

DOT 1011

REPORT NO. CAL-87-N05

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST
CHRYSLER CANADA LTD
1987 PLYMOUTH VOYAGER
VAN

NHTSA NO. MH0300
CALSPAN TEST NO. 7556-5

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
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FINAL REPORT

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OFFICE OF MARKET INCENTIVES
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16. Abstract A Frontal Load Cell Barrier Test of a 1987 Plymouth Voyager Van was performed at the Calspan Corporation, Advanced Technology Center Crash Test Facility in Buffalo, New York on March 19, 1987. Impact speed was 35.0 mph and the ambient temperature at the Barrier face at the time of impact was 46°F. The maximum post-test vehicle crush was 22.5 inches.					
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Section 1
PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY 87 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.

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 MH0300

A load cell barrier consisting of 36 load cells was impacted by a 1987 Plymouth Voyager Van at a velocity of 35.0 mph. The test was performed at the Calspan Corporation Advanced Technology Center on March 19, 1987. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

Two Part 572, 50th percentile male anthropomorphic test devices (ATDs) were placed in the driver and right-front passenger seating positions, according to dummy placement instructions specified in 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 used in previous tests, the driver (Serial No. 749) in test (MH0201) and the right front passenger (Serial No. 1022) in test (CH0501). The Injury Criteria Values were not exceeded in these tests. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 67 channels of data were recorded in 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 steeling wheel hub; the HIC was 903. The maximum chest deceleration over 3 milliseconds was 43 g's and femur loads were 1,595 and 776 pounds.

The right-front passenger HIC was 501 and maximum chest deceleration over 3 milliseconds was 47 g's. Femur loads were 275 and 453 pounds.

Table 1

GENERAL TEST AND VEHICLE DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1987 Plymouth Voyager VanNHTSA NO.: MH0300 VIN.: 2P4FH21C4HR167286BODY COLOR: Brown DATE OF MANUFACTURE: 10-86

Engine: 4 cylinders; 135 C.I.D.; 2.2 Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

Transmission: 5 Speed X Manual; - Automatic; - Overdrive
 Final Drive: X Front Wheel; - Rear Wheel; - Four Wheel

Date Received: 2-18 Odometer Reading: 107.8
- A/C; X P/S; X P/B; - P/wdo.; - Tilt Wheel
- P/seats; - Cruise Control

Type of Occupant Restraint: 3 Point Continuous Belt SystemDATA RECORDED FROM VEHICLE'S TIRE PLACARD:Tire Pressure (at capacity): Front 35 psi, Rear 35 psiRecommended Tire Size: P195/75R14Recommended Cold Tire Pressure: Front 35 psi, Rear 35 psiTires on Vehicle: P195/75R14; Manufacturer: GoodyearNumber of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 TOTALType of Front Seats: X Bucket; - Bench; - Split BenchType of Front Seat Back: X Fixed; - Adj. With - Lever - Rot. KnotVehicle Capacity Weight (VCW) = - lbs. (A)No. of Occupants x 150 lbs. = - lbs. (B)

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

GVWR 4550 lbs. GAWR: Front 2426 lbs. Rear 2280 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 = <u>910</u> lbs.	Right Rear = <u>620</u> lbs.
Left Front = <u>900</u> lbs.	Left Rear = <u>610</u> lbs.
TOTAL FRONT WEIGHT = <u>1810</u> lbs. (<u>59.5</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT = <u>1230</u> lbs. (<u>40.5</u> % of Total Vehicle Weight)	
TOTAL DELIVERY WEIGHT = <u>3040</u> lbs.	

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (3040 lbs.)
VCW = Vehicle Capacity Weight (- lbs.)
DSC = Designated Seating Capacity (5)
RCLW = VCW - 150 (DSC) = 300 lbs.
Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)
Target Test Weight = 3668 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 192 POUNDS CARGO:

Right Front = <u>1020</u> lbs.	Right Rear = <u>810</u> lbs.
Left Front = <u>1040</u> lbs.	Left Rear = <u>790</u> lbs.
TOTAL FRONT WEIGHT = <u>2060</u> lbs. (<u>56.3</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT = <u>1600</u> lbs. (<u>43.7</u> % of Total Vehicle Weight)	
TOTAL TEST WEIGHT = <u>3660</u> lbs.	
Weight of ballast secured in vehicle trunk area = <u>100</u> lbs.	

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude:	RF	<u>29.7</u>	LF	<u>29.7</u>	RR	<u>30.3</u>	LR	<u>30.3</u>
Test Attitude:	RF	<u>28.8</u>	LF	<u>29.0</u>	RR	<u>28.6</u>	LR	<u>28.6</u>
Wheel Base: <u>112.0</u> in.; C.G. = <u>49.0</u> in. rearward of front wheel C/L								
Remarks: <u>13.9 gallons of solvent in fuel tank</u>								
<u>Vehicle was delivered without owner's manual and warranty information</u>								

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

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0 °
 Date of Test: 3/19/87 Time of Test: 1125
 Ambient Temperature: 46 °F at impact area
 Temperature in Occupant Compartment: 72 °F.
 Windshield Molding Temperature: 71 °F.
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: primary = 35.0 mph, secondary = 35.1 mph
 Distance From Front Bumper to Barrier Face When Entering Speed Trap: 52.0
 inches; Exiting Speed Trap: 12.0 inches

VEHICLE REBOUND AND CRUSH (inches):

Vehicle Length:	Pre-test	= R	<u>174.3</u>	C _L	<u>176.0</u>	L	<u>174.0</u>
	Post-test	= R	<u>152.0</u>	C _L	<u>153.5</u>	L	<u>152.5</u>
	Crush	= R	<u>22.3</u>	C _L	<u>22.5</u>	L	<u>21.5</u>

Distance from front of test vehicle to point of impact:

R 15.7 C/L 14.2 L 13.9

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Steering Wheel Hub</u>	<u>None</u>
Chest	<u>None</u>	<u>None</u>
Abdomen	<u>None</u>	<u>None</u>
Left Knee	<u>Dash Panel</u>	<u>Glove Box Door</u>
Right Knee	<u>Dash Panel</u>	<u>Glove Box Door</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>Not</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>None</u>	<u>None</u>

Glazing Damage

Backlight/Windshield Windshield has stress cracks

Other Notable Impact Effects: Steering Column separated from dash
shear capsal.

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)	-135	-11	79	150	-43	11	-13	43
DUMMY (2)	-22	23	63	68	-61	28	49	47
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE - FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	1595	776
DUMMY (2)	275	453
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)	1880	-	1697
DUMMY (2)	2072	2065	-
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Max. t ₁ (SEC)	t ₂ (SEC)	AVE. ACC. (g) t ₁ TO t ₂
DUMMY (1)	903	.08542	.09495	97.9
DUMMY (2)	501	.08062	.11662	45.4
DUMMY (3)				
DUMMY (4)				

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

**AS DEFINED IN FMVSS NO. 208

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION

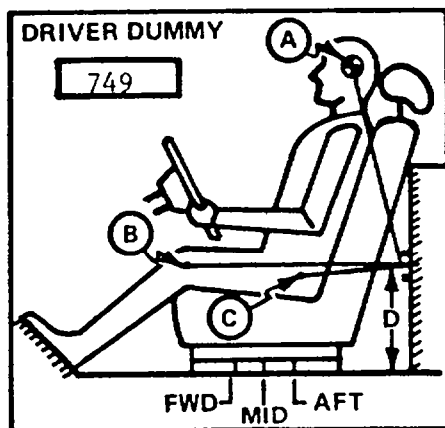
TEST NO.: MH0300

VEHICLE: 1987 Plymouth Voyager Van

SEAT TYPE:
 Bench
 X Bucket
 Split Bench

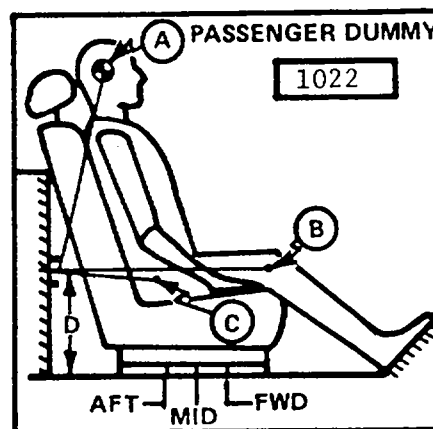
ADJUSTER TYPE:
 X Manual
 Power

BUCKET SEAT BACK TYPE:
 X Fixed
 Adjustable Reclining



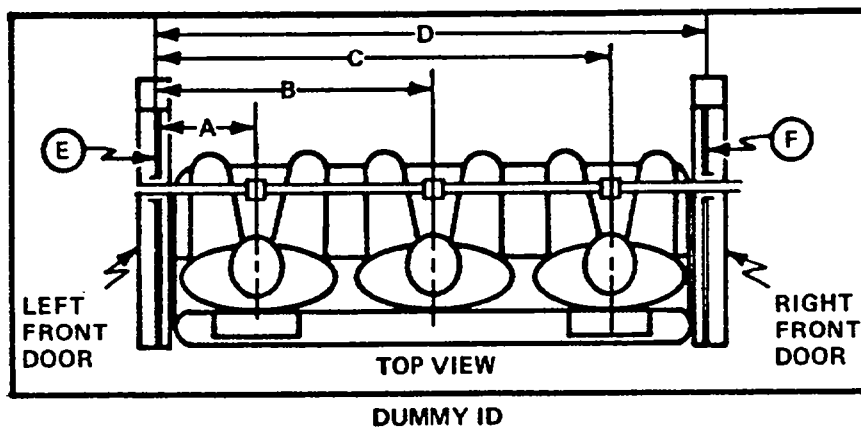
MEASUREMENT
LOCATION

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



A = 25.3 in. 5 Degrees
 B = 23.4 in. 89 Degrees
 C = 7.8 in. 110 Degrees
 D = 17.9 in.

A = 25.7 in. 0 Degrees
 B = 22.8 in. 88 Degrees
 C = 7.0 in. 107 Degrees
 D = 17.9 in.



749

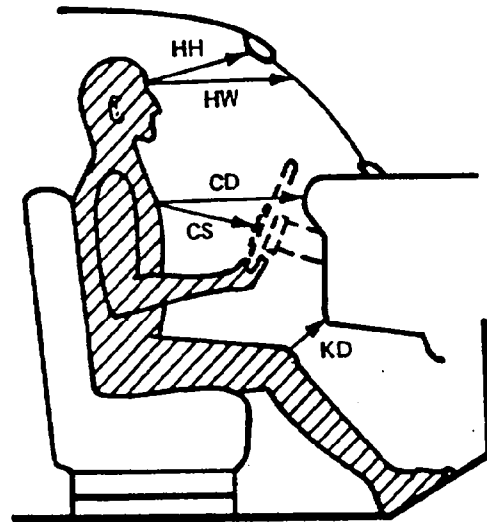
1022

A	=	Left Door to Driver Centerline	<u>11.0</u> in.
B	=	Left Door to Center Passenger Centerline	<u>-</u> in.
C	=	Left Door to Right Passenger Centerline	<u>44.2</u> in.
D	=	Left Door to Right Door	<u>56.2</u> in.
E, F	=	Window Glass Height (Right and Left Must Be Equal)	<u>15.0</u> in.

Figure 2

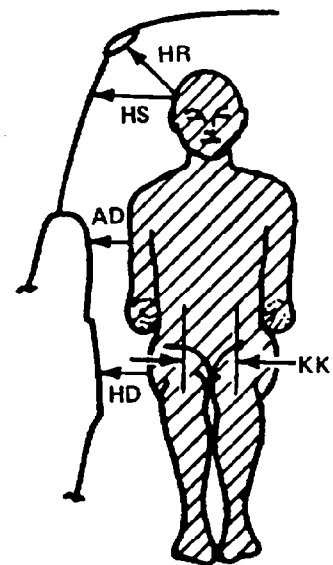
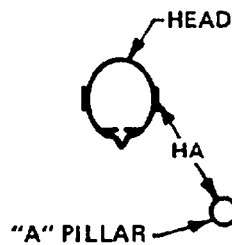
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	19.5	20.5
HW	24.3	25.8
CD	22.5	29.3
CS	14.8	-
KDL	4.9	10.3
KDR	5.3	10.2
SA	Fixed	Fixed
TA	25°	24°



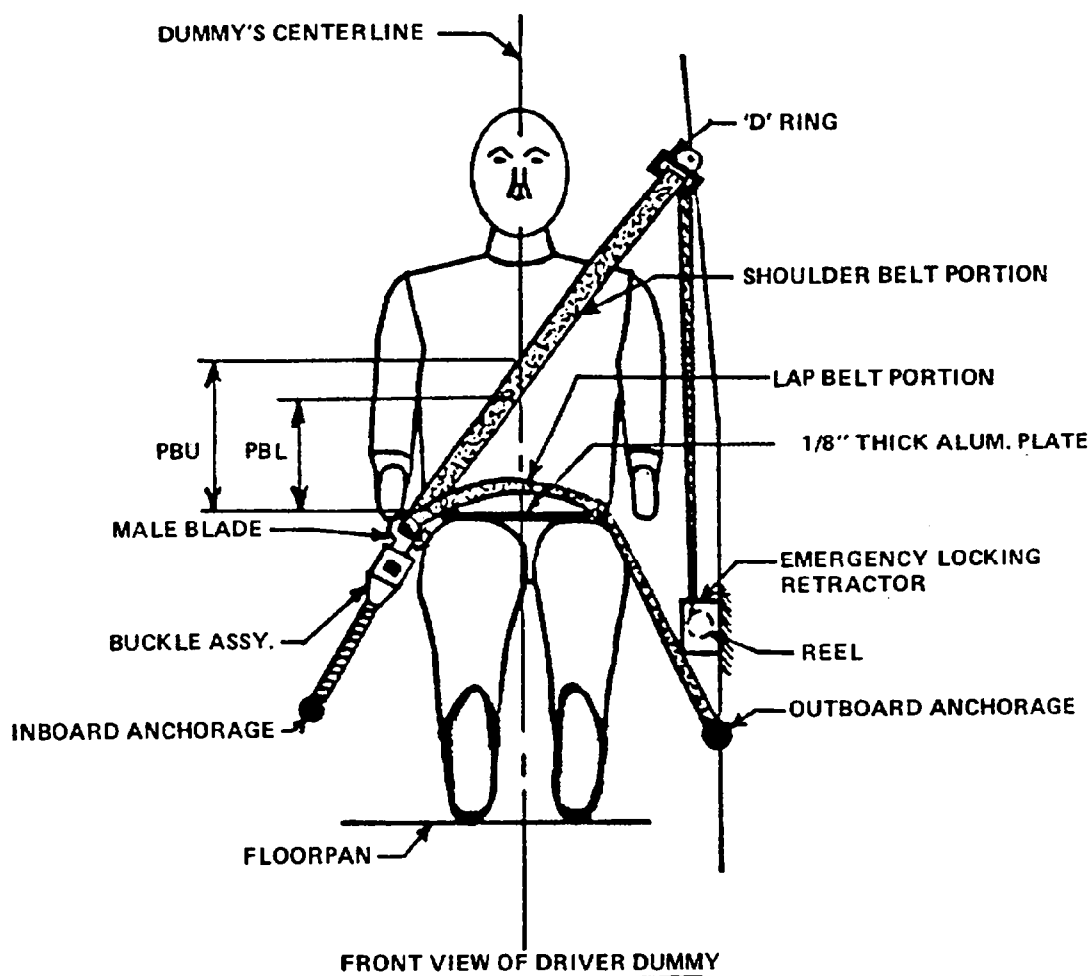
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD(L/R) = Knee to Dash (Left/Right)
 SA = Seat Back Angle
 TA = Torso Angle

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	5.8	7.3
HS	7.8	9.7
AD	4.1	4.0
HD	6.1	5.3
KK	10.0	7.2
HA	19.8	21.5

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	12.5
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	10.5	9.5
<u>LAP BELT TENSION</u>	-	-
<u>SHOULDER BELT TENSION</u>	3.0 lbs	3.0 lbs

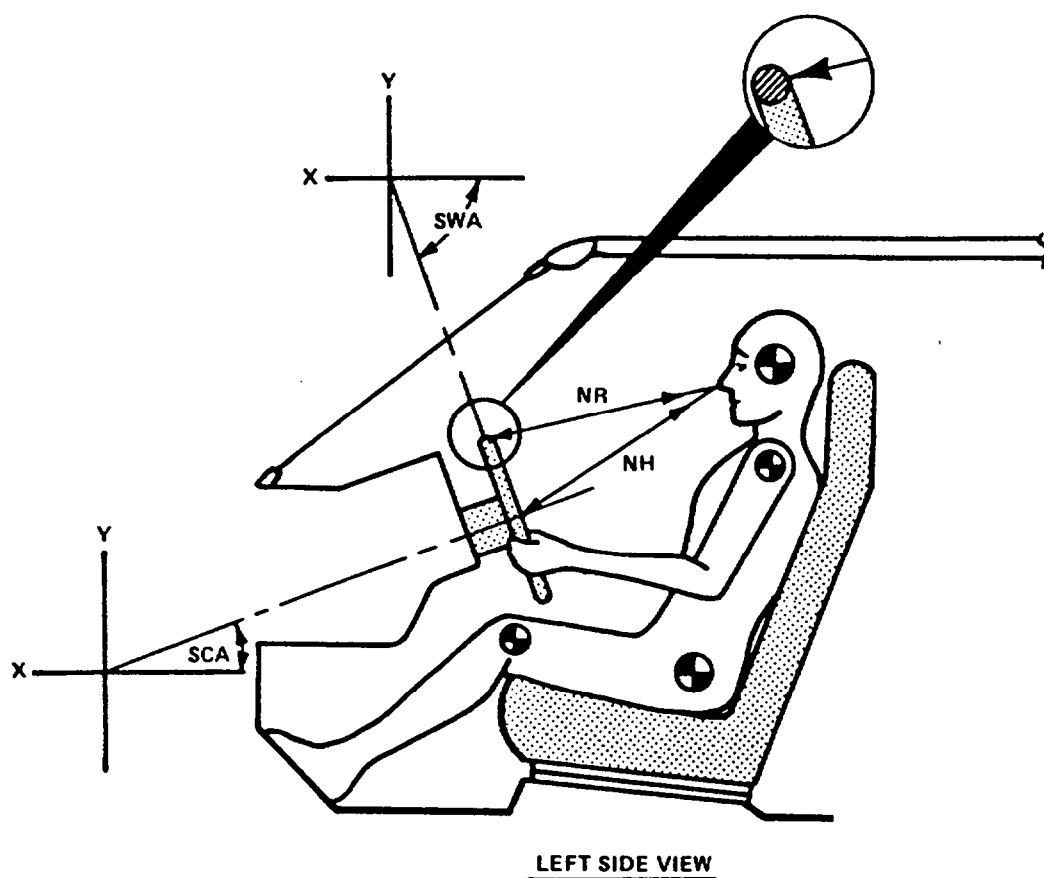
Table 3

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>83.7</u>	<u>83.2</u>
Should belt length as measured on Part 572 Dummy.	<u>34.8</u>	<u>34.3</u>
Lap belt length as measured on Part 572 Dummy.	<u>34.2</u>	<u>34.4</u>
<u>BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	<u>2.0</u>	<u>2.0</u>
As determined mechanically.	<u>2.2</u>	<u>2.0</u>
As determined electronically.	<u>2.7</u>	<u>2.4</u>
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	1.4 <u>in. per ft.</u>	1.2 <u>in. per ft.</u>
Measured Mechanically	<u>0</u>	<u>.5 in. per 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	20.0	Inches
<u>NH</u> -- Distance from tip of dummy's nose to center of steering column hub	20.8	Inches
<u>SCA</u> -- Angle of steering column relative to the horizontal X axis	35	Degrees
<u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis	-55	Degrees

NOTE: Camera Information Shown on Table 4

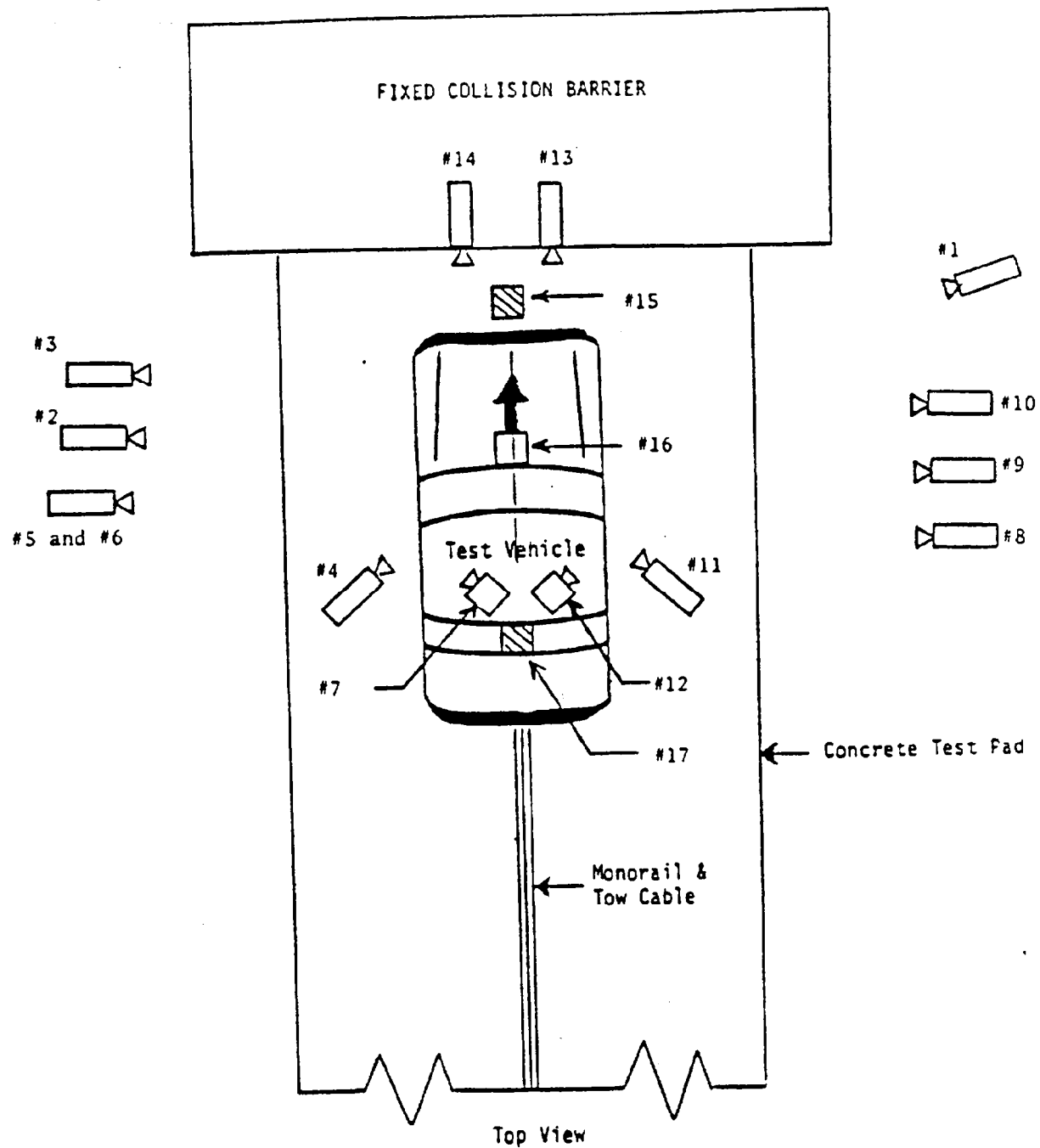


Figure 5 CAMERA POSITION FOR FRONTAL IMPACTS

Table 4
HIGH-SPEED CAMERA LOCATIONS

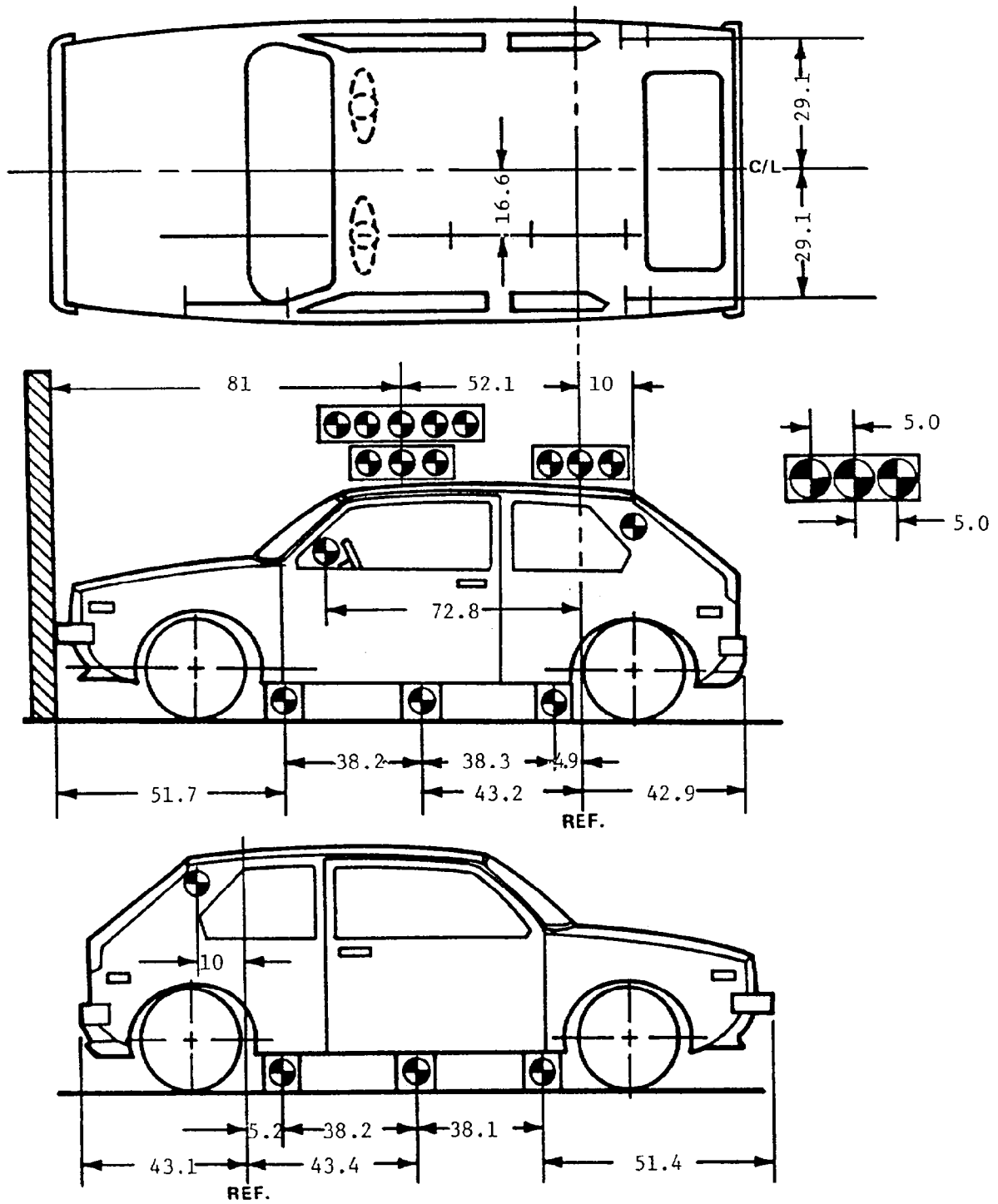
Test No. MH0300 Vehicle 1987 Plymouth Voyager

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	262	45	42	-2	-	13	540
3	Left Side View	251	40	43	-3	-	25	540
4	Driver and Interior View	105	114	70	-14	-	13	700
5	Steering Column (Bottom)	240	78	52	-3	218	25	550
6	Steering Column (Top)	240	78	77	-11	218	25	560
7	Left Belt	-	-	-	-	-	8	No Timing
8	Overall Right Side	246	47	43	-1	-	13	810
9	Right Side View	260	70	44	-4	-	25	825
10	Right Passenger View	276	86	42	-3	254	35	725
11	Passenger & Interior View	87	101	66	-15	-	25	600
12	Right Belt	-	-	-	-	-	8	No Timing
13	Passenger Front View	24	0	72	-40	-	13	550
14	Driver Front View	24	0	72	-40	-	13	590
15	Windshield View	0	0	126	-55	-	13	540
16	Pit View of Engine	0	32	-120	90	-	13	800
17								

* 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

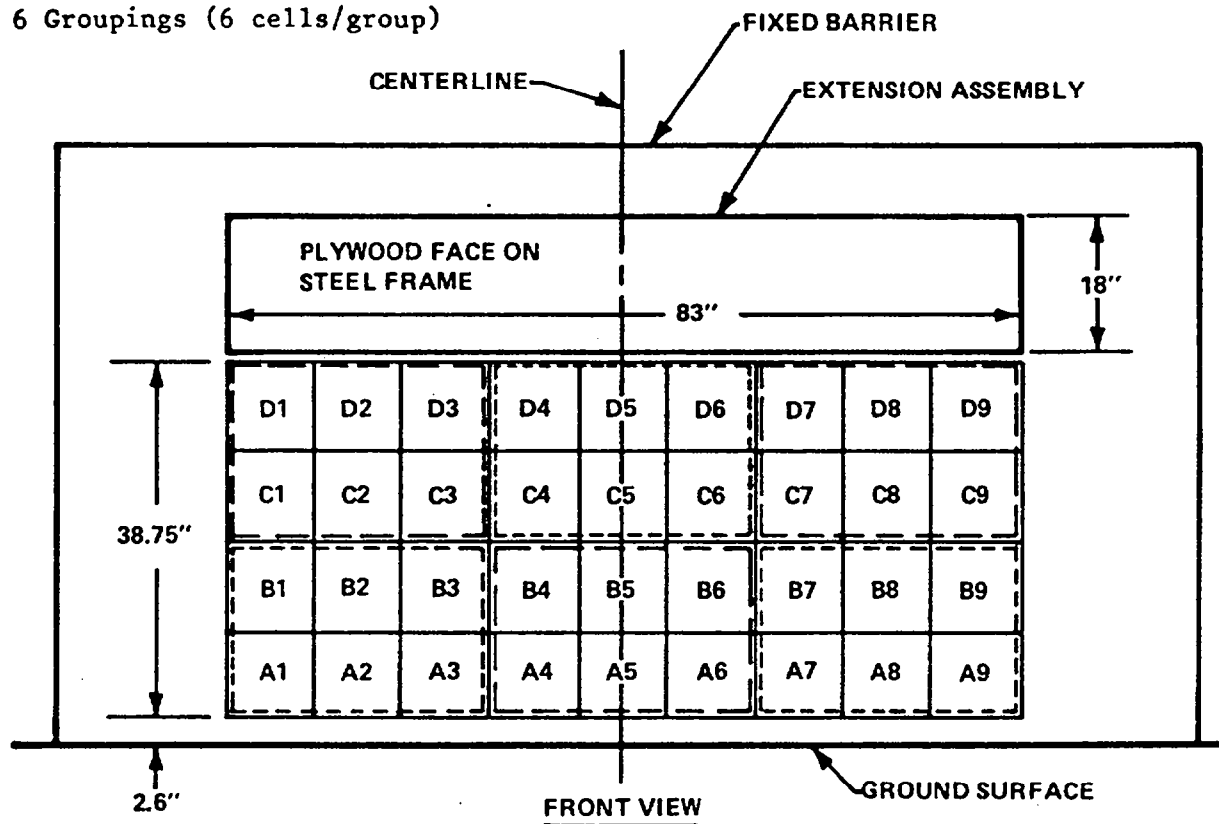
LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells

4 Rows

9 Columns

6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

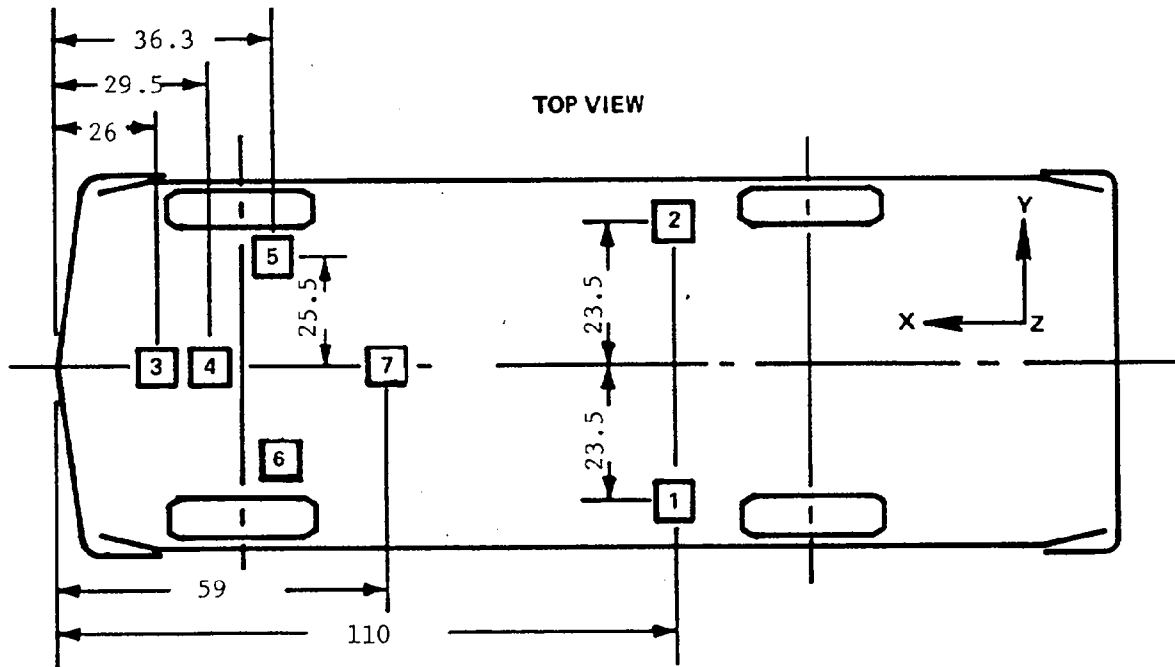
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

The following data is presented in Appendix B:

- (1) Data from 36 individual load cells
- (2) Total or Sum of 36 individual load cells
- (3) Data from 6 Groupings shown above (6 cells/group)

Figure 8

VEHICLE ACCELEROMETER LOCATIONS



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

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

Figure 9

TEST VEHICLE MEASUREMENTS

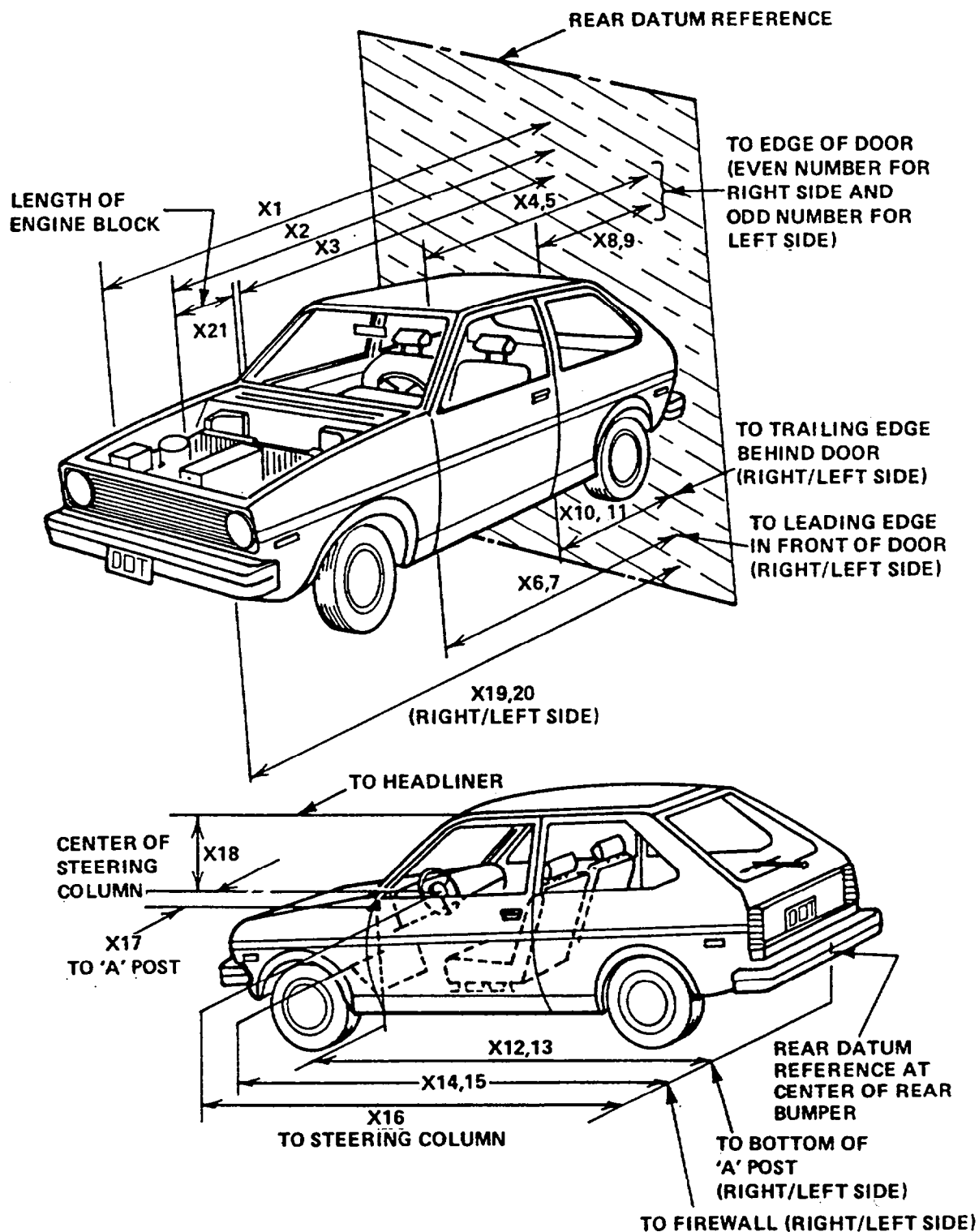


Table 5

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	176.0	153.5	22.5
X2	Rear Surface of Vehicle to Front of Engine	150.6	144.9	5.7
X3	Rear Surface of Vehicle to Firewall	135.3	132.5	2.8
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	126.0	125.5	.5
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	125.9	125.0	.9
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	124.2	123.9	.3
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	124.0	123.5	.5
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	84.5	84.0	.5
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	84.9	84.0	.9
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	84.5	84.1	.4
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	84.5	84.2	.3
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	125.0	123.9	1.1
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	124.9	123.7	1.2
X14	Rear Surface of Vehicle to Firewall, Right Side 108.5 + 24.0	132.5	126.0	6.5
X15	Rear Surface of Vehicle to Firewall, Left Side 111 + 23.5	134.5	127.5	7.0
X16	Rear Surface of Vehicle to Steering Column	108.7	108.9	-.2
X17	Center of Steering Column to "A" Post	16.2	15.0	1.2
X18	Center of Steering Column to Headliner	18.5	16.5	2.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	174.3	152.0	22.3
X20	Rear Surface of Vehicle to Left Side of Front Bumper	174.0	152.5	21.5
X21	Length of Engine Block	17.5	17.5	0

