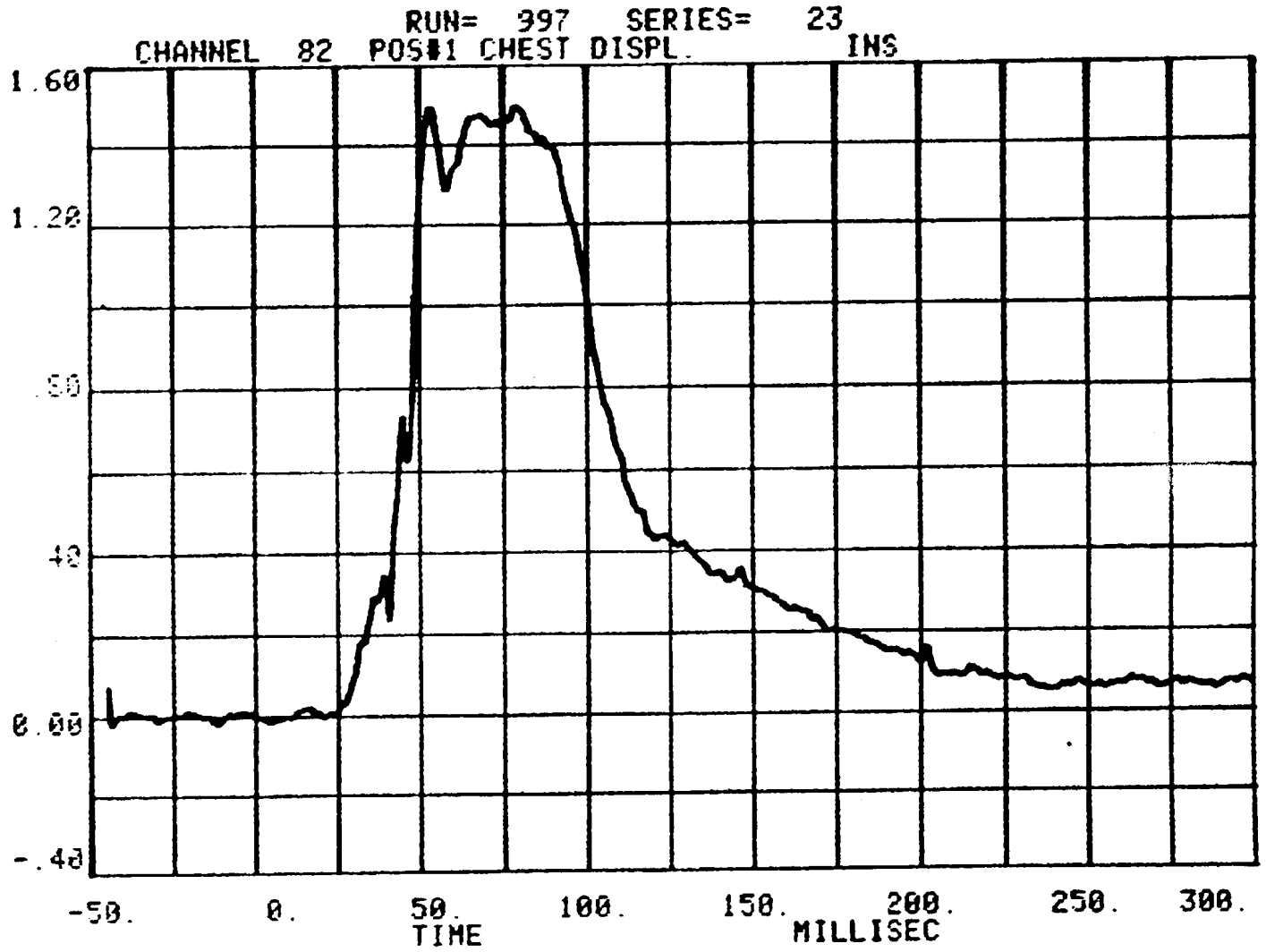
7776-23


CHANNEL 74 POS#1 UPPER NECK MY
RUN= 997 SERIES= 23
FT-LBS
250
0
-250
-500
-750
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23


CHANNEL 75 POS#1 UPPER NECK MZ
RUN= 997 SERIES= 23
FT-LBS
150
50
-30
-130
-150
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23


RUN= 397 SERIES= 23
CHANNEL 82 POS#1 CHEST DISPL. INS
1.60
1.20
.80
.40
0.00
-.40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

NCAP #23

RUN= 997

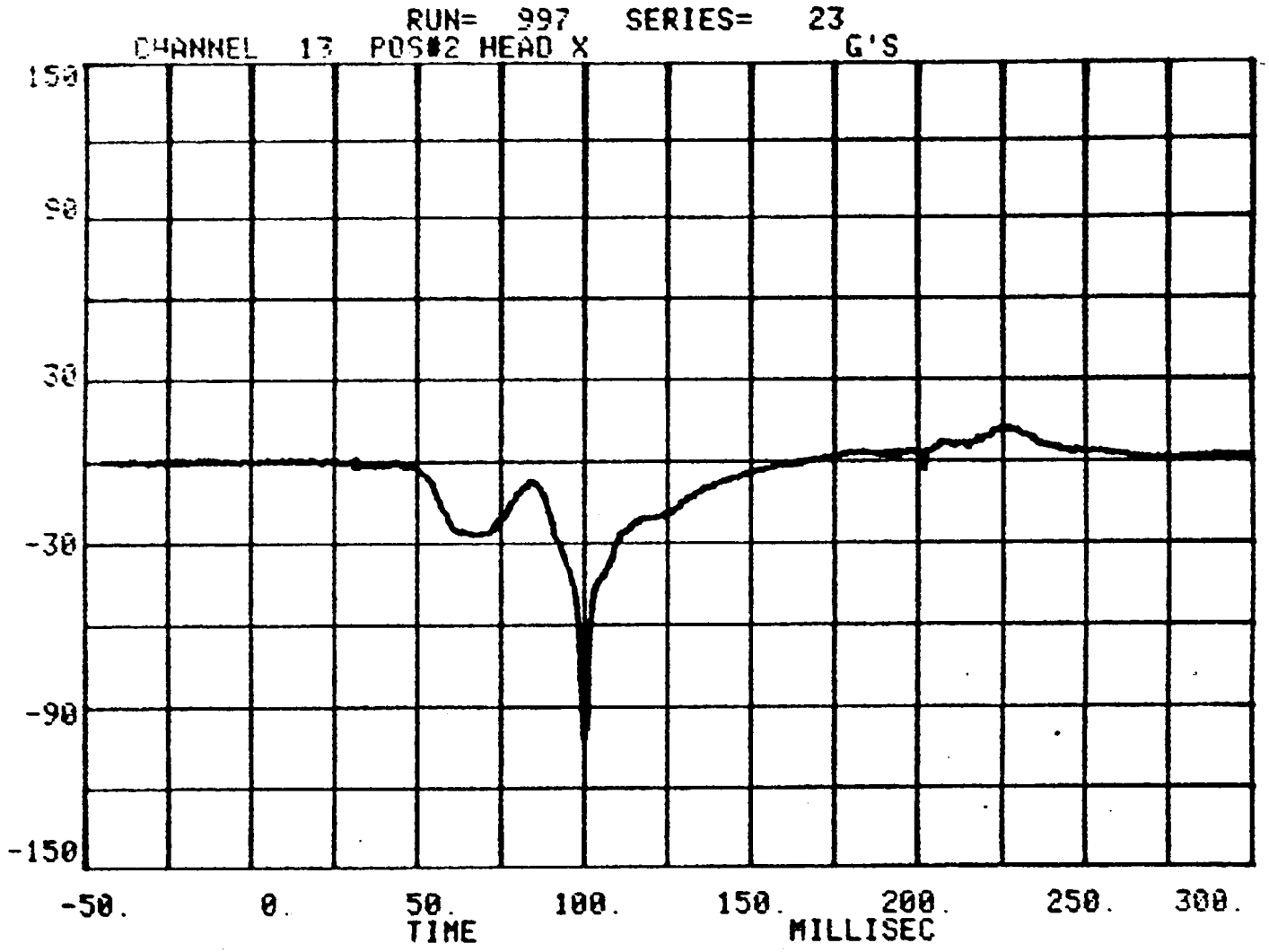
POS#2 HEAD RESULTANT

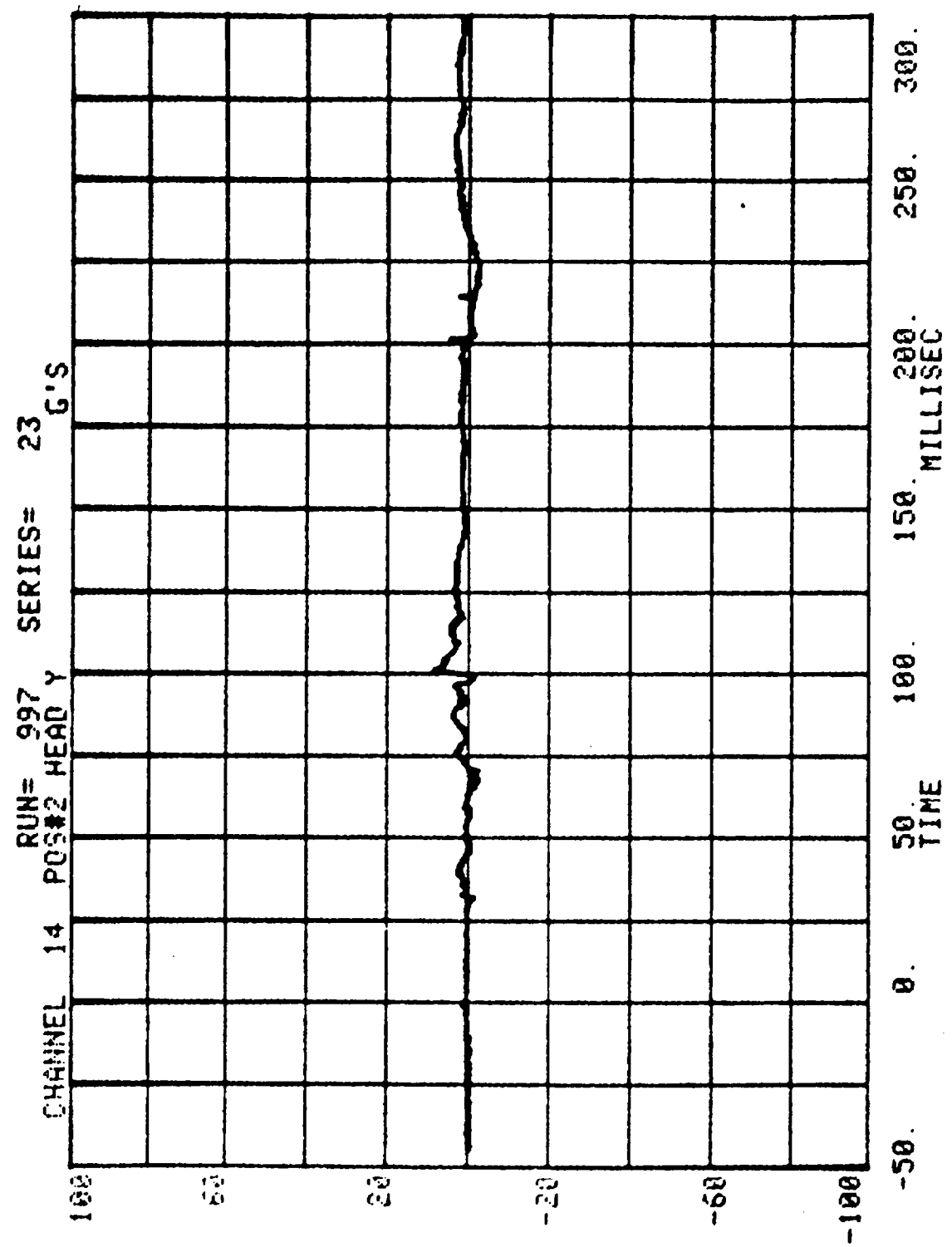
HIC= 840.7 FROM T1= .06817 TO T2= .10417

