

1377

REPORT NUMBER: CAL-90-N01

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

MAZDA MOTOR CORPORATION
1990 MAZDA MX-5 MIATA
2-DOOR CONVERTIBLE

NHTSA NUMBER: ML5400

CALSPAN TEST NUMBER: 7776-1

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November 21, 1989



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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16. Abstract A frontal barrier impact test of a 1990 Mazda Miata 2-Door Convertible was conducted at Calspan Advanced Technology Center crash test facility in Buffalo, New York on November 11, 1989. The impact speed was 35.2 mph and the ambient temperature at the barrier face was 21°F. The maximum vehicle crush was 18.5 inches. The test vehicle was equipped with a manual 3-point belt system at each of the front outboard positions. The test vehicle was also equipped with a driver side airbag as a supplemental restraint system. With regard to FMVSS 208-"Occupant Crash Protection," injury criteria, both the driver and passenger dummies appear to satisfy the head, 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 ML5400

A load cell barrier consisting of 36 load cells was impacted by a 1990 Mazda Miata 2-Door Convertible at a velocity of 35.2 mph. The test was performed at the Calspan Corporation Advanced Technology Center on November 21, 1989. 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 11 high-speed cameras. Camera locations and other pertinent camera information can be found in this report. On-board cameras were not used in this test due to space and weight restrictions.

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 shoulder belts to measure dummy torso section loading. The driver ATD (Serial No. 357) and the right-front passenger ATD (Serial No. 358) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 63 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.

The driver's head struck the air bag; the HIC was 920.2. The maximum chest deceleration over 3 milliseconds was 58.9 g's and femur loads were 1025.6 and 796.6 pounds.

The right front passenger's HIC was 531.4 and maximum chest deceleration over 3 milliseconds was 42.1 g's. Femur loads were 910.7 and 762.5 pounds.

Table 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1990 Mazda MX-5 Miata, 2-Door Convertible

NHTSA No.: ML5400 VIN.: JMINA3518L0109963

Body Color: White Date Of Manufacture: 6-89

Engine: 4 Cylinders; - C.I.D.; 1.6 Liters; - CC
X Gas; - Diesel; - Turbocharged
X Longitudinal; - Transverse

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

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

Date Received: 10-5-89 Odometer Reading: 119

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

Type of Occupant Restraint:

Driver: 3-point continuous loop belt system and airbag

Passenger: 3-point continuous loop belt system

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 26 psi, Rear 26 psi

Recommended Tire Size: P185/60R14 82H

Recommended Cold Tire Pressure: Front 26 psi, Rear 26 psi

Tires on Vehicle: P185/60R14 82H; Manufacturer: Dunlop

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

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

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

Vehicle Capacity Weight (VCW) = 340 lbs. (A)

No. of Occupants x 150 lbs. = 300 lbs. (B)

Rated Cargo and Luggage

Weight (RCLW) A-B = 40 lbs.

GVWR 2700 lbs. GAWR: Front 1380 lbs. Rear 1365 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 = 550 lbs. Right Rear = 520 lbs.
 Left Front = 560 lbs. Left Rear = 560 lbs.
 TOTAL FRONT WEIGHT = 1110 lbs. (51 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1080 lbs. (49 % of Total Vehicle Weight)
 TOTAL DELIVERY WEIGHT = 2190 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (2190 lbs.)
 VCW = Vehicle Capacity Weight (340 lbs.)
 DSC = Designated Seating Capacity (2)
 RCLW = VCW - 150 (DSC) = 40 lbs.
 Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)
 Target Test Weight = 2558 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 52 POUNDS CARGO:

Right Front = 650 lbs. Right Rear = 660 lbs.
 Left Front = 600 lbs. Left Rear = 660 lbs.
 TOTAL FRONT WEIGHT = 1250 lbs. (49 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1320 lbs. (51 % of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 2570 lbs.
 Weight of ballast secured in vehicle trunk area = 0 lbs.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 24.7 LF 24.8 RR 25.5 LR 25.4
 Test Attitude: RF 25.6 LF 25.6 RR 23.5 LR 23.4
 Wheel Base: 89.4 in.; C.G. = 45.6 in. rearward of front wheel C/L
 Remarks: Trunk lid was removed from vehicle and on-board abort package
 was not used in order to achieve test weight. On-board cameras
 were mounted off-board to film belt spool-off. Convertible top
 was removed for better film coverage.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0°
 Date of Test: November 21, 1989 Time of Test: 12:25
 Ambient Temperature: 21 °F at impact area
 Temperature in Occupant Compartment: 68 °F
 Windshield Molding Temperature: 72 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: primary = 35.2 mph, secondary = 35.2 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 150.7 L 155.5 L 151.2
 Post-test = R 135.2 L 137.0 L 136.2
 Crush = R 15.5 L 18.5 L 14.4

Distance from front of test vehicle to point of impact:

R 29.1" C 26.0" L 25.6"

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Air Bag</u>	<u>No Contact</u>
Chest	<u>Air Bag</u>	<u>No Contact</u>
Abdomen	<u>No Contact</u>	<u>No Contact</u>
Left Knee	<u>Dash Panel</u>	<u>Dash Panel</u>
Right Knee	<u>Dash Panel</u>	<u>Dash Panel</u>

Table 1
GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	<u>Front</u>	
	<u>Left</u>	<u>Right</u>
Door Opening	<u>operable</u>	<u>operable</u>

	<u>Front</u>	
<u>Seat Movement</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	<u>none</u>	<u>none</u>
Seat Shift (in.)	<u>0.0</u>	<u>0.0</u>

Glazing Damage

Backlight/Windshield: Windshield 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

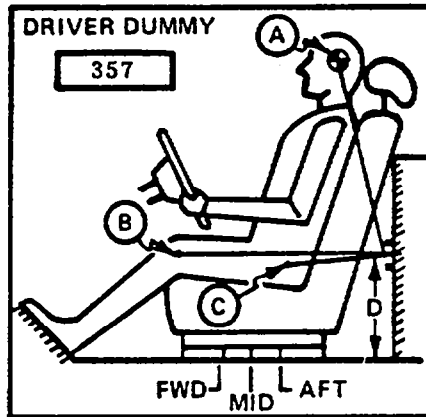
1. Load Cell Barrier Data
2. Vehicle Accelerometer Data
3. Test Vehicle Measurements

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION

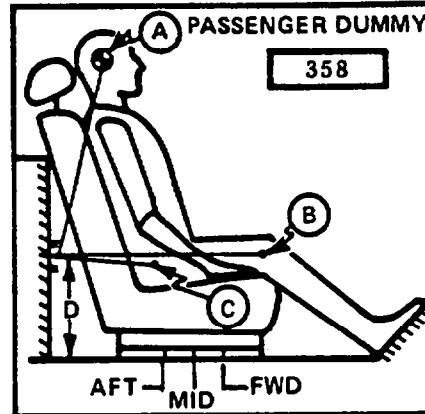
Test No.: ML5400 Vehicle: 1990 Mazda Miata

<u>SEAT TYPE:</u>	<u>ADJUSTER TYPE:</u>	<u>BUCKET SEAT BACK TYPE:</u>
<u>-</u> Bench	<u>X</u> Manual	<u>-</u> Fixed
<u>X</u> Bucket	<u>-</u> Power	<u>X</u> Adjustable Reclining
<u>-</u> Split Bench		

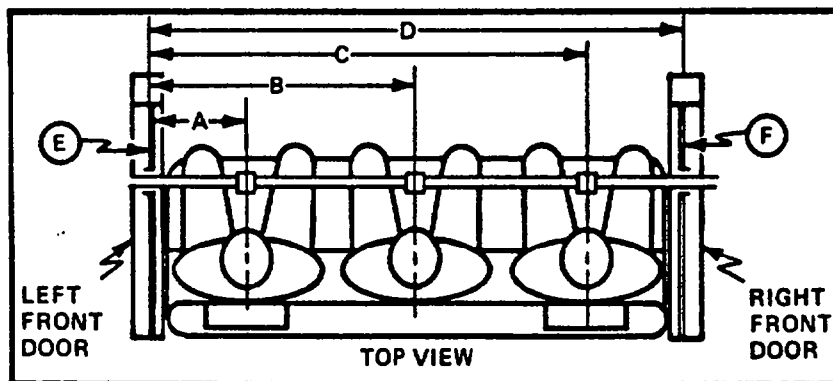


MEASUREMENT
LOCATION

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



A = <u>19.3</u> in. <u>2</u> Degrees	A = <u>19.8</u> in. <u>0</u> Degrees
B = <u>24.0</u> in. <u>96</u> Degrees	B = <u>24.3</u> in. <u>98</u> Degrees
C = <u>9.8</u> in. <u>126</u> Degrees	C = <u>10.2</u> in. <u>126</u> Degrees
D = <u>11.5</u> in. _____	D = <u>11.5</u> in. _____



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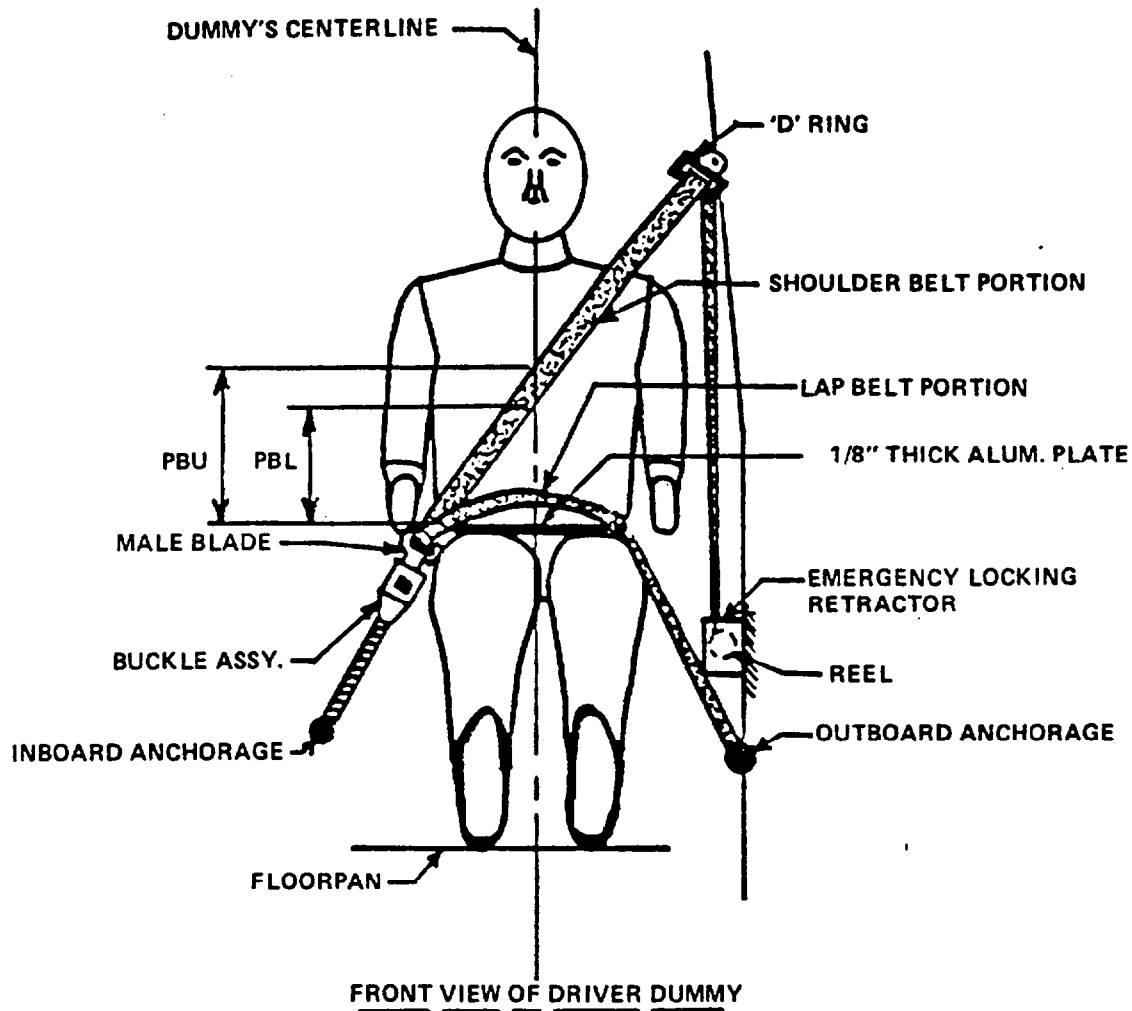
DUMMY ID

358

A = Left Door to Driver Centerline	<u>10.0</u> in.
B = Left Door to Center Passenger Centerline	<u>-</u> in.
C = Left Door to Right Passenger Centerline	<u>37.2</u> in.
D = Left Door to Right Door	<u>46.9</u> in.
E,F = Window Glass Height (Right and Left Must Be Equal)	<u>11.0</u> in.

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Figure 3
SEAT BELT POSITIONING DATA

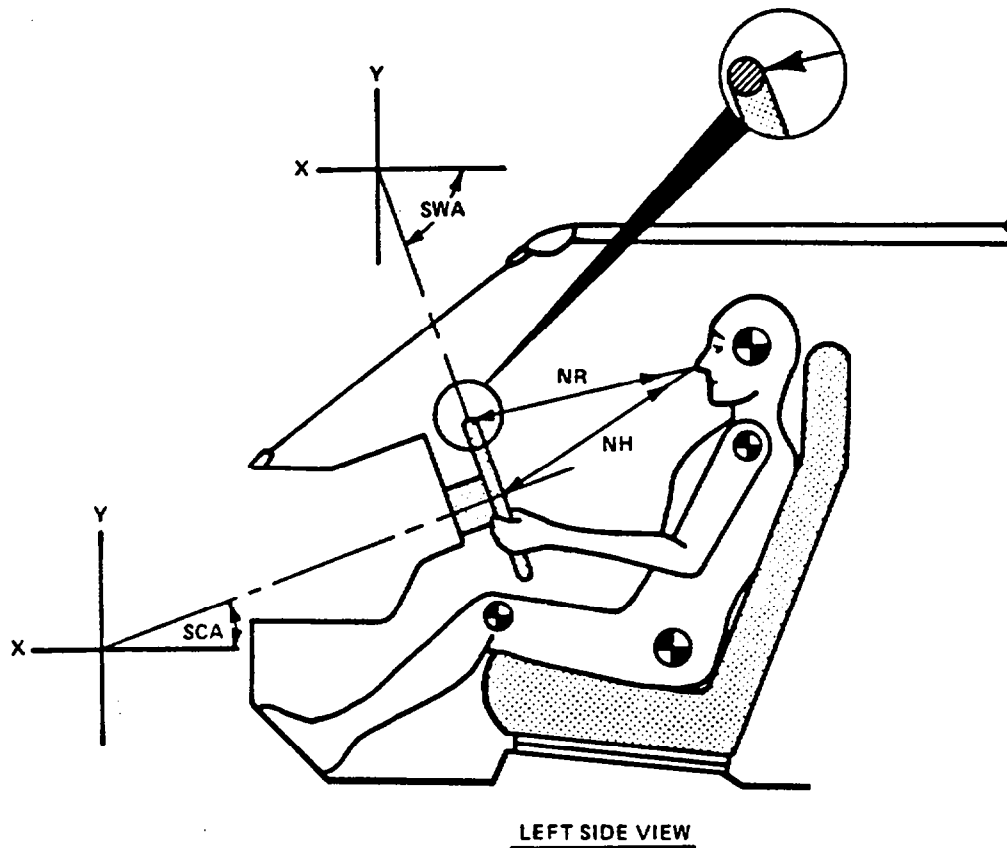


	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	13.2	13.3
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	10.0	10.0
<u>LAP BELT TENSION</u>	2 lbs	2 lbs
<u>SHOULDER BELT TENSION</u>	-	-

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Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



LEFT SIDE VIEW

		MEASUREMENTS	
<u>NR</u>	Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	19.5	Inches
<u>NH</u>	Distance from tip of dummy's nose to center of steering column hub	19.8	Inches
<u>SCA</u>	Angle of steering column relative to the horizontal X axis	18.0	Degrees
<u>SWA</u>	Angle of steering wheel relative to the horizontal X axis	-72.0	Degrees

Table 4

HIGH-SPEED CAMERA LOCATIONS

Test No. ML5400

Vehicle: 1990 Mazda MX-5 Miata 2-Door Convertible

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	311	59	41	-4	294	13	See Note
3	Driver and Interior View	100	104	71	-20	84	13	800
4	Steering Column (Bottom)	261	77	46	-4	245	25	550
5	Steering Column (Top)	261	77	70	-12	245	25	550
6	Overall Right Side	216	67	41	-7	200	13	770
7	Right Side View	294	48	42	-3	278	25	780
8	Passenger and Interior View	95	114	69	-25	79	25	600
9	Passenger Front View	24	-5	73	-43	-	13	570
10	Driver Front View	24	-5	73	-43	-	13	520
11	Windshield View	0	0	126	-45	-	13	510
12	Pit View of Engine	0	32	-120	90	-	13	900

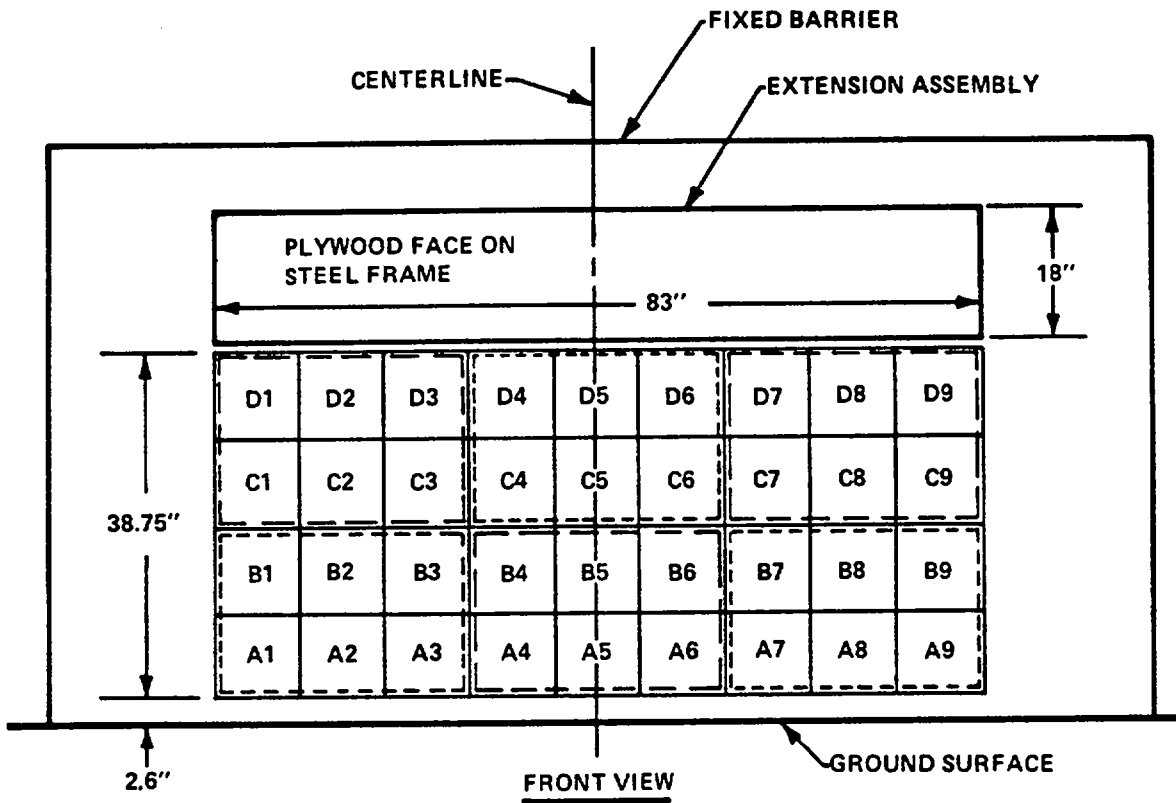
*X = film plane to monorail centerline
 Y = film plane to impact location
 Z = film plan to ground
 ** = referenced to horizontal plane

Note: Film speed is not available for this camera.

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

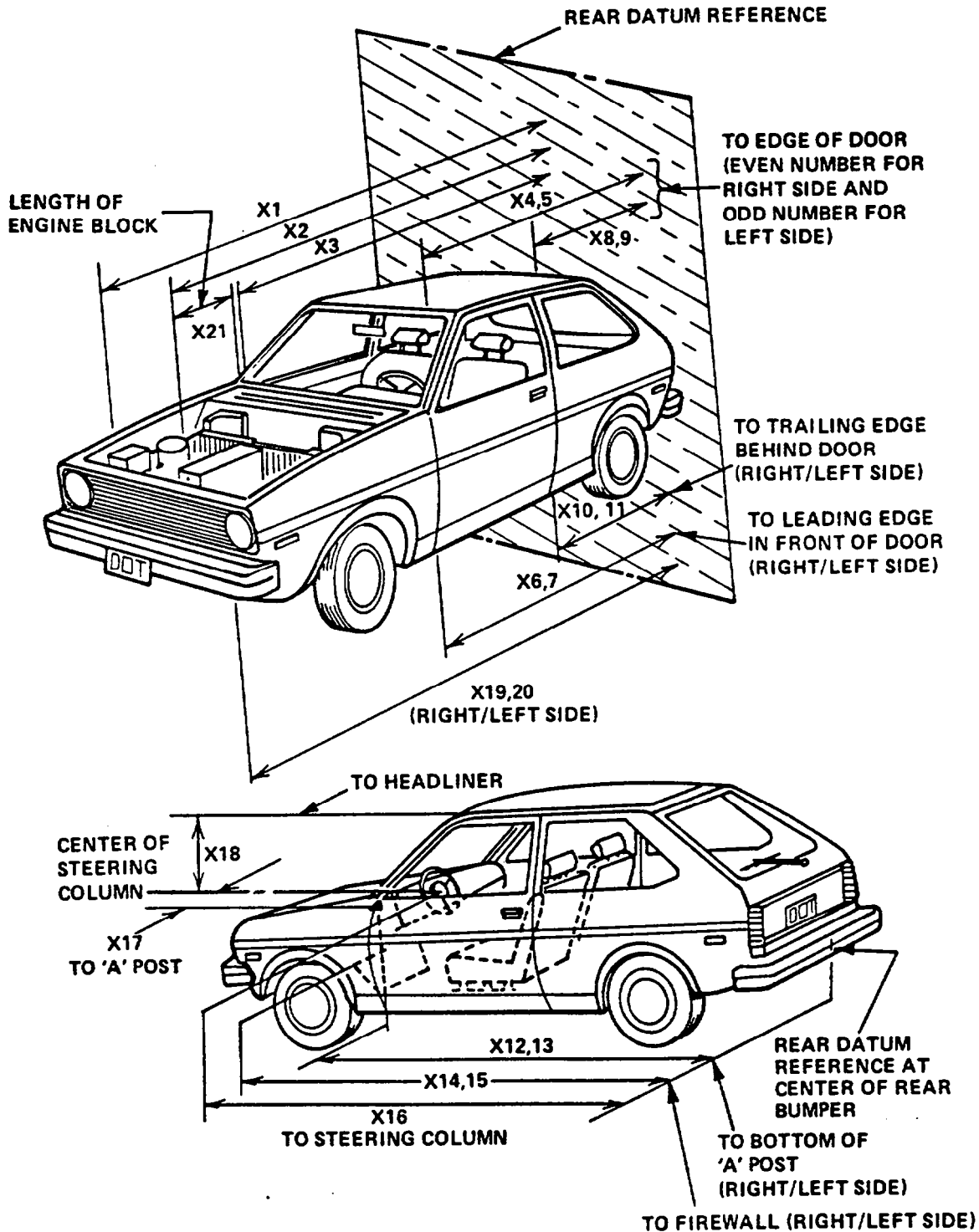
Group 4	Group 5	Group 6
C1 thru D3	C4 thru D6	C7 thru D9
Group 1	Group 2	Group 3
A1 thru B3	A4 thru B6	A7 thru B9

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)

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Figure 9
TEST VEHICLE MEASUREMENTS



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Appendix A

PHOTOGRAPHS

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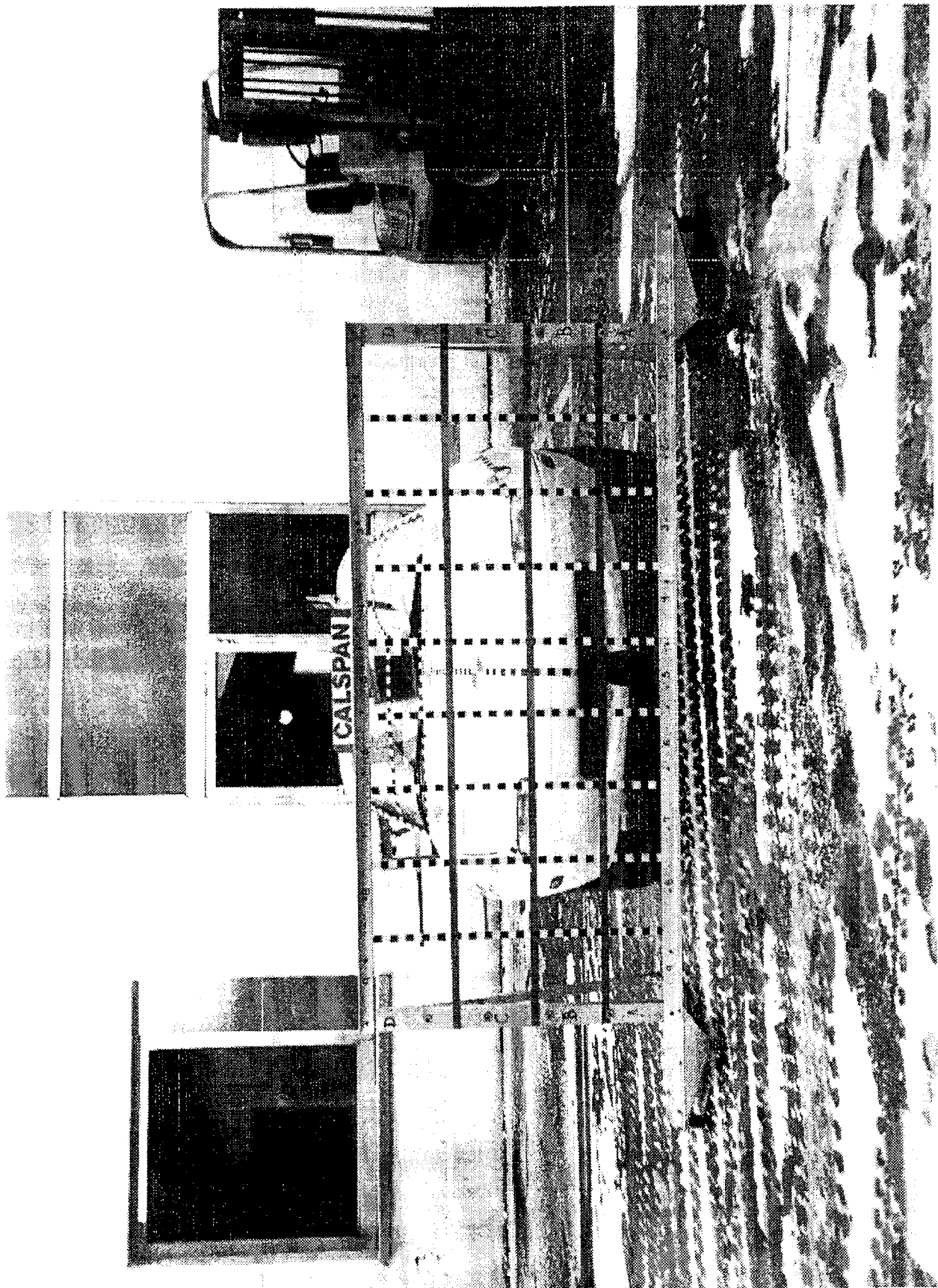


Figure A-1 PRE-TEST LOAD CELL LOCATIONS

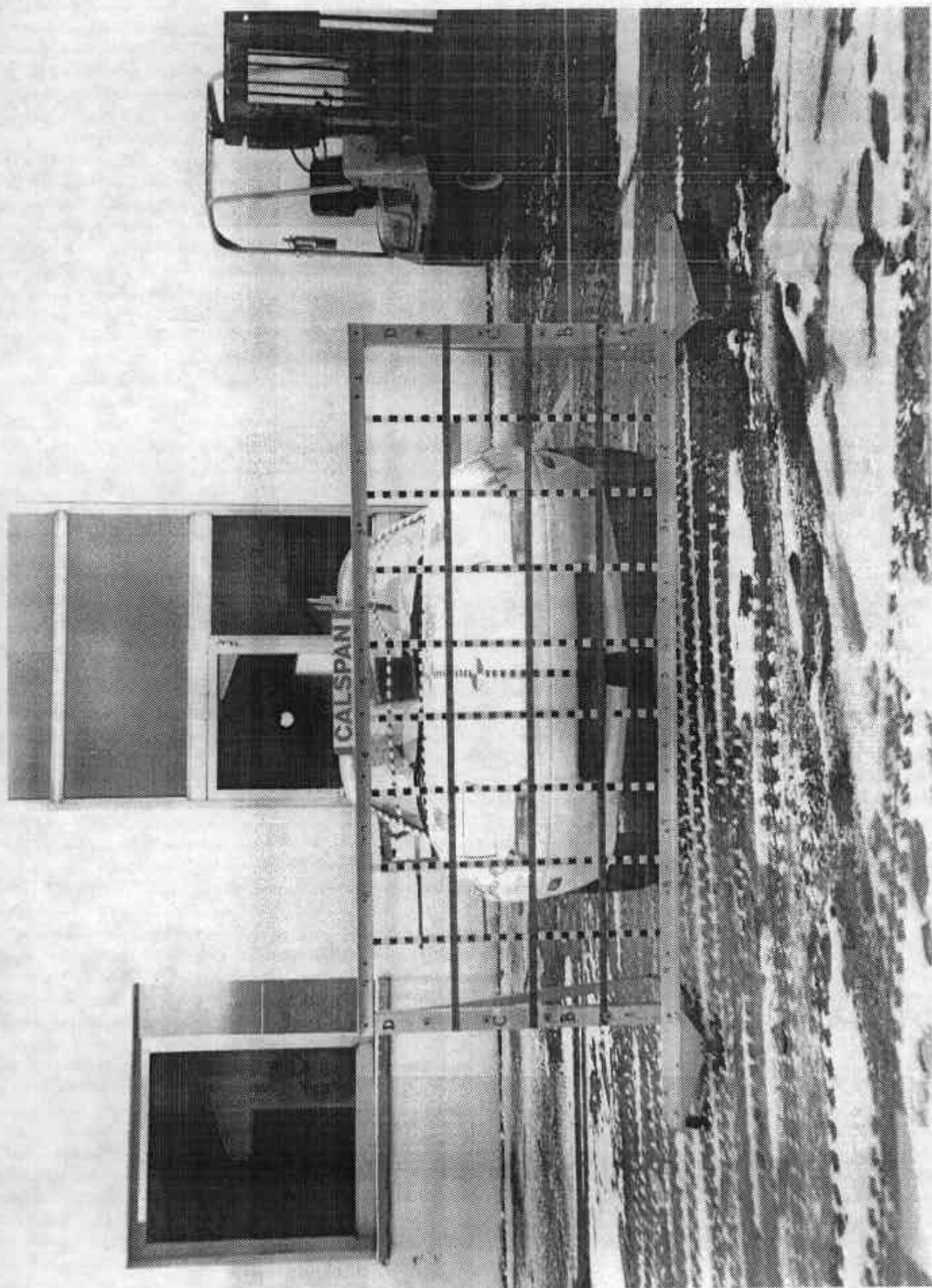


Figure A-1 PRE-TEST LOAD CELL LOCATIONS

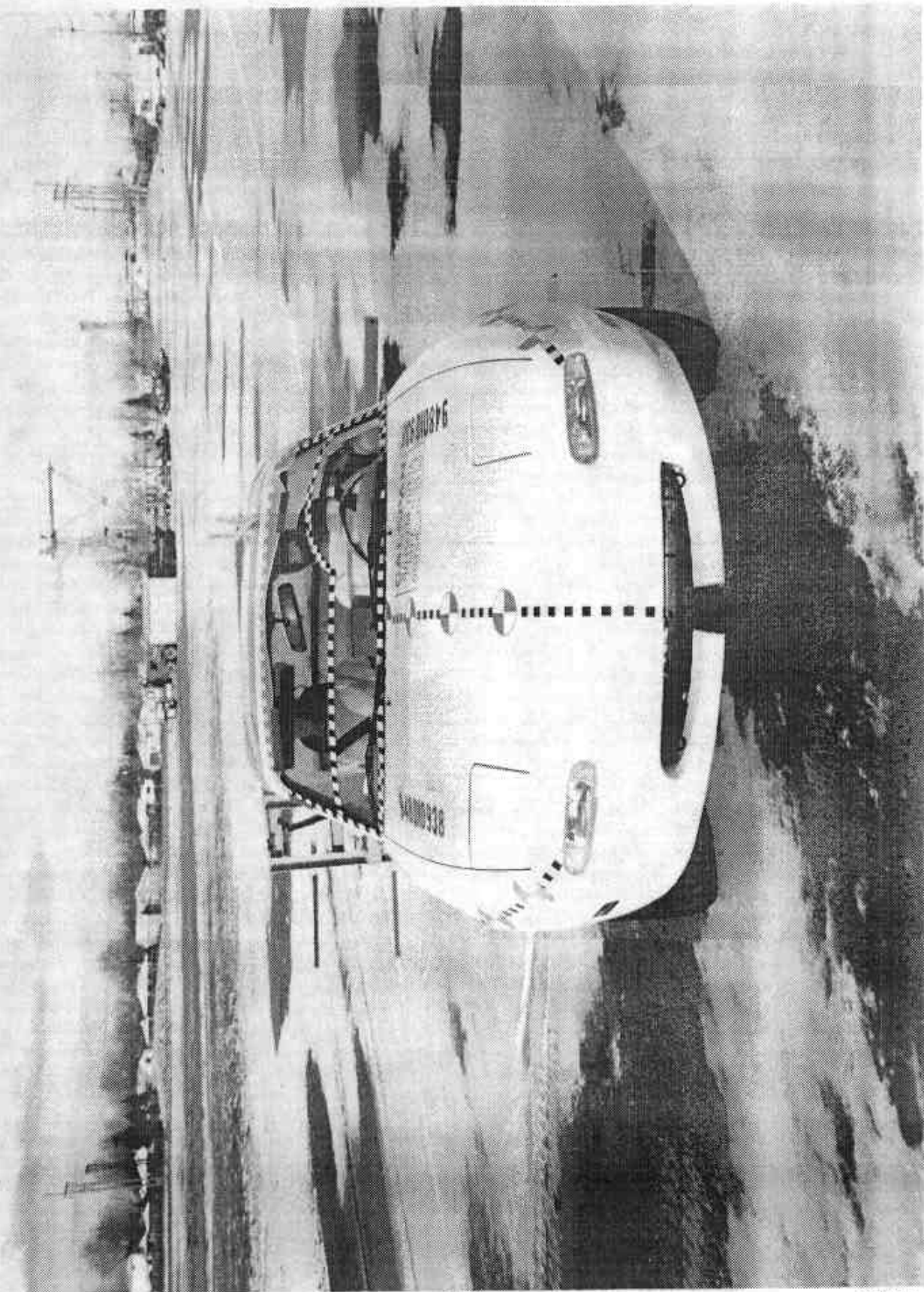


Figure A-2 PRE-TEST FRONT VIEW

A-3

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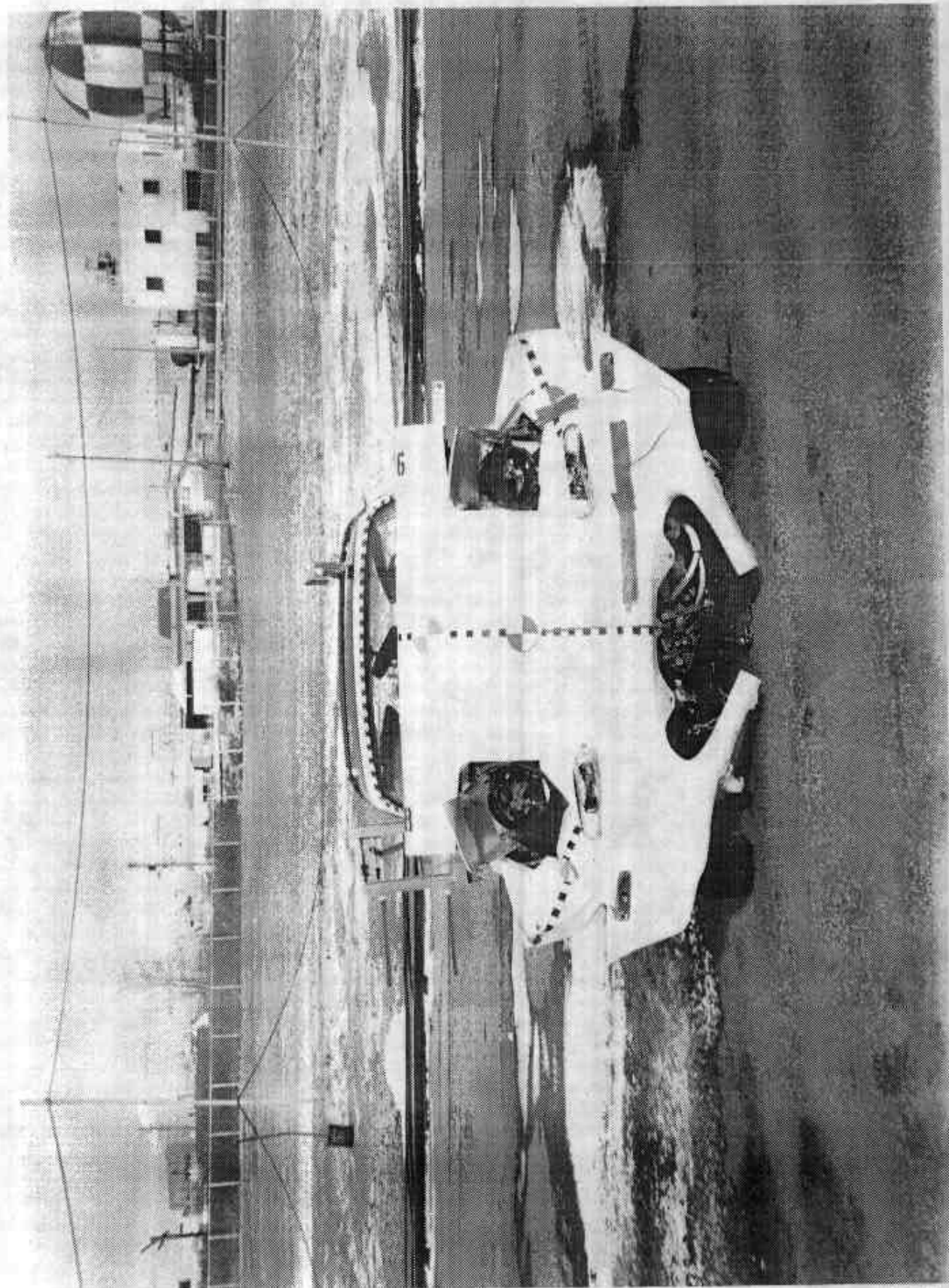


Figure A-3 POST TEST FRONT VIEW

A-4

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Figure A-4 PRE-TEST LEFT SIDE VIEW

A-5

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Figure A-5 POST TEST LEFT SIDE VIEW

A-6

7776-1



Figure A-6 PRE-TEST RIGHT SIDE VIEW

A-7

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Figure A-7 POST-TEST RIGHT SIDE VIEW

A-8

7778-1



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



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

A-10

7776-1

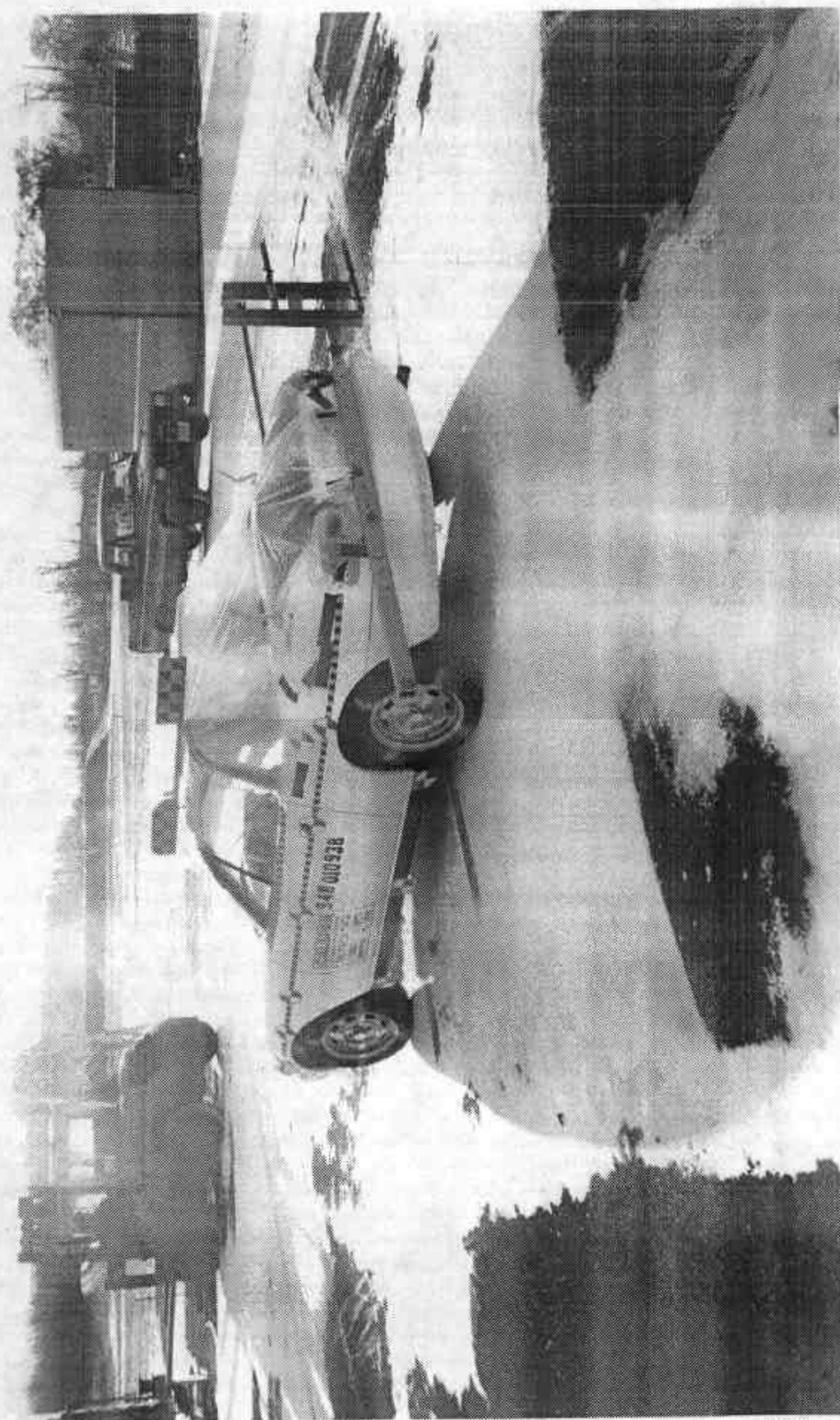


Figure A-10 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-11

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

A-12

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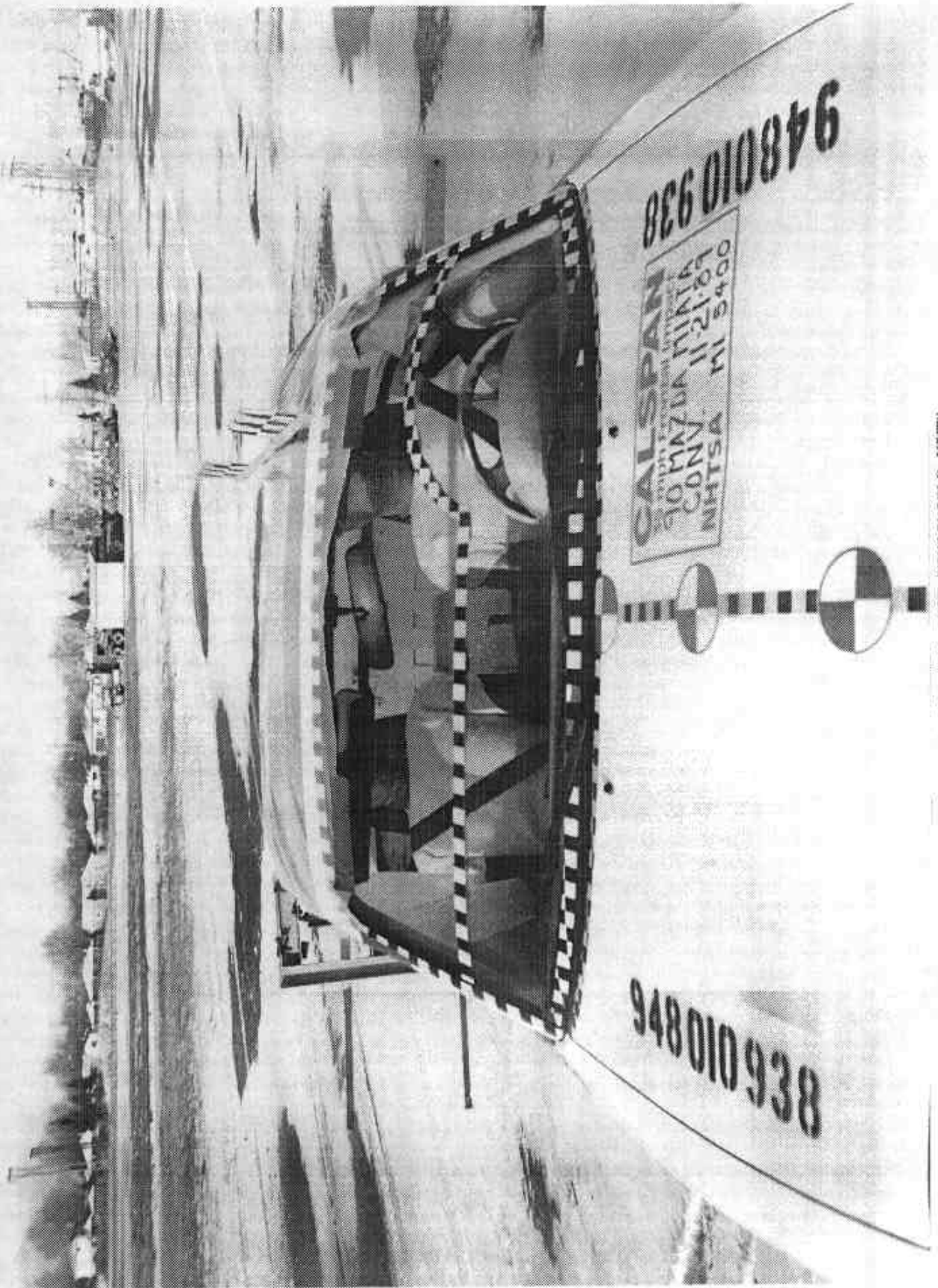


Figure A-12 PRE-TEST WINDSHIELD VIEW

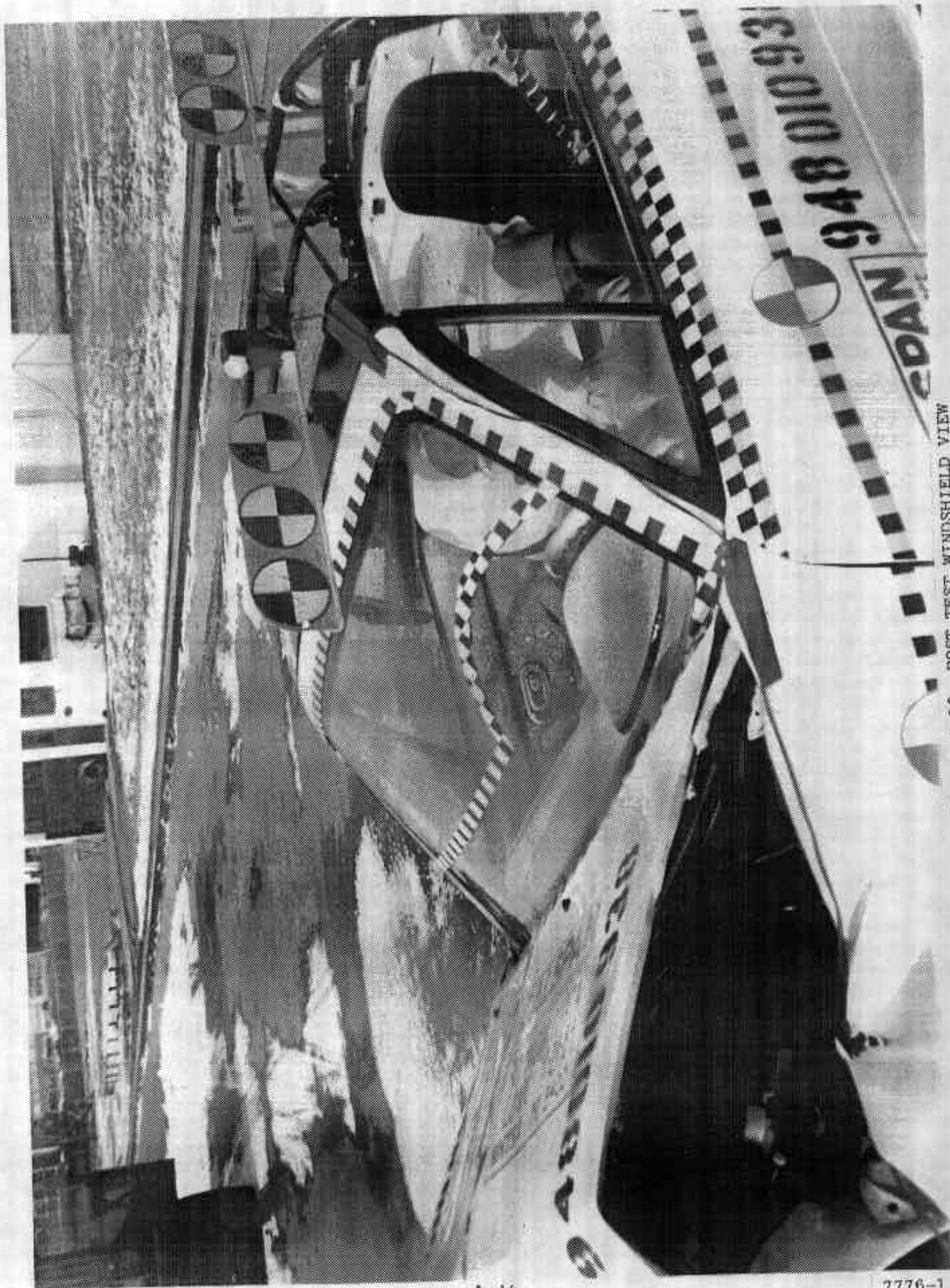


Figure A-13 POST-TEST WINDSHIELD VIEW

A-14

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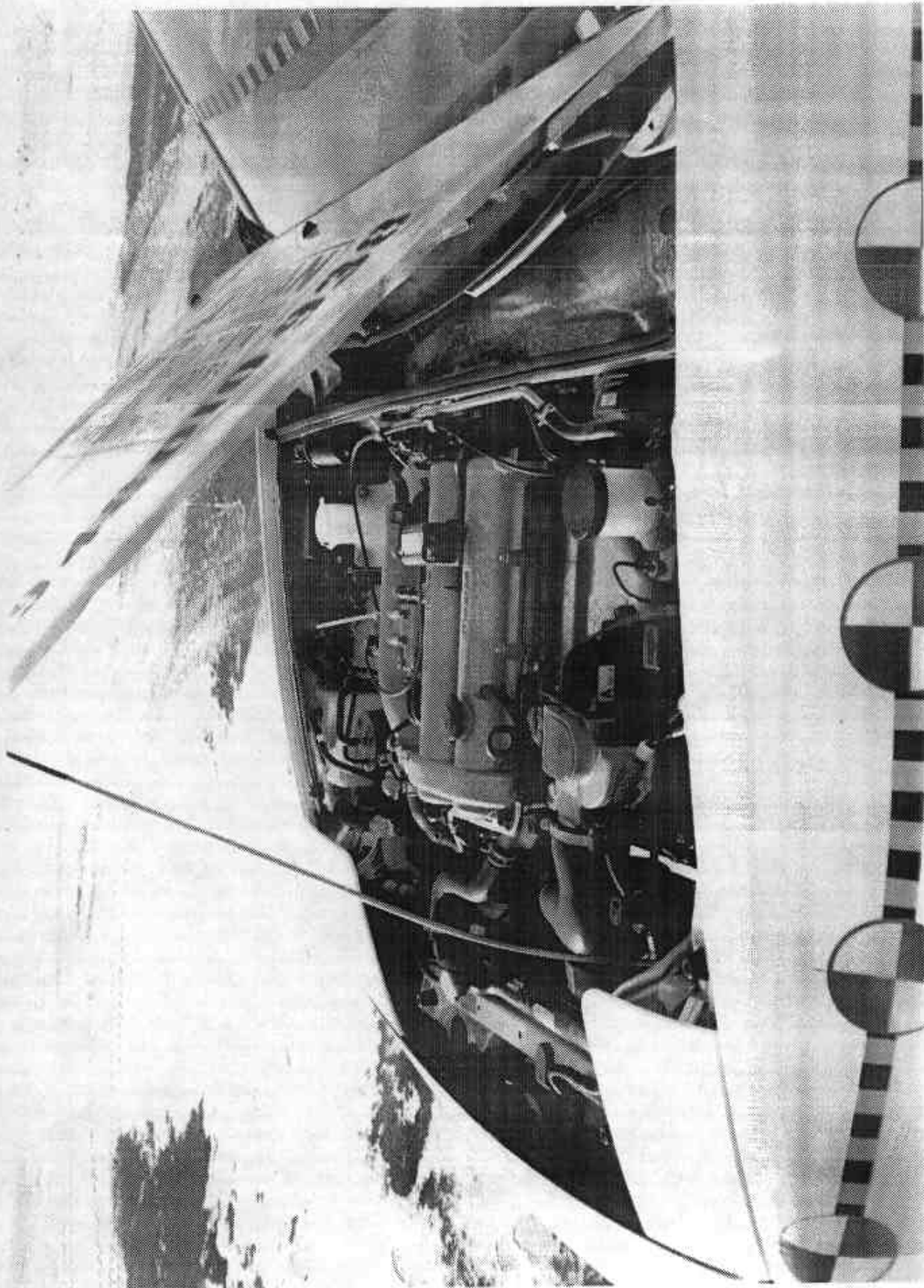


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

A-15

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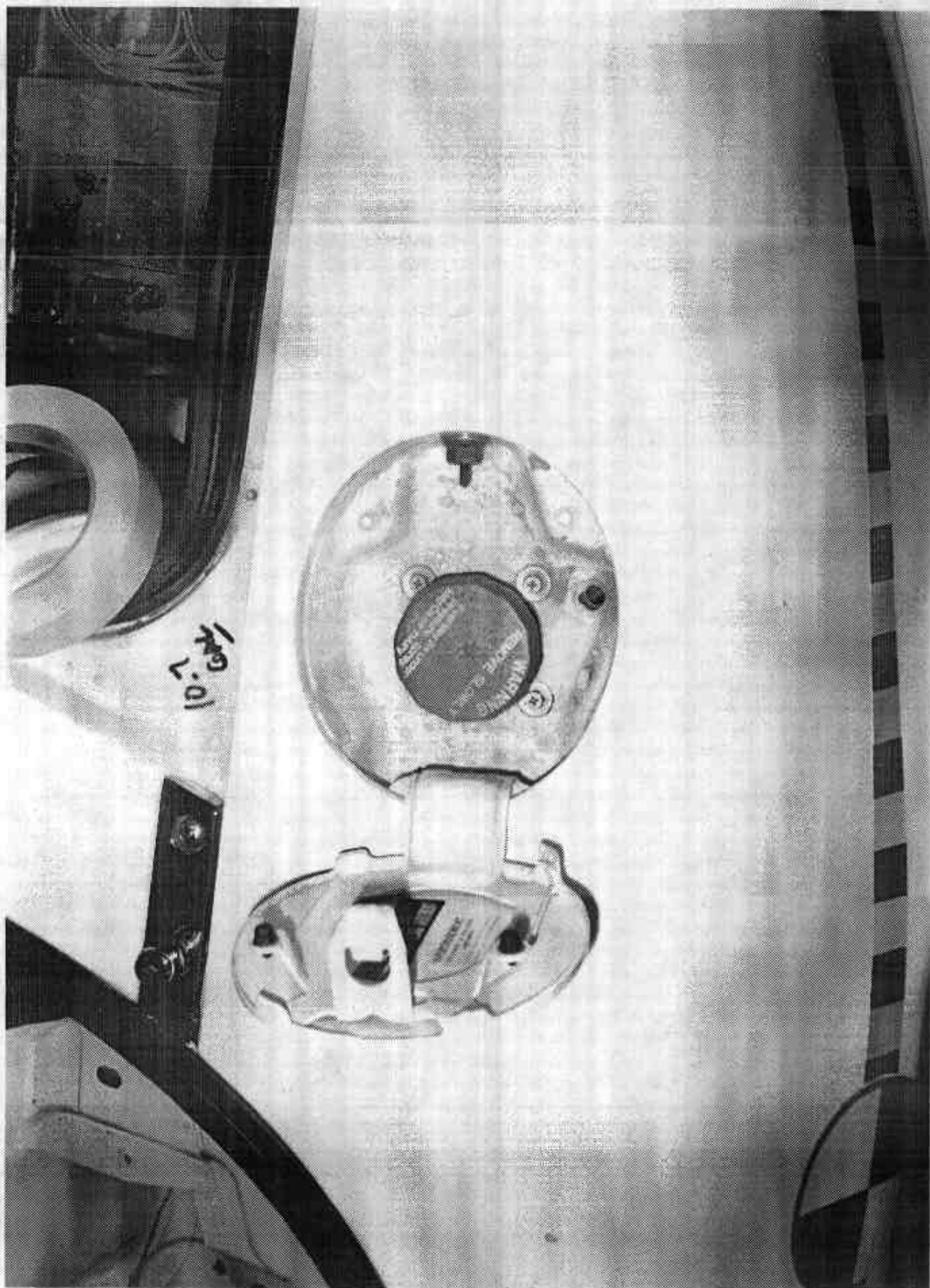


