

DOT# 1042

REPORT NO. CAL- 87-N13

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

1987 ISUZU I-MARK
4-DOOR SEDAN

NHTSA NO. MH5700
CALSPAN TEST NO. 7556-13

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MAY 6, 1987



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 Isuzu I-Mark 4-Door Sedan was performed at the Calspan Corporation Advanced Technology Center Crash Test Facility in Buffalo, New York, on May 6, 1987. Impact speed was 34.9 mph and the ambient temperature at the barrier face at the time of impact was 56°F. The maximum post-test vehicle crush was 21.6 inches.					
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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 DATA AND DUMMY RESPONSE DATA	B-1
APPENDIX C	DUMMY CONFIGURATION TESTS	C-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

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	General Test and Vehicle Data	1-2
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 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 requirement.

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 MH5700

A load cell barrier consisting of 36 load cells was impacted by a 1987 Isuzu I-Mark 4-Door Sedan at a velocity of 34.9 mph. The test was performed at the Calspan Corporation Advanced Technology Center on May 6, 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. 1022) in tests (MH5100 and MH0501), and the right front passenger (Serial No. 749) in tests (MH0301 and MH5501). 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.

Table 1

GENERAL TEST AND VEHICLE DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1987 ISUZU I-MARK 4-DOOR

NHTSA NO.: MH5700 VIN.: JABRT5176H4100960

BODY COLOR: BLUE DATE OF MANUFACTURE: 9/86

Engine: 4 cylinders; 90 C.I.D.; 1.5 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: 2/16/87 Odometer Reading: 12
- A/C; - P/S; X P/B; - P/wdo.; - Tilt Wheel
- P/seats; - Cruise Control

Type of Occupant Restraint: 3 POINT CONTINUOUS

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P175/70R13 P155/80R13

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

Tires on Vehicle: P155/80R13; Manufacturer: BRIDGESTONE

Number of Occupants: 2 Front; 2 Rear; - 3rd Seat; 4 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 725 lbs. (A)

No. of Occupants x 150 lbs. = 600 lbs. (B)

Rated Cargo and Luggage Weight (RCLW) A-B = 125 lbs.

GVWR 2897 lbs. GAWR: Front 1616 lbs. Rear 1362 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>670</u> lbs.	Right Rear = <u>380</u> lbs.
Left Front = <u>650</u> lbs.	Left Rear = <u>400</u> lbs.
TOTAL FRONT WEIGHT = <u>1320</u> lbs. (<u>62.9</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT = <u>780</u> lbs. (<u>37.1</u> % of Total Vehicle Weight)	
TOTAL DELIVERY WEIGHT = <u>2100</u> lbs.	

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (2100 lbs.)
VCW = Vehicle Capacity Weight (725 lbs.)
DSC = Designated Seating Capacity (4)
RCLW = VCW - 150 (DSC) = 125 lbs.
Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)
Target Test Weight = 2553 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND POUNDS CARGO:

Right Front = <u>740</u> lbs.	Right Rear = <u>550</u> lbs.
Left Front = <u>720</u> lbs.	Left Rear = <u>560</u> lbs.
TOTAL FRONT WEIGHT = <u>1460</u> lbs. (<u>56.8</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT = <u>1110</u> lbs. (<u>43.2</u> % of Total Vehicle Weight)	
TOTAL TEST WEIGHT = <u>2570</u> lbs.	
Weight of ballast secured in vehicle trunk area = <u>0</u> lbs.	

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude:	RF	<u>26.2</u>	LF	<u>26.0</u>	RR	<u>26.3</u>	LR	<u>25.8</u>
Test Attitude:	RF	<u>25.5</u>	LF	<u>25.5</u>	RR	<u>24.3</u>	LR	<u>24.1</u>
Wheel Base: <u>94.2</u> in.; C.G. = <u>40.7</u> in. rearward of front wheel C/L								
Remarks: <u>10.0 Gallons of solvent in fuel tank.</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: 5/6/86 Time of Test: 11:50
 Ambient Temperature: 56 °F at impact area
 Temperature in Occupant Compartment: 71 °F.
 Windshield Molding Temperature: 71 °F.
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: primary = 34.9 mph, secondary = 35.0 mph
 Distance From Front Bumper to Barrier Face When Entering Speed Trap: 52
 inches; Exiting Speed Trap: 12.0 inches

VEHICLE REBOUND AND CRUSH (inches):

Vehicle Length:	Pre-test	= R	<u>158.3</u>	C _L	<u>159.9</u>	L	<u>158.4</u>
	Post-test	= R	<u>137.0</u>	C _L	<u>138.3</u>	L	<u>138.1</u>
	Crush	= R	<u>21.3</u>	C _L	<u>21.6</u>	L	<u>20.3</u>

Distance from front of test vehicle to point of impact:

R 14.5 C/L 14.5 L 15.6

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Steering Wheel Hub</u>	<u>Dash Panel</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>

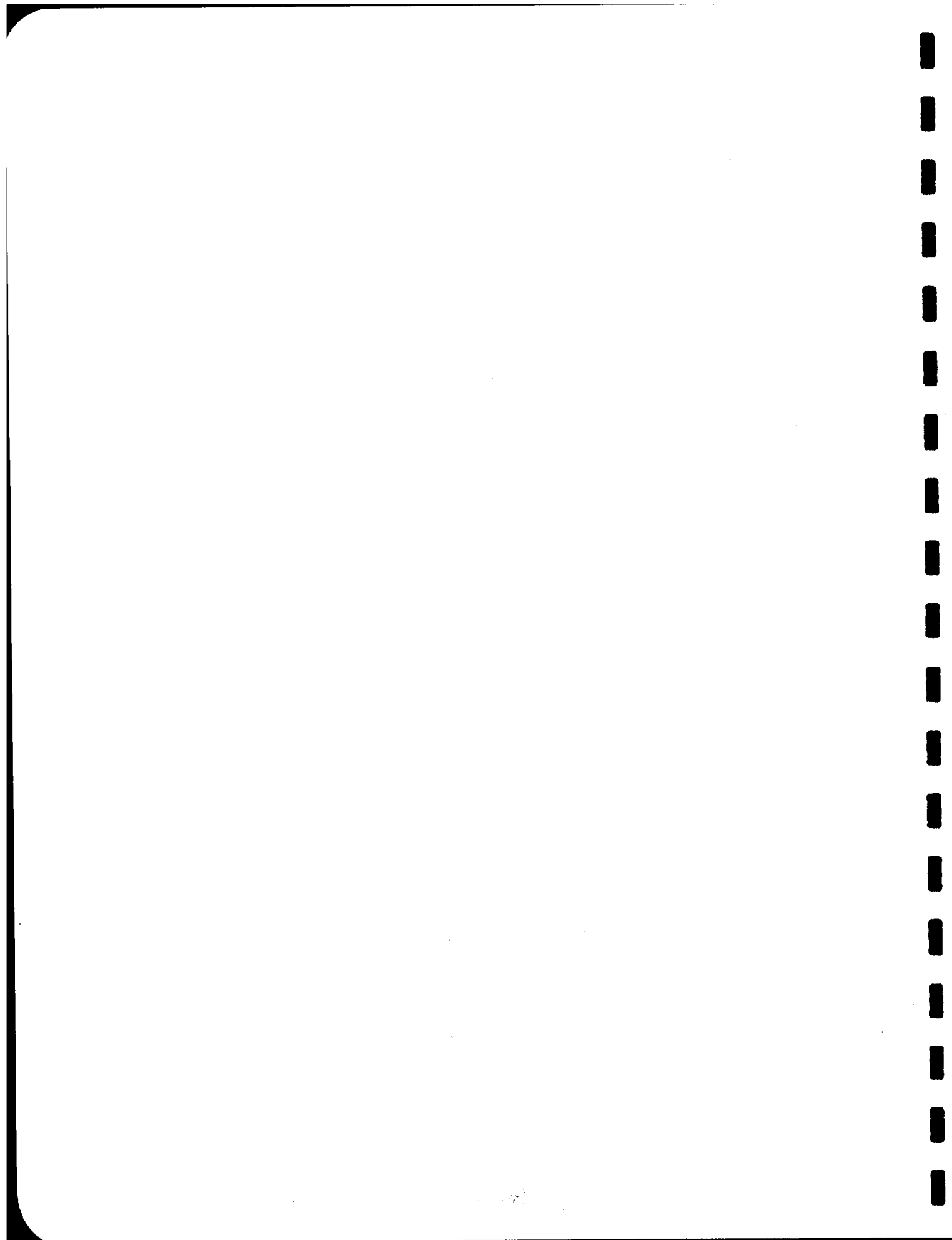
Table 1
GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	Not <u>Operable</u>	<u>Operable</u>	<u>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 Windshield has stress cracks.



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)	-239	-26	122	265	-58	-14	-16	53
DUMMY (2)	-41	15	107	111	-53	9	-16	51
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE - FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	747	351
DUMMY (2)	225	365
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)	2018	-	1796
DUMMY (2)	2739	1350	-
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**			
	HIC	36 MILLISEC MAX.		AVE. ACC. (g)
		t ₁ (SEC)	t ₂ (SEC)	t ₁ TO t ₂
DUMMY (1)	1809	.07672	.08512	136.2
DUMMY (2)	1042	.08242	.11842	60.9
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

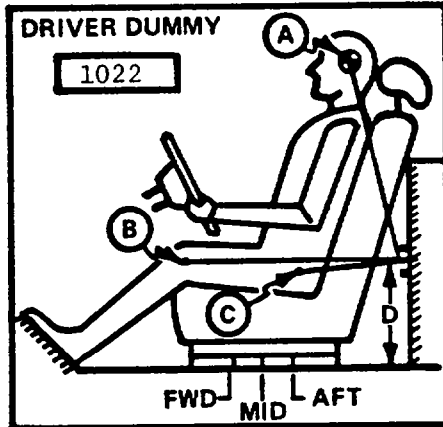
TEST NO.: MH5700

VEHICLE: 1987 ISUZU I-MARK 4-DOOR SEDAN

SEAT TYPE:
☐ Bench
☒ Bucket
☐ Split Bench

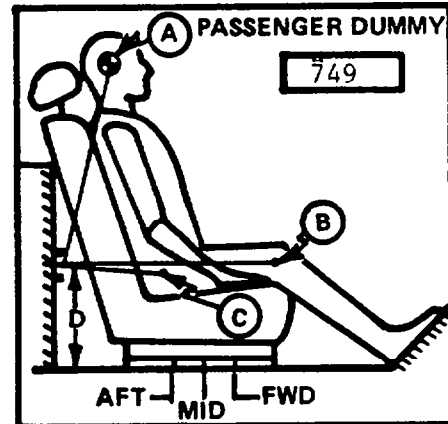
ADJUSTER TYPE:
☒ Manual
☐ Power

BUCKET SEAT BACK TYPE:
☐ Fixed
☒ Adjustable Reclining



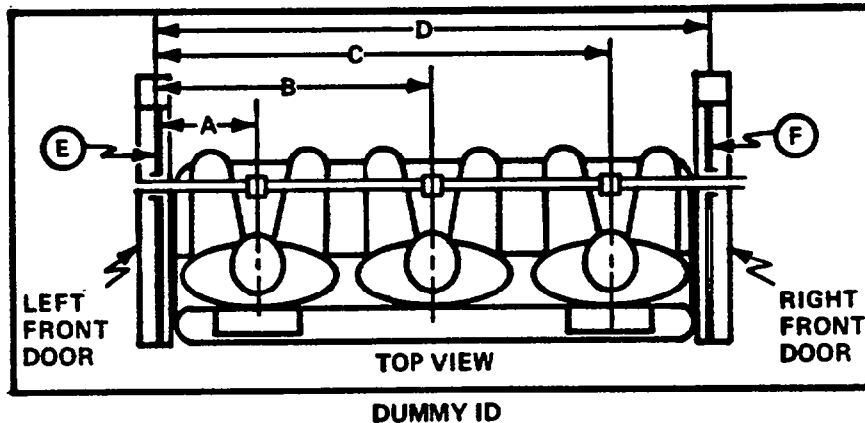
MEASUREMENT LOCATION

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



A = 21.5 in. -1 Degrees
 B = 22.7 in. 95 Degrees
 C = 8.1 in. 128 Degrees
 D = 13.5 in.

A = 21.8 in. -2 Degrees
 B = 23.7 in. 95 Degrees
 C = 9.0 in. 124 Degrees
 D = 13.5 in.



1022

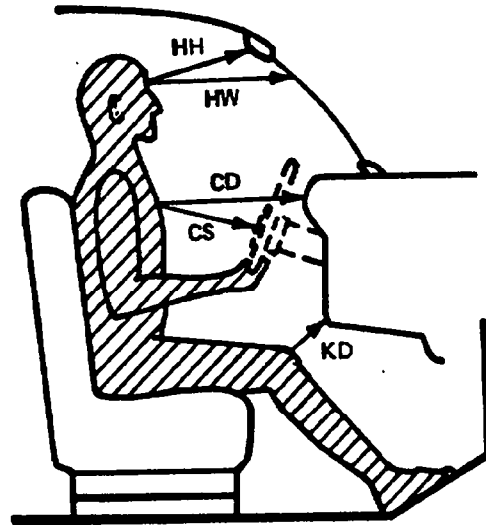
749

A = Left Door to Driver Centerline 11.5 in.
 B = Left Door to Center Passenger Centerline - in.
 C = Left Door to Right Passenger Centerline 37.5 in.
 D = Left Door to Right Door 48.0 in.
 E, F = Window Glass Height (Right and Left Must Be Equal) 12.0 in.

Figure 2

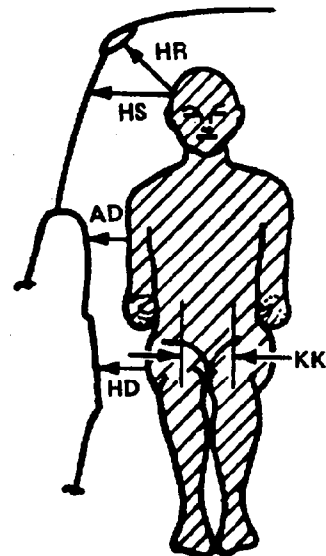
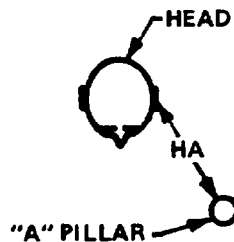
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	15.7	15.7
HW	20.7	21.3
CD	22.0	21.7
CS	15.7	-
KDL	6.4	5.2
KDR	6.0	5.6
SA	8th Position	8th Position
TA	25	25.0



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

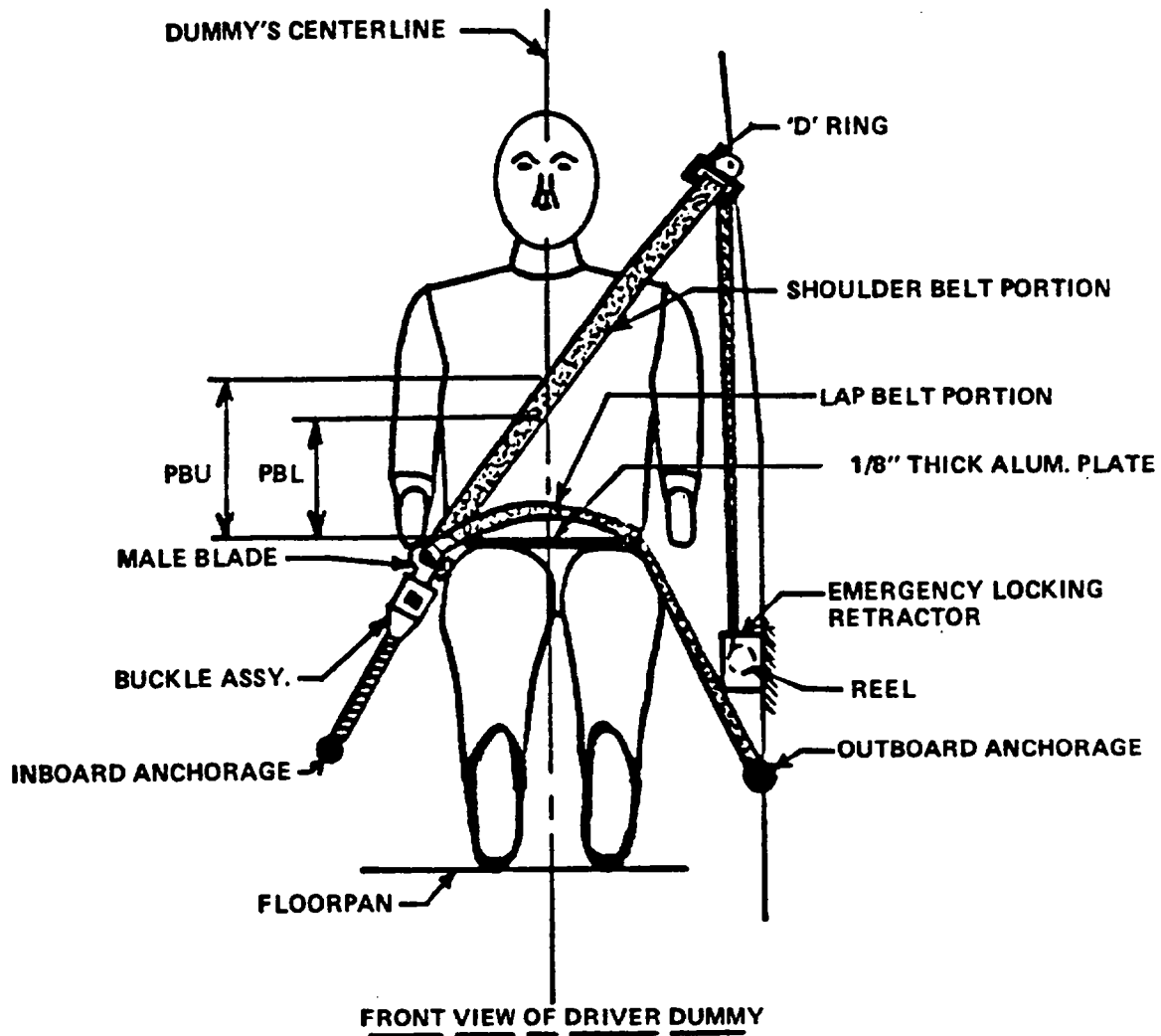
HA = Head Target to "A" Pillar
 HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee



	DRIVER	PASSENGER
HR	5.3	5.2
HS	8.0	7.9
AD	3.3	4.2
HD	6.4	6.1
KK	10.0	9.0
HA	22.0	22.4

Figure 3

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	14.5	14.8
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	11.4	11.5
<u>LAP BELT TENSION</u>	—	—
<u>SHOULDER BELT TENSION</u>	2.0	1.5

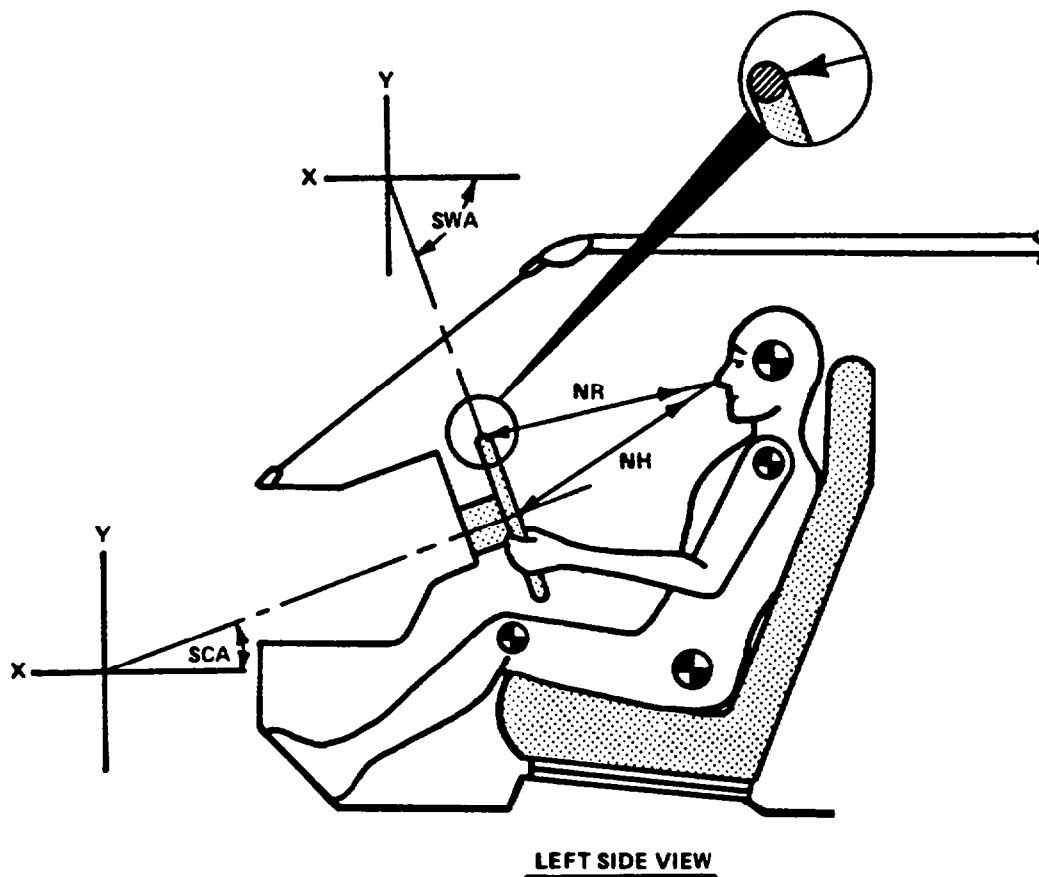
Table 3

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>79.0"</u>	<u>79.4"</u>
Should belt length as measured on Part 572 Dummy.	<u>34.0"</u>	<u>34.4"</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>4.0</u>
As determined mechanically.	<u>3.0"</u>	<u>4.0"</u>
As determined electronically.	<u>3.3"</u>	<u>3.7"</u>
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>.5 in per ft.</u>	<u>1.5 in. per ft.</u>
Measured Mechanically	<u>0.0 in. per ft.</u>	<u>.6 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	20.3 Inches
<u>NH</u> -- Distance from tip of dummy's nose to center of steering column hub	22.6 Inches
<u>SCA</u> -- Angle of steering column relative to the horizontal X axis	24 Degrees
<u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis	-66 Degrees

NOTE: Camera Information Shown on Table 4

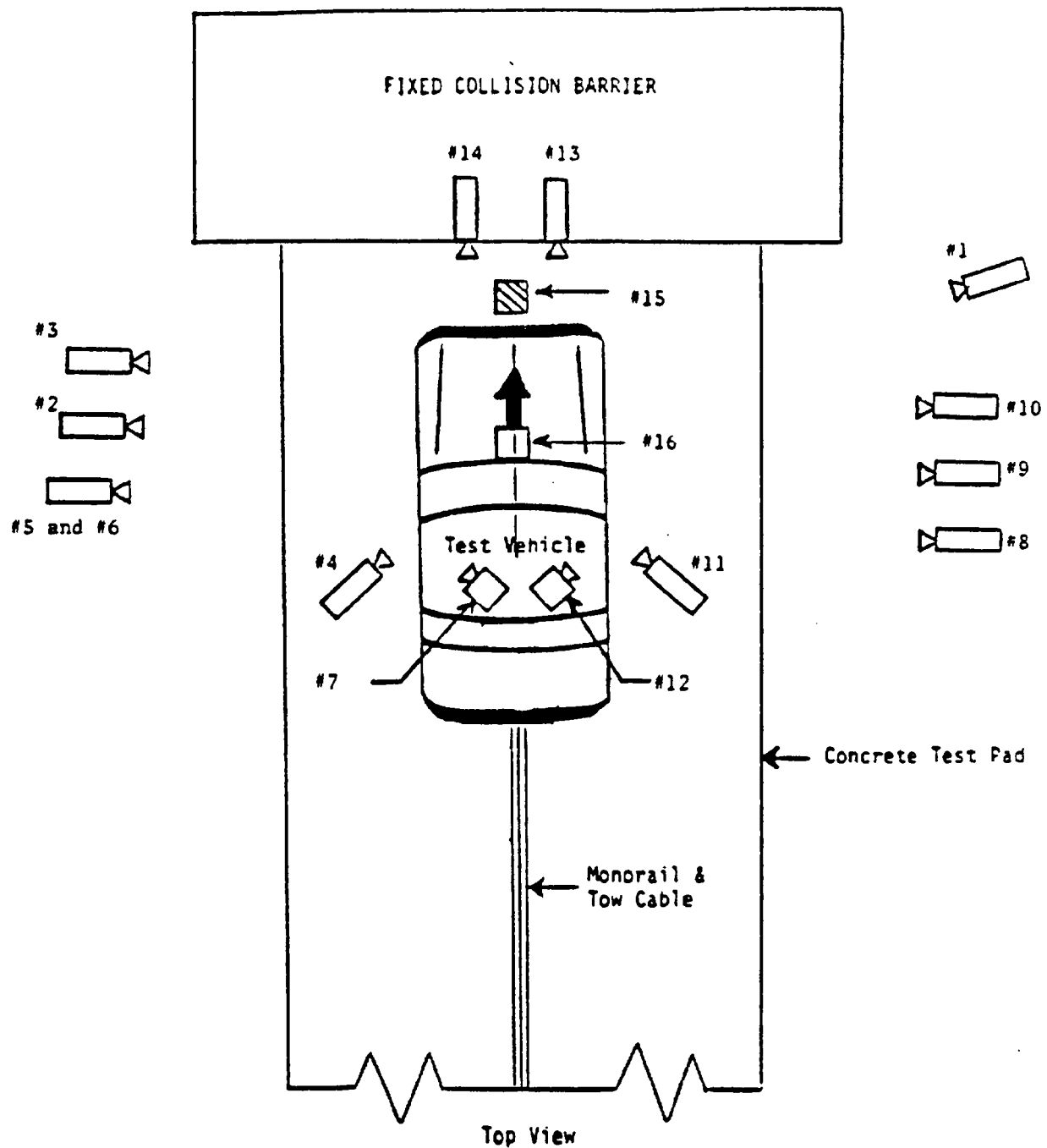


Figure 5 CAMERA POSITION FOR FRONTAL IMPACTS

Table 4
HIGH-SPEED CAMERA LOCATIONS

Test No. MH5700 Vehicle 1987 Isuzu I-Mark 4-Door Sedan

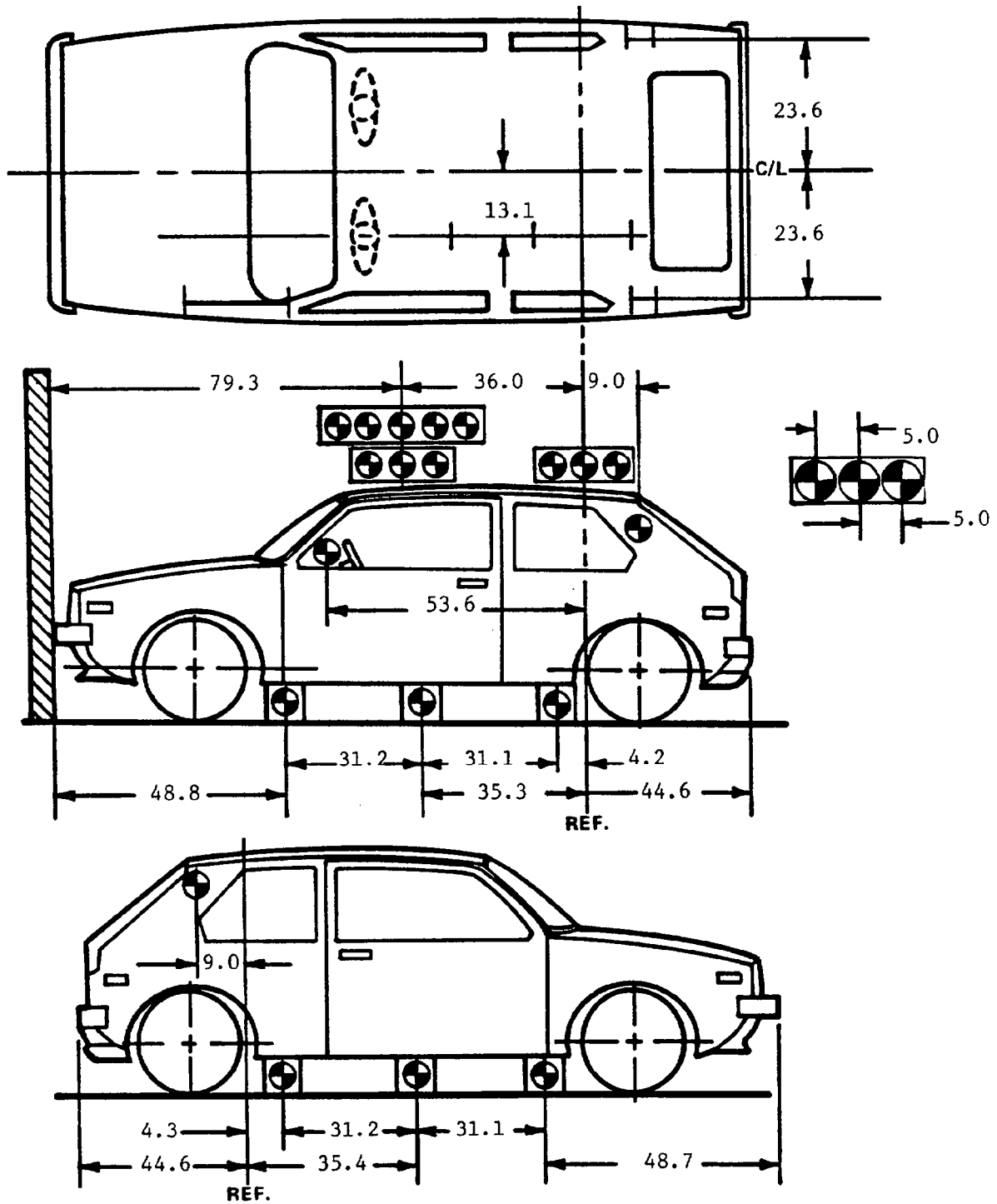
CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	260	45	42	-2	-	13	525
3	Left Side View	251	40	43	-5	-	25	525
4	Driver and Interior View	105	114	70	-17	-	13	700
5	Steering Column (Bottom)	238	78	52	-6		25	Note 1
6	Steering Column (Top)	238	78	77	-13		25	Note 1
7	Left Belt	-	-	-	-	-	8	700
8	Overall Right Side	246	47	43	-1	-	13	800
9	Right Side View	261	70	44	-4	-	25	775
10	Right Passenger View	276	86	42	-3		35	750
11	Passenger & Interior View	87	102	66	-16		25	600
12	Right Belt	-	-	-	-	-	8	850
13	Passenger Front View	24	0	72	-41	-	13	550
14	Driver Front View	24	0	72	-41	-	13	580
15	Windshield View	0	0	126	-58	-	13	540
16	Pit View of Engine	0	30	-120	90	-	13	775
17								

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

Note 1: No timing on this camera.

Figure 6

VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 7

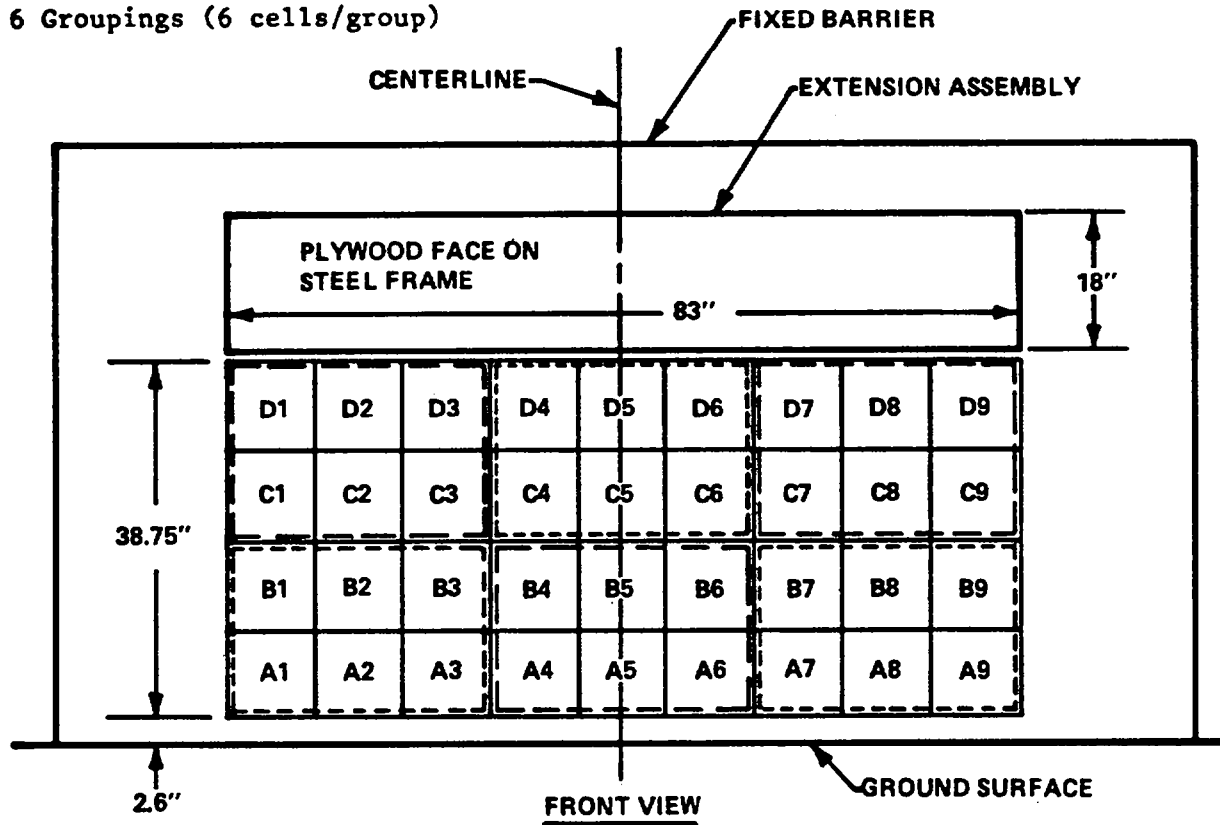
LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells

4 Rows

9 Columns

6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

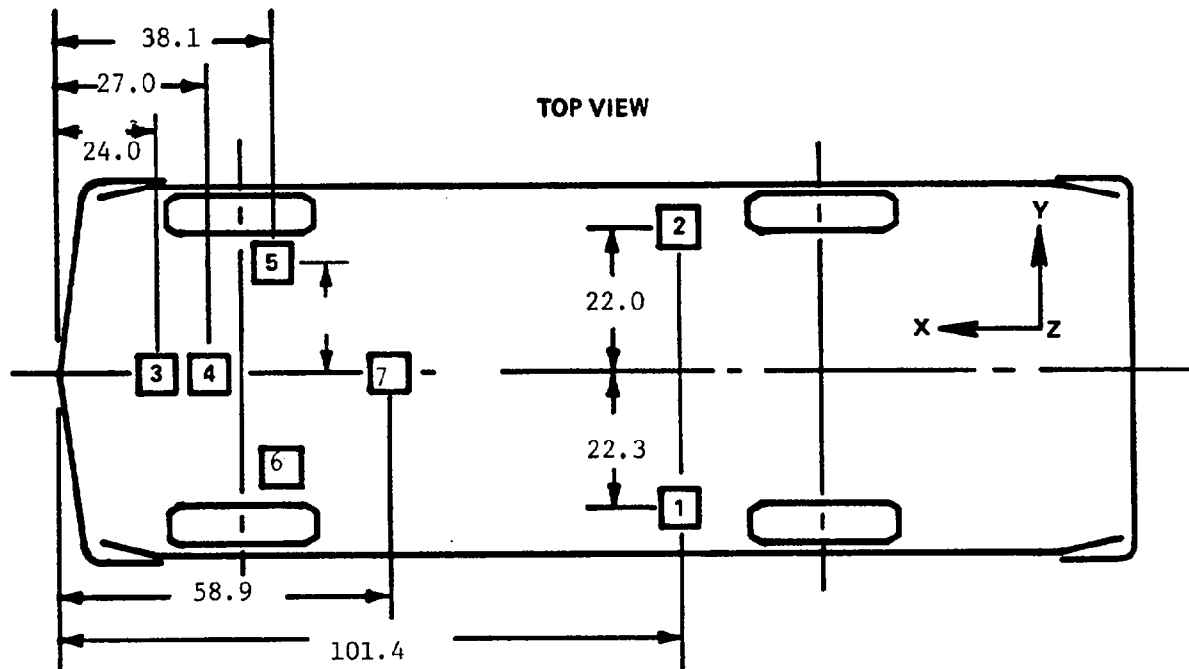
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

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

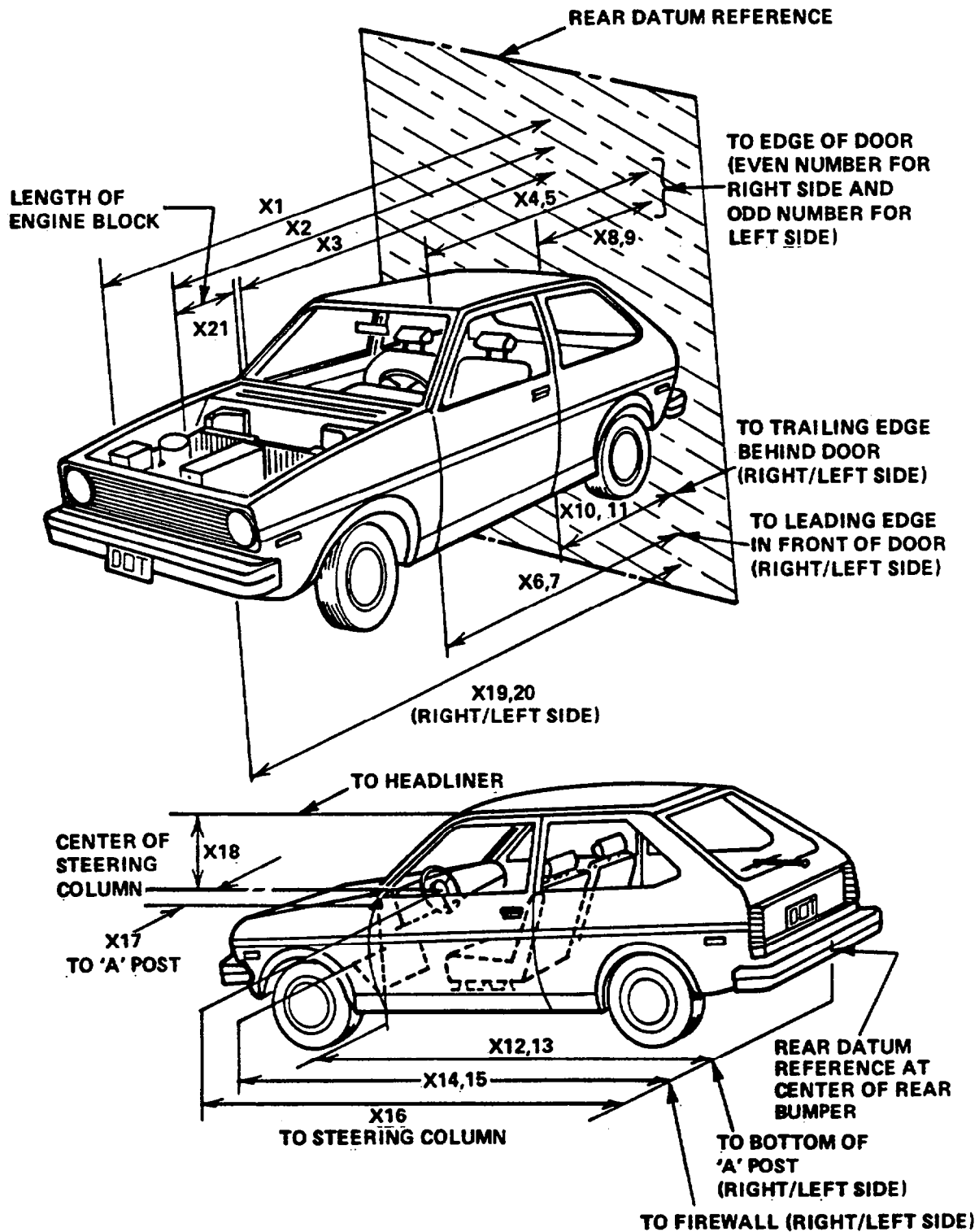
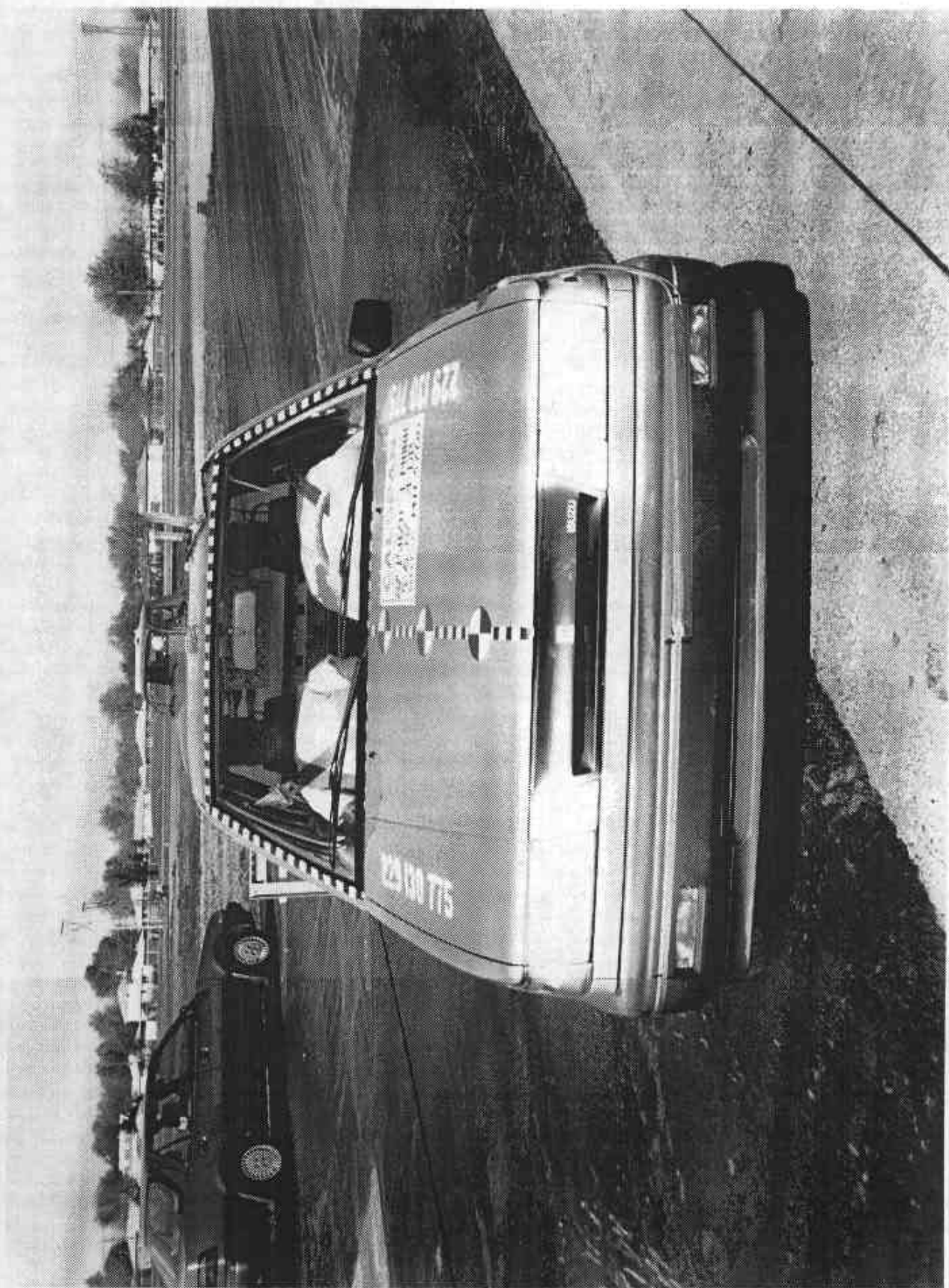


Table 5
VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	159.9	138.3	21.6
X2	Rear Surface of Vehicle to Front of Engine	139.9	130.9	9.0
X3	Rear Surface of Vehicle to Firewall	120.4	114.5	5.9
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	110.5	110.3	0.2
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	110.6	110.6	0.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	110.0	110.0	0.0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	70.1	70.1	0.0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	70.0	70.0	0.0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	70.5	70.1	0.4
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	70.6	70.3	0.3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	110.0	109.5	0.5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	110.1	109.9	0.2
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	119.6	113.5	6.1
X14	Rear Surface of Vehicle to Firewall, Right Side	120.1	112.2	7.9
X15	Rear Surface of Vehicle to Firewall, Left Side	95.4	93.8	1.6
X16	Rear Surface of Vehicle to Steering Column	15.5	14.9	0.6
X17	Center of Steering Column to "A" Post	16.7	15.2	1.5
X18	Center of Steering Column to Headliner	158.3	137.0	21.3
X19	Rear Surface of Vehicle to Right Side of Front Bumper	158.4	138.1	20.3
X20	Rear Surface of Vehicle to Left Side of Front Bumper	16.5	16.5	0.0
X21	Length of Engine Block			

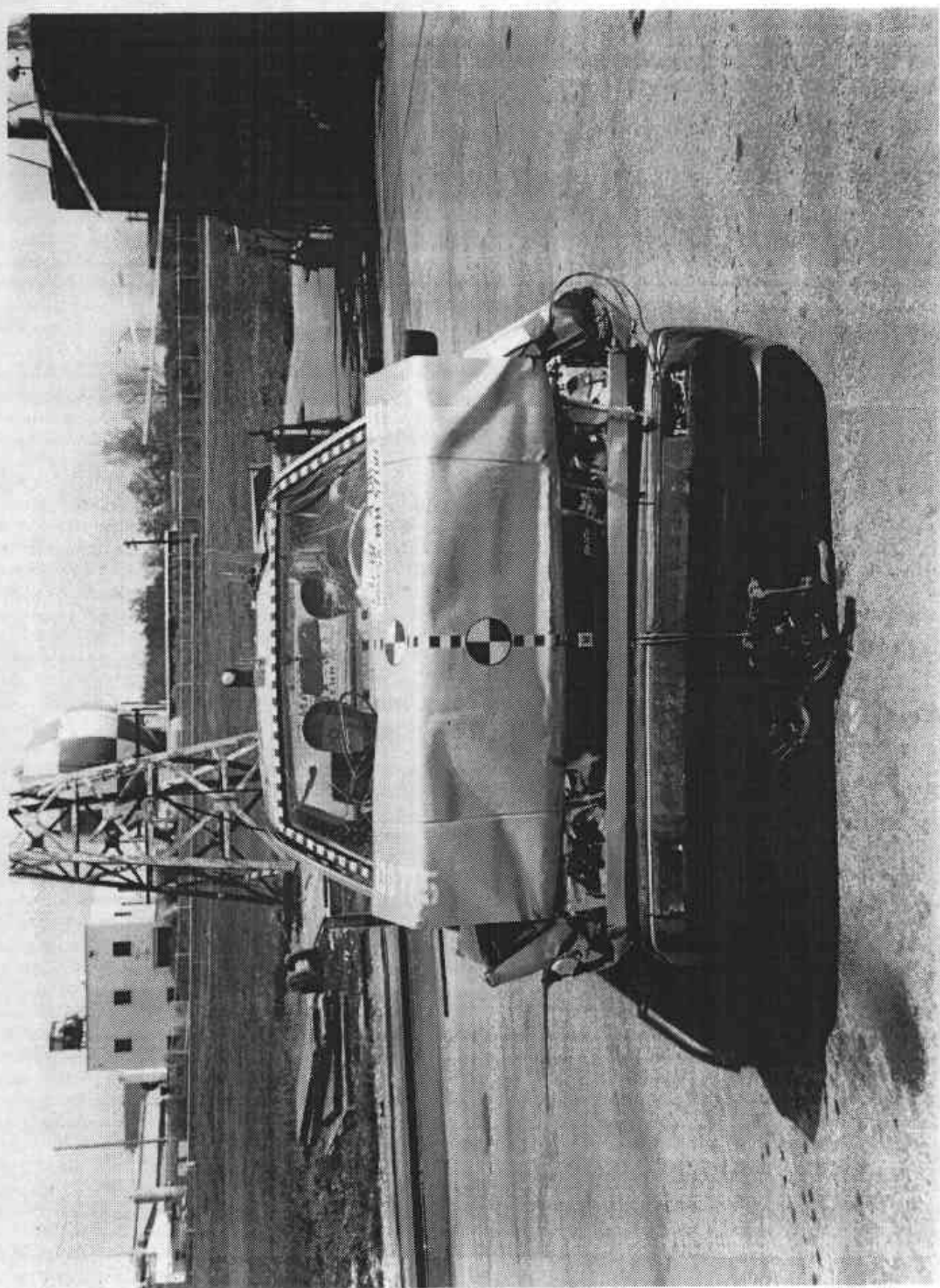
Appendix A
PHOTOGRAPHS



A-1 PRE-TEST FRONT VIEW

A-2

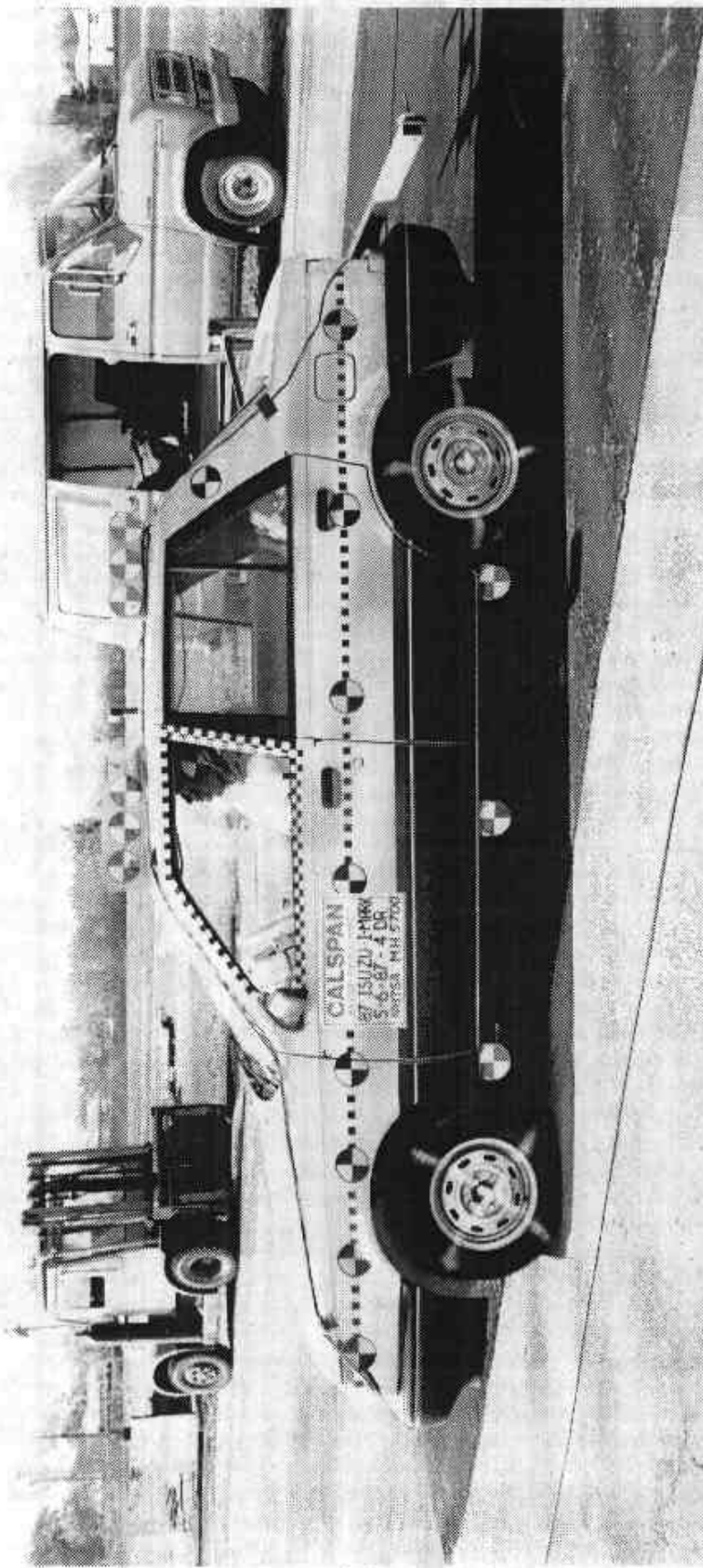
7556-13



A-2 POST-TEST FRONT VIEW

A-3

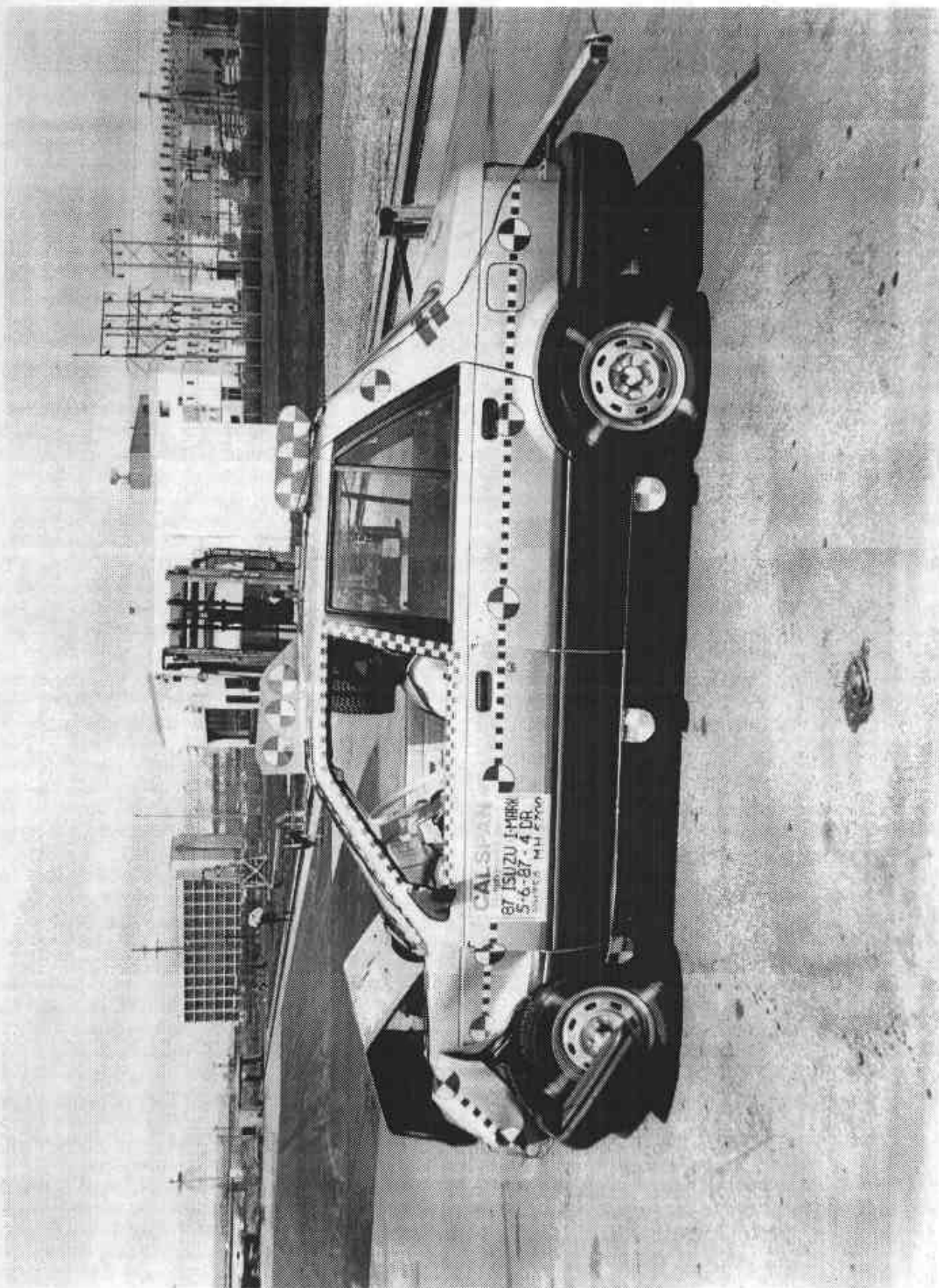
7556-13



A-3 PRE-TEST LEFT SIDE VIEW

A-4

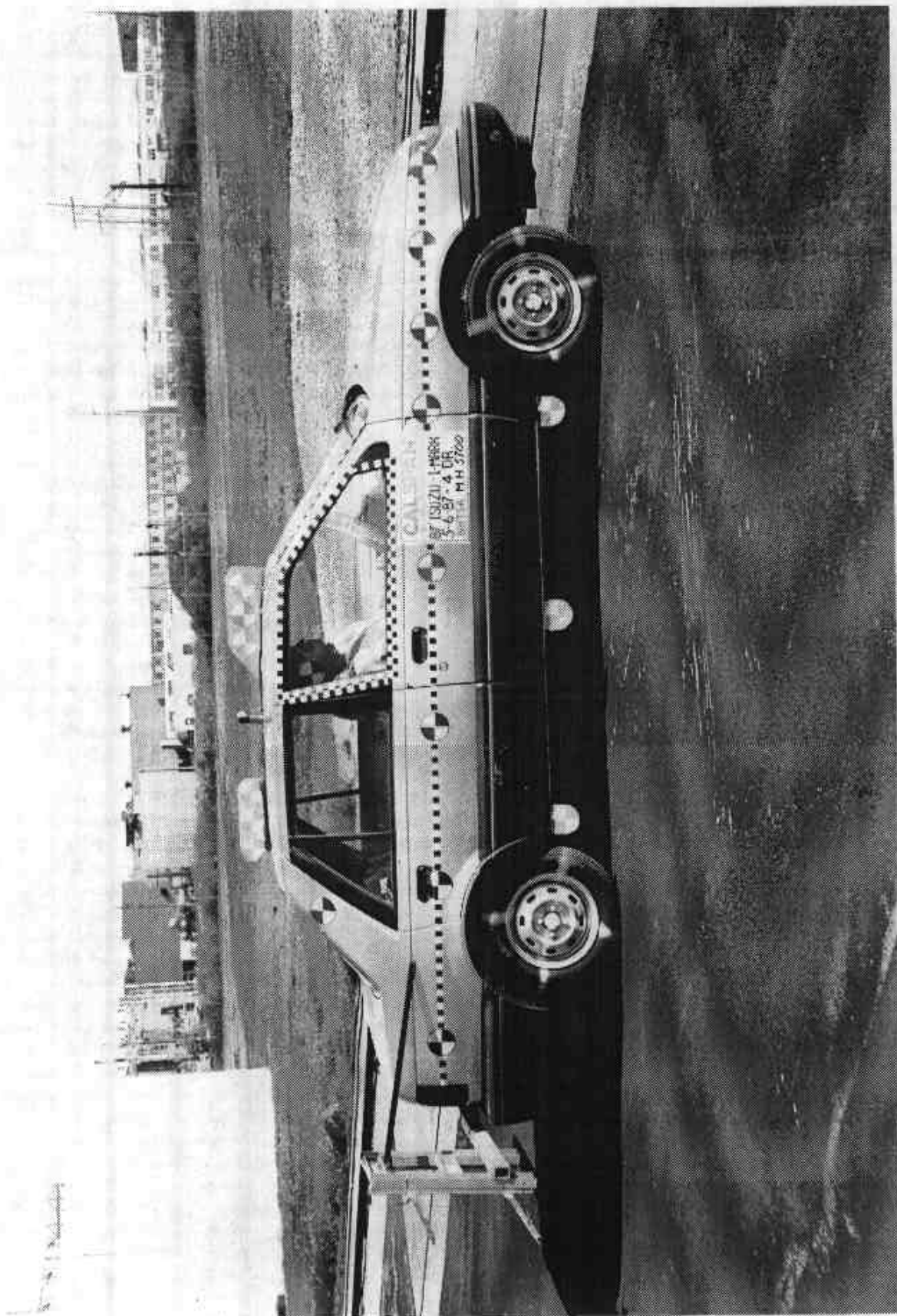
7556-13



A-4 POST-TEST LEFT SIDE VIEW

A-5

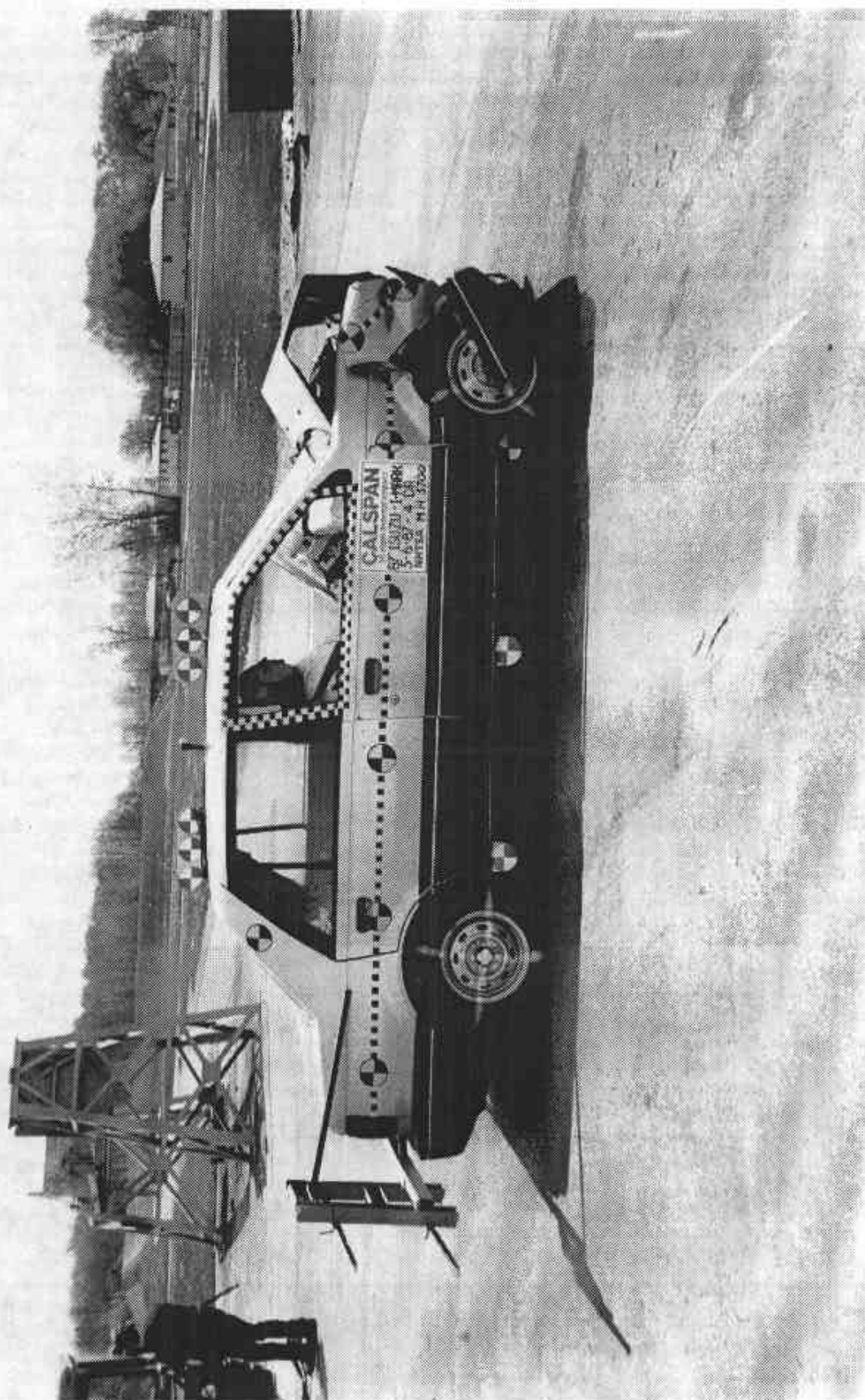
7556-13



A-5 PRE-TEST RIGHT SIDE VIEW

A-6.