Appendix A

PHOTOGRAPHS

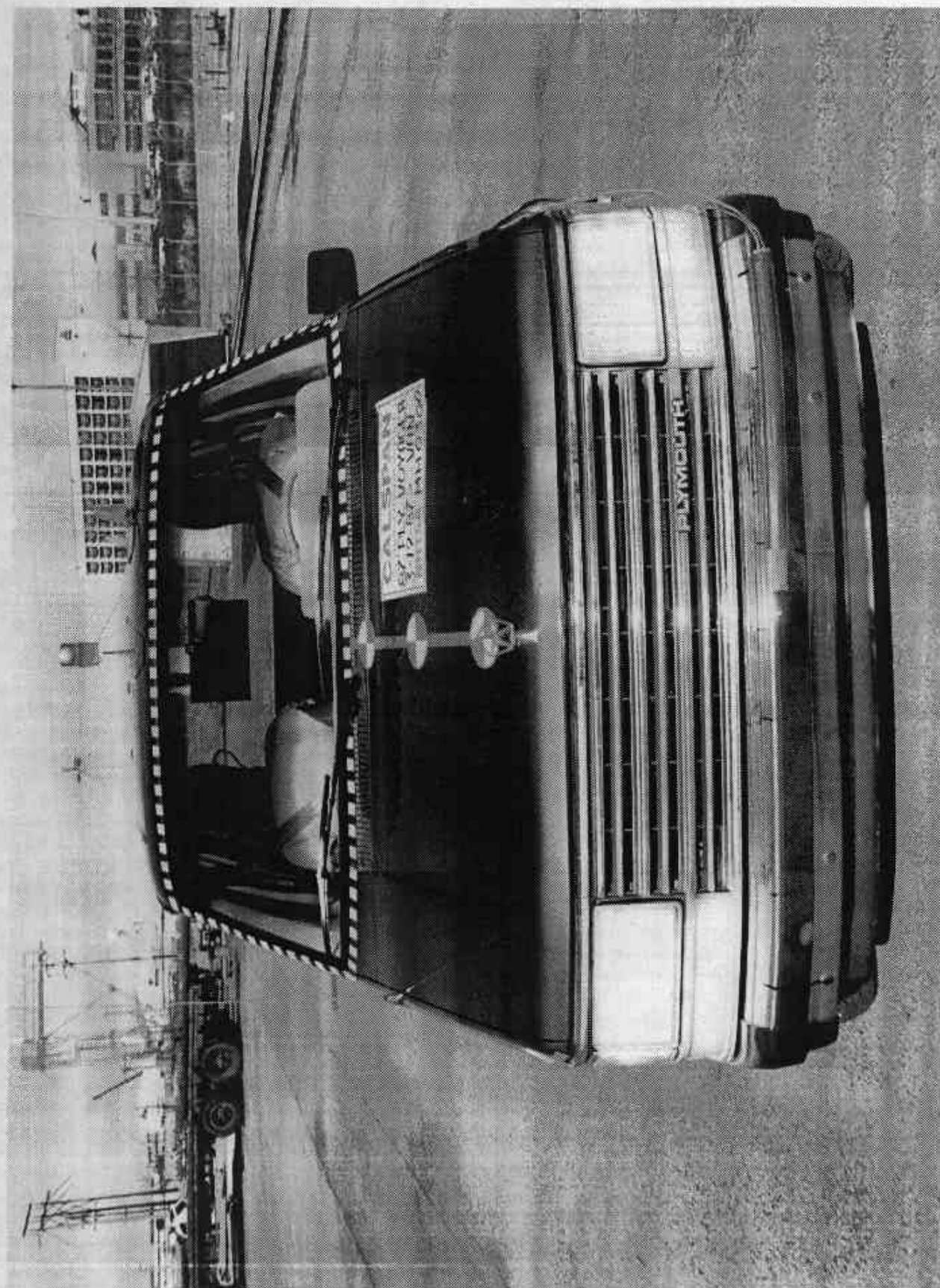


Figure A-1 PRE-TEST FRONT VIEW

A-2

7556-5

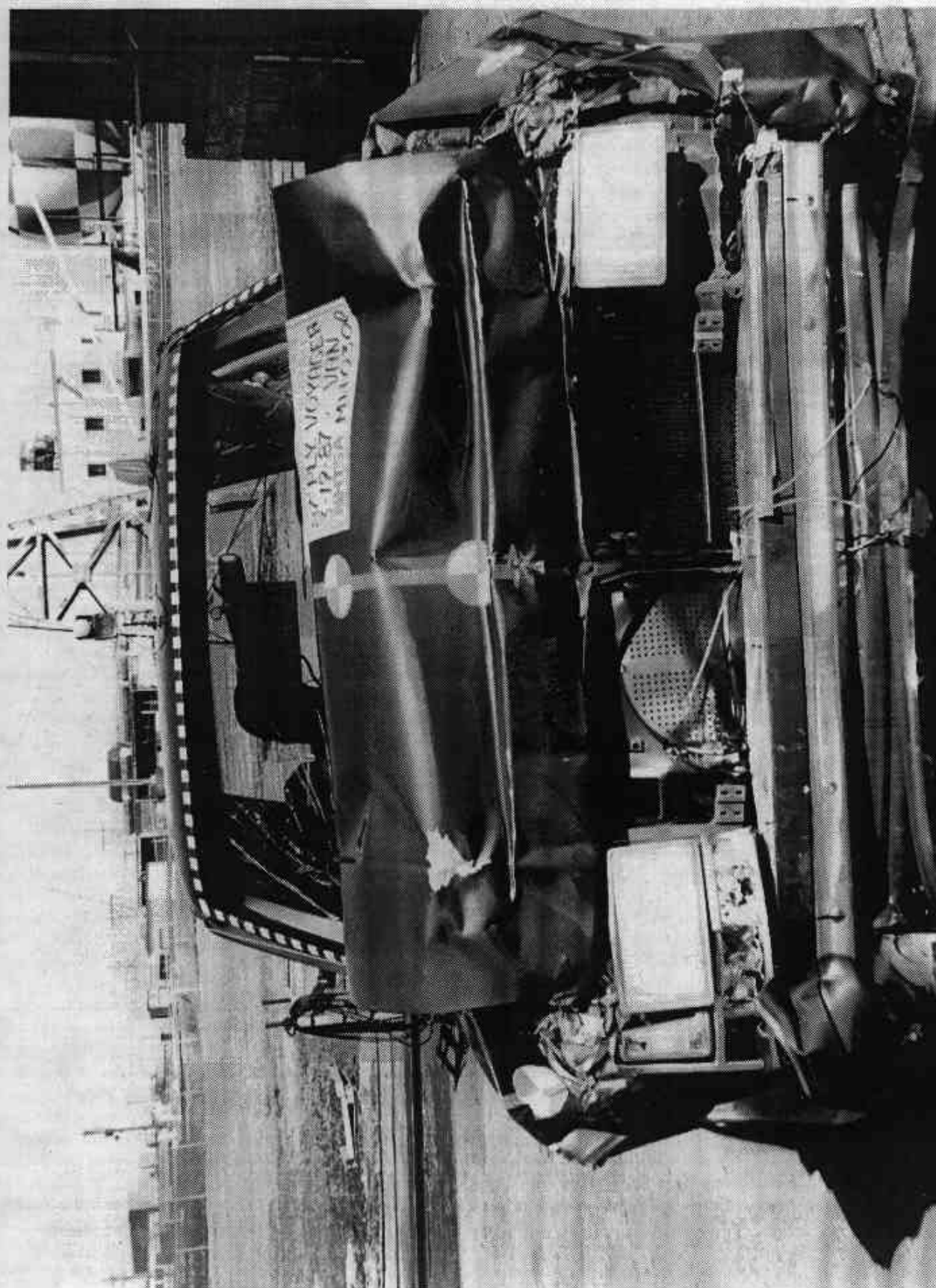


Figure A-2 POST-TEST FRONT VIEW

A-3

7556-5

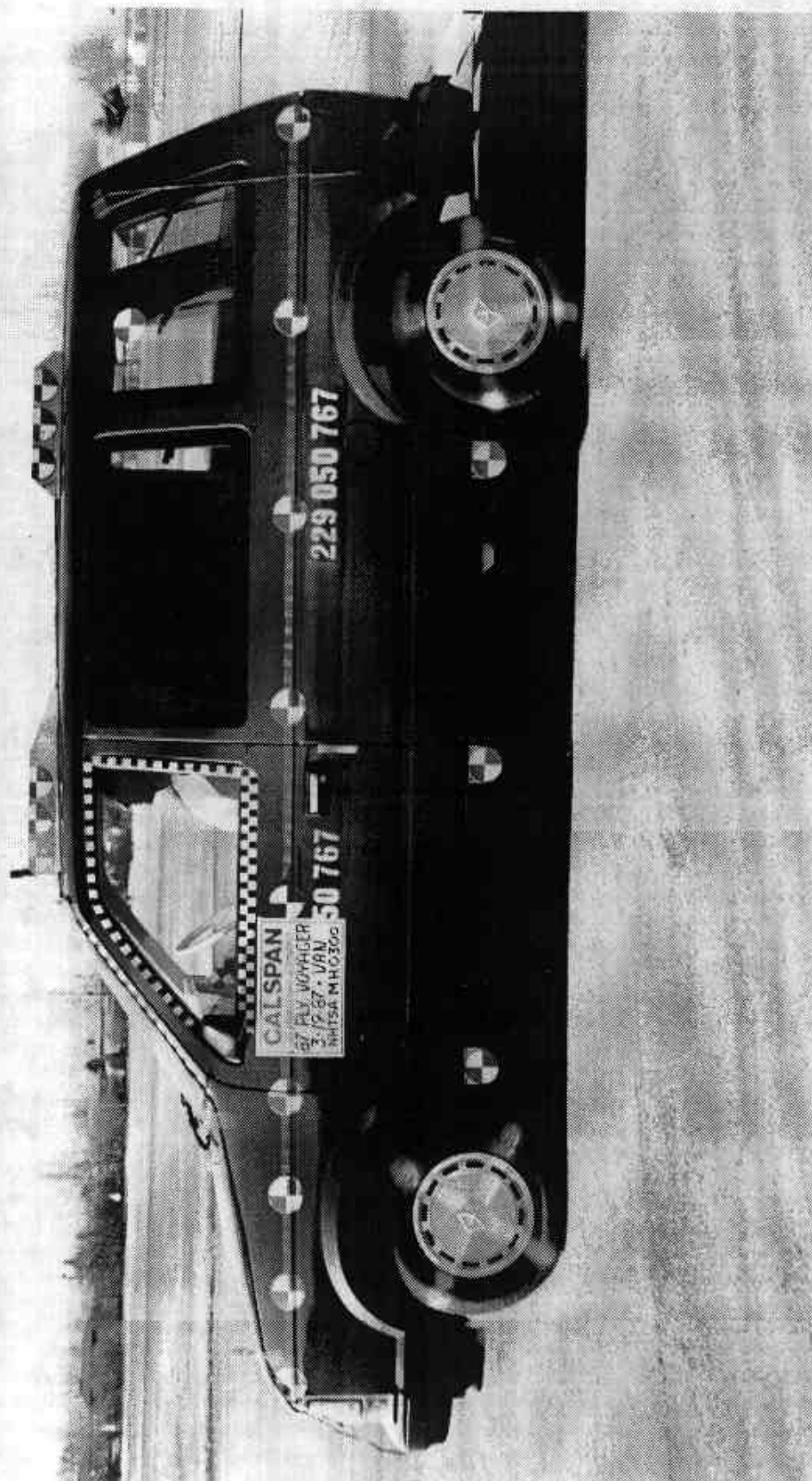


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-4

7554-5

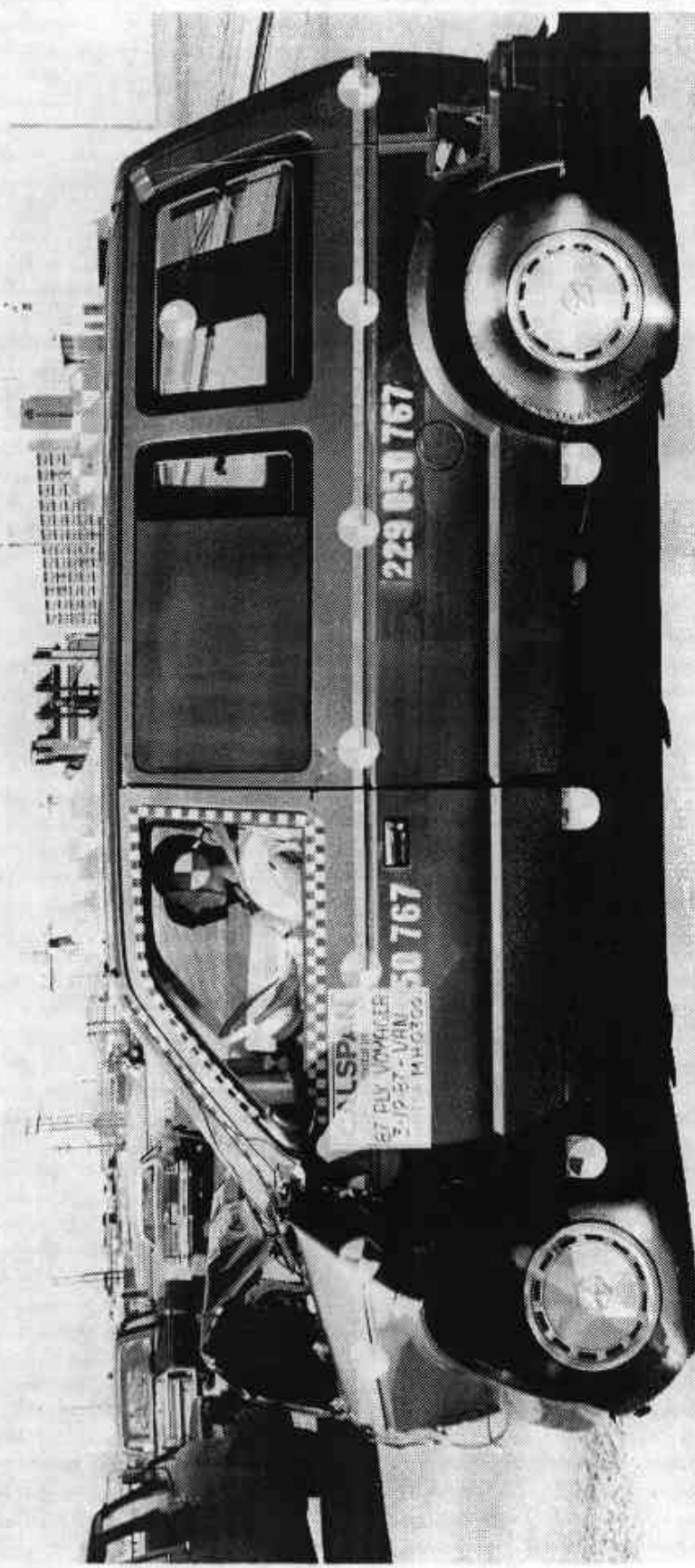


Figure A-4 POST-TEST LEFT SIDE VIEW

A-5

7556-5

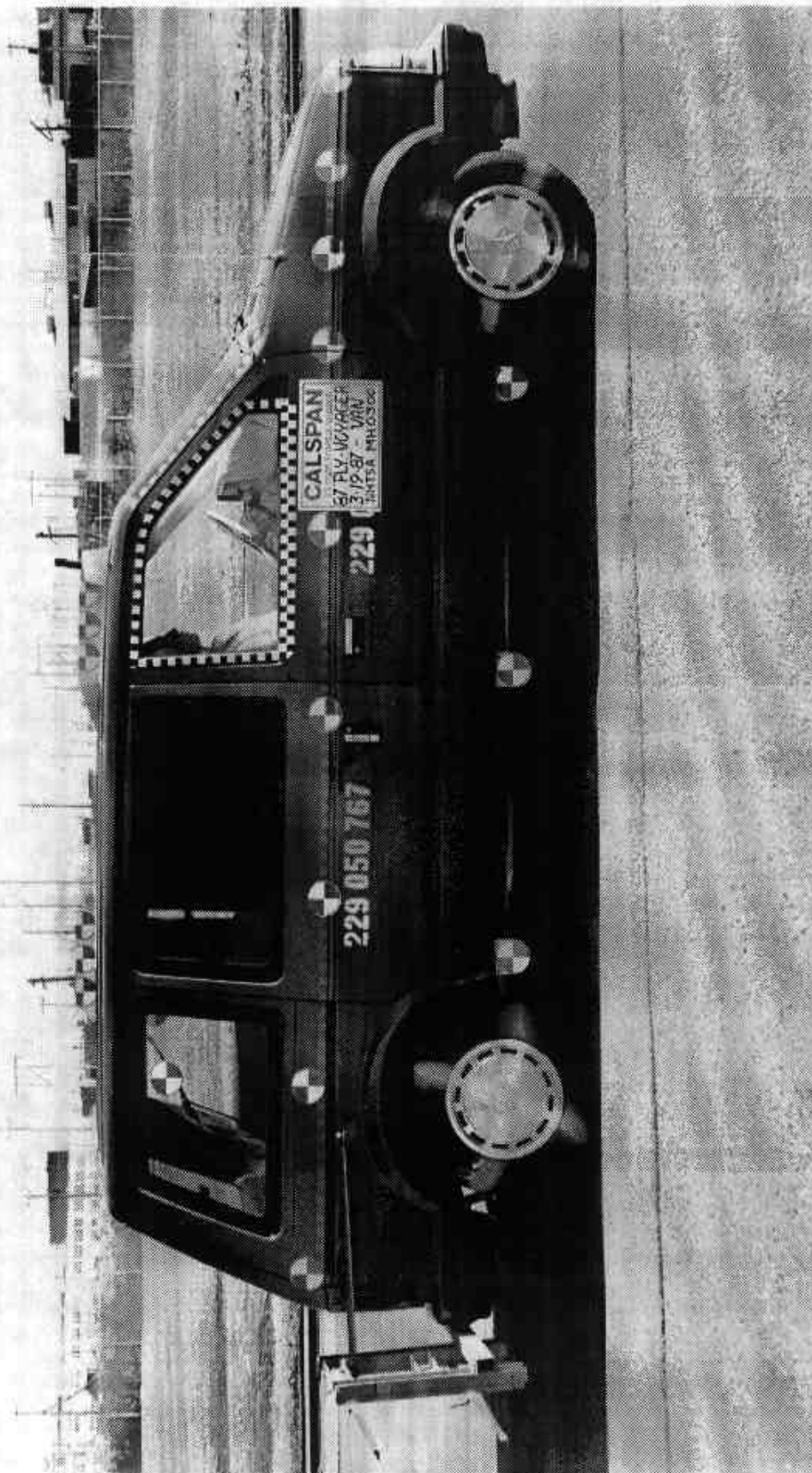


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-6

7556-5

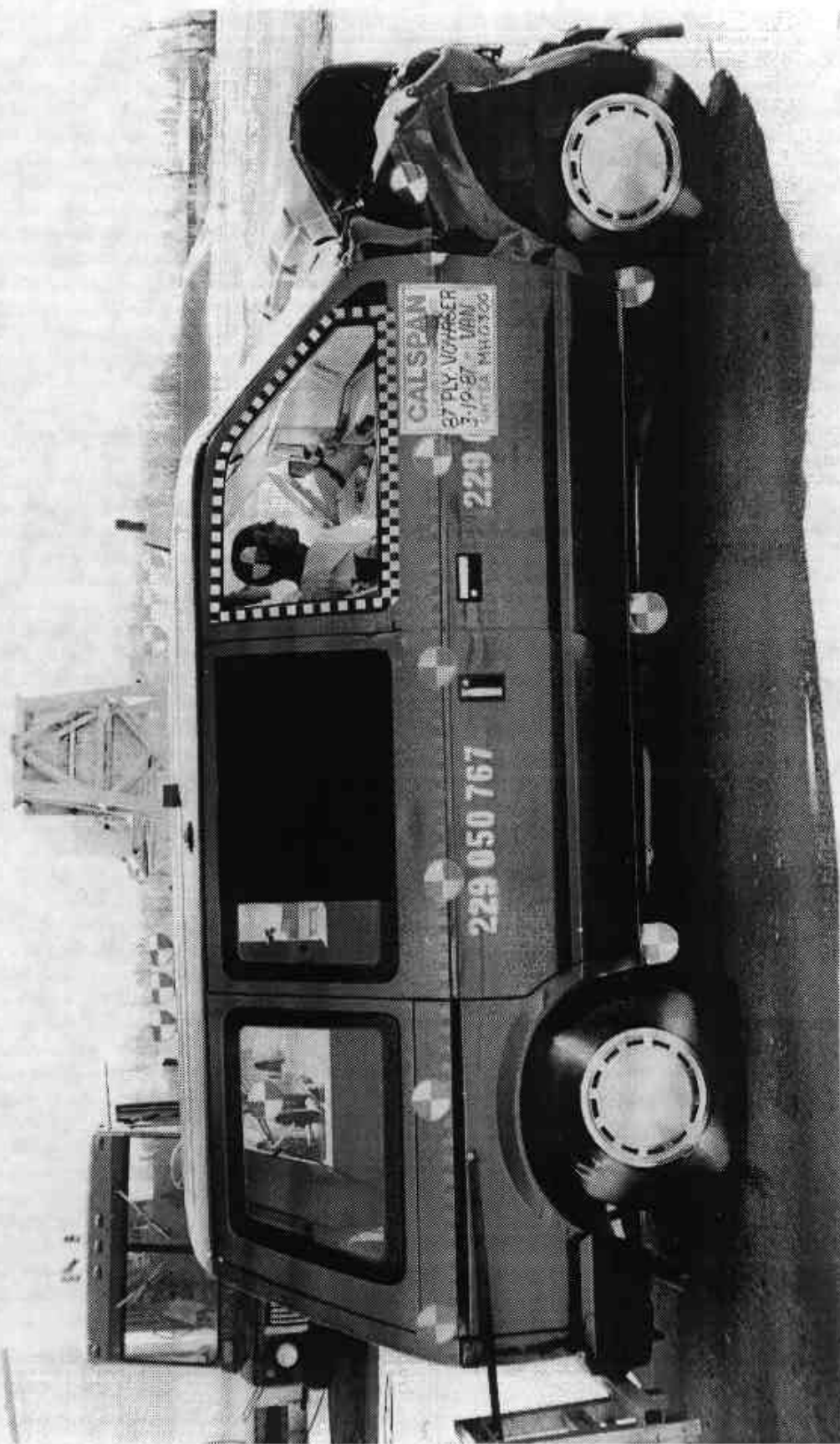


Figure A-6 POST-TEST RIGHT SIDE VIEW

A-7

7556-5

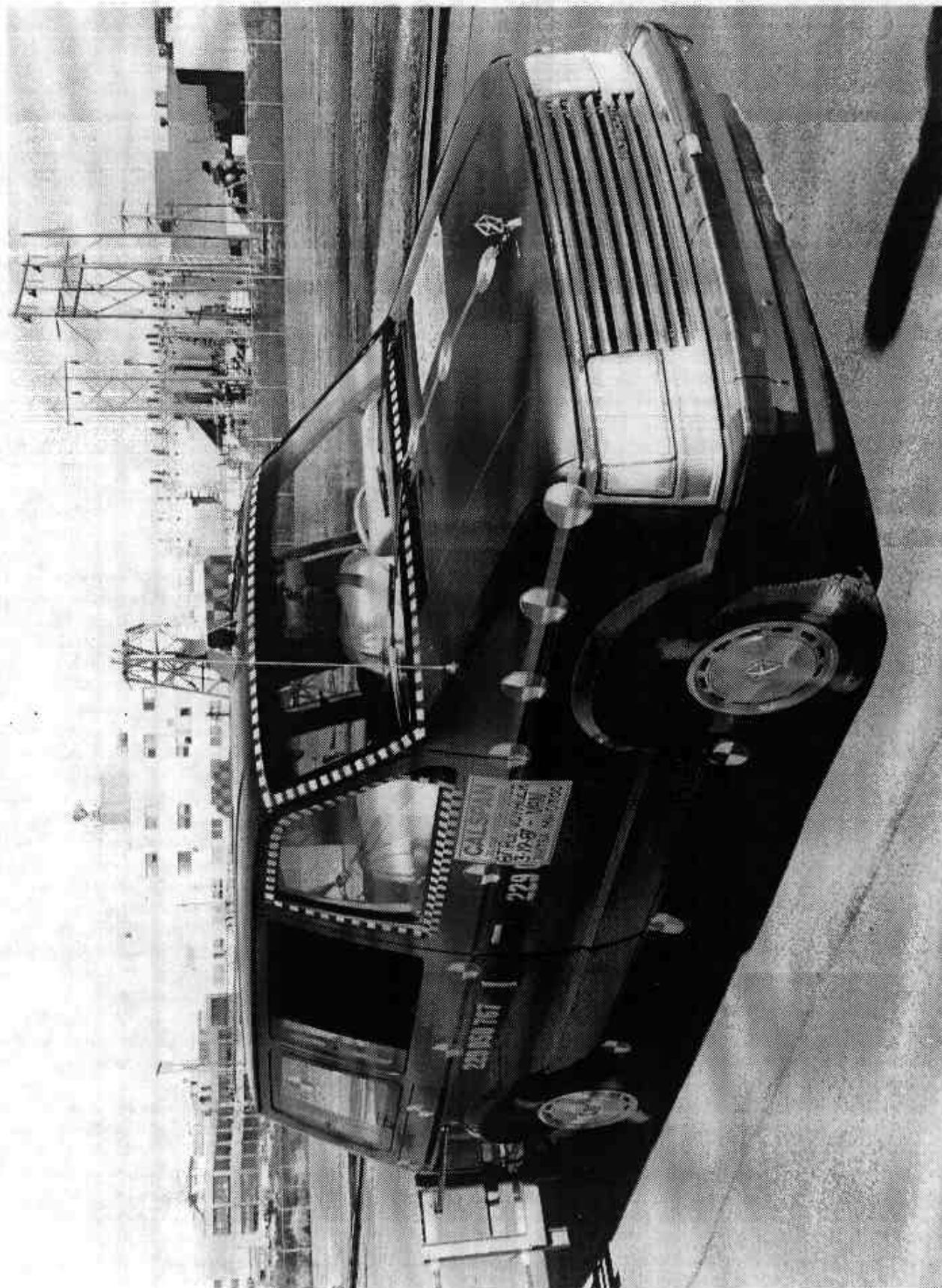


Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



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

A-9

7556-5



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

A-10

7556-5



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

A-11

7556-5

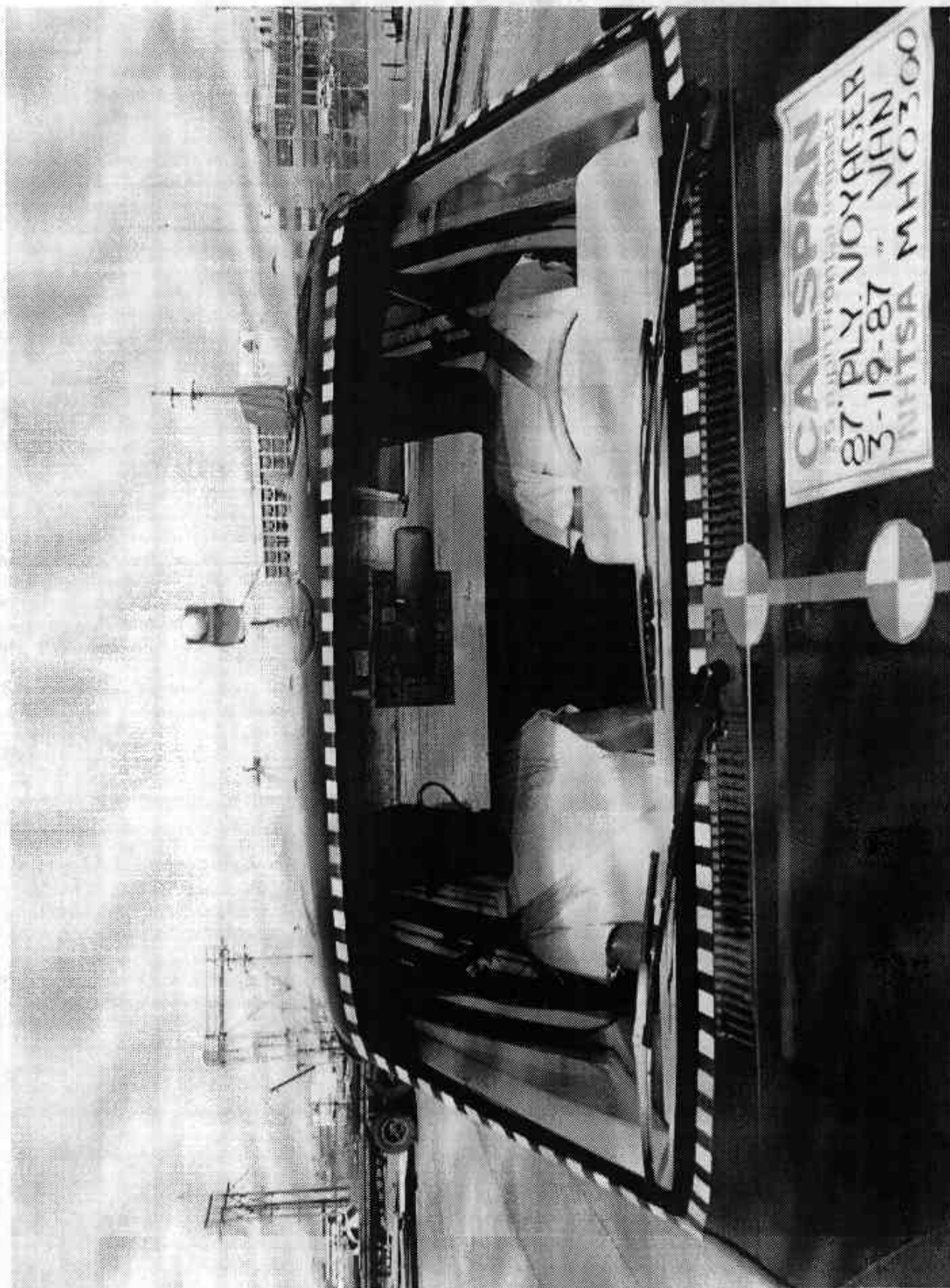


Figure A-11 PRE-TEST WINDSHIELD VIEW

A-12

7556-5



Figure A-12 POST-TEST WINDSHIELD VIEW

A-13

7556-5

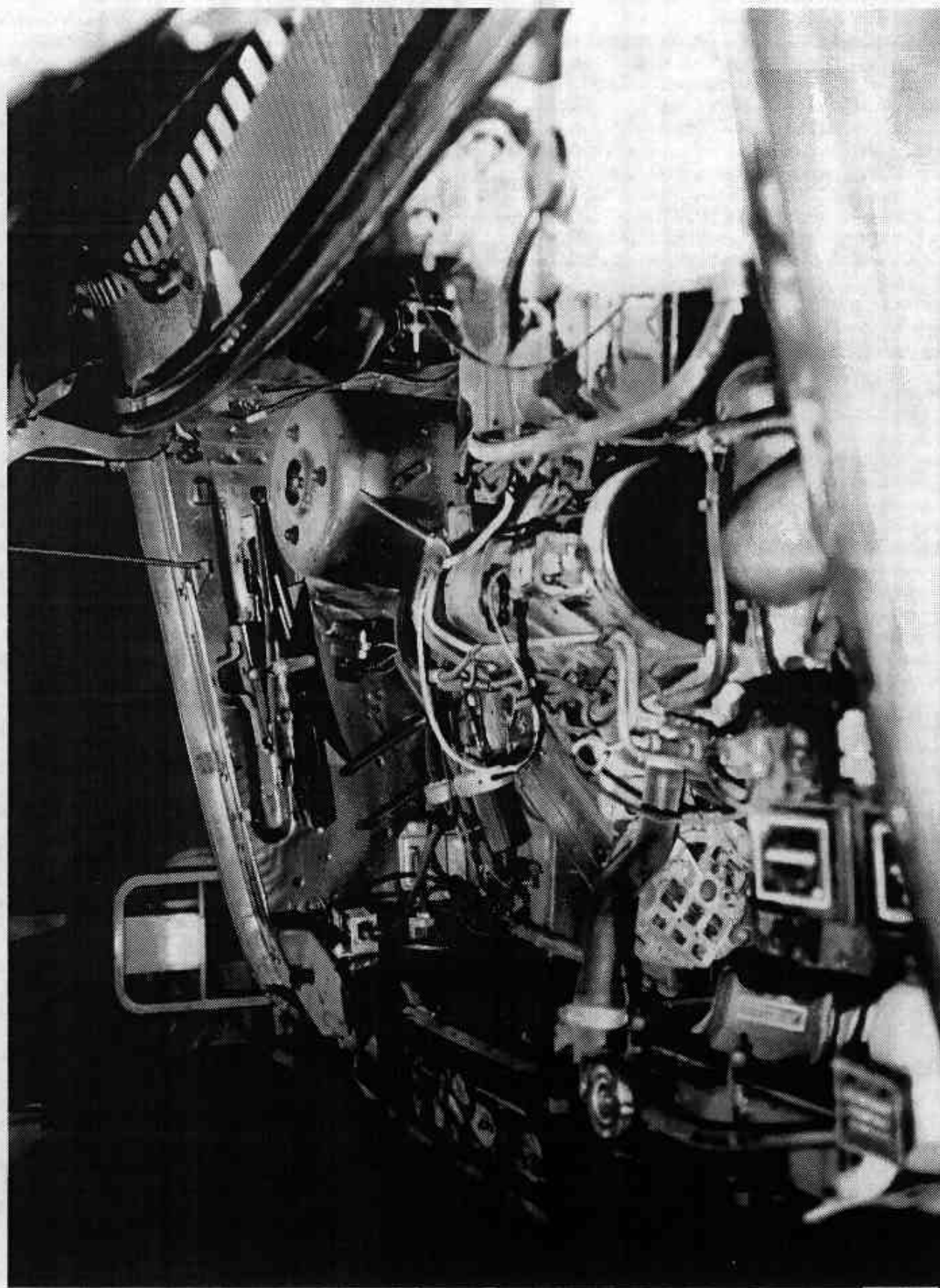


Figure A-13 PRE-TEST ENGINE COMPARTMENT VIEW

A-14

7556-5

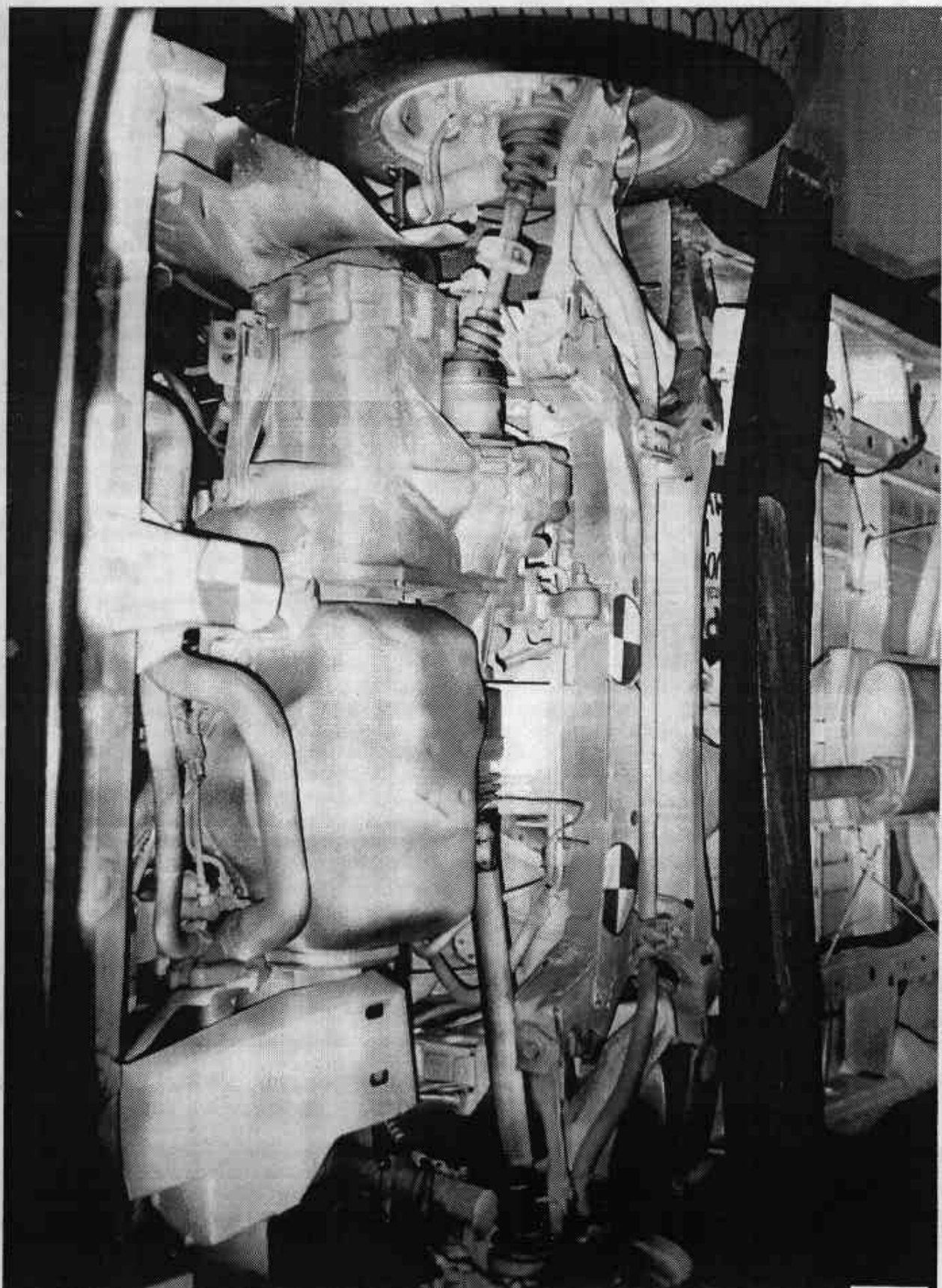


Figure A-14 PRE-TEST FRONT UNDERBODY VIEW

A-15

7556-5

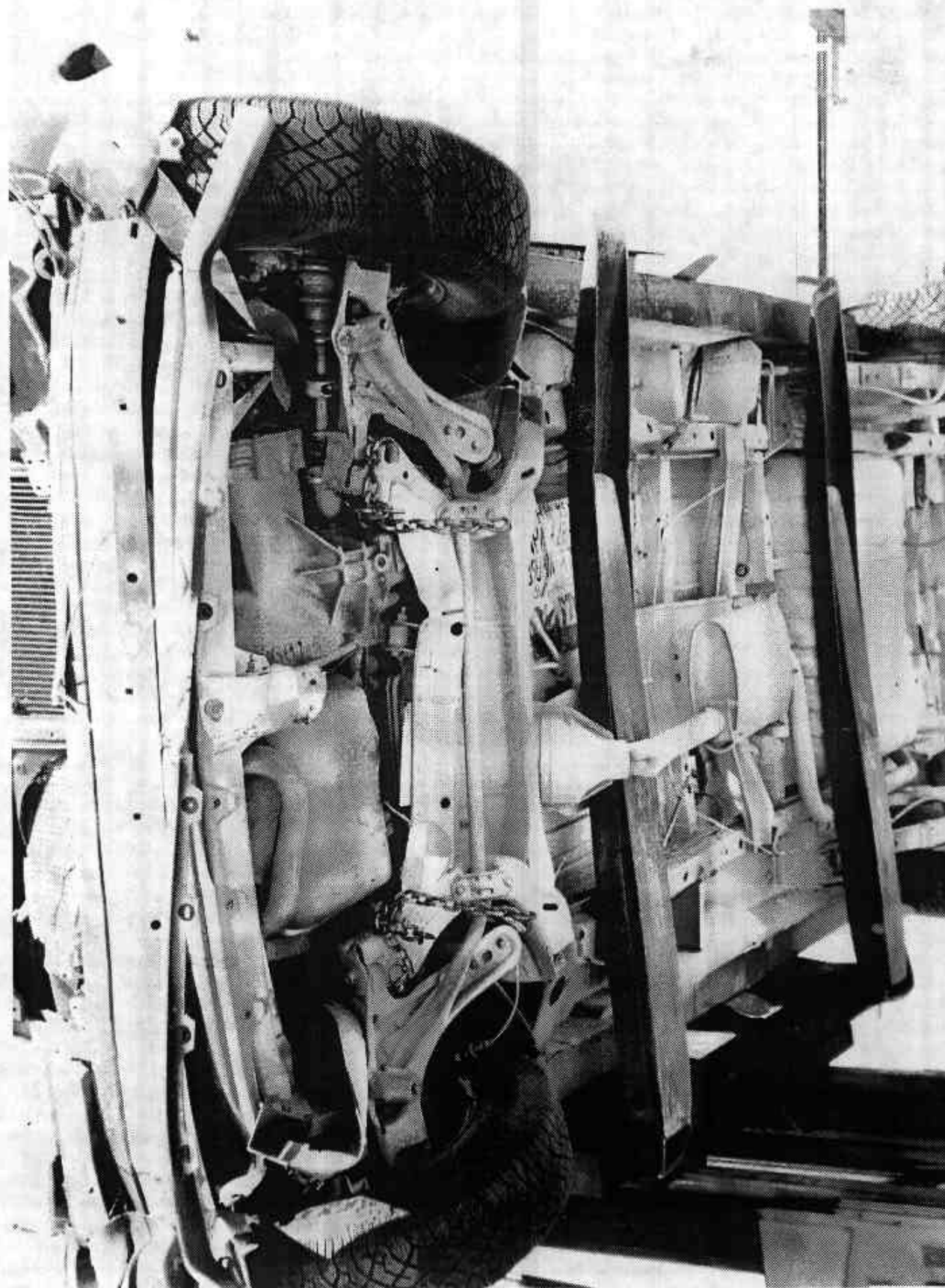


Figure A-15 POST-TEST FRONT UNDERBODY VIEW

A-16

7556-5

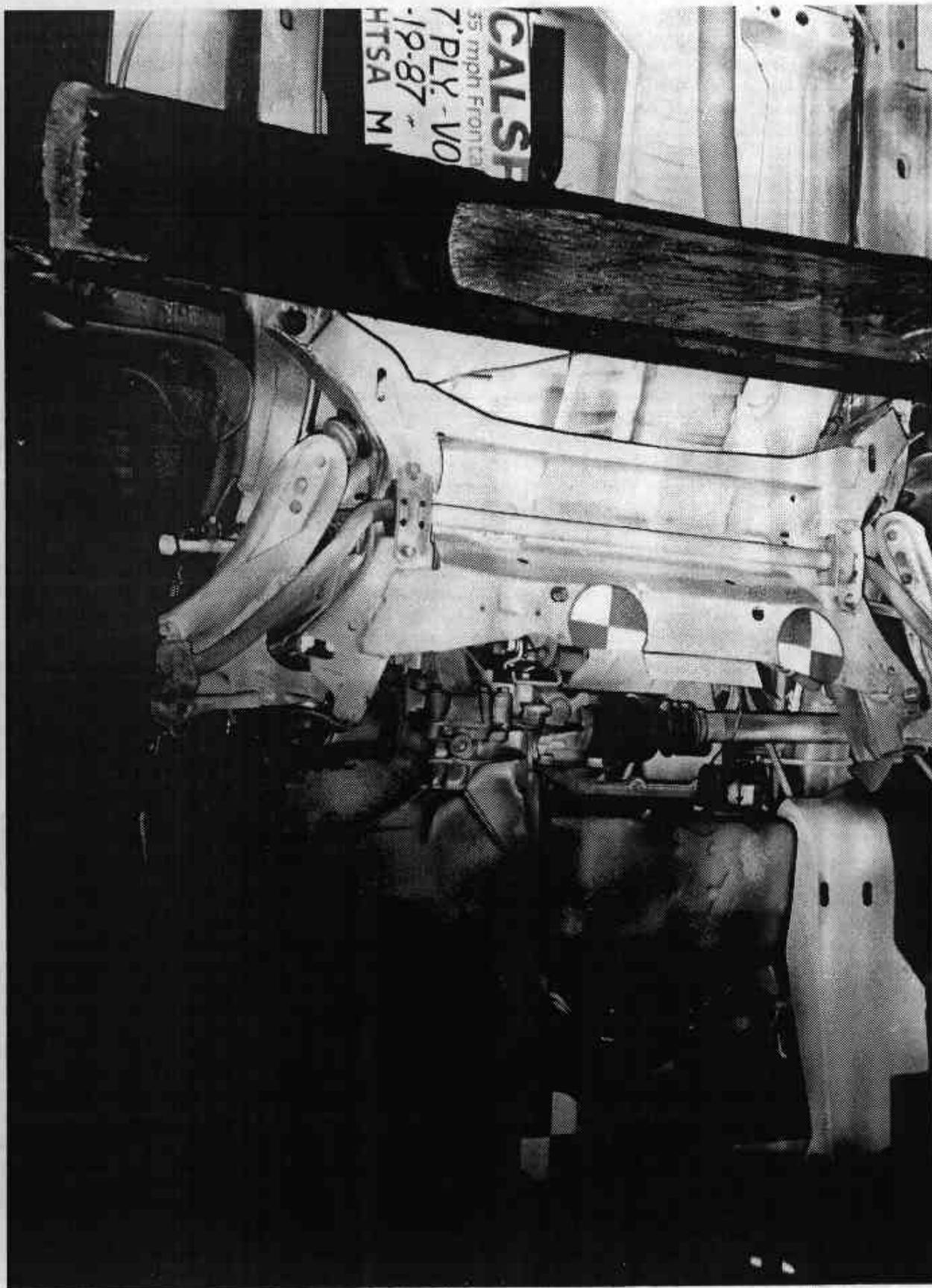


Figure A-16 PRE-TEST FRONT-SIDE UNDERBODY VIEW

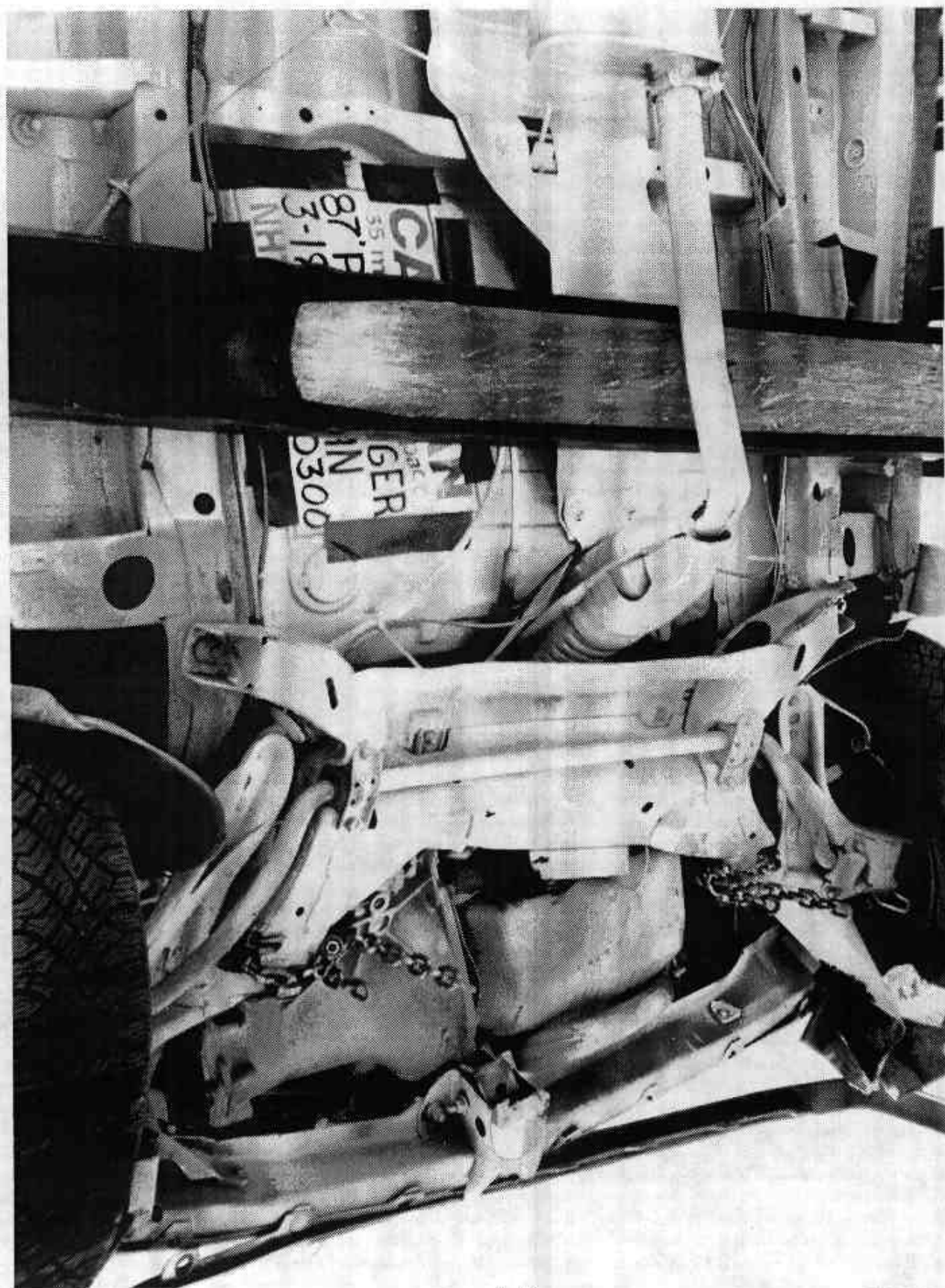


Figure A-17 POST-TEST FRONT-SIDE UNDERBODY VIEW

A-18

7556-5

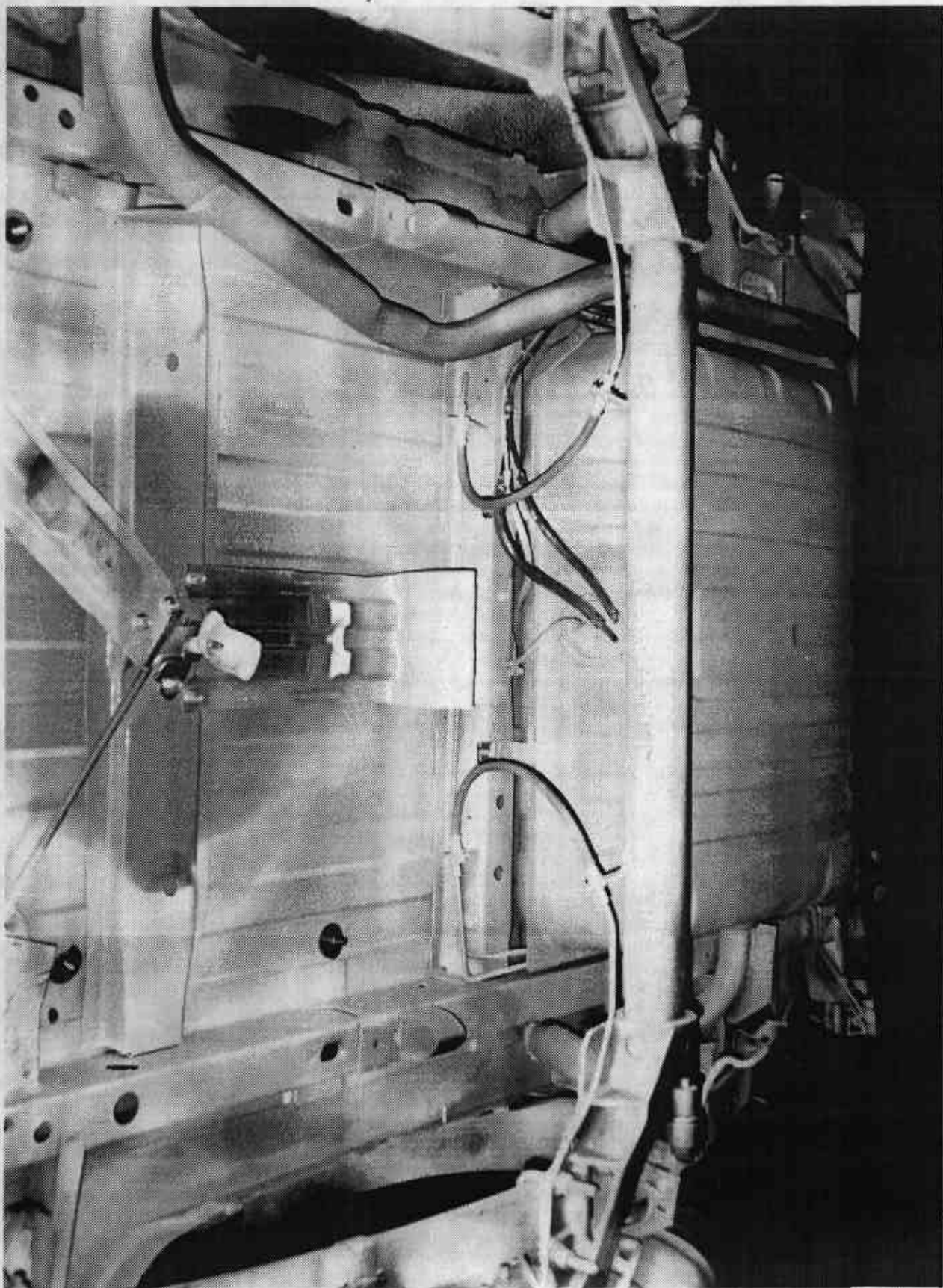


Figure A-18 PRE-TEST REAR UNDERBODY VIEW

A-19

7556-5

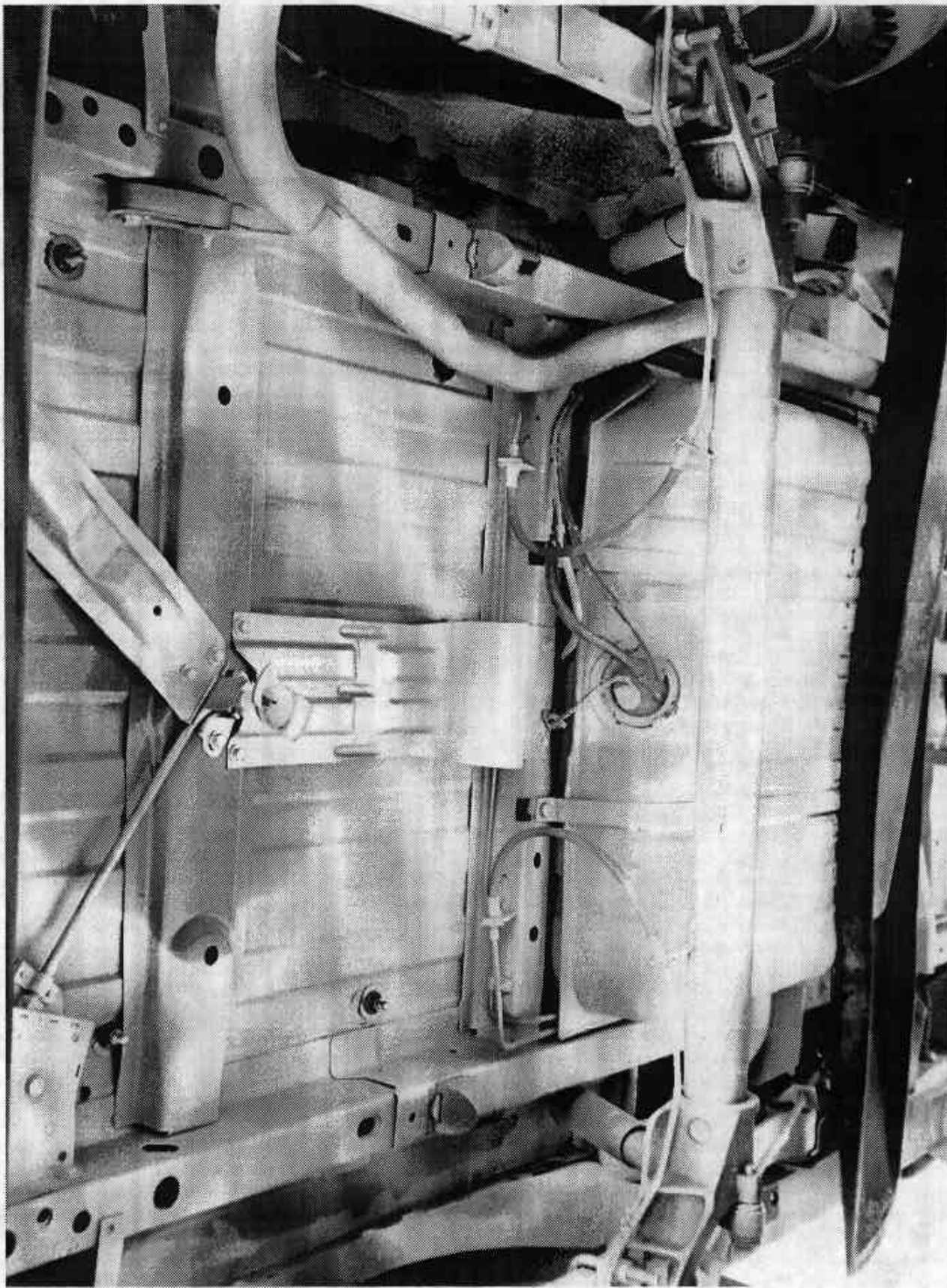


Figure A-19 POST-TEST REAR UNDERBODY VIEW

A-20

7556-5



Figure A-20 PRE-TEST DRIVER POSITION VIEW

A-21

7556-5

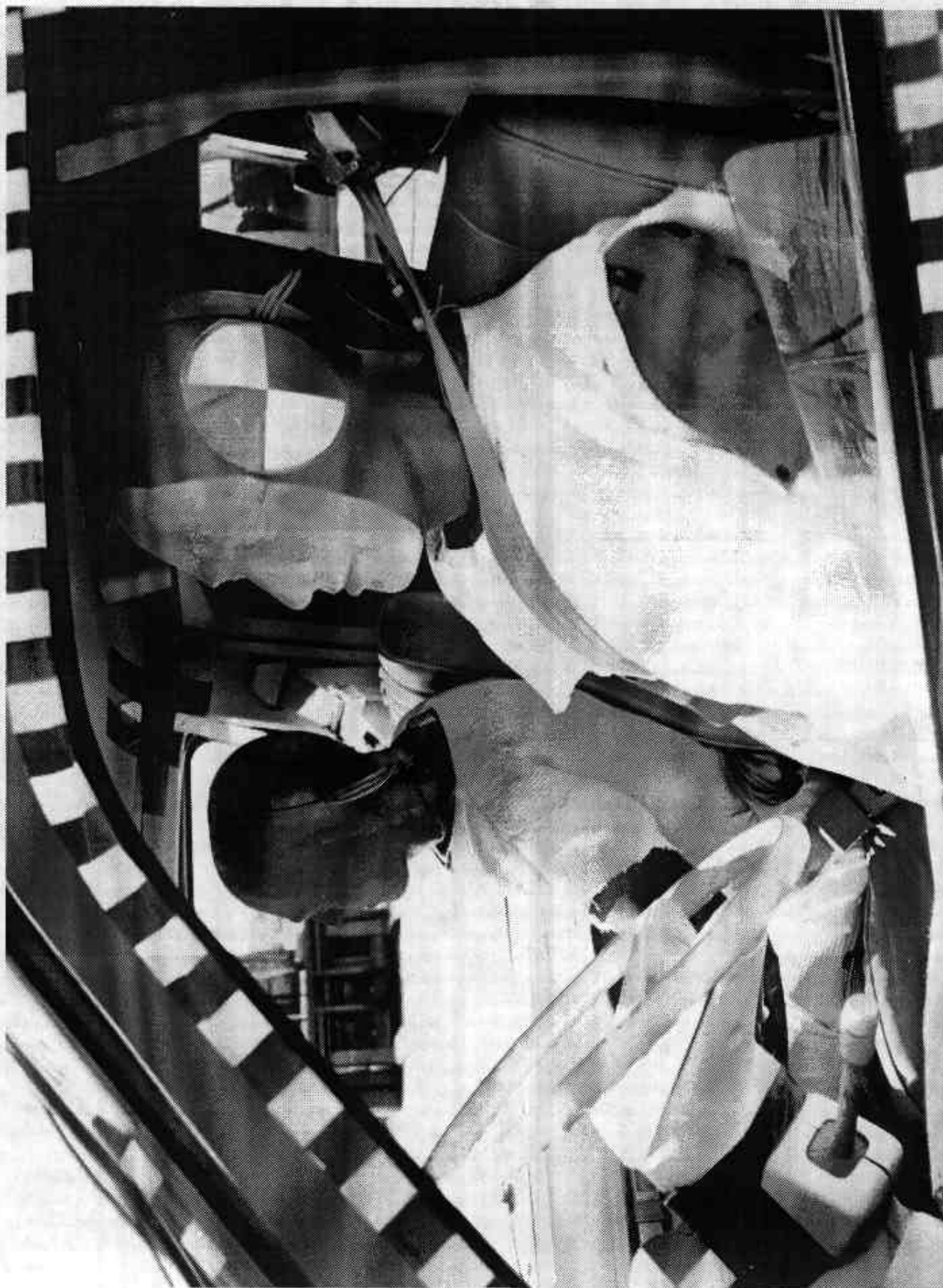


