

DOT 547

REPORT NUMBER: RDI-CAL-83-001

NEW VEHICLE ASSESSMENT FOR SIDE IMPACT PROTECTION

1982 VOLKSWAGEN RABBIT - STRUCK VEHICLE

1982 CHEVROLET CITATION - STRIKING VEHICLE

NHTSA NO. 907-1-570

CALSPAN REPORT NO. 7132-V-1

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FINAL REPORT

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16. Abstract This report summarizes the results of a 90° side impact of a 1982 VW Rabbit. The striking vehicle was a 1982 Chevrolet Citation. The VW Rabbit was travelling at 13.4 mph when struck in the side by the Chevrolet Citation. The impact speed of the Citation was 26.8 mph. Instrumented Side Impact Dummies (SID's) were located in the front and rear seating positions on the struck side of the VW Rabbit. The test objectives were to (1) evaluate the structural performance of the Rabbit (and the aggressivity of the Citation), and (2) to provide baseline full-scale data for assessment of the SID performance. This test was performed at Calspan Corporation, Advanced Technology Center for the National Highway Traffic Safety Administration, Contract No. DTNH22-81-C-87088, New Vehicle Assessment for Side Impact Protection.					
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	TEST OBJECTIVES AND PRESENTATION OF RESULTS	1-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	VEHICLE AND DUMMY RESPONSE DATA	B-1

LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	Vehicle #1 Accelerometer Locations - Struck Vehicle	1-7
2	Vehicle #1 Door Accelerometer Locations	1-8
3	Vehicle #1 Exterior Side and Static Crush Profile	1-9
4	Part 572 Dummy In-Vehicle Position (Vehicle #1)	1-11
5	Occupant Clearance Dimensions (Vehicle #1)	1-12
6	Rear Occupant Clearance Dimensions (Vehicle #1)	1-13
7	Vehicle #2 Accelerometer Locations	1-19
8	Pre-Test and Post-Test Measurement Points-Vehicle #2	1-20
9	Camera Locations	1-22

APPENDIX A

Photographs

Vehicle No. 1 - Volkswagen

A-1	Pre-Test Impact Configuration	A-2
A-2	Pre-Test Front View	A-3
A-3	Post-Test Front View	A-4
A-4	Pre-Test Rear View	A-5
A-5	Post-Test Rear View	A-6
A-6	Pre-Test Right Side View	A-7
A-7	Post-Test Right Side View	A-8
A-8	Pre-Test Left Side View	A-9
A-9	Post-Test Left Side View	A-10
A-10	Pre-Test Right Front Three Quarter View	A-11
A-11	Post-Test Right Front Three Quarter View	A-12
A-12	Pre-Test Left Front Three Quarter View	A-13
A-13	Post-Test Left Front Three Quarter View	A-14
A-14	Pre-Test Left Rear Three Quarter View	A-15
A-15	Post-Test Left Rear Three Quarter View	A-16
A-16	Post-Test Driver View	A-17
A-17	Post-Test Driver Head Contact View	A-18
A-18	Post-Test Left Rear Passenger View	A-19
A-19	Post-Test Interior View	A-20

LIST OF FIGURES (continued)

<u>Figure No.</u>	<u>Vehicle No. 2 - Citation</u>	<u>Page No.</u>
A-20	Pre-Test Front View	A-21
A-21	Post-Test Front View	A-22
A-22	Pre-Test Right Side View	A-23
A-23	Post-Test Right Side View	A-24
A-24	Pre-Test Left Side View	A-25
A-25	Post-Test Left Side View	A-26
A-26	Pre-Test Right Front Three Quarter View	A-27
A-27	Post-Test Right Front Three Quarter View	A-28
A-28	Pre-Test Left Front Three Quarter View	A-29
A-29	Post-Test Left Front Three Quarter View	A-30
A-30	Pre-Test Left Rear Three Quarter View	A-31
A-31	Post-Test Left Rear Three Quarter View	A-32

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	Crash Test Summary	1-2
2	General Test & Vehicle #1 Parameter Data	1-3
3	Vehicle #1 Exterior Profiles and Static Crush	1-10
4	Driver Injury Criteria Values	1-14
5	Left Rear Passenger Injury Criteria Values	1-15
6	General Test and Vehicle #2 Parameter Data	1-16
7	Vehicle #2 Measurements	1-21
8	High Speed Camera Locations	1-23

Section 1

TEST OBJECTIVES AND PRESENTATION OF RESULTS

This report documents the results of a 90° side impact test in which a VW Rabbit traveling at 13.4 mph was struck by a Chevrolet Citation moving at 26.8 mph. Instrumented Side Impact Dummies (SID) were located in the front and rear seating positions on the struck (driver) side of the VW Rabbit. The objectives of this test were to provide baseline data on the structural performance of both cars and for assessing the performance of the special-purpose dummies used to evaluate the level of protection afforded to vehicle occupants in side impacts.

All of the results obtained from this test have been included in this report. Included in this document are pre- and post-test photographs, all the vehicle and dummy response transducer data in plotted form, tabular summary of dummy response data, pre- and post-test crush measurements, and identification of instrumentation used and locations of placement. High-speed motion picture coverage of the test event and digital format tapes of the vehicle and dummy responses have been submitted to the sponsor under separate cover.

Table 1

CRASH TEST SUMMARY

TEST NO.	<u>907-1-570</u>	PROJECT	<u>New Vehicle Assessment for Side Impact Protection</u>
DATE	<u>3/3/83</u>	TIME	<u>1405</u> TEMP. <u>52°F</u>
TEST CONDITION	<u>Car-to-Car Side Impact</u>		
VEHICLE NO. 1	<u>1982 Volkswagen Rabbit - Struck Vehicle</u>		
VEHICLE NO. 2	<u>1982 Chevrolet Citation - Striking Vehicle</u>		

	VEH. NO. 1	VEH. NO. 2
TEST WEIGHT (lbs)	<u>2600</u>	<u>3000</u>
IMPACT ANGLE (deg)*	<u>270°</u>	<u>0°</u>
IMPACT VELOCITY (mph)**	<u>13.4</u>	<u>26.8</u>
MAX. CRUSH (in)	<u>11.5</u>	<u>1.7</u>
MAX. INTRUSION (in)	<u>11.75</u>	<u>0</u>

DUMMIES	VEH. NO. 1	VEH. NO. 2
TYPE	<u>Side Impact, 50th Percentile</u>	<u>None</u>
LOCATION	<u>LF(1) LR(4)</u>	
RESTRAINT	<u>None Lap Belt</u>	
I.D. NO.	<u>U03 4</u>	

NUMBER OF DATA CHANNELS	<u>65</u>
NUMBER OF HIGH SPEED CAMERAS	<u>9 + 1</u> Real Time

* WITH RESPECT TO TOW TRACK CENTERLINE

** SPEED TRAP MEASUREMENT (±0.5% ACCURACY)

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA
VEHICLE NO. 1 - STRUCK VEHICLE

TEST VEHICLE INFORMATION

Make/Model VW-Rabbit Body Style 2DSD
Model Year 1982 NHTSA No. 907-1-570 Color White
Engine Data: 4 cylinders, 105 cubic inches
Transmission Data: 4 speed, (X) manual () automatic
Date Rec'd 2/8/83 Air Cond. - Pw. Str. - Pw. Brks. -
Dealer's Name & Address NHTSA
Odometer Reading 0120

DATA FROM CERTIFICATION LABEL ON LEFT DOOR REAR FACE OR "B" POST

Vehicle Manufactured by: VW of America Inc
Date of Manufacture 7/82 VIN IVWBA0178CV116665
GVRW 2822 lbs., GAWR: front 609 lbs., rear 1278 lbs.

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVE BOX, ETC.

Vehicle Load (up to capacity): front 27 psi
rear 31 psi
Recommended Tire Size P155/80R13 Load Range B C D
Recommended Cold Tire Pressure: front 27 psi, rear 31 psi
Tires on Vehicle P155/80R13
Is Spare Tire a "Space Saver?" yes X no
Is Spare Tire Standard Equipment? X yes no
Vehicle Capacity: Types of Seats: bench, X bucket, split bench
Number of Occupants (Designated Seating Capacity): 2 front
2 rear
4 TOTAL
Cargo Load: 185 lbs.
TOTAL = 785 lbs.

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW

Right Front = 630 lbs. Right Rear = 360 lbs.
Left Front = 650 lbs. Left Rear = 350 lbs.
TOTAL FRONT WEIGHT = 1280 lbs. (64.3 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 710 lbs. (35.7 % of Total Vehicle Weight)
TOTAL DELIVERY WEIGHT = 1990 lbs.

CALCULATION FOR TARGET TEST WEIGHT

RCLW = Rated Cargo and Luggage Weight
UDW = Unloaded Delivered Weight (1990 lbs.)
VCW = Vehicle Capacity Weight (785 lbs.)
DSC = Designated Seating Capacity (4)
RCLW = VCW - 150 (DSC) = 185 lbs.
Target Test Weight = UDW + RCLW + (2 dummies X 164 lbs./dummy)
Target Test Weight = 2503 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 98 POUNDS CARGO

Right Front = 750 lbs. Right Rear = 550 lbs.
Left Front = 740 lbs. Left Rear = 560 lbs.
TOTAL FRONT WEIGHT = 1490 lbs. (57.3 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1110 lbs. (42.7 % of Total Vehicle Weight)
TOTAL TEST WEIGHT = 2600 lbs.
Weight of ballast secured in vehicle trunk area = 0 lbs.

VEHICLE ATTITUDE (all dimensions in inches)

Delivered Attitude:	RF	<u>25.2</u>	LF	<u>25.2</u>	RR	<u>24.2</u>	LR	<u>24.4</u>
Test Attitude:	RF	<u>23.7</u>	LF	<u>24.0</u>	RR	<u>21.8</u>	LR	<u>21.8</u>

Remarks: Wheel Base = 94 inches
Vehicle C/G as tested was 40.1 inches rearward of
Front Wheel C

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA

Car-to-Car
Type of Test Side Impact Impact Angle 270°
Date of Test 3/3/83 Time of Test 1405
Ambient Temperature 52°F °F at impact area -
Temperature in Occupant Compartment 70 °F
Windshield Molding Temperature - °F
Required Impact Velocity Range: 12.5 to 13.5 mph
Impact Velocity: primary = 13.4 mph, secondary 13.4 mph

VEHICLE REBOUND AND CRUSH (inches)

Side Impact

Vehicle Length: Pre-test = R - C - L -
Post-test = R - C - L -
Crush = R - C - L -
Distance from front of test vehicle to point of impact:
R - C/L - L -

VISIBLE DUMMY CONTACT POINTS

	<u>Driver</u>		<u>Passenger</u>	
	<u>Left Side Window & Hood of Veh. #2</u>		<u>Left Roof Header</u>	
Head				
Chest	<u>-</u>		<u>-</u>	
Abdomen	<u>-</u>		<u>-</u>	
Left Knee	<u>-</u>		<u>-</u>	
Right Knee	<u>-</u>		<u>-</u>	

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>Not Operable</u>	<u>Operable</u>	<u>Not Operable</u>	<u>Operable</u>
	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

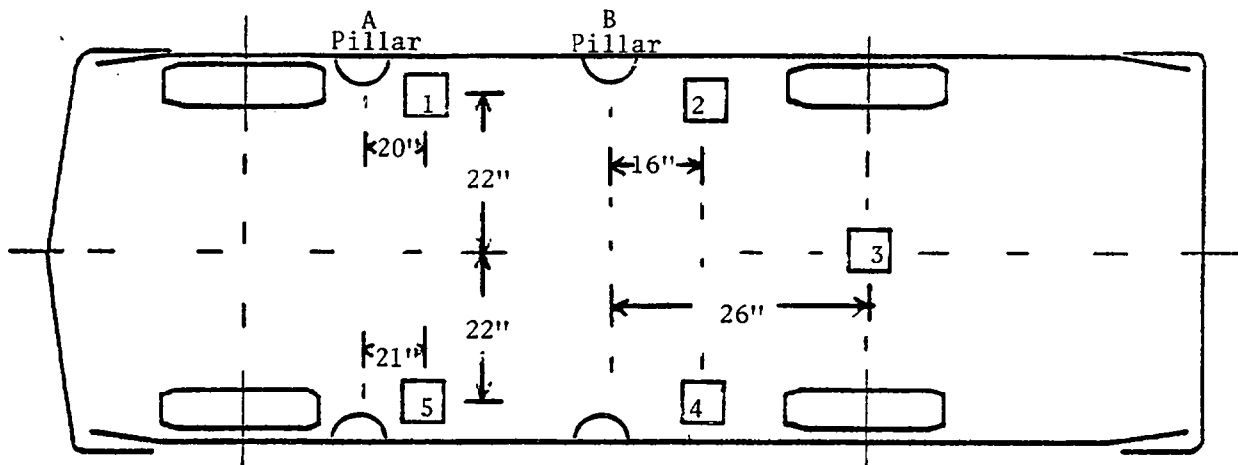
GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

<u>Seat Movement</u>	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	—	—	—	—
Seat Shift (in.)	<u>2 In. Right</u>	—	—	—
	<u>Left Driver Seat</u>			
	<u>Separated from Seat Track</u>			

Glazing Damage

Backlight/Windshield Both Left Side Windows shattered

Other notable impact effects: —

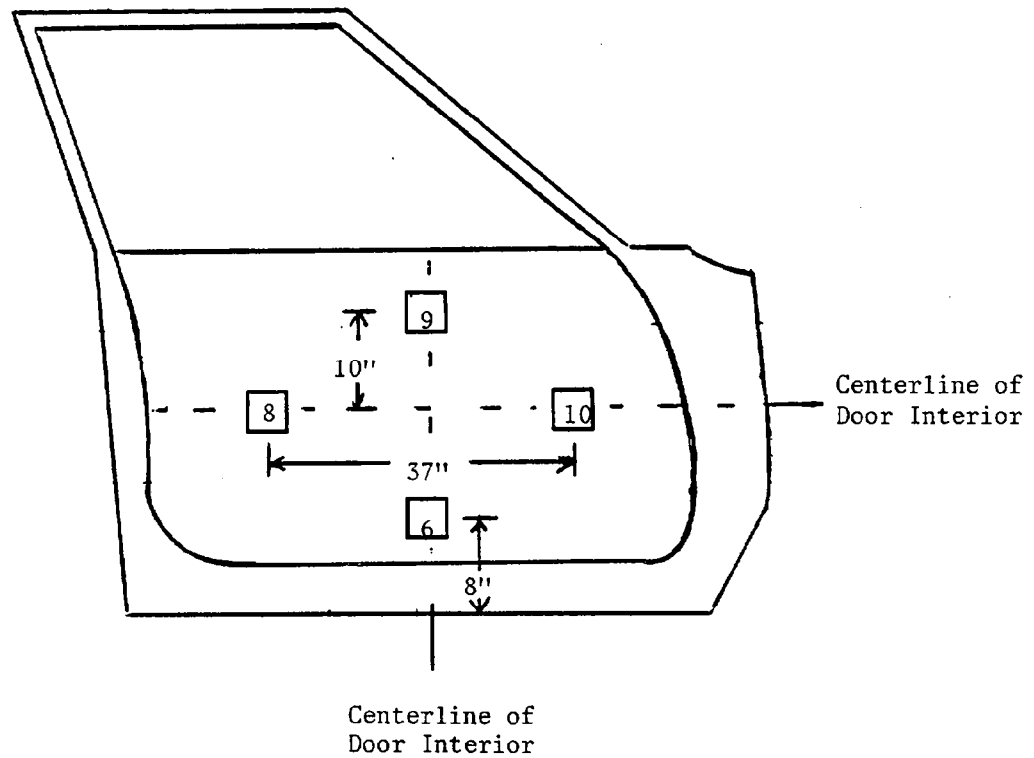


TOP VIEW

ACCELEROMETER NUMBER *	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Right Front Sill	X	X	X
2	Right Rear Sill	X	X	X
3	Deck over Rear Axle	X	X	X
4	Left Rear Sill		X	
5	Left Front Sill		X	

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

FIGURE 1 VEHICLE NO. 1 ACCELEROMETER LOCATIONS - STRUCK VEHICLE



Accelerometer Number	Accelerometer Location	Direction		
		X	Y	Z
6	Bottom Door $\mathcal{C}$		X	
8	Mid Rear Door		X	
9	Upper Door $\mathcal{C}$		X	
10	Mid Front of Door		X	

FIGURE 2 DOOR ACCELEROMETER LOCATIONS
VEHICLE NO. 1 1982 VOLKSWAGEN RABBIT

VEHICLE NO. 1 - 1982 VOLKSWAGEN RABBIT

TOP VIEW

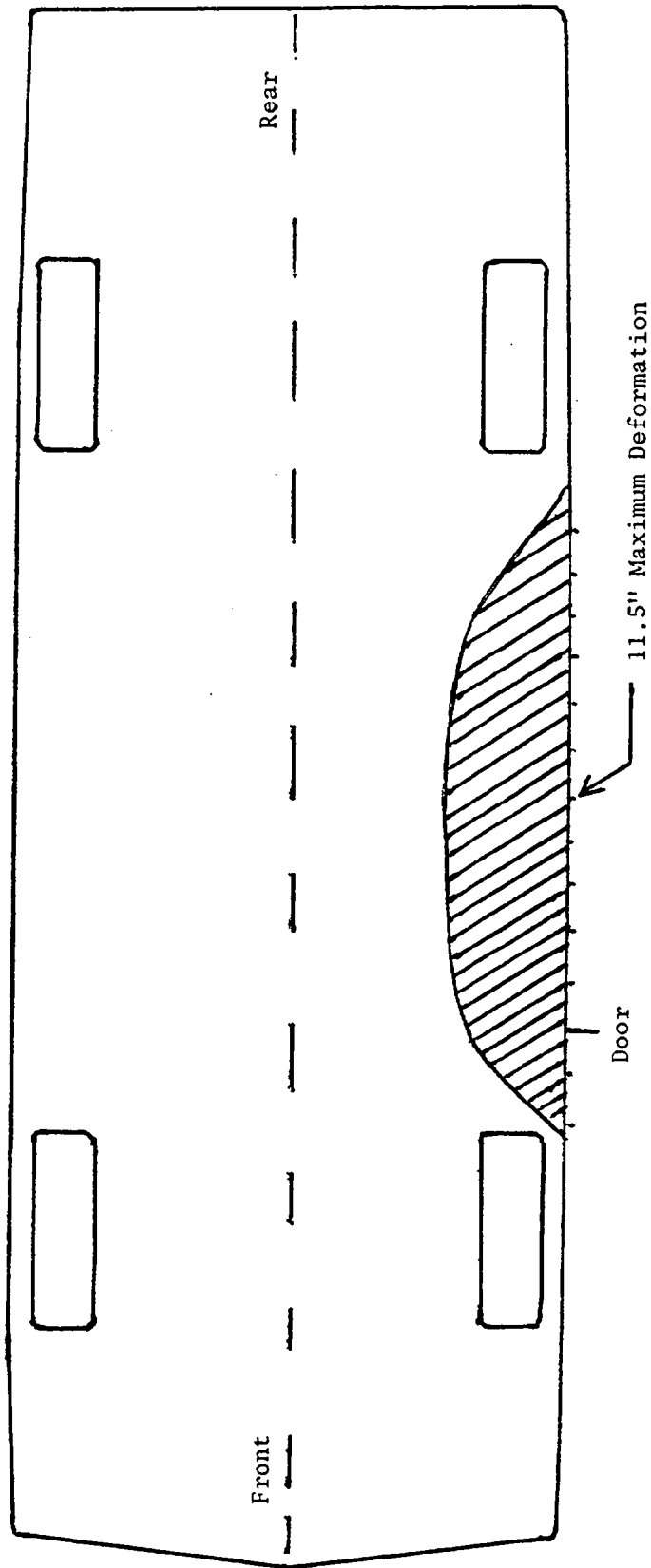


FIGURE 3 VEHICLE NO. 1 EXTERIOR SIDE STATIC CRUSH PROFILE

Table 3

TEST VEHICLE EXTERIOR PROFILE AND STATIC CRUSH
VEHICLE NO. 1 - 1982 VOLKSWAGEN RABBIT

Location	Height (in.)	Zero Distance Starting at D.O.R.(in.)																	
		24	18	12	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
Window Top	52.5								19.0	18.9	18.9	18.8	18.8	18.8	18.9	19.1	19.4	19.4	
Window Sill	35.5								12.7	12.7	12.6	12.6	12.6	12.7	12.7	12.8	12.9	13.0	
Door Center	24.0			10.9	11.3	11.2	11.2	11.1	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0			
Axle Height	10.5				14.1	14.0	14.0	14.0	14.0	14.1	14.1	14.3	14.3	14.3	14.3	14.3			
Post-Test Profile (in.)																			
Window Top								17.5	17.5	17.6	17.6	17.6	17.8	20.1	20.0	20.1	20.0	19.8	
Window Sill								20.8	21.0	21.5	22.2	22.2	22.2	22.5	21.0	18.6	16.0	13.6	
Door Center			12.8	13.6	21.7	22.0	22.1	22.3	22.5	22.5	22.5	22.5	22.5	22.0	20.2	17.7			
Axle Height				14.8	20.3	20.7	20.7	20.1	19.5	19.8	18.9	18.5	18.5	18.2	18.1	15.9			
Post-Test Static Crush (in.)																			
Window Top								+1.5	+1.4	+1.3	+1.2	+1.0	-1.3	-1.1	-1.0	-0.6	-0.4		
Window Sill								-8.1	-8.3	-8.9	-9.6	-9.6	-9.8	-8.3	-5.8	-3.1	-0.6		
Door Center			-1.9	-2.3	-10.5	-10.8	-11.0	-11.3	-11.5	-11.5	-11.5	-11.5	-11.5	-9.2	-6.7				
Axle Height				-0.7	-6.3	-6.7	-6.7	-6.1	-5.5	-5.7	-4.6	-4.2	-3.9	-3.8	-2.6				

*Zero plane set up 12 inches from rear wheel hub and 12 inches from front wheel hub. This plane was set up parallel to the vehicle centerline.

FIGURE 4
PART 572 DUMMY IN-VEHICLE POSITION

Test No. 907-1-570

Vehicle 1982 Volkswagen Rabbit

SEAT TYPE:

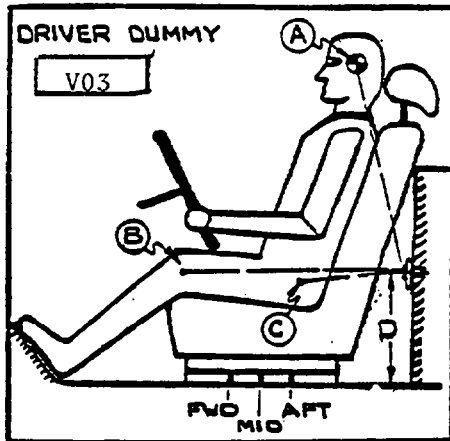
 Bench
 X Bucket
 Split Bench

ADJUSTER TYPE:

 X Manual
 Power

BUCKET SEAT BACK TYPE:

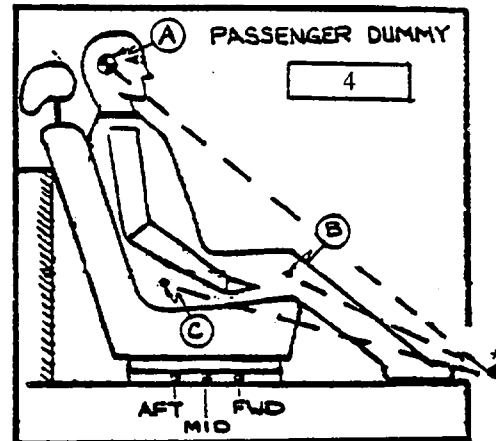
 Fixed
 X Adjustable Reclining



A = 21 in. 30 Degrees
B = 32.6 in. 92 Degrees
C = 19 in. 115 Degrees
D = 17 in.

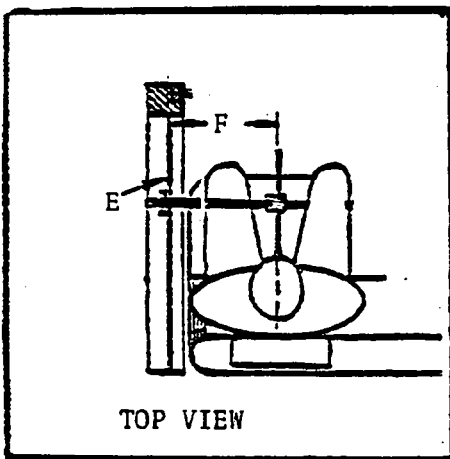
MEASUREMENT LOCATION

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

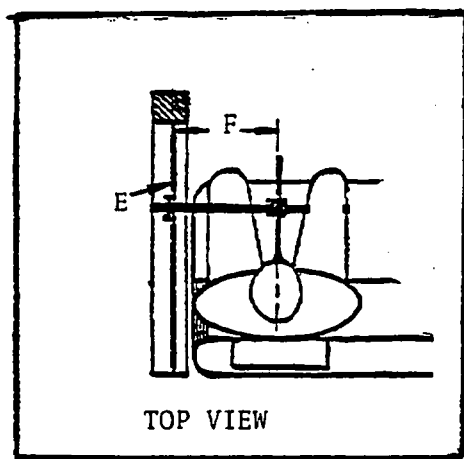


A = 55 in. 30 Degrees
B = 24 in. 45 Degrees
C = 34 in. 19 Degrees

*Rear corner of rear seat track



E = glass height 11 in.
F = glass to driver ϕ 12 in.

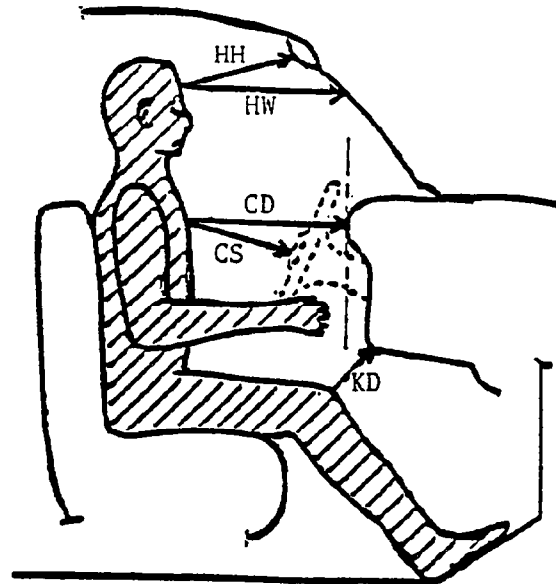


E = glass height 12 in.
F = glass to driver ϕ 11 in.

DRIVER

HH	14.2
HW	18
CD	18.5
CS	11
KDL	3.2
KDR	3.8
SA	25°
TA	18°

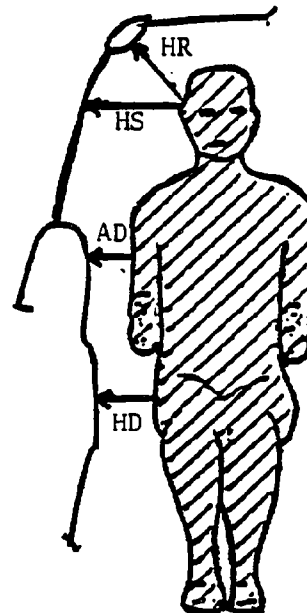
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD = Knee to Dash
 SA = Seat Back Angle
 TA = Torso Angle



HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door

DRIVER

HR	6.5
HS	8.0
AD	4.0
HD	5.5



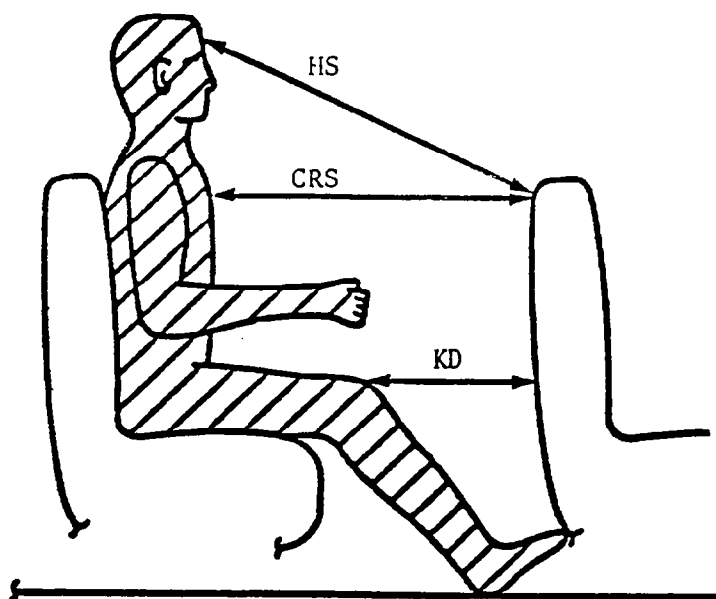
VEHICLE NO. 1 - 1982 VOLKSWAGEN RABBIT

Figure 5 OCCUPANT CLEARANCE DIMENSIONS

PASSENGER

HFS	24
CFS	18.5
KDL	6.5
KDR	6.5

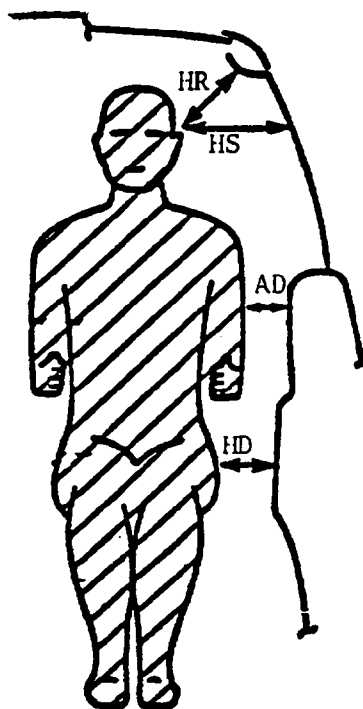
HFS Head to front seat
CFS Chest to front seat
KD Knee to front seat



PASSENGER

HR	6.5
HS	7.5
AD	4.5
HD	4.5

HR Head to side header
HS Head to side window
AD Arm to door
HD Hip to door



VEHICLE NO. 1 - 1982 VOLKSWAGEN RABBIT

Figure 6 REAR OCCUPANT CLEARANCE DIMENSIONS

Table 4
DUMMY INJURY CRITERIA VALUES
MAXIMUM ACCELERATIONS ("Gs")

Vehicle No. 1 - 1982 Volkswagen Rabbit

Position #1 - Driver

	X	Y	Z	Resultant
Head	- 9.2	34.8	52.3	54.3
T01	10.7	74.7	17.7	64.2*
T01(R)**		75.7		
T12	-35.1	70.5	-10.3	62.0*
T12(R)**		70.0		
LUR		85.6		
LUR(R)**		88.4		
LLR		78.7		
LLR(R)**		80.9		
Pelvic	17.1	130.9	-22.4	131.2
Hic	206.6			
T1 (sec)	.05497			
T2 (sec)	.07515			
Ave. Acc ("Gs")	40.2			
Head Severity	322.5			
Chest Pot	1.5 inches max. stroke			

*As defined in FMVSS 208, PAR. S6.3

**Redundant

Table 5
DUMMY INJURY CRITERIA VALUES
MAXIMUM ACCELERATIONS ("Gs")

Vehicle No. 1 - 1982 Volkswagen Rabbit

Position #4 - Left Rear Passenger

	X	Y	Z	Resultant
Head	-27.3	102.7	23.4	103.0
T01	-36.9	74.5	26.6	71.6*
T01(R)**		77.8		
T12	95.0	75.2	-16.9	76.9*
T12(R)**		74.7		
LUR		224.0		
LUR(R)**		98.8		
LLR		119.1		
LLR(R)**		112.6		
Pelvic	-36.7	97.7	-31.5	
Hic	493.4			
T1 (sec)	.05715			
T2 (sec)	.07620			
Ave. Acc ("Gs")	58.3G's			
Head Severity	705.8			
Chest Pot	1.4 inches max. stroke			

*As defined in FMVSS 208, PAR. S6.3

**Redundant

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW

Right Front = 820 lbs. Right Rear = 490 lbs.
Left Front = 830 lbs. Left Rear = 480 lbs.
TOTAL FRONT WEIGHT = 1650 lbs. (63.0 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 970 lbs. (37.0 % of Total Vehicle Weight)
TOTAL DELIVERY WEIGHT = 2620 lbs.

CALCULATION FOR TARGET TEST WEIGHT

RCLW = Rated Cargo and Luggage Weight
UDW = Unloaded Delivered Weight (2620 lbs.)
VCW = Vehicle Capacity Weight (875 lbs.)
DSC = Designated Seating Capacity (5)
RCLW = VCW - 150 (DSC) = 125 lbs.
Target Test Weight = UDW + RCLW + (2 dummies X 164 lbs./dummy)
Target Test Weight = 3073 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND - POUNDS CARGO

Right Front = 900 lbs. Right Rear = 630 lbs.
Left Front = 880 lbs. Left Rear = 590 lbs.
TOTAL FRONT WEIGHT = 1780 lbs. (59.3 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1220 lbs. (40.7 % of Total Vehicle Weight)
TOTAL TEST WEIGHT = 3000 lbs.
Weight of ballast secured in vehicle trunk area = 380 lbs.

VEHICLE ATTITUDE (all dimensions in inches)

Delivered Attitude: RF 27.5 LF 27.6 RR 26.5 LR 26.5
Test Attitude: RF 26.1 LF 26.0 RR 25.5 LR 25.2
Remarks: Wheel Base = 104.5

Vehicle C/G was 42.5 inches rearward of front wheel

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA

Type of Test Car-to-Car
Side Impact Impact Angle 0 °
Date of Test 3/3/83 Time of Test 1405
Ambient Temperature 52 °F at impact area
Temperature in Occupant Compartment - °F
Windshield Molding Temperature - °F
Required Impact Velocity Range: 25 to 27 mph
Impact Velocity: primary = 26.8 mph, secondary - mph

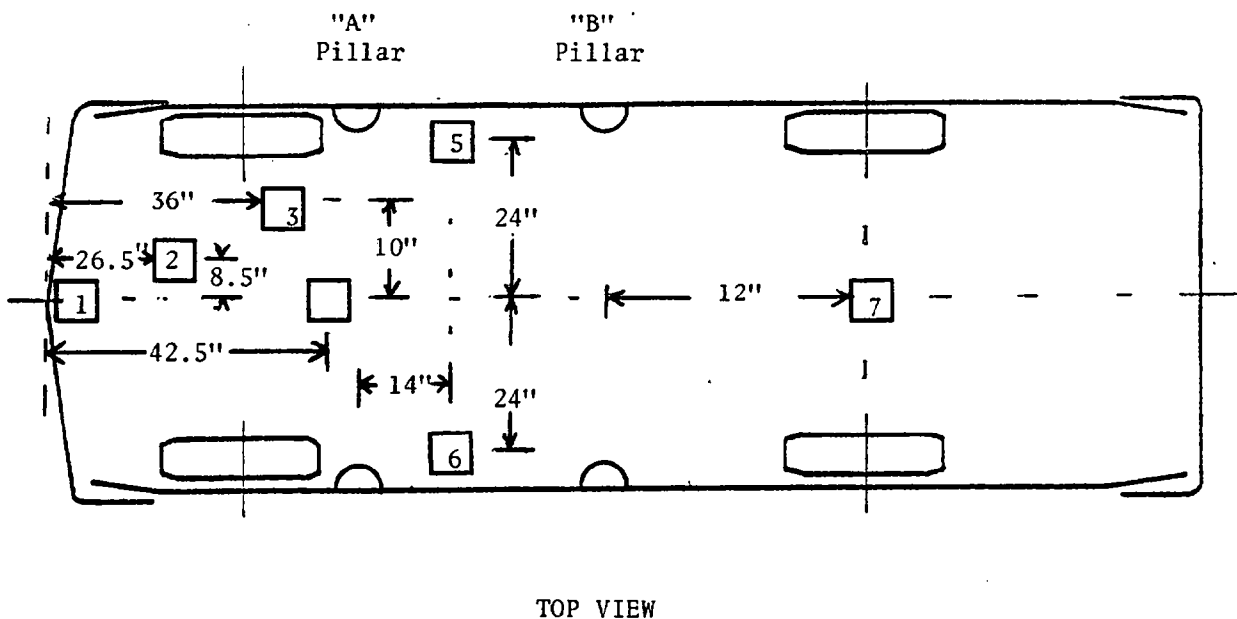
VEHICLE REBOUND AND CRUSH (inches)

Vehicle Length: Pre-test = R 174.5 C 177.0 L 174.5
Post-test = R 173.2 C 175.6 L 172.8
Crush = R 1.3 C 1.4 L 1.7
Distance from front of test vehicle to point of impact:
R - C/L - L -

VISIBLE DUMMY CONTACT POINTS

	<u>Driver</u>	<u>Passenger</u>
Head	<u>No Dummy</u>	<u>No Dummy</u>
Chest	<u></u>	<u></u>
Abdomen	<u></u>	<u></u>
Left Knee	<u></u>	<u></u>
Right Knee	<u></u>	<u></u>

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
	<u>Operable</u>	<u>Operable</u>	<u>Operable</u>	<u>Operable</u>
Door Opening	<u></u>	<u></u>	<u></u>	<u></u>
	<u></u>	<u></u>	<u></u>	<u></u>
	<u></u>	<u></u>	<u></u>	<u></u>



ACCELEROMETER NUMBER *	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Bumper	X		
2	Engine	X	X	X
3	Frame	X		
4	Firewall	X	X	X
5	Right Front Sill	X		
6	Left Front Sill	X		
7	Trunk Floor	X	X	

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

FIGURE 7 VEHICLE NO. 2 ACCELEROMETER LOCATIONS

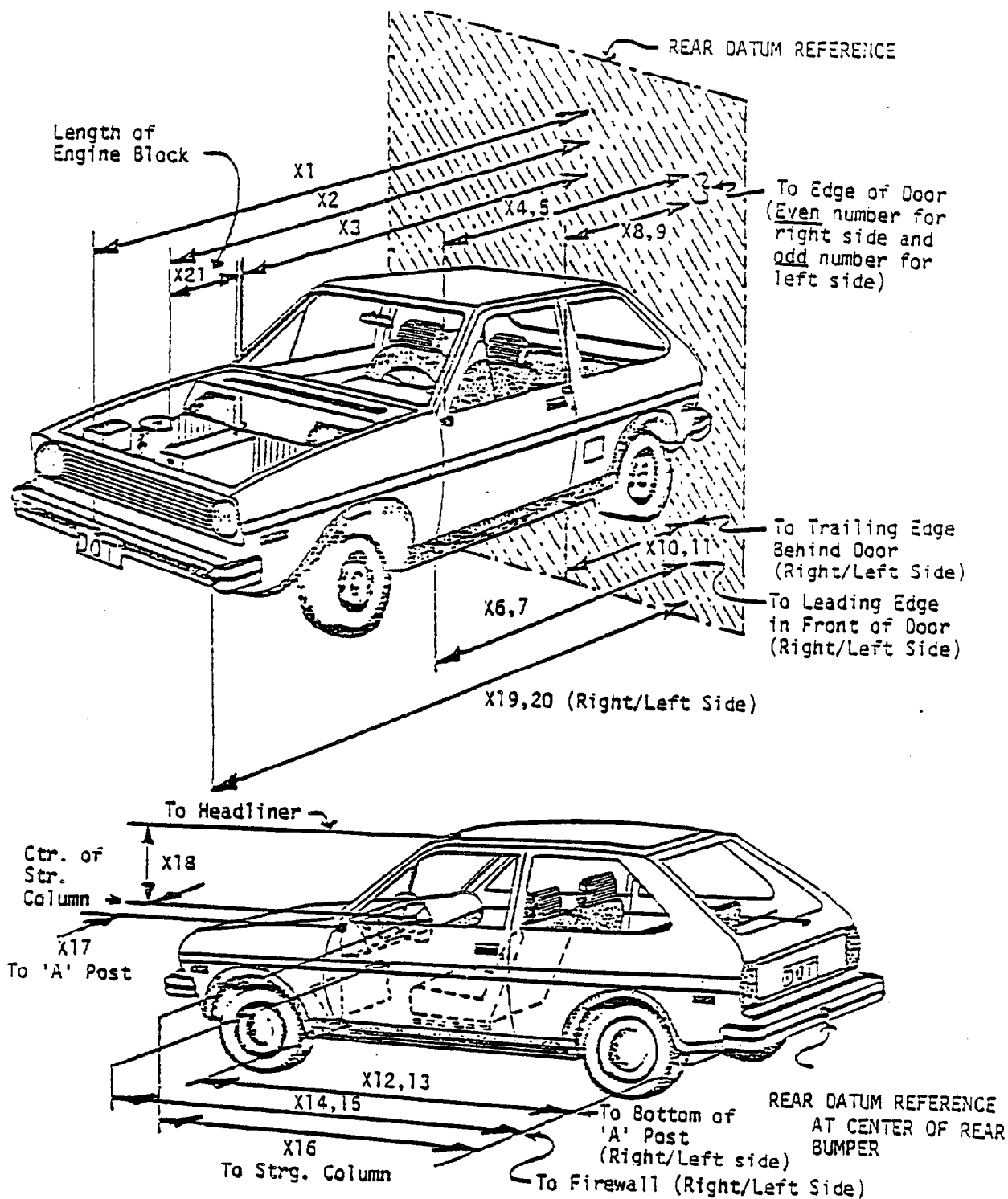


Figure 8 PRE-TEST AND POST-TEST MEASUREMENT POINTS - VEHICLE NO. 2

Table 7

VEHICLE MEASUREMENTS

VEHICLE NO. 2 1982 CHEVROLET CITATION

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	177.0	175.6	1.4
X2	Rear Surface of Vehicle to Front of Engine	153.7	153.7	0
X3	Rear Surface of Vehicle to Firewall	132.4	132.4	0
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	121.3	121.1	.2
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	121.3	120.9	.4
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	121.1	121.1	0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	121.1	121.1	0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	80.2	80.0	.2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	80.1	79.8	.3
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	81.9	81.8	.3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	81.9	81.8	.1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	121.1	121.1	0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	121.1	121.1	0
X14	Rear Surface of Vehicle to Firewall, Right Side	130.1	130.1	0
X15	Rear Surface of Vehicle to Firewall, Left Side	129.2	129.2	0
X16	Rear Surface of Vehicle to Steering Column	102.5	102.5	0
X17	Center of Steering Column to "A" Post	18.4	18.4	0
X18	Center of Steering Column to Headliner	17.3	17.3	0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	174.5	173.2	1.3
X20	Rear Surface of Vehicle to Left Side of Front Bumper	174.5	172.8	1.7
X21	Length of Engine Block	14.0	14.0	0

Note: Camera Information Shown on Table.

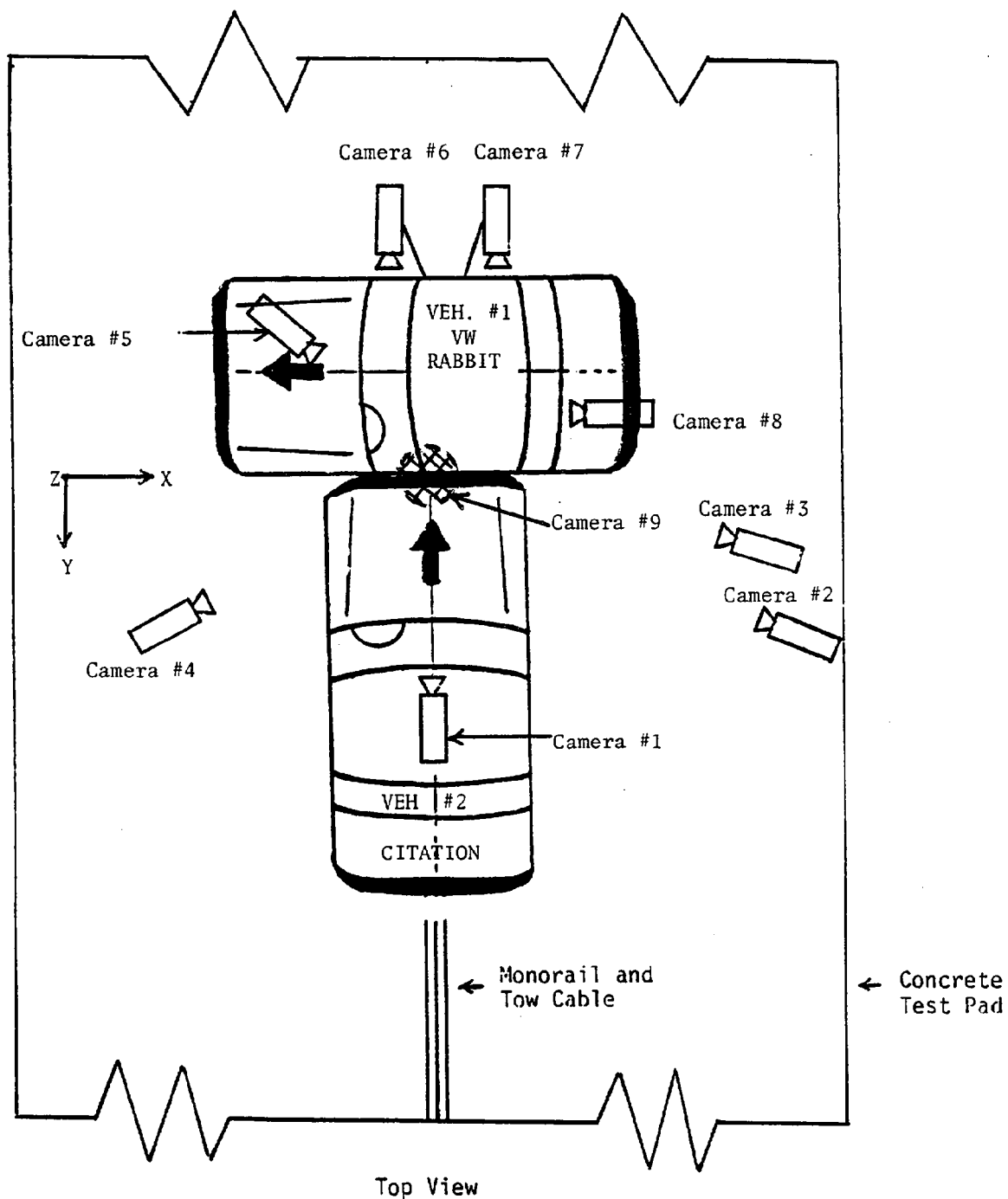


Figure 9 CAMERA LOCATIONS

Table 8

HIGH-SPEED CAMERA LOCATIONS

Vehicle No. 1 1982 Volkswagen Rabbit
Vehicle No. 2 1982 Chevrolet Citation

Test No. 970-1-570

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Side of Vehicle No. 1	-	-	-	-	-	8	-
2	Right Side of Impact	213	96	40	0	-	25	775
3	Right Side of Impact (close)	192	77	12	+2	-	50	800
4	Left Side of Impact	174	84	44	+1	-	13	900
5	Driver	-	-	-	-	52	8	1000
6	Driver	-	-	-	-	48	8	875
7	Left Rear Passenger	-	-	-	-	54	8	900
8	Left Rear Passenger	-	-	-	-	22	8	900
9	Over-head Camera	0	0	366	-90	-	13	900