7556-13



A-6 POST-TEST RIGHT SIDE VIEW

A-7

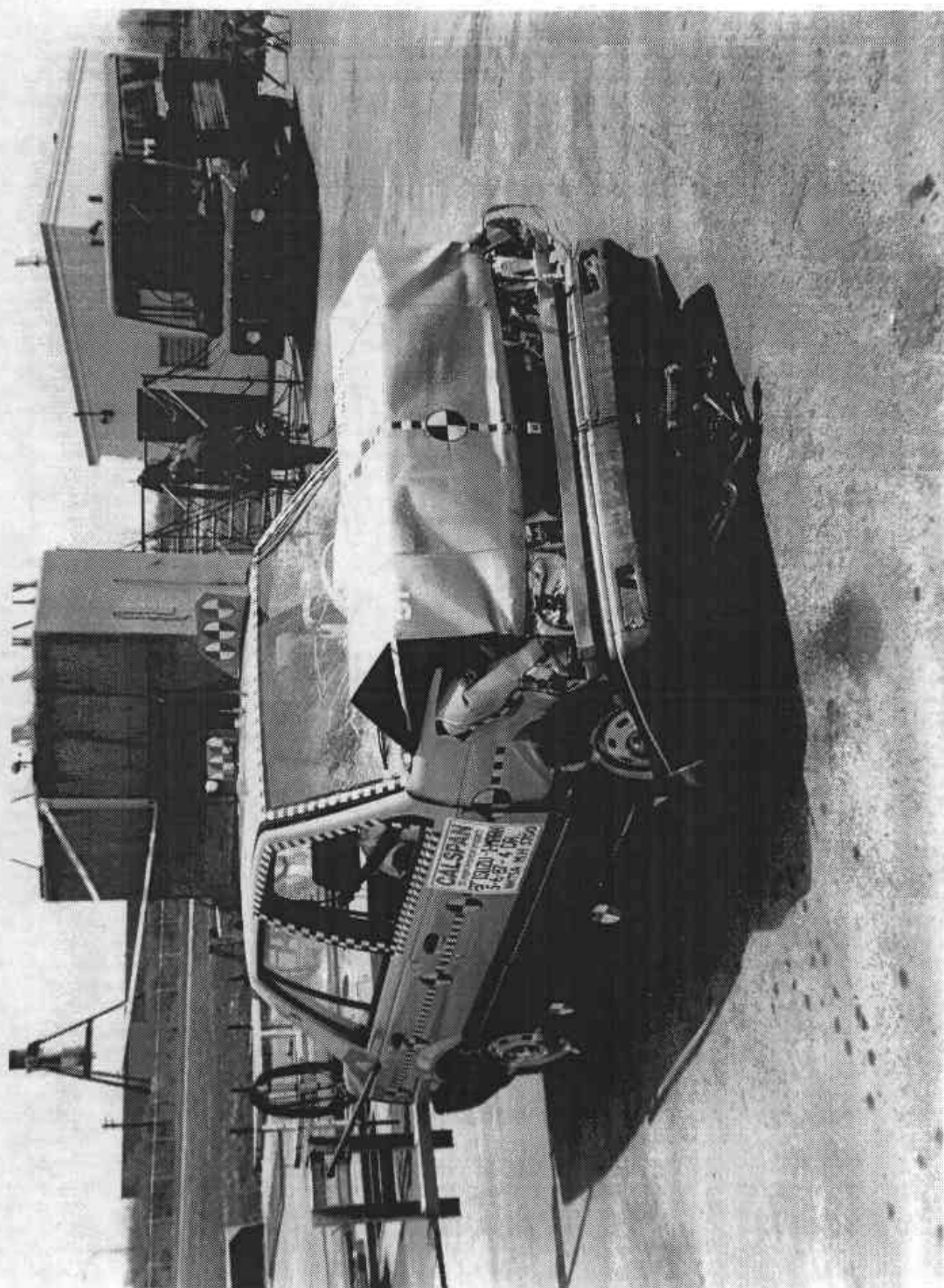
7556-13



A-7 PRE-TEST RIGHT FRONT THREE QUARTER VIEW

A-8

7556-13



A-8 POST-TEST RIGHT FRONT THREE QUARTER VIEW

A-9

7556-13



A-9 PRE-TEST LEFT REAR THREE QUARTER VIEW

A-10

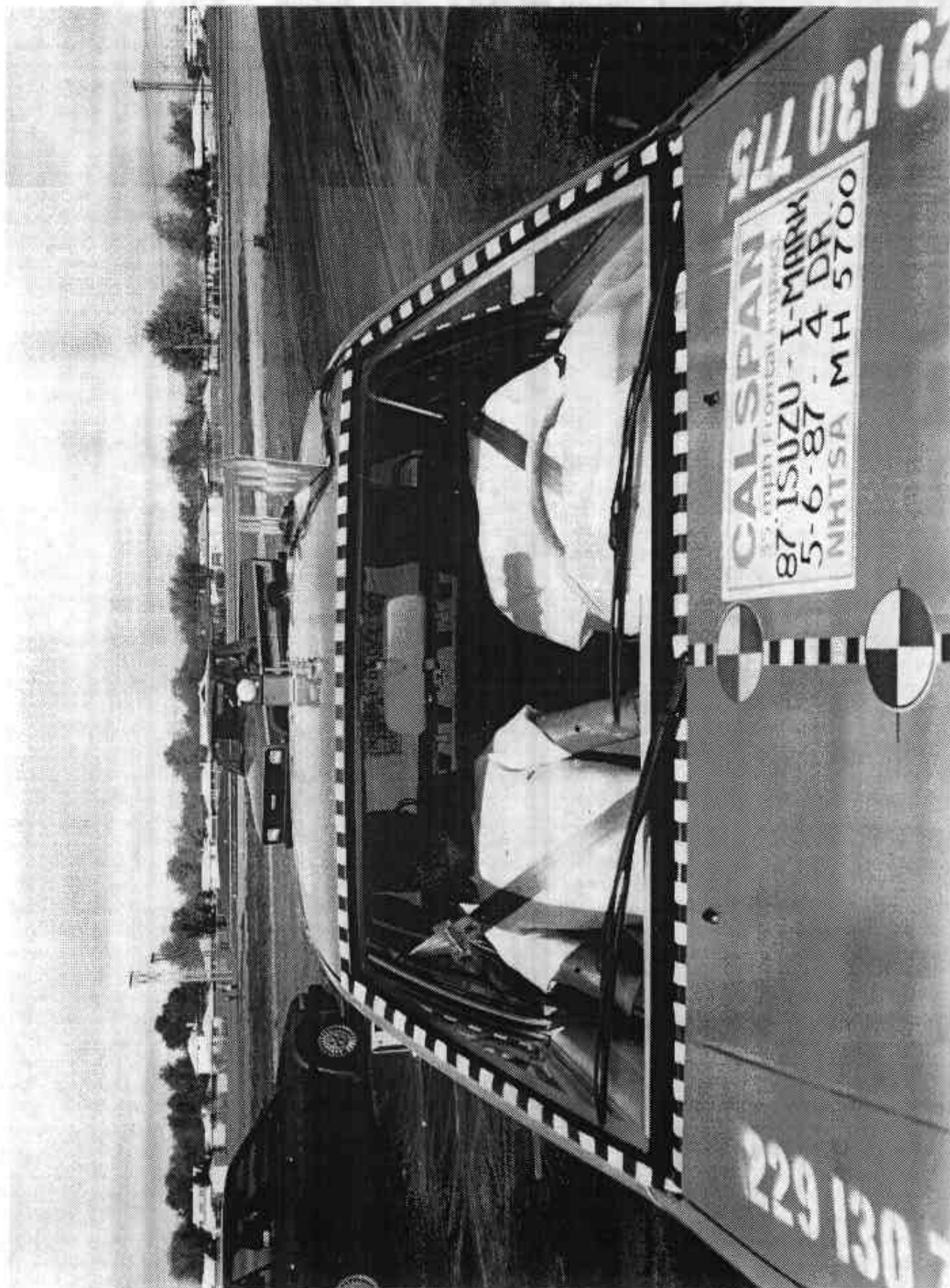
7556-13



A-10 POST-TEST LEFT REAR THREE QUARTER VIEW

A-11

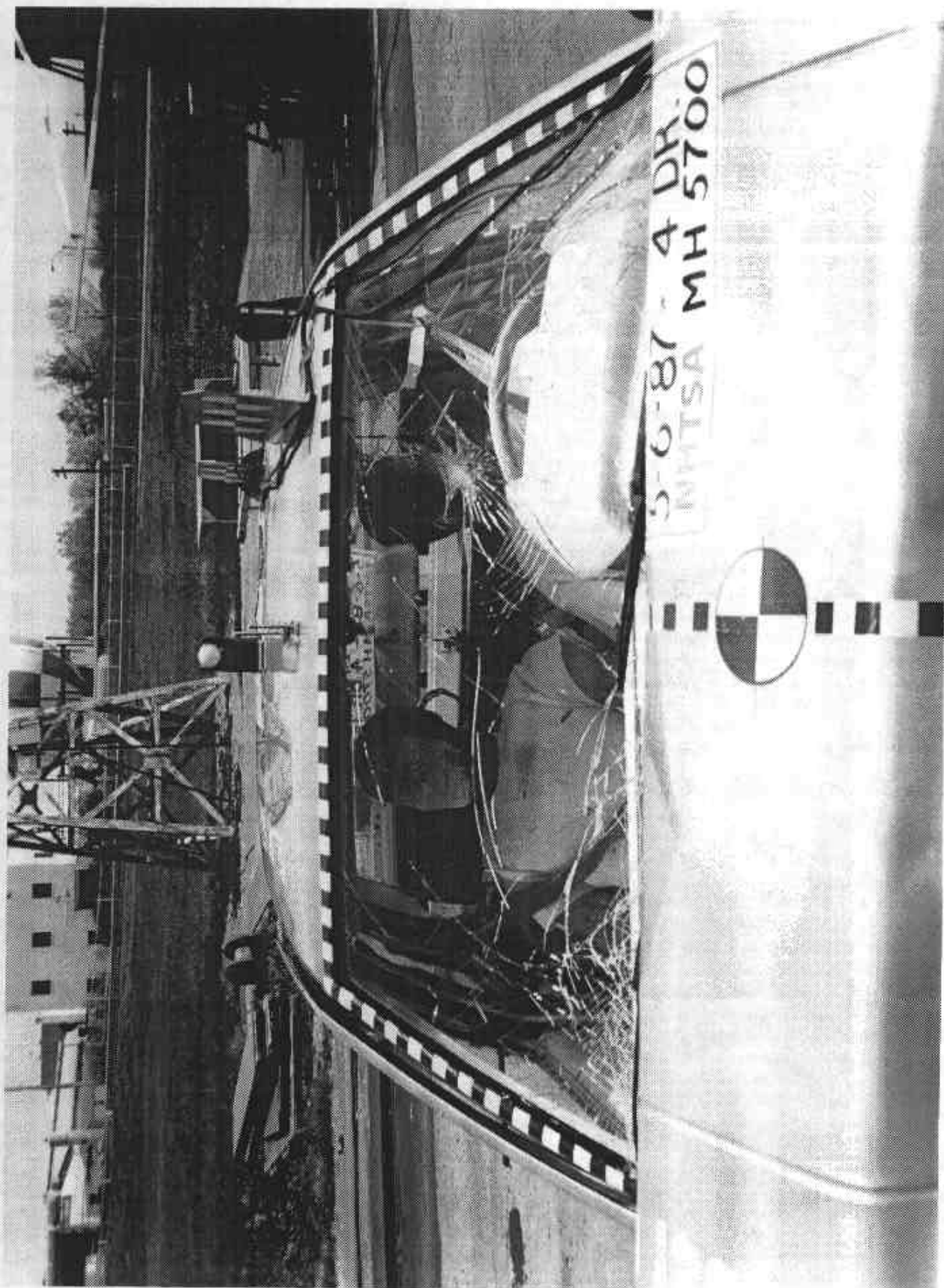
7556-13



A-11 PRE-TEST WINDSHIELD VIEW

A-12

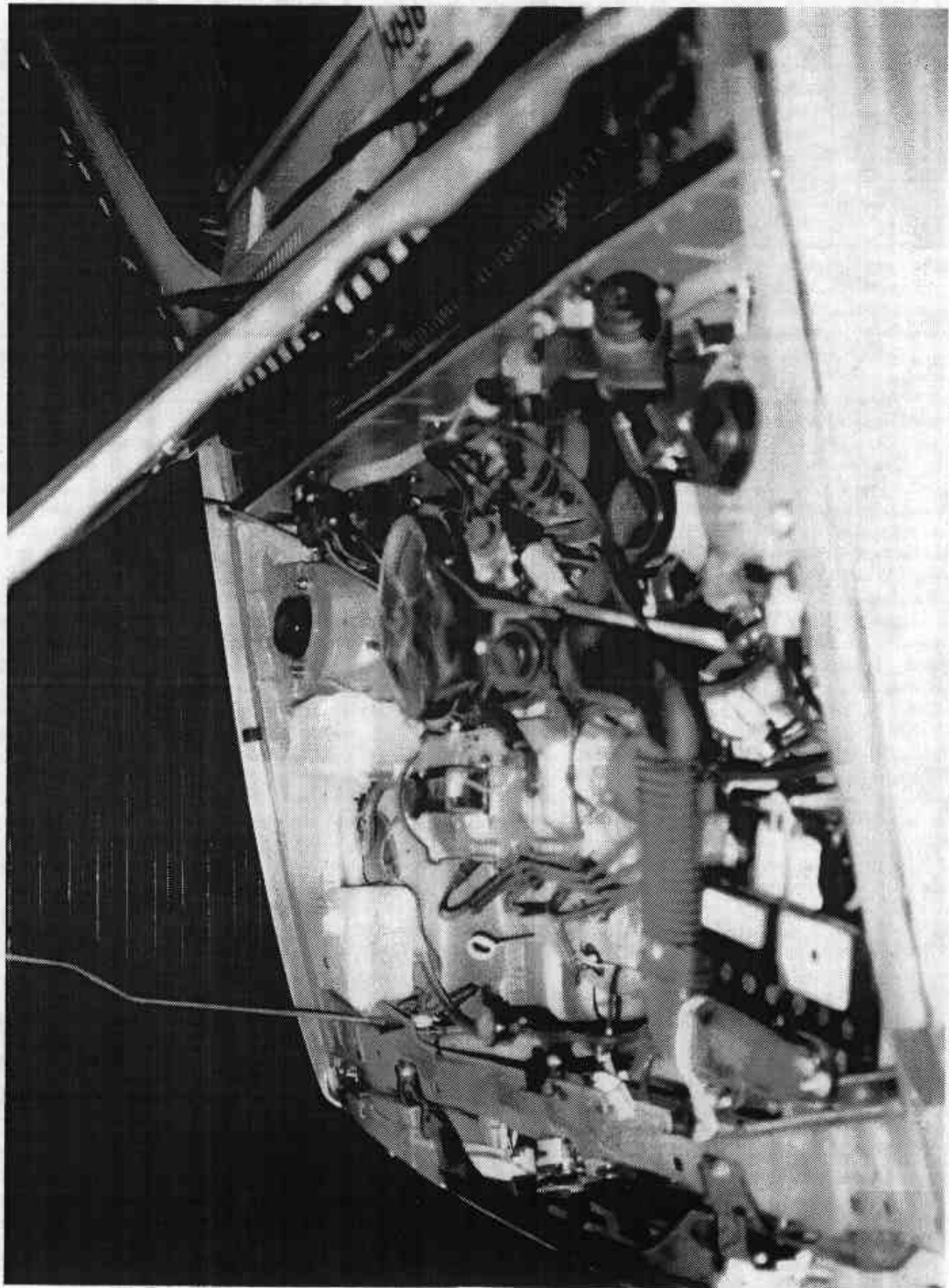
7556-13



A-12 POST-TEST WINDSHIELD VIEW

A-13

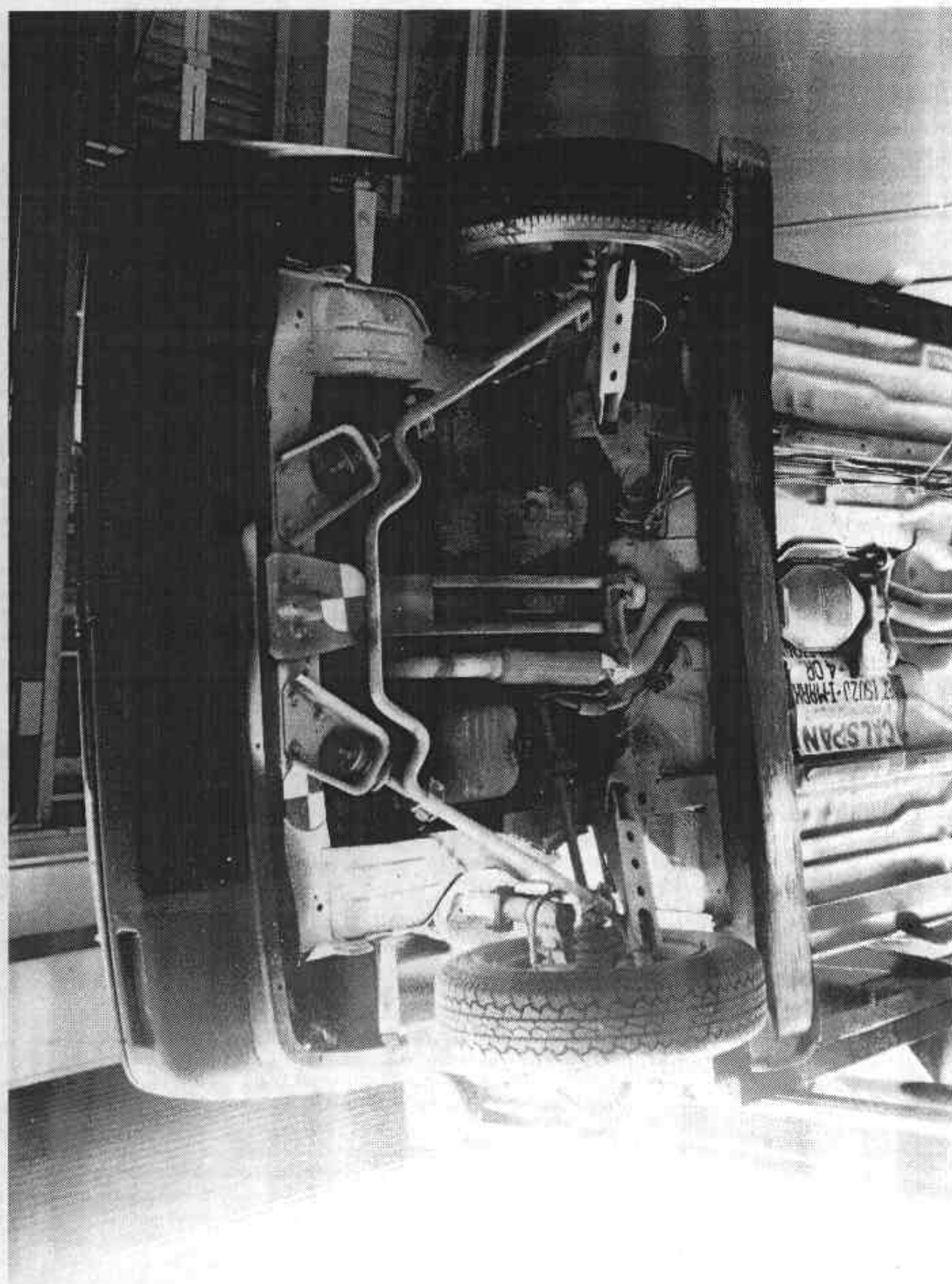
7556-13



A-13 PRE-TEST ENGINE COMPARTMENT VIEW

A-14

7556-13



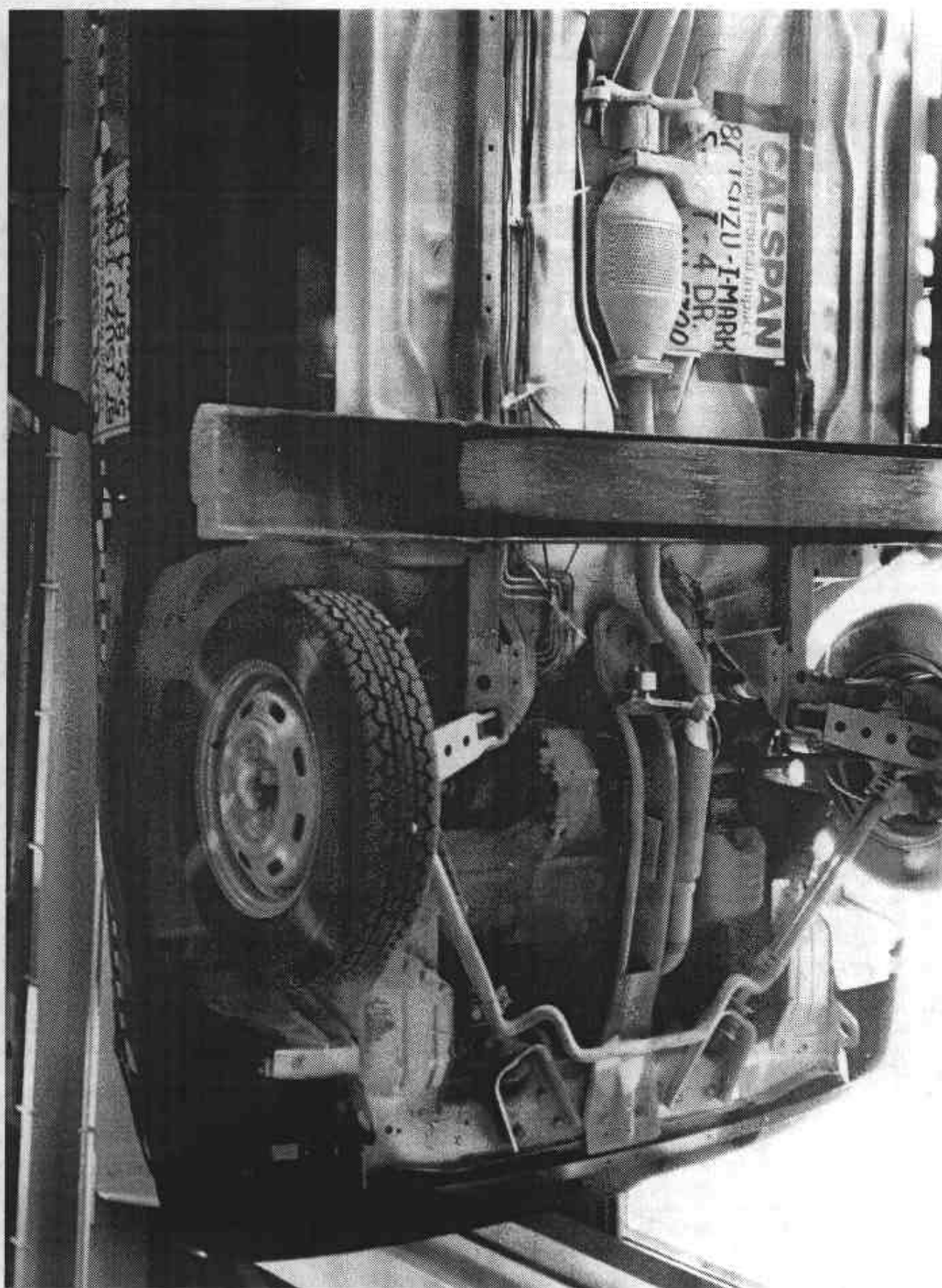
A-14 PRE-TEST FRONT UNDERBODY VIEW



A-15 POST-TEST FRONT UNDERBODY VIEW

A-16

7556-13



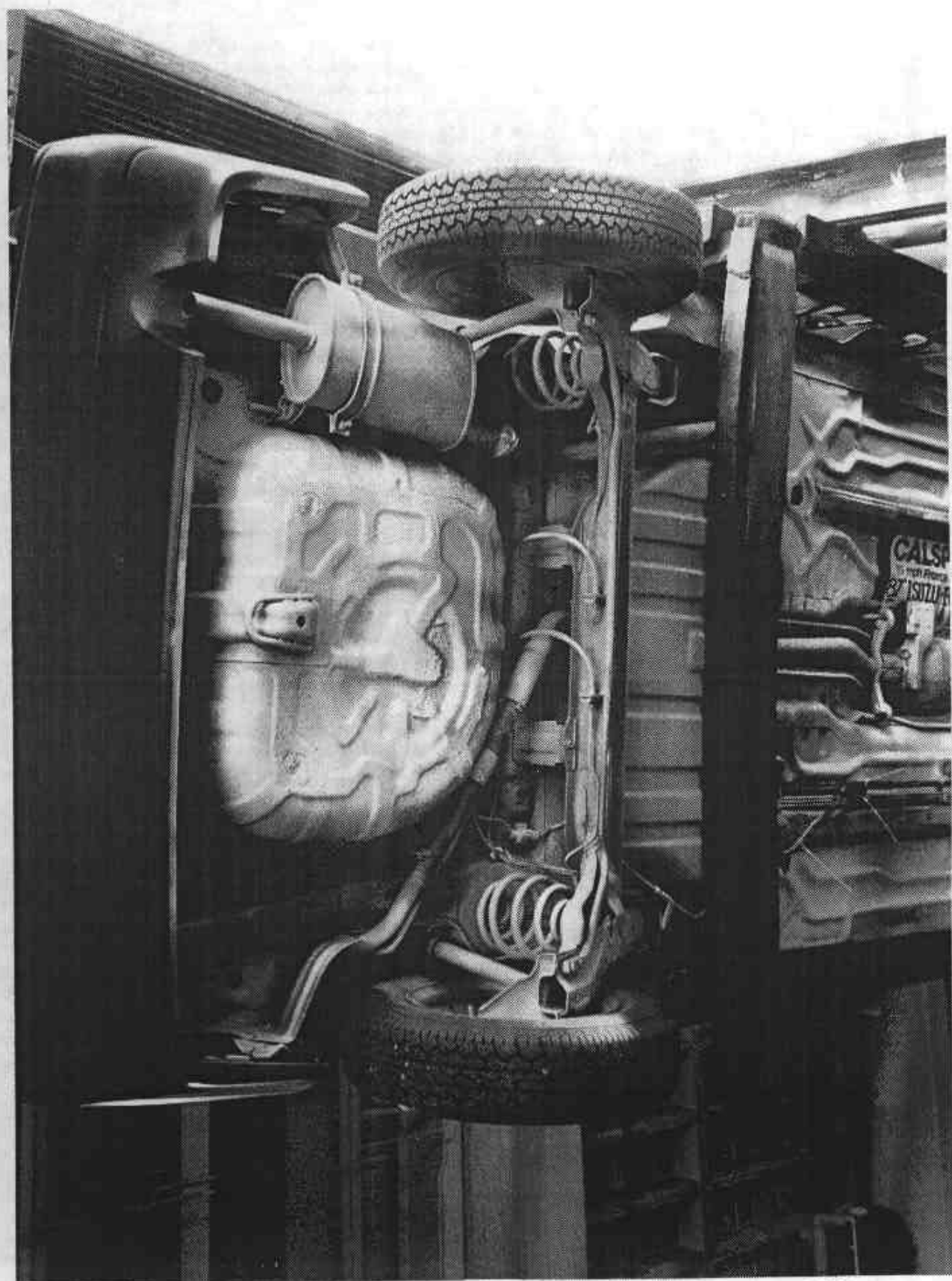
A-16 PRE-TEST FRONT-SIDE UNDERBODY VIEW

A-17

7556-13



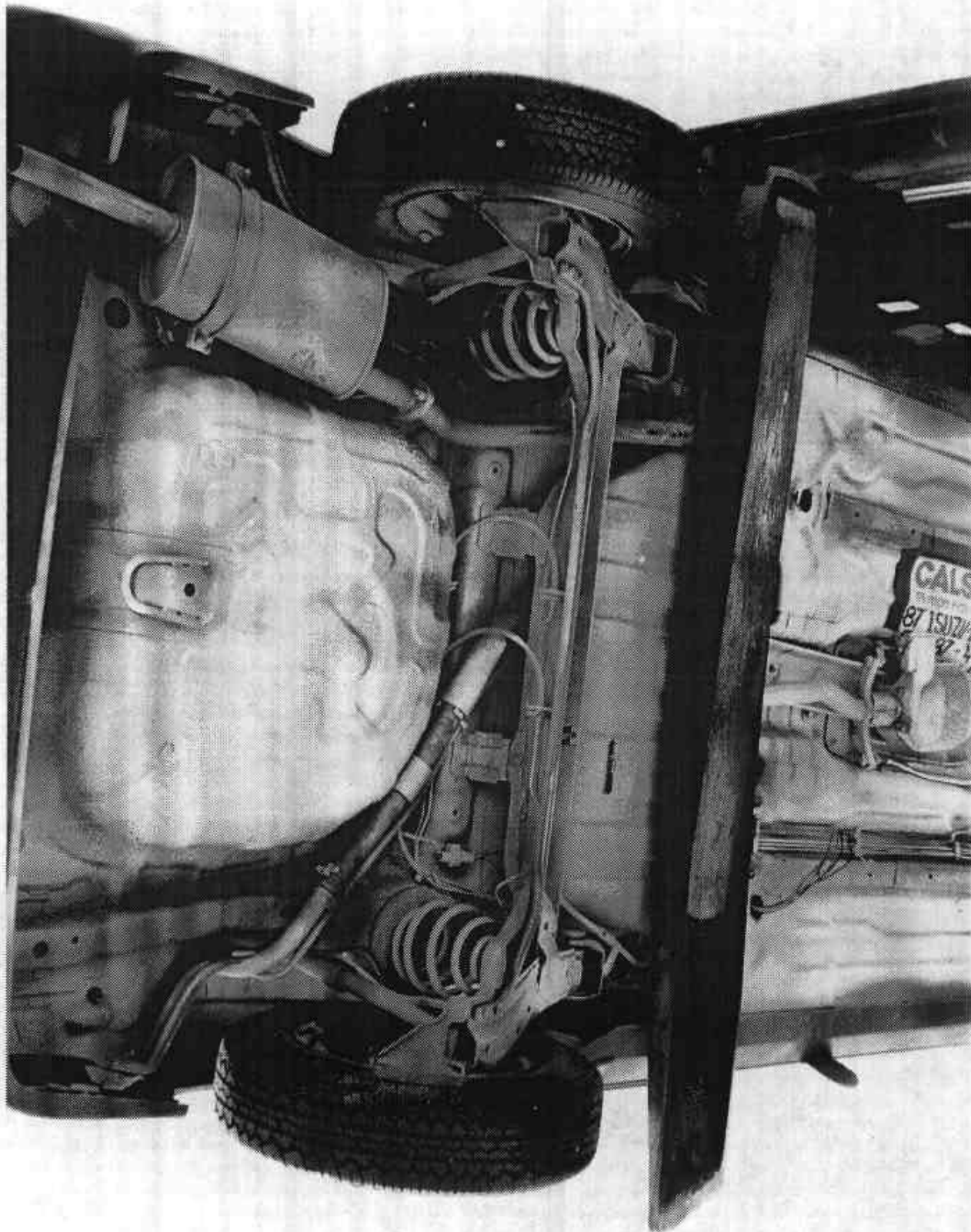
A-17 POST-TEST FRONT-SIDE UNDERBODY VIEW



A-18 PRE-TEST REAR UNDERBODY VIEW

A-19

7556-13



A-19 POST-TEST REAR UNDERBODY VIEW

A-20

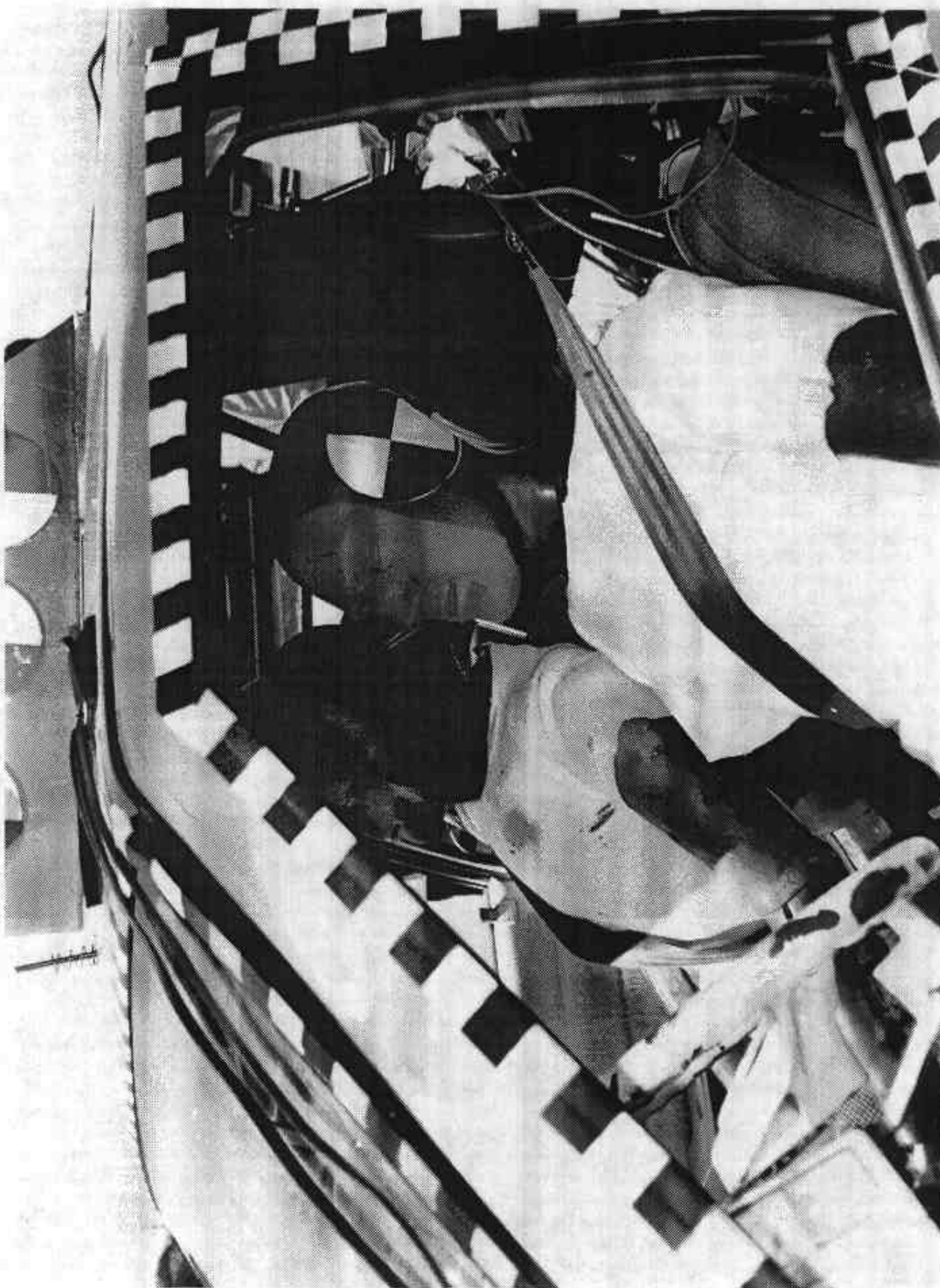
7556-13



A-20 PRE-TEST DRIVER POSITION VIEW

A-21

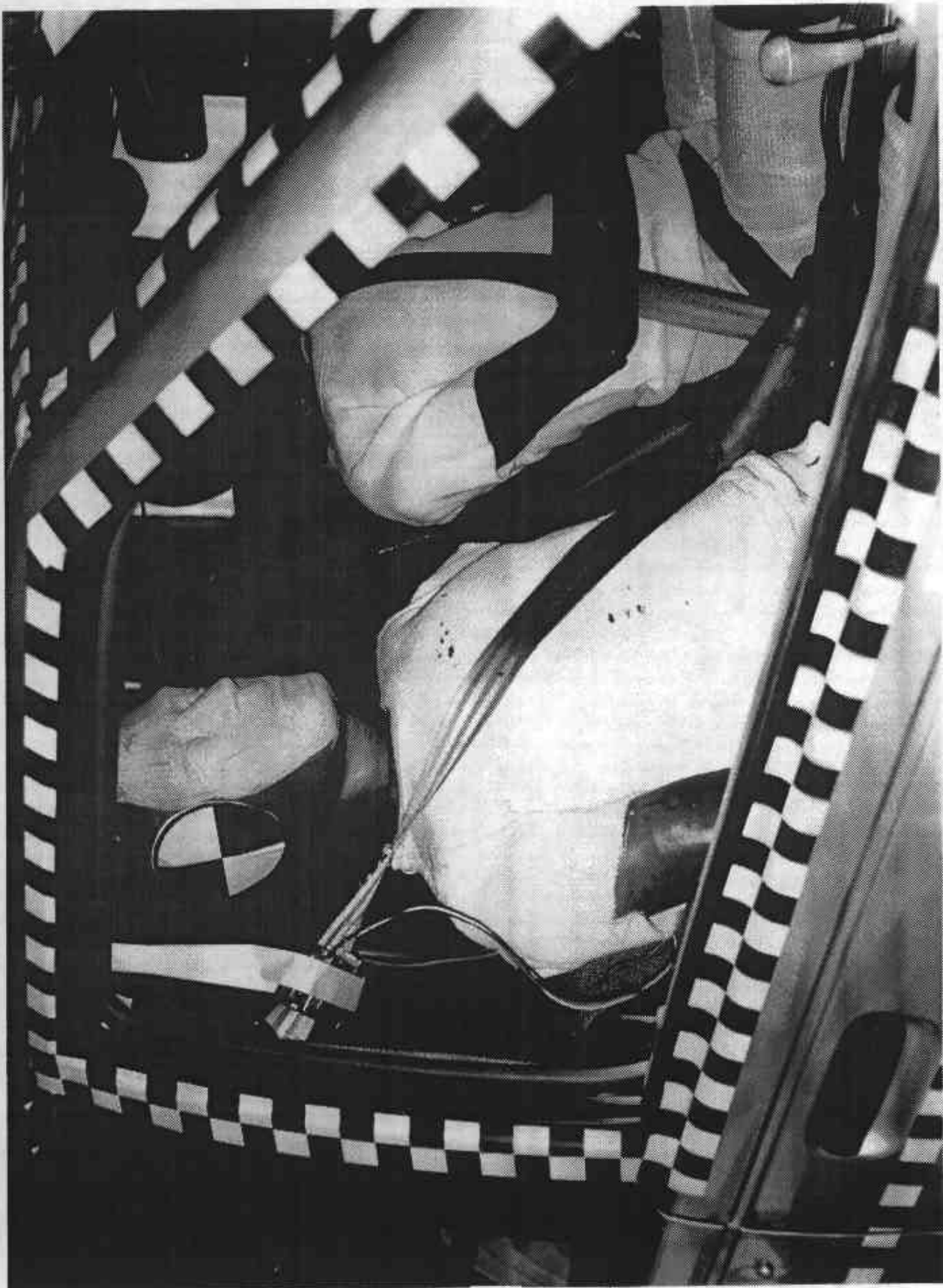
7556-13



A-21 POST-TEST DRIVER POSITION VIEW

A-22

7556-13



A-22 PRE-TEST PASSENGER POSITION VIEW

A-23

7556-13



A-23 POST-TEST PASSENGER POSITION VIEW

A-24

7556-13



A-24 PRE-TEST DRIVER AND INTERIOR VIEW

A-25

7556-13



A-25 POST-TEST DRIVER AND INTERIOR VIEW

A-26

7556-13



A-26 PRE-TEST PASSENGER AND INTERIOR VIEW

A-27

7556-13



A-27 POST-TEST PASSENGER AND INTERIOR VIEW

A-28

7556-13

Appendix B

VEHICLE, DEFORMABLE MOVING BARRIER AND DUMMY RESPONSE DATA

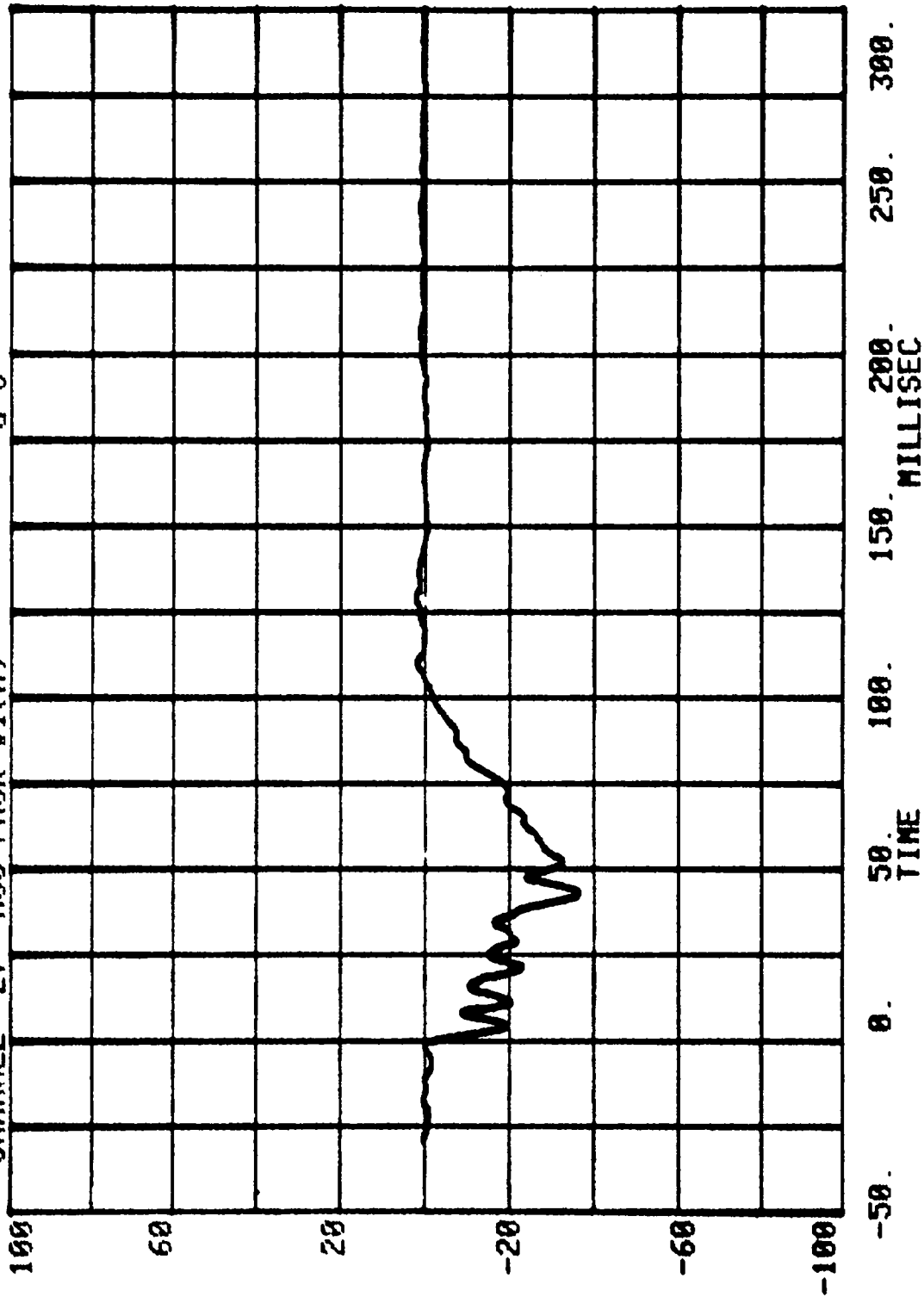
TEST NO. MH5700

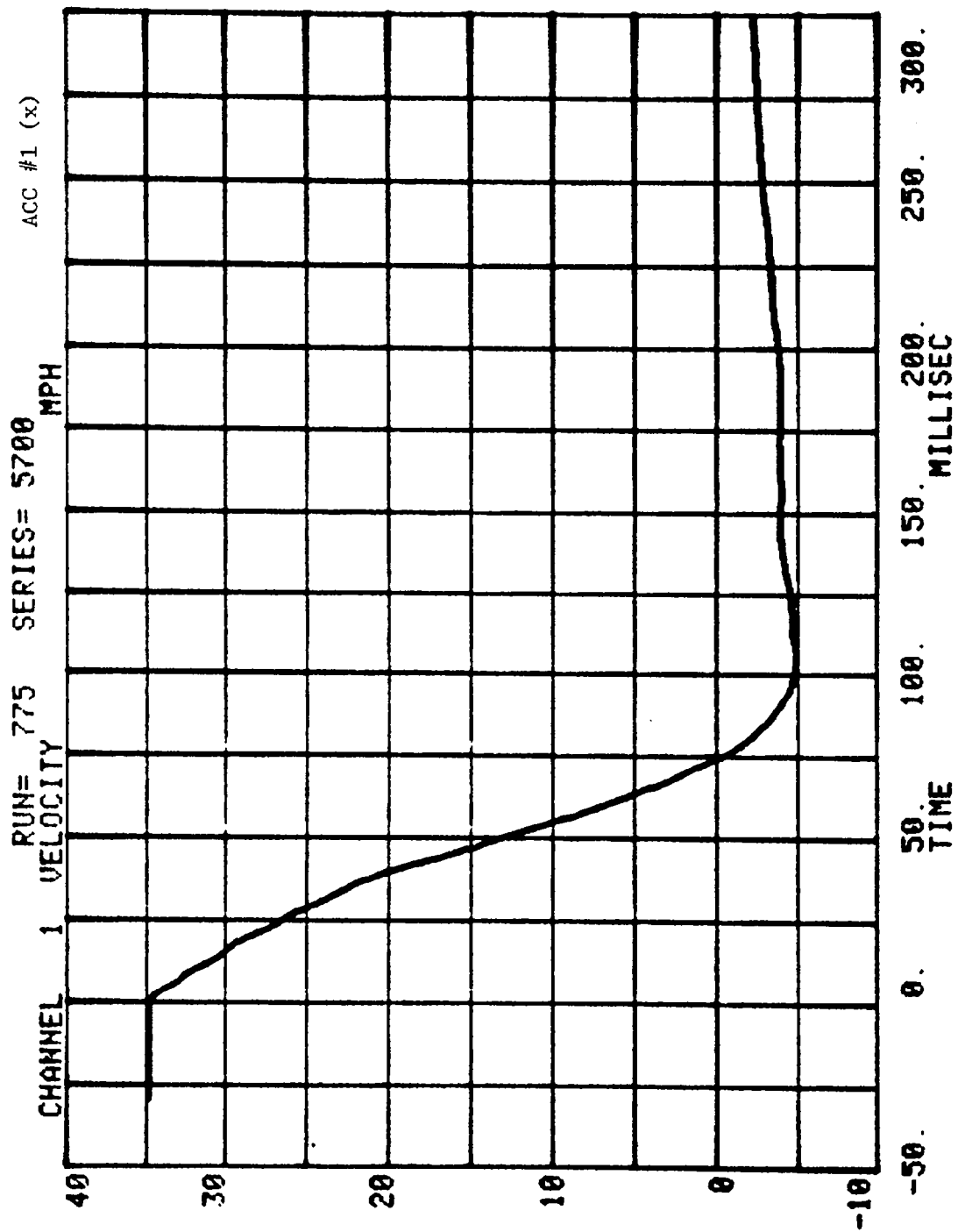
VEHICLE DATA

FILTER CHANNEL CLASS

60

CHANNEL 27 ACC PACK #1(X) RUN= 775 SERIES= 5700 G'S





ACC #1 (x)