Figure A-21 POST-TEST DRIVER POSITION VIEW

A-22

7536-5

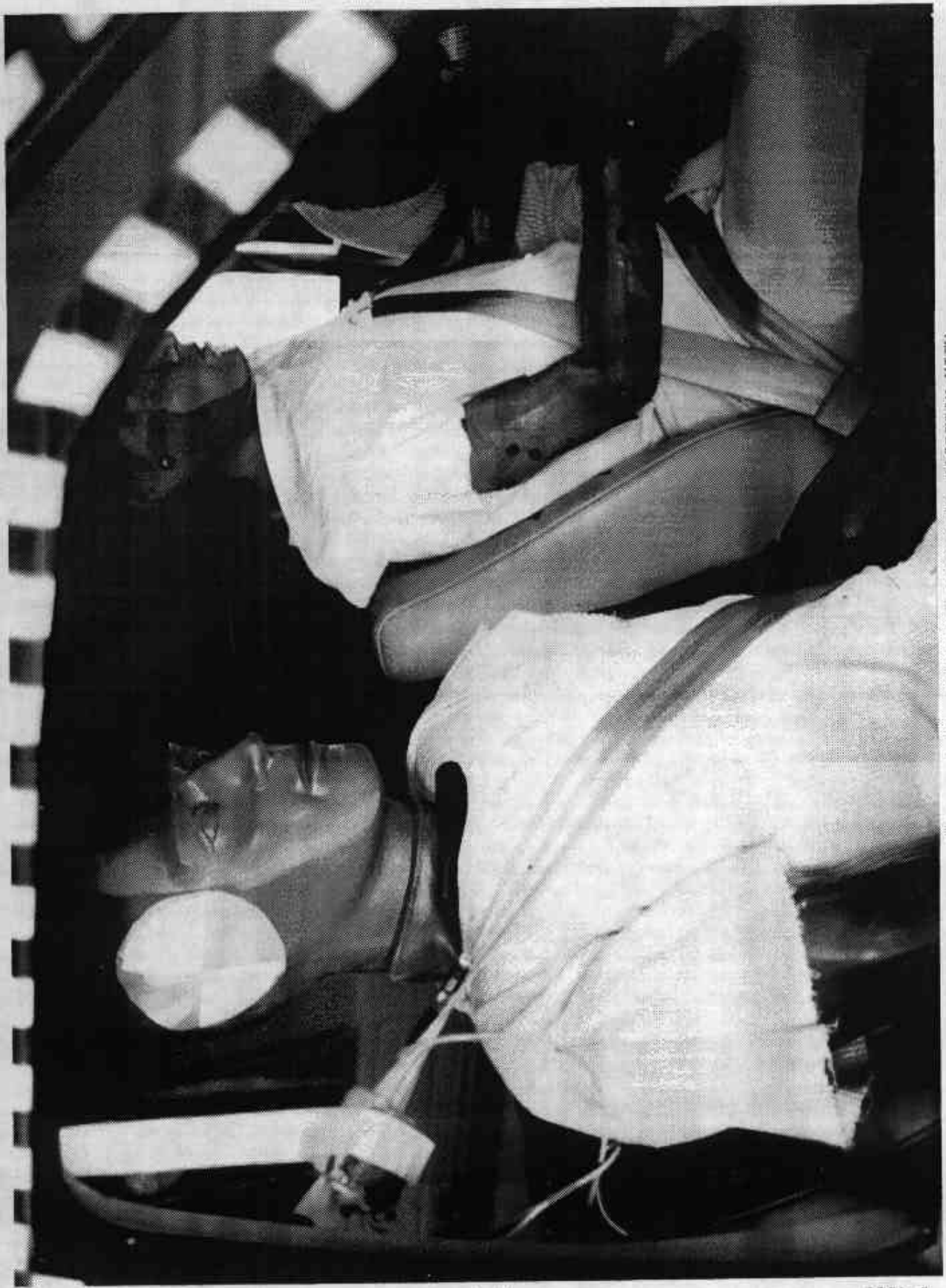


Figure A-22 PRE-TEST PASSENGER POSITION VIEW

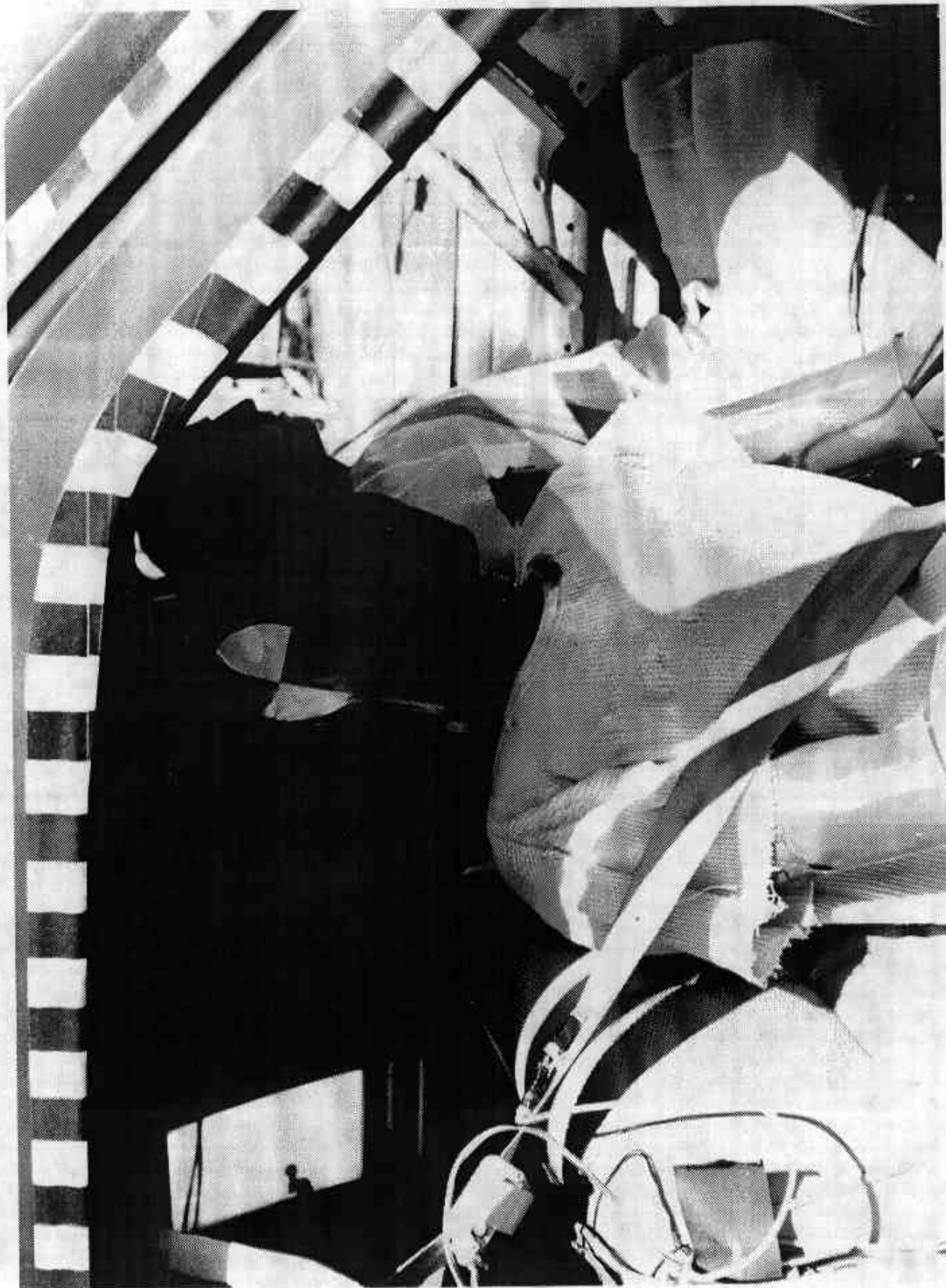


Figure A-23 POST-TEST PASSENGER POSITION VIEW

A-24

7556-5

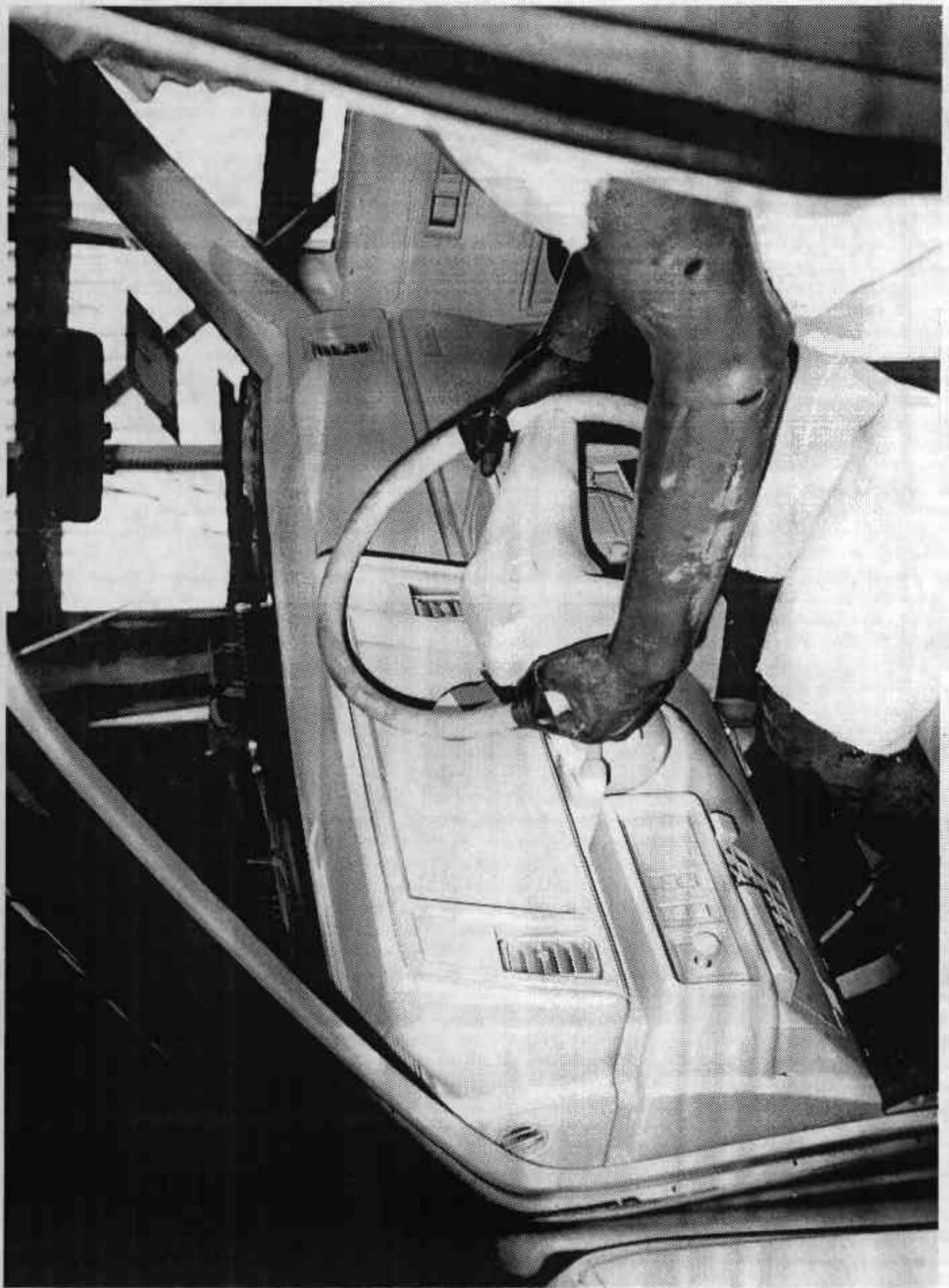


Figure A-24 PRE-TEST DRIVER AND INTERIOR VIEW

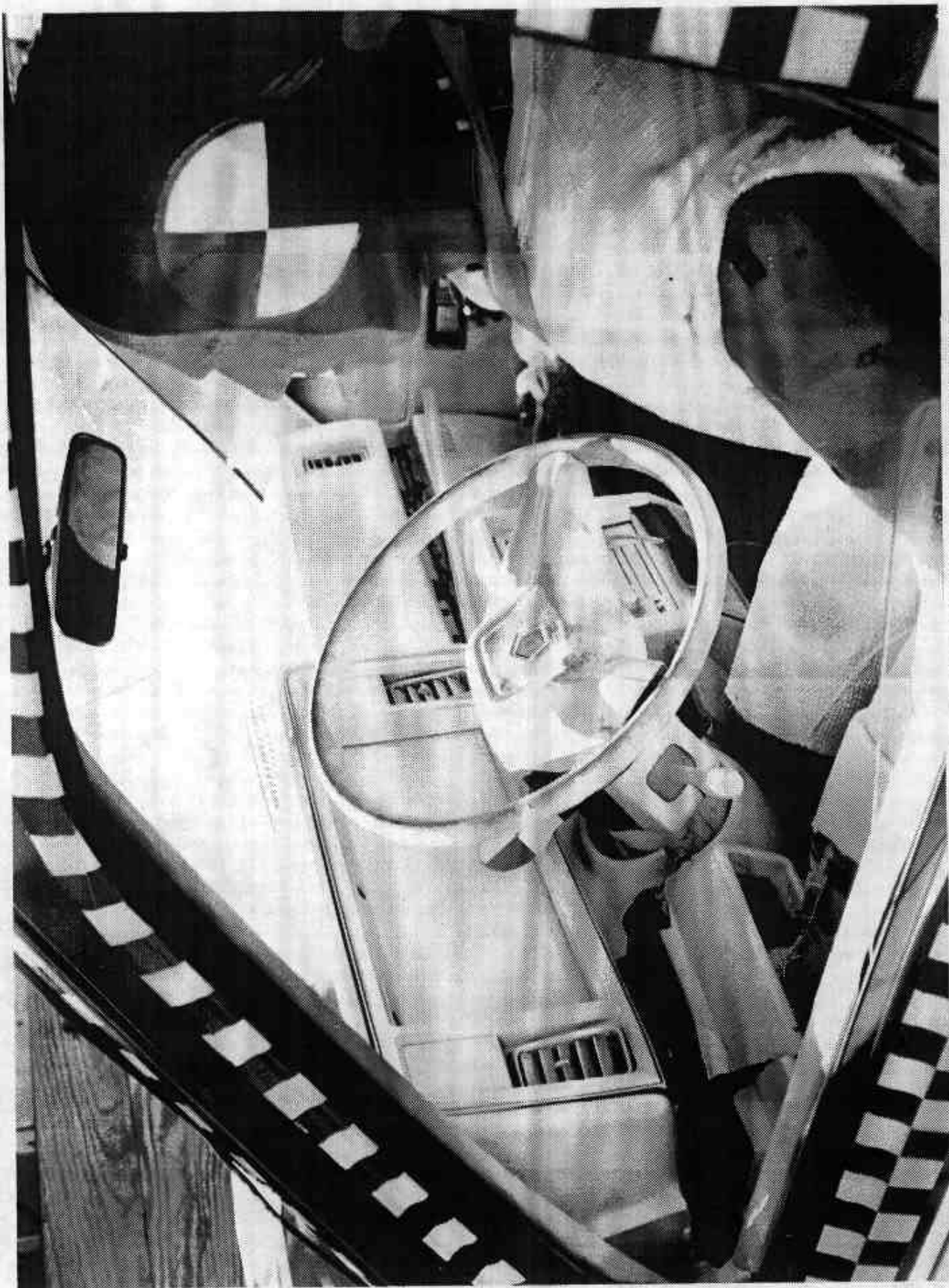


Figure A-25 POST-TEST DRIVER AND INTERIOR VIEW

A-26

7556-5



Figure A-26 PRE-TEST PASSENGER AND INTERIOR VIEW

A-27

7556-5



Figure A-27 POST-TEST PASSENGER AND INTERIOR VIEW

A-28

7556-5



Figure A-28 POST-TEST VEHICLE INTERIOR AND OCCUPANT VIEW

A-29

7556-5

Appendix B

VEHICLE, DEFORMABLE MOVING BARRIER AND DUMMY RESPONSE DATA

TEST NO. MH0300

VEHICLE DATA

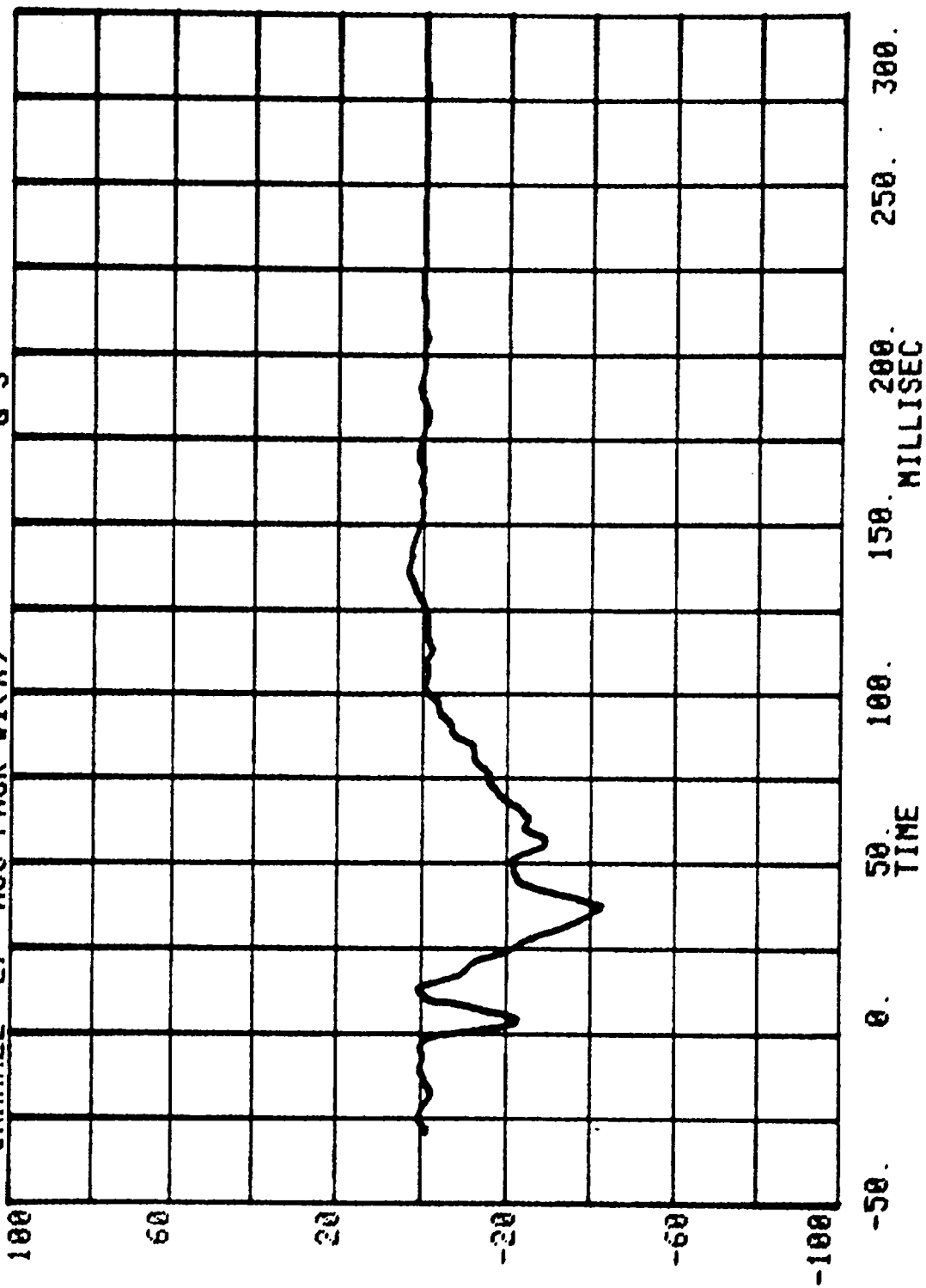
FILTER CHANNEL CLASS

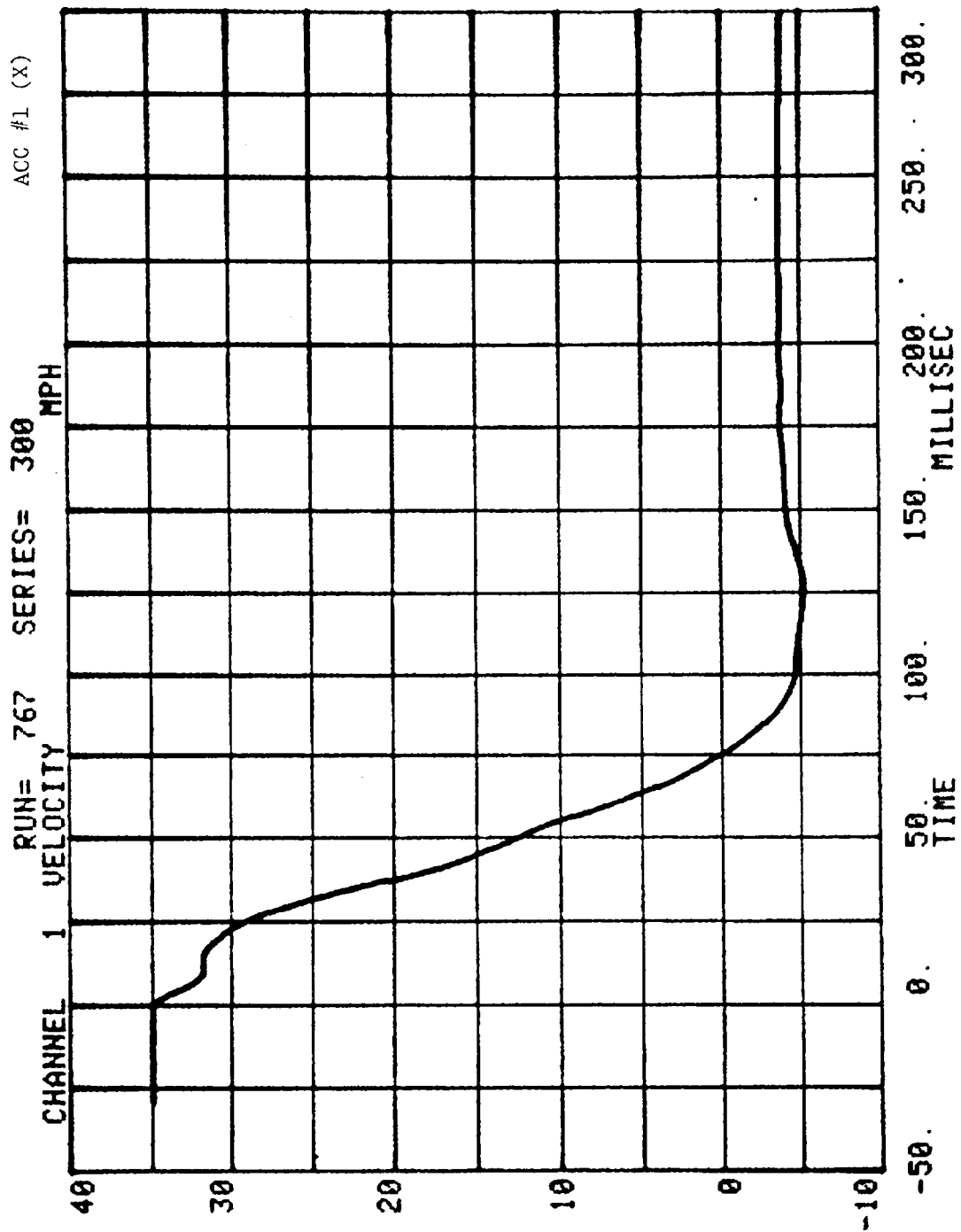
60

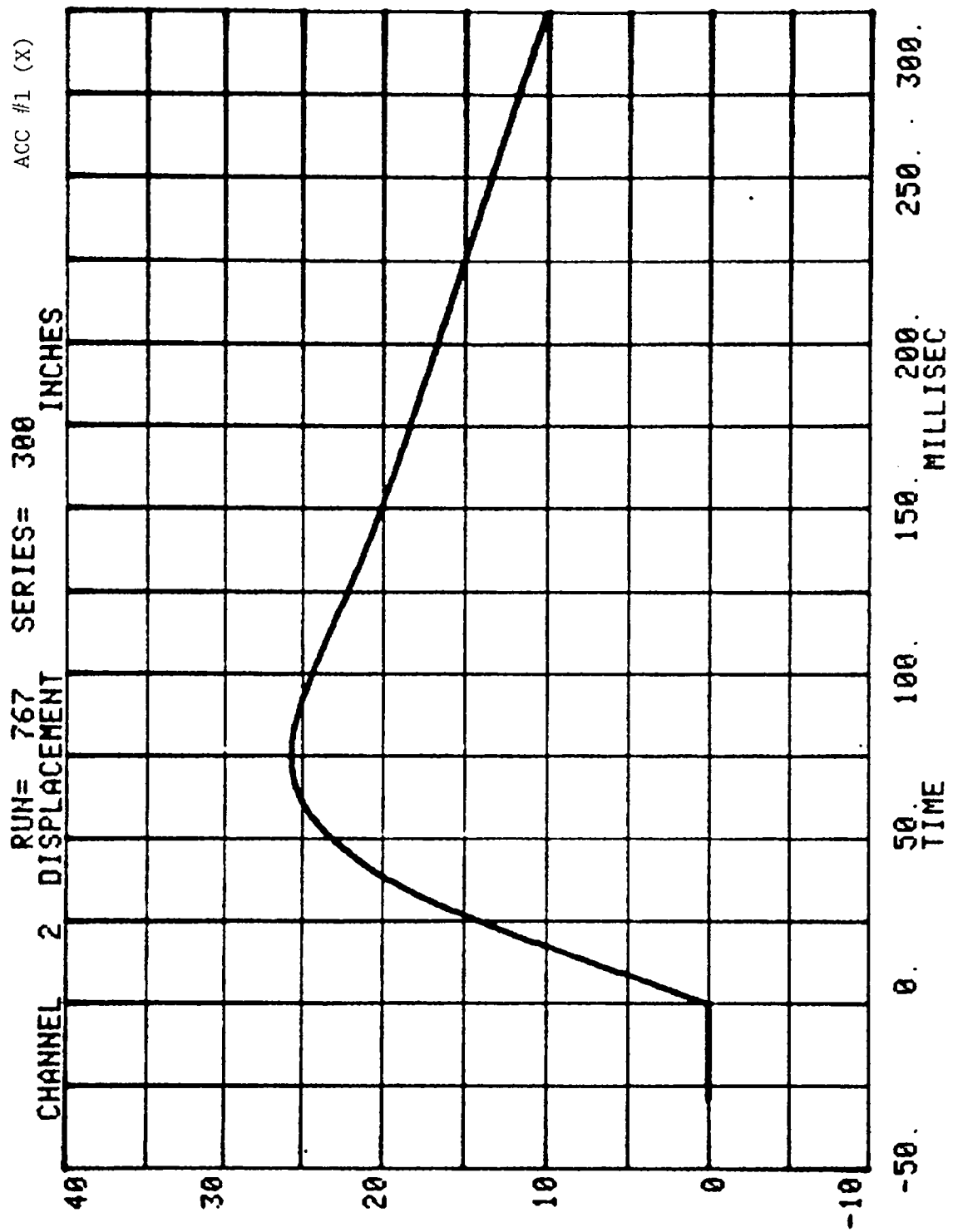
B-2

7556-5

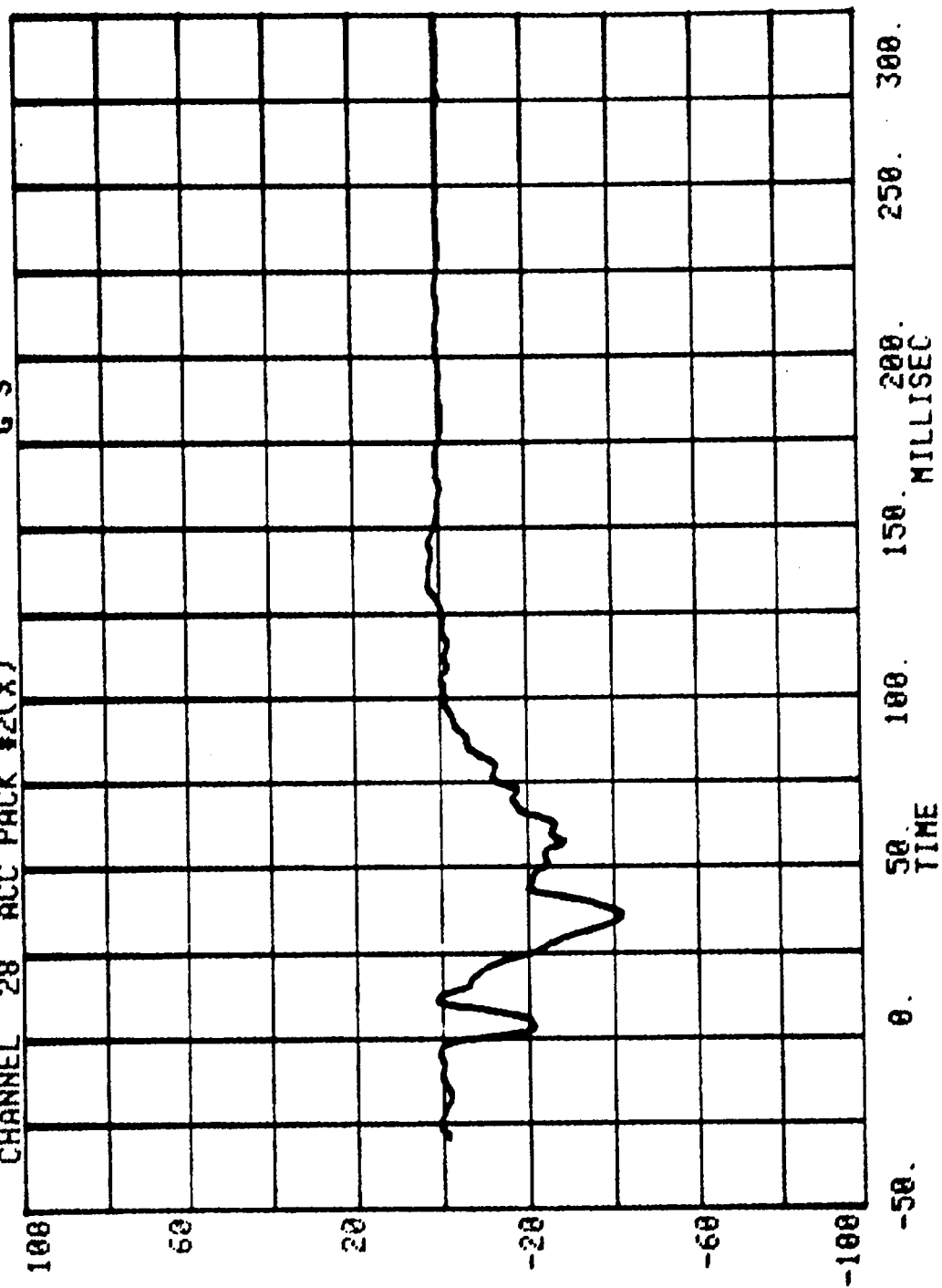
CHANNEL 27 ACC PACK #1(X) RUN= 767 SERIES= 300 G'S

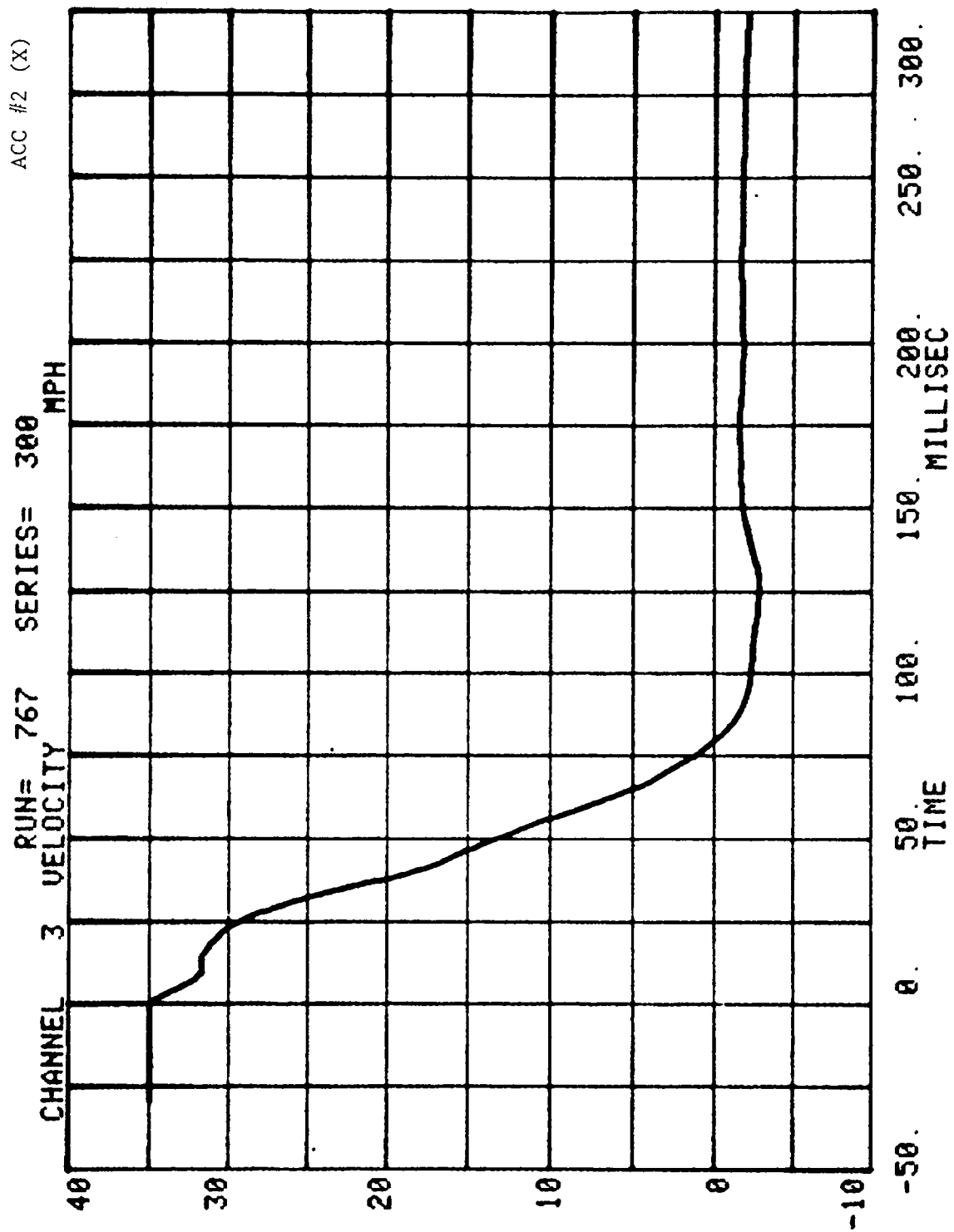


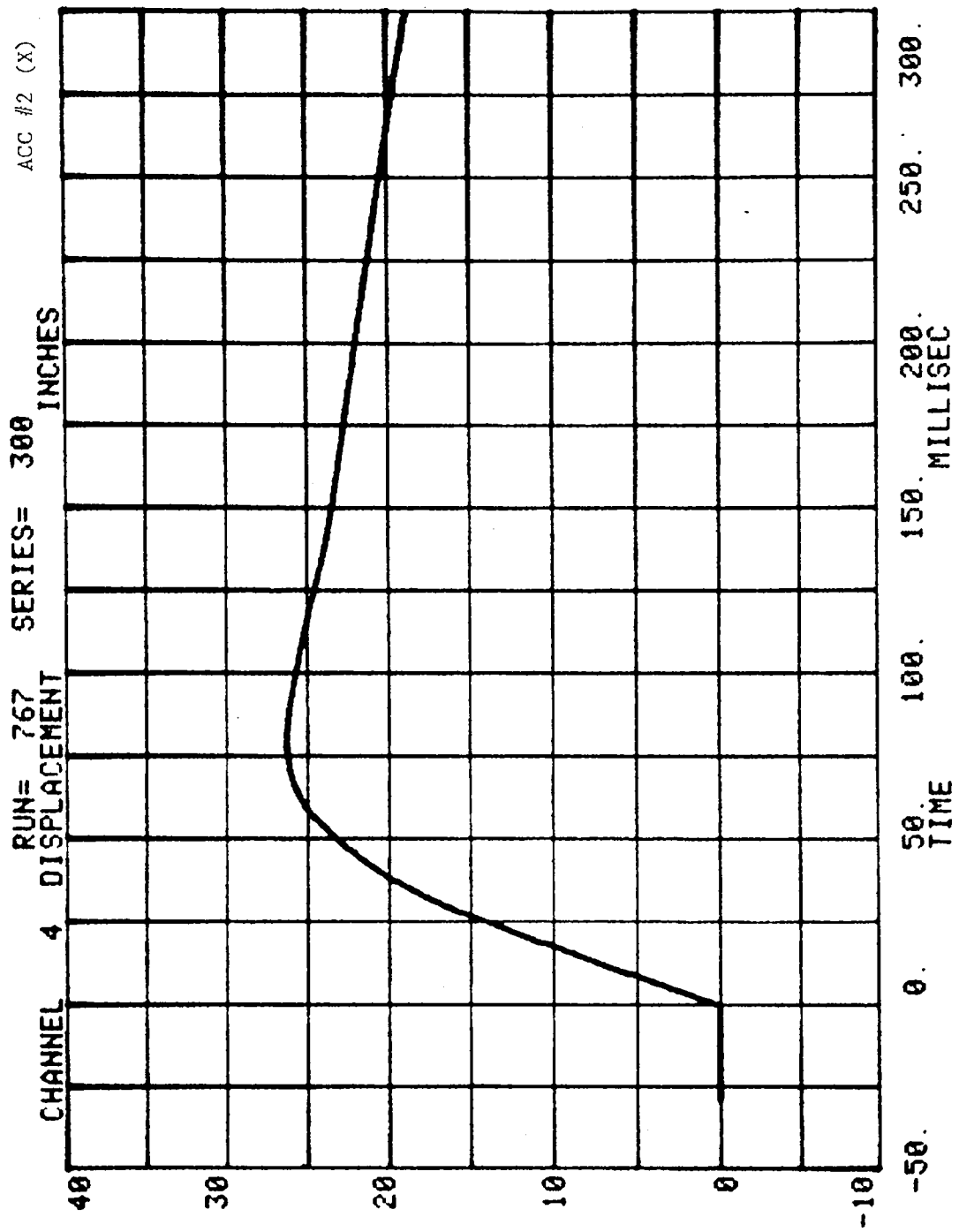




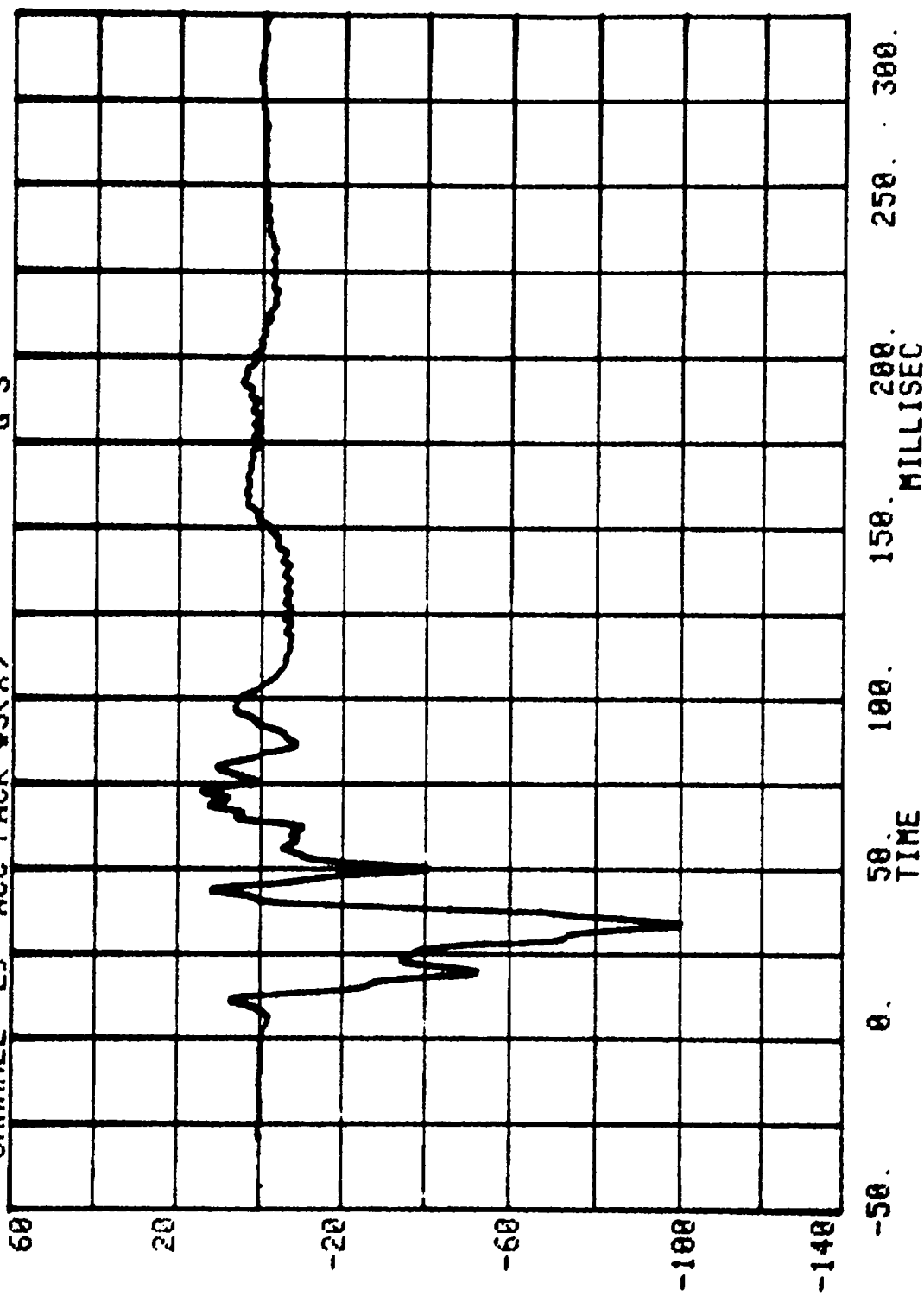
CHANNEL 28 ACC PACK #2(X) RUN= 767 SERIES= 300 G'S

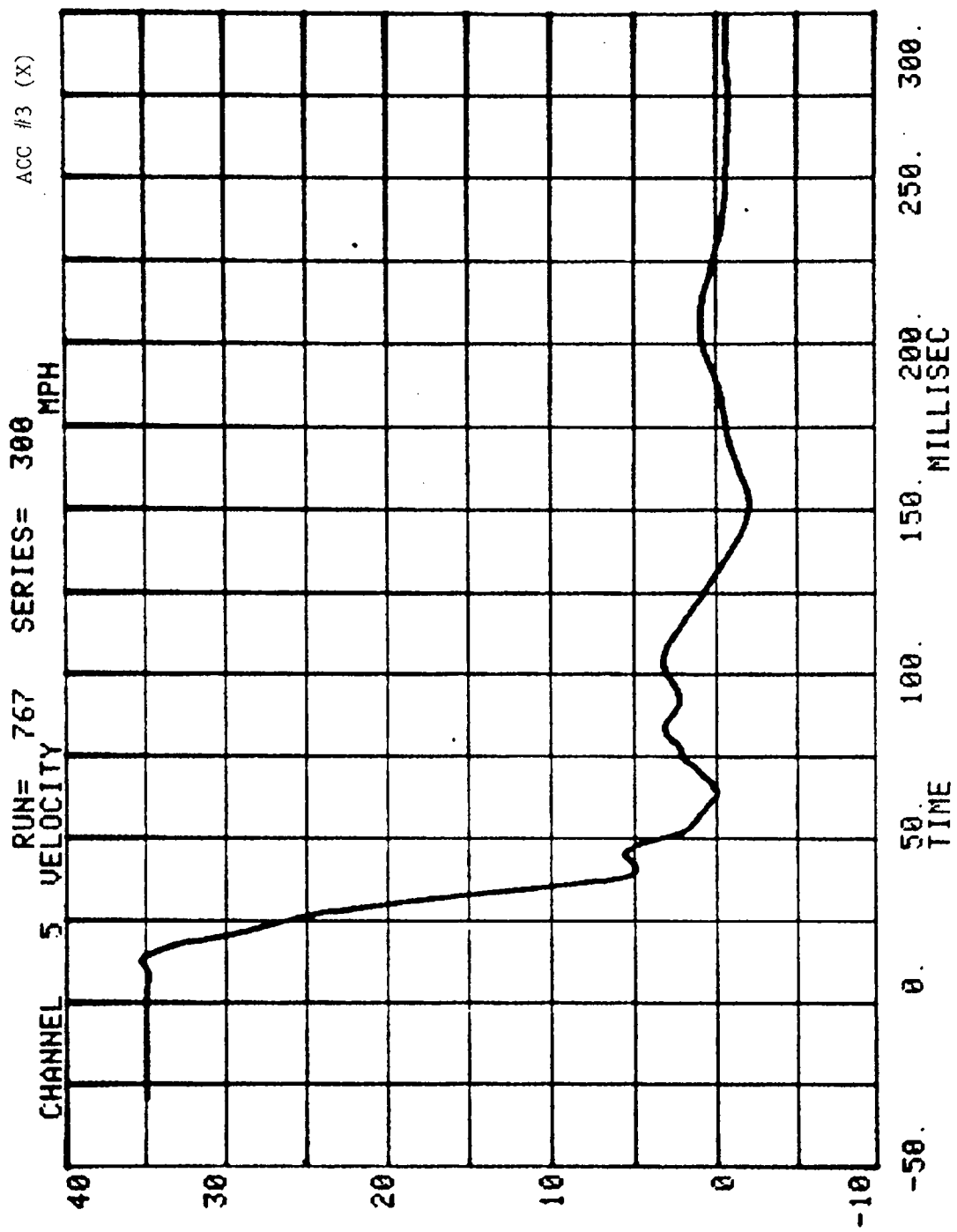


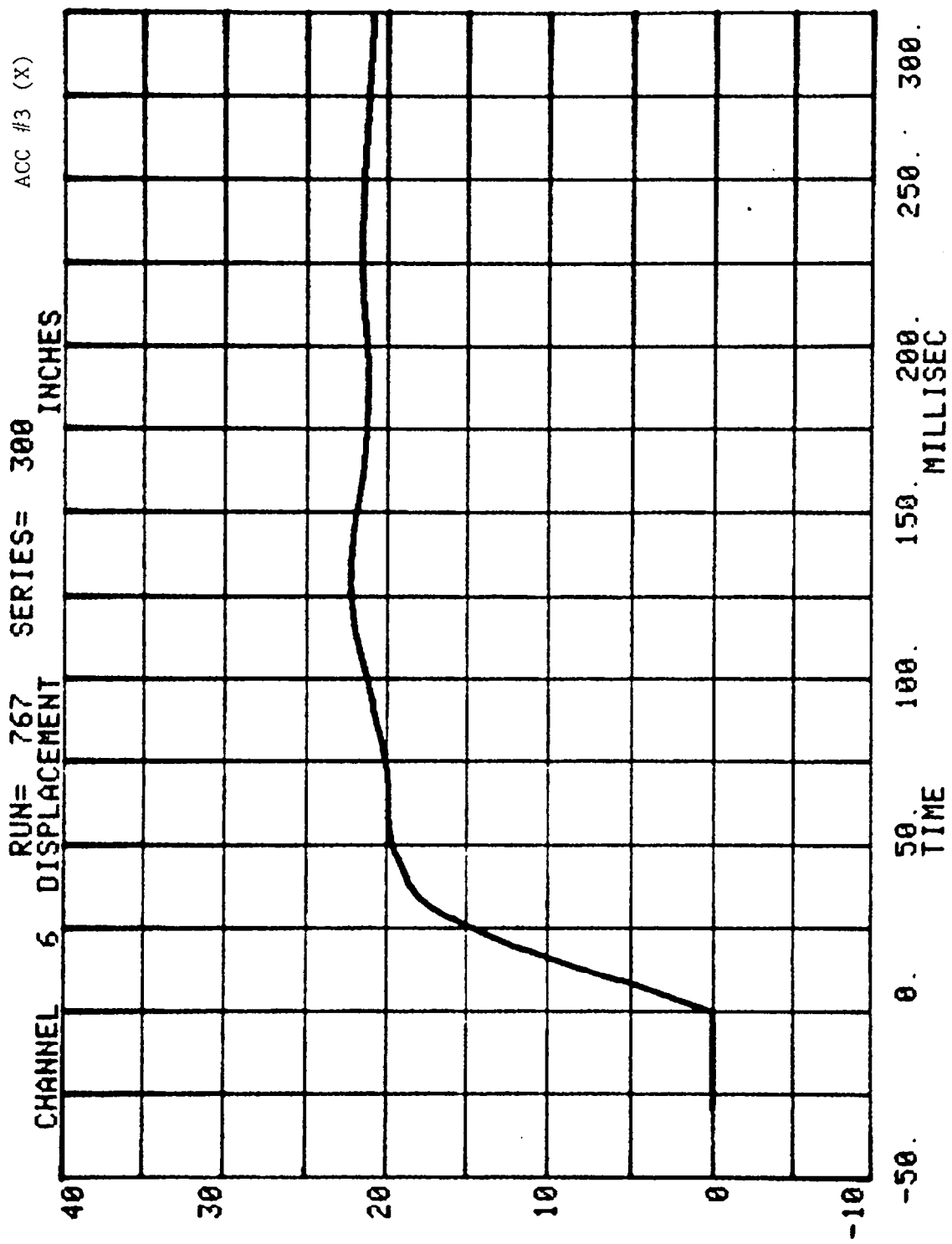


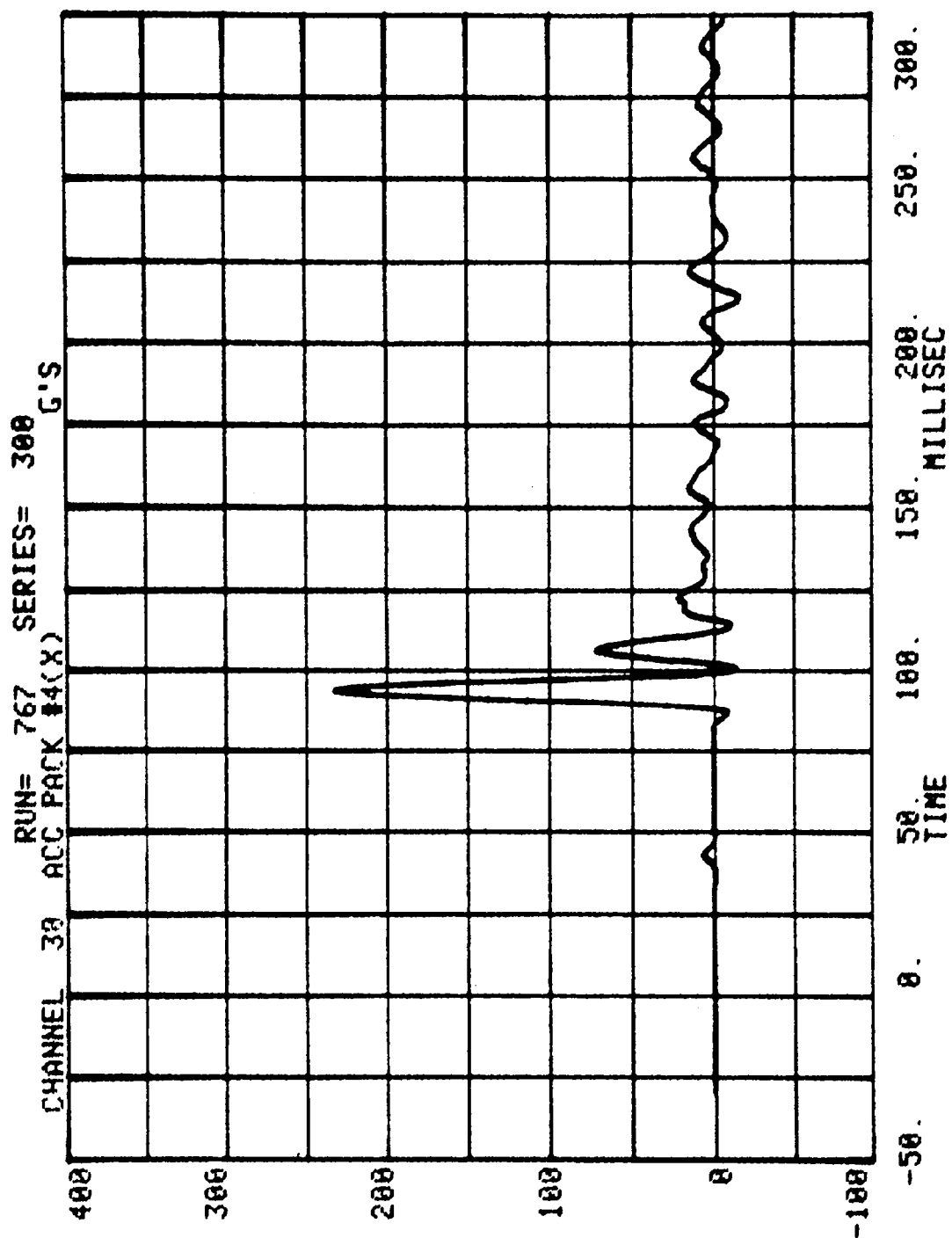


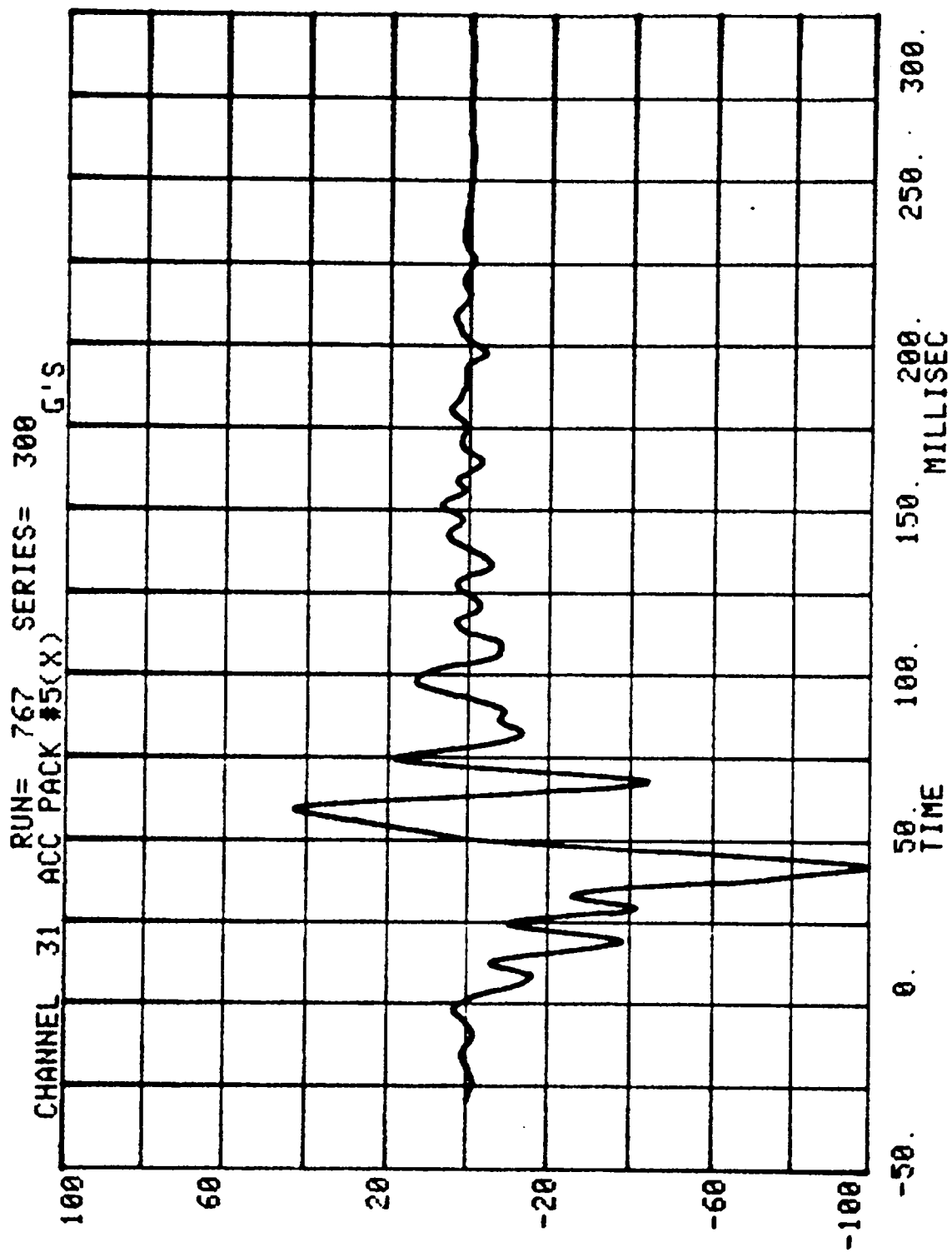
RUN= 767 SERIES= 300
CHANNEL 29 ACC PACK #3(X) G'S

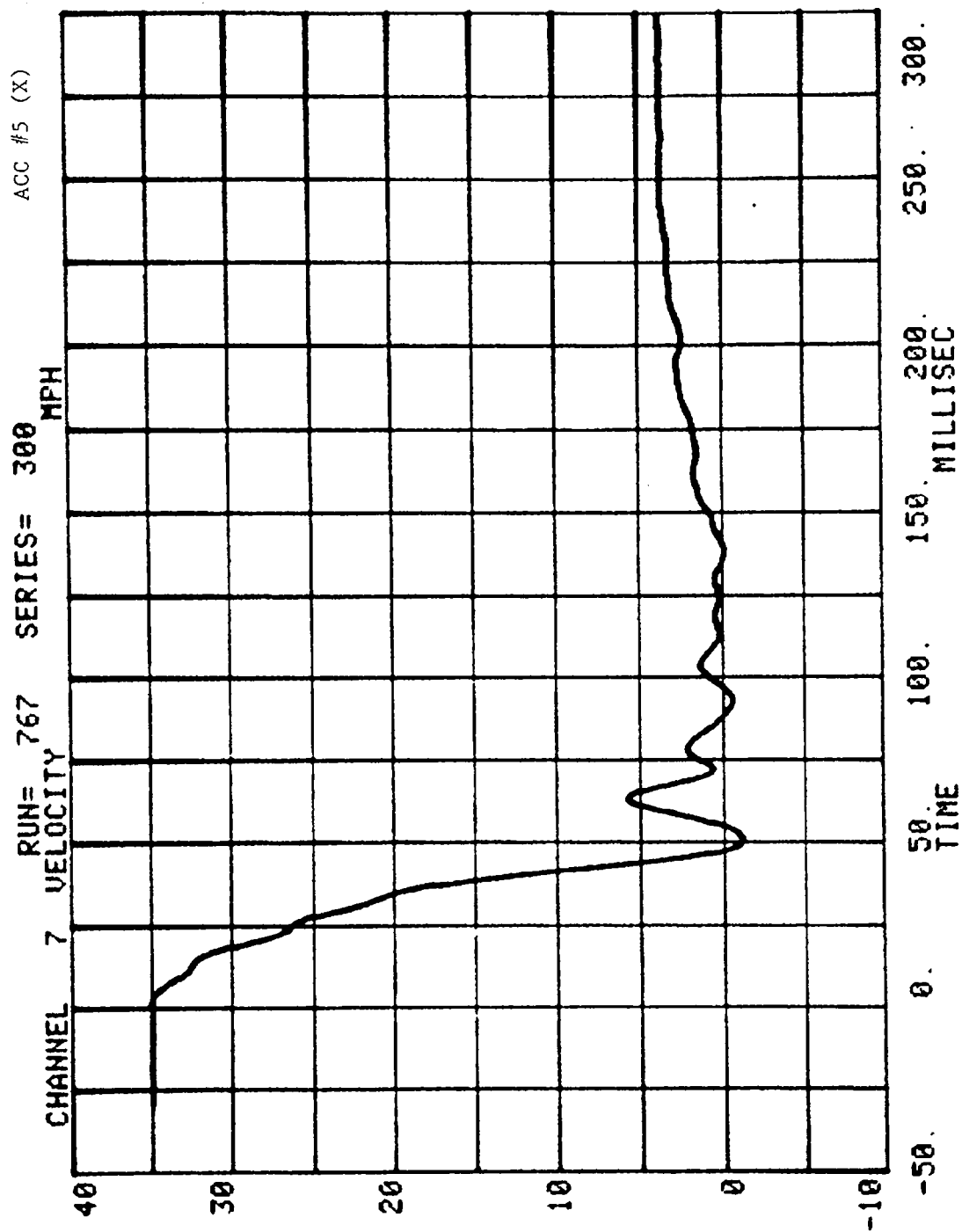


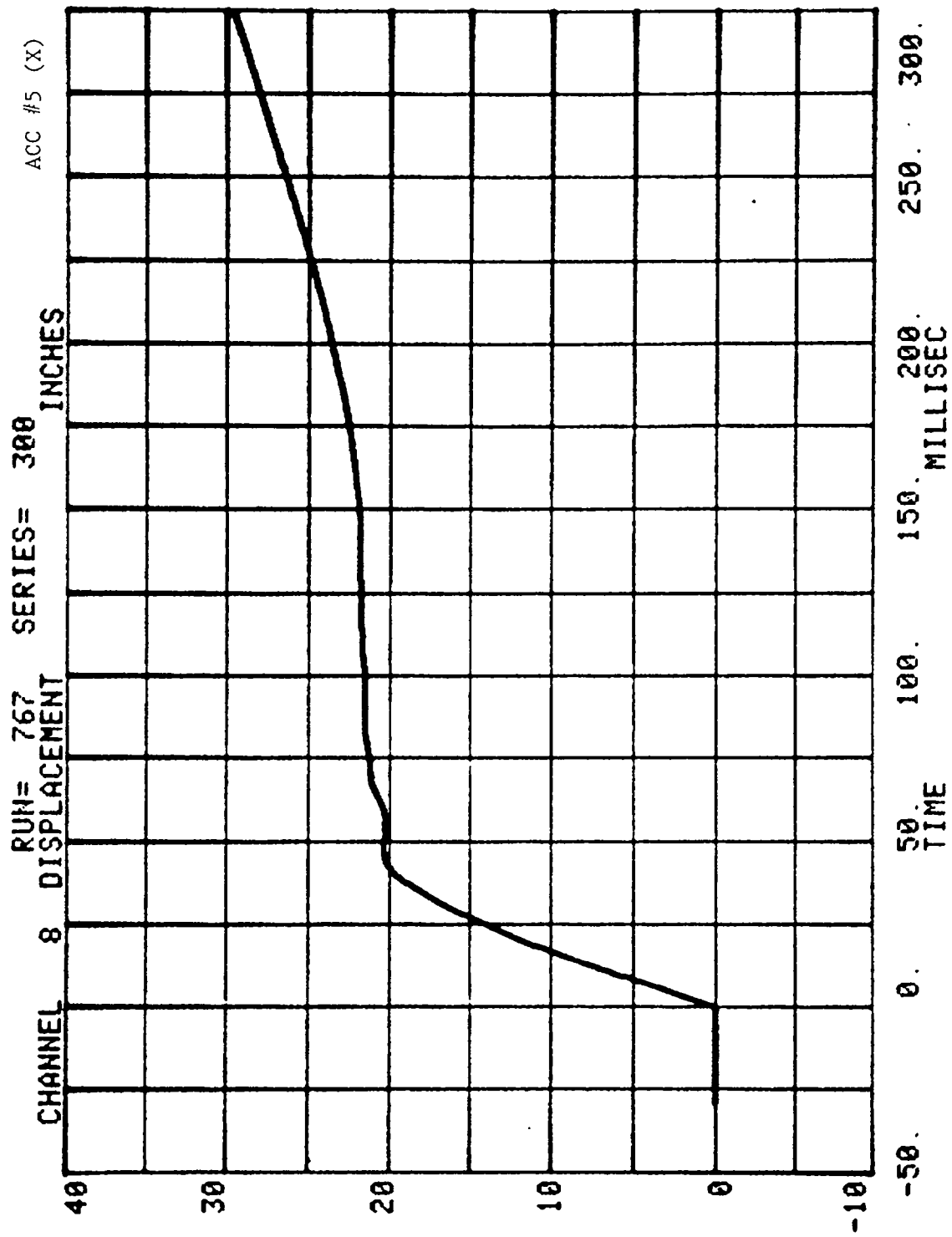


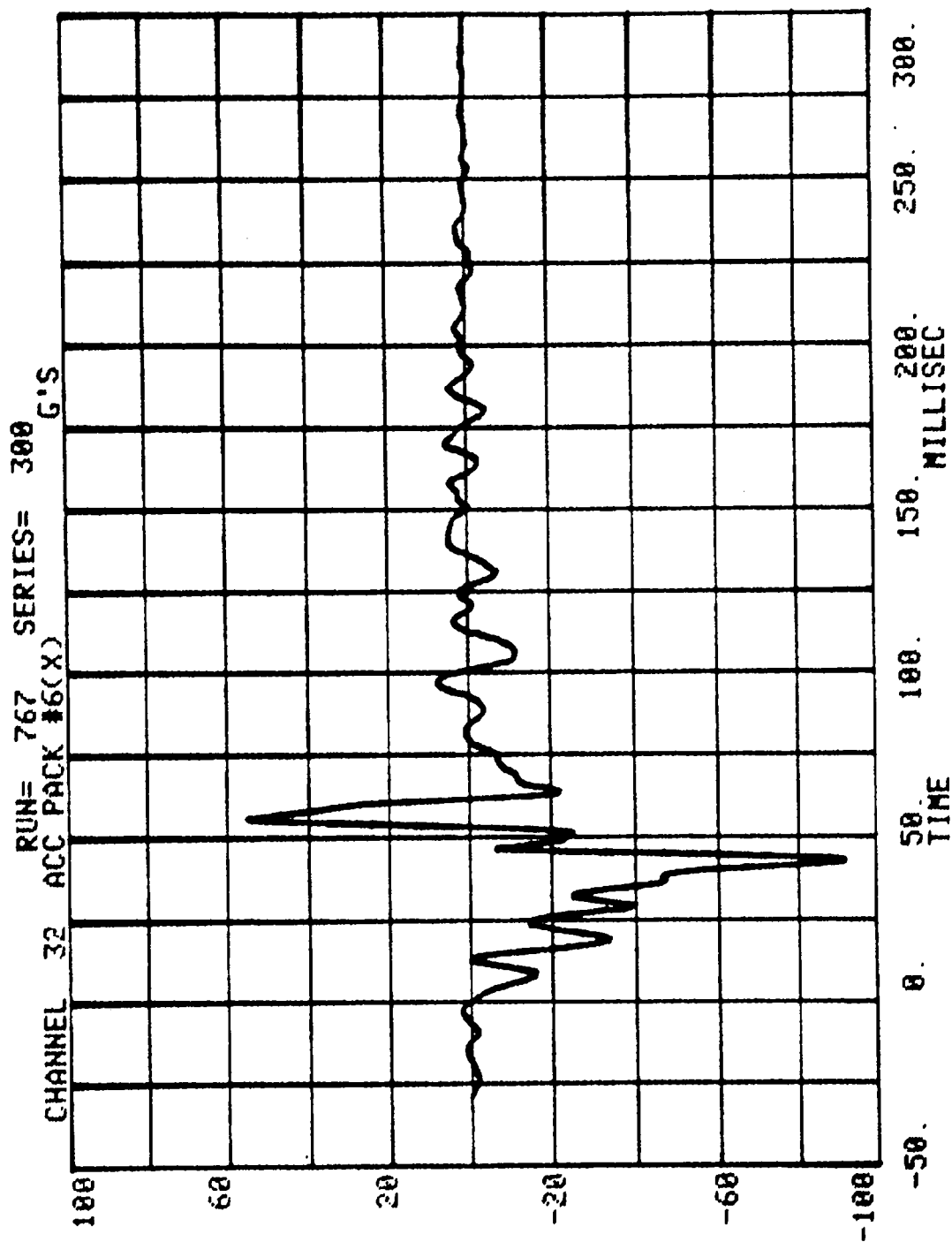


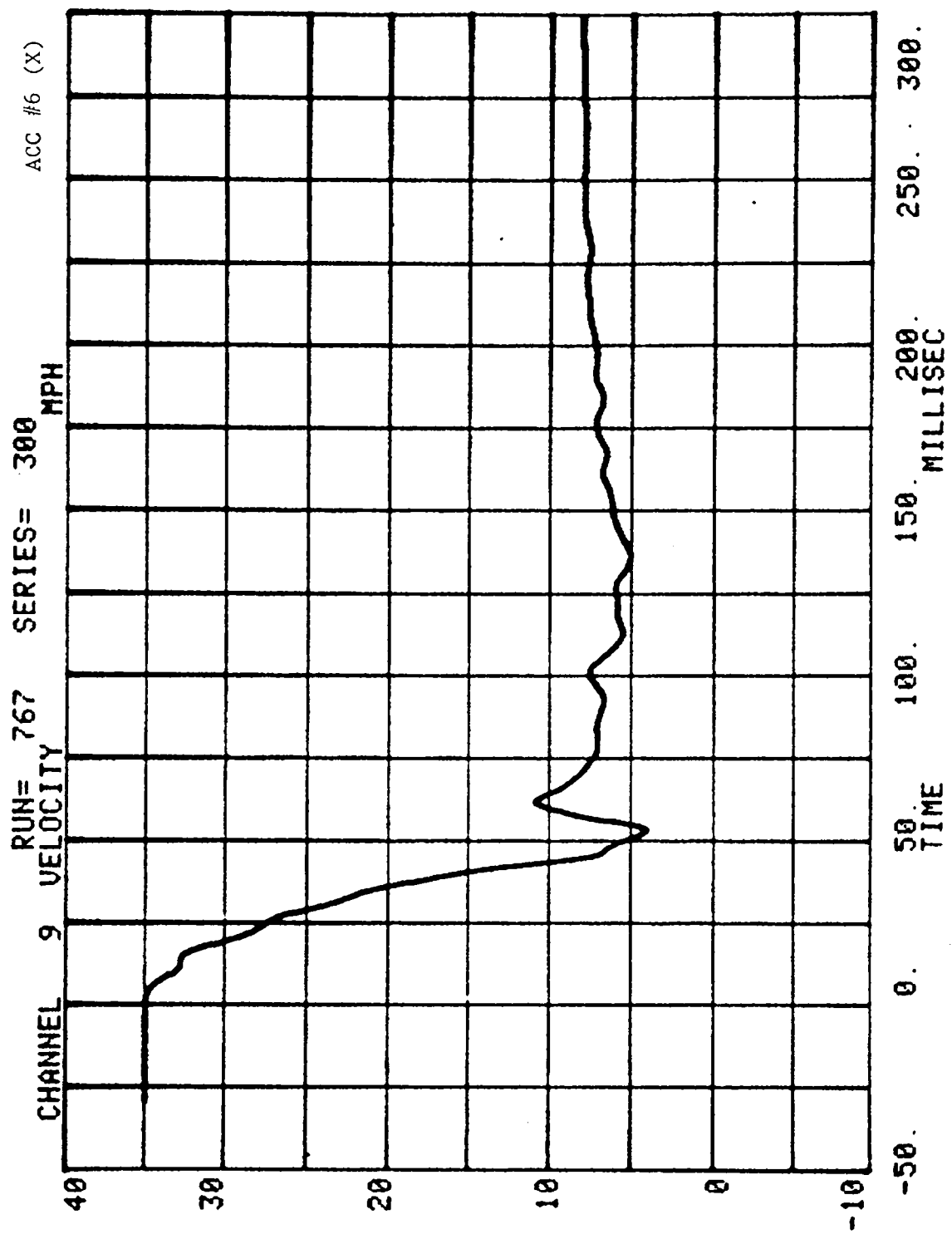


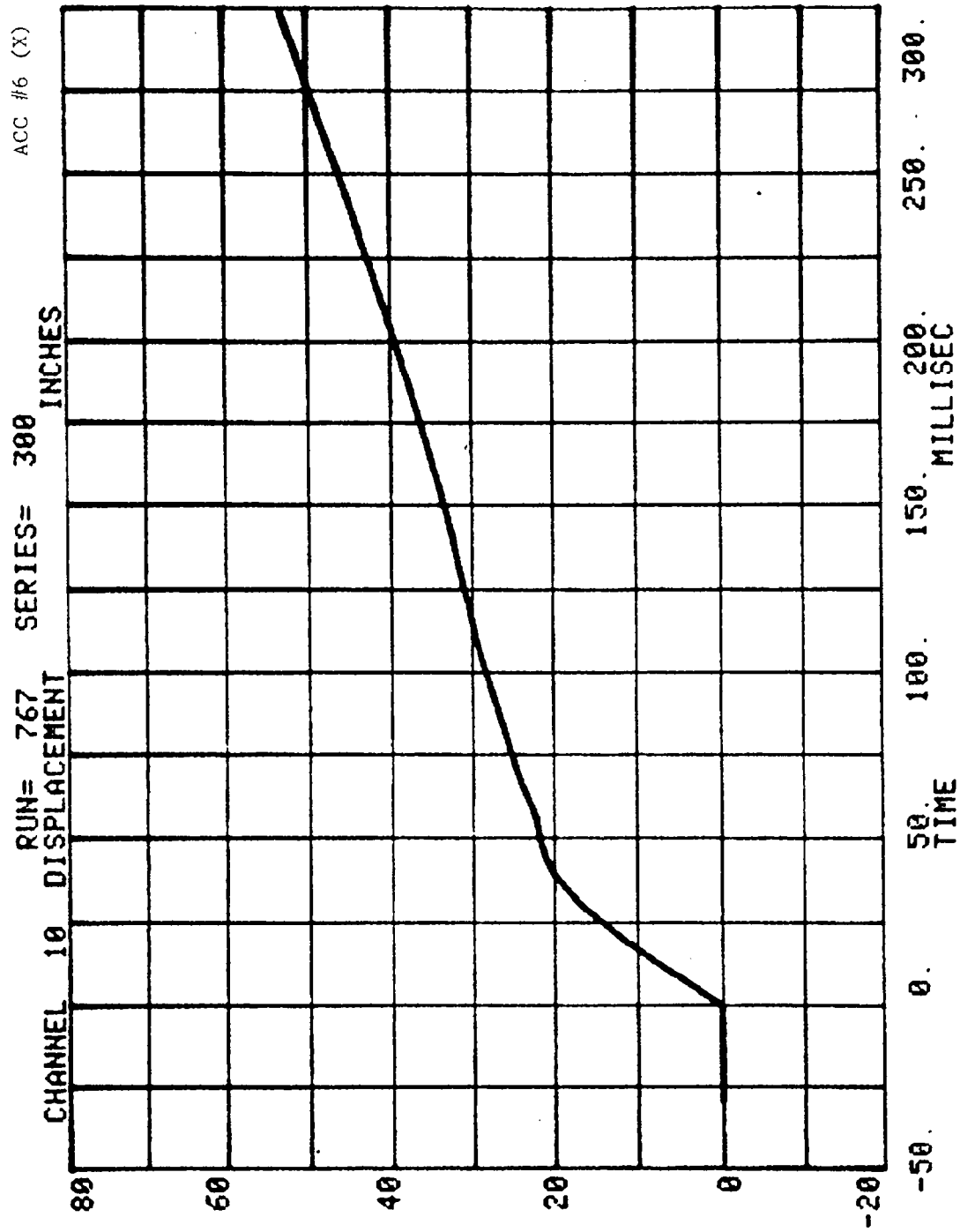




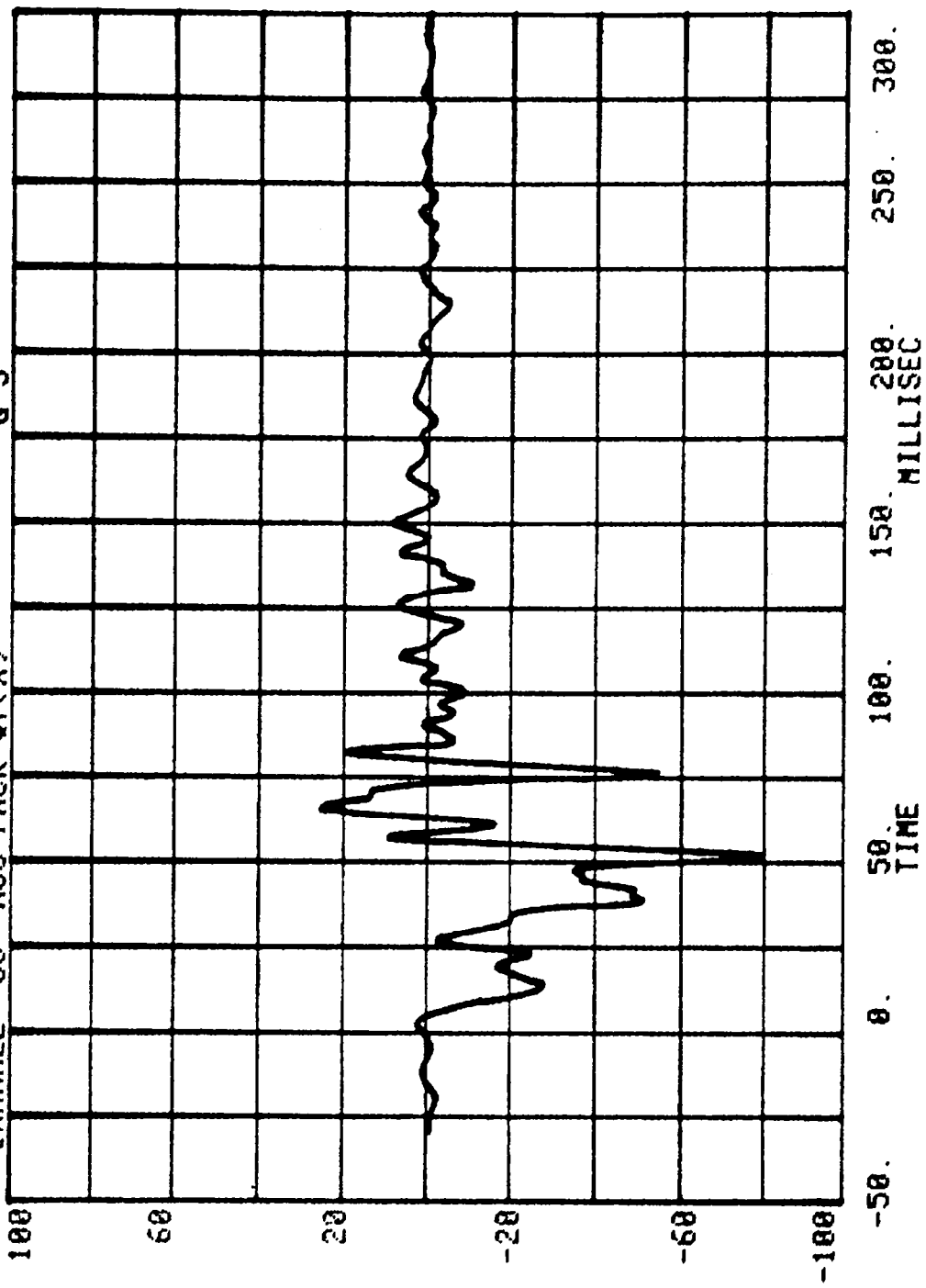






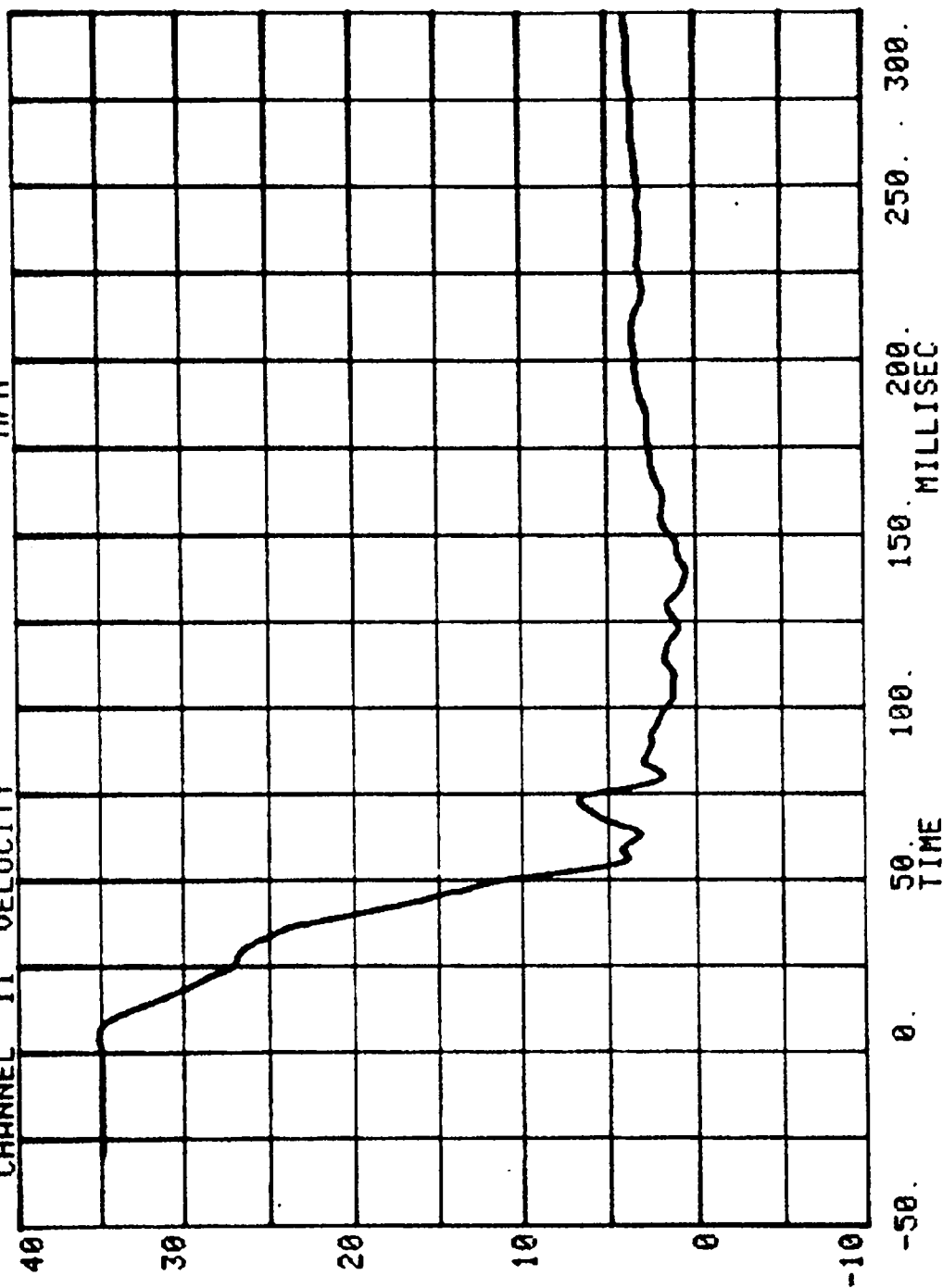


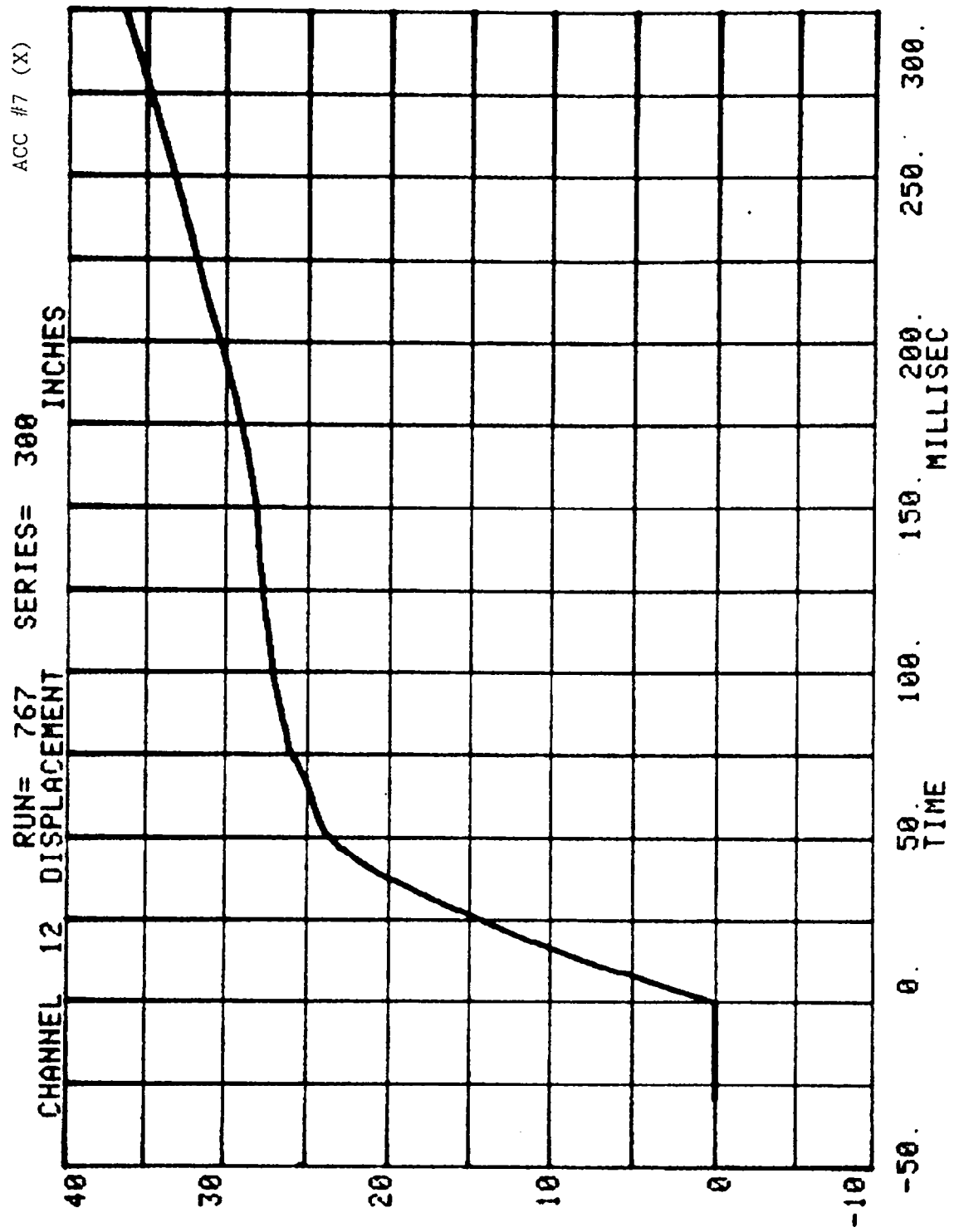
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CHANNEL 33 ACC PACK #7(X) G'S



