

DOT 1361

CALSPAN REPORT NO. 7735-1

**OPTIONAL NEW CAR ASSESSMENT PROGRAM (OPTIONAL NCAP)
FRONTAL BARRIER IMPACT TEST**

NISSAN MOTOR CO. LTD.
1989 NISSAN PICK UP
HARDBODY STANDARD

Test No. 916-010-911
July 11, 1989

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



FINAL REPORT

Sponsored By:

NISSAN MOTOR CORPORATION, LTD.

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**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 1989 Nissan 2-Door Pickup was performed at the Calspan Advanced Technology Center crash test facility in Buffalo, New York, on July 11, 1989. The impact speed was 35.0 mph and the ambient temperature was 79°F. The maximum vehicle crush was 18.8 inches. The test vehicle was equipped with a 3-point continuous restraint system for both outboard positions. With regard to FMVSS 208 - "Occupant Crash Protection," injury criteria, both the driver and passenger dummies appear to satisfy head, chest and femur requirements. Position #1 - right femur's data was lost approximately 110 msec after T_0 . Data was recorded accurately previous to this point and the load cell did not exceed the maximum femur load during the period from 0 to 110 msec.					
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF FRONTAL BARRIER IMPACT TEST	2-1
3	OCCUPANT AND VEHICLE INFORMATION	3-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA	B-1
APPENDIX C	DUMMY CONFIGURATION TESTS	C-1
APPENDIX D	VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS	D-1

LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	Part 572 Dummy In-Vehicle Position	3-3
2	Occupant Clearance Dimensions	3-4
3	Seat Belt Positioning Data	3-5
4	Driver Dummy to Steering Column/Wheel Dimensions	3-7
5	Camera Positions for Frontal Impacts	3-8
6	Vehicle Target Locations	3-10
7	Load Cell Locations on Fixed Barrier	3-11
8	Vehicle Accelerometer Locations	3-12
9	Test Vehicle Measurements	3-13
10	Dummy Configuration Dimensions	C-3

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	General Test and Vehicle Data	2-2
2	Dummy Injury Criteria Values	3-2
3	Seat Belt Performance Assessment Test Data	3-6
4	High Speed Camera Locations	3-9
5	Vehicle Measurements	3-14

Section 1
PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test was conducted as part of the Optional New Car Assessment Program (Optional NCAP). The program provides manufacturers with an opportunity to retest any of their vehicles that were tested in the New Car Assessment Program (NCAP) and subsequently modified with production changes to improve occupant protection. These Optional NCAP test results will be published by NHTSA in a regular NCAP press release.

This Optional NCAP test was conducted in accordance with the current "Laboratory Indicant Test Procedures for the New Car Assessment Program" prepared by the Office of Market Incentives.

Section 2
SUMMARY OF TEST NUMBER 916-010-911

A load cell barrier consisting of 36 load cells was impacted by a 1989 Nissan Hardbody Standard Pickup at a velocity of 35.0 mph. The test was performed at the Calspan Corporation Advanced Technology Center on July 11, 1989. Pre-test 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. These ATDs had been certified prior to the test and certification details, along with the instrumentation calibration data, are 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. Position #1 - right femur experienced a cut wire approximately 110 msec after T_0 .

The driver's head struck the steering wheel rim and his HIC was 741.8. The maximum chest deceleration over 3 milliseconds was 46.3 g's and the left femur load was 793.8 pounds.

The right front passenger's head struck his right knee and his HIC was 965.4. The maximum chest deceleration over 3 milliseconds was 35.0 g's and femur loads were 621.0 and 331.6 pounds.

Table 1

GENERAL TEST AND VEHICLE DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1989 Nissan Hardbody Standard PickupNHTSA NO.: N/A VIN.: 1N6NA11S9KC-305950BODY COLOR: Grey DATE OF MANUFACTURE: October, 1988

Engine: 4 cylinders; - C.I.D.; 2.4 Liters; - CC
X Gas; - Diesel; - Turbocharged
X Longitudinal; - Transverse

Transmission: 4 Speed X Manual; - Automatic; - Overdrive
 Final Drive: - Front Wheel; X Rear Wheel; - Four Wheel

Date Received: 3/27/89 Odometer Reading: 33
- A/C; - P/S; X P/B; - P/wdo.; - Tilt Wheel
- P/seats; - Cruise Control

Type of Occupant Restraint: 3 point continuous restraint systemDATA RECORDED FROM VEHICLE'S TIRE PLACARD:Tire Pressure (at capacity): Front 26 psi, Rear 34 psiRecommended Tire Size: P185/75R14Recommended Cold Tire Pressure: Front 26 psi, Rear 35 psiTires on Vehicle: P185/75R14; Manufacturer: GoodyearNumber of Occupants: 3 Front; - Rear; - 3rd Seat; 3 TOTALType of Front Seats: - Bucket; X Bench; - Split BenchType of Front Seat Back: X Fixed; - Adj. With - Lever - Rot. KnobVehicle Capacity Weight (VCW) = -- lbs. (A)No. of Occupants x 150 lbs. = -- lbs. (B)

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

GVWR 4000 lbs. GAWR: Front 2200 lbs. Rear 2200 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 = 740 lbs. Right Rear = 610 lbs.
 Left Front = 770 lbs. Left Rear = 550 lbs.
 TOTAL FRONT WEIGHT = 1510 lbs. (57 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1160 lbs. (43 % of Total Vehicle Weight)
 TOTAL DELIVERY WEIGHT = 2670 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (2670 lbs.)
 VCW = Vehicle Capacity Weight (-- lbs.)
 DSC = Designated Seating Capacity (3)
 RCLW = VCW - 150 (DSC) = 300 lbs.
 Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)
 Target Test Weight = 3298 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 332 POUNDS CARGO:

Right Front = 850 lbs. Right Rear = 840 lbs.
 Left Front = 840 lbs. Left Rear = 800 lbs.
 TOTAL FRONT WEIGHT = 1690 lbs. (51 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1640 lbs. (49 % of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 3330 lbs.
 Weight of ballast secured in vehicle trunk area = 200 lbs.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 28.1 LF 28.9 RR 29.8 LR 30.8
 Test Attitude: RF 27.4 LF 28.0 RR 28.0 LR 28.9
 Wheel Base: 104.6 in.; C.G. = 51.5 in. rearward of front wheel C/L
 Remarks: _____

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

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0 °
 Date of Test: 7/11/89 Time of Test: 12:25
 Ambient Temperature: 79 °F at impact area
 Temperature in Occupant Compartment: 70 °F.
 Windshield Molding Temperature: 70 °F.
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: primary = 35.0 mph, secondary = 35.0 mph
 Distance From Front Bumper to Barrier Face When Entering Speed Trap: 52 inches; Exiting Speed Trap: 12 inches

VEHICLE REBOUND AND CRUSH (inches):

Vehicle Length:	Pre-test	= R	<u>173.9</u>	C _L	<u>175.1</u>	L	<u>173.9</u>
	Post-test	= R	<u>155.1</u>	C _L	<u>156.5</u>	L	<u>156.2</u>
	Crush	= R	<u>18.8</u>	C _L	<u>18.6</u>	L	<u>17.7</u>

Distance from front of test vehicle to point of impact:

R 12.2 C/L 14.1 L 17.4

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Upper steering rim</u>	<u>Right knee</u>
Chest	<u>No Contact</u>	<u>No Contact</u>
Abdomen	<u>Lower steering rim</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>

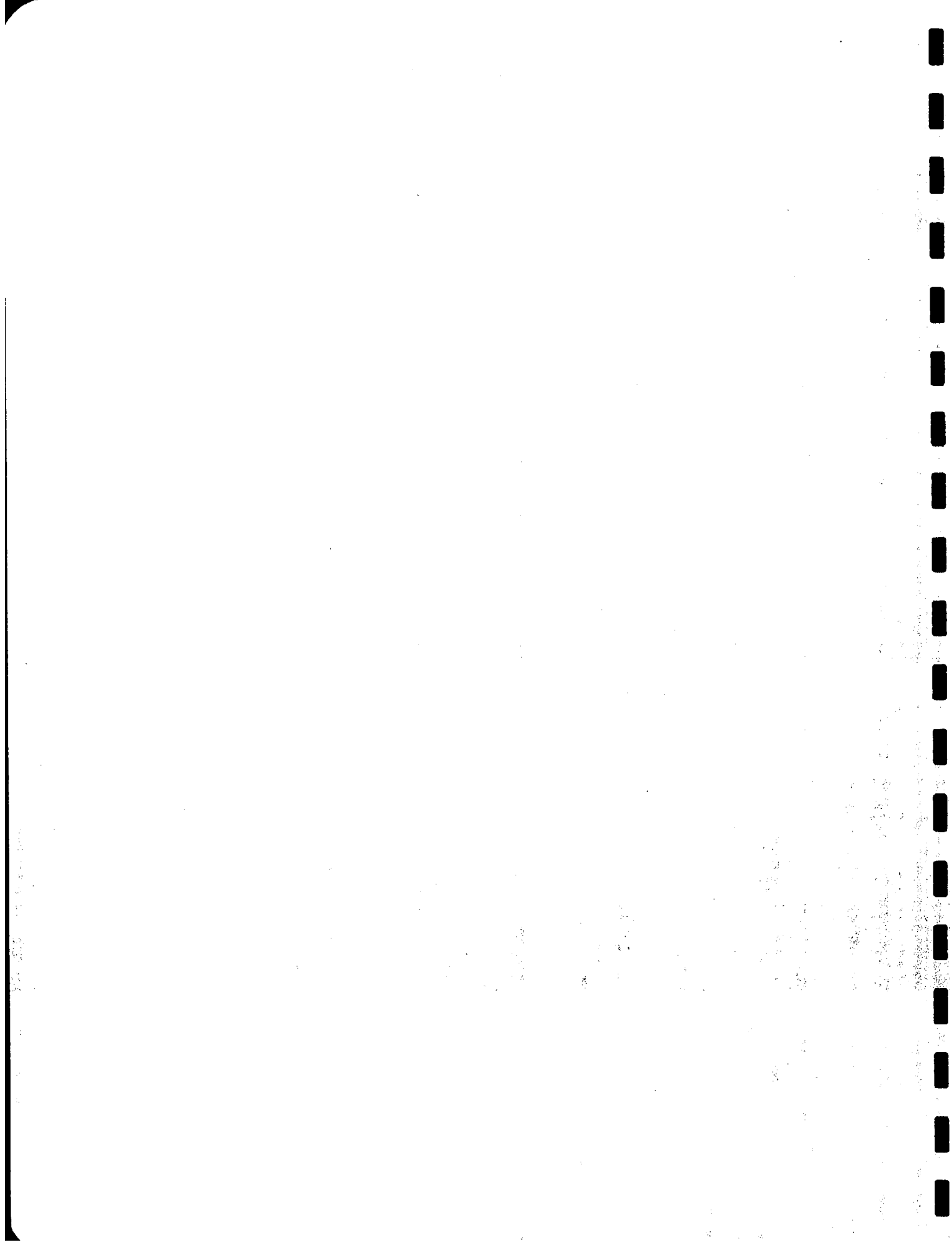
Table 1
GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	<u>Front</u>	
	<u>Left</u>	<u>Right</u>
Door Opening	<u>Not operable</u>	<u>Operable</u>

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

Glazing Damage

Backlight/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

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-84	-11	57	93.7	-49	-19	20	46.3
DUMMY (2)	-118	155	199	274.9	-35	26	-15	35.0
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE - FEMUR LOAD (LBS)	
	LEFT FEMUR	RIGHT FEMUR
DUMMY (1)	793.8	See Note
DUMMY (2)	621.0	331.6
DUMMY (3)		
DUMMY (4)		

	MAXIMUM FORCE - SEAT BELTS LOADS (LBS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	1860.0	-	1435.0
DUMMY (2)	1786.1	1891.9	-
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond max.		AVE. ACC. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
DUMMY (1)	741.8	0.05122	0.08722	53.2
DUMMY (2)	965.4	0.10672	0.10807	219.7
DUMMY (3)				
DUMMY (4)				

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

**AS DEFINED IN FMVSS NO. 208

Note: Position #1 Right Femur experienced a cut wire approximately 110 msec after T₀.

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION

TEST NO.: 916-010-911

VEHICLE: 1989 Nissan 2-Door Pickup

SEAT TYPE:

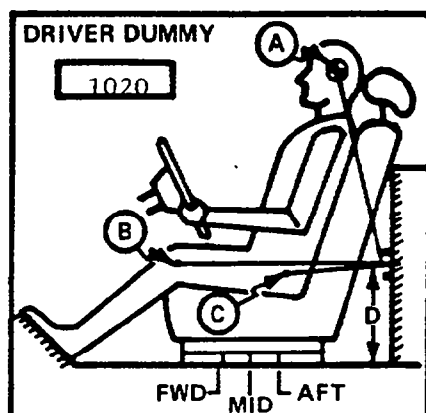
☒ Bench
☐ Bucket
☐ Split Bench

ADJUSTER TYPE:

☒ Manual
☐ Power

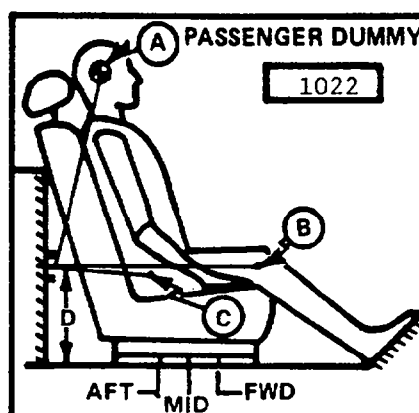
BUCKET SEAT BACK TYPE:

☒ Fixed
☐ Adjustable Reclining



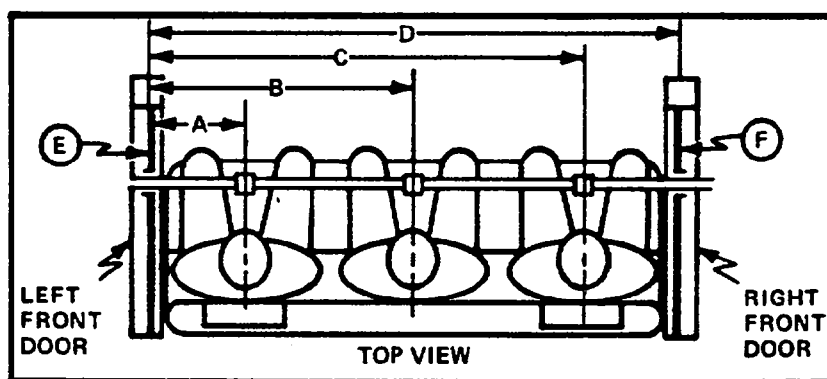
MEASUREMENT
LOCATION

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



A = 22.7 in. 13.0 Degrees
 B = 25.3 in. 98.0 Degrees
 C = 9.9 in. 120.0 Degrees
 D = 15.2 in.

A = 22.7 in. 11.0 Degrees
 B = 25.5 in. 95.0 Degrees
 C = 10.4 in. 118.0 Degrees
 D = 15.2 in.



1020

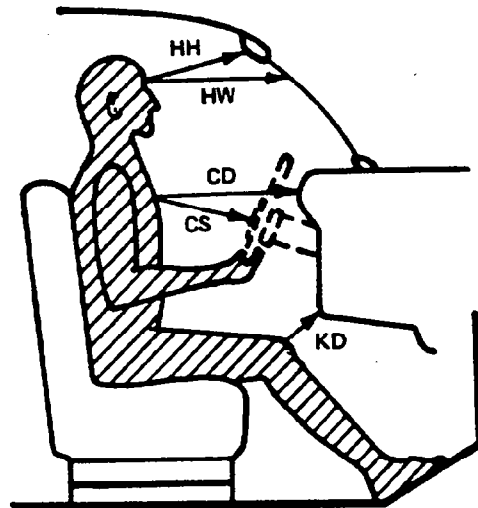
1022

A	=	Left Door to Driver Centerline	12.0 in.
B	=	Left Door to Center Passenger Centerline	- in.
C	=	Left Door to Right Passenger Centerline	41.1 in.
D	=	Left Door to Right Door	52.8 in.
E, F	=	Window Glass Height (Right and Left Must Be Equal)	13.0 in.

Figure 2

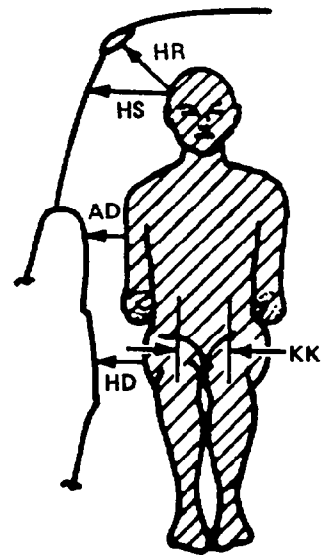
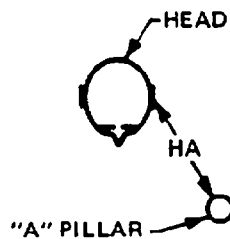
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	18.3	18.7
HW	22.9	22.8
CD	23.7	24.0
CS	13.6	-
KDL	7.1	8.5
KDR	7.3	7.8
SA	Fixed	Fixed
TA	22°	23°



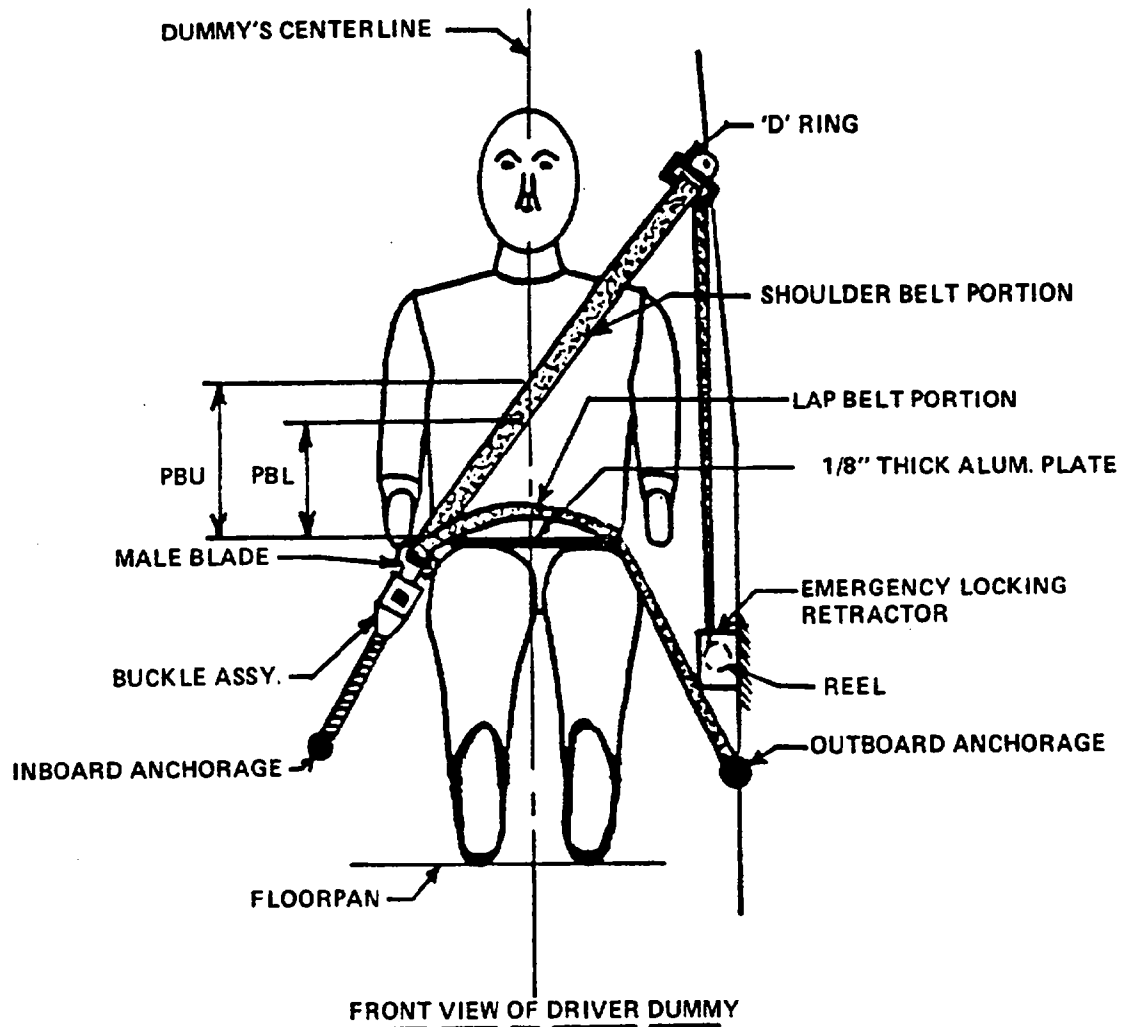
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD(L/R) = Knee to Dash (Left/Right)
 SA = Seat Back Angle
 TA = Torso Angle

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	7.2	7.2
HS	8.8	9.0
AD	3.9	4.0
HD	6.9	6.7
KK	9.0	8.3
HA	22.7	22.5

Figure 3
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	13.5	13.7
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	10.2	10.4
<u>LAP BELT TENSION</u>	2.0 lbs	2.0 lbs
<u>SHOULDER BELT TENSION</u>	-	-

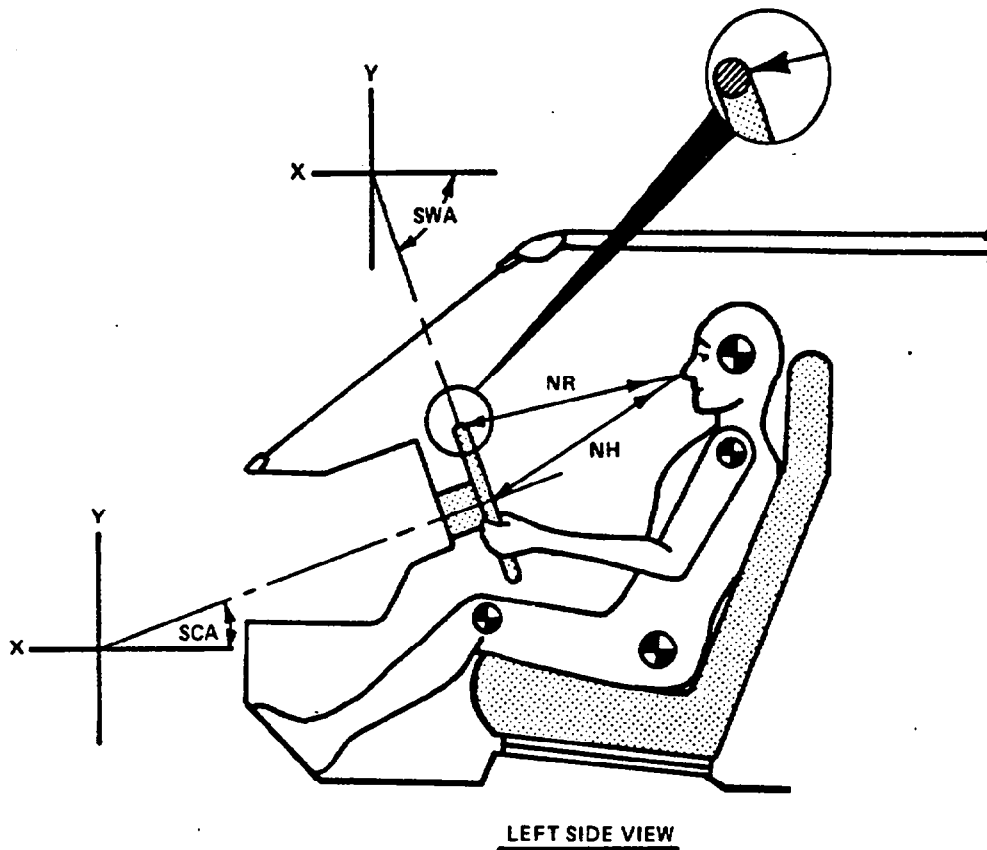
Table 3

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

<u>BELT LENGTH DATA:</u>	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>96.0"</u>	<u>96.0"</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>34.5"</u>	<u>34.5"</u>
Lap belt length as measured on Part 572 Dummy.	<u>34.0"</u>	<u>34.0"</u>
<u>BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	<u>3.0"</u>	<u>3.5"</u>
As determined mechanically.	<u>N/A</u>	<u>1.5"</u>
As determined electronically.	<u>2.6"</u>	<u>2.3"</u>
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>2.0 in/ft</u>	<u>1.8 in/ft</u>
Measured Mechanically	<u>0.6 in/ft</u>	<u>0.6 in/ft</u>

Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



	MEASUREMENTS	
<u>NR</u> -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	17.7	Inches
<u>NH</u> -- Distance from tip of dummy's nose to center of steering column hub	18.7	Inches
<u>SCA</u> -- Angle of steering column relative to the horizontal X axis	24.0	Degrees
<u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis	-66.0	Degrees

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

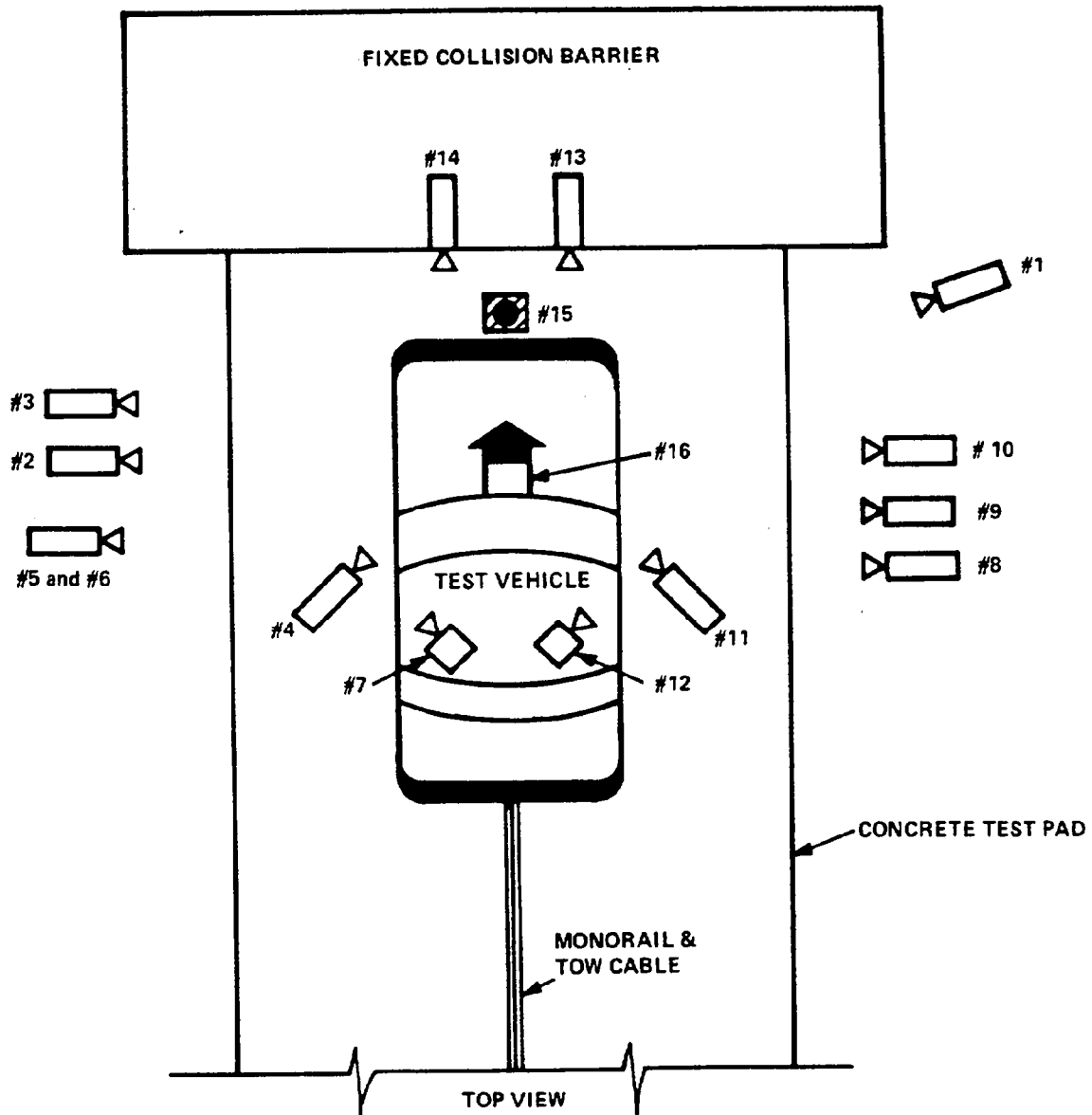


Table 4
HIGH-SPEED CAMERA LOCATIONS

Test No. 916-010-911

Vehicle 1989 Nissan 2-Door Pickup

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	241	52	42	-3	226	13	530
3	Left Side View	290	24	41	-4	275	25	520
4	Driver and Interior View	112	91	67	-14	97	25	330
5	Steering Column (Bottom)	297	69	47	-2	282	25	530
6	Steering Column (Top)	297	69	71	-10	282	25	550
7	Left Belt	-	-	-	-	-	8	No timing
8	Overall Right Side	243	68	42	-3	228	13	790
9	Right Side View	301	44	41	-1	286	25	780
10	Right Passenger View	299	64	57	-3	284	35	750
11	Passenger and Interior View	95	100	69	-18	80	25	640
12	Right Belt	-	-	-	-	-	8	670
13	Passenger Front View	25	0	71	-39	-	13	580
14	Driver Front View	25	0	71	-34	-	13	560
15	Windshield View	0	0	126	-45	-	13	570
16	Pit View of Engine	0	38	-120	90	-	13	No Timing

* X = film plane to monorail centerline

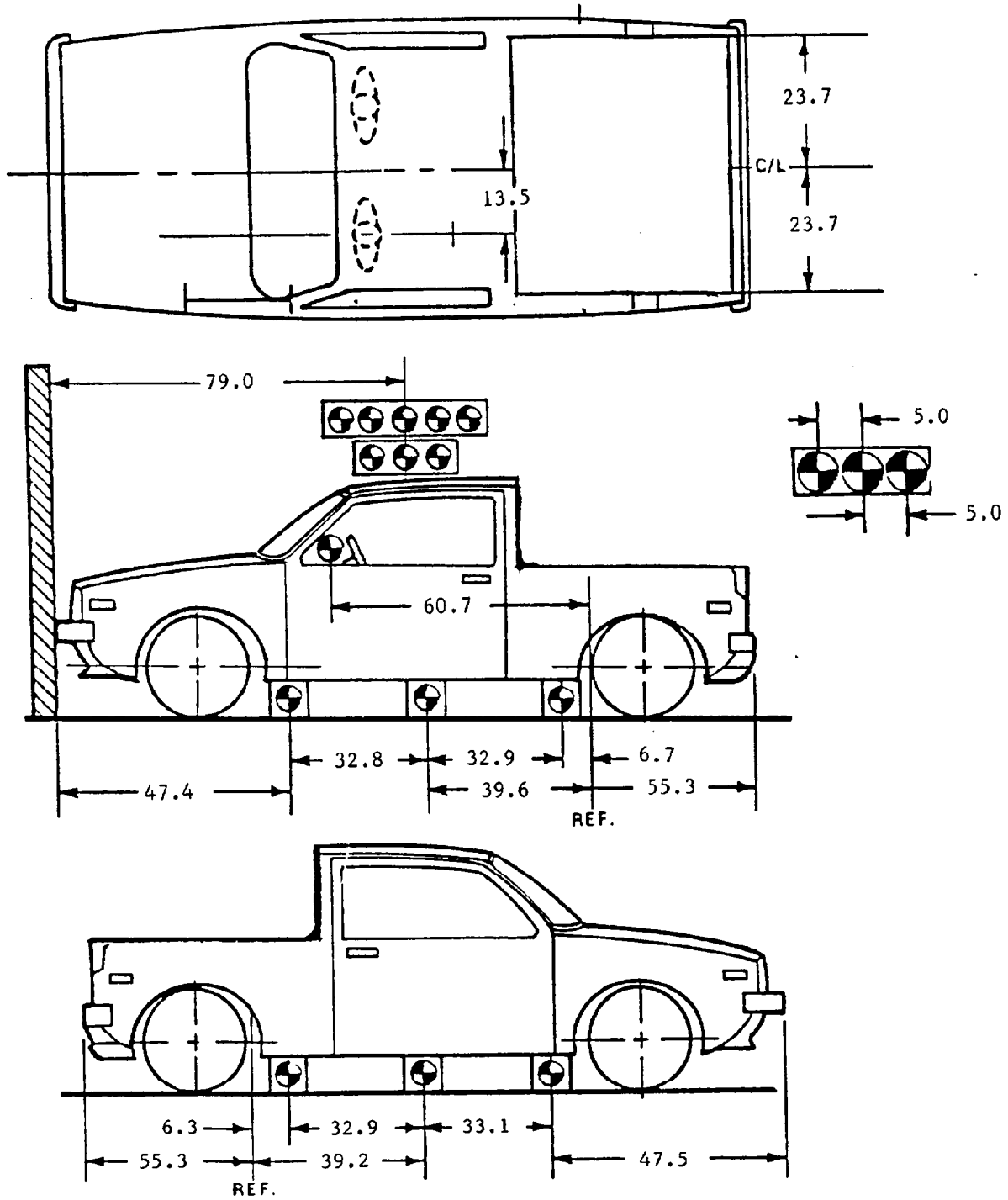
Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

Figure 6

VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 7

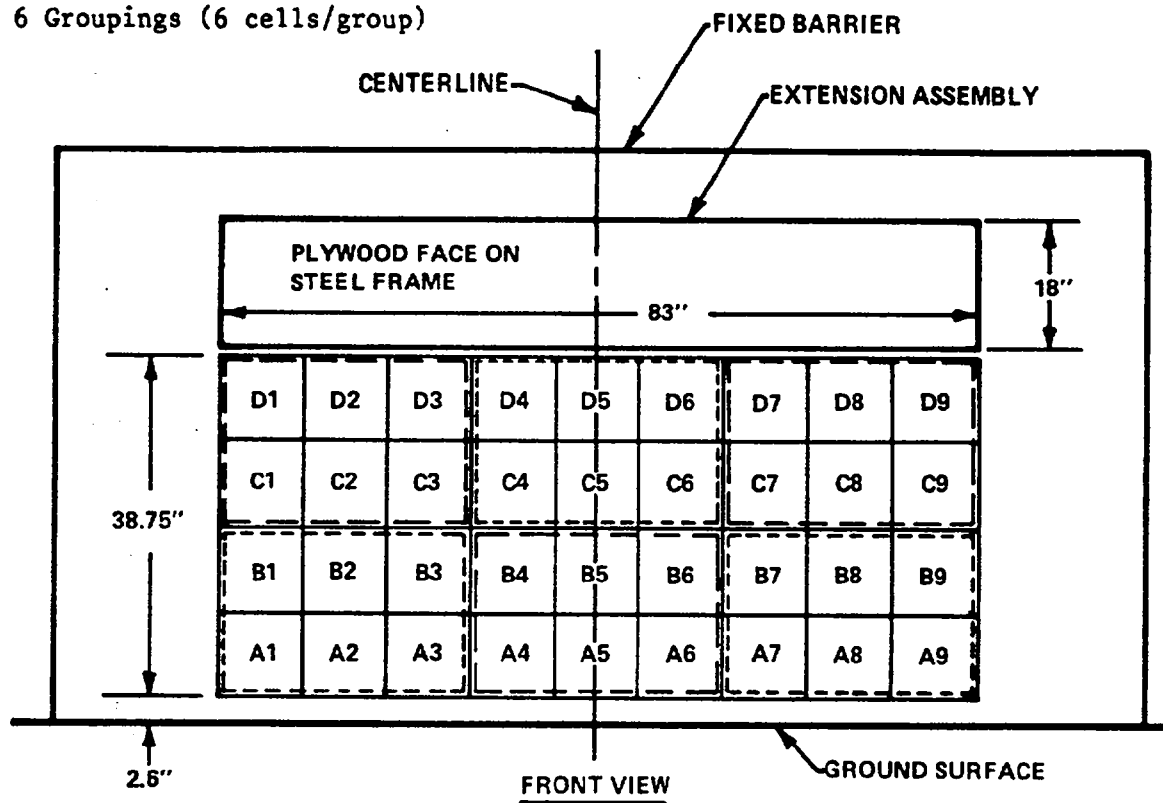
LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells

4 Rows

9 Columns

6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

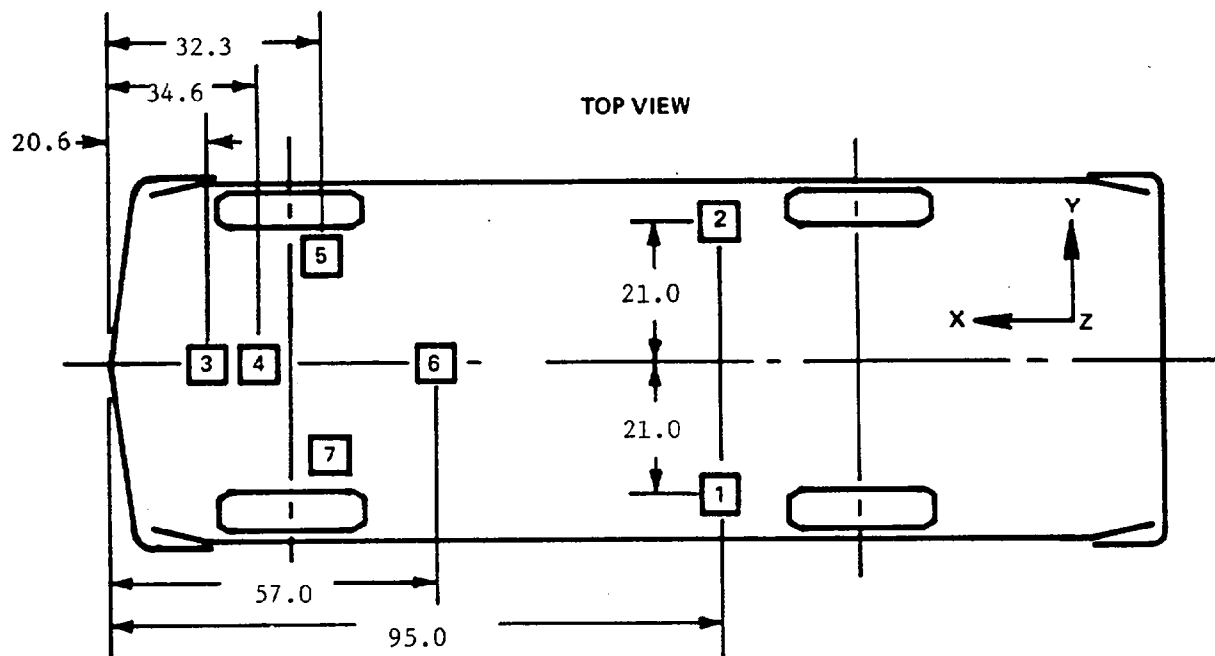
Group 4	Group 5	Group 6
C1 thru D3	C4 thru D6	C7 thru D9
Group 1	Group 2	Group 3
A1 thru B3	A4 thru B6	A7 thru B9

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)

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

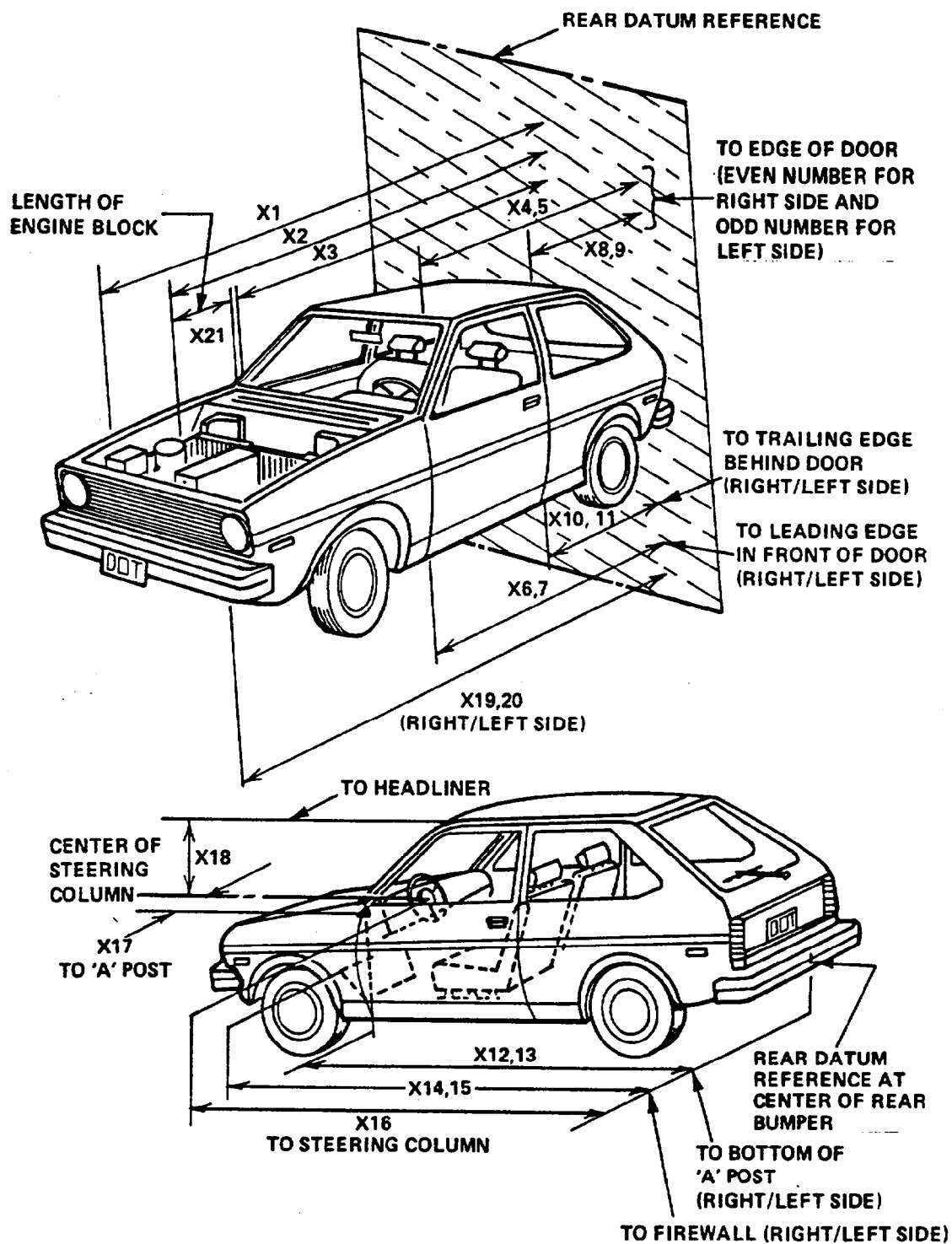


Table 5

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	175.1	156.5	18.6
X2	Rear Surface of Vehicle to Front of Engine	157.3	151.8	5.5
X3	Rear Surface of Vehicle to Firewall	137.2	135.2	2.0
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	127.2	127.3	-0.1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	127.3	127.0	0.3
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	126.2	124.6	1.6
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	126.2	124.0	2.2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	81.9	82.0	-0.1
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	81.9	81.5	0.4
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	82.0	80.8	1.2
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	81.9	80.0	1.9
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	125.9	124.2	1.7
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	126.2	123.9	2.3
X14	Rear Surface of Vehicle to Firewall, Right Side	137.1	136.4	0.7
X15	Rear Surface of Vehicle to Firewall, Left Side	137.1	135.6	1.5
X16	Rear Surface of Vehicle to Steering Column	107.8	108.3	-0.5
X17	Center of Steering Column to "A" Post	15.7	14.0	1.7
X18	Center of Steering Column to Headliner	17.9	19.3	-1.4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	173.9	155.1	18.8
X20	Rear Surface of Vehicle to Left Side of Front Bumper	173.9	156.2	17.6
X21	Length of Engine Block	20.0	20.0	0.0