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

APPENDIX A

PHOTOGRAPHS

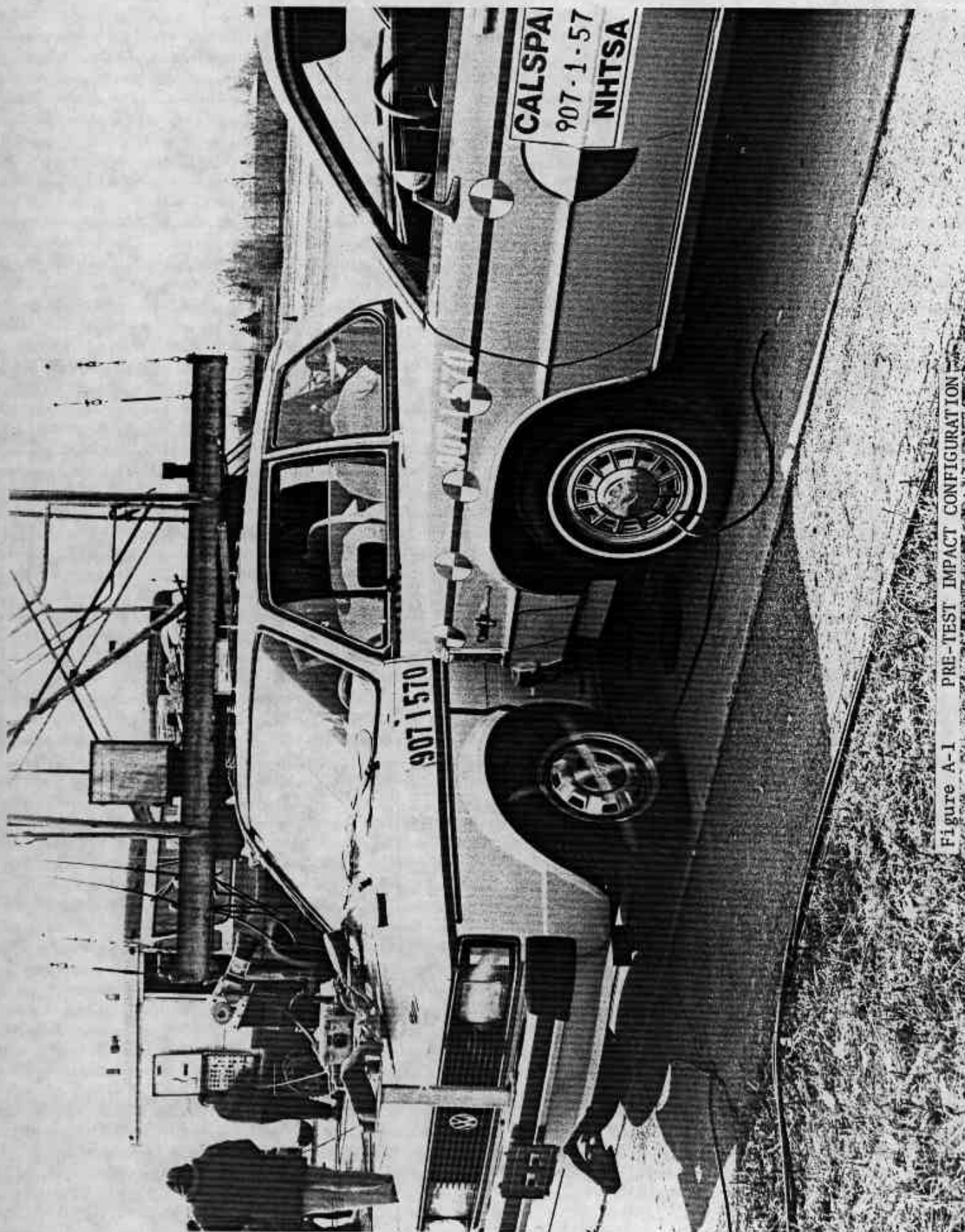


Figure A-1 PRE-TEST IMPACT CONFIGURATION

A-2

7132-V-1



Figure A-2 PRE-TEST FRONT VIEW

A-3

7132-V-1

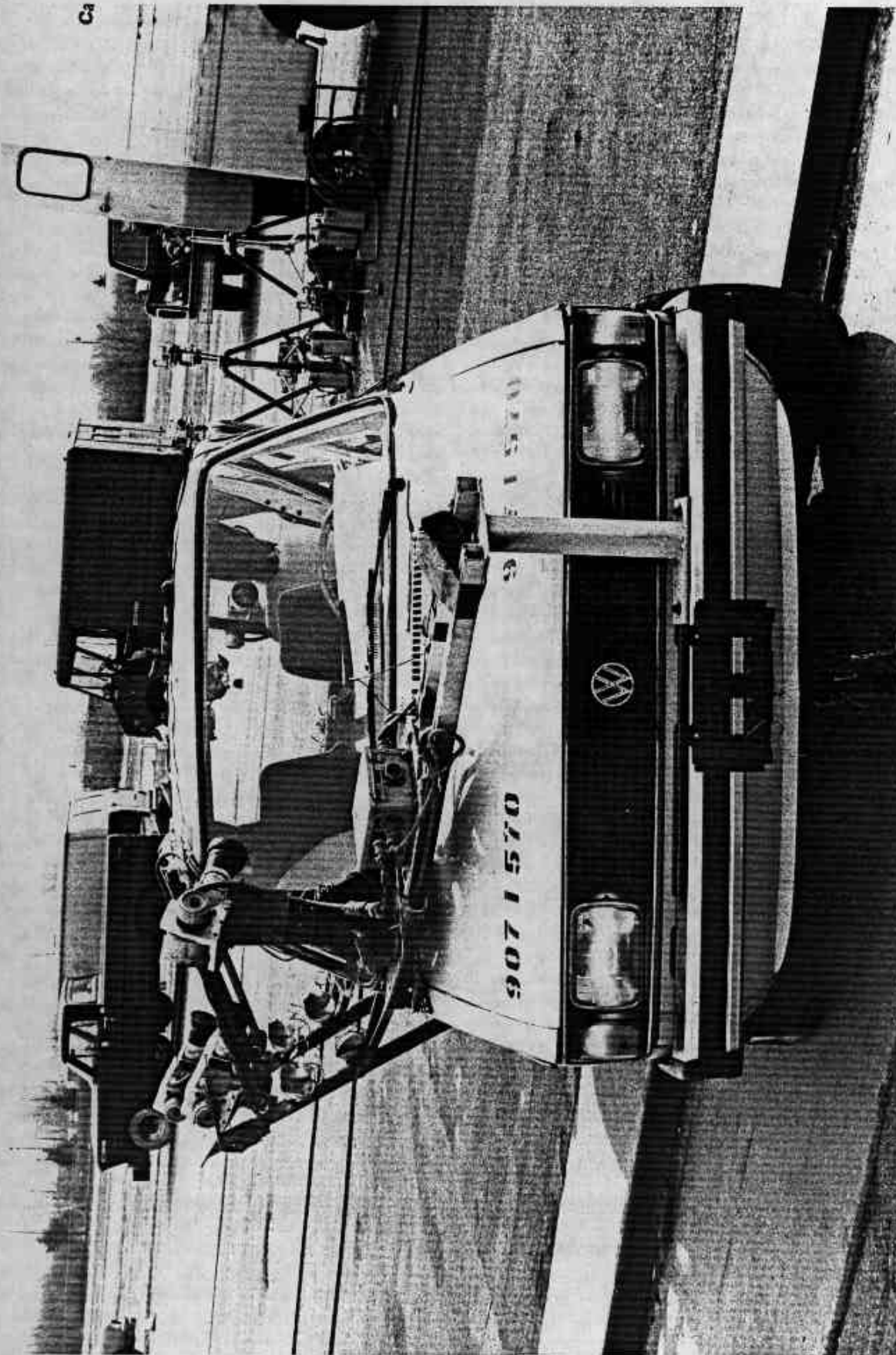


Figure A-3 POST-TEST FRONT VIEW

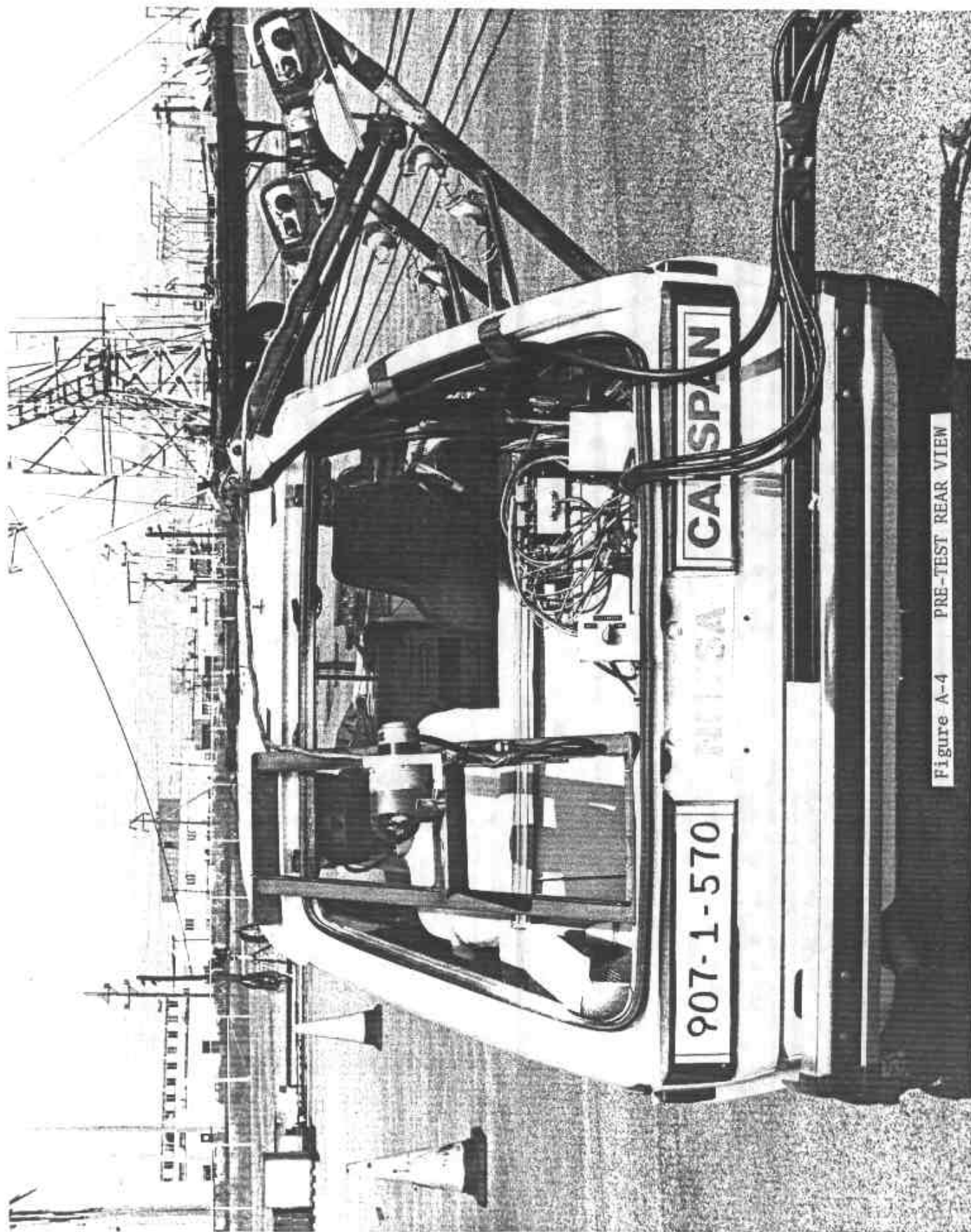


Figure A-4 PRE-TEST REAR VIEW

A-5

7132-V-1

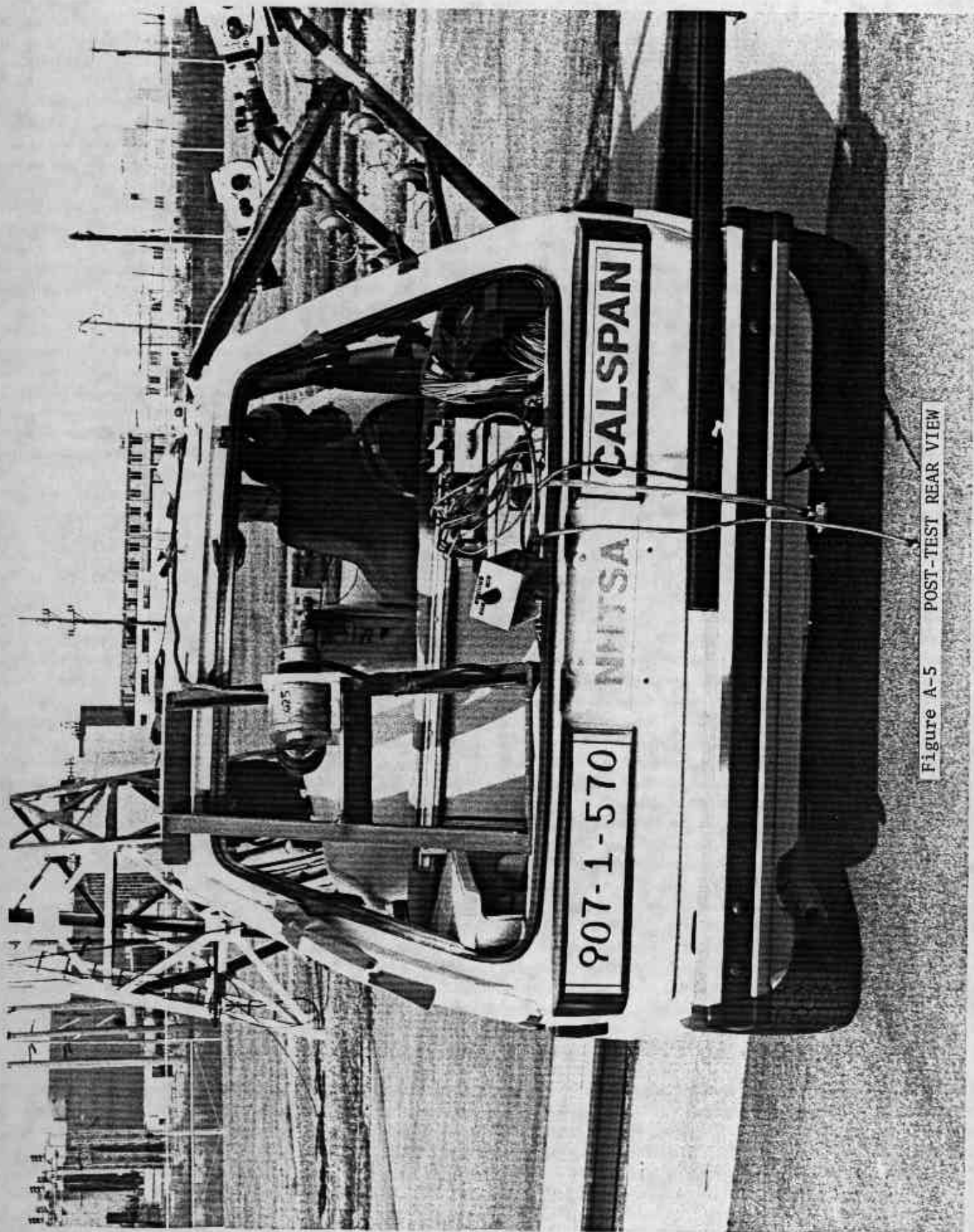


Figure A-5 POST-TEST REAR VIEW

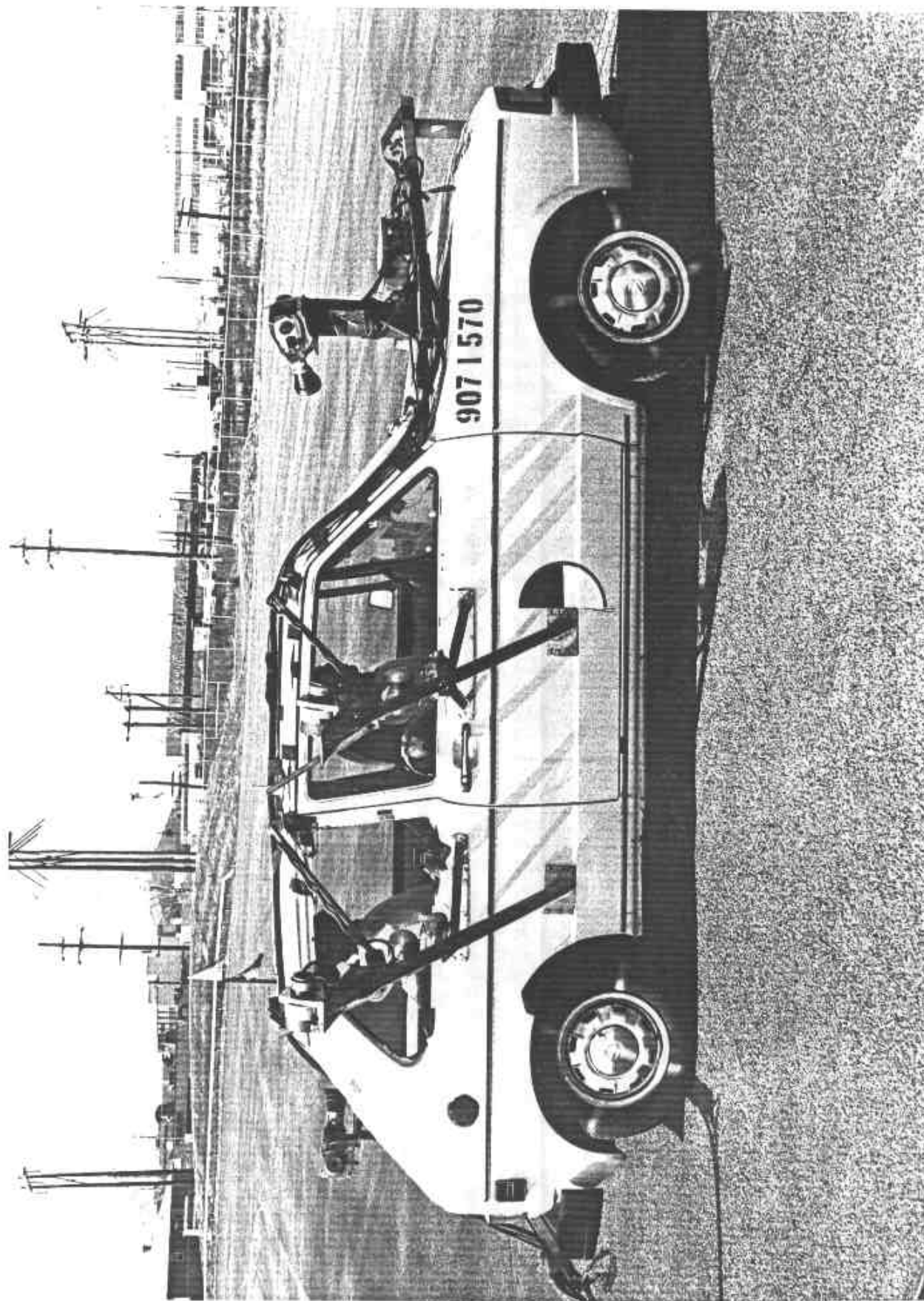


Figure A-6 PRE-TEST RIGHT SIDE VIEW

A-7

7132-V-1

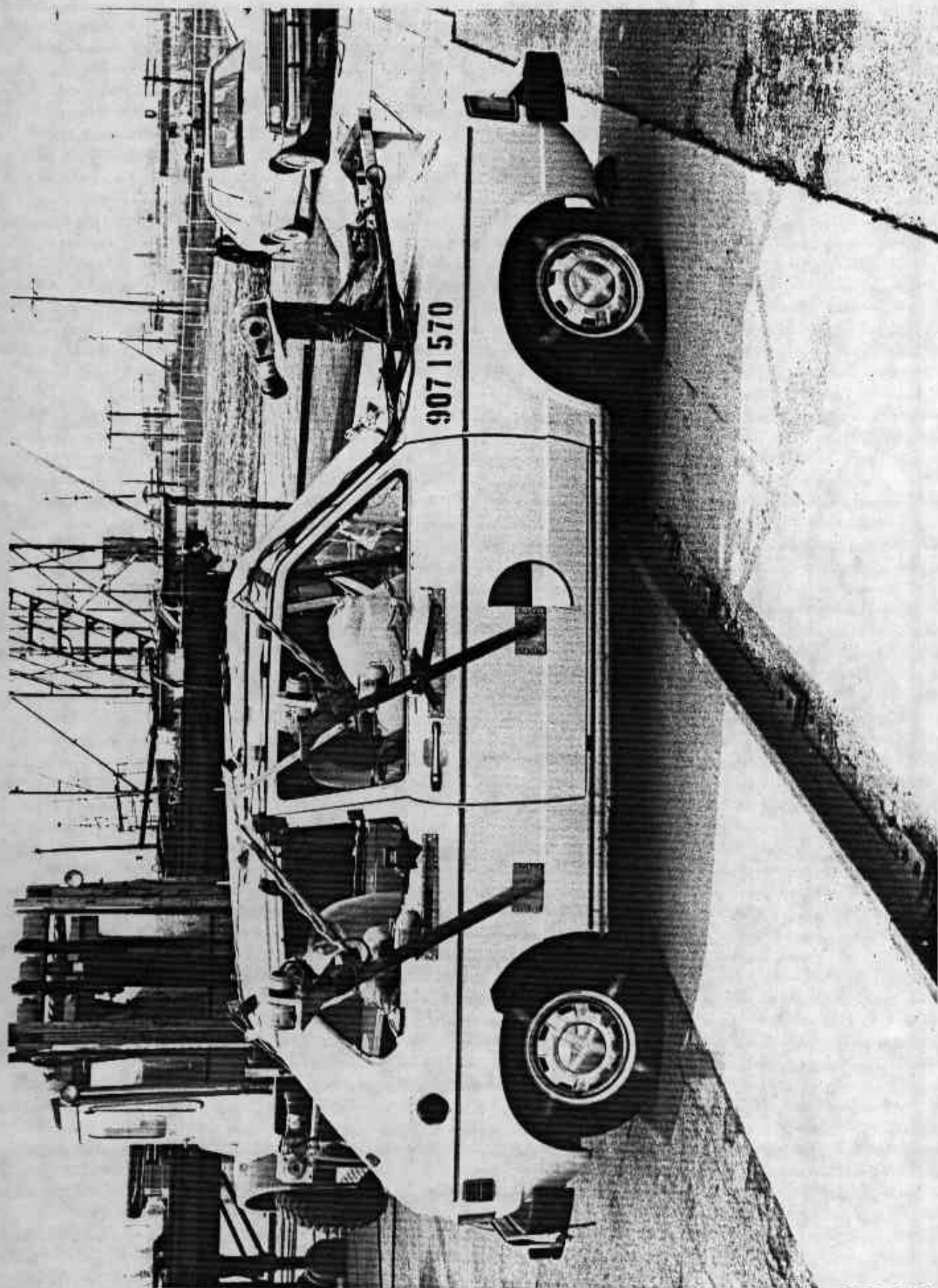


Figure A-7 POST-TEST RIGHT SIDE VIEW

A-8

7132-V-1



Figure A-8 PRE-TEST LEFT SIDE VIEW

A-9

7132-V-1

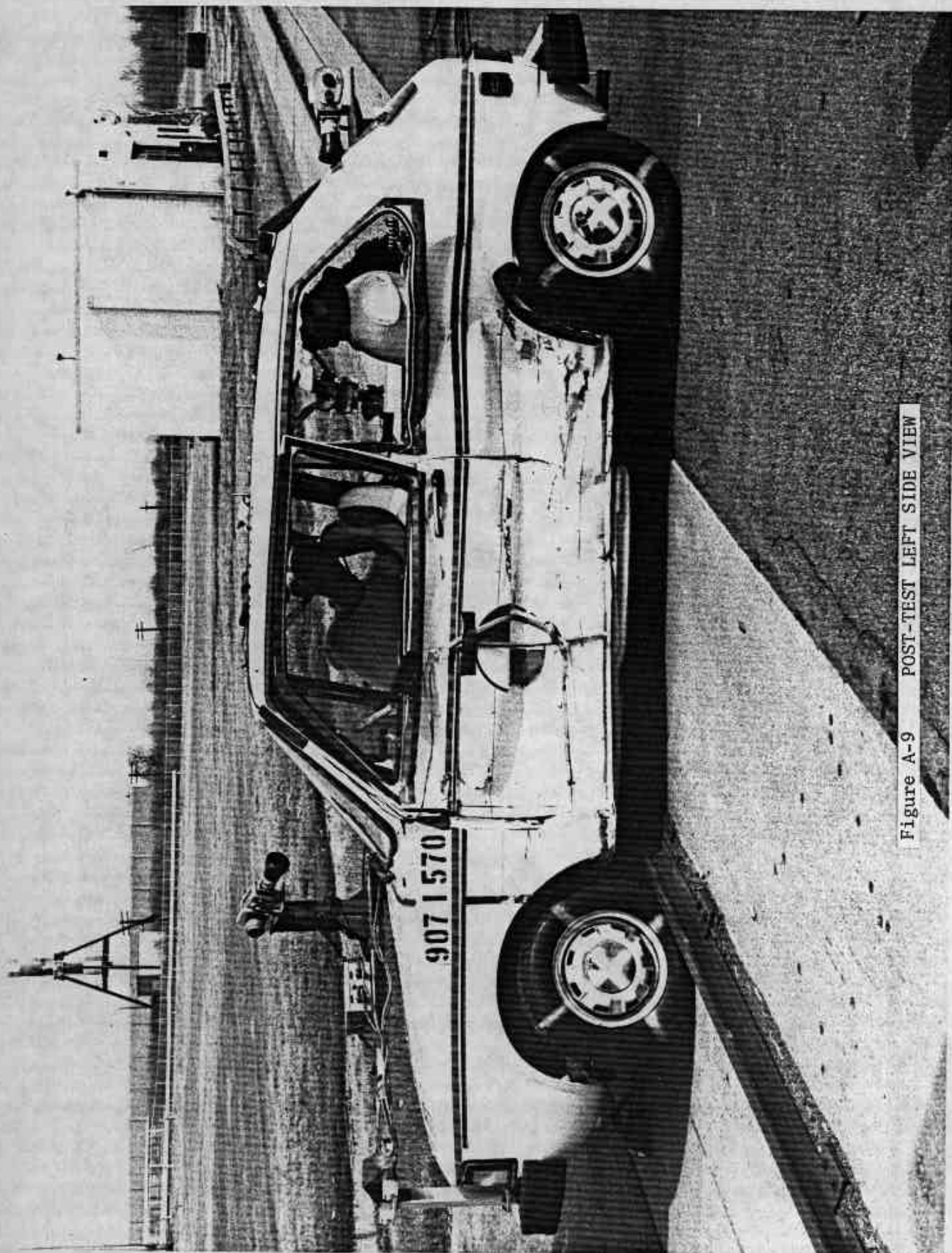


Figure A-9 POST-TEST LEFT SIDE VIEW



Figure A-10 PRE-TEST RIGHT FRONT THREE QUARTER VIEW

A-11

7132-V-1



Figure A-11 POST-TEST RIGHT FRONT THREE QUARTER VIEW

A-12

7132-V-1



Figure A-12 PRE-TEST LEFT FRONT THREE QUARTER VIEW

A-13

7132-V-1



Figure A-13 POST-TEST LEFT FRONT THREE QUARTER VIEW

A-14

7132-V-1



Figure A-14 PRE-TEST LEFT REAR THREE QUARTER VIEW

A-15

7132-V-1



Figure A-15 POST-TEST LEFT REAR THREE QUARTER VIEW

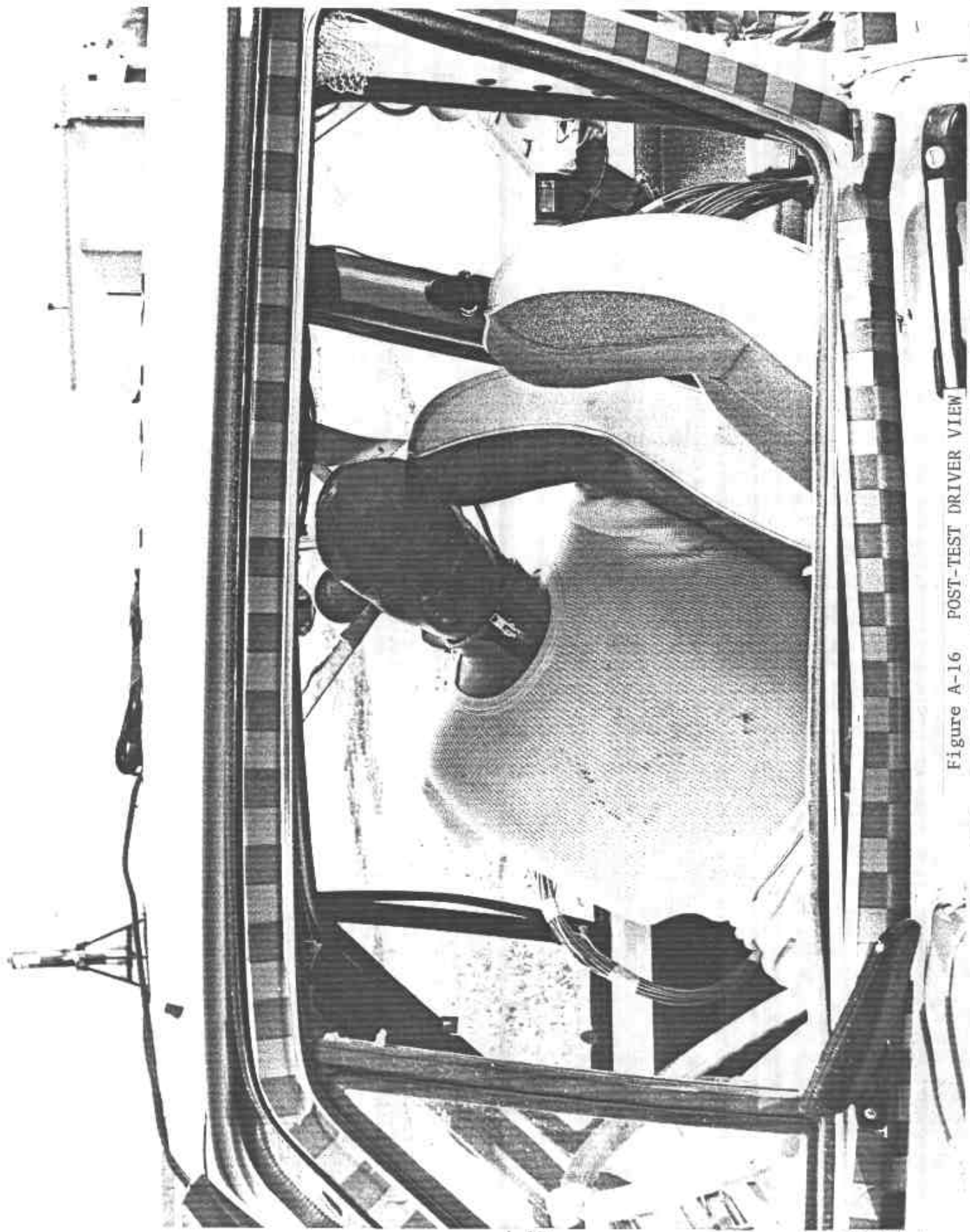


Figure A-16 POST-TEST DRIVER VIEW

A-17

7132-V-1



Figure A-17 POST-TEST DRIVER HEAD CONTACT VIEW



Figure A-18 POST-TEST LEFT REAR PASSENGER VIEW

A-19

7132-V-1

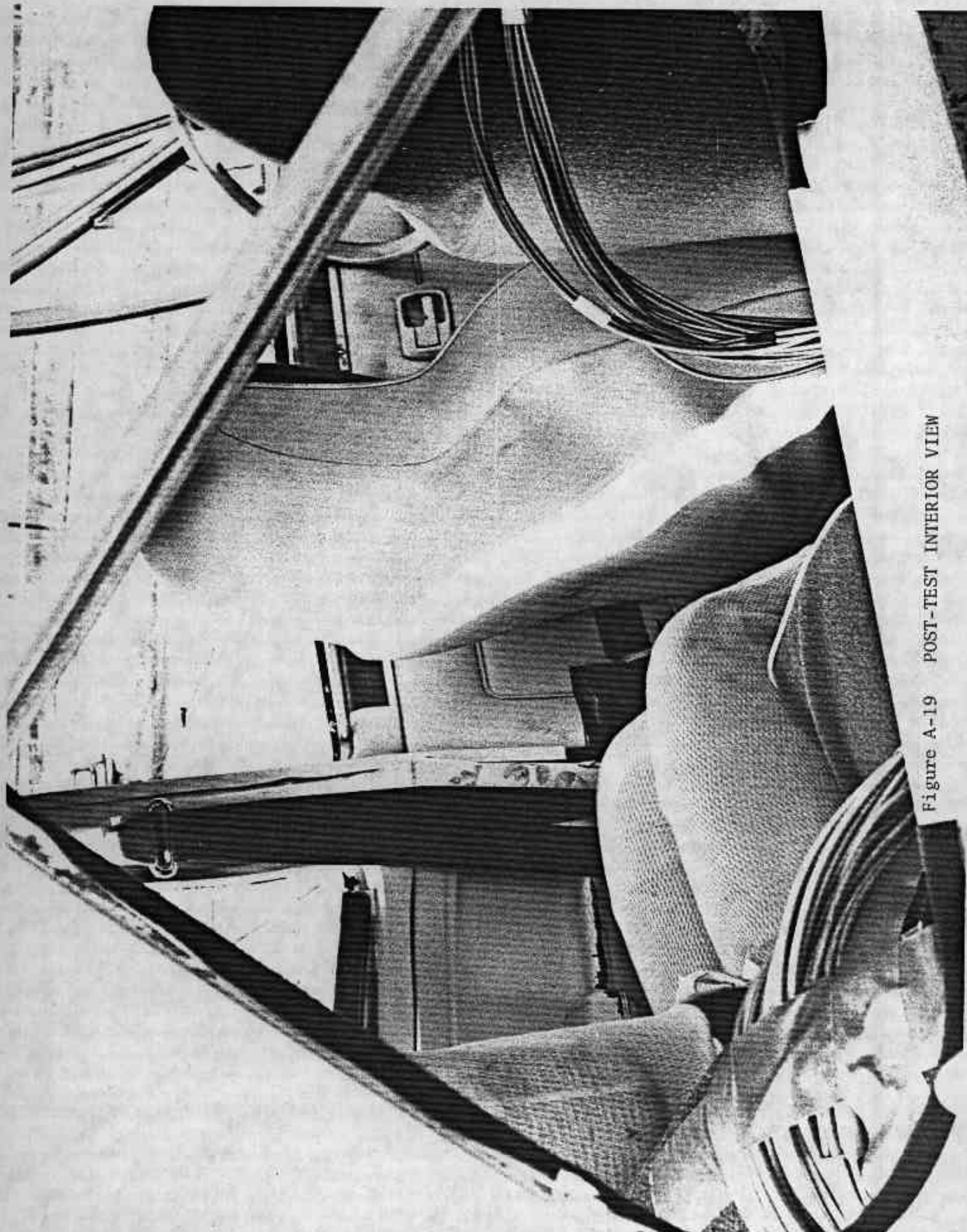


Figure A-19 POST-TEST INTERIOR VIEW

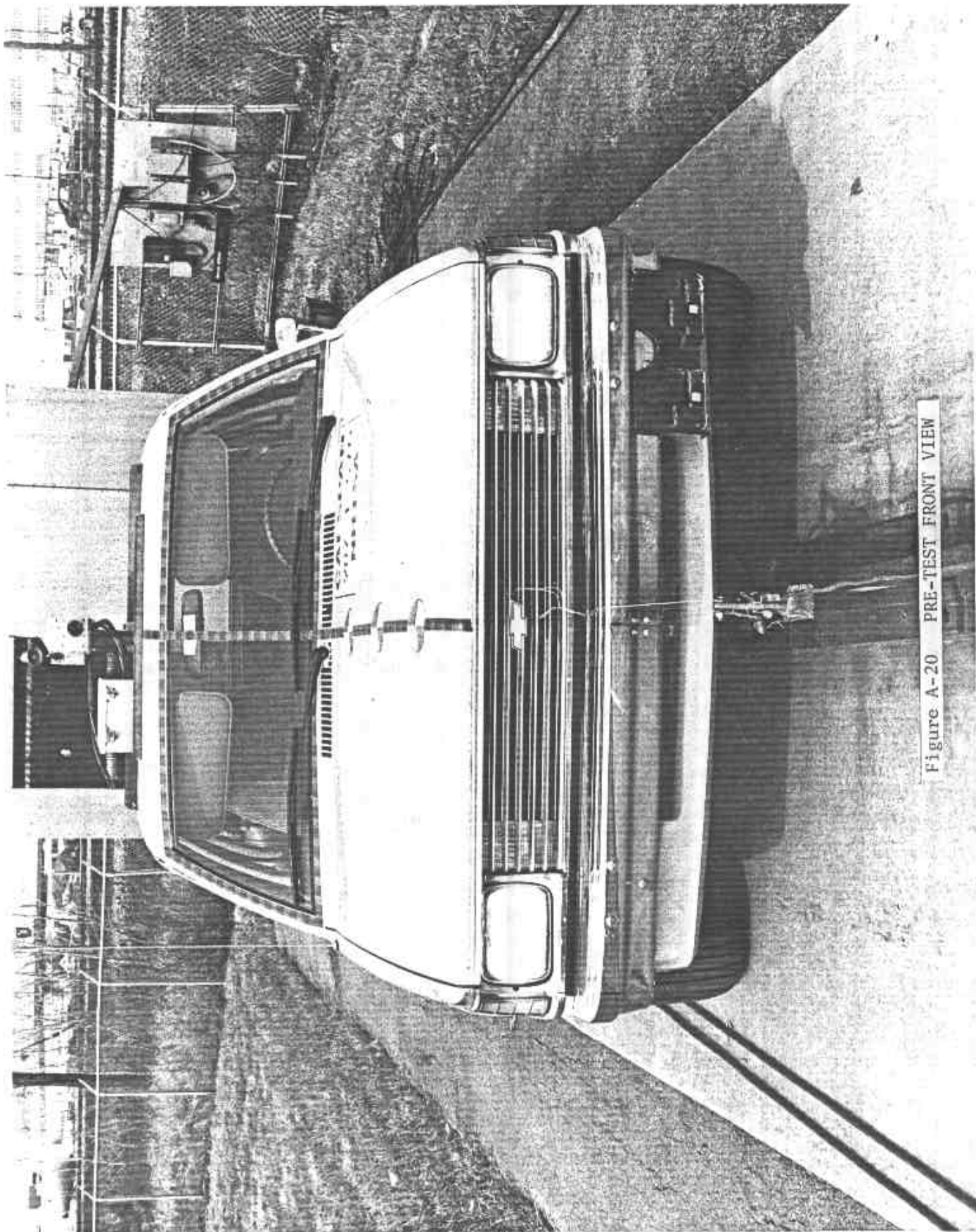


Figure A-20 PRE-TEST FRONT VIEW

A-21

7132-V-1

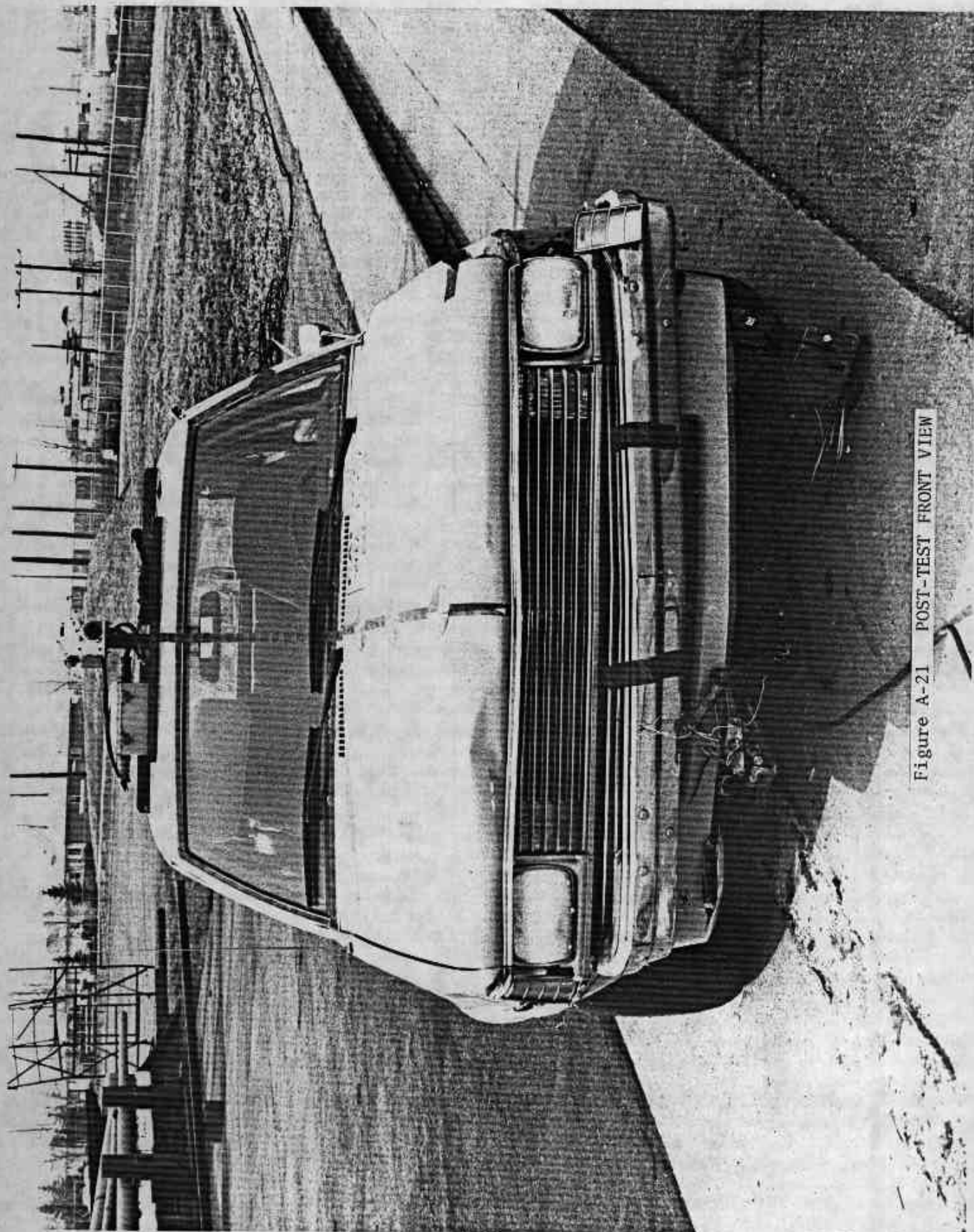


Figure A-21 POST-TEST FRONT VIEW

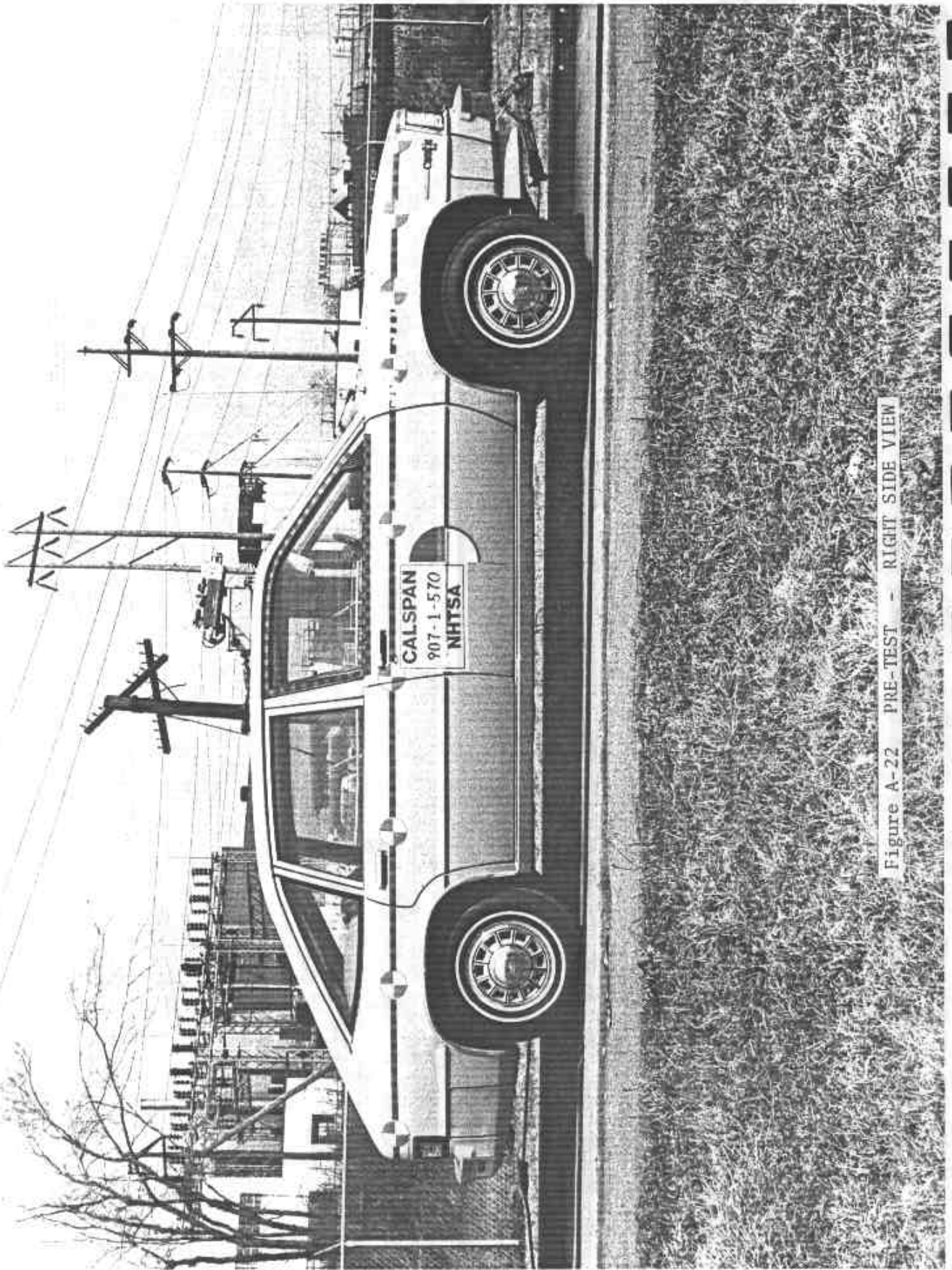


Figure A-22 PRE-TEST - RIGHT SIDE VIEW

A-23

7132-V-1



Figure A-23 POST-TEST - RIGHT SIDE VIEW

A-24

7132-V-1



Figure A-24 PRE-TEST - LEFT SIDE VIEW

A-25

7132-V-1

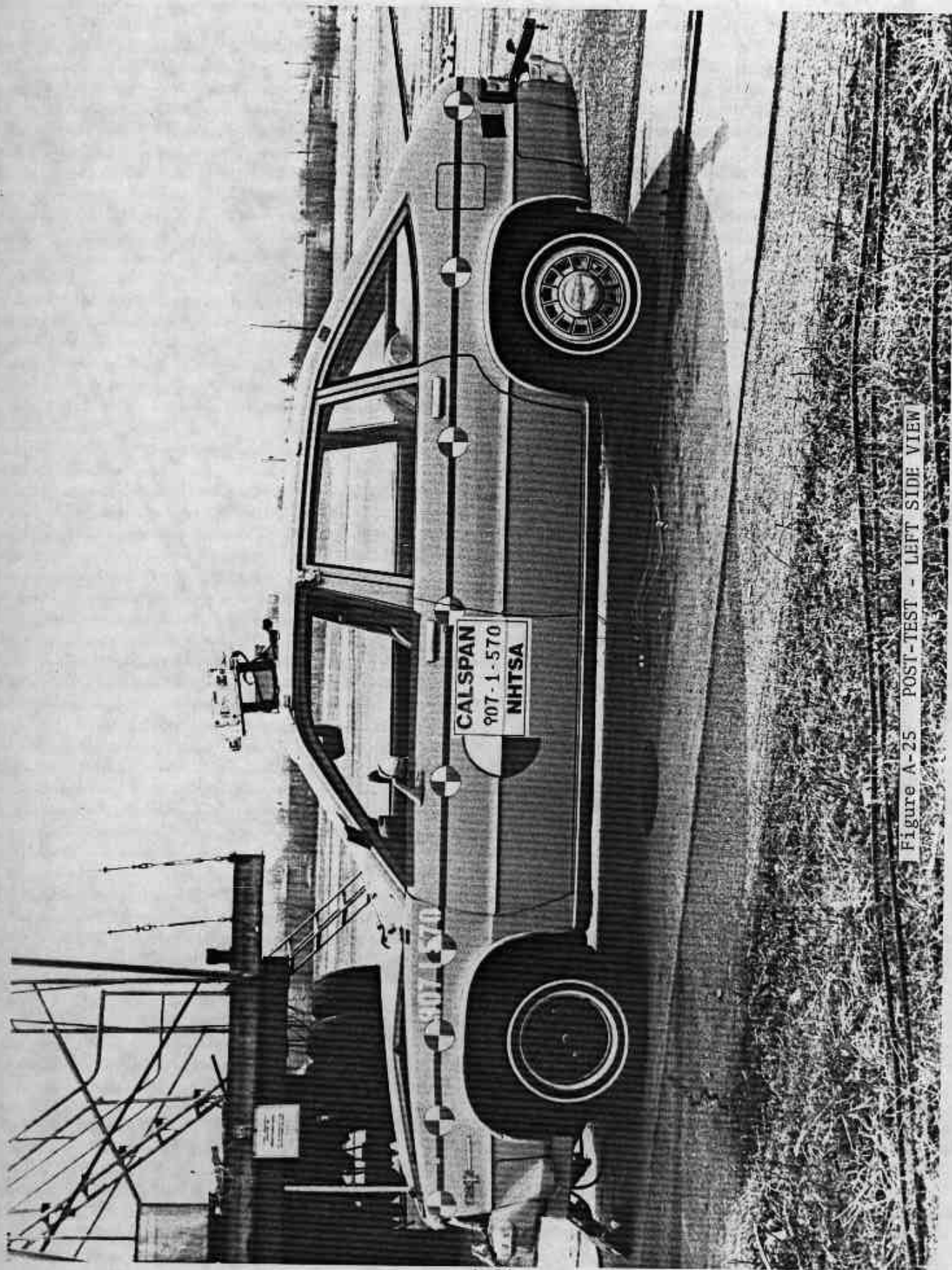


Figure A-25 POST-TEST - LEFT SIDE VIEW

A-26

7132-V-1



Figure A-26 PRE-TEST - RIGHT FRONT THREE QUARTER VIEW

A-27

7132-V-1



Figure A-27 POST-TEST - RIGHT FRONT THREE QUARTER VIEW



Figure A-28 PRE-TEST - LEFT FRONT THREE QUARTER VIEW

A-29

7132-V-1

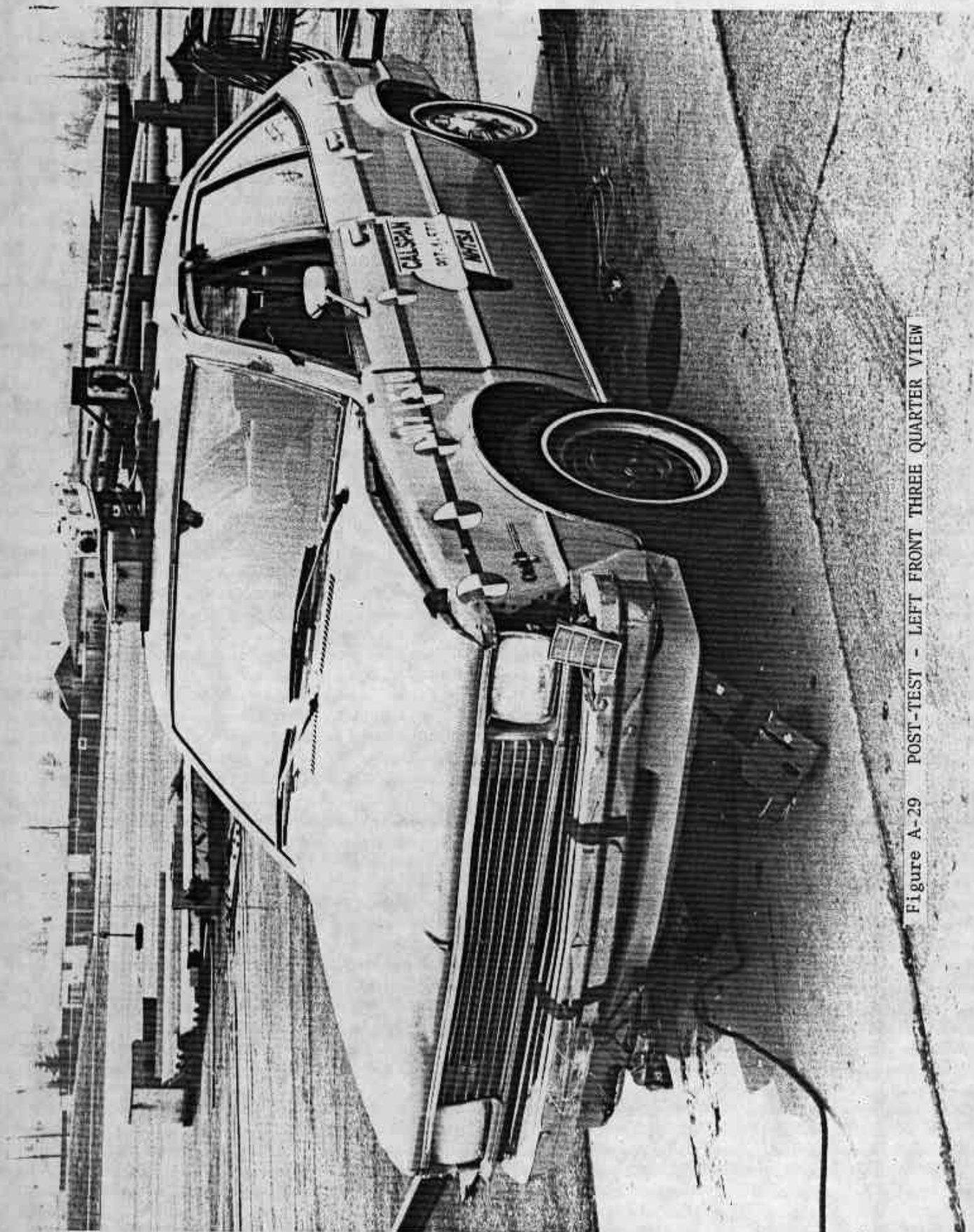


Figure A-29 POST-TEST - LEFT FRONT THREE QUARTER VIEW

A-30

7132-V-1



Figure A-30 PRE-TEST - LEFT REAR THREE QUARTER VIEW

A-31

7132-V-1



Figure A-31 POST-TEST - LEFT REAR THREE QUARTER VIEW

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA

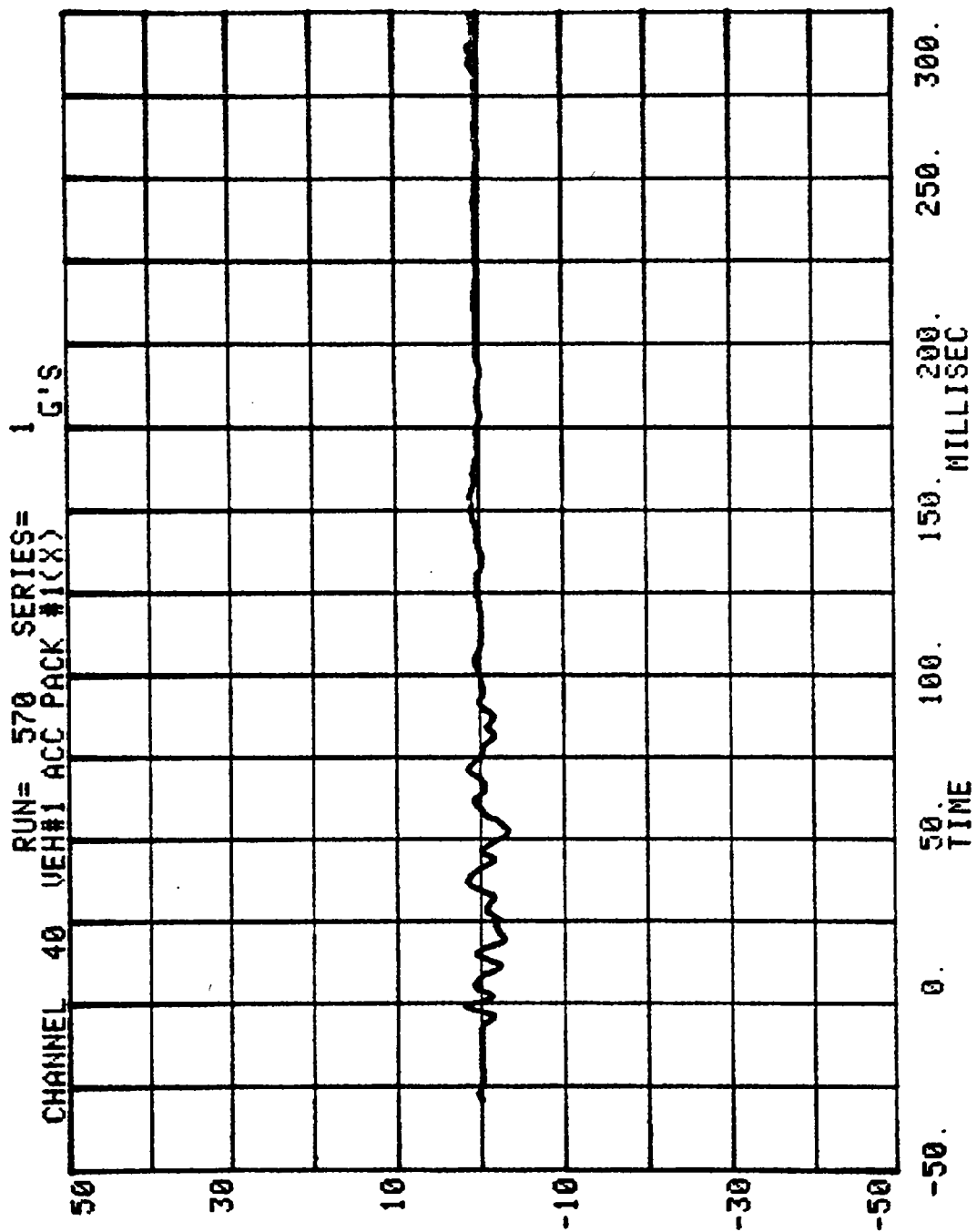
TEST NO. 907-1-570

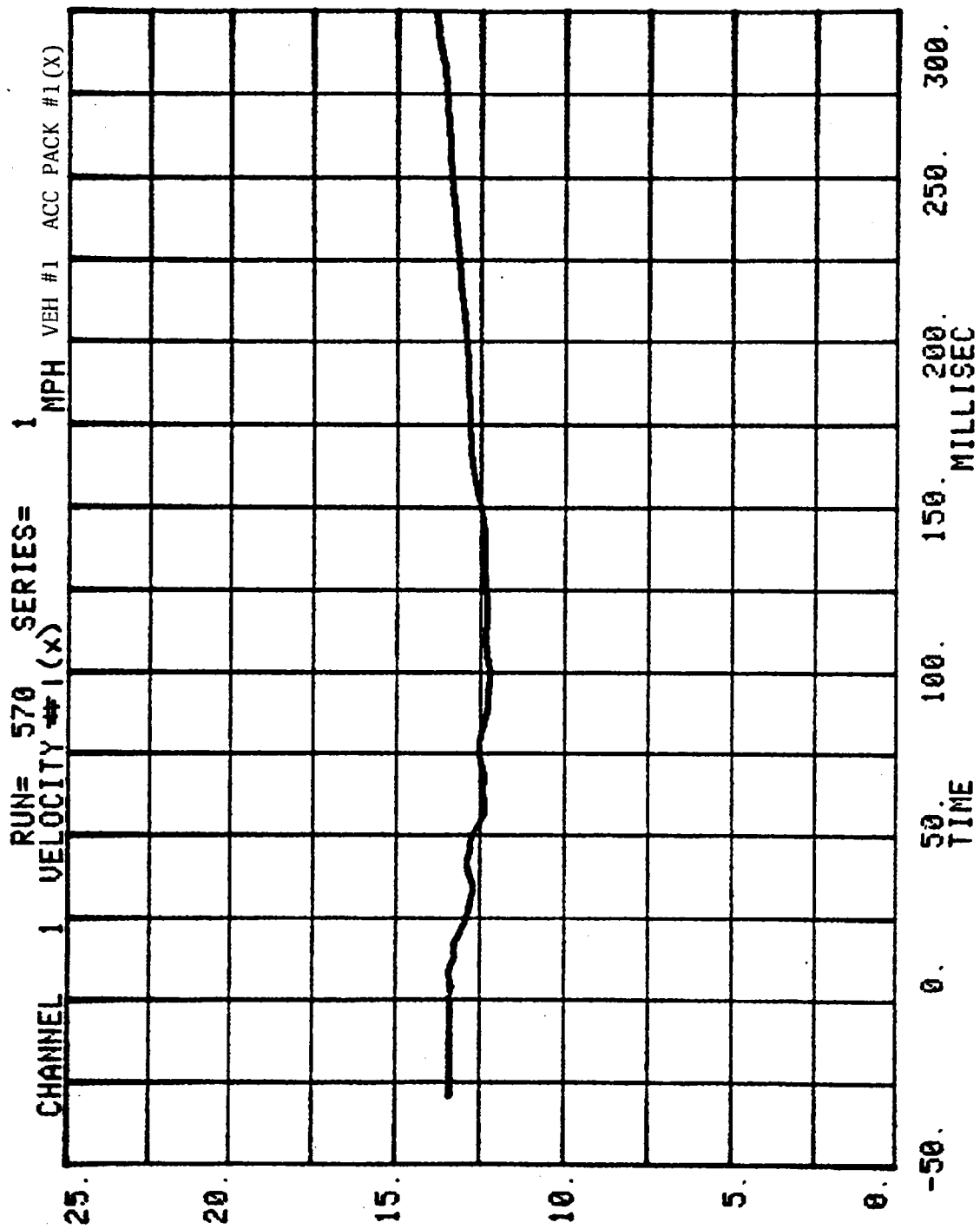
VEHICLE NO. 1 - 1982 VOLKSWAGEN RABBIT

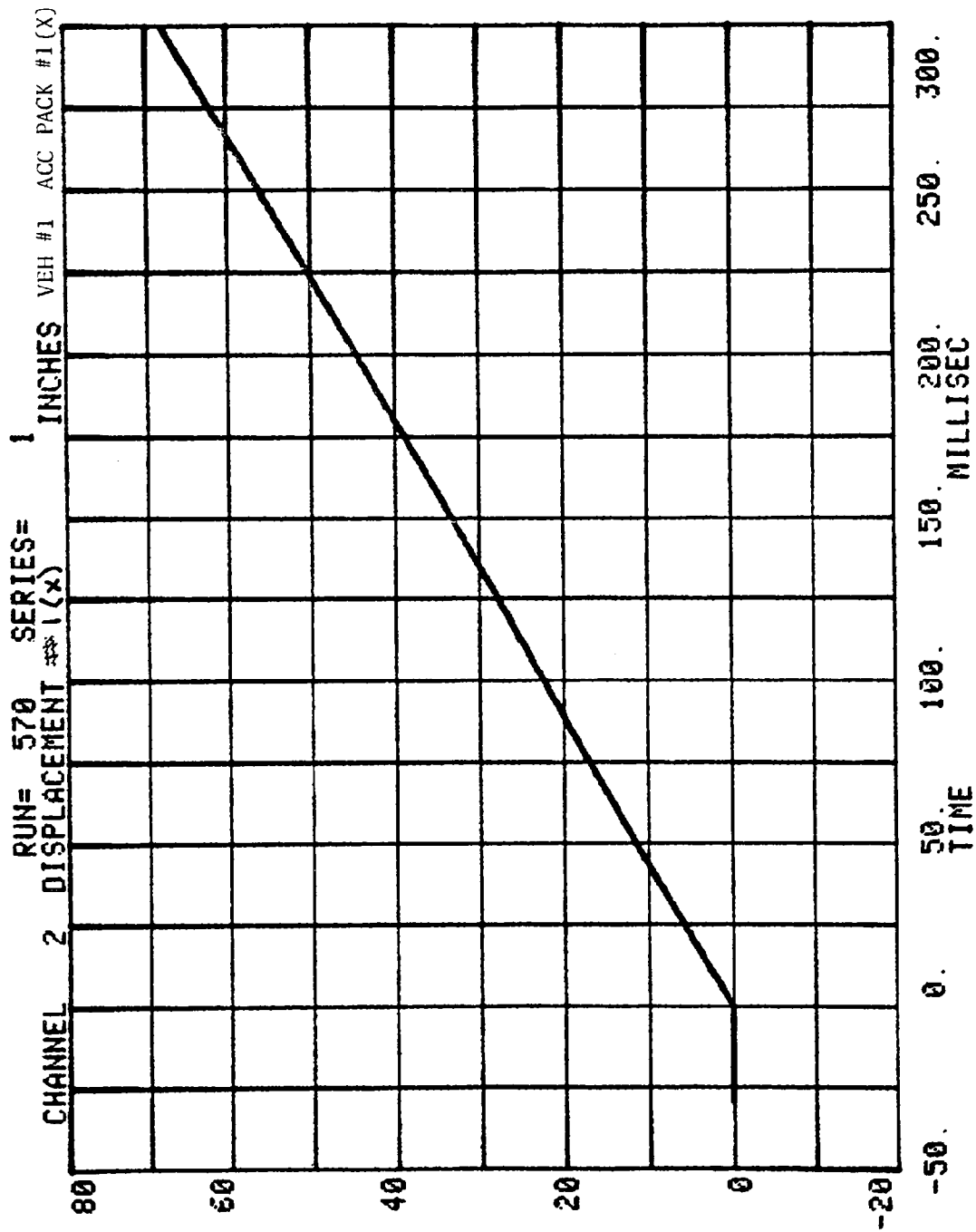
VEHICLE DATA

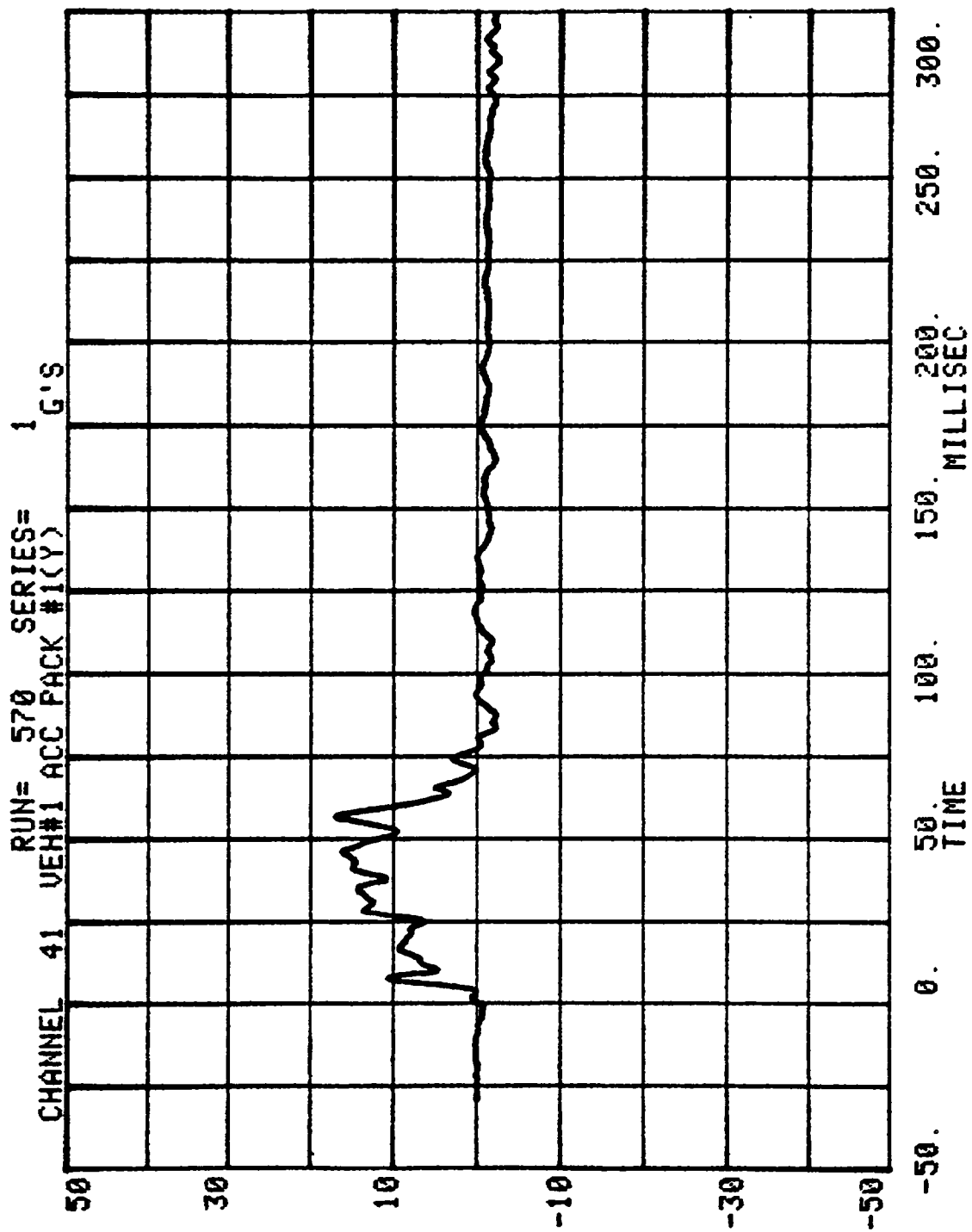
FILTER CHANNEL CLASS

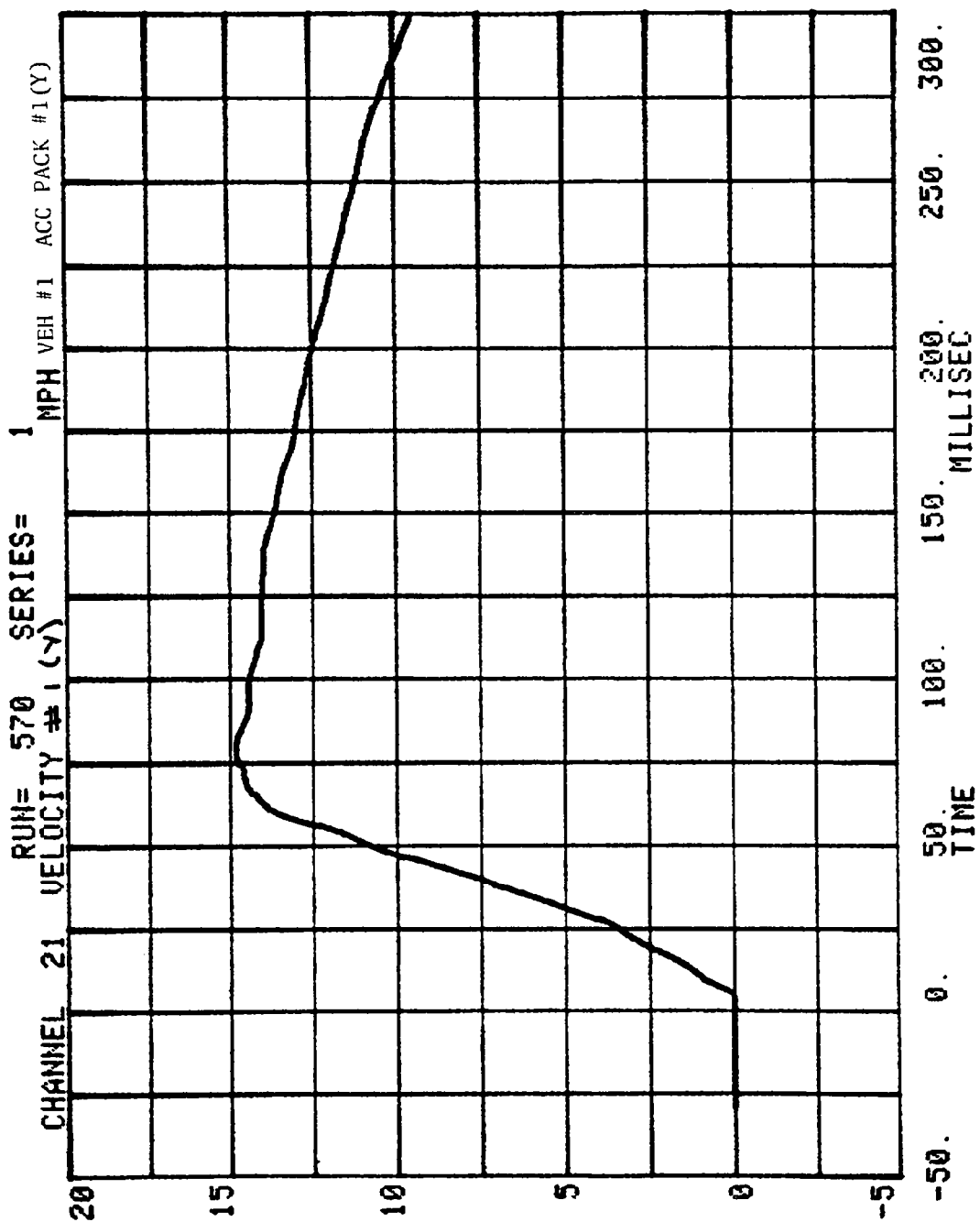
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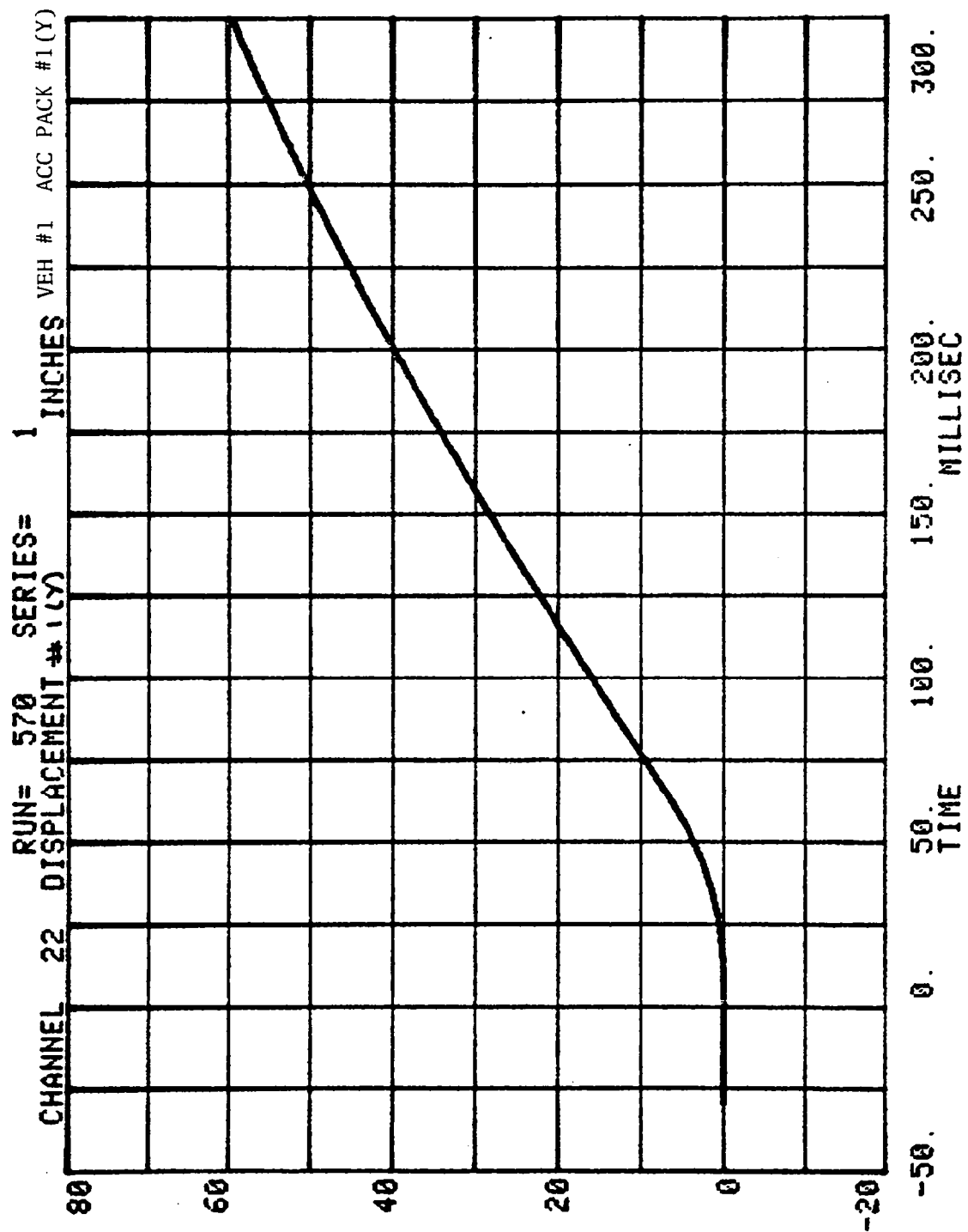