ACC #7 (X)

CHANNEL 11 VELOCITY
RUN= 767 SERIES= 300 MPH





TEST NO. MH0300

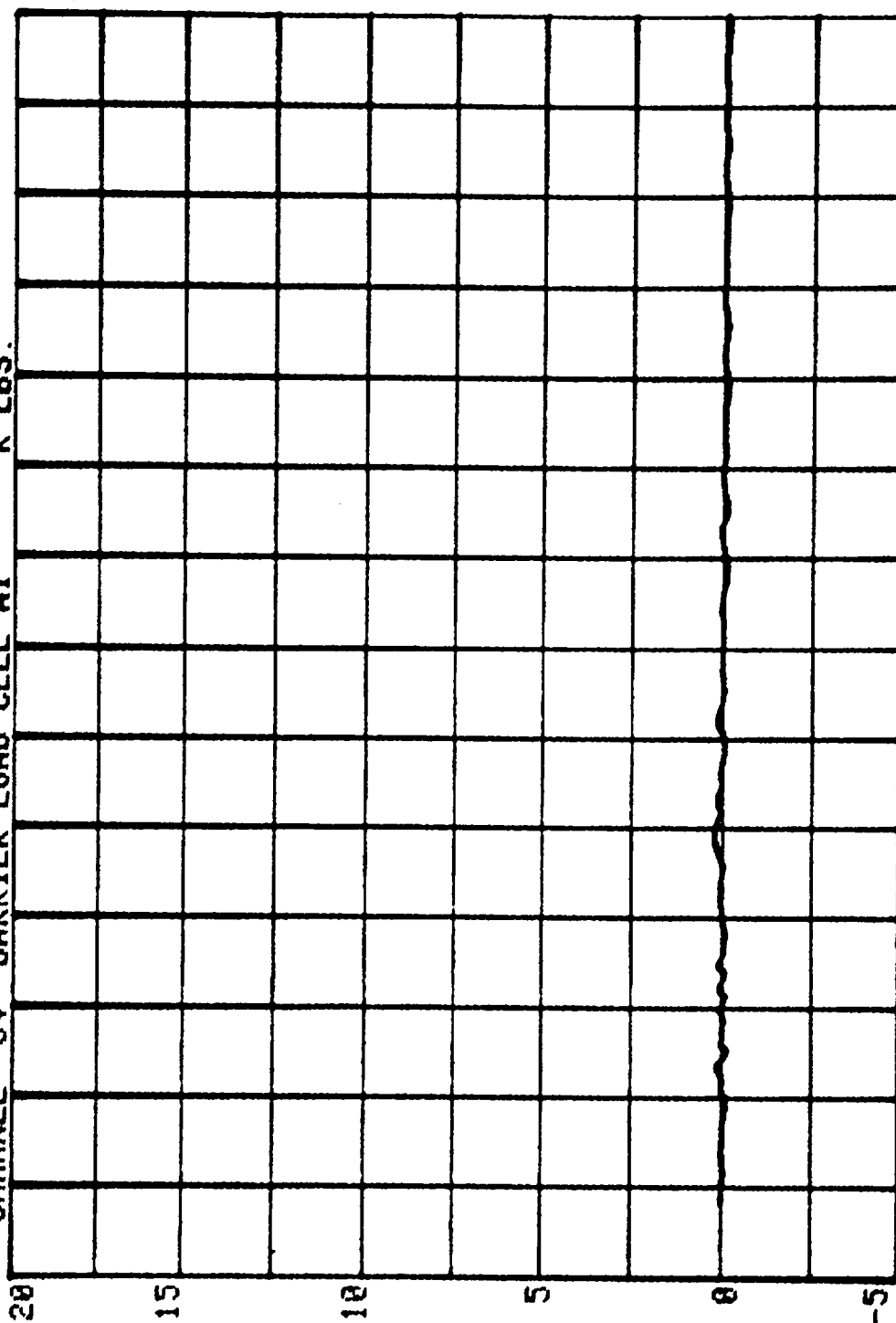
LOAD CELL BARRIER DATA
FILTER CHANNEL CLASS

60

CHANNEL 34 BARRIER LOAD CELL A1

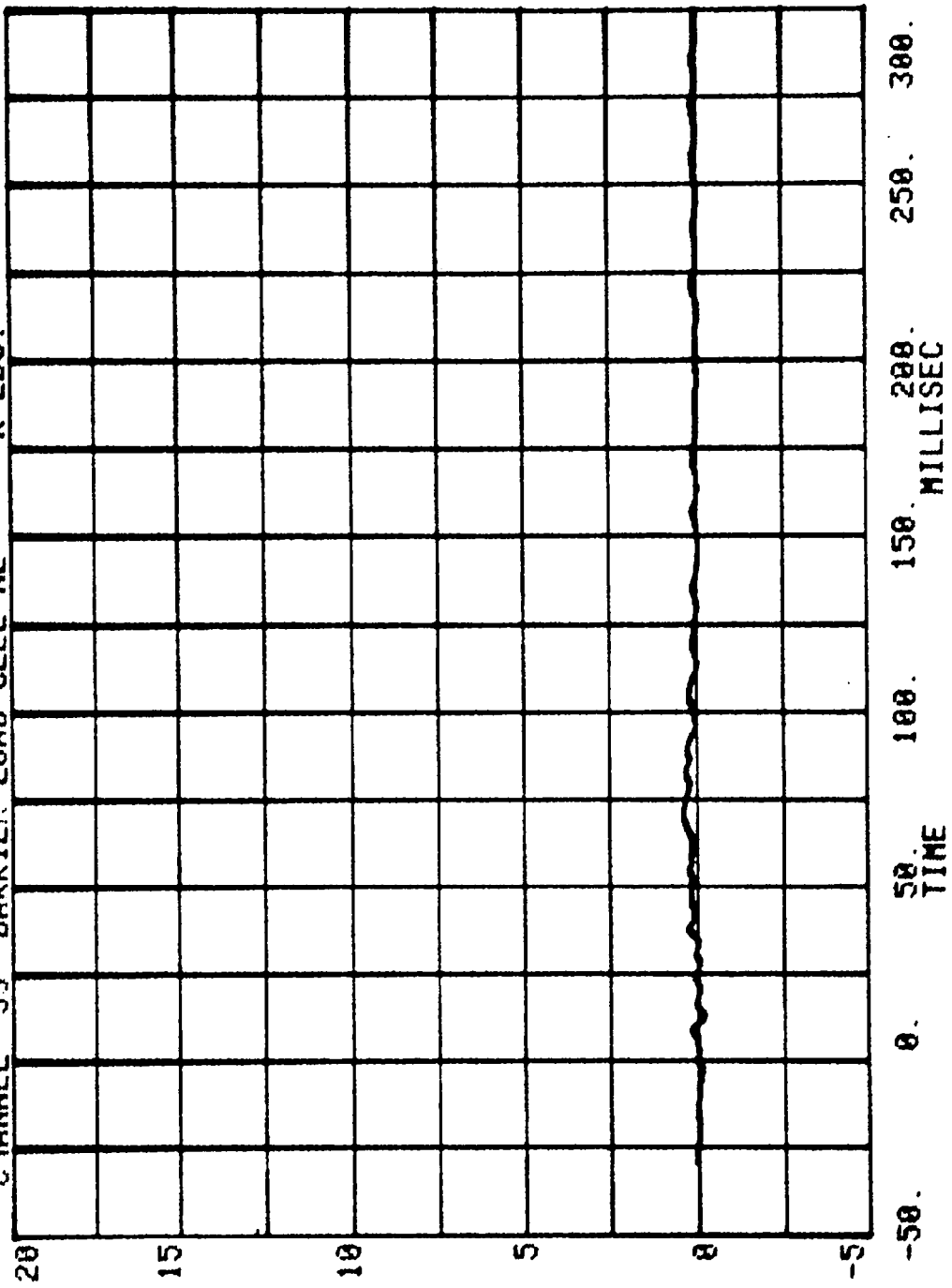
RUN= 767 SERIES= 300

K LBS.

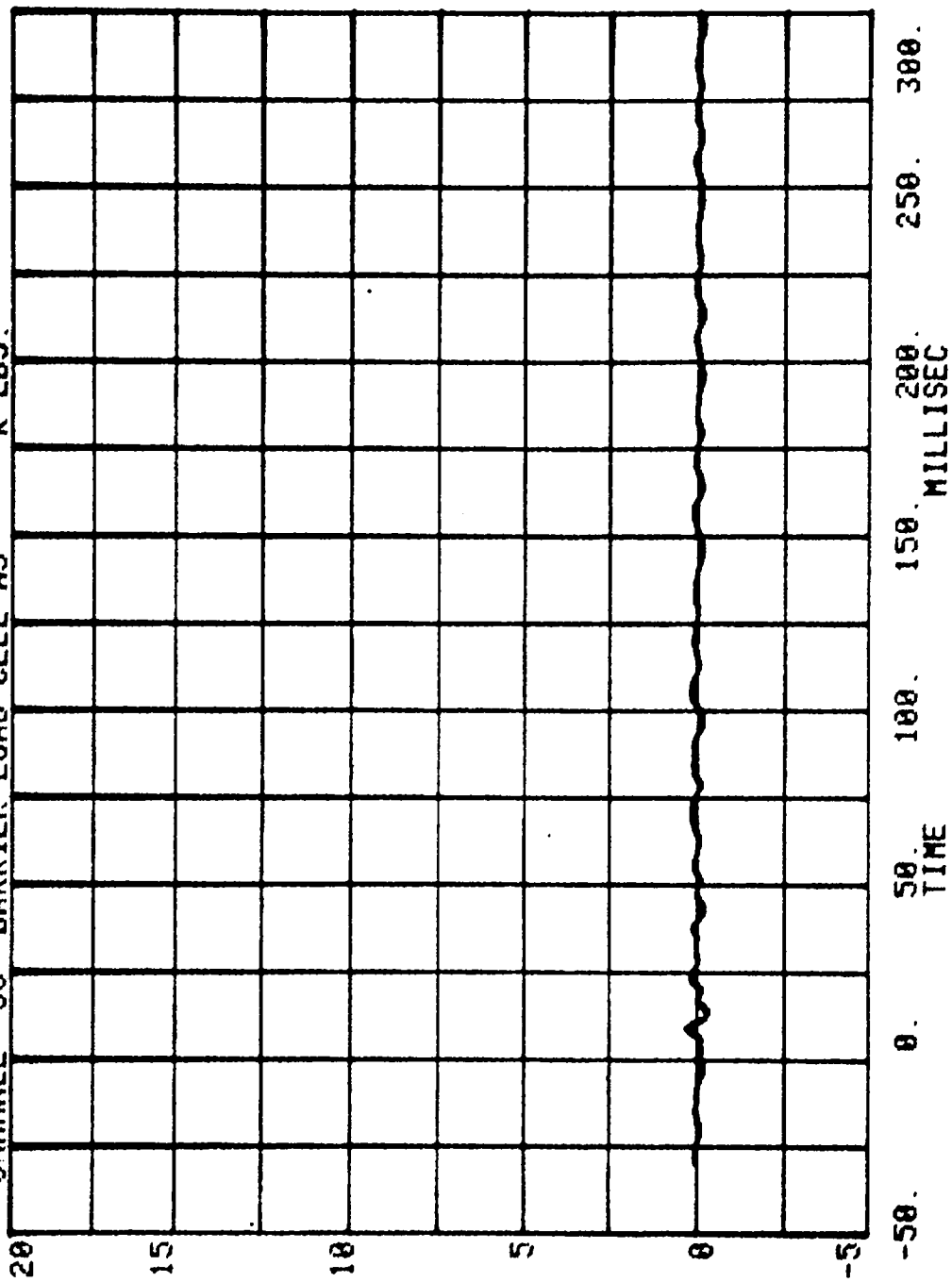


-50. 0. 50. 100. 150. 200. 250. 300.
TIME
MILLISEC

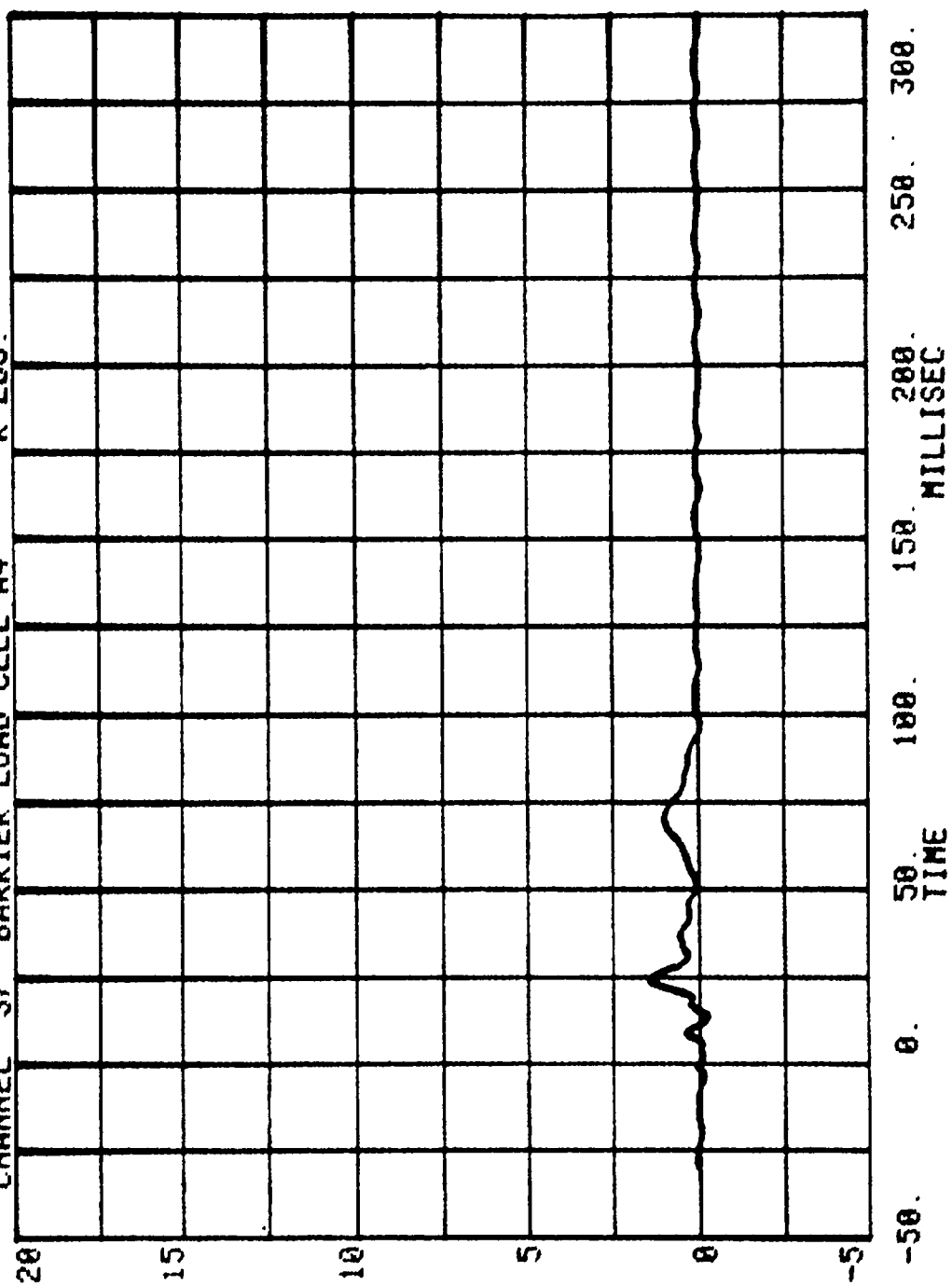
CHANNEL 35 BARRIER LOAD CELL A2 RUN= 767 SERIES= 300 K LBS.



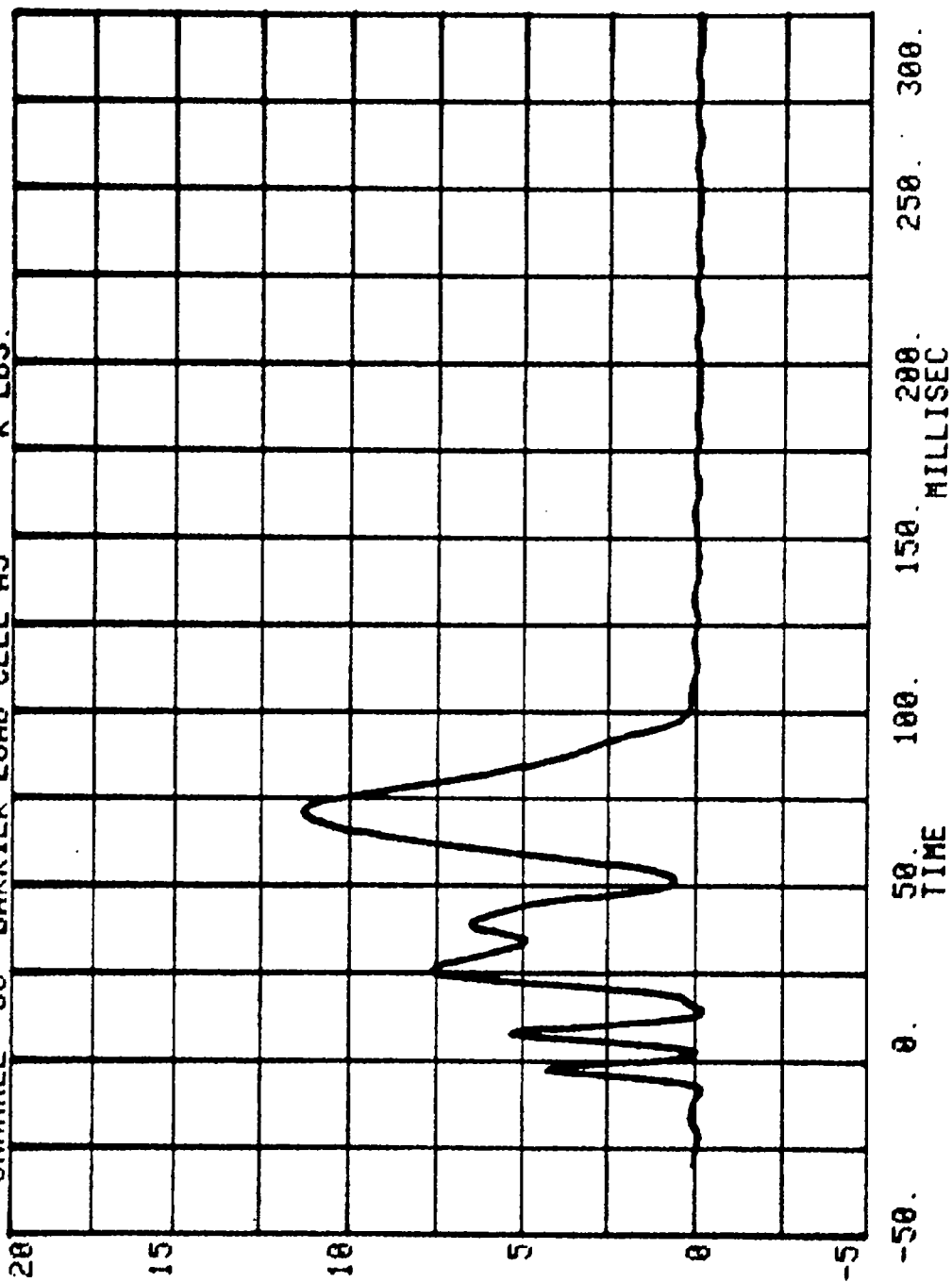
RUN= 767 SERIES= 300
CHANNEL 36 BARRIER LOAD CELL A3 K LBS.



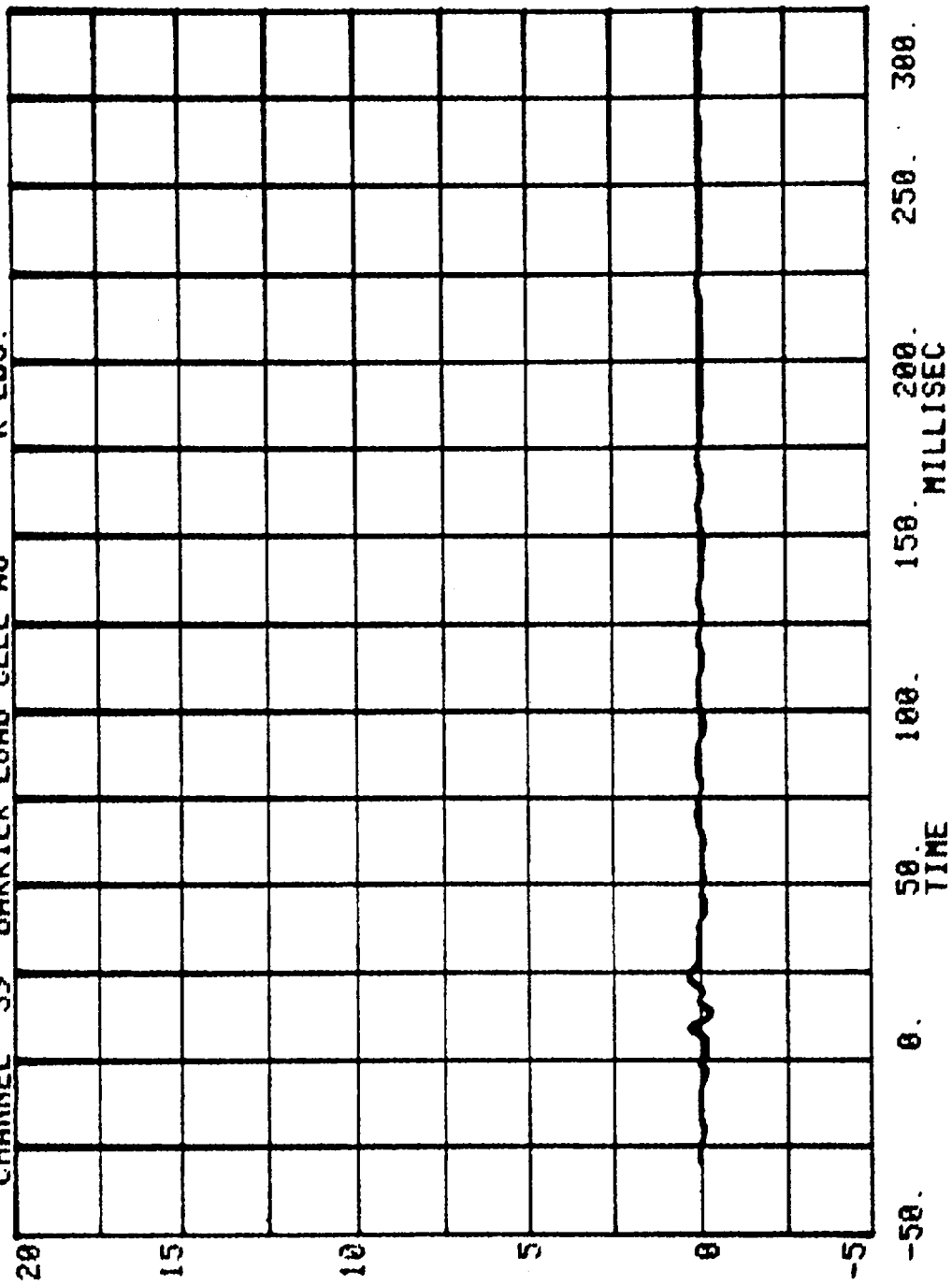
CHANNEL 37 BARRIER LOAD CELL A4 RUN= 767 SERIES= 300 K LBS.



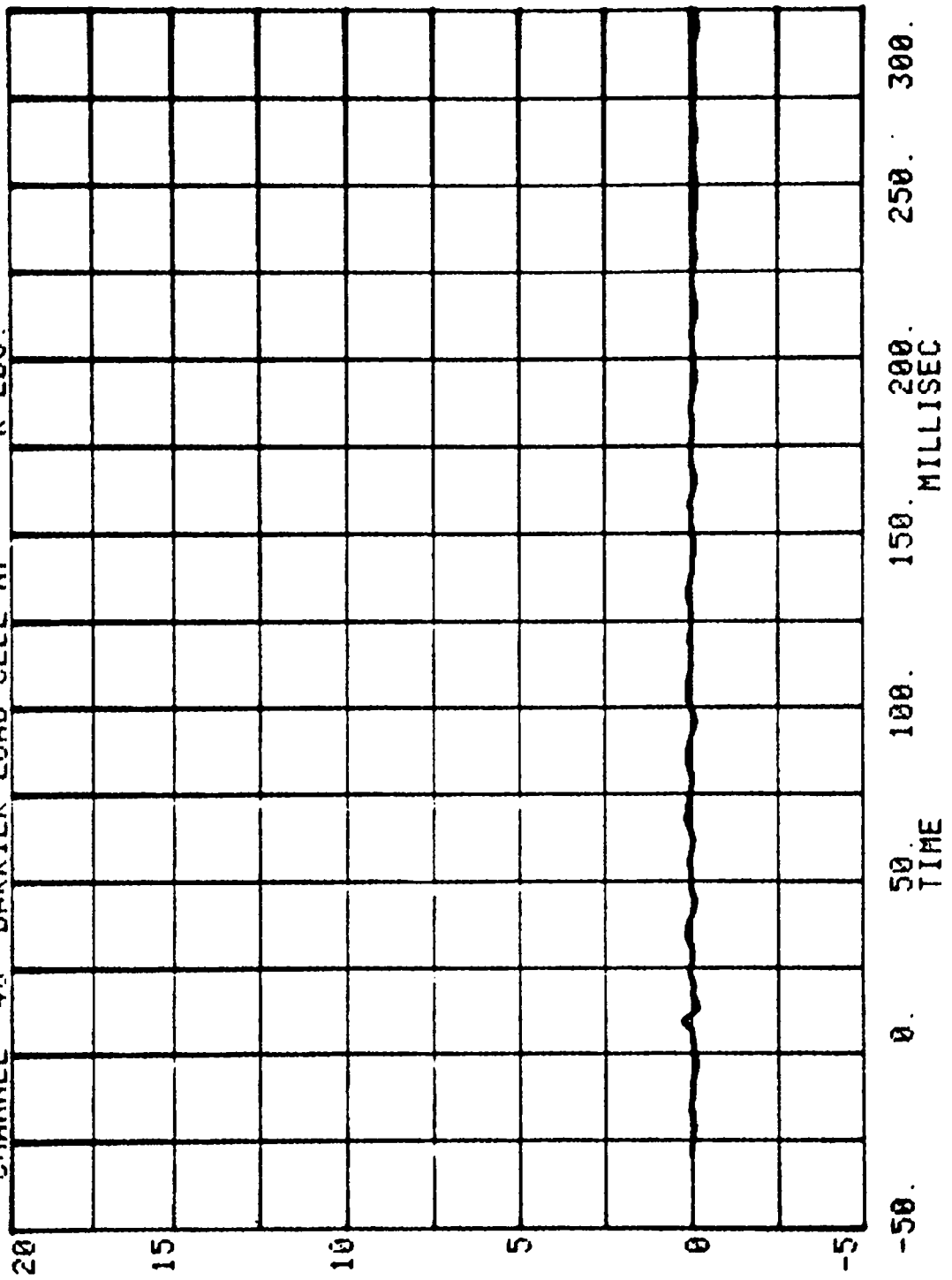
RUN= 767 SERIES= 300
CHANNEL 38 BARRIER LOAD CELL A5 K LBS.



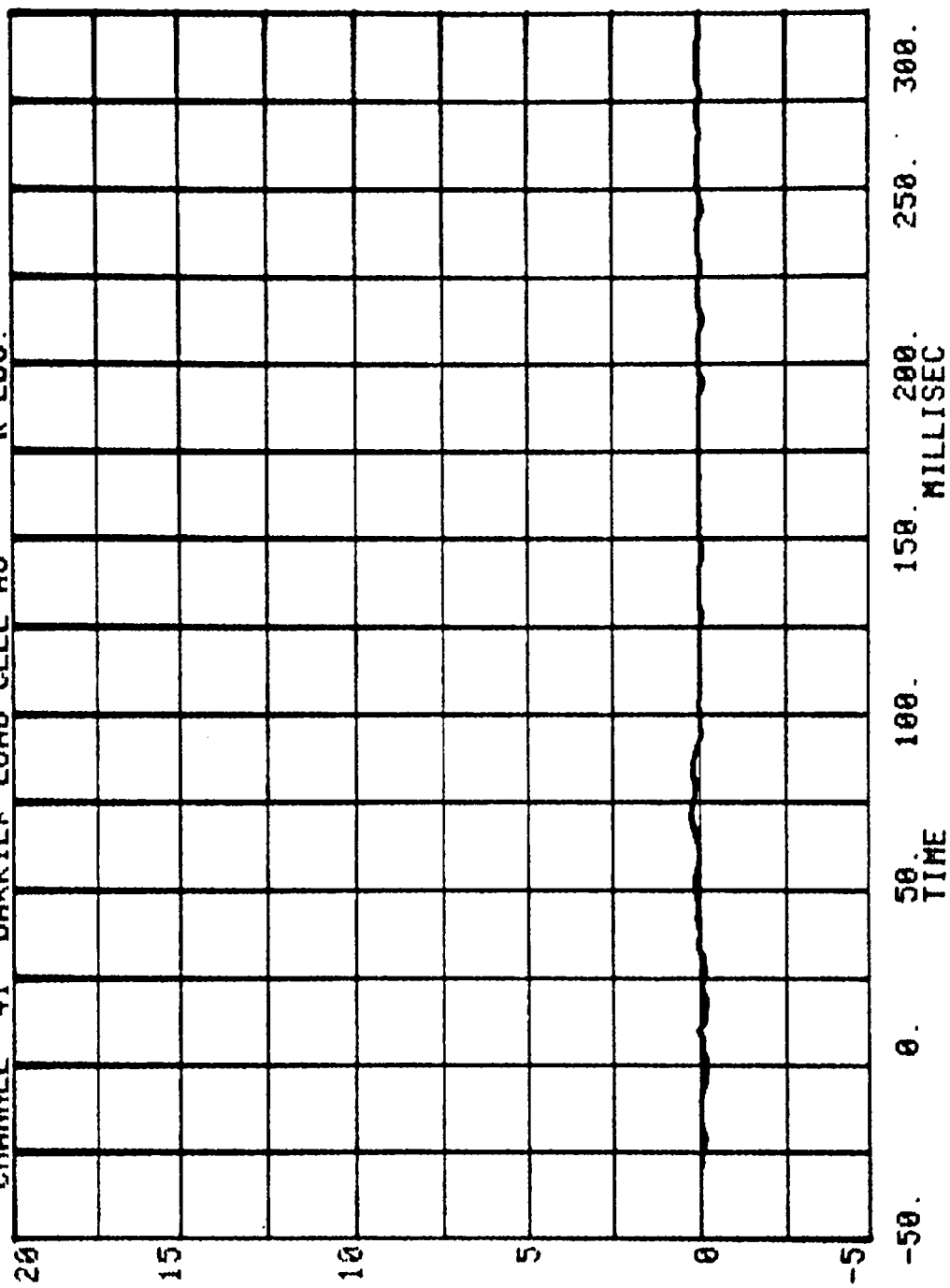
CHANNEL 39 BARRIER LOAD CELL A6
RUN= 767 SERIES= 300 K LBS.



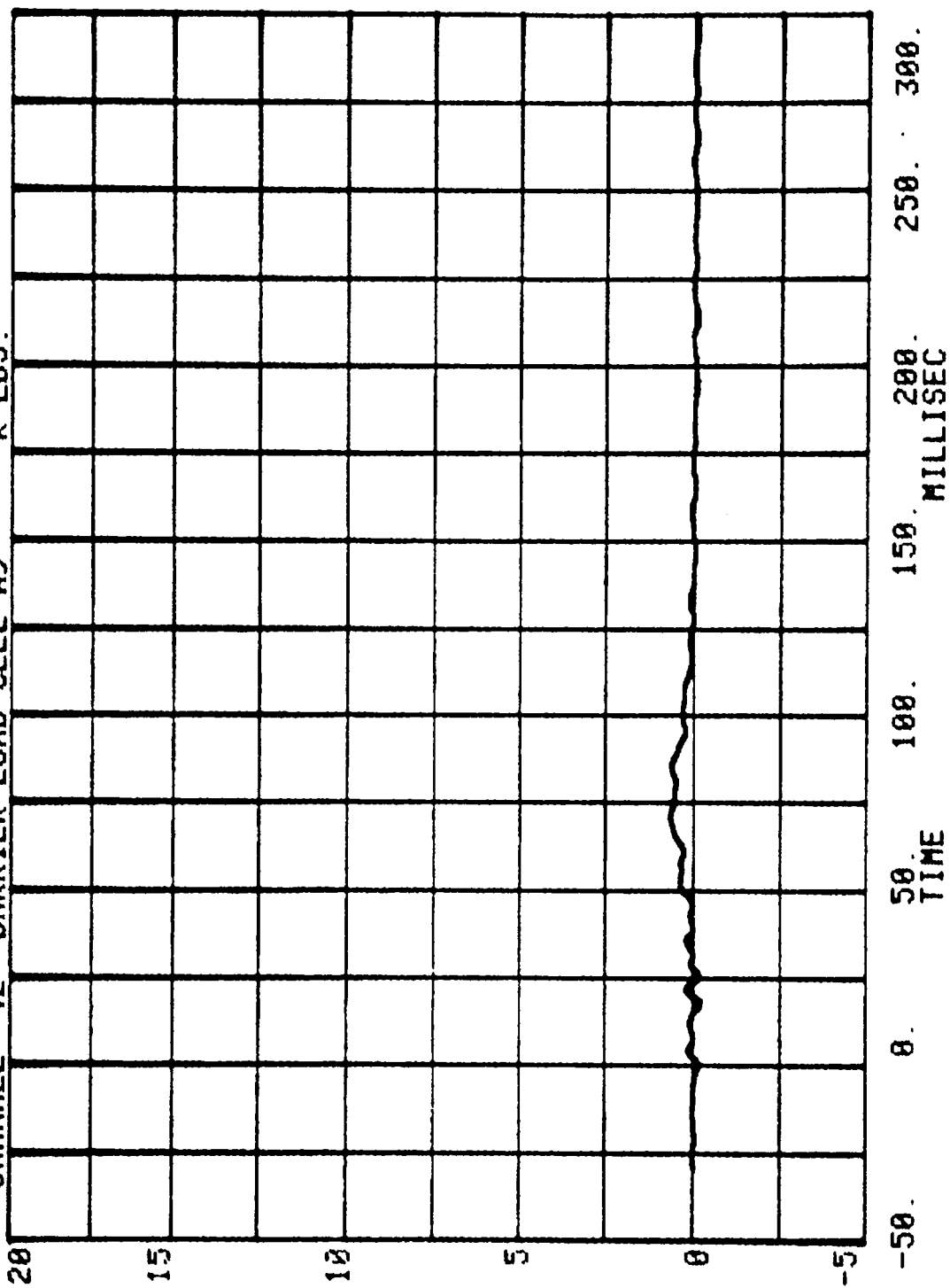
CHANNEL 40 BARRIER LOAD CELL A7 RUN= 767 SERIES= 300 K LBS.



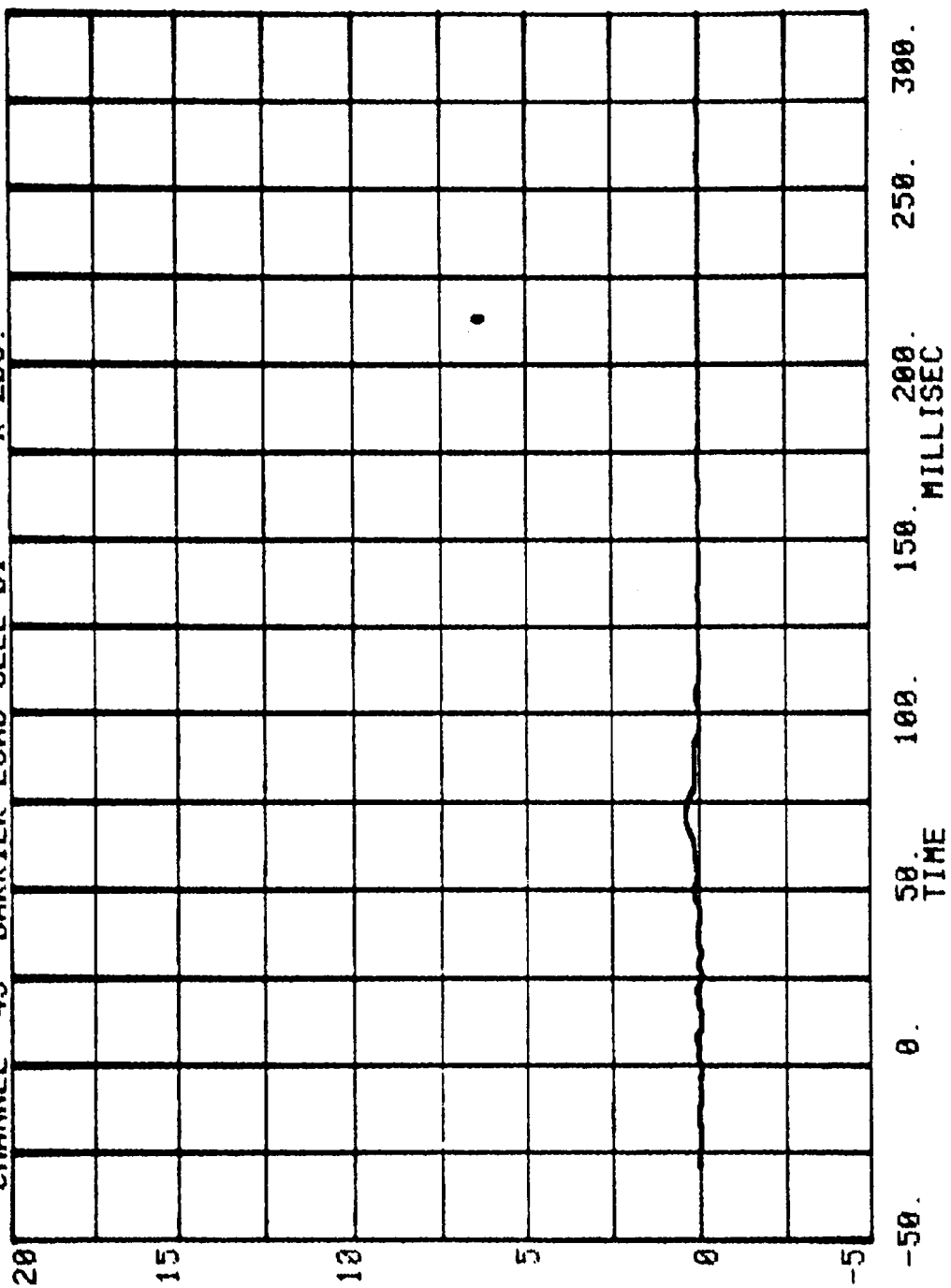
CHANNEL 41 BARRIER LOAD CELL A8 RUN= 767 SERIES= 300 K LBS.



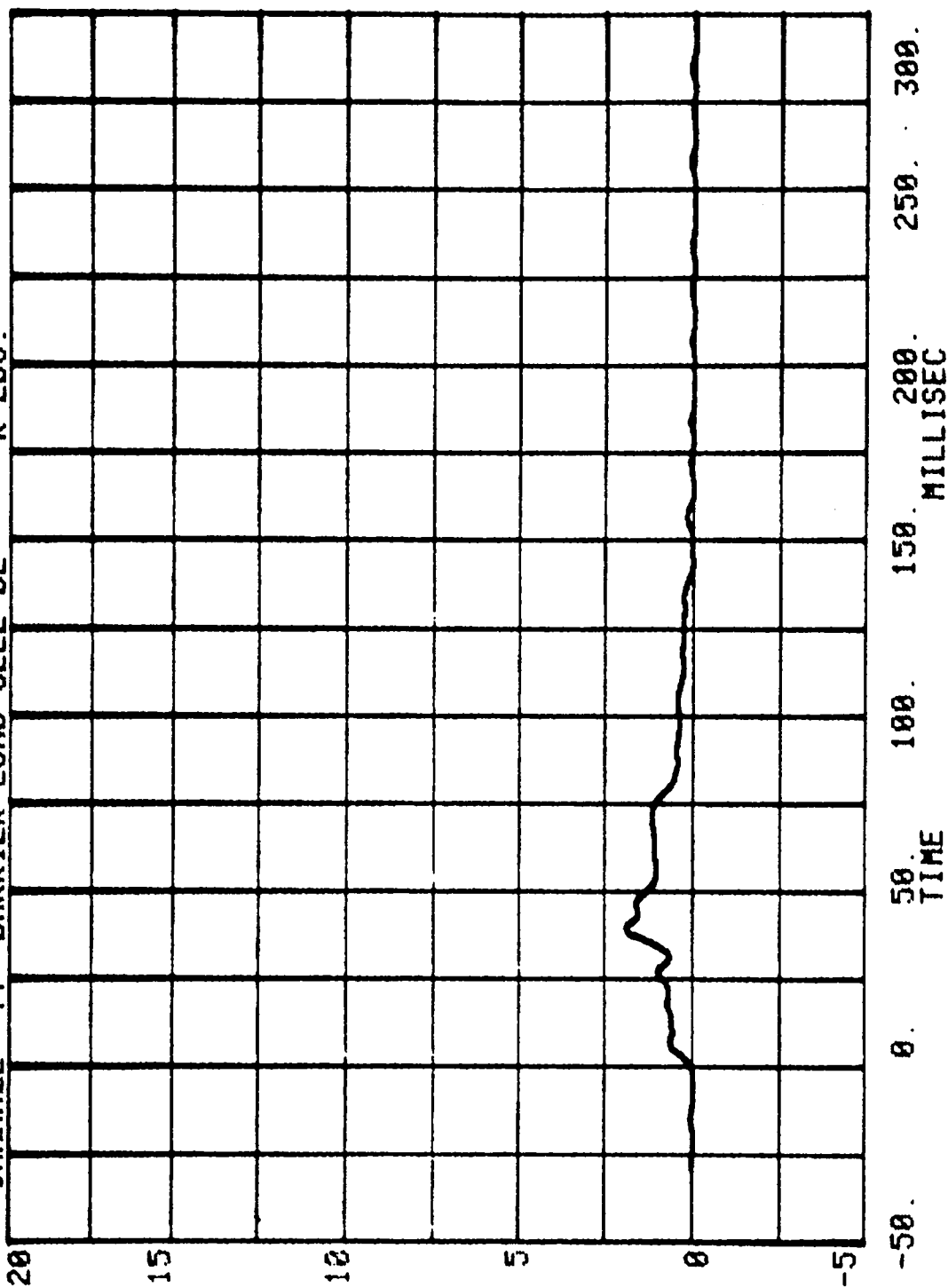
CHANNEL 42 BARRIER LOAD CELL A9 RUN= 767 SERIES= 300 K LBS.

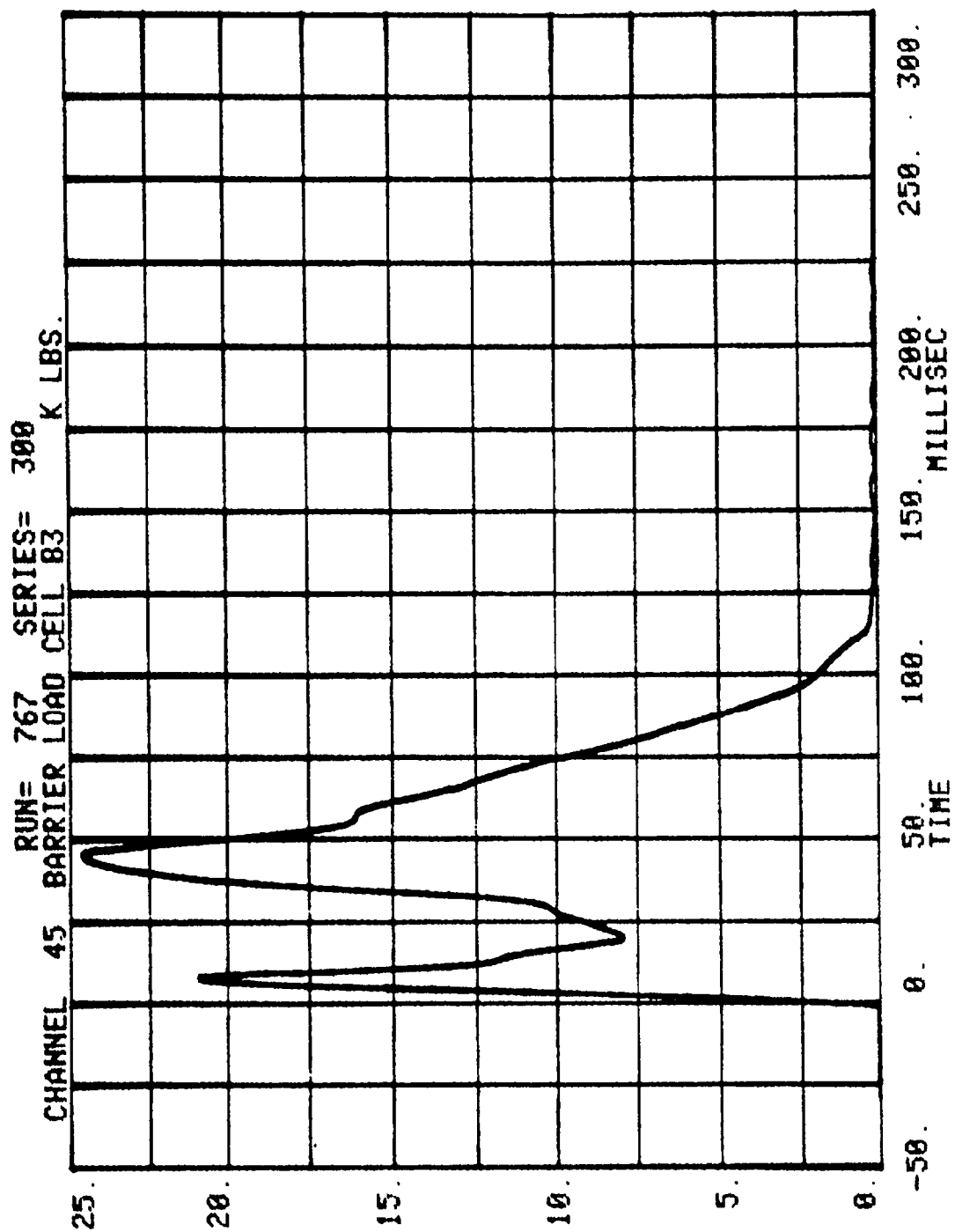


CHANNEL 43 BARRIER LOAD CELL B1 RUN= 767 SERIES= 300 K LBS.