Figure A-15 PRE-TEST FUEL CAP VIEW

A-16

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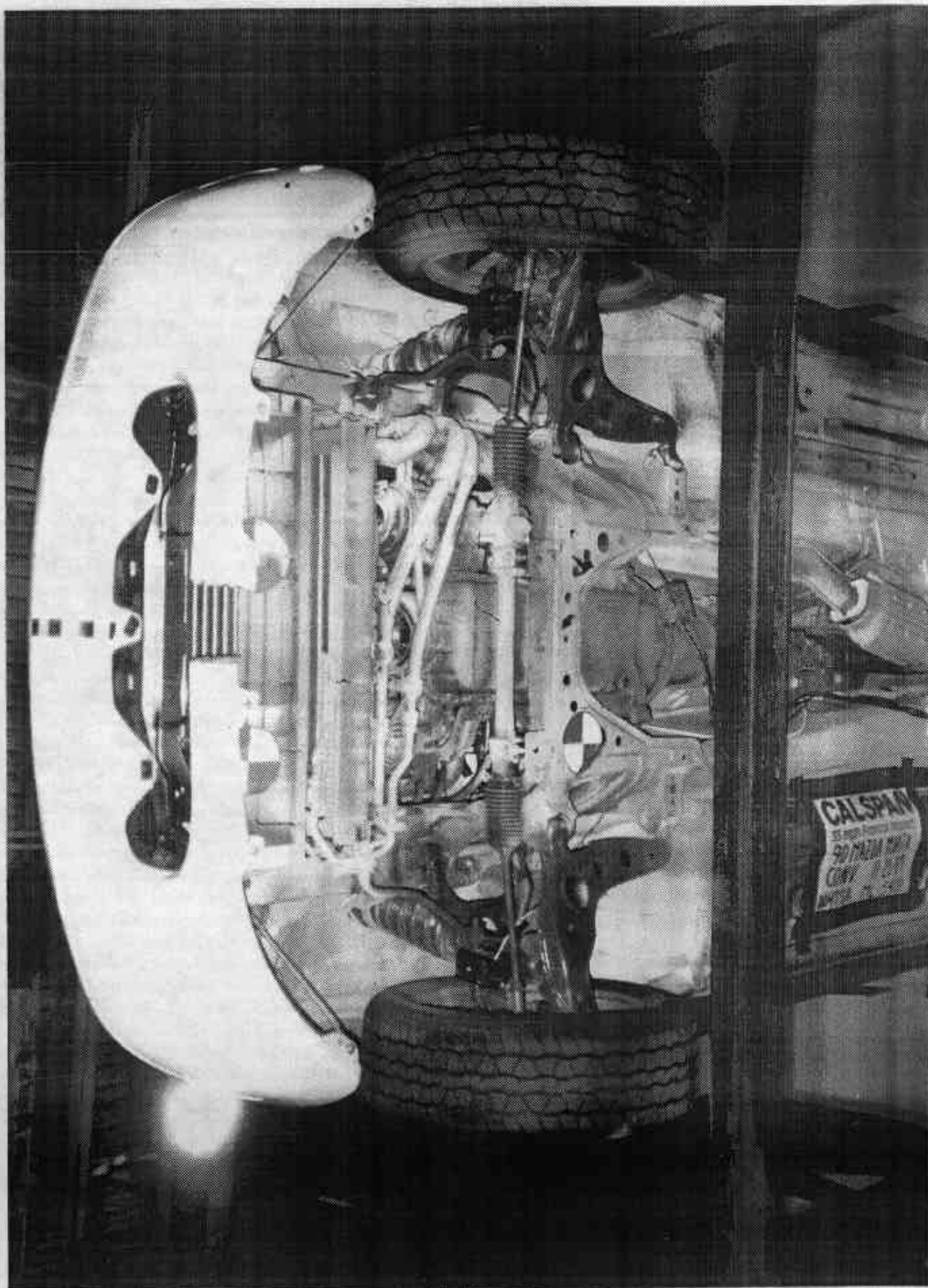


Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

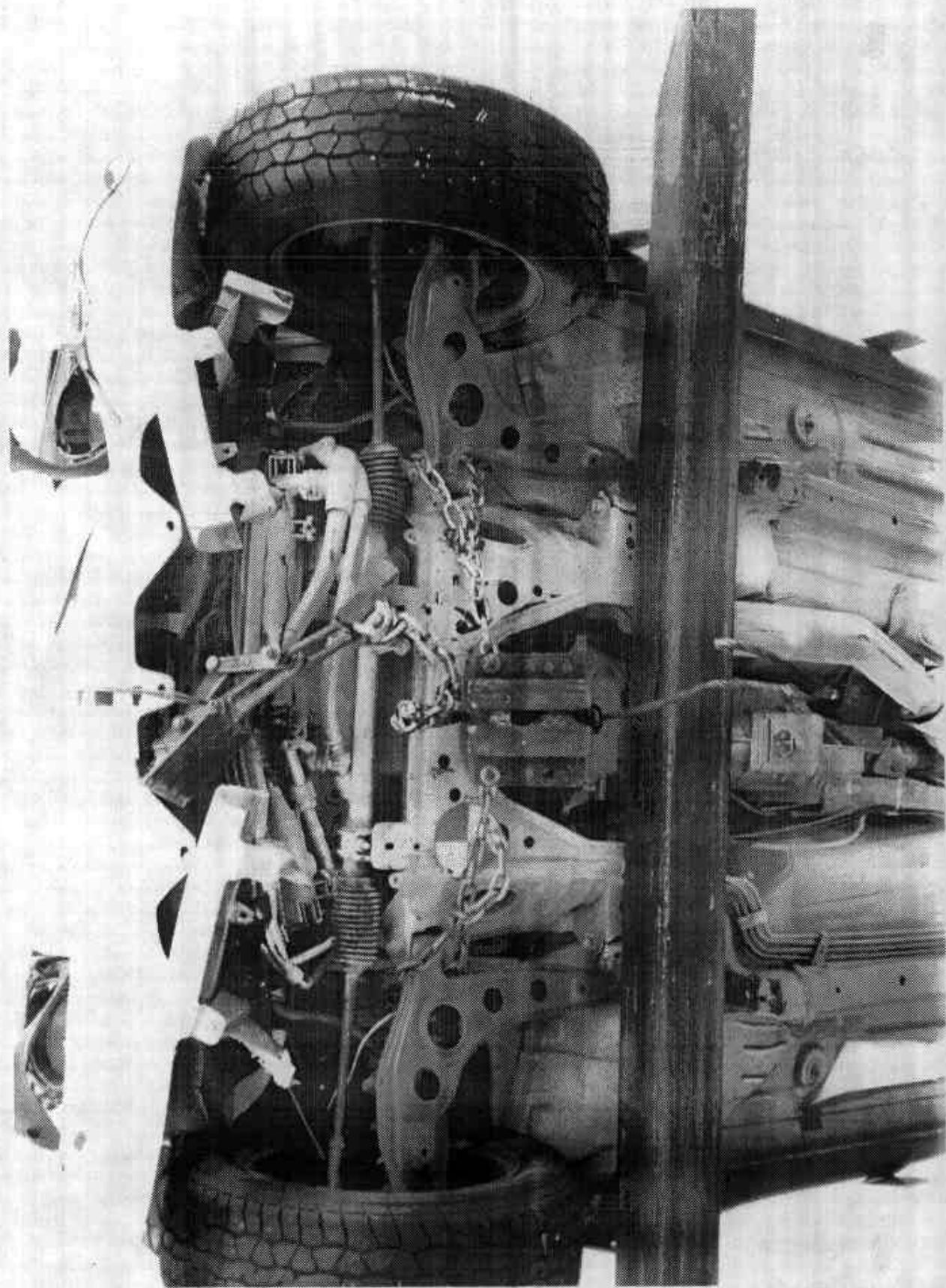


Figure A-17 POST-TEST FRONT UNDERBODY VIEW

A-18

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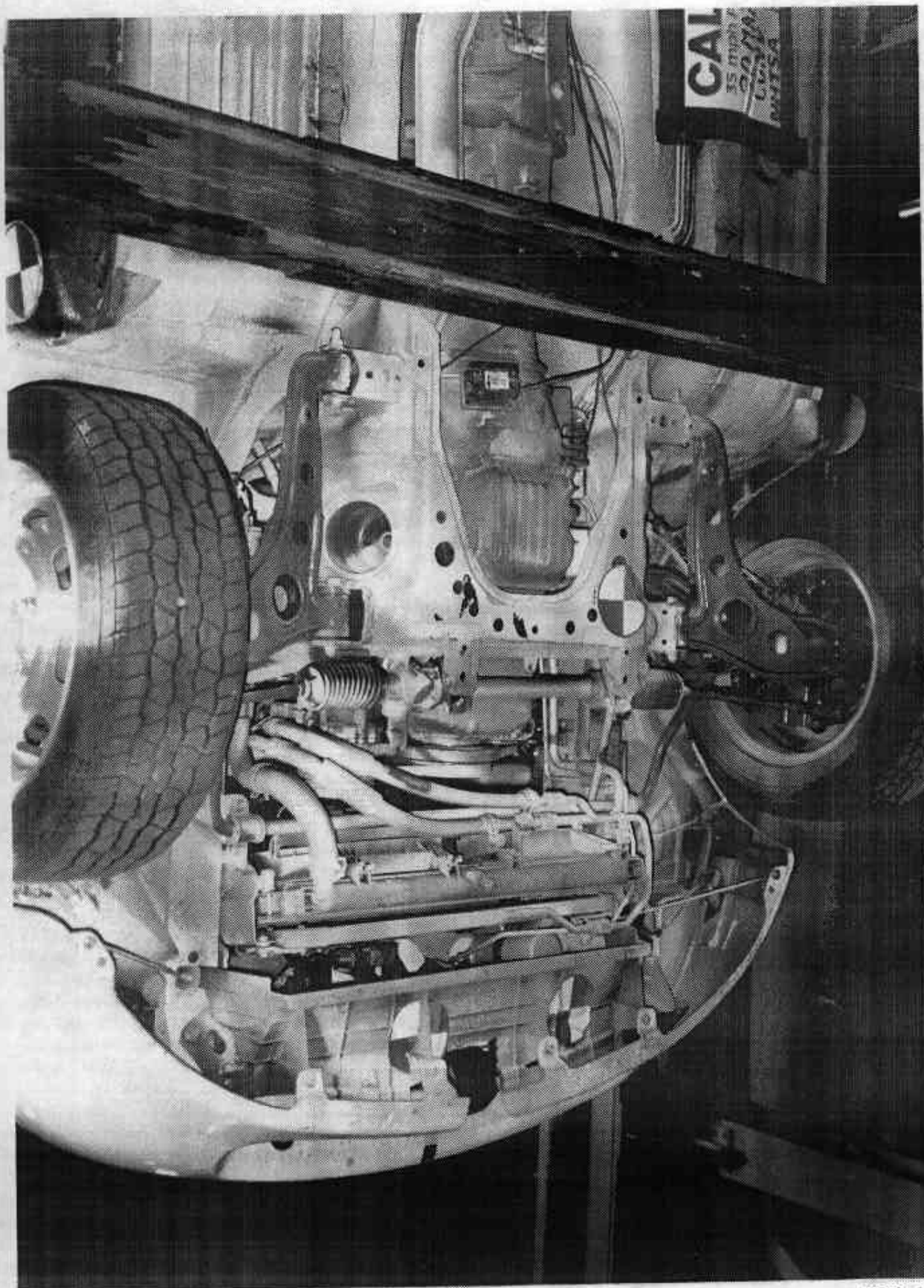


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

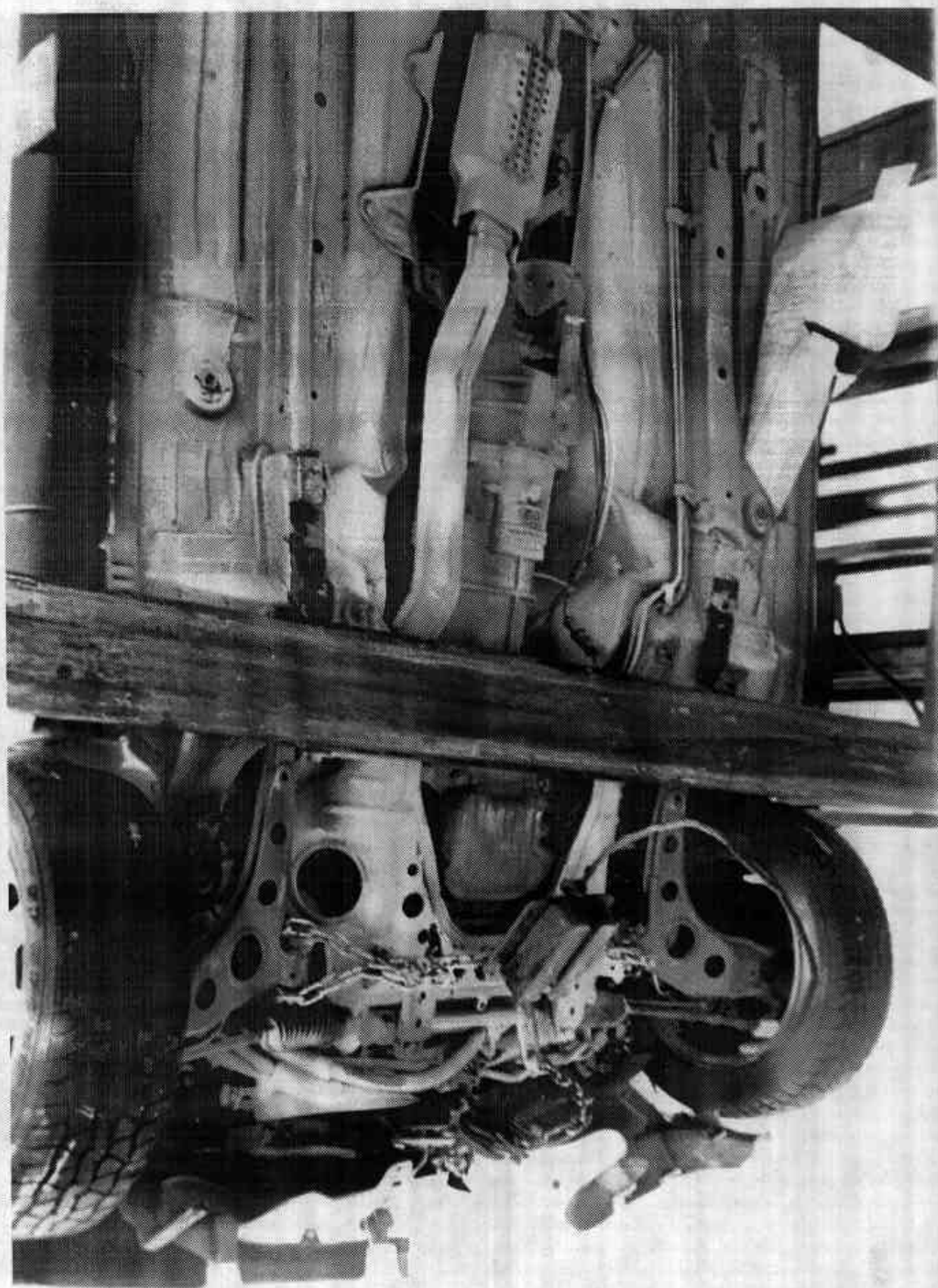


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

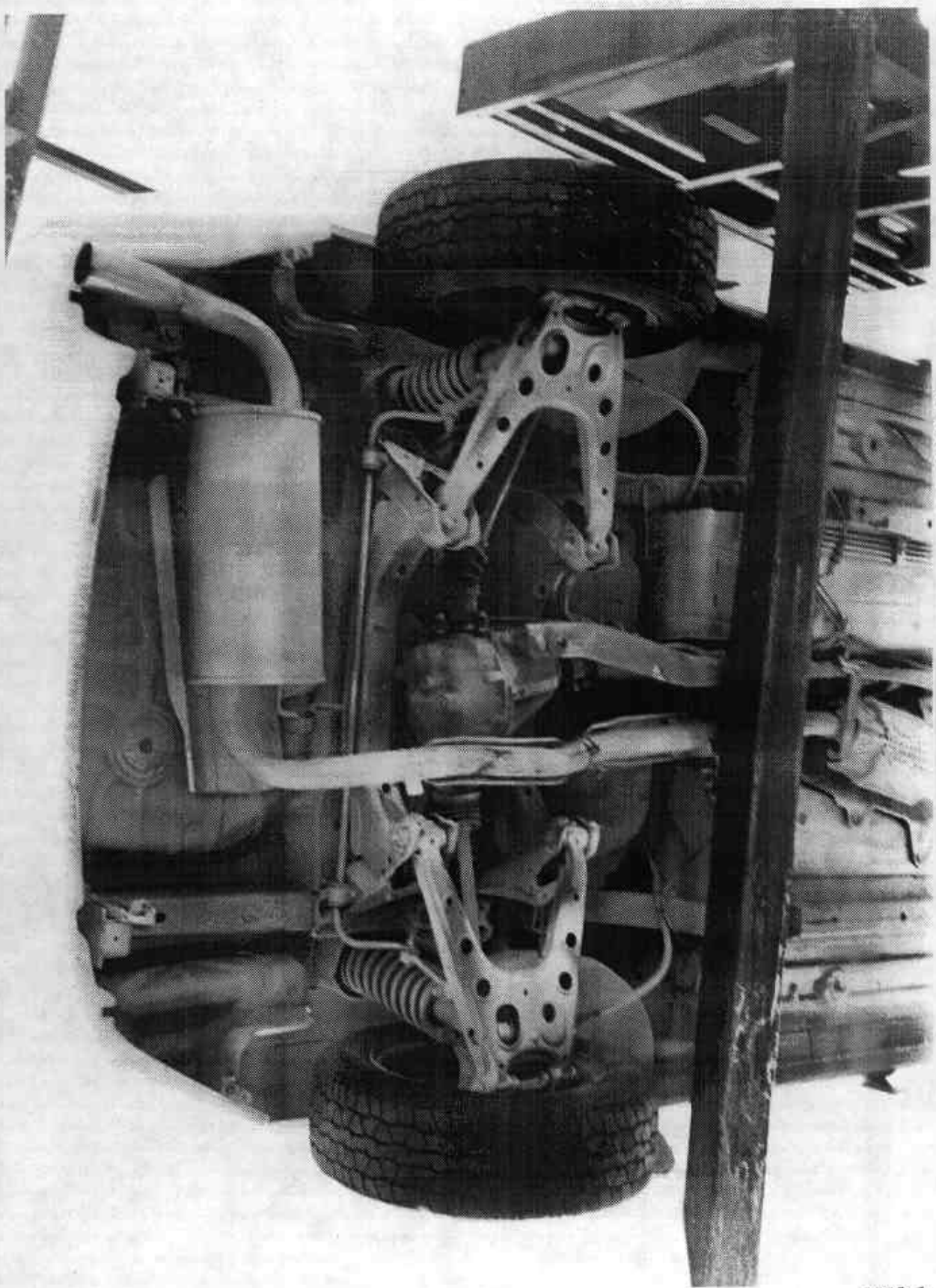


Figure A-20 POST-TEST REAR UNDERBODY VIEW

A-21

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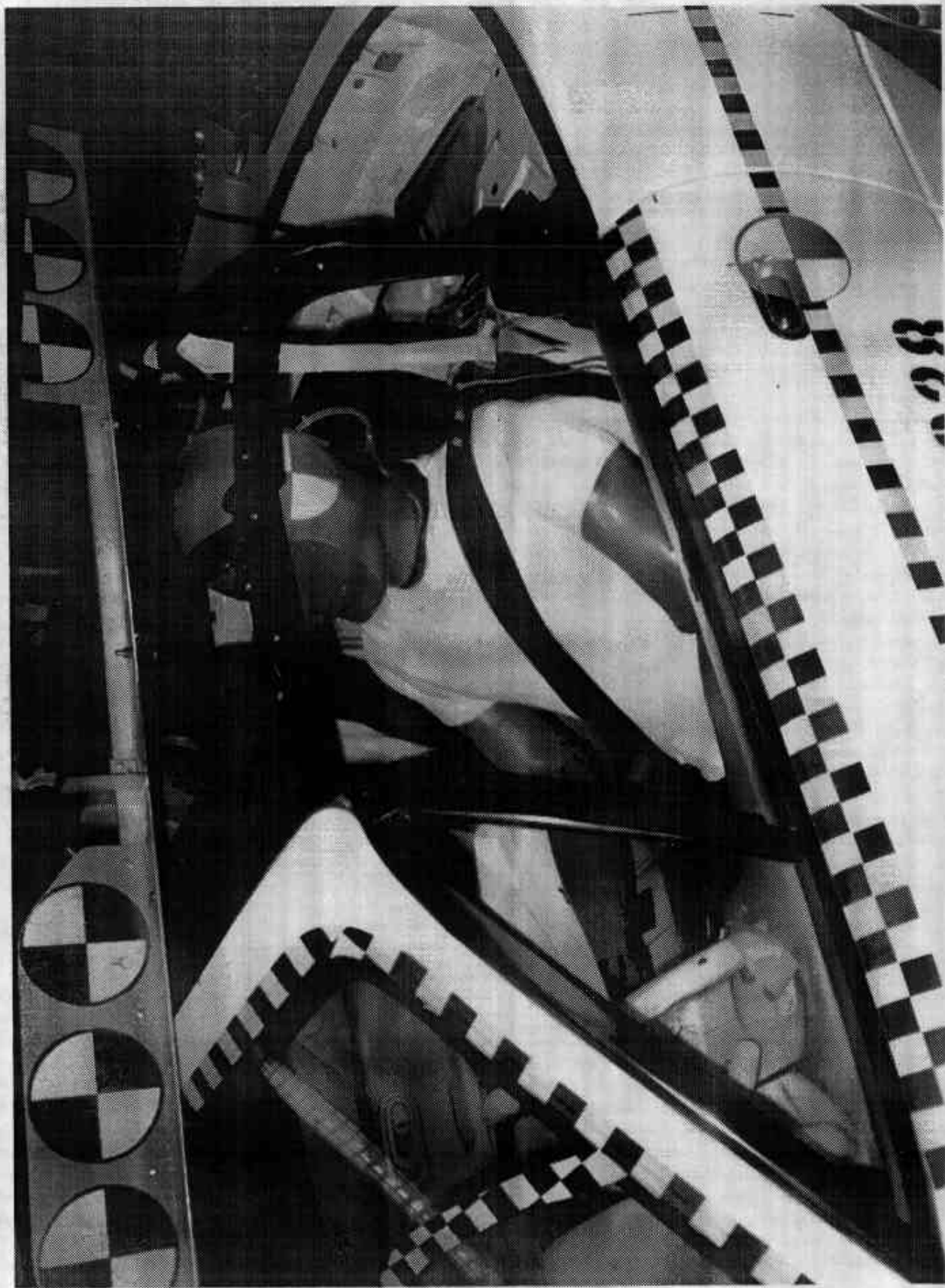


Figure A-21 PRE-TEST DRIVER POSITION VIEW

A-22

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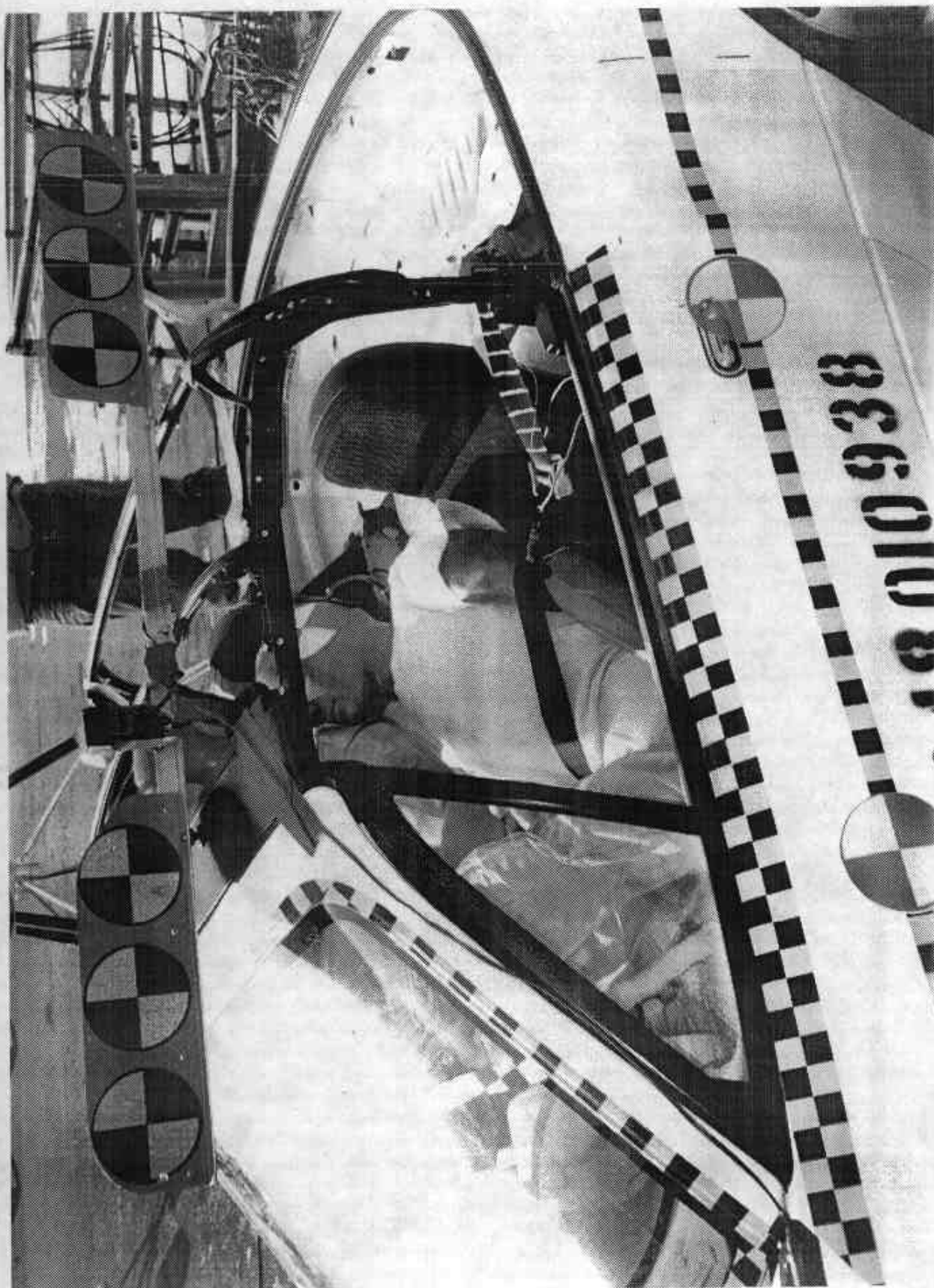


Figure A-22 POST-TEST DRIVER POSITION VIEW

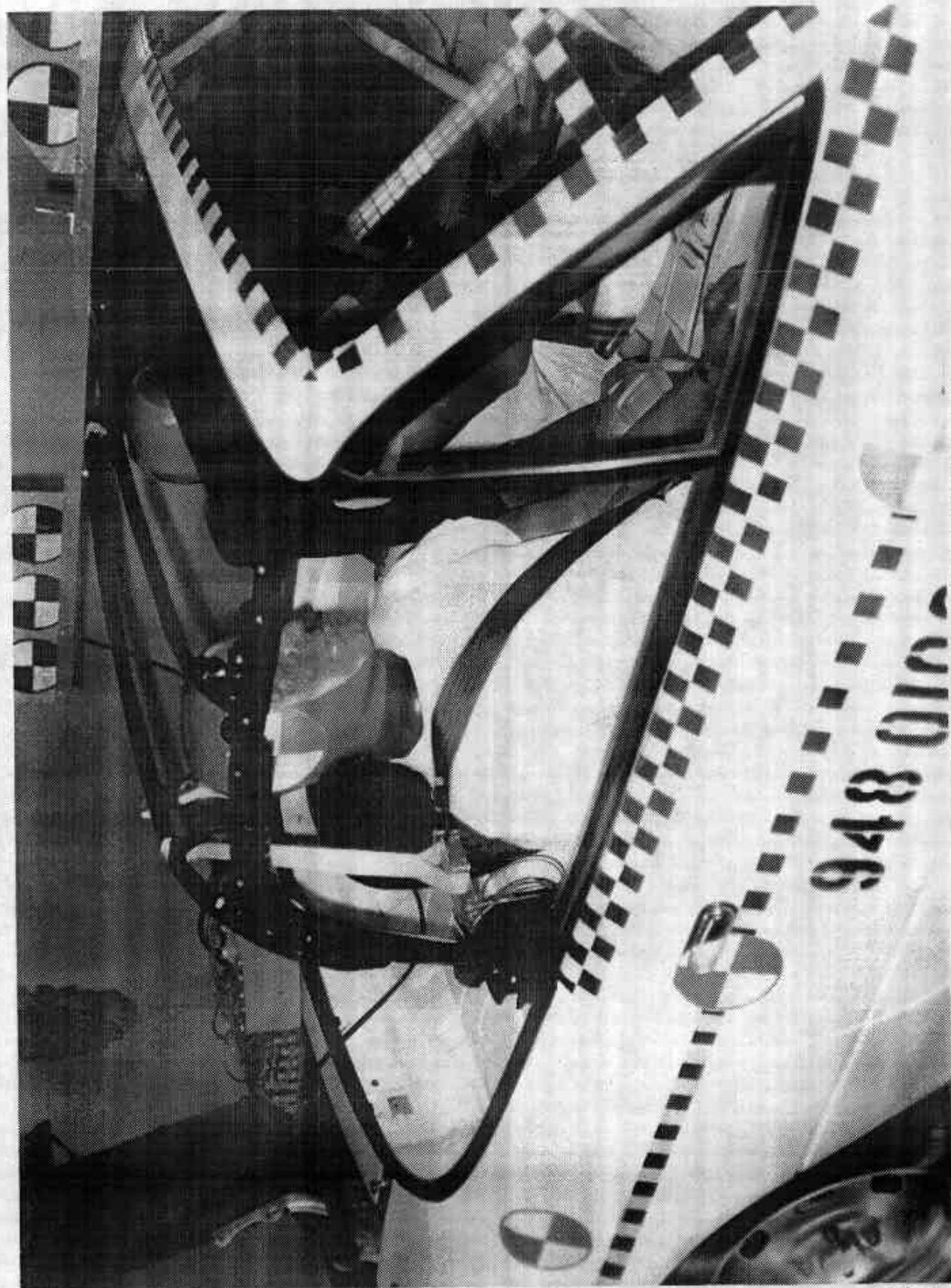


FIGURE A-23 PRE-TEST PASSENGER POSITION VIEW

A-24

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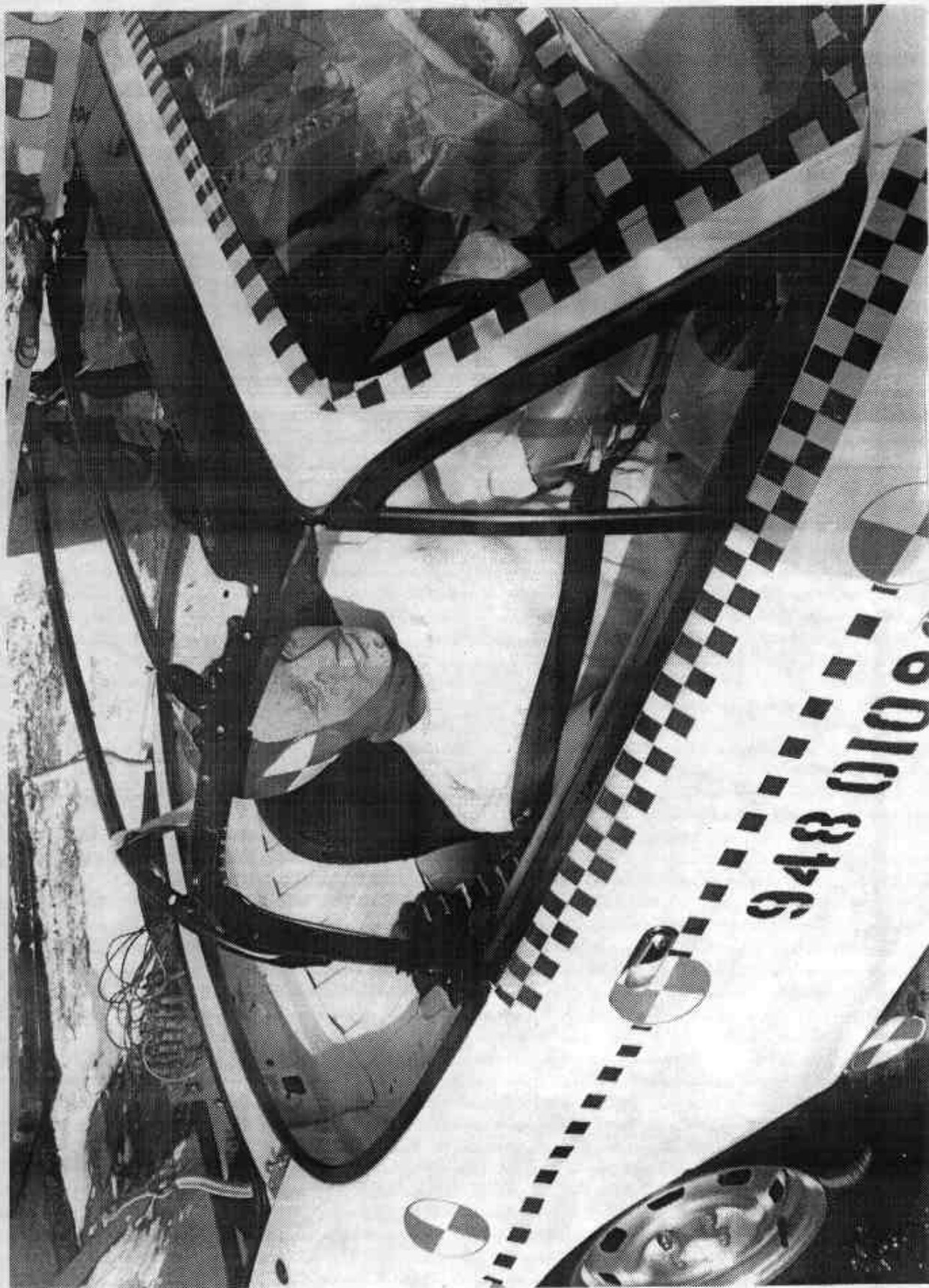


Figure A-24 POST-TEST PASSENGER POSITION VIEW

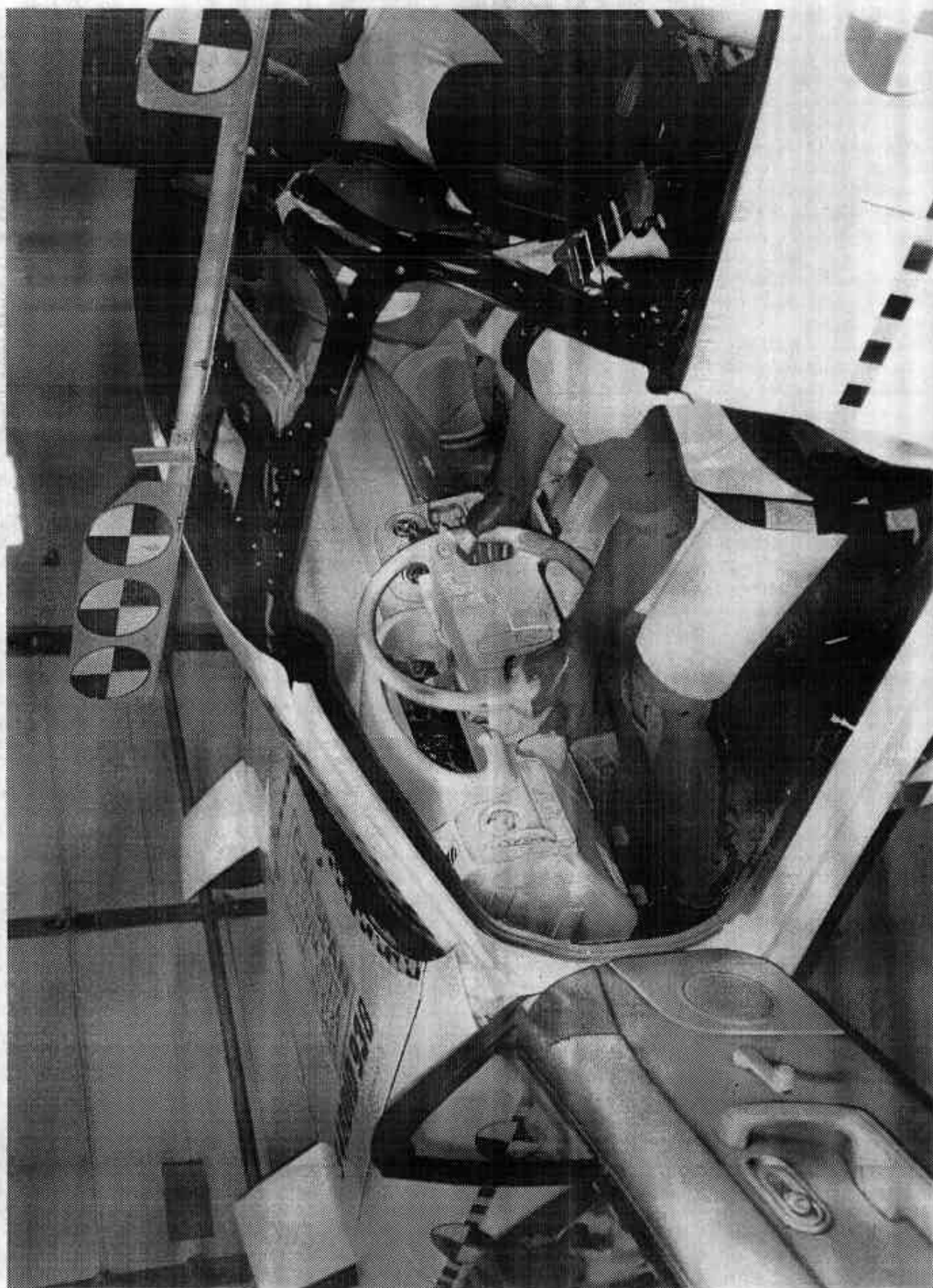


Figure A-25 PRE-TEST DRIVER AND INTERIOR VIEW

A-26

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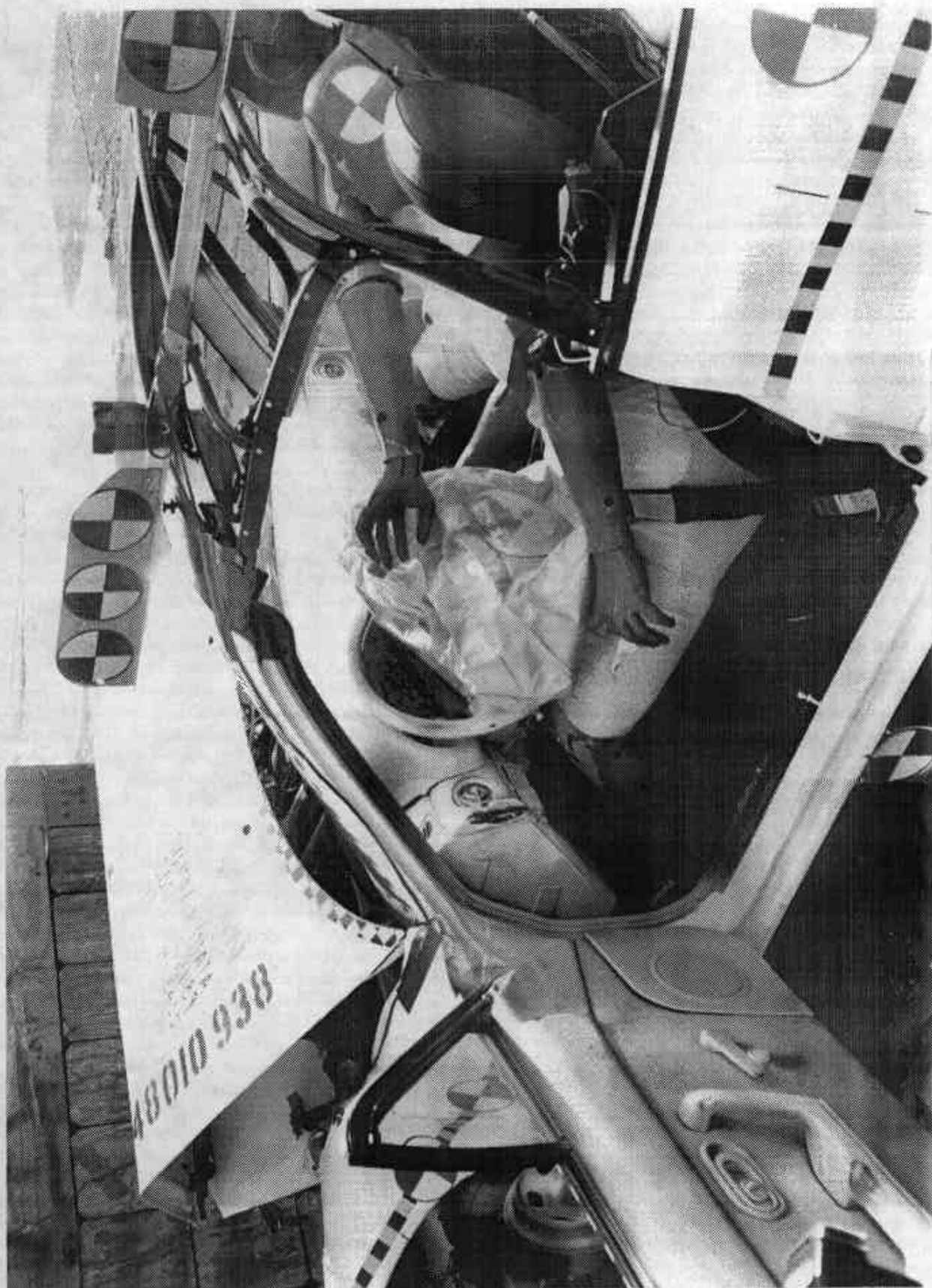


Figure A-26 POST-TEST DRIVER AND INTERIOR VIEW

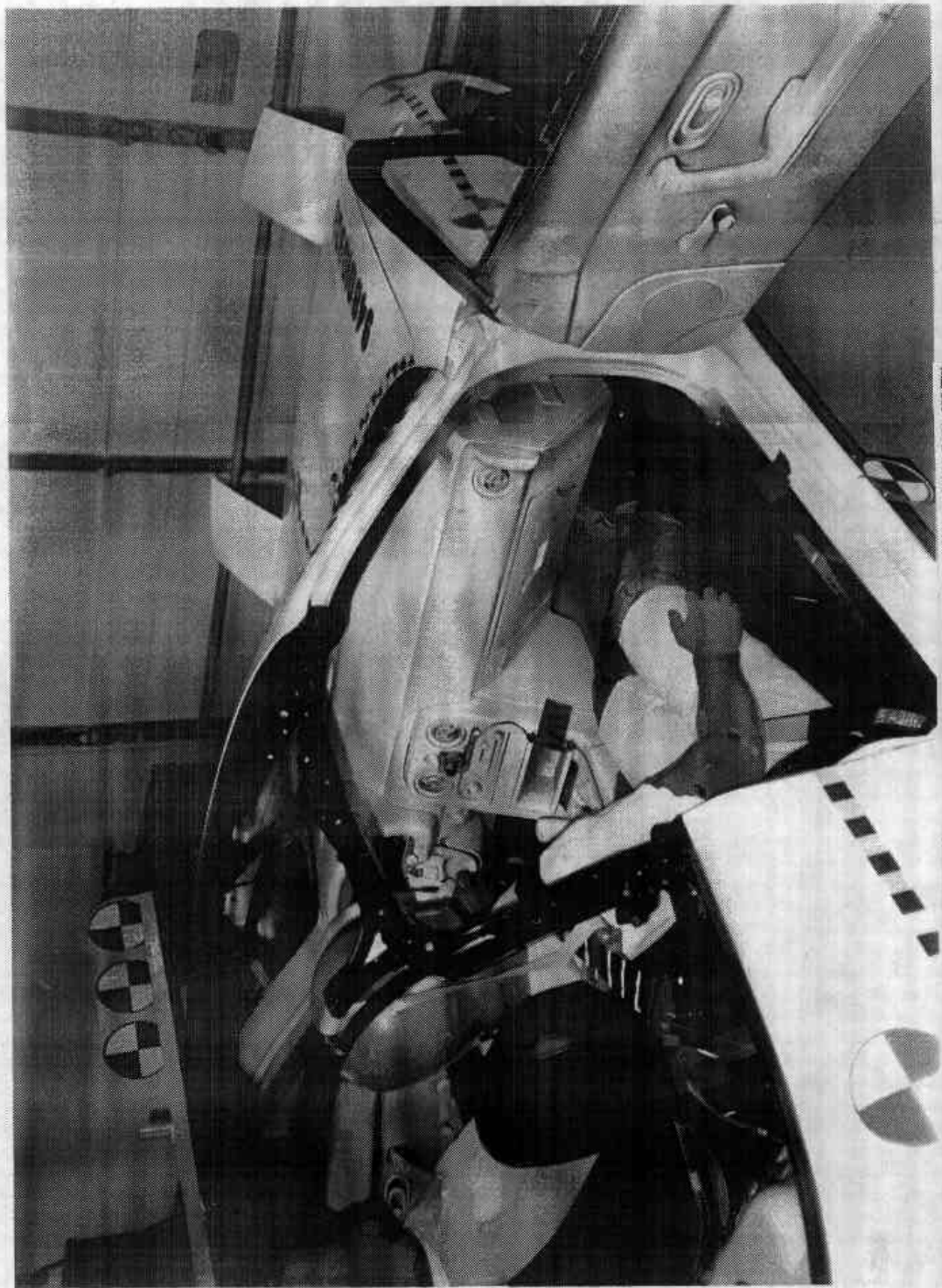


Figure A-27 PRE-TEST PASSENGER AND INTERIOR VIEW

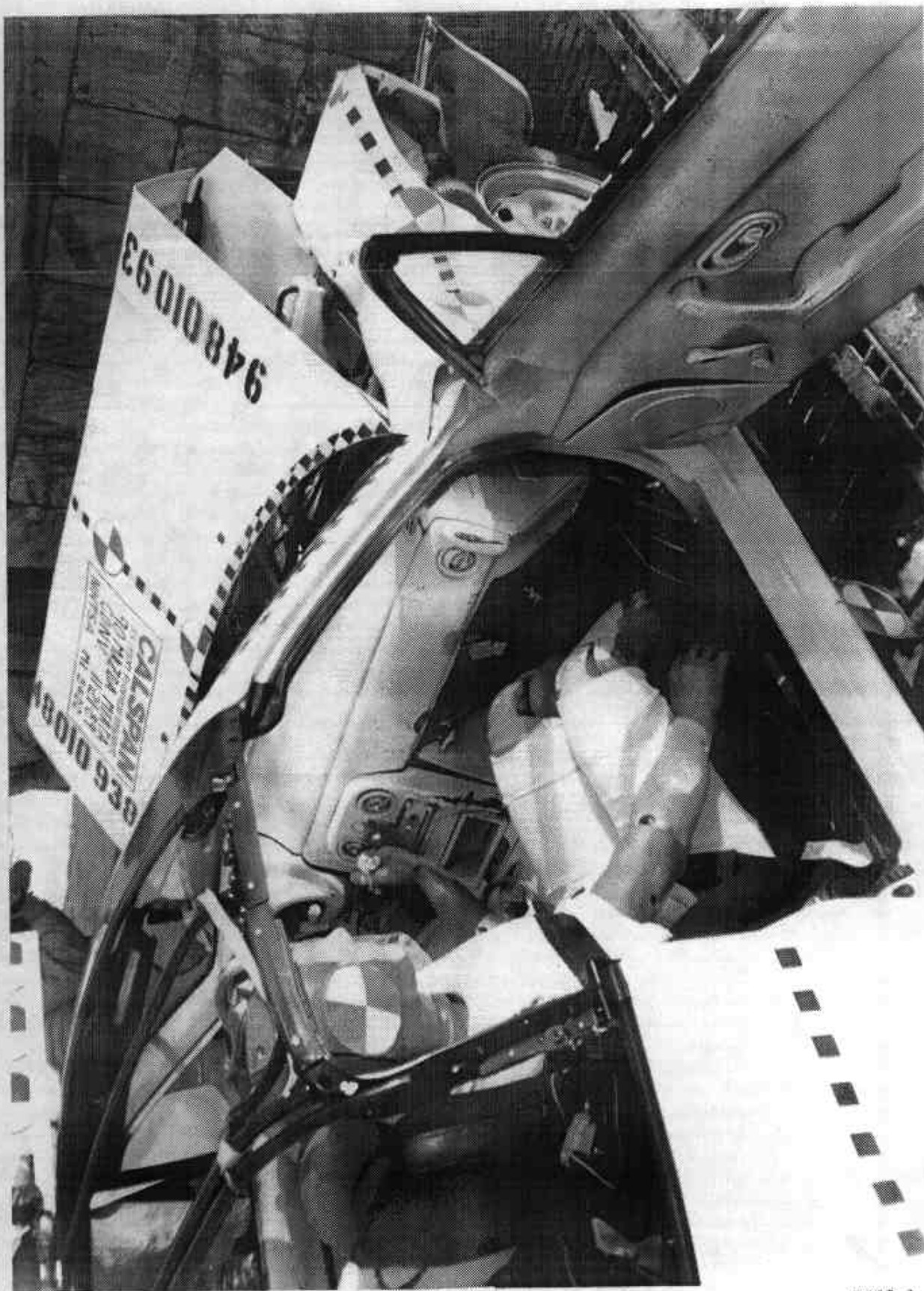


Figure A-28 POST-TEST PASSENGER AND INTERIOR VIEW

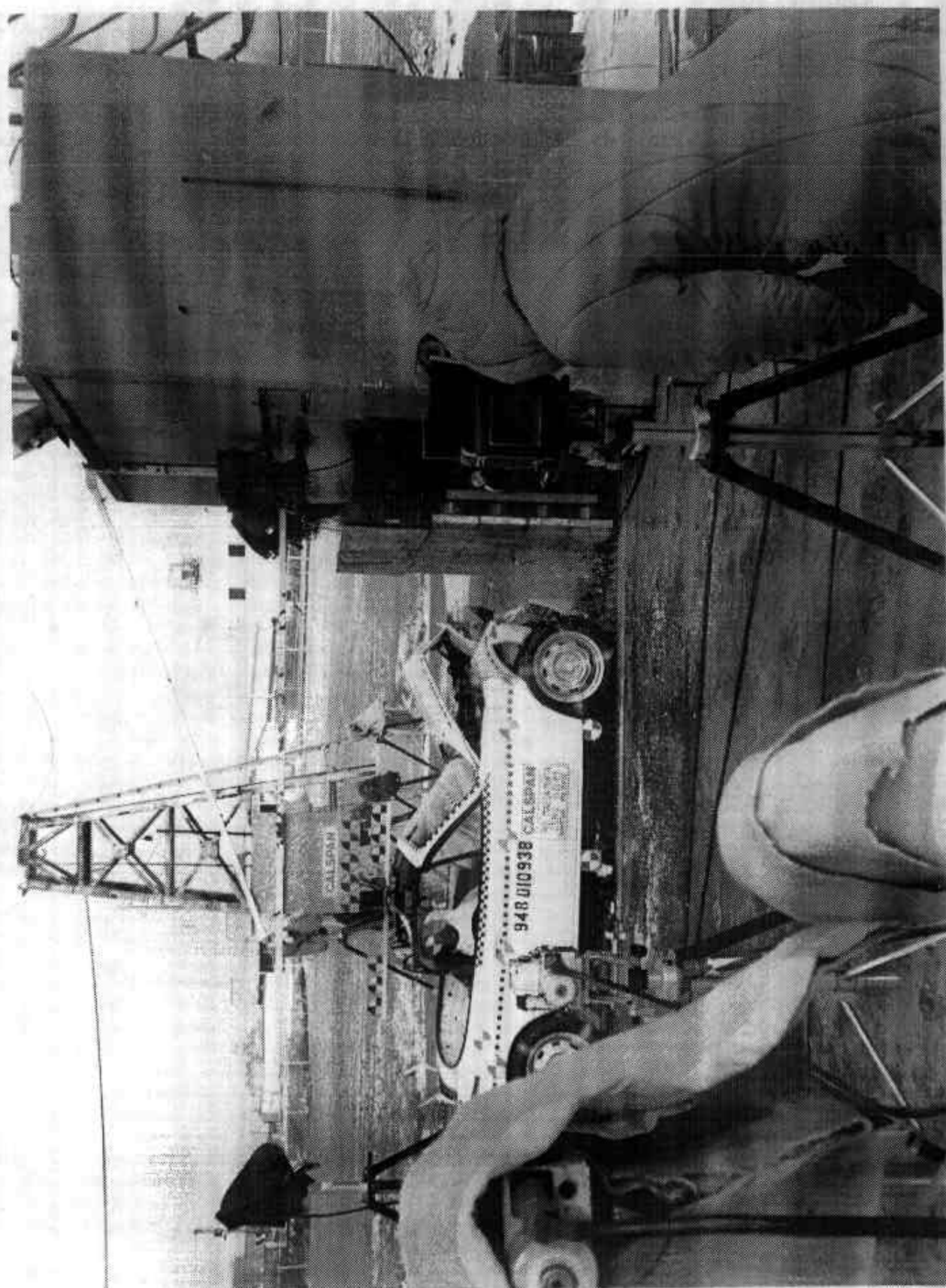


Figure A-29 IMPACT VIEW

A-30

7776-1

Appendix B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

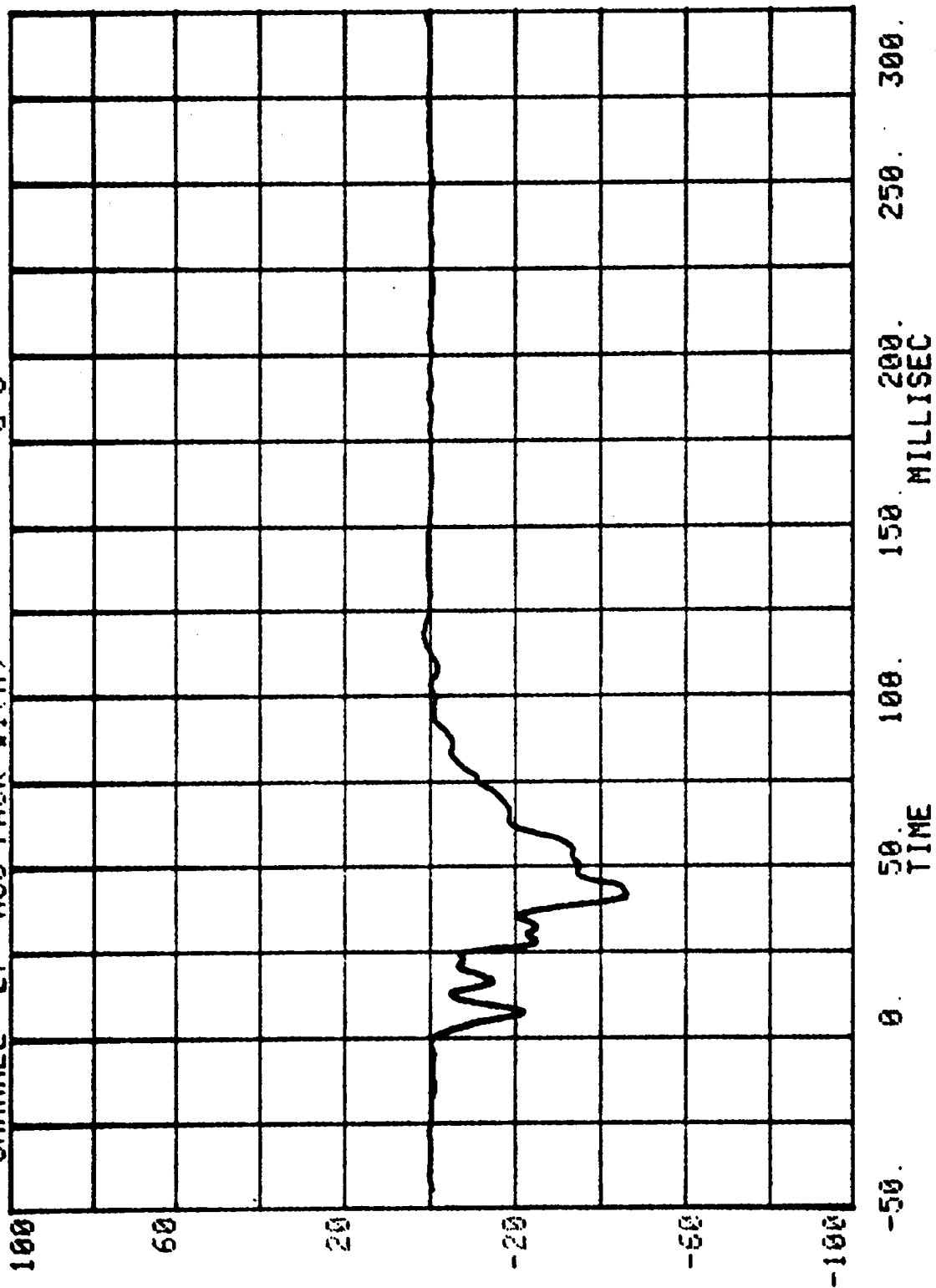
TEST NO. ML5400

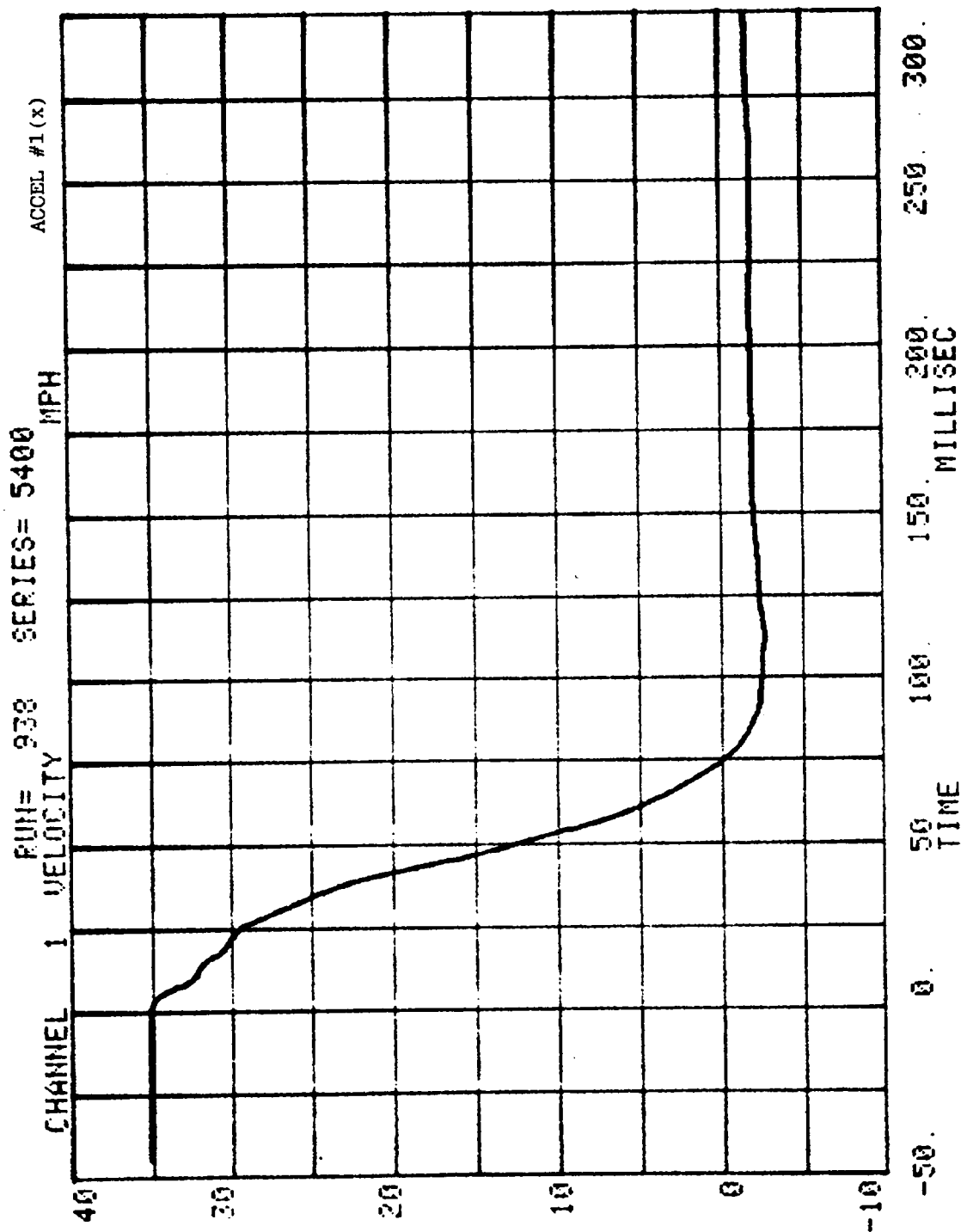
VEHICLE DATA

FILTER CHANNEL CLASS

60

RUN= 938 SERIES= 5400 G'S
CHANNEL 27 ACC PACK #1(X)