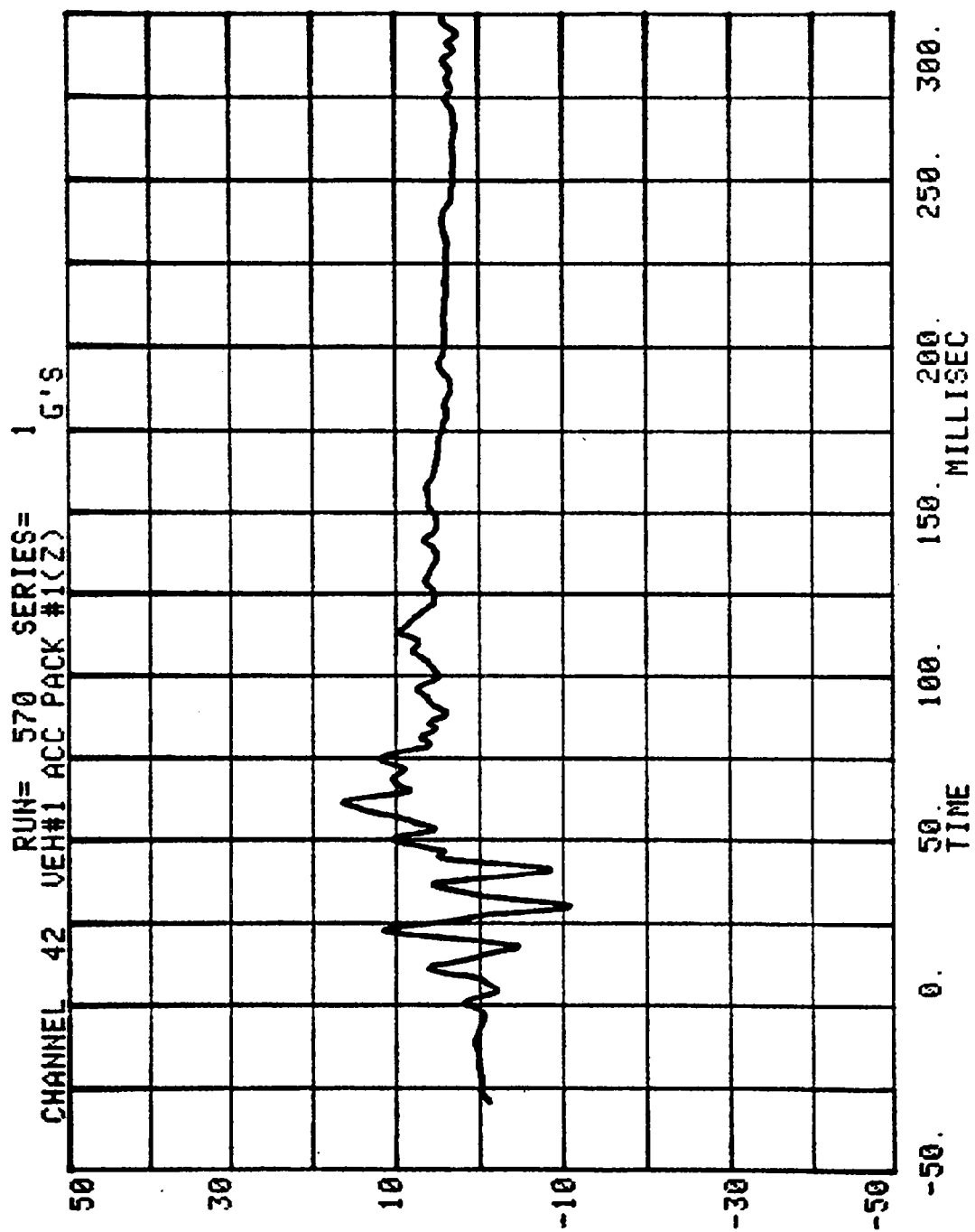




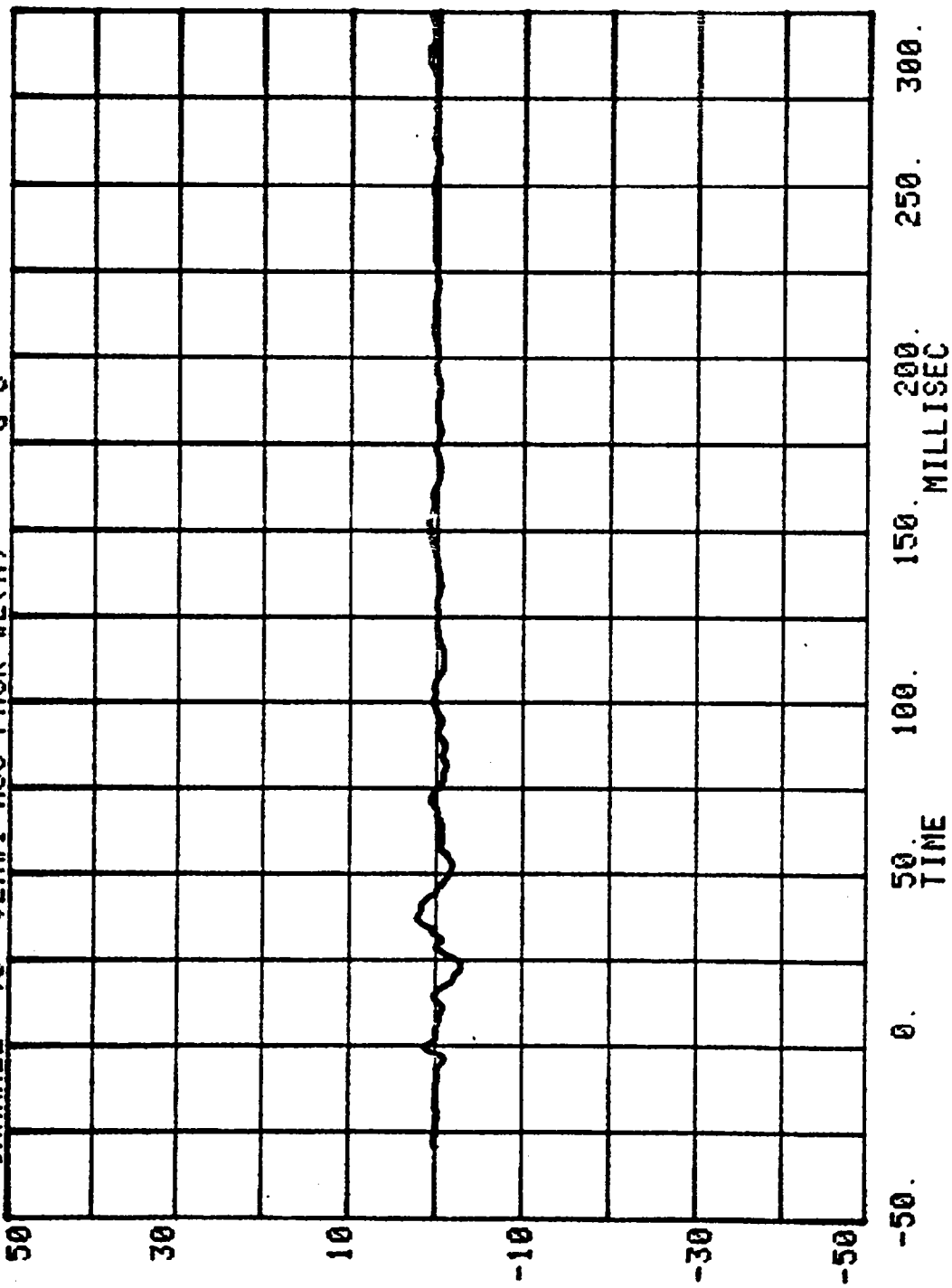


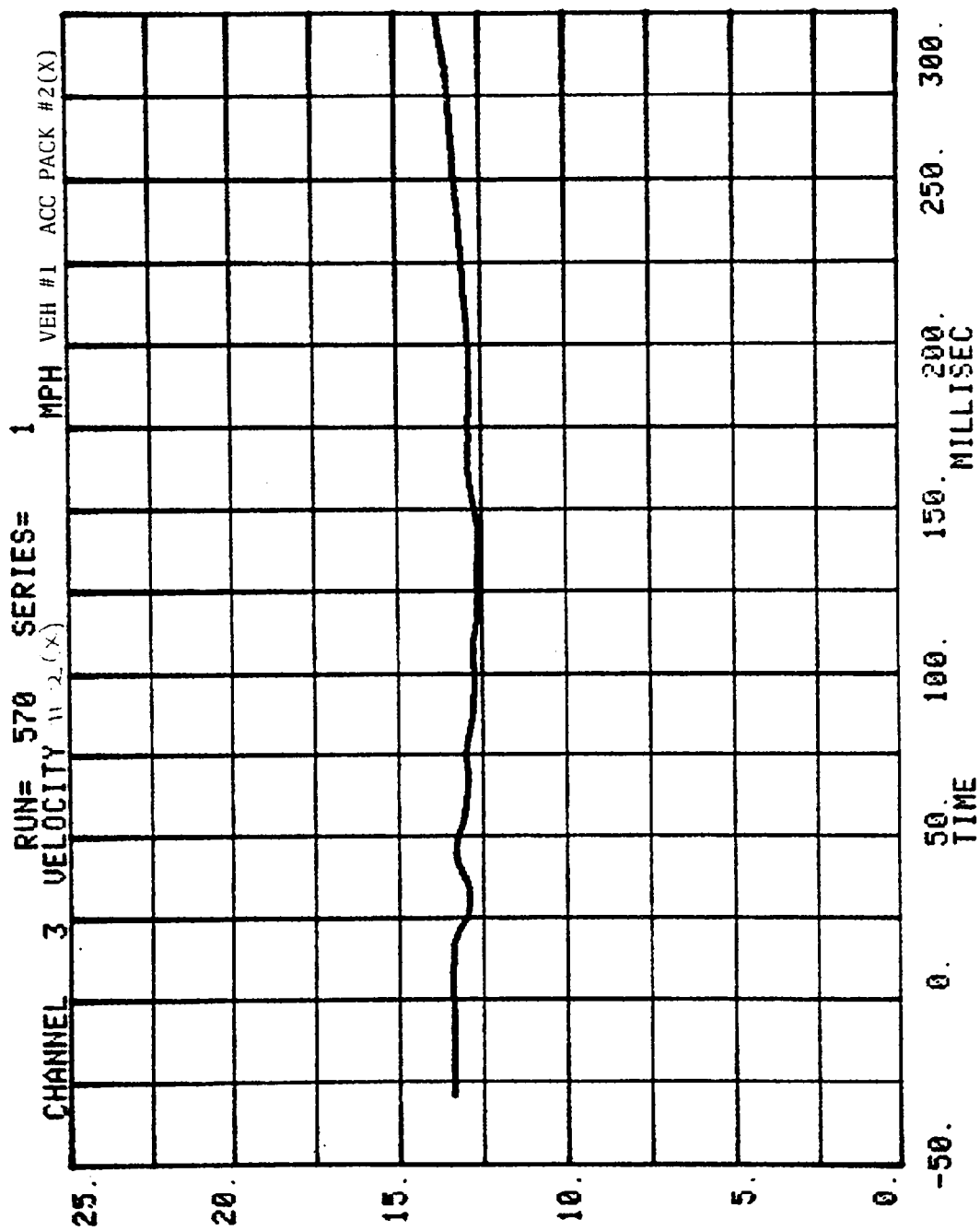


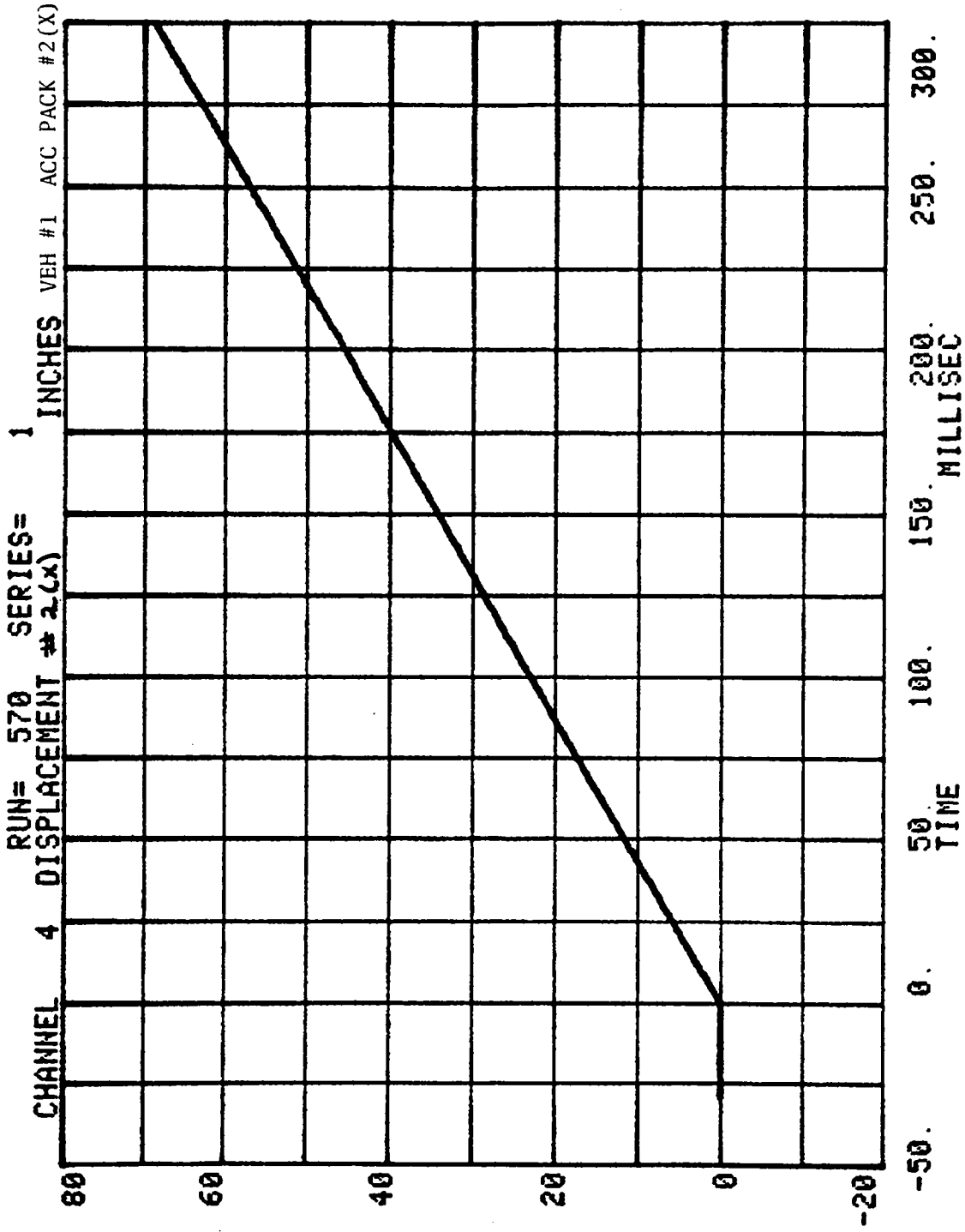


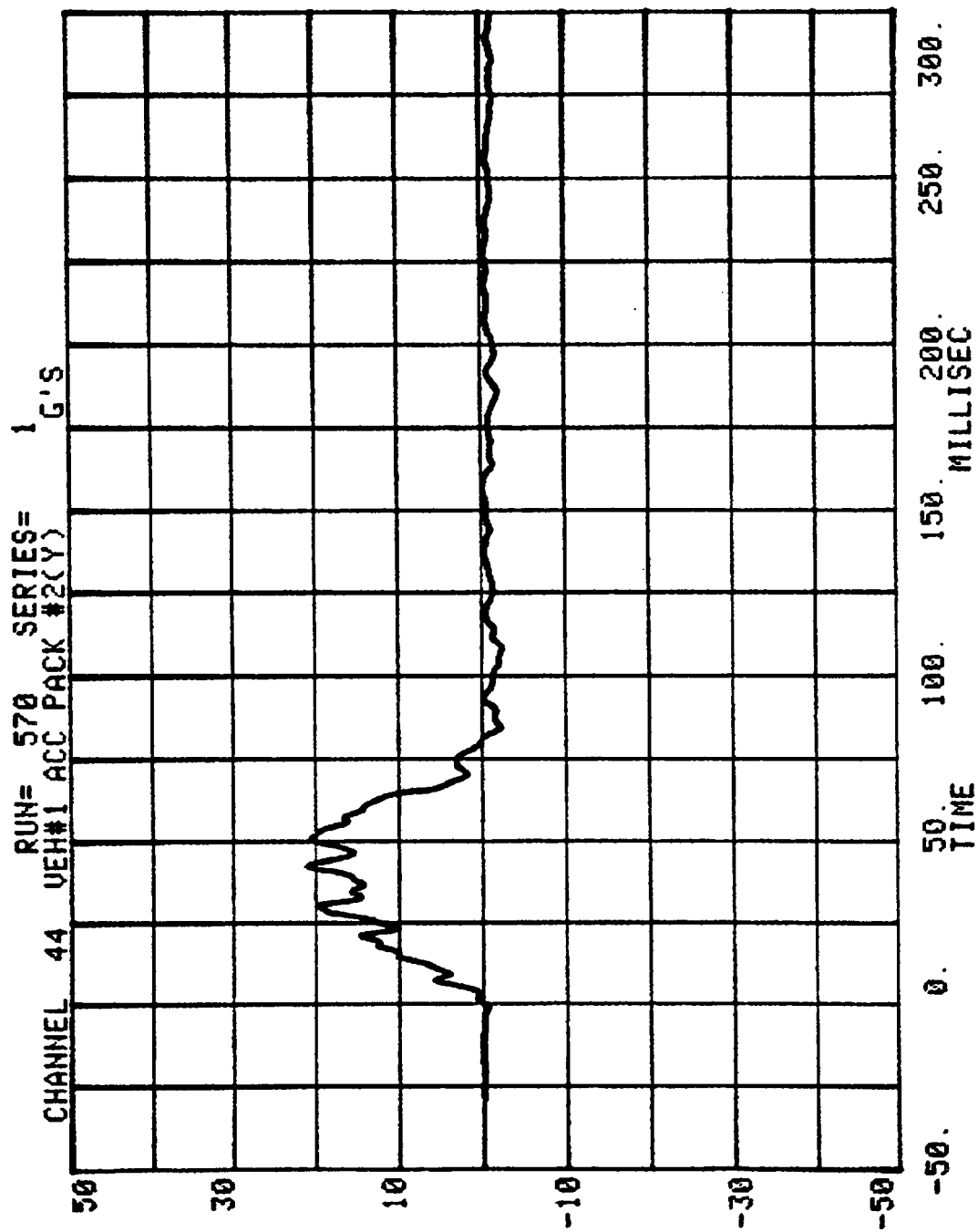


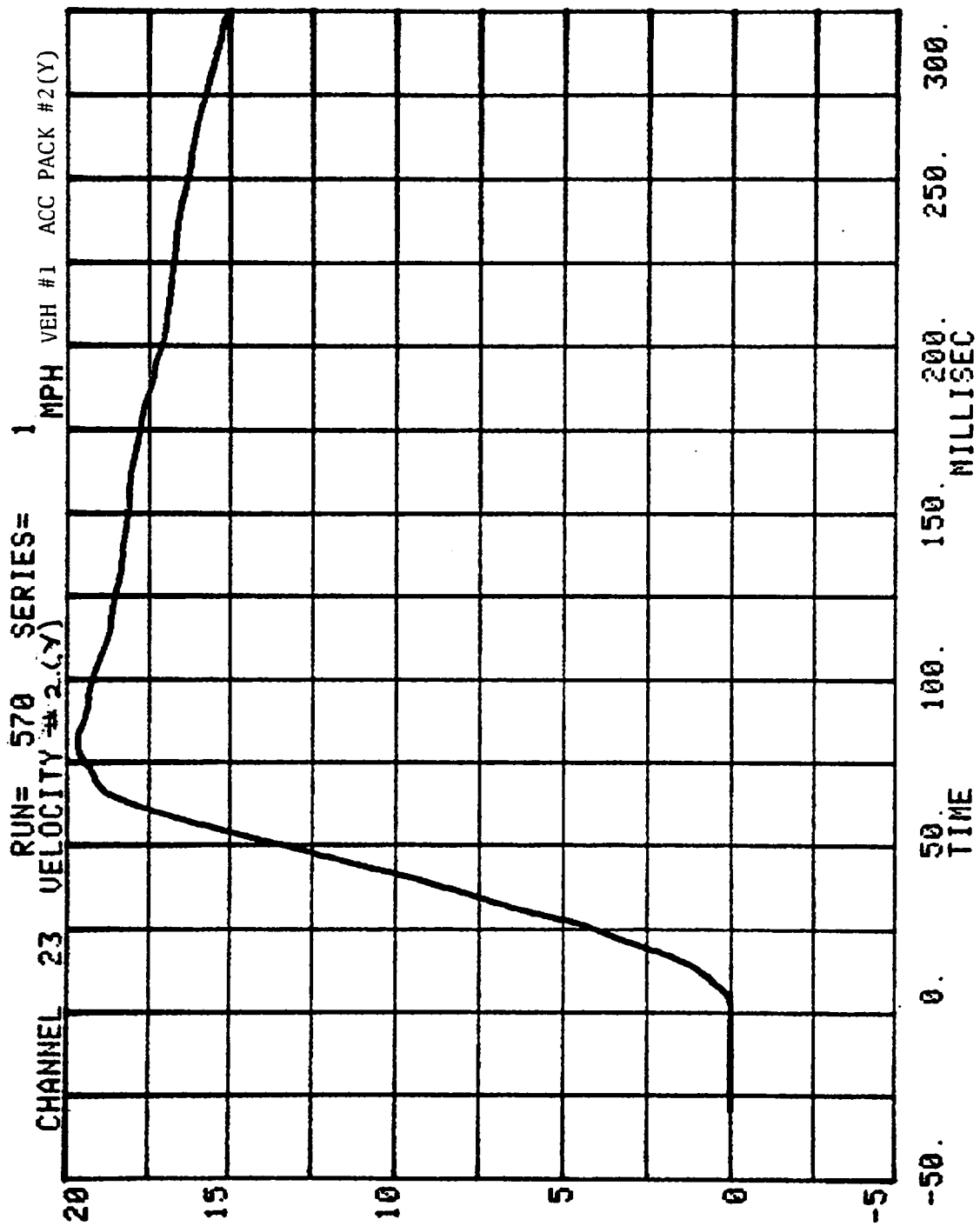
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VEH#1 ACC PACK #2(X) G'S

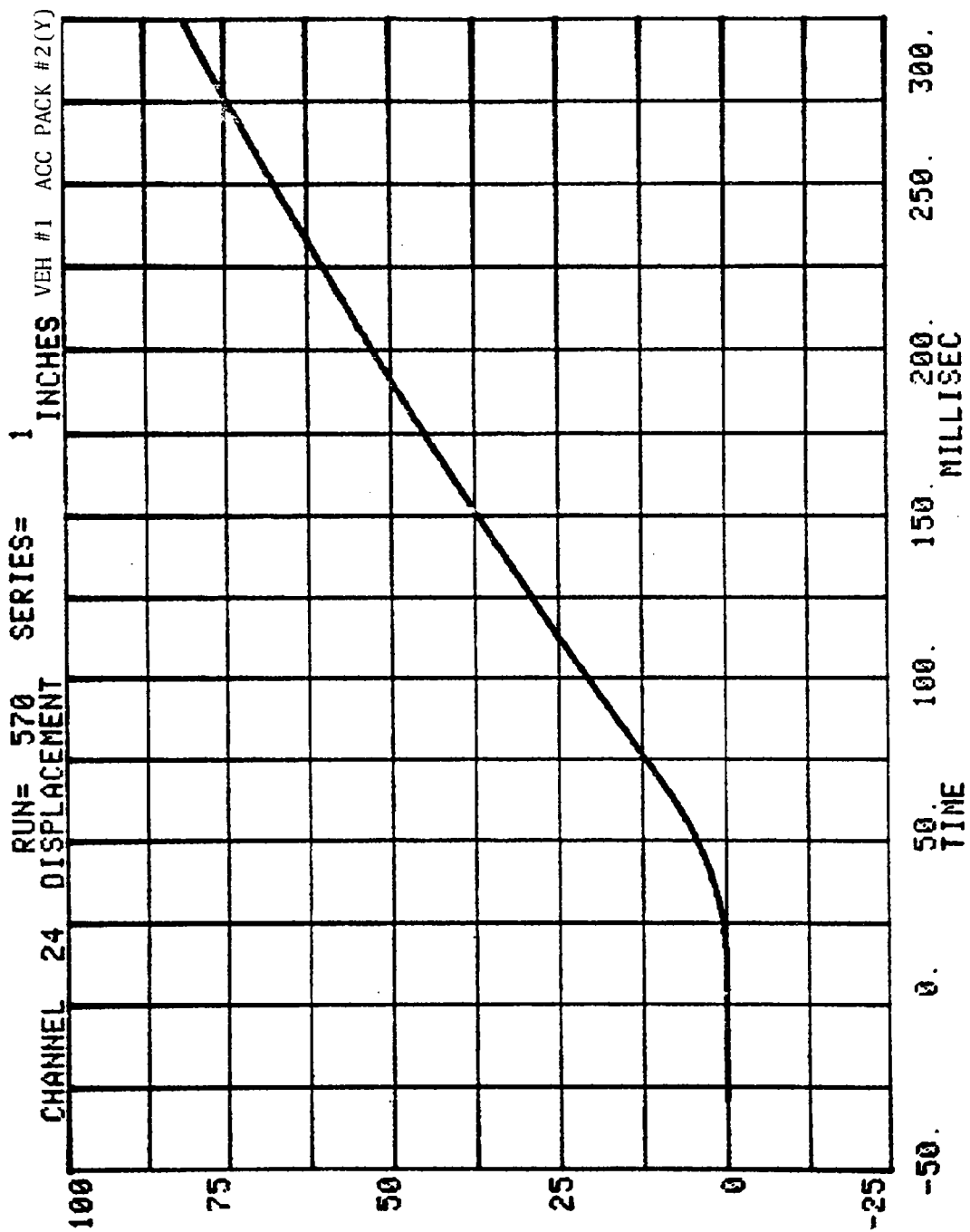


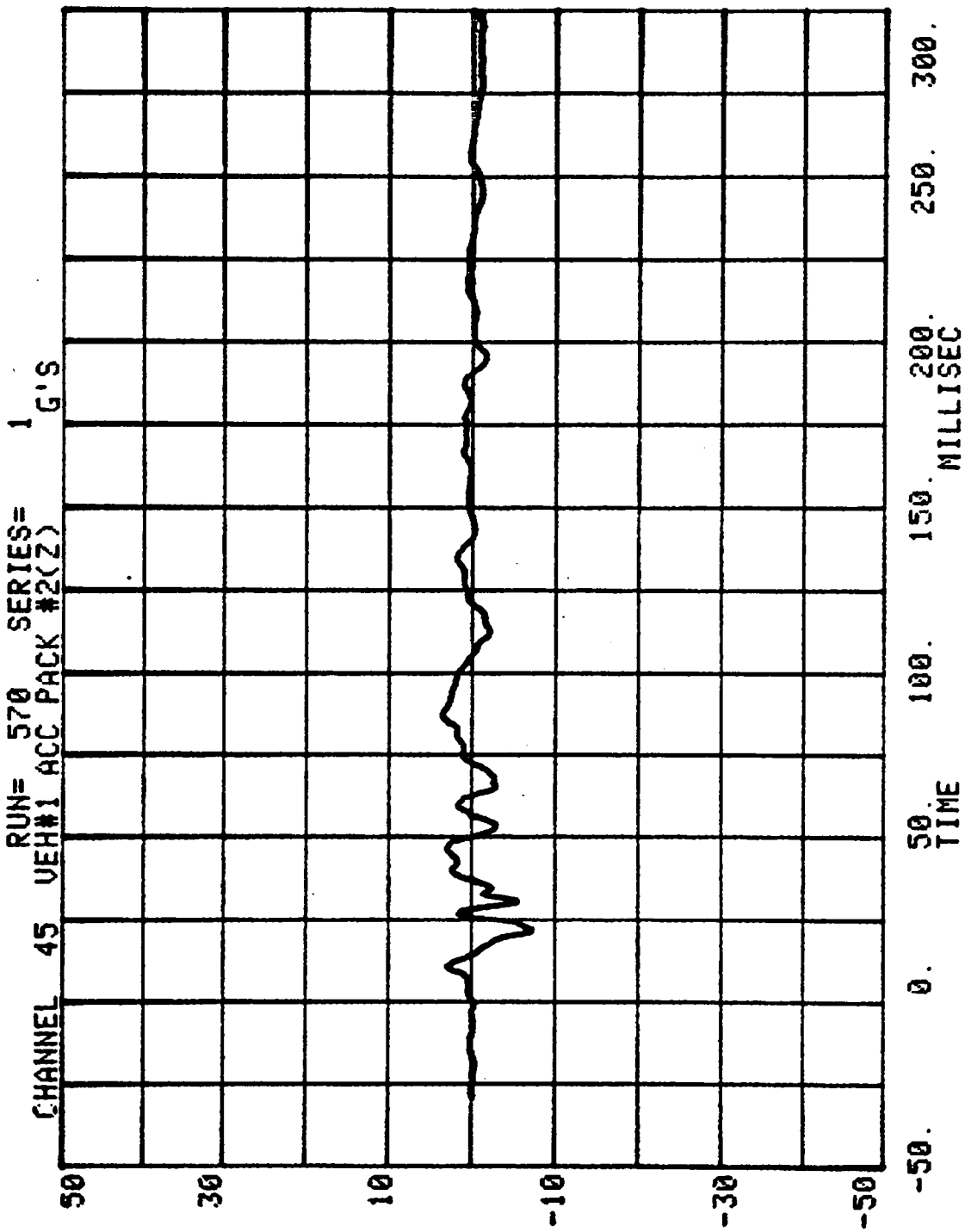




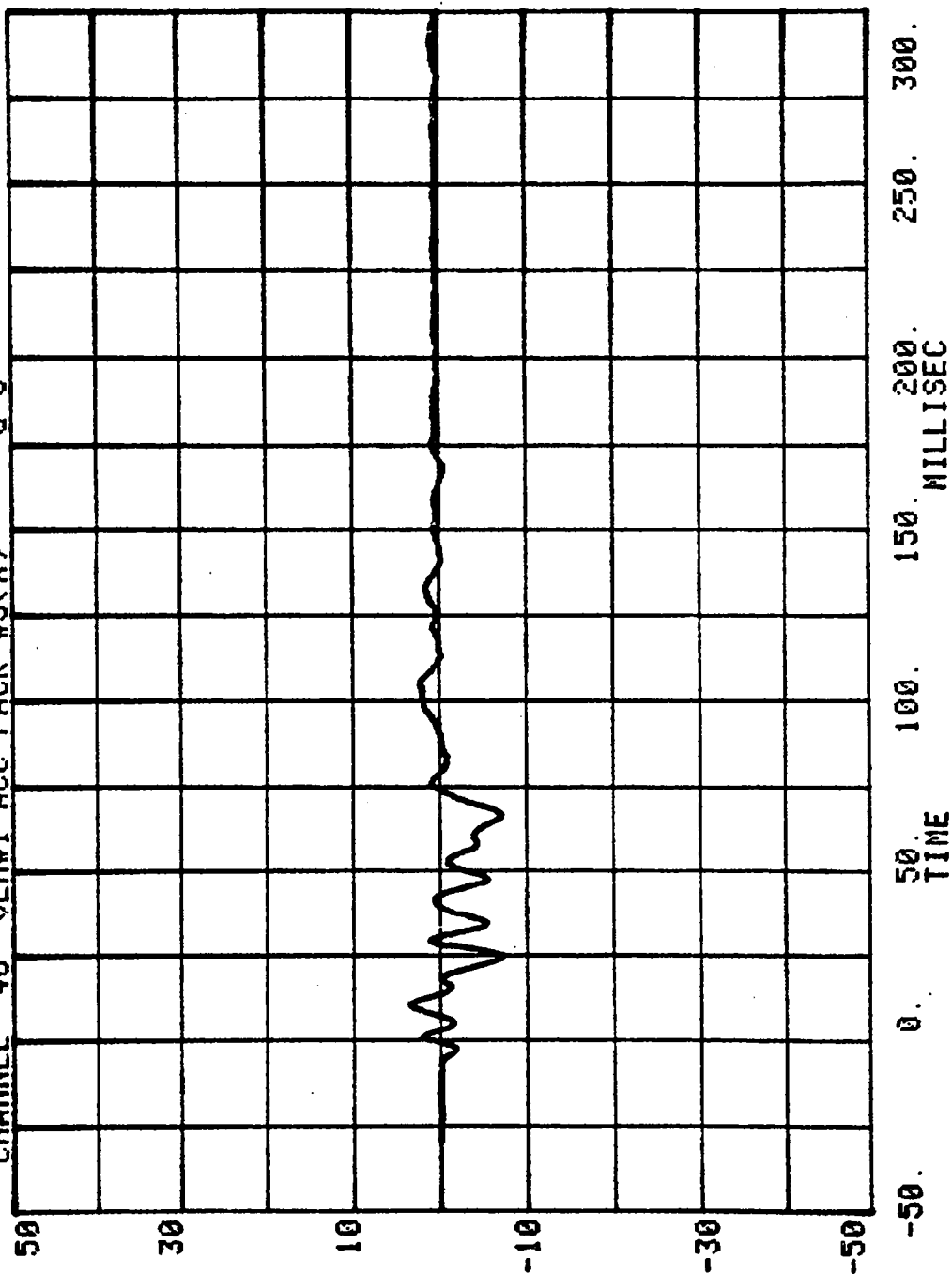


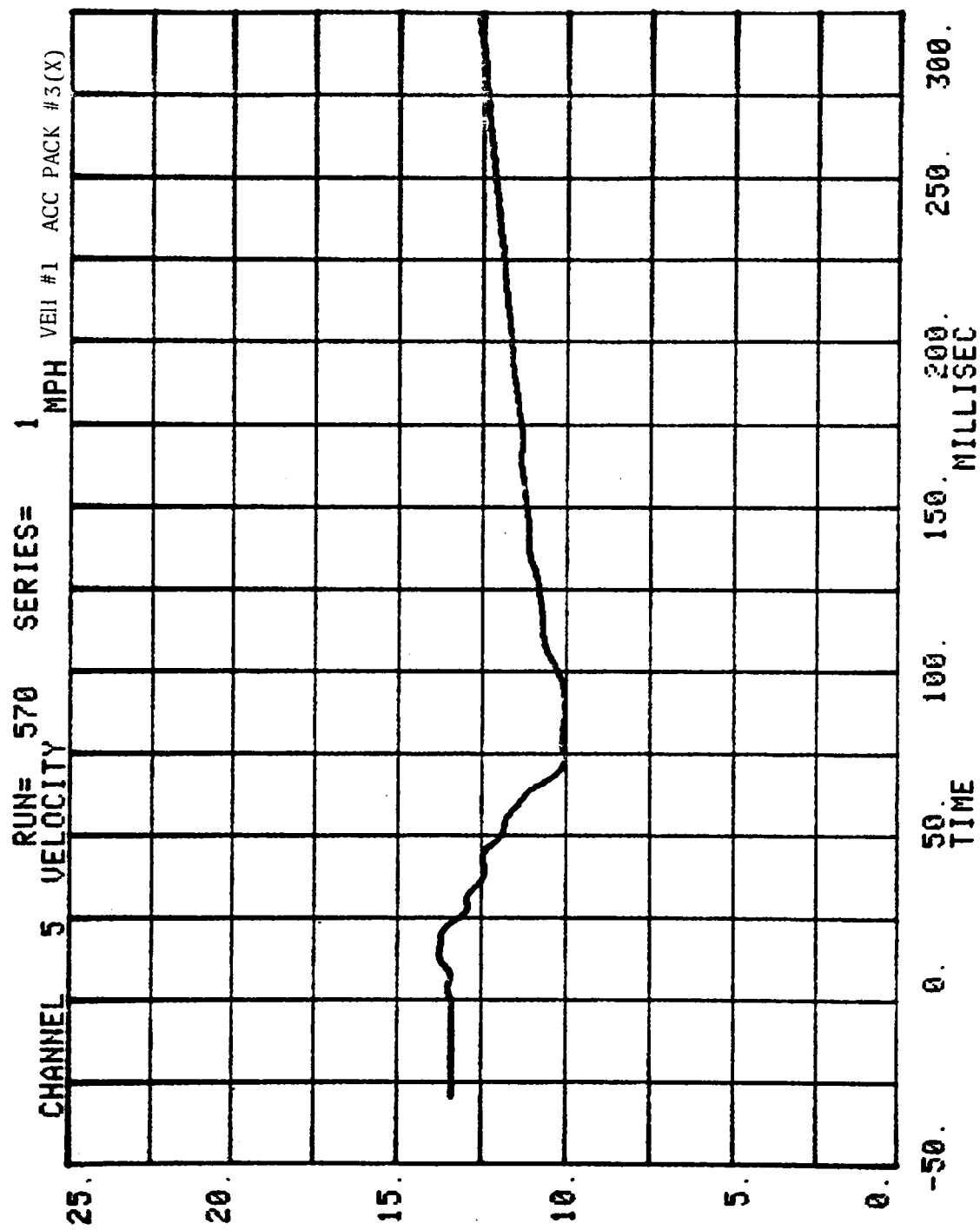


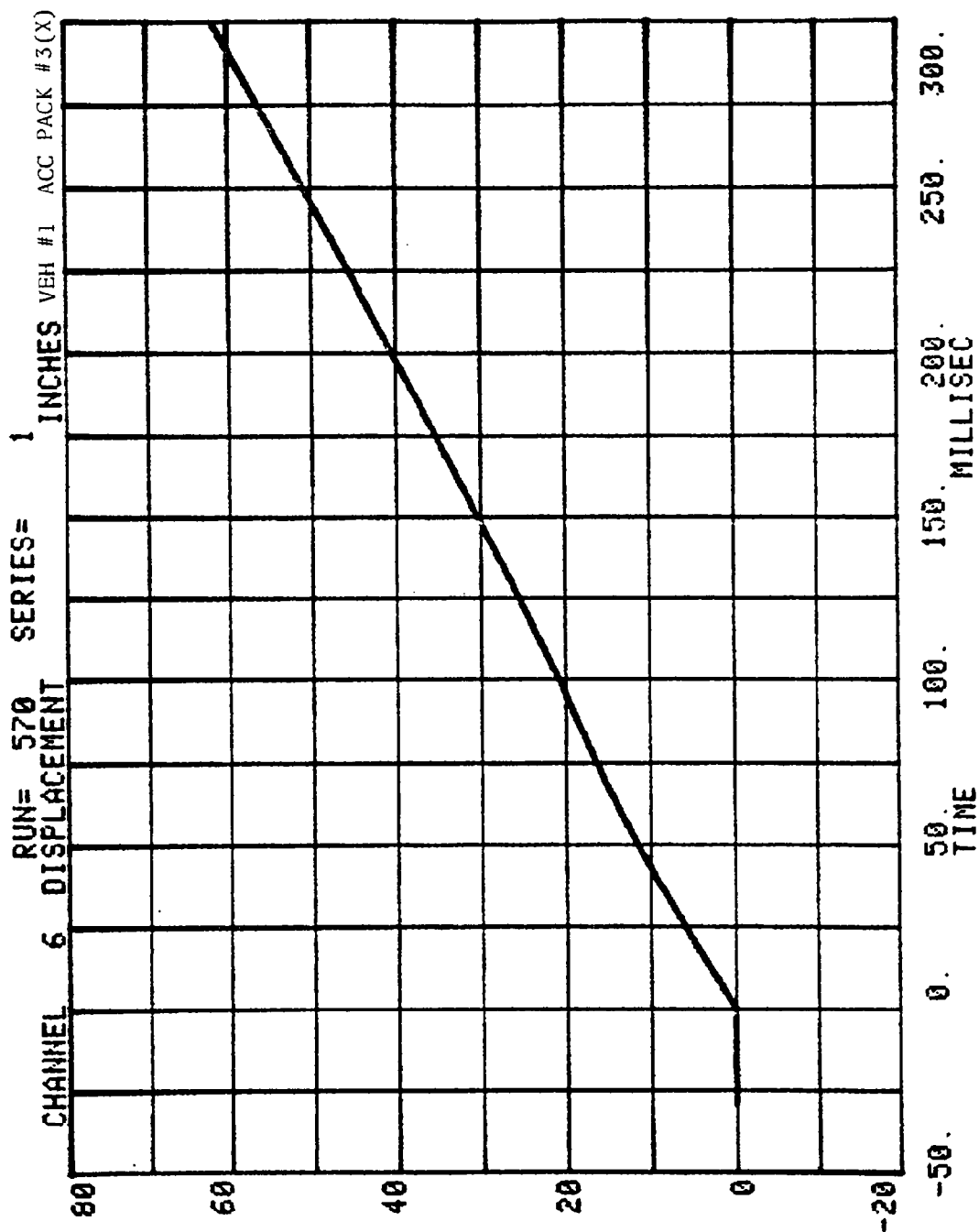


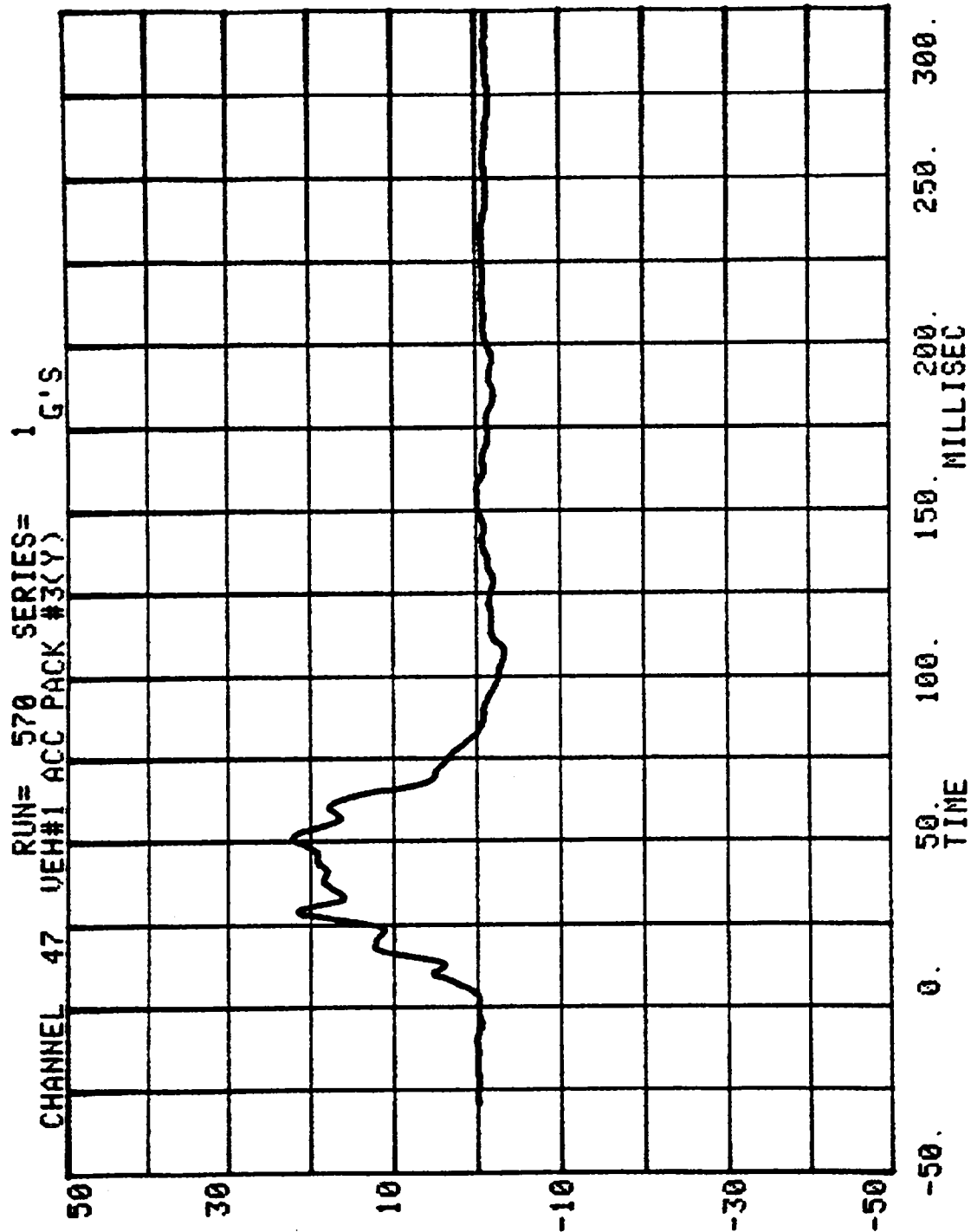


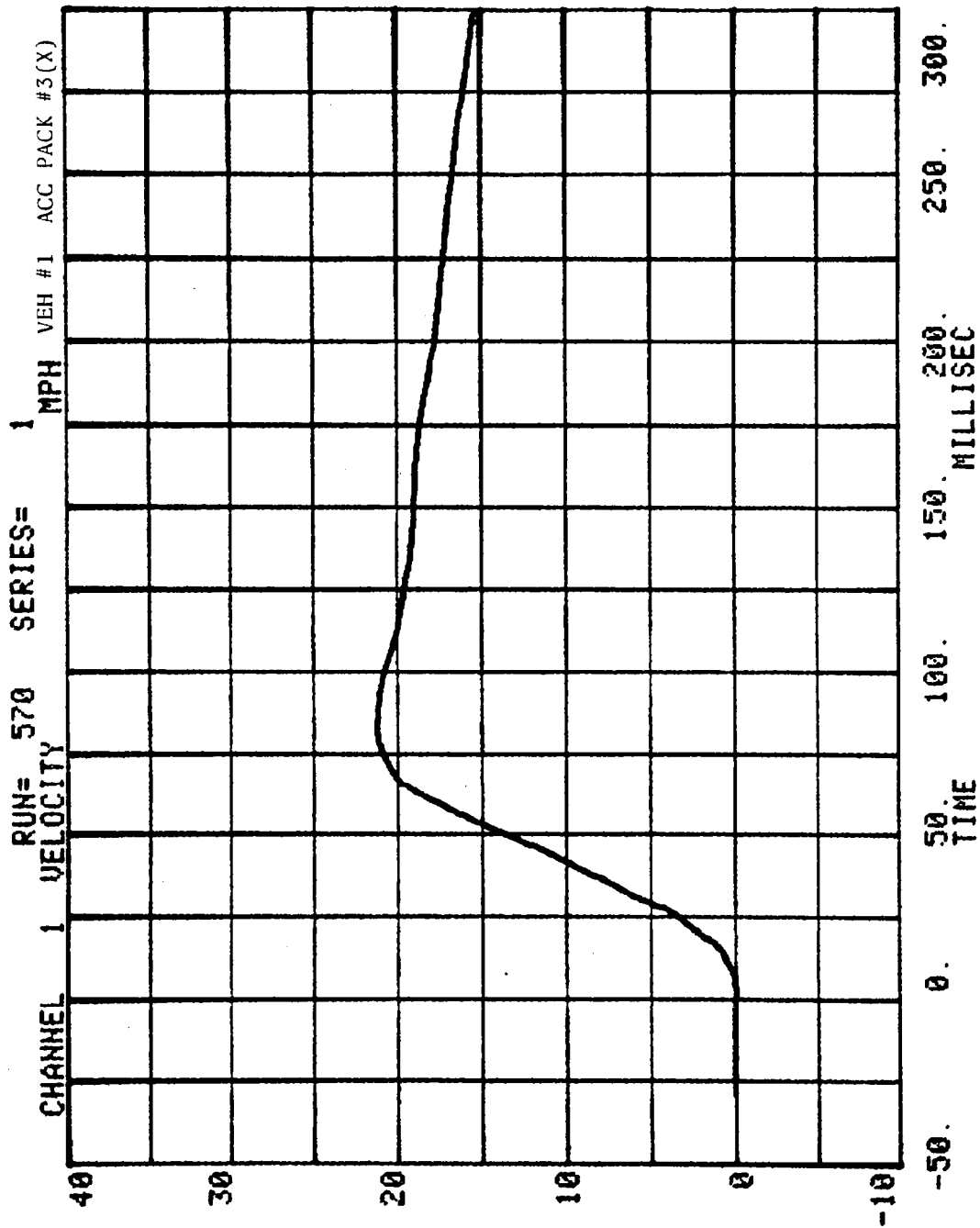
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VEH#1 ACC PACK #3(X) G'S