AVERAGE ACCELERATION BETWEEN T1 AND T2= 55.9G'S

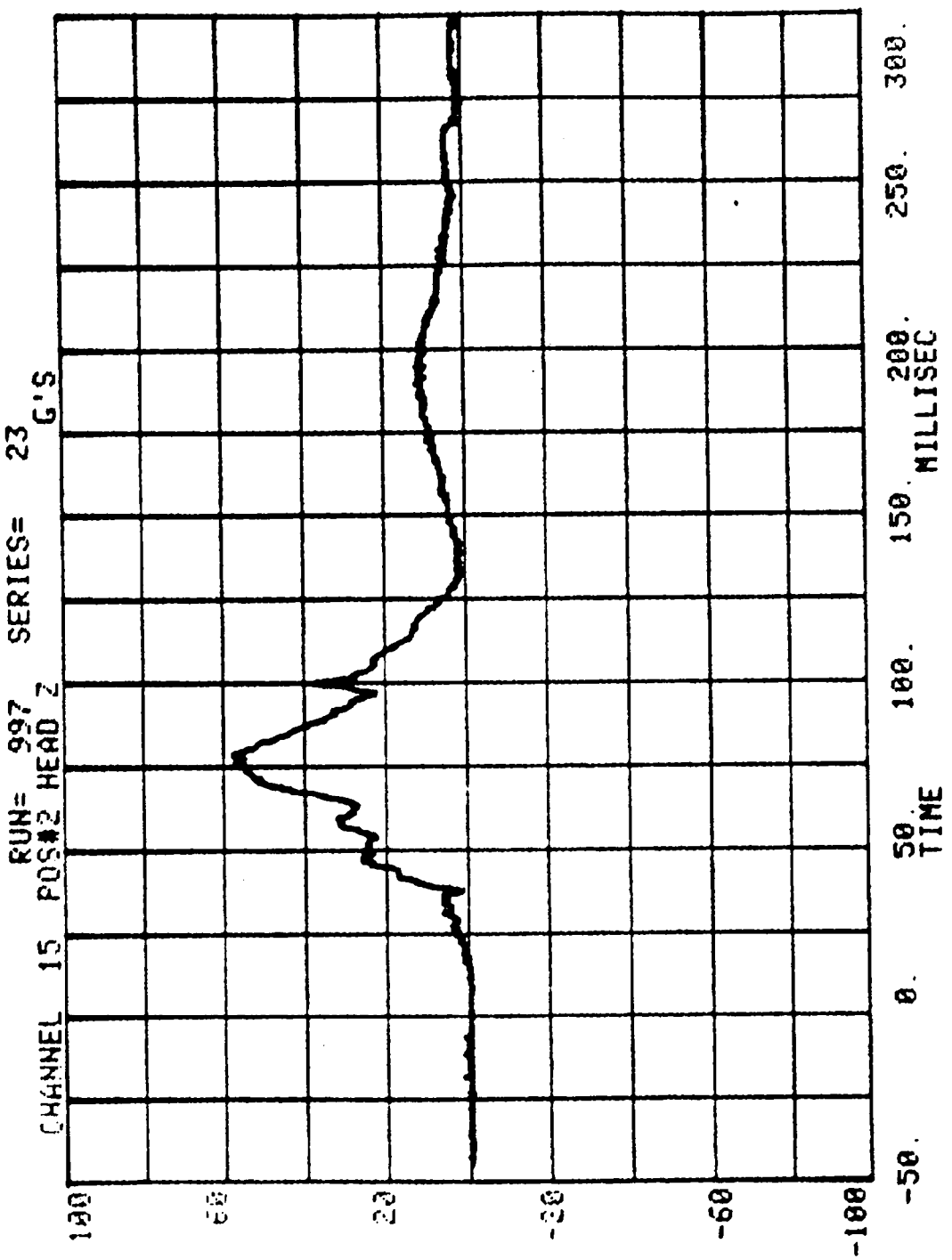
EVENT TIME= 300 0 MSEC

SEVERITY INDEX=1302.8

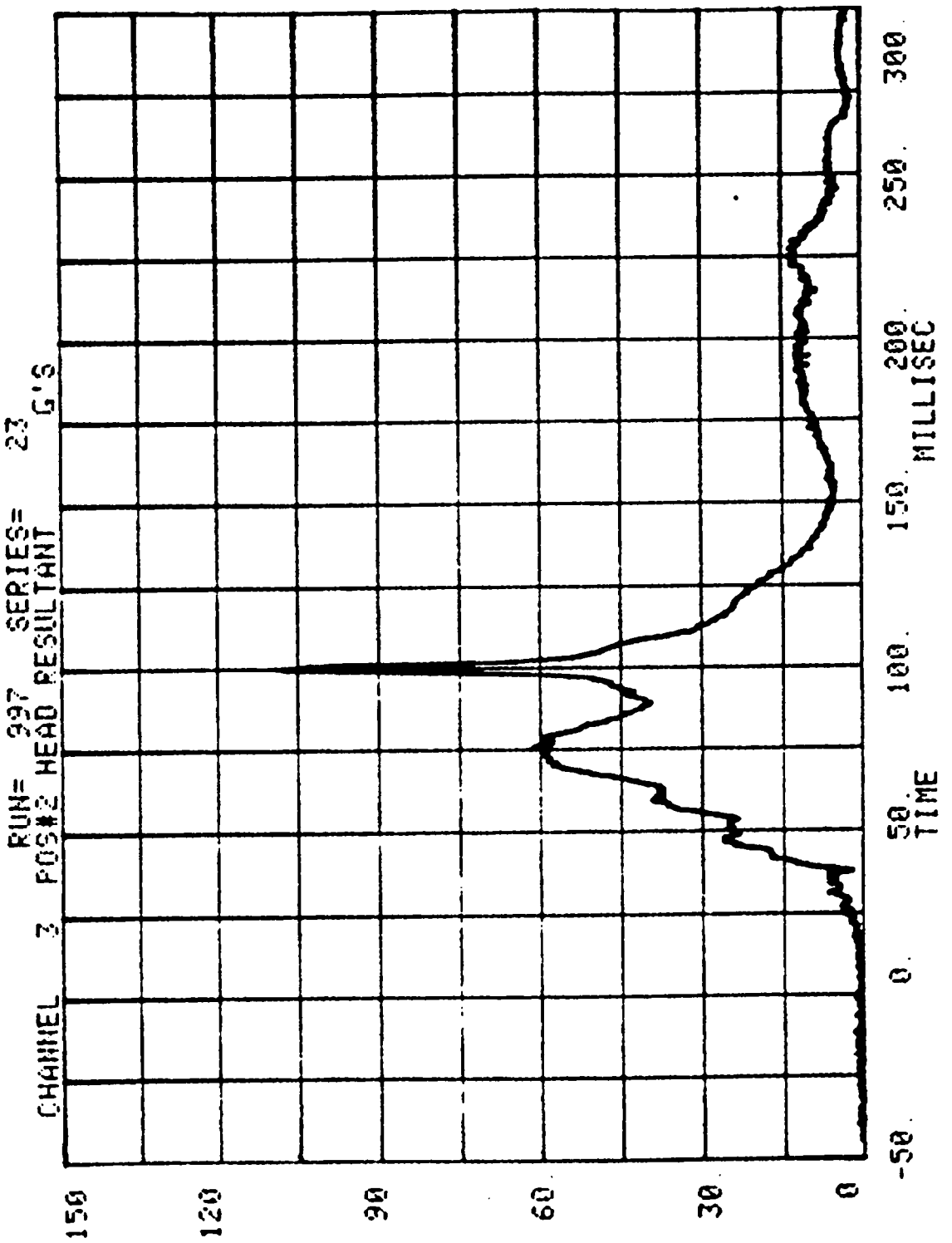

RUN= 997 SERIES= 23
CHANNEL 13 POS#2 HEAD X
G'S
150
90
30
-30
-90
-150
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 14 POS#2 HEAD Y
RUN= 997 SERIES= 23
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

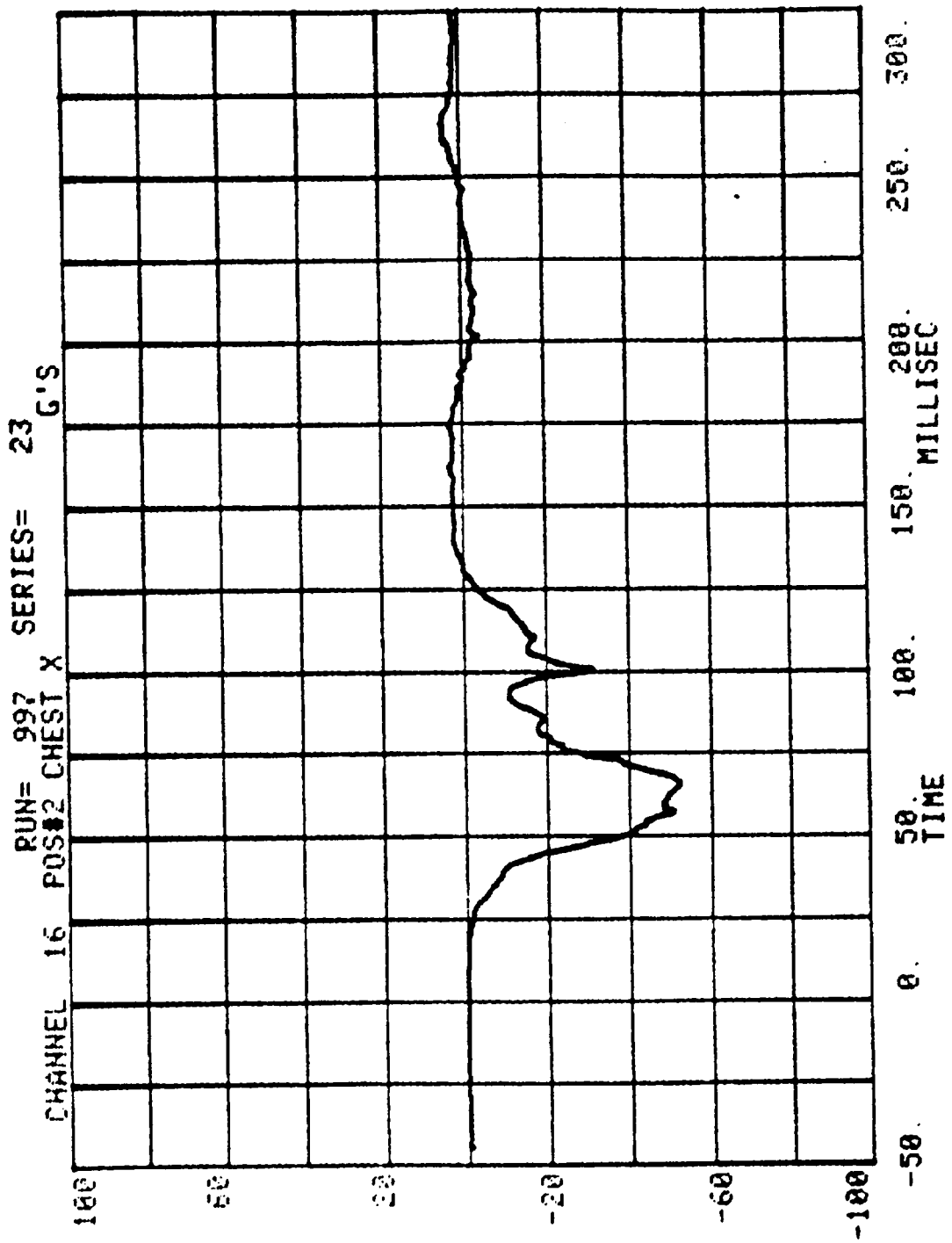
7776-23


CHANNEL 15 POS#2 HEAD 2
RUN= 997 SERIES= 23
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

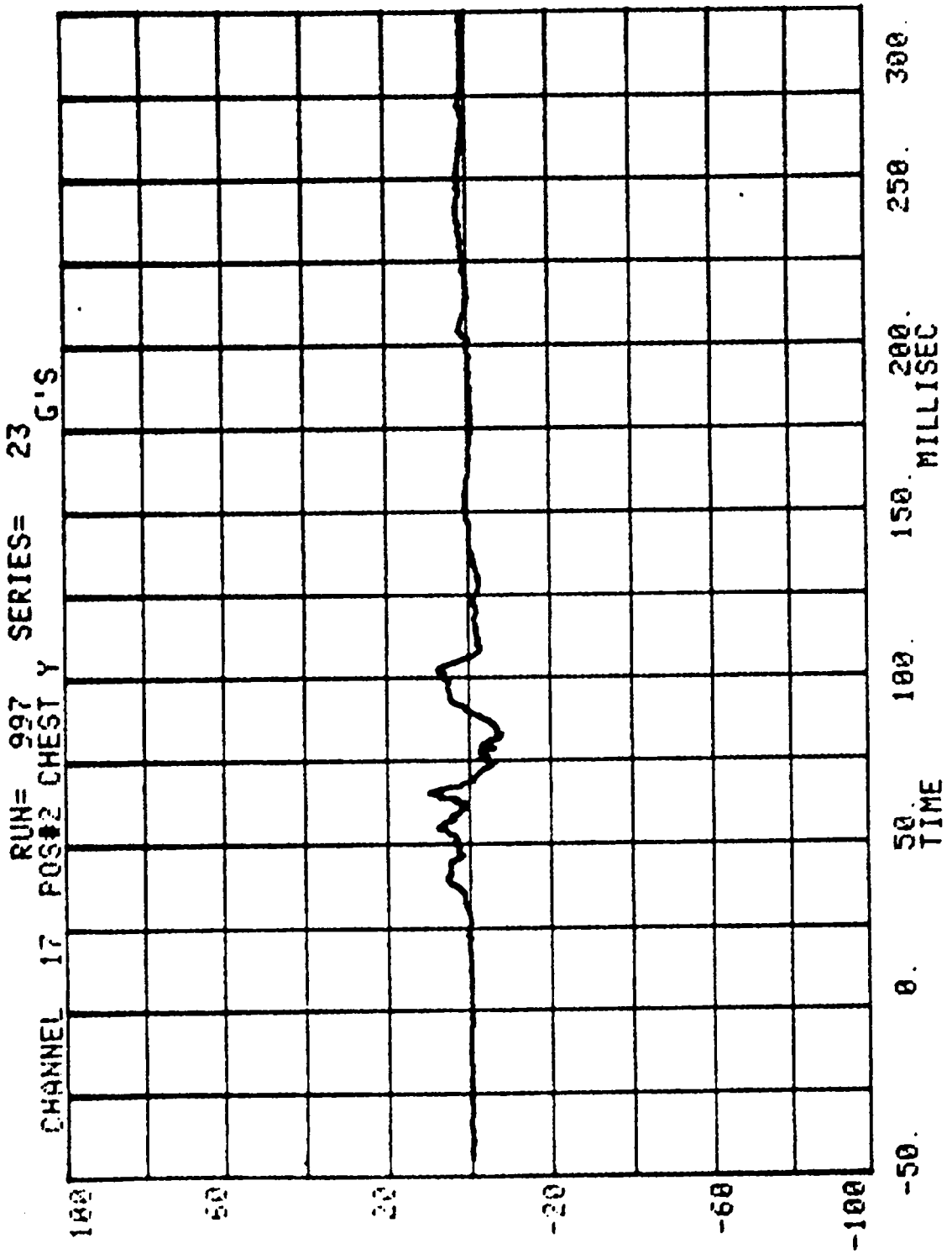
7776-23


CHANNEL 3 POS#2 HEAD RESULTANT
RUN= 297 SERIES= 23
G'S
150
120
90
60
30
0
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