ACCEL #1 (x)

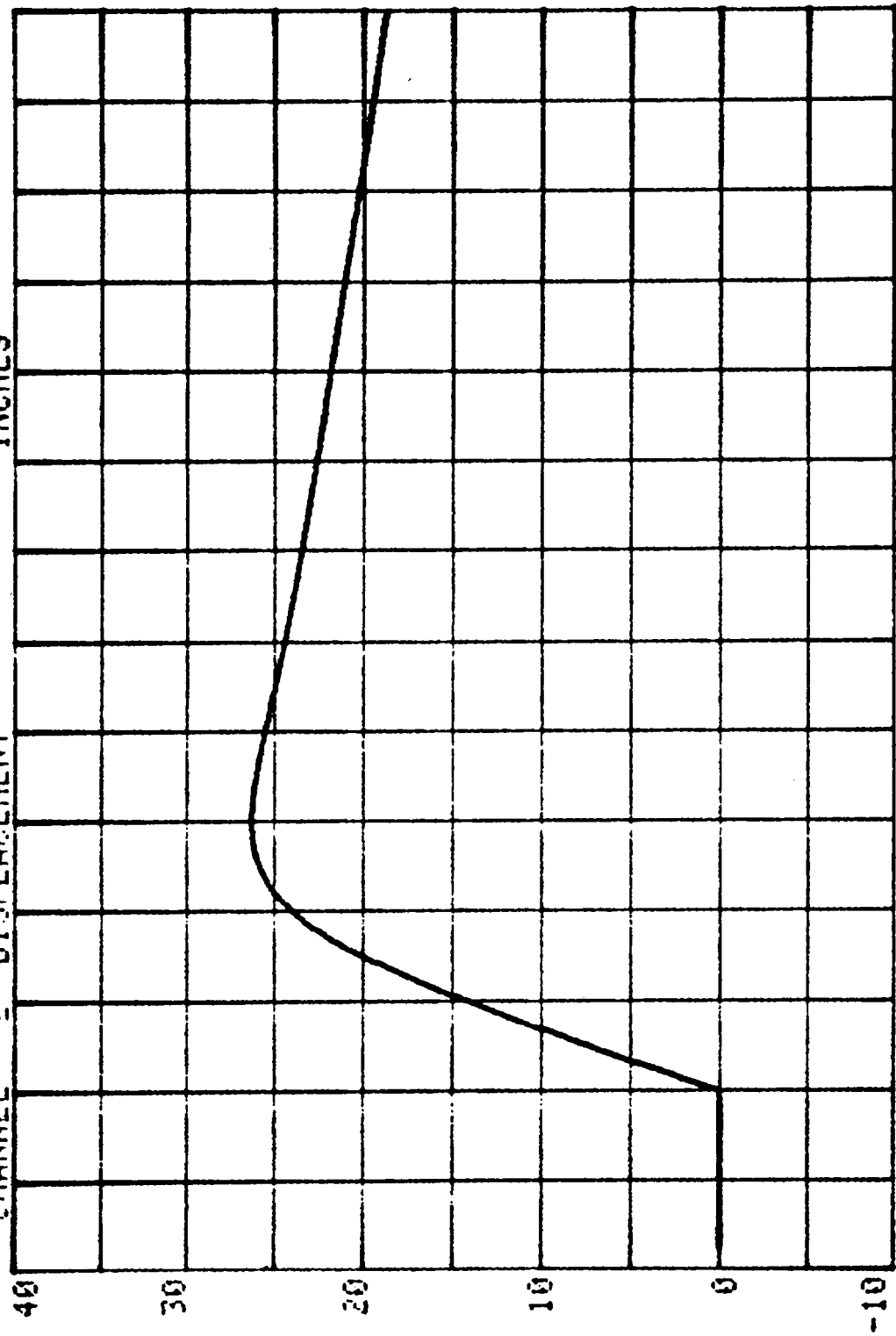
INCHES

SERIES= 5400

RUN= 938

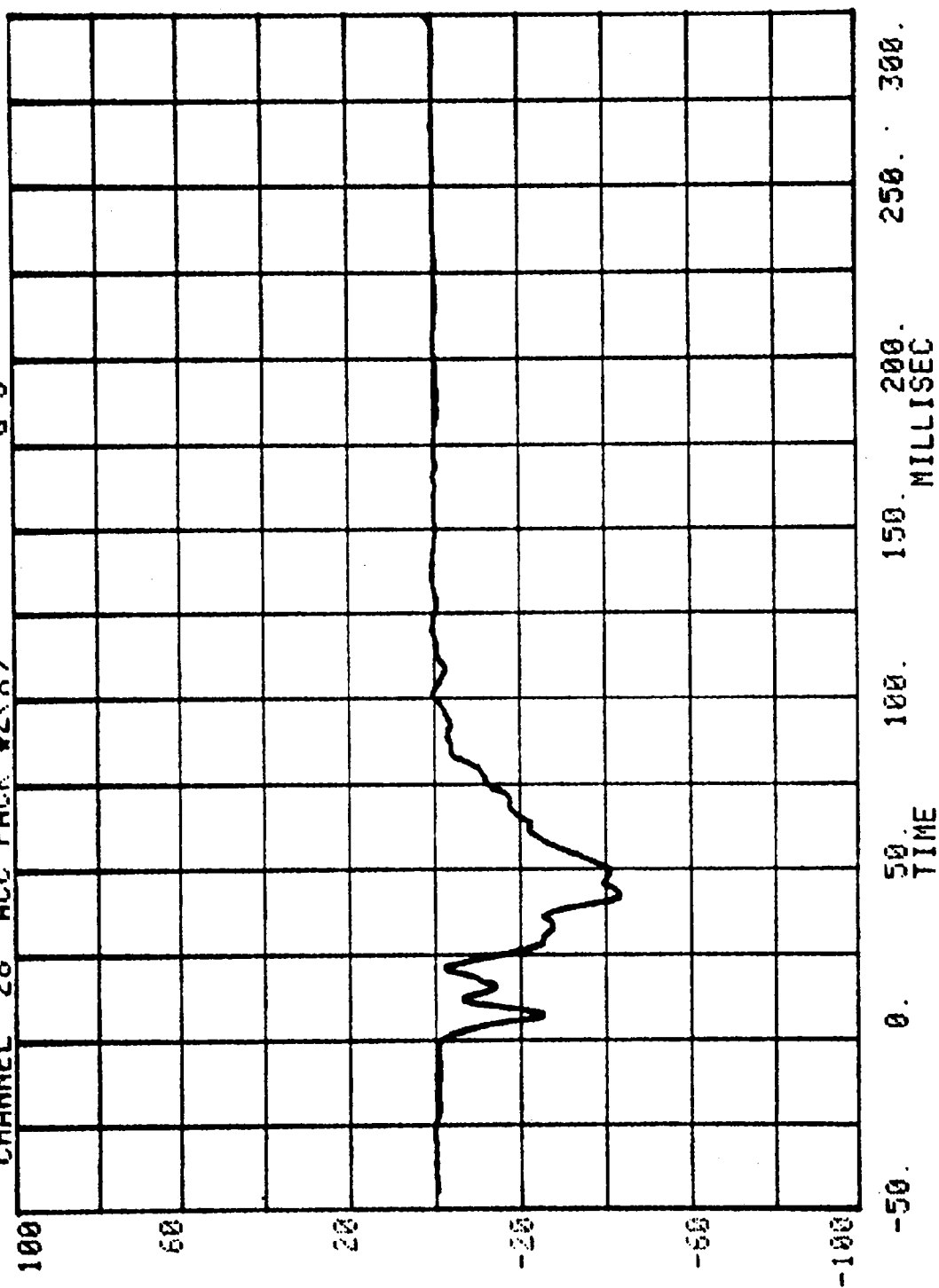
DISPLACEMENT

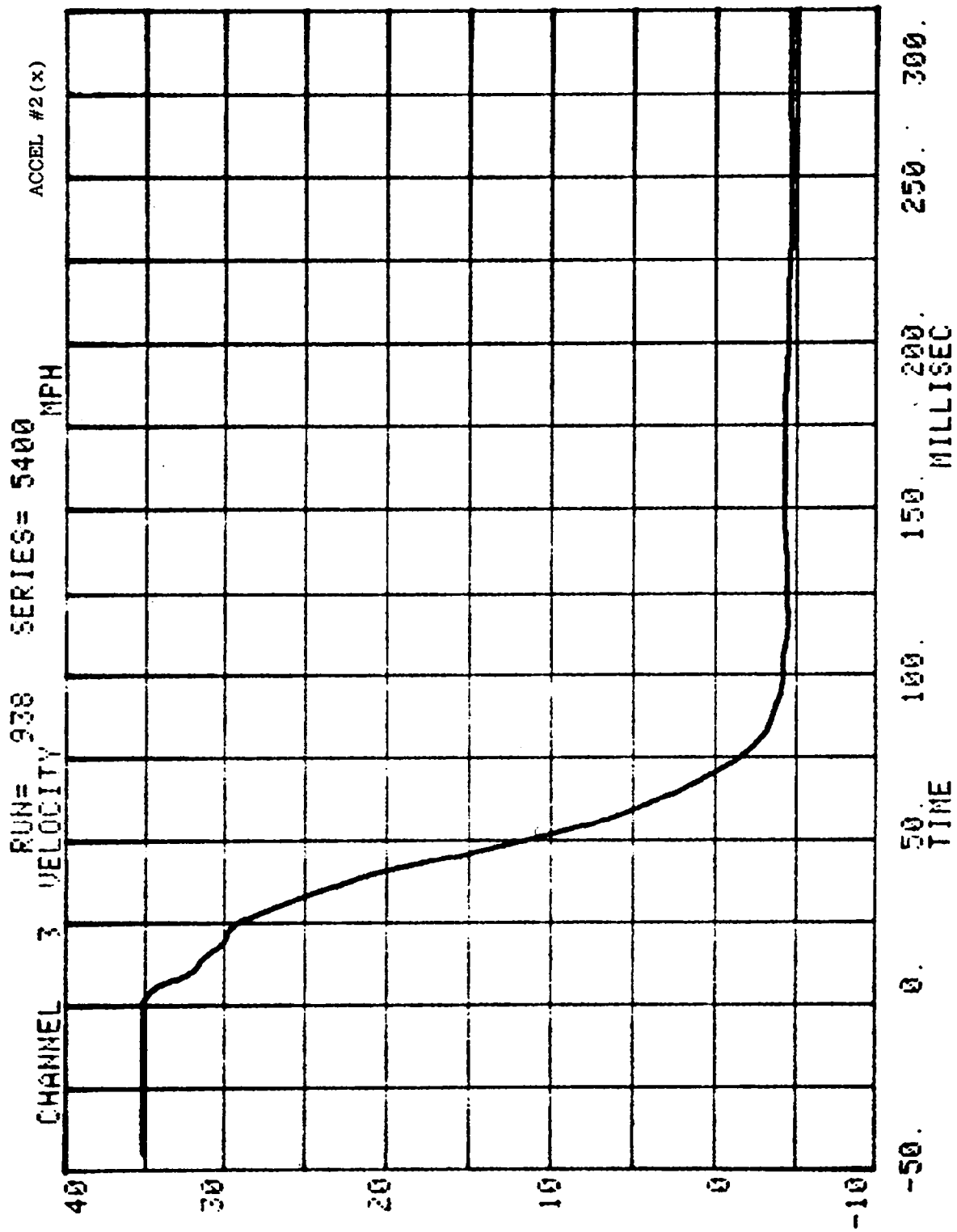
CHANNEL 2

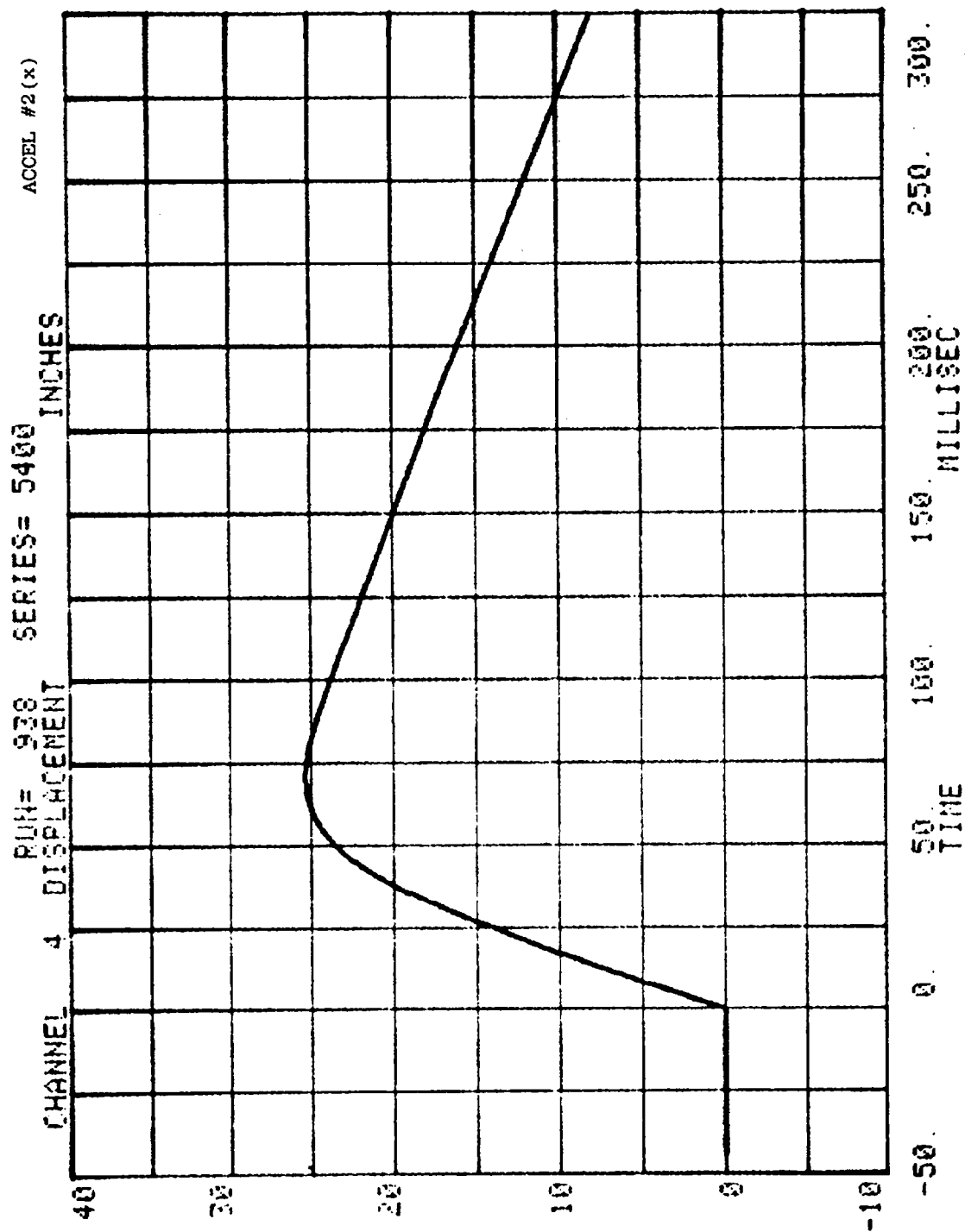


TIME
0. 50. 100. 150. 200. 250. 300.
MILLISEC

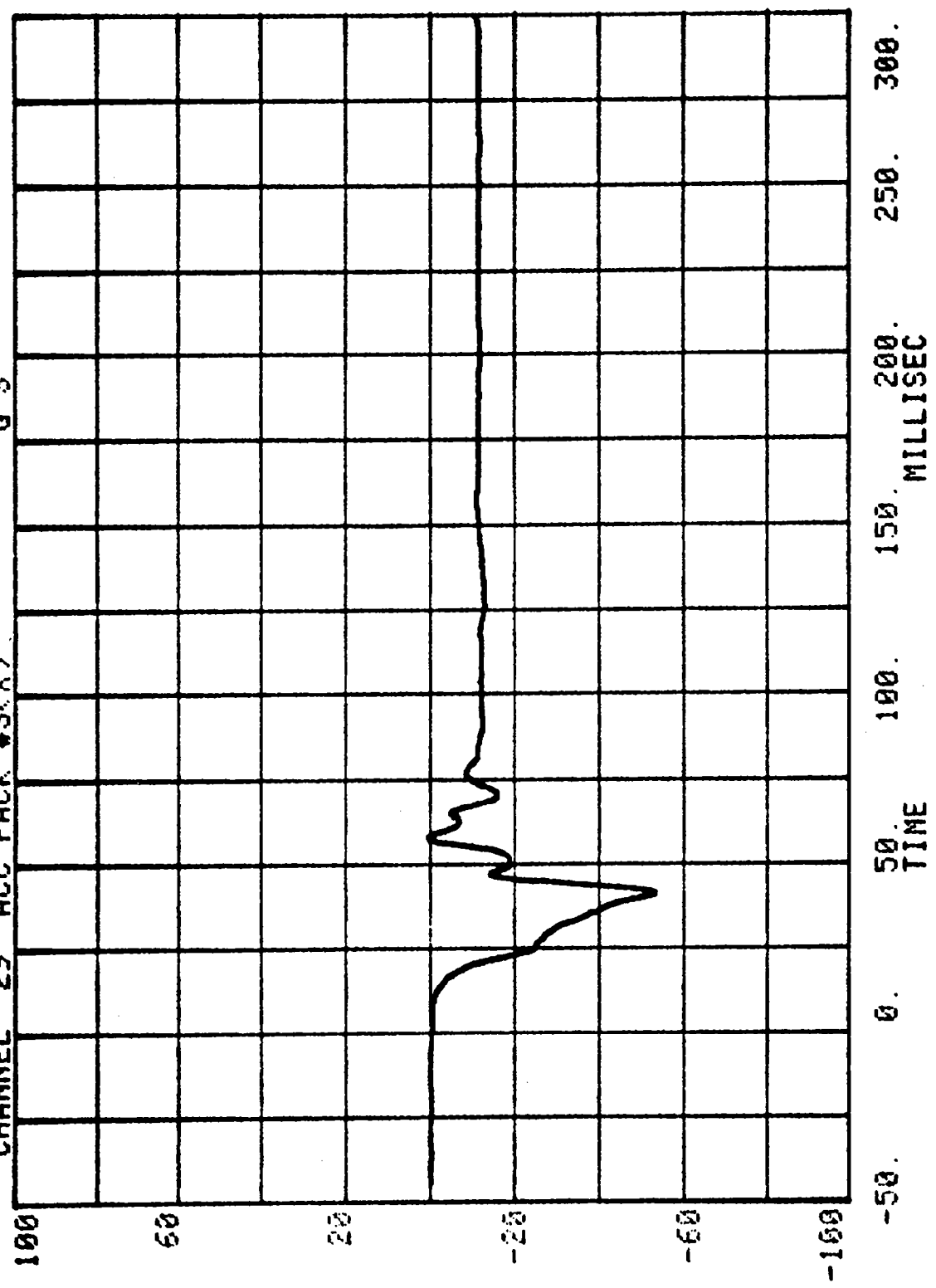
CHANNEL 28 ACC PACK #2(X) RUN= 938 SERIES= 5400 G'S

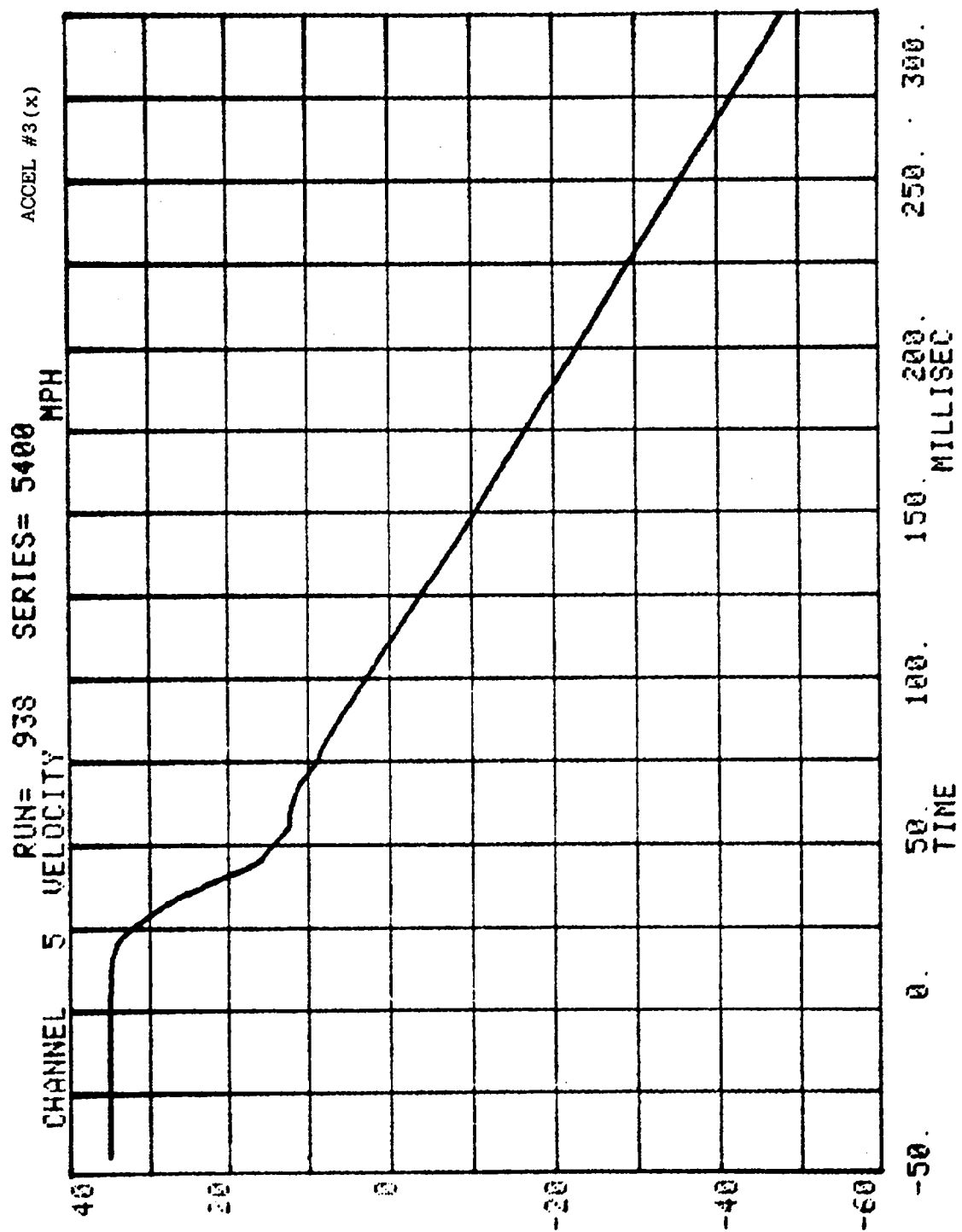


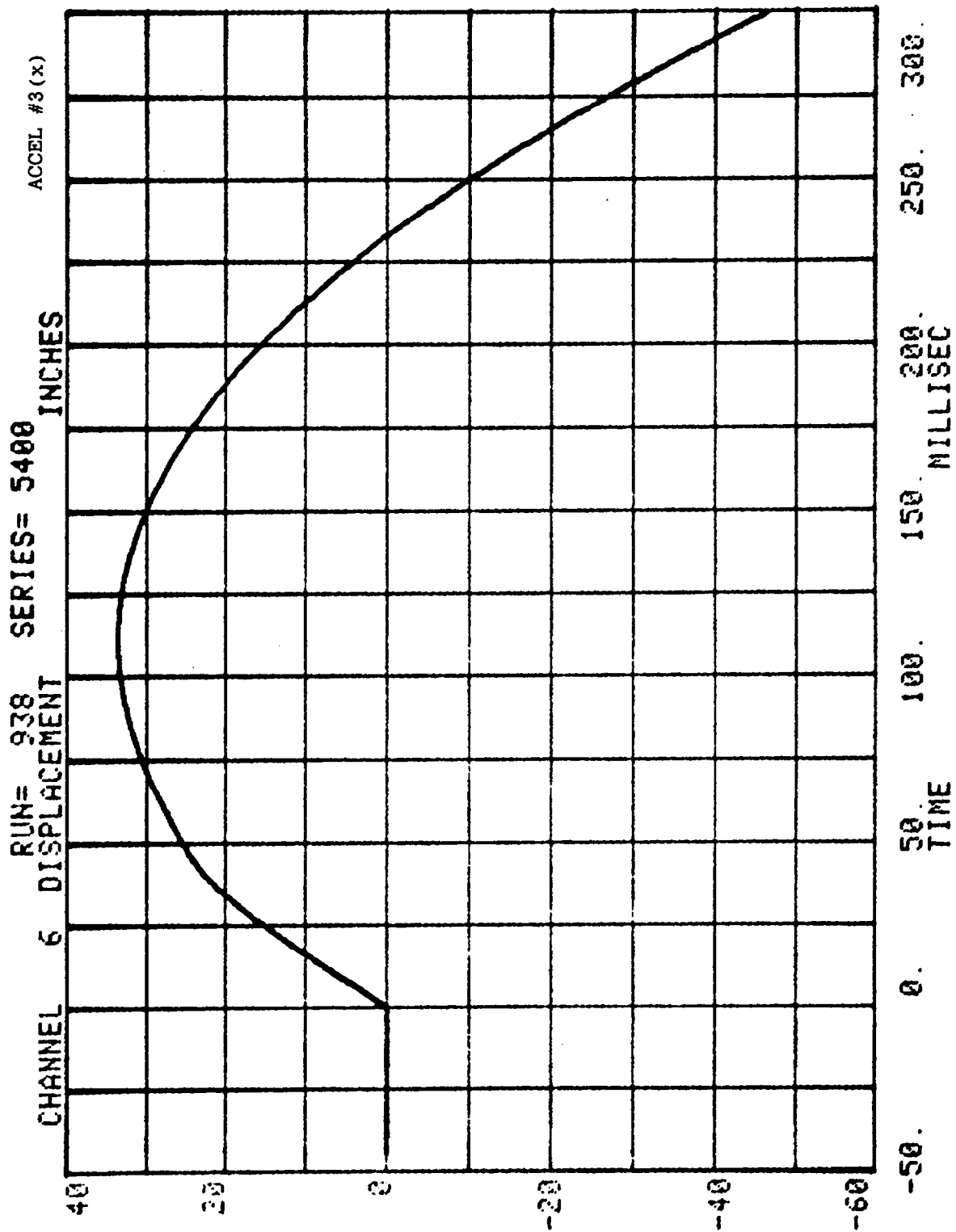




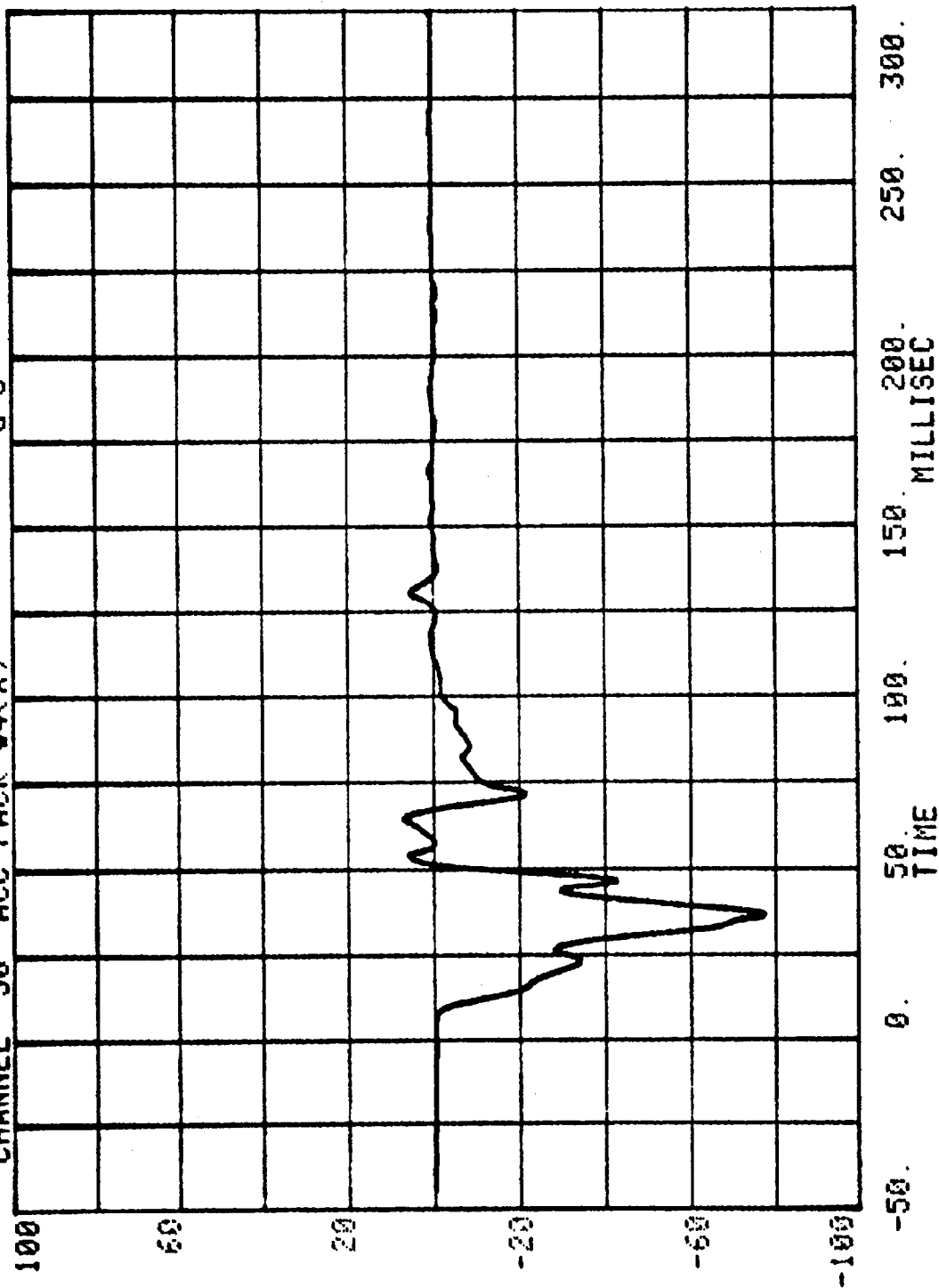
RUN= 938 SERIES= 5400
CHANNEL 29 ACC PACK #3(X) G'S

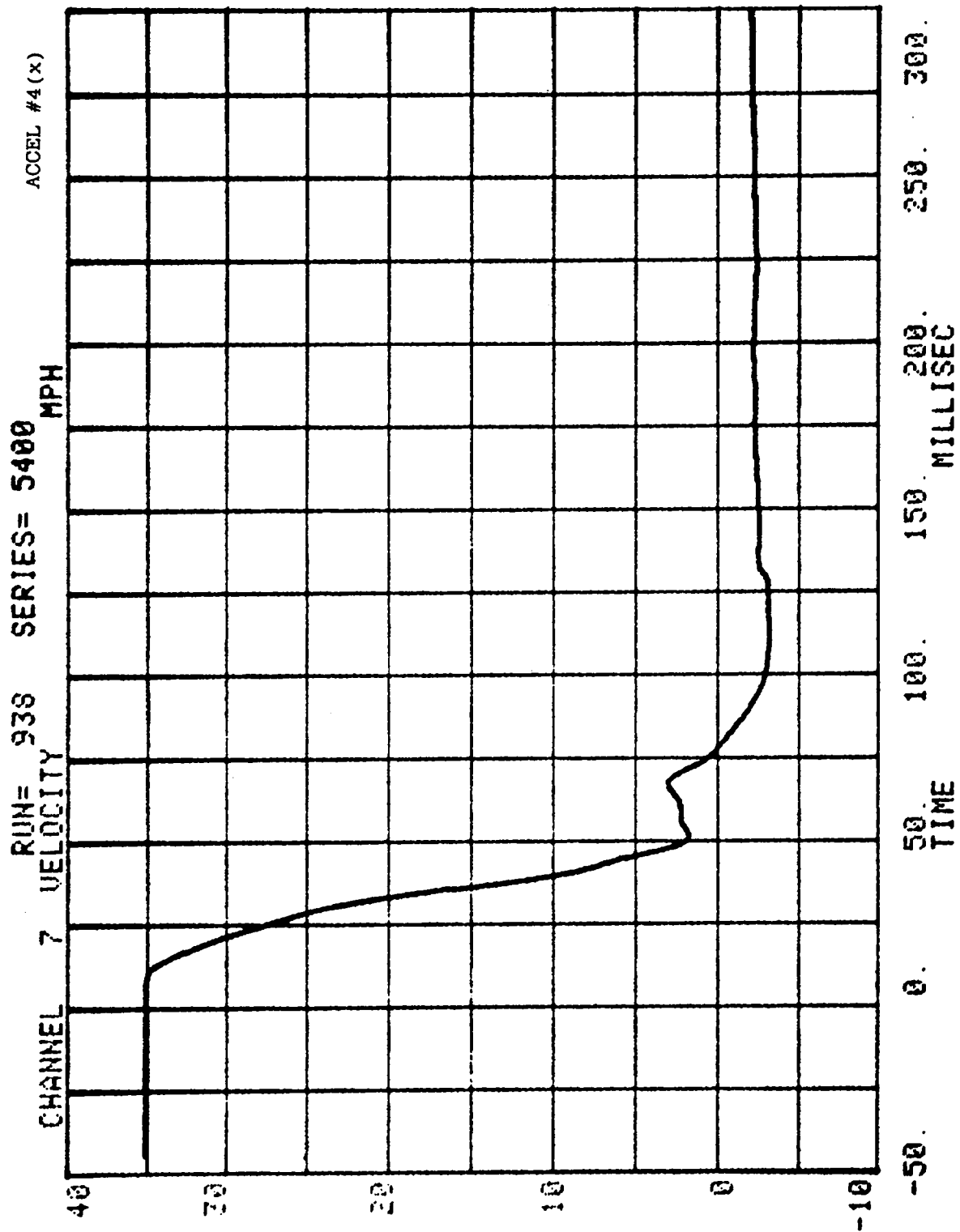


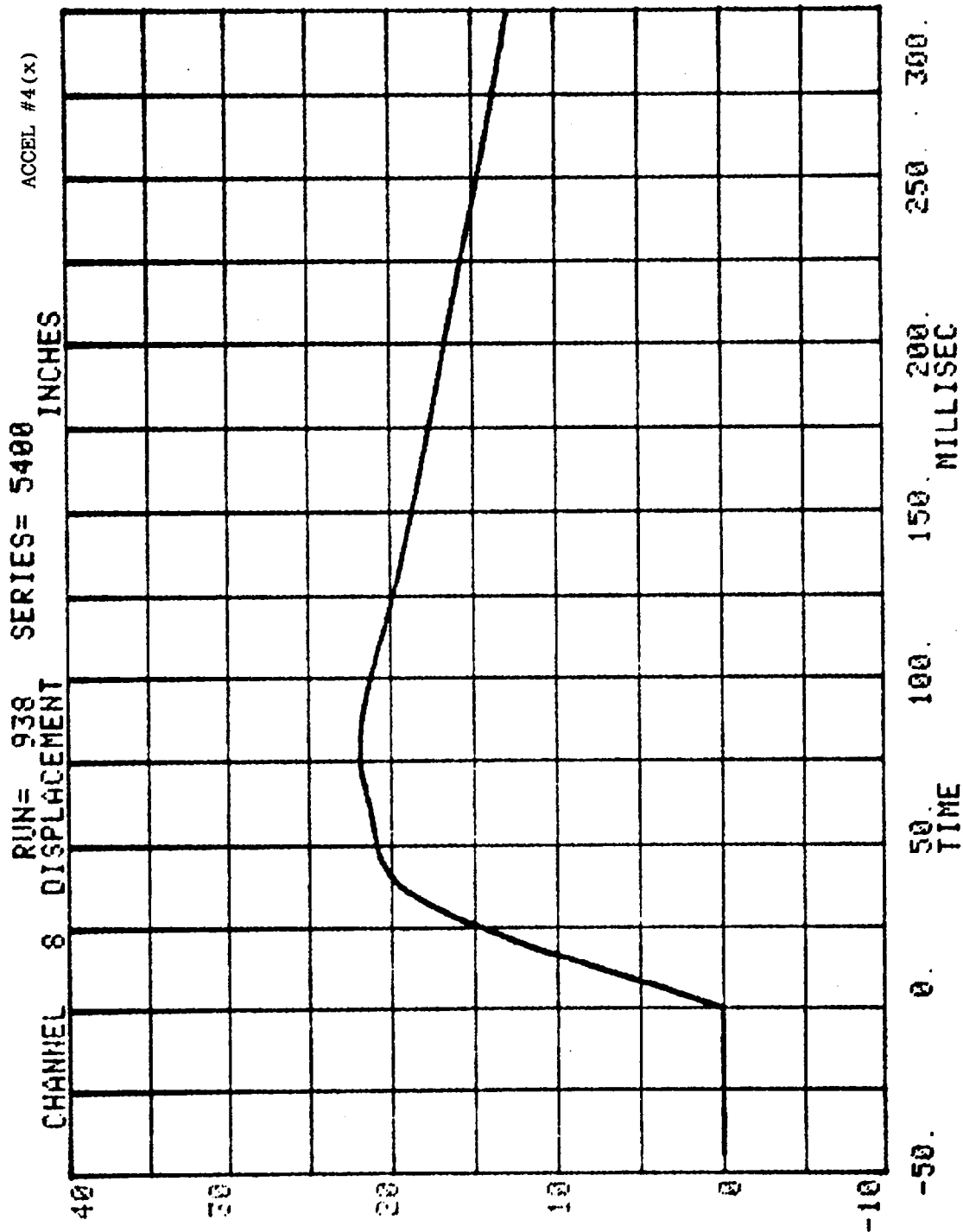




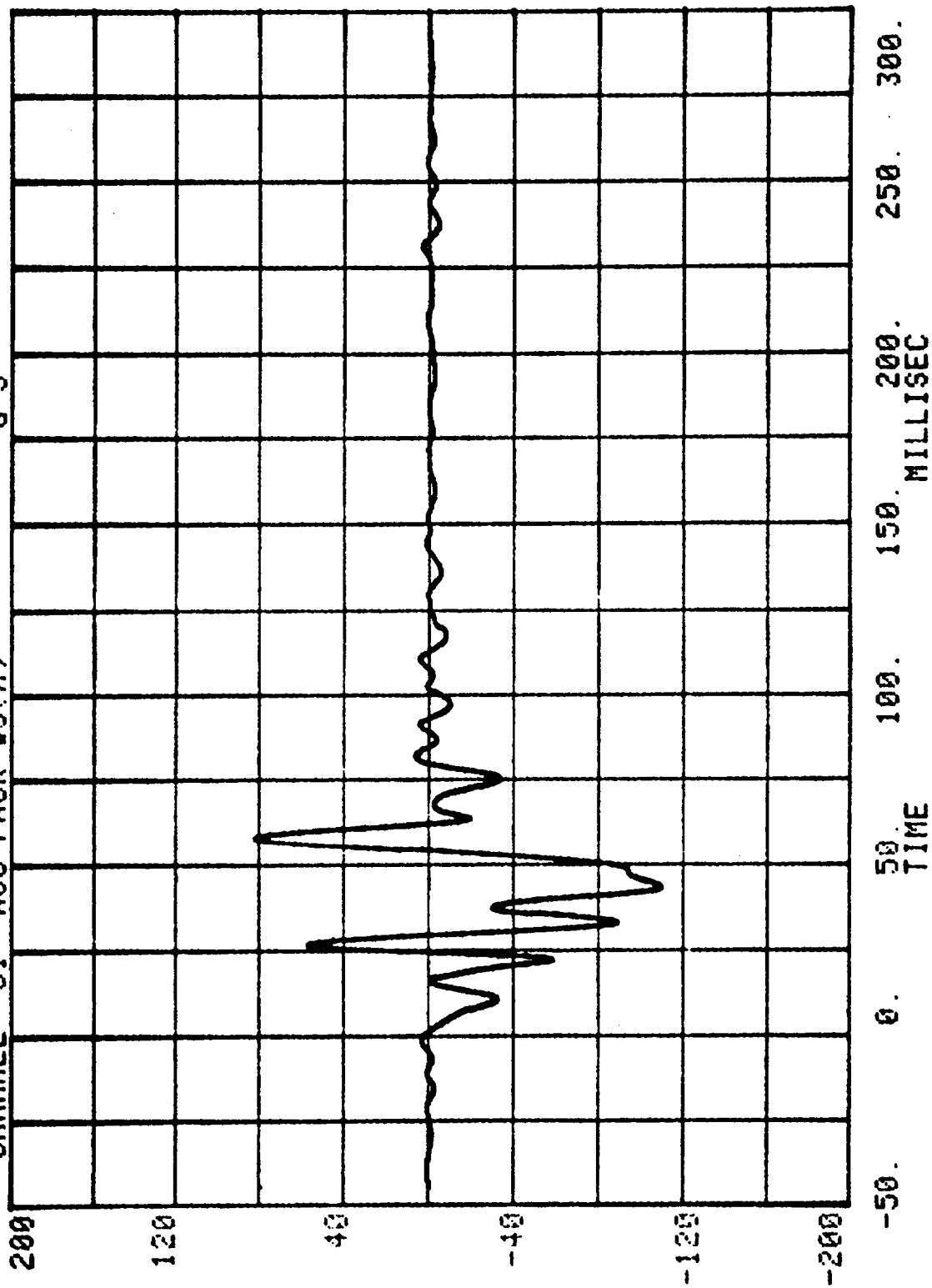
RUN= 938 SERIES= 5400 G'S
CHANNEL 30 ACC PACK #4(X)

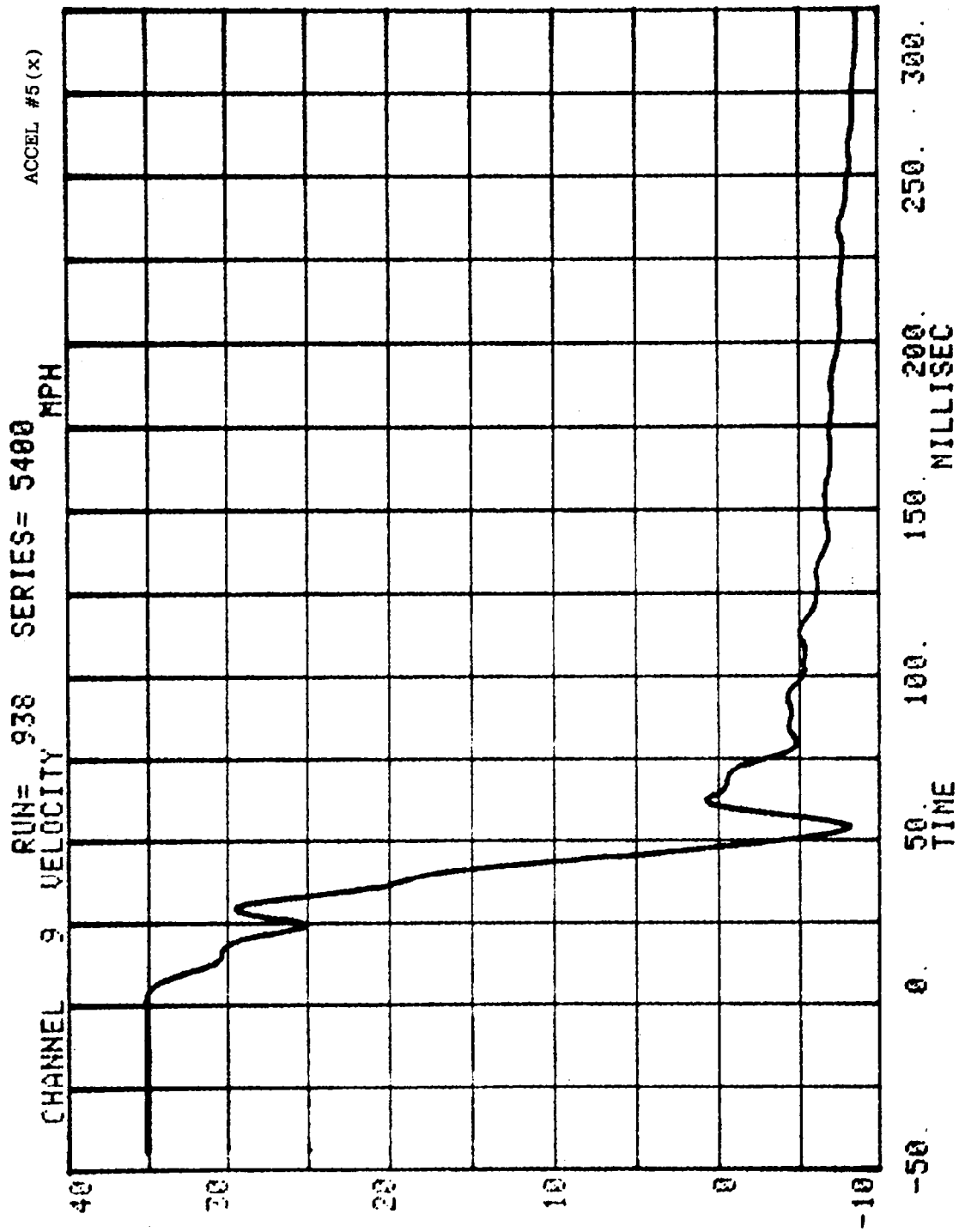






RUN= 938 SERIES= 5400 G'S
CHANNEL 31 ACC PACK #5(X)





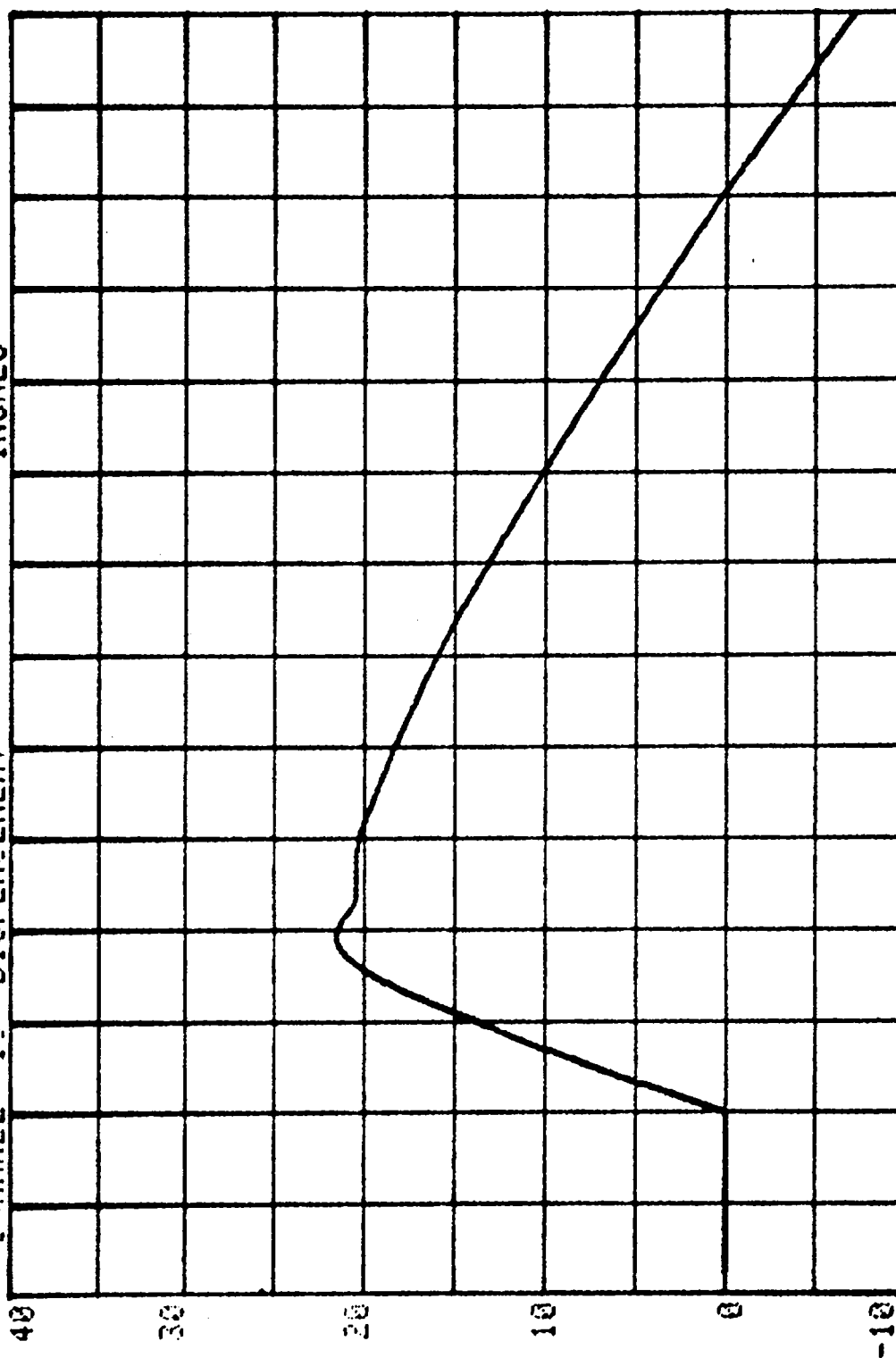
ACCEL #5 (x)

INCHES

SERIES= 5400

RUN= 938

CHANNEL 10 DISPLACEMENT



250. 300.

150. 200.

50. 100.

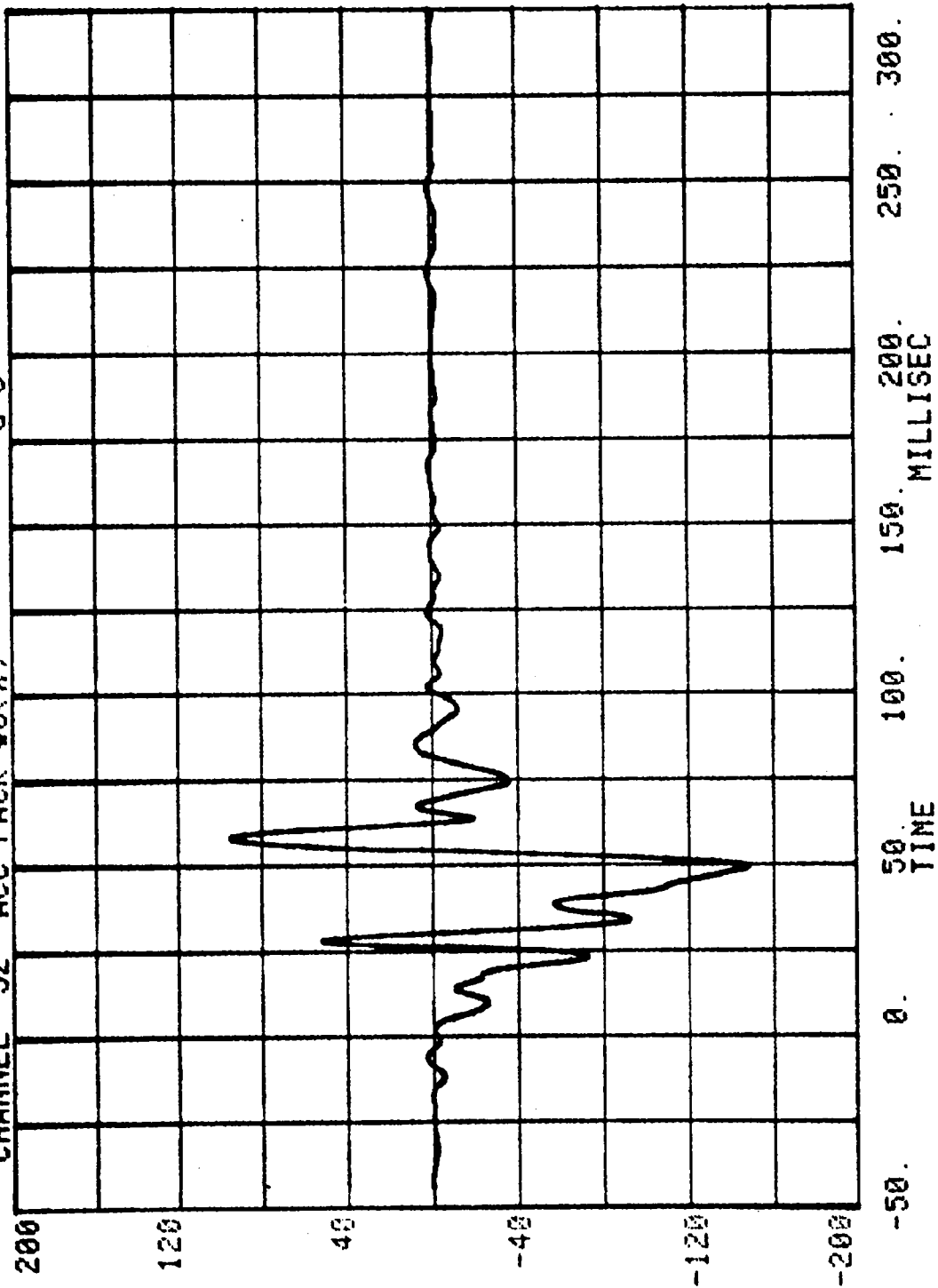
0.

-50.

