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REPORT NUMBER: CAL-90-N10

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY
1990 LINCOLN TOWN CAR
4-DOOR SEDAN

NHTSA NUMBER: ML0203

CALSPAN TEST NUMBER: 7776-10

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

February 20, 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 Lincoln Town Car 4-Door Sedan was performed at Calspan Advanced Technology Center crash test facility in Buffalo, New York on February 20, 1990.

The impact speed was 34.7 mph and the ambient temperature at the barrier face at the time of impact was 30°F. The maximum post-test vehicle crush was 28.4 inches. The test vehicle was equipped with a manual 3-point continuous belt system at each of the front outboard seating positions. The vehicle was also equipped with air bag at each of the front outboard seating positions as a supplemental restraint system.

With regard to FMVSS 208-"Occupant Crash Protection," injury criteria, the driver dummy appears to comply with the head, chest and femur requirements. The passenger dummy's head accelerometers did not record accurately and a HIC value is not available for this dummy. The passenger does, however, appear to satisfy the chest and femur requirements.

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Section I

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.

Section 2

SUMMARY OF TEST NUMBER ML0203

A load cell barrier consisting of 36 load cells was impacted by a 1990 Lincoln Town Car 4-Door Sedan at a velocity of 34.7 mph. The test was performed at the Calspan Corporation Advanced Technology Center on February 20, 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. 357) and the right-front passenger ATD (Serial No. 358) had been used in one previous test (ML5202) and the Injury Criteria Values were not exceeded in that test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 67 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. Load cell D5 did not record accurately. This load cell was not used when the load cell group sums were calculated. The passenger dummy's head X, Y and Z accelerometers did not record accurately. A HIC value is not available for this dummy.

The driver's head struck the air bag and sun visor; the HIC was 471.1. The maximum chest deceleration over 3 milliseconds was 39.5 g's and femur loads were 1727.8 and 883.2 pounds.

The right front passenger's maximum chest deceleration over 3 milliseconds was 36.4 g's. Femur loads were 855.1 and 643.7 pounds.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1990 Lincoln Town Car 4-Door Sedan

NHTSA No.: ML0203 VIN.: 1LNLM81F1LY669849

Body Color: White Date Of Manufacture: December 1989

Engine: 8 Cylinders; - C.I.D.; 5.0 Liters; - CC
X Gas; - Diesel; - Turbocharged
X Longitudinal; - Transverse

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

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

Date Received: 02-01-90

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

Type of Occupant Restraint: Both driver and passenger positions were equipped with a 3-point continuous belt system and an air bag.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 30 psi, Rear 34 psi

Recommended Tire Size: P215/70R15

Recommended Cold Tire Pressure: Front 30 psi, Rear 34 psi

Tires on Vehicle: P215/70R15 ; Manufacturer: Michelin

Number of Occupants: 3 Front; 3 Rear; - 3rd Seat; 6 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 1100 lbs. (A)

No. of Occupants x 150 lbs. = 900 lbs. (B)

Rated Cargo and Luggage
Weight (RCLW) A-B = 200 lbs.

GVWR 5516 lbs. GAWR: Front 2722 lbs. Rear 2838 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 = 1140 lbs. Right Rear = 910 lbs.

Left Front = 1150 lbs. Left Rear = 880 lbs.

TOTAL FRONT WEIGHT = 2290 lbs. (56 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1790 lbs. (44 % of Total Vehicle Weight)

TOTAL DELIVERY WEIGHT = 4080 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (4080 lbs.)

VCW = Vehicle Capacity Weight (1100 lbs.)

DSC = Designated Seating Capacity (6)

RCLW = VCW - 150 (DSC) = 200 lbs.

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

Target Test Weight = 4608 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 202 POUNDS CARGO:

Right Front = 1190 lbs. Right Rear = 1140 lbs.

Left Front = 1190 lbs. Left Rear = 1090 lbs.

TOTAL FRONT WEIGHT = 2380 lbs. (52 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 2230 lbs. (48 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 4610 lbs.

Weight of ballast secured in vehicle trunk area = 80 lbs.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 29.8 LF 29.4 RR 29.1 LR 29.2

Test Attitude: RF 29.0 LF 28.8 RR 27.4 LR 28.5

Wheel Base: 117.3 in.; C.G. = 56.3 in. rearward of front wheel C/L

Remarks: Two 40 pound weights were secured in the trunk area to achieve desired test weight.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0°

Date of Test: February 20, 1990 Time of Test: 12:50

Ambient Temperature: 30 °F at impact area

Temperature in Occupant Compartment: 72 °F

Windshield Molding Temperature: 70 °F

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: primary = 34.7 mph, secondary = 34.7 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	213.8	C_L	218.8	L 213.4
	Post-test	= R	186.5	C_L	190.4	L 192.7
	Crush	= R	27.3	C_L	28.4	L 20.7

Distance from front of test vehicle to point of impact:

R 12.5" C_L 11.2" L 10.8"

VISIBLE DUMMY CONTACT POINTS:

	Driver	Passenger
Head	Air Bag and Sun Visor	Air Bag and Sun Visor
Chest	Air Bag	Air Bag
Abdomen	No Contact	No Contact
Left Knee	Dash Panel	Glove Compartment Door
Right Knee	Dash Panel	Glove Compartment Door

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	Front		Rear	
	Left	Right	Left	Right
Door Opening	operable	operable	operable	operable

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

Glazing Damage

Backlight/Windshield: The windshield sustained stress fractures, but remained intact.

Section 3

OMI FINAL DATA

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.: ML0203 Vehicle: 1990 Lincoln Town Car 4-Door Sedan

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-47.5	16.1	37.1	56.2

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-38.4	-10	13.7	39.5
Position #2 - Passenger	-35.5	-24.4	12.3	36.4

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	1727.8	883.2
Position #2 - Passenger	855.1	643.7

	MAXIMUM FORCE - SEAT BELT LOADS (lbs.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	933.5	-	365.5
Position #2 - Passenger	1241.5	748.1	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t_1 (SEC)	t_2 (SEC)	Average Acceleration t_1 TO t_2
Position #1 - Driver	471.1	.07965	.11565	44.3

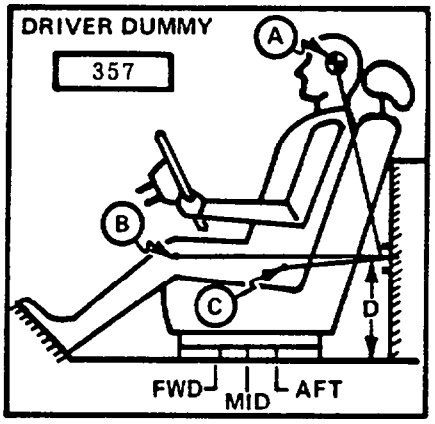
HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 36 milliseconds.

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION

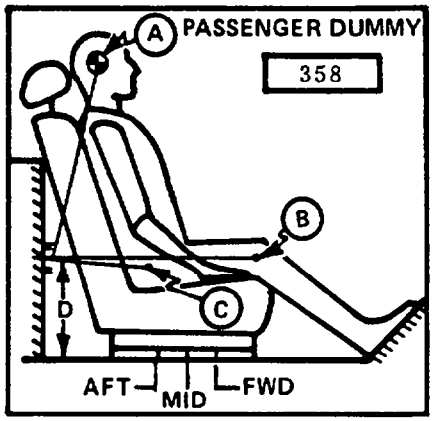
Test No.: ML0203 Vehicle: 1990 Lincoln Town Car

SEAT TYPE:	ADJUSTER TYPE:	SEAT BACK TYPE:
– Bench	– Manual	– Fixed
– Bucket	X Power	X Adjustable Reclining
X Split Bench		

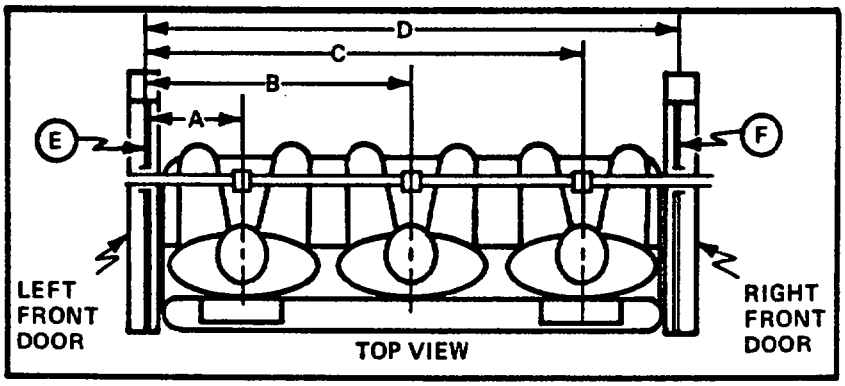


MEASUREMENT LOCATION

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



	357		358	
A =	21.5 in.	2 Degrees	21.8 in.	2 Degrees
B =	24.5 in.	96 Degrees	23.3 in.	98 Degrees
C =	9.4 in.	127 Degrees	9.7 in.	126 Degrees
D =	16.5 in.		16.5 in.	

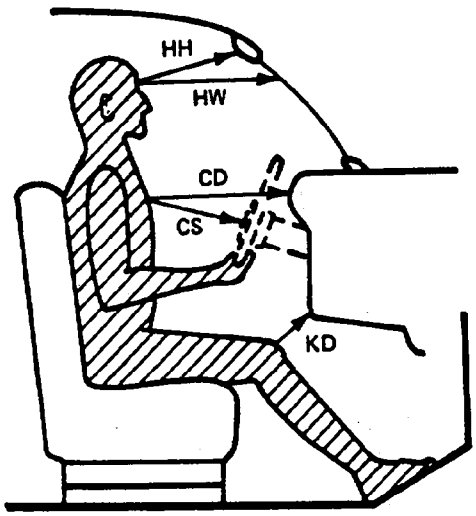


DUMMY ID	357	358
A = Left Door to Driver Centerline	14.0 in.	
B = Left Door to Center Passenger Centerline	– in.	
C = Left Door to Right Passenger Centerline	46.4 in.	
D = Left Door to Right Door	60.0 in.	
E,F = Window Glass Height (Right and Left Must Be Equal)	13.0 in.	

Figure 2

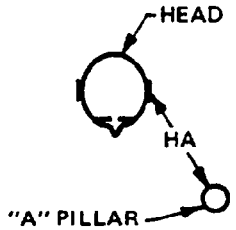
OCCUPANT CLEARANCE DIMENSIONS

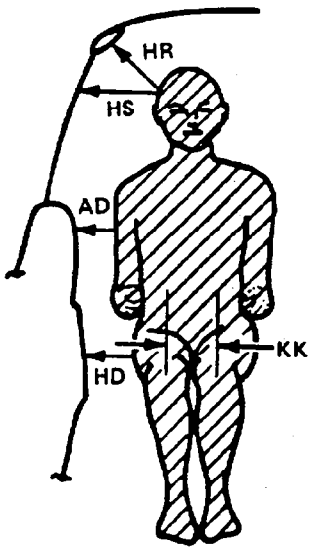
	DRIVER	PASSENGER
HH	16.9	16.9
HW	21.7	21.5
CD	22.8	22.8
CS	12.7	–
KDL	3.1	4.1
KDR	1.0	4.1
SA	See Note	See Note
TA	24°	23°



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



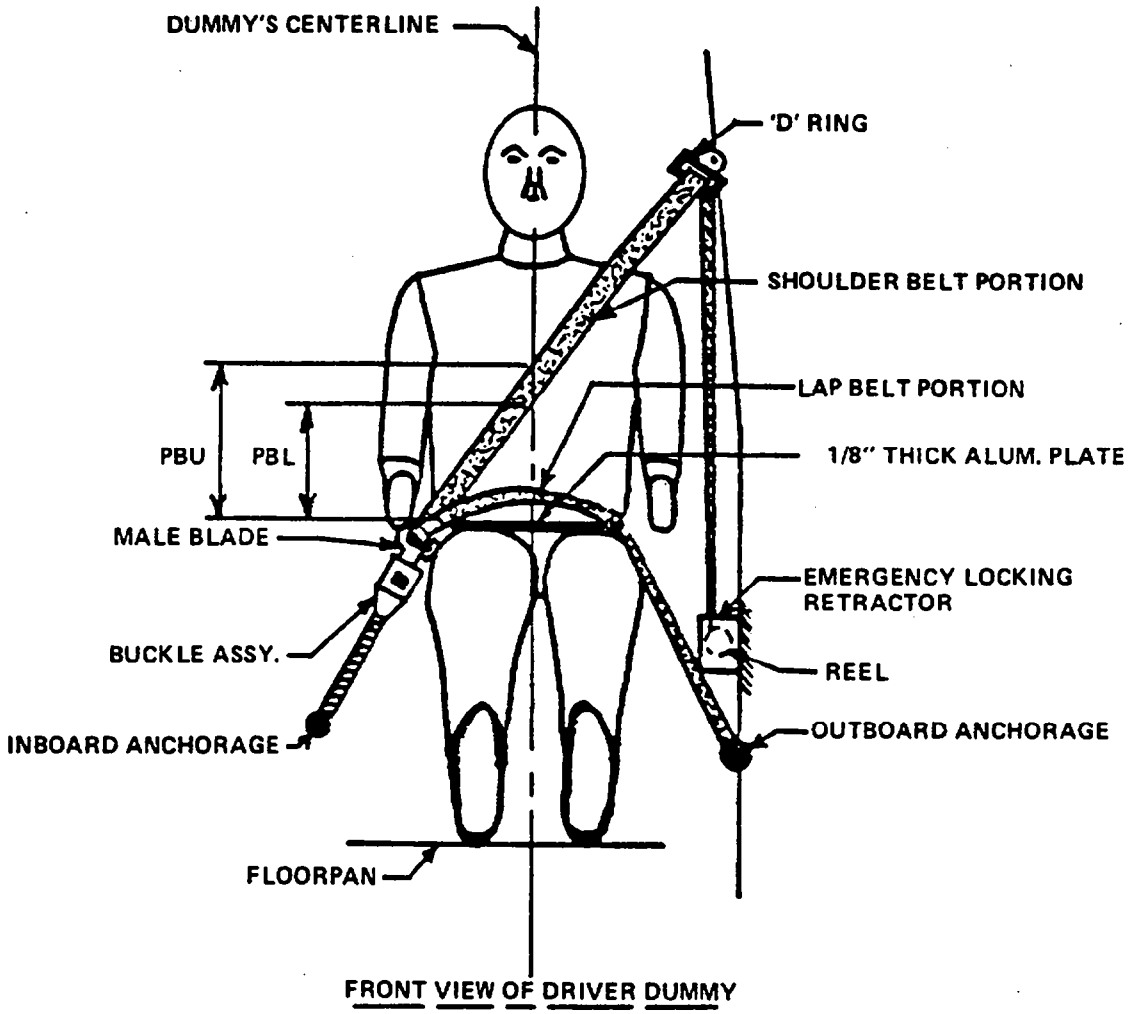


	DRIVER	PASSENGER
HR	6.6	6.5
HS	10.9	10.7
AD	4.7	4.3
HD	6.1	5.8
KK	9.9	7.5
HA	20.9	20.6

Note: Seat back angle was positioned as recommended by manufacturer.

Figure 3

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
PBU -- Top surface of alum. plate to upper edge	14.5	14.5
PBL -- Top surface of alum. plate to belt lower edge	11.0	11.0
LAP BELT TENSION	–	–
SHOULDER BELT TENSION	2 lbs.	2 lbs.

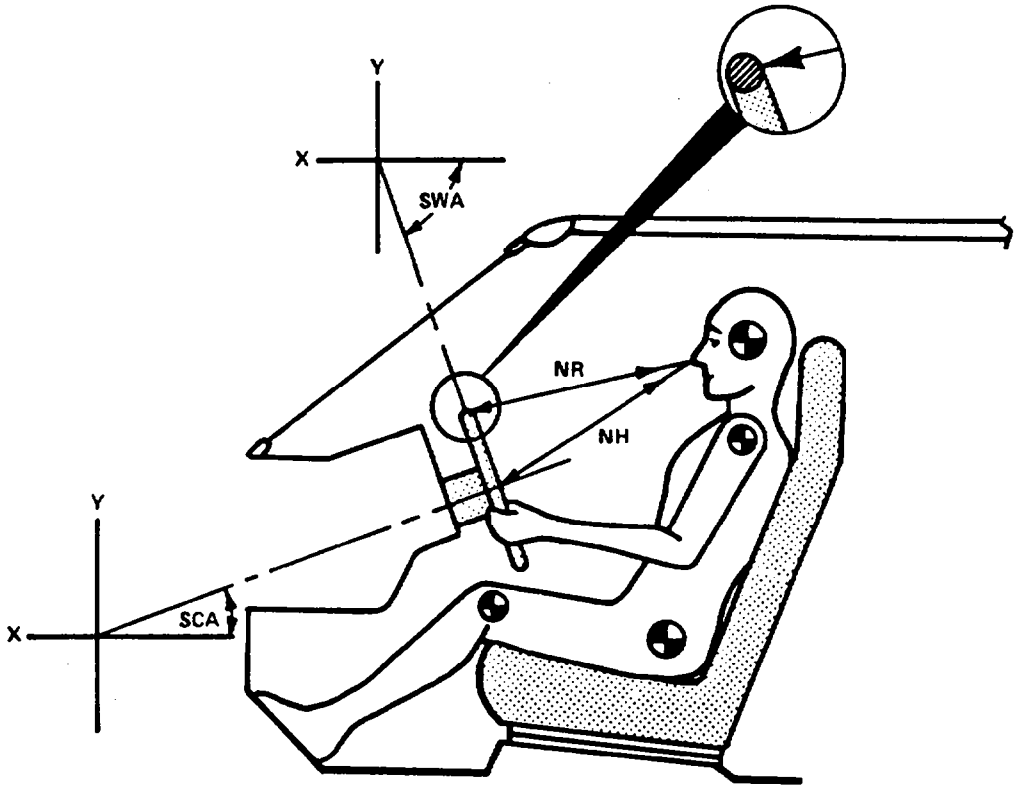
Table 3

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.	81.0"	81.0"
Shoulder belt length as measured on Part 572 Dummy.	33.0"	33.0"
Lap belt length as measured on Part 572 Dummy.	36.0"	36.0"
SHOULDER BELT SPOOL-OFF DATA:		
As determined by film analysis.	1.5"	1.5"
As determined mechanically.	1.8"	1.7"
As determined electronically	1.8"	1.6"
BELT STRETCH DATA:		
Measured electronically between shoulder belt load cell and the "D" ring.	0.6 in/ft	0.6 in/ft
Measured mechanically	0.0 in/ft	0.0 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	18.8	Inches
NH -- Distance from tip of dummy's nose to center of steering column hub	19.1	Inches
SCA -- Angle of steering column relative to the horizontal X axis	23	Degrees
SWA -- Angle of steering wheel relative to the horizontal X axis	-67	Degrees

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

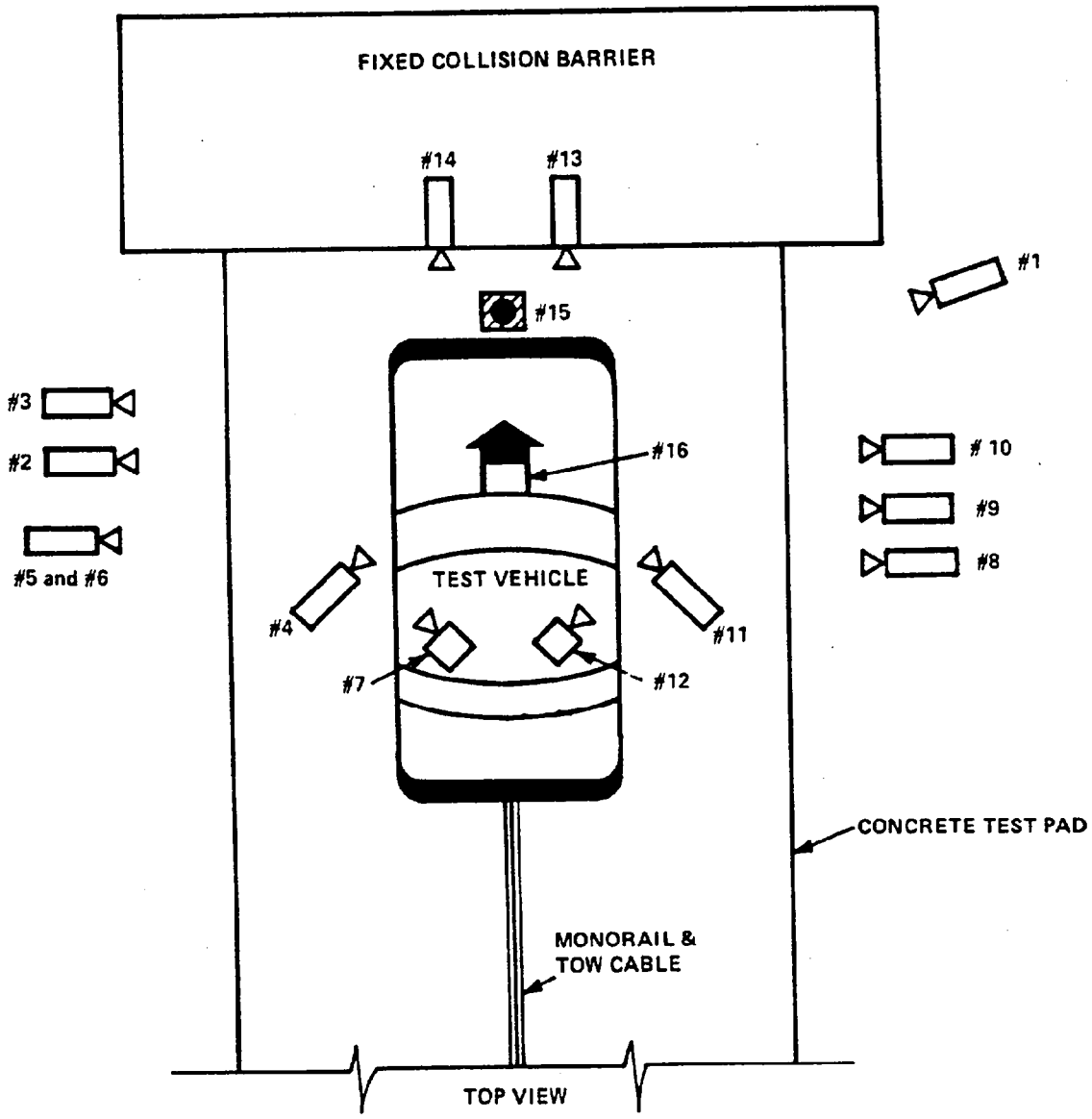


Table 4

HIGH-SPEED CAMERA LOCATIONS

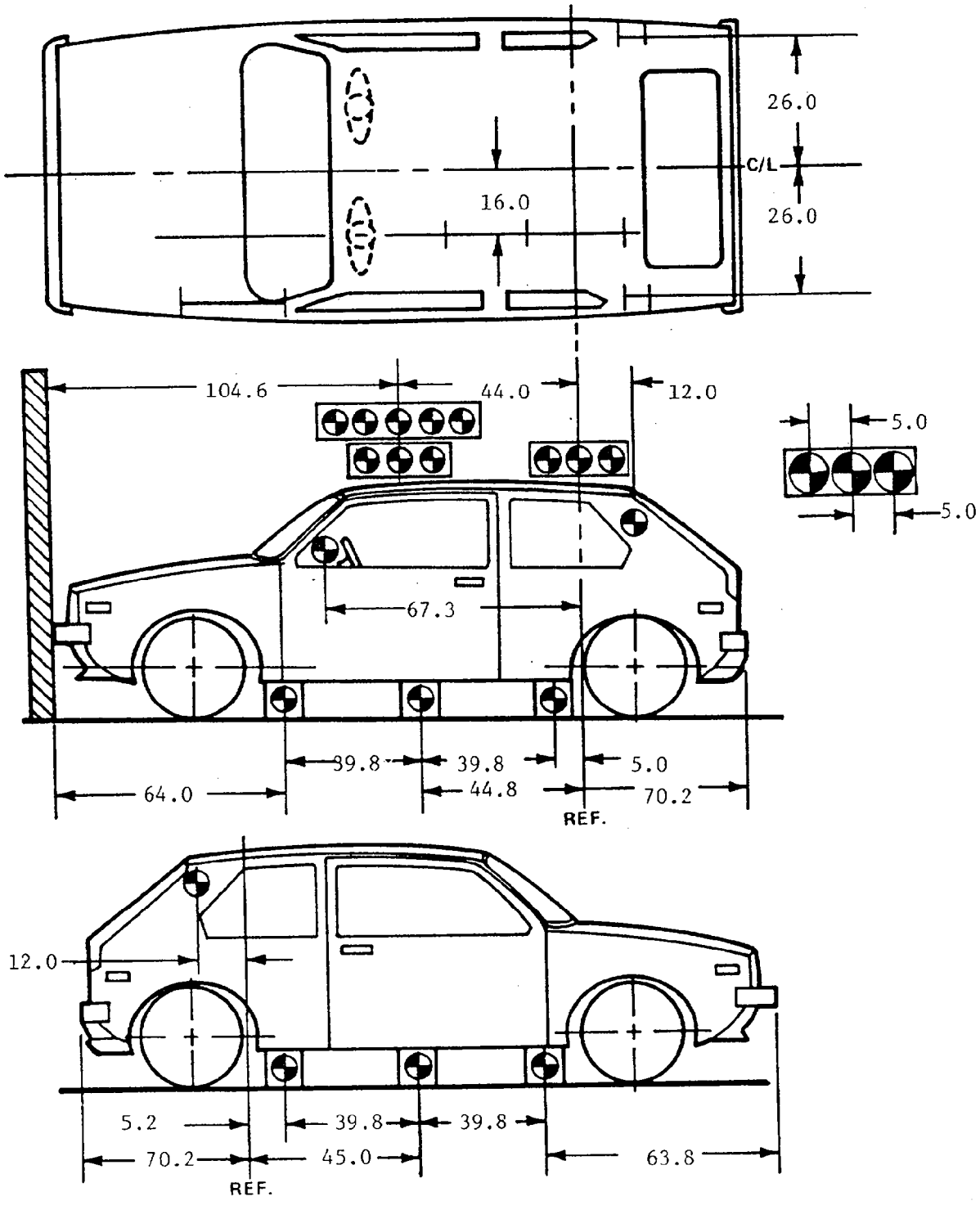
Test No. ML0203 Vehicle: 1990 Lincoln Town Car

CAMERA NO.	VIEW	CAMERA POSITIONS (in)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	–	–	–	–	–	–	24
2	Overall Left Side	260	64	41	-3	241	13	540
3	Left Side View	342	37	41	-5	323	25	540
4	Driver and Interior View	125	108	72	-6	106	13	810
5	Steering Column (Bottom)	313	81	46	-4	294	25	560
6	Steering Column (Top)	313	81	70	-8	294	25	560
7	Left Belt	–	–	–	–	–	8	655
8	Overall Right Side	267	73	42	-4	248	13	800
9	Right Side View	340	50	41	-2	321	25	725
10	Right Passenger View	324	67	50	-4	305	35	640
11	Passenger and Interior View	122	110	75	-20	103	25	610
12	Right Belt	–	–	–	–	–	8	No Timing
13	Passenger Front View	24	-5	73	-29	–	13	575
14	Driver Front View	24	-5	73	-33	–	13	540
15	Windshield View	0	0	126	-45	–	13	500
16	Pit View of Engine	0	32	-120	90	–	13	845

*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

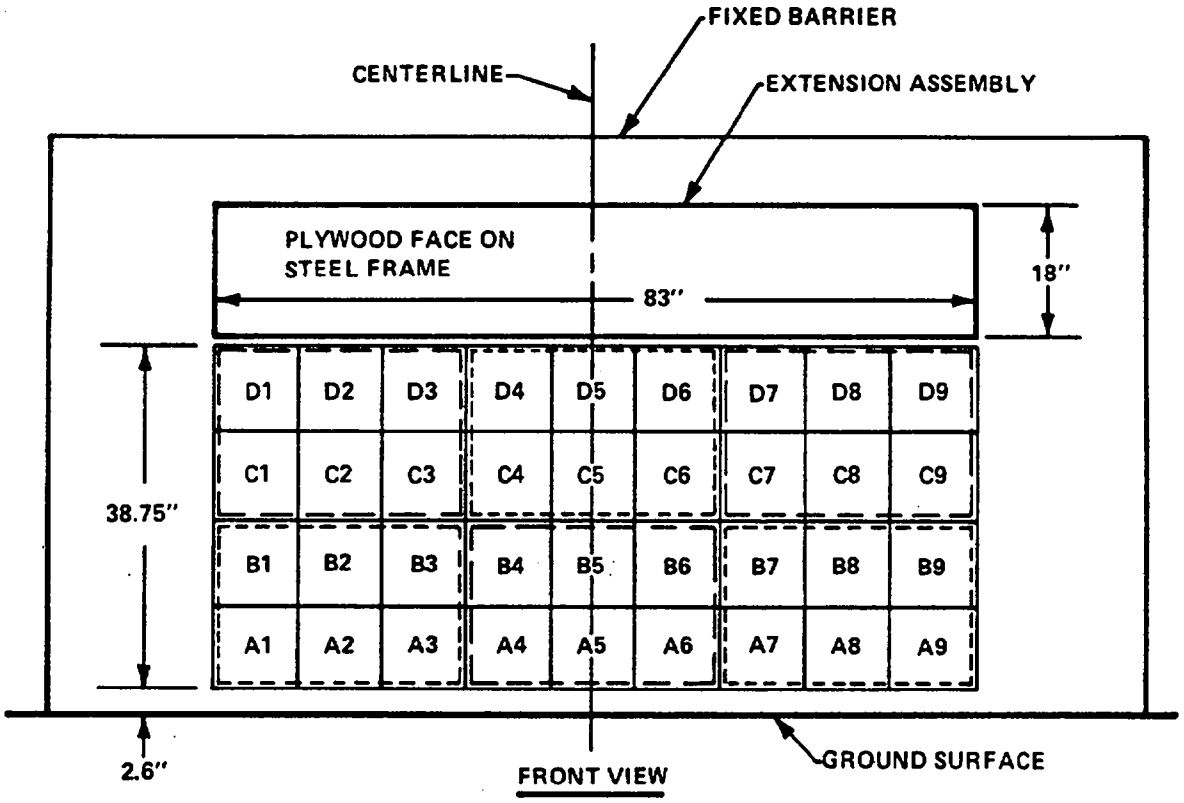


(DIMENSIONS IN INCHES)

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:

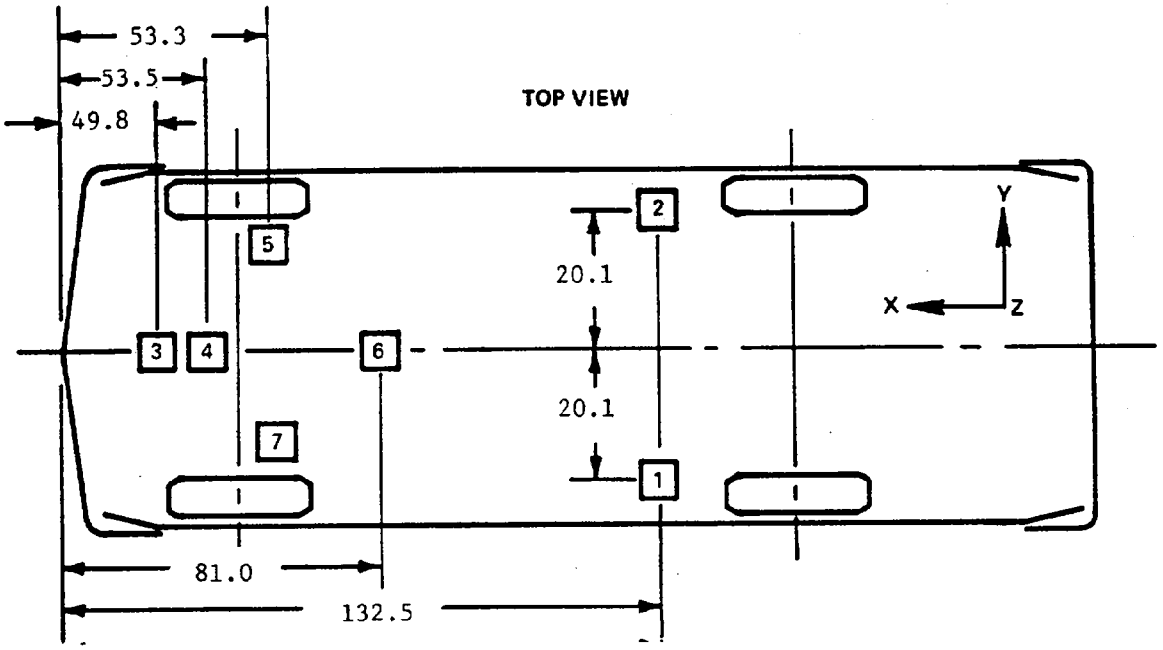
(1) Data from 36 individual load cells

(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

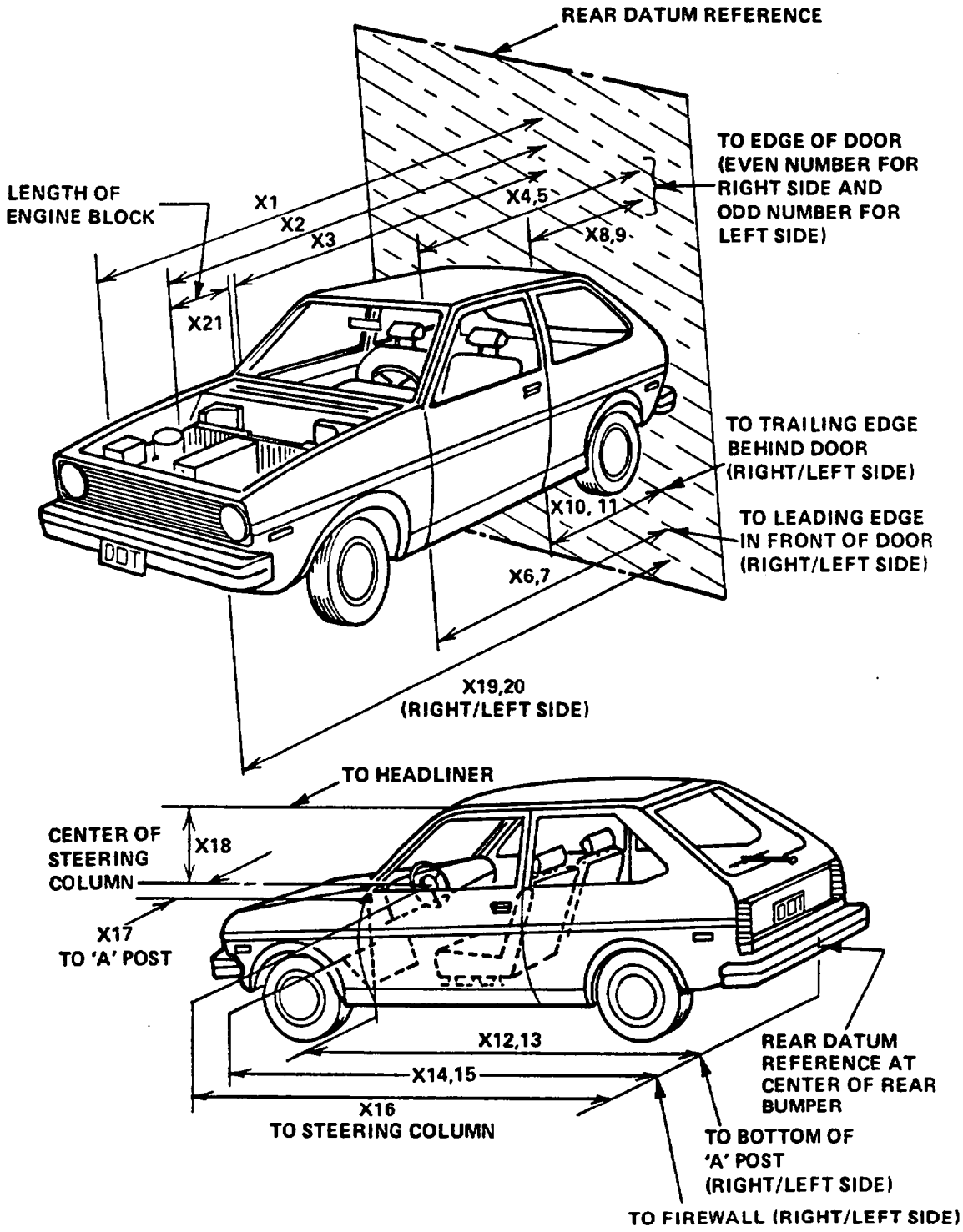


Table 5

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	218.8	190.4	28.4
X2	Rear Surface of Vehicle to Front of Engine	187.4	176.2	11.2
X3	Rear Surface of Vehicle to Firewall	154.4	149.4	5.0
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	149.3	149.4	-0.1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	148.8	149.0	-0.2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	147.1	146.3	0.8
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	146.3	145.3	1.0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	105.5	105.8	-0.3
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	105.1	105.4	-0.3
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	102.9	102.0	0.9
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	102.1	101.4	0.7
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	150.2	148.8	1.4
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	149.5	148.5	1.0
X14	Rear Surface of Vehicle to Firewall, Right Side	156.0	152.5	3.5
X15	Rear Surface of Vehicle to Firewall, Left Side	155.9	154.5	1.4
X16	Rear Surface of Vehicle to Steering Column	127.8	129.2	-1.4
X17	Center of Steering Column to "A" Post	17.8	16.5	1.3
X18	Center of Steering Column to Headliner	16.2	16.6	-0.4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	213.8	186.5	27.3
X20	Rear Surface of Vehicle to Left Side of Front Bumper	213.4	192.7	20.7
X21	Length of Engine Block	27.0	27.0	0.0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	135.4	135.8	-0.4
CD	Rear Surface of Vehicle to Center of Dash Panel	135.8	135.8	0.0
LD	Rear Surface of Vehicle to Left Side of Dash Panel	134.9	135.2	-0.3

Appendix A

PHOTOGRAPHS

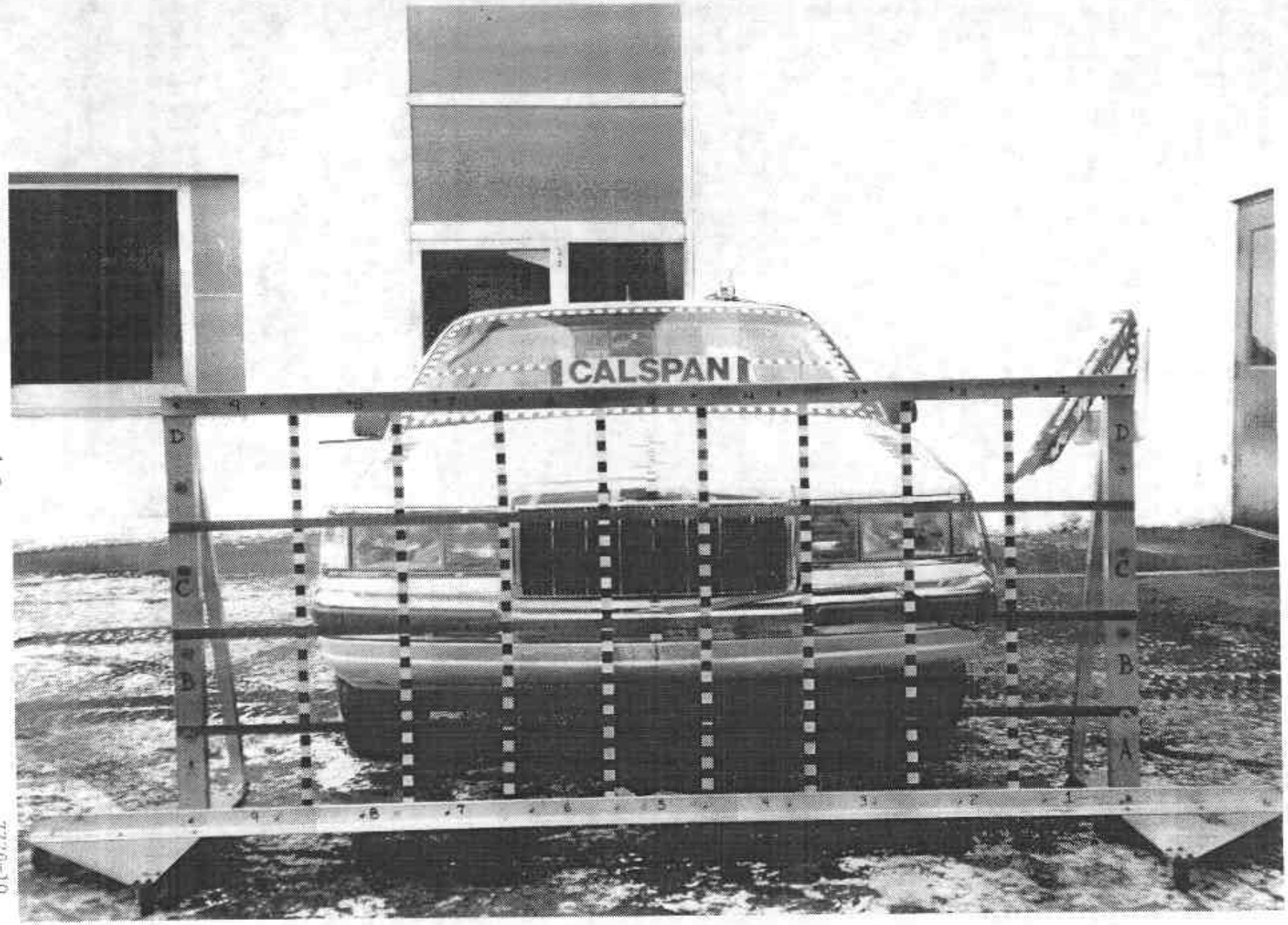


Figure A-1 PRE-TEST LOAD CELL LOCATIONS

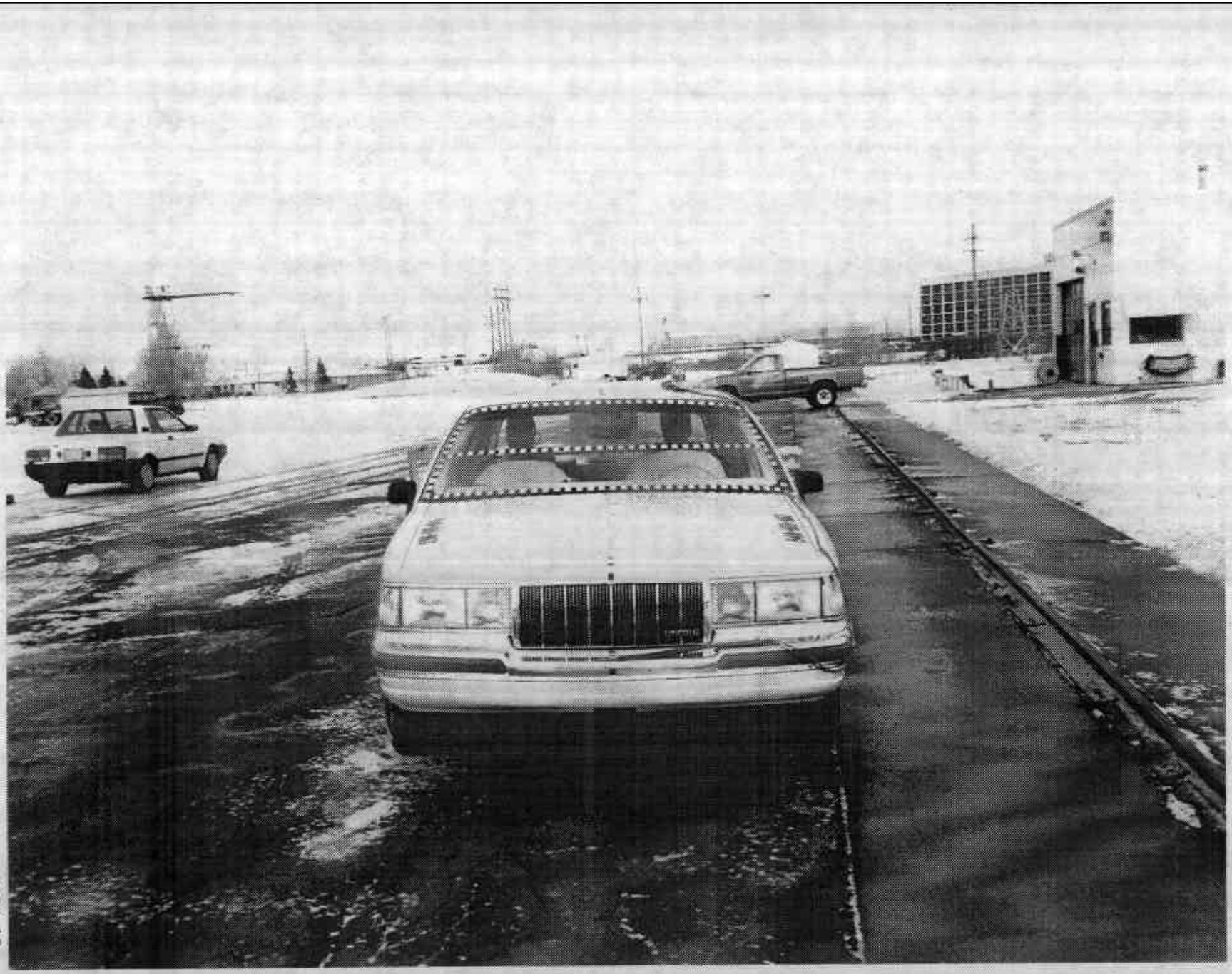
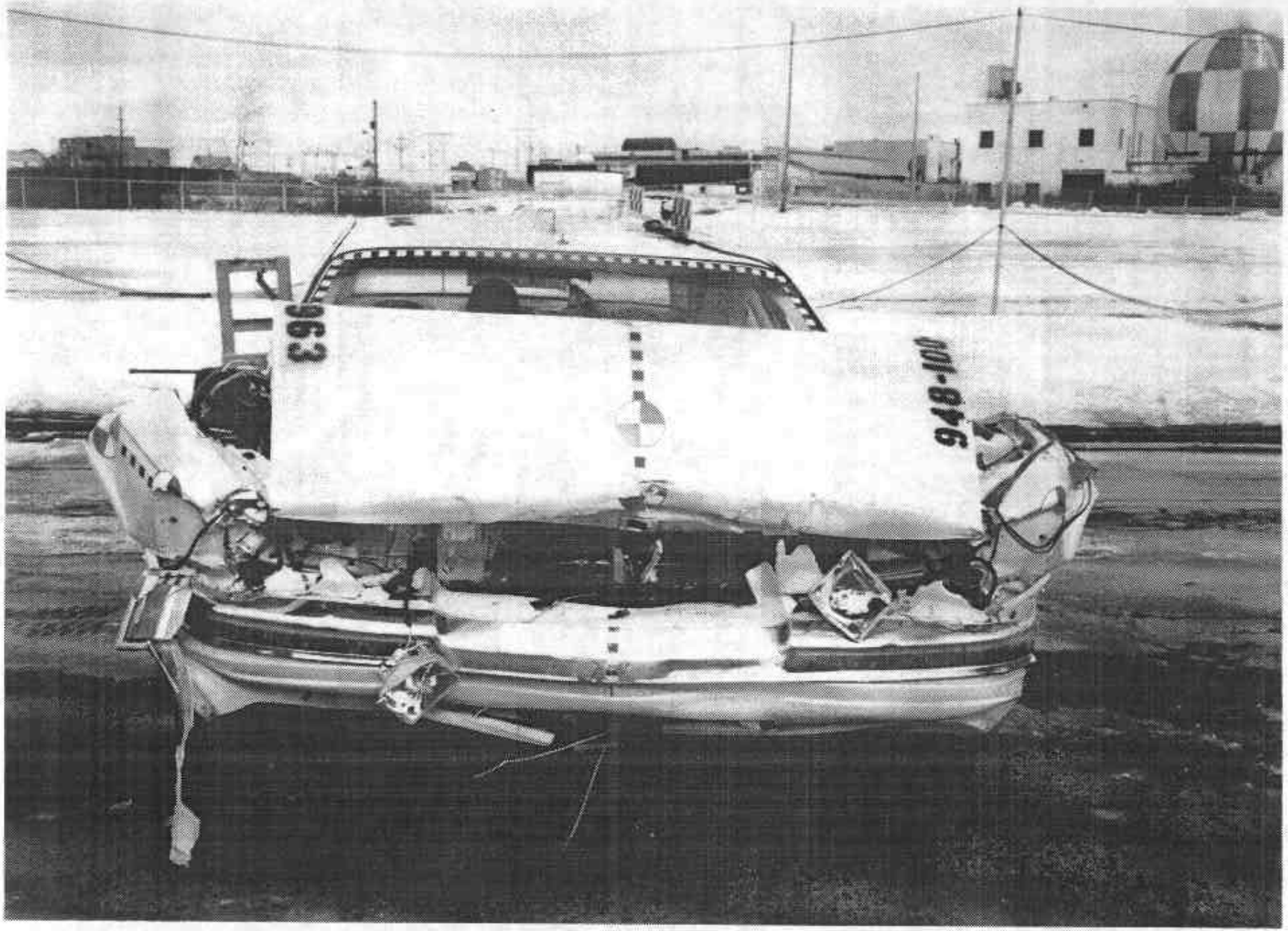


Figure A-2 PRE-TEST FRONT VIEW



7776-10

Figure A-3 POST TEST FRONT VIEW

Figure A-4 PRE-TEST LEFT SIDE VIEW

A-6

Figure A-5 POST TEST LEFT SIDE VIEW

Figure A-6 PRE-TEST RIGHT SIDE VIEW

A-8

7776-10

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

A-11

7776-10

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

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

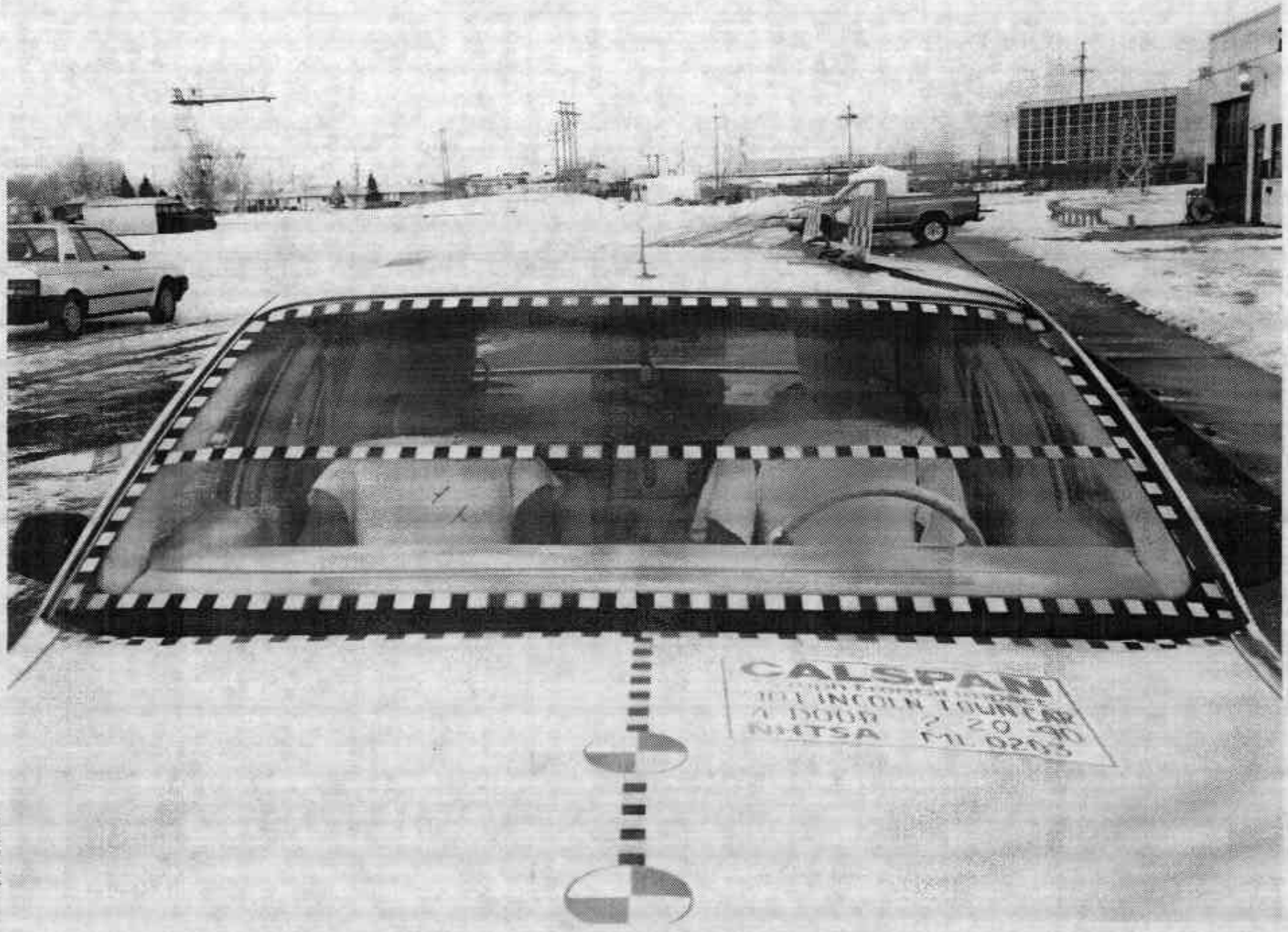


Figure A-12 PRE-TEST WINDSHIELD VIEW

A-14

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Figure A-13 POST-TEST WINDSHIELD VIEW