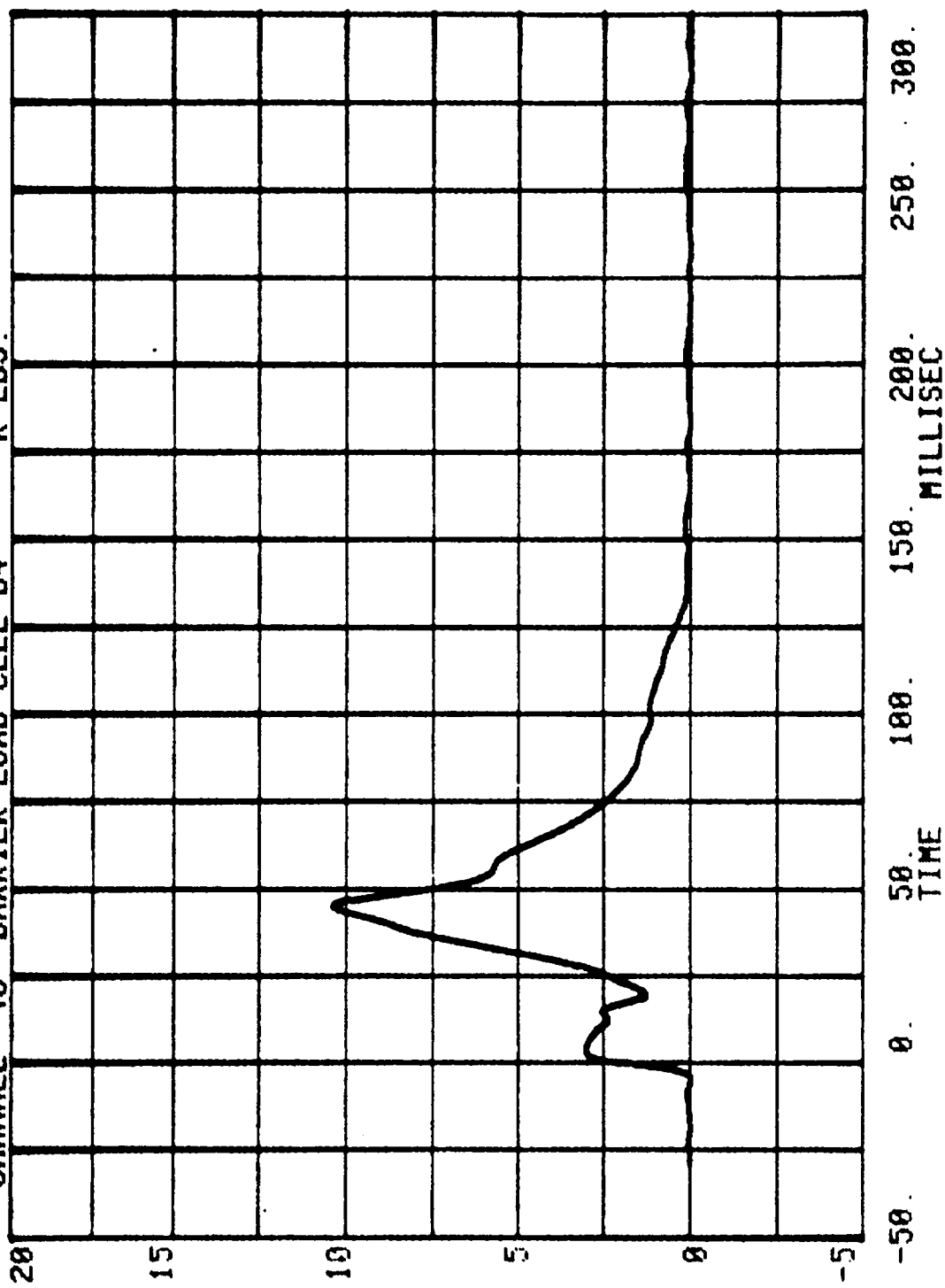


CHANNEL 44 RUN= 767 SERIES= 300 K LBS.
BARRIER LOAD CELL B2

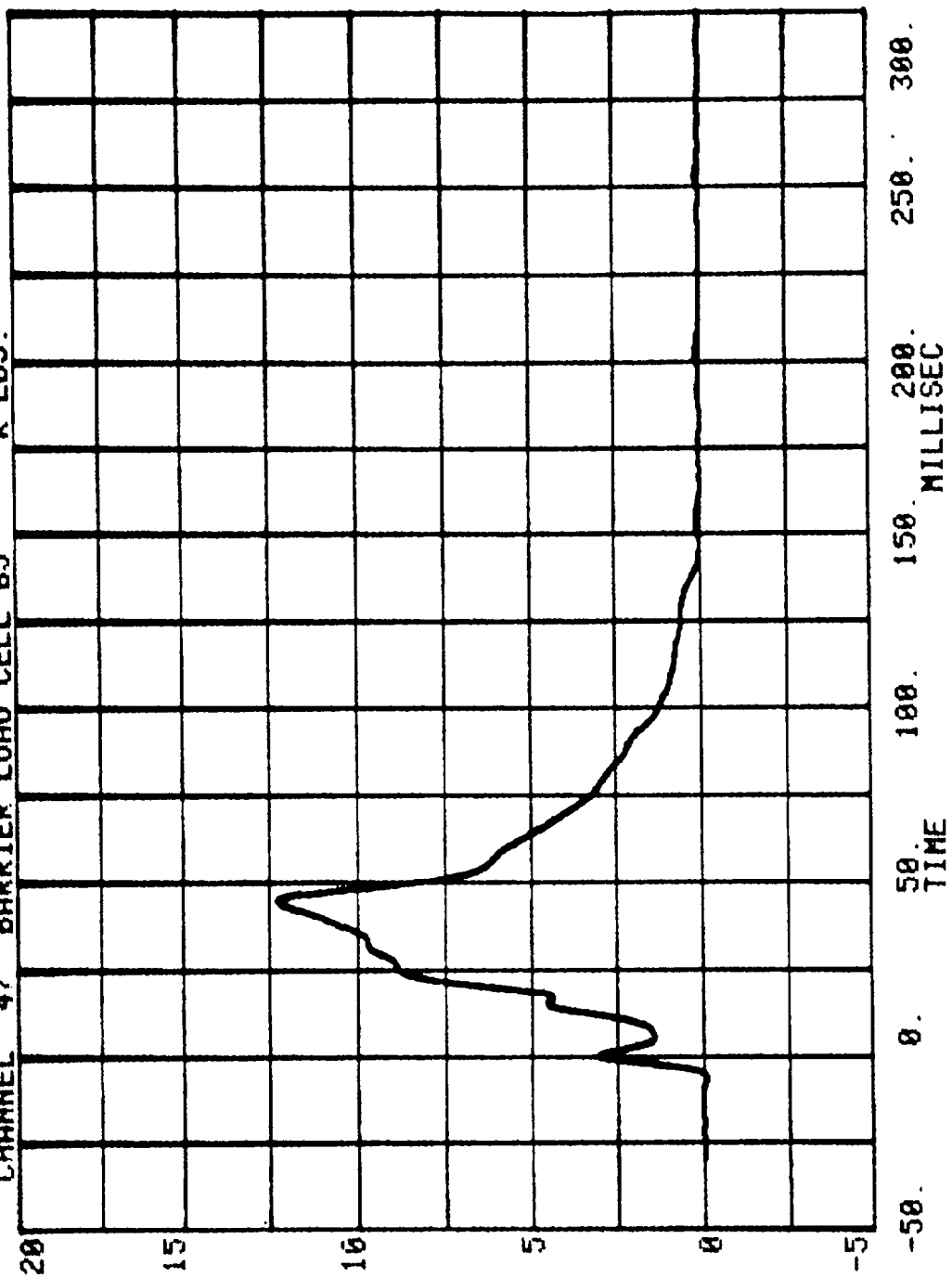




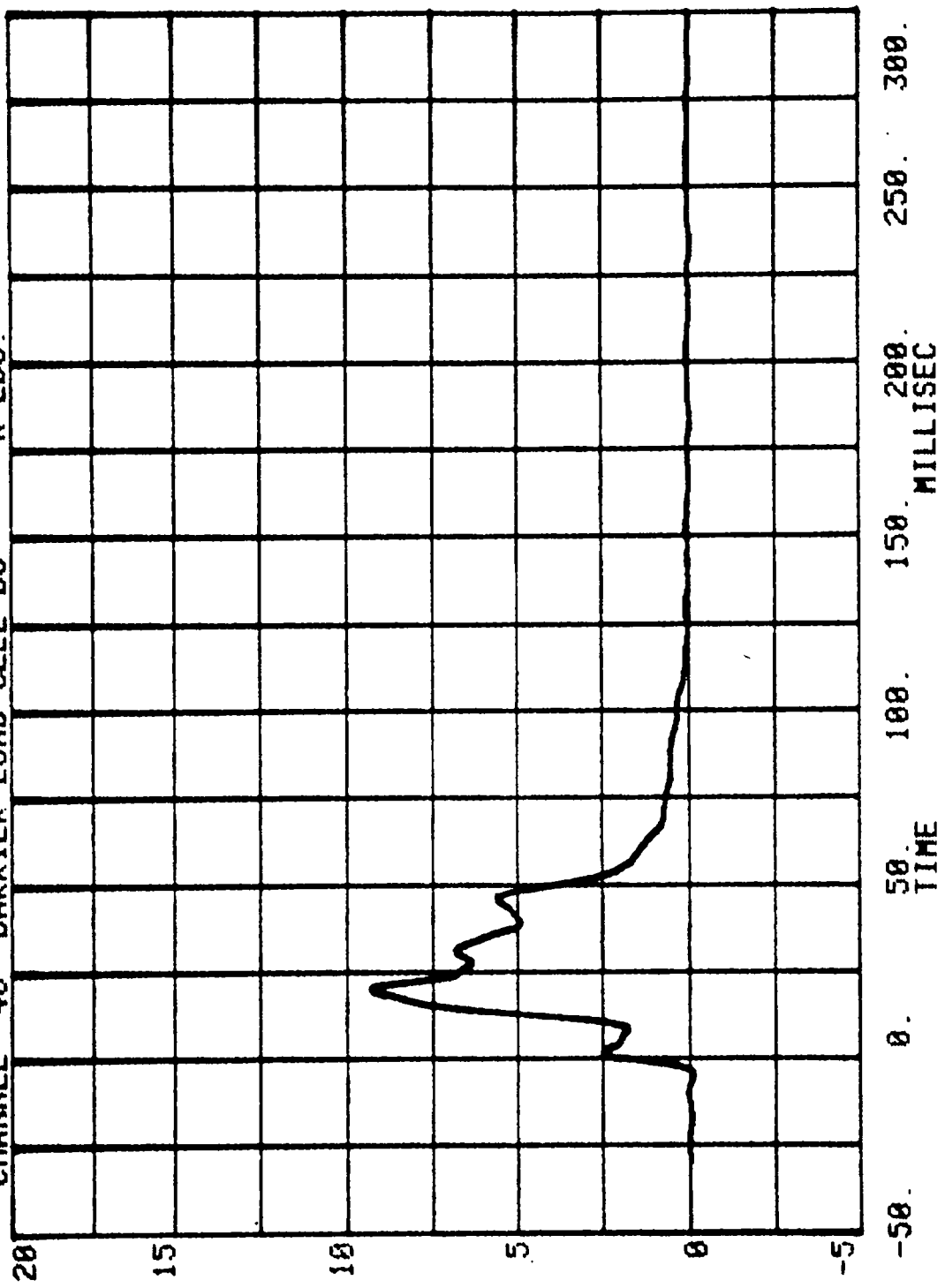
CHANNEL 46 BARRIER LOAD CELL B4 RUN= 767 SERIES= 300 K LBS.



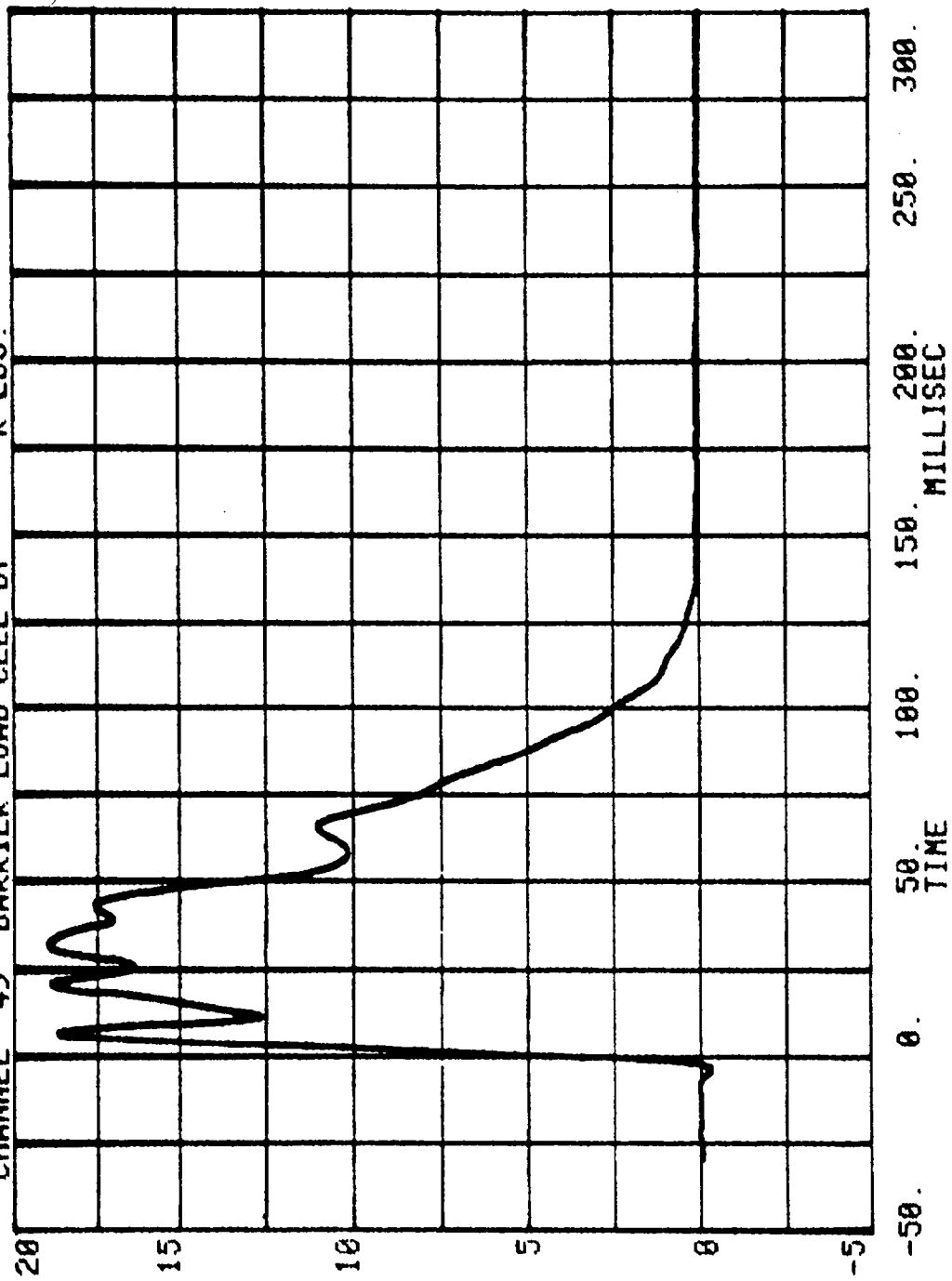
CHANNEL 47 BARRIER LOAD CELL B5
RUN= 767 SERIES= 300 K LBS.



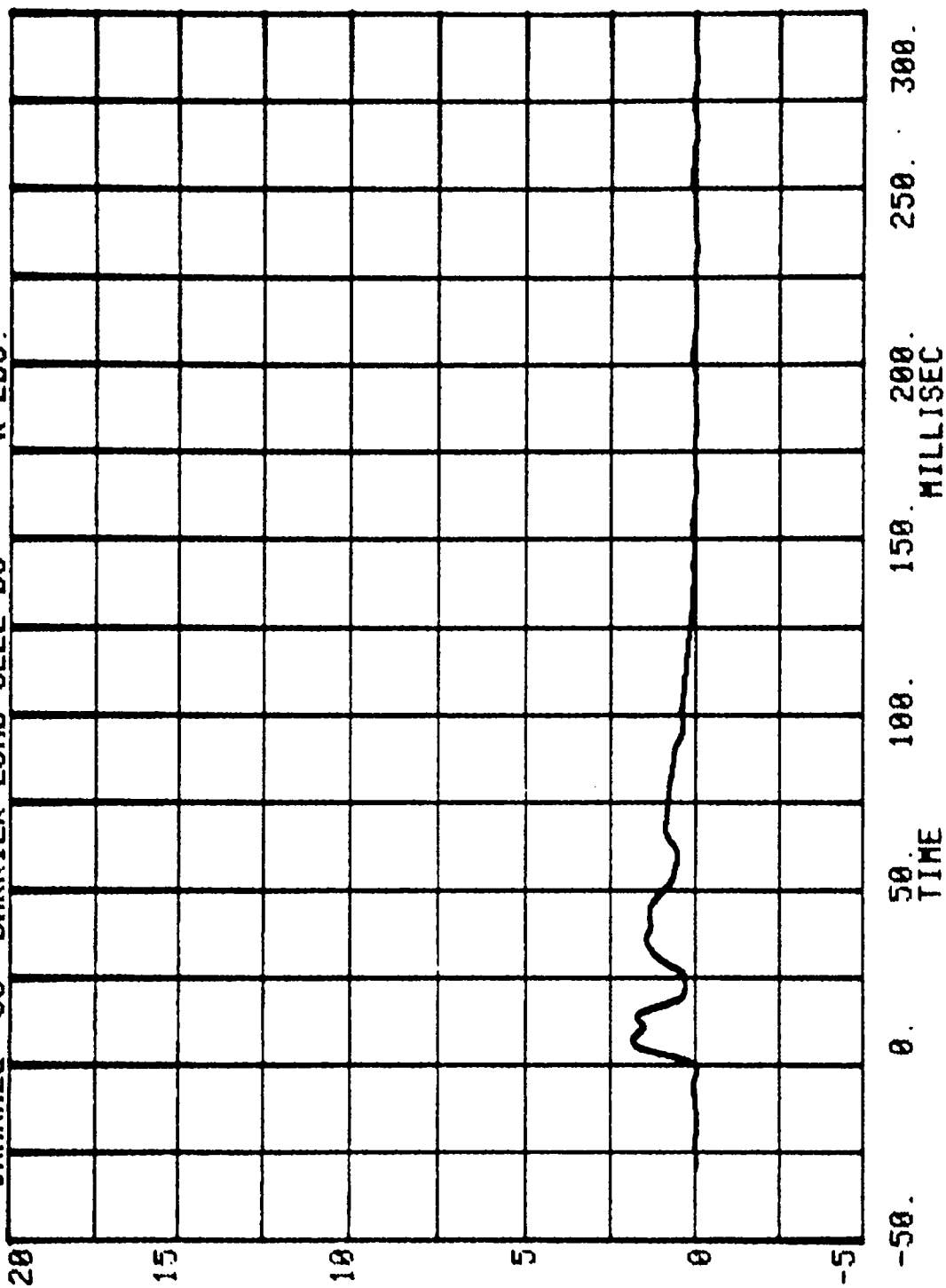
RUN= 767 SERIES= 300
CHANNEL 48 BARRIER LOAD CELL B6 K LBS.



RUN= 767 SERIES= 300
CHANNEL 49 BARRIER LOAD CELL B7 K LBS.

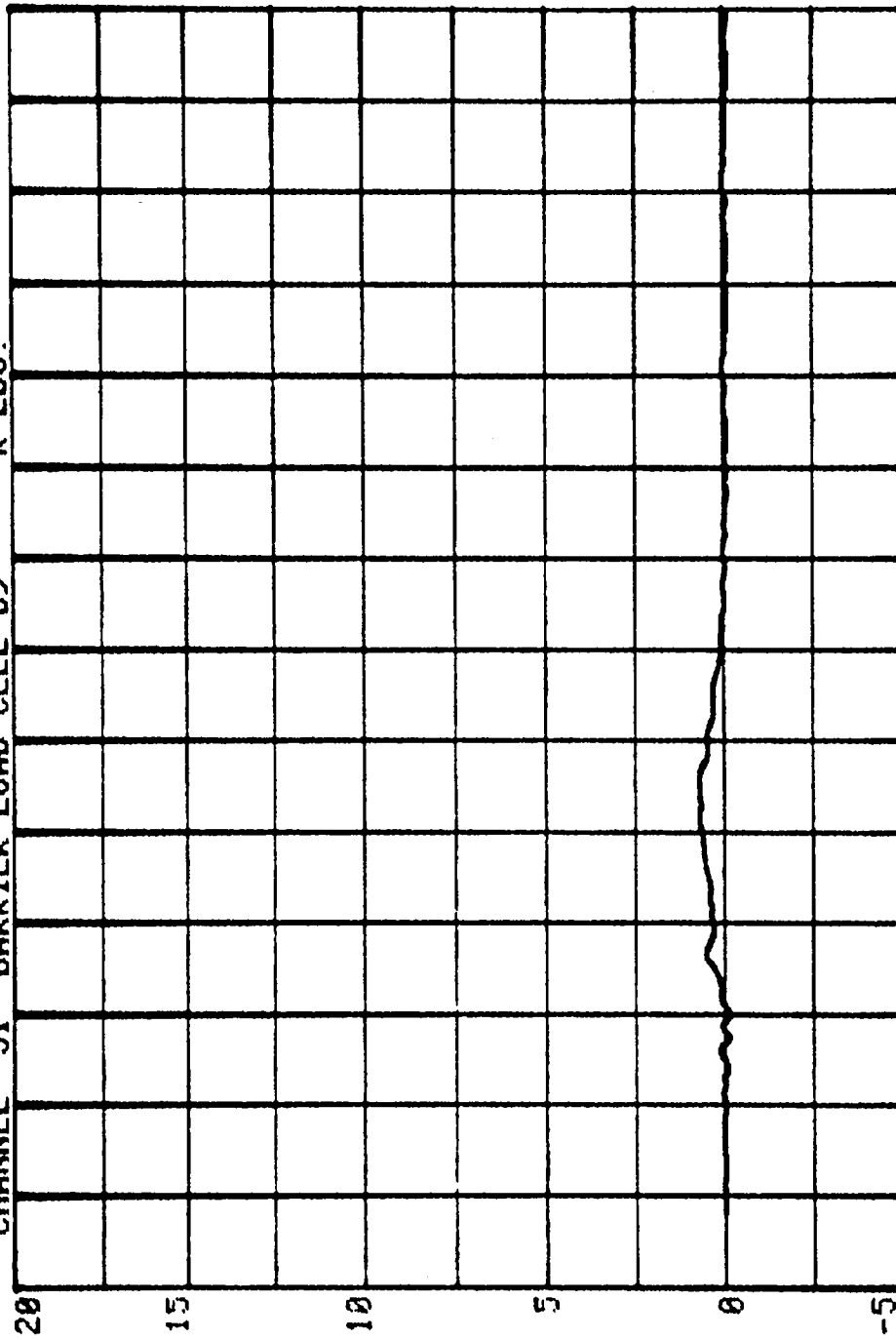


CHANNEL 58 BARRIER LOAD CELL B8
RUN= 767 SERIES= 300 K LBS.



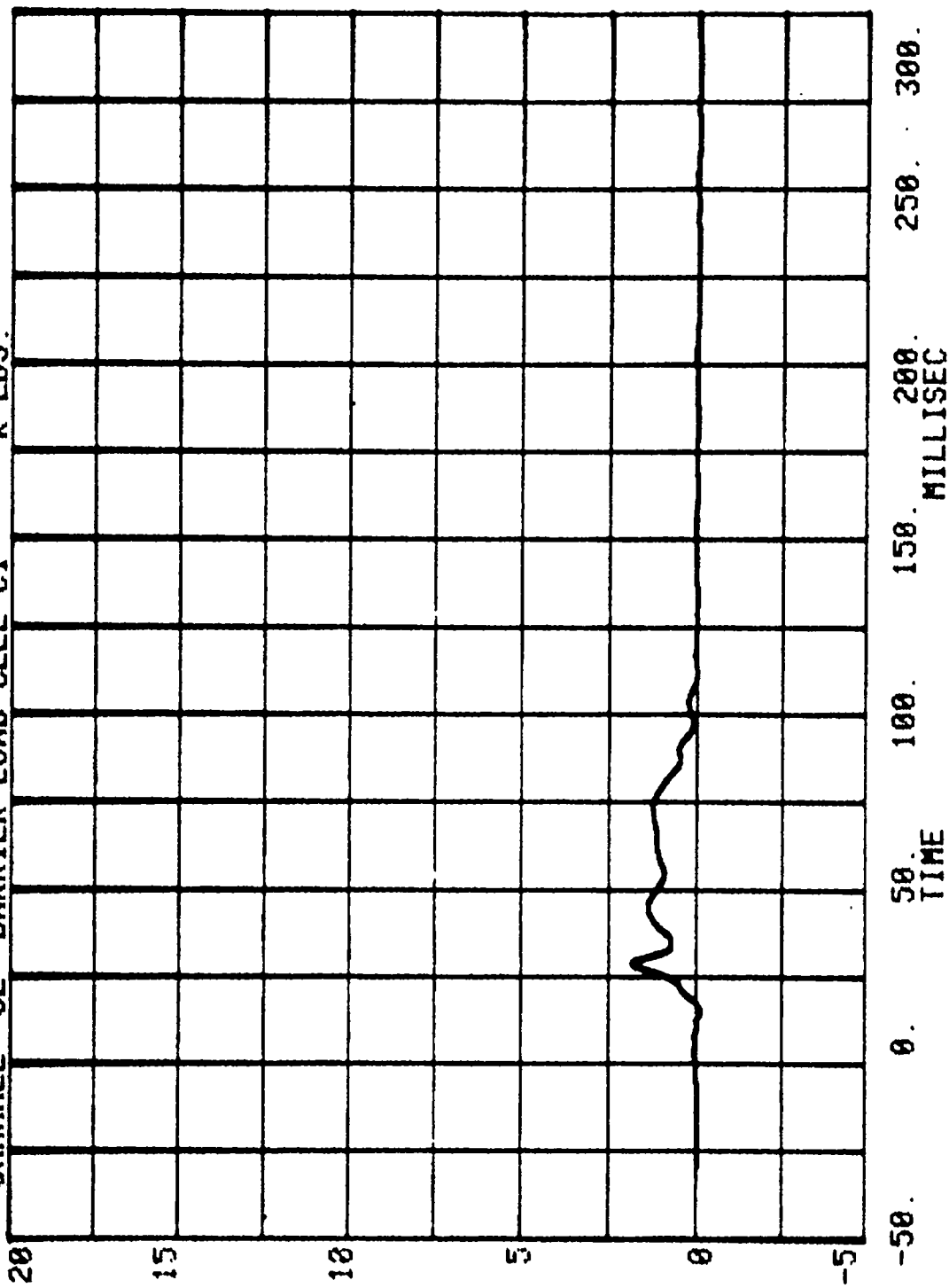
CHANNEL 51 BARRIER LOAD CELL B9 K LBS.

RUN= 767 SERIES= 300

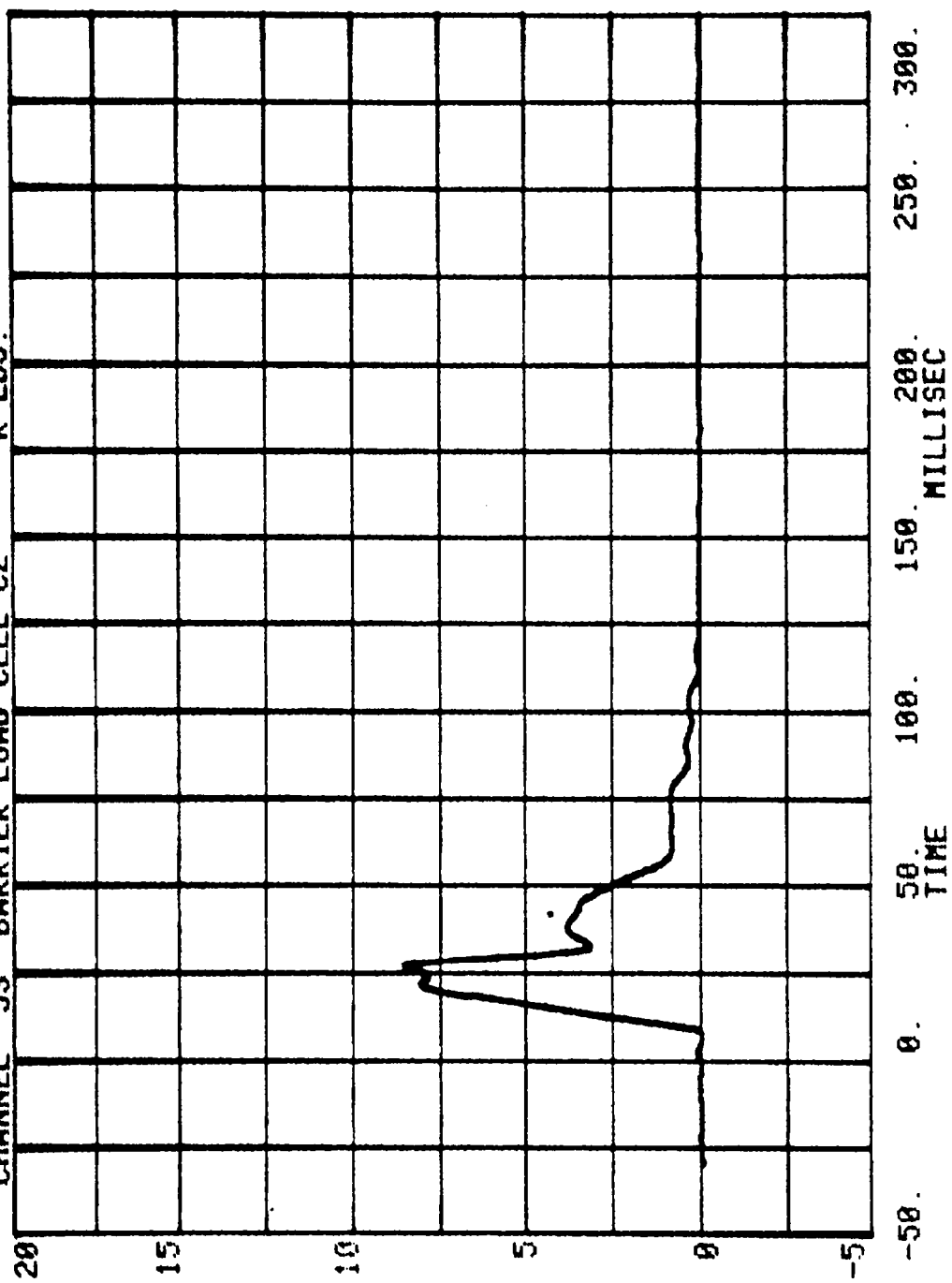


-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC

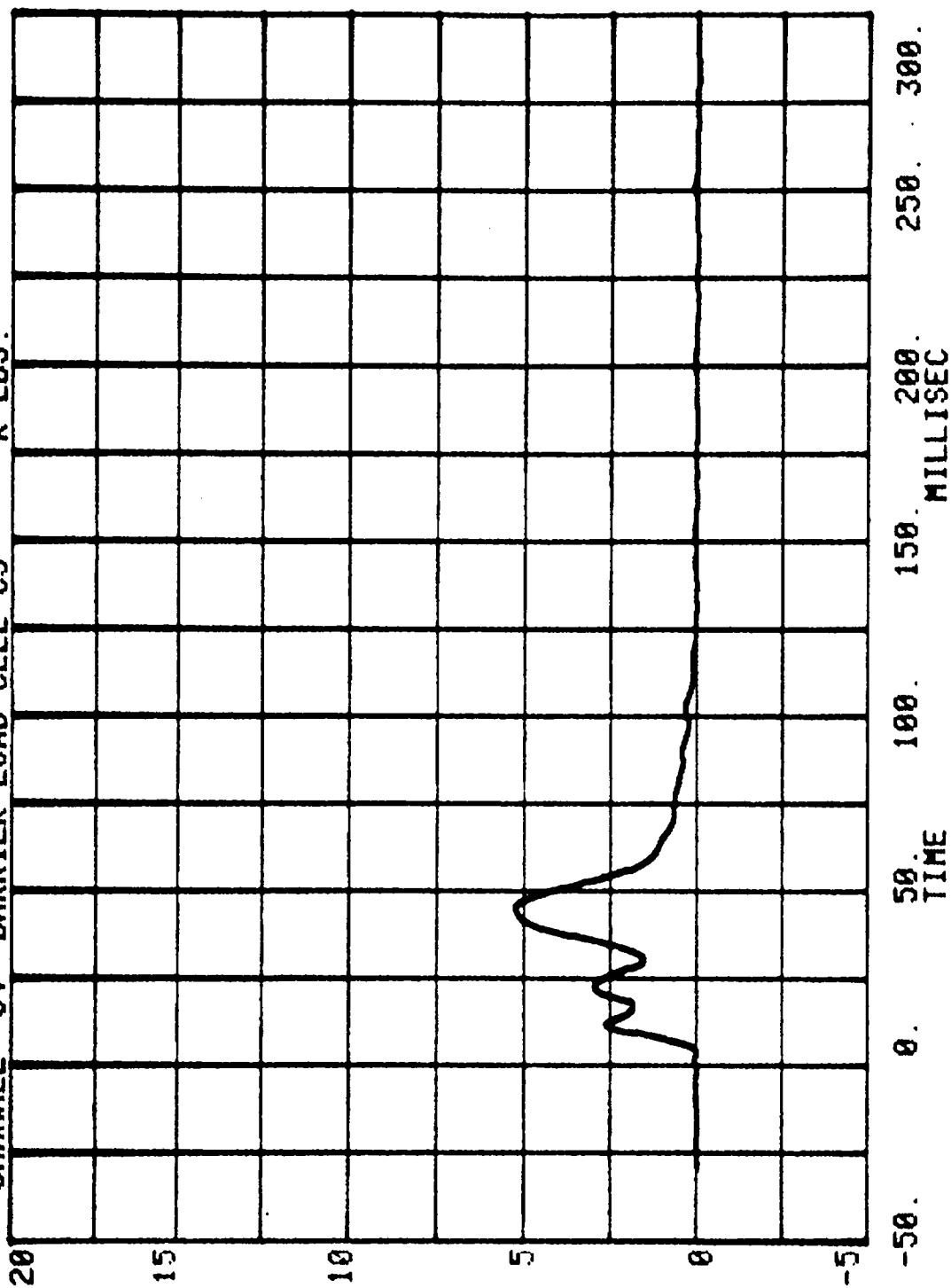
CHANNEL 52 BARRIER LOAD CELL C1 RUN= 767 SERIES= 300 K LBS.



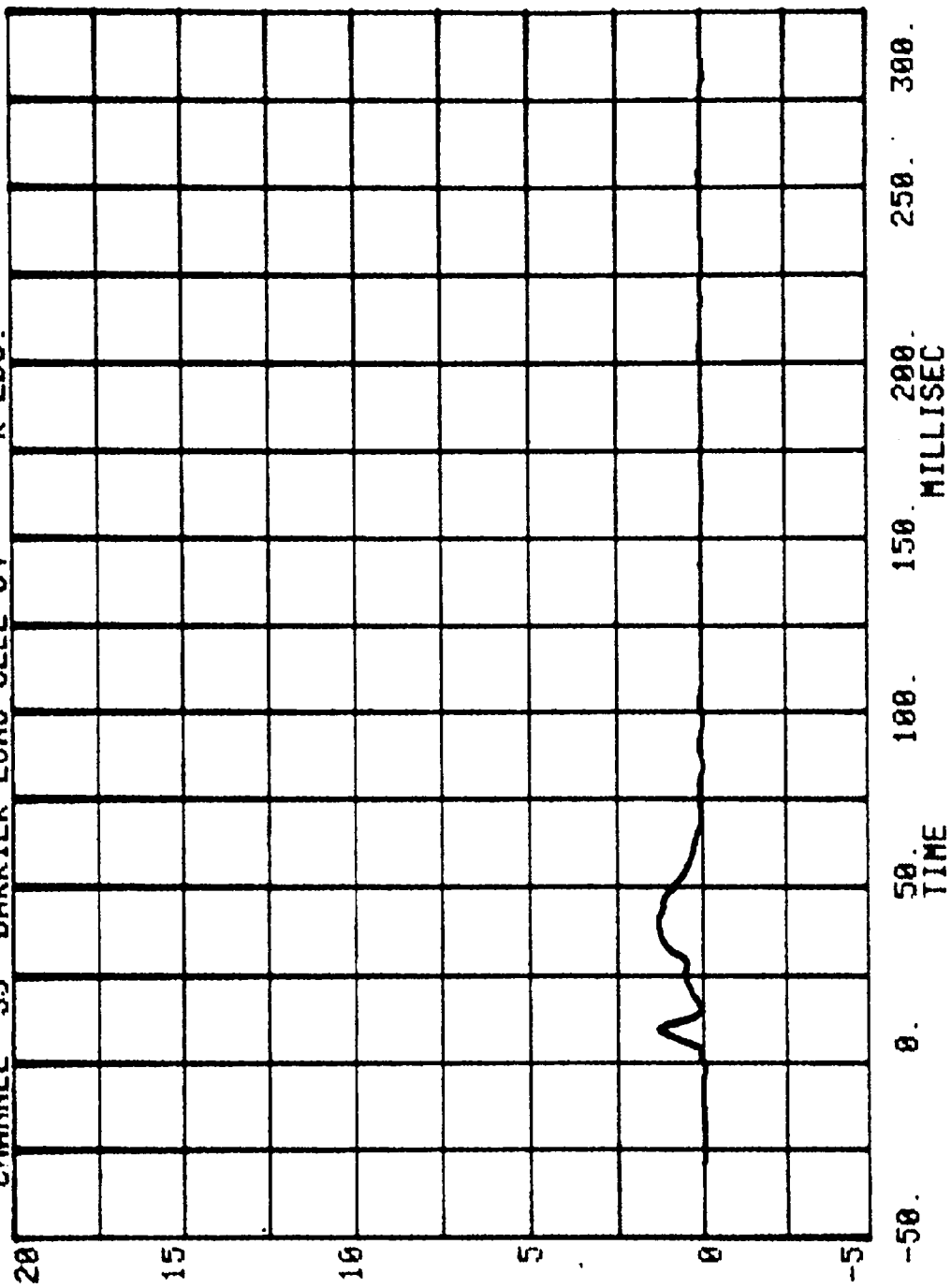
RUN= 767 SERIES= 300
CHANNEL 53 BARRIER LOAD CELL C2 K LBS.



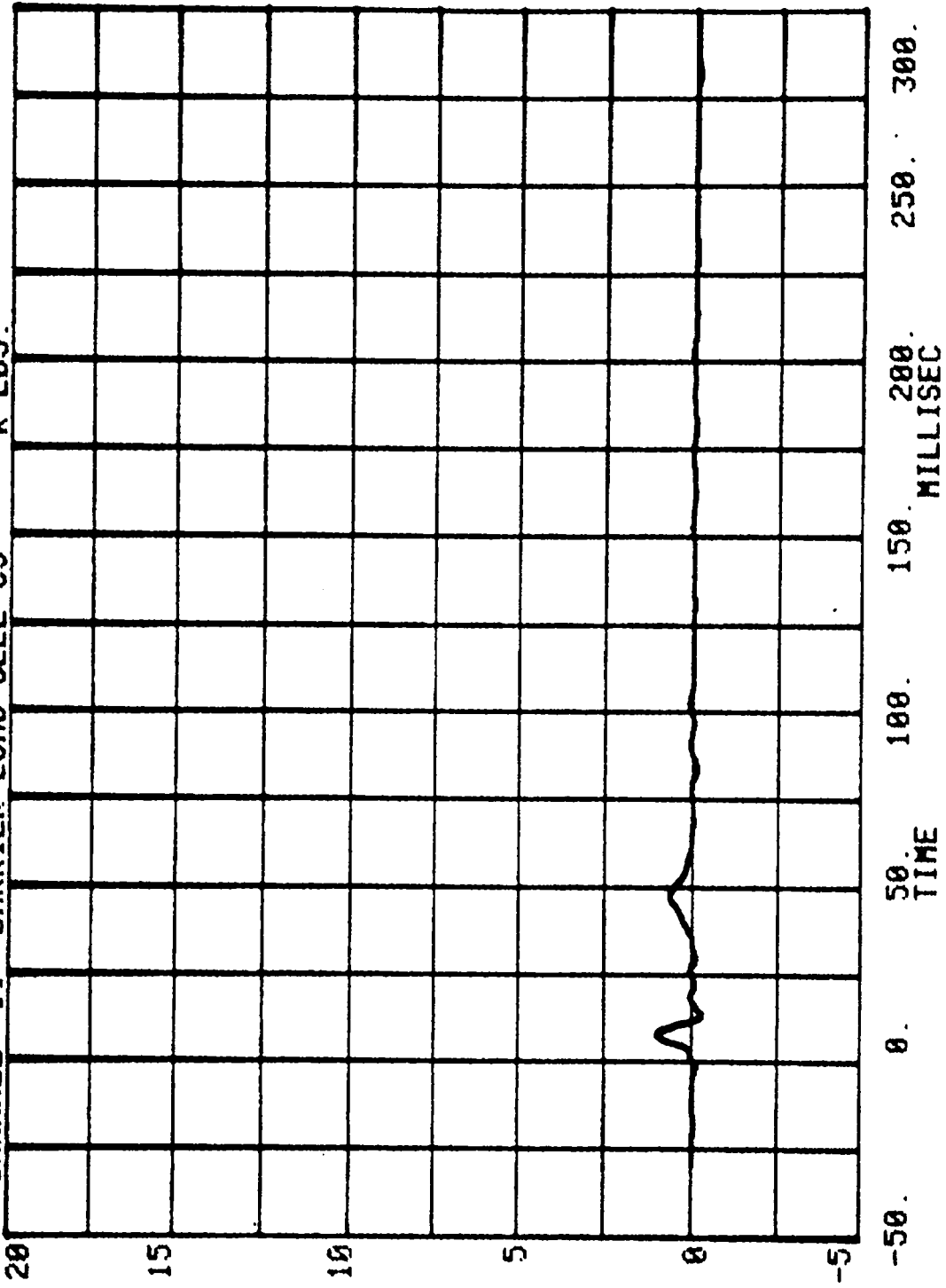
CHANNEL 54 BARRIER LOAD CELL C3 RUN= 767 SERIES= 300 K LBS.



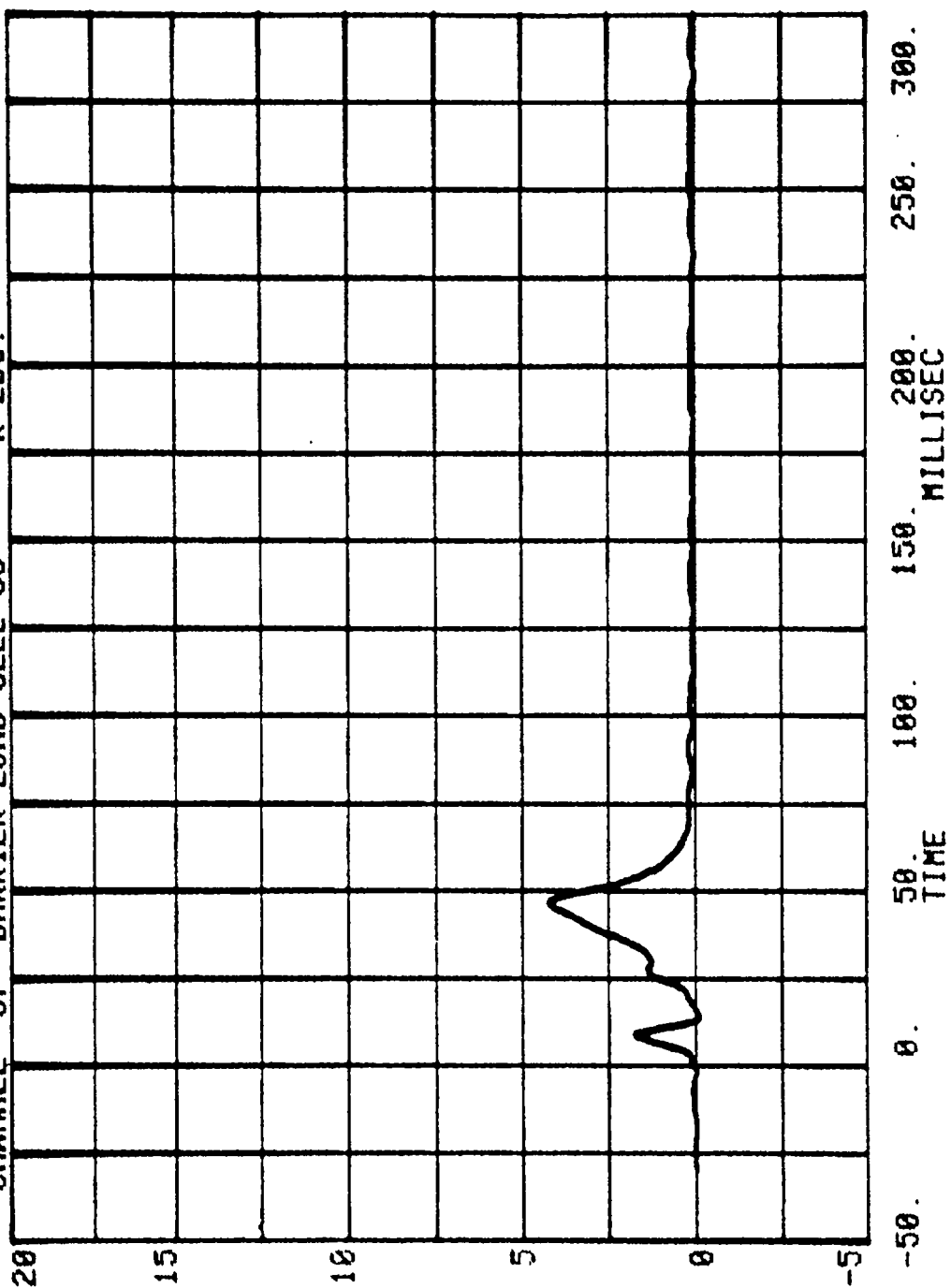
RUN= 767 SERIES= 300
CHANNEL 55 BARRIER LOAD CELL C4 K LBS.



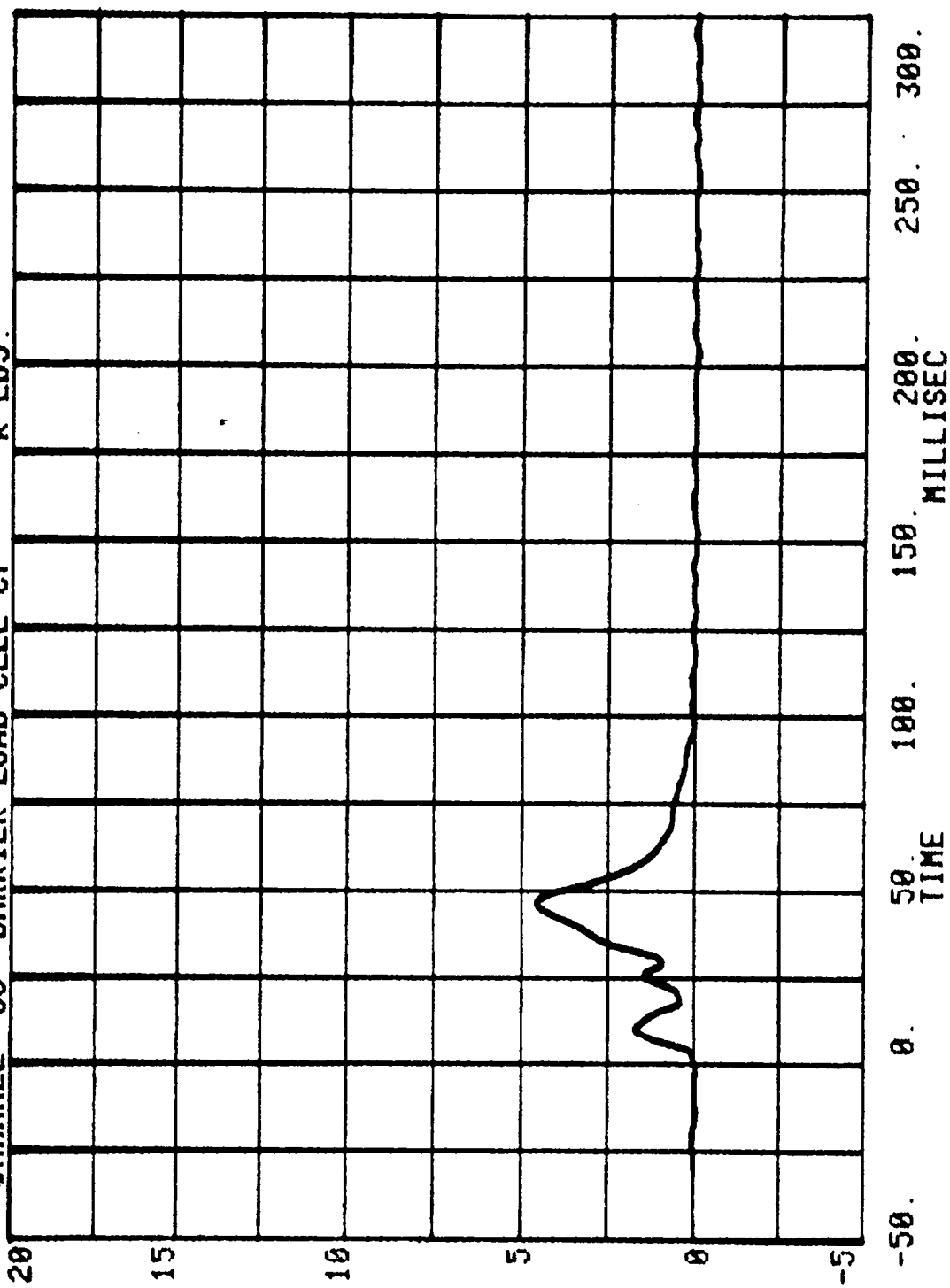
CHANNEL 56 BARRIER LOAD CELL C5 RUN= 767 SERIES= 300 K LBS.

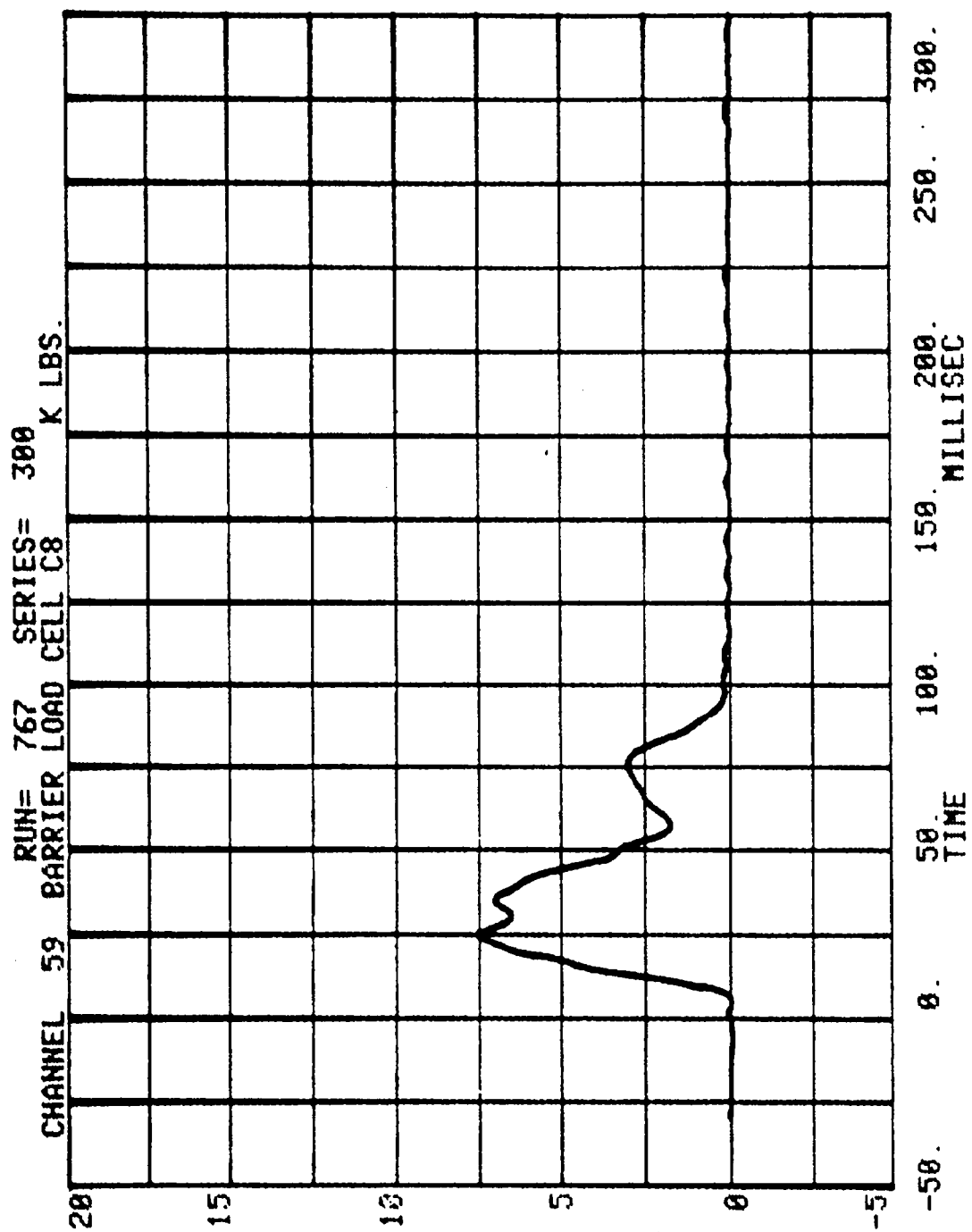


CHANNEL 57 BARRIER LOAD CELL C6 RUN= 767 SERIES= 300 K LBS.

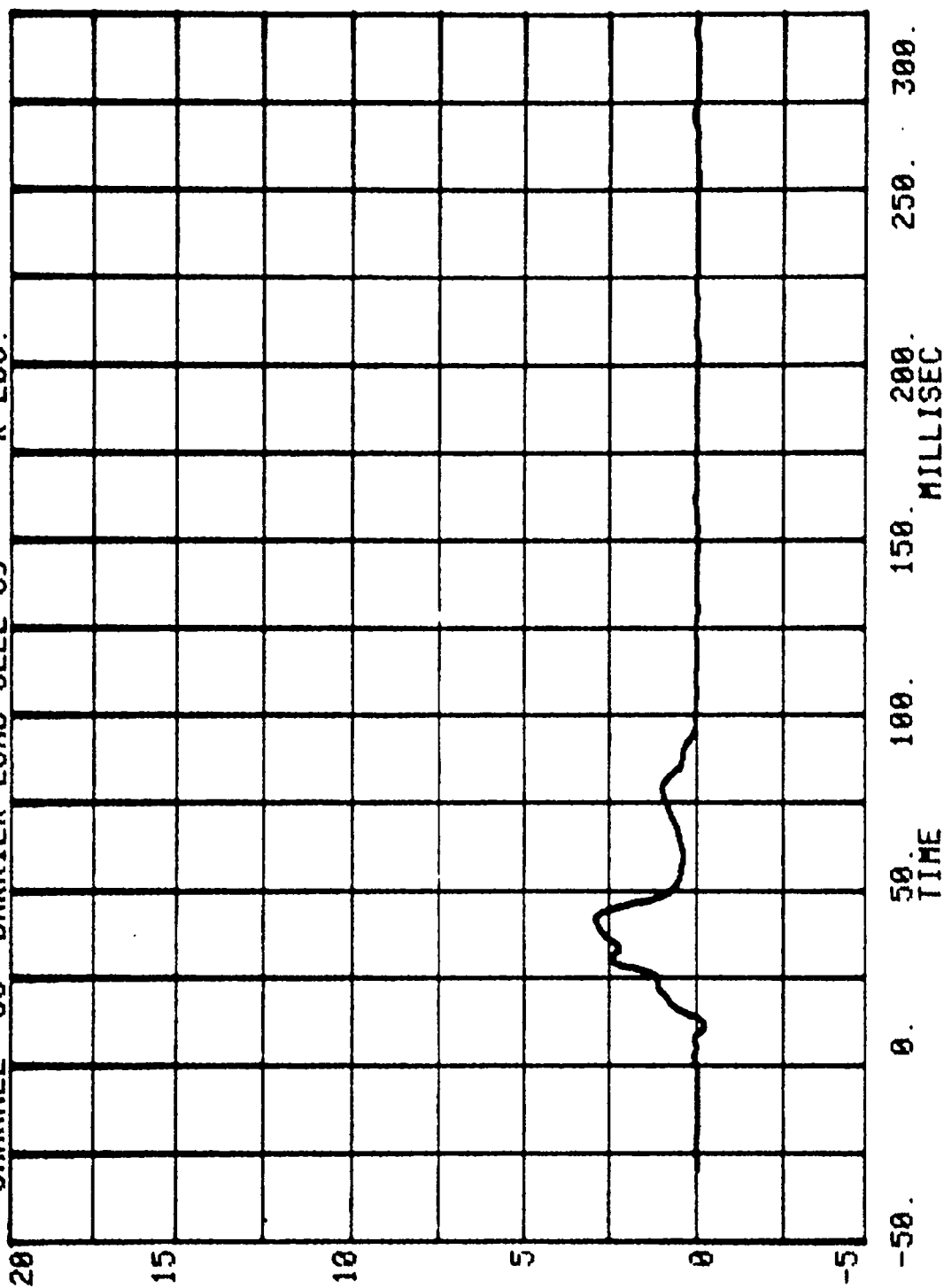


CHANNEL 58 BARRIER LOAD CELL C7 RUN= 767 SERIES= 300 K LBS.

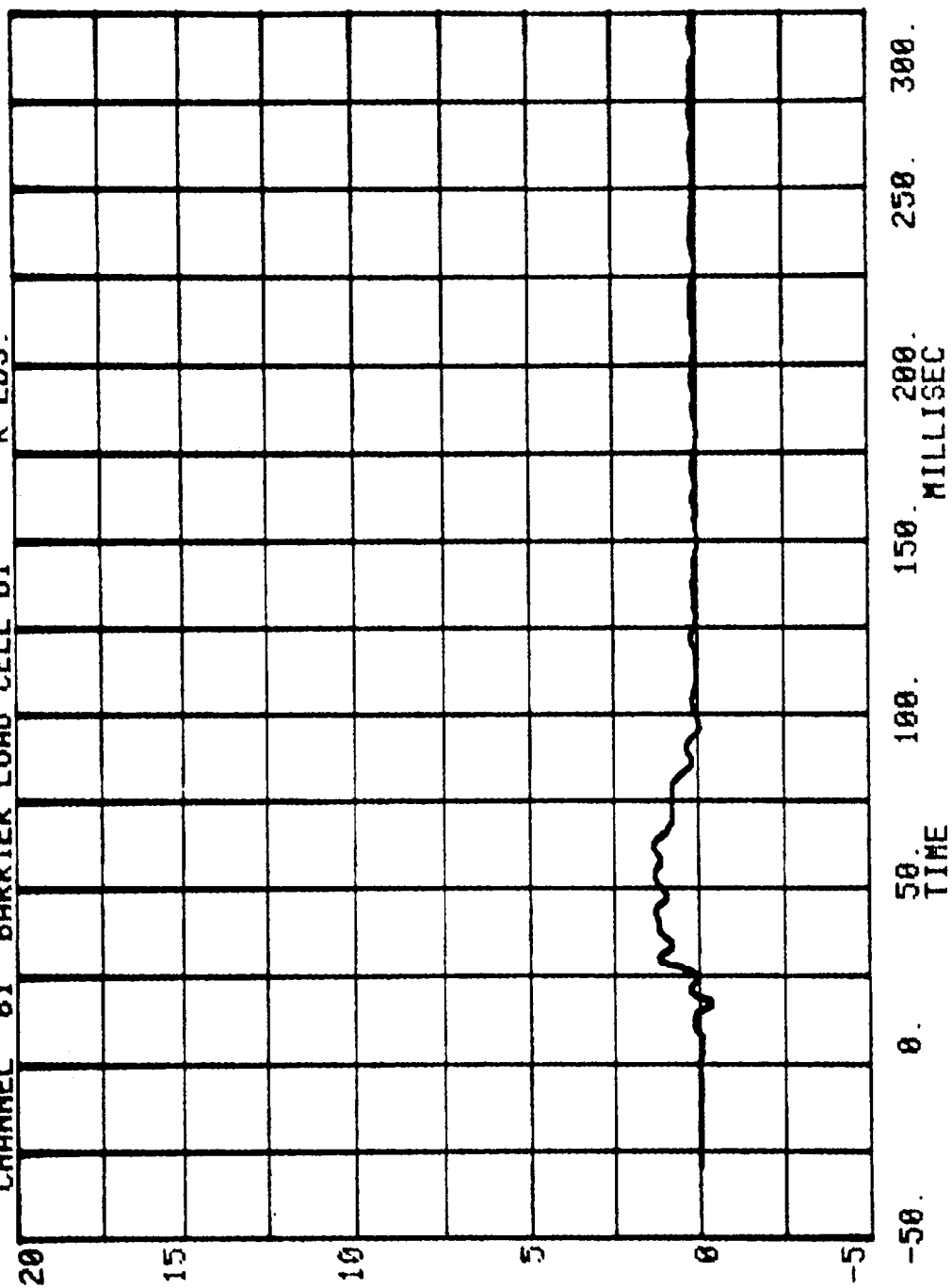




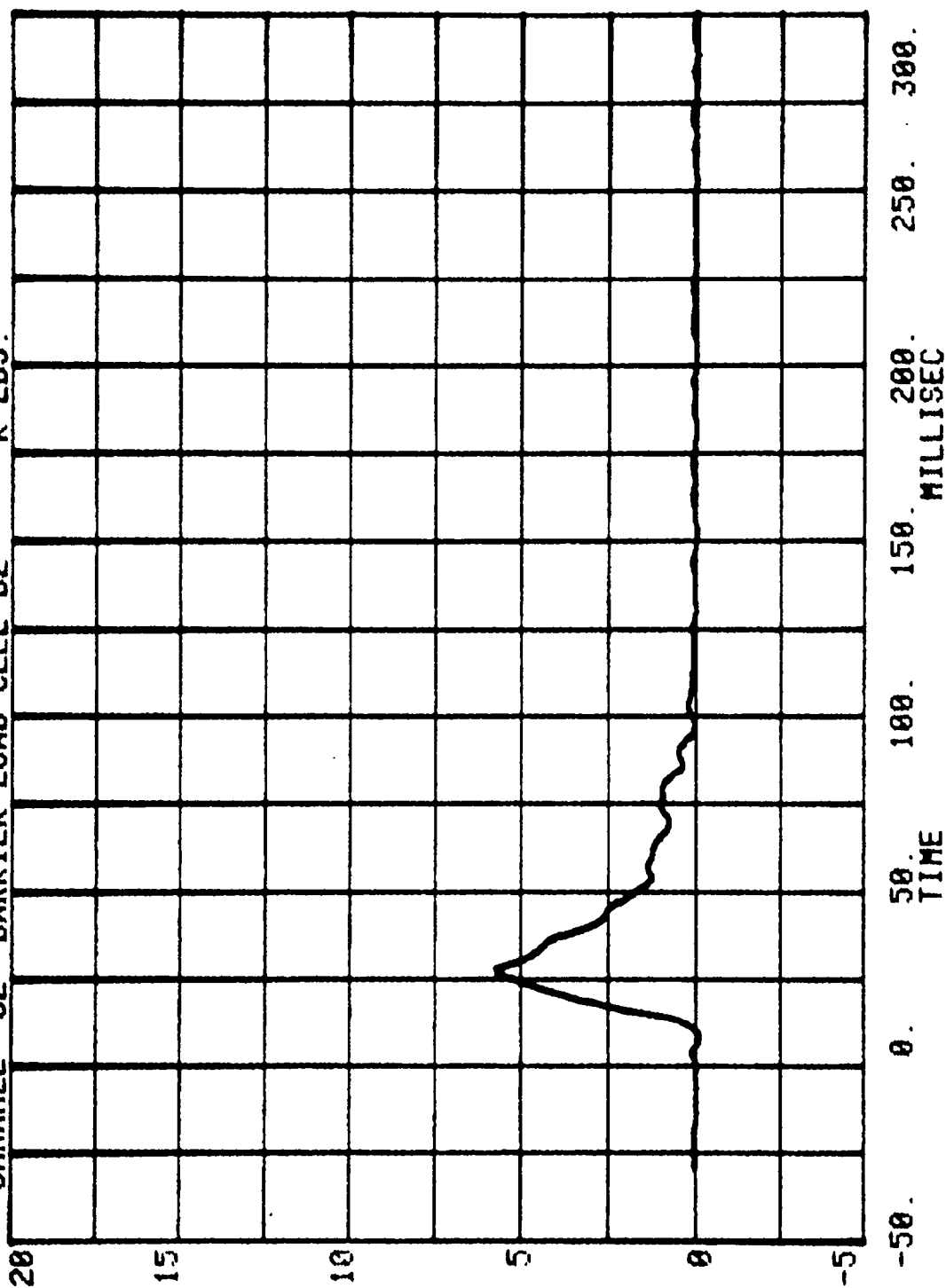
CHANNEL 60 BARRIER LOAD CELL C9 RUN= 767 SERIES= 300 K LBS.