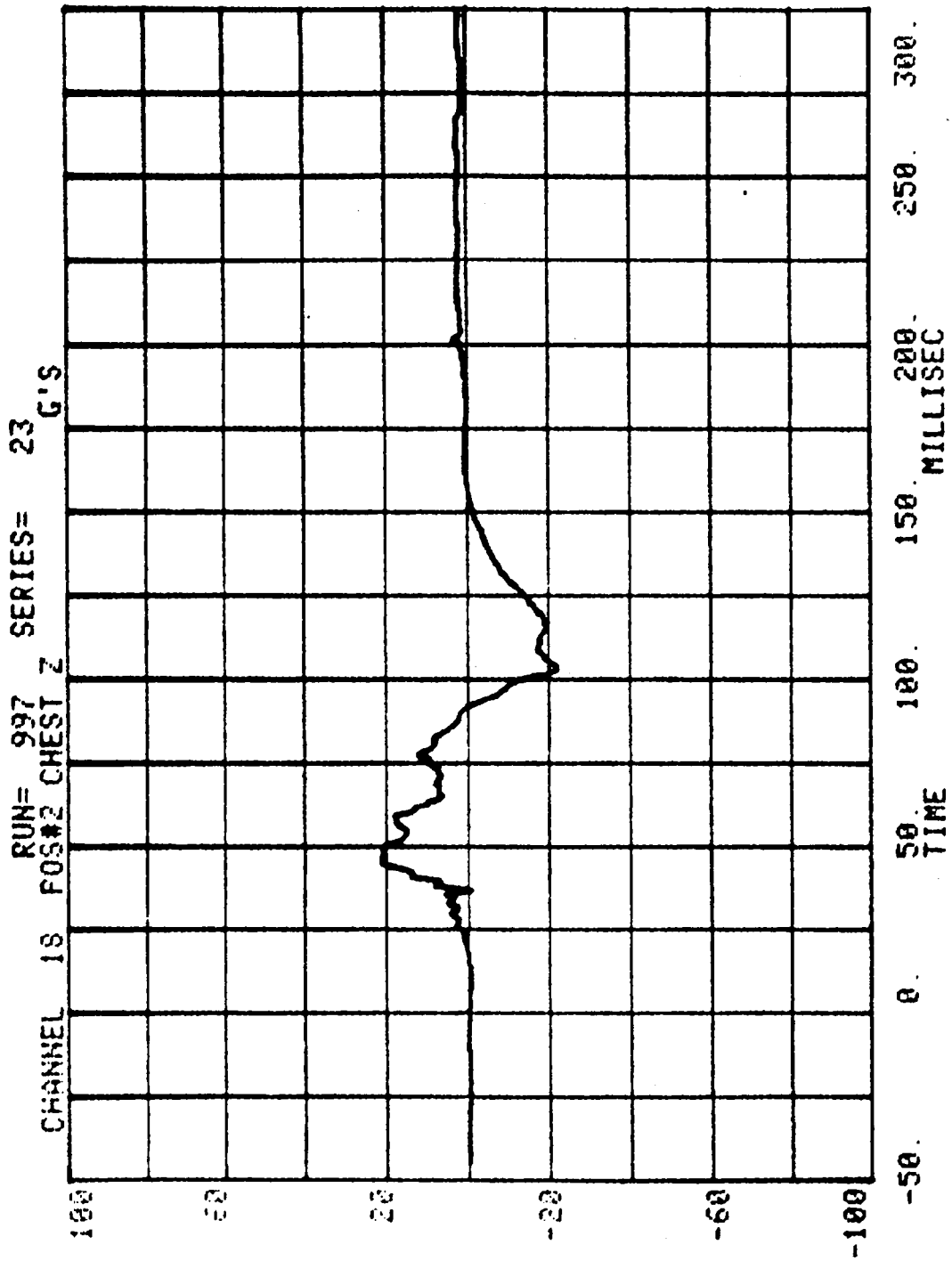
7776-23

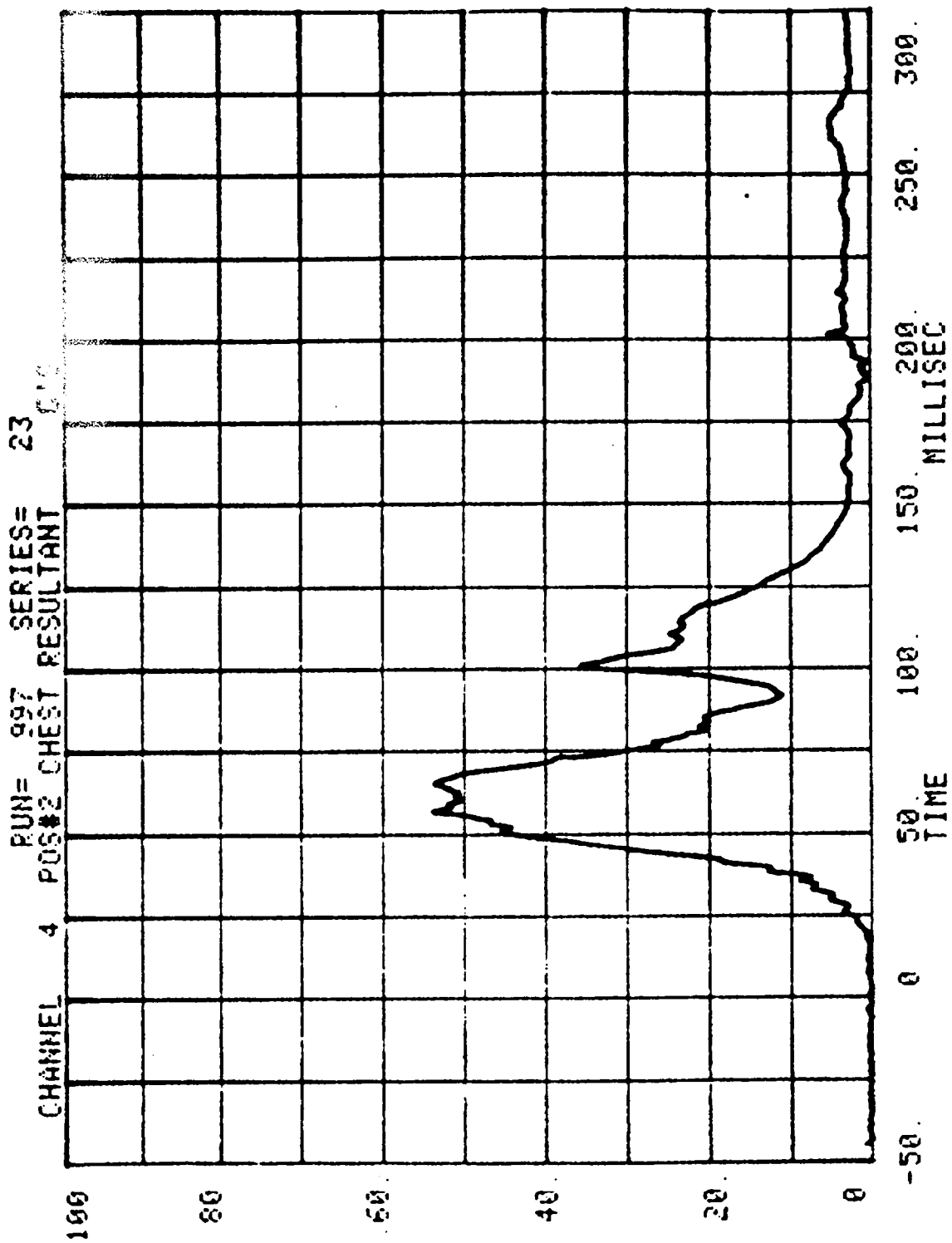

CHANNEL 16
RUN= 997
POS#2 CHEST X
SERIES= 23
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