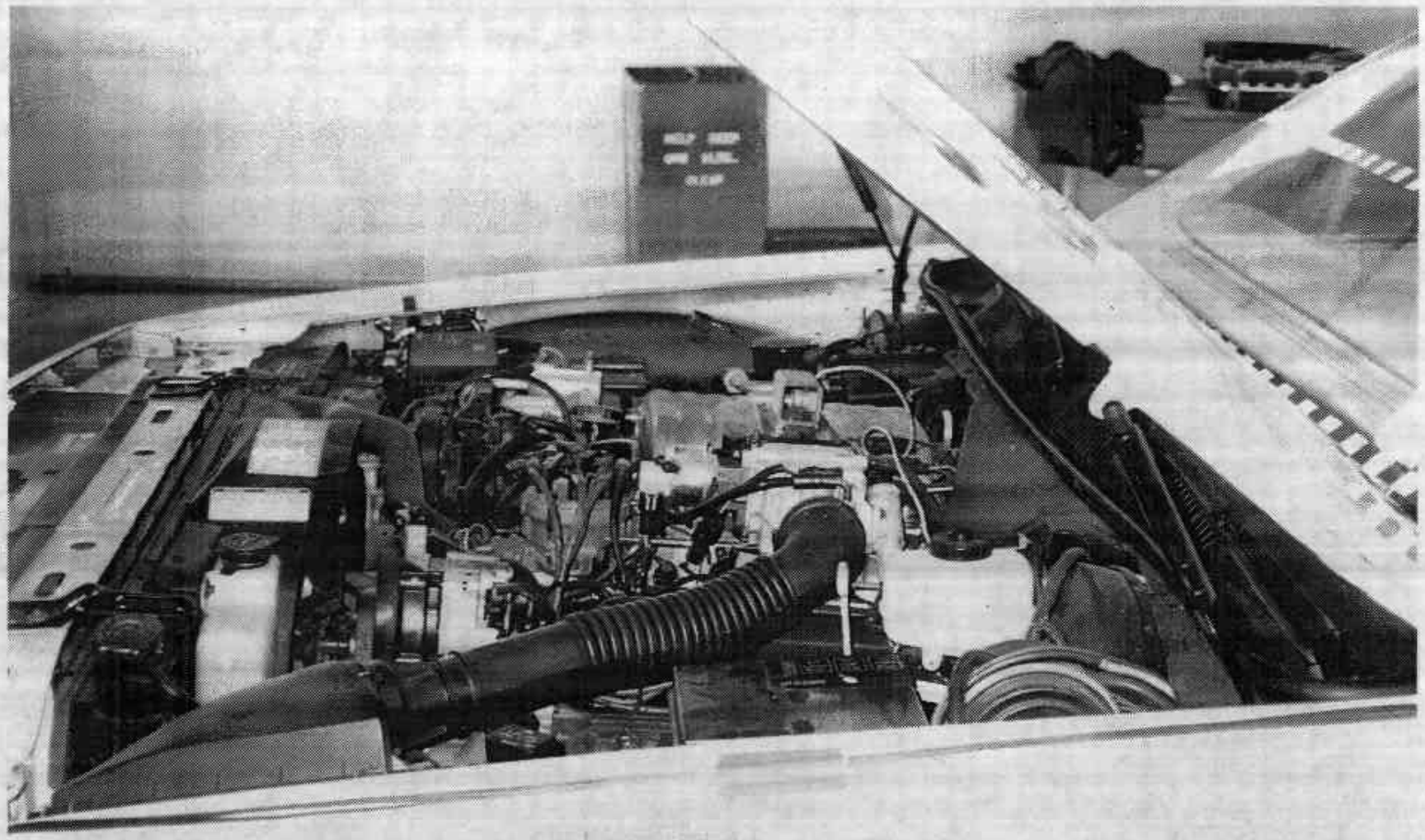

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

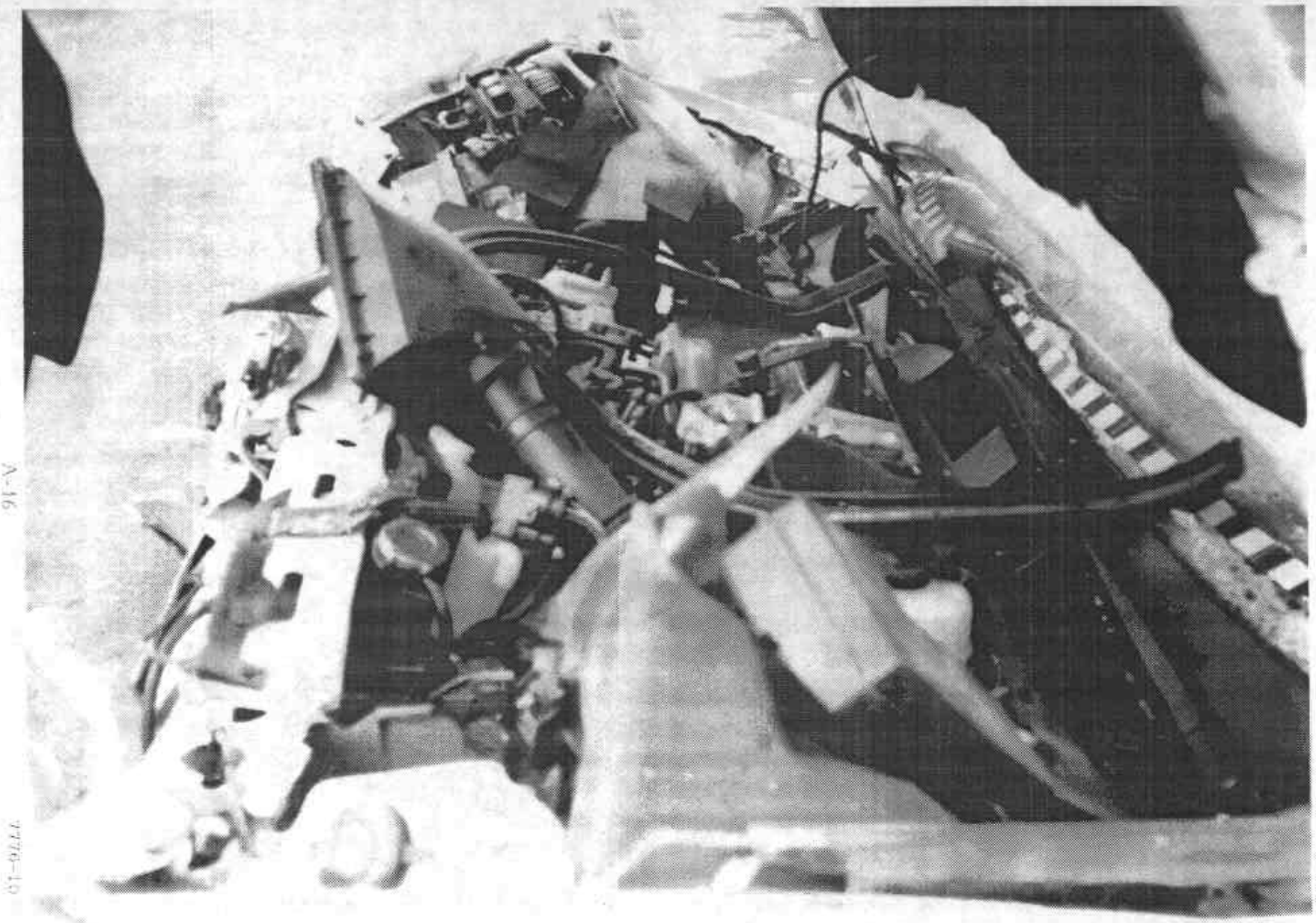

Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

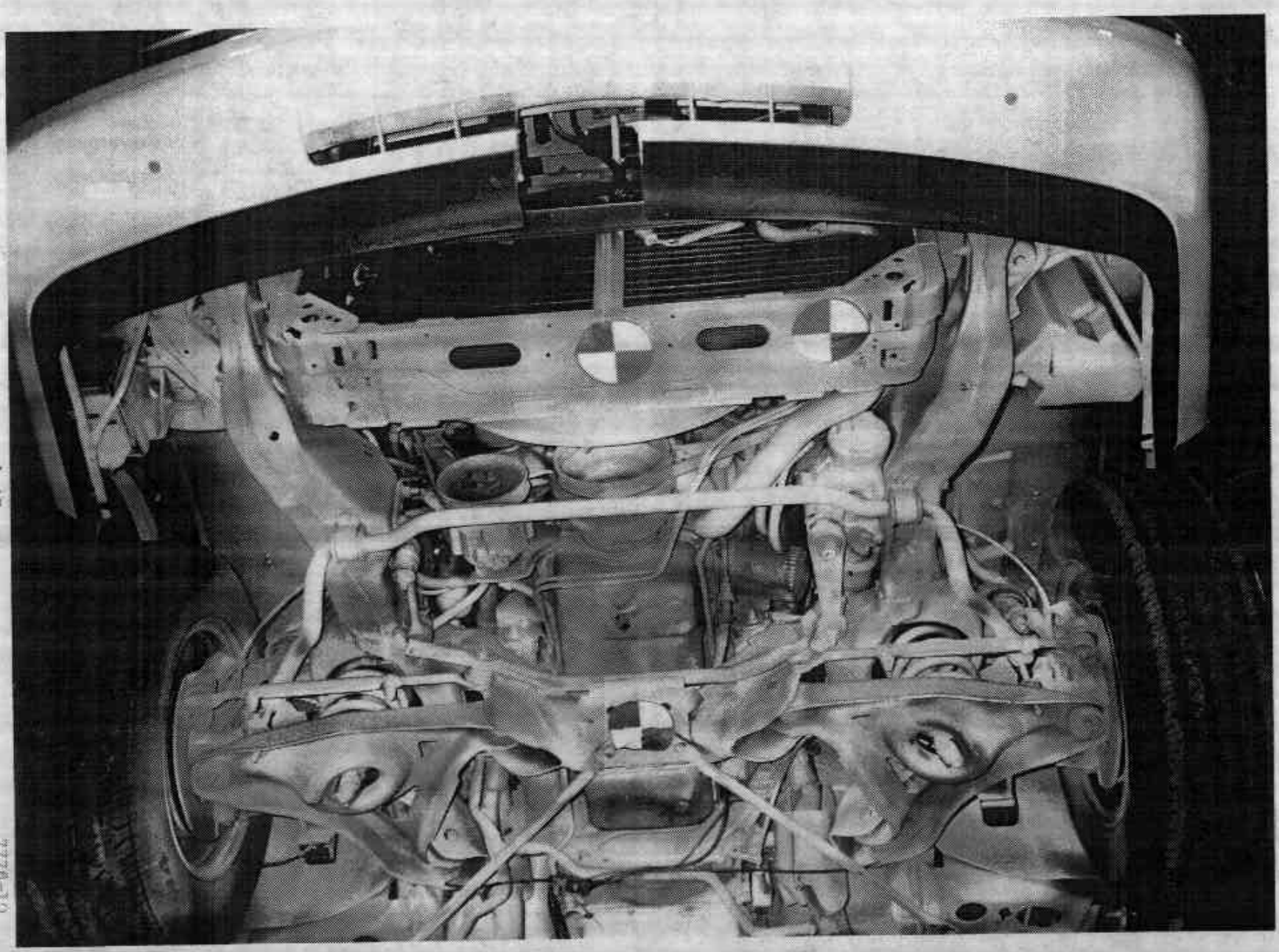

Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

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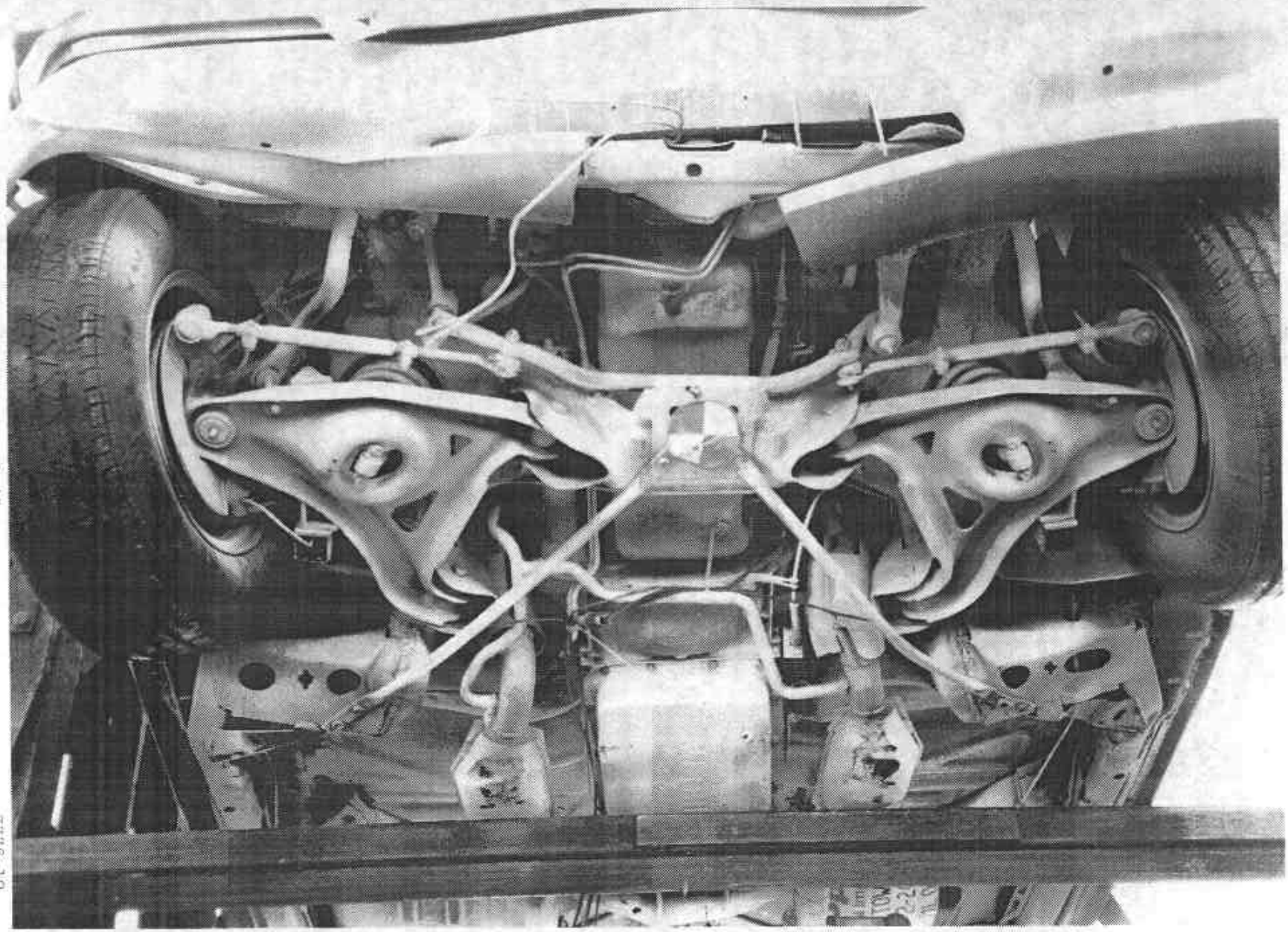


Figure A-17 POST-TEST FRONT UNDERBODY VIEW

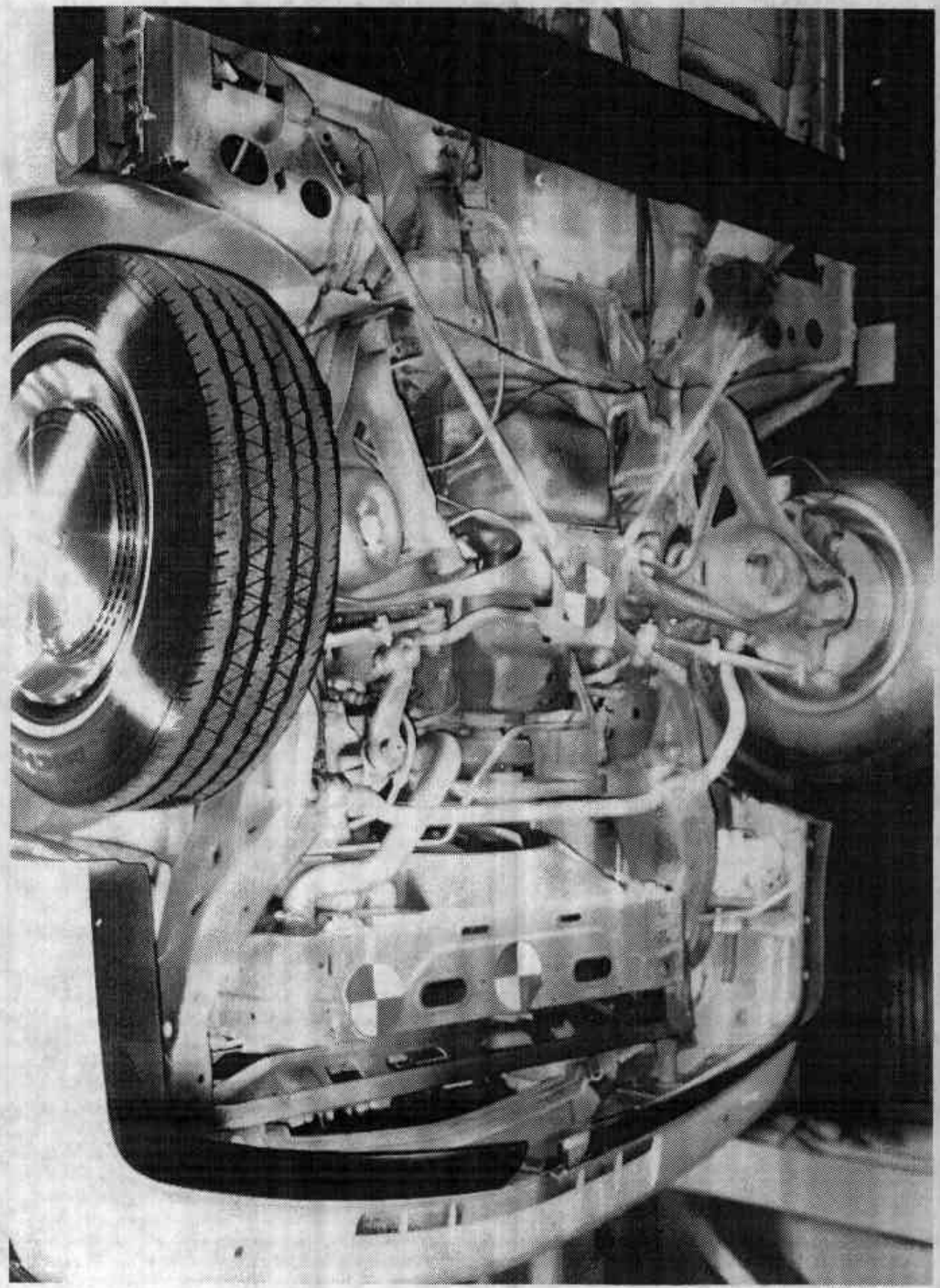


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

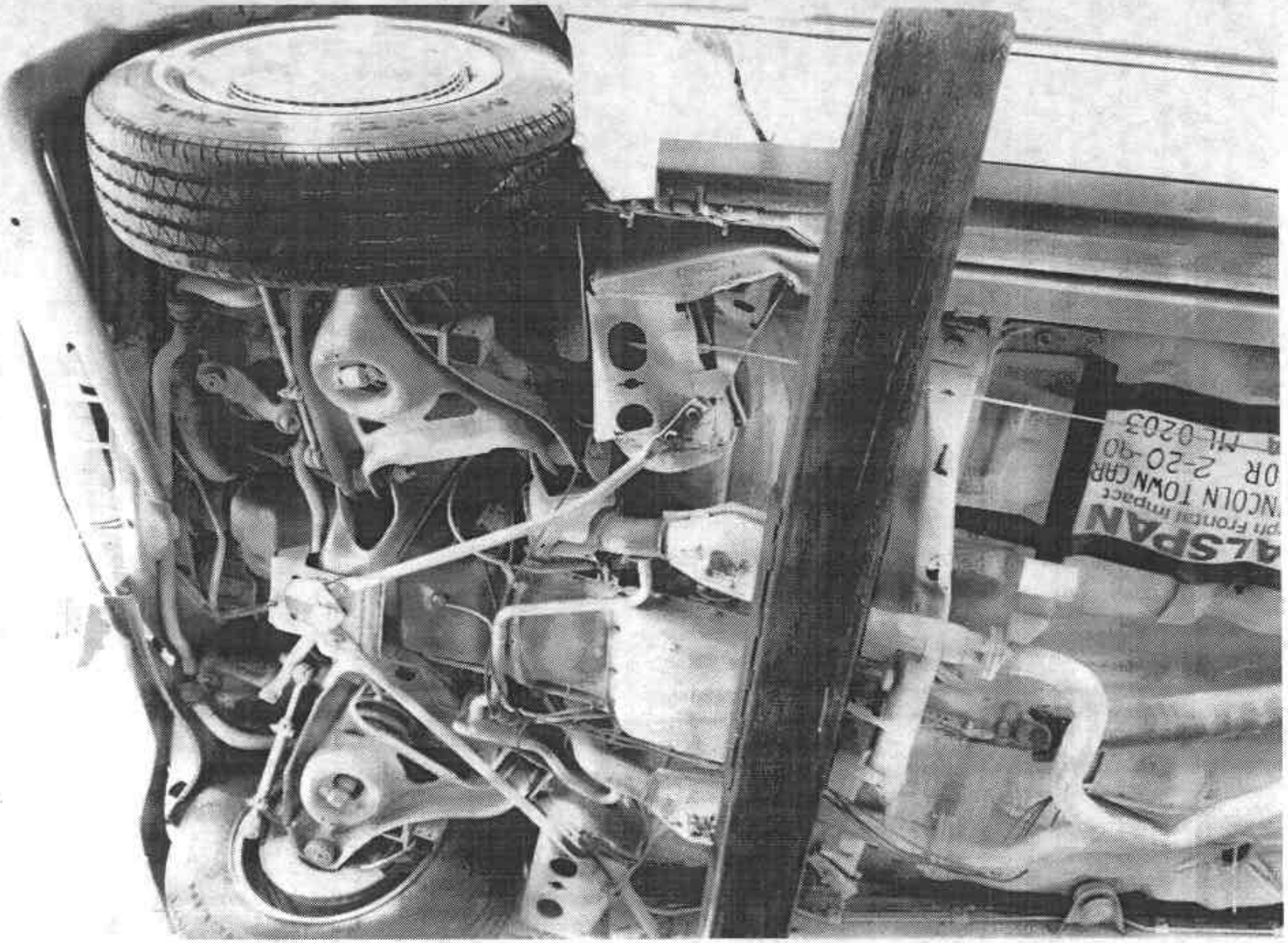


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

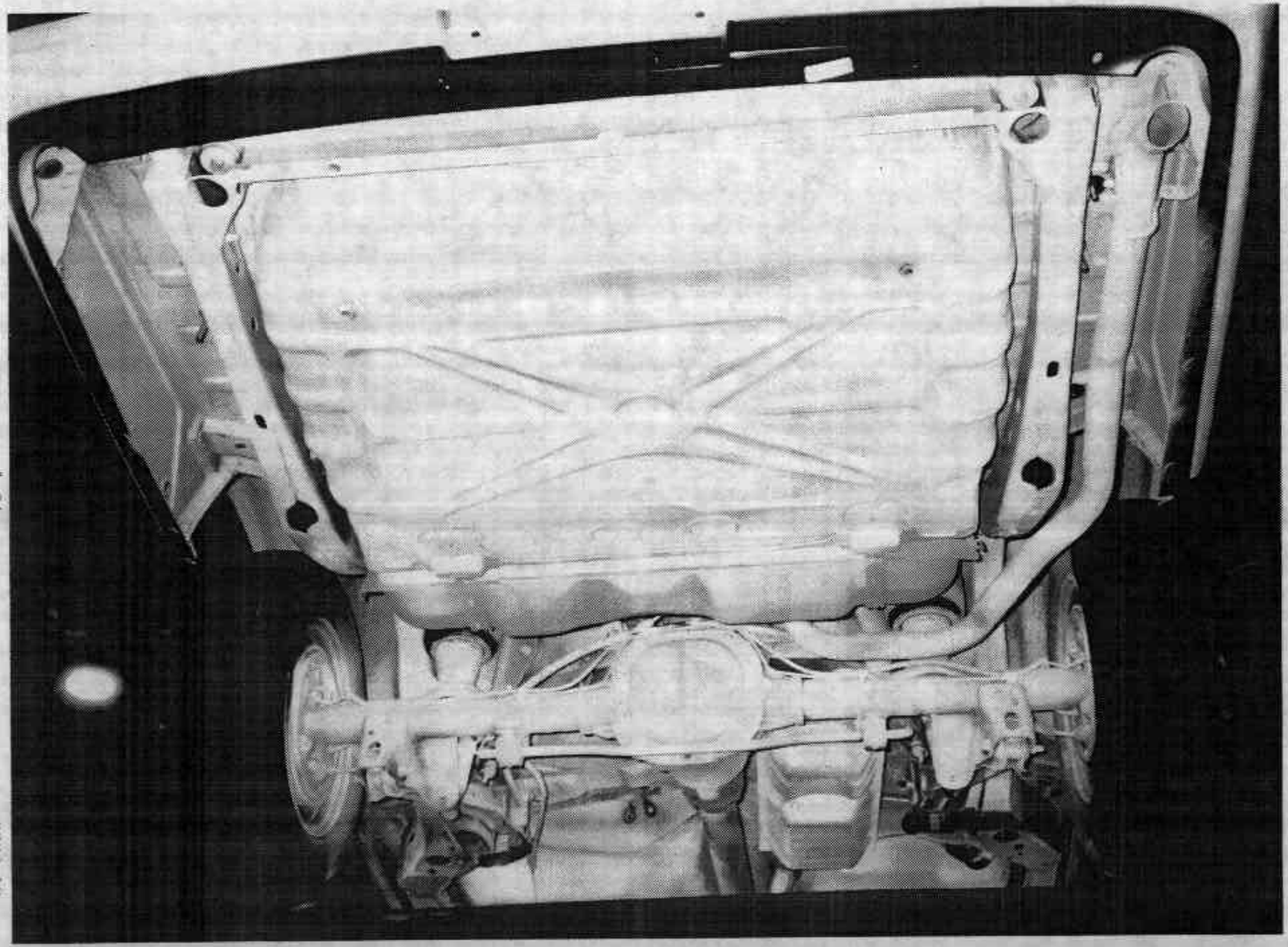


Figure A-20 PRE-TEST REAR UNDERBODY VIEW

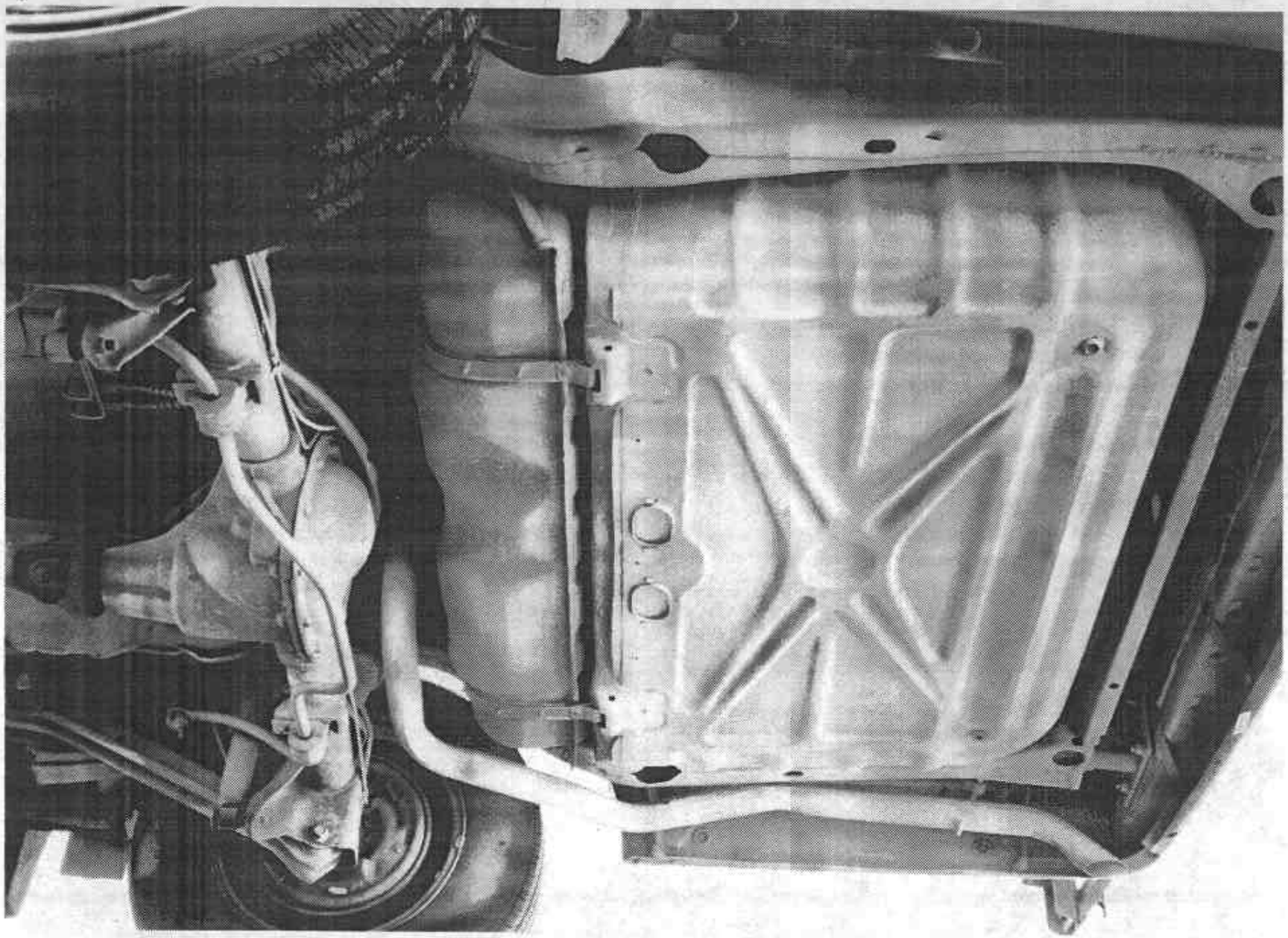


Figure A-21 POST-TEST REAR UNDERBODY VIEW

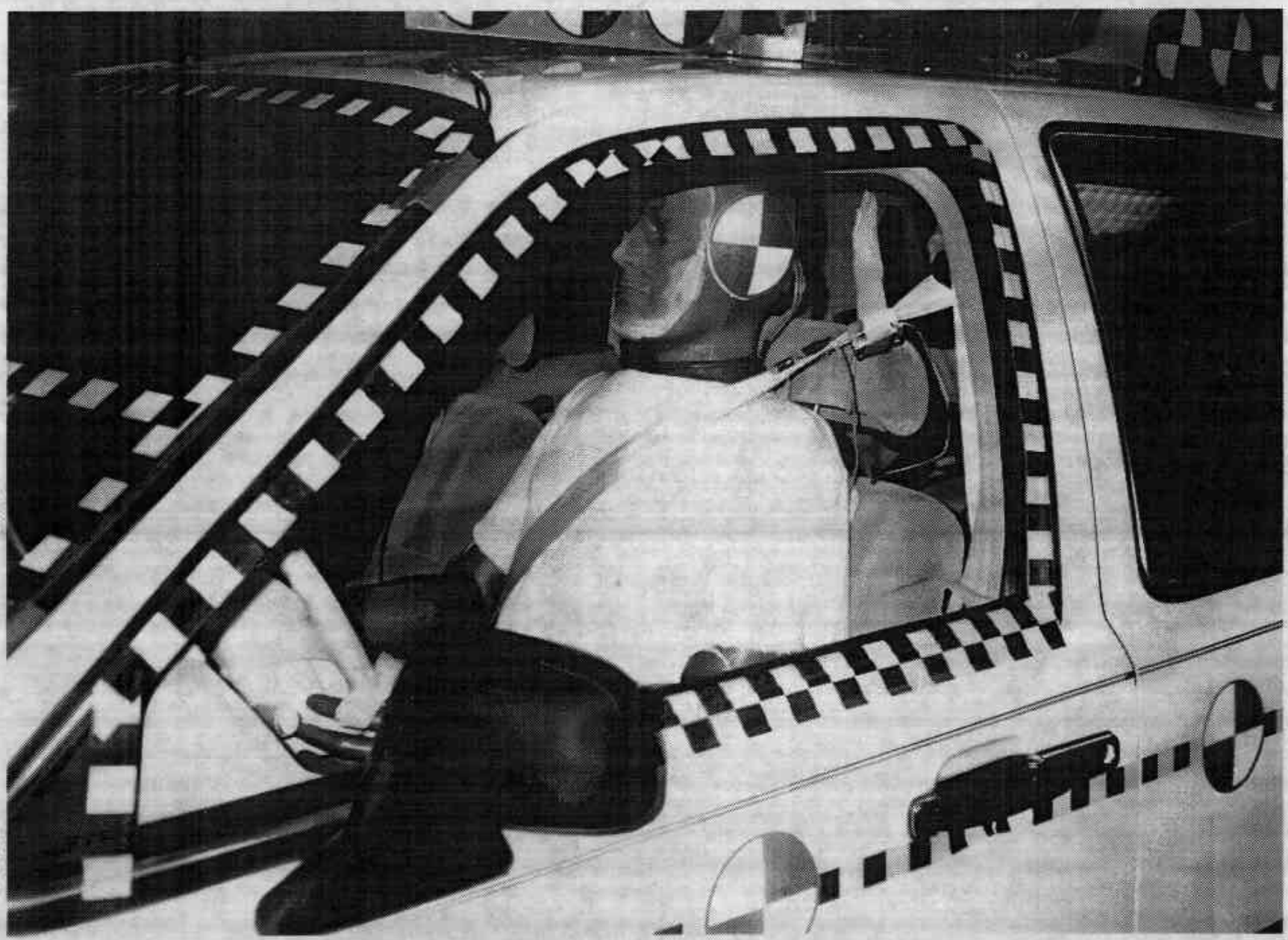


Figure A-22 PRE-TEST DRIVER POSITION VIEW

Figure A-23 POST-TEST DRIVER POSITION VIEW

Figure A-24 PRE-TEST PASSENGER POSITION VIEW

Figure A-25 POST-TEST PASSENGER POSITION VIEW

Figure A-26 PRE-TEST DRIVER AND INTERIOR VIEW

Figure A-27 POST-TEST DRIVER AND INTERIOR VIEW

Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW

Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

Figure A-30 IMPACT VIEW

Appendix B

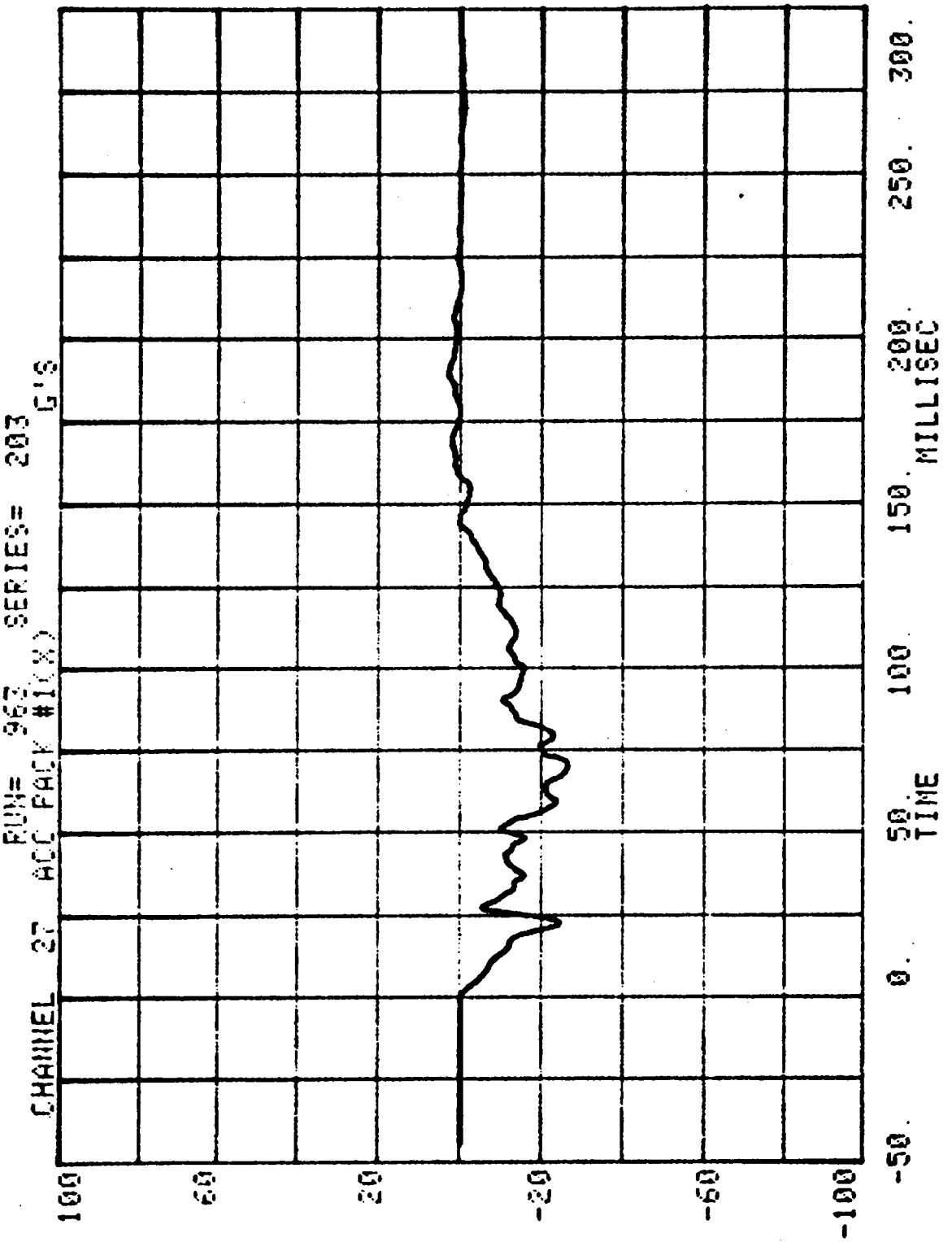
VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

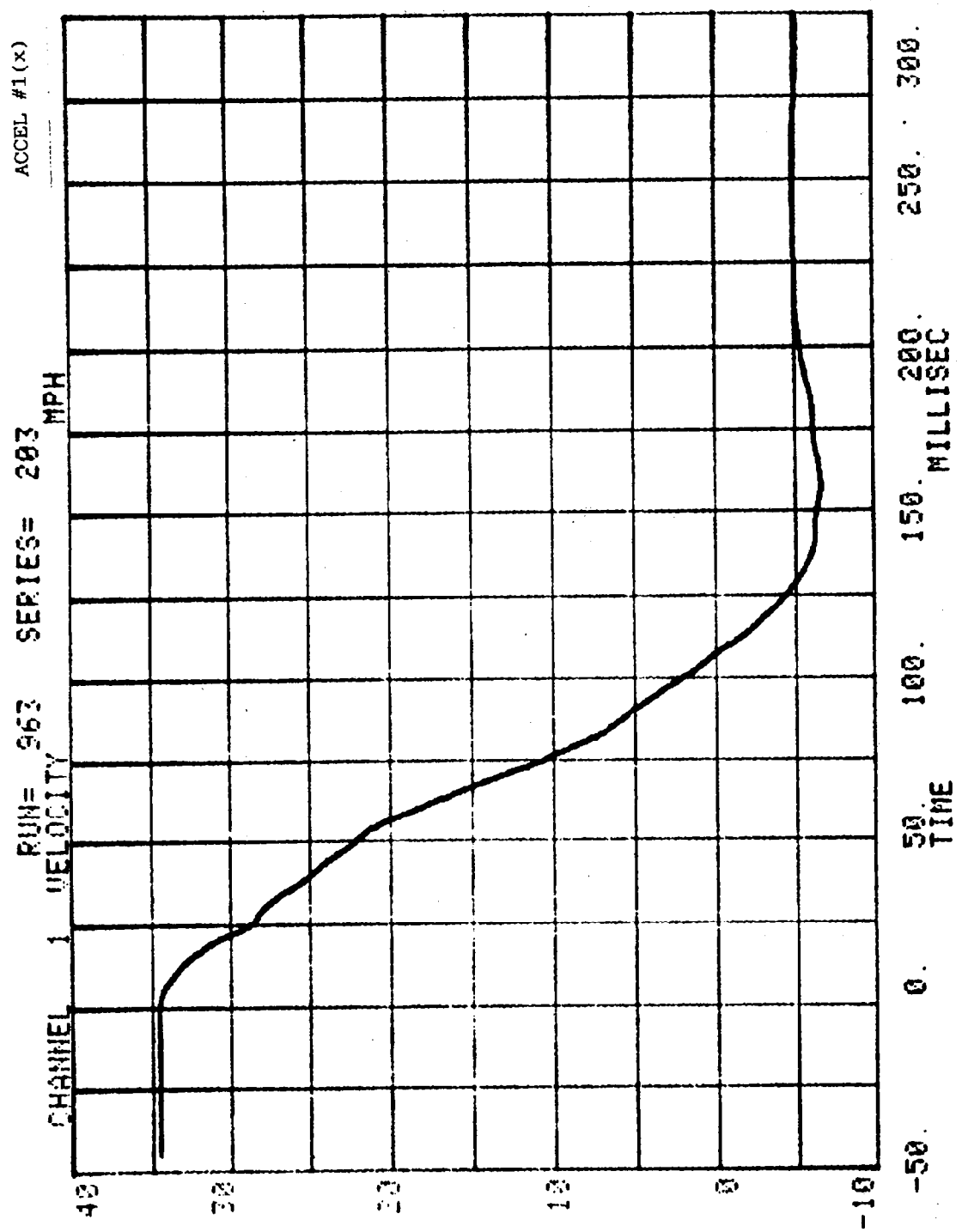
TEST NO. ML0203

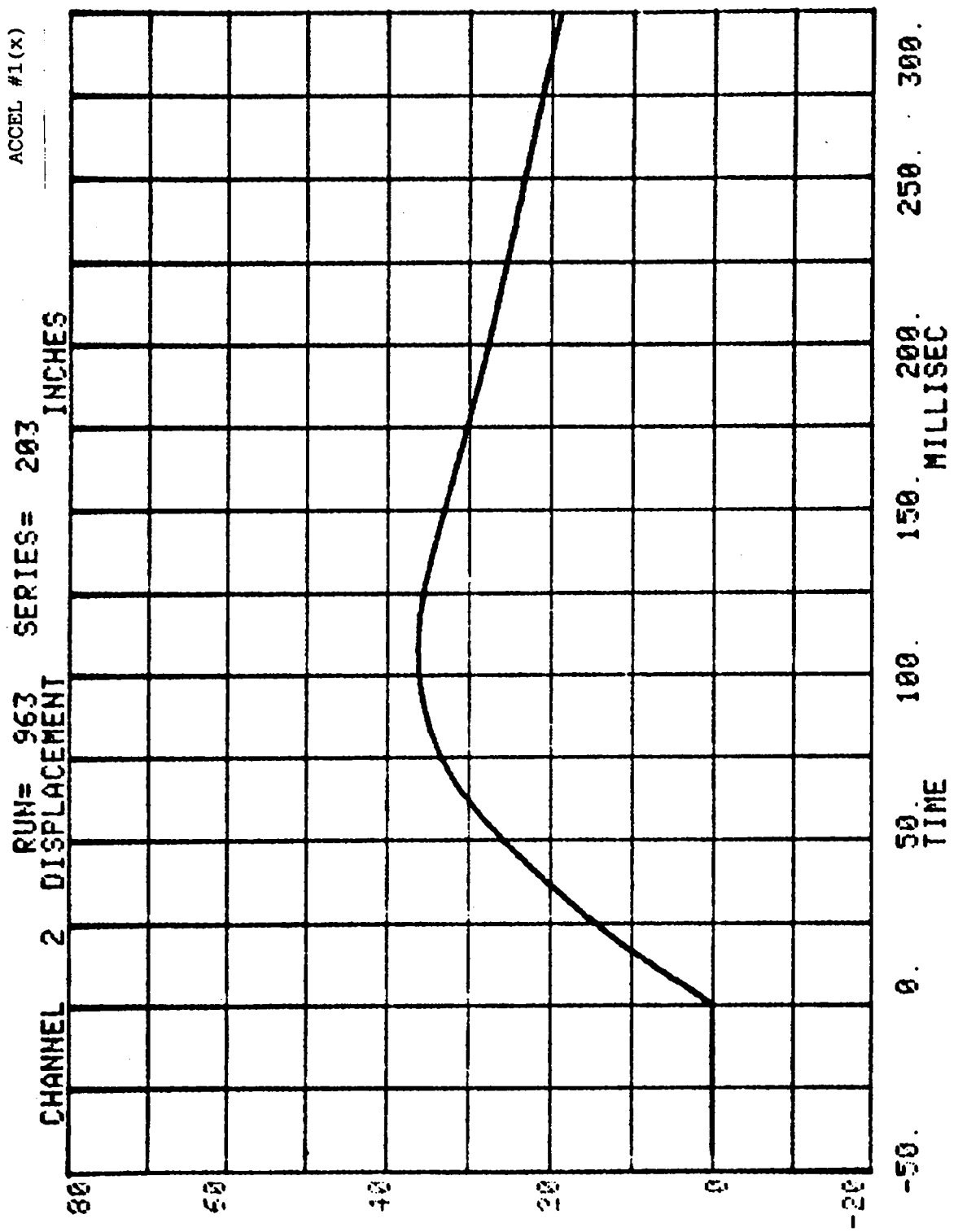
VEHICLE DATA

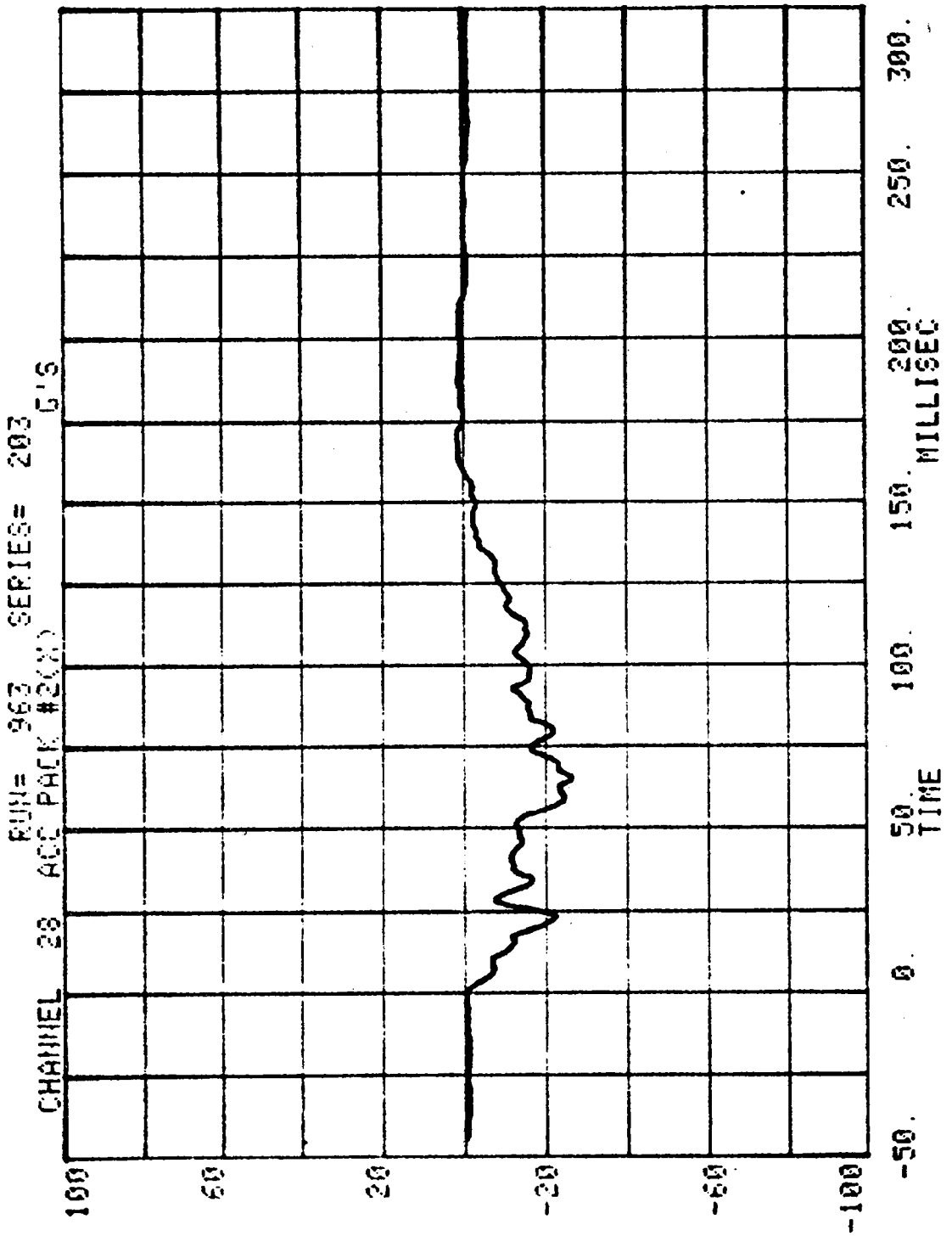
FILTER CHANNEL CLASS

60

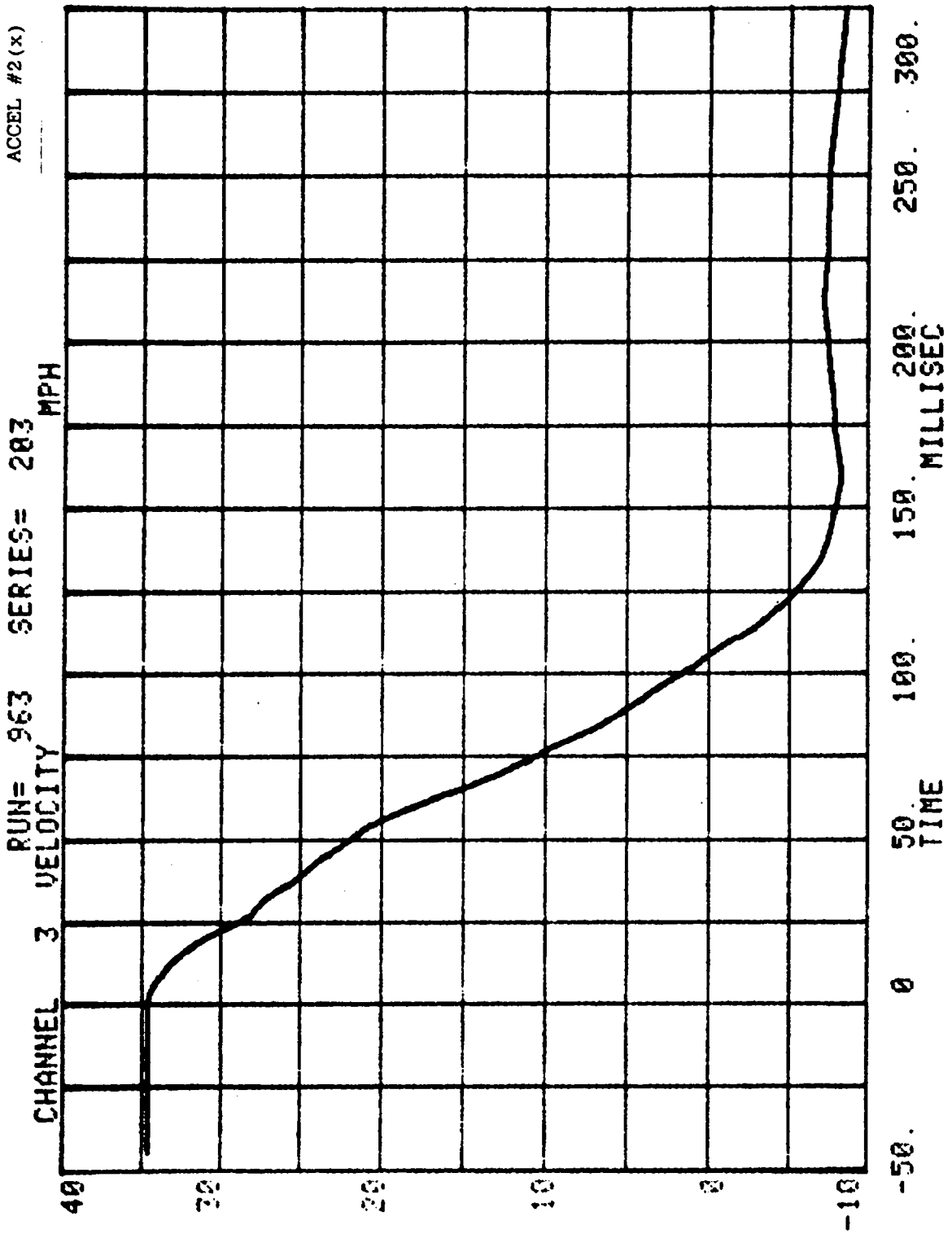

CHANNEL 27 ACC PACK #1(X)
RUN= 963 SERIES= 203
G'S
100
50
0
-50
-100
-50.
0.
50.
100
150.
200.
250.
300.
TIME
MILLISEC


ACCEL #1(X)
CHANNEL 1 VELOCITY
RUN= 963 SERIES= 203 MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACCEL #1(x)
CHANNEL 2 DISPLACEMENT
RUN= 963 SERIES= 203
INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 28 ACC PACK #2(X)
RUN= 963 SERIES= 203
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10