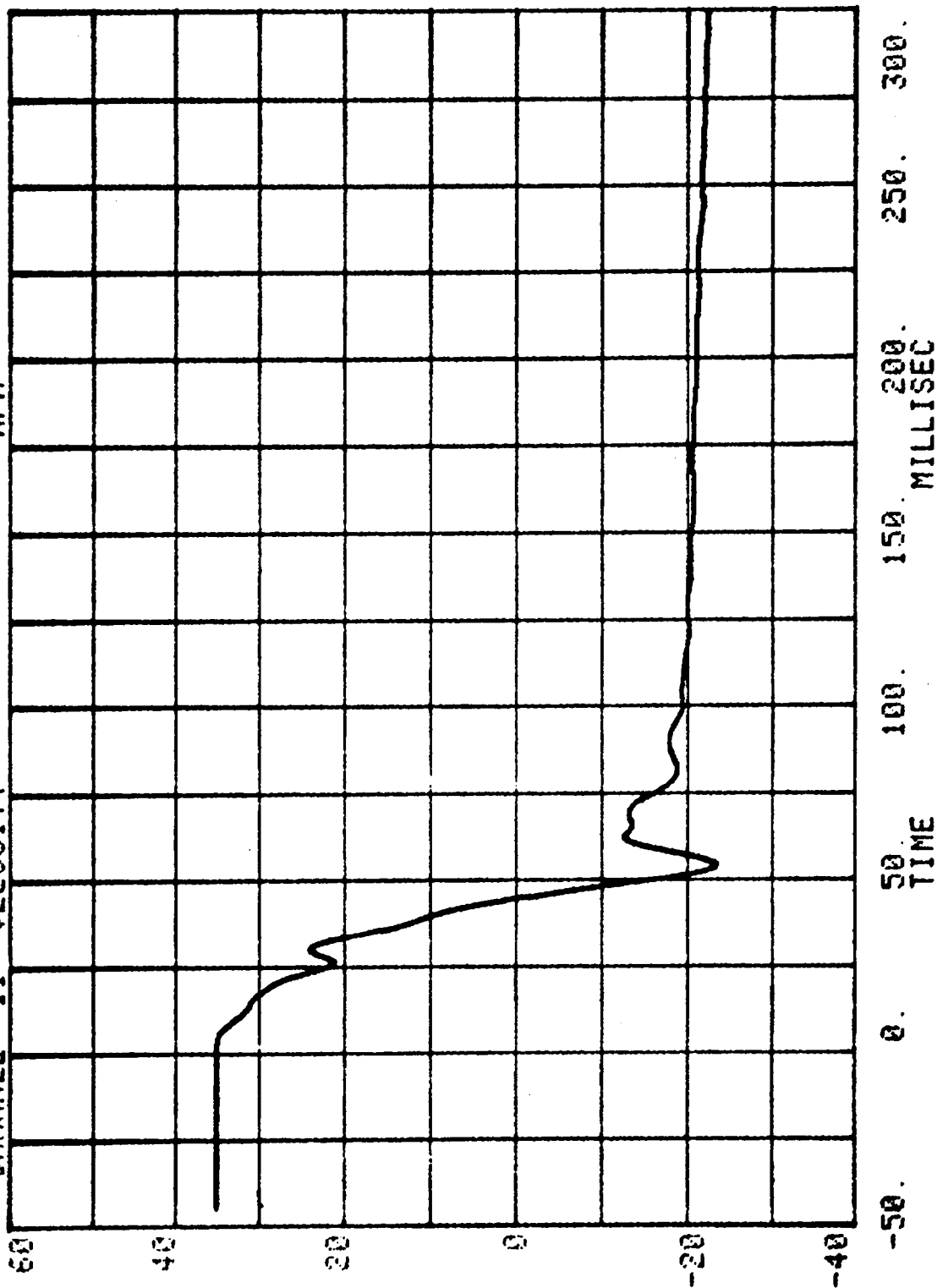
MILLISEC

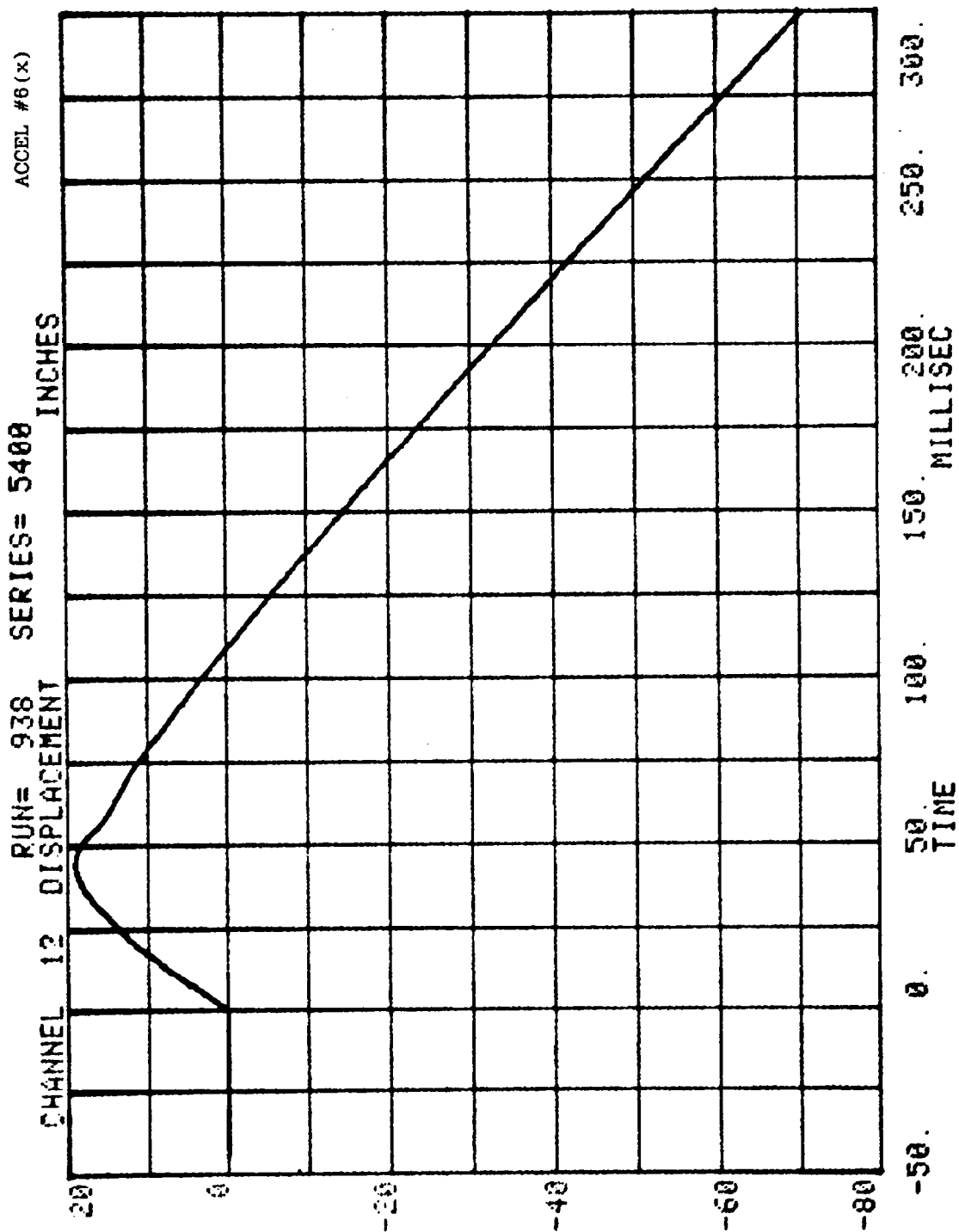
TIME

RUN= 938 SERIES= 5400
CHANNEL 32 ACC PACK #6(X) G'S

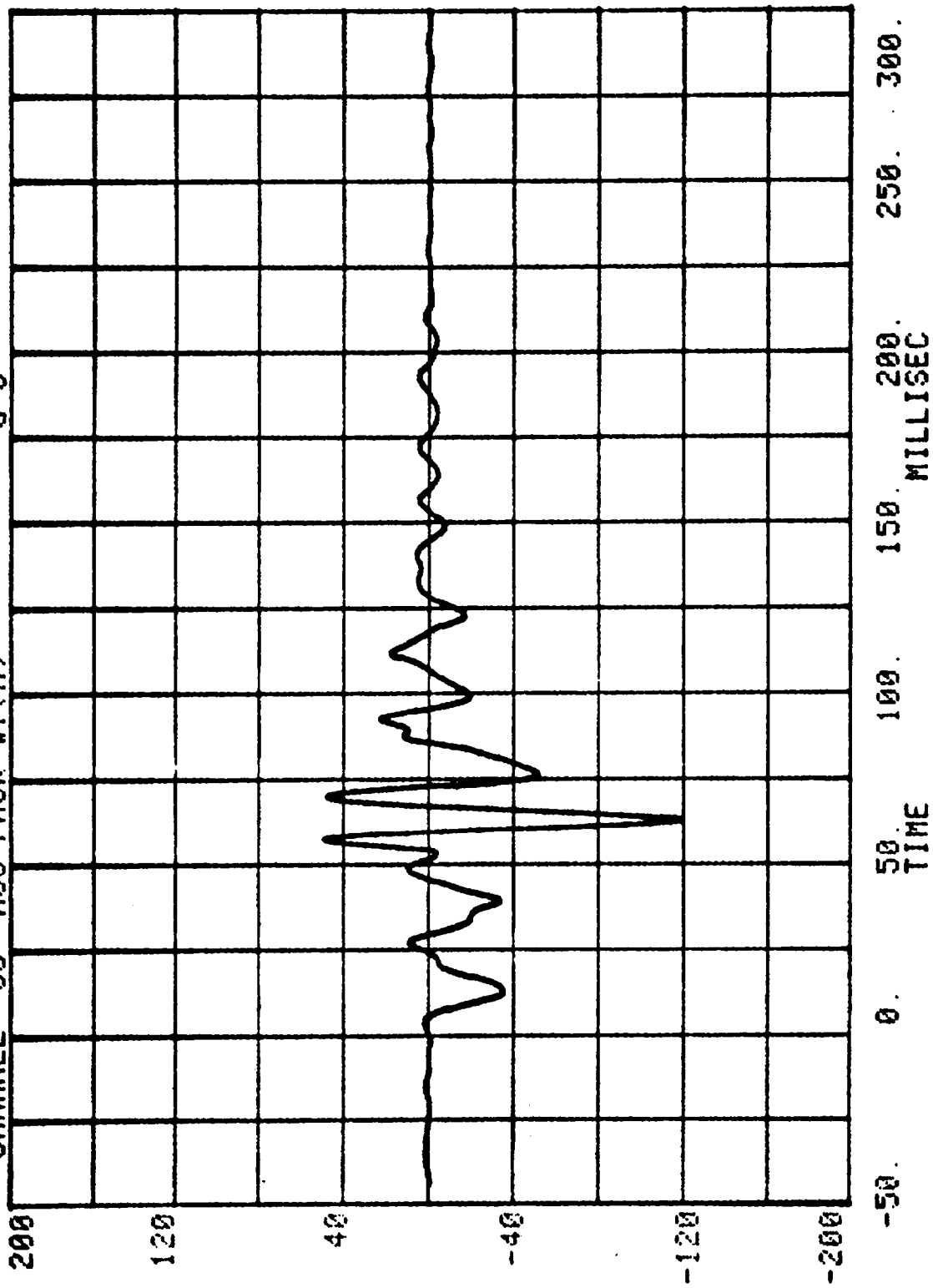


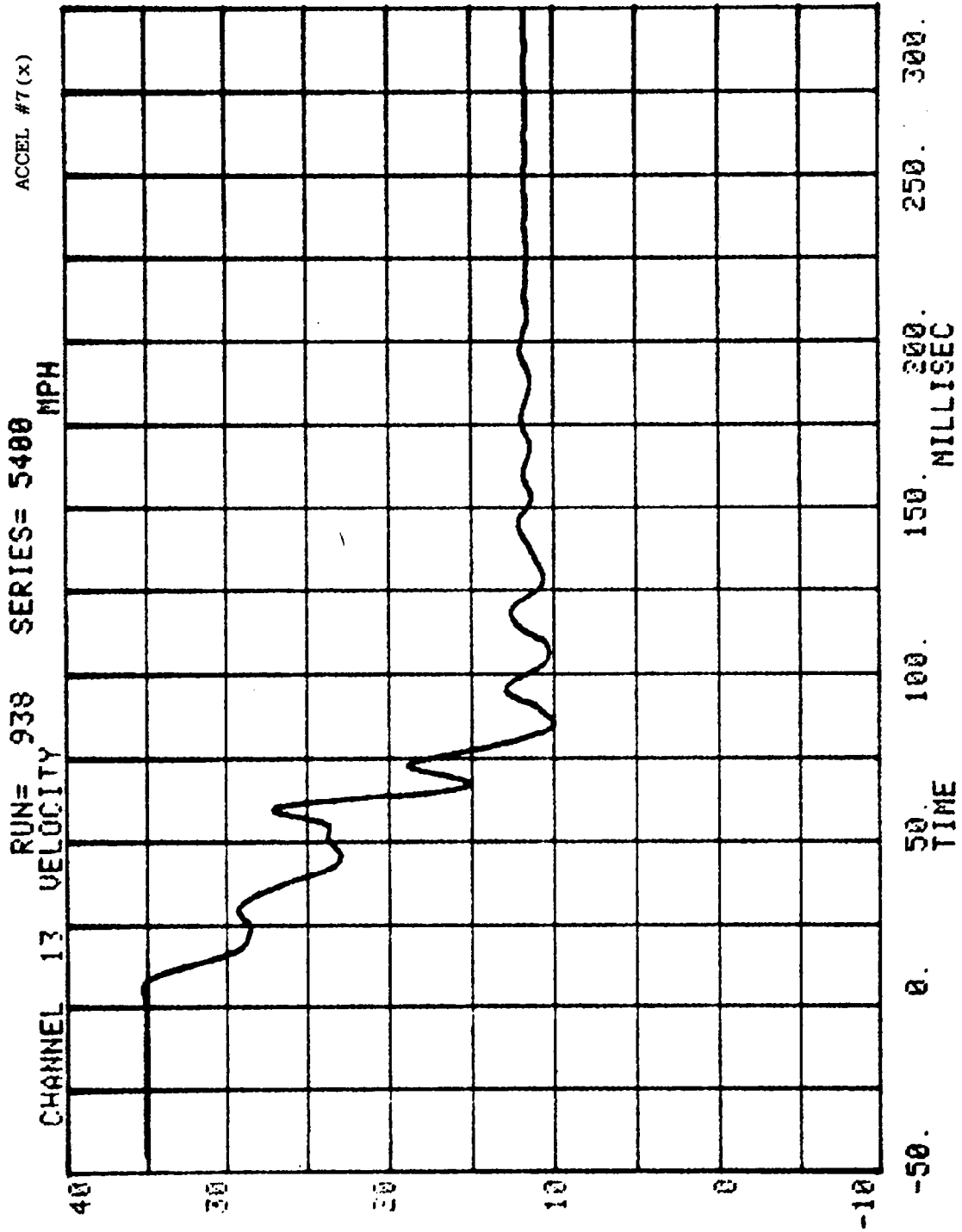
CHANNEL 11 VELOCITY
RUN= 938 SERIES= 5400 MPH
ACCEL #6(x)





CHANNEL 33 ACC PACK #7(X) RUN= 938 SERIES= 5400 G'S





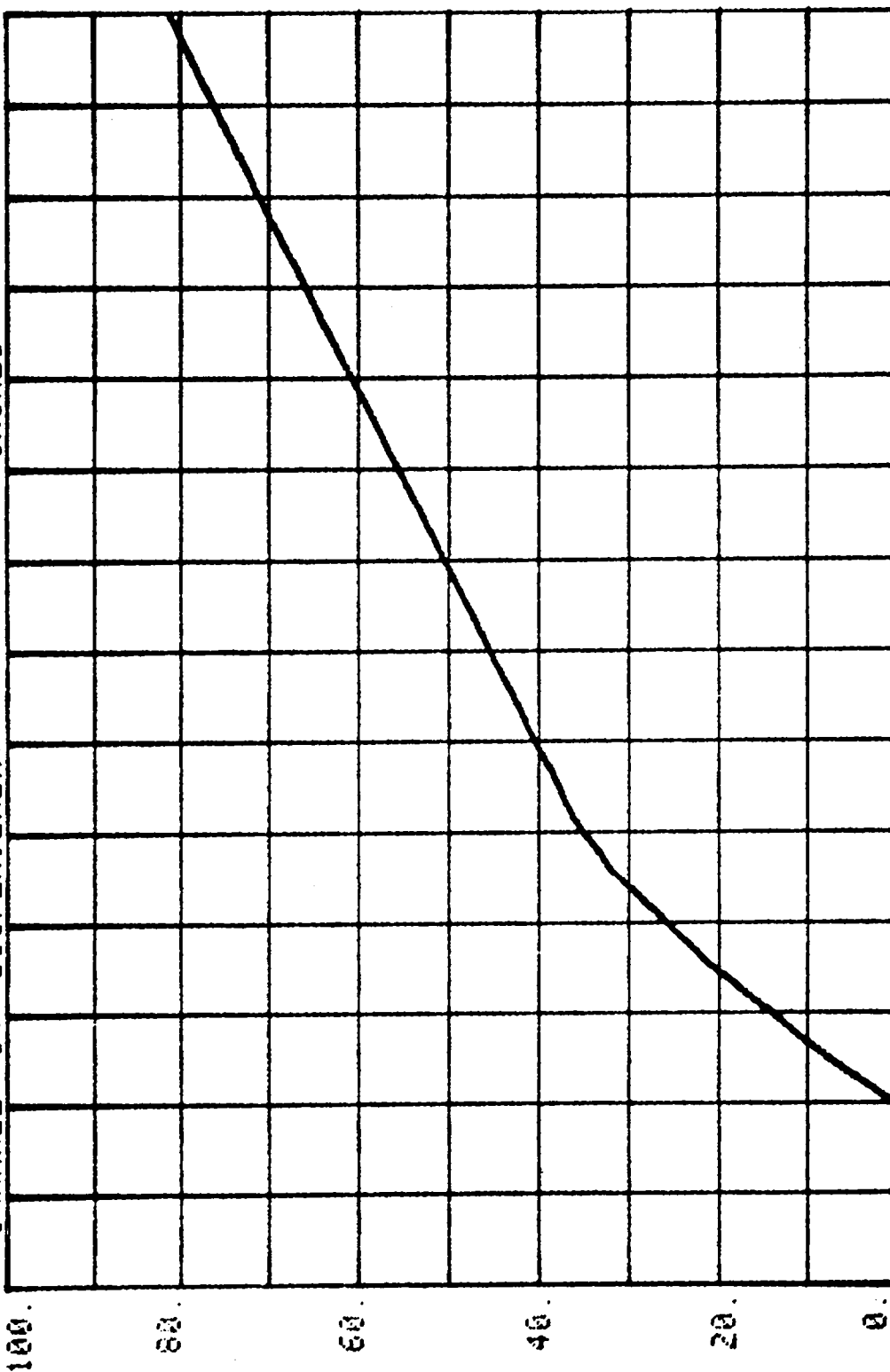
ACCEL #7 (x)

INCHES

SERIES= 5400

RUN= 938

CHANNEL 14 DISPLACEMENT



300.

250.

200.

150.

100.

50.

0.

-50.

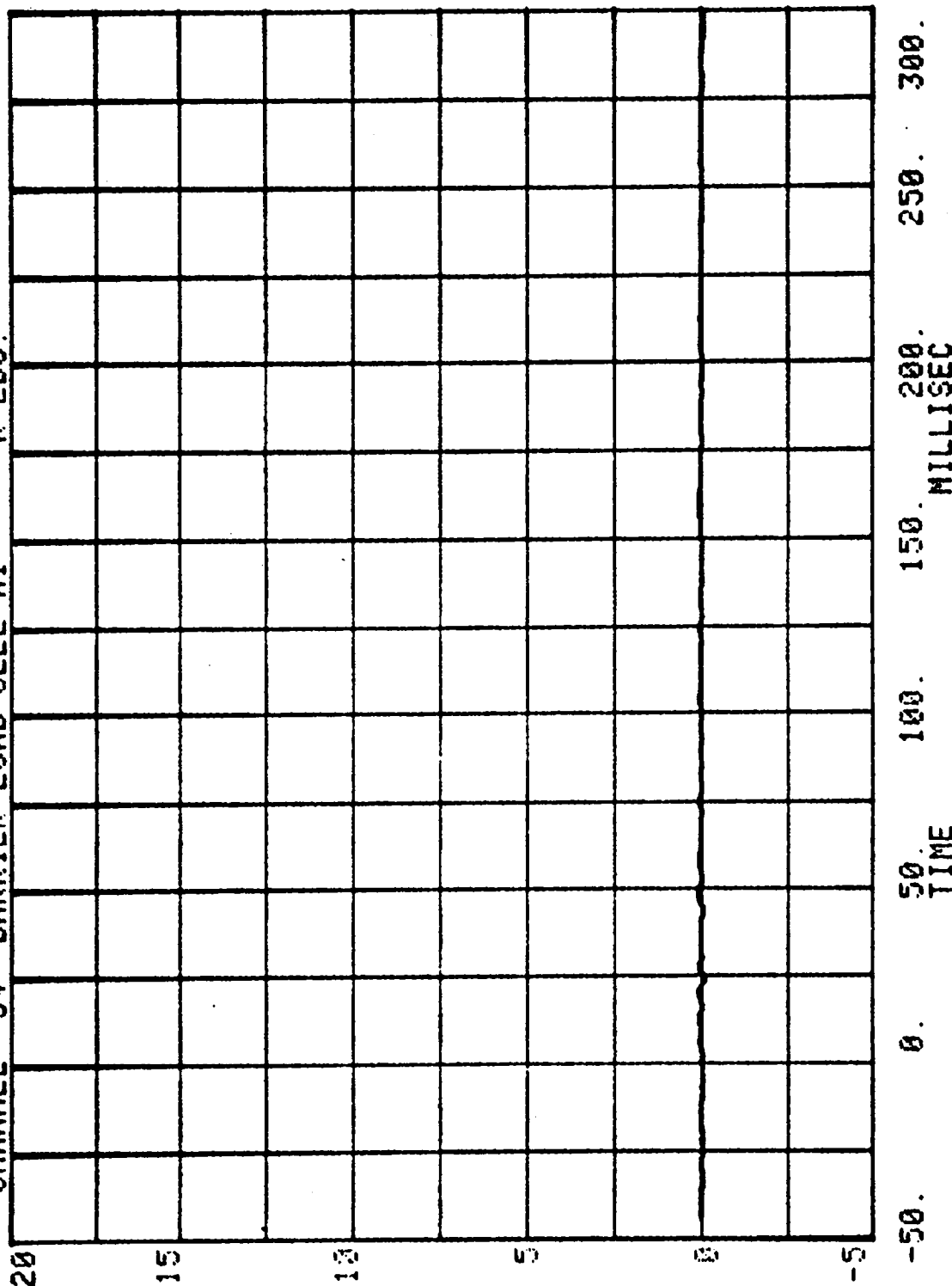
TEST NO. ML5400

LOAD CELL BARRIER DATA

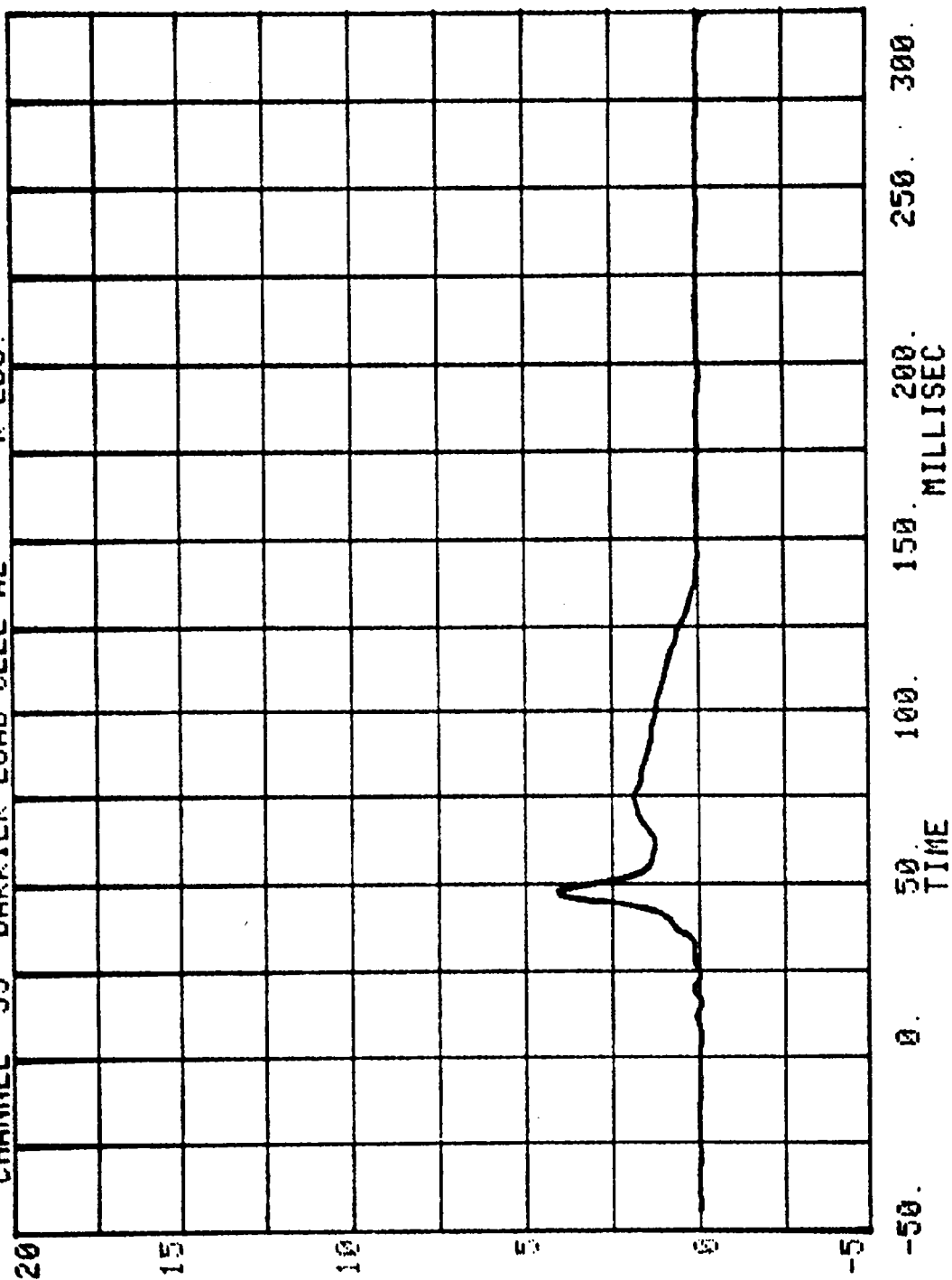
FILTER CHANNEL CLASS

60

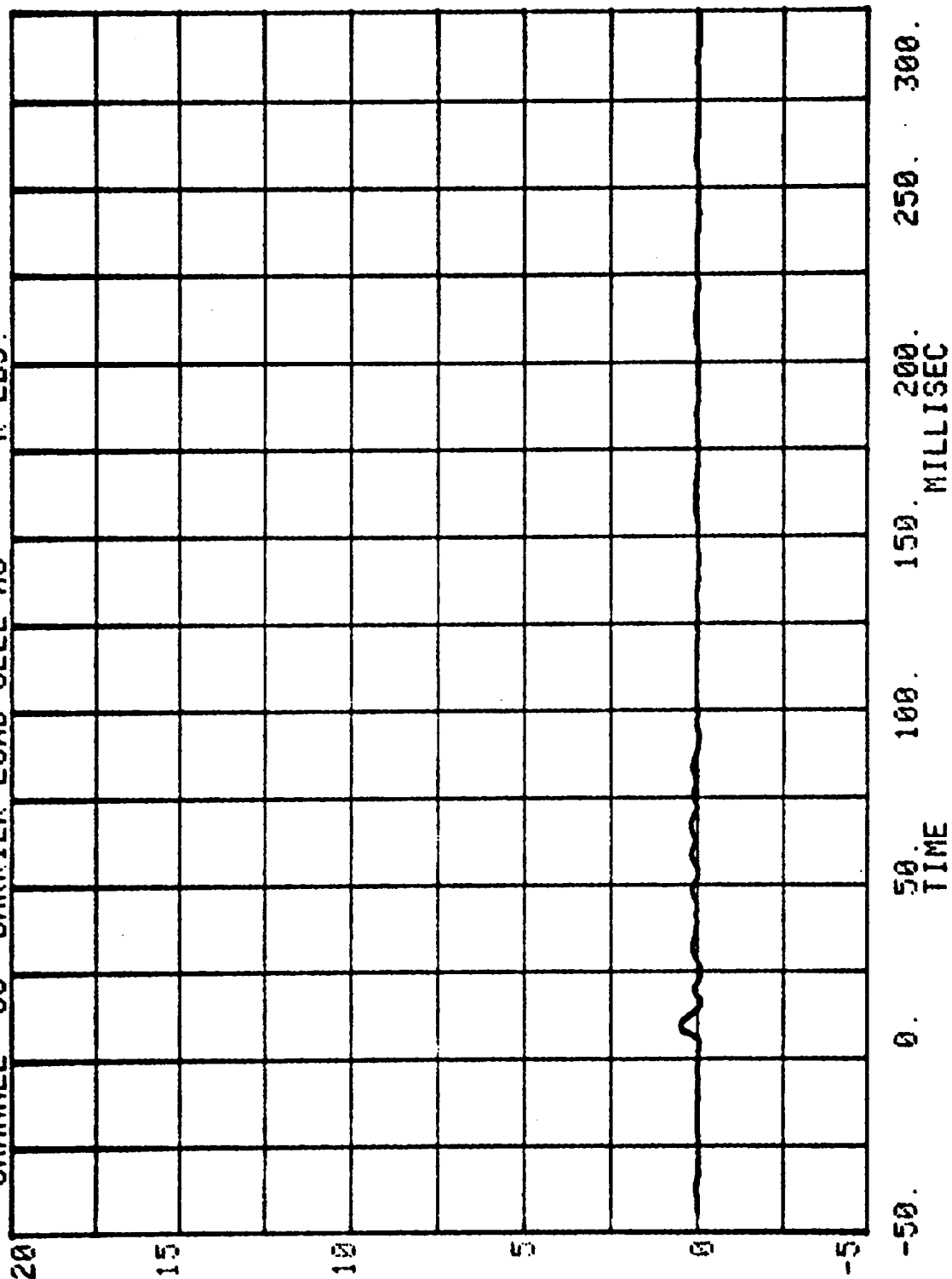
CHANNEL 34 BARRIER LOAD CELL A1 RUN= 938 SERIES= 5400 K LBS.



CHANNEL 35 BARRIER LOAD CELL A2 RUN= 938 SERIES= 5400 K LBS.

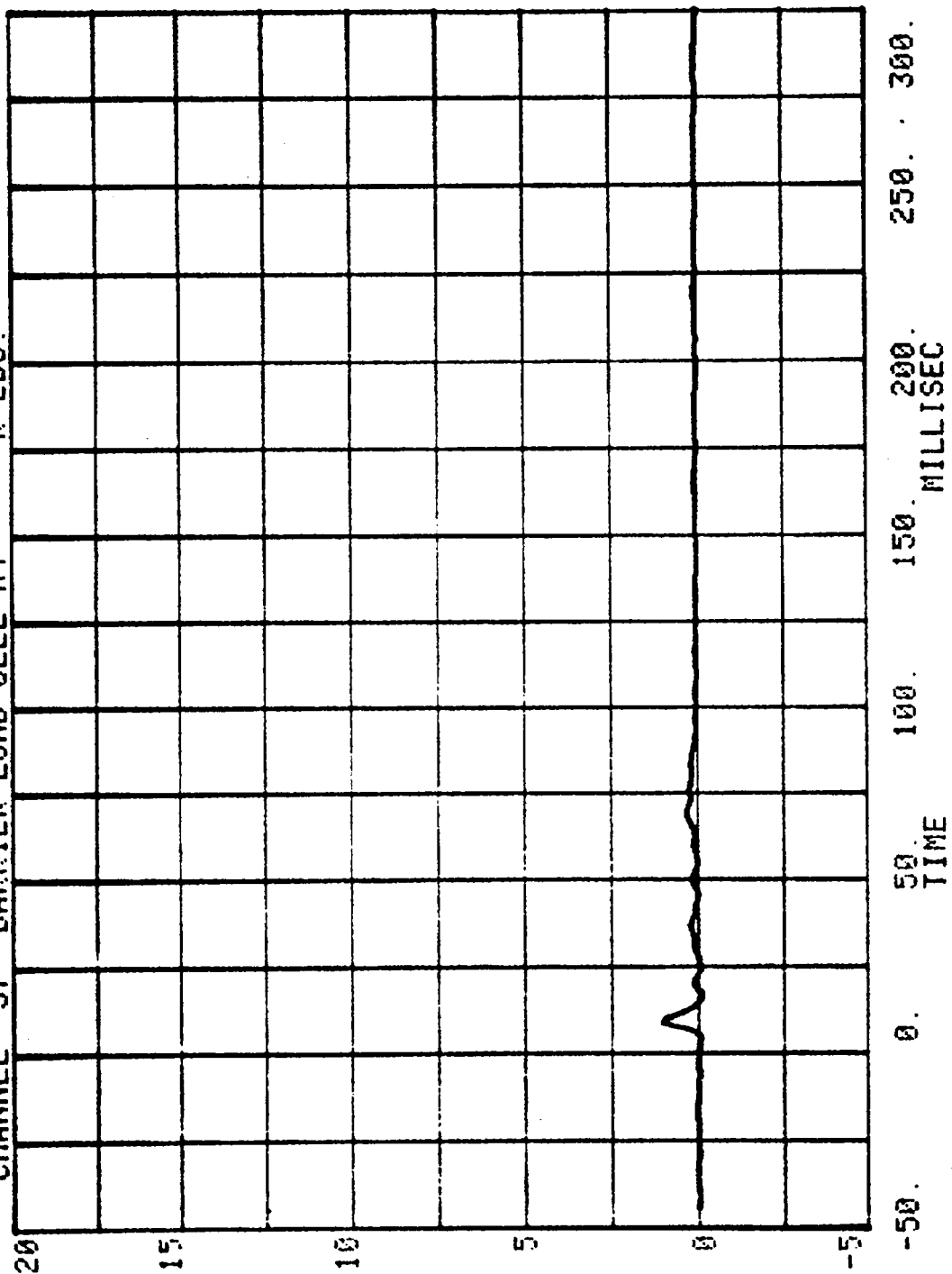


RUN= 938 SERIES= 5400
CHANNEL 36 BARRIER LOAD CELL A3 K LBS.

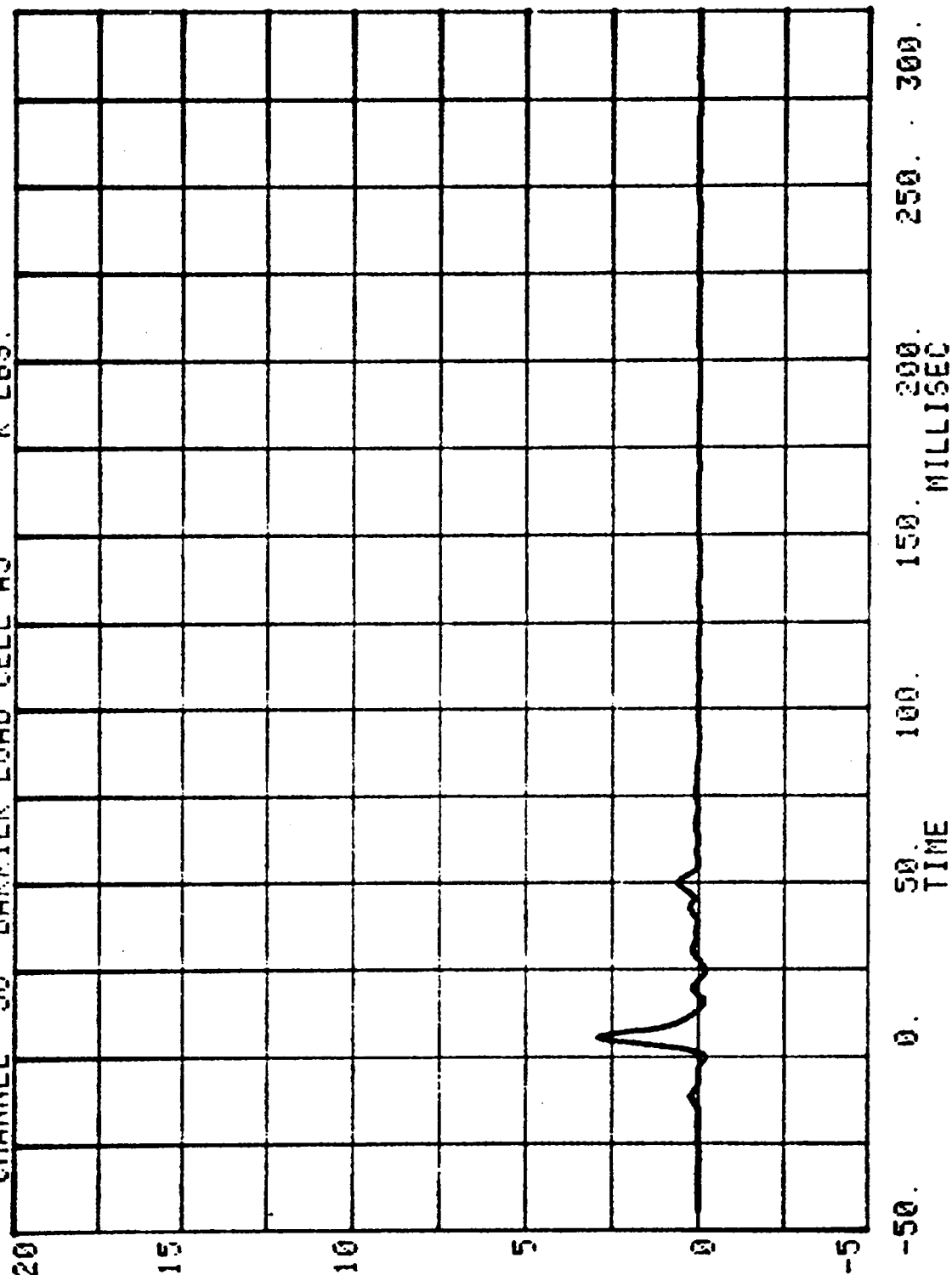


CHANNEL 37 BARRIER LOAD CELL A4 K LBS.

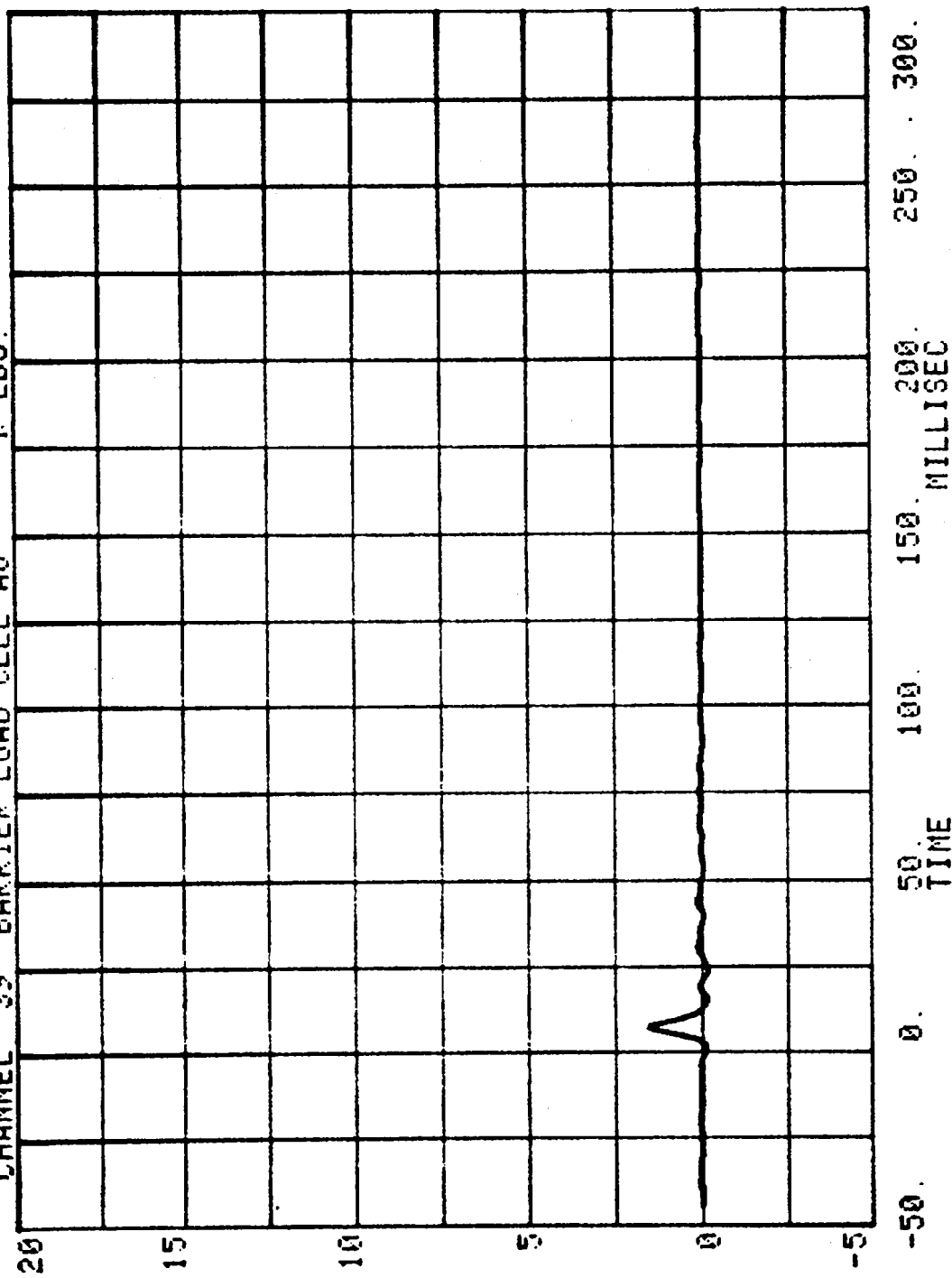
RUN= 938 SERIES= 5400



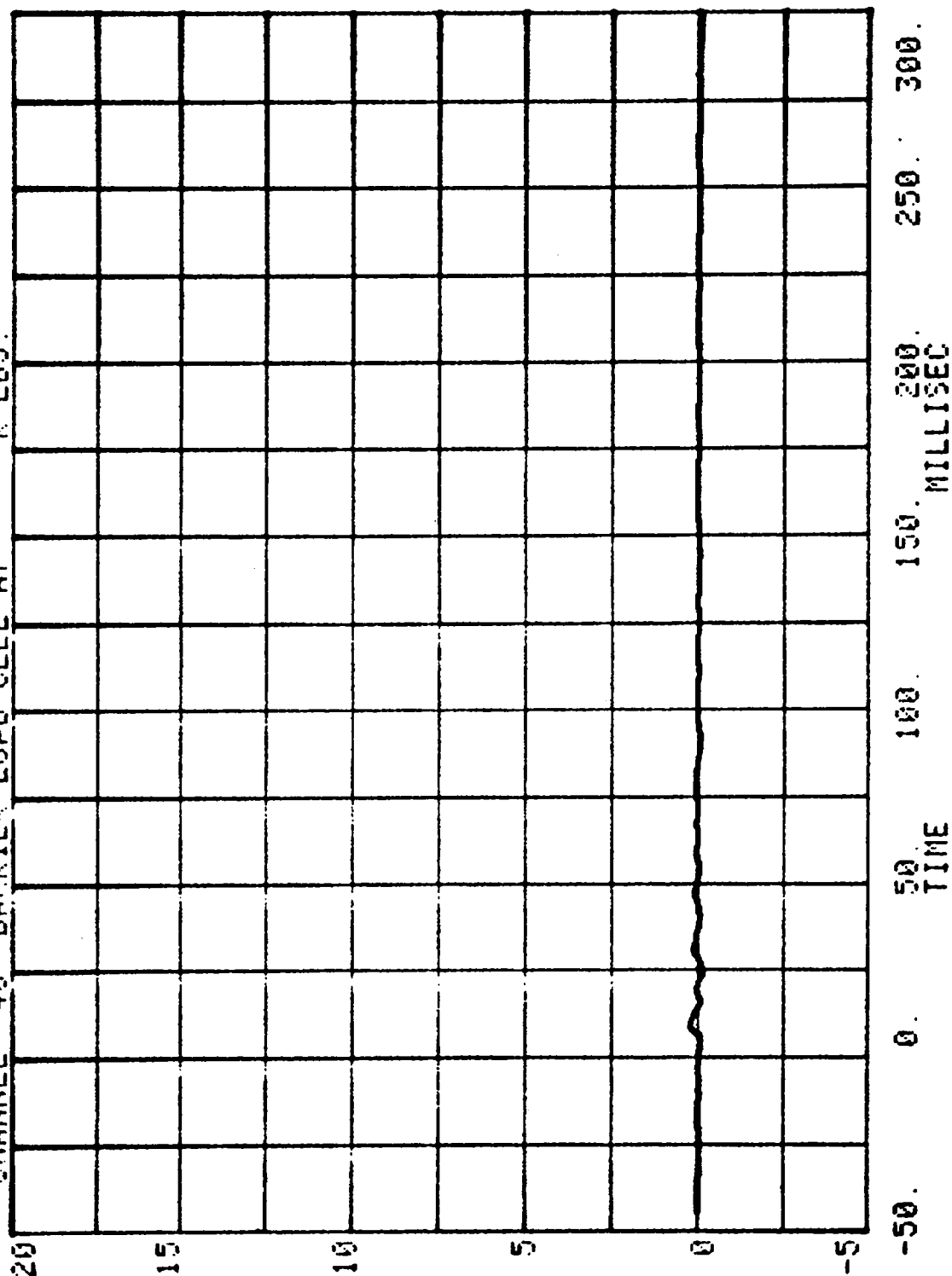
CHANNEL 38 BARRIER LOAD CELL A5 RUN= 938 SERIES= 5400 K LBS.



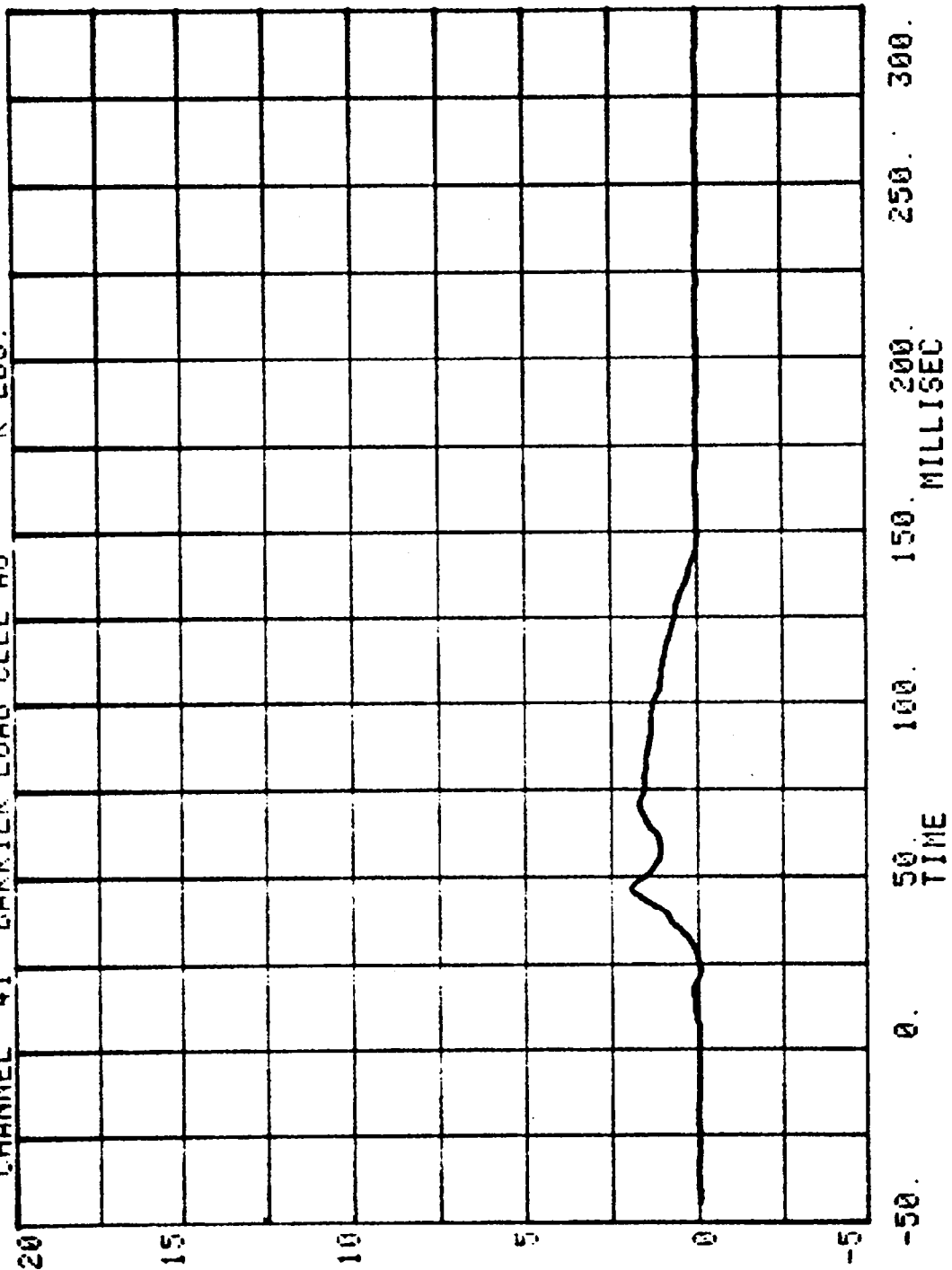
CHANNEL 39 BARRIER LOAD CELL A6 K LBS.
RUN= 938 SERIES= 5400



CHANNEL 40 BARRIER LOAD CELL A7 RUN= 938 SERIES= 5400 K LBS.

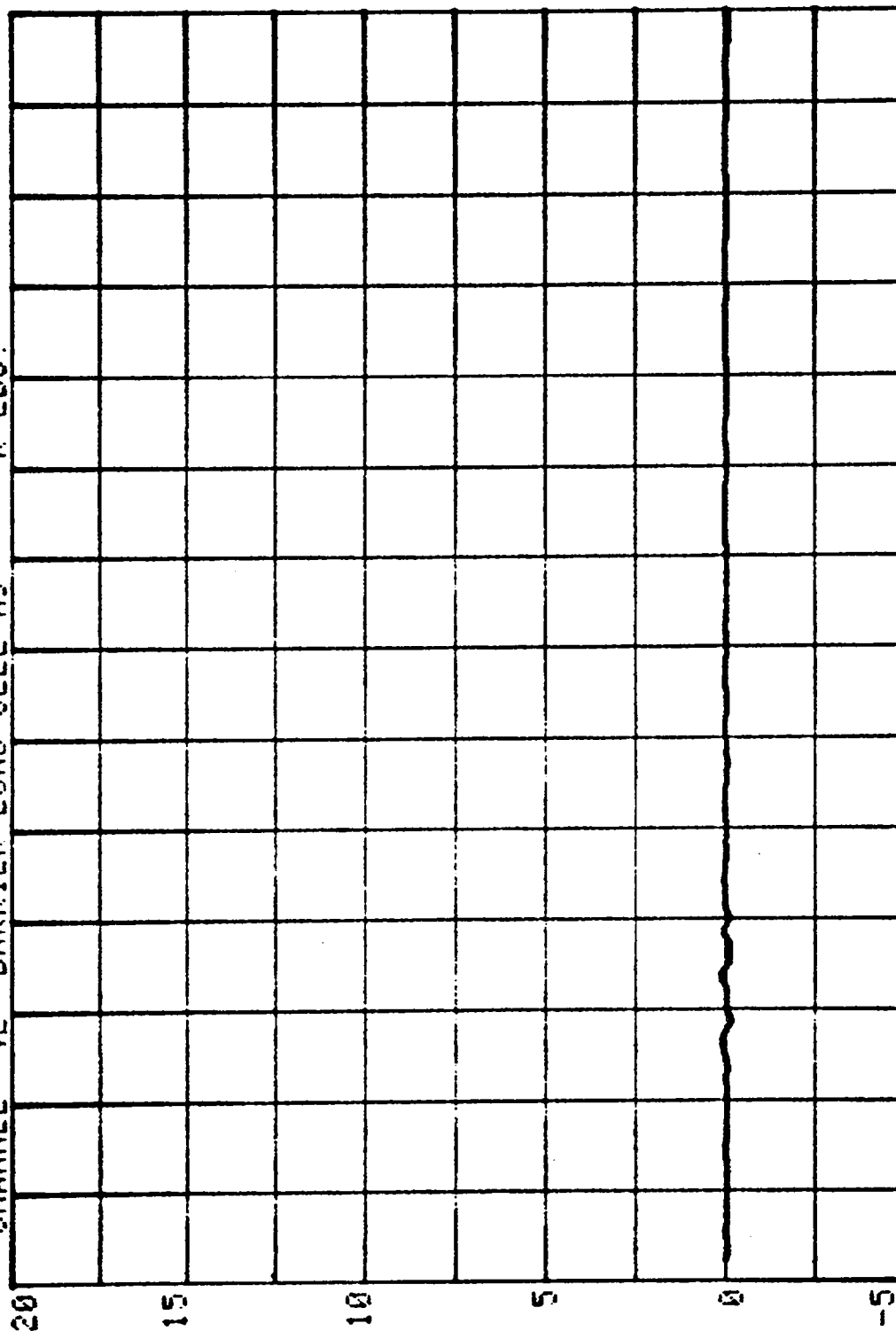


CHANNEL 41 BARRIER LOAD CELL A8
RUN= 938 SERIES= 5400 K LBS.

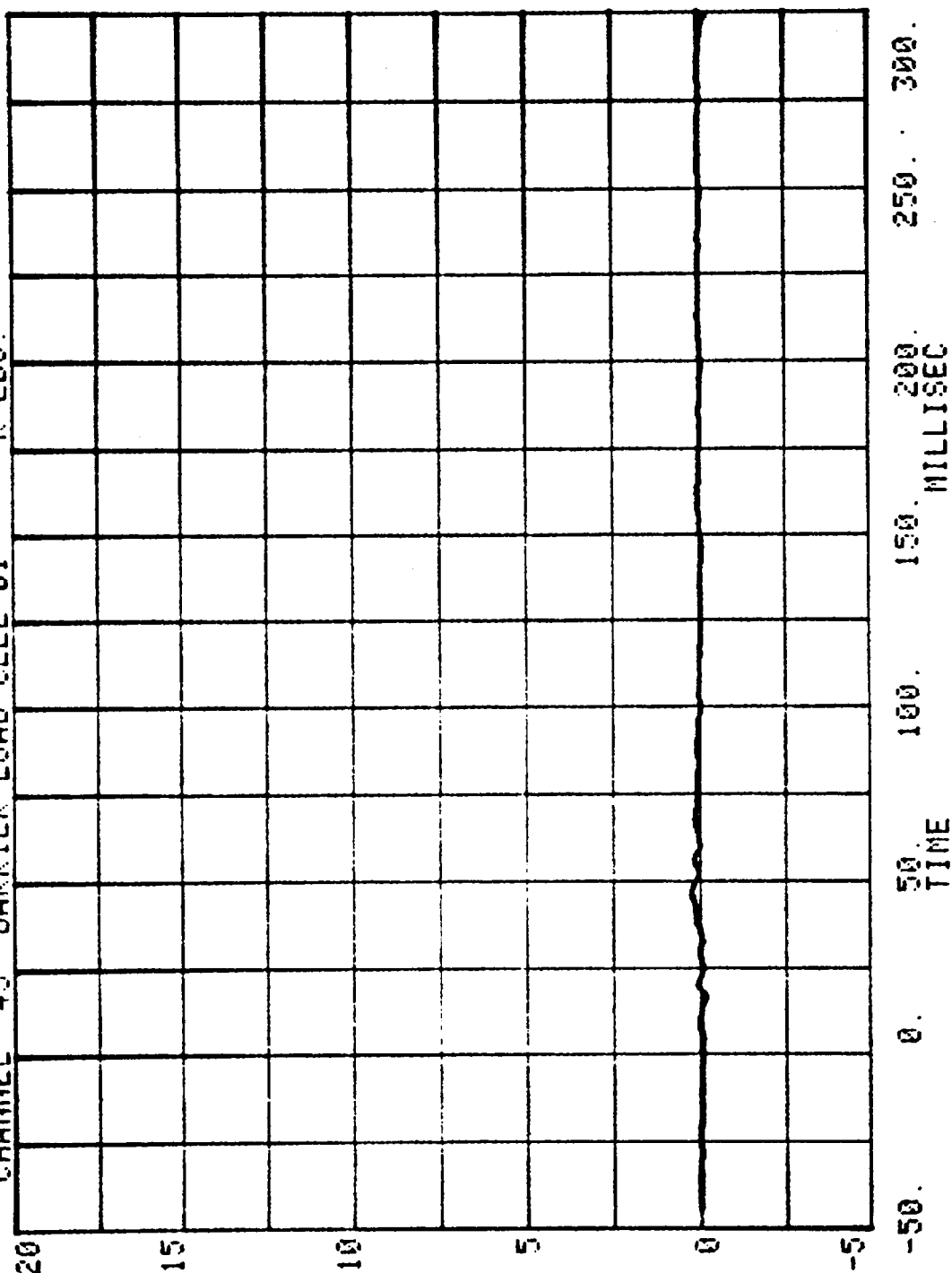


CHANNEL 42 BARRIER LOAD CELL #2 K LBS.