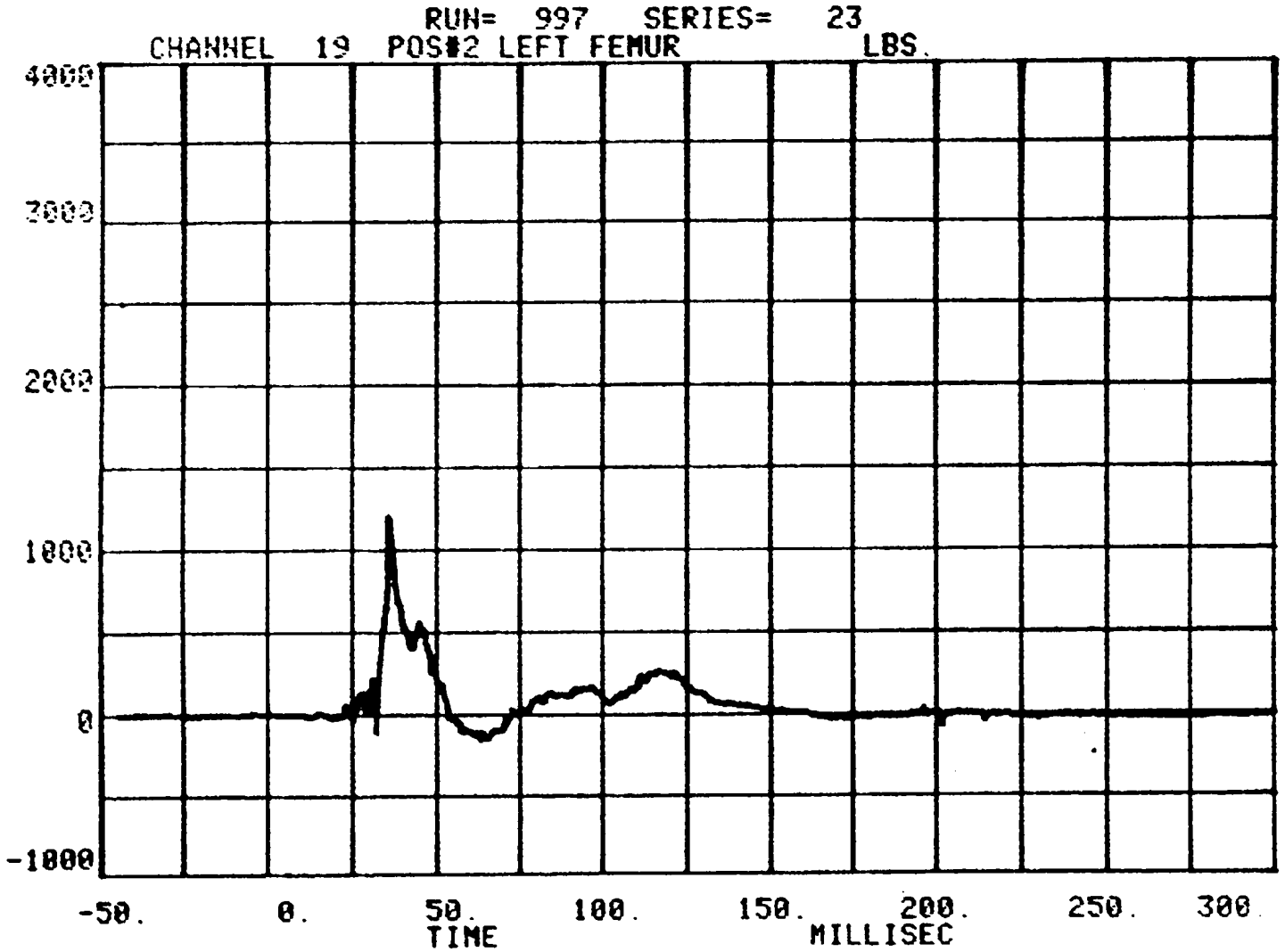
7776-23

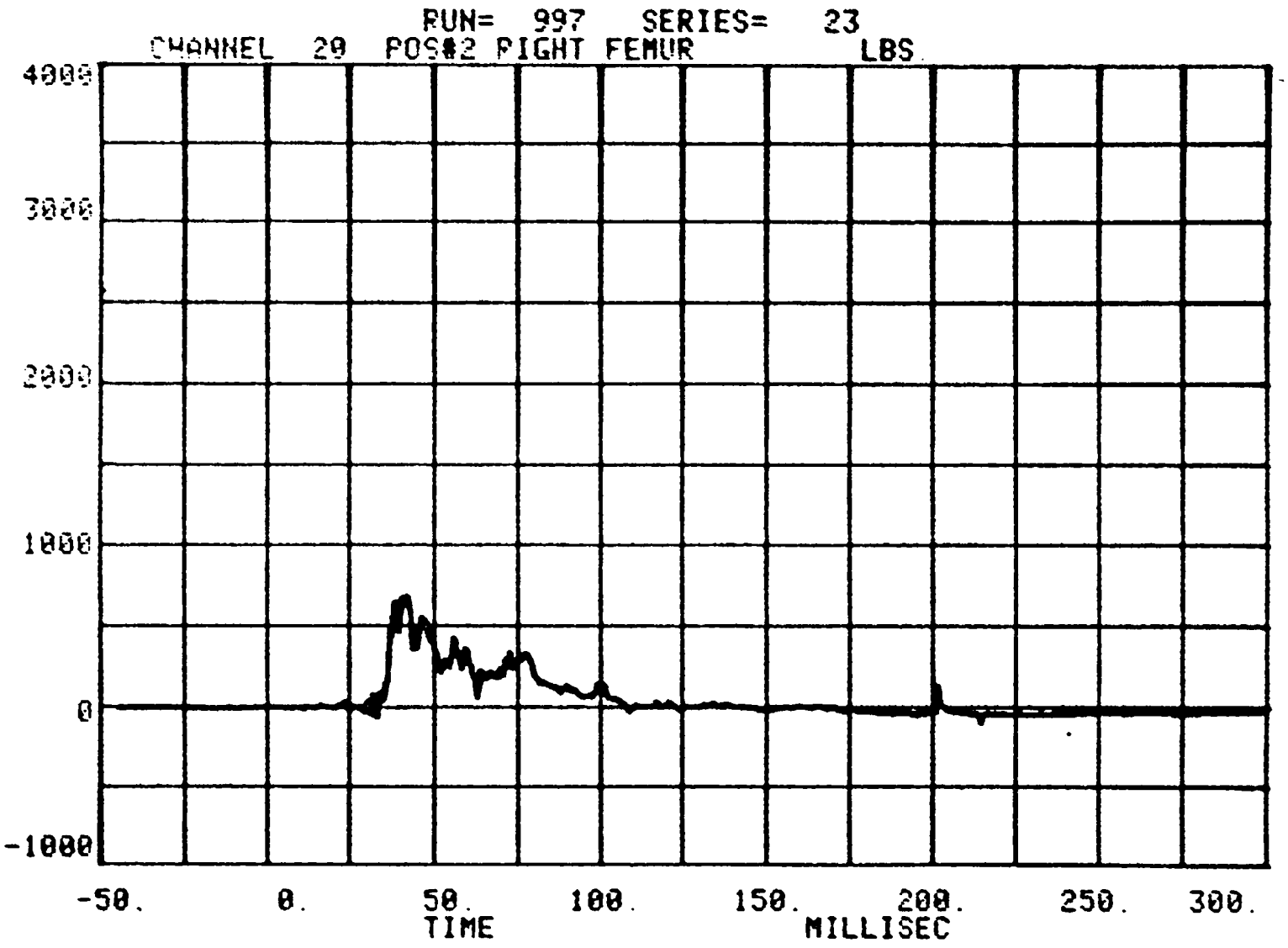

CHANNEL 17 POS#2 CHEST Y
RUN= 997 SERIES= 23
G'S
100
50
0
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

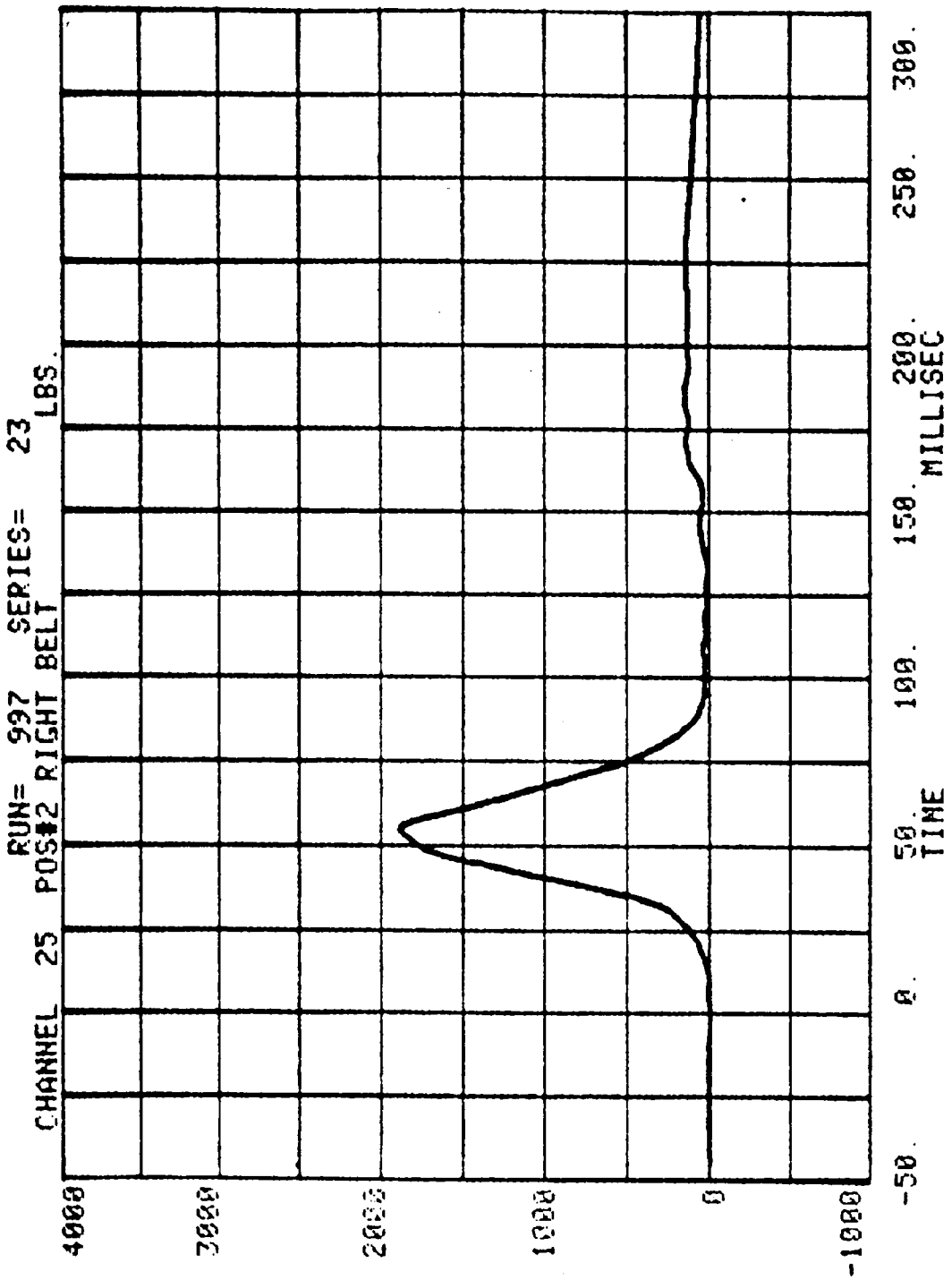
7776-23

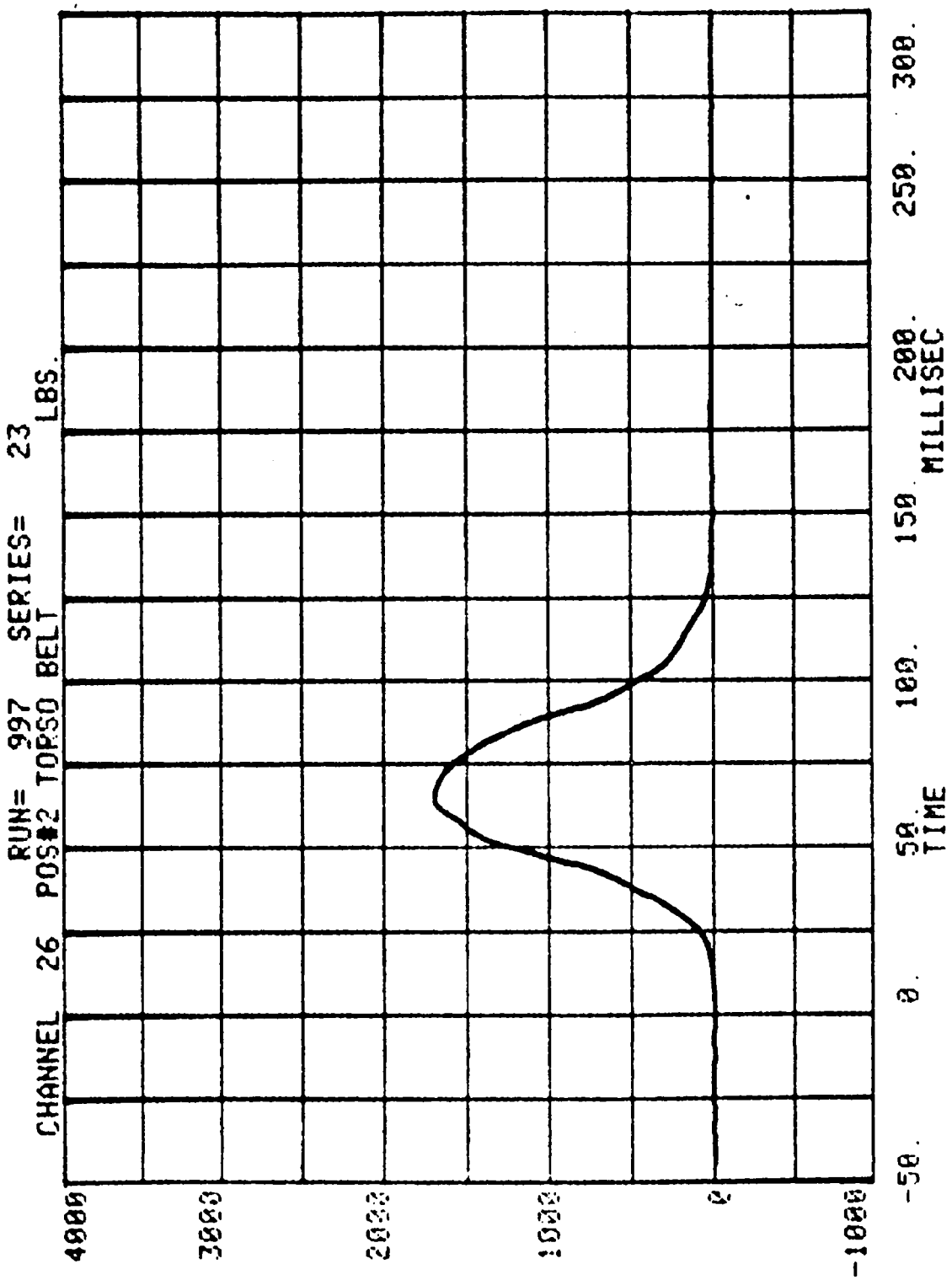

CHANNEL 18 FOS#2 CHEST Z
RUN= 997 SERIES= 23
G'S
100
22
-22
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

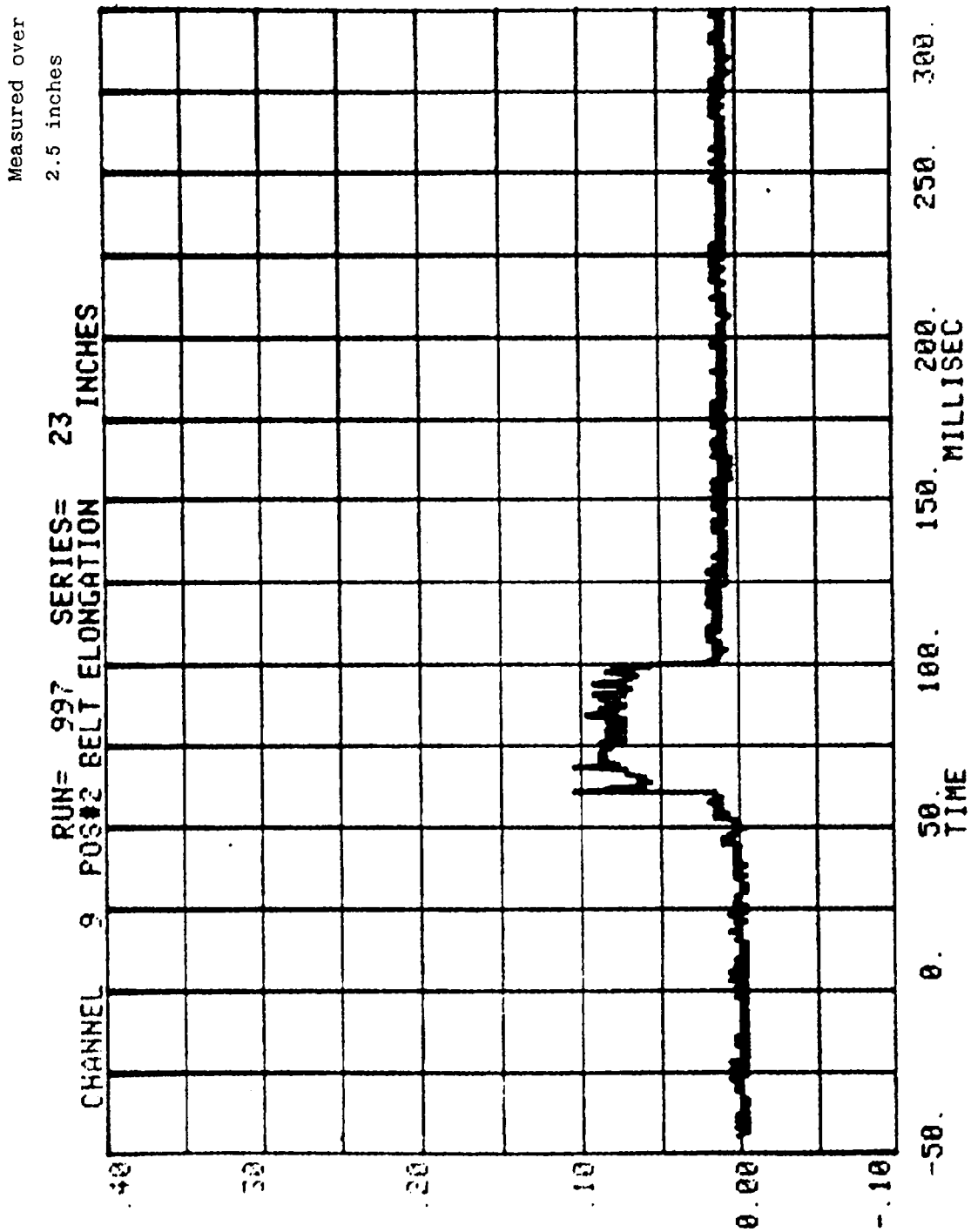

CHANNEL 4 POS#2 CHEST
RUN= 997 SERIES= 23
RESULTANT
100.
80.
60.
40.
20.
0
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