ACCEL #2(x)
CHANNEL 3 VELOCITY
RUN= 963 SERIES= 203
MPH
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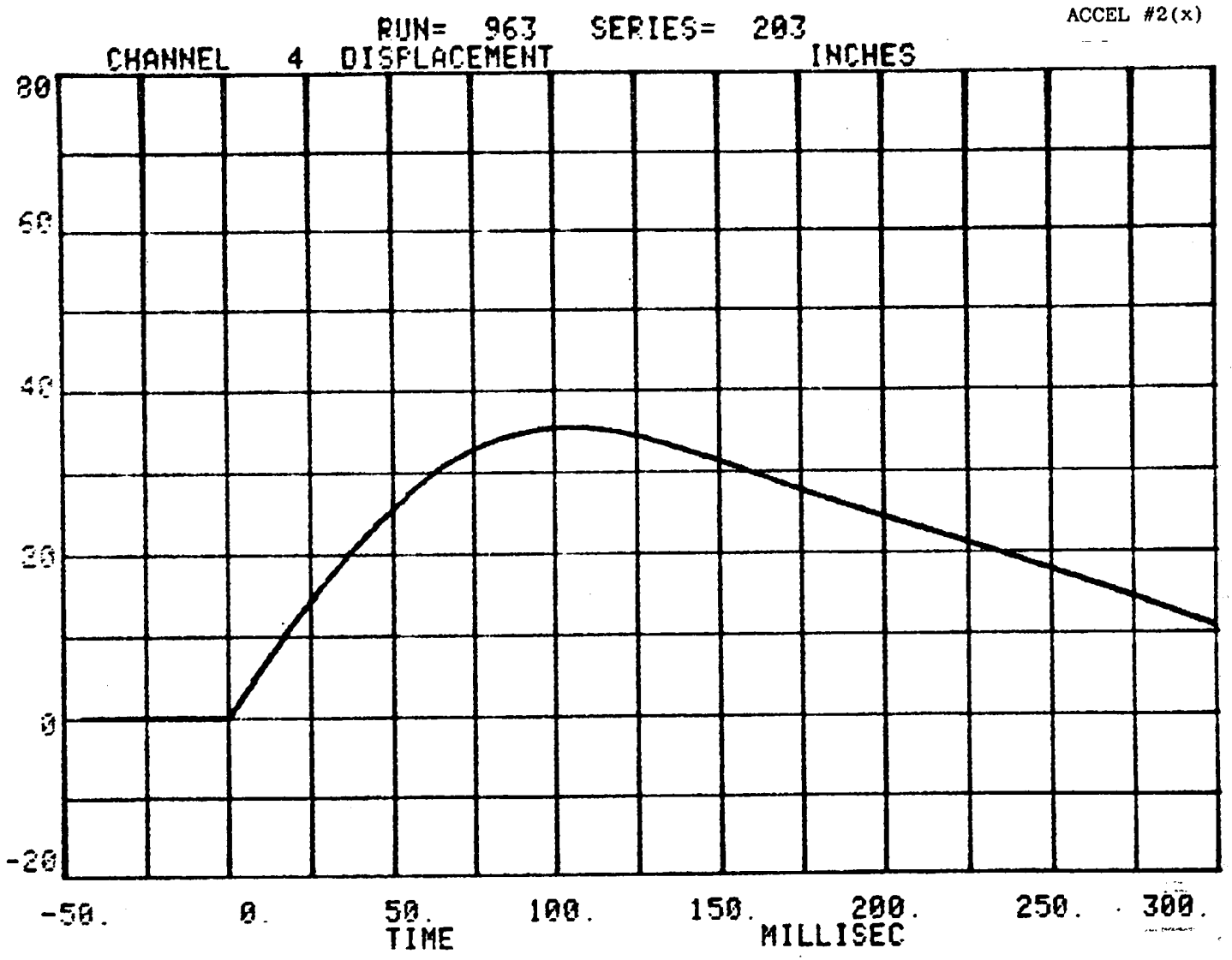
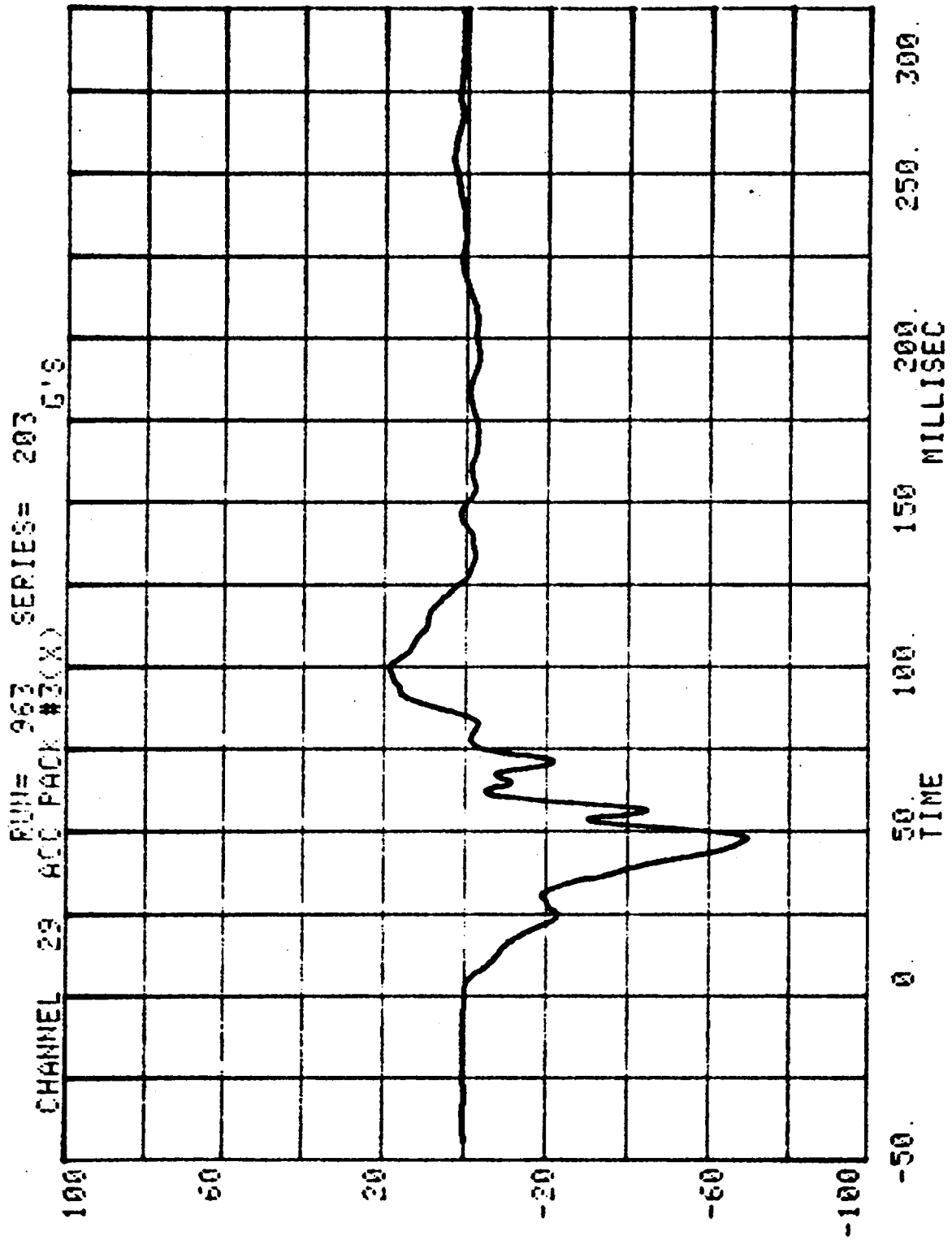
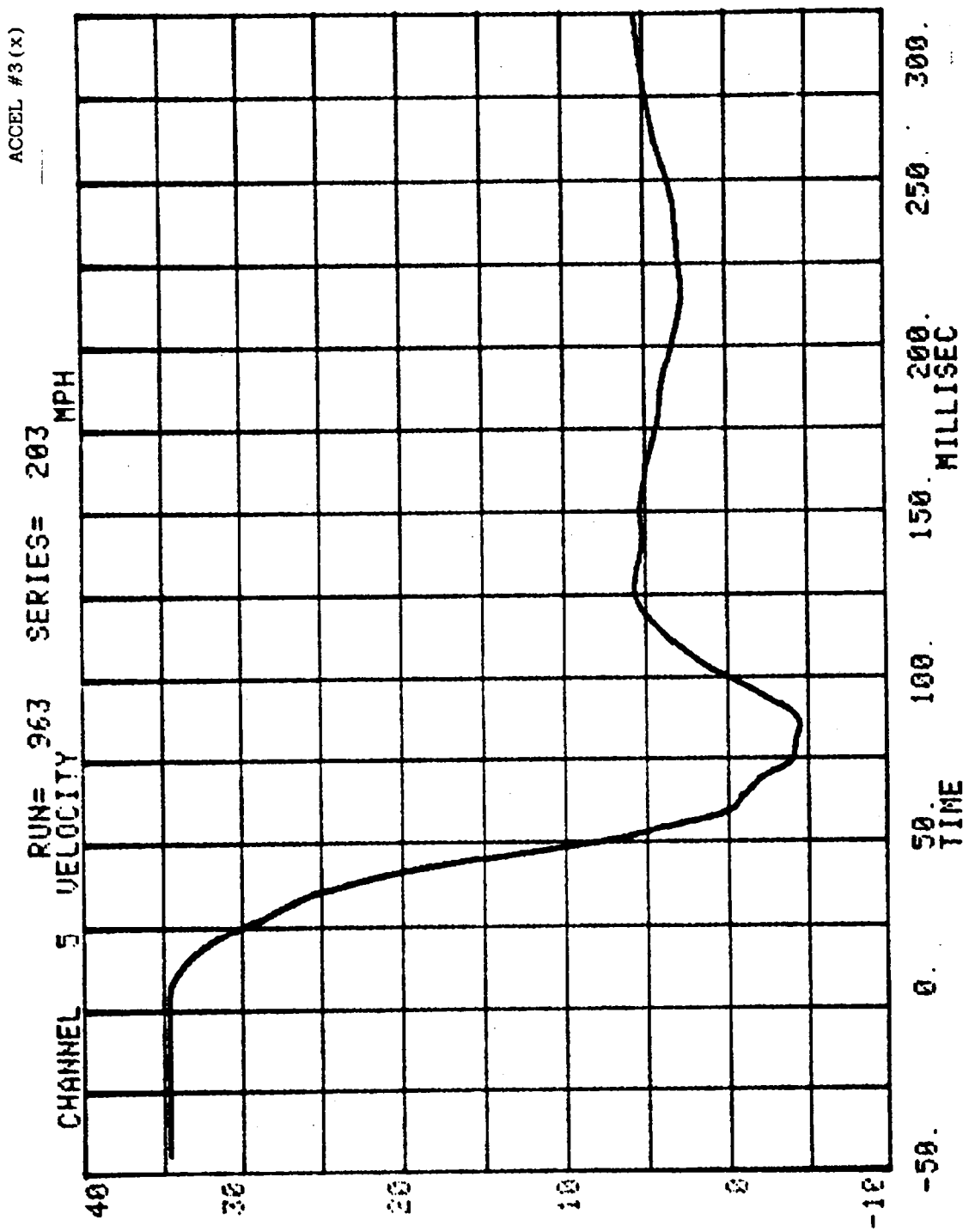
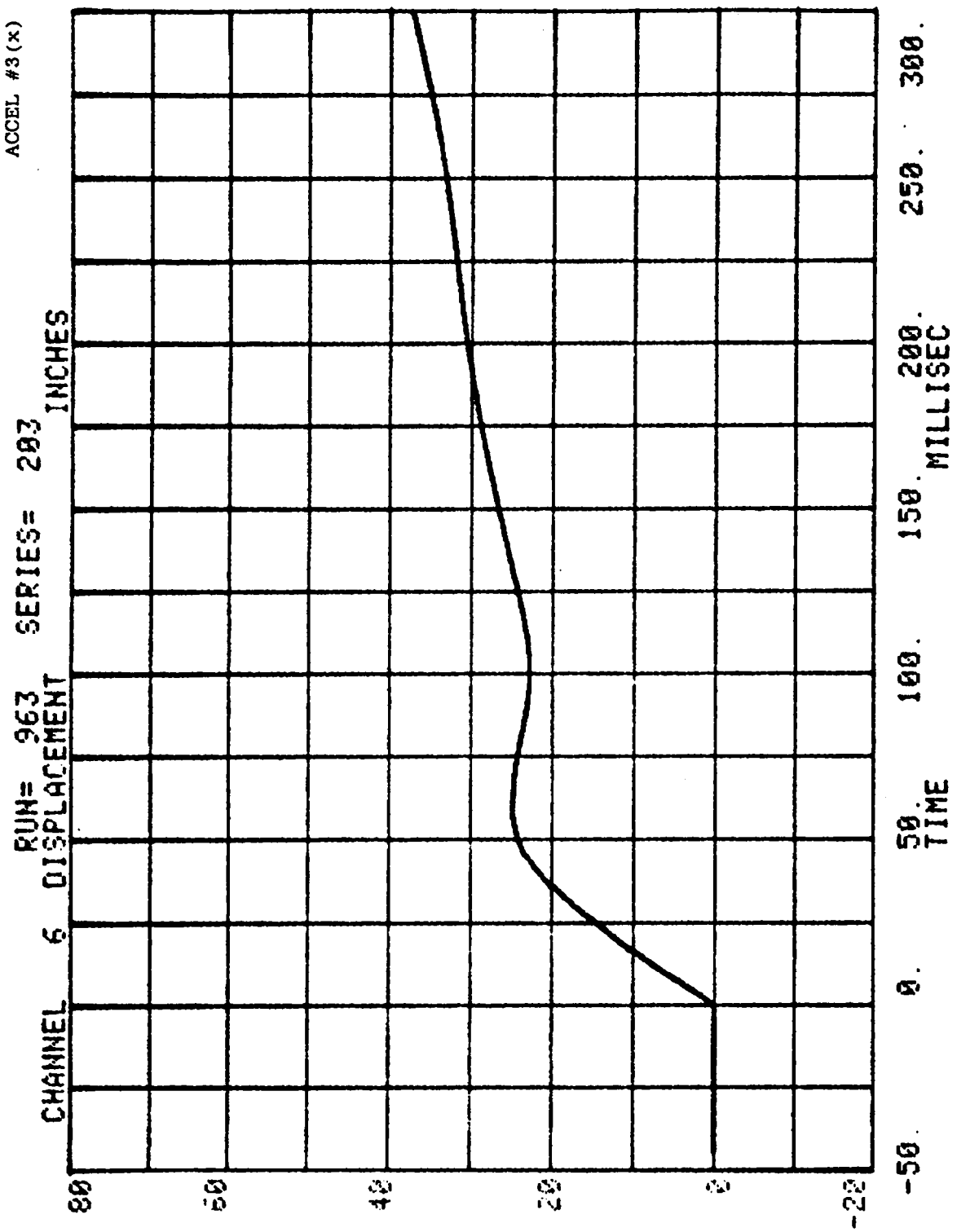
20
0
-10
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACCEL #2(x)
RUN= 963 SERIES= 203
CHANNEL 4 DISPLACEMENT INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC


CHANNEL 22 ACC PACK #3(X)
RUN= 963 SERIES= 203
G'S
100
60
20
-20
-60
-100
-50.
0
50.
100.
150
200.
250.
300.
TIME
MILLISEC


ACCEL #3(x)
CHANNEL 5 VELOCITY
RUN= 963 SERIES= 203
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10


ACCEL #3(x)
CHANNEL 6 DISPLACEMENT
RUN= 963 SERIES= 203
INCHES
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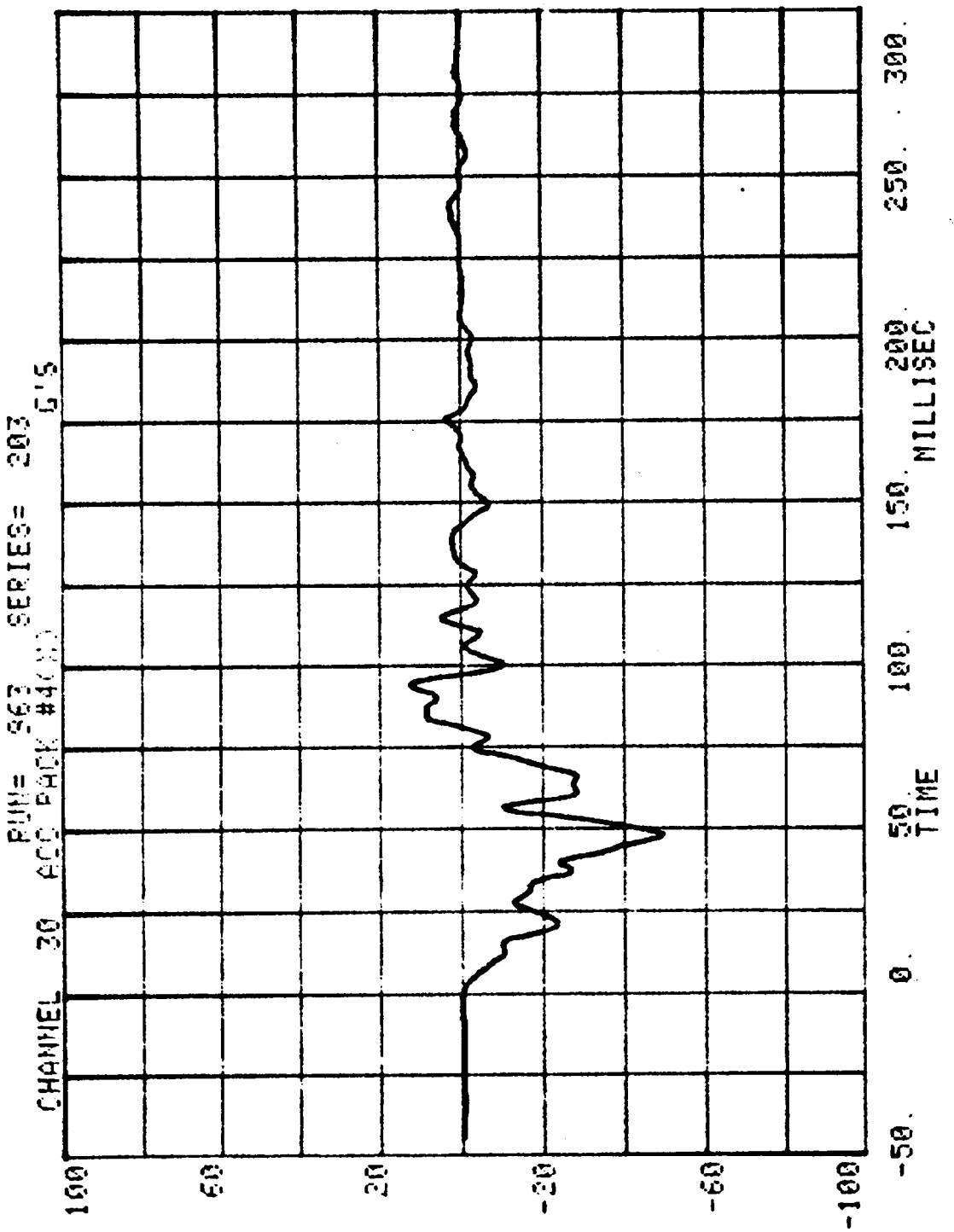
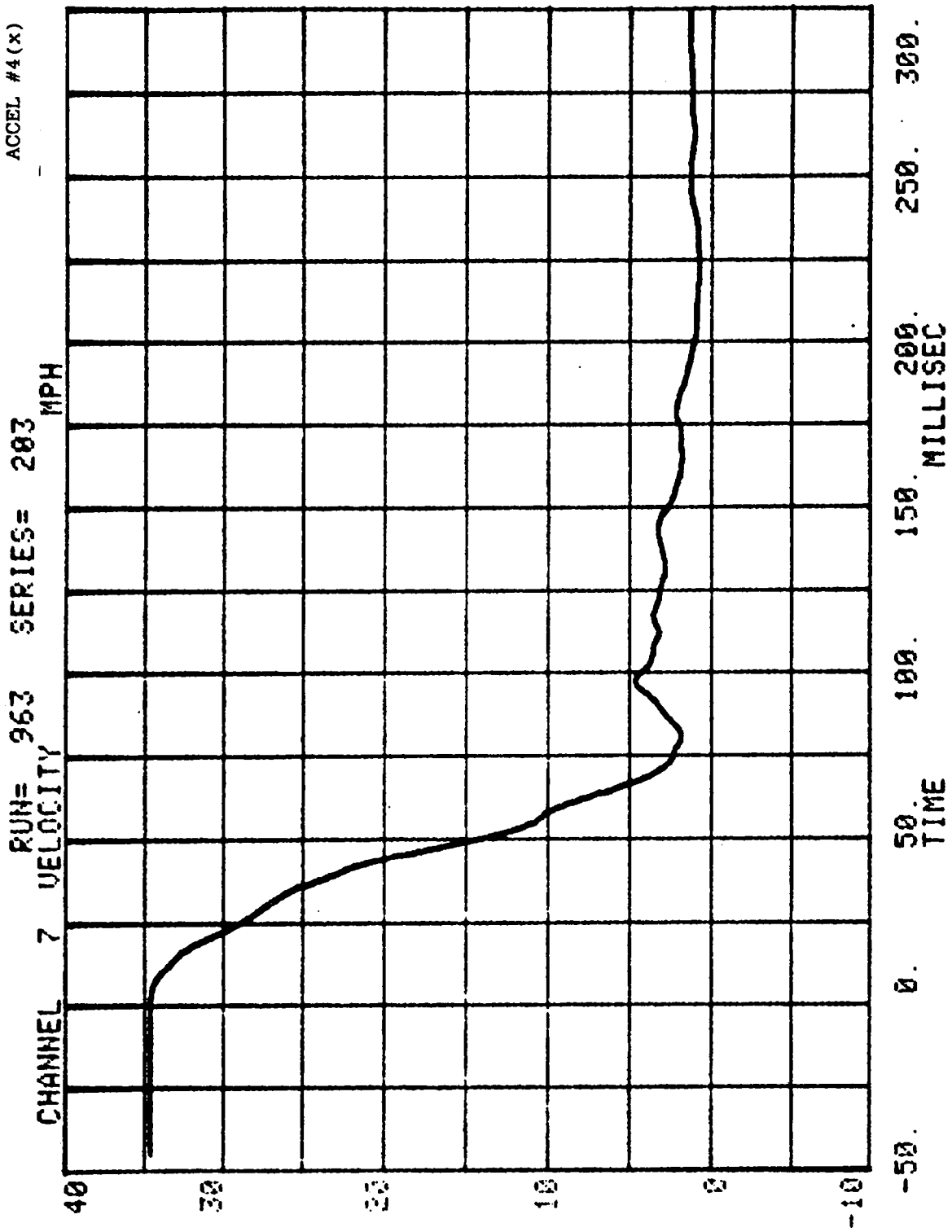
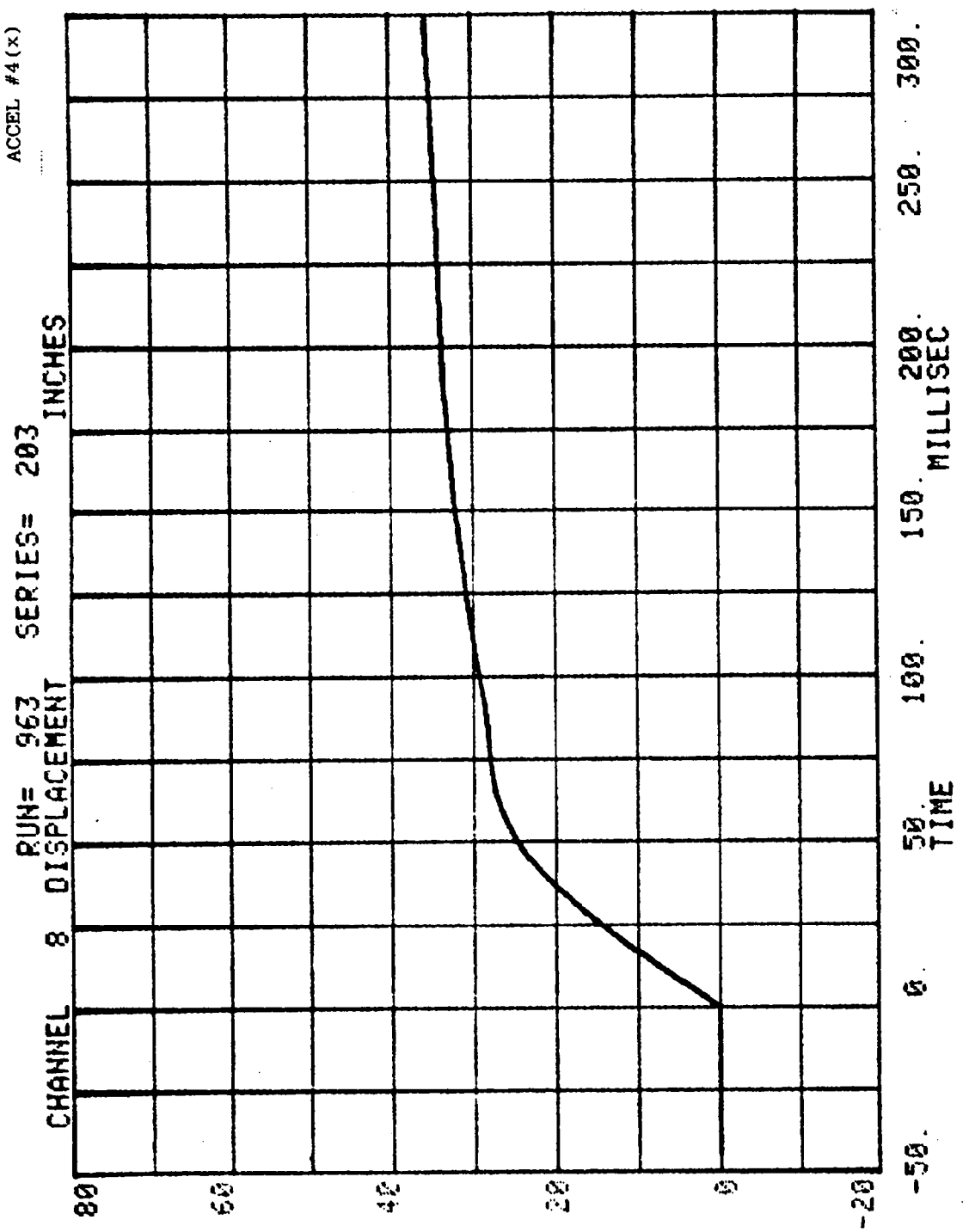
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 30
RUN= 963 SERIES= 203
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10


ACCEL #4(x)
CHANNEL 7 VELOCITY
RUN= 963 SERIES= 203
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACCEL #4(x)
CHANNEL 8 DISPLACEMENT
RUN= 963 SERIES= 203
INCHES
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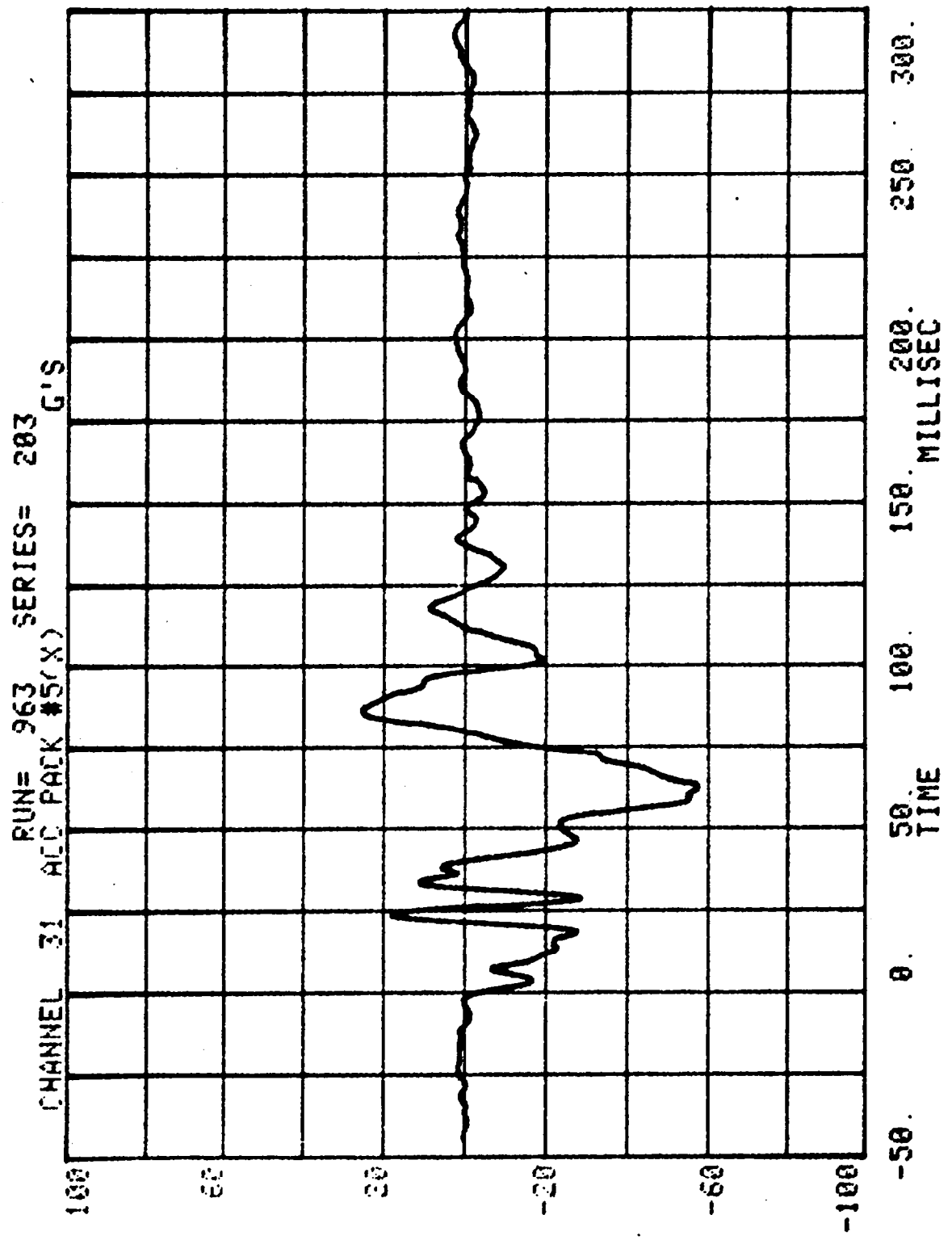
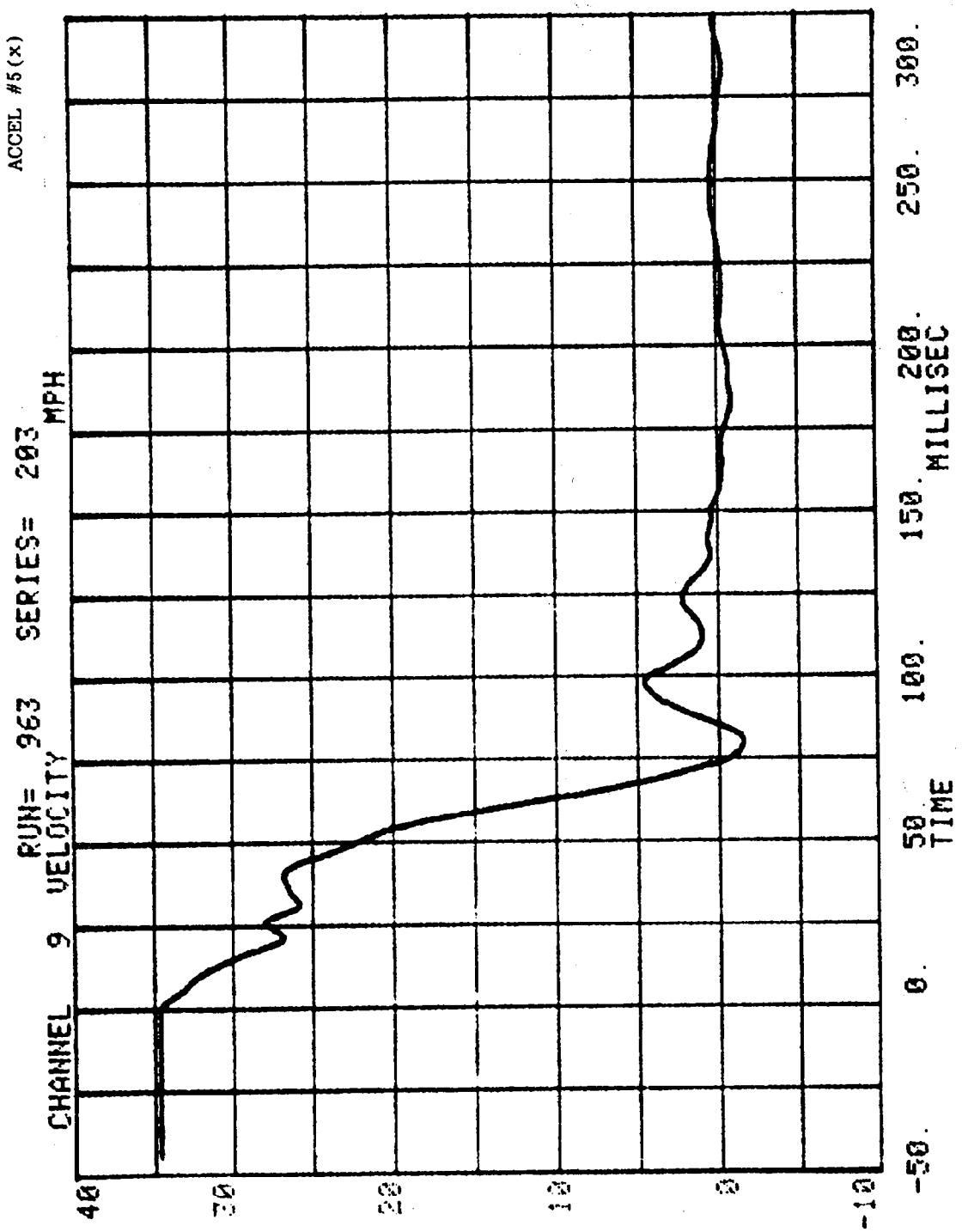
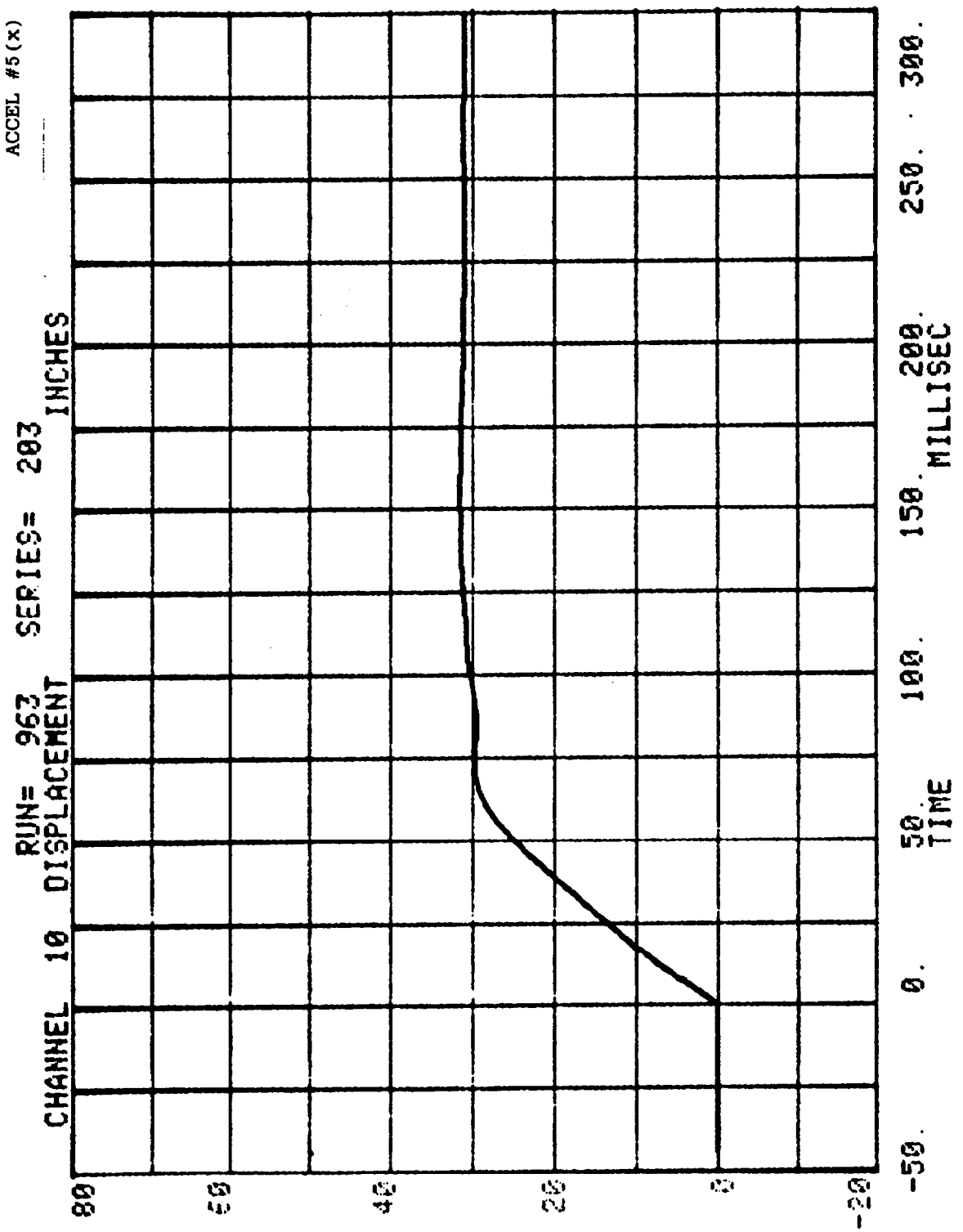
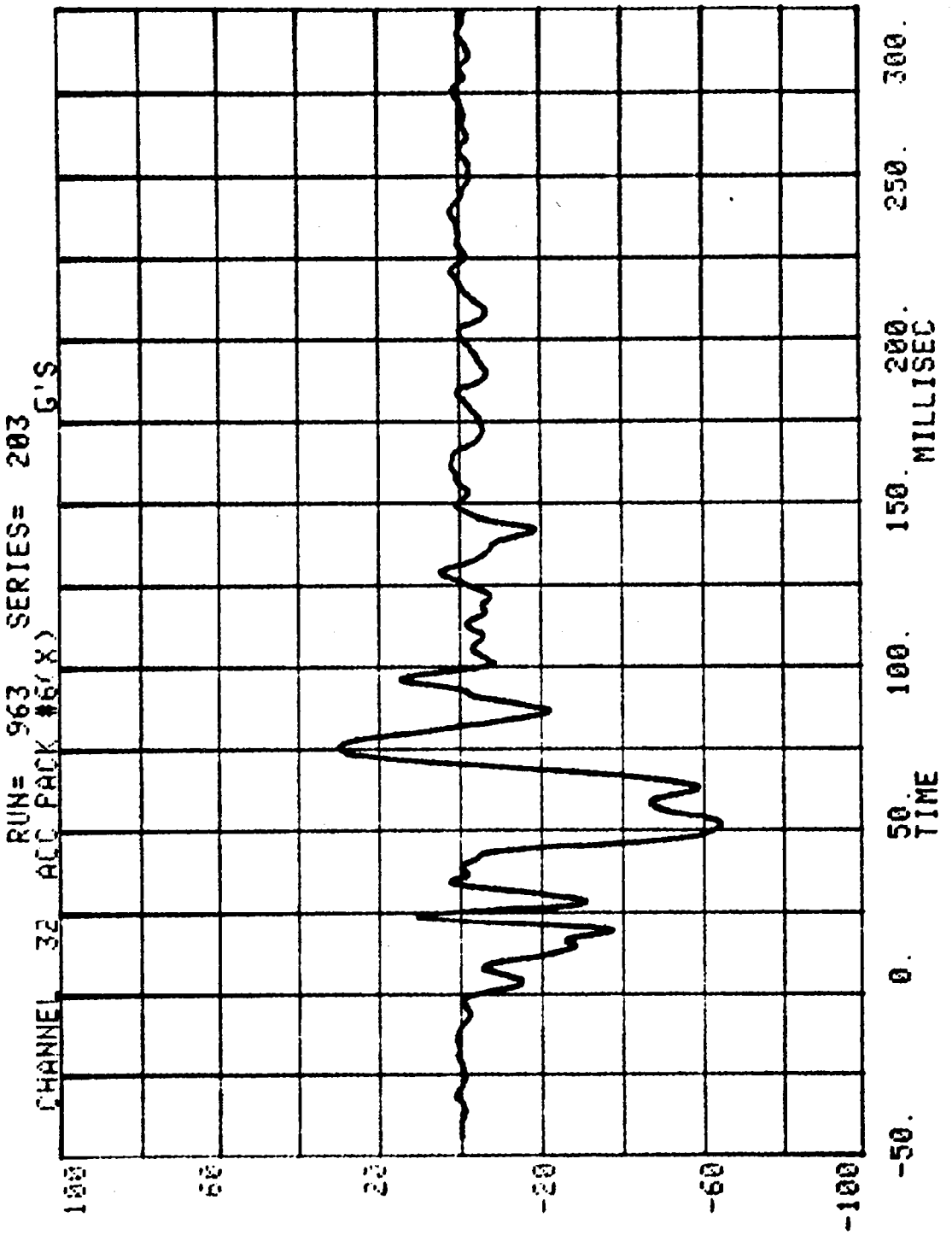
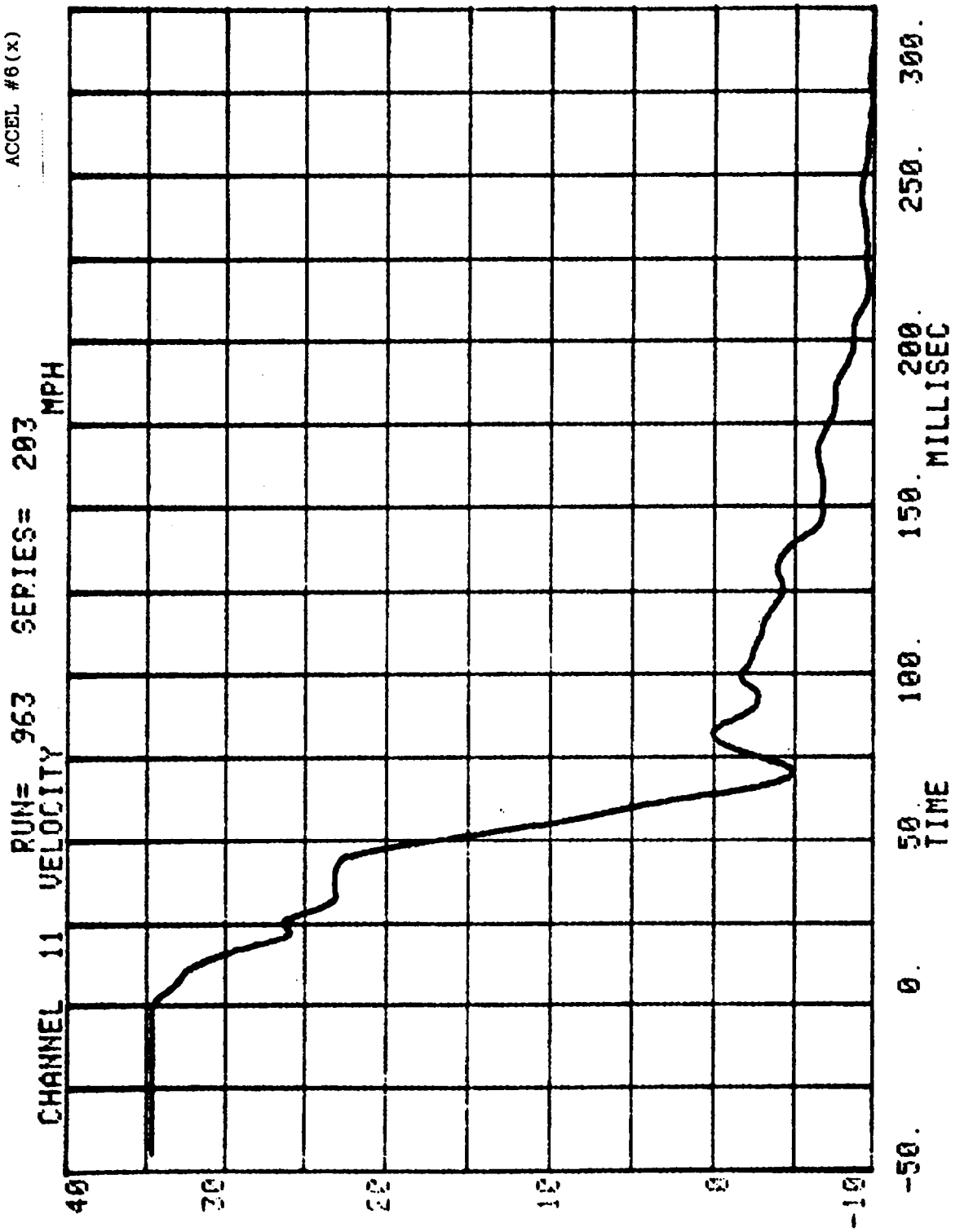
60
40
20
0
-20
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

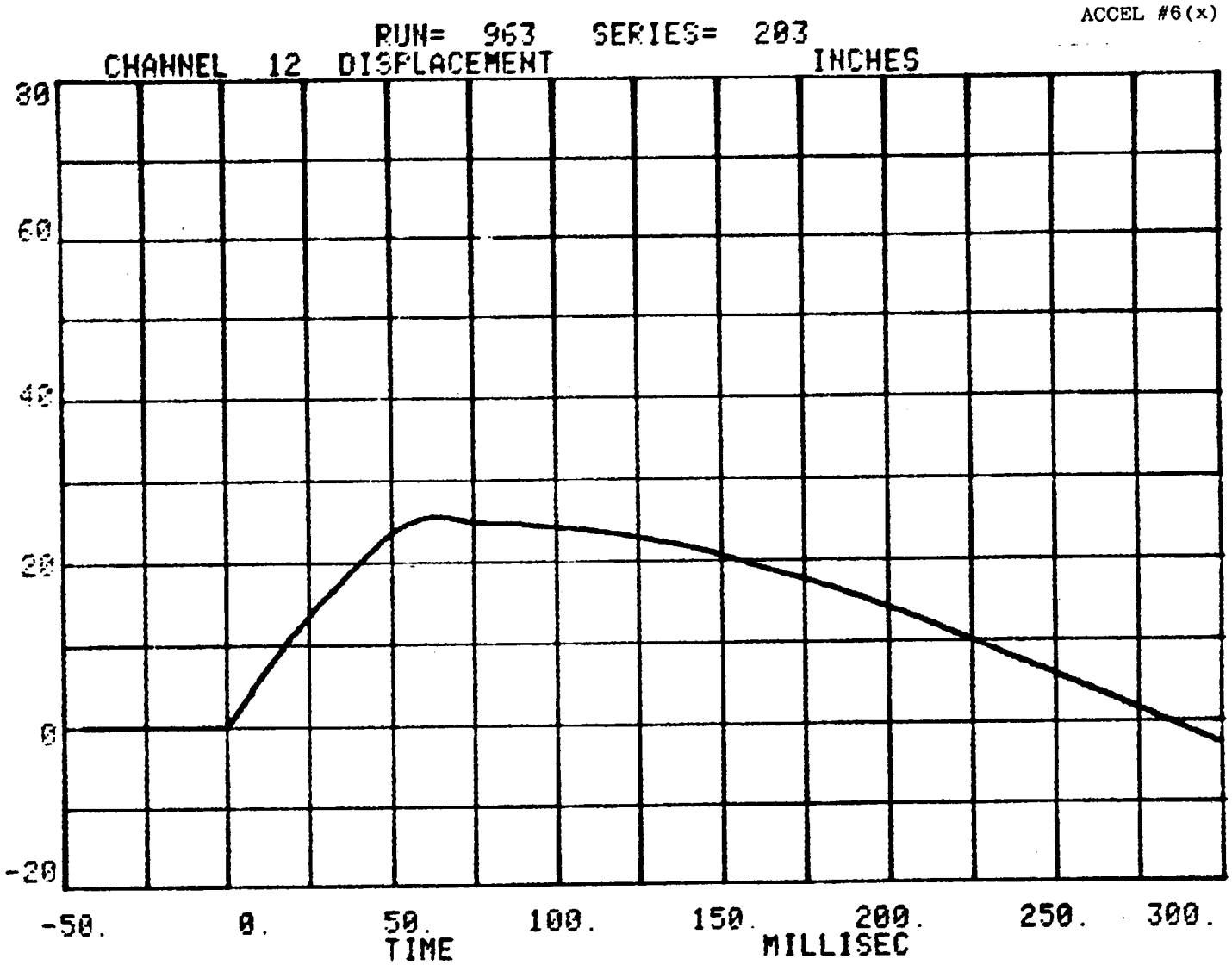

CHANNEL 31 ACC PACK #5(X)
RUN= 963 SERIES= 203
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250
300.
TIME
MILLISEC

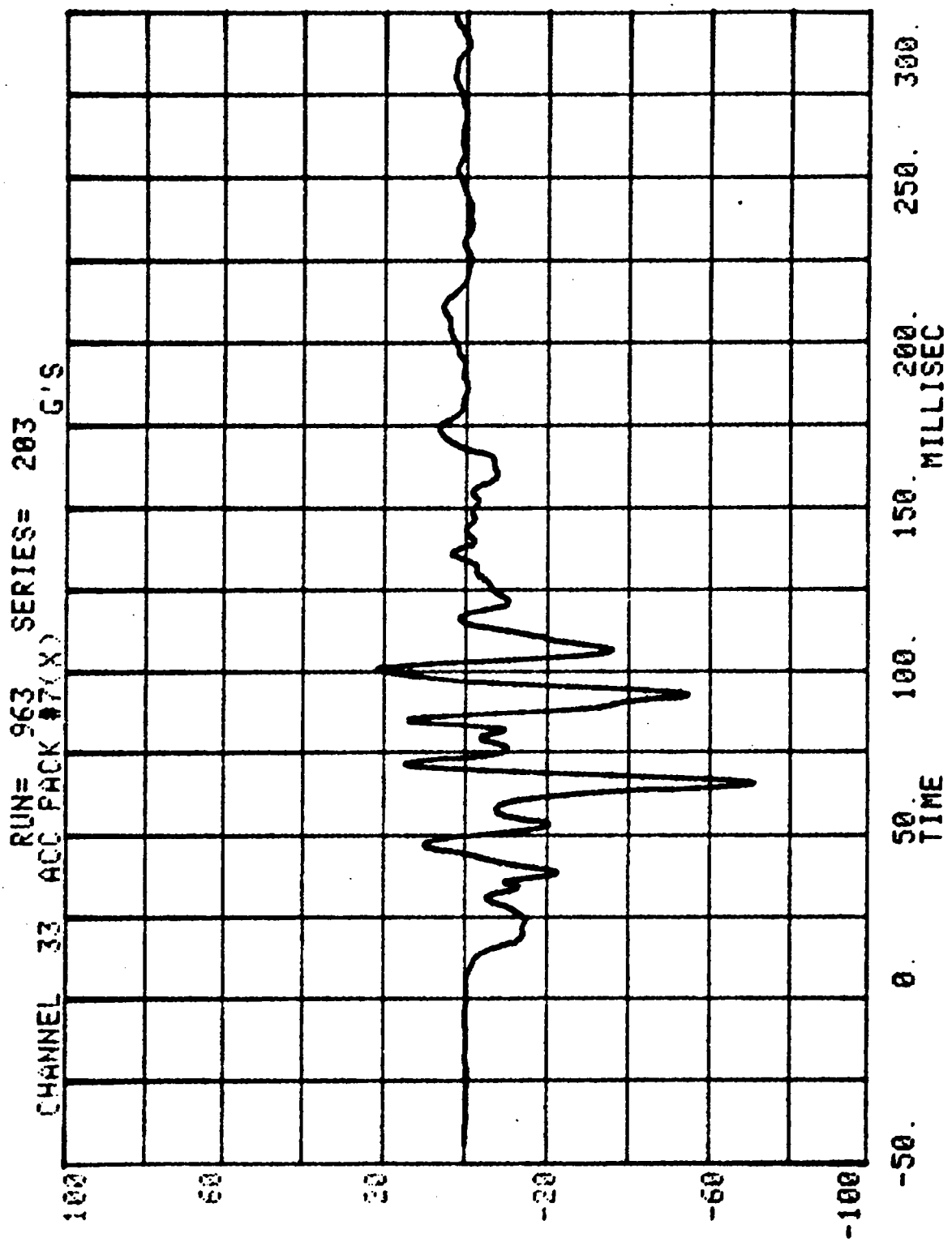

ACCEL #5(X)
CHANNEL 9 VELOCITY
RUN= 963 SERIES= 203
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACCEL #5(x)
CHANNEL 10 DISPLACEMENT
RUN= 963 SERIES= 203
INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

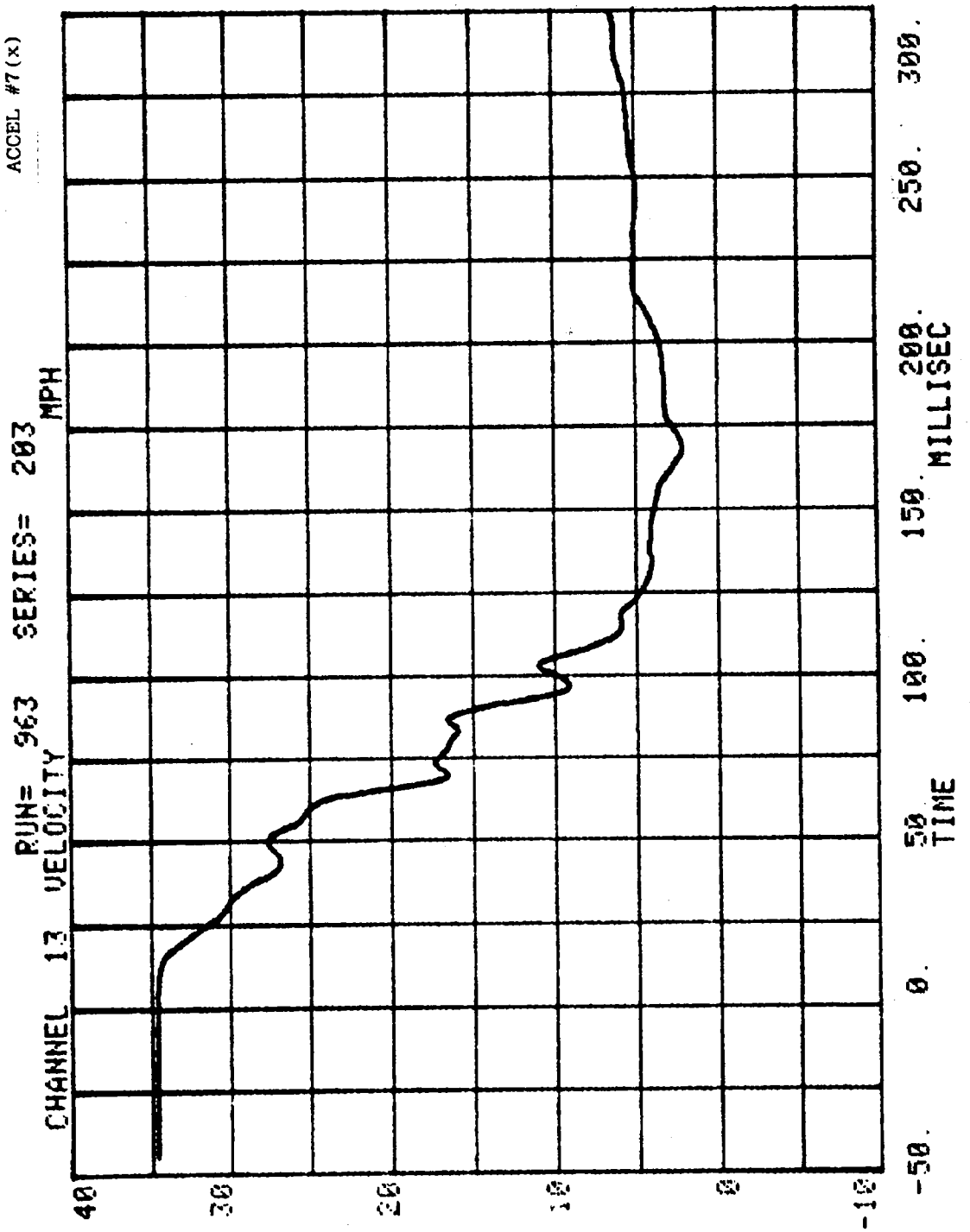

CHANNEL 32 ACC PACK #6(X)
RUN= 963 SERIES= 203
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

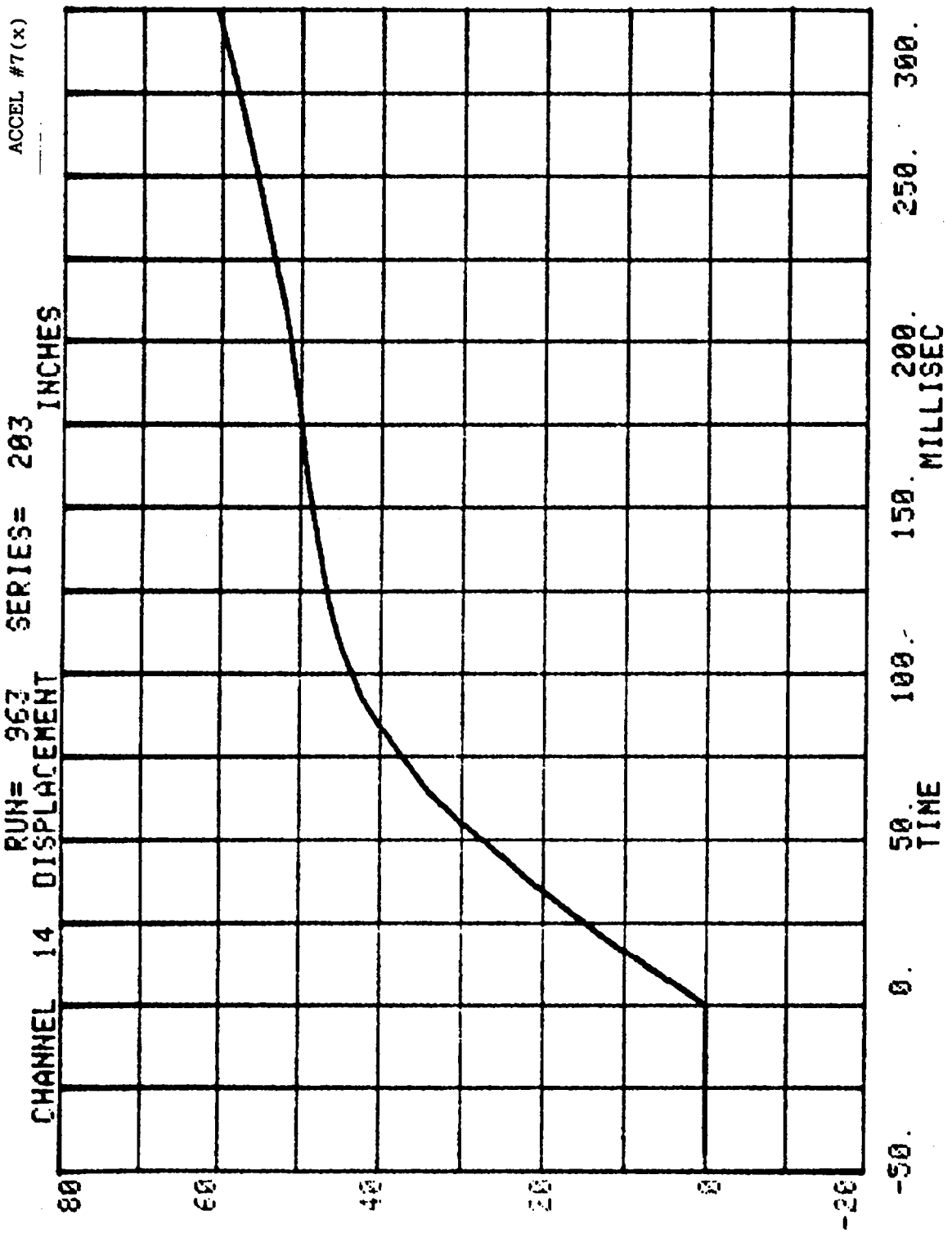

ACCEL #6(x)
CHANNEL 11 VELOCITY
RUN= 963 SERIES= 203
MPH
40
20
0
-20
-40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACCEL #6(x)
RUN= 963 SERIES= 203
CHANNEL 12 DISPLACEMENT
INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 33 ACC PACK #7(X)
RUN= 963 SERIES= 203
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10


ACCEL #7(x)
CHANNEL 13 VELOCITY
RUN= 963 SERIES= 203
MPH
40
30
20
10
0
-10
-50.
0.
50
100.
150.
200.
250.
300.
TIME
MILLISEC

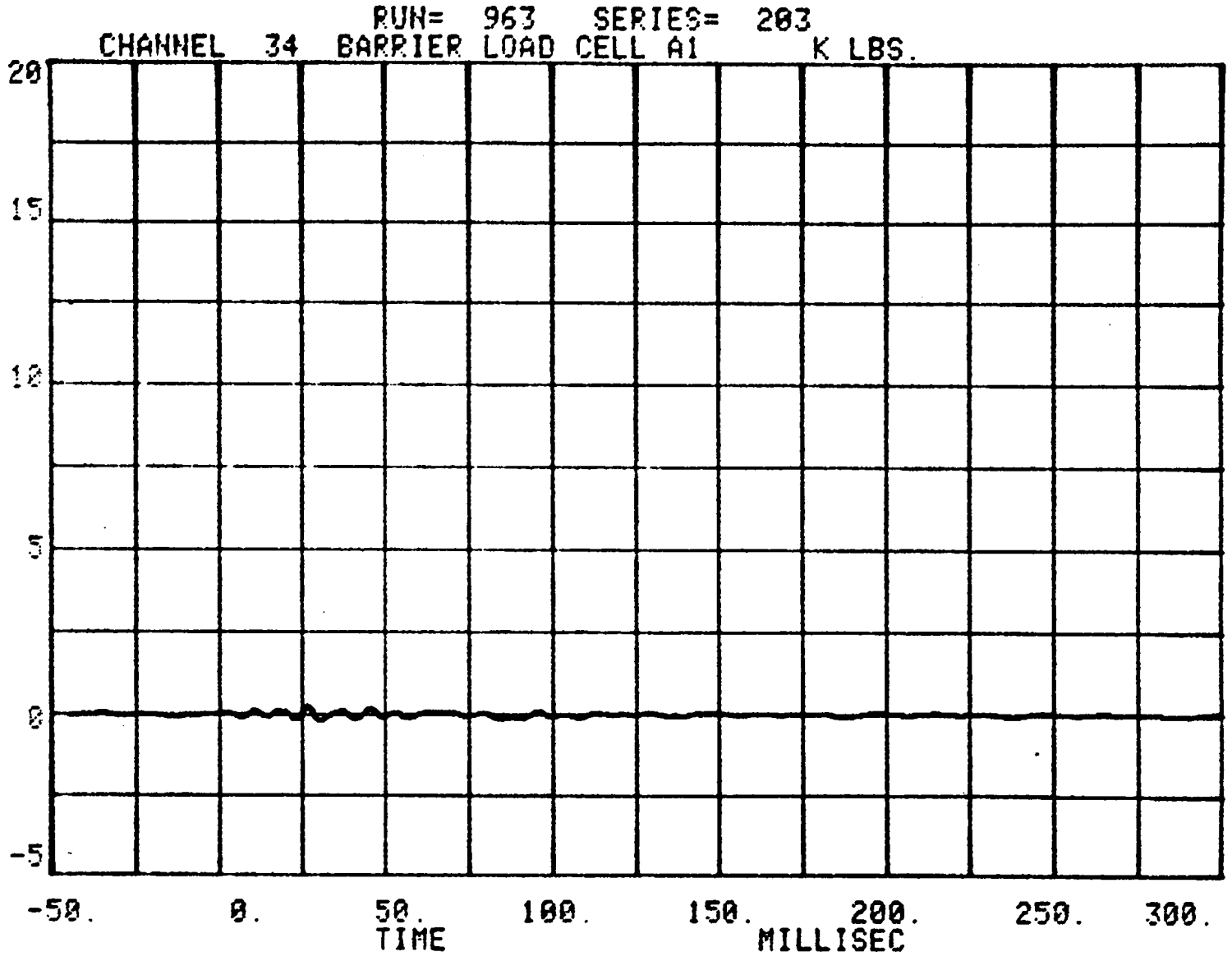

ACCEL #7(x)
CHANNEL 14 DISPLACEMENT
RUN= 963 SERIES= 203
INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