Appendix A

PHOTOGRAPHS

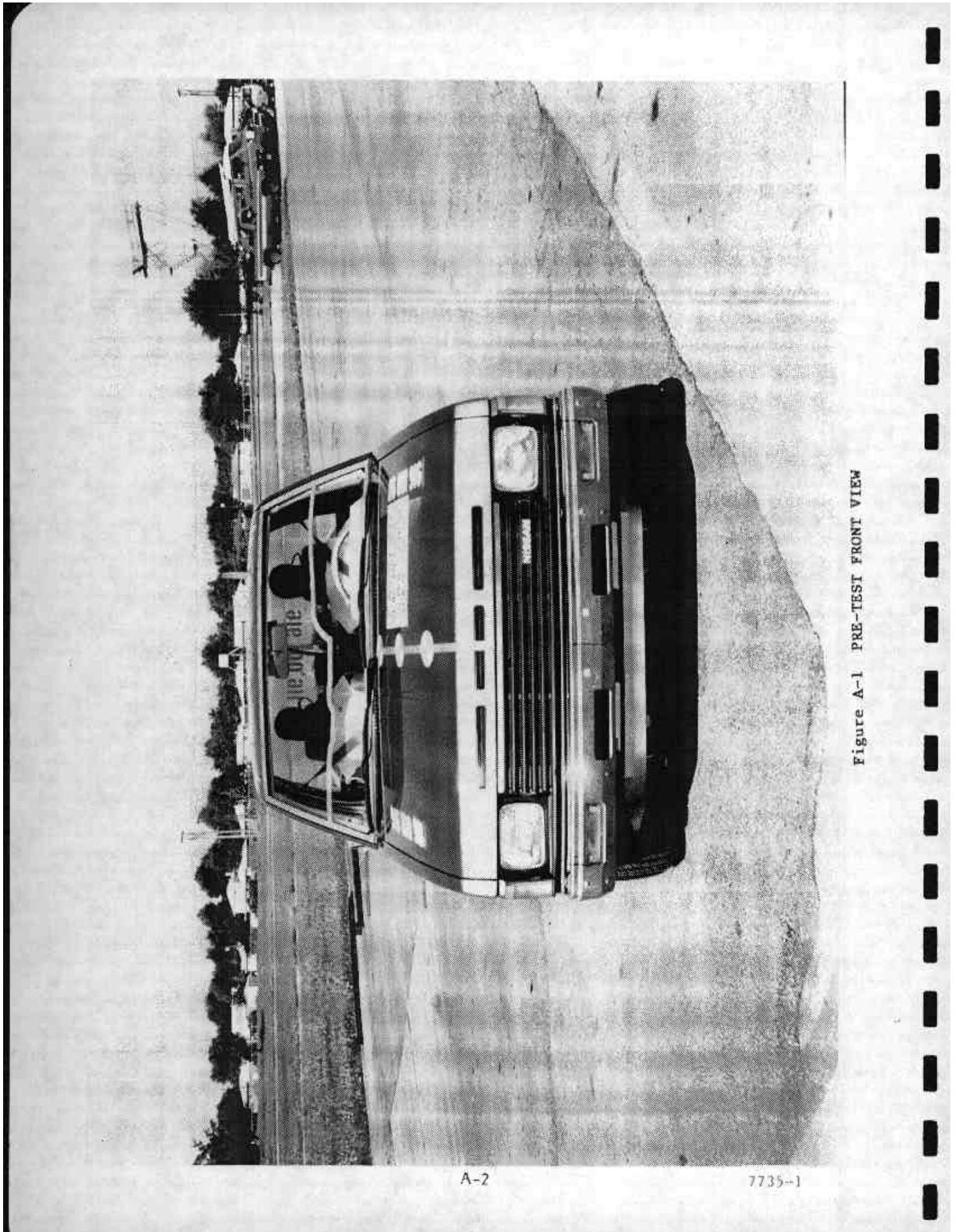


Figure A-1 PRE-TEST FRONT VIEW

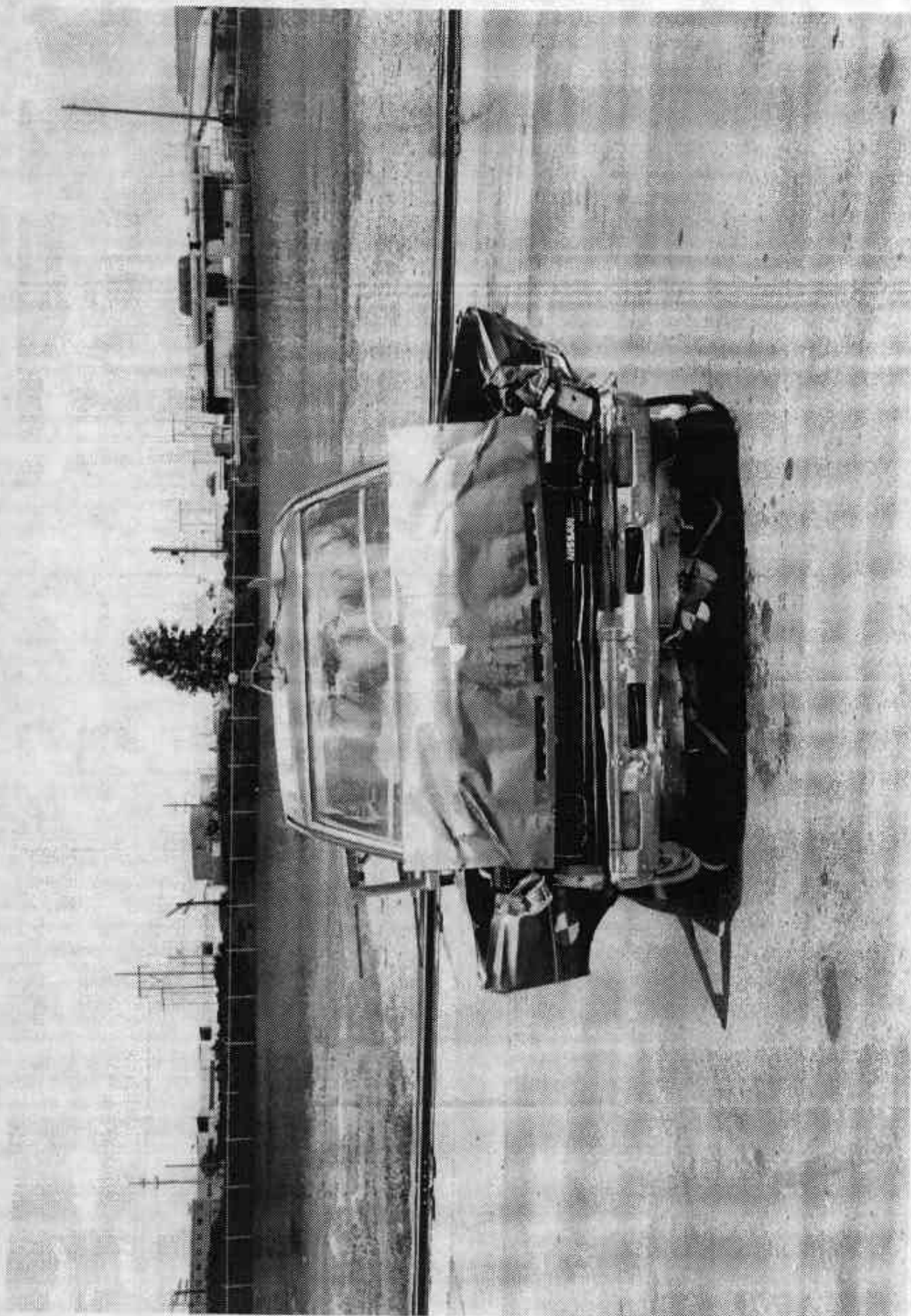


Figure A-2 POST-TEST FRONT VIEW

A-3

7735-1

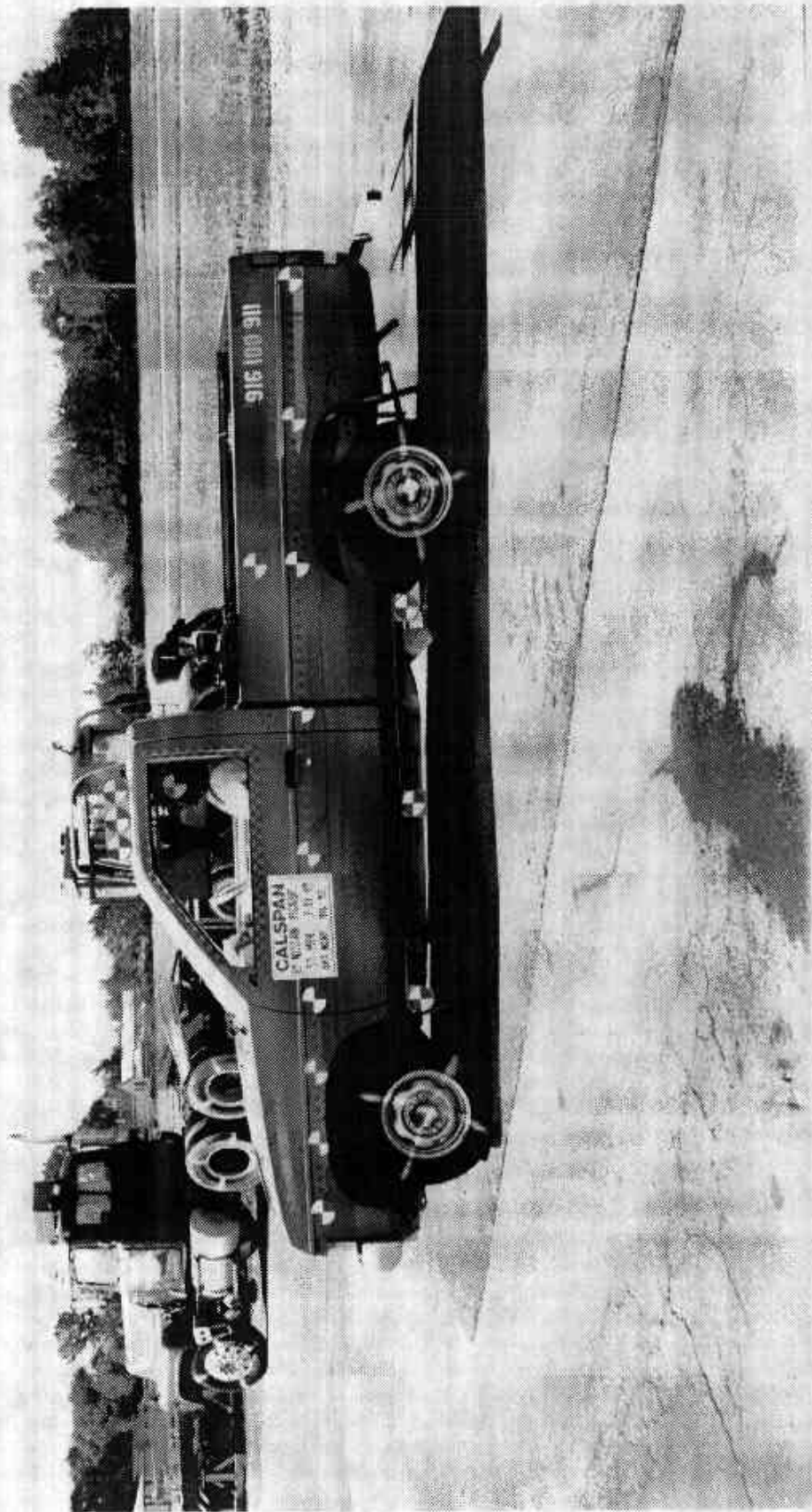


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-4

7735-1

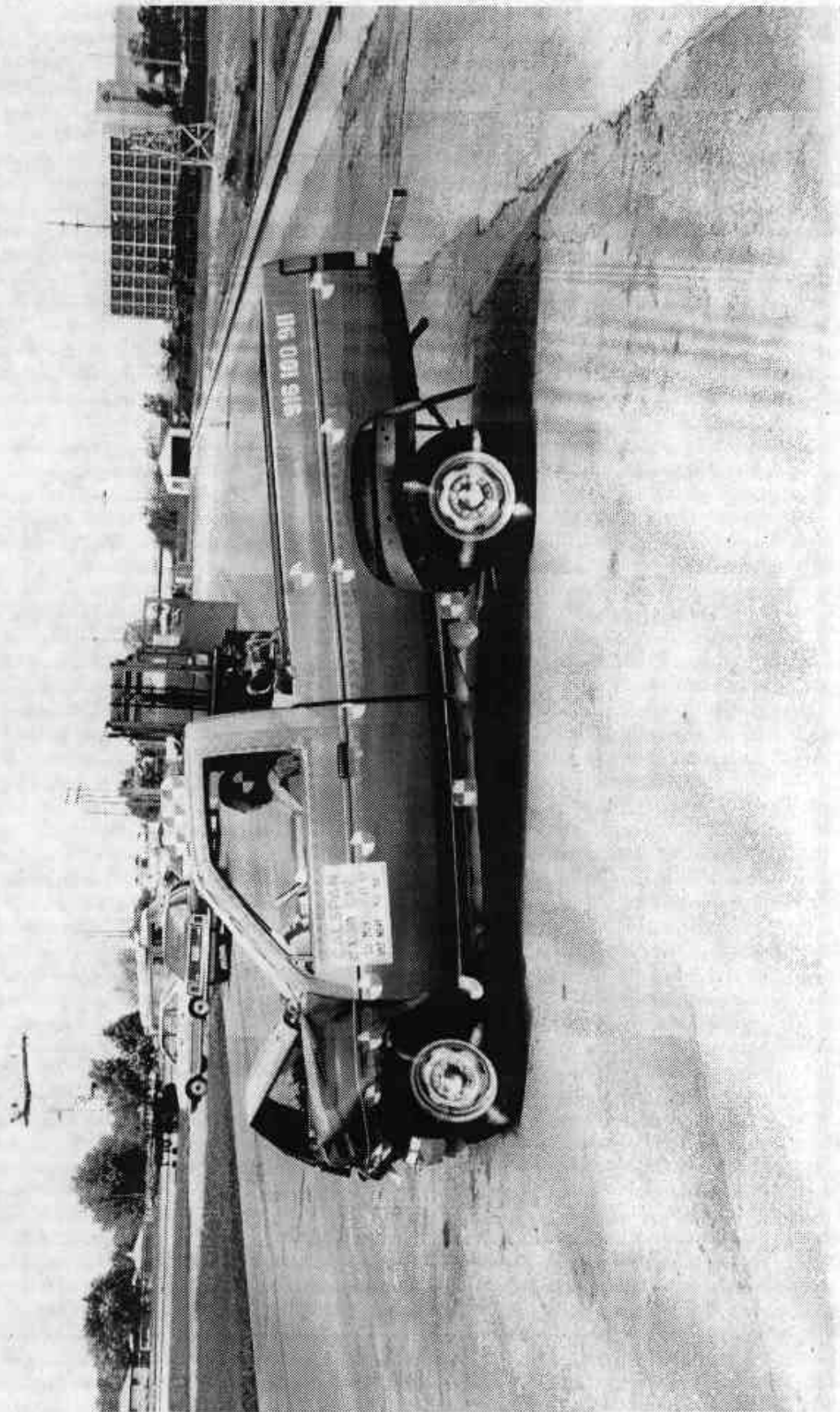


Figure A-4 POST-TEST LEFT SIDE VIEW

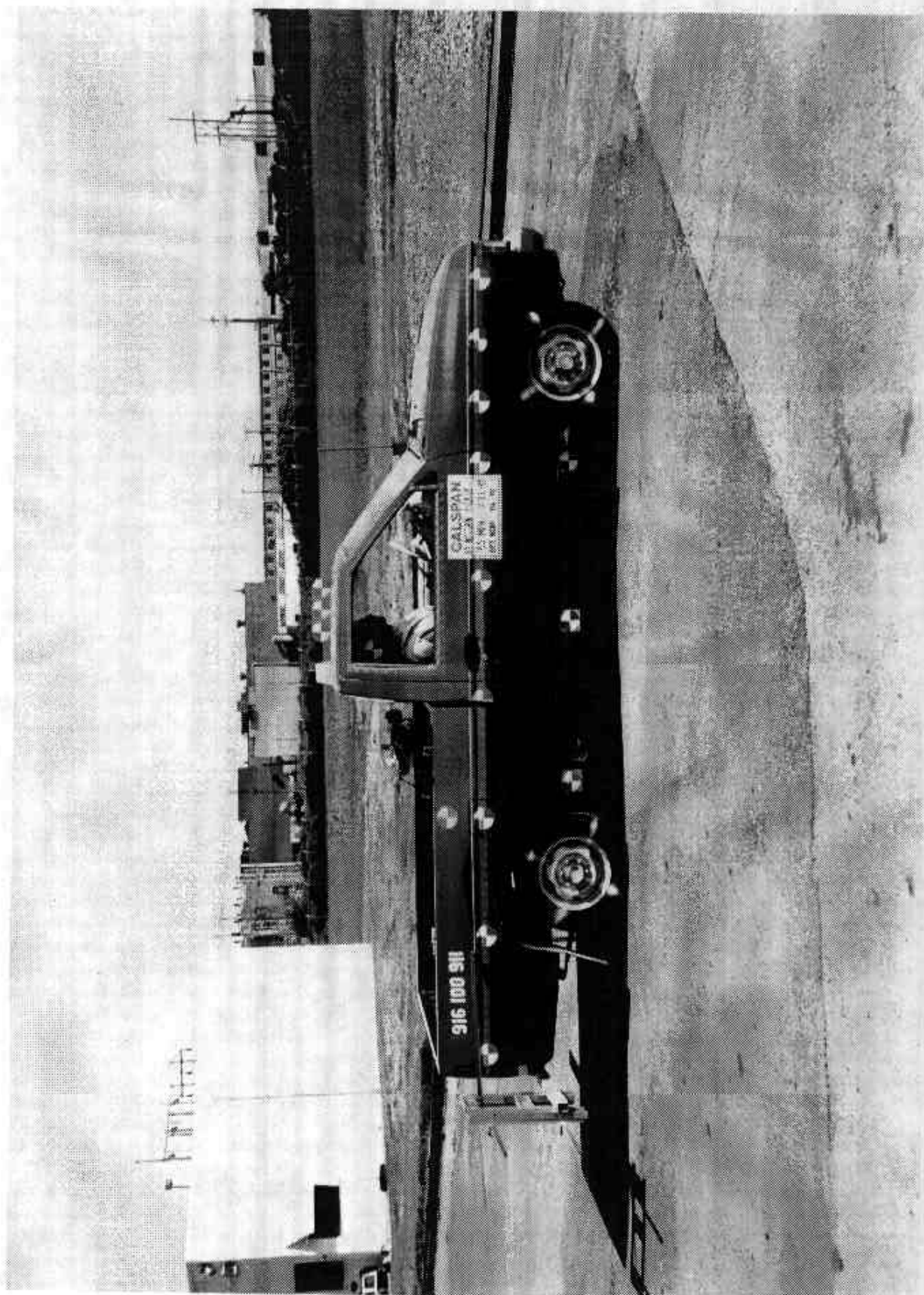


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-6

7735-1

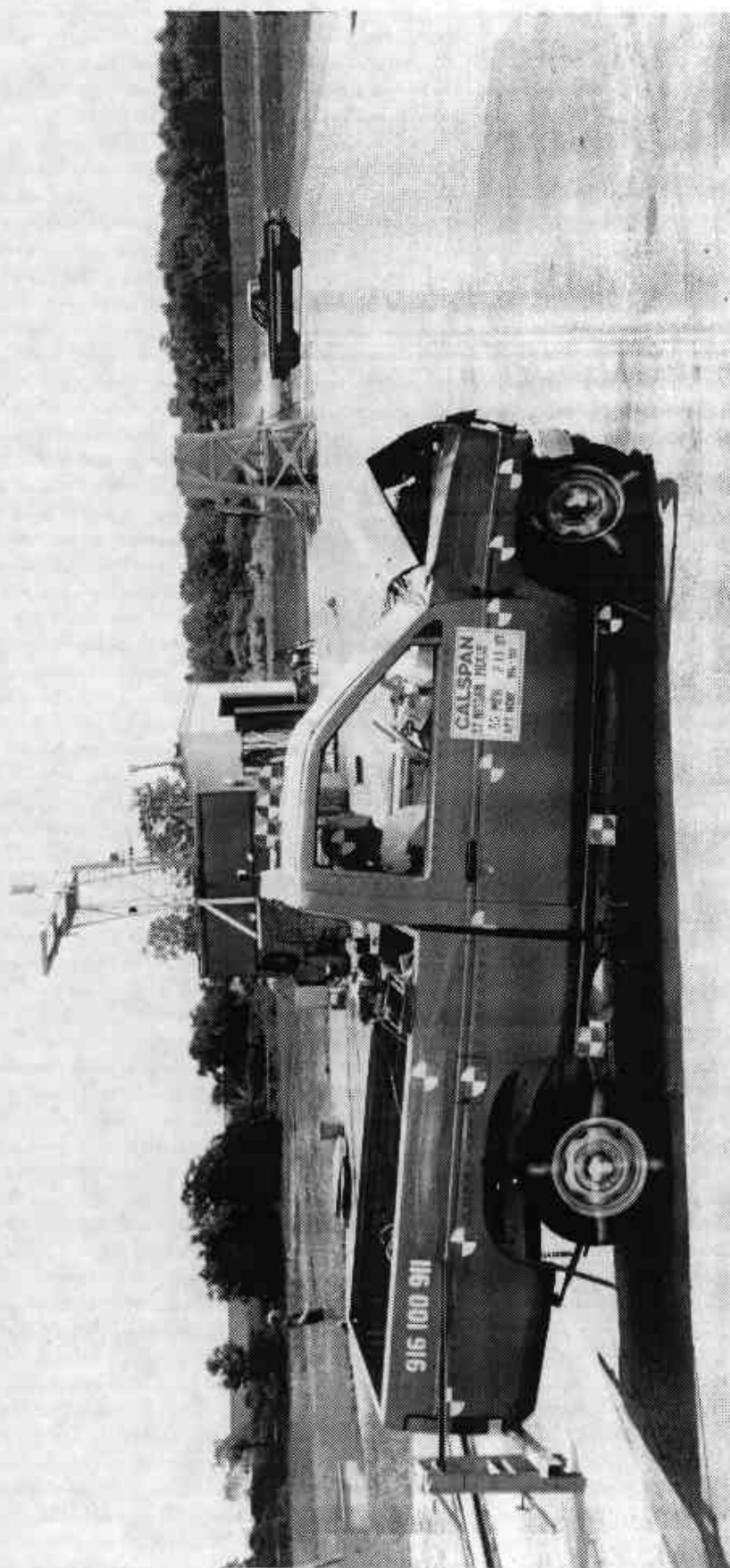


Figure A-6 POST-TEST RIGHT SIDE VIEW

A-7

7735-1



Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-8

7735-1

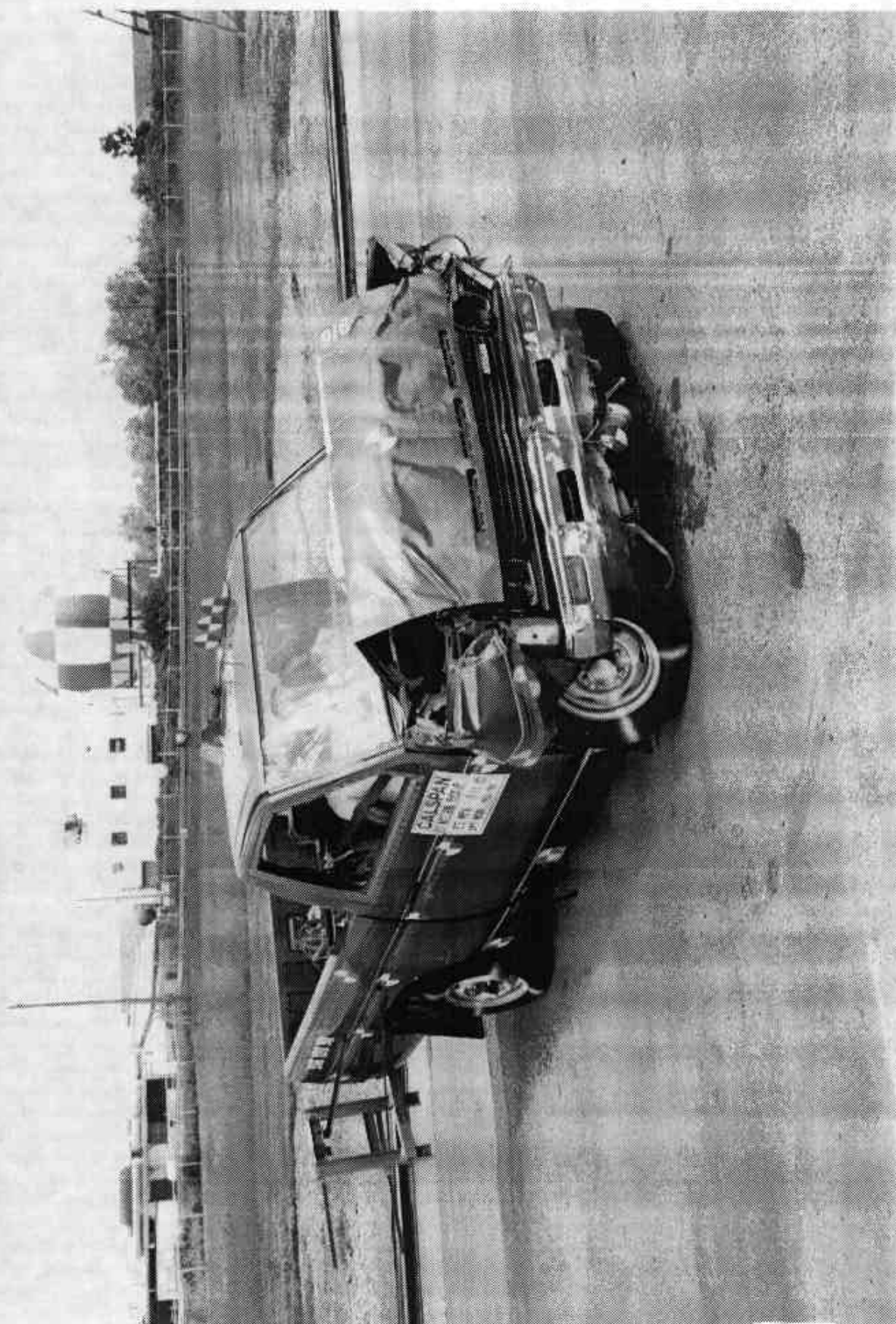


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-10

7735-1

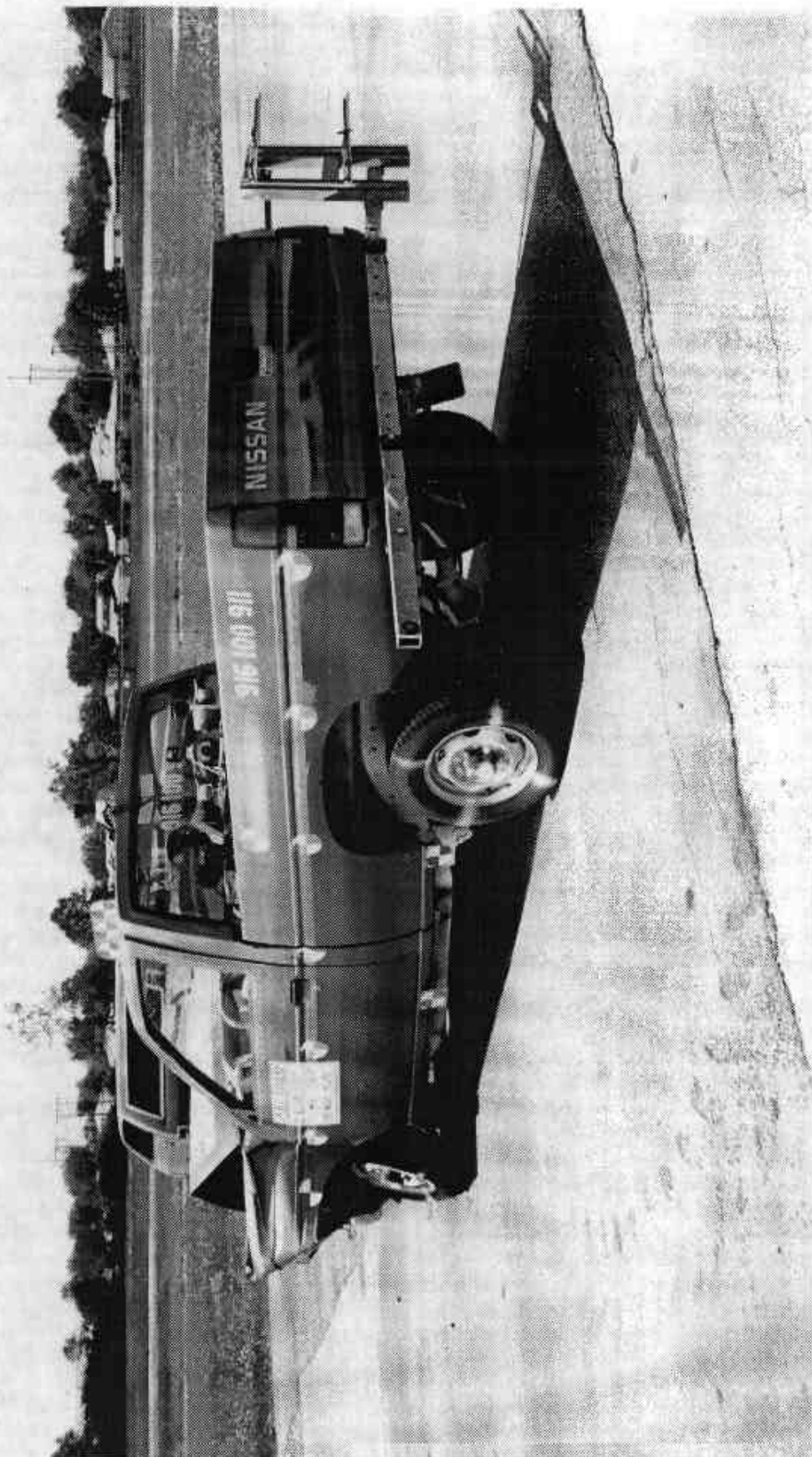


Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-11

7735-1

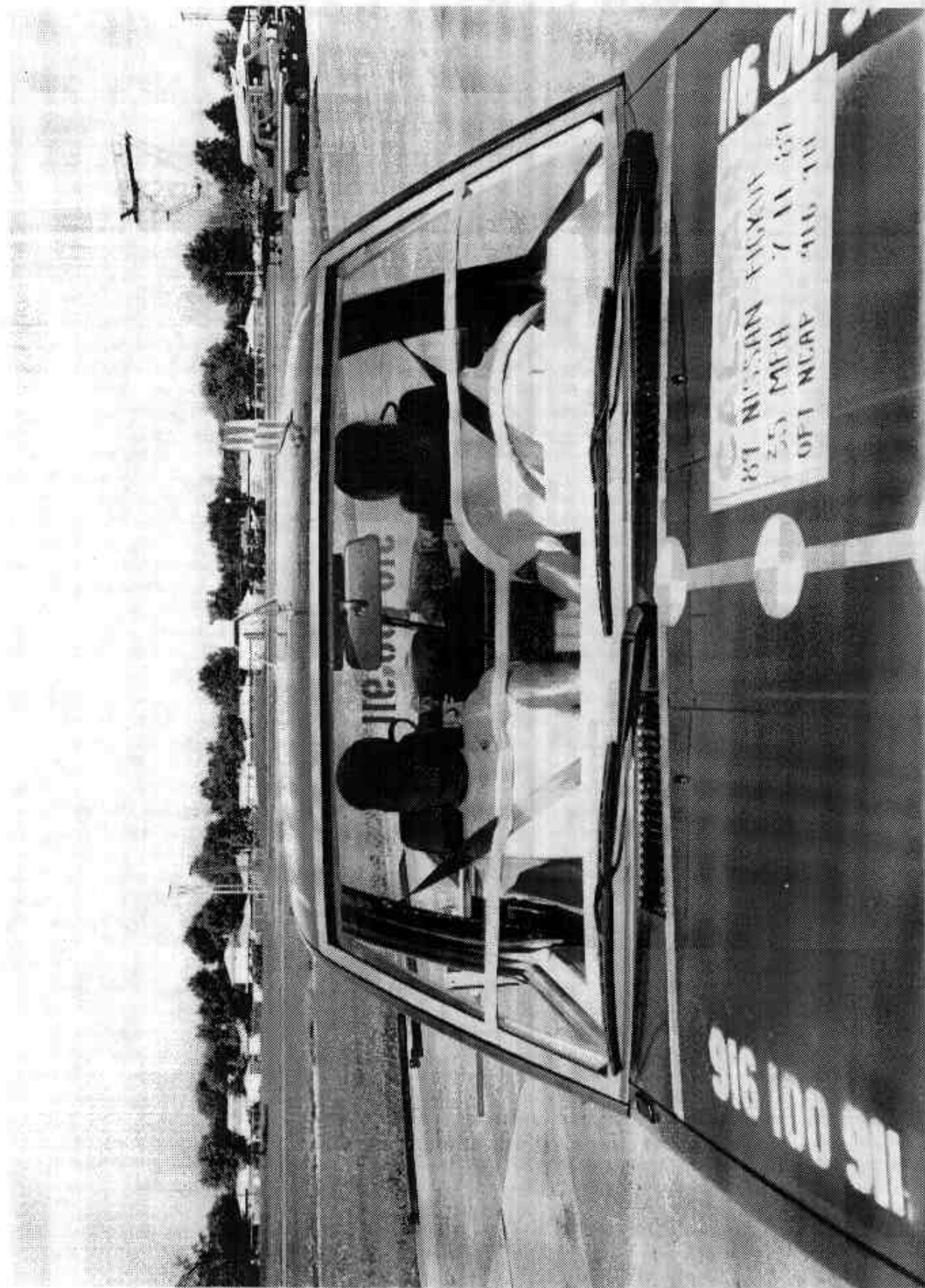


Figure A-11 PRE-TEST WINDSHIELD VIEW



Figure A-12 POST-TEST WINDSHIELD VIEW

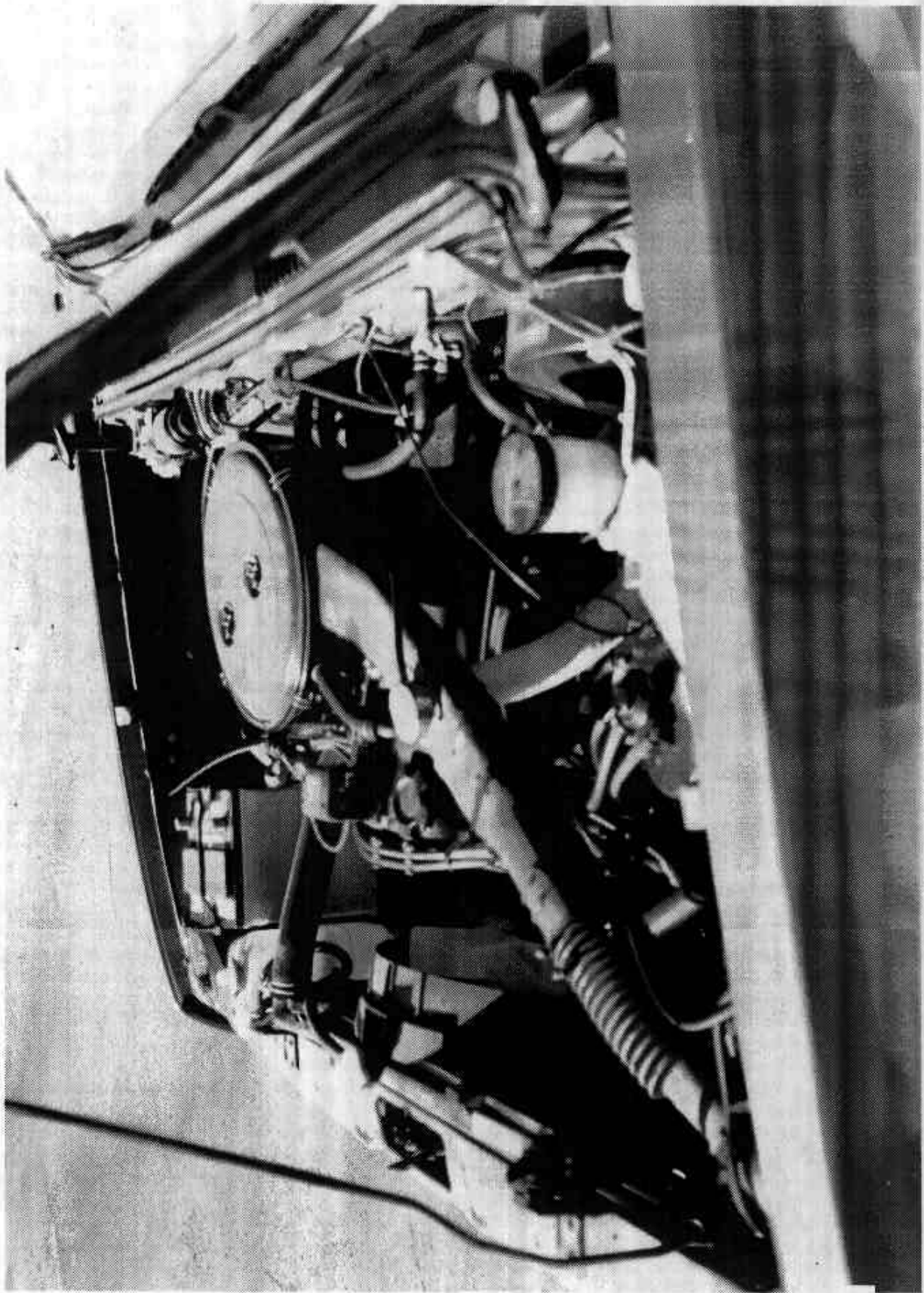


Figure A-13 PRE-TEST ENGINE COMPARTMENT VIEW

A-14

7735-1

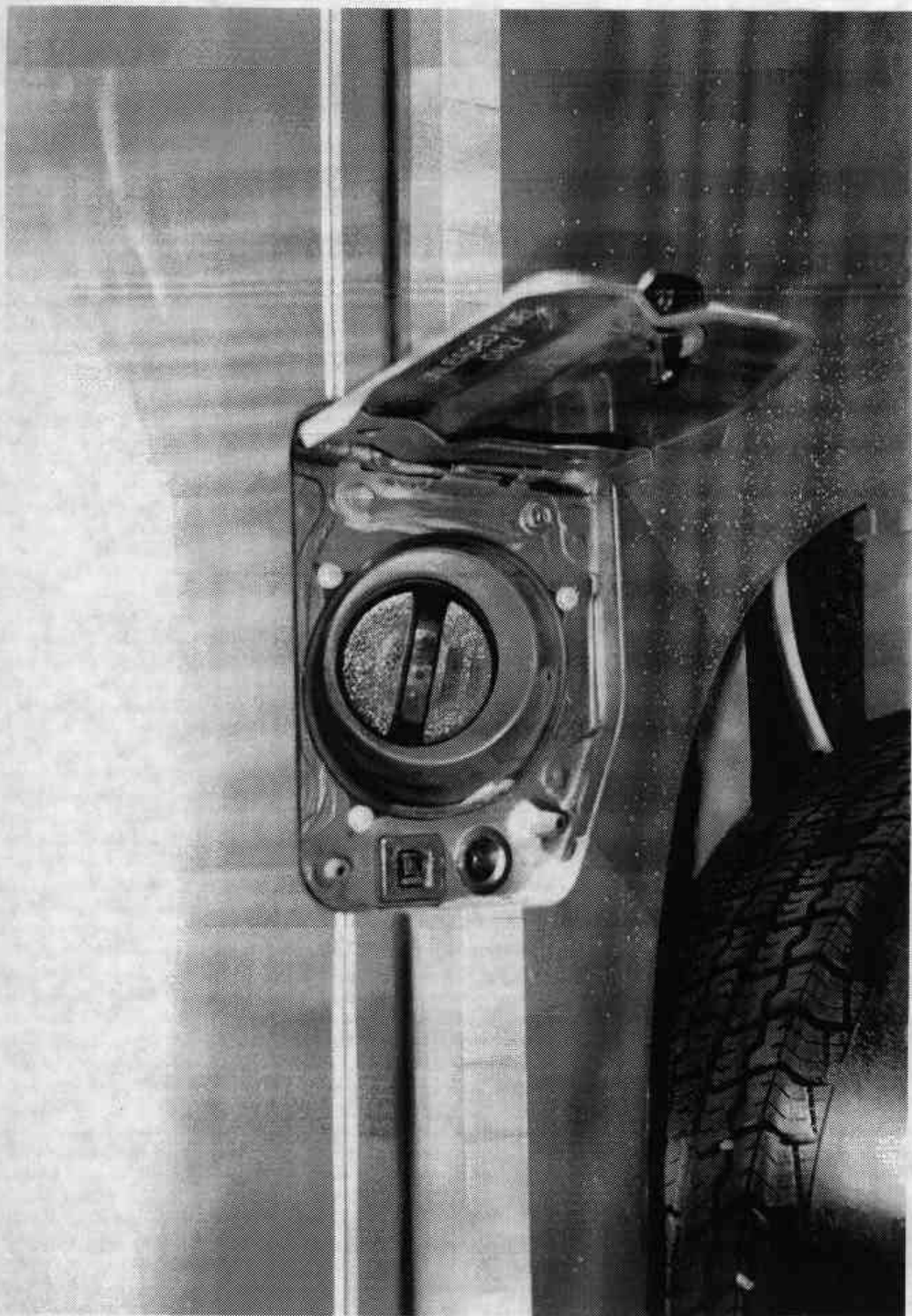


Figure A-14 PRE-TEST FUEL CAP VIEW

A-15

7735-1

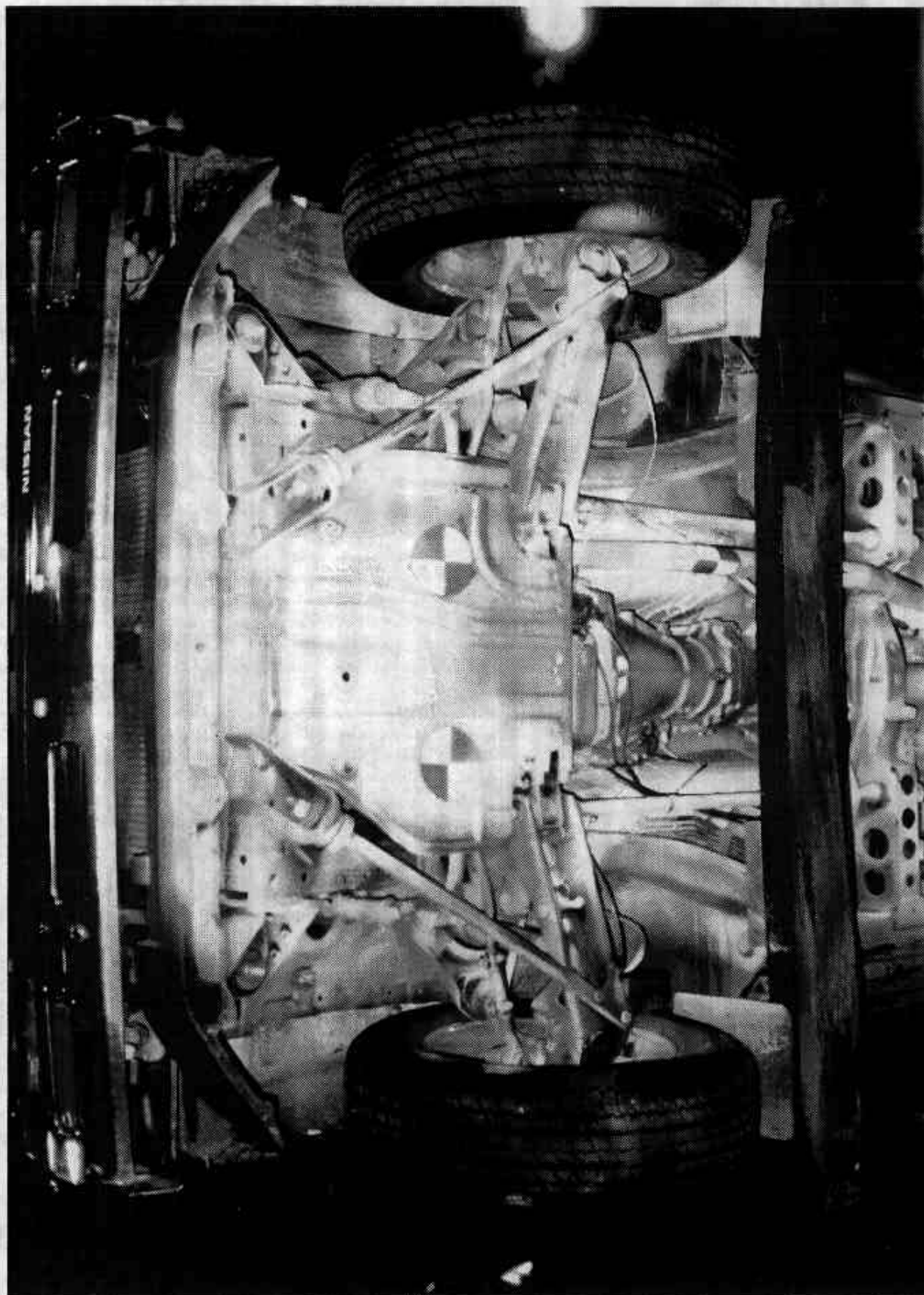


Figure A-15 PRE-TEST FRONT UNDERBODY VIEW

A-16

7735-1

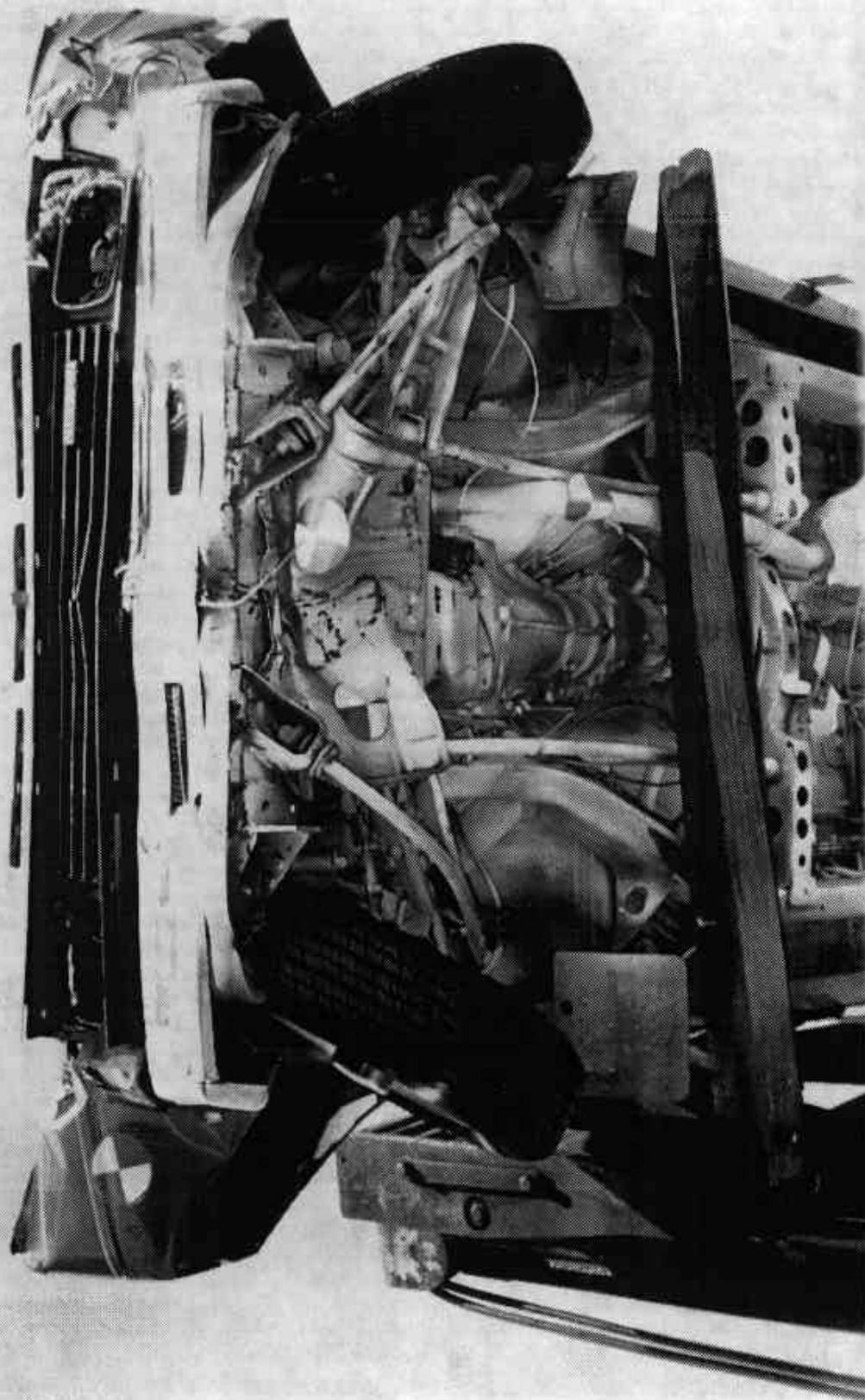


Figure A-16 POST-TEST FRONT UNDERBODY VIEW

A-17

7735-1

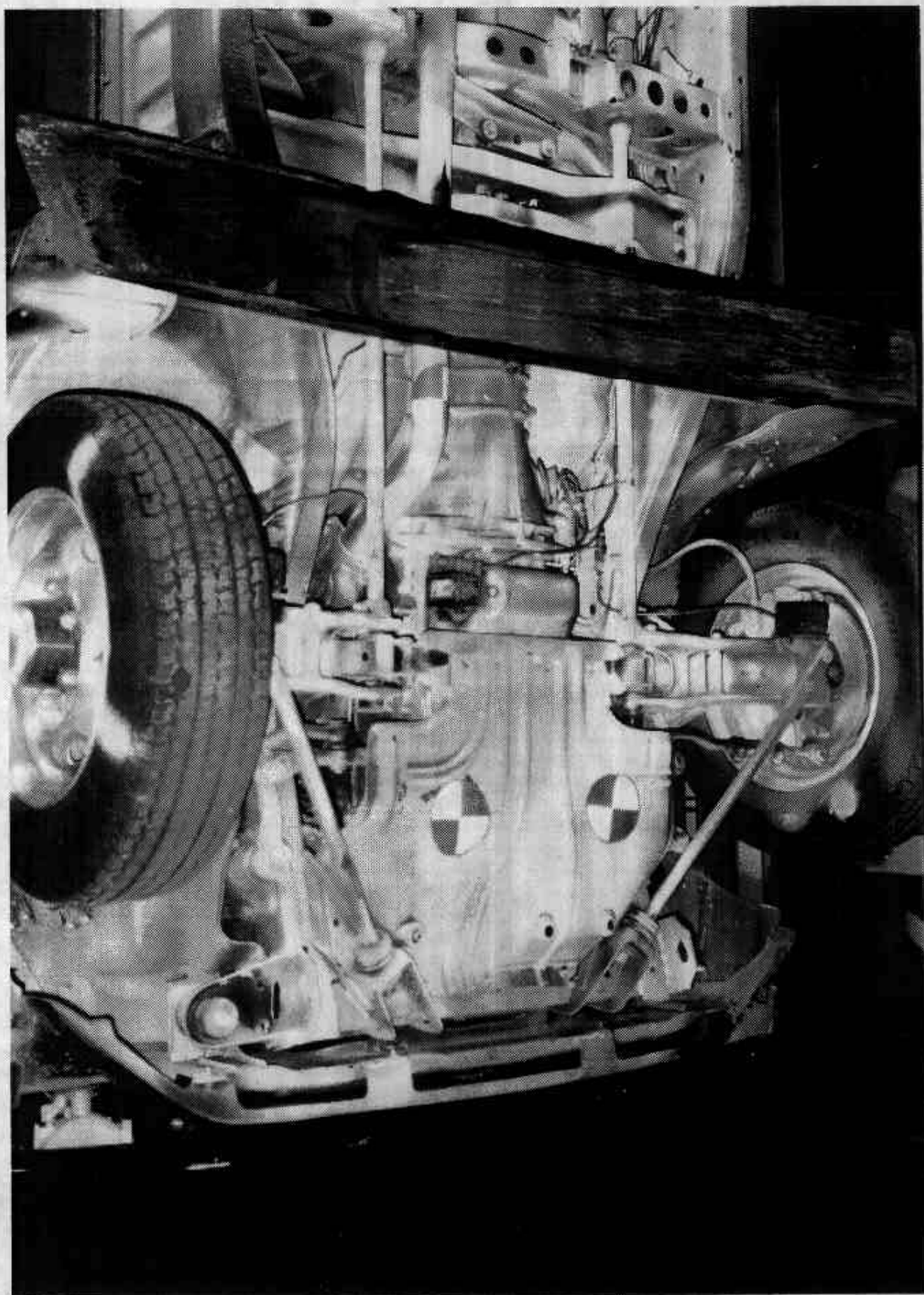


Figure A-17 PRE-TEST FRONT-SIDE UNDERBODY VIEW

A-18

7735-1

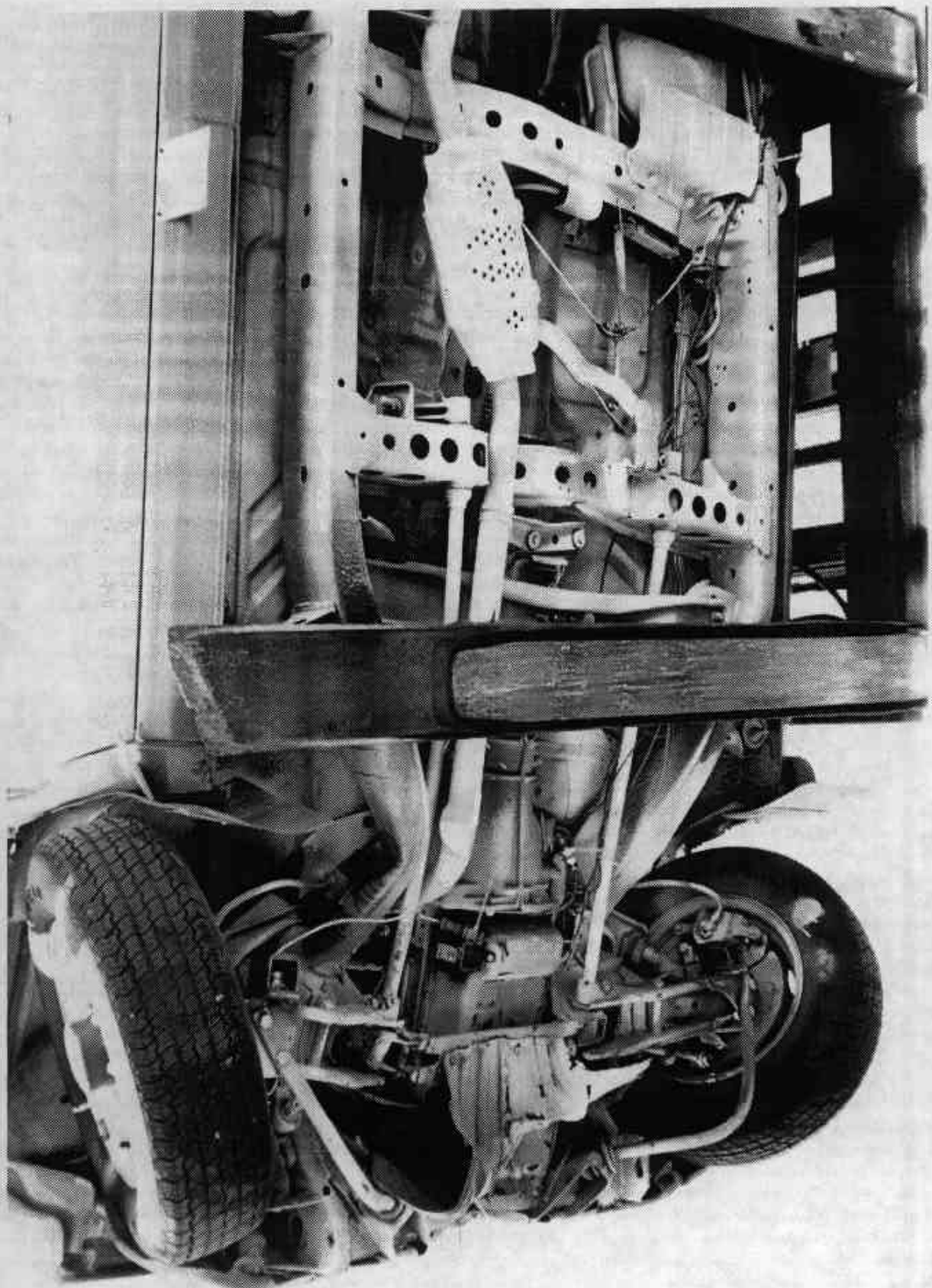


Figure A-18 POST-TEST FRONT-SIDE UNDERBODY VIEW

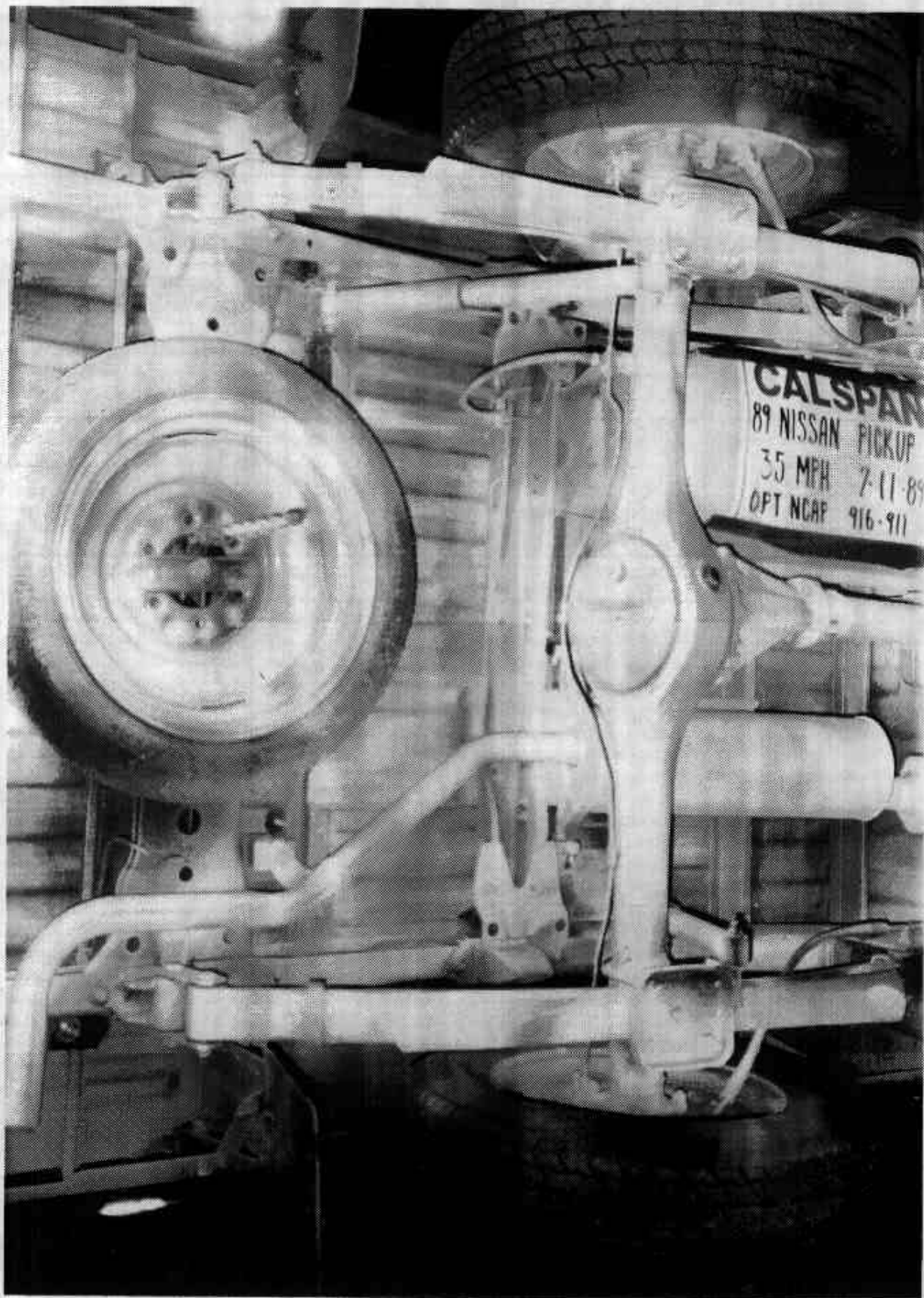


Figure A-19 PRE-TEST REAR UNDERBODY VIEW

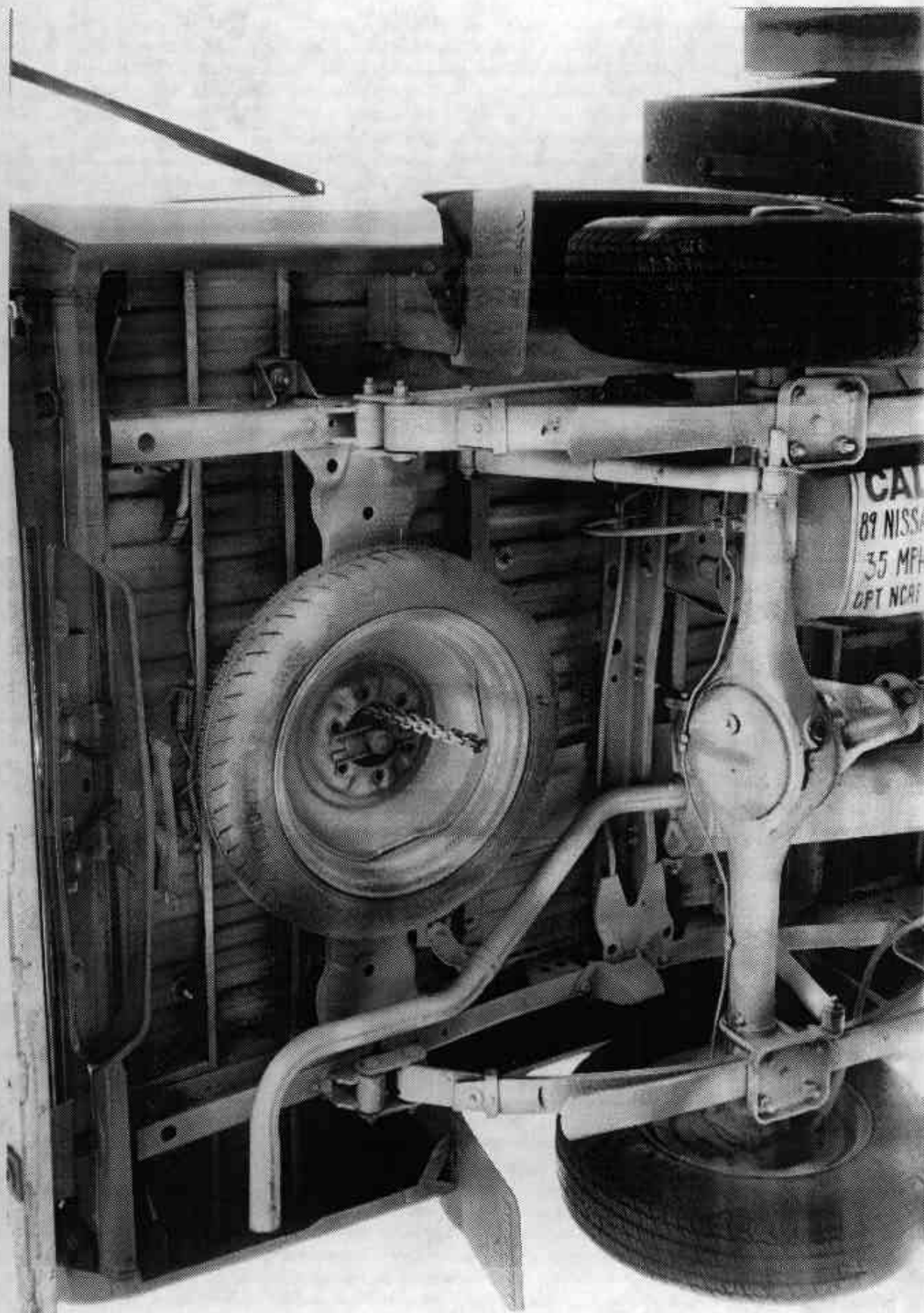


Figure A-20 POST-TEST REAR UNDERBODY VIEW

A-21

7735-1



Figure A-21 PRE-TEST DRIVER POSITION VIEW

A-22

7735-1



Figure A-22 POST-TEST DRIVER POSITION VIEW



Figure A-23 PRE-TEST PASSENGER POSITION VIEW

A-24

7735-1



Figure A-24 POST-TEST PASSENGER POSITION VIEW

A-25

7735-1



Figure A-25 PRE-TEST DRIVER AND INTERIOR VIEW

A-26

7735-1



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

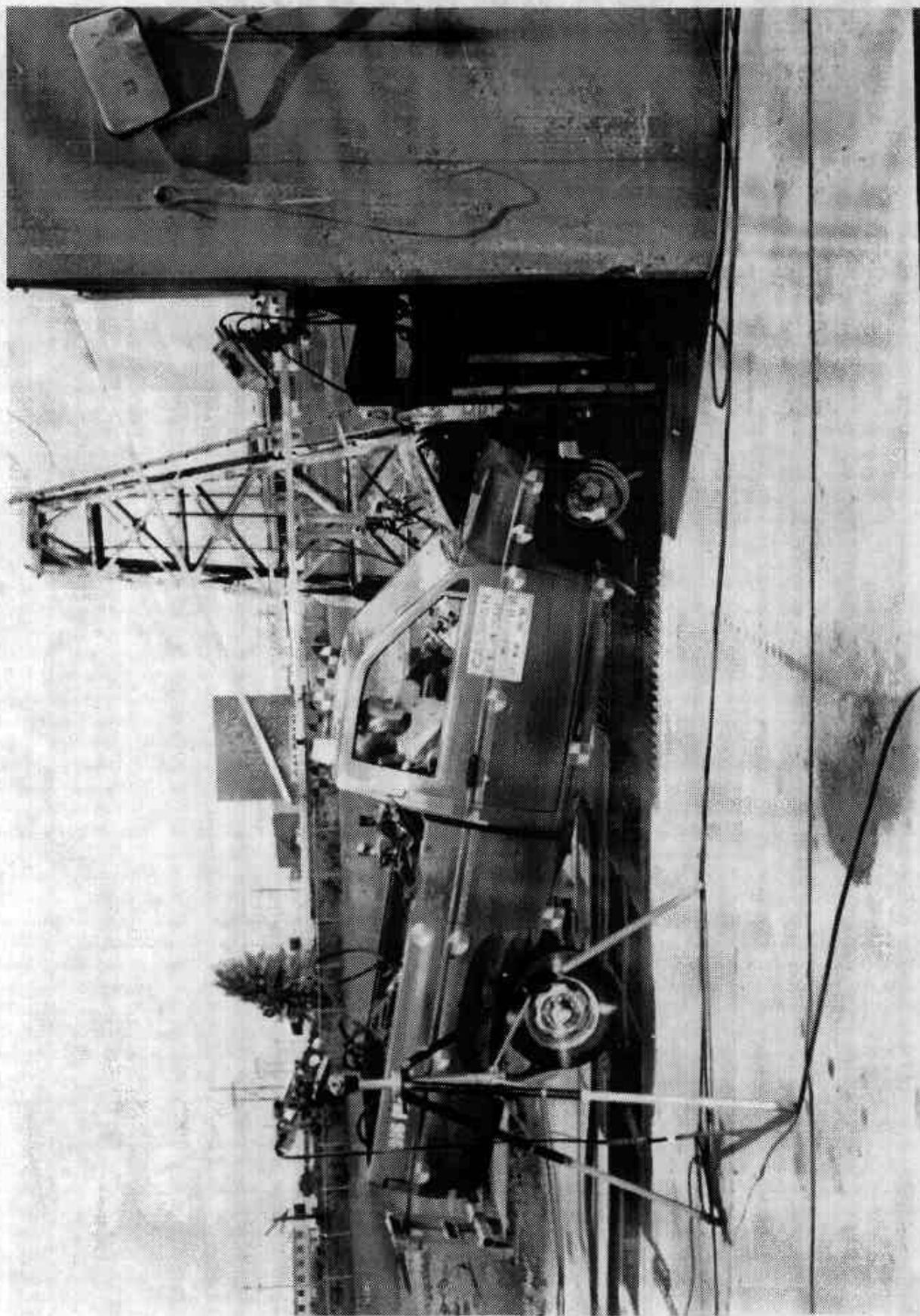


Figure A-29 IMPACT VIEW

A-30

7735-1

Appendix B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

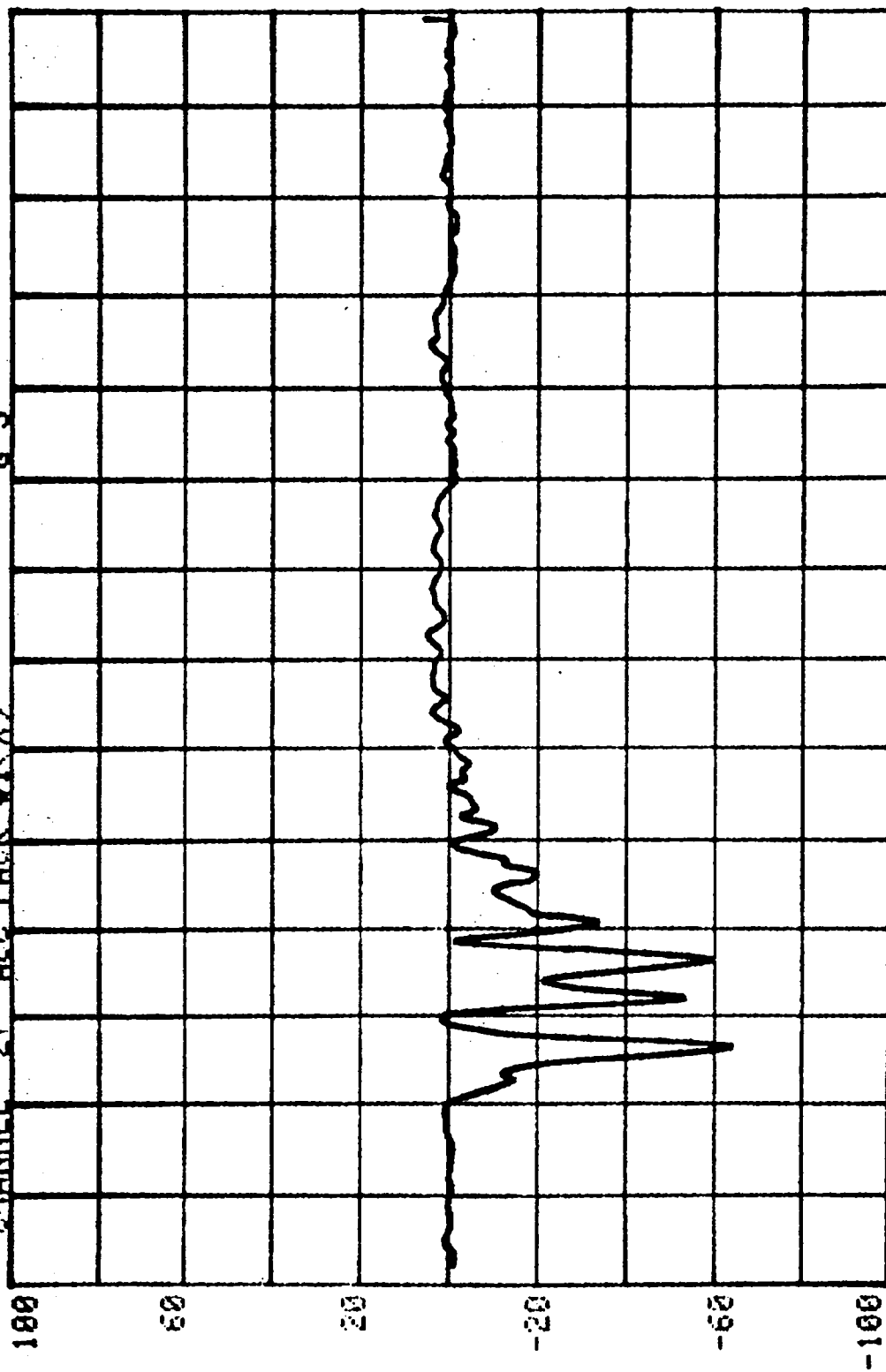
TEST NO. 916-010-911

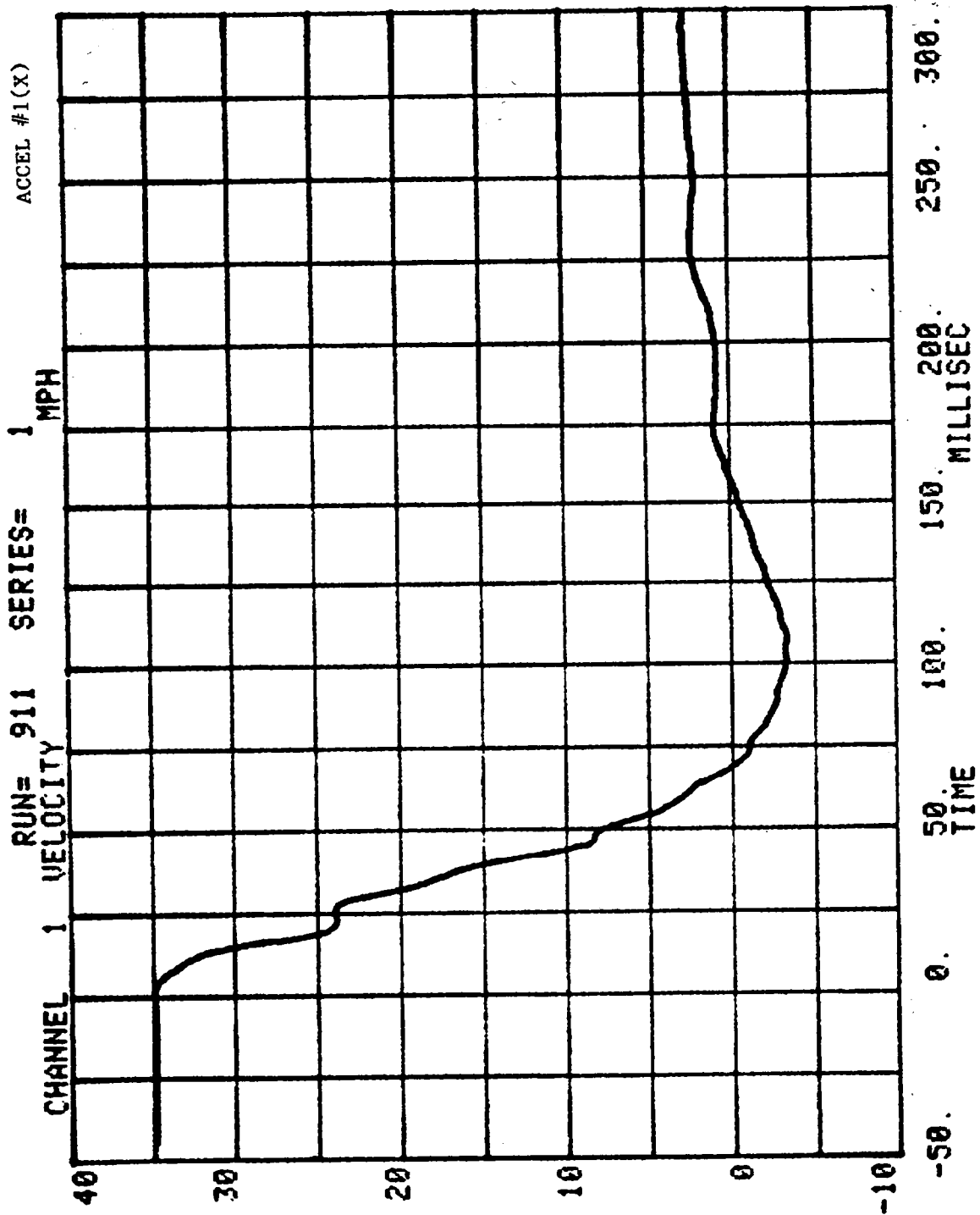
LOAD CELL BARRIER DATA

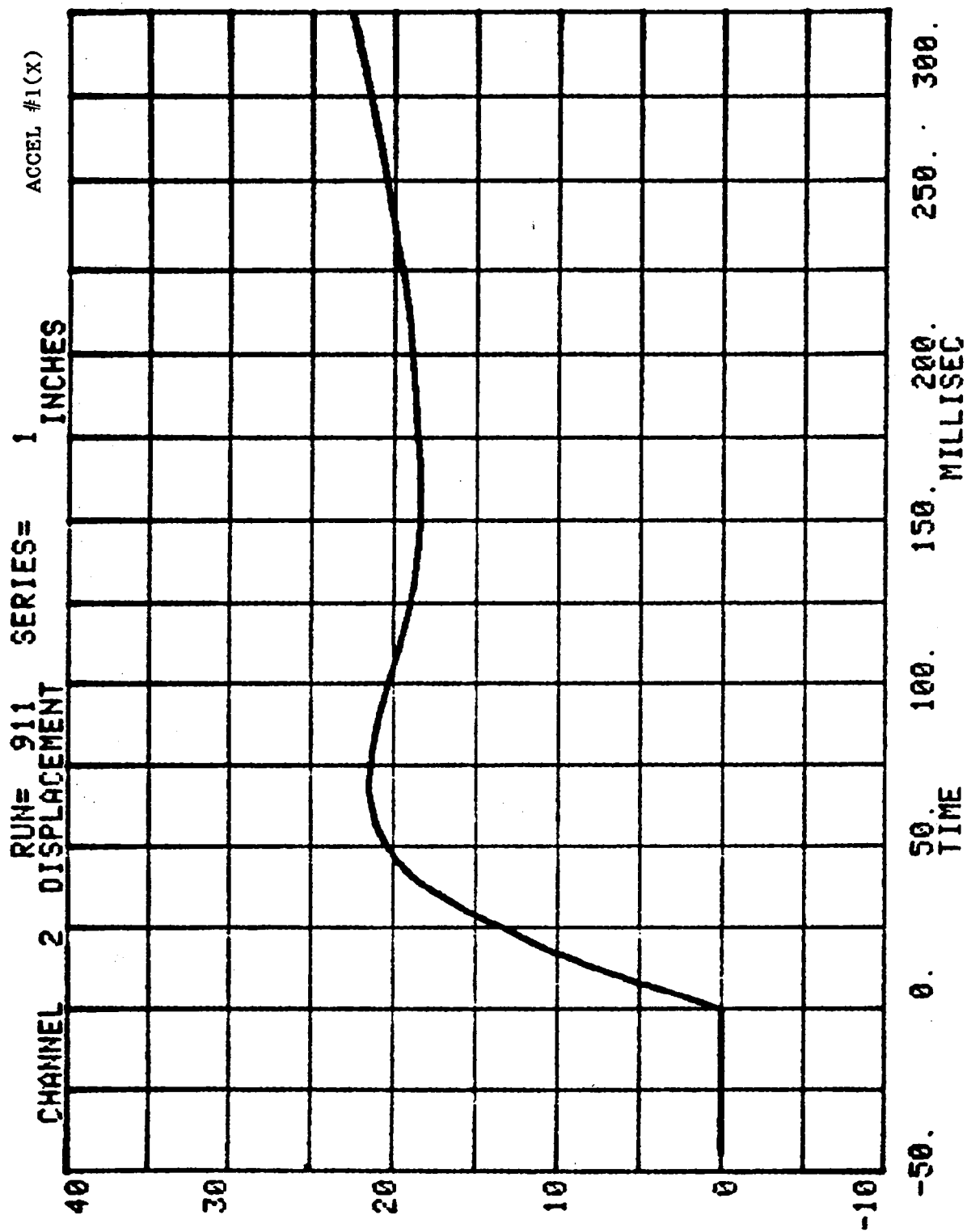
FILTER CHANNEL CLASS

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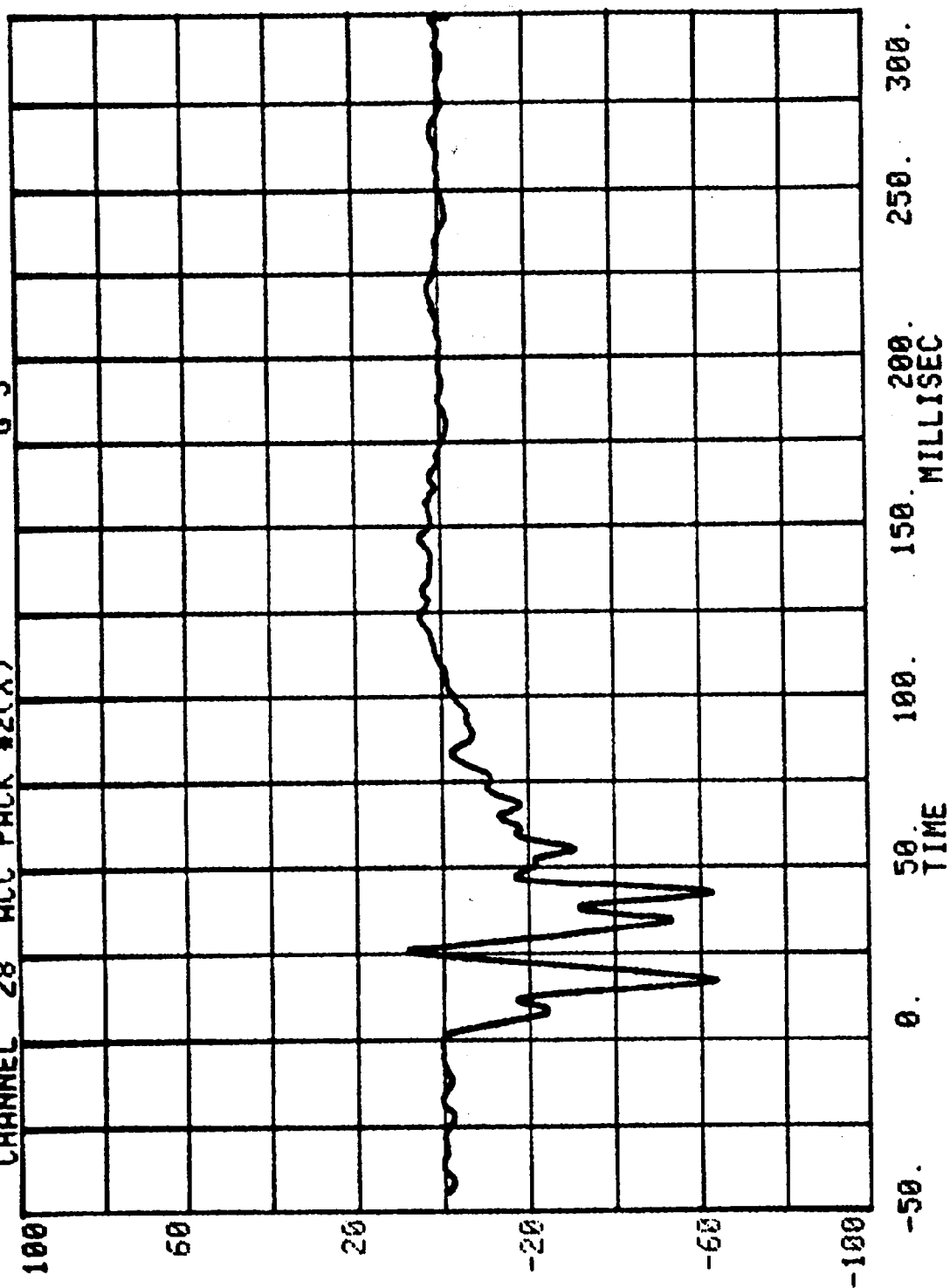
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CHANNEL 27 ACC PACK #1(X) G'S