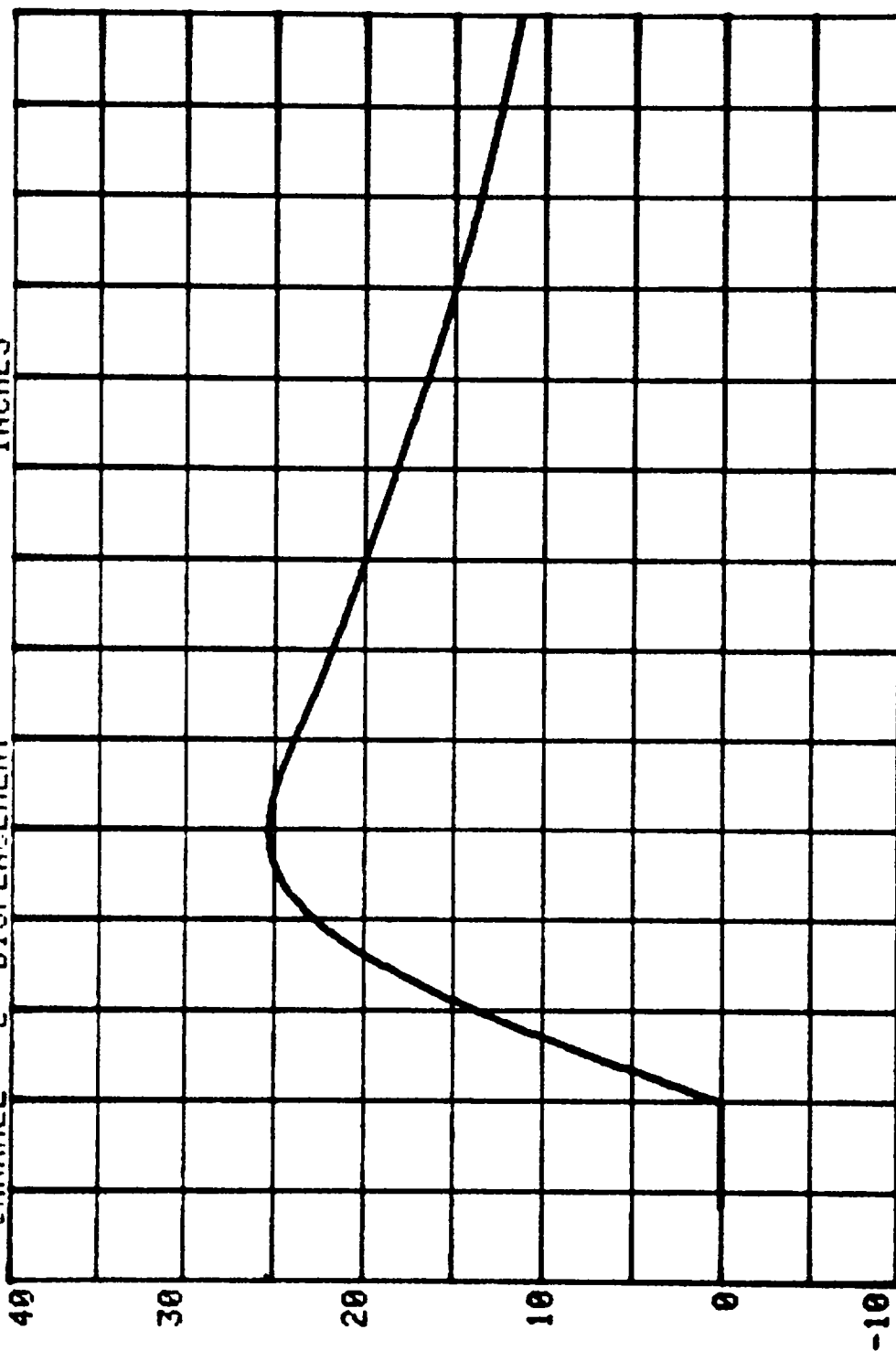
INCHES

SERIES= 5700

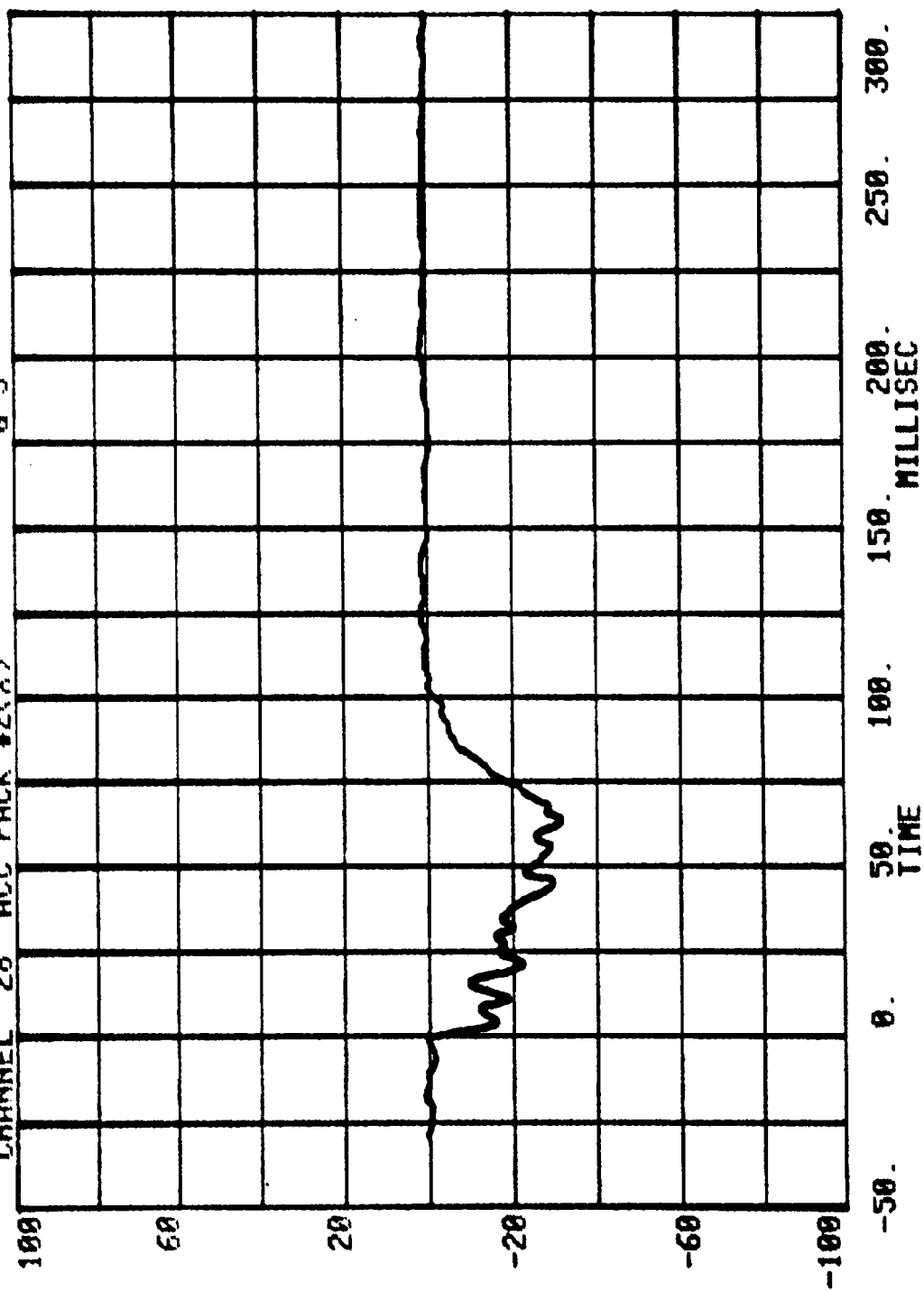
RUN= 775
DISPLACEMENT

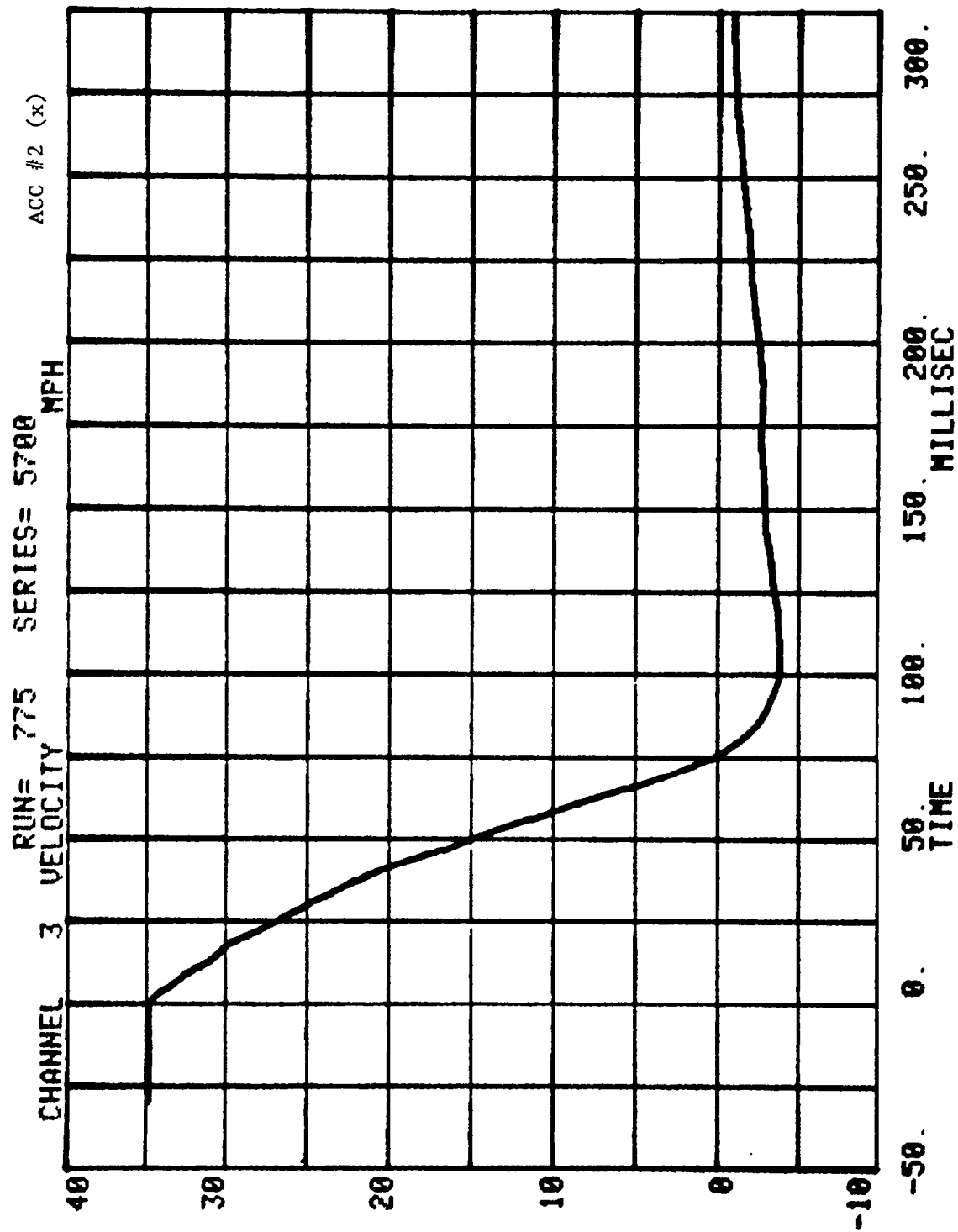
CHANNEL 2

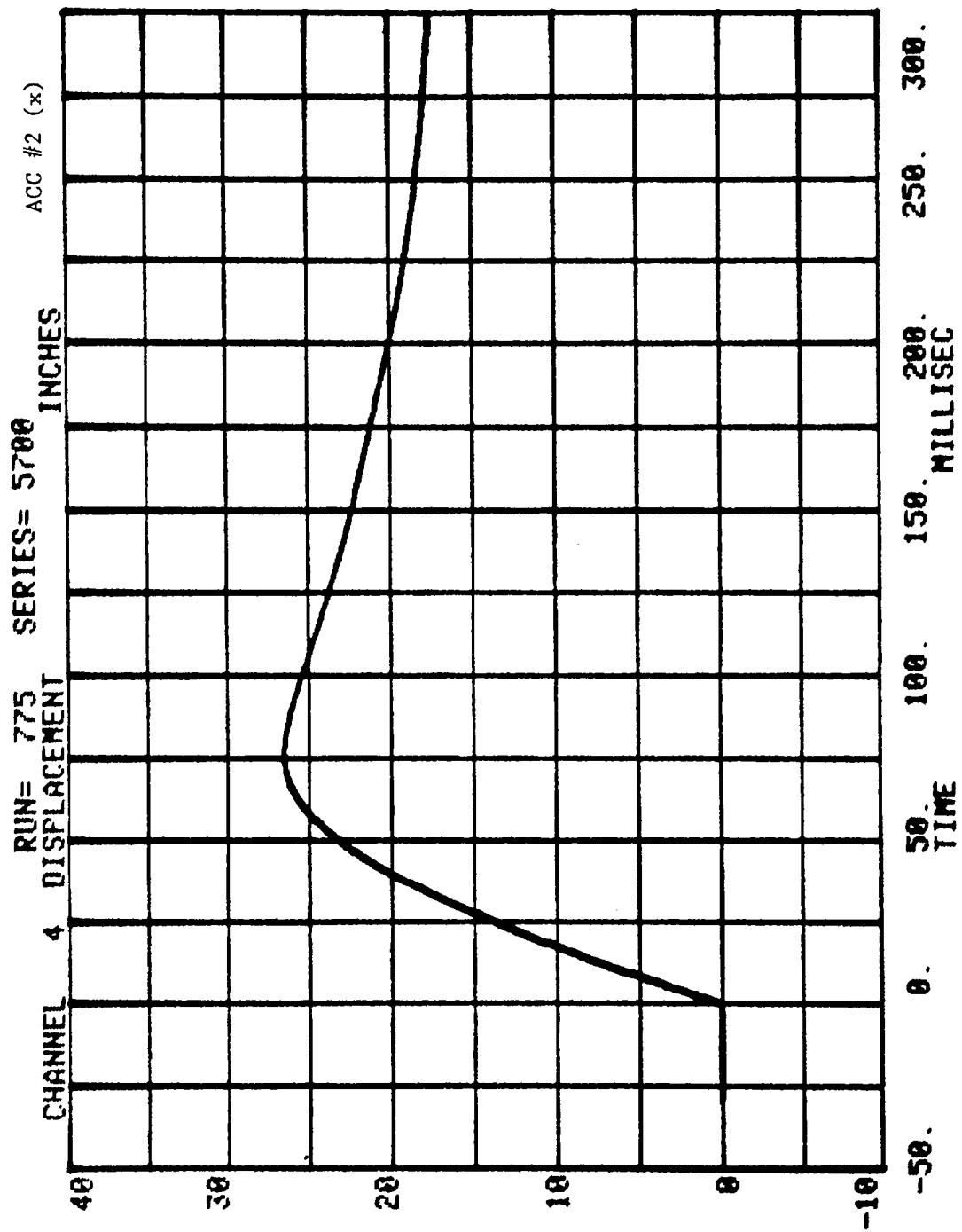
TIME



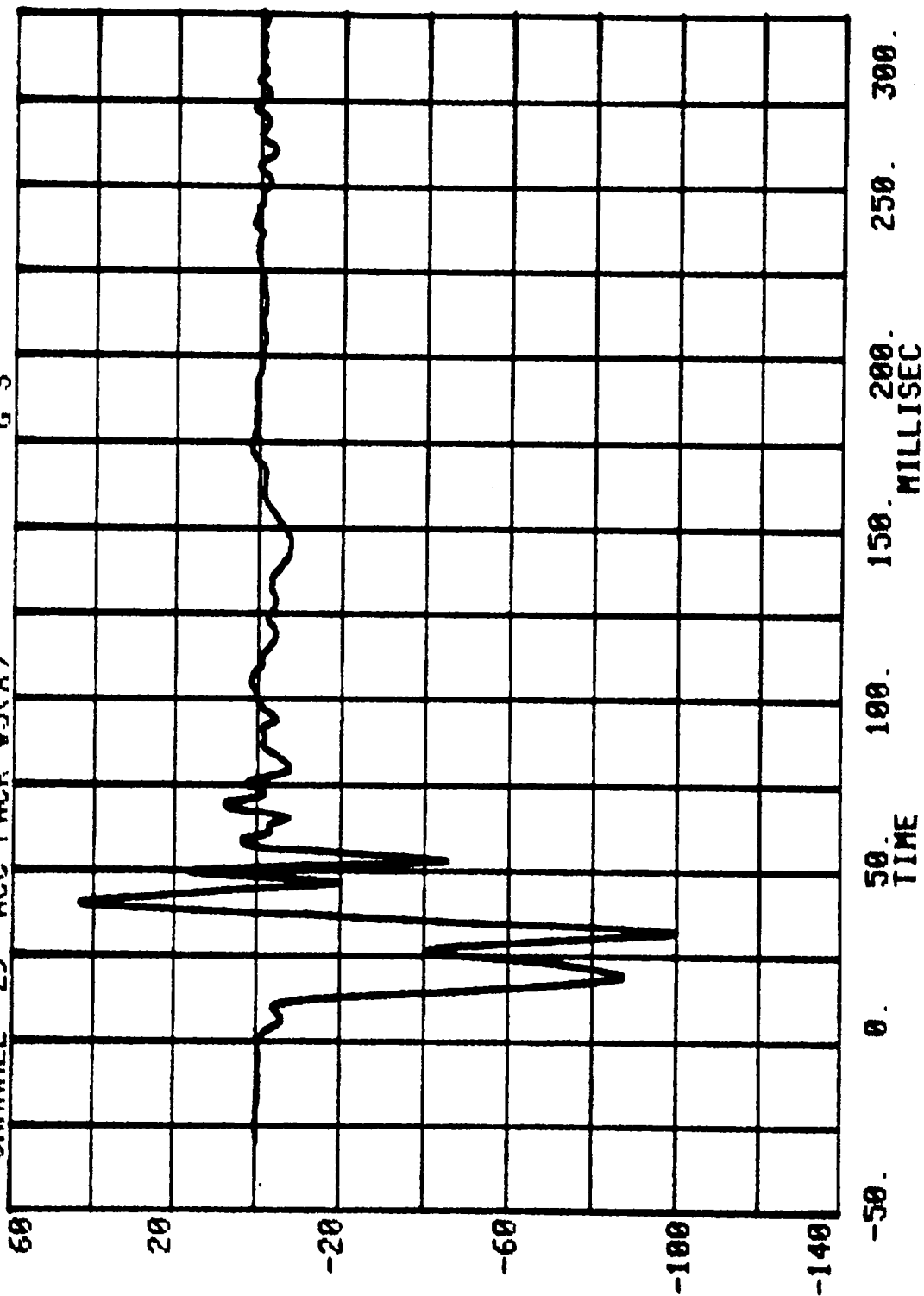
CHANNEL 28 ACC PACK #2(X) RUN= 775 SERIES= 5700 G'S

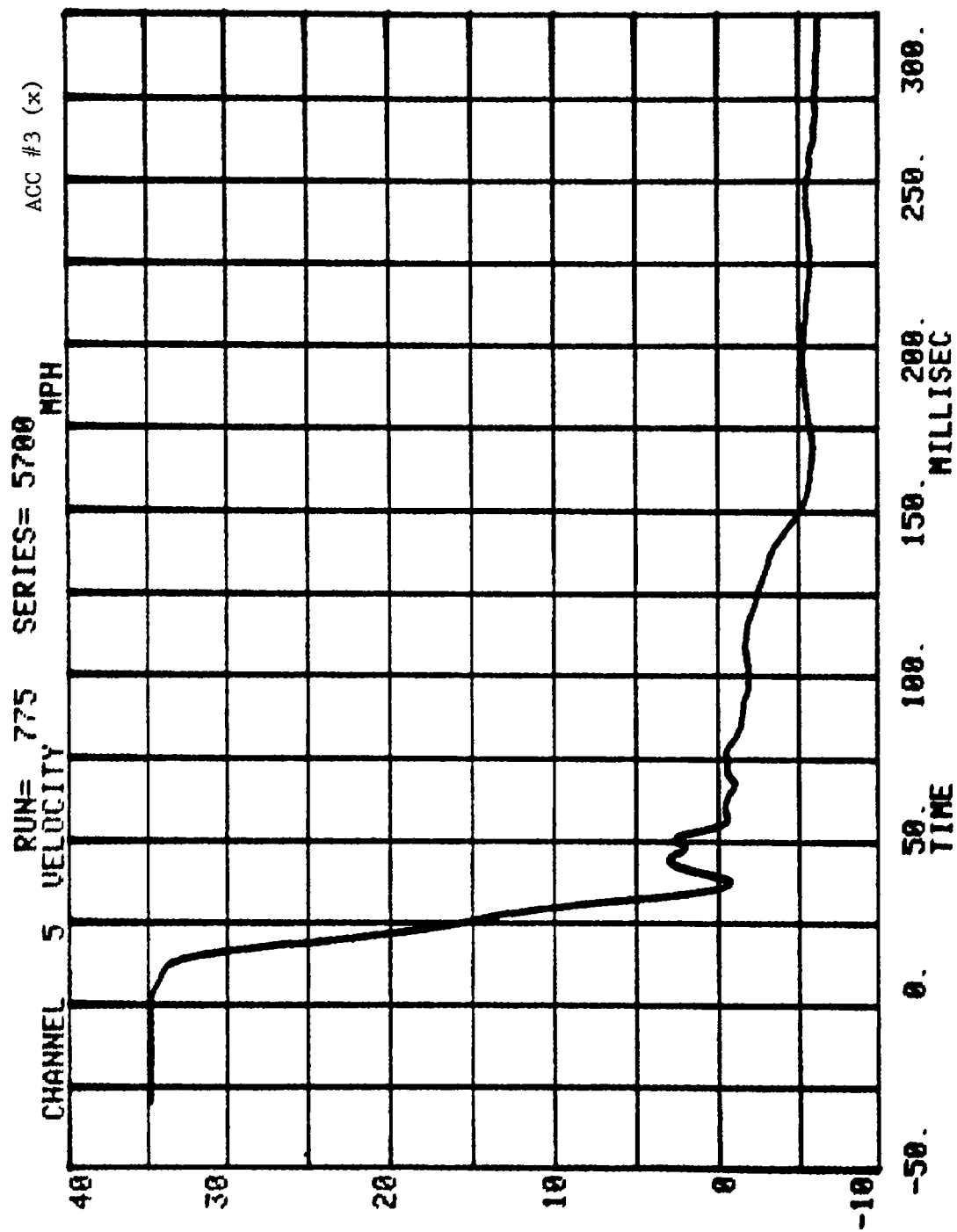


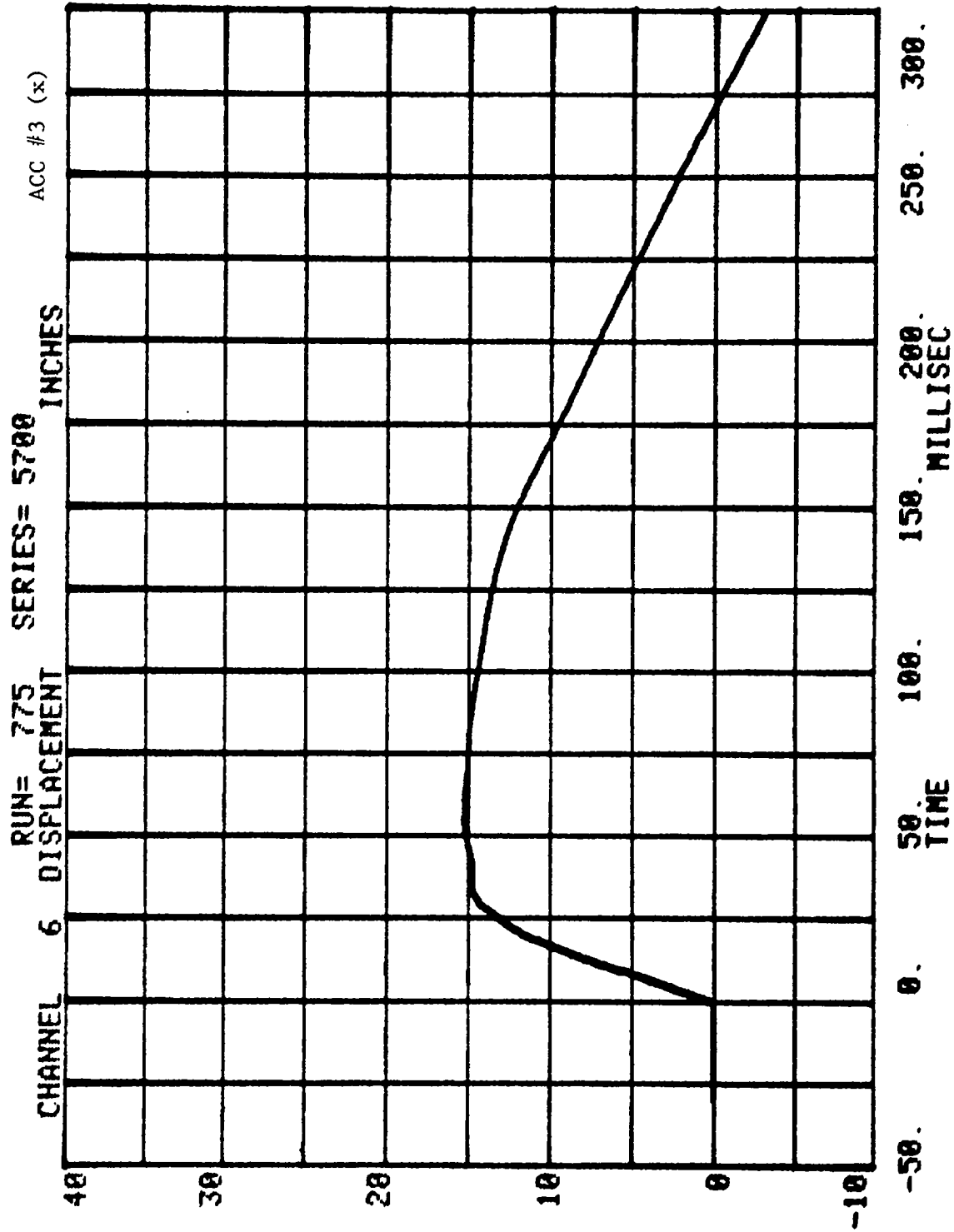




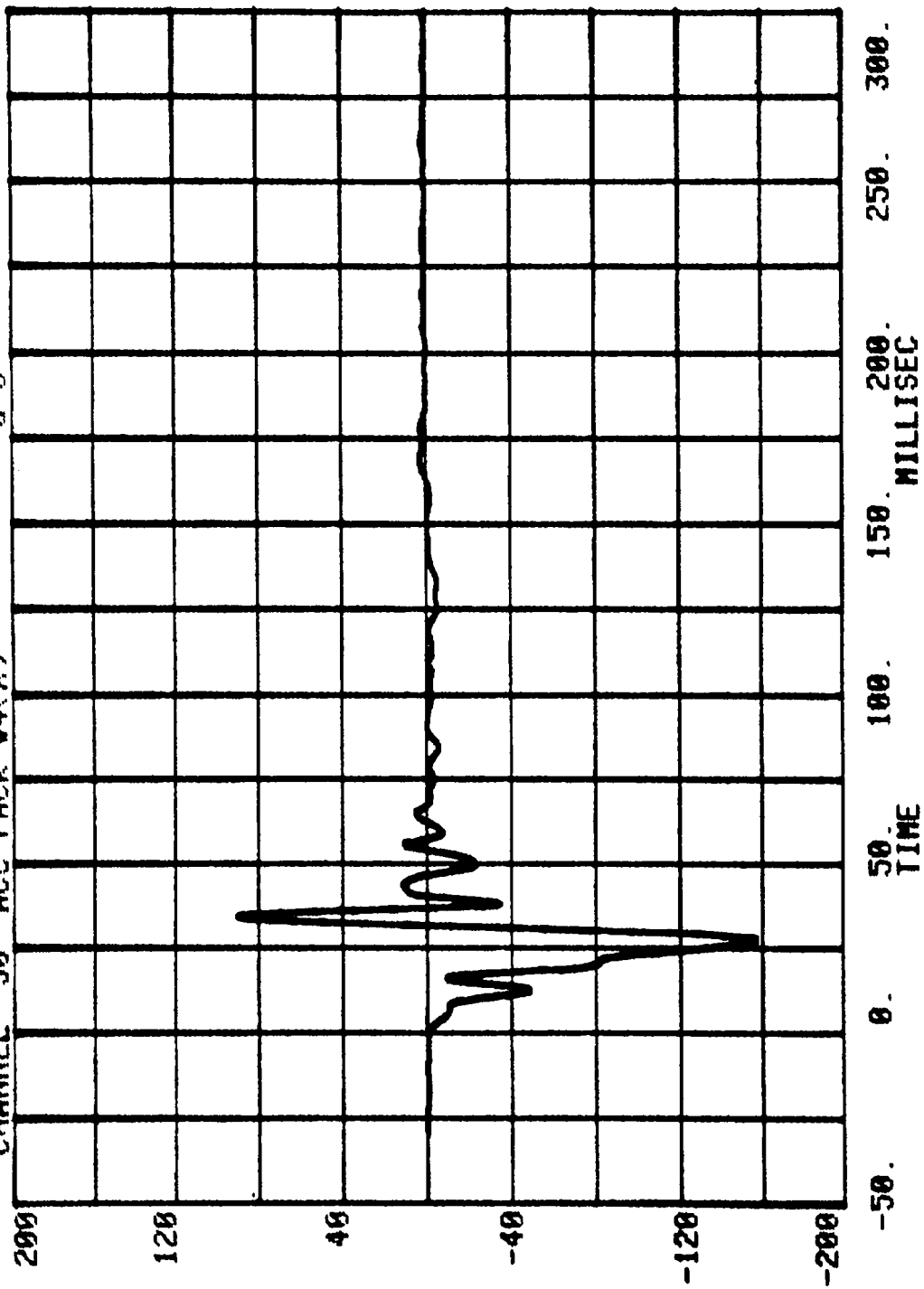
CHANNEL 29 ACC PACK #3(X) RUN= 775 SERIES= 5700 G'S

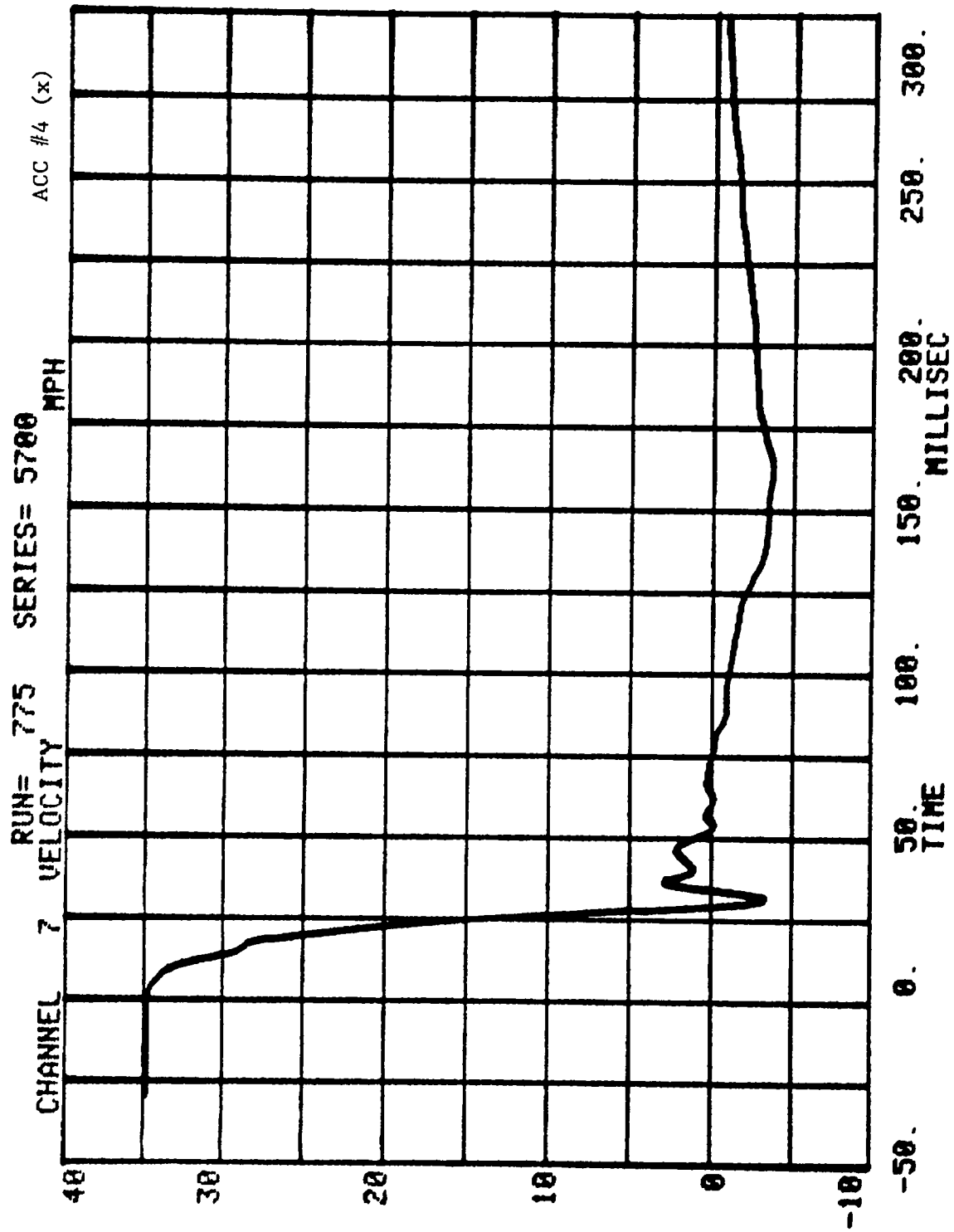


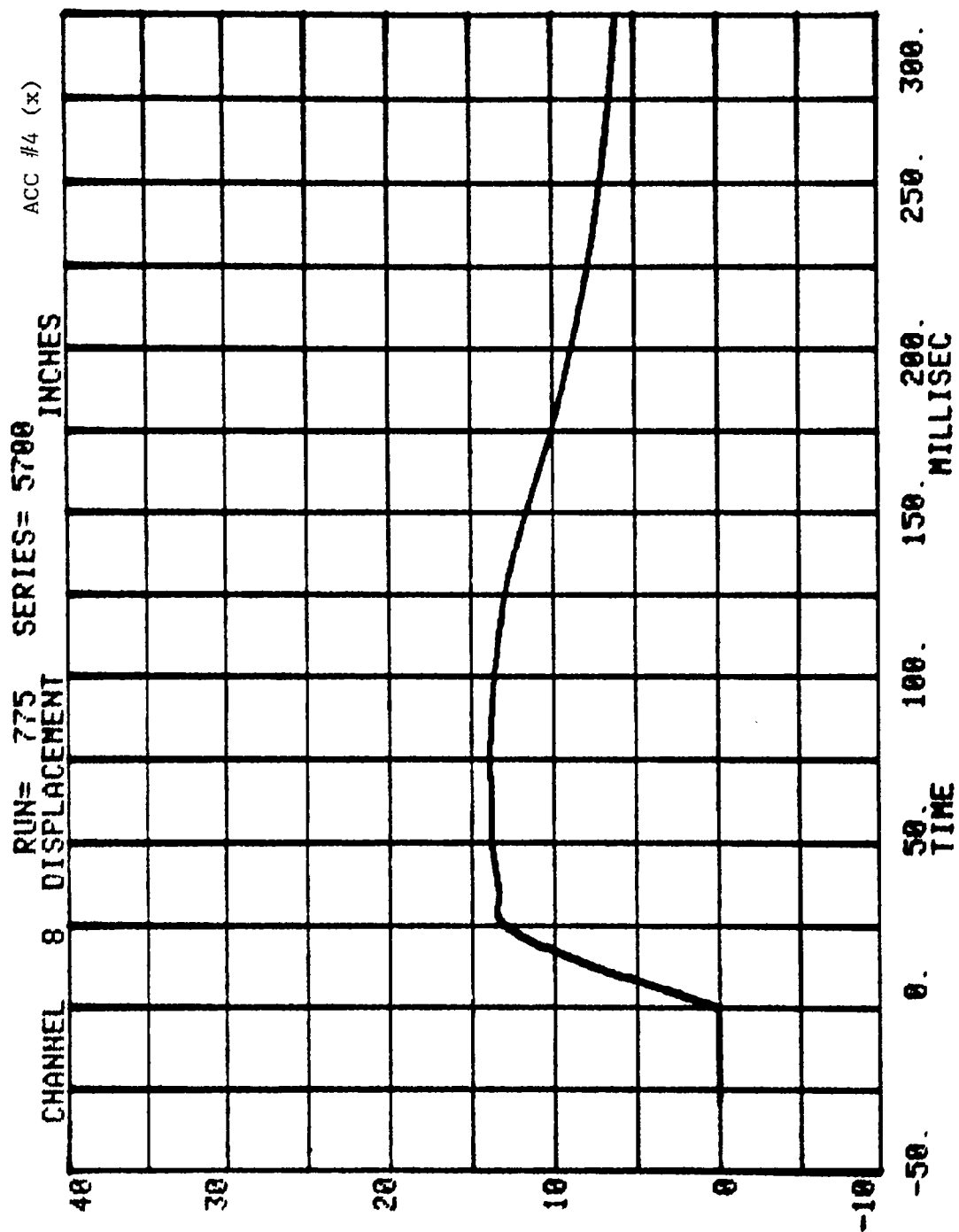




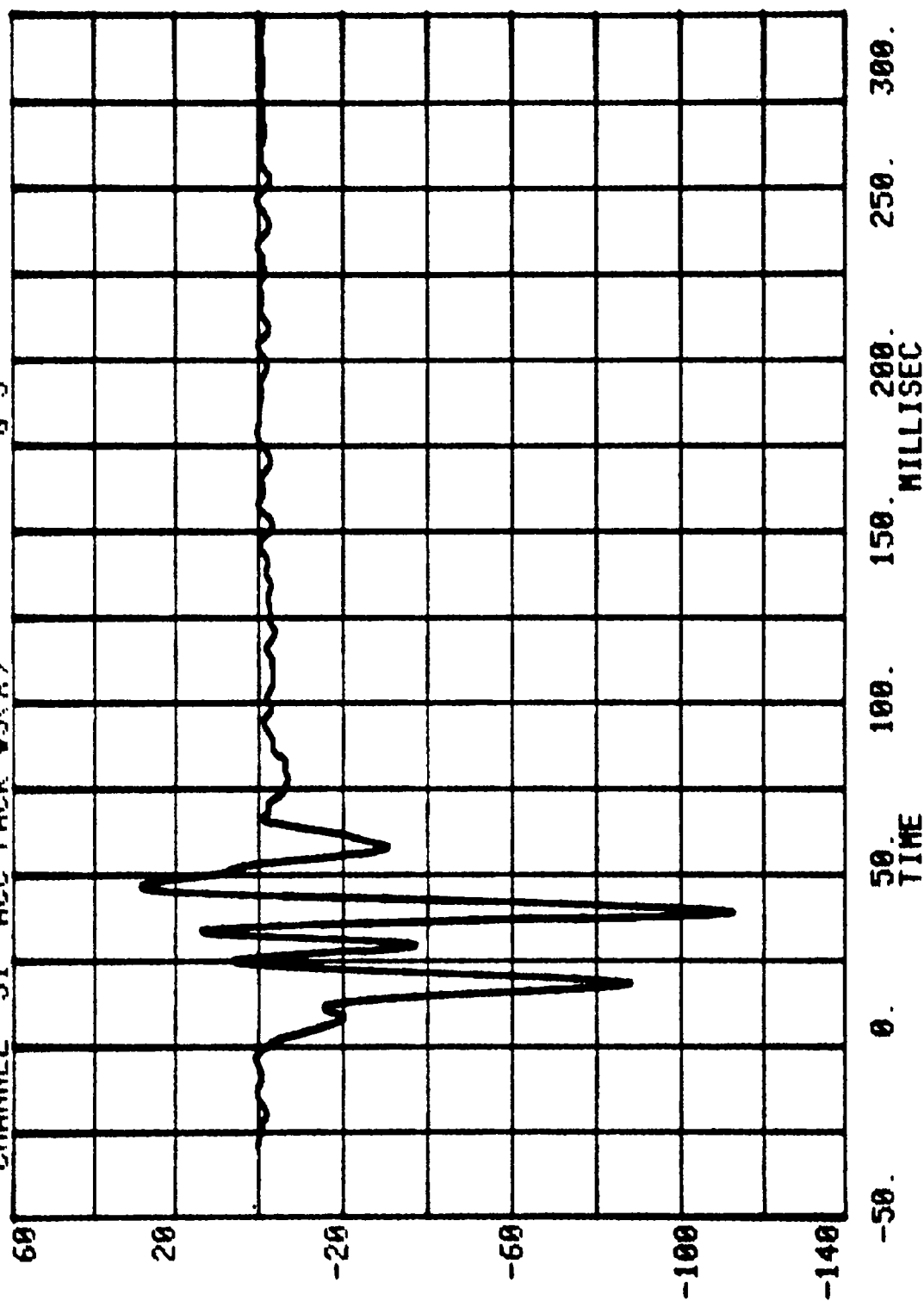
RUN= 775 SERIES= 5789
CHANNEL 30 ACC PACK #4(X) G'S

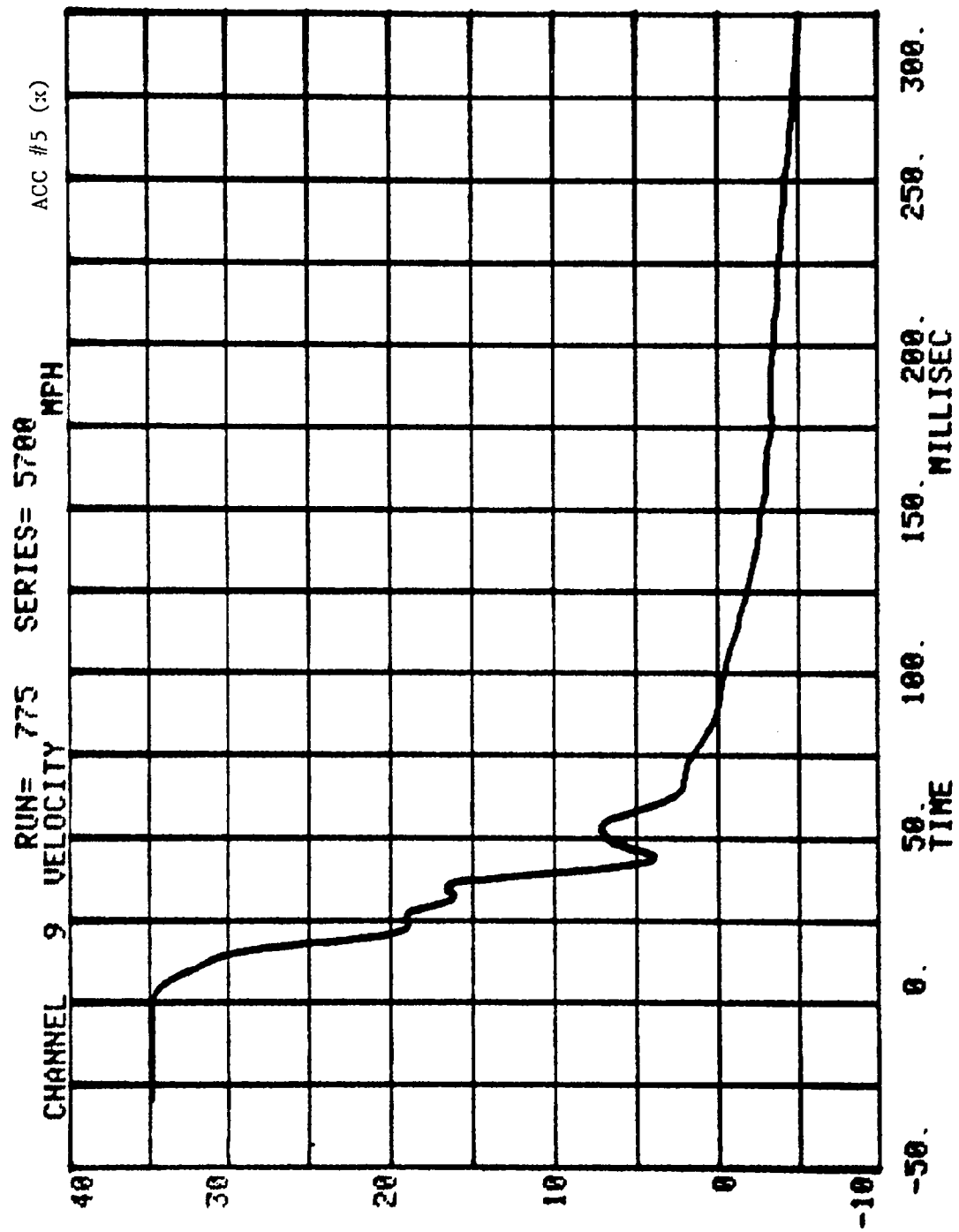


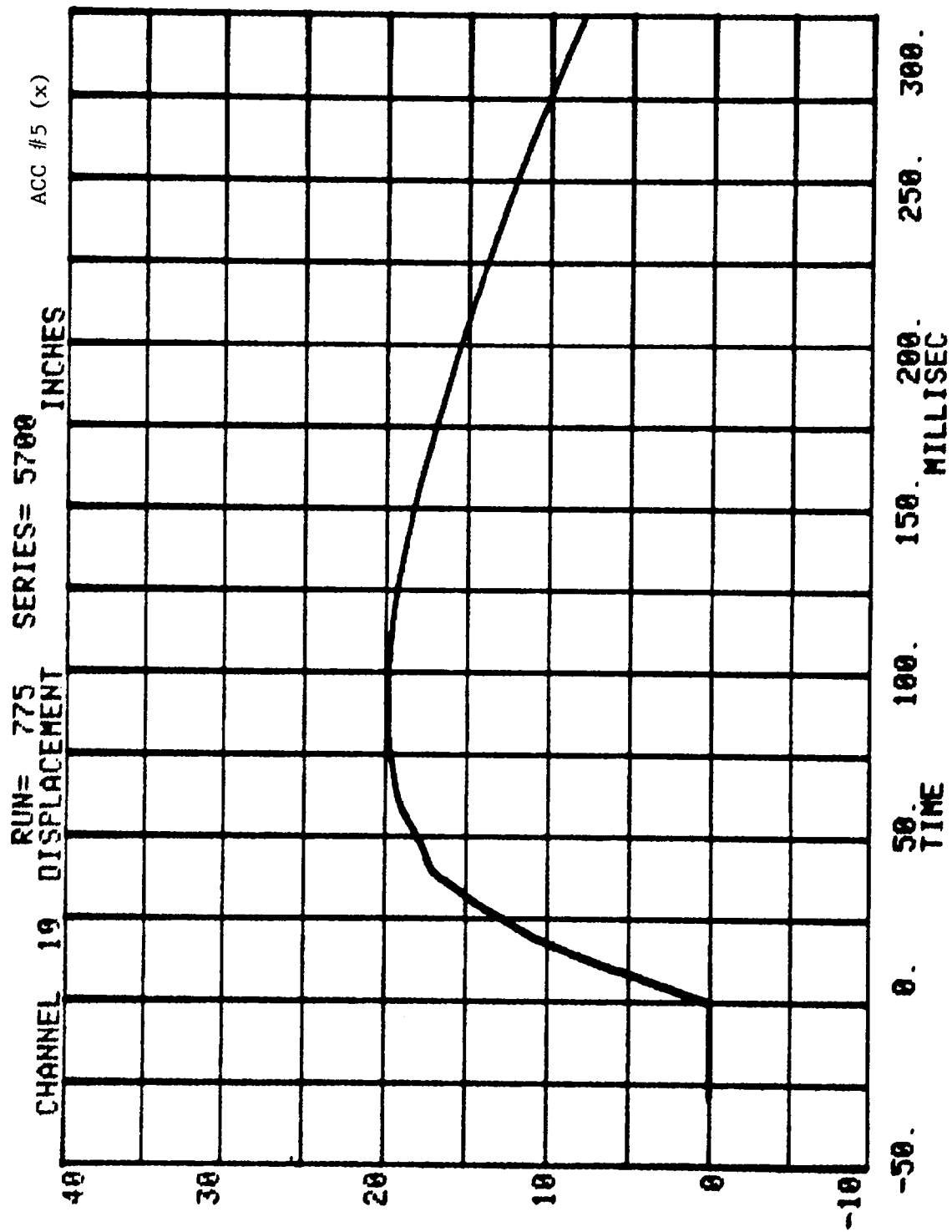


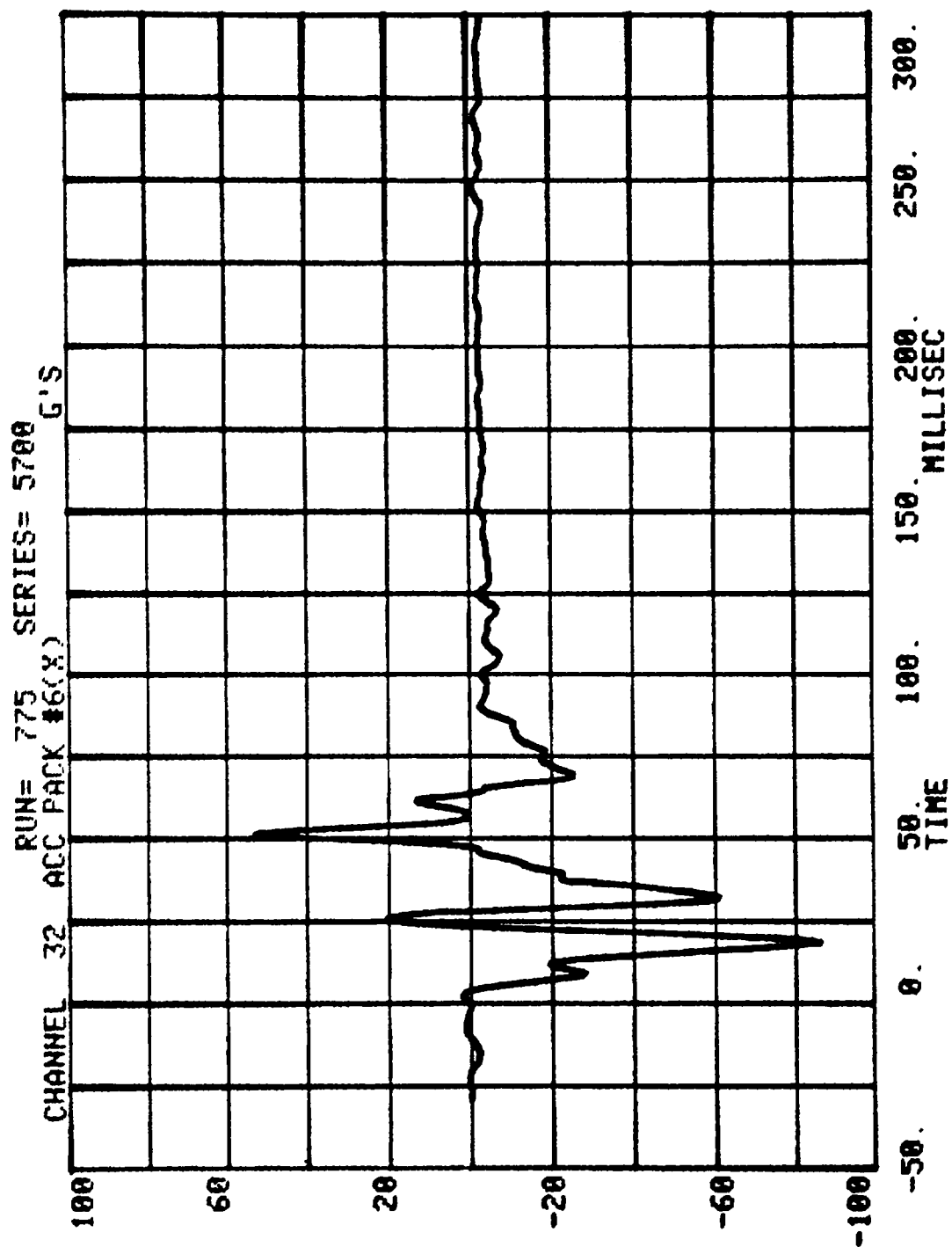


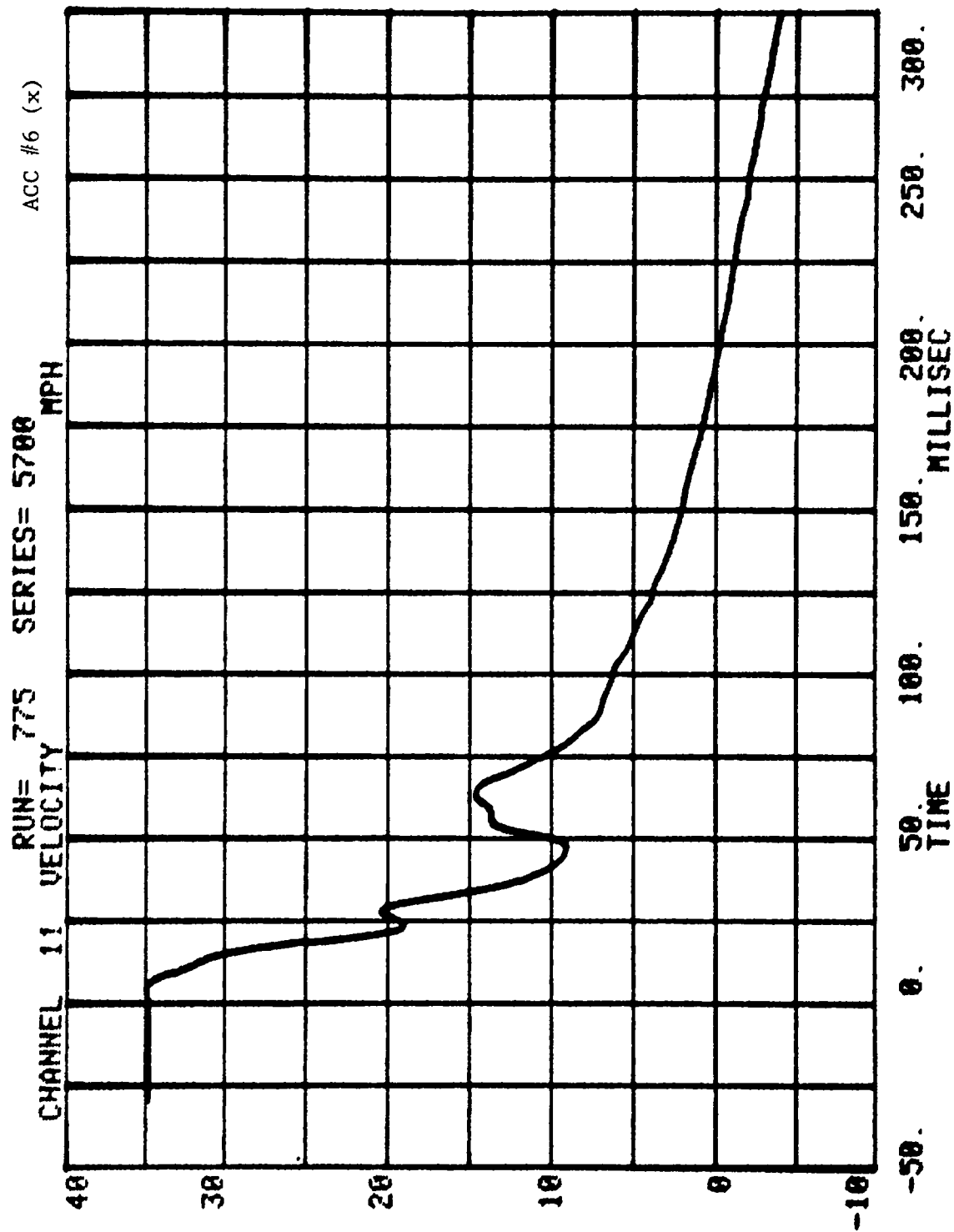
CHANNEL 31 ACC PACK #5(X) RUN= 775 SERIES= 5700 G'S