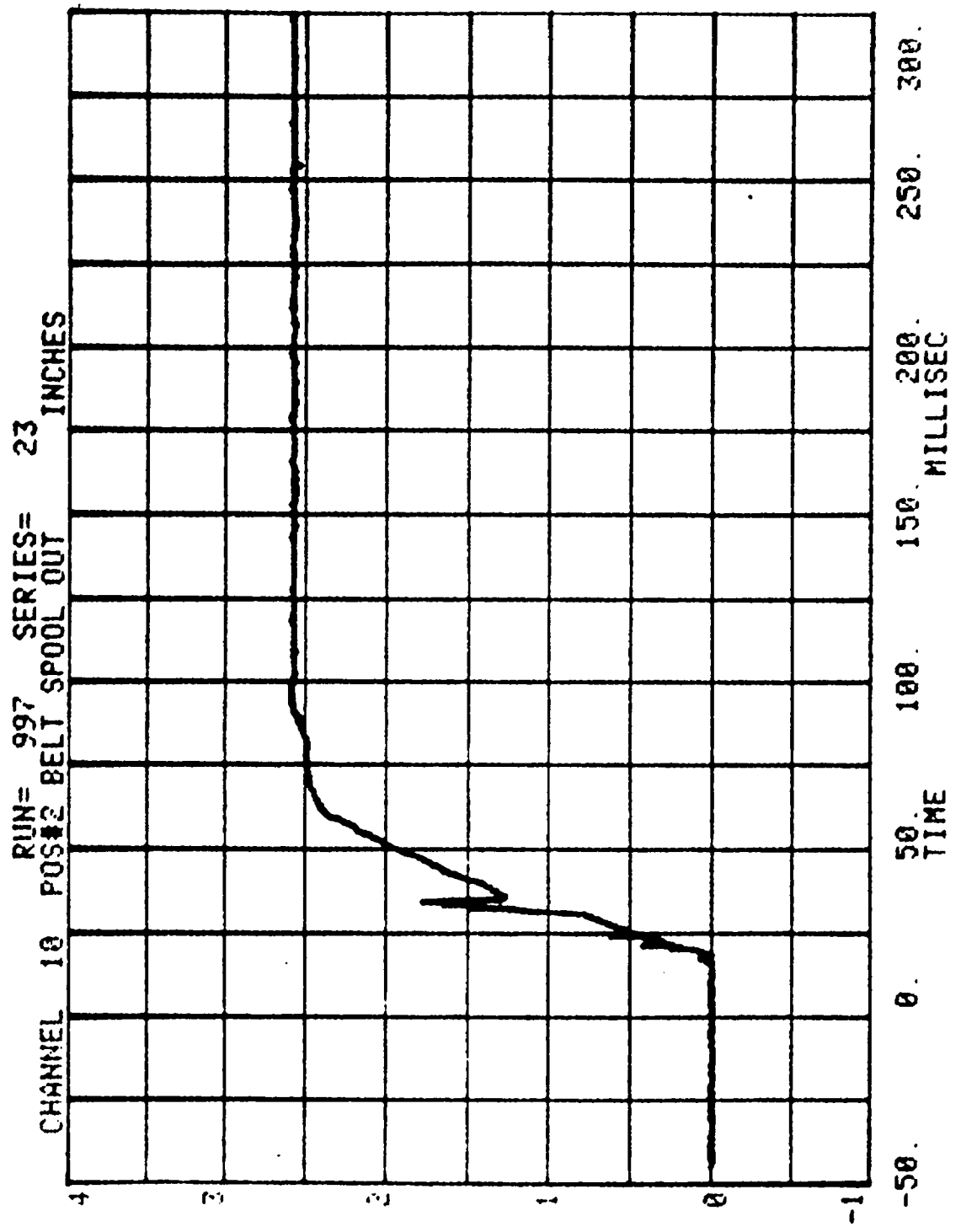

RUN= 997 SERIES= 23
CHANNEL 19 POS#2 LEFT FEMUR LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300
TIME
MILLISEC

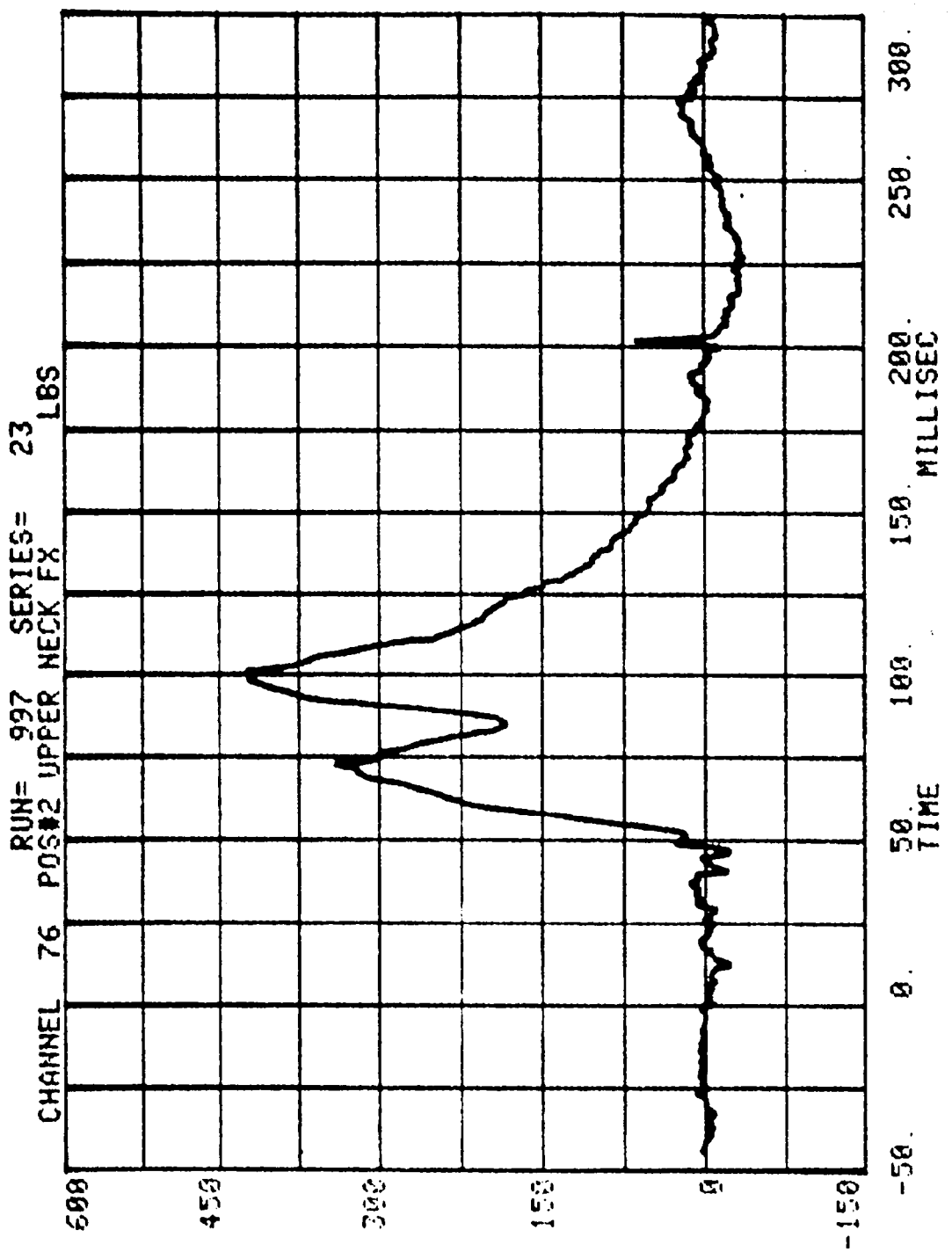

RUN= 997 SERIES= 23
CHANNEL 20 POS#2 RIGHT FEMUR LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 25 POS#2 RIGHT BELT
RUN= 997 SERIES= 23
LBS.
4000
2000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

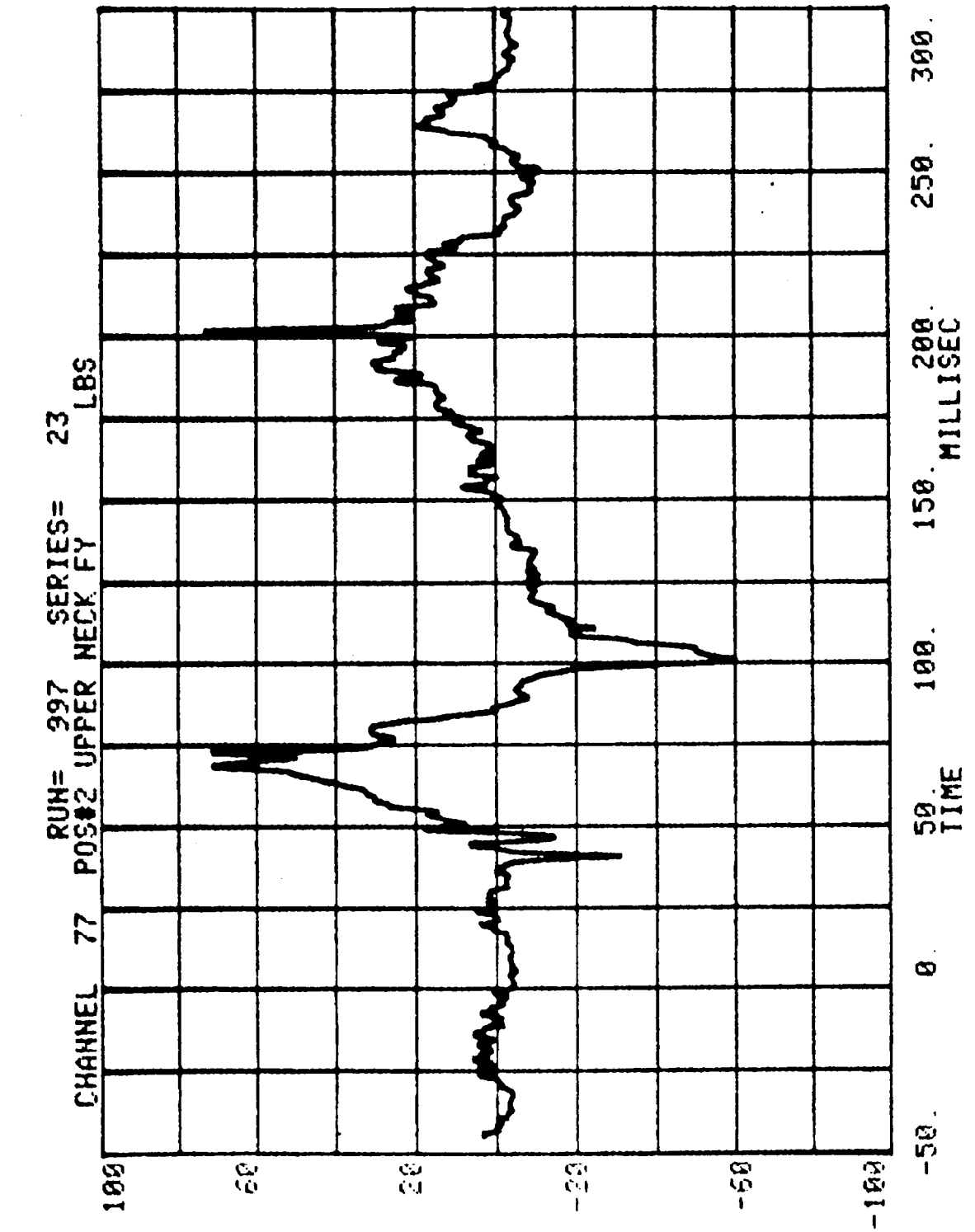

CHANNEL 26 POS#2 TORSO BELT
RUN= 997 SERIES= 23
LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