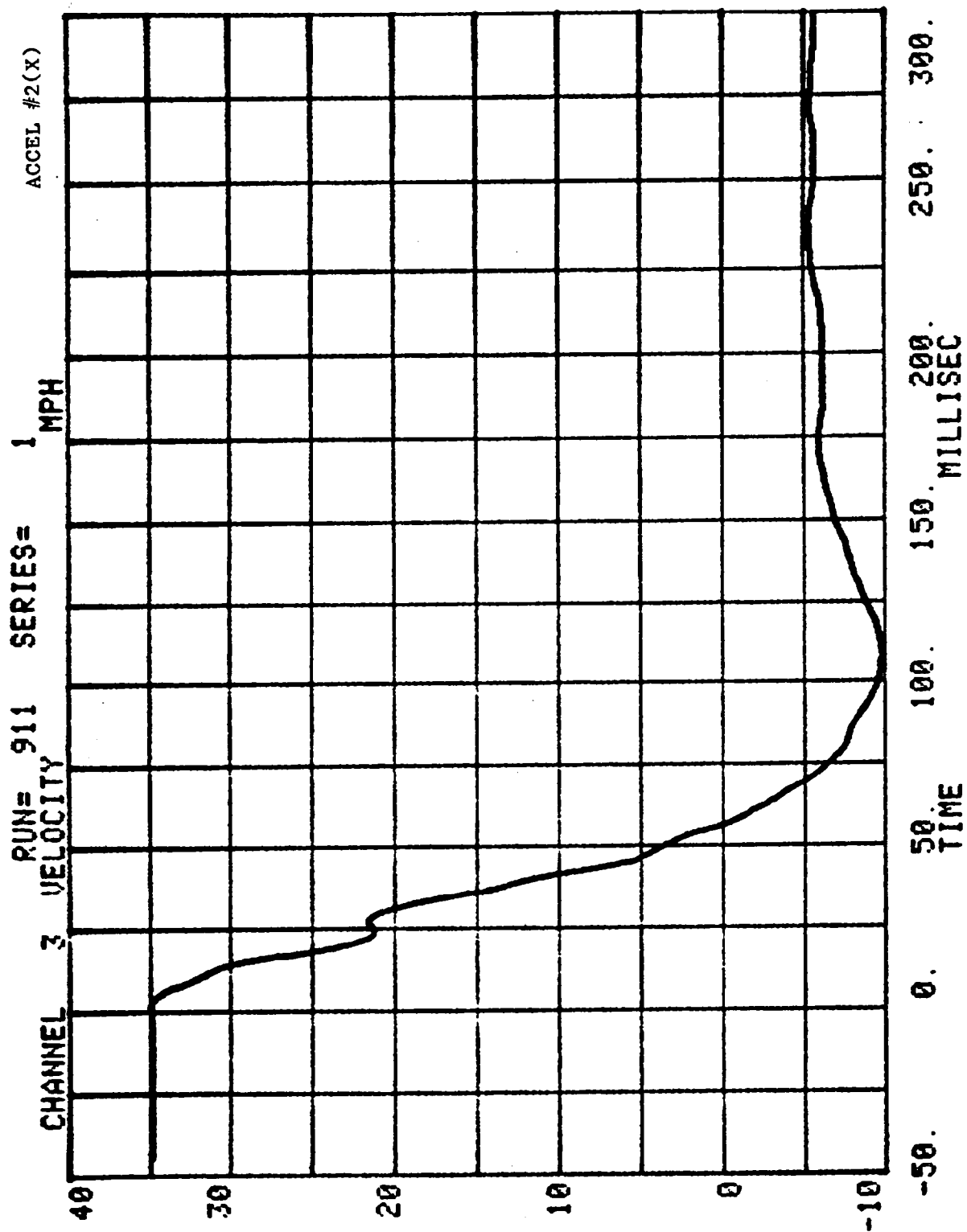


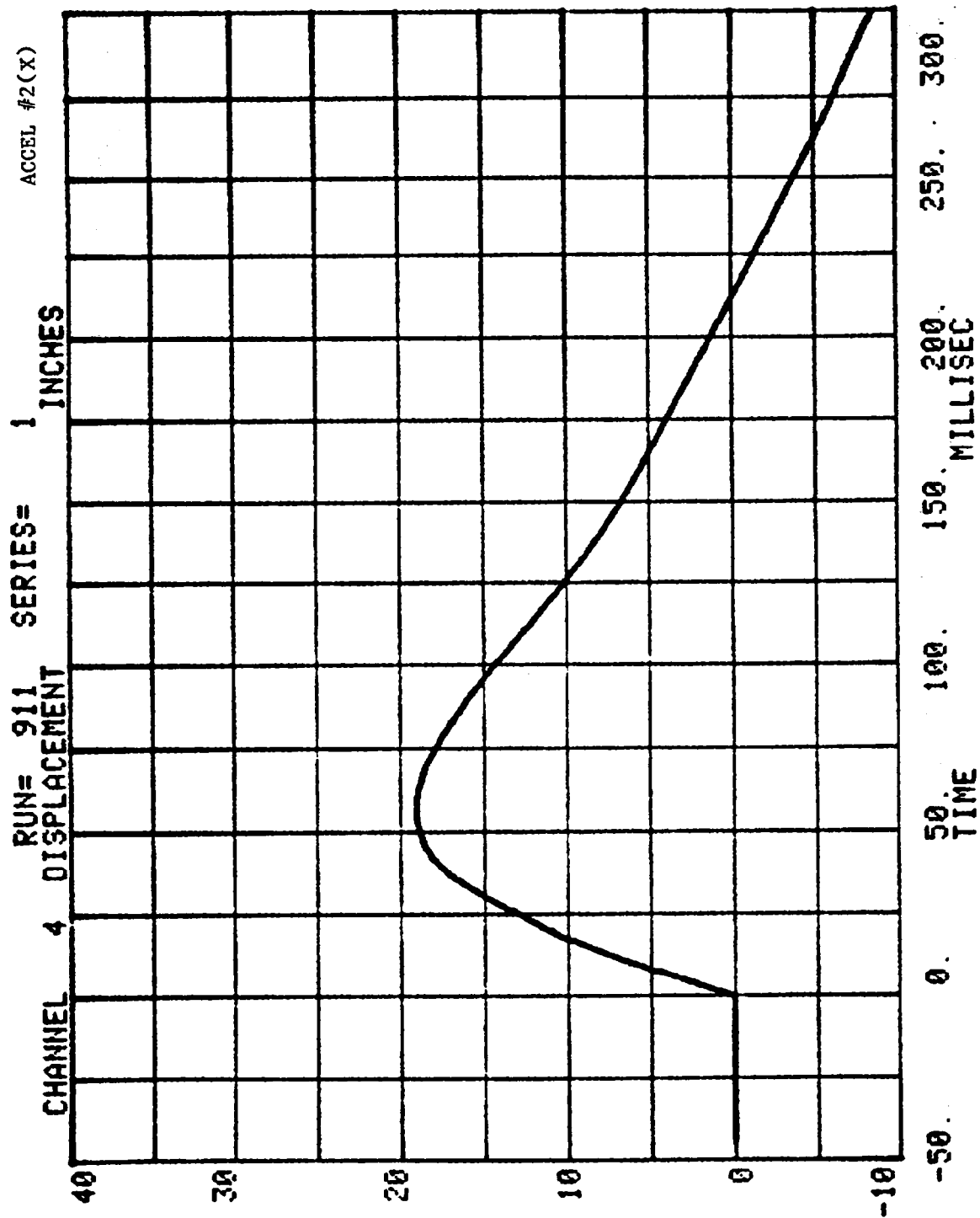




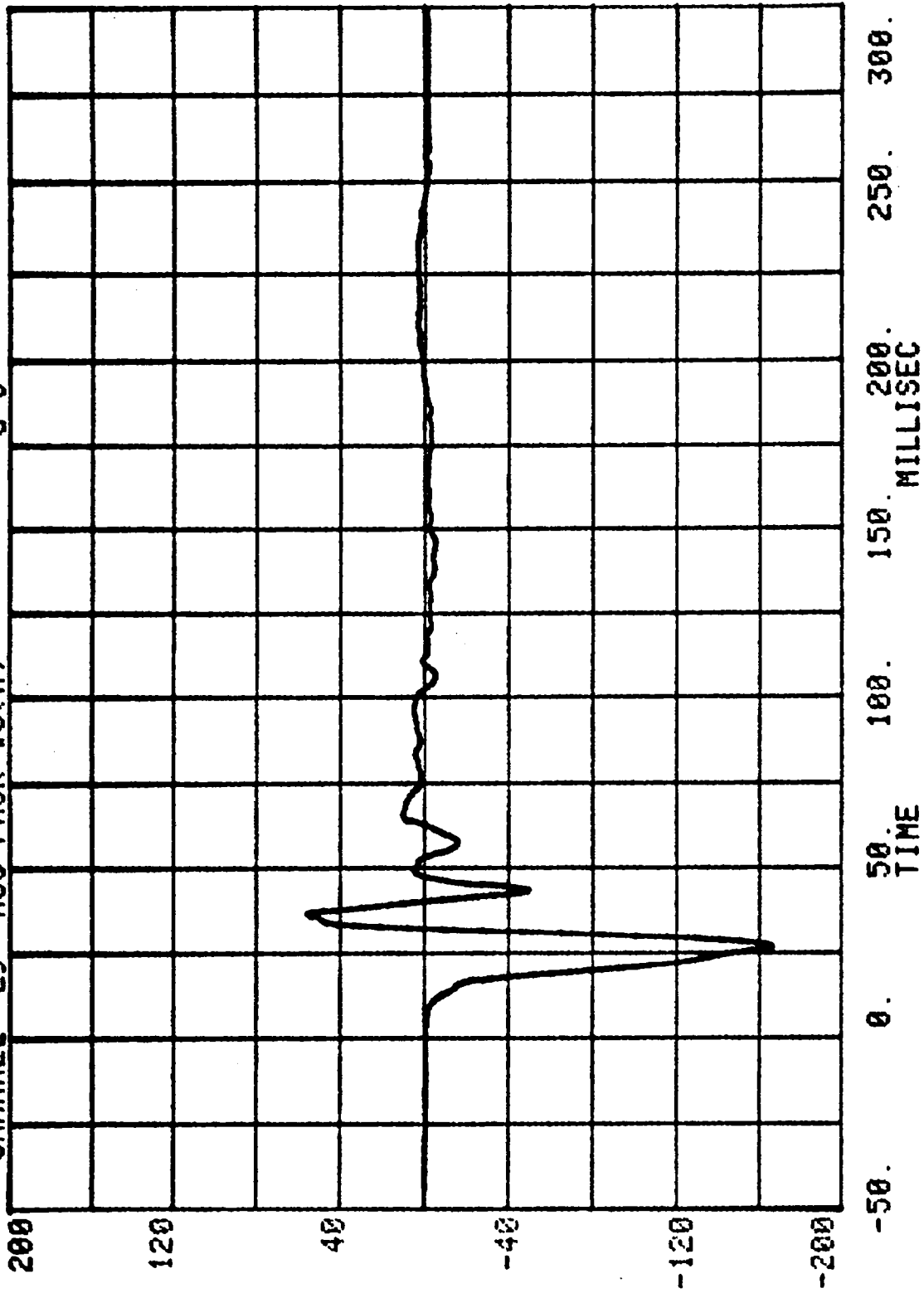
RUN= 911 SERIES= 1
CHANNEL 28 ACC PACK #2(X) G'S

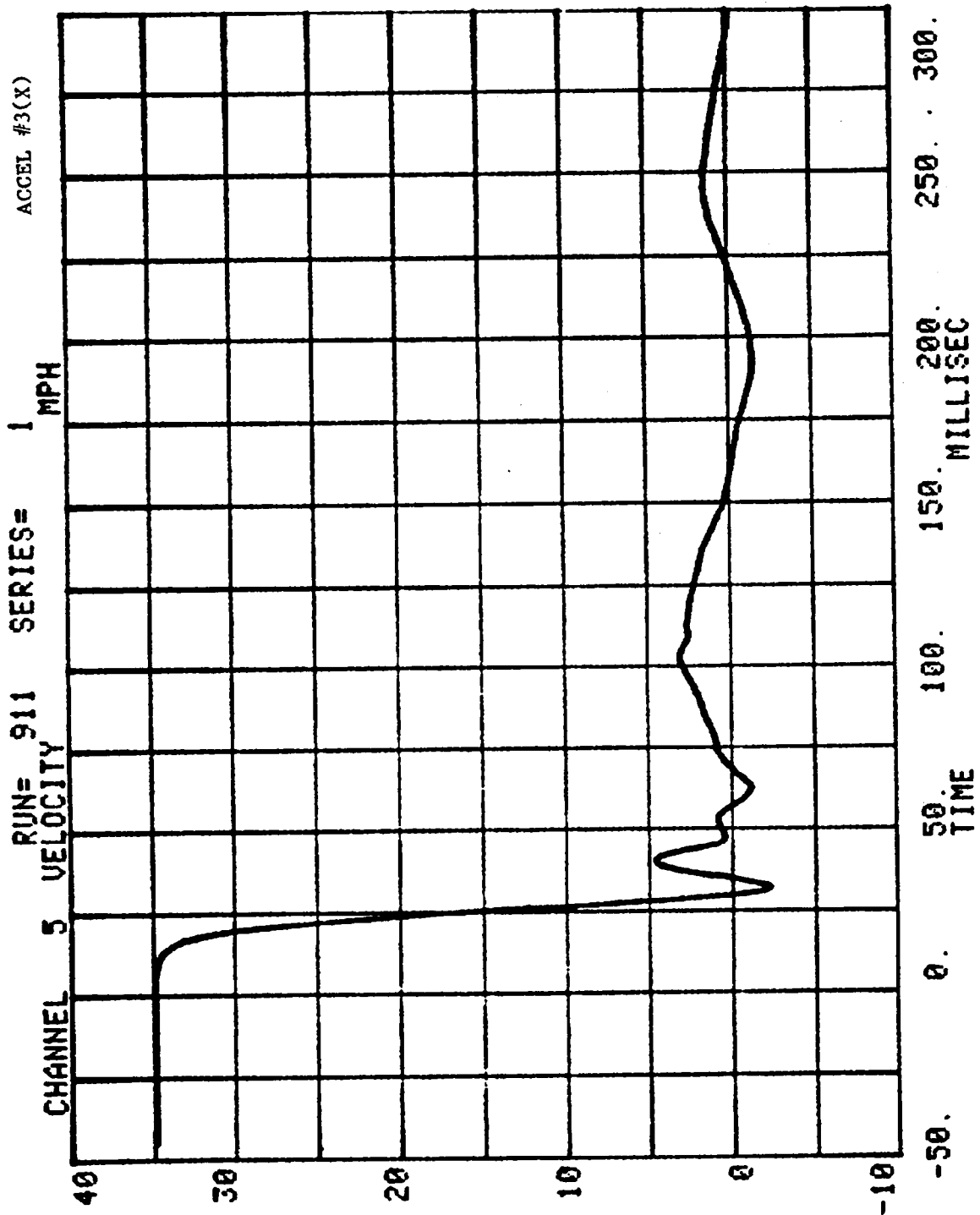






RUN= 911 SERIES= 1 G'S
CHANNEL 29 ACC PACK #3(X)



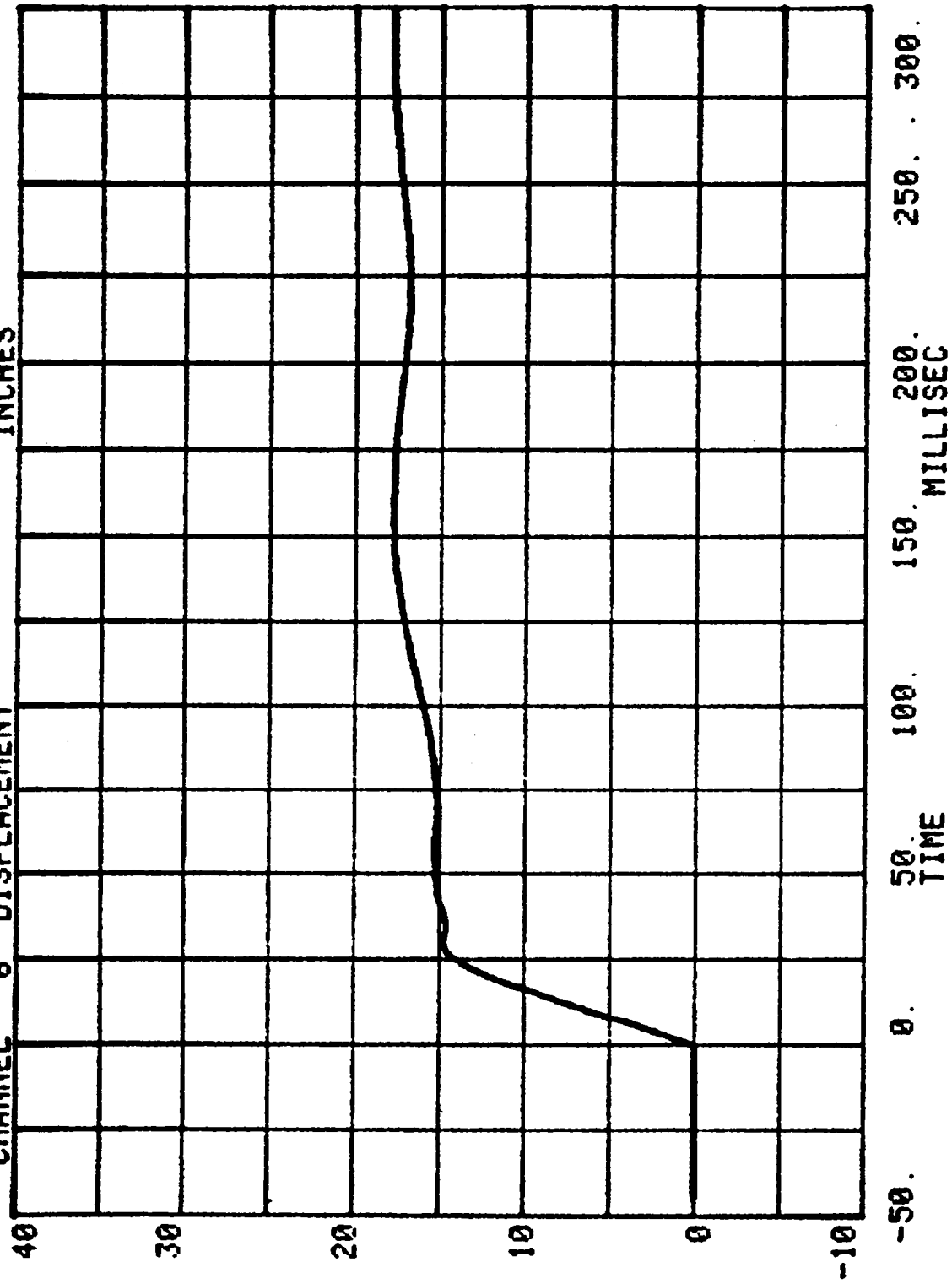


ACCEL #3(X)

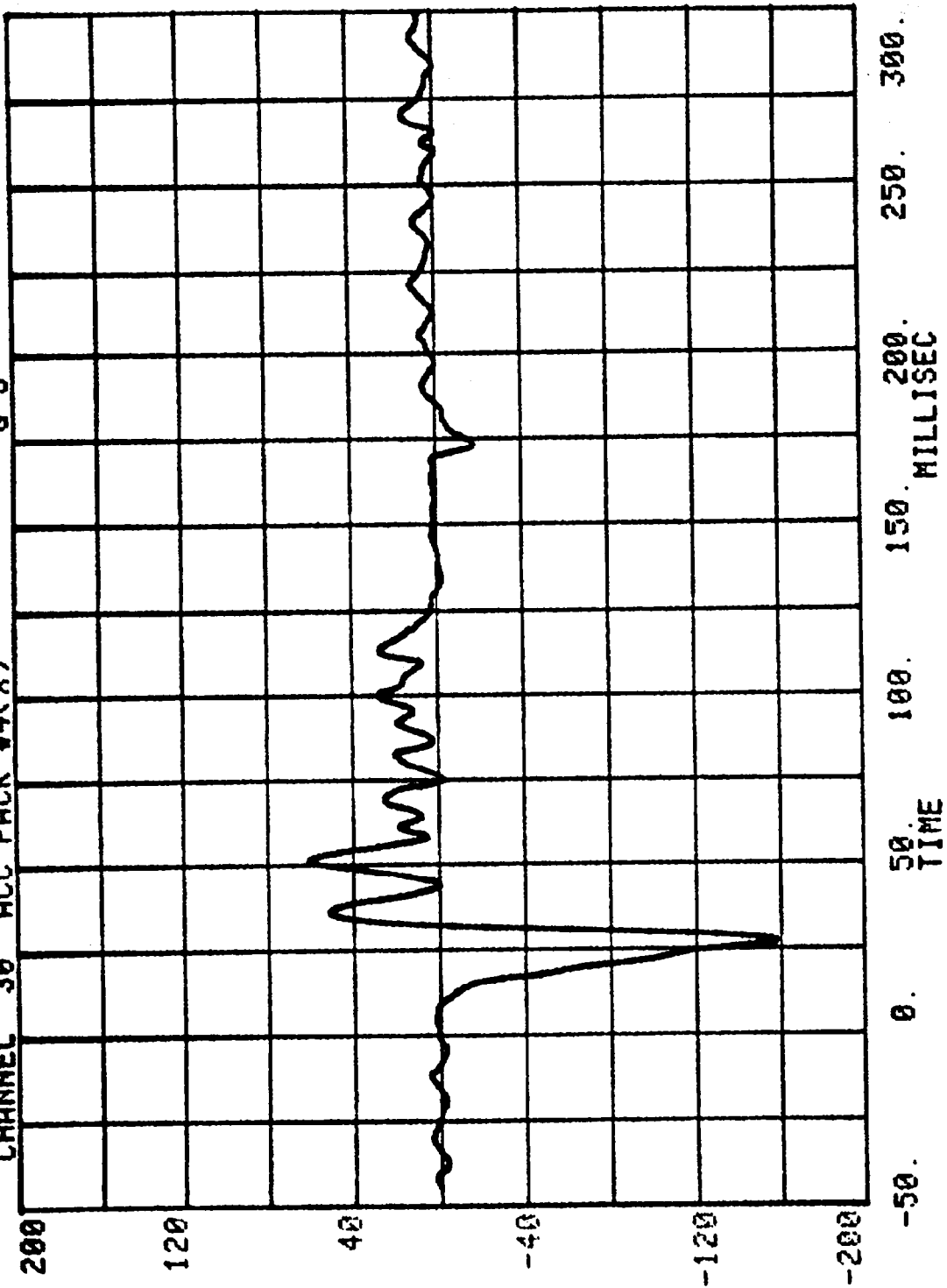
SERIES= 1 INCHES

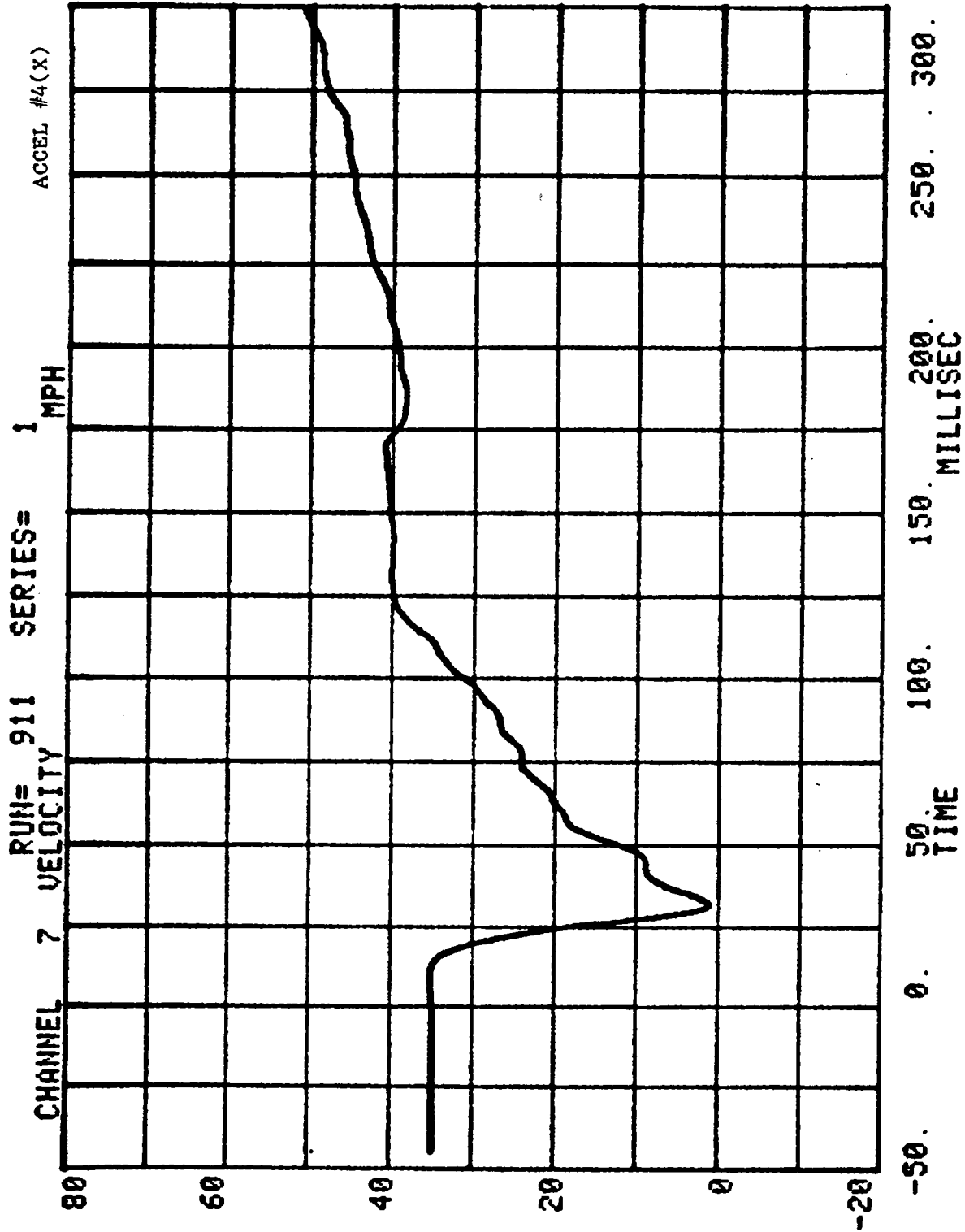
RUN= 911

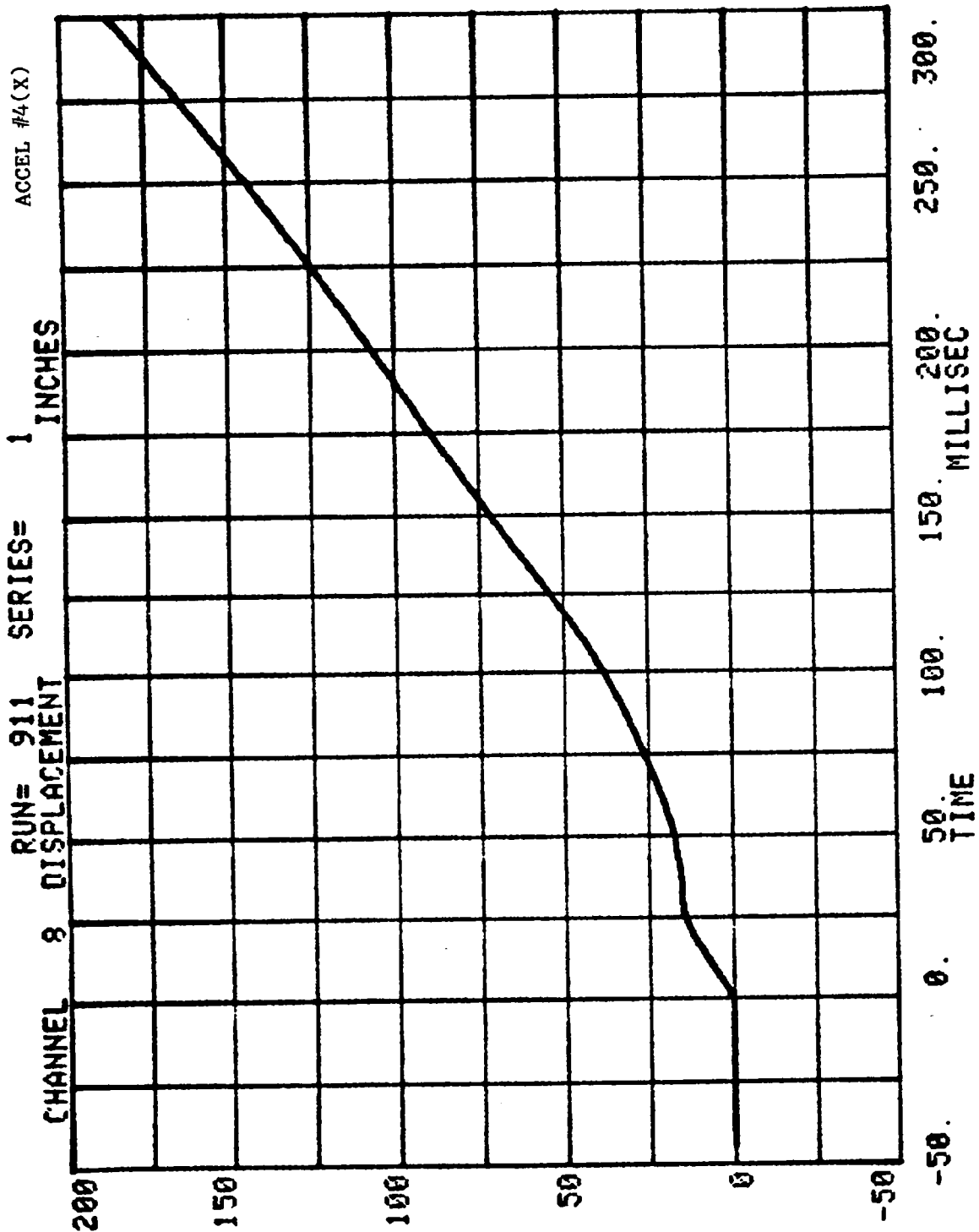
CHANNEL 6 DISPLACEMENT



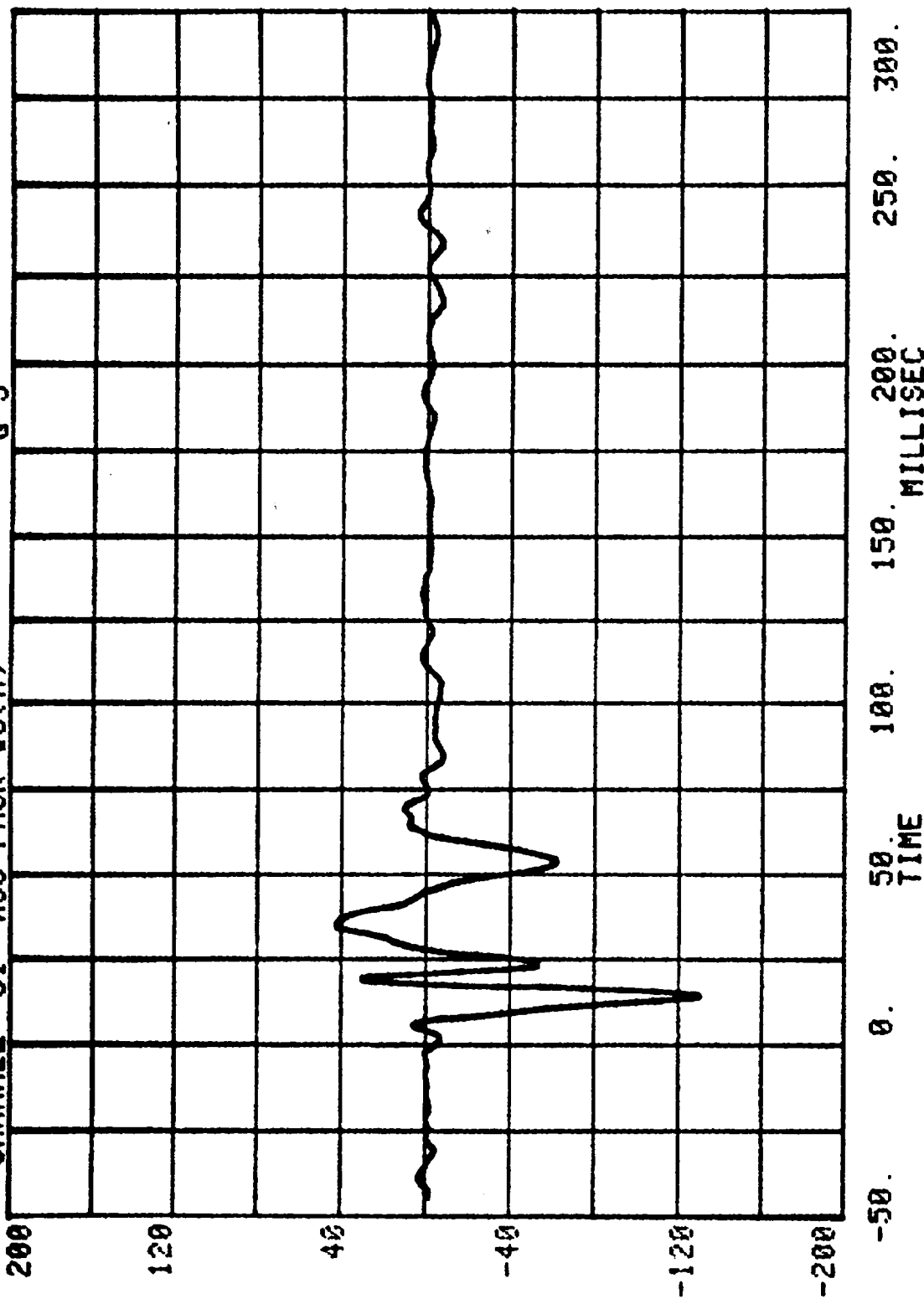
RUN= 911 SERIES= 1 G'S
CHANNEL 30 ACC PACK #4(X)

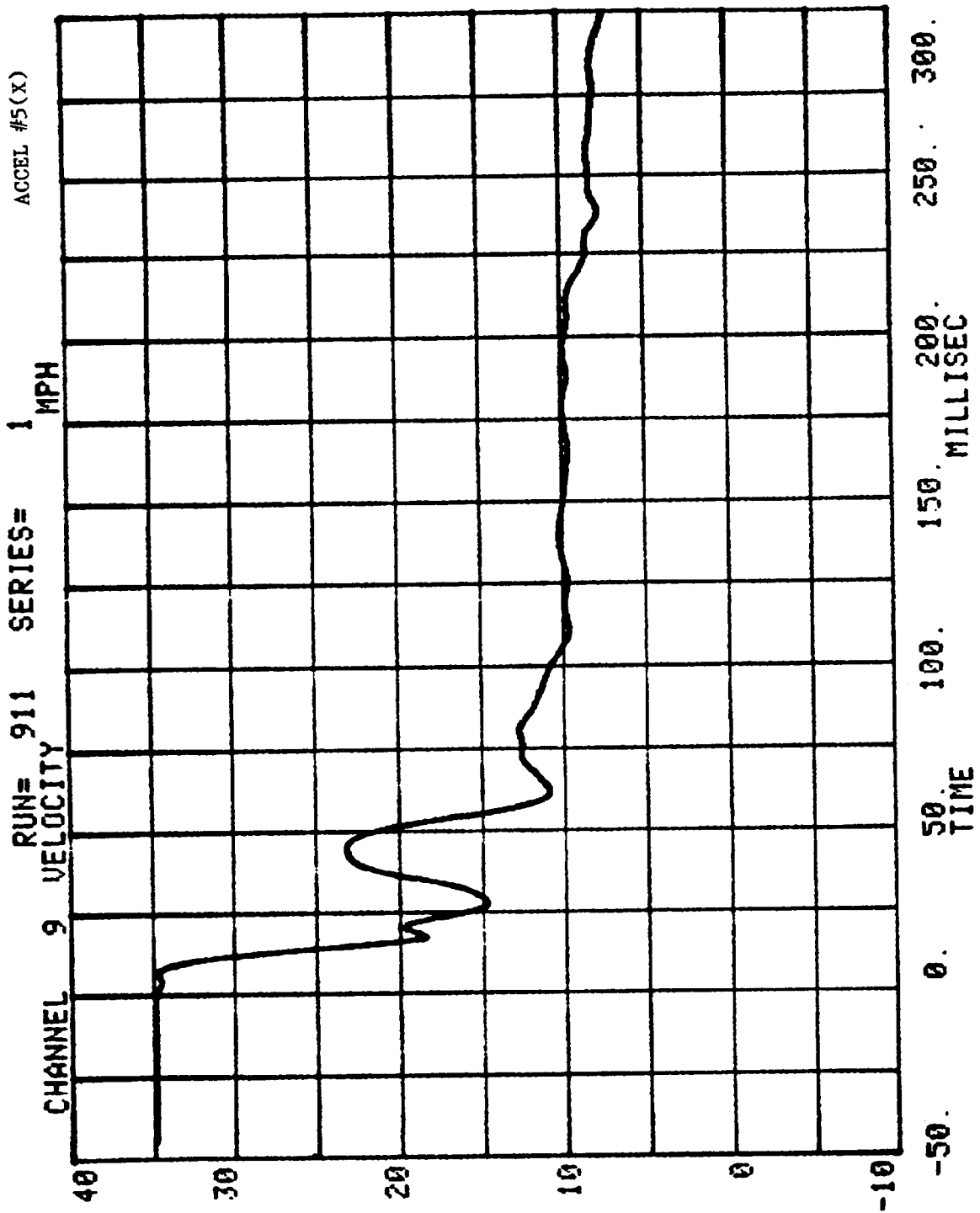


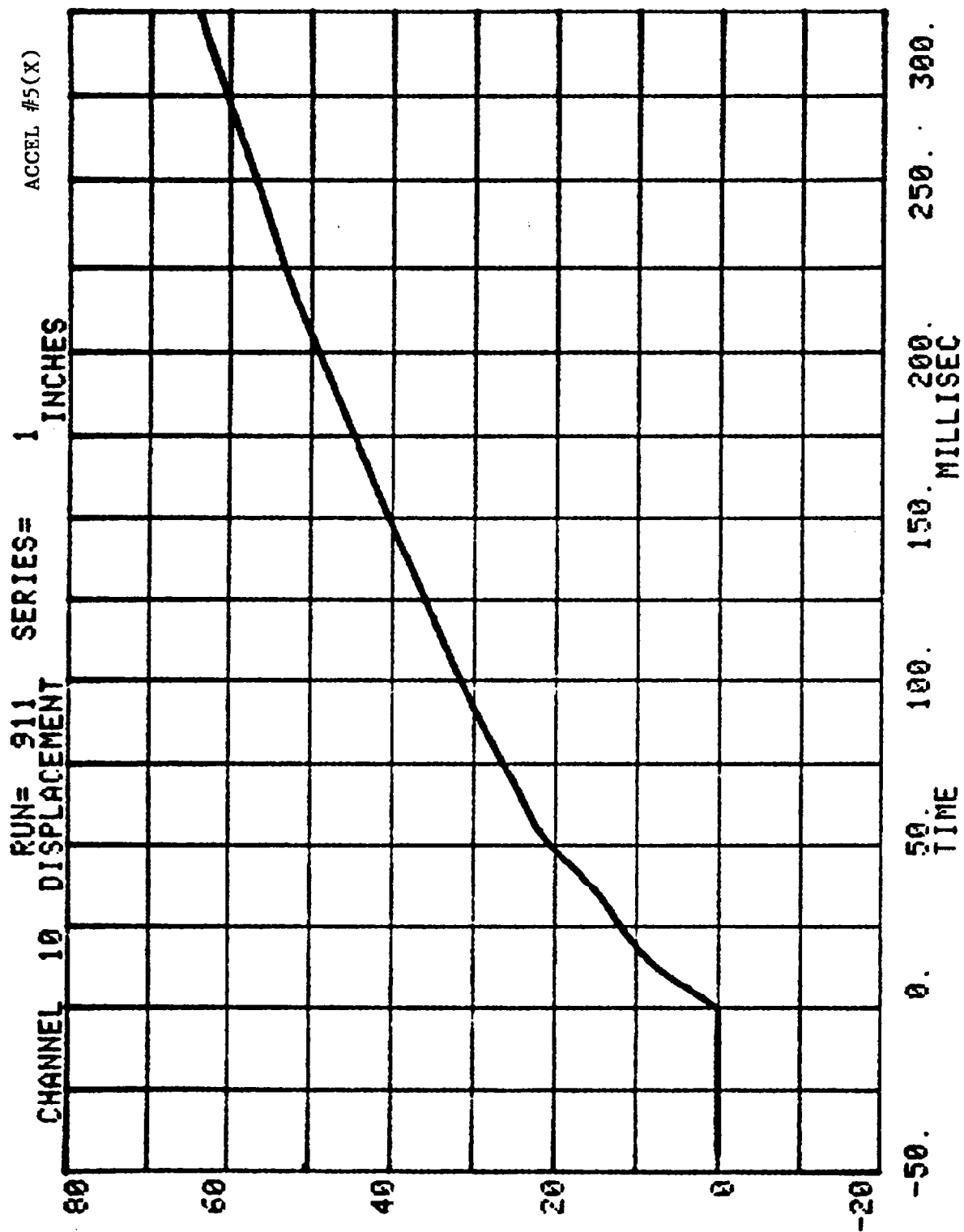




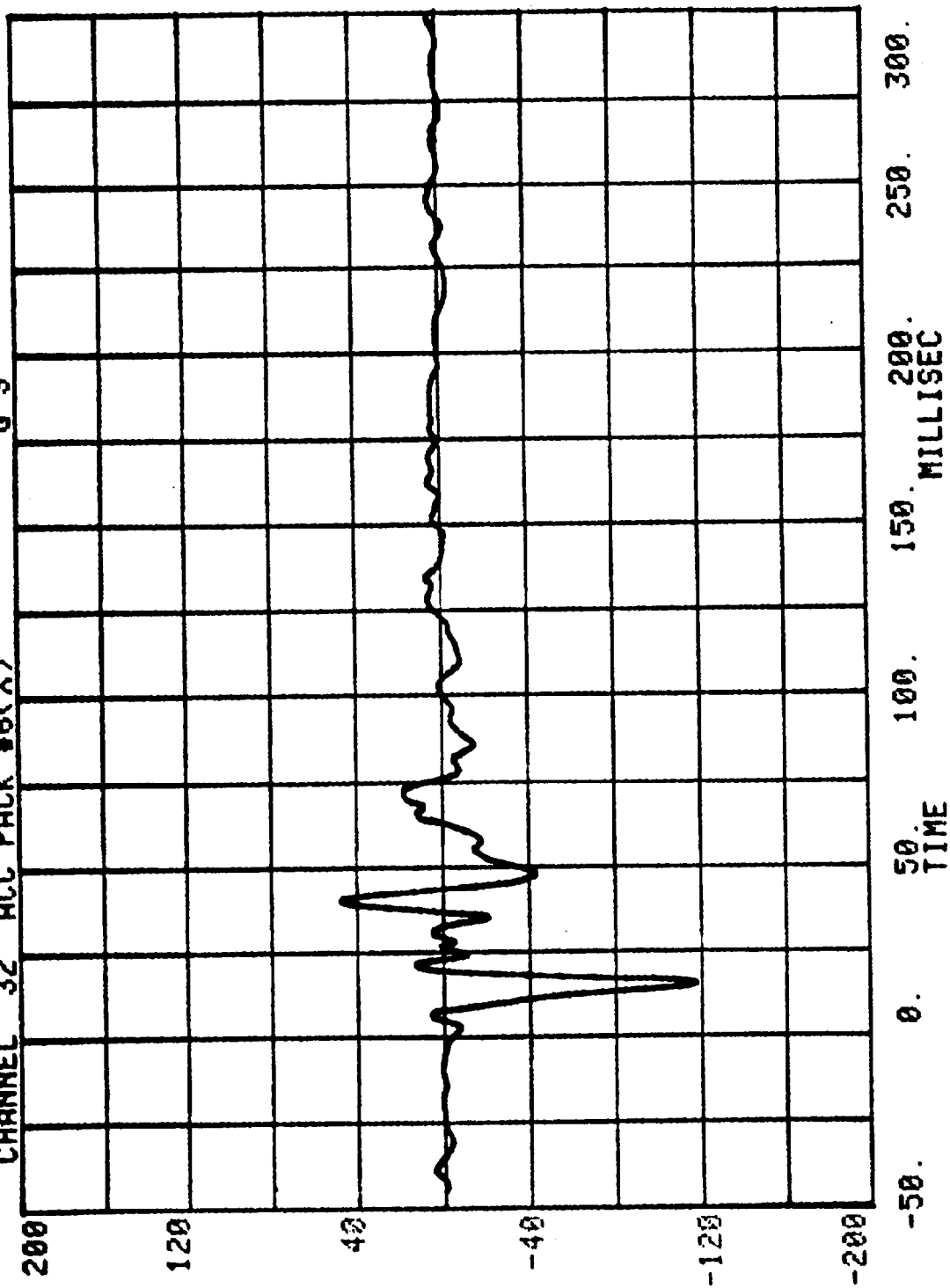
RUN= 911 SERIES= 1
CHANNEL 31 ACC PACK #5(X) G'S







CHANNEL 32 ACC PACK #6(X) RUN= 911 SERIES= 1 G'S



ACCEL #6(X)

1 MPH

SERIES=

RUN= 911

VELOCITY

CHANNEL 11



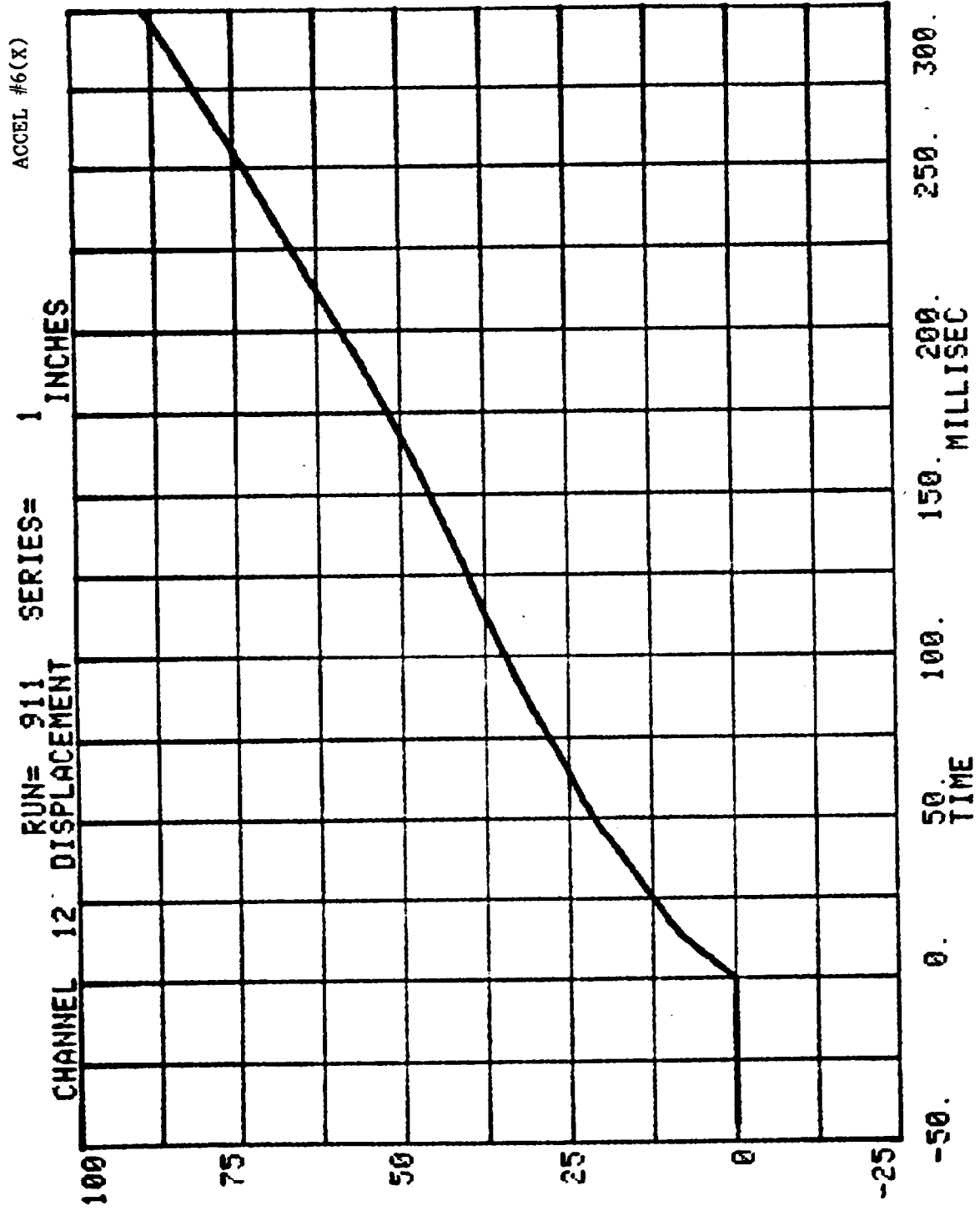
250. 300.

150. 200.

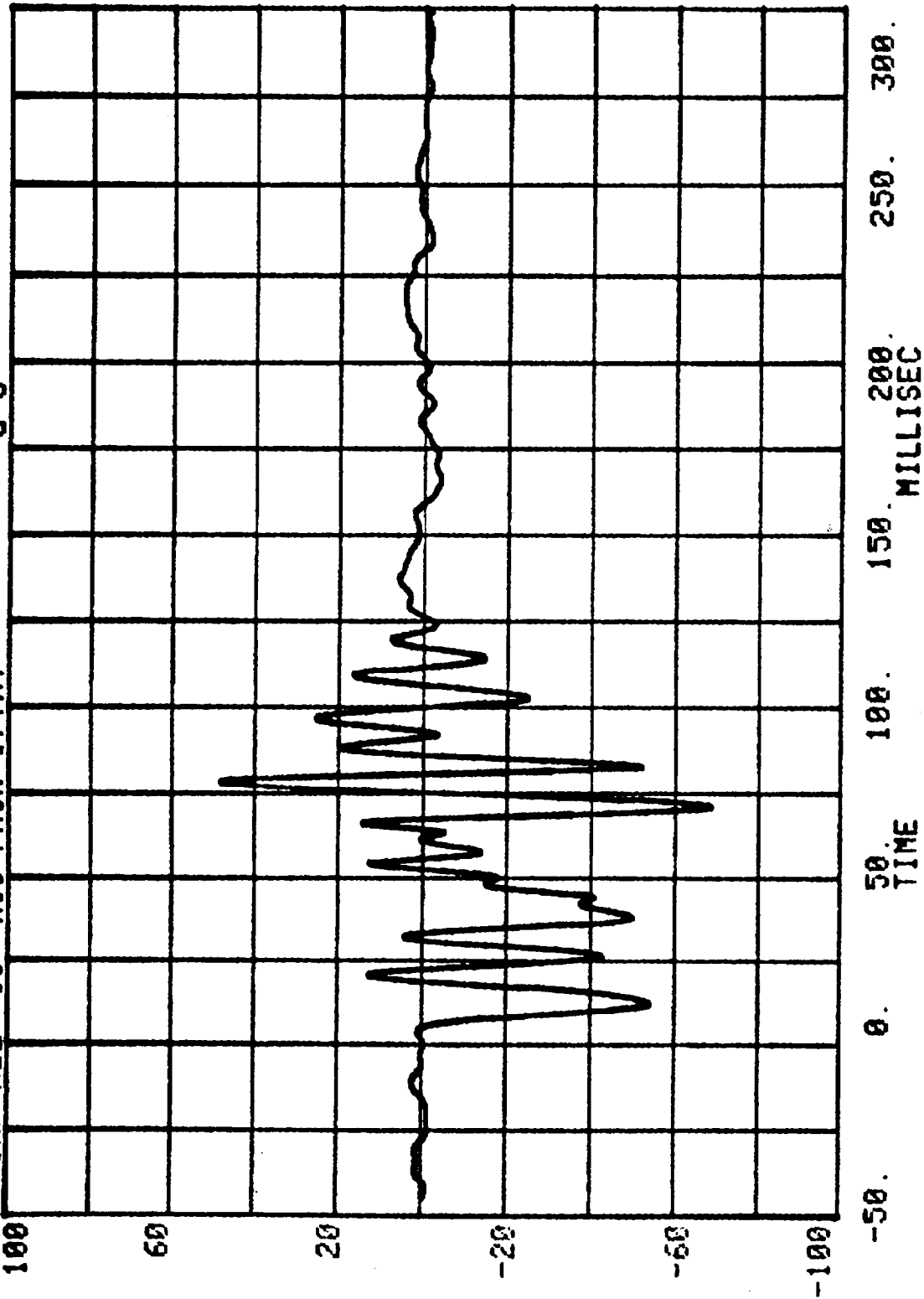
100. 50.