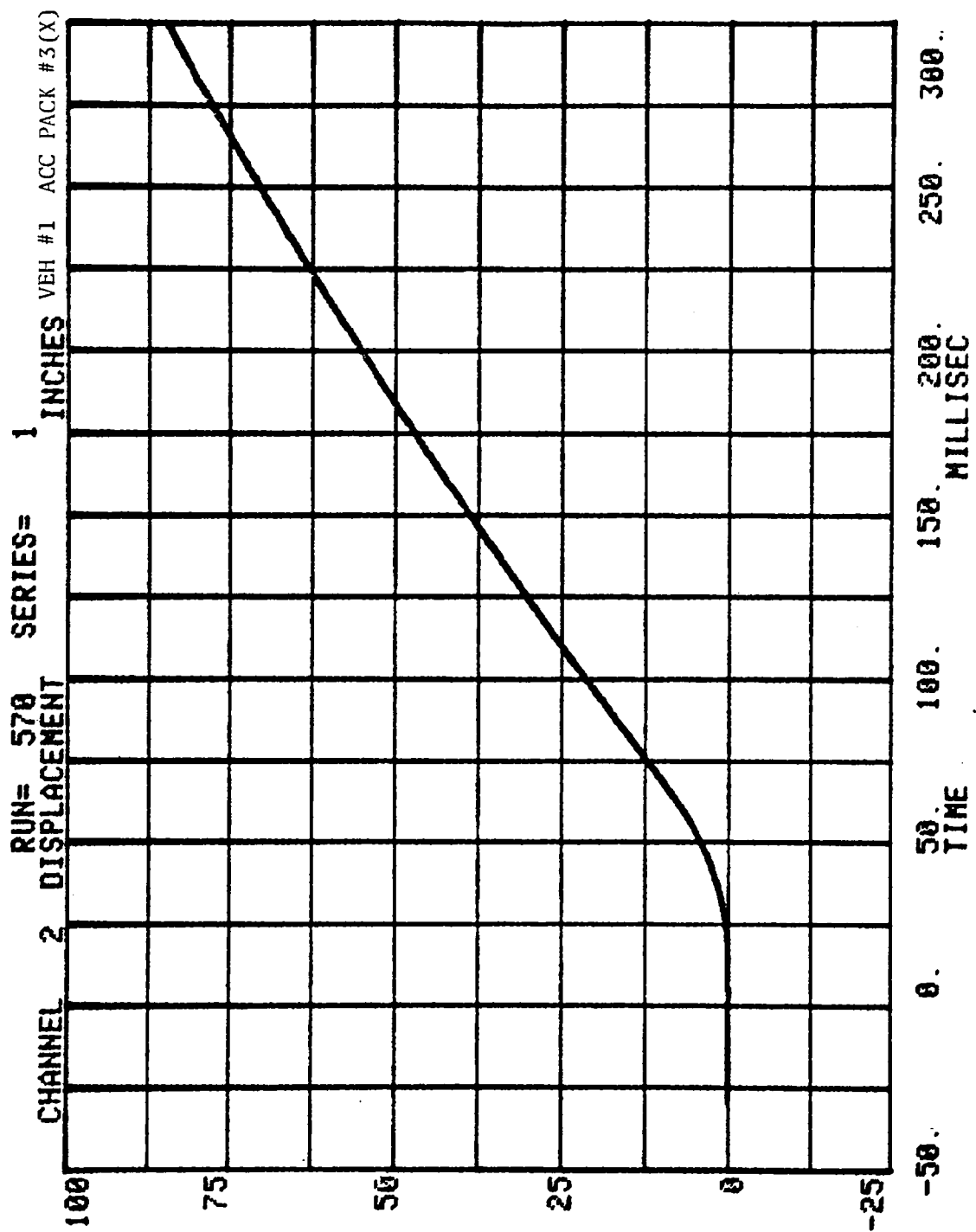


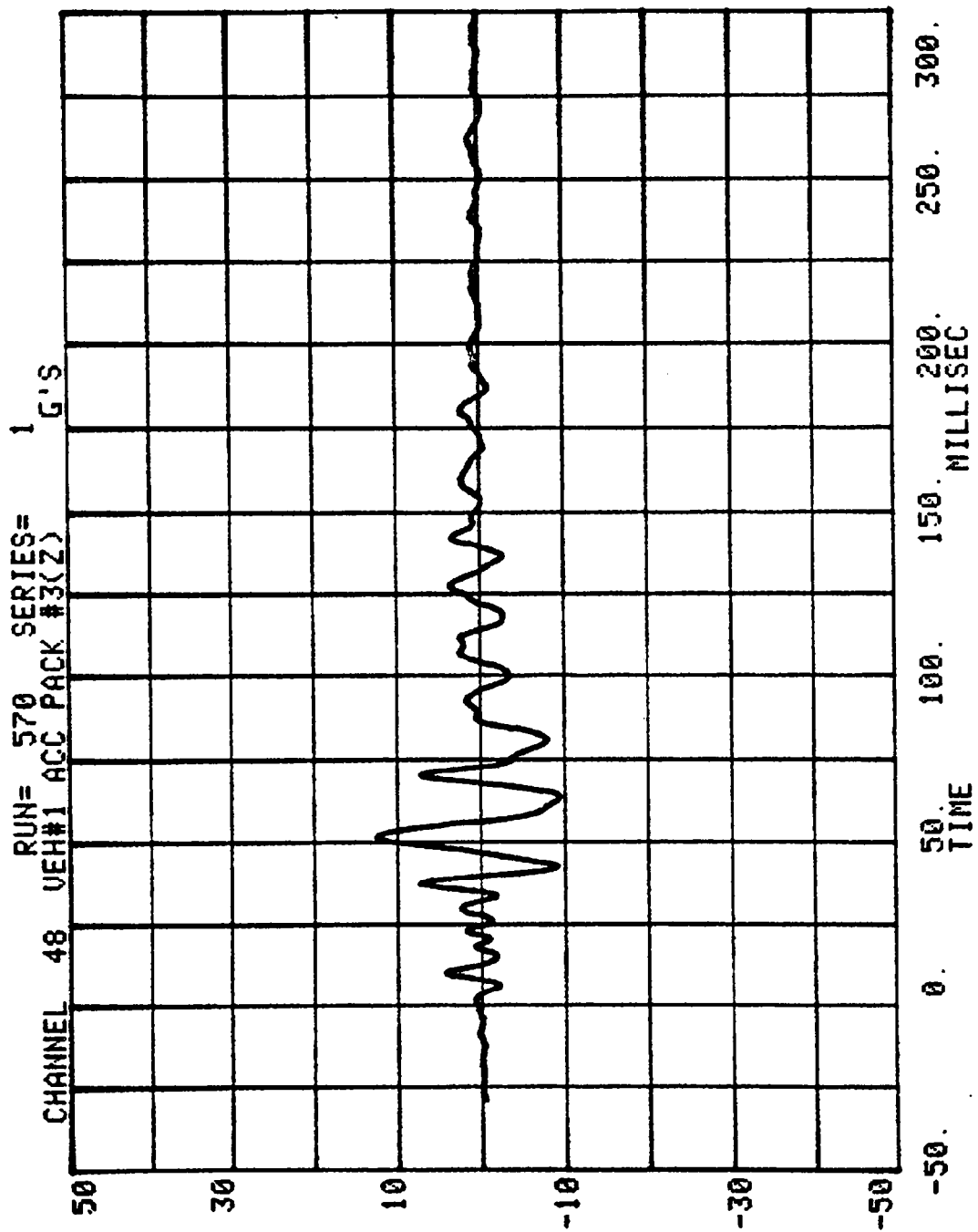


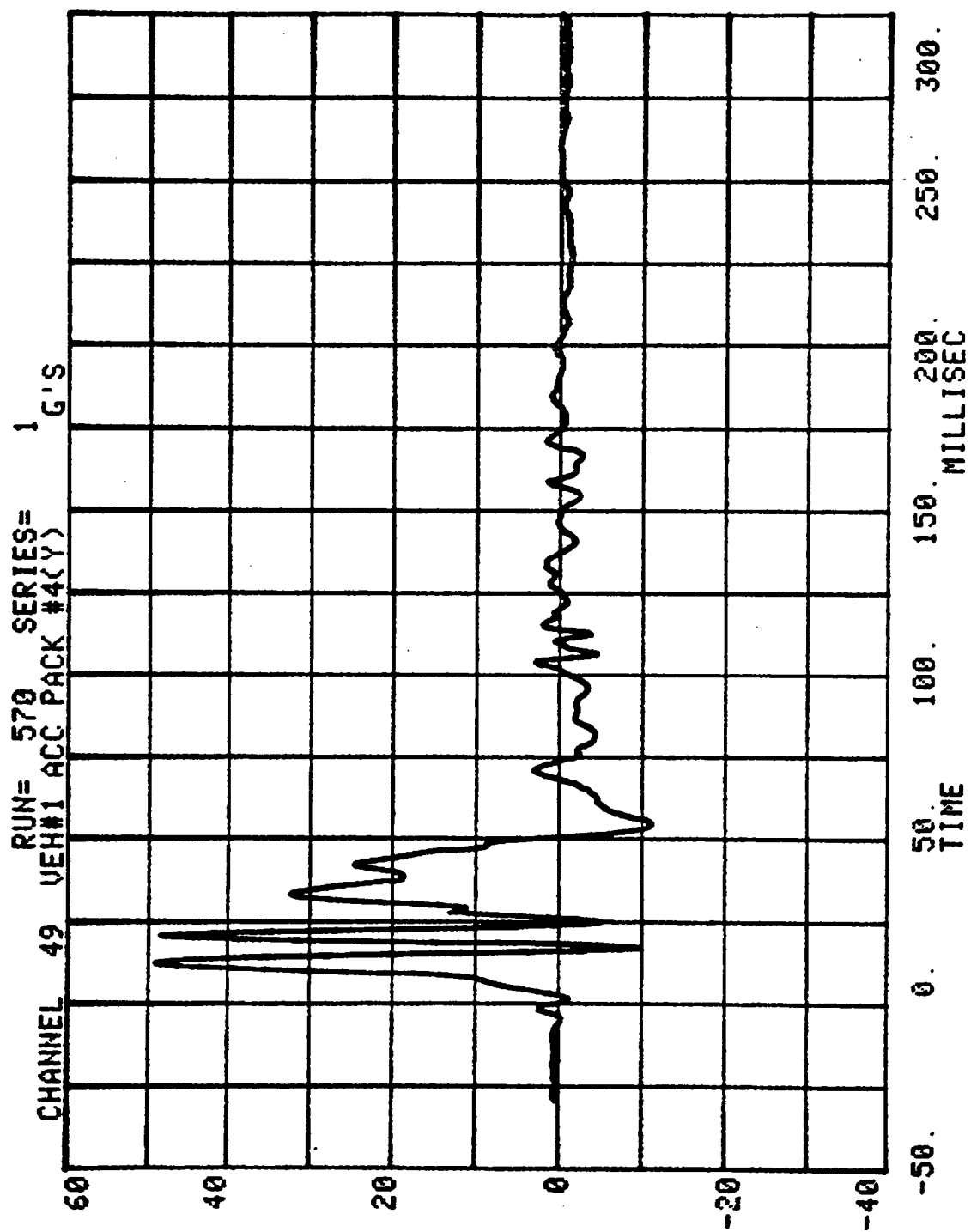


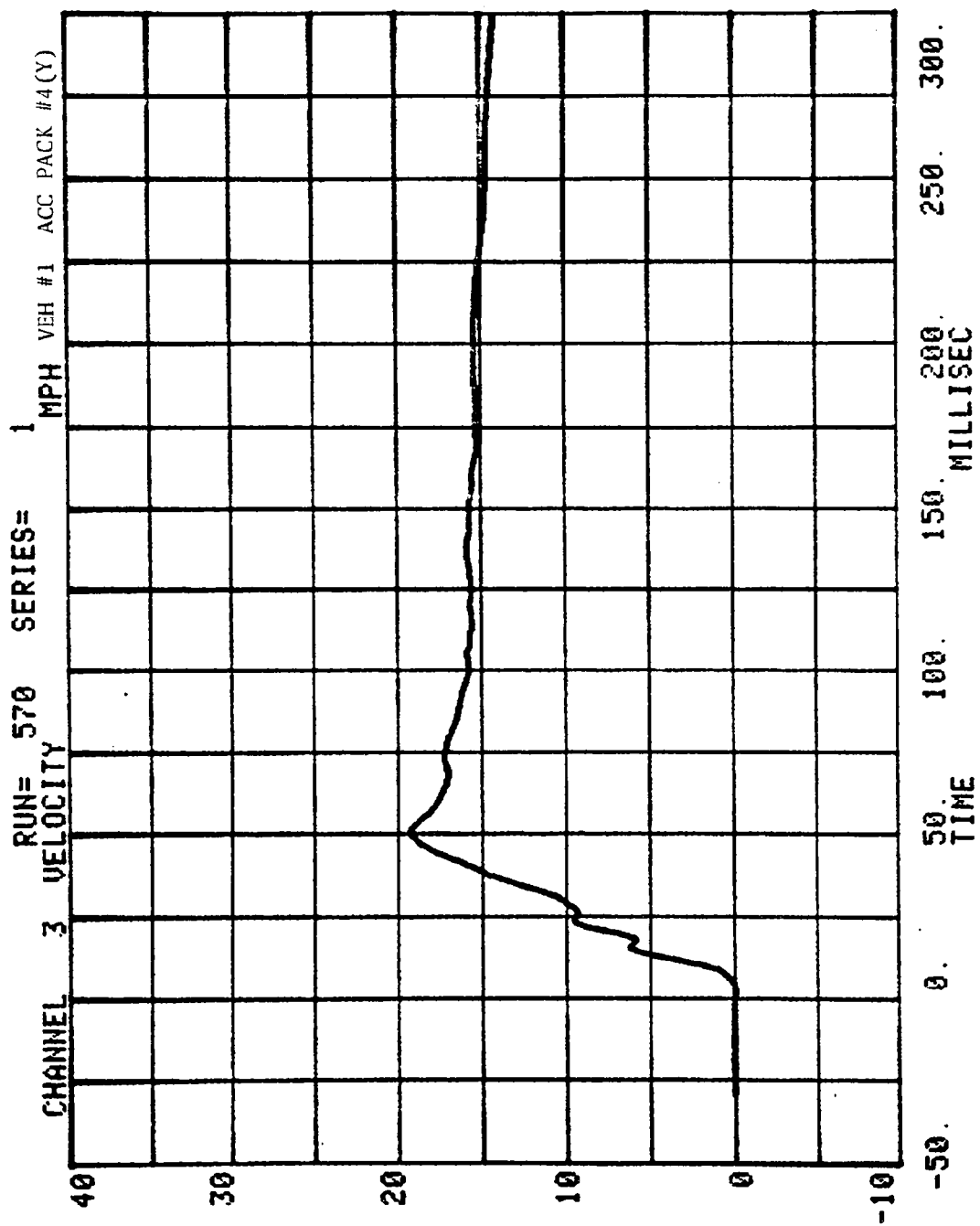


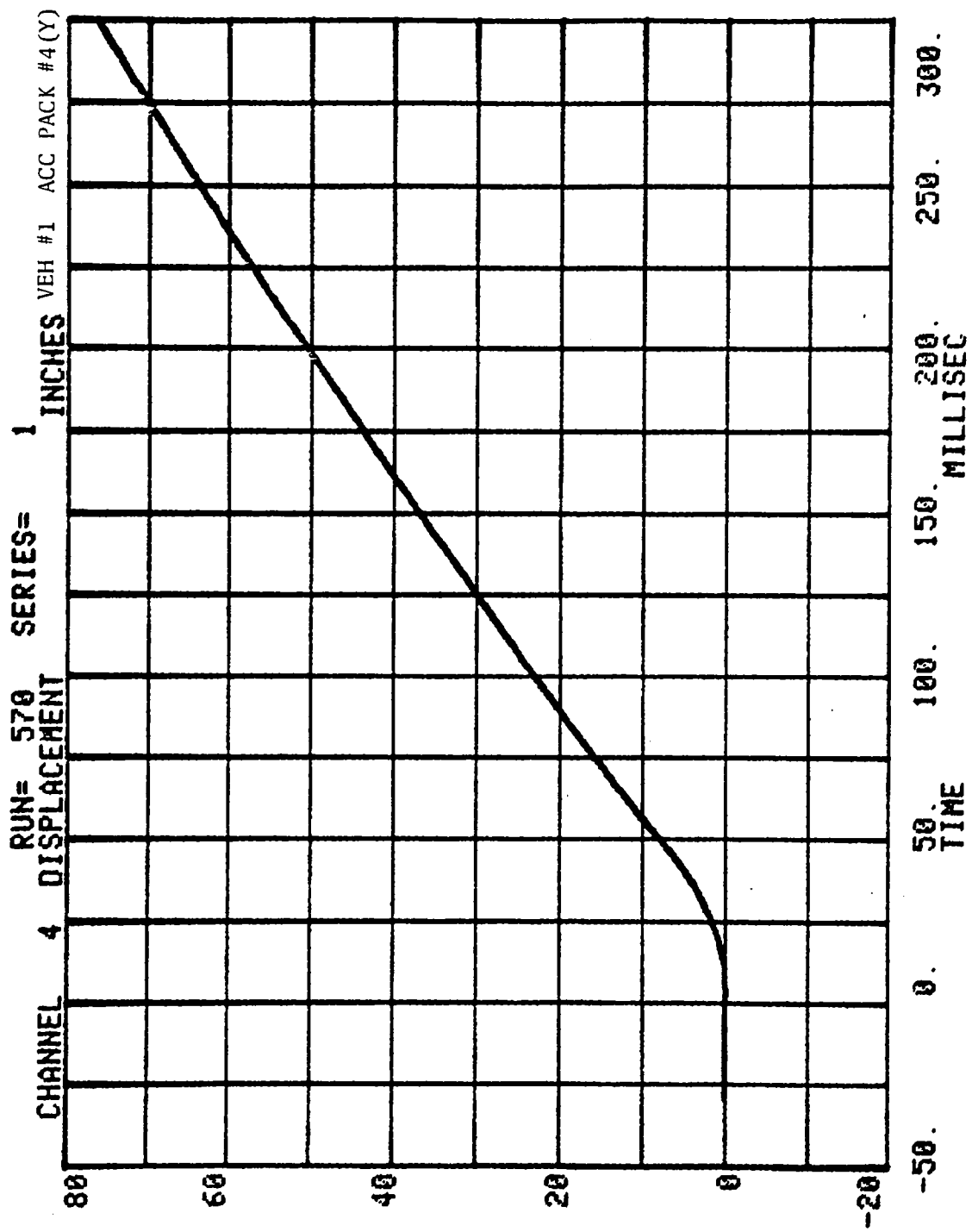


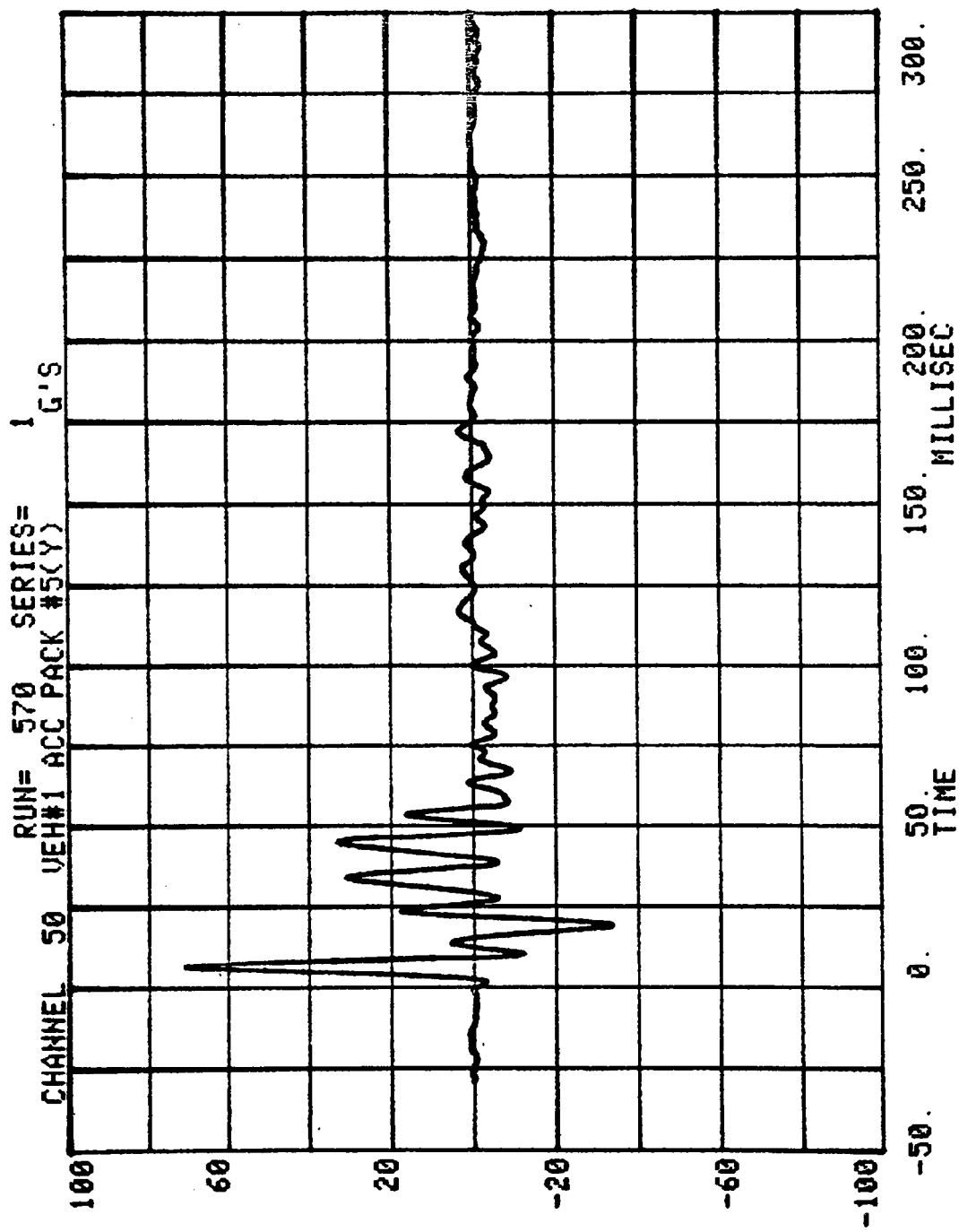


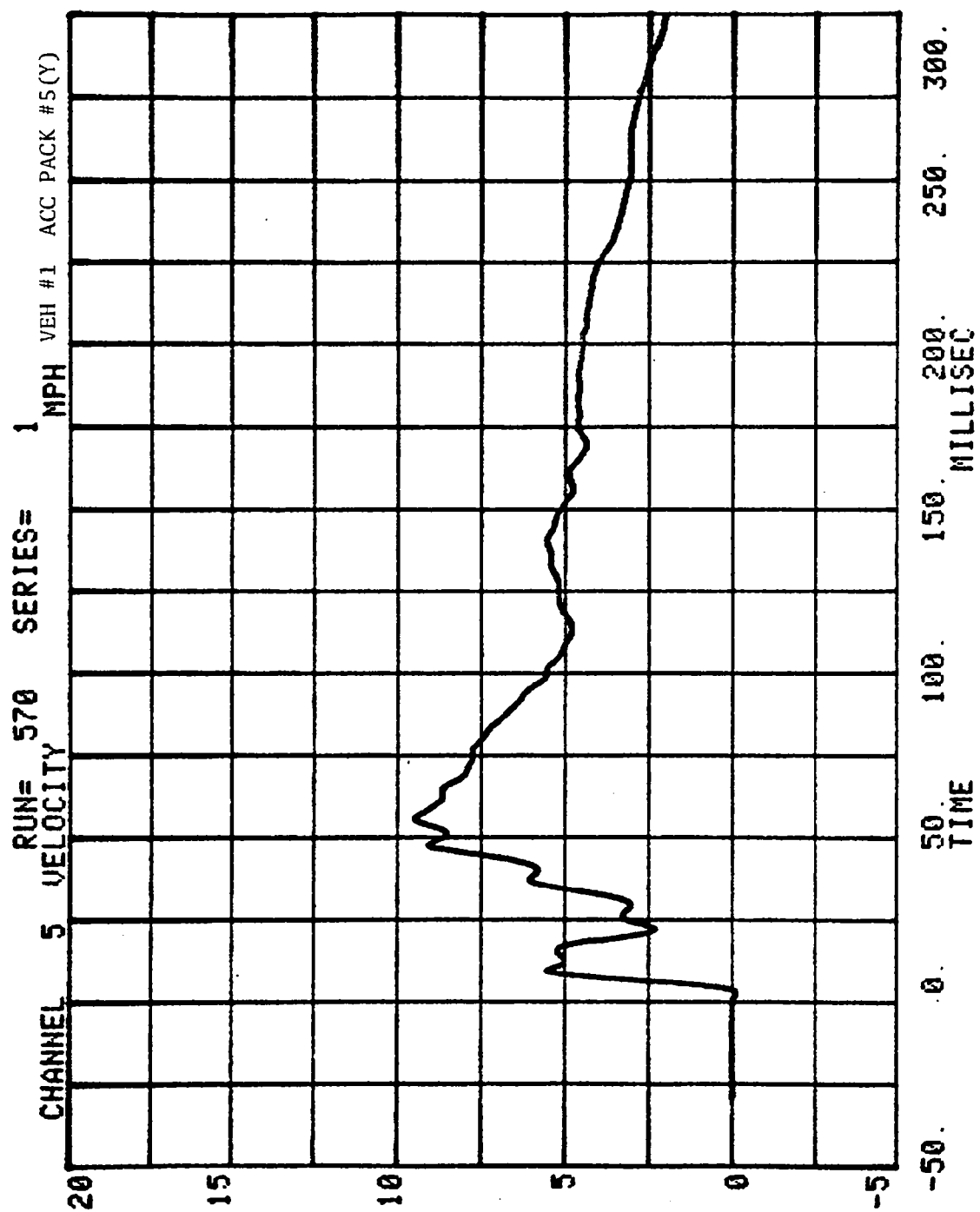


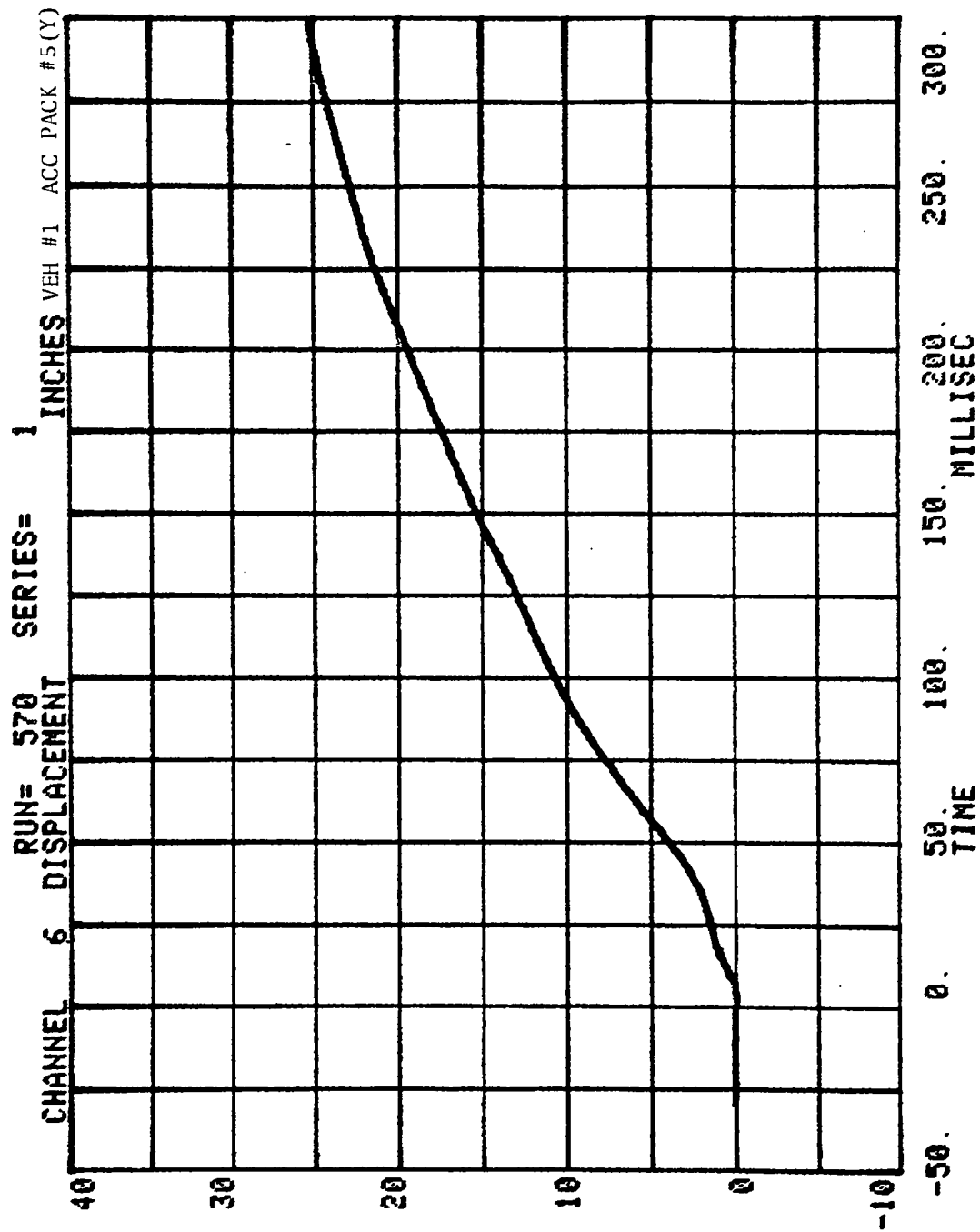


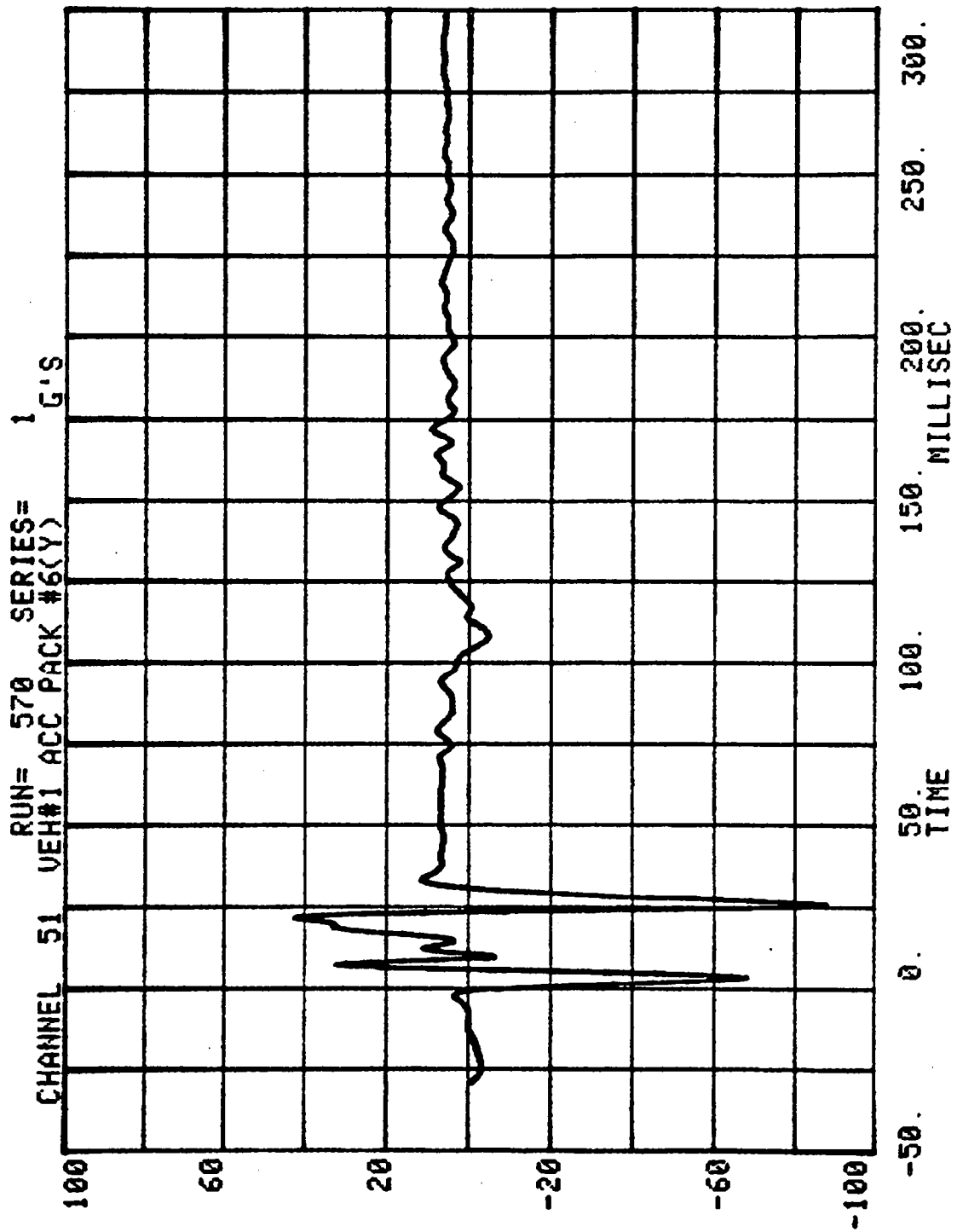


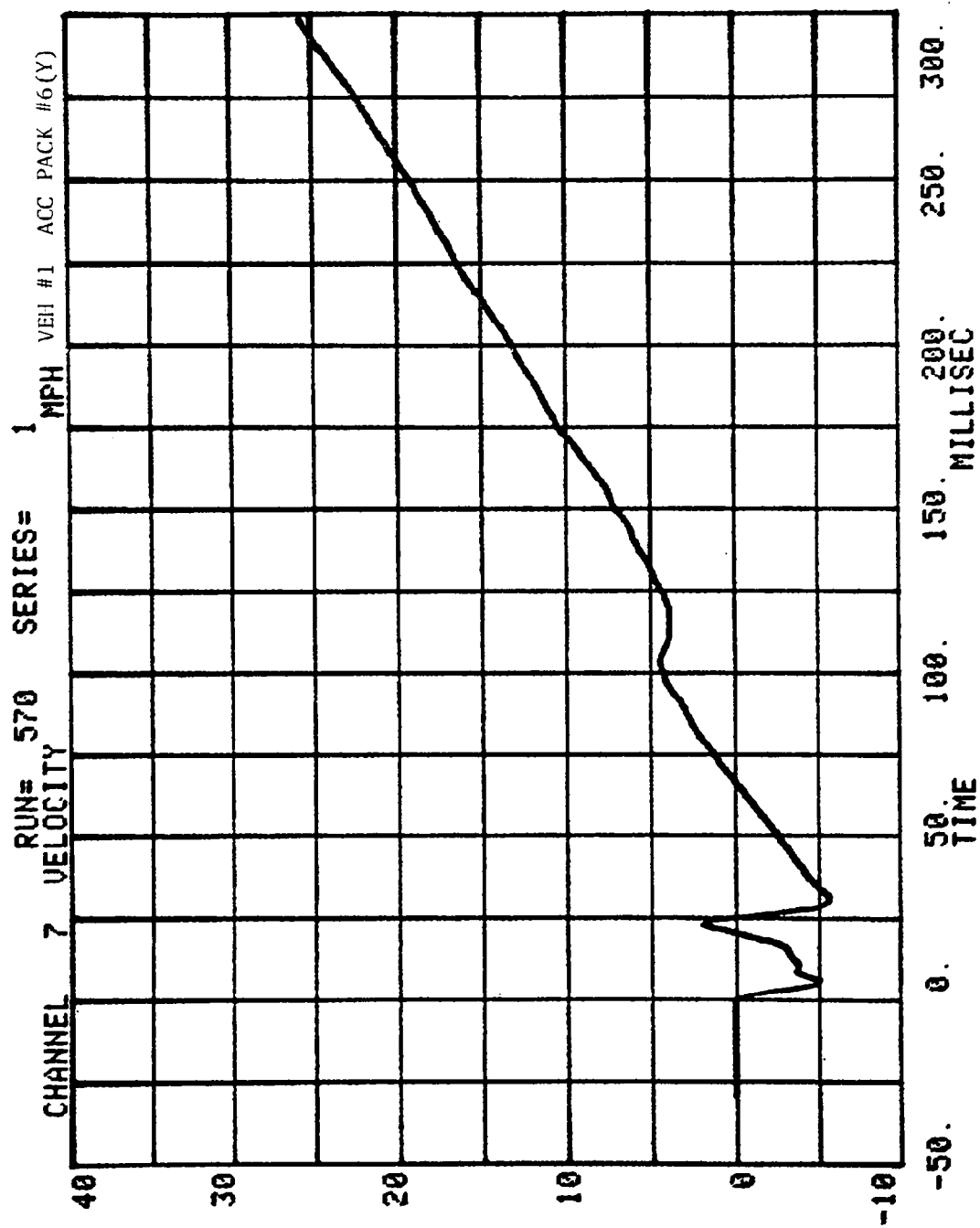


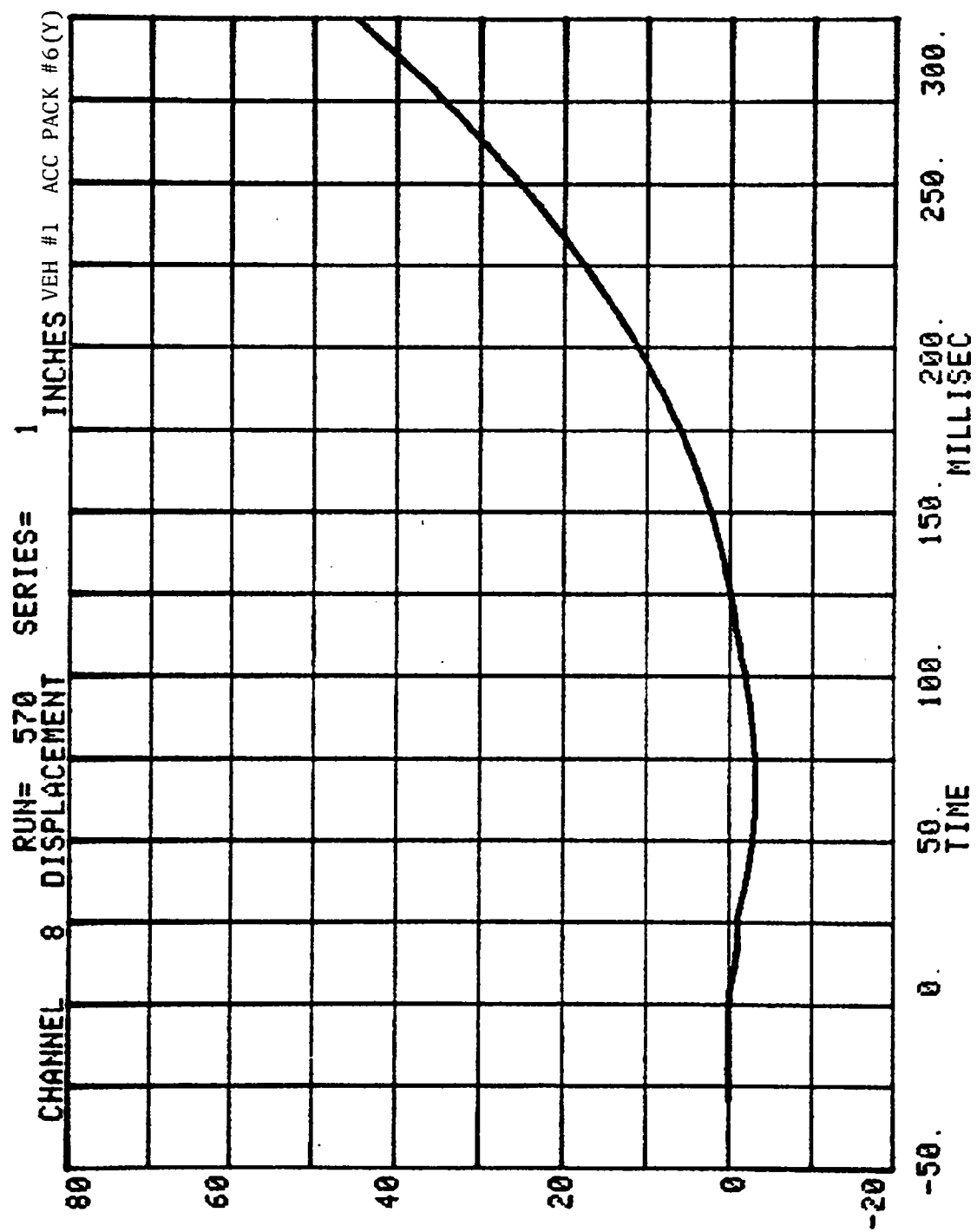


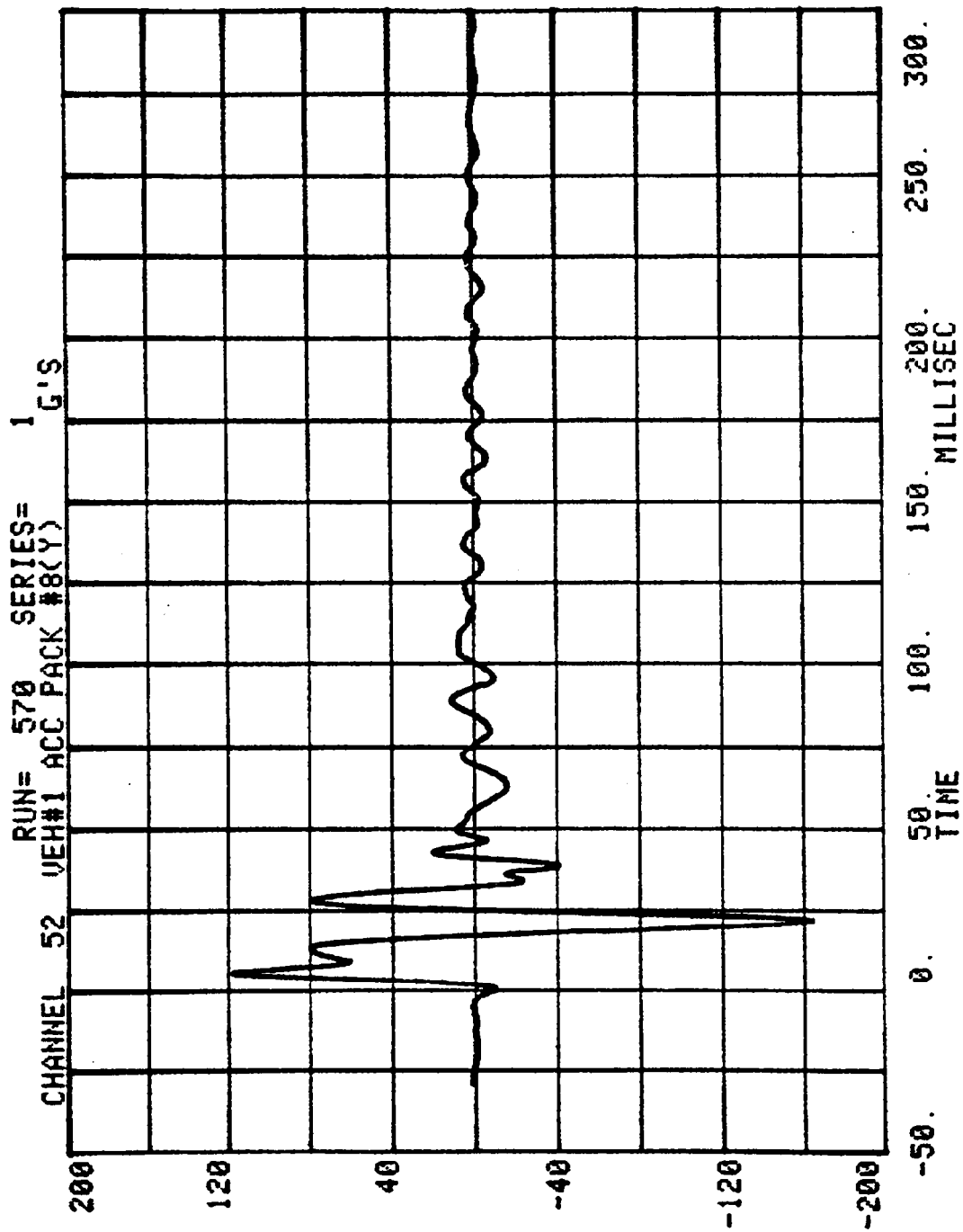


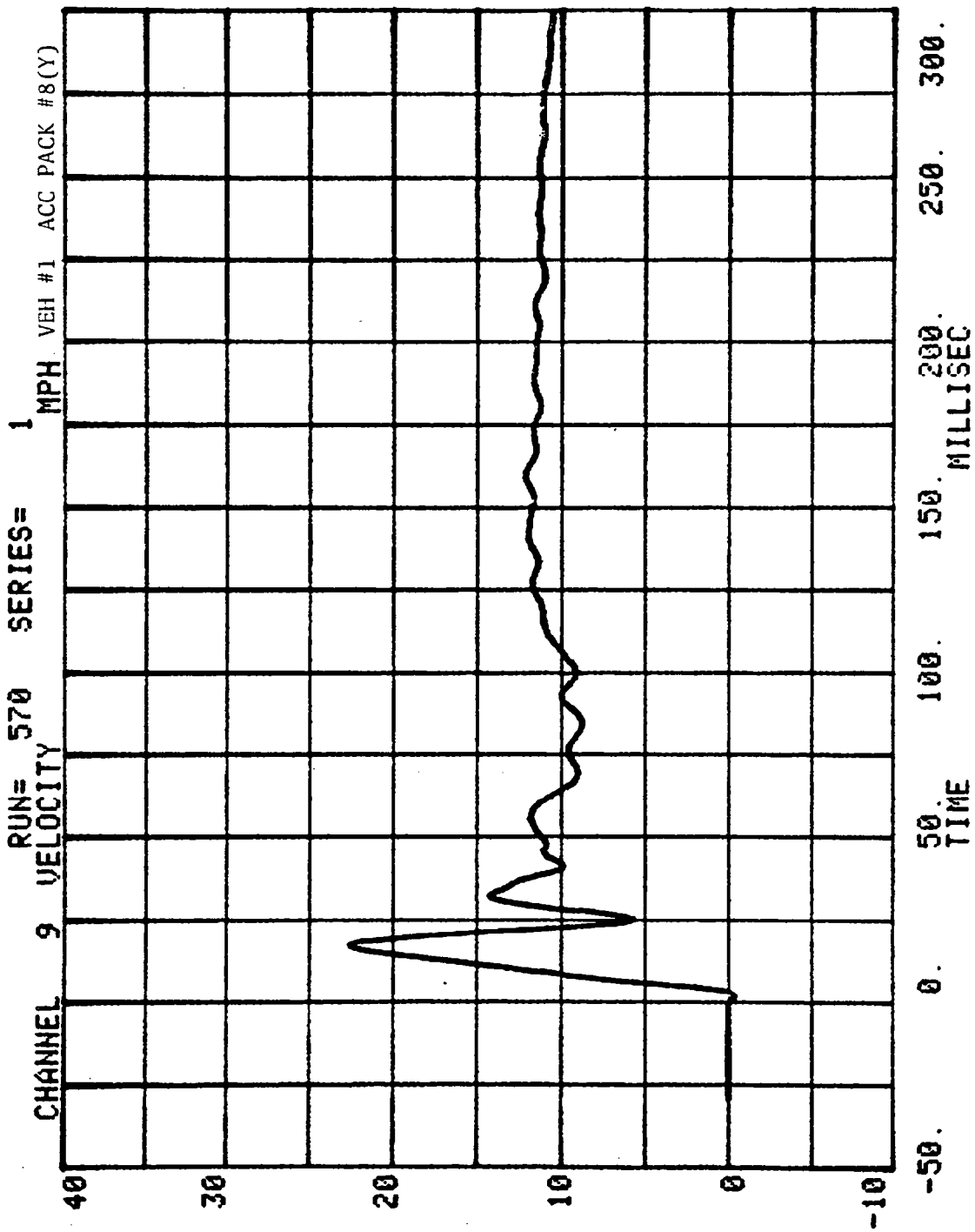


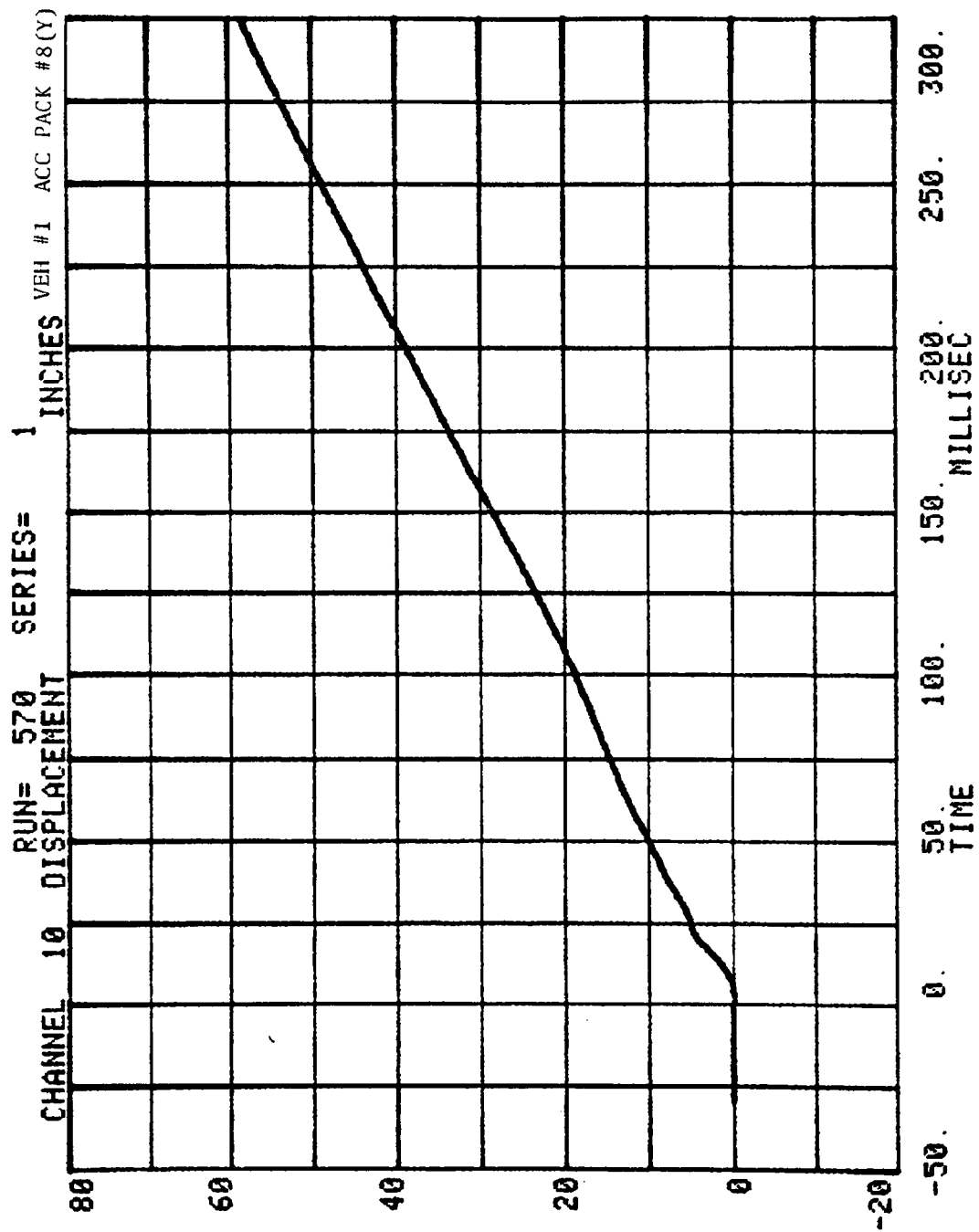


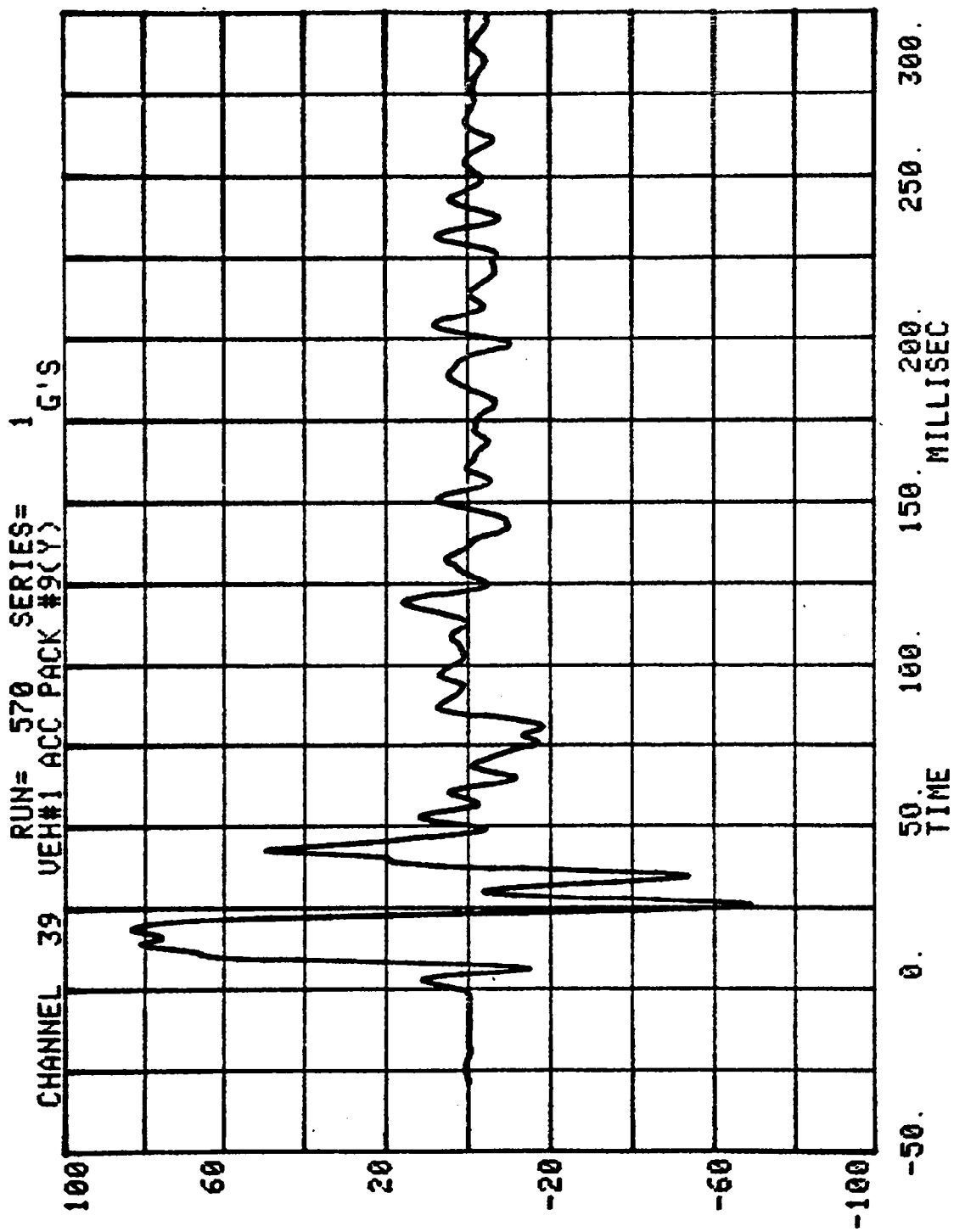


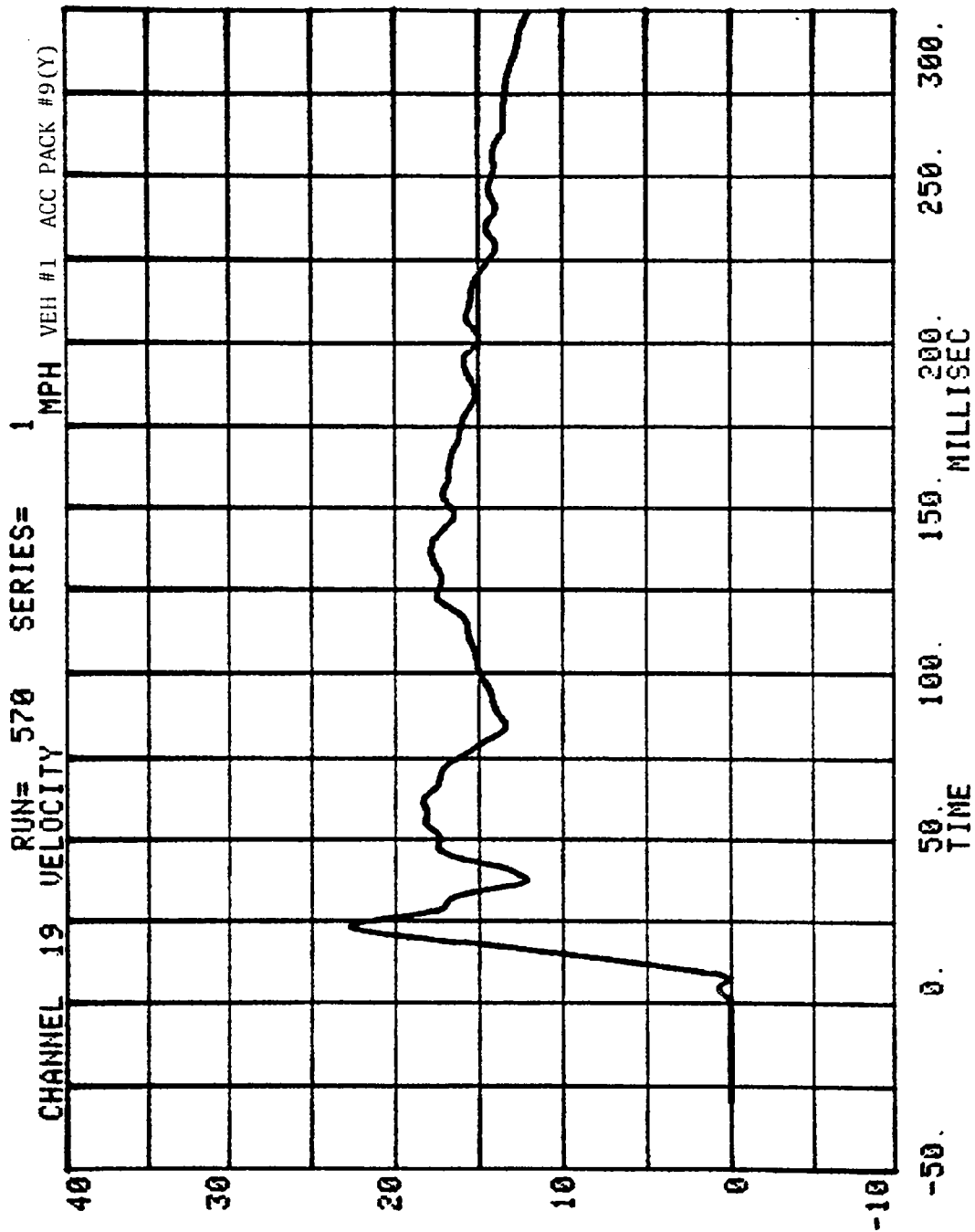


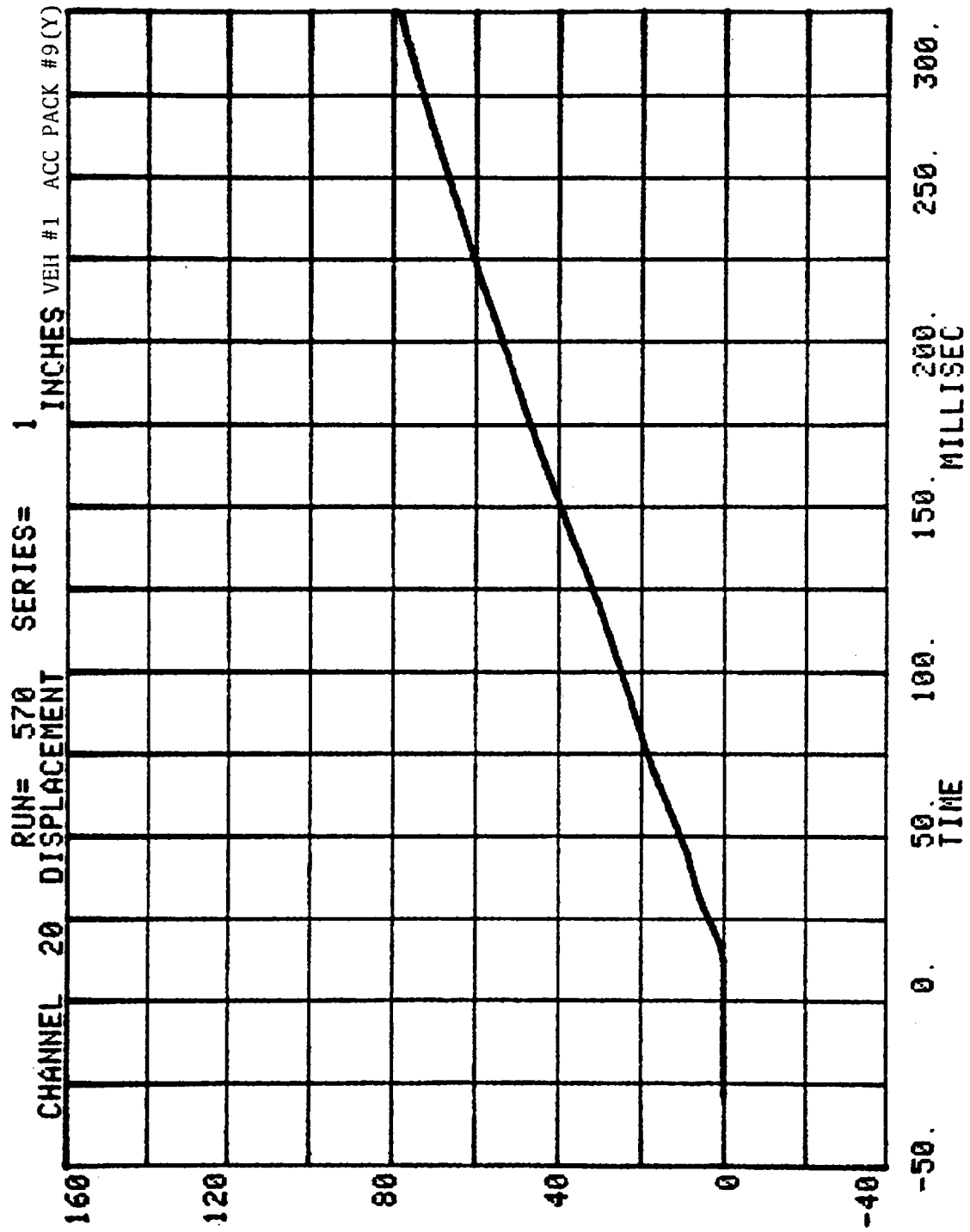


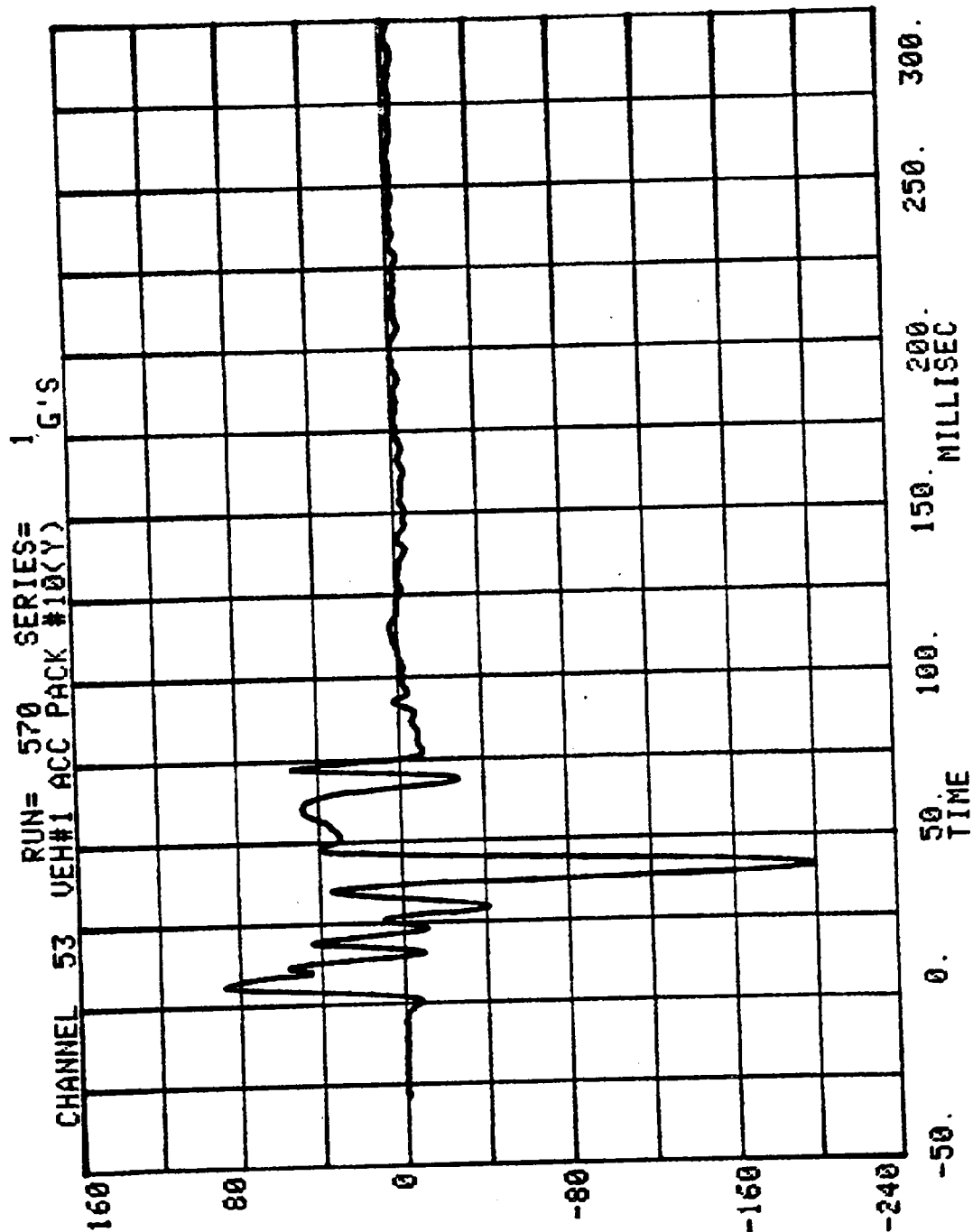


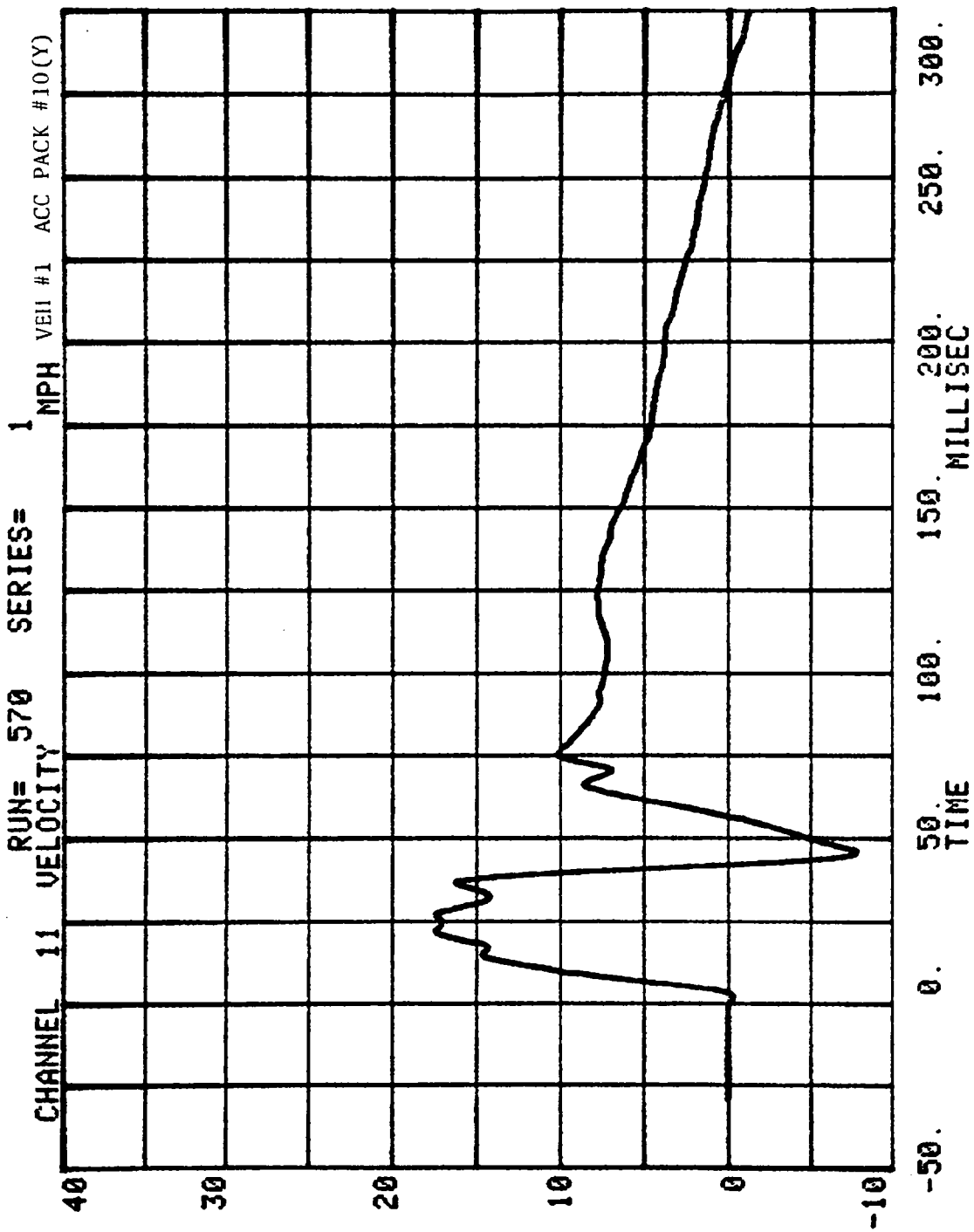


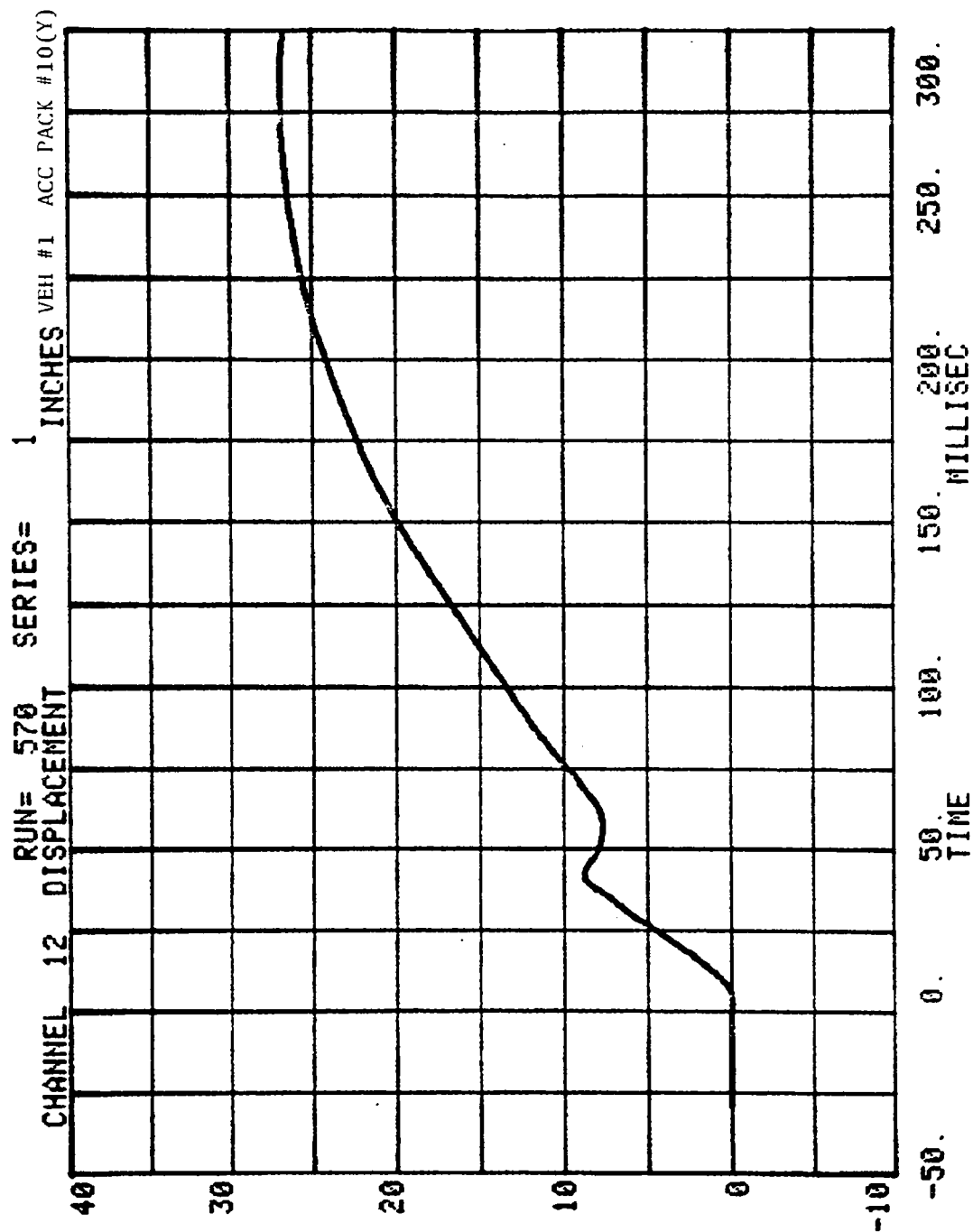












TEST NO. 907-1-570

VEHICLE NO. 1 1982 VOLKSWAGEN RABBIT

DUMMY DATA

	FILTER CHANNEL CLASS
HEAD ACCELERATIONS	1000
CHEST ACCELERATIONS	180
PELVIC ACCELERATIONS	180

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

CAR-T0-CAR 90-DEG SIDE IMPACT TEST

RUN= 570

VEH#1 POS#1 HEAD R

HIC= 206.6 FROM T1= .05497 TO T2= .07515

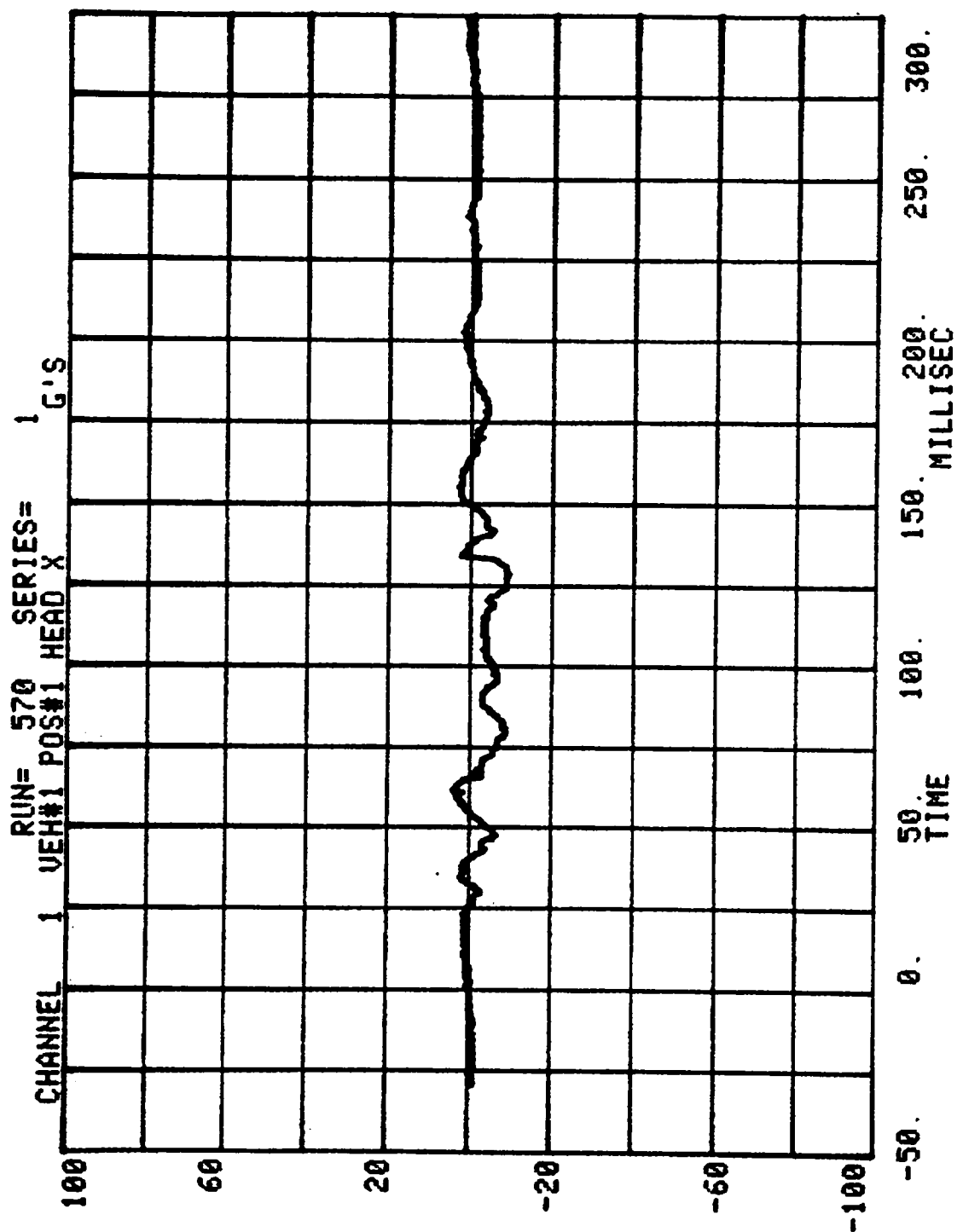
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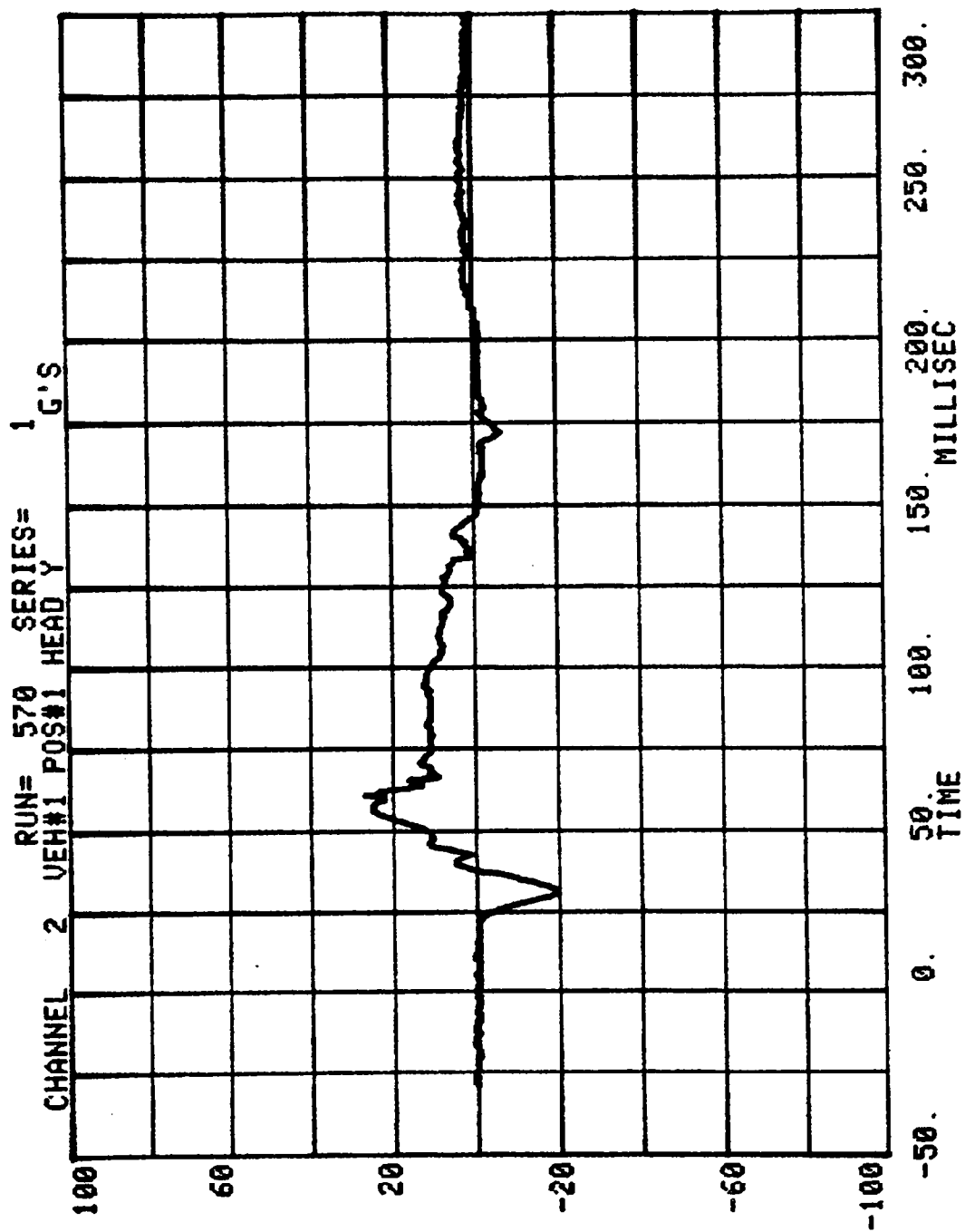
EVENT TIME= 300.0 MSEC