Measured over
2.5 inches
CHANNEL 9 POS#2 BELT ELONGATION
RUN= 997 SERIES= 23 INCHES
.40
.30
.20
.10
0.00
-.10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

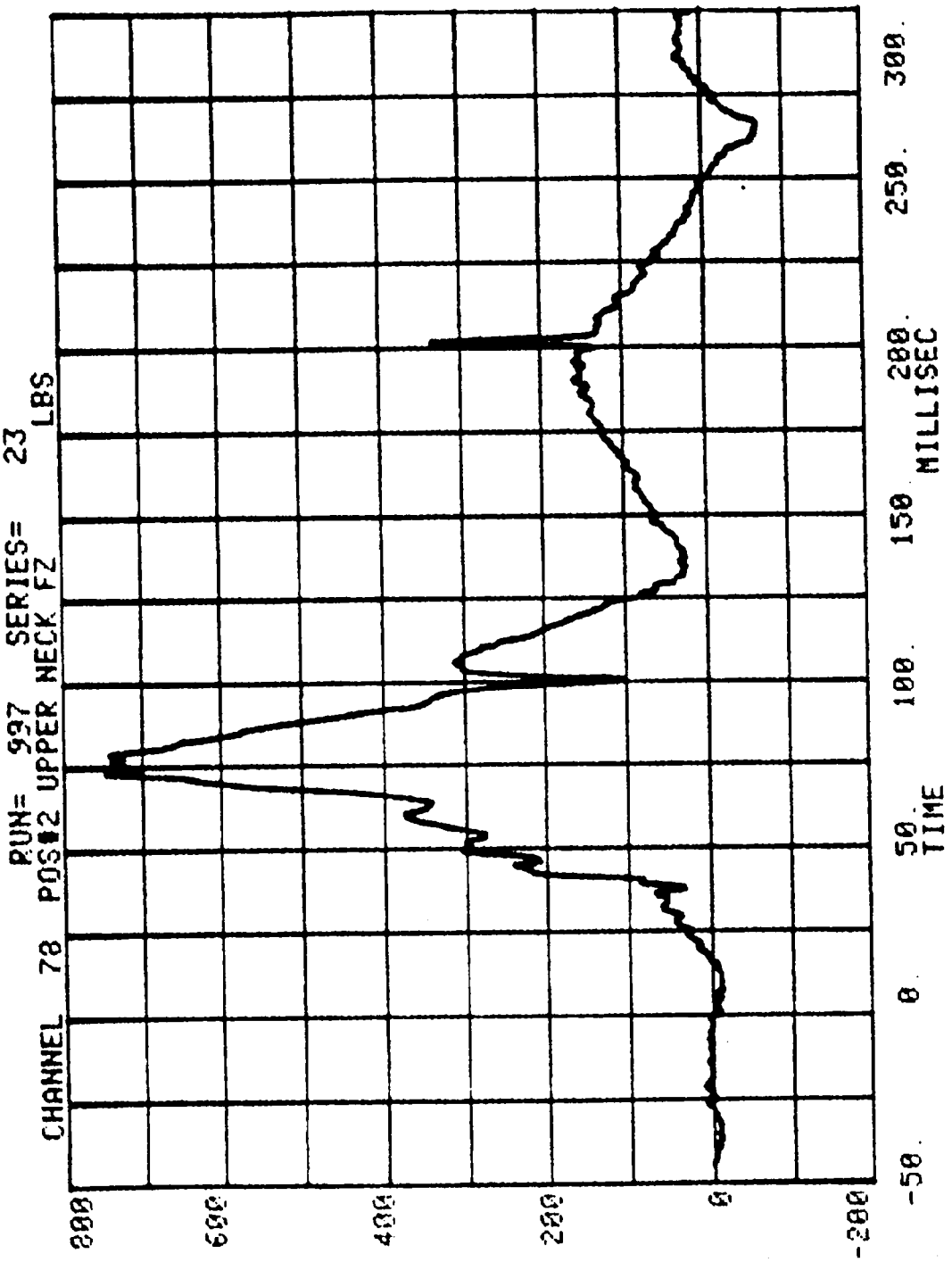

CHANNEL 10 POS#2 BELT SPOOL OUT
RUN= 997 SERIES= 23
INCHES
4
3
2
1
0
-1
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 76 POS#2 UPPER NECK FX
RUN= 997 SERIES= 23 LBS
500
450
300
150
0
-150
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

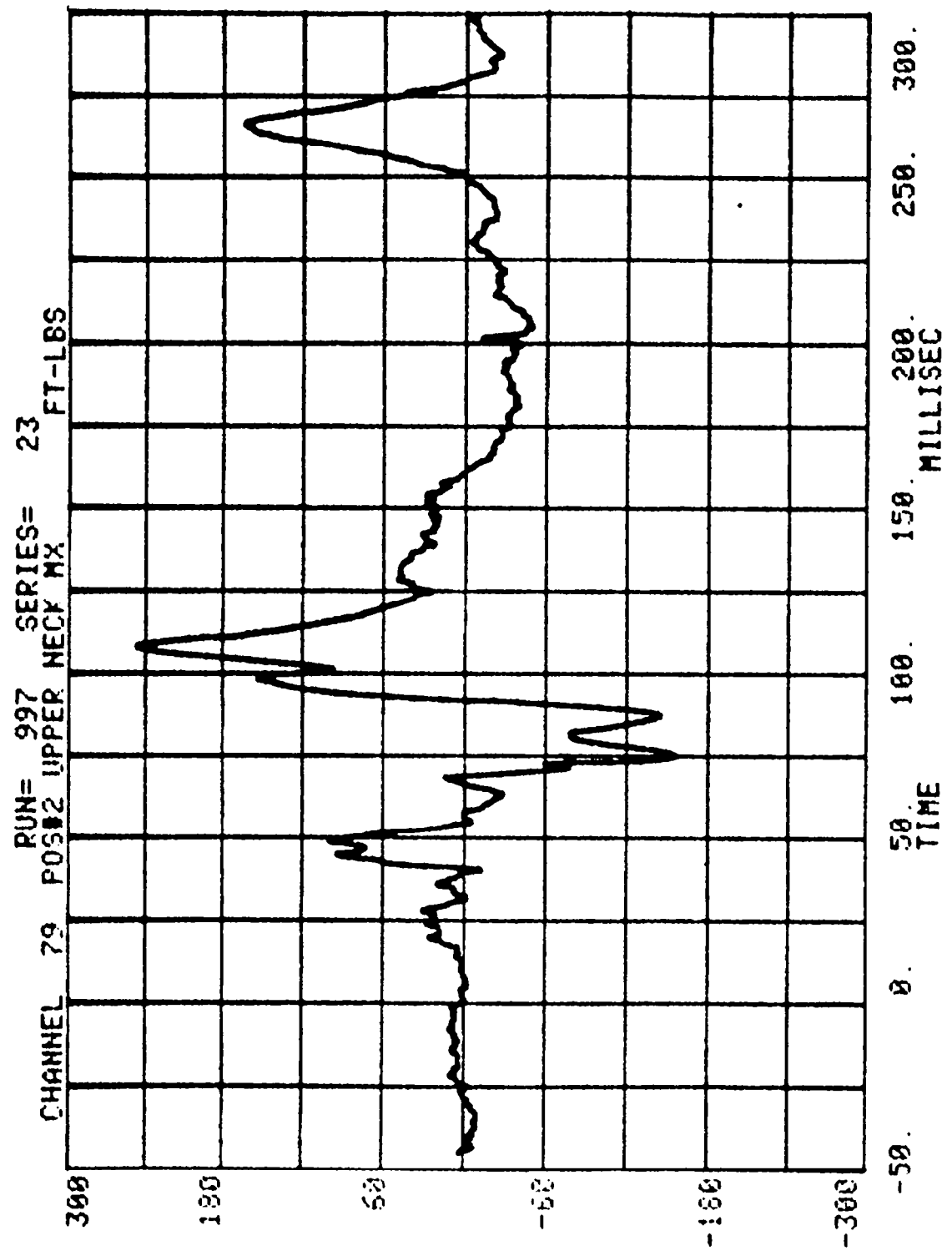
7776-23

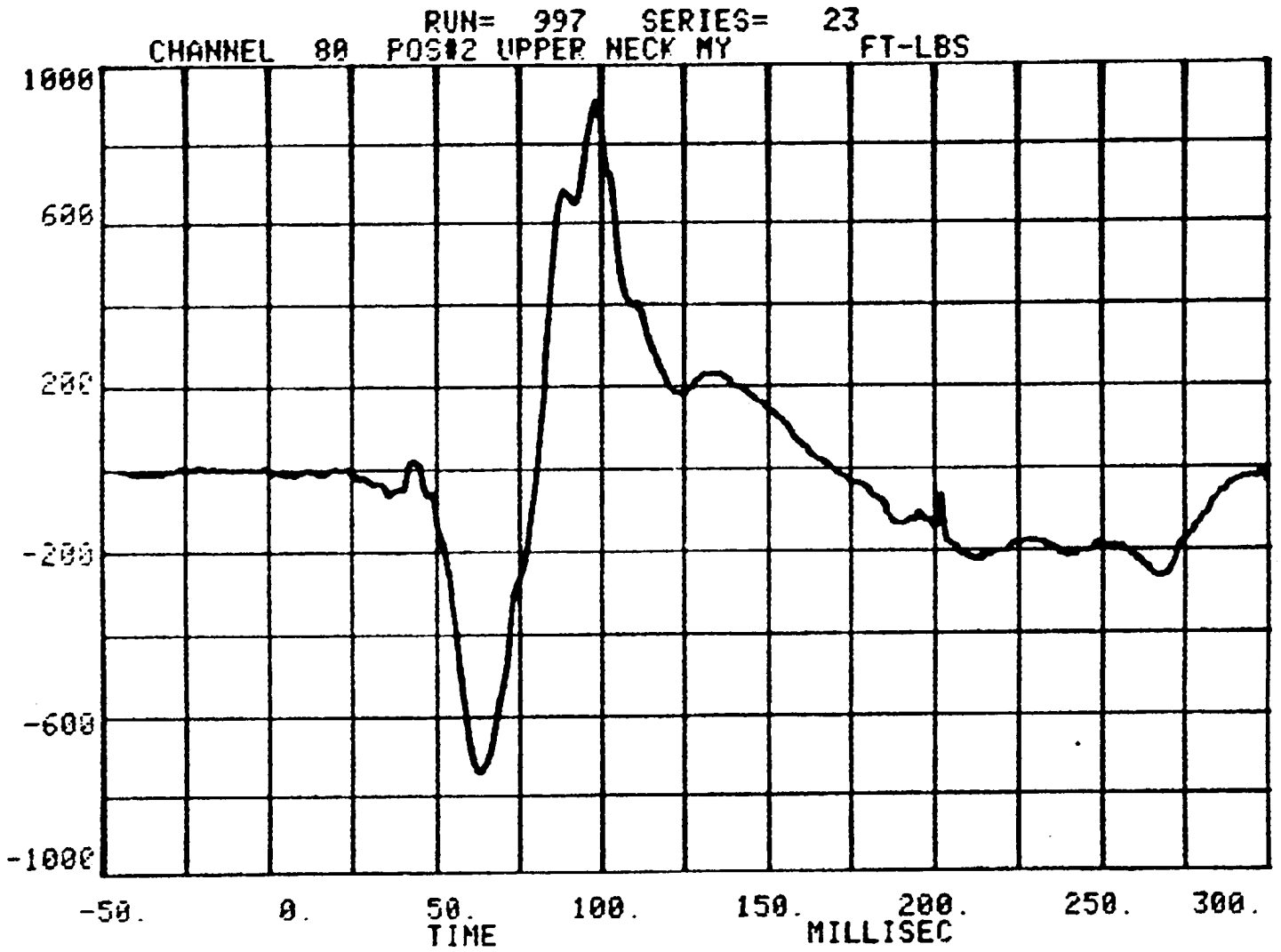

CHANNEL 77 POS#2 UPPER NECK FY
RUN= 397 SERIES= 23 LBS
100
50
0
-50
-100
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