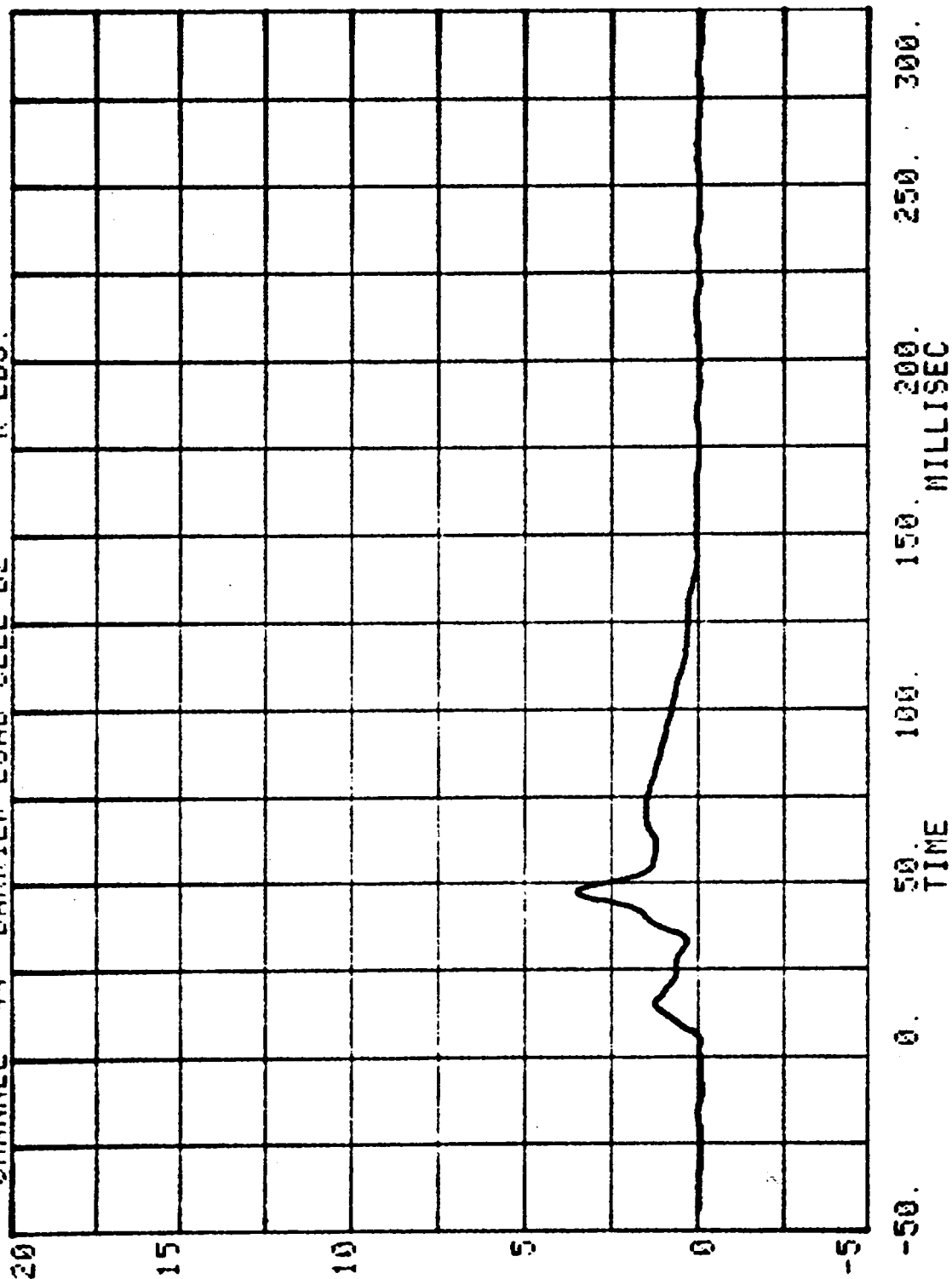
RUN= 938 SERIES= 5400



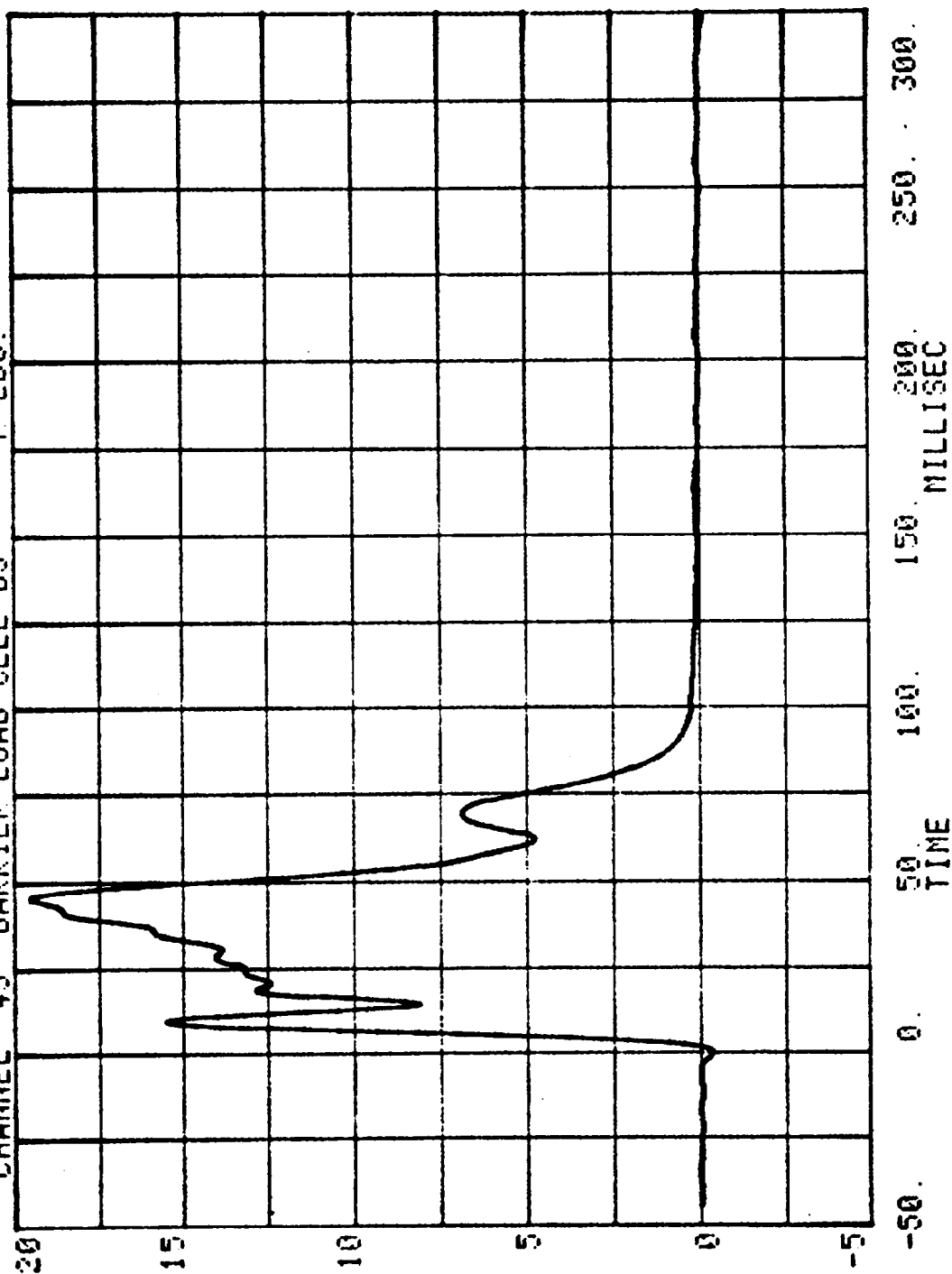
CHANNEL 43 BARRIER LOAD CELL B1
RUN= 938 SERIES= 5400 K LBS.



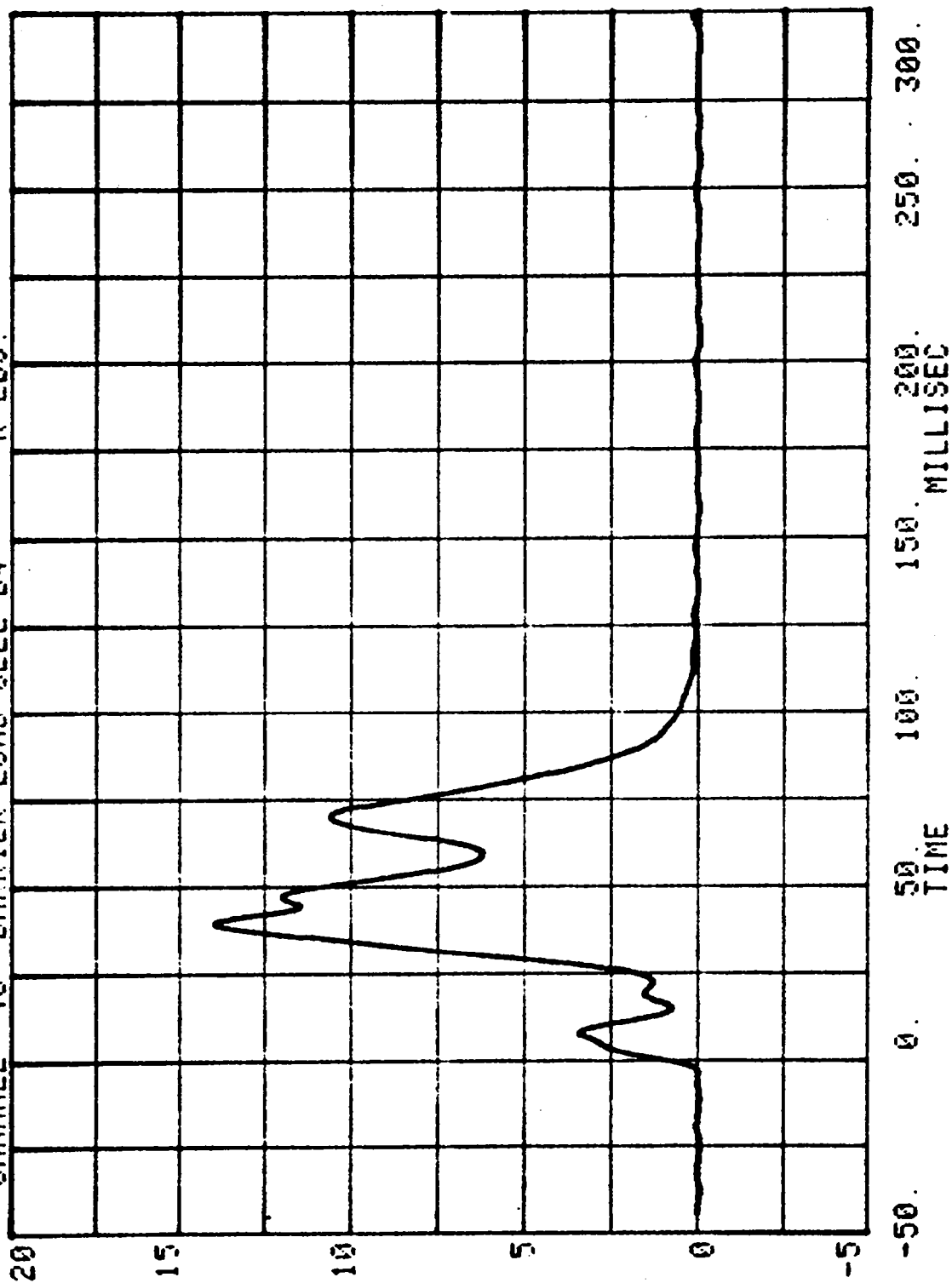
CHANNEL 44 BARRIER LOAD CELL B2 RUN= 938 SERIES= 5400 K LBS.



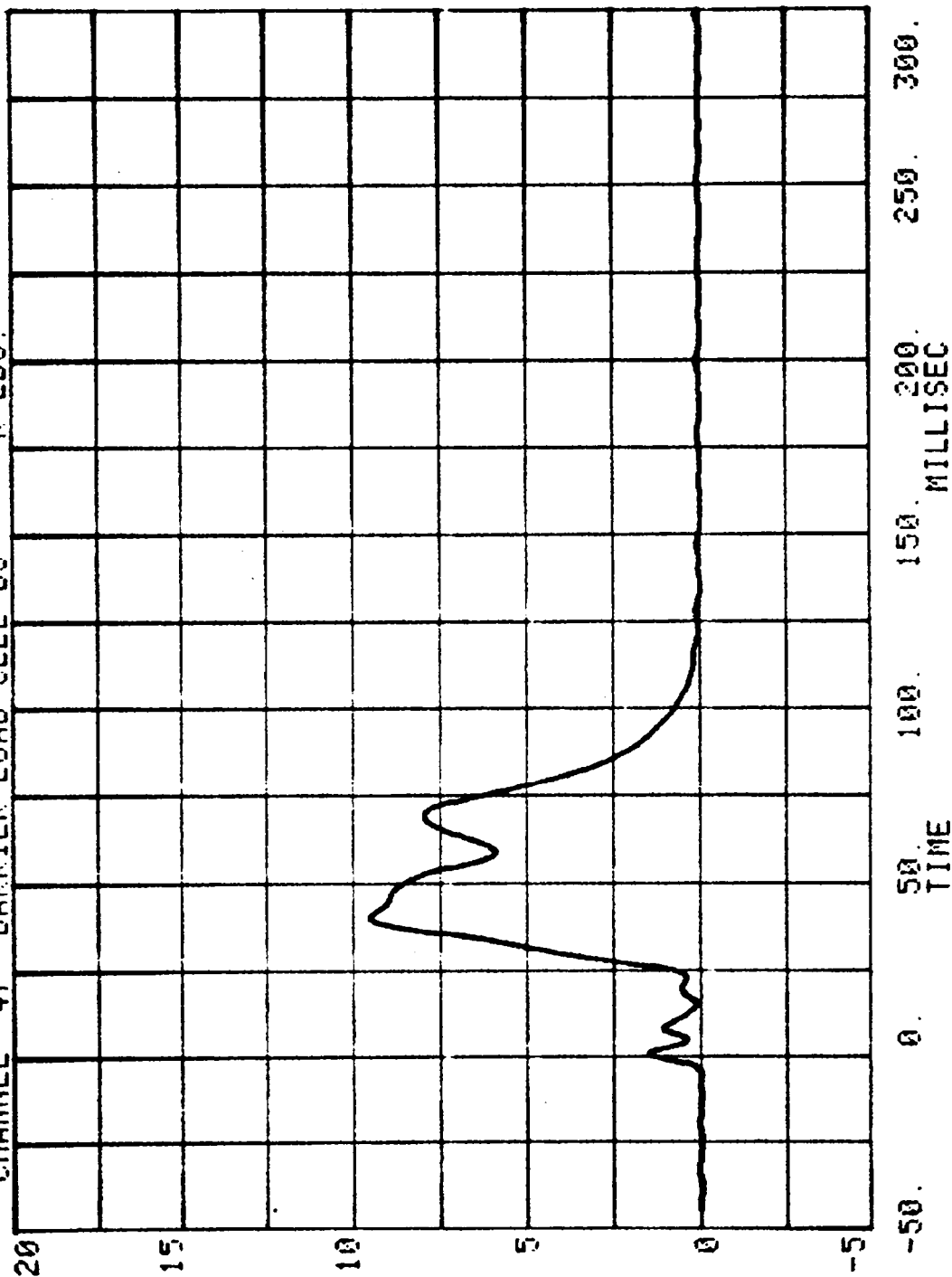
CHANNEL 45 BARRIER LOAD CELL B3
RUN= 938 SERIES= 5400 K LBS.



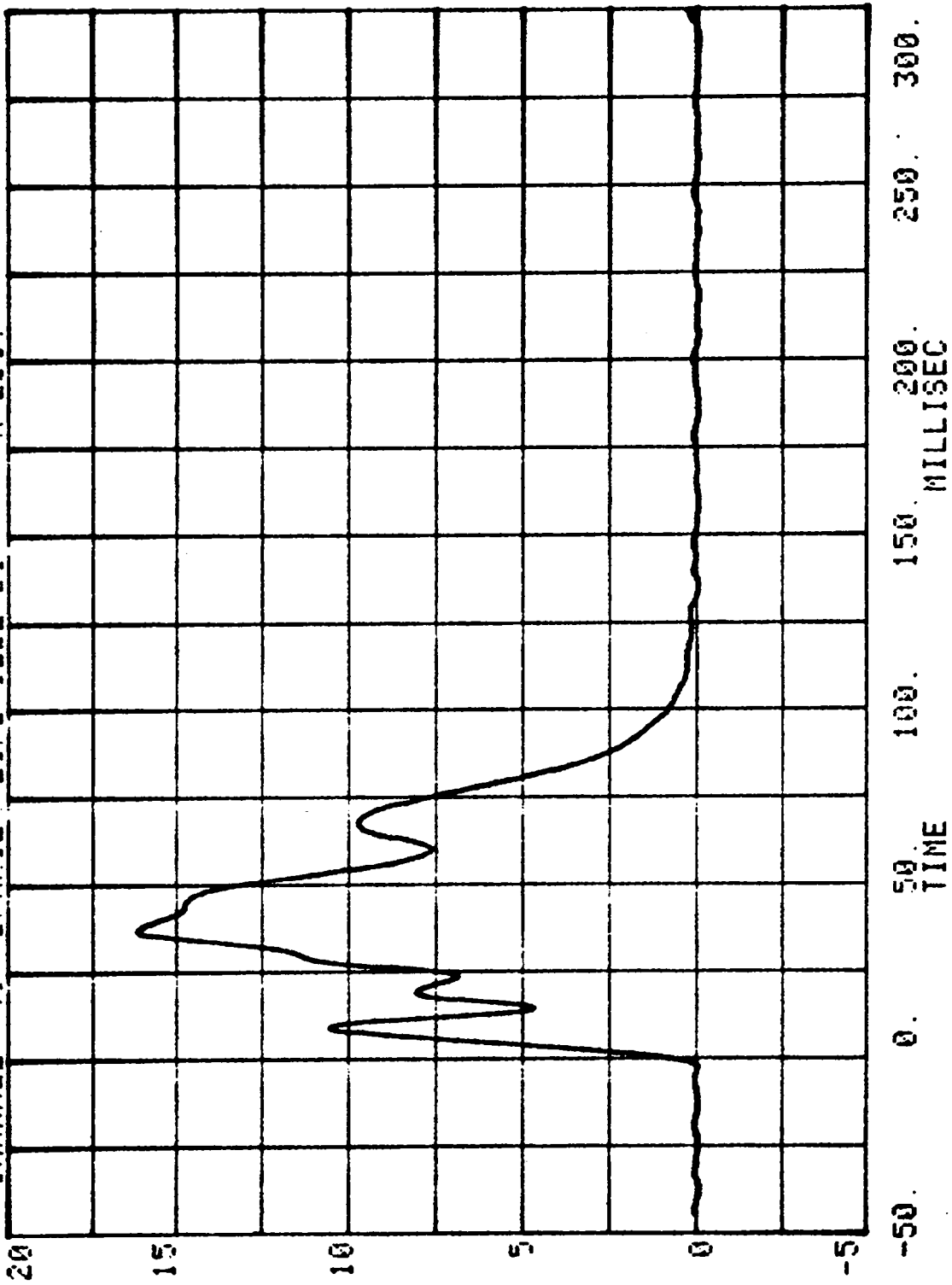
CHANNEL 46 BARRIER LOAD CELL B4 RUN= 938 SERIES= 5400 K LBS.



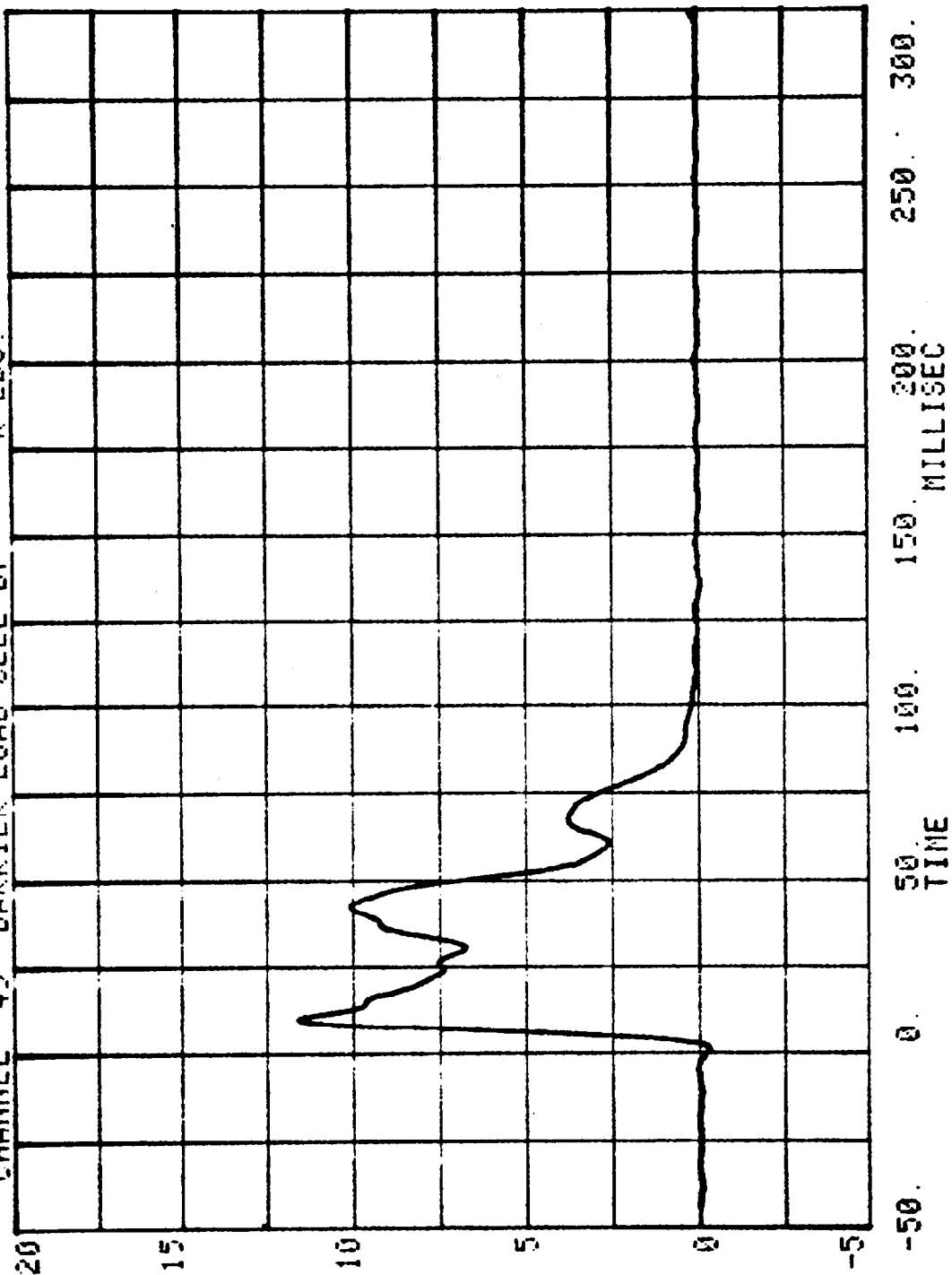
CHANNEL 47 BARRIER LOAD CELL B5
RUN# 938 SERIES= 5400 K LBS.



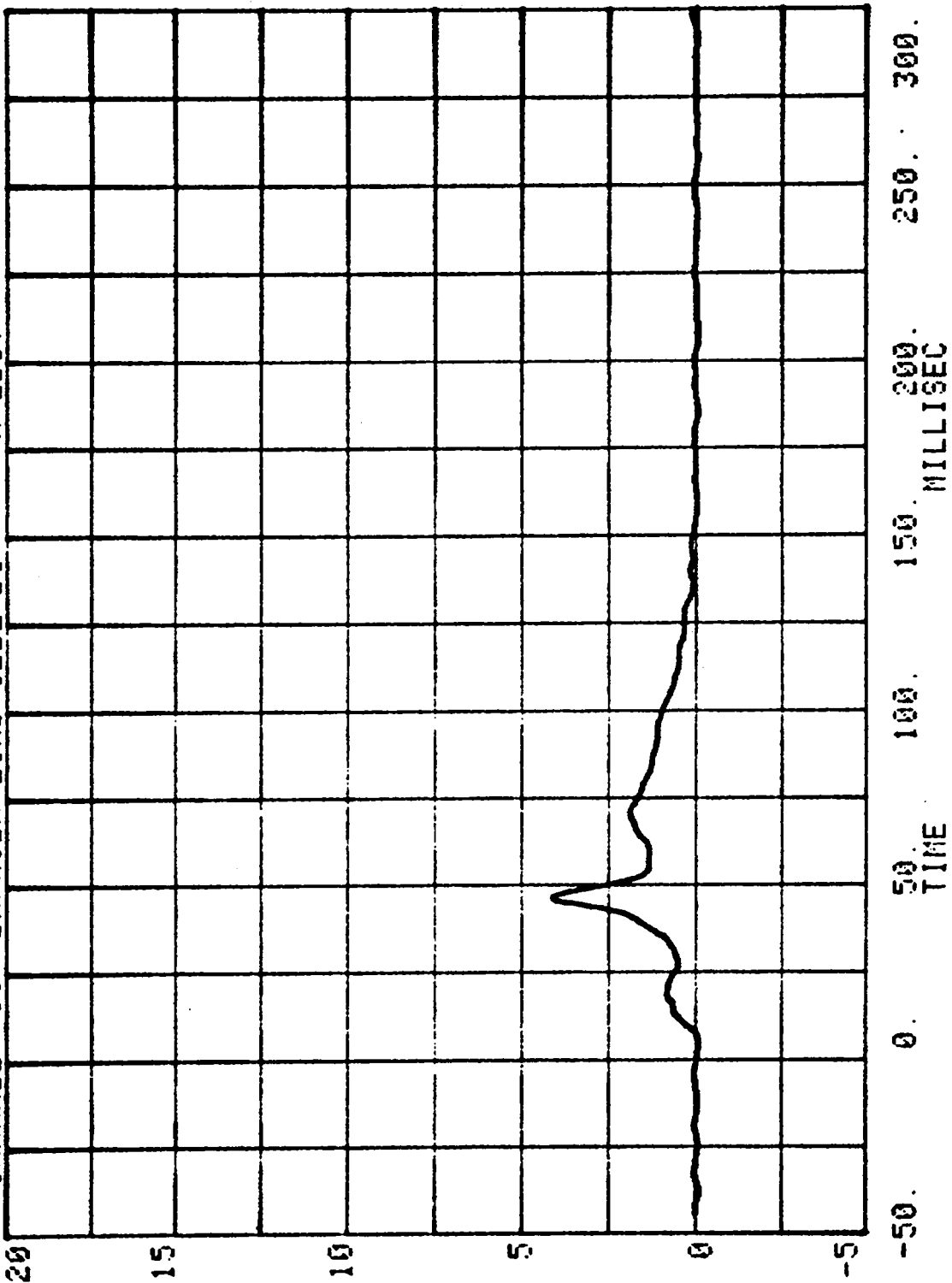
CHANNEL 48 BARRIER LOAD CELL B6 RUN= 938 SERIES= 5400 K LBS.



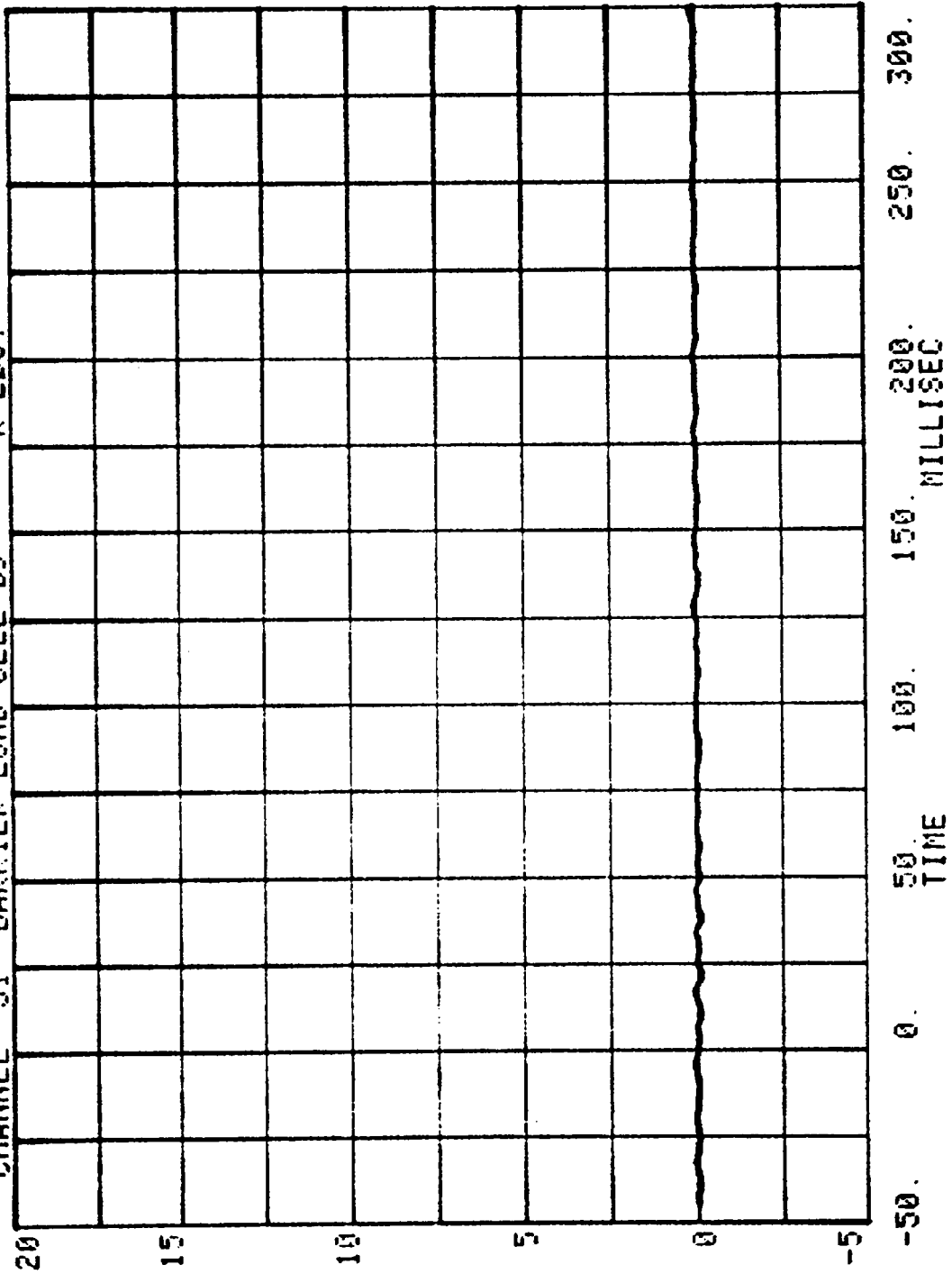
RUN= 938 SERIES= 5400
CHANNEL 49 BARRIER LOAD CELL B7 K LBS.



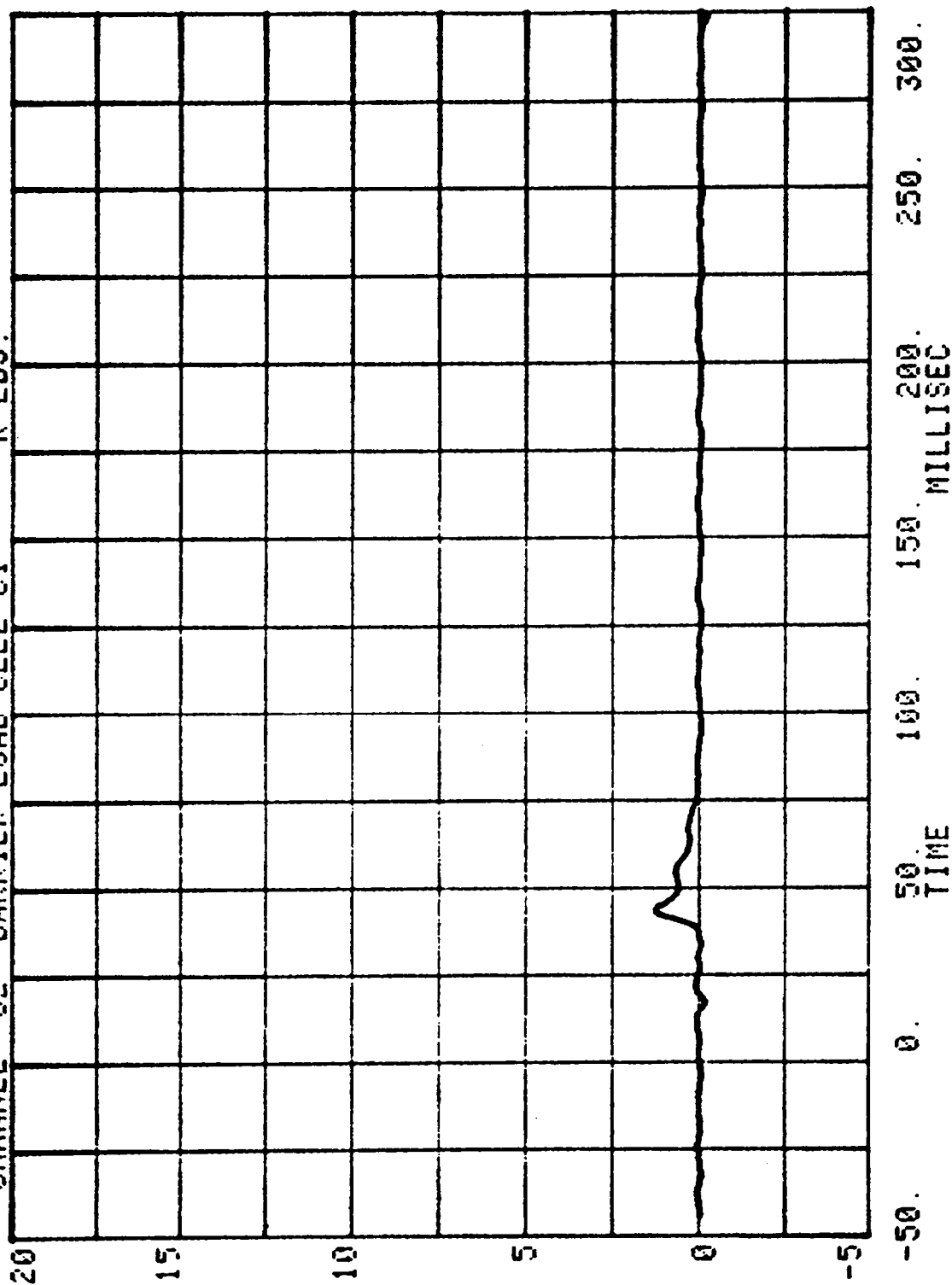
CHANNEL 50 BARRIER LOAD CELL B8 RUN= 938 SERIES= 5400 K LBS.



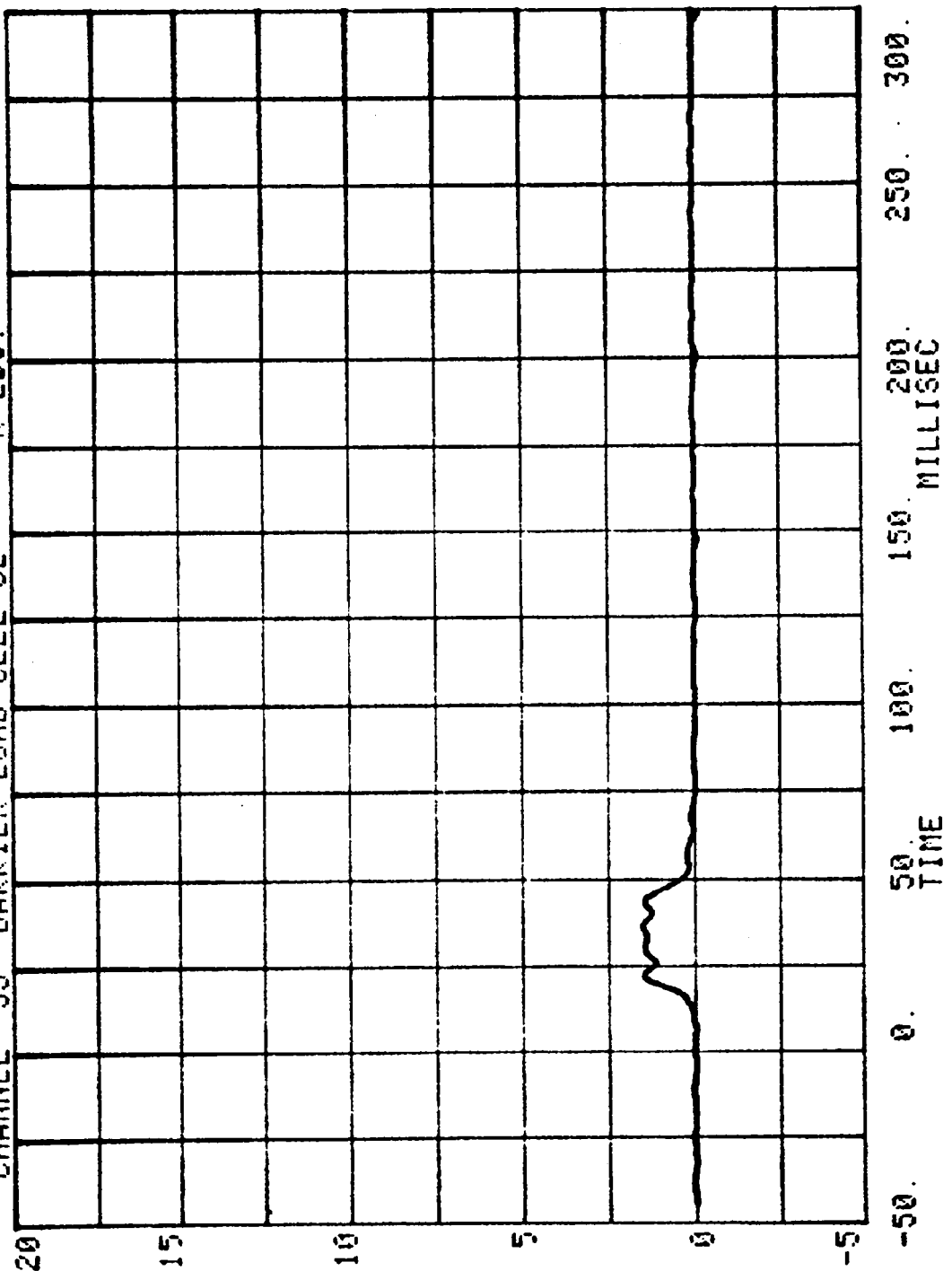
CHANNEL 51 BARRIER LOAD CELL B9 RUN= 938 SERIES= 5400 K LBS.



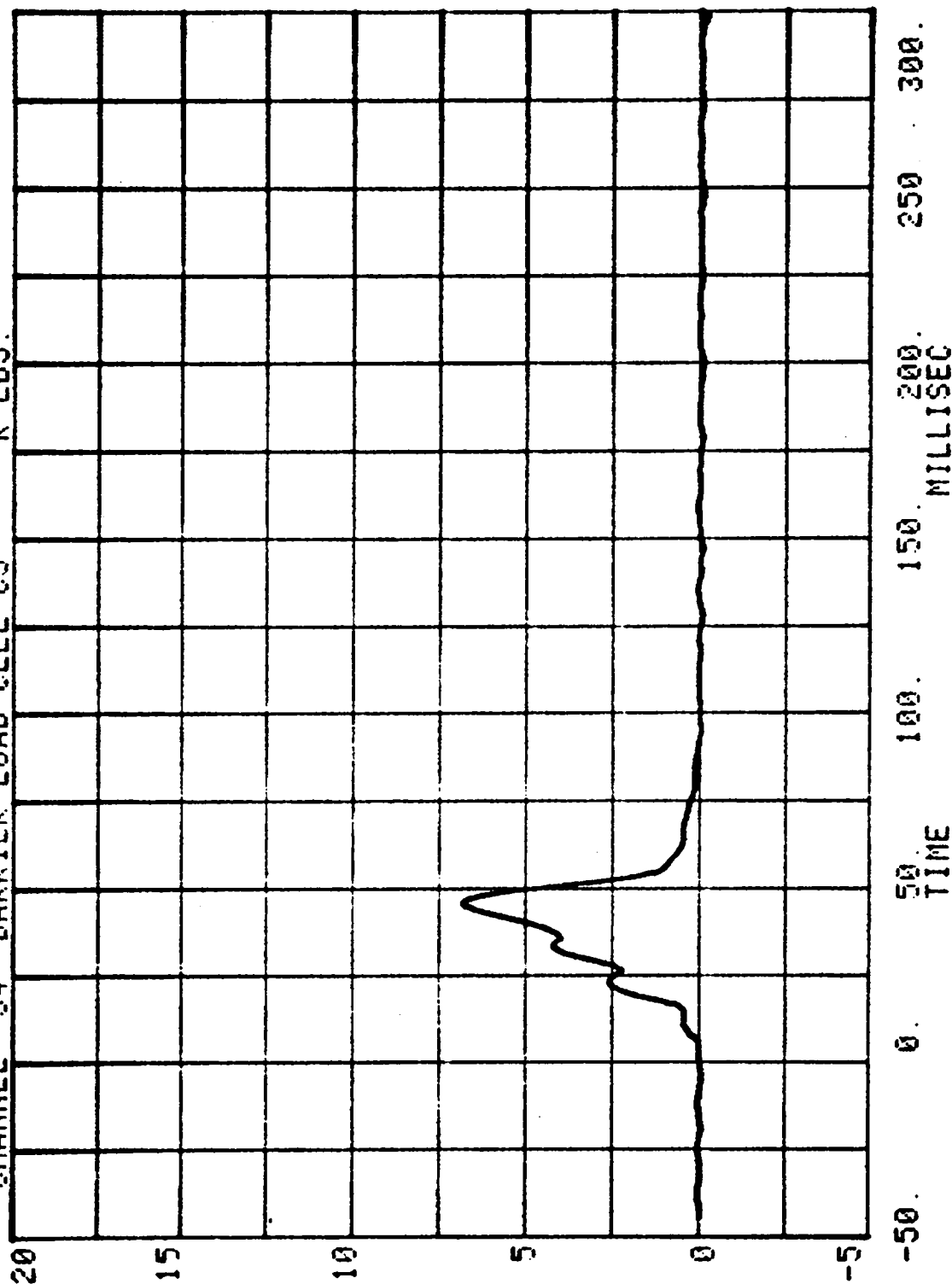
RUN= 938 SERIES= 5400 K LBS.
CHANNEL 52 BARRIER LOAD CELL C1



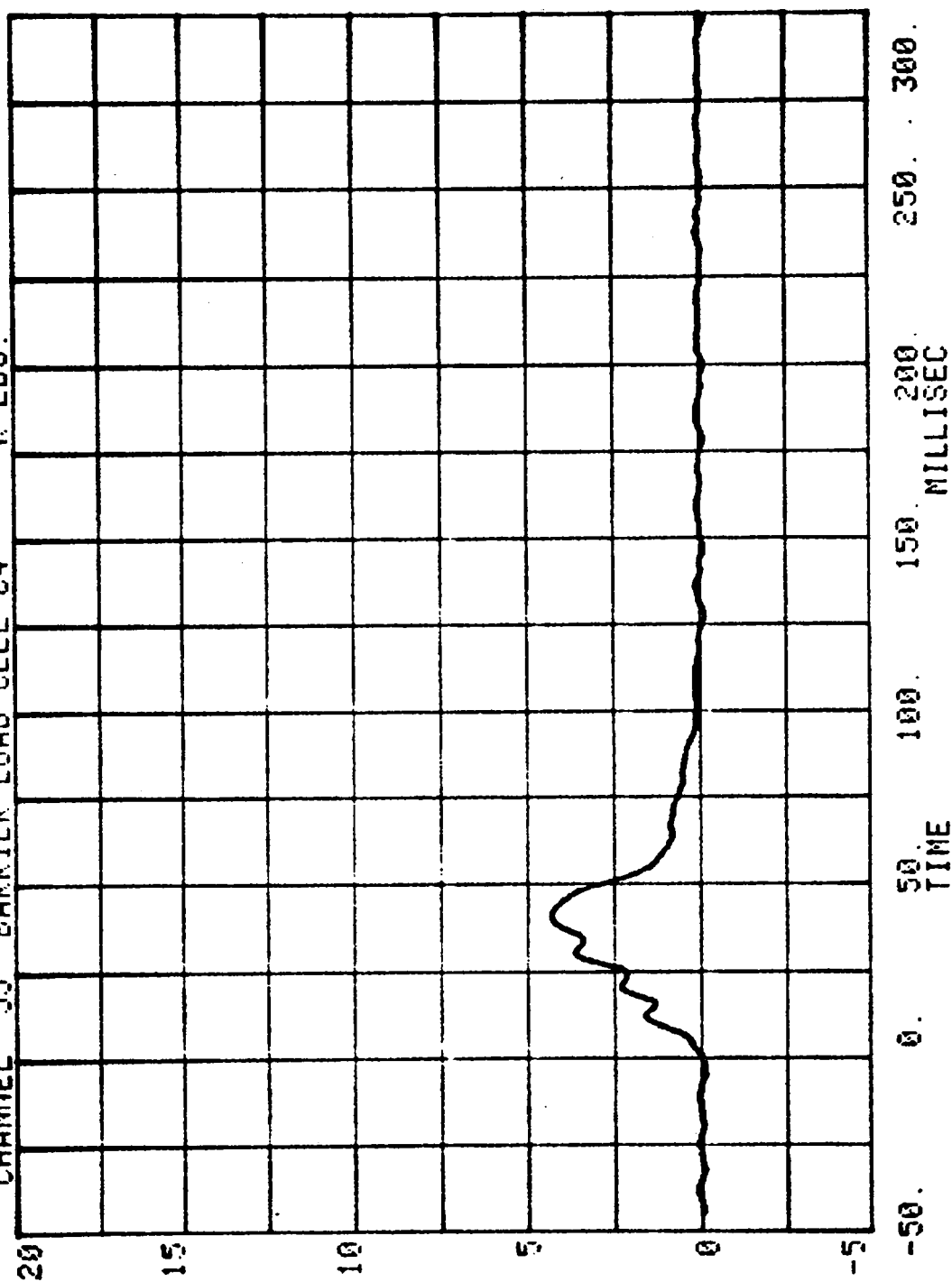
RUN= 938 SERIES= 5400
CHANNEL 53 BARRIER LOAD CELL C2 K LBS.



RUN= 938 SERIES= 5400
CHANNEL 54 BARRIER LOAD CELL C3 K LBS.

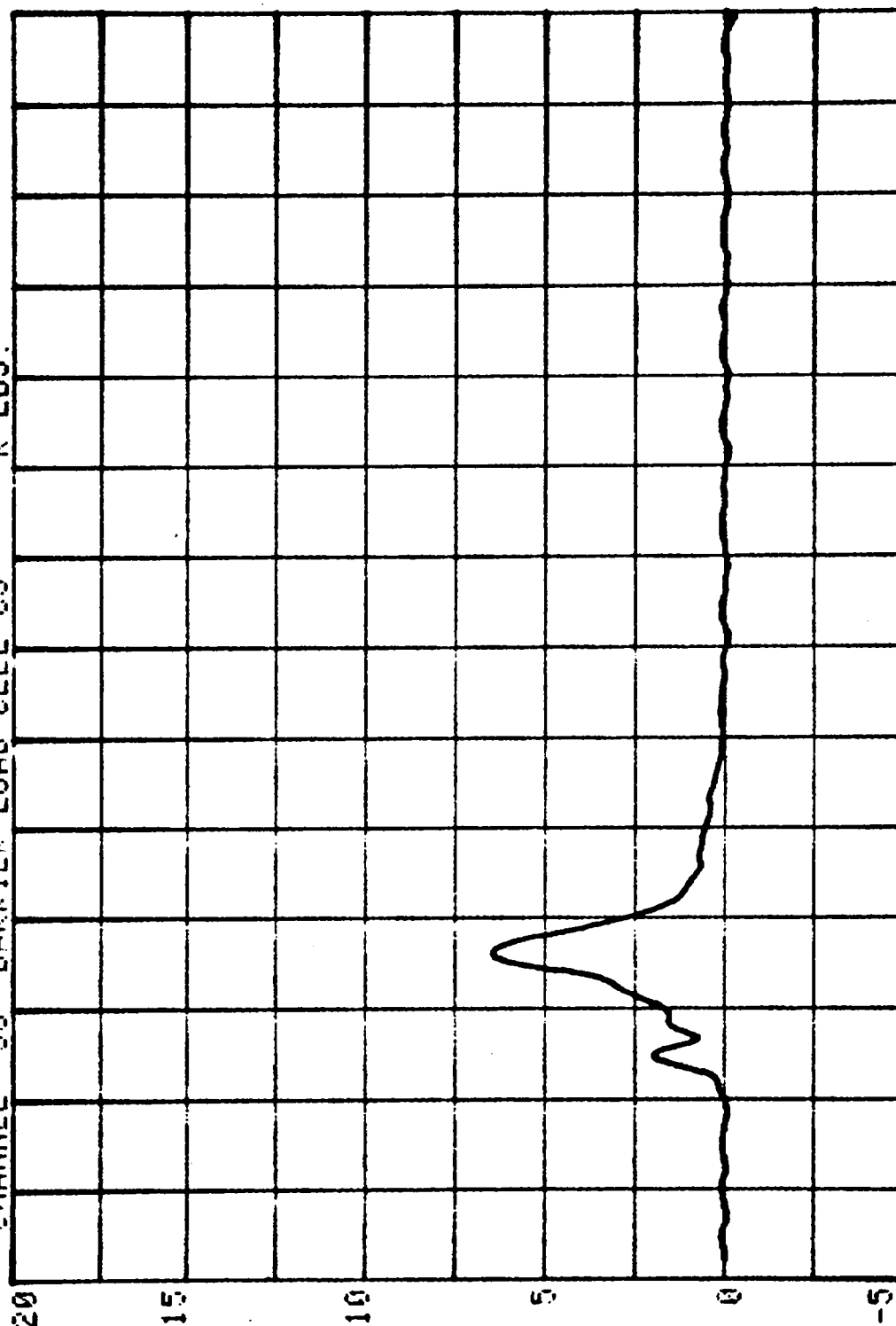


CHANNEL 55 BARRIER LOAD CELL C4
RUN= 938 SERIES= 5400 K LBS.



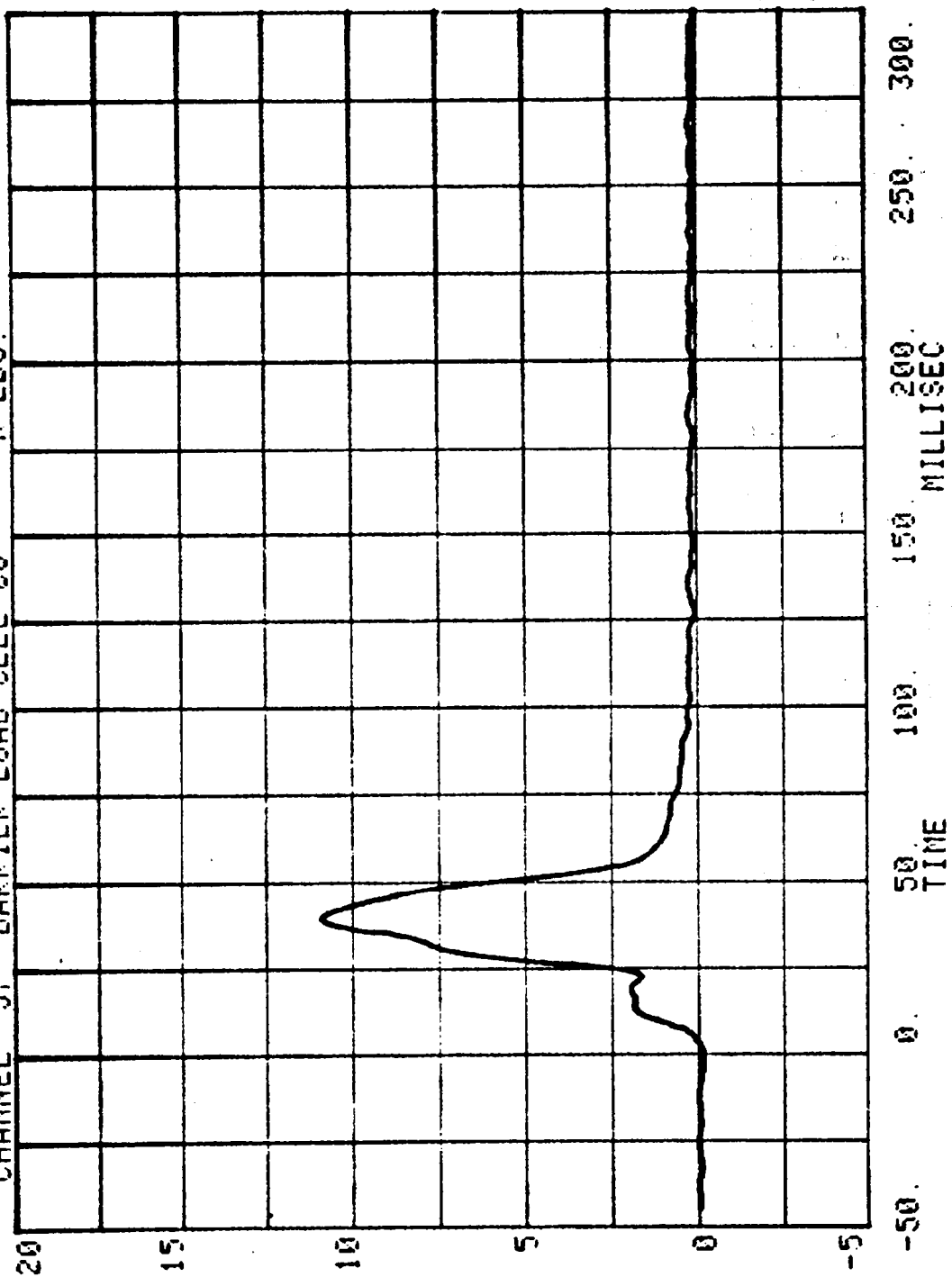
CHANNEL 56 BARRIER LOAD CELL C5 K LBS.

RUN= 938 SERIES= 5400

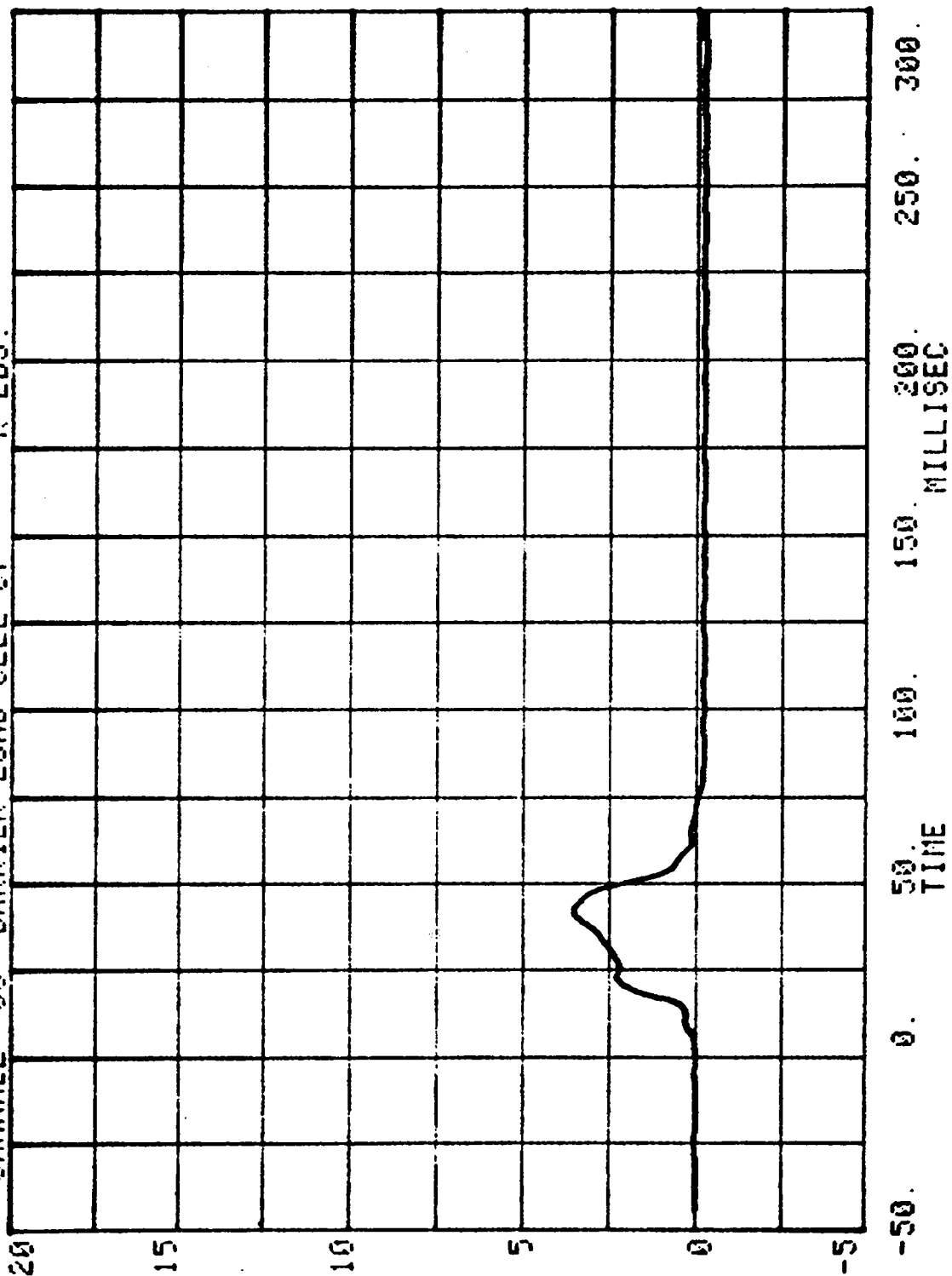


-50. 0. 50. 100. 150. 200. 250. 300.
TIME
MILLISEC

RUN= 938 SERIES= 5400
CHANNEL 57 BARRIER LOAD CELL C6 K LBS.

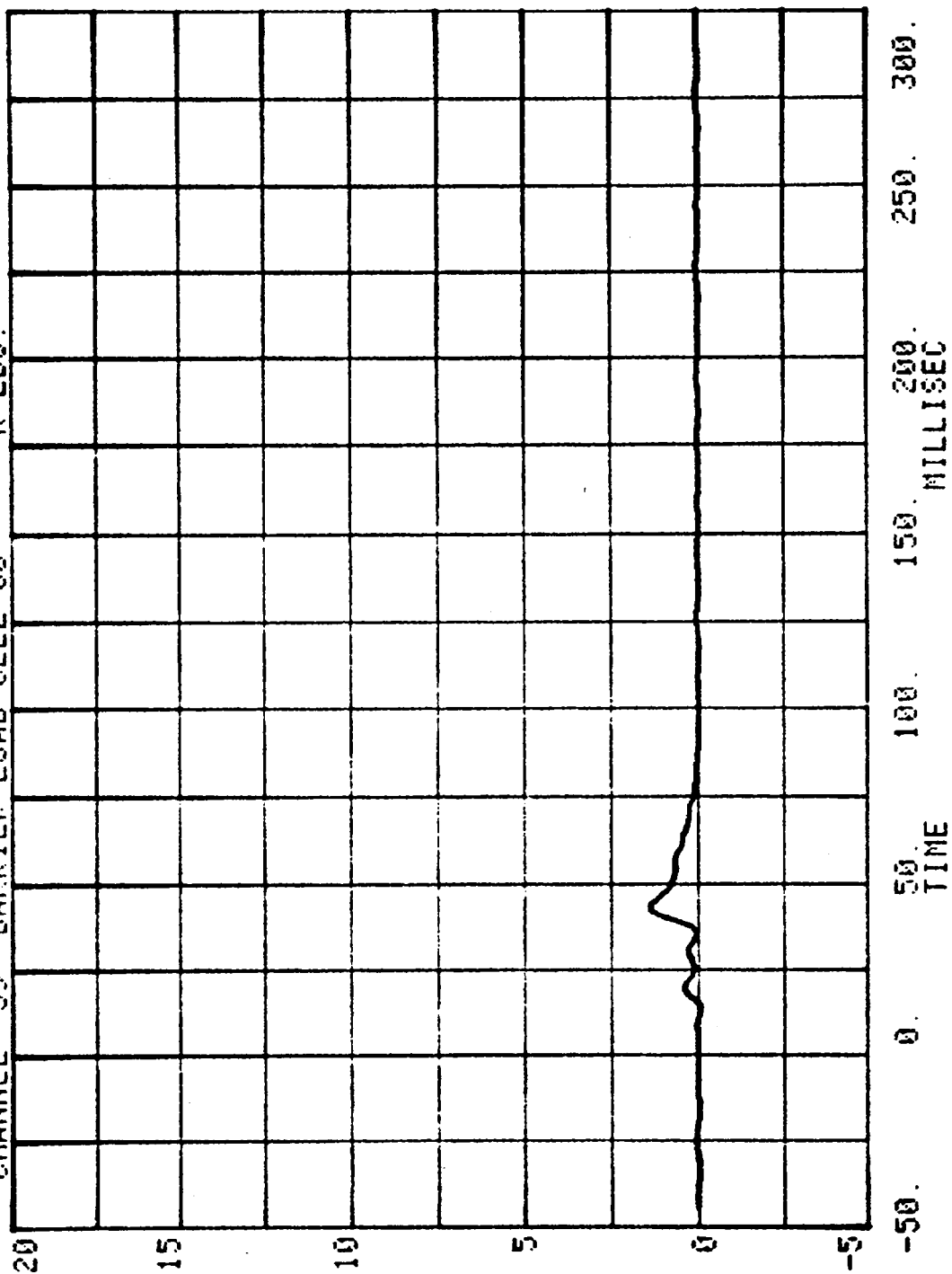


CHANNEL 58 BARRIER LOAD CELL C7 K LBS.
RUN= 938 SERIES= 5400

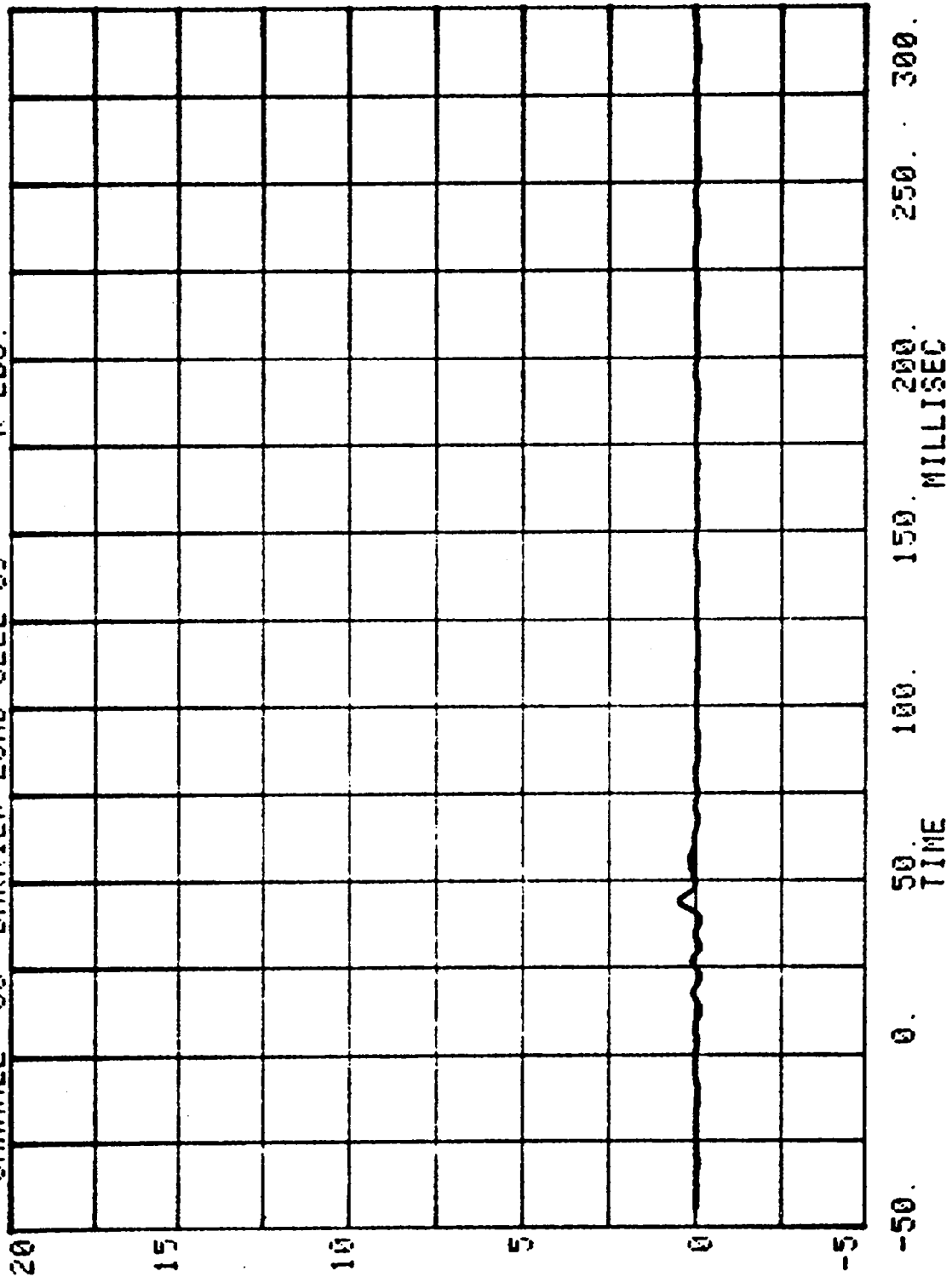


CHANNEL 59 BARRIER LOAD CELL C8 K LBS.