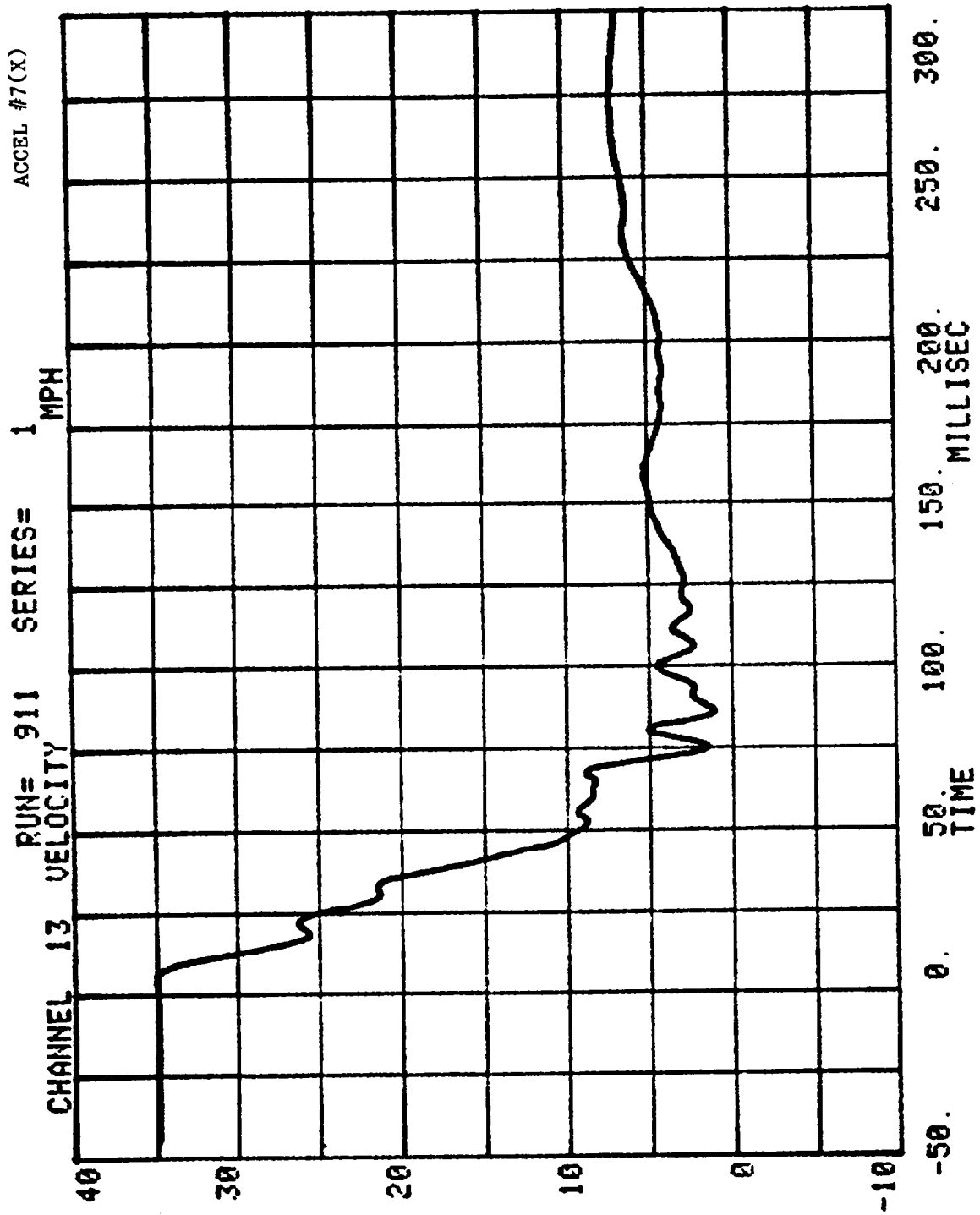
0. -50.

MILLISEC



CHANNEL 33 ACC PACK #7(X) RUN= 911 SERIES= 1 G'S



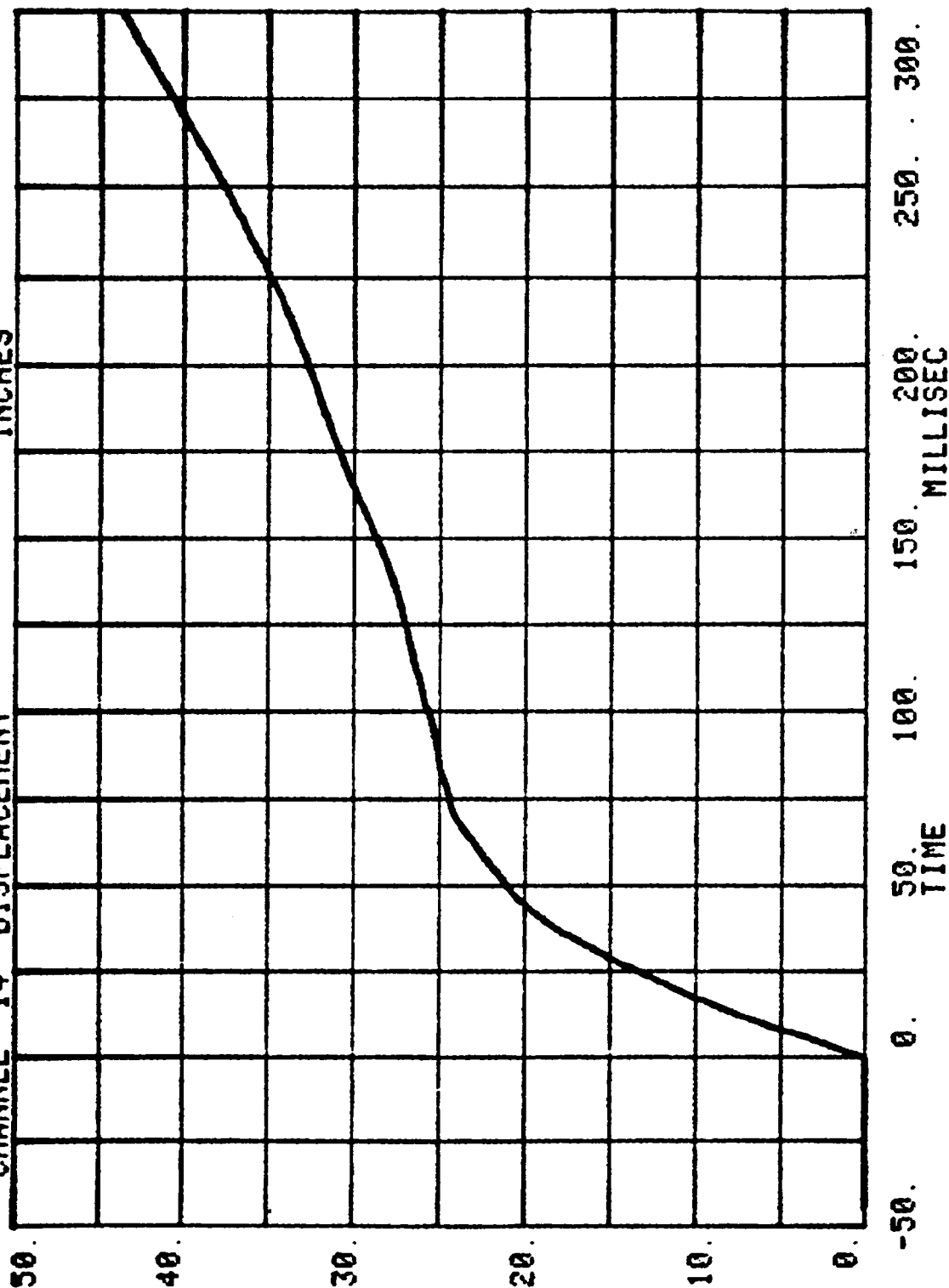


ACCEL #7(X)

SERIES= 1 INCHES

RUN= 911

CHANNEL 14 DISPLACEMENT



TEST NO. 916-010-911

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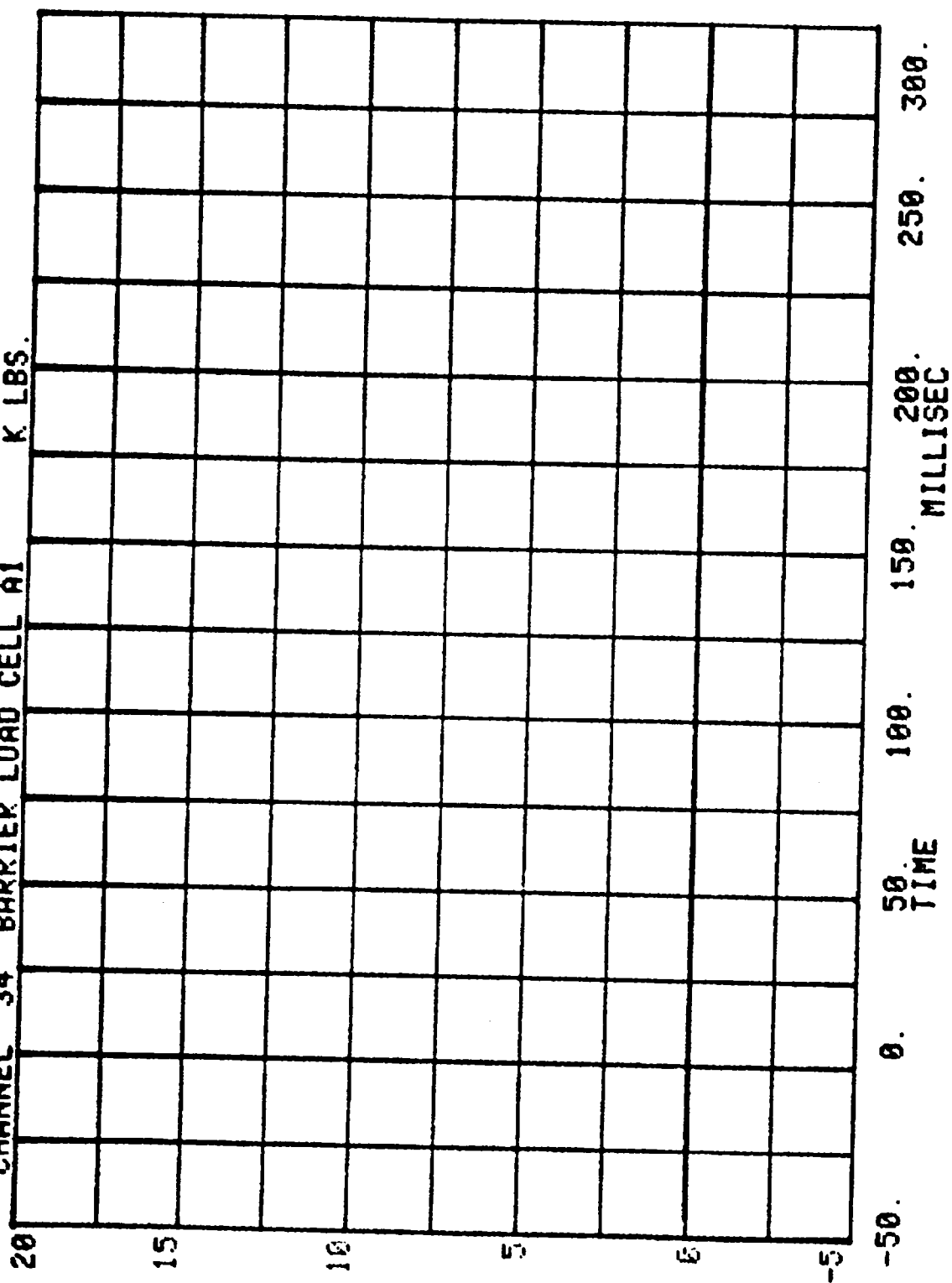
FILTER CHANNEL CLASS

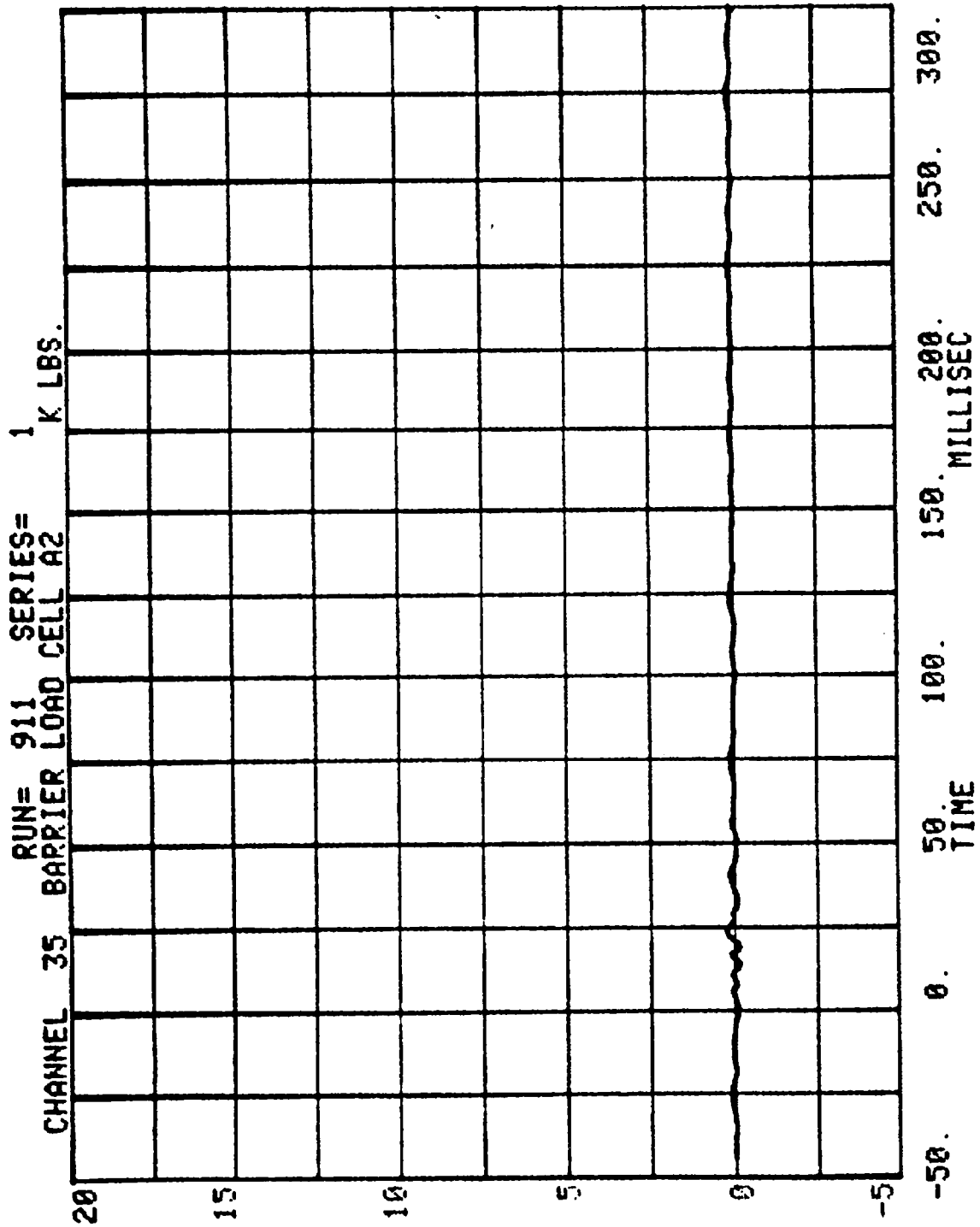
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B-24

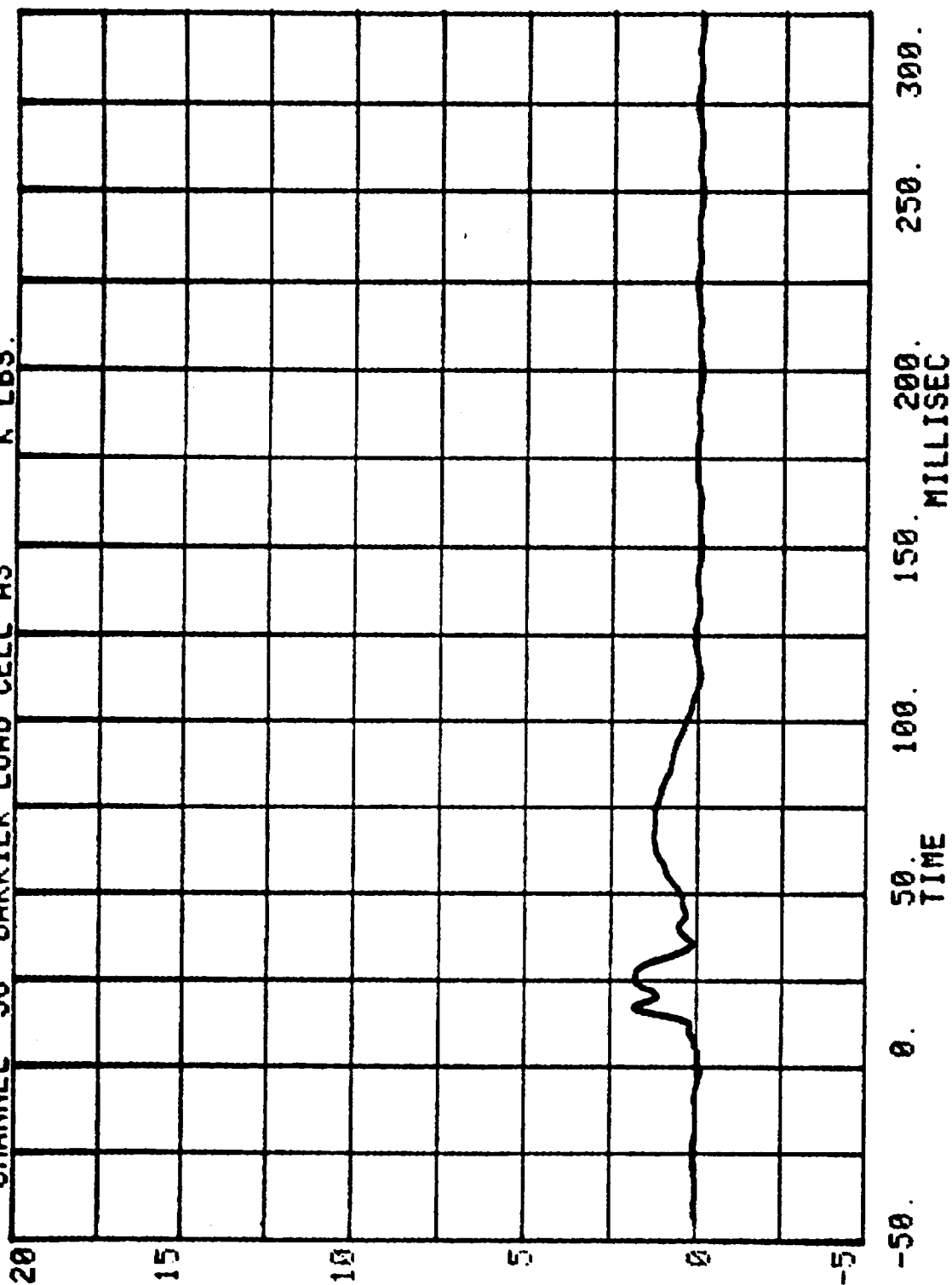
7735-1

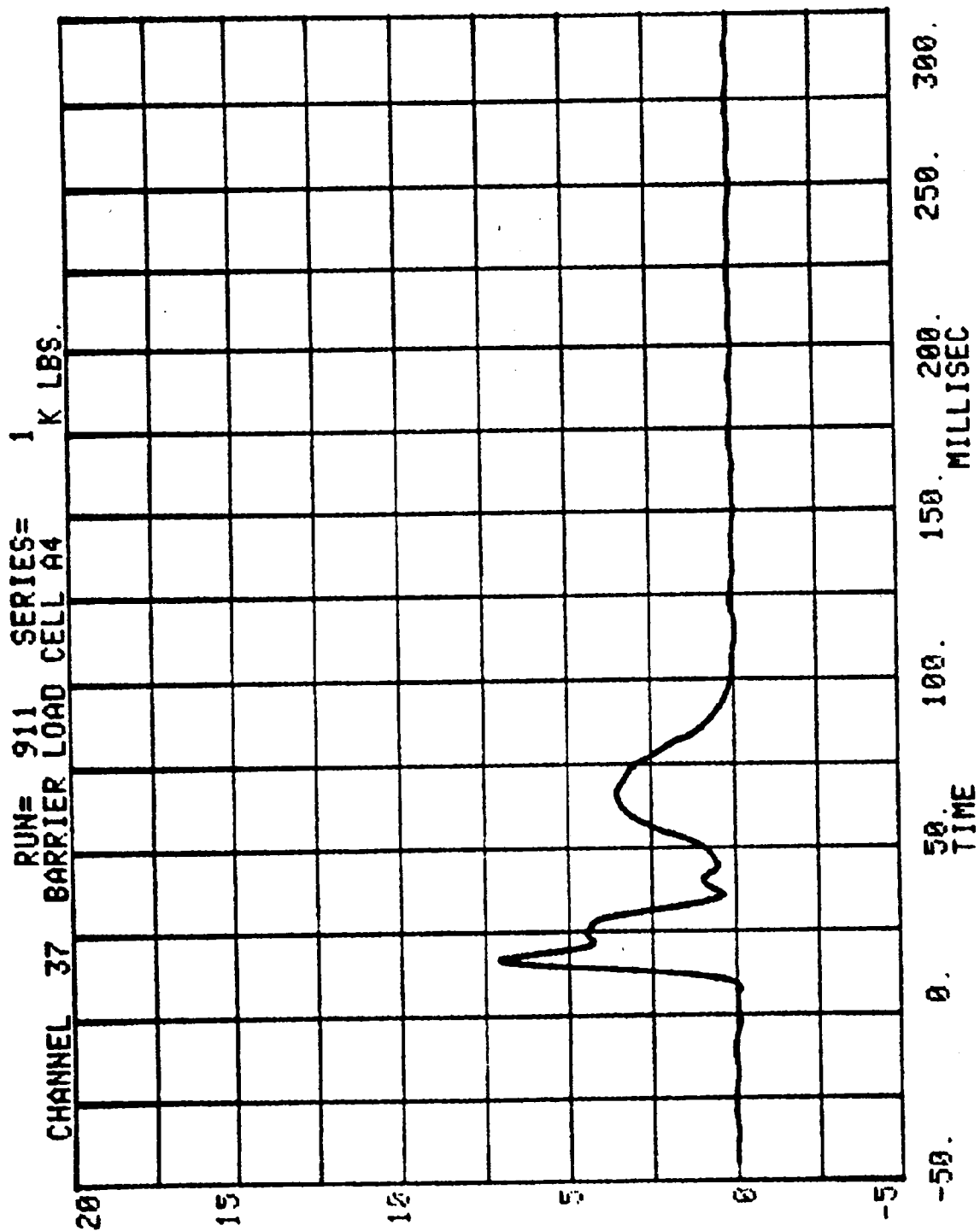
CHANNEL 34 RUN= 911 SERIES= 1
BARRIER LOAD CELL A1 K LBS.



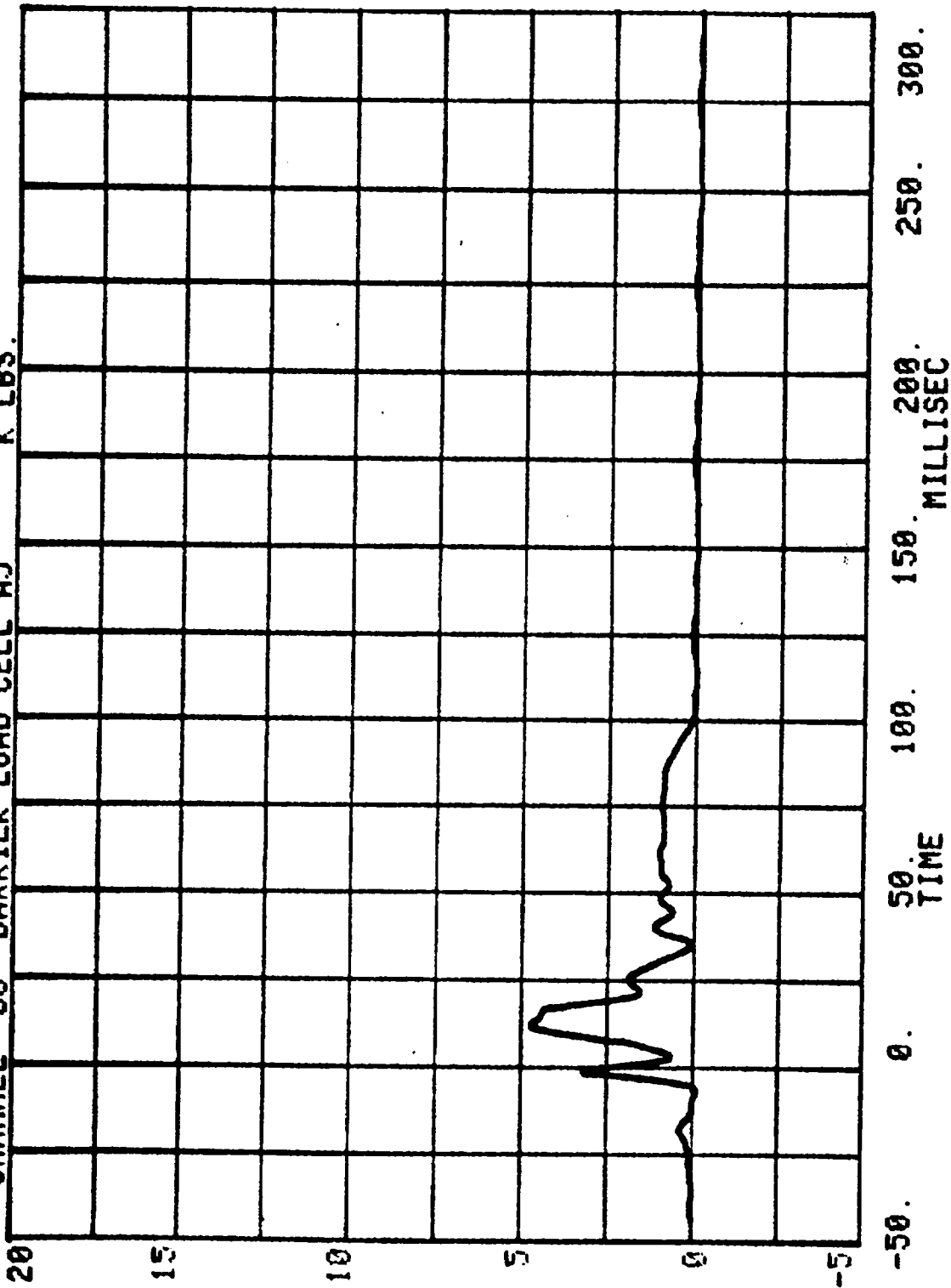


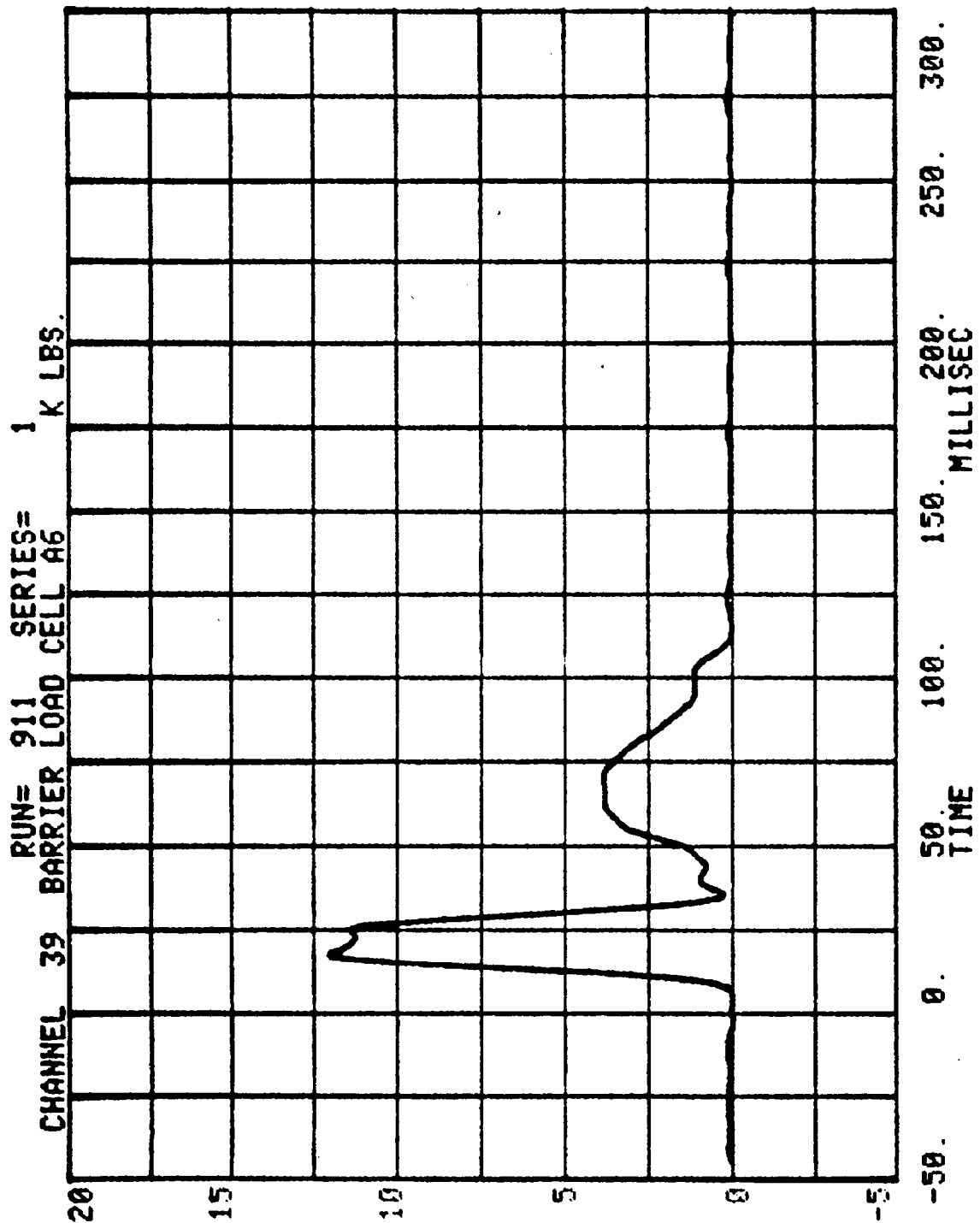
RUN= 911 SERIES= 1
CHANNEL 36 BARRIER LOAD CELL A3 K LBS.



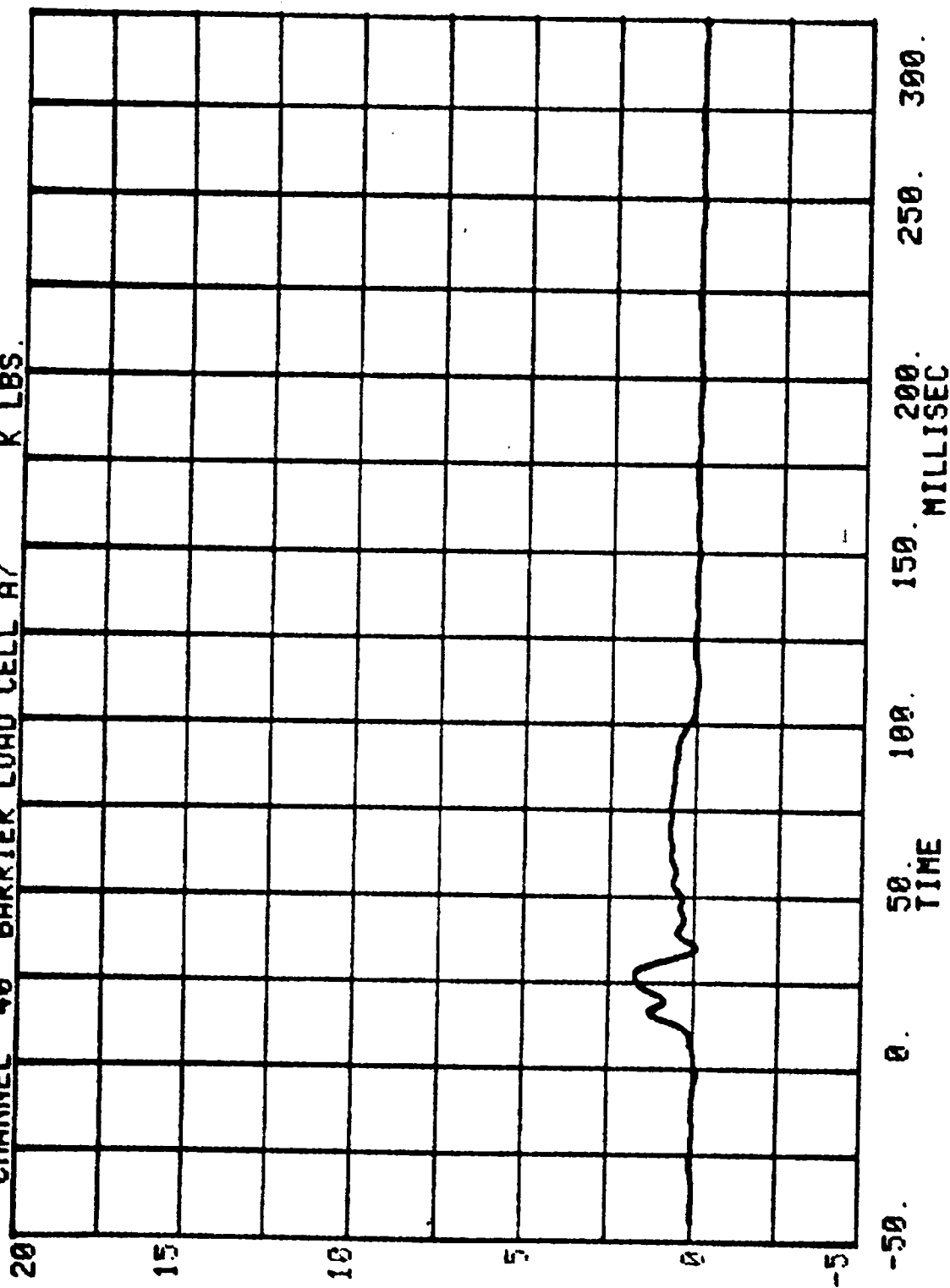


RUN= 911 SERIES= 1
CHANNEL 38 BARRIER LOAD CELL A5 K LBS.

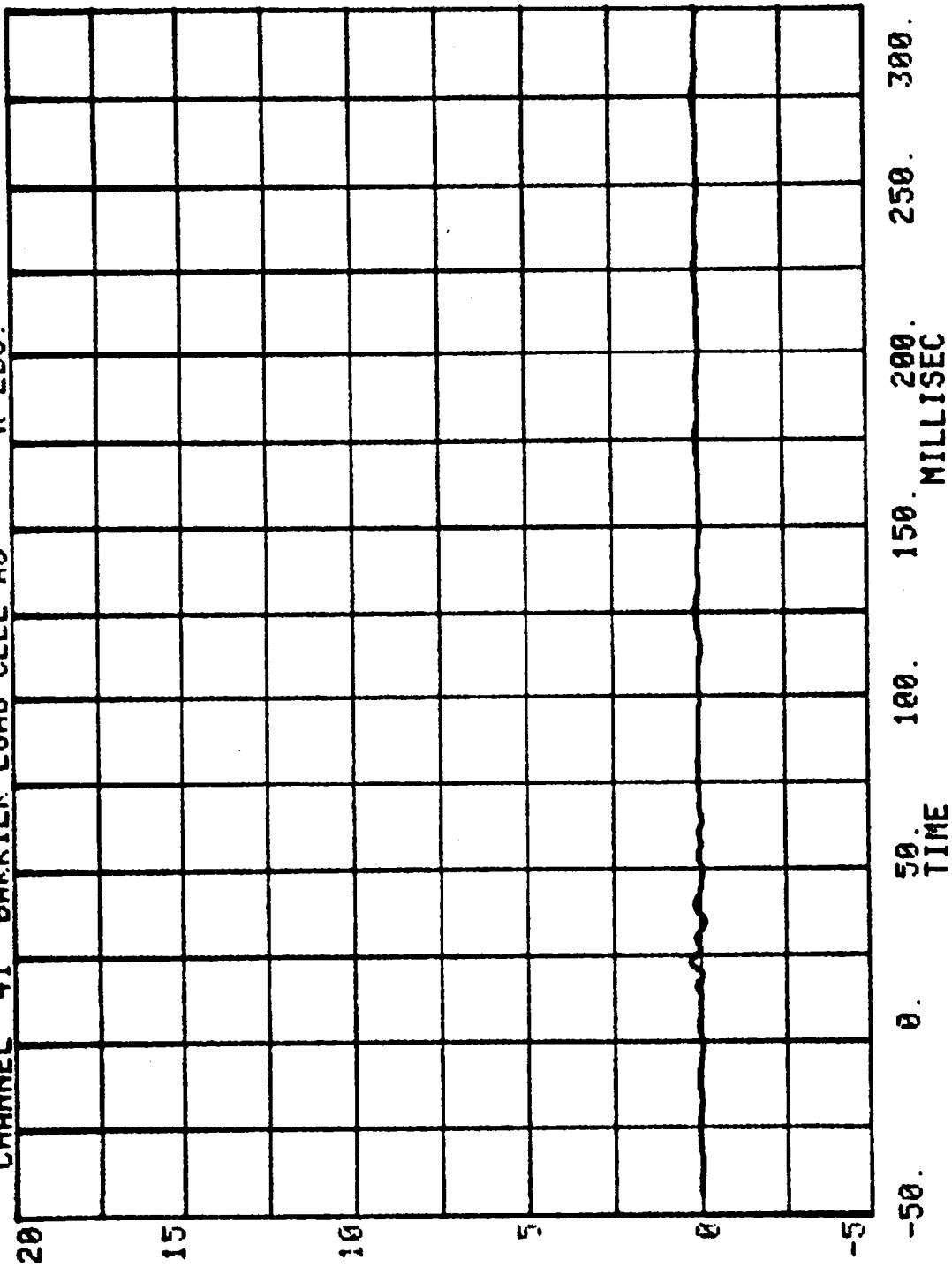




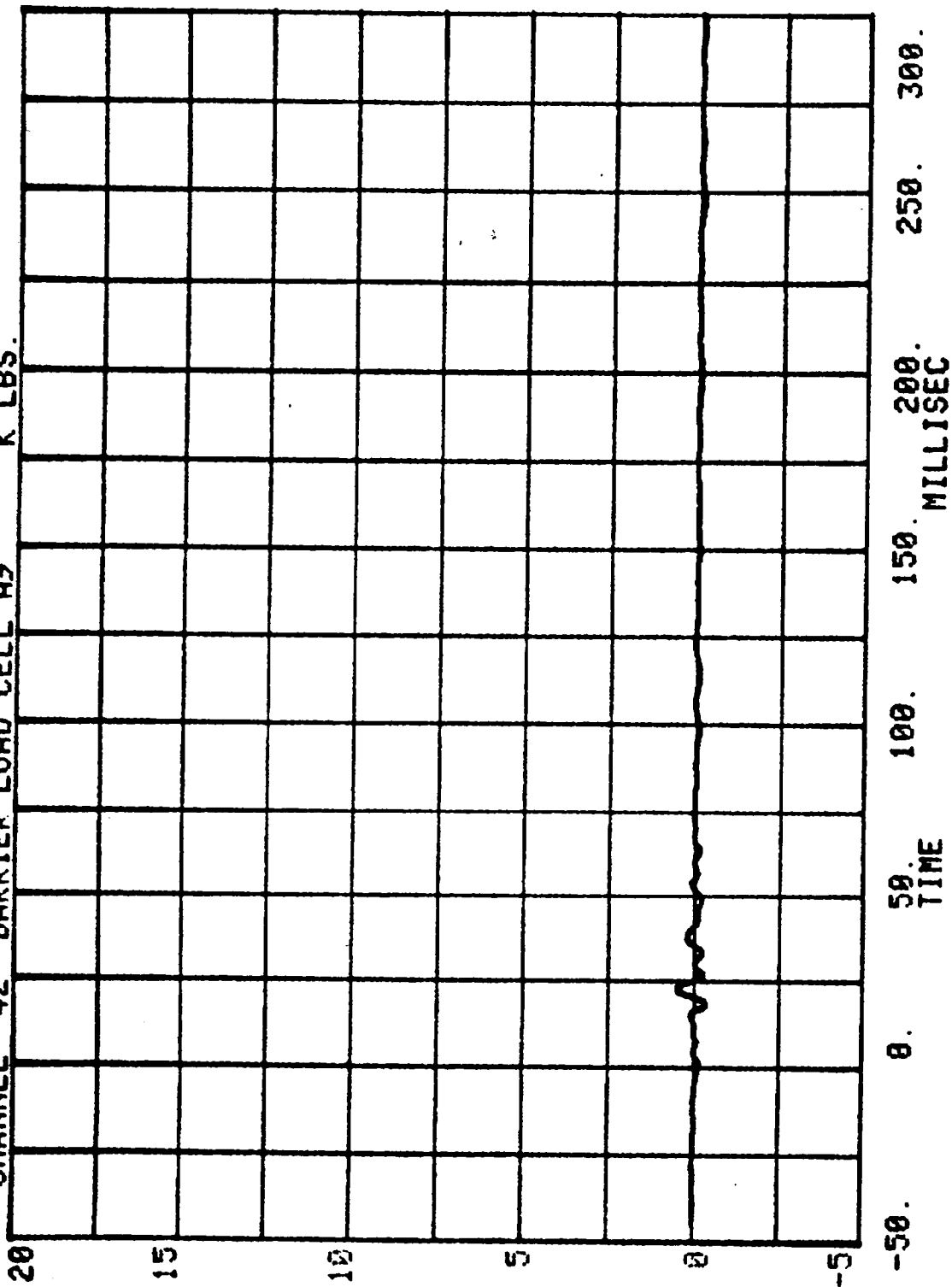
CHANNEL 40 BARRIER LOAD CELL A7 RUN= 911 SERIES= 1 K LBS.



CHANNEL 41 BARRIER LOAD CELL A8 RUN= 911 SERIES= 1 K LBS.



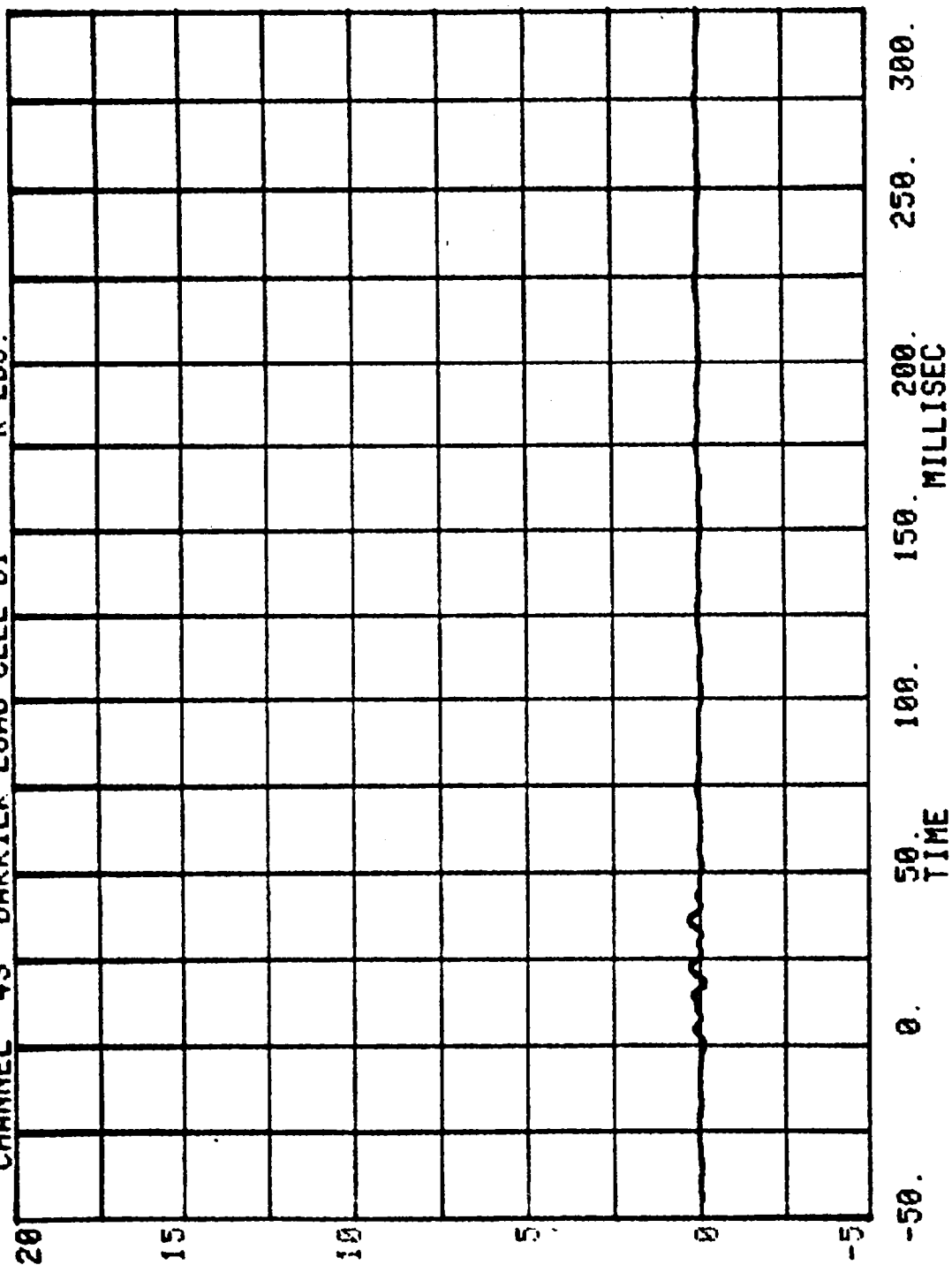
RUN= 911 SERIES= 1
CHANNEL 42 BARRIER LOAD CELL A9 1 K LBS.



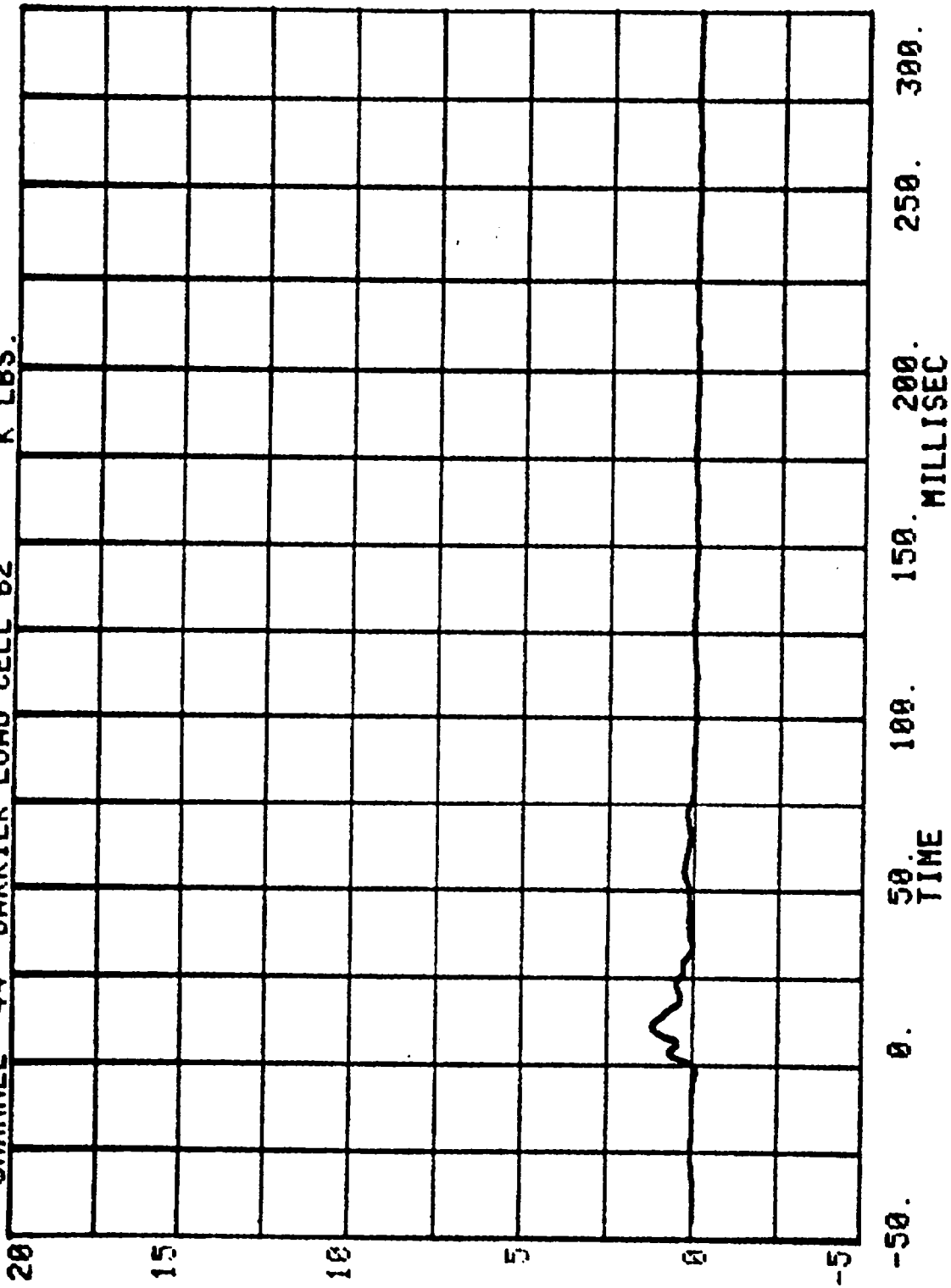
CHANNEL 43 BARRIER LOAD CELL B1

RUN= 911 SERIES= 1

K LBS.



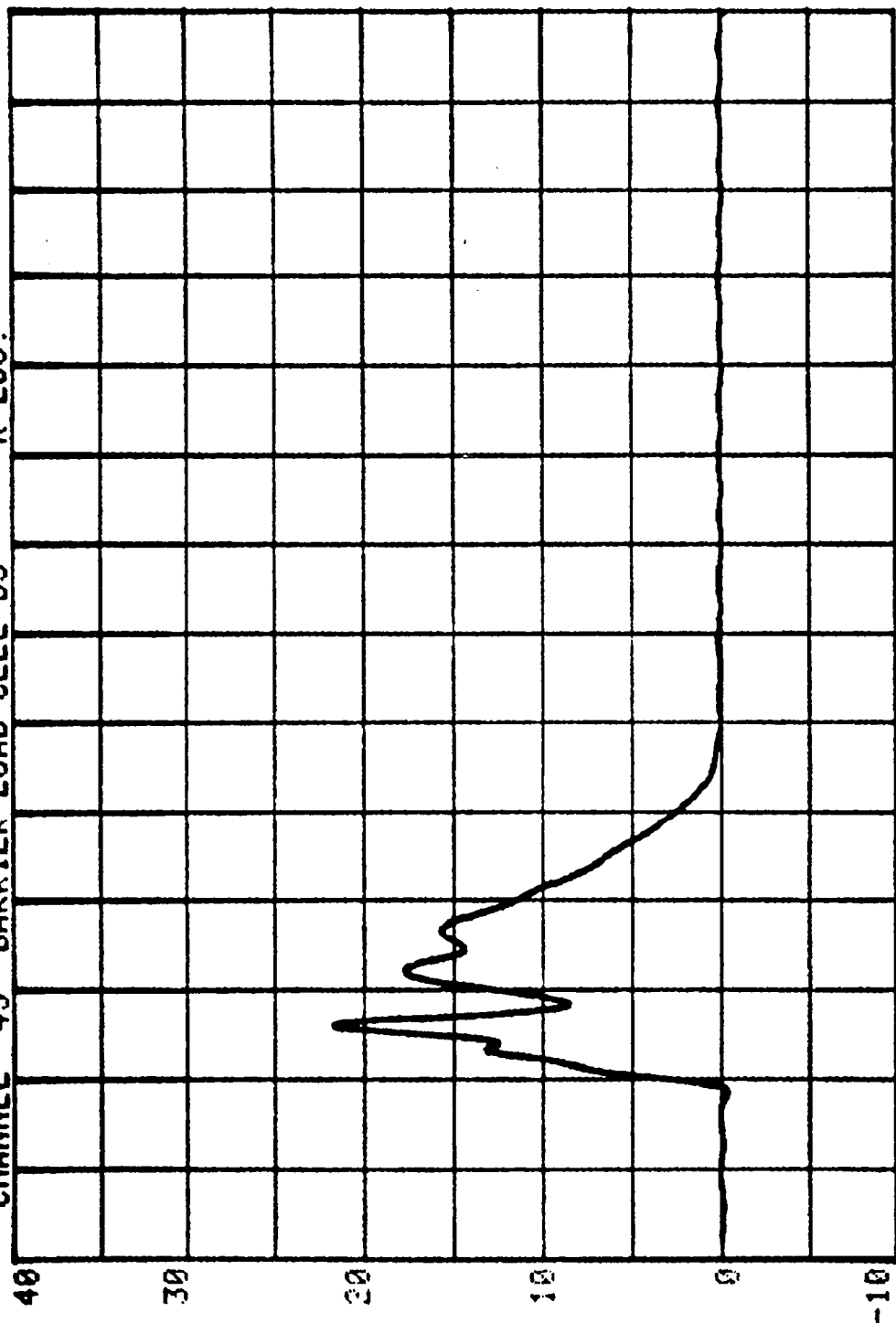
RUN= 911 SERIES= 1
CHANNEL 44 BARRIER LOAD CELL B2 K LBS.



CHANNEL 45 BARRIER LOAD CELL B3

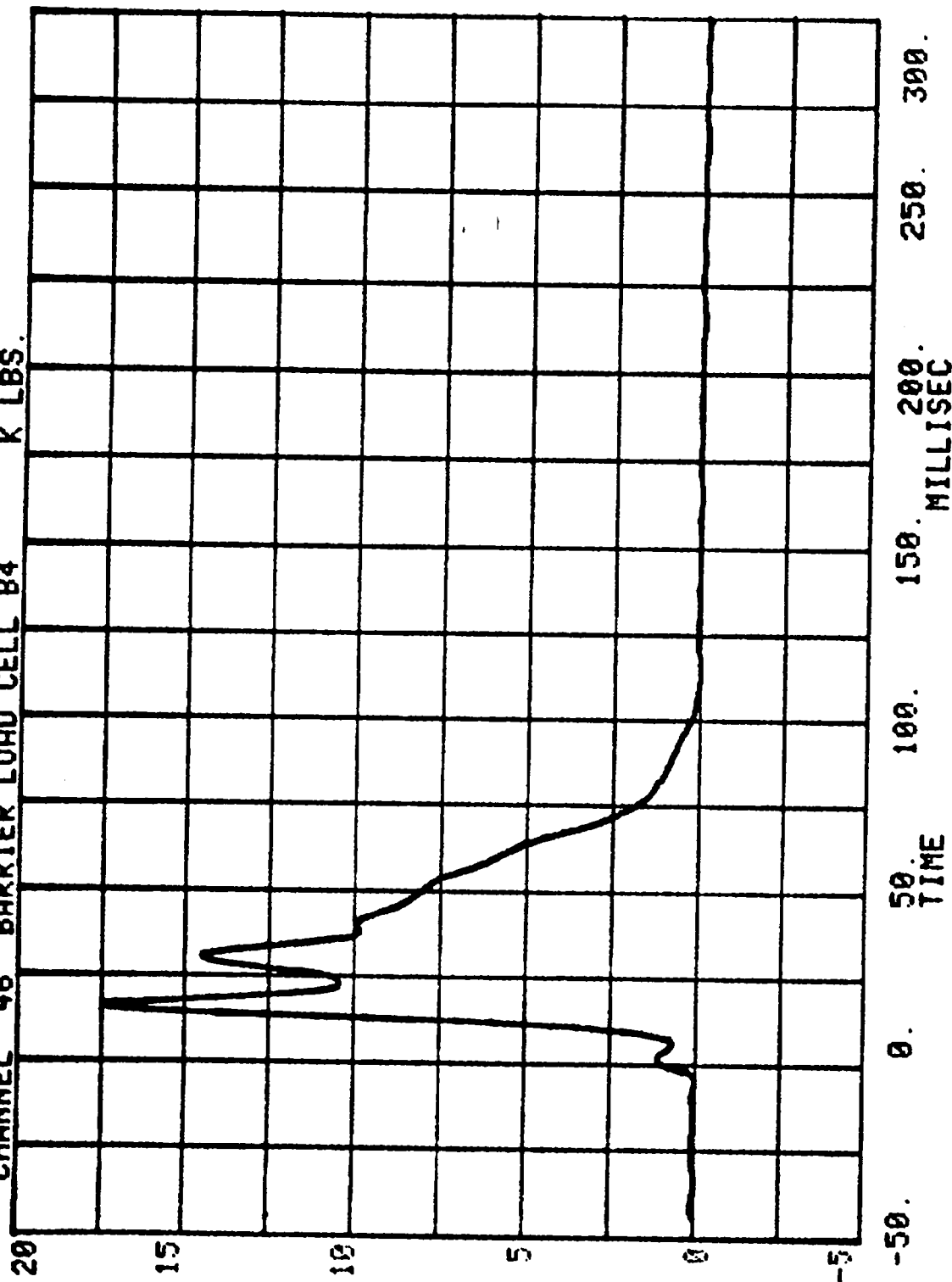
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K LBS.

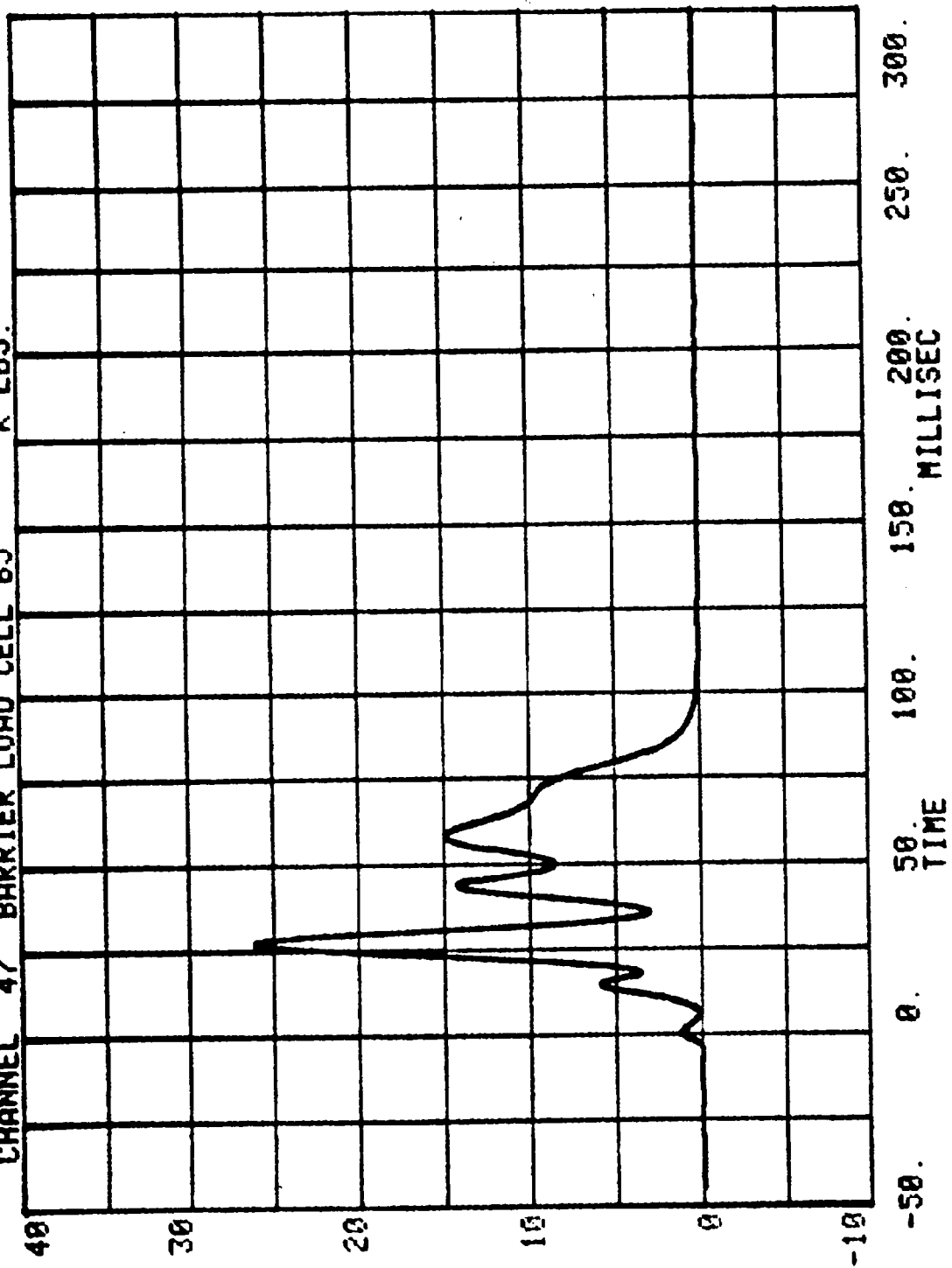


TIME
-50. 0. 50. 100. 150. 200. 250. 300.