CHANNEL 61 BARRIER LOAD CELL D1 RUN= 767 SERIES= 300 K LBS.

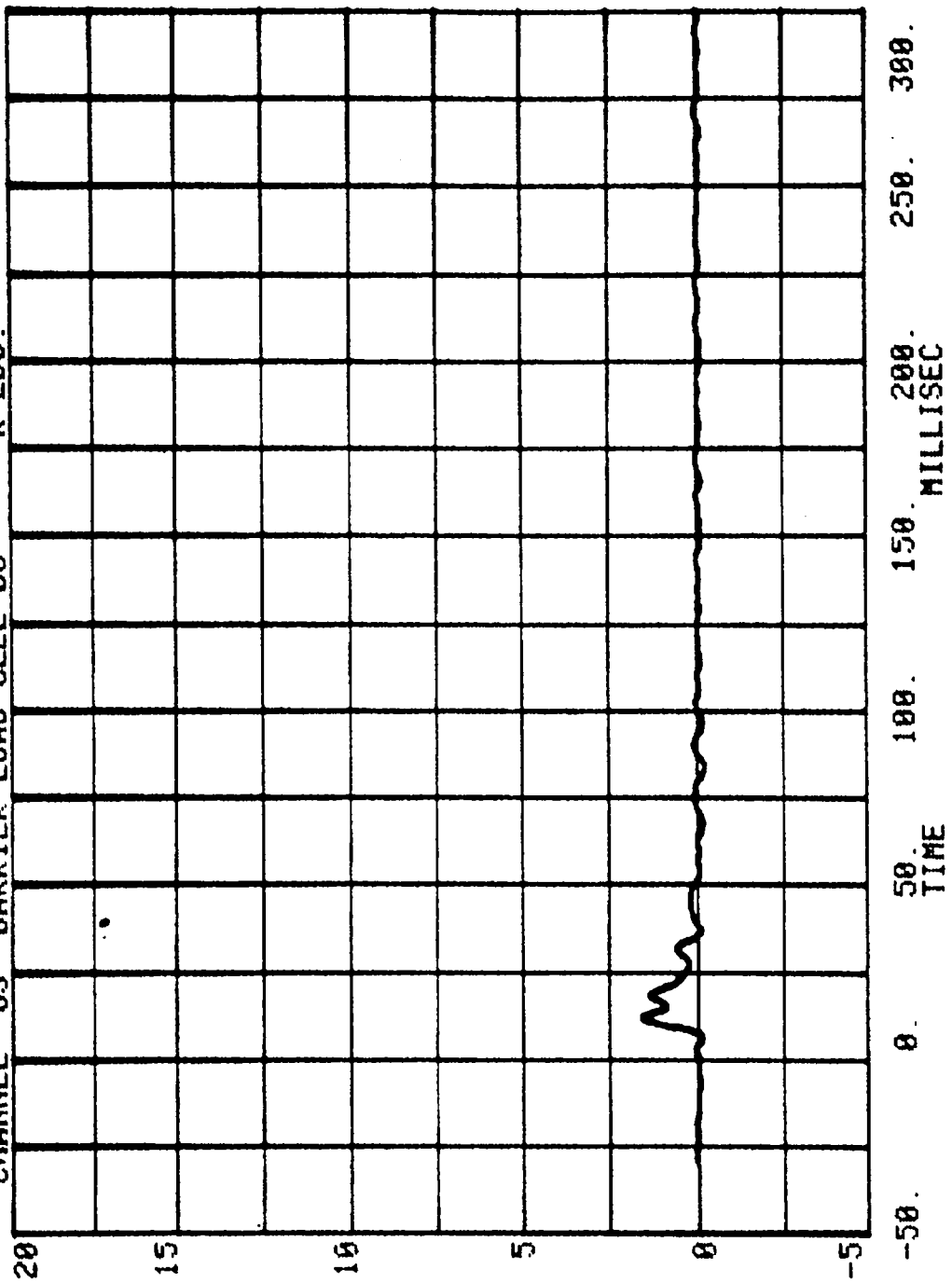


RUN= 767 SERIES= 300
CHANNEL 62 BARRIER LOAD CELL D2 K LBS.

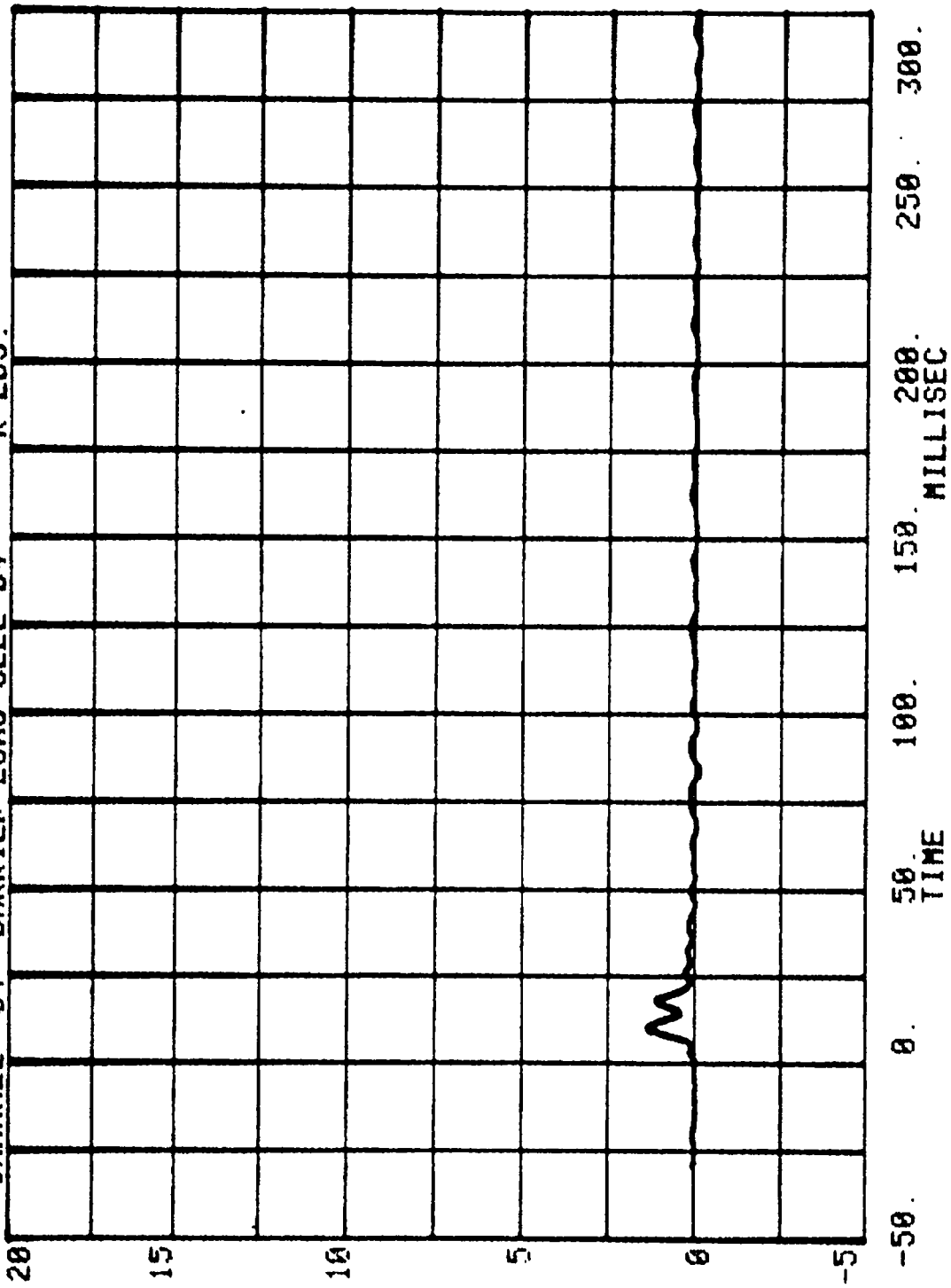


CHANNEL 63 BARRIER LOAD CELL D3 K LBS.

RUN= 767 SERIES= 300



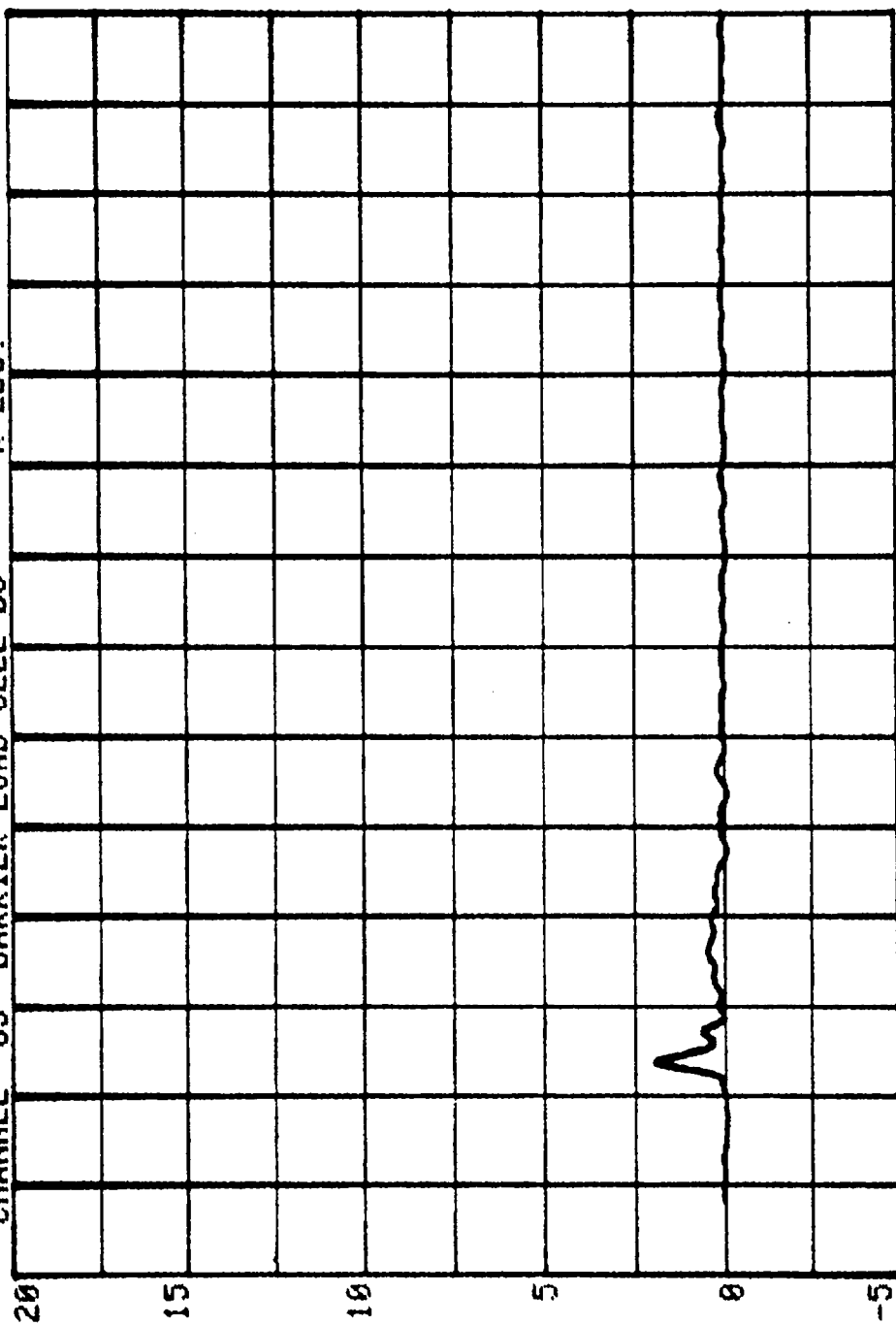
CHANNEL 64 RUN= 767 SERIES= 300
BARRIER LOAD CELL D4 K LBS.



CHANNEL 65 BARRIER LOAD CELL D5

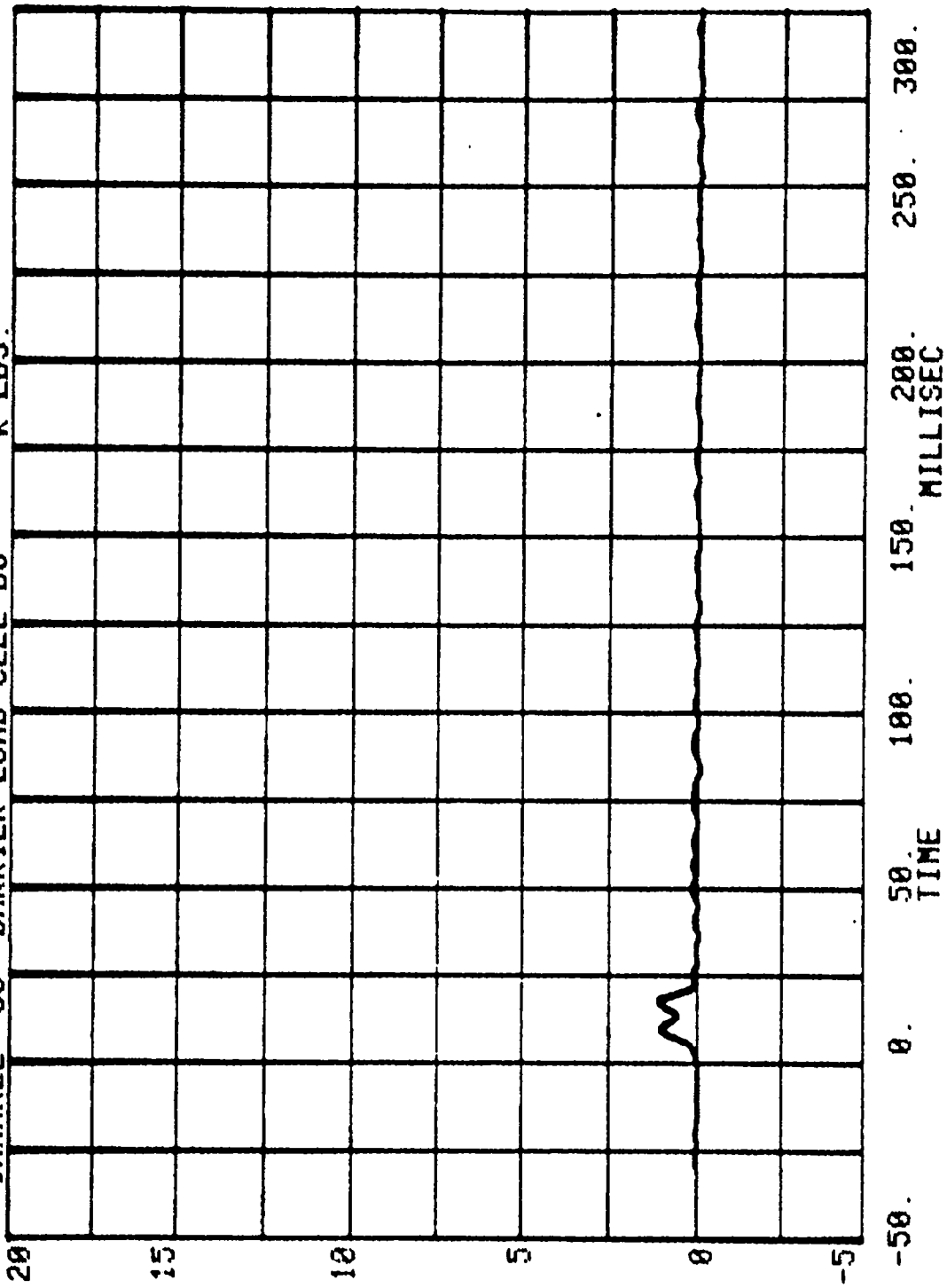
RUN= 767 SERIES= 300

K LBS.



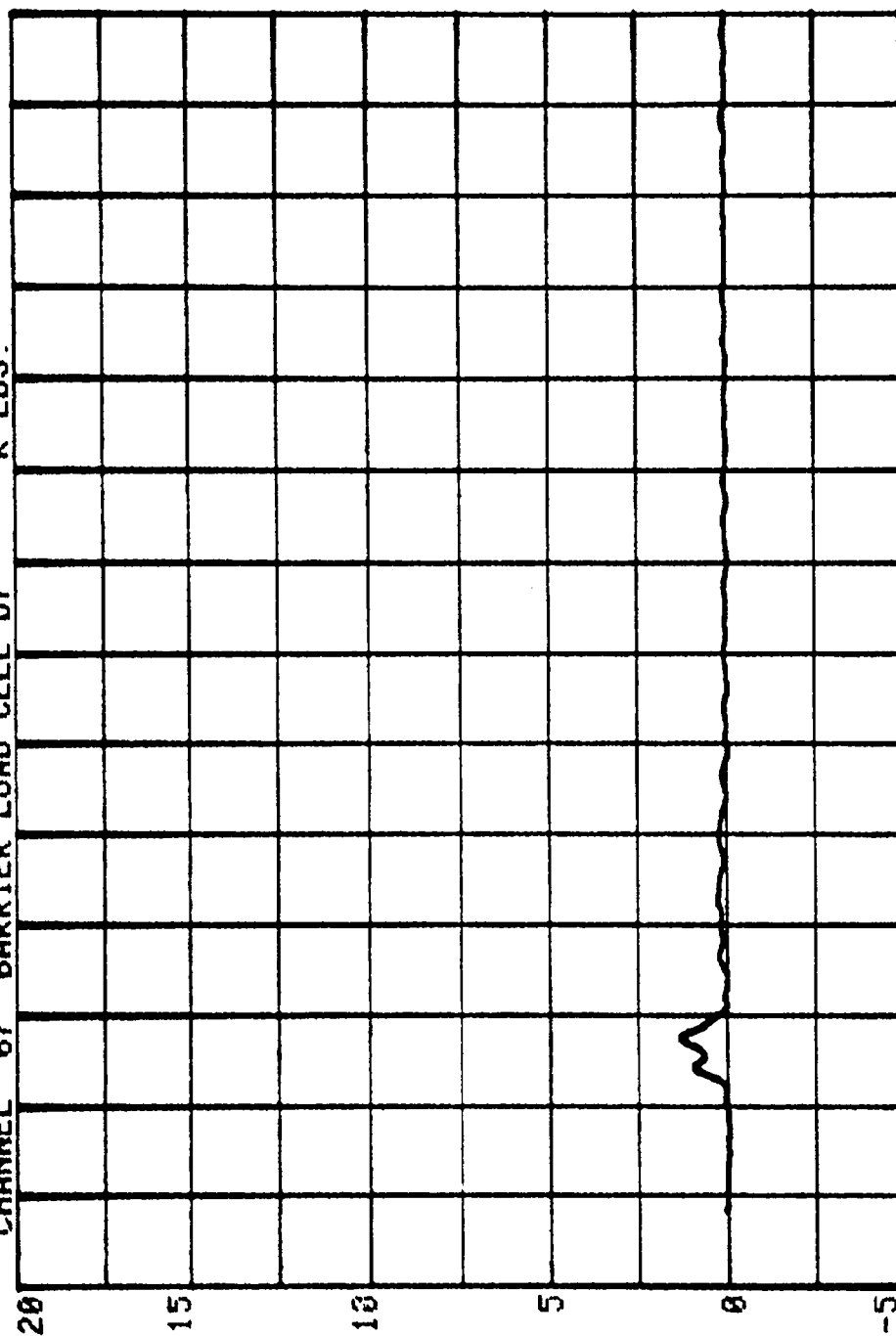
-50. 0. 50. 100. 150. 200. 250. 300.
TIME
MILLISEC

CHANNEL 66 RUN= 767. SERIES= 300 K LBS.
BARRIER LOAD CELL D6

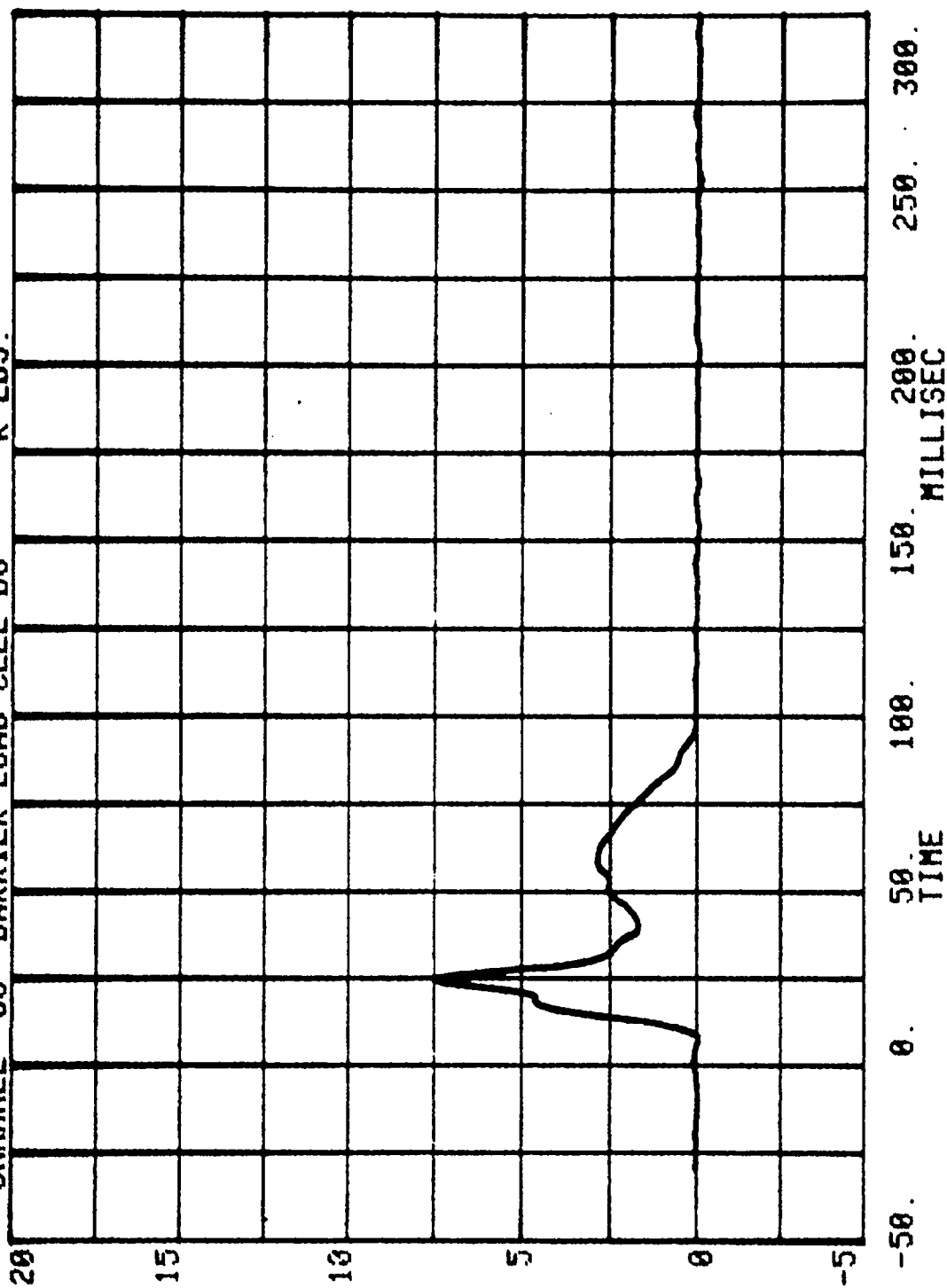


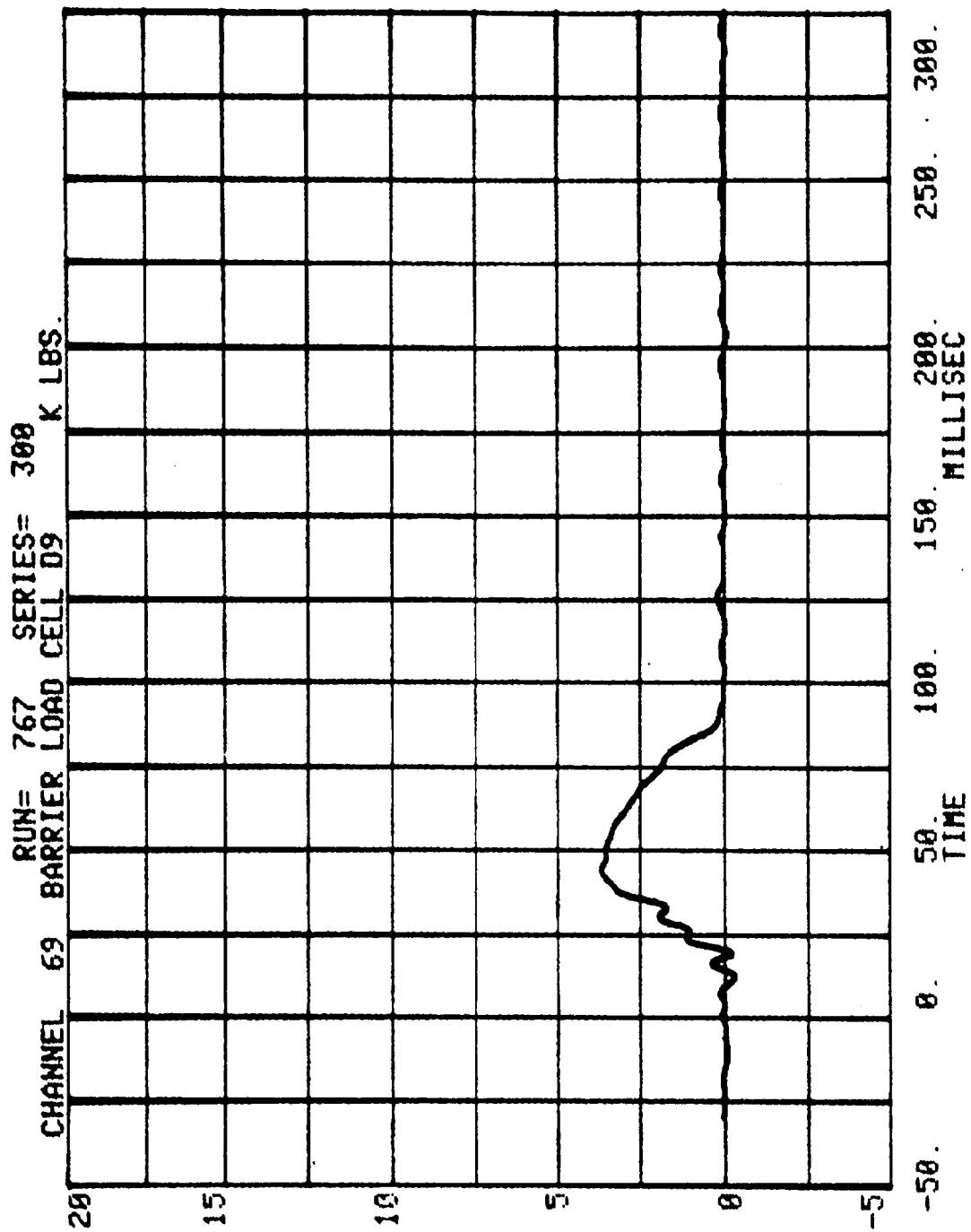
CHANNEL 67 BARRIER LOAD CELL D7 K LBS.

RUN= 767 SERIES= 300



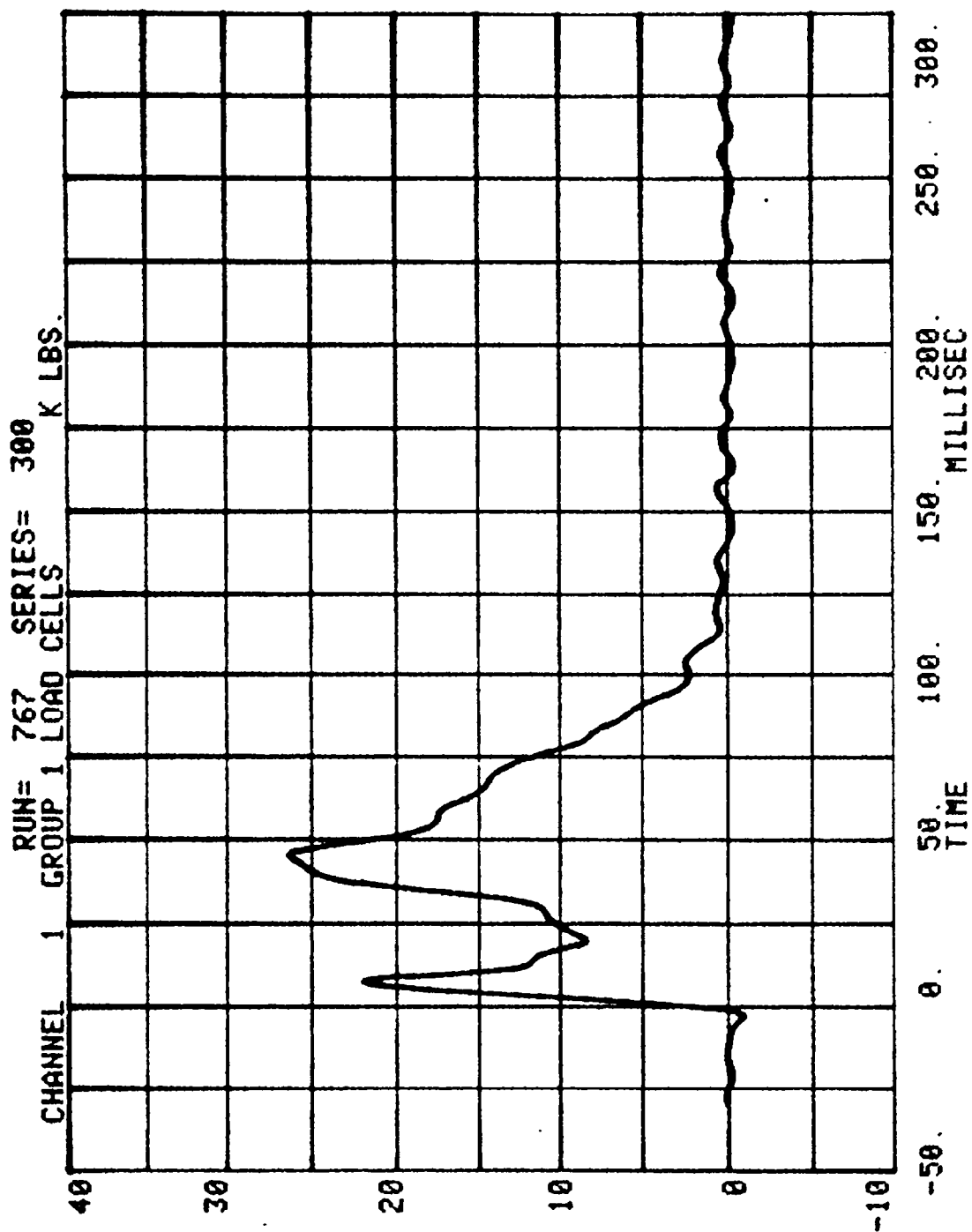
CHANNEL 68 RUN= 767 SERIES= 300 K LBS.
BARRIER LOAD CELL D8





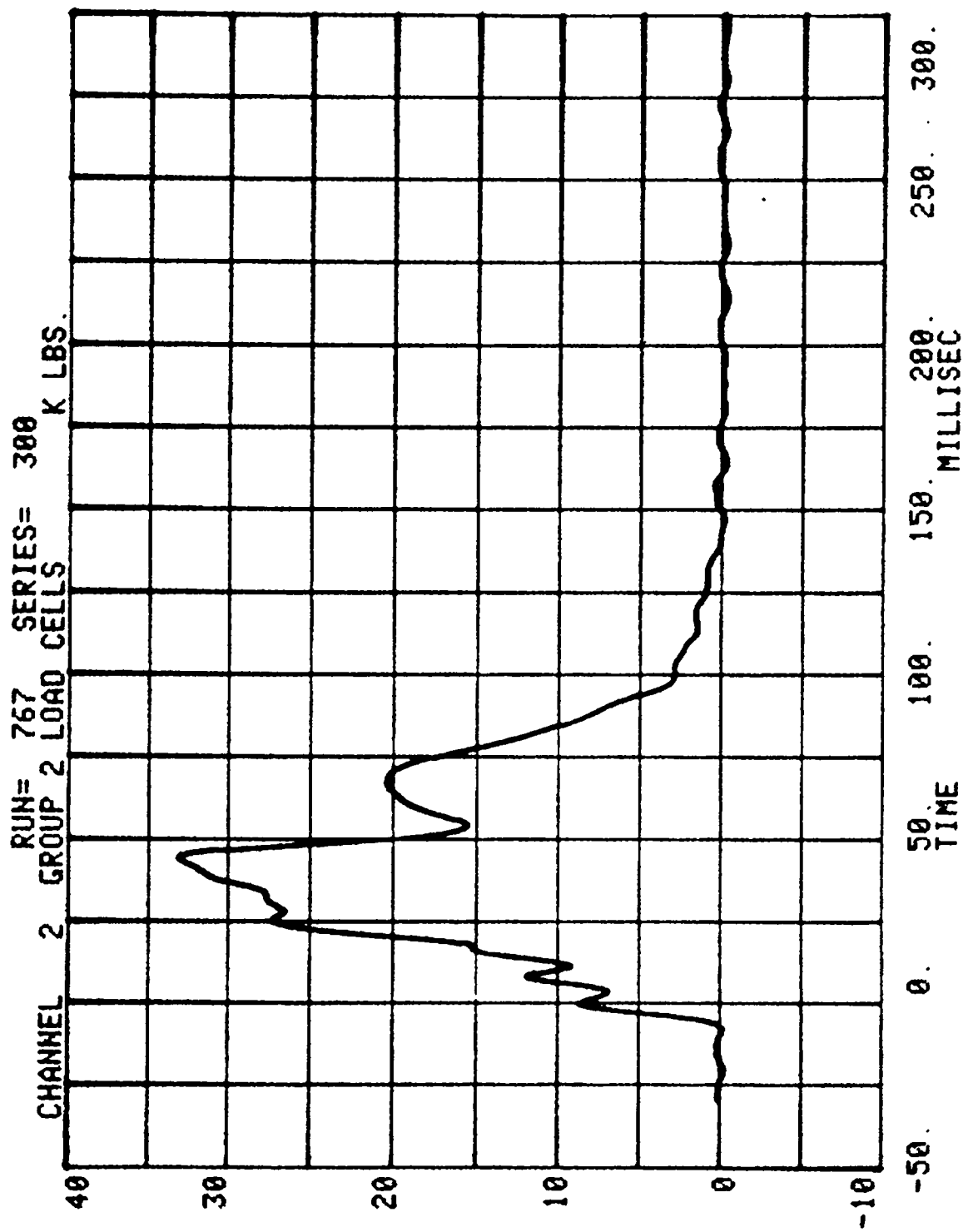
NEW CAR ASSESSMENT BARRIER TESTS - 1987

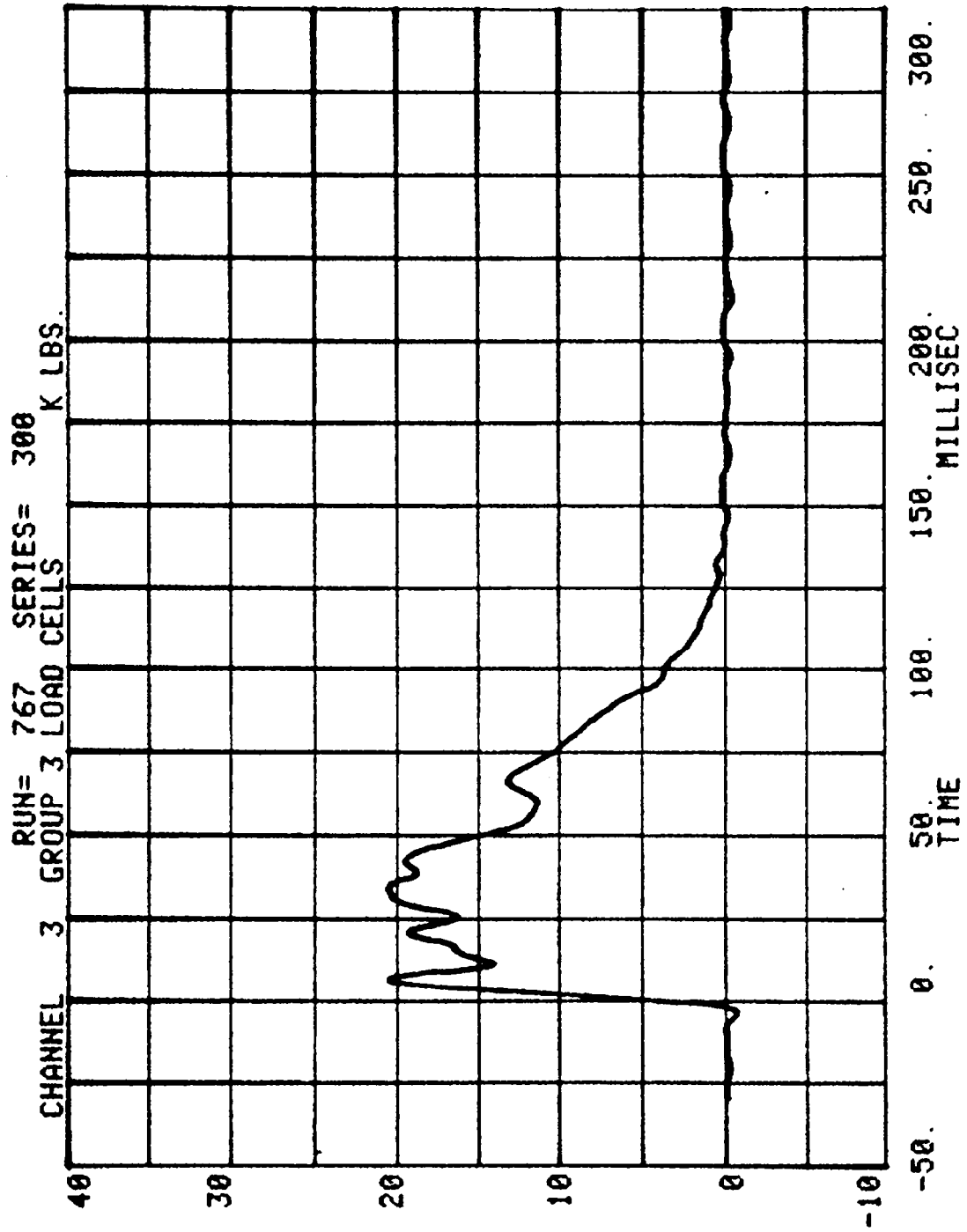
RUN # 767		SERIES # 300	
CHAN	TITLE	MINIMUM	MAXIMUM
1 GROUP	1 LOAD CELLS	- .798	26.338 K LBS.
2 GROUP	2 LOAD CELLS	- .326	33.178 K LBS.
3 GROUP	3 LOAD CELLS	- .625	20.601 K LBS.
4 GROUP	4 LOAD CELLS	- .213	18.738 K LBS.
5 GROUP	5 LOAD CELLS	- .394	7.965 K LBS.
6 GROUP	6 LOAD CELLS	- .348	18.956 K LBS.
7 TOTAL	LOAD CELL SUM	-1.114	116.175 K LBS.

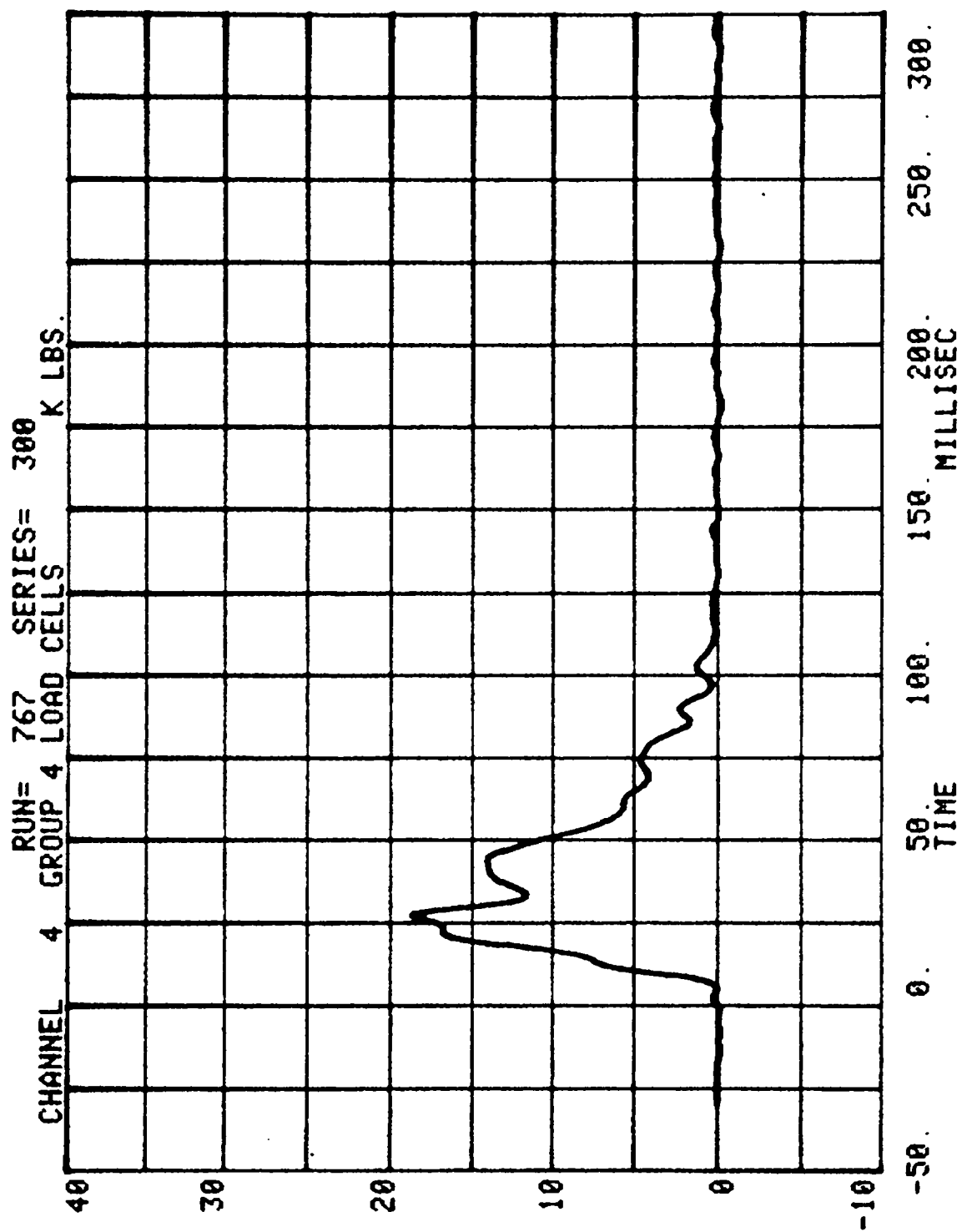


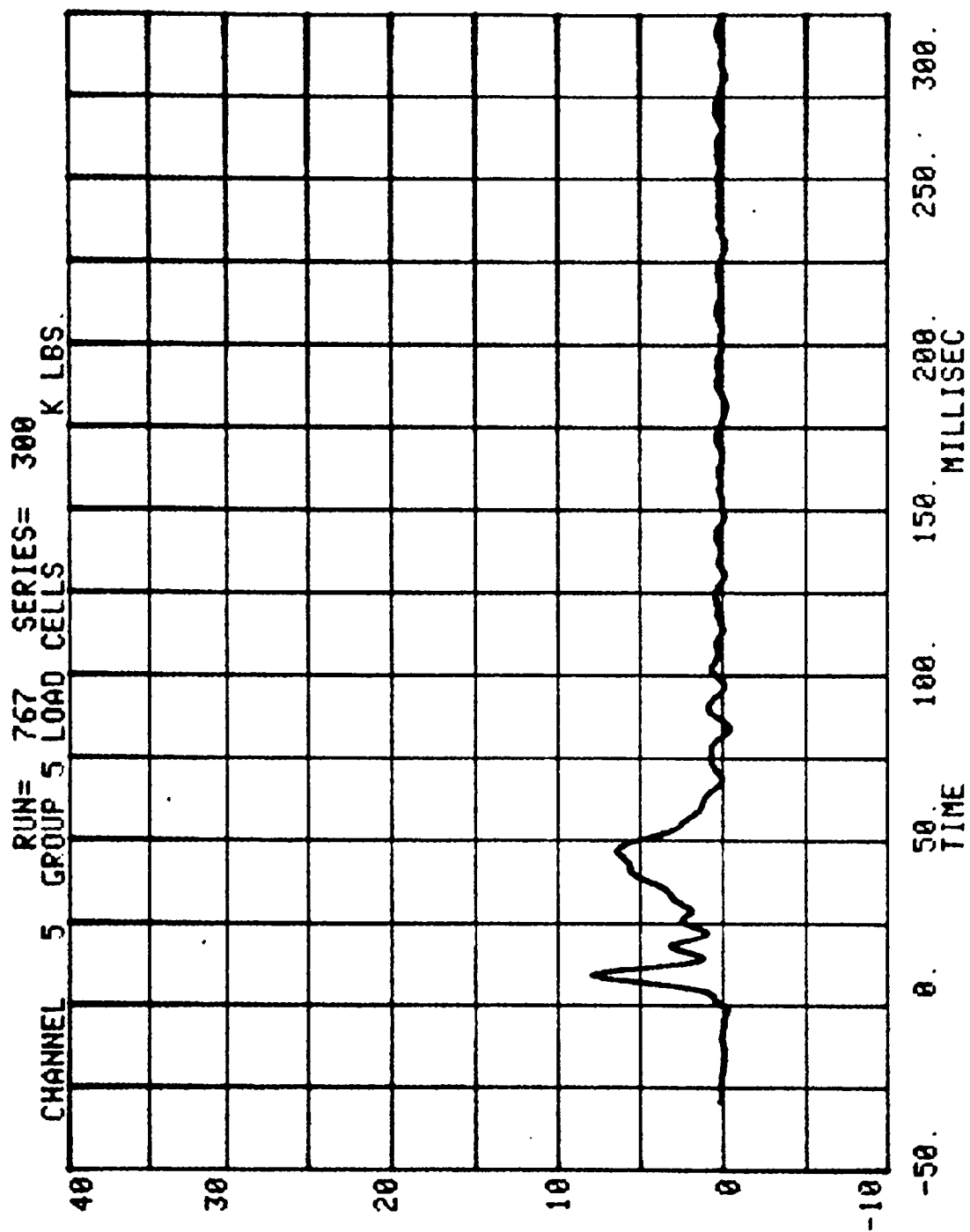
B-60

7556-5

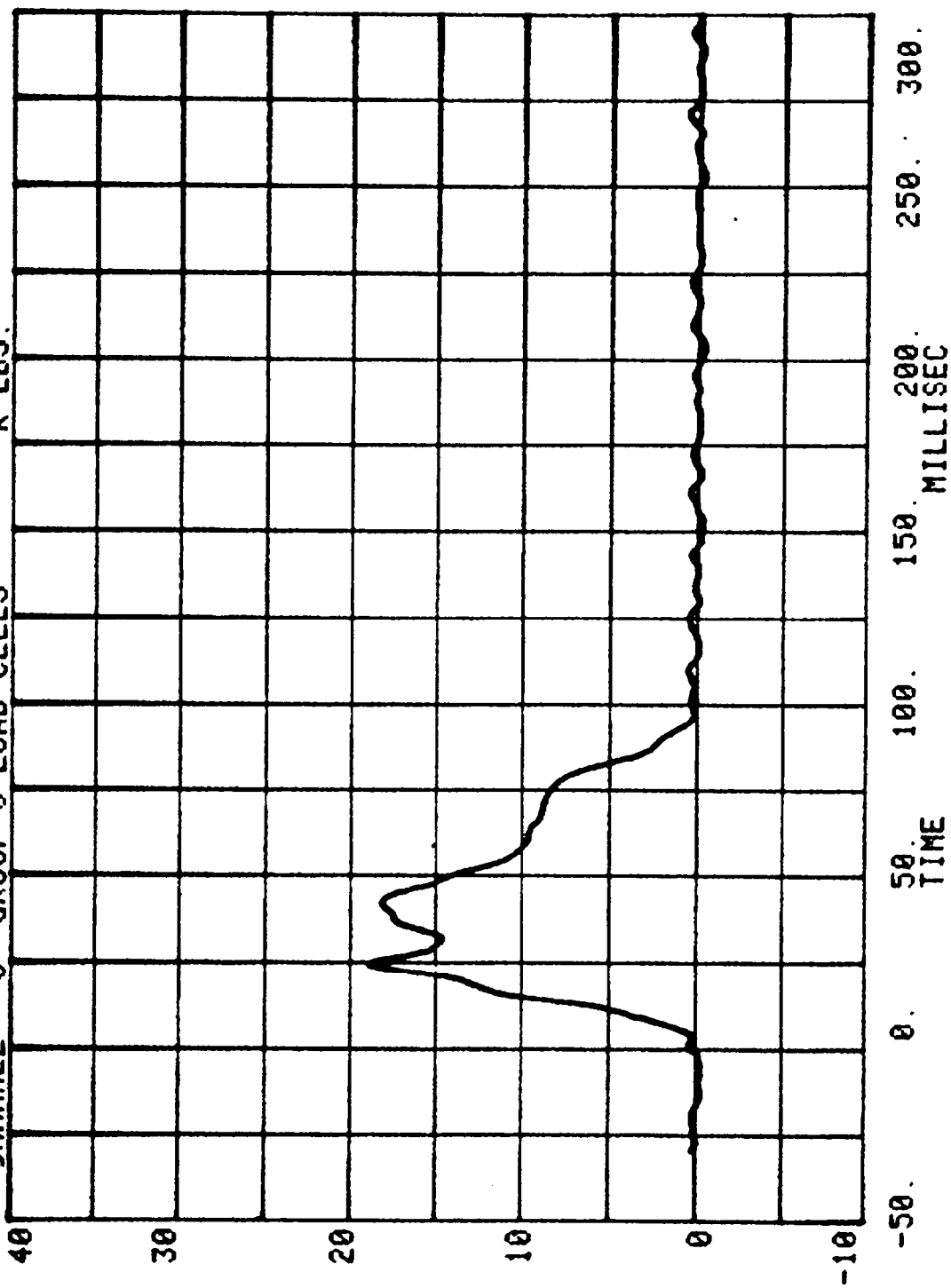


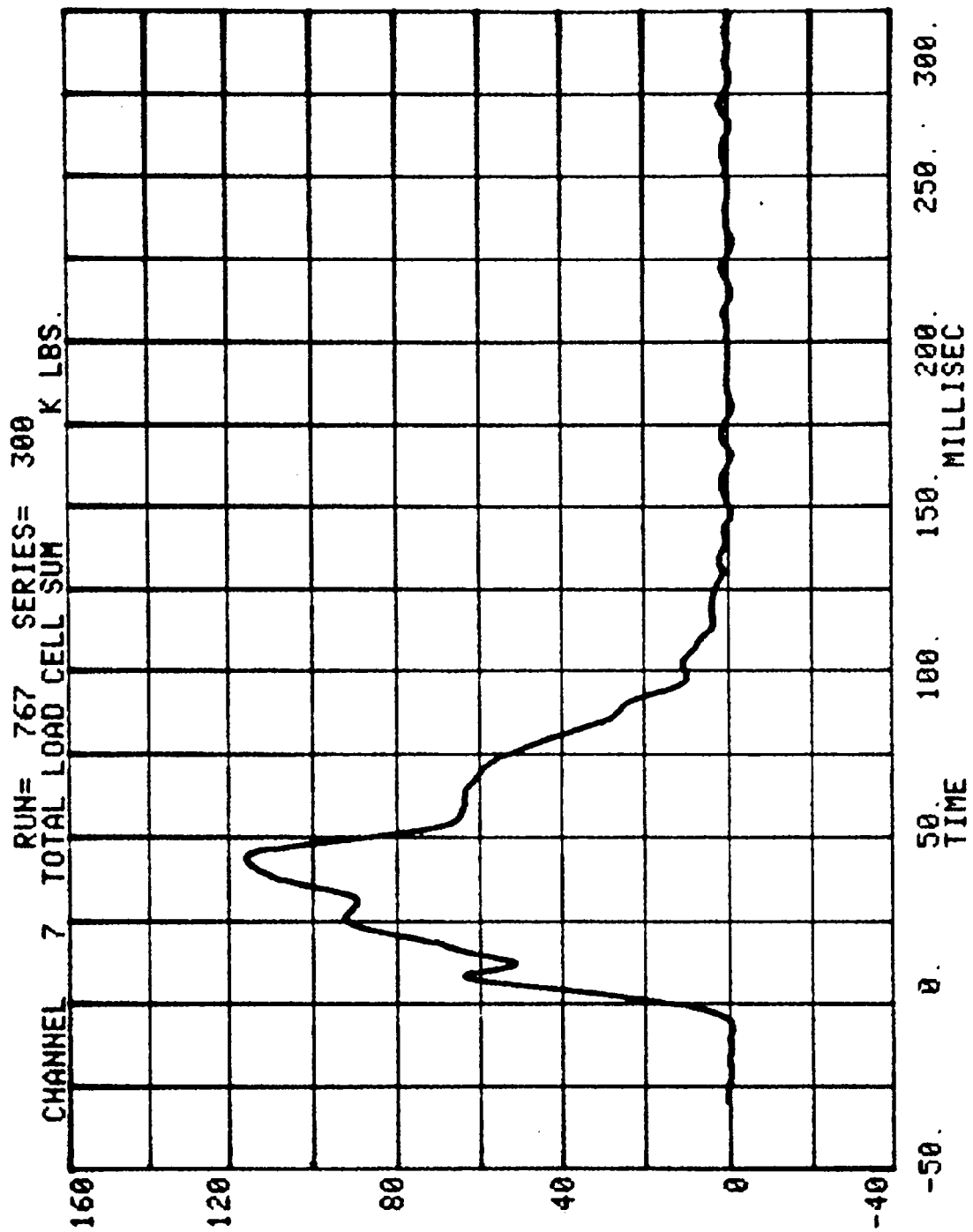






CHANNEL 6 GROUP 6 LOAD CELLS RUN= 767 SERIES= 300 K LBS.