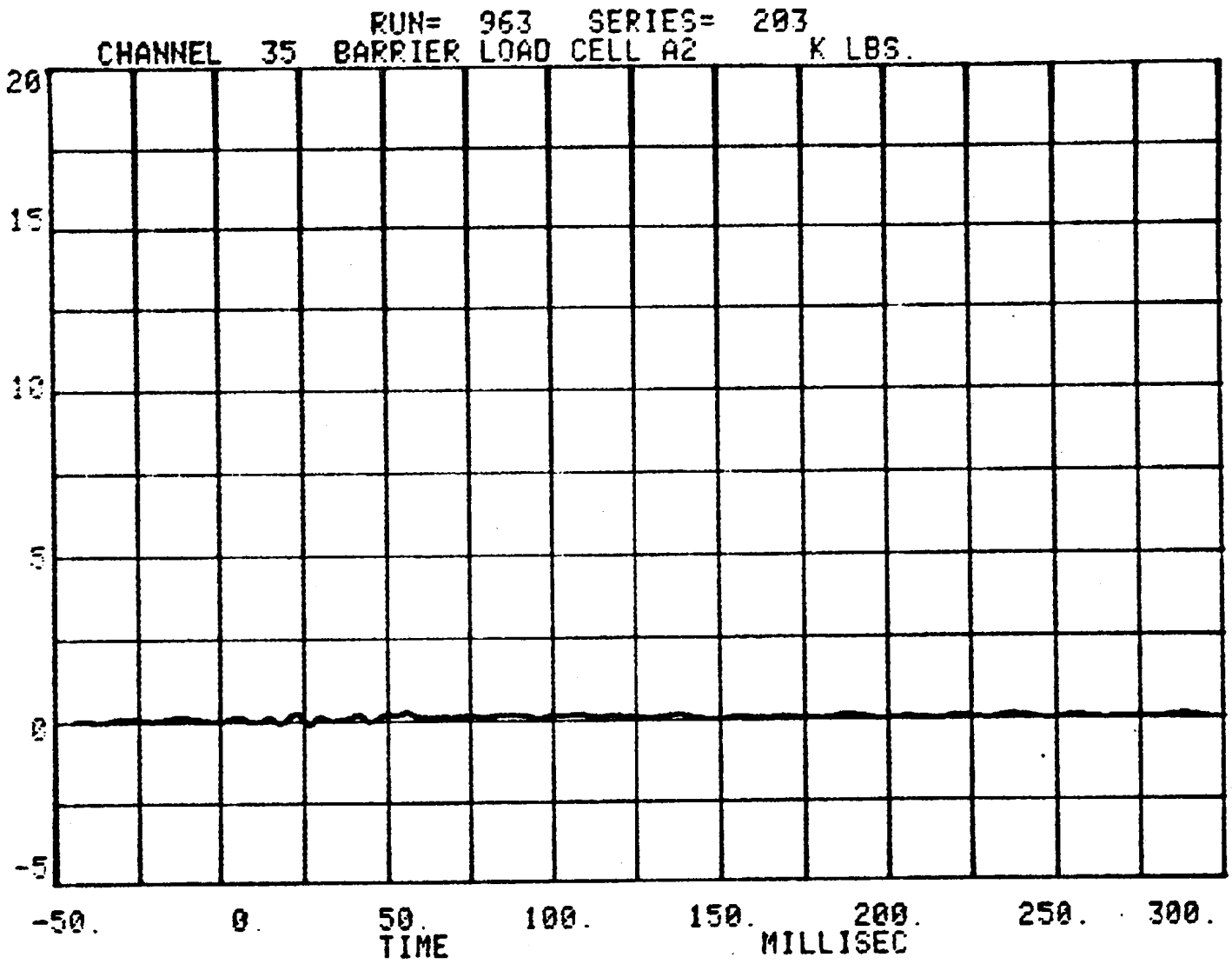
TEST NO. ML0203

LOAD CELL BARRIER DATA

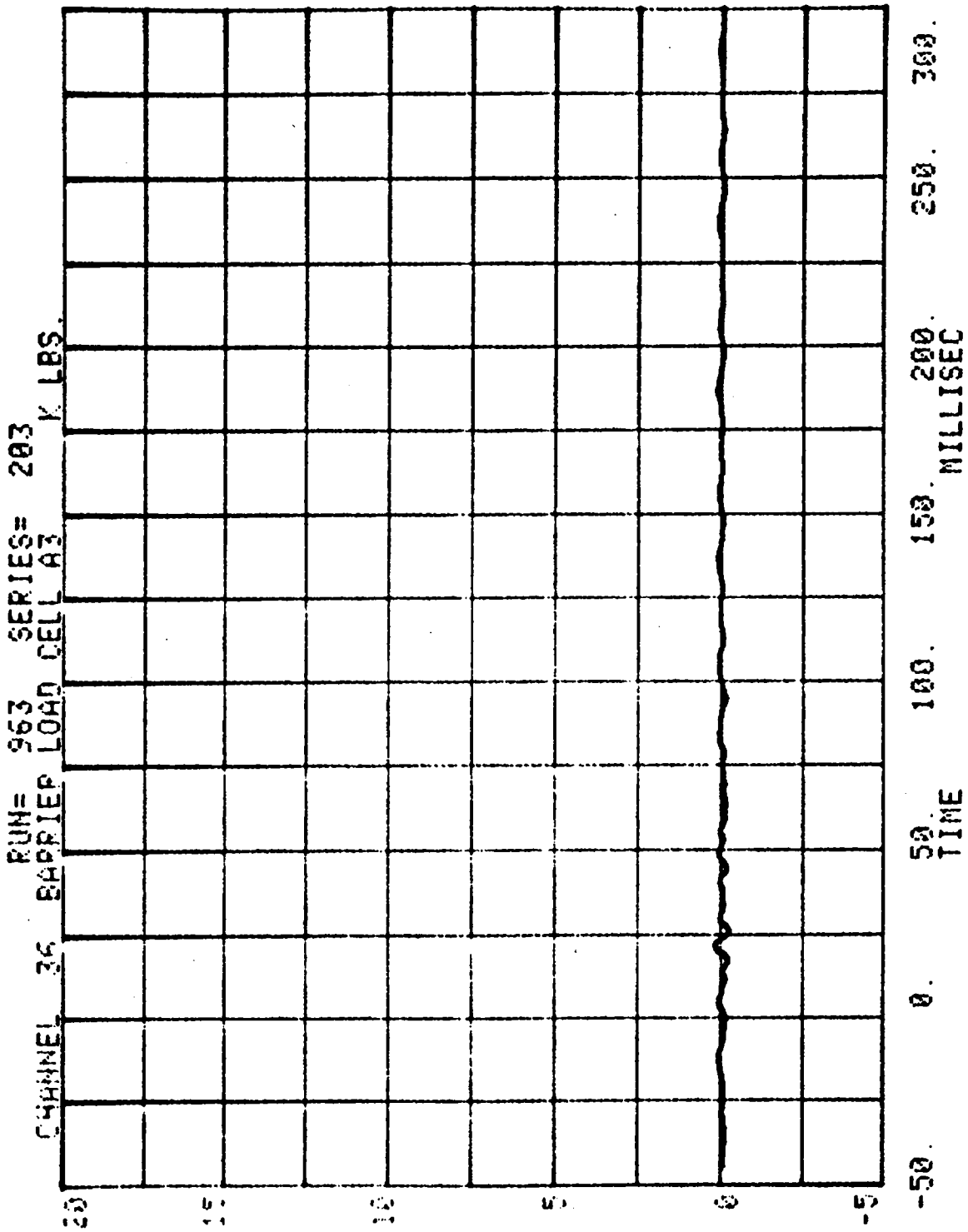
FILTER CHANNEL CLASS

60

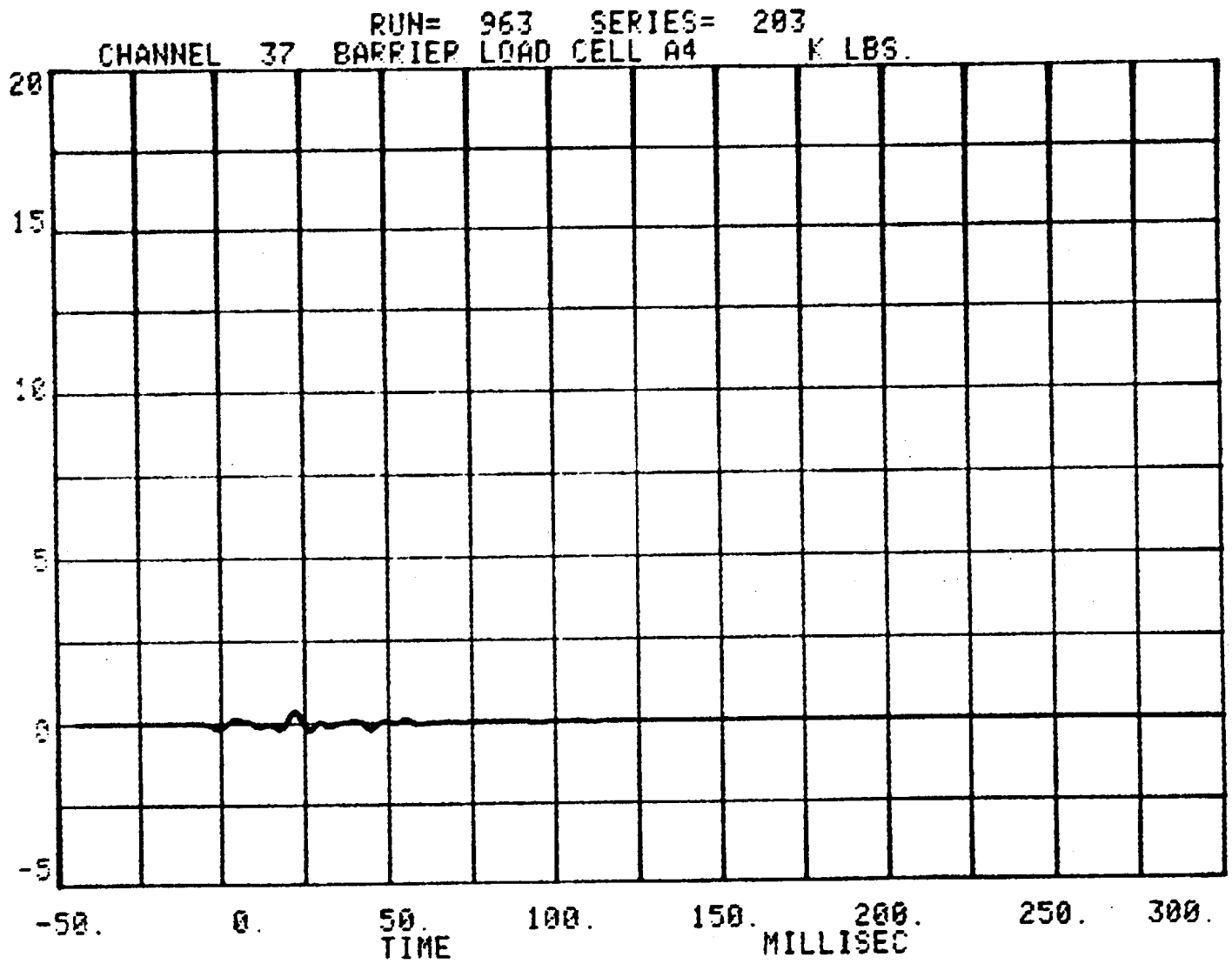

RUN= 963 SERIES= 203
CHANNEL 34 BARRIER LOAD CELL A1 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 963 SERIES= 203
CHANNEL 35 BARRIER LOAD CELL A2 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

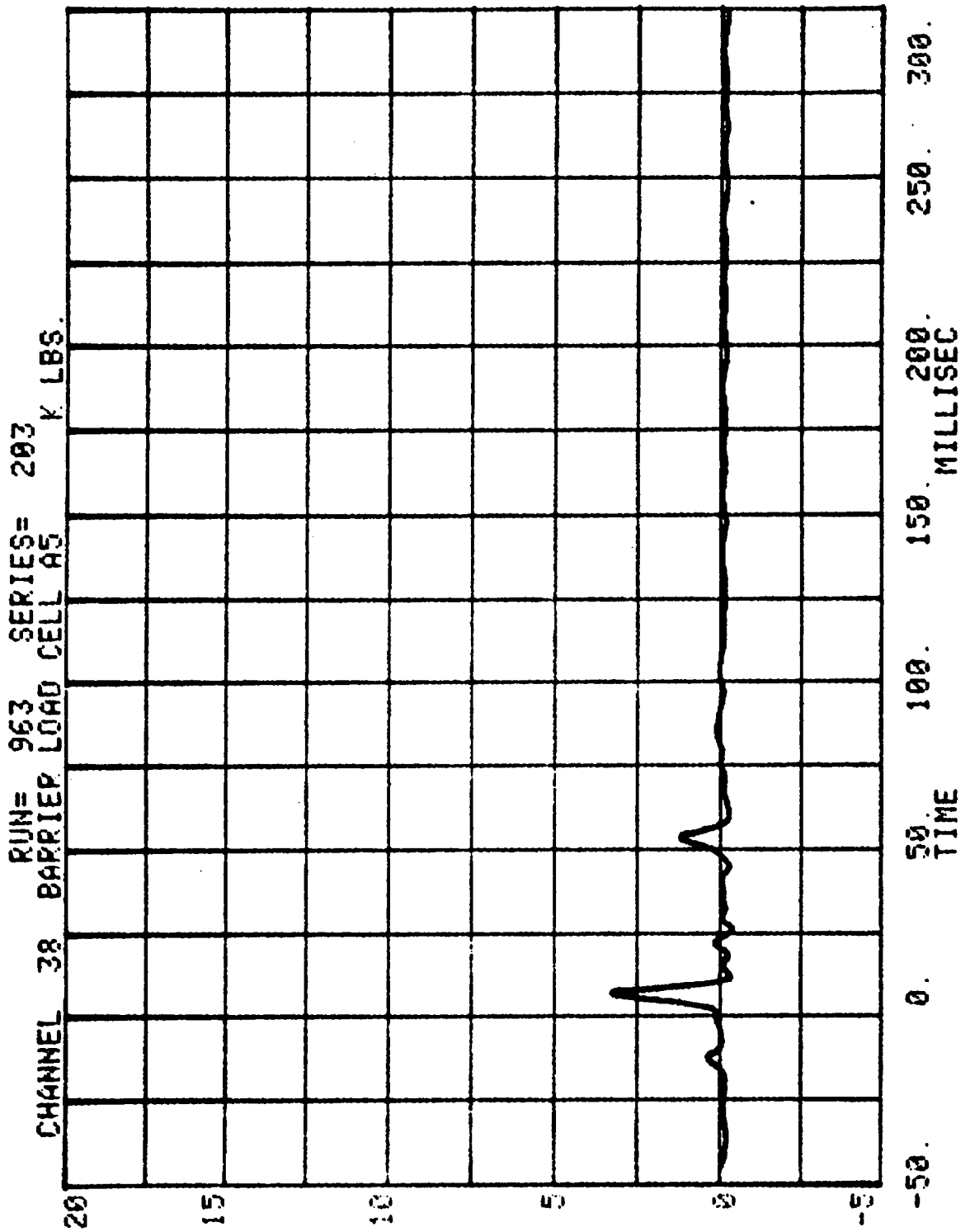
7776-10

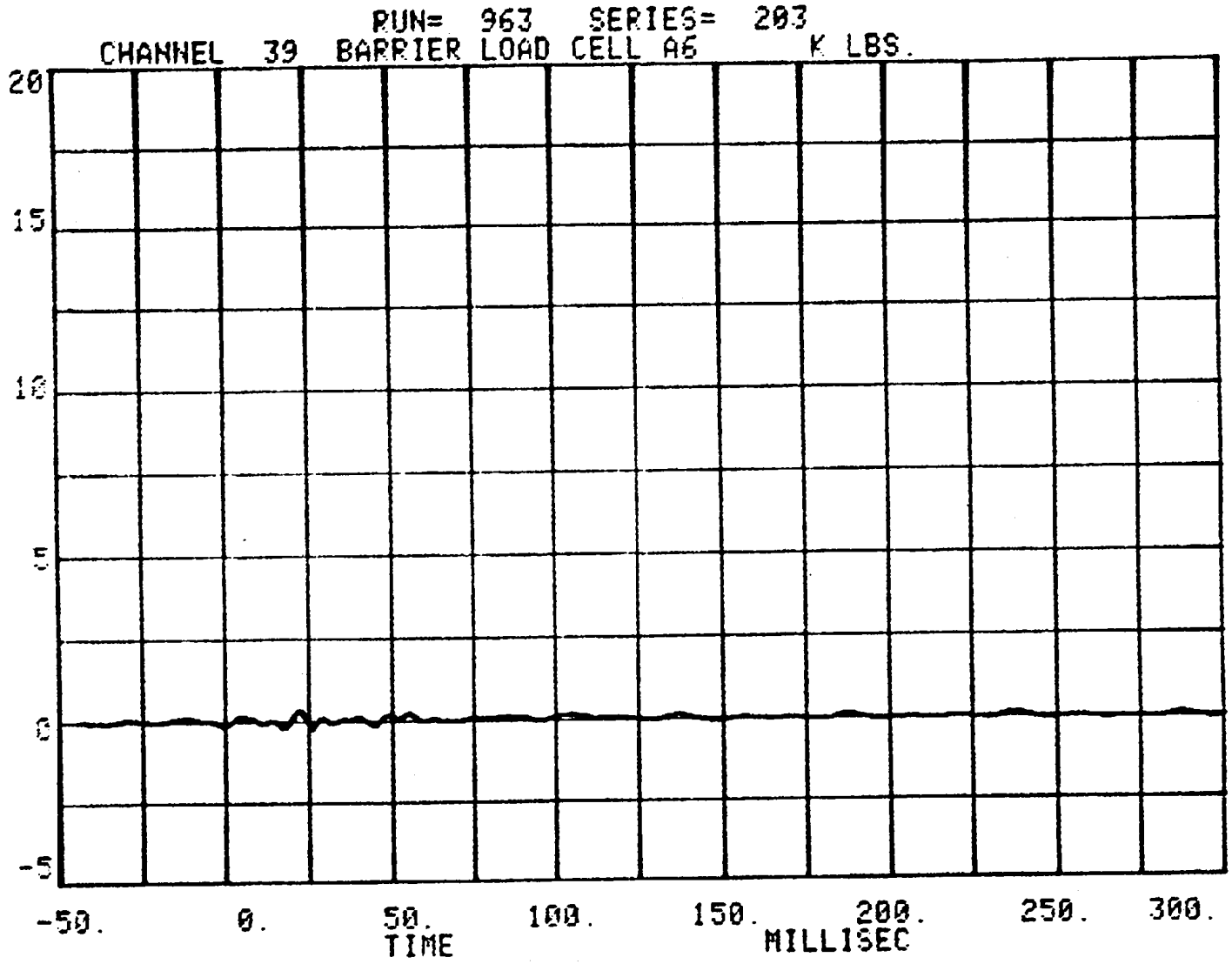

CHANNEL 36
RUN= 963 SERIES= 203
BARRIER LOAD CELL A3
K LBS.
-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC

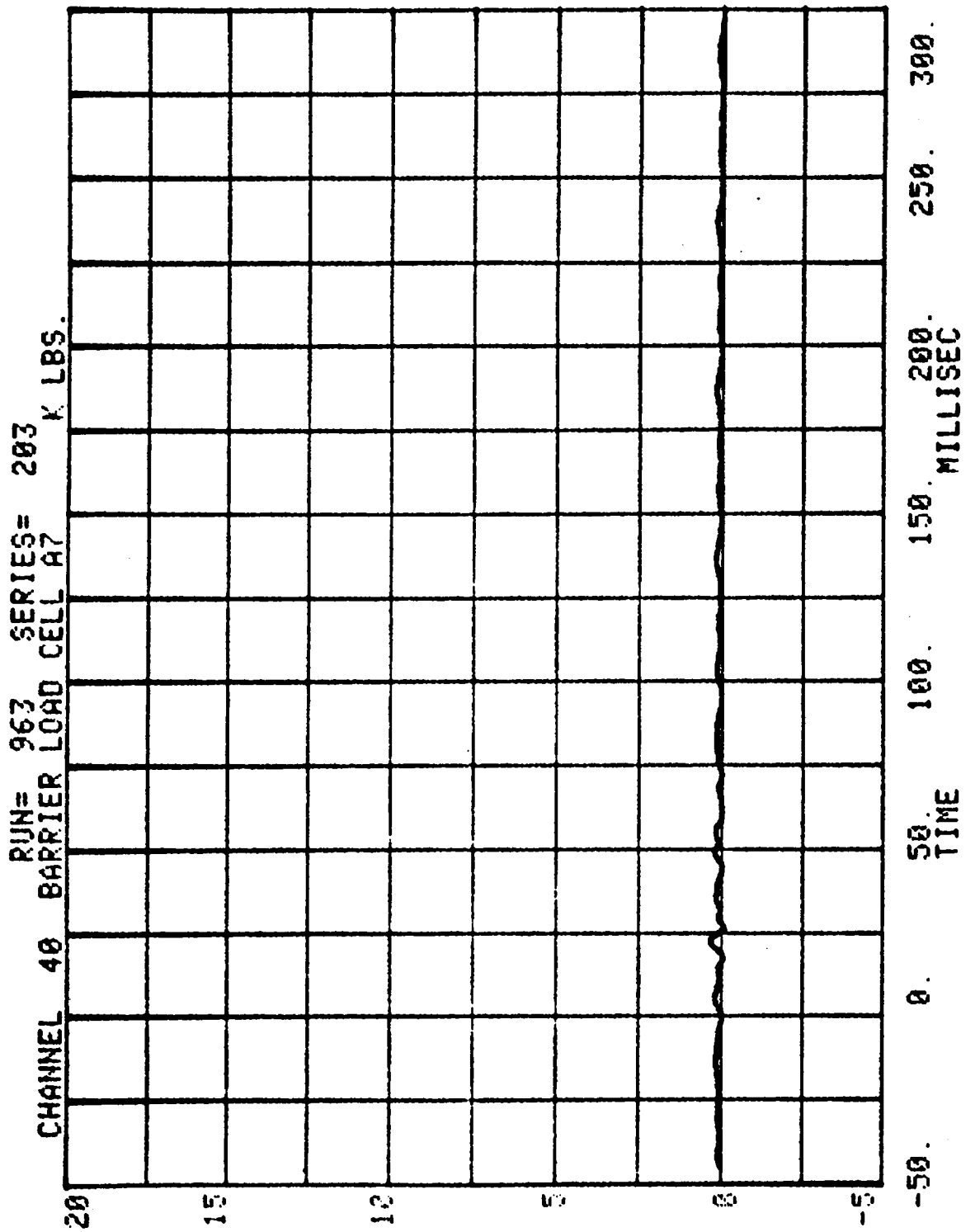
7776-10

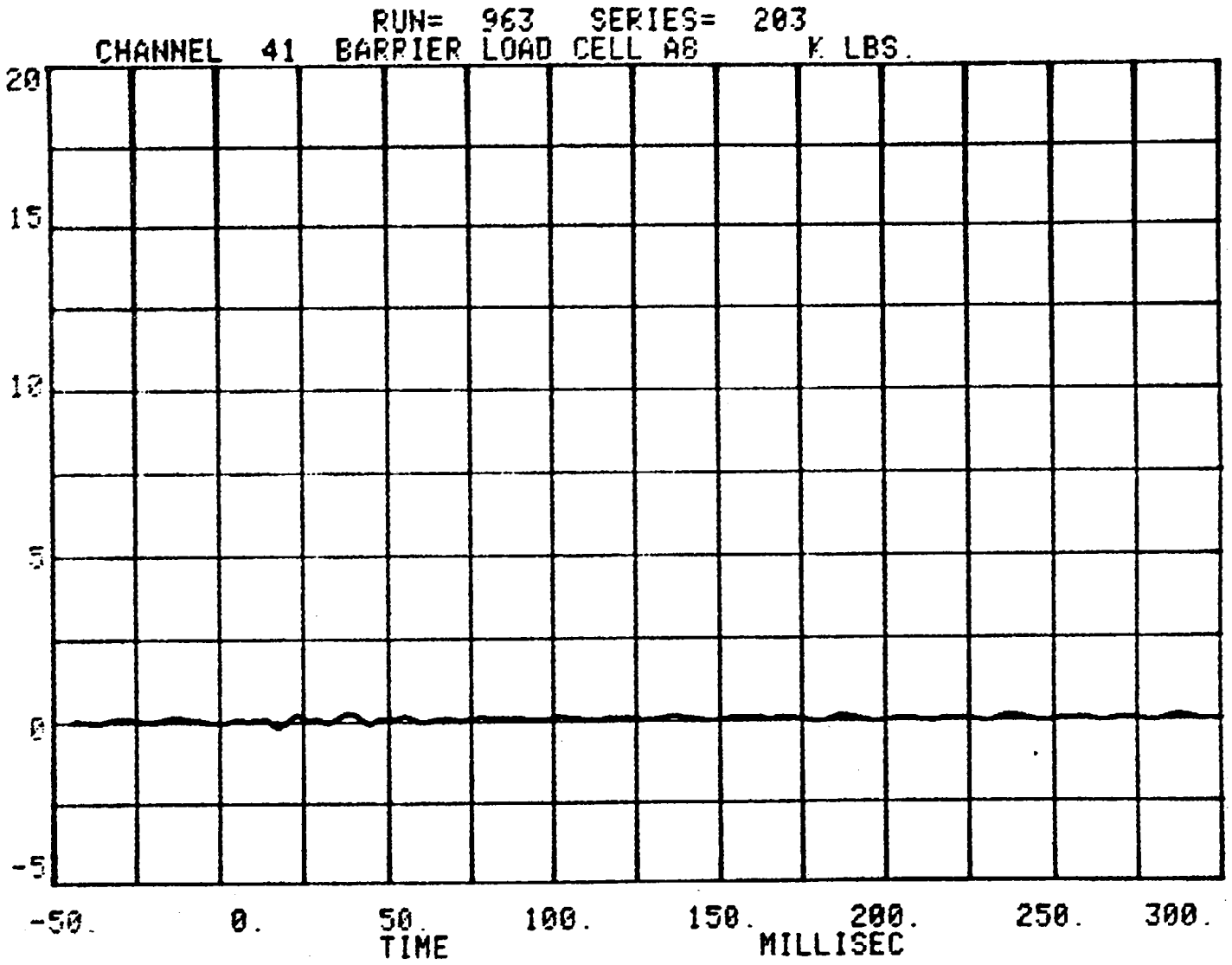

RUN= 963 SERIES= 203
CHANNEL 37 BARRIEP LOAD CELL A4 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

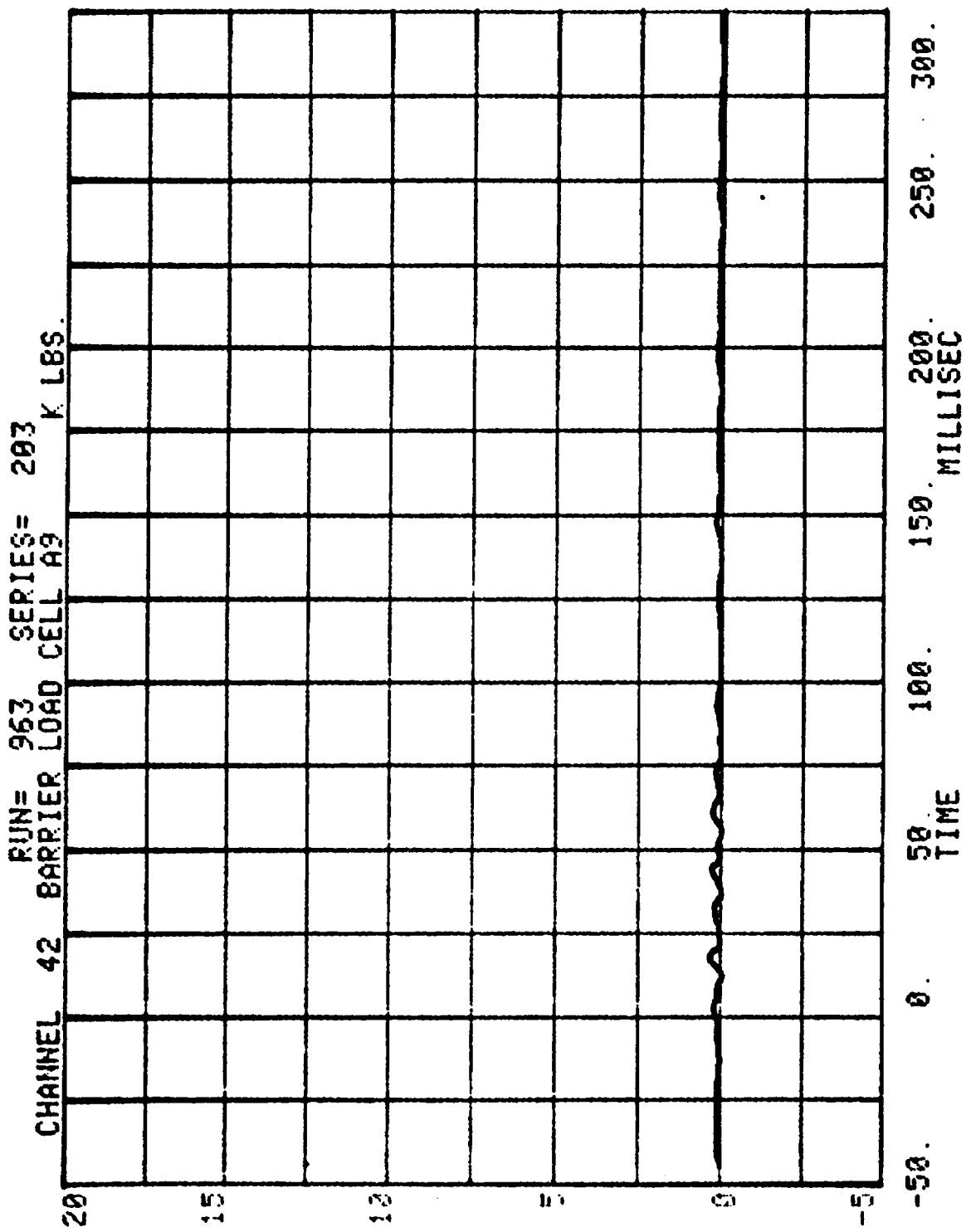
7776-10

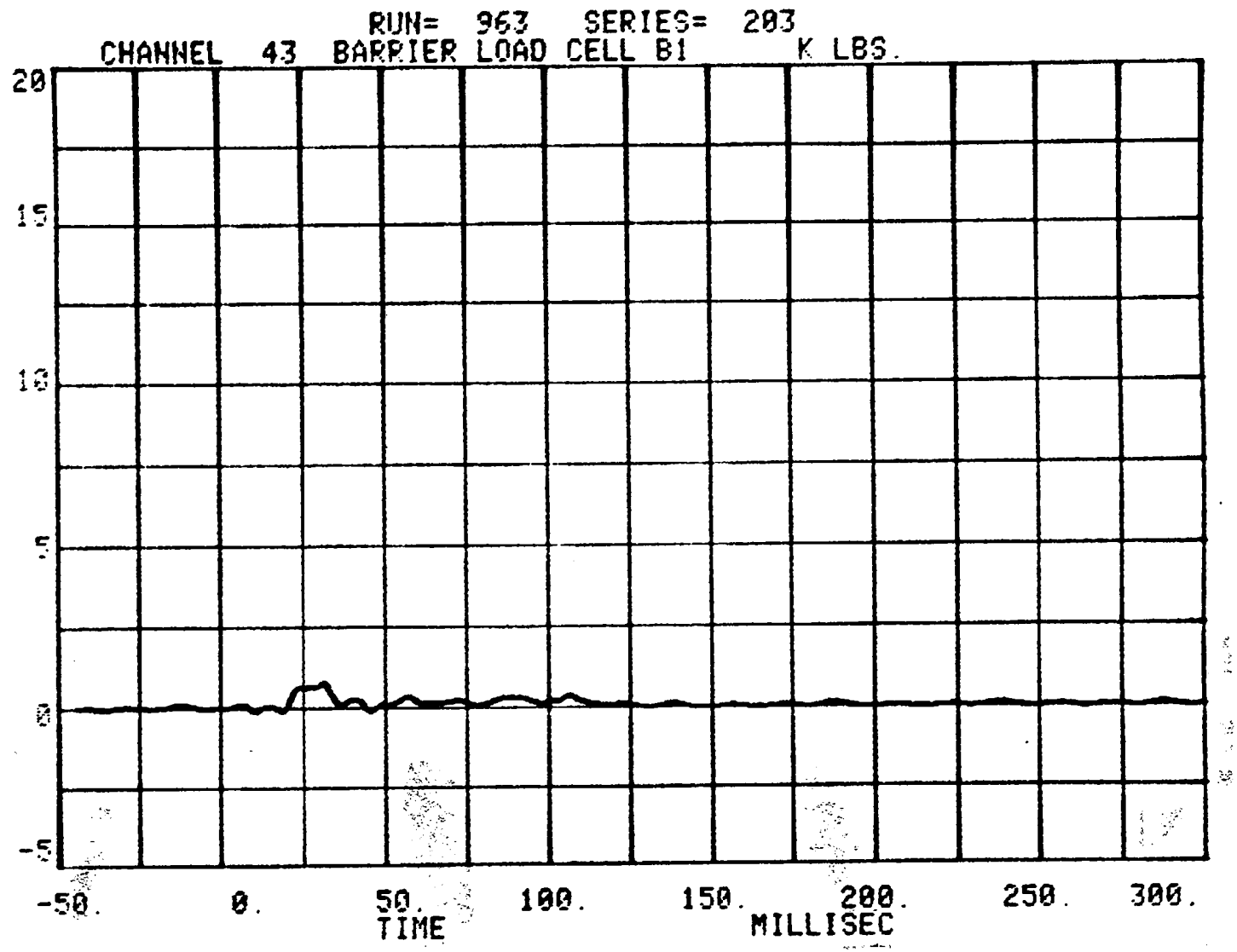

CHANNEL 38
RUN= 963 SERIES= 203
BARRIER LOAD CELL A5
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 963 SERIES= 203
CHANNEL 39 BARRIER LOAD CELL A6 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

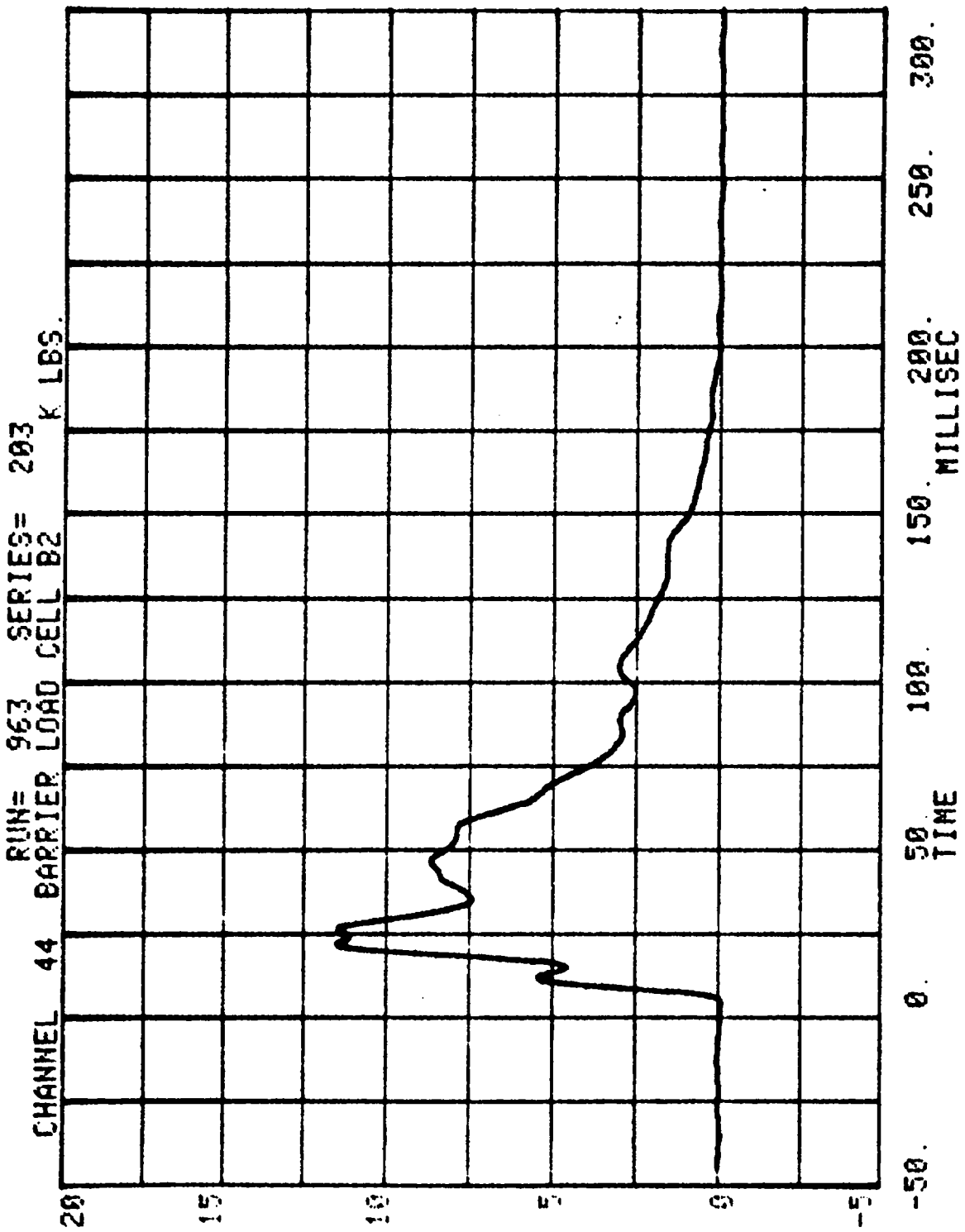

CHANNEL 40 BARRIER LOAD CELL A7
RUN= 963 SERIES= 203
K LBS.
20
15
12
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

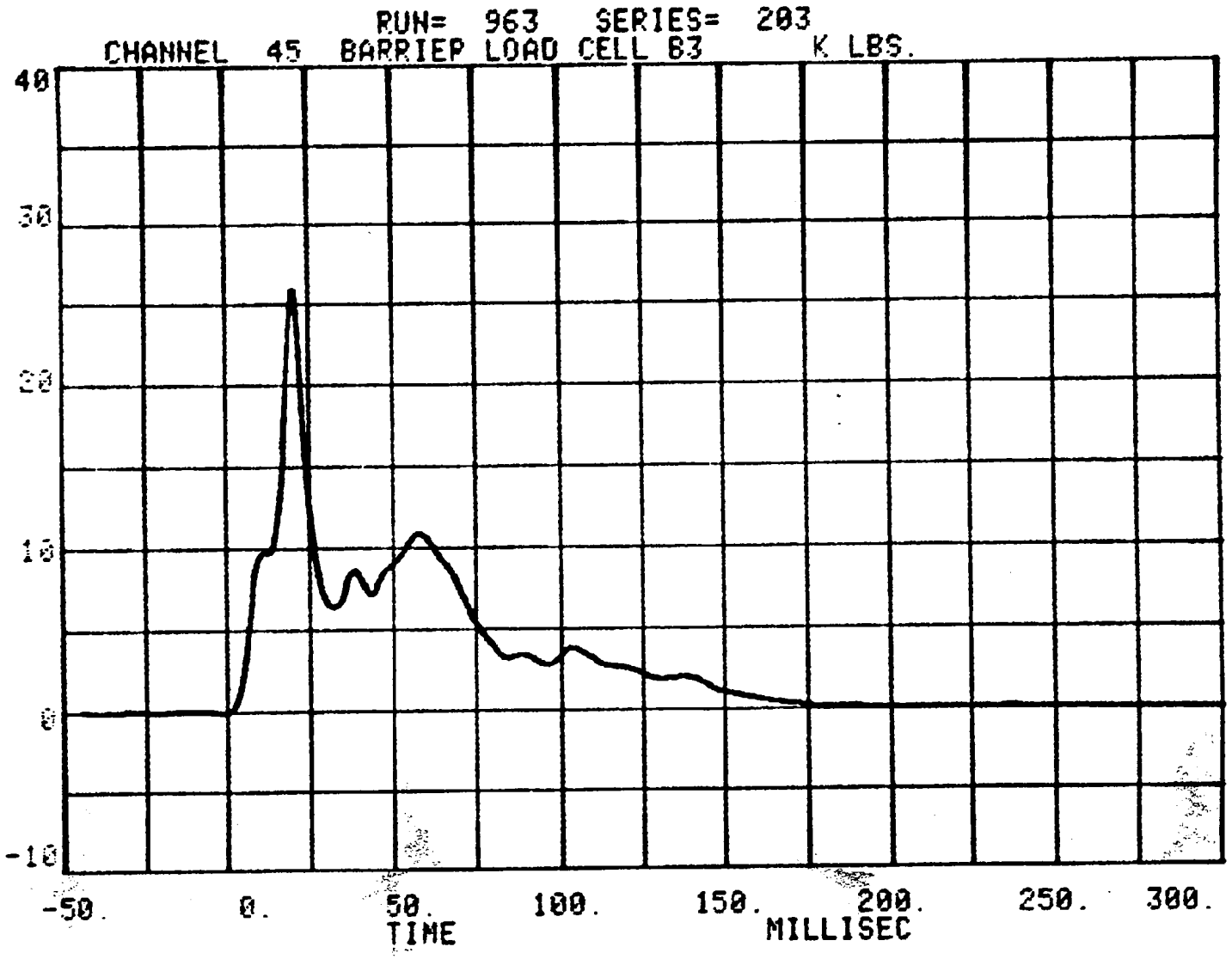

RUN= 963 SERIES= 203
CHANNEL 41 BARRIER LOAD CELL A8 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

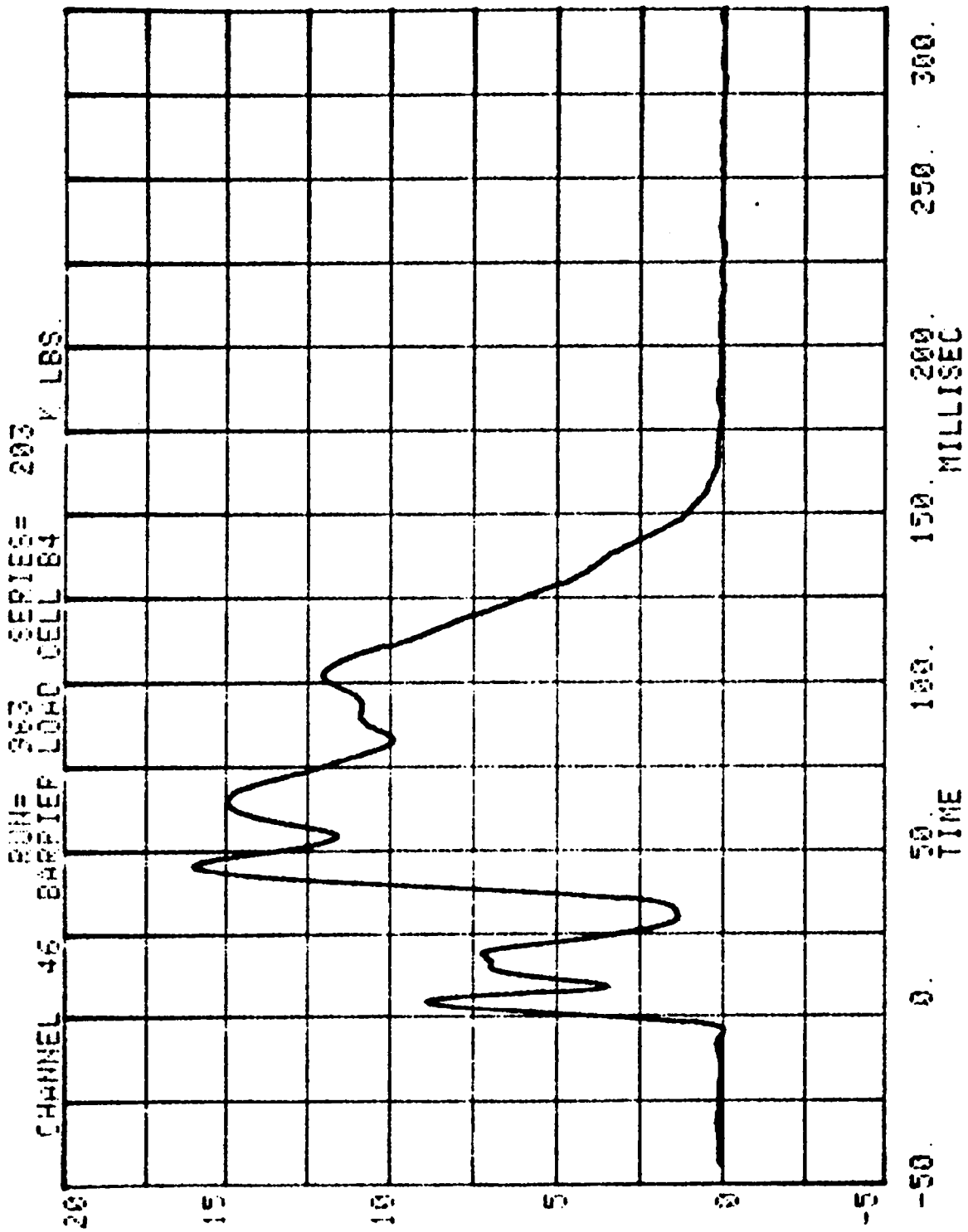

CHANNEL 42
RUN= 963 SERIES= 203
BARRIER LOAD CELL A9
K LBS.
20
15
10
5
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

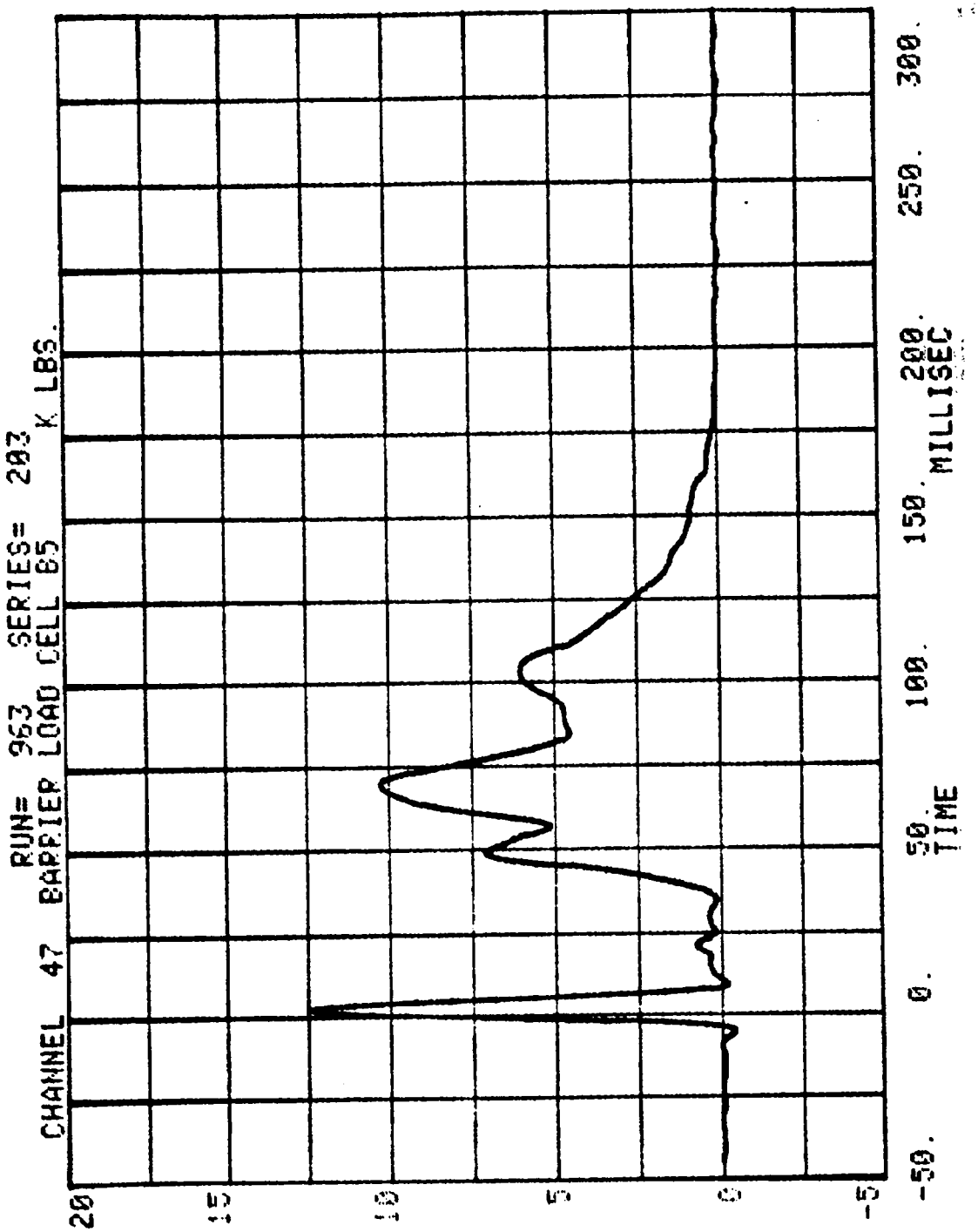

RUN= 963 SERIES= 203
CHANNEL 43 BARRIER LOAD CELL B1 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

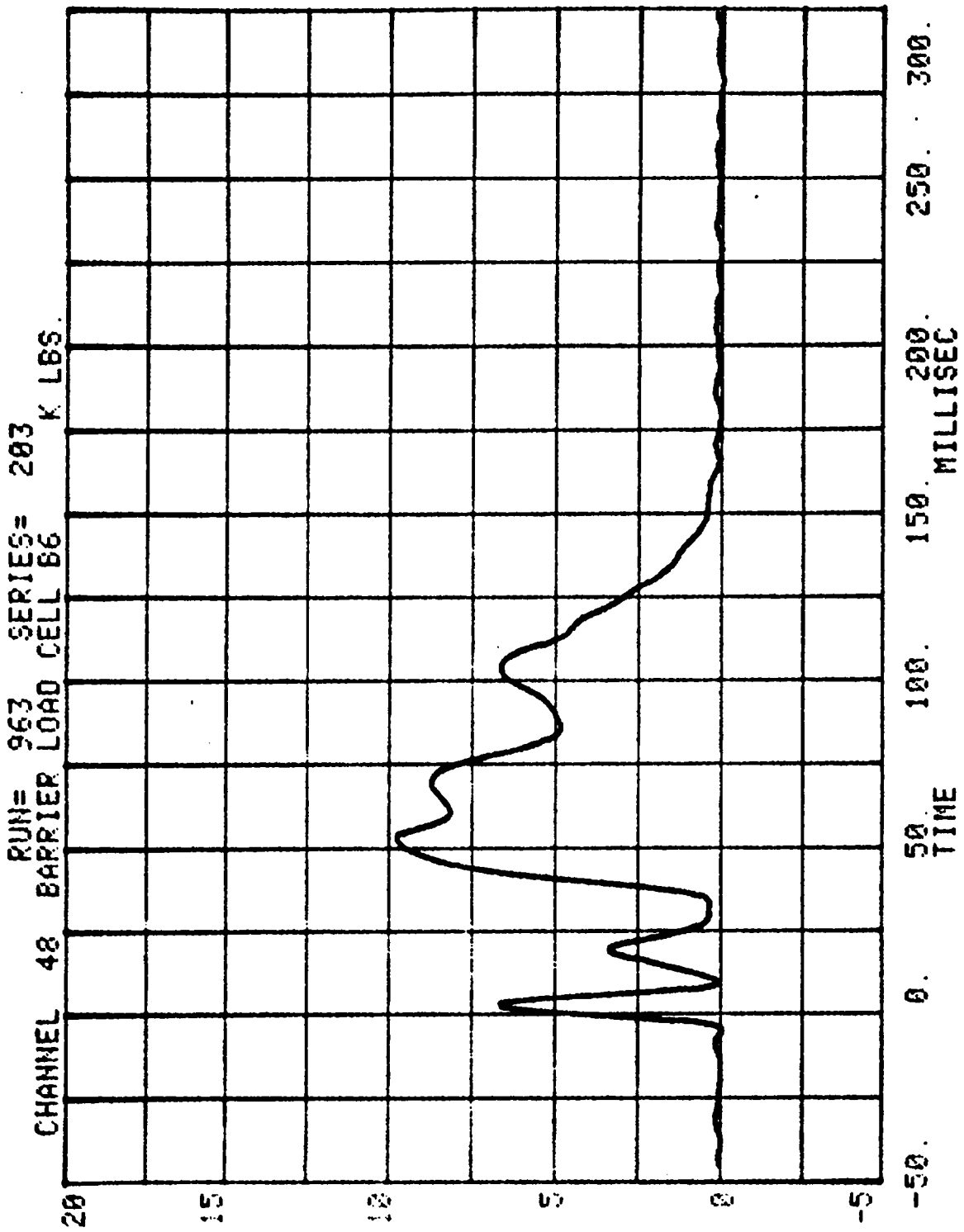
7776-10

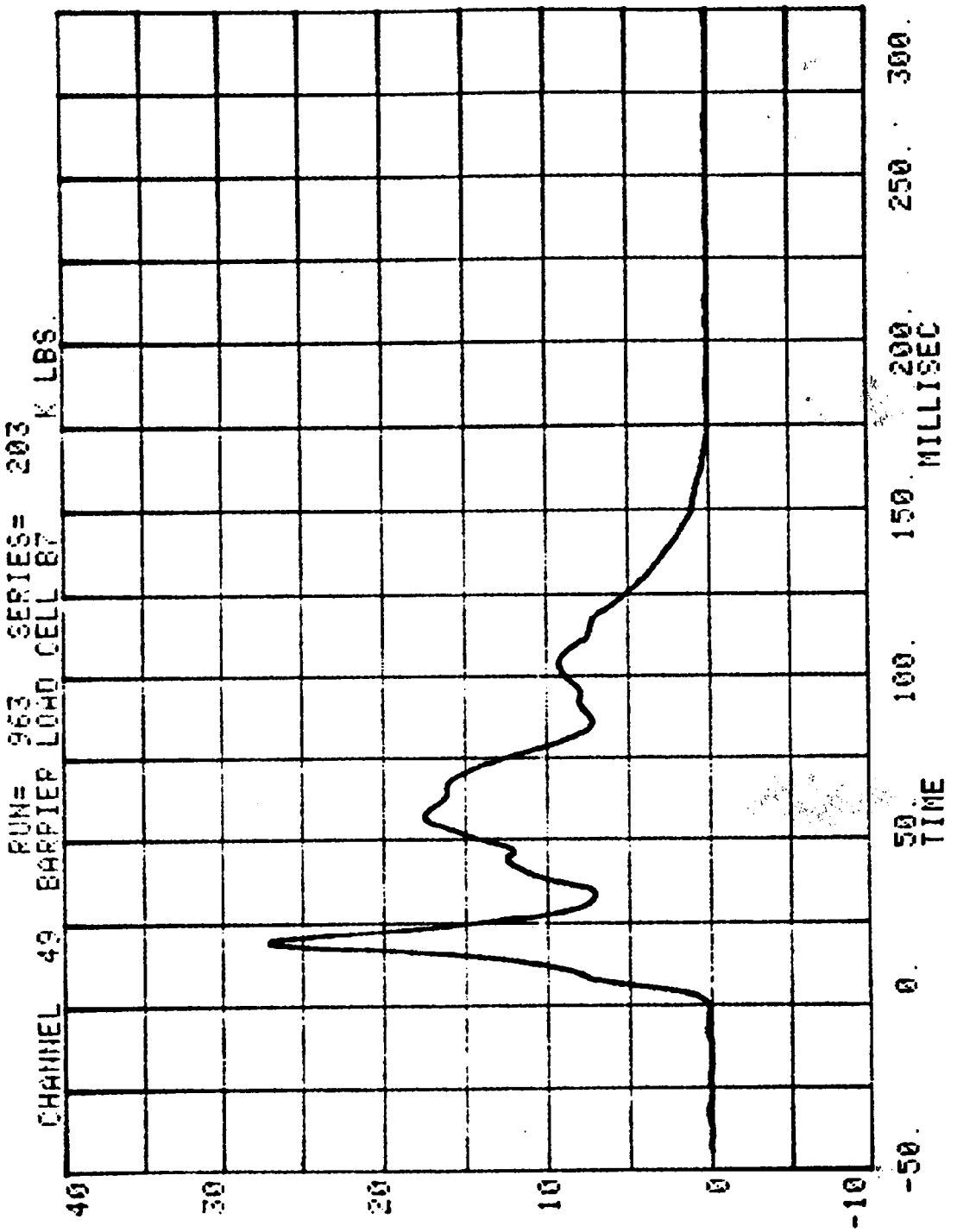

CHANNEL 44
RUN= 963 SERIES= 203
BARRIER LOAD CELL B2
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