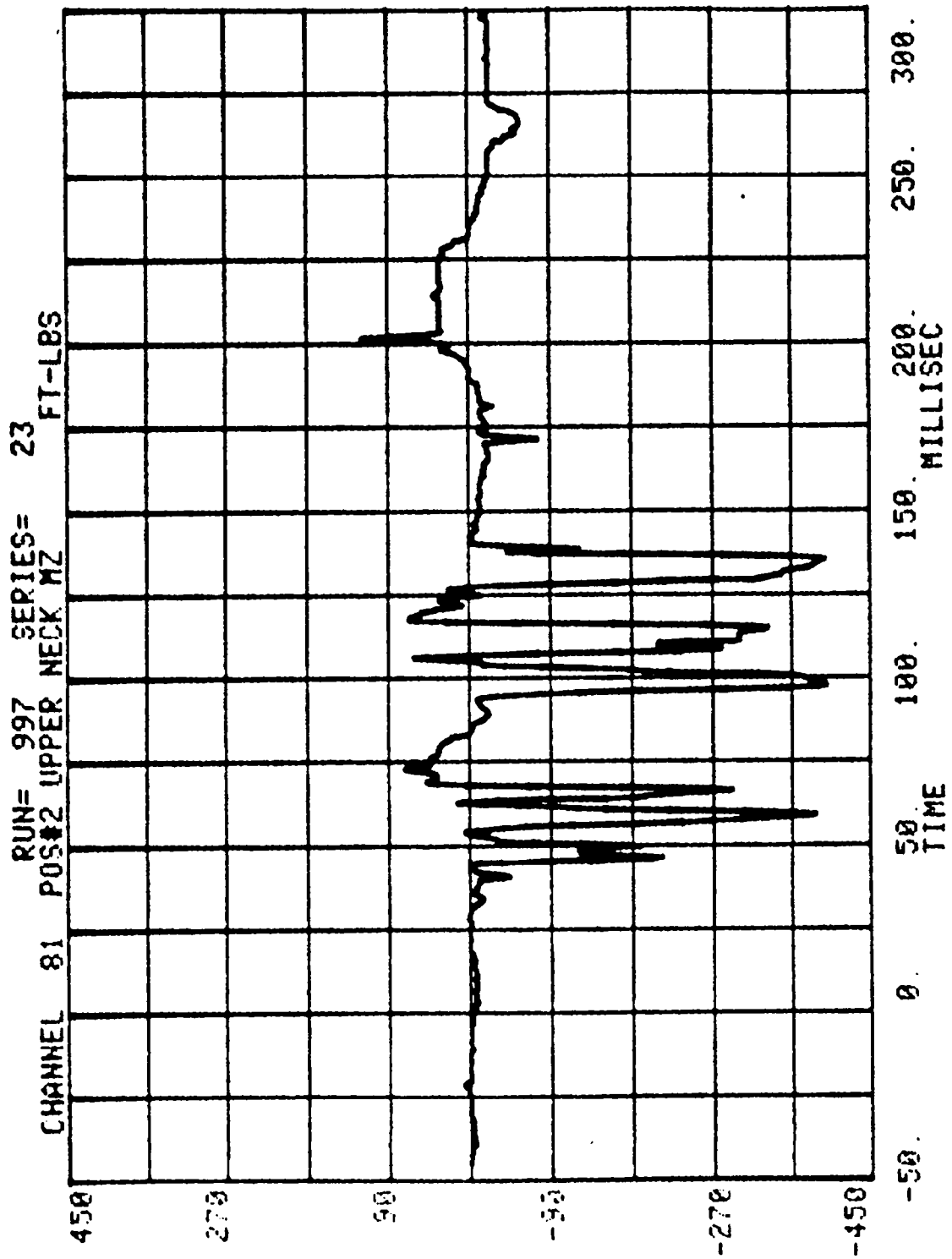
7776-23


CHANNEL 78 POS#2 UPPER NECK FZ
RUN= 997 SERIES= 23
LBS
200
600
400
200
0
-200
-50.
0
50.
100.
150
200.
250.
300.
TIME
MILLISEC

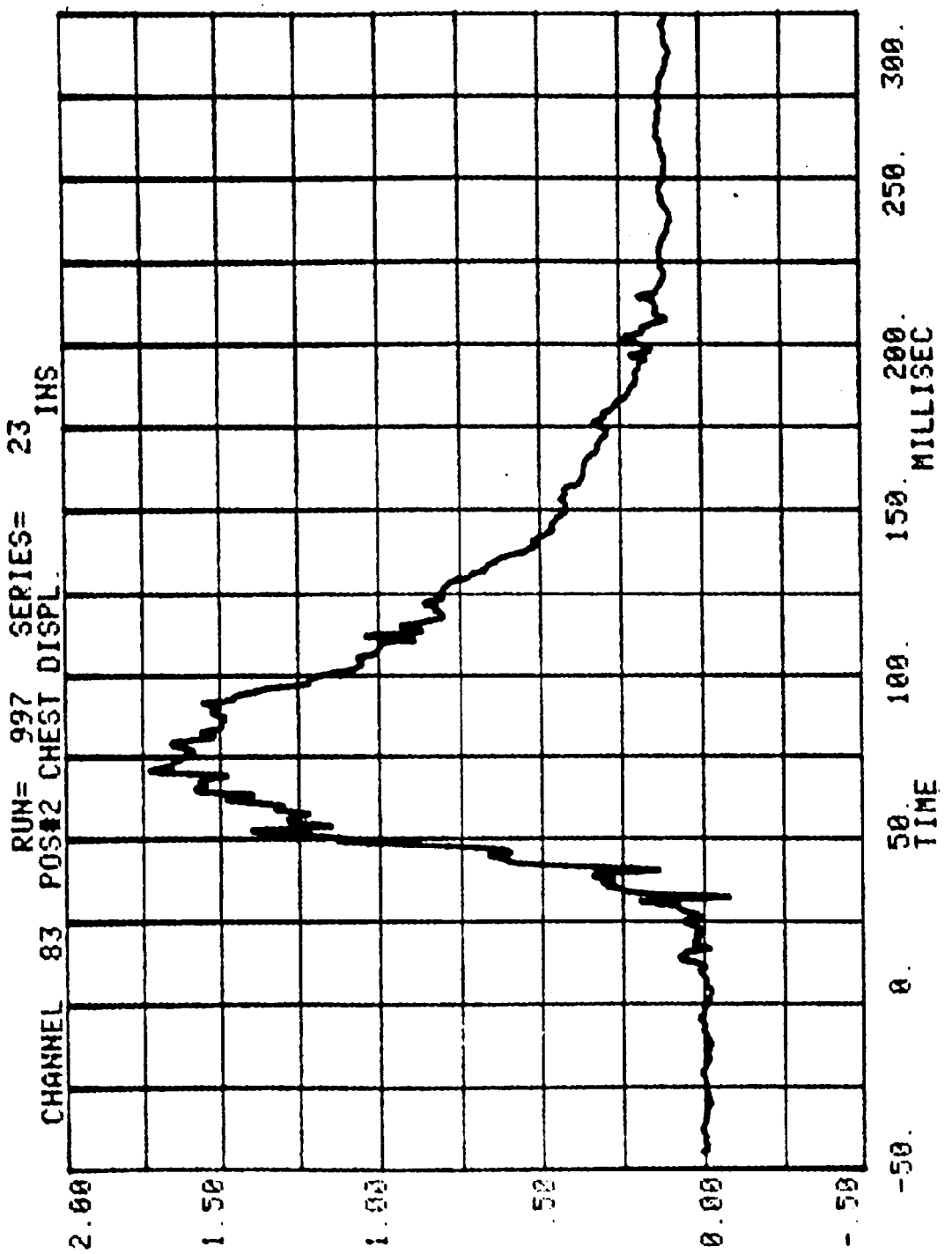
7776-23


CHANNEL 79 RUN= 997 SERIES= 23
POS#2 UPPER NECK MX FT-LBS
300
100
50
-50
-100
-300
-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC


RUN= 397 SERIES= 23
CHANNEL 80 POS#2 UPPER NECK MY FT-LBS
1000
600
200
-200
-600
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 81 POS#2 UPPER NECK MZ
RUN= 997 SERIES= 23
FT-LBS
450
270
90
-90
-270
-450
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23


CHANNEL 83 POS#2 CHEST DISPL.
RUN= 997 SERIES= 23
INS
2.00
1.50
1.00
.50
0.00
-.50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-23

Appendix C

DUMMY CERTIFICATION TESTS

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 Calspan Corporation, Advanced Technology Center. A summary of the test results, Part 572 specifications and instrument calibration information is included in this Appendix.

Dummy serial numbers and certification dates are:

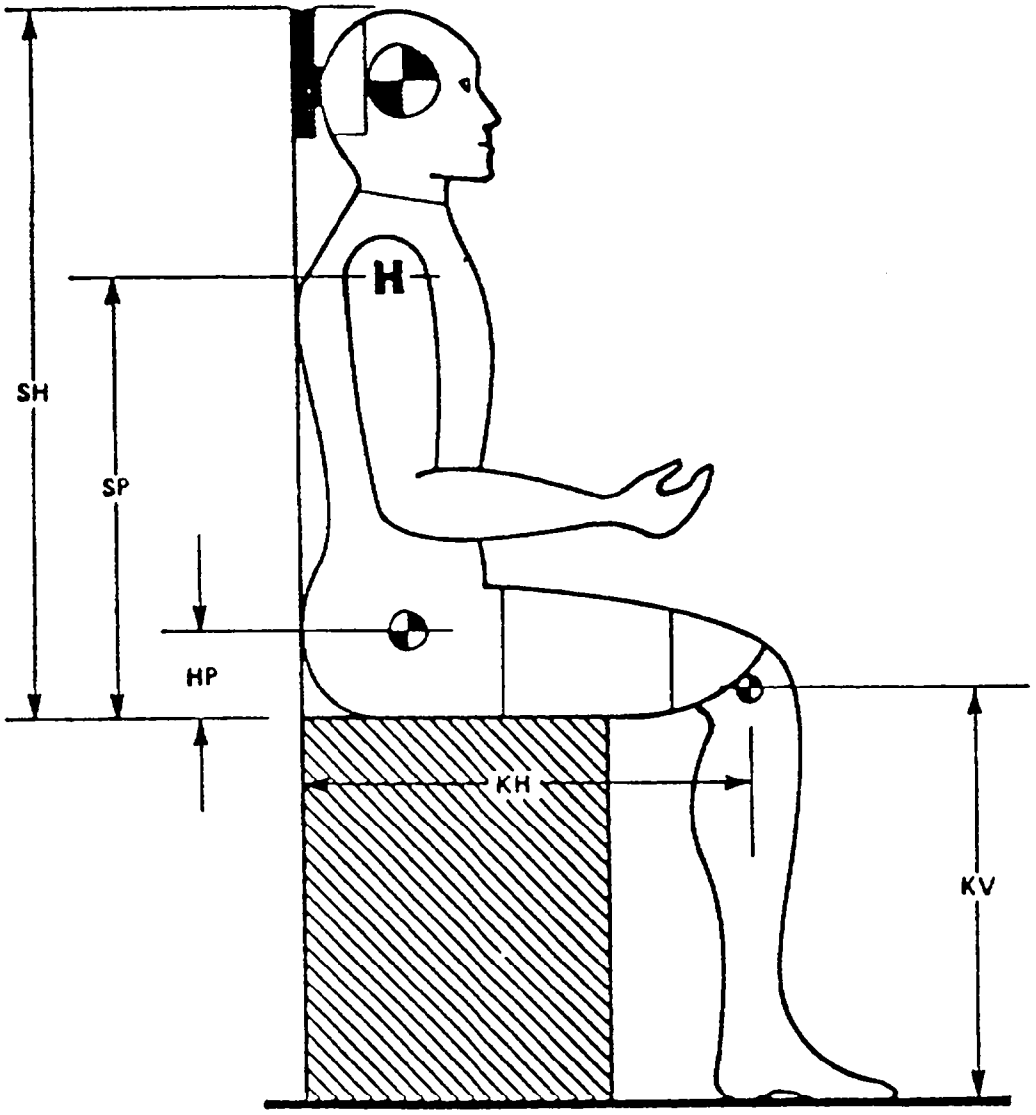
Serial No.	Completion Data
45	06-08-90
150	06-08-90

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.

Figure 10

DUMMY CONFIGURATION DIMENSIONS



7776-23

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 08 JUNE 1990

CALSPAN HY3 SN 45 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	71 DEG. F
RELATIVE HUMIDITY	10% - 70%	48 %
PEAK RESULTANT ACCELERATION	225 - 275 G	226.7 G
PEAK LATERAL ACCELERATION	15 G MAX	2.3 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK EXTENSION TEST

HYBRID III

DATE : 07 JUNE 1990 AXIS NECK TRANSDUCER

CALSPAN HY3 SN 45 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	71 DEG. F
RELATIVE HUMIDITY		10% - 70%	48 %
IMPACT VELOCITY		19.50 - 20.30 FPS	20.20 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.53 G
	20 MS	14.00 - 19.00 G	17.53 G
	30 MS	11.00 - 16.00 G	14.44 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.44 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	45.50 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	102.37 DEG.
	TIME	72 - 82 MS	75.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-59.0/-39.0 FT.-LBS.	58.10 FT.-LBS.
	TIME	65 - 79 MS	70.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	152.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	132.13 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 07 JUNE 1990 AXIS NECK TRANSDUCER

CALSPAN HY3 SN 45 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	71 DEG. F
RELATIVE HUMIDITY		10% - 70%	48 %
IMPACT VELOCITY		22.6 - 23.4 FPS	22.6 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.76 G
	20 MS	17.60 - 22.60 G	22.17 G
	30 MS	12.50 - 18.50 G	17.12 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	17.12 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.38 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	77.53 DEG.
	TIME	57 - 64 MS	58.25 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	79.92 FT.-LBS.
	TIME	47 - 58 MS	52.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	101.13 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

THORAX IMPACT TEST

HYBRID III

DATE : 06 JUNE 1990

CALSPAN HY3 SN 45 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71 DEG. F
RELATIVE HUMIDITY	10% - 70%	48 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.60 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.55 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1221.80 POUNDS
INTERNAL HYSTERESIS	69% - 85%	71 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 06 JUNE 1990 KNEE : LEFT

CALSPAN HY3 SN 45 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	50 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.00 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1098 LBS.
PROBE WEIGHT	11 LBS.	11 LBS.