TEST NO. MH0300

DUMMY DATA

	FILTER CHANNEL CLASS
HEAD ACCELERATIONS	1000
CHEST ACCELERATIONS	180
FEMUR FORCES	600
BELT LOADS	60

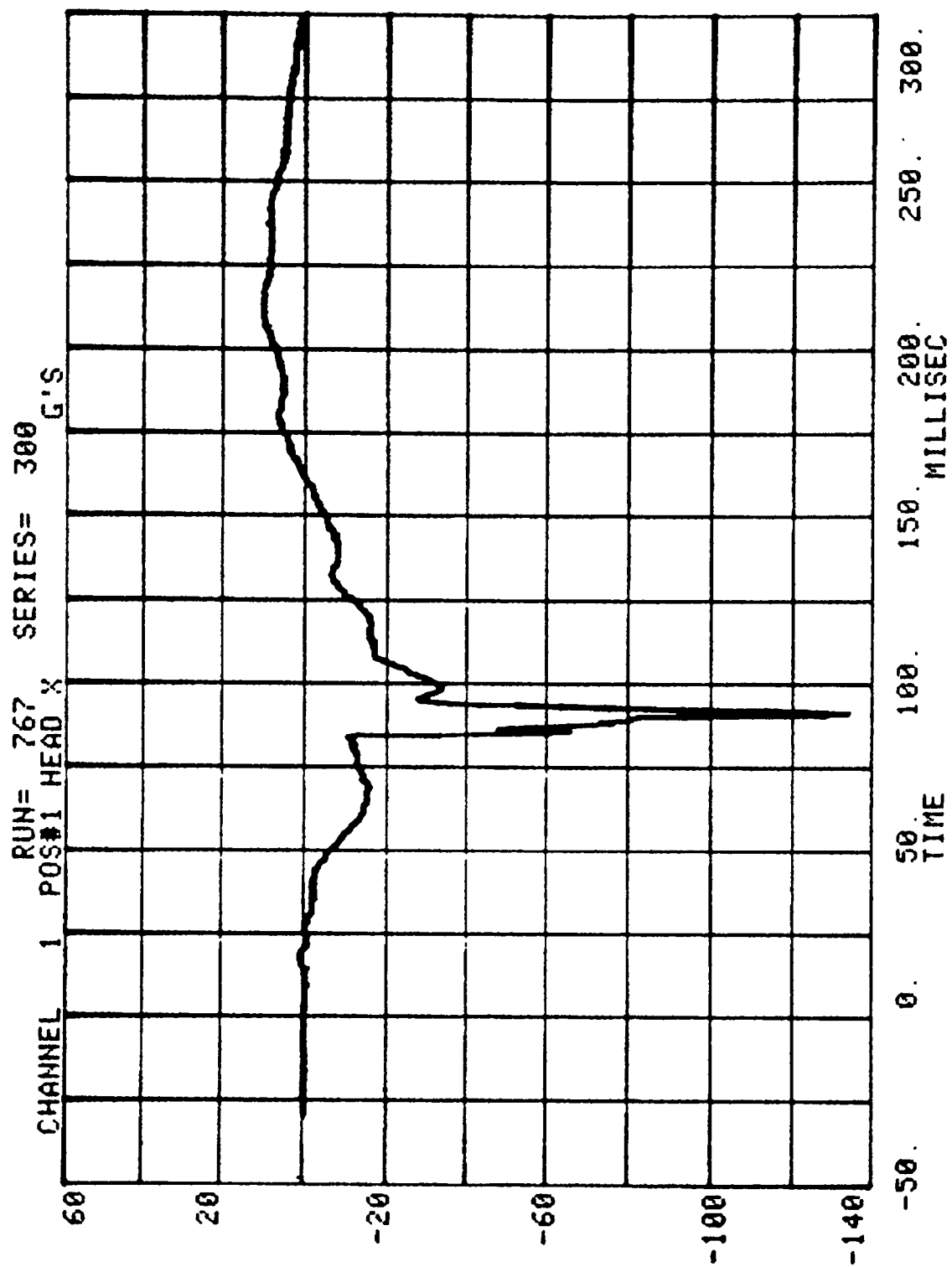
HEAD INJURY CRITERION
HEAD SEVERITY INDEX

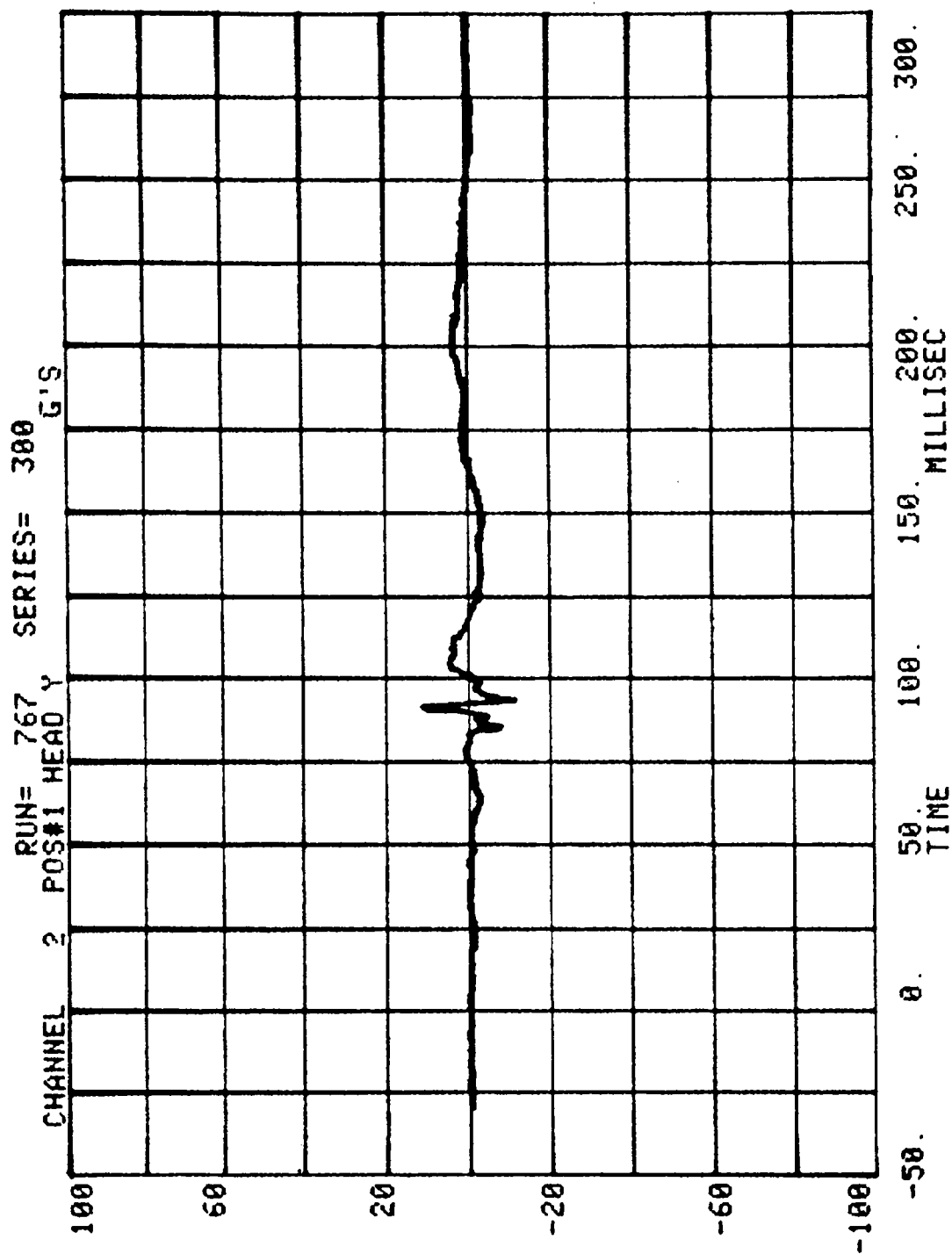
NEW CAR ASSESSMENT BARRIER TESTS - 1987

RUN= 767

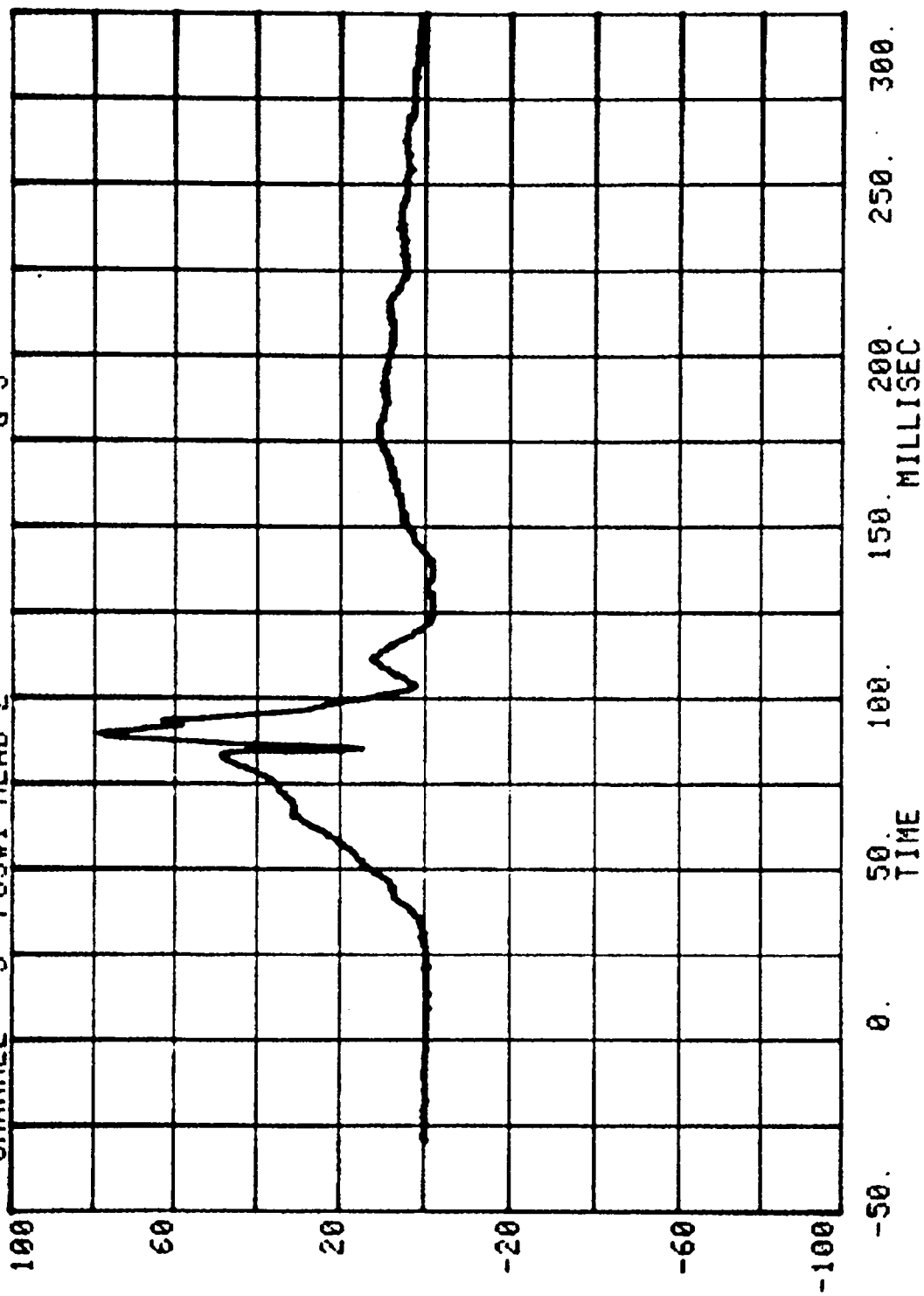
POS#1 HEAD R

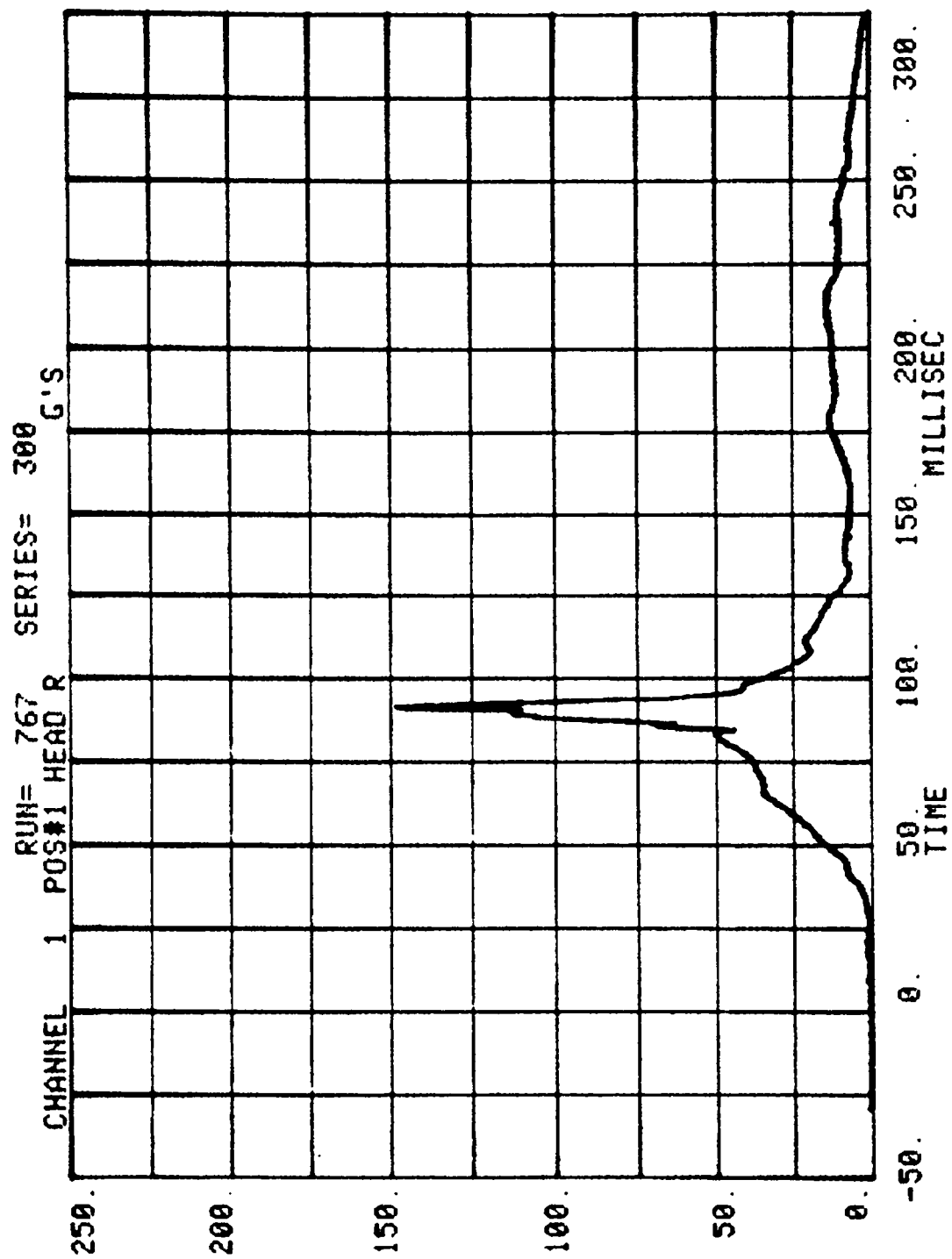
HIC= 903.1 FROM T1= .08542 TO T2= .09495
AVERAGE ACCELERATION BETWEEN T1 AND T2= 97.9G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX=1448.5

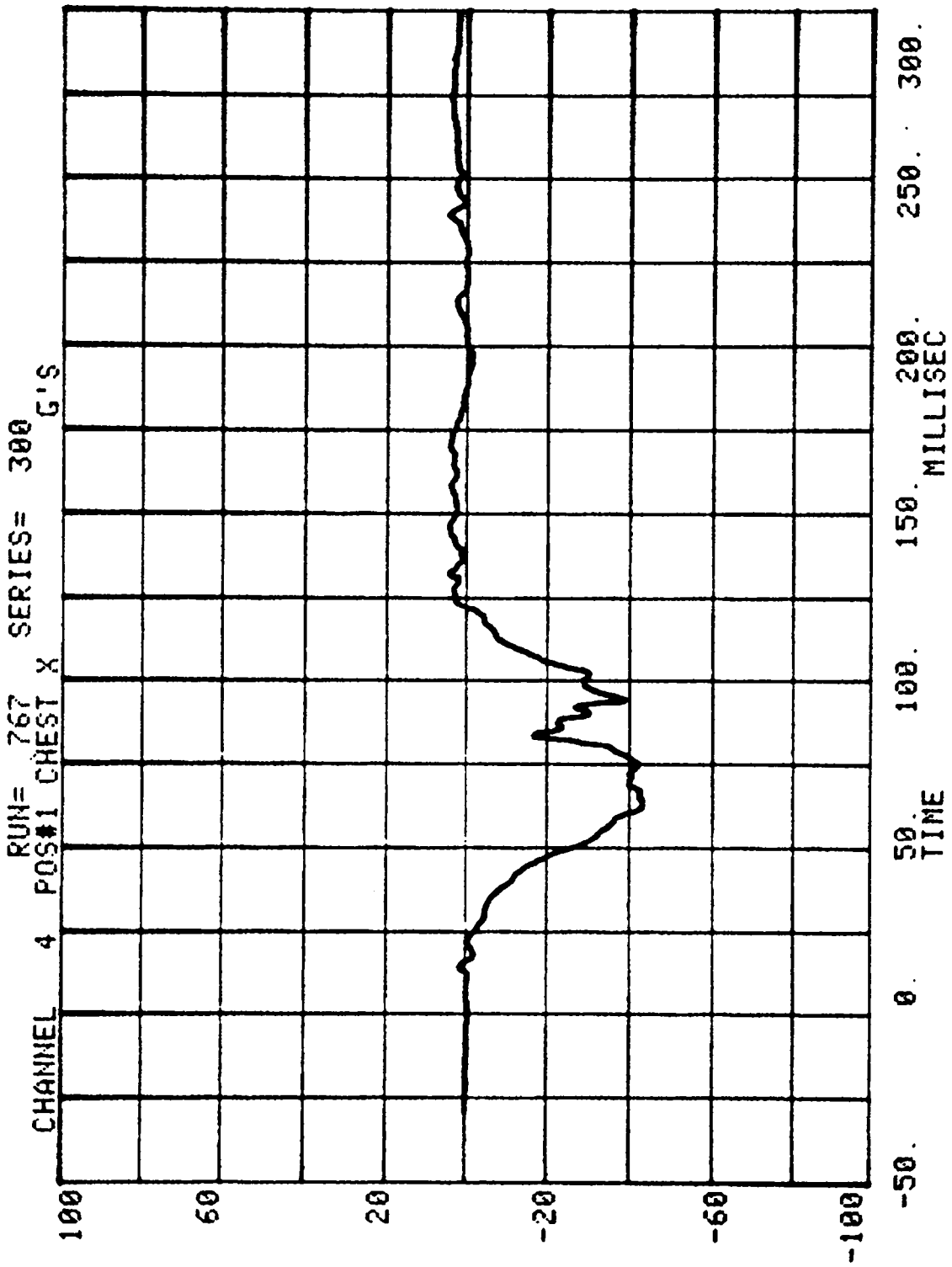


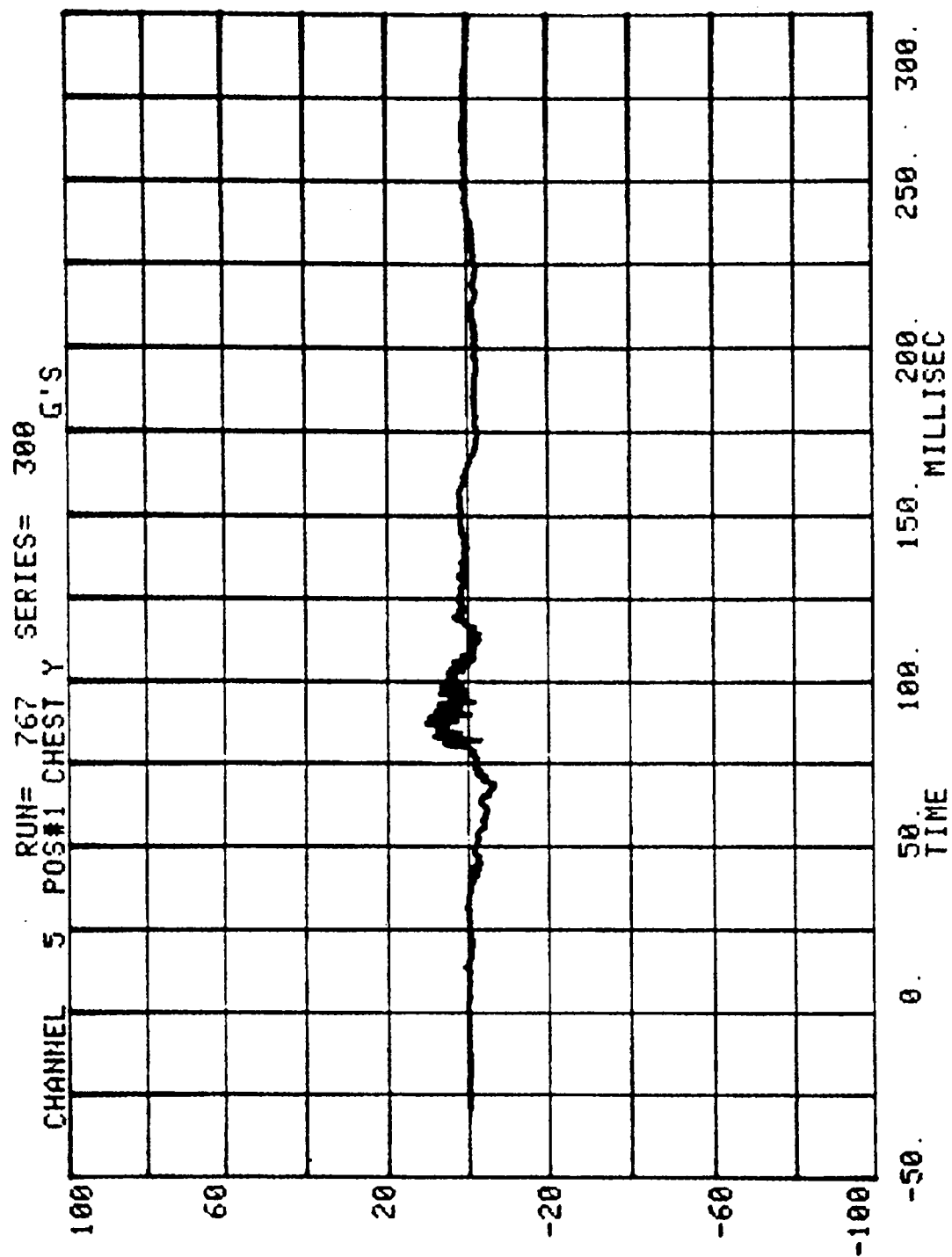


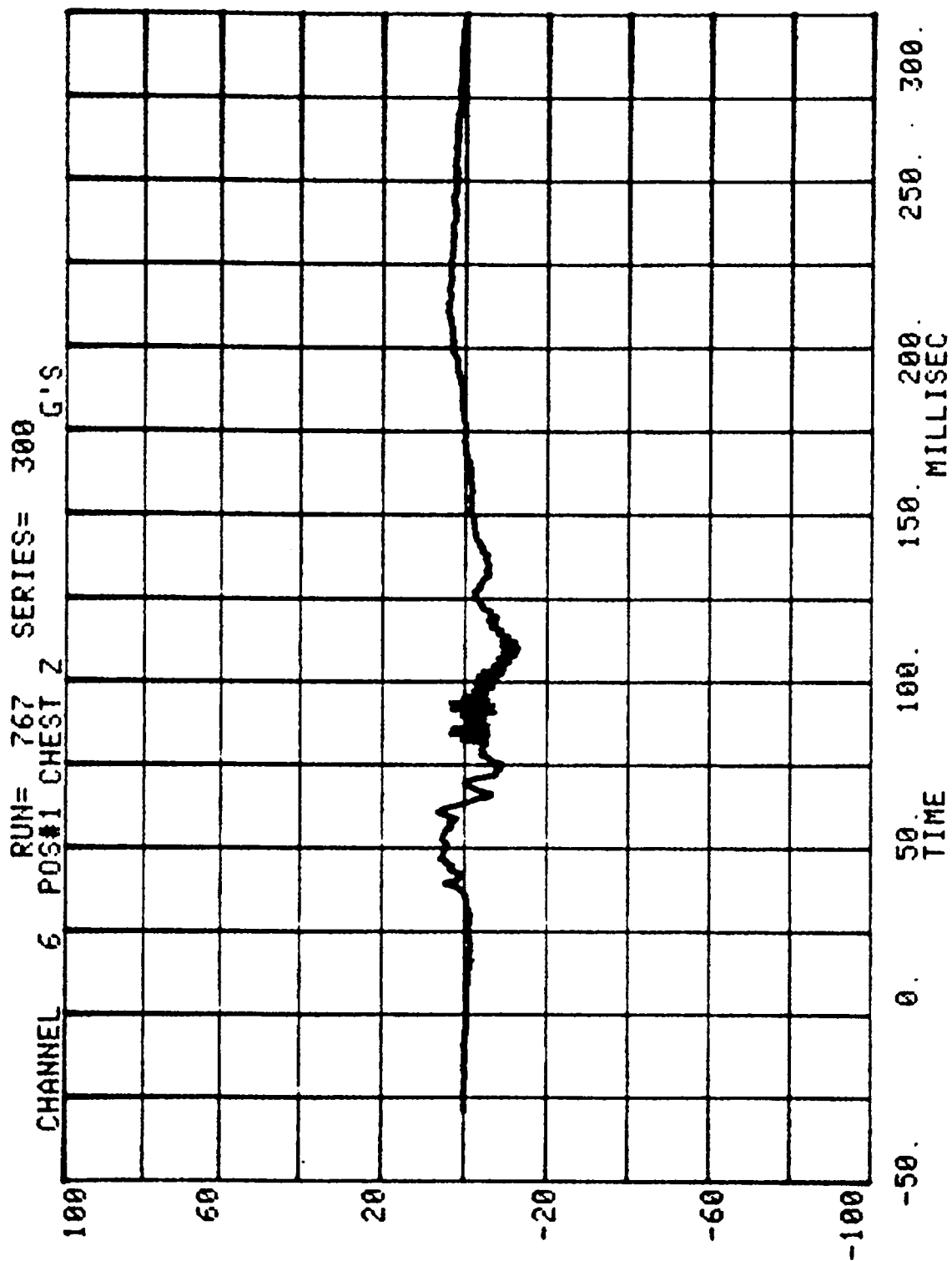
CHANNEL 3 POS#1 HEAD Z RUN= 767 SERIES= 300 G'S

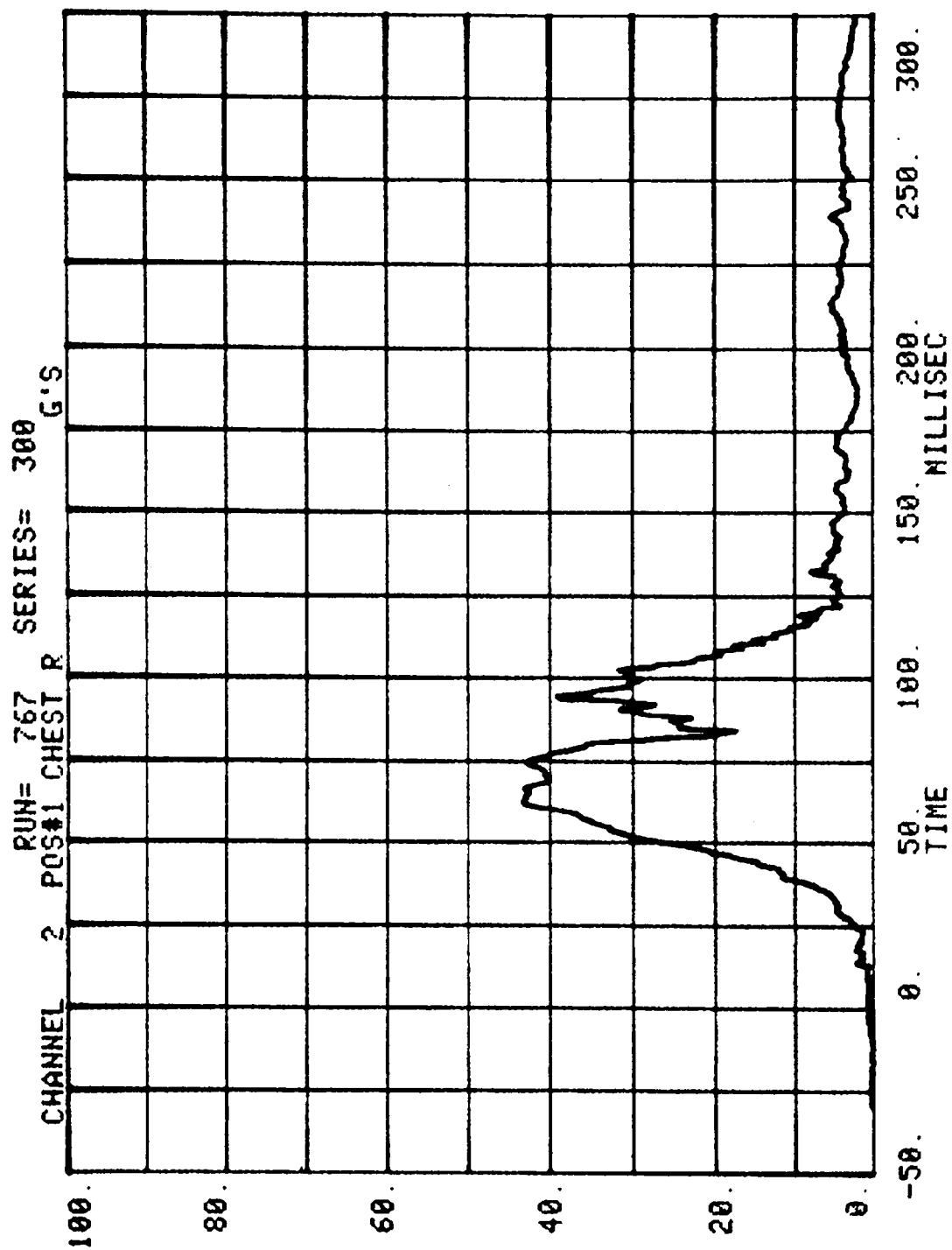




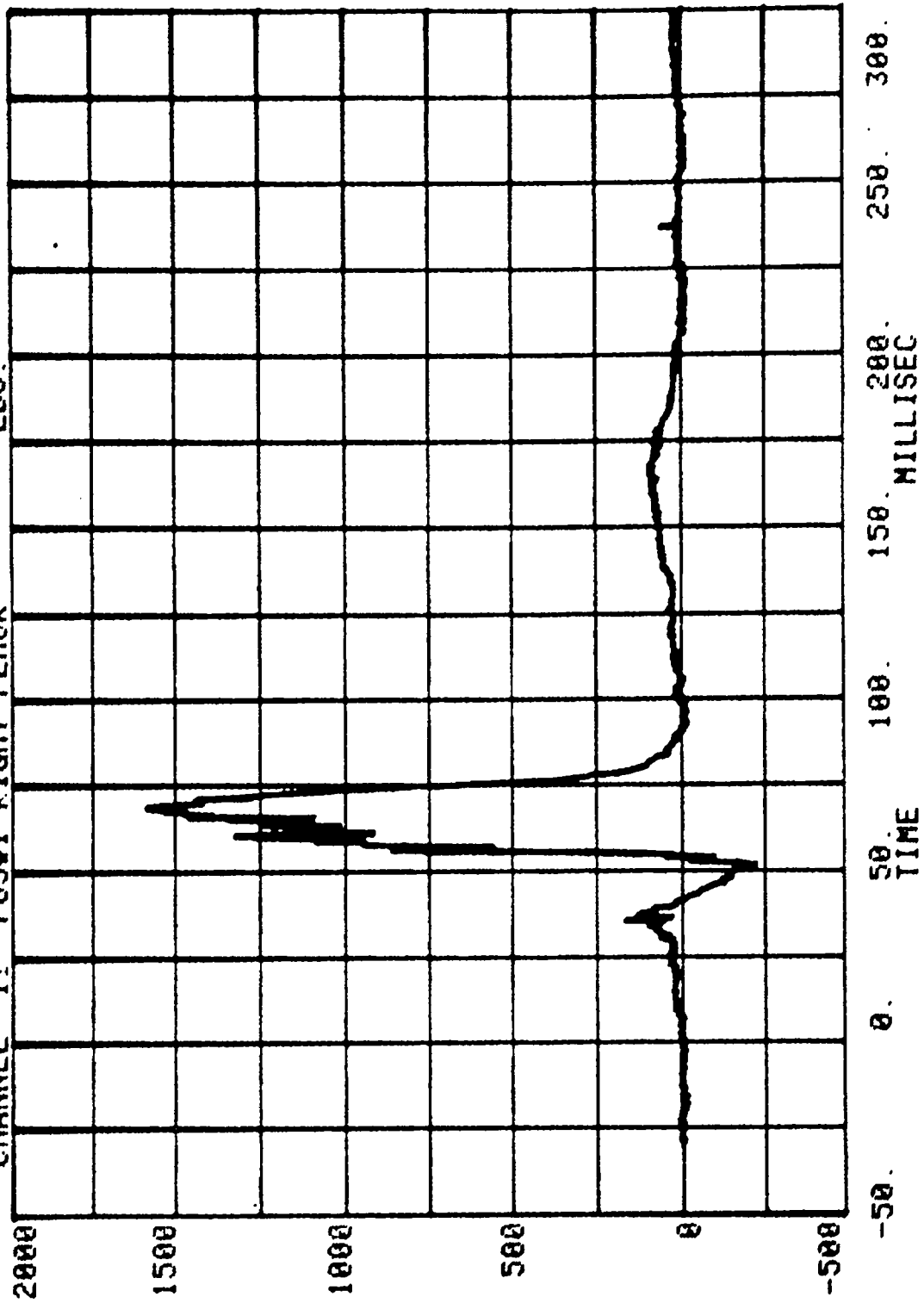


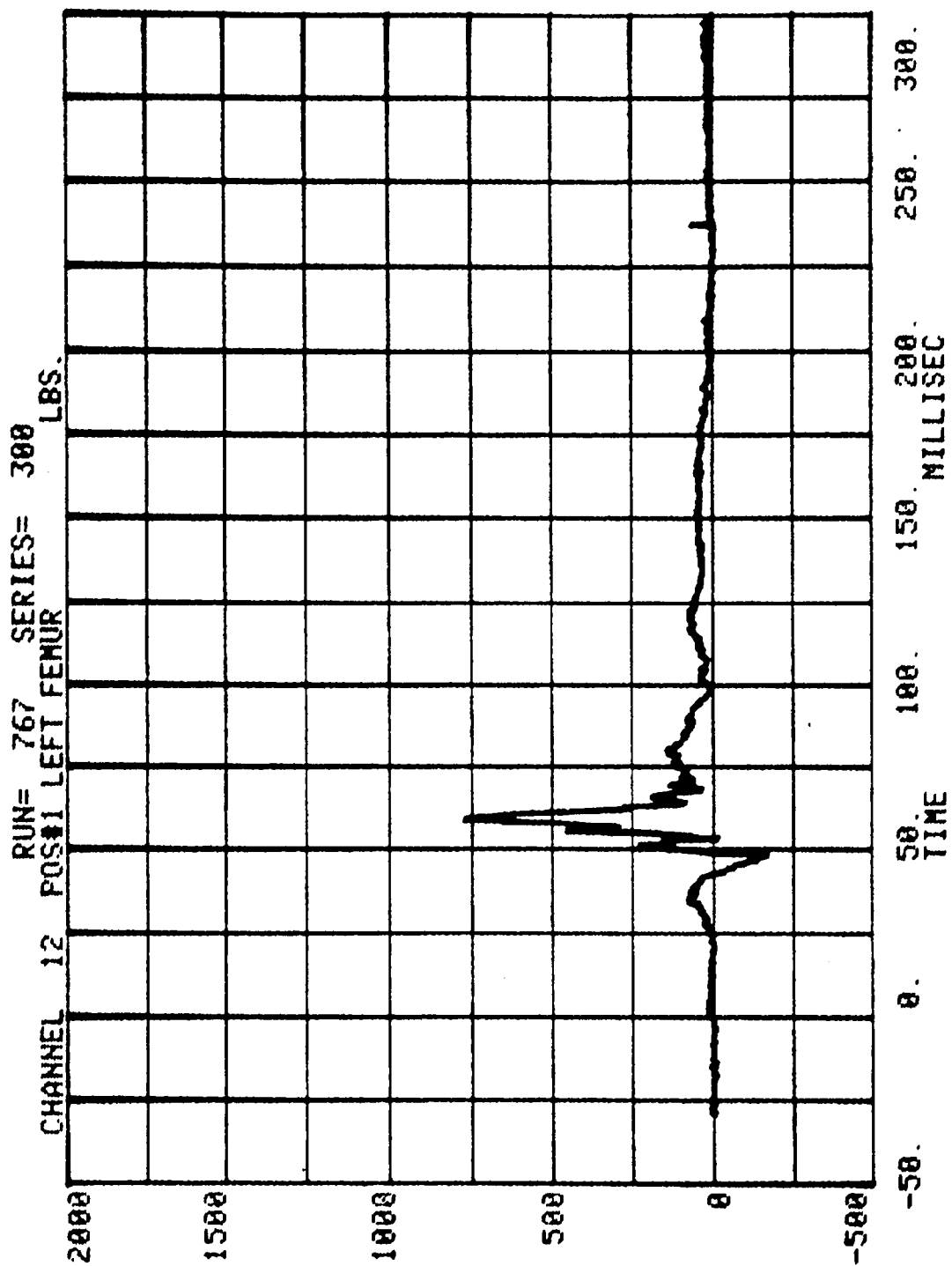




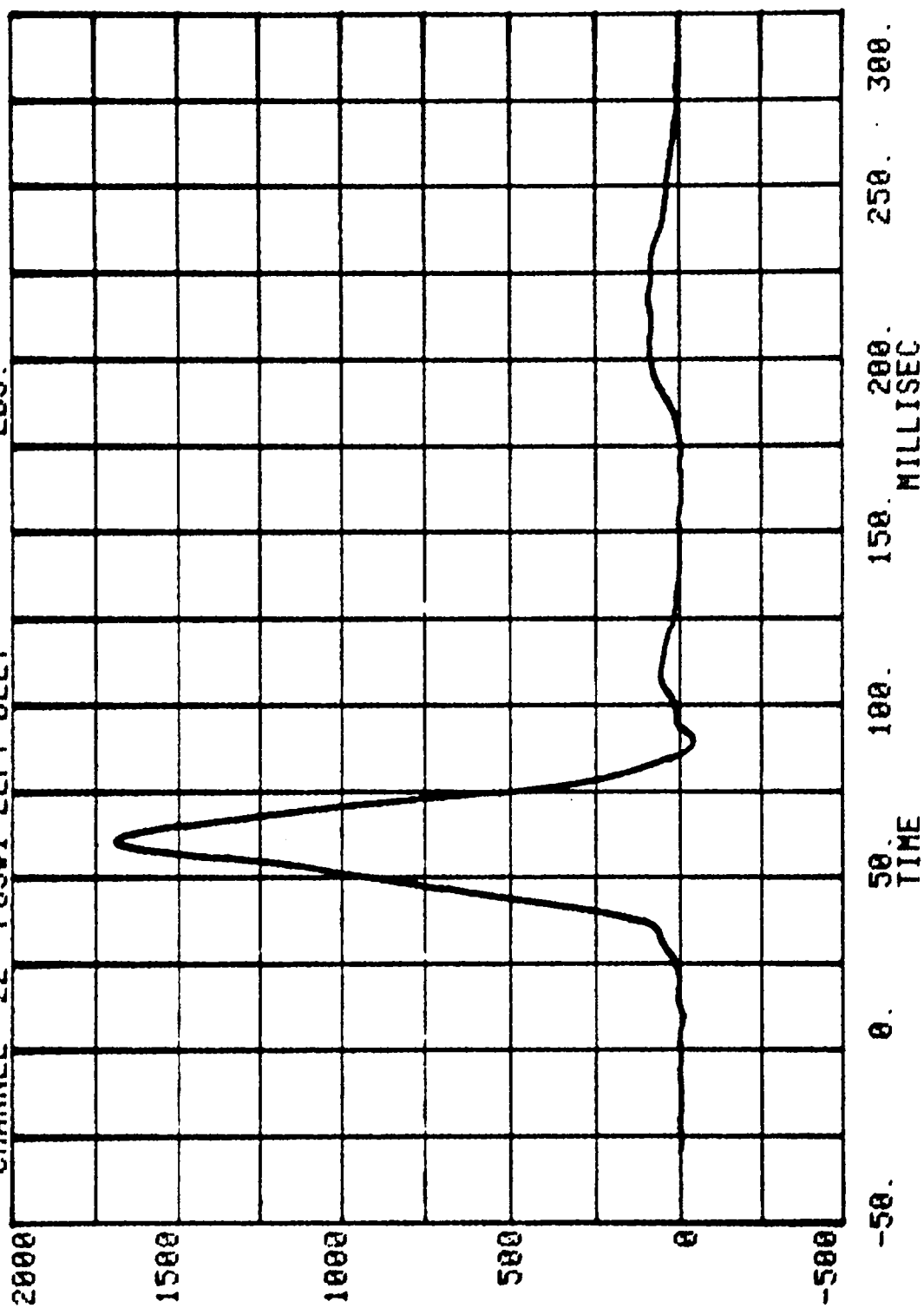


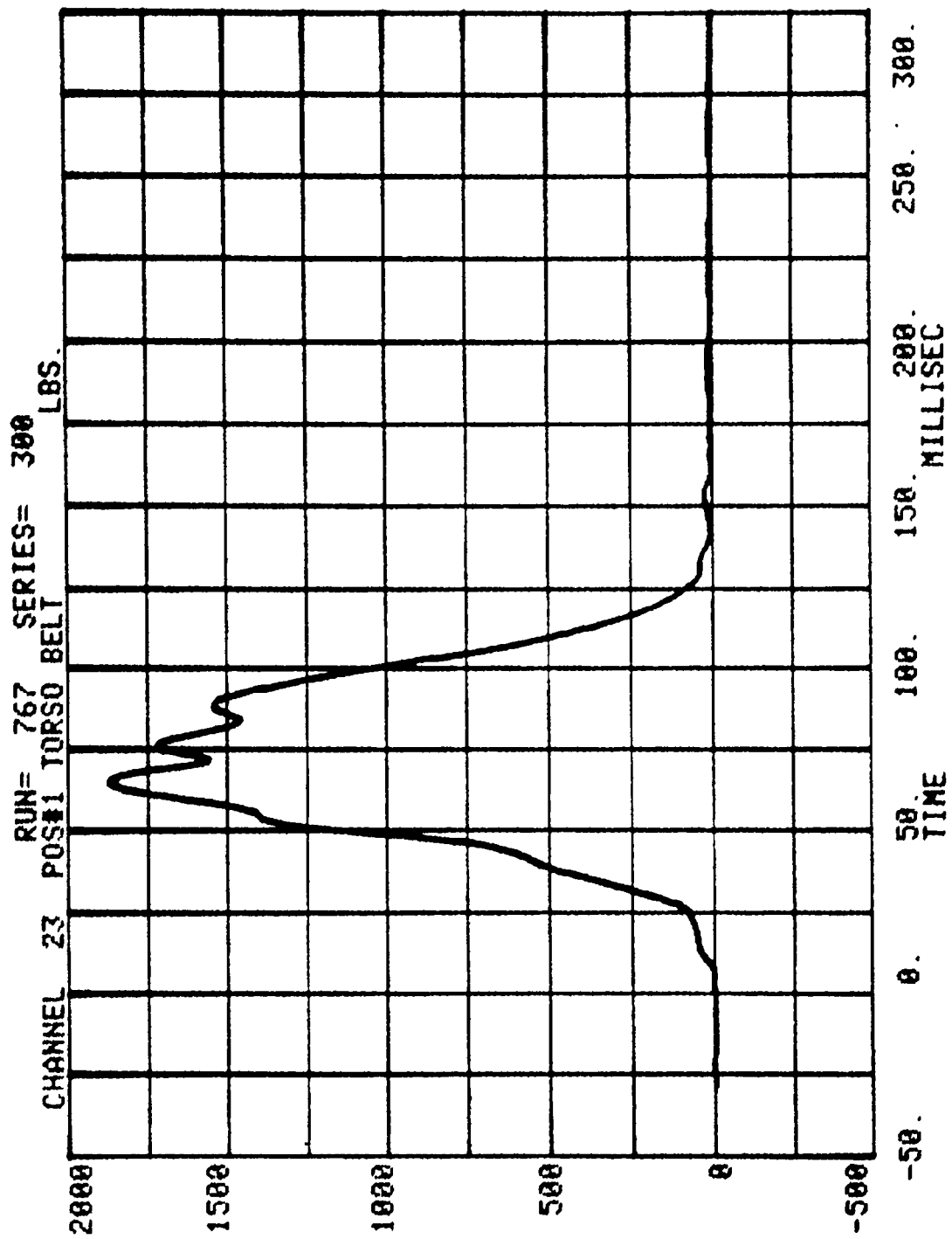
CHANNEL 11 POS#1 RIGHT FEMUR RUN= 767 SERIES= 300 LBS.

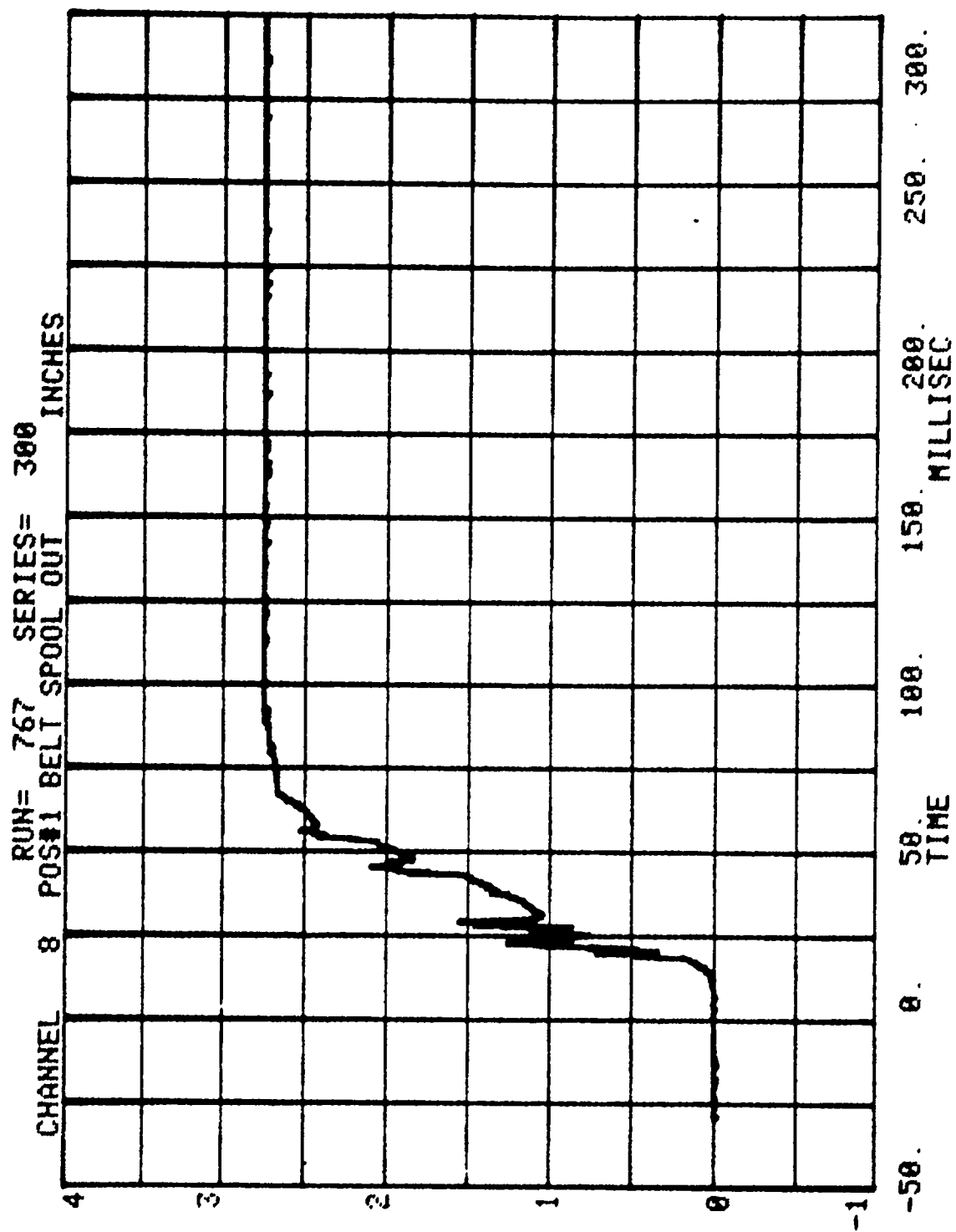


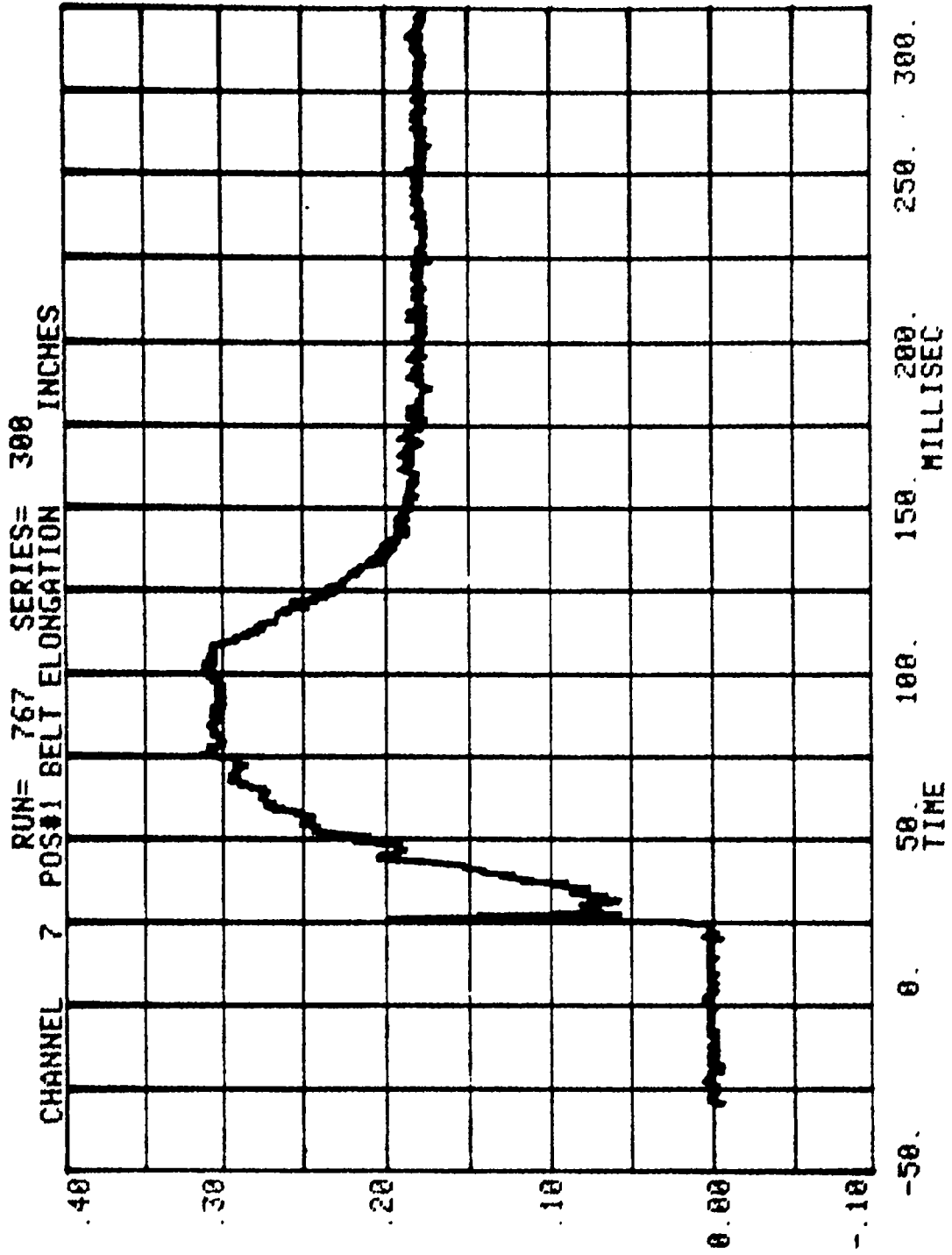


CHANNEL 22 POS#1 LEFT BELT
RUN= 767 SERIES= 300 LBS.