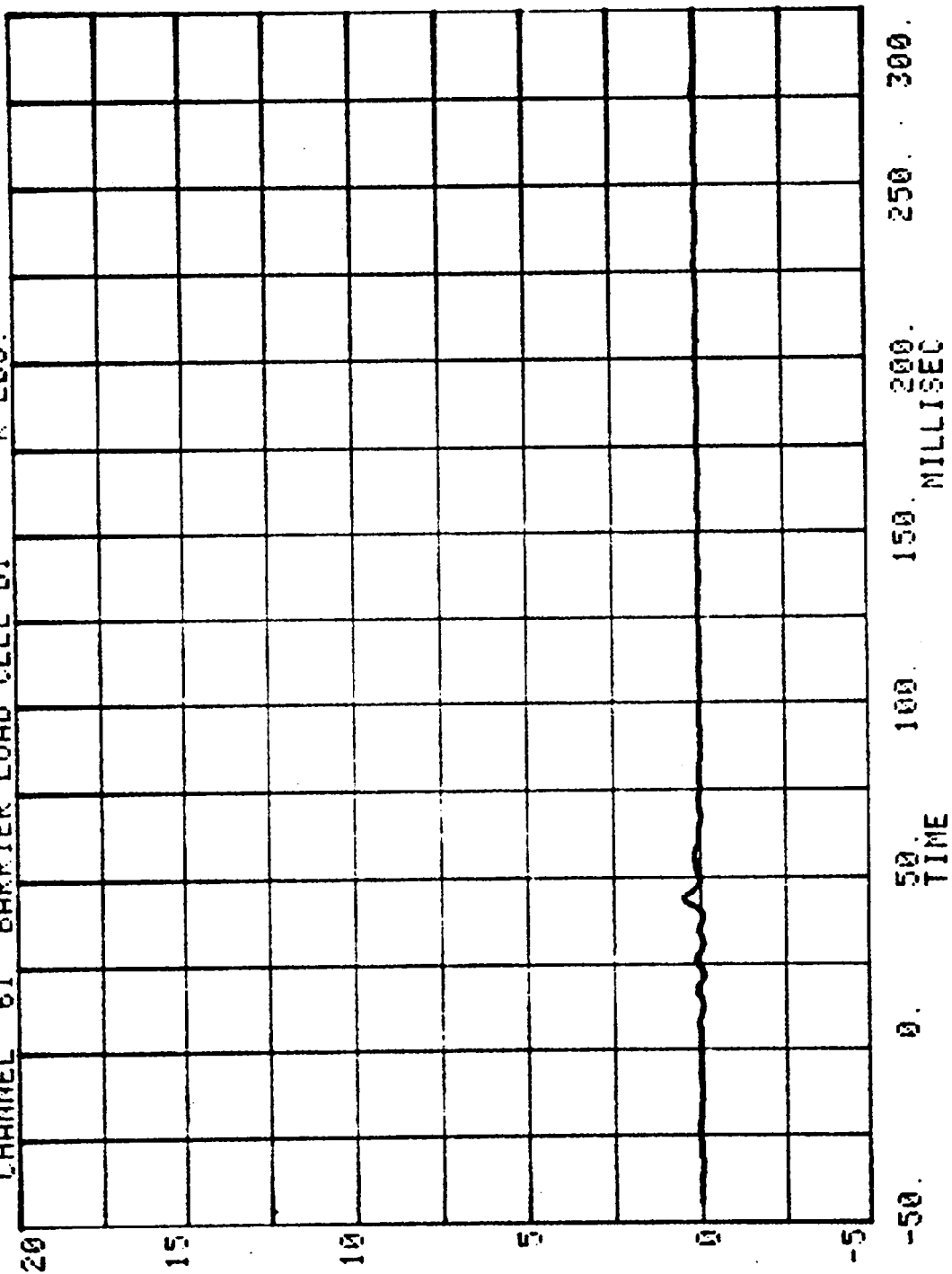
RUN= 938 SERIES= 5400



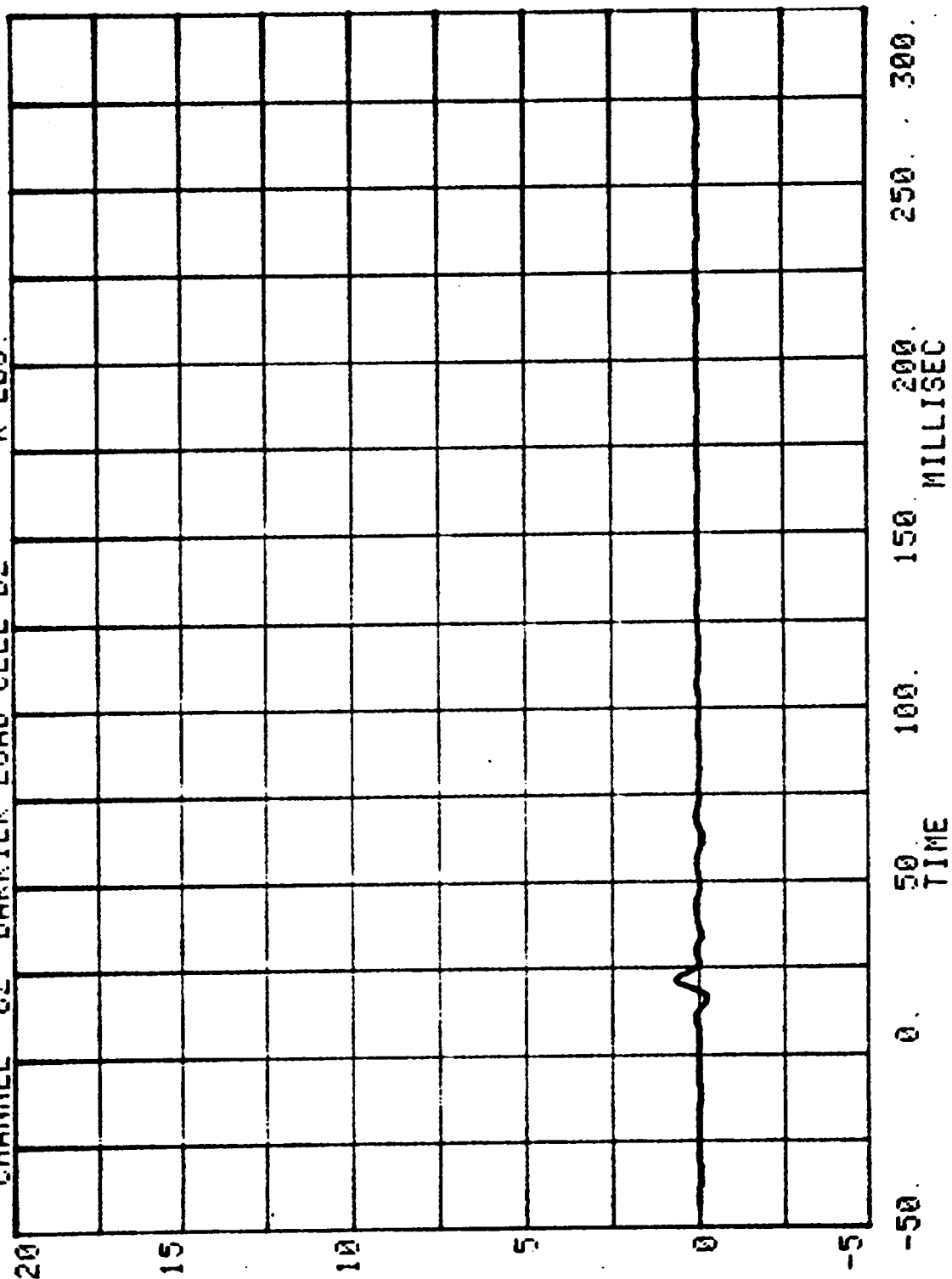
RUN= 938 SERIES= 5400
CHANNEL 60 BARRIER LOAD CELL C9 K LBS.



CHANNEL 61 BARRIER LOAD CELL D1 RUN= 938 SERIES= 5400 K LBS.

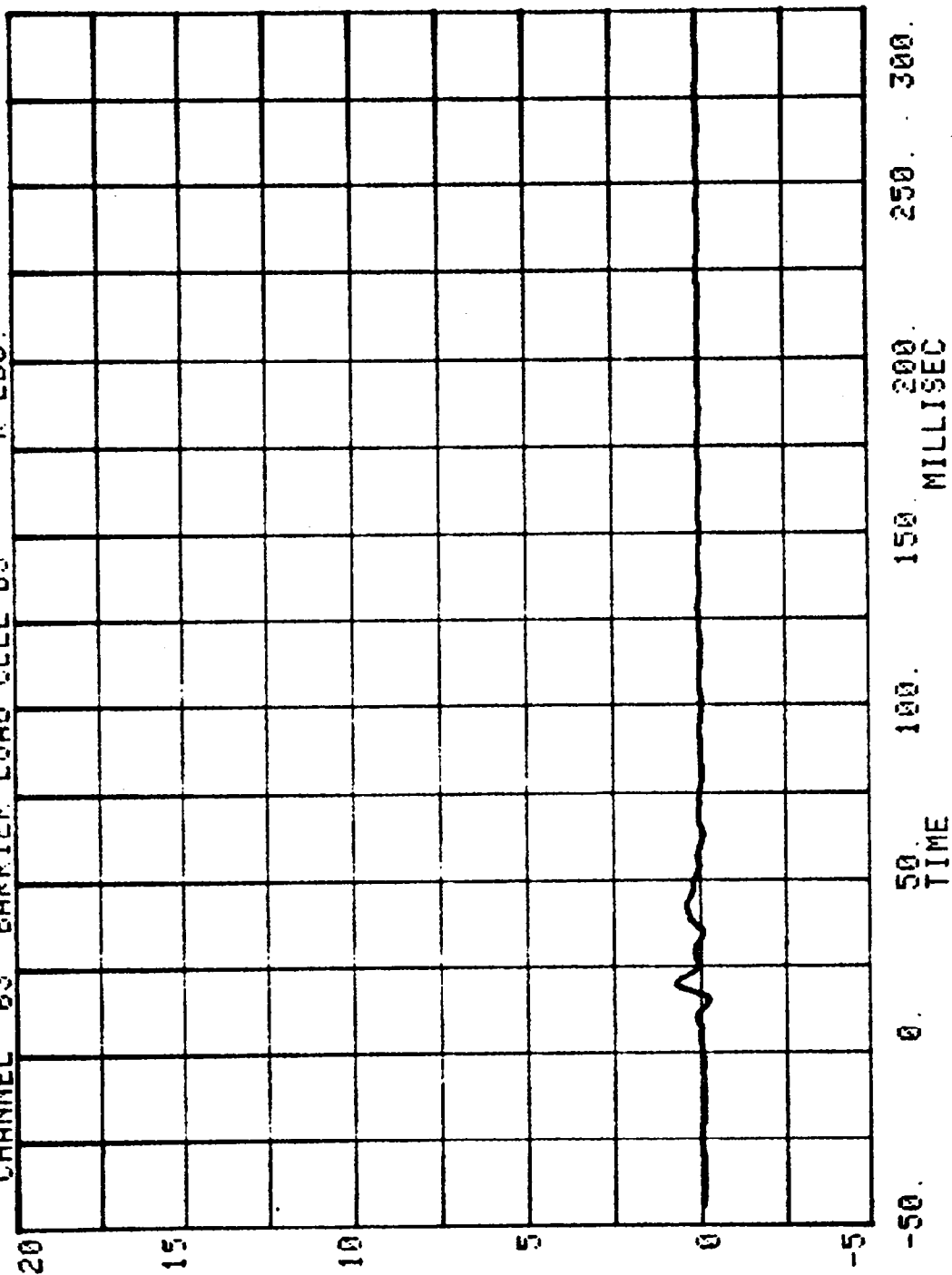


CHANNEL 62 RUH= 938 SERIES= 5400 K LBS.
BARRIER LOAD CELL D2

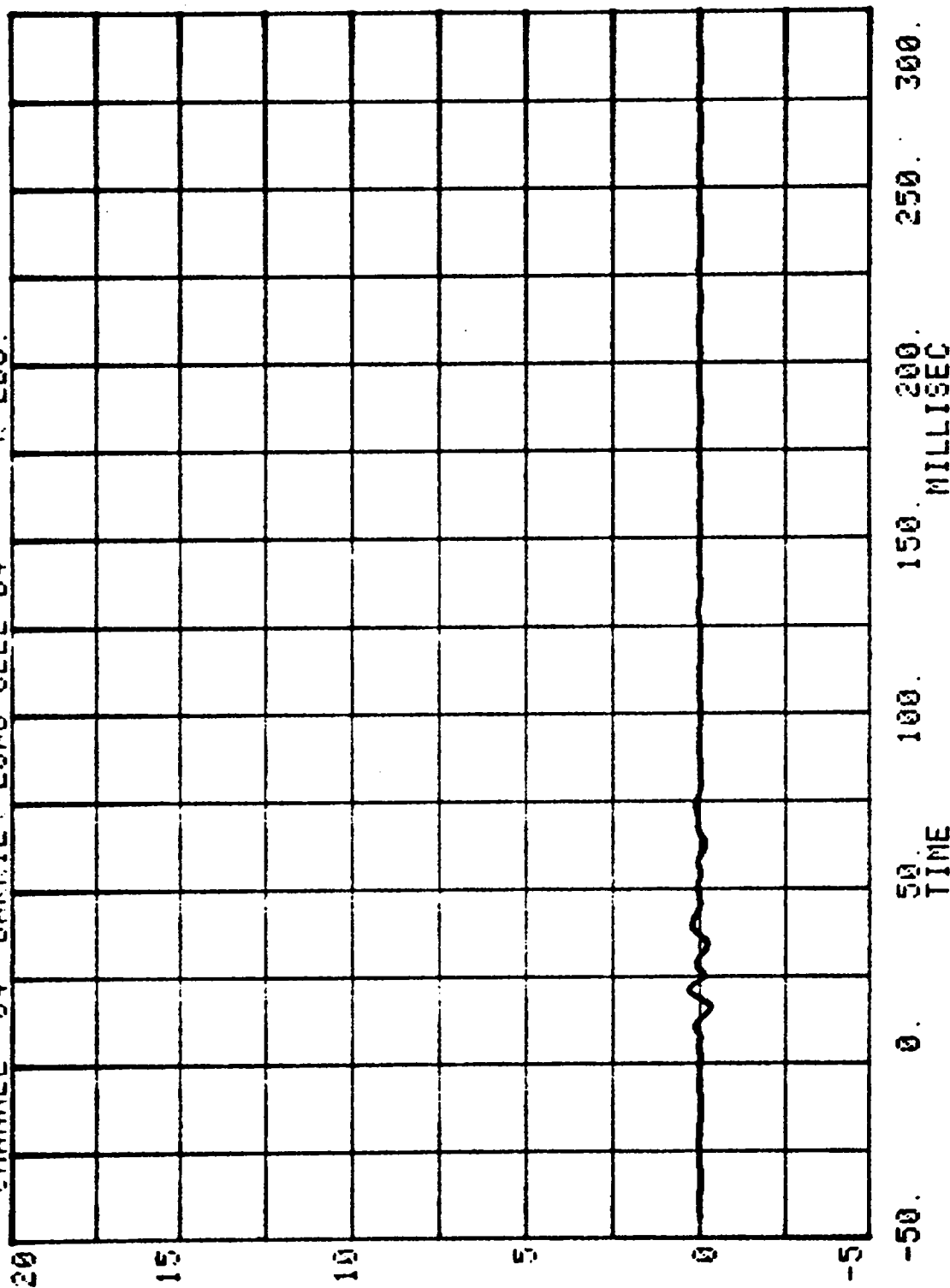


CHANNEL 63 BARRIER LOAD CELL 03 K LBS.

PUH= 938 SERIES= 5400

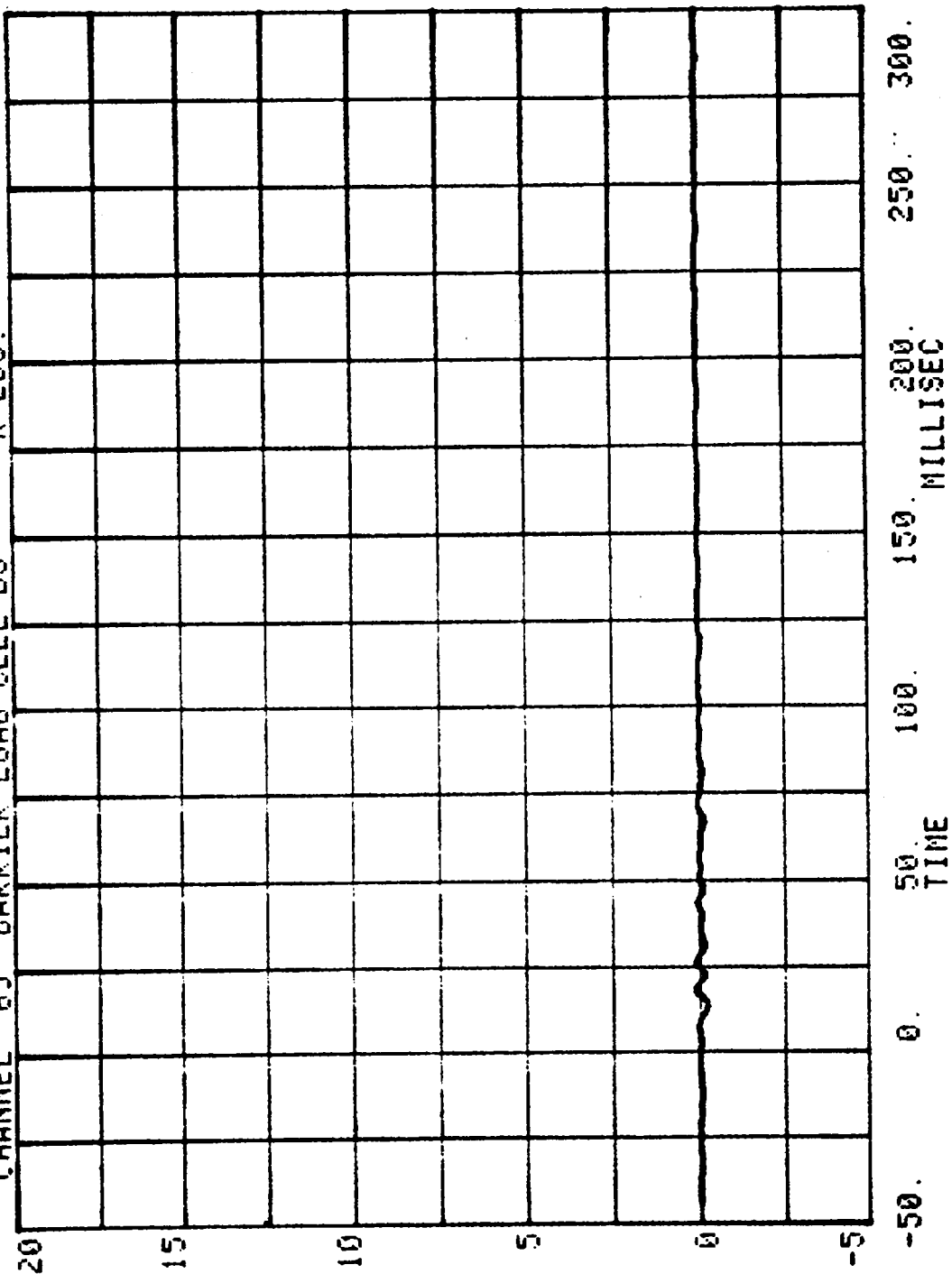


CHANNEL 64 BARRIER LOAD CELL 04 K LBS.
RUN= 938 SERIES= 5400



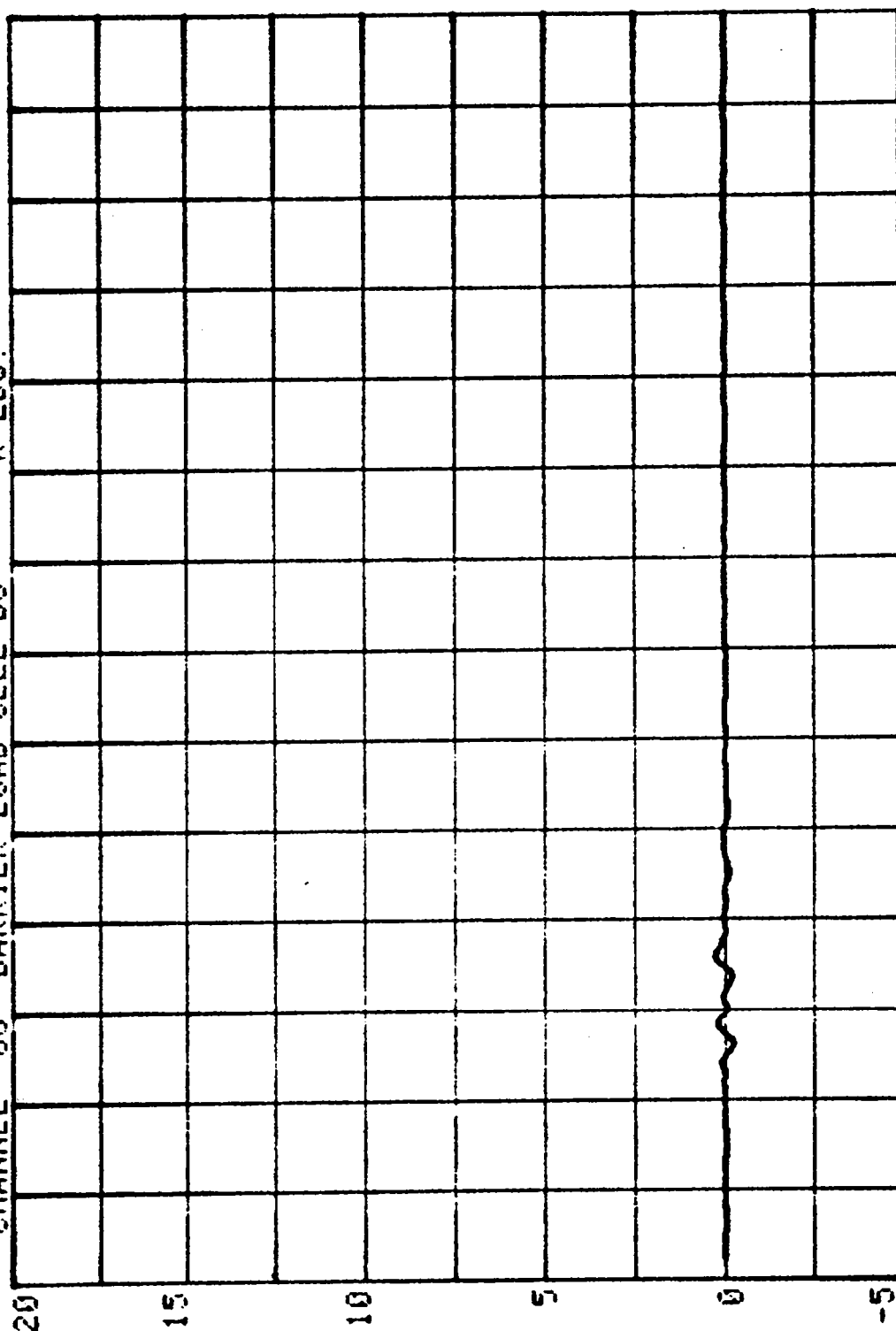
CHANNEL 65 BARRIER LOAD CELL D5 K LBS.

RUN= 938 SERIES= 5400



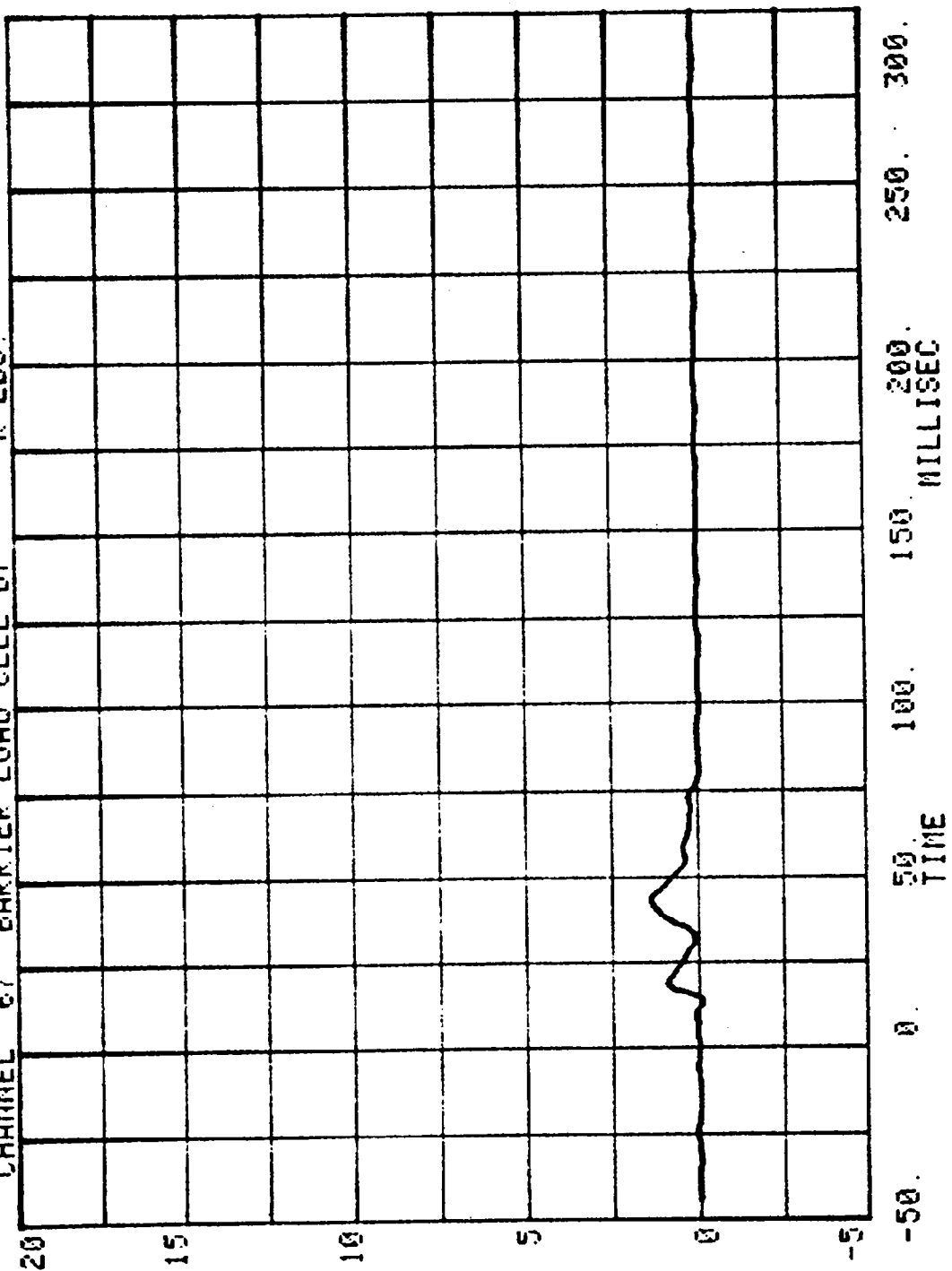
CHANNEL 66 BARRIER LOAD CELL D6 K LBS.

RUN= 938 SERIES= 5400

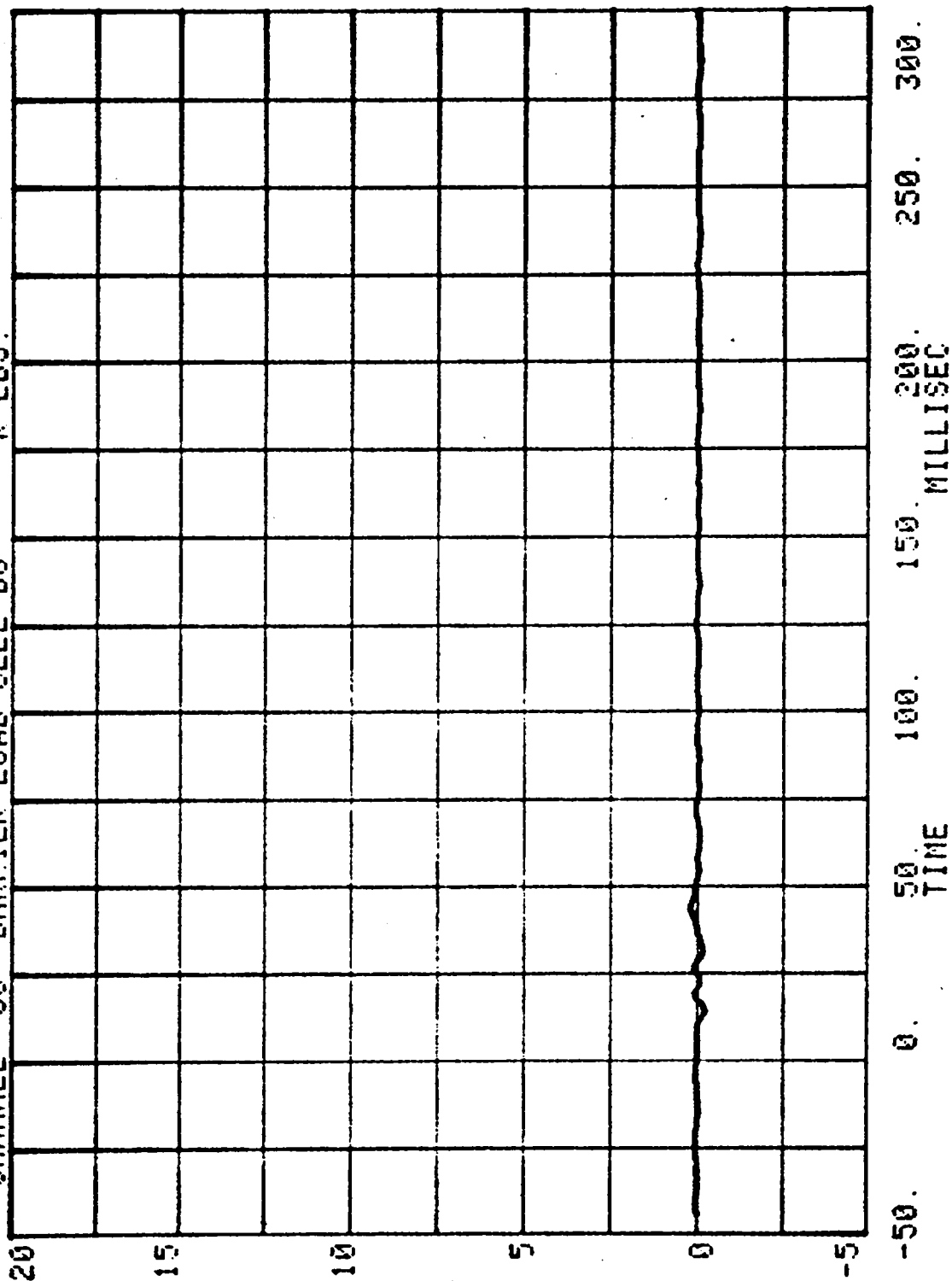


CHANNEL 67 BARRIER LOAD CELL 07 K LBS.

RUN= 938 SERIES= 5400

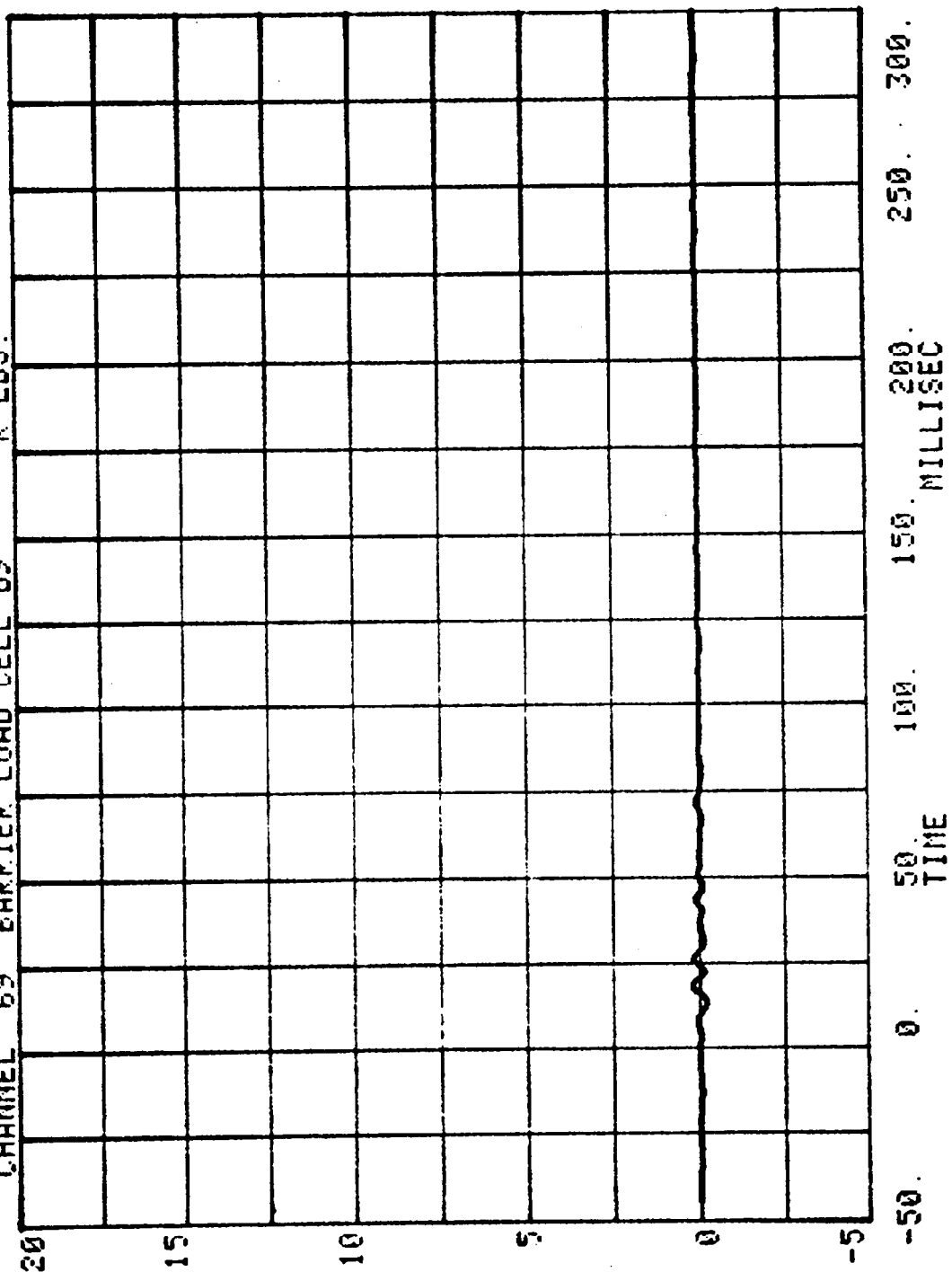


RUN= 938 SERIES= 5400
CHANNEL 68 BARRIER LOAD CELL D8 K LBS.



CHANNEL 69 BARRIER LOAD CELL 09 K LBS.

RUN= 938 SERIES= 5400



NEW CAR ASSESSMENT PROGRAM - 1990

RUN # 938

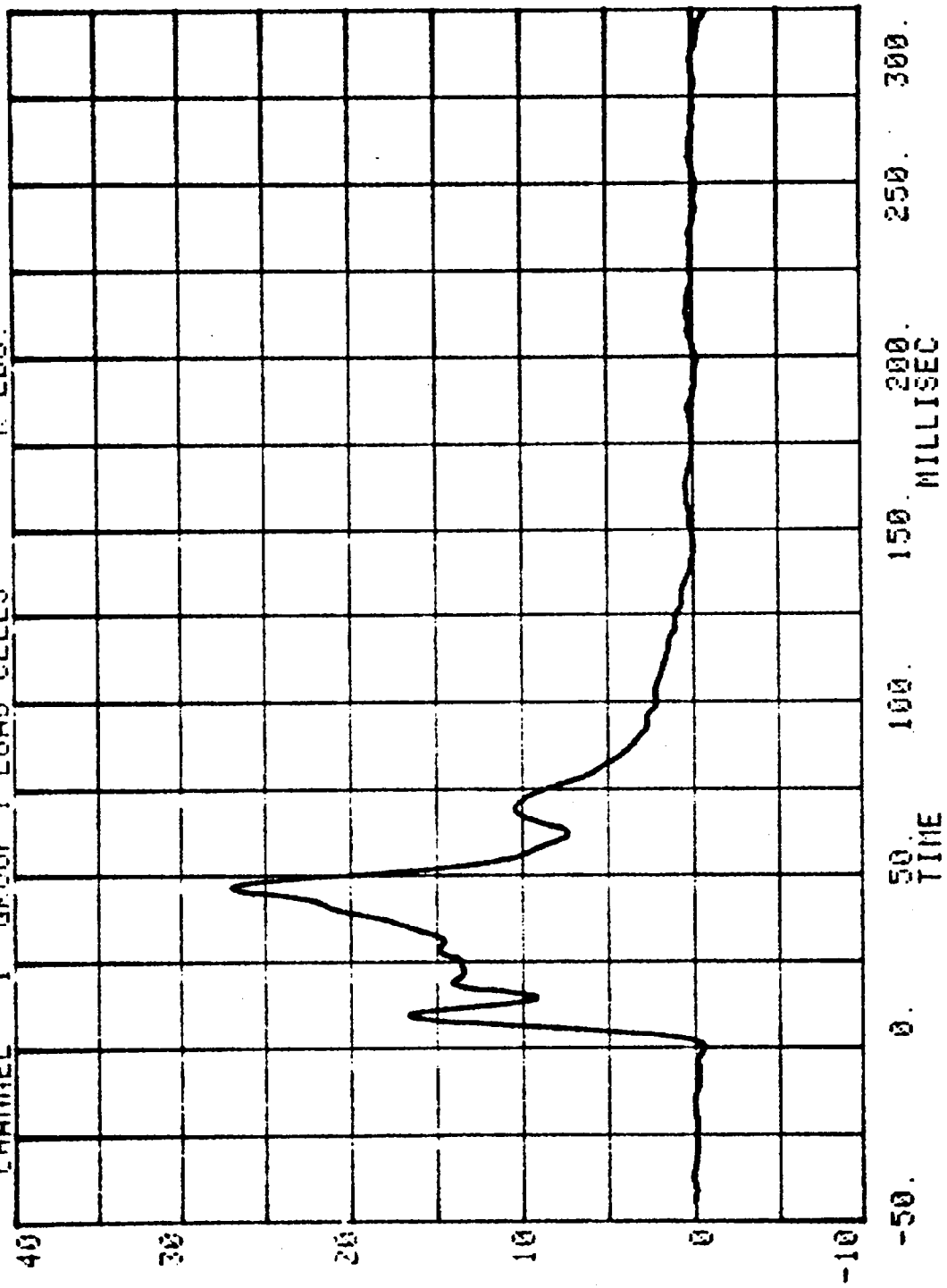
SERIES # 5400

CHAN	TITLE	MINIMUM	MAXIMUM	AT	TIME
1	GROUP 1 LOAD CELLS	- 773 K	LBS.	300.00	MS.
		27.035	K	46.80	MS.
2	GROUP 2 LOAD CELLS	- 176 K	LBS.	291.68	MS.
		39.267	K	39.45	MS.
3	GROUP 3 LOAD CELLS	- 378 K	LBS.	1.35	MS.
		15.510	K	46.12	MS.
4	GROUP 4 LOAD CELLS	- 485 K	LBS.	299.85	MS.
		9.949	K	41.40	MS.
5	GROUP 5 LOAD CELLS	- 286 K	LBS.	299.25	MS.
		22.101	K	40.05	MS.
6	GROUP 6 LOAD CELLS	- 474 K	LBS.	118.65	MS.
		7.083	K	43.57	MS.
7	TOTAL LOAD CELL SUM	- 246 K	LBS.	300.00	MS.
		111.090	K	45.30	MS.

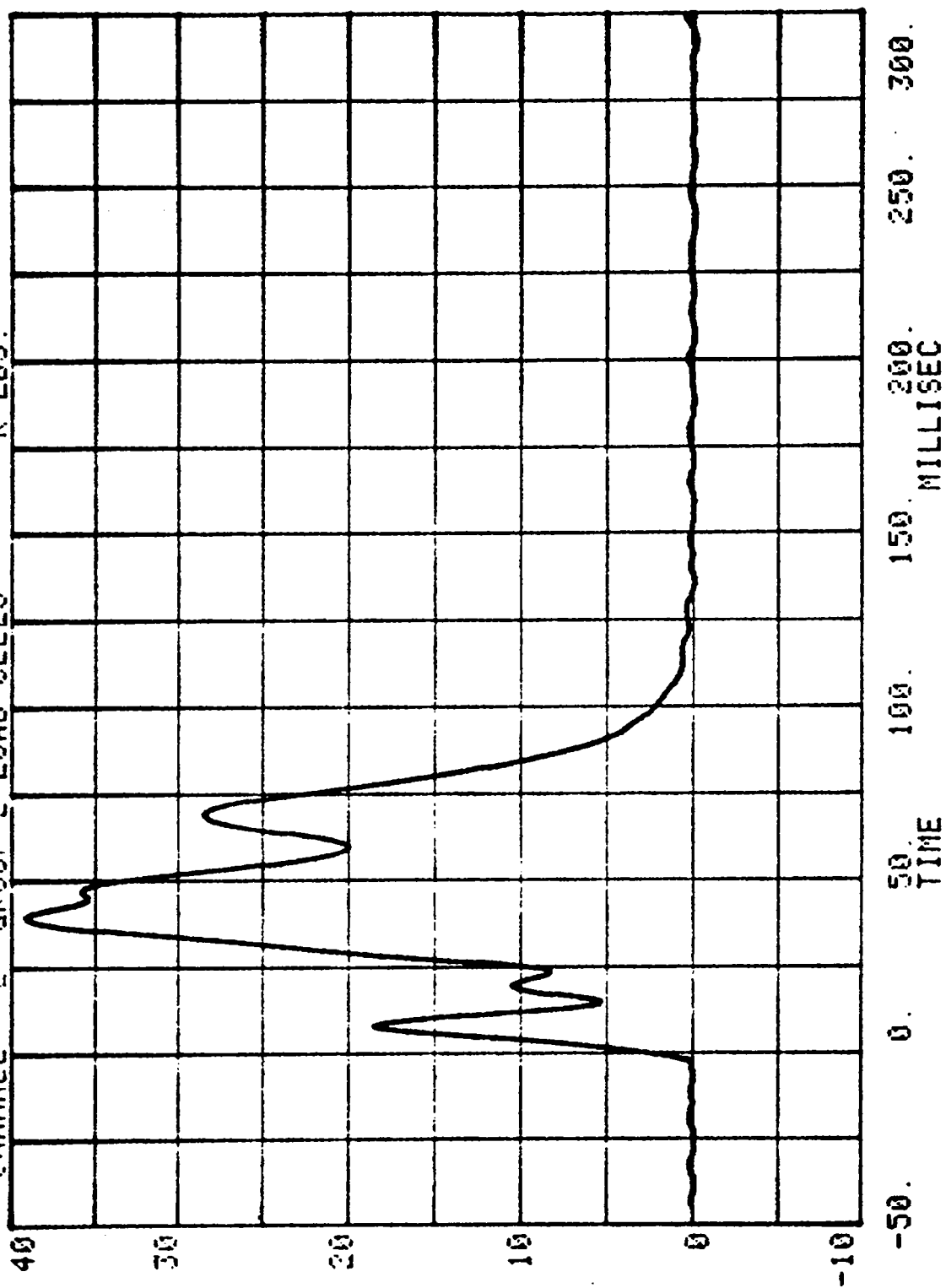
CHANNEL 1 GROUP 1 LOAD CELLS

RUN= 938 SERIES= 5400

K LBS.

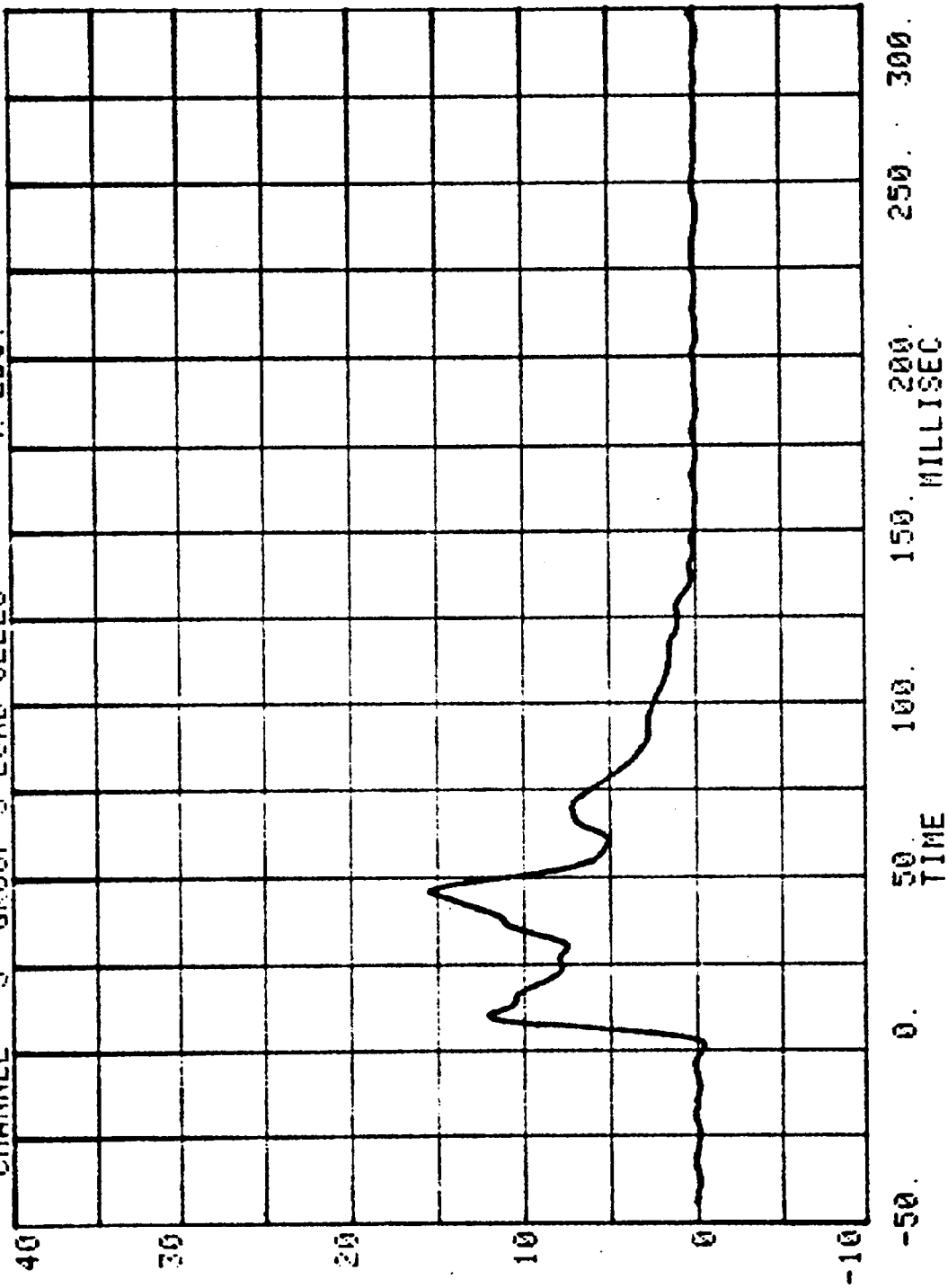


CHANNEL 2 GROUP 2 LOAD CELLS RUN= 938 SERIES= 5400 K LBS.

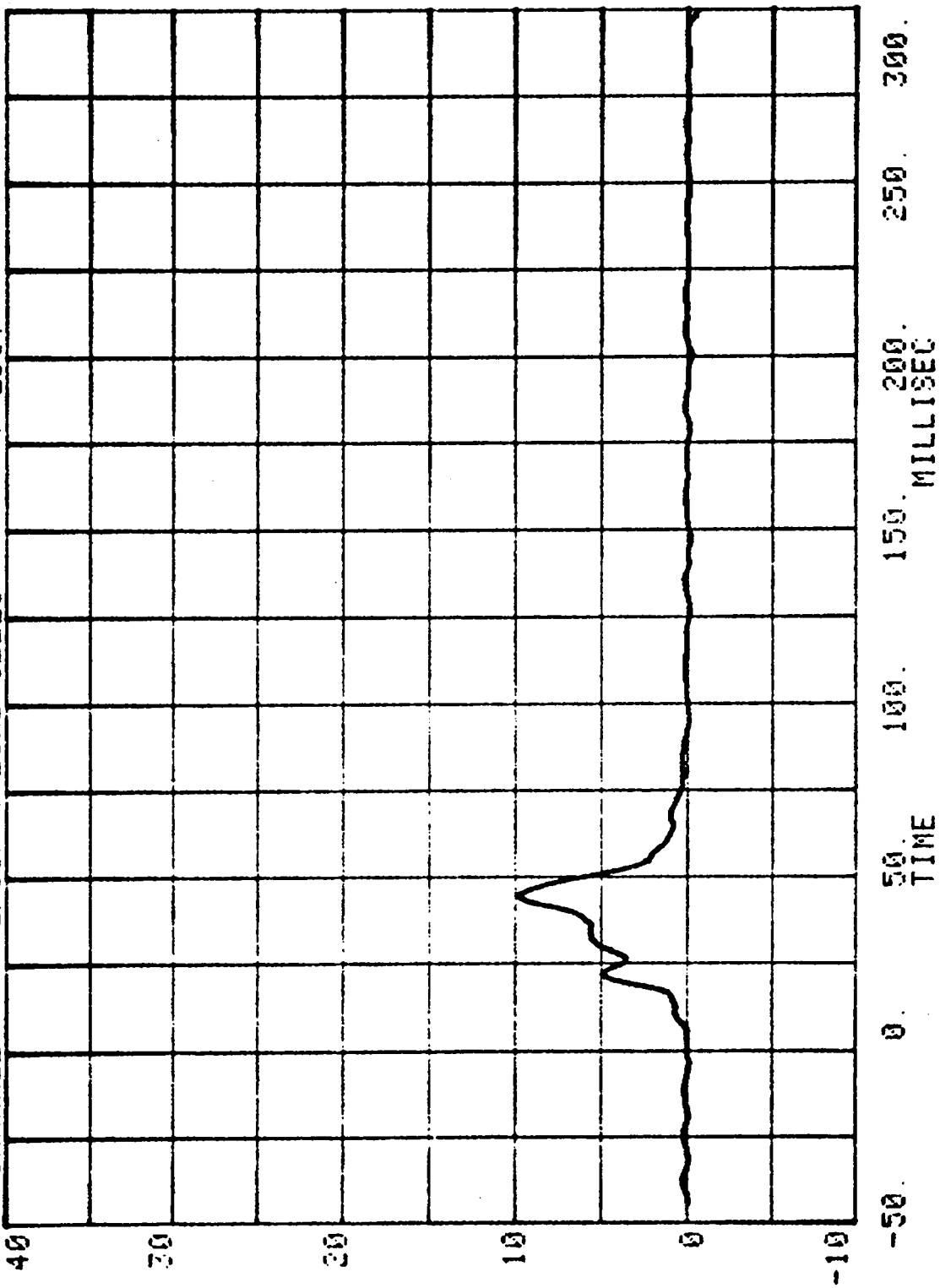


CHANNEL 3 GROUP 3 LOAD CELLS K LBS.

RUN= 938 SERIES= 5400



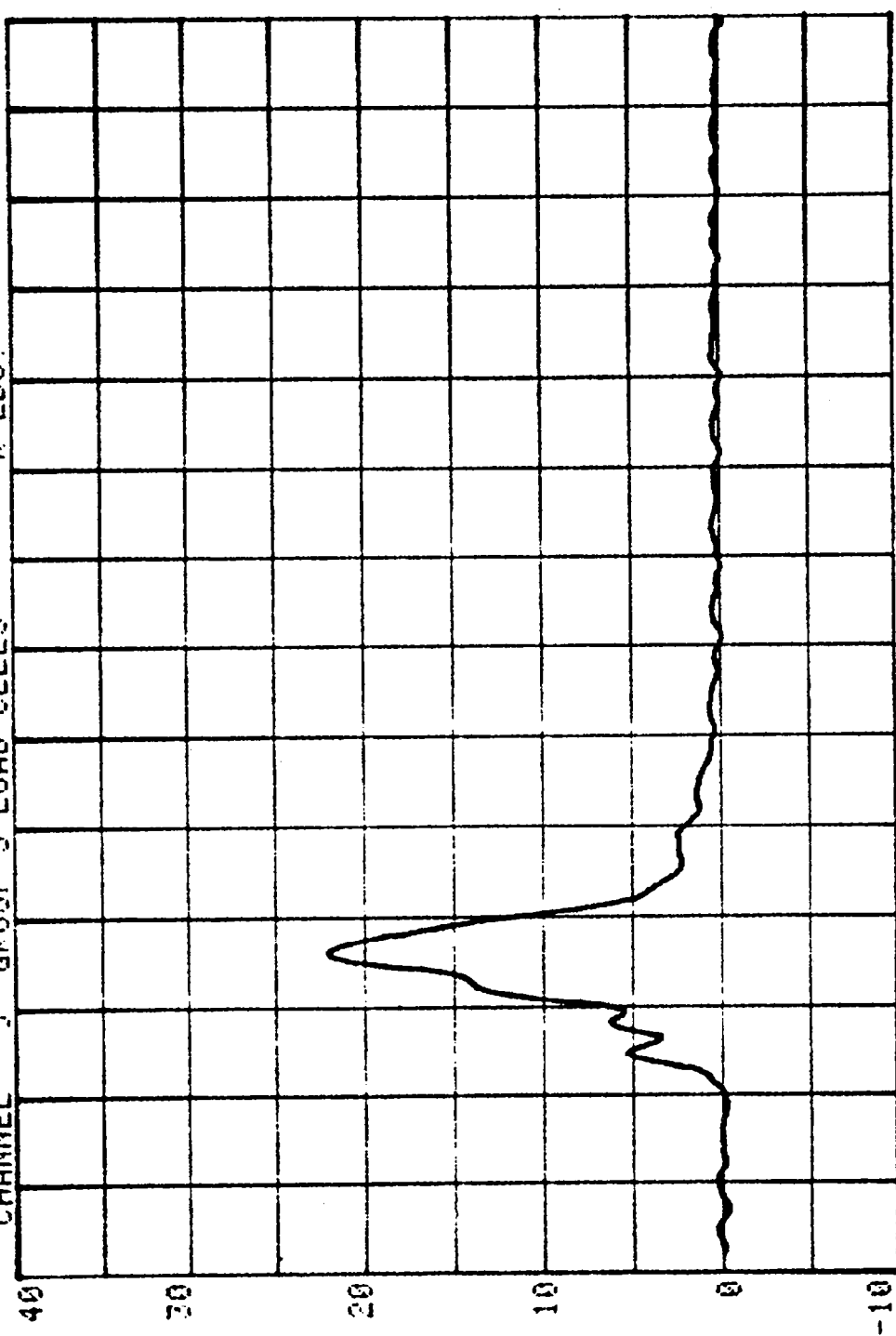
CHANNEL 4 GROUP 4 LOAD CELLS FUH= 938 SERIES= 5400 K LBS.