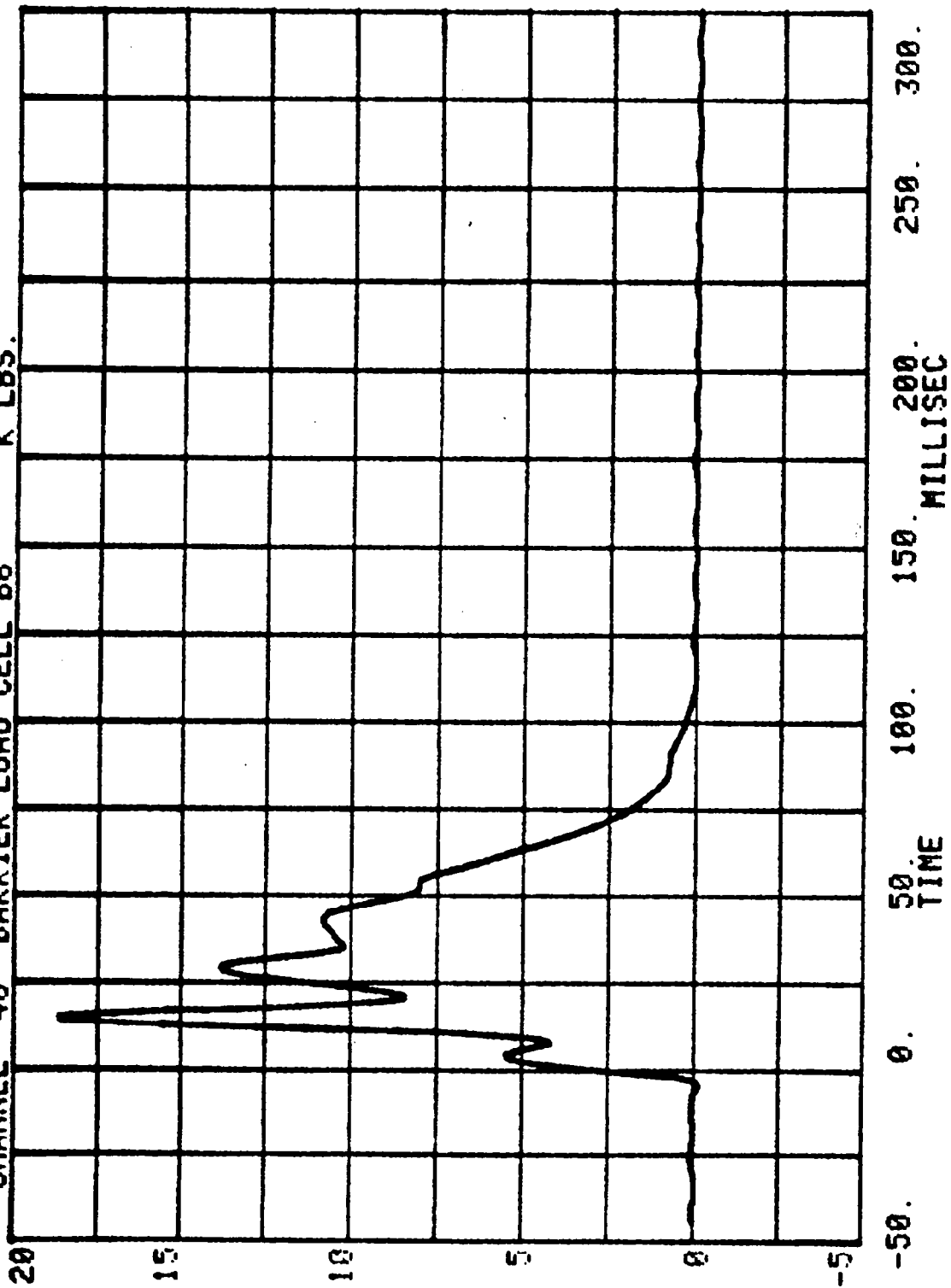
CHANNEL 46 BARRIER LOAD CELL B4 RUN= 911 SERIES= 1 K LBS.



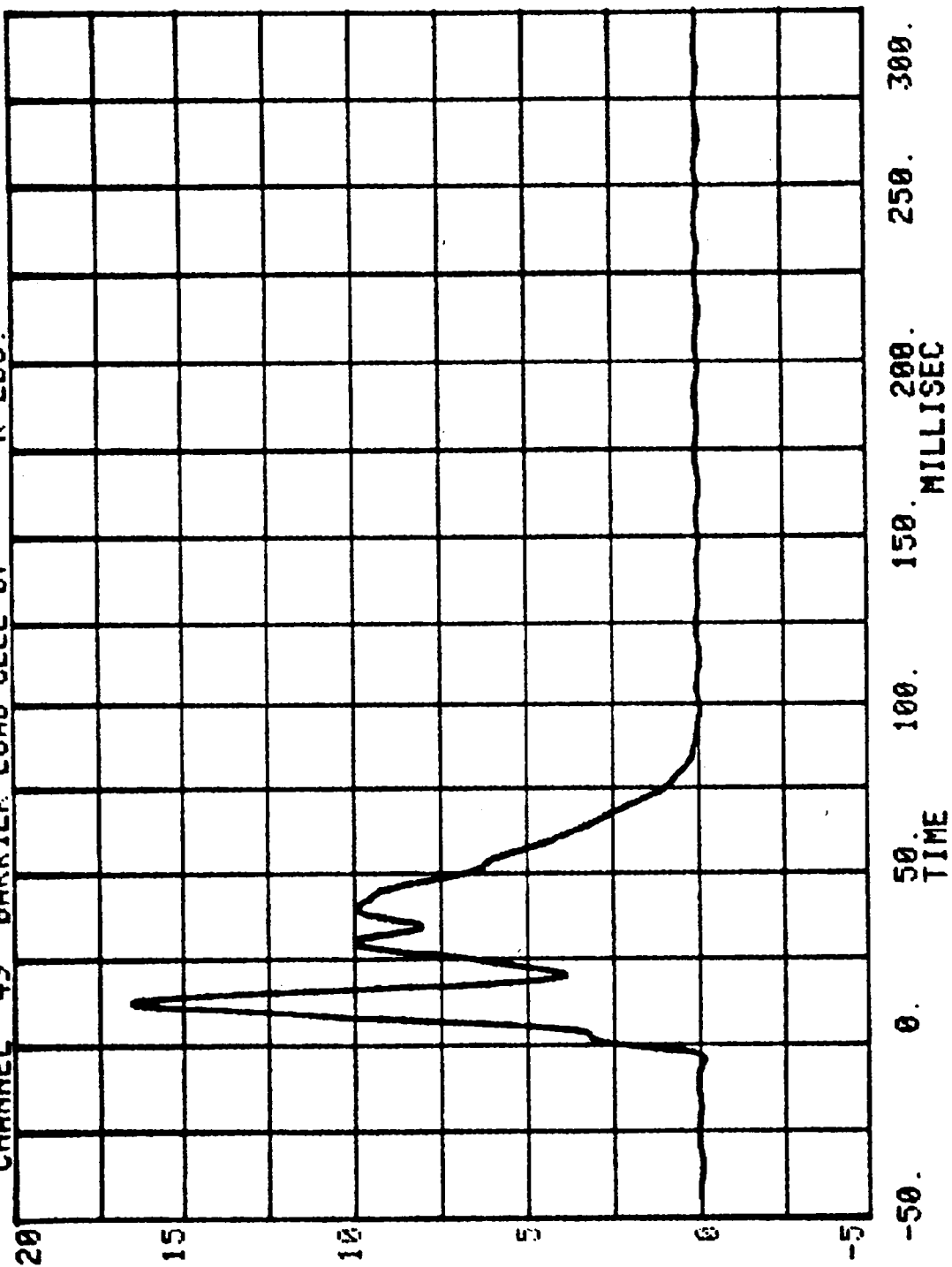
CHANNEL 47 BARRIER LOAD CELL B5
RUN= 911 SERIES= 1
K LBS.



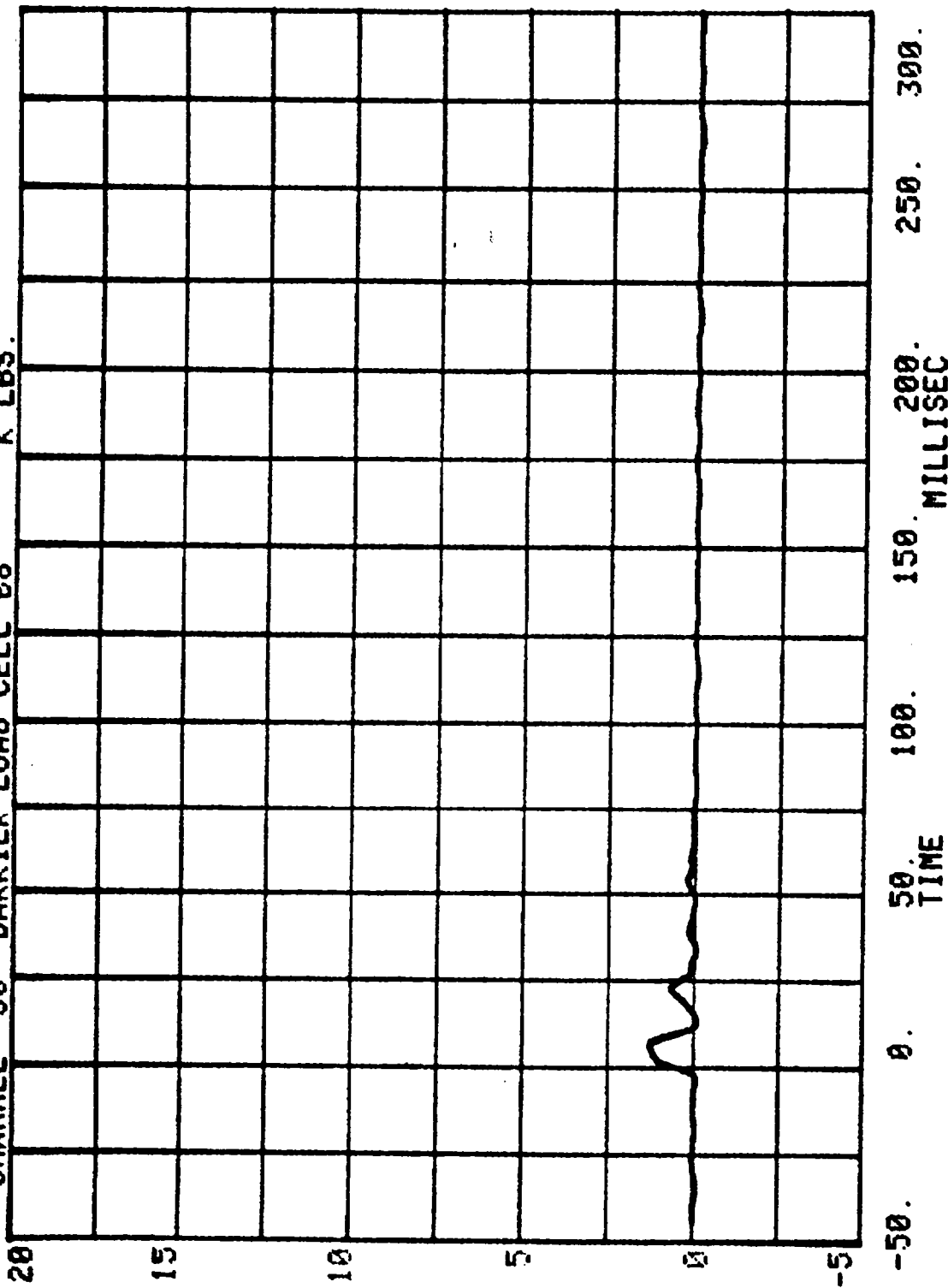
RUN= 911 SERIES= 1
CHANNEL 48 BARRIER LOAD CELL B6 1 K LBS.



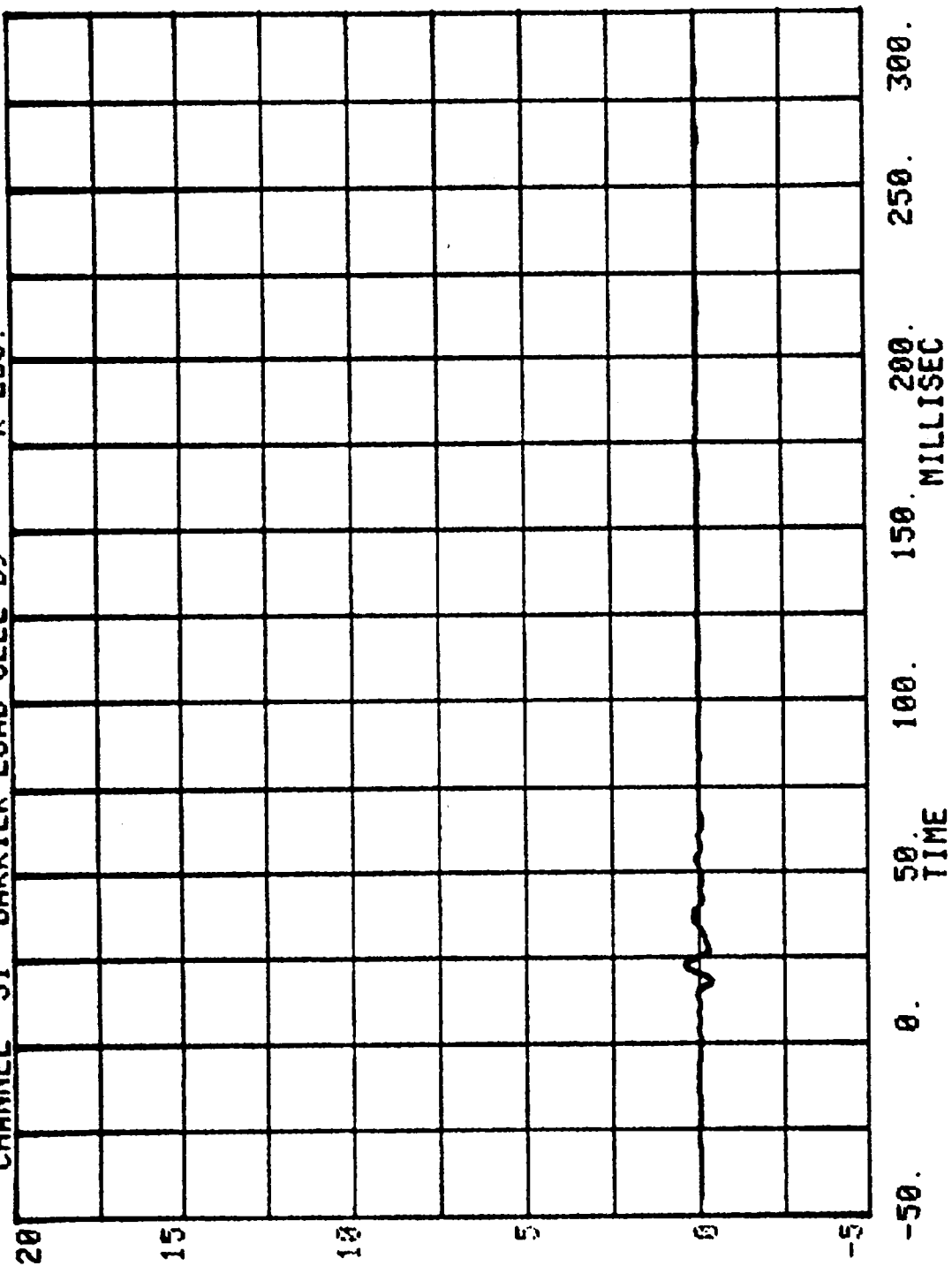
CHANNEL 49 BARRIER LOAD CELL 87 RUN= 911 SERIES= 1 K LBS.



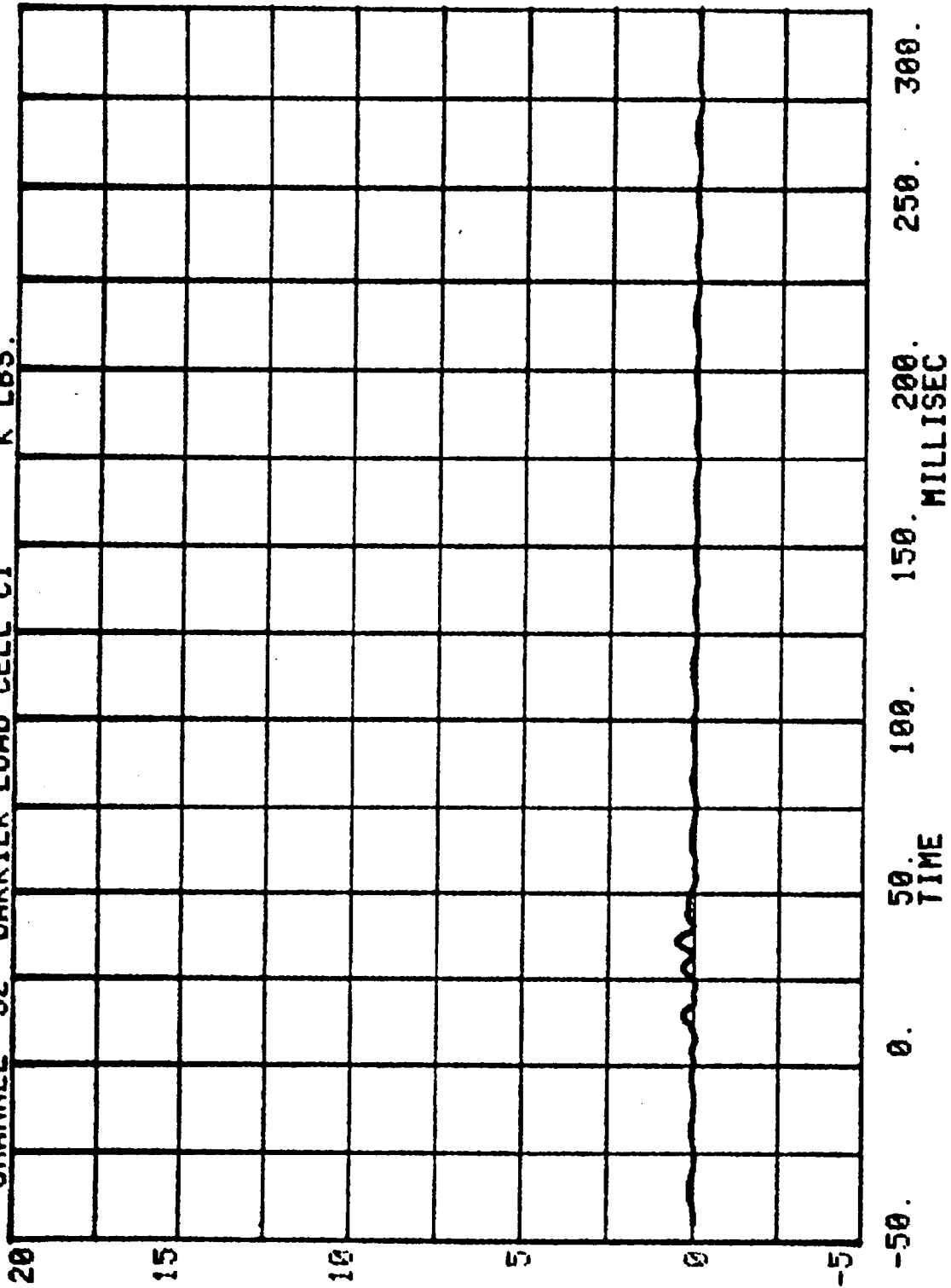
CHANNEL 50 BARRIER LOAD CELL B8 RUN= 911 SERIES= 1 K LBS.



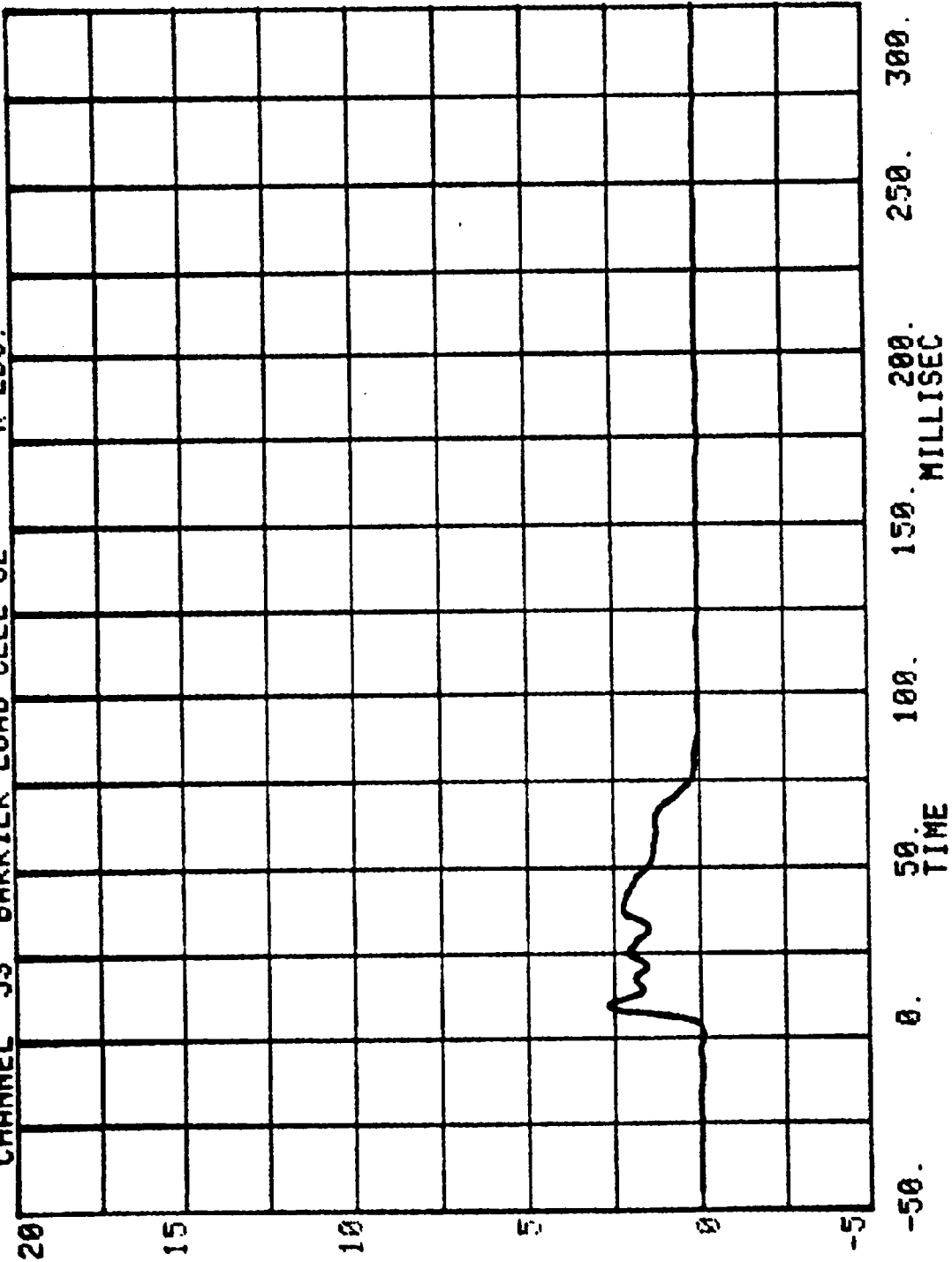
CHANNEL 51 BARRIER LOAD CELL B9 RUN= 911 SERIES= 1 K LBS.



RUN= 911 SERIES= 1
CHANNEL 52 BARRIER LOAD CELL C1 K LBS.



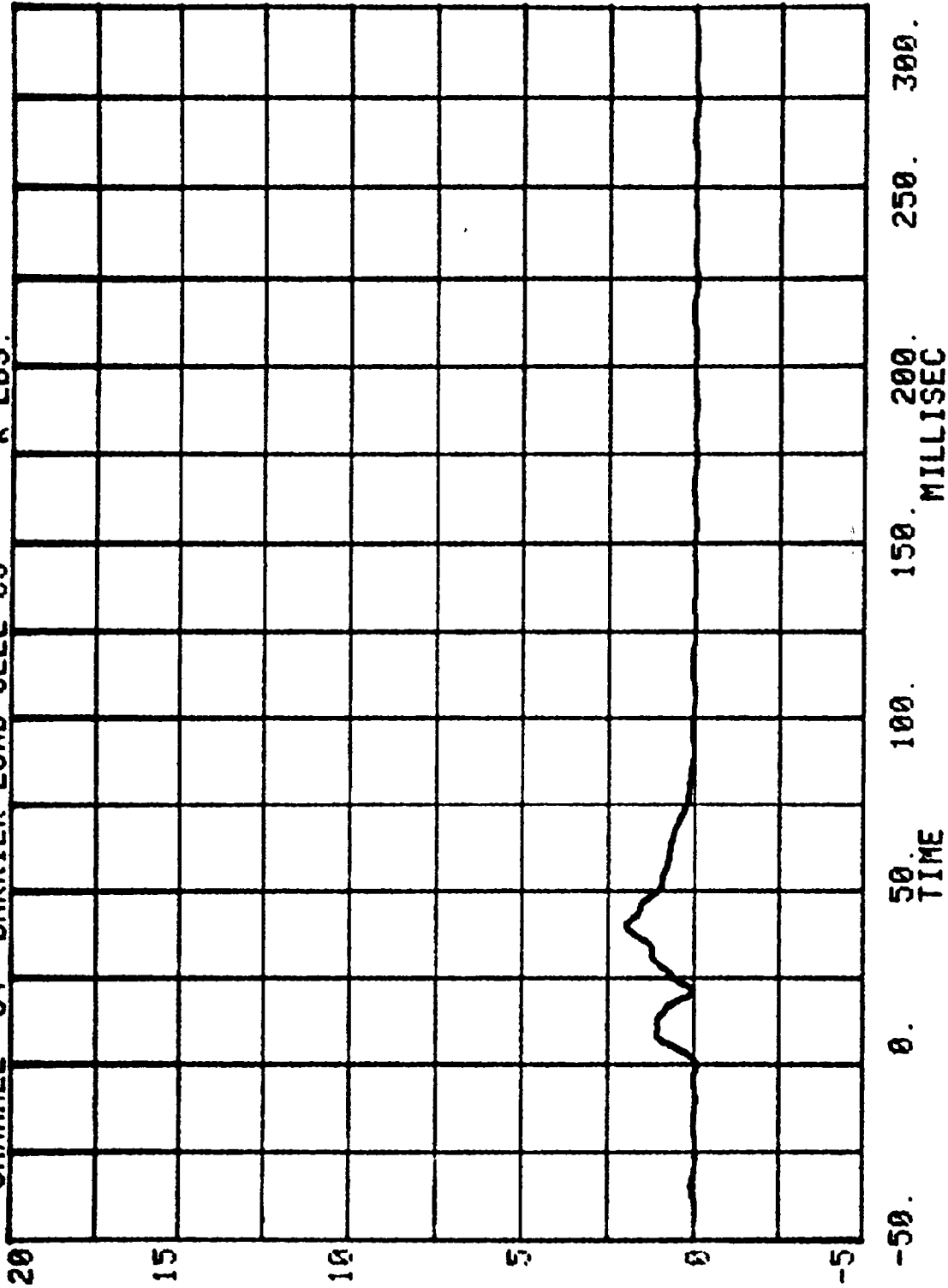
CHANNEL 53 BARRIER LOAD CELL C2 RUN= 911 SERIES= 1 K LBS.



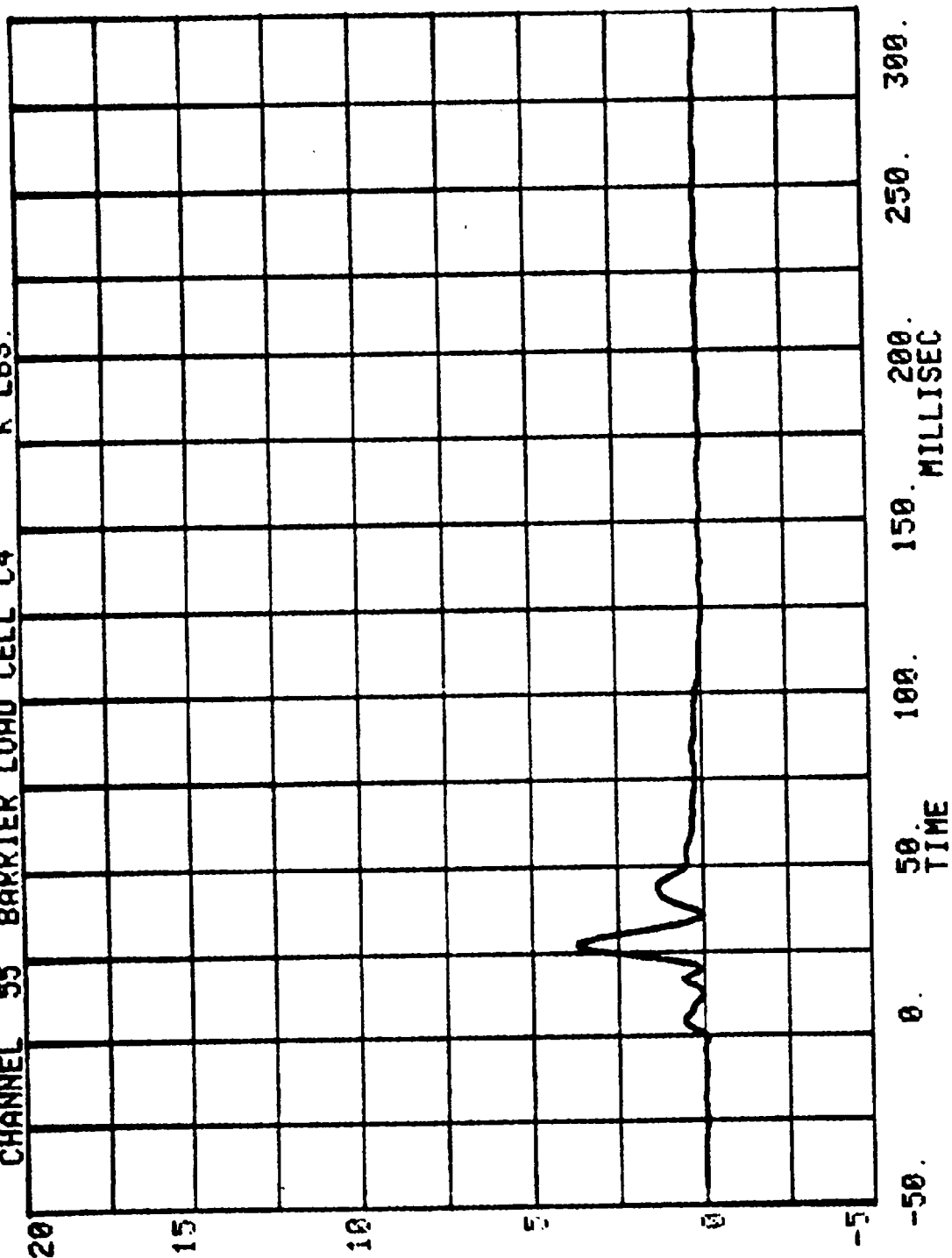
CHANNEL 34 BARRIER LOAD CELL C3

RUN= 911 SERIES= 1

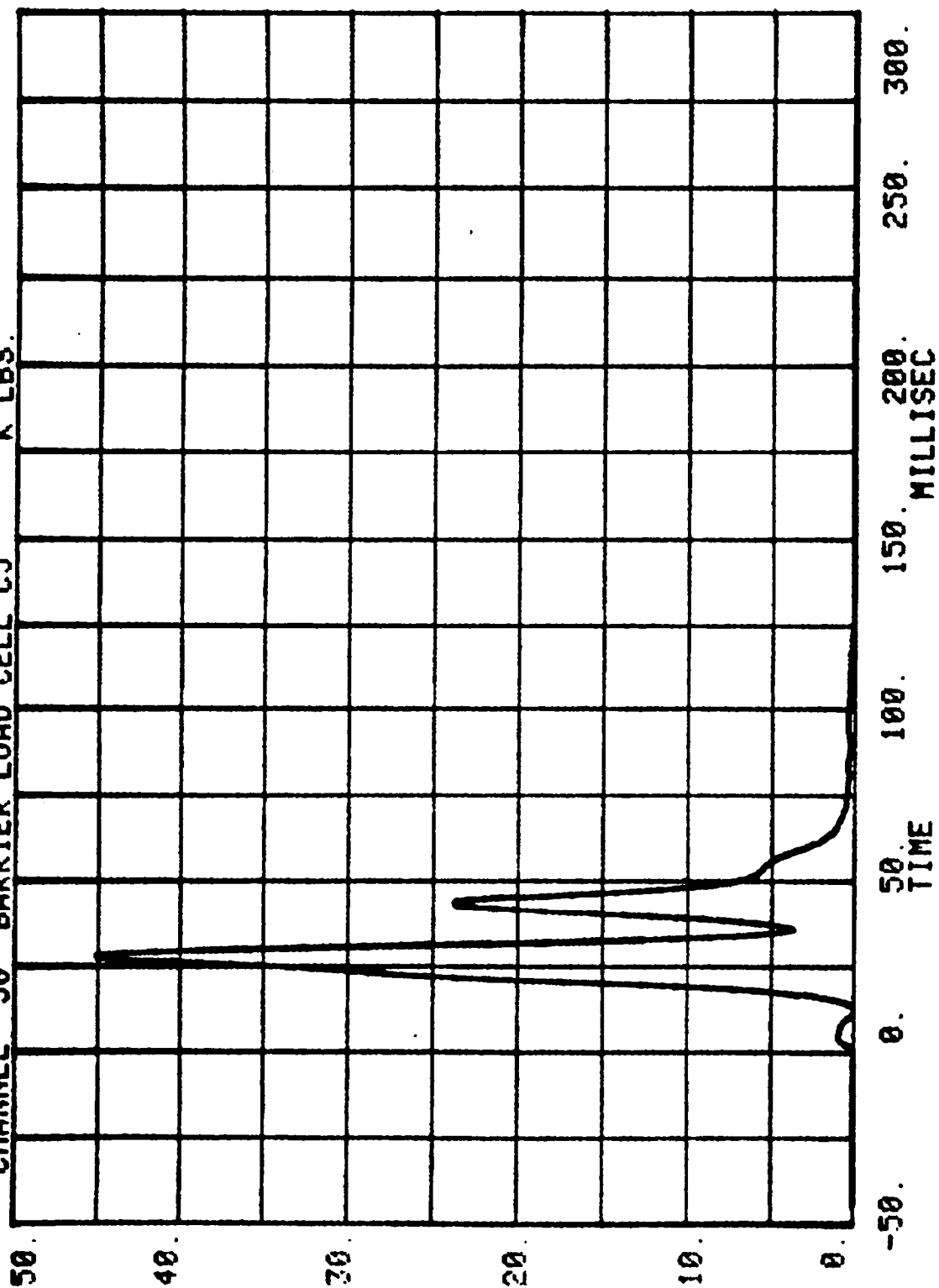
K LBS.



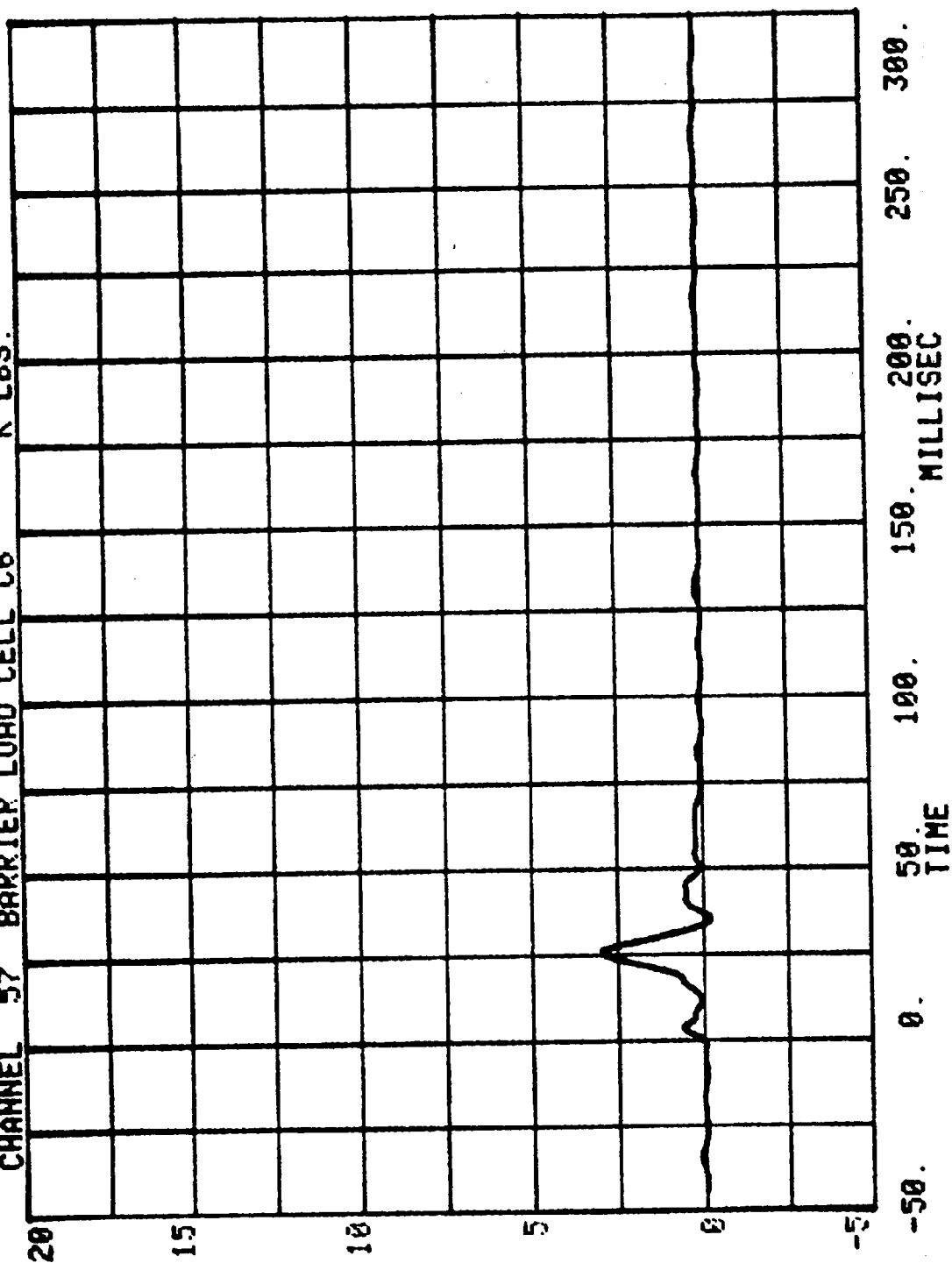
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CHANNEL 55 BARRIER LOAD CELL C4 K LBS.



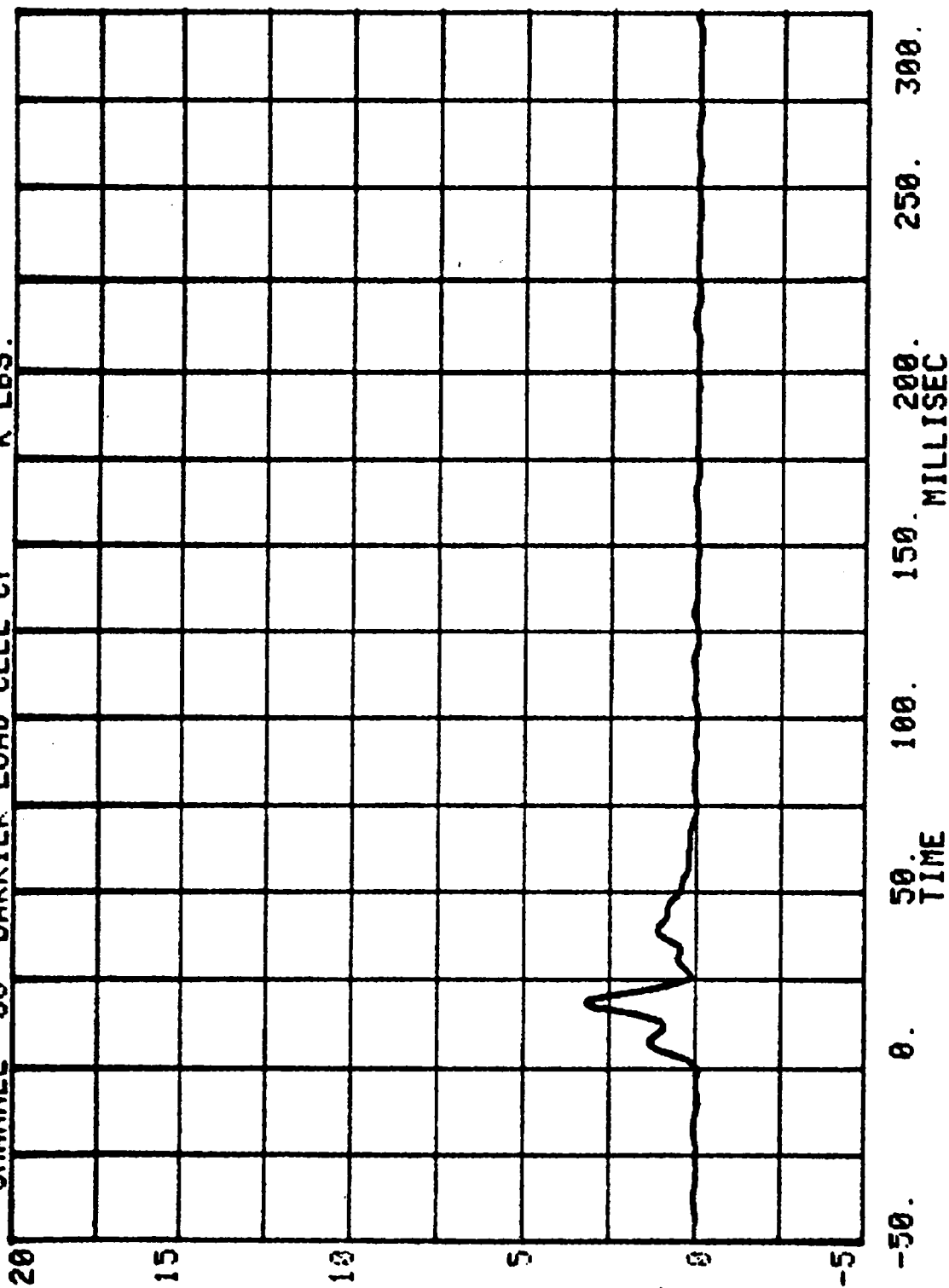
RUN= 911 SERIES= 1
CHANNEL 56 BARRIER LOAD CELL C5 K LBS.



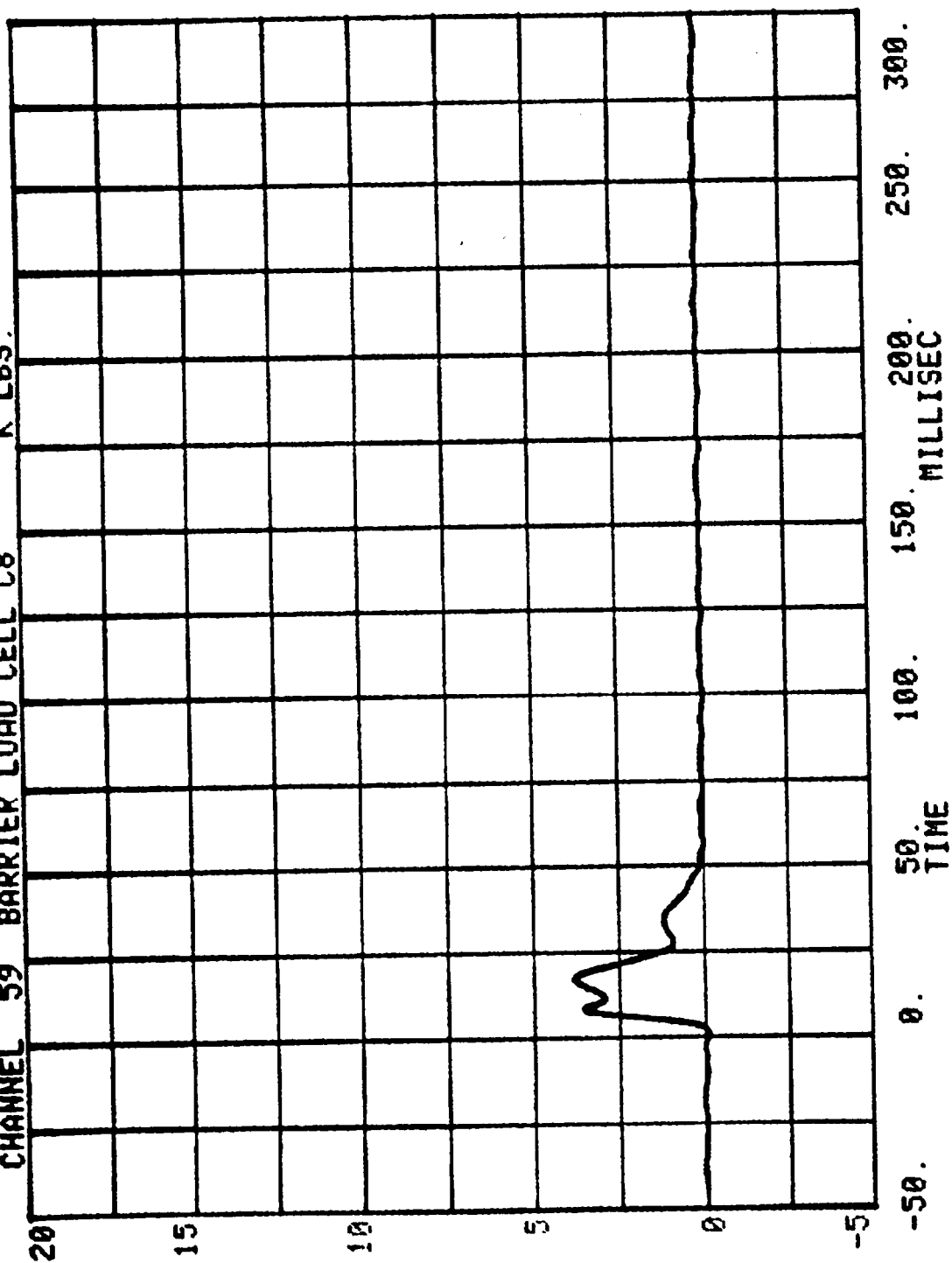
CHANNEL 57 RUN= 911 SERIES= 1
BARRIER LOAD CELL C6 K LBS.



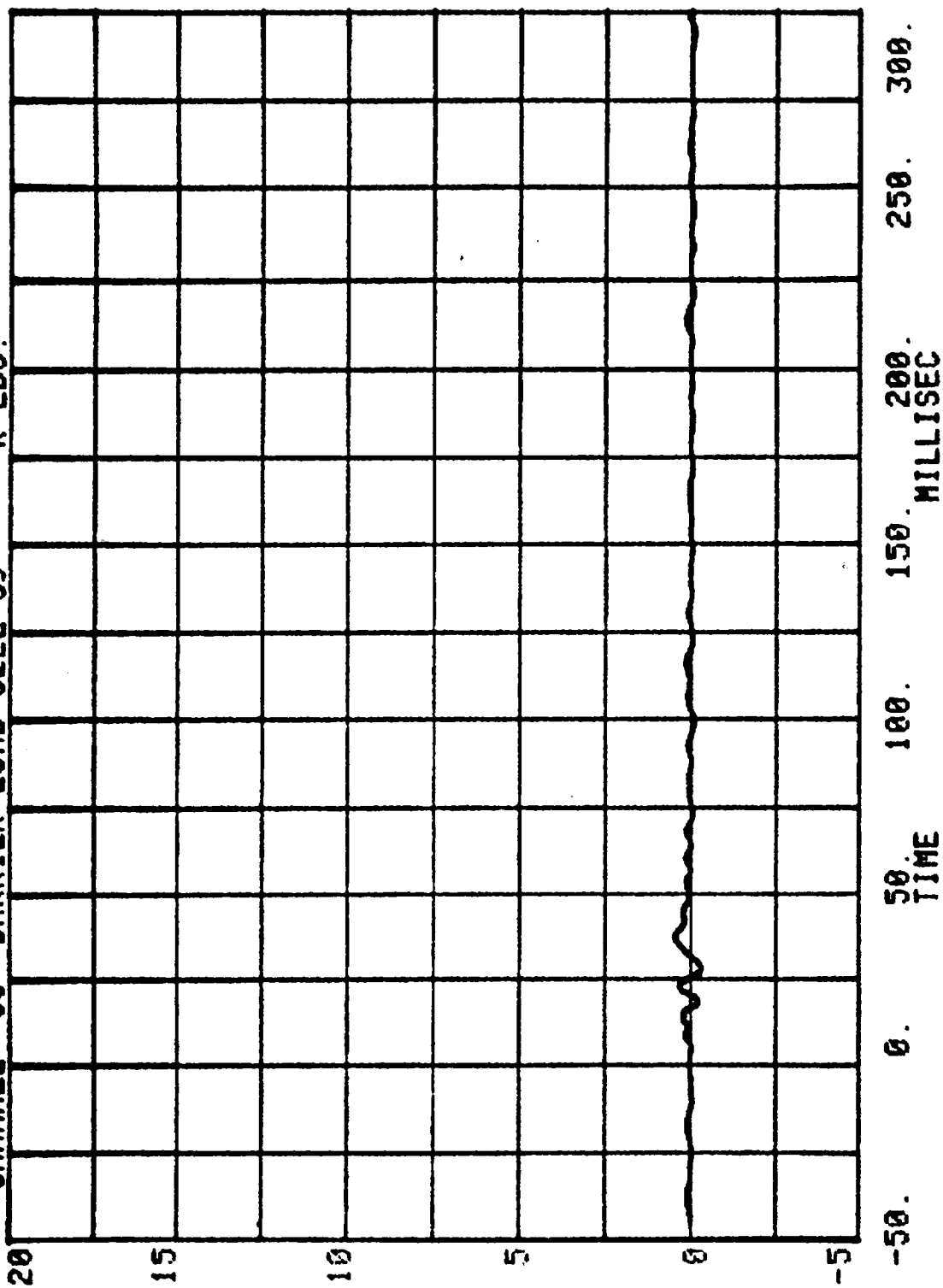
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CHANNEL 58 BARRIER LOAD CELL C7 K LBS.



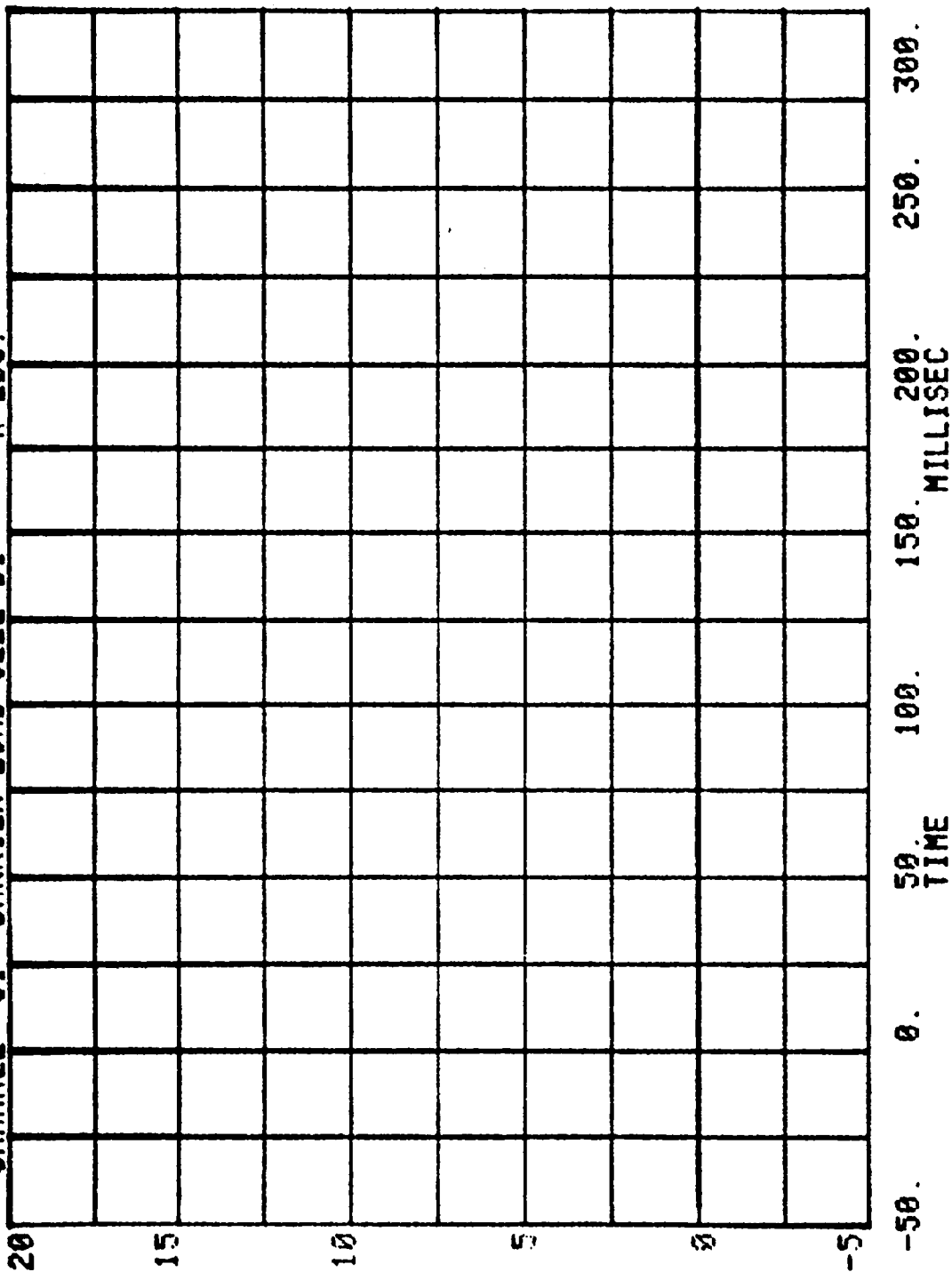
CHANNEL 59 RUN= 911 SERIES= 1 K LBS.
BARRIER LOAD CELL C8



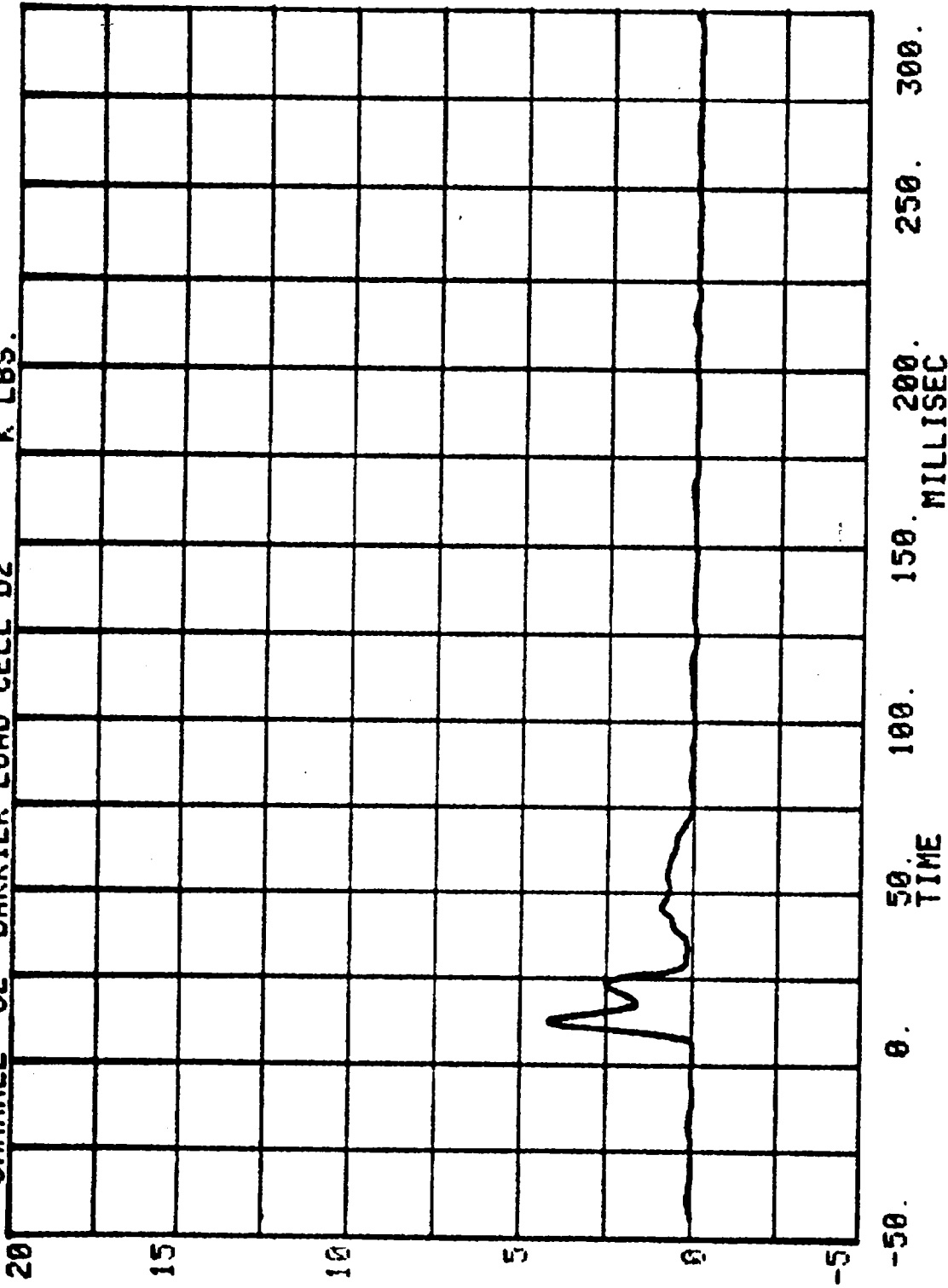
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CHANNEL 60 BARRIER LOAD CELL C9 K LBS.



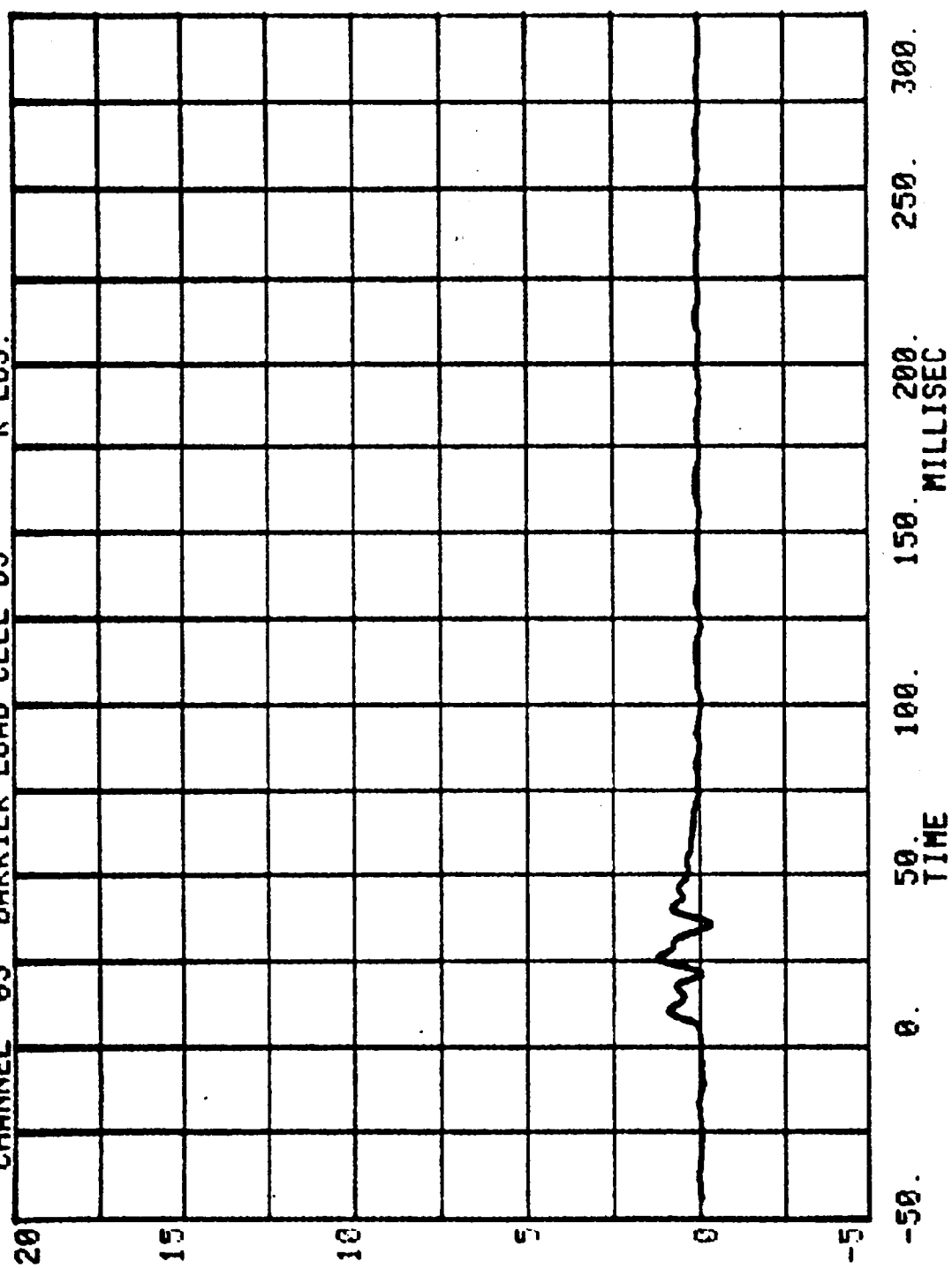
CHANNEL 61 BARRIER LOAD CELL 01 RUN= 911 SERIES= 1 K LBS.