HEAD INJURY CRITERION
HEAD SEVERITY INDEX

NEW CAR ASSESSMENT BARRIER TESTS - 1987

RUN= 767

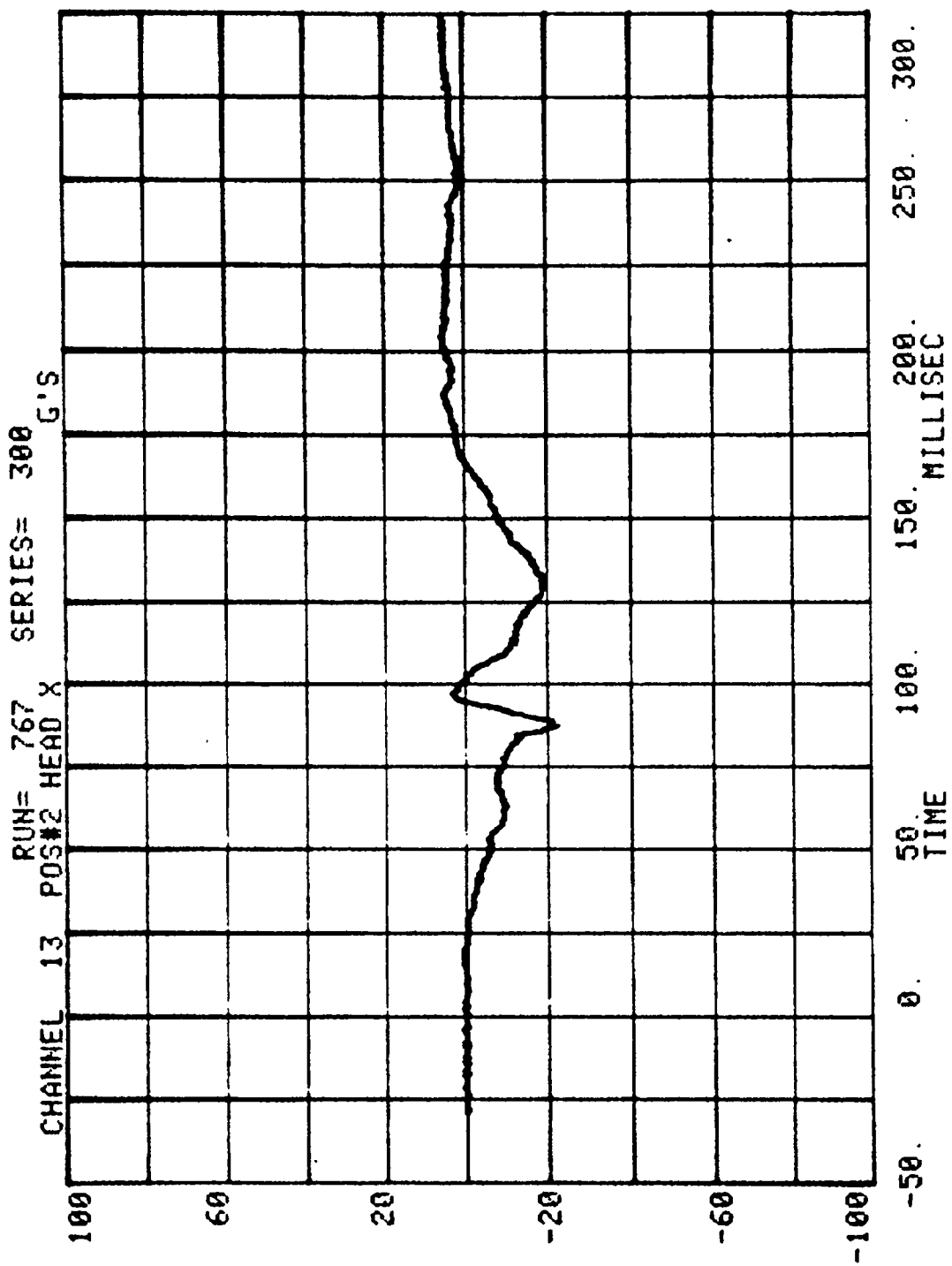
POS#2 HEAD R

HIC= 501.0 FROM T1= .03062 TO T2= .11662

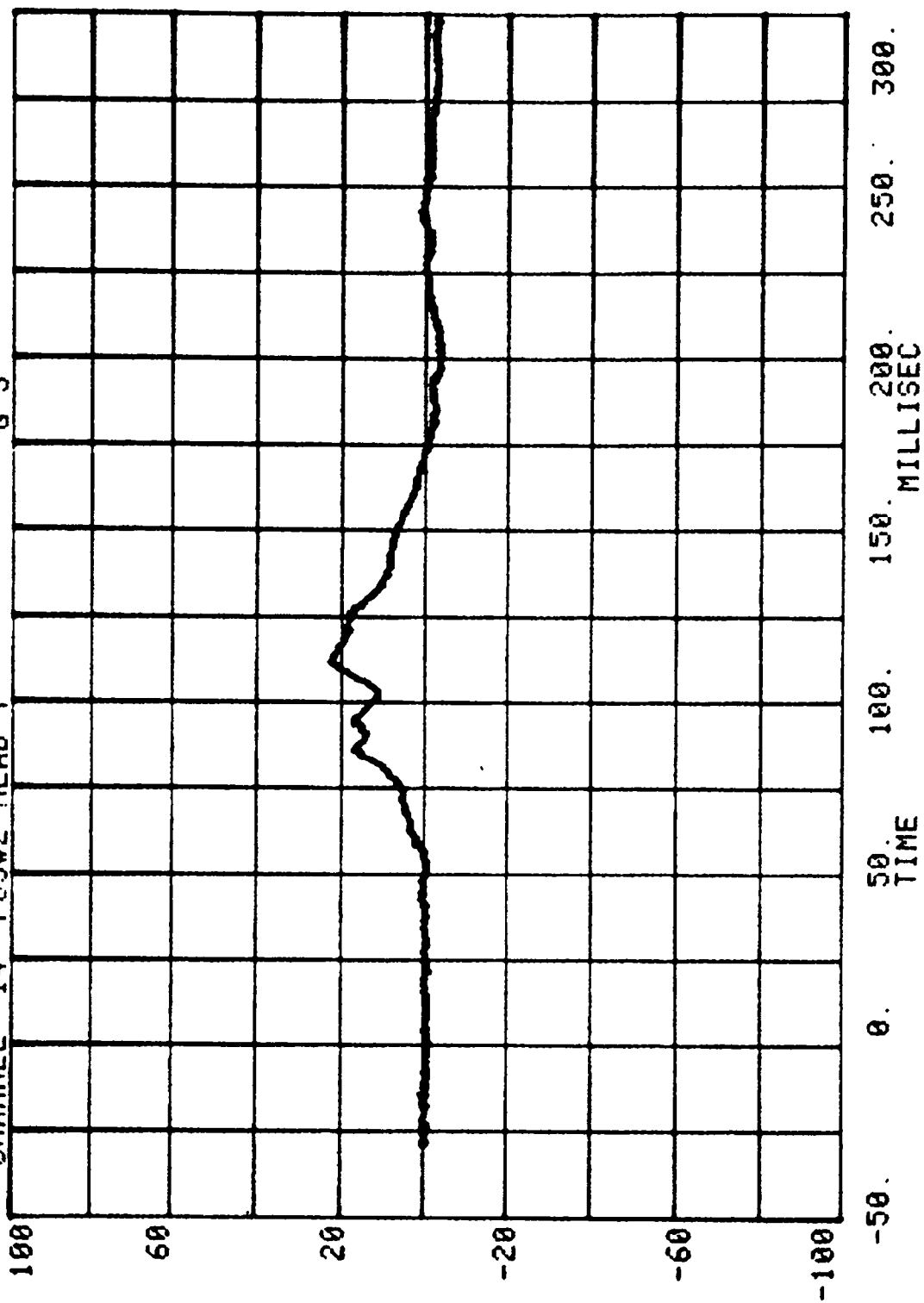
AVERAGE ACCELERATION BETWEEN T1 AND T2= 45.4G'S

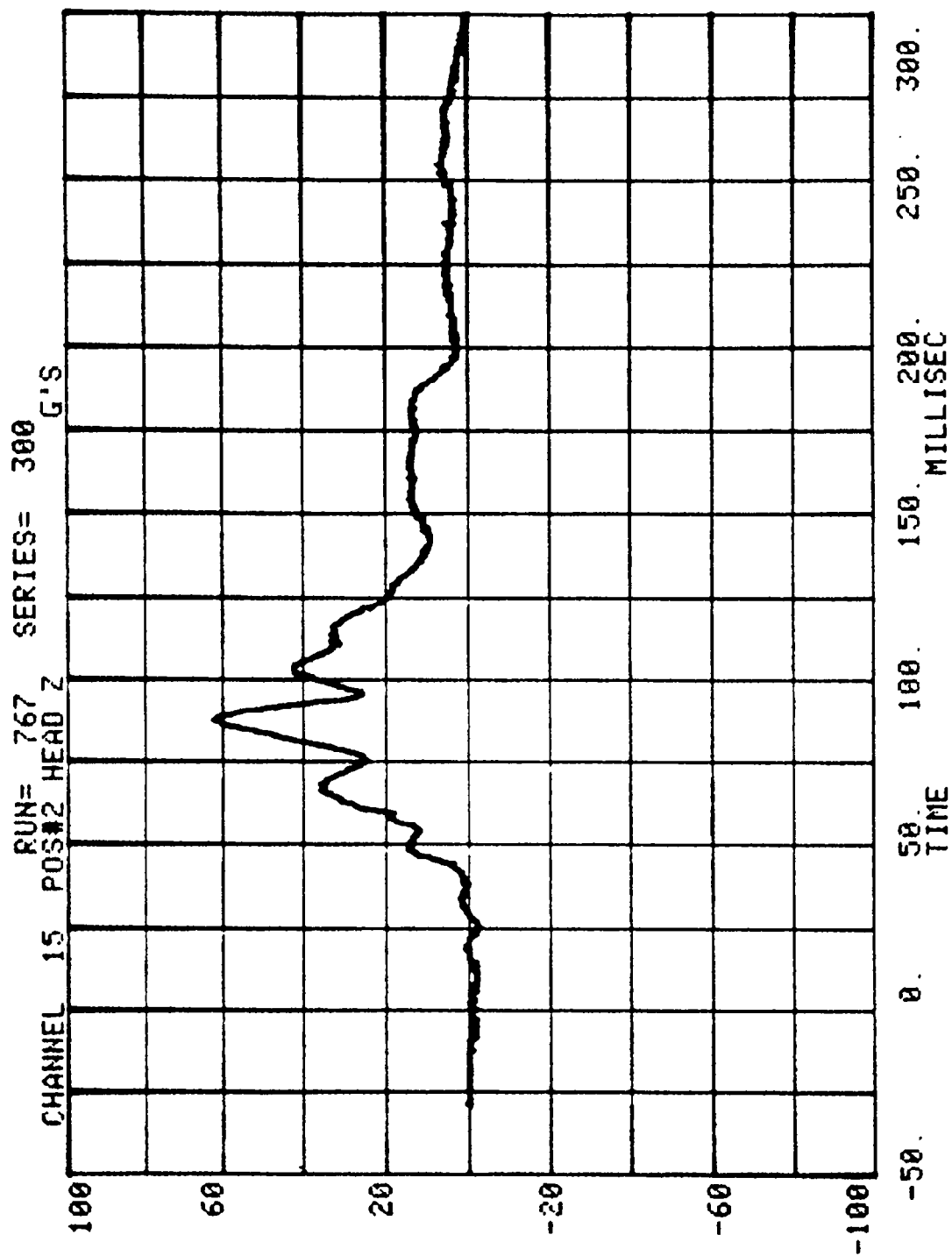
EVENT TIME= 300.0 MSEC

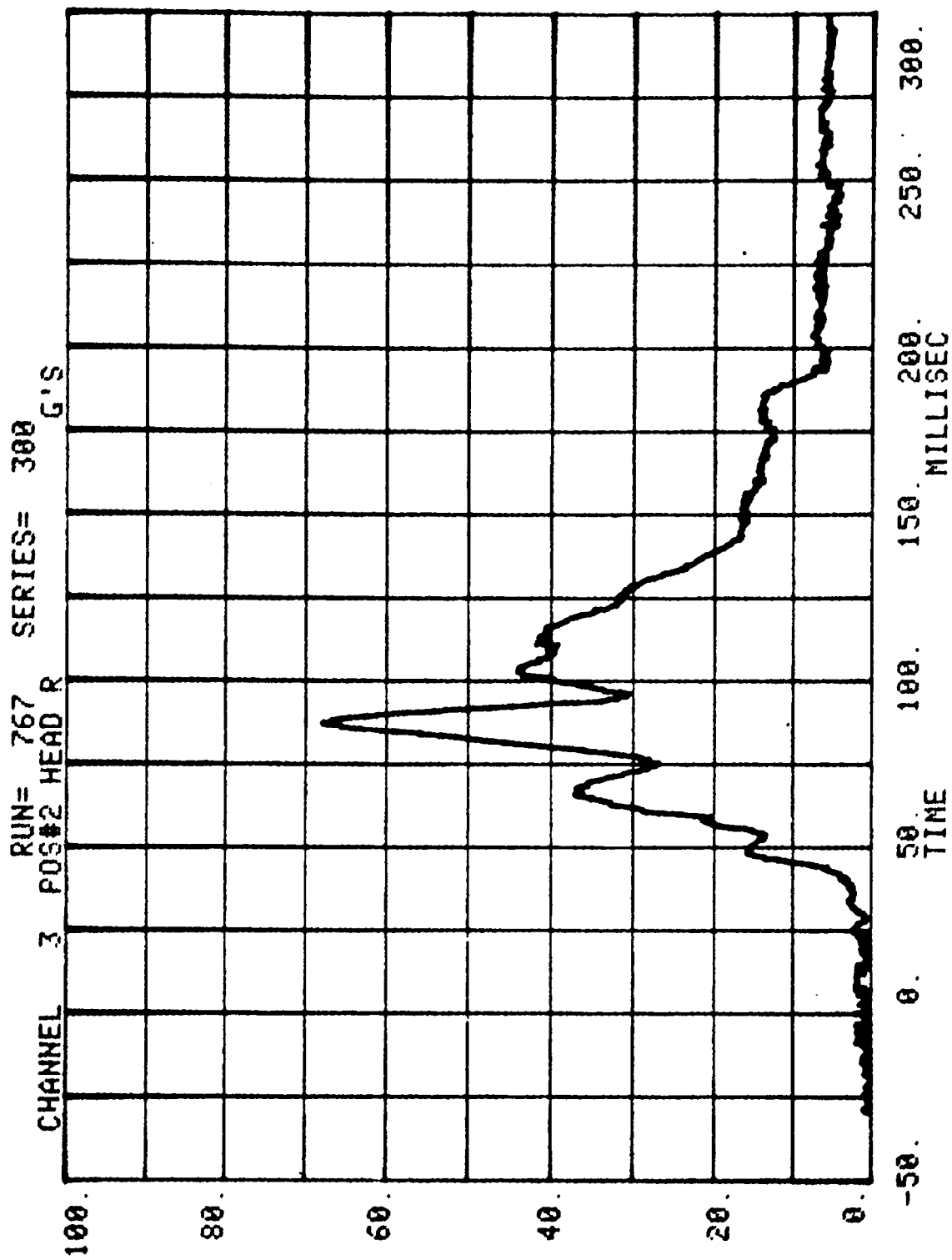
SEVERITY INDEX= 867.5

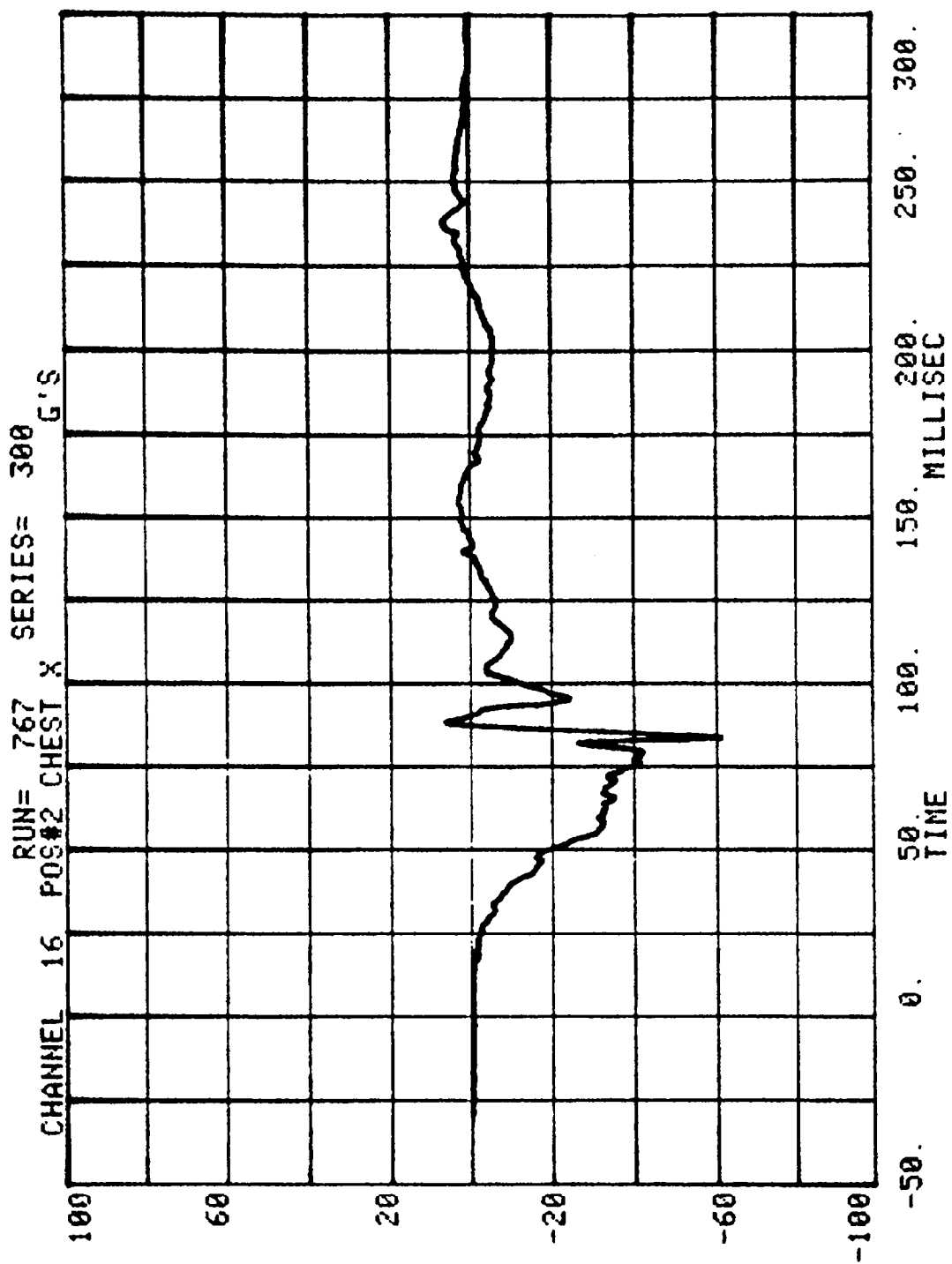


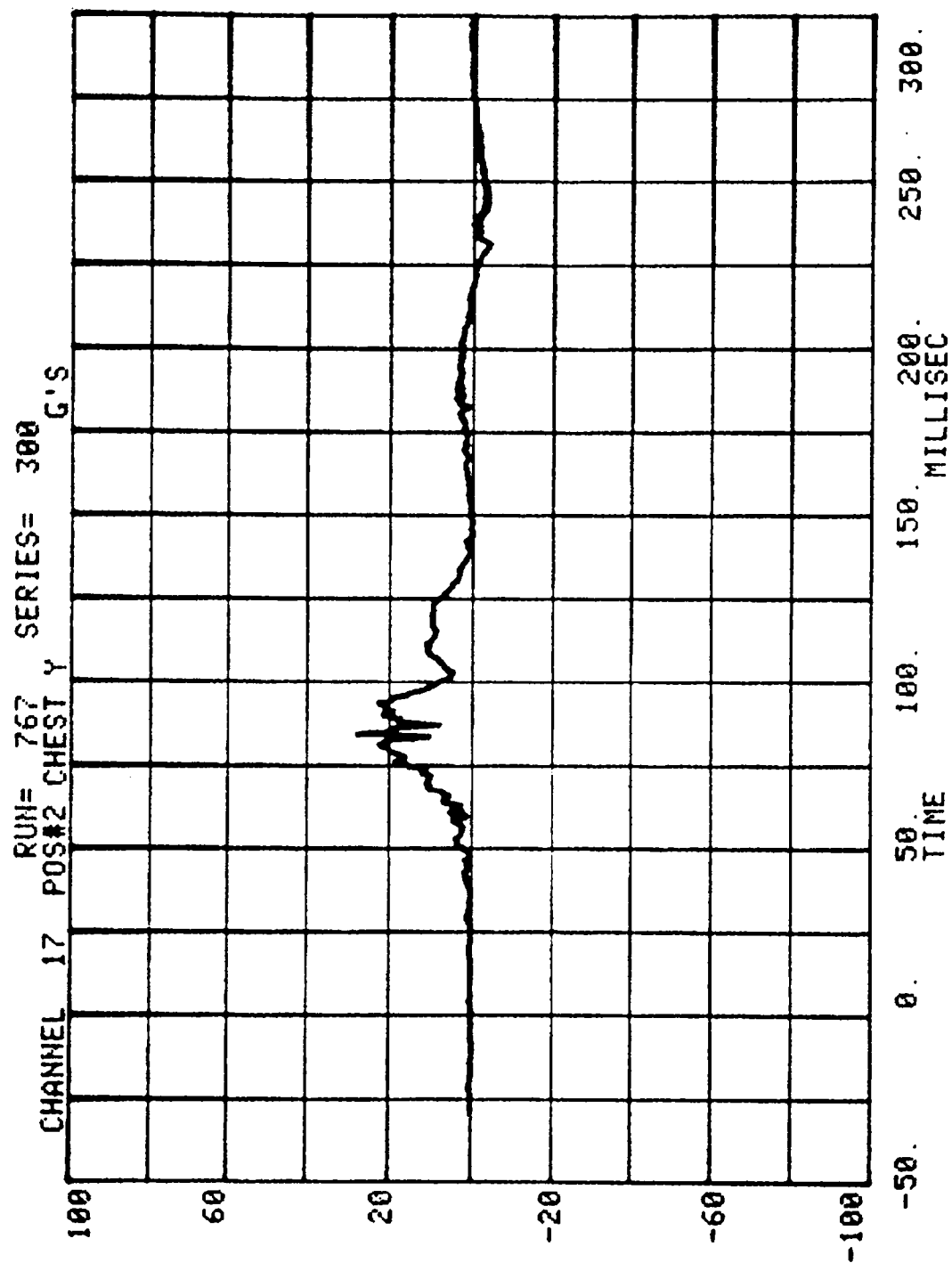
CHANNEL 14 POS#2 HEAD Y RUN= 767 SERIES= 300 G'S







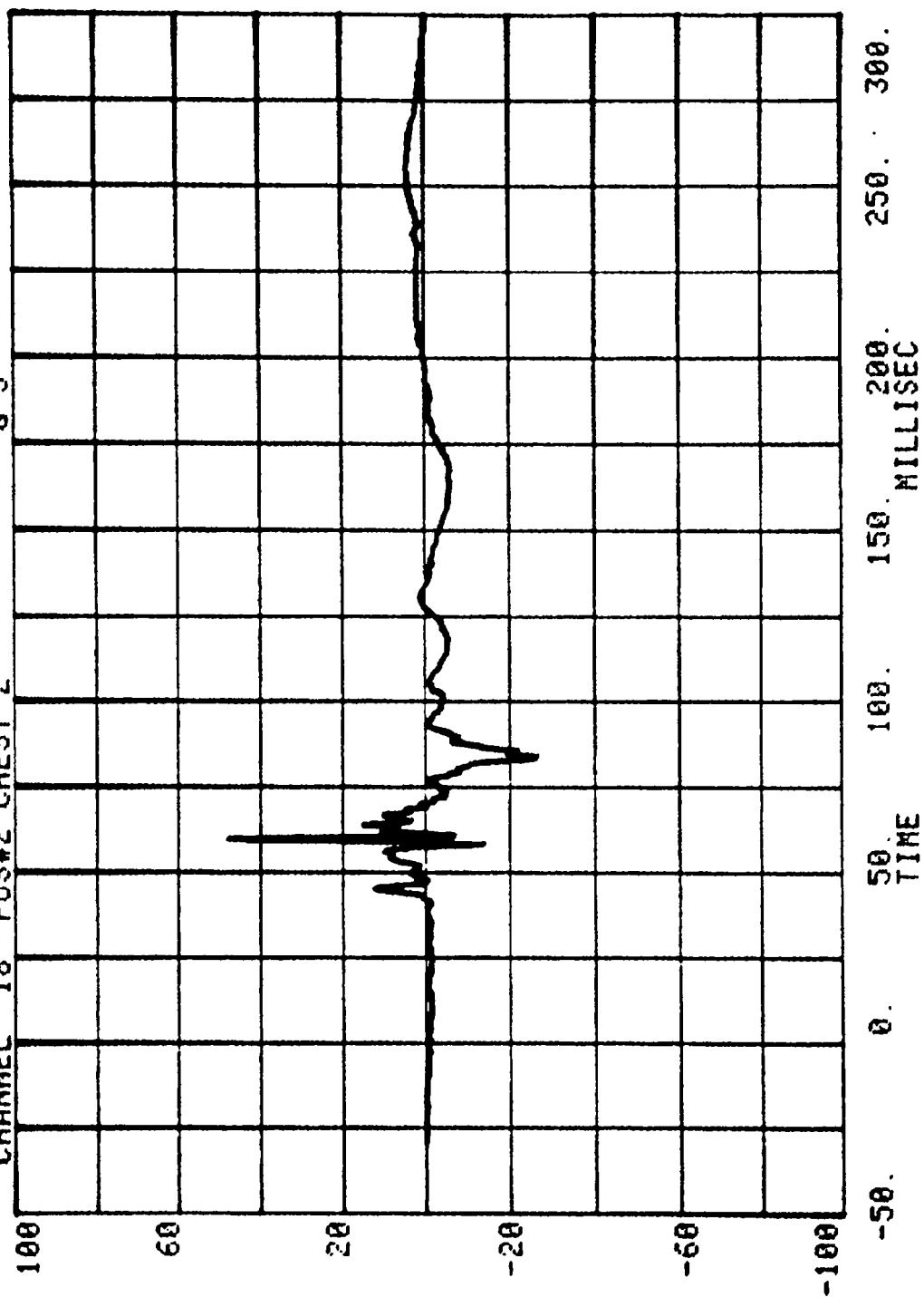


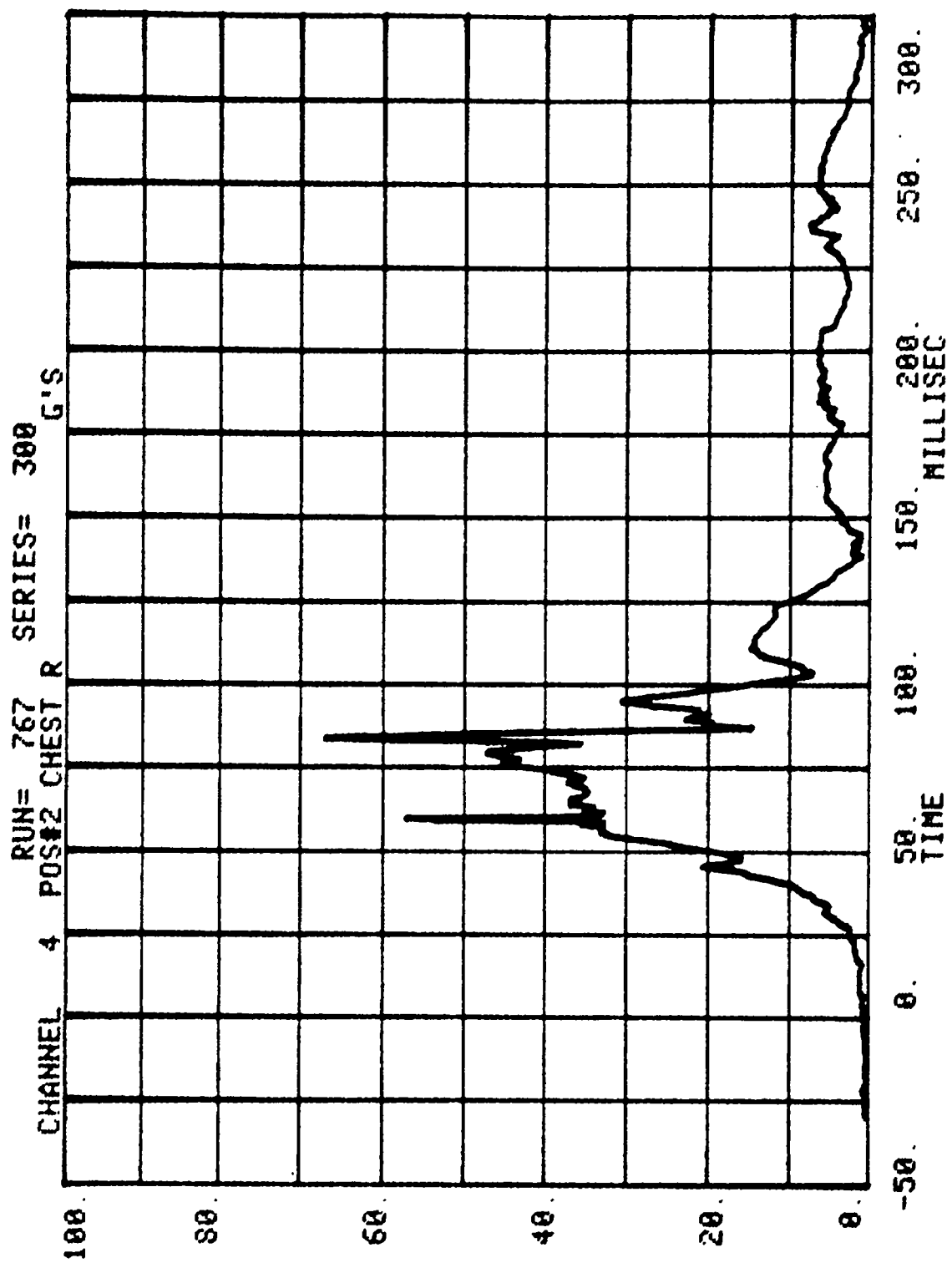


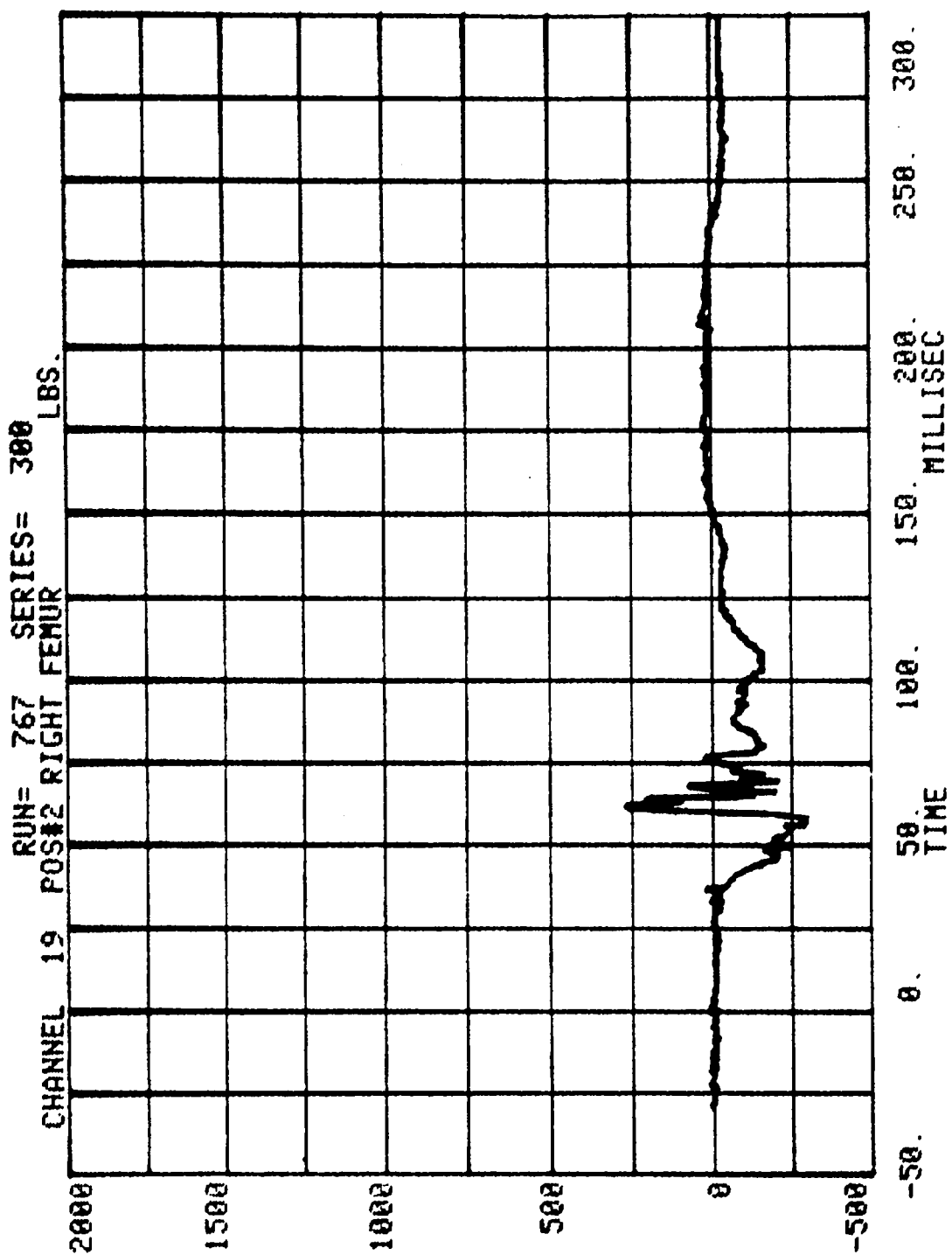
B-89

7556-5

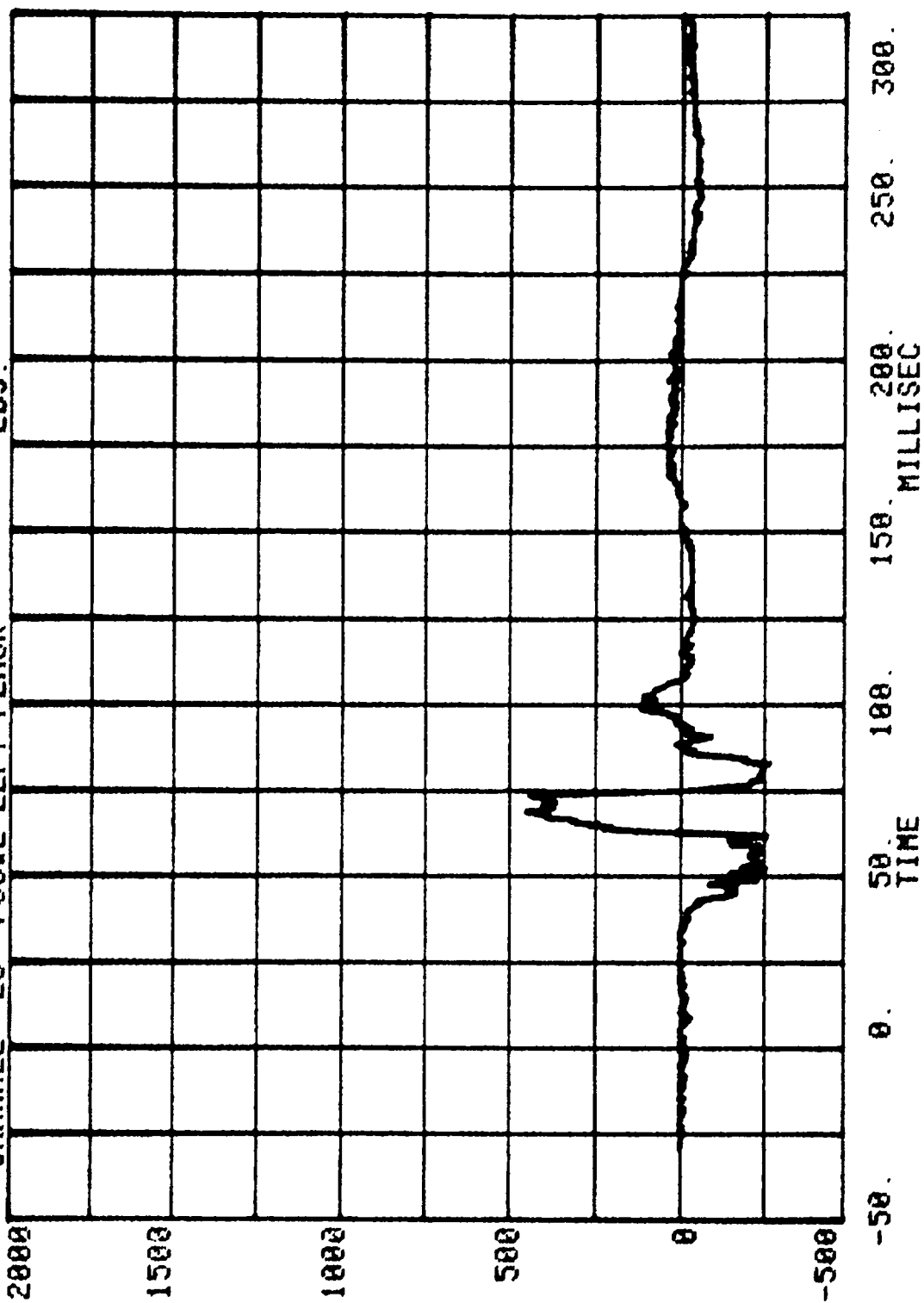
CHANNEL 18 POS#2 CHEST Z
RUN= 767 SERIES= 300 G'S

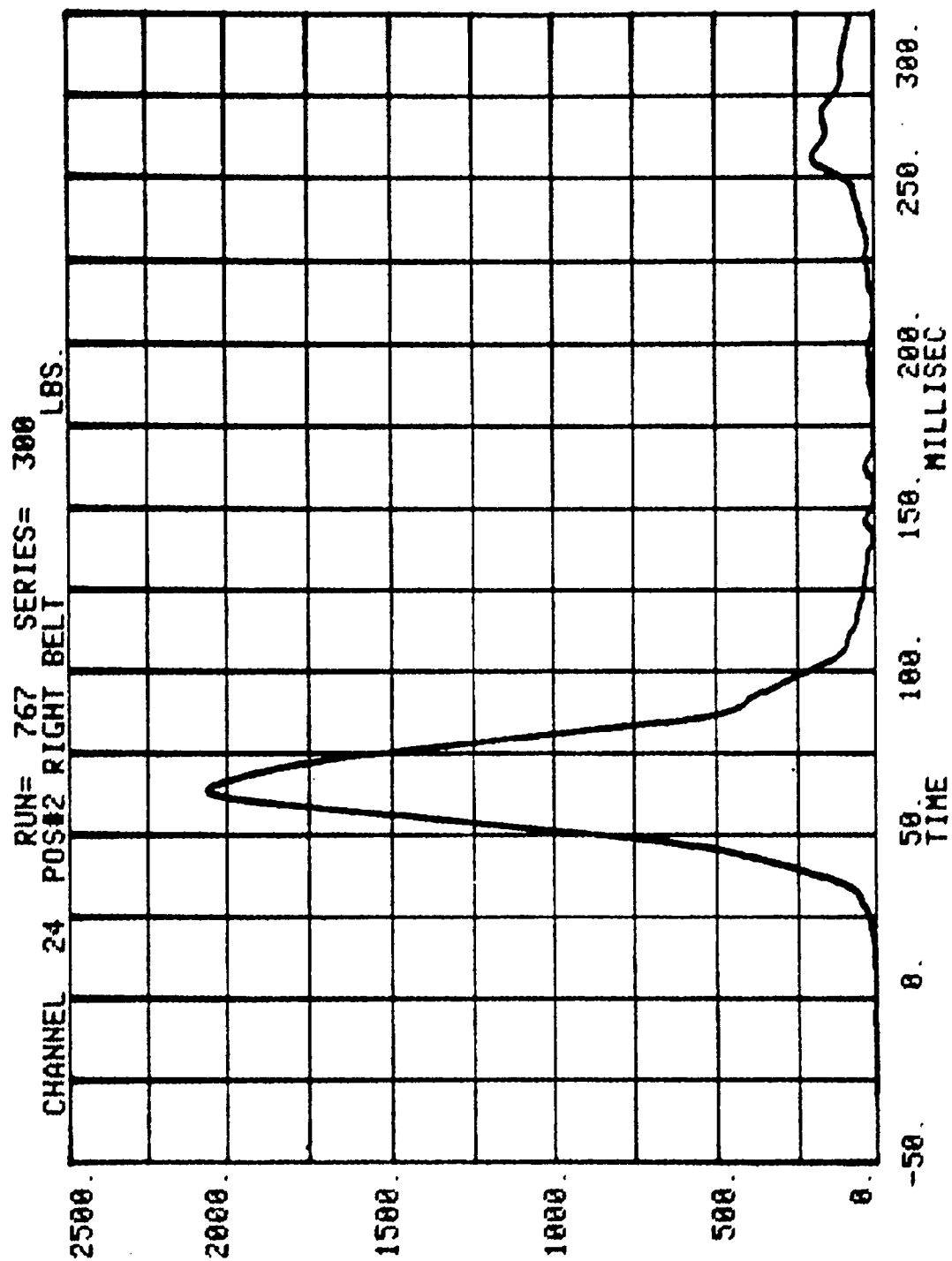


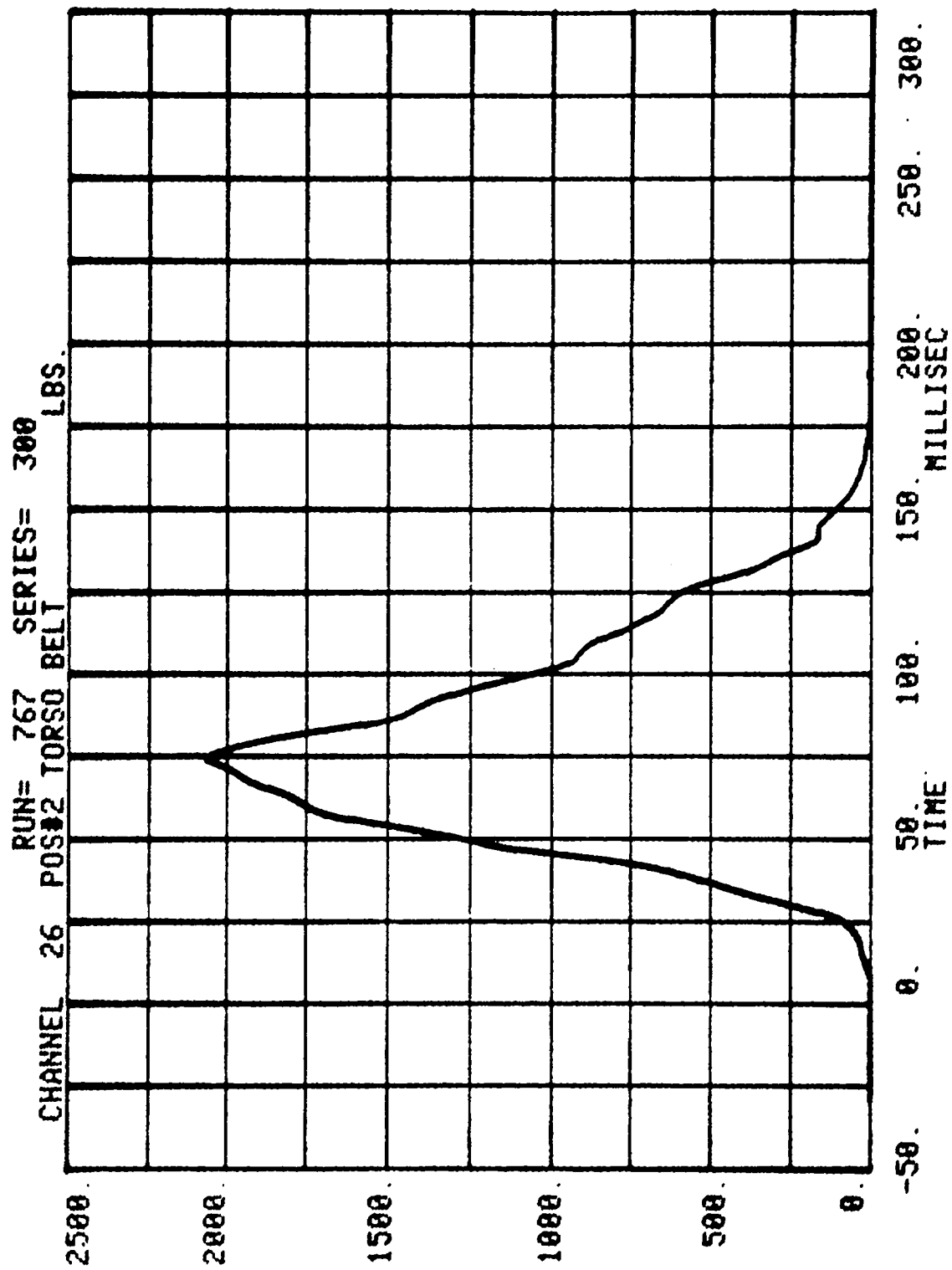




RUN= 767 SERIES= 300 LBS.
CHANNEL 28 POS#2 LEFT FEMUR



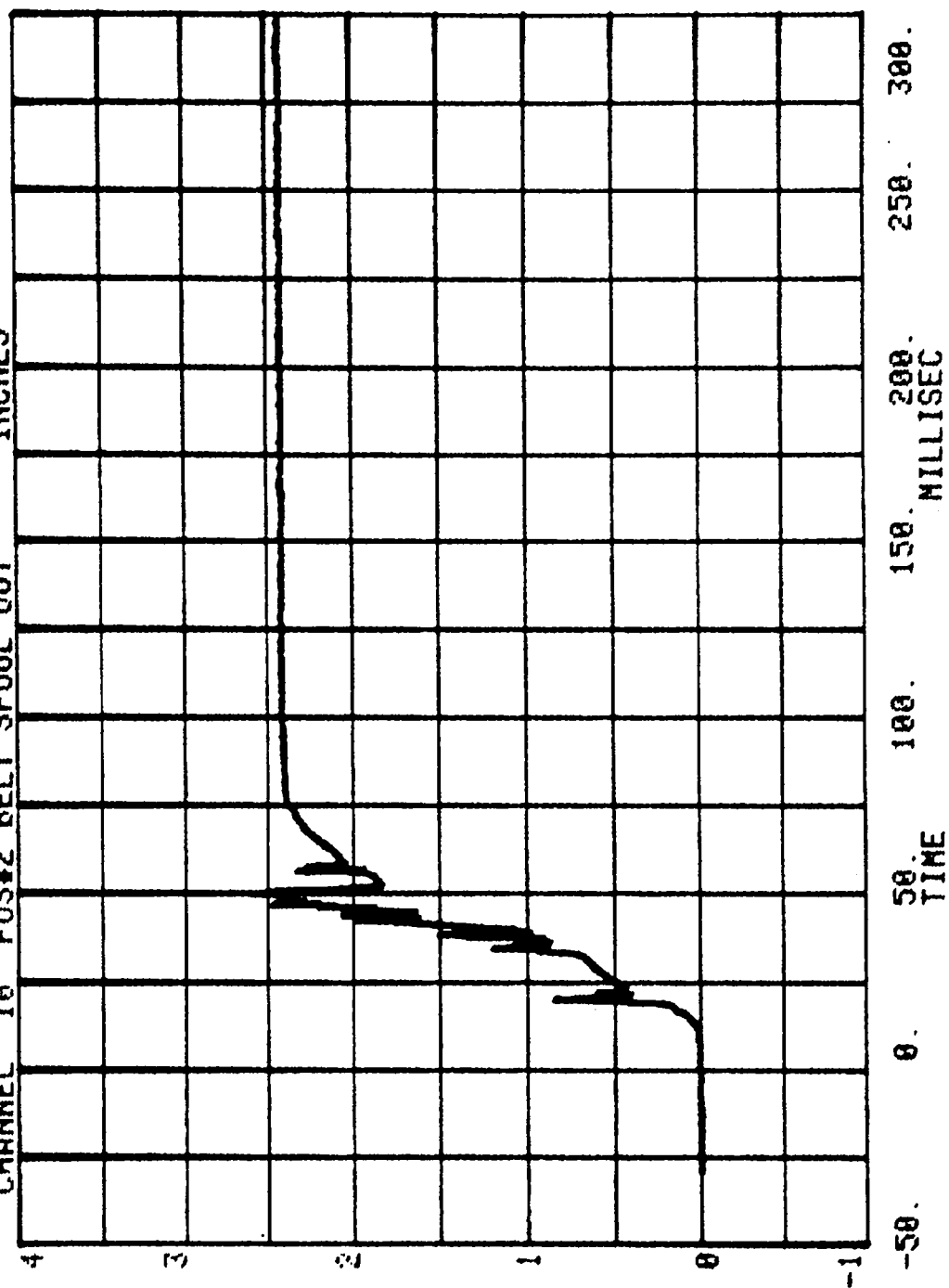


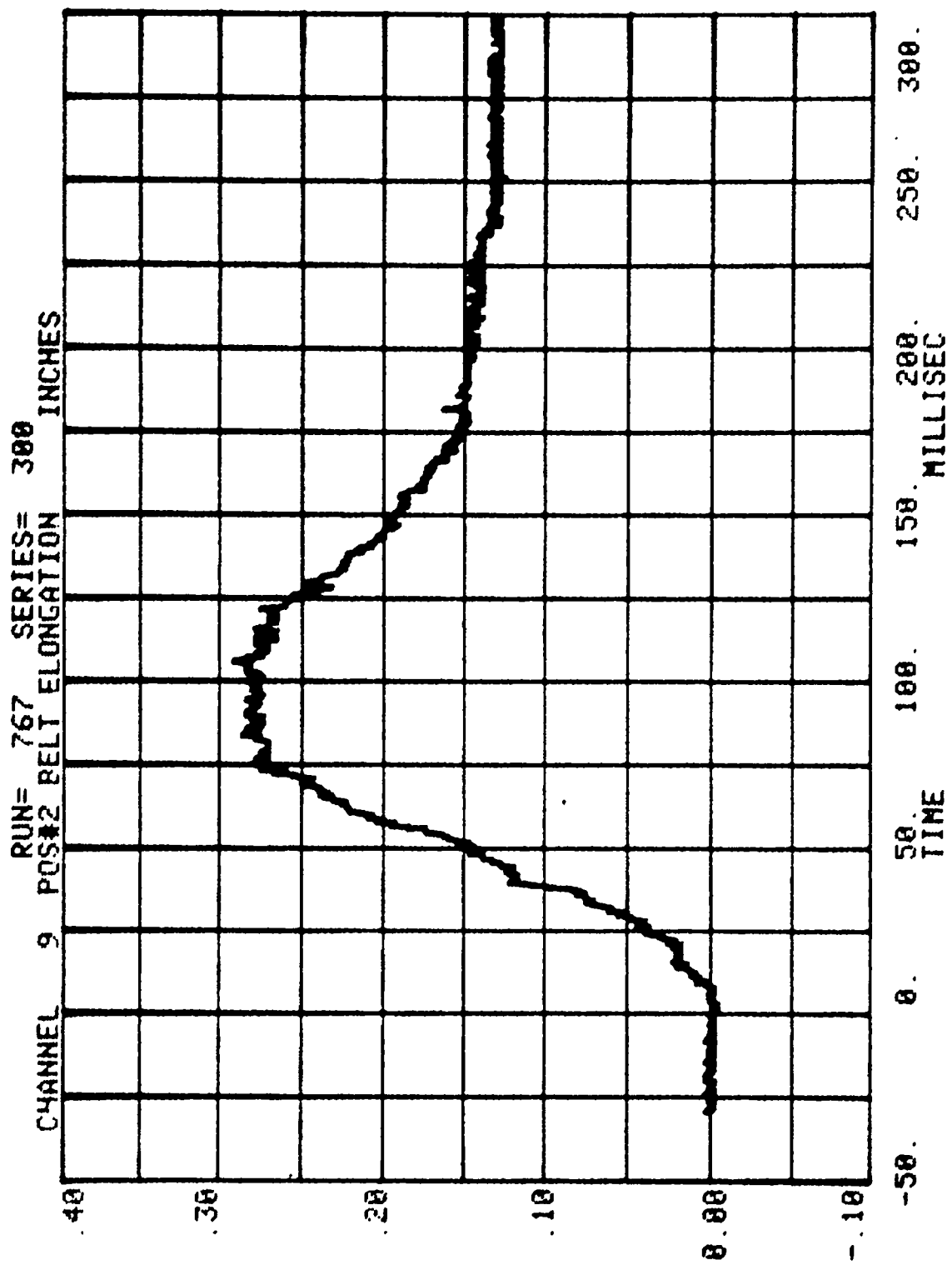


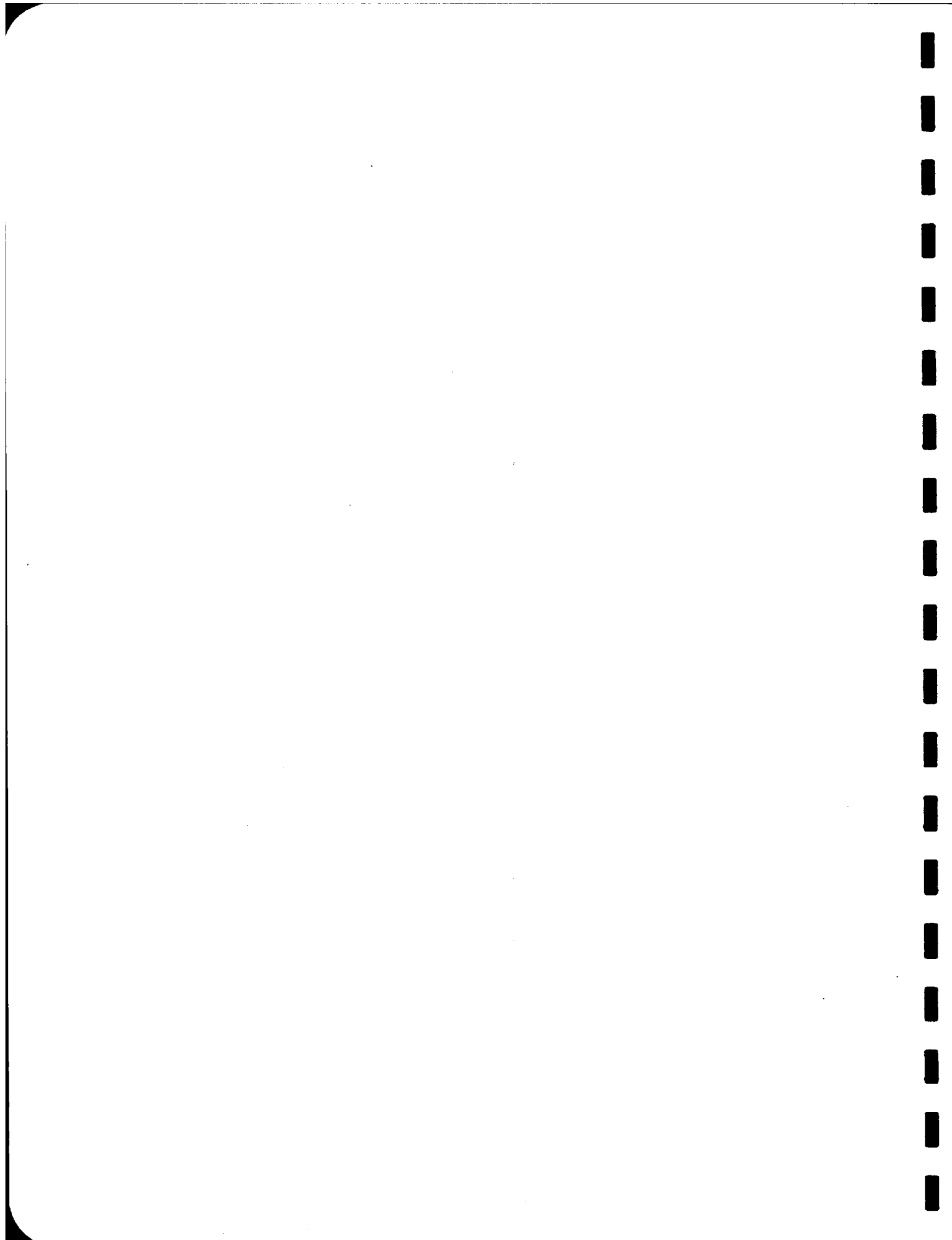
CHANNEL 10 POS#2 BELT SPOOL OUT

RUN= 767 SERIES= 300

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 the Appendix.

Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
749	2/24/87
1022	2/24/87

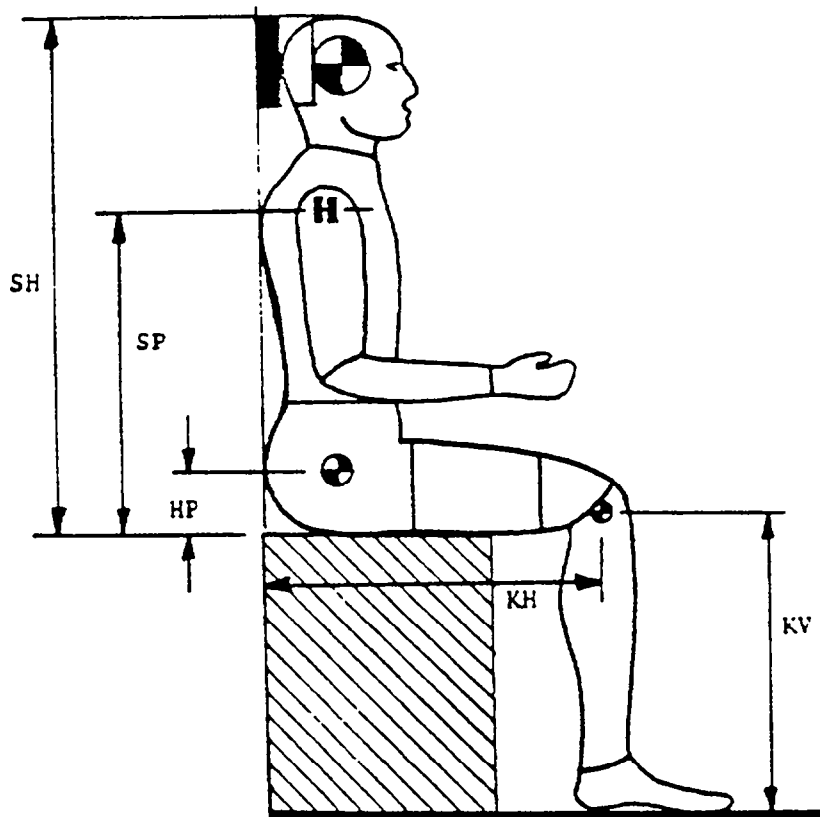
Electronic Test Equipment

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.

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 749

I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		2-24-87	
VERIFICATION NUMBER FOR DUMMY*		1	
SH - Seated Height- - - - -	35.6 to 35.8"	35.7	
SP - Shoulder Pivot Height- - -	21.8 to 22.4"	22.2	
HP - Hip Pivot Height - - - - -	3.9" ref.	3.9	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.6	
KV - Knee Pivot from floor- - -	19.3 to 19.9"	19.6	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.1	
HW - Hip Width- - - - -	14.0 to 15.4"	15.2	

TECHNICIAN'S NAME: D. W. Hess

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

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.: 749

TECHNICIAN'S NAME: D. W. Hess

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		2/24/87	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		1	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		66-72 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		22-28 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	243 g	
b. Peak Lateral Accel.-	≤ - 10G	6 g	
c. Time above 100G- - -	0.9 to 1.5ms	1.12 ms	
2. NECK BENDING TEST--			
a. Pendulum Speed - - -	21.5 to 25.5 fps	22.66 fps	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	24 g	
c. Peak Resultant Head Acceleration - - - -	26G max.	24 g	
d. Pendulum Decel.(t ₂ -t ₁)	≤ - 3ms	2 ms	
e. Pendulum Decel.(t ₃ -t ₂)	25 to 30 ms	28.5 ms	
f. Pendulum Decel.(t ₄ -t ₃)	≤ - 10ms	8 ms	
g. Max. Head Rotation - -	63 to 73°	72°	
h. Chordal Displacement-- Head Rotation Angle-			
0°	Time- - -2 to 2 ms	0.0 ms	
	Displ.- -.5 to .5"	0.0"	
30°	Time- - 25.6 to 34.4ms	30 ms	
	Displ.- 2.1 to 3.1"	2.8"	
60°	Time- - 40.3 to 51.7ms	45.6 ms	
	Displ.- 4.3 to 5.3"	5.0"	
Maximum (72 °)	Time- - 53.2 to 66.8ms	61.5 ms	
	Displ.- 5.0 to 6.0"	5.5"	

*beginning with "1" at the start of each fiscal year's crash test program

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.: 749

TECHNICIAN'S NAME: D. W. Hess

TEST PARAMETER		SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST....				
<u>Continued:</u>				
h. Chordal Displacement:				
Head Rotation Angle--				
60°	Time	67.0 to 83.0 ms	78.5 ms	
	Displ.	4.3 to 5.3 in.	4.5"	
30°	Time	85.4 to 104.6 ms	94.5 ms	
	Displ.	2.1 to 3.1 in.	2.3"	
0°	Time	101.0 to 123.0 ms	108.5 ms	
	Displ.	-.5 to 0.5 in.	0.0"	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - -		23 to 36 lbs.	28.5 lbs.	
b. Force @ .75" - - - -		36 to 50 lbs.	40.0 lbs.	
c. Force @ 1.0" - - - -		50 to 63 lbs.	58.5 lbs.	
d. Force @ 1.5" - - - -		73 to 88 lbs.	82 lbs.	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - -		22 to 34 lbs.	30 lbs.	
b. Force @ 30° - - - -		34 to 46 lbs.	39 lbs.	
c. Force @ 40° - - - -		46 to 58 lbs.	46.5 lbs.	
d. Return Angle - - - -		12° maximum	6.5°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -		21.78-22.22 fps	22.14 fps	
(2) Peak Deflection-		1.7" maximum	1.5"	
(3) Peak Resistive Force- - - - -		2250 lbs. maximum	2184 lbs.	
(4) Internal Hysteresis - - -		50 to 70%	50.1%	
b. Low Speed				
(1) Probe Speed- - -		13.86-14.14 fps	14.12 fps	
(2) Peak Deflection-		1.1" maximum	.92"	
(3) Peak Resistive Force- - - - -		1450 lbs. maximum	1326 lbs.	
(4) Internal Hyster.-		50 to 70%	61.1%	

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.: 749

TECHNICIAN'S NAME: D. W. Hess

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.01 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2250 lbs.	
(3) Time Above 1000g--	1.7 ms minimum	1.8 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.95 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1925 lbs.	
(3) Time Above 1000g--	1.7 ms minimum	2.16 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

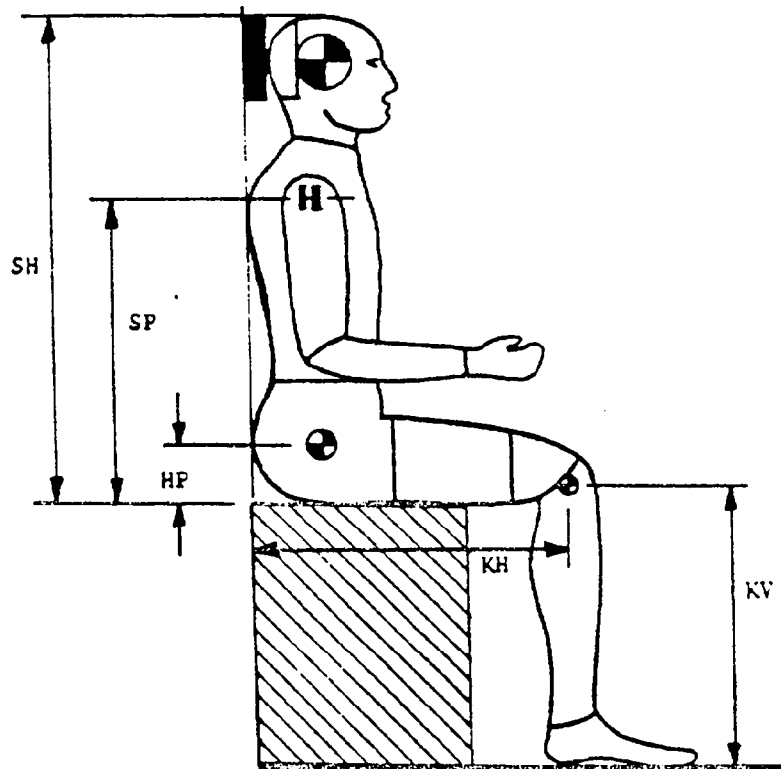
NHTSA DUMMY ID NO. 749 CALIB. SEQ. NOS. FOR DUMMY: 1 &

A. <u>DUMMY INSTRUMENTS:</u>	<u>MANUFACTURER</u>	<u>SERIAL NUMBER</u>	<u>DATE LAST CALIBRATED</u>	<u>DATE OF NEXT CALIBRATION</u>
1. Head Accelerometers --				
a. Triaxial unit - - - - -	NA	-----	-----	-----
b. Uniaxial units				
(1) Longitudinal (A_x) -	Endevco	CK54	2-87	8-87
(2) Lateral (A_y) - - -	"	CK78	2-87	8-87
(3) Vertical (A_z) - - -	"	CD75	2-87	8-87
2. Chest Accelerometers --				
(Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -	NA	-----	-----	-----
b. Uniaxial units				
(1) Longitudinal (A_x) -	CEC	A52	2-87	8-87
(2) Lateral (A_y) - - -	Endevco	CL65	2-87	8-87
(3) Vertical (A_z) - - -	CEC	A90	2-87	8-87
3. Chest Potentiometer - - -	NA	-----	-----	-----
4. Femur Load Cells --				
a. Right Side - - - - -	GSE	77	2-87	8-87
b. Left Side - - - - -	"	76	2-87	8-87
3. <u>CALIB. LAB. INSTRUMENTS:</u>				
1. Pendulum Accelerometer - - -	CED	18259	2-87	8-87
2. Test Probe Accelerometer - - -	"	17815	2-87	8-87
3. Lumbar Flexion Test Push Force Gauge - - - - -	Transducer Inc.	20051	2-87	8-87
4. Abdominal Compression Test Force Gauge - - - - -	BLH	72952	2-87	8-87
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11	2-87	8-87

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 1022

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		2-24-87	
VERIFICATION NUMBER FOR DUMMY*		1	
SH - Seated Height- - - - -	35.6 to 35.8"	35.7"	
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"	19.7"	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.1"	
HW - Hip Width- - - - -	14.0 to 15.4"	14.9"	

TECHNICIAN'S NAME: D. W. Hess

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

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.: 1022

TECHNICIAN'S NAME: D. W. Hess

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		2-24-87	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		1	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		66-72 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		22-28 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	260 g	
b. Peak Lateral Accel.-	≤ - 10G	6 g	
c. Time above 100G- - -	0.9 to 1.5ms	1.0 ms	
2. NECK BENDING TEST--			
a. Pendulum Speed - - -	21.5 to 25.5 fps	22.97 fps	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	24 g	
c. Peak Resultant Head Acceleration - - - -	26G max.	26 g	
d. Pendulum Decel.(t ₂ -t ₁)	≤ - 3ms	2.3 ms	
e. Pendulum Decel.(t ₃ -t ₂)	25 to 30 ms	27.5 ms	
f. Pendulum Decel.(t ₄ -t ₃)	≤ - 10ms	6 ms	
g. Max. Head Rotation - -	63 to 73°	71°	
h. Chordal Displacement-- Head Rotation Angle-			
0°	Time- - -2 to 2 ms	0.0 ms	
	Displ.- -.5 to .5"	0.0"	
30°	Time- - 25.6 to 34.4ms	28.5 ms	
	Displ.- 2.1 to 3.1"	2.5"	
60°	Time- - 40.3 to 51.7ms	43 ms	
	Displ.- 4.3 to 5.3"	5.2"	
Maximum (71°)	Time- - 53.2 to 66.8ms	58.5 ms	
	Displ.- 5.0 to 6.0"	6.0"	

*beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.: 1022

TECHNICIAN'S NAME: D.W. Hess

TEST PARAMETER		SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST....				
<u>Continued:</u>				
h. Chordal Displacement:				
Head Rotation Angle--				
60°	Time	67.0 to 83.0 ms	74 ms	
	Displ.	4.3 to 5.3 in.	4.8"	
30°	Time	85.4 to 104.6 ms	90 ms	
	Displ.	2.1 to 3.1 in.	2.1"	
0°	Time	101.0 to 123.0 ms	105 ms	
	Displ.	-.5 to 0.5 in.	0.0"	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - -		23 to 36 lbs.	24 lbs.	
b. Force @ .75" - - - -		36 to 50 lbs.	38.5 lbs.	
c. Force @ 1.0" - - - -		50 to 63 lbs.	56 lbs.	
d. Force @ 1.3" - - - -		73 to 88 lbs.	84.5 lbs.	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - -		22 to 34 lbs.	31 lbs.	
b. Force @ 30° - - - -		34 to 46 lbs.	41 lbs.	
c. Force @ 40° - - - -		46 to 58 lbs.	47.5 lbs.	
d. Return Angle - - - -		12° maximum	8.5°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -	21.78-22.22 fps	21.91 fps		
(2) Peak Deflection-	1.7" maximum	1.63"		
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	2028 lbs.		
(4) Internal Hysteresis - - -	50 to 70%	61%		
b. Low Speed				
(1) Probe Speed- - -	13.86-14.14 fps	13.89 fps		
(2) Peak Deflection-	1.1" maximum	1.0"		
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1248 lbs.		
(4) Internal Hyster.-	50 to 70%	64.8%		

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:II. PERFORMANCE VERIFICATION DATA (Continued)NHTSA DUMMY I.D. NO.: 1022TECHNICIAN'S NAME: D. W. Hess

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.81 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2100 lbs.	
(3) Time Above 1000g--	1.7 ms minimum	1.72 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.96 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1900 lbs.	
(3) Time Above 1000g--	1.7 ms minimum	2 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1022 CALIB. SEQ. NOS. FOR DUMMY: 1 &

A. <u>DUMMY INSTRUMENTS:</u>	MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. Head Accelerometers --				
a. Triaxial unit - - - - -	NA	-----	-----	-----
b. Uniaxial units				
(1) Longitudinal (A_x) -	Endevco	DB47	2-87	8-87
(2) Lateral (A_y) - - -	"	CX05	2-87	8-87
(3) Vertical (A_z) - - -	"	CJ54	2-87	8-87
2. Chest Accelerometers -- (Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -	NA	-----	-----	-----
b. Uniaxial units				
(1) Longitudinal (A_x) -	CEC	A115	2-87	8-87
(2) Lateral (A_y) - - -	Endevco	CS09	2-87	8-87
(3) Vertical (A_z) - - -	CEC	A29	2-87	8-87
3. Chest Potentiometer - - -	NA	-----	-----	-----
4. Femur Load Cells --				
a. Right Side - - - - -	GSE	75	2-87	8-87
b. Left Side - - - - -	GSE	74	2-87	8-87
B. <u>CALIB. LAB. INSTRUMENTS:</u>				
1. Pendulum Accelerometer - - -	CED	18259	2-87	8-87
2. Test Probe Accelerometer - - -	CED	17815	2-87	8-87
3. Lumbar Flexion Test Push Force Gauge - - - - -	Transducer Inc.	20051	2-87	8-87
4. Abdominal Compression Test Force Gauge - - - - -	BLH	72952	2-87	8-87
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11	2-87	8-87