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ____IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 06 JUNE 1990 KNEE : RIGHT

CALSPAN HY3 SN 45 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	50 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.00 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1078 LBS.
PROBE WEIGHT	11 LBS.	11 LBS.

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER ____45_____

DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	CH83	5-90	11-90
HY LATERAL--	ENDEVCO	CU62	5-90	11-90
HZ VERTICAL--	ENDEVCO	CM86	5-90	11-90
2. CHEST ACCELEROMETER-				
CX LONGITUDINAL--	CEC	A73	5-90	11-90
CY LATERAL--	ENDEVCO	CE06	5-90	11-90
CZ VERTICAL--	CEC	A44	5-90	11-90
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	74	12-89	6-90
RIGHT SIDE	GSE	1927	12-89	6-90
CALIBRATION LABORATORY INSTRUMENTS--				
1. PENDULUM ACC.--	CEC	A160	1-90	7-90
2. TEST PROBE ACCELEROMETER--	CEC	A161	1-90	7-90
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS-DUCER INC	20051	2-90	8-90
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	2-90	8-90
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	2-90	8-90

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 08 JUNE 1990

CALSPAN HY3 SN 150 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	71 DEG. F
RELATIVE HUMIDITY	10% - 70%	48 %
PEAK RESULTANT ACCELERATION	225 - 275 G	267.5 G
PEAK LATERAL ACCELERATION	15 G MAX	10.1 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 08 JUNE 1990 AXIS NECK TRANSDUCER

CALSPAN HY3 SN 150 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	48 %
IMPACT VELOCITY		22.6 - 23.4 FPS	22.60 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.36 G
	20 MS	17.60 - 22.60 G	22.35 G
	30 MS	12.50 - 18.50 G	16.88 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.88 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.00 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	73.49 DEG.
	TIME	57 - 64 MS	57.50 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	71.40 FT.-LBS.
	TIME	47 - 58 MS	49.13 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	116.38 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	98.50 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK EXTENSION TEST

HYBRID III

DATE : 08 JUNE 1990 AXIS NECK TRANSDUCER

CALSPAN HY3 SN 150 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	48 %
IMPACT VELOCITY		19.50 - 20.30 FPS	20.20 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.45 G
	20 MS	14.00 - 19.00 G	18.88 G
	30 MS	11.00 - 16.00 G	14.49 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.49 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	43.25 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	98.17 DEG.
	TIME	72 - 82 MS	74.63 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-59.0/-39.0 FT.-LBS.	54.81 FT.-LBS.
	TIME	65 - 79 MS	69.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	153.50 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	131.00 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

THORAX IMPACT TEST

HYBRID III

DATE : 07 JUNE 1990

CALSPAN HY3 SN 150 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71 DEG. F
RELATIVE HUMIDITY	10% - 70%	50 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.60 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.56 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1237.78 POUNDS
INTERNAL HYSTERESIS	69% - 85%	72.7 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 06 JUNE 1990 KNEE : LEFT

CALSPAN HY3 SN 150 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	50 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.00 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1140 LBS.
PROBE WEIGHT	11 LBS.	11 LBS.

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ____IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 06 JUNE 1990 KNEE : RIGHT

CALSPAN HY3 SN 150 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	50 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.00 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1140 LBS.
PROBE WEIGHT	11 LBS.	11 LBS.

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ____IVAN MINKEWICZ_____

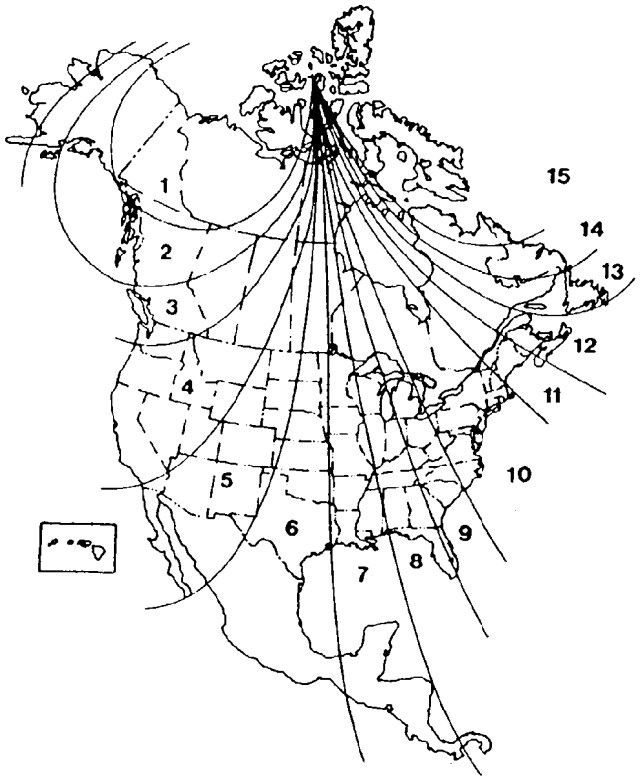
INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER _____150_____

DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	CS75	1-90	7-90
HY LATERAL--	ENDEVCO	CY89	1-90	7-90
HZ VERTICAL--	ENDEVCO	CE76	1-90	7-90
2. CHEST ACCELEROMETER-				
CX LONGITUDINAL--	CEC	A129	3-90	9-90
CY LATERAL--	ENDEVCO	CN64	3-90	9-90
CZ VERTICAL--	CEC	A56	3-90	9-90
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	311	12-89	6-90
RIGHT SIDE	GSE	312	12-89	6-90
CALIBRATION LABORATORY INSTRUMENTS--				
1. PENDULUM ACC.--	CEC	A160	1-90	7-90
2. TEST PROBE ACCELEROMETER--	CEC	A161	1-90	7-90
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS-DUCER INC	20051	2-90	8-90
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	2-90	8-90
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	2-90	8-90

Appendix D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS



b) **Variance**

Variance is the difference between magnetic North and geographic North. In some areas the difference between magnetic and geographic north is great enough to cause the compass to give false readings. If this occurs, the variance must be set.

To set the variance: turn the ignition switch ON, depress and hold the Comp/Temp button located to the left of the display, then depress and hold the US/M button located to the right for

approximately 5 seconds. The VAR symbol will be displayed and all other symbols will be off. Release the buttons.

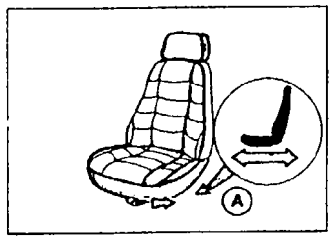
Consult the map to determine the variance number for your geographic location. Depress and release the US/M button until your variance number appears on the display, then press the Comp/Temp button. The display will go blank, then reappear after approximately 5 seconds and will be functioning normally.

DO NOT ATTACH MAGNETIC DEVICES SUCH AS MAGNETIC CB ANTENNAS TO THE VEHICLE ROOF AS THEY CAN CAUSE THE COMPASS TO GIVE FALSE READINGS.

Seats and Passenger Safety Restraints

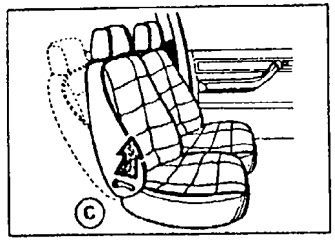
Front Seat Adjustment

Move seat forward or rearward using lever (A). Be sure the latch engages fully.



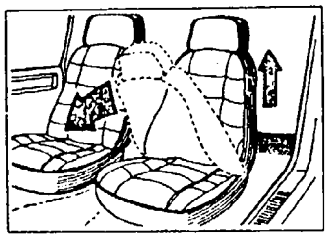
Front Seat Adjustment - Recline

To adjust seatback, lift lever (C), lean back, and release lever at desired position. To return seatback, lift the lever, lean forward and release the lever.



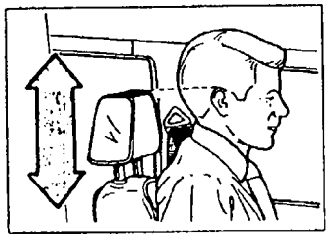
WARNING: *Do not adjust the driver's seat with the vehicle moving. Do not ride with the seatback reclined so that the shoulder belt is no longer resting against your chest. In a collision, you could slide under the seat belt and be seriously or even fatally injured.*

Seatback Release, 2-door Models



Lift the lever up to fold the seatback forward. When the seatback is returned to the upright position, make sure it is latched by trying to move the seatback without lifting the lever.

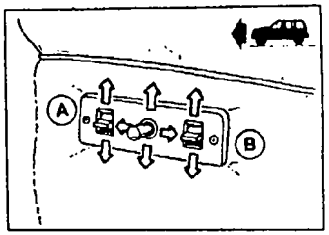
Headrests



Move headrest up or down to adjust to correct height for driver and passenger. The top of the headrest should be level with the top of the seat occupant's ears.

Headrests provide better protection when adjusted to the back of your head, not to the back of your neck.

Six-Way Power Seats

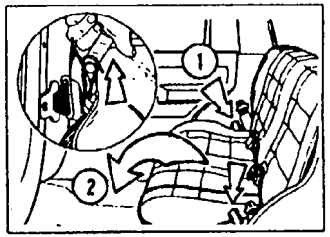


A control is mounted on the outboard side of each power seat.

WARNING: *Do not adjust the driver's seat with the vehicle moving. Avoid possible loss of control of the vehicle by adjusting the driver's seat while the vehicle is stopped.*

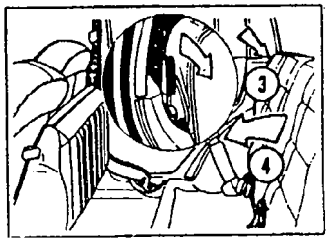
- To raise/lower seat: Move center control upward or downward.
- To move seat forward/rearward: Move center control forward/rearward.
- To tilt front of seat upward/downward: Move control (A) upward or downward.
- To tilt rear of seat upward/downward: Move control (B) upward/downward.

Fold-Down Rear Seat



To expand cargo area:

1. Pull either side loop;
2. Pivot seat cushion forward;

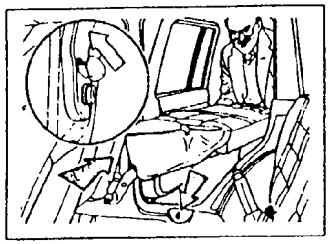


3. Release the lock at either side of seatback;
4. Fold the seatback flat.

To carry passengers, place the seatback in the upright position and latch it securely. Fold the seat cush-

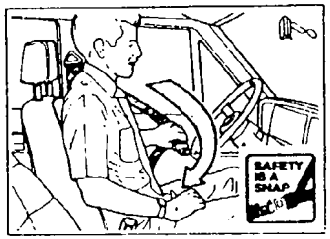
ion into place and be sure seat belts are placed where they can be used.

Rear Seat Cushion Removal



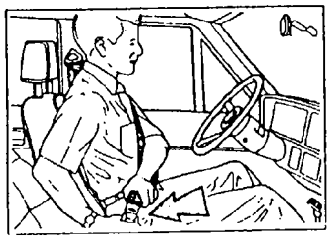
To lengthen the cargo area, pull the passenger-side loop to release the cushion. Then pull up on pivot release lever and remove cushion from pivot. Carefully pull cushion toward you until pin is removed from pivot on driver's side. Remove cushion. Reverse the procedure to replace the cushion.

Seat Belts



For your safety, drive with properly adjusted seat belts. Some states and all Canadian provinces require belt use. Check the laws of the area in which you drive.

Outboard front and rear seating positions have a one-piece combination lap/shoulder belt with a latch plate that slides up and down the belt for proper fit. This continuous loop system has a single emergency-locking retractor reel which locks upon very rapid acceleration or deceleration of the vehicle and when the belt is pulled or jerked rapidly by hand.



Lap/Shoulder Belt Adjustment: For proper belt fit, adjust the front seat before buckling the belt.

- Sit straight and well back in the seat.
- Position the lap belt across the hips as low as possible. Insert the latch plate into the buckle until a definite "snap" is heard. Grasp the shoulder portion of the belt under the connector and pull it snug across lap and chest.

Rear Center Lap Belt

The lap belt should be worn with the upper edge of the belt drawn across the thighs and snug against the hips. To reduce the risk of sliding under the belt in a collision, adjust the belt as tight as comfort will allow while sitting back and erect in the seat.

To lengthen the belt, tilt the latch plate relative to the webbing and pull to the desired length. To shorten the belt, pull the loose end of the webbing.

Seat Belt Reminder: An indicator light and buzzer or chime alerts you to buckle the seat belts.

CHILD RESTRAINT

According to accident statistics, children are safer when properly restrained in the rear seating positions than in the front. When transporting children in your vehicle, they should be properly restrained in an adequate child restraint system, or, if they are large enough, they should use the available safety belts. This is required by law in all states and in most Canadian Provinces. Failure to use a proper restraint system can result in severe or fatal injury to your child in the event of an accident, and fines and other penalties being assessed against you.

Infants and Small Children

Two different child restraint systems are generally available: the infant carrier for babies weighing up to 20 lbs. (9kg.), and the child seat for small children over 20 lbs. In addition, some manufacturers make systems that can be used first as an infant carrier, and then converted to a child seat as the child grows older. Both an infant carrier and a child seat are available from your dealer.