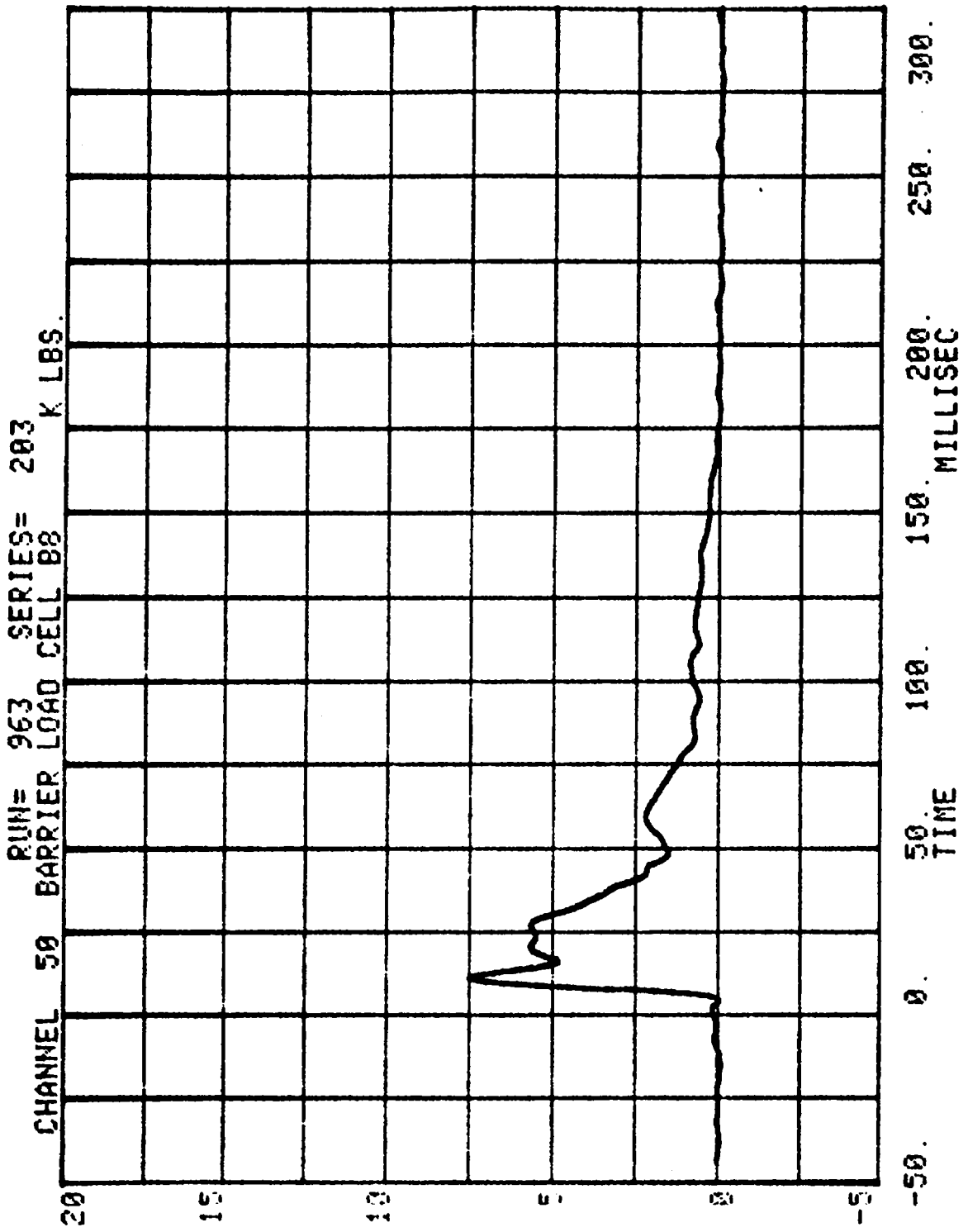

RUN= 963 SERIES= 203
CHANNEL 45 BARRIER LOAD CELL B3 K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

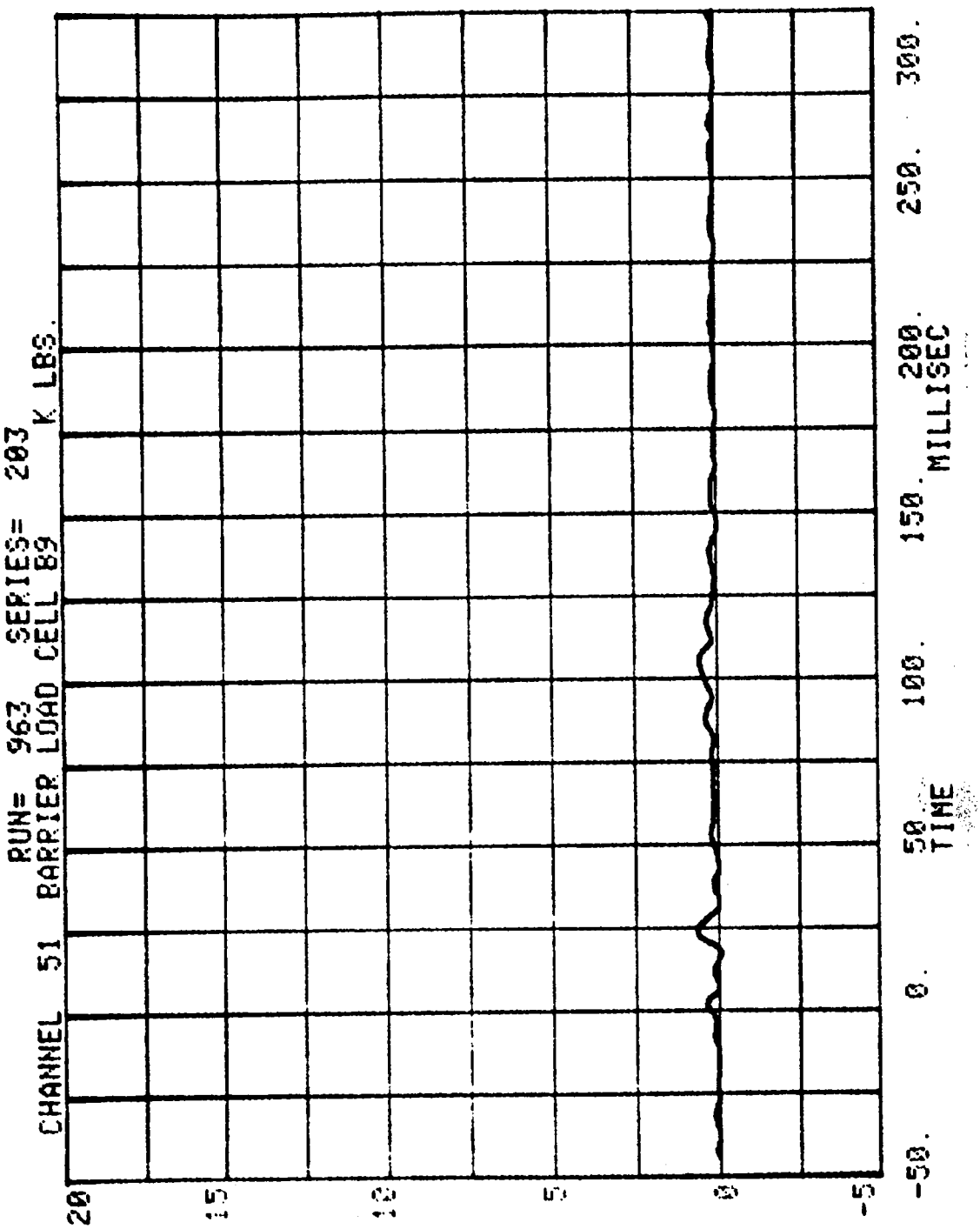

CHANNEL 45 BARRIER LOAD CELL 84
RUN= 283 SERIES= 283
-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC
20 15 10 5 0 -5
X LBS.

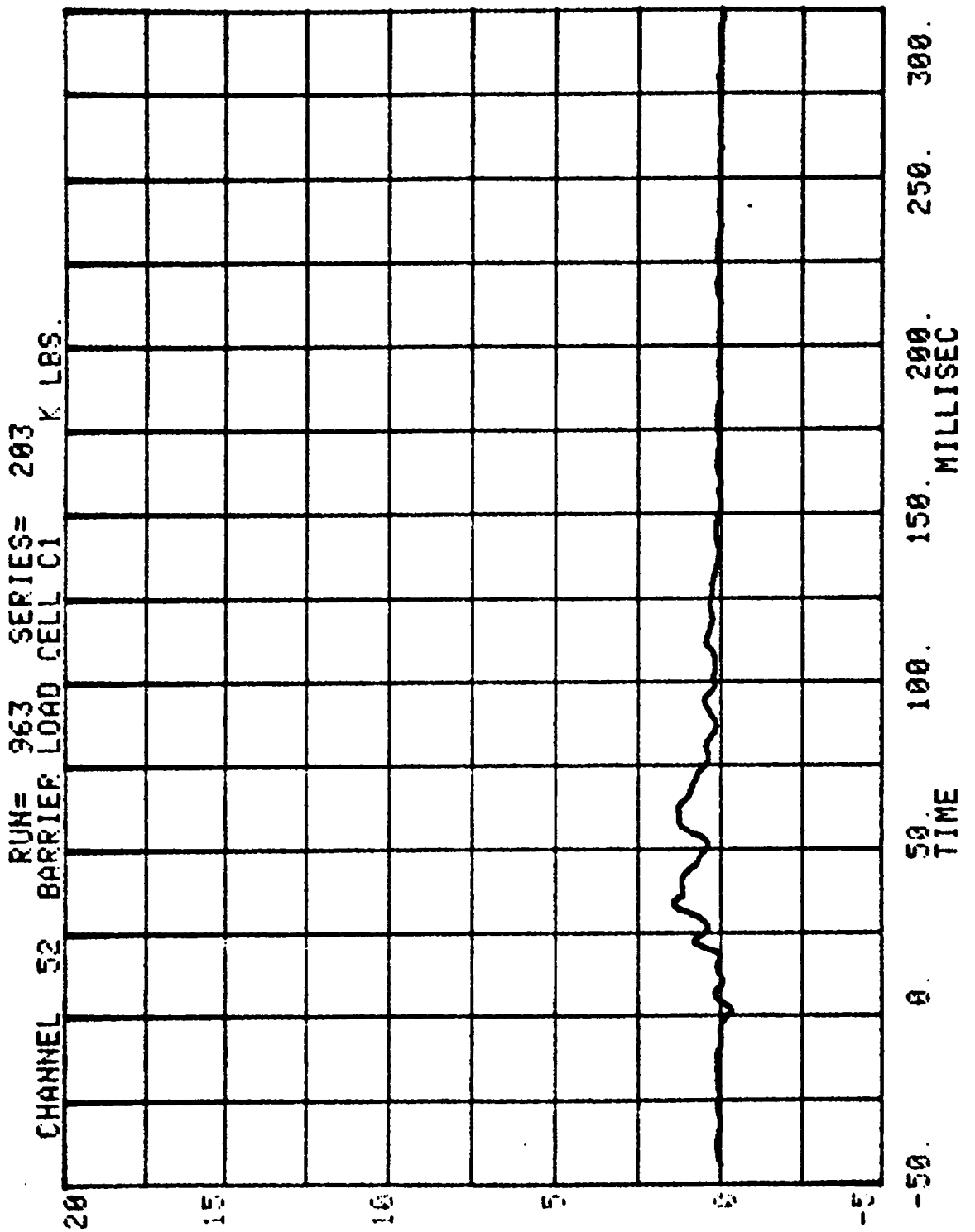

CHANNEL 47 BARRIER LOAD CELL 85
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

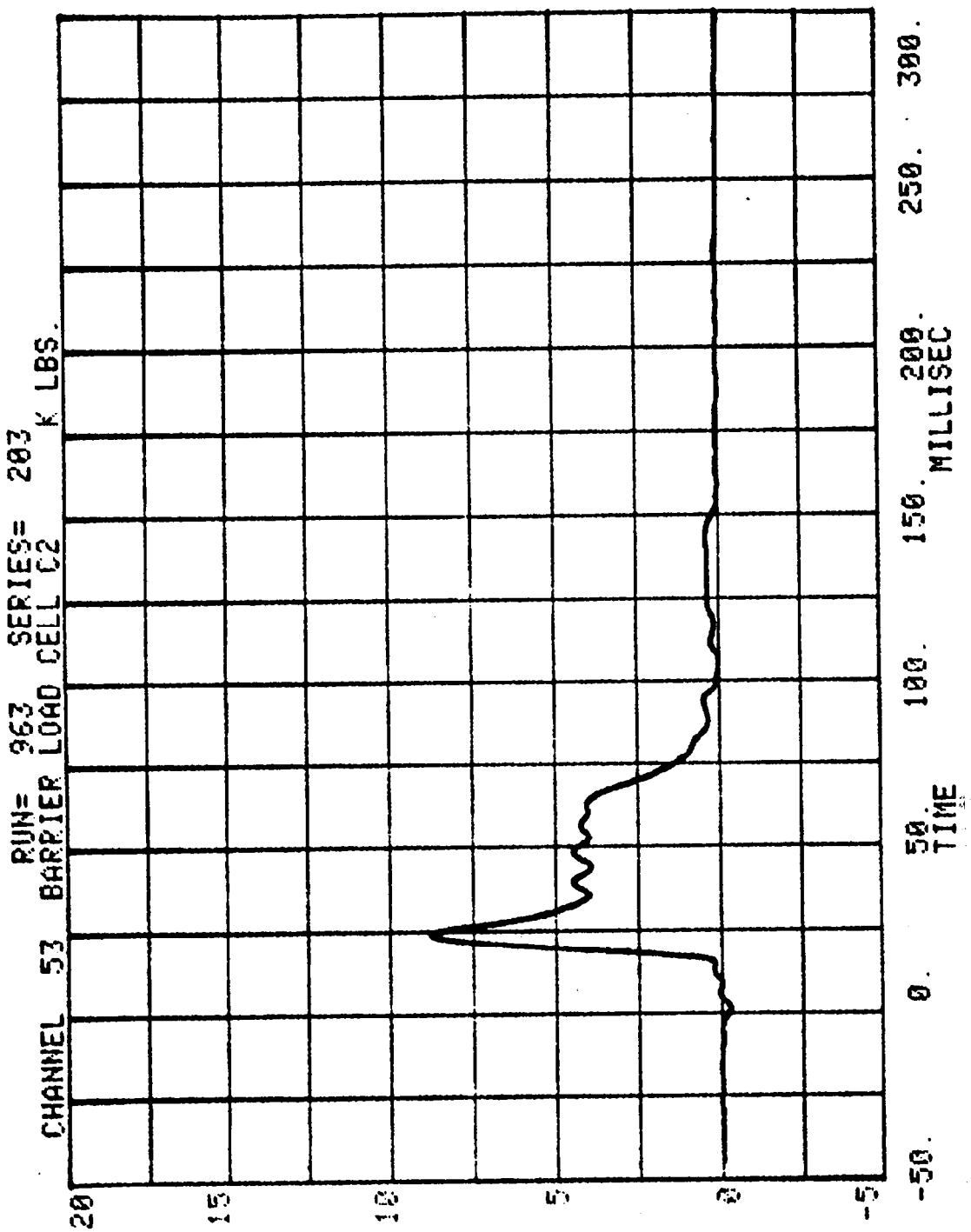

CHANNEL 48 BARRIER LOAD CELL 86
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

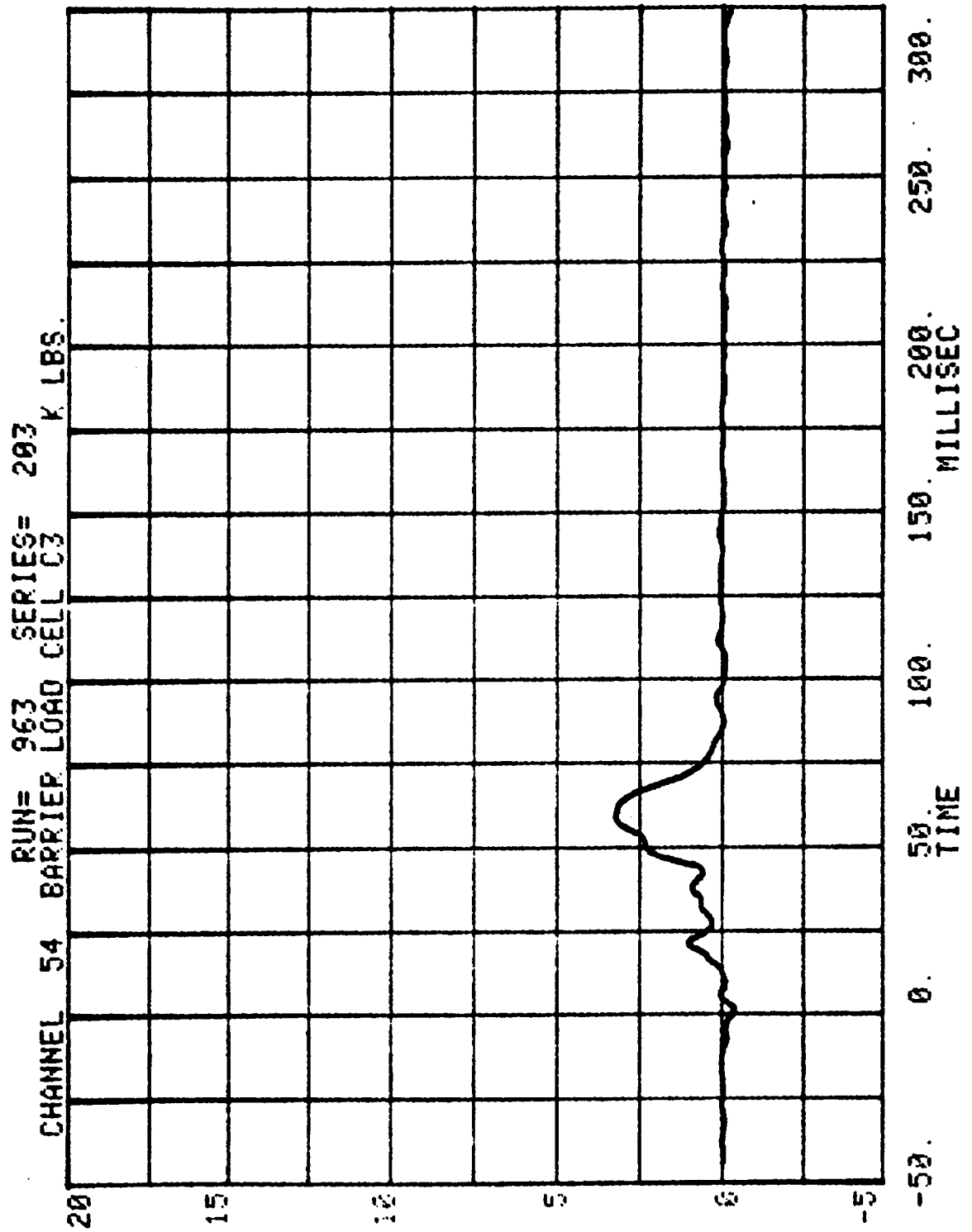

CHANNEL 49 BARRIER LOAD CELL 87
RUN= 963 SERIES= 203
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

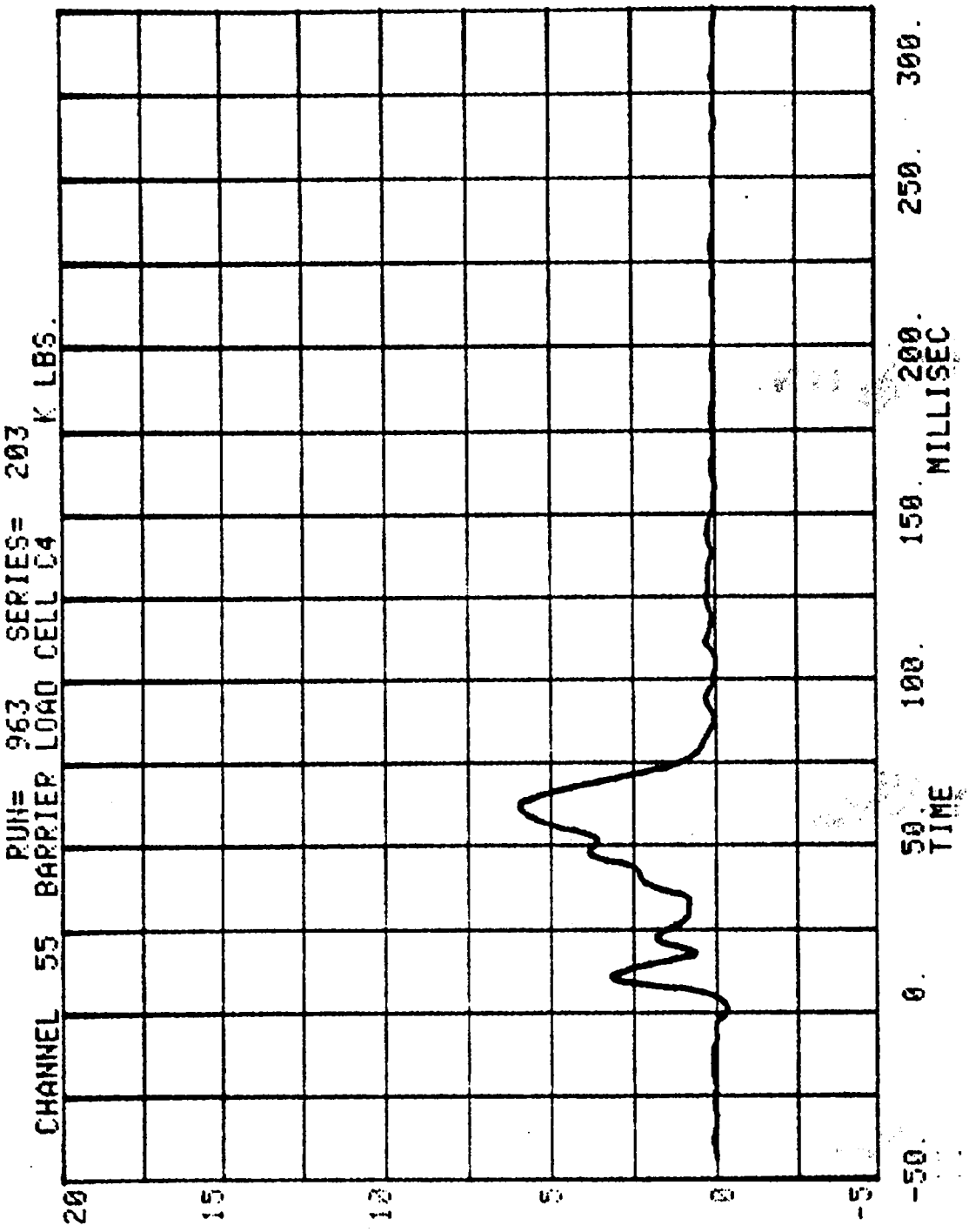

CHANNEL 50 BARRIER LOAD CELL 88
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

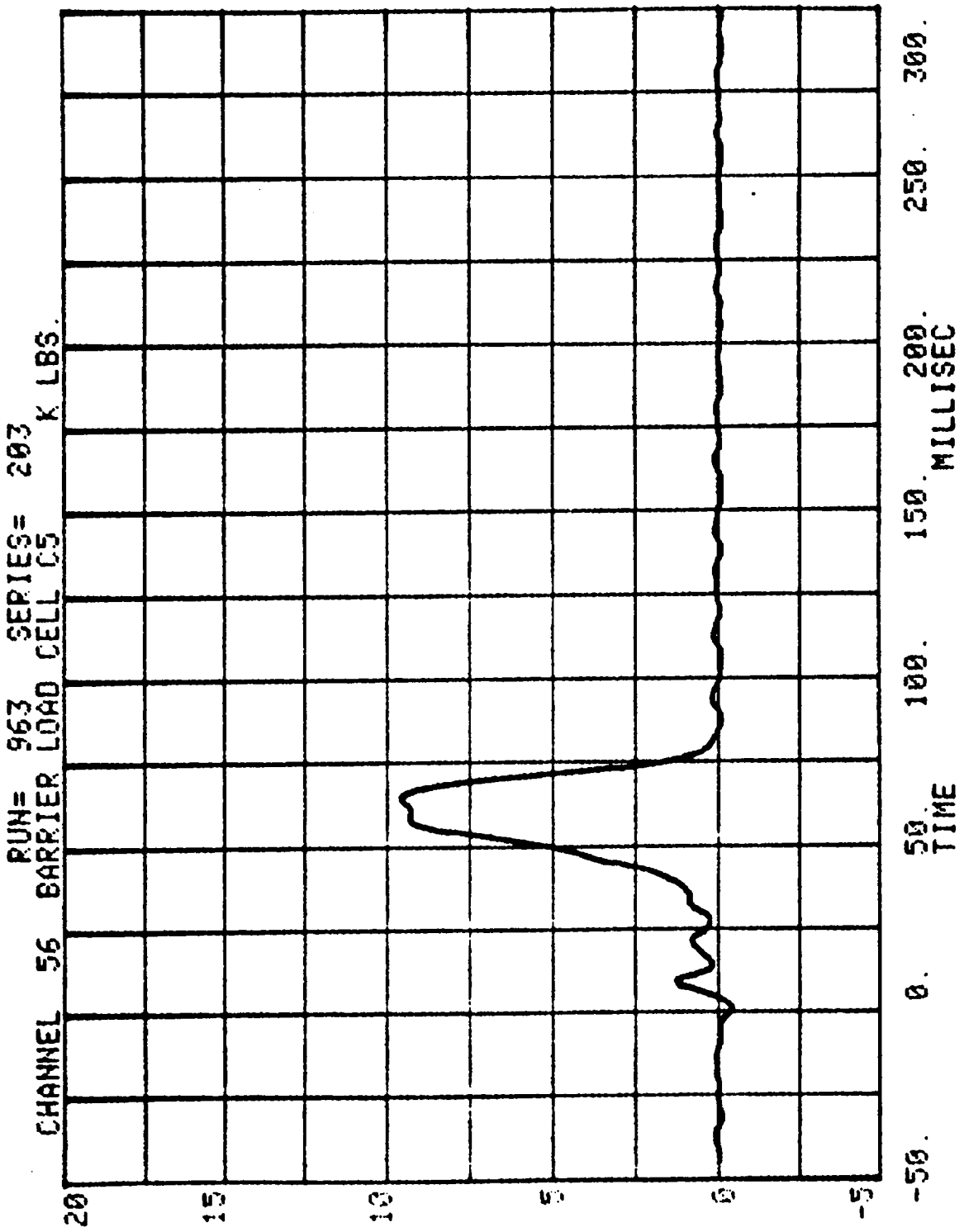

CHANNEL 51 BARRIER LOAD CELL 89
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

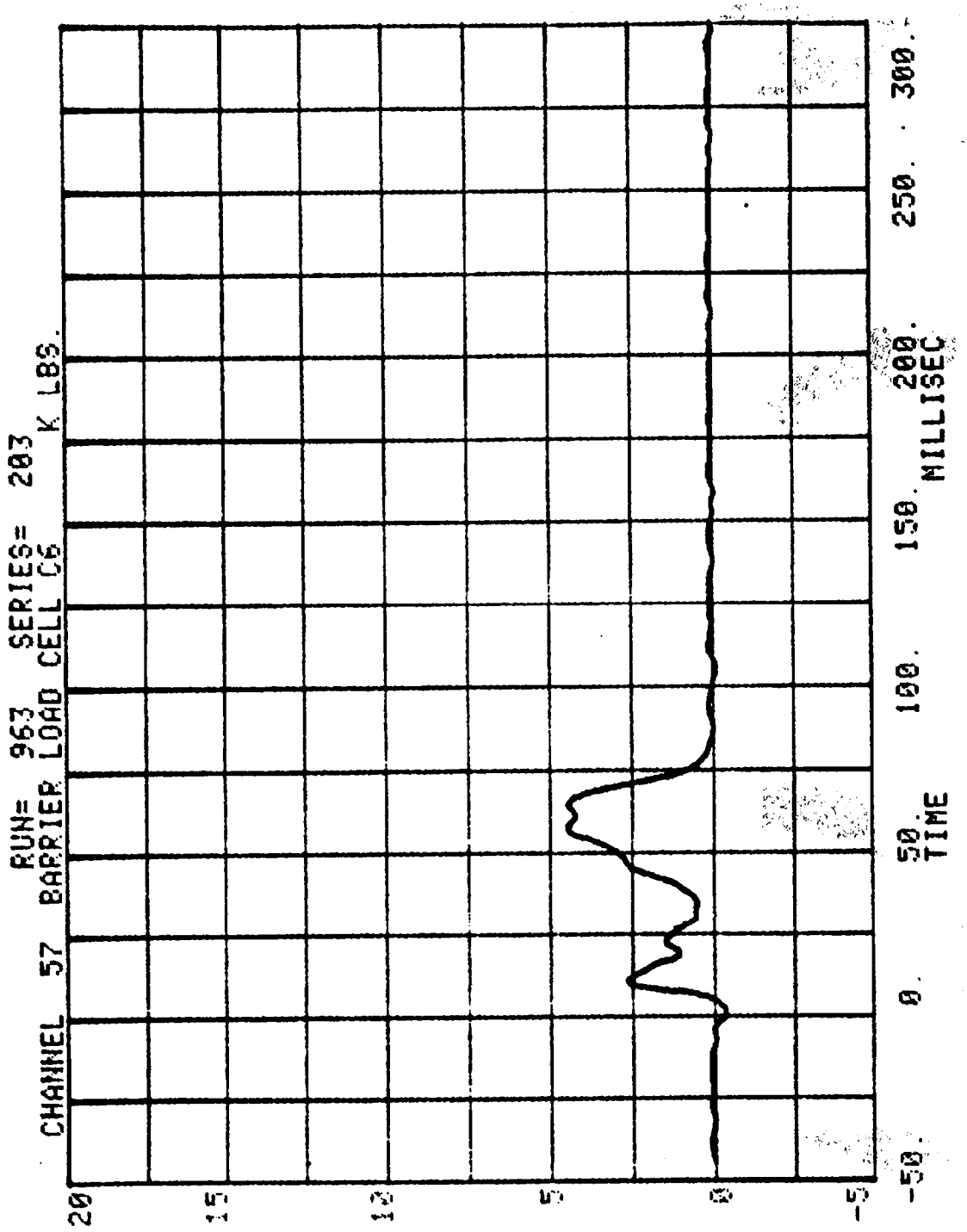

CHANNEL 52 RUN= 963 SERIES= 203
BARRIER LOAD CELL C1
K LBS.
20
15
10
5
0
-5
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

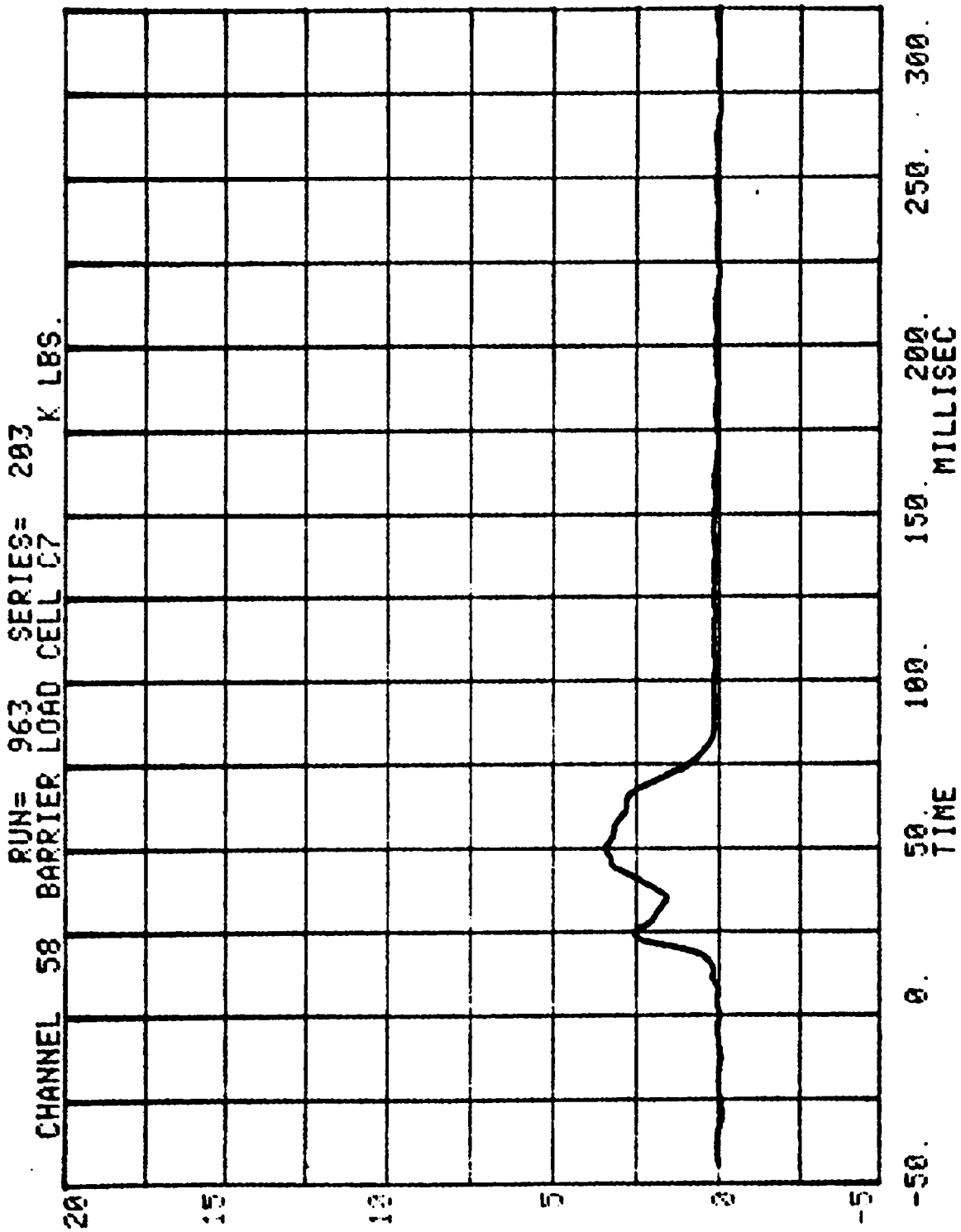

CHANNEL 53 BARRIER LOAD CELL C2
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 54 BARRIER LOAD CELL C3
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

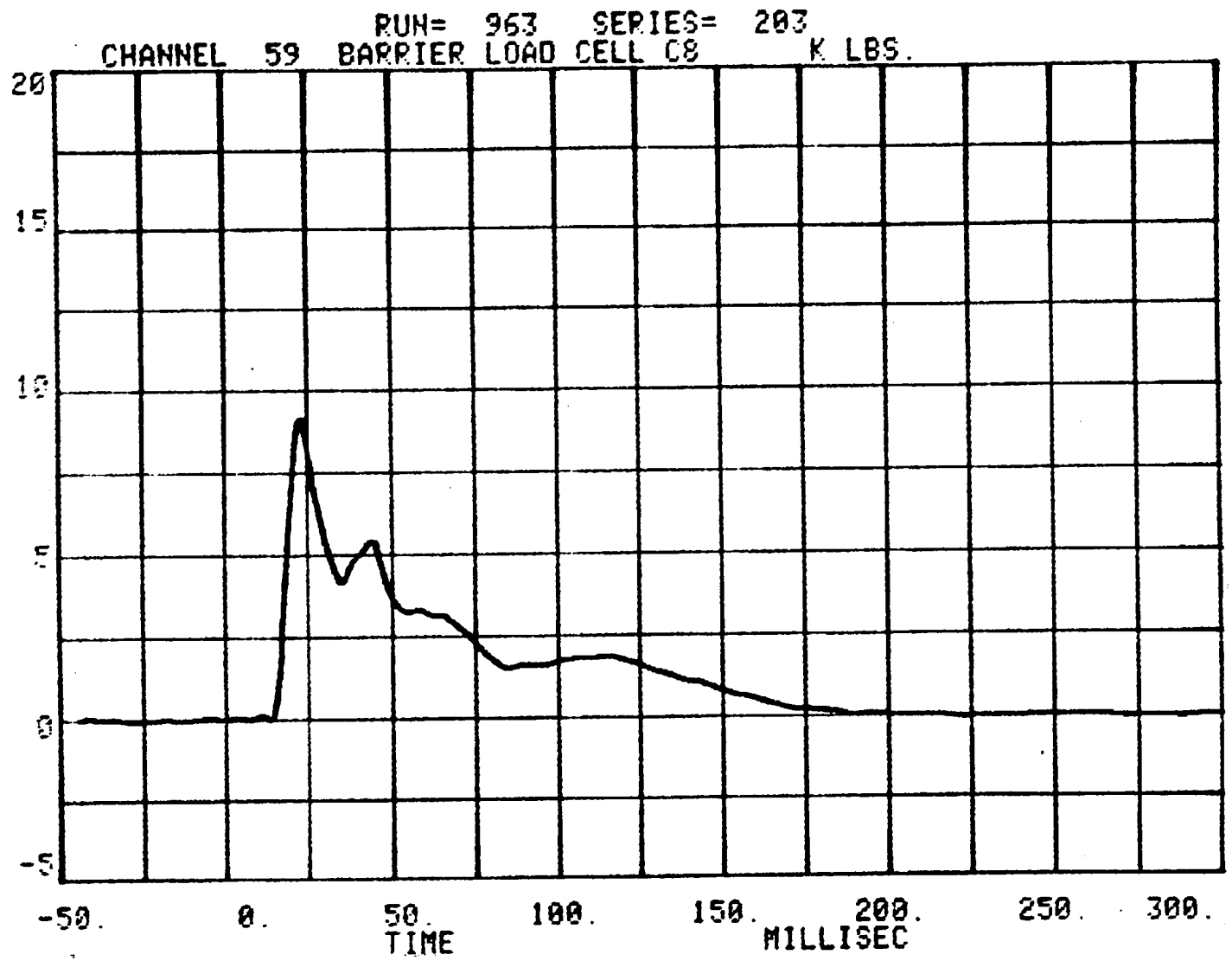

CHANNEL 55 BARRIER LOAD CELL C4
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

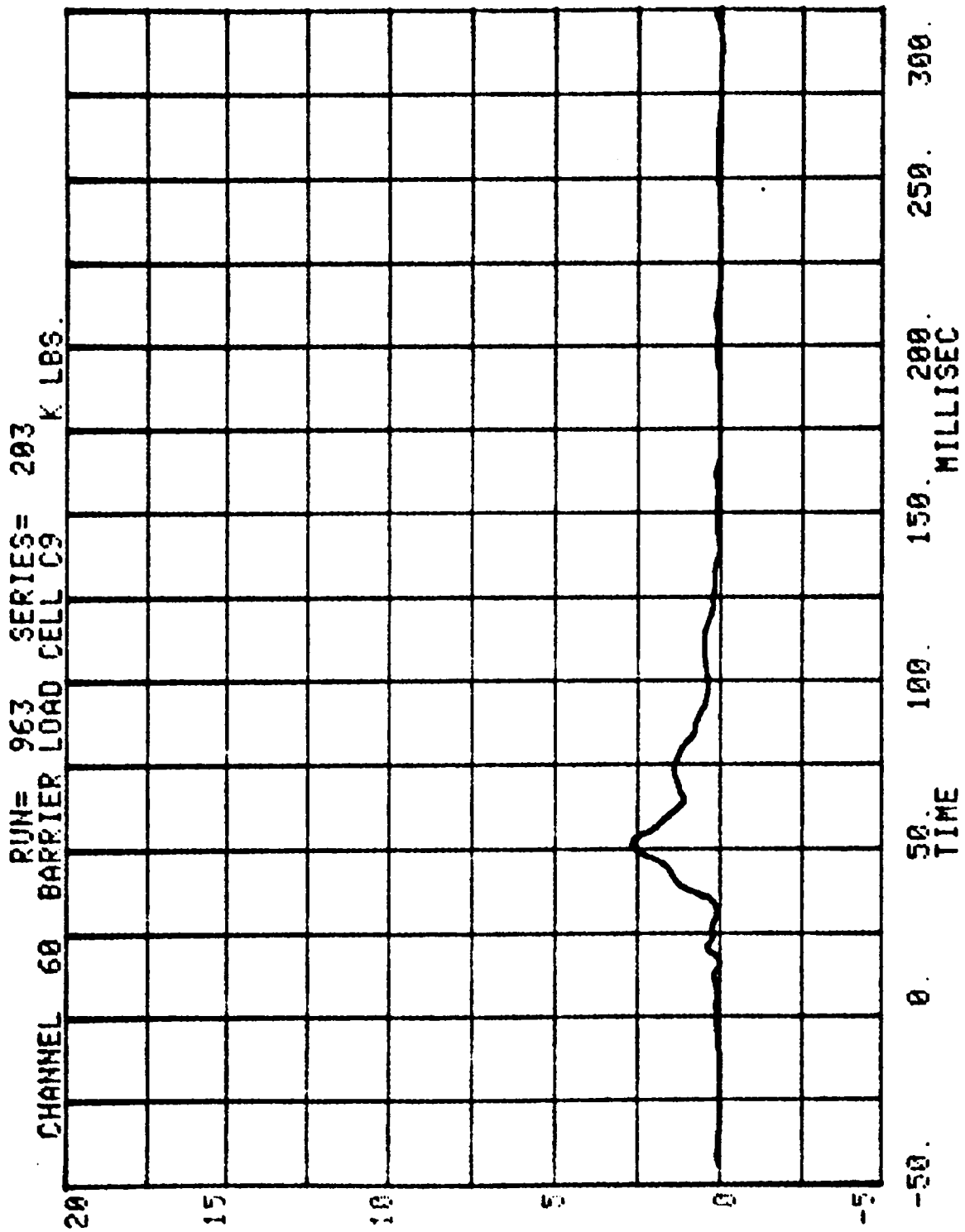

CHANNEL 56 BARRIER LOAD CELL C5
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

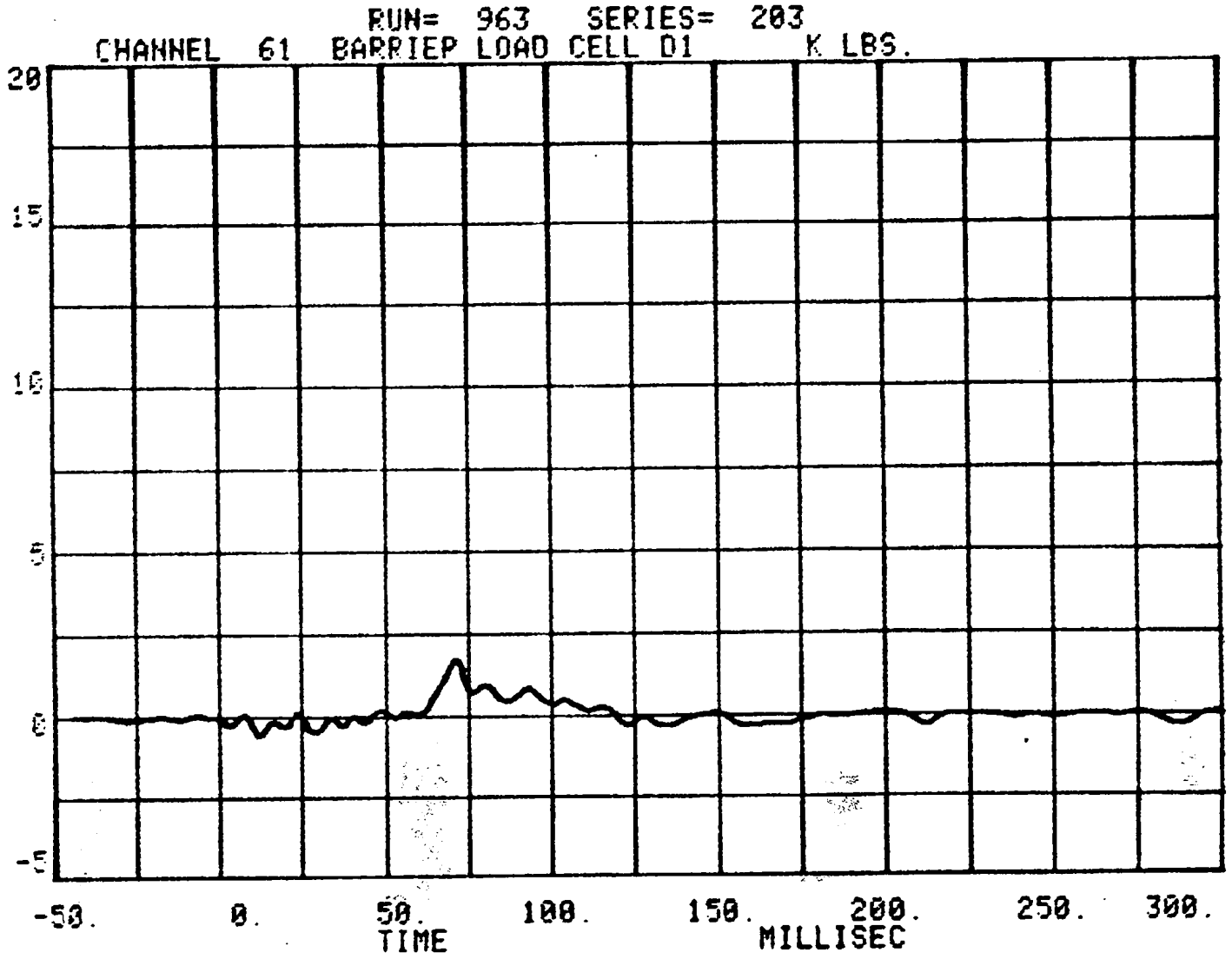

CHANNEL 57 BARRIER LOAD CELL C6
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

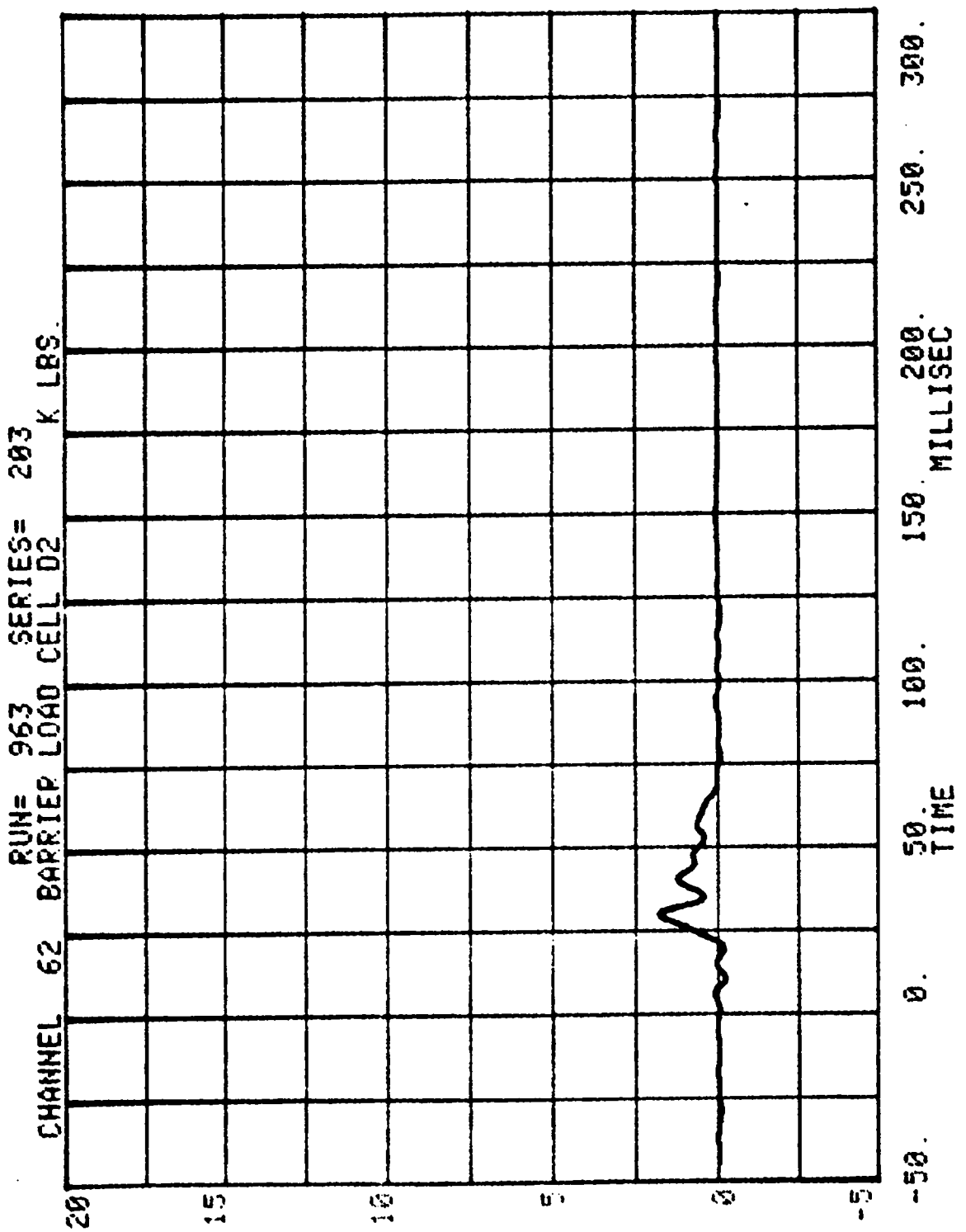

CHANNEL 58 BARRIER LOAD CELL C7
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

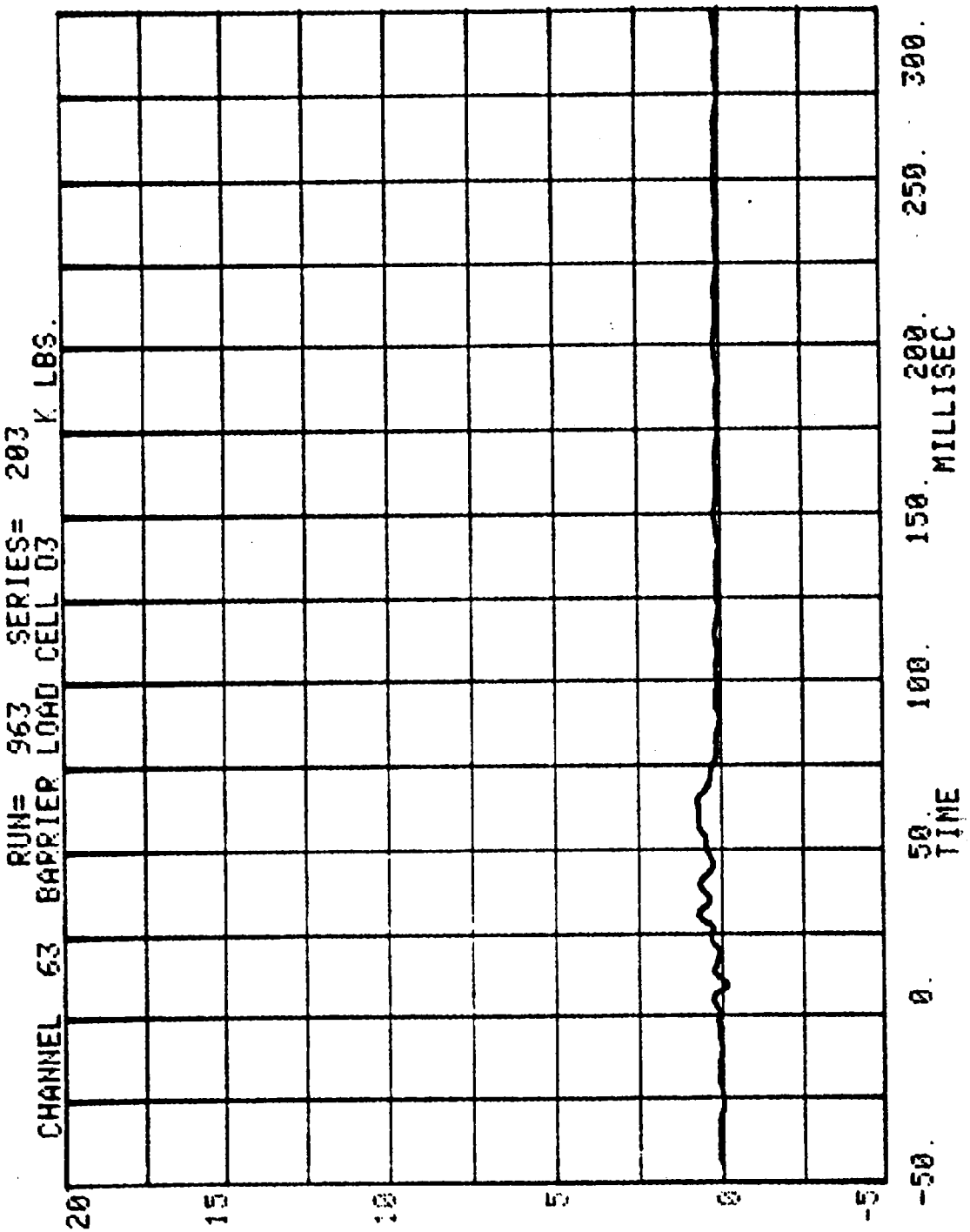
7776-10

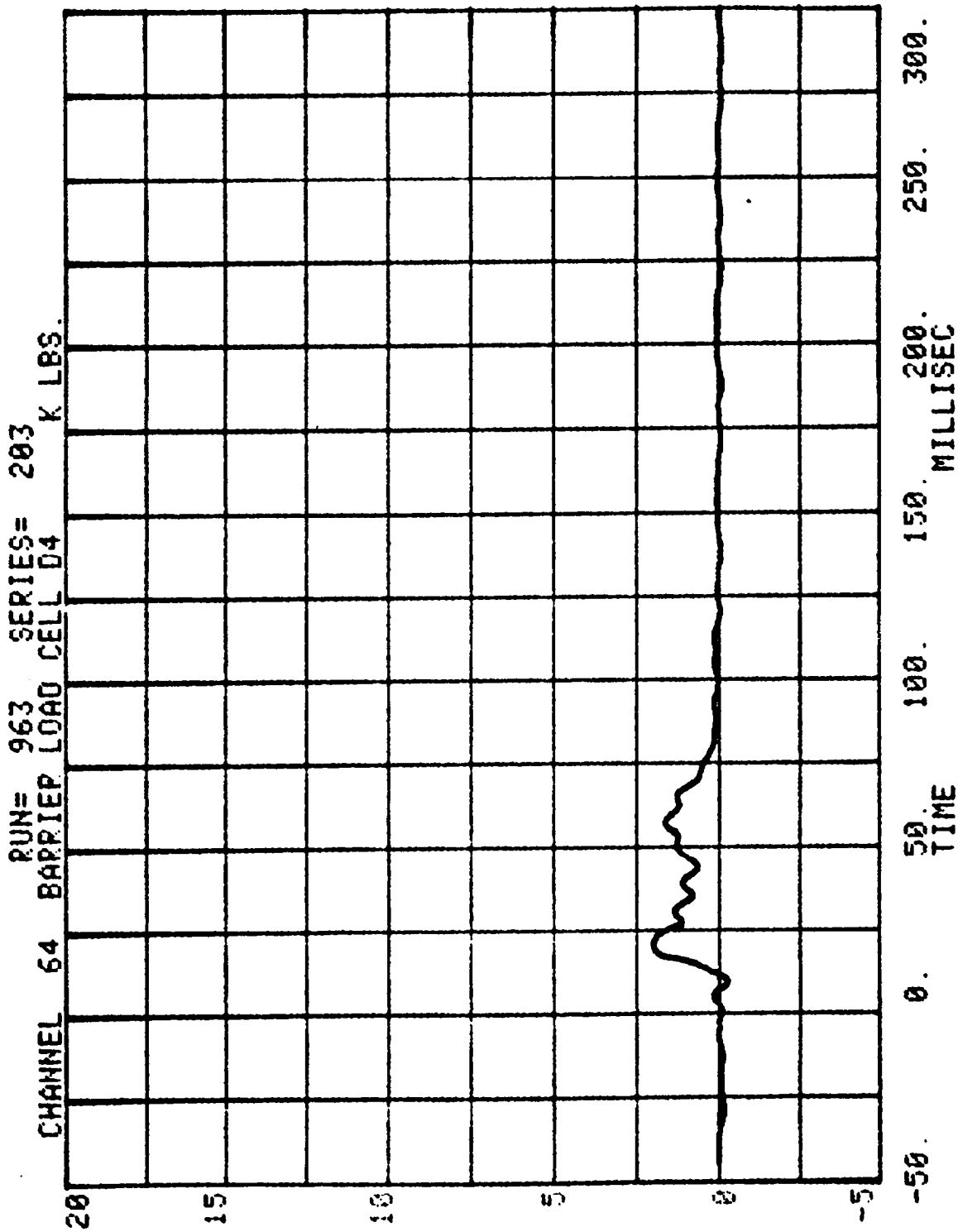

RUN= 963 SERIES= 203
CHANNEL 59 BARRIER LOAD CELL C8 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