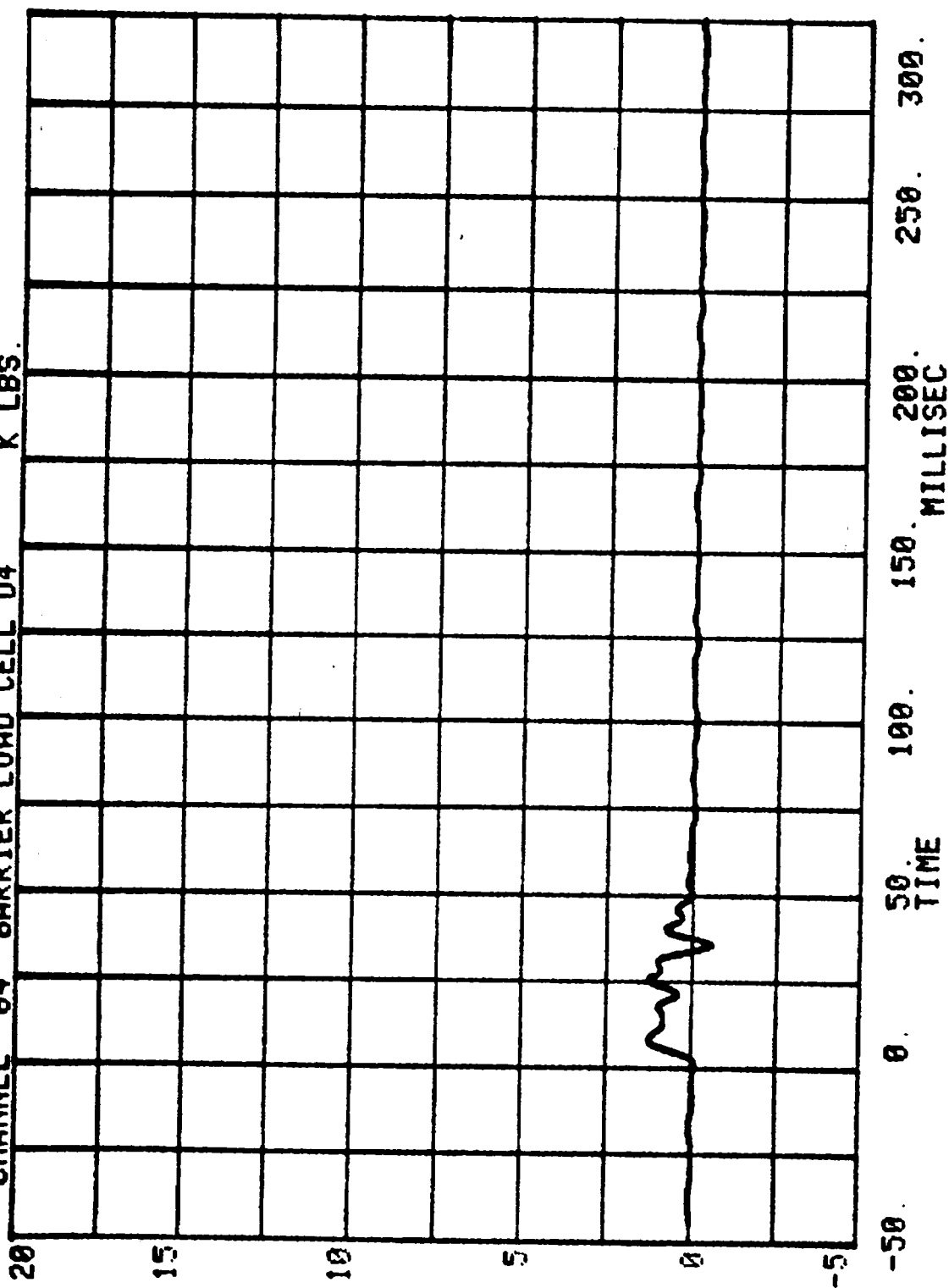
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CHANNEL 62 BARRIER LOAD CELL D2 K LBS.



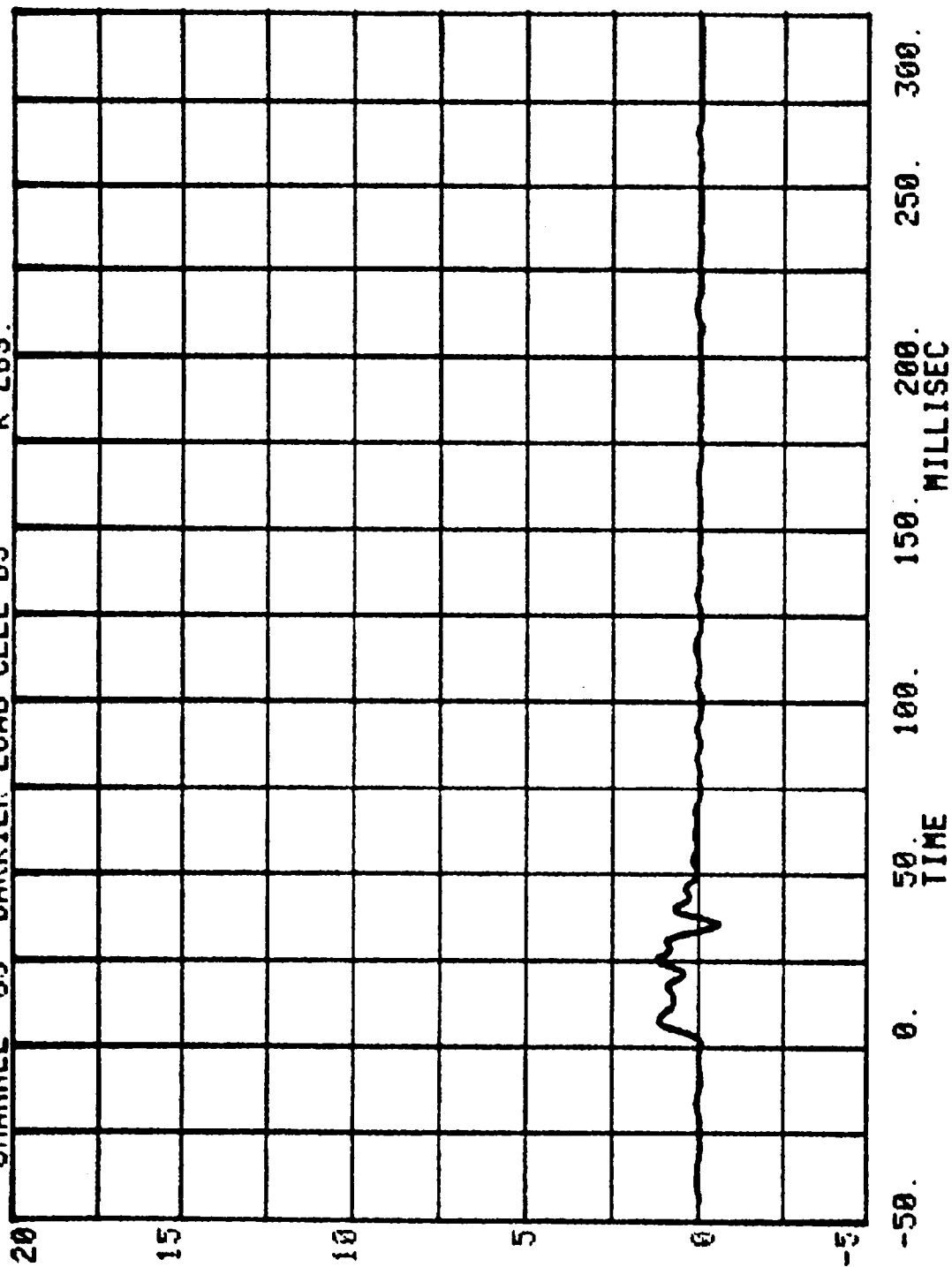
RUN= 911 SERIES= 1
CHANNEL 63 BARRIER LOAD CELL D3 K LBS.



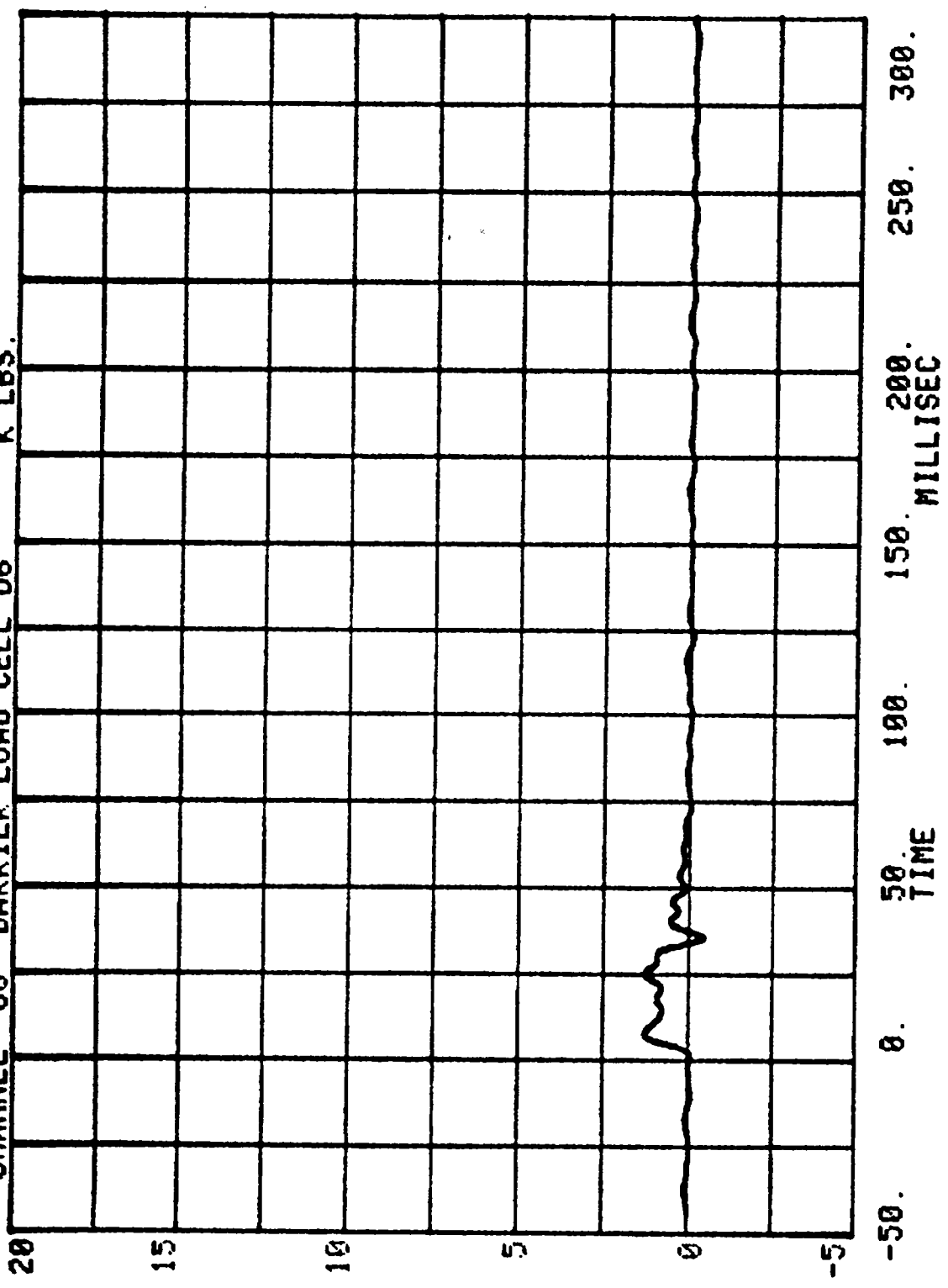
CHANNEL 64 BARRIER LOAD CELL D4
RUN= 911 SERIES= 1
K LBS.

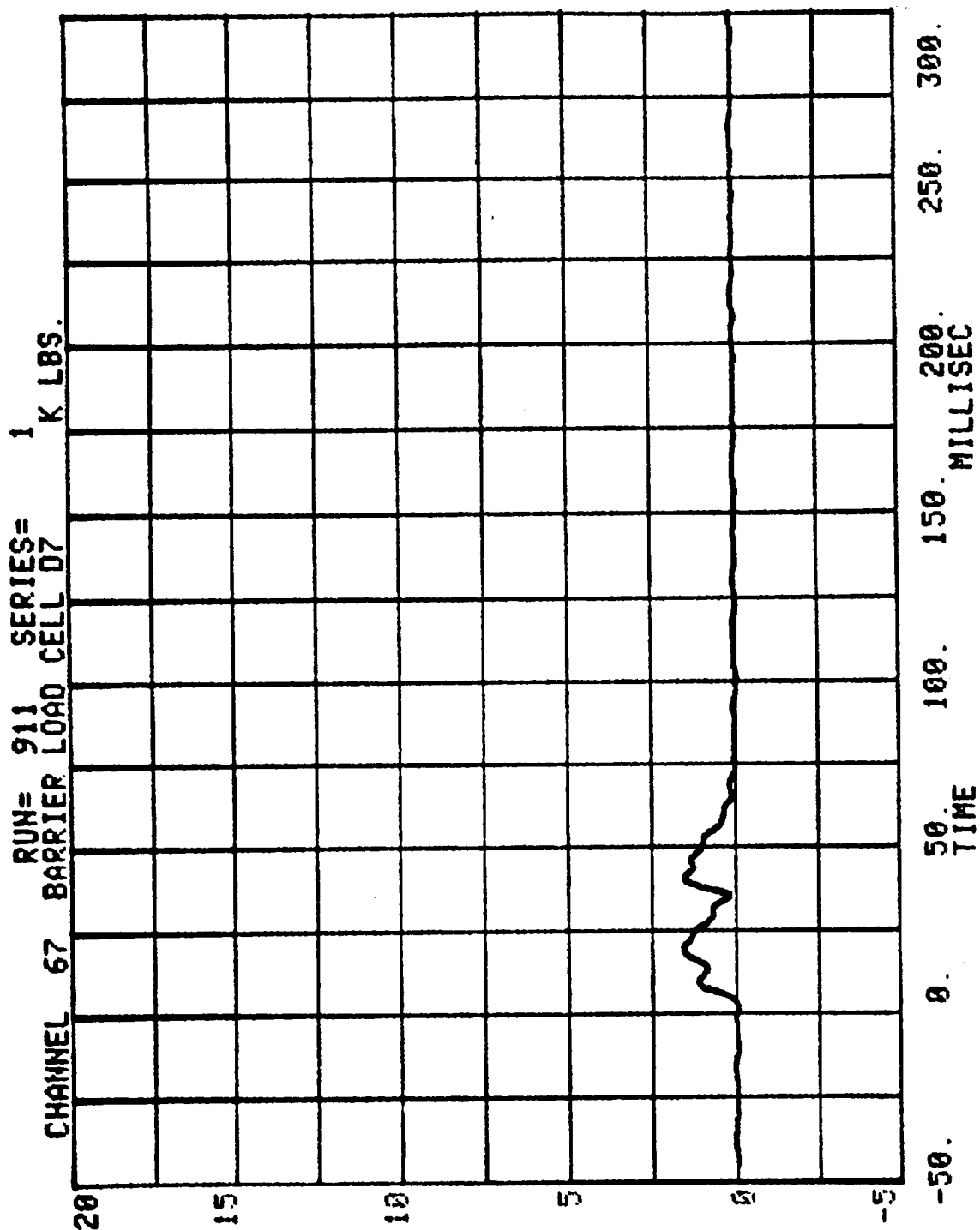


RUN= 911 SERIES= 1
CHANNEL 65 BARRIER LOAD CELL D5 K LBS.

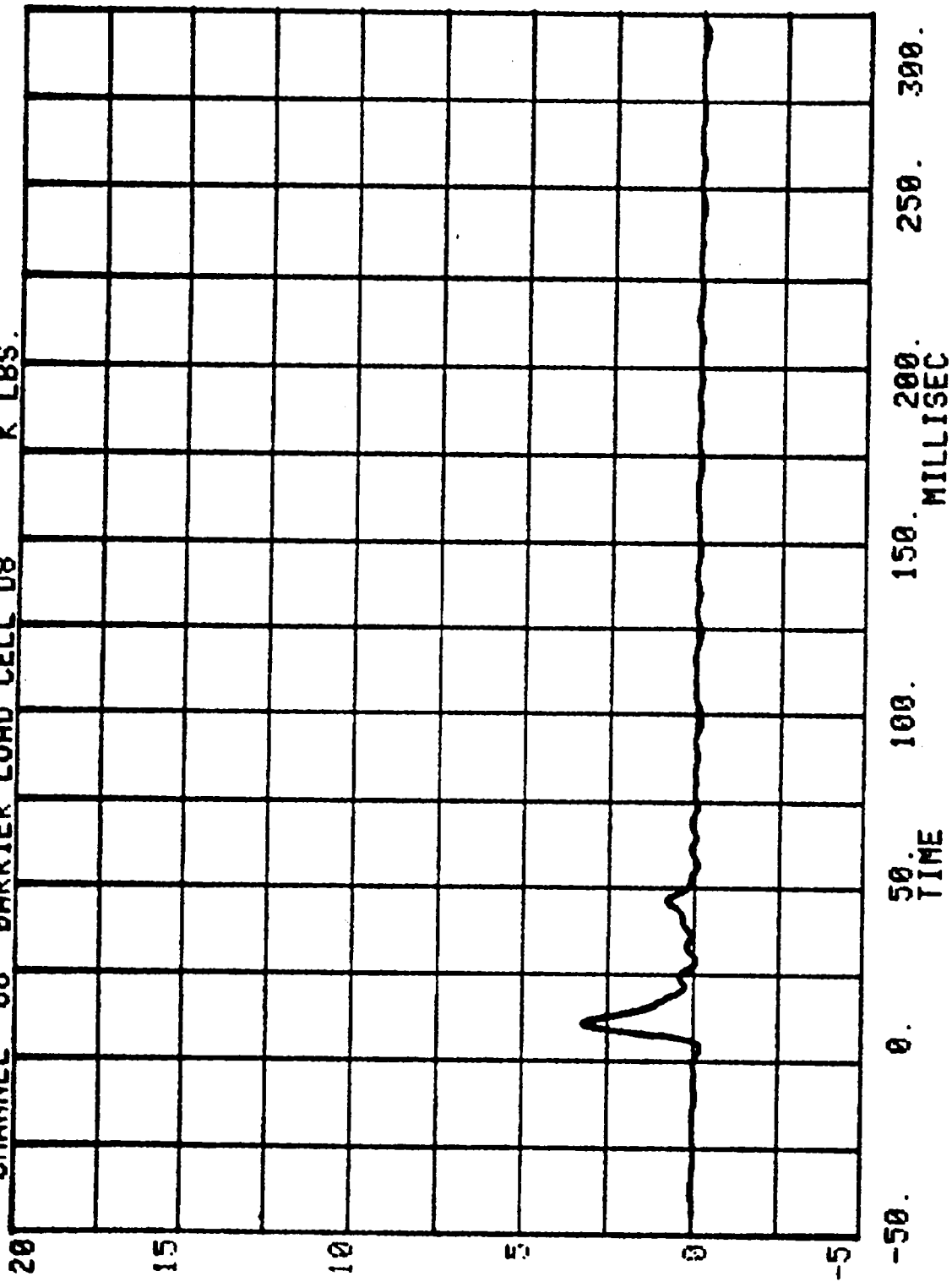


CHANNEL 66 BARRIER LOAD CELL D6 RUN= 911 SERIES= 1 K LBS.

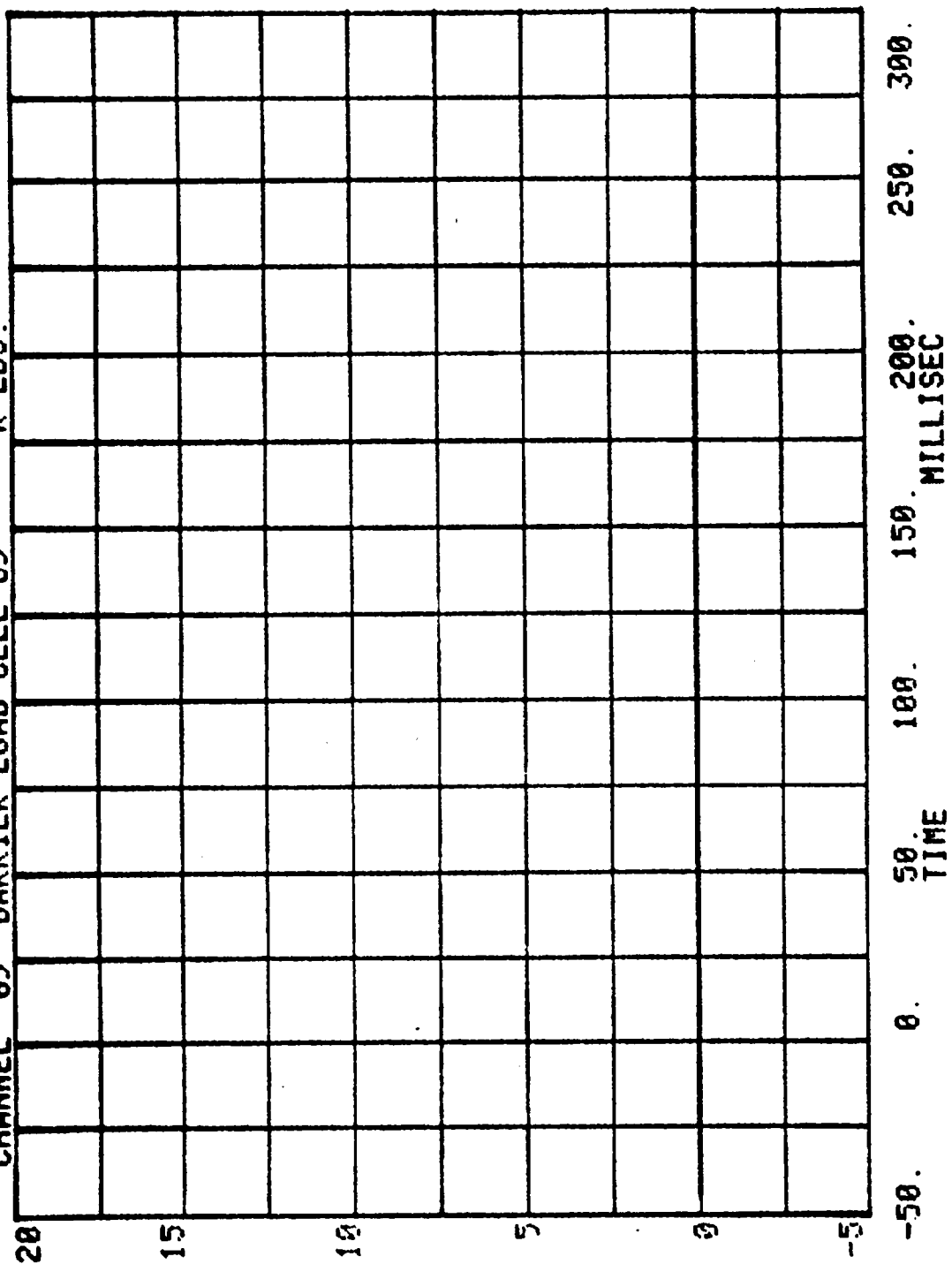




RUN= 911 SERIES= 1
CHANNEL 68 BARRIER LOAD CELL D8 1 K LBS.

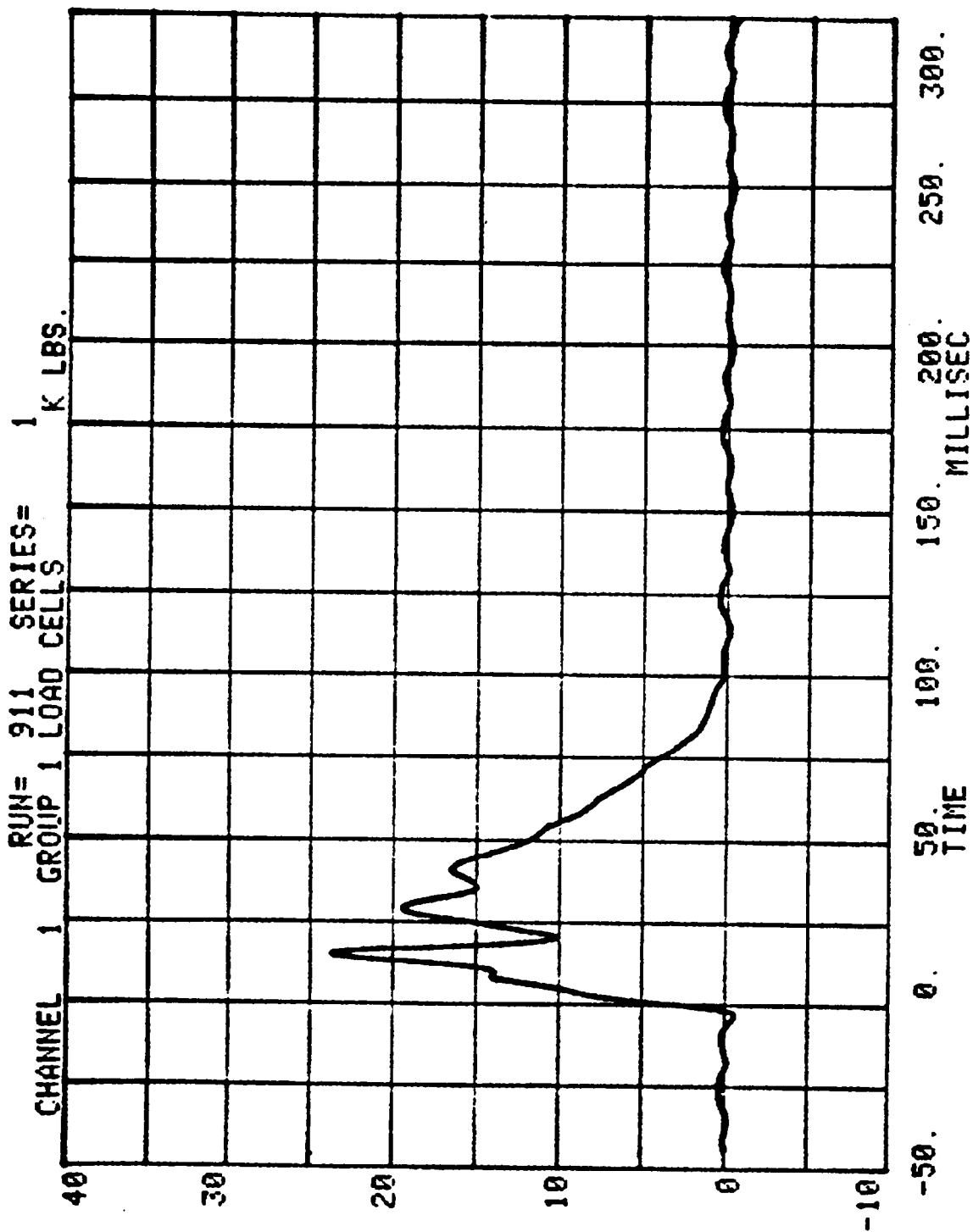


RUN= 911 SERIES= 1
CHANNEL 69 BARRIER LOAD CELL 09 K LBS.

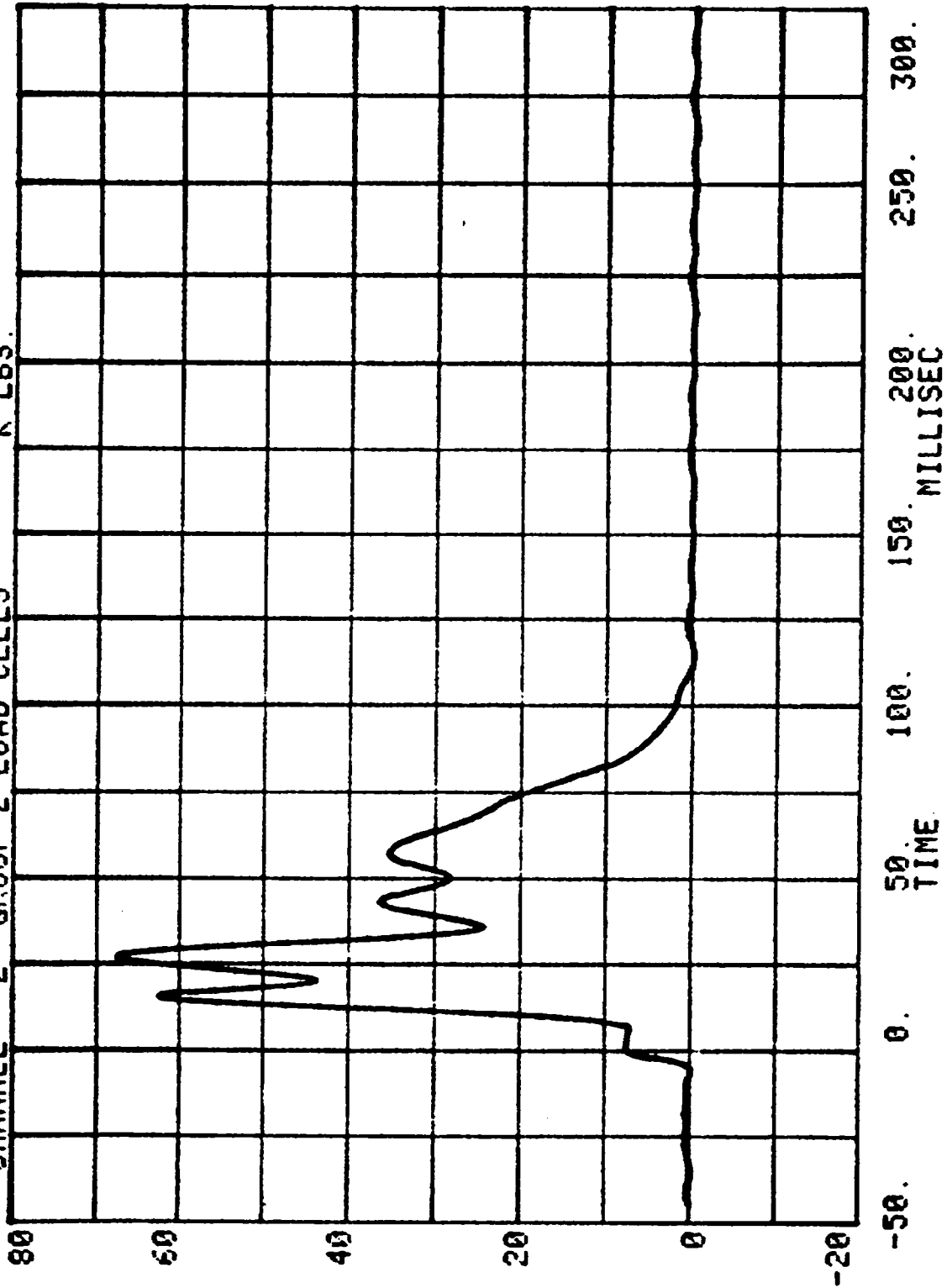


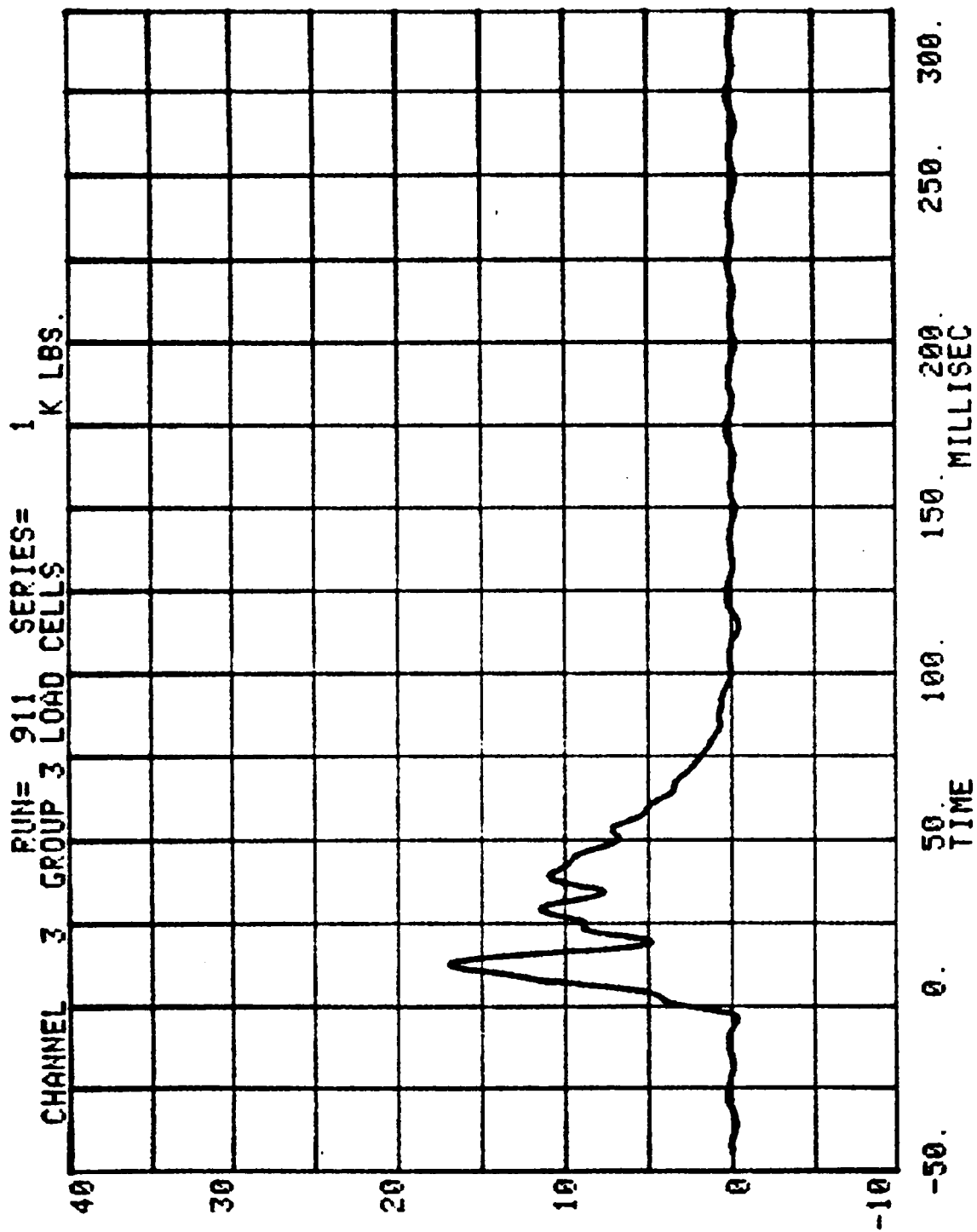
NEW CAR ASSESSMENT CRASH TEST - 1989

RUN # 911		SERIES # 1	
CHAN	TITLE	MINIMUM/MAXIMUM	AT TIME
1	GROUP 1 LOAD CELLS	- 530 K LBS. 23.713 K LBS.	-3.23 MS. 15.15 MS.
2	GROUP 2 LOAD CELLS	- 369 K LBS. 67.613 K LBS.	300.00 MS. 27.22 MS.
3	GROUP 3 LOAD CELLS	- 431 K LBS. 16.943 K LBS.	114.60 MS. 12.82 MS.
4	GROUP 4 LOAD CELLS	- 223 K LBS. 8.069 K LBS.	173.78 MS. 12.00 MS.
5	GROUP 5 LOAD CELLS	- 427 K LBS. 54.103 K LBS.	- 45 MS. 27.60 MS.
6	GROUP 6 LOAD CELLS	- 484 K LBS. 9.016 K LBS.	100.35 MS. 17.92 MS.
7	TOTAL LOAD CELL SUM	-1.002 K LBS. 156.515 K LBS.	149.55 MS. 27.67 MS.

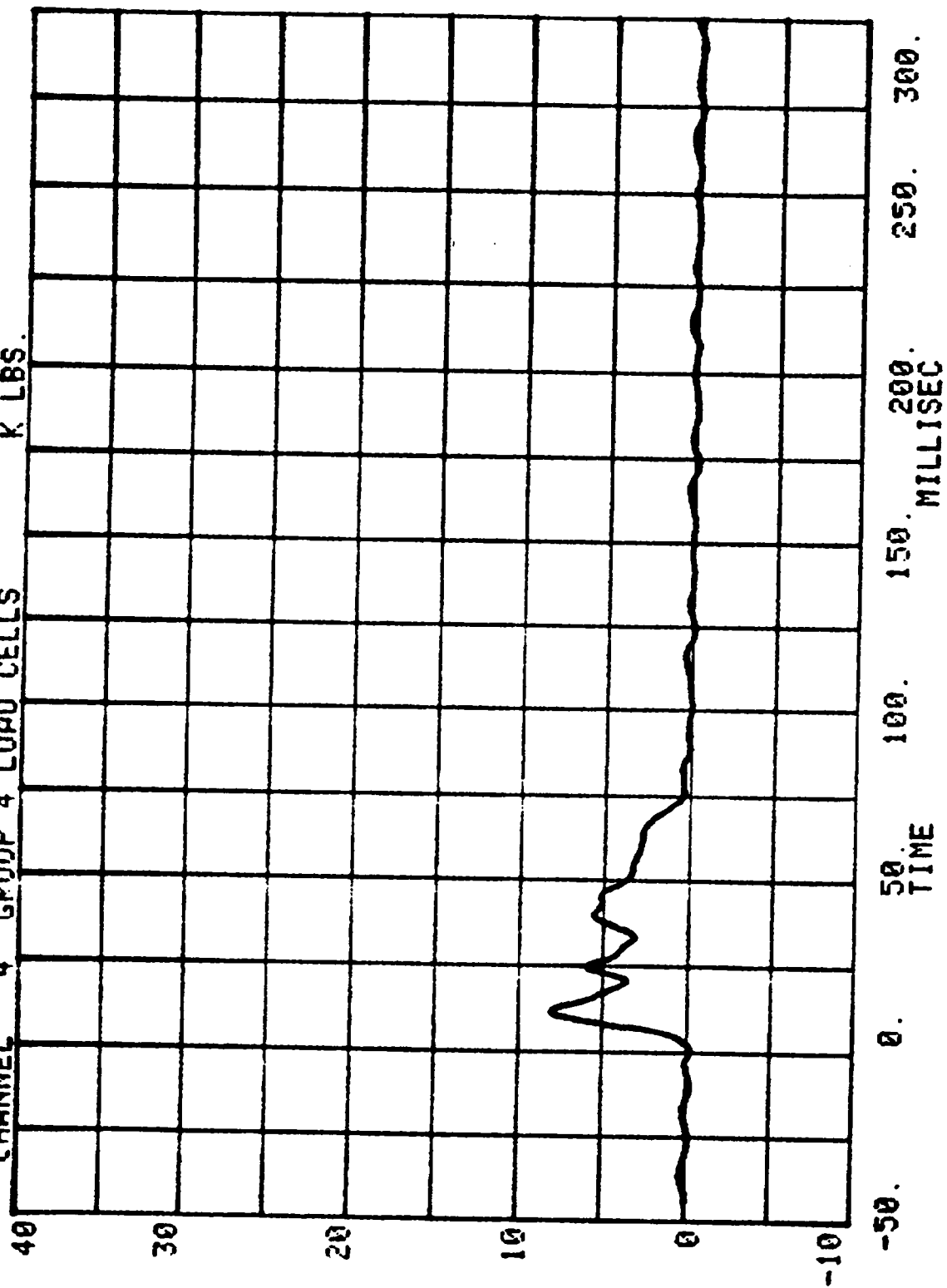


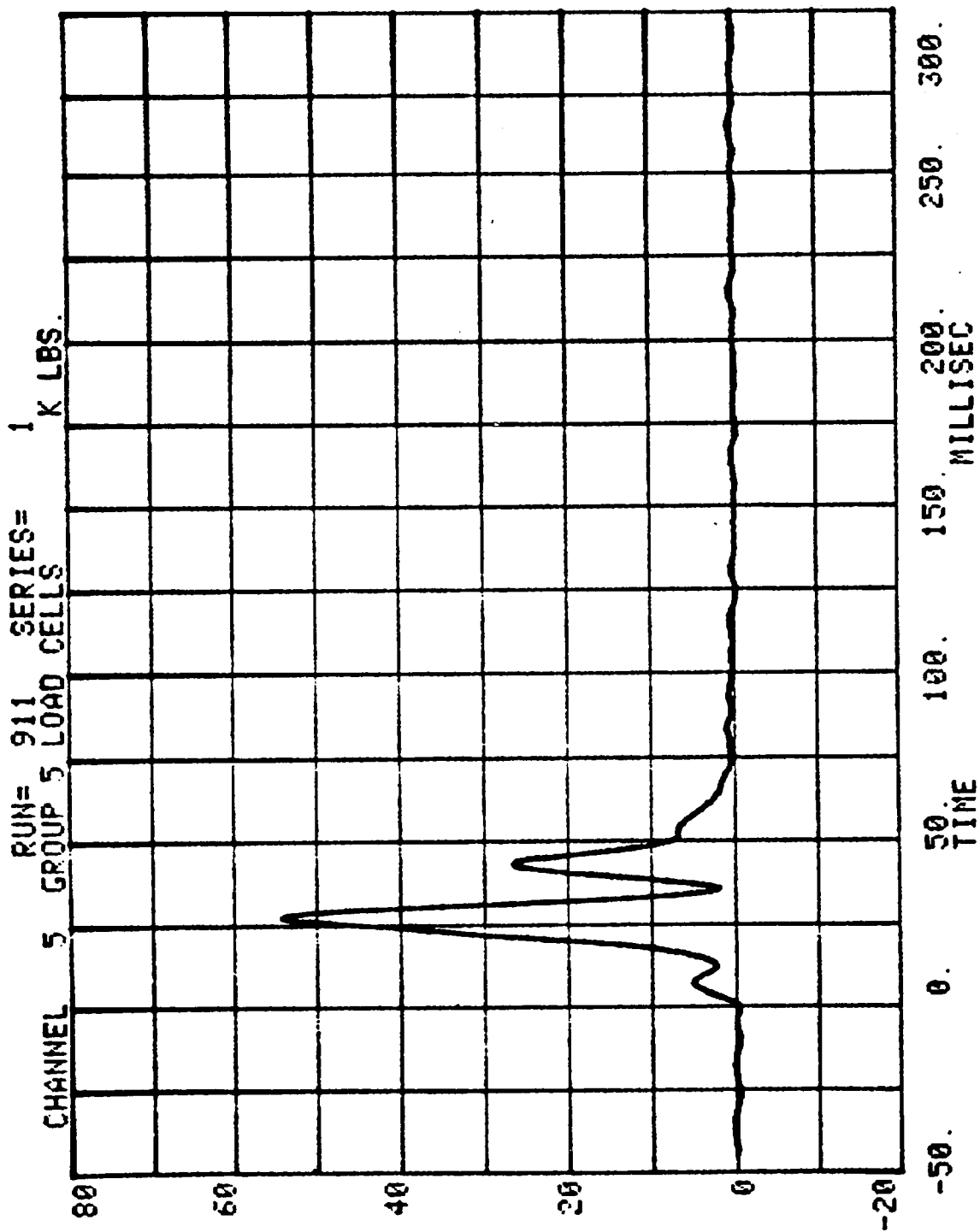
CHANNEL 2 GROUP 2 LOAD CELLS
RUN= 911 SERIES= 1
K LBS.



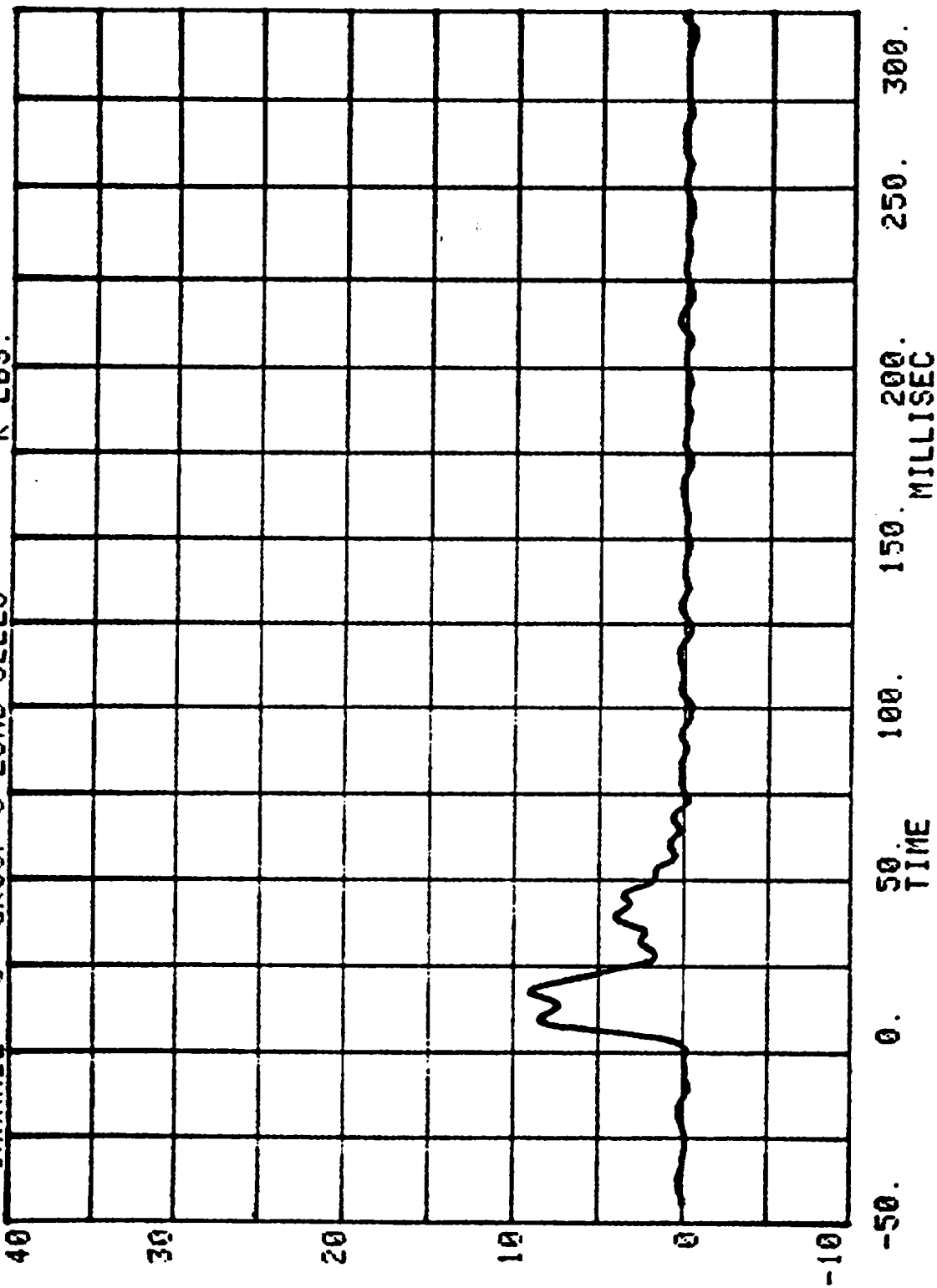


RUN= 911 SERIES= 1
CHANNEL 4 GROUP 4 LOAD CELLS K LBS.

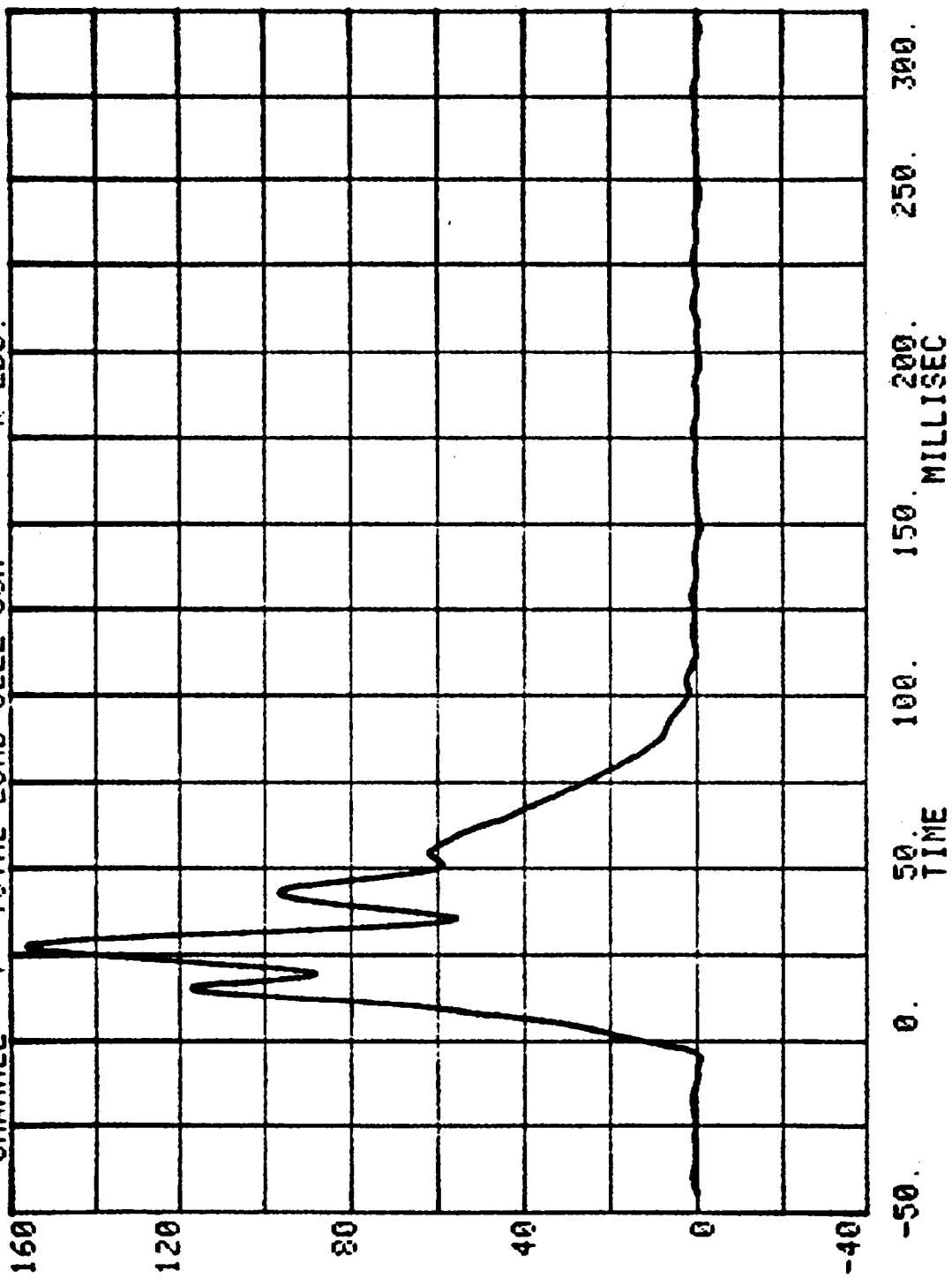




RUN= 911 SERIES= 1
CHANNEL 6 GROUP 6 LOAD CELLS K LBS.



CHANNEL 7 TOTAL LOAD CELL SUM RUN= 911 SERIES= 1 K LBS.



TEST NO. 916-010-911

DUMMY DATA

FILTER CHANNEL

CLASS

HEAD ACCELERATION	1000
CHEST ACCELERATION	180
FEMUR FORCES	600
BELT LOADS	60

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

NEW CAR ASSESSMENT CRASH TEST - 1989

RUN= 911

POS#1 HEAD R

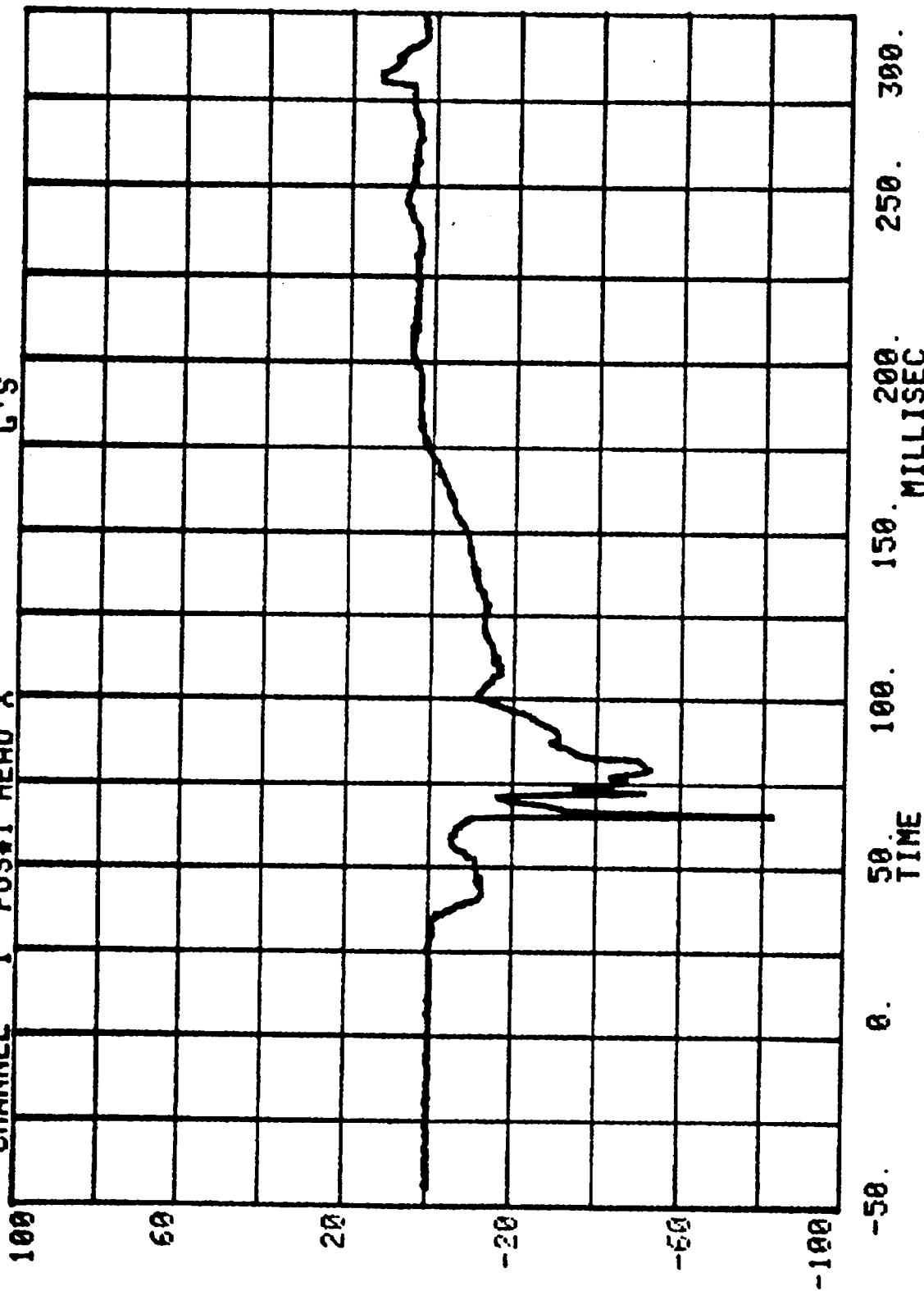
HIC= 741.8 FROM T1= .05122 TO T2= .08722
AVERAGE ACCELERATION BETWEEN T1 AND T2= 53.25'G
EVENT TIME= 300.0 MSEC
SEVERITY INDEX= 969.0