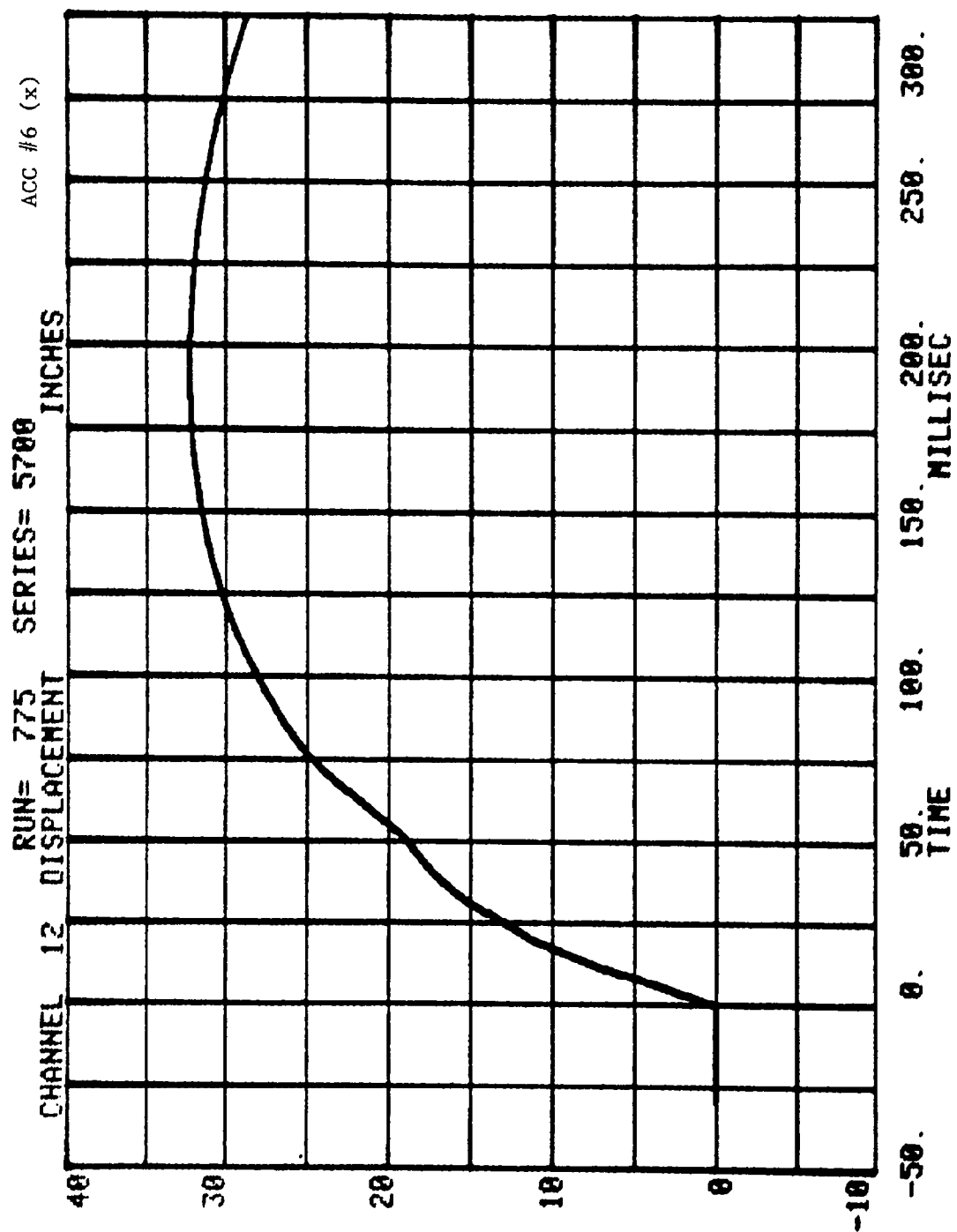




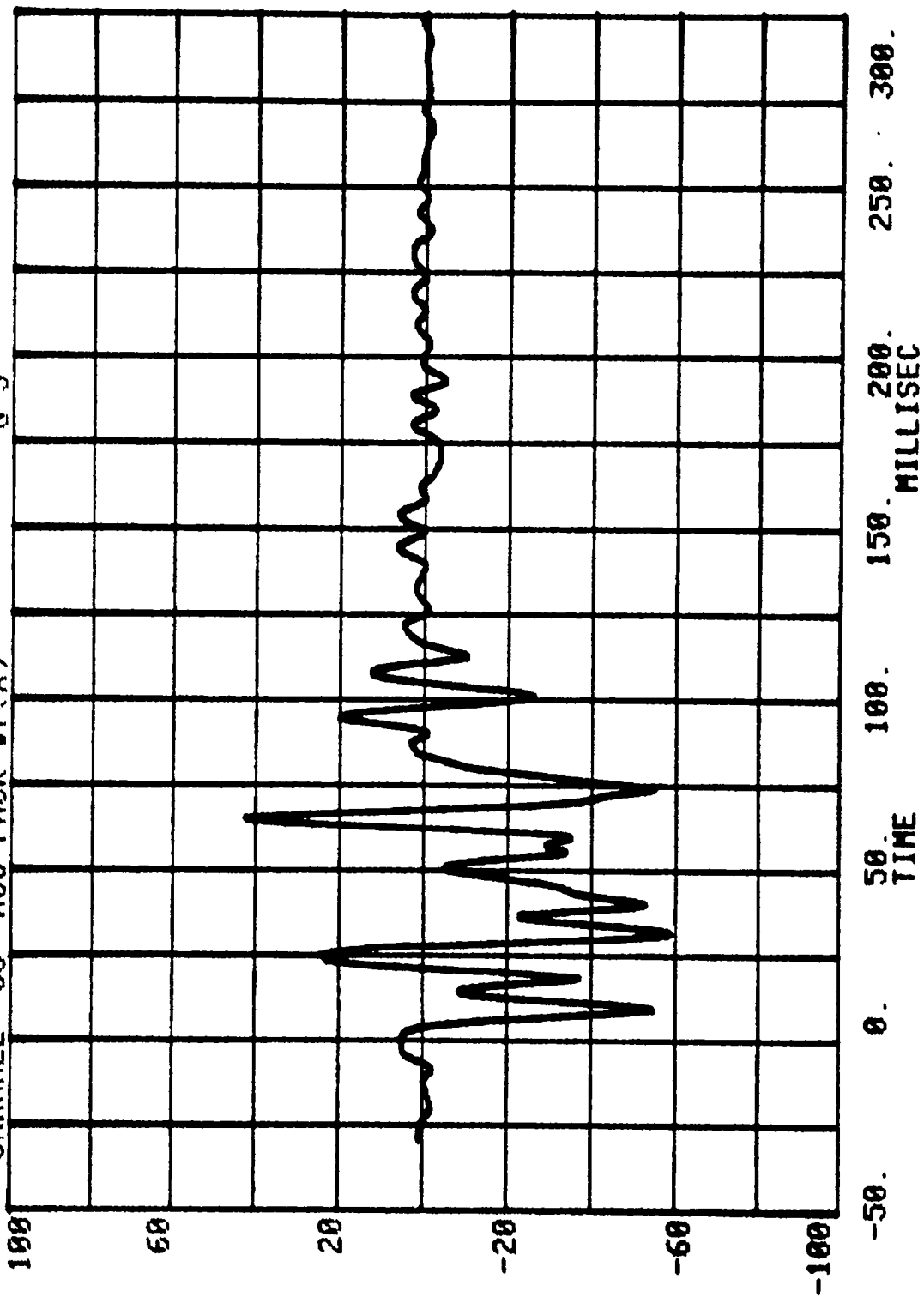


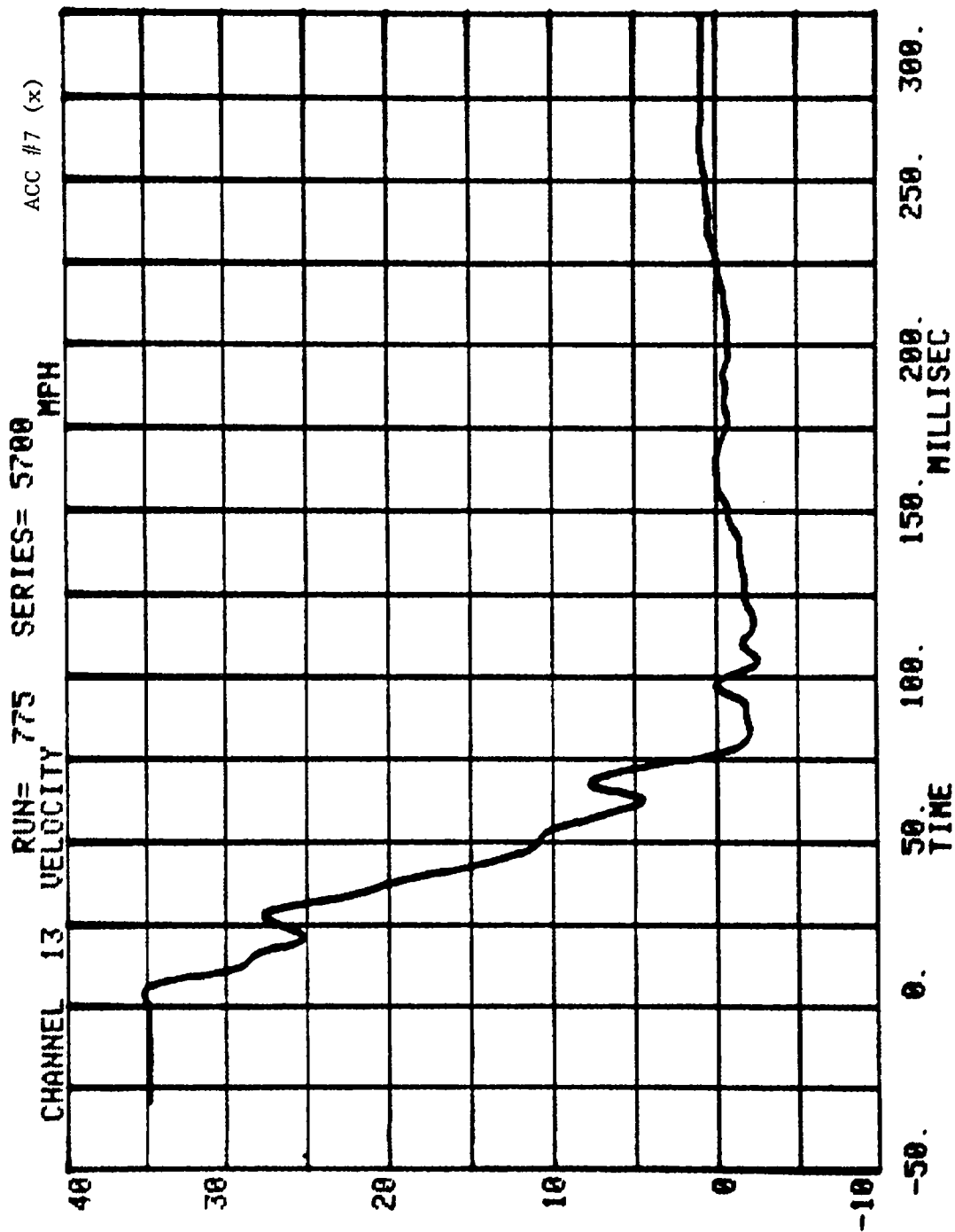


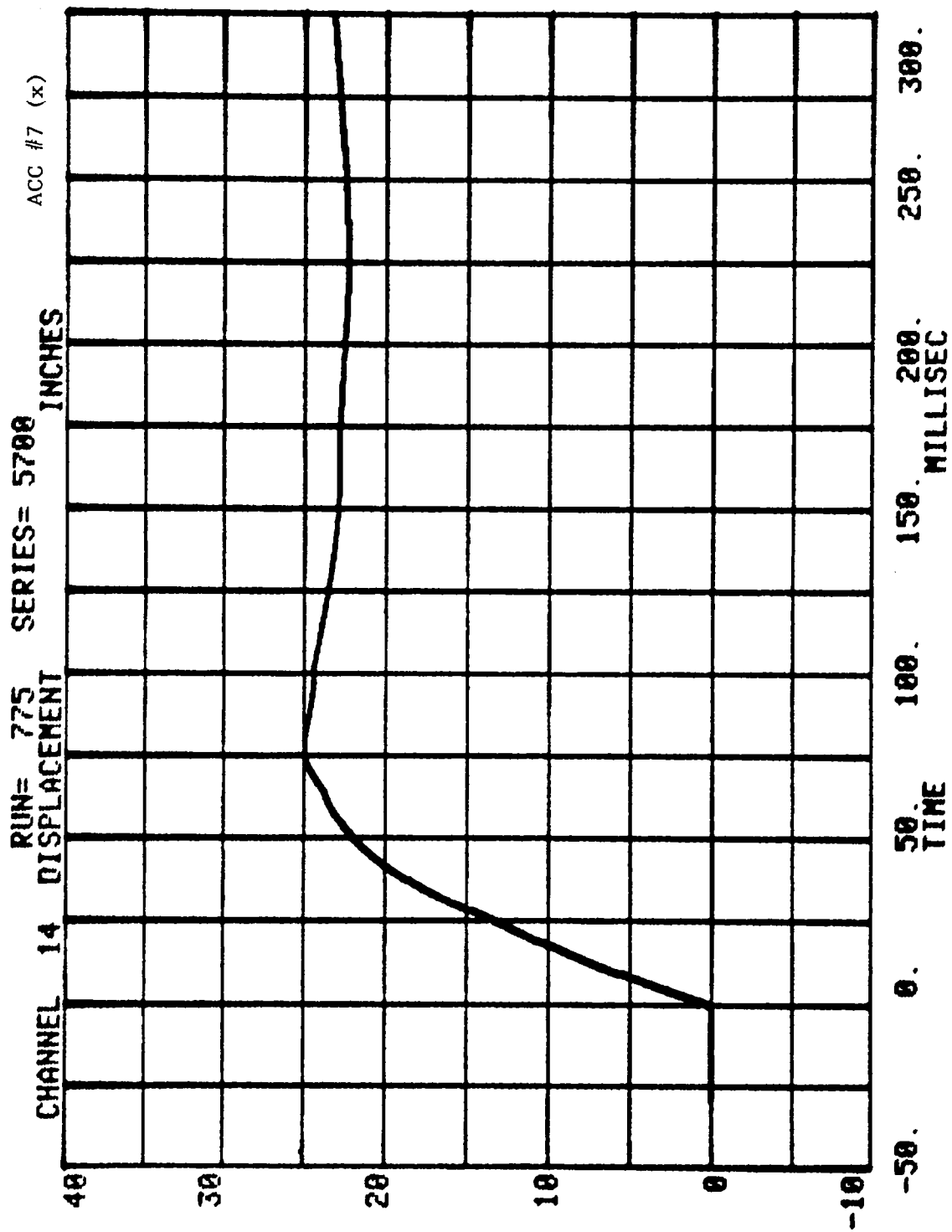




CHANNEL 33 ACC PACK #7(X) RUN= 775 SERIES= 5700 G'S







TEST NO. MH5700

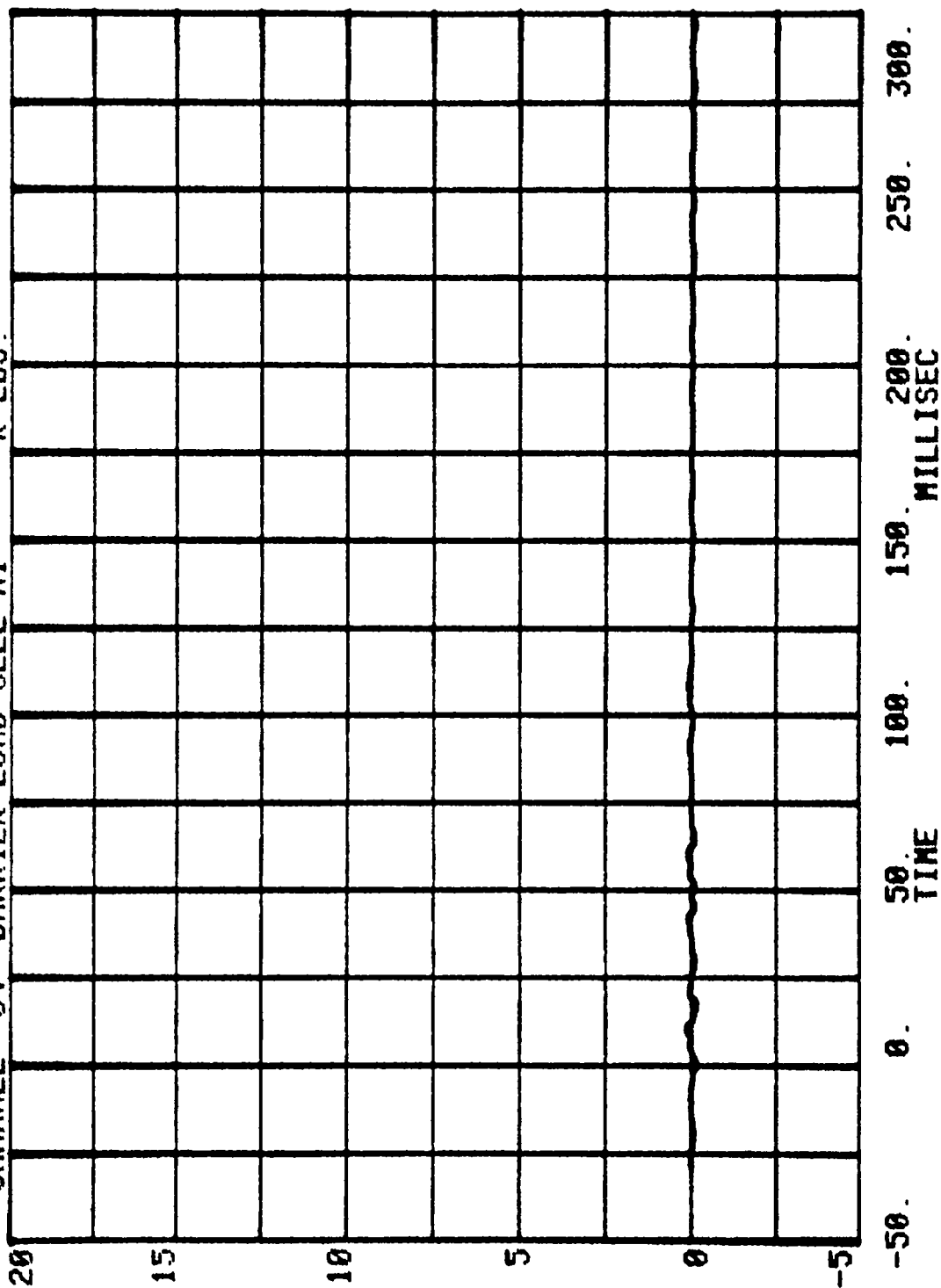
LOAD CELL BARRIER DATA
FILTER CHANNEL CLASS

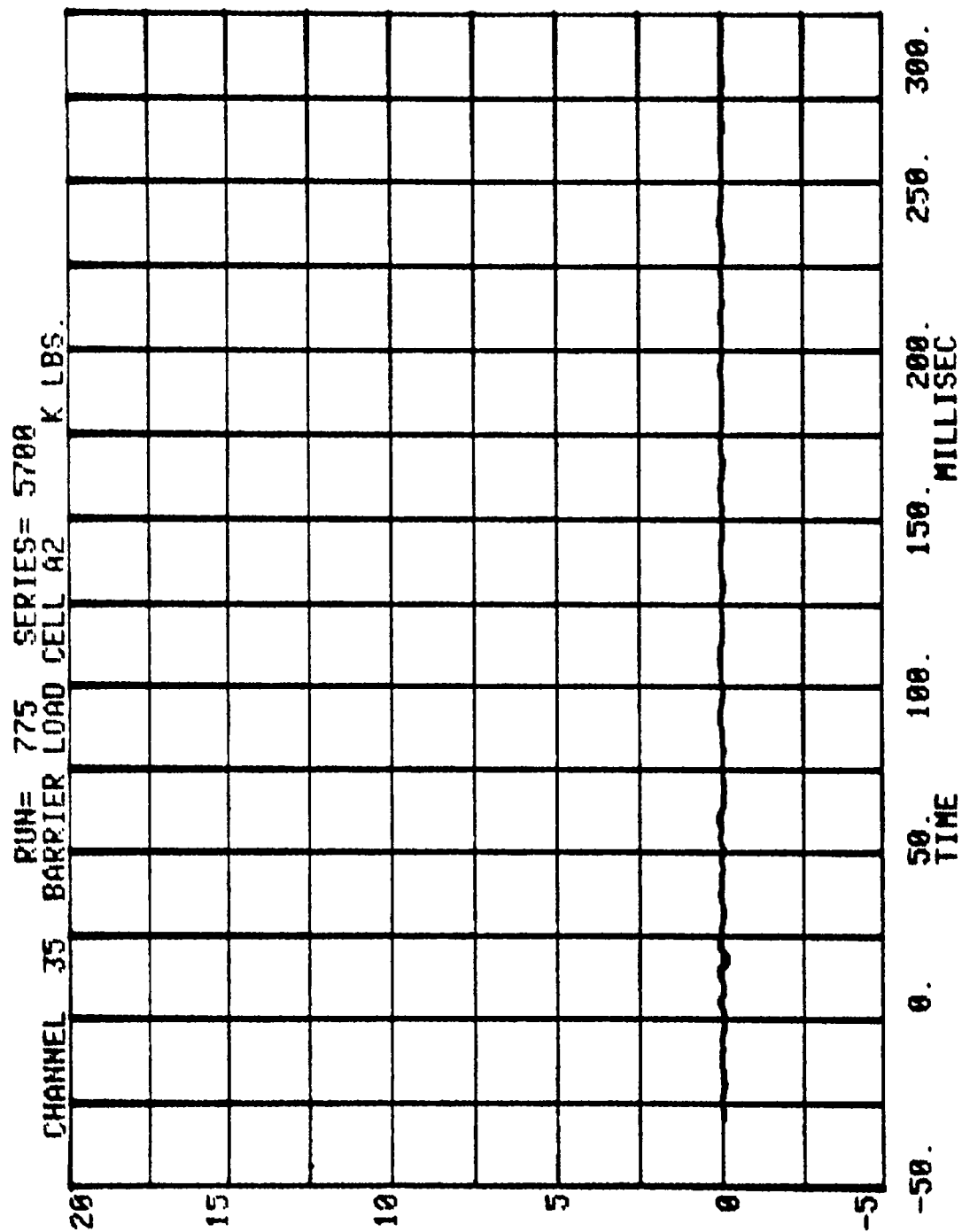
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B-24

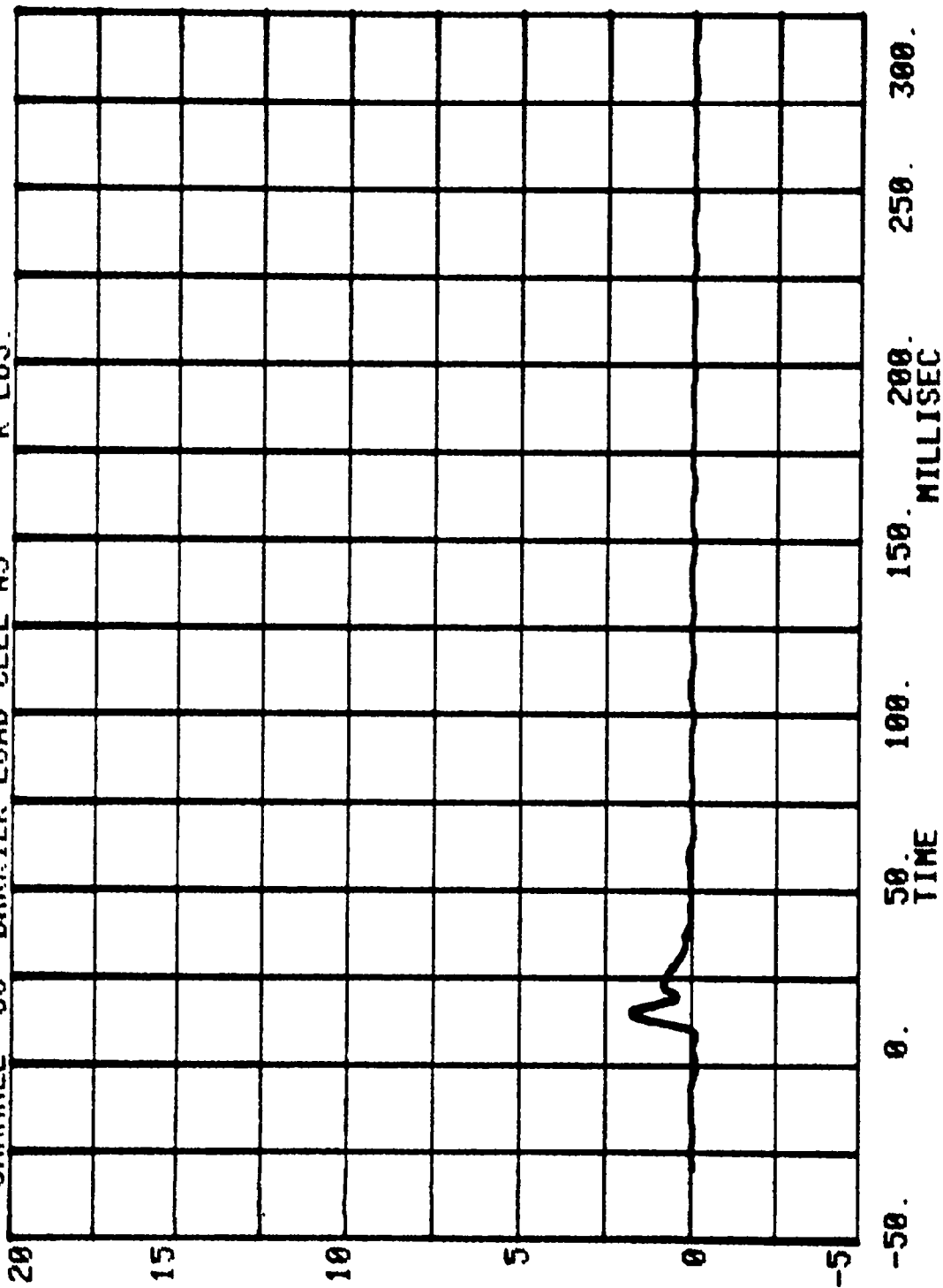
7556-13

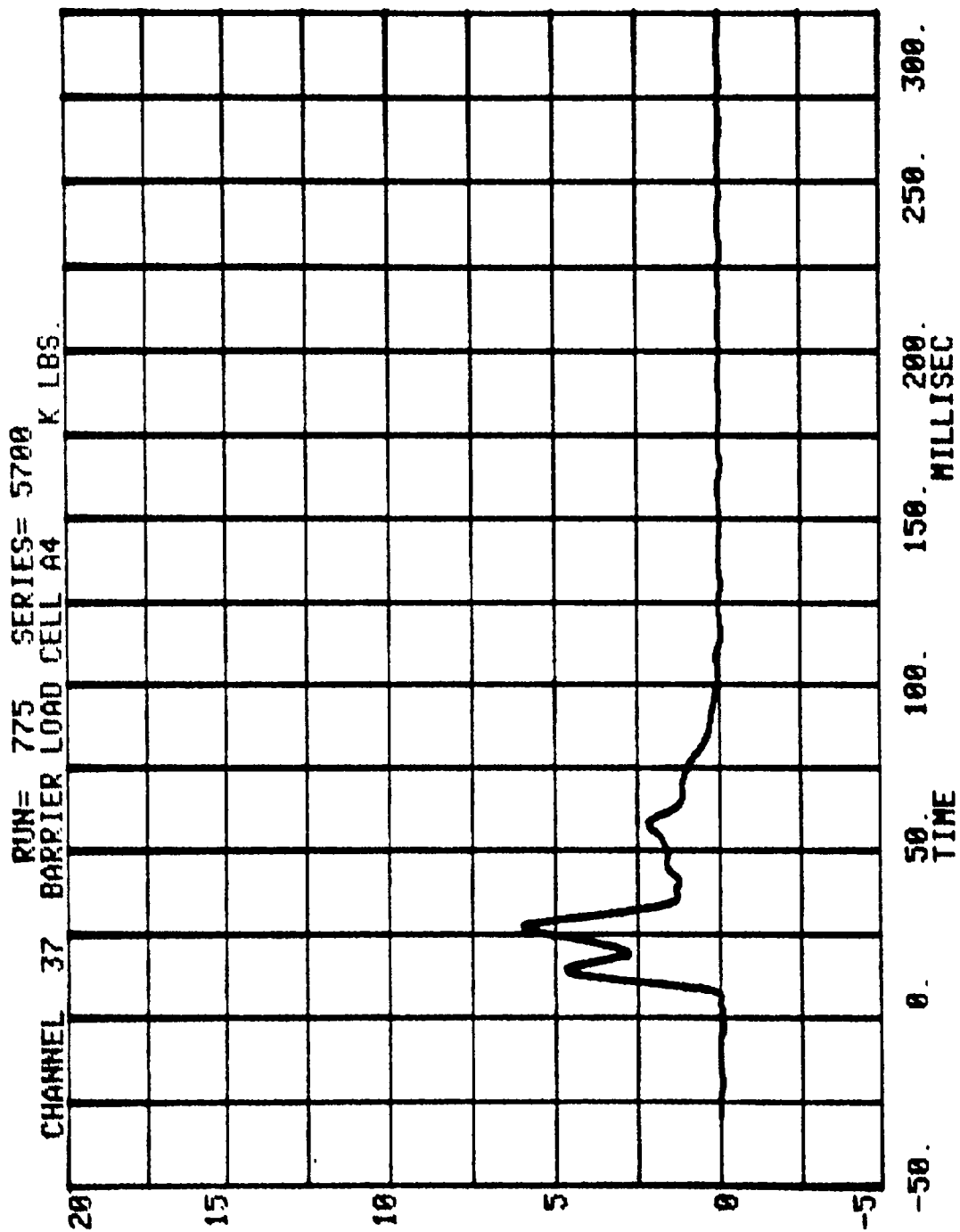
CHANNEL 34 BARRIER LOAD CELL A1 RUN= 775 SERIES= 5780 K LBS.





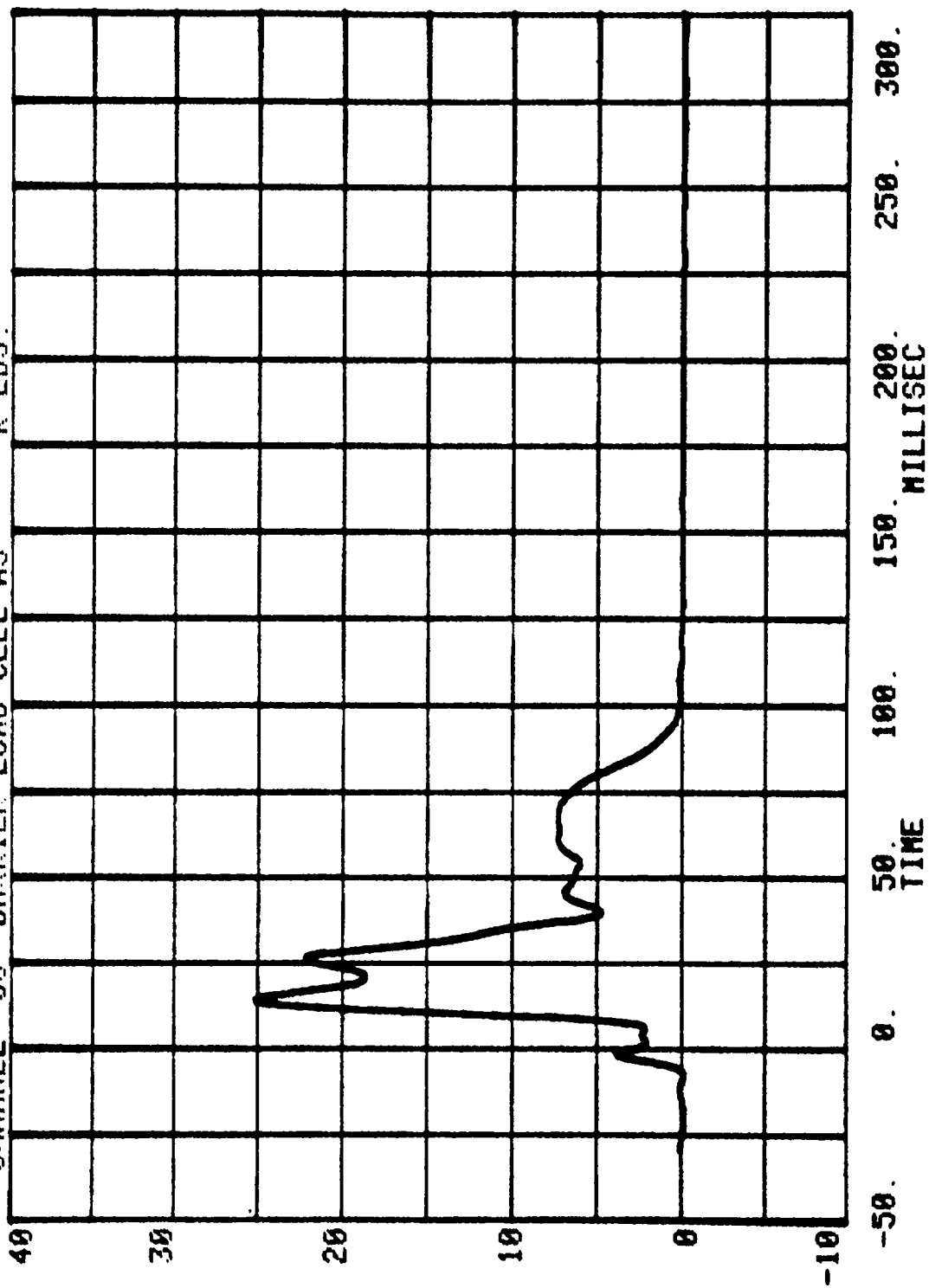
CHANNEL 36 BARRIER LOAD CELL A3 RUN= 775 SERIES= 5700 K LBS.



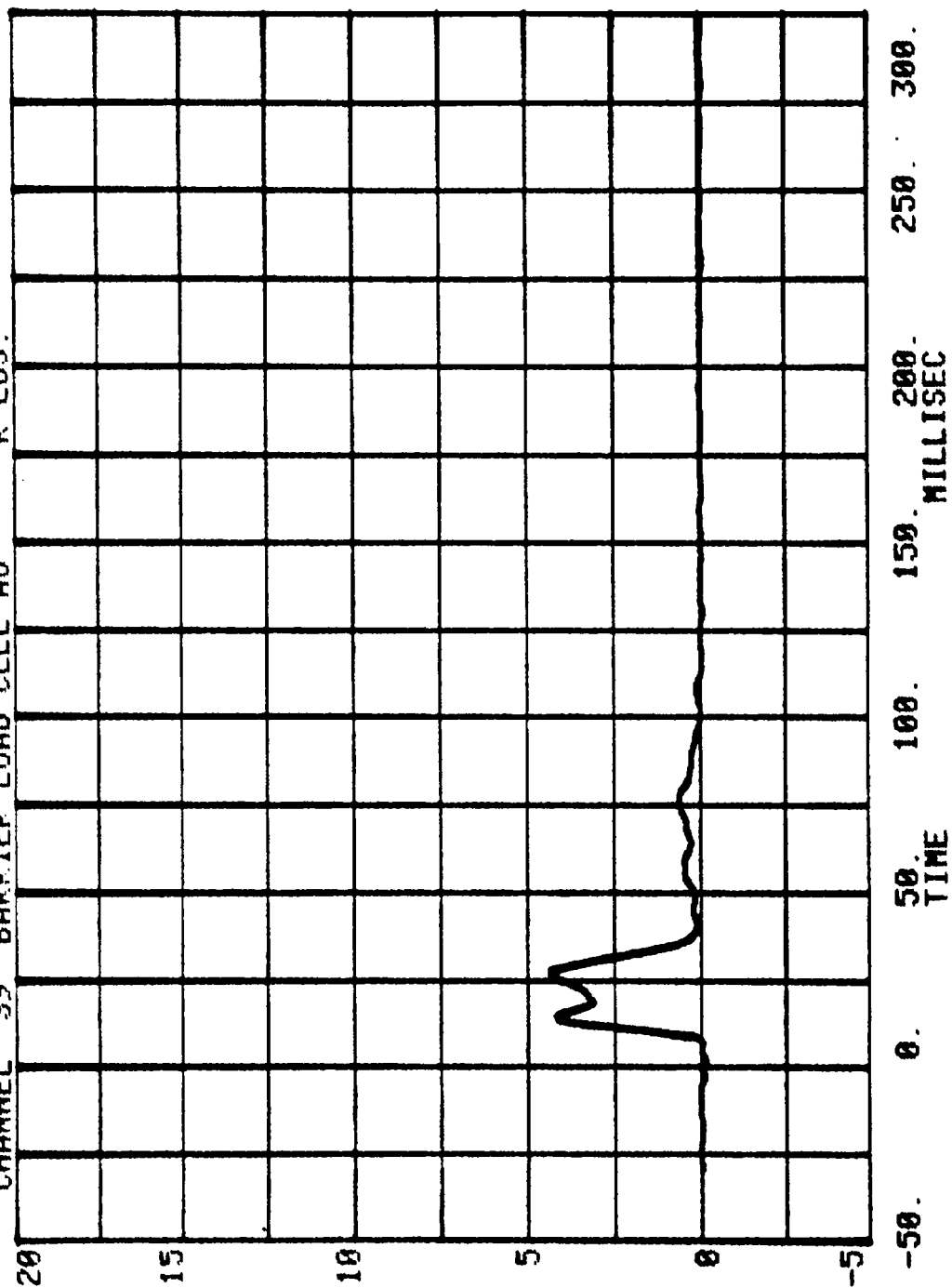


CHANNEL 38 BARRIER LOAD CELL A5 K LBS.

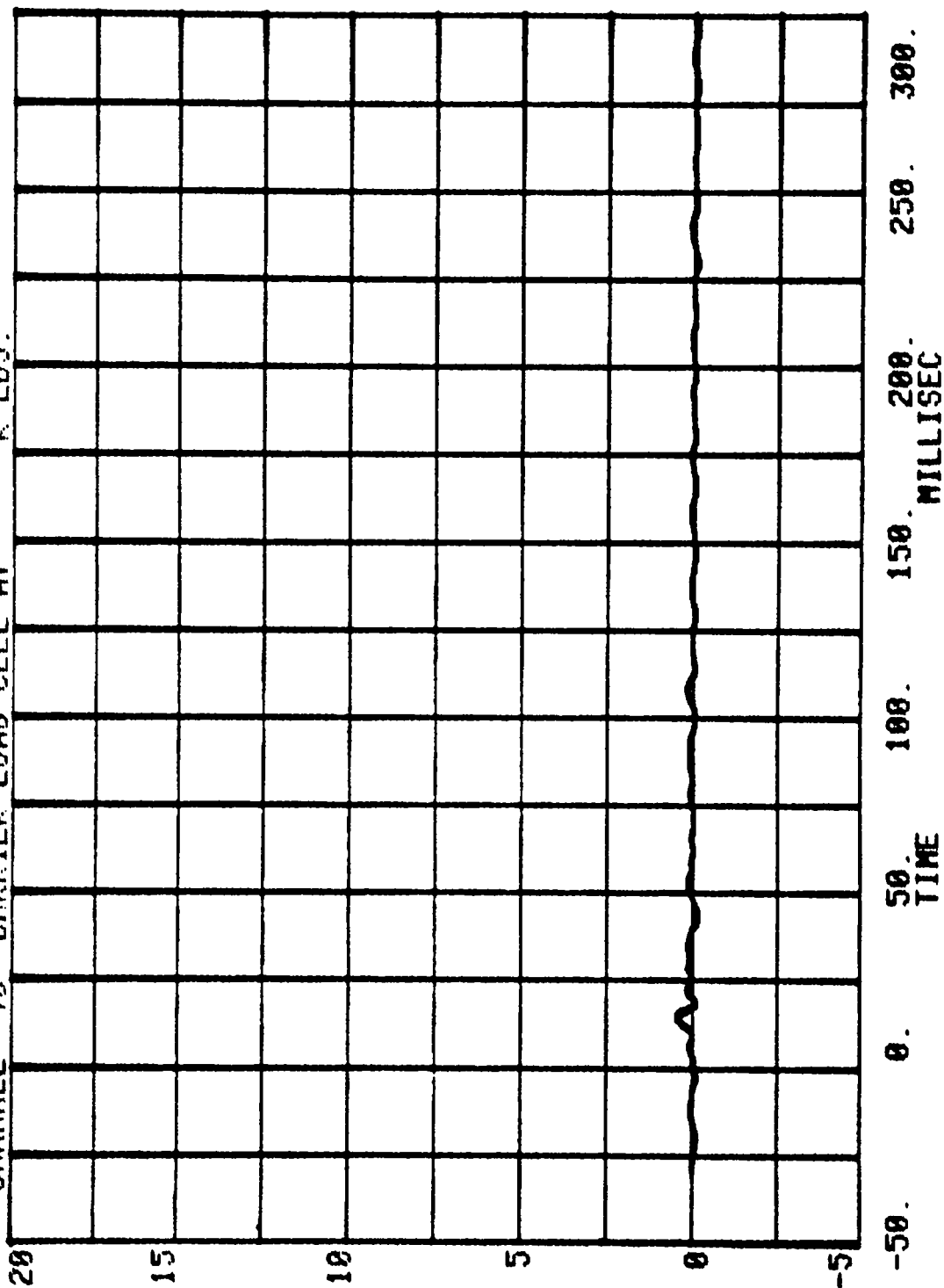
RUN= 775 SERIES= 5700



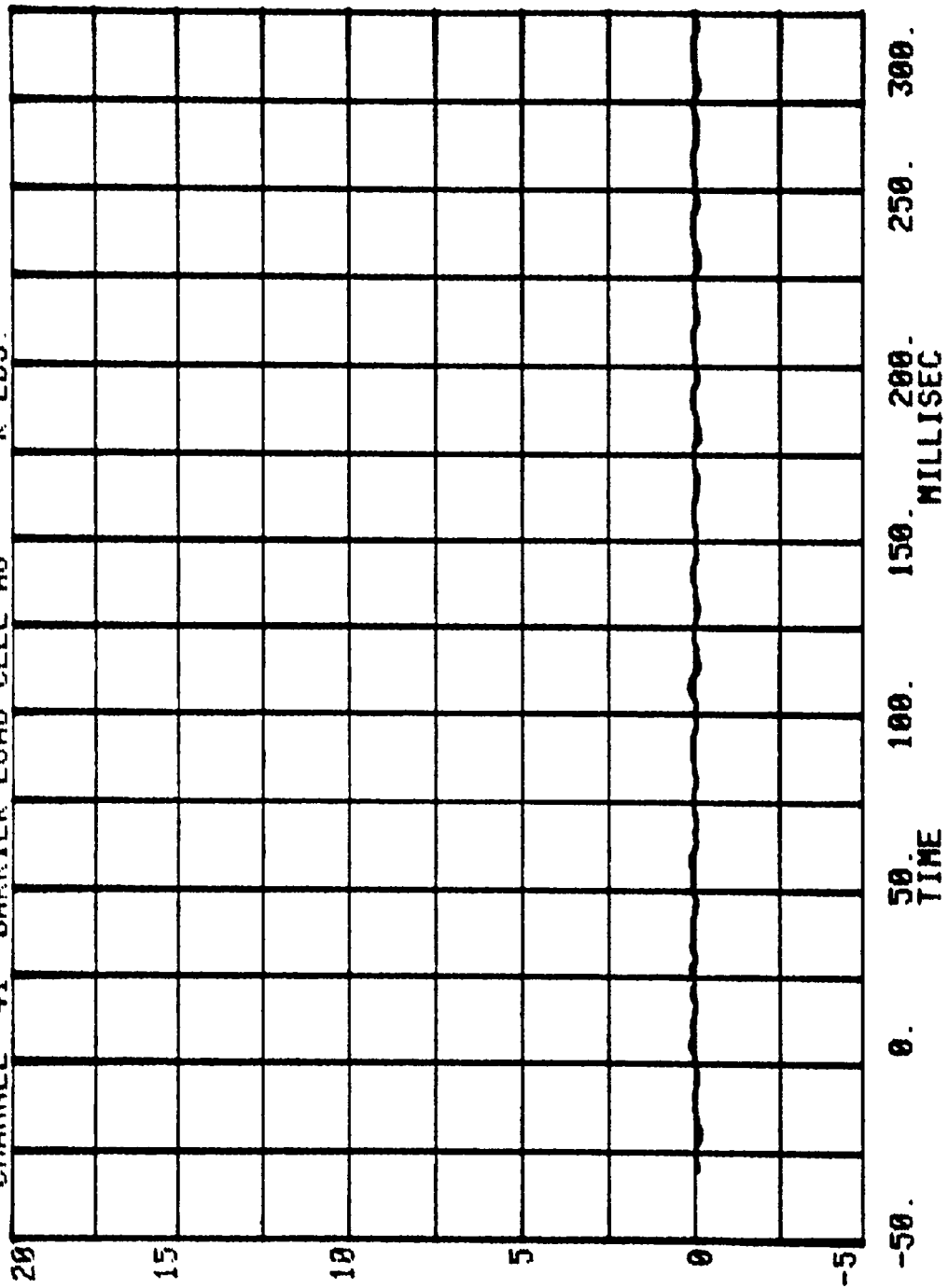
CHANNEL 39 BARRIER LOAD CELL A6 K LBS.
RUN= 775 SERIES= 5700



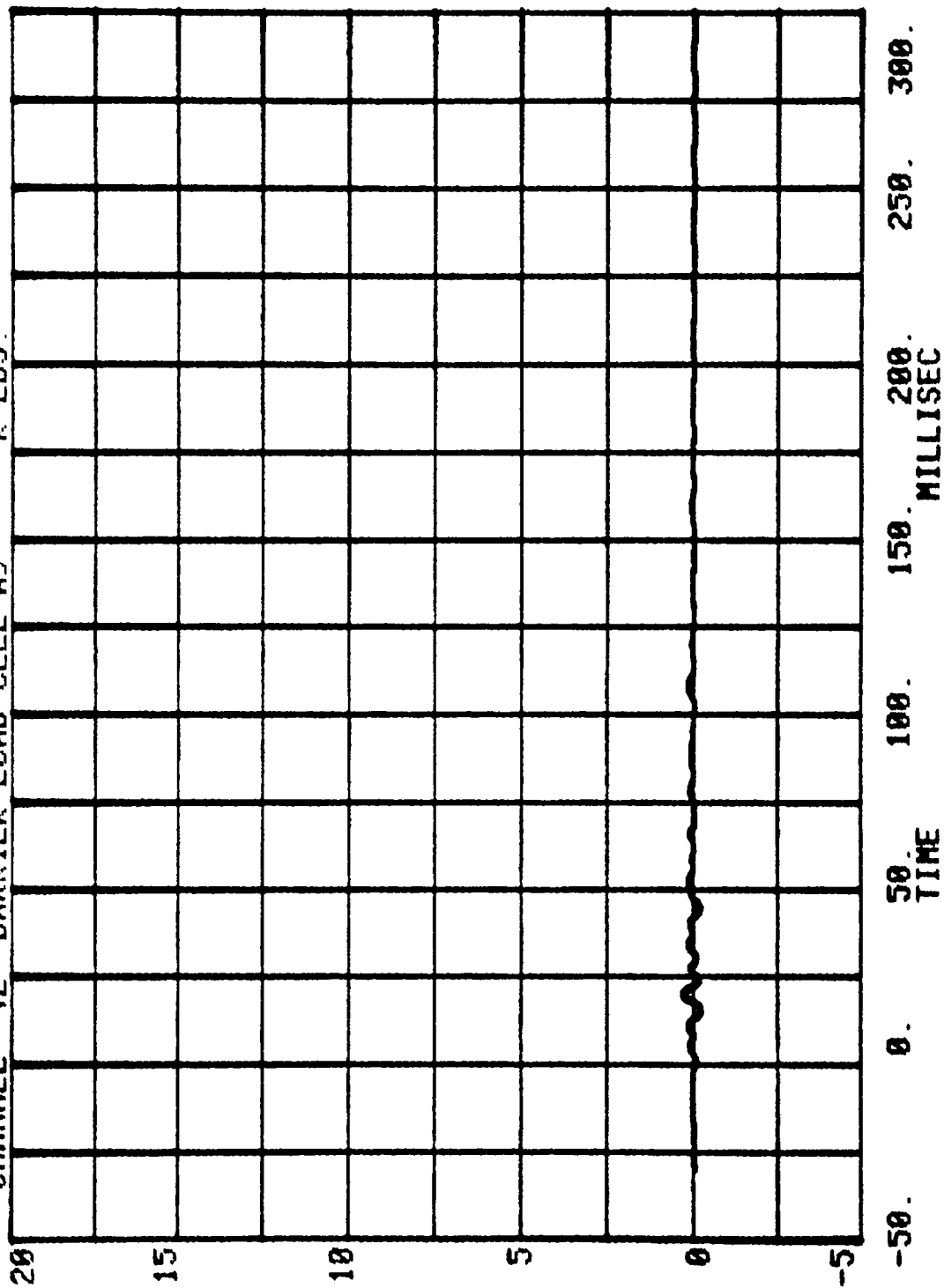
CHANNEL 40 RUN= 775 SERIES= 5700
BARRIER LOAD CELL A7 K LBS.



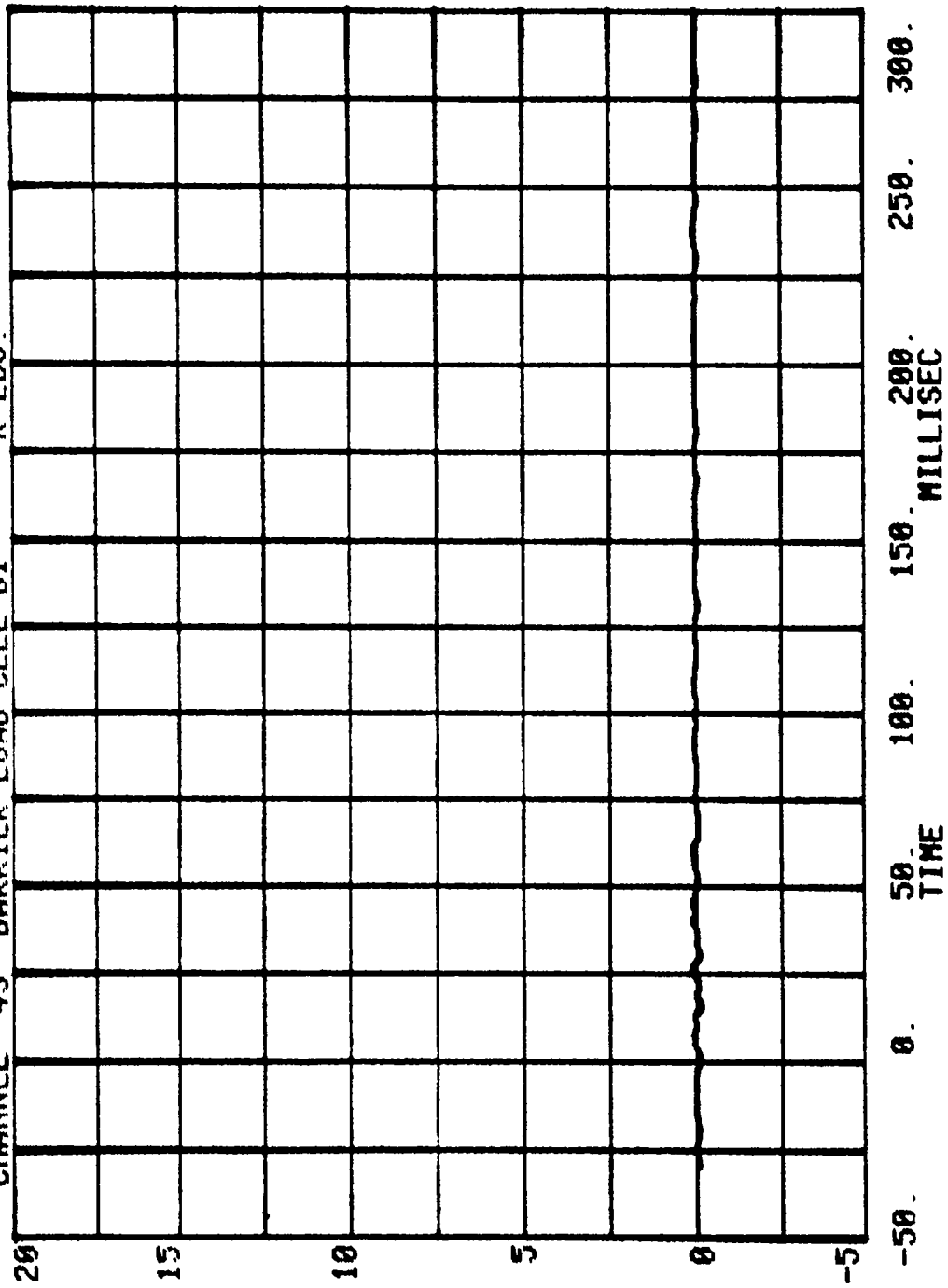
CHANNEL 41 BARRIER LOAD CELL A8 RUN= 775 SERIES= 5700 K LBS.



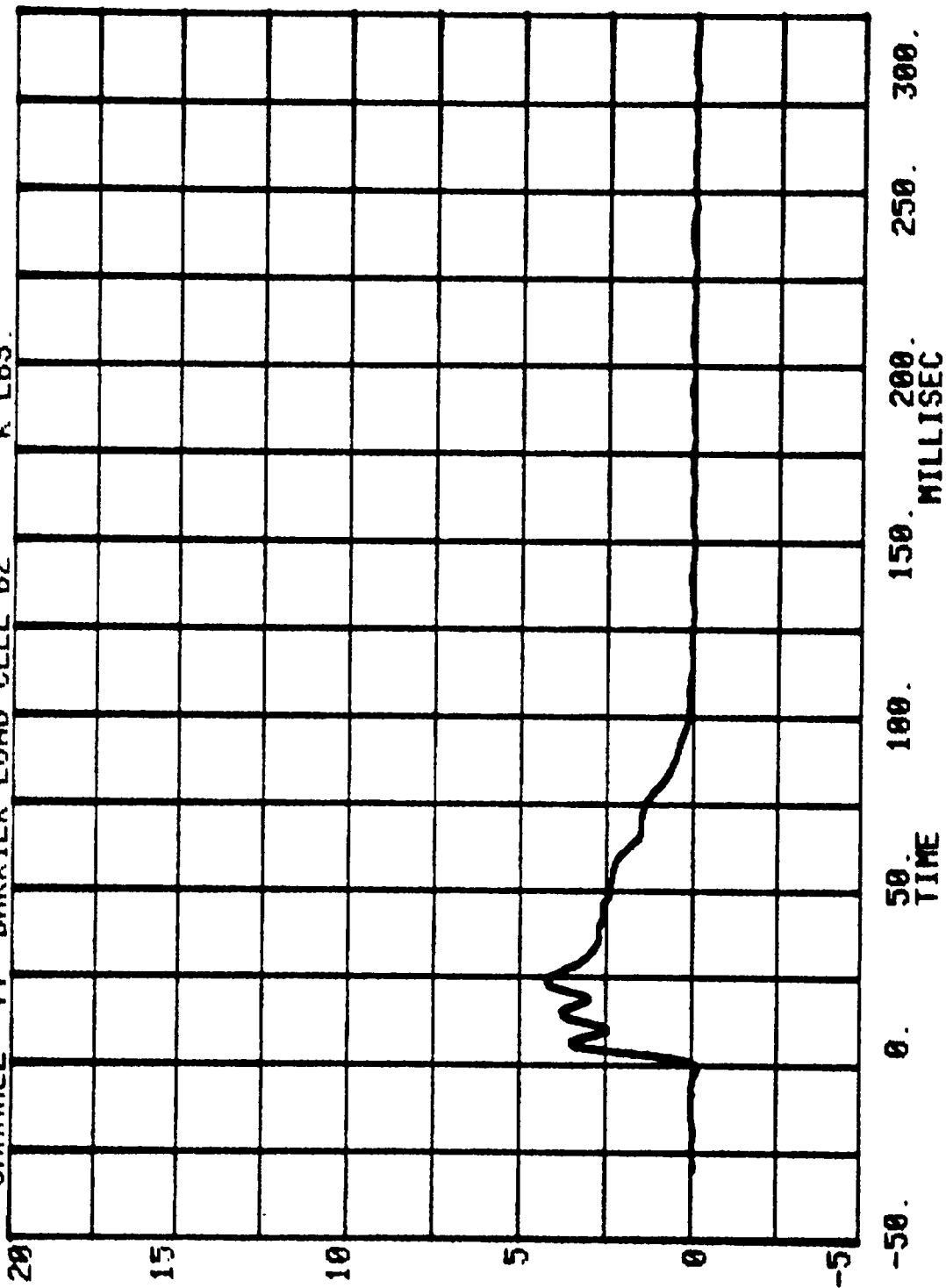
CHANNEL 42 BARRIER LOAD CELL A9
RUH= 775 SERIES= 5700 K LBS.



CHANNEL 43 BARRIER LOAD CELL B1
RUN= 775 SERIES= 5700 K LBS.

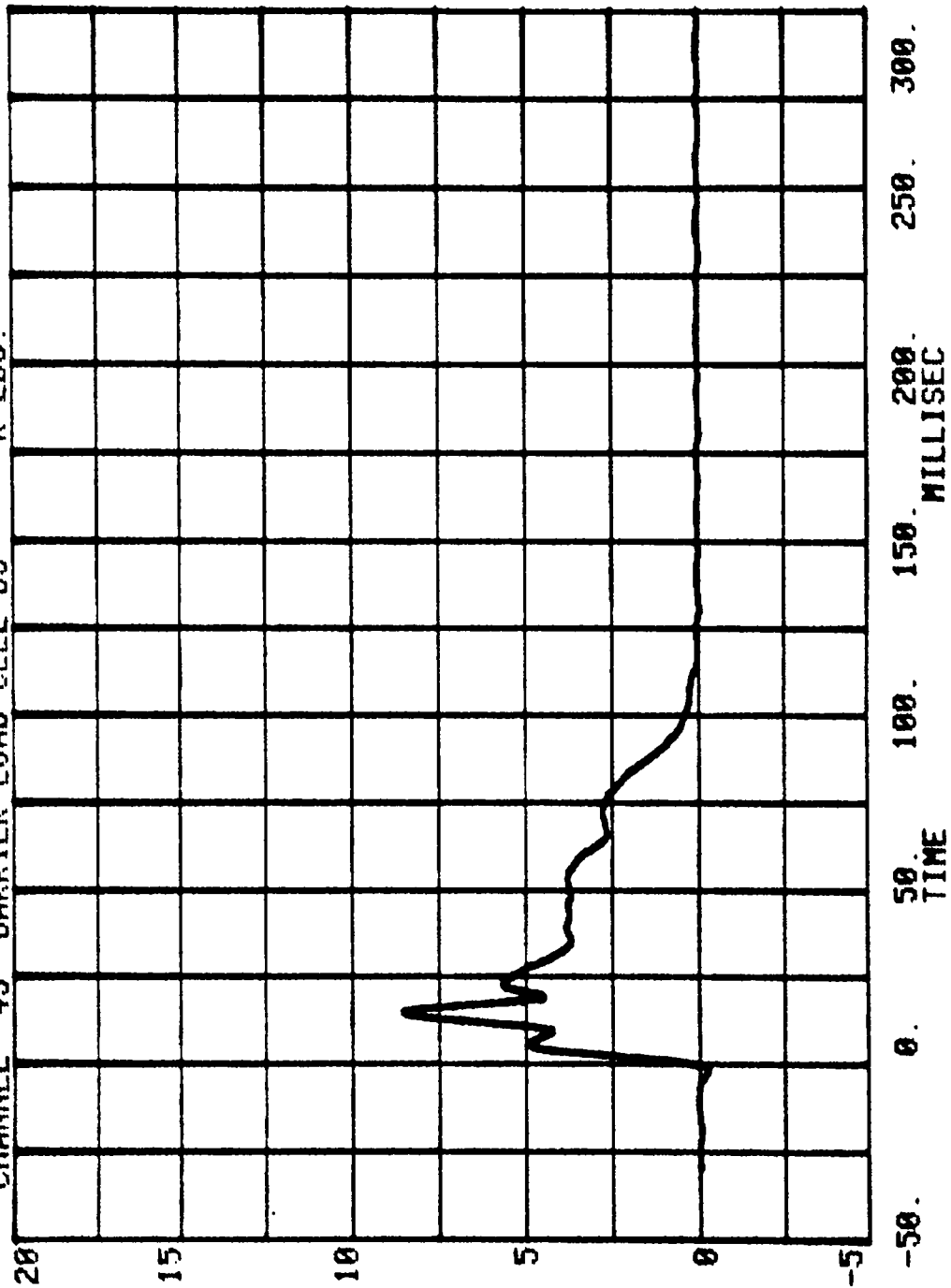


CHANNEL 44 RUN= 775 SERIES= 5700 K LBS.
BARRIER LOAD CELL B2

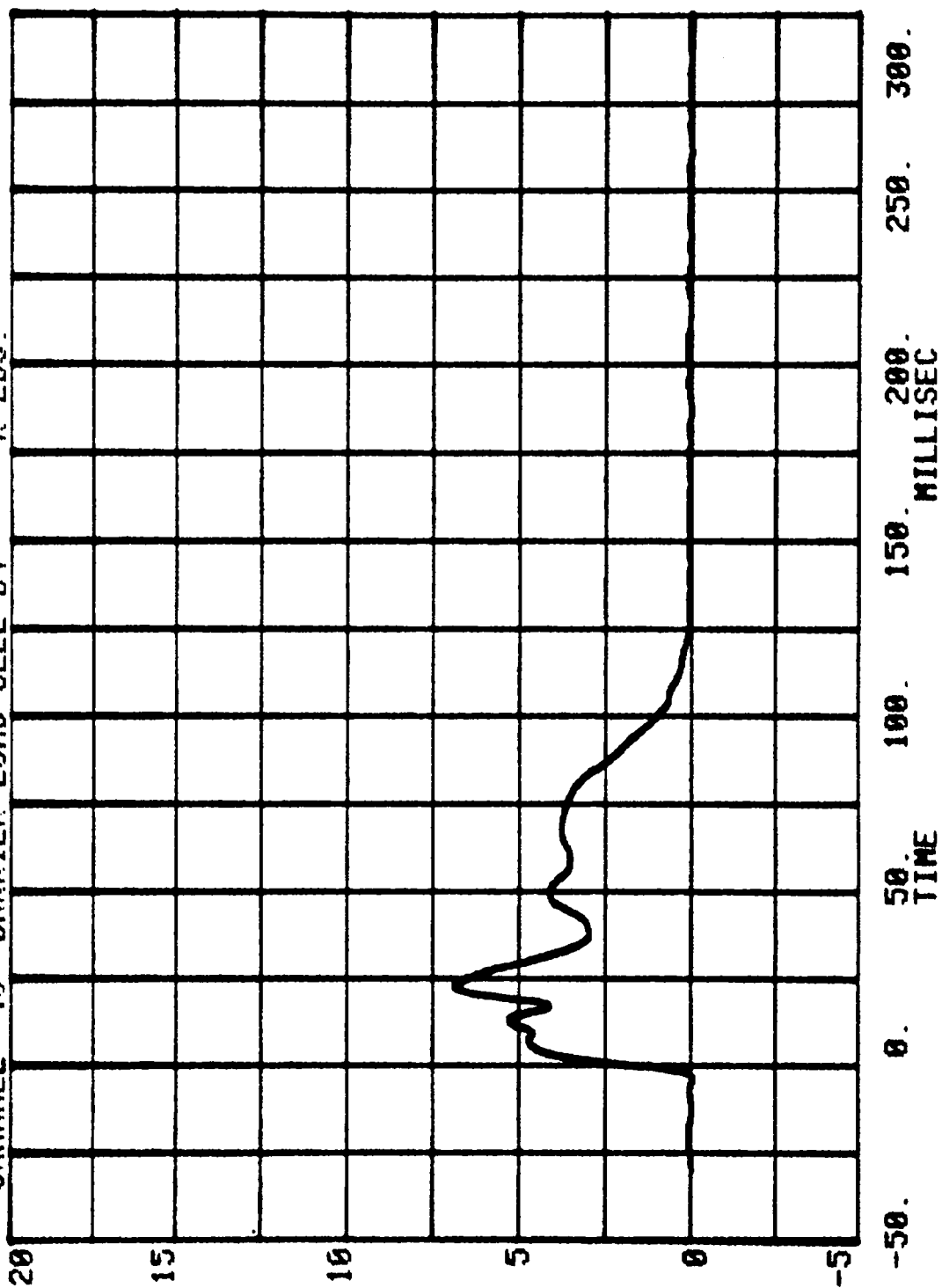


CHANNEL 45 BARRIER LOAD CELL B3 K LBS.