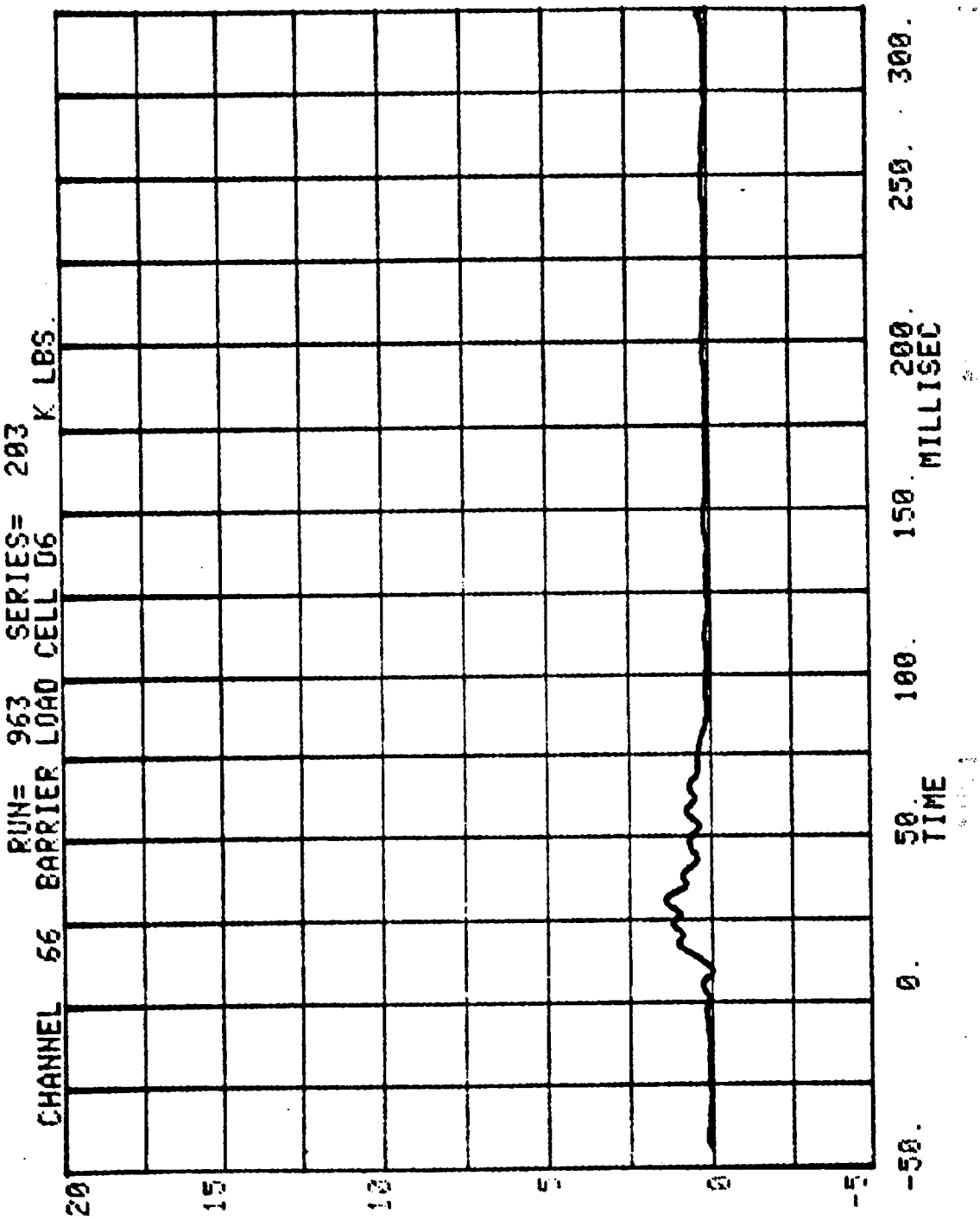

CHANNEL 60 BARRIER LOAD CELL C9
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

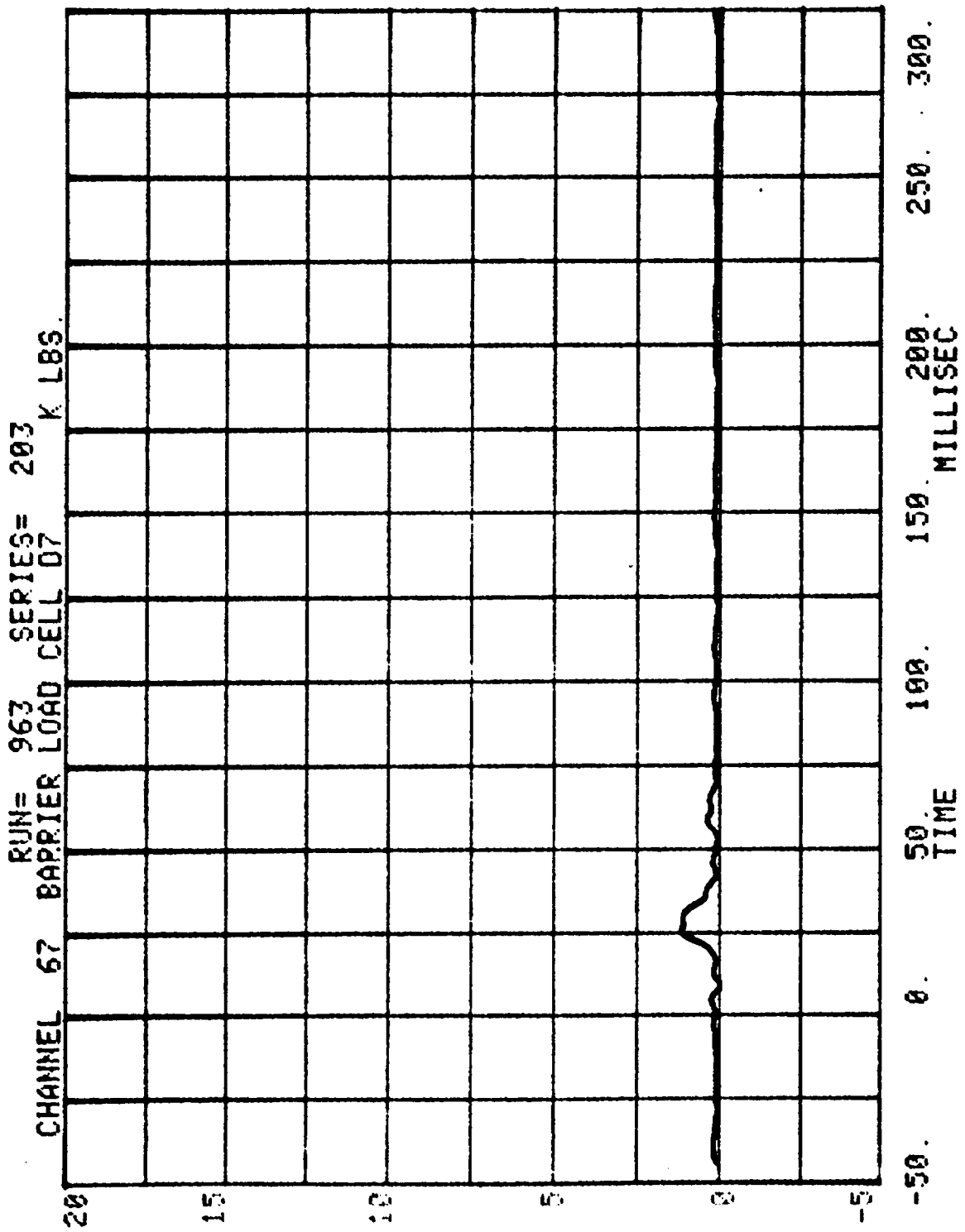

RUN= 963 SERIES= 203
CHANNEL 61 BARRIEP LOAD CELL D1 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

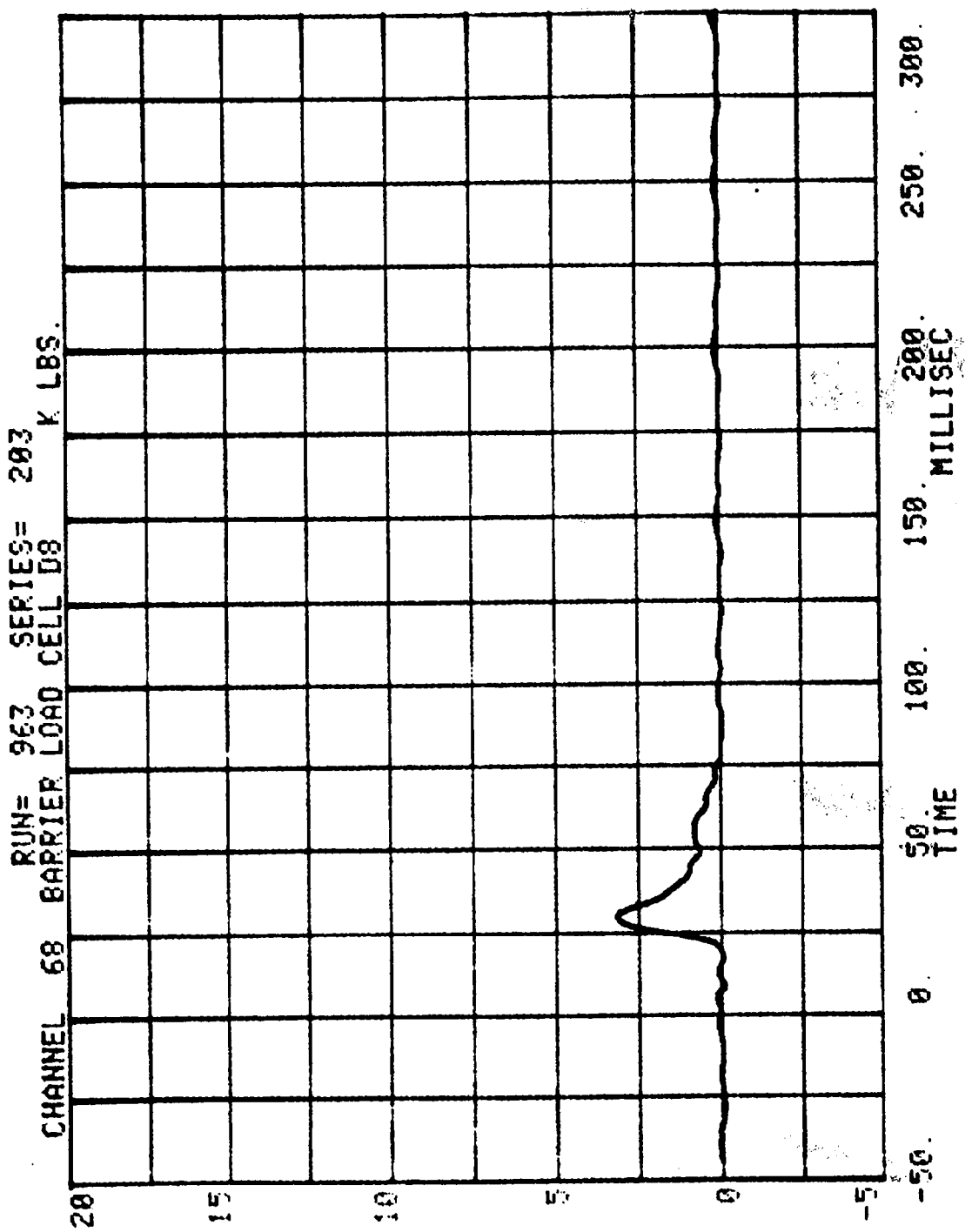

CHANNEL 62 BARRIER LOAD CELL D2
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 63 BARRIER LOAD CELL 03
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

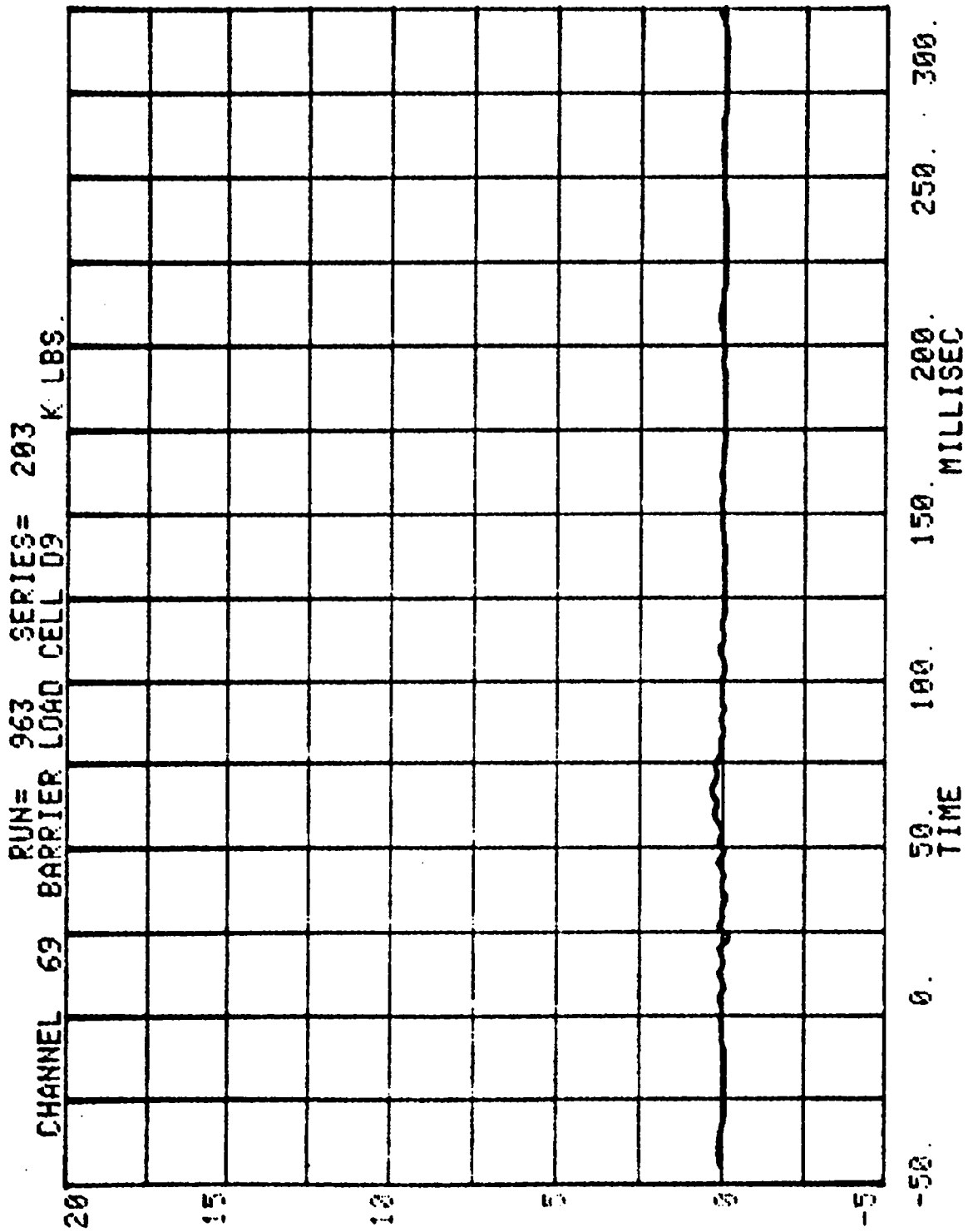

CHANNEL 64 BARRIER LOAD CELL D4
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 56 BARRIER LOAD CELL 06
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 67 BARRIER LOAD CELL 07
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 68 BARRIER LOAD CELL D8
RUN= 963 SERIES= 203
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

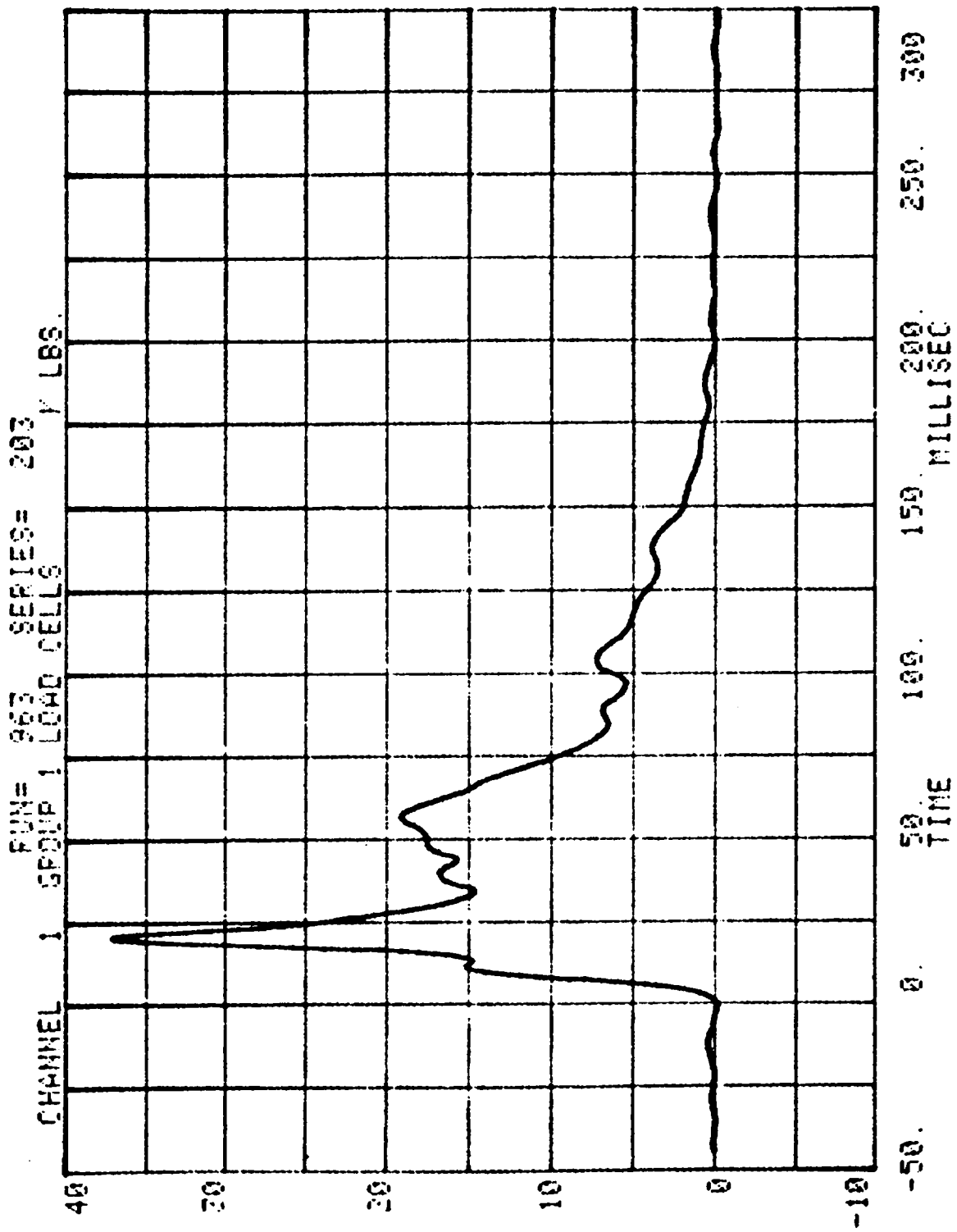
7776-10

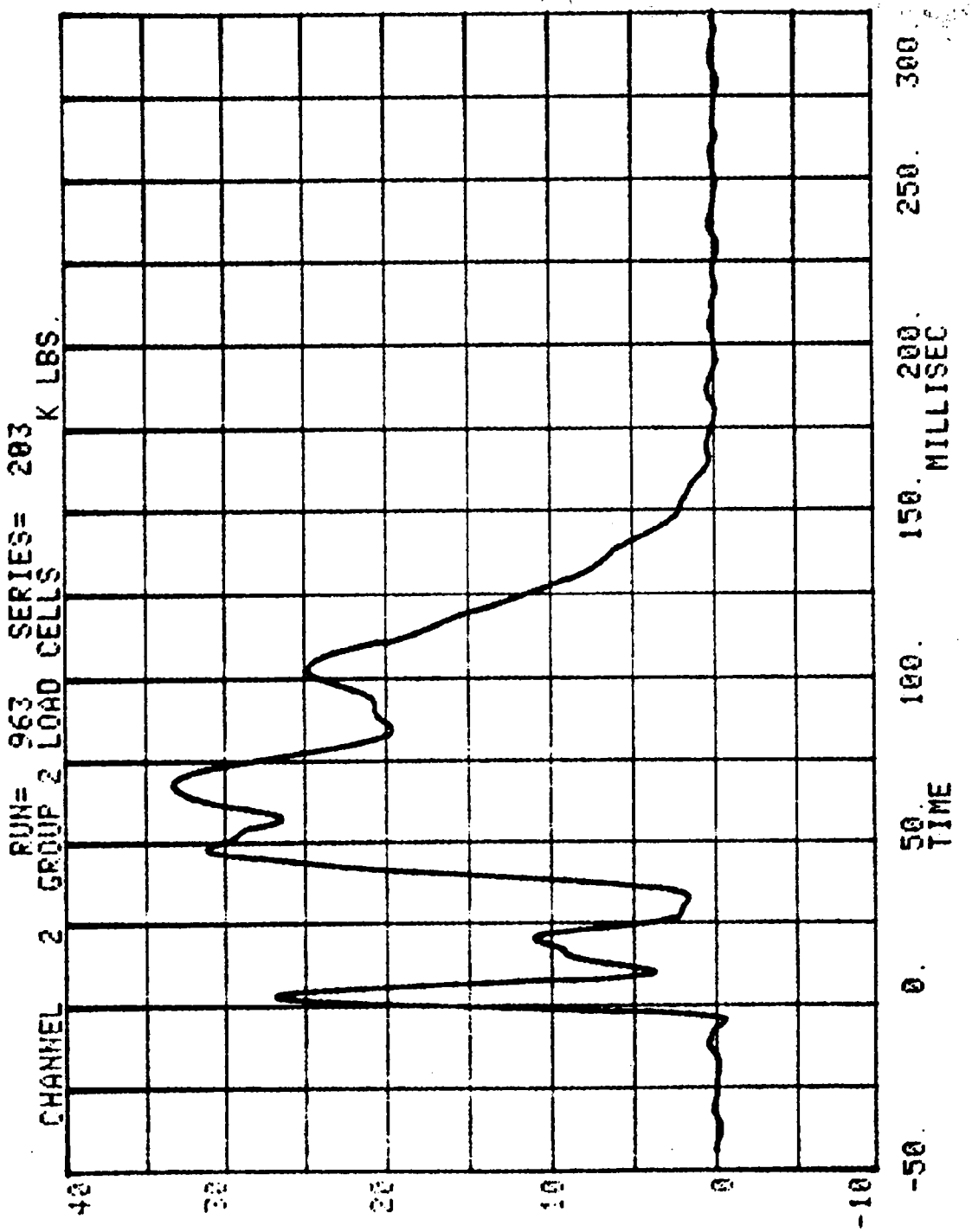

CHANNEL 69
RUN= 963 SERIES= 203
BARRIER LOAD CELL 09
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

NEW CAR ASSESSMENT PROGRAM - 1990

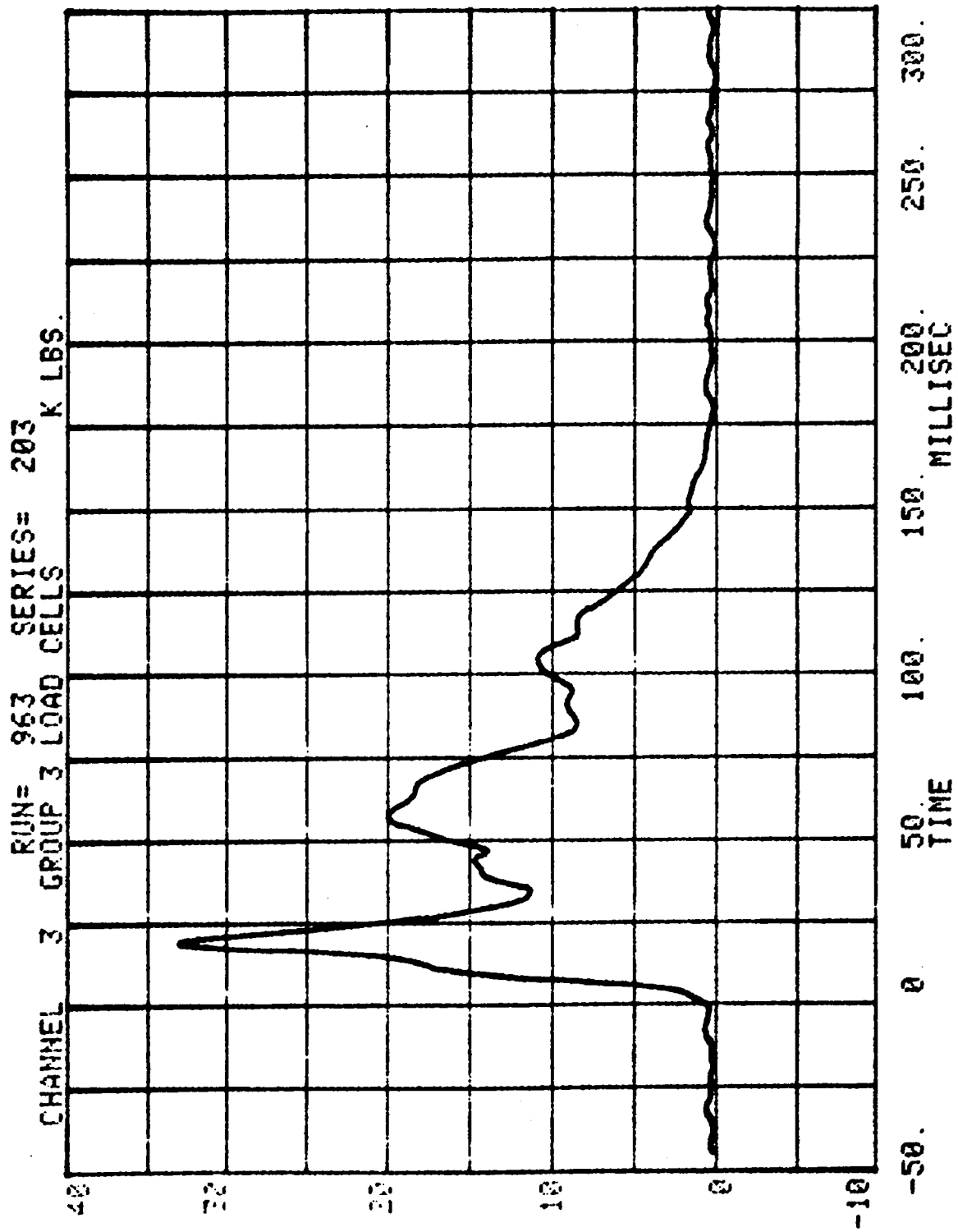
RUN # 963 SERIES # 203

CHAN	TITLE	MINIMUM/MAXIMUM	AT	TIME
1	GROUP 1 LOAD CELLS	-.160 K LBS.		-.53 MS.
		37.248 K LBS.		20.70 MS.
2	GROUP 2 LOAD CELLS	-.499 K LBS.		-4.87 MS.
		33.380 K LBS		68.10 MS.
3	GROUP 3 LOAD CELLS	.022 K LBS.		-45.00 MS.
		33.111 K LBS.		19.50 MS.
4	GROUP 4 LOAD CELLS	-1.016 K LBS.		1.65 MS.
		11.091 K LBS.		23.55 MS.
5	GROUP 5 LOAD CELLS	-1.039 K LBS.		1.12 MS.
		21.669 K LBS.		58.35 MS.
6	GROUP 6 LOAD CELLS	-.212 K LBS.		-28.50 MS.
		13.726 K LBS.		25.20 MS.
7	TOTAL LOAD CELL SUM	.235 K LBS.		-45.00 MS.
		106.776 K LBS.		57.82 MS.

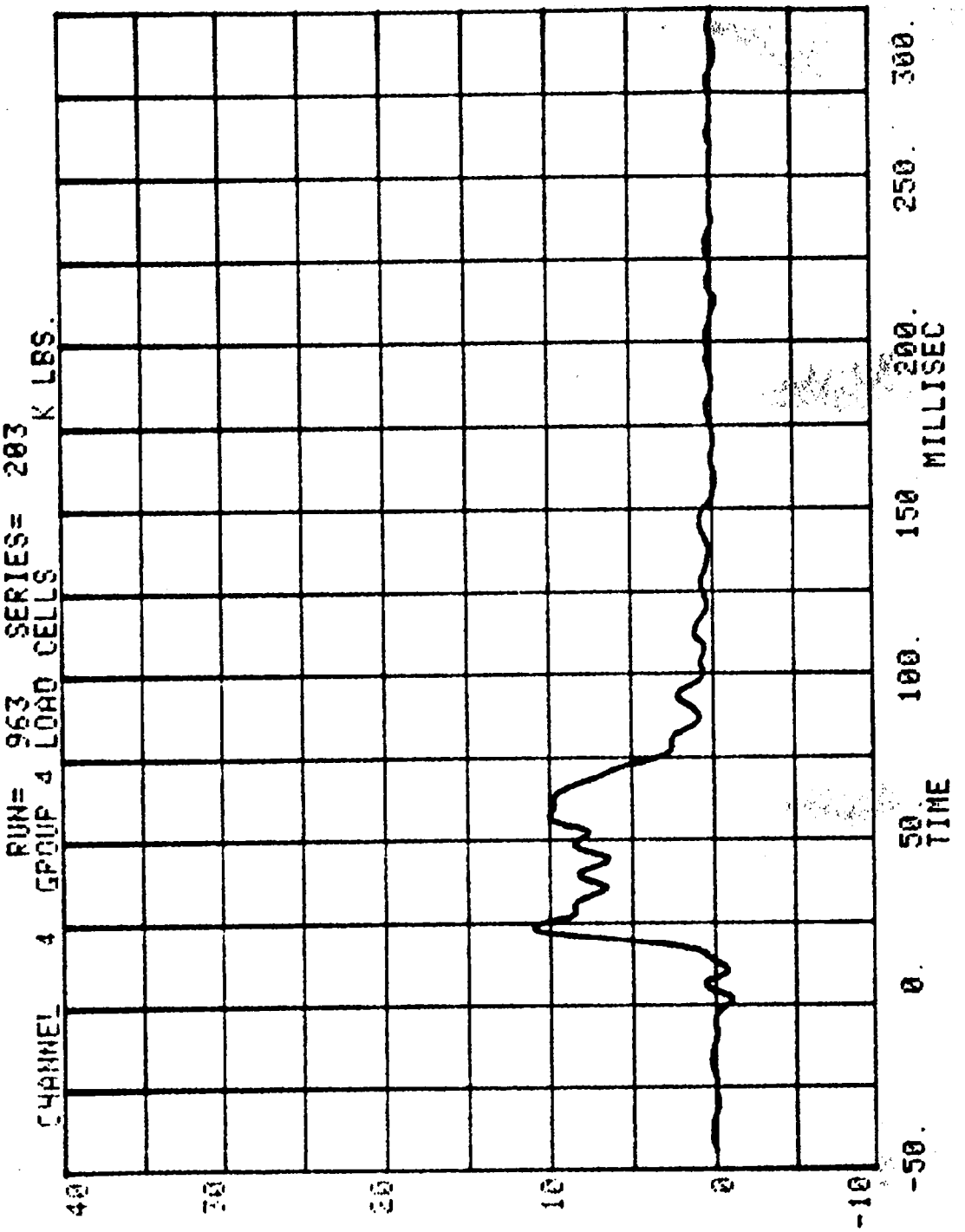

CHANNEL 1 GROUP 1 LOAD CELLS
RUN= 263 SERIES= 203
Y LBS.
40
20
30
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300
TIME
MILLISEC


CHANNEL 2
RUN= 963 SERIES= 203
GROUP 2 LOAD CELLS
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

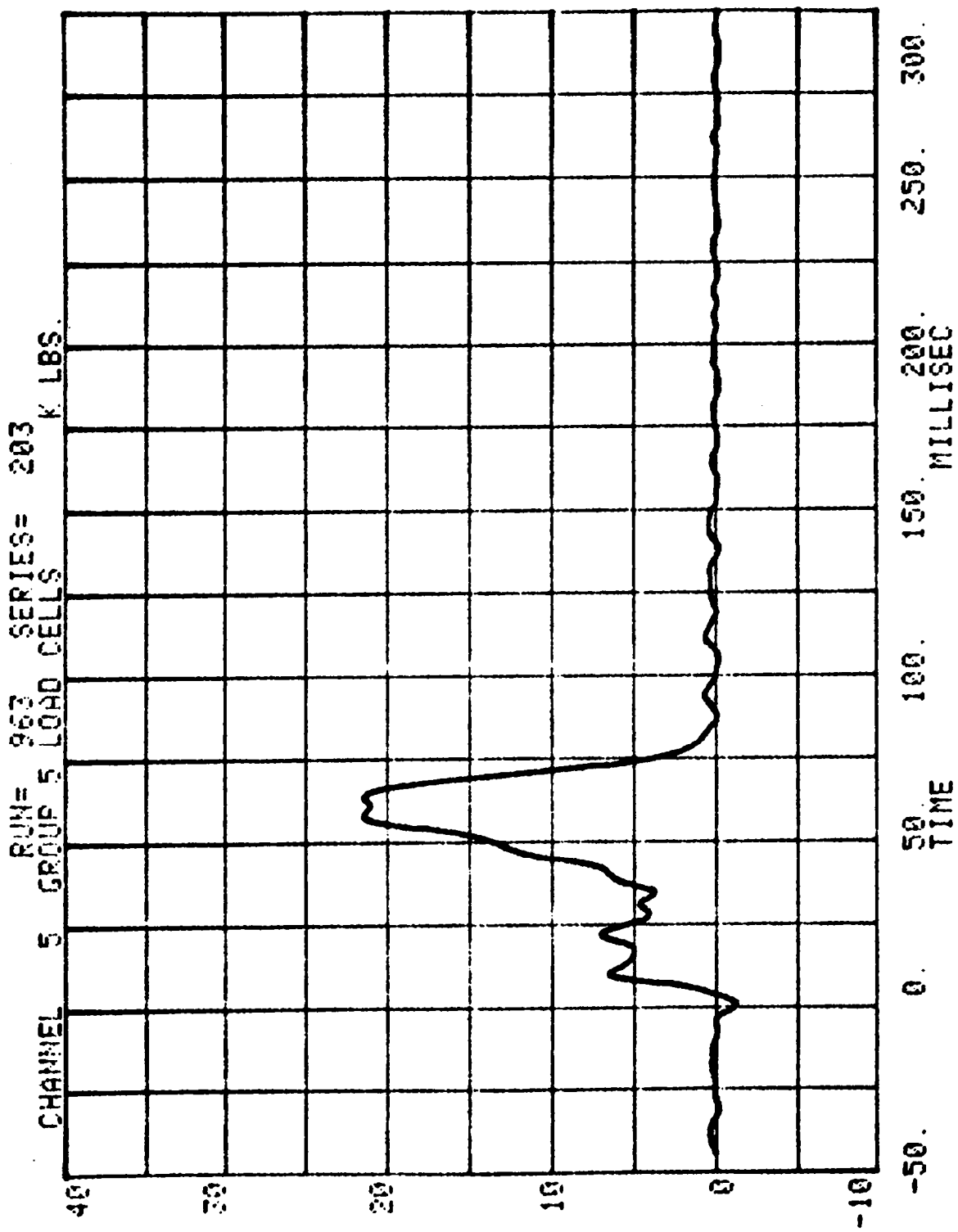
7776-10

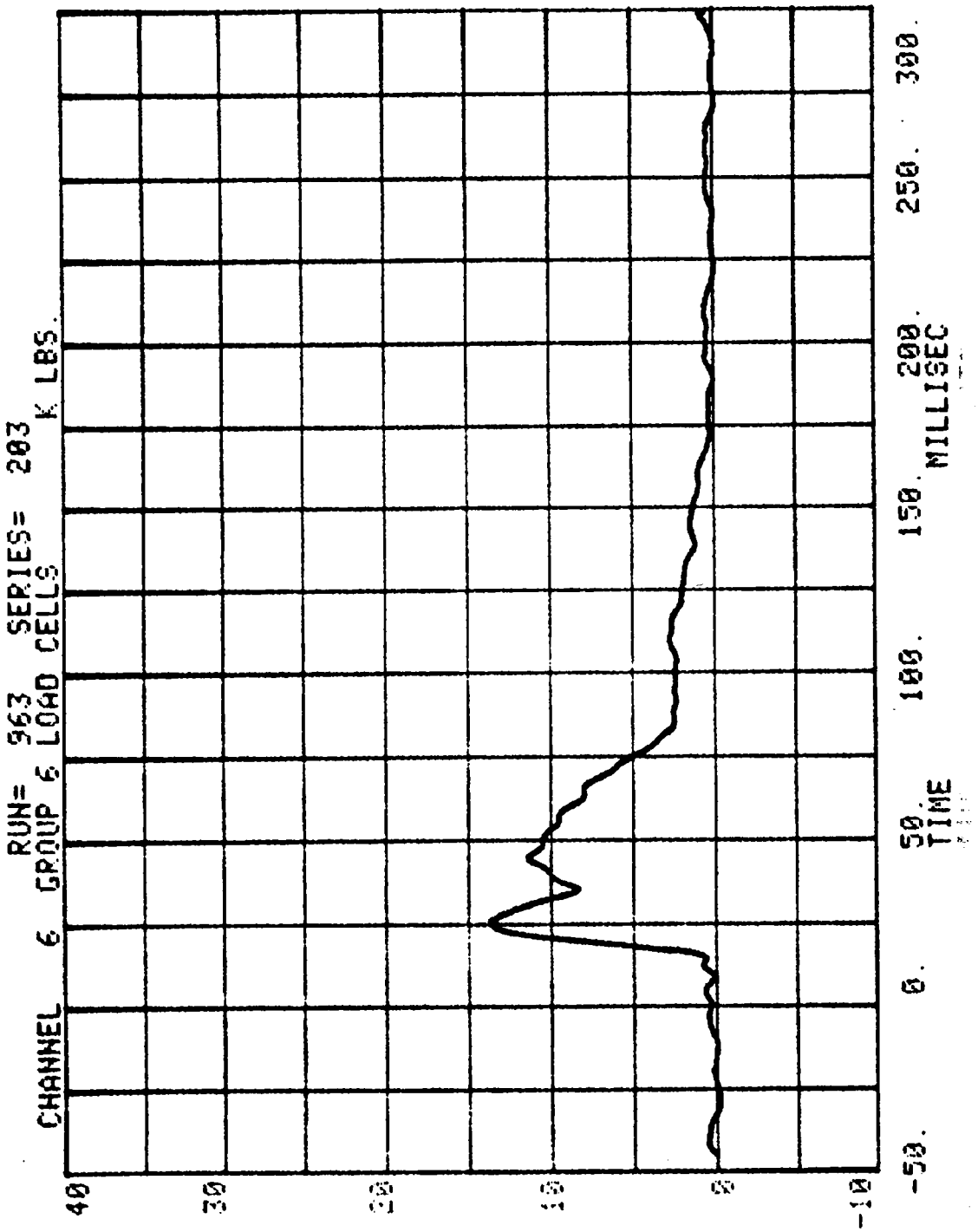

CHANNEL 3 GROUP 3 LOAD CELLS
RUN= 963 SERIES= 203
K LBS.
40
30
20
10
0
-10
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

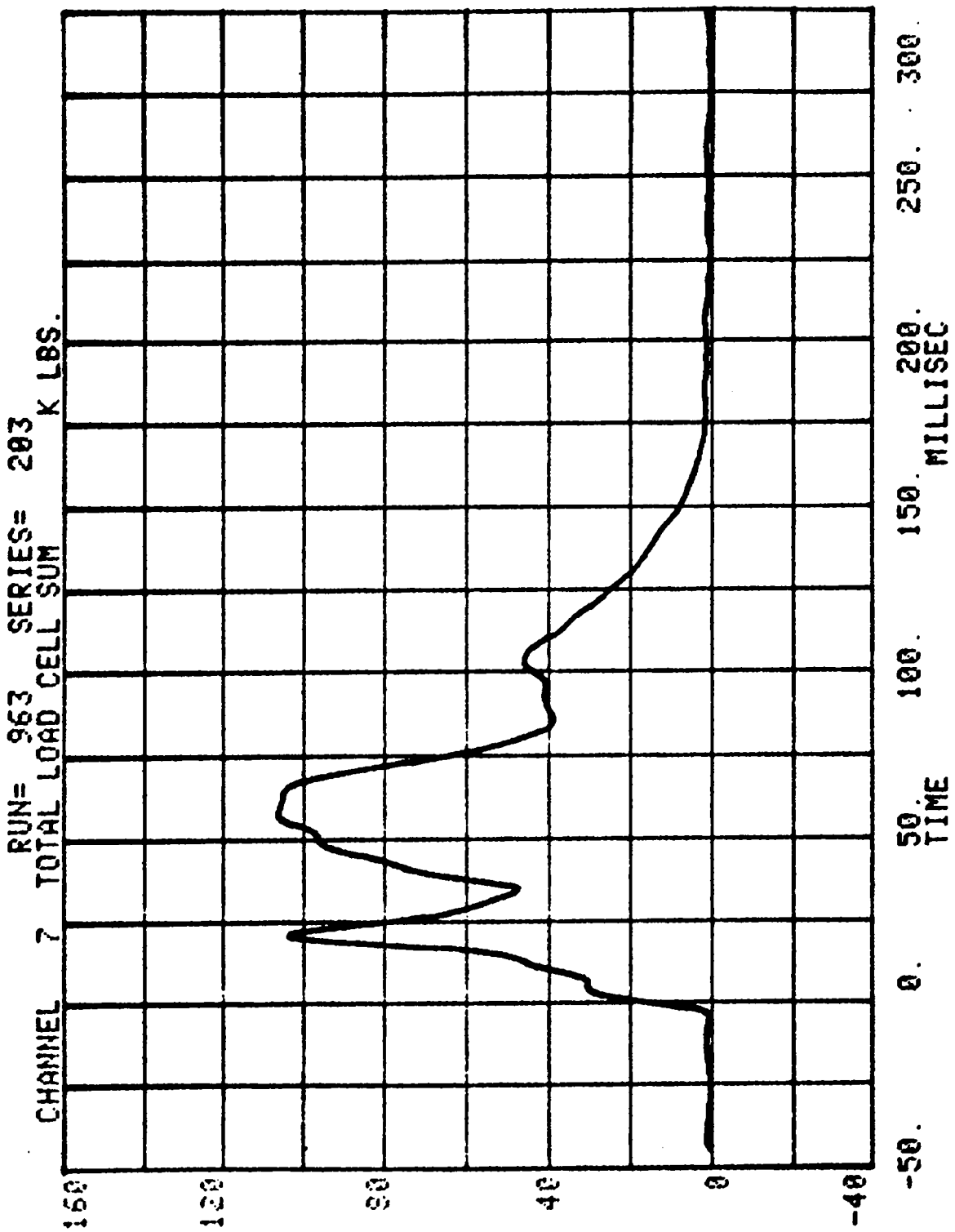
7776-10


CHANNEL 4 GROUP 4 LOAD CELLS
RUN= 963 SERIES= 203
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150
200.
250.
300.
TIME
MILLISEC

7776-10


CHANNEL 5 GROUP 5 LOAD CELLS
RUN= 963 SERIES= 203
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 6 GROUP 6 LOAD CELLS
RUN= 963 SERIES= 203
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 7 TOTAL LOAD CELL SUM
RUN= 963 SERIES= 203
K LBS.
160
120
80
40
0
-40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10

TEST NO. ML0203

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

NEW CAR ASSESSMENT PROGRAM - 1990

RUN= 963

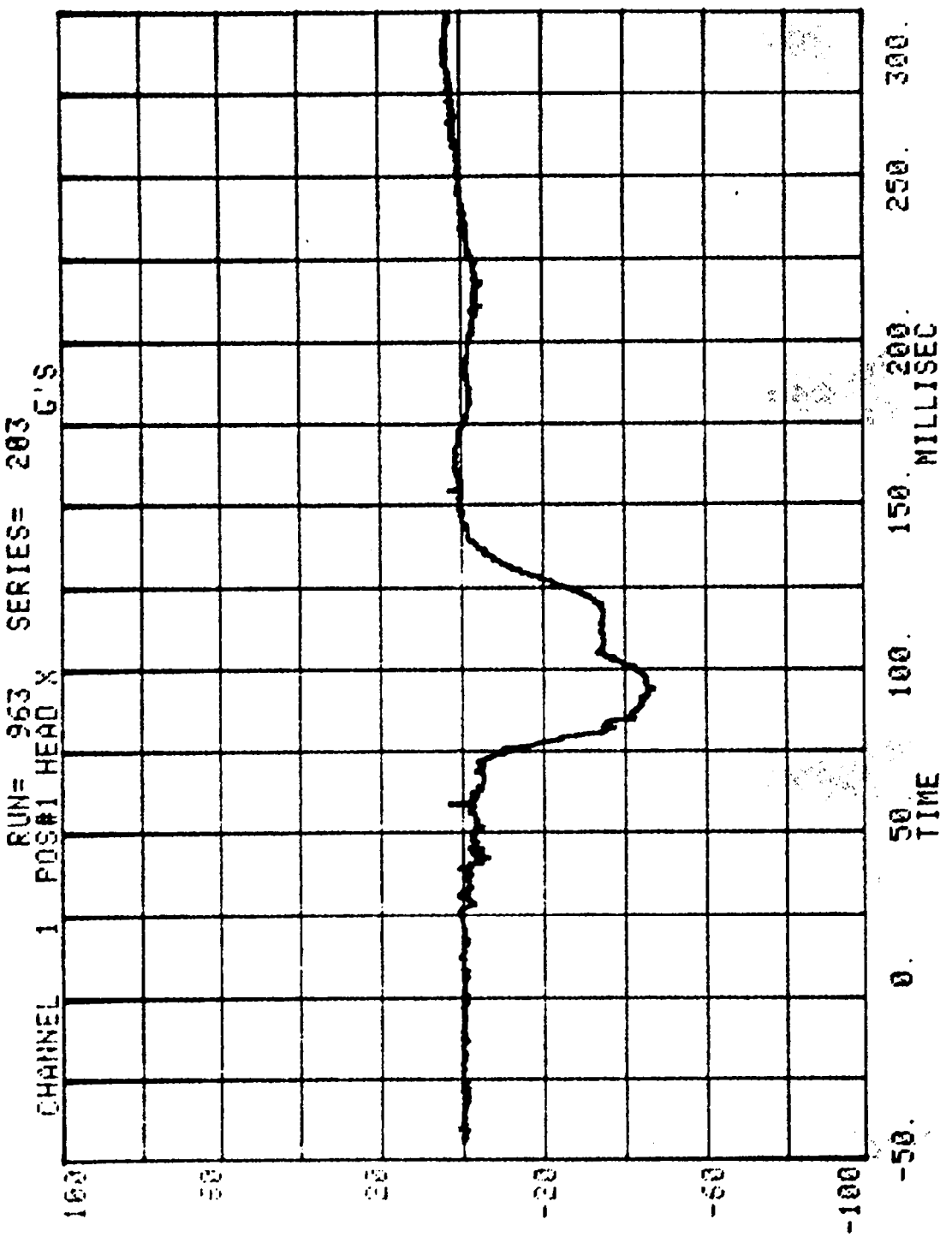
POS #1 HEAD RESULTANT

HIC= 471.1 FROM T1= .07965 TO T2= .11565

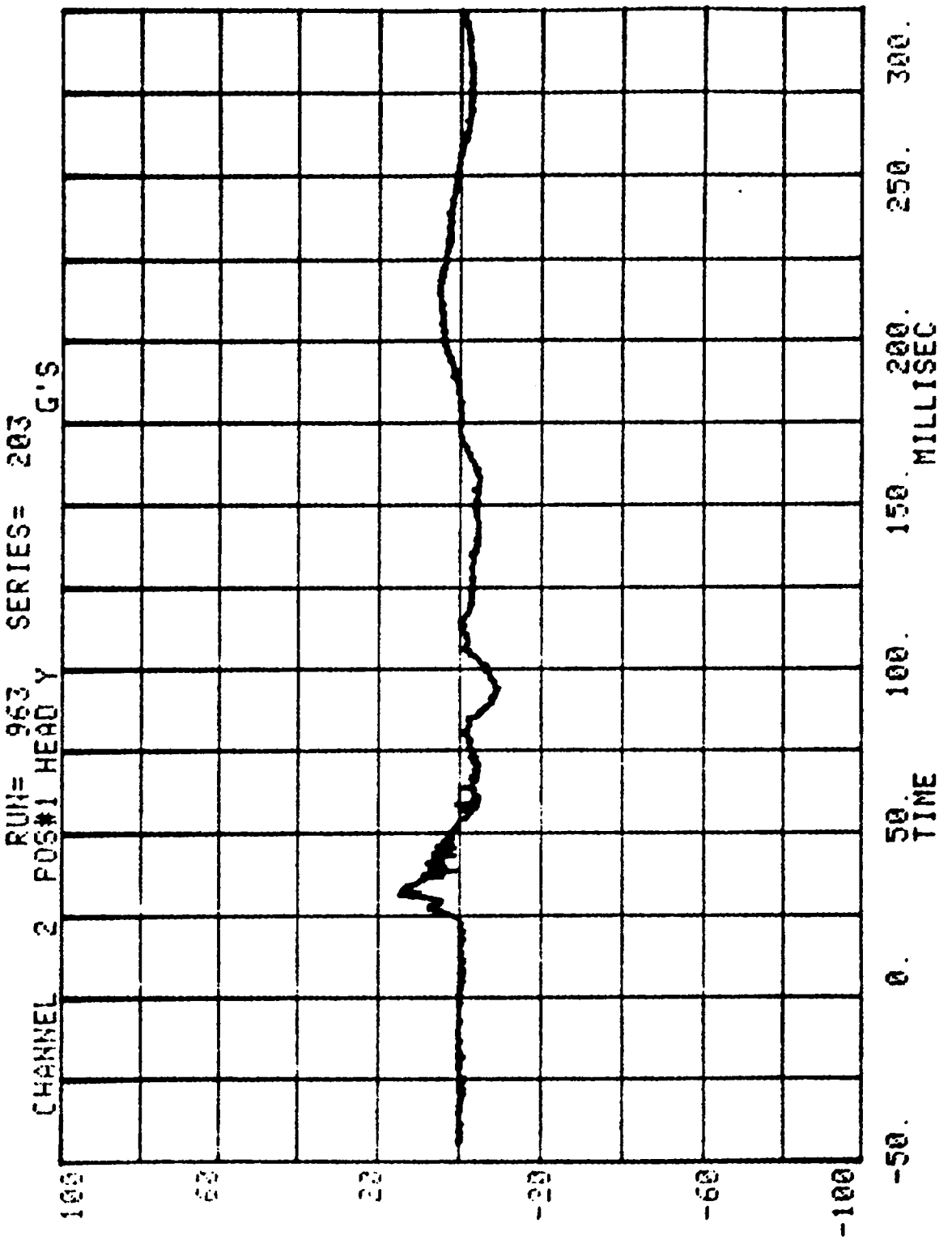
AVERAGE ACCELERATION BETWEEN T1 AND T2= 44.3G'S

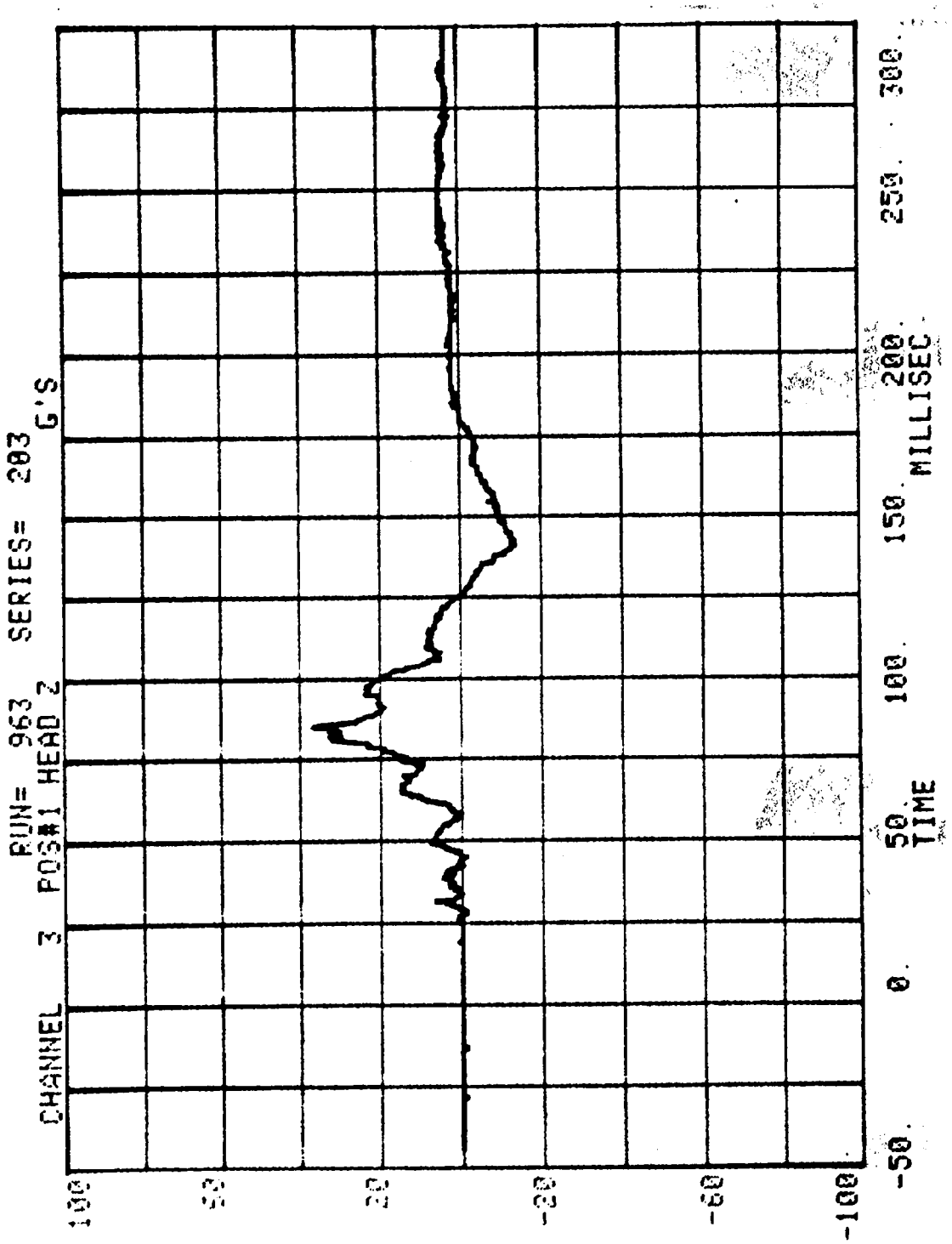
EVENT TIME= 300.0 MSEC

SEVERITY INDEX= 615.1

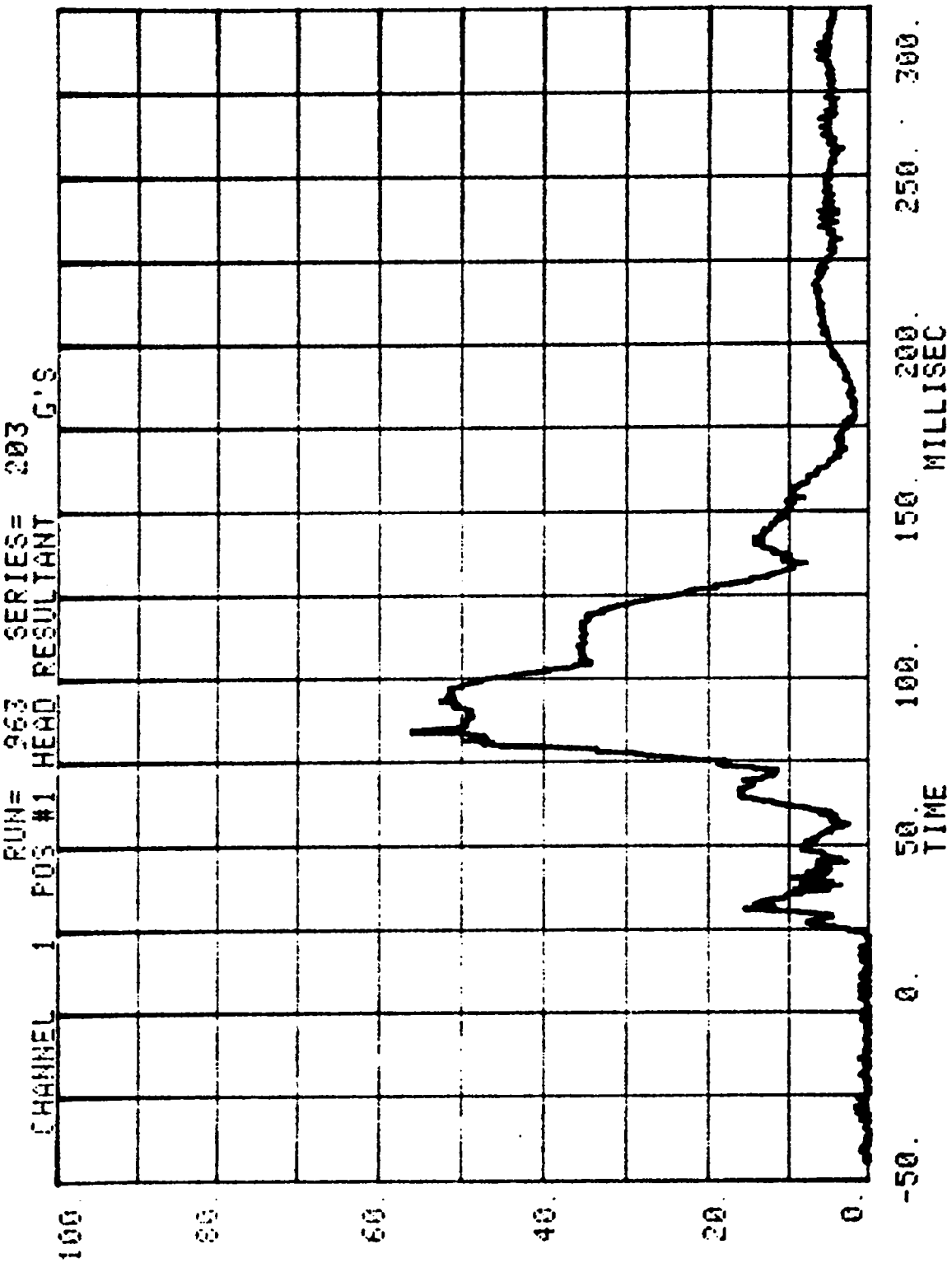

CHANNEL 1 POS#1 HEAD X
RUN= 963 SERIES= 203
G'S
100
50
0
-20
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