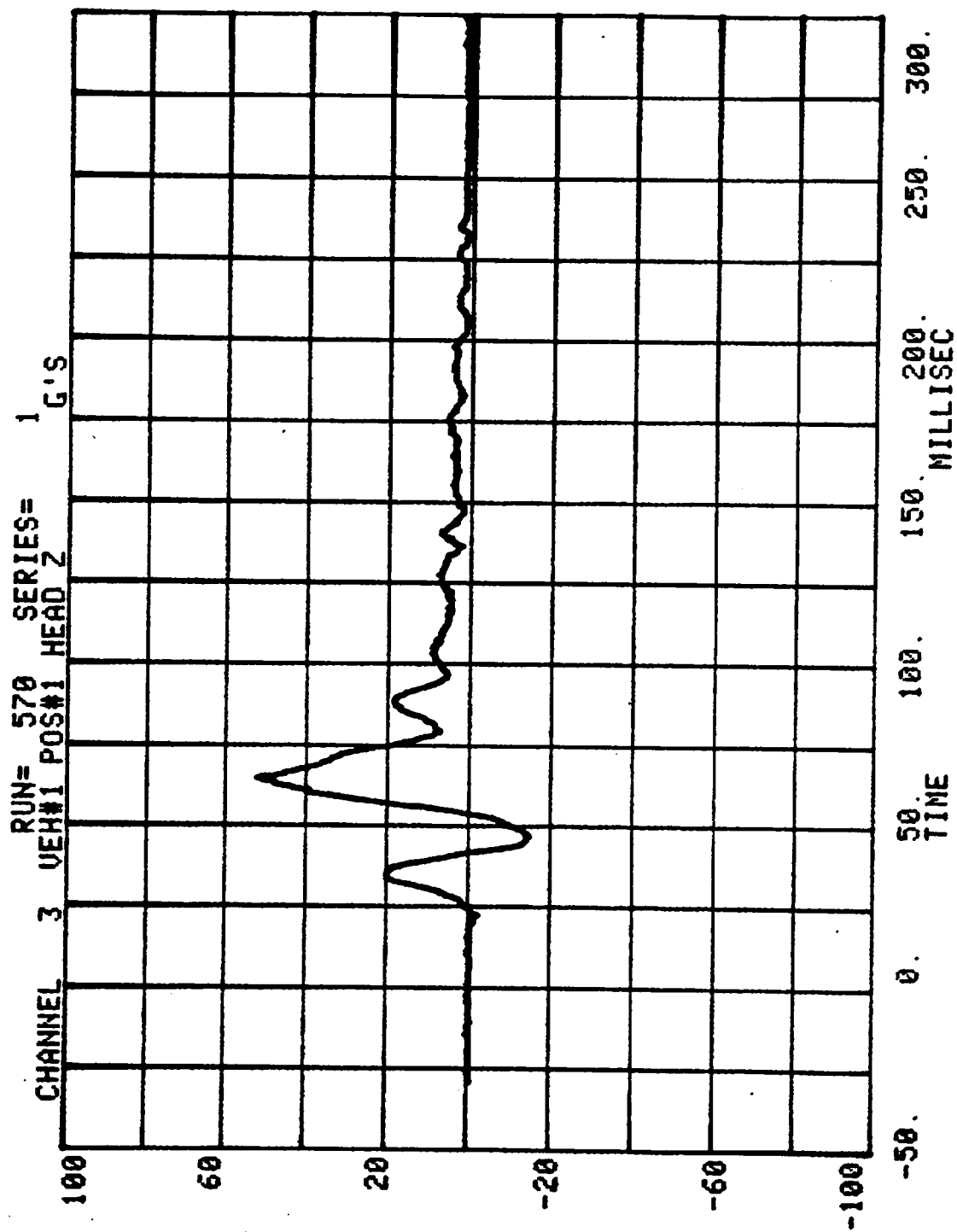
SEVERITY INDEX= 322.5

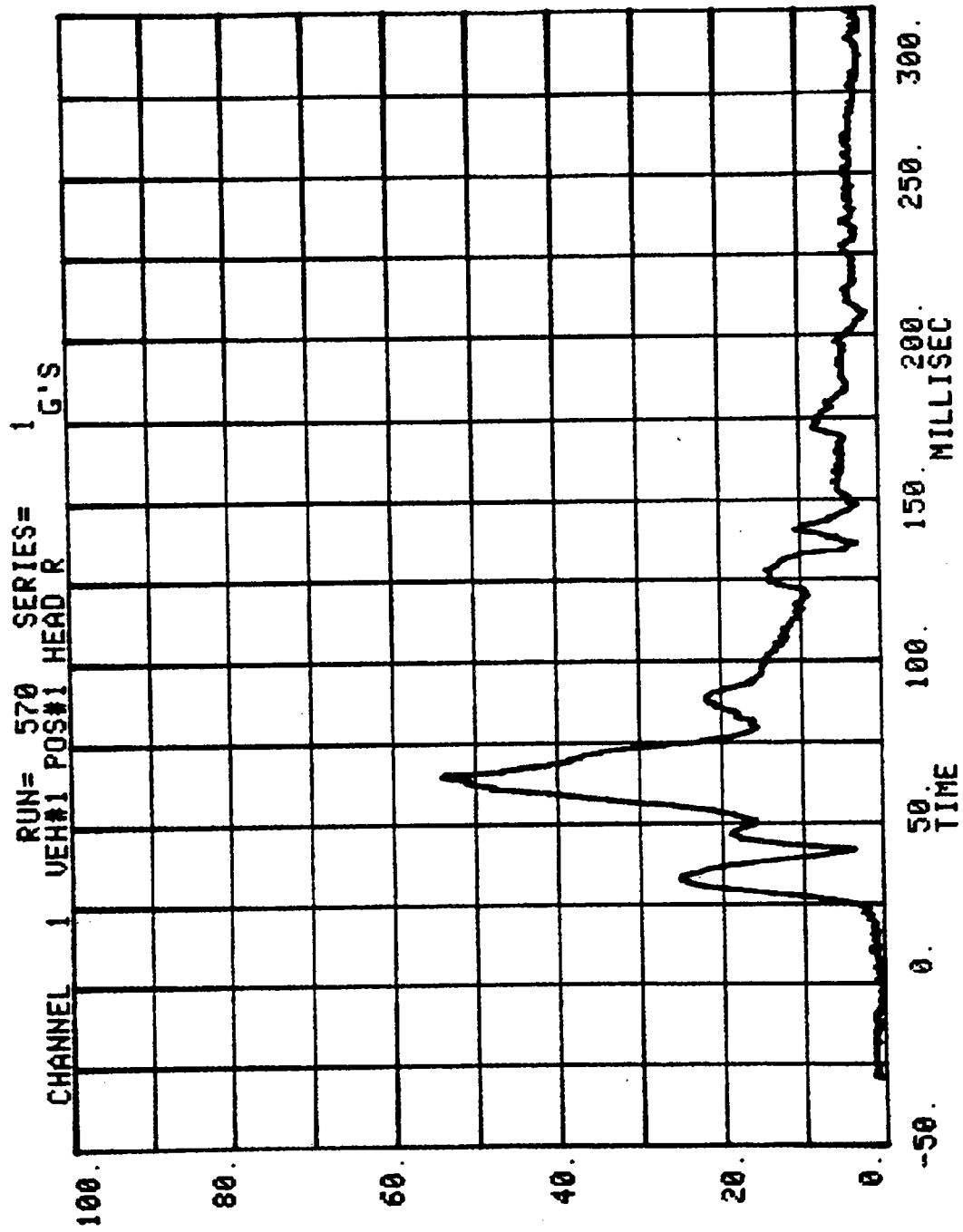
CP**

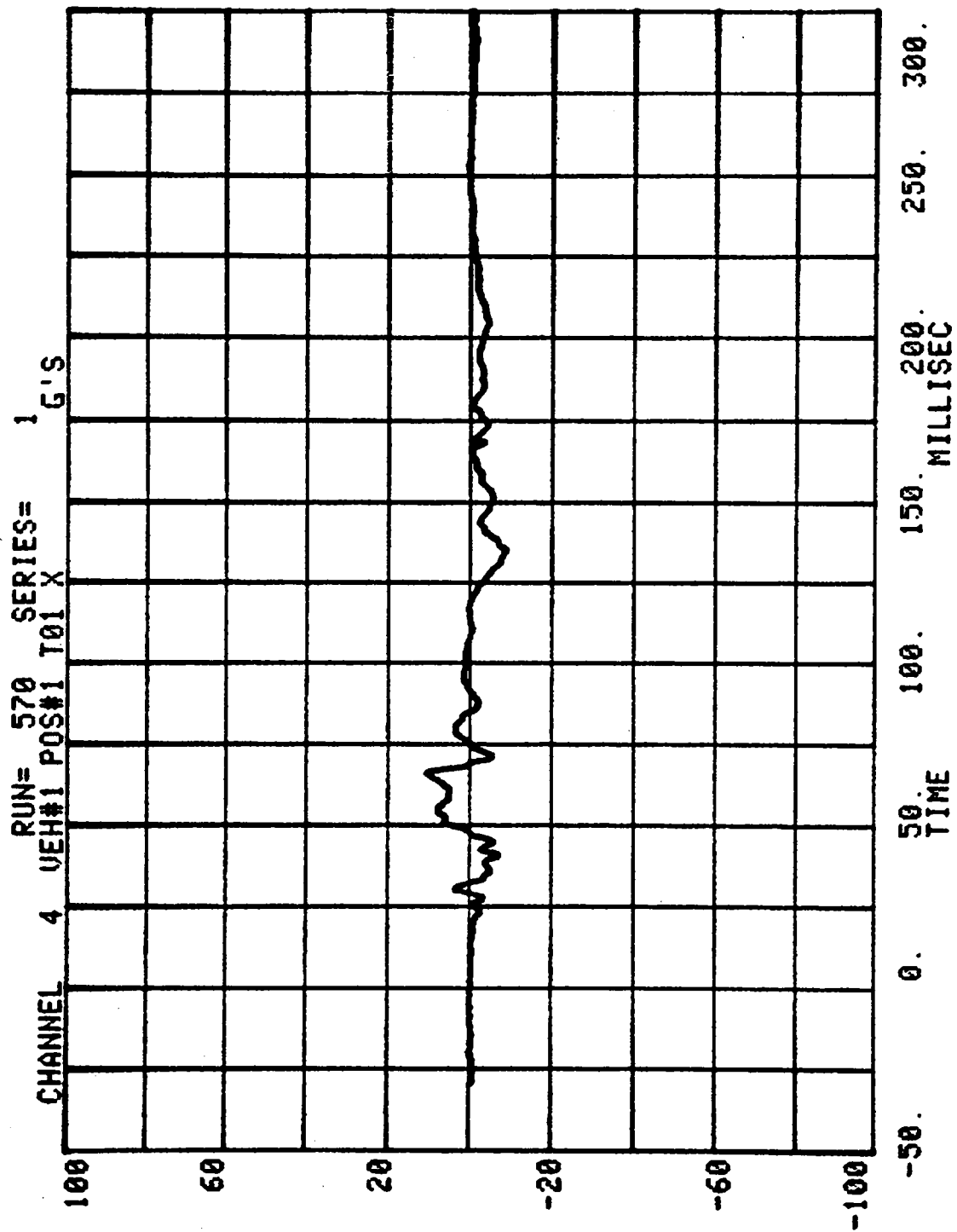
RUNLP HIC

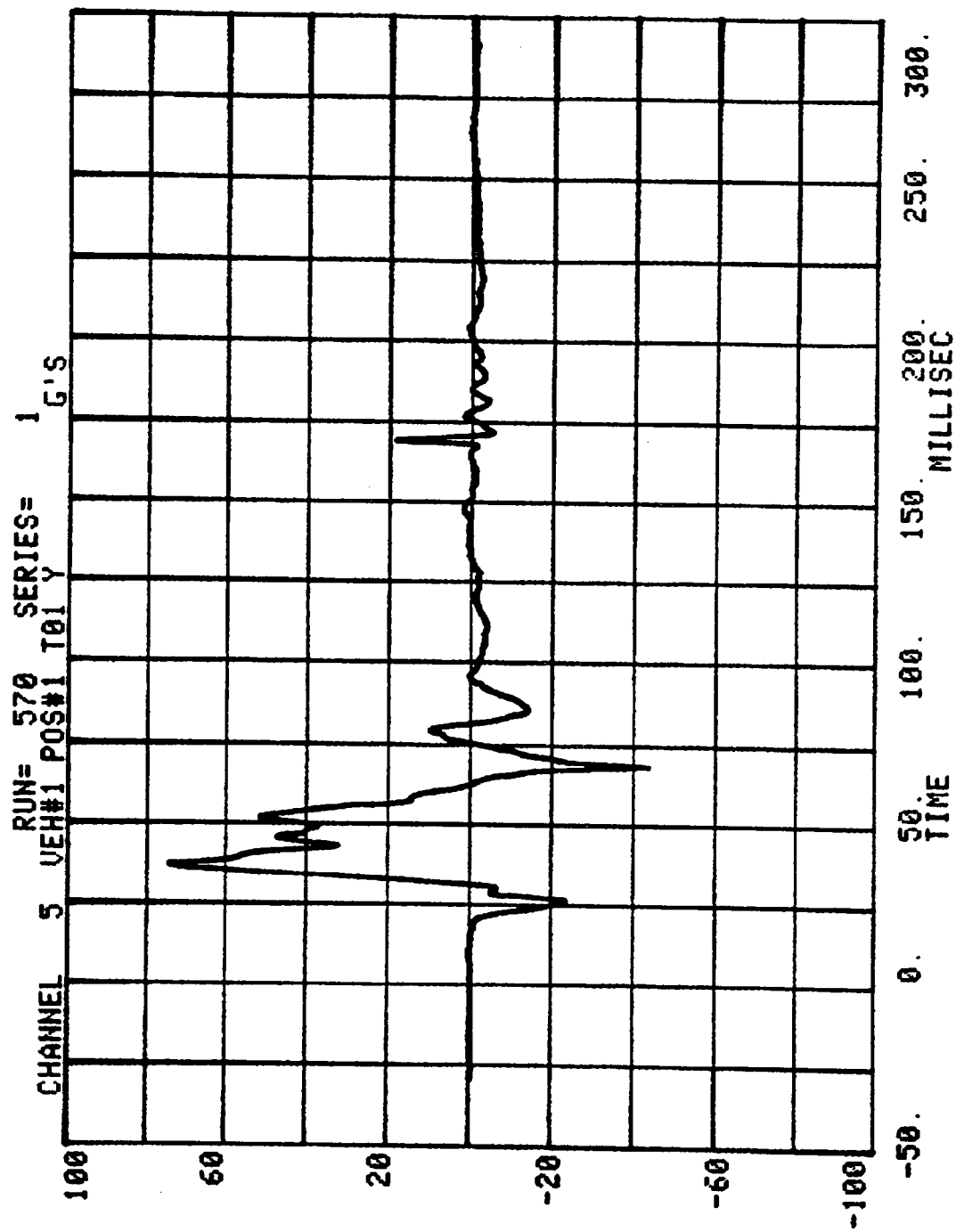


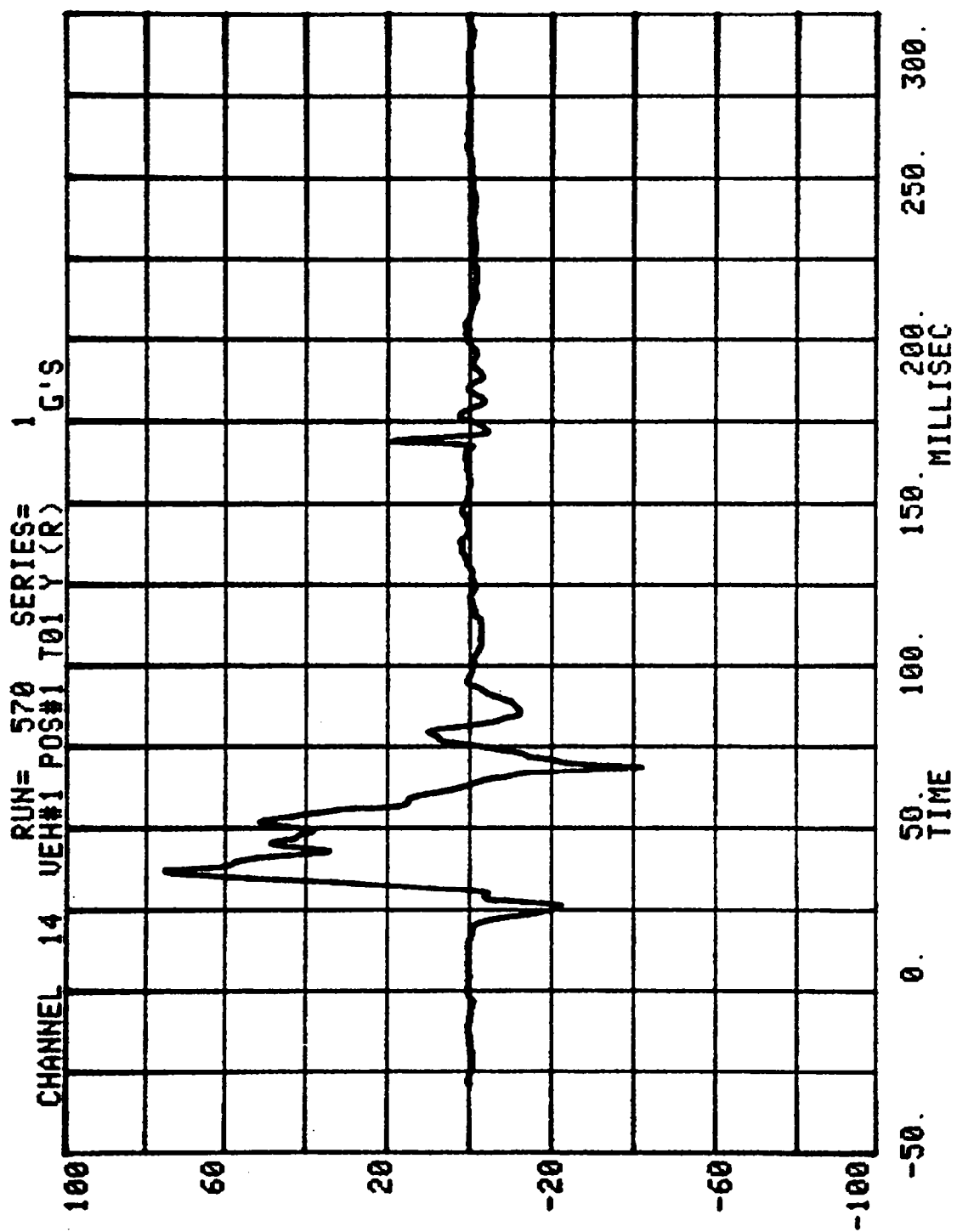


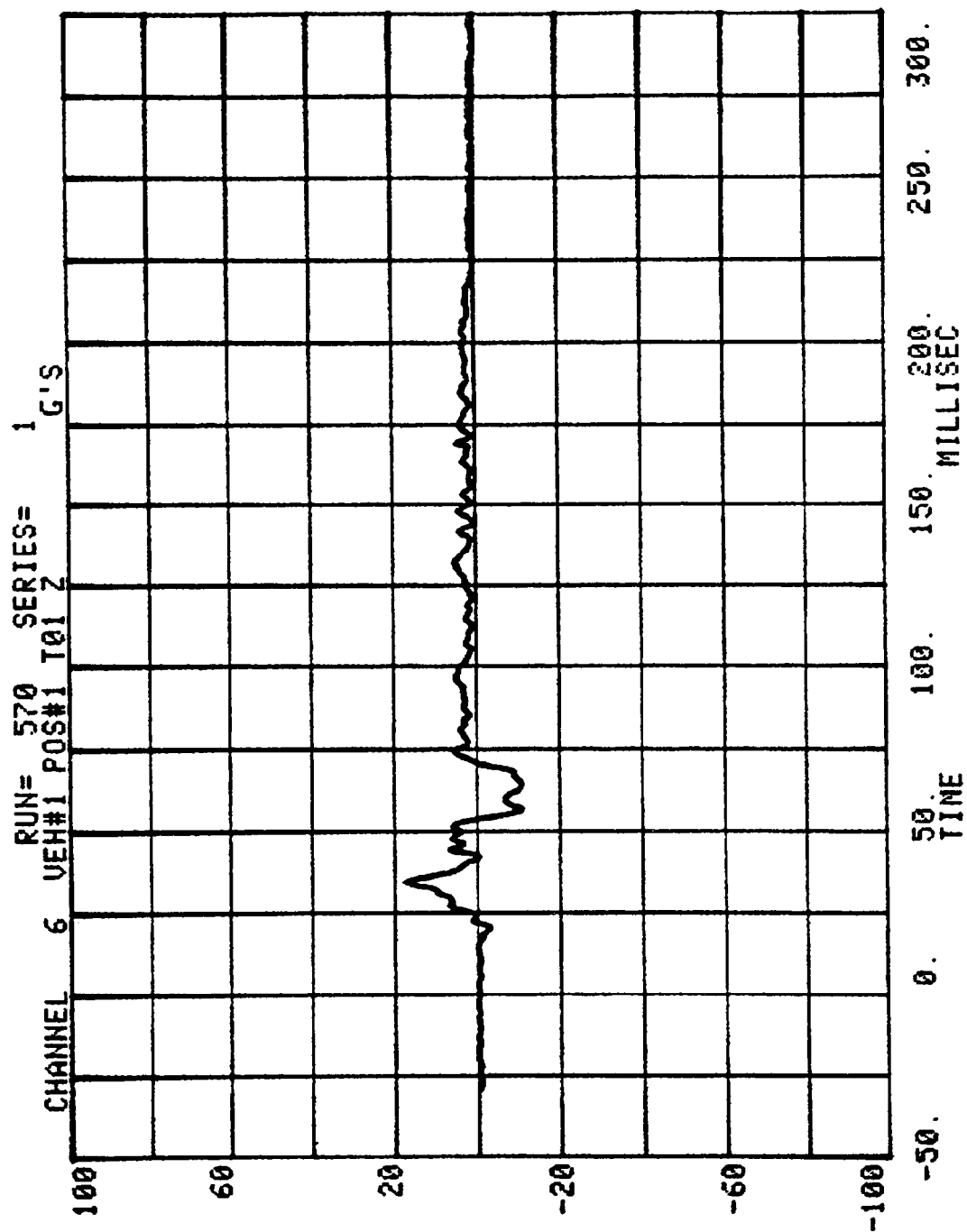


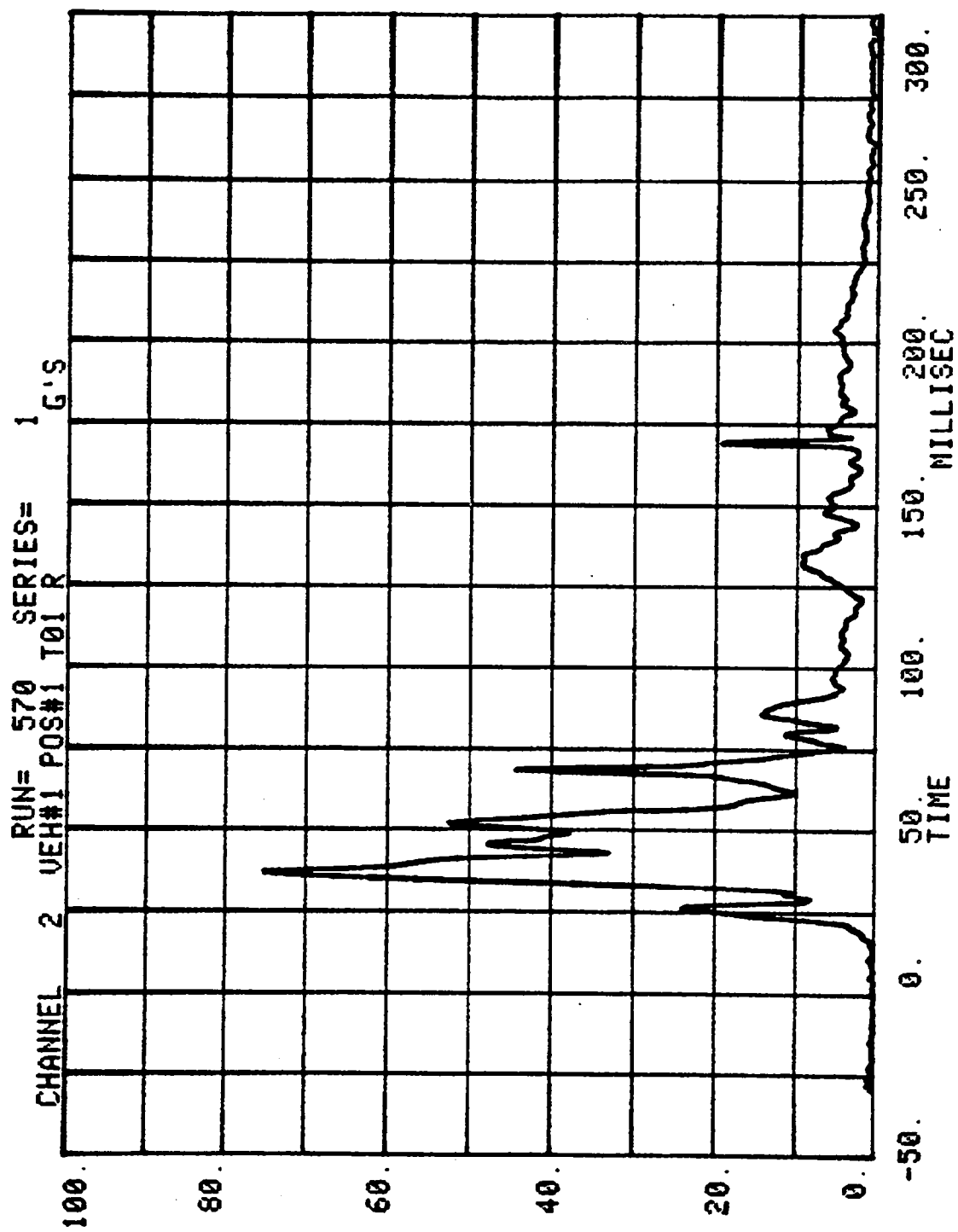


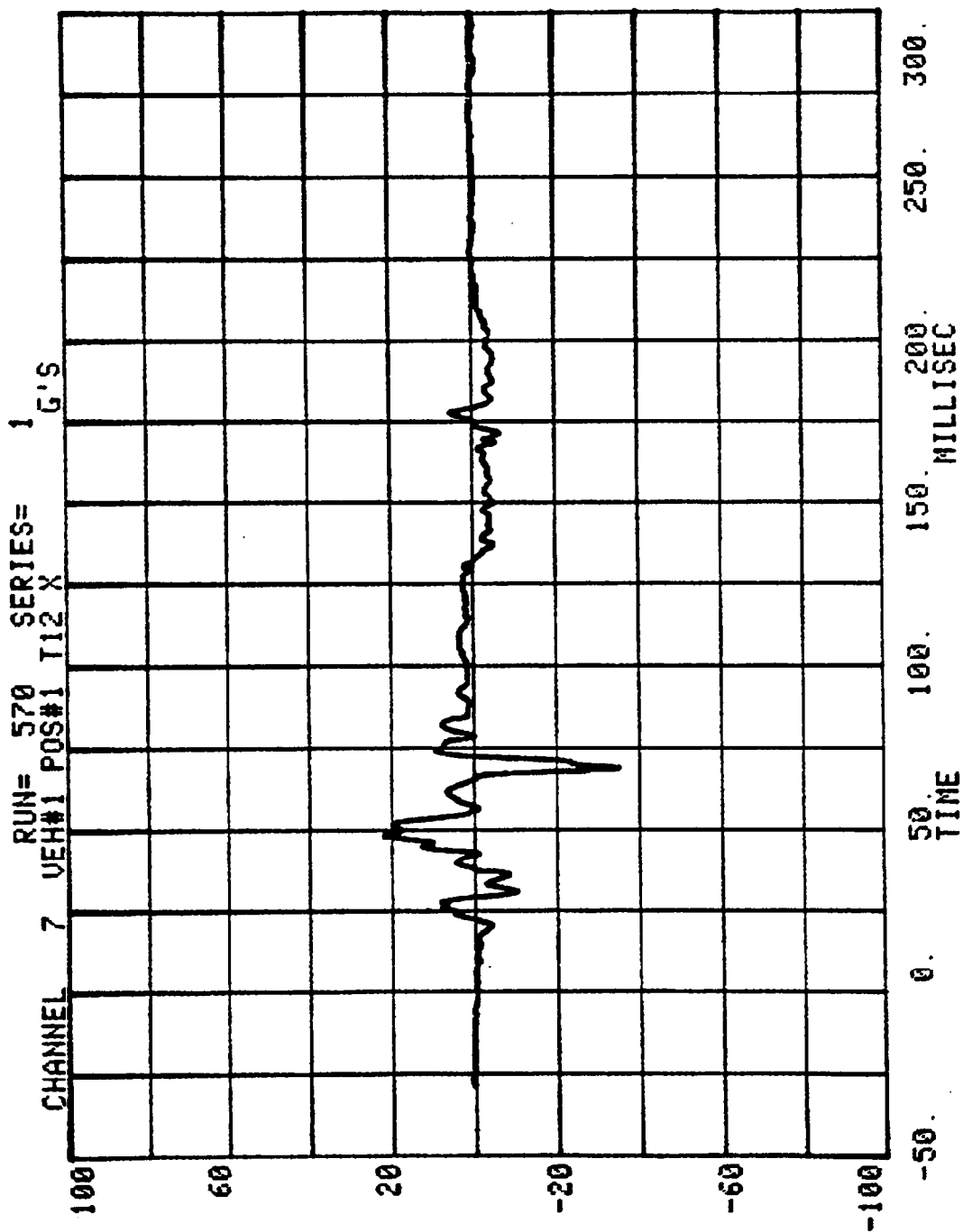


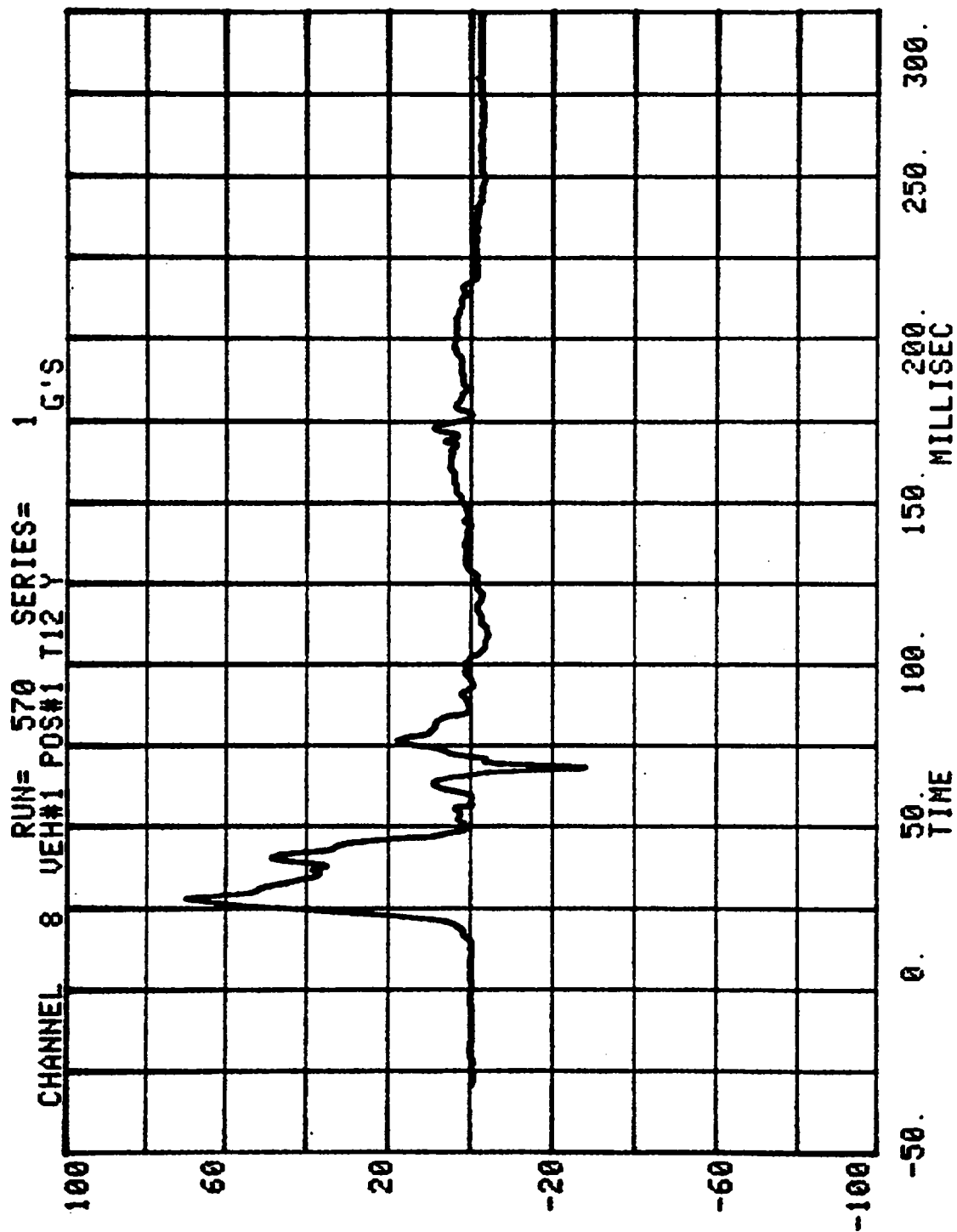


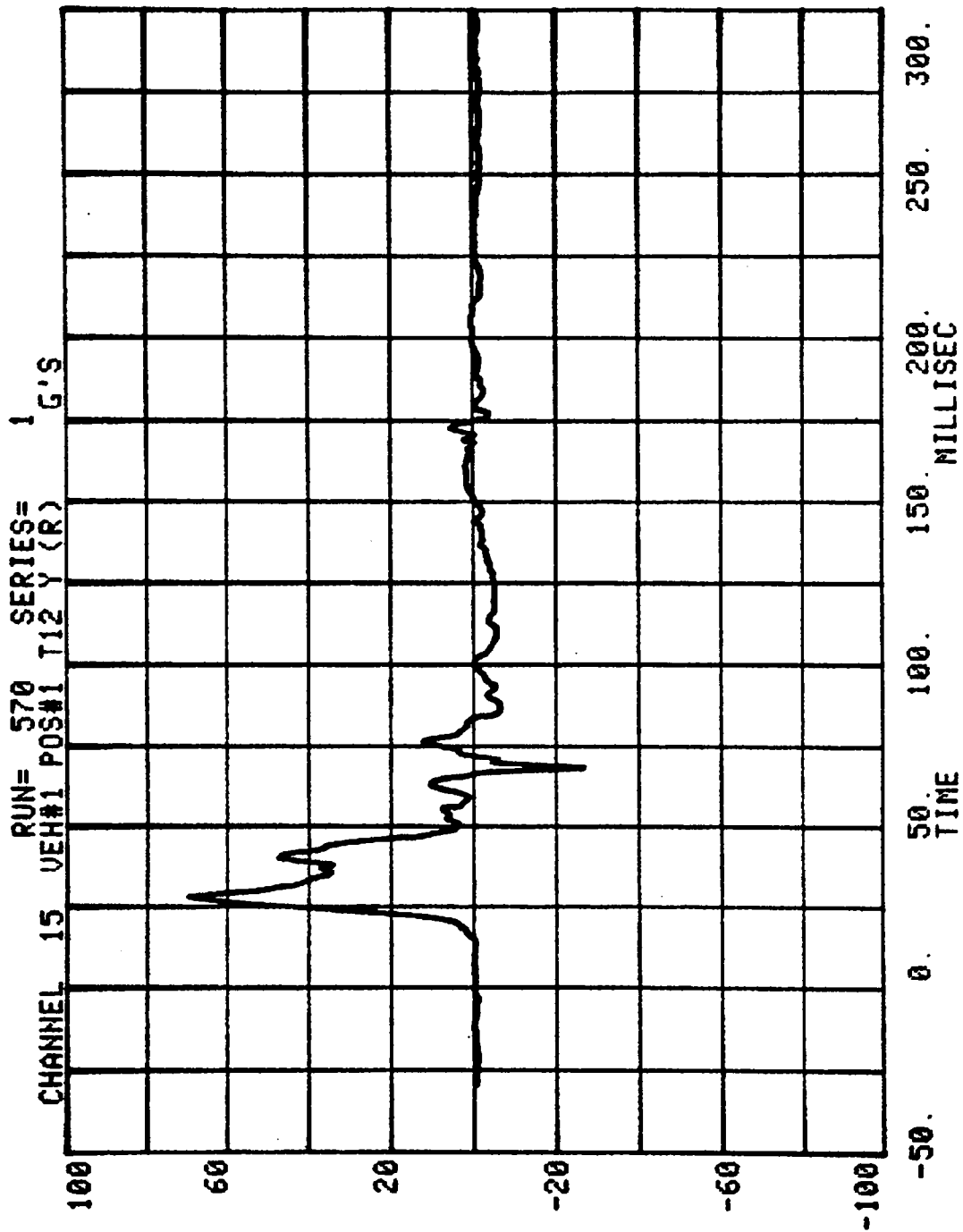




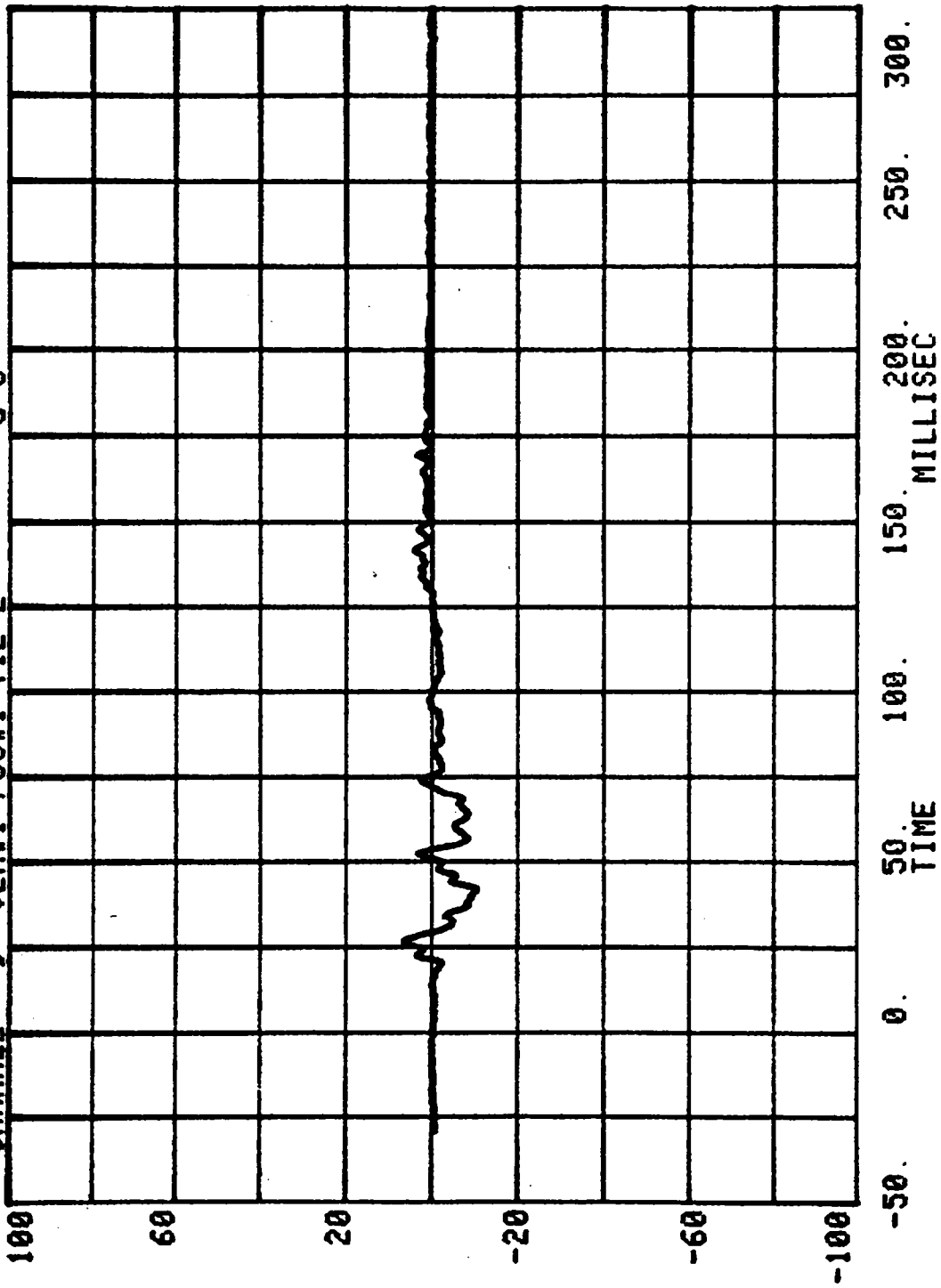


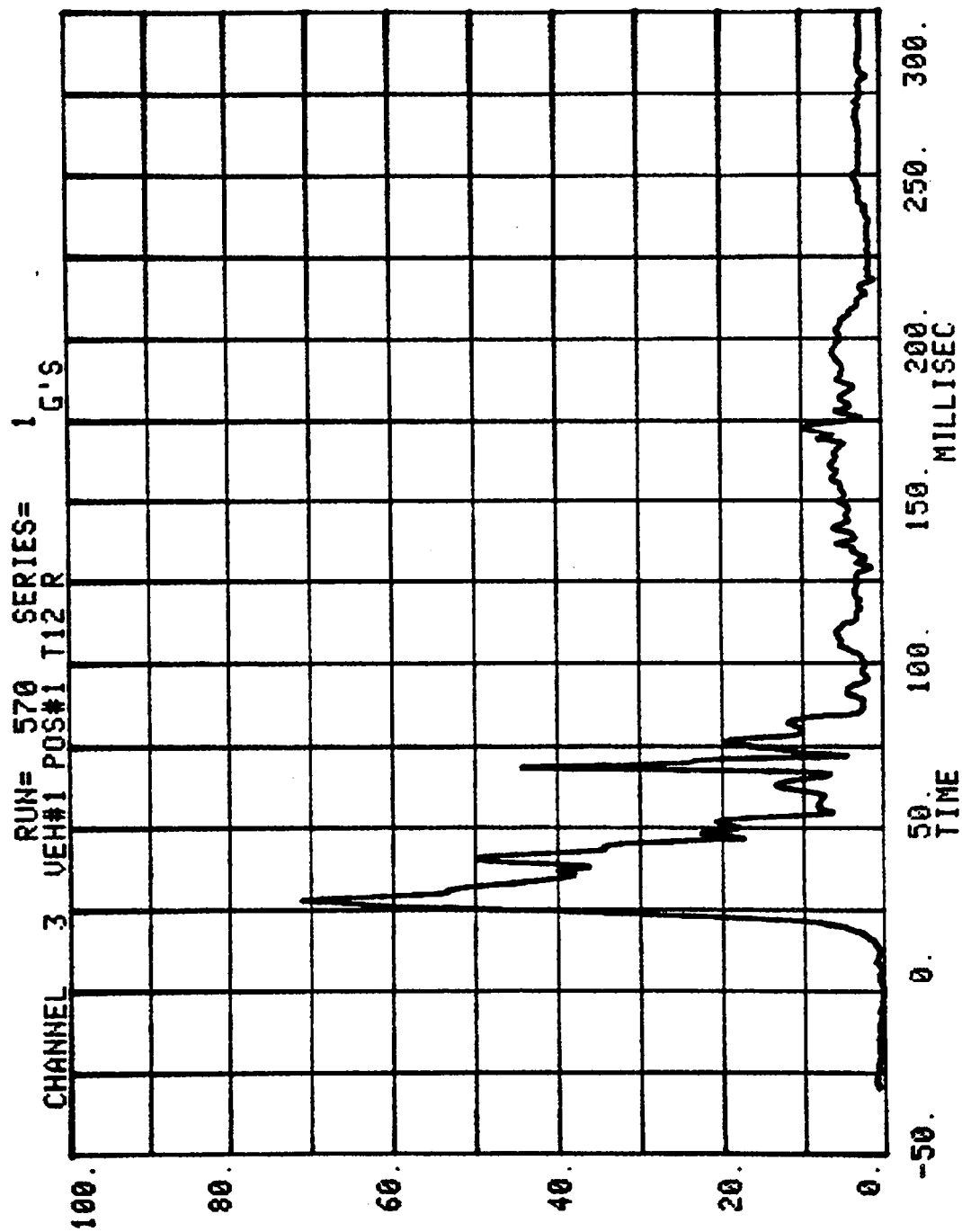


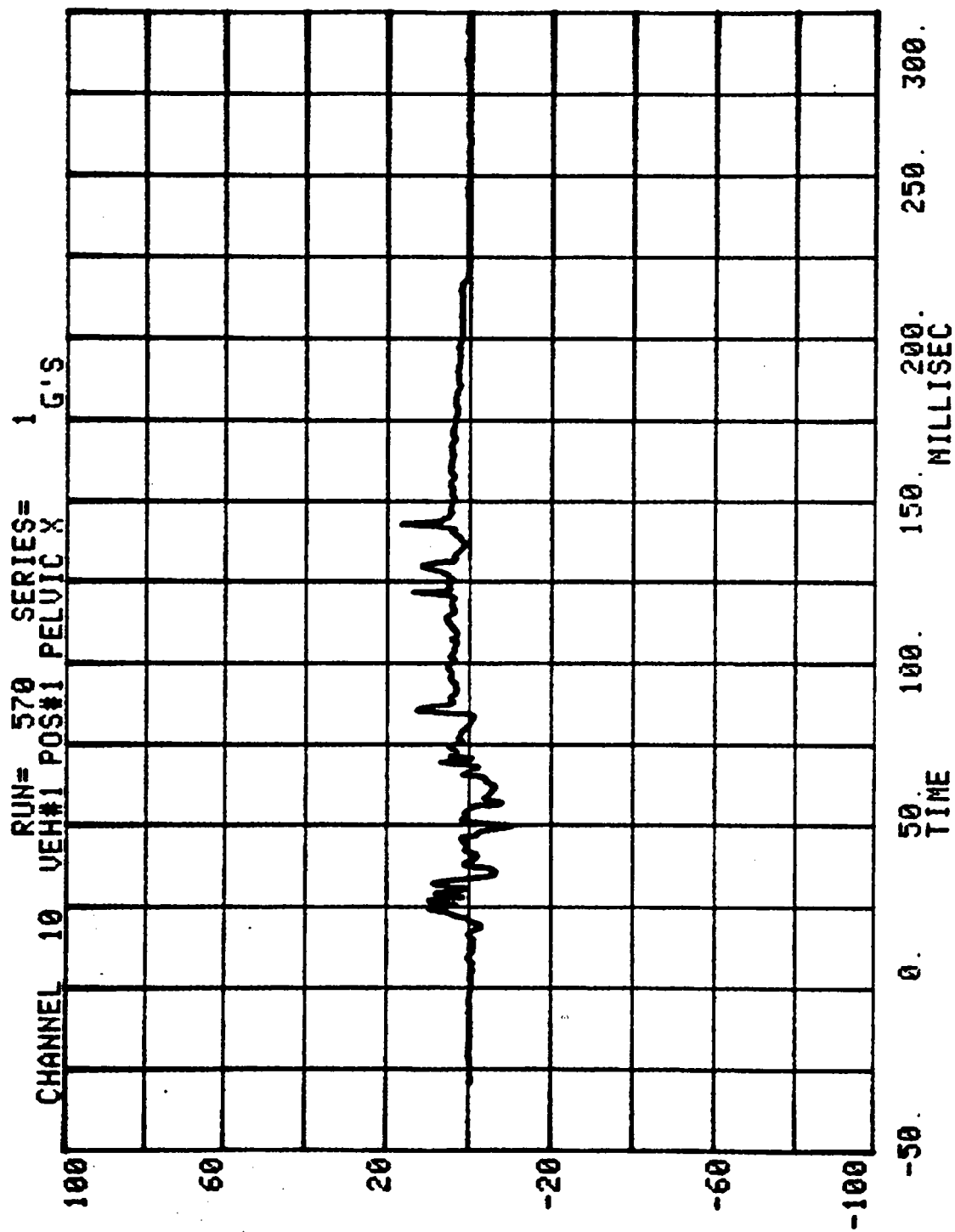


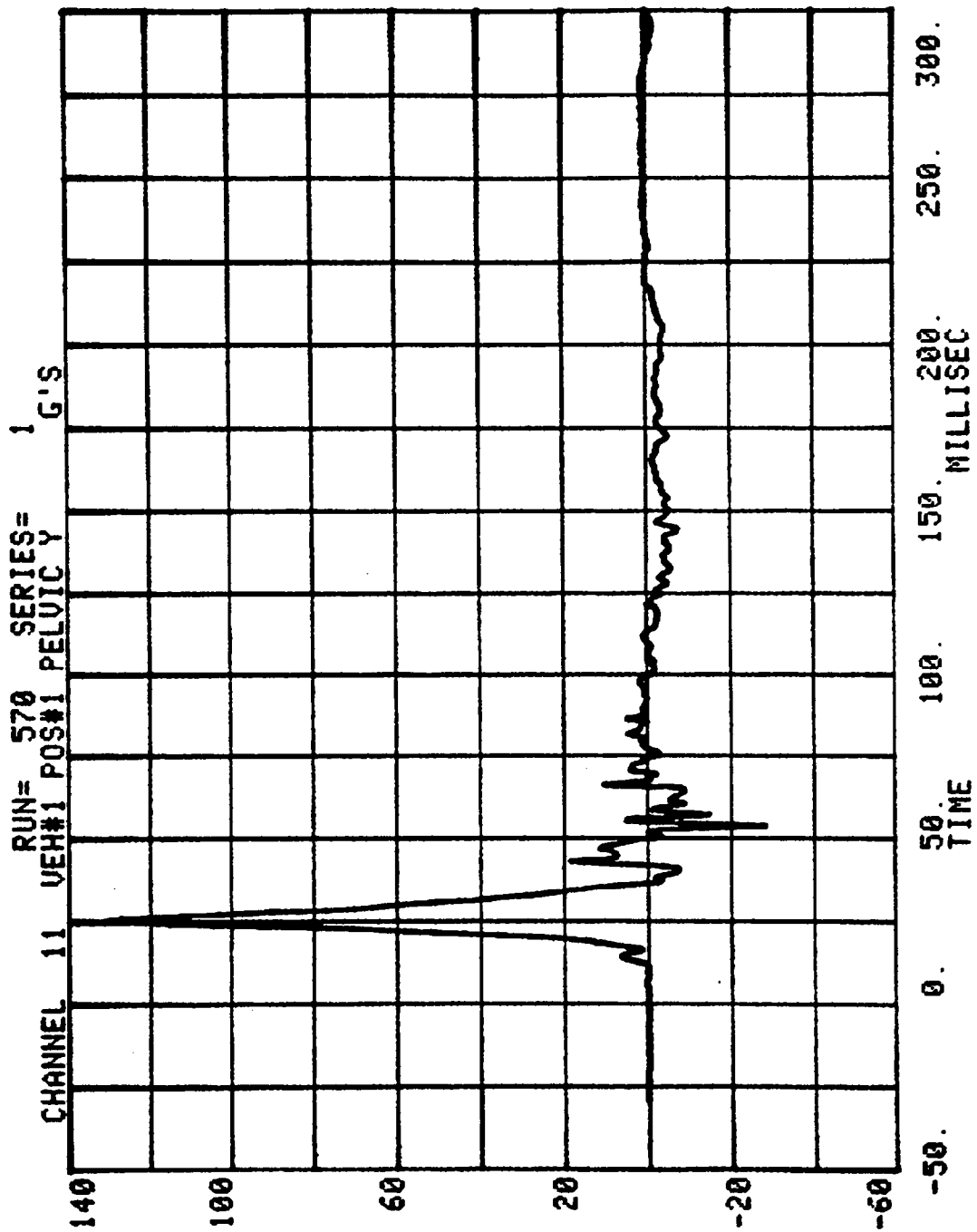


CHANNEL 9 RUN= 570 SERIES= 1
VEH#1 POS#1 T12 Z G'S

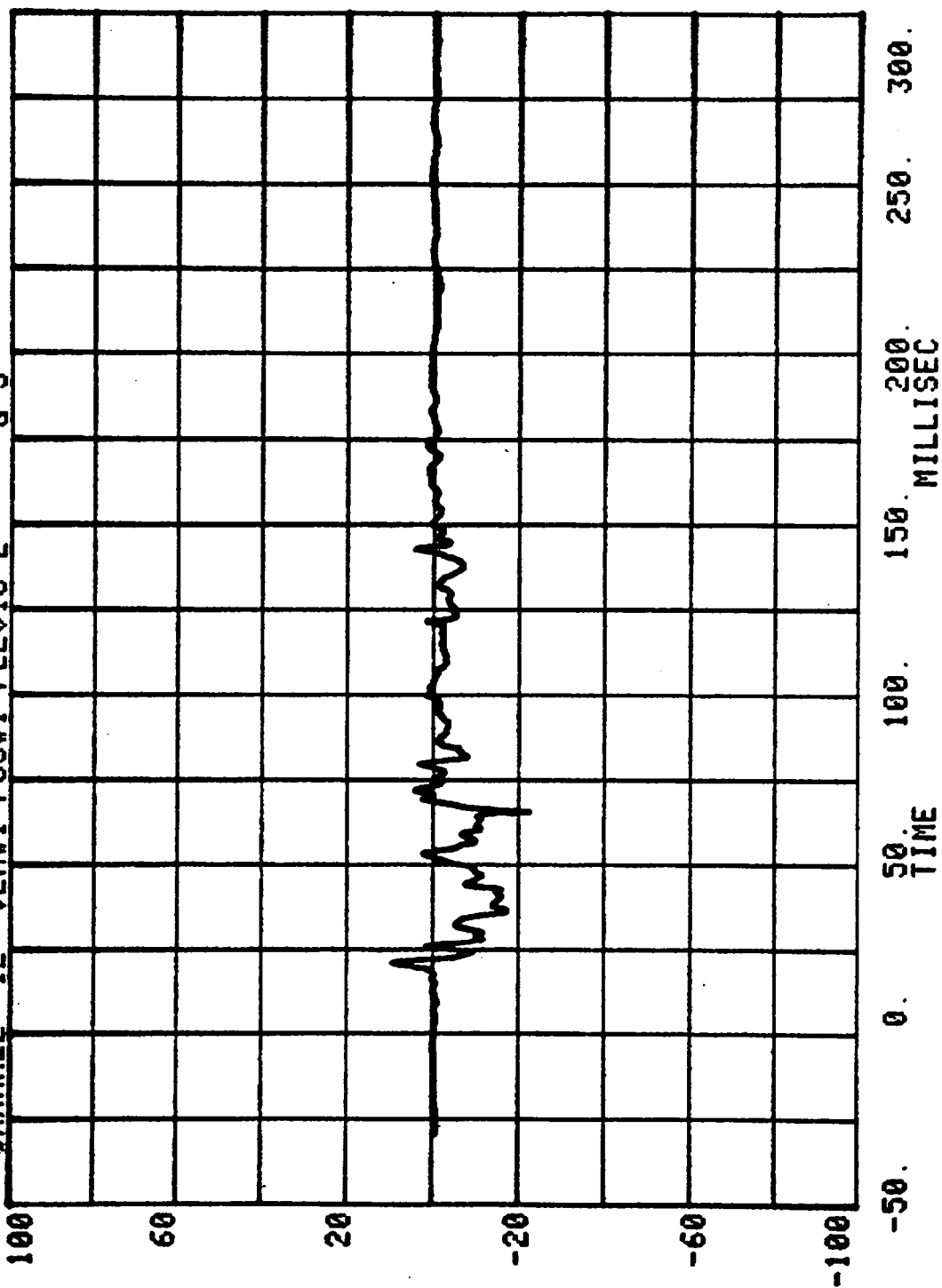


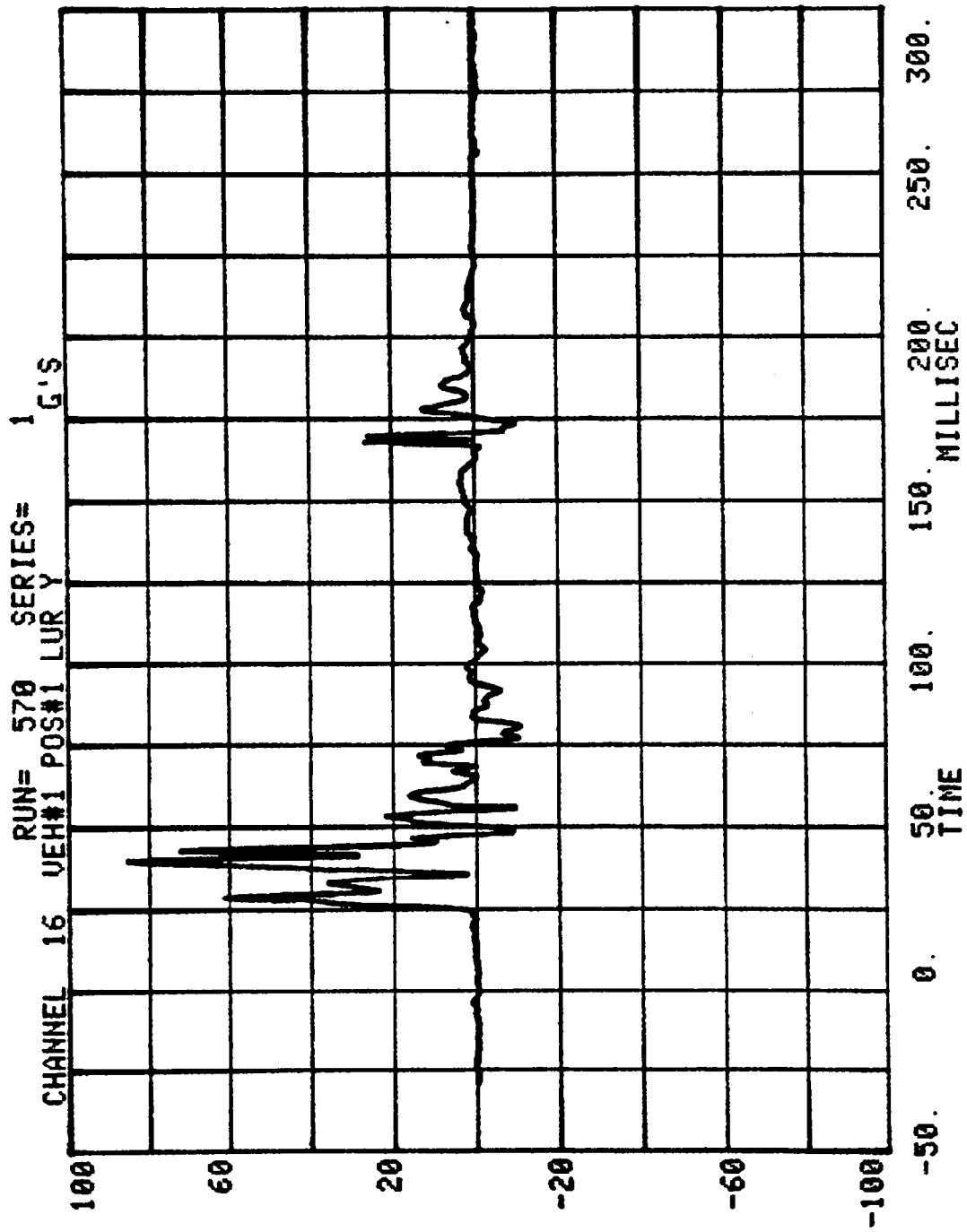


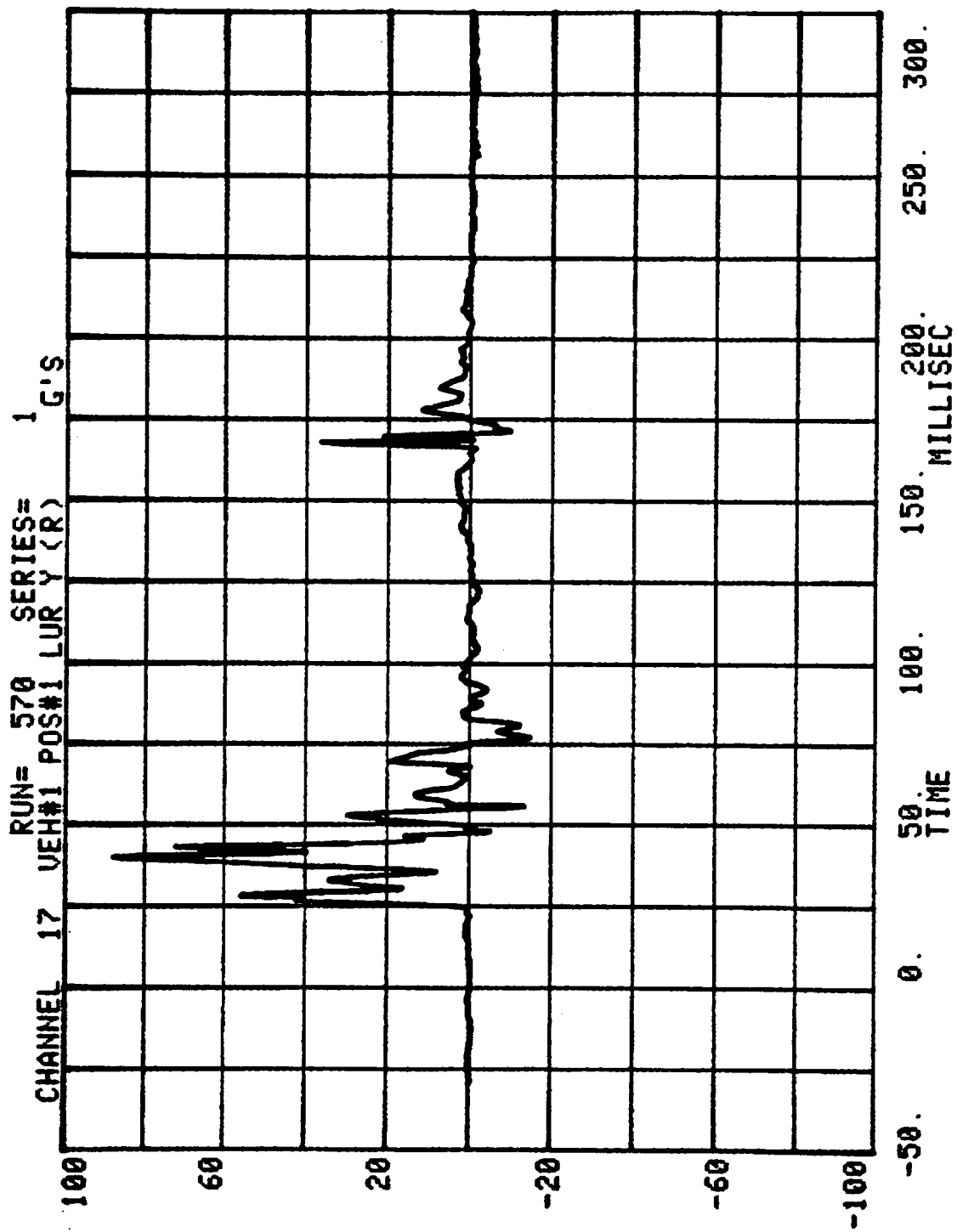


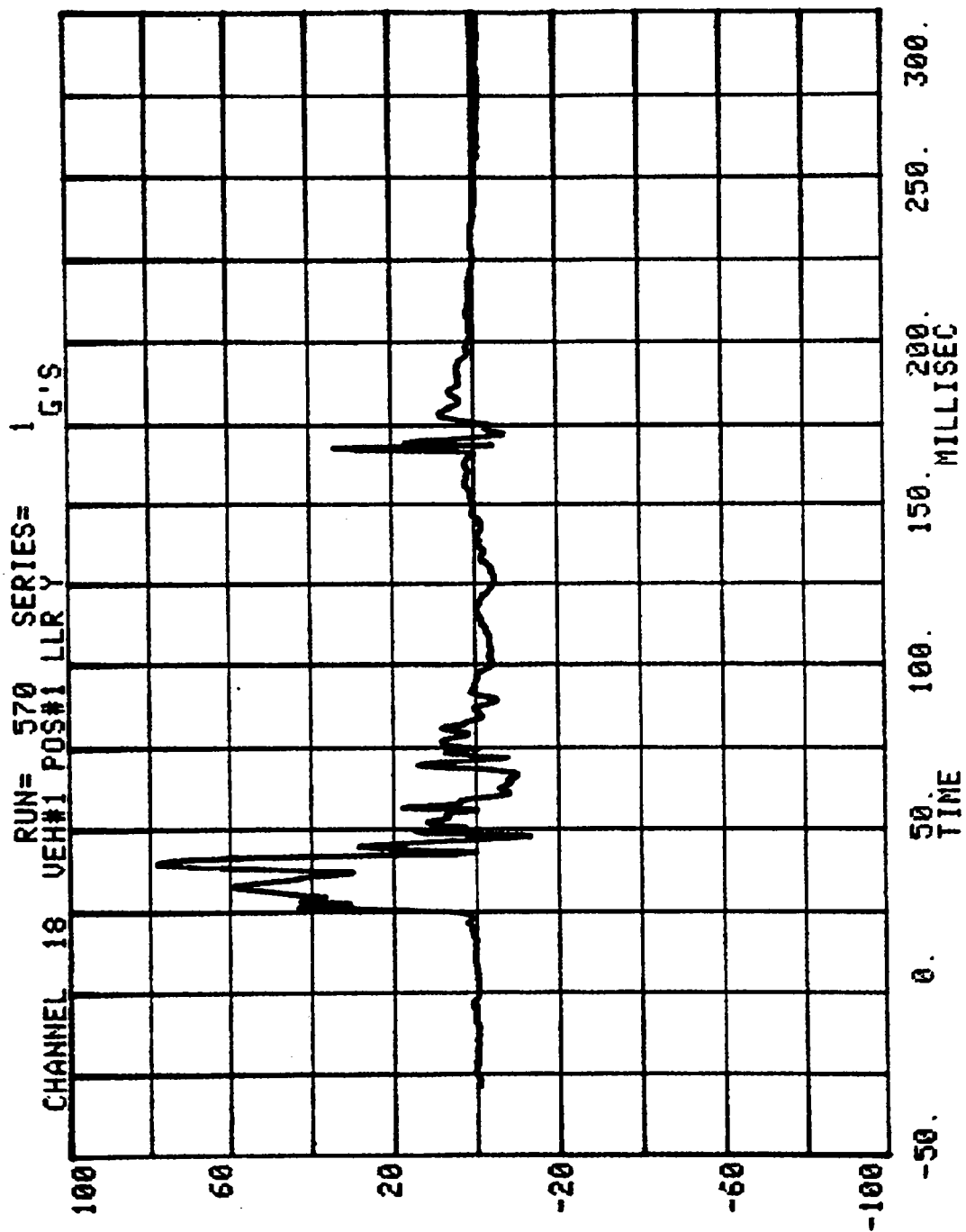


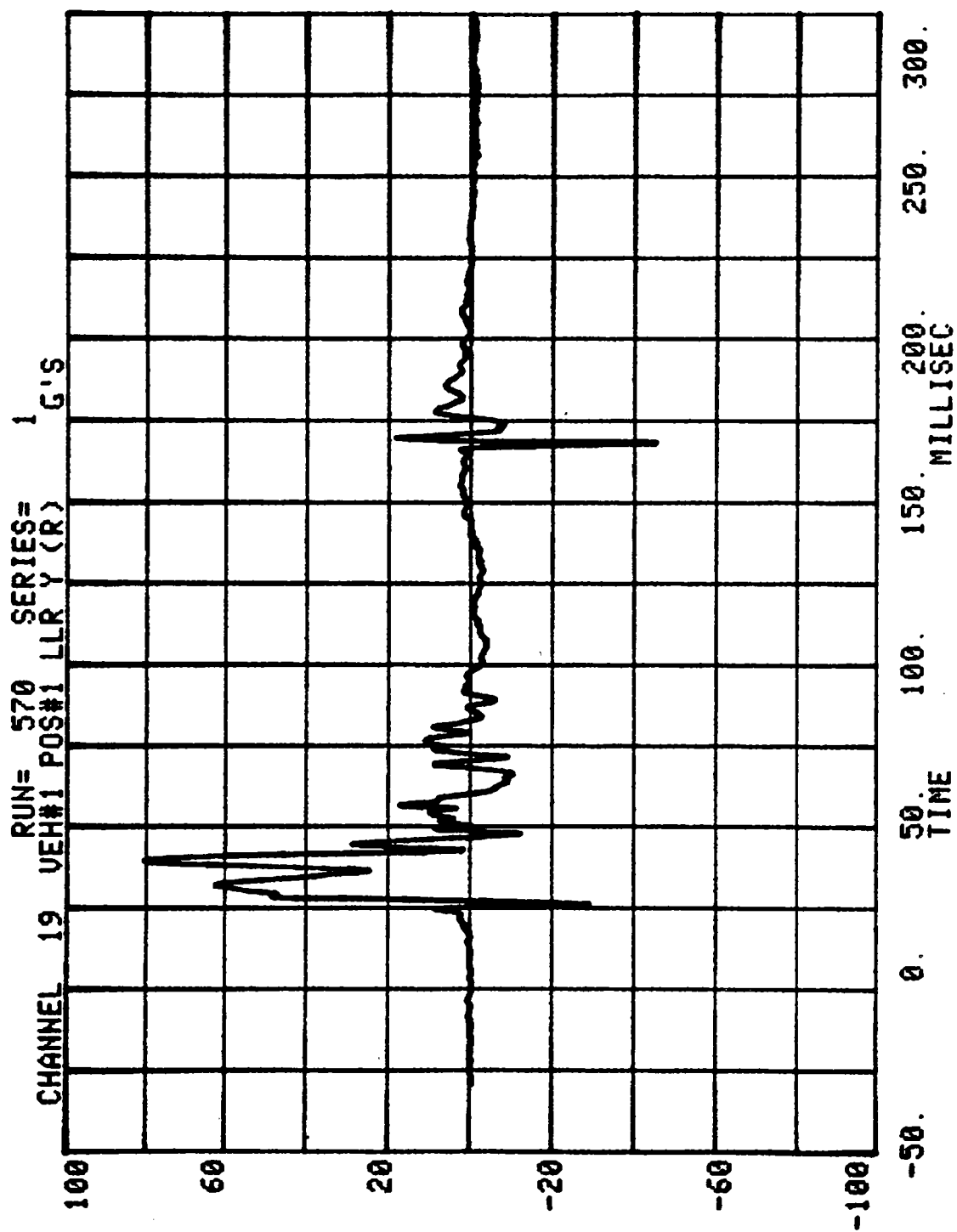