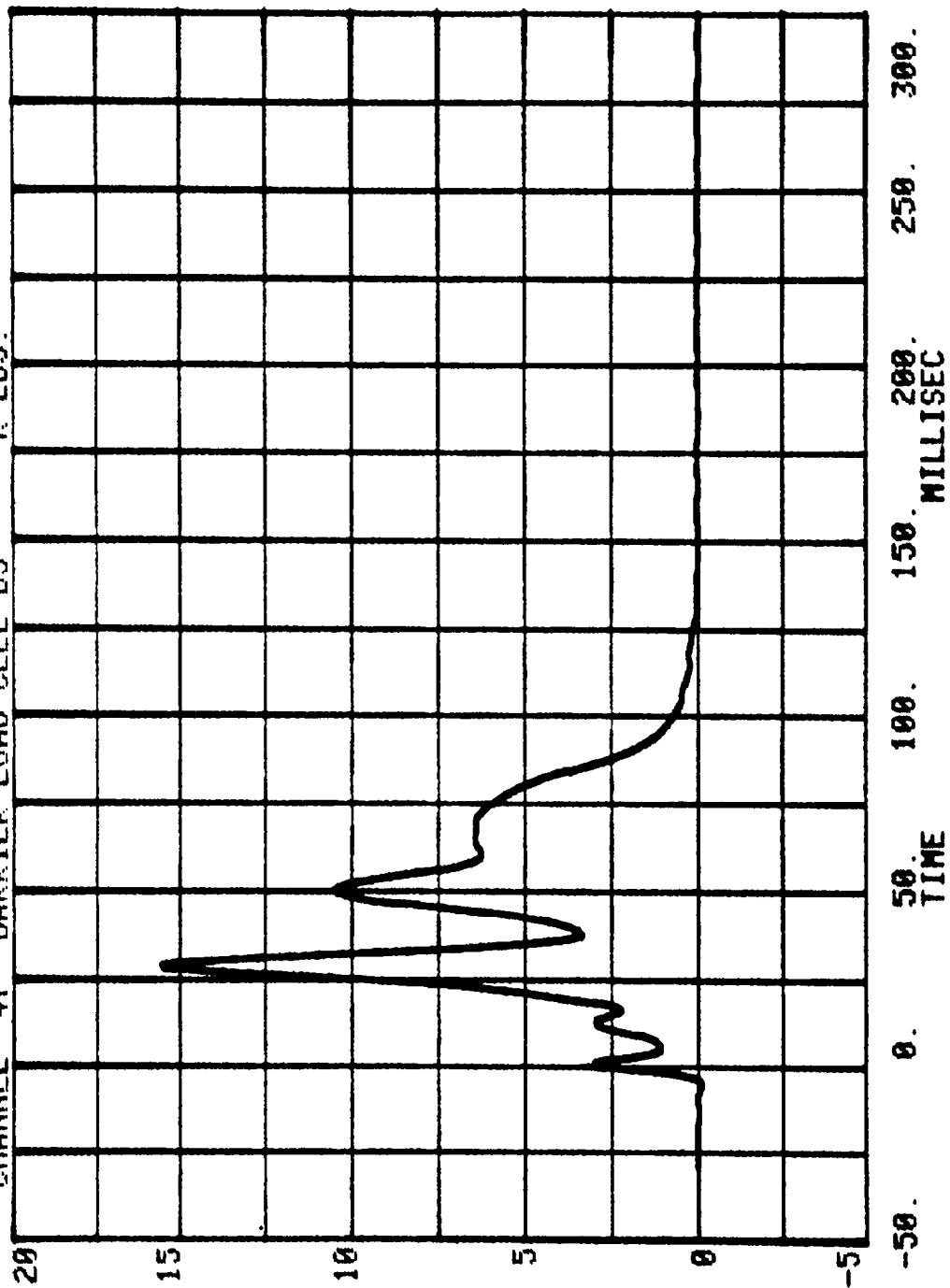
RUN= 775 SERIES= 5700



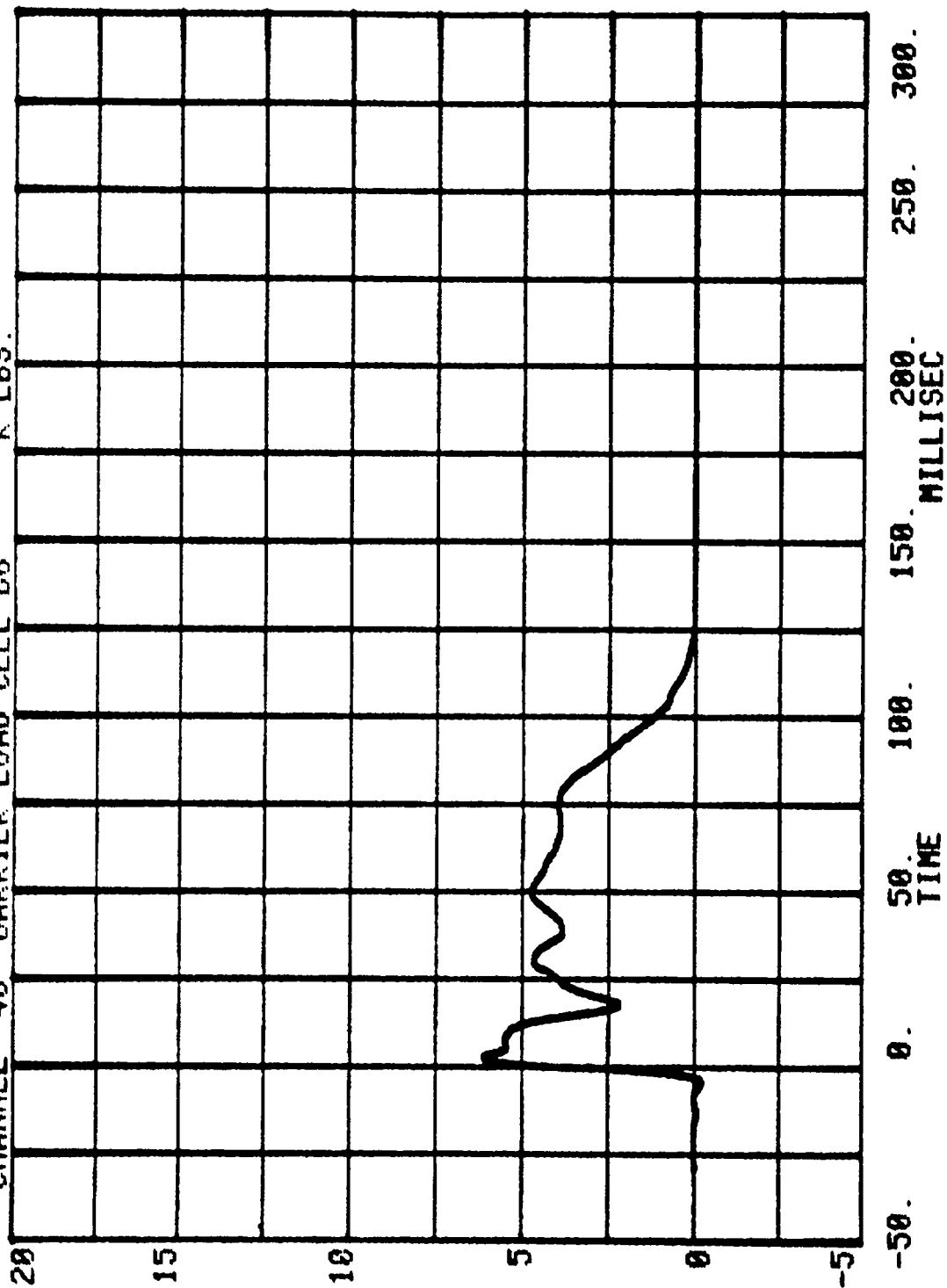
CHANNEL 46 BARRIER LOAD CELL B4 K LBS.
RUN= 775 SERIES= 5700



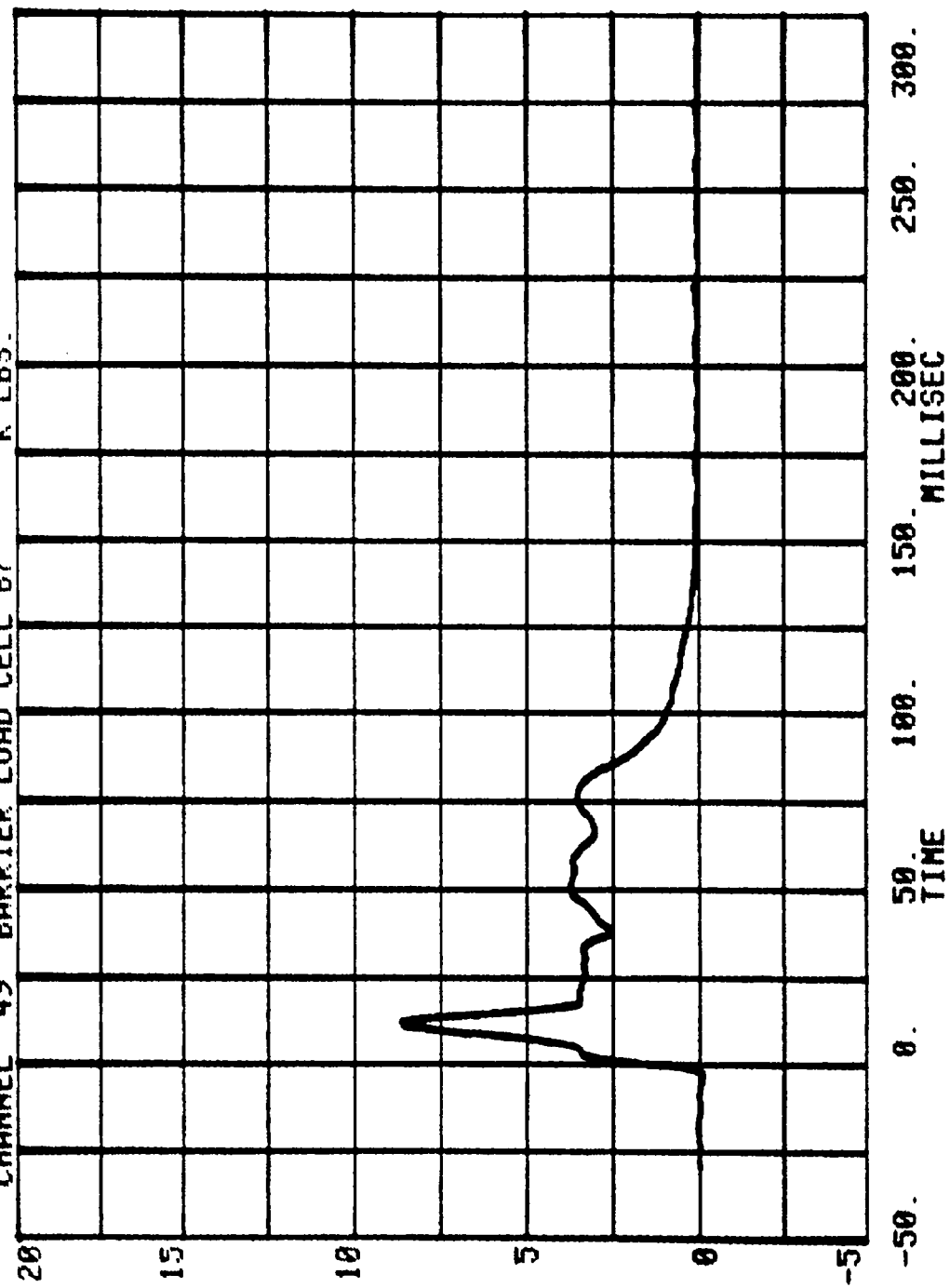
CHANNEL 47 BARRIER LOAD CELL B5 RUN= 775 SERIES= 5700 K LBS.



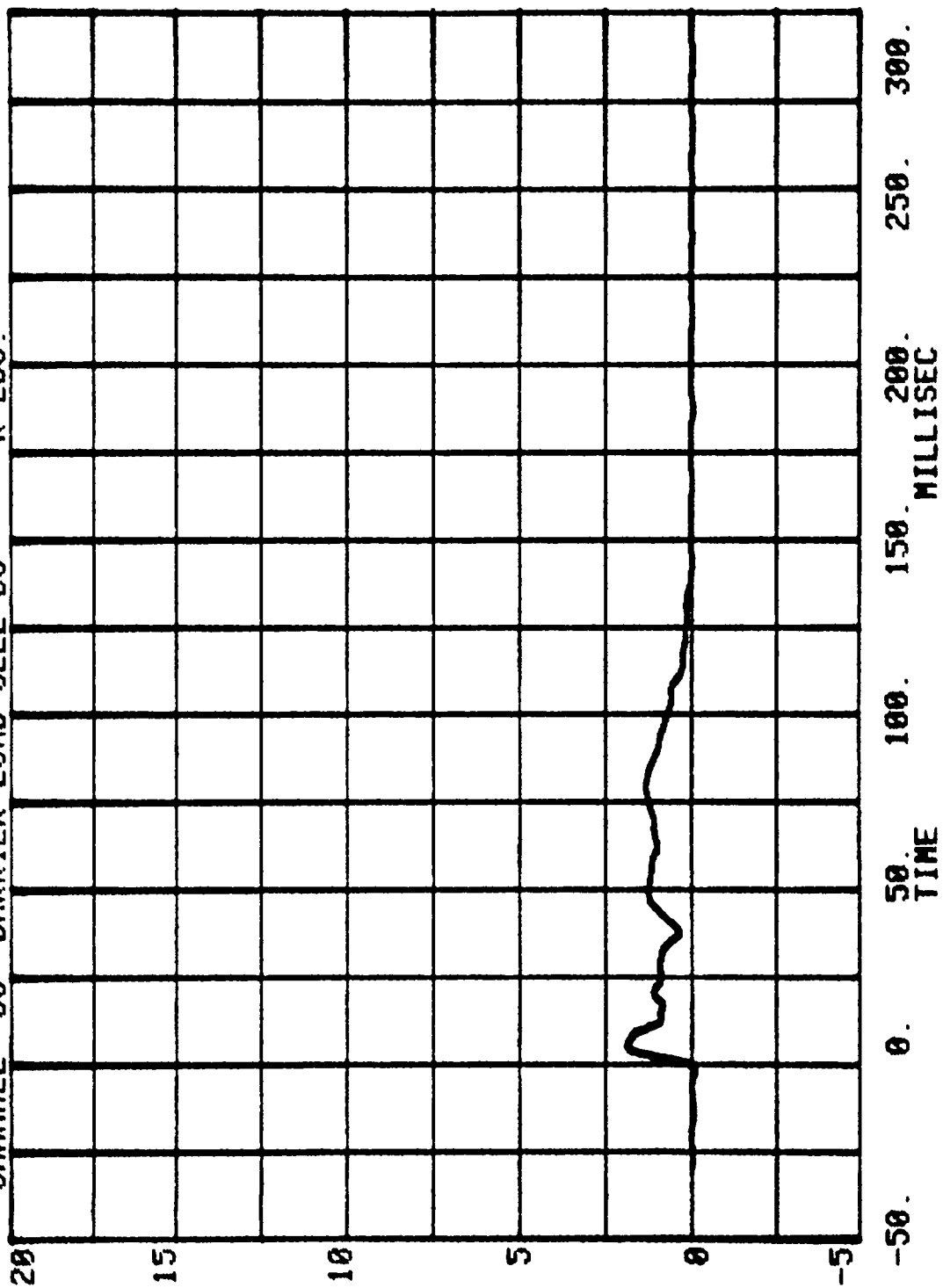
CHANNEL 48 BARRIER LOAD CELL B6
RUN= 775 SERIES= 5700 K LBS.



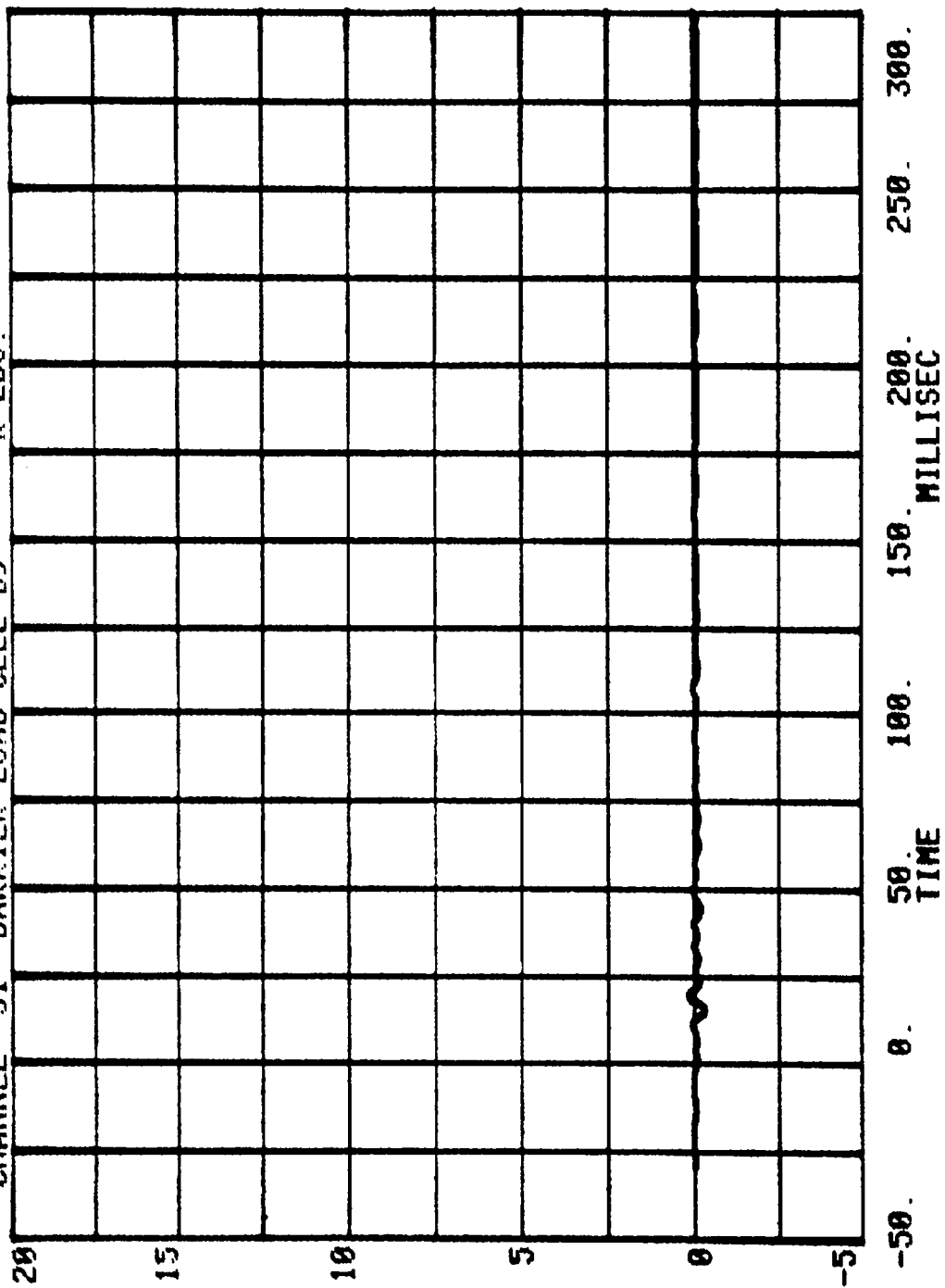
CHANNEL 49 RUN= 775 SERIES= 5700
BARRIER LOAD CELL B7 K LBS.



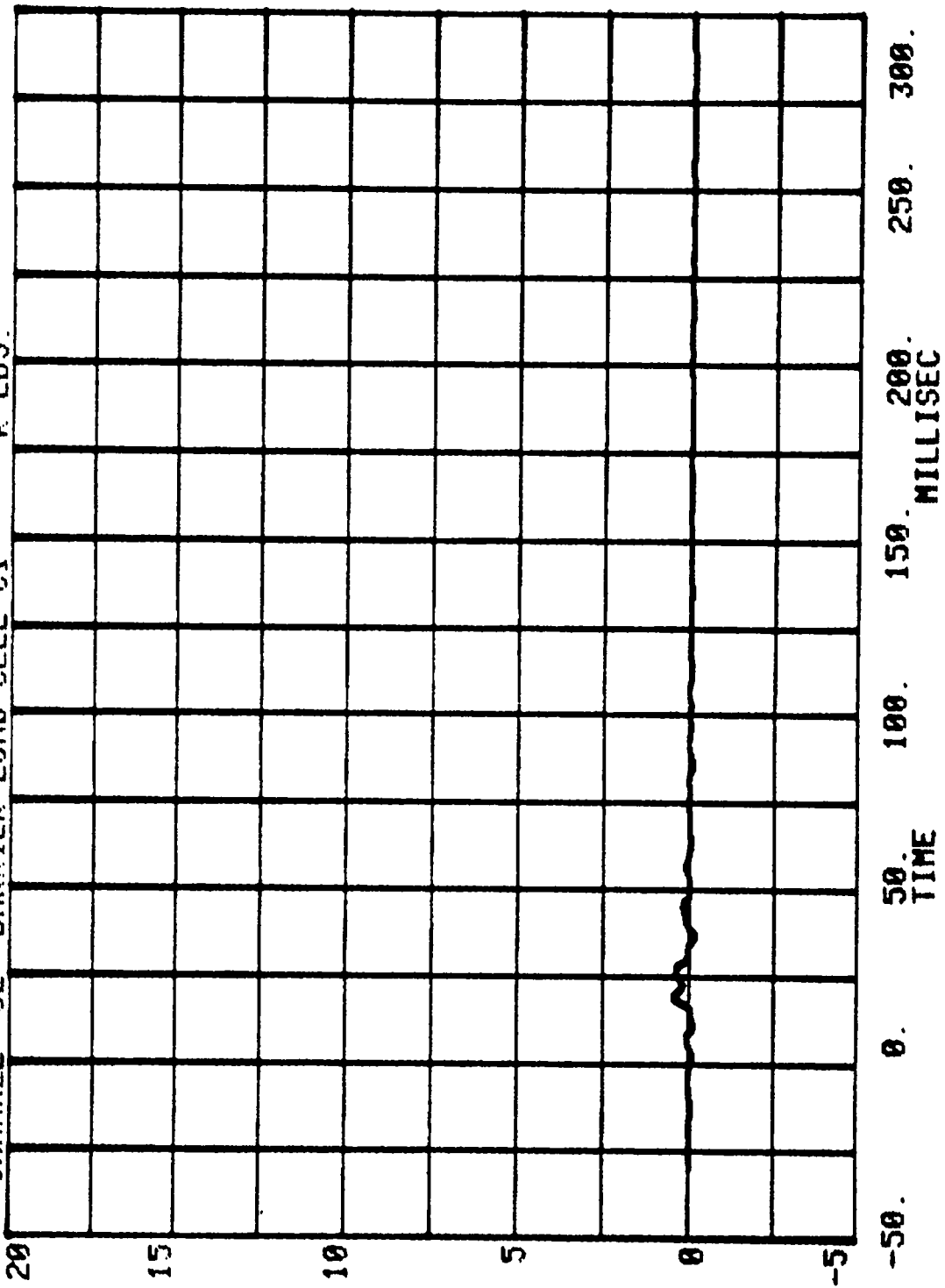
CHANNEL 50 BARRIER LOAD CELL B8 RUN= 775 SERIES= 5700 K LBS.

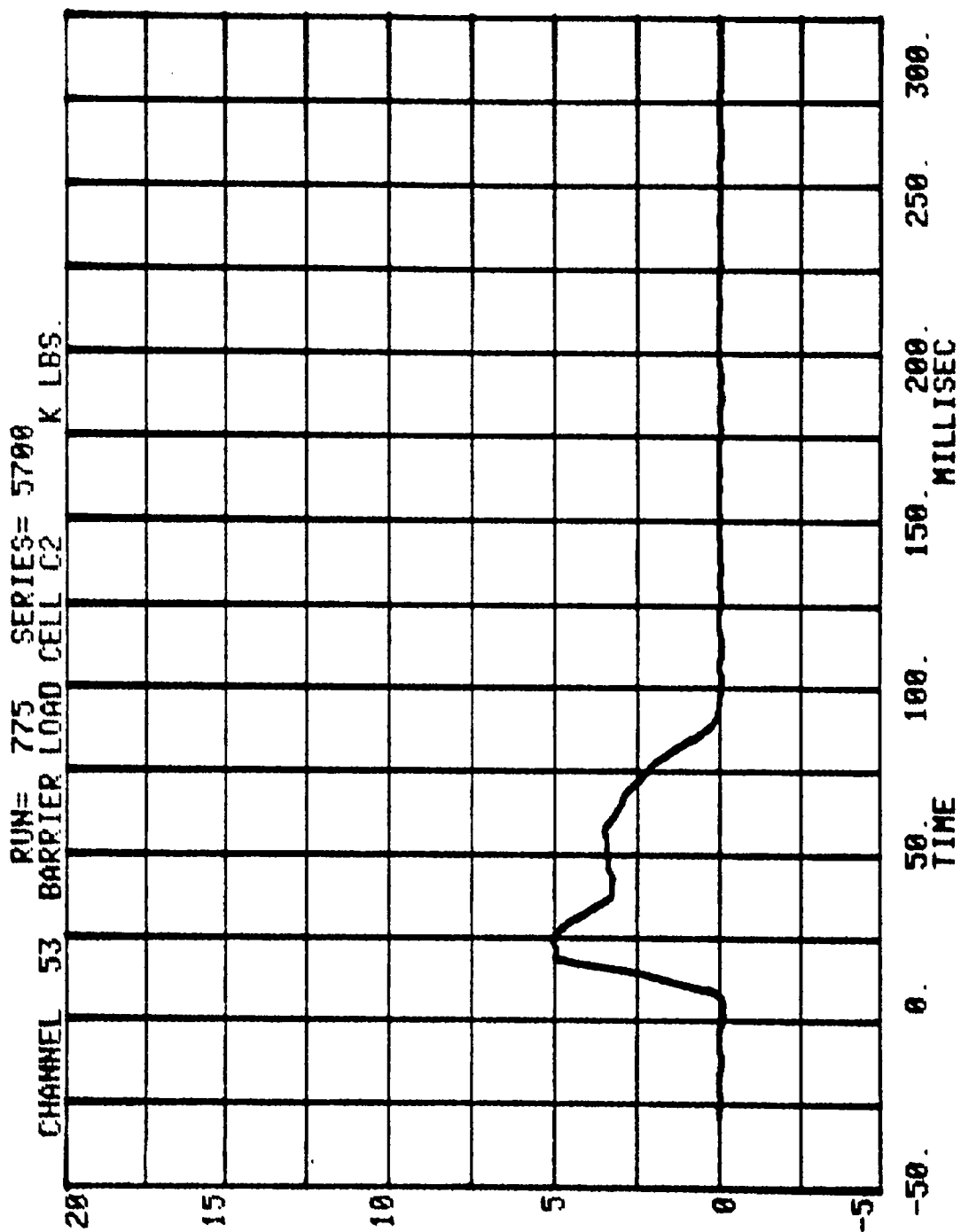


CHANNEL 51 BARRIER LOAD CELL B9 K LBS.
RUN= 775 SERIES= 5700

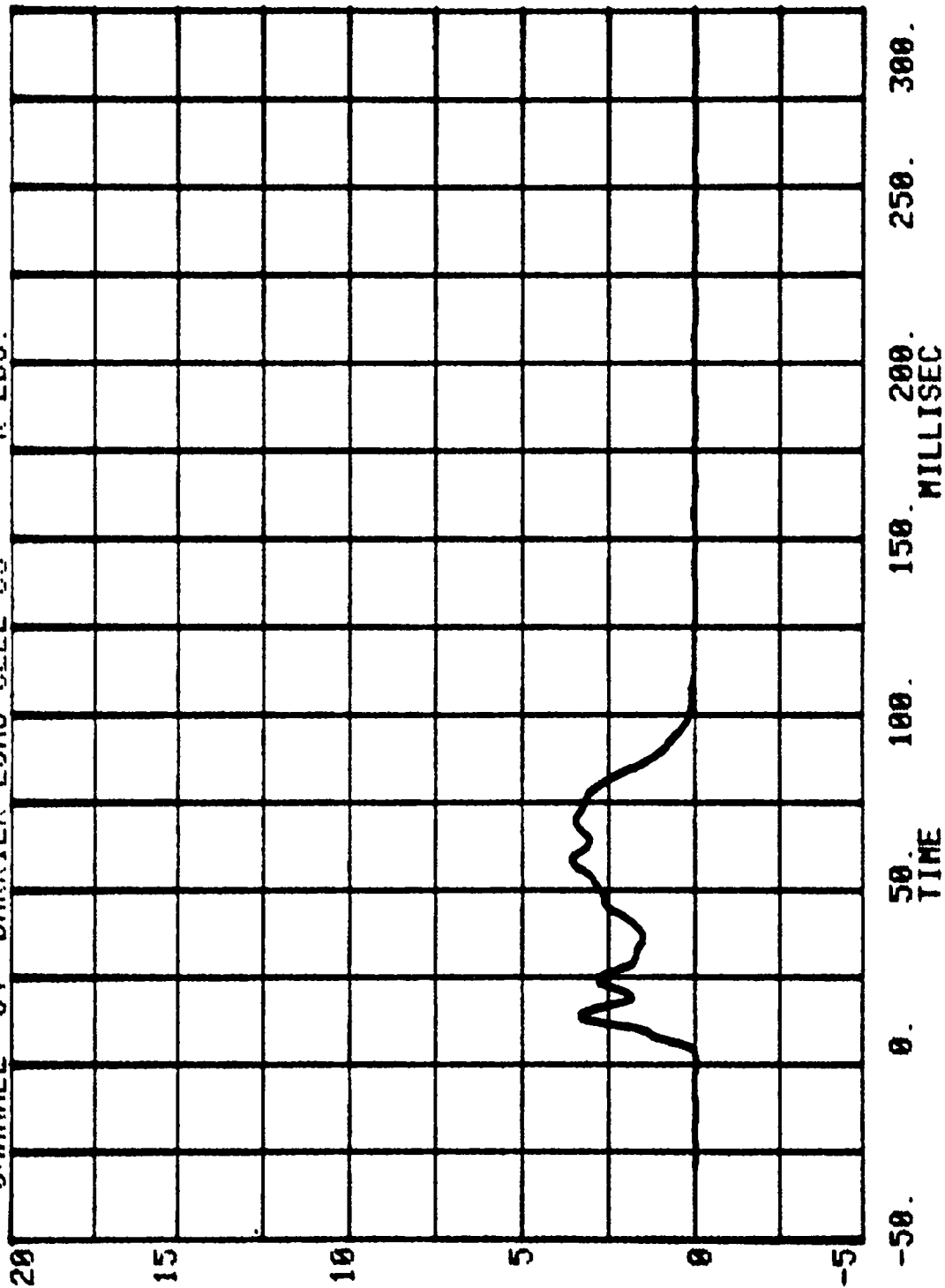


CHANNEL 52 RUN= 775 SERIES= 5700 K LBS.

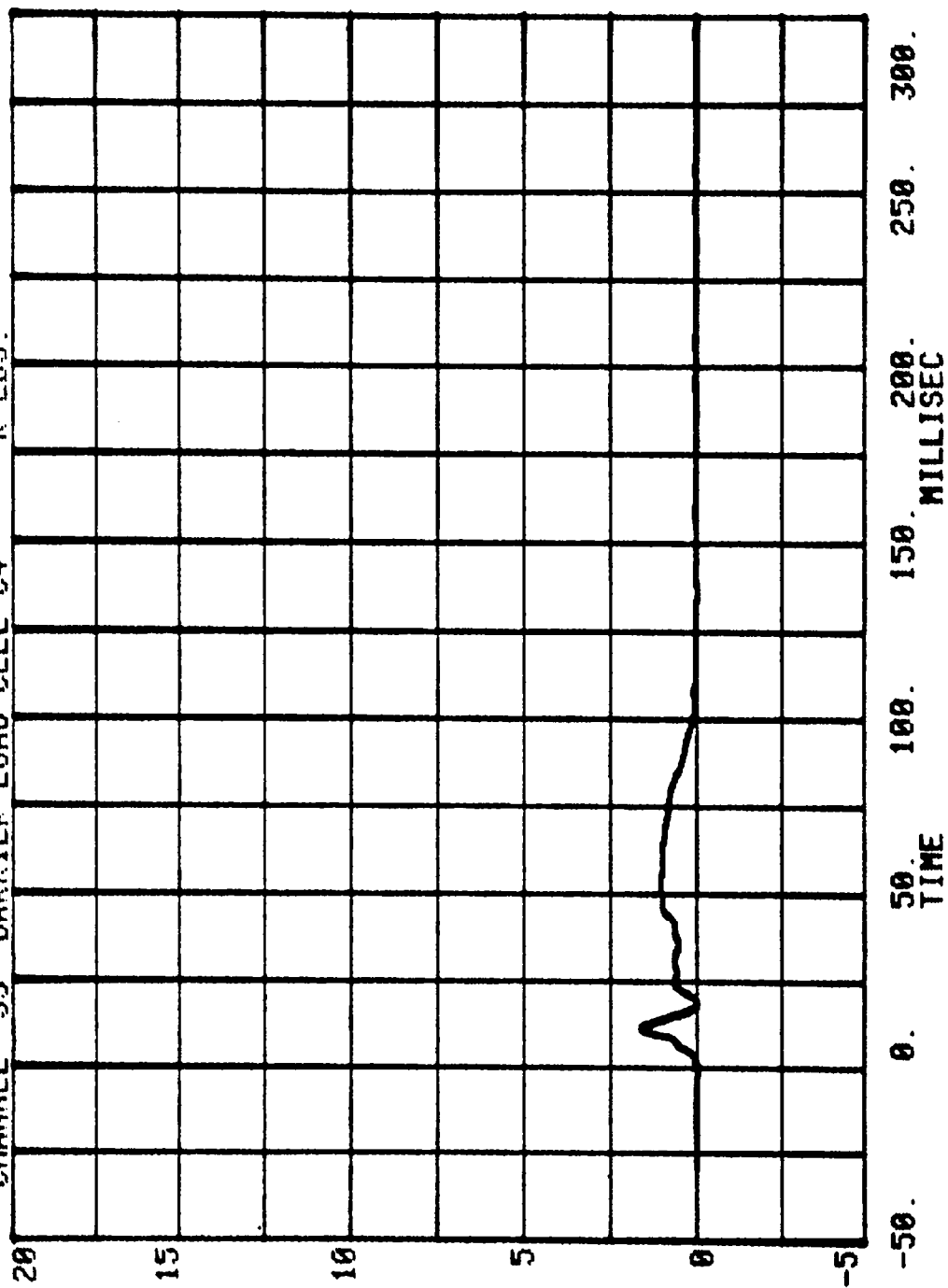




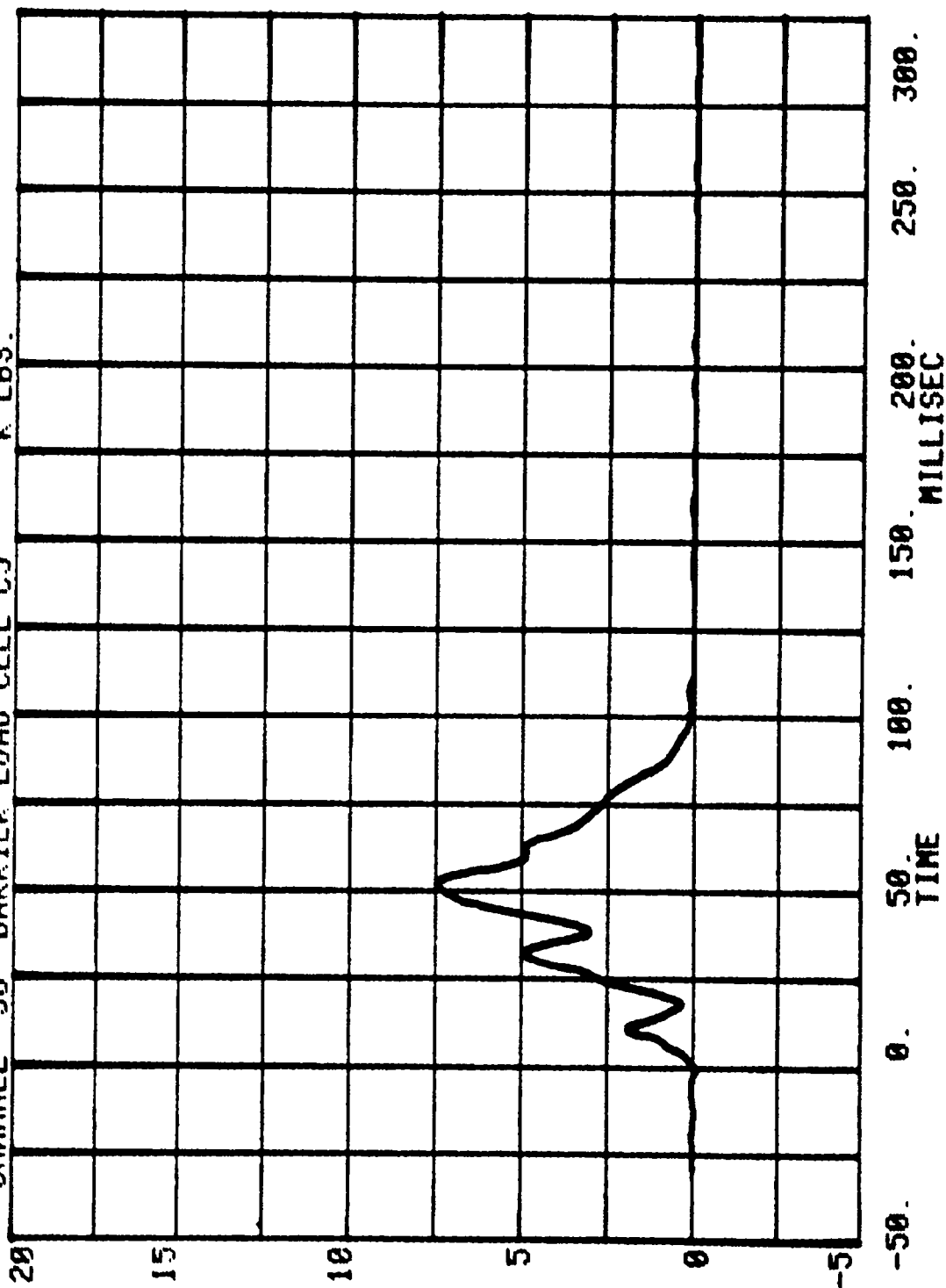
CHANNEL 54 BARRIER LOAD CELL C3 RUN= 775 SERIES= 5700 K LBS.



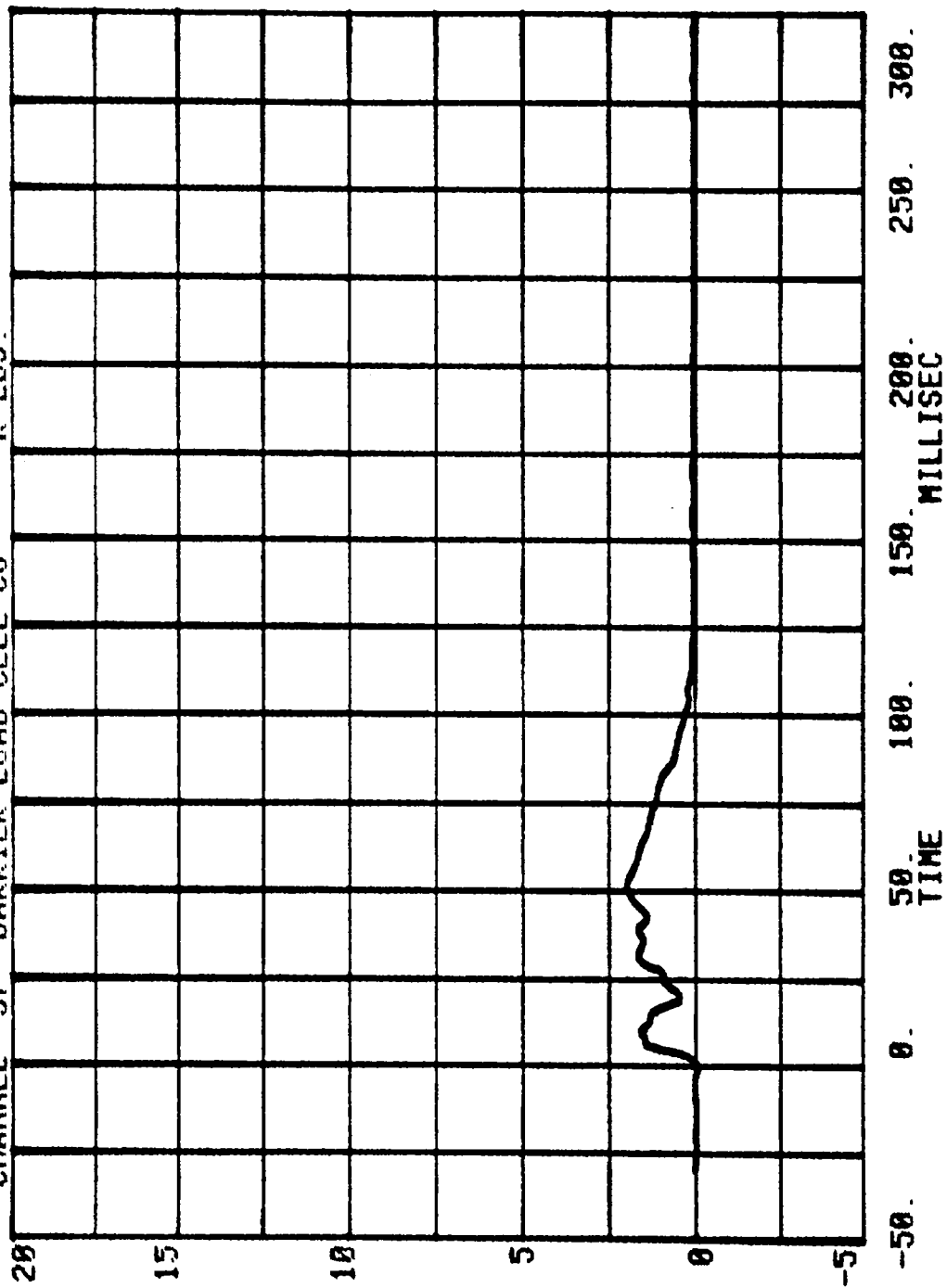
RUN= 775 SERIES= 5700
CHANNEL 55 BARRIER LOAD CELL C4 K LBS.



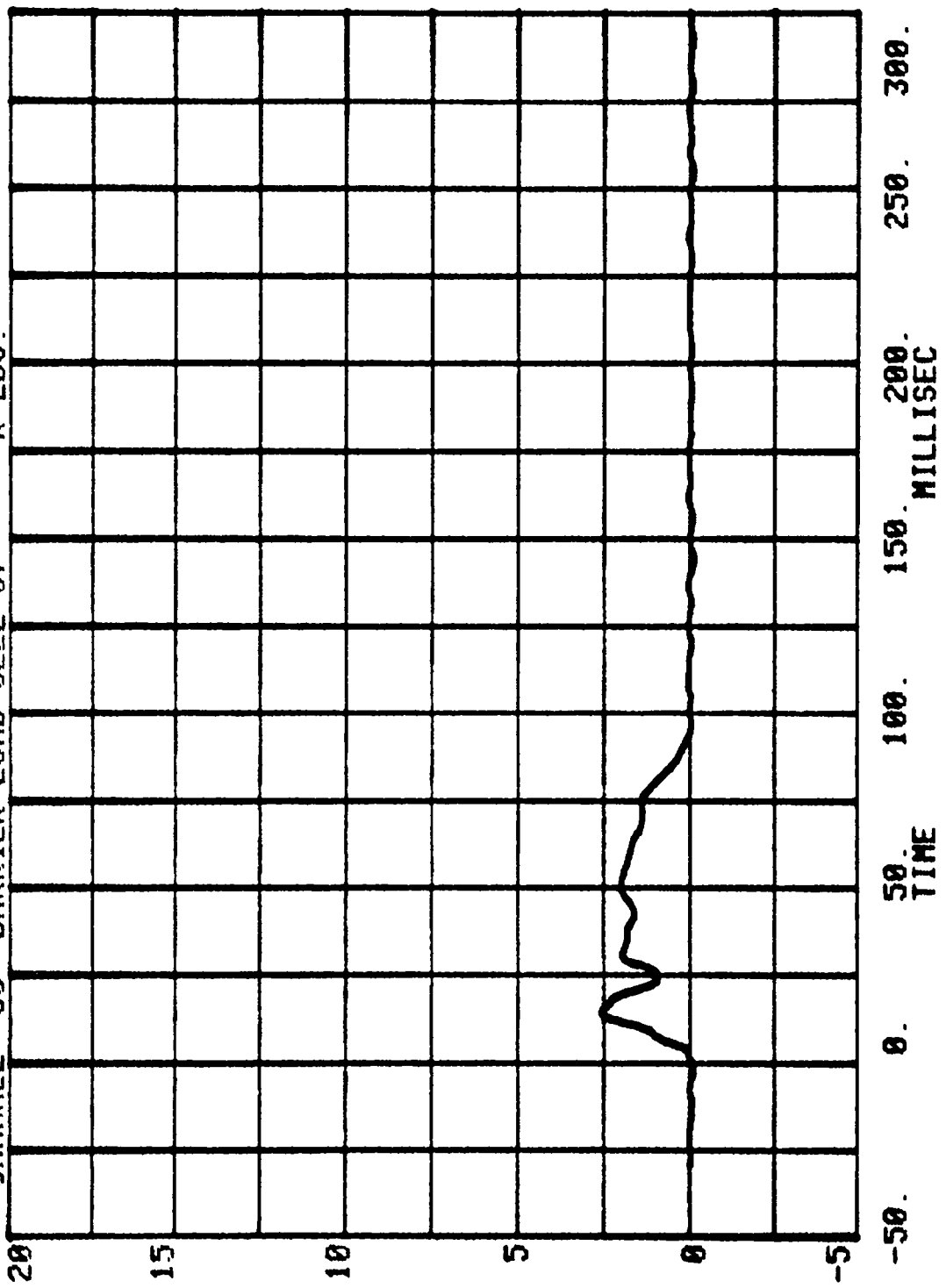
CHANNEL 56 BARRIER LOAD CELL C5
RUN= 775 SERIES= 5700 K LBS.



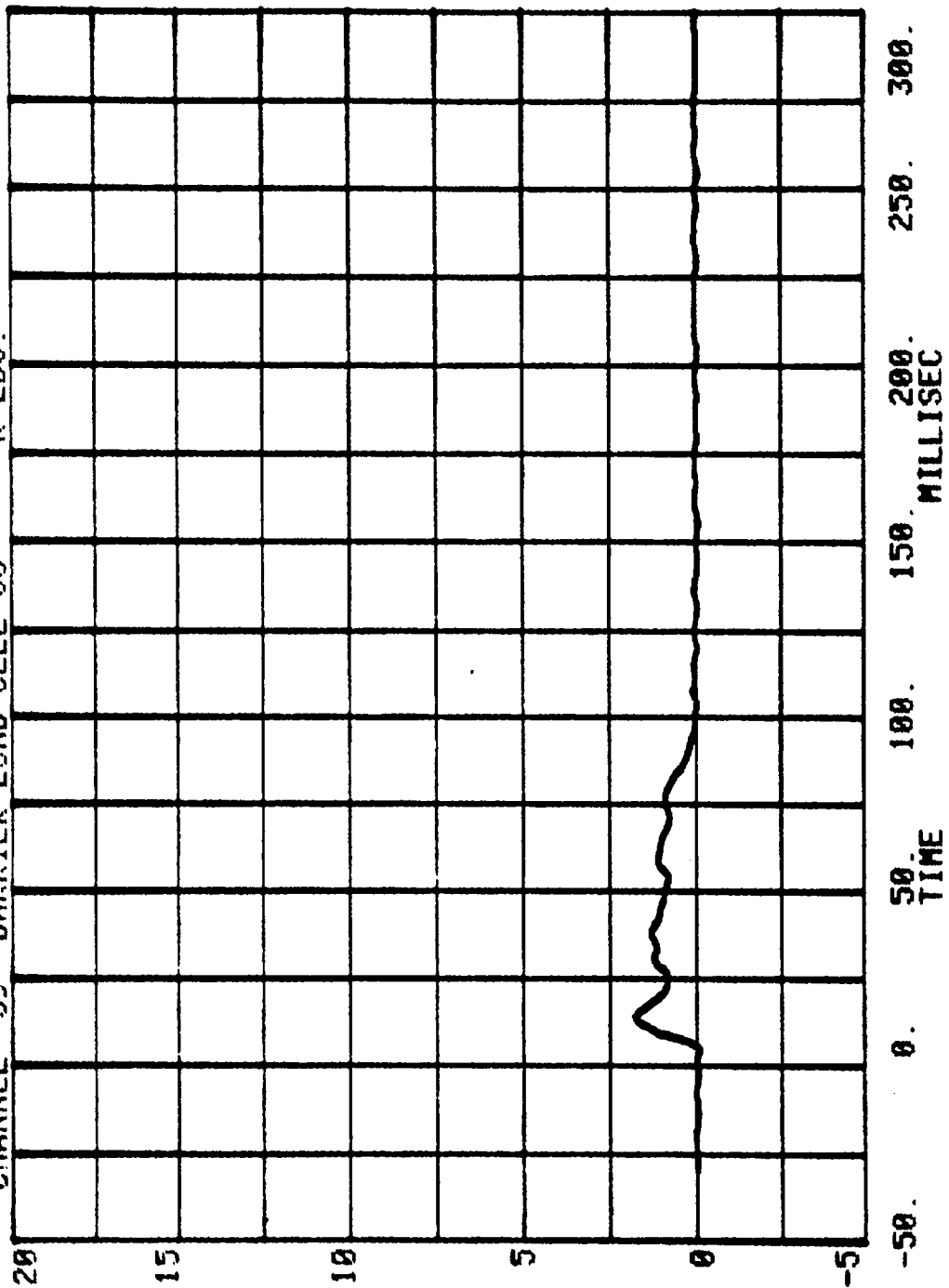
CHANNEL 57 BARRIER LOAD CELL C6
RUN= 775 SERIES= 5700 K LBS.



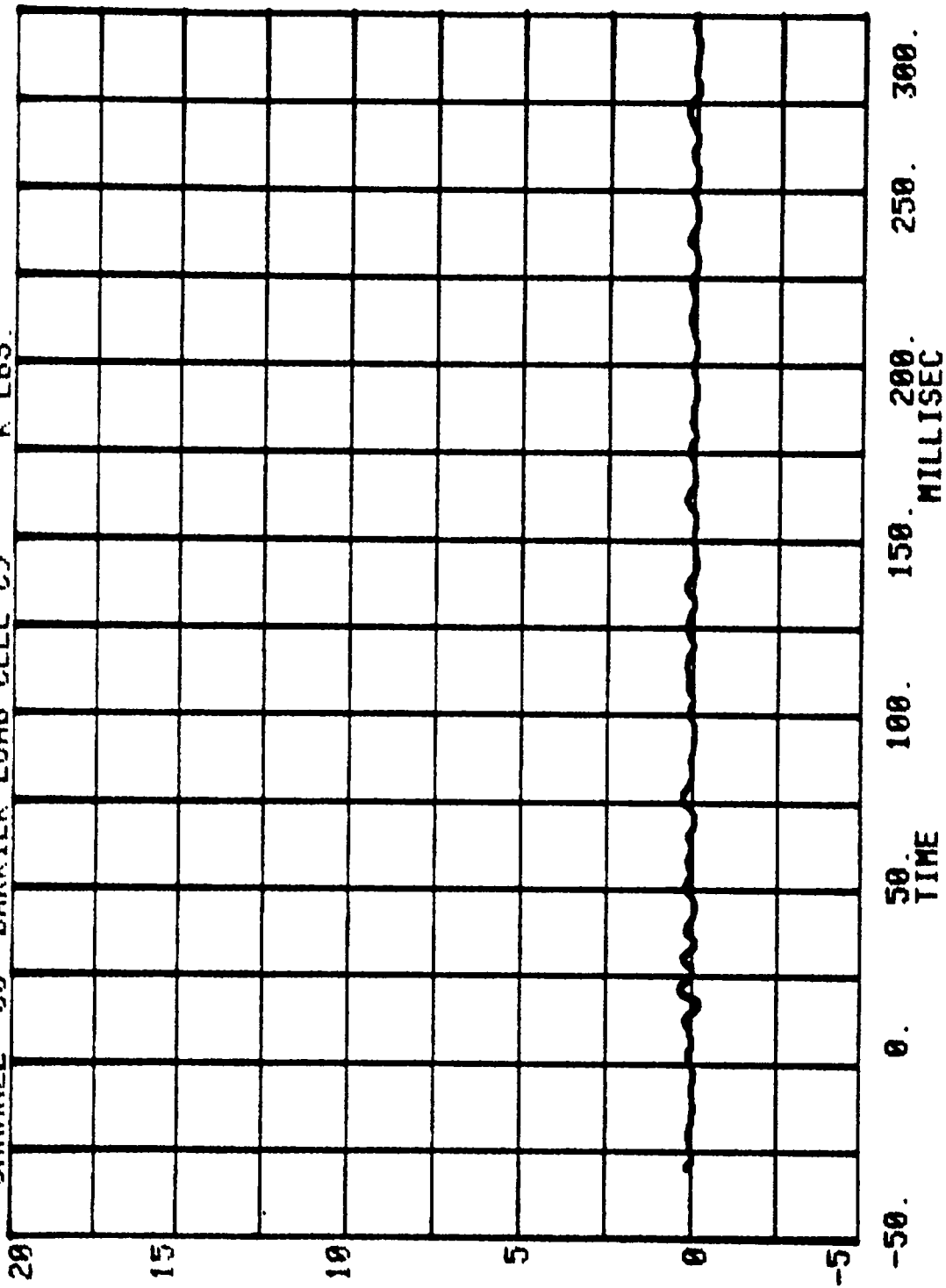
CHANNEL 58 RUN= 775 SERIES= 5700 K LBS.



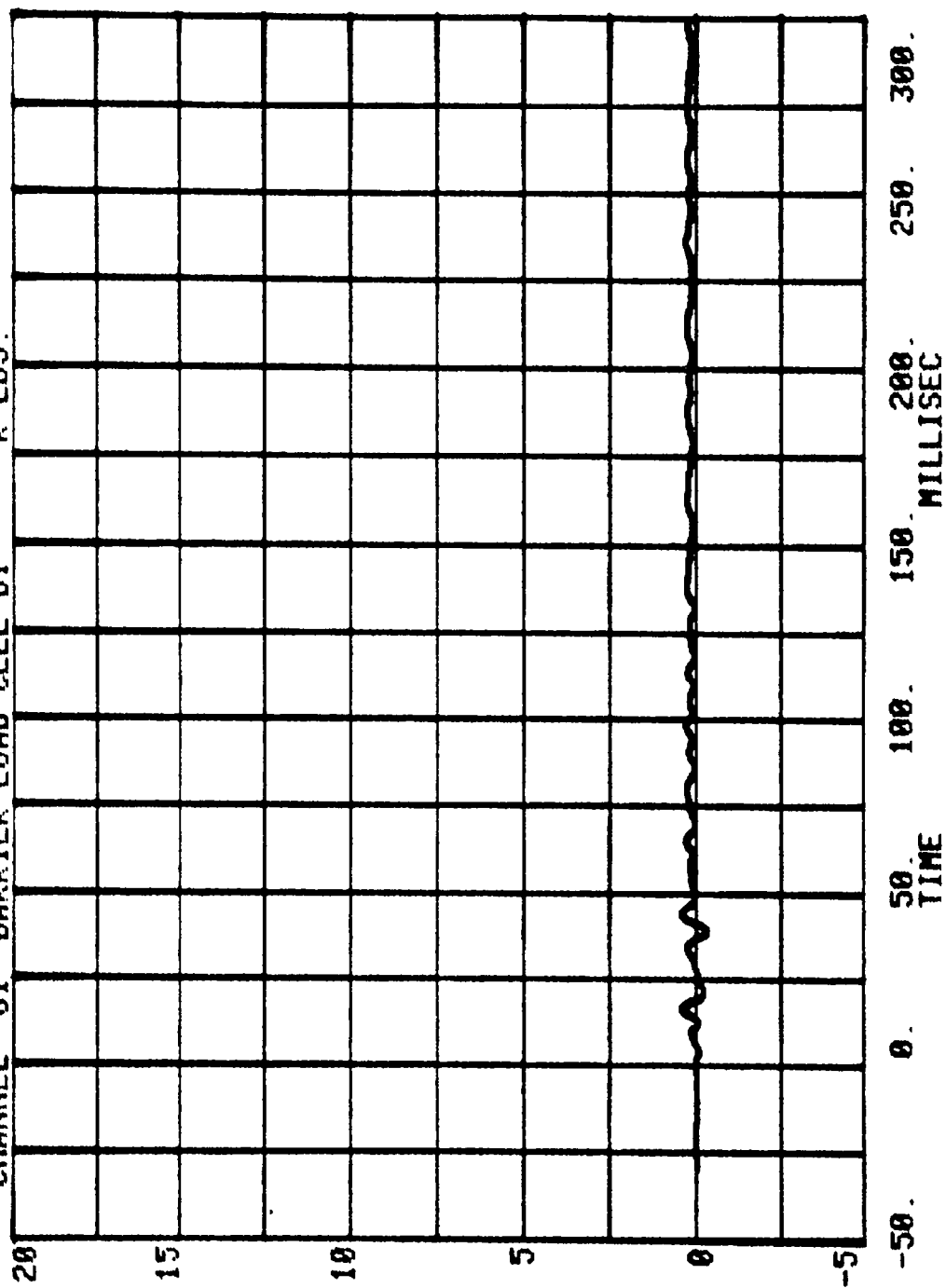
CHANNEL 53 BARRIER LOAD CELL C8 K LBS.
RUN= 775 SERIES= 5700



RUN= 775 SERIES= 5700
CHANNEL 60 BARRIER LOAD CELL C9 K LBS.