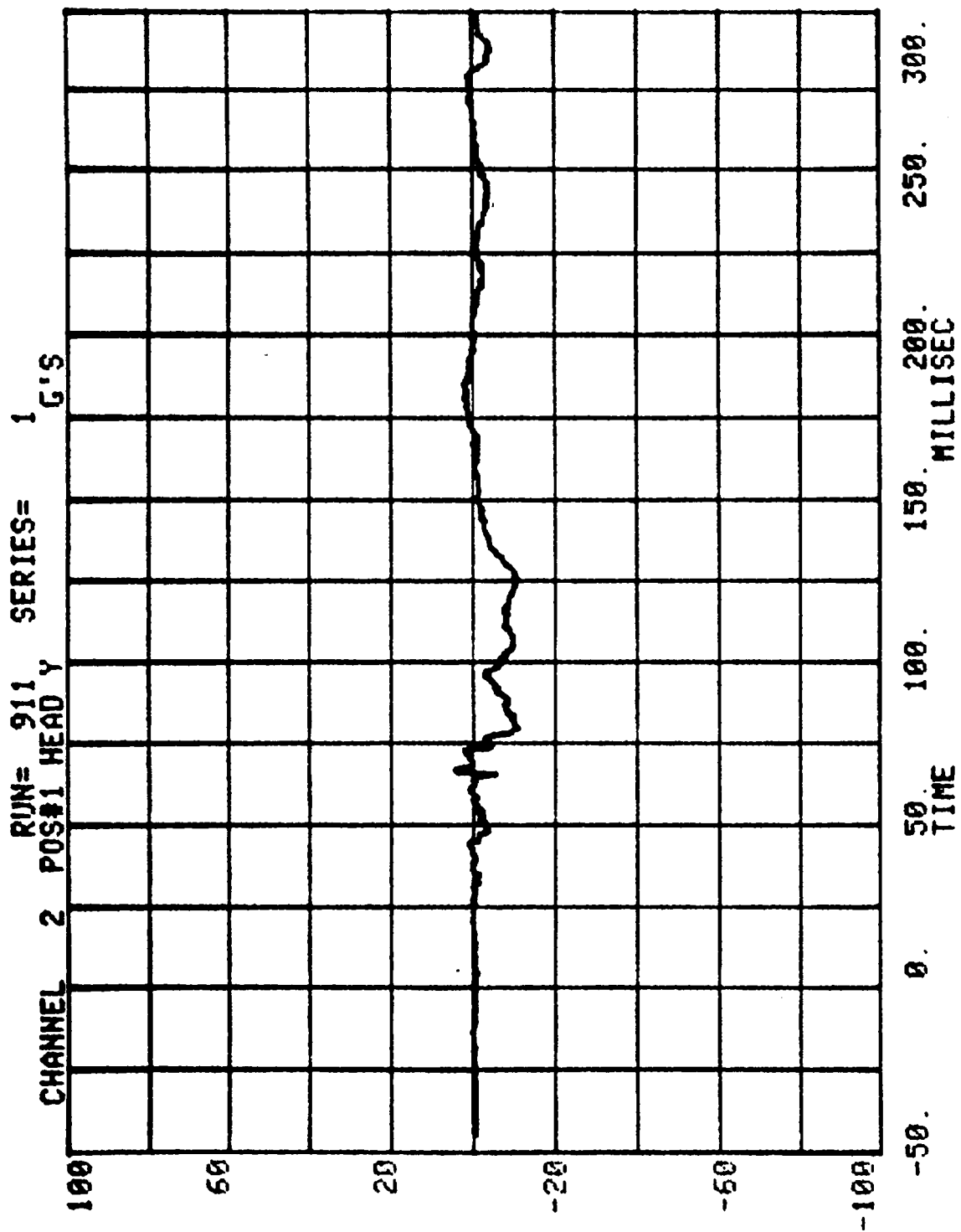
CHANNEL 1 POS#1 HEAD X

RUN= 911

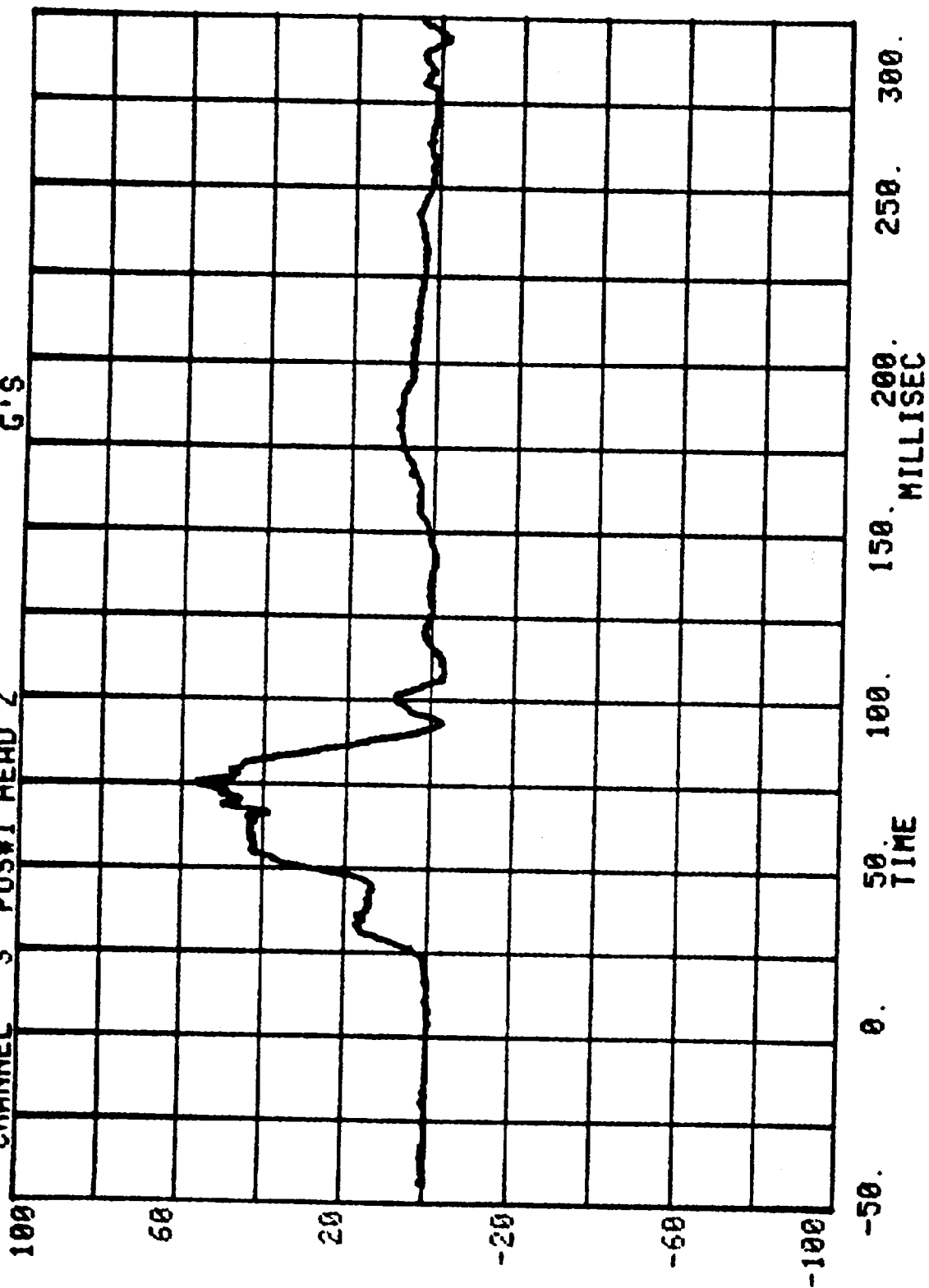
SERIES=

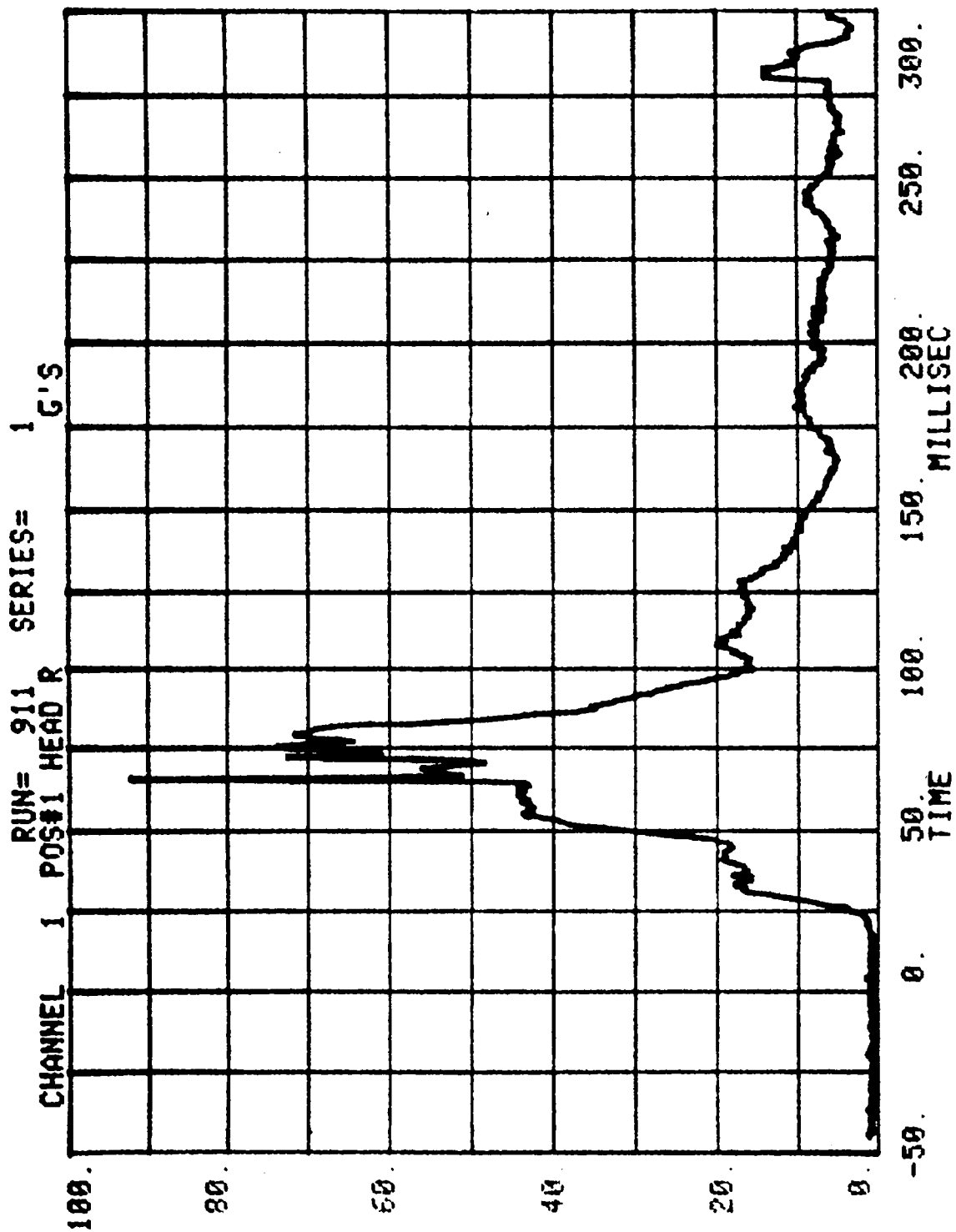
1 G'S



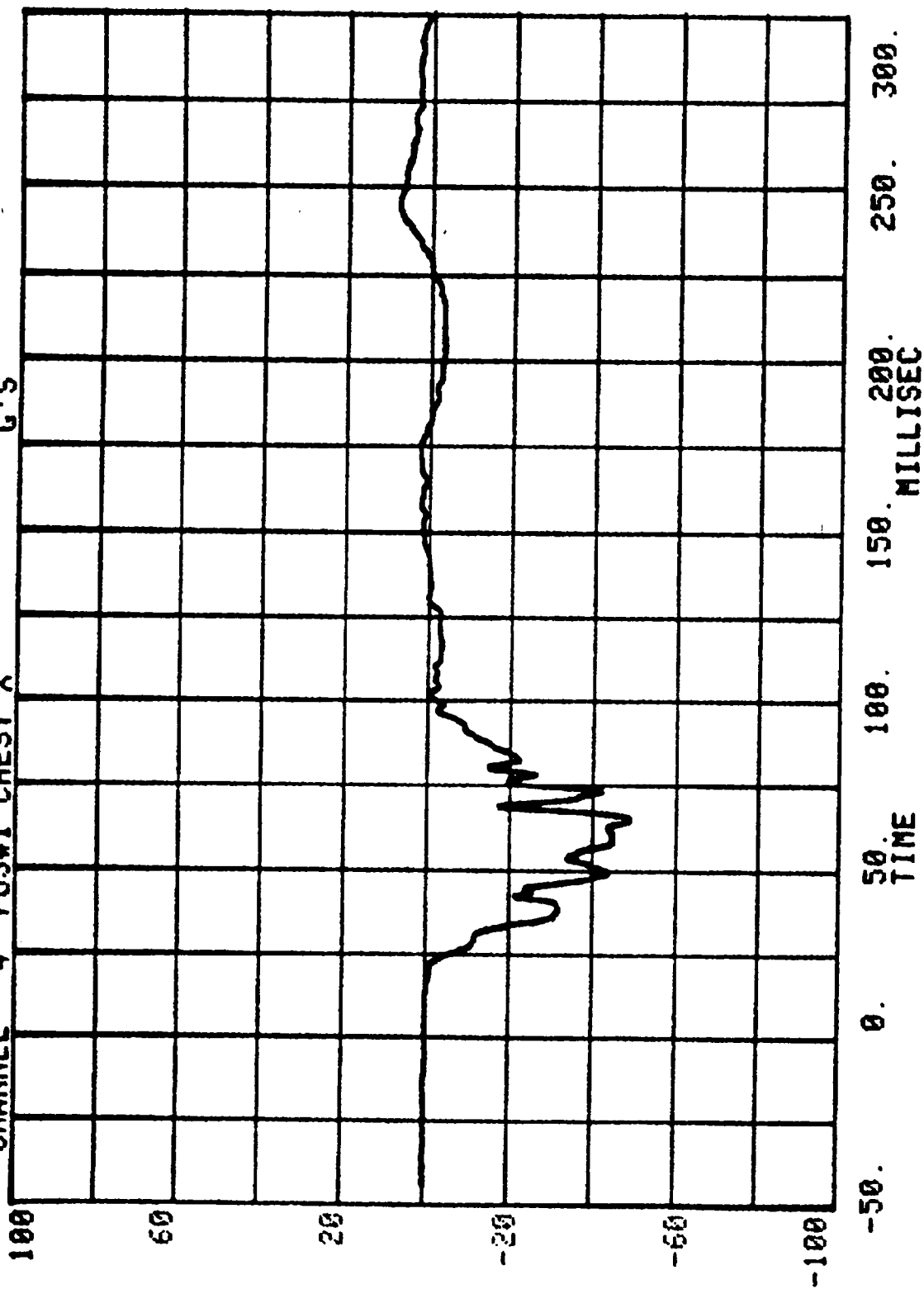


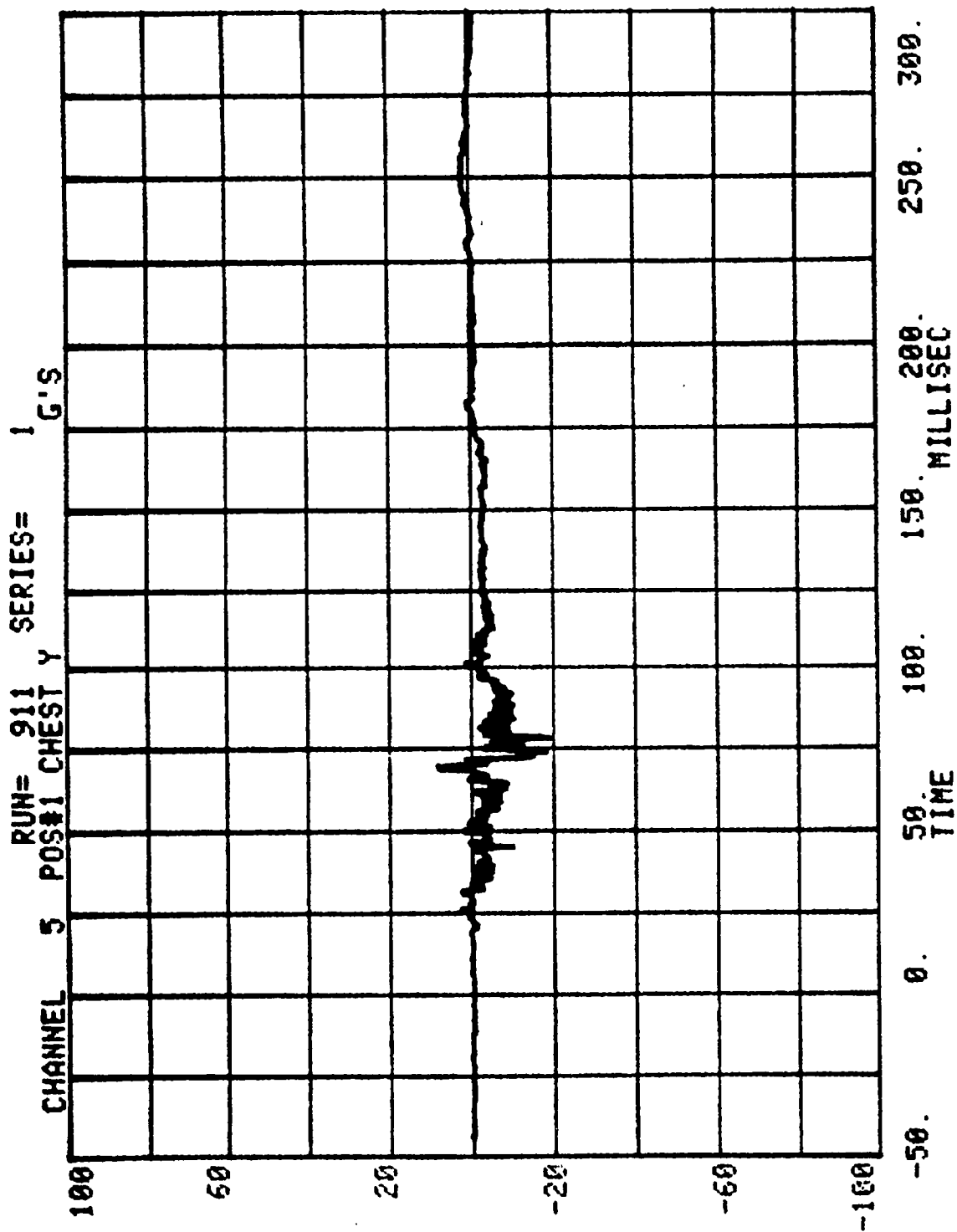
CHANNEL 3 POS#1 HEAD Z RUN= 911 SERIES= 1 G'S



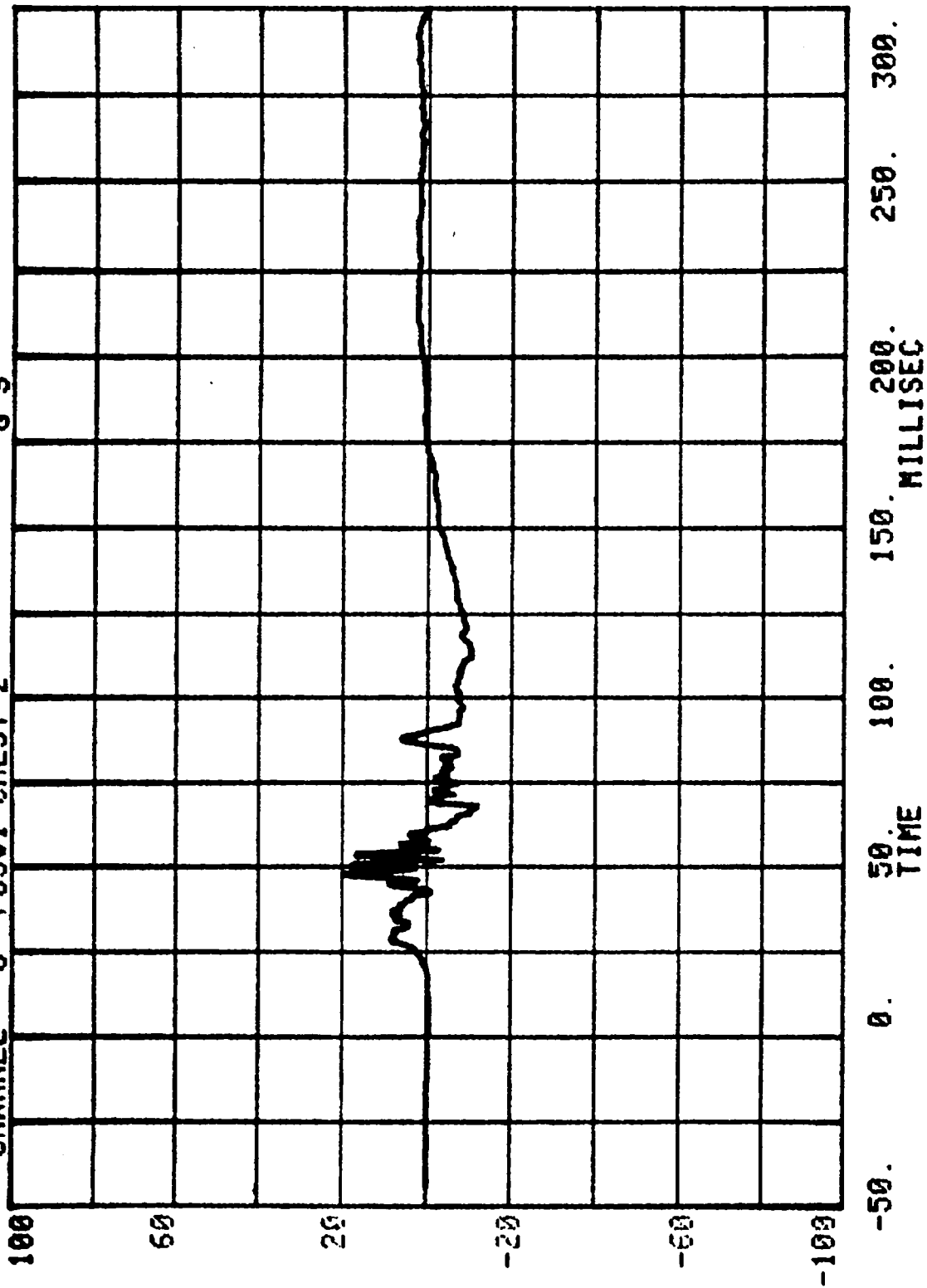


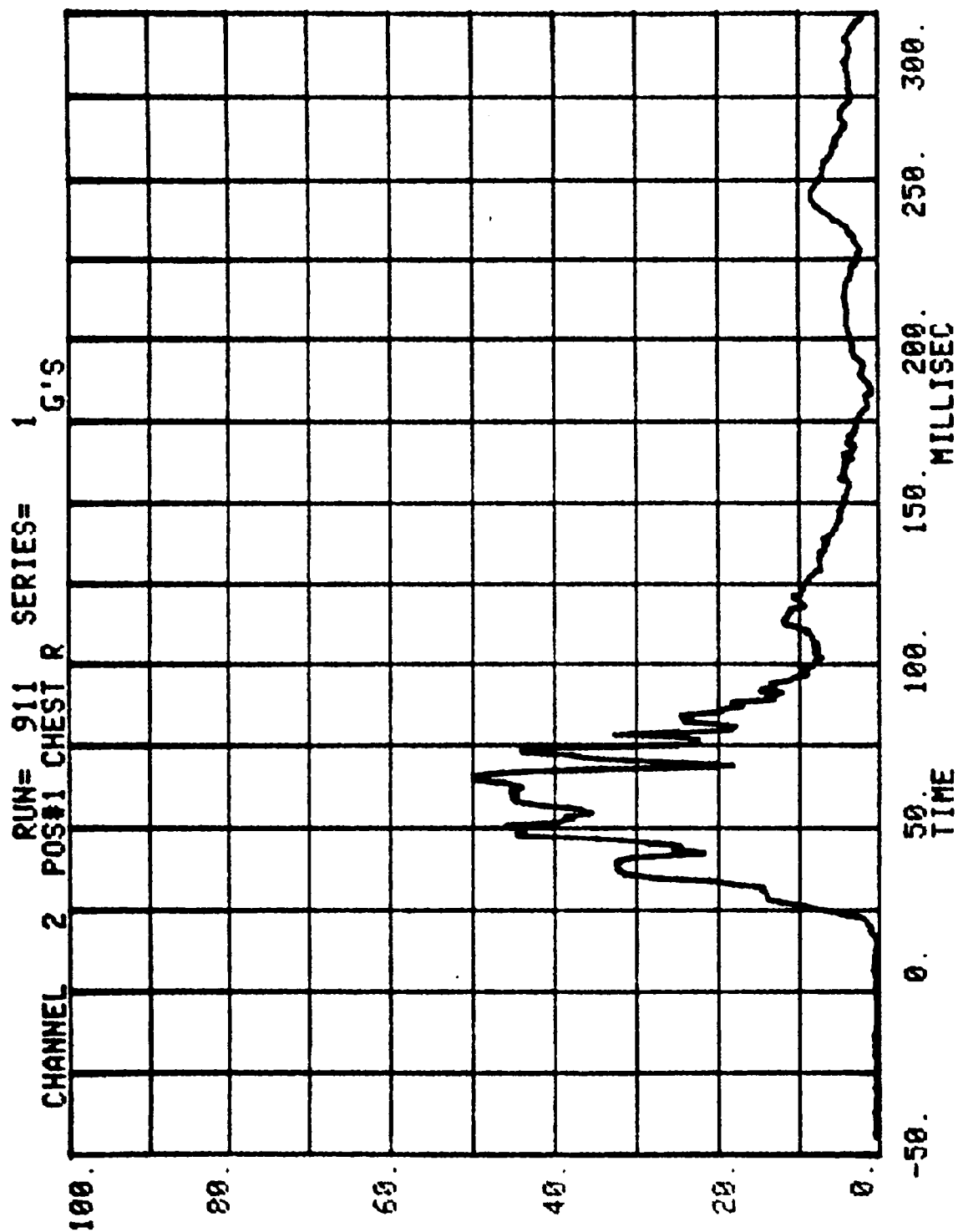
RUN= 911 SERIES= 1
CHANNEL 4 POS#1 CHEST X G'S



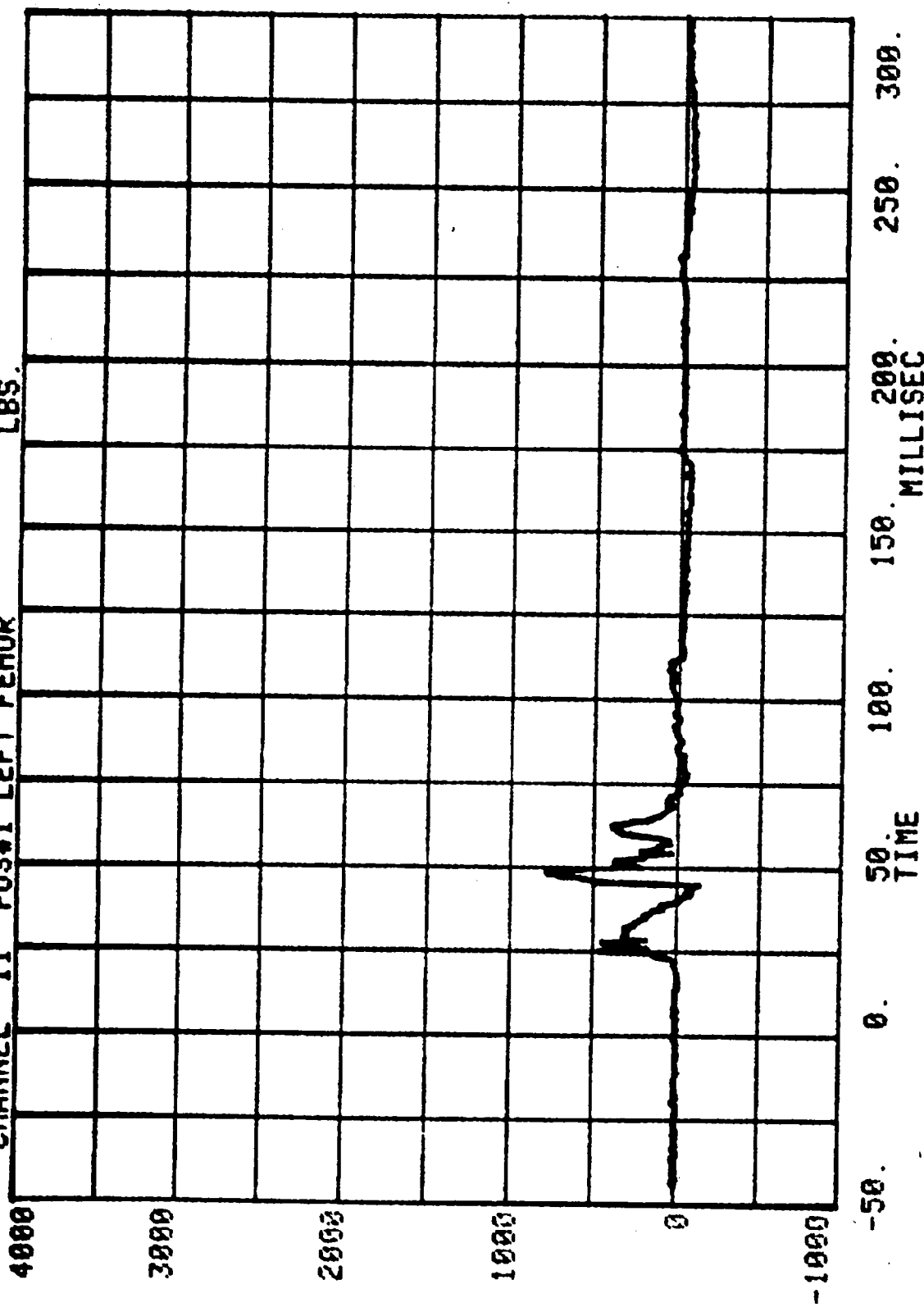


CHANNEL 6 POS#1 CHEST 2 RUN= 911 SERIES= 1 G'S



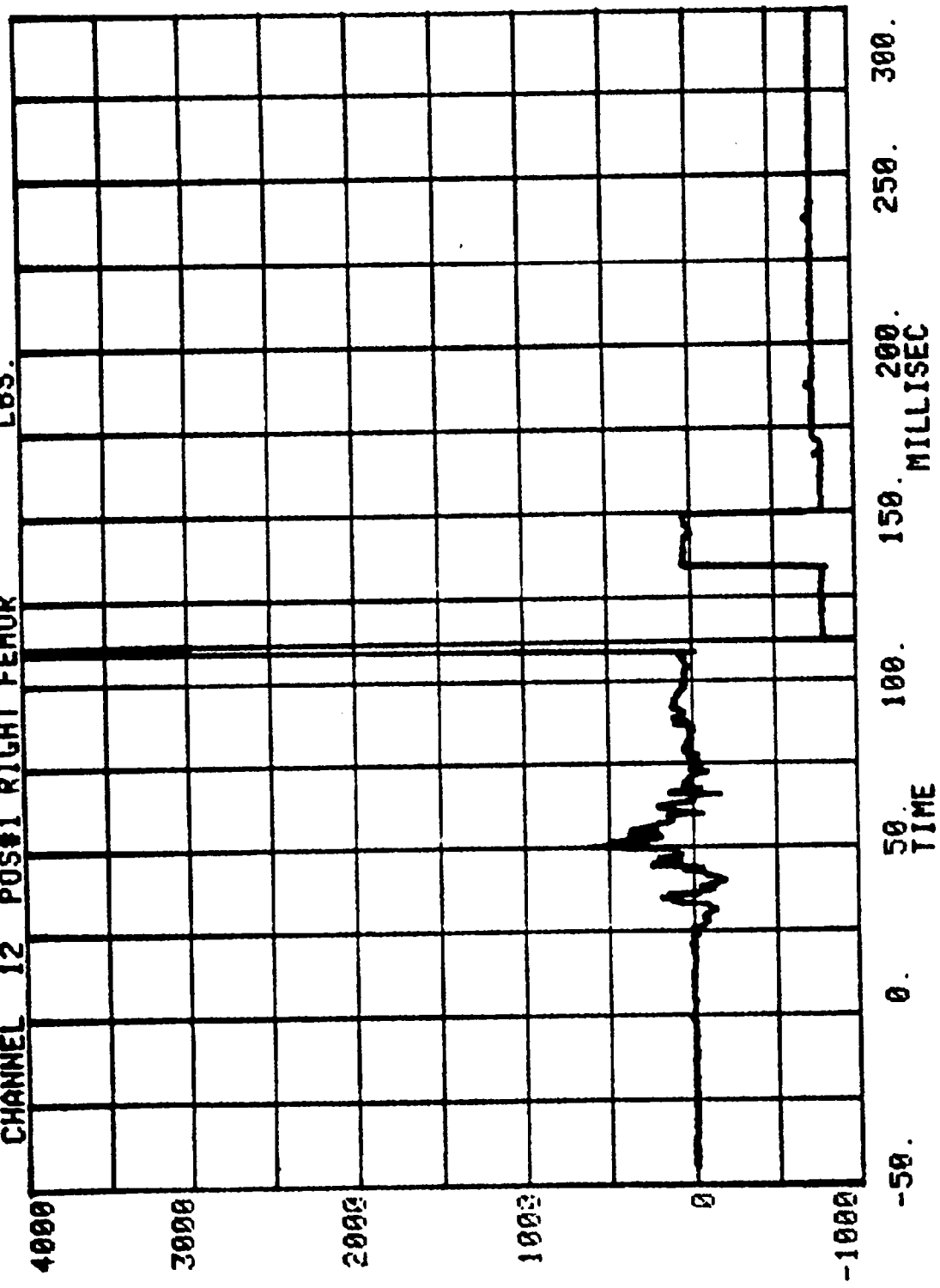


CHANNEL 11 POS#1 LEFT FEMUR RUN= 911 SERIES= 1 LBS.

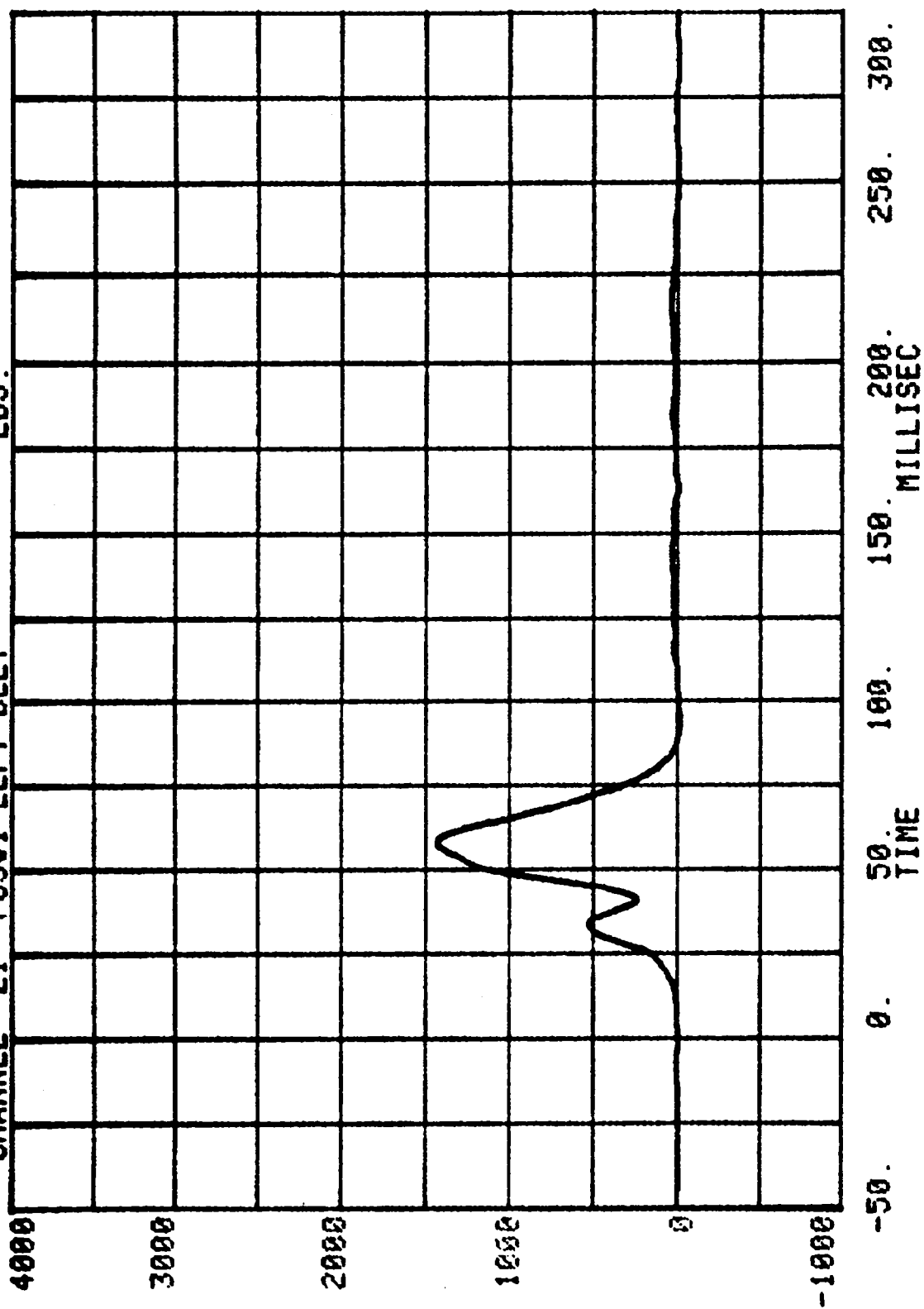


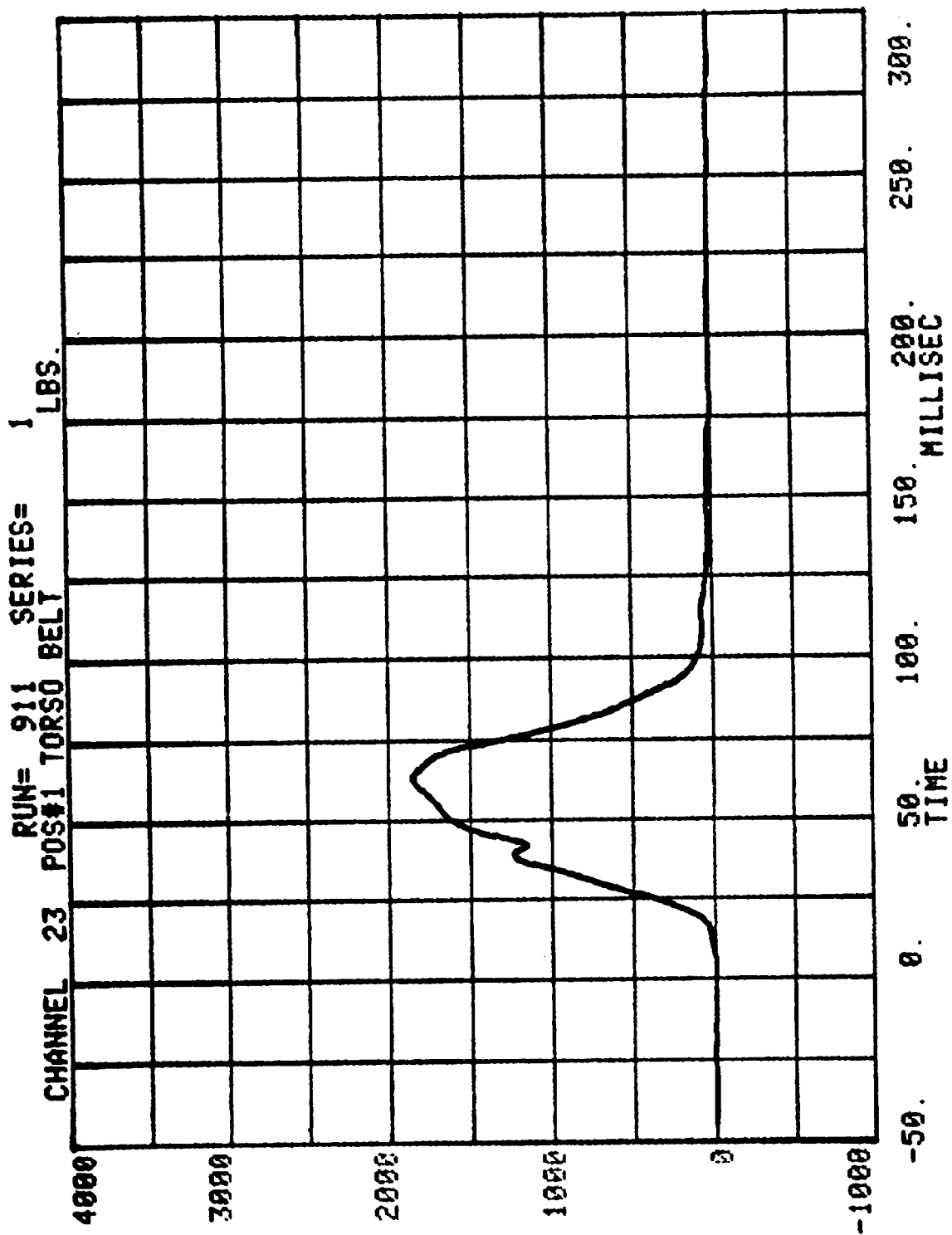
Data not accurate
after 110 msec

CHANNEL 12 POS#1 RIGHT FEMUR RUN= 911 SERIES= 1 LBS.



RUN= 911 SERIES= 1
CHANNEL 21 POS#1 LEFT BELT LBS.



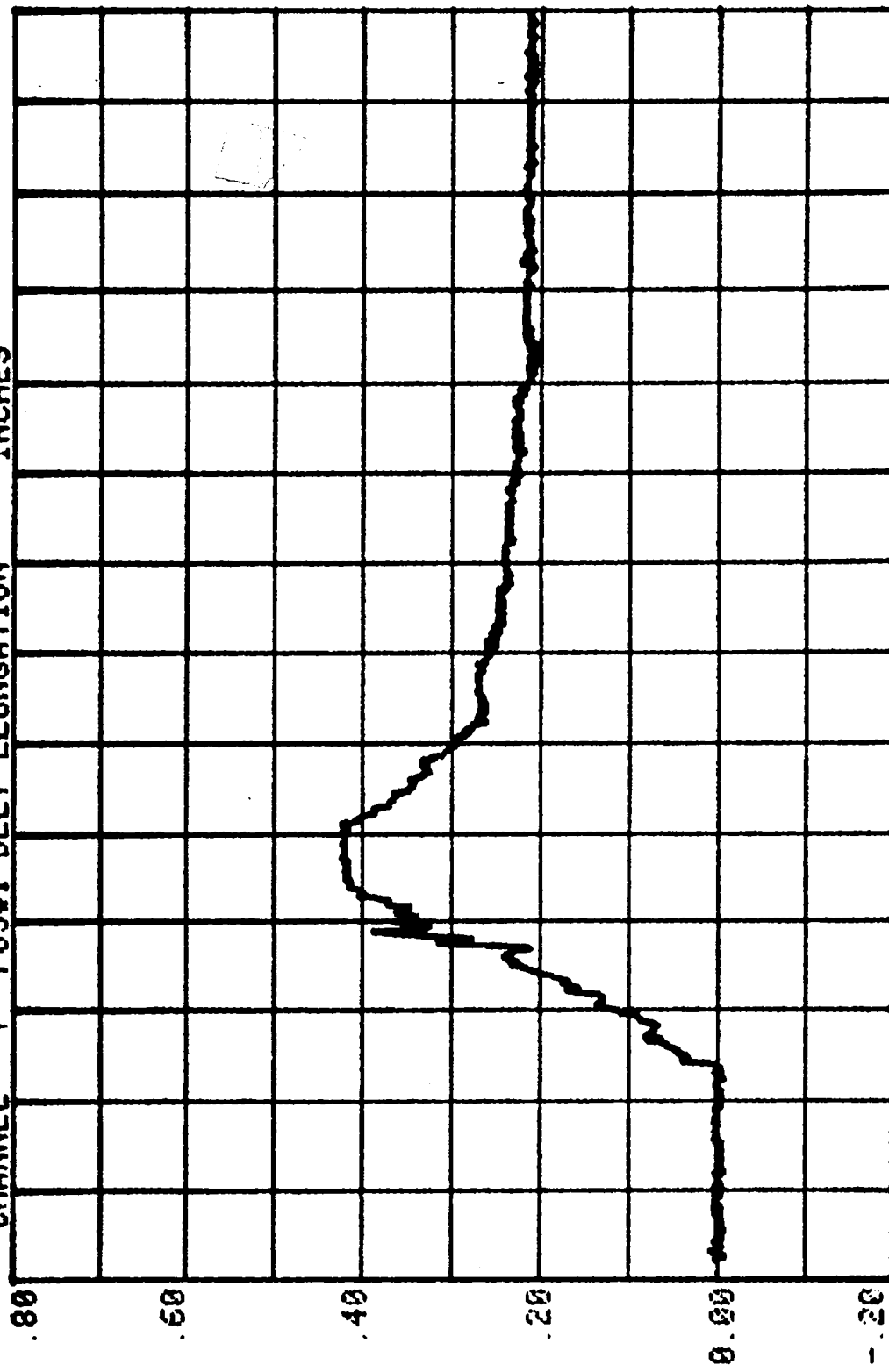


Measured over 2.5 inches

CHANNEL 7 POS#1 BELT ELONGATION

1 INCHES

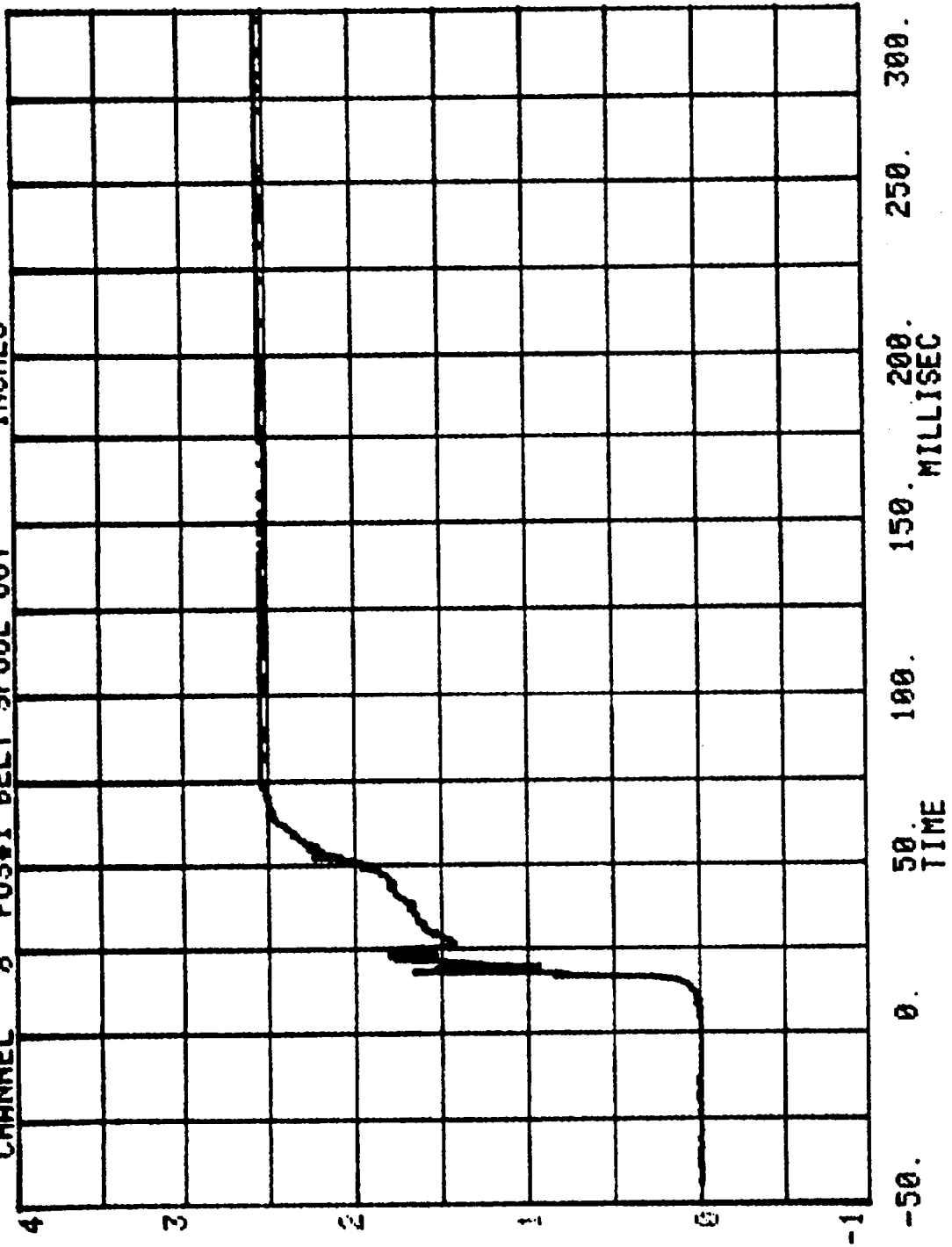
RUN= 911 SERIES=



200. 250. 300. MILLISEC

TIME

CHANNEL 8 POS#1 BELT SPOOL OUT 1 INCHES



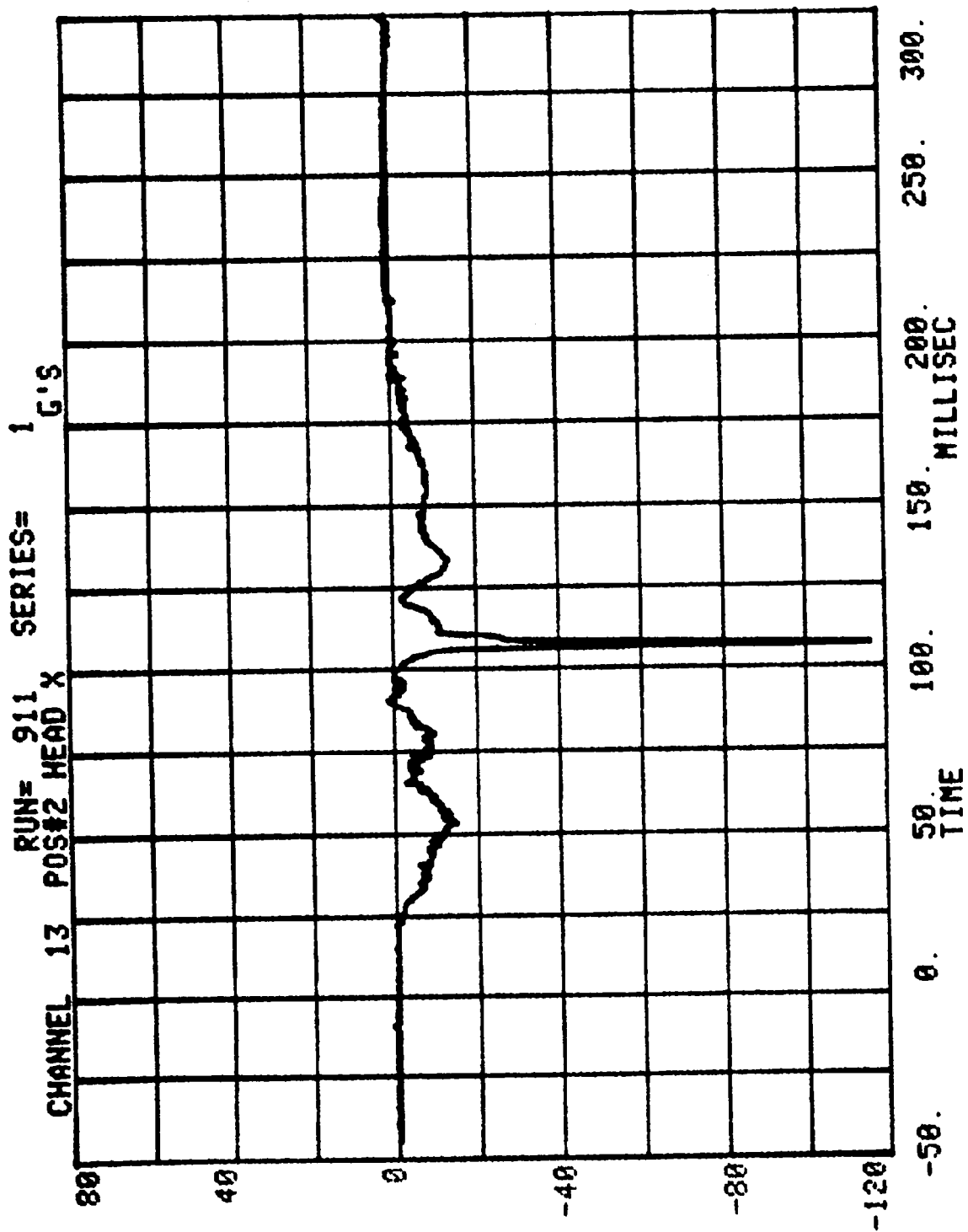
HEAD INJURY CRITERION
HEAD SEVERITY INDEX
35MS. MAXIMUM DURATION

NEW CAR ASSESSMENT CRASH TEST - 1989

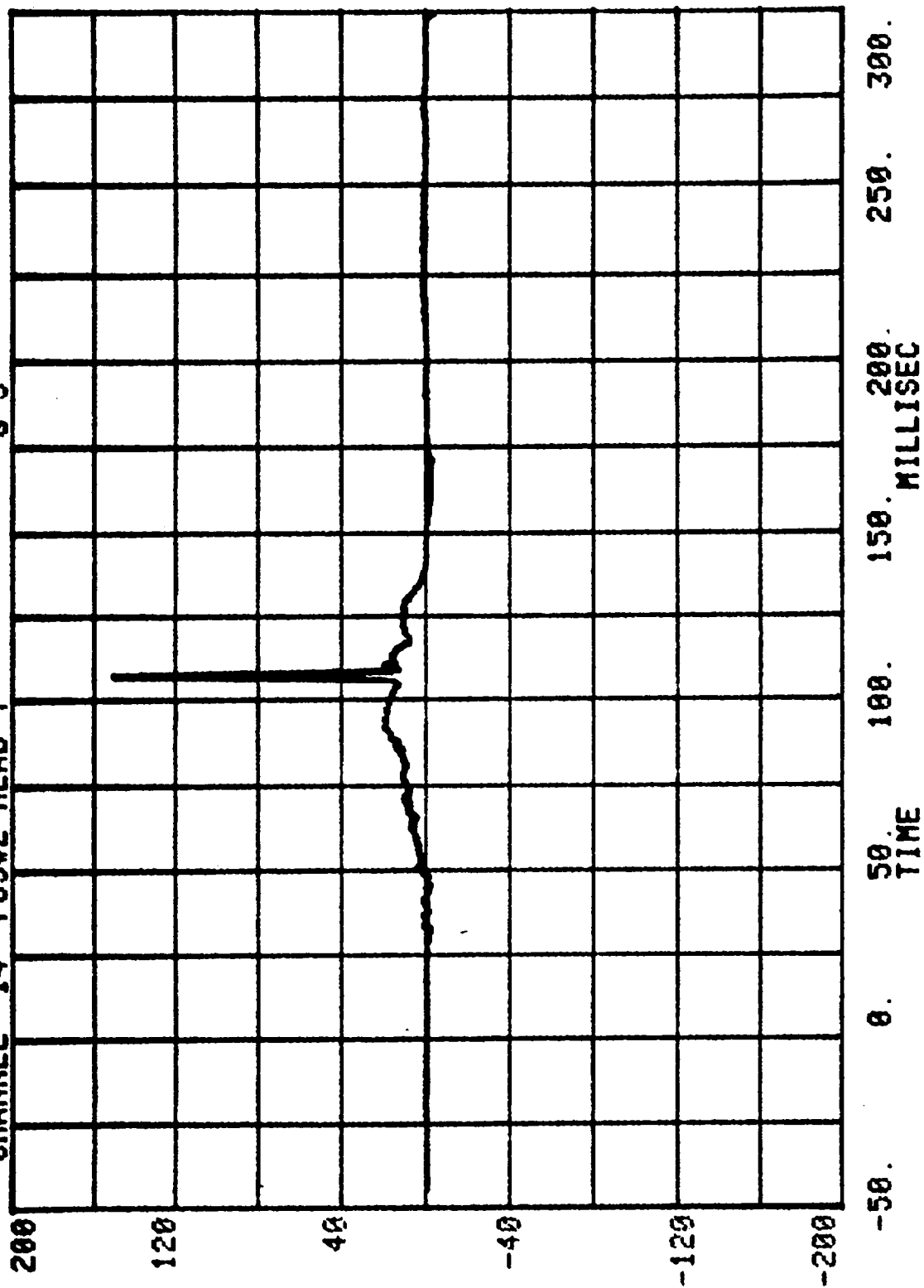
RUN= 911

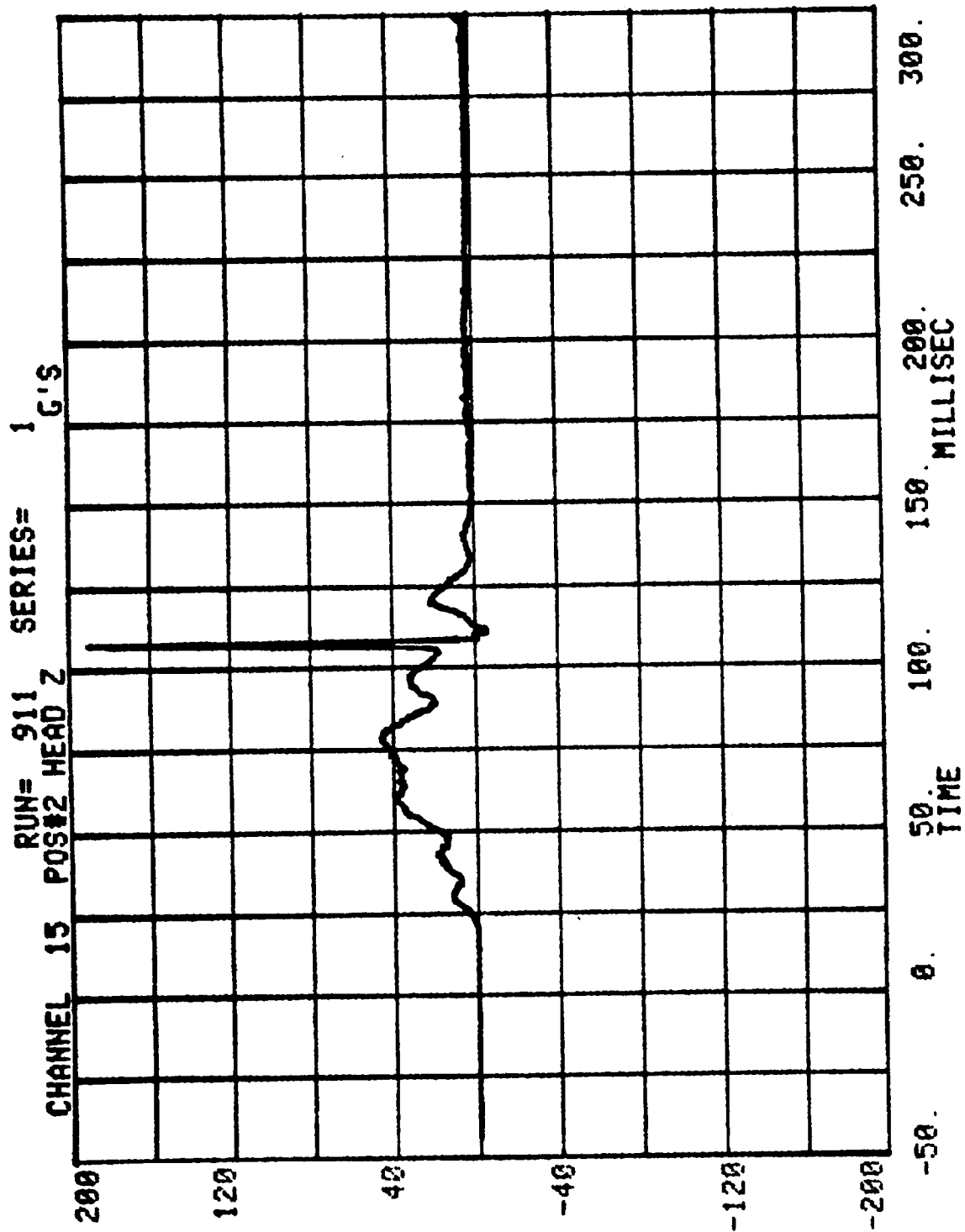
POS#2 HEAD R

HIC= 965.4 FROM T1= .10672 TO T2= .10807
AVERAGE ACCELERATION BETWEEN T1 AND T2= 219.7G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX=1655.4

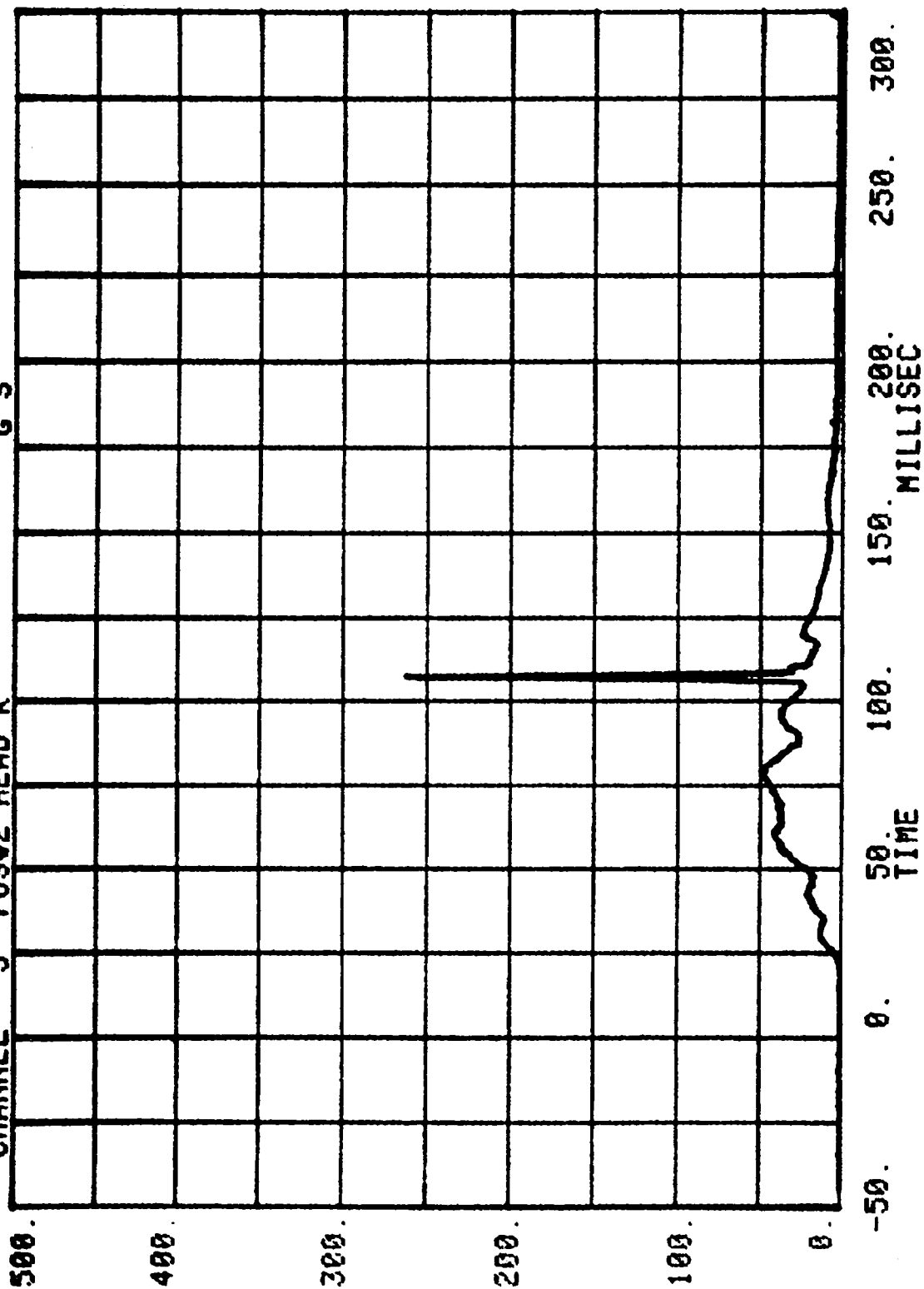


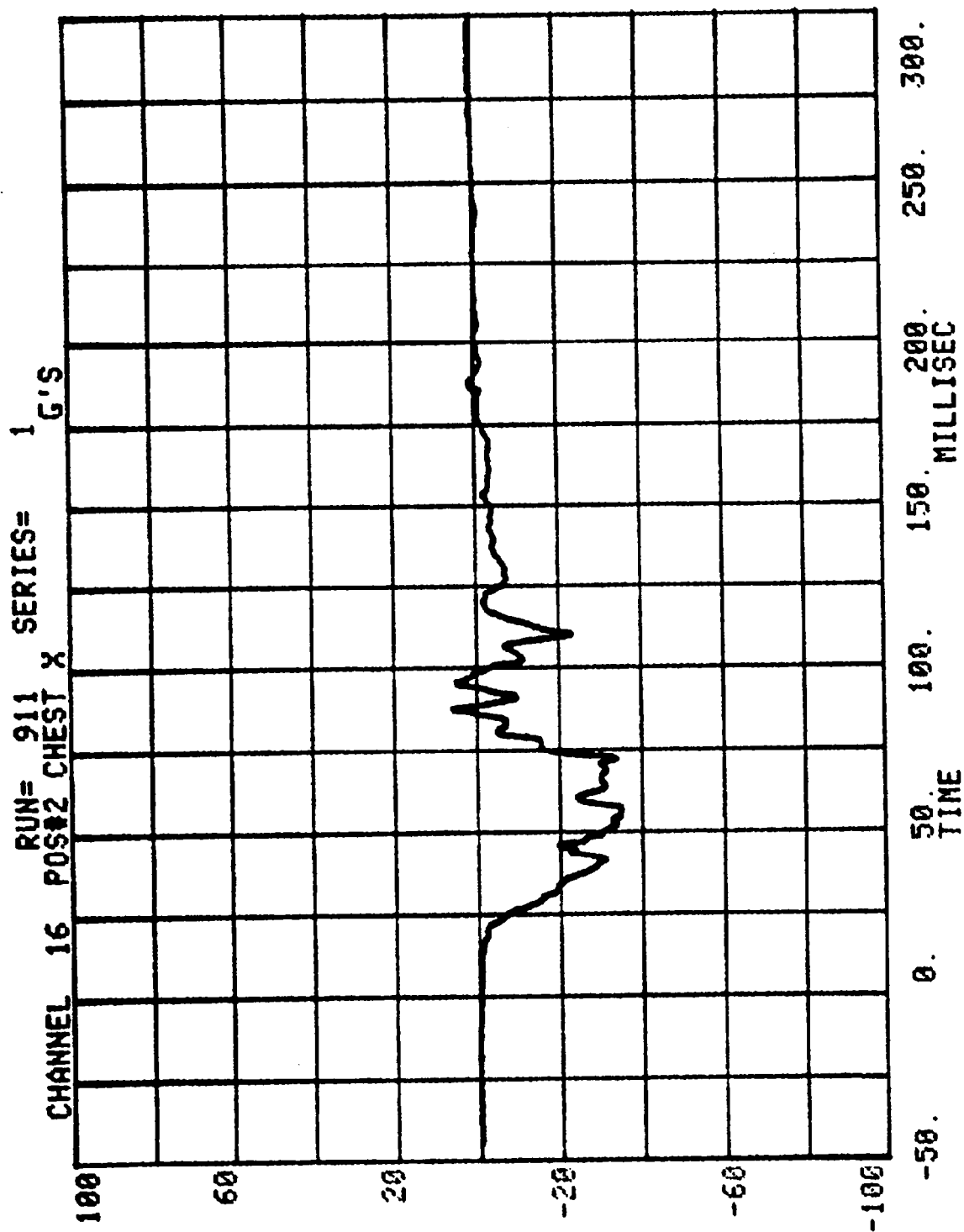
CHANNEL 14 POS#2 HEAD Y RUN= 911 SERIES= 1 G'S