CHANNEL 12 RUN= 570 SERIES= 1
VEH#1 POS#1 PELVIC 2 G'S

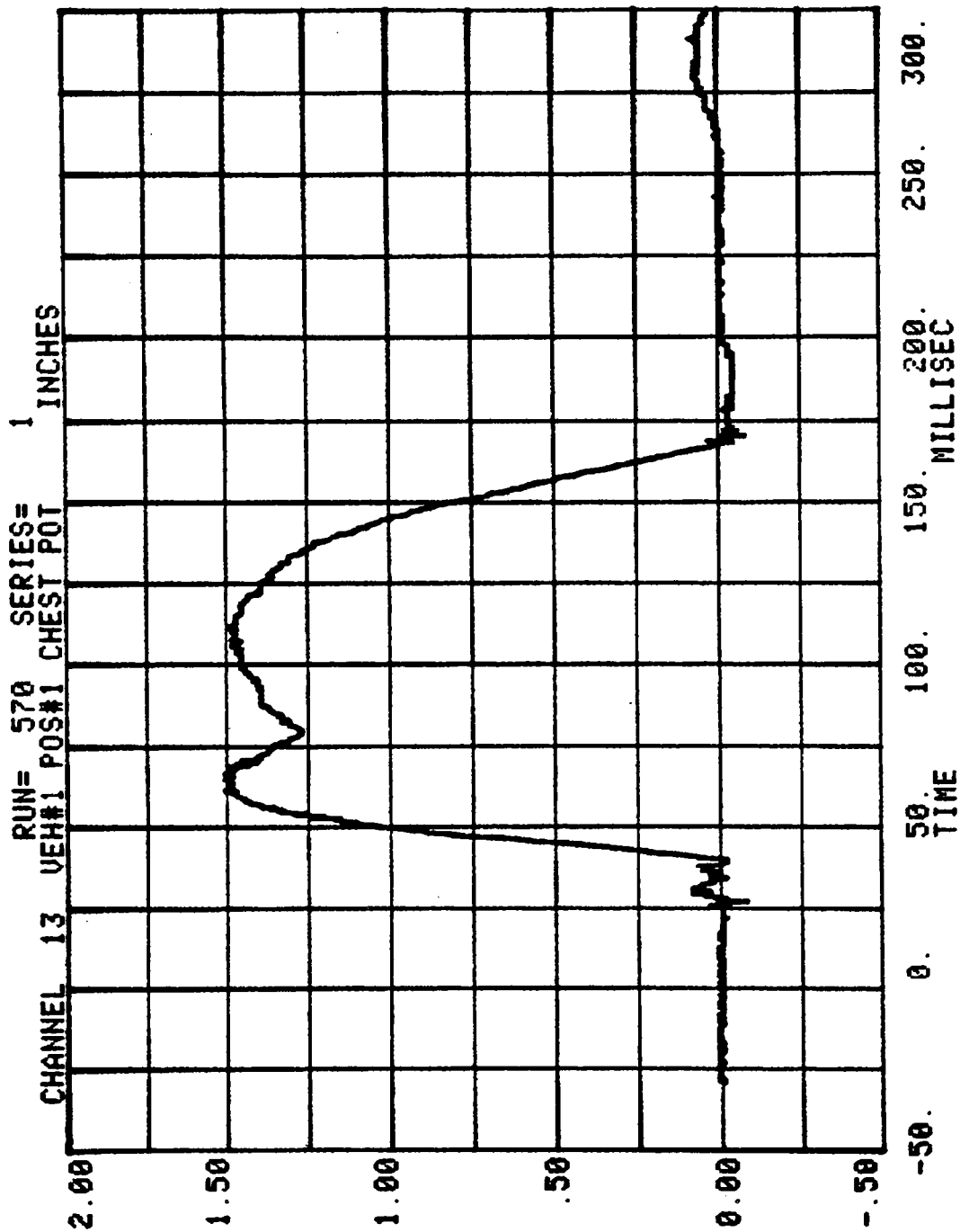












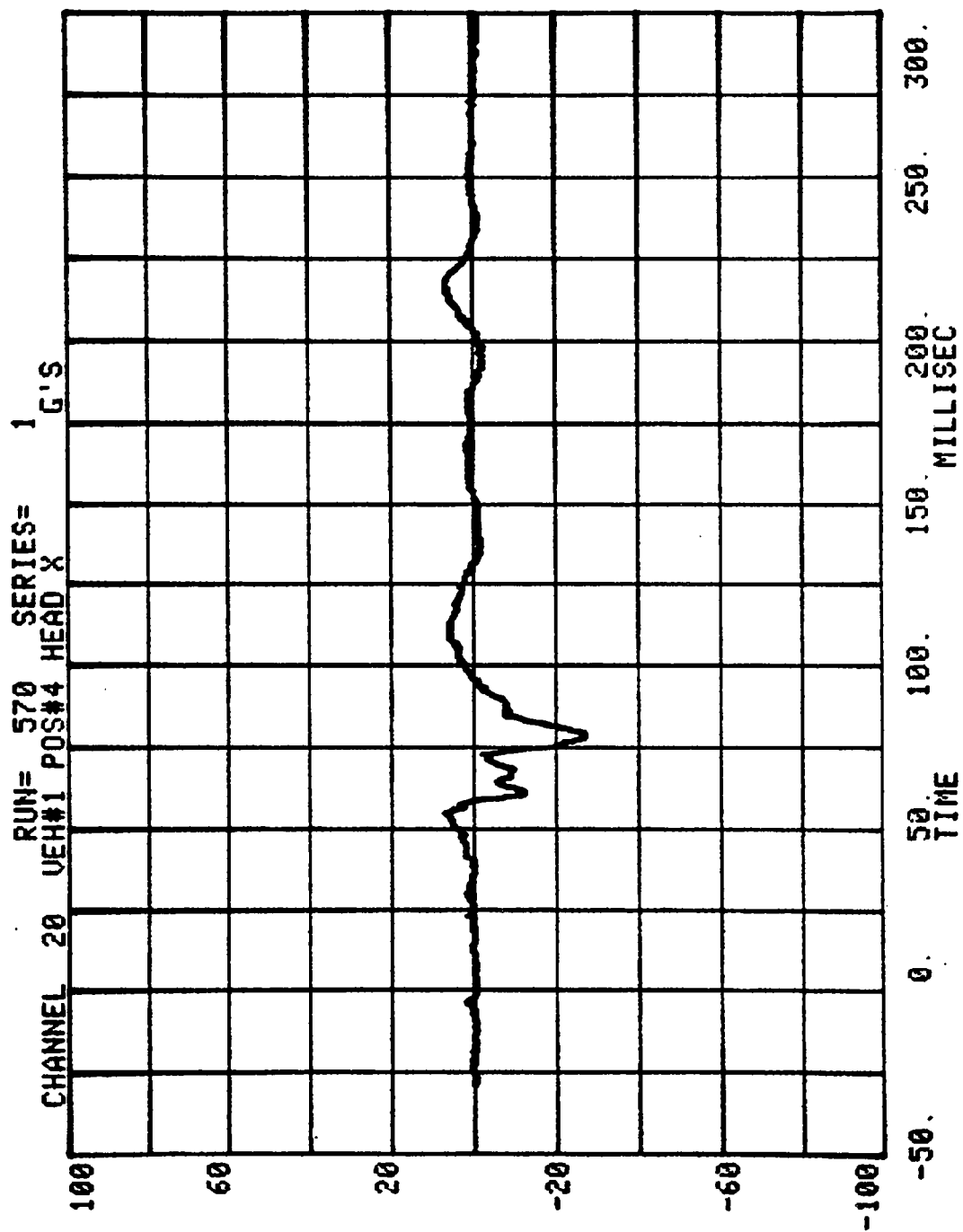
HEAD INJURY CRITERION
HEAD SEVERITY INDEX

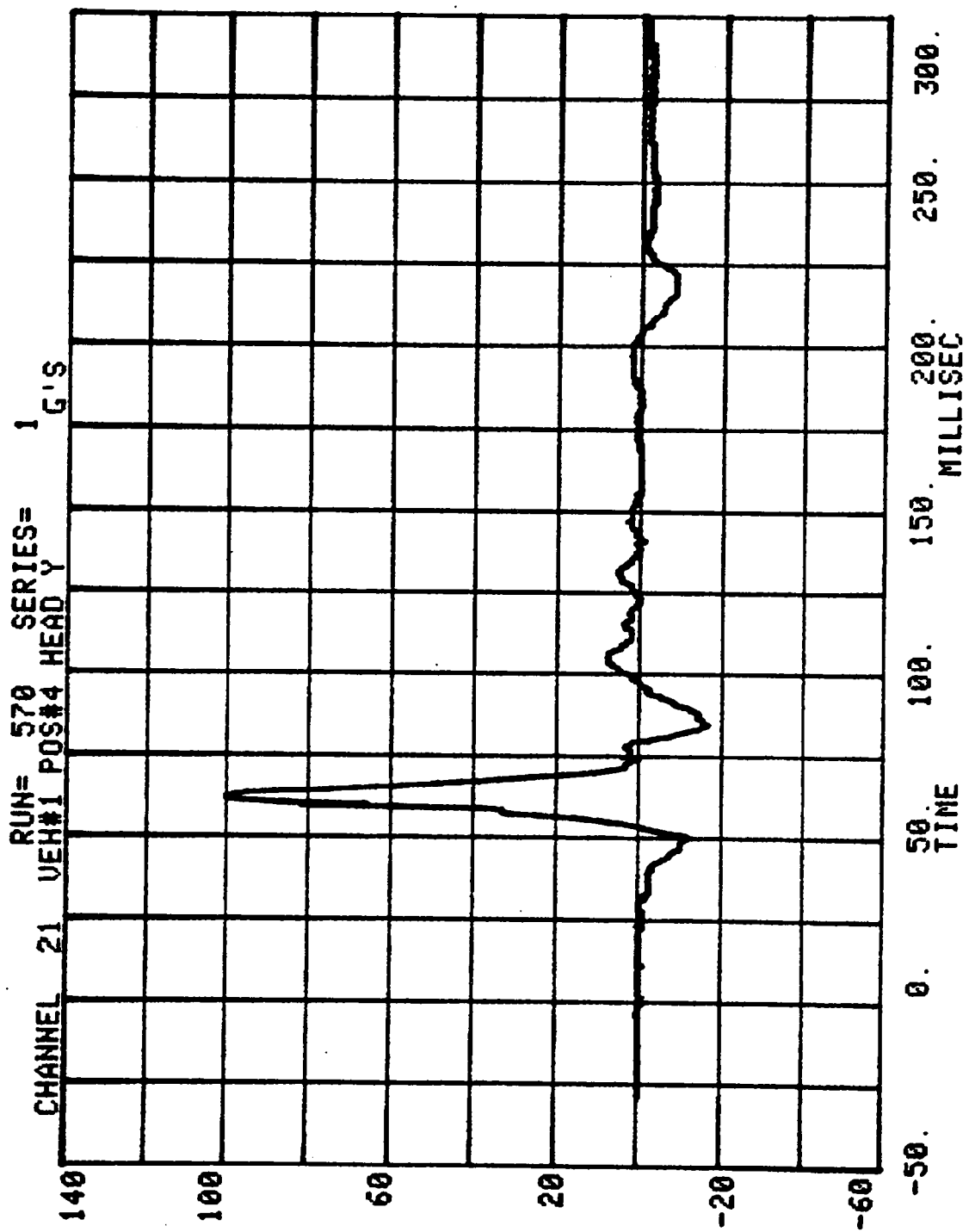
CAR-TO-CAR 90-DEG SIDE IMPACT TEST

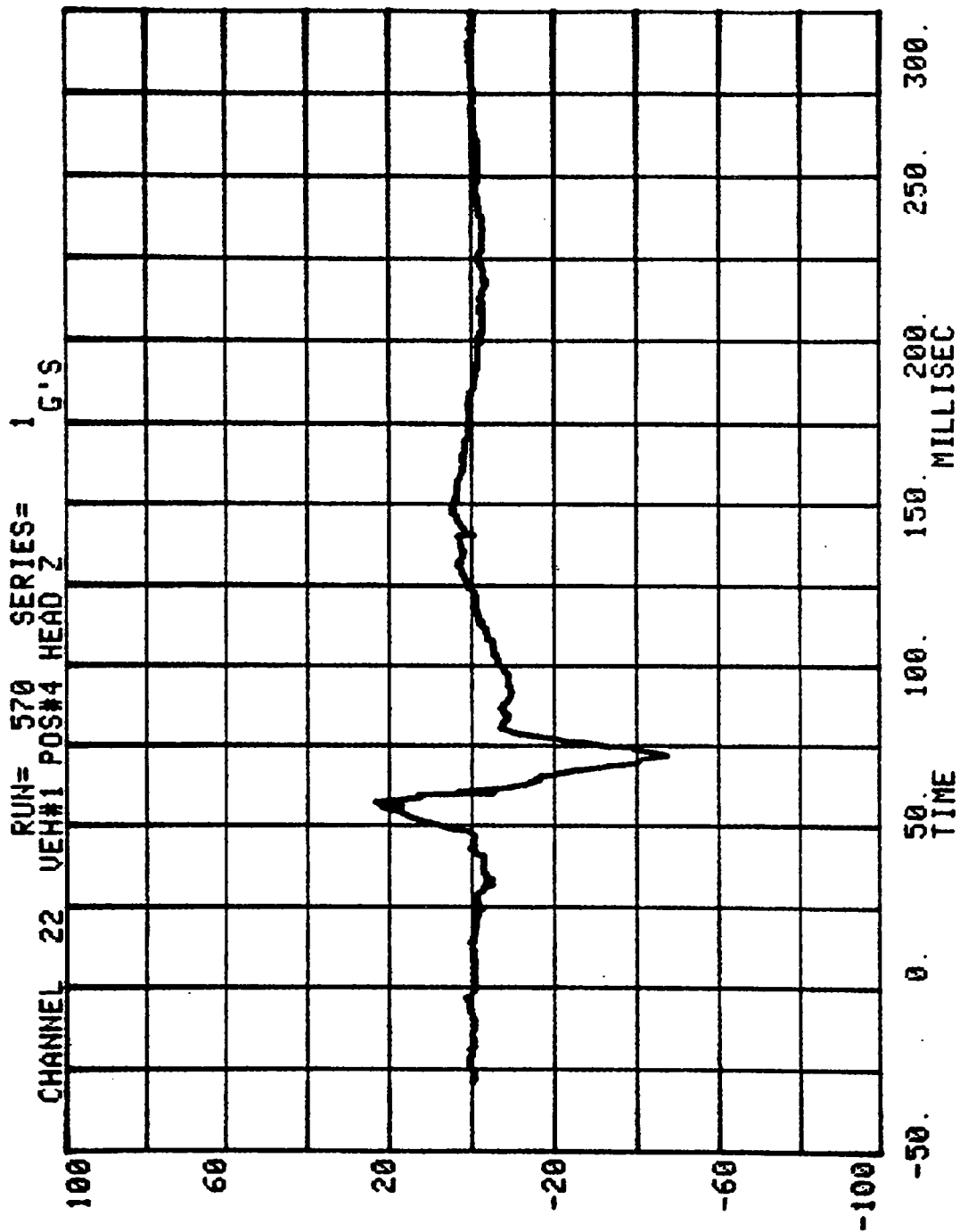
RUN= 570

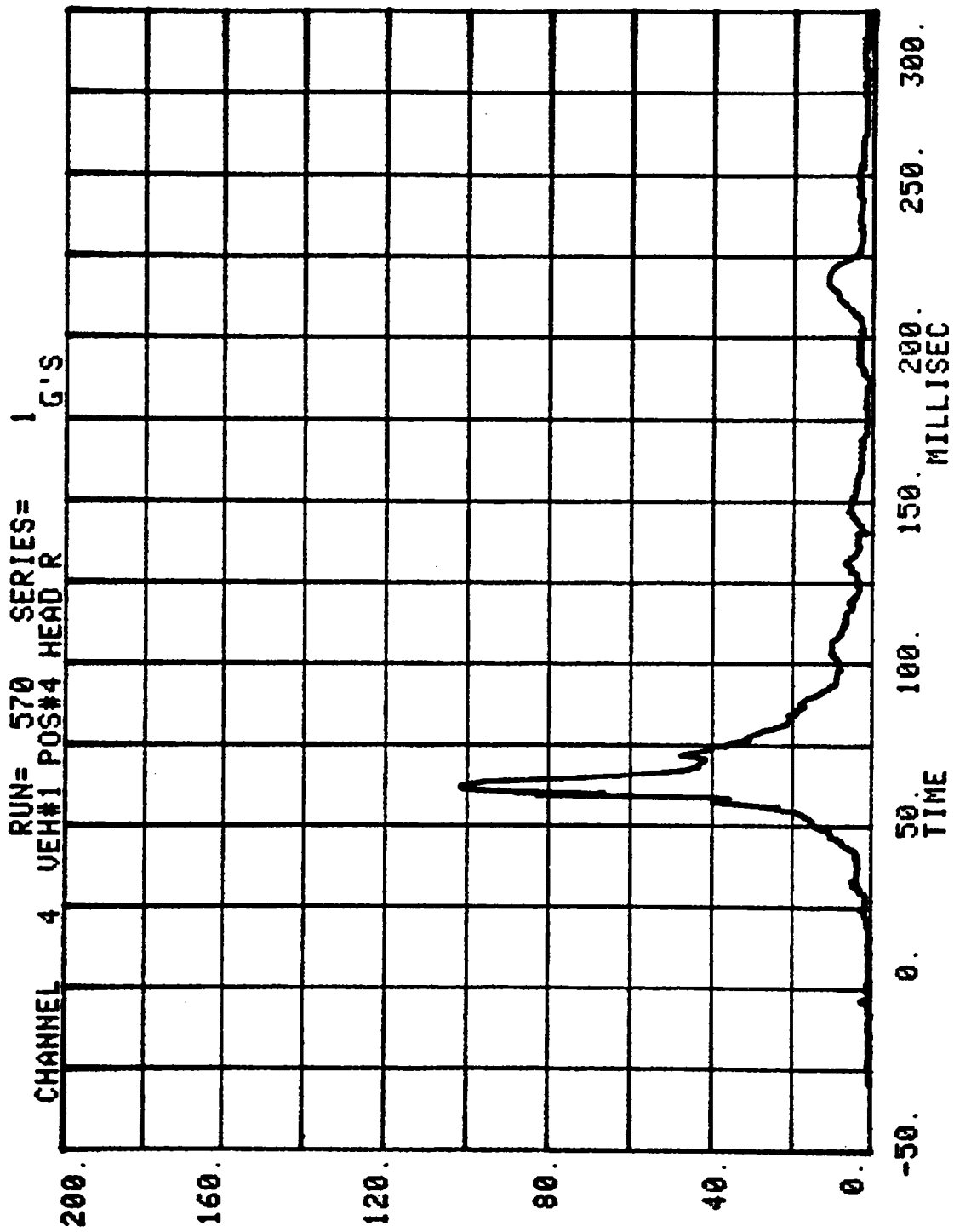
VEH#1 POS#4 HEAD R

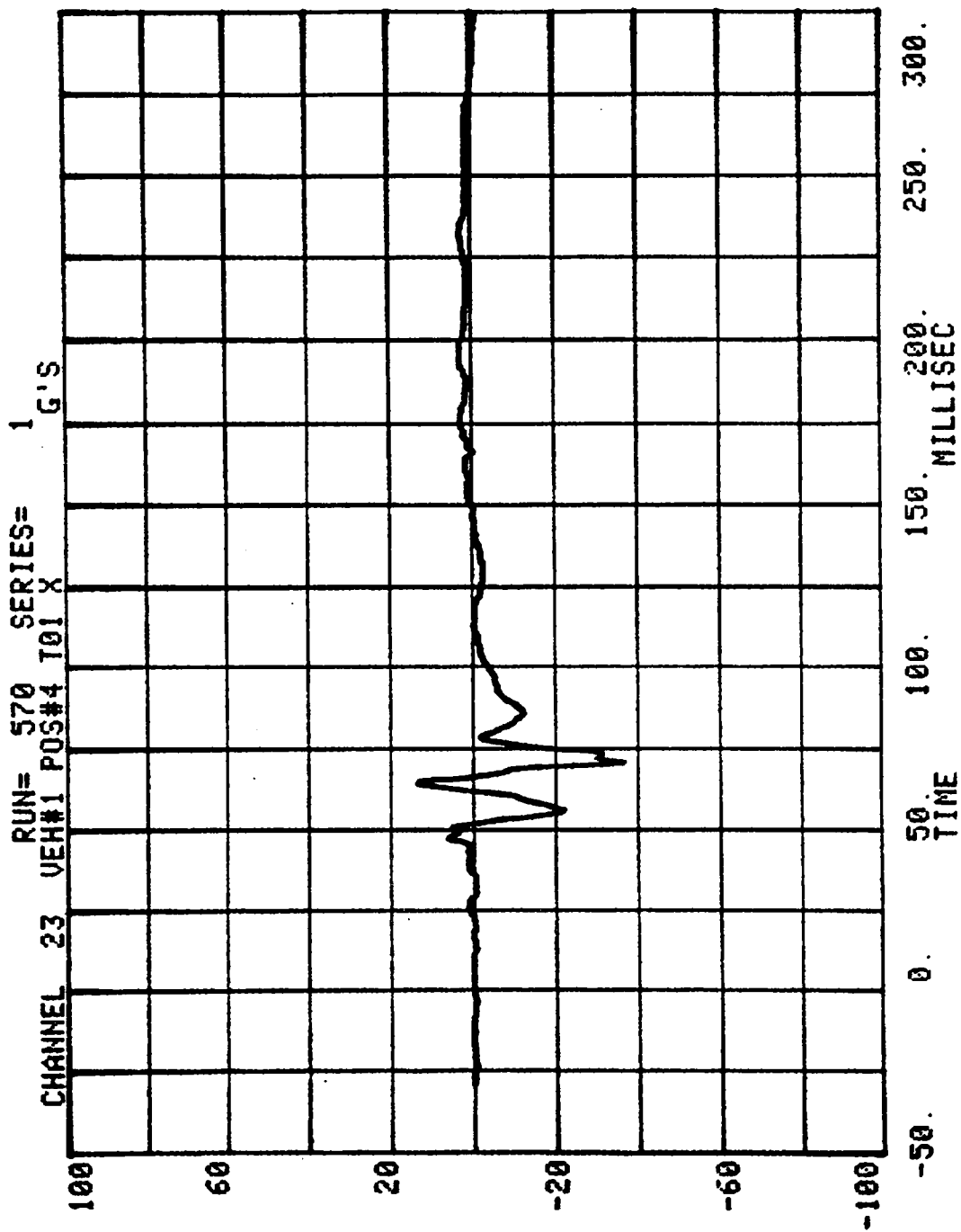
HIC= 493.4 FROM T1= .05715 TO T2= .07620
AVERAGE ACCELERATION BETWEEN T1 AND T2= 58.3G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX= 705.8

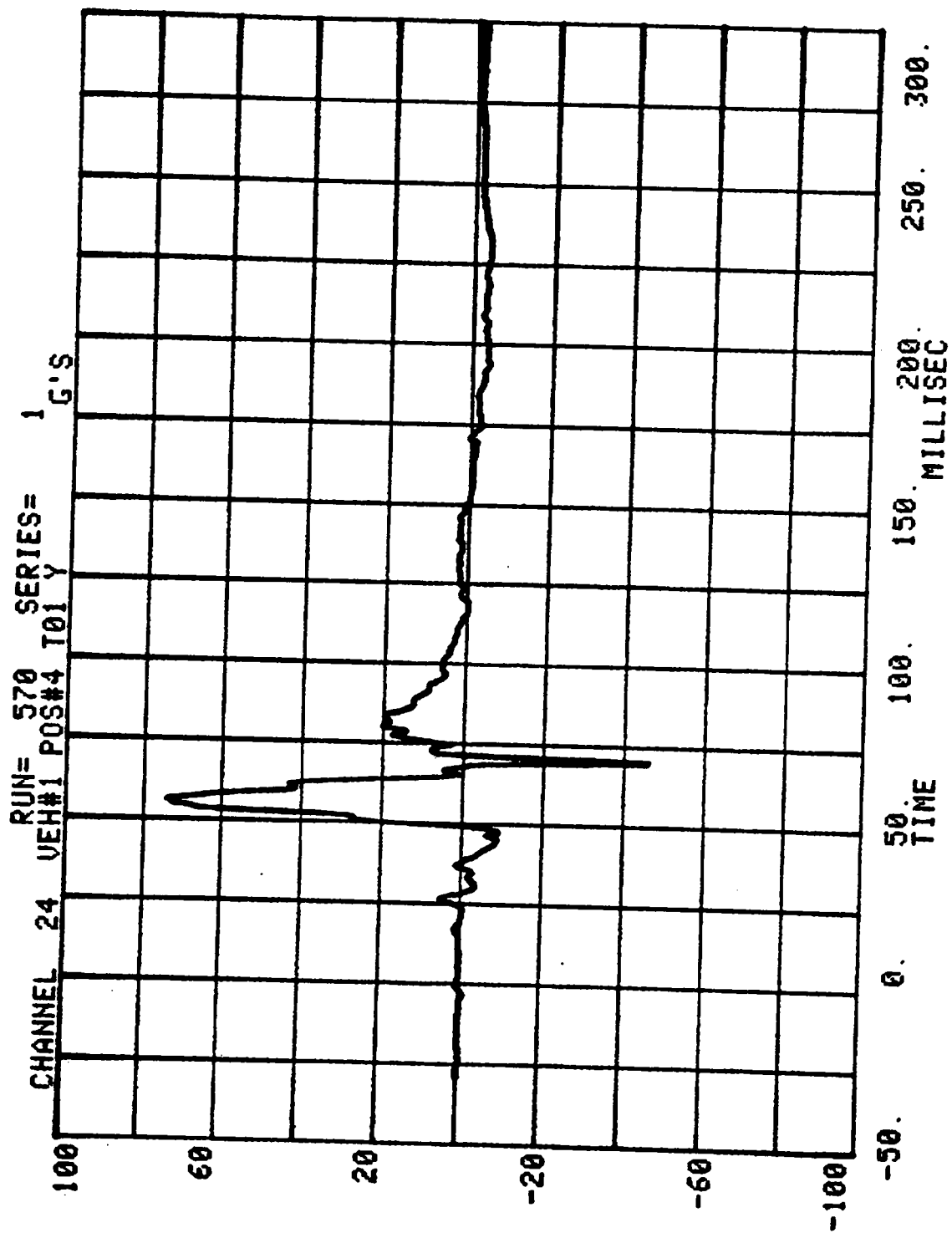


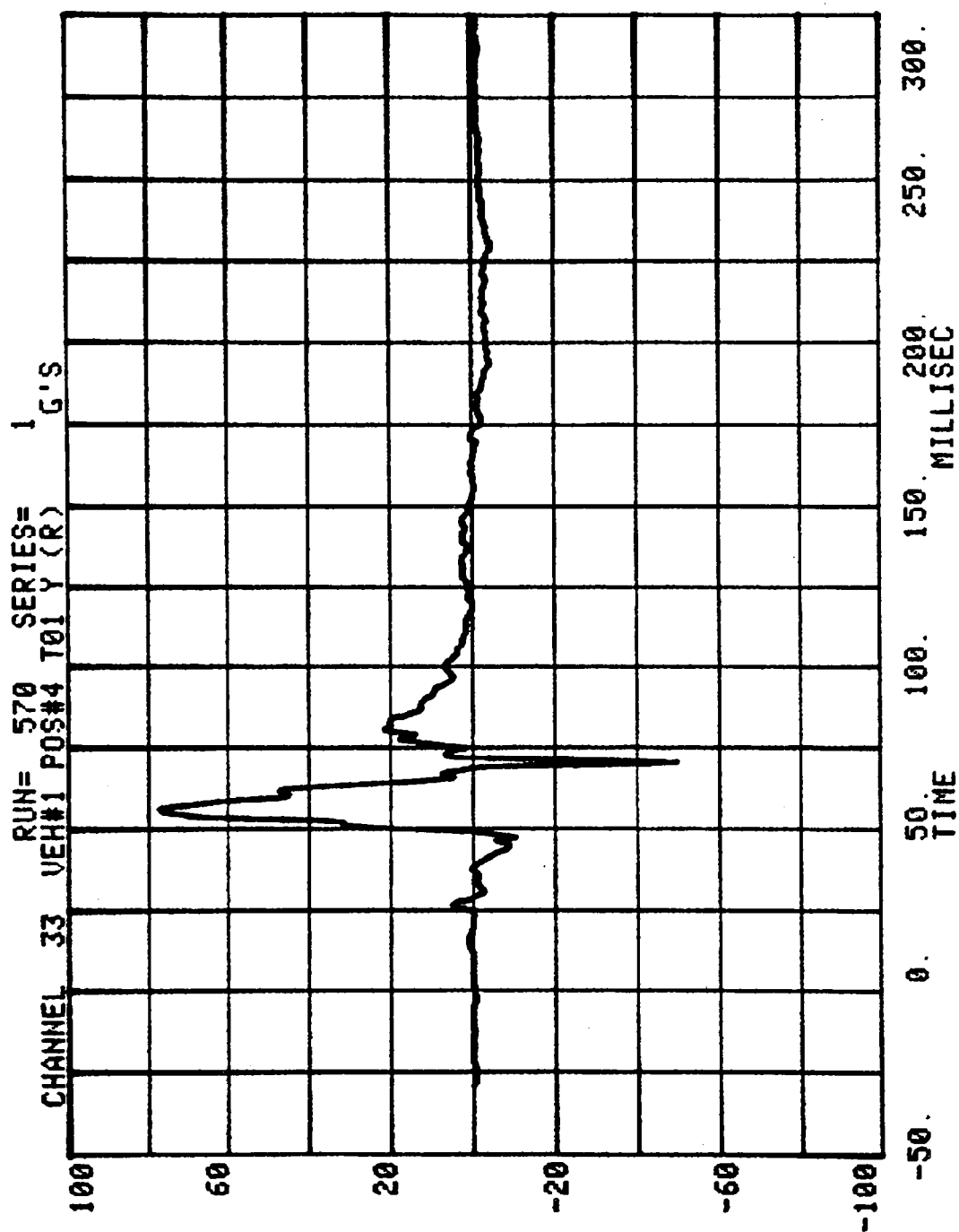




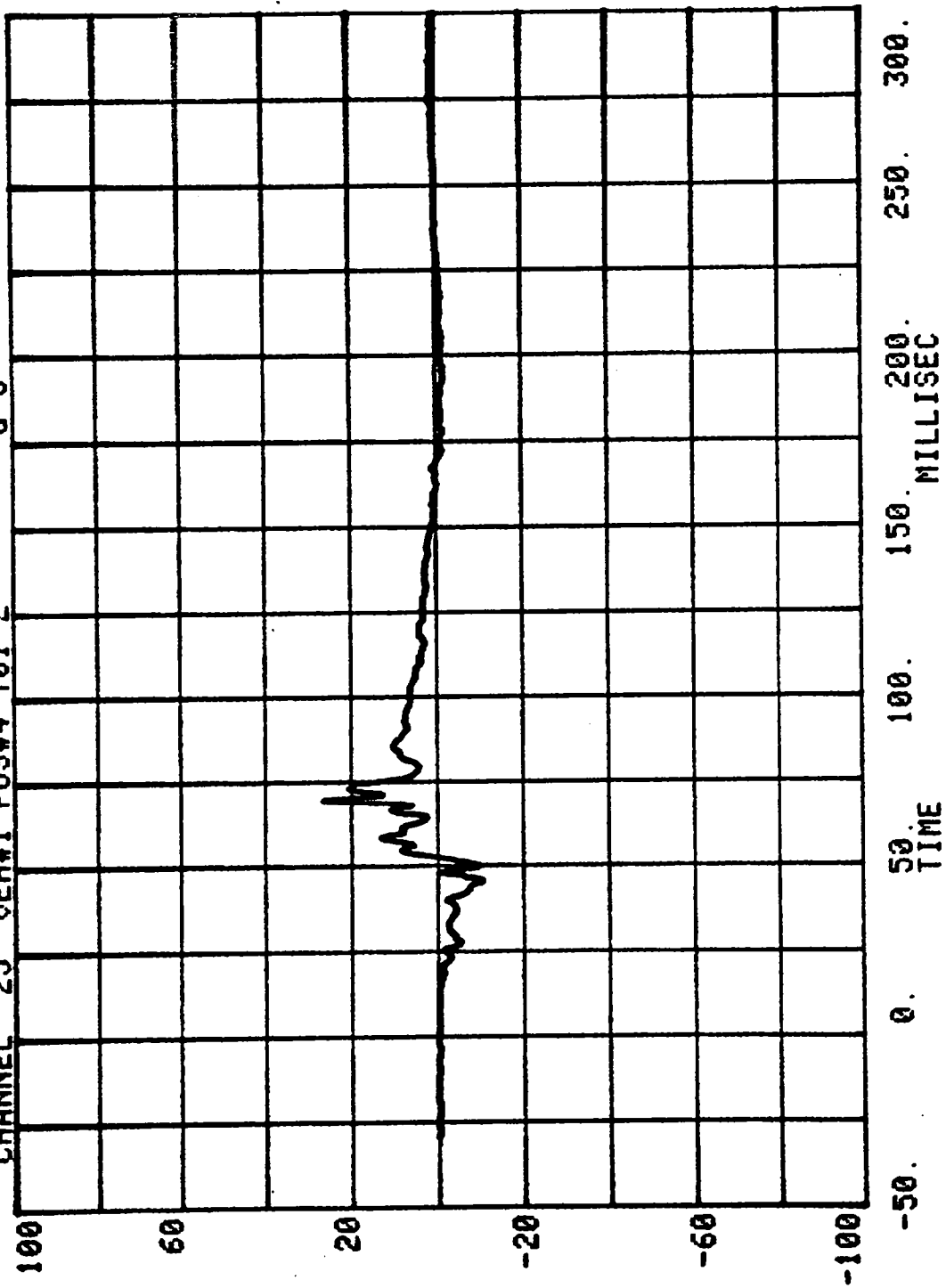


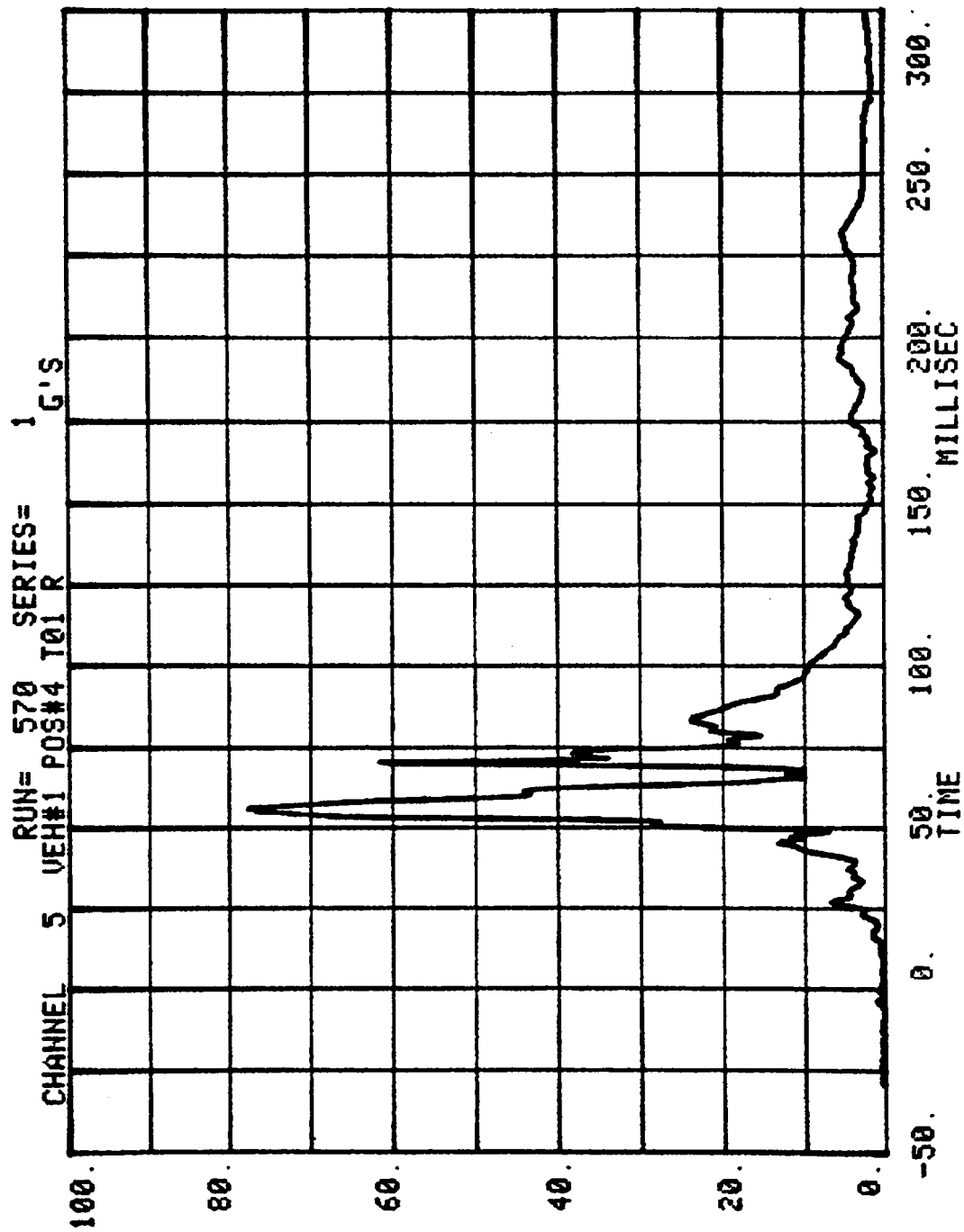




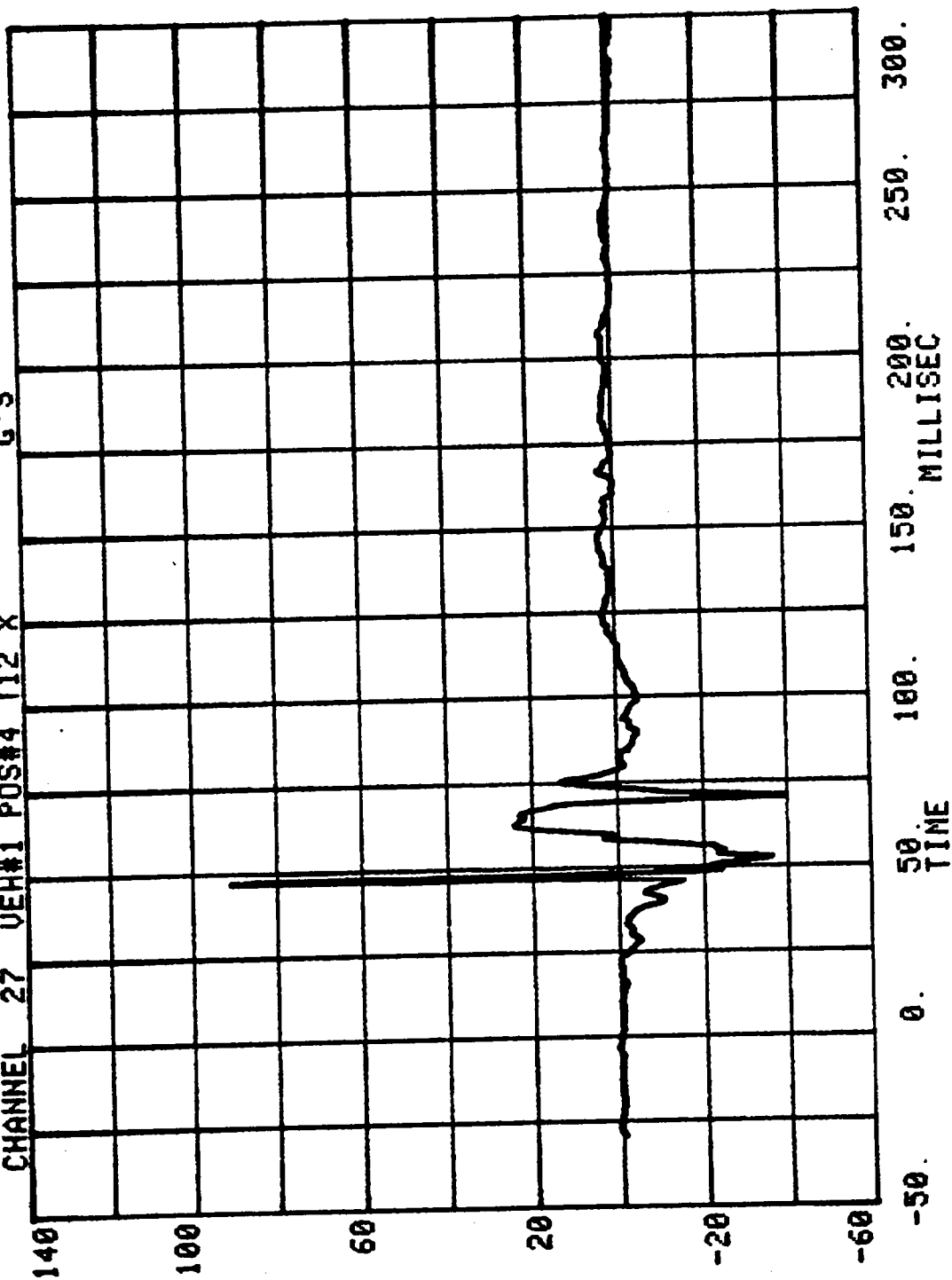


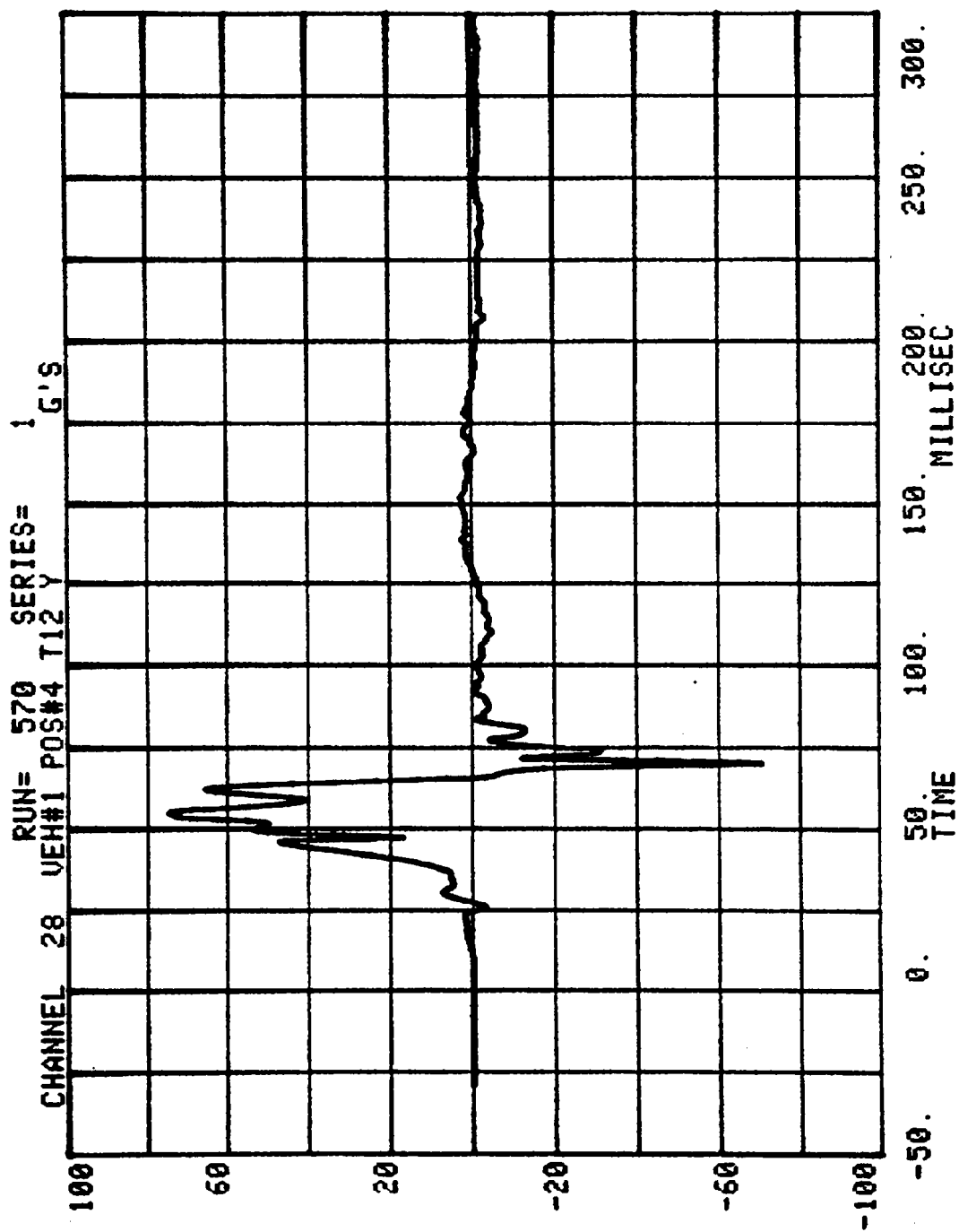
CHANNEL 25 RUN= 570 SERIES= 1 G'S
VEH#1 POS#4 T01 Z