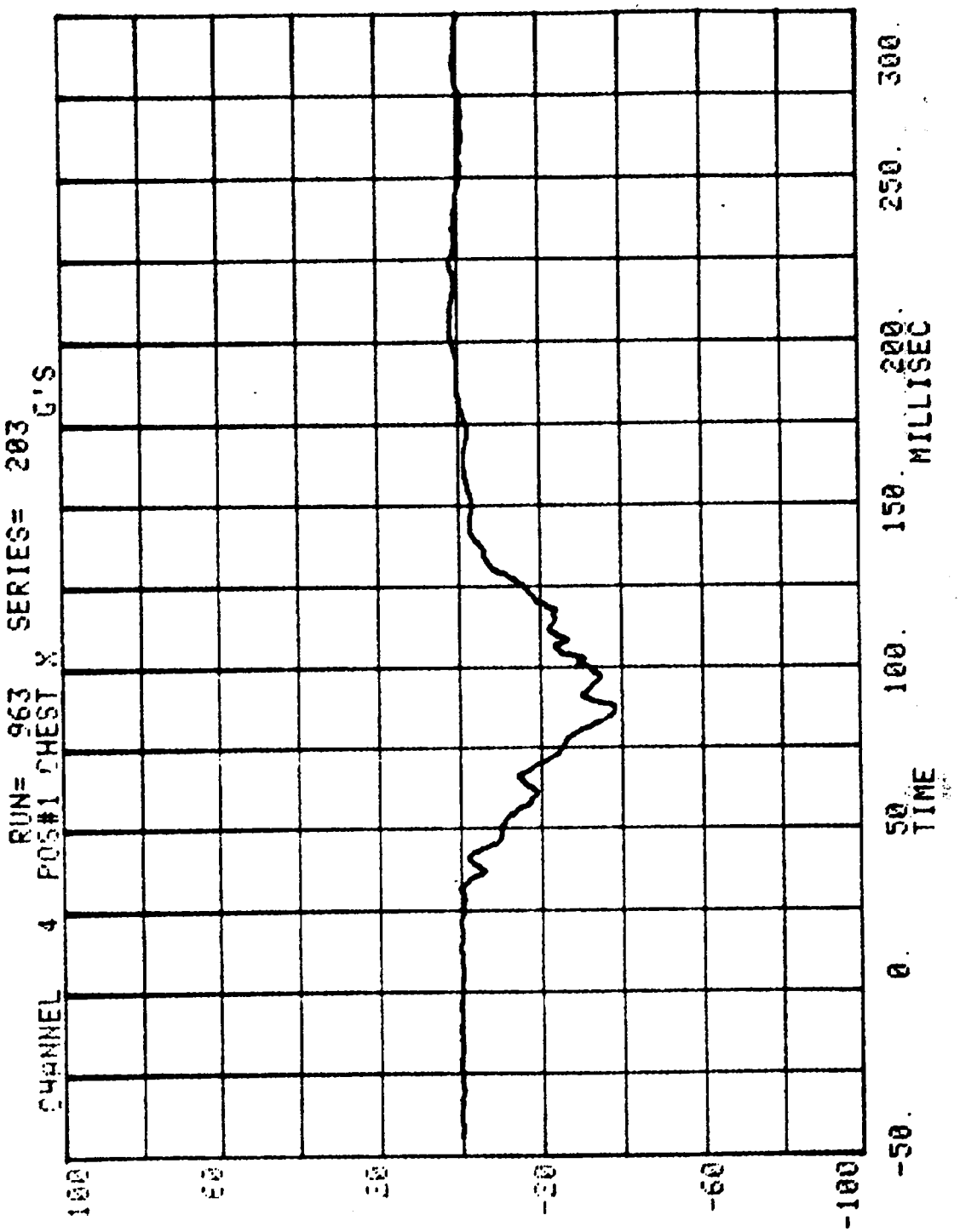
7776-10

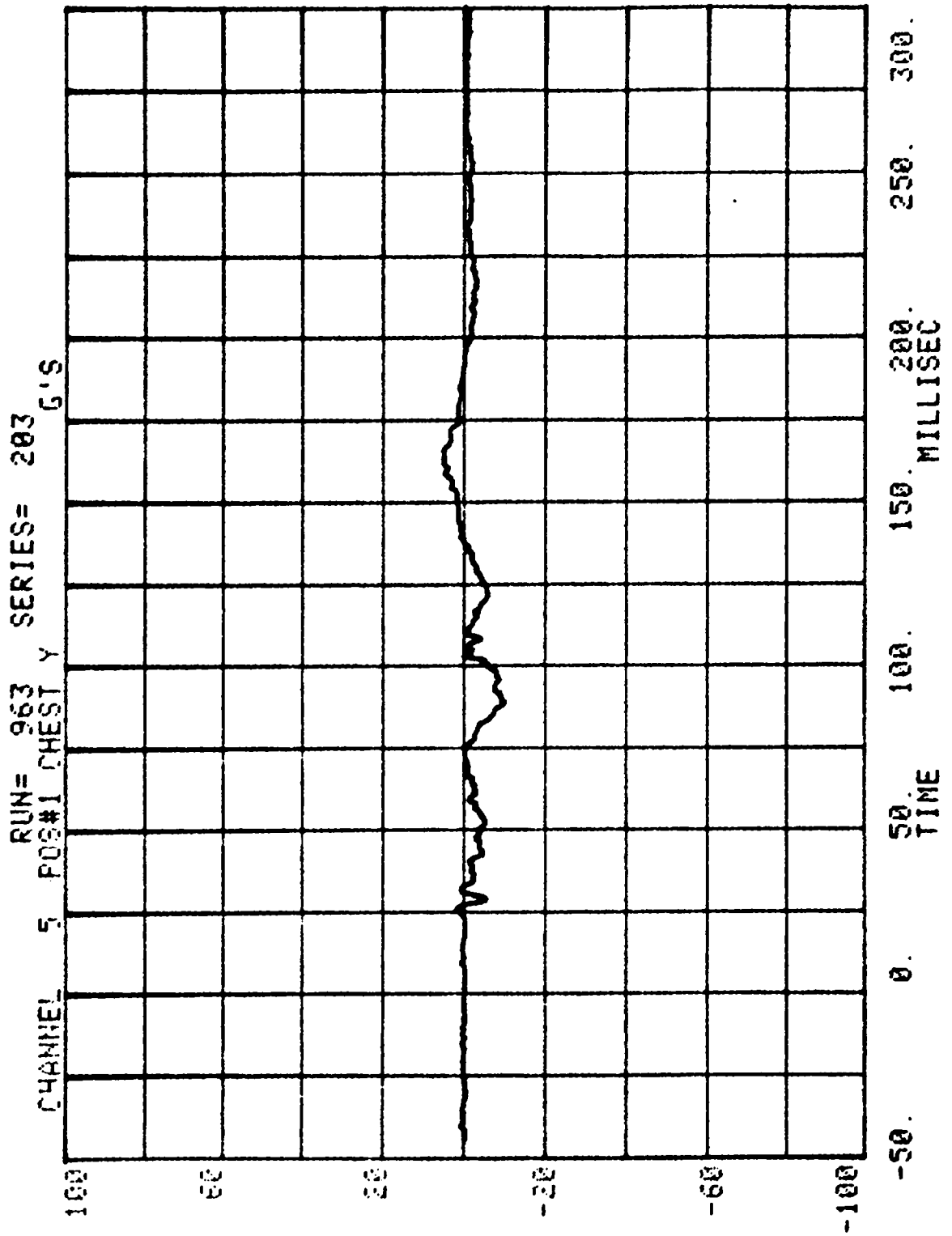

CHANNEL 2 POS#1 HEAD Y
RUN= 963 SERIES= 203
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

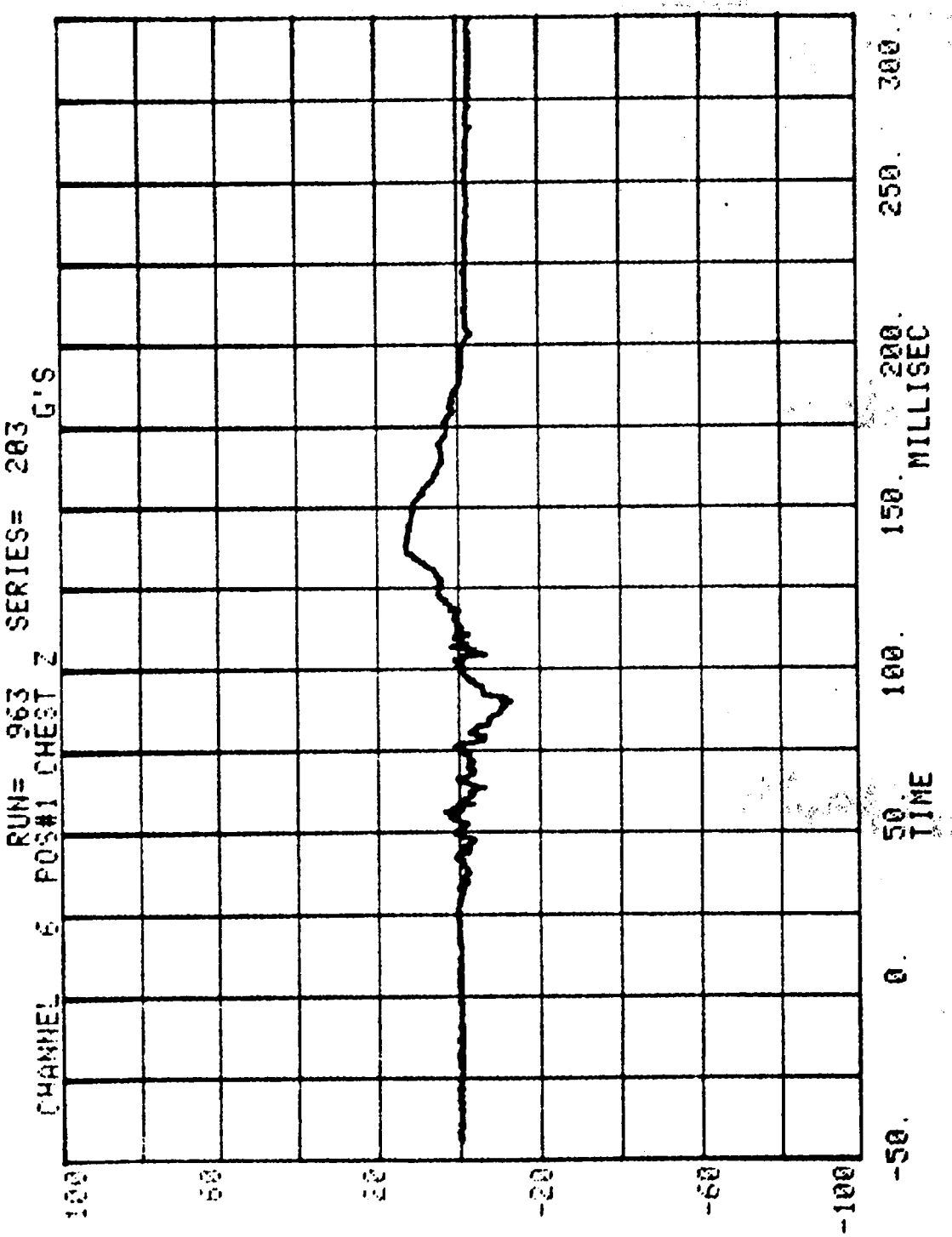

CHANNEL 3 POS#1 HEAD 2
RUN= 963 SERIES= 203
G'S
100.
50.
0.
-50.
-100.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC.

7776-10

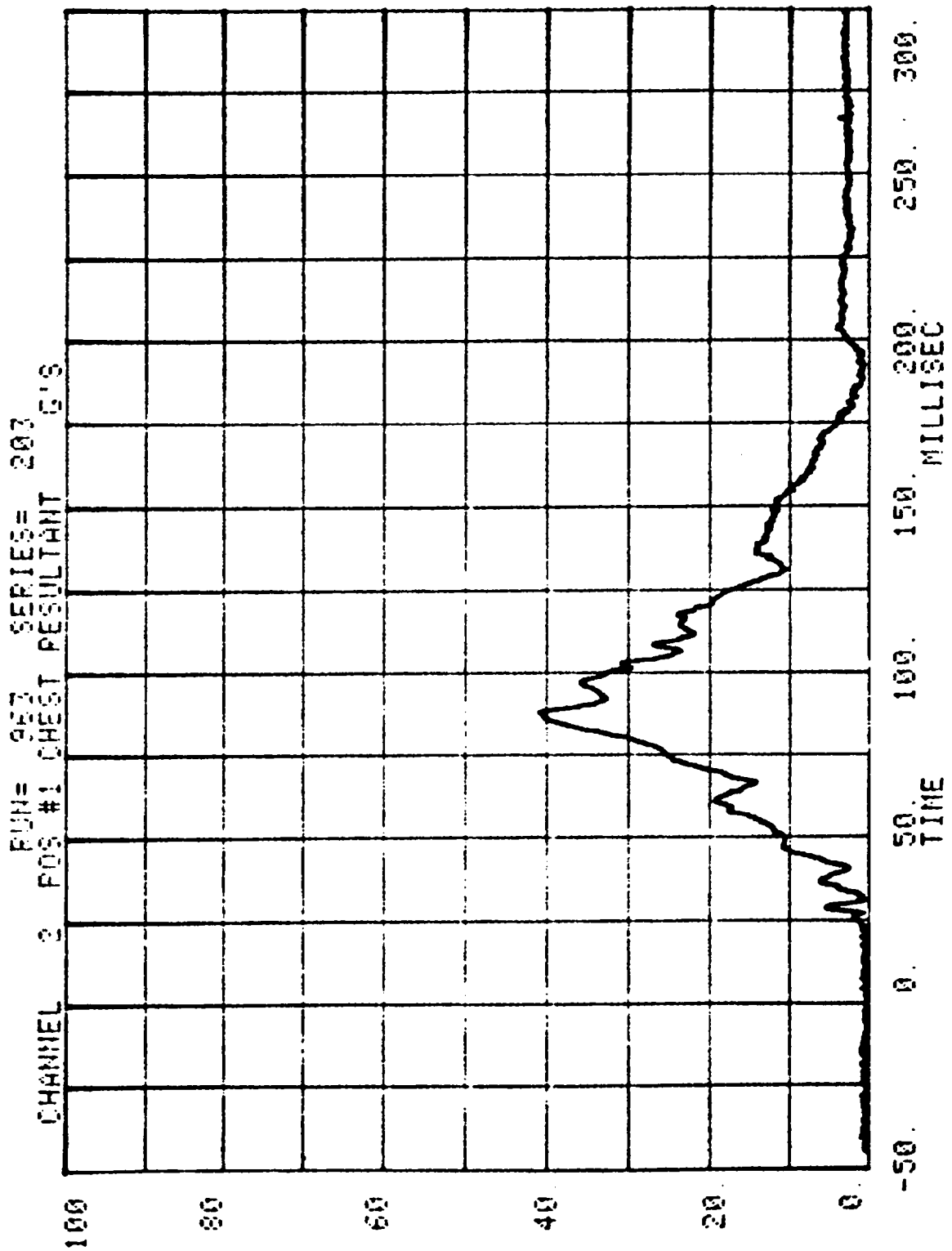

CHANNEL 1
RUN= 963 SERIES= 203
POS #1 HEAD RESULTANT G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

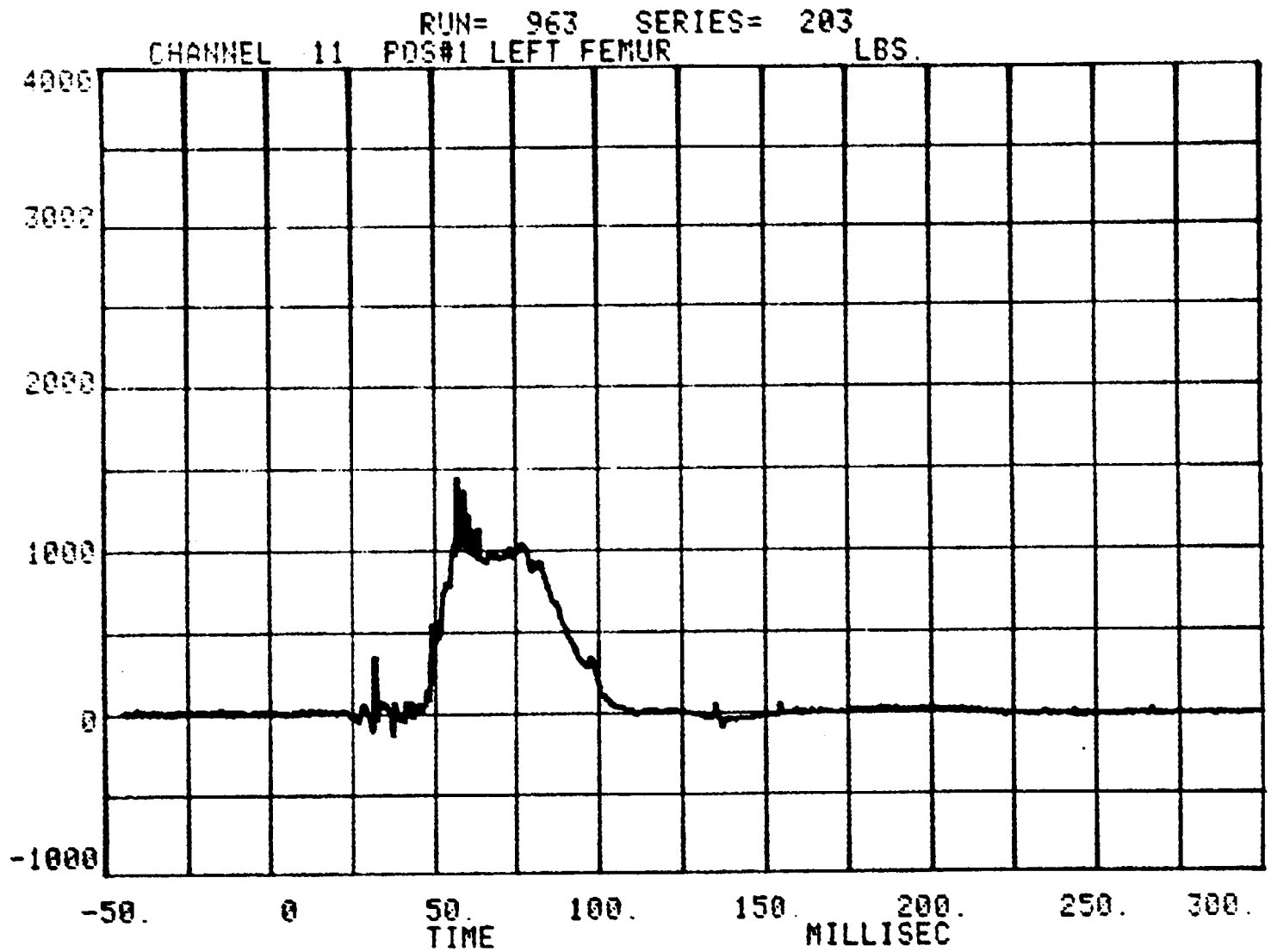

CHANNEL 4 POS#1 CHEST X
RUN= 963 SERIES= 203 G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

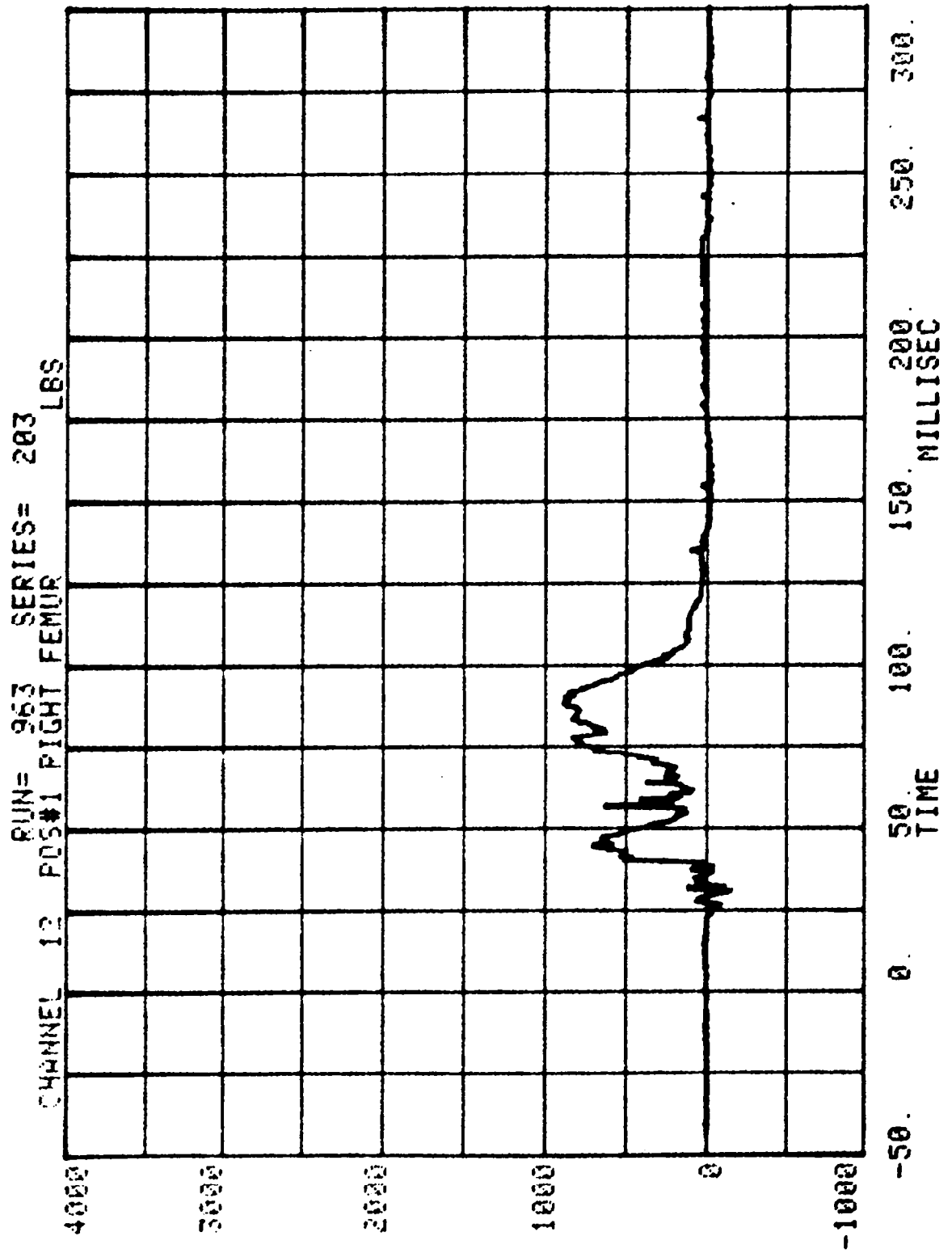

CHANNEL 5 POS#1 CHEST Y
RUN= 963 SERIES= 203
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 963 SERIES= 203
CHANNEL 6 POS#1 CHEST Z
G'S
100.
50.
0.
-50.
-100
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

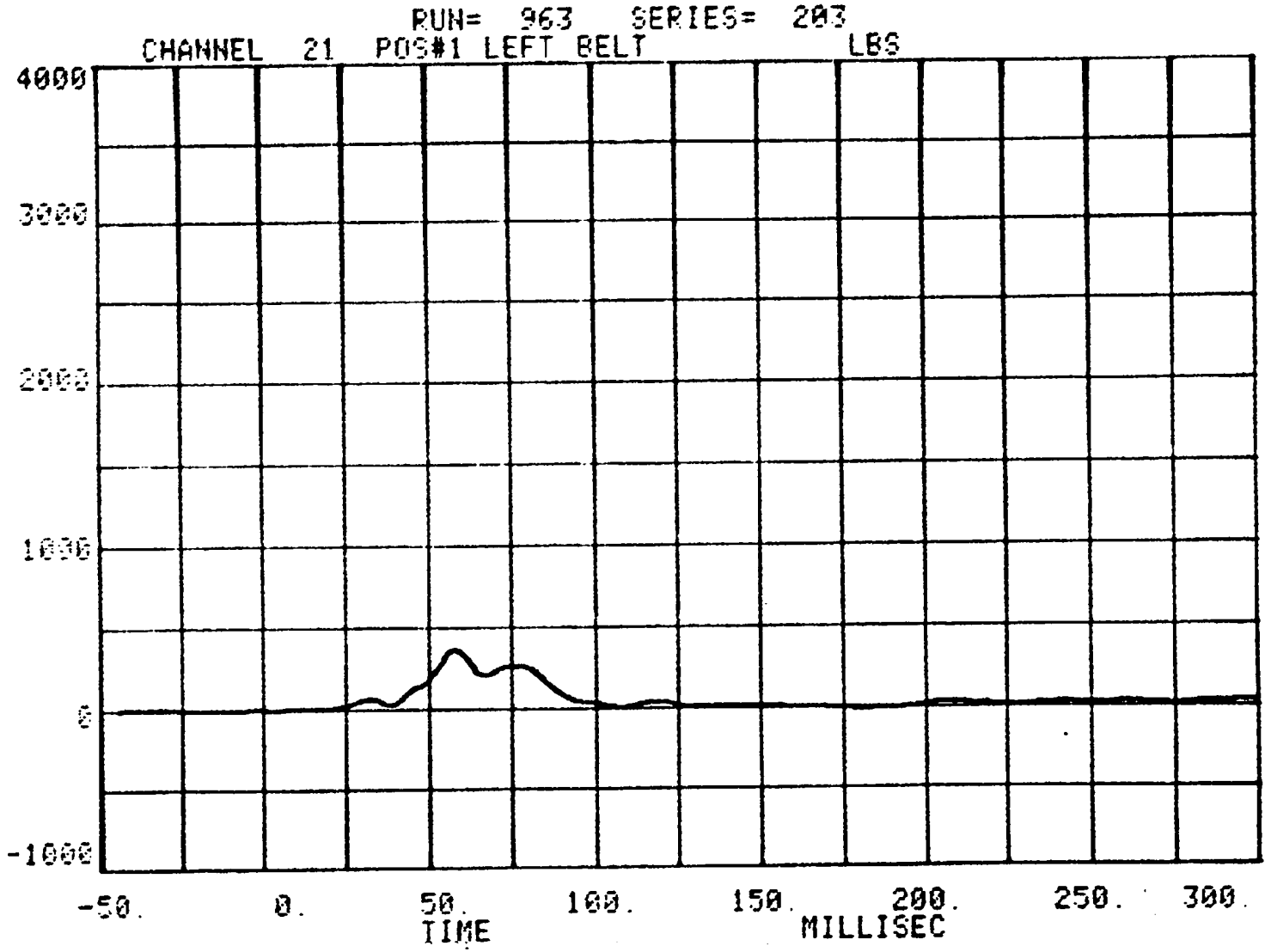
7776-10

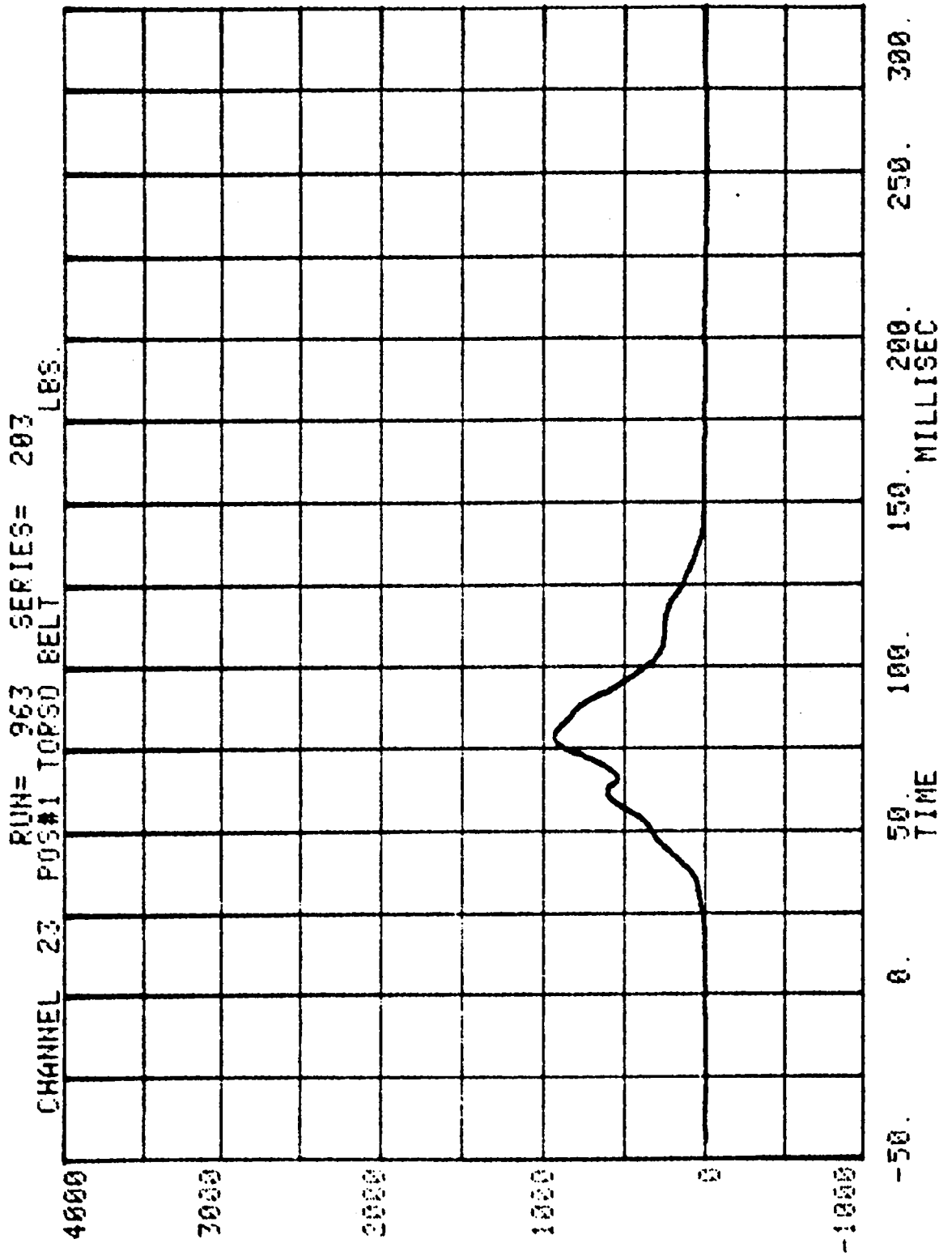

CHANNEL 3 POS #1 CHEST RESULTANT
RUN= 967 SERIES= 203 G'S
100
80
60
40
20
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 963 SERIES= 203
CHANNEL 11 POS#1 LEFT FEMUR LBS.
4000
3000
2000
1000
0
-1000
-50.
0
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 12 POS#1 RIGHT FEMUR
RUN= 963 SERIES= 203
LBS
4000.
3000.
2000.
1000.
0
-1000.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

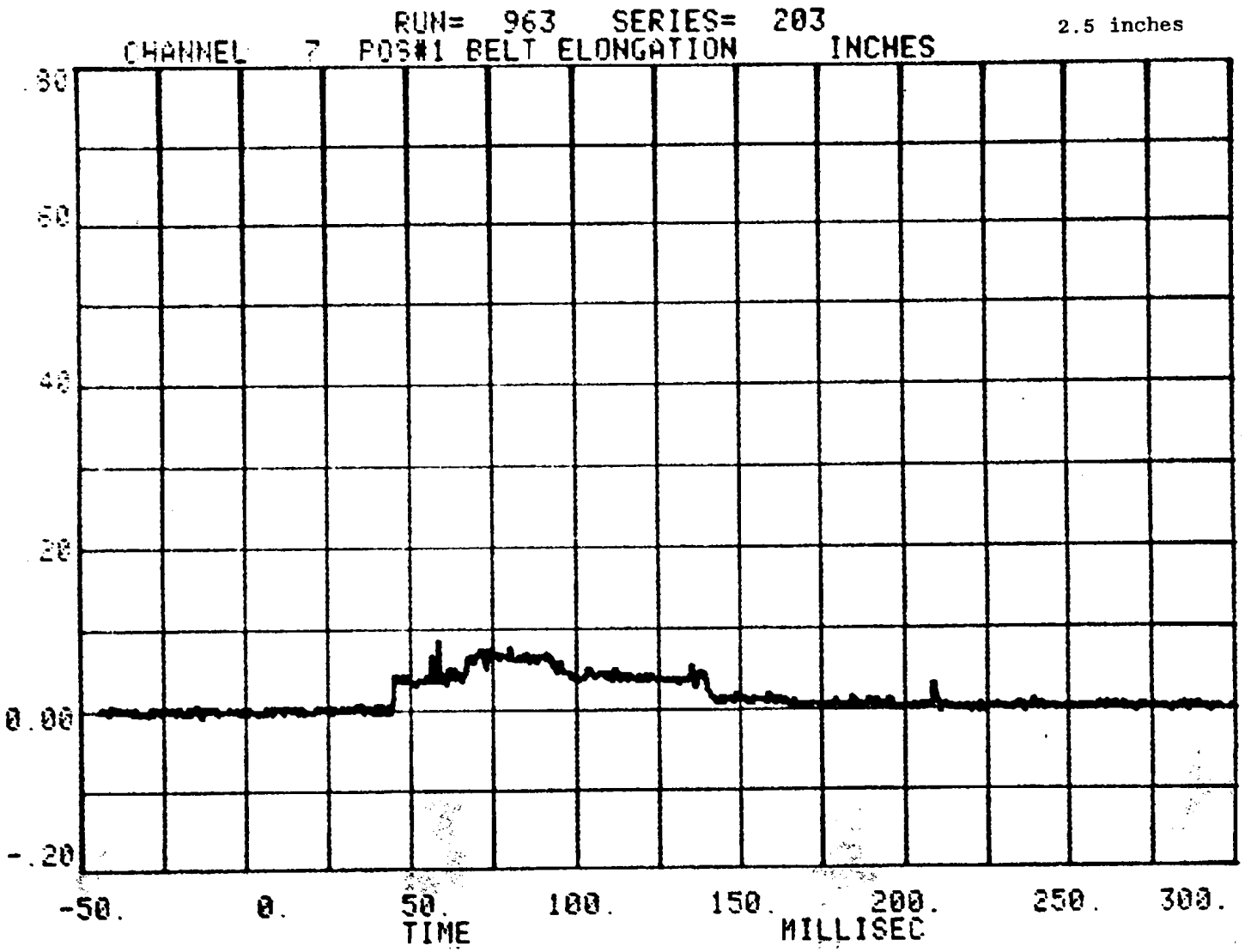
7776-10


RUN= 963 SERIES= 203
CHANNEL 21 POS#1 LEFT BELT
LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

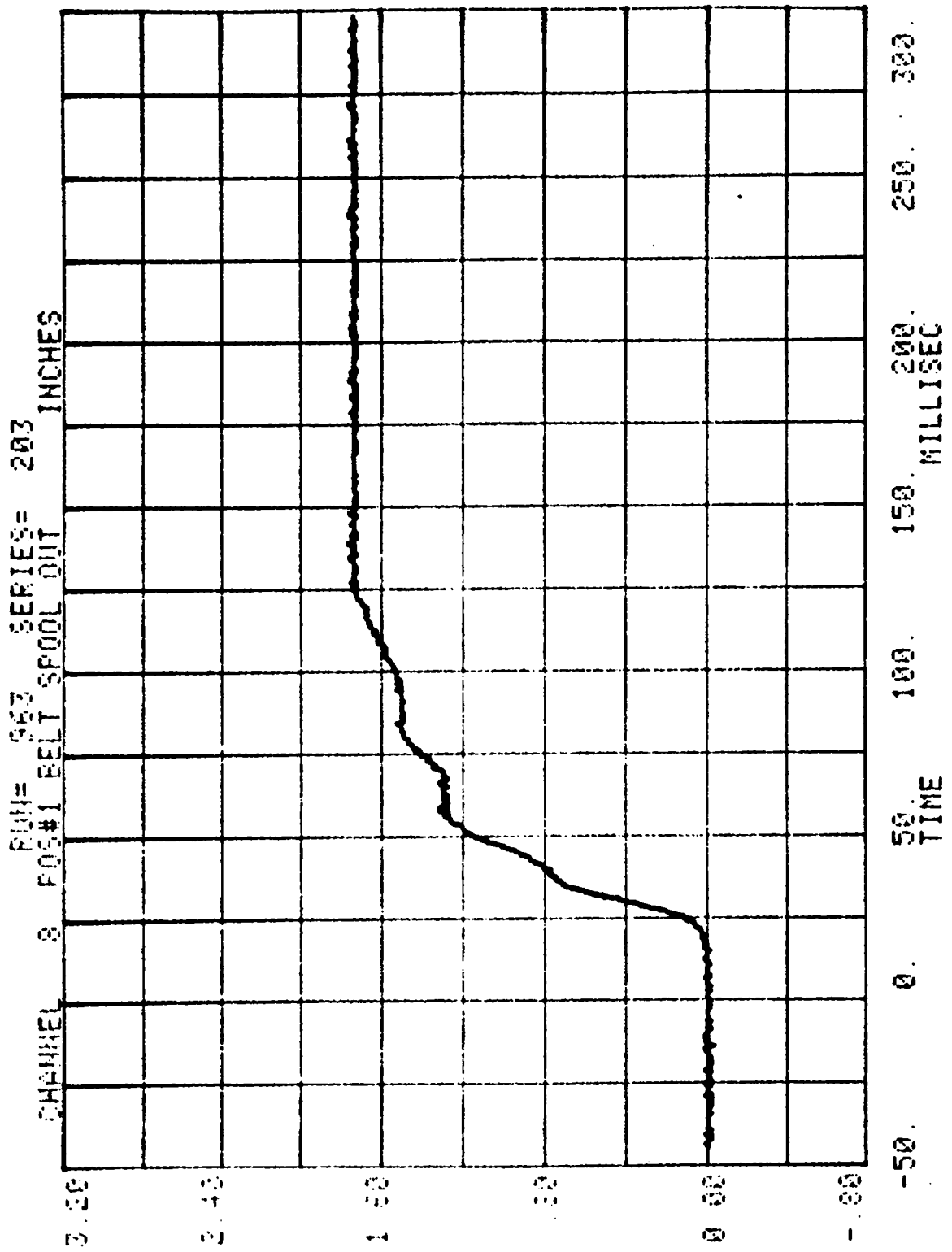

CHANNEL 23 POS#1 TOPSD BELT
RUN= 963 SERIES= 207
LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10

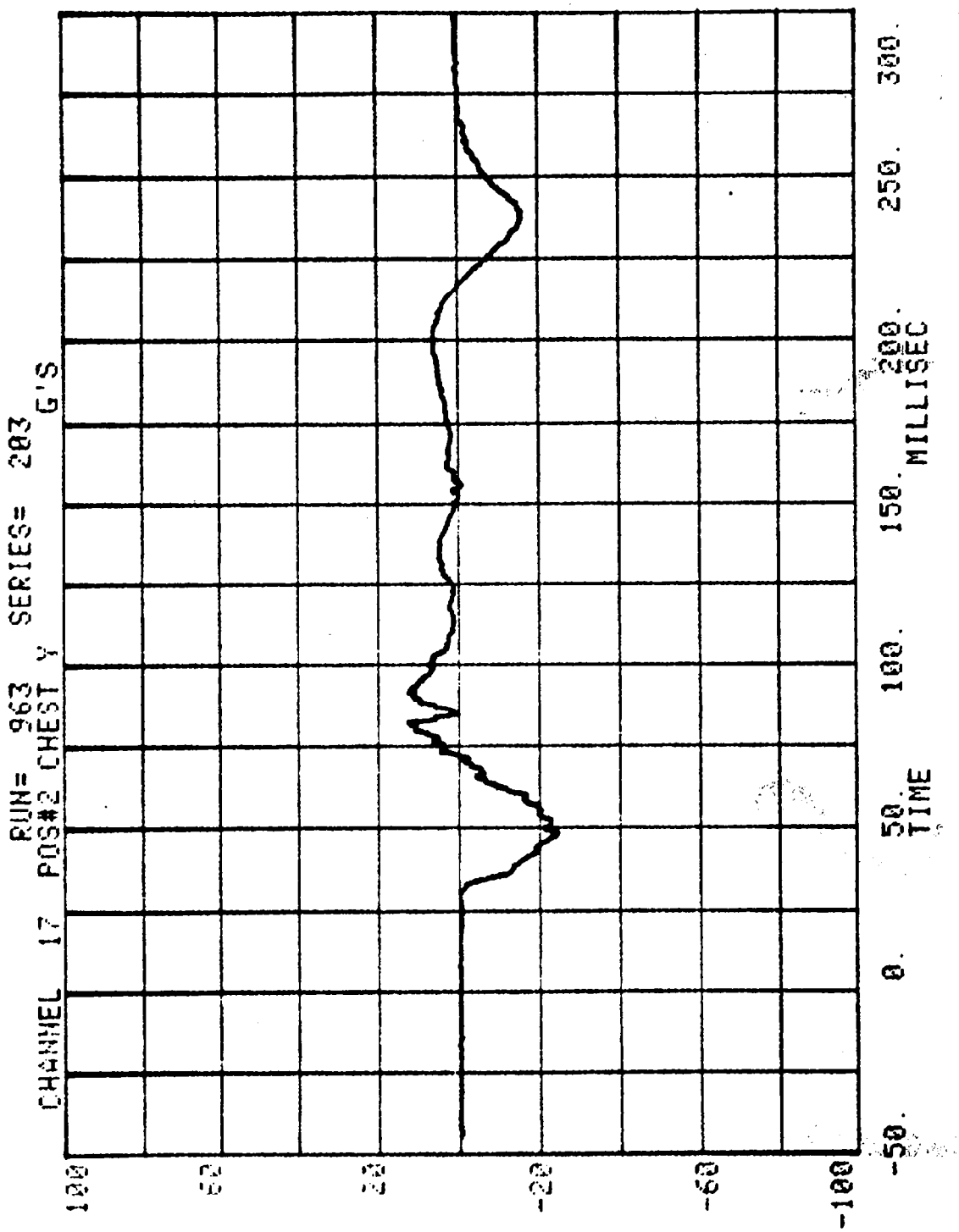
Measured over
2.5 inches

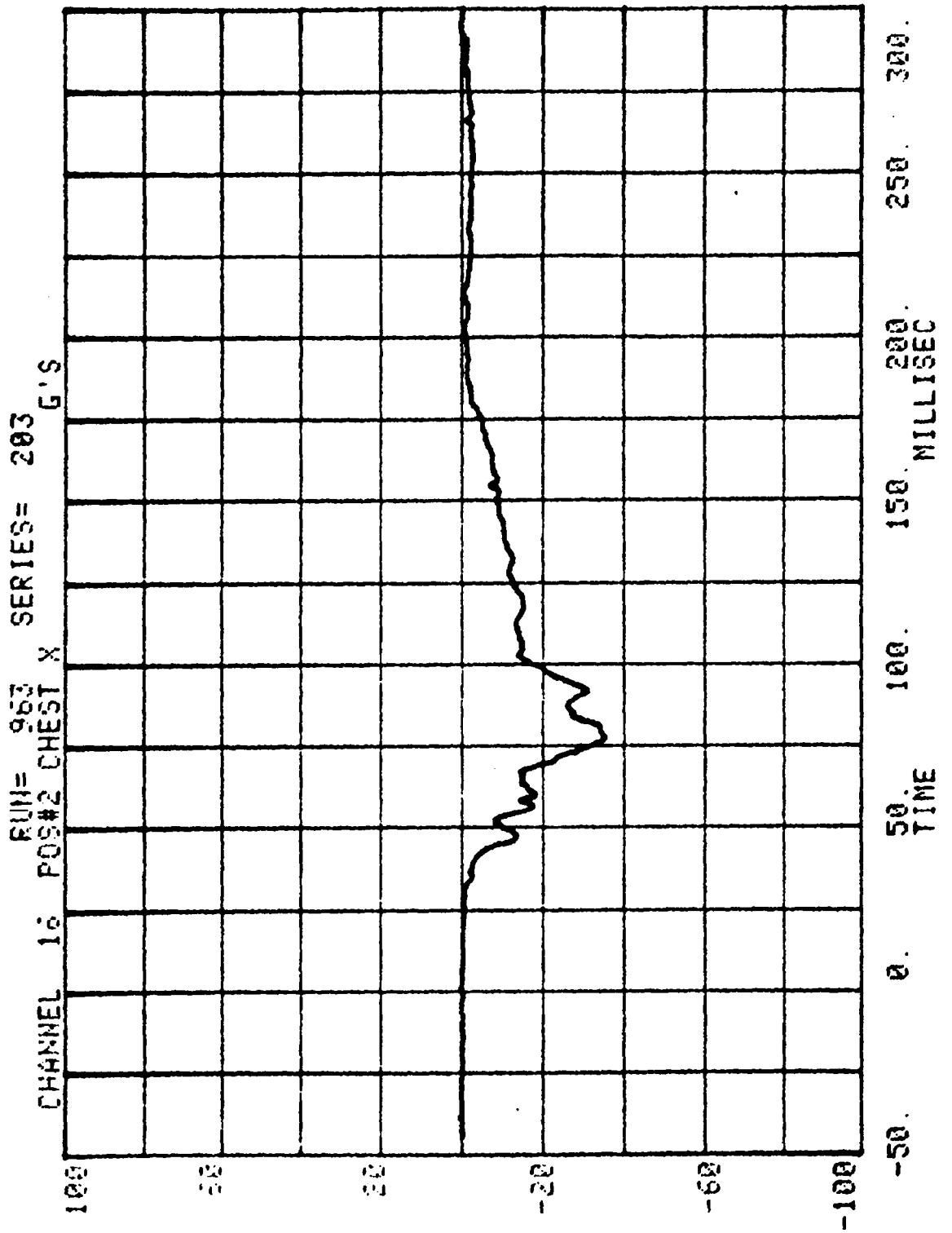


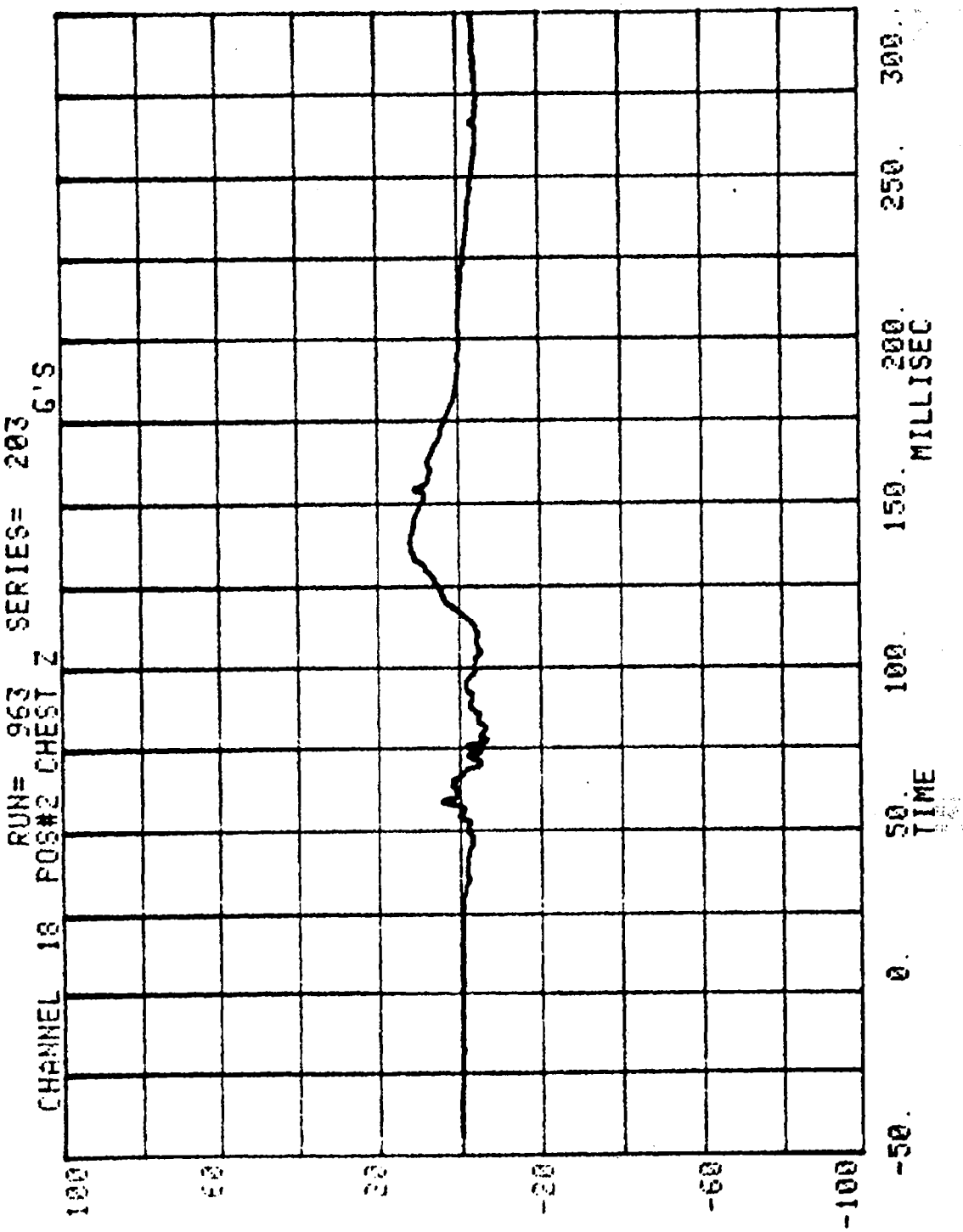
7776-10


CHANNEL 8 FILM= 963 SERIES= 203
POS#1 BELT SPOOL OUT
INCHES
2.00
1.00
0.00
-.00
-50. 0. 50. 100. 150. 200. 250. 300.
TIME
MILLISEC