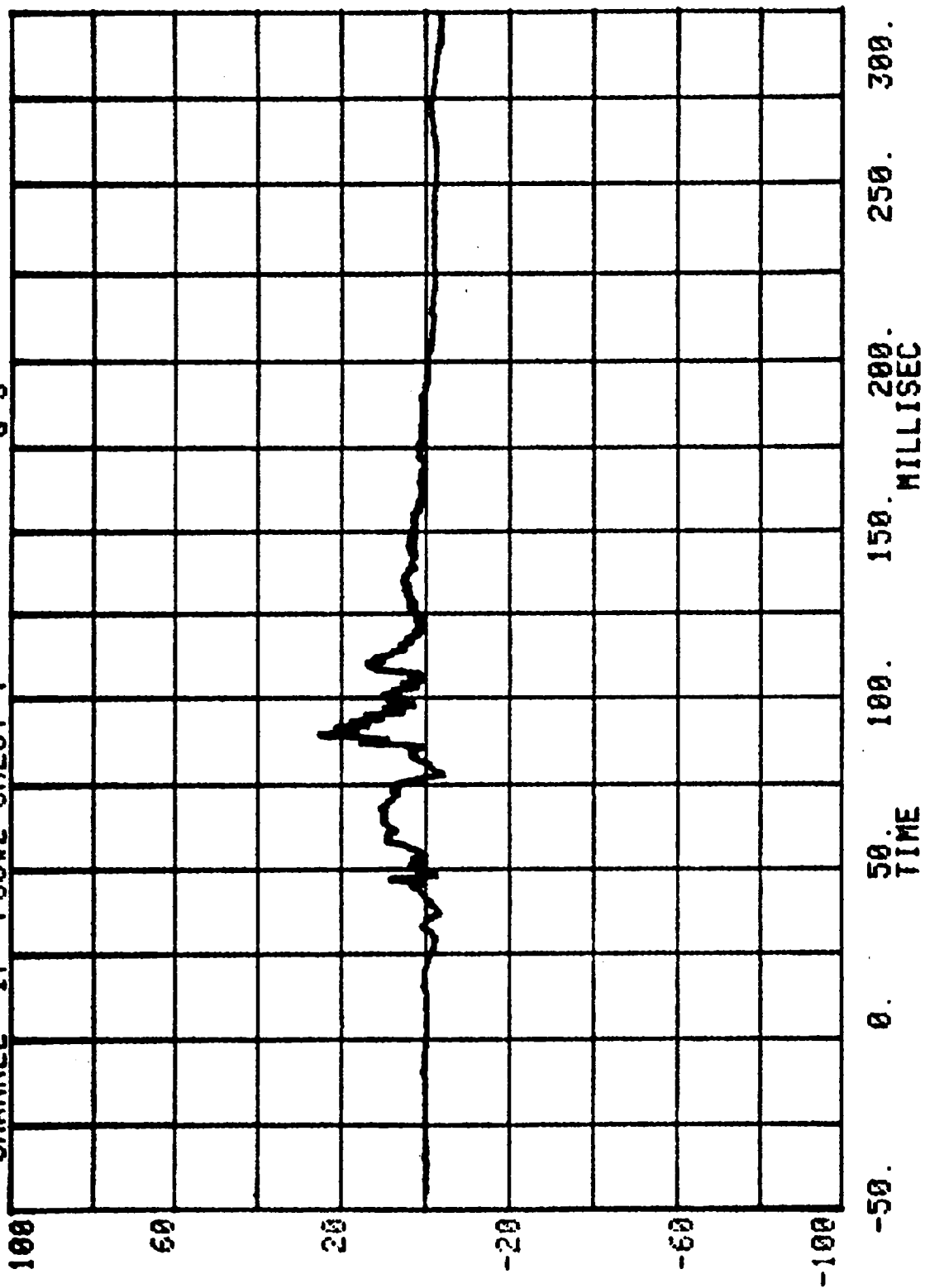


CHANNEL 3 RUN= 911 SERIES= 1
POS#2 HEAD R G'S

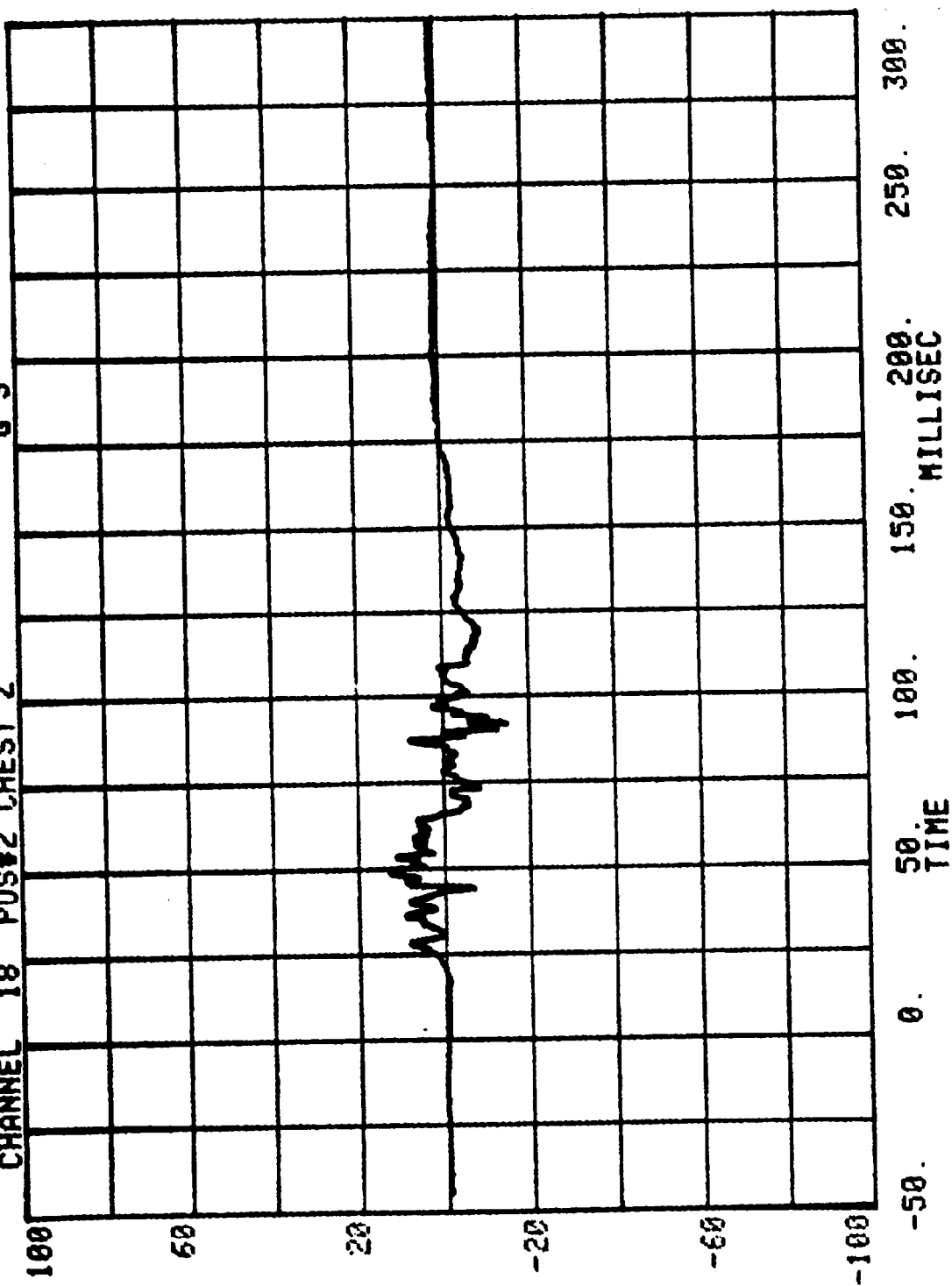




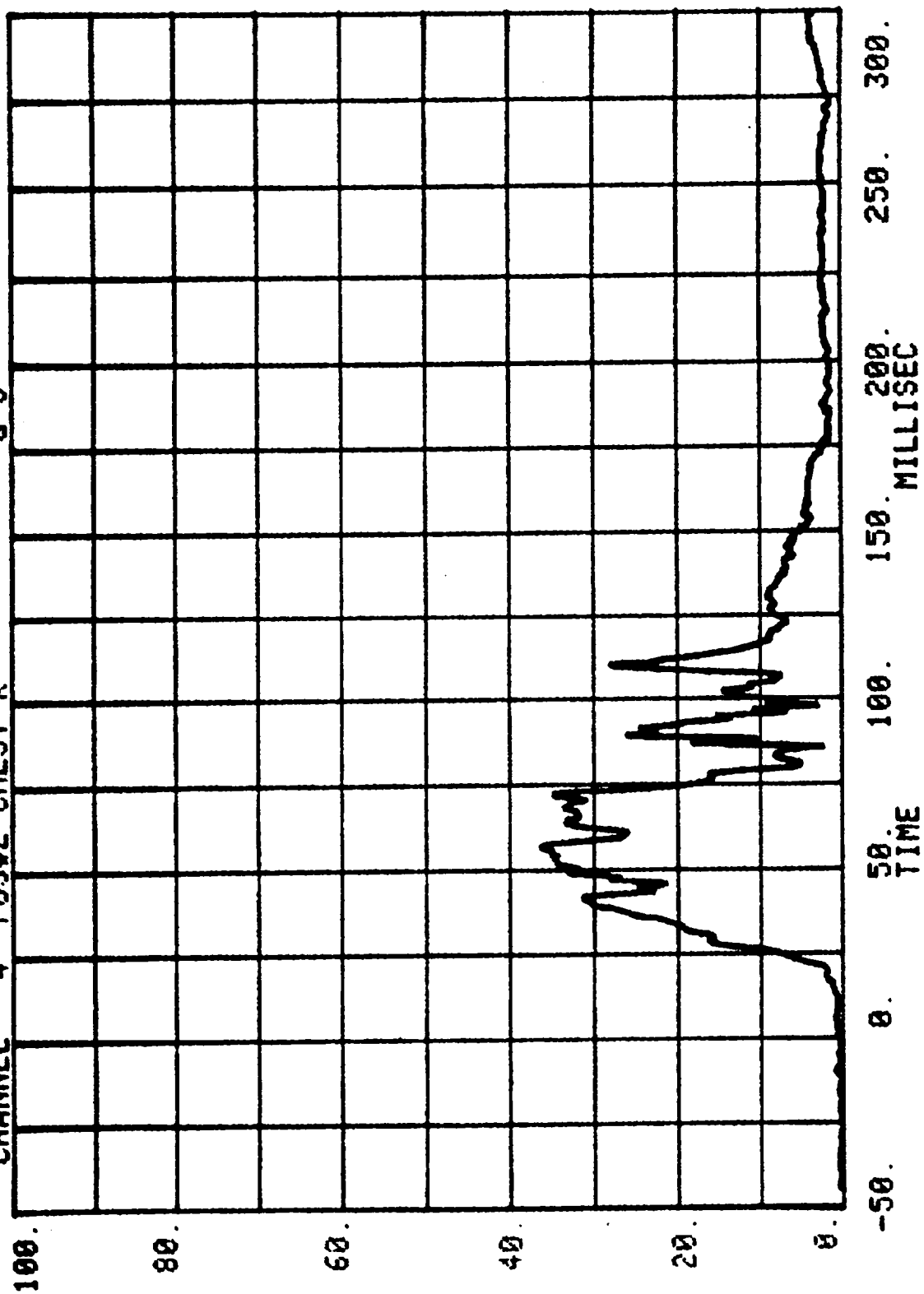
CHANNEL 17 POS#2 CHEST Y SERIES= 1 G'S



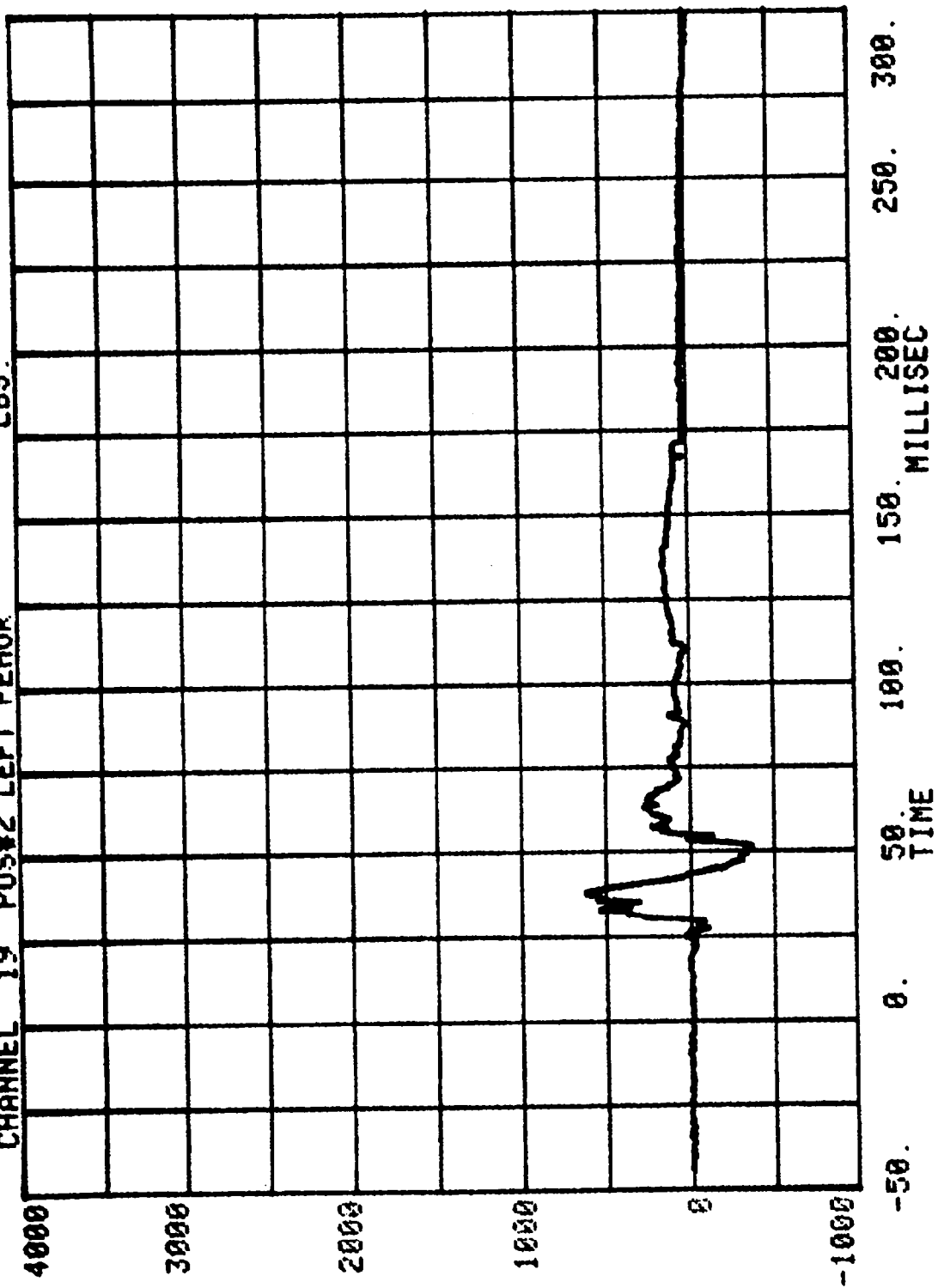
CHANNEL 18 POS#2 CHEST Z RUN= 911 SERIES= 1 G'S



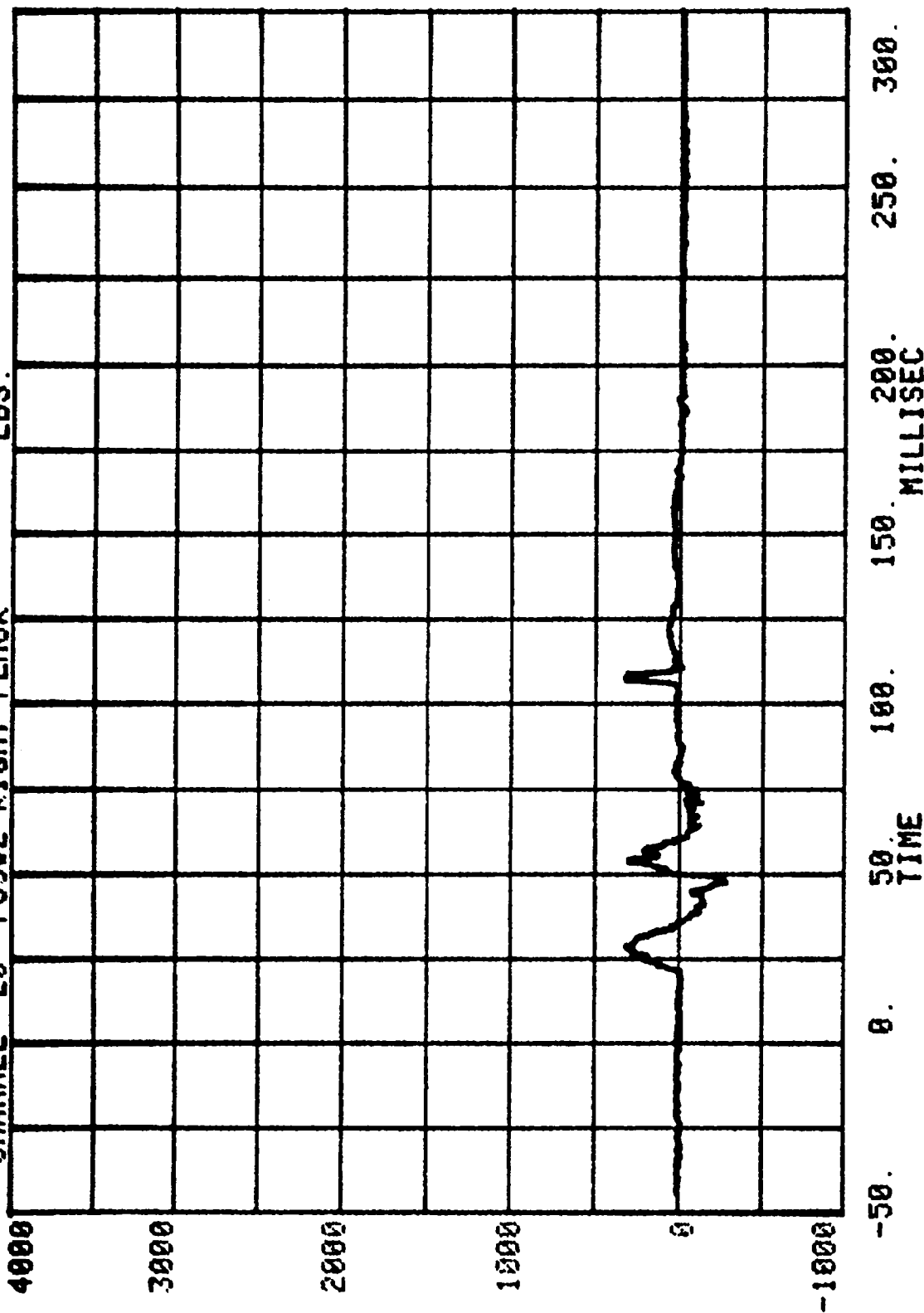
CHANNEL 4 POS#2 CHEST R RUN= 911 SERIES= 1 G'S



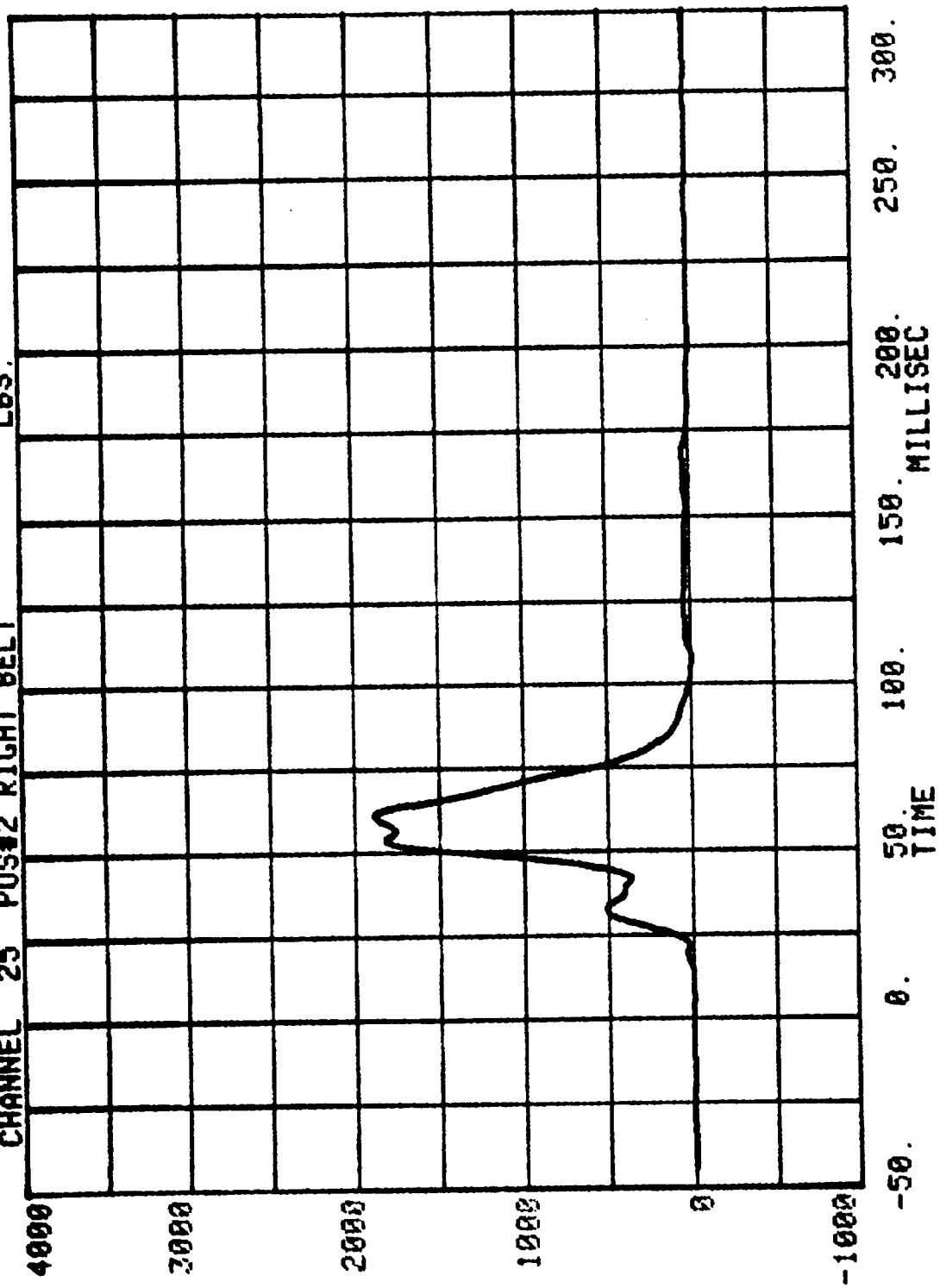
RUN= 911 SERIES= 1 LBS.
CHANNEL 19 POS#2 LEFT FEMUR



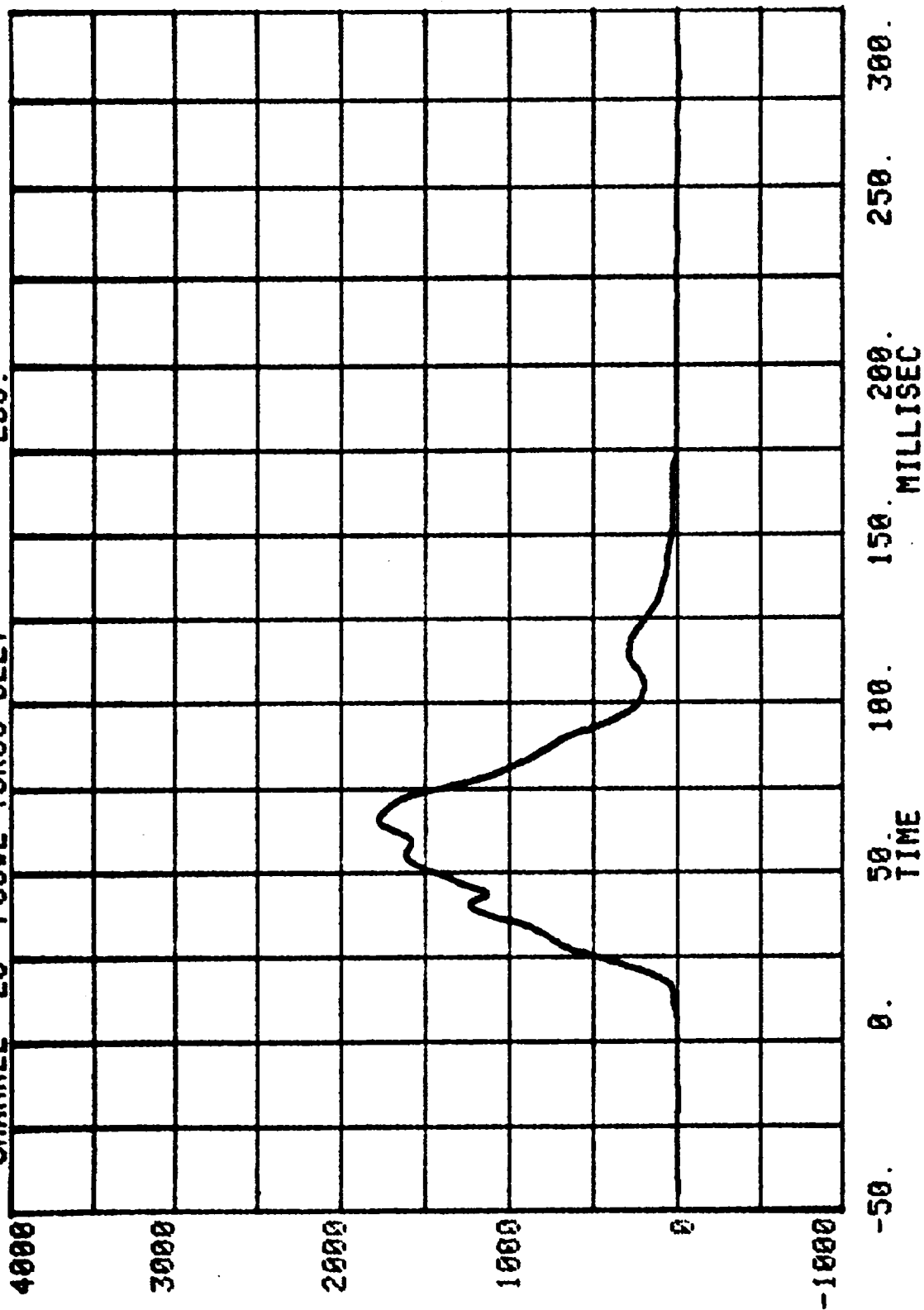
RUN= 911 SERIES= 1
CHANNEL 20 POS#2 RIGHT FEMUR LBS.



RUN= 911 SERIES= 1 LBS.
CHANNEL 25 POS#2 RIGHT BELT

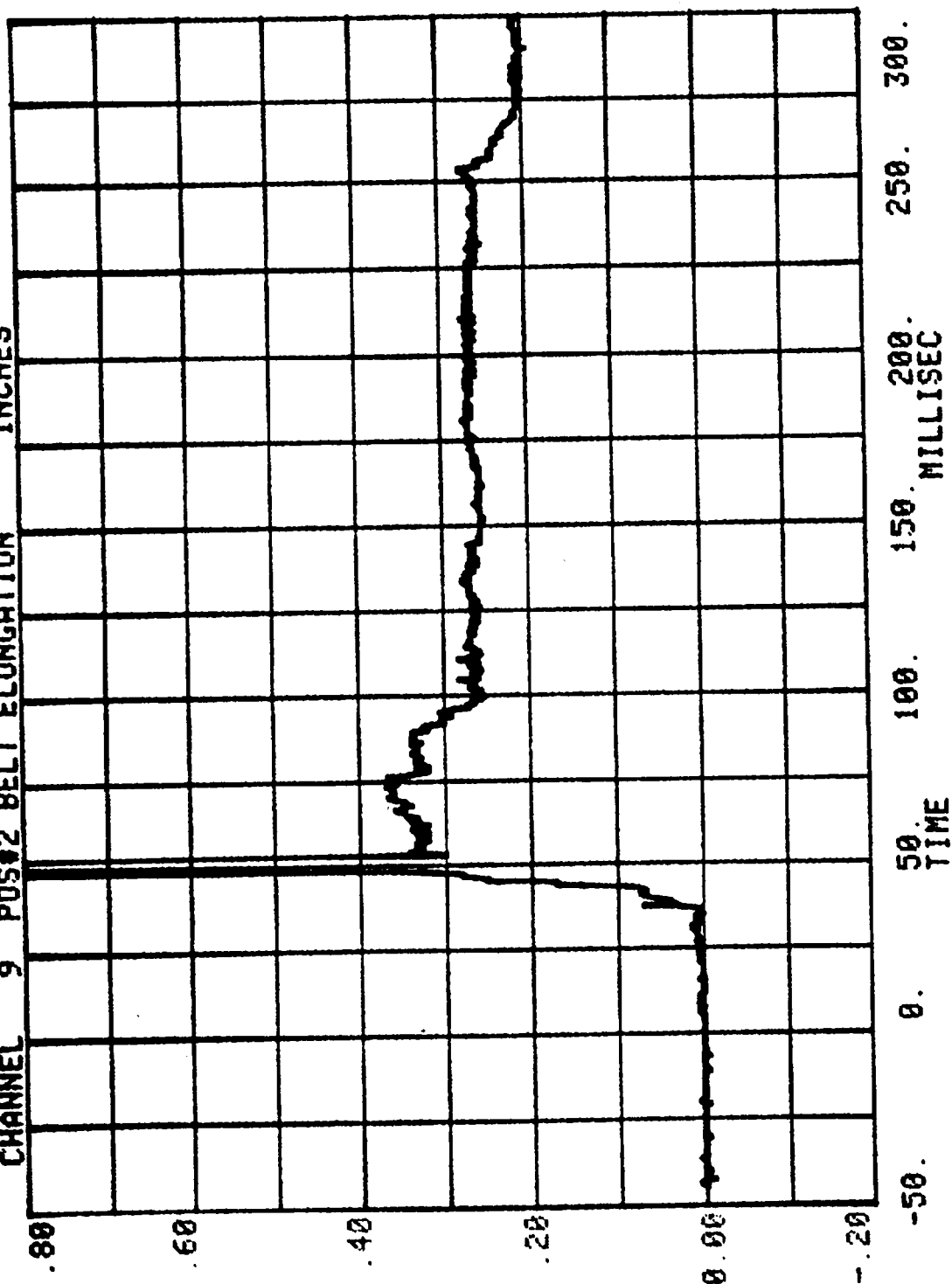


CHANNEL 26 POS#2 TORSO BELT RUN= 911 SERIES= 1 LBS.

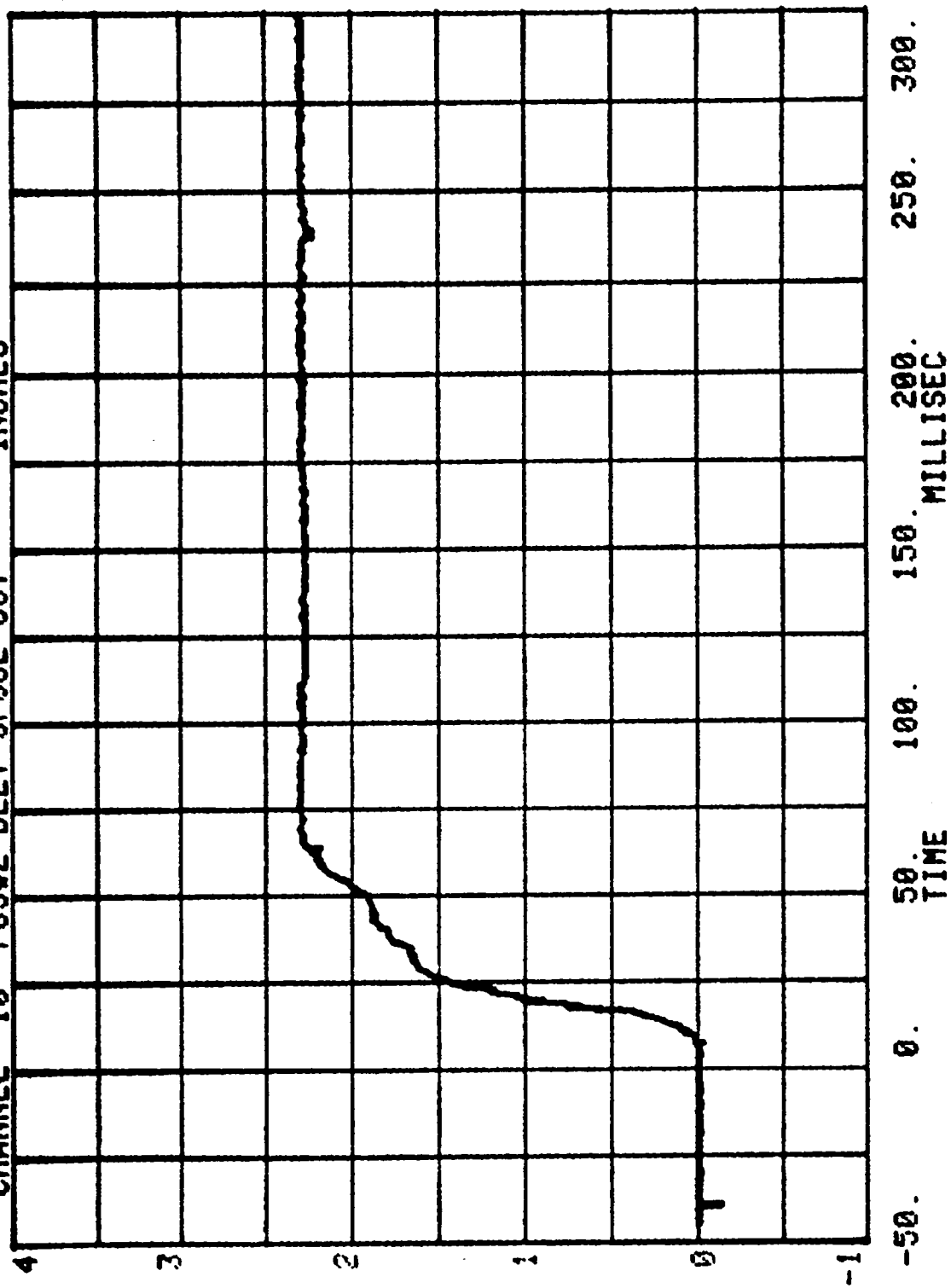


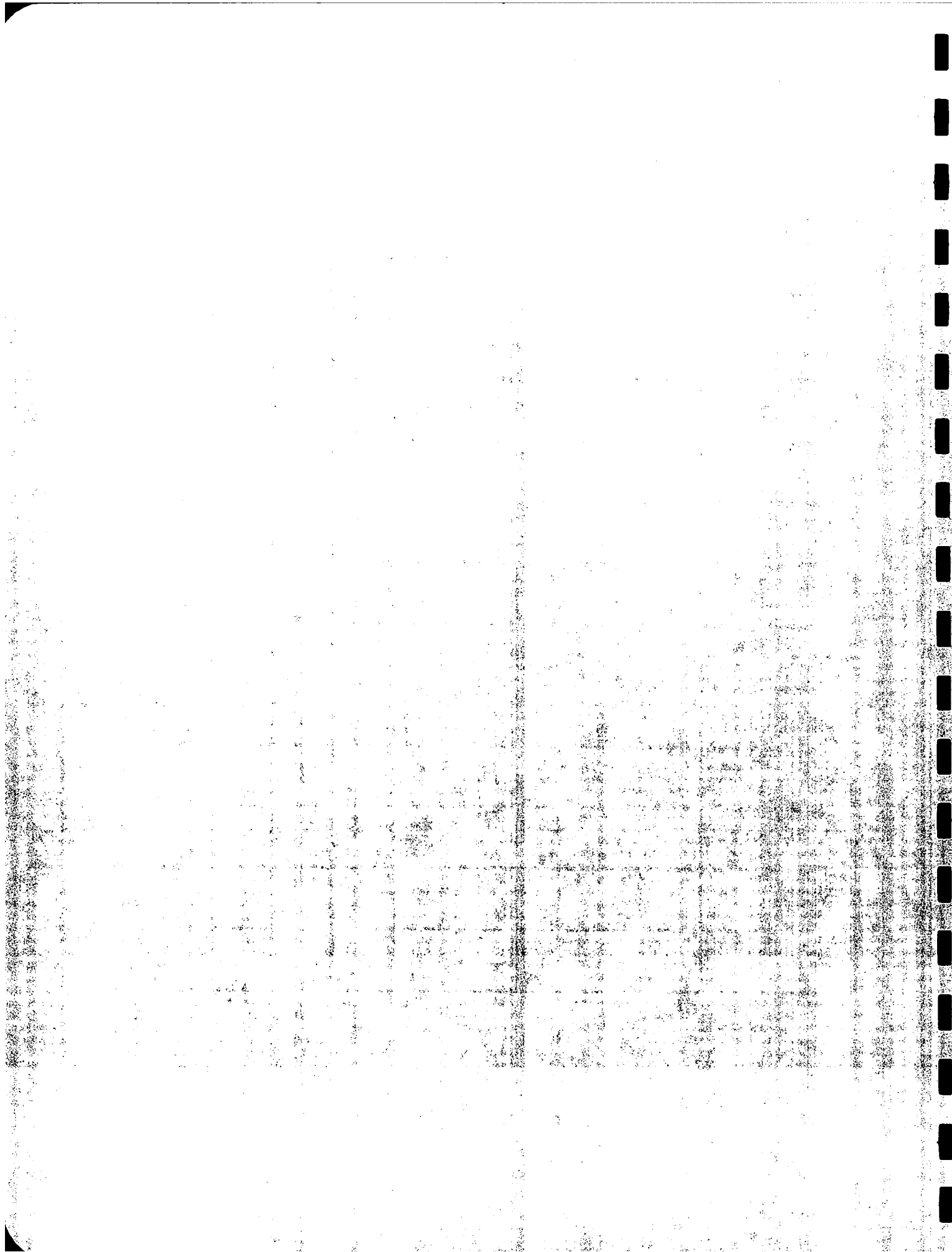
Measured over 2.5 inches

CHANNEL 9 RUN= 911 POS#2 BELT ELONGATION SERIES= 1 INCHES



RUN= 911 SERIES= 1
CHANNEL 10 POS#2 BELT SPOOL OUT INCHES





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.

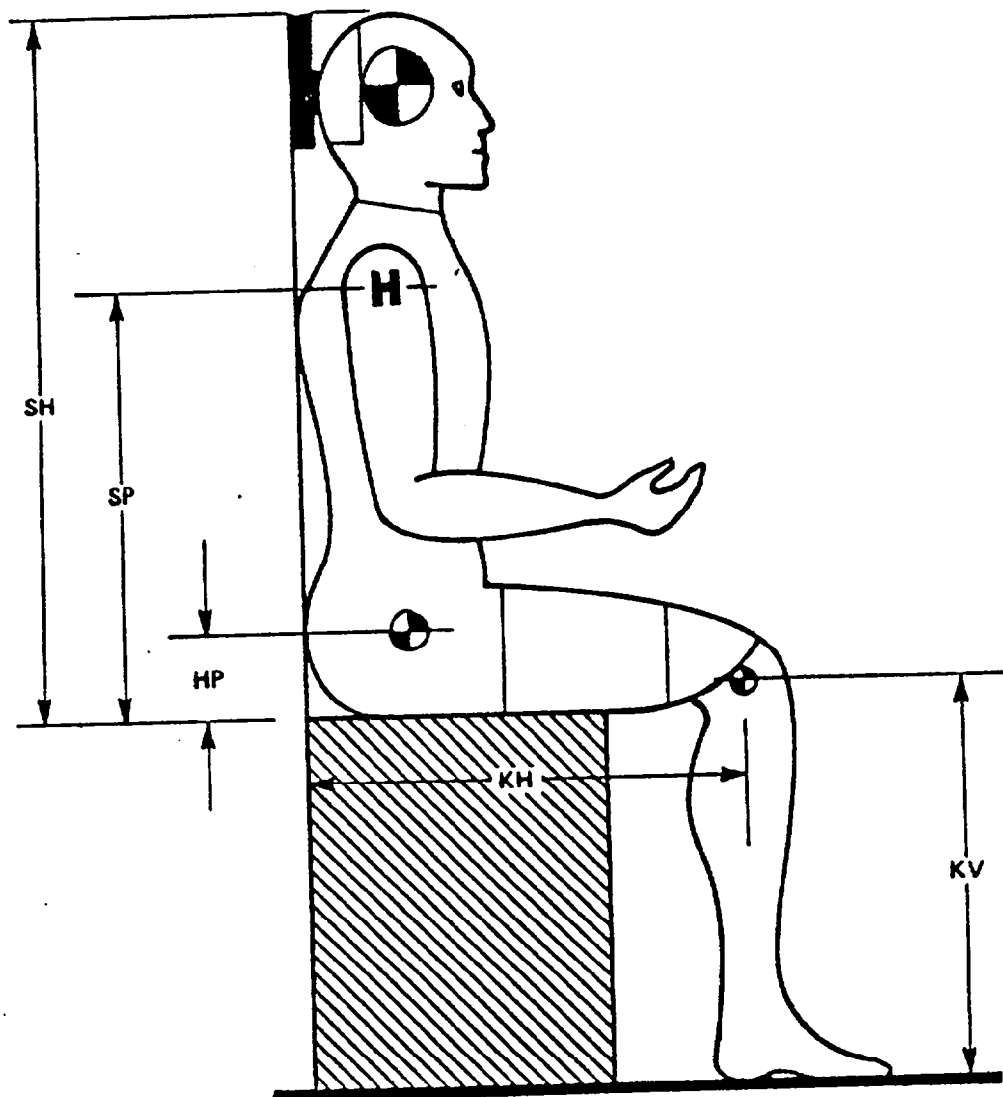
Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
1020	7/10/89
1022	7/10/89

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 Inducant Testing Final Report, Report No. 6525-V-1.

Figure 10 DUMMY CONFIGURATION DIMENSIONS



PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER.: 1020

I. CONFIGURATION VERIFICATION DATA

	P. 572 SPECIFICATION	PRE-TEST if required	POST-TEST if required
DATE OF CONFIGURATION VERIFICATION	XXXXXXXXXXXXXX	7-10-89	
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"	19.8 "	"
SW - Shoulder Width	17.8 to 18.4"	18.1 "	"
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		7-10-89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		1	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		70-72 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		46-52 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	252 G's	G's
b. peak lateral accel.	<= 10 G's	7 G's	G's
c. Time above 100 G's	0.9 to 1.5 ms.	1.2 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: 1020

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
2. NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.	22.4 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	22.3 G's	
c. Peak Resultant Head Acceleration		26 G's max.	25 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	2.4 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	26.1 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	3.9 ms	
g. Max. Head Rotation		63 to 73 deg.	72 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.	27.9 ms	
	Displ.	2.1 to 3.1"	2.5 "	
60 deg.	Time	40.3 to 51.7 ms.	42 ms	
	Displ.	4.3 to 5.3"	4.8 "	
Maximum	Time	53.2 to 66.8 ms.	54 ms	
	Displ.	5.0 to 6.0"	5.7 "	
60 deg.	Time	67.0 to 83.0 ms.	76 ms	
	Displ.	4.3 to 5.3"	4.6 "	
30 deg.	Time	85.4 to 104.6 ms.	90.7 ms	
	Displ.	2.1 to 3.1"	2.5 "	
0 deg.	Time	101.0 - 123.0 ms.	105.8 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1020

		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.	24.5 lbs	
b. Force @ 0.75"	36 to 50 lbs.	38 lbs	
c. Force @ 1.0"	50 to 63 lbs.	53 lbs	
d. Force @ 1.3"	73 to 88 lbs.	74 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	27 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	40 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	52.5 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	1.5 "	
(3) Peak Resistive Force	2250 lbs maximum	2043 lbs	
(4) Internal Hysteresis	50 to 70%	50.1 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	14.0 fps	
(2) Peak Deflection	1.1" maximum	.98 "	
(3) Peak Resistive Force	1450 lbs maximum	1279 lbs	
(4) Internal Hysteresis	50 to 70%	50.7 %	

TECHNICIAN'S NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1020

		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	2105 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	2310 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 1020

DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	CL60	4-89	10-89
HY LATERAL--	ENDEVCO	FK57	4-89	10-89
HZ VERTICAL--	ENDEVCO	FL03	4-89	10-89
2. CHEST ACCELEROMETER--				
CX LONGITUDINAL--	CEC	A129	2-89	8-89
CY LATERAL--	ENDEVCO	CN64	2-89	8-89
CZ VERTICAL--	CEC	A56	2-89	8-89
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	3-89	9-89
2. TEST PROBE ACCELEROMETER--	CEC	A142	5-89	11-89
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS- DUCER INC	20051	5-89	11-89
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	5-89	11-89
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	5-89	11-89

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER.: 1022

I. CONFIGURATION VERIFICATION DATA

	P. 572 SPECIFICATION	PRE-TEST if required	POST-TEST if required
DATE OF CONFIGURATION VERIFICATION	XXXXXXXXXXXXXX	7-10-89	
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"	20.4 "	"
KV - Knee Pivot from floor	19.3 to 19.9"	19.7 "	"
SW - Shoulder Width	17.8 to 18.4"	18.3 "	"
HW - Hip Width	14.0 to 15.4"	15.0 "	"

II. PERFORMANCE VERIFICATION DATA:

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION		7-10-89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		1	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		72 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		46-52 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	250 G's	G's
b. peak lateral accel.	<= 10 G's	2.4 G's	G's
c. Time above 100 G's	0.9 to 1.5 ms.	1.2 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: 1022

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
2. NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.	22.5 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	22.3 G's	
c. Peak Resultant Head Acceleration		26 G's max.	24.9 G's	
d. Pendulum Decel. (t2-t1)		≤ 3 ms.	2 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	25.9 ms	
f. Pendulum Decel. (t4-t3)		≤ 10 ms.	4.8 ms	
g. Max. Head Rotation		63 to 73 deg.	72 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.	27.9 ms	
	Displ.	2.1 to 3.1"	2.5 "	
60 deg.	Time	40.3 to 51.7 ms.	42.5 ms	
	Displ.	4.3 to 5.3"	4.9 "	
Maximum	Time	53.2 to 66.8 ms.	54 ms	
	Displ.	5.0 to 6.0"	5.8 "	
60 deg.	Time	67.0 to 83.0 ms.	76.5 ms	
	Displ.	4.3 to 5.3"	4.8 "	
30 deg.	Time	85.4 to 104.6 ms.	92.8 ms	
	Displ.	2.1 to 3.1"	2.4 "	
0 deg.	Time	101.0 - 123.0 ms.	108.3 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1022

		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.	37.5 lbs	
c. Force @ 1.0"	50 to 63 lbs.	52.5 lbs	
d. Force @ 1.3"	73 to 88 lbs.	78 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	27.5 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	39 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	51 lbs	
d. Return Angle	12 deg. maximum	9.5 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	1.6 "	
(3) Peak Resistive Force	2250 lbs maximum	2028 lbs	
(4) Internal Hysteresis	50 to 70%	50.4 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	14.0 fps	
(2) Peak Deflection	1.1" maximum	1.08 "	
(3) Peak Resistive Force	1450 lbs maximum	1190 lbs	
(4) Internal Hysteresis	50 to 70%	54.7 %	

TECHNICIAN'S NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1022

		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	2000 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	2250 lbs	
(3) Time Above 1000 lbs.	1.7 ms. minimum	2.0 ms	

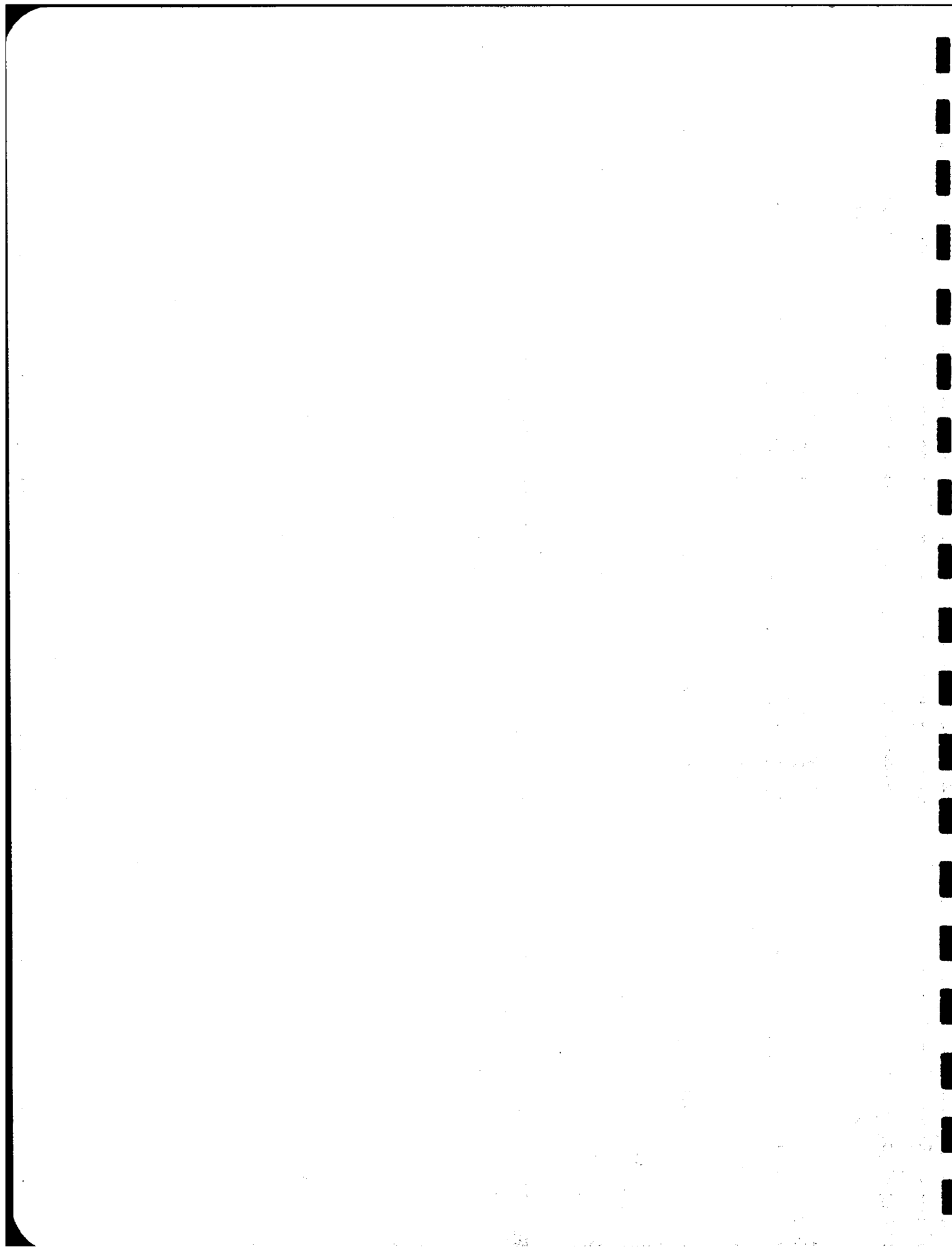
REMARKS:

TECHNICIAN'S NAME: IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER 1022

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	77	6-89	12-89
RIGHT SIDE	GSE	1707	6-89	12-89
CALIBRATION LABORATORY INSTRUMENTS--				
1. PENDULUM ACC.--	CEC	A144	3-89	9-89
2. TEST PROBE ACCELEROMETER--	CEC	A142	5-89	11-89
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS- DUCER INC	20051	5-89	11-89
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	5-89	11-89
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	5-89	11-89

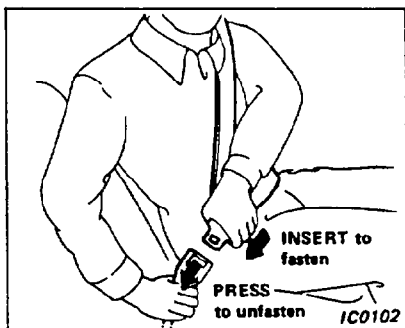


Appendix D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

SEAT BELTS

3-POINT TYPE WITH RETRACTOR



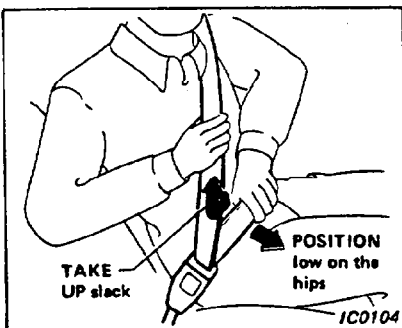
Every person who drives or rides in this vehicle should wear a seat belt at all times.

Fastening the belts

1. Adjust the seat.

The seatback should not be in a reclining position any more than needed for comfort. Seat belts are most effective when the passenger sits well back and straight up in the seat.

2. Slowly pull the seat belt out of the retractor and insert the tongue into the buckle until it snaps.



The retractor is designed to lock during a sudden stop or on impact. A slow pulling motion will permit the belt to move, and allow you some freedom of movement in the seat.

3. Position the lap belt portion low on the hips as shown.
4. Pull the shoulder belt portion toward the retractor to take up extra slack.

Unfastening the belts

To unfasten the belt, press the button on the buckle. The seat belt will automatically retract.

Checking seat belt operation

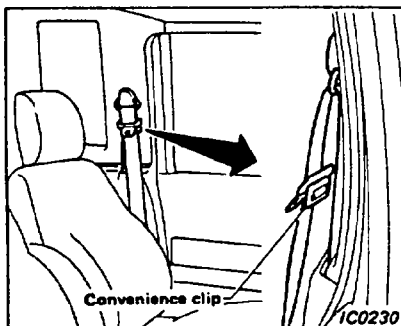
Your seat belt retractors are designed to lock belt movement by two separate methods:

- 1) When the belt is pulled quickly from the retractor.
- 2) When the vehicle slows down rapidly.

To increase your confidence in the belts, check the operation as follows:

- Grasp the shoulder belt and pull quickly forward. The retractor should lock and restrict further belt movement.

If the retractor does not lock during this check or if you have any question about belt operation see your NISSAN dealer.

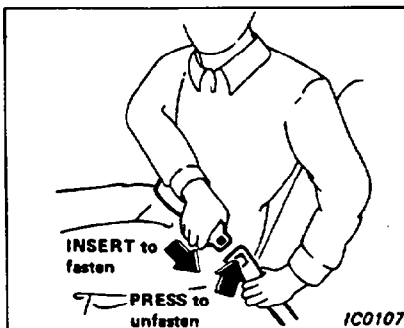


Convenience clip

The convenience clip is provided to keep the belt tongue in an accessible position when not being used.

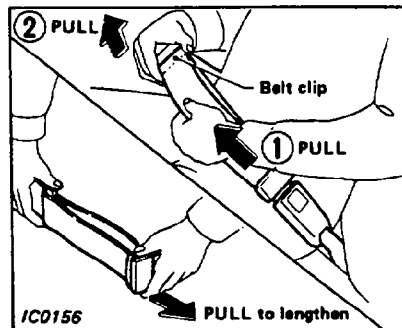
Slide it away from the buckle if the convenience clip contacts the belt tongue when the belt is worn.

2-POINT TYPE WITHOUT RETRACTOR

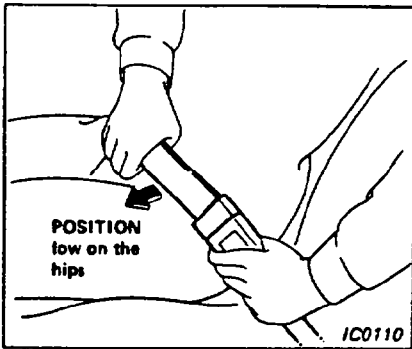


Fastening the belts

1. Insert the tongue into the buckle until it snaps.



2. To lengthen, hold the tongue at a right angle to the belt and pull on the belt. To shorten, pull the free end of the belt away from the tongue, then pull the belt clip to take up the slack.



3. Position the lap belt low on the hips as illustrated.

Unfastening the belts

To unfasten the belt, press the button on the buckle.

SEAT BELT EXTENDERS

If, because of body size or driving position, it is not possible to properly fit the lap-shoulder belt and fasten it, an extender is available which is compatible with the installed seat belts. The extender adds approximately 8 inches (200 mm) of length and may be used for either the driver or passenger seating position. See your NISSAN dealer for assistance if the extender is required.

- Only NISSAN belt extenders, made by the same company which made the original equipment belts, should be used with NISSAN belts.
- Persons who can use the standard seat belt should not use an extender. Such unnecessary use could result in serious personal injury in the event of an accident.

PRECAUTIONS ON SEAT BELT USAGE

NISSAN strongly encourages you and all of your passengers to buckle up every time you drive.

Your chances of being injured in an accident and/or the severity of injury may be greatly reduced if you are wearing your seat belt and it is properly adjusted.

Some states, provinces or territories may require by law that seat belts be worn at all times when a vehicle is being driven.

- The belt should be adjusted to a snug fit. Slack in the lap-shoulder belt will reduce the effectiveness of the entire restraint system.
- Never wear the belt inside out or twisted.
- Do not allow more than one person to use the same belt.

Infant or small child

NISSAN recommends that infants or small children be seated in a child restraint system. You should choose a child restraint system which fits your vehicle and always follow the manufacturer's instructions for installation and use.

Children

Children who are too large for child restraint systems should be seated and restrained by the seat belts which are provided.

Never let a child stand or kneel on any seat or allow a child in the cargo areas while the vehicle is moving.

Pregnant women

NISSAN recommends that pregnant women use seat belts. Contact your doctor for specific recommendations. The lap belt should be worn snug and positioned as low as possible around the hips, not the waist.

Injured persons

NISSAN recommends that injured persons use seat belts, depending on the injury. Check with your doctor for specific recommendations.

SEAT BELT MAINTENANCE

- To clean the belt webbings, apply a mild soap solution or any solution recommended for cleaning upholstery or carpets. Then brush it, wipe with a cloth and allow it to dry in the shade. Do not allow the belts to retract until they are completely dry.
- Periodically check to see that the belt and the metal components such as buckles, tongues, retractors, flexible wires and anchors work properly. If loose parts, deterioration, cuts or other damage on the webbing is found, or if the belt has been stressed because it was worn during an accident, the entire belt assembly should be replaced.

CHILD RESTRAINT SYSTEMS FOR INFANTS AND SMALL CHILDREN

It is very important that infants and small children riding in a vehicle be placed in a restraint system.

Children and infants should never be carried on your lap; it is not possible for even the strongest adult to resist the forces of an accident. The child could be crushed between the adult and parts of the vehicle. Also, do not put the same seat belt around both your child and yourself. Do not install the child restraint system on the jump seats, because they are not suitable for a child restraint system.

Child restraint systems specially designed for infants and small children are offered by several manufacturers. Some systems may be used for both infants and small children. When selecting any child restraint system, keep the following points in mind:

- 1) Choose only a system with a label certifying that it complies with Federal Motor Vehicle Safety Standard 213 or Canadian Motor Vehicle Safety Standard 213.
- 2) Place your child in the child restraint and check the various adjustments to be sure the child restraint is compatible with your child. Always follow all of the recommended procedures.