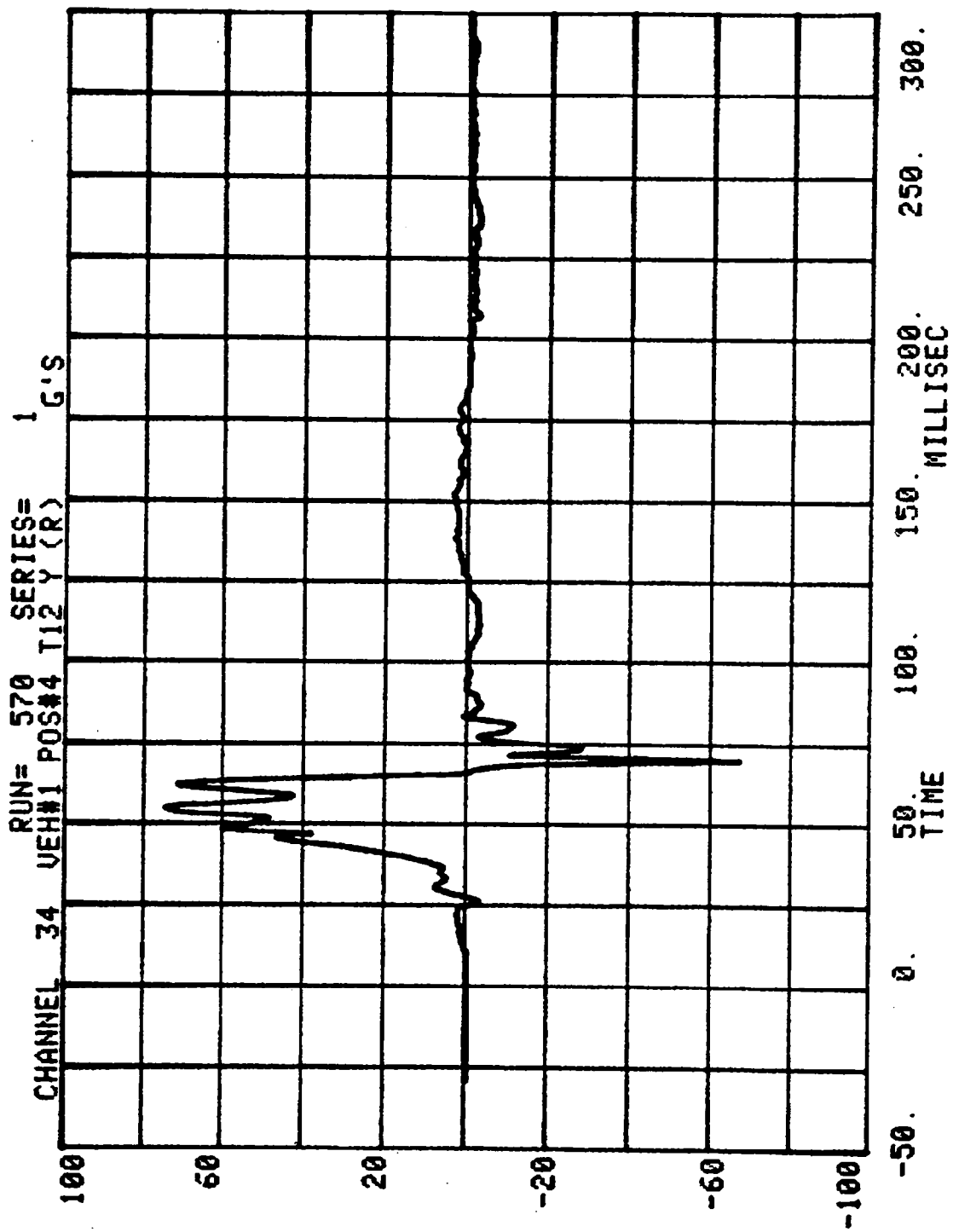


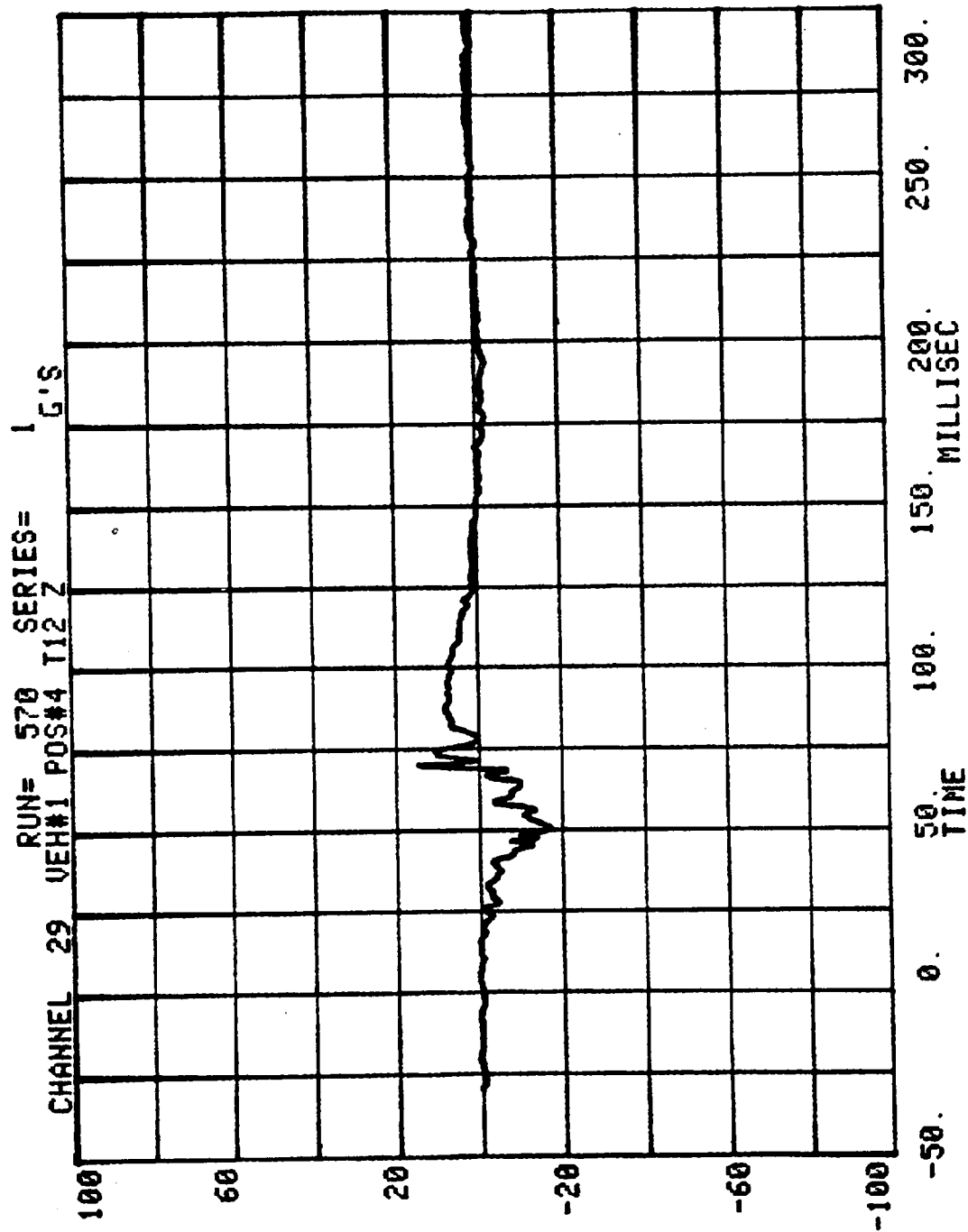


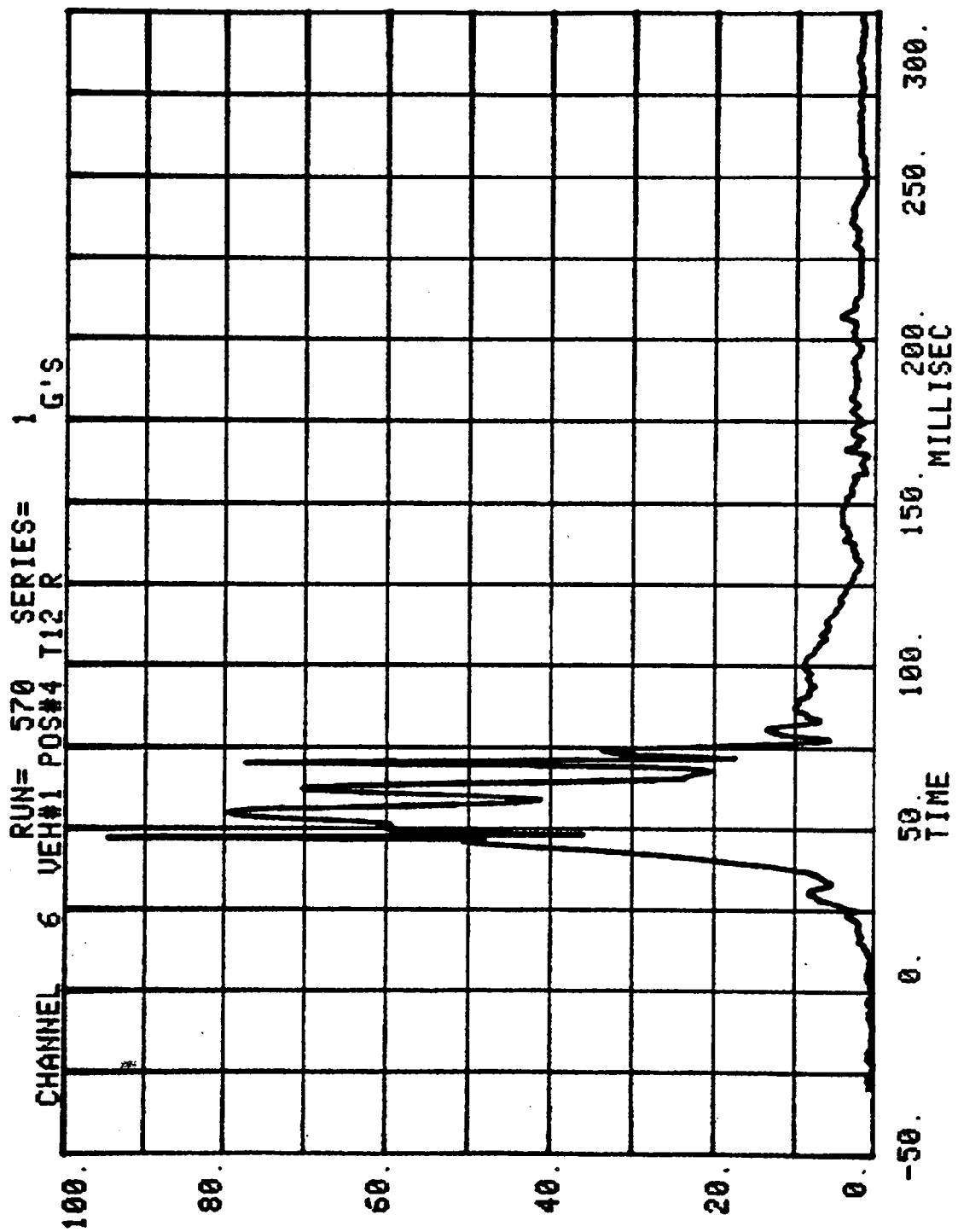
CHANNEL 27 RUN= 570 SERIES= 1 G'S
VEH#1 POS#4 T12 X