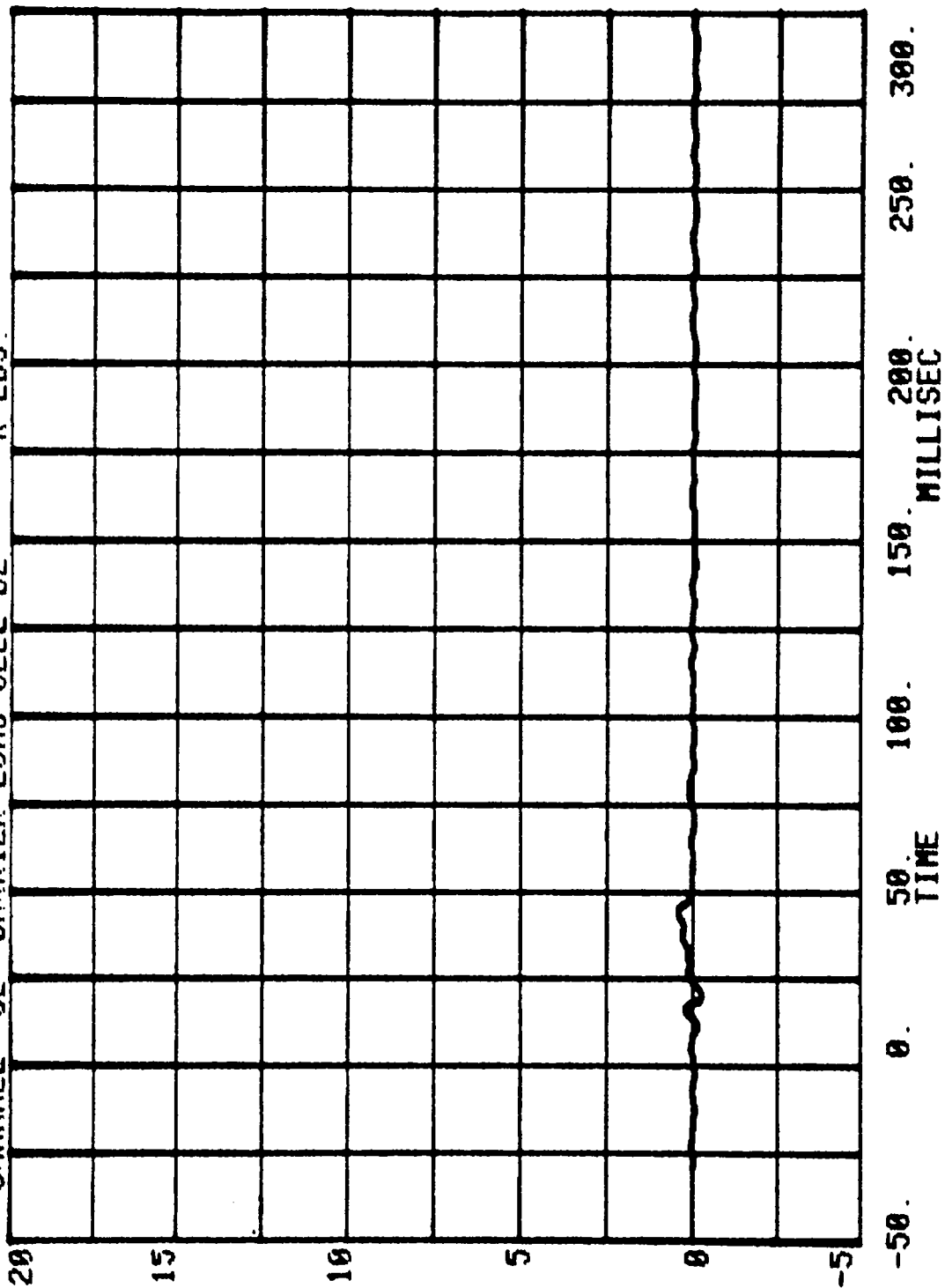


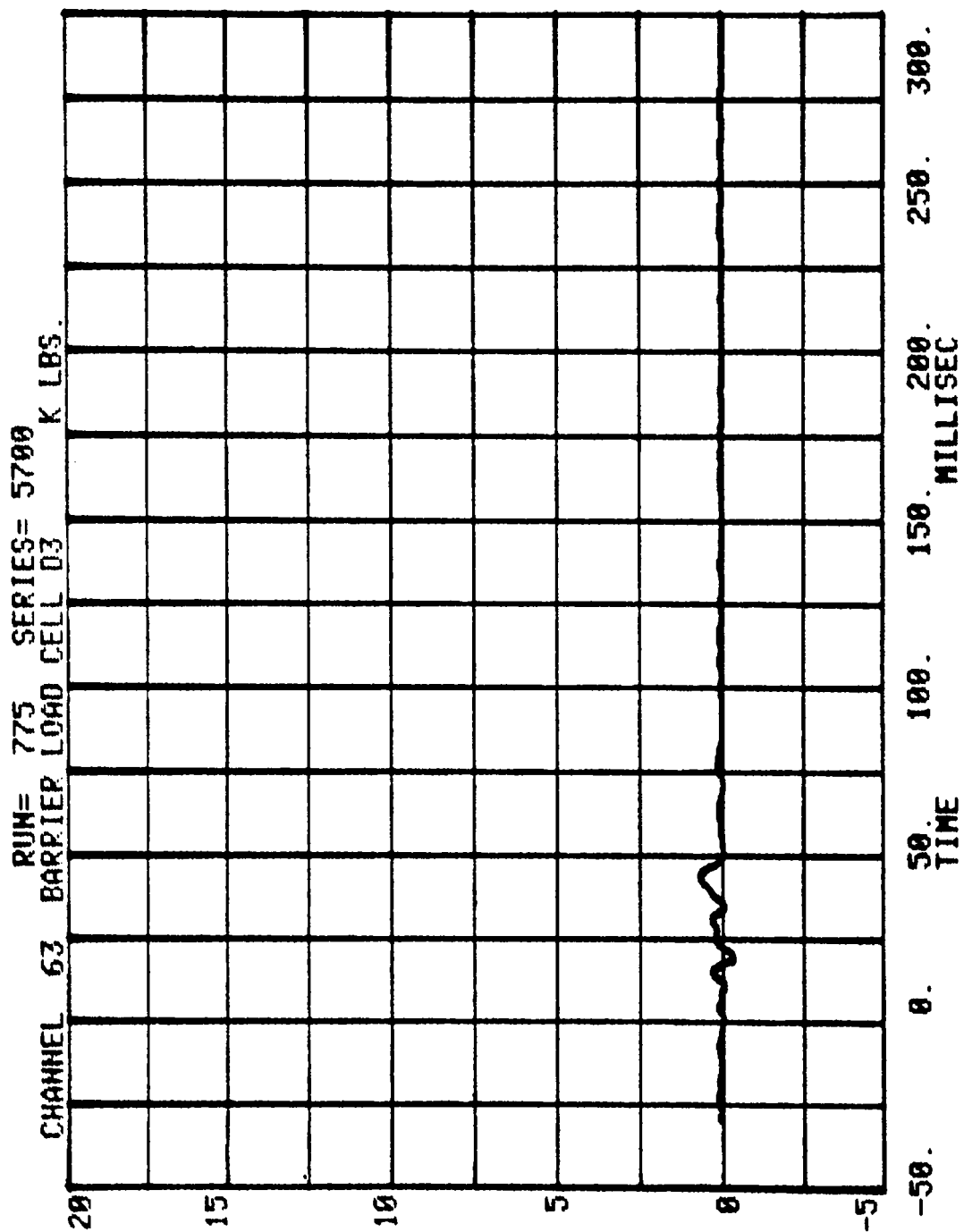
CHANNEL 61 BARRIER LOAD CELL 01 RUN= 775 SERIES= 5700 K LBS.



CHANNEL 62 BARRIER LOAD CELL 02 K LBS.

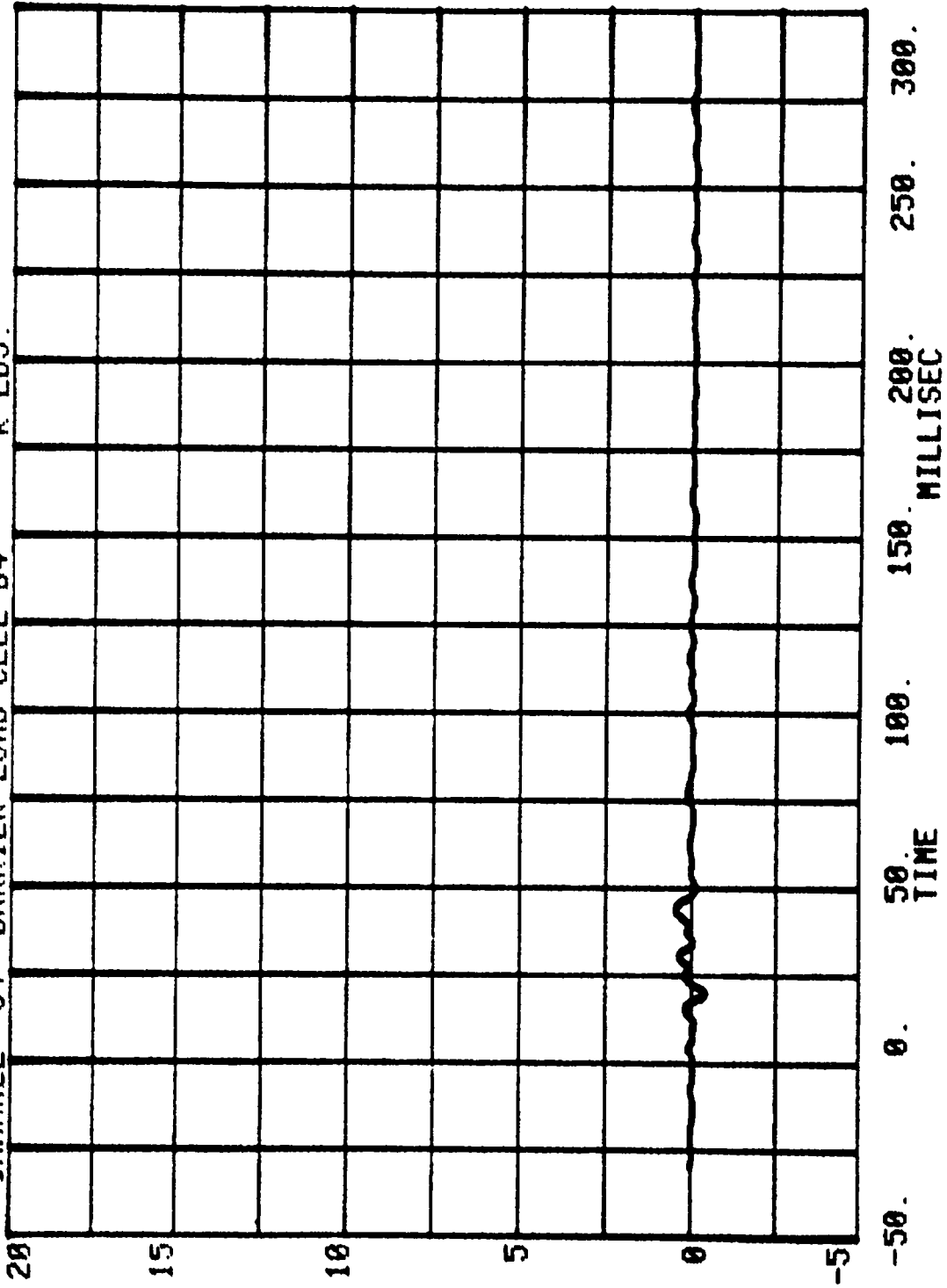
RUN= 775 SERIES= 5700



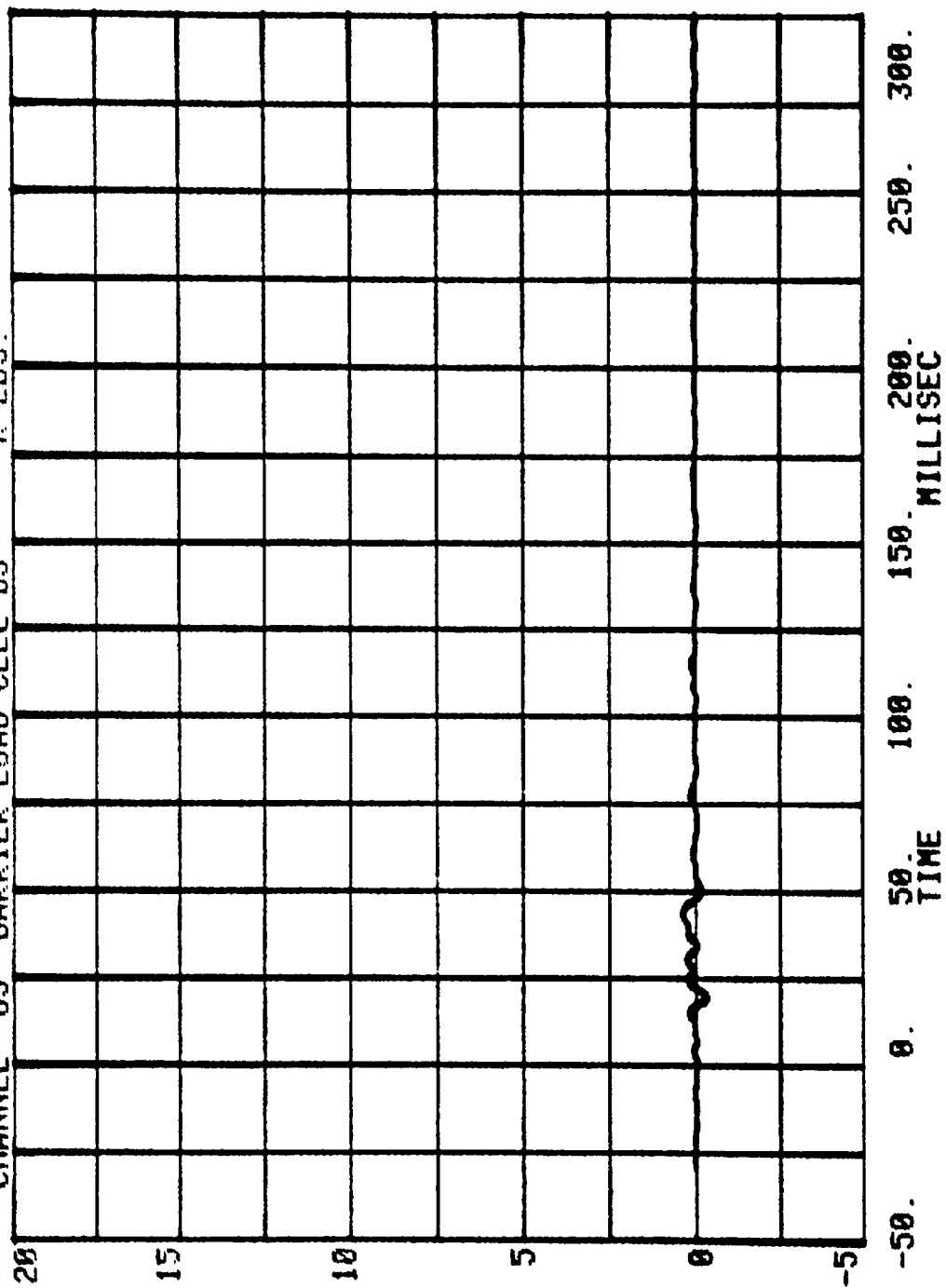


CHANNEL 64 BARRIER LOAD CELL D4 K LBS.

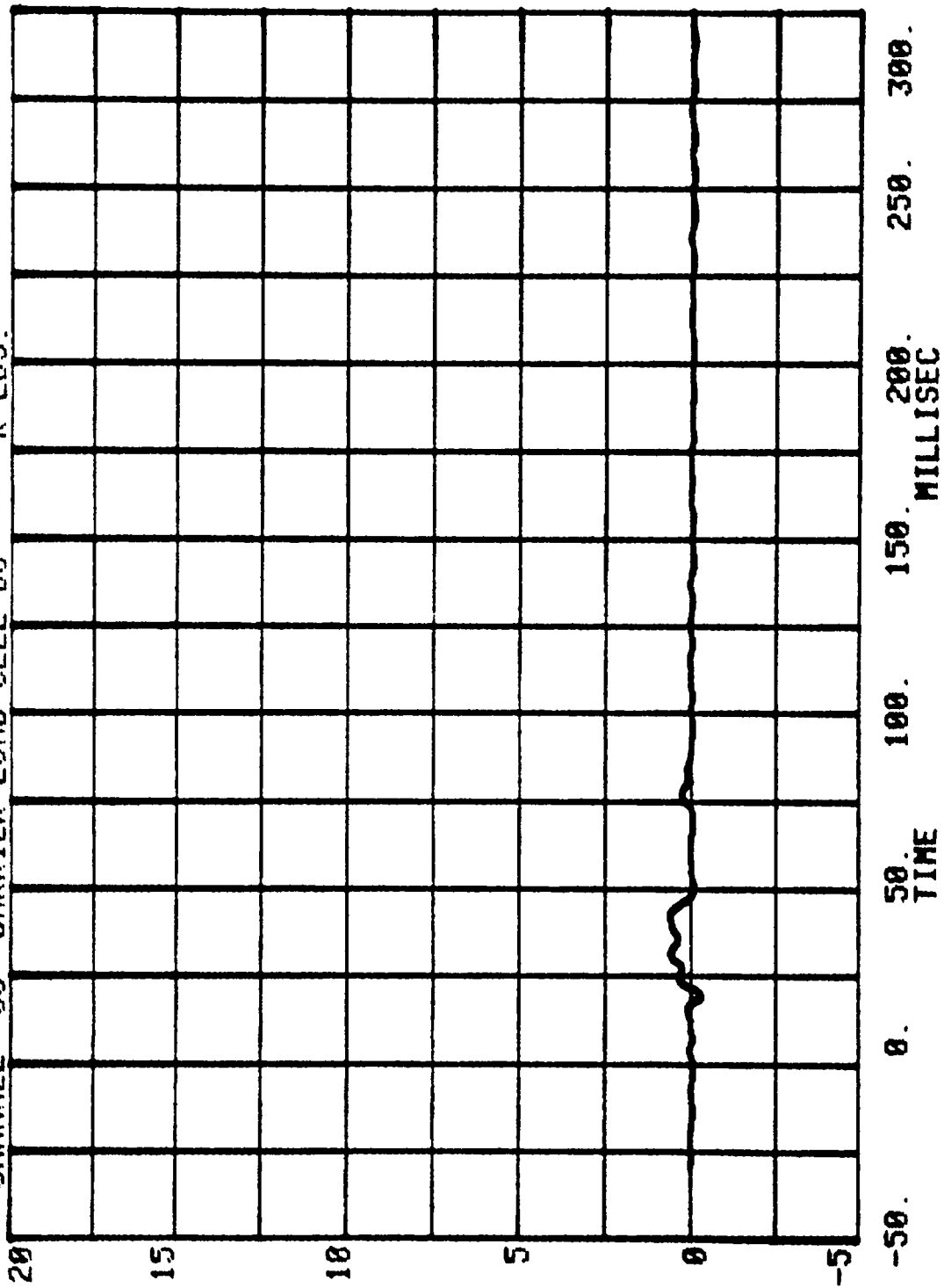
RUN= 775 SERIES= 5700



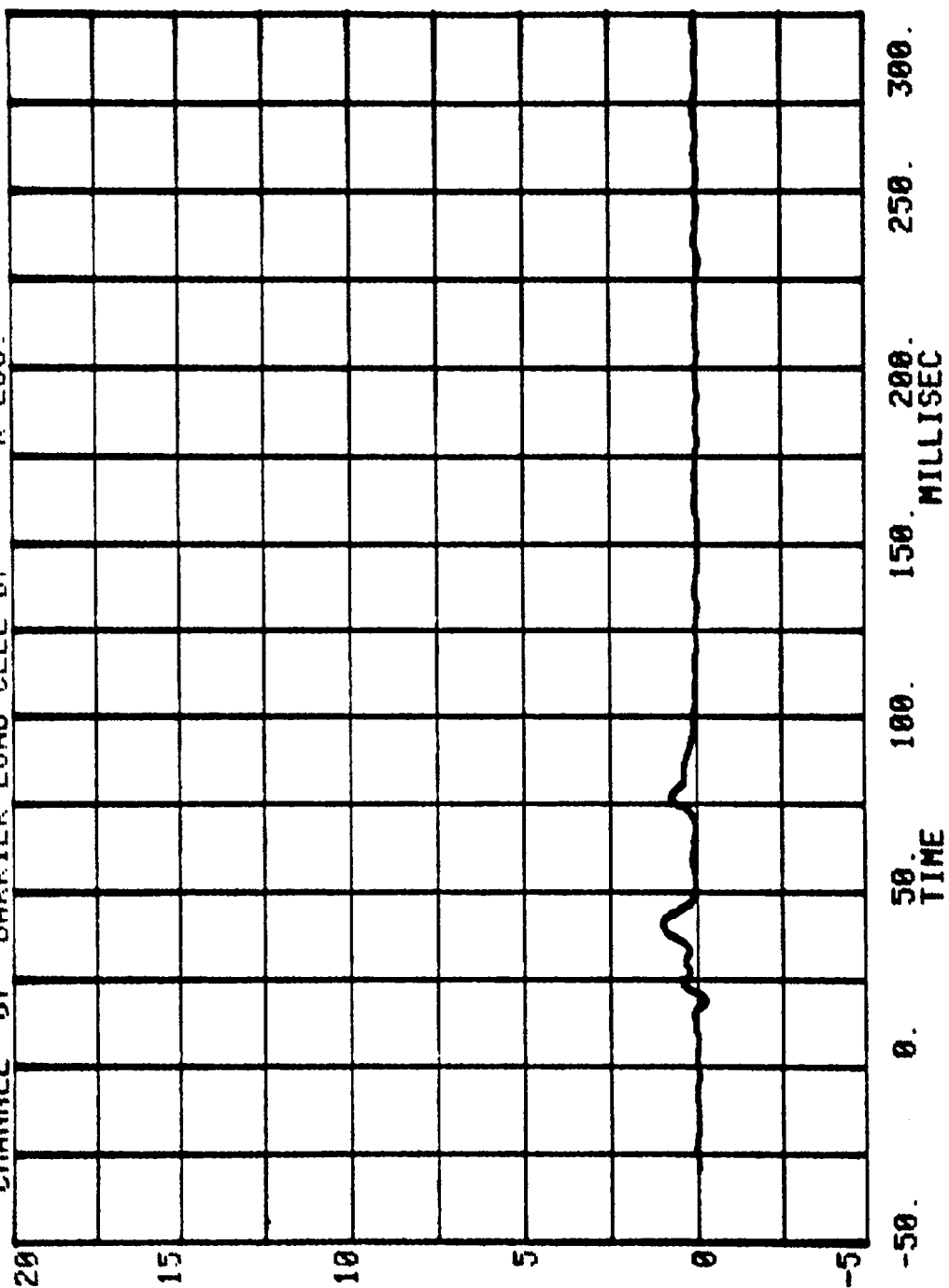
RUN= 775 SERIES= 5700
CHANNEL 65 BARRIER LOAD CELL D5 K LBS.



CHANNEL 66 RUN= 775 SERIES= 5700 K LBS.
BARRIER LOAD CELL D6

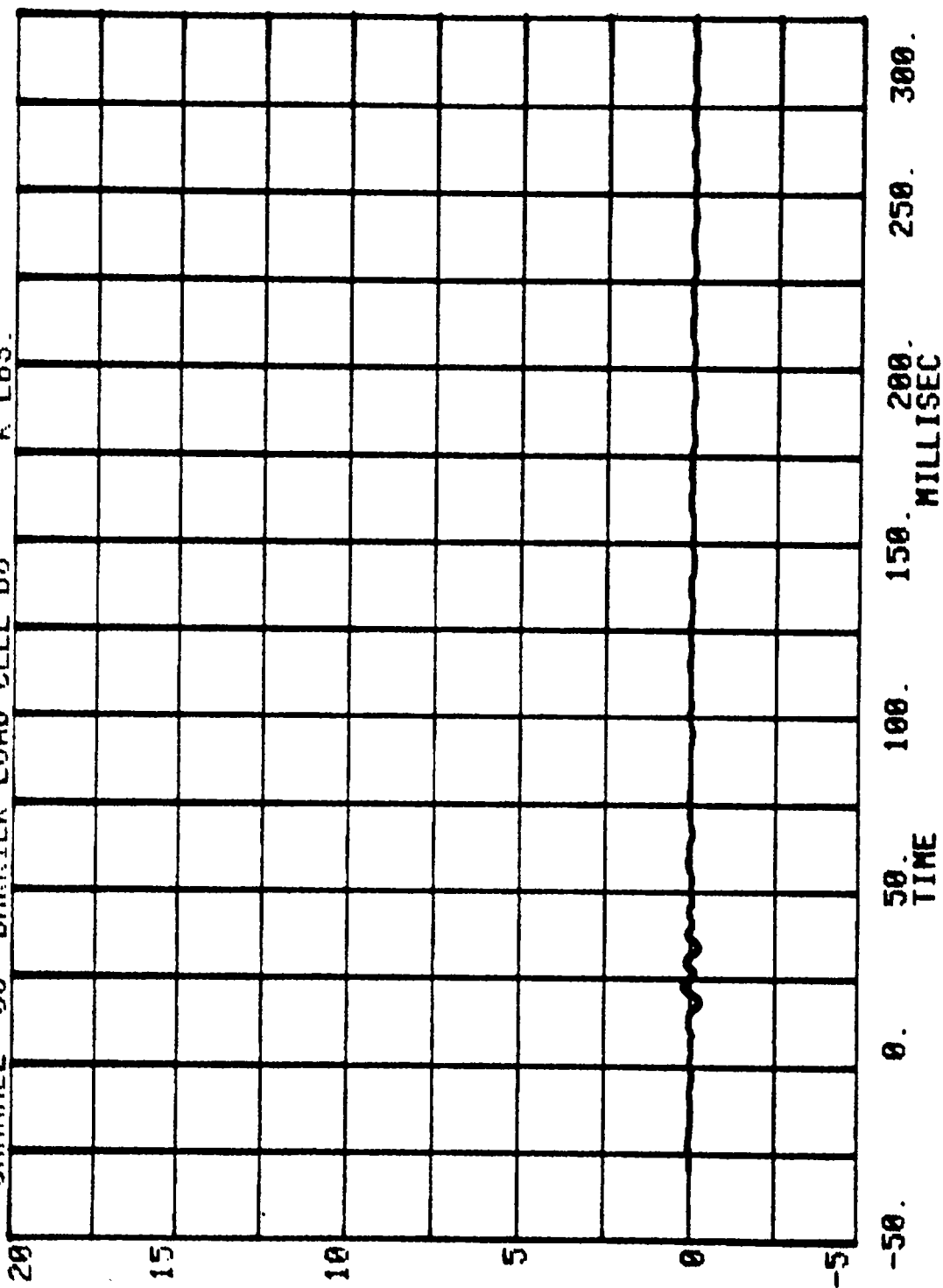


CHANNEL 67 BARRIER LOAD CELL D7 K LBS.
RUN= 775 SERIES= 5700

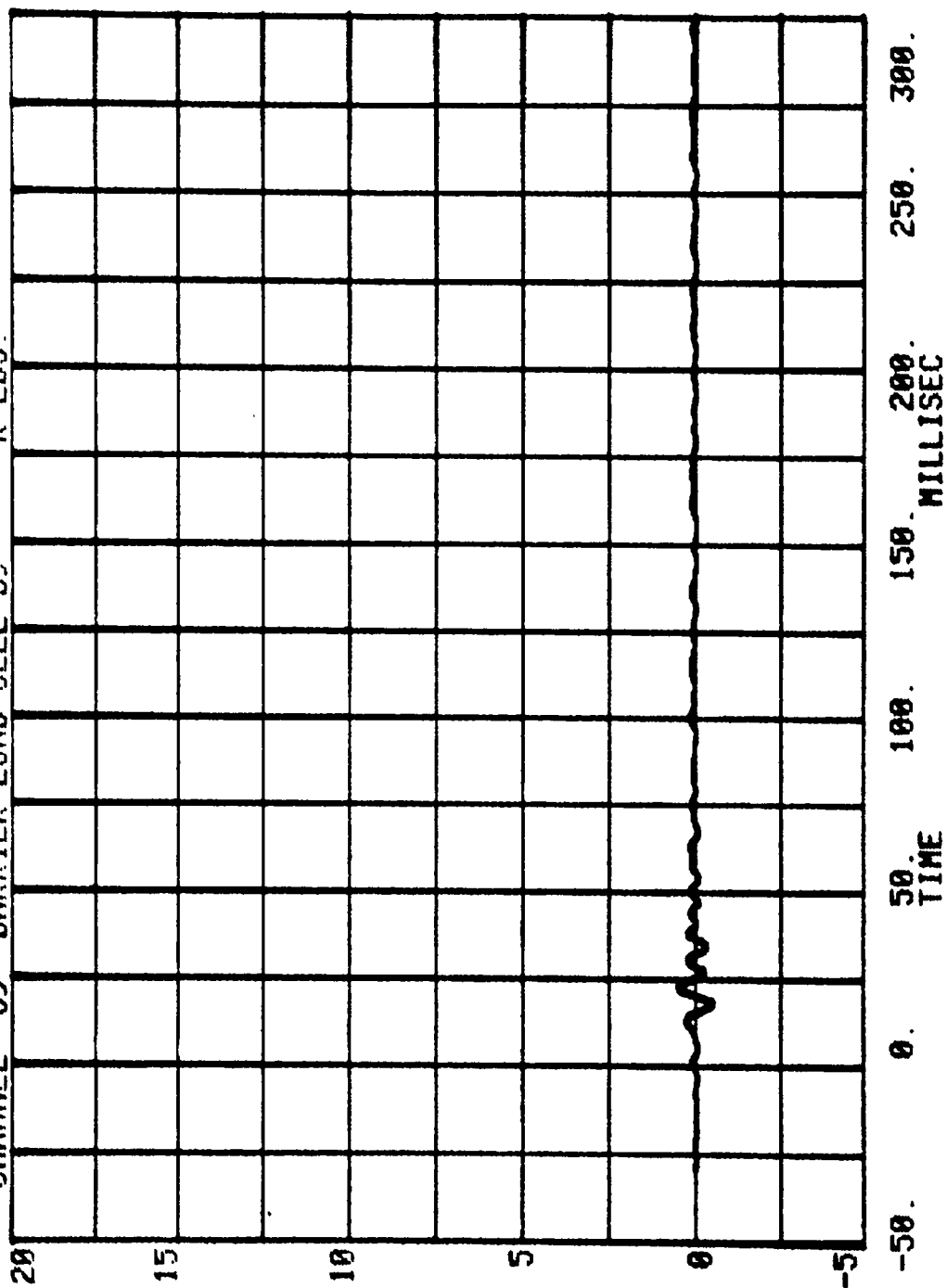


CHANNEL 68 BARRIER LOAD CELL D8 K LBS.

RUN= 775 SERIES= 5700

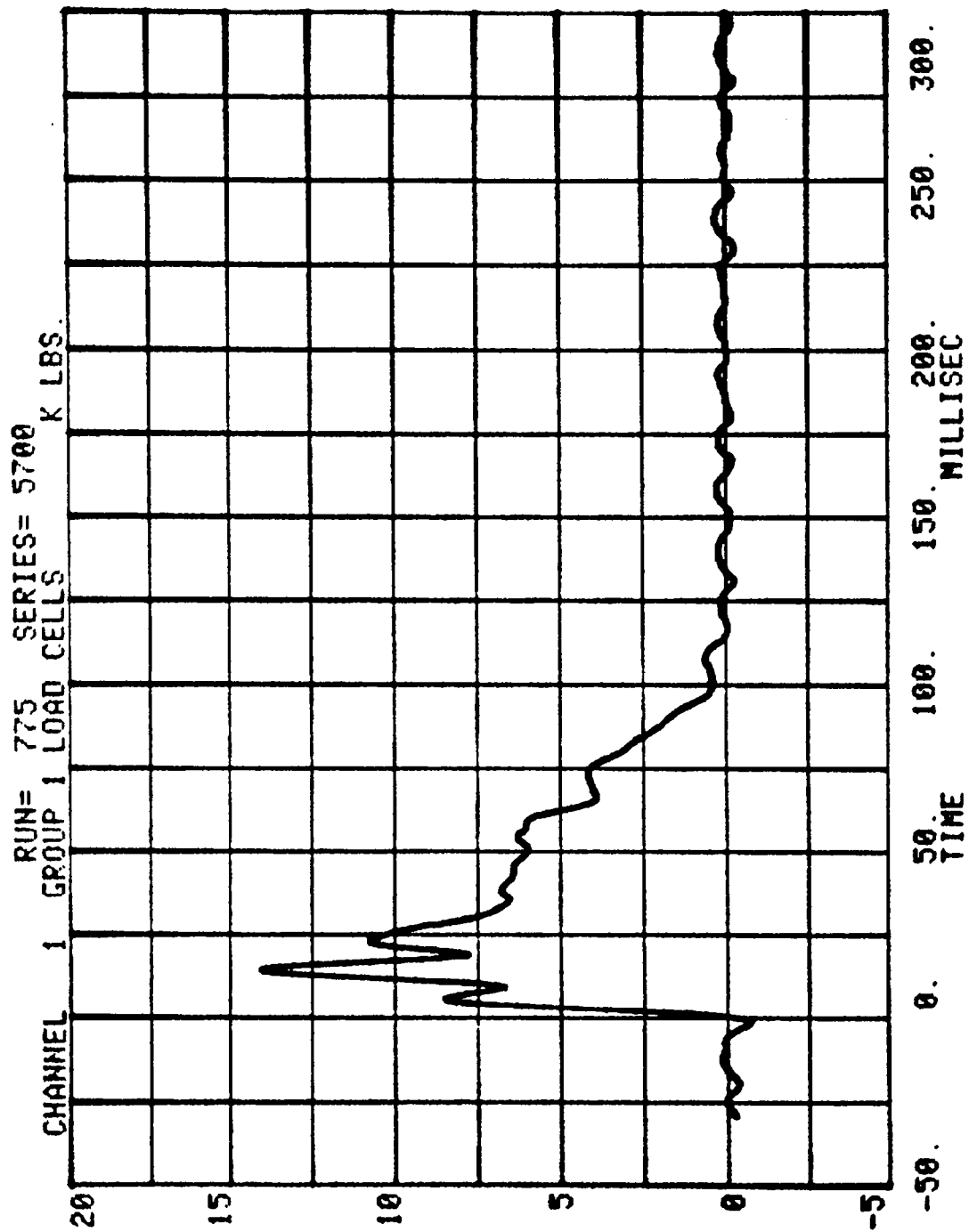


CHANNEL 69 BARRIER LOAD CELL D9 K LBS.
RUN= 775 SERIES= 5700



NEW CAR ASSESSMENT BARRIER TESTS - 1987

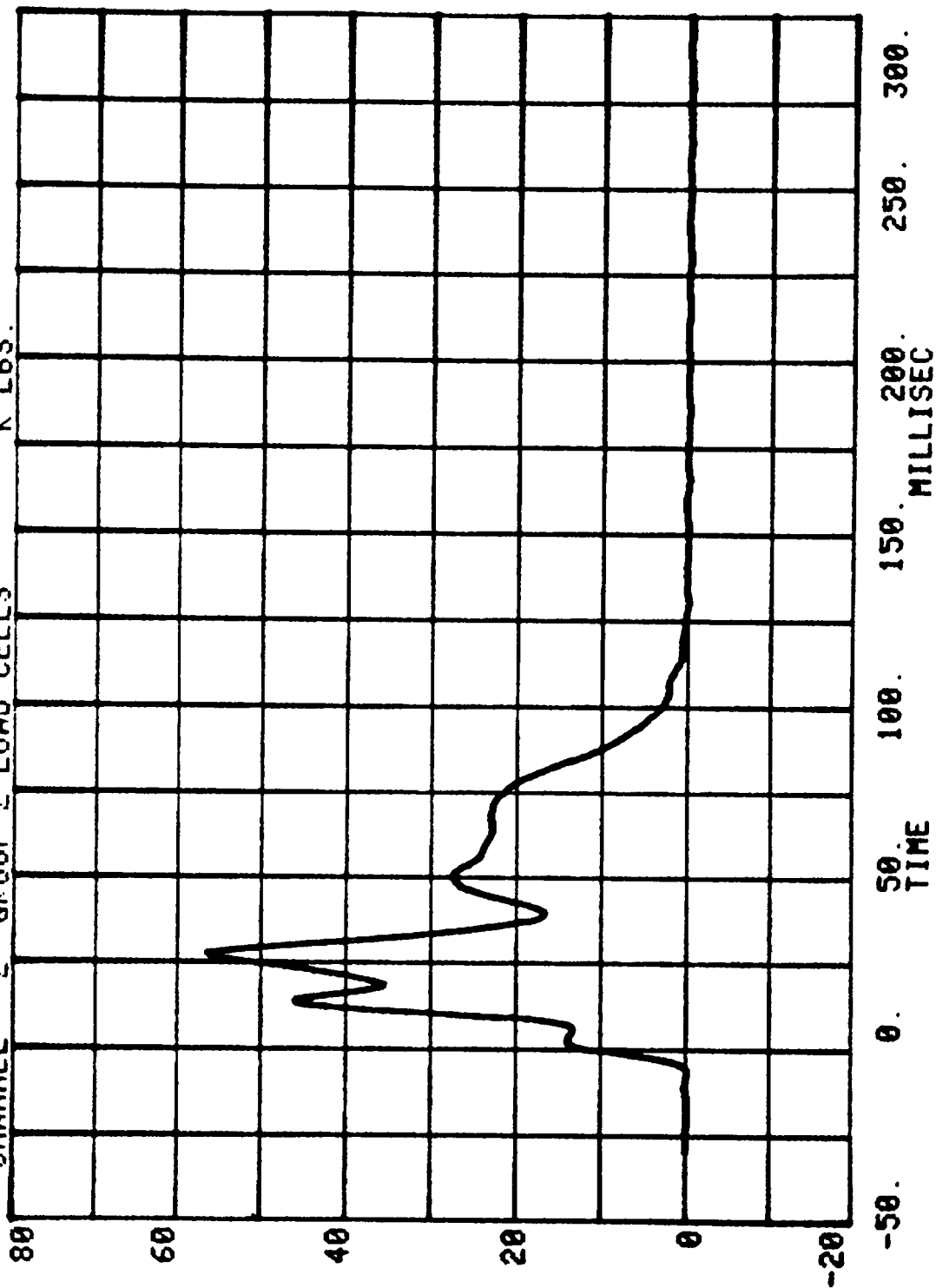
RUN # 775		SERIES # 5700	
CHAN	TITLE	MINIMUM	MAXIMUM
1	GROUP 1 LOAD CELLS	- .708	14.075 K LBS.
2	GROUP 2 LOAD CELLS	- .254	56.424 K LBS.
3	GROUP 3 LOAD CELLS	- .309	9.982 K LBS.
4	GROUP 4 LOAD CELLS	- .322	8.333 K LBS.
5	GROUP 5 LOAD CELLS	- .392	10.314 K LBS.
6	GROUP 6 LOAD CELLS	- .426	4.801 K LBS.
7	TOTAL LOAD CELL SUM	-1.062	85.376 K LBS.

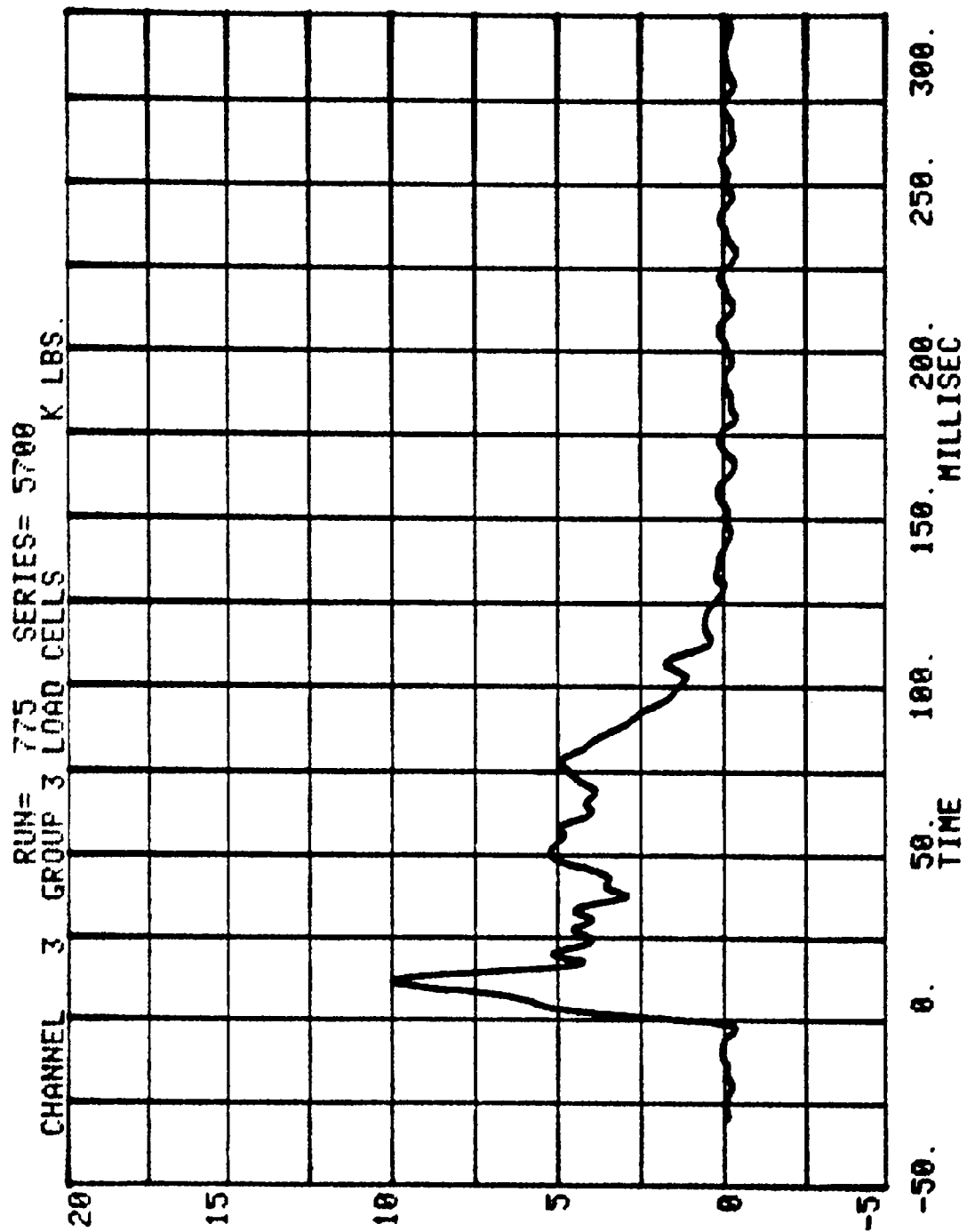


CHANNEL 2 GROUP 2 LOAD CELLS

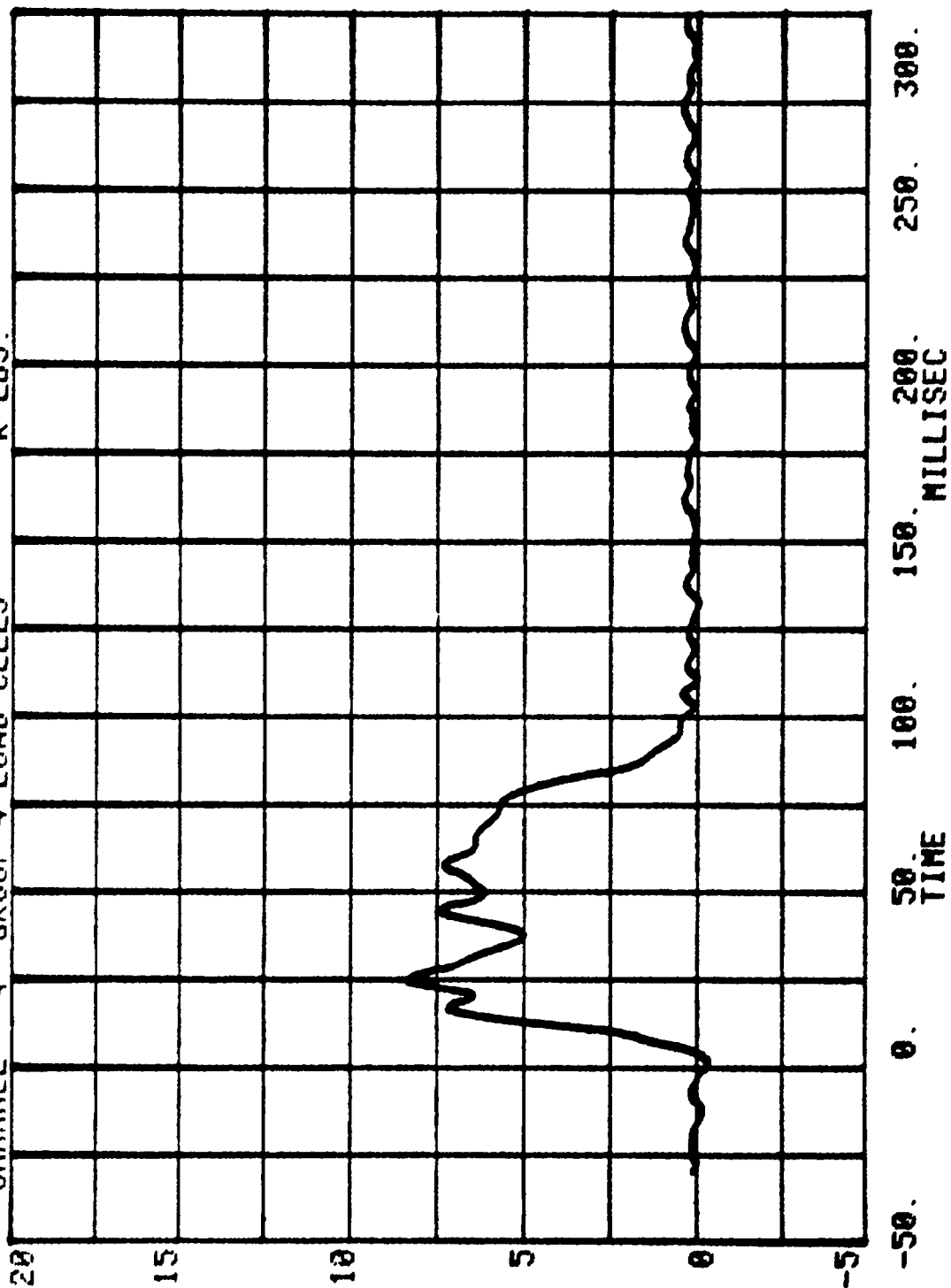
RUN= 775 SERIES= 5700

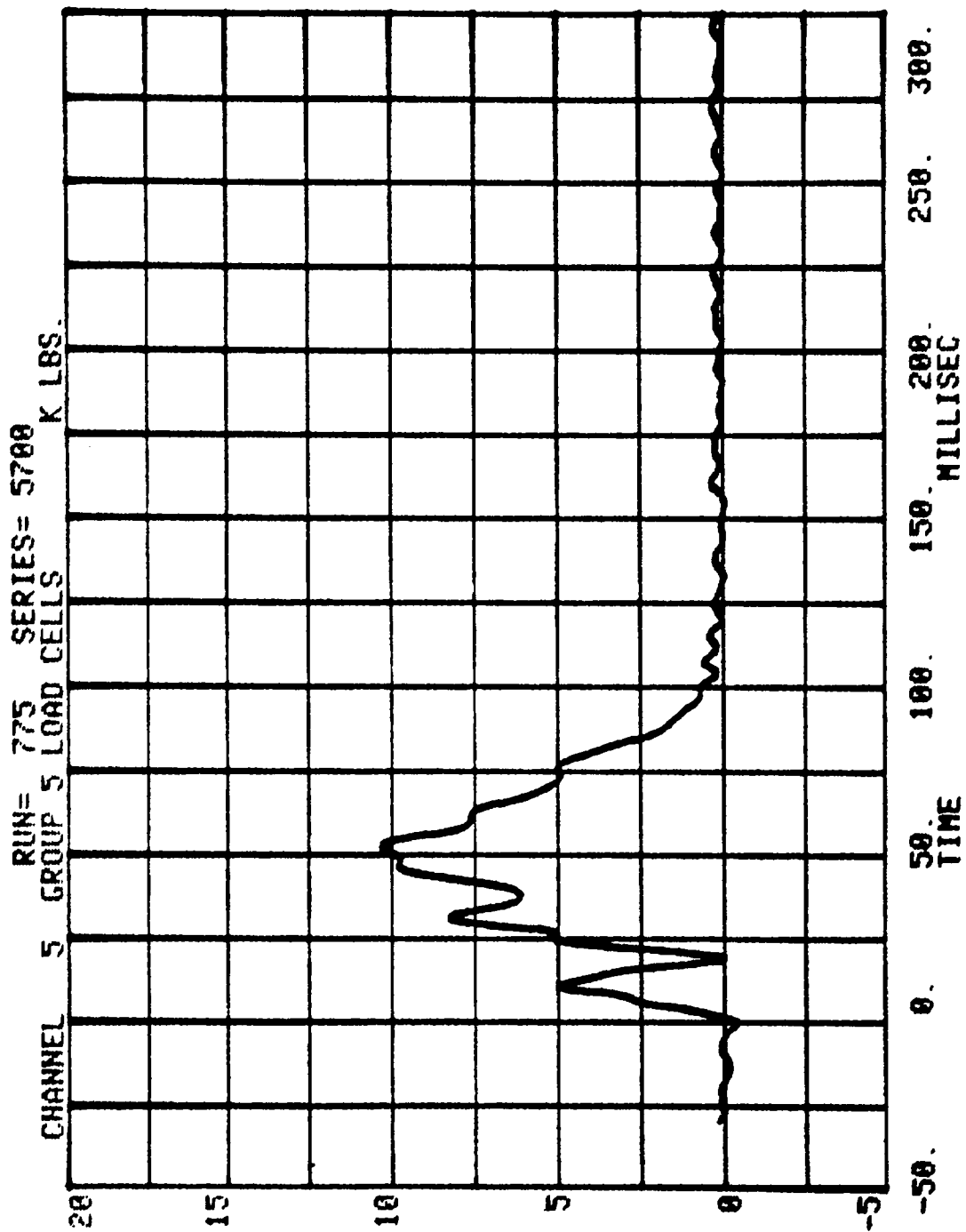
K LBS.



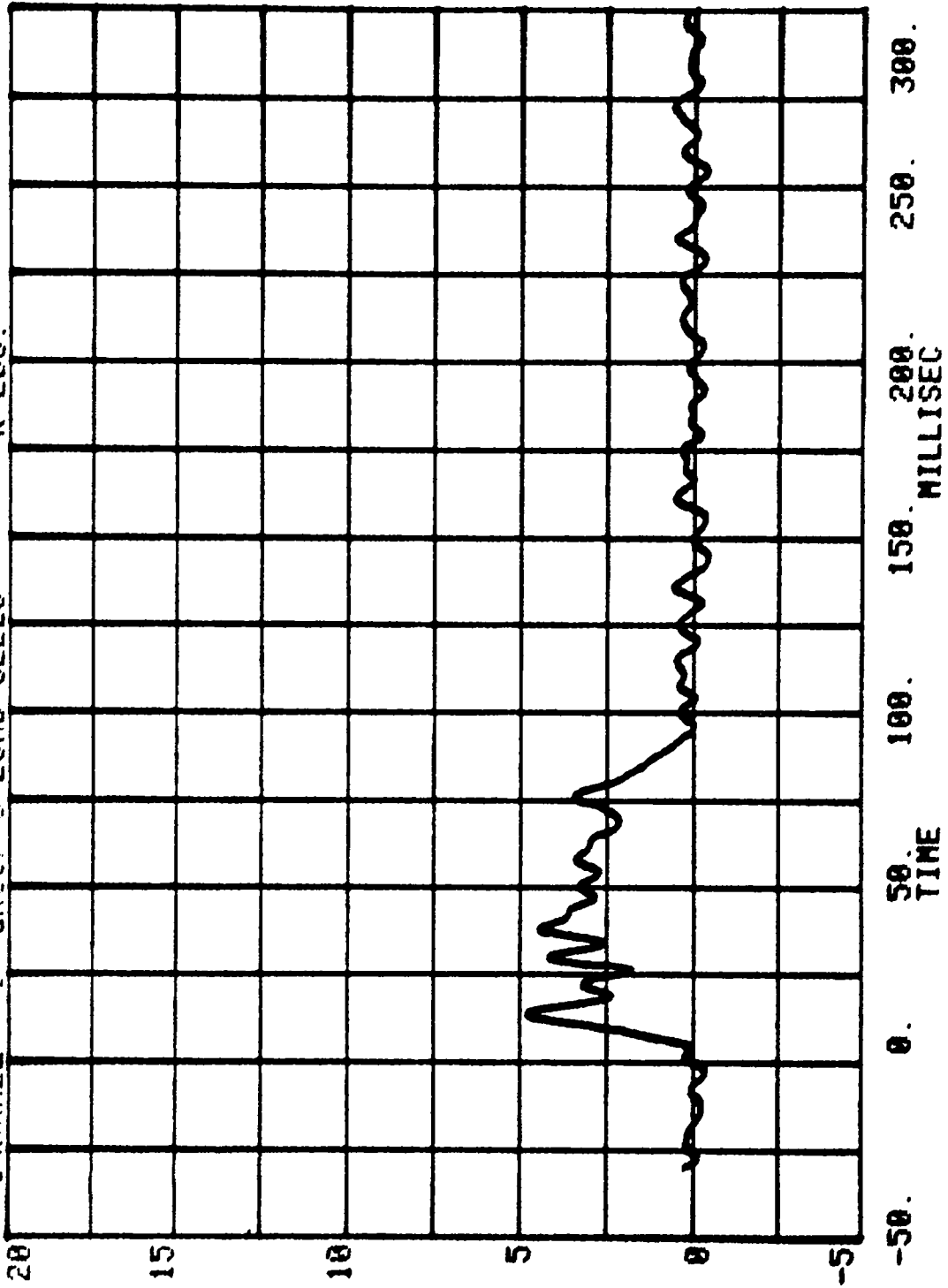


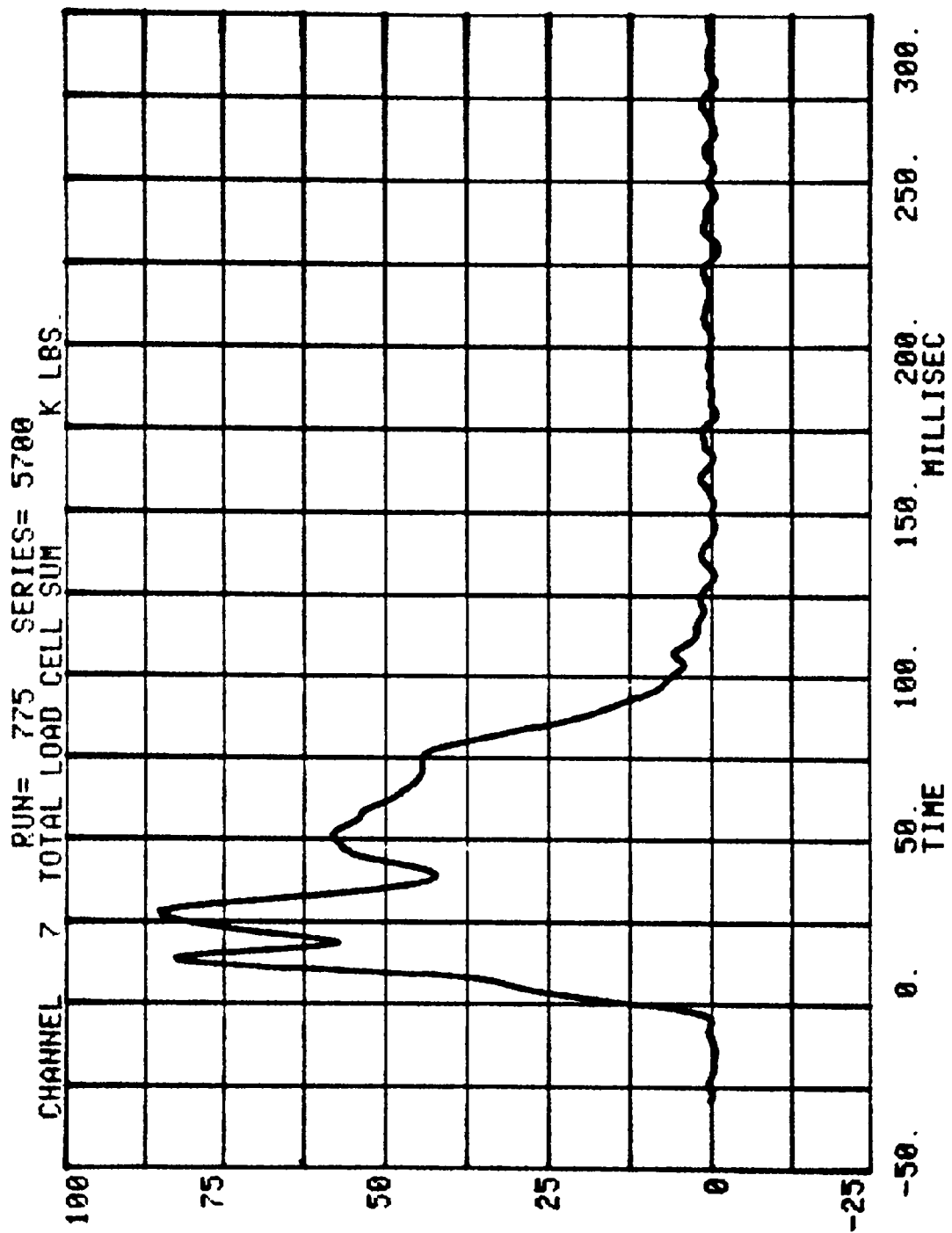
RUN= 775 SERIES= 5700
CHANNEL 4 GROUP 4 LOAD CELLS K LBS.





CHANNEL 6 GROUP 6 LOAD CELLS RUN= 775 SERIES= 5700 K LBS.