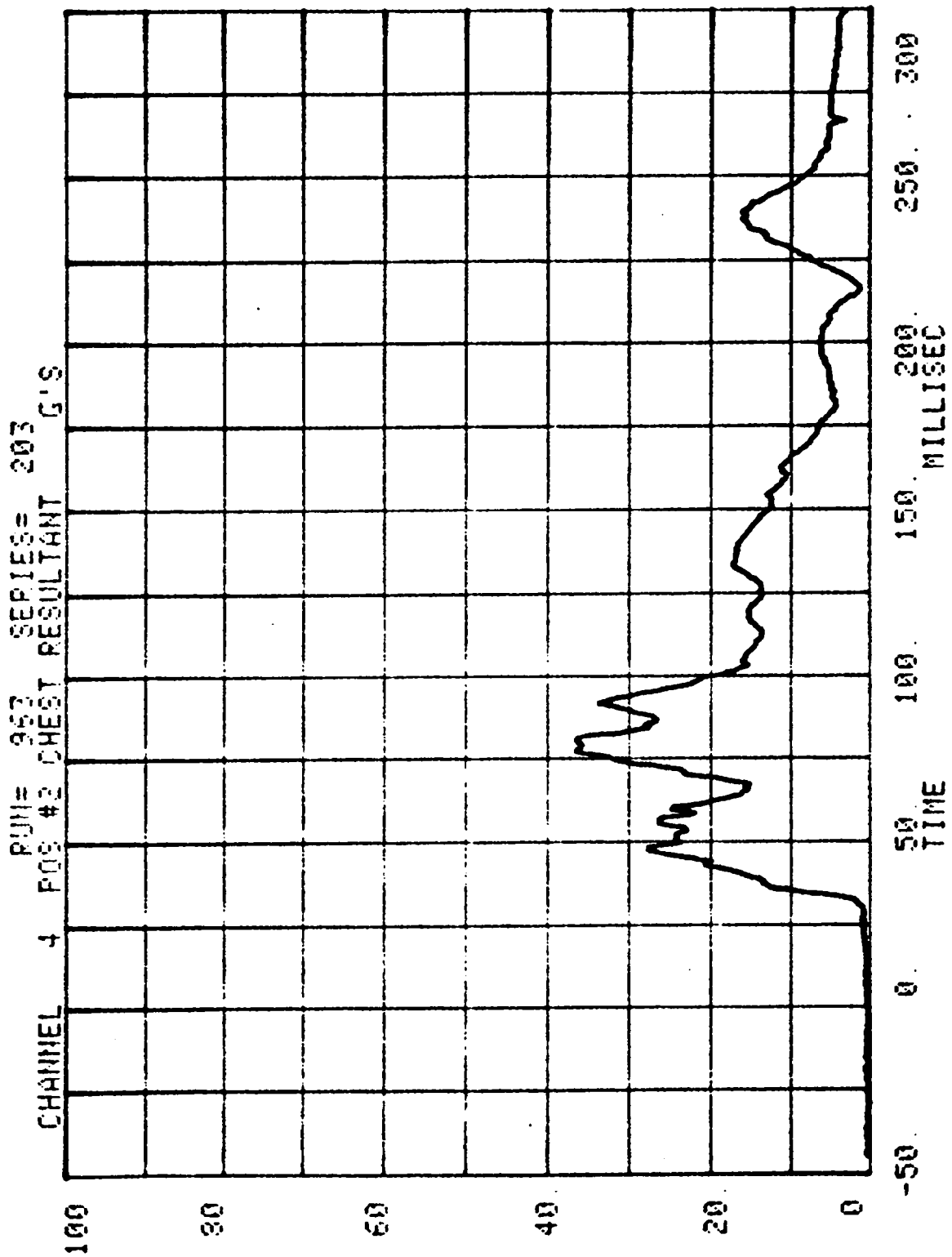
7776-10

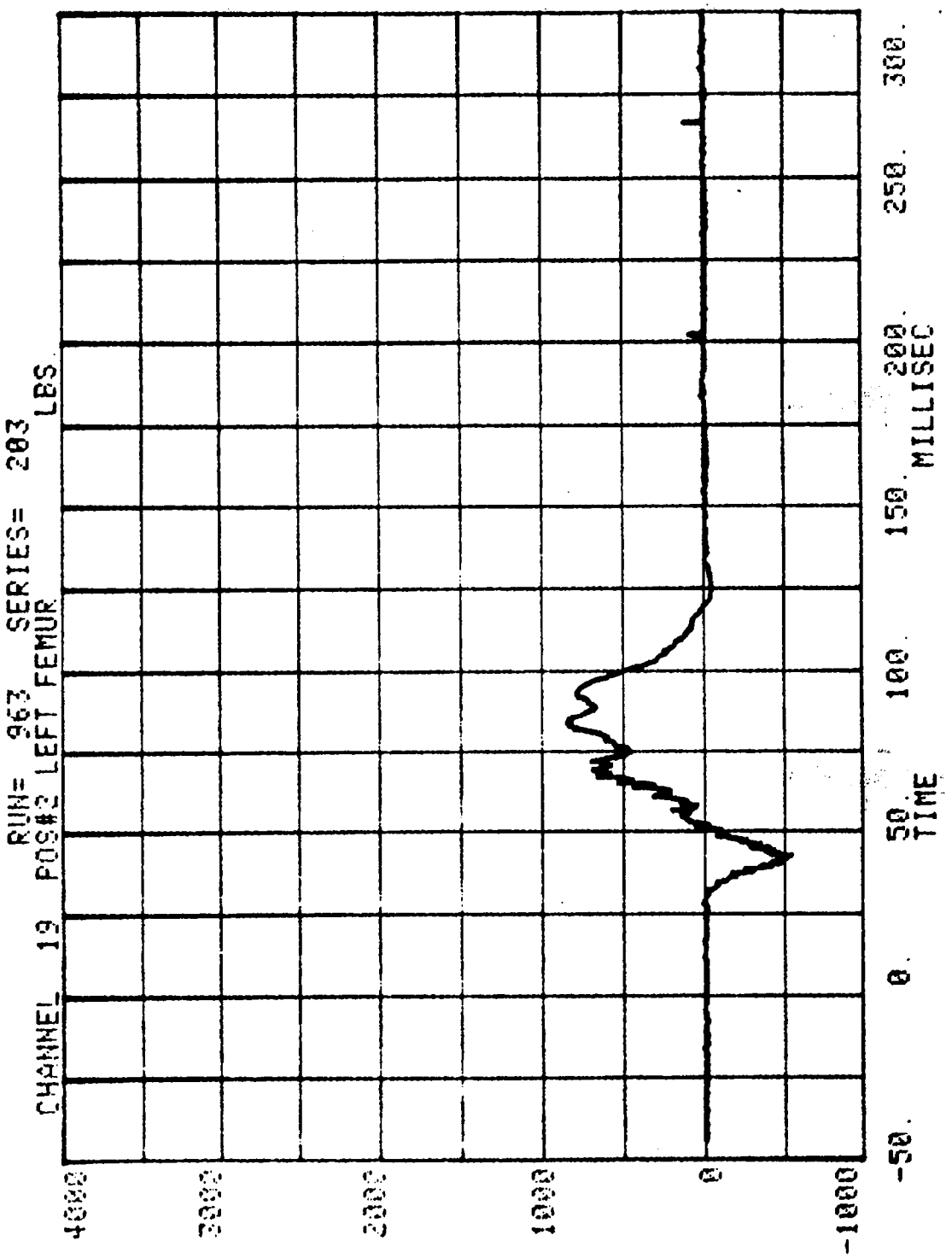

CHANNEL 17 POS#2 CHEST Y
RUN= 963 SERIES= 203
G'S
100
50
0
-50
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 16 POS#2 CHEST X
RUN= 963 SERIES= 203
G'S
100.
50.
0.
-50.
-100
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

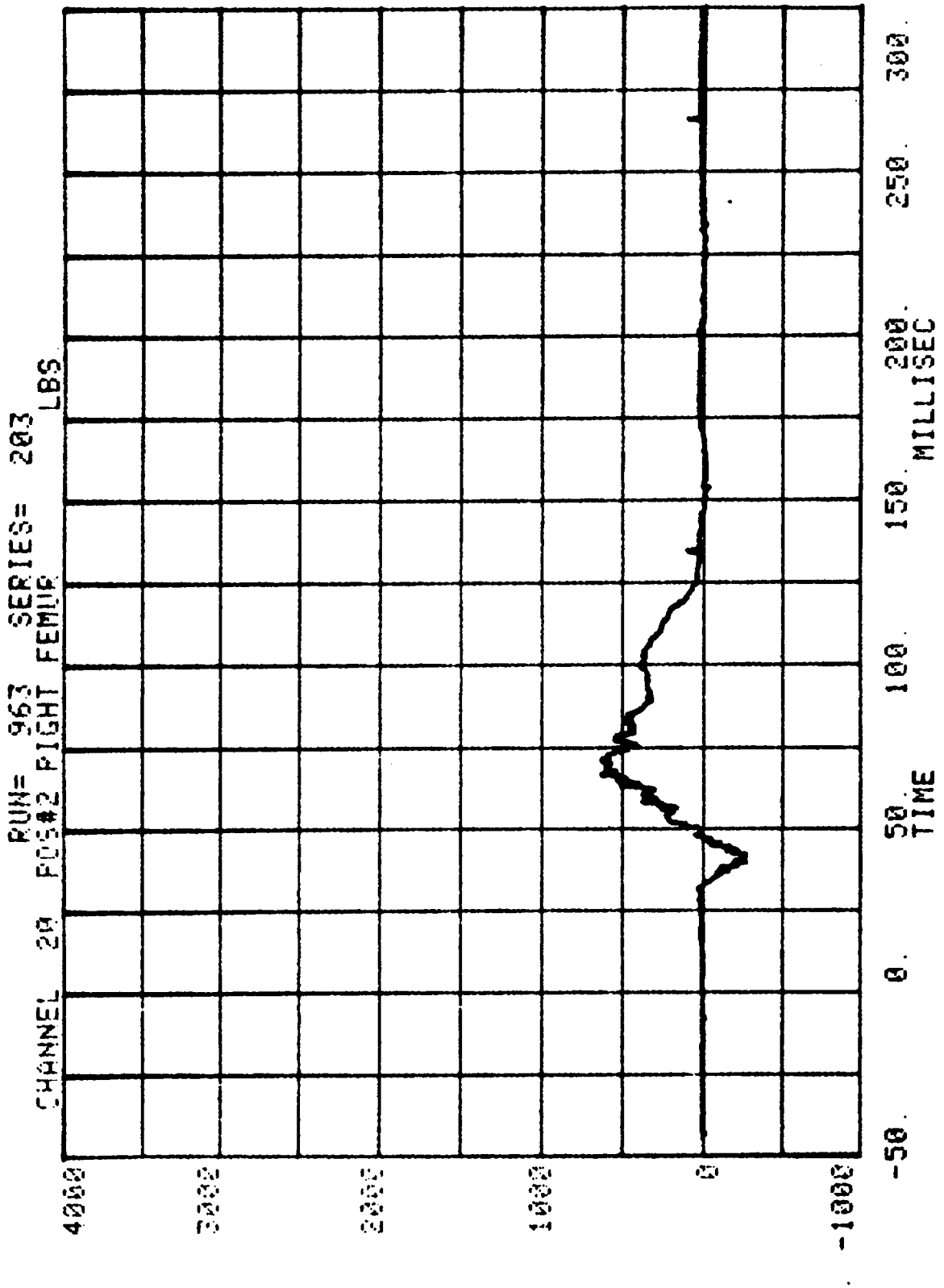

CHANNEL 18 POS#2 CHEST Z
RUN= 963 SERIES= 203
G'S
100
0
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

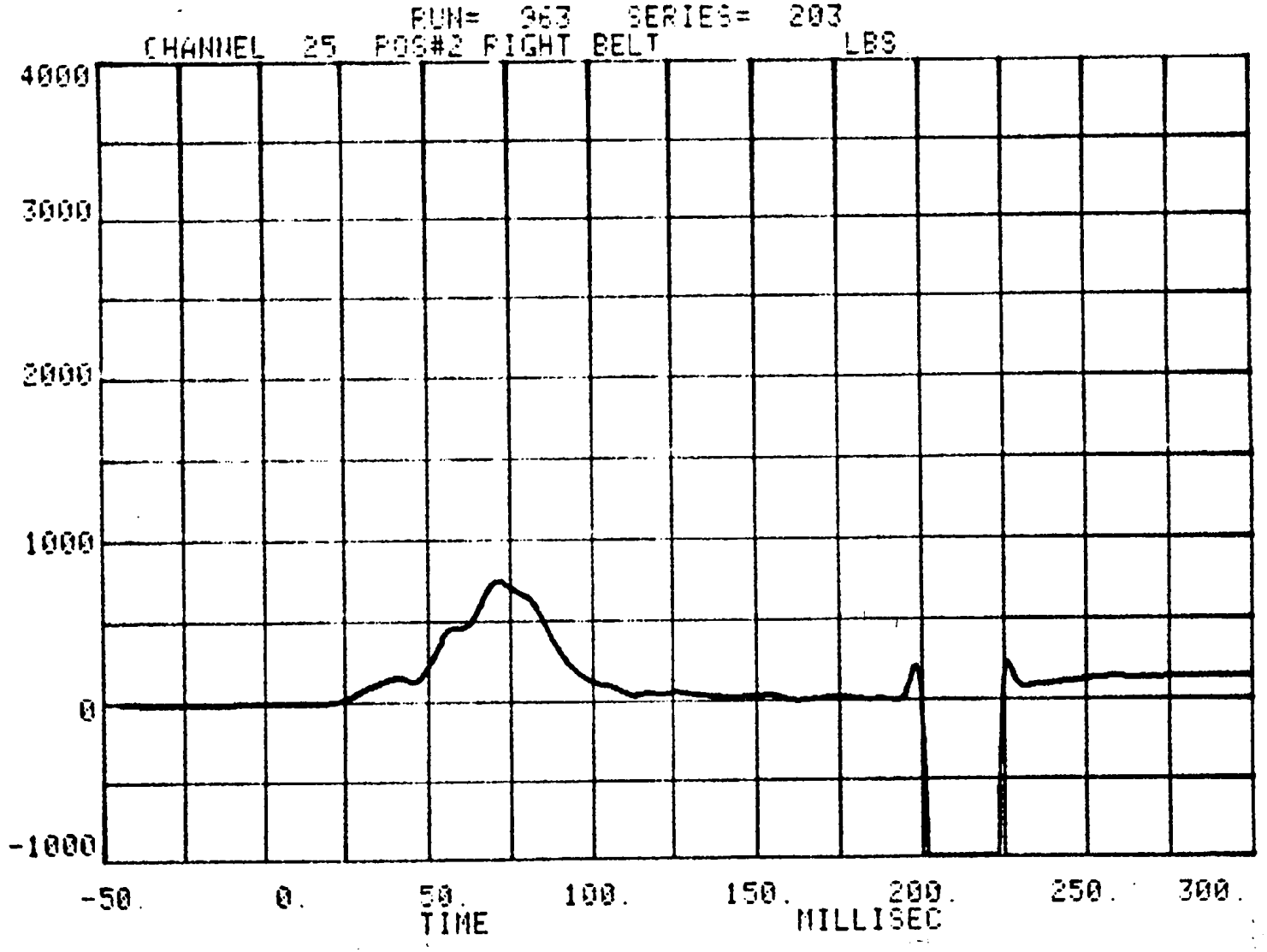
7776-10


CHANNEL 4 POS #2 CHEST RESULTANT
RUN= 953 SERIES= 203
G'S
100
80
60
40
20
0
-50
0
50
100
150
200
250
300
TIME
MILLISEC

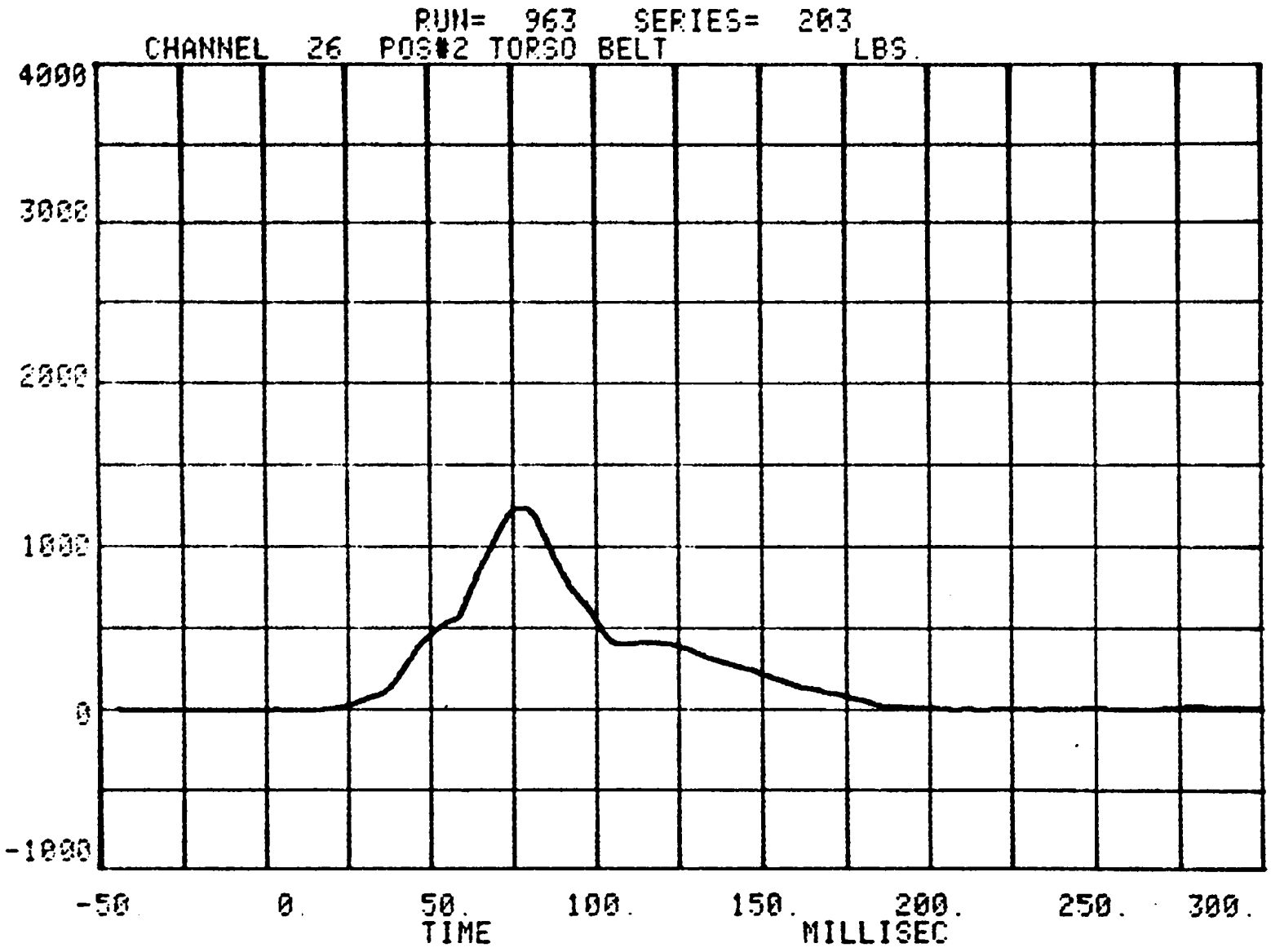

CHANNEL 12 POS#2 LEFT FEMUR
RUN= 963 SERIES= 203
LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

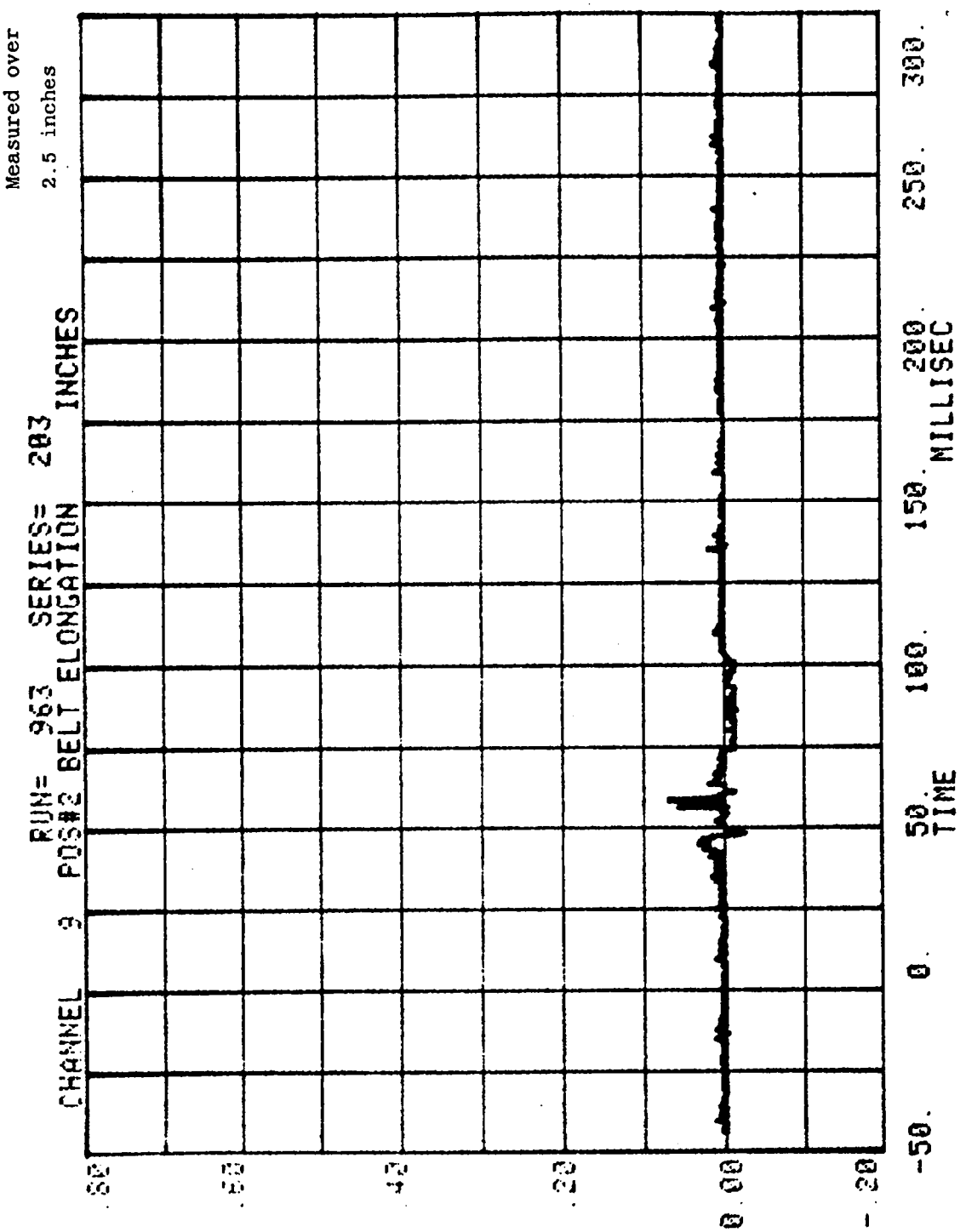
7776-10

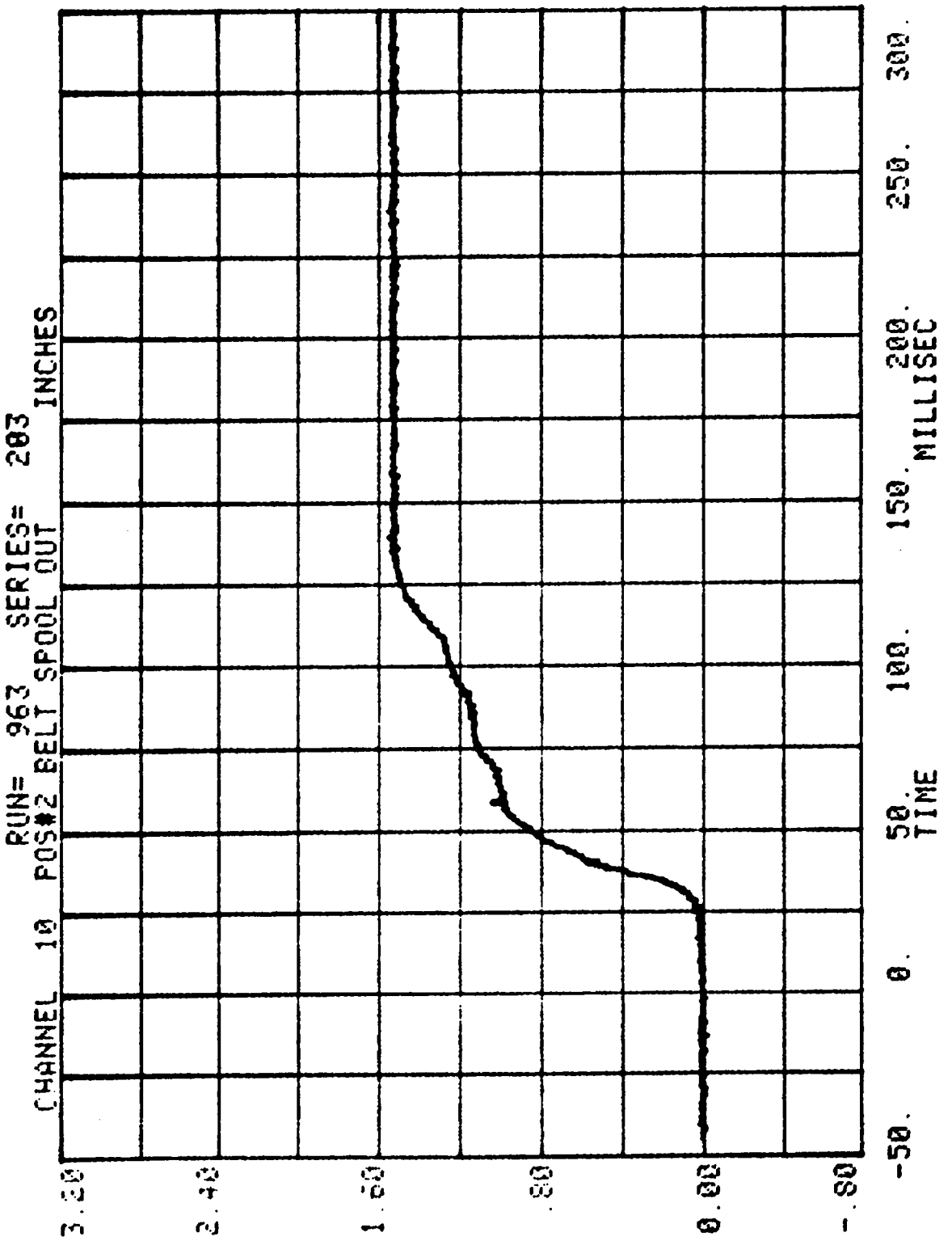

CHANNEL 20 POS#2 RIGHT FEMUR
RUN= 963 SERIES= 203
LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 963 SERIES= 203
CHANNEL 25 POS#2 RIGHT BELT LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10


RUN= 963 SERIES= 203
CHANNEL 26 POS#2 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 3 POS#2 BELT ELONGATION
RUN= 963 SERIES= 203 INCHES
60.
40.
20.
0.00
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 10 POS#2 BELT SPOOL OUT
RUN= 963 SERIES= 203
INCHES
3.30
2.40
1.50
.60
0.00
-.30
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7776-10

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:

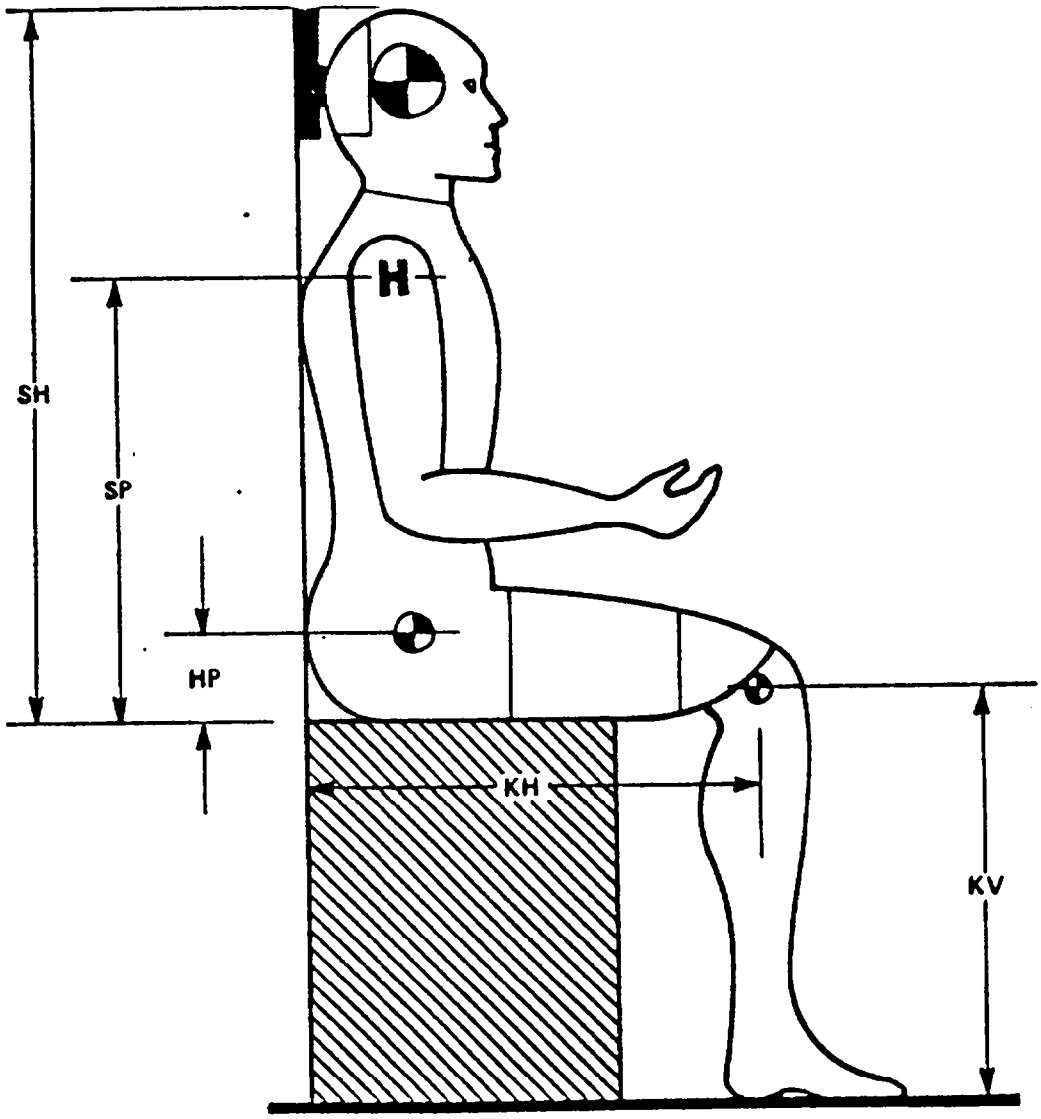
Serial No.	Completion Data
357	01-24-90
358	01-25-90

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



PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER.: 357

I. CONFIGURATION VERIFICATION DATA

	P. 572 SPECIFICATION	PRE-TEST if required	POST-TEST if required
DATE OF CONFIGURATION VERIFICATION	XXXXXXXXXXXX	1-24-90	
VERIFICATION NUMBER FOR DUMMY (*)	XXXXXXXXXXXX	3	
SH - Seated Height	35.6 to 35.8"	35.6 "	"
SP - Shoulder Pivot Height	21.8 to 22.4"	21.9 "	"
HP - Hip Pivot Height	3.9" ref.	3.9 "	"
KH - Knee Pivot from Back Line	20.1 to 20.7"	20.4 "	"
KV - Knee Pivot from floor	19.3 to 19.9"	19.5 "	"
SW - Shoulder Width	17.8 to 18.4"	18.0 "	"
HW - Hip Width	14.0 to 15.4"	14.3 "	"

II. PERFORMANCE VERIFICATION DATA:

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION		1-24-90	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		3	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		69 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		29-33 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	211 G's	G's
b. peak lateral accel.	<= 10 G's	2.2 G's	G's
c. Time above 100 G's	0.9 to 1.5 ms.	1.25 ms	ms

* Sequential number beginning with "1" at the start of each fiscal years's crash test program.

TECHNICIAN'S NAME: IVAN MINKEWICZ

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
2. NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.	24.0 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	23.7 G's	
c. Peak Resultant Head Acceleration		26 G's max.	22.78 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	2.23 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	25.92 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	9.18 ms	
g. Max. Head Rotation		63 to 73 deg.	71.73 deg	
h. Chordal Displacement				
HEAD ROTATION ANGLE				
0 deg.	Time	-2 to 2 ms.	0.0 ms	
	Displ.	-.5 to .5"	0.0 "	
30 deg.	Time	25.6 to 34.4 ms.	27.16 ms	
	Displ.	2.1 to 3.1"	2.51 "	
60 deg.	Time	40.3 to 51.7 ms.	42.78 ms	
	Displ.	4.3 to 5.3"	4.96 "	
Maximum	Time	53.2 to 66.8 ms.	56.67 ms	
	Displ.	5.0 to 6.0"	5.72 "	
60 deg.	Time	67.0 to 83.0 ms.	73.41 ms	
	Displ.	4.3 to 5.3"	4.82 "	
30 deg.	Time	85.4 to 104.6 ms.	90.65 ms	
	Displ.	2.1 to 3.1"	2.11 "	
0 deg.	Time	101.0 - 123.0 ms.	104.29 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKEWICZ

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
3. ABDOMINAL COMPRESSION			
TEST: (preload = 50 lbs.)			
a. Force @ 0.5"	23 to 36 lbs.	24 lbs	
b. Force @ 0.75"	36 to 50 lbs.	37 lbs	
c. Force @ 1.0"	50 to 63 lbs.	56 lbs	
d. Force @ 1.3"	73 to 88 lbs.	83.5 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	25.5 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	38 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	52 lbs	
d. Return Angle	12 deg. maximum	10 deg	
5. CHEST IMPACT TESTS:			
A.High Speed			
(1) Probe Speed	21.78-22.22 fps.	21.8 fps	
(2) Peak Deflection	1.7" maximum	1.55 "	
(3) Peak Resistive Force	2250 lbs maximum	2009 lbs	
(4) Internal Hysteresis	50 to 70%	57 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	13.9 fps	
(2) Peak Deflection	1.1" maximum	.92 "	
(3) Peak Resistive Force	1450 lbs maximum	1208 lbs	
(4) Internal Hysteresis	50 to 70%	50.5 %	

TECHNICIAN'S NAME: IVAN MINKEWICZ

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
6. KNEE IMPACT TEST			
A. Left Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	2337 lbs	
(3) Time above 1000 lbs.	1.7 ms. minimum	1.75 ms	
B. Right Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	2146 lbs	
(3) Time Above 1000 lbs.	1.7 ms. minimum	1.75 ms	

REMARKS:

TECHNICIAN'S NAME: IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER _____357_____

DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	CK54	1-90	7-90
HY LATERAL--	ENDEVCO	GD98	1-90	7-90
HZ VERTICAL--	ENDEVCO	CD75	1-90	7-90
2. CHEST ACCELEROMETER-				
CX LONGITUDINAL--	CEC	A115	1-90	7-90
CY LATERAL--	ENDEVCO	CS09	1-90	7-90
CZ VERTICAL--	CEC	A29	1-90	7-90
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	548	1-90	7-90
RIGHT SIDE	GSE	549	1-90	7-90
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

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER.: 358

I. CONFIGURATION VERIFICATION DATA

	P. 572 SPECIFICATION	PRE-TEST if required	POST-TEST if required
DATE OF CONFIGURATION VERIFICATION	XXXXXXXXXXXX	1-25-90	
VERIFICATION NUMBER FOR DUMMY (*)	XXXXXXXXXXXX	3	
SH - Seated Height	35.6 to 35.8"	35.6 "	"
SP - Shoulder Pivot Height	21.8 to 22.4"	22.1 "	"
HP - Hip Pivot Height	3.9" ref.	3.9 "	"
KH - Knee Pivot from Back Line	20.1 to 20.7"	20.5 "	"
KV - Knee Pivot from floor	19.3 to 19.9"	19.6 "	"
SW - Shoulder Width	17.8 to 18.4"	18.0 "	"
HW - Hip Width	14.0 to 15.4"	14.8 "	"

II. PERFORMANCE VERIFICATION DATA:

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION		1-25-90	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		3	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		69 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		30-33 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	228.9 G's	G's
b. peak lateral accel.	<= 10 G's	6.1 G's	G's
c. Time above 100 G's	0.9 to 1.5 ms.	1.25 ms	ms

* Sequential number beginning with "1" at the start of each fiscal years's crash test program.

TECHNICIAN'S NAME: IVAN MINKEWICZ

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA...continued

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 358

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
2. NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.	24.2 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	23.5 G's	
c. Peak Resultant Head Acceleration		26 G's max.	23.67 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	2.36 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	27.65 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	6.82 ms	
g. Max. Head Rotation		63 to 73 deg.	70.84 deg	
h. Chordal Displacement				
HEAD ROTATION ANGLE				
0 deg.	Time	-2 to 2 ms.	.87 ms	
	Displ.	-.5 to .5"	0.0 "	
30 deg.	Time	25.6 to 34.4 ms.	27.28 ms	
	Displ.	2.1 to 3.1"	2.35 "	
60 deg.	Time	40.3 to 51.7 ms.	42.66 ms	
	Displ.	4.3 to 5.3"	4.92 "	
Maximum	Time	53.2 to 66.8 ms.	56.67 ms	
	Displ.	5.0 to 6.0"	5.68 "	
60 deg.	Time	67.0 to 83.0 ms.	73.91 ms	
	Displ.	4.3 to 5.3"	4.72 "	
30 deg.	Time	85.4 to 104.6 ms.	90.53 ms	
	Displ.	2.1 to 3.1"	2.1 "	
0 deg.	Time	101.0 - 123.0 ms.	104.91 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKEWICZ

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 358

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
3. ABDOMINAL COMPRESSION			
TEST: (preload = 50 lbs.)			
a. Force @ 0.5"	23 to 36 lbs.	26 lbs	
b. Force @ 0.75"	36 to 50 lbs.	41.5 lbs	
c. Force @ 1.0"	50 to 63 lbs.	58.5 lbs	
d. Force @ 1.3"	73 to 88 lbs.	87 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	26 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	38 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	50.5 lbs	
d. Return Angle	12 deg. maximum	10.5 deg	
5. CHEST IMPACT TESTS:			
A.High Speed			
(1) Probe Speed	21.78-22.22 fps.	21.8 fps	
(2) Peak Deflection	1.7" maximum	1.53 "	
(3) Peak Resistive Force	2250 lbs maximum	2031 lbs	
(4) Internal Hysteresis	50 to 70%	56.4 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	14.0 fps	
(2) Peak Deflection	1.1" maximum	1.01 "	
(3) Peak Resistive Force	1450 lbs maximum	1267 lbs	
(4) Internal Hysteresis	50 to 70%	58.8 %	

TECHNICIAN'S NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 358

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
6. KNEE IMPACT TEST			
A. Left Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	2145 lbs	
(3) Time above 1000 lbs.	1.7 ms. minimum	1.75 ms	
B. Right Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	1875 lbs	
(3) Time Above 1000 lbs.	1.7 ms. minimum	2.0 ms	

REMARKS:

TECHNICIAN'S NAME: IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER _____358_____

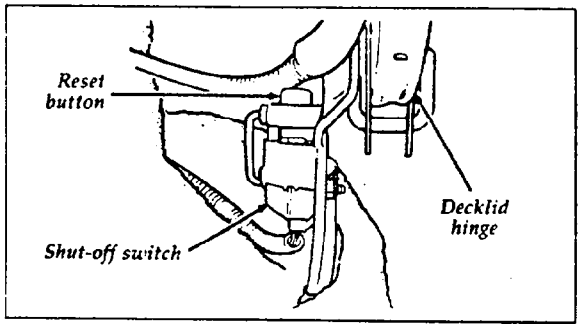
DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	EL86	10-89	4-90
HY LATERAL--	ENDEVCO	FR42	10-89	4-90
HZ VERTICAL--	ENDEVCO	GD35	10-89	4-90
2. CHEST ACCELEROMETER-				
CX LONGITUDINAL--	CEC	A150	1-90	7-90
CY LATERAL--	ENDEVCO	EL79	1-90	7-90
CZ VERTICAL--	CEC	A151	1-90	7-90
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	551	1-90	7-90
RIGHT SIDE	GSE	552	1-90	7-90
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

switch is a safety device intended to automatically stop the flow of fuel to the engine when your vehicle has been hit or you are involved in a collision. The impact does not have to be great for the switch to be triggered. Minor parking lot bumping and severe road impacts (such as potholes) may trigger the switch even when there is no apparent body damage. In many instances, you might not even know that the switch has been triggered.

Once the shut-off switch is triggered, you must reset the switch by hand before you can start your vehicle. The switch is on the left side of the trunk.



The fuel pump shut-off switch

Warning: If you see or smell gas, do not reset the switch or try to start your vehicle. You could injure yourself or others. Have all the passengers get out of the vehicle and call the local fire department or a towing service.

If your engine cranks but does not start after a collision:

1. Turn the key in the ignition to OFF.
2. Check under the vehicle for leaking gas.

3. If you do not see or smell gas, push the white reset button down. If the button is already set, you may have a different mechanical problem.
4. Turn the ignition key ON for a few seconds, then turn it OFF.
5. Check under the vehicle again for leaking gas. If you see or smell gas, do not start your vehicle again. If there is no gas, you can start your vehicle.

Pushing

Vehicles with automatic transmissions cannot be started by pushing. Follow the directions under Use of Jumper Cables.

Using Safety Restraints Properly

Safety Belts

Safety belts help protect you and your passengers in case of a collision. In most states, the law requires their use. We strongly recommend that you use them every time you travel in your vehicle.

Warning: Always drive and ride with your seat back upright and the lap belt snug across the hips to reduce the risk of serious injury to the abdomen or neck that could be caused by sliding under the safety belts in a collision.

Safety belts provide best restraint when:

- ❑ the seat back is upright
- ❑ the occupant is sitting upright (not slouched)
- ❑ the lap belt is snug and low on the hips

- ❑ the shoulder belt is snug against the chest
- ❑ the knees are straight forward

For your safety, your vehicle has different types of safety belts:

- ❑ Front and rear lap and shoulder belts – for people who sit next to the windows in either the front or rear seats
- ❑ Lap belts without retractors – for people who sit in the front and rear center seats.
- ❑ Manual front lap and shoulder belts (Canadian vehicles only) – for people who sit in the front seat.

See the following sections for directions on how to properly use these safety belts. Also see *Safety restraints for children* in this chapter for special instructions about using safety belts for children.

Warning: Make sure that you and your passengers, including pregnant women, wear safety belts. Be sure that lap belts fit snugly and as low as possible around the hips. Do not wear them around the waist. If safety belts are not used properly, the chances of you or your passengers being injured in a collision greatly increase.

Warning: Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the chance and/or severity of injury in an accident.

Do not allow people to ride in the cargo area of your vehicle. People who are not riding in a seat with a fastened safety belt are much more likely to be injured if you have a collision.

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Never use a single belt for more than one person or across seating positions. This greatly increases the chance that one or both of the people will be injured in a collision. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue. Each assembly is designed to be used as a pair.

Warning: Be sure to lock all doors before you drive away. This will lessen the risk of your being thrown from the vehicle in a collision.

Safety Belt Maintenance

Also, check the safety belt systems periodically to make sure that they work properly and are not damaged.

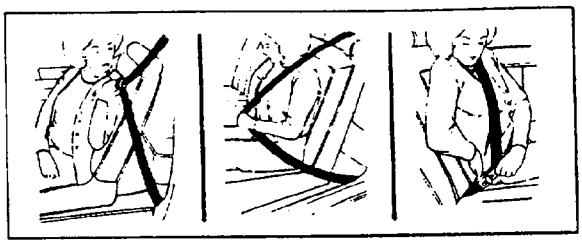
Warning: All safety belt assemblies including retractors and attaching hardware should be inspected after any collision. Ford recommends that all safety belt assemblies used during a collision be replaced unless the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Combination Lap and Shoulder Belts

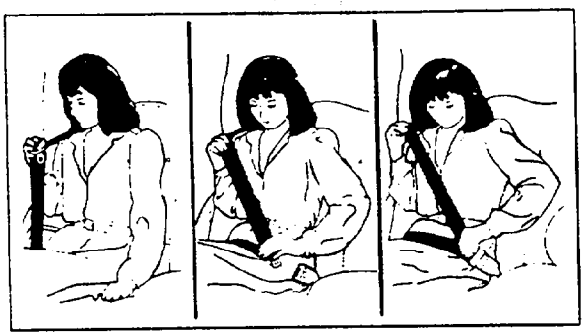
While your vehicle is in motion, the front and rear combination lap and shoulder belts adjust to your movement. However, if you brake hard, corner hard or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and prevents you from moving.

After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

To fasten the belt, find the long strap of the belt near the door, pull it across your shoulder and chest, and insert the tongue into the proper buckle on your seat until you hear a snap and feel it lock. Be sure to use the correct buckle and check to make sure the buckle is securely fastened.



Fastening the front seat lap and shoulder belt



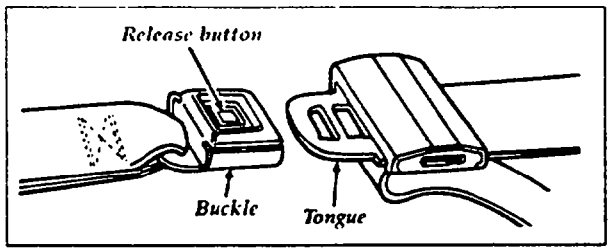
Fastening the rear seat lap and shoulder belt

Warning: Use the shoulder belt only on the shoulder that is closest to the vehicle door. Never wear the belt under your arm. If you do not use the shoulder belt properly, the chances of your being injured in a collision greatly increase.

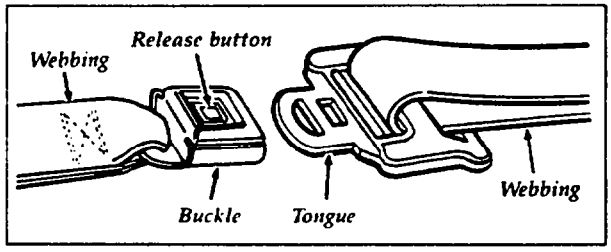
To adjust the lap part of the belt, pull up on the shoulder belt until the lap belt fits snugly low on your hips.

To unfasten the belt:

1. Push the release button in the center of the buckle. This allows the tongue to unlatch from the buckle.



Unfastening center lap safety belts



Unfastening the outboard lap/shoulder belts

2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.

To Untangle the Belt:

If you should jam the lap belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Pull on the belt with both hands to tighten it on the retractor spool.
2. Feed the belt back into the retractor until it is completely retracted. Repeat previous step if necessary.
3. Pull the belt out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.

4. Then, pull the belt out and let it retract several times to be sure that the belt works properly.

Lap belts — Center Seating Positions

The lap belts in the center of the front and rear seats do not adjust automatically. You must adjust them to fit snugly around your hips. Do not wear them around your waist.

Before you fasten your center position lap belts in the front or rear seats, you may need to lengthen them.

To lengthen the belt, tip the belt tongue at a right angle to the belt. Pull the belt tongue over your lap until it reaches the buckle.

To fasten the belt, pull the belt across your hips and **insert the tongue into the correct buckle** on your seat until you hear a snap and feel it lock. Make sure the buckle is securely fastened.

Adjust the belt so that it fits snugly around your hips:

- ❑ If you need to shorten the belt, pull on the loose end of the webbing.

To unfasten the belt, push the release button on the buckle. This allows the tongue to unlatch from the buckle.

Center Rear Lap Belts

Because the center lap belts do not have retractors, they should be shortened and fastened when not in use. To lengthen the belt, tip the tongue at a right angle to the belt, and pull the belt over your lap until the tongue reaches the buckle.

To fasten the belt, insert the tongue into the open end of the proper buckle until you hear a snap and feel the latch engage. Then pull on the loose end of the webbing to snug up the belt. The belt should be snug and as low as possible around the hips, never around the waist.

Rear Seat Lap-Shoulder Belts

Pull the lap-shoulder belt from the retractor so the shoulder portion of the belt crosses your shoulder and chest and insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Pull up on the shoulder portion of the belt to tighten the lap portion to a snug fit. Be sure the belt is as low on your hips as possible.

Warning: Front and rear seat occupants (including pregnant women) should wear both lap and shoulder belts, for optimum protection in an accident.

Safety Lap Belt Extension Assembly

A safety belt that is too short even when fully extended can be lengthened. Available from your dealer is a safety belt extension assembly (54611C22). This assembly will add approximately eight inches (20 cm) to the length of the belt.

Warning: To ensure that the safety belt extension assembly will hold in the event of a collision, only safety belt extensions manufactured by the same supplier as the safety belt should be used. Manufacturer identification is located at the end of the webbing on a label.

Supplemental Air Bag Restraint System (SRS)

Driver and right front passenger

This vehicle has a standard driver side air bag. If the letters "SRS" are above the glove box it also has the optional right front passenger air bag.

Your car is equipped with an air bag for the driver. This air bag is a supplemental restraint system. It is designed to be used in addition to safety belts to help protect against head and chest injuries in certain moderate to severe frontal collisions.

Warning: Safety belts must be worn by all vehicle occupants to help reduce the risk of injury in an accident.

The Importance of Wearing Safety Belts

There are four very important reasons to use safety belts even with an air bag system. Use your safety belts to:

- help keep you in the proper position when the air bag inflates
- reduce the risk of harm in rollover, side or rear impact accidents, since an air bag is not designed to inflate in such situations

- reduce the risk of harm in frontal collisions that are not severe enough to activate the air bag
- reduce the risk of being thrown from your car

Warning: The optional right front passenger air bag is not designed to protect occupants in the center front seating position.

The Importance of Proper Seated Position

In an accident, air bags must inflate extremely fast to help provide additional protection for you. In order to do this, the air bags must inflate with considerable force. If you are not seated in a normal riding position with your back against the seat back, the air bag may not protect you properly and could possibly hurt you as it inflates.

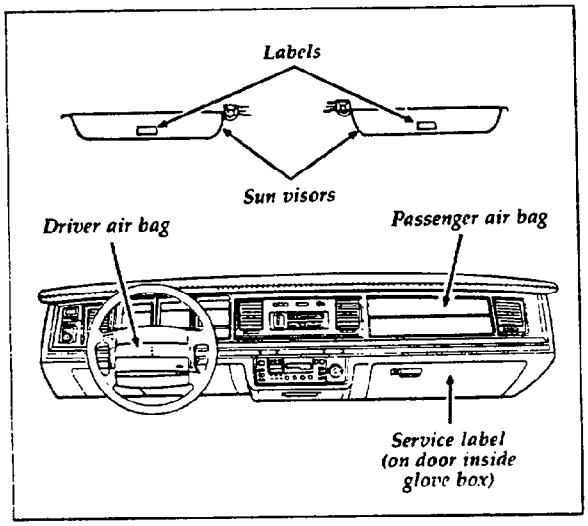
Warning: If your vehicle is equipped with the optional right front passenger air bag, front passengers, especially children and small adults, should never sit on the edge of the seat, stand near the glove compartment of the instrument panel, or lean over with their faces near the glove compartment when the vehicle is moving. All occupants should sit with the backs against the seat back and use the safety belts. Children below 40 lbs. (18 kg) should use child or infant seats. Forward facing child seats must have the passenger seat moved as far back from the instrument panel as possible. REAR FACING INFANT SEATS SHOULD NEVER BE USED IN THE FRONT SEAT, BECAUSE THE FORCE OF THE RAPIDLY INFLATING PASSENGER AIR BAG WOULD PUSH THE TOP OF THE REAR FACING SEAT AGAINST THE VEHICLE SEAT BACK OR CENTER ARM RESTS. WE RECOMMEND THAT REAR FACING INFANT SEATS BE PLACED IN THE REAR SEAT.

Warning: Do not put objects in front of the air bag system storage area that might restrict inflation or that might increase personal injury.

How the Supplemental Air Bag System Operates

The supplemental air bag system has two main parts. One part is the air bag system with driver and, if so equipped, passenger-side air bags and inflators. The second part is the electrical

system, which has impact sensors, a diagnostic module, and back-up power supply. The diagnostic module monitors the supplemental air bag electrical system readiness, including the five crash sensors and wiring connecting them to the modules, readiness light, air bag power, and supplemental air bags. The driver air bag is in the center of the steering wheel. The optional right front passenger air bag is in the instrument panel above the glove compartment. For all vehicles with the optional right front passenger air bag, the letters "SRS" appear above the glove box.



The location of air bags and warning labels

The air bag system uses a readiness light and a tone to indicate the condition of the system. The readiness light is in the instrument cluster. When you turn the ignition key to ON, this light will light up for six seconds and then turn off. This indicates that the system is operating

normally. **NOTE:** Regularly scheduled maintenance of the air bag system is not required.

If there is a problem with the system, two things may happen: the readiness light will either flash or stay lit up, or you will hear a beeping sound. If either of these things happen, have the air bag system serviced at your Ford or Lincoln-Mercury dealer immediately.

Tone Generator

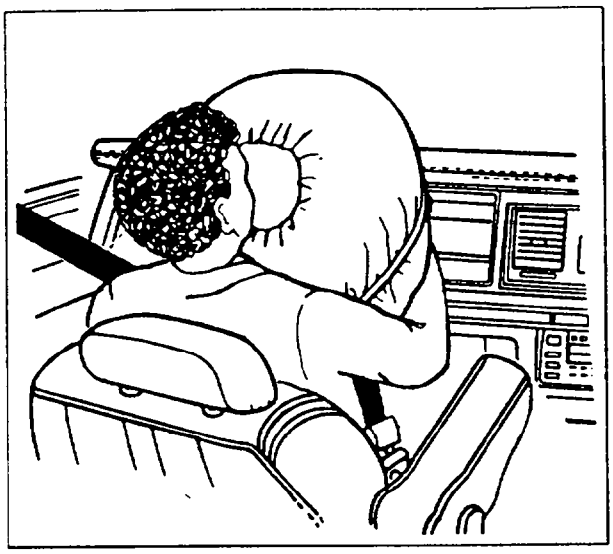
The air bag readiness light indicates the air bag system condition. However, a series of five sets of five beeps will be heard only if the readiness light doesn't work and there is a problem with the air bag system. This also means that the Air Bag Restraint System (SRS) is in need of service. The tone pattern will repeat (five sets of five beeps) periodically until the problem and light are repaired. Unless serviced, the Air Bag Restraint System may not function properly in the event of an accident.

Warning: Do not attempt to service, repair, or modify the Supplemental Air Bag Restraint System; tampering could cause activation of the system and increase the risk of personal injury. For servicing of the Supplemental Air Bag Restraint System, see your Ford or Lincoln-Mercury dealer.

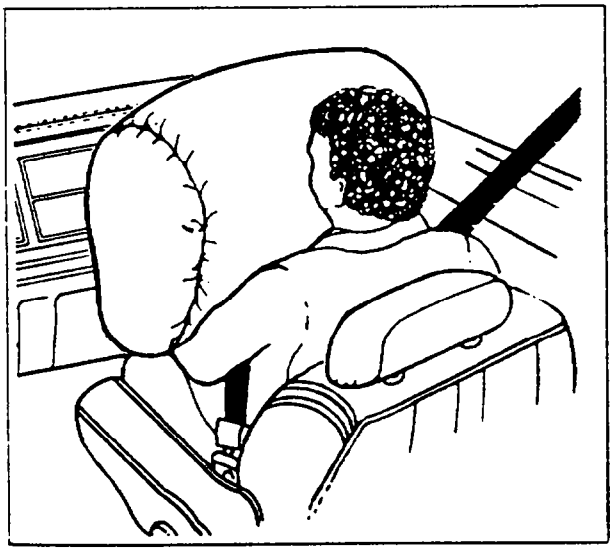
The air bag system is designed to stay out of sight until it is activated. The air bag system only operates in frontal accidents more severe than hitting a parked car of similar size and weight head-on at about 28 mph (47 km/h). In such a collision, you would be thrown forward against your safety belt. After receiving a signal from the crash sensors, the air bags inflate in about 5 one-hundredths of a second.

The air bag system is designed to inflate in moderate to severe head-on and front angle collisions, and then deflate almost immediately. The air bag and safety belt help restrain forward motion and can help reduce injuries to the head and chest. **NOTE:** Several air bag system components get hot after inflation. Do not try to touch them after inflation.

Air bags will not inflate in minor frontal collisions, even though the vehicle may be badly damaged. The fact that your air bag did not inflate in such a collision does not mean that something is wrong with the air bag system.



The driver side supplemental air bag inflated



The passenger side air bag inflated

Report Air Bag Inflation

If an air bag inflates during a collision or for any other reason, Ford Motor Company wants to know. Please report the inflation to the Accident Investigation Team by calling "collect" (313) 337-8040.

The Accident Investigation Team reviews the information you provide. An investigator may contact you for more information. In some cases, the investigator may want to examine your car, and if an accident occurred, to get an accident report.

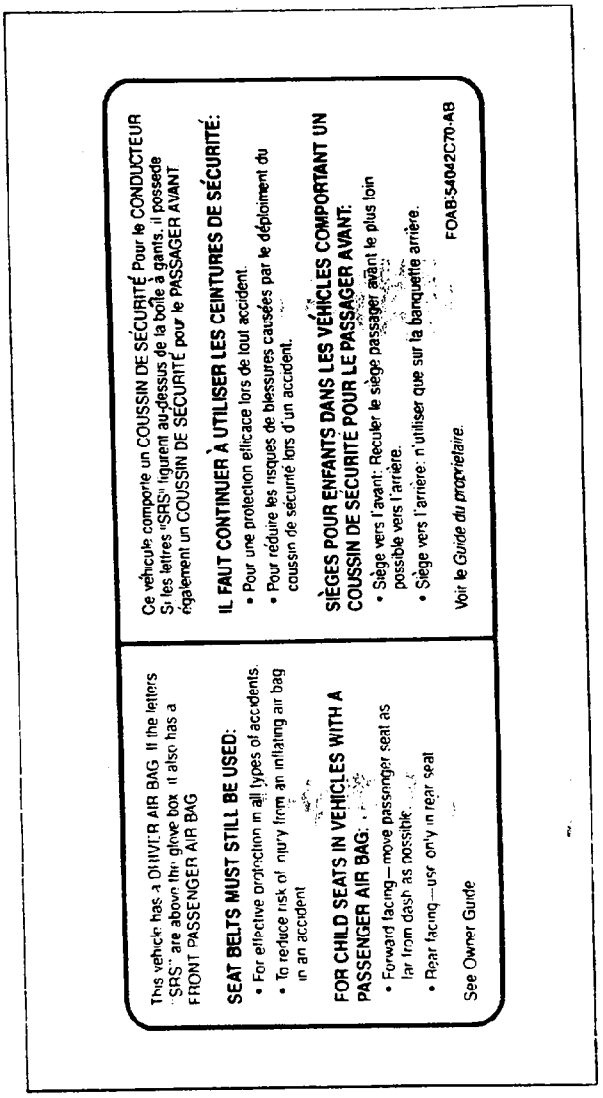
Warning: The air bag will inflate only once. The system is designed to function on a one-time-only basis. If the air bag is inflated, THE AIR BAG WILL NOT FUNCTION AGAIN AND MUST BE REPLACED IMMEDIATELY. If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

Disposal of Air Bag Equipped Vehicles

For disposal of air bags or air bag equipped vehicles, refer to the procedures in the 1990 Ford Shop Manual. Information on how to order a shop manual is available at an authorized Ford or Lincoln-Mercury Dealer. You can also order a shop manual using the order form in the back of your Owner's Guide.

Service Information Labels

Service and information labels are attached inside the glove compartment, on the sun visor, and on the radiator support in the engine compartment.



The label located on the back of both sun visors