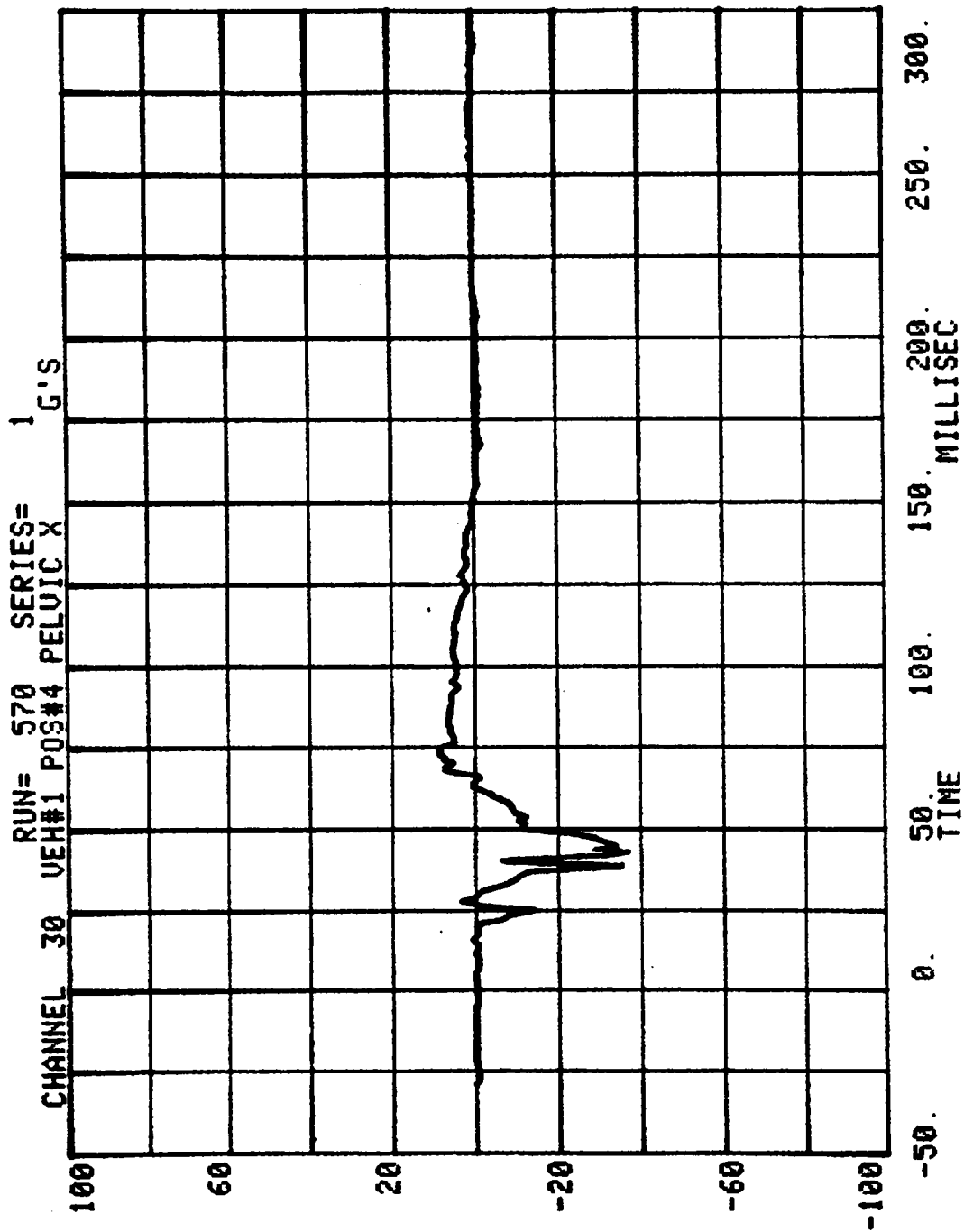


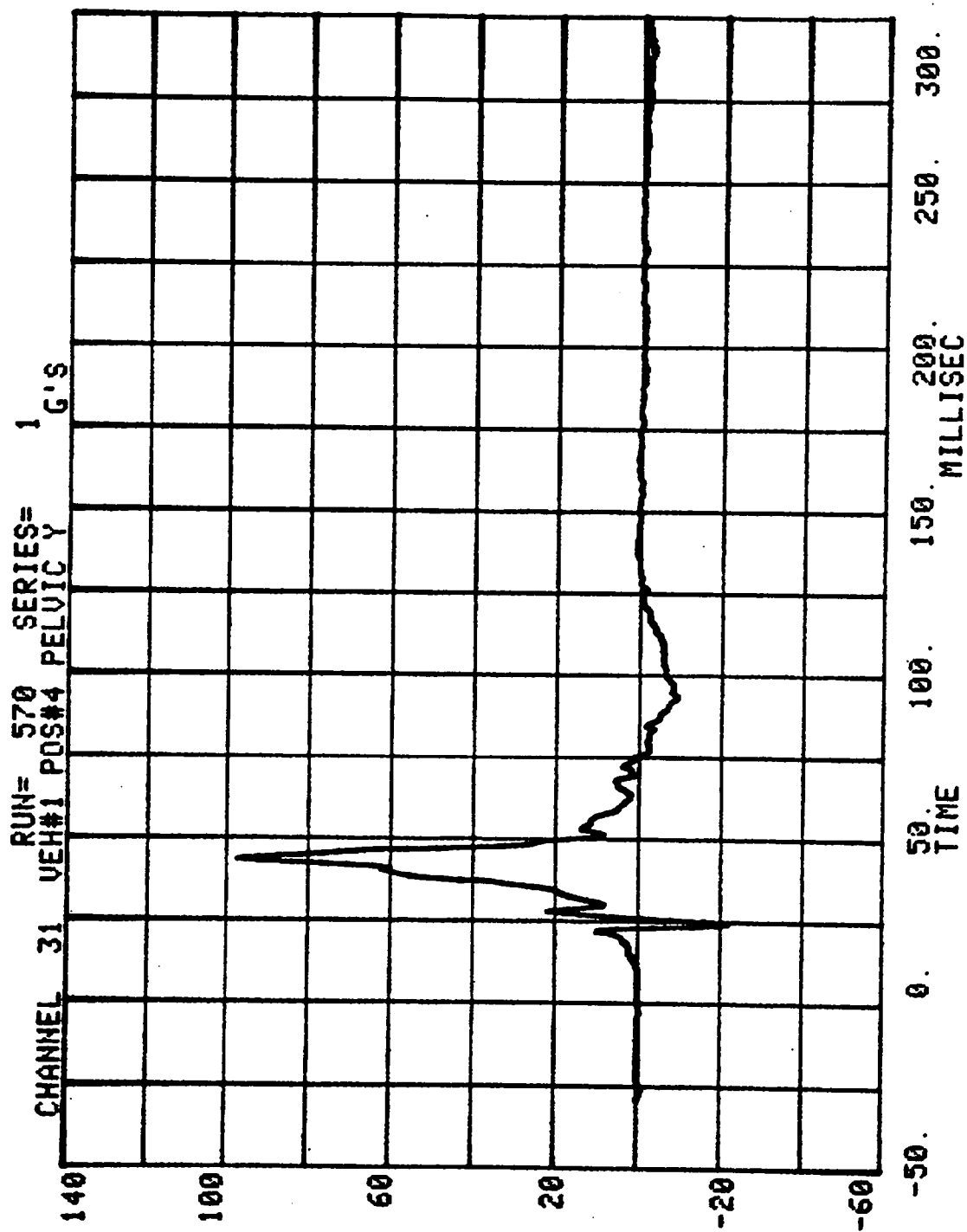


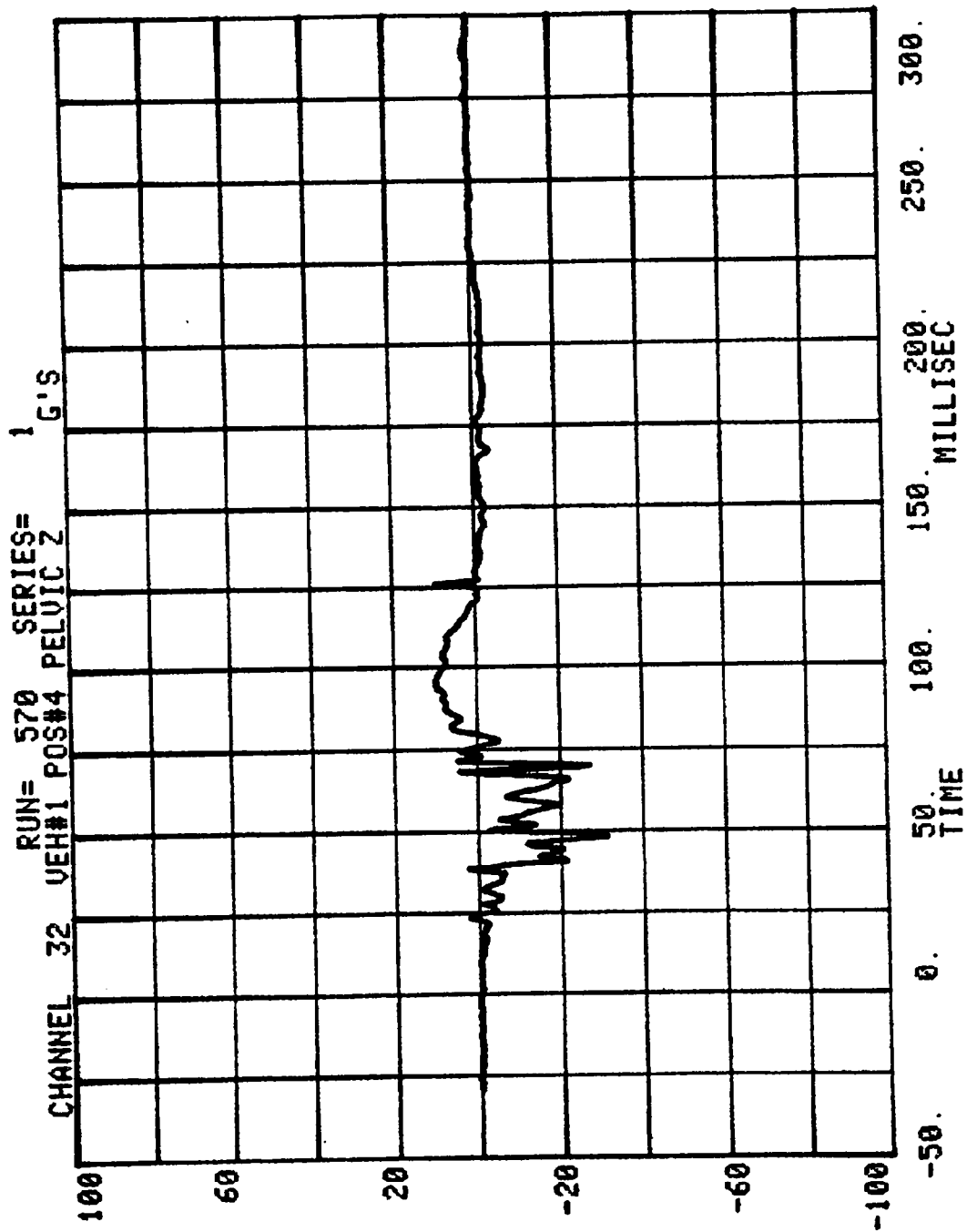








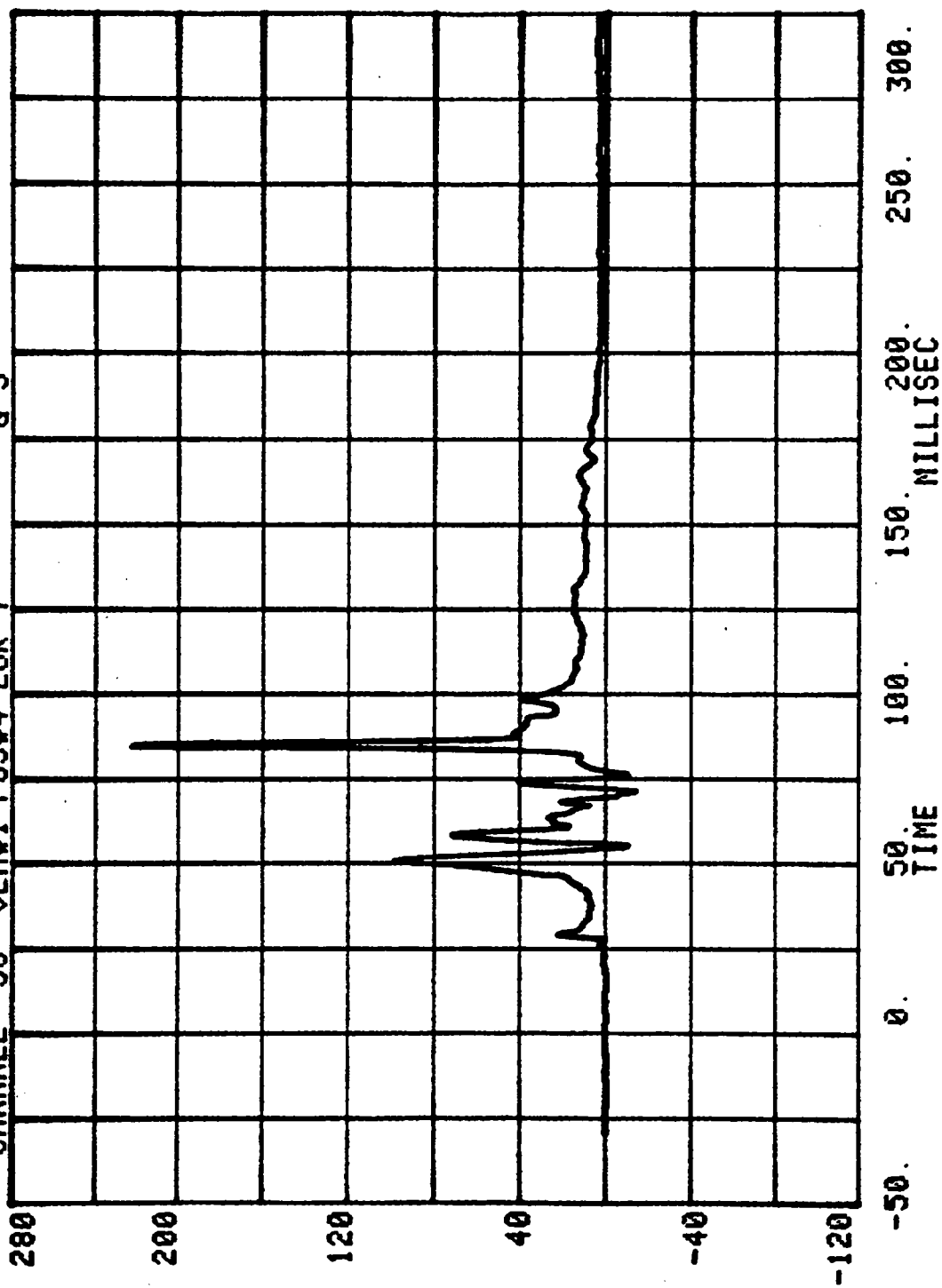


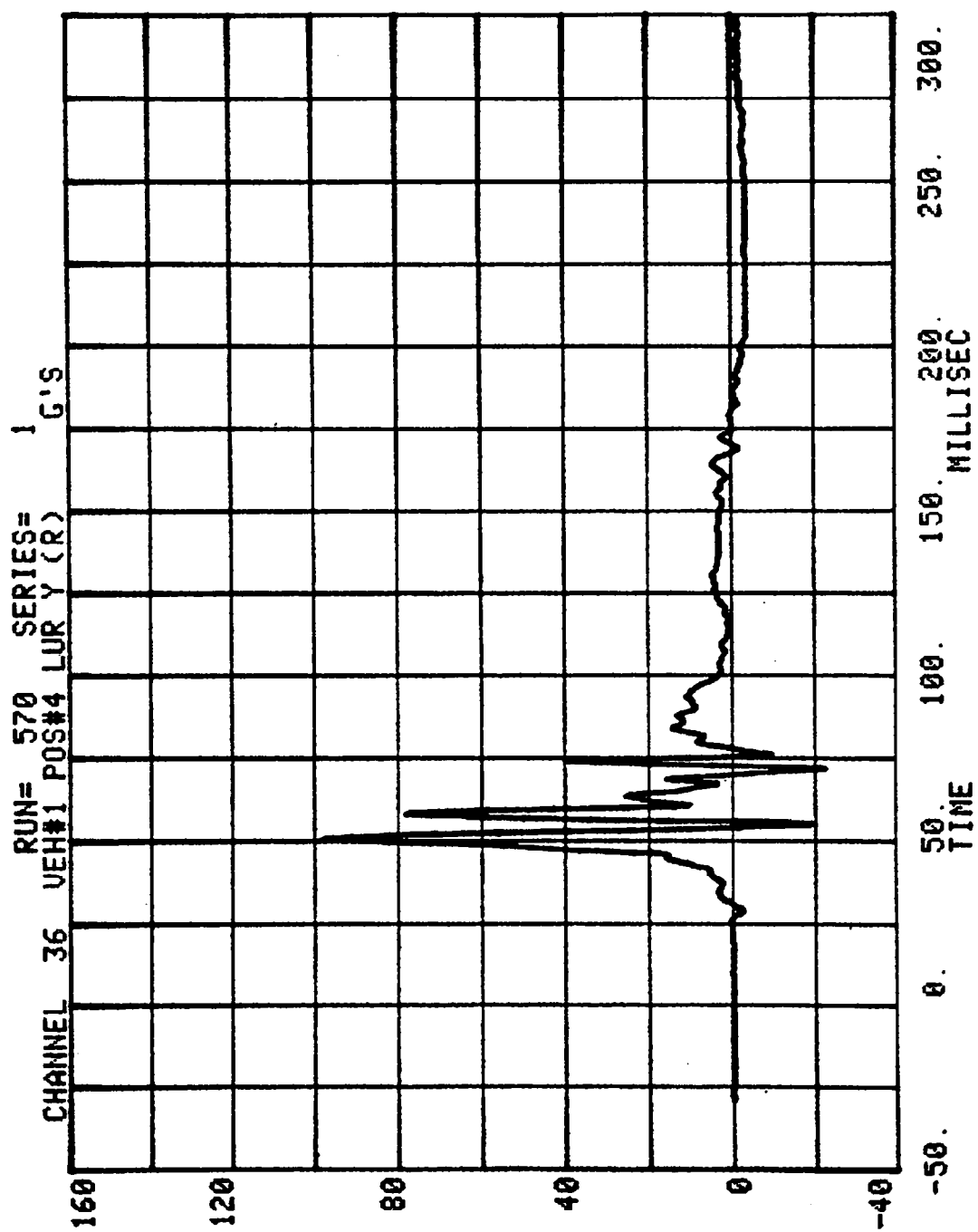


CHANNEL 35 VEH#1 POS#4 LUR Y

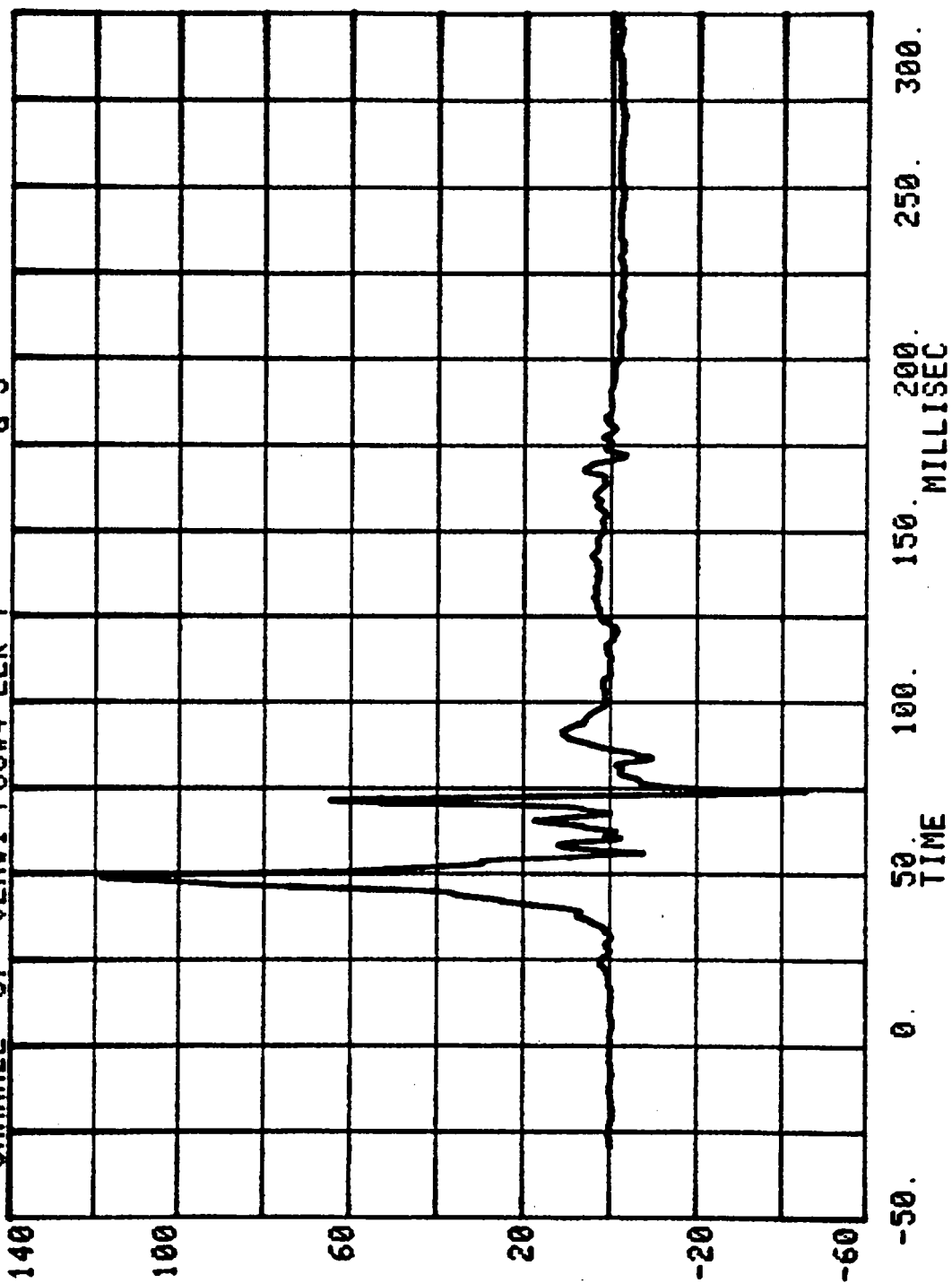
RUN= 570 SERIES= 1

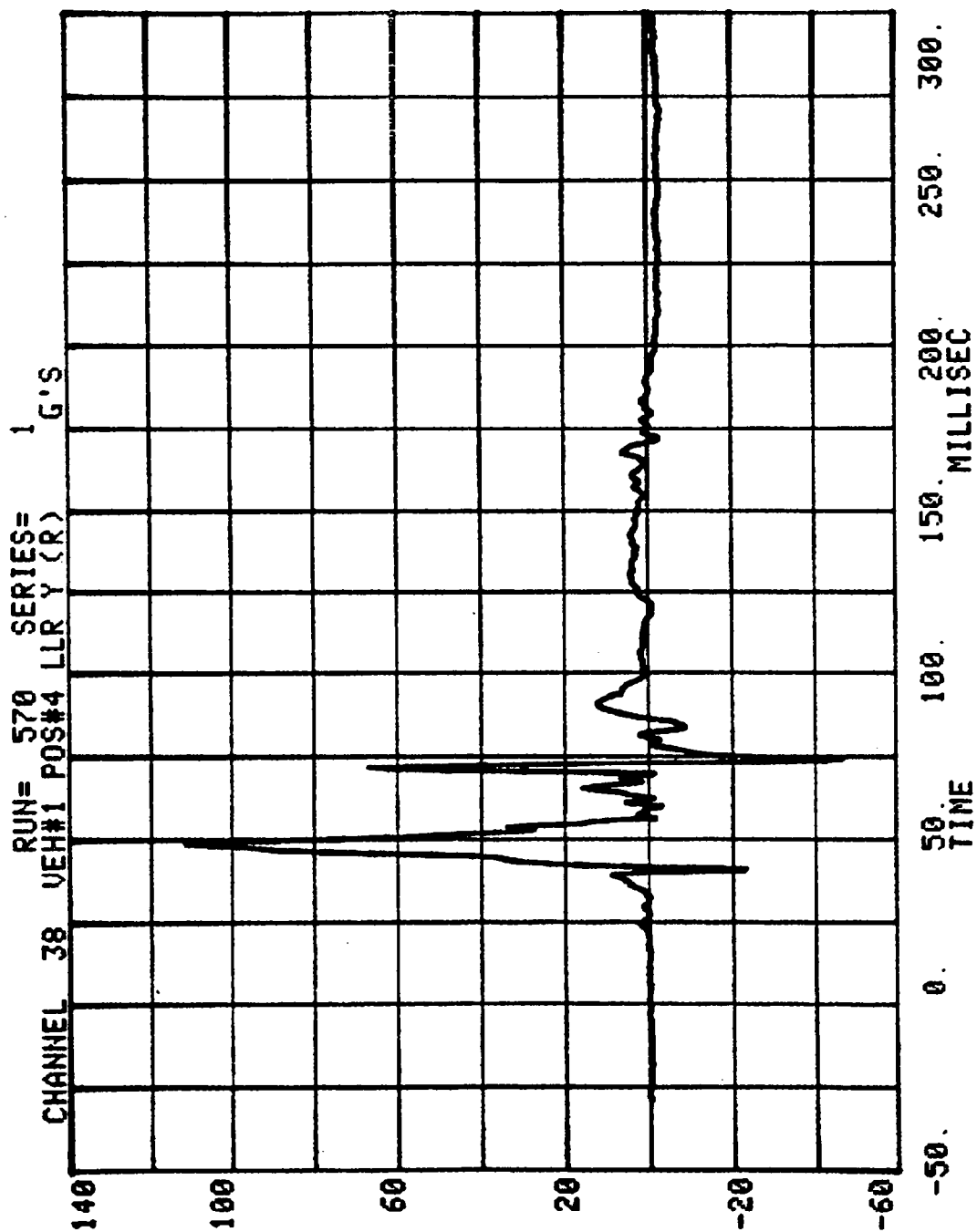
G'S



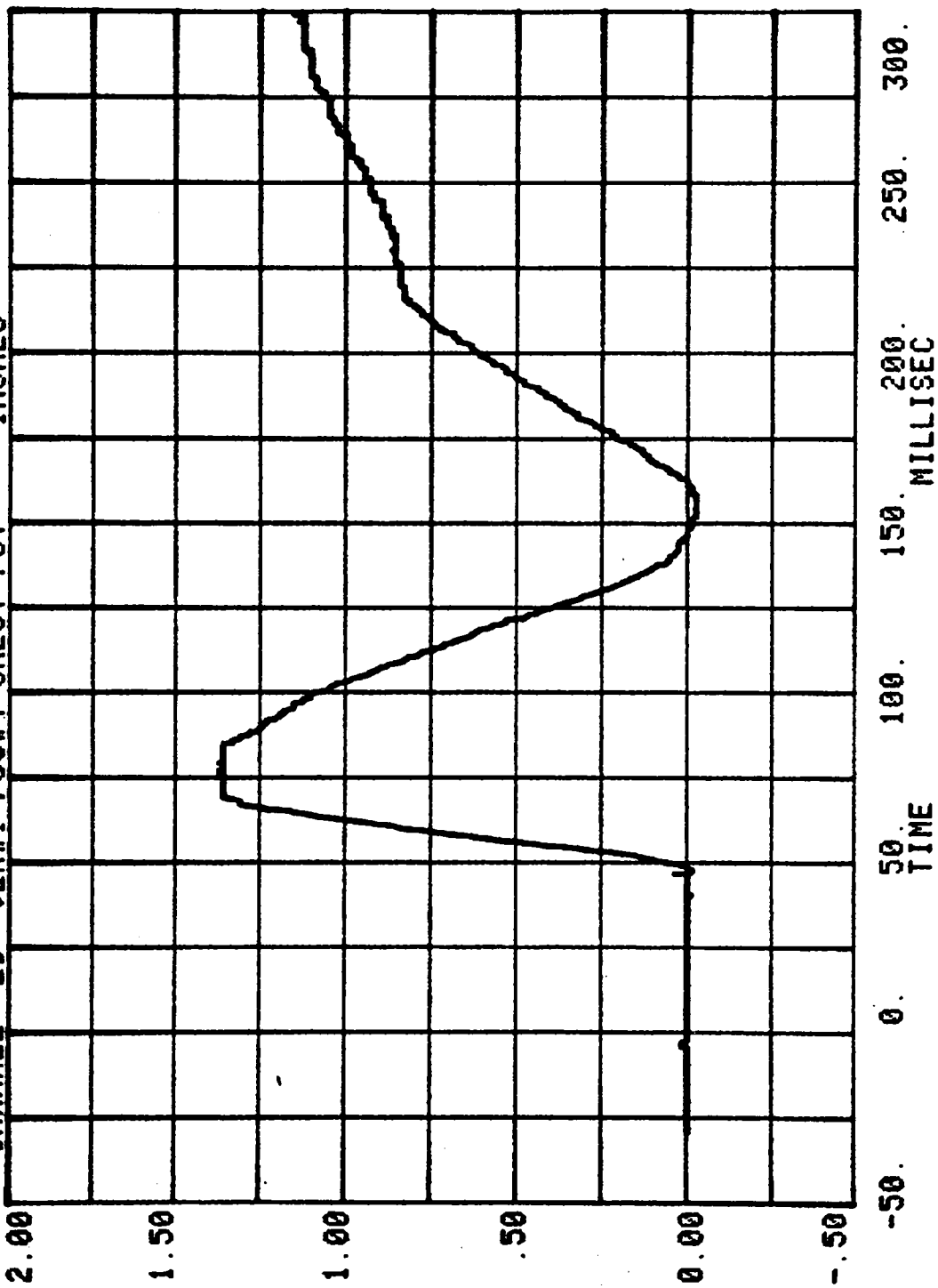


CHANNEL 37 RUN= 570 SERIES= 1
VEH#1 POS#4 LLR Y G'S





CHANNEL 26 RUN= 570 SERIES= 1
VEH#1 POS#4 CHEST POT 1 INCHES



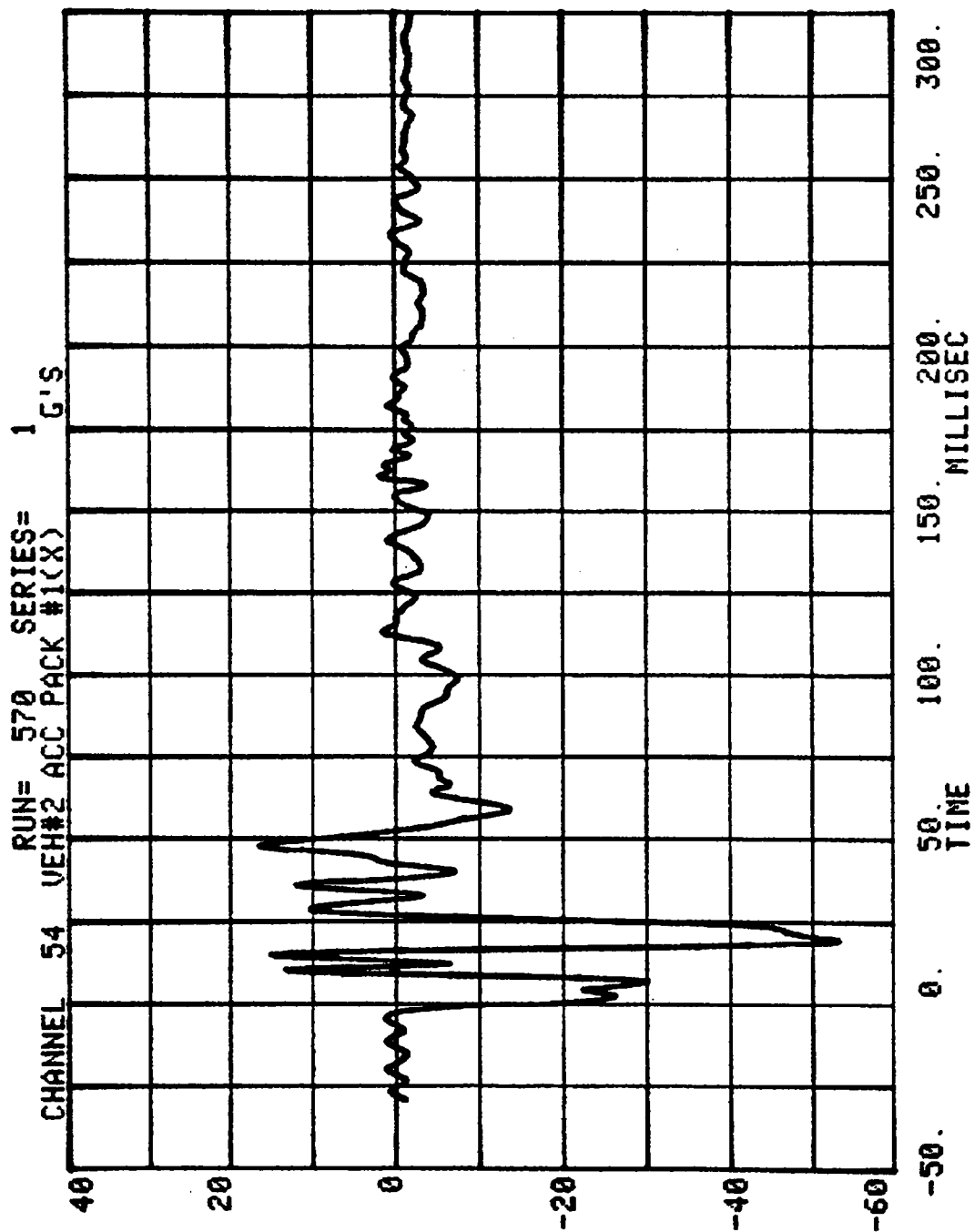
TEST NO. 907-1-570

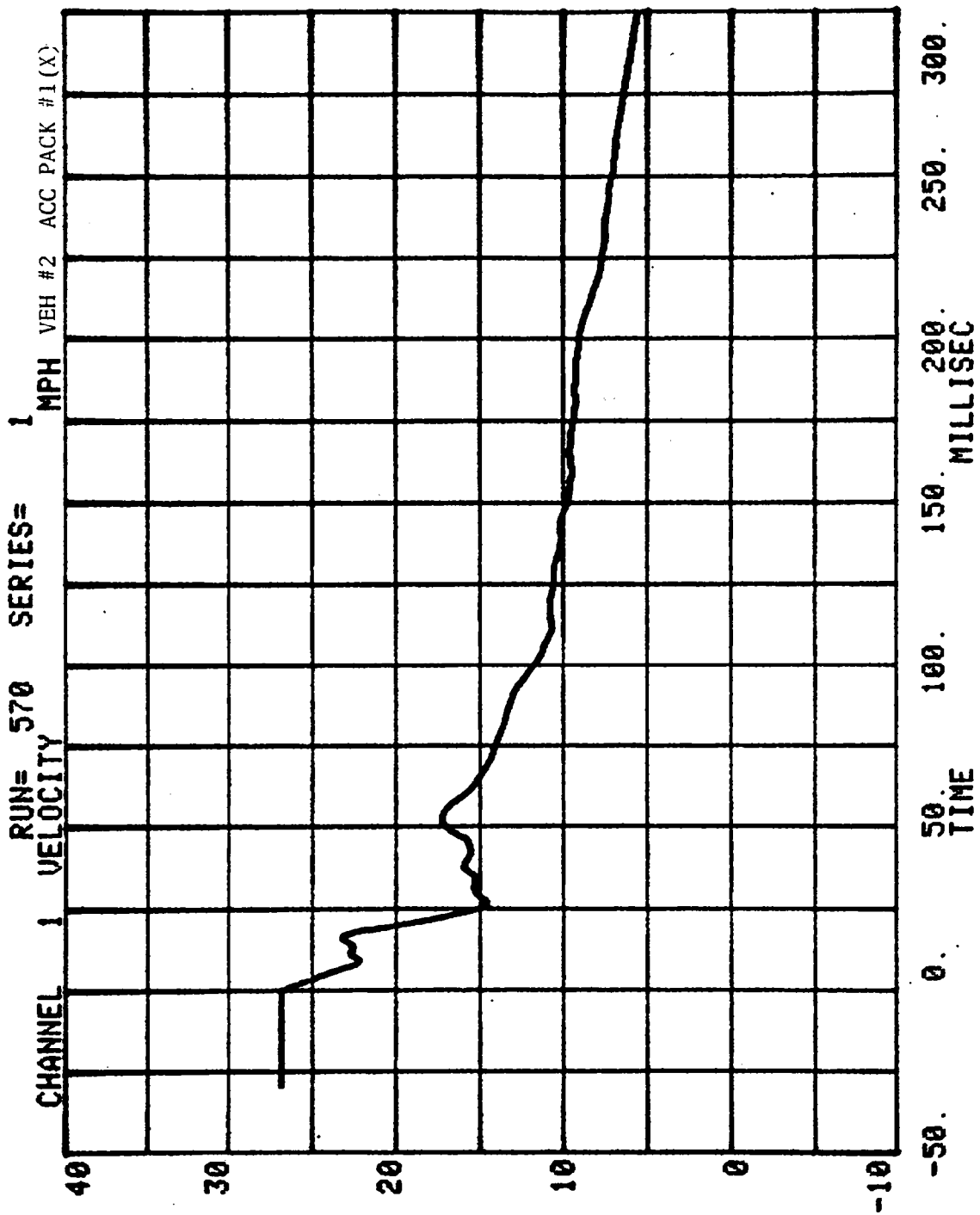
1982 CHEVROLET CITATION

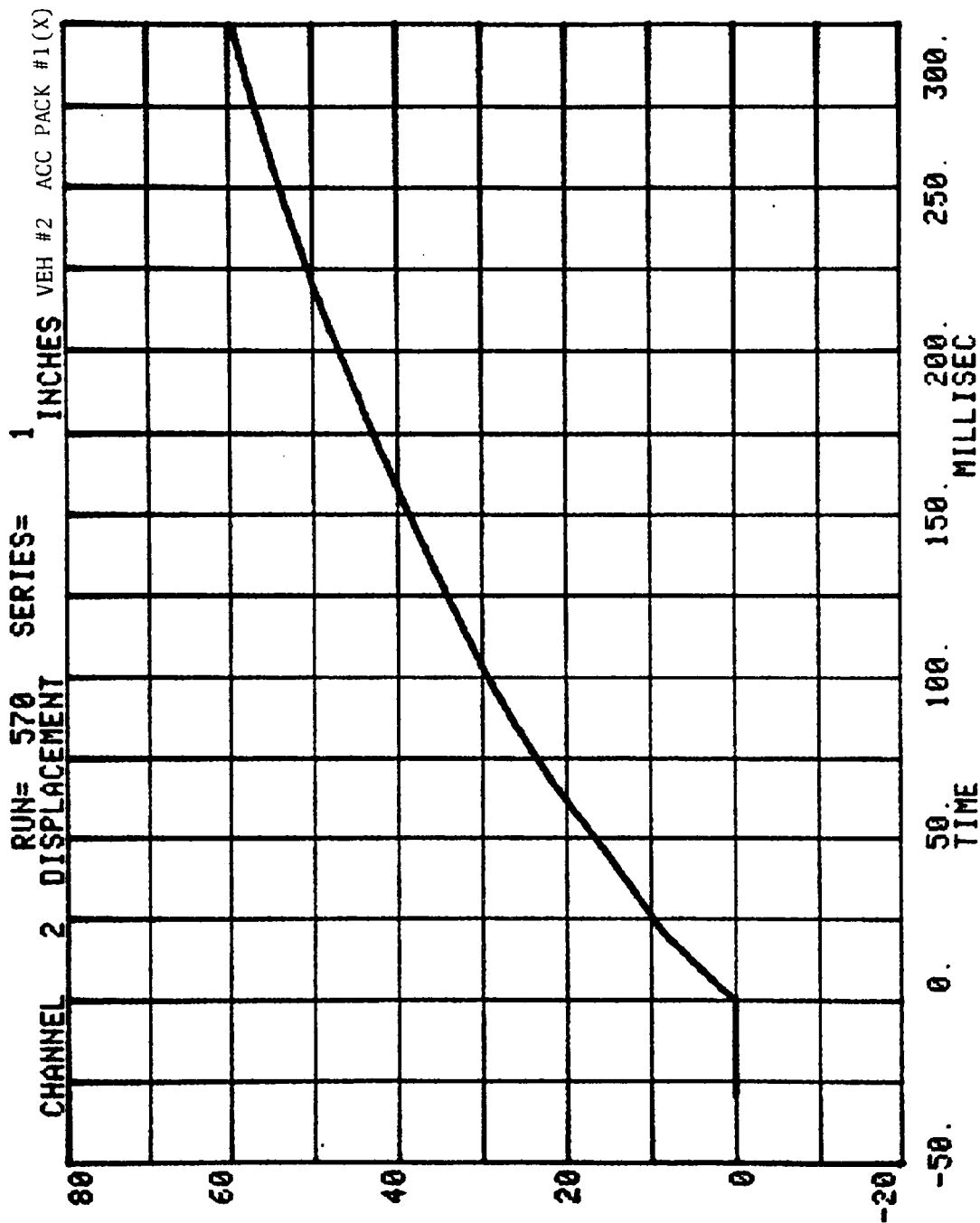
VEHICLE DATA

FILTER CHANNEL CLASS

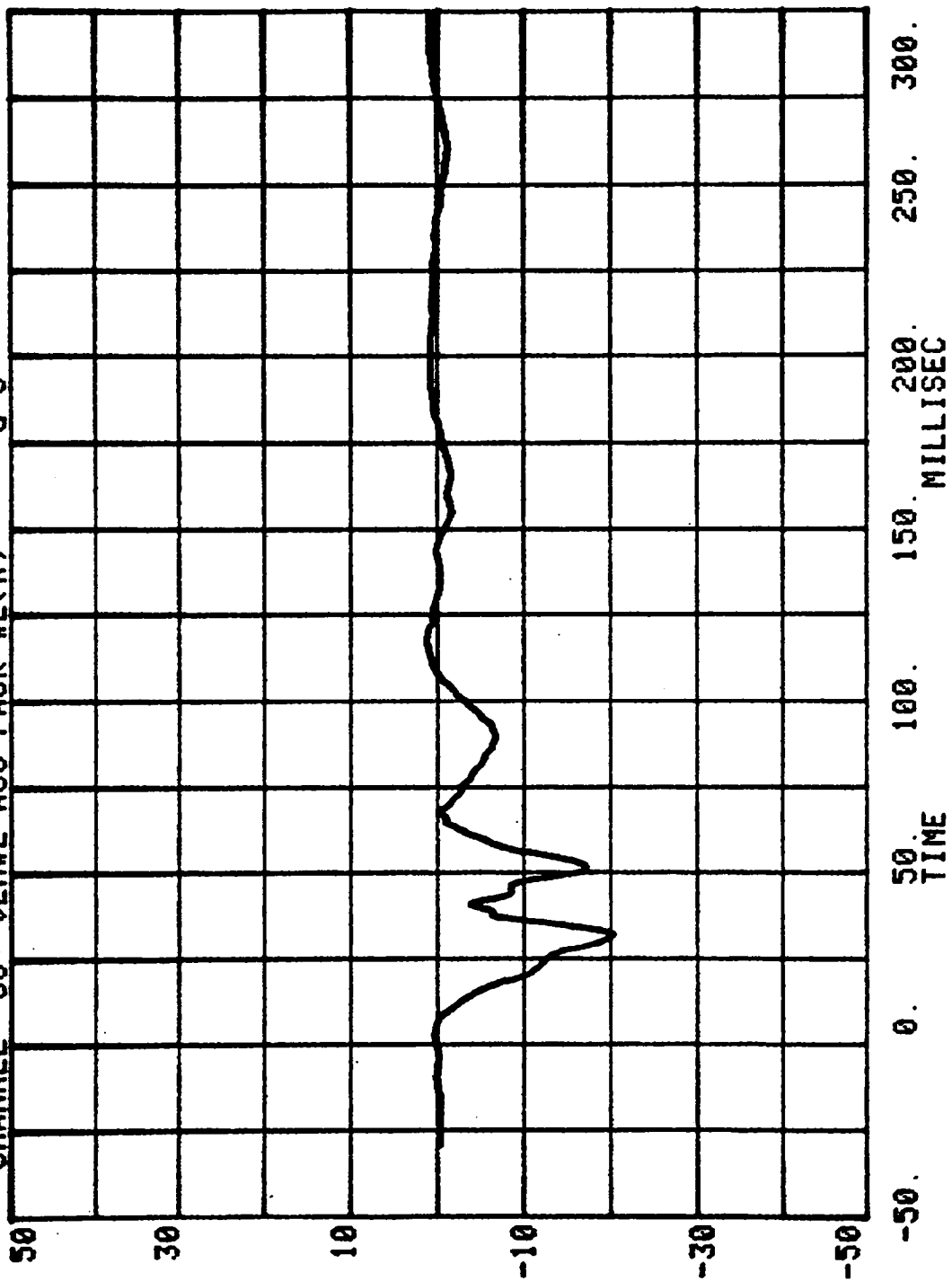
60

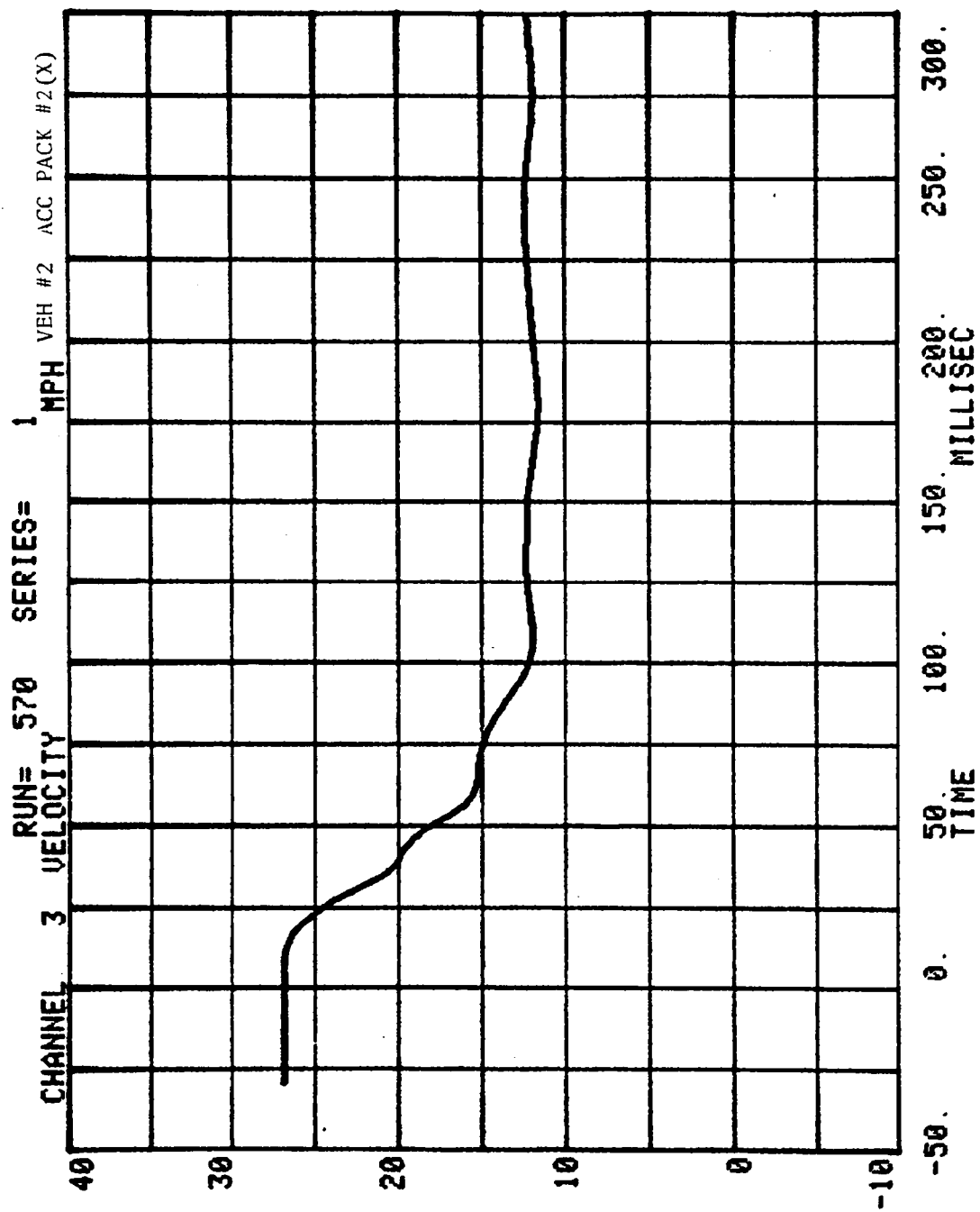


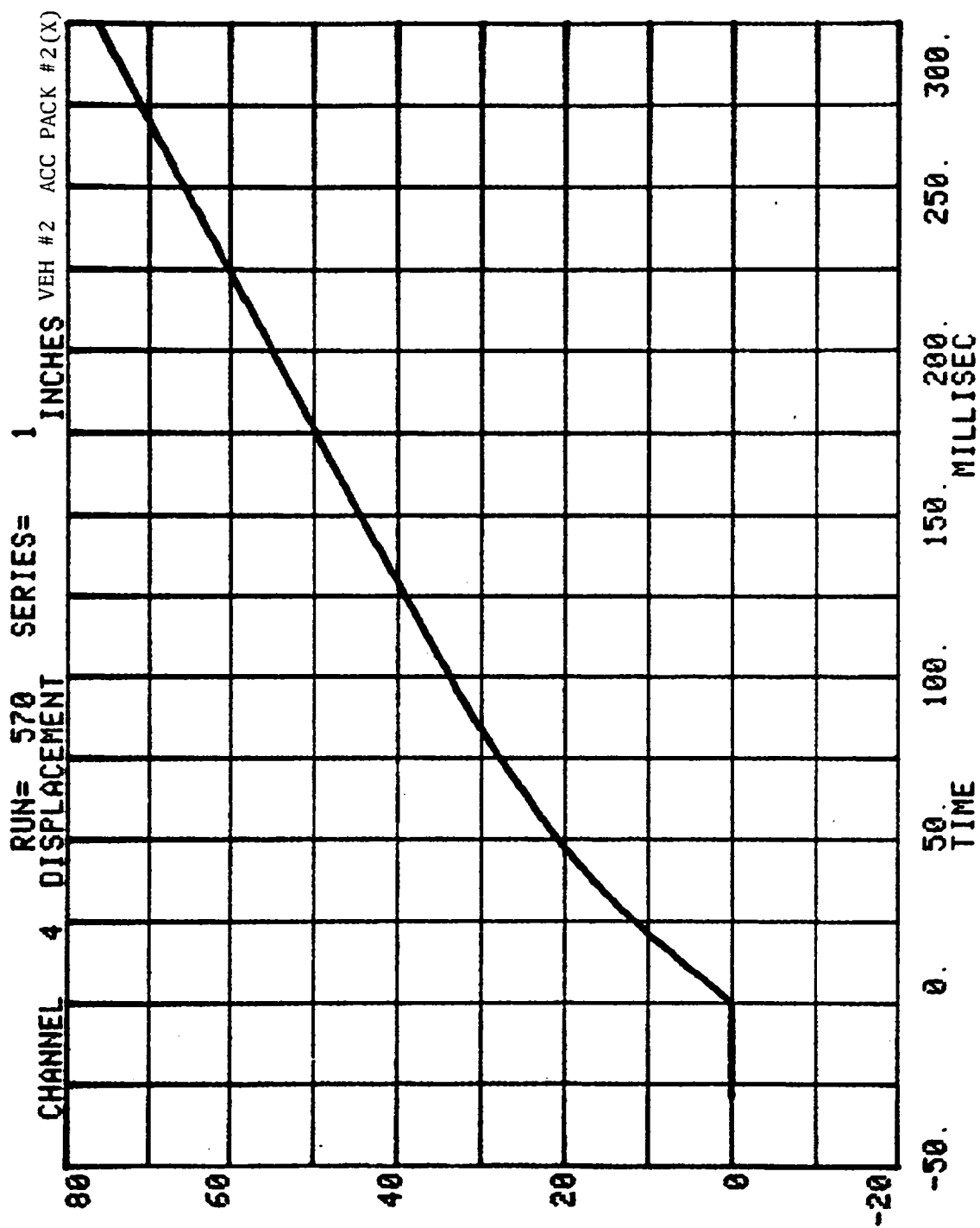


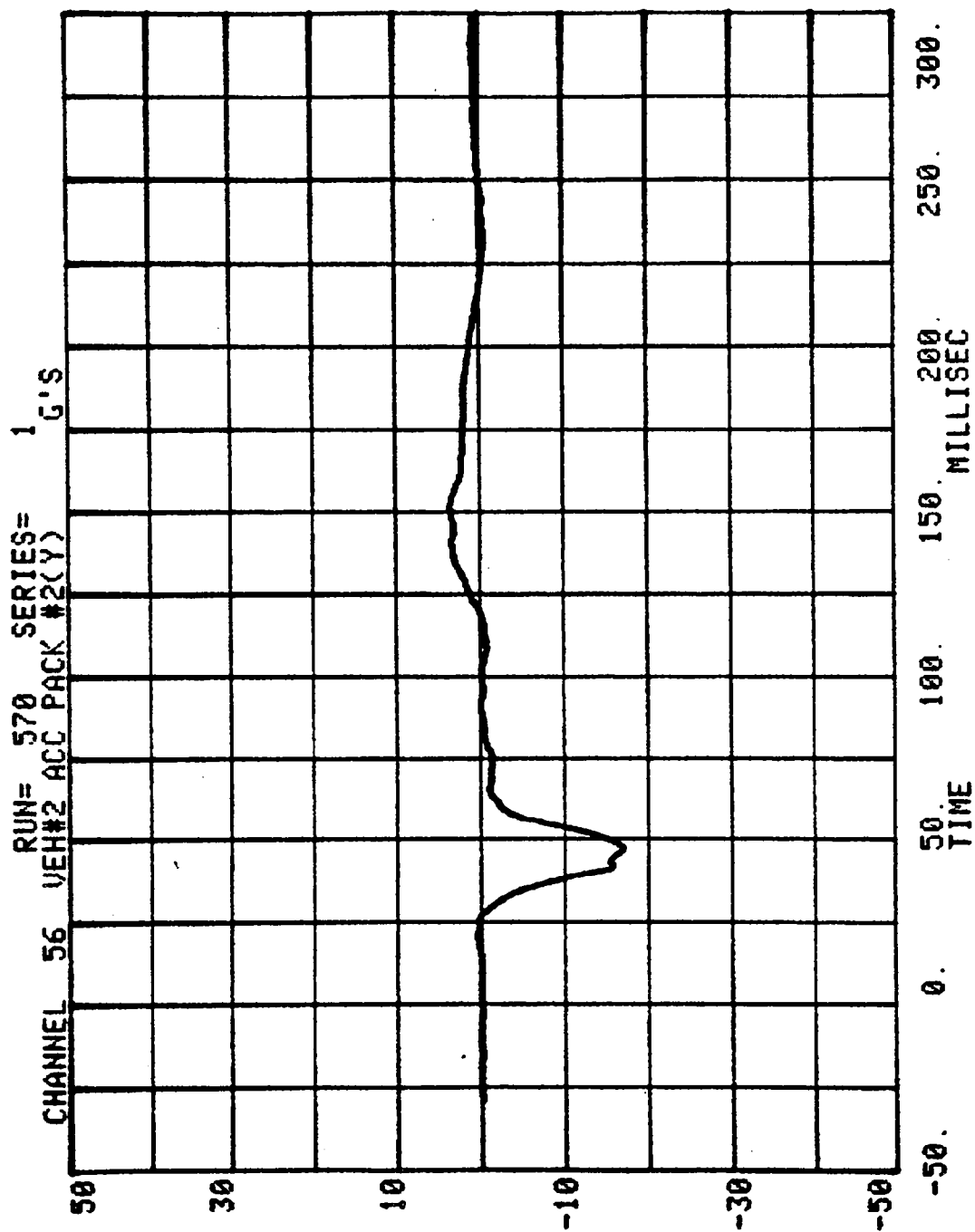


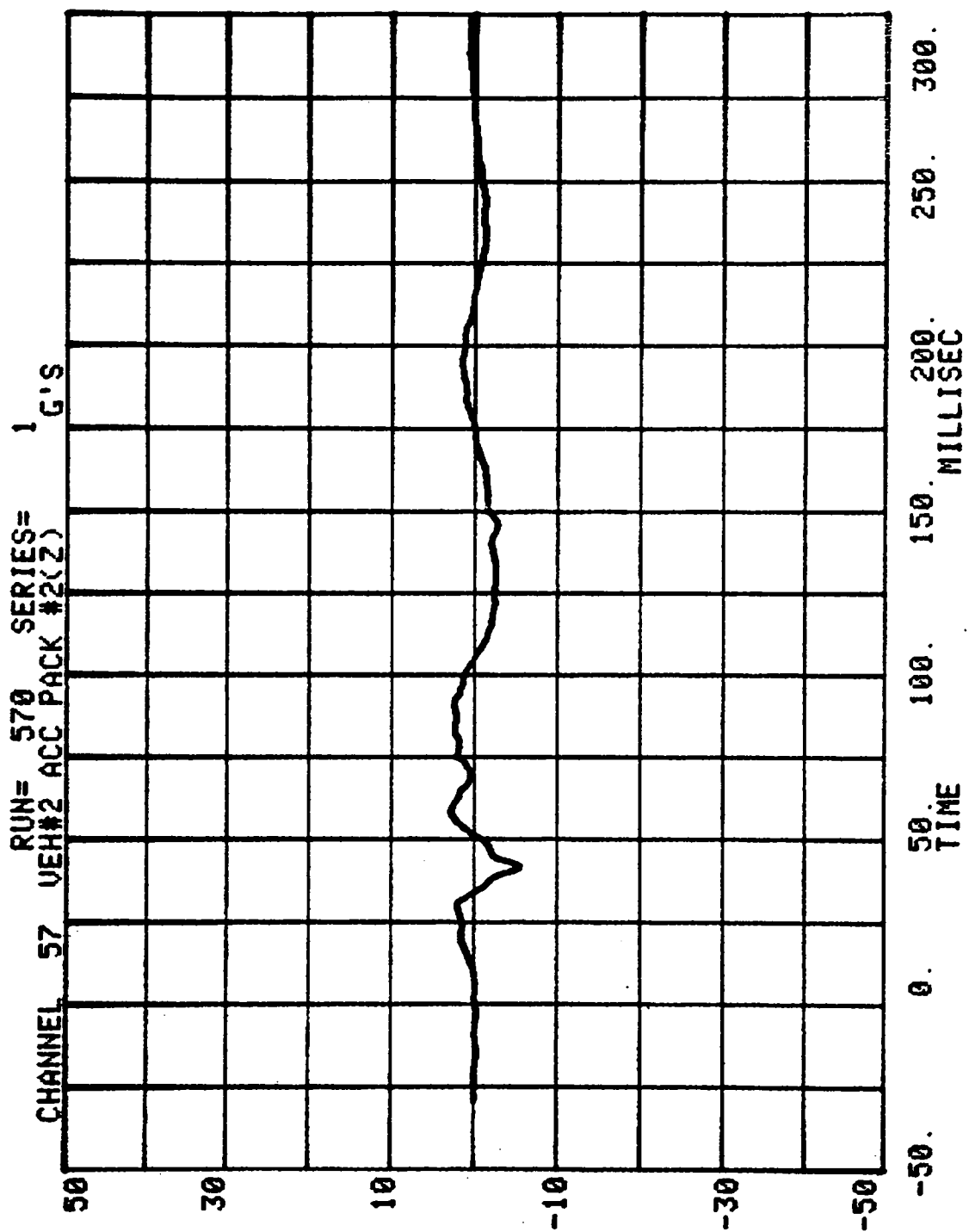
CHANNEL 55 RUN= 570 SERIES= 1 G'S
VEH#2 ACC PACK #2(X)

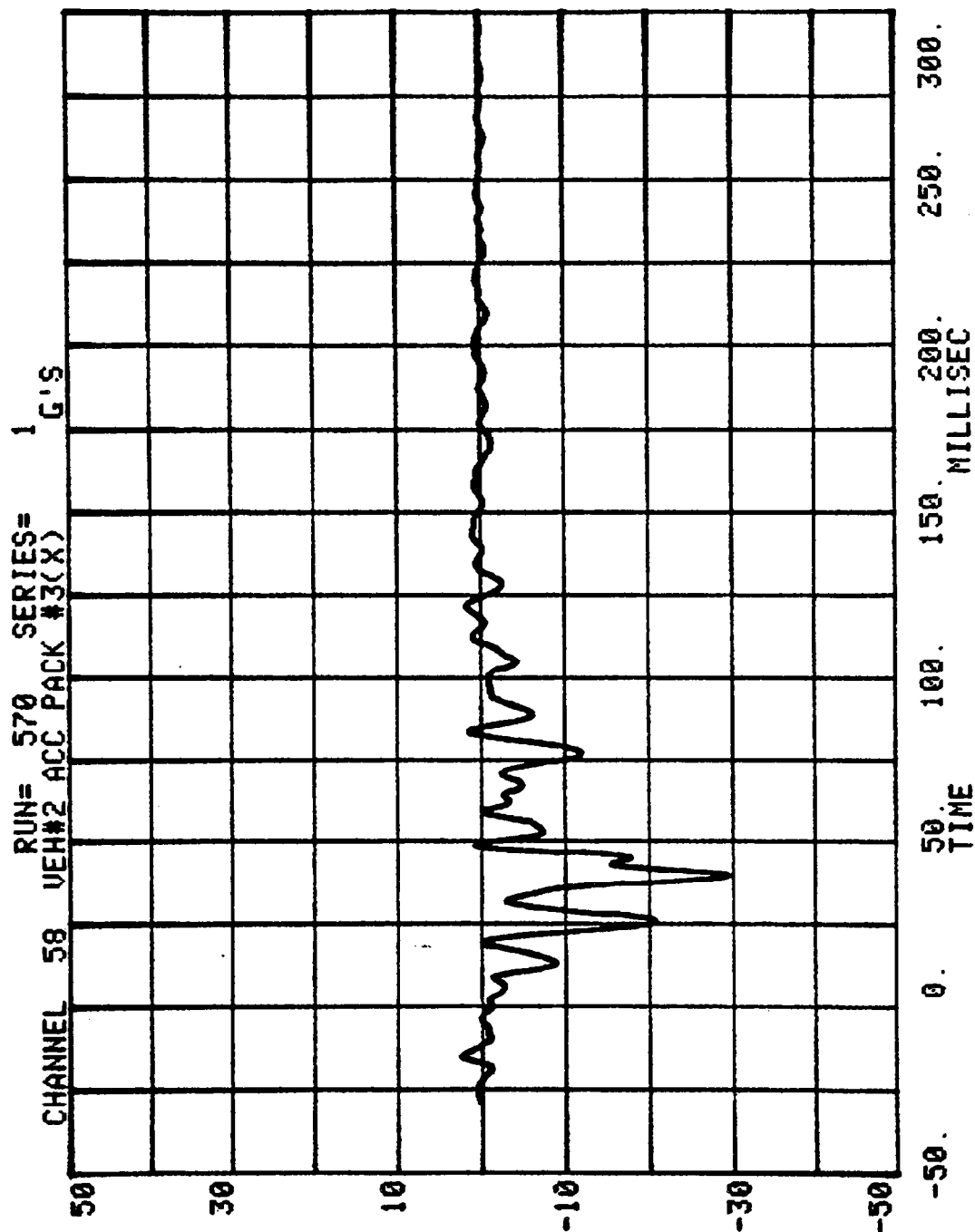


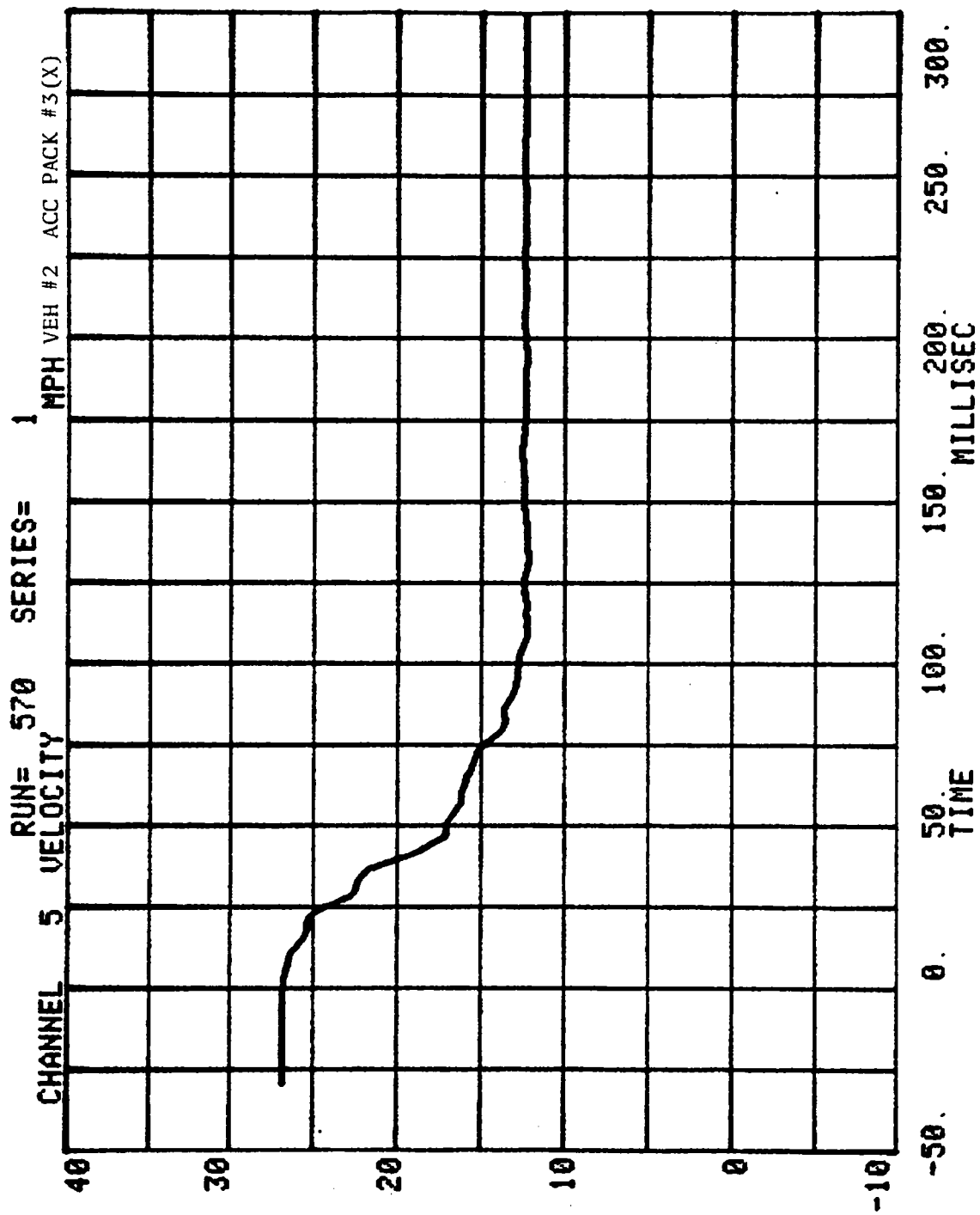


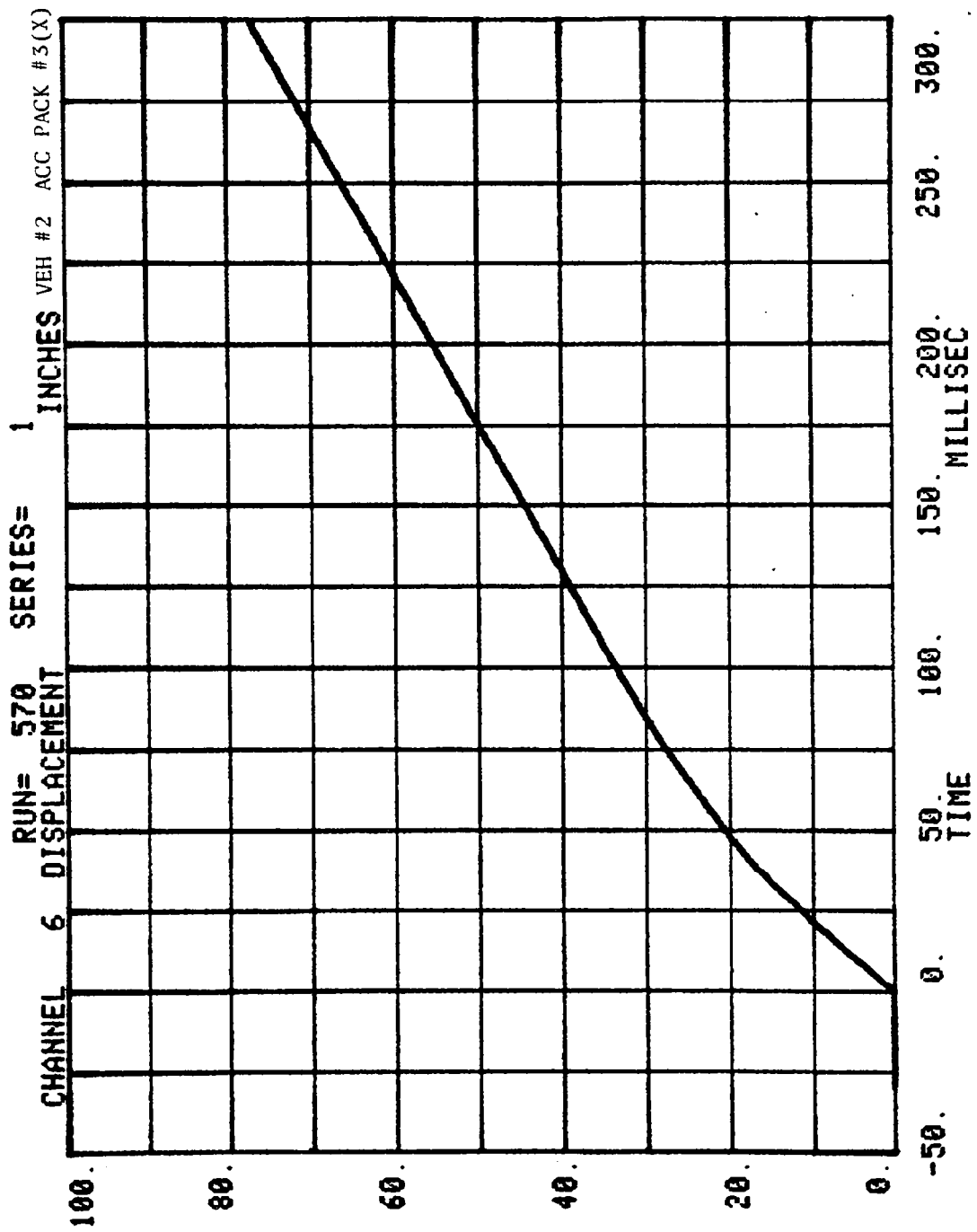


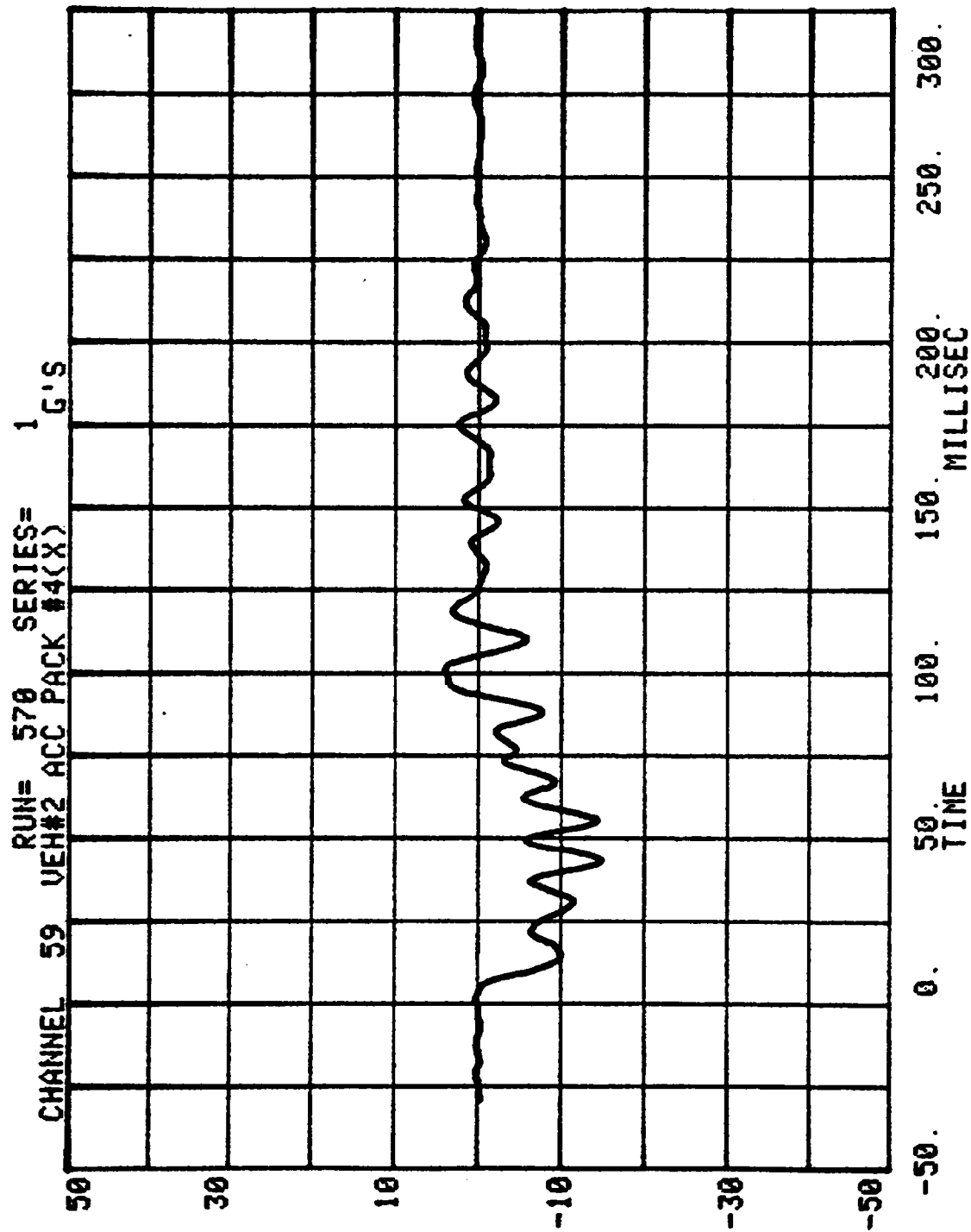


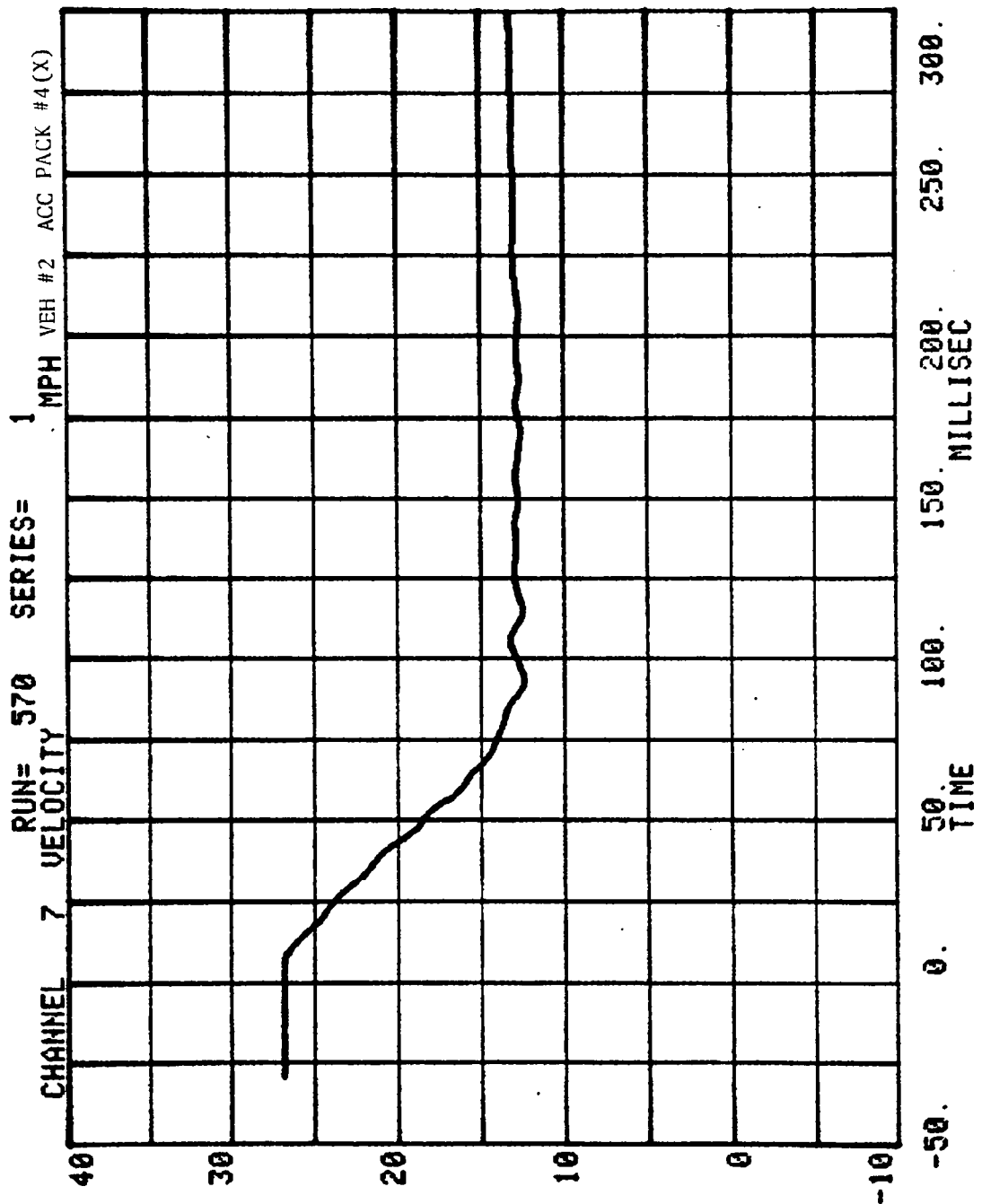


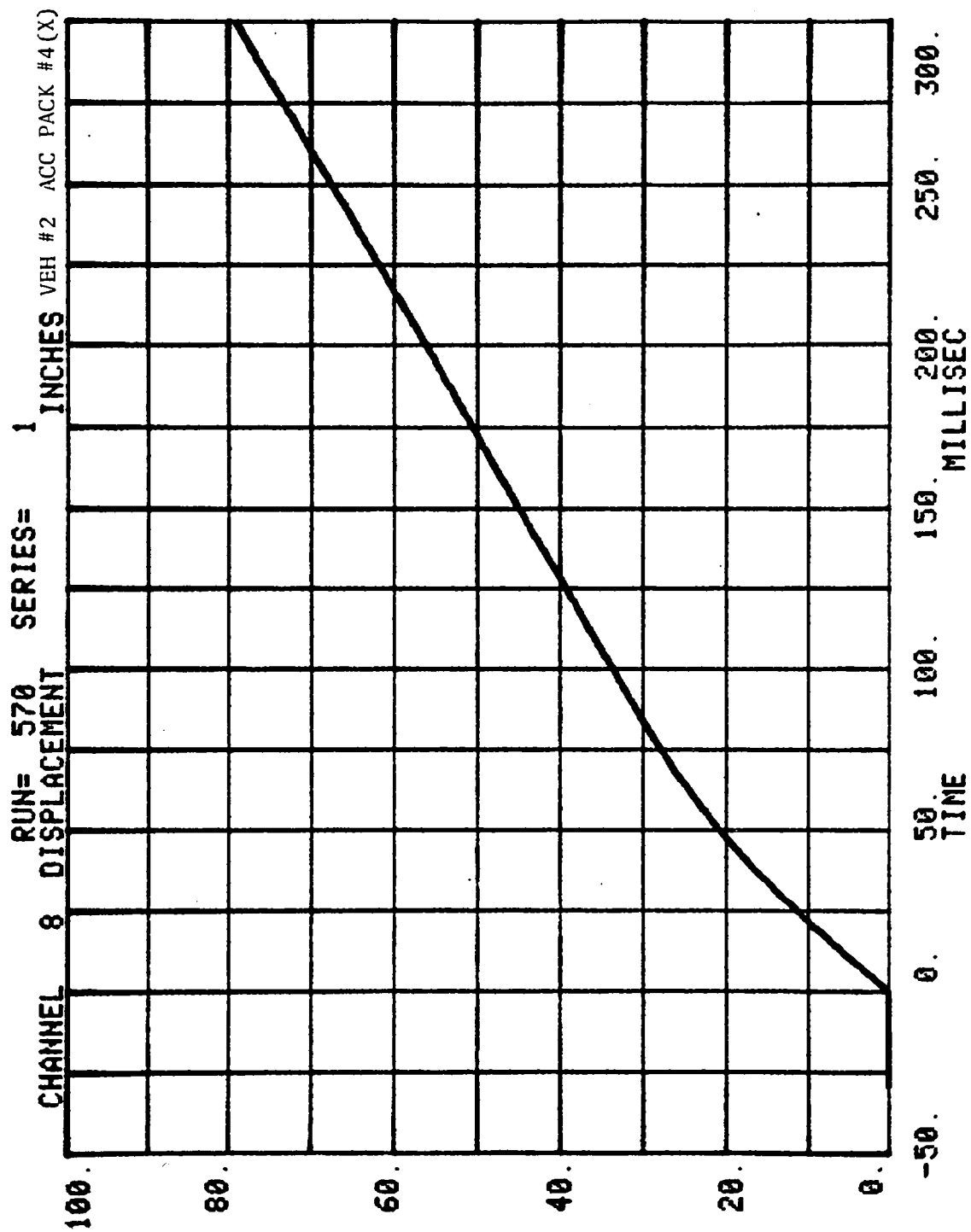


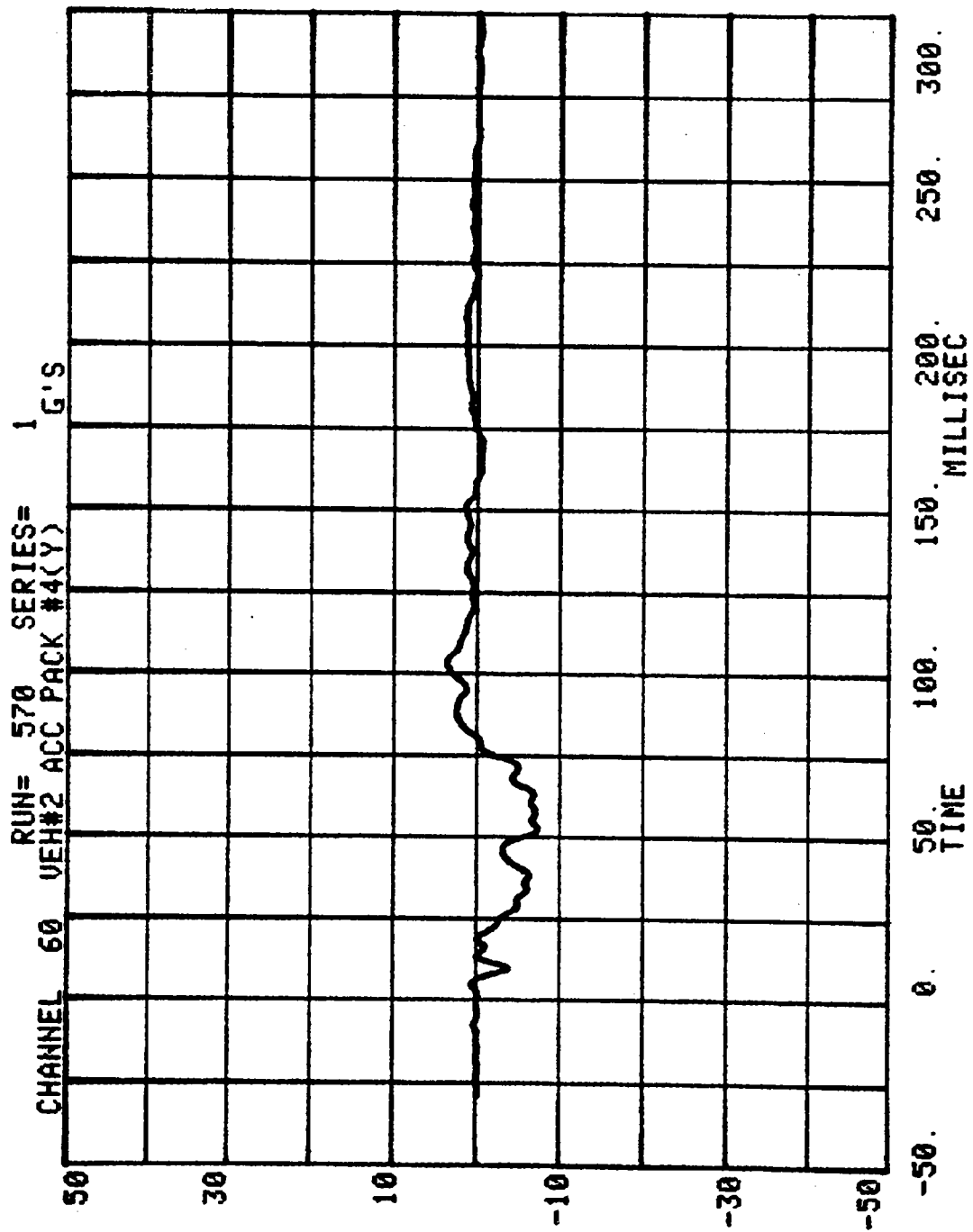


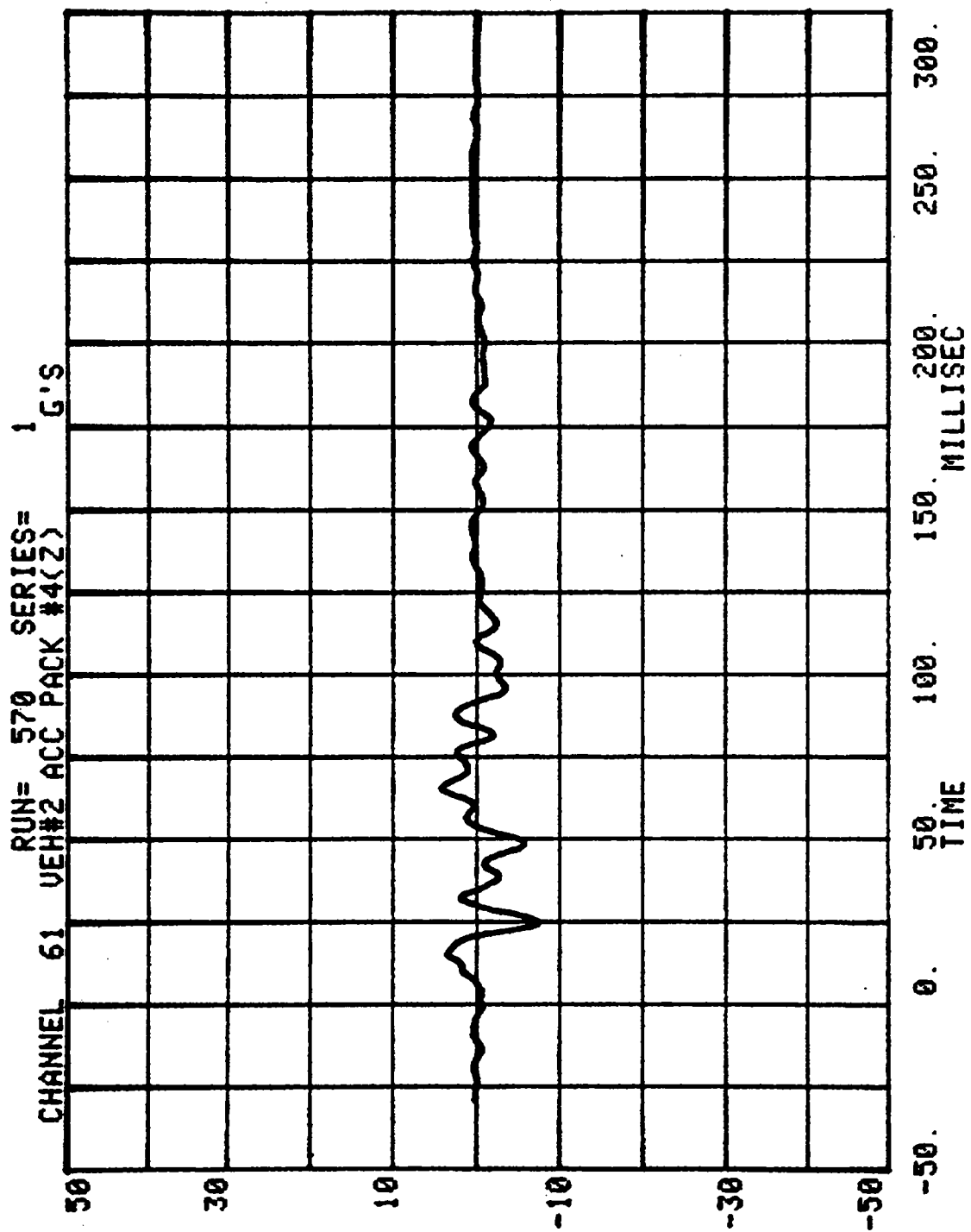


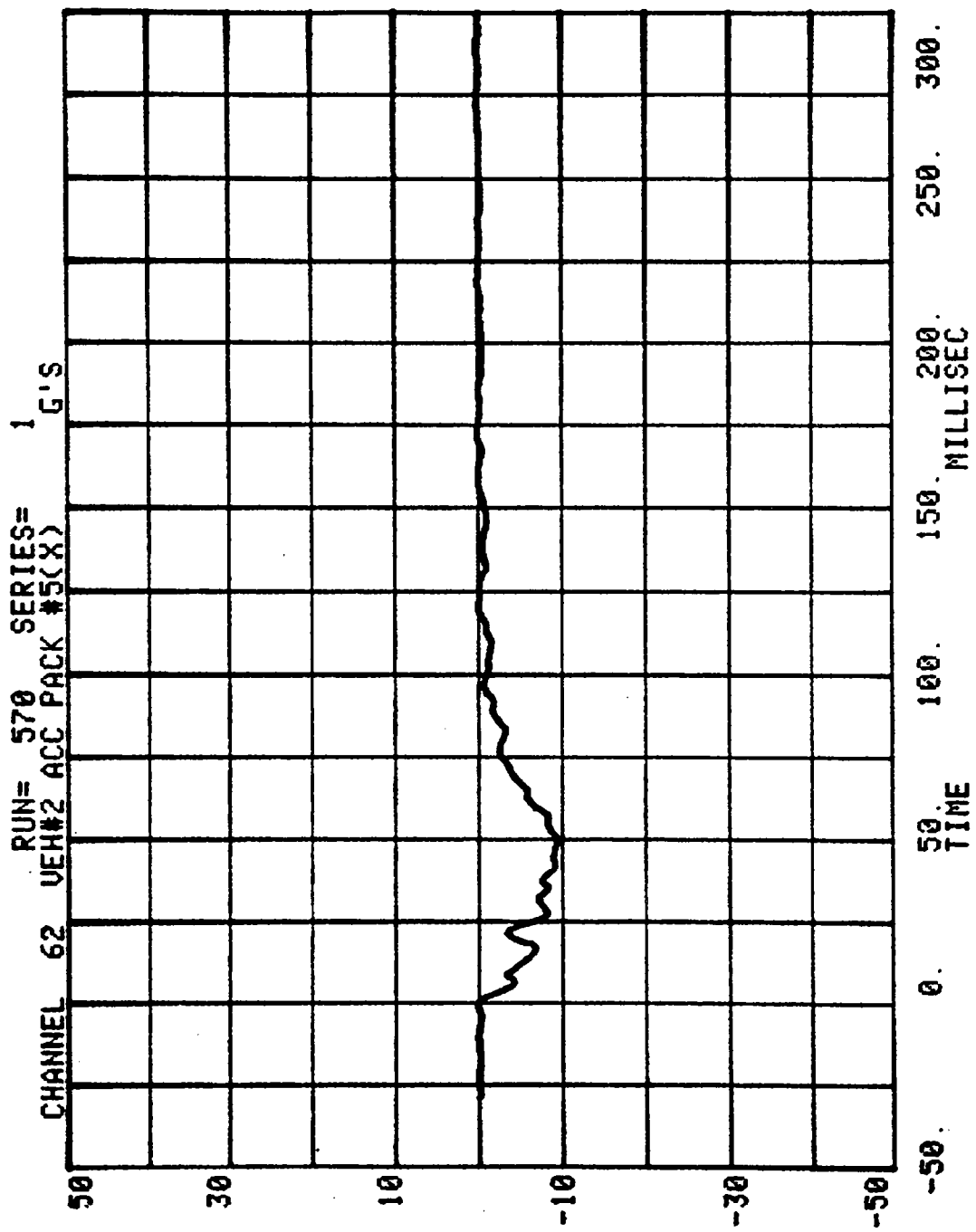


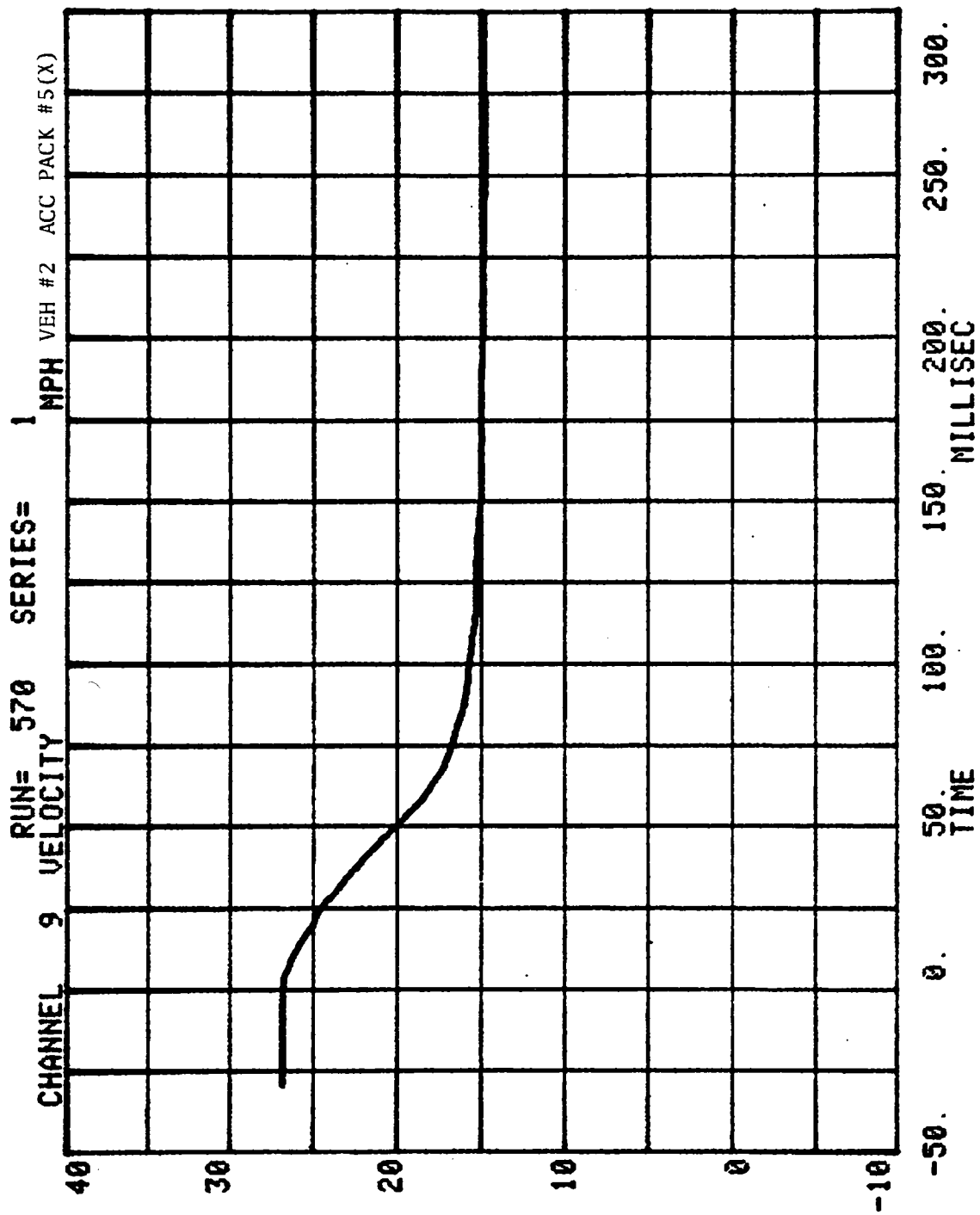


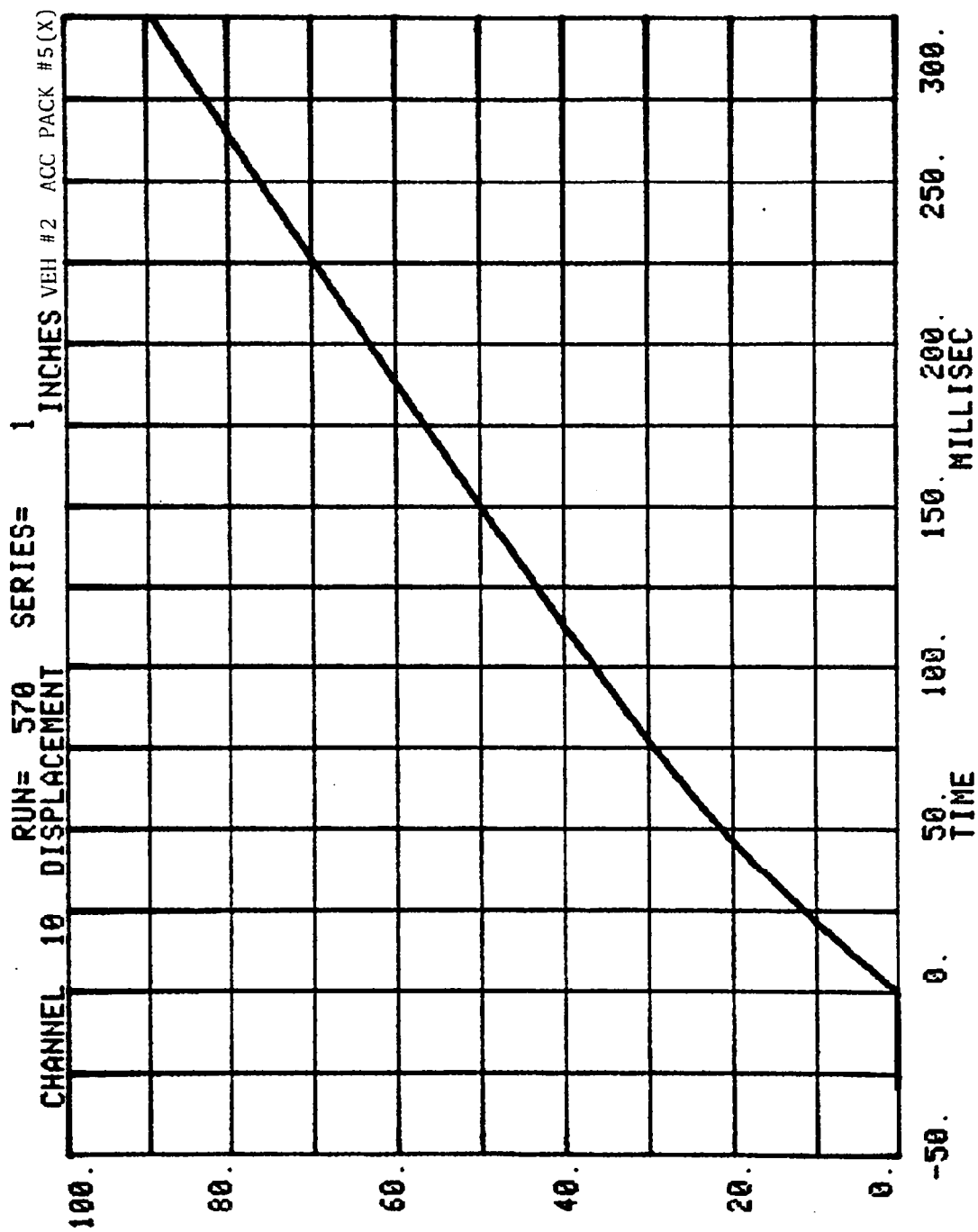




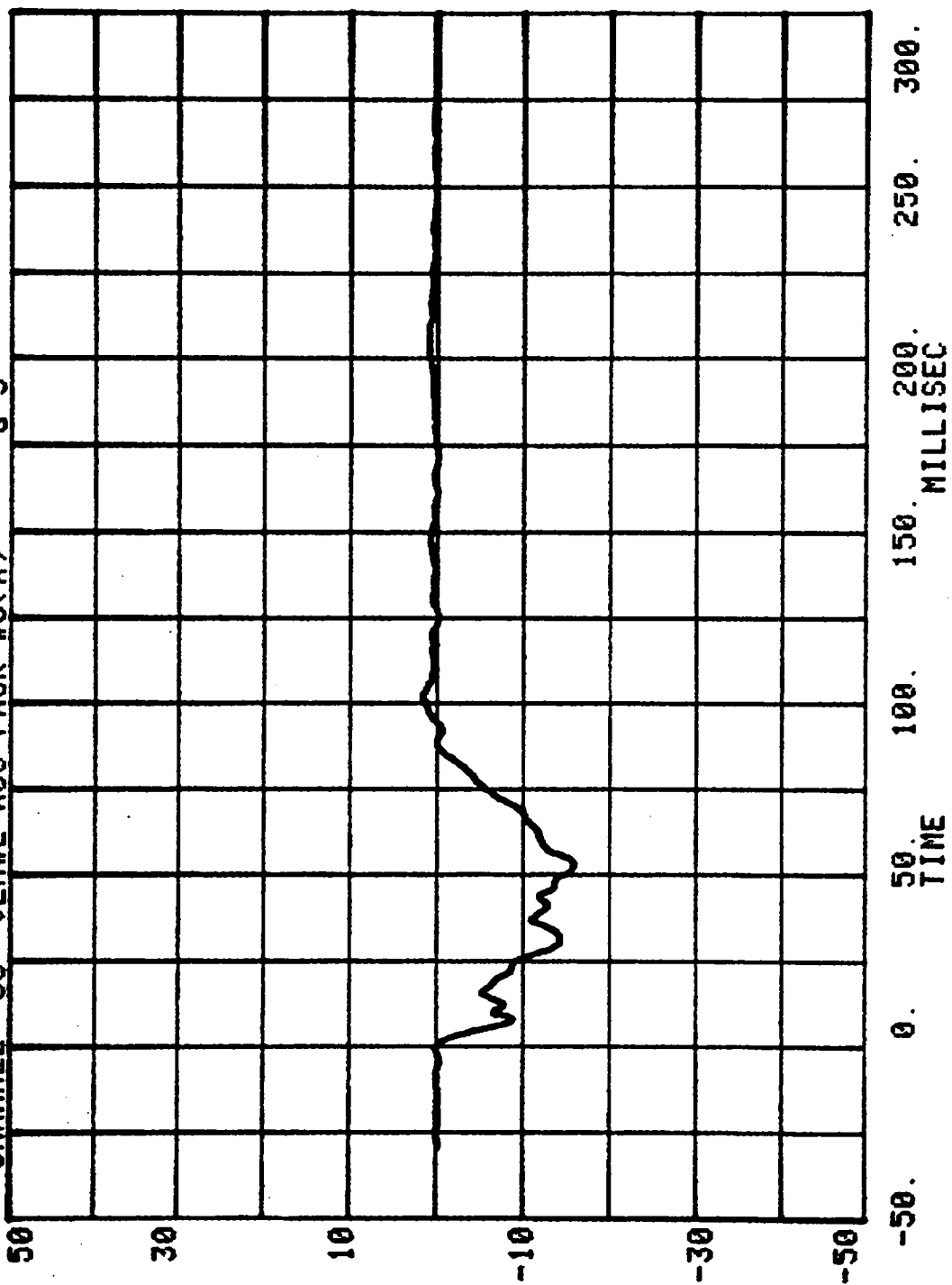


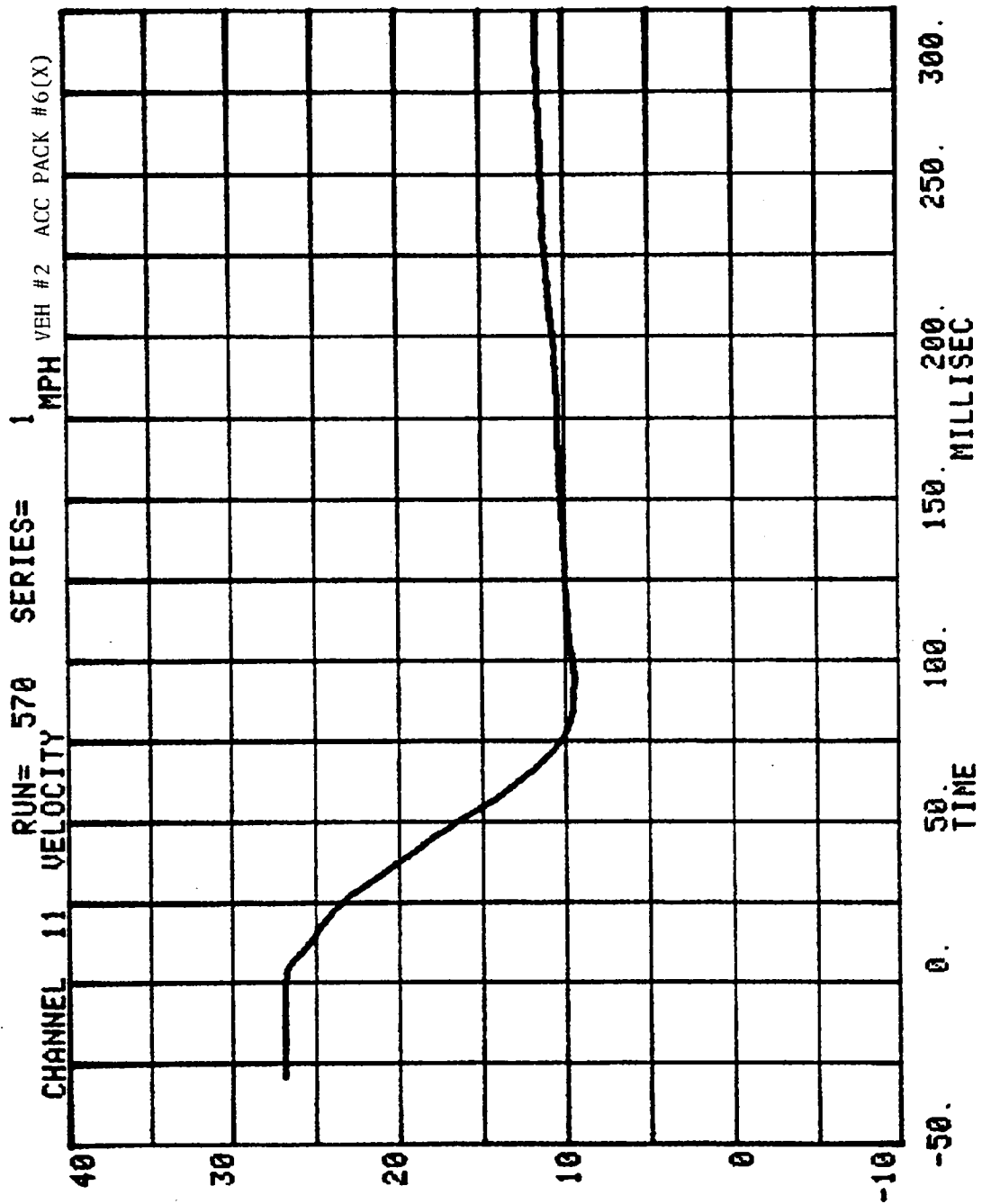


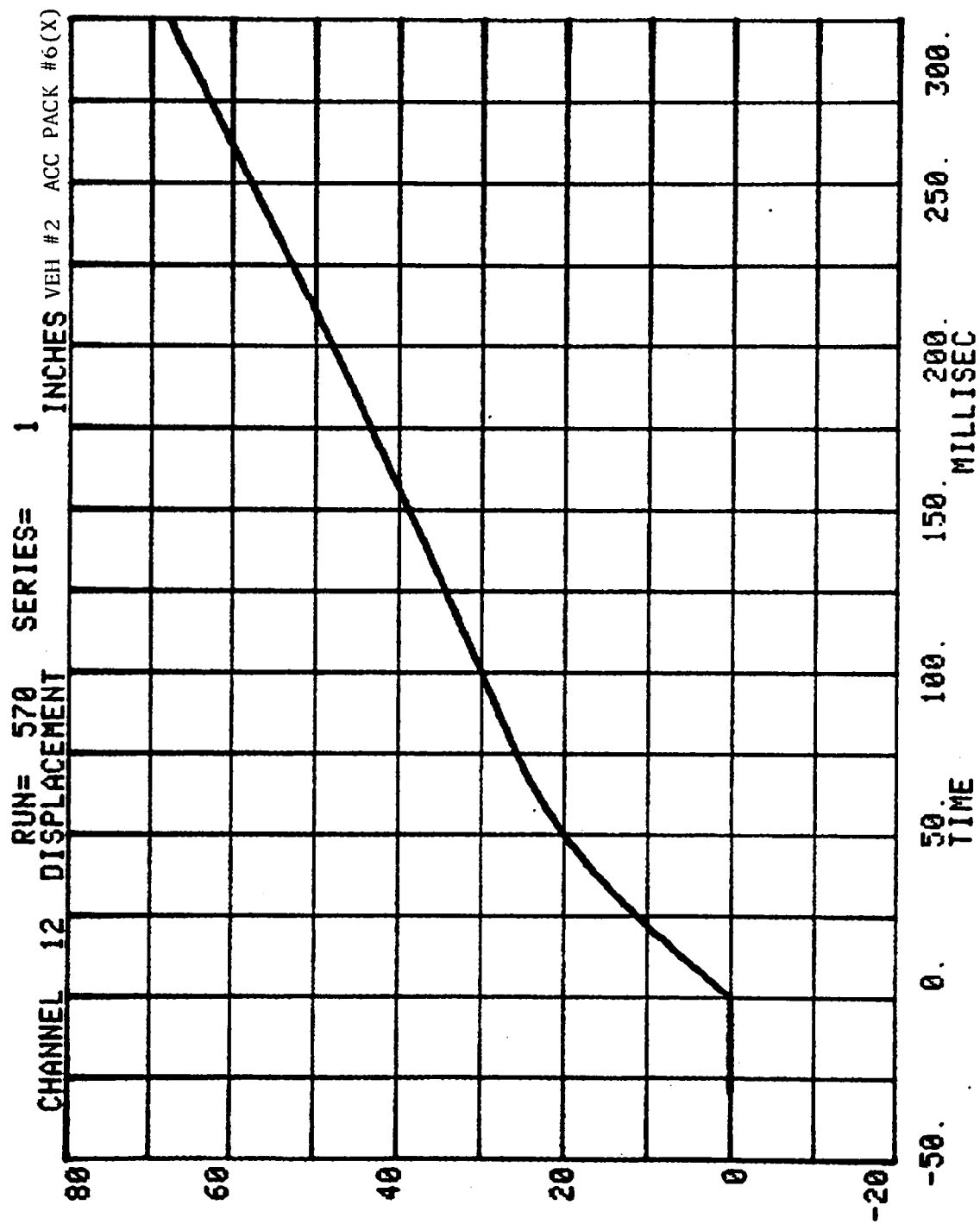




CHANNEL 63 RUN= 570 SERIES= 1 G'S
VEH#2 ACC PACK #6(X)







CHANNEL 64 RUN= 570 SERIES= 1 G'S
VEH#2 ACC PACK #7(X)