TEST NO. MH5700

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= 775

POS#1 HEAD R

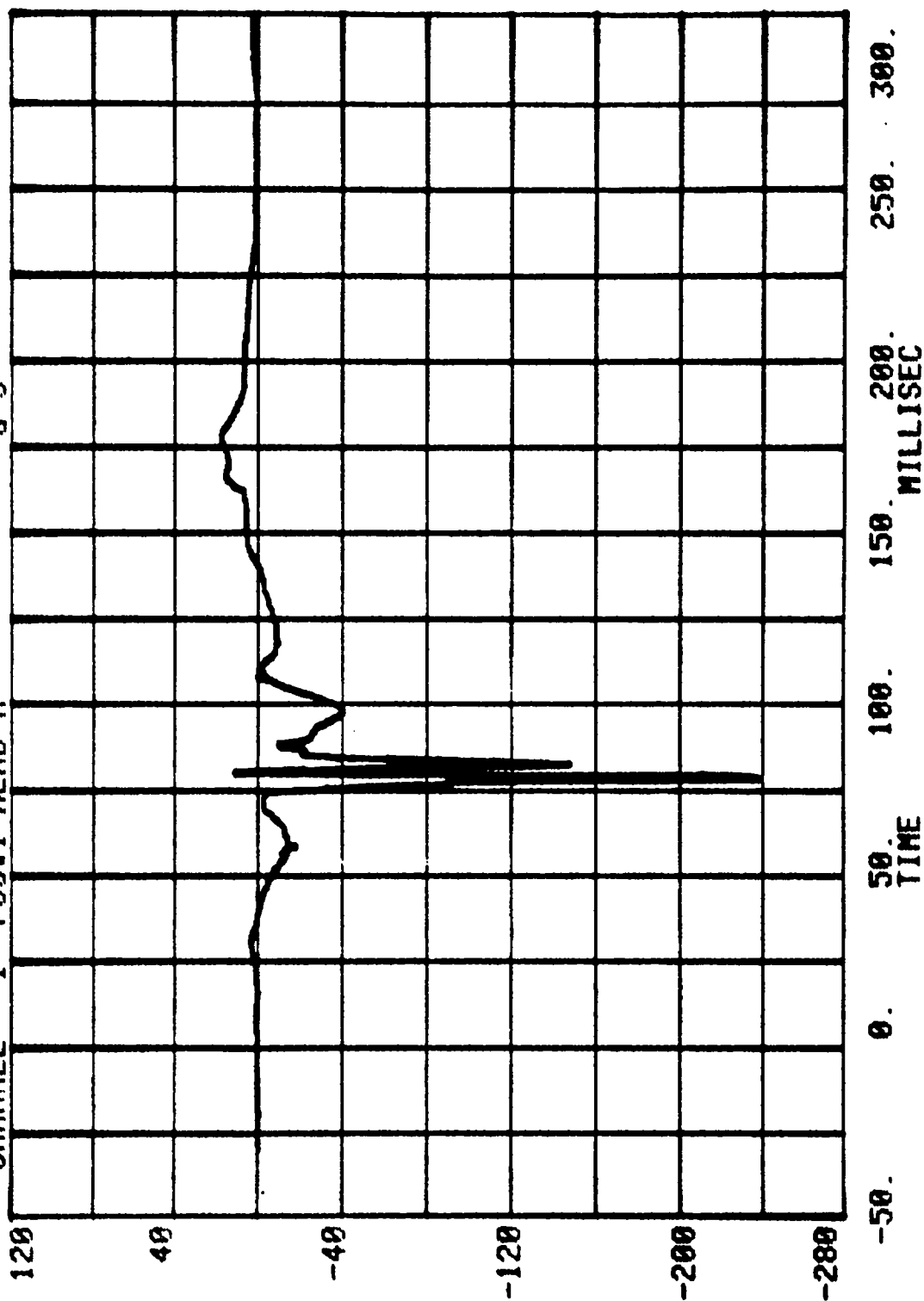
HIC=1808.9 FROM T1= .07672 TO T2= .08512

AVERAGE ACCELERATION BETWEEN T1 AND T2= 135.9G'S

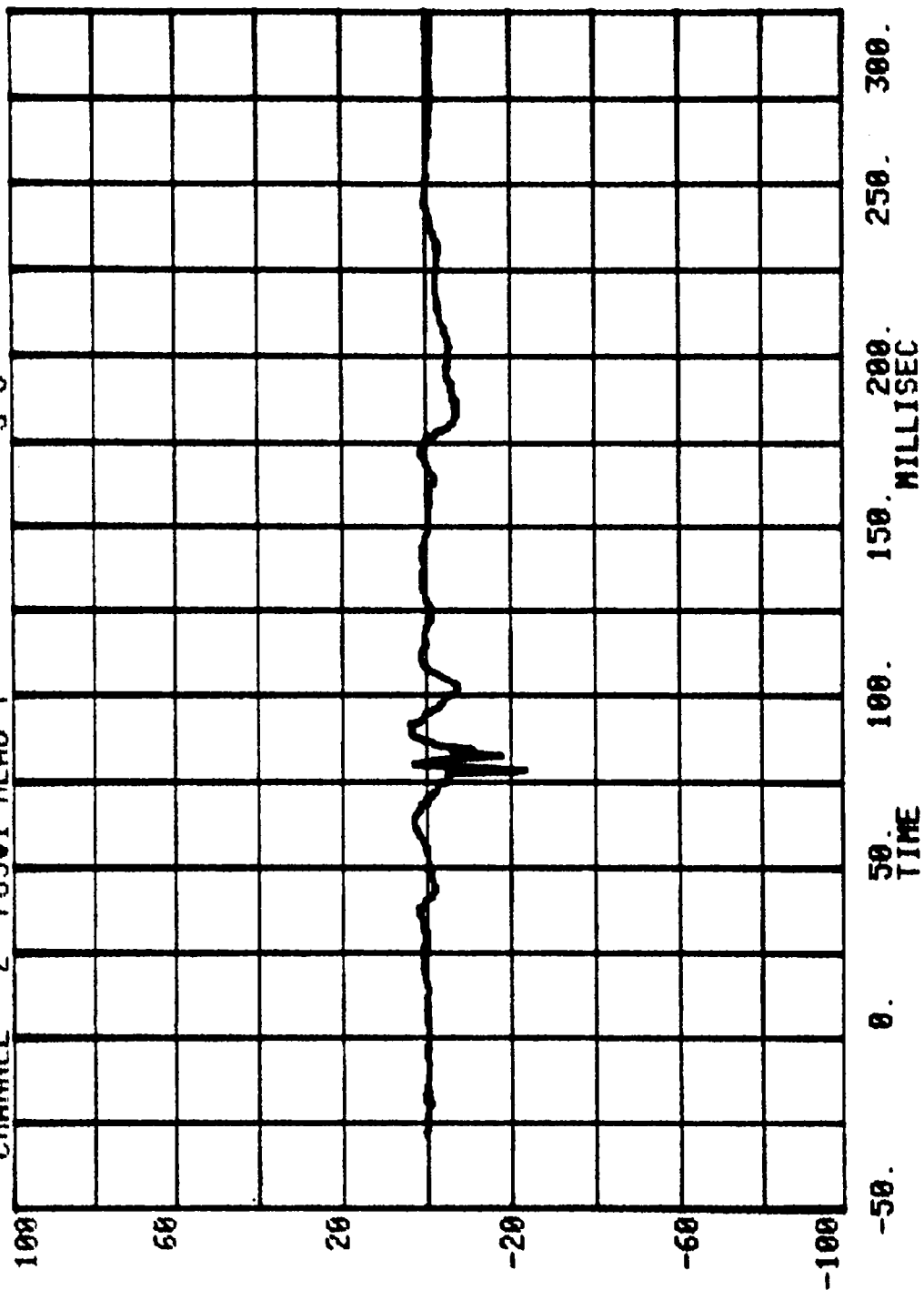
EVENT TIME= 300.0 MSEC

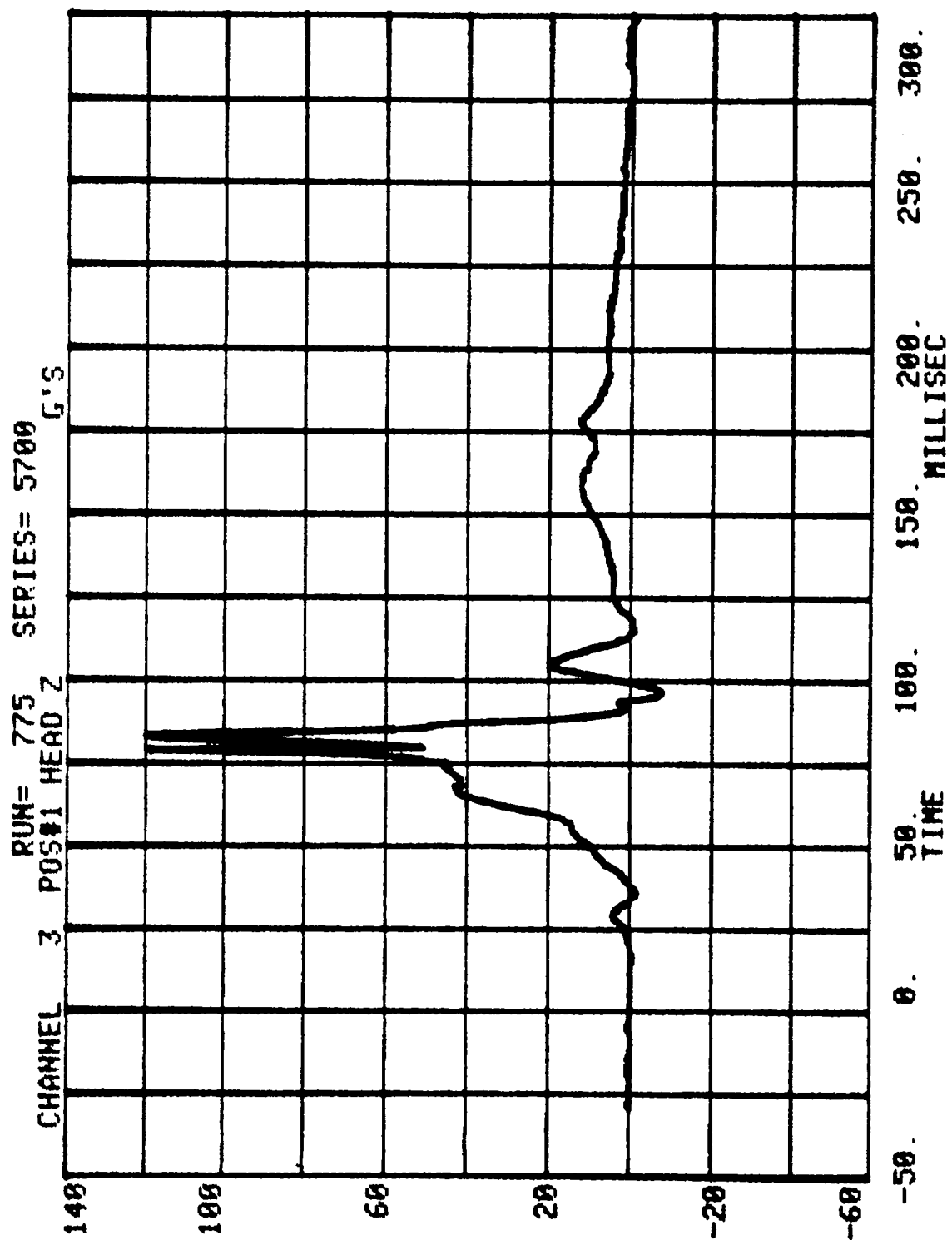
SEVERITY INDEX=2993.0

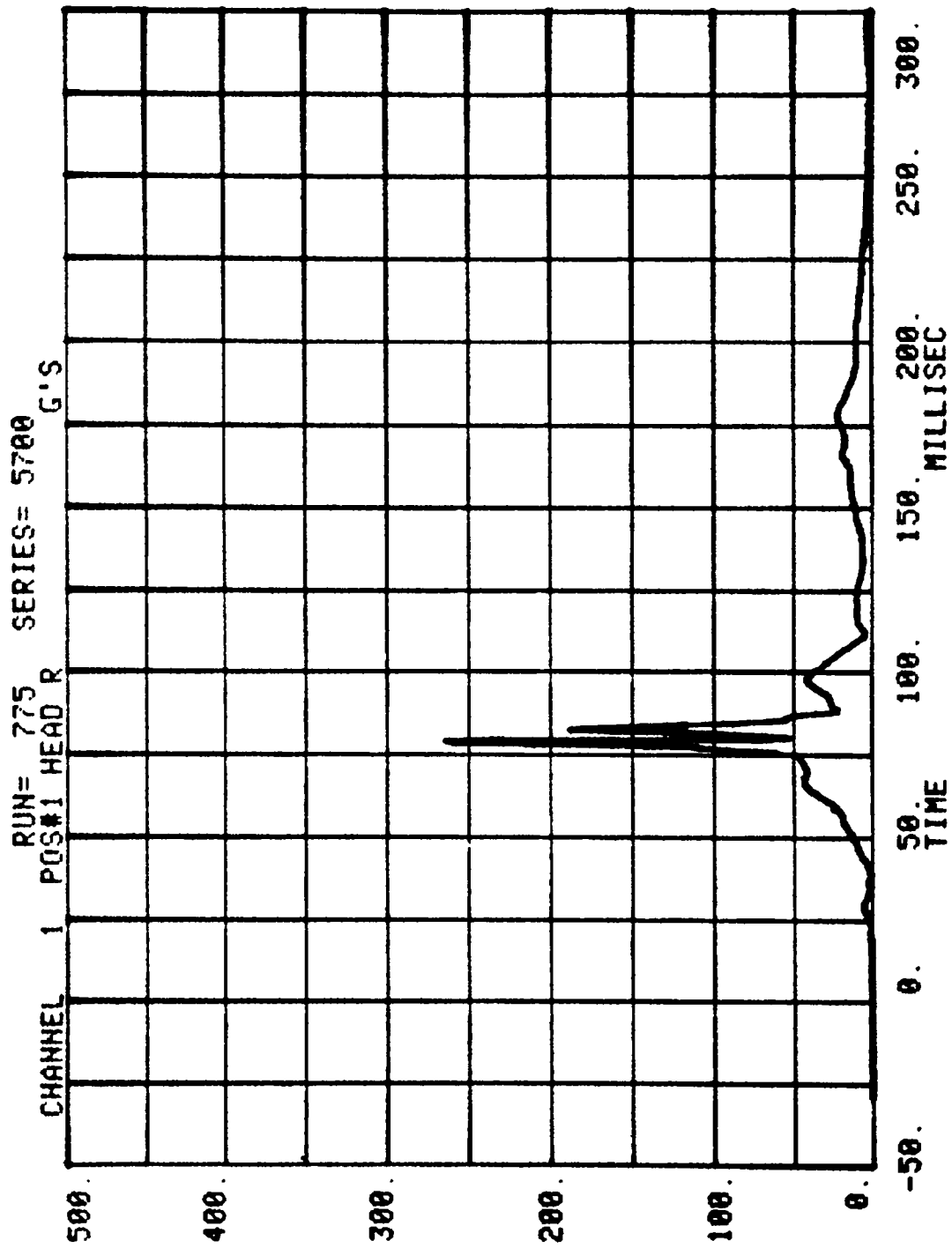
CHANNEL 1 POS#1 HEAD X
RUN= 775 SERIES= 5700 G'S



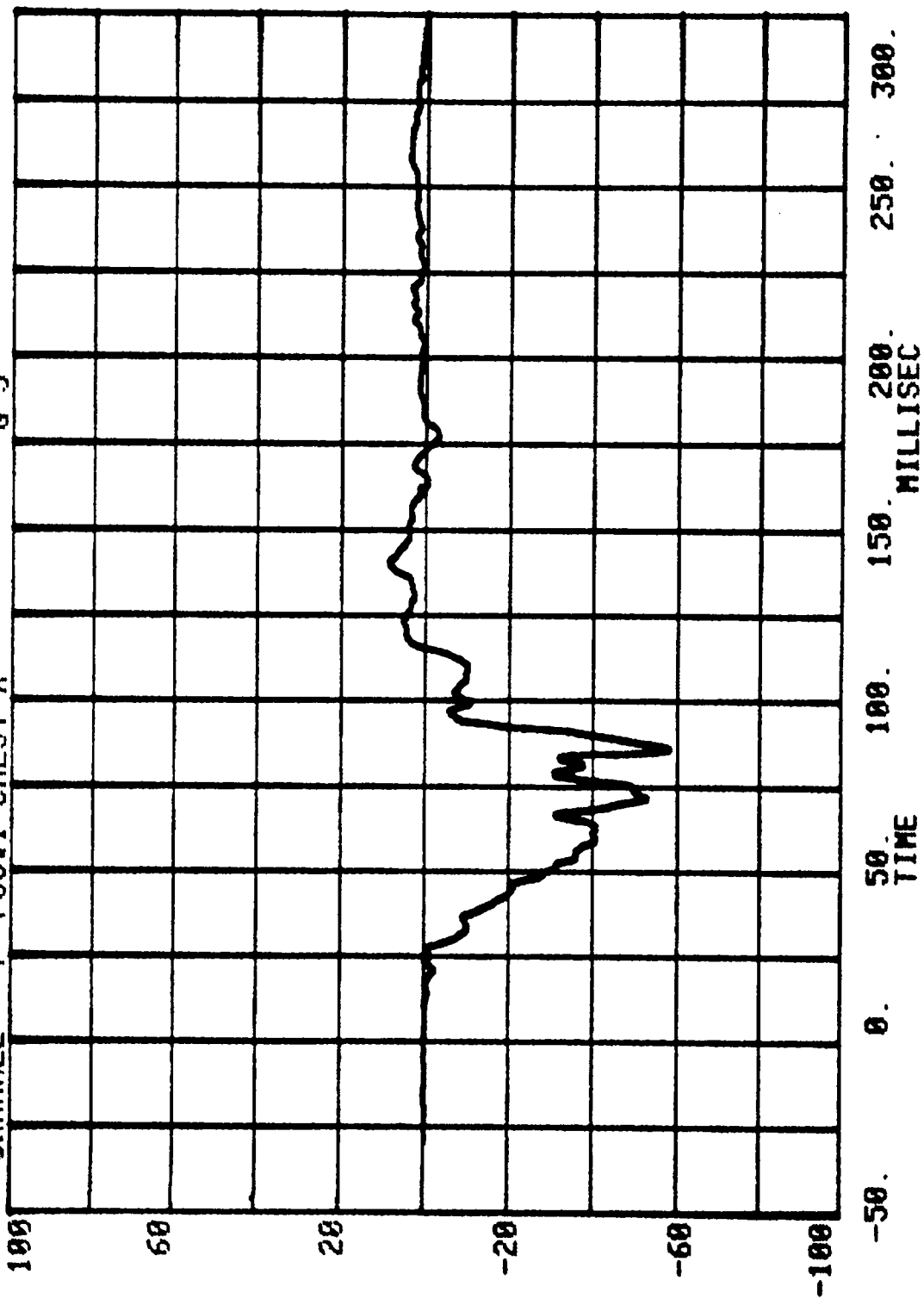
CHANNEL 2 POS#1 HEAD Y RUN= 775 SERIES= 5700 G'S

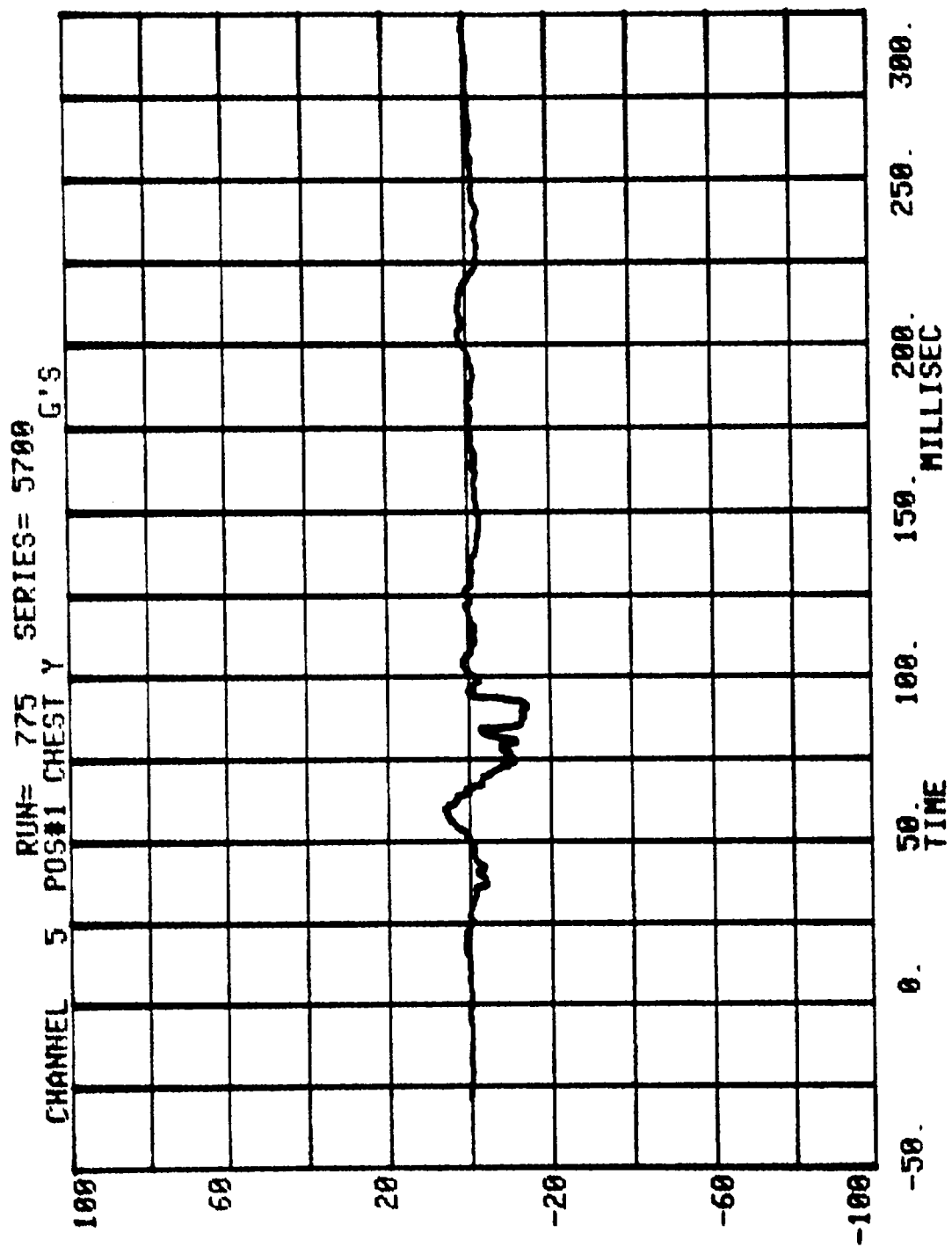




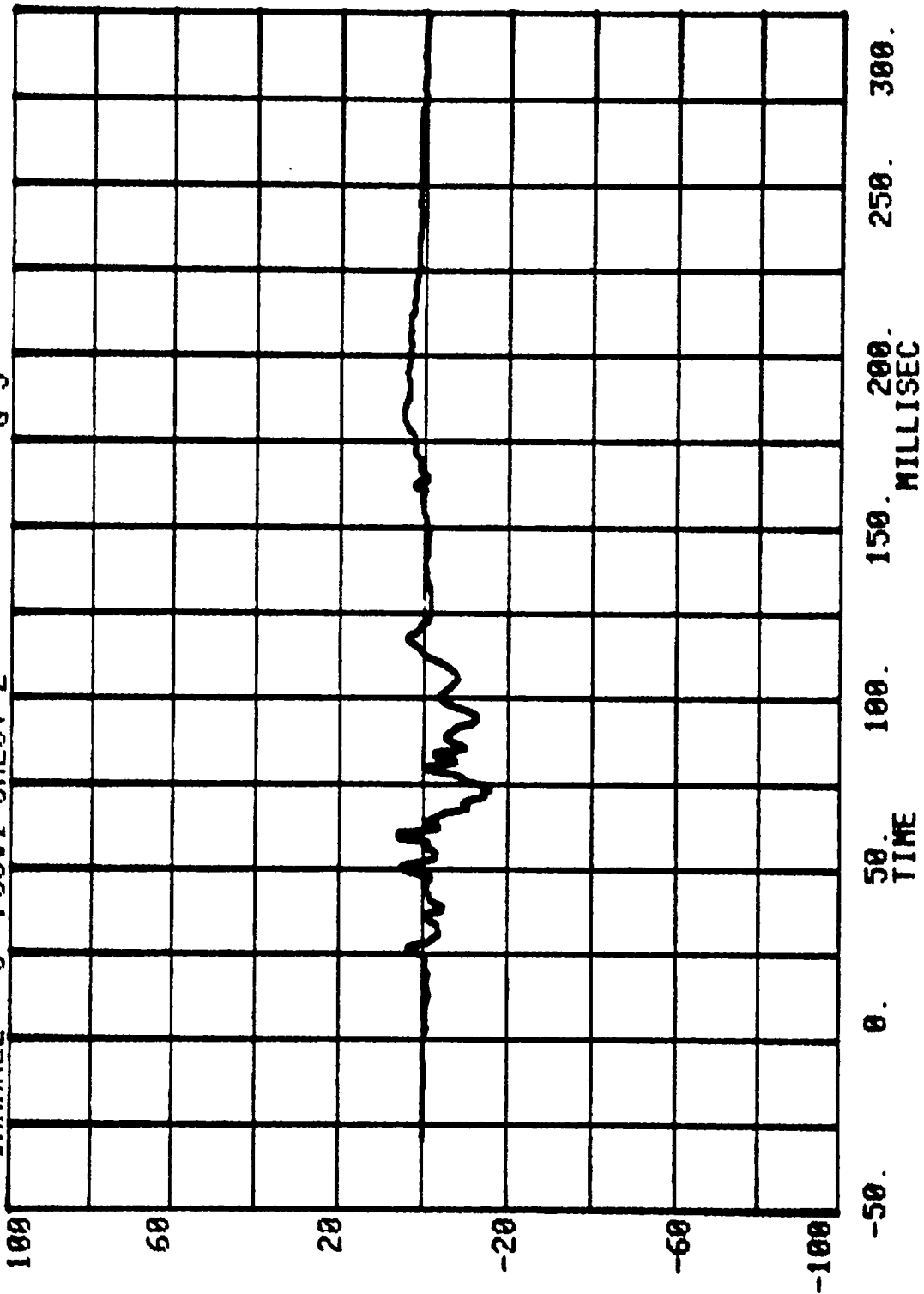


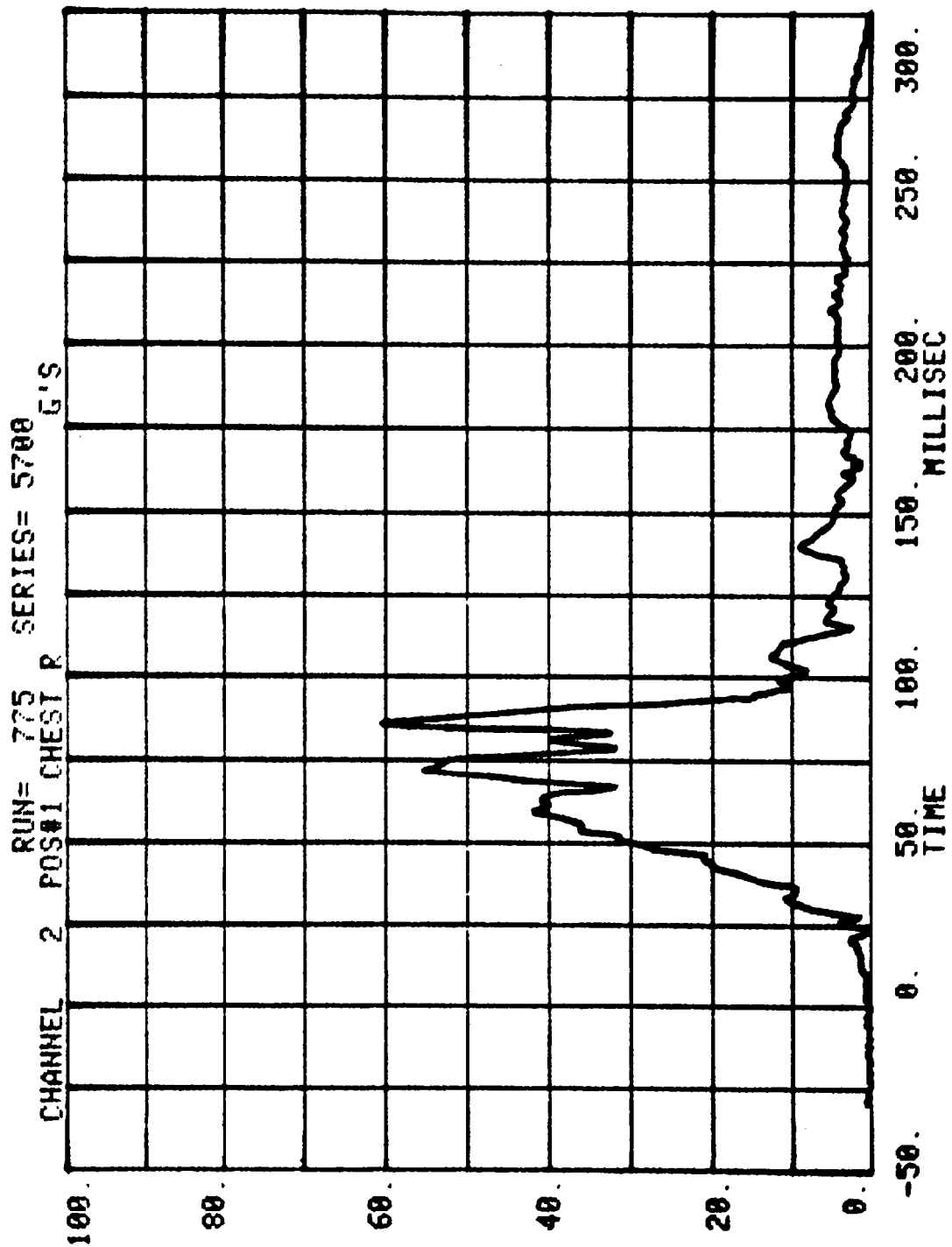
CHANNEL 4 POS#1 CHEST X
RUN= 775 SERIES= 5790 G'S

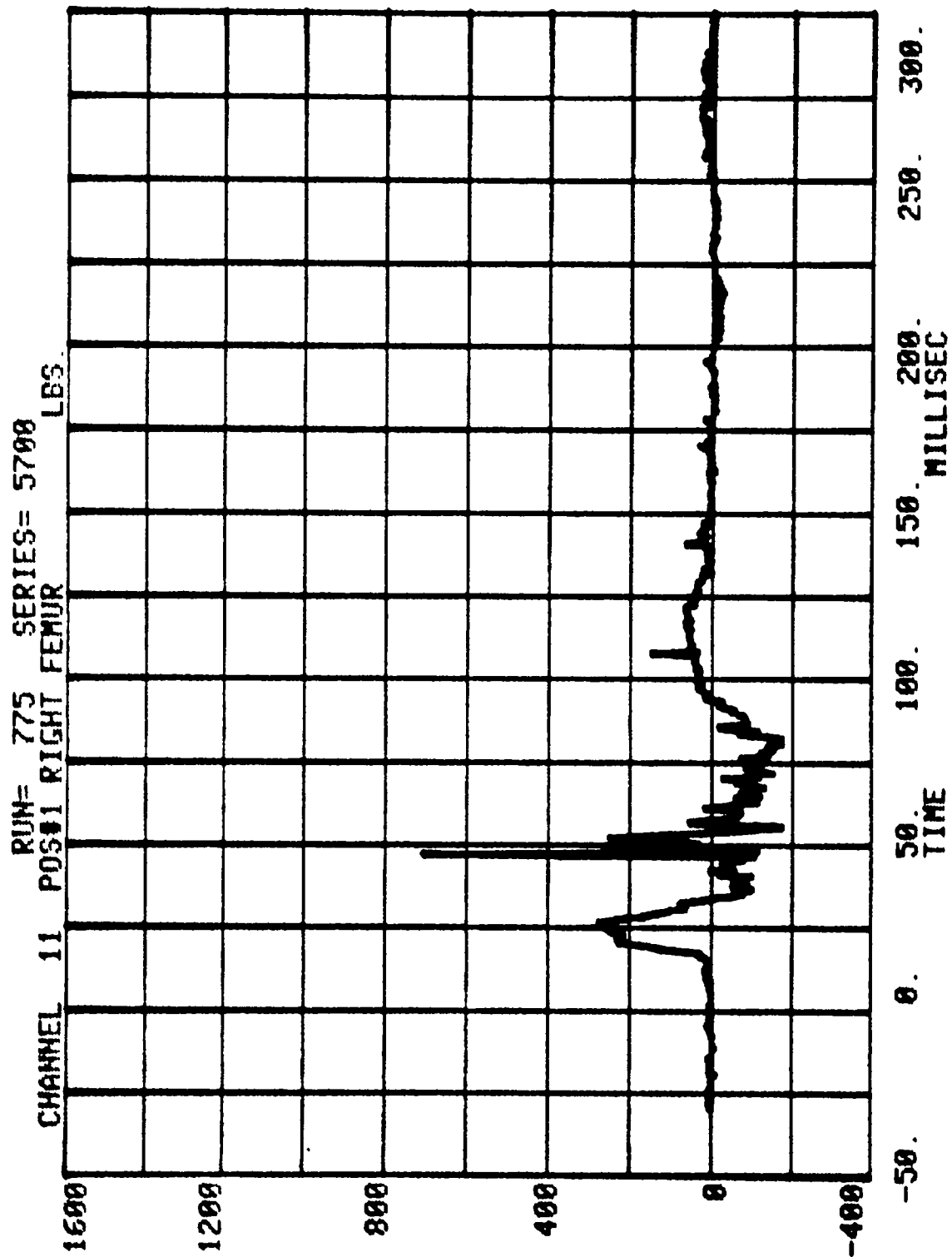




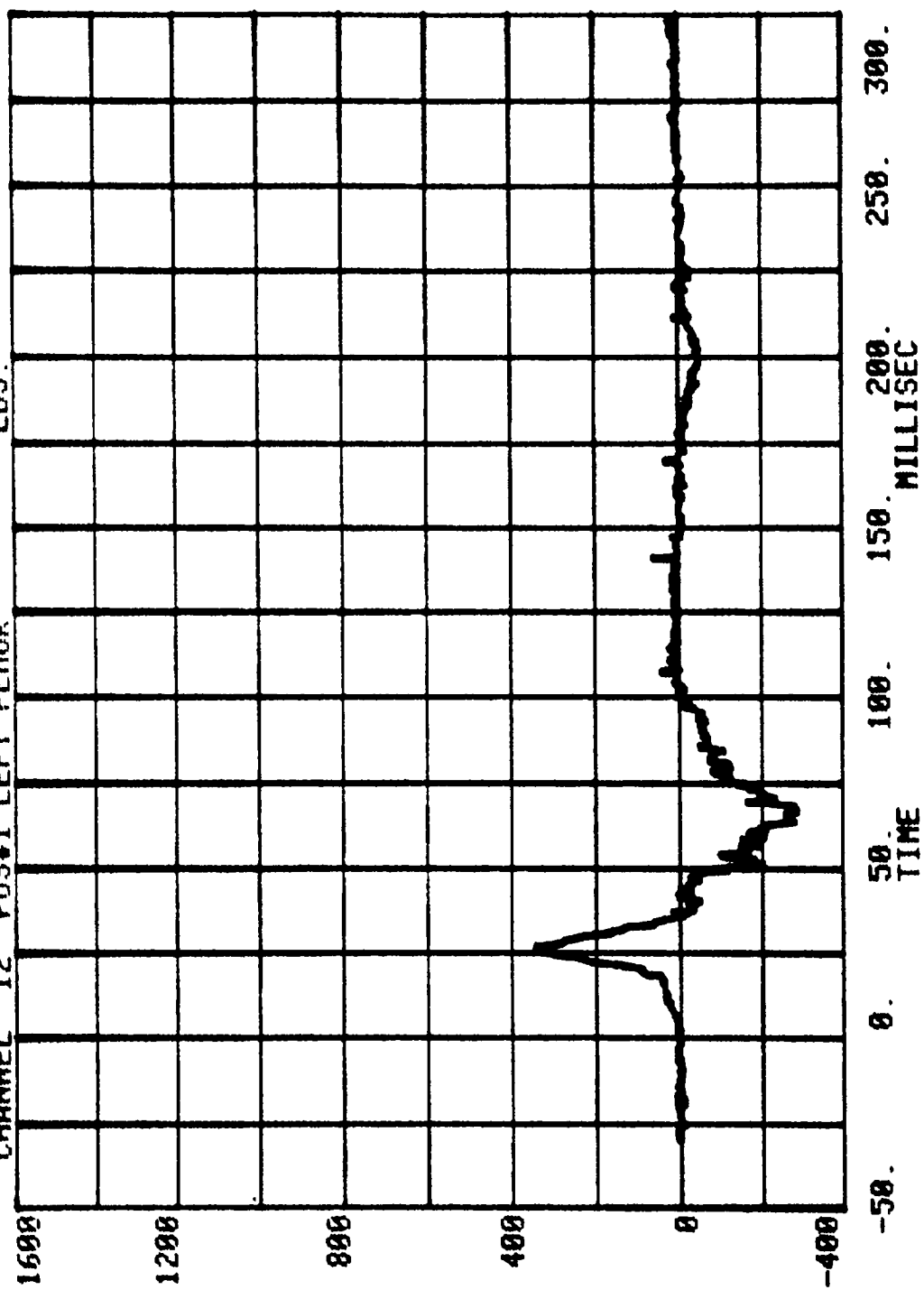
CHANNEL 6 POS#1 CHEST Z RUN= 775 SERIES= 5700 G'S



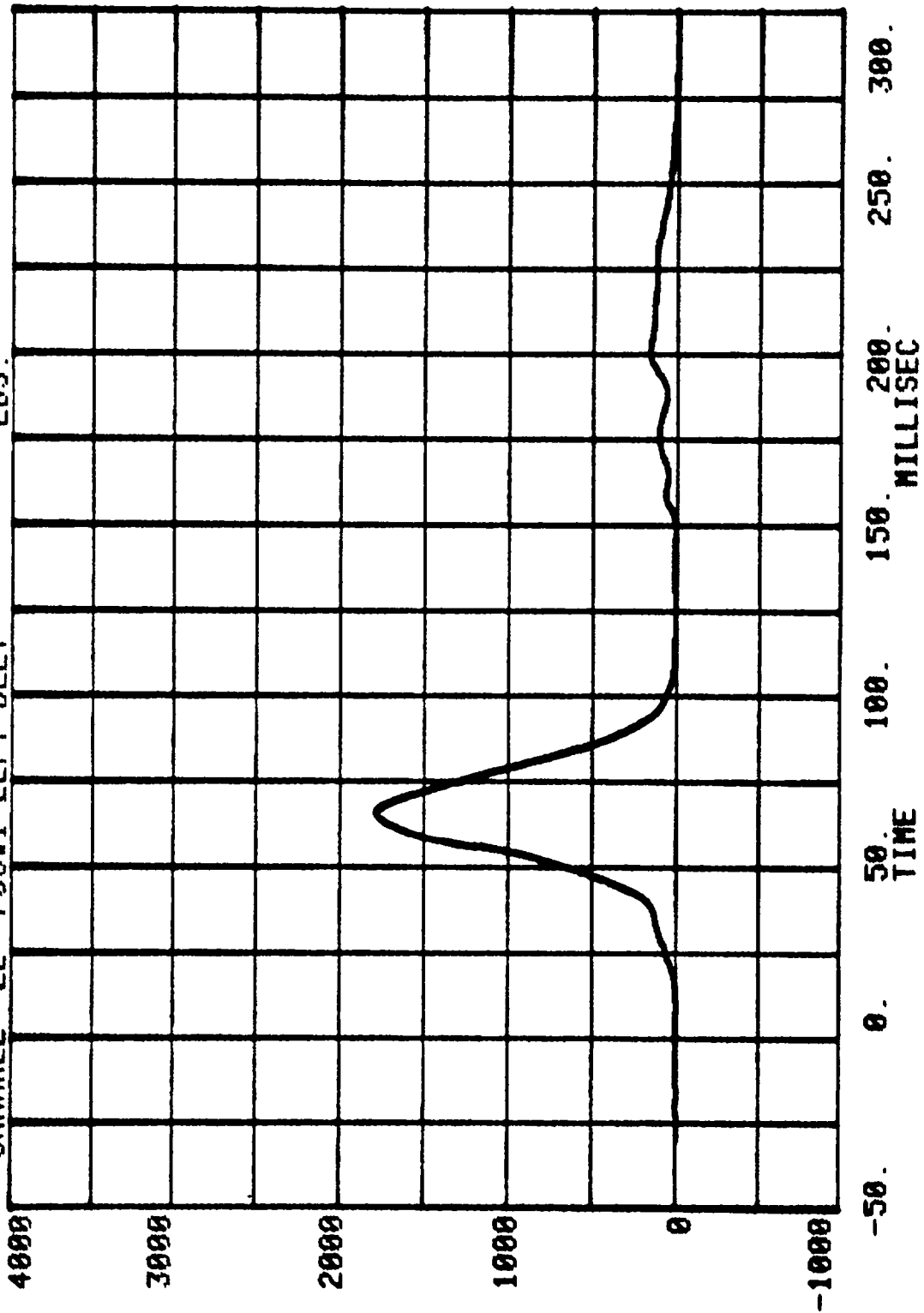




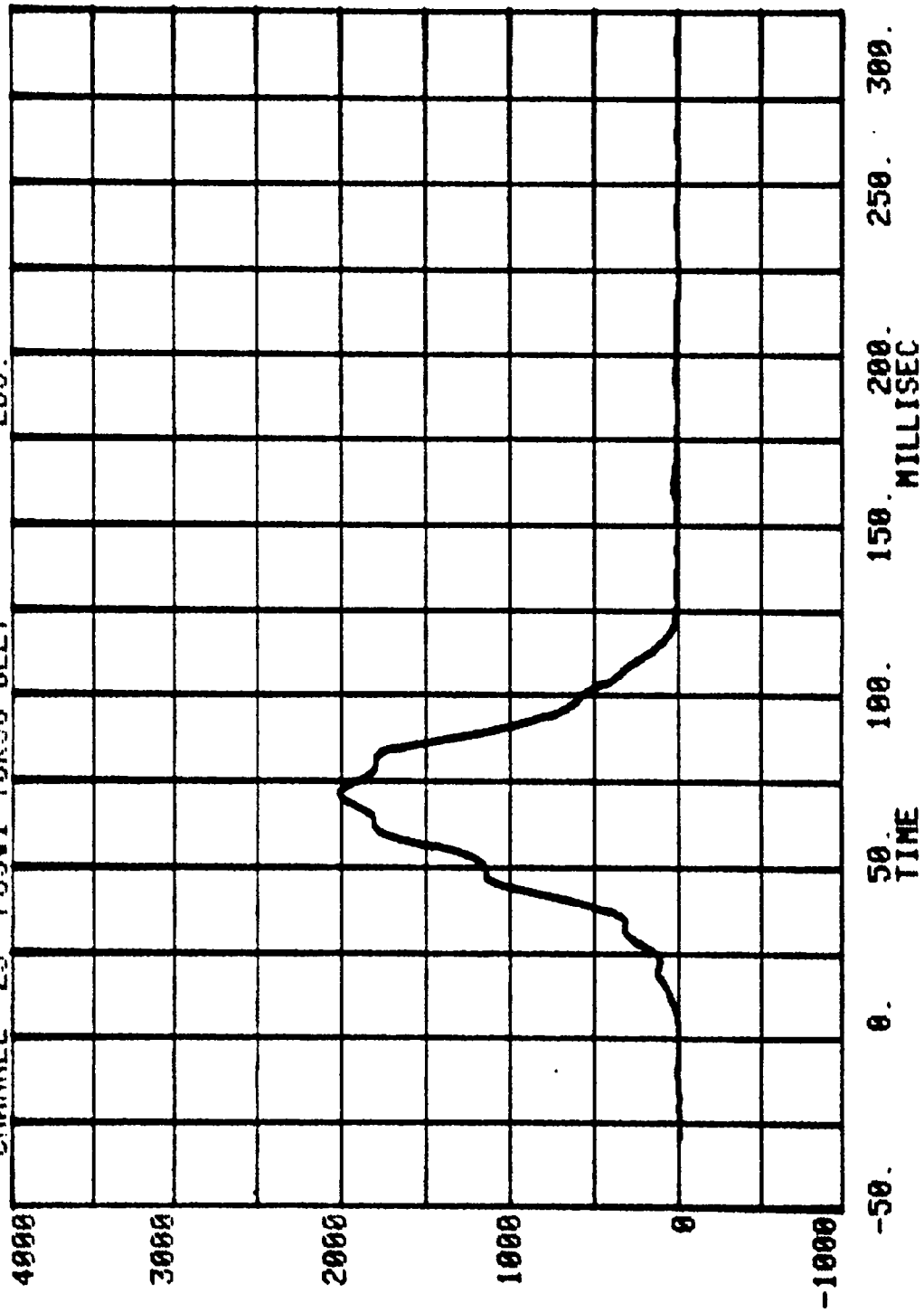
CHANNEL 12 POS#1 LEFT FEMUR
RUN= 775 SERIES= 5700 LBS.

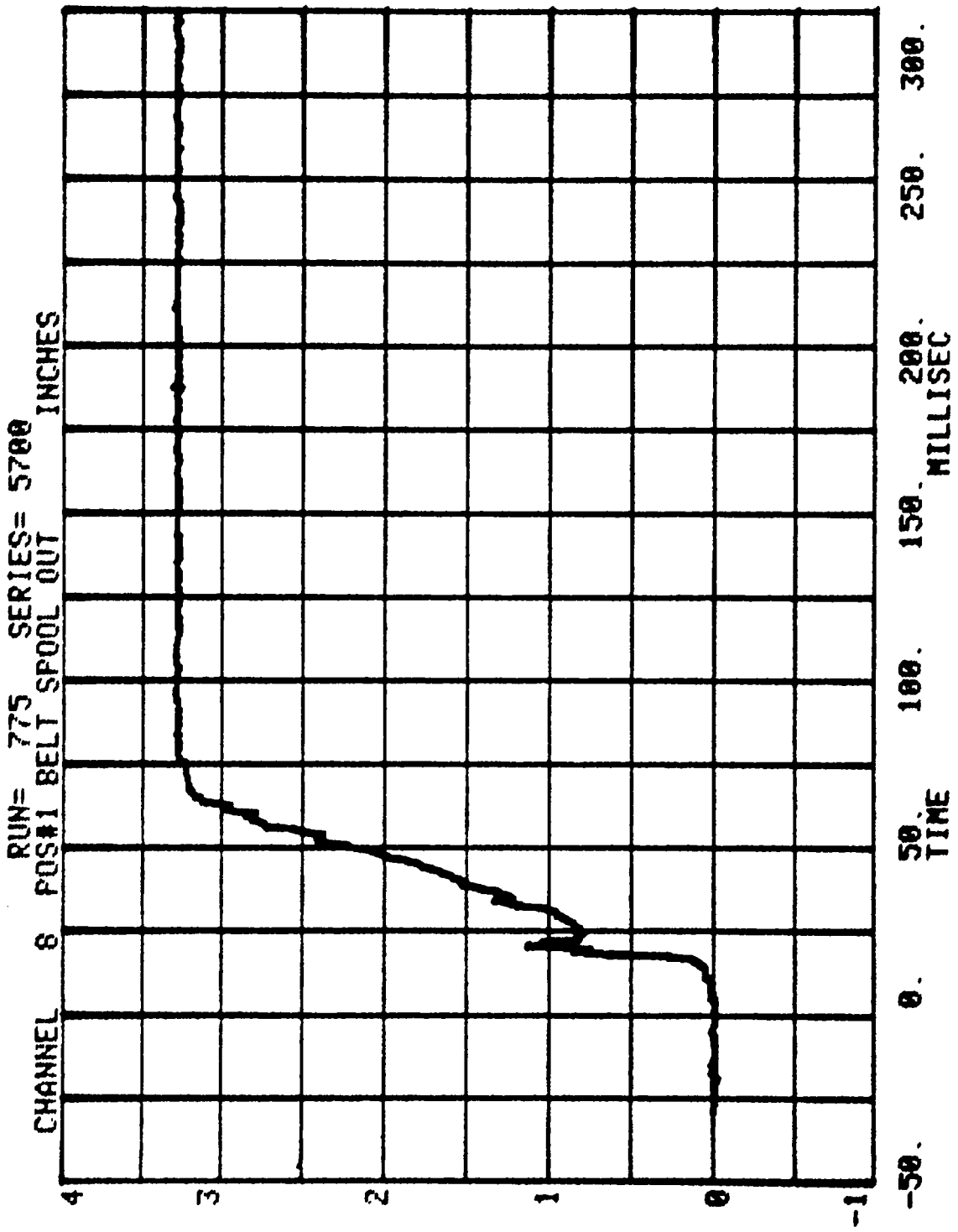


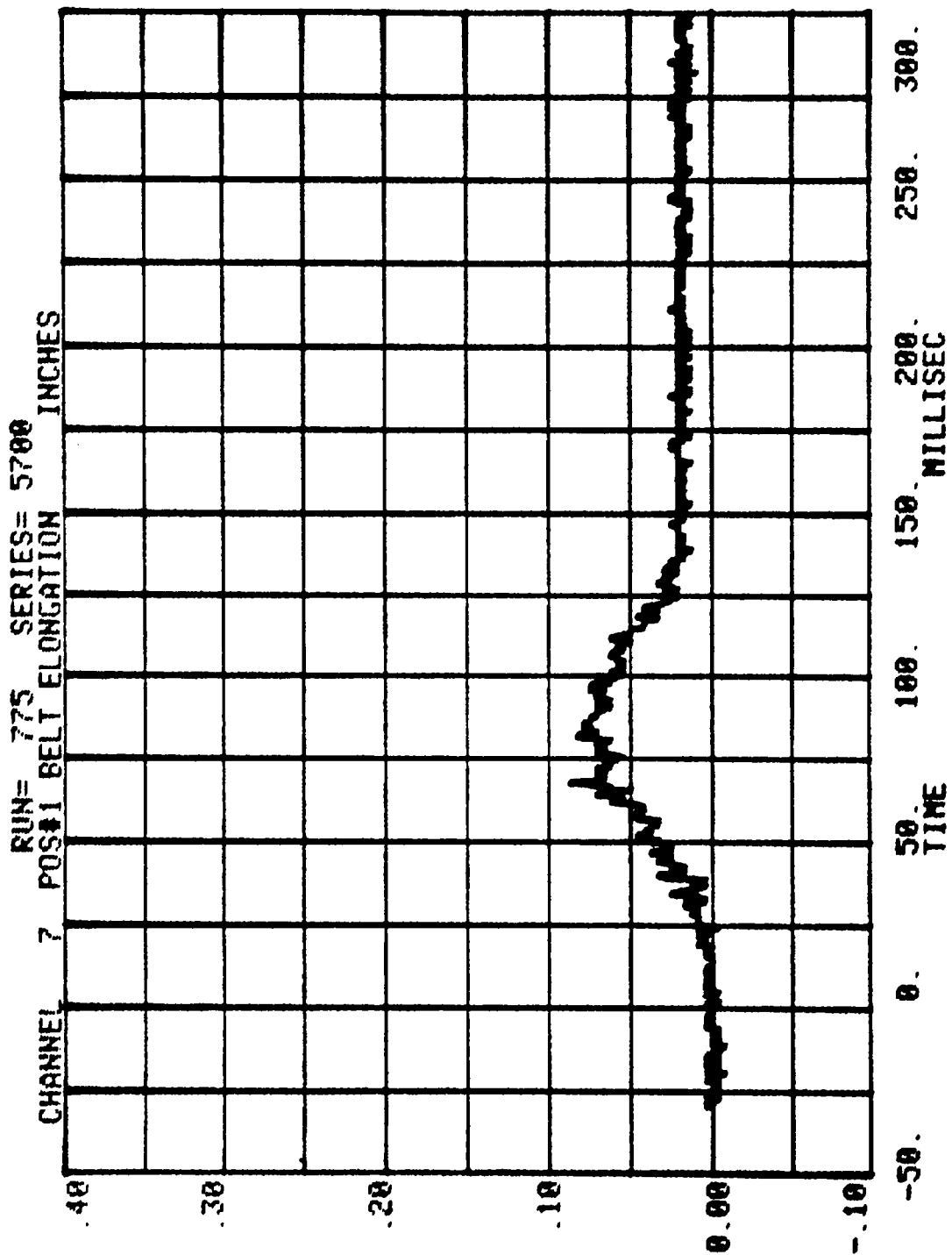
CHANNEL 22 POS#1 LEFT BELT
RUN= 775 SERIES= 5700 LBS.



RUN= 775 SERIES= 5700
CHANNEL 23 POS#1 TORSO BELT LBS.