CHANNEL 5 GROUP 5 LOAD CELLS

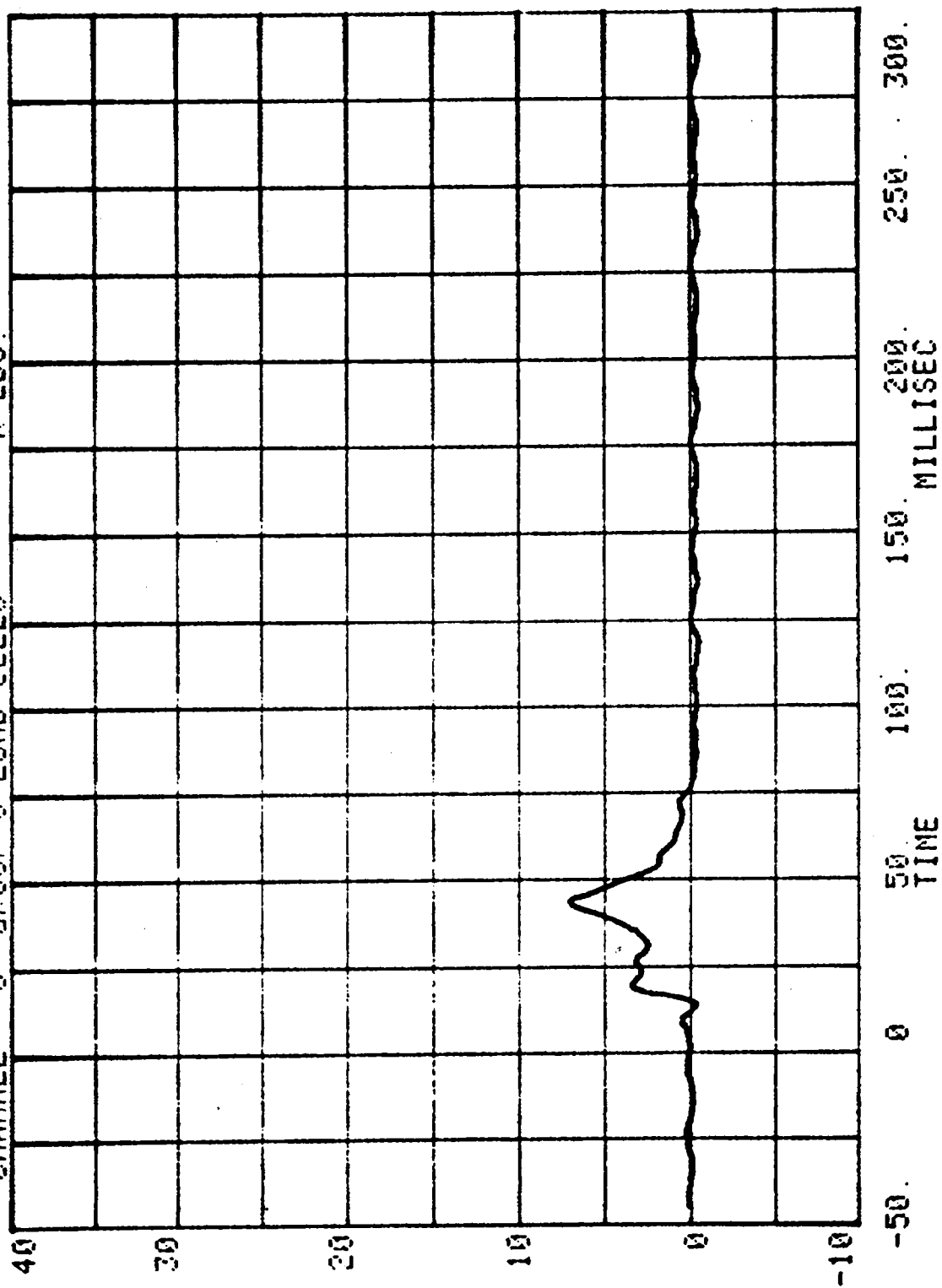
RUN= 938 SERIES= 5400

K LBS.



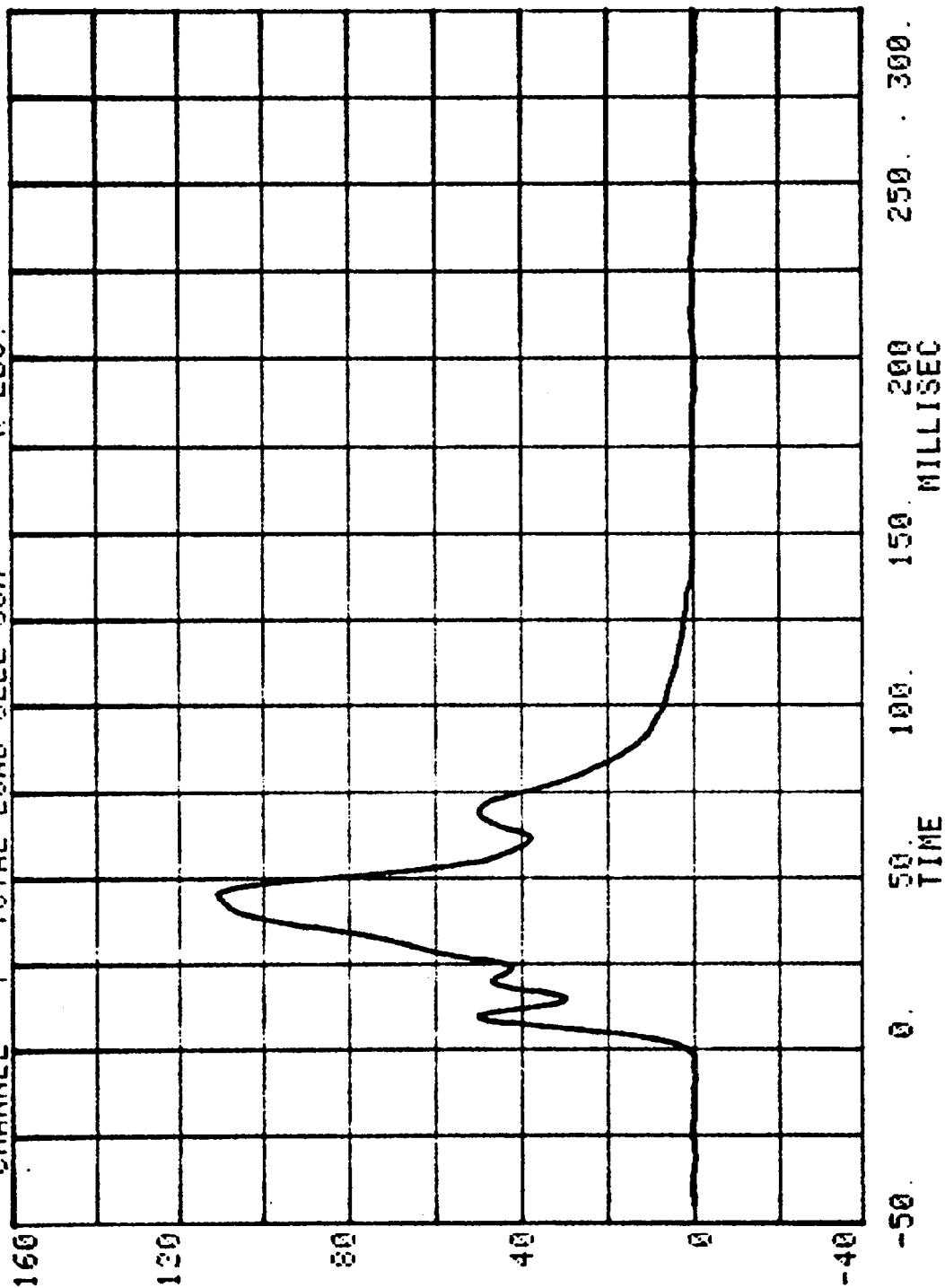
TIME
-50. 0. 50. 100. 150. 200. 250. 300.
MILLISEC

CHANNEL 6 GROUP 6 LOAD CELLS RUN= 933 SERIES= 5400 K LBS.



CHANNEL 7 TOTAL LOAD CELL SUM K LBS.

RUN= 939 SERIES= 5400



TEST NO. ML5400

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= 938

POS#1 HEAD R

HIC= 920.2 FROM T1= .06382 TO T2= .09450
AVERAGE ACCELERATION BETWEEN T1 AND T2= 61.85'G
EVENT TIME= 300.0 MSEC
SEVERITY INDEX=1144.3

NEW CAR ASSESSMENT PROGRAM - 1990

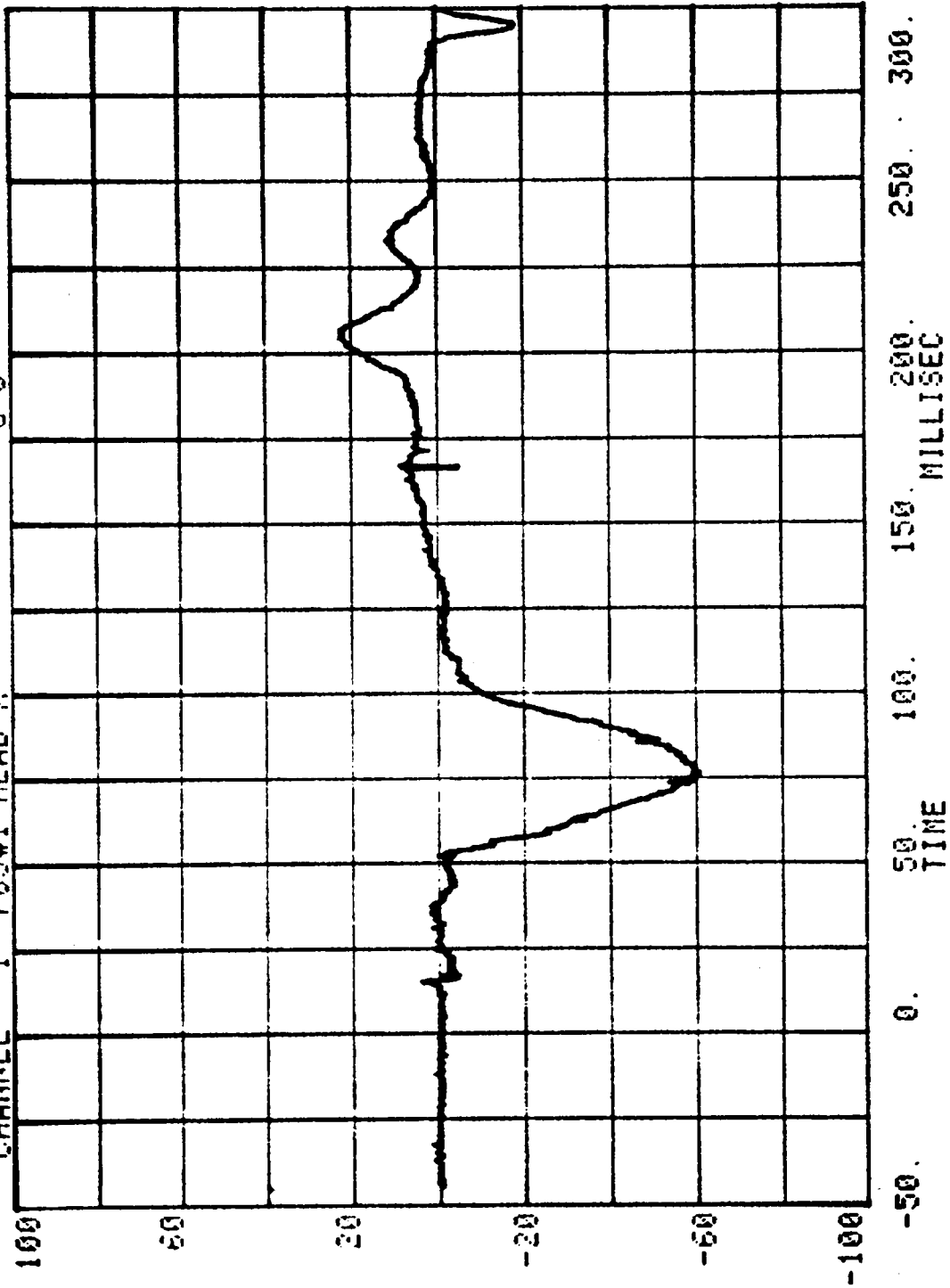
CHANNEL	RUN #	TITLE	SERIES #	3 MS. CLIPPED PEAK
2	POS#1	CHEST R	5400	58.997 G'S
4	POS#2	CHEST R		42.143 G'S

CHANNEL 1 POS#1 HEAD X

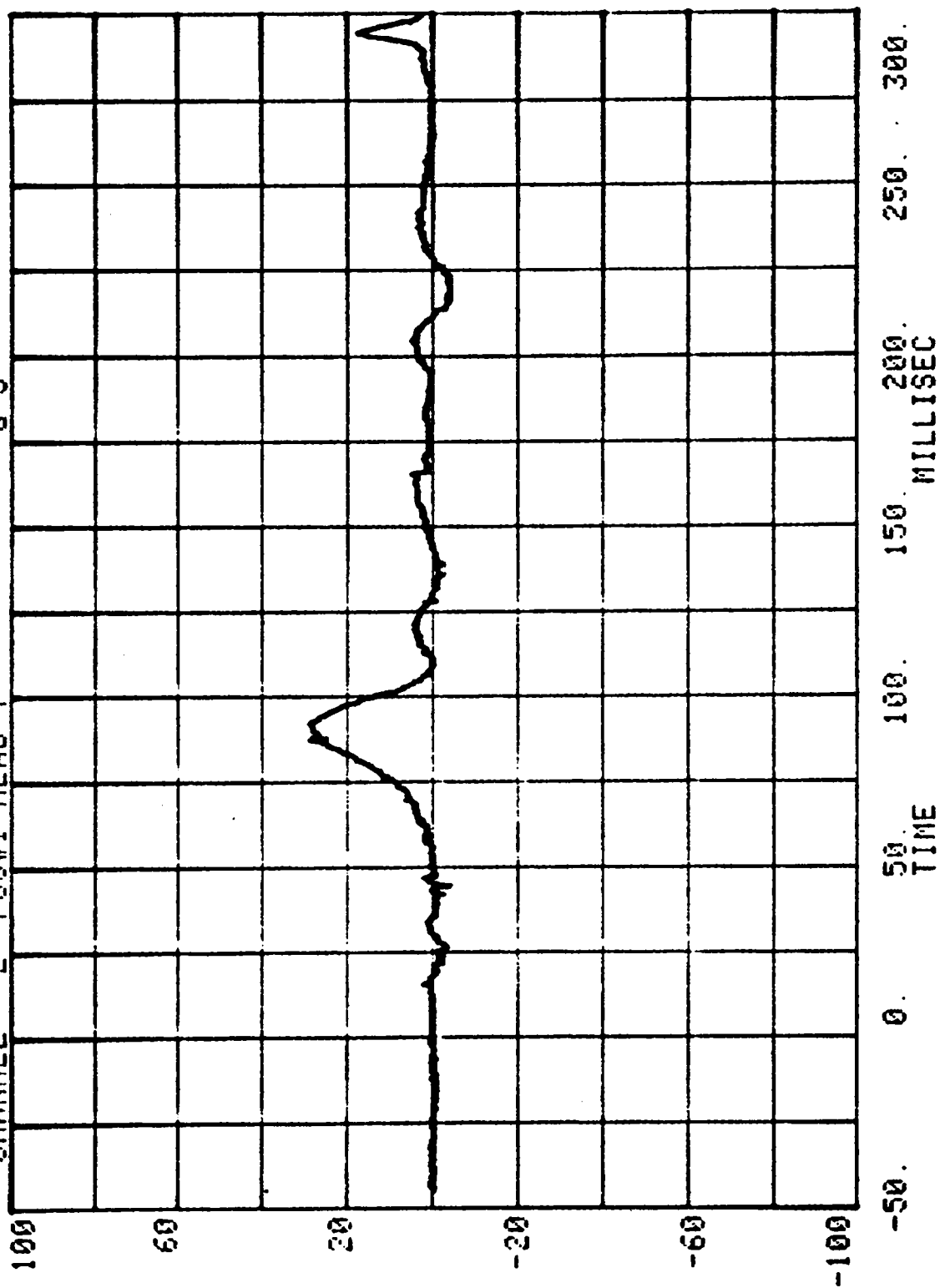
RUN= 938

SERIES= 5400

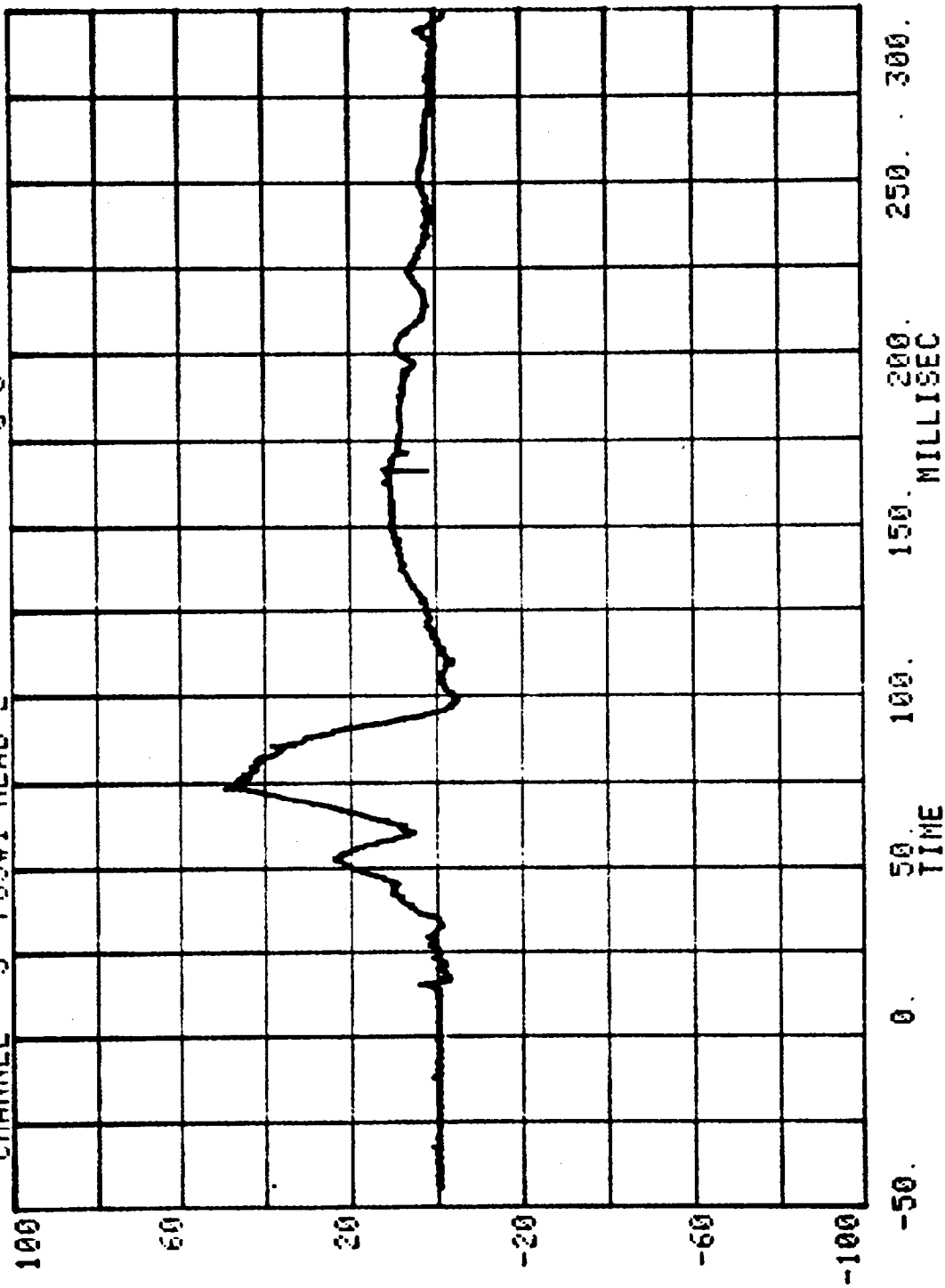
G'S



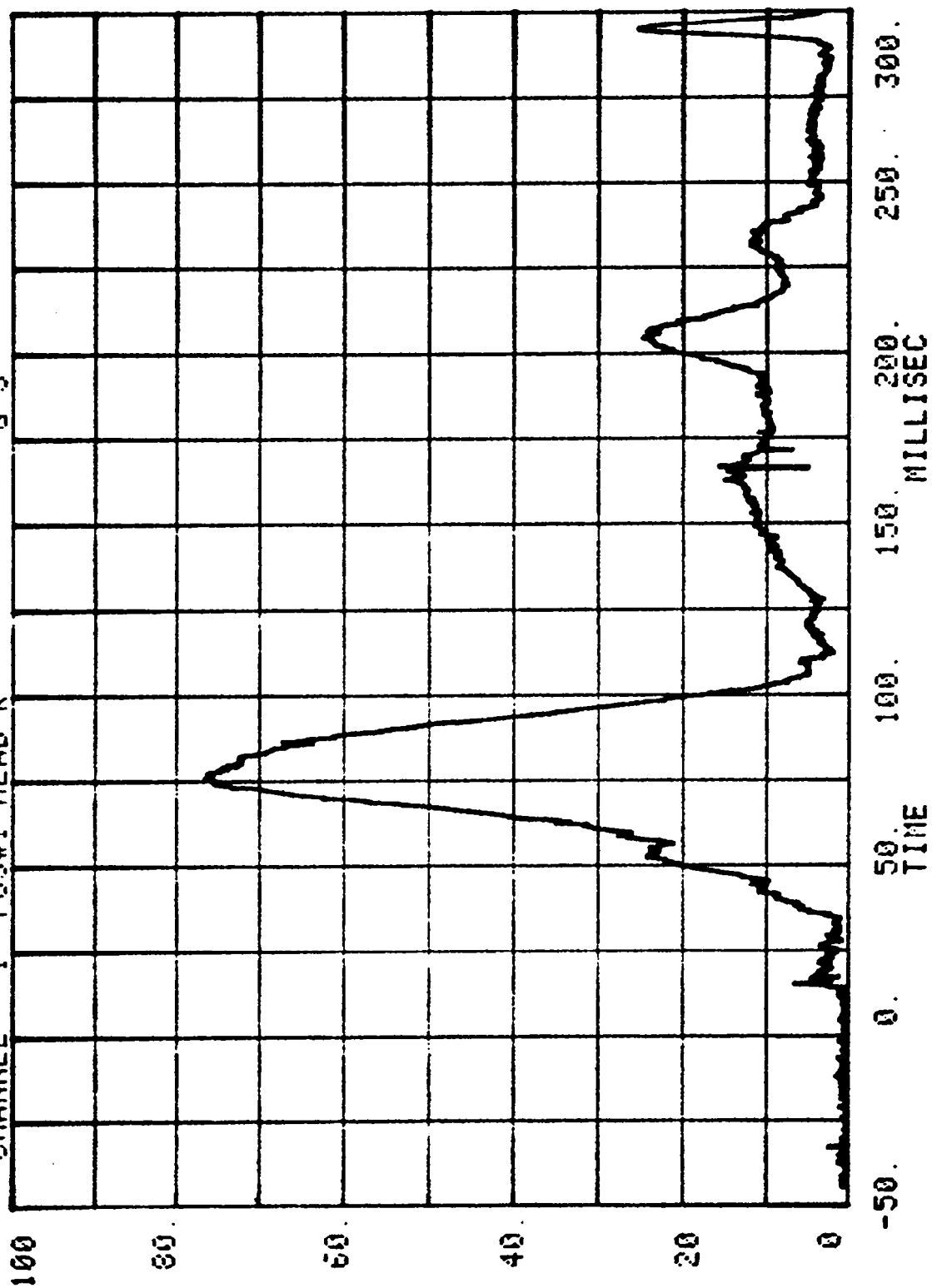
CHANNEL 2 POS#1 HEAD Y RUN= 938 SERIES= 5400 G'S



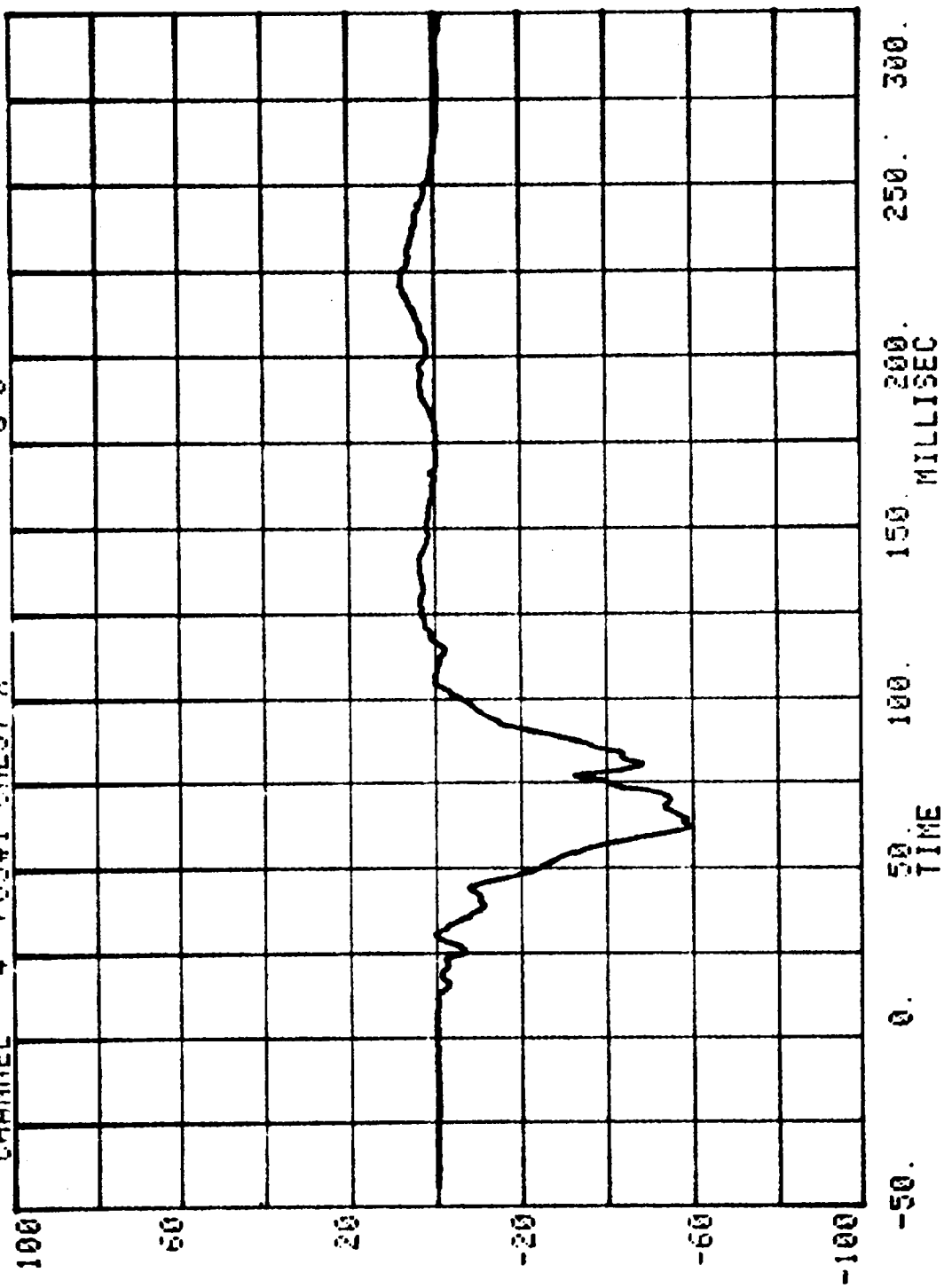
CHANNEL 3 POS#1 HEAD Z RUN= 938 SERIES= 5400 G'S



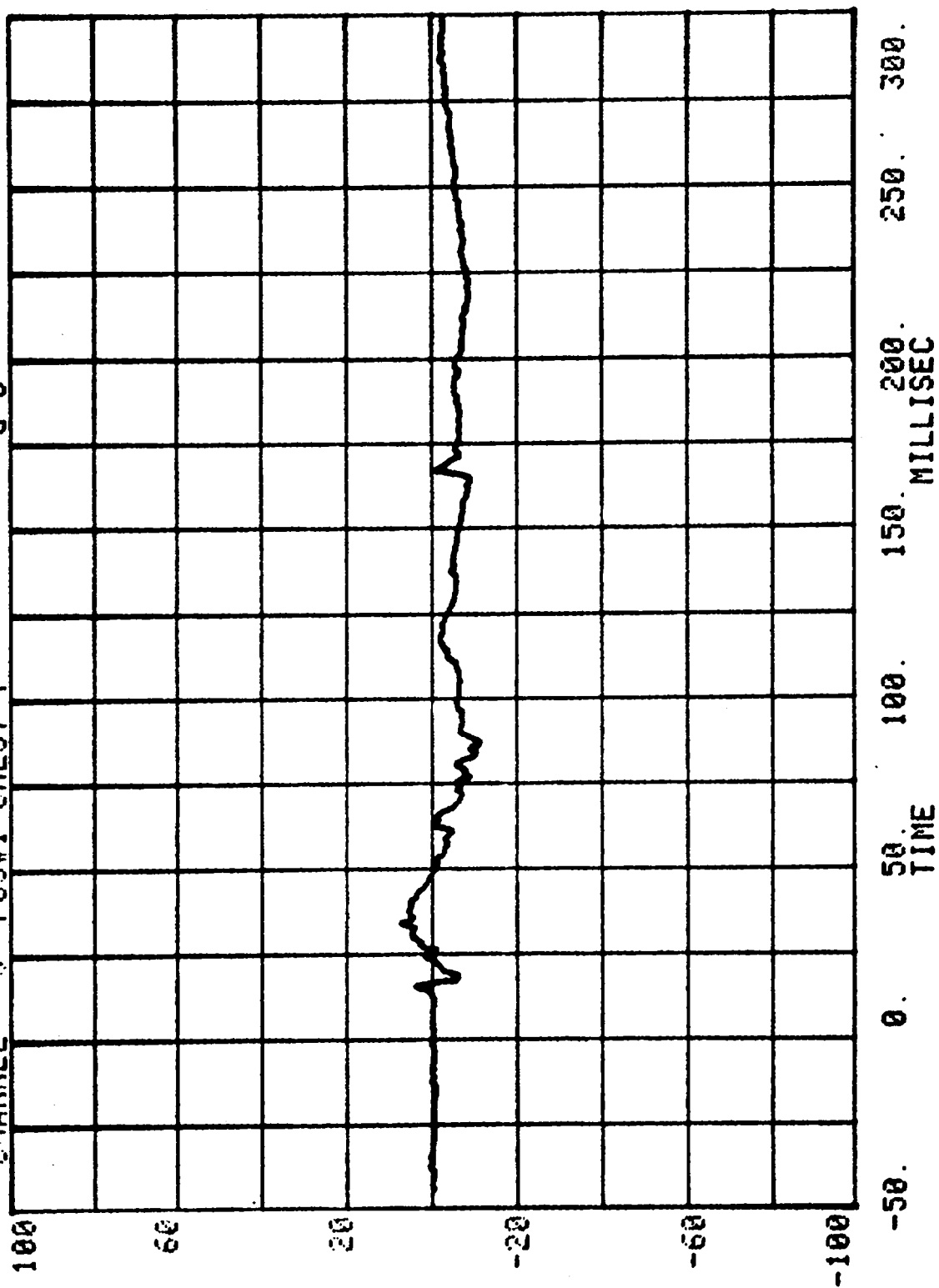
CHANNEL 1 FUN= 938 SERIES= 5400 G'S
POS#1 HEAD R



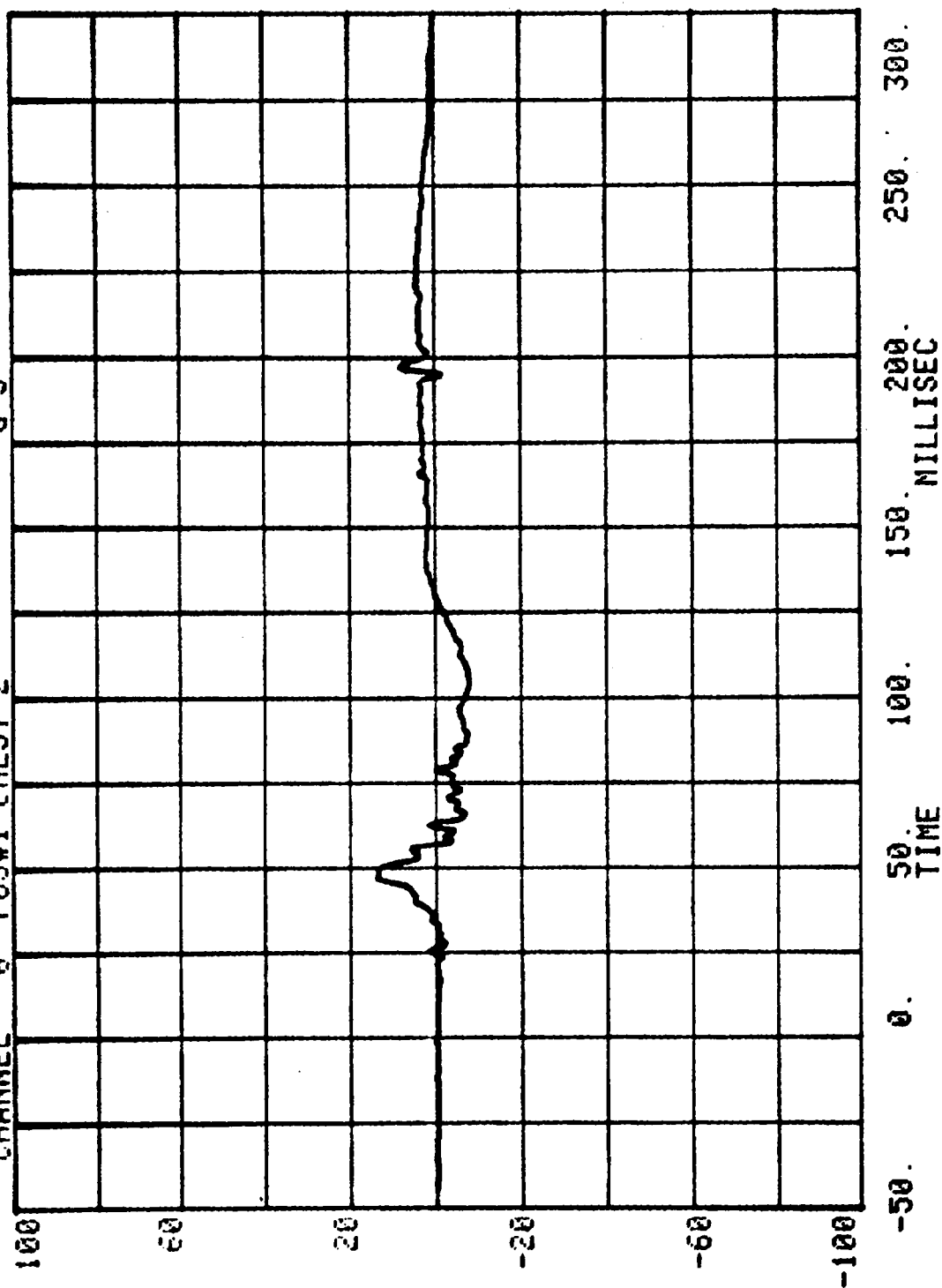
CHANNEL 4 POS#1 CHEST X
RUN= 938 SERIES= 5400 G'S



RUN= 938 SERIES= 5400
CHANNEL 5 POS#1 CHEST Y G'S



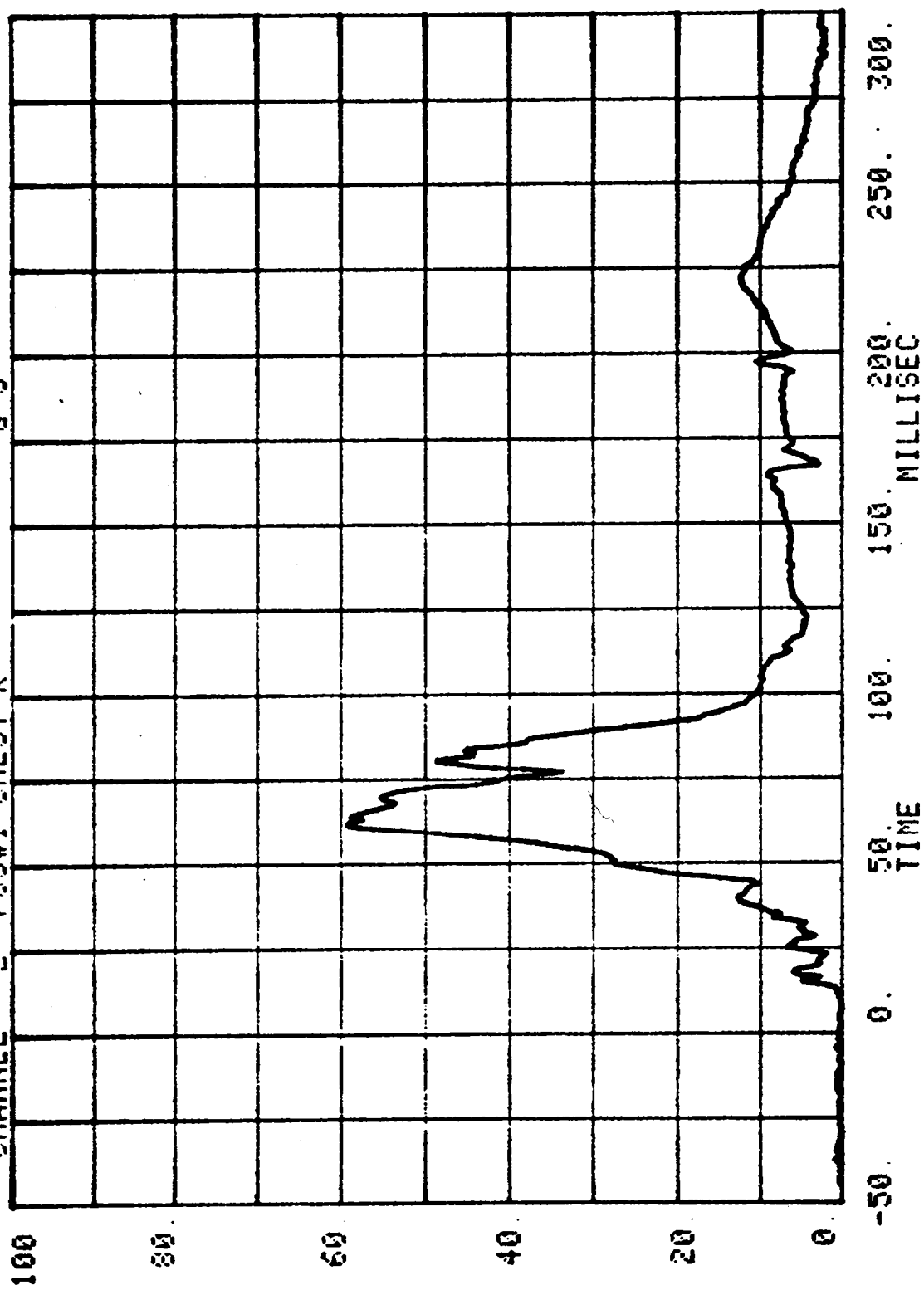
RUN= 938 SERIES= 5400 G'S
CHANNEL 6 POS#1 CHEST Z



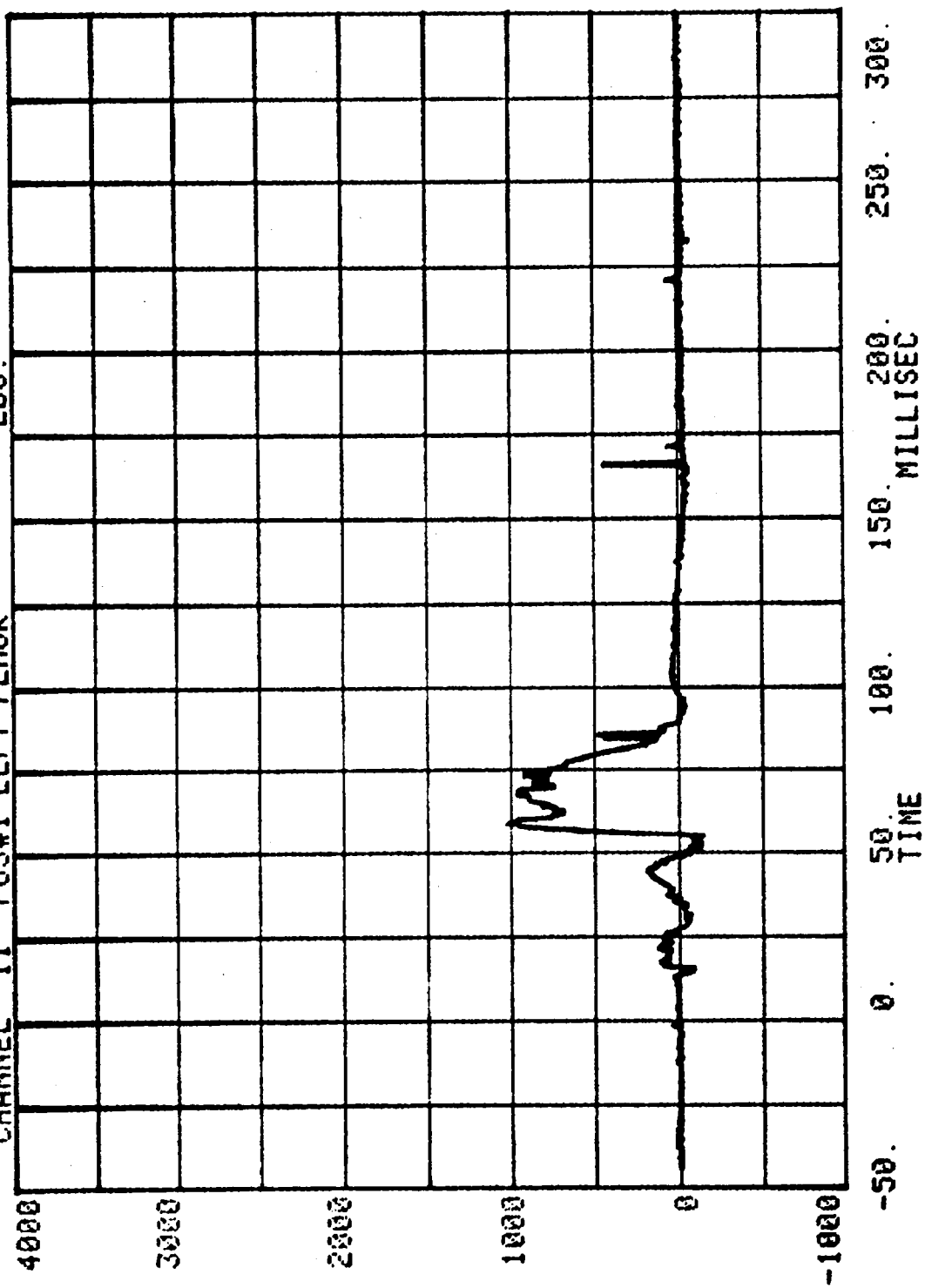
CHANNEL 2 POS#1 CHEST R G'S

RUN= 938

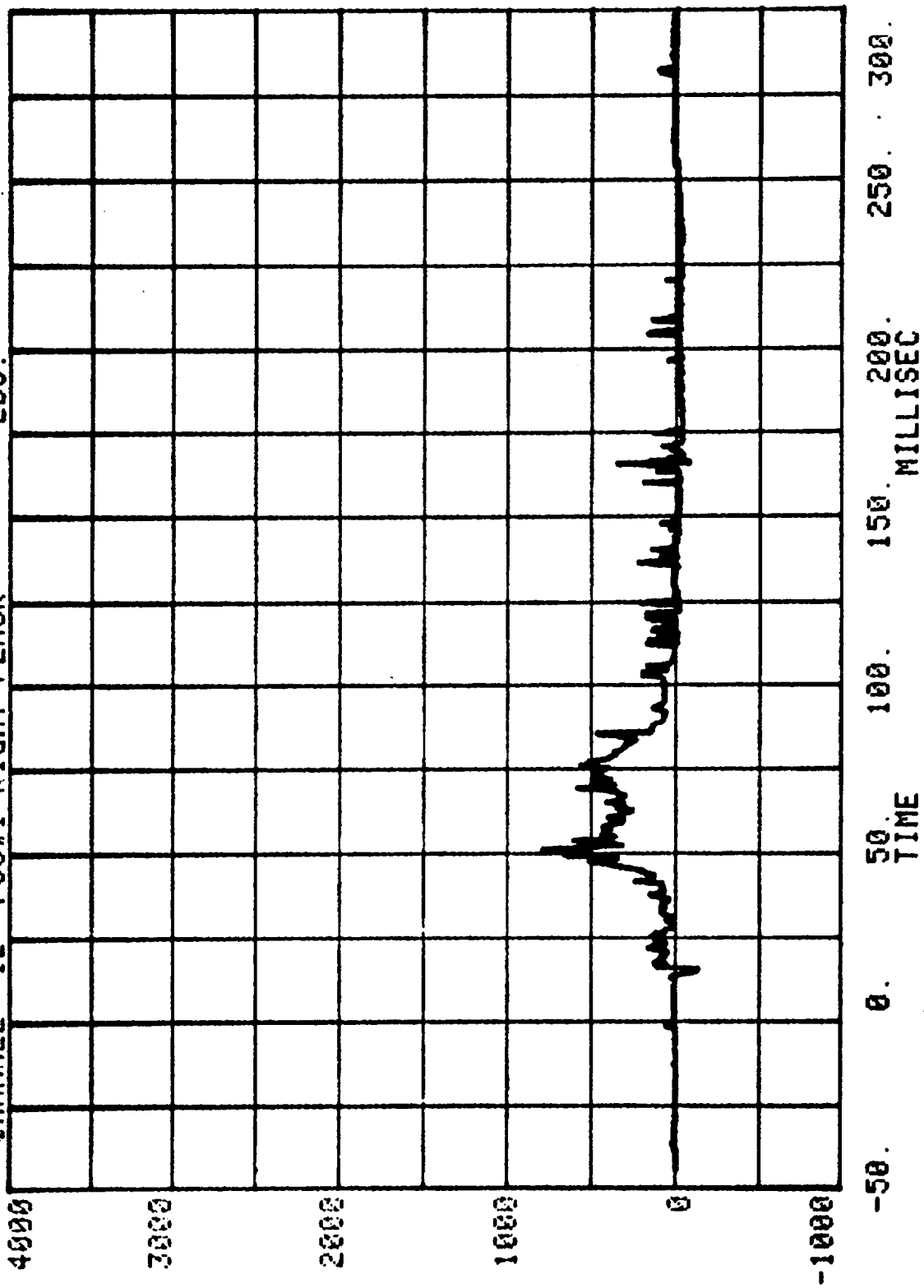
SERIES= 5400



CHANNEL 11 RUN= 938 SERIES= 5400 LBS.
POS#1 LEFT FEMUR



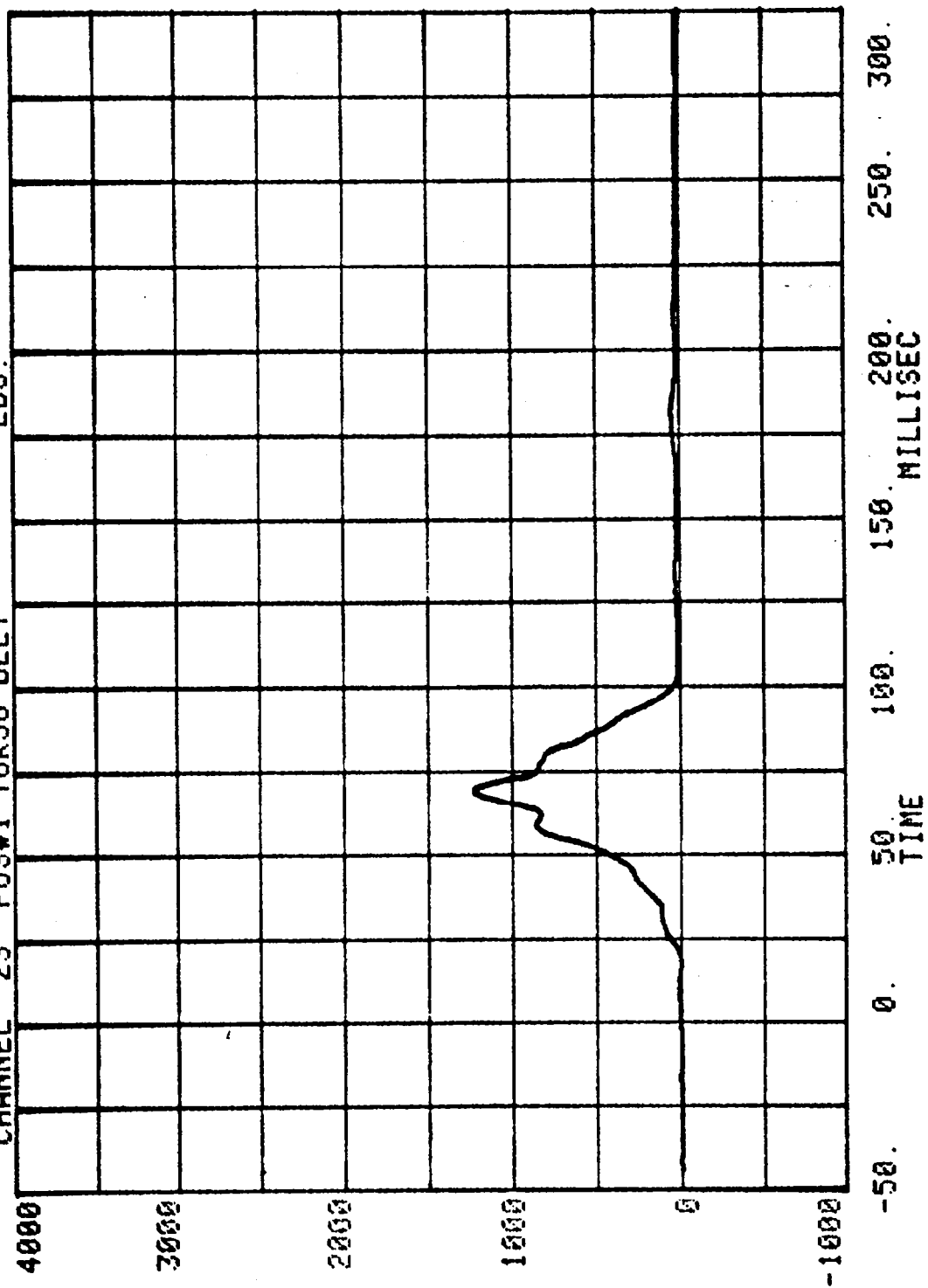
RUN= 938 SERIES= 5400
CHANNEL 12 POS#1 RIGHT FEMUR LBS.

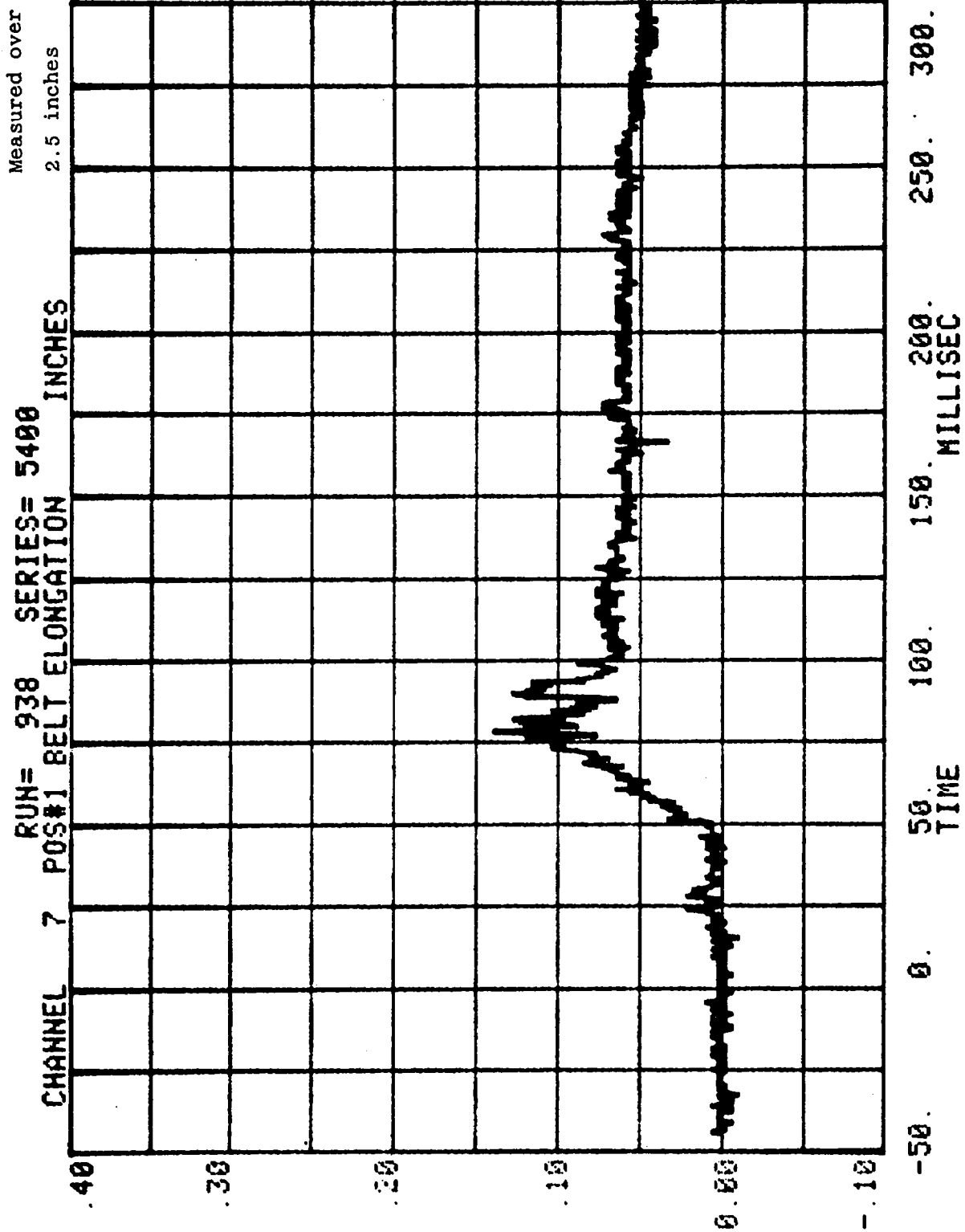


CHANNEL 23 POS#1 TORSO BELT LBS.