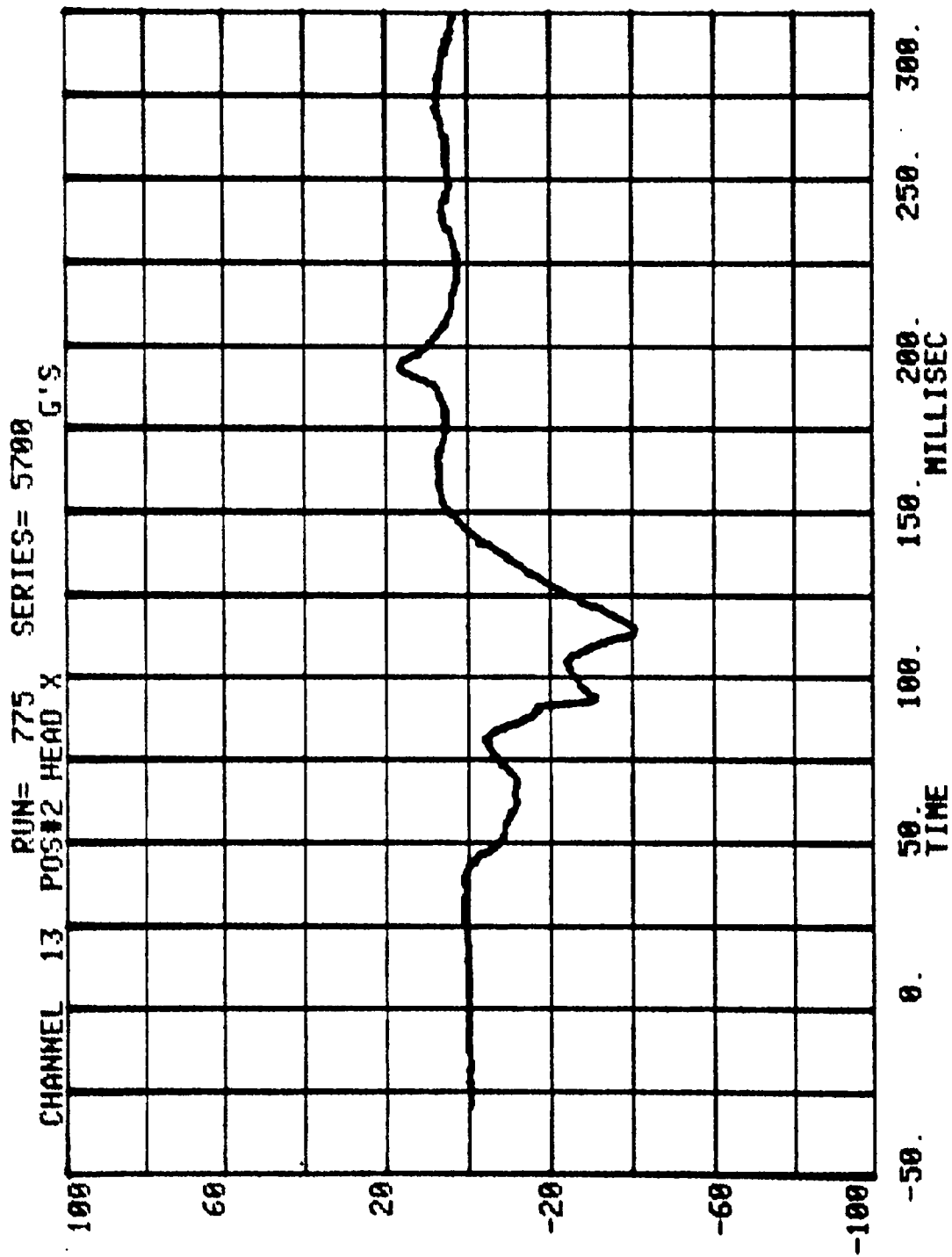
HEAD INJURY CRITERION
HEAD SEVERITY INDEX

NEW CAR ASSESSMENT BARRIER TESTS - 1987

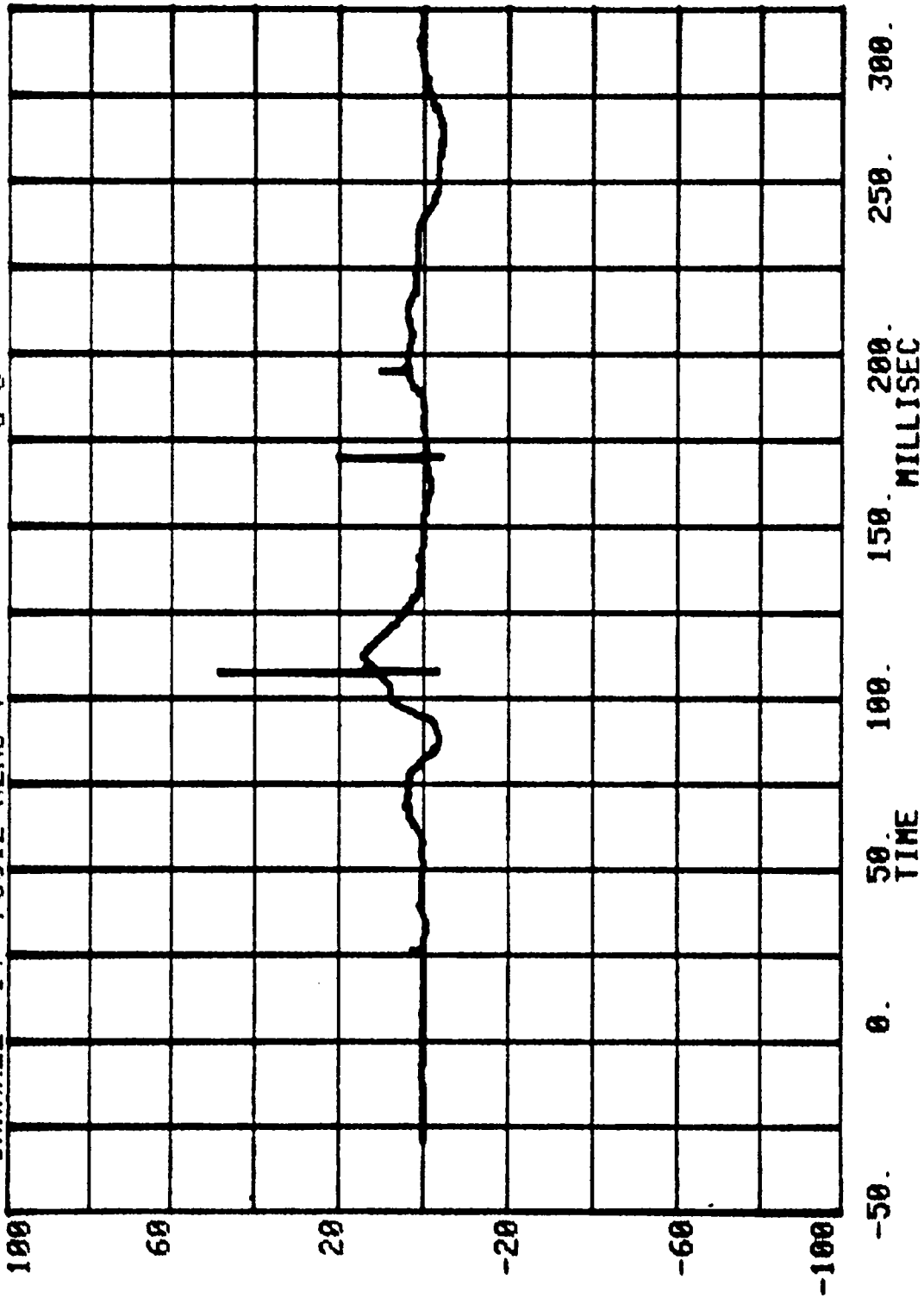
RUN= 775

POS#2 HEAD R

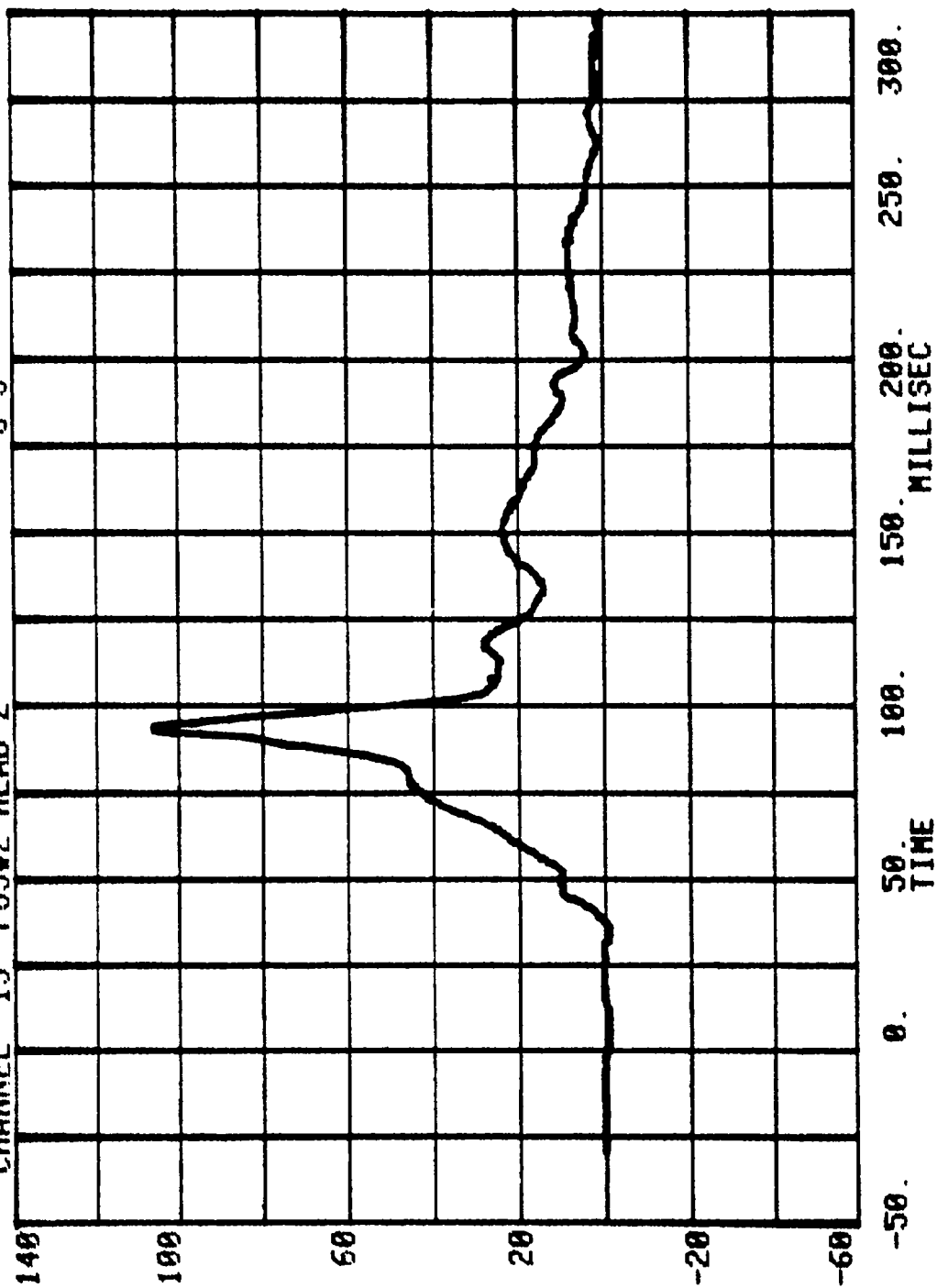
HIC=1041.6 FROM T1= .03242 TO T2= .11842
AVERAGE ACCELERATION BETWEEN T1 AND T2= 60.9G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX=1760.9



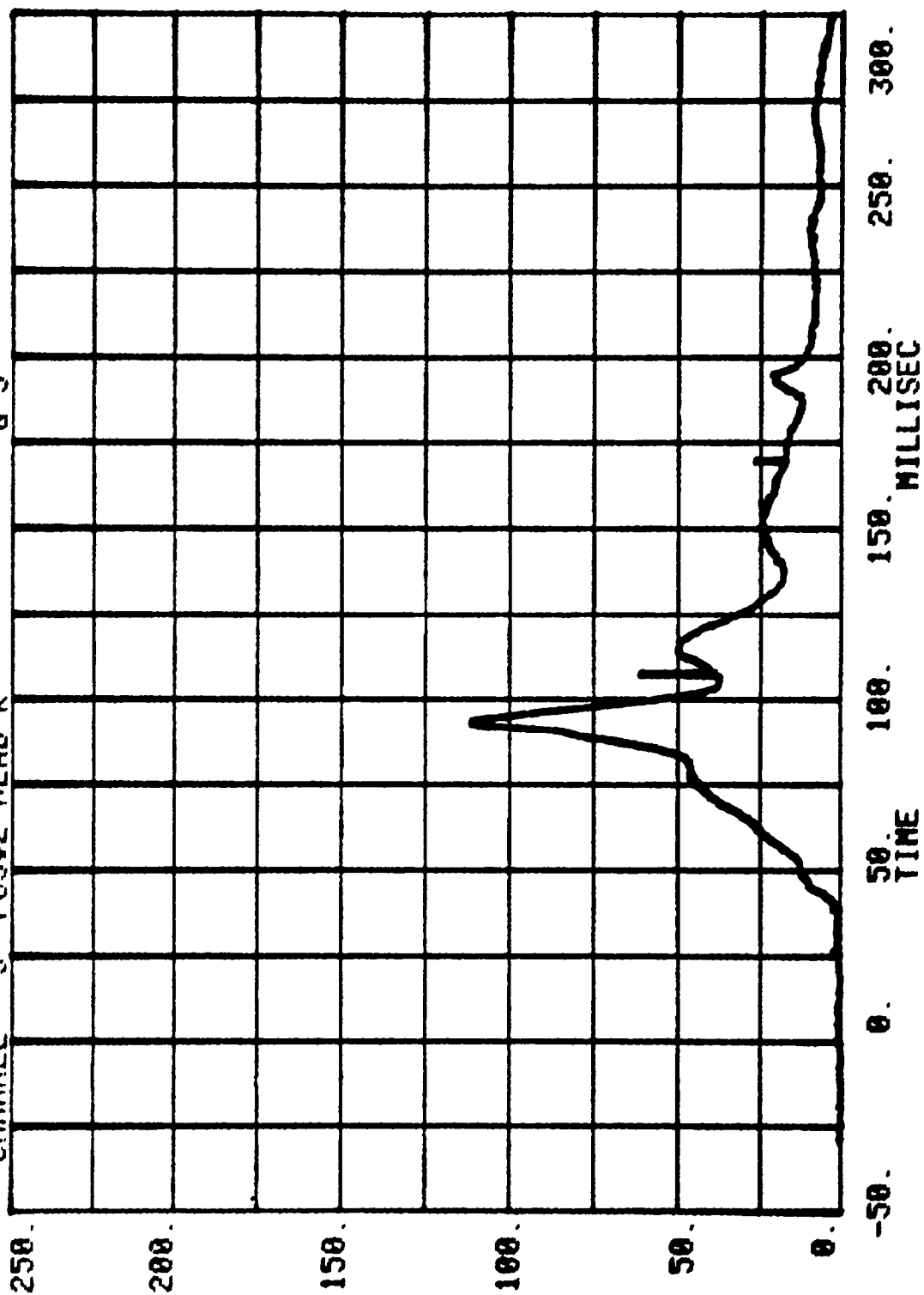
CHANNEL 14 POS#2 HEAD Y RUN= 775 SERIES= 5700 G'S



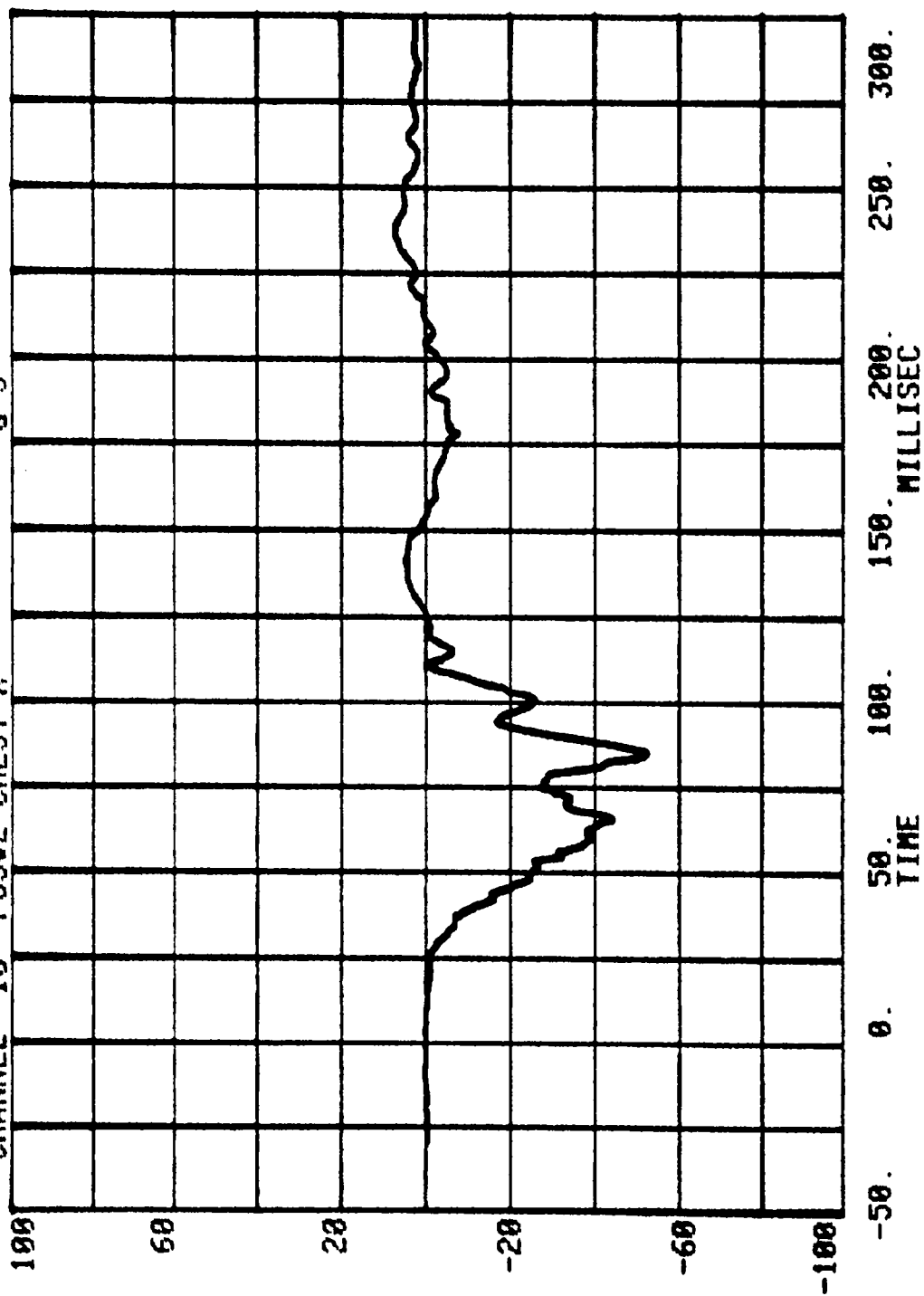
CHANNEL 15 POS#2 HEAD Z RUN= 775 SERIES= 5700 G'S



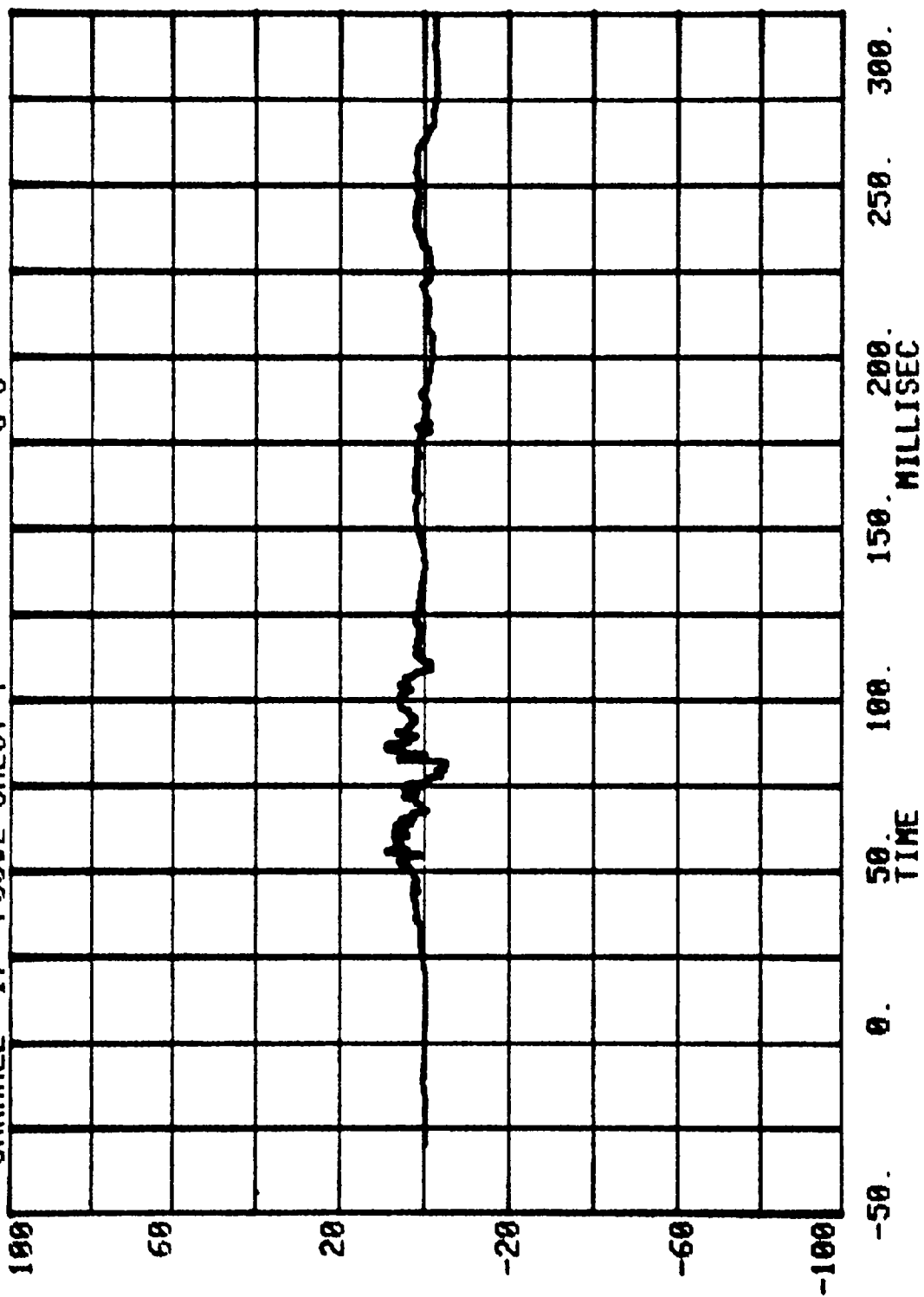
CHANNEL 3 POS#2 HEAD R RUN= 775 SERIES= 5700 G'S



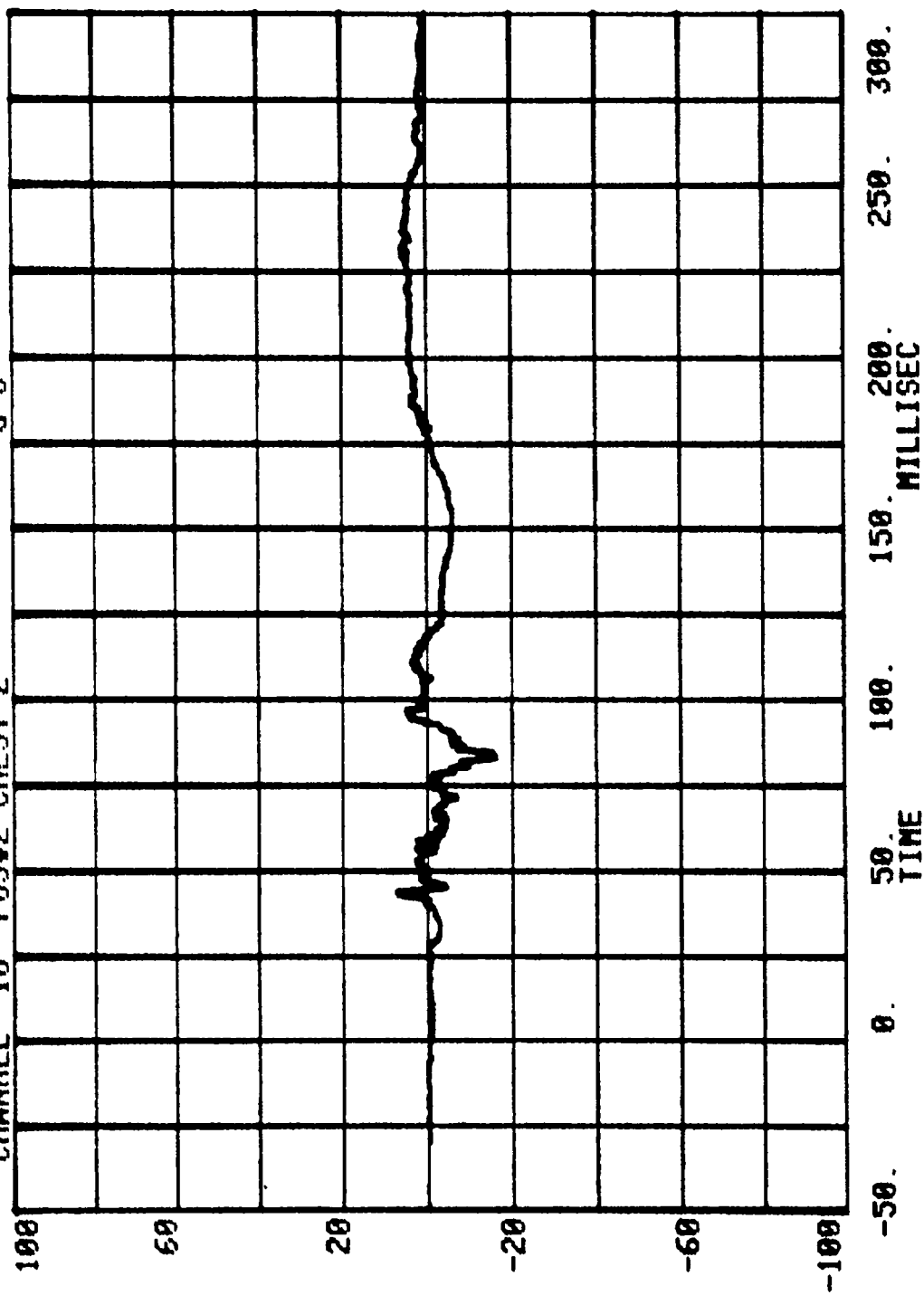
CHANNEL 16 POS#2 CHEST X RUN= 775 SERIES= 5700 G'S



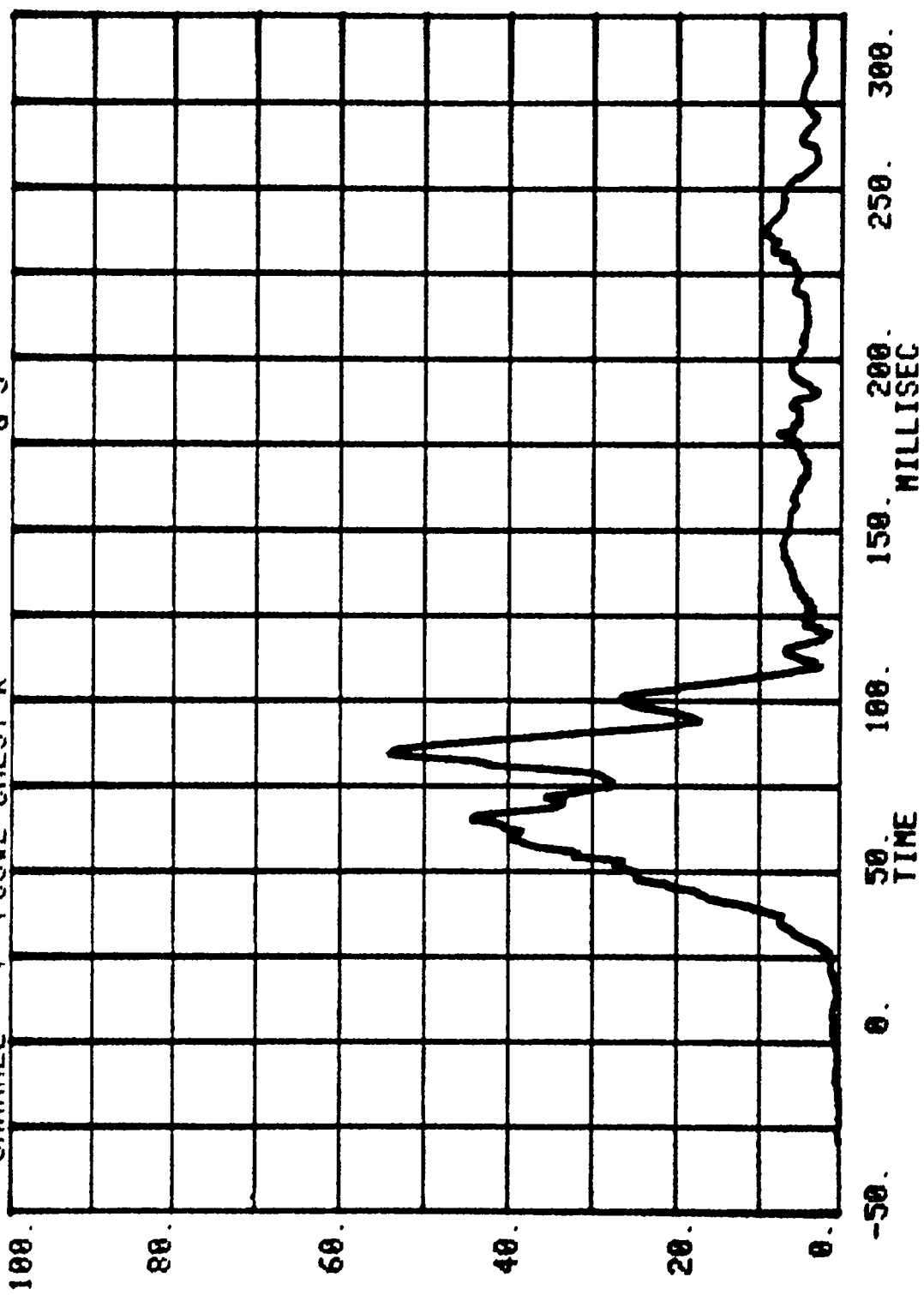
CHANNEL 17 POS#2 CHEST Y RUN= 775 SERIES= 5700 G'S



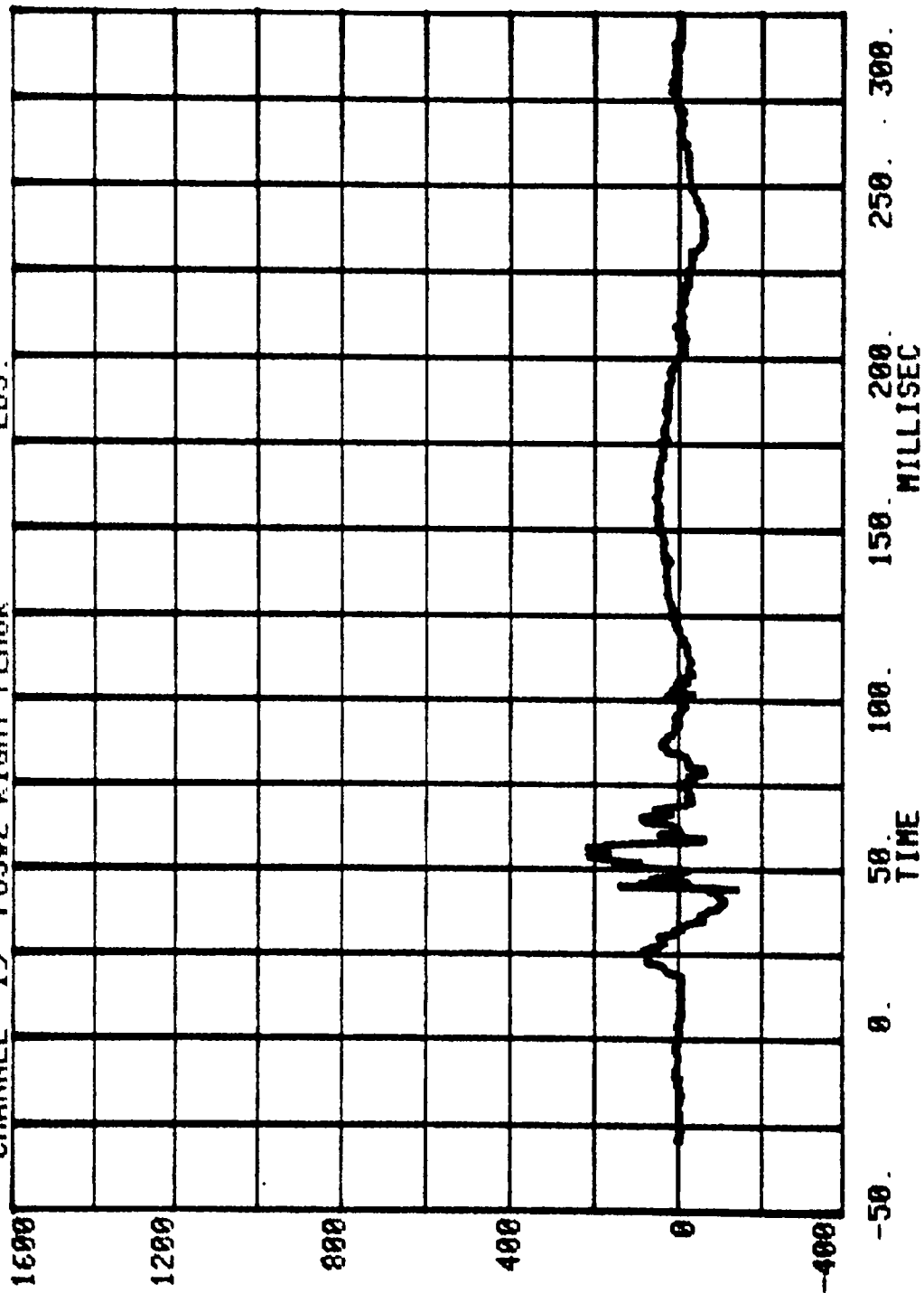
CHANNEL 18 POS#2 CHEST Z RUN= 775 SERIES= 5700 G'S



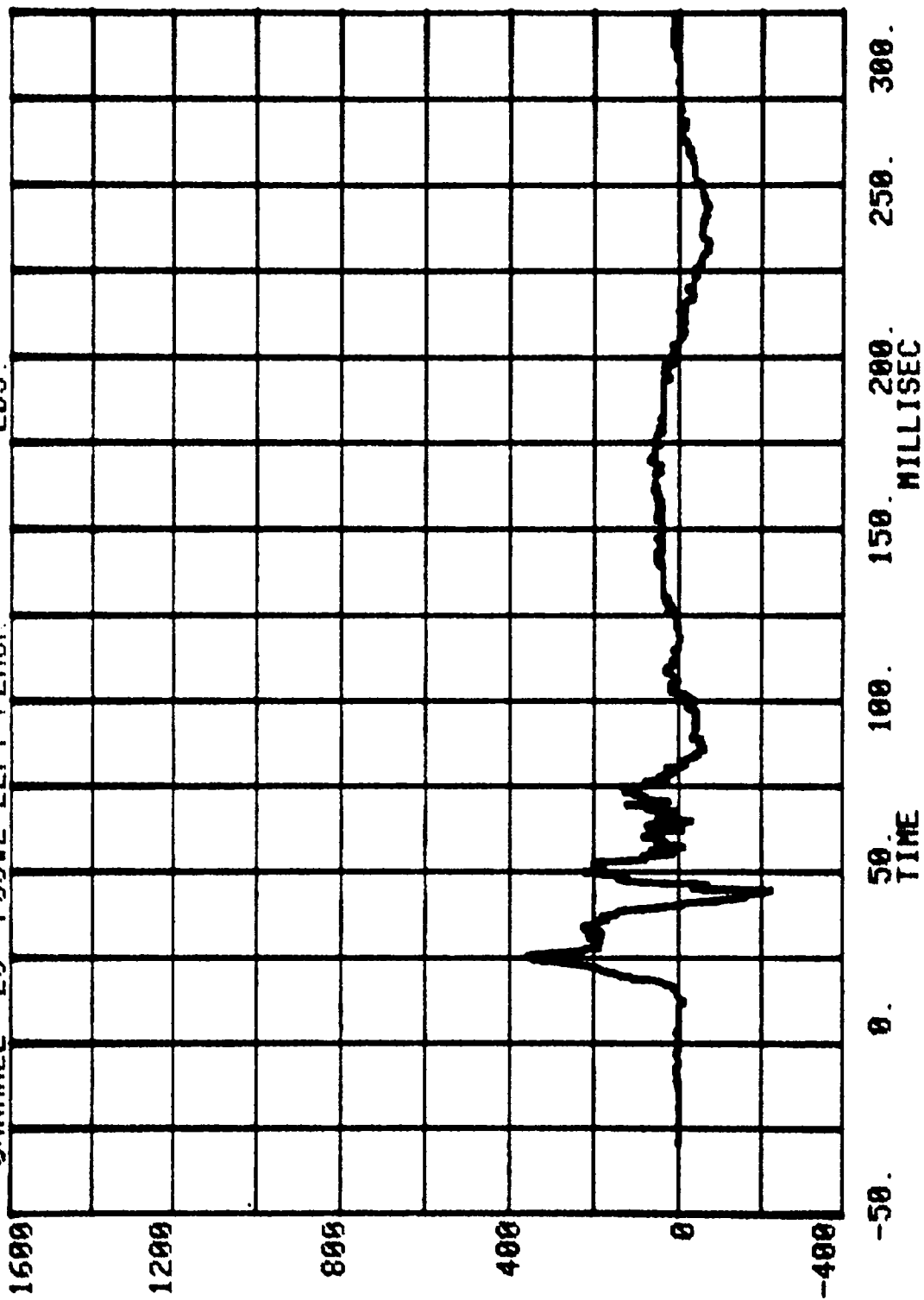
CHANNEL 4 POS#2 CHEST R RUN= 775 SERIES= 5700 G'S



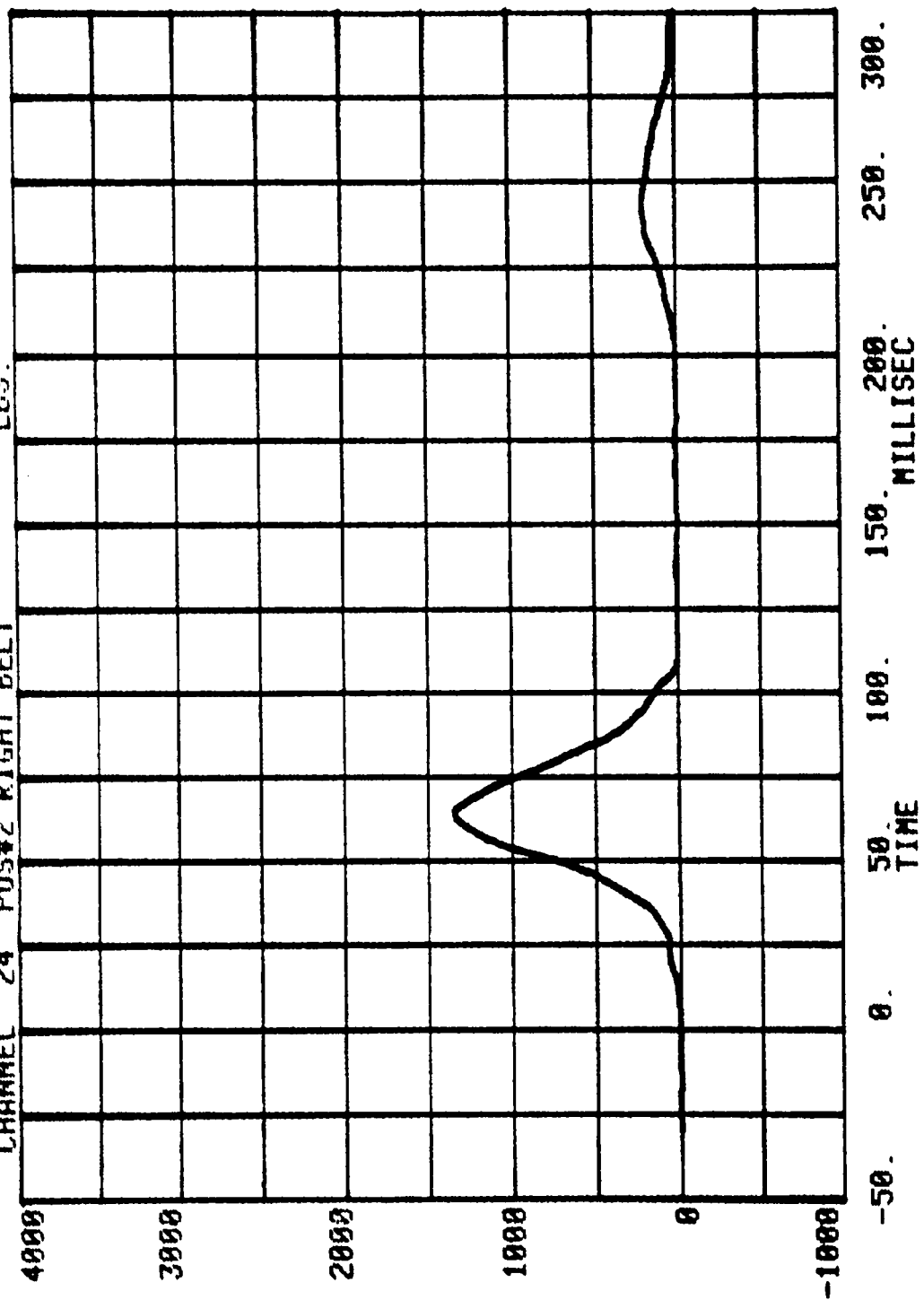
RUN= 775 SERIES= 5790
CHANNEL 19 POS#2 RIGHT FEMUR LBS.



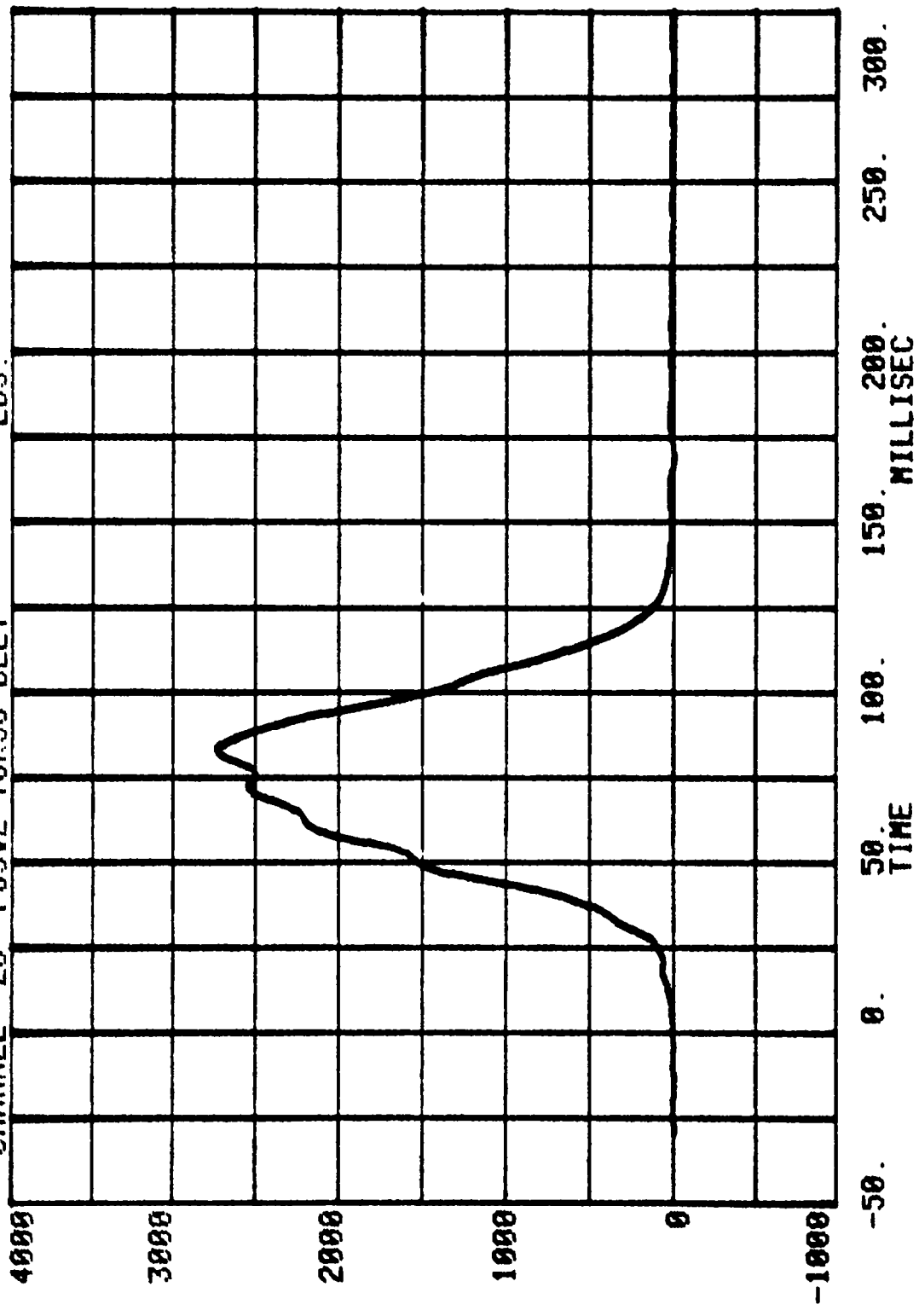
CHANNEL 20 POS#2 LEFT FEMUR RUN= 775 SERIES= 5700 LBS.



CHANNEL 24 POS#2 RIGHT BELT
RUN= 775 SERIES= 5700 LBS.

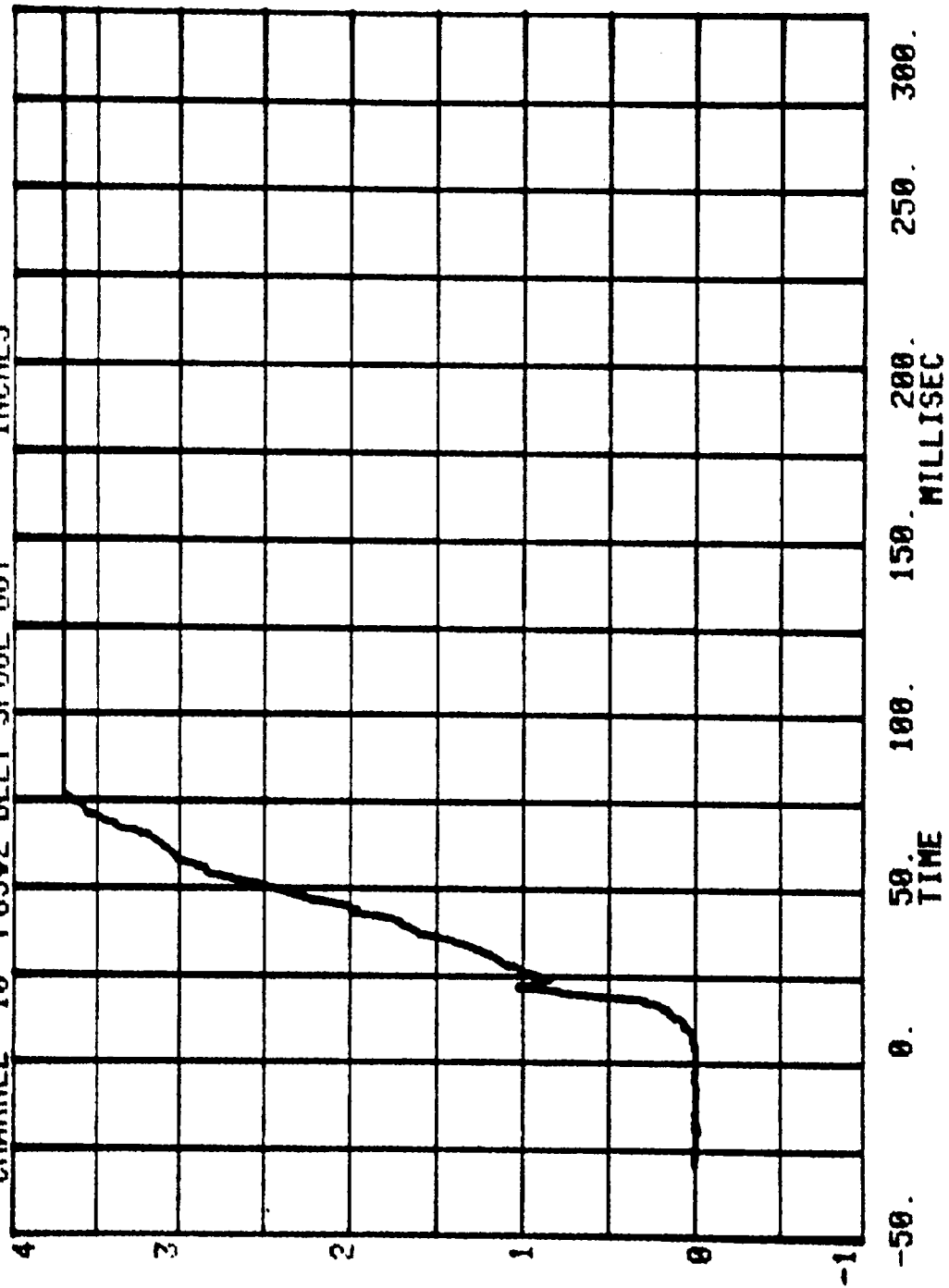


CHANNEL 26 POS#2 TORSO BELT
RUN= 775 SERIES= 5700 LBS.



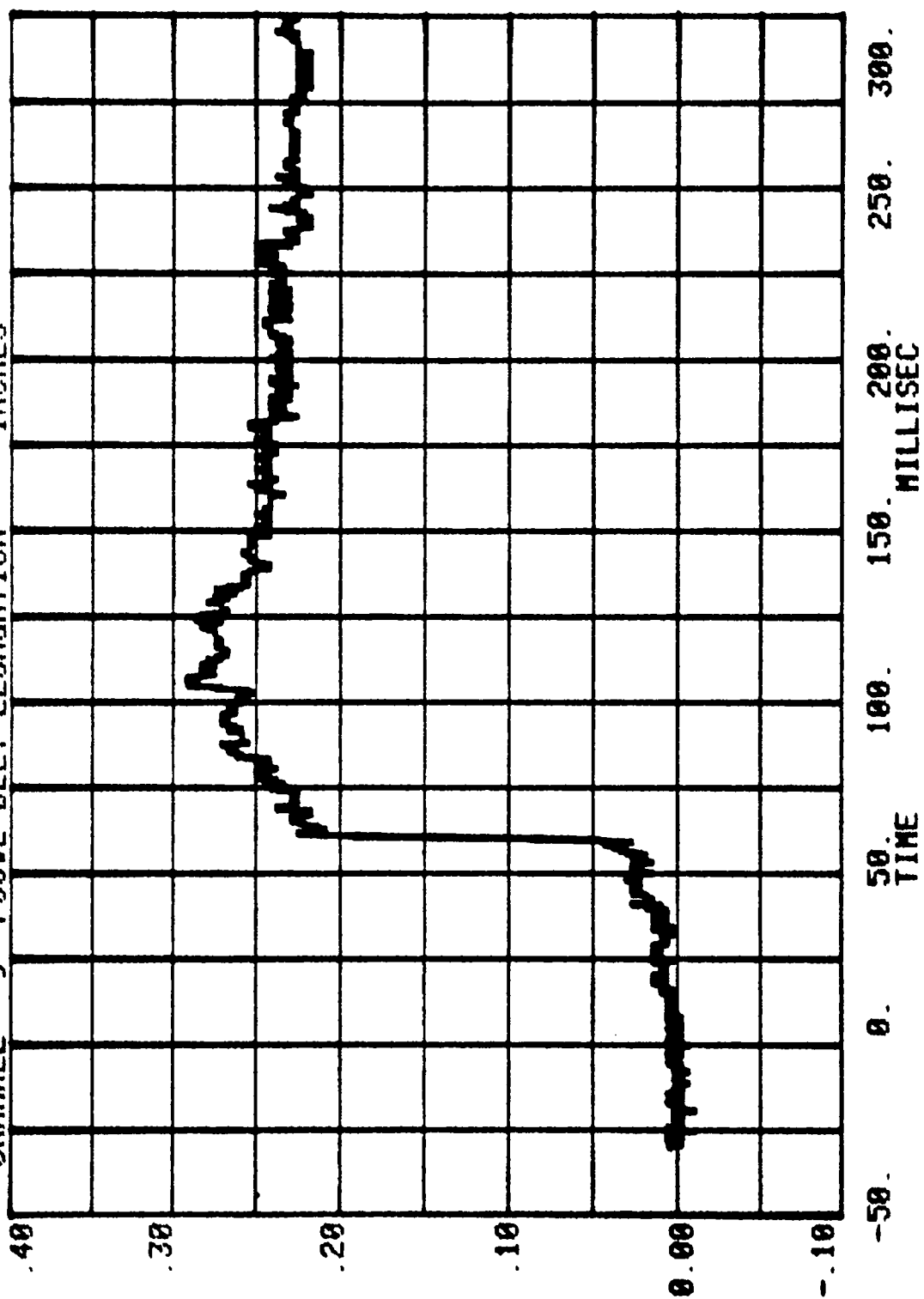
CHANNEL 10 POS#2 BELT SPOOL OUT INCHES

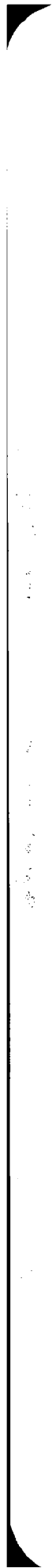
RUN= 775 SERIES= 5700



CHANNEL 3 POS#2 BELT ELONGATION INCHES

RUN= 775 SERIES= 5700





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>
1022	4/7/87
749	4/7/87

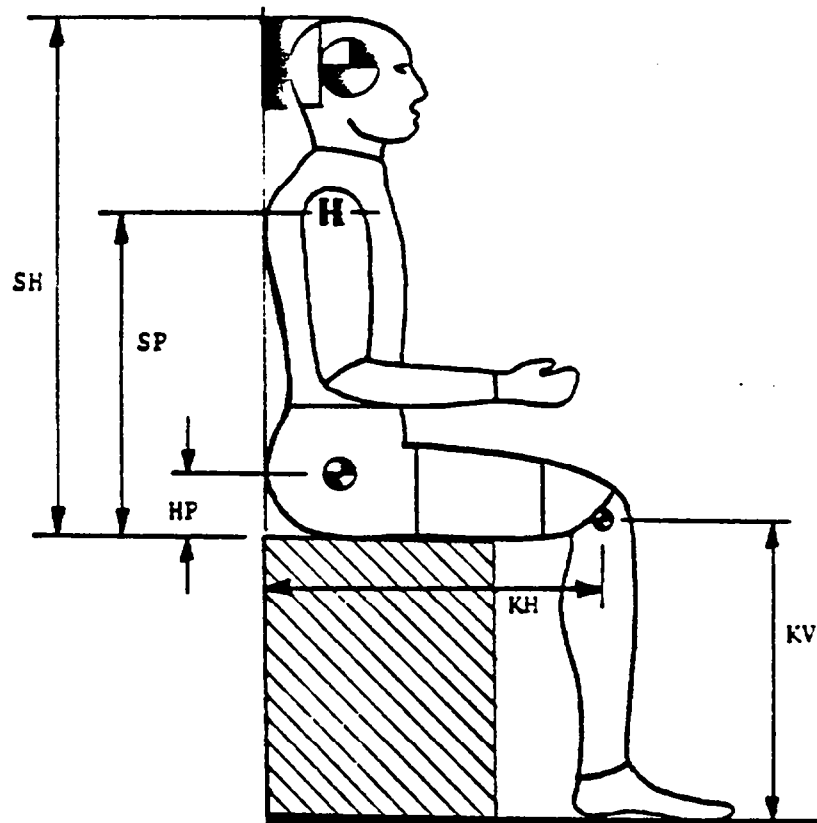
Electronic Test Equipment

The complement of signal conditioning recording and display equipment in conjunction with dummy certification testing can be found in New Car Assessment and Standards Indicant Testing Final Report, Report No. 6525-V-1.

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		4/7/87	
VERIFICATION NUMBER FOR DUMMY*		2	
SH - Seated Height- - - - -	35.6 to 35.8"	35.7"	
SP - Shoulder Pivot Height- - -	21.8 to 22.4"	22.0"	
HP - Hip Pivot Height - - - - -	3.9" ref.	3.9"	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.4"	
KV - Knee Pivot from floor- - -	19.3 to 19.9"	19.5"	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.1"	
HW - Hip Width- - - - -	14.0 to 15.4"	14.6"	

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-----		4/7/87	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		2	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		70-74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		35-50 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	240 g	
b. Peak Lateral Accel.-	≤ - 10G	8 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	21.61 fps	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	23 g	
c. Peak Resultant Head Acceleration. - - - -	26G max.	25.5 g	
d. Pendulum Decel.(t ₂ -t ₁)	≤ - 3ms	2 ms	
e. Pendulum Decel.(t ₃ -t ₂)	25 to 30 ms	27 ms	
f. Pendulum Decel.(t ₄ -t ₃)	≤ - 10ms	4 ms	
g. Max. Head Rotation - -	63 to 73°	67°	
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	29 ms	
	Displ.- 2.1 to 3.1"	2.9"	
60°	Time- - 40.3 to 51.7ms	44 ms	
	Displ.- 4.3 to 5.3"	5.1"	
Maximum (67°)	Time- - 53.2 to 66.8ms	56 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.: 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	69 ms	
	Displ.	4.3 to 5.3 in.	5.0"	
30°	Time	85.4 to 104.6 ms	89 ms	
	Displ.	2.1 to 3.1 in.	2.4"	
0°	Time	101.0 to 123.0 ms	104 ms	
	Displ.	-.5 to 0.5 in.	0.0"	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - -		23 to 36 lbs.	26.5 lbs.	
b. Force @ .75" - - - -		36 to 50 lbs.	39.5 lbs.	
c. Force @ 1.0" - - - -		50 to 63 lbs.	58.5 lbs.	
d. Force @ 1.5" - - - -		73 to 88 lbs.	85.5 lbs.	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - -		22 to 34 lbs.	34 lbs.	
b. Force @ 30° - - - -		34 to 46 lbs.	40.5 lbs.	
c. Force @ 40° - - - -		46 to 58 lbs.	50.5 lbs.	
d. Return Angle - - - -		12° maximum	10°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - - -	21.78-22.22 fps	22.04 fps		
(2) Peak Deflection- - -	1.7" maximum	1.42"		
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	2080 lbs.		
(4) Internal Hysteresis - - -	50 to 70%	57.8%		
b. Low Speed				
(1) Probe Speed- - - -	13.86-14.14 fps	13.92 fps		
(2) Peak Deflection- - -	1.1" maximum	.74"		
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1222 lbs.		
(4) Internal Hyster. - - -	50 to 70%	61.5%		

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)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.03 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2250 lbs.	
(3) Time Above 1000g-	1.7 ms minimum	1.75 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.03 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1880 lbs.	
(3) Time Above 1000g-	1.7 ms minimum	1.99 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1022 CALIB. SEQ. NOS. FOR DUMMY: 2

A. DUMMY INSTRUMENTS:

1. Head Accelerometers --

- a. Triaxial unit - - - - -
- b. Uniaxial units
 - (1) Longitudinal (A_x) -
 - (2) Lateral (A_y) - - -
 - (3) Vertical (A_z) - - -

2. Chest Accelerometers -- (Vehicle Crash Test Usage)

- a. Triaxial unit - - - - -
- b. Uniaxial units
 - (1) Longitudinal (A_x) -
 - (2) Lateral (A_y) - - -
 - (3) Vertical (A_z) - - -

3. Chest Potentiometer - - -

4. Femur Load Cells --

- a. Right Side - - - - -
- b. Left Side - - - - -

B. CALIB. LAB. INSTRUMENTS:

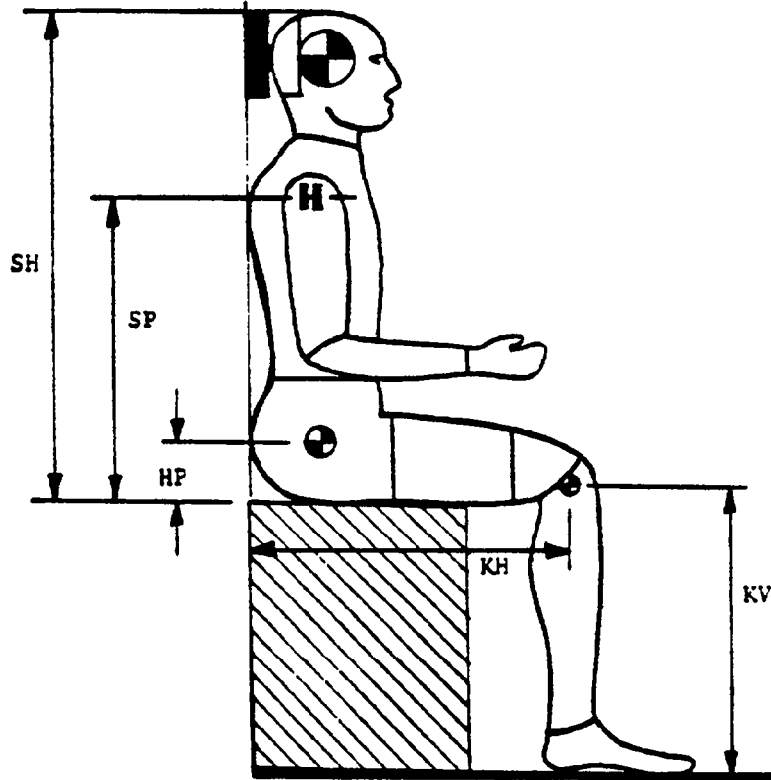
- 1. Pendulum Accelerometer - - -
- 2. Test Probe Accelerometer - - -
- 3. Lumbar Flexion Test Push
Force Gauge - - - - -
- 4. Abdominal Compression Test
Force Gauge - - - - -
- 5. Abdominal Compression Test
Displacement Gauge - - - - -

<u>MANUFACTURER</u>	<u>SERIAL NUMBER</u>	<u>DATE LAST CALIBRATED</u>	<u>DATE OF NEXT CALIBRATION</u>
NA	-----	-----	-----
Endevco	DB47	2-87	8-87
"	CX05	2-87	8-87
"	CJ54	2-87	8-87
NA	-----	-----	-----
CEC	A115	2-87	8-87
Endevco	CS09	2-87	8-87
CEC	A29	2-87	8-87
NA	-----	-----	-----
GSE	75	2-87	8-87
GSE	74	2-87	8-87
CED	18259	2-87	8-87
CED	17815	2-87	8-87
Transducer Inc.	20051	2-87	8-87
BLH	72952	2-87	8-87
CIC	567-11	2-87	8-87

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		4/7/87	
VERIFICATION NUMBER FOR DUMMY*		2	
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"	20.4"	
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"	14.7"	

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-----		4/7/87	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		2	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		70-74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		35-48 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	235 g	
b. Peak Lateral Accel.-	≤ - 10G	2 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	21.58 fps	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	23 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	27 ms	
f. Pendulum Decel.(t ₄ -t ₃)	≤ - 10ms	3 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	28.5 ms	
	Displ.- 2.1 to 3.1"	3.1"	
60°	Time- - 40.3 to 51.7ms	42.7 ms	
	Displ.- 4.3 to 5.3"	5.1"	
Maximum	Time- - 53.2 to 66.8ms	57 ms	
(72 °)	Displ.- 5.0 to 6.0"	5.9"	

*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.: 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	77 ms	
	Displ.	4.3 to 5.3 in.	4.8"	
30°	Time	85.4 to 104.6 ms	94 ms	
	Displ.	2.1 to 3.1 in.	2.5"	
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 lbs.	
b. Force @ .75"- - - - -		36 to 50 lbs.	42.5 lbs.	
c. Force @ 1.0"- - - - -		50 to 63 lbs.	57.5 lbs.	
d. Force @ 1.5"- - - - -		73 to 88 lbs.	82 lbs.	
4. LUMBAR FLEXION TEST:				
a. Force @ 20°- - - - -		22 to 34 lbs.	32 lbs.	
b. Force @ 30°- - - - -		34 to 46 lbs.	42.5 lbs.	
c. Force @ 40°- - - - -		46 to 58 lbs.	54 lbs.	
d. Return Angle - - - - -		12° maximum	5°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - - - -	21.78-22.22 fps	22.04 fps		
(2) Peak Deflection- - - - -	1.7" maximum	1.42"		
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	2184 lbs.		
(4) Internal Hysteresis - - - - -	50 to 70%	62.6%		
b. Low Speed				
(1) Probe Speed- - - - -	13.86-14.14 fps	13.95 fps		
(2) Peak Deflection- - - - -	1.1" maximum	.96"		
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1300 lbs.		
(4) Internal Hyster. - - - - -	50 to 70%	59.7%		

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	6.98 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1995 lbs.	
(3) Time Above 1000g-	1.7 ms minimum	1.71 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.00 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2130 lbs.	
(3) Time Above 1000g-	1.7 ms minimum	1.9 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 749

CALIB. SEQ. NOS. FOR DUMMY: 2

A. DUMMY INSTRUMENTS:

1. Head Accelerometers --

a. Triaxial unit - - - - -

b. Uniaxial units

(1) Longitudinal (A_x) -

(2) Lateral (A_y) - - -

(3) Vertical (A_z) - - -

2. Chest Accelerometers -- (Vehicle Crash Test Usage)

a. Triaxial unit - - - - -

b. Uniaxial units

(1) Longitudinal (A_x) -

(2) Lateral (A_y) - - -

(3) Vertical (A_z) - - -

3. Chest Potentiometer - - -

4. Femur Load Cells --

a. Right Side - - - - -

b. Left Side - - - - -

B. CALIB. LAB. INSTRUMENTS:

1. Pendulum Accelerometer - - -

2. Test Probe Accelerometer - - -

3. Lumbar Flexion Test Push
Force Gauge - - - - -

4. Abdominal Compression Test
Force Gauge - - - - -

5. Abdominal Compression Test
Displacement Gauge - - - - -

MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
NA	-----	-----	-----
Endevco	CK54	2-87	8-87
"	CK78	2-87	8-87
"	CD75	2-87	8-87
NA	-----	-----	-----
CEC	A52	2-87	8-87
Endevco	CL65	2-87	8-87
CEC	A90	2-87	8-87
NA	-----	-----	-----
GSE	77	2-87	8-87
"	76	2-87	8-87
CED	18259	2-87	8-87
"	17815	2-87	8-87
Transducer Inc.	20051	2-87	8-87
BLH	72952	2-87	8-87
CIC	567-11	2-87	8-87