RUN= 938

SERIES= 5400





HEAD INJURY CRITERION
HEAD SEVERITY INDEX
26MS. MAXIMUM DURATION

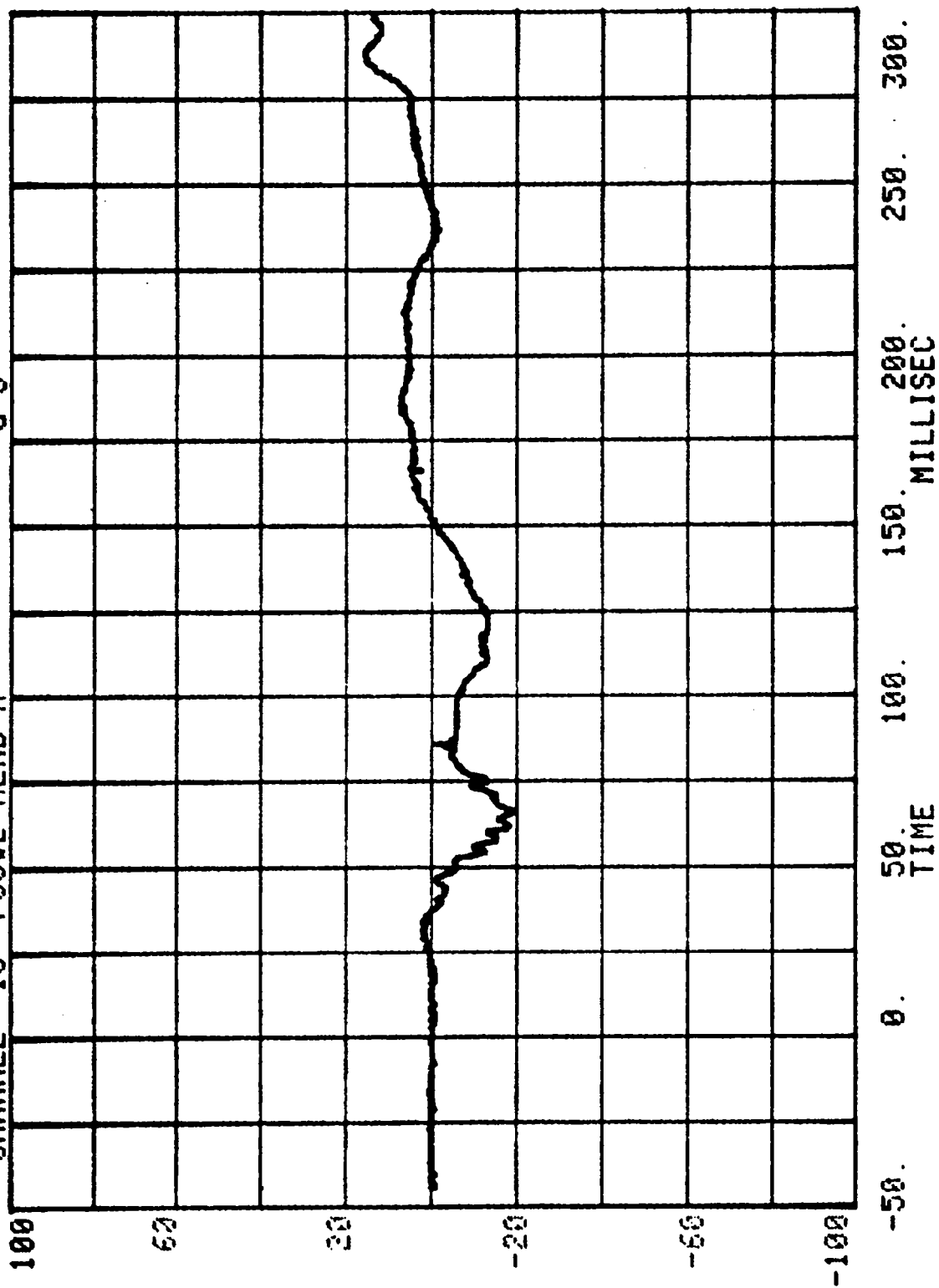
NEW CAR ASSESSMENT PROGRAM - 1990

RUN= 938

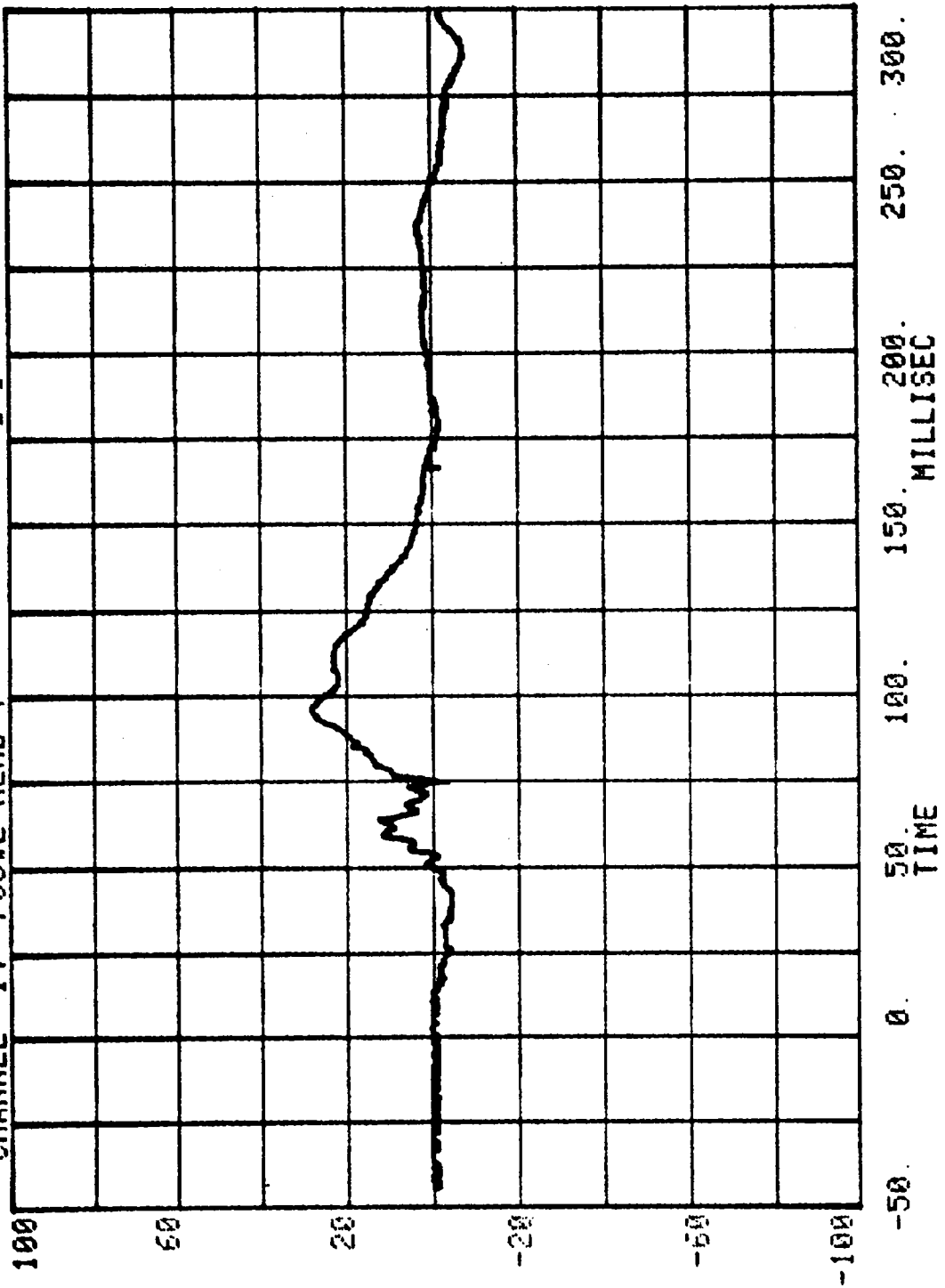
POS#2 HEAD R

HIC= 531.4 FROM T1= .07215 TO T2= .10615
AVERAGE ACCELERATION BETWEEN T1 AND T2= 46.5G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX= 847.5

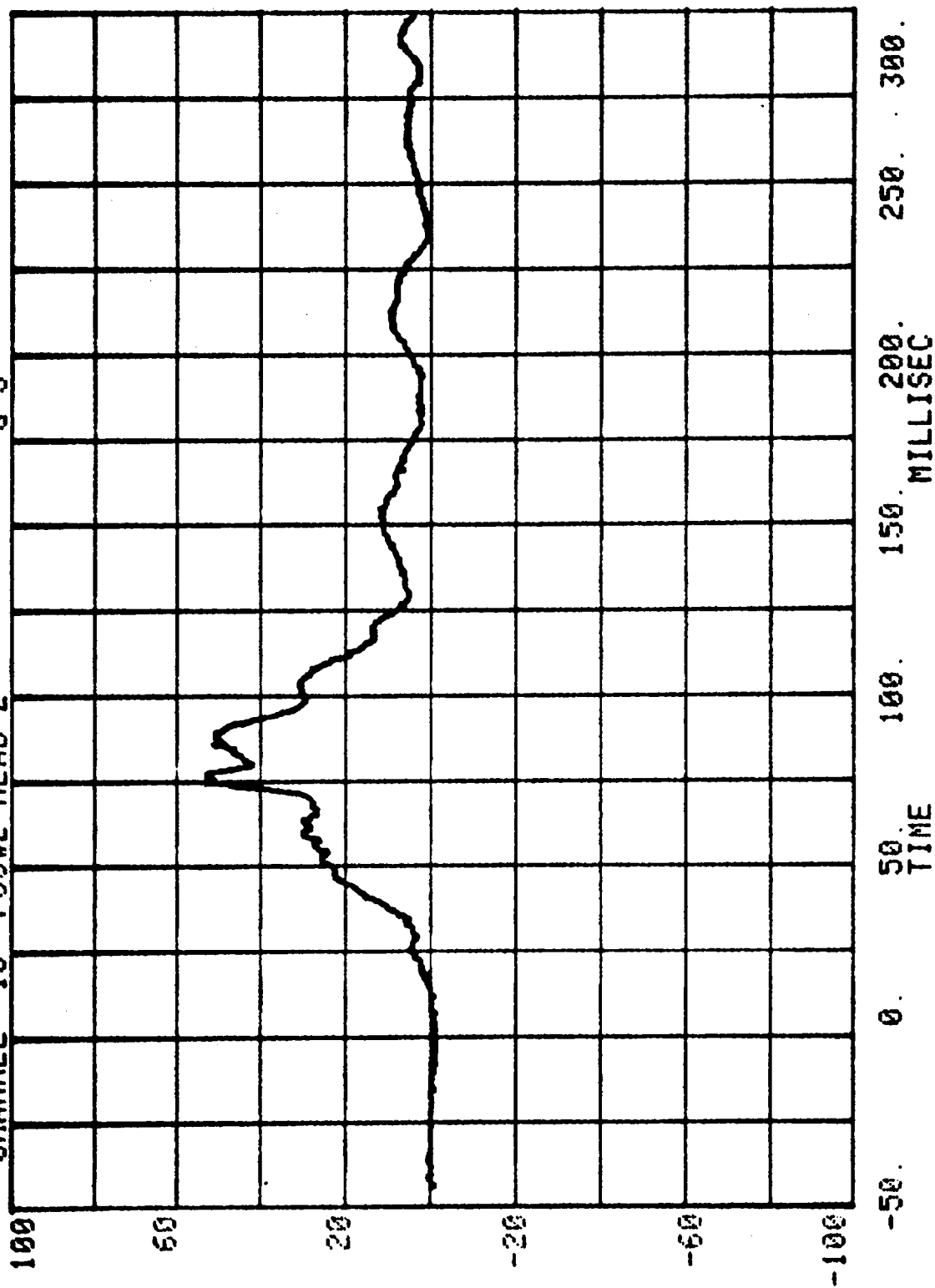
RUN= 938 SERIES= 5400
CHANNEL 13 POS#2 HEAD X G'S



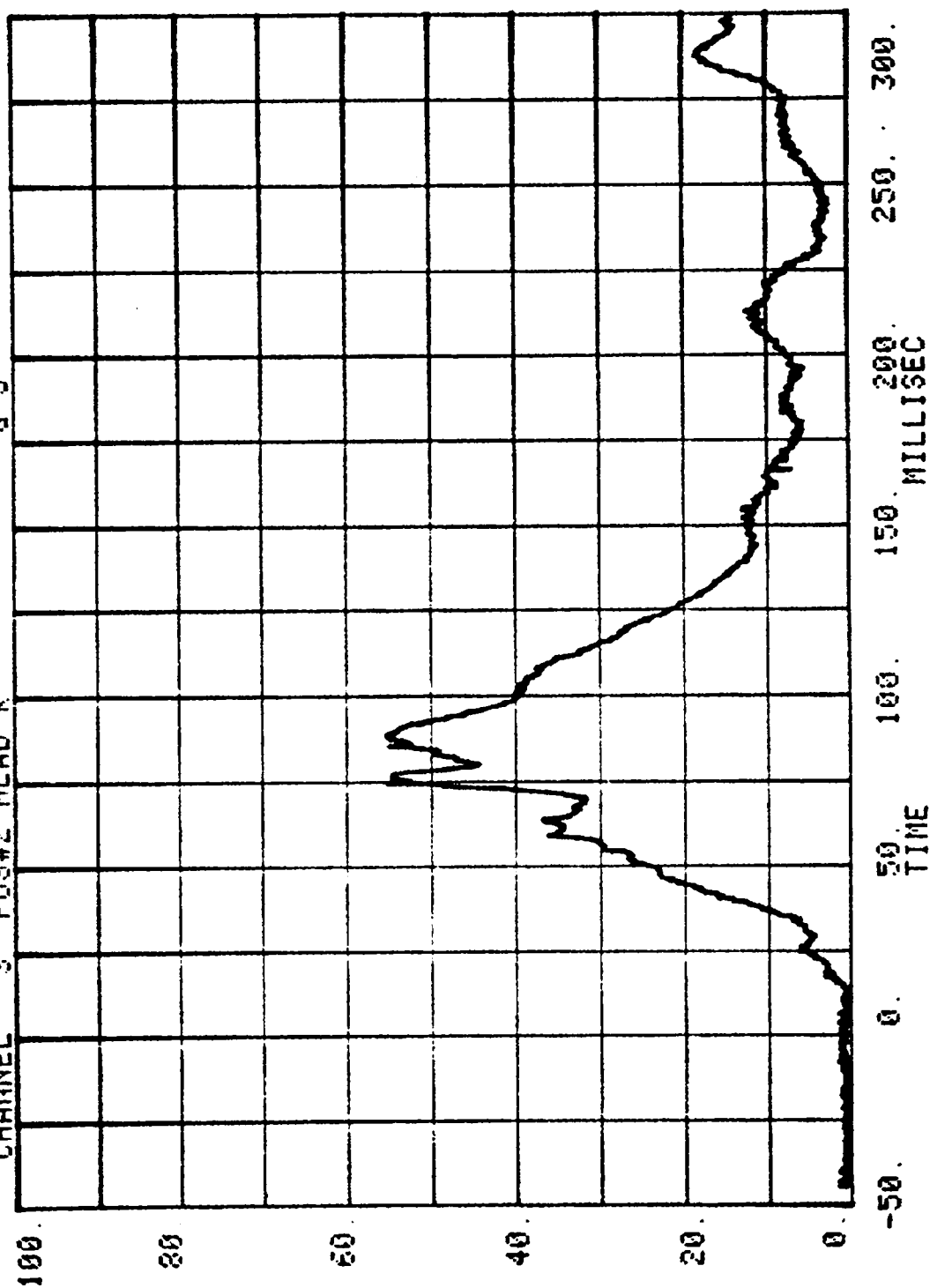
RUN= 938 SERIES= 5400
CHANNEL 14 POS#2 HEAD Y G'S



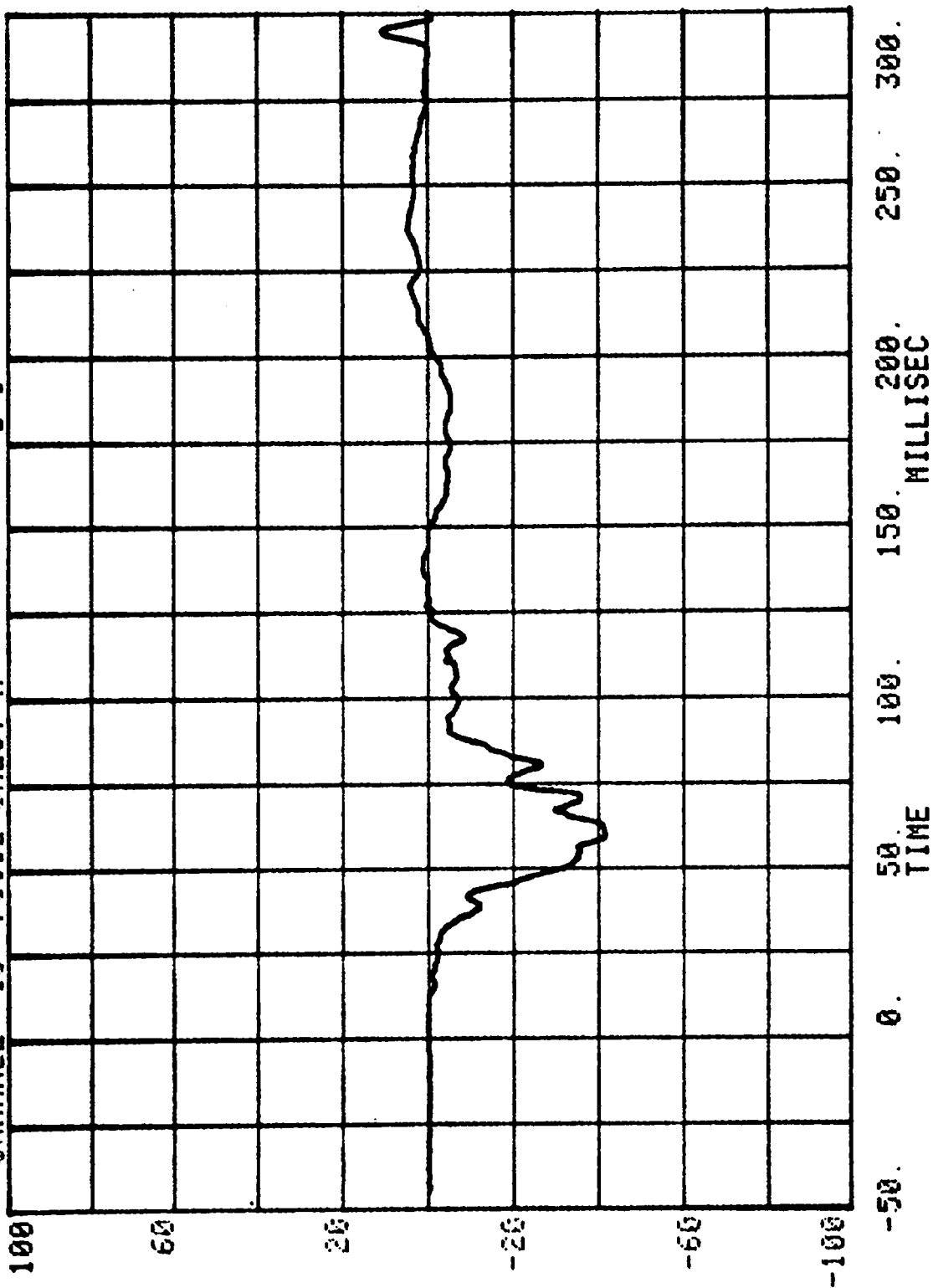
CHANNEL 15 POS#2 HEAD 2 RUN= 938 SERIES= 5400 G'S



CHANNEL 3 POS#2 HEAD R FUH= 938 SERIES= 5400 G'S

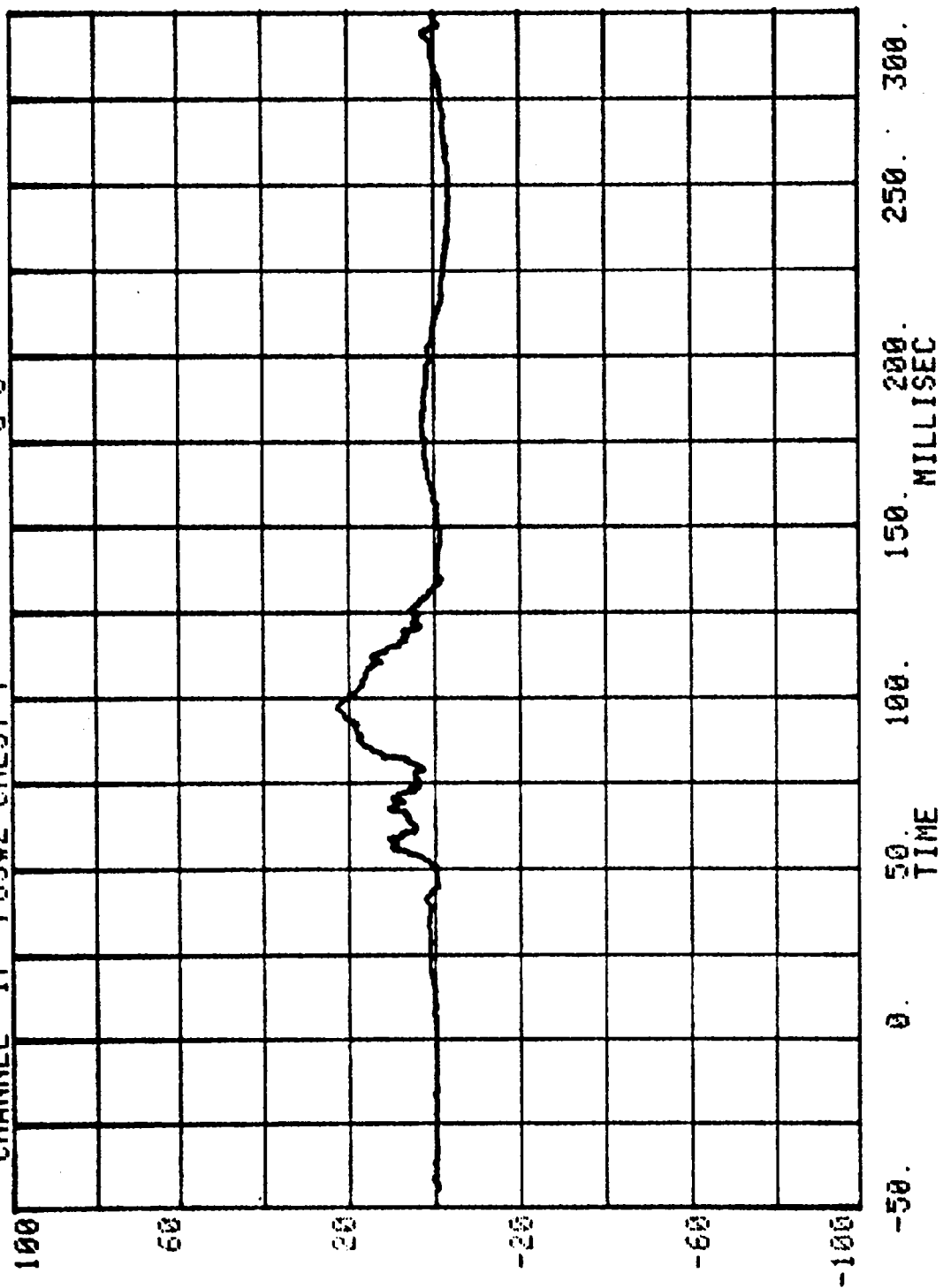


CHANNEL 16 POS#2 CHEST X
RUN= 938 SERIES= 5400 G'S



CHANNEL 17 POS#2 CHEST Y G'S

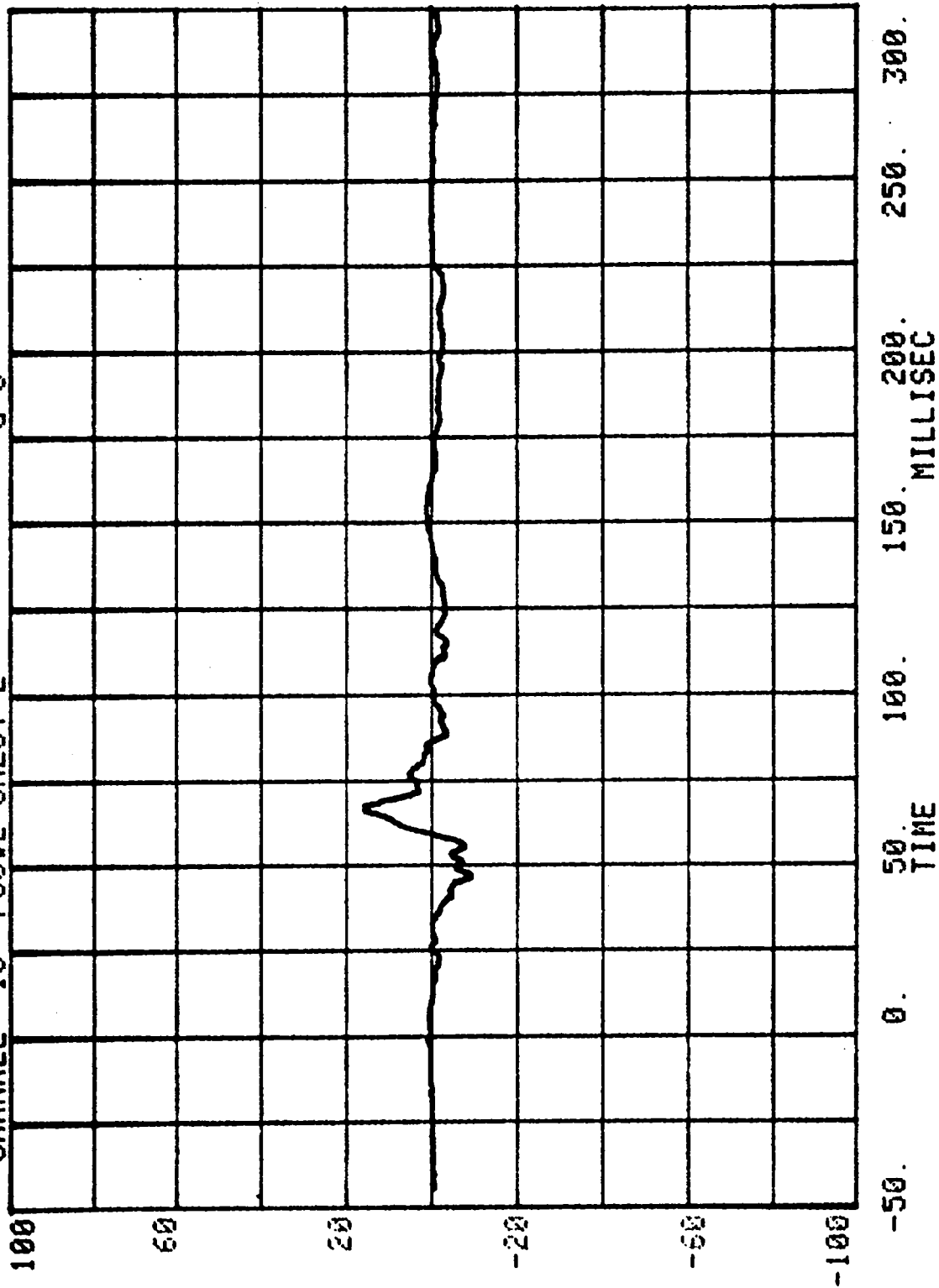
RUN= 938 SERIES= 5400



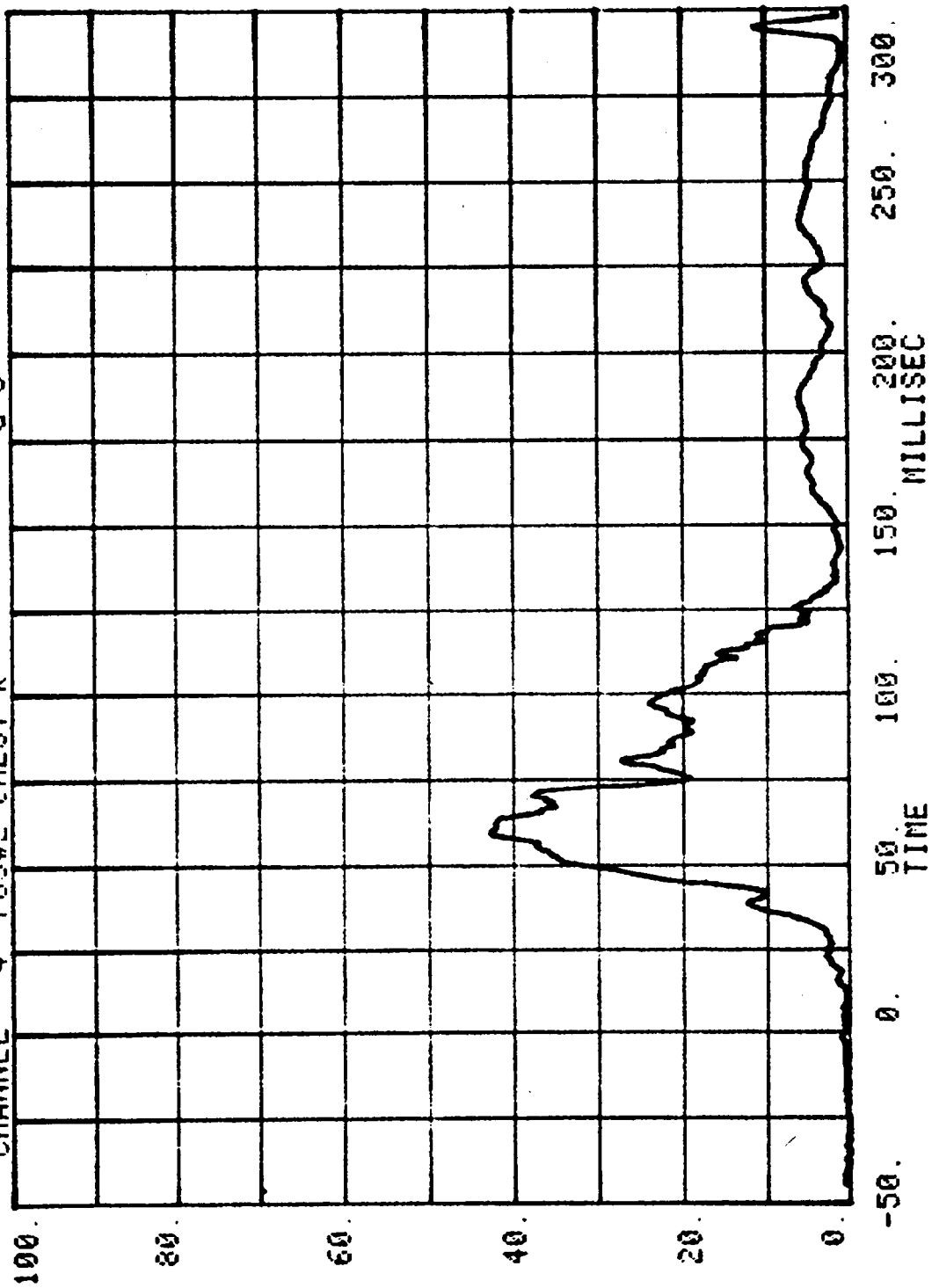
CHANNEL 18 POS#2 CHEST Z G'S

RUN= 938

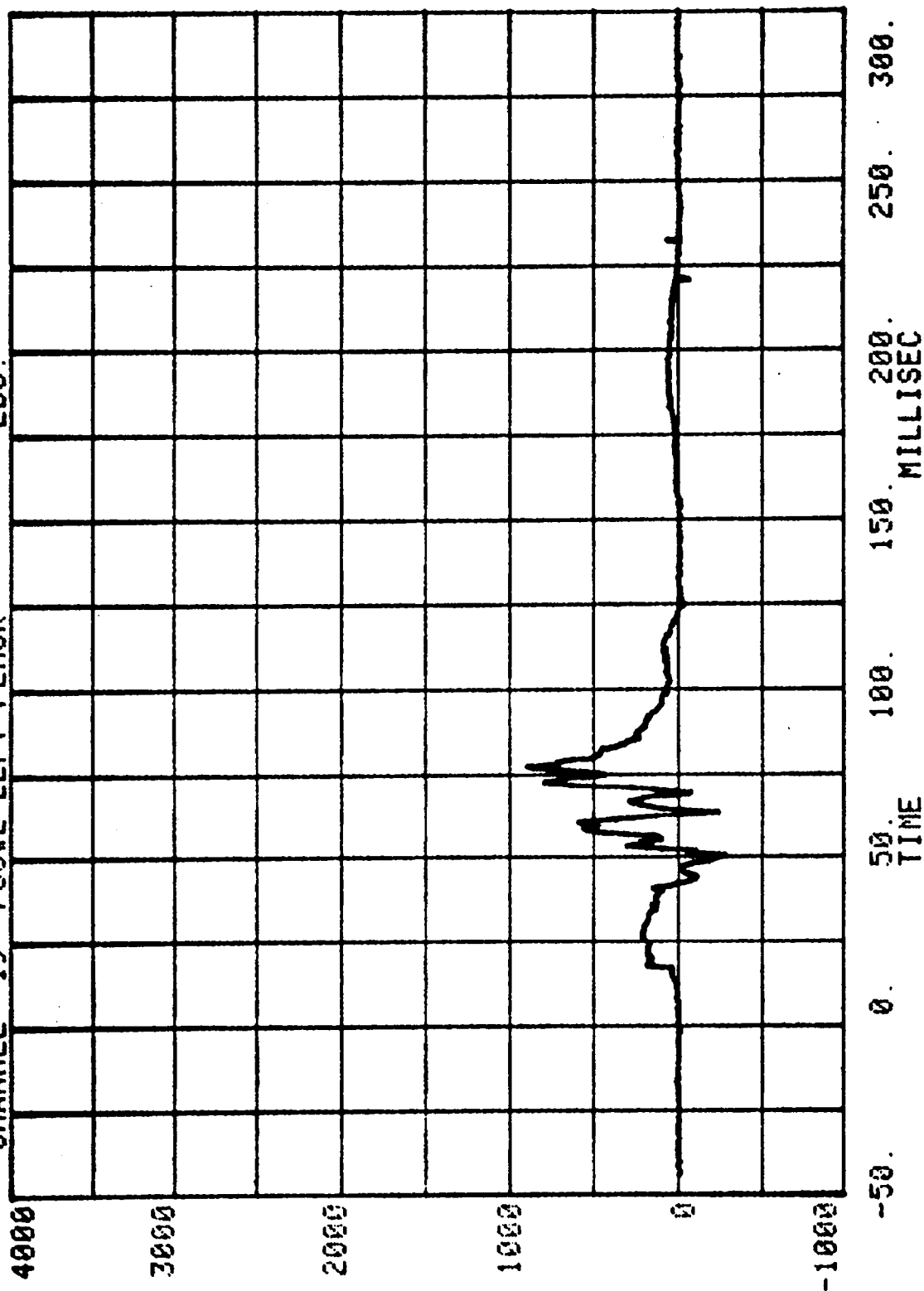
SERIES= 5400



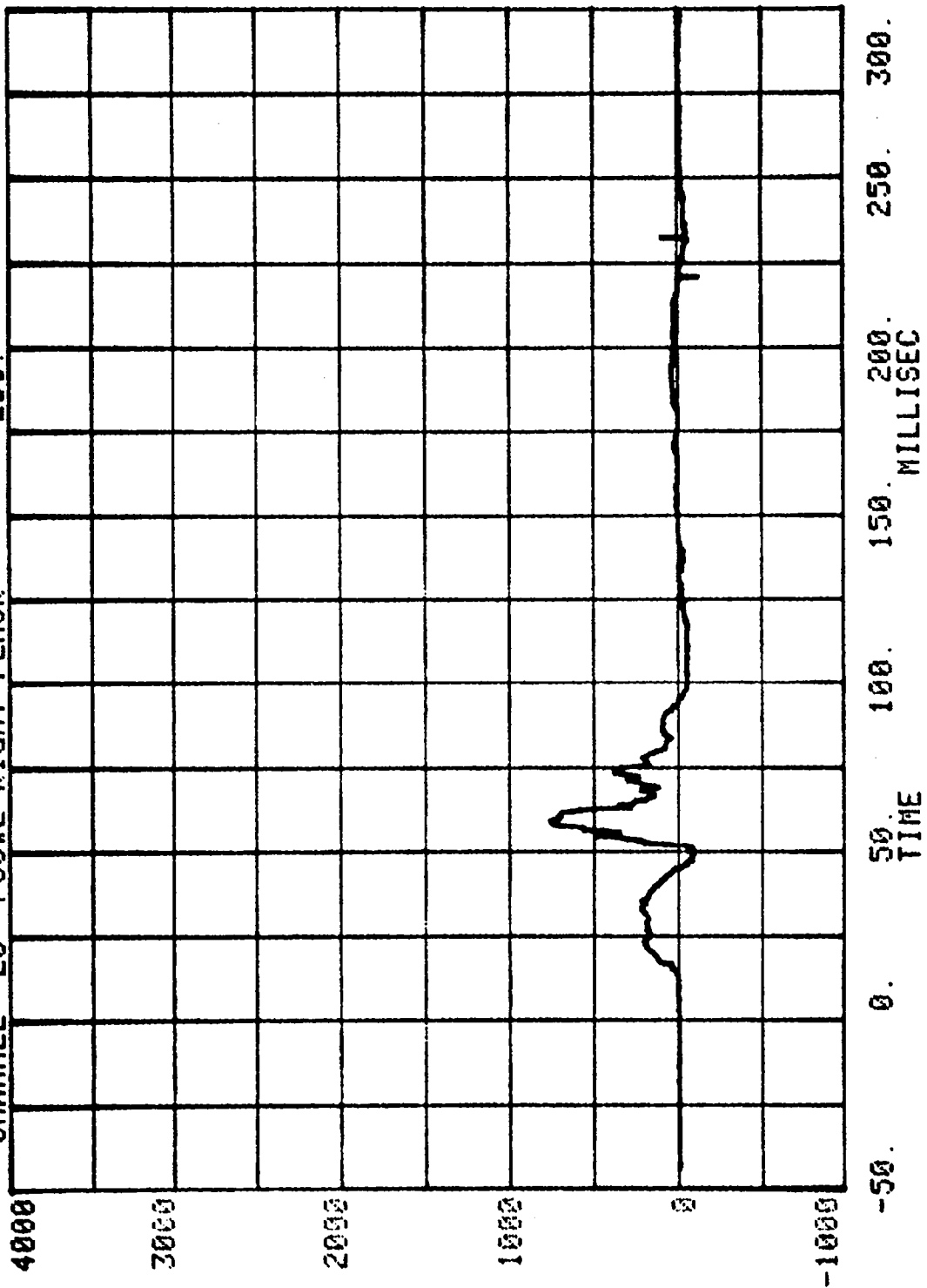
CHANNEL 4 POS#2 CHEST R RUN= 938 SERIES= 5400 G'S



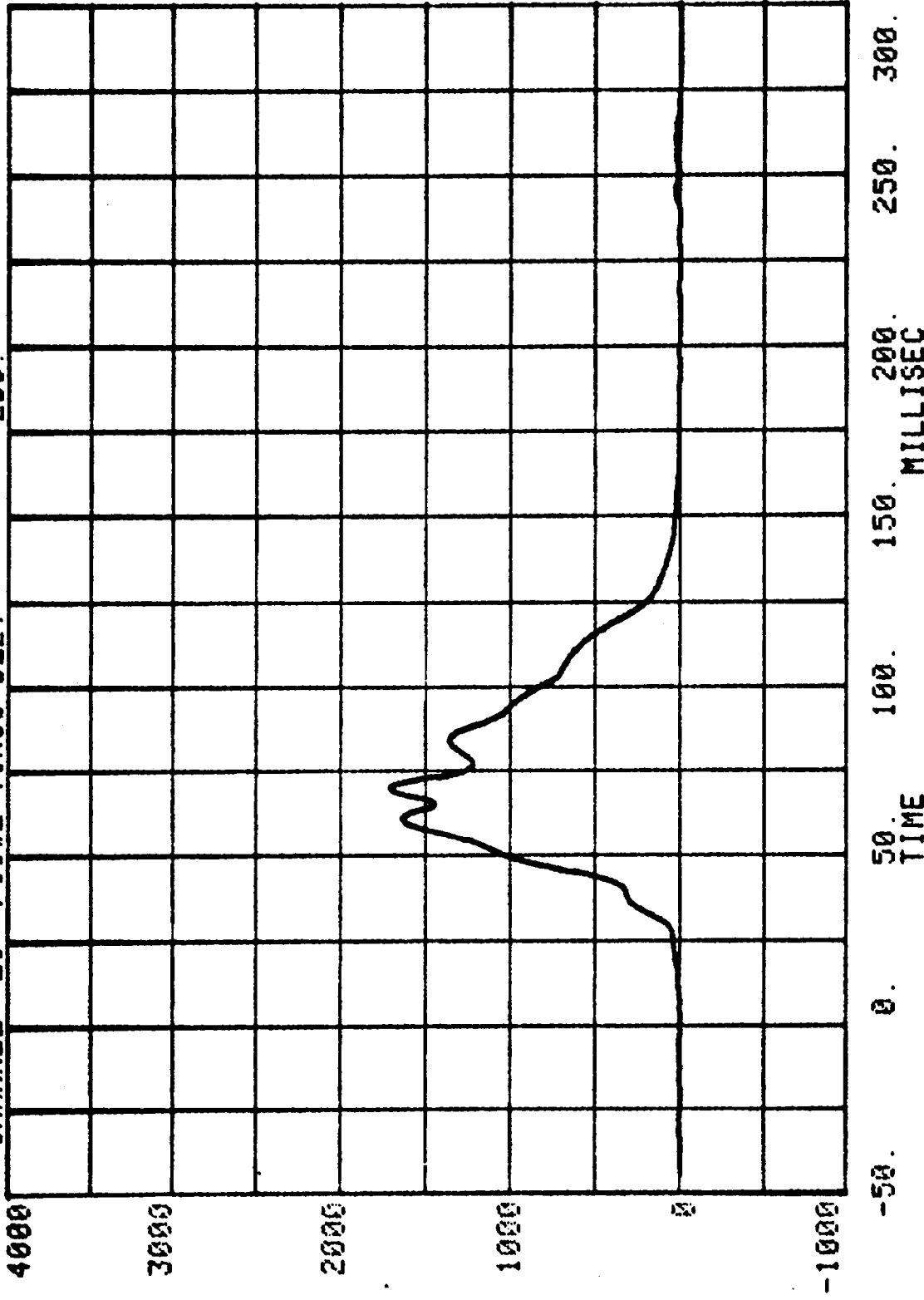
CHANNEL 19 POS#2 LEFT FEMUR LBS.
RUN= 938 SERIES= 5400

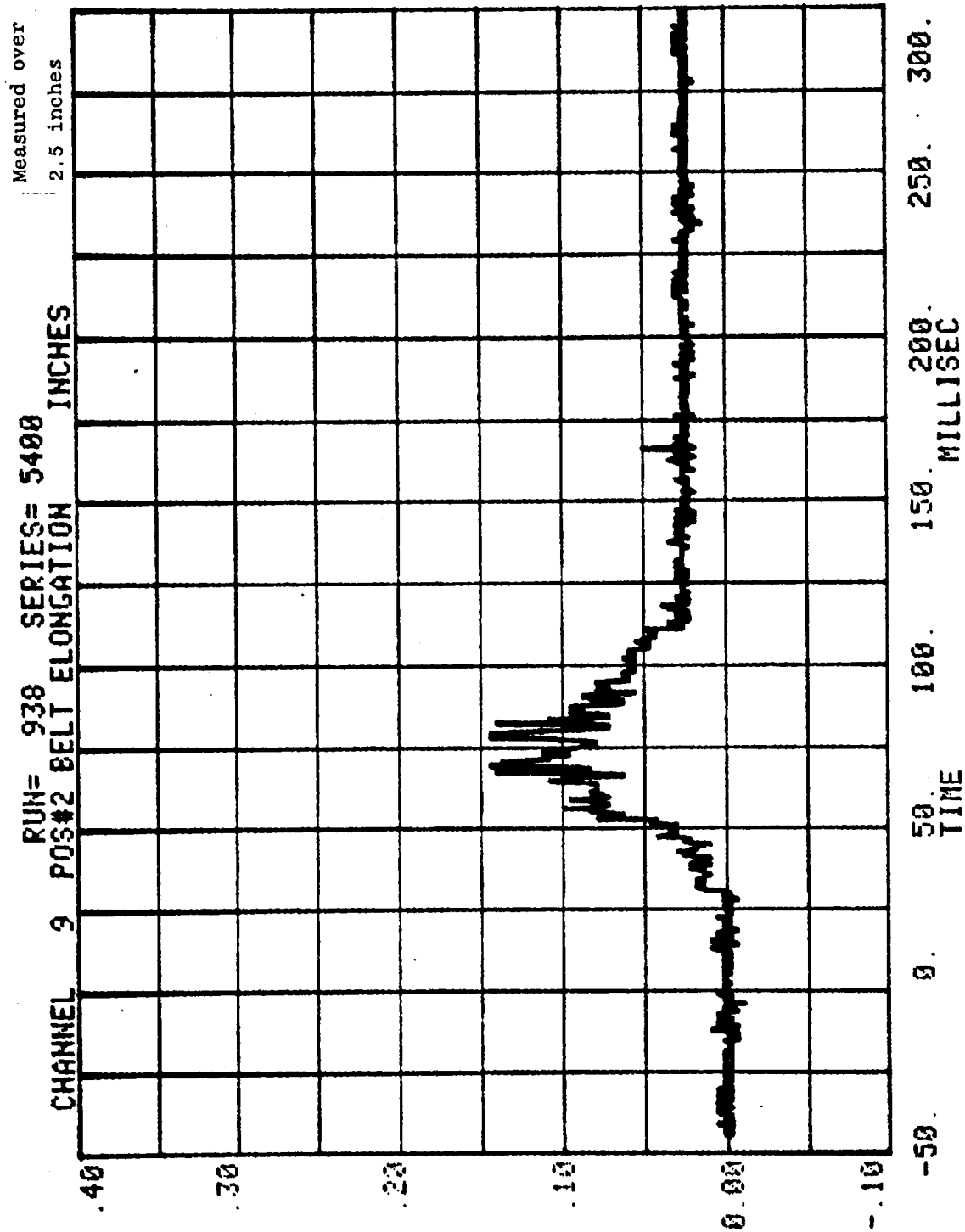


CHANNEL 20 POS#2 RIGHT FEMUR
RUN= 938 SERIES= 5400 LBS.



RUN= 938 SERIES= 5400 LBS.
CHANNEL 26 POS#2 TORSO BELT





Appendix C

DUMMY CERTIFICATION TESTS

7776-1

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:

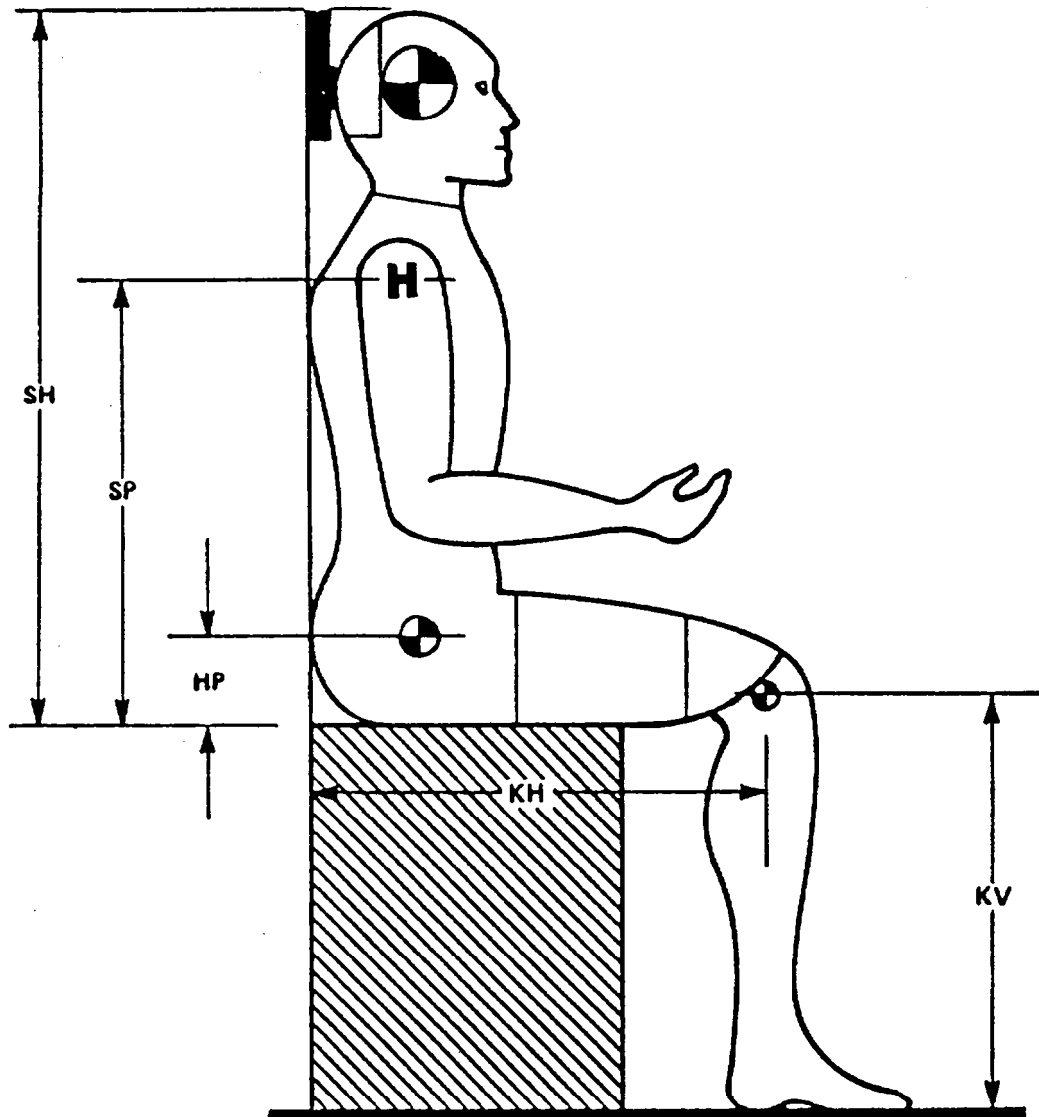
<u>Serial No.</u>	<u>Completion Data</u>
357	9-14-89
358	9-15-89

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.

7776-1

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	XXXXXXXXXXXXXX	9-14-89	
VERIFICATION NUMBER FOR DUMMY (*)	XXXXXXXXXXXXXX	1	
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		9-14-89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		1	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		69-70 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		41-50 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	213 G's	G's
b. peak lateral accel.	<= 10 G's	1.6 G's	G's
c. Time above 100 G's	0.9 to 1.5 ms.	1.38 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: 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.	22.1 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	23.2 G's	
c. Peak Resultant Head Acceleration		26 G's max.	25 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	2 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	26 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	3.9 ms	
g. Max. Head Rotation		63 to 73 deg.	68 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.	26.5 ms	
	Displ.	2.1 to 3.1"	2.55 "	
60 deg.	Time	40.3 to 51.7 ms.	41 ms	
	Displ.	4.3 to 5.3"	4.75 "	
Maximum	Time	53.2 to 66.8 ms.	53.7 ms	
	Displ.	5.0 to 6.0"	5.6 "	
60 deg.	Time	67.0 to 83.0 ms.	68.1 ms	
	Displ.	4.3 to 5.3"	5.0 "	
30 deg.	Time	85.4 to 104.6 ms.	86.4 ms	
	Displ.	2.1 to 3.1"	2.55 "	
0 deg.	Time	101.0 - 123.0 ms.	101.9 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKIEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

		PRE-TEST (if required)	POST-TEST (if required)
TEST PARAMETER	SPECIFICATION		
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.	38 lbs	
c. Force @ 1.0"	50 to 63 lbs.	55 lbs	
d. Force @ 1.3"	73 to 88 lbs.	86 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	27.5 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	41 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	52.5 lbs	
d. Return Angle	12 deg. maximum	6 deg	
5. CHEST IMPACT TESTS:			
A. High Speed			
(1) Probe Speed	21.78-22.22 fps.	21.9 fps	
(2) Peak Deflection	1.7" maximum	1.5 "	
(3) Peak Resistive Force	2250 lbs maximum	2090 lbs	
(4) Internal Hysteresis	50 to 70%	58.8 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	14.1 fps	
(2) Peak Deflection	1.1" maximum	1.05 "	
(3) Peak Resistive Force	1450 lbs maximum	1416 lbs	
(4) Internal Hysteresis	50 to 70%	55.2 %	

TECHNICIAN'S NAME: IVAN MINKIEWICZ

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

		PRE-TEST (if required)	POST-TEST (if required)
TEST PARAMETER	SPECIFICATION		
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	2046 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	6.83 fps	
(2) Maximum Force	1850 to 2500 lbs	1973 lbs	
(3) Time Above 1000 lbs.	1.7 ms. minimum	1.75 ms	

REMARKS:

TECHNICIAN'S NAME: IVAN MINKIEWICZ

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	6-89	12-89
HY LATERAL--	ENDEVCO	CK78	6-89	12-89
HZ VERTICAL--	ENDEVCO	CD75	6-89	12-89
2. CHEST ACCELEROMETER--				
CX LONGITUDINAL--	CEC	A115	6-89	12-89
CY LATERAL--	ENDEVCO	CS09	6-89	12-89
CZ VERTICAL--	CEC	A29	6-89	12-89
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	548	6-89	12-89
RIGHT SIDE	GSE	549	6-89	12-89
CALIBRATION LABORATORY INSTRUMENTS--				
1. PENDULUM ACC.--	CEC	A144	6-89	12-89
2. TEST PROBE ACCELEROMETER--	CEC	A142	6-89	12-89
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS- DUCER INC	20051	7-89	1-90
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	7-89	1-90
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	7-89	1-90

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	XXXXXXXXXXXXXX	9-15-89	
VERIFICATION NUMBER FOR DUMMY (*)	XXXXXXXXXXXXXX	1	
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		9-15-89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		1	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		69-70 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		44-50 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	224 G's	G's
b. peak lateral accel.	<= 10 G's	4.2 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

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.	22.1 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	23.9 G's	
c. Peak Resultant Head Acceleration		26 G's max.	25.69 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	2.36 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	26.04 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	3.84 ms	
g. Max. Head Rotation		63 to 73 deg.	66.6 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.	26.29 ms	
	Displ.	2.1 to 3.1"	2.41 "	
60 deg.	Time	40.3 to 51.7 ms.	41.42 ms	
	Displ.	4.3 to 5.3"	4.99 "	
Maximum	Time	53.2 to 66.8 ms.	54.0 ms	
	Displ.	5.0 to 6.0"	5.78 "	
60 deg.	Time	67.0 to 83.0 ms.	67.83 ms	
	Displ.	4.3 to 5.3"	4.96 "	
30 deg.	Time	85.4 to 104.6 ms.	86.43 ms	
	Displ.	2.1 to 3.1"	2.11 "	
0 deg.	Time	101.0 - 123.0 ms.	101.19 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKIEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 358

		PRE-TEST (if required)	POST-TEST (if required)
TEST PARAMETER	SPECIFICATION		
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.	39.5 lbs	
c. Force @ 1.0"	50 to 63 lbs.	55 lbs	
d. Force @ 1.3"	73 to 88 lbs.	79 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	27 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	38 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	51.5 lbs	
d. Return Angle	12 deg. maximum	11 deg	
5. CHEST IMPACT TESTS:			
A. High Speed			
(1) Probe Speed	21.78-22.22 fps.	21.9 fps	
(2) Peak Deflection	1.7" maximum	1.49 "	
(3) Peak Resistive Force	2250 lbs maximum	2073 lbs	
(4) Internal Hysteresis	50 to 70%	63.4 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	14.1 fps	
(2) Peak Deflection	1.1" maximum	1.07 "	
(3) Peak Resistive Force	1450 lbs maximum	1414 lbs	
(4) Internal Hysteresis	50 to 70%	58.7 %	

TECHNICIAN'S NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 35B

		PRE-TEST (if required)	POST-TEST (if required)
TEST PARAMETER	SPECIFICATION		
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	2287 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	1995 lbs	
(3) Time Above 1000 lbs.	1.7 ms. minimum	1.75 ms	

REMARKS:

TECHNICIAN'S NAME: IVAN MINKIEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER 358

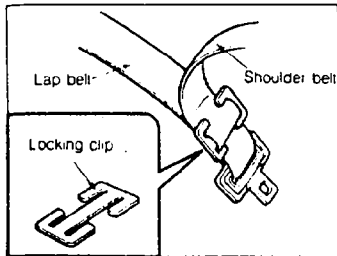
DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	EL86	10-89	4-90
HY LATERAL--	ENDEVCO	FR42	10-89	4-90
HZ VERTICAL--	ENDEVCO	GD35	10-89	4-90
2. CHEST ACCELEROMETER--				
CX LONGITUDINAL--	CEC	A150	6-89	12-89
CY LATERAL--	ENDEVCO	CH35	6-89	12-89
CZ VERTICAL--	CEC	A151	6-89	12-89
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	551	6-89	12-89
RIGHT SIDE	GSE	552	6-89	12-89
CALIBRATION LABORATORY INSTRUMENTS--				
1. PENDULUM ACC.--	CEC	A144	6-89	12-89
2. TEST PROBE ACCELEROMETER--	CEC	A142	6-89	12-89
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS- DUCER INC	20051	7-89	1-90
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	7-89	1-90
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	7-89	1-90

Appendix D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

SEAT BELTS

Seat Belts



4. To install the locking clip, insert the webbing through the recesses of the locking clip near the seat-belt latch.
5. After securing the belt with the locking clip, tuck the shoulder portion of the belt between the child-restraint system and the seat back.

NOTE

When your child-restraint system is not installed, store the locking clip in the glove box to prevent its loss.

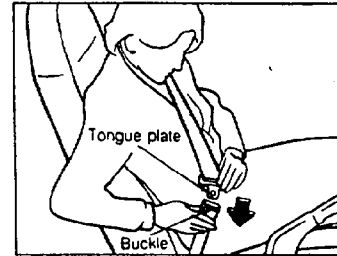
WARNING!

- **Never wear the shoulder belt under the arm.**
- **Never swing it around your neck and over the inside shoulder.**
- **Never use a single belt for more than one person at a time.**
- **Be sure the lap portion of the belt is fitted snugly around the hips, not the waist.**
- **Use the shoulder belt on the outside shoulder only.**

Failure to follow these precautions could increase the chance and severity of injury.

NOTE

If the belt locks when being pulled out, rewind it completely in the retractor, then pull it out to the desired length.



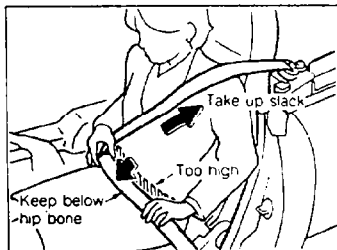
To fasten seat belt

1. Grasp the buckle and tongue plate.
2. Slowly pull out the lap/shoulder belt.
3. Insert the tongue plate into the open end of the buckle until an audible click is heard. An audible click will come out when the belt is securely locked.

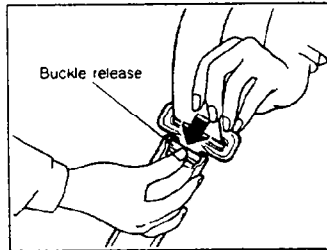
(cont'd)

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SEAT BELTS

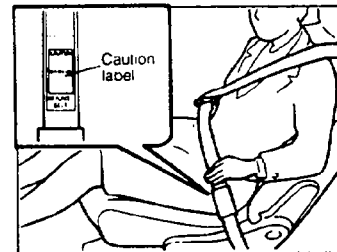


Position the lap belt across your lap as **LOW ON THE HIPS** as possible to reduce the risk of sliding under it during an accident. Adjust the belt to a **SNUG FIT** by pulling it. The belt retractor is designed to take up excess webbing automatically and to maintain tension on the belt.



To unfasten seat belt

Depress the buckle release.



SEAT-BELT CAUTION LABEL

A caution label has been placed inside the sleeve of the lap belt of your vehicle's seat belts. When an accident occurs while the seat belt is in use, the resulting stress on the belt will cause the caution label to be pulled out of the sleeve. This indicates that **the seat belt must be replaced**.

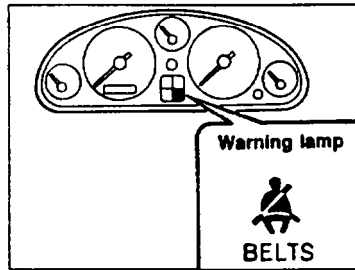
Also note that if at any time the seat belt has undergone stress because of an accident, etc.—there may be damage to the seat belt's webbing, metal fittings, or anchor bolt, even though nothing appears to be wrong with the belt. For this reason we recommend that the seat belt be replaced after it has undergone

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SEAT BELTS



stress, whether the caution label is or is not exposed

SEAT-BELT WARNING LAMP/BEEP

When you turn the ignition switch ON (II) without first having fastened your seat belt, a warning lamp will come on and a beep will sound. (For more detailed information, refer to Warnings and Indicators on page 4-15.)

Proper Use and Care of Seat-Belt System

To gain maximum effectiveness from the seat-belt system, follow these suggestions:

- Use the belts at all times—even on short trips.
- Never use the same belt for more than one person at a time.
- Avoid wearing twisted belts.
- Keep sharp edges and damaging objects away from the belts and other parts of the restraint system.
- Periodically inspect belt webbing, anchors, buckles, and all other parts for signs of wear, damage, and weakness. Replace questionable parts immediately.
- To clean the belt webbing, use any mild soap solution recommended for cleaning upholstery or carpets; follow the instructions provided with the soap. Do not bleach or redye the webbing because this may weaken it.
- No modifications or additions should be made by the user.
- After wearing a seat belt, make sure it is not caught on the adjusting levers or elsewhere.

(cont'd)

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